



TERREQUIP ENVIRONMENTAL
PTY LTD PTY LTD

WATER MANAGEMENT PLAN





**TERREQUIP ENVIRONMENTAL
PTY LTD PTY LTD
WATER MANAGEMENT PLAN**

20 NOVEMBER 2020

WARRICK LIMESTONE MINE

EPIC ENVIRONMENTAL PTY LTD

Level 6, 193 North Quay,
Brisbane, QLD 4000

Email: enquiries@epicenvironmental.com.au

www.epicenvironmental.com.au

ABN: 54 169 579 275

ACN: 169 579 275





CONTENTS

1	PURPOSE AND SCOPE	1
2	LEGAL COMPLIANCE OBLIGATIONS	2
3	ENVIRONMENTAL VALUES AND RISK	3
4	RESPONSIBILITY	4
5	EXISTING ENVIRONMENT	5
5.1	SURFACE WATER	5
5.2	GROUNDWATER	5
5.3	SURROUNDING WATER USE	6
6	EROSION AND SEDIMENT CONTROL	7
6.1	MANAGEMENT OF EROSION AND SEDIMENT CONTROL	7
6.2	SEDIMENT DAMS	7
6.3	SEDIMENT DAM WATER MANAGEMENT	8
7	WATER MONITORING PROGRAM	10
7.1	SURFACE WATER QUALITY MONITORING PROGRAM	10
7.1.1	Quarterly Surface Water Quality Monitoring	10
7.2	WATER LEVEL MONITORING AND MANAGEMENT IN DAMS	11
7.2.1	Catchment Dam 2 – Catchment Dam 1 – Sediment Dam 7 System	11
7.2.2	Sediment Dam 3 & 4 – Aspal Pit Void	11
7.2.3	Sediment Dam 2 – Sediment Dam 1 – Aspal Pit Void	12
7.2.4	Sediment Dam 8, Sediment Dam 9 – East-West Pit Void	12
8	REPORTING	13
9	INCIDENTS, COMPLAINTS AND REGULATORY BREACHES	14
9.1	INCIDENTS	14
9.2	EMERGENCY RESPONSE	14
9.3	REGULATORY BREACH	14
10	CHANGES TO OPERATIONS	15
11	TRAINING	15
12	REVIEW	16
13	LIMITATIONS AND DISCLAIMER	17
14	REFERENCES	18

LIST OF TABLES

Table 1: Condition C10 of the EA	2
Table 2: Water Management Responsibilities	4
Table 3: Erosion and Sediment Control Monitoring	7
Table 4: Sediment and Water Storage Dams	8
Table 5: Water Reporting Requirements	13



LIST OF APPENDICES

Appendix A – EA Sections C1-C16

Appendix B - Site Plan

Appendix C - Rainfall Data

Appendix D - Sub-Catchment Map



Document History and Status

Revision	Date Issued	Approved By	Date Approved	Revision Type	Issued To
A	20/11/2020			Draft for internal review	K. Douglas
0	20/11/2020	K. Douglas	20/11/2020	Issued to Client	J. Fuller

Printed:	20 November 2020
Last saved:	20 November 2020 11:33 AM
File name:	BE200142.01-RPT-WMP-Rev0
Author:	Dare Lawrence
Project manager:	Kirsty Douglas
Client:	TERREQUIP ENVIRONMENTAL PTY LTD PTY LTD
Document Title:	WATER MANAGEMENT PLAN
Document version:	Final
Project number:	BE200142.01



1 PURPOSE AND SCOPE

This document covers aspects of the water management required for Terrequip Environmental Pty Ltd (Terrequip Environmental) to comply with their requirements under the Environmental Authority EPML00136213 (hereon referred to as the EA) and ensure consistency with Terrequip Environmental site management principles.

This Plan details the management of water at Terrequip Environmental's Warwick limestone operation. It applies to all Terrequip Environmental controlled activities for this site and covers all new developments, all construction activities, and onsite operations through to site closure.

As per conditions C9 and C10, this plan covers all activities including:

- Water usage and management;
- Sampling methodology;
- Direct and indirect discharge involving surface water (including run-off);
- Impounded water;
- Groundwater; and
- Erosion and sediment control.

2 LEGAL COMPLIANCE OBLIGATIONS

All key legislation and regulations associated with site operations are included in the sites Compliance Register which is developed in accordance with Terrequip Environmental 's EHS Legal Compliance Obligations Procedure.

The following table ([Table 1](#)) identifies specific conditions of approval and their corresponding requirements relevant to site operations in relation to water management.

Formatted: Font: Bold

Table 1: Condition C10 of the EA

Item	The site WMP must:
(a)	be carried out by a person possessing appropriate qualifications and experience in the field of surface water monitoring program design to be able to competently make recommendations about these matters
(b)	identify the environmental values of the licensed place and water quality objectives (i.e. ANZECC trigger levels for stock water) by monitoring locations (i.e. sediment dams) on the site for water quality characteristics (including total dissolved solids mg/l, total suspended solids mg/l, and pH) and identify any potential receiving waters in the event of an uncontrolled release that will be protected
(c)	provide representative water sampling, in consideration of the availability of water on the site, carried out with sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the water quality on the site
(d)	give considerations to relevant methodology and water quality criteria by the Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand in Australian Guidelines for Water Quality Monitoring and Reporting 2000 and "Australian and New Zealand Guidelines of Fresh and Marine Water Quality 2000"
(e)	determine potential environmental harm within the predicted zone of influence arising from mining activities
(f)	incorporate a risk management approach to how changing levels of flood, drought and water quality risks should be addressed e.g. increasing the lip of sediments ponds to increase capacity
(g)	Determine measures to manage and/or recycle storm water discharges to minimise stormwater contaminated from the mining activities reaching any surrounding watercourses
(h)	develop and implement a system for emergency spills or discharges including procedures to minimise extent and duration of release, staff training, investigation and reporting procedures
(i)	manage the environmental impacts of any uncontrolled release of wastewater to the environment so that any impacts are minimised e.g. improving sediment control measures and/or separating clean water from undisturbed areas and water from disturbed areas
(j)	manage site water quality and quantity during the (3) phases of mining: development, operation and decommission
(k)	safeguard against the potential for soil erosion
(l)	provide details of operational monitoring and monitoring of hydrological processes including associated performance indicators



3 ENVIRONMENTAL VALUES AND RISK

All environmental risks associated with site operations have been assessed in accordance with Terrequip Environmental's EHS Risk Management, JRAs & SOPs Procedure. An environmental risk register has been developed which details the environmental risks associated with the impact on water resources.

The Project area lies within the Headwaters of the Southern Condamine which forms part of the Condamine River Basin (WQ4223), in turn forming part of the QLD Murray-Darling and Bulloo Basins (Basin 422) As a result the following environmental values are applicable:

- Aquatic ecosystems;
- Irrigation;
- Farm supply;
- Stock water;
- Human consumption;
- Secondary recreation;
- Visual recreation;
- Drinking water;
- Industrial use; and
- Cultural and spiritual values

4 RESPONSIBILITY

It is the responsibility of all employees and contractors to undertake practices to manage surface water and groundwater in accordance with this Water Management Plan (WMP). The following people are the key Terrequip Environmental personnel responsible for the implementation and review of this Management Plan.

All works will be carried out by a person possessing appropriate qualifications and experience in the field of surface water monitoring.

Table 2: Water Management Responsibilities

Personnel	Summary of Responsibility
Site Supervisor	- Ensure the implementation of all control, monitoring and reporting measures as specified in this Plan; - Ensure compliance with Conditions of Approval; - Participate in the annual review of the Plan; - Ensure changes to operational plans are communicated to the Environmental Manager and support staff; and - Participate in the annual review of the Plan;
General Manager Operations	- Ensure performance targets specified in this Plan are being met; - Participate in the annual review of the Plan where required; and - Consult with the Environmental Manager regarding communication with government agencies.
Environmental Manager	- Provide technical advice in the development and implementation of the Plan; - Put systems in place to implement the controls, monitoring and reporting measures specified in this Plan; - Participate in the annual review of the Plan; - Approve amendments to the Plan; - Conduct biennial environmental audits of site operations against performance. - Communicate with government agencies on environmental matters in consultation with the Site Supervisor and General Manager as required.
Mining Support	- Provide technical support and advice for management of water; and - Provide technical support and advice for mine planning.

5 EXISTING ENVIRONMENT

5.1 SURFACE WATER

The Warwick Plant site and Aspinall pit areas (on ML 50146) are located on a natural ridgeline which drains to the northeast via Lucky Valley Gully which then flows toward the Condomine Creek 3 kilometres to the northeast (**Appendix B – Site map**).

The East-West pit area is located on the western side of a local topographic high and rainfall run-off drains west via Lord John Creek and then on to Oak Creek, which then flows north into the Condomine River some 9 kilometres (kms) to the north of the mine area.

The Phoenix pit area located on the east side of Keogh Road which is a local topographic high and drainage divide between the East-West Pit area and the Phoenix pit area. Drainage lines control rainfall run-off in a north-easterly direction via 'Frenchman's Gully' which then joins Luck Valley Gully prior to draining to the Condomine Creek.

The local drainage features surrounding the mine area are all ephemeral, and usually only run after significant rainfall (Appendix C).

5.2 GROUNDWATER

The Warwick limestone mining areas are within the Balone-Condomine Groundwater Management Area (MineOnlineMap). Local groundwater levels are around 20 to 25m depth below ground level as observed from drill logs and minor seepage in pits. Groundwater flow is very slow as observed from the minor pit seepage. Rainfall run-off and slow percolation and subsurface drainage is the main source of water to the pits.

A groundwater bore (Bore Licence WL86305T, maximum annual extraction 10ML) located on ML50083 is currently inactive and has been for several years. Yields are less than 1 litre/ second has been estimated by site personnel. Groundwater levels are below 15m below surface. Historical data suggests groundwater salinity is of the range 750 – 2240EC (ERM, 2008). Minor groundwater seepage is observed in the Phoenix pit at approximately 20m below ground level.

Typically, aquifer transmissivity is low in limestone. This means that the impacts on other groundwater users in the area are considered negligible due to the low transmissivity and their proximity to potential mine influence. The nearest bore (bore number 86326) in the area are some 2 kms to the east and is located in weathered granite yielded less than 0.5 litres per second (l/s). Groundwater quality was described as potable water from a drill depth of 22 m, with pH of 8.4 and salinity of 2191EC.



5.3 SURROUNDING WATER USE

The Warwick limestone mining operation is surrounded by farmland, mostly cattle grazing. Hence the main water users are farmers for cattle drinking water. Further down catchment, the Condomine River supplies water for irrigation, raw drinking water supply and recreational activities such as fishing, swimming, and boating as well as other activities outlined in section 3.

6 EROSION AND SEDIMENT CONTROL

6.1 MANAGEMENT OF EROSION AND SEDIMENT CONTROL

Aims:

- To minimise risk of movement of mine contaminated waters and sediment off-site; and
- Minimise effect of potential anthropogenic influences to environmental features on-site and off-site.

Best practice:

- Design and maintenance of water retention and sediment control structures (dams and levees) to meet regulatory requirements that are suitable for the climate and geographic location;
- Assess the potential risk for dam failure and determine the need for an appropriately qualified engineering assessment if required; and
- Regular on-going inspections to ensure compliance with Environmental Authority requirements and best practice.

Table 3: Erosion and Sediment Control Monitoring

Description of monitoring	Timing/ Frequency	Monitoring Method
Site Dam Inspections	Monthly or prior to wet climate event and post wet climate event	4WR-F9.108.01 Site Dam Inspection Checklist
Dam Water Levels	Weekly	Monitoring data form 2018 Warwick
Rehab areas	Quarterly	Site EHS Inspection
Mine pit boundaries and internal levees	Weekly	Site EHS Inspection

6.2 SEDIMENT DAMS

The Warwick site watershed sub-catchments and sediment dam capacity requirements were assessed in March 2018. The assessment outcome realised some shortfalls in sediment dam capacities due to progressive expansion of the mine operation and to discrepancies with EA specifications for sediment dam capacities. The 2008 WMP stated that a 1:10 year Average Recurrence Interval (ARI) rainfall was with DES for planning purposes. The Amalgamated EA (March 2018) specifies the following required dam storage criteria in [Table 4Table 4](#).

Terrequip Environmental recognises there are dam capacity deficiencies in all but Sediment Dam 8 and therefore pump and pipe systems will be required to transfer water to available storage areas such as mining voids of East-West pit and Aspinall pits to manage excess run-off and prevent uncontrolled discharges.

Formatted: Font: Bold

Table 4: Sediment and Water Storage Dams

Water Storage ID	Location (Coordinates GDA 94)		Mining Lease	Rainfall Criteria specified for capacity	Preferred water transfer destination
	East	North			
Sediment Dam 1	413378	6859379	ML50146	1:10yr ARI	Aspinal Pit void
Sediment Dam 2	413397	6859342	ML50146	1:10yr ARI	Aspinal Pit void
Sediment Dam 3	413350	6859771	ML50146	1:10yr ARI	Aspinal Pit void
Sediment Dam 4	413321	6859814	ML50146	1:10yr ARI	Aspinal Pit void
Catchment Dam 1	413248	6859102	ML50146	1:50yr ARI	Aspinal Pit void
Catchment Dam 2	413169	6859154	ML50146	1:50yr ARI	Aspinal Pit void
Sediment Dam 6	412421	6858553	ML50083	1:10yr ARI	East-West Pit void
Sediment Dam 7	413363	6858918	ML50146	1:10yr ARI	Aspinal Pit void
Sediment Dam 8	413298	6858587	ML50237	1:10yr ARI	East-West Pit void
Sediment Dam 9	413843	6858437	ML50237	1:10yr ARI	East-West Pit void

6.3 SEDIMENT DAM WATER MANAGEMENT

Sediment Dam 1 and Sediment Dam 2 operate as one system with Sediment Dam 2 decanting to Sediment Dam 1. Sediment Dam 2 has an outlet pipe to decant clean water off-site as required. The 120mm diameter outlet pipe has a riser pipe top at RL552.25 m. Discharge is achieved by opening the valve on the downstream side of the overflow discharge pipe (Outlet RL550.16). The lowest point on the spillway is RL552.45 m.

Catchment Dam 1 effectively acts as a water supply and sediment dam capturing run-off from the stockpile and plant area. Dust suppression water is obtained from this dam. Overflow from Catchment Dam 2 flows into Catchment Dam 1.

Catchment Dam 2 captures run-off water from disturbed and undisturbed areas, effectively acting as a sediment dam and supply of water for Catchment Dam 1.

Sediment Dam 3 and 4 are located north of the plant area. Historically, this area has had minimal disturbance in 'sub-catchment A' and the requirement for sediment dam capacity is also minimal.

Sediment Dam 6 located in the East-West sub-catchment "G" is west of the rehabilitated waste dump and was originally intended to manage water run-off from the north-western area outside of the pit. Run-off currently filters through a naturally generated system of reeds which filter out sediment into Sediment Dam 6. The area is rehabilitated land and is not considered "disturbed" ground, therefore a Sediment Dam is considered non-essential in this location.

Sediment Dam 7 located in sub-catchment "F" adjacent to the current wash-down area captures rainfall run-off from the Run of Mine (ROM) stockpile area and the access road to the plant and manages sediment from the wash down system.

Sediment Dam 8 is located on Phoenix mine area (sub-catchment area "I") and receives run-off from the topographic high along Keogh Road, west of the Phoenix mine. The discharge invert is at RL537 m and is



designed to drain water to a point that equates to spare capacity to accommodate a 1:10 yr ARI rainfall run-off event.

Sediment Dam 9 (sub-catchment area "J") is located south of the active Phoenix mine area. Planning is underway to increase the Sediment Dam storage capacity by constructing a secondary Sediment Dam downstream (nominally Sediment Dam 10).

7 WATER MONITORING PROGRAM

The purpose of the water monitoring program is to ensure compliance with EA requirements and to minimise potential off-site environmental impacts.

The EA conditions allow settled storm water release only if sediment dams have the required sediment dam capacity and water quality meets the following limits:

- Maximum pH = 9.0; and
- Maximum Electrical Conductivity (EC) = 1500 $\mu\text{S}/\text{cm}$.

However, since the Sediment Dam capacities are insufficient for the stated rainfall intensities listed in the EA and reproduced in Table 4 (except Sediment Dam 8), then no off-site discharge is permitted.

Obtaining regular water quality data is still required to satisfy the EA section C10 (c) and may also provide future opportunity to apply for concessions to allow controlled discharges.

All surface water sampling will be conducted as per the Queensland Monitoring and Sampling Manual (EHP, 2009) and more recently published methodologies (DES, 2018).

7.1 SURFACE WATER QUALITY MONITORING PROGRAM

A program of regular monitoring (quarterly) and event-based monitoring is employed at Warwick Limestone Operation. For a practical guide for the Warwick site, a 'significant rainfall event' of 50mm in 24hrs is considered appropriate, which would occur more than once per year (**Appendix C**).

A quarterly sampling program is designed to provide data to make valid conclusions about water quality on site over time as required to meet EA condition 'C10 (c)':

"Provide representative water sampling, in consideration of the availability of water on the site, carried out with sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the water quality on the site".

7.1.1 Quarterly Surface Water Quality Monitoring

Surface water monitoring involves quarterly sampling of each sediment dam and water storage dams (**Table 4**).

Sample analytes include:

- Total Dissolved Solids (mg/L);

Formatted: Font: Bold

- Total Suspended Solids (mg/L);
- pH; and
- Electrical Conductivity ($\mu\text{S}/\text{cm}$).

7.2 WATER LEVEL MONITORING AND MANAGEMENT IN DAMS

Controlled or uncontrolled releases from site is not permitted according to the EA unless sediment dams have the minimum required design capacity to meet the EA specified rainfall events (Section 6.2). The March 2018 assessment of sediment dam capacity determined that only Sediment Dam 8 has sufficient storm water capacity to meet the EA requirements.

Therefore, as a minimum, weekly dam water level checks should be undertaken in addition to immediately following or during a 'significant rainfall event'. Sediment Dam water levels should be inspected prior to a significant event to ensure management of dam water levels and prevention of uncontrolled discharge.

The following dam water level management strategies are to be employed at Warwick:

7.2.1 Catchment Dam 2 – Catchment Dam 1 – Sediment Dam 7 System

Catchment Dam 2

Ensure minimum water levels are present in Catchment Dam 2 at all times with excess water pumped to Aspalpit as required.

Catchment Dam 1

Operate Catchment Dam 1 to suit operation needs (plant to use dust control and wash-downs as required) but maintain maximum level equivalent of the bottom of the culvert pipe (RL545.18 m). Pump excess water to Aspalpit as required.

Sediment Dam 7

Regularly pump sediment contaminated water from Sediment Dam 7 back to either Catchment Dam 2 or alternatively to Aspalpit void.

7.2.2 Sediment Dam 3 & 4 – Aspalpit Void

Pump from Sediment Dam 3 and 4 to Aspalpit (distance of 375 m).



7.2.3 Sediment Dam 2 – Sediment Dam 1 – Aspinal Pit Void

Pump from Sediment Dam 1 and 2 to Aspinal Pit (distance of 300 m).

7.2.4 Sediment Dam 8, Sediment Dam 9 – East-West Pit Void

Pump from Sediment Dam 9 to Sediment Dam 8 (distance of 600 m). Pump from Sediment Dam 8 to East-West Pit void as required to ensure storm water capacity is available (distance of 550 m).

8 REPORTING

Table 5: Water Reporting Requirements

Description of Reporting	Frequency of reporting	Reporting tool:	Reporting to
Water level and water quality data	Rainfall event and quarterly	Monitoring data form 2018 Warwick	Site Supervisor/ Environmental Manager
Incidents – uncontrolled water release	Event based	IMS	Site Supervisor/ Environmental Manager
Site Inspection Reports – Dams water levels	Weekly Dam Water Levels	4WR-F9.108.01 Site Dam Inspection Checklist	Site Supervisor/ Environmental Manager
Site Inspection Reports – Dam and levee infrastructure	Monthly and following significant rain event	Site EHS Inspection Reports	Site Supervisor/ Environmental Manager

9 INCIDENTS, COMPLAINTS AND REGULATORY BREACHES

The following section details Terrequip Environmental's management approach in responding to, investigating, and acting on incidents, complaints and regulatory breaches. This section details a standard approach applied across all Terrequip Environmental sites. All incidents, complaints and regulatory breaches are recorded and tracked through Terrequip Environmental's incident management system (IMS);

Corrective actions arising from these events are documented and tracked in the IMS and added to the Site Action Plan where responsibilities are assigned, and completion dates established. Progress on open actions is reported regularly to senior management ensuring such events are managed in a timely manner and reoccurrences limited.

9.1 INCIDENTS

- Follow the Environment, Health and Safety (EHS) Incident Notification and Investigation CWP-10.202;
- Contact Site Supervisor;
- Contact Environmental Manager; and
- Contact relevant Regulatory Authority (where required).

9.2 EMERGENCY RESPONSE

Refer to the Site Emergency Plan 4WR-P10.201.01.

9.3 REGULATORY BREACH

Any verified regulatory breach (i.e. breach of regulations, licence condition or conditions of approval) will be logged in the IMS as a breach. Relevant external agencies will be notified in accordance with any prescribed legislation or specific conditions of approval.

A detailed investigation will follow to determine the root cause of the breach. will document the investigation in writing and provide a report to the relevant government agencies within an agreed timeframe. The report will detail the investigation findings and any short term and/or long-term actions that have or will be taken to prevent future breaches from occurring.

Any compliance breach will prompt a review of the site's legal compliance and environmental risk registers. The Site Action Plan will be updated to include any corrective actions.

10 CHANGES TO OPERATIONS

Any assessment of new development or operational changes must be conducted in accordance with CWP pertaining to:

- Key Risk Requirement – Planning, Design, Construct & Commission;
- EHS Managing Change Procedure; CWP-6.002;
- Environmental Approvals, Licences and Permits Procedure; and
- EHS Risk Management, JRAs & SOPs Procedure.

The environmental assessment must confirm that water management under normal and worst-case conditions will comply with State or national water quality regulations, criteria and/or licence conditions.

11 TRAINING

All training shall be determined and implemented in accordance with the Terrequip Environmental's Training Procedure CWP- 7.501.

12 REVIEW

Site performance will be reviewed on a quarterly basis by senior management via the Environment Program Reports. Any recommendations from this review shall be passed to the General Manager Operations for consideration.

Incidents, complaints, and regulatory breaches will prompt a review of the site's environmental compliance and risk registers. This will ensure these registers accurately reflect the legal obligations and environmental risk of site operations.

This WMP will be reviewed on an annual basis. The review shall be conducted with the Site Supervisor, Environmental Manager, and the General Manager Operations.

The review will involve the examination of all monitoring data, complaints, incidents, regulatory breaches (should they occur) and comparisons of this data and information to mandatory limits outlined in the EA and internal Key Performance Indicators (KPIs).

Procedural changes or a review of targets and/or KPIs should be employed if targets are not met. A review of the site environmental compliance and risk registers will also occur at this stage to ensure completeness and that this WMP adequately controls these obligations and risks.

Any amendments to this WMP will be approved by the Environmental Manager and General Manager Operations.



13 LIMITATIONS AND DISCLAIMER

Epic Environmental Pty Ltd (Epic) has prepared the following report for the exclusive benefit of Terrequip Environmental Pty Ltd (Client) and for the singular purpose of Managing Water at the Warwick Limestone Mine. All interpretations, finding or recommendations outlined in this report should be read and relied upon only in the context of the report as a whole.

The following report cannot be relied upon for any other purpose, at any other location or for the benefit of any other person, without the prior written consent of Epic. Except with Epic's prior written consent, this report may not be:

- a. released to any other person, whether in whole or in part;
- b. used or relied upon by any other party; or
- c. filed with any Governmental agency or other person or quoted or referred to in any public document.

This report has been prepared based on information provided by the Client and other parties. In preparing this report Epic:

- a. presumed the accuracy of the information provided by the Client (including its representatives);
- b. has not undertaken any verification to the accuracy or reliability included in this information (with the exception where such verification formed part of the scope of works);
- c. has not undertaken any independent investigations or enquiries outside the scope of works with respect to information provided for this report; and
- d. provides no warranty or guarantee, expressed or implied, as to the accuracy or reliability of the information provided in this report.

In recognition of the limited use of this report, the Client agrees that, to the maximum extent permitted by law, Epic (including its representatives and related entities) is not liable for any losses, claims, costs, expenses, damages (whether pursuant to statute, in contract or tort, for negligence or otherwise) suffered or incurred by the Client or any third party as a result of the information, findings, opinions, estimates, recommendations and conclusions provided in this report.

Without limiting the above, Epic (including its representatives and related entities) is not liable, in any way whatsoever:

- a. for the use or reliance of this report for any purpose other than that for which it has been prepared;
- b. for any use or reliance upon this report by any person other than the Client;
- c. where another person has a different interpretation of the same information contained in the report;
- d. for any consequential or indirect losses, or for loss of profit or goodwill or any loss or corruption of any data, database or software.

If a section of this disclaimer is determined by any court or other competent authority to be unlawful and/or unenforceable, the other sections of this disclaimer continue in effect. Where further information becomes available, or additional assumptions need to be made, Epic reserves its right to amend this report, but is not obliged to do so.

14 REFERENCES

Industry guidelines, codes of practice, policy and regulations

AS/NZS 5667.1: Water quality – Sampling Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples

Department of Environment and Heritage Protection (EHP) (2009). Monitoring and Sampling Manual, Version 2, ISBN 978-09806986-1-9

Department of Environment and Science (DES) (2018). Monitoring and Sampling Manual.

Stormwater and environmentally relevant activities Guidelines – (DEHP, 2014)

Water Management – A Guide to Leading Practice Sustainable Development in Mining
<https://industry.gov.au/resource/Documents/LPSDP/guideLPSD.pdf>;

Manual for Assessing consequence categories and hydraulic performance of structures (ESR/2016/1933), DEHP

Structures which are dams or levees constructed as part of environmentally relevant activities (ESR/2016/1934, DEHP)

Relevant Terrequip Environmental Procedures:

Water Management Key Risk Requirement (CWP-6.124)

Site EHS Inspection Checklist

EHS Risk Management, JSAs & SOPs Procedure

EHS Audit Procedure

EHS Incident Notification & Investigation Procedure

EHS Objectives, Targets, Plans and Performance Measure Procedure

EHS Legal Compliance Obligations Procedure

Environmental Approvals, Licences and Permits

APPENDIX A – EA SECTIONS C1 - C16

Schedule C - Water

C1 Release to waters:

- (a) With respect to ERA 16-(2c) Extractive, 16-(2b) Extractive, 16-(3b) Screening: Contaminants must not be released from the boundary to any waters or the bed banks of any waters other than authorised by this schedule.
- (b) With respect to Schedule 2A 21 Mining Activities: Contaminants must not be released from the boundary of the mining lease(s) to any waters or the bed and banks of any waters other than authorised by this schedule.

C2

- (a) With respect to ERA 16-(2c) Extractive, 16-(2b) Extractive, 16-(3b) Screening: Notwithstanding condition C1(a), in the event of a significant rainfall event (i.e. a 1:10 year rainfall event) that may cause any sediment dam(s) and/or water supply dam(s) to overtop, the holder of this approval is authorised to release treated/settled stormwater, supply water and sediment dam water to drainage lines in accordance with the contaminant release limits defined in Schedule C - Table 1.
- (b) With respect to Schedule 2A 21 Mining Activities: Notwithstanding condition C1(b), in the event of a significant rainfall event (i.e. a 1:100 year rainfall event) that may cause any sediment dam(s) and/or water supply dam(s) to overtop, the holder of this environmental authority is authorised to release treated/settled stormwater, supply water and sediment dam water to drainage lines in the catchment of Lord John Creek (including Lucky Valley Gully and Frenchman Gully) in accordance with the contaminant release limits defined in schedule C-Table 1.

Schedule C - Table 1 (Contaminant release limits)

Parameter	Units	Minimum	Maximum
pH	-	8.0	9.0
Electrical conductivity	µS/cm	-	1500

- C3 (a) With respect to ERA 16-(2c) Extractive, 16-(2b) Extractive, 16-(3b) Screening: Any release must be managed in accordance with the Unimin Australia Limited *Warwick Limestone Deposit Site Water Management Plan* (September 2008) or subsequent amendment.
- (b) With respect to Schedule 2A 21 Mining Activities: With respect to condition (C2)(b), the release must be managed in accordance with the Site Water Management and Monitoring Plan in a manner that will ensure the contaminant release limits specified in Schedule C - Table 1 are not exceeded.
- C4 Erosion and sediment control: Erosion protection measures and sediment controls must be provided and maintained to effectively minimise the likelihood of erosion and release of sediments from the site and be maintained during site clearing, construction, mining operations and rehabilitation. Such measures should include diversion drainage works and sedimentation traps and dams.
- C5 Erosion control and sediment control structures must be maintained at all times and repaired or replaced as required after rainfall events.
- C6 Groundwater: All reasonable and practicable measures must be taken to prevent the contamination of groundwater.
- C7 Contaminants must not be directly or indirectly released to any groundwater as a result of mining activities.
- C8 Any draw down of groundwater must not impact on the users of groundwater.
- C9 Site Water Management and Monitoring Plan:
 - (a) With respect to ERA 16-(2c) Extractive, 16-(2b) Extractive, 16-(3b) Screening: The holder of this approval must implement the Unimin Warwick Limestone Deposit Site Water



Management Plan (September 2008) or subsequent amendment.

- (b) **With respect to Schedule 2A 21 Mining Activities:** The holder of this environmental authority must develop and implement a Site Water Management and Monitoring Plan, within twelve (12) months of the date this environmental authority takes effect, for the site.

C10 The Site Water Management Plan must:

- (a) be carried out by a person possessing appropriate qualifications and experience in the field of surface water monitoring program design to be able to competently make recommendations about these matters;
- (b) identify the environmental values of the licensed place and water quality objectives (i.e. ANZECC trigger levels for stock water) by monitoring locations (i.e. sediment dams) on the site for water quality characteristics (including total dissolved solids mg/l, total suspended solids mg/l, and pH) and identify any potential receiving waters in the event of an uncontrolled release that will be protected;
- (c) provide representative water sampling, in consideration of the availability of water on the site, carried out with sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the water quality on the site;
- (d) give considerations to relevant methodology and water quality criteria by the Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand in Australian Guidelines for Water Quality Monitoring and Reporting 2000 and "Australian and New Zealand Guidelines of Fresh and Marine Water Quality 2000";
- (e) determine potential environmental harm within the predicted zone of influence arising from mining activities;
- (f) incorporate a risk management approach to how changing levels of flood, drought and water quality risks should be addressed e.g. increasing the lip of sediments ponds to increase capacity;
- (g) Determine measures to manage and/or recycle storm water discharges to minimise stormwater contaminated from the mining activities reaching any surrounding watercourses;
- (h) develop and implement a system for emergency spills or discharges including procedures to minimise extent and duration of release, staff training, investigation and reporting procedures;
- (i) manage the environmental impacts of any uncontrolled release of wastewater to the environment so that any impacts are minimised e.g. improving sediment control measures and/or separating clean water from undisturbed areas and water from disturbed areas;
- (j) manage site water quality and quantity during the (3) phases of mining: development, operation and decommission;
- (k) safeguard against the potential for soil erosion;
- (l) provide details of operational monitoring and monitoring of hydrological processes including associated performance indicators.

C11 With respect to condition (C9)(b), the holder of this environmental authority must submit to the administering authority a draft of the Site Water Management and Monitoring Plan as soon as practicable following the date of issue of the environmental authority for comment prior to implementation of the plan.

C12 A copy of the Site Water Management Plan and any subsequent amendment of the Site Water Management Plan must be kept at the place to which this approval relates and be



available for examination by Emergency Services Personnel or an authorised person on request.

- C13 A record of the results of the surface water-monitoring conducted, including background water quality monitoring, must be kept and forwarded to the administering authority on request.

- C14 **Water Storage:** Sediment collection and water supply dams must be designed and maintained to prevent overtopping in accordance with Schedule C - Table 2 and to facilitate the settlement of suspended solids in stormwater contaminated by approved activities.

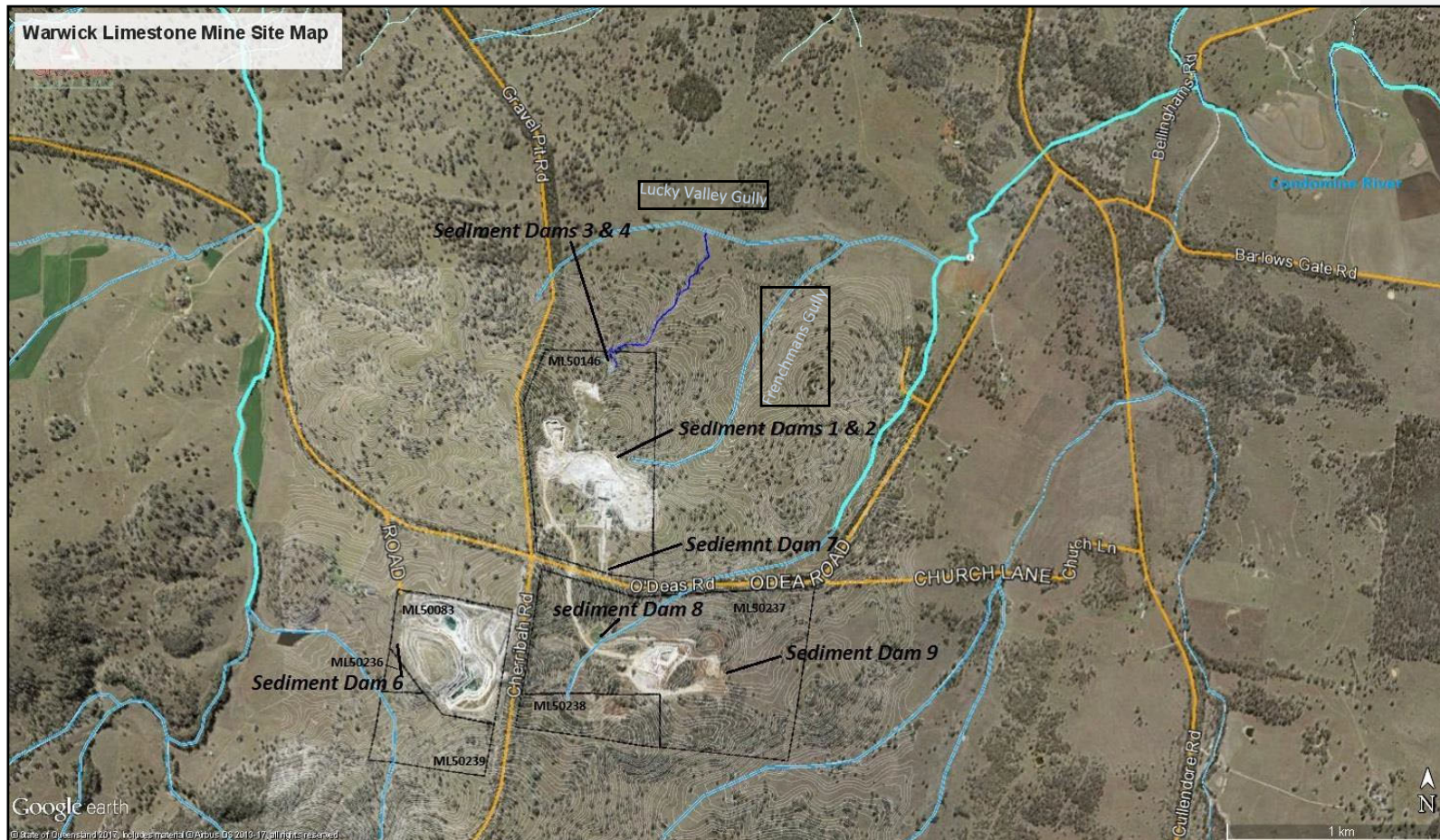
Schedule C - Table 2 (Storage Design - all mining leases unless specified otherwise)

Storage Type	Design Wet Period Storage (4 month wet season)	Spillway Critical design Storm ^a
Sediment Dams Any new sediment dams	1:10	>1:10
Water Supply Dams (Two (2) on ML50146) Any new water supply dams	1:50	>1:50

^athe critical storm has a duration that produces the peak discharge for the catchment

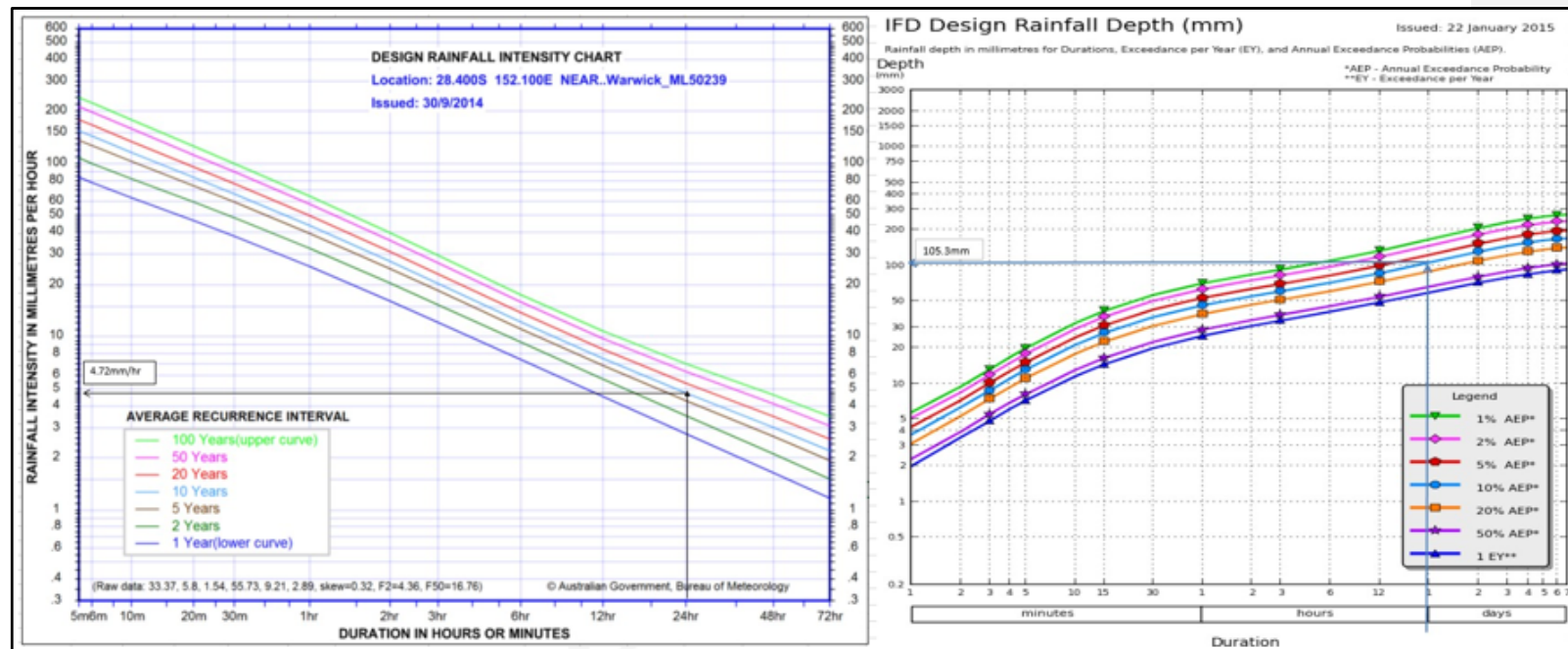
- C15 The base and walls of the sediment dams must be constructed, installed and maintained:
- (a) to minimise the likelihood of effluent through the bed or banks of the dam to any waters (including groundwater);
 - (b) to ensure the stability of the dams construction; and
 - (c) to maintain a minimum freeboard of 0.5m.
- C16 (a) With respect to ERA 16-(2c) Extractive, 16-(2b) Extractive, 16-(3b) Screening: Water and/or stormwater collected in excavation pits must be utilised (i.e. for dust suppression) and/or redirected to the sediment dam(s) and/or water supply dam(s) on the mine site as soon as practicable after accumulation in the pits.
- (b) With respect to Schedule 2A 21 Mining Activities: Water and/or stormwater collected in excavation pits one - three (1-3) on mining lease 50083 must be utilised (i.e. for dust suppression) and/or redirected to the sediment dam(s) and/or water supply dam(s) on the mine site as soon practicable after accumulation in the pits.

APPENDIX B – SITE PLAN



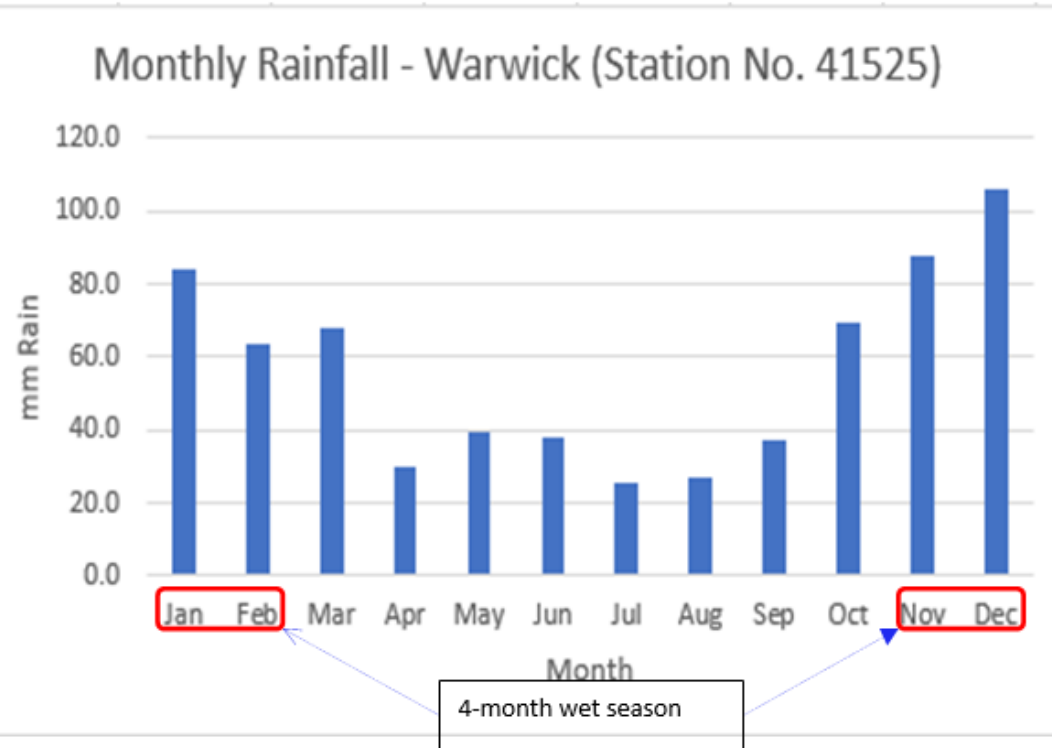
APPENDIX C - RAINFALL DATA

Rainfall Intensity

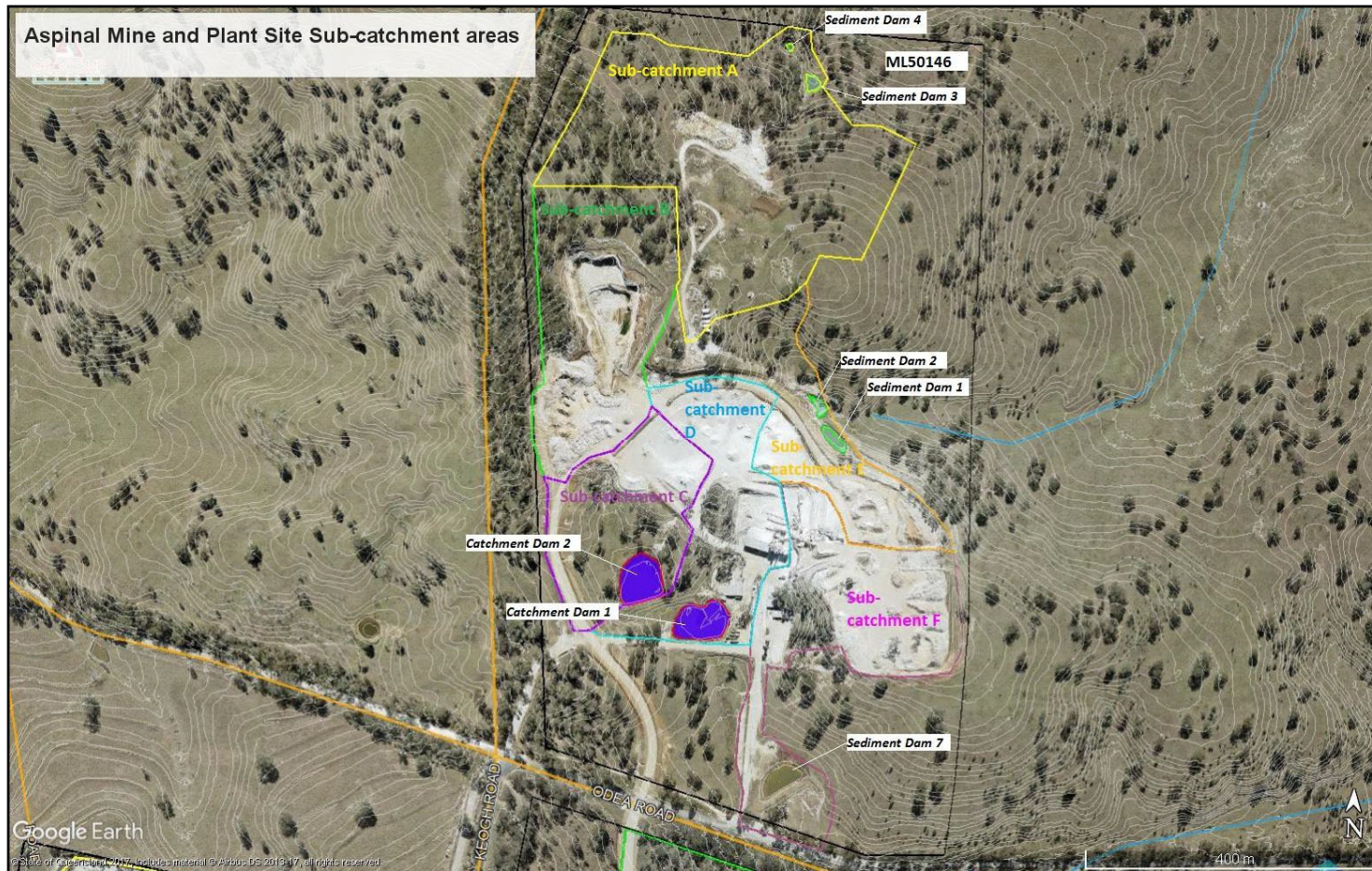


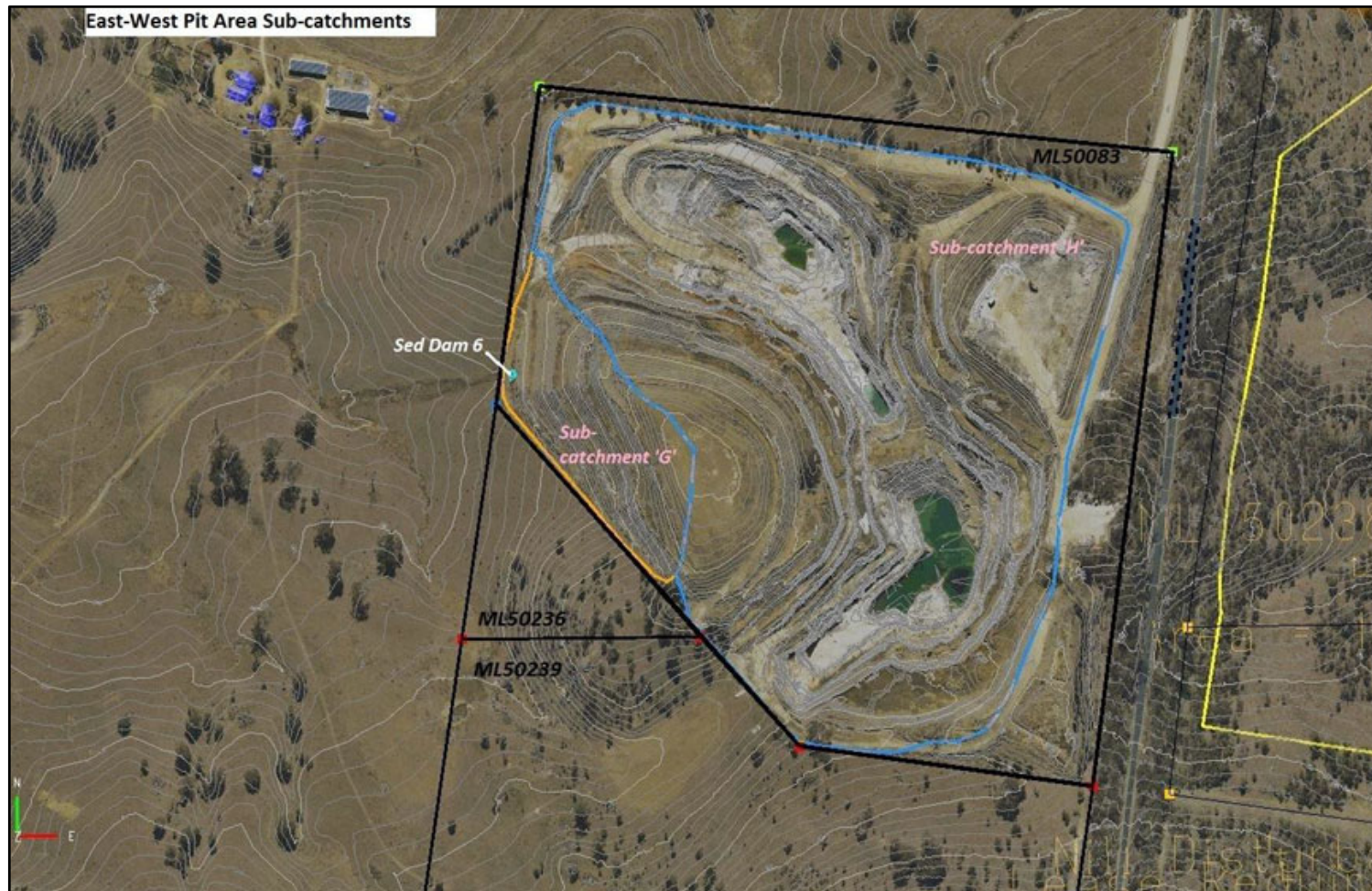
Average Monthly Rainfall

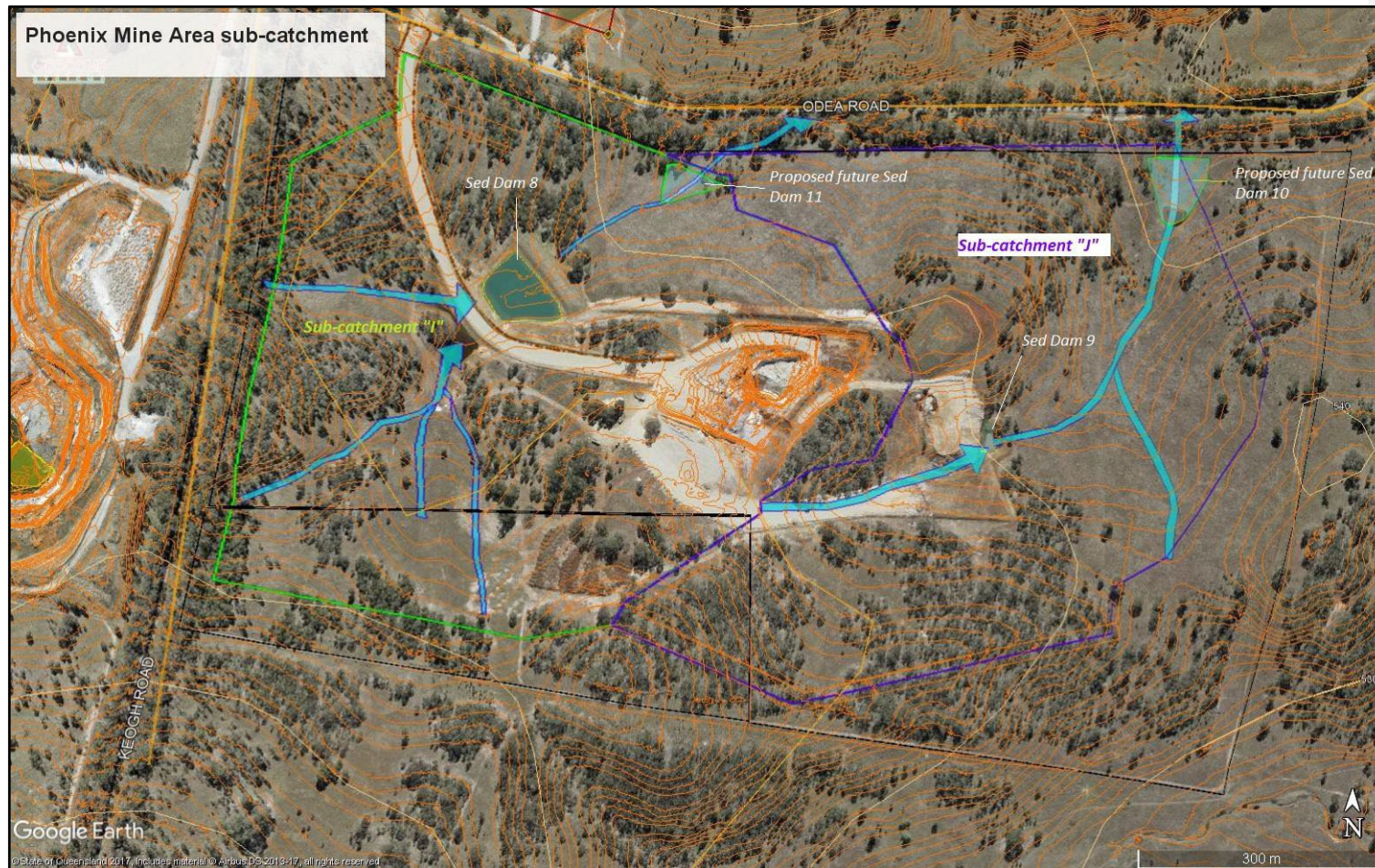
Month	Rainfall (mm)
Jan	84.0
Feb	63.5
Mar	68.2
Apr	29.7
May	39.3
Jun	38.0
Jul	25.5
Aug	27.1
Sep	36.9
Oct	69.3
Nov	87.9
Dec	106.0



APPENDIX D – SUB-CATCHMENT MAPS









The Epic team provides a wide range of skills and experience on numerous environmental management issues, across a wide range of public, commercial and industrial projects. In addition, we focus on the practical aspects of environmental planning, engineering and science, providing comprehensive services in:

- Strategic advice and project support;
- Contaminated site assessment, management and remediation;
- Asbestos assessment and advisory;
- Naturally Occurring Radiological Material assessment and management;
- Contaminated land auditing services (QLD –Contaminated Land Auditor; NSW – Contaminated Site Auditor);
- Statutory planning and impact assessment covering QLD, NSW and Commonwealth legislation;
- Environmental approvals and permitting – full array;
- Ecological (fauna, flora and habitat) site assessments;
- Site suitability assessments;
- Environmental offset assessments and development of management strategies;
- Waste auditing and management;
- Landfill design and management;
- Compliance and auditing;
- Erosion sediment control; and
- Hydrogeology.

CONTACT

Sydney / Brisbane / Melbourne / Hobart

1800 779 363
enquiries@epicenvironmental.com.au

www.epicenvironmental.com.au