Permit

Environmental Protection Act 1994

Environmental authority EA0001935

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994*.*

Environmental authority number: EA0001935

Environmental authority takes effect on the date that your related development approval 4502/2018/MCU takes effect or 31 December 2021, whichever is the latter. Within 20 business days of the environmental authority taking effect, the administering authority must be given written notice of the occurrence. Prior to the commencement of the activity, the administering authority must be given written notice of the proposed date of commencement.

The first annual fee is payable within 20 business days of the effective date.

The anniversary date of this environmental authority is the same day each year as the effective date. The payment of the annual fee will be due each year on this day.

Environmental authority holder

Name	Registered address
CLEANAWAY SOLID WASTE PTY LTD	Level 4, 441 St Kilda Rd MELBOURNE VIC 3004

Environmentally relevant activity and location details

Environmentally relevant activities	Locations
ERA 54 - Mechanical waste reprocessing 1: Operating a facility for receiving and mechanically reprocessing, in a year, more than 5,000t of inert, non-putrescible waste or green waste only	100 Chum Street and 20 Rhondda Road NEW CHUM QLD 4303 Lot 268 on SP103913 Lot 227 on SP103913
ERA 60 - Waste disposal 2: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(b) (h) more than 200,000t	
ERA 62 - Resource recovery and transfer facility operation 1: Operating a facility for receiving and	

Queensland Government

Environmentally relevant activities	Locations
sorting, dismantling, baling or temporarily storing- (b) general waste	

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days);

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority on the nominated day; or

b) if the authority states a day or an event for it to take effect on the stated day or when the stated event happens; or

c) otherwise on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State*

Development and Public Works Organisation Act 1971), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.

Scott Blanchard
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Date issued: 29 June 2021

Enquiries:
Waste Assessment
Department of Environment and Science
Phone: 1300 130 372
Email: palm@des.qld.gov.au

Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site.

Development Approval

This permit is not a development approval under the *Planning Act 2016*. The conditions of this environmental authority are separate, and in addition to, any conditions that may be on the development approval. If a copy of this environmental authority is attached to a development approval, it is for information only, and may not be current. Please contact the Department of Environment and Science to ensure that you have the most current version of the environmental authority relating to this site.

Conditions of environmental authority

The environmentally relevant activities conducted at the locations as described above must be conducted in accordance with the following conditions of approval.

Agency interest: General	
Condition number	**Condition**
G1	**Activities** under this environmental authority must be conducted in accordance with the following limitations: a) The lateral and vertical expansion of the **landfill facility** must be designed and constructed in accordance with the figures depicted in Figures 1 to 5. b) The existing **landfill facility** prior to this environmental authority taking effect are those depicted in Figure 6 as "existing". c) Mechanical waste reprocessing must only be undertaken in the "Proposed Resource Recovery Area" depicted in Figure 6. d) For the lateral and vertical extension of the **landfill facility**, the minimum standard landfill liner systems for any **landfill units** designed and constructed must include: i. 300mm select fill layer (for sidewall protection only, placed progressively during operations); ii. Protection geotextile; iii. 2mm **HDPE** geomembrane; iv. Geosynthetic Clay Liner; and v. 600 mm earthen fill layer (e.g., compacted clay or compacted engineered fill).
G2	All reasonable and practicable **measures** must be taken to prevent or minimise **environmental harm** caused by the **activities**.
G3	Any breach of a condition of this environmental authority must be reported to the **administering authority** as soon as practicable and within 24 hours of becoming aware of the breach.
G4	The reporting of breaches required in condition G3 must include the following details about the breach, as it becomes available: a) Date; and b) Time; and c) Duration; and d) Location; and e) What happened; and f) Why did it happen; and g) Conditions breached; and h) Actions taken to contain and rectify; and i) Actions to prevent a recurrence.
G4A	Not more than 10 business days following any notification provided under condition G3, written advice must be supplied to the **administering authority** detailing the information required under condition G4 and also include the results of any monitoring performed.
G5	Other than as expressly permitted by this environmental authority, the **release of any contaminant into the environment** that may cause **environmental harm** must not occur nor be likely to occur.
G6	All information and **records,** except environmental monitoring data, required by the conditions of this environmental authority must be kept for a minimum of five years at the licensed place. Environmental monitoring data must be kept until the surrender of this environmental authority.

	All information and **records** required by the conditions of this environmental authority must be provided to the **administering authority** upon request and in the format requested.
G7	An **appropriately qualified person(s)** must monitor, record, report and interpret all monitoring results for all monitoring required by this environmental authority and in the manner specified by this environmental authority.
G8	All analyses required under this environmental authority must be carried out by a laboratory that has National Association of Testing Authorities (NATA) certification, or an equivalent certification, for such analyses. The only exception to this condition is for *in situ* monitoring of surface water releases for pH, dissolved oxygen (DO), turbidity and electrical conductivity.
G9	When required by the **administering authority**, monitoring must be undertaken in the manner prescribed by the **administering authority**, to investigate a complaint of **environmental harm**, which includes **environmental nuisance,** arising from the **activity**. On completion of any complaint investigation, the monitoring data and an analysis of the results must be provided within 10 business days to the **administering authority** upon its request.
G10	A **receiving environment monitoring program** must be designed and implemented by an **appropriately qualified person(s)** to monitor the effects of the **activity** to any **waters**, **groundwater**, air **sensitive place**, noise **sensitive place** and **land**.
G11	The **receiving environment monitoring program** must be implemented on the date that this environmental authority takes effect and include at least the following: a) For release to **waters**, a **receiving environment monitoring program** design document produced in accordance with the 'Receiving Environment Monitoring Program guideline—For use with environmentally relevant activities under the Environmental Protection Act 1994' (ESR/2016/2399); b) a **groundwater monitoring program** in accordance with condition WT8 and WT9; c) a surface water monitoring program in accordance with condition WT4; d) continuous monitoring of dust and particulate matter in accordance with condition A4; e) **landfill gas** monitoring in accordance with condition A10; and f) noise monitoring at the nearest **sensitive place**, and then annually after that.
G12	An annual monitoring report must be prepared by an **appropriately qualified person(s)** and submitted to the **administering authority** with the annual return each year. The annual monitoring report must include: a) A summary of the previous 12 months monitoring data obtained in accordance with any of the monitoring requirements of this approval; b) An evaluation/explanation of the data from any monitoring programs, including graphical representations showing relevant limits and trends against all historical data; c) An outline of actions taken, and proposed to be taken, to minimise the environmental risk from any deficiency identified by the monitoring or recording programs; d) For noise monitoring outlined in condition G11, any measured exceedance of noise limits specified in condition N2 must be investigated and the report include: i. Review of monitoring locations; ii. Frequency and cause of any exceedances of noise limits measured by the monitoring program; iii. Noise complaints; iv. An analysis of how any exceedances may affect monitoring or compliance for any future stages of the landfill; and v. Locations of sensitive receptors relative to the activities.

	e) For air monitoring outlined in condition A4 and A5, any measured exceedances of PM_{10}, PM_{90}, crystalline silica (as $PM_{2.5}$) or dust deposition as specified in condition A3, must be investigated to determine the influence of emissions from the site on any **sensitive place** or **commercial place** and the report include: i. Review of monitoring locations; ii. Frequency and cause of any exceedances of air quality objectives measured by the monitoring program; iii. Dust complaints; iv. An analysis of how any exceedances may affect monitoring or compliance for any future stages of the landfill; and v. Locations of sensitive receptors relative to the activities. f) For the **groundwater monitoring program** outlined in condition G11, a groundwater assessment report which includes: i. Description of the groundwater monitoring network; ii. Description of the groundwater sampling methods utilised; iii. Identification of the background or baseline groundwater quality at the site; iv. Assessment of any changes to the hydrogeology at the site; v. Identification of all potential receptors; vi. Summary of the quality control procedures applied to the sampling and analysis program; vii. Identification of the assessment criteria and trigger values for evaluating the monitoring results; and viii. Assessment of the monitoring data against both derived trigger values, regional assessment criteria and historical monitoring data to identify elevated levels or upward trends.
G13	Written procedures must be developed for the **activity** that meet the following standards: a) identify all potential risks to the environment from the **activity**, including when the activity is not in operation or in an emergency; b) establish and maintain control **measures** that prevent and/or minimise the potential for environmental harm; c) detail an inspection and maintenance program that ensures all required plant and equipment are maintained in a proper and effective condition; d) ensure plant and equipment are operated in a proper and effective manner; e) establish and submit to the **administering authority** a **Construction Quality Assurance plan** for the construction of the lateral and vertical extension **landfill units** cells within the **landfill facility** prior to commencement of the cell works; f) detail how and when staff training is to be conducted (at least annually) to ensure awareness of obligations under the environmental authority and the *Environmental Protection Act 1994*; g) detail how reviews of environmental risks and environmental performance, including complaints, are undertaken at regular intervals (at least annually); and h) ensure that reviews of environmental performance are undertaken at least annually.
G14	Procedures required by condition G13 must be: a) implemented so the activity is undertaken in accordance with these procedures; and b) Reviewed at least annually.
G15	Chemicals and fuels in containers of greater than 15 litres must be stored within a **secondary containment system**.
G16	The **activity** must not be carried out until the holder of the environmental holder has given the **financial assurance** required to the **administering authority**.

G17	If the **administering authority** increases the amount of **financial assurance,** the holder of the environmental authority must give the additional **financial assurance** to the **administering authority** within 20 business days of receiving written notice of the increase.
G18	A three-dimensional geotechnical model is to be provided to the **administering authority** for approval at least six (6) months prior to commencing construction on the lateral and vertical extension of the **landfill facility**. As a minimum, the three-dimensional geotechnical model must include: a) Historic mine geometry and pit extraction with subsequent filling with material consolidation and pillar re-loading; b) Intact rock and mine spoil strength and property ranges; c) Estimated intact and mine spoil material bulking ranges; d) Fault structure; e) Groundwater table height; f) Future landfill cells; g) Potential subsidence impact of progressive failure of pillars with low width: height ratio; and h) For the lateral and vertical expansion **landfill unit**, induced strain estimated along the liner from settlement and subsidence scenarios, including strain concentrations along the pit-mine spoil interface. The three-dimensional geotechnical model must also include a conceptual hydrogeological model which considers the following: a) Three-dimensional **groundwater** flow model; b) The effect of subsidence, settlement, consolidation of backfill and reduction of evaporation on any future expected impacts to **groundwater**; and c) The effect of future construction of the lateral and vertical extension of the **landfill facility** on any expected impacts to **groundwater**.
G19	**Detailed Landfill Unit Design** Landfill liner to be modelled using **Slope/W**, or equivalent, as part of detailed **landfill unit** design, for any **landfill unit** designed and constructed for the lateral and vertical expansion of the **landfill facility**.
G20	Before commencing deposition of waste within the lateral and vertical expansion of the **landfill facility**, geotechnical monitoring (inclinometers) along the western boundary of the site must be installed. As a minimum the geotechnical monitoring must include: a) monitoring for deformation along the pit-mine spoil contact above existing landfill cell 4A and 5B; and b) establishing an early warning for subsidence growth.
Agency interest: Air	
Condition number	**Condition**
A1	Notwithstanding any other condition of this environmental authority, no release of contaminants from the approved place is to cause a noxious or offensive odours beyond the **boundaries** of the approved place.
A1A	Notwithstanding any other condition of this environmental authority, no release of airborne contaminants from the approved place is to cause **environmental harm** beyond the **boundaries** of the approved place.

A2	The only material that can be used for dust suppression purposes are: a) stormwater that has not been in contact with waste; and b) products specifically designed for dust suppression.
A3	Dust and particulate matter emissions must not exceed the following concentration at any **sensitive place** or **commercial place**: a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard AS/NZS3580.10.1:2016 : Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter – Gravimetric method (or more recent editions). b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM_{10}) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with the most recent version of either: i. Australian Standard AS/NZS3580.9.6:2015: Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM_{10} high volume sampler with size-selective inlet – Gravimetric method; or ii. Australian Standard AS 3580.9.8- 2008: Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM_{10} continuous direct mass method using a tapered element oscillating microbalance (TEOM) analyser. c) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of AS/NZS 3580.9.3:2015 : Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method. d) A concentration of respirable crystalline silica (as $PM_{2.5}$) of 3 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with Australian Standard AS 3580.9.10 (or more recent editions) or any other method approved by the **administering authority.**
A4	Continuous monitoring must be conducted for PM_{10} at a minimum of two locations and for dust deposition at a minimum of four locations during the operation of the **activity** and in accordance with the associated requirements. **Associated requirements:** 1. Monitoring must include meteorological monitoring (including at least temperature, wind speed and direction). 2. Locations representative of the nearest **sensitive place** as agreed with the **administering authority**. 3. The monitoring locations must comply with the Australian Standard AS/NZS 3580.1.1:2016 "Methods for siting and analysis of ambient air. Part 1.1: Guide to siting air monitoring equipment". 4. If an alternative sampling method be required, the environmental authority holder must seek approval from the **administering authority**.
A5	Sequential monitoring of $PM_{2.5}$ and crystalline silica (as $PM_{2.5}$) at a minimum of two locations representative of the nearest **sensitive place** must be conducted for the first 12 months of operation of the activity and in accordance with the associated requirements. **Associated requirements:** 1. Monitoring must include meteorological monitoring (including at least temperature, wind speed and direction). 2. Locations representative of the nearest **sensitive place** as agreed with the **administering authority**. 3. The monitoring locations must comply with the Australian Standard AS/NZS 3580.1.1:2016 "Methods for siting and analysis of ambient air. Part 1.1: Guide to siting air monitoring equipment".

	4. If an alternative sampling method be required, the environmental authority holder must seek approval from the **administering authority**.
A6	Install a monitoring station, in accordance with Australian Standard AS2923 - 1987 "Ambient air – guide for measurement of horizontal wind for air quality applications" (or a later version), to continually record and log the following parameters: a) barometric pressure; b) humidity; c) temperature; d) rainfall; and e) wind speed and direction.
A7	When requested by the **administering authority**, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and the results notified within 10 business days to the **administering authority** following completion of the complaint investigation. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place and at upwind control sites and must include: a) for a complaint alleging dust nuisance, dust deposition; and b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM_{10}) suspended in the atmosphere over a 24hr averaging time.
A8	A **landfill gas** collection system must be designed, installed, operated and maintained by **appropriately qualified person(s)**.
A9	A **landfill gas** monitoring network must be installed for each **landfill unit** to measure **landfill gas** levels in **landfill facility** structures and at the site **boundary**. The network must consist of gas monitoring devices, such as monitoring bores and be designed, installed, operated and maintained by **appropriately qualified person(s).**
A10	A **landfill gas** monitoring program must be designed, carried out and periodically reviewed and updated by **appropriately qualified person(s)**. As a minimum the **landfill gas** monitoring program must include: a) monitoring relevant components of **landfill gas**; i. on the surface of the landfill; ii. on each **landfill unit** and all side batters above the ground surface no more than 50mm above the ground; iii. in **landfill facility** structures; iv. in subsurface geological formations; v. in subsurface soil all around the site **boundary** as well as in any potential preferential pathways that may leave the approved place; and vi. at the site **boundary**.
A11	The **landfill gas** monitoring program must monitor **landfill gas** at a minimum frequency of quarterly.
A12	**Landfill gas** measured as methane must not exceed the following limits: a) 25% of the **lower explosive limit** at any location at the landfill (but excluding facility structures used for the management of landfill gas or leachate) including service pits, service trenches and stormwater drains; b) The **lower explosive limit** in subsurface geology at or beyond the site **boundary**; and c) 25% of the **lower explosive limit** within service pits, service trenches, stormwater drains or other structures beyond the landfill site **boundary**.

<table>
<tr><td>A13</td><td>Landfill gas levels measured as methane must not exceed 500 parts per million at a height of 50mm above the final and intermediate cover surface, including the batter slopes of the landfill unit.</td></tr>
<tr><td>A14</td><td>Landfill gas collected by the landfill gas collection system must be combusted to achieve a minimum 98 percent destruction efficiency.</td></tr>
<tr><td>A15</td><td>Contaminants must not be released from any landfill gas flare emission point to the atmosphere:
a) from an emissions point that has a height less than that specified in Table 1 – Landfill gas flare emissions;
b) at a velocity that is lower than the minimum velocity specified in Table 1 – Landfill gas flare emissions; or
c) for each contaminant specified in Table 1 – Landfill gas flare emissions — at a mass emission rate that is higher than the maximum release limit specified in the table.
Table 1 – Landfill gas flare emissions
<table>
<tr><th>Release point number</th><th>Minimum release height (metres)</th><th>Minimum velocity (m/sec)</th><th>Contaminant release</th><th>Maximum release limit</th><th>Sampling frequency</th></tr>
<tr><td rowspan="3">Landfill gas flare release point one (1)</td><td rowspan="3">8m</td><td rowspan="3">8</td><td>Nitrogen oxides (NO_x)</td><td>0.62 g/s</td><td rowspan="3">Quarterly</td></tr>
<tr><td>Carbon monoxide (CO)</td><td>1.70 g/s</td></tr>
<tr><td>Non-methane hydrocarbons (NMHC)</td><td>0.18 g/s</td></tr>
</table></td></tr>
<tr><td>A16</td><td>The holder of this environmental authority must:
a) ensure the emissions from the landfill gas flare are monitored for each of the parameters, and at the frequency specified in condition A15, Table 1 – Landfill gas flare emissions; and
b) ensure temperature is monitored continuously whilst the flare is operating; and
c) that the results of any such monitoring conducted over the preceding 12 months are given or sent to the administering authority with each annual return.</td></tr>
<tr><td>A17</td><td>The holder of this environmental authority must ensure that, when contaminant monitoring is conducted in accordance with condition A15, Table 1 – Landfill gas flare emissions, the following requirements are complied with:
a) monitoring provisions for the release points listed in A15, Table 1 – Landfill gas flare emissions must comply with the Australian Standard AS 4323.1 - 1995 'Stationary source emissions Method 1: Selection of sampling positions';
b) the following tests must be performed:
i. gas velocity and volume flow rate;
ii. temperature; and
iii. water vapour concentration (moisture content);
c) where practicable samples must be taken when emissions are expected to be at maximum rates;
d) time, date and duration of sampling must be recorded; and
e) test methods and methods’ accuracies must be recorded.</td></tr>
</table>

Agency interest: Water	
Condition number	**Condition**
WT1	Other than as permitted within this environmental authority, contaminants must not be released to **waters**.
WT2	Contaminants that will, or have the potential to cause **environmental harm** must not be released directly or indirectly to any **waters** as a result of the authorised activities, except as permitted under the conditions of this environmental authority.
WT3	No releases of contaminants from the **landfill facility** are authorised to **waters** until: a) a minimum of eight (8) surface water monitoring samples, collected as part of a surface water monitoring program and the associated monitoring requirements have been met; and b) locally-derived water quality limits have been developed based on the monitoring samples required in a) above; and c) those locally-derived water quality limits are approved by the **administering authority**.
WT4	A surface water monitoring program must include: a) the design and implementation of a **receiving environment monitoring program** to monitor the waters of Six Mile Creek to: i. identify Environmental Protection (Water and Wetland Biodiversity) Policy 2019 water quality objectives and aquatic macroinvertebrate assemblages within the Six Mile Creek receiving environment; ii. identify all potential contaminant source zones and potential pathways into the receiving environment; and iii. develop locally-derived water quality limits for electrical conductivity and all contaminants of concern applicable in Six Mile Creek in accordance with the Queensland Water Quality Guidelines (2009 or most recent update) and the monitoring parameters listed in d) below. b) monitoring locations upstream and downstream of the discharge points, and at a minimum, the monitoring locations defined in Figure 7; c) surface monitoring samples collected prior to the commencement of waste deposition in the lateral and vertical extension of the **landfill facility** must be no less than two (2) months between sample events and no more than four (4) months between sampling events; and d) monitoring of at least the following parameters: i. pH (pH units); ii. Electrical Conductivity (µs/cm); iii. Dissolved Oxygen (mg/L); iv. Suspended Solids (mg/L); v. Total Organic Carbon (mg/L); vi. Ammonia as N (mg/L); vii. Nitrate as N (mg/L); viii. Total Nitrogen (TN) and Total Phosphorus (TP) (mg/L); ix. Sulfate (mg/L); x. Alkalinity (bicarbonate and carbonate) (mg/L); xi. Total Dissolved Solids (TDS) (mg/L); xii. Total Suspended Solids (TSS) (mg/L); xiii. Biological Oxygen Demand (BOD) (mg/L); xiv. Chemical Oxygen Demand (COD) (mg/L); xv. Total and dissolved metals (aluminium, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, zinc) (mg/L); xvi. **PFAS compounds**, TOP Assay and TOF as required by condition WT17 (µg/L);

and

xvii. Total fluorinated organic compounds (µg/L).

Associated monitoring requirements

1. Monitoring must be in accordance with the methods prescribed in the current edition of the **administering authority's** *Water Quality Sampling Manual.*
2. Samples must be taken using representative samples.
3. All determinations must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives/limits relevant to the particular water quality characteristic.
4. All monitoring devices must be correctly calibrated and maintained.
5. For monitoring of PFAS compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan and using low level trace analysis, under both standard analysis and total oxidisable precursor assay.
6. For monitoring of fluorinated organic compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan.

WT5

The only releases permitted to surface **waters** are stormwater runoff waters from areas outside of the **landfill facility** and must be in accordance with the limits and associated monitoring requirements specified in *Table 2 - Surface water release limits*.

Table 2 - Surface water release limits

Release Point Description (GDA94 decimal degrees) *			**Quality characteristic (units)**	**Limit**	**Limit Type**	**Minimum Monitoring Frequency**
Name	Latitude	Longitude				
LPD 1 - North-west corner HES basin	S 27° 36' 36.1"	E 152° 49' 50.1"	pH	6.5 - 8.5	Range	Prior to release, and daily thereafter during release
			Dissolved Oxygen (mg/L)	6	Minimum	
			Turbidity	<50 NTU	Maximum	
			Electrical Conductivity (µS/cm)	1500	Maximum	
			Sulfate (SO_4) (mg/L)	1000	Maximum	
			Ammonia as N (µg/L)	900	Maximum	
			Nitrate as N (µg/L)	700	Maximum	
			Total Nitrogen (TN) and Total Phosphorus (TP) (µg/L)	500 (TN) 50 (TP)	Maximum	

					Total Dissolved Solids (TDS) (mg/L)	1000	Maximum		
					Total Suspended Solids (TSS) (mg/L)	6	Maximum		
					Biochemical Oxygen Demand (BOD) (mg/L)	15	Maximum		
					Chemical Oxygen Demand (COD) (mg/L)	40	Maximum		
					Aluminium (µg/L)	55	Maximum		
					Arsenic (µg/L)	13	Maximum		
					Cadmium (µg/L)	0.2	Maximum		
					Chromium (µg/L)	1	Maximum		
					Cobalt (µg/L)	90	Maximum		
					Copper (µg/L)	1.4	Maximum		
					Iron (µg/L)	300	Maximum		
					Lead (µg/L)	3.4	Maximum		
					Manganese (µg/L)	1900	Maximum		
					Mercury (µg/L)	0.2	Maximum		
					Nickel (µg/L)	11	Maximum		
					Zinc (µg/L)	8	Maximum		
					PFOS (µg/L)	0.00023	Maximum		

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<tr><td></td><td></td><td></td><td>PFOA (µg/L)</td><td>19</td><td>Maximum</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Total fluorinated organic compounds (µg/L) as required by condition WT17</td><td colspan="2">Monitoring only</td><td></td></tr>
<tr><td></td><td></td><td></td><td>PFAS Compounds, and TOP Assay and TOF as required by condition WT17</td><td colspan="2">Monitoring only</td><td></td></tr>
</table>
Associated monitoring requirements
1. Monitoring must be in accordance with the methods prescribed in the current edition of the administering authority's Water Quality Sampling Manual.
2. Samples must be taken using representative samples.
3. All determinations must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives/limits relevant to the particular water quality characteristic.
4. Monitoring must be undertaken during a release as per the frequency stated.
5. All monitoring devices must be correctly calibrated and maintained.
6. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
7. For any monitoring results of surface water found to contain more that 50% additional PFAS present on a molar basis or organic fluorine content compared to the standard analysis, qualitative compound identification by liquid chromatography quadrupole time of flight mass spectrometry (LC-QToF-MS) must be undertaken.
8. For monitoring of fluorinated organic compounds, monitoring must be undertaken in accordance with the latest version of the PFAS National Environmental Management Plan.
9. For monitoring of PFAS compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan and using low level trace analysis, under both standard analysis and total oxidisable precursor assay.
</td></tr>
<tr><td>WT6</td><td>Stormwater sediment basins and collection devices on site must, at a minimum, retain the stormwater runoff from disturbed areas, generated by (up to and including) a 24 hour storm event with an average recurrence interval of 1 in 10 years.</td></tr>
<tr><td>WT7</td><td>Any release of stormwater must be conducted in a way and at a rate that does not cause:
a) re-suspension of particles; or
b) erosion of bed or banks of receiving waters; or
c) landscape damage; or
d) ponding of the water; or
e) vegetation damage.</td></tr>
<tr><td>WT8</td><td>The groundwater monitoring program required by condition G11 must be designed, carried out and periodically reviewed and updated by an appropriately qualified person(s). The appropriately qualified person(s) must have appropriate qualifications and experience in the fields of hydrology and groundwater monitoring programs to be able to competently make recommendations about these matters.</td></tr>
</table>

WT9	The **groundwater monitoring program** required by condition G11, must be progressed prior to the commencement of the waste deposition into the lateral and vertical extension of the **landfill facility** and must include but not necessarily be limited to: a) identification of the aquifer(s) and geological unit for which each **groundwater monitoring bore** will be monitored; b) the collection of a minimum of eight (8) groundwater monitoring sample events prior to the first deposition of waste to the **landfill facility**; c) groundwater monitoring sample events prior to the first deposition of waste to the **landfill facility** must be no less than two (2) months between sample events and no more than four (4) months between sampling events; d) identification of groundwater quality limits for parameters that are associated with the potential or actual contaminants held on the site; e) identification of triggers that are suitable for early detection of contaminant releases at the site; f) installation of background **groundwater monitoring bores** where groundwater quality will not have been affected by the site's activities authorised under this environmental authority to use as reference sites for determining impacts; g) installation of **groundwater monitoring bores** that: i. are within formations potentially affected by the activities authorised under this environmental authority (i.e. within the potential area of impact); ii. provide for the early detection of negative impacts in the immediate vicinity of potential contaminant sources, prior to reaching **groundwater** dependent ecosystems, site boundaries, landholder's active groundwater bores, or water supply bores; iii. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e. faults, areas of unconformities known to connect two or more formations and shallow groundwater); iv. establishes quality of **groundwater** down-gradient of any potential leakage of contaminants to **groundwater** from the approved place; and v. as a minimum are the **groundwater monitoring bores** depicted in Figure 7. h) monitoring of **groundwater** at each background **groundwater monitoring bore** and **groundwater monitoring bore** at least quarterly for the trigger parameters identified in point d) above and Table 3 below; i) **groundwater** trigger action response procedures for when water quality limits and trigger levels identified in point d) and (e) above trigger the early detection of seepage of contaminants, or upon becoming aware of any monitoring results that indicate potential **groundwater** contamination; and j) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis.
WT10	Groundwater quality limits in accordance with condition WT9 d) must be derived using the latest version of the **administering authority's** guideline *Using Monitoring Data to Assess Groundwater Quality and Potential Environmental Impacts.*
WT11	Groundwater trigger values in accordance with condition WT9 e) must be derived using the latest version of the **administering authority's** guideline *Using Monitoring Data to Assess Groundwater Quality and Potential Environmental Impacts.*
WT12	Prior to commencement of waste deposition within the lateral and vertical extension of the **landfill facility** the **administering authority** must approve derived groundwater quality limits and trigger values after monitoring has been conducted in accordance with condition WT9.
WT13	The locations of wells and **groundwater** monitoring facilities that comprise the **groundwater monitoring program** must be given with horizontal coordinates of such facilities accurate to 1.0 metre.

WT14	On any occasion that samples are obtained, the holder of the environmental authority must measure and record standing **groundwater** levels in metres, accurate to 0.01 metres. The elevation of the reference point, relative to Australian Height Datum, for use in any **groundwater** level measurement must be determined to an accuracy of 0.005 metres.
WT15	Measurements of **groundwater** levels must be undertaken prior to any disturbance by sampling, and must be reported as the depth in metres from the established reference point to the water surface within the bore.
WT16	The **groundwater** monitoring program must be undertaken for, at least, the water quality characteristics and the associated monitoring requirements specified in *Table 3 - Groundwater monitoring parameters*.

Table 3 - Groundwater monitoring parameters

Quality Characteristic	Unit of Measure	Monitoring Frequency
pH, dissolved oxygen, electrical conductivity, redox potential and temperature	pH, µS/cm, mV °C	Quarterly
Standing Water Level	m AHD	
Total Organic Carbon	mg/L	
Total Dissolved Solids	mg/L	
Calcium	mg/L	
Magnesium	mg/L	
Potassium	mg/L	
Sodium	mg/L	
Chloride	mg/L	
Sulphate	mg/L	
Fluoride	mg/L	
Alkalinity (Carbonate and Bicarbonate)	mg/L	
Ammonia	mg/L	
Nitrate and nitrite	mg/L	
Total phosphorus	mg/L	
Aluminium	mg/L	
Arsenic	mg/L	

Barium	mg/L		
Cadmium	mg/L		
Chromium	mg/L		
Cobalt	mg/L		
Lead	mg/L		
Copper	mg/L		
Iron	mg/L		
Manganese	mg/L		
Mercury	mg/L		
Nickel	mg/L		
Zinc	mg/L		
Phenols	mg/L		
Petroleum Hydrocarbons	mg/L		
Monoaromatic Hydrocarbons (Benzene, Toluene, Ethylbenzene and xylene)	mg/L		
Organochlorine and Organophosphate Pesticides	mg/L		
Chlorinated Compounds	mg/L		
Polycyclic Aromatic Hydrocarbons	mg/L		
PFAS Compounds, TOP Assay and TOF as required by condition WT17	µg/L		
Total fluorinated organic compounds.	µg/L		

Associated monitoring requirements

1. Monitoring must be in accordance with the methods prescribed in the current edition of the **administering authority*'s*** *Water Quality and Sampling Manual.*
2. Samples must be representative of the groundwater quality within the well.
3. All determinations must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives / limits relevant to the water quality characteristic.
4. Monitoring must be undertaken as per the frequency stated.
5. All monitoring devices must be correctly calibrated and maintained.
6. For any monitoring results of **groundwater** found to contain more that 50% additional PFAS present on a molar basis or organic fluorine content compared to the standard analysis, qualitative compound identification by liquid chromatography quadrupole time of flight mass spectrometry (LC-QToF-MS) must be undertaken.

	7. For monitoring of PFAS compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan and using low level trace analysis, under both standard analysis and total oxidisable precursor assay. 8. For monitoring of total fluorinated organic compounds, monitoring must be undertaken in accordance with the latest version of the PFAS National Environmental Management Plan.
WT17	The surface water and groundwater monitoring programs must include: a) determination of **PFAS compounds** low level trace analysis, under both standard analysis and total oxidisable precursor assay; b) determination of total organic fluorine content; c) for characterising leachate and any surface water or groundwater found to contain more that 50% additional PFAS present on a molar basis or organic fluorine content compared to the standard analysis, qualitative compound identification by liquid chromatography quadrupole time of flight mass spectrometry (LC-QToF-MS); d) compliance with quality assurance and quality control measures, including those advised in the PFAS National Environmental Management Program; and e) measurement of PFAS concentrations in sediments in any water storages or waters found to be materially affected by **PFAS compounds.**
WT18	Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from entering any **leachate** storage facility or other structures used for the storage of contaminants or wastes.
Agency interest: Land	
Condition number	**Condition**
L1	Other than permitted within this environmental authority, contaminants must not be released to **land.**
L2	Any waste-filled areas that have not been landfilled for more than 90 days must have intermediate soil cover that meets the following requirements: a) cover layer should be a minimum 300mm layer of clean earth in the form of a fine-grained, largely cohesive soil or any alternative cover with equivalent performance; b) soil cover should have a saturated hydraulic conductivity of less than 1×10^{-5} m/s; and c) the soil cover layer should minimise rainwater infiltration into the waste.
L3	When the deposition of waste to the **landfill unit** ceases, a final capping system to the **landfill unit** must be designed by an **appropriately qualified person(s)** and installed to: a) minimise infiltration of water into the landfill unit and water ponding on the surface; b) achieve hydraulic balance within the landfill units (hydraulic balance is achieved when water ingress into the landfill unit is equal to the amount of moisture removed from the landfill unit through evaporation or transpiration; and c) avoid any erosion occurring to either the final capping system or the landfilled materials. A final capping system is not required where the deposition of waste to a **landfill unit** ceases temporarily for the purpose of using an alternative working face.
L4	Land that has been disturbed for **activities** conducted under this environmental authority must be rehabilitated in a manner such that: a) suitable species of vegetation for the location are established and the vegetation is sustained for a period of no less than 12 months; and b) potential for erosion is avoided; and c) the quality of **water**, including seepage, released from the site does not cause **environmental harm**; and

	d) potential for environmental nuisance caused by dust is avoided; and e) the water quality of any residual water body does not have potential to cause **environmental harm**; and f) the final landform is stable and protects public safety; and g) the contaminant concentrations within the final capping layer for the **landfill facility** are appropriate for the final land use and in accordance with the latest edition of the 'National Environmental Protection (Assessment of Soil Contamination) Measure'. **NOTE:** Pursuant to section 207(3) of the *Environmental Protection Act* 1994, this condition continues to apply after the environmental authority has ended or ceased to have effect.
L5	Following cessation of deposition of waste at the **landfill facility**, a post-closure landfill care program must be conducted for a minimum period of 30 years or until the operator demonstrates that the **landfill facility** and surrounding site are stable and that no release of waste materials, **leachate**, **landfill gas** or other contaminants that may cause **environmental harm** is likely. **NOTE:** Pursuant to section 207(3) of the *Environmental Protection Act 1994*, this condition continues to apply after the environmental authority has ended or ceased to have effect.
L6	The program of post-closure care implemented must be effective in preventing the likelihood of **environmental harm** being caused. The program must include **measures** to: a) achieve the final rehabilitation criteria stated in condition L4; b) maintain the structural integrity and effectiveness of the final capping system; c) maintain and operate the **leachate** collection system; d) maintain and operate the groundwater protection systems; e) maintain the **groundwater monitoring program** and monitor quality of groundwater at a frequency sufficient to detect any release of contaminants to groundwater; f) monitor long term subsidence, waste settlement and stability monitoring using routine GPS survey monitoring, Lidar or equivalent monitoring method, to provide a means to quantify the occurrence of settlement and link the results to the **groundwater monitoring program**; g) maintain and operate the **landfill gas** monitoring system; and h) maintain and operate the **landfill gas** collection system. **NOTE:** Pursuant to section 207(3) of the *Environmental Protection Act 1994*, this condition continues to apply after the environmental authority has ended or ceased to have effect.
Agency interest: Noise	
Condition number	**Condition**
N1	Noise generated by the **activity** must not cause **environmental nuisance** to any **sensitive place** or **commercial place.**
N2	Noise from the **activity** must not include **substantial low frequency noise** components and must not exceed the levels identified in *Table 4 - Noise limits* when measured in accordance with the associated requirements at any **sensitive place** or **commercial place**. **Table 4 - Noise limits**

Noise level measured in dB(A)	**Monday to Saturday**			**Sunday and Public Holidays**		
	6am–7am	**7am–6pm**	**6pm–6am**	**6am–7am**	**7am–6pm**	**6pm–6am**
	Noise measured at the sensitive place					

	$L_{Aeq\ adj,\ T}$	40	45	Bkg + 0dBA	Bkg + 0dBA	Bkg + 0dBA	Bkg + 0dBA
		Noise measured at a commercial place					
	$L_{Aeq\ adj,\ T}$	Bkg + 5dBA	Bkg + 5dBA	Bkg + 0dBA	Bkg + 0dBA	Bkg + 0dBA	Bkg + 0dBA

Associated requirements

1. All monitoring devices must be calibrated and maintained according to the manufacturer's instruction manual.
2. Any monitoring must be in accordance with the most recent version of the **administering authority's** *Noise Measurement Manual.*
3. Any monitoring of noise emissions from the activity must be undertaken when the **activity** is in operation.
4. Monitoring location(s) must be relevant to the matter(s) under investigation.
5. Monitoring must include:
    a. $L_{Aeq,\ adj,\ T}$.
    b. **Background** noise (background) as $L_{A90,\ adj,\ T}$.
    c. The level and frequency of occurrence of any impulsive or tonal noise.
    d. Atmospheric conditions including wind speed and direction.
    e. Effects due to extraneous factors such as traffic noise.
    f. Location, date and time of recording.

Agency interest: Waste

Condition number	Condition
W1	Only the following waste streams can be received at the site: a) **Construction and demolition waste**; b) Dry **inert commercial and industrial waste**; c) **Green waste**; d) Contaminated soil; and e) **Limited regulated waste**.
W2	In addition to condition W1, the following waste streams must not be disposed at the **landfill facility**: a) **liquid** or semi-liquid waste, other than: i. **liquid** or **semi-liquid** waste that has been produced in the carrying out of the **activity**; ii. **liquid** or **semi-liquid** waste that is incidental to, and commingled with, the permitted waste streams. b) hot ash; c) material that is smouldering or aflame; d) waste that possesses characteristics of controlled waste listed in the 'National Environmental Protection (Movement of Controlled Waste between states and territories) Measure 1998' other than **toxic material** or ecotoxic if it complies with condition W1 and W9; e) an explosive; f) all radioactive wastes and any soils contaminated by radioactive material, unless otherwise approved under the *Radiation Safety Act 1999*; g) ammunition, other than ammunition that no longer contains explosives, pyrotechnics or propellants apart from trace residues that are no longer capable of supporting combustion or an explosive reaction; h) salt or brine generated from coal seam gas water; and

	i) **putrescible waste**.
W3	Asbestos disposal must: a) only be accepted for disposal if packaged and managed in accordance with all relevant work health and safety legislation requirements; b) be managed at all times to avoid any potential release of particulate matter to the atmosphere; c) be disposed of as a special burial of waste that is not located not less than 2 metres from the sides and final waste surface of the landfill cell; and d) be covered immediately with at least 200mm of soil or 1000mm of non-asbestos waste, and prior to any compaction.
W4	Deposited waste must be covered as soon as practicable, or at least at the end of each working day, to limit stormwater infiltration and prevent exposure of waste.
W5	Deposited waste must be covered: a) with earthen material to a thickness of at least 0.2 metres; or b) other dense and alternative material of sufficient thickness and nature to ensure that there is no exposure of waste.
W6	All reasonable and practicable **measures** must be taken to exclude vectors of disease and pest species to prevent **environmental nuisance**.
W7	All reasonable and practicable **measures** must be taken to contain litter.
W8	Excepting combustion of **landfill gas**, waste must not be burned. If waste has unintentionally being burned within the approved place, the waste must be extinguished as soon as practicable.
W9	Waste and any contaminated soil disposed of at the premises to which this environmental authority relates: a) must only be accepted subject to effectively implementing risk assessment practices and procedures for contaminant testing that ensure that the material accepted complies with the maximum contaminant levels and the allowable leaching contaminant levels prescribed in *Table 5 - Maximum total contaminant levels in soils* and *Table 6 - Allowable leaching contaminant* levels respectively; b) if the contaminated soil is used as cover material, contaminant levels must not exceed the maximum concentration limits in *Table 7 - Maximum total contaminant levels in soils used as cover material*, must not cause contaminated stormwater release and must not include any soil that is contaminated due to the concentration of monocyclic aromatic hydrocarbons, polycyclic aromatic hydrocarbons, chlorinated hydrocarbons, pesticides, petroleum hydrocarbons or asbestos; and c) All waste previously deposited in existing Cells 1, 2, 2B, 3A, 4A, 4B, 5, 5A, 5A1 and 5B prior to this environmental authority taking effect must comply with *Table 8a – Maximum contaminant levels in previously disposed wastes* and *Table 8b – Allowable leaching contaminant levels in previously disposed wastes*. **Table 5 - Maximum contaminant levels in soils** Contaminant | Maximum contaminant level for **double lined** cells (mg/kg) *Monocyclic aromatic hydrocarbons (MAH)*

Benzene	20
Ethyl Benzene	1,000
Toluene	600
Xylene	500
Total MAH	1,000
Polycyclic aromatic hydrocarbons (PAH)	
Total PAH	1,000
Phenolic contaminants - Non halogenated compounds	
Phenol	250
m-cresol	500
o-cresol	500
p-cresol	500
Total non-halogenated phenol	500
Phenolic contaminants - Halogenated phenol	
Chlorophenol	5
Pentachlorophenol	20
Trichlorophenol	20
Total halogenated phenol	20
Chlorinated Hydrocarbons - Chlorinated aliphatic compounds	
Carbon tetrachloride	10
1,2 Dichloroethane	20
1,1 Dichloroethene	1
Tetrachloroethene	20
Trichloroethene	25
Total chlorinated aliphatic compounds	50
Chlorinated Hydrocarbons - Chlorinated aromatic compounds	

Chlorobenzene	200
Hexachlorobenzene	1
Total chlorinated aromatic compounds	200
Non scheduled solid polychlorinated biphenyls (PCBs)	50
Pesticides (screening)	
Total organochlorine	50
Total herbicides	50
Total carbamates	50
Total organophosphorus	50
Petroleum hydrocarbons	
Total petroleum hydrocarbons (C_6-C_9)	1,000
Total petroleum hydrocarbons (C_{10}-C_{14})	10,000
Total petroleum hydrocarbons (C_{15}-C_{28})	50,000
Total petroleum hydrocarbons (C_{29}-C_{36})	50,000

Table 6 - Allowable leaching contaminant levels

Contaminant	**Allowable leaching contaminant levels (TCLP*) for double lined landfills (mg/L)**
Non-specific contaminants	
Biochemical oxygen demand	20,000
Total organic carbon	10,000
Petroleum hydrocarbons	50
Metals and metalloids	
Antimony	5
Arsenic	5

Barium	100
Cadmium	0.5
Chromium	5
Cobalt	5
Copper	100
Lead	5
Mercury	0.1
Molybdenum	5
Nickel	5
Selenium	1
Silver	5
Thallium	1
Tin	3
Vanadium	5
Zinc	500
Inorganic anions	
Bromide	50
Chloride	6,000
Cyanide (total)	5
Fluoride	150
Nitrate	1,000
Sulphate	4,000
Monocyclic aromatic hydrocarbons (MAH)	
Benzene	1
Ethyl benzene	50
Toluene	30
Xylene	20

Total MAH	50
Polycyclic aromatic hydrocarbons (PAH)	
Anthracene	0.7
Benz (a) anthracene	0.05
Benz (c) phenanthrene	0.05
Benzo (a) pyrene	0.02
Benzo (b) fluoranthene	0.05
Benzo (k) fluoranthene	0.05
Chrysene	0.1
Dibenz (a,h) anthracene	0.02
Dibenz (a,h) pyrene	0.1
Dimethylbenz (a) anthracene	0.05
Fluoranthene	0.2
Indeno (1,2,3-cd) pyrene	0.1
Naphthalene	0.7
Phenanthrene	0.1
Pyrene	0.7
Total PAH	1
Phenolic contaminants – Non-halogenated compounds	
Phenol	10
m-cresol	20
o-cresol	20
p-cresol	20
Phenolic contaminants - Halogenated phenols	
Chlorophenol	0.1
Pentachlorophenol	1
Trichlorophenol	1

Chlorinated hydrocarbons - *Chlorinated aliphatic compounds*	
Carbon tetrachloride	0.3
1,2 Dichloroethane	1
1,1 Dichloroethene	0.03
Tetrachloroethene	1
Trichloroethene	3
Chlorinated hydrocarbons - *Chlorinated aromatic compounds*	
Chlorobenzene (total)	10
Hexachlorobenzene	0.02
Pesticides – Organochlorine	
Aldrin	0.01
Chlordane	0.06
Chlorpyrifos	0.03
Dieldrin	0.01
DDT	0.03
Endrin	0.01
Heptachlor	0.03
Lindane	1
Methoxychlor	1
Toxaphene	0.05
Pesticides – Herbicides	
2,4-D	1
2,4-DB	2
2,4,5 -T	0.02
MCPA	2
Pesticides – Carbamates	
Carbaryl	0.6

Carbofuran	0.3
Pesticides – Organophosphorus	
Diazinon	0.1
Methyl Parathion	0.06
Parathion	0.3
Pesticides – Triazines	
Atrazine	0.03
Simazine	0.03
Fluorinated organic compounds	
Total fluorinated organic compounds (if leachate reused on or off-site)[#]	0.0003
Total fluorinated organic compounds (if leachate not reused on or off-site)[#]	0.05

*Allowable leaching levels to be determined using the **TCLP** procedure mentioned in United States Environmental Protection Agency (USEPA), Washington DC (2008) "Test methods for evaluating solid waste, physical/chemical methods" Document number SW 846. 3rd Edition or more recent editions or supplement to that procedure as they become available or as modified to reflect non-acidic leaching procedures suitable for waste characteristic assessment where co-disposal with putrescible waste will not occur.

[#]The standard suite of Total fluorinated organic compounds (PFCs) (including key sulfonates), plus total oxidisable precursor assay reported as the analyses for the resulting perfluorinated carboxylates for C4 to C14 carbon chain length (refer to PFAS National Environmental Management Plan JANUARY 2018

https://www.epa.vic.gov.au/~/media/Files/Your%20environment/Land%20and%20groundwater/PFAS%20in%20Victoria/ PFAS%20NEMP/FINAL_PFAS-NEMP-20180110.pdf).

Table 7 - Maximum total contaminant levels in soils used as cover material (note: this material is not suitable for final capping)

Contaminant	Maximum total contaminant levels in soils used as cover material (mg/kg)
Metals and metalloids	
Arsenic (total)	200
Beryllium	40
Cadmium	40

Chromium (III)	240,000
Chromium (VI)	200
Copper	2,000
Lead	600
Manganese	3,000
Mercury (inorganic)	30
Methyl Mercury	20
Nickel	600
Zinc	14,000
Other	
PFOS (Perfluoro-octane sulfonate)	6
PFOA (Perfluoro-octanoic acid)	16
Total fluorinated organic compounds	10 (not including PFOS & PFOA)

Table 8a – Maximum contaminant levels for previously disposed wastes

Contaminant	**Cells 1, 5, 5A, 5A1**	**Cells 2, 2B, 3A, 4A, 4B, 5B**
	Maximum contaminant level for clay lined landfills (mg/kg)	**Maximum contaminant level for double lined landfills (mg/kg)**
Monocyclic aromatic hydrocarbons (MAH)		
Benzene	10	20
Ethyl Benzene	500	1,000
Toluene	300	600
Xylene	250	500

Total MAH	500	1,000
Polycyclic aromatic hydrocarbons (PAH)		
Total PAH	500	1,000
Phenolic contaminants		
Phenol	100	250
m-cresol	250	500
o-cresol	250	500
p-cresol	250	500
Total non halogenated phenol	250	500
Halogenated phenol		
Chlorophenol	1	5
Pentachlorophenol	5	20
Trichlorophenol	5	20
Total halogenated phenol	5	20
Chlorinated Hydrocarbons		
Polychlorinated Biphenyl	2	-
Chlorinated aliphatic compounds		
Carbon tetrachloride	5	10
1,2 Dichloroethane	10	20
1,1 Dichloroethene	1	1
Tetrachloroethene	10	20
Trichloroethene	25	25
Total chlorinated aliphatic compounds	50	50
Chlorinated aromatic compounds		
Chlorobenzene	100	200
Hexachlorobenzene	1	1

Total chlorinated aromatic compounds	100	200
Non scheduled solid polychlorinated biphenyls (PCBs)	-	50
Pesticides		
Total organochlorine	5	50
Total herbicides	25	50
Total carbamates	25	50
Total organophosphorus	10	50
Petroleum hydrocarbons		
Total petroleum hydrocarbons (C6-C9)	500	1,000
Total petroleum hydrocarbons (C10-C14)	5,000	10,000
Total petroleum hydrocarbons (C15-C28)	10,000	50,000
Total petroleum hydrocarbons (C29-C36)	10,000	50,000
Metals / Non-metals		
Arsenic (total)	200	-
Beryllium	40	-
Cadmium	40	-
Chromium (iii)	240,000	-
Chromium (vi)	200	-
Copper	2,000	-
Lead	600	-
Manganese	3,000	-
Methyl Mercury	20	-
Mercury (inorganic)	30	-

Nickel	600	-
Zinc	14,000	-

Table 8b - Allowable leaching contaminant levels for previously disposed wastes

Contaminant	Cells 1, 5, 5A, 5A1	Cells 2, 2B, 3A, 4A, 4B, 5B
	Allowable leaching contaminant levels (TCLP) for clay lined landfills (mg/l)	Allowable leaching contaminant levels (TCLP) for double lined landfills (mg/l)
Non specific contaminants		
Biochemical oxygen demand	20,000	20,000
Total organic carbon	10,000	10,000
Petroleum hydrocarbons	25	50
Metals/non-metals		
Antimony	0.5	5
Arsenic	0.5	5
Barium	10	100
Cadmium	0.05	0.5
Chromium	0.5	5
Cobalt	0.5	5
Copper	10	200
Lead	0.5	5
Mercury	0.01	0.1
Molybdenum	0.1	5
Nickel	0.5	5
Selenium	0.1	1

Silver	0.5	10
Thallium	0.1	1
Tin	0.3	3
Vanadium	0.5	5
Zinc	50	500
Inorganic anions		
Bromide	5	50
Chloride	6,000	6,000
Cyanide (total)	1	8
Fluoride	15	150
Nitrate	100	5,000
Sulphate	2,500	50,000
Monocyclic aromatic hydrocarbon (MAH)		
Benzene	0.1	1
Ethyl benzene	5	50
Toluene	3	80
Xylene	2	60
Total MAH	5	80
Polycyclic aromatic hydrocarbons (PAH)		
Anthracene	0.07	0.7
Benz (a) anthracene	0.005	0.05
Benz (c) phenanthrene	0.005	0.05
Benzo (a) pyrene	0.002	0.02
Benzo (b) fluoranthene	0.005	0.05
Benzo (k) fluoranthene	0.005	0.05
Chrysene	0.1	0.1
Dibenz (a,h) anthracene	0.002	0.02

Dibenz (a,h) pyrene	0.01	0.1
Dimethylbenz (a) anthracene	0.005	0.05
Fluoranthene	0.02	0.2
Indeno (1,2,3-cd) pyrene	0.01	0.1
Naphthalene	0.07	0.7
Phenanthrene	0.01	0.1
Pyrene	0.07	0.7
Total PAH	0.1	1
Phenolic contaminants		
Non halogenated compounds		
Phenol	1	10
m-cresol	2	20
o-cresol	2	20
p-cresol	2	20
Halogenated phenols		
Chlorophenol	0.01	0.1
Pentachlorophenol	0.1	1
Trichlorophenol	0.1	1
Chlorinated hydrocarbons		
Chlorinated aliphatic compounds		
Carbon tetrachloride	0.03	0.3
1,2 Dichloroethane	0.1	1
1,1 Dichloroethene	0.003	0.03
Tetrachloroethene	0.1	1
Trichloroethene	0.3	3
Chlorinated aromatic compounds		
Chlorobenzene (total)	1	30

Hexachlorobenzene	0.002	0.02
Pesticides		
Organochlorine		
Aldrin	0.001	0.03
Chlordane	0.006	0.1
Chlorpyrifos	0.01	-
Dieldrin	0.001	0.03
DDT	0.003	2
Endrin	0.001	0.03
Heptachlor	0.003	0.03
Lindane	0.1	2
Methoxychlor	0.1	30
Toxaphene	0.005	0.05
Herbicides		
2,4-D	0.1	3
2,4-DB	0.2	2
2,4,5 -T	0.002	10
MCPA	0.2	2
Carbamates		
Carbaryl	0.06	3
Carbofuran	0.03	1
Organophosphorus		
Diazinon	0.01	0.3
Methyl Parathion	0.006	10
Parathion	0.03	1
Triazines		
Atrazine	0.01	-

	<table><tr><td>Simazine</td><td>0.01</td><td>-</td></tr></table>
W8	A landfill liner system must be designed, installed and maintained by **appropriately qualified persons(s)** to: a) prevent release of contaminants, including **leachate**, to land and **waters**; and b) prevent subsurface migration of **landfill gas** from the **landfill unit**.
W9	A **leachate** management system must be designed by an **appropriately qualified person(s)** and installed and maintained to: a) collect **leachate** generated in the **landfill unit**; and b) convey the collected **leachate** out of the landfill unit to an appropriate **leachate** storage facility; and c) restrict the height of the **leachate** above the liner system to a maximum level of 300mm.
W10	**Leachate** must be stored in the **leachate** storage facility and be: a) recirculated through the **landfill unit**; or b) treated for lawful disposal or reuse; or c) disposed of at a facility that is approved to receive such waste.
W11	**Leachate** must be separated from any surface water management systems.
W12	The **leachate** storage facility must be designed and constructed so as to minimise the likelihood of any release of contaminants from the storage facility to any **waters**, be **double lined** and built in accordance with Figure 1.
W13	A **Leachate** Monitoring Program must be implemented within 6 months from the date this environmental authority takes effect and as a minimum must include: a) **leachate** quality monitoring undertaken at least once annually in the event of any leachate recirculation; b) the annual measurement and recording of the quantity of **leachate** recirculated through the **landfill facility**; and c) monitoring for, at a minimum, the following water quality characteristics: i. Ammonia (as N) (mg/L); ii. Calcium (mg/L); iii. Chloride (mg/L); iv. Iron (total) (mg/L); v. Lead (total µg/L); vi. Nitrate + Nitrite (as N) (mg/L); vii. pH (pH units); viii. Potassium (mg/L); ix. Sodium (mg/L); x. Sulphate (mg/L); xi. specific conductance (µS/cm); xii. Total Organic Carbon (TOC) (mg/L); xiii. Zinc (total µg/L); xiv. Aluminium (total µg/L); xv. Carbonate and bicarbonate (mg/L); xvi. Magnesium (mg/L); xvii. Total nitrogen (mg/L); xviii. Copper (total µg/L); xix. Lead (total µg/L); and xx. PFAS, TOP Assay and TOF as required by condition WT17.

Definitions

Key terms and/or phrases used in this document are defined in this section and **bolded** throughout this document. Applicants should note that where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

24 hour storm event with an average recurrence interval of 1 in 10 years means the maximum rainfall depth from a 24 hour duration precipitation event with an average recurrence interval of once in 10 years. *For example, an Intensity-Frequency-Duration table for a 24 hour duration event with an average recurrence interval of 1 in 10 years, identifies a rainfall intensity of 8.2mm/hour. The rainfall depth for this event is therefore 24 hour x 8.2mm/hour = 196.8mm.*

Activity means the environmentally relevant activities, whether resource activities or prescribed activities, to which the environmental authority relates.

Administering authority means the Department of Environment and Science or its successor or predecessors.

Appropriately qualified person(s) means a person or persons who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature.

Background means noise, measured in the absence of the noise under investigation, as L_{A90},T being the A-weighted sound pressure level exceeded for 90 per cent of the time period of not less than 15 minutes, using Fast response.

Boundary means within one metre of the cadastral boundary of the site.

Clay lined means a landfill lined with compacted clay at least 600mm thick achieving a maximum permeability of 1×10^{-9} metres per second.

Commercial place means a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

Construction and demolition waste as defined in the Waste Reduction and Recycling Regulation 2011.

Construction quality assurance plan means a framework with defined procedures and practices to ensure that the completed products meets or exceeds the specified quality requirements.

Commercial and industrial waste as defined in the Environmental Protection Regulation 2019.

Disturbed areas includes areas:

1. that are susceptible to erosion;
2. that are contaminated by the **activity**; and/or
3. upon which stockpiles of soil or other materials are located.

Double lined means a landfill lined with at least two liners composed by combining any two of the following liners**:**

1. Geomembrane Liner (**HDPE**, **LLDPE** or similar)
2. Geosynthetic Clay Liner;
3. 600mm thick compacted clay or compacted engineering fill achieving a permeability of 1×10^{-9} metres per second.

Environmental harm as defined in Chapter 1 of the *Environmental Protection Act 1994*.

Environmental nuisance as defined in Chapter 1 of the *Environmental Protection Act 1994*.

Financial assurance as defined in Chapter 5 of the *Environmental Protection Act 1994*.

Green waste means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature.

Groundwater means water that occurs naturally in, or is introduced artificially into, an aquifer.

Groundwater monitoring bore means groundwater monitoring bore, constructed in accordance with the relevant Australian Standard, and used to sample groundwater from an aquifer the water quality of which may be potentially affected by the activity. This may be a background bore, an up-gradient bore, down-gradient bore or bore in the same aquifer in a nearby location unaffected by the activity.

Groundwater monitoring program means a system of groundwater monitoring devices, such as monitoring bores, and specified monitoring requirements used to provide data in respect to the level and quality of groundwater in the uppermost aquifer.

HDPE means high density polyethylene.

Inert means bricks, pavers, ceramics, concrete, glass or steel; or similar general waste that does not biodegrade or decompose.

$L_{Aeq\ adj,T}$ means the adjusted A weighted equivalent continuous sound pressure level **measures** on fast response, adjusted for tonality and impulsiveness, during the time period T, where T is measured for a period no less than 15 minutes when the **activity** is causing a steady state noise, and no shorter than one hour when the approved **activity** is causing an intermittent noise.

Land does not include **waters**.

Landfill facility means land and structures at the site approved used for the disposal of solid waste.

Landfill gas means a mixture of gas (primarily methane and carbon dioxide) that is generated in landfills by the anaerobic decomposition of organic wastes.

Landfill unit means a discrete area of land or an excavation that receives solid waste.

Leachate means a **liquid** that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of at the site that contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

Limited regulated waste means any of the following types of regulated waste:

1. Asbestos; and
2. Shredded tyres.

Liquid means any substance that:

1. has an angle of repose of less than five degrees; or
2. becomes free flowing at or below 60 degrees Celsius or when it is transported; or
3. is not generally capable of being picked up by a spade or shovel.

LLDPE means linear low density polyethylene

Lower explosive limit means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at $25^{O}C$ and atmosphere pressure.

Measures has the broadest interpretation and includes plant, equipment, physical objects, monitoring, procedures, actions, directions and competency.

PFAS means Per- and Poly-Fluoroalkyl Substances.

PFAS Compounds means the PFAS sub-classes outlined in Appendix A of the most recent edition of the PFAS National Environmental Management Plan.

Putrescible waste means waste food or waste animal matter (including dead animals and animal parts), and includes any mixtures of such waste.

Receiving environment monitoring program means a monitoring program designed to monitor and assess the potential impacts of controlled or uncontrolled releases of contaminants to the environment from the **activity**.

Records include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a condition of this authority.

Release of any contaminant into the environment means to:

1. deposit, discharge, emit or disturb the contaminant; and
2. cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
3. fail to prevent the contaminant from being deposited, discharged emitted or disturbed; and
4. allow the contaminant to escape; and
5. fail to prevent the contaminant from escaping.

Secondary containment system means a system designed, installed and operated to prevent any release of contaminants from the system, or containers within the system, to land, groundwater, or surface waters.

Semi-liquid waste means imperfectly fluid, having both fluid and solid characteristics.

Sensitive place includes the following and includes a place within the curtilage of such a place reasonably used by persons at that place:

1. a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
2. a motel, hotel or hostel; or
3. a kindergarten, school, university or other educational institution; or
4. a medical centre or hospital; or
5. a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area; or
6. a park or gardens; or
7. for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2019.

Slope/W means a slope stability software program for geotechnical, civil and engineering purposes.

Substantial low frequency noise means a noise emission that has an unbalanced frequency spectrum shown in a one-third octave band measurements, with a predominant component within the frequency range 10 to 200 Hz.

TCLP means the test described in "*U.S. EPA: Toxicity Characteristic Leaching Procedure (TCLP)*" Federal Register, 40 CFR, Vol. 51, No. 286, Appendix 2, Part 268, page 40643 or as modified to reflect non-acidic leaching procedures suitable for waste characteristic assessment where co-disposal with **putrescible wastes** will not occur.

Toxic material means:

1. cytotoxic wastes;
2. drugs and poisons as cited in the Standards for Uniform Scheduling of Drugs and Poisons (Schedules 8 and 9 drugs as per the Poisons (Health and Drugs) Regulation 1996); and
3. any other material that:
    a. has contaminant concentrations in the waste exceeding the allowable levels in Table 5 - Maximum contaminant levels in soils; or
    b. has leaching contaminant levels in the waste when measured in accordance with toxicity characteristic leaching procedure (**TCLP**), exceeding the concentrations prescribed in Table 6 - Allowable leaching contaminant levels.

Waters includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water, natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and **groundwater** and any part thereof.

Figures

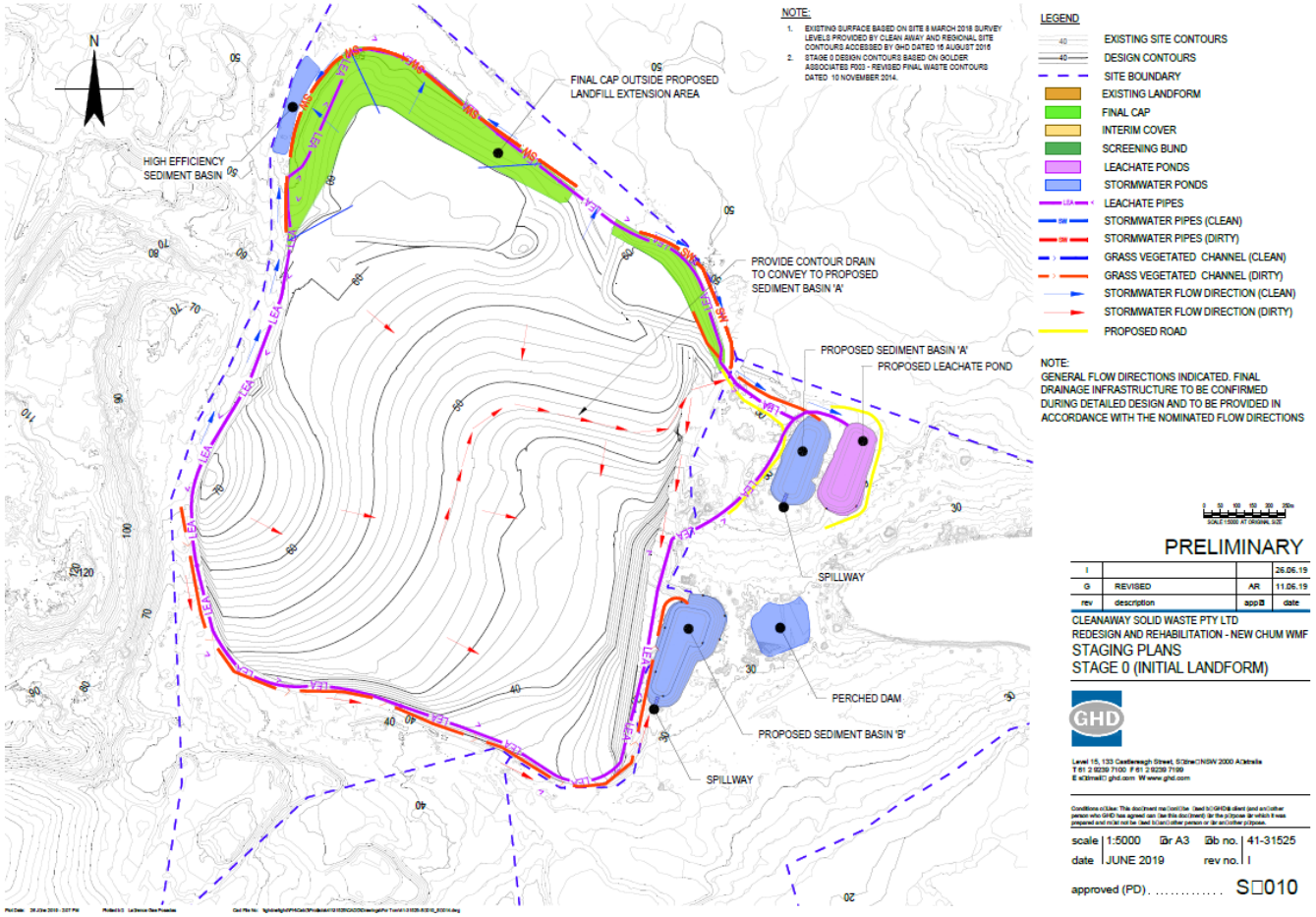


Figure 1: Lateral and vertical extension of the landfill (Stage 0 – initial landform)

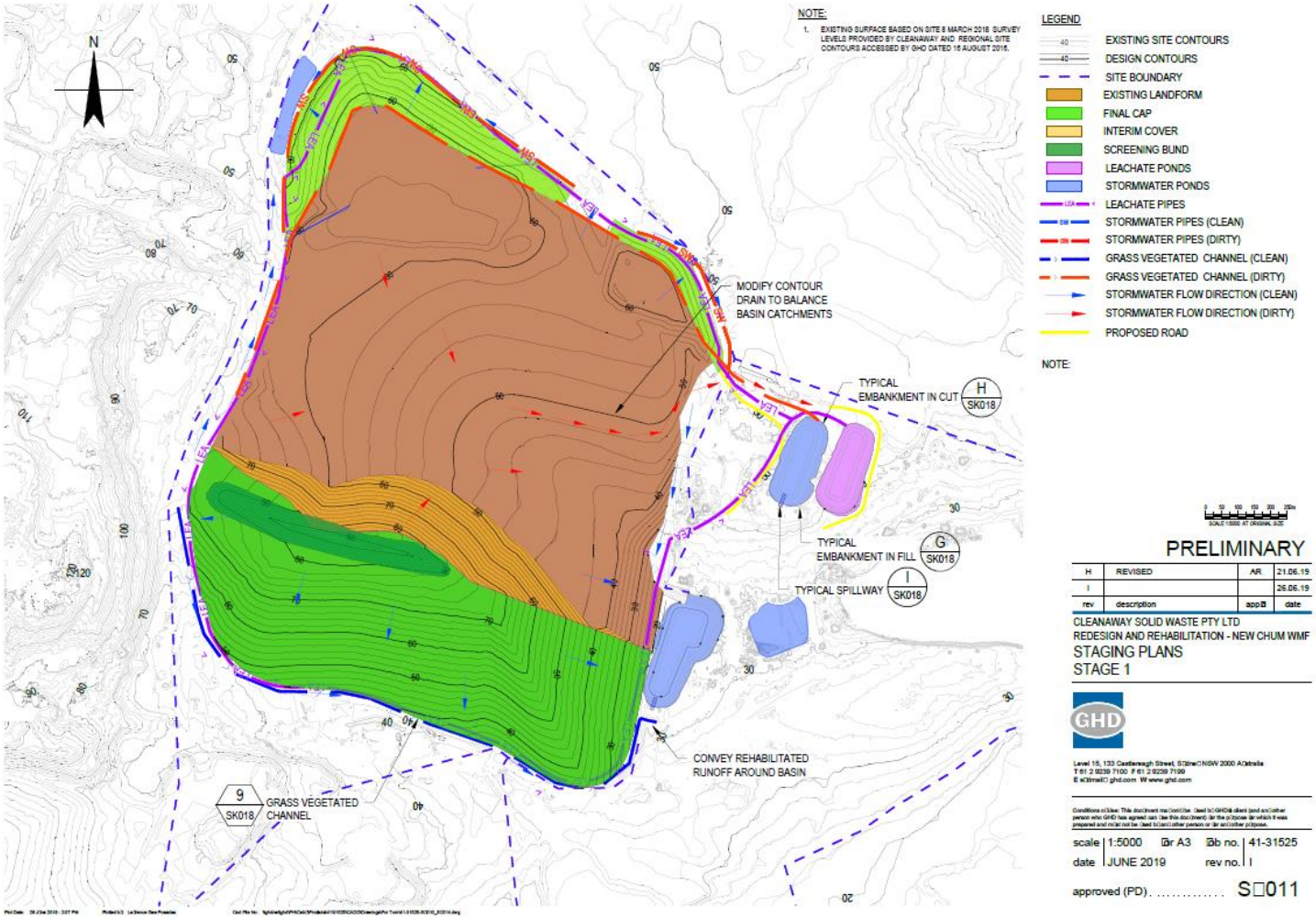


Figure 2: Lateral and vertical extension of the landfill (Stage 1)

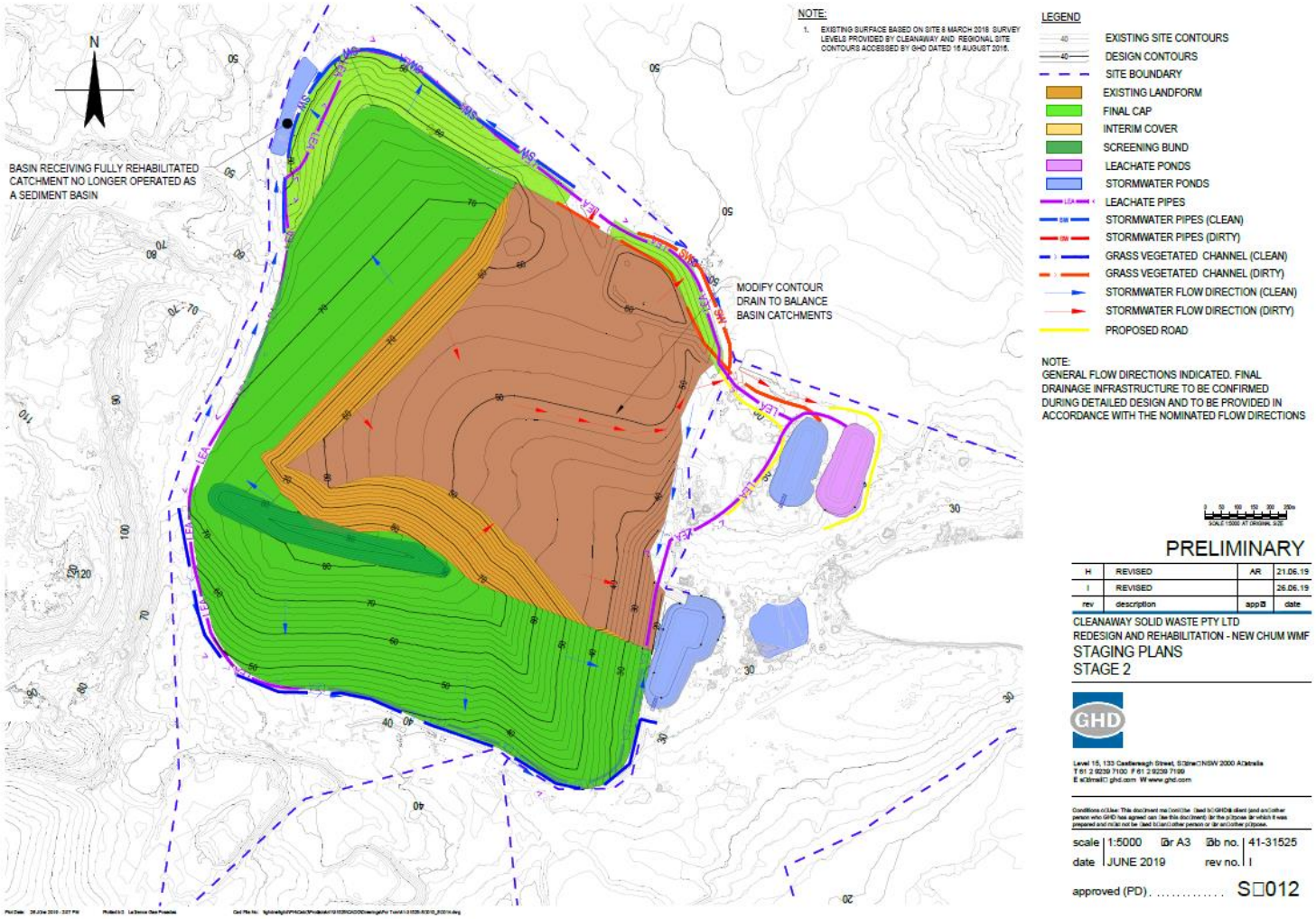


Figure 3: Lateral and vertical extension of the landfill (Stage 2)

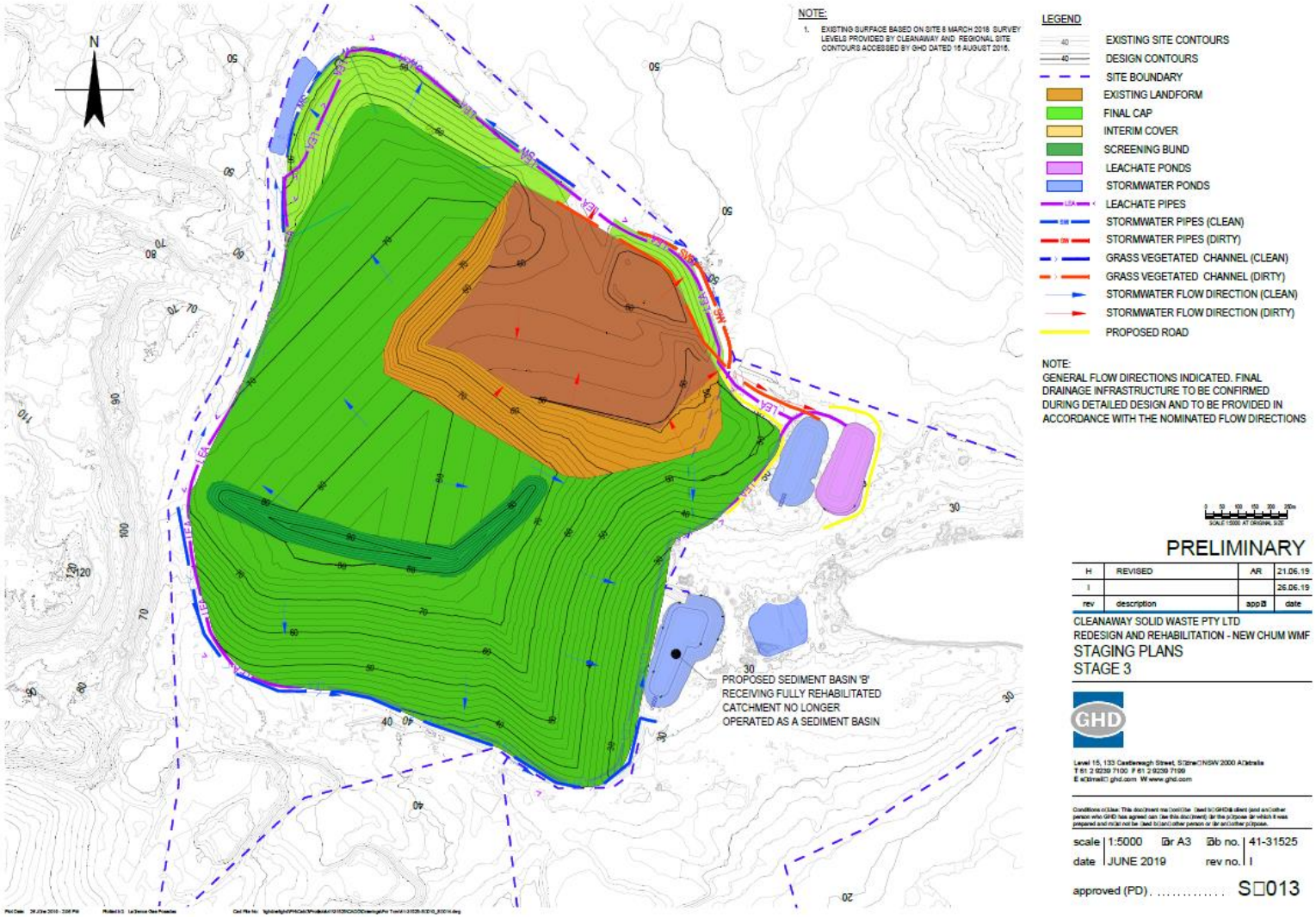


Figure 4: Lateral and vertical extension of the landfill (Stage 3)

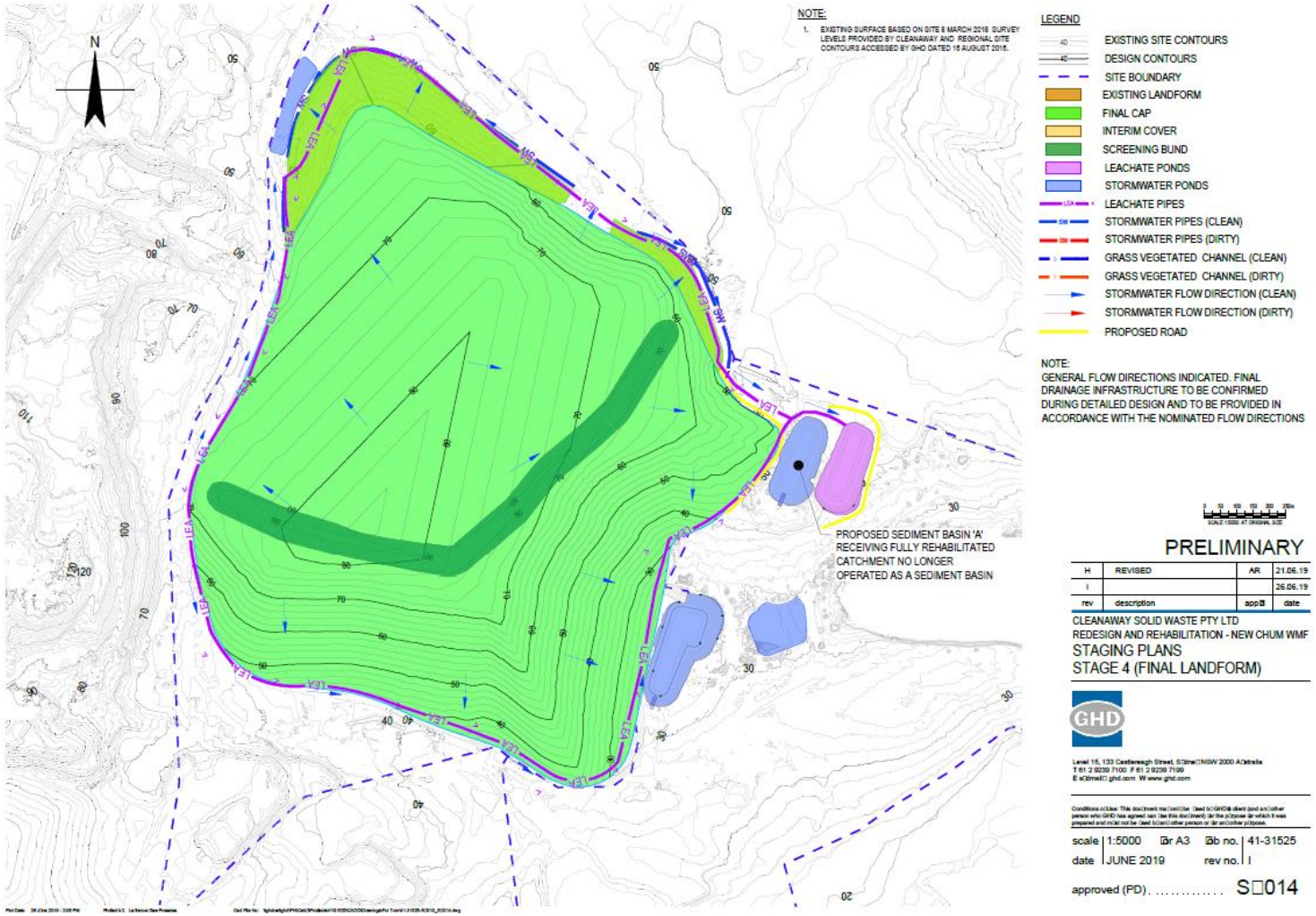


Figure 5: Lateral and vertical extension of the landfill (Stage 4 – final landform)

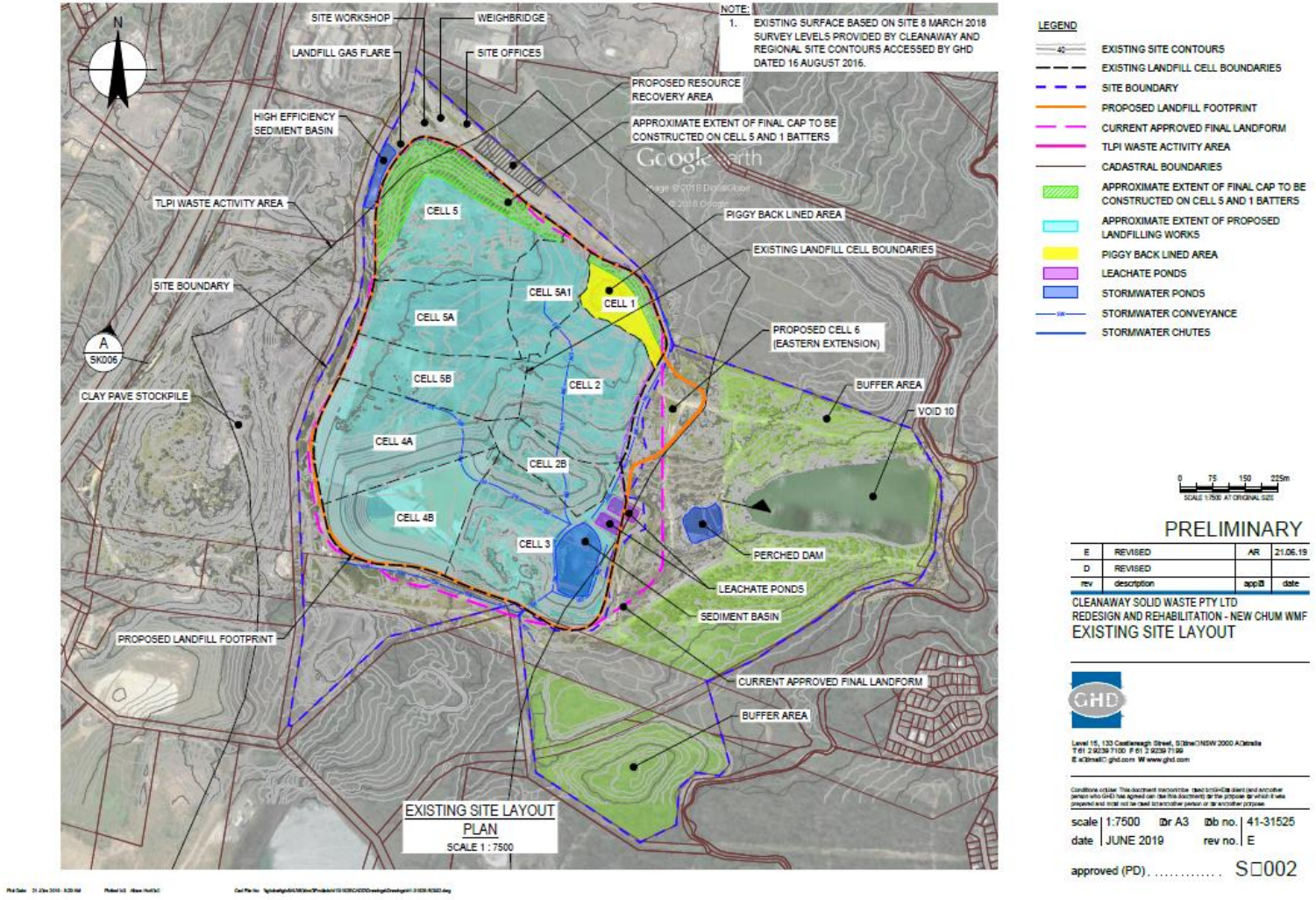


Figure 6: Existing landfill footprint

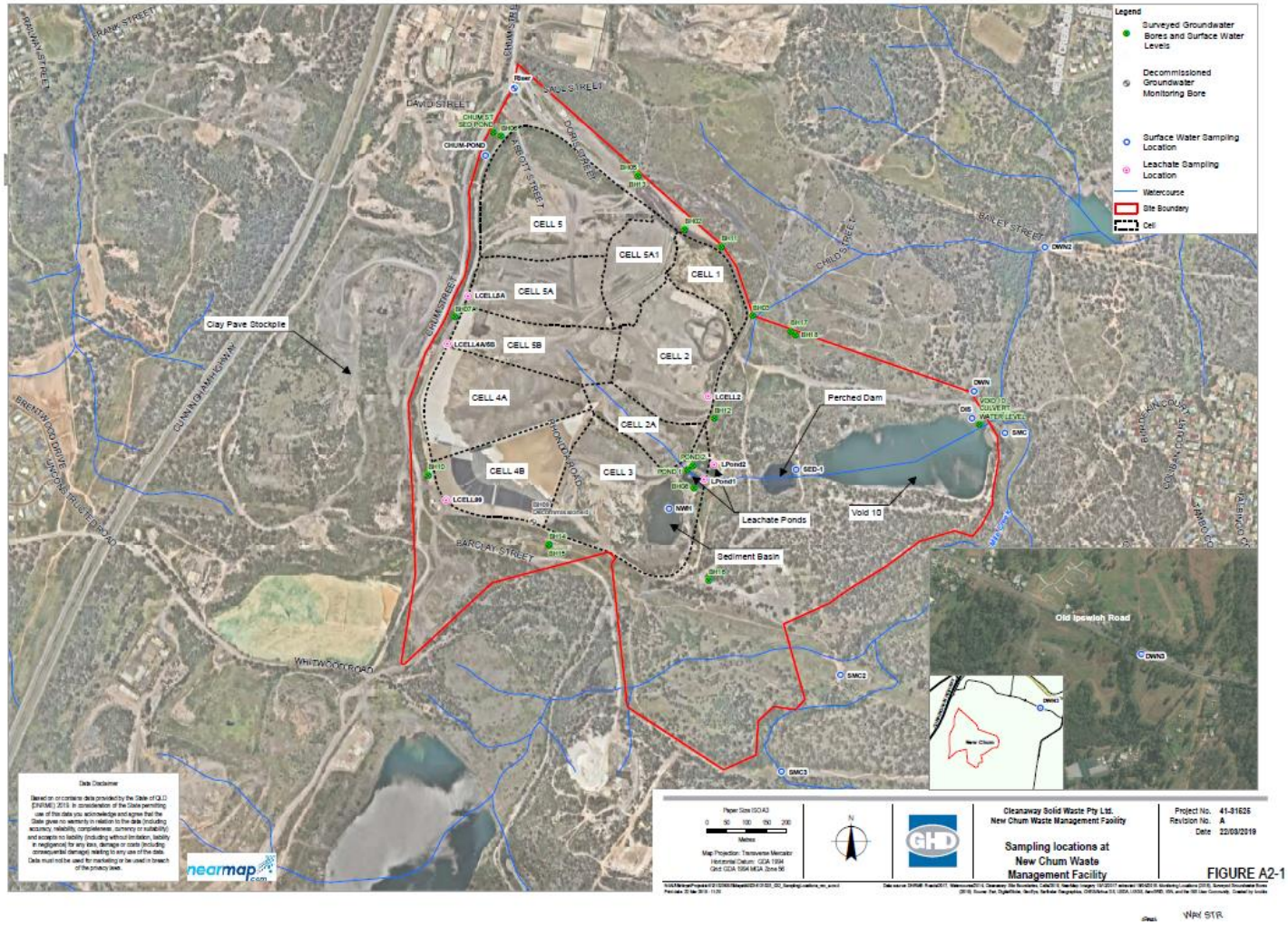


Figure 7 Sampling locations and groundwater monitoring bores