Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W2814/2024/1
Applicant	Opalvale Pty Ltd
ACN	106 512 896
File number	APP-0026258
Premises	Salt Valley Road Class II Landfill Chitty Road, HODDYS WELL WA 6566 Legal description - Part of Lot 11 on Deposited Plan 34937 Certificate of Title Volume 2535 Folio 391 As defined by the coordinates in Schedule 2 of the works approval
Date of report	06/03/2025
Decision	Works approval granted

Abbie Crawford

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Abbie Crawford
Manager, Waste Industries

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W2814/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary and overview of premises

Opalvale Pty Ltd (the applicant) currently holds licence L9089/2017/1 for the operation of the Salt Valley Road Class II Landfill located at Part of Lot 11 on Deposited Plan 34937, Chitty Road, Hoddys Well (the premises). The premises' operation has been split into two stages, with Stage 1 consisting of the construction and operation of Cells 1 to 6. Cells 1, 2, 3 and 4 are reaching their maximum operating height and the construction of Cells 5 and 6 are required to facilitate the progression of the landfill in accordance with the landfill's *Closer and Post-Closure Management Plan* (Talis 2021).

On 4 October 2024, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act) for the construction and operation of Cells 5 and 6.

3. Landfill engineering and design

3.1 Class II putrescible landfill

Table 1 provides a summary of the landfill engineering as constructed. Figure 1 shows the proposed site layout.

Table 1: Landfill cell design

Landfill design aspect	Description
Cell available airspace	Cell 5 – 240,283 m^3 Cell 6 – 503,833 m^3
Cell lifespan	Cell 5 – 1 year Cell 6 – 2.2 years
Side slopes	1V:3H
Basal gradient	3% cross-fall slopes to 1% spines orientated perpendicular across cell base
Final slope profile	1V:20H profile on the crown and 1V:5H on the side slopes
Pre-settlement restoration levels	312 m AHD

Landfill design aspect	Description
Containment infrastructure	Basal lining system, leachate collection system, gas management system, capping system and surface water management system
Groundwater separation distance	2 m between Cells 5 and 6 sumps and long-term maximum groundwater level

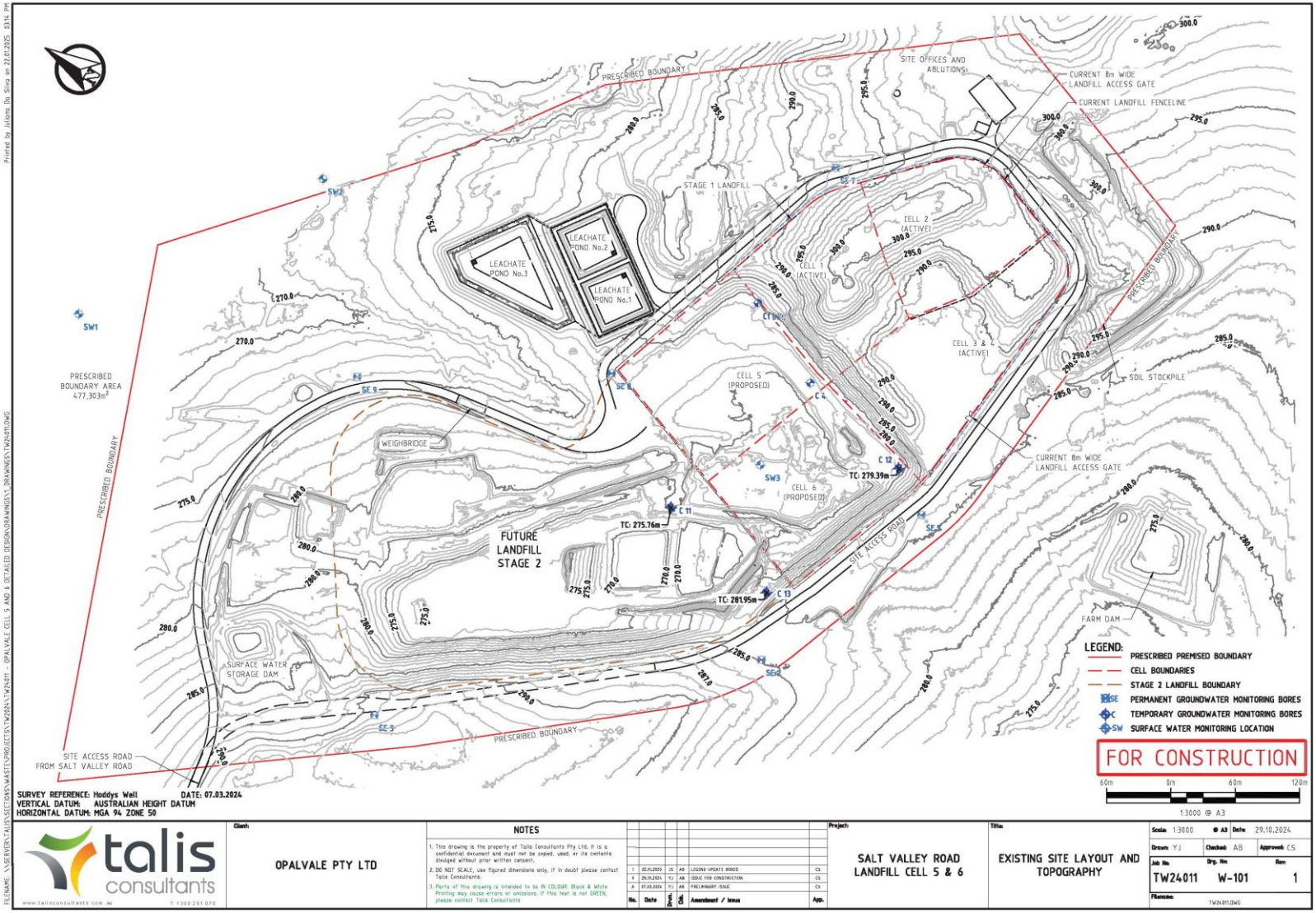

Figure 1: Proposed site layout

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3.1.1 Landfill liner design

The Class II landfill comprises of an engineered composite lining system consisting of the following elements (in order of construction/installation):

- 500 mm engineered fill;
- Geosynthetic clay liner (GCL);
- 2 mm double textured high-density polyethylene (HDPE) geomembrane;
- Protection geotextile;
- Leachate collection, extraction and management system consisting of;
    - 300 mm thick aggregate leachate collection layer;
    - 225 mm diameter perforated primary leachate collection pipes;
    - 160 mm diameter perforated secondary leachate collection pipes;
    - Dual 355 mm leachate extraction riser pipes and manually operated submersible pump;
    - Leachate main for future connection to the existing leachate evaporation ponds; and
    - Separation geotextile.

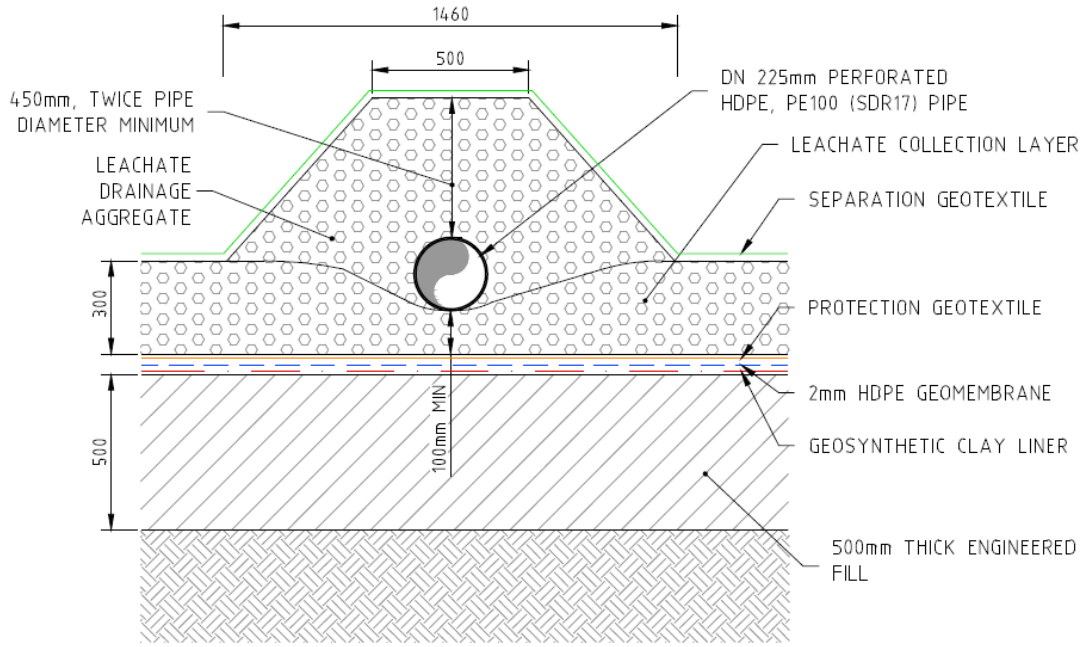

Figure 2: Basal lining system including primary leachate collection pipe

3.1.2 Construction quality assurance

Construction Quality Assurance (CQA) activities will be required to be undertaken during the construction of the lined landfill cells. These activities are undertaken by an independent, suitably qualified engineer that is not affiliated with contractors, subcontractors, suppliers or manufacturers. A CQA plan has been prepared that outlines CQA requirements including quality assurance procedures and testing methods for construction.

3.1.3 Landfill stability

Landfill stability for Stage 1, including Cells 5 and 6, was assessed as part of the original works approval W5800/2015/1 granted on 27 August 2015. The department engaged GHD Pty Ltd (GHD) to critically review the stability assessment conducted by Golder Associates Pty Ltd (2014) and found that the landform design was considered stable and regarded the assessments findings and recommendations to be appropriate. During the Cells 5 and 6 design process, Talis considered the principal components of the conceptual stability site model and screened out the requirement for assessment / reassessment of the basal subgrade, sideslope subgrade, basal and sideslope lining system. An assessment of temporary waste slopes was undertaken using the geometry presented in the IW Projects Drawings submitted with the Stage 1 Works Approval with all calculated factors of safety being considered to be acceptable.

Following the redesign of Cells 5 and 6 by Talis, Talis undertook a review of the geometry and found that the temporary slope height between the intercell bund between the future Stage 2 and Cells 5 and 6 was 2 m greater. To assess the impact of the 2 m higher slope on the factor of safety, a mass block analysis was undertaken and found that the lowest factor of safety reduced from 1.062 to 1.042 (1:1000 AEP seismic loading). While still considered acceptable, it is also noted that the temporary waste slope should only be in place for a few years until such time that it is buttressed with the first lift of waste from Stage 2, with the likelihood of a severe seismic event occurring in this time to be low. As a result, repeating the stability risk assessment modelling was not considered necessary (Talis 2024).

3.1.4 Leachate management

Leachate is collected via the leachate collection layer integrated within the engineered lining system. The leachate collection layer utilises a combination of aggregate and collection pipes directed to a leachate collection sump within each cell. The key elements of the system are:

- 300 mm thick highly permeable low calcareous aggregate leachate collection layer;
- 225 mm diameter perforated primary leachate collection pipes;
- 160 mm diameter perforated secondary leachate collection pipes;
- Dual 355 mm leachate extraction riser pipes and manually operated submersible pump; and
- Leachate main for future connection to the existing leachate evaporation ponds.

The 300 mm thick aggregate drainage layer consists of low calcareous aggregate with a hydraulic conductivity of >1 x 10^{-3} m/s and will be installed across the full extent of the base and 4.5 m vertically up the side batters. A fine grained sand protection layer will extend a further minimum 1 m up the side batters. The fine grained sand protection layer will be 300 mm thick and will be placed in principal during the operational of the cell to protect the underlaying liner layers.

The base of the cell is designed with a 3% slope to a 1% spine orientated perpendicular across the cell base which will also direct leachate towards the leachate collection sump.

Cells 5 and 6 will be developed simultaneously without an intercell bund, however, each cell has its own leachate collection system and corresponding sump for extracting leachate. The sump is located within the north-western corner for Cell 5 and the south-western corner for Cell 6.

The leachate sump contains a primary 355 mm sider riser pipe with a secondary one installed as a contingency measure. A submersible electric pump will be installed inside the primary

riser of each cell which will extract leachate when sufficient head is present over the pump's inlet. Pumps will be electrically switched in the same manner as existing pumps in Cell 1 and Cells 3 and 4.

3.1.5 Landfill gas management

As part of the closure plan, landfill gas (LFG) generation was assessed. The numerical modelling software, GasSim, was used to model LFG generation over the premises' operational and post-operational lifespan. GasSim estimates the quantity of LFG generated, including emissions, migration, dispersion, and possible impacts.

The results of the gas modelling indicate that bulk gas production will peak in 2029 at a rate of approximately 890 m^3/hr. This peak rate coincides with the final capping of Phase 1. The anticipated landfill gas generation obtained from the model is shown in Figure 3 below (source: Talis 2024).

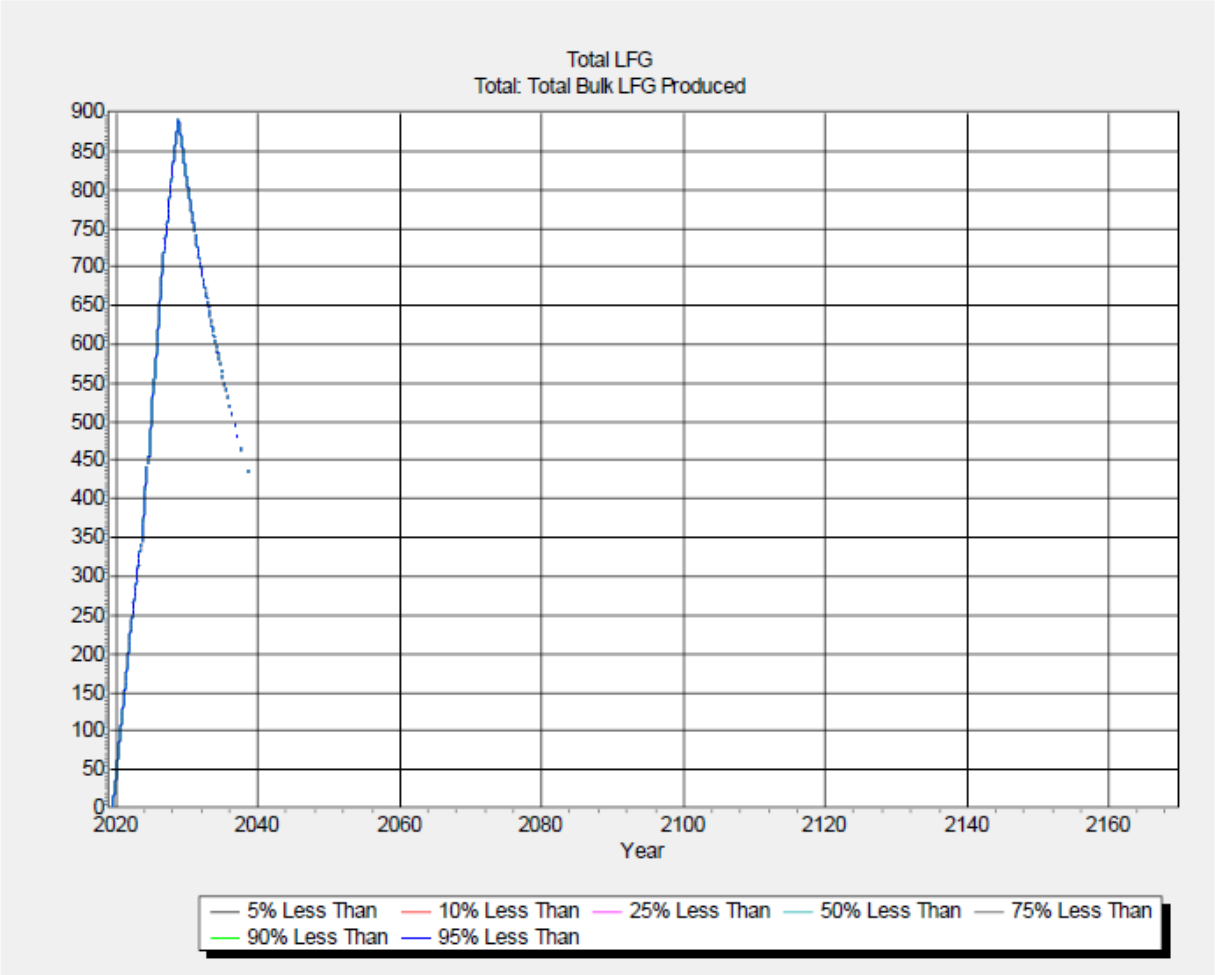

Figure 3: Modelled landfill gas production

Given the anticipated peak LFG production rate of 890 m^3/hr following the final capping of Phase 1, an active system will be required.

A total of 21 vertical gas extraction wells will be installed in Stage 1 in a regular grid-like pattern at a spacing of 50 m as shown in Figure 4. Gas extraction wells will not be installed within 5 m of the edge of the landfill to reduce the risk of oxygen infiltration into the landfill, nor will they be installed on the temporary waste slope to the west of the premises. Wells should be drilled to 75% of the waste depth at a minimum depth of 10m to ensure optimal gas extraction without causing leachate ingress into the system.

Vertical gas wells will be installed once the waste mass has reached its final height, and there is flexibility in their design depth at the time of installation. This may include the installation of sacrificial wells that are used to manage landfill gas before the waste mass has reached its final height.

Each landfill gas well will be connected to a 250 mm diameter ring main header that extends north to south of the premises. Individual wells are connected in parallel to this ring main via a series of 110 mm and 160 mm diameter header HDPE pipes. The circular design enables gas to continually flow to the gas destruction system, even in the event of a blockage along the header or any of the pipes. The main header and lateral pipes are sloped against the flow of gas to facilitate the drainage of leachate and condensate, either back into the landfill or a number of naturally low ‘drop out’ points where leachate can then be returned to the landfill.

An active landfill gas system will be installed at the Site following the first stage of landfill capping.

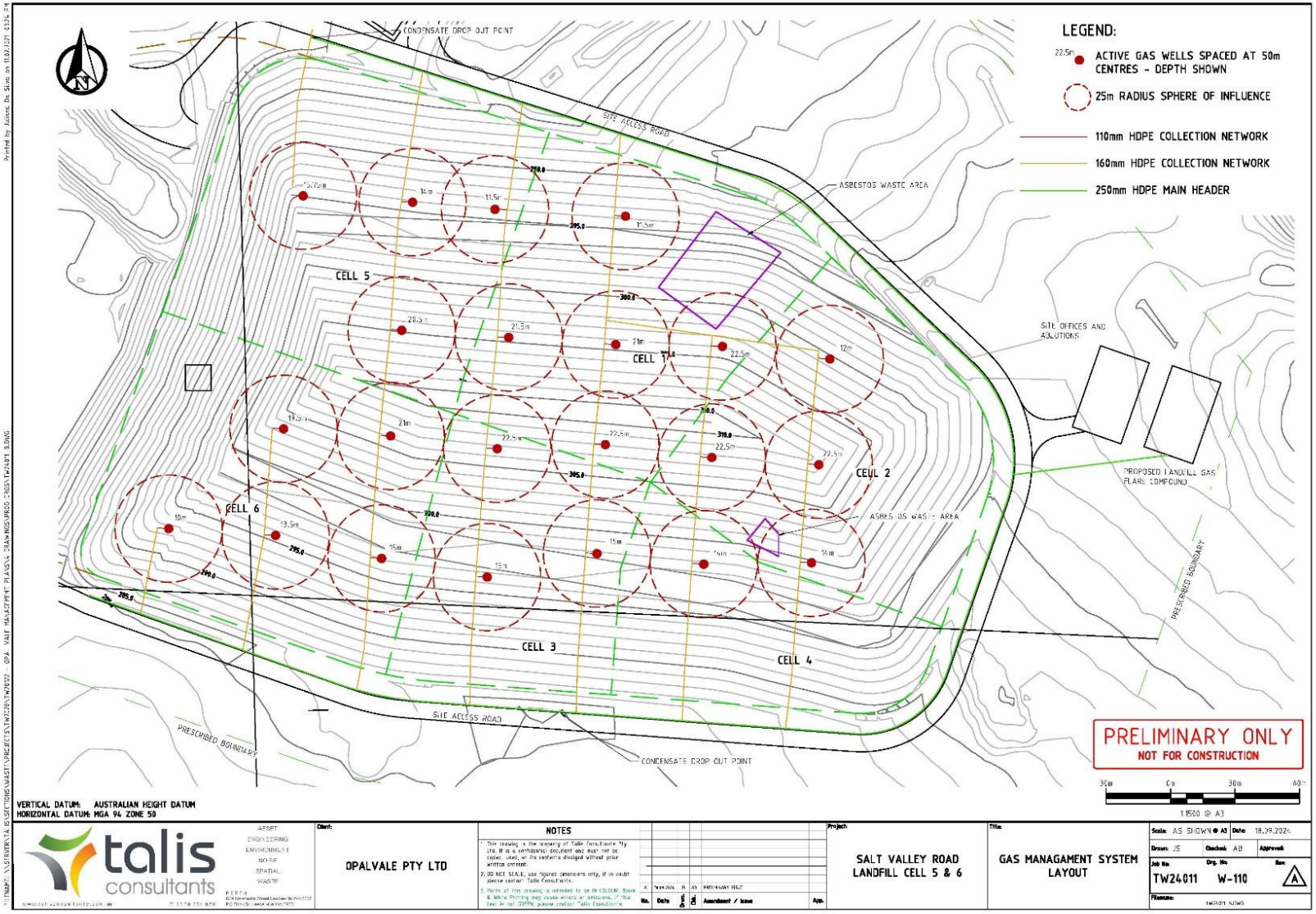

Figure 4: Landfill gas management system

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3.1.6 Surface water management system

Surface water bunds will be constructed around Cells 5 and 6 to divert clean surface water away from the landfill to minimise leachate generation. Bunds will be 0.5 m high designed with a 2% fall away from the landfill cells to avoid run off from entering the cells. A larger intercell bund will be installed to the west of Cells 5 and 6 to avoid any run off from entering the landfill cell along this boundary.

Surface water is expected to flow along existing drainage pathways to the northwest and southwest of the premises. Drainage channels adjacent to the access roads have been lined with aggregate to minimise scouring.

3.1.7 Cell closure

The applicant proposes to progressively cap the landfill in three phases. The proposed capping system, starting at the waste mass, is as described below:

- 300 mm sand, gas collection layer / regulating layer;
- 1.5 mm textured Linear Low Density Polyethylene (LLDPE) geomembrane layer;
- geonet drainage layer;
- 1000 mm of restoration layer, comprising of:
    - 800 mm thick layer of site sourced soils; and
    - 200 mm thick layer of growing medium / mulch.
- Vegetation layer incorporating hydromulch / seeding.

4. Operational overview

4.1 Waste acceptance

Cells 5 and 6 will operate as Class II landfill cells with waste acceptance to be consistent with the current licence (L9089/2017/1). The following waste types are currently accepted at the premises in accordance with L9089/2017/1:

- Clean fill and uncontaminated fill;
- Inert waste type 1;
- Inert waste type 2;
- Special waste type 1;
- Special waste type 2;
- Putrescible waste (must meet the acceptance criteria for Class II landfills); and
- Contaminated solid waste (must meet the acceptance criteria for Class II landfills).

The premises currently accepts waste six days a week, Monday to Saturday, receiving waste from both community and commercial operators. Approximately 90,000 to 100,000 tpa of waste is accepted at the premises with the approximate composition as reported by the licence holder presented in Table 2.

Table 2: Approximate waste composition

Waste Type	Percentage (%)
Food	15
Paper and cardboard	15
Garden and parks	5
Wood and wood waste	25
Textiles (e.g. carpets)	5
Rubber and leather	5
Plastics	20
Other inert	10

Upon arrival to the weighbridge, customers are required to provide information on the source and type of waste material being delivered. An elevated camera is mounted on the weighbridge gatehouse to allow the weighbridge operator to monitor the contents of incoming vehicles where possible.

If there is a likelihood that the incoming load may contain non-acceptable waste, the load inspected as best as possible before discharge at the active tipping face. If not possible, the load is tipped under supervision on the side of the active landfill area to allow adequate inspection while unloading. If the load is deemed unacceptable, it is placed back into the delivery vehicle and removed from the premises. If deemed acceptable, it is pushed up into the landfill and compacted. The active tipping face is permanently manned, with all loads being inspected upon arrival. If a customer has departed the site and non-conforming waste has been identified, the premises operator separates the waste, quarantines the waste and makes the necessary arrangements to remove the waste from the premises.

4.1.1 Asbestos management

Asbestos material is only accepted if appropriately wrapped and sealed in plastic. Upon delivery, it is promptly taken to the landfill where it is buried in a specially designated area with proper coordination and documentation.

4.2 Leachate management

Leachate is collected via a combination of aggregate and collection pipes integrated into the liner system. The sloped floor directs leachate to a sump which contains a submersible electric pump installed in a 355 mm leachate extraction riser pipe.

Leachate pumps are switched manually and operated on a campaign basis when sufficient head is present over the pump's inlet.

The hydraulic head of leachate over the landfill liner surface is proposed to be managed during landfill operations through extraction of leachate from the sump. Leachate levels on the landfill liner are proposed to be managed as low as reasonably practicable.

Leachate pumped from the leachate sump will be transferred via a solid HDPE pipe rising to the premises' centralised landfill leachate evaporation pond system located to the north of the landfill.

The premises has three landfill leachate evaporation ponds, consisting of one pond 1,322 m^3

in size, and the other two ponds 5,024 m^3 in size each, providing a combined operational capacity of approximately 11,370 m^3. The ponds are managed under the current licence L9089/2017/1 with a freeboard of 0.5 m.

A pump flow meter measures the cumulative volume of leachate removed from each sump. A pair of shut-off valves are used to direct the flow either to the premises' leachate pond system or recirculate leachate back into the landfill. Leachate can also be abstracted from the leachate pond system for recirculation within the landfill's waste mass.

A water balance assessment was conducted as part of the application to assess the adequacy of the existing leachate ponds capacity to determine if additional leachate evaporation ponds are required to manage leachate at the premises. The water balance assessment determined that the maximum worst case leachate generation will occur immediately following the construction of Cells 5 and 6 and prior to the capping of Phase 1. During this modelled worst-case scenario, the results of the modelling suggest that the leachate management system is capable of managing leachate generation during this time. Should leachate recirculation be required to manage leachate levels during this time, there is an estimated two year timeframe whereby the premises will be able to manage leachate levels within the need to construct an additional pond. Should a wet year be experienced during the worst-case scenario period, an updated water balance assessment will need to be undertaken to determine if an additional pond is required.

4.3 Stormwater management

Surface water bunds 0.5 m high around the perimeter of Cells 5 and 6 will divert clean surface water away from the landfill to minimise leachate generation. Surface water is expected to flow along existing drainage pathways to the northwest and southwest of the premises where informal surface water ponds are present.

Surface water captured within the existing quarry footprint will be allowed to pool in this area, with slopes immediately adjacent to the landfill sloped to ensure this water does not enter the landfill cell. Pumps will be used to empty this void on an as-needs basis, with the water either being stored within empty ponds for use in dust suppression and premises operation or discharged into the environment via existing drainage lines.

The landfill's design incorporates a sloped waste profile, directing uncontaminated surface water away from the active landfill area, while ensuring exposed waste surfaces slope into the landfill to minimise run-off. Intermediate cover materials will be regularly inspected to minimise erosion risks and potential surface water contamination. Water collected in the external water storage dam will be monitored for turbidity, and if water quality exceeds set limits, it will not be discharged, instead being used for dust suppression or other similar activities at the premises.

5. Location and siting

5.1 Siting context

The premises is located approximately 65 km north-east of Perth on the southeastern portion of Lot 11 on Plan 34937 Chitty Road, Hoddy's Well within the Shire of Toodyay. The landfill is sited within Williamsons Clay Pit, situated approximately 1.25 kilometres (km) to the east of Chitty Road and 3 km to the southeast of the site entrance at of Salt Valley Road. Access to the site is via Salt Valley Road, using an existing 3 km internal assess road previously used as part of clay extractions activities. The premises is approximately 47.7 ha in size and includes the Stage 1 landfill area (10 ha) and associated operational areas (site access rods, and other infrastructure).

The surrounding land uses are predominately agricultural farm land (cropping and grazing) and native bushland. The premises and the Lot on which the premises is located for part of an

extensive farming property comprising large areas of remnant native vegetation and cleared agricultural land.

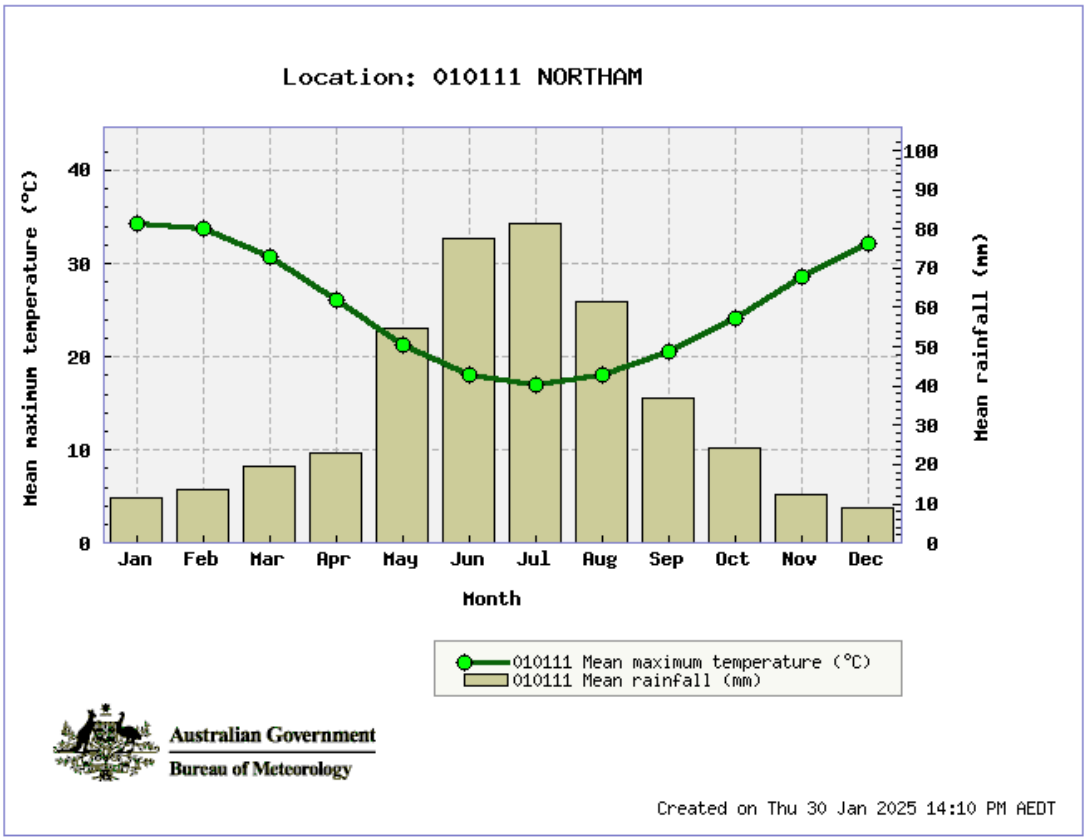
5.2 Environmental siting

5.2.1 Climate and rainfall

The Toodyay area is situated in a temperate climate (based on the Koppen climate classification) characterised by warm to hot, dry summers and cool, wet winter.

The nearest Bureau of Meteorology (BoM) weather station site with complete data to the premises is the Northam station (BoM site number 010111). Data shows that the area in the vicinity of the premises has an annual average rainfall of 424.5 mm (based on data from 1877 to 2024), with the majority of rainfall received between May and September.

The hottest month is January, with an average maximum temperature of 33.4°C and average minimum temperature of 17.2°C. The coldest month is July with an average maximum temperature of 17.0°C and average minimum temperature of 5.5°C. The monthly mean rainfall and maximum temperature is shown on Figure 5.

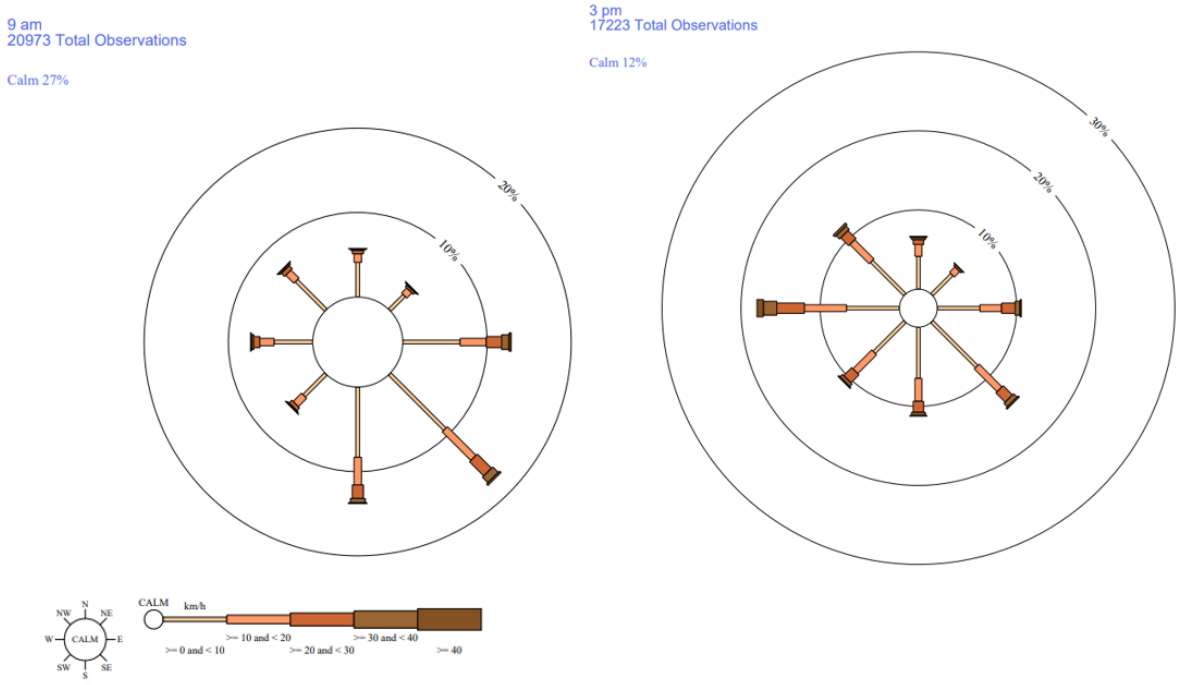


Source: BoM Station No. 010111

Figure 5: Rainfall and maximum temperature Northam (1877-2024)

5.2.2 Wind direction and strength

Based on the climate data for the Northam station (1965-2010), the prevailing wind is south easterly in the morning and westerly in the afternoon. Wind roses for the Northam station are shown in Figure 6.



Source: BoM Station No. 010111

Figure 6: Wind direction and strength at Northam at 9am (left) and 3pm (right)

5.2.3 Topography

The premises is situated within a former clay pit, with elevation ranges from approximately 270 m Australian Height Datum (AHD) in the base of the pit to 300 m AHD outside the Stage 1 footprint, in the eastern portion of the Site.

5.2.4 Geology and soils

The regional geology of the area is characterised by Pre-Cambrian linear metamorphic belts including the Jimperding, Chittering and Balingup Metamorphic Belts. The metamorphic sequences comprise layered quartz-feldspar-biotite gneiss, enveloped by areas of migmatite and isolated rafts of earlier gneissic sequences. Intrusion of late Archaen granitiods within the metamorphic sequences typically post-dates metamorphism as well as regional faulting and folding (Stass 2015).

The landfill site is located within the Jimperding metamorphic system which forms an elongate feature, extending from York to Clackline to Jimperding, containing inter-bedded schists, quartzites and minor metamorphosed volcanics. The metamorphic grade of the belt increases towards Jimperding, before becoming the higher metamorphic grade Chittering Belt at Chittering. In the vicinity of the clay extraction pits, the metamorphic schists are highly weathered (to >40 m below natural surface), and are likely to be steeply dipping at depth where weathering is less pronounced. Prolonged weathering of the metamorphic schists, quartzite and volcanic sequences has produced deep sequences of micaceous clays and sandy clays, with minor laterisation at depth (Stass 2015).

The excavation of clays in the Williamson's Pit, along with drilling on and close to the premises

has been used to describe the local geology (IWP 2017). The geologic materials in proximity of the premises are silty clays with occasional sandy silts formed from weathering of basement schists. Remnant hydrothermal quartz veins intersect the exposed regolith within the clay pit, as massive white quartz, or fractured red-stained quartz, the latter of which typically contains clay/silt matrix infill within the fractures (Stass 2015). Drilling undertaken by Austral bricks indicates that the weathered zone extends more than 15 m below the base of the pit (IWP 2017), and underlying bedrock is expected to consist of moderately weathered schists and quartzite.

Examination of the clay pit walls, and total magnetic intensity (TMI) surveys of the region indicate that there is no significant faulting in the vicinity of the landfill site (Golder 2014).

The soils overlying the weathered schists are thin (<0.5 m) and are described as a yellow gravelly loamy sand and loam, overlying sandy clay (Stass, 2015).

5.2.5 Hydrology

There are no permanent natural water bodies on the premises with the closest major hydrological feature being the Jimperding Brook located approximately 900 m of the premises. To the north of the operational area, an ephemeral drainage line, that flows only during and immediately following heavy rain, crosses the northern boundary of the premises and flows to the north west into Jimperding Brook. The ephemeral creek is fed by a small tributary which commences just north of the clay pit.

Jimperding Brook is a non-perennial watercourse that flows to the north west until is converges with the Avon River, approximately 17 km downstream of the premises. Surface water flows in the vicinity of the premises are heaviest during winter and following storm events, and water quality is generally fresh, becoming more saline as flows decrease in spring. The brooks have been known to flow following seasonal storm event throughout the remainder of the year.

Stormwater received within the clay pit drains to an unlined surface water storage dam as is contained in the pit either to infiltrate slowly into groundwater or is lost to evaporation.

5.2.6 Hydrogeology

The groundwater aquifers in the region are characterised by low permeability, fractured and deeply weathered basement rocks or metamorphic or granitoid origin, with localised shallow aquifers, where deeper sequences of sediments have been deposited by recent erosion. Groundwater in the region is inferred to flow to the north north-west based on the general topography and surface water bodies.

Regional groundwater quality is slightly acidic (4 to 5 pH units), with variable salinity ranging from 500 mg/L to 3000 mg/L TDS.

In 2014, Golder undertook permeability testing on materials samples in the clay pit prior to construction of Cell 1. Falling head permeability tests found that the insitu clays had low permeability (2.2×10^{-9} to 9.1×10^{-9} m/s). The permeability of weathered basement materials below the clays was higher than the clays, ranging from 1.3×10^{-7} to 5.9×10^{-7} m/s (Stass, 2015).

Groundwater flow within the basement groundwater table is generally from the east of the clay pit to the south and north west, following the general line of topography, with a relatively steep hydraulic gradient. Based on the regional hydrogeological model, it is possible that groundwater ultimately discharges to Jimperding brook on a seasonal basis. Groundwater yields have not been tested; however, based on the characteristics of the geologic materials that make up the aquifer and aquitard, the aquifer is likely to be low yielding, with poor transmissivity, making it potentially unsuitable for use as a groundwater resource in the local area. Furthermore, the low transmissivity of the geologic materials indicates that groundwater

travel times between the landfill footprint and down hydraulic-gradient surface water bodies are likely to be very slow.

As part of the works approval application, Talis completed a review of groundwater levels at the premises for the purpose of assessing the separation distance to groundwater beneath Cells 5 and 6 (Talis 2024a). Based on the results, it was concluded that the long-term maximum groundwater level between Cells 5 and 6 is approximately 271.9 mAHD. The design level for the lowest part of the cell development area, the leachate sumps, is 273.9 mAHD, achieving a 2 m separation distance between the landfill and groundwater.

5.3 Residential and sensitive receptors

The distances to residential and sensitives receptors are detailed in Table 3.

Table 3: Sensitive receptors and distance from premises boundary

Sensitive receptors	Distance from activity or prescribed premises
Privately owned farmland	Immediately adjacent to premises (east and west)
Residential premises	Internal farmhouse approximately 400 m south-west of premises (note: farmhouse has previously been excluded as a receptor on written consent from landowner)
	Two properties approximately 1,100 m north-east of the premises
	Approximately 70 houses within a 1-5km radius of the premises, predominately to the north and south

5.4 Specified ecosystems and ecological receptors

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at, or emissions and discharges from, the premises. The description of specified ecosystems and distances from the premises are discussed in Table 4.

Table 4: Specified ecosystems and environmental receptors

Specified ecosystems and environmental receptors	Distance from activity or prescribed premises
Flora and Fauna	
Department of Biodiversity, Conservation and Attractions Managed Lands and Waters	Clackline nature reserve approximately 2.3 km south-east Nanamoolan Nature Reserve 2.3 km east and north-east
Threatened and/or priority fauna	Recorded within 3 km buffer of premises boundary: • *Hydromys chrysogaster* (Rakali / water rat) • *Zanda latirostris* (Carnaby's cockatoo) • *Dasyurus geoffroii* (Chuditch / western quoll)
Surface water	
Waterways Conservation areas	The premises is within the Avon River Management Area.

Specified ecosystems and environmental receptors	Distance from activity or prescribed premises
Rights in Water and Irrigation Act 1914 (RIWI Act) - Proclaimed surface water area	The Premises is within the Avon River Catchment Area.
Groundwater	
Underlying groundwater	270 – 271.9 m AHD Low permeability fractured rock aquifer (confined) potentially suitable for domestic and non-potable use as well as stock watering. No registered users within 5 km of premises.

5.5 Social and cultural values

5.5.1 Aboriginal heritage

The premises is located on Ballardong country and lies within the Ballardong People Indigenous Land Use Agreement Area.

The Avon River (site ACH-00015979) is located approximately 700 m south west of the premises boundary.

5.5.2 European heritage

No European heritage sites were identified within a 1 km radius of the premises.

6. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

6.1 Source-pathways and receptors

6.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction which have been considered in this decision report are detailed in Table 5 below. Table 5 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 5: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Vehicle movements on unsealed surfaces, earthworks, construction and installation of site infrastructure	Air / windborne pathway	• Vehicle to comply with a maximum speed limit of 40 km/hr; • Road surfacing to minimise dust generation; • Wetting down access roads; • Restricted activities during certain weather conditions (strong winds); • Application of dust suppressant chemicals; and • Use of a water cart as necessary.
Noise			• The facility's operating hours are 7:00am to 6:00pm Monday to Saturday (excluding public holidays); • All mobile machinery is fitted with low frequency reversing alarms; • Regular maintenance of equipment; and • Complaints management system.
Operation			
Dust	Waste acceptance and handling, disposal of waste, decomposition of wastes,	Air / windborne pathway	• Vehicle to comply with a maximum speed limit of 40 km/hr; • Road surfacing to minimise dust generation;

Emission	Sources	Potential pathways	Proposed controls
	tipping, application of landfill cover and vehicle movements		• Wetting down access roads; • Wetting of the active tip face in accordance with the site licence; • Restricted activities during certain weather conditions (strong winds); • Application of dust suppressant chemicals; • Use of a water cart as necessary; • Covering of waste during transport; and • Appropriate handling and unloading of waste to minimise dust generation.
Noise			• The facility's operating hours are 7:00am to 6:00pm Monday to Saturday (excluding public holidays); • All mobile machinery is fitted with low frequency reversing alarms; • Regular maintenance of equipment; and • Complaints management system.
Windblown waste			• Waste delivery vehicles are covered or tarped; • Utilisation of 2 m high temporary or mobile litter panels around the active landfill tipping area; • Regular removal of litter from litter screens and fences as soon as possible, but at least every two days; • Collecting litter blown beyond the active landfill as soon as possible, but at least on a weekly basis; • Collecting any litter blown beyond the property boundary on a weekly basis at a minimum; and • Daily inspections of the active landfill tipping area and weekly inspections of the greater landfill site.

Emission	Sources	Potential pathways	Proposed controls
Odour			• Installation of landfill gas management post-closure; • Consideration of meteorological conditions during material handling and leachate recirculation; • Regular maintenance and monitoring of leachate treatment system; • Rejection of excessively odourous waste streams; • Covering waste during transport; • Management of tip face size in accordance with the site licence; • Daily cover and compaction of waste as per site licece; • Immediate burial of highly odorous wastes; and • Odour complaint system and follow-up investigations/actions.
Pests / vermin		Biological pathway	• Regular pushing up and compaction of waste; • Application of adequate cover material; • Progressive closure of compacted landfill areas; • Monthly inspections by operational staff to identify any vermin presence on or around the landfill; • Use of a 2 m high chain link fence with a 400 mm wire mesh skirt around the landfill cell disposal area; • Electrification of landfill area fence using two hotwire lines; • Placement of motion sensor infrared cameras to monitor landfill area and detect feral animal activity; and • Vermin control such as baiting and trapping when required.
Landfill gas		Air / windborne pathway Lateral migration through soil	• Landfill gas extraction wells to be installed following the progressive closure of cells; • Landfill gas will be removed and transferred to a flare for

Emission	Sources	Potential pathways	Proposed controls
		Dissolution into groundwater	combustion; • Management in accordance with the landfill gas management plan; • Monitoring of landfill gas; and • Undertaking contingency actions when required in accordance with the landfill gas management plan.
Fire / smoke		Air / windborne pathway	• All waste is accepted in accordance with DWER waste acceptance criteria and the sites licence conditions; • Waste is properly compacted and covered; • Litter is regularly cleared from around the litter fence; • Avoid piling up of significant amounts of flammable material in one spot; • Flammable materials such as plastics and tyres are evenly distributed throughout the waste mass; • The site is kept secure and locked outside operating hours; and • Maintain appropriate firefighting equipment on site including: ○ A waste cart; ○ Sufficient cover material is store nearby the active tipping area; ○ At least 50 kL of water stored on site in a storage dam; and ○ Adequate staff training.
Leachate		Infiltration into groundwater	• Leachate will be collected in the leachate collection system designed for each landfill cell; • A 300 mm fine grained protection layer will be placed on the side batters extending beyond the leachate collection aggregate; • Leachate will be pumped from sumps via automatic pneumatic

Emission	Sources	Potential pathways	Proposed controls
			pumps with the ability to activate manually if required; • Leachate extraction points are checked on a daily basis; • Leachate will be transferred to the existing leachate evaporation ponds; • Regular inspections of pumps and pipework; • Monitoring leachate levels in accordance with the current licence; and • Groundwater monitoring.
Asbestos fibres		Air / windborne pathway	• All asbestos material received must be appropriately wrapped and sealed in plastic; • Substandard asbestos material identified is appropriately securely wrapped on site; • Asbestos is buried in a dedicated disposal area; • Asbestos is not to be disposed of within 2 m of the final landfill surface; • Asbestos is placed and covered as soon as practicable or by the end of the working day after unloading; • Disposal activities are recorded in the asbestos disposal register; and • An Asbestos Management Plan has been implemented at the site.
Contaminated stormwater / firewater		Overland runoff Infiltration into groundwater	• Stormwater is diverted from active landfill cells and leachate ponds via minimum 0.5 m bunding; • Existing drainage lines direct surface water to existing informal surface water ponds; • Surface water accumulation within the existing quarry to be

Emission	Sources	Potential pathways	Proposed controls
			managed via pumps into other ponds; • Regular inspections of bunds, drains and sedimentation ponds to be undertaken and identified issues will be immediately addressed; • The landfill's design incorporates a sloped waste profile to direct uncontaminated stormwater away from the active landfill area; and • Water collected in the external water storage dam will be measured for turbidity, and if water exceeds set limits, will not be discharged and instead use for dust suppression.

6.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the delegated officer has excluded the applicant's employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Sections 5.3, 5.4 and 5.5 provide a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental Siting* (DWER 2020)).

6.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 6.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 6.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 6.

Works approval W2814/2024/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 6 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 6: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Vehicle movements on unsealed surfaces, earthworks, construction and installation of site infrastructure	Dust	Air / windborne pathway causing impacts to health and amenity	Adjacent privately owned farmland Recreational users of Clackline Nature Reserve and Nanmoolan Nature Reserve	Refer to Section 6.1	C = Minor L = Possible **Medium Risk**	Y	N/A	Emission to be regulated under the general provisions of the EP Act
	Noise			Refer to Section 6.1	C = Minor L = Possible **Medium Risk**	Y	N/A	Emission to be regulated under the *Environmental Protection (Noise) Regulations 1997* (EP Noise Regulations)
Operation **(including time-limited-operations operations)**								
Waste acceptance and handling, disposal of waste, decomposition of wastes, tipping, application of landfill cover and vehicle movements	Dust	Air / windborne pathway causing impacts to health and amenity	Adjacent privately owned farmland Recreational users of Clackline Nature Reserve and Nanmoolan Nature Reserve	Refer to Section 6.1	C = Minor L = Possible **Medium Risk**	Y	N/A	The delegated officer considers that the existing dust management controls specified in licence L9089/2017/1 are sufficient in mitigating dust emissions from the operation of Cells 5 & 6.
	Noise	Air / windborne pathway causing impacts to health and amenity		Refer to Section 6.1	C = Minor L = Possible **Medium Risk**	Y	N/A	The delegated officer considers that the existing noise management controls specified in licence L9089/2017/1 are sufficient in mitigating noise emissions from the operation of Cells 5 & 6.
	Windblown waste	Air / windborne pathway causing impacts amenity		Refer to Section 6.1	C = Slight L = Possible **Low Risk**	Y	N/A	The delegated officer considers that the existing windblown waste management controls specified in licence L9089/2017/1 are sufficient in mitigating windblown waste emissions from the operation of Cells 5 & 6.
	Odour	Air / windborne pathway causing impacts to health and amenity	Adjacent privately owned farmland Residents within 5 km of premises Recreational users of Clackline Nature Reserve and Nanmoolan Nature Reserve	Refer to Section 6.1	C = Minor L = Unlikely **Medium Risk**	Y	Conditions 11, 12, 13, 14, 15 & 19	N/A
	Pests / vermin	Biological pathway causing impacts to health and amenity	Adjacent privately owned farmland Residents within 5 km of premises Clackline Nature Reserve and Nanmoolan Nature Reserve Threatened/priority fauna	Refer to Section 6.1	C = Minor L = Unlikely **Medium Risk**	Y	Conditions 13, 14, 15 & 19	N/A
	Landfill gas	Lateral migration through soil, movement through groundwater or passive venting to air causing impacts to human health, amenity or explosion risk	Adjacent privately owned farmland Residents within 1 km of premises	Refer to Section 6.1	C = Severe L = Unlikely **High Risk**	Y	Conditions 13 & 16	The delegated officer considers that the volume of landfill gas generated during the time limited operations of Cells 5 and 6 will be negligible. Construction of the proposed landfill gas management system will be assessed and conditioned under the licence.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
	Fire / smoke	Air/windborne pathway causing impacts to health and amenity	Adjacent privately owned farmland Residents within 5 km of premises Clackline Nature Reserve and Nanmoolan Nature Reserve	Refer to Section 6.1	C = Moderate L = Possible **Medium Risk**	Y	Conditions 13, 14 & 15	The delegated officer considers that the existing fire management controls specified in licence L9089/2017/1 are sufficient in mitigating emissions resulting from fires during the time limited operation of Cells 5 & 6.
	Leachate	Infiltration into groundwater causing contamination and impacting groundwater quality	Underlying groundwater	Refer to Section 6.1	C = Moderate L = Unlikely **Medium Risk**	Y	Conditions 1, 2, 3, 4, 5, 6, 9, 11, 12, 13, 14, 15 & 19 **Conditions 9 & 10**	The delegated officer notes that the applicant has proposed to install a 300 mm fine grained protection layer on the side batters beyond where the leachate collection aggregate is installed to protect the underlying liner system. The delegated officer considers that this fine grained protection layer may reduce the efficiency of leachate movement vertically through the closed system. Conditions 9 & 10 has been included to specify the minimum material requirements of the fine grained protection layer to ensure the efficiency of the system.
	Asbestos fibres	Air/windborne pathway causing impacts to health	Adjacent privately owned farmland Residents within 1 km of premises	Refer to Section 6.1	C = Severe L = Unlikely **High Risk**	Y	Conditions 11, 12, 13, 14 & 15	N/A
	Contaminated stormwater / firewater	Overland runoff / migration into surrounding land causing ecosystem disturbance Seepage through soil to groundwater causing contamination and impacting groundwater quality	Avon River catchment Adjacent privately owned farmland Underlying groundwater	Refer to Section 6.1	C = Moderate L = Unlikely **Medium Risk**	Y	Conditions 1, 2, 3, 4, 5, 6, 9, 11, 13, 14 & 15	The delegated officer considers that contaminated stormwater / firewater can be effectively managed during time limited operations through the conditions specified on the works approval in conjunction with surface water management conditions specified in licence L9089/2017/1

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

7. Consultation

Table 7 provides a summary of the consultation undertaken by the department.

Table 7: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 10 December 2024	None received	N/A
Shire of Toodyay advised of proposal on 12 December 2024	The Shire of Toodyay provided a letter response om 13 January 2025. The Shire opposed the works approval on the grounds that the application contradicted conditions of the development approval (DA) (WASAT88, DR292 of 2012).	The department sent a request for information to the applicant on 21 January 2025 outlining the inconsistencies within the application package and the DA and requested further evidence from the applicant that the conditions of the DA can be met. A number of inconsistencies fell outside the regulatory remit of the works approval and were included in the request for information as other items. The applicant provided a letter response on 28 January 2025 providing additional information and evidence of compliance with the DA on all items with regulatory cross-over with the works approval. The delegated officer notes that by granting the works approval, this does not negate the works approval holder's requirement to comply with decisions and approvals made by other decision-making authorities.
Other interested stakeholders advised of proposal on 12 December 2024	None received	N/A
Applicant was provided with draft documents on 21 February 2025	See Appendix 1	See Appendix 1

8. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

The delegated officer notes that while time limited operations have been granted under works approval W2814/2024/1, the operational conditions specified in licence L9089/2017/1 remain in

force.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. IW Projects 2017, *Opalvale Salt Valley Class II Landfill*, Perth, WA
5. Golder Associates Pty Ltd 2014, *Opal Vale Landfill Technical Studies to Support Design*, Perth, Western Australia.
6. Stass Environmental 2015, *Report on: Groundwater Assessment, 11 Chitty Road, Toodyay, WA*, Perth, WA
7. Talis Consultants 2021, *Closure and Post-Closure Management Plan*, Perth, Western Australia.
8. Talis Consultants 2024, *Environmental Assessment and Management Plan*, Perth, Western Australia.
9. Talis Consultants 2024a, *Technical Memorandum Maximum Groundwater Level Salt Valley Road Class II Landfill – Development of Cells 5 and 6,* Perth, Western Australia.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Condition 1 – Table 1, Line 3	Applicant recommends 'sub base' be replaced with "subgrade"	Amended for technical accuracy
Condition 1 – Table 1, Line 4	Applicant recommends 'attenuation layer' be replaced with "fill / subgrade".	Amended for technical accuracy
Condition 1 – Table 1, Line 8	Applicant recommends 'pneumatic pump' be replaced with "submersible electric pump" to correct an error in the EAMP document	Amended to correct error
Condition 2 – Table 2 GCL Requirements – CQA testing	Applicant recommends 'Fluid loss' frequency be changed from '1 sample per 2,500 m2' to "1 1 sample per 5,000 m2" And 'Peel strength' frequency be changed from '1 sample per 2,500 m^2' to "1 sample per 4,000 m^2" No explanation for recommendation is provided.	Amended to reflect the criteria stated in Application Appendix C -Technical Specification - Table 5-3
Condition 3 – Table 3 – Geomembrane CQA requirements	Applicant recommends 'Destructive weld testing' weld seam strength value of 'N/A' be changed to that referred to in Application Appendix C – Technical Specs Lining Works - Table 5-8	Amended to refer to criteria stated in Application Appendix C - Technical Specification Salt Valley Road Landfill – Cells 5 and 6 Lining Works lining works – Table 5-8.
	Applicant recommends 'Destructive weld testing' weld seam strength value of 'N/A' be changed to "Less than 10% loss in pressure over a 5 minute period when pressurised to 2 bar. No visible bubbles."	Amended to refer to criteria stated in Application Appendix C - Technical Specification Salt Valley Road Landfill – Cells 5 and 6 Lining Works lining works s. 5.3.4.1.
Condition 10 – Table 6	Applicant recommends 'Frequency' be changed from '1 sample per 100m^3' to "1 sample per 500m^3" on the basis that the	For works completed under Works approval W5800/2015/1, the fine grain protection layer was required due to degradation of the cushion geotextile, and

Condition	Summary of applicant's comment	Department's response
	volume of soil protection layer is approximately 1,500m^3 so 1 test every 100m^3 is a little excessive; 1 test every 500m^3 should be sufficient to manage risk of material variability.	homogeneity of the material in meeting the required technical specifications requires management. This proposal will extend the separation geotextile 1m past the leachate collection layer (not all the way up the sideslope), therefore the Delegated Officer considers that the same testing regime used for W5800/2015/1 is required.