Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Licence

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

Licence Number	L7084/1997/17
Applicant	Shire of Donnybrook Balingup
File number	DER2015/001439-1
Premises	Donnybrook Waste Management Facility Goodwood Road PAYNEDALE WA 6239 Being Portion of State Forest 27 as depicted in Schedule 1 of the licence
Date of report	16 September 2024
Decision	Licence granted

Abbie Crawford

Digitally signed by Abbie Crawford
Date: 2024.09.16 12:36:07 +08'00'

Abbie Crawford
MANAGER, WASTE INDUSTRIES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Table of Contents

1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the operation of the premises. As a result of this assessment, licence L7084/1997/17 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

On 28 March 2024, the applicant submitted an application for a licence to the department under section 57 of the *Environmental Protection Act 1986* (EP Act).The application is for a licence renewal relating to the operation of the Donnybrook Waste Management Facility (DWMF).

The premises relates to the categories and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) as defined in licence L7084/1997/17. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in licence L7084/1997/17.

The DWMF currently operates as a Class II putrescible landfill and a community waste transfer station. The DWMF was first licensed in 1997, but has been in operation since the 1950's. The site was initially used as an area that waste was aggregated and burnt. The site later evolved into a trench system landfill where large trenches were dug and waste deposited and covered in layers.

The current landfill area is on top of the former trenches and compacted to form a constructed mound. As part of the renewal, the Shire of Donnybrook Balingup has requested to extend the current active landfilling area to extend the operational life of the landfill by 10 years.

The DWMF accepts and processes waste for disposal and/or recycling. It is proposed that the premises continued to be licensed as a Category 64 Class II putrescible landfill, a Category 61A solid waste facility and Category 62 solid waste depot. The proposed categories and throughputs are detailed in Table 1 below.

Table 1: Prescribed premises categories

Classification of premises	Description	Approved premises production or design capacity throughput
Category 61A	**Solid waste facility:** premises (other than premises within Category 67A) on which solid waste produced on other premises is stored, reprocessed, treated or discharged onto land.	500 tonnes per annual period
Category 62	**Solid waste depot:** premises on which waste is stored or sorted pending final disposal or re-use.	2,000 tonnes per annual period
Category 64	**Class II putrescible landfill site:** premises on which waste (as determined by reference to the waste type set out in the document "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer as amended from time to time) is accepted for burial.	6,700 tonnes per annual period

The premises is approximately 850 m south-west of Donnybrook as shown in Figure 1 below.

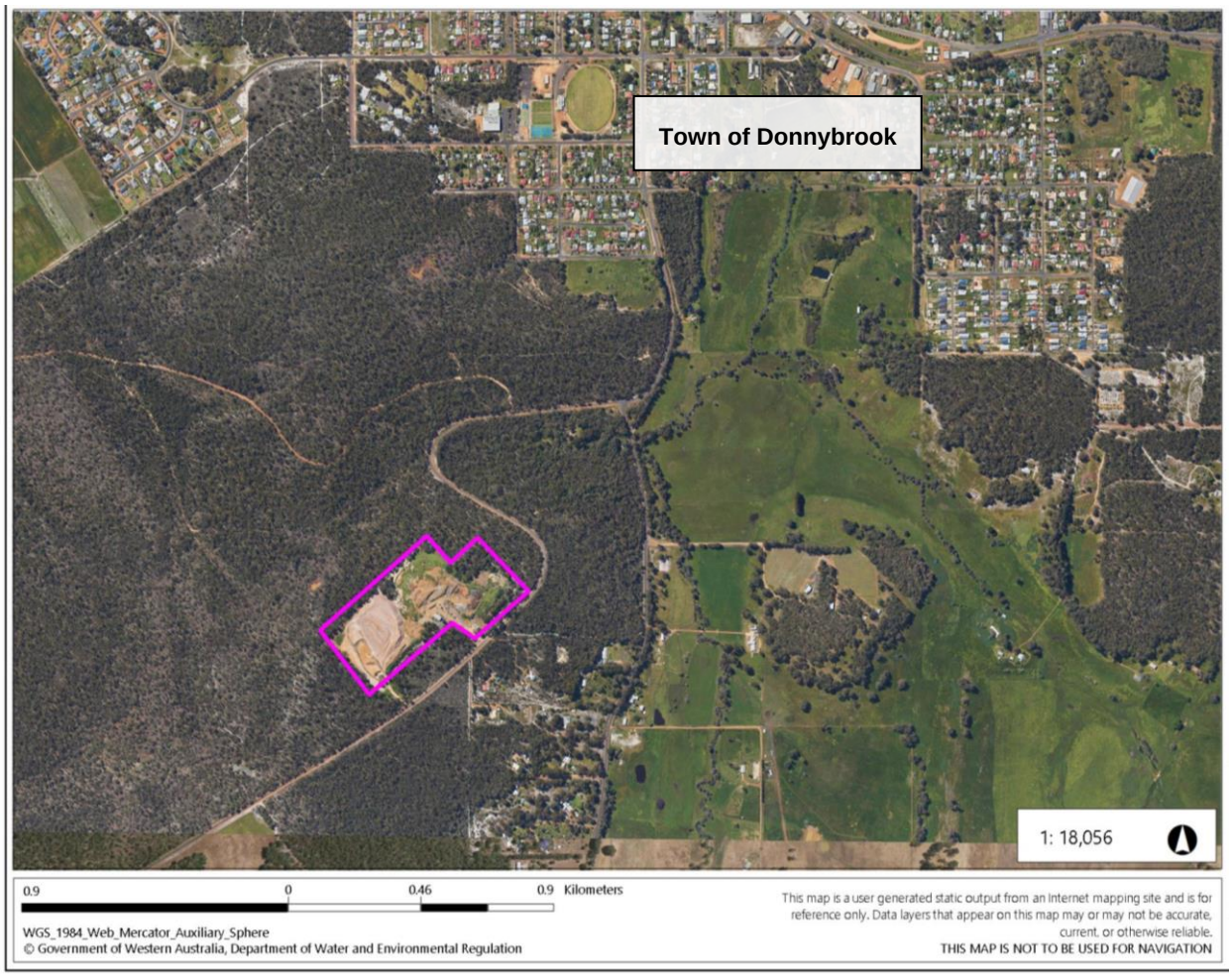


Figure 1: Regional location

2.3 Legislative context

2.3.1 Part V of the EP Act

The DWMF operated under licence L7084/1997/16 held by the Shire of Donnybrook Balingup (licence holder). The licence expires of 16 September 2024 with the licence holder submitting a renewal application on 28 March 2024. This decision report documents the assessment of the renewal application.

2.3.2 Contaminated Sites Act

The premises was first reported to the Department of Environment and Conservation (DEC) in April 2007 as per reporting obligations under Section 11 of the *Contaminated Sites Act 2003* and was reported again in July 2012. The premises was reported due to the site being operated as a landfill. Limited soil and groundwater investigations were carried out between December 2011 and January 2012 and identified exceedances of ecological guideline values for some analytes.

As there were grounds to indicate possible contamination of the site, and since a suitable investigation of soil and groundwater and a risk assessment to determine the risk to human health, the environment, or any environmental value had not been carried out, further works are required to determine the contamination status of the site and the premises was therefore classified as 'possibly contaminated - investigation required'.

3. Location and siting

3.1 Siting context

The DWMF is located within a portion of State Forest 27 (Boyanup State Forest), managed by the Department of Biodiversity, Conservation and Attractions (DBCA) under the *Conservation and Land Management Act 1984.* The Shire of Donnybrook Balingup have an agreement with DBCA for the continued used of a portion of State Forest 27 for the DWMF.

The DWMF is located approximately 850 m south-west of the town of Donnybrook within the Shire of Donnybrook Balingup.

3.2 Residential and sensitive 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.

Table 2 and Figure 2 below provides a summary of potential human receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental Siting* (DWER 2020)).

Table 2: Sensitive human receptors and distance from prescribed activity

Human receptors	Distance from prescribed premises
Rural properties	A number of rural properties are within 2 kms of the premises to the east and the south-east. The closest properties are 130 m to the south-east of the premises.
Town of Donnybrook	Approximately 850 m north and 1.3 km north-east of premises
Groundwater users	Nine registered groundwater bore users 20 m to 900 m south-east of the prescribed premises boundary. Groundwater is abstracted for the town water supply from the Leederville Formation at depths ranging from 15 to 64 m approximately 1.4 km north north-east of the premises.

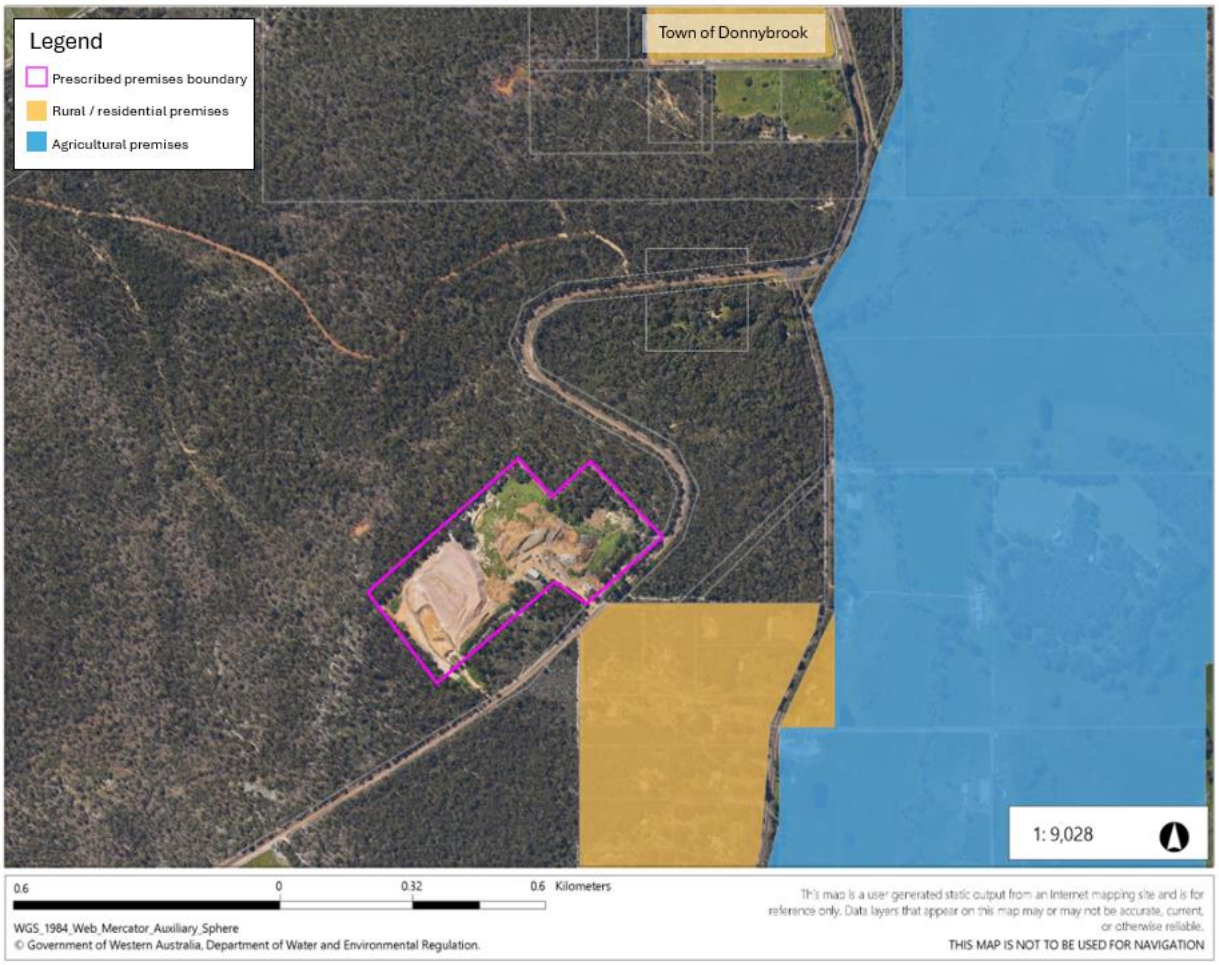


Figure 2: Residential and sensitive receptors in relation to the prescribed premises

3.3 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 3 and shown in Figure 3.

Table 3: Environmental receptors and distance from prescribed premises

Environmental receptors	Distance from prescribed premises
Flora and fauna	
Department of Biodiversity, Conservation and Attractions (DBCA) managed land	The premises is within Boyanup State Forest
Threatened fauna – • *Calyptorhynchus baudinii* (Baudin's Cockatoo); • *Dasyurus geoffroii* (Chuditch, Western quoll); • *Phascogale tapoatafa wambenger* (South-western brush tailed phascogale, wambenger); and • *Pseudocheirus occidentalis* (Western ringtail possum, ngwayir).	Found within 1 km of the premises
Groundwater	
Underlying groundwater	Depth to groundwater ranges from 49 – 59 m below ground level. Shallow / perched aquifers may be present.
Public Drinking Water Source Area (PDWSA)	Located within the Donnybrook Water Reserve Priority 3 PDWSA and surrounded by Priority 1 PDWSA
Rights in Water and Irrigation Act 1914 (RIWI Act) Proclaimed Groundwater Area – Busselton-Capel Groundwater Area	Within the Busselton-Capel Groundwater Area
Surface water bodies	
Noneycup Creek	Surface water from the site flows towards Noneycup Creek located approximately 500m east of the site. The Noneycup Creek in turn flows to the Preston River, 3.5km to the north. The Noneycup Creek is considered to recharge the Leederville Formation which is used to supply water to the town of Donnybrook.

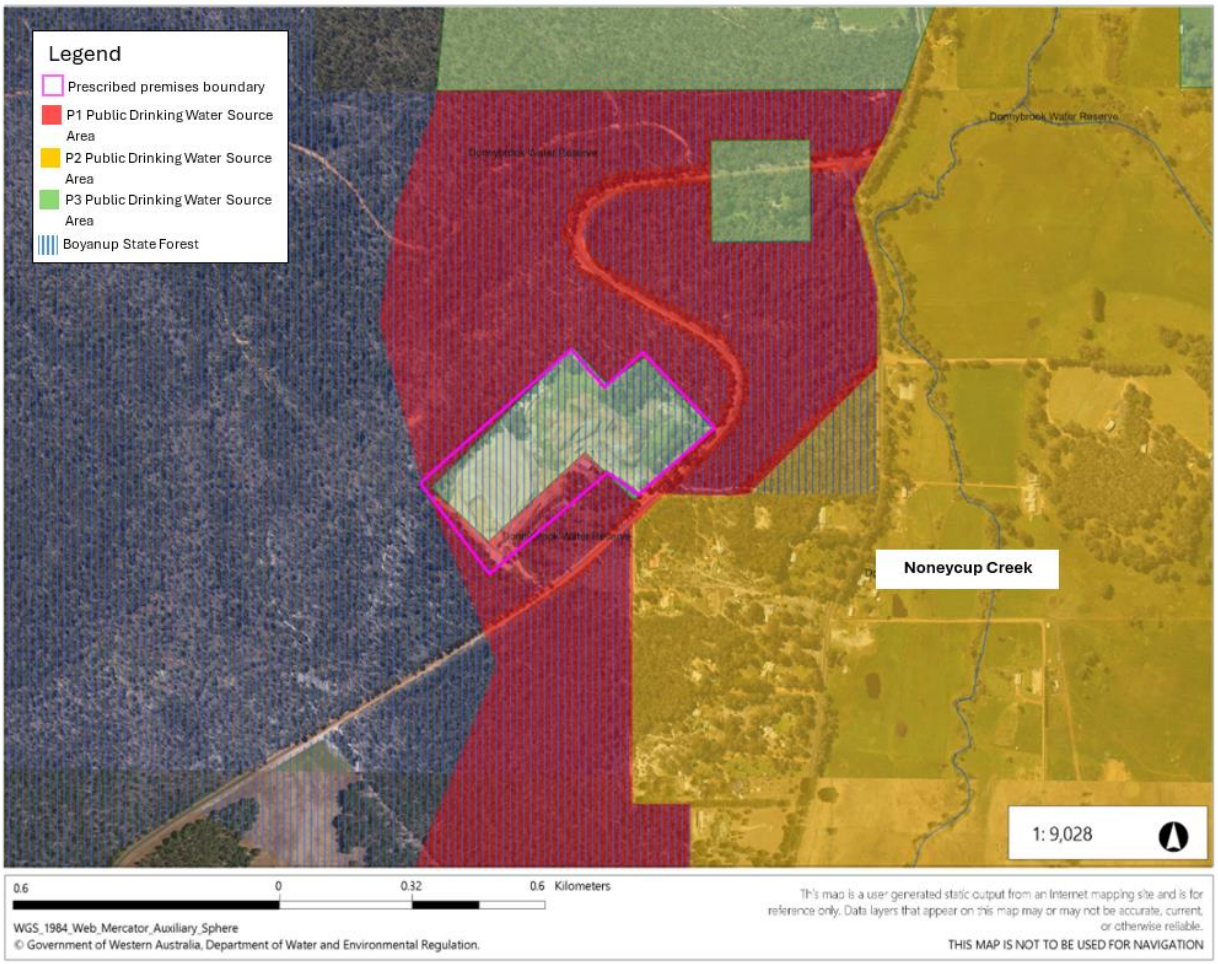


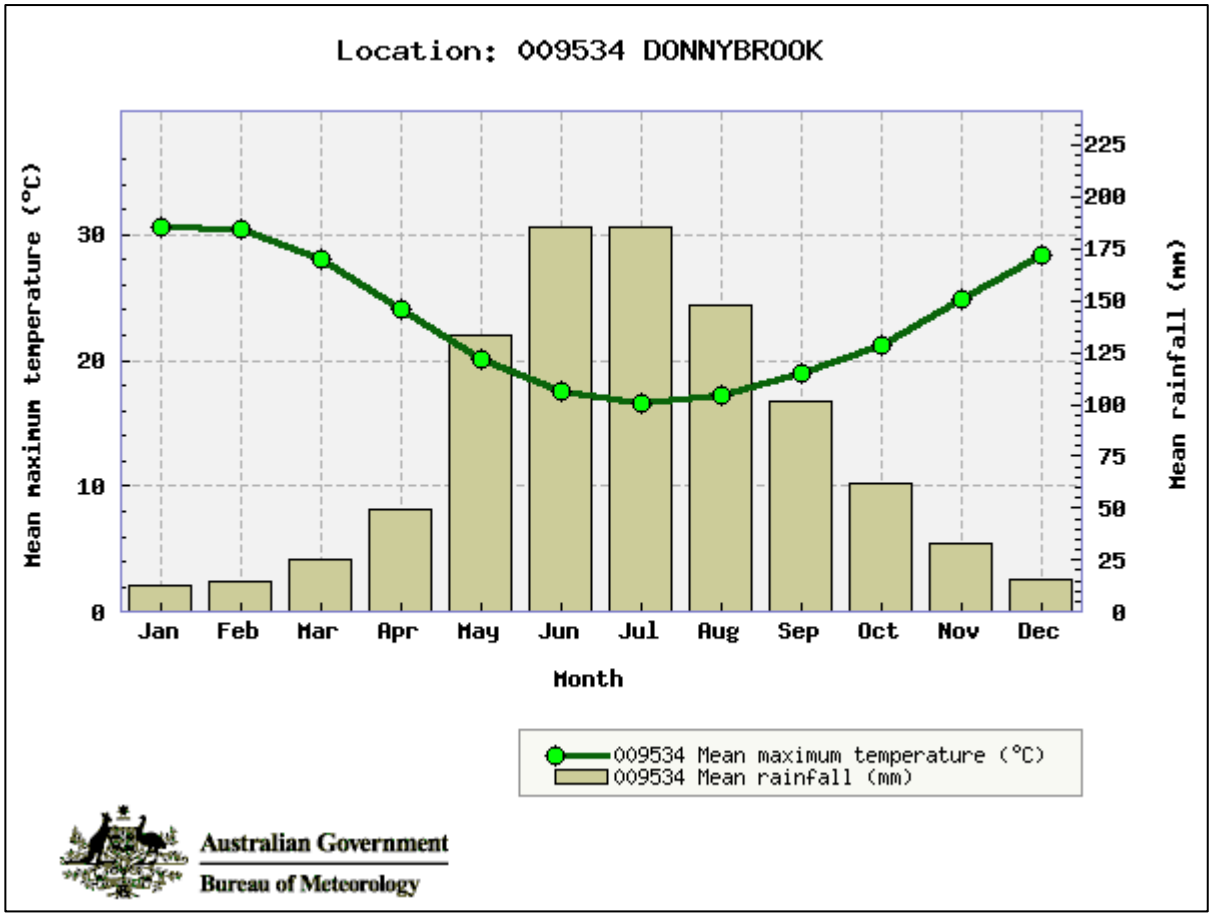
Figure 3: Ecological receptors in relation to the prescribed premises

3.4 Environmental Siting

3.4.1 Climate and rainfall

The climate in Donnybrook is described as temperate with warm dry summers and cool wet winters. The Bureau of Meteorology (BoM) data from the Donnybrook weather station (Station No. 009534) shows that the area in the vicinity of the premises has an average annual rainfall of 969.9 mm (based on data from 1900 to 2024), with the majority of rainfall received between May to September.

The average annual maximum temperature is 30.6°C, with the hottest month being January. The average minimum temperature is 5.7 °C, with the coldest month being July. The monthly mean rainfall and mean maximum temperature are shown on Figure 4.

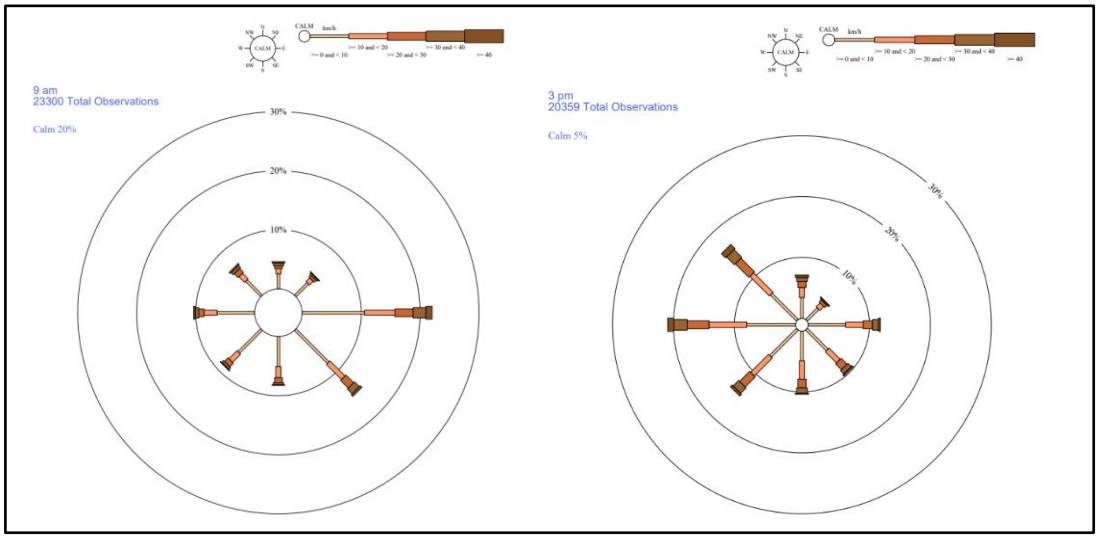


Source: BoM (Station No. 009534)

Figure 4: Rainfall and maximum temperature Donnybrook (1900-2024)

3.4.2 Wind direction and strength

Based on the climate data for the Donnybrook station (1957-2023), the prevailing 9am wind direction easterly to south-easterly and westerly to north-westerly at 3pm. This is depicted in the wind roses shown in Figure 5.



Source: BoM (Station No. 009534)

Figure 5: Wind direction and strength at Donnybrook at 9am (left) and 3pm (right)

3.4.3 Topography

The premises slopes gradually down to the north-east from approximately 135 m AHD to approximately 125 m AHD and continues to slope down north-west offsite towards Noneycup Creek. The topography of the premises is shown in Figure 6.

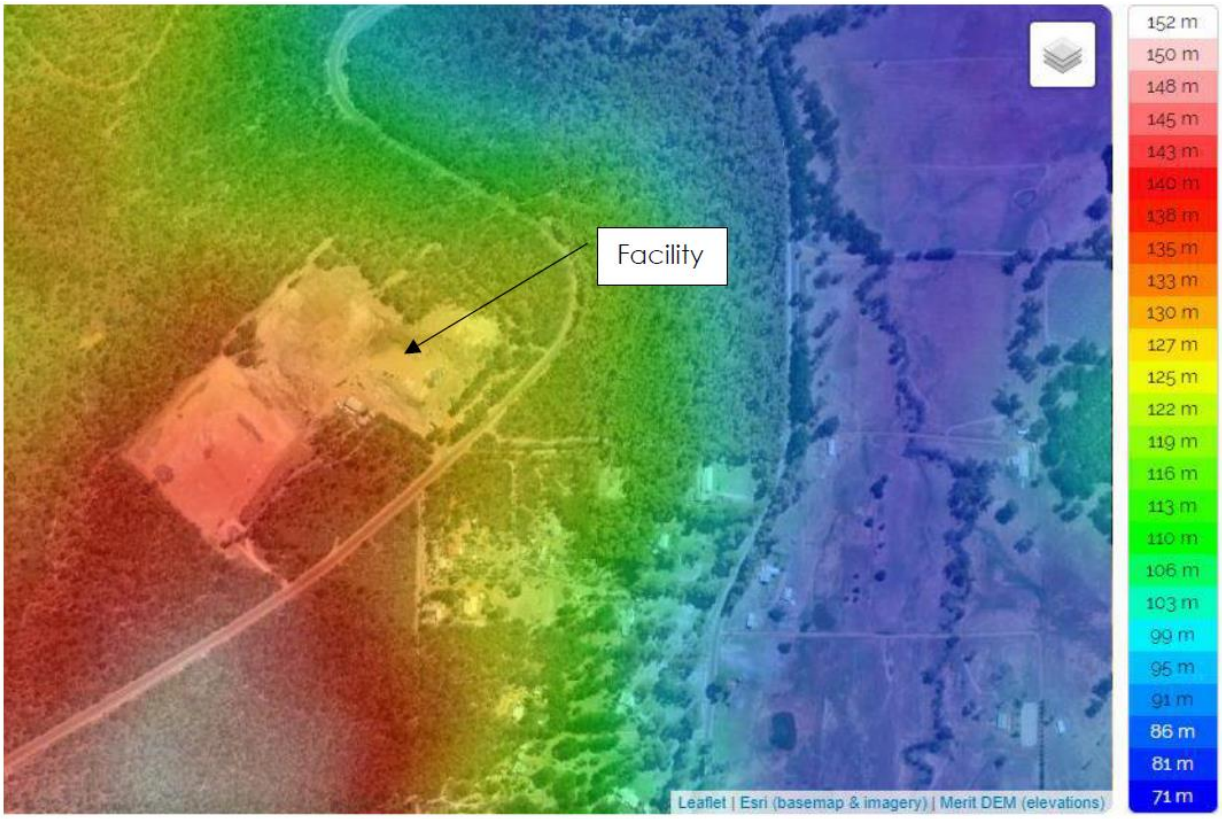


Figure 6: Topography of the premises and surrounding area

3.4.4 Geology

The premises lies at the eastern edge of the southern onshore Perth Basin, on the Darling Fault. JBS&G Australia Pty Ltd (JBS&G) installed a groundwater monitoring bore at the premises in November 2023 and described the lithology beneath the premises to consist of:

- SAND – yellow, orange and grey, moderately sorted medium-fine sand, sub angular quartz (surface to 69 m bgl); overlying
- CLAY – dark grey and mottled orange-red, poorly sorted fine sand, rounded quartz, circle and U-shape formed (69 to 76 m bgl).

The premises is considered to be situated on both laterite and Donnybrook sandstone, though there is uncertainty about its presence and extent. Previous investigations around the Donnybrook area have characterised the geology in the area to comprise a thin layer of surficial sediments at the surface, which overlies the Leederville Formation to several hundred meters deeps (Koomberi 1996). Where Donnybrook Sandstone is present, it is considered likely that there is a hydraulic connection with the unconfined Leederville Formation (as discussed in Section 3.4.6).

3.4.5 Hydrology

The town of Donnybrook lies within the Preston Water Catchment with the Preston River running through the town of Donnybrook. The premises is considered to be within the local Noneycup Creek catchment area, with the Noneycup Creek situated approximately 500 m from the premises. The Noneycup Creek discharges to the Preston River and is also considered to recharge the Leederville

Formation.

3.4.6 Hydrogeology

The premises and the Donnybrook area overlie the Leederville Formation. The Leederville Formation consists of discontinuous beds of sandstone, siltstone and shale, which forms a multi-layered aquifer system (Wharton 1981). Two main aquifer systems have been identified near Donnybrook, described as the Leederville Formation and the Lower Leederville Formation. These formations are separated by a 50 to 75 m thick shale layer. The upper formation extends from the surface to depths of around 110 m, the top of the lower aquifer being found at depths of around 180 m (Water Authority 1995). Groundwater is considered to be generally fresh to marginal, commonly with a high iron content and is abstracted for the town water supply from the Leederville Formation at depths ranging from 15 to 64 m (DoW 2009).

Within the Donnybrook area, the Leederville Formation is considered unconfined, due to a thin cover of superficial sediments which allows direct recharge from rainfall (DoW 2009).

A groundwater investigation was conducted by JBS&G at the premises in December 2023 and February 2024. The investigation found that:

- Depth to the regional groundwater table across the premises ranges from 49 – 59 m bgl;
- The thickness of the unsaturated zone between the perched aquifer (if present) and the regional water table is likely around 40 m bgl assuming the perched aquifer is in the top 7 – 10 m bgl;
- Results from the groundwater investigation indicated that the water quality of the regional aquifer has not been adversely impacted by seepage from the landfill site as all contaminants of potential concern were found to be below laboratory detection limits and / or the adopted assessment criteria; and
- Previous investigations by Cardno in 2014 identified a shallow perched aquifer beneath the premises which likely flows to hillside seeps.

3.5 Aboriginal Heritage

The premises is located within the registered Gnaala Karla Booja Indigenous Land Use Agreement (ILUA) area managed by the Gnaala Karla Booja Aboriginal Corporation. The IULA was registered in 2018.

4. Operational overview

4.1 Site operations

Access to the DMWF is via Goodwood Road with customers needing to pass through to the gatehouse where waste loads are inspected, and customers are directed to the various drop off areas. There is no weighbridge present at the facility.

Access to the tipping face is restricted to the site contractor, municipal waste trucks and Shire staff.

4.1.1 Waste acceptance

Waste types proposed to be accepted onto the premises include:

- Green waste (for shredding);
- Mattresses (for stripping prior to disposal via landfilling);
- Putrescible waste;
- Treated timber (storage only);
- Scrap metal (storage only);
- White goods, e-waste and batteries (storage only);
- Hazardous waste (fire extinguishes, fluorescent tubes, paint/thinners and gas bottles for storage only);
- Agricultural chemical containers (storage only, limited to drumMUSTER program containers);
- Waste oil (storage only);
- Clean fill;
- Inert waste type 1;
- Inert waste type 2;
- Special waste type 1; and
- Special waste type 2.

As part of the renewal, the Shire of Donnybrook Balingup has requested that the active landfilling area be expanded to extend the operational life of the landfill by 10 years. Figure 7 below shows the current active landfilling area with the next stage of landfilling continuing to the east.

Figure 7: Current and future extend of landfilling

4.1.2 Landfill closure

The Shire has developed a Landfill Closure Management Plan (LCMP; Ask 2021) detailing the plan for closure, capping and rehabilitation of the landfill. It is expected the remaining operational life of the landfill is 10 to 12 years. Final capping is proposed to be undertaken in phases as the waste profile reaches the proposed final heights to reduce the generation of contaminated stormwater and leachate as well as spread rehabilitation costs. The capping design is detailed in Figure 8 with shallow rooted species proposed to be used for rehabilitation to avoid damage to the compacted clay layer.

A surface water management system is proposed to be developed around the perimeter of the landfill directing stormwater away from the waste cell to a sediment dam. The Shire has informed the department that the proposed design of the surface water management system detailed in the LCMP is expected to be redesigned.

The landfill gas management system proposed in the LCMP comprises of a biocover in the form of the 300 mm sub soil layer and 100 mm mulch layer. Modelling demonstrated that at its peak, approximately 24m^3/hr of landfill gas will be generated, making passive venting an acceptable form of management. The department notes, however, that the low permeability compacted clay later will likely reduce the effectiveness of the biocover.

Figure 8: Proposed final cap

5. 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.

5.1 Source-pathways and receptors

5.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this decision report are detailed in Table 4 below. Table 4 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 4: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Dust	Waste acceptance handling, disposal of waste, decomposition of wastes, application of landfill cover, mulching of green waste, processing mattresses and vehicle movements	Air / windborne pathway	No proposed controls.
Noise		Air / windborne pathway	No proposed controls.
Odour		Air / windborne pathway	No proposed controls.
Leachate		Infiltration into groundwater Overland runoff	When post closure works progress the Shire will make contact with DWER about the construction requirements for the proposed sediment dam as illustrated in the concept design.
Contaminated stormwater		Overland runoff Infiltration into groundwater	The final capping system will incorporate a perimeter drainage system diverting stormwater away from the waste cell into a sediment dam.
Fire / smoke		Air / windborne pathway	No proposed controls.
Fire water		Overland runoff Infiltration into groundwater	No proposed controls.
Landfill gas		Air / windborne pathway Lateral migration through soil	Landfill gas is proposed to be managed via a biocover cap design as part of closure which includes modelling of the landfill gas generation.
Asbestos fibres		Air / windborne pathway	Asbestos waste is only accepted in accordance with the *Health (Asbestos) Regulations 1992* (i.e. wrapped, tapped, labelled)
Pests / vermin		Biological pathway	No proposed controls.
Windblown waste		Air / windborne pathway	No proposed controls.
Weeds		Biological pathway Air / windborne pathway	No proposed controls.
Biological contamination (mulch derived)		Biological pathway	No proposed controls.
Refrigerant leaks		Air / windborne pathway	No proposed controls.

5.2 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 5.1. 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 5.1), 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 licence 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 5.

Licence L7084/1997/17 that accompanies this decision report authorises emissions associated with the operation of the premises.

The conditions in the issued licence, as outlined in Table 5 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 5: Risk assessment of potential emissions and discharges from the premises during operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of licence	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation								
Waste acceptance and handling, disposal of waste, decomposition of wastes, tipping, application of landfill cover, mulching of green waste, processing mattresses and vehicle movements	Dust	Air/windborne pathway causing impacts to health and amenity	Rural properties within a 2 km radius Boyanup State Forest adjacent to premises Threatened fauna	Refer to Section 5.1	C = Slight L = Unlikely **Low Risk**	See Section 5.1	**Conditions 13, 28 & 32**	The delegated officer considers that dust emissions are effectively regulated by the proposed dust management controls and by the general provisions of the EP Act. Condition 13 gives effect to this. Conditions 28 and 32 have been added as standard record keeping and reporting conditions.
	Noise	Air/windborne pathway causing impacts to health and amenity	Rural properties within a 2 km radius Threatened fauna	Refer to Section 5.1	C = Slight L = Unlikely **Low Risk**	See Section 5.1	**Conditions 1, 5, 28 & 32**	Condition 1 has been added as a standard condition to ensure plant and machinery are maintained in good working order. Condition 5 has been added as a standard condition to enforce speed limits on the premises. Conditions 28 and 32 have been added as standard record keeping and reporting conditions.
	Odour	Air/windborne pathway causing impacts to health and amenity	Rural properties within a 2 km radius	Refer to Section 5.1	C = Moderate L = Unlikely **Medium Risk**	See Section 5.1	**Conditions 14, 28 & 32**	Condition 14 has been added to ensure that no odour generated from the premises unreasonably interferes with the health and amenity of receptors. Conditions 28 and 32 have been added as standard record keeping and reporting conditions..
	Leachate	Infiltration into groundwater causing contamination and impacting water quality Overland runoff / migration onto surrounding land causing ecosystem disturbance	Rural properties within a 2 km radius (groundwater users) Town of Donnybrook 850 m north (groundwater users) Boyanup State Forest adjacent to premises Underlying groundwater 35-60 m bgl Noneycup creek 500 m east of premises Threatened fauna	Refer to Section 5.1	See detailed risk assessment outlined in Section 5.3			
	Contaminated stormwater	Overland flow / runoff / migration onto surrounding land causing ecosystem disturbance Infiltration into groundwater causing contamination and impacting water quality	Rural properties within a 2 km radius (groundwater users) Town of Donnybrook 850 m north (groundwater users) Boyanup State Forest adjacent to premises Underlying groundwater 35-60 m bgl Noneycup creek 500 m east of premises Threatened fauna	Refer to Section 5.1	C = Major L = Possible **High Risk**	See Section 5.1	Condition 34 **Conditions 15 & 16**	Condition 15 has been added to prevent stormwater run-off becoming contaminated by activities and operations undertaken on the premises. The delegated officer notes that stormwater has been observed pooling on the waste mass at the premises. Pooling of stormwater on the waste mass can increase leachate generation. Condition 16 has been added to prevent the pooling of water on the waste mass.
	Fire / smoke	Air/windborne pathway causing impacts to health and amenity	Rural properties within a 2 km radius Boyanup State Forest adjacent to premises Threatened fauna	Refer to Section 5.1	C = Major L = Unlikely **Medium Risk**	See Section 5.1	**Conditions 9, 19, 20, 21, 22 and 24**	Condition 9 has been added to ensure greenwaste stockpiles are monitored for temperature and moisture content at a minimum weekly basis Conditions 19, 20, 21 and 22 has been added as standard conditions for fire management. Monitoring of greenwaste stockpiles/windrows has been added to the licence to ensure temperatures within stockpiles/windrows are maintained below 75ºC. The Delegated Officer notes that the applicant is also required to adhere to the requirements of the *Bush Fires Act 1954* which

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of licence	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
								includes the maintenance of fire breaks.
	Fire water	Overland runoff / migration onto surrounding land causing ecosystem disturbance Infiltration into groundwater causing contamination and impacting water quality	Rural properties within a 2 km radius (groundwater users) Town of Donnybrook 850 m north (groundwater users) Boyanup State Forest adjacent to premises Underlying groundwater 35-60 m bgl Noneycup creek 500 m east of premises Threatened fauna	Refer to Section 5.1	C = Moderate L = Unlikely **Medium Risk**	See Section 5.1	**Condition 22**	Condition 22 has been added as a standard condition relating to the recovery of fire water.
	Landfill gas	Lateral migration through soil, movement through groundwater, or passive venting to air / accumulation in buildings causing impacts to human health, amenity or explosion risk	Rural properties within a 2 km radius Boyanup State Forest adjacent to premises	Refer to Section 5.1	C = Severe L = Rare **High Risk**	See Section 5.1	N/A	The delegated officer notes that during the operational life of the landfill, landfill gas generation is relatively low and can be managed via passive venting. The LCMP incorporated a biocover into the final capping, however, the delegated officer notes that the biocover is situated on top of the low permeability compacted clay layer and will therefore likely be ineffective as the compacted clay will act as a barrier for vertical migration of landfill gases. The delegated officer notes that while this does not impact the operational life of the landfill, additional regulatory controls may be implemented at closure to prevent lateral migration of landfill gases outside the premises boundary.
	Pests / vermin	Biological pathway causing impacts to health and amenity	Rural properties within a 2 km radius Boyanup State Forest adjacent to premises Threatened fauna	Refer to Section 5.1	C = Minor L = Possible **Medium Risk**	See Section 5.1	**Conditions 28 & 32**	Conditions 28 and 32 have been added as standard record keeping and reporting conditions.
	Windblown waste	Air/windborne pathway causing impacts to amenity	Boyanup State Forest adjacent to premises	Refer to Section 5.1	C = Minor L = Possible **Medium Risk**	See Section 5.1	**Conditions 12, 28 & 32**	Condition 12 has been included to ensure all reasonable and practical measures are taken to prevent windblown waste and return windblown waste to the tipping face. Conditions 28 and 32 have been added as standard record keeping and reporting conditions.
	Weeds	Air/windborne or biological pathway causing impacts to ecosystem health and amenity	Boyanup State Forest adjacent to premises	Refer to Section 5.1	C = Minor L = Possible **Medium Risk**	See Section 5.1	**Conditions 28 & 32**	Conditions 28 and 32 have been added as standard record keeping and reporting conditions.
Mulch quality (fit-for-purpose mulch)	Release of physical, chemical and / or biological contamination	Direct contact of mulch by consumers and the receiving environment impacting amenity and environmental and human health	Mulch users and the environment receiving the product	Refer to Section 5.1	C = Moderate L = Possible **Medium Risk**	See Section 5.1	**Condition 9**	Mulch produced on the premises is classed as a Category B product as per the Guideline: Better practice organics recycling (December 2022). It is the responsibility of the licence holder to ensure that all products are fit-for purpose for the proposed end use. A fit-for purpose product provides beneficial uses for the environment when used and does not contain contaminants at a level that could cause pollution or environmental harm. Unpasteurised mulch is typically only fit for purpose is areas that are not weed sensitive or close to sensitive receptors. The delegated officer considers it appropriate that the licence holder communicates to mulch users that the mulch does not comply with AS 4454 and any risks associated with use of the mulch in terms of pathogens, weeds and contaminants. Condition 9 has been added requiring the licence holder to install a sign at the entrance of the premises communicating this information.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of licence	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Acceptance, handling, storage and degassing of white goods	Refrigerant leaks	Air/windborne pathways causing impacts to ecosystem health	Receiving environment / atmosphere	Refer to Section 5.1	C = Major L = Rare **Medium Risk**	See Section 5.1	**Condition 9**	Condition 9 has been added to ensure that the licence holder engages a suitably qualified person to degas white goods in the appropriate manner.

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.

5.3 Detailed risk assessment for leachate emissions

5.3.1 Description of leachate emissions resulting from landfilling activities

Landfill leachate is generated through the disposal and decomposition of accepted wastes, infiltration of water into landfill cells and the moisture content of buried waste. Leachate can enter the environment via overland flow or seepage to soils and to underlying groundwater. Infiltration to groundwater can occur in unlined cells over the lifecycle of the cell, with the generation of leachate only easing after caping and closure of the cell. Waste at the DWMF is placed above the natural ground level and compacted into a tightly packed mound. This type of landfilling is known as a mound landfill. Mound landfills are susceptible to leachate emissions occurring via overland runoff, and from seeps of leachate from the sides of the mound.

5.3.2 Identification and general characterisation of emission

Leachate generated from the decomposition of putrescible wastes disposed in the landfill may contain organic matter, salts, nutrients, hydrocarbons, metals, pesticides and herbicides, persistent organic pollutants and pathogens. The quantity and quality of leachate produced will be influenced by a number of factors including waste types, management of waste within cell, the presence and integrity of a landfill liner, management of leachate head within the waste mass and meteorological conditions.

The DWMF does not have any leachate management system or a liner system. Leachate either infiltrates through the waste mass to the underlying soil / groundwater, or flows overland likely either settling in natural depressions (either on or off site) or flowing down the topographical gradient into the Noneycup Creek.

In November 2023, JBS&G installed a groundwater monitoring bore at the northern edge of the DWMF to address data gaps relating to the potential for leachate migration into the underlying regional groundwater table to support the expansion of the landfill. Two subsequent rounds of groundwater gauging and monitoring (monitoring of the new BH05 only) was conducted in December 2023 and February 2024. Results from the project found that:

- Depth to regional groundwater across the site ranges from 49 – 59 m bgl;
- The presence of a perched aquifer (based on Cardno (2014) and previous DWER advice) could not be substantiated, however, if present, the thickness of the unsaturated zone is likely around 40 m; and
- Groundwater monitoring (limited to data collected from the newly drilled BH05) indicates that the regional aquifer has not been significantly impacted from seepage of leachate from landfilling on the premises. All contaminants of potential concern were below laboratory detection limits or were below the adopted assessment criteria.

Groundwater does not appear to be impacted from landfilling activities on the premises, likely due to both the presence of a seasonal perched aquifer and the thickness of the unsaturated zone beneath the perched aquifer and the underlying Leederville aquifer, which would act as a barrier to prevent the seepage of leachate into the deeper aquifer.

It is considered possible that leachate is contaminating groundwater in the perched aquifer which may periodically be discharged from hillside seeps to the east near the landfill site, potentially transporting contaminants via overland flow. A schematic showing a conceptual site model is shown in Figure 9.

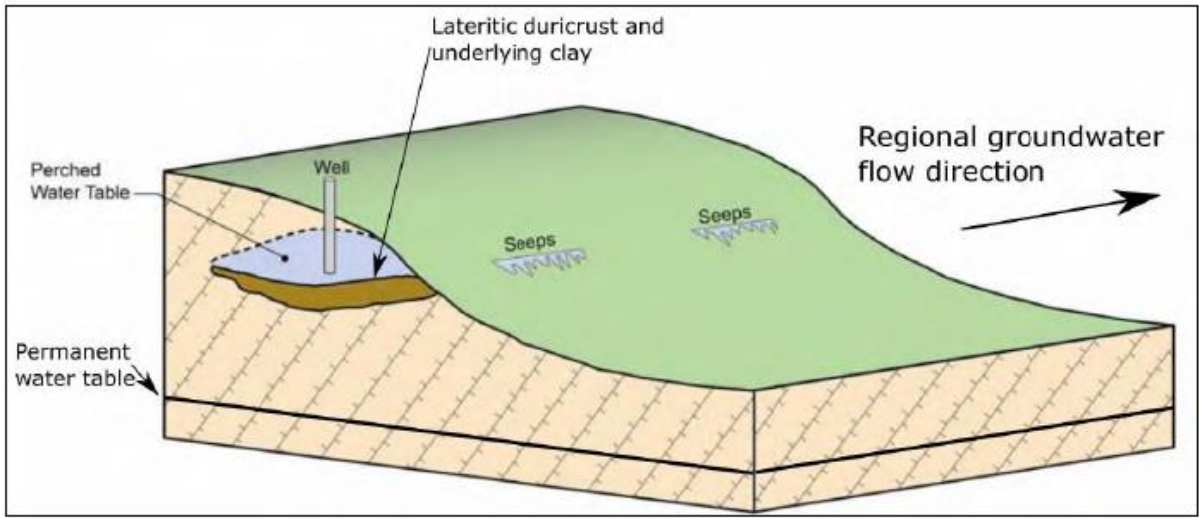


Figure 9: Schematic view of potential hillside seepage

5.3.3 Description of potential adverse impact from the emission

Receptors that may be impacted by leachate emissions include beneficial users of groundwater and surface water bodies.

Groundwater may become contaminated via leachate seepage through the soil and into groundwater. Contaminants dissolved in groundwater may become highly mobile and be carried down the hydraulic gradient to receptors.

Surface water systems, namely the Noneycup Creek, may become contaminated via overland flow of leachate off the premises and migration into the creek. Contaminants dissolved in surface water in the creek may migrate toward the Preston River or infiltrate to groundwater through recharge from the creek.

The premises is located within the Donnybrook Water Reserve Public Drinking Water Source Area (PDWSA). The premises is situated within a Priority 3 area, however, is surrounded by the Priority 1 area. Drinking water is abstracted from bores located approximately 1.4 km north north-east of the premises.

Groundwater is assumed to flow in a northerly direction, although this has not been verified using the onsite monitoring network. No other modelling or hydraulic testing has been conducted at the premises.

A range of human and ecological beneficial users of groundwater exist in the immediate area and downgradient of the DWMF. A conceptual site model has been developed to assess the risk to receptors that may be adversely impacted from leachate emissions as a result of landfilling at the premises and is detailed below in Table 6.

Table 6: Source-pathway-receptor linkages and potential impacts

Source	Pathway	Receptor	Complete pathway? (Y/N)	Description of potential impact
Contaminated groundwater resulting from infiltration of leachate; or Contaminated surface water resulting from overland runoff	Migration of contaminated groundwater downgradient across the aquifer; or Overland flow of seepage of leachate from hillsides or contaminated stormwater and migration into surface water bodies	Donnybrook Water Reserve (drinking water supply)	Y – in exceptional circumstances only	Groundwater sampling from BH05 onsite has not shown clear evidence that the underlying Leederville aquifer has been contaminated from landfilling activities at the DWMF with the chemical composition and quality of groundwater in the bore being comparable to the groundwater that has been monitored in water supply production bores within the Donnybrook townsite. This is likely due to the thickness of the unsaturated zone as well as the presence of a perched aquifer/aquifers, which would act as a barrier to the seepage of landfill leachate into the deeper aquifer. Due to these factors and given the extended history of the landfill, it is considered highly unlikely that ongoing operations would result in impacts to the Donnybrook Water Reserve from leachate emissions.
		Rural properties (closest 130 m south-east of premises)	Y – partial	Rural properties may be impacted by leachate via direct contact with contaminated stormwater or through beneficial uses of groundwater. Rural properties within the vicinity of the premises have registered groundwater bores, however, it is undetermined what purpose the private bores serve. Groundwater is considered to flow in a northerly direction, with the majority of rural properties being cross-gradient. However, some uncertainty does exist regarding groundwater flow direction. As stated above, it is highly unlikely that ongoing landfilling operations at the premises would result in impacts to the Leederville aquifer. As such, groundwater is not considered a complete pathway for leachate to cause impacts to rural properties. It is considered possible that seepage of leachate from hillsides

				or contaminated stormwater may migrate onto rural properties, however, while the SPR linkage is possible, no known impacts have occurred to date and it is therefore considered unlikely that significant impacts will occur from the continuation of landfilling on the premises.
		Noneycup Creek	Y – partial with spatial limitations	It is considered possible that seepage of leachate from hillsides or contaminated stormwater may migrate into the Noneycup Creek. The Noneycup Creek is a tributary to the Preston River and is also considered to recharge to the Leederville aquifer. Noneycup Creek is located within the P1 PDWSA. The Noneycup Creek is located approximately 500 m east of the premises. As there is no pathway for direct discharge to the Noneycup Creek, it is considered that leachate would be diluted or partially attenuated by the time is reached the creek and even more so when the Noneycup Creek joins the Preston River.

5.3.4 Applicant controls

The applicant's proposed controls are detailed in Section 5.1.

5.3.5 Key findings

The delegated officer has reviewed the information regarding leachate emissions and has found:

1. Groundwater in the region has beneficial uses to the region for potable and non-potable purposes.
2. The applicant has no controls in place to mitigate emissions of leachate or contaminated stormwater from landfilling activities during the operational life of the landfill.
3. Results from recent groundwater monitoring indicate that the underlying Leederville aquifer (Donnybrook Water Reserve) has not been impacted by current and historical landfilling operations. An expansion of the landfill over previously landfilled areas is therefore unlikely to result in any impact to the underlying drinking water resource.
4. There has been no reported or observed impacts to human or ecological receptors from surficial runoff or hillside seeps of leachate, however, a pathway exists whereby human and ecological receptors may be exposed to leachate.

5.3.6 Risk assessment

The delegated officer has:

- considered that the consequence to receptors exposed to leachate/contaminated surface water or contaminated groundwater through the infiltration of leachate/contaminated stormwater from the site could have major impacts to human and environmental health and amenity;
- considered that the likelihood of impacts to receptors is unlikely based on the controls proposed by the applicant; and
- determined that the overall rating for the risk of impacts from leachate, based on a consequence of major and a likelihood of unlikely, is **medium**.

5.3.7 Regulatory controls

In considering the findings of the risk assessment for leachate emissions, the delegated officer considers the risk to receptors from leachate impacts to be acceptable subject to the additional regulatory listed in Table 7 to address uncertainties regarding overland flow / hillside seepage of leachate and ensure the continual protection of the Donnybrook Water Reserve.

Table 7: Summary of additional regulatory controls for leachate

Condition number	Regulatory control
Condition 25	Annual groundwater monitoring of BH05 has been included for a select number of chemical analytes which may act as early indicators of potential contamination. The delegated officer considers that ongoing groundwater monitoring is necessary to ensure the ongoing protection of the Donnybrook Water Reserve drinking water supply. The licence holder is required to report on monitoring results every second year including statistical analysis of the groundwater data. If the chemical composition in BH05 significantly changes, the delegated officer may require further investigations to determine the source of the changes and re-evaluate the risk to the drinking water resource.
Condition 32 and 33	Uncertainty exists to the direction of groundwater flow in the Leederville aquifer beneath the premises. Conditions 33 and 34 have been included to require the determination of groundwater flow beneath the premises.
Condition 35, 36 & 37	The delegated officer notes that currently none of the waste mass has final capping, despite areas of the waste mass having reached or being close to reaching final heights. To reduce the generation of leachate at the premises, the delegated officer has conditioned that Phase A of final capping must be completed within 12 months. The Phase A waste mass is either at final height or within 2 m of final height therefore the delegated officer considers 12 months to be a reasonable timeframe to complete the capping.

6. Consultation

Table 8 provides a summary of the consultation undertaken by the department.

Table 8: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 19 June 2024	None received	N/A
Department of Biodiversity, Conservation and Attractions advised of the proposal on 19 June 2024	The Department of Biodiversity, Conservation and Attractions (DBCA) provided an email response on 12 July 2024 with the following comments: 1. DBCA is currently working with the Shire of Donnybrook-Balingup to finalise the grant of a new lease to the Shire for this facility within Boyanup State Forest. 2. Having considered the situation regarding the new lease outlined above, and potential impacts on the DBCA-managed State forest from the facility, DBCA has no comments on the application to renew the works licence for the facility.	Noted.
Department of Health advised of the proposal on 19 June 2024	The Department of Health (DoH) provided an email response on 12 July 2024 with the following comments: In relation to the management of wastewater, the proposed development must ensure that the disposal of wastewater that is generated on site complies with the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations,* 1974 and Government Sewerage Policy. The site lies 1.5 km south of Donnybrook township and 140 m northwest of three dwellings. As the DoH endorses the Environmental Protection Authority (EPA) (2005) guideline "Separation Distances between Industrial and Sensitive Land Uses" DoH recommend that a default separation or buffer	 The delegated officer notes that no wastewater acceptance has been proposed and therefore, wastewater is not regulated under licence L7084/1997/17. For any wastewater or sewage generated by workers on the premises, the onus is on the Shire of Donnybrook-Balingup to ensure that the site complies with all relevant legislation. Noted. The licence is for the continuation and expansion of the current landfilling operations, a new landfill has not been proposed.

	distance of 150-500m be established around all sensitive land-uses such as residential dwellings to avoid impacts from noise, dust and odour risks arising of the proposed activities. Whilst recognising that the current submission is for a continuation of an existing landfill operation, the DoH does not support a new landfill site development at this location. Any future proposals for new waste depots (or transfer stations) at this landfill site should comply with the recommended minimum 200m separation distance set out in EPA (2005) Guidelines.	
	As previously stated, the landfill site lies within a P3 drinking water protection zone for the town supply. Given limited groundwater monitoring in 2023 found superficial groundwater to be acidic and brackish, although with no chemical analytes above limits of reporting DoH recommend consideration for a condition requiring annual groundwater monitoring and reporting to be applied to the licence at renewal.	Annual groundwater monitoring and reporting requirements have been included in the renewed licence.
	The site is licensed to receive putrescible waste and ground-gas modelling has estimated that the site will generate significant volumes of landfill gas for at least the next thirty years. Due to the nature of the waste and the predicted landfill gas generation rates, DoH recommend a condition be applied to the licence renewal requiring the monitoring and assessment of landfill gas, including around the footprint of any future buildings, enclosed structures and at site perimeter locations. The DoH considers the reliance on the monitoring of surface gas emissions is inappropriate, unreliable and does not comply with the monitoring and risk mitigation methodology set out in NSW EPA (2020) “Assessment and Management of Hazardous Ground Gas” guidelines.	The volume of landfill gas generated at the premises is considered to be relatively low. During the operational life of the landfill, landfill gas is expected to passively vent to the atmosphere. The delegated officer notes that while this does not impact the operational life of the landfill, additional regulatory controls may be implemented at closure to prevent lateral migration of landfill gases outside the premises boundary.
	In addition, groundwater and landfill gas monitoring and management measures at the site should remain in place beyond the operational life of the landfill site, and until emissions from the site have demonstrably reduced to acceptable levels.	Ongoing groundwater monitoring requirements have been included in the revised licence. Landfill gas is considered to passively vent to the atmosphere during the operational life of the landfill. Landfill

	It is considered that the recommended conditions are critically important to monitor and manage public health risks arising from the licensed operation. If these protections are later found to be ineffective, DoH recommend and support that the landfill site be classified as contaminated requiring ongoing regulation in accordance with the guidelines and standards set out in the *Contaminated Sites Act 2003.*	gas monitoring and additional regulatory controls may be considered as part of closure requirements at a later stage. Noted.
Water Corporation advised of the proposal on 19 June 2024	None received.	N/A
Applicant was provided with draft documents on 23 August 2024	See Appendix 1	See Appendix 1

7. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that the application to renew licence L7084/1997/17 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Cardno 2014, *Hydrogeological Assessment – Bore Installation and Sampling and Analysis Quality Plan, Donnybrook Waste Management Facility, Goodwood Road*, Perth, Western Australia.
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water (DoW) 2009, *Donnybrook Water Reserve drinking water source protection plan*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
6. JBS&G Australia Pty Ltd (JBS&G) 2024, *Groundwater Assessment: Donnybrook Waste Management Facility*.
7. Koomberi, HA 1996, *Hydrology of the Leederville Formation in the Donnybrook horticultural area*, Perth, Western Australia.
8. Water Authority 1995, *Donnybrook water supply source review and assessment*, Perth, Western Australia.
9. Wharton, PH 1981, *The geology and hydrogeology of the Quindalup borehole line*, Western Australia.

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

Condition	Summary of applicant's comment	Department's response
Decision report – Figure 2	Figure 2 – the "rural/residential premises" marked in red below is the Shire Pound (located within a Crown Reserve) so likely not considered a sensitive receptor with relation to the landfill.	Noted. The figure has been updated to remove the Shire Pound as a receptor.
Decision report – Figure 7	As discussed, the Shire has met with the site contractor to discuss the proposed conditions. In an effort to better achieve compliance with respect to daily cover and windblown waste control, Shire officers have prepared a report to Council to consider changing the site operation hours to better align with the municipal waste collection drop off. This may result in a change to the site operations as outlined in Figure 7, but will still be well within the proposed operating hours as contained in proposed condition 3.	Noted. The reference to opening hours in the Operational Overview has been removed to avoid future confusion if operational hours are changed.
Decision report – Table 4	With respect to the comments regarding asbestos – the proposed control is that the asbestos is only accepted in accordance with the handling regulations (wrapped, taped, labelled etc.).	Table 4 has been amended to include the Shire's proposed control for the acceptance of asbestos waste.
Condition 6 – Table 2 Waste Acceptance	The Shire is aware that the local contractor who provided a service for car removal has recently closed. Is there capacity to retain car bodies (as a drop off facility) with perhaps a limit and specific storage requirements?	The delegated officer has removed the specification that car bodies must not be accepted and has included in Condition 9, Table 3, that car bodies must only be stored within the tip shop. Noting the size of the tip shop, the delegated officer notes that only a limited number of cars will be able to be stored at any one time. No processing of vehicle bodies is permitted and any spills of liquids from vehicles must be immediately recovered in accordance with conditions 17 and 18.
Condition 22(b) Firewater containment	I note within the decision report that this is a standard condition. Is there capacity for this to be reviewed given the nature of our site? i.e. limited hard stand/stormwater management systems that limits the Shire's ability to comply with this proposed condition.	Given the siting of the premises in relation to sensitive receptors, the delegated officer does not consider it appropriate to remove or change the requirement for the Shire to contain recoverable firefighting wash water or other waste that may result from firefighting at the premises. The onus is on the Shire to determine how to comply with the condition.

Condition	Summary of applicant's comment	Department's response
Condition 33 Gauging round	Is it possible to have the timing of this condition reviewed to 12 months from grant date? It is anticipated that this will likely involve some specialist services that will need to be sourced to the region and potentially budgeted for (depending on quotes received).	The condition has been amended to give the Shire 12 months to complete the specified works.
Condition 35 Capping design	The Shire is committed to progressing with the capping of the landfill area. The recent contour surveys obtained have identified some unrealised potential within the Phase A area i.e. areas that are significantly under height/air space that is able to be utilised. The Shire's experienced machine operator has indicated that the capping material will only be workable/pliable from January to March. In addition, the comments within the decision report suggest that the proposed capping methodology needs to be reviewed to ensure that optimal passive venting can occur, which may necessitate a redesign. Is there any capacity to review the compliance timeframe for this condition to enable: - The Shire to engage a consultant to review the proposed capping design - Landfilling of the areas that are currently under height, to enable the contour to match the proposed closure plan - Staged approach to capping given short timeframe for works given workability of material to be used	The condition has been amended to give the Shire 24 months to complete the capping of Phase A.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
Works approval	☐				
Licence	☐	Relevant works approval number:		None	☐
		Has the works approval been complied with?		Yes ☐ No ☐	
		Has time limited operations under the works approval demonstrated acceptable operations?		Yes ☐ No ☐ N/A ☐	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?		Yes ☐ No ☐	
		Date Report received:			
Renewal	☒	Current licence number:	L7084/1997/16		
Amendment to works approval	☐	Current works approval number:			
Amendment to licence	☐	Current licence number:			
		Relevant works approval number:		N/A	☐
Registration	☐	Current works approval number:		None	☐
Date application received		28 March 2024			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Shire of Donnybrook Balingup			
Premises name		Donnybrook Waste Management Facility			
Premises location		Portion of State Forest 27 as depicted on the existing premises map			
Local Government Authority		Shire of Donnybrook Balingup			
Application documents					
HPCM file reference number:		DER2015/001439-1~3			
Key application documents (additional to application form):		Supporting documents Groundwater Assessment: Donnybrook Waste Management Facility			
Scope of application/assessment					
Summary of proposed activities or changes to existing operations.		Renewal: Operation of class II putrescible landfill. Renewal application includes amendment to expand the current active landfill area.			

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production or design capacity
Category 61A: Solid waste facility	500 tpa
Category 62: Solid waste depot	500 tpa
Category 64: Class II putrescible landfill	6,700 tpa

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	N/A
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	N/A
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	N/A
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Certificate of title ☐ General lease ☒ Expiry: Current lease under renewal with DBCA Mining lease / tenement ☐ Expiry: Other evidence ☐ Expiry:
Has the applicant obtained all relevant planning approvals?	Yes ☐ No ☐ N/A ☒	Works are public works and do not require development approval.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☐	No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☒ No ☐	Licence / permit not required.

Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☒ No ☐	Name: Busselton-Capel Groundwater Area Type: Proclaimed Groundwater Area Has Regulatory Services (Water) been consulted? Yes ☒ No ☐ N/A ☐ Regional office: South West
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☒ No ☐	Name: Donnybrook Water Reserve Priority: P3 Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☐ No ☒ N/A ☐
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☐ No ☒	*Dangerous Goods Safety Act 2004* (storage of HHW)
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	N/A
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	N/A
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☒ No ☐	Classification: possibly contaminated – investigation required (PC–IR) Date of classification: 31 July 2012