

# **Amendment Report**

Works Approval Number	W5800/2015/1
Works Approval Holder	Opalvale Pty Ltd
ACN	106 512 896
File Number:	DER2014/003195
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 depicted in Schedule 1 of W5800/2015/1
Date of Report	19 September 2019

# **Definitions and interpretation**

# **Definitions**

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
AHD	Australian Height Datum
Amendment Report	refers to this document
Applicant	Opalvale Pty Ltd
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means:
	Director General Department Administering the <i>Environmental Protection Act</i> <i>1986</i> Locked Bag 33 Cloisters Square PERTH WA 6850 <u>info@dwer.wa.gov.au</u>
CS Act	Contaminated Sites Act 2003 (WA)
DBCA	Department of Biodiversity, Conservation and Attractions
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	Environmental Protection Act 1986 (WA)
EP Regulations	Environmental Protection Regulations 1987 (WA)
Licence	Licence L9089/2017/1

Term	Definition
Minister	the Minister responsible for the EP Act and associated regulations
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in Guidance Statement: Risk Assessment
Works Approval Holder	Opalvale Pty Ltd

# 1. Amendment Scope

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Works Approval issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

The scope of this assessment is limited to an amendment for the construction of Cell 2 of the Category 64 Class II putrescible landfill site for the Premises located at 768 Chitty Road, Hoddy's Well WA (Part Lot 11 on Plan 34937) originally approved as part of works approval W5800/2015/1.

The following guidance statements have informed the decision made on this amendment:

- Guidance Statement: Regulatory principles (July 2015)
- Guidance Statement: Setting conditions (October 2015)
- Guidance Statement: Environmental Standards (September 2016)
- Guidance Statement: Environmental Siting (November 2016)
- Guidance Statement: Risk Assessments (February 2017)
- Guideline: Decision Making (June 2019)

As part of the amendment to the works approval, Amendment Notices 1 and 2 have been consolidated into the Works Approval document. No additional assessment has been undertaken as part of this consolidation. Decisions related to the consolidated changes are published in previous Amendment Notices 1 and 2. Section 4.1 summarises the content of previous amendments to the Works Approval. In accordance with Section 59(1)(e), (f), (h), (i), or (j) of the EP Act it is noted that consolidation of the amendments made as part of previous decisions may not be appealed against.

# 2. Background

The Salt Valley Road Landfill (the Premises) is located within a 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, a clay extraction 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. Lot 11 is approximately 619 hectares (ha) in size, and forms part of a large farming property which is largely cleared of native vegetation. The Lot has been used historically for farming (animal grazing) and extraction of clay for the production of bricks and tiles.

Stage 1 of the Class II landfill at Salt Valley Road Landfill was approved for construction under works approval (W5800/2015/1) and subsequent Amendment Notices 1 and 2. Stage 1 of the landfill comprises six (6) Cells located in the eastern portion of the allocated landfill footprint. Cell 1 of Stage 1 was constructed in March 2016. Compliance to the works approval and Amendment No. 1 and No. 2 was assessed by DWER and was finalised on 6 December 2018 with assessment finding the Applicant in compliance with the conditions of the regulatory controls contained in the approval and subsequent amendments.

Licence L9089/2017/1 (Licence) was granted on 5 February 2019, with conditions of the instrument authorising the operation of Cell 1 only.

# 2.1 Classification of Premises

Table 2 summarises the classification and approved capacity for the Prescribed Premises.

Category	Description	Assessed production or design capacity or throughput
Category 64	Class II or III putrescible landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer and as amended from time to time) is accepted for burial	150 000 tonnes per annual period

Table 2: Classification of premises and assessed design capacity

### 2.2 Stakeholder Consultation

The amendment application was advertised for public comment on the DWER website, in the West Australian on 5 August 2019 and in the Avon Valley Advocate on 7 August 2019 for a period of 21 days.

All stakeholders that made submissions in regards to previous works approval and licence applications were notified with a direct interest letter on 2 August 2019.

All submissions relevant to the scope of this assessment were considered as part of this assessment. A summary of all submissions received and DWER responses to submissions from stakeholders is included in Appendix 3.

# 2.3 Works Approval Holder's comments

The Works Approval Holder was provided with the draft Amendment on 17 September 2019. Comments received from the Works Approval Holder have been considered by the Delegated Officer as shown in Appendix 2.

# 3. Description of proposed amendment

On 28 June 2019 Opalvale Pty Ltd (the Applicant) submitted an application to amend Works Approval W5800/2015/1 (the Application) to lower the floor design level for the proposed Cell 2 by a maximum of 2 m (to a lowest level of RL 275.1 m Australian Height Datum (AHD)) to align with the constructed grades and levels established by Cell 1. The western edge will be approximately 1.6 m lower than the original application and the northern edge will be approximately 1.45 m lower.

The Applicant has proposed that the amendment to the Works Approval is limited to the modification of the floor design level for the proposed Cell 2 to align with the constructed grades and levels established by Cell 1, to be constructed in accordance with the following additional documents:

- IW Projects Pty Ltd, Opal Vale Pty Ltd Proposed Class II Landfill: Landfill Cell 2 Construction, June 2019
- Opalvale Pty Ltd, Tender OV01/19\_RevA: Construction of Landfill Cell 2 and Associated Works at the Salt Valley Road Landfill Facility, Hoddy's Well, June 2019
- Golder Associates Pty Ltd, Cell 2 Design: Salt Valley Road Class Landfill Facility (Document No. 19123998-001-R-Rev1), June 2019

Table 3 lists the documents submitted during the assessment process, with full references provided in Appendix 1.

Document/information description	Date received
Application form and supporting documentation (IWP, 2019), including:	
Opalvale Class II Works Approval (WA5800/2015/1) Amendment Application Supporting documentation;	
<ul> <li>Proposed Class II Landfill (Cell 2) Drawing OV-C2-SK1, May 2019;</li> </ul>	
<ul> <li>Proposed Class II Landfill – Landfill Cell 2 Construction Drawings OV-C2-01 to OV-C2-11 June 2019</li> </ul>	28 June 2019
<ul> <li>Groundwater Monitoring For Cell 2 Construction, June to December 2018, And Perimeter Bores June 2018 to December 2018, Stass Environmental, May 2019</li> </ul>	
<ul> <li>Cell 2 Design – Salt Valley Road Class Landfill Facility, 19123998-001-R-Rev1, Golder Associates Pty Ltd, June 2019</li> </ul>	
Request for information:	25 July 2010
Addendum to Tender OV01/19, Table 3	25 July 2019
<ul> <li>Tender OV01/19_RevA - Construction of Landfill Cell 2 and Associated Works at the Salt Valley Road Landfill Facility, Hoddy's Well, Opalvale Pty Ltd</li> </ul>	2 September 2019

### 3.1 Cell 2 Layout

Due to the construction of Cell 1 of the landfill as a lower than planned base level, approved as part of the works approval and subsequent amendments, the Applicant has proposed that further construction of Stage 1 landfill infrastructure that is linked to the Cell 1 leachate collection system be modified to facilitate conveyance of leachate within the relevant landfill Cells (Cell 2, 3 and 4 of the Stage 1 landfill). This is proposed to be achieved by lowering the base of future cells to follow the levels and grades established in Cell 1, while still achieving the environmental outcomes of the original approved works approval.

The proposed design change assessed in the scope of this amendment is to modify the Cell 2 leachate collection system to tie-in with Cell 1 to achieve similar drainage grades to that established in Cell 1. This will be achieved by lowering the floor of Cell 2 and the invert level of the leachate collection system, being the lowest level of the floor. The lowest point of Cell 2 would then connect with the established leachate infrastructure within Cell 1. The invert of Cell 2 will have a 1% central grade in a north westerly direction while the sides of the floor towards the invert will maintain a 3% grade. The northern and eastern side batter will have a 1 in 3 gradient, while the batters separating the cells will have a 1 in 2 gradient.

With the proposed design amendment, the landfill airspace for Cell 2 will increase from 270,000 m<sup>3</sup> to approximately 279,100 m<sup>3</sup>, equating to a 3.4 % increase in airspace volume, and as such, this increase of 9,100 m<sup>3</sup> airspace will provide Cell 2 with additional volume for waste burial. The increase in waste acceptance capacity within Cell 2 is not proposed to be varied from the current approved under the Licence which is limited to 150,000 tonnes per annual period for the entire premises.

# 3.2 Cushion Geotextile Assessment

The lowering of the Cell 2 floor design elevation will generate an additional 9,100 m<sup>3</sup> airspace and create a total waste thickness of 36 m. Calculations provided in the amendment application indicate that, based on the amended cell design, the cushion geotextile should have a minimum mass per unit area of 800 g/m<sup>2</sup> for a non-woven needle punched staple fibre material. This minimum mass per unit area is proposed to be added to the existing specifications utilised for the construction of Cells for the landfill, and will therefore be required to be met for Cell 2 construction compliance.

### 3.3 Seismicity and stability

The proposed Cell 2 design change will result in an increase of slope length by approximately 1.5 m on the northern and eastern external slopes of Cell 2, with the length of the slope approximately 63.2m at the longest point. The external slope batter will have a grade of 1V:3H while the internal bunds that connects to Cell 1 and future cells to the south will have a batter of 1V:2H. The liner configuration will remain unchanged and the final pre-settlement waste height will remain at 312m AHD. Drawing OV-C2-05, provided in Appendix 4, depicts the layout and dimensions of the proposed Cell 2.

A global stability for Cell 2 was provided for the proposed Cell 2 design. It used a 2D limit equilibrium slope stability analyses software with consideration to the geometry of the landfill, geometry of the subsurface conditions, and sequence of waste deposition.

The stability analyses undertaken for the basal liner system interface has determined that the minimum acceptable factors of stability has been achieved for the analysed scenarios, with the required factors of safety for stability achieved by using a double textured HDPE geomembrane, assuming similar material will be used for the construction of Cell 2 to what was used in Cell 1 construction. The liner parameters remain unchanged as part of the proposed amendment.

A detailed assessment of the stability of the Stage 1 landfill was conducted by DWER as part of the original works approval assessment and is summarised in Section 7.4.1 of the Licence Decision Report. The assessment concluded that the risk associated with the stability of the Stage 1 landfill design is considered to be acceptable.

### 3.4 Construction documentation

Due to developments in industry, learnings from Cell 1 and learning from the material testing of the unconfined area of Cell 1, the liner material specifications have been proposed to be updated, along with proposed improvements to the construction specifications quality assurance requirements originally approved as part of the works approval. Technical aspects of the cushion geotextile described in Section 3.2 are modified in the revised specification document provided in the application.

Additional proposed amendments to the description of works in the Specifications for Cell 2 include:

- Filling and sealing of groundwater monitoring bores within the footprint of Cell 2 (C2, C3, C5 and C6);
- Reshaping of the floor of the clay-pit around the landfill cell to ensure appropriate runoff to surface water and to ensure no ponding within the vicinity of the new landfill area;
- The cushion geotextile must have a minimum mass per unit area (MA) of 800g/m<sup>2</sup> if a non-woven needle punched staple fibre material is used, while a continuous filament material with a lower MA could be used if deemed acceptable if motivated through a modified cylinder testing; and

• Construction Quality Control testing and sampling to ensure that the geotextiles used in the GCL are free of any broken needles and updated GCL material specification to align with the CQA testing.

# 4. Legislative Context

No other approvals are relevant in relation to this amendment Application.

### 4.1 Amendment history

The amendment history for W5800/2015/1 is outlined in Table 4.

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	Instrument	Issued	Amendment
	W5800/2015/1	27 August 2015	Original works approval issued
	W5800/2015/1	22 July 2016	Amendment to give effect to the Minister's determination (068-074/15)
	W5800/2015/1	17 August 2017	Amendment Notice 1 - to address compliance matters relating to construction of Cell 1, Stage 1
	W5800/2015/1	12 October 2018	Amendment Notice 2 - to give effect to the Minister's determination (023/17)
	W5800/2015/1	19 September 2019	Amendment to lower the floor design of Cell 2 and to amalgamate previous amendments into a consolidated works approval

#### orks approval amendments

# 5. Emission Sources, Receptors and Pathways

### 5.1 Emissions

The potential for emissions to impact on sensitive receptors has been assessed in accordance with the DWER's Risk Framework. As construction of Cell 2 will nominally occur in the same manner as per the original works approval application, it is considered that the emissions for construction activities associated with Cell 2 will not vary from the initial assessment. Emissions associated with the operation of Cell 2 have been considered due to the proposed Cell design amendment. The key emissions which have been considered in this report are:

- leachate generation from the increased volume of waste accepted and buried within Cell 2, with potential receptors being beneficial users of groundwater and surface water ecosystems;
- odour emissions from the increased volume of waste accepted and buried within Cell
   2.
- fugitive landfill gas emissions from the increased volume of waste accepted and buried within Cell 2.

#### 5.1.1 Leachate generation

The original proposal for Cell 2 was a design for 270,000 m<sup>3</sup> of landfill airspace. The proposed design amendment of Cell 2 will result in an increased capacity to approximately 279,100 m<sup>3</sup>, equating to a 3.4% increase of airspace volume, and as such, this increase of 9,100 m<sup>3</sup> airspace will provide Cell 2 with additional volume for waste burial. The increase in waste acceptance capacity within Cell 2 is not proposed to be varied from the current approved under the Licence which is limited to 150,000 tonnes per annual period for the entire premises.

The application refers to the outcome of the assessment of the increased waste volume on leachate generation rates that was assessed as part of the Licence application of operation of Cell 1. This found that the "additional airspace will not result in a significant increase in leachate generation quantities estimated as part of the Cell 1 design. However, the leachate generation rate should be monitored and used to calibrate the model."

It is noted that Condition 27 of the Licence currently requires the Works Approval Holder to undertake leachate monitoring consistent with the outcome of the original assessment.

#### **Key Finding:**

1. The Delegated Officer considers that the proposed additional airspace in Cell 2 is not likely to result in a marked increase in leachate volumes generated through the life of operation of the Cell.

#### 5.1.2 Odour and fugitive landfill gas

The proposed design amendment of Cell 2 will result in an increased capacity to approximately 279,100 m<sup>3</sup>, equating to a 3.4% increase of airspace volume, and as such, this increase of 9,100 m<sup>3</sup> airspace will provide Cell 2 with additional volume for waste burial. There is no increased in waste acceptance proposed by the amendment to Cell 2 design and therefore odour and fugitive landfill gas emissions are likely to be similar to those assessed within the original works approval.

### 5.2 Receptors

Risk is assessed as a combination of emission sources, the proximity and sensitivity of receptors to those emission sources and any pathways that can allow the emission to reach and potentially harm the receptor. Tables **Error! Reference source not found.**5 and 6 provide a summary of human and environmental receptors, respectively, in proximity to the premises which have a potential to be impacted from the proposed amendment, and the risk assessment in Section 6 considers these receptors in the context of emissions and potential pathways. Note that previous Decision Reports for the Works Approval and the Licence have given a full description of the environmental siting and sensitive receptors for the Premises.

Residential and sensitive premises	Distance from Prescribed Premises
Privately owned farm land	Immediately adjacent (east and west)
Residential premises	Internal farmhouse, approximately 400 m south west The original Works Approval application included a letter of consent from the landowner of Lot 11 Chitty Road dated 10 November 2014, which states 'As the landowner of Lot II Chitty Road, I consent to the development of a class II putrescible landfill on the site. In accordance with this development, I acknowledge the presence of the farmhouse that is approximately 400 m to the south west of the landfill footprint and accept that this dwelling can be ignored as a receptor when considering the environmental impact of the proposed development'.
	Two properties approximately 1.1 km north east of the premises. One property approximately 1.7 km south of the primary prescribed activity

Environmental receptors	Distance from Prescribed Premises
Department of Biodiversity, Conservation and Attractions (DBCA) Managed Lands and Waters	Clackline Nature Reserve approximately 2.3 km south east
	Nanamoolan Nature Reserve 2.3 km east and north east.
	DBCA managed land, being Lot 889 on Deposited Plan 415818, containing suitable foraging, roosting and breeding habitat for threatened black cockatoo species, located approximately 670 m south. The land is managed as part of the adjacent Clackline Nature Reserve pending inclusion to the existing reserve
Waterways Conservation areas	The Premises is within the Avon River Management Area.
Proclaimed surface water area	The Premises is within the Avon River Catchment Area.
Directory of Important Wetlands of Australia	Avon River Valley, approximately 17 km downstream from the closest feeding tributary to the premises.
	The Avon River is a registered type B2 wetland and provides high environmental value to public and the environment.
Threatened Ecological Communities and Priority Ecological Communities	A number of threatened ecological communities (wheatbelt woodlands) >5 km to the north east and south east
Groundwater	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.

#### Table 6: Environmental receptors and distance from activity boundary

### 5.3 Pathways

#### 5.3.1 Movement of leachate through soil to groundwater

The following considerations to groundwater characteristics were presented in the Application; namely within the IW Projects supporting documentation dated 28 June 2019 (IW Projects, 2019) and Golder Associates Pty Ltd Cell 2 Design – Salt Valley Road Class Landfill Facility, 19123998-001-R-Rev1, (Golder Associates, 2019):

- Data from the Bureau of Meteorology for site 010244 (Bakers Hill) demonstrates that rainfall for the 2016, 2017 and 2018 calendar years have been the highest recorded in the past two decades, being 790 mm, 674.4 mm and 663.5 mm respectively.
- Groundwater monitoring bores for the construction of Cell 2 (bores C2, C3, C5 and C6) were installed and monitored in accordance with Table 2.1.1 of the Works Approval. Data presented (Stass, May 2019) for these bores demonstrated the required 2 m separation distance between the lowest base of the liner and the highest level of the water table.

• Previous groundwater monitoring for 2016 and 2017 was undertaken using dataloggers supplemented by monthly physical measurements. Accounting for winter recharge, a maximum inferred level was calculated (Golder Associates, 2018) and assessed by DWER as part of the appeal determination to Amendment Notice 1 of the works approval. These maximum inferred groundwater levels are shown In Figure 1.

Monitoring bore	Maximum Recorded groundwater level (m AHD) pre 2018	Golders maximum inferred groundwater level (mAHD)
C2	271.90	272.14
C3	271.16	271.40
C5	273.09	273.33
C6	272.54	272.76

Figure 1: Maximum inferred groundwater levels

Figure supplied within the Application

- Appendix 5 provides the locations of monitoring bores C2, C3, C5 and C6 in relation to the proposed footprint of Cell 2.
- The standing water level monitoring data collected, by both data-loggers and monthly physical measurement, for the 2018 period, is graphically presented in Figure 2.



Figure 2: Maximum inferred groundwater levels

Figure supplied within the Application

- This monitoring data was used to create groundwater contours to establish separation distances based on the highest reading at each bore. Drawing OV-C2\_SK1 within the Application shows the relative height of the monitoring bore C2, C3, C5 and C6 in relation to the cell design, with the separation distances based on the groundwater contouring.
- Of note, Bores C2 and C3 show water levels that may have been influenced by recharge from ponding water in the area due to the winter rainfall and sedimentation effects from the eroded slopes which impeded the surface flows to the clay pit sump. It has been suggested that these bore may be hydraulically connected with the

underlying, more permeable semi-confined saprock, or connectivity with temporary surface water bodies on site, and therefore once removed, groundwater levels are likely to decline (Golder, 2018). It is also noted that Bore C2 was dry for extended periods, evident by the constant readings from the data-logger.

• Based on the floor of Cell 2 being 275.10 m AHD at its lowest point, the separation distance of 2 m is met as per Figure 3.

Location	Bore C2	Bore C3	Bore C5	Bore C6	Lowest point of Cell 2 – leachate drain invert
Cell 2 Floor level (m AHD)	275.95	277.13	277.13	280.91	275.10
2016 and 2017 highest recorded level (m AHD)	271.90	271. <mark>1</mark> 6	273.09	272.54	n/a
2018 Max water level (m AH)	272.018 (18/9/2018)	271.478 (19/10/2018)	273.056 (11/12/2018)	272.742 (12/12/2018)	n/a
January 2019 manual measure (m AHD)	271.055	270.89	273.11	272.88	
Min separation to groundwater based on 2018 monitor (m)	3.932	5.65	4.074	8.168	3.1m (determined from contour)
Max expected groundwater level <sup>1</sup> (m AHD) Golder	272.14	271.40	273.33	272.78	n/a
Min separation distance based on Golder predict (m)	3.81	5.73	3.80	8.13	Also likely to be ~3m

#### Figure 3: Separation distance

Note 1: From Golders advice to DWER during the appeals of Works Approval W5800 Amendment Notice 1 entitled: Additional groundwater assessment – response to request for further information regarding Works Approval W5800/2015/1, dated 19 April 2018.

#### Figure supplied within the Application

At the lowest point of Cell 2 design, being the leachate valley connecting Cell 2 to Cell 1, the separation distance to groundwater is approximately 3.1 m. It is noted that the Stass, May 2019 report made reference to a separation distance of 2.87 m using the lowest level of Cell 1, rather than the lowest level of Cell 2, as the report was prepared prior to the proposed Cell 2 floor level.

A cross section of the Cell 2 flow in relation to potentiometric groundwater was shown in Figure OV-C2-O4 of the application to demonstrate the groundwater separation distance across the entirety of Cell 2. Given groundwater contours indicate a gradient flow from east to west, the separation distance to groundwater increases to the east. This is further evident with an increase in elevation of the Cell 2 floor to the east.

#### **Key Findings:**

- 1. The Delegated Officer has reviewed the groundwater monitoring data and the separation distances when compared to the representative standing water levels measured in corresponding groundwater monitoring bores.
- 2. The Delegated Officer is satisfied that the proposed amendment to the Cell 2 design ensures that a minimum separation distance of 2 m is achieved between the base of the Cell and the highest natural elevation of groundwater beneath the Cell as demonstrated by groundwater contour plans and landfill cell design drawings.

# 6. Risk assessment

Table 7 below describes the Risk Events associated with the amendment consistent with the Guidance Statement: Risk Assessments. The table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

As construction of Cell 2 will nominally occur in the same manner as per the original works approval application, it is considered that the risk profile for construction activities associated with Cell 2 will not change from the initial assessment. Risks associated with the operation of Cell 2 have been considered due to emissions directly impacted by the cell floor variations.

### Table 7: Risk assessment for proposed amendments during operation

Risk Event		Consequence	Likelihood	4		Regulatory controls (refer		
Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls	rating*	rating*	Risk*	Reasoning	to conditions of the granted instrument)
	Leachate arising from the Class II waste types	Infiltration through soil profile to groundwater causing potential impacts on ecological values and beneficial uses associated with quality of water in the aquifer.	Controls will remain consistent with the original works approval application, with the following revisions: - Reshaping of the floor of the clay- pit around the landfill cell to ensure appropriate runoff to surface water and to ensure no ponding within the vicinity of the new landfill area - The cushion geotextile must have a minimum mass per unit area (MA) of 800g/m <sup>2</sup> if a non-woven needle punched staple fibre material is used; - Construction Quality Control testing and sampling to ensure that the geotextiles used in the GCL are free of any broken needles and updated GCL material specification to align with the CQA testing.	Moderate	Unlikely	Medium	The assessment previously undertaken by DWER for Amendment Notice 1 determined an acceptable risk event relating to the lowering of the Cell 1 floor level to create an additional airspace of 12,000m <sup>3</sup> , with the increase insignificant in the context of the facility design. Data from the Bureau of Meteorology for site 010244 (Bakers Hill) demonstrates that rainfall for the 2016, 2017 and 2018 calendar years have been wetter than average years. Based on this data, the recent rainfall impact on the water table is likely to represent higher than average groundwater levels influenced by the rainfall. The Delegated Officer notes that the historical monitoring data for the site indicates the presence of a confined or semi-confined groundwater system. This confining layer lies above the top of the aquifer, and as such, the groundwater separation distance beneath the landfill cell is likely to be a conservative estimate based on the potentiometric surface. Review of groundwater monitoring data demonstrates that a separation distance of 2 m is achieved between the base of the cell and the highest natural elevation of groundwater beneath the cell, in accordance with Condition 1.2.4 of the Works Approval. The Delegated Officer considers that the Applicant's proposed leachate mitigation controls, in conjunction with current leachate mitigation controls, are likely to be sufficient at mitigating leachate emissions associated with the proposed amendment to Cell 2.	Existing regulatory controls are proposed to be updated to reflect the construction of Cell 2 I occur in accordance with revised documentation.
Cell 2 of Category 64 Acceptance and burial of wastes including asbestos and Class II contaminated Soils – additional 9,100 m <sup>3</sup> of waste over the life of Cell 2 operation	Leachate arising from the Class II waste types	Overland flow of from the overtopping of leachate ponds causing potential impacts to Jimperding Brook and the Greater Avon River Valley catchment.	Controls will remain consistent with the original Works Approval application and current Works Approval.	Moderate	Unlikely	Medium	The proposed design amendment of Cell 2 will result in an increased capacity to approximately 279,100 m3, equating to a 3.4% increase of airspace volume. The Delegated Officer considers that the additional airspace will not result in a significant increase in leachate generation quantities Monitoring of leachate generation rate is currently required by Condition 27 of the Licence. The Delegated Officer considers that the Applicant's proposed leachate mitigation controls, in conjunction with current leachate mitigation controls, are likely to be sufficient at mitigating leachate emissions associated with the proposed deviation to Cell 2.	No proposed amendment to existing regulatory controls.
	Odour arising from the acceptance of Class II waste types	Airborne odour causing impacts to health and amenity of closest human receptors (two properties approximately 1.1 km north east of the premises and one property approximately 1.7 km south of the primary prescribed activity)	Controls will remain consistent with the original Works Approval application and current Works Approval.	Minor	Unlikely	Medium	The Delegated Officer considers the additional airspace of Cell 2 does not alter the nature and extent of potential odour emissions to that previously assessed in Section 9.7 of the Licence Decision Report and as such considers previously proposed emission controls for odour are acceptable to manage potential odour emissions.	No proposed amendment to existing regulatory controls.
	Fugitive landfill gas arising from the acceptance of Class II waste types	Airborne odour causing impacts to health and amenity of closest human receptors (two properties approximately 1.1 km north east of the premises and one property approximately 1.7 km south of the primary prescribed activity)	Controls will remain consistent with the original Works Approval application and current Works Approval.	Slight	Unlikely	Low	The Delegated Officer considers the additional airspace of Cell 2 does not alter the nature and extent of potential fugitive gas emissions to that previously assessed in Section 9.9 of the Licence Decision Report and considers previously proposed emission controls for are acceptable to manage potential fugitive gas emissions.	No proposed amendment to existing regulatory controls.

\*Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

# 7. Regulatory Controls

The Delegated Officer considers that existing regulatory controls within the Works Approval are sufficient to mitigate the risk of leachate infiltrating through the soil profile to groundwater. Primary controls limiting leachate emissions to groundwater (and indirectly to surface water) relate to the correct design and construction of landfill cells. DWER's assessment of the design and proposed construction of the Stage 1 landfill was originally documented in the Decision Document attached to the Works Approval granted to Opalvale on 27 August 2015.

Regulatory controls within Licence L9089/2017/1 currently ensure the appropriate maintenance of leachate recovery, monitoring and storage infrastructure with process monitoring requirements for in-cell leachate management (leachate level monitoring) and on-going groundwater monitoring around the landfill area to detect potential leachate loss from the landfill cells.

Regulatory controls relating to the operation of Cell 2 will be further reviewed upon the likely licence amendment application following the construction of Cell 2, as the current licence limits the disposal of waste only within Cell 1.

# 8. Conclusion

Based on the assessment in this Amendment report, the Delegated Officer has determined to amend the Works Approval in accordance with section 59(1) of the EP Act, subject to conditions commensurate with the determined controls. Table 8 summarises these changes.

Works Approval condition	Amendment description		
1.2.1	The construction of Cell 2 to occur in accordance with the following revised documentation:		
	<ul> <li>IW Projects Pty Ltd, Opal Vale Pty Ltd Proposed Class II Landfill: Landfill Cell 2 Construction, June 2019;</li> </ul>		
	<ul> <li>Opalvale Pty Ltd, Tender OV01/19_RevA: Construction of Landfill Cell 2 and Associated Works at the Salt Valley Road Landfill Facility, Hoddy's Well, June 2019; and</li> </ul>		
	<ul> <li>Golder Associates Pty Ltd, Cell 2 Design: Salt Valley Road Class Landfill Facility (Document No. 19123998-001-R-Rev1), June 2019</li> </ul>		

Table 8: Condition amended

#### A/EXECUTIVE DIRECTOR REGULATORY SERVICES

Officer delegated under section 20 of the Environmental Protection Act 1986

# Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L9089/2017/1 and Decision Report – Salt Valley Road Class II Landfill	Licence	accessed at <u>www.dwer.wa.gov.au</u>
2	Works Approval W5800/2015/1 and Amendment No. 1 and Amendment No. 2	Works Approval	DWER records (A959913) DWER records (A1508339) DWER records (A1729749)
3	Opalvale Class II Works Approval (WA5800/2015/1) Amendment Application Supporting documentation (June 2019) – emailed to DWER on 28 June 2019	IW Projects, 2019	DWER records (A181243)
4	Proposed Class II Landfill (Cell 2) Drawing OV-C2-SK1, May 2019	N/A	DWER records (A181243)
5	Proposed Class II Landfill – Landfill Cell 2 Construction Drawings OV-C2-01 to OV-C2-11 June 2019	N/A	DWER records (A181243)
6	Groundwater Monitoring For Cell 2 Construction, June to December 2018, And Perimeter Bores June 2018 to December 2018, Salt Valley Road Class II Landfill Hoddy's Well, WA 6566, Stass Environmental, May 2019, Report Version 1.2	Stass, May 2019	DWER records (A181247)
7	Additional Groundwater Level Assessment – Response t Request for Further Information, 1897398-001- L-Rev2, Golder Associates Pty Ltd, April 2018	Golder Associates, 2018	DWER records (A1660698)
8	Cell 2 Design – Salt Valley Road Class Landfill Facility, 19123998-001- R-Rev1, Golder Associates Pty Ltd, June 2019	Golder Associates, 2019	DWER records (A181251)
9	Tender OV01/19_RevA - Construction of Landfill Cell 2 and Associated Works at the Salt Valley Road Landfill Facility, Hoddy's Well, Opalvale Pty Ltd – emailed to DWER on 2 September 2019	Specifications	DWER records (A1819552)
10	Application Form: Works Approval Amendment, Opalvale Pty Ltd – emailed to DWER on 28 June 2019	Amendment Application	DWER records (A181252)

11	DER, July 2015. <i>Guidance Statement:</i> <i>Regulatory principles.</i> Department of Environment Regulation, Perth.	DER 2015a	
12	DER, October 2015. <i>Guidance</i> <i>Statement: Setting conditions.</i> Department of Environment Regulation, Perth.	DER 2015b	
13	DER, September 2016. <i>Guidance</i> <i>Statement: Environmental Standards.</i> Department of Environment Regulation, Perth.	DER 2016c	
14	DER, November 2016. <i>Guidance</i> <i>Statement: Environmental Siting.</i> Department of Environment Regulation, Perth.	DER 2016d	accessed at <u>www.dwer.wa.gov.au</u>
15	DER, February 2017. <i>Guidance</i> <i>Statement: Risk Assessments.</i> Department of Environment Regulation, Perth.	DER 2017b	
16	DWER, June 2019. <i>Guideline:</i> <i>Decision Making.</i> Department of Water and Environmental Regulation, Perth.	DWER 2019a	

### **Appendix 2: Summary of Works Approval Holder comments**

The Works Approval Holder was provided with the draft Amendment on 17 September 2019 for review and comment. The Works Approval Holder responded on 17 September 2019 waiving the remaining comment period. No comments were submitted on the draft Amendment.

Appendix 3: Summar	y of comments	received during	public c	onsultation period
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Stakeholder	Summary of Submission Points	DWER response
Department of Planning,	- No land use planning issues	DWER notes the submission
Lands and Heritage		
Department of	- No comment on the proposal	DWER notes the submission
Biodiversity,		
Conservation and		
Attractions		
Department of Health	- No specific concerns	DWER notes the submission
Shire of Toodyay	- The current cell locations seem to be different to those approved by the State Administrative Tribunal.	- The locations of the cells were not proposed to be amended, and thus were not considered in this amendment decision. However, Requirement 7 of SAT Decision [2013] WASAT 88 requires that the final engineering design of the facility, including the batter slopes and shape and base level of each landfill stage, shall be implemented in accordance with the works approval issued by the Department of Environment and Conservation. Works have been constructed in accordance with the footprint and configuration approved by the current Works Approval.
Member of public	- Concerns were raised regarding the interpretation of the data presented by Golder in calculating earthquake risk. In Table 6 the margin for safety is zero for the liner under the maximum design earthquake and only 0.1 in Table 7. This is when FoS values are rounded up to 1 decimal place so the actual margin for safety could approach -0.5 in Table 6 and 0.5 in Table 7. Golder's statement that "there is little established literature to evaluate continuous filament material" only makes the situation worse.	The suitability of the landfill design in relation to stability was previously assessed during previous works approval and licence applications and included independent technical review of the stability model. Section 7.4.1 of the Licence Decision Report summarises the outcome of the works approval assessment and found the stability model approach to be acceptable

Stakeholder	Summary of Submission Points	DWER response
Member of public	<ul> <li>Lack of information within the Groundwater report of when all manual groundwater measurements were taken and the results of those measurements.</li> <li>The highest reading for well C5 (273.007) in January 2019 is only 2.093 m above the proposed lowest level of the landfill for Cell 2 (275.1).</li> <li>There is no reference to a perched or superficial water table in the groundwater report or any details of it.</li> </ul>	<ul> <li>All groundwater monitoring events were provided within the Opalvale Cell 2 bores loggers 2019 spreadsheet that accompanied the application.</li> <li>Groundwater measurements were used to create a groundwater contour plan to calculate separation distances across the cell. Due to the locations of the bores and differing groundwater and floor levels, each bore cannot be compared individually relative to the lowest level of Cell 2 as this is not representative of the actual separation distance.</li> <li>As previously assessed in the Works Approval decision report, the Delegated Officer notes that the historical monitoring data for the site indicates the presence of a confined or semi-confined groundwater system beneath the landfill site. This means that the potentiometric surface of these aquifers usually lies above the top of the aquifer and confining layer at that point, and that the height of the water level measured in a monitoring layer.</li> </ul>
Member of public	<ul> <li>Suggestion that the highest natural groundwater elevation has not been established to a level of confidence to meet Condition 2.1.5 of the Works Approval, based on discrepancies in the accuracy assumed within the supporting documentation.</li> <li>The documentation provided does not demonstrate Condition 1.2.4 has been met, as groundwater monitoring and discrepancies have not provided conclusive data a 2 m separation distance between the lowest elevation of the design floor and the highest natural groundwater elevation can be achieved or maintained.</li> </ul>	<ul> <li>DWER considers that the groundwater monitoring data, together with expected peak groundwater levels, and current separation distance calculations, provides sufficient separation distance between Cell 2 and the groundwater beneath the cell.</li> <li>DWER considers the methods used by the Applicant to calculate the standing water level to be appropriate and in accordance with the Works Approval, noting that no areas of the groundwater water system are classified as highly saline, as defined, <i>Stream salinity status and trends in south-west Western Australia, Department of Environment, Salinity and land use impacts series, Report No. SLUI 38.</i></li> <li>The Report to the Minister for Environment for Appeal Numbers: 023/17.001-00, August 2018, previously addressed some concerns regarding the groundwater</li> </ul>

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Stakeholder	Summary of Submission Points	DWER response
		<ul> <li>monitoring methods, and as such, are relevant to this submission.</li> <li>It is noted that an incorrect lowest level for Cell 2 was used for the calculations within the Stass, 2019 report, with the actual level creating a greater separation distance.</li> <li>Groundwater data logger measurements were consistent with manual measurements, substantiating the standing water levels calculated.</li> <li>DWER considers that measurements from Bores C2 and C3 may have been influenced by recharge from temporary water ponding in the area.</li> <li>As previously addressed during Amendment Notice 1, groundwater monitoring data indicates that measured potentiometric head in the saprock aquifer that underlies the site is periodically less than two metres for Cell 1, but is not considered to have a significant impact on the risk of leachate from the landfill contaminating groundwater. As such, the increased separation distance (meeting the required 2 m) above the confining layer does not pose an unacceptable risk.</li> </ul>

# Appendix 4: Cell 2 Layout Plan



N ARE AT 0.50m INTERVAL AND CE LEVELS (TOP OF PAVEMENT). E FINISHED EARTHWORKS SURFACE TO BE PLACED ON TOP OF THIS IN NOTIFY THE SUPERVISING SPENCIES BETWEEN THE DESIGN ONS ON SITE PRIOR TO EARTHWORKS. ALLABLE TO ASSIST WITH SETOUT
L 2 SETOUT TABLE
NORTHING R I

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6495910.893	280.943
6495898.379	292.484
6495925.754	293.891
6495957.070	295.457
6495988 393	298.582
6496013.086	297.183
6496034.303	296.073
6496058.356	294.300

# Appendix 5: Groundwater bore location



Figure supplied as part of the Application

### Appendix 5: Stage 1 layout



Figure supplied as part of the Application

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