Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L9127/2018/1
Licence Holder	City of Greater Geraldton
File Number	INS-0002041
Premises	Meru Waste Disposal Facility Landfill Road, NARNGULU WA 6532 Legal description – Lot 204 on Plan 403161; Lot 2268 on Plan 250829; and Lot 203 on Plan 403161
Date of Report	3 November 2025
Decision	Revised licence granted

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1. Decision summary

Licence L9127/2018/1 is held by City of Greater Geraldton (Licence Holder) for the Meru Waste Disposal Facility (the Premises), located at Lot 204 on Plan 403161, Lot 2268 on Plan 250829 and Lot 203 on Plan 403161.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L9127/2018/1 has been granted.

The Revised Licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department 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 Amendment summary

On 20 June 2025, the Licence Holder submitted an application to the department to amend Licence L9127/2018/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Construction and operation of landfill gas management infrastructure;
- Change to the prescribed premises boundary;
- Changes to weekly fence inspection requirements;
- Changes to entrance signage condition;
- Changes to fire management conditions;
- Changes to biosolid management conditions; and
- Update to groundwater monitoring well network.

2.2.1 landfill gas management

Landfill gas emissions can result in fire and explosion and result in asphyxia at high concentrations. Landfill gas such as hydrogen sulphide generates odour and can also have toxic effects on the health and wellbeing of flora, fauna and human receptors.

In order to manage landfill gas, the Licence Holder proposes to install 59 vertical extraction wells with a typical well spacing of 40 to 50 m. Wells will nominally be constructed of a 200 mm HDPE well casing inserted into a 600 mm bore which is to be backfilled by a suitable aggregate. The wells will be connected to a vacuum source (nominally at the power station and or flare) via a network of HDPE gas mains and well headers

Progressive installation of horizontal wells (perforated lateral pipework embedded in a free draining rock pack) will be undertaken as required. In operating cells, horizontal wells are typically installed every second waste lift (approximately 3-4m per lift) with each new series being offset from the previously installed pipework. This provides a staggered design within the waste mass and increases overall coverage.

The majority of landfill gas will be generated in the putrescible waste Cells (landfill cells 2 and 3). These cells will host the primary network of gas pipelines. In contrast, Cells 1 and 4, which primarily receive inert waste, will be equipped with limited gas collection lines designed to capture vertically migrating gas. A conceptual layout of the gas extraction system for Cells 1–4 is presented in Figure 1 below.

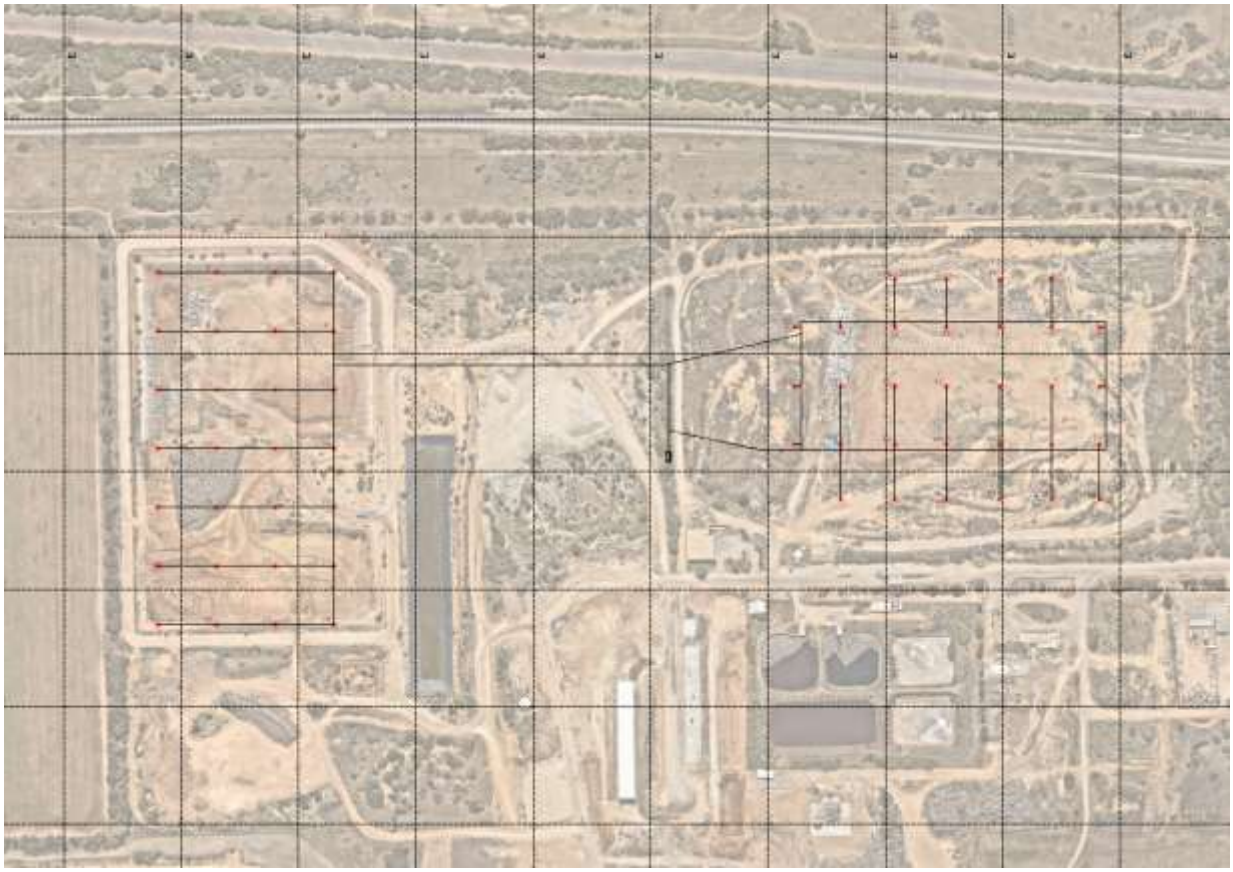

Figure 1: Proposed landfill gas extraction wells

The system is designed so that condensate in the header pipework will be minimised by placing the wellhead stations at the top of the landfill, therefore at the highest point in the collection system. All condensate that forms within the lateral flow lines will drain back through the gas collection system, collected within J-traps or condensate knockout vessels before being returned to the underlying waste mass.

The collected landfill gas will be combusted via a flare. The proposed LMS flare has a maximum capacity of 1,000 m^3/hour with the ability for the destruction of greater than 98% of non-methane organic compounds.

During the assessment, inconsistencies were identified between the supporting documents supplied with the application and the landfill cells as defined in the infrastructure table of the licence. Therefore the licence has been updated to clearly define Class II and Class III waste cells to ensure Class III waste is not being landfilled in a Class II waste cell.

The below requested amendments have been deemed to be administrative in nature as they do not alter the risk profile of the Premises, providing that activities, emissions and receptors as stated in existing approvals remain unchanged:

- Changes to weekly fence inspection requirements;
- Changes to entrance signage condition;
- Changes to fire management conditions;

- Changes to biosolid management conditions; and
- Update to groundwater monitoring well network.

3. 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.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 1 below. Table 1 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 1: Licence Holder controls

Sources	Emission	Potential pathways	Proposed controls
Earthworks and construction works associated with the installation of landfill gas management system.	Dust	Air/windborne pathway	Speed limit of 10 km/hr
Earthworks and construction works associated with the installation of landfill gas management system.	Noise	Air/windborne pathway	Works undertaken during normal working hours (7am- 5pm, Mon – Fri) as per noise regulation
Disturbance of waste mass during installation of landfill gas management infrastructure.	Odour	Air/windborne pathway	Landfill gas wells balancing will occur on a regular basis to ensure efficient destruction of landfill gas. No controls have been proposed for the disturbance of waste during installation of the landfill gas management infrastructure.
Landfill gas generated through the decomposition of waste within the	Landfill gas	Lateral migration of landfill gas through the soil profile Passive venting	Construction and operation of landfill gas management infrastructure. Flaring of captured landfill gas. Ongoing monitoring of the landfill gas

landfill		to air	management infrastructure. Implementation of an Emergency Response Plan for the operation of the landfill gas management system.
Disturbance of waste mass during installation of landfill gas management infrastructure.	Windblown waste	Air/windborne pathway	The current operational licence requires the Licence Holder to ensure that any wind-blown waste emanating from the premises is collected and removed on a weekly basis
Disturbance of waste mass during installation of landfill gas management infrastructure.	Pest/vermin	Air/windborne pathway	Clean fill suitable for end of day cover will be retained on site and used as end of day cover if Posi-shell fails to provide adequate control of access to waste by pest/vermin. Weekly monitoring of the Posi-shell effectiveness as an alternative daily cover will be undertaken for 12 weeks.
Disturbance of waste mass during installation of landfill gas management infrastructure.	Asbestos	Air/windborne pathway	No further controls proposed.
Leachate from landfill gas condensate	Leachate	Overland runoff / migration onto surrounding land and into waterways causing ecosystem disturbance Seepage through soil and to groundwater causing contamination and impacting water quality Direct dermal contact and ingestion of contaminated surface water causing impacts to human health.	Condensate in the header pipework will be minimised by placing the wellhead stations at the top of the landfill. All condensate that forms within the lateral flow lines will drain back the gas collection system or collected within J-traps or condensate knockout vessels before being returned to the underlying waste mass.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's 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 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Rural residential premises	Closest are approximately 700m north, approximately 750m northwest, and approximately 730m northeast of the premises boundary.
Residential suburbs	Karloo - Approximately 1.5km northwest of the premises boundary. Wandina – Approximately 1.6km southwest of the premises boundary.
Industrial premises	Premises is located within an industrial area. The closest neighbouring industrial premises is immediately adjacent to the eastern boundary of the premises.
Environmental receptors	**Distance from prescribed activity**
Rights in Water and Irrigation Act 1914 (RIWI Act) - Groundwater Areas	Premises within a proclaimed RIWI Act Arrowsmith Groundwater Area
Greenough River and Tributaries Catchment Area	Immediately adjacent to the east of the premises boundary.
Underlying groundwater (non-potable purposes)	Depth to groundwater is approximately 10-20mBGL. Groundwater salinity is 3000-7000mg/L.
Western Australian Herbarium specimens	Two identifications of *Beyeria cinerea* subsp. *cinerea* located within 1km of premises boundary
Threatened and Priority Flora	One species identified within 1km of premises boundary
Cultural receptors	**Distance from activity / prescribed premises**
Aboriginal Sites and Heritage Places	Three within 2km of premises boundary: •Place ID – 26739 GSTCS2-Artefact scatter AS001/2009 •Place ID – 20854 Geraldton Southern Transport Corridor Field Site 03 •Place ID – 20852 GSTC-ISO-01 to 04

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder'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 Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

The Revised Licence L9127/2018/1 that accompanies this Amendment Report authorises emissions associated with the construction and operation of the Premises landfill gas management infrastructure.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 3. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Earthworks and construction works associated with the installation of landfill gas infrastructure Disturbance of landfilled material	Dust	Air/windborne pathway causing impacts to health and amenity	Residences 700m north and 750m northwest and 730m northeast of the premises Industrial properties located immediately east of the premises	Refer to Section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Yes	N/A	Emission to be regulated under the general provisions of the EP Act
	Noise			Refer to Section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Yes	N/A	Emission to be regulated under the *Environmental Protection (Noise) Regulations 1997* (EP Noise Regulations)
	Odour			Refer to Section 3.1.1	C = Minor L = Unlikely **Medium Risk**	No	**Condition 13**	Additional regulatory controls have been added to the licence to ensure all waste that is uncovered or excavated during the construction of the landfill gas infrastructure is immediately landfilled following disturbance.
	Asbestos			Refer to Section 3.1.1	C = Severe L = Unlikely **High Risk**	No	**Conditions 13 & 14**	Additional controls relating to the discovery and management of unexpected asbestos finds have been included within the

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								licence.
	Pests / vermin	Biological pathway causing impacts to health and amenity	Residences 700m north and 750m northwest and 730m northeast of the premises Industrial properties located immediately east of the premises	Refer to Section 3.1.1	C = Minor L = Unlikely **Medium Risk**	No	Condition 4 **Condition 13**	Additional regulatory controls have been added to the licence to ensure all waste that is uncovered or excavated during the construction of the landfill gas infrastructure is immediately landfilled following disturbance.
Operation								
Decomposition of buried waste	Landfill gas	Air/windborne pathway causing impacts to health and amenity	Residences 700m north and 750m northwest and 730m northeast of the premises Industrial properties located immediately east of the premises	Refer to Section 3.1.1	C = Major L = Unlikely **Medium Risk**	No	Condition 12 **Conditions 54, 55 & 56**	Condition 12 is added to the Licence to ensure that the landfill gas management infrastructure is constructed as designed. Conditions 55, 56 and 57 are added to certify that the infrastructure was constructed as per the specifications.
Capture and transfer of landfill gas generated through the decomposition of waste within the landfill Flaring of captured landfill	Noise	Air/windborne pathway causing impacts to health and amenity Air/windborne	Residences 700m north and 750m northwest and 730m northeast of	Refer to Section 3.1.1	C = Slight L = Unlikely **Low Risk**	Yes	N/A	Emission to be regulated under the *Environmental Protection (Noise) Regulations 1997* (EP Noise

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
gas		pathway causing impacts to health and amenity	the premises Industrial properties located immediately east of the premises					Regulations)
	Odour		Residences 700m north and 750m northwest and 730m northeast of the premises Industrial properties located immediately east of the premises	Refer to Section 3.1.1	C = Moderate L = Unlikely **Medium Risk**	No	Condition 12, 38, 39 **Conditions 40, 41, 54, 55 & 56**	Additional regulatory controls have been added to the licence to ensure the efficient destruction of landfill gas that has the potential to generate odour emissions.
	Fugitive landfill gas	Air / wind dispersion, lateral migration of landfill gas through the soil profile and passive venting to air causing impacts to health and amenity lateral migration of landfill gas through the soil profile causing explosive risk	Residences 700m north and 750m northwest and 730m northeast of the premises Industrial properties located immediately east of the premises	Refer to Section 3.1.1	C = Major L = Rare **Medium Risk**	Yes	Condition 12, 38	The Delegated Office notes that the installation of landfill gas management infrastructure will result in reduction in the likelihood of landfill gas passively venting to the atmosphere or migrating laterally from the landfill.
	Leachate from landfill	Overland runoff / migration onto	Groundwater located	Refer to Section	C = Moderate	Yes	N/A	All condensate formed within the

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
	gas condensate	surrounding land and into waterways causing ecosystem disturbance Seepage through soil and to groundwater causing contamination and impacting water quality Direct dermal contact and ingestion of contaminated surface water causing impacts to human health.	approx. 10-20m beneath the premises Rights in Water and Irrigation Act 1914 (RIWI Act) - Groundwater Areas Greenough River and Tributaries Catchment Area Residences 700m north and 750m northwest and 730m northeast of the premises Industrial properties located immediately east of the premises	3.1.1	L = Unlikely **Medium Risk**			landfill gas management system will drain back into the landfill waste mass.

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

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

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Licence Holder was provided with draft amendment on 13 October 2025	The Licence Holder provided comments on the draft package on 30 October 2025 which are summarised in Appendix 1.	See Appendix 1.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 5: Summary of licence amendments

Condition no.	Proposed amendments
Condition 1 Table 1	Inclusion of new landfill gas management infrastructure Update landfill cell referencing
Condition 4 Table 3	Udated waste processing requirement requiring wastes meeting the waste acceptance criteria specified for Class III landfills and Special Wastes Type 1, Type 2 and Type 3 to be disposed in Class III waste cells.
Condition 7	Changes from weekly to monthly monitoring of fencing inspections and updated timeframe to repair any identified damage.
Condition 12 Table 4	Inclusion of design and construction requirements relating to landfill gas management infrastructure.
Condition 13	Inclusion of ensuring waste is not uncovered or excavated unless for the installation of the landfill gas collection and management system infrastructure
Condition 14	Requirements for the identification of Special Waste Type 1 (ACM) during installation of the landfill gas management infrastructure.
Condition 17	Amendment to fire management requirement requiring any waste or infrastructure fire to be extinguished immediately upon the Licence Holder being notified of the fire.
Condition 32	Amendment to the management of biosolids, requiring the Licence Holder to remove accumulated biosolids from the truck wash separator on a monthly basis or as required.
Condition 34 Table 5	Update to groundwater monitoring wells following the decommissioning of Bore 1 and the addition of Bore 4.

Condition 38 Table 6	Inclusion of landfill gas monitoring requirements.
Condition 39 Table 7	Inclusion of landfill gas trigger levels.
Condition 40 Condition 41	Inclusion of landfill gas trigger levels notification requirements.
Condition 54	Deletion of Condition 54 following submission of Environmental Compliance Report.
Condition 55 Condition 56	Amendment to compliance reporting conditions to include the landfill gas management infrastructure and remove the reference to the Liquid Waste Pond 1 disposal point following submission of Environmental Compliance Report.
Condition 58 Condition 59 Condition 60	Amendment to records and reporting wording to align with contemporary licence format.
Condition 61	Amendment to AACR reporting condition wording to align with contemporary licence format.
Condition 62 Table 9	Amendment to annual reporting requirements for the inclusion of landfill gas infrastructure.
Definitions	Inclusion of definitions for biennially, GFMS and waste. Update to definitions for CEO, department and DWER.
Schedule 1 Figures	Amendment to Figure 1: Update to prescribed premises boundary. Amendment to Figure 2: Update to groundwater monitoring well network. Amendment to Figure 4: Update to Premises Layout. Addition of Figure 8: Landfill gas management infrastructure layout. Addition of Figure 9: Typical landfill gas HDPE perforated lateral pipe design specification. Addition of Figure 10: Typical landfill gas t-well design design specifications. Addition of Figure 11: Typical landfill gas main with j-trap design specifications. Addition of Figure 12: Typical landfill gas vertical / horizontal well design specifications. Addition of Figure 13: Typical landfill gas manifold design specifications. Addition of Figure 14: Typical landfill gas well details. Addition of Figure 15: Typical landfill gas HDPE perforated lateral pipe design specifications.
Schedule 2	Terminology change from attachment to schedule to align with contemporary licence format.
Schedule 3	Terminology change from attachment to schedule to align with contemporary licence format.
Schedule 4	Terminology change from attachment to schedule to align with contemporary licence format.
Schedule 5	Terminology change from attachment to schedule to align with contemporary licence format.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

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

Condition	Summary of Licence Holder's comment	Department's response
Condition 1 Table 1	Request to change the reference from landfill gas management infrastructure to landfill gas extraction/collection system.	The Delegated Officer has determined to keep the reference to the landfill gas management infrastructure in the licence. This terminology has the ability to include the extraction, collection, transfer and flaring of landfill gas.
Condition 12 Table 4	Applicant confirms the 200mm HDPE casing.	Noted
Condition 39 Table 7	Request for trigger levels to by a 'dual criteria'. High levels of O_2 (10% or higher), can occur for many reasons within the gas field - not always related to hot spot management, (the reason for these trigger level within the licence). Having O_2 as its own trigger level could result in wells being shut down unnecessary for a longer period of time (reducing gas extraction), whilst being further investigated. Reporting for every occurrence of a reading above 10% O_2 would create unnecessary admin for items that are simple operational fixes.	The Delegated Officer has reviewed the trigger limits, corrective actions and reporting requirements and updated them as required. Monitoring parameters have been updated to ensure monitoring is achievable, whilst being capable of detecting a landfill fire should one occur at the premises. The Delegated Officer notes that regular monitoring of the landfill gas collection system will facilitate the prevention and early detection of fires, enable balancing of the gas field and ensure that landfill gas is being extracted efficiently.
Condition 41	Applicant has requested additional time to submit a notification to the department following the exceedance of a landfill gas collection trigger level. The additional time is required to undertake the required specified actions.	The Delegated Officer has updated the notification requirements to 28 days following the exceedance of a landfill gas collection trigger level.
Condition 54 Condition 55 Condition 56 Condition 57	The applicant has requested the conditions relating to the liquid waste pond 1 disposal point be removed from the licence following the submittal of the Environmental Compliance Report (ECR) required in accordance with Condition 55.	Conditions 54 and reference to the liquid waste pond 1 disposal point have been removed from the licence. The Delegated Officer notes that on 31 October 2025, the Licence Holder was notified that the ECR submitted to the department on 4 August 2025 met the requirements of licence L9127/2018/1.