Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 1

Licence Number	L8575/2011/1
Licence Holder	Independence Long Pty Ltd
ACN	098 270 789
File Number:	2012/002653
Premises	Victor Long Nickel Complex Part of Lot 13 on Plan 48932 (within coordinates 373,122.20 E 6,550,741.97 N, 374,292.19 E 6,550,741.96 N, 374,292.17 E 6,550,541.97 N, 374,648.19 E 6,550,541.97 N, 374,847.28 E 6,550,455.91 N, 374,949.83 E 6,549,577.97 N, 374,310.18 E 6,549,569.96 N, 373,422.20 E 6,550,151.96 N and 373,083.18 E 6,550,151.96 N) and mining tenements M15/1761, M15/1762 and M15/17632 COOLGARDIE WA 6442
Date of Amendment	21 August 2018

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Date signed: 21 August 2018

Tim Gentle

Manager, Resource Industries

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

Definitions and interpretation

Definitions

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

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Amendment Notice	refers to this document
BOM	Bureau of Meteorology
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 *Environmental Protection Act 1986* Locked Bag 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DMIRS	Department of Mines, Industry Regulation and Safety
DPIRD	Department of Primary Industries and Regional Development (Agriculture and Food)
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this

	Review
Landfill Definitions	Landfill Waste Classification and Definitions 1996 (As amended December 2009)
Licence Holder	Independence Long Pty Ltd
m^3	cubic metres
mbgl	metres below ground level
Minister	the Minister responsible for the EP Act and associated regulations
Noise Regulations	Environmental Protection (Noise) Regulations 1997 (WA)
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

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence 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.

This notice is limited only to an amendment application to add landfilling activities (Categories 63 and 64) and changes to existing Category 6 – Mine dewatering. No changes to the aspects of the original Licence relating to Category 61(A) – Solid Waste facility have been requested by the Licence Holder. Other administrative amendments have also been requested.

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

- *Guidance Statement: Setting Conditions* (October 2015)
- *Guidance Statement: Decision Making* (February 2017)
- *Guidance Statement: Risk Assessment* (February 2017)
- *Guidance Statement: Environmental Siting* (November 2016)

Amendment description

On 27 November 2017, Independence Long Pty Ltd (Licence Holder) submitted an application for an amendment to the Long Victor Nickel Complex Licence (L8575/2011/1). The Licence Holder has advised that mining at the Long Operation mine will be suspended in June 2018 and the site placed in care and maintenance. The amendment application relates to the inclusion of categories 63 and 64 for the construction of two landfills (a Class I landfill and a Class II landfill) to facilitate eventual mine closure.

The Licence Holder has also requested a number of amendments to licence conditions relating to mine dewatering (described below) as a result of mine closure.

Landfilling proposal

This amendment notice includes conditions authorising the establishment and operation of two landfills. Table 2 lists the additional prescribed premises categories that have been applied for.

Table 2: Prescribed Premises categories

Classification of Premises	Description	Premises production, design capacity or throughput
Category 63	Class I inert 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.	Landfill 1: 27,000 tonnes Landfill 2: 6,000 tonnes
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.	Landfill 2: 5,000 tonnes

Landfill 1 will receive both Class I and Class II waste as described in the Landfill Definitions. Waste will be deposited into two existing water storage dams (Long Dam east and west) which will form two individual “cells”. The dams have been previously compacted and clay lined. Waste will be deposited into the dams and stacked to 3m (equates to the height of the dam) prior to encapsulation with an additional 1m capping material. Approximately 32,000 tonnes of will be disposed of in this landfill in total.

The eastern dam is currently unused and will receive waste first. The west dam will continue to be used during care and maintenance for the storage and evaporation of water from the Long South fan, which captures water vapour from the vent from underground. This is required intermittently for small volumes of water when inspection of the underground mine is required. Disposal of waste into the west dam will not occur until the fan is no longer operational.

Landfill 2 will only receive Class I waste and will be constructed in an already cleared area bounded by existing waste rock dumps on three sides. The area will be divided into 5 sections that will be lined with rock windrows to create above ground cells for waste burial. Approximately 6,000 tonnes of inert waste (Inert Waste Type 1) is proposed to be deposited into the landfill. Waste will be stacked from ground level to 3m high prior to being covered beneath 1m of capping material.

Waste will consist of light and medium industrial wastes following demolition of buildings and workshop structures. The applicant also intends to dispose of hydrocarbon contaminated soil from potential dredging of dewatering dams and remediation of spills around the site. Waste types and quantities to be received at each landfill are summarised in Table 3. Putrescible waste is not proposed to be disposed of at the landfills.

Table 3. Waste types and quantities to be deposited in the proposed landfills

Landfill	**Waste Type[1]**	**Quantity of waste to be buried (tonnes)[2]**
Landfill 1	Inert Waste Type 1	20,000
	Inert Waste Type 2	5,000
	Contaminated solid waste (Class II)	5,000
	Special Waste Type 1 (asbestos)	2,000
Landfill 2	Inert Waste Type 1	6,000

Note 1: Refers to the waste types described in the Landfill Definitions

Note 2: Waste quantities is total volume of waste to be deposited into the landfills not annual throughput.

The landfills will operate temporarily to facilitate closure of the mine. The mine was placed into care and maintenance in June 2018. At this stage the date of final closure of the mine is unknown. The Licence Holder will reassess feasibility of reopening the mine every two years.

The Licence Holder intends to use one of the landfills (or both depending on the waste types encountered and requiring disposal) for a short period in 2018 to dispose of industrial waste collected as part of progressive rehabilitation following the site being placed into care and maintenance. The landfill(s) will be partially covered but remain open until cessation of operations.

There is an additional area located adjacent to the Landfill 1 cells which relates to a historical sand plant. The site contain a depression with only the concrete foundations remaining from the sand plant. The location has been used in the past to store sediment from the site (possibly dam sediment), however specific details of what has been disposed of there is not available. The Licence Holder recently completed a preliminary site investigation into potential contamination which identified it as a location for further investigation and, given the proximity to the proposed landfill, the Licence Holder is proposing to classify it as a landfill going forward. While no further waste will be disposed of at this location, the Licence Holder intends to apply the same closure strategy to the adjacent dams so that any potential contamination that may exist is adequately contained. As part of the closure process, further investigation of contamination will be conducted.

Mine dewatering

To maintain safe mining conditions, the Long Operation is dewatered. Dewatering is predominantly recycled underground, with excess being pumped to the Victor Dam and then discharged via a pipeline to Lake Lefroy. Previously, water was transferred via pipeline from Victor Dam to Long Dam, with discharge to Lake Lefroy occurring predominantly from the Long Dam. Discharge from the Long Dam to Lake Lefroy has ceased and the Victor Dam is used as the primary discharge point. The Long Dam (west dam) is still used to receive water from the Long South Fan, although volumes are not sufficient to require discharge to the environment. Long Dam (east) has been decommissioned and does not receive any dewatering water.

Considering that the Long Dam discharge is no longer operational, the Licence Holder has requested that Licence conditions are amended to remove the discharge point (W1) from the Licence. Monitoring requirements relating to W1 were also requested to be removed.

Condition 1.3.5 of the Licence currently requires daily monitoring of dewatering pipelines and containment ponds to identify leaks/spills and confirm freeboard capacity. The Licence Holder contends that daily monitoring requirements are unnecessary given that the Long Dam, and pipeline connection to the Victor Dam, is not operational. The Delegated Officer considers that inspections of pipelines and freeboard on remaining dewatering infrastructure is still necessary to mitigate risk of leaks/spills or overflow from these facilities which remain operational. The Annual Environmental Report (IGO 2017) submitted to DWER indicates that daily monitoring is not currently occurring but rather infrastructure is inspected on a biweekly basis. Further information provided by the Licence Holder indicated that only 100m of pipeline from the point of extraction to discharge was exposed and would pose a risk in the event of a rupture or leak. Condition 1.3.4 currently requires a minimum freeboard on the Victor Dam ponds of 300mm of 1 in 100 yr/72 hour rainfall event (whichever is greater). The Licence Holder also advised that the freeboard on the ponds would be increased beyond the current licence requirements to limit the risk of overtopping. Based on this information, Delegated Officer considers that weekly inspections are appropriate for managing risks associated pipeline leaks and failures

and condition 1.3.5 has been amended accordingly. It should be noted that monitoring of decommissioned pipelines is not required.

The Licence Holder requested further amendments to conditions 3.2.1 and 3.3.1 regarding monitoring of the quality and quantity of water discharged to Lake Lefroy to accommodate reduced operations as the Premises moves into care and maintenance. The Delegated Officer notes dewatering of the underground mine will continue during care and maintenance although may occur on a periodic basis. The Licence Holder has indicated that the volume of water will initially remain unchanged (approximately 300,000kL per annum) and will decrease over time although timeframes for when discharge will decrease or cease are not clear at this stage.

The Delegated Officer has determined that the current conditions regarding water quality sampling under condition 3.2.1 are appropriate for managing risks associated discharge to Lake Lefroy considering the continued requirement to discharge water, and uncertainty of timeframes for decommissioning discharge infrastructure. As such, the frequency of monitoring specified in condition 3.2.1 remains unchanged. It should be noted that conditions will no longer apply once dewatering ceases.

The Delegated Officer has allowed the amendment of condition 3.3.1 regarding monitoring the volume of dewatering water discharged to Lake Lefroy by decreasing the frequency of monitoring from monthly to quarterly. The Delegated Officer determined that altering the frequency of monitoring did not alter the environmental risk as the Licence Holder was still required to meet the limit for discharge specified in condition 2.2.2.

Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 4.

Table 4: Relevant approvals

Legislation	Number	Approval
Mining Act 1978	M15/1761 M15/1762 M15/1763	Some of the mine infrastructure is located on mining tenements that were granted under the *Mining Act 1978*. A Mine Closure Plan has been endorsed by the DMIRS. The proposed landfills are located on private freehold land (Lot 13 on Plan 48932) and are therefore not subject to the requirements of the *Mining Act 1978* although are captured in the Mine Closure Plan.
Rights in Water and Irrigation Act 1914	GWL151344(5)	Groundwater abstraction for the purpose of dewatering is undertaken in accordance with the Groundwater Operating Strategy developed as a requirement of the licence to take water.

Amendment history

Table **5** provides the amendment history for L8575/2011/1.

Table 5: Licence amendments

Instrument	Issued	Amendment

L8575/2011/1	22/10/2015	Increase the throughput for category 61A from 50,000 tonnes per year to 110,000 tonnes per year; and Convert the licence into the latest format available at that time.
L8575/2011/1	21/08/2018	Amendment Notice 1 Add Categories 63 and 64; Remove conditions relating to the W1 dewatering discharge; and Amend conditions relating to dewatering during care and maintenance.

Location and receptors

Table 6 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 6: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Kambalda (Town: residential, schools, etc.)	2.55km south west of the landfills
BHP Nickel West (operational mine)	1km south west of the landfills.

Groundwater and water sources

The distances to groundwater and water sources are shown in Table 7.

Table 7: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Groundwater	Groundwater is hypersaline (>100,000µS/cm) and flows towards Lake Lefroy. Most groundwater flow occurs in partially weathered rock at the base of the weathered profile and in localised fractures in the underlying bedrock. Groundwater is confined beneath a thick sequence of clayey regolith, and although the natural potentiometric surface in these bedrock aquifers may be close to the ground service, the thick sequence of clays limits the extent to which direct groundwater discharge from these aquifers would take place into salt lakes like Lake Lefroy. It is possible that at shallow depth the regolith may consist of highly permeable sands and lateritic gravels which may form an ephemeral perched aquifer after heavy rainfall. Monitoring data at bores shown in Figure 1 indicates that groundwater depth ranges from >10mbgl north and south of the landfills (bores NKCMW10 and KD5105A), to less than 2mbgl east of the landfills (bore KD5253). Data suggests that groundwater in bores that fringe Lake Lefroy (NKCMW9 and KC6013A) is intercepted between 4.3 – 7.2mbgl. A groundwater study for the site showed that groundwater at a bore located ~380m south of Landfill 1 is approximately 23mbgl (GRM 2013).	The Premises is located in the Goldfields Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914.* There are no beneficial uses of groundwater although groundwater drains to Lake Lefroy which supports aquatic communities.
Surface water	Lake Lefroy is located adjacent to the boundary of the Premises and <200m from the proposed landfills.	No domestic/industrial use. Highly saline lake system which is currently receiving dewatering discharge from

		mine operations. Salt lakes support aquatic biota including algae, invertebrates and birds. Fringing vegetation provides habitat for other fauna.

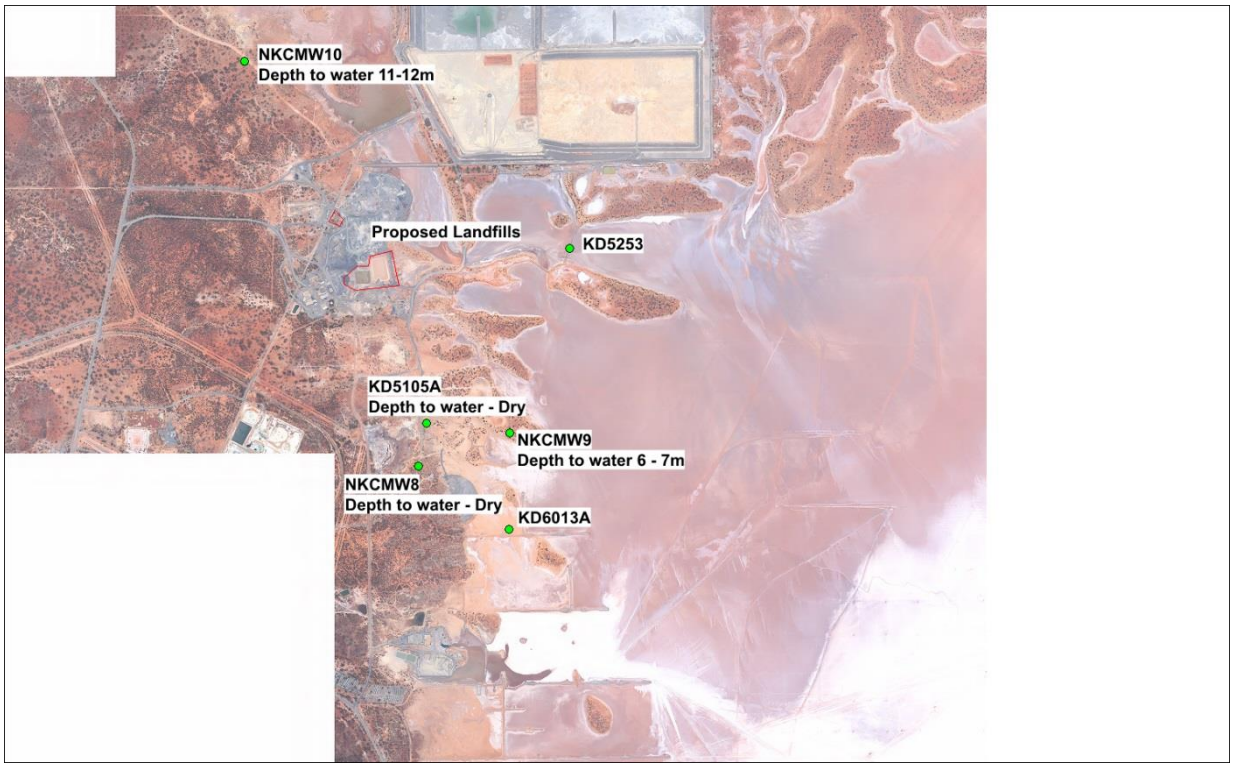


Figure 1. Location of nearby groundwater monitoring bores.

Risk assessment

Table 8 and Table 9 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 8: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 63 Class I inert landfill site **Cat 64** Class II or II putrescible landfill	Construction of landfills	**Dust:** associated with construction activities	No residents or receptors in close proximity. Kambalda located 2.5km south west and BHP operated mine located 1km south west.	**Air:** Particulate matter (fugitive dust)	Health and amenity impacts	Slight	Rare	Low	No clearing is required as the landfills will be located in already disturbed areas of the mine. Emissions will be short term during the short construction period. The closest sensitive receptor is 2.5km away. The Delegated Office considers there is sufficient separation from sensitive receptors and has determined that there is a low risk of dust impacts.
		Noise: associated with construction activities		**Air:** Noise generated through the operation of equipment and earthworks	Health and amenity impacts	Slight	Rare	Low	No receptor present. The closest receptor is 1km away which is an operational mine. The nearest residential receptor is located 2.5km away. The Delegated Office considers there is sufficient separation from sensitive receptors and has determined that there is a low risk of noise impacts.

Table 9: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 63 Class I inert landfill site **Cat 64** Class II or II putrescible landfill	Operation of Class I and II landfill cells	**Dust**: Associated with stockpiled cover material, vehicle movement and covering activities	No residents or receptors in close proximity. Kambalda located 2.5km south west and BHP operated mine located 1km south west.	**Air:** Particulate matter (dust)	Health and amenity impacts	Slight	Rare	Low	Fugitive dust from landfilling activities Fugitive dust emissions associated with waste burial are expected to be minimal. A water cart will be used to minimise dust emissions. **Note this risk assessment does not include risk from handling and disposal of asbestos-containing materials. Specific conditions for asbestos management applied**
		Noise: Associated with vehicular movement and covering activities	No residents or receptors in close proximity. Kambalda located 2.5km south west and BHP operated mine located 1km south west.	**Air:** Noise generated through the operation of equipment	Health and amenity impacts	Slight	Rare	Low	The closest receptor is 1km away which is an operational mine. The nearest residential receptor is located 2.5km away. The Delegated Office considers there is sufficient separation from sensitive receptors and has determined that there is a low risk of noise impacts.
		Waste: Windblown waste	No residents or sensitive receptors in close proximity. No priority fauna within 1 km of the landfill	**Air:** Windblown waste and deposition outside of landfill cells	Pollution of the environment with plastics and other windblown materials	Slight	Rare	Low	Waste is dominated by heavier industrial wastes unlikely to be moved by wind. The landfill will be fenced to contain any windblown waste. The Delegated Office considers windblown

									waste can result in minimal on-site impacts and therefore the consequence is Slight. Given the type of waste to be buried and the short life of the landfills, the Delegated Officer has determined that the likelihood of impact is Rare. The overall consequence rating is Low.
		Waste: Contaminated stormwater associated with contact with deposited waste	Surface water systems. Lake Lefroy located directly adjacent to Premises (<200m from the landfill)	**Land and waters:** Contaminated stormwater	Contamination of stormwater potentially impacting on surface water systems	Slight	Rare	Low	Landfill 2 will contain inert waste only and therefore there is no potential for stormwater contamination. Landfill 1 will be situated within existing water storage dams with embankments situated 1-2m above ground acting as stormwater diversion. Records of the waste types and quantities will be recorded to ensure that only acceptable waste types are received at the landfill. Given that controls in place, the Delegated Officer considers that minimal on-site impacts will occur and therefore, the consequence is considered Slight. The Delegated Officer considers that the likelihood of contaminated

									stormwater impacting the environment to be Rare. The overall risk rating is Low.
		Waste: Fire	Surface water systems. Lake Lefroy located directly adjacent to Premises (<200m from the landfill). No residents or receptors in close proximity. Kambalda located 2.5km south west and BHP operated mine located 1km south west.	**Land and waters:** **C**ontaminated fire water and burnt materials **Air:** Smoke	Contamination of soil, surface waters and groundwater. Public health and amenity.	Minor	Rare	Low	Improper storage/burial of tyres can increase the risk of tyre fires which burn for long periods releasing toxic smoke to the atmosphere and can result in soil and groundwater contamination. Part 6 of the *Environmental Protection Regulations 1987* contains requirements for the burial of tyres in batches with soil separation. The licence Holder has committed to complying with legislative requirements. Separation into batches reduces the risk of large persistent fires. Provided these requirements are met, and given the distance to human receptors, the quantity of waste and short term operation of the landfill, the Delegated Officer considers that a tyre fire may have low level on-site impacts with minimal offsite impacts. Therefore, the consequence is considered Minor. The Delegated Officer considers that tyre fire may only occur in

									exceptional circumstances and therefore has determined the likelihood to be Rare. The overall risk rating is Low.
		Waste: Overflow of leachate from the confines of the landfill due to contact of contaminated waste with precipitation	Surface water systems. Lake Lefroy located directly adjacent to Premises (<200m from the landfill).	**Waters**: surface water	Impacts to surface water quality	Slight	Unlikely	Low	Based on advice from DWER's contaminated sites experts the Delegated Officer determined that sufficient quantity of leachate would not be generated to cause the embankments of Landfill 1 to overtop and result in overland flow of leachate impacting Lake Lefroy.
		Waste: Seepage of leachate due to contact of contaminated waste with precipitation	Groundwater	**Waters**: underlying groundwater	Impacts to groundwater or surface water quality	Moderate	Possible	Medium	Refer to "Risk Assessment – Leachate" for detailed risk assessment
		Waste: Seepage of leachate due to contact of contaminated waste via groundwater or surface water intrusion	Surface water systems. Lake Lefroy located directly adjacent to Premises (<200m from the landfill). Groundwater	**Waters**: underlying groundwater	Impacts to groundwater or surface water quality	Moderate	Possible	Medium	Refer to "Risk Assessment – Leachate" for detailed risk assessment

Risk Assessment – Leachate

Description of emission

Landfill 1 will receive 5,000 tonnes of Class II contaminated solid which is considered the main source for potential leachate. Inert waste placed in Landfill 1 and Landfill 2 will is considered to have a lower potential for contamination via leachate. The third area, the historical sand plant site, will not receive additional waste but will be captured under the same closure program.

Leachate is produced when moisture enters waste materials in a landfill and extracts contaminants into the liquid phase. Sources of moisture include:

- liquid present in the waste at placement;
- rainfall captured in the landfill at placement;
- rainfall entering the landfill via overland flow;
- rainfall infiltrating after cover has been applied; and
- intrusion of groundwater from outside into the landfill.

A water balance assessment undertaken by DWER's contaminated sites estimated that under normal rainfall conditions low levels of leachate were expected but some leachate infiltration was possible after a high-rainfall event.

Description of potential adverse impact from the emission

Improper containment of landfill leachate can result in direct contamination of local soils. Leachate may also seep from the landfill infiltrating groundwater and resulting in contamination. Contaminants can also potentially migrate towards Lake Lefroy via a shallow perched aquifer that develops after heavy rainfall.

Lake Lefroy is an ephemeral system that fill episodically in response to heavy rainfall. Due to the close proximity of the landfills to Lake Lefroy (Landfill 1 is approximately 350m to the lake edge), there is a risk that during these periods of inundation, surface water may approach the landfill due to flooding or prevailing winds and contribute to the generation of leachate via surface water flow and groundwater intrusion.

Lake Lefroy is a highly saline system currently receiving mine dewatering water from a number of operations. Salt lake systems in the Goldfields support aquatic biota including algae, invertebrates and water birds which can be adversely affected by contamination (Outback Ecology, 2009).

Criteria for assessment

ANZECC and ARMCANZ, 2000 provide recommended trigger values for freshwater quality. Ecological and human health assessment levels for soil and water are described in the *Contaminated sites guidelines: Assessment and management of contaminated sites* (DER 2014).

Licence Holder controls

Landfill 1

Landfill 1 will be situated within two existing water storage dams. During operation, stormwater at Landfill 1 will be managed via the existing pond embankments as they sit approximately 1-2m above ground level and act to divert stormwater and prevent infiltration.

Although the dams were compacted and clay lined at construction, the permeability and integrity of the liners is unknown. While it may provide some protection from intrusion of ground and surface waters, and subsequent seepage of leachate, the level of protection is not certain.

The Landfill will be capped with at least 1m of material upon completion of waste burial which will provide some management of stormwater infiltration post-closure however, this may not prevent the infiltration of groundwater following heavy rainfall events.

The interim closure strategy is detailed in the Mine Closure Plan and will be refined as closure approaches. The final closure plan will be submitted to DMIRS for approval.

The landfill is required to facilitate mine closure and is only intended to be operated for a short period of time.

Landfill 2

Landfill 2 is bounded by waste rock dumps on three sides which will assist with the diversion of stormwater away from the landfill. The road on the western side will also prevent stormwater ingress.

General

Additional controls in place to manage potential leachate include:

- No putrescible waste will be buried at the landfill. Landfills will primarily receive inert waste types; and
- Records of the waste types and quantities will be recorded to ensure correct material is disposed of at the landfill.

Consequence

Groundwater and surface water in the area is highly saline with no domestic or industrial use however the lake system does support aquatic communities including algae, invertebrates and migratory birds during periods of inundation. The primary risk is associated with Class II contaminated soil to be deposited into Landfill 1 impacting Lake Lefroy due to its close proximity to the edge of the lake. The Delegated Officer considers the consequence to be **Moderate**.

Likelihood of Risk Event

The Application was referred to DWER's contaminated sites experts who undertook a water balance assessment to estimate the volume of leachate expected. Based on rainfall data and pan evaporation rates sourced from BOM and DPIRD, it was estimated that under normal rainfall conditions, the likelihood of leachate generation was low. It should be noted that the assessment assumed a 1m waste cover of clayey-loam material and that without the waste cover, some infiltration of rainfall into

the waste, and subsequent leachate generation, was possible. The likelihood of leachate generation increased if the site experienced a series of wet months, although these events were considered rare due to the semi-arid climate conditions present in the region.

DWER technical specialists also noted uncertainties regarding material underlying the landfill indicating that the presence of shallow lateritic gravels and sands is likely to result in the formation of a perched aquifer following rainfall events and facilitate flow of groundwater into the landfill (increasing potential leachate generation) and enhance movement of leachate towards Lake Lefroy. The Delegated Officer notes that expert advice indicates that the construction of cut-off drains up-gradient of the landfills may reduce the likelihood of groundwater infiltration via a perched aquifer, however, to remain effective, cut-off drains would need to be maintained in perpetuity following closure of the landfills and this is not considered to be operationally practical.

Landfill 1 is proposed to be located adjacent to the boundary of Lake Lefroy. Lake Lefroy is subject to inundation during periods of heavy rainfall. In such instances the banks of the lake have potential to flood. Given that the permeability of the liner of the landfill is not confirmed, the Delegated Officer considers that, in the event of inundation Lake Lefroy, there is a risk that surface waters may infiltrate into the landfill.

Given that waste will remain in the landfill long term following post closure, the Delegated Officer considers that any of the above events are likely to occur at some stage during operation or post closure resulting in leachate impacting Lake Lefroy. Therefore, the Delegated Officer has determined the overall likelihood to be **Possible**.

Overall rating of leachate

The Delegated Officer considers that the overall risk of leachate is **Medium**.

Decision

Landfills

The Delegated Officer considers that the key risks associated with the construction and operation of the two proposed landfills relate to asbestos dust and contamination associated with surface water and leachate. In accordance with DWER's *Guidance Statement: Risk Assessment* (DER 2017) the Licensee's controls in relation to the management of asbestos waste, stormwater contamination and leachate will be conditioned as they lower the assessed risk (Conditions 1.3.12 – 1.3.15 and condition 3.4.1).

The Delegated Officer has determined that additional requirements for the burial of asbestos, including covering of waste, are required to reduce the potential risk associated with airborne asbestos fibres. These are detailed in Conditions 1.3.13 and 1.3.14.

Specifications for the burial of Inert Waste Type 2 (tyres) to prevent fire such as batching and separation distances are captured under the *Environmental Protection Regulations 1987* and are therefore not conditioned in the licence.

Condition 1.3.14 has been included on the licence specifying requirements for waste covering.

Although minimal construction is required for the operation of the landfills, the Licence

Holder controls are conditioned on the Licence to ensure that pollution controls such as stormwater diversion systems are implemented as committed (Condition 1.3.8).

The Delegated Office does not consider that controls proposed by the Licence Holder for the disposal of Class II contaminated waste into Landfill 1 are sufficient for mitigating risks associated with leachate. The Licence Holder has indicated that waste can be removed from site and disposed of to another local licensed facility if required. To ensure that leachate does not impact Lake Lefroy, the licence does not allow the receipt and disposal of Class II contaminated waste.

Noting that the Long Dam (west) will continue to be used for water storage, the condition also requires that the dam is empty of water prior to the disposal of waste to minimise leachate. On completion of construction, and prior to the operation of each landfill, a compliance document confirming that works are completed is required to be submitted (Conditions 1.3.9 and 1.3.10).

Dewatering

The Licence has been amended to remove reference to the Long Dam discharge point W1 from Conditions 2.2.1, 2.2.2, 3.2.1 and 3.3.1 as it is no longer operational. Noting that the Long Dam (west) continues to be used for water storage associated with the Long South Fan, Condition 1.3.3, which specifies containment infrastructure, remains unchanged.

The Delegated Officer has determined that the current conditions relating to water quality sampling are appropriate for managing risks associated with discharge to Lake Lefroy considering the continued requirement to discharge water from the Victor Dam, and uncertainty of timeframes for decommissioning discharge infrastructure. As such, the conditions regarding water quality sampling remain unchanged.

The Delegated Officer has considered further information provided by the Licence Holder regarding the requirement to visually inspect pipelines and dewatering containment ponds and considers that weekly inspections are appropriate for managing risks associated pipeline leaks and failures. Condition 1.3.5 has been amended accordingly. It should be noted that the conditions will no longer apply once discharge to Lake Lefroy ceases.

The requirement to monitoring volume of dewatering discharge has been amended from monthly to quarterly. Cumulative volumes will still need to meet the limit specified in condition 2.2.2 and be reported in the Annual Environmental Report.

Conditions 4.1.1 and 4.1.2 have been removed as the improvements requirements have been completed.

The Delegated Officer has considered DER's *Guidance Statement: Regulatory Principles* (DER 2015a), *Guidance Statement: Setting Conditions* (DER2015b) and *Guidance Statement: Risk Assessment* (DER 2017) in granting this amendment, and does not consider that this amendment will impact the risk profile of the premises, which is currently considered Low.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 7 August 2018. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. Definitions of the Licence is amended by the insertion of the red text shown in underline below:

'asbestos fibres' *has the meaning defined in the Guidelines for Assessment, Remediation and Management of Asbestos Contaminated Sites, Western Australia, (DOH, 2009);*

'Inert Waste Type 1' *has the meaning defined in Landfill Definitions;*

'Inert Waste Type 2' *has the meaning defined in Landfill Definitions;*

'Landfill 1' *means the area defined as "Landfill 1" in Schedule 1: Map of Landfill Areas and approved for the burial of waste;*

'Landfill 2' *means the area defined as "Landfill 2" in Schedule 1: Map of Landfill Areas and approved for the burial of waste;*

'Landfill Definitions' *means the document titled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer of the Department of Water and Environmental Regulation as amended from time to time;*

'Special Waste Type 1' *has the meaning defined in Landfill Definitions;*

2. The Licence is amended by the insertion of the following Conditions 1.3.8 to 1.3.17:

1.3.8 The Licence Holder shall carry out the Works within the Premises in accordance with the requirements set out in Table 1.3.4 below.

Table 1.3.4: Works specifications		
Item	***Works***	***Specifications***
1	*Construction of a Class II landfill (Landfill 1)*	*To be located within the area shown in Schedule 1: Map of Landfill Areas.* *Has appropriate stormwater diversion levees around the landfill designed to prevent any stormwater from entering the landfill from the outside.* *2 existing water storage dams which are compacted and clay lined and which shall be empty of water prior to deposition of waste*
2	*Construction of an above ground Class I landfill (Landfill 2)*	*To be located within the area shown in Schedule 1: Map of Landfill Areas.* *Divided into 5 waste disposal sections via rock windrows.* *Has appropriate stormwater diversion levees around the landfill designed to prevent any*

		stormwater from entering the landfill from the outside.

1.3.9 Subject to Condition 1.3.8, on completion of the works and prior to operation of the landfills, the Licence Holder must provide to the CEO with written confirmation (including photographic evidence) that works have been completed as specified in Table 1.3.4.

1.3.10 The compliance document specified in Condition 1.3.9 must be signed by a person authorised to represent the Licence Holder and contain the printed name and position of that person within the authorised.

1.3.11 The Licensee shall only dispose of waste into Landfill 1 and Landfill 2:

a) if it has been generated from within the Premises
b) it is of a type listed in Table 1.3.5;
c) the quantity accepted is below any quantity limit listed in Table 1.3.5; and
d) it meets any specification listed in Table 1.3.5.

Table 1.3.5: Landfill waste disposal

Waste type	***Quantity limit (tonnes)***	***Specification***
Inert Waste Type 1	*26,000*	*None specified.*
Inert Waste Type 2	*5,000*	*None specified*
Special Waste Type 1	*2,000*	*None specified*

1.3.12 The Licensee shall ensure that where waste does not comply with condition it is removed from the Premises, where that is not possible, stored in a segregated storage area or container and removed to an appropriately authorised facility as soon as practicable.

1.3.13 The Licensee shall ensure that wastes deposited into Landfill 1 and Landfill 2 are only subjected to the process(es) set out in Table 1.3.6 and in accordance with any process limits described in that Table.

Table 1.3.6: Waste processing

Waste type[1]	***Process(es)***	***Process limits[2,3]***
Inert Waste Type 1	*Receipt, handling and disposal of waste by landfilling*	*Disposal of waste by landfilling shall only take place within Landfill 1 and Landfill 2 shown on the Map of Landfill Areas in Schedule 1.* *Disposal of waste shall not exceed 20,000 tonnes in total at Landfill 1 and 6,000 tonnes in total at Landfill 2.*
Inert Waste Type 2	*Receipt, handling and disposal of waste by landfilling*	*Disposal of shall only occur within the Landfill 1 identified on the Map of Landfill Areas in Schedule 1.*

Table 1.3.6: Waste processing		
Waste type[1]	**Process(es)**	**Process limits[2,3]**
Special Waste Type 1	*Receipt, handling and disposal of waste by landfilling*	*Disposal of shall only occur within the Landfill 1 identified on the Map of Landfill Areas in Schedule 1.* *Must be separated from other material for disposal where that is reasonably practical.* *Must be wrapped or otherwise contained in a manner that prevents asbestos fibres entering the atmosphere.* *Must be labelled or marked with the words "CAUTION ASBESTOS" in letters not less than 50 mm high* *All locations used for the disposal of Special Waste Type 1 must be recorded as grid references on a premises plan and kept as a permanent record* *Shall not to be disposed within 2m of the final tipping surface of the landfill.* *No works shall be carried out on the landfill that could lead to a release of asbestos fibres.*

Note 1: Defined in the Landfill Definitions.
Note 2: Requirements for landfilling tyres are set out in Part 6 of the Environmental Protection Regulations 1987.

1.3.14 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.3.7 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.3.7: Cover requirements[1]			
Waste Type	**Material**	**Depth**	**Timescales**
Inert Waste Type 1	*Soil*	*At least 1,000mm*	*Within 6 months of achieving final waste contours.*
Inert Waste Type 2			
Contaminated solid waste			
Special Waste Type 1	*Soil*	*300mm*	*As soon as practical following disposal in the landfill but not later than the end of the working day after disposal and before compaction to prevent the release of asbestos fibres as a result of compaction and other landfilling activities.*

		At least 1,000 mm	*Within 6 months of achieving final waste contours.*

Note 1: Additional requirements for the covering of tyres are set out in Part 6 of the Environmental Protection Regulations 1987.

1.3.15 The Licensee shall manage the landfilling activities to ensure:

a) that the tipping height shall not exceed 3 metres in vertical height; and

b) waste is placed and compacted to ensure all faces are stable and capable of retaining rehabilitation material.

3. The Licence is amended by the insertion of the following Condition 3.4

3.4 Monitoring of inputs and outputs

3.4.1 The Licensee shall undertake the monitoring specified in Table 3.4.1 according to the specifications in that table.

Table 3.4.1: Monitoring of inputs and outputs				
Input/ Output	***Parameter***	***Units***	***Averaging Period***	***Frequency***
Waste Inputs	*Inert Waste Type 1, Inert Waste Type 2 and Special Waste Type 1*	*tonnes or (where no weighbridge is present) m^3*	*N/A*	*Each load arriving at the landfill*

4. Conditions 1.3.5, 2.2.1, 2.2.2, 3.2.1, 3.3.1 and 5.2.1 of the Licence are amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

1.3.5 The Licensee shall:

(a) undertake inspections as detailed in Table 1.3.2;

(b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and

(c) maintain a record of all inspections undertaken.

Table 1.3.2: Inspection of infrastructure		
Scope of inspection	***Type of inspection***	***Frequency of inspection***
Dewatering pipelines	*Visual integrity*	*~~Daily~~ Weekly*
Embankment freeboard of containment ponds	*Visual to confirm required freeboard capacity is available*	*~~Daily~~ Weekly*

2.2.1 The Licensee shall ensure that where waste is emitted to surface water from the emission points in Table 2.2.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emission points to surface water			
Emission point reference	***Emission point reference on Map of emission points***	***Description***	***Source including abatement***

~~*Lake Lefroy discharge point – Long dam*~~	~~*W1*~~	*Mine dewater discharge from underground workings to Lake Lefroy*	*Mine dewater from underground workings to Lake Lefroy. Abatement includes settlement dams to reduce sediment loading, erosion and scouring impacts. The settling dams must be maintained to ensure sufficient retention time to maximise the removal of suspended solids prior to discharge to Lake Lefroy.*
Lake Lefroy discharge point – Victor dam	*W2*		
Lake Lefroy discharge point – Victor Fan	*W3*	*Water vapour from underground discharged to Lake Lefroy*	*The water vapour is directed into the shroud where it condenses out of the air and it is then collected within the trench and gravity fed through a flow meter onto Lake Lefroy.*

2.2.2 The Licensee shall not cause or allow point source emissions to surface water greater than the limits listed in Table 2.3.2.

Table 2.2.2: Point source emission limits to surface water			
Emission point reference	***Parameter***	***Limit (including units)***	***Averaging period***
~~*W1,*~~ *W2 and W3*	*Volume*	*600 000 kL per year*	*Annually*

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of point source emissions to surface water				
Monitoring point reference and location	***Parameter***	***Units***	***Averaging period***	***Frequency***
~~*W1*~~ *W2* *W3*	*pH*[1]	*-*	*Spot sample*	*Six monthly*
	Total dissolved solids	*mg/L*		
	Total suspended solids			
	Metals: cadmium, selenium, iron, cobalt, lead, copper, nickel, zinc, arsenic and chromium			
	Major anions and cations: sodium, potassium, calcium, magnesium, chlorine, bicarbonate and sulfate			
	Total recoverable hydrocarbons			

Note 1: In-field non-NATA accredited analysis permitted.

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

Table 3.3.1: Process monitoring					
Monitoring point reference	***Process description***	***Parameter***	***Units***	***Frequency***	***Averaging period***
~~*W1,*~~ *W2 and W3*	*Volumetric flow*	*Discharge*	*kL*	*Continuous*	~~*Monthly*~~

	rate (cumulative)	*volume*			*Quarterly*

5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report by 31 August each year. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: Annual Environmental Report		
Condition or table (if relevant)	***Parameter***	***Format or form[1]***
-	*Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken*	*None specified*
1.3.3	*Quantity of tailings accepted onto the Premises*	*None specified*
1.3.7	*Dewatering discharge report*	*None specified*
Table 3.2.1	*Monitoring of point source emissions to surface water*	*None specified*
Table 3.3.1	*Process monitoring*	*None specified*
Table 3.4.1	*Monitoring inputs and outputs*	*None specified*
5.1.3	*Compliance*	*Annual Audit Compliance Report (AACR)*
5.1.4	*Complaints summary*	*None specified*

~~*Note 1: Forms are in Schedule 2*~~

5. The Licence is amended by the deletion of the following Conditions 4.1.1 and 4.1.2:

~~*4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.*~~

~~*4.1.2 The Licensee, for improvements not specifically requiring a written submission, shall write to the CEO stating whether and how the Licensee is compliant with the improvement within one week of the completion date specified in Table 4.1.1.*~~

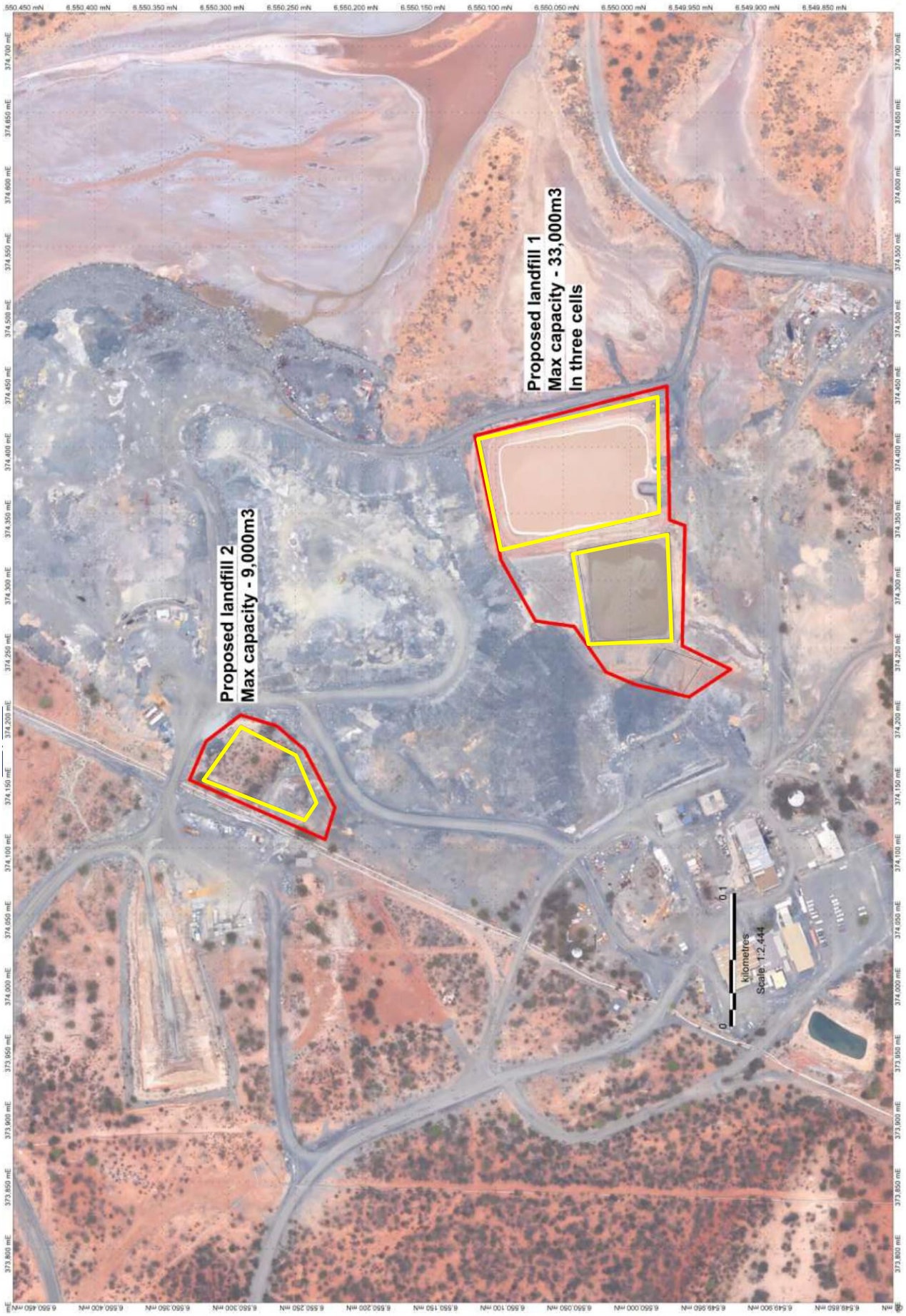
~~***Table 4.1.1: Improvement program***~~		
~~***Improvement reference***~~	~~***Improvement***~~	~~***Date of completion***~~
~~*IR1*~~	~~*The Licensee shall construct and install infrastructure at the South Fan to ensure no hypersaline water or mist is discharged into the environment. Any discharge that occurs from the operation of the fan must be captured and directed to an approved discharge point.*~~	~~*29 February 2016*~~

6. Schedule 1 of the Licence is amended by the insertion of the following Map of Landfill Areas:

Map of Landfill Areas

The location of the landfill areas defined in Tables 1.3.4 and 1.3.6 are shown below in yellow outline.

7. Schedule 1 of the Licence is amended by the insertion of the following Map of Landfill Areas:


Proposed landfill 1
Max capacity - 33,000m3
In three cells
Proposed landfill 2
Max capacity - 9,000m3
0
0.1
kilometres
Scale 1:2,444

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	ANZECC and ARMCANZ (2000), *Australian Water Quality Criteria Guidelines for Fresh and Marine Water Quality*, National Water Quality Management Strategy	ANZECC/ ARMCANZ 2000	accessed at www.environment.gov.au
2.	Application Form (Amendment): L8575/2011/1 – Independence Long Pty Ltd	Independence Long 2017a	DWER records
3.	IGO Long Operation – Application to Amend Environmental Licence Request for Further Information, Independence Long Pty Ltd, 11 December 2017	Independence Long 2017b	DWER records
4.	Email from Chris Tiemann (IGO) dated 2 March 2018 entitled RE: Applicant to amend Licence L8575/2011/1 - Request for clarification	Independence Long 2018a	DWER records
5.	Email from Chris Tiemann (IGO) dated 11 June 2018 entitled RE: {EXTERNAL}-APPLICANT NOTIFICATION - L8575/2011/1 - NOTICE OF PROPOSED AMENDMENT TO LICENCE	Independence Long 2018b	DWER records A1690648
6.	Email from Chris Tiemann (IGO) dated 12 June 2018 entitled RE: {EXTERNAL}-APPLICANT NOTIFICATION - L8575/2011/1 - NOTICE OF PROPOSED AMENDMENT TO LICENCE	Independence Long 2018c	DWER records A1690904
7.	Email from Chris Tiemann (IGO) dated 8 August 2018 entitled RE: {EXTERNAL}-APPLICANT NOTIFICATION - L8575/2011/1 - NOTICE OF PROPOSED AMENDMENT TO LICENCE	Independence Long 2018d	DWER records A1710433
8.	Bureau of Meteorology, 2017. Monthly Rainfall (Kambalda West)	BOM 2017	http://www.bom.gov.au/climate/data/index.shtml
9.	Department of Environment and Conservation, 1996. *Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009)*	DEC 1996	accessed at www.dwer.wa.gov.au

10.	DER, December 2014. *Contaminated Sites guidelines: Assessment and management of contaminated sites*, Department of Environmental Regulation, Perth	DER 2014	
11.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	
12.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
13.	DER, November 2016. *Guidance Statement: Environmental Siting*. Department of Environment Regulation, Perth	DER 2016	
14.	DER, February 2017. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2017	
15.	Department of Health, 2009. *Guidelines for Assessment, Remediation and Management of Asbestos Contaminated Sites*	DoH 2009	accessed at www.health.wa.gov.au
16.	Groundwater Resource Management, 2013. *Desktop study and site visit – Victor Long Complex Project*	GRM 2013	DWER records
17.	Licence L8575/2011/1 – Long Victor Nickol Complex	L8575/2011/1	accessed at www.dwer.wa.gov.au
18.	Outback Ecology, 2009. *Development of a Framework for Assessing the Cumulative Impacts of Dewatering Discharge to Salt Lakes in the Goldfields of WA*. Department of Water, Perth	Outback Ecology 2009	Accessed at https://www.water.wa.gov.au/__data/assets/pdf_file/0019/5149/102743.pdf

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 7 August 2018 for review and comment. The Licence Holder responded on 8 August 2018. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
1.3.5	The Licence Holder requested that the frequency of visual inspections required for dewatering pipelines and freeboard of dewatering ponds be amended from daily to weekly. The Licence Holder has advised that there is only approximately 100m of pipeline exposed between the point of dewatering and discharge into the Victor Dams that would present a risk to the environment in the event of a rupture. Condition 1.3.4 currently requires a minimum freeboard on the Victor Dam ponds of 300mm of 1 in 100 yr/72 hour rainfall event (whichever is greater). The Licence Holder also advised that the freeboard on the ponds would be increased beyond the current licence requirements to limit the risk of overtopping.	The Delegated Officer has considered information provided by the Licence Holder and determined that amending the frequency of monitoring from daily to weekly does not significantly alter the environmental risk.