Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Roy Hill Iron Ore Pty Ltd

Licence: L8621/2011/1

Registered office: 5 Whitham Road
PERTH AIRPORT WA 6105

ACN: 123 722 038

Premises address: Roy Hill Iron Ore Mine
M46/518 and M46/519
NEWMAN WA 6753

Issue date: Thursday, 22 March 2012

Commencement date: Monday, 26 March 2012

Expiry date: Saturday, 25 March 2034

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations.

Decision Document prepared by: Paul Anderson
Licensing Officer

Decision Document authorised by: Alana Kidd
Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	5	65,000,000 tonnes per annual period
	6	378,000 tonnes per annual period
	12	6,570,000 tonnes per annual period
	54	593 cubic metres per day
	57	No more than 5,000 tyres
	64	8,000 tonnes per annual period
	73	5,530 cubic metres in aggregate
Application verified Application fee paid	Date: N/A Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes☒ No☐ N/A☐ Yes☒ No☐ N/A☐	
Commercial-in-confidence claim	Yes☐ No☒	

Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes☒ No☐	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☒ No☐	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☒
Is the proposal subject to Ministerial Conditions?	Yes☒ No☐	Ministerial statement No: 824, 829, 902, 979 and 980 EPA Report No: 1342, 1345, 1439, 1519 and 1520
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

Roy Hill Iron Ore Pty Ltd (the Licensee) operates the Roy Hill Iron Ore Mine (Roy Hill), which is located approximately 280 kilometres (km) south of Port Hedland and 110 km north of Newman in the Pilbara region of Western Australia. Roy Hill sits wholly within the Roy Hill Pastoral Station, which is currently used for low intensity cattle grazing. Other nearby land uses include mineral exploration and mining. The nearest residence is Roy Hill Station homestead located approximately 6.5 km south of the southern recharge basin and the Chichester Metals Pty Ltd's Christmas Creek mining operation located approximately 20 km to the north-west of the Licensee's mining leases.

Roy Hill currently includes the operation of:

- Dewatering with excess water discharged to the northern and southern recharge basins;
- Bulk fuel storage and handling facility (Bulk Fuel Facility);
- Accommodation Village WWTP capable of treating 510 cubic metres per day (m^3/day);
- Mine Services Area (MSA) WWTP capable of treating 48 m^3/day;
- Putrescible landfill;
- Used tyre storage area; and
- Crushing and screening facilities to aid the construction of mine infrastructure including the Accommodation Village, internal roads, airport runway and railway (via the provision of ballast).

The Licensee has applied to amend the licence to include category 5 for the operation of the ore processing plant (Process Plant) and tailings storage facility (TSF) constructed under Works Approval W5067/2011/1, operation of the Process Plant Wastewater Treatment Plant (WWTP) constructed under W5732/2014/1, operation of the northern and southern recharge basins and construction of a new Class II landfill (Landfill 2).

The Process Plant is designed to process up to 65 million tonnes of run of mine (ROM) ore to produce 55 million tonnes (wet) of iron ore product. The Process Plant includes a desanding plant with rejects discharged to the TSF. The TSF is located approximately 3km south west of the Process Plant and is an above ground facility. Approximately 12.7 million tonnes of tailings will be produced each year. The TSF is also referred to as the 'Waste Fines Storage Facility' in other decision making authority approvals.

The WWTP will service ablutions, cribs, office buildings and laboratory. The WWTP has a design capacity for the daily treatment and disposal of 35 m^3/day of effluent. Treated wastewater is irrigated to a 15,000 square metre (m^2) spray field.

The Licensee submitted compliance documentation for W5067/2011/1 following each phase of construction of the Process Plant and TSF and is detailed below:

- Phase 1 - Conveyors and train load-out. Received 1 October 2015.
- Phase 2 - Crushing Station 1. Received 5 October 2015.
- Phase 3 - COS vault, scrubber, tertiary crusher, dry screen, desands thickener, laboratory, tailings pipeline, TSF and stockyard. Received 27 November 2015.
- Phase 4 - Reclaimer, conveyor and transfer station. Received 11 November 2015.
- Phase 5 - Outstanding Process Plant infrastructure. Received 9 December 2015.

The commissioning report required by condition 3.1.1 of Works Approval W5067/2011/1 was received on 8 April 2016.

The compliance and commissioning documentation for W5732/2014/1 for construction of the WWTP was received on 28 July 2015 and 20 April 2016 respectively.

A compliance report was received on the 31 May 2015 for the construction of the Northern Recharge Basin.

The Licensee is proposing to construct an additional landfill site at the Roy Hill Iron Ore Mine. The existing Class II landfill is estimated to reach total capacity by the end of 2016. Therefore the proposed Landfill 2 is required to allow the disposal of waste at the Mine. The Landfill 2 will be located 5.9km northwest of the existing landfill site with a total capacity of 3,000 tonnes per annum (tpa) within a total disturbance area of 15.5ha

Justification is provided in Section 4 where conditions have been added, removed or altered as part of this Licence amendment.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
N/A	N/A	Numbering of the conditions in the Licence have been updated to reflect any changes made to conditions of the Licence through this amendment.	N/A
Licence	N/A	The design capacity for Category 6 on the Licence has been amended by removing the voumes of dewatering effluent discharged to No Name Creek via the southern and northern discharge basins. Approval from the Environmental Protection Authority (EPA) for the discharge of dewatering effluent to No Name Creek via the southern and northern discharge locations has expired. The Licensee is applying to the EPA for new approval. Following the decision made by the EPA, DER may reinstate approval to discharge dewatering effluent to No Name Creek through the licence amendment process.	N/A
Definitions	N/A	Various definitions have been removed where no longer relevant to the amended Licence, or added where necessary to account for current operations and Licence conditions.	N/A
General Conditions	1.15 L1.2.1 to L1.2.4	Previous condition 1.1.5 has been removed from the Licence. *1.1.5 Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the Licence, where the emission amounts to:* *(a) pollution;* *(b) unreasonable emission;* *(c) discharge of waste in circumstances likely to cause pollution; or*	General provisions of the *Environmental Protection Act 1986.* *Environmental*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		(d) being contrary to any written law. This provision is not a condition. It is an explanatory statement that provided clarification of the operation of a licence. Previous condition 1.2.1 has been removed from the Licence. *1.2.1 The Licensee shall operate and maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant and effective internal management system.* This condition is not clear or certain in the Licence for what type of pollution control and monitoring equipment is required to be operated and maintained, and what maintenance schedule is to be followed. Previous condition L1.2.2 has been removed from the Licence to avoid duplication with other legislation. *1.2.2 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.* The general provisions of the *Environmental Protection Act 1986* with respect to the causing of pollution and environmental harm apply, as does subsidiary legislation including the *Environmental Protection (Unauthorised Discharges) Regulations 2004*. It is the responsibility of the Licensee to ensure all spills are recovered or removed and disposed of correctly so as to prevent or reduce any further environmental harm or pollution from occurring. Previous condition 1.2.3 has been removed from the Licence.	*Protection (Unauthorised Discharges) Regulations 2004*

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		1.2.3 The Licensee shall: *(a) implement all practical measures to prevent stormwater run-off becoming contaminated by the activities on the Premises; and* *(b) treat contaminated or potentially contaminated stormwater as necessary prior to being discharged from the Premises.*[1] *Note 1: The Environmental Protection (Unauthorised Discharges) Regulations 2004 make it an offence to discharge certain materials into the environment.* This does not specify what stormwater infrastructure is required to be constructed and maintained or what if any specific management actions are required. DER has assessed the risk associated with the discharge of potentially contaminated stormwater from prescribed activities to determine if any further regulatory controls are required. <u>Emission description</u> *Emission:* Discharge of potentially contaminated stormwater from prescribed activities to the environment. *Impact:* Impacts to groundwater and surface water quality; contamination and ecosystem disruption. *Controls:* The following measures have been implemented at the premises: • Stormwater is directed away from landfill; • Stormwater from the ore processing plant is collected by a drainage network, incorporating bunds and sediment traps; • The TSF will have the capacity to temporarily store stormwater from a 1:100 year ARI 72 hour storm event plus freeboard; • The TSF is an above ground facility which diverts stormwater around the facility to prevent contamination; • Sediment basins and sumps will be cleaned out periodically as part of routine	

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		maintenance. Potentially contaminated sediment will be placed into a landfarm on site for bioremediation of any hydrocarbon content. • All hydrocarbon spillage and hydrocarbon contaminated water captured within the various bunded areas within the overall workshop complex will be transferred to a lined storage pond. Water from this pond will be treated through a hydro-cyclone type separator to achieve a maximum total petroleum hydrocarbon content of 5ppm. Treated water will be recycled into two 200,000L water tanks that provide feed to the heavy vehicle wash down bays. This water will be recycled through the vehicle wash down bays; • Oil recovered by the oily water separator will be stored for disposal off site; • Runoff from stockpiles will be diverted into sediment basins; and • Stormwater collected on site and considered not to be at risk from hydrocarbon contamination will be kept separate from natural drainage and passed through settling ponds to reduce sediment loading prior to release off site. Groundwater at the Roy Hill is typically 10 to 25 metres below ground level. Groundwater at this depth is unlikely to be impacted from the infiltration of contaminated stormwater. Results from soil testing at Roy Hill indicate low permeability soils (7.0 x 10-8 m/s to 1.0 x 10-8 m/s for clayey gravel / clay). Kulbee Creek passes through the centre of the mine however stream flow in the mine area is highly ephemeral, and for most of the year the creeks are dry except for occasional pools. There are no wetlands within the mine with the nearest wetland 2 km away. <u>Risk Assessment</u> *Consequence:* Minor	

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Likelihood: Rare *Risk rating:* Low Regulatory Controls: Requirements of Ministerial Statement 824 (MS824) for the management of run-off from the waste rock dump, waste fines storage facilities and evaporation pond. The general provisions of the *Environmental Protection Act 1986* with respect to the causing of pollution and environmental harm apply, as does subsidiary legislation including the *Environmental Protection (Unauthorised Discharges) Regulations 2004*. Due to the low risk, management practices implemented on site and the separate regulatory requirements of MS824, no further regulatory controls are required. Residual Risk: *Consequence:* Minor *Likelihood:* Rare *Risk rating:* Low	
Premises operation	L1.3.1 - L1.3.18	Condition 1.3.2 (Table 1.3.1) has been amended by including a quantity limit for sewage accepted at the mine process plant WWTP which was constructed under Works Approval W5732/2014/1. Condition 1.3.4 (Table 1.3.2) has been amended by including 'Landfill 2' into the waste processing table. Condition 1.3.6 (Table 1.3.3) has been amended by removing 'inert waste type 1' from cover requirements. Inert waste type 1 wastes are generally non-biodegradable and not chemically reactive so do not require specified routine covering. **Operation of the Process Plant** Emission Description	General provisions of the *Environmental Protection Act 1986*. Works Approval W5067/2011/1 Works Approval W5732/2014/1 Operational

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Emission: Dust and noise emissions from ore processing (crushing, screening, ore movement etc.) *Impact:* Reduction in human amenity. Impacts to vegetation by smothering with dust. *Controls:* • Remote location with the nearest sensitive residents being 6.5km away (pastoral station); • Premises is located within a pastoral station which is currently used for low intensity cattle grazing; • Management measures for dust and noise include: - Regular maintenance of equipment; - Moisture conditioning of plant feed; - Visual inspections to ensure dust control is effective; - Chemical suppressants and binders if required; - Water sprays fitted to transfer points including on the stacker boom at the course ore stockpile; - Surge bins, belt feeder and crusher discharge chutes located on secondary and tertiary crushers; - The outside faces of the stockpile will be sprayed with water to form a crust and minimise dust lift off; and - The moisture content of ROM and final product will be continuously monitored through the use of moisture analysers to ensure ore is within appropriate dust extinction levels. <u>Risk Assessment</u> *Consequence:* Insignificant *Likelihood:* Rare *Risk Rating:* Low	Procedure IR-OP-02 – Redundant Conditions (19 May 2016) *Environmental Protection (Noise) Regulation 1997*

<table>
<tr><th colspan="4">DECISION TABLE</th></tr>
<tr><th>Works Approval / Licence section</th><th>Condition number
W = Works Approval
L= Licence</th><th>Justification (including risk description & decision methodology where relevant)</th><th>Reference documents</th></tr>
<tr><td></td><td></td><td>
<u>Regulatory Controls</u>
Fugitive dust emissions can be sufficiently regulated under section 49 of the Environmental Protection Act 1986.

Noise emission can be sufficiently regulated under section 49 of the Environmental Protection Act 1986 and the Environmental Protection (Noise) Regulation 1997.

<u>Residual Risk</u>
Consequence: Insignificant
Likelihood: Rare
Risk Rating: Low

Operation of the TSF
DER’s assessment and decision making are detailed in Appendix A.

Previous condition 1.3.13 has been removed with the construction requirements incorporated into a new condition.

1.3.13 The Licensee shall construct the northern recharge basin and the southern and northern discharge locations to No-Name Creek in accordance with the documentation detailed in Table 1.3.6.

Table 1.3.6: Construction Requirements[1]
<table>
<tr><th>Document</th><th>Parts</th><th>Date of Doc</th></tr>
<tr><td>Roy Hill Mine Operating Licence Amendment – Dewatering, Bulk Fuel, Bioremediation and Exploration Camp WWTP (OP-REP-00178)</td><td>All</td><td>22 February</td></tr>
</table>
Note 1: Where the details and commitments of the documents listed in condition 1.3.13 are inconsistent with any other condition of this Licence, the conditions of this Licence shall prevail.
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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Any reference to the construction requirements for the northern recharge basin has not been carried over because these works have now been completed and a compliance document received. Further details on the operation and monitoring for the southern and northern discharge locations to No Name Creek is explained in section Emissions to surface water. **Construction of Landfill 2** The existing Class II landfill site at the Roy Hill Mine is estimated to reach total capacity by the end of 2016. Therefore the Licensee proposes to construct a new landfill (Landfill 2) to allow the continual disposal of waste at the Premises. The Landfill 2 will be located 5.9km northwest of the existing landfill site. The Landfill 2 will have a total capacity of 3,000 tonnes per annum, which is the same as the existing landfill, with no increase in waste generated at the Premises. Consideration for the location of the new Landfill 2 was based upon environmental risk, ease of access and outside of proposed future mining areas. The risks to the environment are presented in Appendix A as part of the operation of the Landfill. Conditions 1.3.13 to 1.3.17 has been included in the Licence to set out the construction requirements for the new Landfill 2. Dust and noise emissions from earth works during construction of the Landfill 2 are expected however are considered low risk to the environment. There are no receptors considered sensitive within 14 km of the proposed works and a water cart will be used to supress dust. Fugitive dust emissions can be sufficiently regulated under section 49 of the *Environmental Protection Act 1986* and Noise emissions can be sufficiently regulated under section 49 of the *Environmental Protection Act 1986* and the *Environmental Protection (Noise) Regulation 1997*.	

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Operation of Landfill 2 DER's assessment and decision making are detailed in Appendix A. The recording and establishment of limits for process throughputs is already included in the licence through condition L1.3.18 – Production or design capacity limits. This condition has been amended by including limits for category 5 which has been added to the Licence through this amendment.	
Emissions to surface water including monitoring	Previous conditions 2.2.1, 2.2.2 and 3.2.1	Previous conditions 2.2.1, 2.2.2 and 3.2.1, which relate to the discharge of dewatering effluent to the southern and northern discharge locations to No Name Creek, and the monitoring of those emissions, have been removed from the Licence. The Environmental Protection Authority (EPA) granted the Licensee approval for the discharge of dewatering effluent to the southern and northern discharge locations to No Name Creek. The Licensee advised DER that this approval has now expired. The Licensee also advised that they have made an application to the EPA for new approval. As this discharge to the environment was previously subject to Ministerial approval and is now under review by the EPA, DER can not grant approval at this stage to the Licensee to discharge dewatering effluent to the southern and northern discharge locations to No Name Creek. Following the decision made by the EPA, and subject to the outcomes of that decision, DER may reinstate approval to discharge dewatering effluent to the southern and northern discharge locations to No Name Creek through the licence amendment process. Form WR1 for sampling results required through previou condition 3.2.1 has been removed from the Licence	Email from Murali Mahendran, Superintendent Environment and Approvals, Roy Hill, dated 31 October 2016
Emissions to land including	L2.4.1, L2.4.2 and L3.4.1.	**Operation of the Process Plant WWTP**	General provisions of the

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monitoring		The WWTP will receive wastewater from the following: • Crib Room facilities; • Ablutions facilities; • Treated water from an oily water separator with a petroleum hydrocarbon content less than 5ppm, up to 5m3/day; and • Laboratory waste including 20L/day of 10% citric acid • <u>*Emission Description*</u> *Emission:* Wastewater will be discharged from the WWTP to a dedicated spray irrigation field. *Impact:* Contaminates in wastewater may impact surrounding land or groundwater. *Controls:* • The WWTP has a design capacity for the daily treatment and disposal of 35 m^3/day of effluent however is only expected to treat 6.25 m^3/day; • The WWTP was originally designed to irrigate to a 4,500 m^2 spray field which has been increased to a 15,000 m^2 spray field; • Appropriately trained personnel; • Regular monitoring of plant and treated wastewater; • High level audio and visual warning alarms; • Depth to groundwater is 25 metres below ground level; • Laboratory waste consists of 20L/day of 10% citric acid which only makes up 0.05 percent of the total daily volume into the WWTP; and • High evaporation rates. <u>Risk Assessment</u> *Consequence:* Minor *Likelihood:* Unlikely *Risk Rating:* Moderate	*Environmental Protection Act 1986*. Works Approval W5732/2014/1

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		Regulatory Controls Condition 2.4.1 (Table 2.4.1) has been amended to include the Mine Process Plant Irrigation area as an emission point in the Licence. A map of the irrigation area has been included into Schedule 1. Condition 3.4.1 (Table 3.4.1) has been amended to include monitoring of the discharge to the irrigation area. It includes a requirement for quarterly monitoring of wastewater parameters pH, *E.coli*, Total Nitrogen, Total Phosphorus, Total Suspended Solids, Biochemical Oxygen Demand, and continuous monitoring of the volumes discharged to the irrigation area. Residual Risk *Consequence:* Minor *Likelihood:* Unlikely *Risk Rating:* Moderate	
Process Monitoring	L3.6.1 and L3.6.2	Condition 3.6.1 has been included as a new condition which requires the Licensee to record the volumes of tailings material discharged into the TSF and the volumes of water recovered from the TSF. The original Works Approval application for the TSF proposed to reuse the decant water for the processing of ore. However a further investigation by the applicant after the issuing of the Works Approval indicated, that re-using the decant water will increase the chloride concentration in the ore to above target concentrations. The Licensee will now use fresh water from production bores in the process instead. With the removal of TSF decant water out of the process, there will be an increase in supernatant water remaining on the TSF. As a result, the applicant sought an amendment to the Works Approval to install evaporators onto the TSF to assist in reducing the supernatant water remaining. The Works Approval was amended on the	N/A

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		25 February 2016 to assess and include the evaporators. The evaporators are expected to be completed by December 2016. The Licensee has submitted a separate application to have the Licence amended to include the evaporators. The Licence will be amended once compliance documentation for the evaporators has been submitted. Condition 3.5.2 has been included as a new condition which requires the Licensee to undertake an annual water balance for the TSF. The water balance as a minimum will need to consider the following: (a) site rainfall; (b) evaporation; (c) tailings return water recovery volumes; (d) seepage recovery volumes; and (e) volumes of tailings deposited. The results of the water balance are required to be reported to DER in the AER under Table 4.2.1 in the Licence. The water balance assessment requirement will assist in determining if there has been an increase in seepage from the TSF as a result of decant return water no longer being used in the processing of ore.	
Ambient environmental quality monitoring	L3.7.1.	Condition 3.6.1, Table 3.6.1 has been amended by removing the requirement to sample for some parameters; total cyanide, nitrate as nitrogen, total phosphorus and biochemical oxygen demand. Total cyanide is not used in the process at the Premises. The other parameters are normally associated with assessing ambient groundwater at premises that discharge nutrient rich wastewater to land and are not applicable here.	General provisions of the *Environmental Protection Act 1986*
Information	L4.1.1 - L4.1.5, L4.2.1 - L4.2.3 and L4.3.1.	Previous condition 4.1.2 has been removed from the Licence. *4.1.2 The Licensee shall ensure that:* *(a) any person left in charge of the Premises is aware of the conditions of this Licence and has access at all times to this Licence or copies*	Operational Procedure IR-OP-02 – Redundant Conditions (19 May 2016)

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		thereof; and *(b) any person who performs tasks on the Premises is informed of all of the conditions of this Licence that relate to the tasks which that person is performing.* This condition is not enforceable as the requirements for compliance are not clear. It is not a defence to offences under the EP Act for the Licensee or its agents to claim they were unaware of licence conditions. Moreover, knowledge does not ensure compliance and the obligation to comply with conditions of the Licence must remain with it and its agents. Table 4.2.1 and 4.3.1 have been updated to align with licence conditions. Condition 4.3.1 Table 4.3.1 has been amended by removing the following notification requirement: *Notify the CEO in writing following the construction of the northern recharge basin and the southern and northern discharge locations to No-Name Creek as specified in condition 1.3.13.* *The written notification shall:* *(a) confirm that the works were constructed in accordance with condition 1.3.13 and Table 1.3.6; and* *(b) be signed by a person authorised to represent the Licence Holder and contain the printed name and position of that person within the company.* *Following submission of the written notification, the Licensee shall operate the northern recharge basin and the southern and northern discharge locations to No-Name Creek in accordance with the conditions of this Licence.* This is now a requirement of new condition 1.3.16, with exception of the operation of	

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		the southern and northern discharge locations to No-Name Creek. Details for operation is provided in the emissions to surface water section of this document. The Annual Audit Compliance Report (AACR) template shown in Schedule 2 has been removed from the Licence. The requirement for the submission of an AACR is still a requirement of condition 4.1.2 of the Licence however the format can be presented by the Licensee.	
Licence duration	N/A	The previous expiry date for the Licence was the 25 March 2017. This has been amended to 25 March 2034 as part of DER's licence expiry date amendment process and in accordance with the *Guidance Statement: Licence Duration*.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
9/6/2016	Proponent sent a copy of draft instrument	Comments received 20/6/2016. Comments received include: • The construction of a new landfill had not been assessed. • The Samsung C&T WWTP was separate to the Mine Process Plant WWTP and any reference to it should remain in the Licence. • Construction requirements for the northern recharge basin can be removed as it has now been completed. • Update notification requirements to include Landfill 2 and remove already constructed works. • Update maps	Assessment undertaken for the new Landfill 2 and other comments incorporated into the Licence amendment. New Licence amendment draft provided to Licensee for comment.
16/9/2016	Coments received from proponent	Provided an alternative risk based condition that focuses on ensuring the appropriate controls are in place to minimise the risk of spillage of tailings to the environment and meets the intent of the original condition. Provided details of the current controls in place on the tailings delivery and return lines to minimise the risk to the environment in the event of a pipeline failure.	The Licensee proposed condition has not been included in the Licence. It is not clear or certain in the Licence, what type of controls are required to be used. Two standard tailings delivery and return pipeline conditions have been included in the Licence. - 1. Pipelines equipped with automatic cut out in the event of a failure; or - 2. Provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections. It is the responsibility of the Licensee to ensure they are compliant with these conditions. However from the information

Date	Event	Comments received/Notes	How comments were taken into consideration
			provided, it appears the current infrastructure and the proposed installation of an additional flow metre to detect a difference in flow rates which results in an automatic fast stop, satisfy the requirements of this condition.
31/10/2016	Coment received from proponent	The Licensee advised that Ministerial approval for the discharge of dewatering effluent to the southern and northern discharge locations to No Name Creek had expired.	Previous conditions 2.2.1, 2.2.2 and 3.2.1, which relate to the discharge of dewatering effluent to the southern and northern discharge locations to No Name Creek, and the monitoring of those emissions, have been removed from the Licence.
14/11/2016	Coment received from proponent	The Licensee provided the following comments: • Requested condition 1.3.10 (pipelines) be amended; • Tailings Storage Facility (TSF) embankment heights were incorrect; • Southern and Northern discharge locations should be removed from the licence as this activity not currently approved by the EPA; • Minimum separation distance from base and groundwater at both landfills is different; • No limits for landfills in Table 1.3.7; and • Clarification required for frequency of sampling in Table 3.2.1.	• Pipeline condition to remain unchanged. Alternative condition will be created for review and will be included in a future licence amendment; • Corrections made to TSF specifications; • Table amended by removing specifications for discharge locations; • Corrected to 3 m for both landfills; • Limits for landfills are covered by Table 1.3.1; and • Changed to quarterly.

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 4: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Appendix A

Operation of the TSF

The TSF which was constructed under Works Approval W5067/2011/1 is a two cell, above ground facility located approximately 3km south west of the processing plant site and will be utilised to store tailings from ore processing. The TSF is approximately 439.82 hectares in size and will receive up to 15 million tonnes per annum (Mtpa) of tailings. The TSF is a segmented ring dike impoundment configuration formed by construction of a perimeter embankment around the entire facility and an embankment in the centre of the facility. Tailings deposition will be via a twin tailings delivery pipeline system alternated between the two cells to allow sufficient tailings beach drying time in order to achieve maximum storage capacity. Whilst deposition takes place in one cell, construction of the lift on the other cell will be completed. Perimeter embankment lifts (8 in total) will be required throughout the 10 year life of the TSF. On completion, the maximum height of the TSF will be 30m.

Tailings deposited into the TSF will consist of approximately 60 percent solids with water reclaimed and re-used in the processing plant. Each cell will have its own decant systems installed to manage water return that can work independently to discharge return water away from the cell. The decant systems are a tower decant consisting of concrete sump segments surrounded by rock fill which serves to filter fine materials and prevent them from entering and accumulating in the concrete well. Water is pumped using submersible pumps for reuse in the processing plant. A minimum freeboard of 1.2 metres will be maintained on the TSF. The freeboard has been determined by the total sum of operational freeboard of 300 mm, beach freeboard of 200 mm and storm requirement of 700 mm.

Chemical analysis of the tailings indicates that it is non-acid forming and is relatively benign with a pH of between 6 to 8 and a salinity level of up to 3,000 mg/L TDS.

Stability and seepage analysis of the proposed TSF indicates that there is a low potential for seepage however seepage recovery systems have been implemented, including a seepage recovery trench and underdrainage line. The seepage recovery trench is constructed adjacent to the downstream toe of the southern perimeter embankment of the TSF in order to reduce potential horizontal seepage through the surficial soils and into the areas downstream of the tailings storage. The seepage trench was excavated through clays and clayey gravels to a depth of 4 m below the ground surface. The trench was backfilled with select rock/coarse aggregate and the trench interfaces were lined with geotextile in order to act as a filter. Seepage water intercepted flows to a sump constructed using concrete well liners. A pump within the well liners pumps seepage water (if detected) to the decant tower.

Supernatant water will be kept as low as possible to further reduce seepage. This will be achieved through the use of 14 evaporators located on the TSF. The evaporators are currently under construction with the works expected to be completed by the end of 2016. A separate amendment application has been submitted by the Licensee for the operation of the evaporators. Depth to groundwater near the TSF is 25mbgl.

As a requirement of MS824, eight groundwater monitoring bores have been installed at the TSF for the monitoring of ambient groundwater quality and the Licensee has prepared a TSF Groundwater Monitoring Plan which proposes to take quarterly samples from each of the monitoring bores and have those samples analysed for pH, TDS, and common metals and non-metals. Additionally, as a requirement of MS824, the proponent is required to collect baseline data prior to commissioning of the TSF.

Baseline water quality monitoring has been undertaken by the proponent as required by MS824. Results from the water quality monitoring have also been provided to DER as part of the

commissioning report. The commissioning report was required by condition 3.1.1 of Works Approval W5067/2011/1 and was received on 8 April 2016.

The Licensee submitted a compliance document on the 27 November 2015 for the TSF constructed under Works Approval W5067/2011/1.

Risk assessment

Normal Operations
Emission Description
Emission: Discharge of mine tailings into a tailings storage facility.

Impact: Contamination of groundwater from TSF seepage, mounding, impacts to vegetation by increased groundwater levels.

Controls:
- Installation of seepage recovery trench and underdrainage line;
- Water recovery from the TSF via a decant pump to reduce the size of the supernatant pond;
- Even tailings beach development by varying the discharge locations with twin tailings delivery pipeline system alternated between the two cells;
- TSF groundwater monitoring plan which includes quarterly monitoring of samples taken from 8 groundwater monitoring bores;
- Twice daily inspections of the discharge points and supernatant ponds;
- Chemical analysis of the tailings indicates that it is non-acid forming and is relatively benign with a pH of between 6 to 8 and salinity up to 3,000 mg/L TDS.

Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls
Condition 1.3.11 requires the Licensee to minimise as far as possible the supernatant pond on the TSF. Minimising the supernatant pond reduces the likelihood of water ponding against perimeter embankments which can result in increased seepage from the TSF.

Condition 1.3.12 requires the Licensee to undertake daily inspections of the TSF to confirm the embankment freeboard is being maintained.

The requirement for ambient groundwater monitoring at the TSF and reporting and notification requirements, have not been applied to the Licence as this is already a requirement under Part IV of the *Environmental Protection Act 1986* through conditions of MS824.

Residual Risk
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Emergency situation
Emission Description
Emission: Discharge of tailings to the environment as a result of overtopping and pipeline failure.

Impact: Soil contamination, vegetation harm and contamination of surface and ground waters.

Controls:

- Use of evaporators on the TSF (currently under construction) to reduce the size of the supernatant pond;
- Even tailings beach development by varying the discharge locations with twin tailings delivery pipeline system alternated between the two cells;
- Daily inspections of the TSF facility to assess embankment freeboard, integrity and supernatant pond;
- Daily inspections of pipelines;
- Chemical analysis of the tailings indicates that it is non-acid forming and is relatively benign with a pH of between 6 to 8 and salinity up to 3,000 mg/L TDS;
- Independent audits of the TSF will be conducted on a yearly basis;
- Inspections of the tailings lines, water return lines, discharge points decant system and supernatant ponds will be carried out at least twice per shift; and
- Embankments will be monitored for stability during operations through visual inspections and the installation of piezometers in the perimeter embankment.

Risk Assessment
Consequence: Moderate.
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls
Condition 1.3.10 requires the Licensee to ensure all tailings delivery and tailings return pipelines are equipped with automatic cut-outs in the event of a pipe failure or provided with secondary containment.

Condition 1.3.11 requires the Licensee to maintain a minimum freeboard of 1,200 mm at the TSF, operate the TSF to minimise the likelihood of erosion of the embankments by wave action and minimise the supernatant ponds on the TSF as far as possible.

Condition 1.3.12 of the Licence requires daily inspections of the TSF embankment freeboard and TSF discharge and return pipelines, recording of those inspections, and where those inspections identify that an appropriate level of environmental protection is not being maintained, the Licensee is to take corrective action.

Structural integrity of TSFs is regulated by the Department of Minerals and Petroluem (DMP). The Licensee submitted to DMP for approval, as part of the Mining Proposal, the *'Tailings Storage Facility, Design Report (18 August 2011)*.

Residual Risk
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Operation of the Landfill 2
Emission Description
Emission: Waste disposal into the Landfill 2.

Impact: Potential for contamination of surrounding environment, including surface water and groundwater.

Controls:

- Surface water will be diverted away from the facility with stormwater diversion levee northeast of the landfill;
- All stormwater in contact with waste will be retained within the designated landfill area through the use of the trench design;
- The landfill 2 will consist of 48 independent tipping areas with only one trench operational at any given time. Each trench will be approximately 8m wide, 3m deep and 65m long;
- A 1.8m security fence and gate will be erected around the perimeter of the landfill. Access to the landfill will be restricted, with only authorised personnel permitted entry;
- Appropriate signage for the landfill, including signage within the facility to designate specific areas e.g. recycling area, tipping area;
- No hazardous materials will be stored at the facility;
- The landfill will be inspected at least once a month for windblown waste, with any such waste being returned to the tipping area of the site;
- Two new landfill groundwater monitoring bores will be constructed and located hydraulically up and down gradient of the landfill. Groundwater monitoring will be conducted in accordance with current Licence conditions (L8621/2011/1);
- The standing water level (SWL) of groundwater around the proposed landfill 2 occurs between 10m and 25m below ground level (bgl), which is well below the recommended minimum separation distance of 3 metres as set out in the *Environmental Protection (Rural Landfill) Regulations 2002* .Groundwater flows in a south-westerly direction; and
- The nearest surface water body is more than 400 m away.

Risk Assessment
Consequence: Minor
Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls
No new conditions for the operation of the Landfill 2 are required to be added to the Licence. Conditions are already included in the Licence for the operation of the existing landfill and will also apply to the operation of the Landfill 2.

Condition 1.3.2 sets out what types of wastes can be accepted at the landfills and the quantity limits. The Landfill 2 will accept inert waste type 1, putrescible waste and clean fill with a combined total capacity of 3,000 tpa. This condition ensures that only the amount and types of wastes that are suitable for burial at these locations are accepted at the landfills.

Condition 1.3.3 requires the Licensee to store in a quarantined area and then remove from the Premises when practicable, any waste that does not meet the acceptance criteria required in condition 1.3.2. This condition ensures any waste that does not meet the acceptance criteria in condition 1.3.2 is not buried at the Premises, and is removed to other premises which are permitted to accept those materials.

Condition 1.3.4 establishes criteria for the storage, handling and burial of waste accepted at the landfills to ensure risks to the environment are minimised. This condition has been amended to include the Landfill 2 and remove the Delta 1 Pit Landfill which is no longer used as a landfill.

Condition 1.3.5 requires the Licensee to within 6 months after the completion of using a cell, undertake restoration works at the cell. This condition ensures potential impacts to groundwater from leachates, contamination of soil and surface water from contaminated stormwater and wind blown litter are minimised.

Condition 1.3.6 establishes criteria for the covering of each waste type accepted at the landfills for burial. This condition ensures wind blown litter and access by vermin is minimised. Additionally, cover materials reduce the likelihood of fires within the waste materials.

Condition 1.3.7 requires the Licensee to maintain suitable fencing around the landfill facilities, undertake regular inspections of the fencing and repair any damage as soon as practicable. This condition ensures livestock and fauna do not have access to the landfill.

Condition 1.3.8 requires the Licensee to collect any windblown waste that has blown outside of the landfill area and return it to the tipping area on a weekly basis.

Condition 3.7.1 updated to include two new bores at the Landfill 2.

Residual Risk
Consequence: Minor
Likelihood: Unlikely
Risk Rating: Moderate