



Licence

Environmental Protection Act 1986, Part V

Licensee: 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
As depicted in Schedule 1

Issue date: Thursday, 22 March 2012

Commencement date: Monday, 26 March 2012

Expiry date: Saturday, 25 March 2034

Prescribed premises category

Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes or more per year	65,000,000 tonnes per annual period
6	Mine dewatering	50,000 tonnes or more per year	378,000 tonnes per annual period
12	Screening, etc. of material	50,000 tonnes or more per year	6,570,000 tonnes per annual period
54	Sewage facility	100 cubic metres or more per day	593 cubic metres per day
57	Used tyre storage (general)	100 tyres or more	No more than 5,000 tyres
64	Class II putrescible landfill site	20 tonnes or more per year	8,000 tonnes per annual period
73	Bulk storage of chemicals, etc	1,000 cubic metres in aggregate	5,530 cubic metres in aggregate

Conditions

This Licence is subject to the conditions set out in the attached pages.

Date signed: 24 November 2016

.....
Alana Kidd
Manager Licensing – Resource Industries
Officer delegated under section 20
of the *Environmental Protection Act 1986*



Contents

Licence	1
Contents	3
Introduction	2
Licence Conditions	5
1 General	5
2 Emissions	11
3 Monitoring	12
4 Information	15
Schedule 1: Maps	18
Schedule 2: Reporting & Notification Forms	29

Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role

The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

Licence requirements

This licence is issued under Part V of the Act. Conditions contained within the licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
<http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html>

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.
- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.
- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.



Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Licence fees

If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial Conditions

If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

Premises Description and Licence Summary

Roy Hill Iron Ore Pty Ltd (the Licensee) operates the Roy Hill Iron Ore Mine, which is located approximately 280 kilometres (km) south of Port Hedland and 110 km north of Newman in the Pilbara region of Western Australia. The Roy Hill Iron Ore Mine currently includes operation of the following:

- Accommodation Village Wastewater Treatment Plant (WWTP) capable of treating 510 m³/day;
- Mine Services Area (MSA) WWTP capable of treating 48 m³/day;
- Putrescible landfill;
- Used tyre storage area;
- 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); and
- Dewatering to the northern and southern recharge basins.

The Roy Hill Iron Ore Mine also includes the following facilities:

- Bioremediation facility;
- Delta 1 Pit Landfill;
- Bulk Fuel Facility and minor fuel storage facilities;
- Reverse Osmosis plant; and
- Oily water separators.

The Licensee also operates seven (7) less than 20 m³/day WWTPs on the Premises. These WWTPs fall below the prescribed threshold under Schedule 1 of the *Environmental Protection Regulations 1987* and hence are not subject to conditions as outlined in DER's Guidance Statement: *Licensing and works approvals process*.

This Licence is the result of an amendment sought by the Licensee to include category 5 for the operation of the ore processing plant (Process Plant) and the tailings storage facility (TSF) constructed under Works Approval W5067/2011/1, the operation of the Mine Process Plant WWTP constructed under Works Approval W5732/2014/1, operation of the northern and southern recharge basins, and the construction of a new class II landfill.

The licences and works approvals issued for the Premises since 2011 are:

Instrument Log		
Instrument	Issued	Description
W4802/2010/1	27/01/2011	New application (Category 54 and 89 - Accommodation Village and landfill)
W5059/2011/1	17/11/2011	New application (Category 85 - Mankarlyirrakurra Exploration Camp)
L8621/2011/1	22/03/2012	New application (Category 85)
W5067/2011/1	7/6/2012	New application (Category 5 - Processing Plant and



		Tailings Storage Facility)
W5251/2012/1	4/10/2012	New application (Category 85 – Fly Camp)
W5395/2013/1	24/04/2013	New application (Category 12 - Crushing and Screening)
L8621/2011/1	30/05/2013	Amended to include category 89 landfill
L8621/2011/1	19/09/2013	Amendment to include category 12 and upgrade from category 85 to category 54
W5500/2013/1	24/10/2013	New application for landfill expansion (Category 89)
L8621/2011/1	8/05/2014	Amendment to include the landfill expansion (Category 89)
W5676/2014/1	3/07/2014	New application (Category 73 – Bulk Fuel Storage and Handling Facility)
W5718/2014/1	20/10/2014	New application (Category 85 – MSA WWTP)
L8621/2011/1	05/02/2015	Amendment to add category 57, increase category 64 landfill production and design capacity and excise land for a small WWTP
L8621/2011/1	09/04/2015	Administrative amendment
W5863/2015/1	1/10/2015	New application (Category 6 – Discharge to Infiltration Trench)
L8621/2011/1	5/11/2015	Amendment to include the MSA WWTP constructed under W5718/2014/1 and update template to version 2.9
L8621/2011/1	7/04/2016	Amendment to include category 6 and 73, construction of the northern recharge basin and southern and northern discharge locations to No-Name Creek, administrative changes and remove the Mankarlykkakurra Exploration Camp
L8621/2011/1	24/11/2016	Amendment to include category 5 for the operation of the ore processing plant (Process Plant), and the tailings storage facility (TSF) constructed under W5067/2011/1, the operation of the Mine Process Plant WWTP constructed under W5732/2014/1, operation of the northern and southern recharge basin, and the construction of a new class II landfill.

Severance

It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION



Licence Conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986*;

'AHD' means the Australian height datum;

'Acceptance Criteria' has the meaning defined in Landfill Definitions;

'anniversary date' means 31 December of each year;

'annual audit compliance report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website;

'annual period' means the period from 1 January until 31 December in that year;

'AS/NZS 5667.1' means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*;

'AS/NZS 5667.6' means the Australian Standard AS/NZS 5667.6 *Water Quality – Sampling – Guidance on sampling of rivers and streams*;

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters*;

'AS/NZS 5667.11' means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*;

'averaging period' means the time over which a limit is measured or a monitoring result is obtained;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means:

Chief Executive Officer
Department Div.3 Pt. V EP Act
Locked Bag 33 Cloister Square
Perth WA 6850
info@der.wa.gov.au

'cfu/100 mL' means colony-forming units per 100 millilitres;

'Clean Fill' has the meaning defined in Landfill Definitions;



'Department' means the department established under s.35 of the Public Sector Management Act 1994 and designated as responsible for the administration of Division 3 Part V of the Environmental Protection Act 1986;

'HDPE' means high-density polyethylene;

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

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

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

'Licence' means this Licence numbered L8621/2011/1 and issued under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'µS/cm' means microSiemens per centimetre;

'NATA' means the National Association of Testing Authorities, Australia;

'NATA accredited' means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

'OWS' means oily water separator;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'Putrescible' has the meaning defined in Landfill Definitions;

'quarterly' means the 4 inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September and 1 October to 31 December in that year;

'restoration' means the completion of the engineering of a landfill cell and may include capping and/or final cover;

'Reduced level (RL)' means the height or elevation above the point adopted as the site datum for the purpose of establishing levels;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'sewage' means waste containing faecal matter or urine and conveyed in sewers;

'spot sample' means a discrete sample representative at the time and place at which the sample is taken;

'usual working day' means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia; and

'WWTP' means wastewater treatment plant.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.



- 1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 General conditions

- 1.2.1 The Licensee shall maintain permanent markers along the boundary of the Samsung C&T WWTP and Irrigation Area as depicted in the Schedule 1 Licence exclusion map so it can be identified on the ground as excised from the Premises.

1.3 Premises Operations

- 1.3.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit in this section.
- 1.3.2 The Licensee shall only accept waste onto the Premises if:
- (a) it is of a type listed in Table 1.3.1;
 - (b) the quantity accepted is below any quantity limit listed in Table 1.3.1; and
 - (c) it meets any specification listed in Table 1.3.1.

Table 1.3.1: Waste acceptance		
Waste type	Quantity limit	Specification ¹
Inert Waste Type 1	3,000 tonnes per annual period in total	None specified.
Putrescible Waste		
Clean Fill		
Inert Waste Type 2	5,000 tonnes per annual period in total	Tyres, Conveyor and HDPE pipe only. No more than 5,000 used tyres may be stored at any one time.
Sewage	510 m ³ /day	Accepted at the Accommodation Village WWTP through sewer inflow(s) only.
	48 m ³ /day	Accepted at the Mine Services Area WWTP through sewer inflow(s) only.
	35 m ³ /day	Accepted at the Mine Process Plant WWTP through sewer inflow(s) only.

Note 1: Additional requirements for the acceptance of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

- 1.3.3 The Licensee shall ensure that where waste does not comply with condition 1.3.2 it is removed from the Premises by a controlled waste contractor, where that is not possible, stored in a segregated storage area or container and removed to an appropriately authorised facility as soon as practicable.
- 1.3.4 The Licensee shall ensure that wastes accepted onto the Premises are only subjected to the process(es) set out in Table 1.3.2 and in accordance with any process limits described in that Table.

Table 1.3.2: Waste processing		
Waste type	Process(es)	Process limits ^{1,2}
Inert Waste Type 1	Receipt, handling and disposal of waste by landfilling	Disposal of waste by landfilling shall only take place within the Landfill, Landfill 2 and Delta 1 Pit Landfill shown on the Landfill Area Maps in Schedule 1.
Putrescible Waste		



Clean Fill		The separation distance between the base of the landfill and the highest groundwater level shall be greater than 3 m. Disposal of waste shall not exceed 3,000 tonnes per annual period. The size of the tipping face is kept to a minimum and not larger than 30 m in length. Must meet the acceptance criteria for a Class II landfill³.
Inert Waste Type 2 ¹	Receipt, handling and disposal of waste by landfilling	Disposal of Inert Waste Type 2 shall only occur within the Landfill identified on the Landfill Area Maps in Schedule 1. Disposal of waste shall not exceed 5,000 tonnes per annual period and shall only include tyres, conveyors and HDPE pipe. Not more than 5,000 used tyres shall be stored at the Premises at any one time. Storage of used tyres in the Tyre Storage Area shown on the Landfill Area Map in Schedule 1 shall only occur in units not more than 100 tyres. Used tyres must be stacked on their side walls or if stored on treads, the area shall be baled with a securing device made of non-combustible material. A separation distance of 6 m must be maintained between units.
Sewage	Biological, physical and chemical treatment	Treatment of sewage waste at the WWTPs listed in Table 1.3.1 shall be at or below the quantity limit specified in that same table.

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

Note 2: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

Note 3: Defined in the Landfill Definitions.

1.3.5 The Licensee shall manage the landfilling activities to ensure that restoration of a cell or phase takes place within 6 months after disposal in that cell or phase has been completed.

1.3.6 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.3.3 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.3.3: Cover requirements¹

Waste Type	Material	Depth	Timescales
Putrescible Waste	Inert and incombustible material	Sufficient to ensure the waste is completely covered and that no waste is exposed	Weekly or as soon as practicable after deposit and prior to compaction.



Inert Waste Type 2 (Tyres, conveyor and HDPE pipe only)	Soil	1,000 mm	As soon as practical following the achievement of final waste levels in the area(s) in which Inert Waste Type 2 are deposited.
---	------	----------	--

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

1.3.7 The Licensee shall:

- (a) erect and maintain suitable fencing around the irrigation area and landfill facilities that acts as an effective barrier to unauthorised persons, cattle, horses and other stock; and
- (b) undertake regular inspections of all security measures and repair damage as soon as practicable.

1.3.8 The Licensee shall ensure that wind-blown waste is contained within the landfill area and that wind-blown waste is returned to the tipping area on at least a monthly basis.

1.3.9 The Licensee shall ensure that the irrigation of treated wastewater meets the following:

- (a) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the irrigation area;
- (b) wastewater is evenly distributed over the irrigation area;
- (c) soil erosion is prevented from occurring; and
- (d) a healthy vegetation cover is maintained over the wastewater irrigation areas.

1.3.10 The Licensee shall ensure that all tailings delivery and tailings return pipelines are:

- (a) equipped with automatic cut-outs in the event of a pipe failure; or
- (b) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

1.3.11 The Licensee shall ensure that tailings material, dewatering water and hydrocarbons are only stored and/or treated within vessels or compounds provided with the infrastructure requirements specified in Table 1.3.4 and identified in Schedule 1.

Table 1.3.4: Containment infrastructure		
Containment cell or dam number(s) as depicted in Schedule 1	Material	Infrastructure requirements
Tailings Storage Facility	Tailings	A minimum top of embankment freeboard of 1,200mm ¹ is maintained. Methods of operation minimise the likelihood of erosion of the embankments by wave action. The supernatant pond on the TSF is minimised as far as possible. Final perimeter embankment height of 456 m RL.
Process Water Dam	Mine dewatering water, tailings return water and water from the Stage 1 Borefield	HDPE lined (1.5 mm thickness) dam, which stores water prior to use in the mine process plant.
Bulk Fuel Facility	C1 Combustible Liquid (diesel)	Two 2,765,000 litre storage tanks situated inside a HDPE lined bund, with bund permeability no less than 10 ⁻⁹ metres per



		second. Bund height sufficient to prevent surface water ingress up to 500 mm deep. Bund floor with both mechanical and fire protection in the form of clean fill and sloped and graded to allow drainage to sump. Ring beam has floor leak detection indicators.
--	--	--

Note 1: Determined by the total sum of operational freeboard of 300 mm, beach freeboard of 200 mm and 10,000 year storm requirement of 700 mm.

1.3.12 The Licensee shall:

- (a) undertake inspections as detailed in Table 1.3.5;
- (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 1.3.5: Inspection of infrastructure

Scope of inspection	Type of inspection	Frequency of inspection
Tailings delivery pipelines	Visual integrity	Daily
Tailings return pipelines	Visual integrity	Daily
Embankment freeboard	Visual to confirm required freeboard capacity is available	Daily
Mine dewater pipelines	Visual integrity	Weekly

1.3.13 The Licensee must ensure that the proposed Works specified in Column 1 of Table 1.3.6 are designed and constructed to meet or exceed the specifications in Column 2 of Table 1.3.6 for the infrastructure in each row of Table 1.3.6.

1.3.14 The Licensee must not depart from the specifications in Table 1.3.6 except:

- (a) where such departure is minor in nature and does not materially change or affect the infrastructure; or
- (b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment; and
- (c) all other Conditions in this Licence are still satisfied.

Table 1.3.6: Works specifications

Column 1	Column 2
Landfill 2 (See Schedule 1: Maps)	The Licensee must ensure that the Landfill 2: 1. has a 1.8 metre security fence and gate erected around the perimeter of the landfill; 2. has appropriate signage which specifies what types of wastes are accepted at the landfill and where they are to be deposited; 3. is contained within the Premises boundary; 4. has a firebreak of 3 metres around the boundary of the landfill; 5. has a stormwater diversion levee north east of the landfill which is designed to prevent any stormwater from entering the landfill from outside; 6. a minimum distance of 3 metres is maintained between the base of each trench and the highest level of the water table aquifer; 7. is designed so all contaminated stormwater is retained within the landfill area; 8. has sufficient soil, which has been excavated from the creation of trenches at the landfill, stockpiled adjacent to the open trenches and enough to cover the tipping area at least twice;



	9. has water used for dust suppression during excavation and backfilling of each trench; and 10. has two groundwater monitoring bores located hydraulically up and down gradient of the landfill, and baseline groundwater monitoring is conducted prior to disposal of any waste into the landfill.
--	--

1.3.15 If departures under Condition 1.3.14 apply, then the Licensee must provide the CEO with a list of departures which are certified as complying with Condition 1.3.14 at the same time as the certifications under Condition 1.3.16.

1.3.16 The Licensee must submit a construction compliance document to the CEO, within one month, following the construction of the Works and prior to operating the new works at the premises.

1.3.17 The Licensee must ensure the construction compliance document:

- (a) is certified by a suitably qualified professional engineer or builder that each item of infrastructure specified in Condition 1.3.13, Table 1.3.6 has been constructed in accordance with the Conditions of the Licence with no material defects; and
- (b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.

1.3.18 The Licensee shall ensure the limits specified in Table 1.3.7 are not exceeded.

Table 1.3.7: Production or design capacity limits		
Category ¹	Category description ¹	Premises production or design capacity limit
5	Processing or beneficiation of metallic or non-metallic ore	65,000,000 tonnes per annual period
6	Mine dewatering	378,000 tonnes per annual period
12	Screening, etc. of material	6,570,000 tonnes per annual period
73	Bulk storage of chemicals, etc	5,530 cubic metres in aggregate as per Bulk Fuel Facility specifications in Table 1.3.4

Note 1: *Environmental Protection Regulations 1987*, Schedule 1.

2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

2.2 Point source emissions to groundwater

2.2.1 The Licensee shall ensure that where waste is emitted to groundwater 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 groundwater		
Emission point reference and location on Map of emission points	Description	Source including abatement
Southern Recharge Basin	Disposal of excess water where dewatering production exceeds other mine site demands for	Water from mine dewatering



Northern Recharge Basin	dust suppression and construction and when the mine process plant is shutdown for maintenance	
-------------------------	---	--

2.2.2 The Licensee shall not cause or allow point source emissions to groundwater greater than the limit listed in Table 2.2.2

Table 2.2.2: Point source emission limits to groundwater

Emission point reference	Parameter	Limit (including units)	Averaging period
Southern Recharge Basin	Total Dissolved Solids	6,000 mg/L	Spot sample
Northern Recharge Basin			

2.3 Emissions to land

2.3.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.3.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.3.1: Emissions to land

Emission point reference and location on Map of emission points	Description	Source including abatement
Accommodation Village Irrigation Area	Discharge from the Accommodation Village WWTP to the on-site irrigation area	Treated wastewater
	Reverse osmosis reject to the on-site irrigation area	
Mine Services Area Irrigation Area	Discharge from the Mine Services Area WWTP to the on-site irrigation area	
Mine Process Plant Irrigation area	Discharge from the Mine Process Plant WWTP to the on-site irrigation area	
OWS discharge location	Discharge of treated water from the OWS at the Bulk Fuel Facility to the environment	Water that has been treated through the OWS to the environment via a headwall with rock protection

2.3.2 The Licensee shall not cause or allow emissions to land greater than the limit listed in Table 2.3.2.

Table 2.3.2: Emission limits to land

Emission point reference	Parameter	Limit (including units)	Averaging period
OWS discharge location	Total Recoverable Hydrocarbons	15 mg/L	Spot sample

3 Monitoring

3.1 General monitoring

3.1.1 The Licensee shall ensure that:

- (a) all water samples are collected and preserved in accordance with AS/NZS 5667.1 unless otherwise indicated in the relevant table;



- (b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
- (c) all surface water sampling is conducted in accordance with AS/NZS 5667.6;
- (d) all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and
- (e) all samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters to be measured unless otherwise indicated in the relevant table.

3.1.2 The Licensee shall ensure that:

- (a) monthly monitoring is undertaken at least 15 days apart; and
- (b) quarterly monitoring is undertaken at least 45 days apart.

3.1.3 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.4 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

3.2 Monitoring of point source emissions to groundwater

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 groundwater			
Emission point reference	Parameter	Units	Frequency
Southern Recharge Basin and Northern Recharge Basin	Volumetric flow rate ¹	m ³ /day	Continuous
	Duration of discharge	Dates/days	Quarterly
	Electrical Conductivity ¹	µS/cm	
	Total Dissolved Solids ¹	mg/L	

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

3.3 Monitoring of emissions to land

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: Monitoring of emissions to land				
Emission point reference	Parameter	Units	Reference period	Frequency
Accommodation Village WWTP (Prior to discharge to the irrigation areas)	Cumulative Volume	m ³	Monthly	Continuous
	Biochemical Oxygen Demand	mg/L	Spot sample	Quarterly
	Total Suspended Solids	mg/L		
	pH ¹	pH units		
	Total Nitrogen	mg/L		
	Total Phosphorus	mg/L		
	<i>E. coli</i>	cfu/100 mL		
	Total Dissolved Solids	mg/L		
Mine Services Area WWTP (Prior to discharge to the irrigation areas)	Cumulative Volume	m ³	Monthly	Continuous
	Biochemical Oxygen Demand	mg/L	Spot sample	Quarterly
	Total Suspended Solids	mg/L		
	pH ¹	pH units		
	Total Nitrogen	mg/L		
	Total Phosphorus	mg/L		



	<i>E. coli</i>	cfu/100 mL		
Mine Process Plant WWTP (Prior to discharge to the irrigation area)	Cumulative Volume	m ³	Monthly	Continuous
	Biochemical Oxygen Demand	mg/L	Spot sample	Quarterly
	Total Suspended Solids	mg/L		
	pH ¹	pH units		
	Total Nitrogen	mg/L		
	Total Phosphorus	mg/L		
	<i>E. coli</i>	cfu/100 mL		
OWS discharge location	Total Recoverable Hydrocarbons	mg/L	Spot sample	Quarterly (unless there is no discharge during the quarter)

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

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, Putrescible Waste and Clean Fill	tonnes or (where no weighbridge is present) m ³	N/A	Each load arriving at the landfill

3.5 Process monitoring

3.5.1 The Licensee shall undertake the monitoring specified in Table 3.5.1.

Table 3.5.1: Process monitoring

Monitoring point reference	Process description	Parameter	Units	Frequency	Method
Tailings Storage Facility	-	Volumes of tailings deposited	m ³	Continuous	None specified
Tailings Storage Facility	-	Volumes of water recovered	m ³	Continuous	None specified

3.5.2 The Licensee shall undertake an annual water balance for the TSF. The water balance shall as a minimum consider the following:

- site rainfall;
- evaporation;
- tailings return water recovery volumes;
- seepage recovery volumes; and
- volumes of tailings deposited.

3.6 Ambient environmental quality monitoring

3.6.1 The Licensee shall undertake the monitoring in Table 3.6.1 according to the specifications in that table.



Table 3.6.1: Monitoring of ambient groundwater quality

Monitoring point reference as depicted in Schedule 1	Parameter	Units	Averaging period	Frequency
RHPZ0026S and RHPZ0034 Landfill2: 2 bores as shown in Landfill 2 map, following construction and prior to operation.	Standing Water Level	m(AHD)	Spot sample	Quarterly
	pH ¹	pH units		
	Electrical Conductivity	µS/cm		
	Total Dissolved Solids	mg/L		
	Total Hardness			
	Aluminium (Al), Arsenic (As), Barium (Ba), Boron (B), Cadmium (Cd), Chloride (Cl), Chromium (Cr), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Silver (Ag), Sodium (Na) and Zinc (Zn)			
RHZ0026S, RHPZ0034 and RHPZ0035	Total Recoverable Hydrocarbons	mg/L		

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

4 Information

4.1 Records

4.1.1 All information and records required by this Licence shall:

- (a) be legible;
- (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
- (c) except for records listed in 4.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
- (d) for those following records, be retained until the expiry of the Licence or any subsequent licence:
 - (i) off-site environmental effects; or
 - (ii) matters which affect condition of the land or waters.

4.1.2 The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous licence issued under Part V of the Act for the Premises for the previous annual period.

4.1.3 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

4.1.4 The Licensee shall implement and maintain a system which ensures that a record is made of:

- (a) the waste types and quantities accepted at the site;
- (b) the waste types and quantities disposed of at the site; and
- (c) any documentary evidence to demonstrate compliance with the Class II landfill acceptance criteria.



4.2 Reporting

- 4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 90 calendar days after the end of the annual period. The report shall contain the information listed in Table 4.2.1 in the format or form specified in that table.

Table 4.2.1: Annual Environmental Report		
Condition or Table (if relevant)	Parameter	Format or Form¹
-	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
Tables 1.3.1 and 1.3.7	Actual throughput for the reporting period for approved categories under Schedule 1 of the <i>Environmental Protection Regulations 1987</i>	None specified
Table 2.3.1	An updated description of the irrigation area(s) reporting any decline in health, against previous years, and corrective actions	None specified
Table 3.2.1	Volumetric flow rate, Duration of discharge, Electrical Conductivity, Total Dissolved Solids	GR1
Table 3.3.1	Monthly records and cumulative volume for each WWTP	None specified
	Biochemical Oxygen Demand, Total Suspended Solids, pH, Total Nitrogen, Total Phosphorus, <i>E.coli</i> , Total Dissolved Solids, Total Recoverable Hydrocarbons	LR1
Table 3.5.1	Process monitoring	None specified
3.5.2	Annual water balance of TSF	None specified
Table 3.6.1	Groundwater quality parameters: Standing Water Level, pH, Electrical Conductivity, Total Dissolved Solids, Aluminium (Al), Arsenic (As), Barium (Ba), Boron (B), Cadmium (Cd), Chromium (Cr), Chloride (Cl), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Silver (Ag), Sodium (Na), Zinc (Zn), and Total Recoverable Hydrocarbons	AGW1
4.1.2	Compliance	None Specified
4.1.3	Complaints summary	None specified
4.1.4	Records of waste types and quantities received at the site and disposed of at the site	None specified

Note 1: Forms are in Schedule 2

- 4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains an assessment of the information contained within the report against previous monitoring results and/or background data.
- 4.2.3 The Licensee shall submit the information in Table 4.2.2 to the CEO according to the specifications in that table.



Table 4.2.2: Non-annual reporting requirements

Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form
-	Copies of original monitoring reports submitted to the Licensee by third parties	Not Applicable	Within 30 days of the CEOs request	As received by the Licensee from third parties

4.3 Notification

4.3.1 The Licensee shall ensure that the parameters listed in Table 4.3.1 are notified to the CEO and in accordance with the notification requirements of the table.

Table 4.3.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement ¹	Format or form ²
1.3.1 and 2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable, but no later than 5pm of the next usual working day from the incident being identified. Part B: As soon as practicable	N1
3.1.4	Calibration report	As soon as practicable.	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act.

Note 2: Forms are in Schedule 2

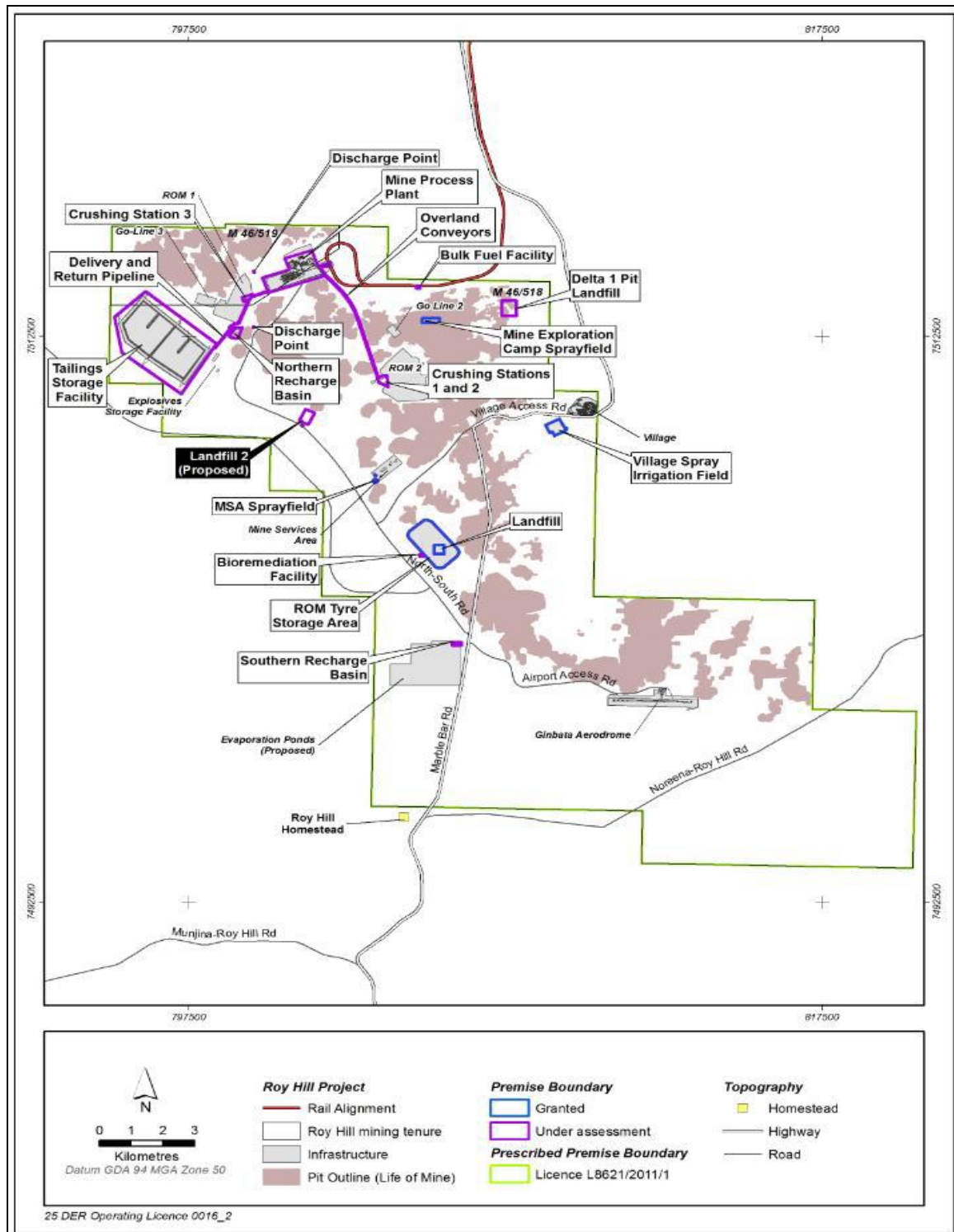


Schedule 1: Maps

Premises map and map of storage locations

The Premises is shown in the map below. The green line depicts the Premises boundary.

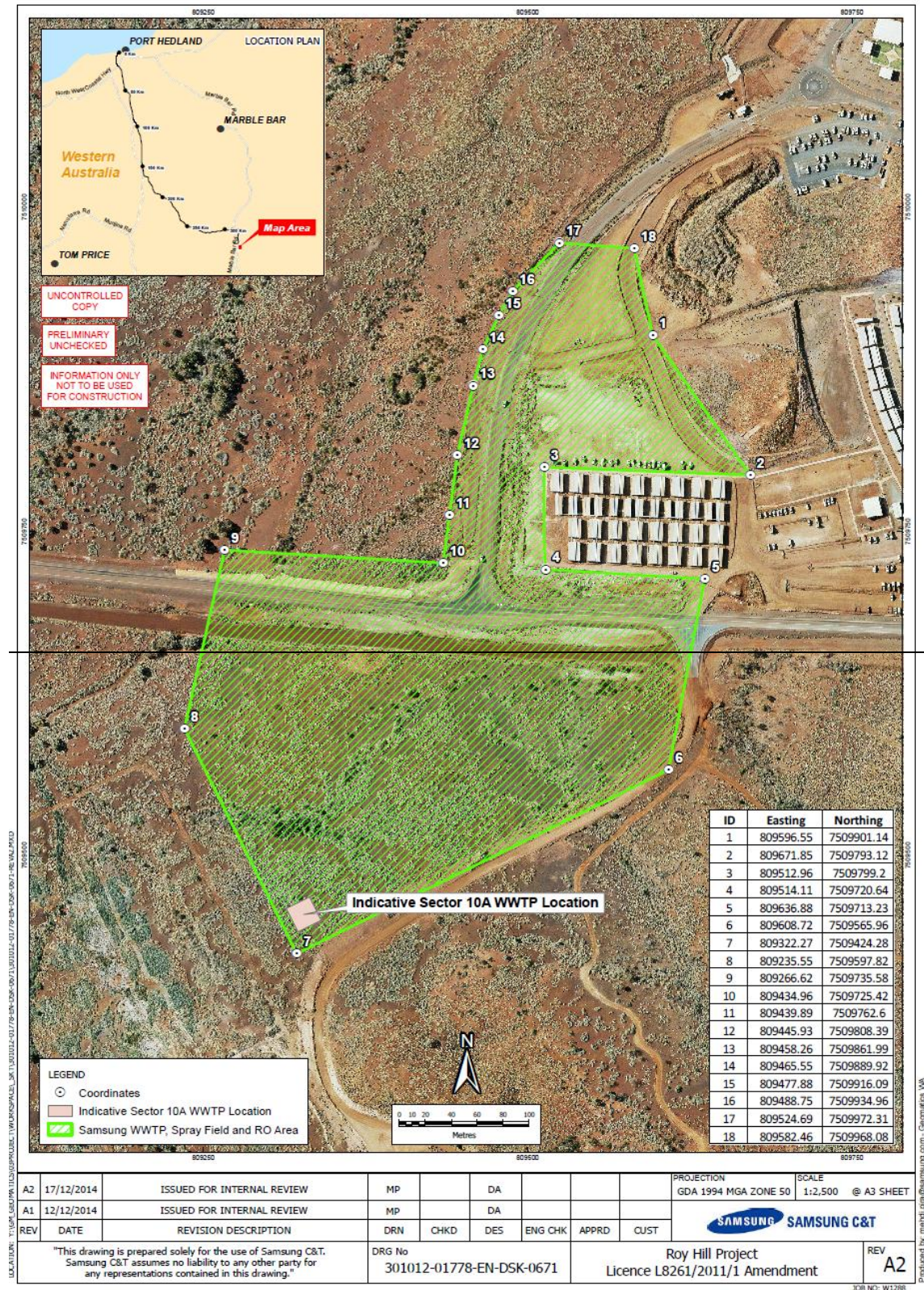
The location of the storage areas defined in Table 1.3.4 are shown below.





Map of licence exclusion

The map below depicts the Samsung C&T WWTP and Irrigation Area excised from the Premises as referenced in condition 1.2.1.

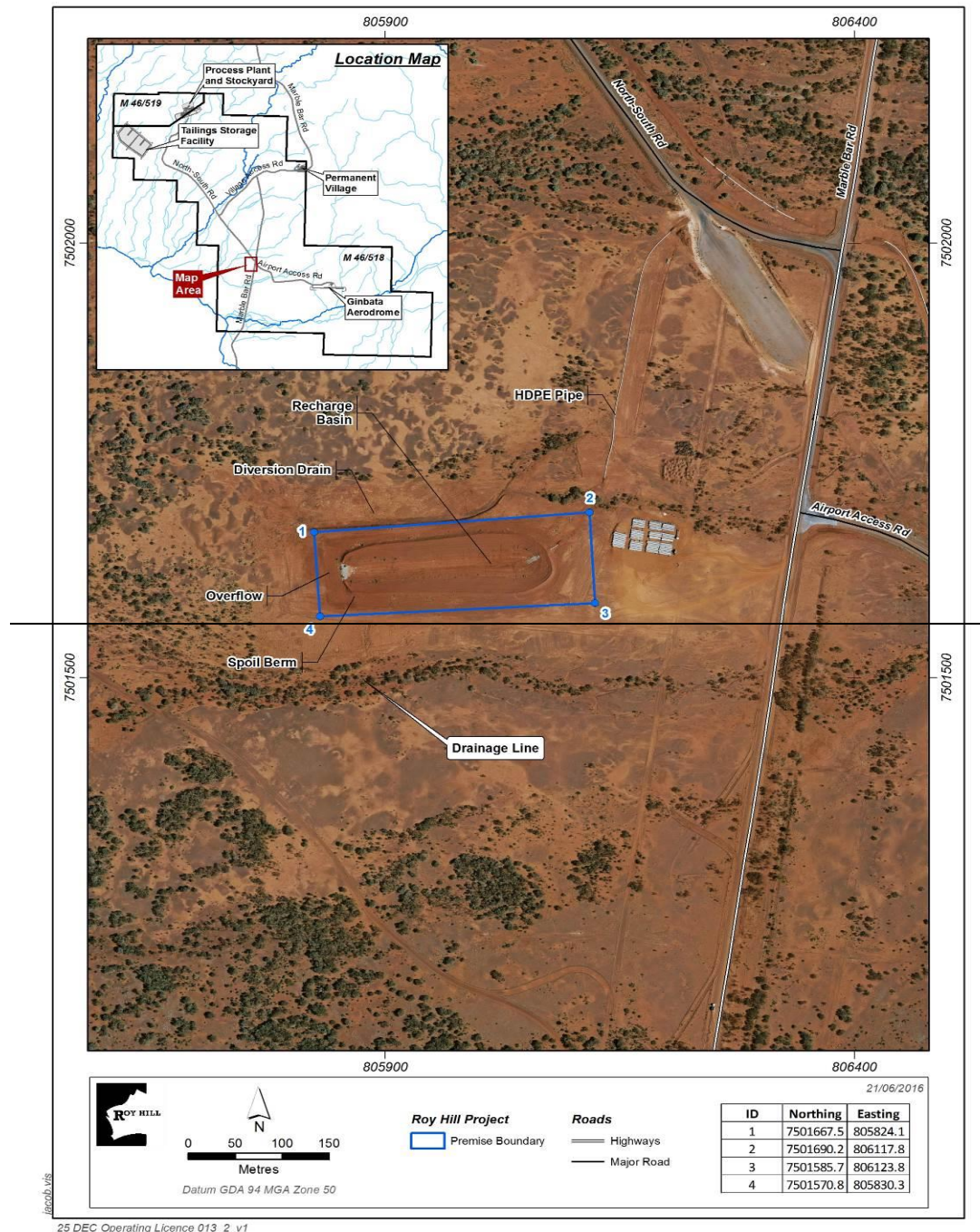




Map of emission points

The locations of the emission points defined in 2.2.1 and 2.3.1 are shown in the 7 maps below.

Southern Recharge Basin



Roy Hill Project

Legend:

- Premise Boundary (Blue line)
- Project Roads - Major (Black line)
- Major Road (Thick black line)
- Creek (Blue line)

Location Map:

The location map shows the project area in relation to the Ginbata Aerodrome, Permanent Village, Process Plant and Stockyard, and Tailing Storage Facility. Key roads include M 46/519, M 46/518, North-South Rd, and Airport Access Rd.

Map Data:

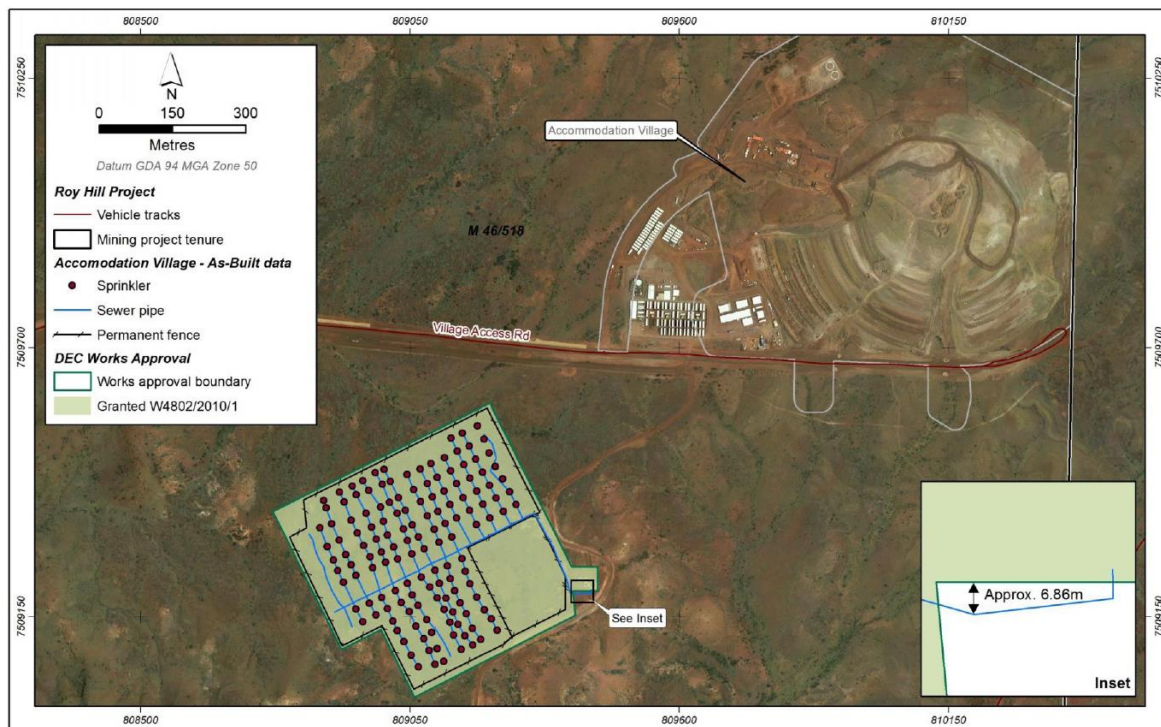
ID	Northing	Easting	ID	Northing	Easting
1	7512809.6	799196.2	9	7512531.2	798783.6
2	7512698.4	799145.3	10	7512740.5	798934.1
3	7512413.5	799063.1	11	7512744.0	798947.5
4	7512417.2	799025.0	12	7512803.2	798968.1
5	7512447.9	798872.5	13	7512797.5	799017.3
6	7512452.6	798849.6	14	7512792.6	799071.9
7	7512457.9	798837.4	15	7512791.9	799080.2
8	7512492.2	798785.2			

Datum GDA 94 MGA Zone 50

22/06/2016

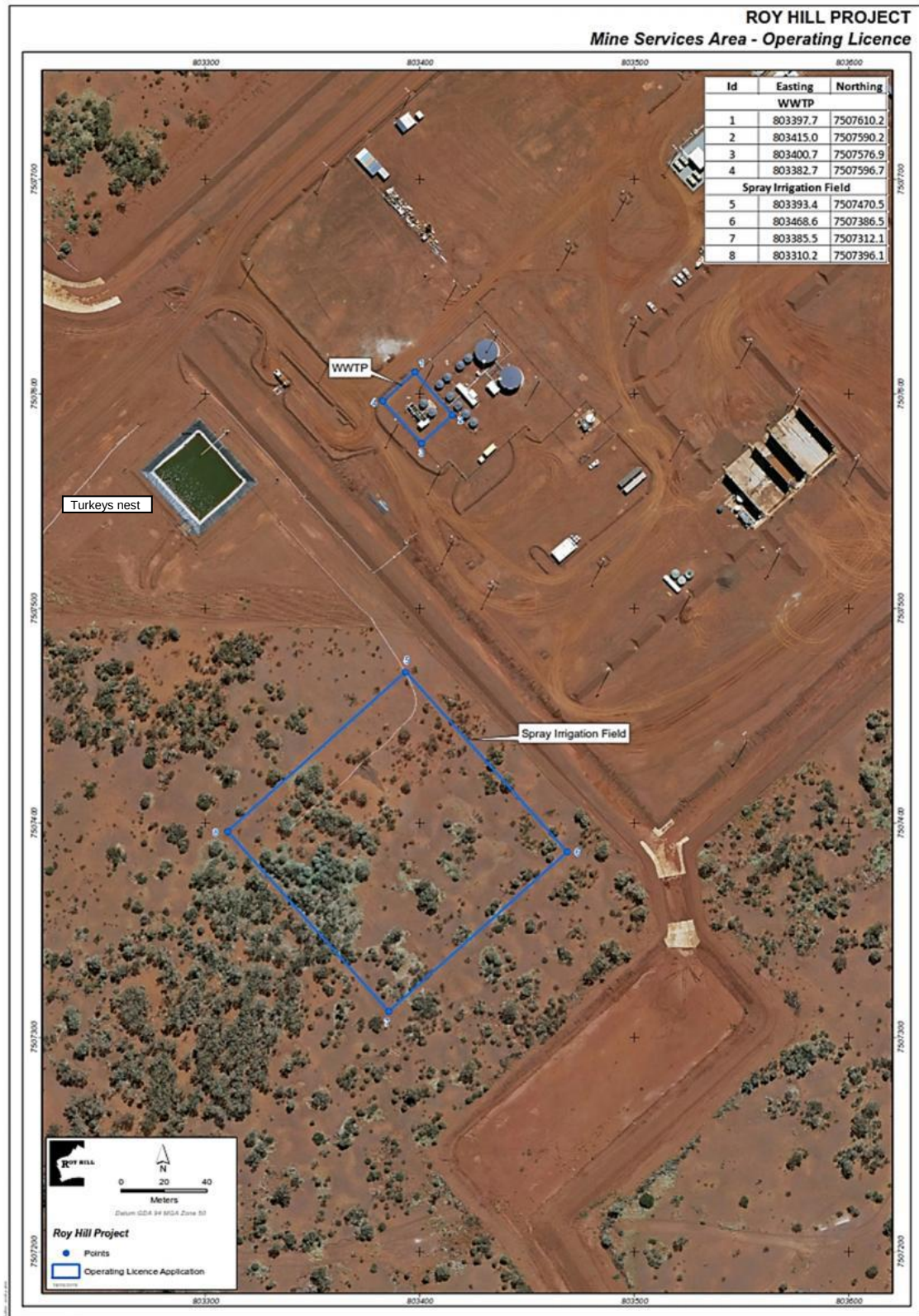


Accommodation Village Irrigation Area

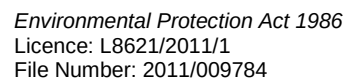




Mine Services Area Spray Irrigation Field

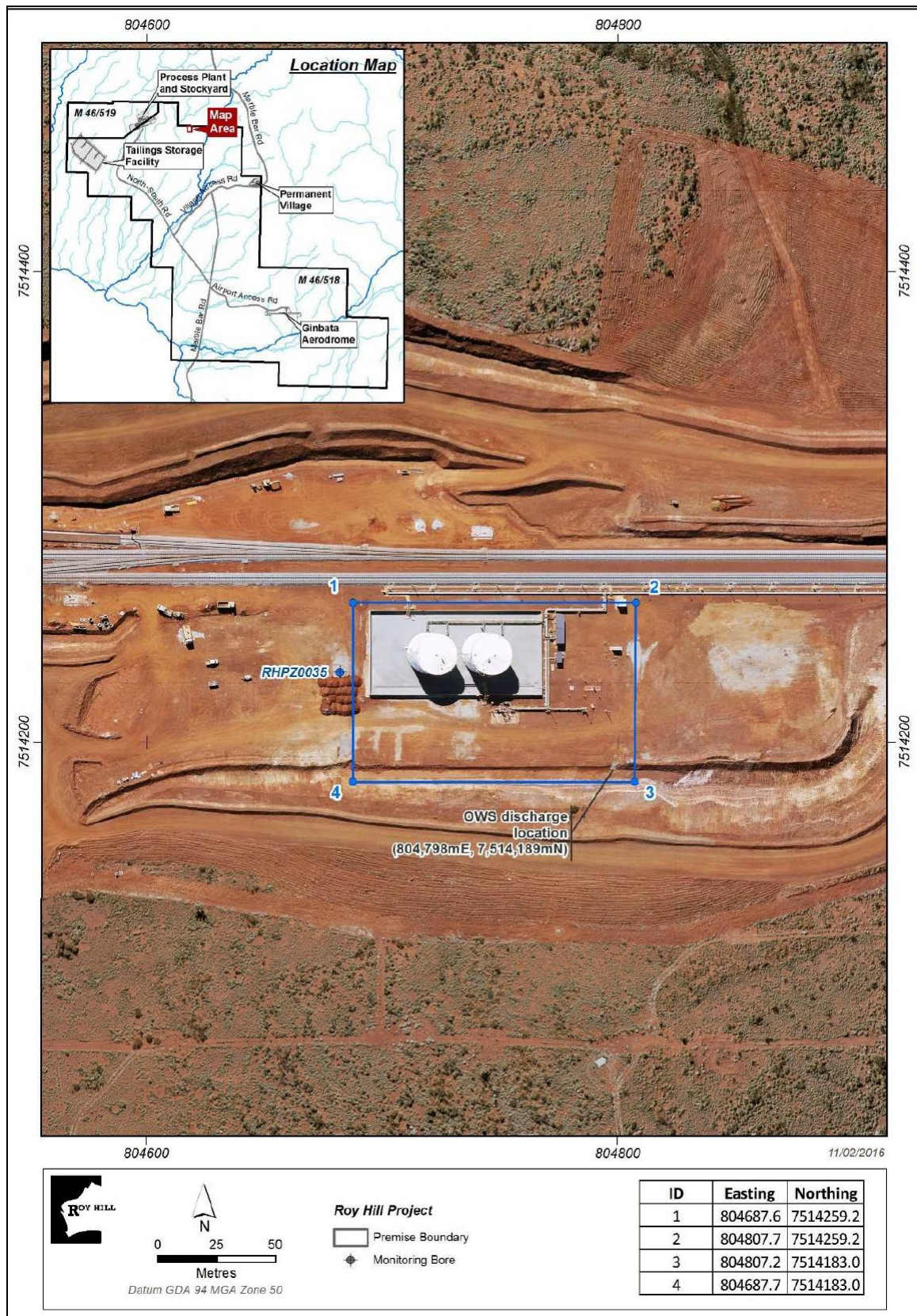


Mine Process Plant Irrigation Area





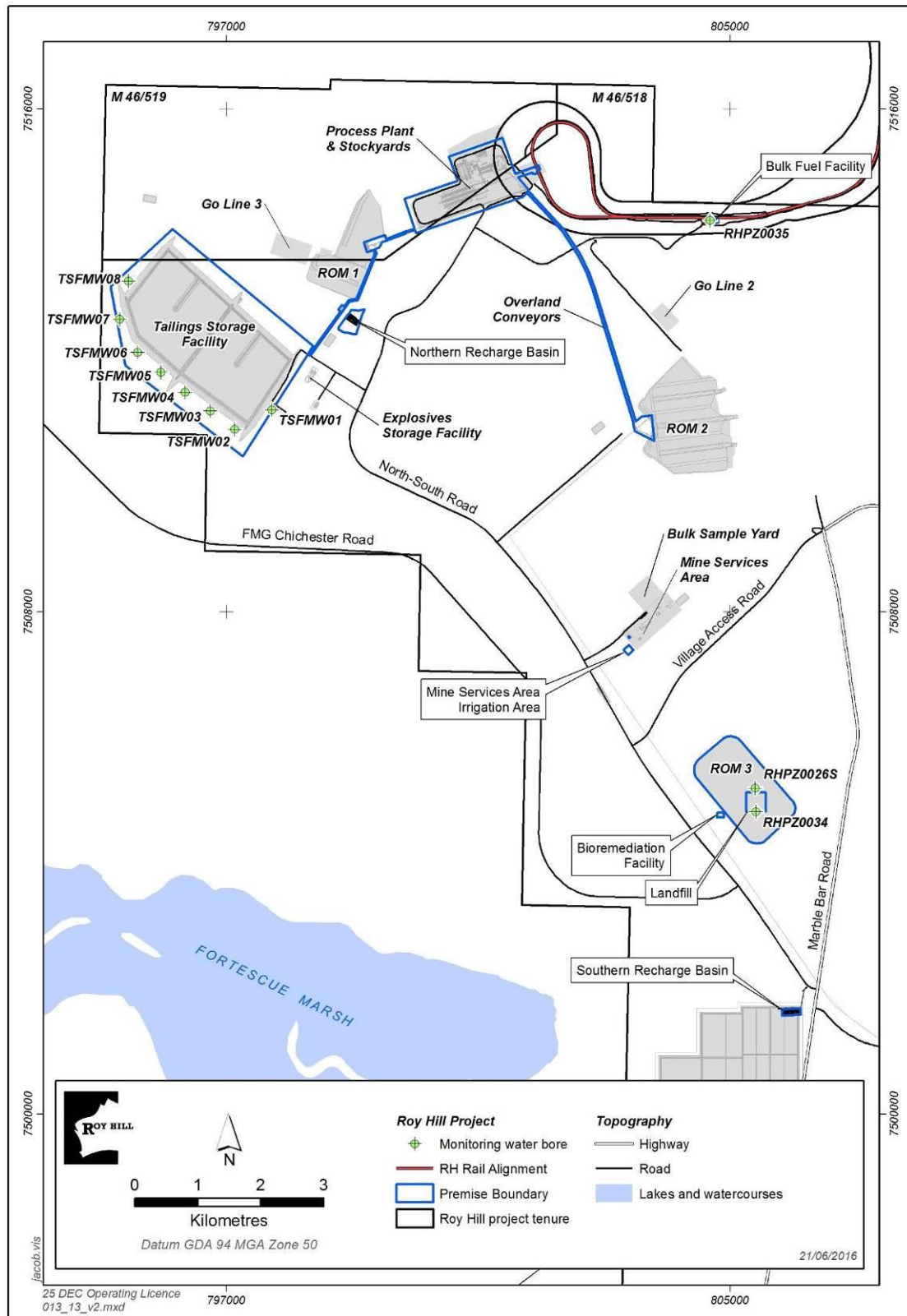
OWS discharge location





Map of monitoring locations

The locations of the groundwater monitoring points defined in Table 3.6.1 are shown below.

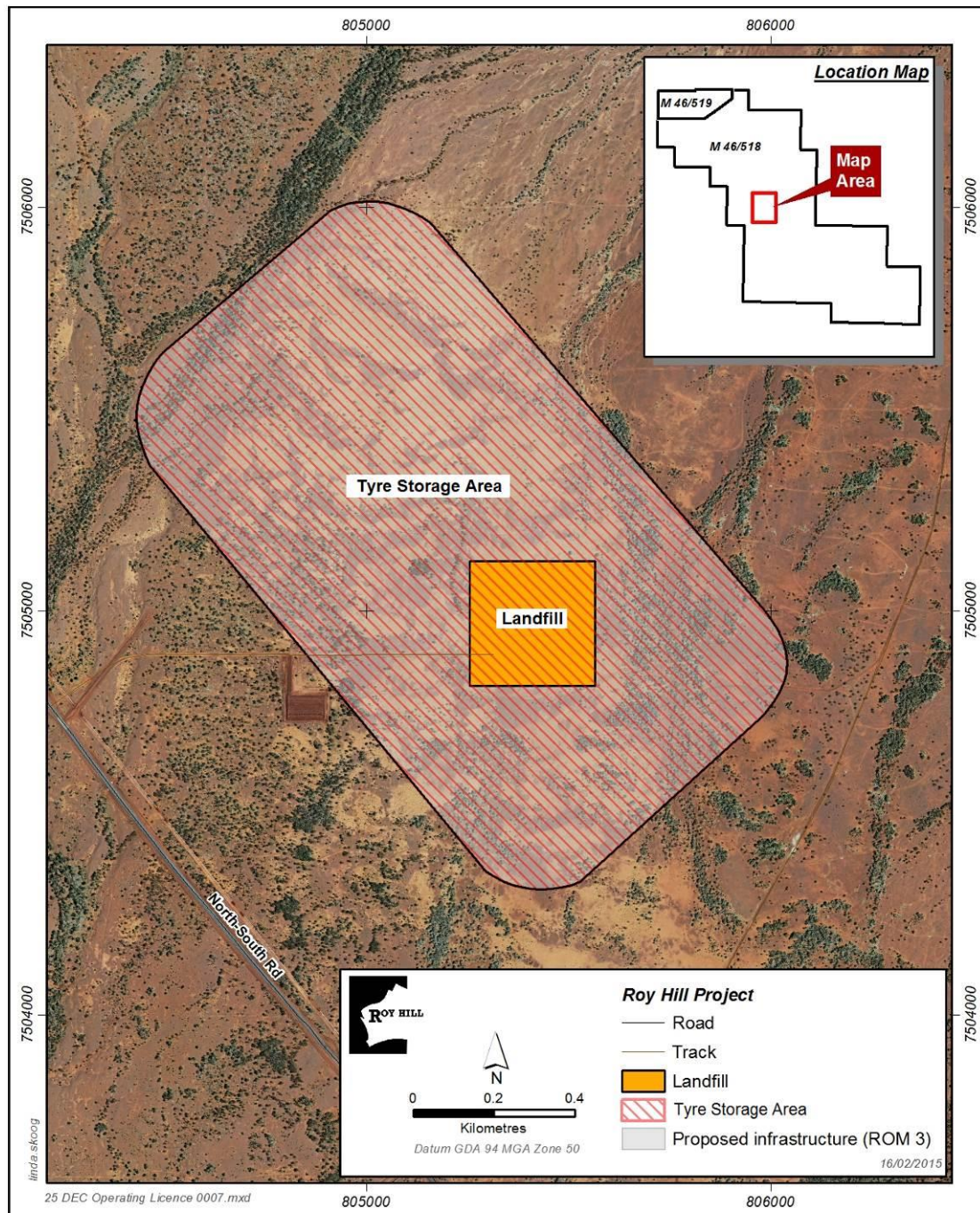




Landfill Area Maps

The area in which the storage of tyres and disposal of waste by landfilling may take place is shown in the maps below.

Landfill





Landfill 2





Schedule 2: Reporting & Notification Forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

Licence: L8621/2011/1 Licensee: Roy Hill Iron Ore Pty Ltd
Form: GR1 Period:
Name: Monitoring of point source emissions to groundwater

Form GR1: Monitoring of point source emissions to groundwater					
Emission point	Parameter	Result	Averaging Period	Method	Sample date & Times
Southern Recharge Basin and Northern Recharge Basin	Volumetric flow rate		Continuous		
	Duration of discharge		Days		
	Electrical Conductivity		Spot Sample		
	Total Dissolved Solids				

Signed on behalf of Roy Hill Iron Ore Pty Ltd: Date:



Licence: L8621/2011/1
Form: LR1
Name: Monitoring of emissions to land

Licensee: Roy Hill Iron Ore Pty Ltd
Period:

Form LR1: Monitoring of emissions to land					
Emission point	Parameter	Result	Averaging Period	Method	Sample date & Times
Accommodation Village WWTP	Biochemical Oxygen Demand		Spot Sample		
	Total Suspended Solids				
	pH				
	Total Nitrogen				
	Phosphorus				
	<i>E. coli</i>				
	Total Dissolved Solids				
Mine Services Area WWTP	Biochemical Oxygen Demand				
	Total Suspended Solids				
	pH				
	Total Nitrogen				
	Phosphorus				
	<i>E. coli</i>				
Mine Process Plant WWTP	Biochemical Oxygen Demand				
	Total Suspended Solids				
	pH				
	Total Nitrogen				
	Phosphorus				
	<i>E. coli</i>				
OWS discharge location	Total Recoverable Hydrocarbons				

Signed on behalf of Roy Hill Iron Ore Pty Ltd: Date:



Licence: L8621/2011/1
Form: AGW1
Name: Monitoring of ambient groundwater quality

Licensee: Roy Hill Iron Ore Pty Ltd
Period:

Form AGW1: Monitoring of ambient groundwater quality						
Emission point	Parameter	Unit	Result	Averaging Period	Method	Sample date & Times
RHPZ0026S and RHPZ0034	Standing Water Level	m(AHD)		Spot Sample		
	pH	pH units				
	Electrical Conductivity	µS/cm				
	Total Dissolved Solids	mg/L				
	Chloride	mg/L				
	Sodium	mg/L				
	Aluminium (Al)	mg/L				
	Arsenic (As)	mg/L				
	Barium (Ba)	mg/L				
	Boron (B)	mg/L				
	Cadmium (Cd)	mg/L				
	Chromium (Cr)	mg/L				
	Copper (Cu)	mg/L				
	Iron (Fe)	mg/L				
	Lead (Pb)	mg/L				
	Manganese (Mn)	mg/L				
	Mercury (Hg)	mg/L				
	Molybdenum (Mo)	mg/L				
	Nickel (Ni)	mg/L				
	Selenium (Se)	mg/L				
	Silver (Ag)	mg/L				
	Zinc (Zn)	mg/L				
TSFMW01, TSFMW02, TSFMW03, TSFMW04, TSFMW05, TSFMW06, TSFMW07 and TSFMW08	Standing Water Level	m(AHD)				
	pH ¹	pH units				
	Electrical Conductivity	µS/cm				
	Total Dissolved Solids	mg/L				
	Aluminium (Al)	mg/L				
	Arsenic (As)	mg/L				
	Barium (Ba)	mg/L				
	Boron (B)	mg/L				



	Cadmium (Cd)	mg/L				
	Chromium (Cr)	mg/L				
	Chloride (Cl)	mg/L				
	Copper (Cu)	mg/L				
	Iron (Fe)	mg/L				
	Lead (Pb)	mg/L				
	Manganese (Mn)	mg/L				
	Mercury (Hg)	mg/L				
	Molybdenum (Mo)	mg/L				
	Nickel (Ni)	mg/L				
	Selenium (Se)	mg/L				
	Silver (Ag)	mg/L				
	Sodium (Na)	mg/L				
	Zinc (Zn)	mg/L				
RHPZ0026S, RHPZ0034 and RHPZ0035	Total Recoverable Hydrocarbons	mg/L				

Signed on behalf of Roy Hill Iron Ore Pty Ltd: Date:



Licence: L8621/2011/1
Form: N1

Licensee: Roy Hill Iron Ore Pty Ltd
Date of breach:

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	



Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of previous N1 notifications for the Premises the preceding 24 months.	

Name	
Post	
Signature on behalf of Roy Hill Iron Ore Pty Ltd	
Date	



Environmental Protection Act 1986, Part V

Licence: L8621/2011/1

Expiry date: Saturday, 25 March 2034

Decision Document authorised by: Alana Kidd
Delegated Officer



Contents

Decision Document	1
Contents	2
1 Purpose of this Document	2
2 Administrative summary	2
3 Executive summary of proposal and assessment	3
4 Decision table	5
5 Advertisement and consultation table	19
6 Risk Assessment	21
Appendix A	22

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	Date: N/A	
Application fee paid	Date: N/A	
Works Approval has been complied with	Yes ☒ No ☐ N/A ☐	
Compliance Certificate received	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 <i>Environmental Protection Act 1986</i> ?	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 <i>Environmental Protection Act 1986</i>)?	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 (m³/day);
- Mine Services Area (MSA) WWTP capable of treating 48 m³/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 m³/day of effluent. Treated wastewater is irrigated to a 15,000 square metre (m²) 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 volumes 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. <i>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:</i> (a) pollution; (b) unreasonable emission; (c) discharge of waste in circumstances likely to cause pollution; or	General provisions of the <i>Environmental Protection Act 1986</i>. <i>Environmental</i>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		(d) <i>being contrary to any written law.</i> 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. <i>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.</i> 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. <i>1.2.2 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.</i> The general provisions of the <i>Environmental Protection Act 1986</i> with respect to the causing of pollution and environmental harm apply, as does subsidiary legislation including the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>. 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.	<i>Protection (Unauthorised Discharges) Regulations 2004</i>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		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. <u>Impact</u>: Impacts to groundwater and surface water quality; contamination and ecosystem disruption. <u>Controls</u>: 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	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		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 (7.0×10^{-8} m/s to 1.0×10^{-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> <u>Consequence:</u> Minor	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<i>Likelihood: Rare</i> <i>Risk rating: Low</i> <u>Regulatory Controls:</u> 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 <i>Environmental Protection Act 1986</i> with respect to the causing of pollution and environmental harm apply, as does subsidiary legislation including the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>. Due to the low risk, management practices implemented on site and the separate regulatory requirements of MS824, no further regulatory controls are required. <u>Residual Risk:</u> <i>Consequence: Minor</i> <i>Likelihood: Rare</i> <i>Risk rating: Low</i>	
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 <u>Emission Description</u>	General provisions of the <i>Environmental Protection Act 1986</i>. Works Approval W5067/2011/1 Works Approval W5732/2014/1 Operational



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<i>Emission:</i> Dust and noise emissions from ore processing (crushing, screening, ore movement etc.) <i>Impact:</i> Reduction in human amenity. Impacts to vegetation by smothering with dust. <i>Controls:</i> • 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> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low	Procedure IR-OP-02 – Redundant Conditions (19 May 2016) <i>Environmental Protection (Noise) Regulation 1997</i>



DECISION TABLE												
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents									
		<u>Regulatory Controls</u> Fugitive dust emissions can be sufficiently regulated under section 49 of the <i>Environmental Protection Act 1986</i>. Noise emission can be sufficiently regulated under section 49 of the <i>Environmental Protection Act 1986</i> and the <i>Environmental Protection (Noise) Regulation 1997</i>. <u>Residual Risk</u> <i>Consequence</i>: Insignificant <i>Likelihood</i>: Rare <i>Risk Rating</i>: 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. <i>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.</i> <table><tr><th colspan="3">Table 1.3.6: Construction Requirements¹</th></tr><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.	Table 1.3.6: Construction Requirements ¹			Document	Parts	Date of Doc	Roy Hill Mine Operating Licence Amendment – Dewatering, Bulk Fuel, Bioremediation and Exploration Camp WWTP (OP-REP-00178)	All	22 February	
Table 1.3.6: Construction Requirements ¹												
Document	Parts	Date of Doc										
Roy Hill Mine Operating Licence Amendment – Dewatering, Bulk Fuel, Bioremediation and Exploration Camp WWTP (OP-REP-00178)	All	22 February										



DECISION TABLE			
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 suppress dust. Fugitive dust emissions can be sufficiently regulated under section 49 of the <i>Environmental Protection Act 1986</i> and Noise emissions can be sufficiently regulated under section 49 of the <i>Environmental Protection Act 1986</i> and the <i>Environmental Protection (Noise) Regulation 1997</i>.	



DECISION TABLE			
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 previous 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



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
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> <i>Emission:</i> Wastewater will be discharged from the WWTP to a dedicated spray irrigation field. <i>Impact:</i> Contaminates in wastewater may impact surrounding land or groundwater. <i>Controls:</i> • The WWTP has a design capacity for the daily treatment and disposal of 35 m³/day of effluent however is only expected to treat 6.25 m³/day; • The WWTP was originally designed to irrigate to a 4,500 m² spray field which has been increased to a 15,000 m² 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> <i>Consequence:</i> Minor <i>Likelihood:</i> Unlikely <i>Risk Rating:</i> Moderate	<i>Environmental Protection Act 1986.</i> Works Approval W5732/2014/1



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<u>Regulatory Controls</u> 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, <i>E.coli</i>, Total Nitrogen, Total Phosphorus, Total Suspended Solids, Biochemical Oxygen Demand, and continuous monitoring of the volumes discharged to the irrigation area. <u>Residual Risk</u> <i>Consequence</i>: Minor <i>Likelihood</i>: Unlikely <i>Risk Rating</i>: 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



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		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 <i>Environmental Protection Act 1986</i>
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)



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		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: <i>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.</i> <i>The written notification shall:</i> (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. <i>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.</i> This is now a requirement of new condition 1.3.16, with exception of the operation of	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		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 <i>Guidance Statement: Licence Duration</i> .	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	Comments 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 Petroleum (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