Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: Northern Star Resources Ltd

Licence: L6498/1995/11

Registered office: Level 1
388 Hay St
SUBIACO WA 6008

ACN: 092 832 892

Premises address: Jundee Operations
SHIRE OF WILUNA
WILUNA WA 6646
Mining tenements: G53/20, L53/52, L53/60, L53/68, L53/69, L53/70 - L53/73, L53/75, L53/99, L53/100, L53/102, L53/112, L53/113, L53/117, L53/136 - L53/138, L53/142, L53/143, L53/153, L53/169, L53/174, M53/155, M53/156, M53/182, M53/191, M53/192, M53/196 - M53/198, M53/199, M53/221, M53/226, M53/228 - M53/230, M53/235 - M53/237, M53/245 - M53/250, M53/326, M53/347, M53/372, M53/412 - M53/414, M53/441, M53/446, M53/451, M53/452, M53/461, M53/477 - M53/480, M53/492, M53/535 - M53/541, M53/552, M53/588, M53/589, M53/611, M53/707, M53/708, M53/711, M53/712, M53/836, M53/874, M53/895, M53/911, M53/929, M53/935, M53/940, M53/966, PL34 as depicted in Schedule 1.

Issue date: Thursday, 21 November 2013

Commencement date: Friday, 22 November 2013

Expiry date: Thursday, 21 November 2024

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
05	Processing or beneficiation of metallic or non-metallic ore	50 000 tonnes or more per year	3,000,000 tonnes per annual period
06	Mine dewatering	50 000 tonnes or more per year	3 000 000 tonnes per annual period
52	Electric power generation	10MW or more in aggregate (using a fuel other than natural gas)	42.21 MW
54	Sewage Facility	100 cubic metres or more per day	150m^3 per day
64	Class II or III Putrescible Landfill	20 tonnes or more per year	600 tonnes per annual
73	Bulk storage of chemicals	1000 cubic metres in aggregate	10 000m^3

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

Date signed: 4 August 2016
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Tim Gentle
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

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 works with the business owners, community, consultants, industry and other representatives 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

Jundee Operations (Jundee) is an operational gold mine recently acquired by Northern Star Resources from Newmont Asia Pacific. The Jundee Process Plant is currently fed with ore from three underground mines. Surface mining was suspended indefinitely in 2007, following depletion of viable surface stocks.

Jundee is located approximately 55 km north-east of the township of Wiluna and is situated on the Jundee, Lake Violet and Millrose Pastoral Leases. Land use in the Jundee area is a mixture of mining and pastoral enterprise. The major pastoral properties with a direct relationship are Barwidgee/Yandal, Millrose, Lake Violet and Jundee stations. Northern Star is the leaseholder of Jundee which continues to be sublet to Millrose Station.

Jundee comprises two historically separate operations called Jundee and Nimary. Following aggregation of the operations, the Nimary processing site was decommissioned in 2007 with final rehabilitation completed in 2010.

In 1995 a Notice of Intent was lodged with the Department of Mines for the Nimary Gold Project, on behalf of the Wiluna Joint Venture, headed by majority shareholder Eagle Mining Pty Ltd. The Nimary Gold Project comprised the Nim 1, Nim 2, Nim 3 and Nim 4 open pits.

Also in 1995, the adjacent Jundee Operations was commissioned by Great Central Mines Pty Ltd (GCM). Nimary and Jundee were immediate neighbours, separated by a tenement boundary with different owners. Two mills were constructed, one at Nimary and one at Jundee. In 1997 GCM acquired the Eagle/Nimary leases incorporating Nimary and Jundee as one operation.

In April 2000, GCM was acquired by Normandy Mining Limited (Normandy). In February 2002, Newmont Yandal Pty Ltd acquired Normandy. In July 2015 the site was acquired by Northern Star Resources. Currently the premises has a nominal rated throughput covered by the licence to process 3 000 000 tonnes of ore per annum. Processing of ore is through the Carbon in Pulp (CIP) and Carbon in Leach (CIL) process, with tailings disposal to Tailings Storage Facility (TSF) 2 and Fisher In-pit TSF. Underground mining commenced in 2007.

TSF1 was commissioned in October 1995 and was in operation until November 1999. Construction of TSF 2 commenced in February 1999 and was completed in June 1999. Deposition commenced into TSF 2 in November 1999 and this facility was used on a continuous basis until August 2004. TSF 2 has been used on a rotational basis since the commissioning of the Fisher In-pit TSF in August 2004. Fisher In-pit TSF was used continuously until October 2007. Tailings deposition is now cycled between the Fisher Pit and TSF 2 with the aim of optimising water return by depositing into the Fisher Pit in the hotter summer months to help improve water recoveries.

The licence allows for the following activities at the Jundee Operations:

- Carbon in pulp (CIP) and carbon in leach (CIL) process plant and associated infrastructure;
- Tailings disposal into Tailings Storage Facilities (TSFs): TSF 2 and Fisher In-pit TSF.
- A bioremediation facility which utilises treated wastewater from the sewage treatment facility and may be used for the disposal and treatment of hydrocarbon contaminated soils and oily water removed from the minesite
- Decommissioned TSF 1 for the treatment of contaminated soils and materials including sewage water
- Electrical power is generated on-site using six 2.2 MW gas engine generators, two 950kW gas engine generators, two 730 kW gas engine generators, one 900kW diesel engine generator and six 750 kW diesel engine generators. Additionally, three 750 kW diesel engine generators are at Nimary.

September 2015 Amendment

This Licence is the result of an amendment sought by the Licensee to alter the freeboard limit for the Fisher In-pit TSF. It also includes a transfer of ownership and a conversion to a current format licence.

August 2016 Amendment

This amendment authorises the construction of 6 gas generators and associated infrastructure as to increase the installed capacity of the power station at Jundee to 42.2 MW.

A 1.5 MW waste heat recovery unit will also be installed which captures waste heat from the new gas generators' exhaust gases and converts it to steam, using a thermal fluid heat transfer.

Three redundant groundwater bores have also been removed from the monitoring requirement in Table 3.3.1. General conditions found to be inconsistent with DER's *Guidance Statement: Setting Conditions, October 2015* have also been removed from the Licence. The due dates for the improvement requirements under condition 4.1.1 have also been revised.

The licences and works approvals issued for the Premises since 05/02/2001 are:

Instrument log		
Instrument	**Issued**	**Description**
L6498/1995/4	05/02/2001	Licence re-issue
L6498/1995/5	28/12/2001	Licence re-issue
L6498/1995/6	28/12/2002	Licence re-issue
L6498/1995/7	28/12/2003	Licence re-issue
L6498/1995/8	28/12/2003	Licence re-issue
L6498/1995/9	22/11/2004	Licence re-issue
L6498/1995/10	22/11/2010	Licence re-issue
W5164/2012/1	25/06/2012	Works approval for Stage 6 embankment raise of 2m on TSF 2 (includes condition to develop a Groundwater Recovery and Seepage Management plan)
L6498/1995/11	22/11/2013	Licence re-issue
W5744/2014/1	22/12/2014	Works approval for Stage 7 embankment raise of 2m on TSF 2
L6498/1995/11	17/09/2015	Licence amendment to current format, including transfer of ownership
L6498/1995/11	04/08/2016	Licence amendment to increase capacity of power station by to 42.2 MW.

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;

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

'AS 4323.1' means the Australian Standard AS4323.1 *Stationary Source Emissions Method 1: Selection of sampling positions;*

'**AS 4482.1**' means the Australian Standard AS4482.1 2005 *Guide to the investigation and sampling of sites with potentially contaminated soil; Part 1: Non-volatile and semi-volatile compounds*;

'**AS 4482.2**' means the Australian Standard AS4482.2 1999 *Guide to the sampling and investigation of potentially contaminated soil; Part 2: Volatile substances*;

'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 5667.10' 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 or target is measured or a monitoring result is obtained;

'bioremediation' means the above-ground remediation of soils to reduce the concentrations of hydrocarbons through biodegradation. The process involves the stimulation of bacteria in the soil, which consume hydrocarbons as an energy source, releasing water and carbon dioxide as the ultimate breakdown products. This may include bioaugmentation of microbes to target specific contaminants;

'CEMS' means continuous emissions monitoring system;

'CEMS Code' means the current version of the Continuous Emission Monitoring System (CEMS) Code for Stationary Source Air Emissions, Department of Environment & Conservation, Government of Western Australia;

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

'CEO' for the purpose of correspondence means;
Chief Executive Officer
Department Administering the Environmental Protection Act 1986
Locked Bag 33

CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au

'freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

'hardstand' means a surface with a permeability of 10^{-9} metres/second or less;

'Licence' means this Licence numbered L6498/1995/11 and issued under the Act;

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

'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;

'normal operating conditions' means any operation of a particular process (including abatement equipment) excluding start-up, shut-down and upset conditions, in relation to stack sampling or monitoring;

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

'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 the same year;

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

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

'six monthly' means the 2 inclusive periods from 1 January to 30 June and 1 July to 31 December in the same year;

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

'SWL' means Standing Water Level;

'TSF' means an engineered containment pond or dam used to store tailings;

'USEPA' means United States (of America) Environmental Protection Agency;

'USEPA Method 2' means United States (of America) Environmental Protection Agency Method 2 – *Determination of stack gas velocity and volumetric flow*;

'USEPA Method 7E' means United States (of America) Environmental Protection Agency Method 7E – *Determination of nitrogen oxides emissions from stationary sources;*

'USEPA Method 10' means United States (of America) Environmental Protection Agency Method 10 – *Determination of carbon monoxide emissions from stationary sources;*

'µS/cm' means microsiemens per centimetre; and

'zone of influence' means the area of a receiving environment with the potential to be altered or changed as a result of an emission or discharge.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the 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 Premises operation

1.2.1 The Licensee shall ensure that all pipelines containing saline, alkaline or cyanide constituents are either:
(a) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections; and/ or
(b) equipped with automatic cut-outs in the event of a pipe failure; and/or
(c) shall install telemetry systems and pressure sensors along pipelines carrying saline, alkaline or cyanide constituents to allow the detection of leaks and failures.

1.2.2 The Licensee shall ensure that waste material is only stored and/or treated within vessels or compounds provided with infrastructure requirements and at the locations specified in Table 1.2.1.

Table 1.2.1: Containment infrastructure

Storage vessel or compound	Material	Infrastructure requirements
TSF 2	Tailings	Clay lined
Fisher In-pit TSF	Tailings	Maintain a minimum 1 m height perimeter earthen bund surrounding the Fisher In-pit TSF.
TSF 1	Tailings; Hydrocarbon contaminated soils and materials; Sewage water	Facility currently inactive except for receipt of hydrocarbon contaminated soils and sewage wastewater.
Nimary TSF	Tailings	N/A - Decommissioned
Bioremediation treatment cells	Hydrocarbon contaminated soil	Clay lined (or equivalent) with a permeability of 10^{-9} m/s or less. All leachate runoff is directed to, and contained within, an impermeable leachate collection sump with capacity to contain an 1 in 100 year, 72 hour duration rainfall event. The leachate collection sump is lined in accordance with Water Quality Protection Note 27, Liners for containing pollutants, using engineered soils, June 2010 or Water Quality Protection Note 26, Liners for containing pollutants, using synthetic membranes, February 2009.
Barton Level 4 Clean Water Dam	Mine dewater	Ingress pond located underground. No liner.
Bulk diesel storage facility (BDSF) Turkey's Nest	Treated water from oil water separator at BDSF	HDPE liner
TSF 2 Return Water Dam	Tailings Decant Water	HDPE liner
R2D2 Seepage Return Water Dam	Seepage groundwater recovered near TSF2	HDPE liner
R1D1 Seepage Return Water Dam	Seepage groundwater recovered near TSF1	HDPE liner
WWTP Tanks	Wastewater undergoing treatment	None specified
Effluent Storage Ponds	Wastewater	None specified
WWTP Sewage Sludge Drying Beds	Sewage sludge	A bunded hardstand area capable of preventing surface run-off of leachate and sludge

1.2.3 The Licensee shall manage the effluent storage ponds in Table 1.2.1 in a manner such that:
(a) Uncontaminated stormwater runoff resulting from roof and site drainage does not cause erosion of outer pond embankments; and
(b) Vegetation (emergent or otherwise) shall be prevented from growing in the pond wastewaters or on the inner pond embankments of all ponds.

1.2.4 The Licensee shall maintain the following freeboards:

Table 1.2.2: Freeboard requirements

Storage vessel or compound	Freeboard requirements
TSF 2	Minimum vertical freeboard of 500mm or equivalent to contain a 1 in 100 year rainfall event over 72 hours (whichever is greater) from the operational pond to lowest elevation of perimeter embankment.
Fisher In-pit TSF	Maintain a minimum top of embankment/ operational freeboard of 300mm.
TSF 1	Facility currently inactive.
Bioremediation treatment cells leachate collection sump	Capacity to contain an 1 in 100 year, 72 hour duration rainfall event
TSF 2 Return Water Dam	Minimum vertical freeboard of 300mm
Bulk diesel storage facility (BDSF) Turkey's Nest	Minimum vertical freeboard of 300mm
WWTP Tanks	None specified
Effluent Storage Ponds	Minimum vertical freeboard of 300mm

1.2.5 The Licensee shall:
(a) undertake inspections as detailed in Table 1.2.3;
(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 1.2.3: Inspection of infrastructure

Scope of inspection	Type of inspection	Frequency of inspection
Tailings pipelines	Visual integrity	Twice every 12 hours
Return water lines	Visual integrity	Twice every 12 hours
Embankment freeboard	Visual to confirm required freeboard capacity is available	Twice every 12 hours
Borefield pipelines and pump stations	Visual	Three times per week
Fisher In-pit TSF operating level/capacity	Survey	Annual

1.2.6 The Licensee shall ensure that where wastes produced on the Premises are not taken off-site for lawful use or disposal, they are managed in accordance with the requirements in Table 1.2.4.

Table 1.2.4 Management of waste

Waste type	Management strategy	Requirements

Sewage	Biological, physical and chemical treatment	Maximum of 150 m^3/day cumulatively
Sewage sludge	Drying and storage	Dispose of sludge solids and other residuals in accordance with the *Western Australian guidelines for direct land application of biosolids and biosolid products*, February 2002
Hydrocarbon contaminated waste	Bioremediation	Ensure soil is bioremediated by maintaining a suitable soil thickness, maintaining an appropriate moisture content and nutrient level within the soil which sustains biological activity; and at least monthly soil aeration when facility is in use.
Inert Waste Type 1 & 2 Putrescible Waste Clean Fill Other waste that meets the acceptance criteria for Class II landfills	Receipt, handling and disposal of waste by landfilling	<u>All waste types</u> No more than 600 tonnes per year of all waste types cumulatively shall be disposed of by landfilling. Disposal of waste by landfilling shall only take place within the landfill areas shown on the Emission Maps in Schedule 1; Waste shall be placed in a defined trench or within an area enclosed by earthen bunds; and The active tipping area shall be restricted to a maximum linear length of 30 metres. Construction, operation and decommissioning of landfill cells can occur within the defined landfill area providing there is no waste within: 100 m of any surface water body; and 3 m of the highest level of the water table aquifer. Waste shall not be burned within the trench or within the areas enclosed by earth bunds Fires within the defined trench or within the areas enclosed by earth bunds shall be extinguished as soon as practicable, upon becoming aware of the fire
Waste lubricants, hydraulic fluids	Disposal	Collect in holding tanks for recycling and disposal off-site
Waste radiator coolant/inhibitors	Disposal/re-use	Collect spent radiator coolant/inhibitors in holding tanks for subsequent disposal off-site or for use within the mine site for dust suppression.

Note 1: Requirements for landfilling tyres are set out in Part 6 of the Environmental Protection Regulations1987.

1.2.7 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.2.5 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.2.5: Cover requirements [1]

Waste Type	Material	Depth	Timescales
Putrescible waste	Inert and incombustible material	300mm	As soon as practicable, but at least weekly, after deposit
All waste		1000mm	Within three months of the final waste load in each trench
Inert Waste Type 2 (Tyres)	Inert and incombustible material	500mm	As soon as practical following the achievement of final waste levels in the area(s) where tyres are disposed of

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

1.2.8 The Licensee shall take all reasonable and practical measures to ensure that no windblown waste escapes from the landfill area and that windblown waste is collected on at least a monthly basis and returned to the active tipping area.

1.2.9 The Licensee shall construct the works to install the 6 new gas generators, waste heat recovery unit and associated infrastructure in accordance with the documentation detailed in Table 1.2.6:

1.2.6: Construction Requirements[1]		
Document	**Parts**	**Date of Document**
Zenith Pacific Pty Ltd (2016) Jundee Gold Mine, Power Station Project , Facility Description, Document No: JU004 –DOC-001 The power station works comprise: • 6 x 11kV gas generators and auxiliaries • HV switchboard (10 tier) • 6 x Generator control panels • 415V MCC • 11kV/41V auxiliary transformer • 6 x cooling system radiators • 10 000 L lube oil tank • Gas power station building – 35m x 18m • Switch room comprising HV room/LV room and office	All	9 May 2016
1.5 MW Waste heat recovery system as detailed in the file note 'Jundee Heat to Power Plant – Process Description' by Jacques F.Gouws The waste heat recovery system comprises: • Exhaust collector system with a main exhaust dust that connects to each of the six generators, pressure sensors and temperature monitors • Exhaust heat exchanger module that has temperature monitoring on all streams entering and leaving the unit, whilst the thermal fluids pressure is monitored • Exhaust collector skid with a blower, valve manifold and remote control system elements • Thermal governing skid comprising control system, pumps, expansion vessel and water treatment devices • Wet steam cycle module comprising an evaporator, Lysholm expander, pump, control system • Organic rankin cycle module comprising two evaporators, Lysholm expander, pump, control system • Cooling system comprising cooling tower, pump and dosing unit.	All	20 July 2016

Note 1: Where the details and commitments of the documents listed in condition 1.2.9 are inconsistent with any other condition of this Licence, the conditions of this Licence shall prevail.

2 Emissions

2.1 General

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

2.2 Point source emissions to air

2.2.1 The Licensee is permitted, subject to conditions in the Licence, to emit waste to the atmosphere from the emissions points listed in Table 2.2.1 and identified in the Map of emission points, Figure 4 in Schedule 1.

Table 2.2.1: Emission points to air			
Emission point reference and location on Figure 4	**Emission point**	**Emission point height (m)**	**Source including abatement**
A1	Gold Room Exhaust	20	Gold Room
A2	Carbon Regeneration Kiln Stack	8	Carbon Regeneration Kiln

A3	Gas Generator	10	Gas fired genset
A4	Gas Generator	10	Gas fired genset
A5	Gas Generator	10	Gas fired genset
A6	Gas Generator	10	Gas fired genset
A7	Gas Generator	10	Gas fired genset
A8	Gas Generator	10	Gas fired genset
A9	Gas Generator	8	Gas fired genset
A10	Gas Generator	10	Gas fired genset
A11	Diesel Generator	8	Diesel generator
A12	Diesel Generator	8	Diesel generator
A13	Diesel Generator	8	Diesel generator
A14	Diesel Generator	8	Diesel generator
A15	Diesel Generator	8	Diesel generator
A16	Diesel Generator	8	Diesel generator
A17	Gas Generator	5.2	Gas fired genset
A18	Gas Generator	5.2	Gas fired genset
A19	Gas Generator	7.5	Gas fired genset Jenbacher JGS 620
A20	Gas Generator	7.5	Gas fired genset Jenbacher JGS 620
A21	Gas Generator	7.5	Gas fired genset Jenbacher JGS 620
A22	Gas Generator	7.5	Gas fired genset Jenbacher JGS 620
A23	Gas Generator	7.5	Gas fired genset Jenbacher JGS 620
A24	Gas Generator	7.5	Gas fired genset Jenbacher JGS 620
A25	Exhaust heat exchanger stack	8	Waste heat recovery exhaust heat exchanger

2.3 Point source emissions to groundwater

2.3.1 The Licensee is permitted to discharge 3 000 000 tonnes of mine dewater to the main pit, location as identified in Schedule 1, Map of emission points, Figure 5 .

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;
(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
(c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
(d) all soil sampling is conducted in accordance with AS 4482.1 and AS 4482.2 as relevant; and
(e) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured (unless indicated otherwise in the relevant table).

3.1.2 The Licensee shall ensure that :
(a) monthly monitoring is undertaken at least 15 days apart;
(b) quarterly monitoring is undertaken at least 45 days apart;
(c) six monthly monitoring is undertaken at least 5 months apart; and
(d) annual monitoring is undertaken at least 9 months 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 and the requirements of the Licence.

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 air

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 air

Emission point reference	Parameter	Units[1]	Frequency[2]	Method
New Gas Gensets	Volumetric flow rate	m^3/s	n/a	USEPA Method 2
	Oxides of nitrogen (NOx)	mg/m^3	Quarterly for first 12 months of operation	Modified USEPA Method 7E
	Carbon monoxide (CO)			Modified USEPA Method 10

Note 1: All units are referenced to STP dry
Note 2: Monitoring shall be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production.

3.2.2 The Licensee shall ensure that sampling required under Condition 3.2.1 of the Licence is undertaken at sampling locations in accordance with the AS 4323.1 or relevant part of the CEMS Code.

3.2.3 The Licensee shall ensure that all non-continuous sampling and analysis undertaken pursuant to condition 3.2.1 is undertaken by a holder of NATA accreditation for the relevant methods of sampling and analysis.

3.3 Monitoring of inputs and outputs

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 inputs and outputs

Input/Output	Parameter	Units	Averaging period	Frequency
Tailings deposition	Volume of tailings deposited to TSF2 and Fisher In-pit TSF	m^3	Monthly	Cumulative monthly total
	Volume of tailings supernatant liquor returned to process plant from TSFs			
	Volume of seepage recovered			
Mine dewater discharged to dam/pit	Volume	m^3	Monthly	Cumulative monthly total
Barton level 4 Clean Dam	pH	-	Spot sample	Quarterly
	Total dissolved solids	mg/L		
	Total recordable hydrocarbons	mg/L		
	Total phosphorus, total nitrogen	mg/L		
	Sodium, potassium, calcium, magnesium, chloride, carbonate, bicarbonate, sulfate, nitrate, fluoride, silica	mg/L		
	Aluminium, arsenic, boron, cadmium, iron, mercury, nickel, lead, zinc	mg/L		
Main pit receiving water body	pH	-	Spot sample	Quarterly
	Total dissolved solids	mg/L		
	Total recoverable hydrocarbons	mg/L		
	Total phosphorus, total nitrogen	mg/L		
	Sodium, potassium, calcium, magnesium, chloride, carbonate, bicarbonate, sulfate, nitrate, fluoride, silica	mg/L		
	Aluminium, arsenic, boron, cadmium, iron, mercury, nickel, lead, zinc	mg/L		

3.4 Ambient environmental quality monitoring

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 and Table 3.4.2 according to the specifications in those tables and record and investigate results that do not meet any limit specified.

Table 3.4.1: Monitoring of ambient groundwater quality[3]

Monitoring point reference and location	Parameter	Limit	Units	Averaging period	Frequency
Jundee (TSF 1 & 2) Recovery Bores					
JRB01, JRB02, JRB03, JRB05, JRB06, JRB07, JRB08, JRB09, JRB10, JRB11, JRB12, JRB13, JRB14, JRB15	SWL[1]	-	m(AHD)	Spot sample	Monthly
Jundee (TSF 1 & 2) Seepage Indication Bores					
JMB17, JMB01-D, JMB04-D, JMB07-D, JMB08-D, JMB09-D, JMB10-S, JMB10-D, JMB14-D, JMB15-D, JMB16-D	SWL[1]	-	m(AHD)	Spot sample	Quarterly
Jundee (TSF 1 & 2) Compliance Bores					
JMB05-S, JMB05-D, JMB06-S, JMB06-D, JMB23A, JMB24	SWL[1]	-	mbgl	Spot sample	Quarterly
JMB11-S, JMB11-D, JMB19, JMB20		>1			
JMB12-S, JMB12-D, JMB13-S, JMB13-D, JMB25, JMB26, JMB27, JMB28, JMB29		>1			
JMB05-D, JMB06-D, JMB11-D, JMB12-D, JMB13-D, JMB19, JMB20, JMB21, JMB22, JMB23A, JMB24, JMB25, JMB26, JMB27, JMB28, JMB29	pH[2]	6.0 - 9.0	-		
	Total dissolved solids[2]	<14 000	mg/L		
	Weak Acid Dissociable Cyanide (WAD CN)	<0.5	mg/L		
	Dissolved metals – As, Cd, Cu, Hg, Ni, Pb, Zn	-	mg/L		
Fisher In-Pit TSF Monitoring Bores					
FMB04, FMB05, FMB09, FMB10, FMB11	SWL[1]	-	m(AHD)	Spot sample	Quarterly
	pH[2]	-	-		
	Total dissolved solids[2]	-	mg/L		
	Weak Acid Dissociable Cyanide (WAD CN)	-	mg/L		
	Dissolved metals – As, Cd, Cu, Hg, Ni, Pb, Zn	-	mg/L		
FMB12	SWL[1]	-	m(AHD)	Spot sample	Quarterly
Fisher In-Pit TSF Seepage Recovery Bores					
FRB01, FRB04, FRB05	SWL[1]	-	m(AHD)	Spot sample	Quarterly
Nimary TSF Seepage Indication Bores					
NMB01-D, NMB02-D, NMB03-D	SWL[1]	-	m(AHD)	Spot sample	Annually
Nimary TSF Compliance Bores					
NMB04-D, NMB07-D, NMB08-D, NMB09-D, NMB10-D,	SWL[1]	-	m(AHD)	Spot sample	Annually
	pH[2]	6.0 - 9.0	-		

NMB10-S	Total dissolved solids[2]	<14 000	mg/L		
	Weak Acid Dissociable Cyanide (WAD CN)	<0.5	mg/L		
	Dissolved metals – As, Cd, Cu, Hg, Ni, Pb, Zn	-	mg/L		
Bioremediation Landfarm					
JHMB01, JHMB02, JHMB03	TRH	-	mg/L	Spot sample	Annually

Note 1: SWL shall be determined prior to collection of other water samples.
Note 2: Non-NATA in field measurement of pH and TDS permitted.
Note 3: A minimum of 90% of all bores listed in Table 3.3.1 will be sampled during any quarterly period to allow for maintenance and operational constraints.

Table 3.4.2: Monitoring of ambient soil quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Landfarm	TRH	mg/kg	Spot sample	Six monthly
TSF 1	TRH	mg/kg	Spot sample	Six monthly

4 Improvements

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

Table 4.1.1: Improvement program

Improvement reference	Improvement	Date of completion
IR1	The Licensee shall, prior to commencing commissioning of gas generators and waste heat recovery unit, submit a commissioning plan to the CEO. The commissioning plan shall include details relating to: (a) the commissioning stages and expected timescales for commissioning; (b) expected emissions and discharges during commissioning and the environmental implications of the emissions; (c) how emissions and discharges will be managed during commissioning; (d) the monitoring that will be undertaken during the commissioning period including monitoring to verify the operational performance of the new generators; (e) how accidents or malfunctions will be managed; (f) start up and shut down procedures; and (g) reporting accidents, malfunctions and proposals in the commissioning plan Commissioning shall be carried out in accordance with the commissioning plan.	At least two weeks prior to commencement of commissioning
IR2	The Licensee shall complete a water quality monitoring program to test the concentration of selenium in mine dewater at the Barton Level 4 clean dam and in the main pit receiving water body (locations as listed in Table 3.3.1).	01/03/16
IR3	The Licensee shall complete a water quality monitoring program to test the concentration of selenium in groundwater for all Jundee Compliance bores, Nimary Compliance bores and Fisher In-Pit Monitoring Bores as listed in Table 3.4.1.	01/03/16
IR4	The Licensee shall submit to the CEO a report detailing the results of the monitoring programs as listed in IR2 and IR3. The report can be as one submission or individual submissions to address IR2 and IR3.	30/11/16

5 Information

5.1 Records

5.1.1 All information and records required by the 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 5.1.1(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 and any subsequent licence:
  - (i) off-site environmental effects; or
  - (ii) matters which affect the condition of the land or waters.

5.1.2 The Licensee shall ensure that:
- (a) any person left in charge of the Premises is aware of the conditions of the Licence and has access at all times to the Licence or copies thereof; and
- (b) any person who performs tasks on the Premises is informed of all of the conditions of the Licence that relate to the tasks which that person is performing.

5.1.3 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.

5.1.4 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.

5.2 Reporting

5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report by 31 March in each year, after the end of the annual period 1 January to 31 December. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: Annual Environmental Report

Condition or table (if relevant)	Parameter	Format or form[1]
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
Table 3.2.1	Stack testing results of emissions from new gas generators	None specified
Table 3.3.1	Volumes of tailings deposited, supernatant liquor returned to process plant and seepage water recovered. Volume of mine dewater discharge and surface water parameters	None specified
Tables 3.4.1 – 3.4.2	Groundwater quality parameters Soil quality sampling	None specified
5.1.3	Compliance	Annual Audit Compliance Report (AACR)
5.1.4	Complaints summary	None specified

Note 1: Forms are in Schedule 2

5.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:
(a) any relevant process, production or operational data recorded under Condition 3.1.3; and
(b) an assessment of the information contained within the report against previous monitoring results and Licence limits and/or targets

5.2.3 The Licensee shall submit the information in Table 5.2.2 to the CEO according to the specifications in that table.

Table 5.2.2: Non-annual reporting requirements

Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form[1]
-	Copies of original monitoring reports submitted to the Licensee by third parties	Not Applicable	Within 14 days of the CEOs request	As received by the Licensee from third parties
Table 4.1.1	Reports as required by IR1 and IR4.	Not Applicable	As per Table 4.1.1	Form A1 and/or as received by the Licensee from third parties

Note 1: Forms are in Schedule 2

5.2.4 The Licensee shall submit a compliance document to the CEO, following the construction of the power station upgrade works and prior to commissioning of the same.

5.2.5 The compliance document shall:
(a) certify that the works were constructed in accordance with the conditions of the Licence;
(b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.

5.2.6 The Licensee shall submit a commissioning report for the new gas generators, to the CEO within 3 months of the completion of commissioning.

5.2.7 The Licensee shall ensure the report includes:

(a) a summary of the monitoring results recorded under condition 4.1.1;
(b) a list of any original monitoring reports submitted to the Licensee from third parties for the commissioning period;
(c) a summary of the environmental performance of the gas generators as installed, against the design specification set out in the works approval application;
(d) a review of performance against the works approval conditions; and
(e) where they have not been met, measures proposed to meet the design specification and/or works approval conditions, together with timescales for implementing the proposed measures.

5.3 Notification

5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the CEO in accordance with the notification requirements of the table.

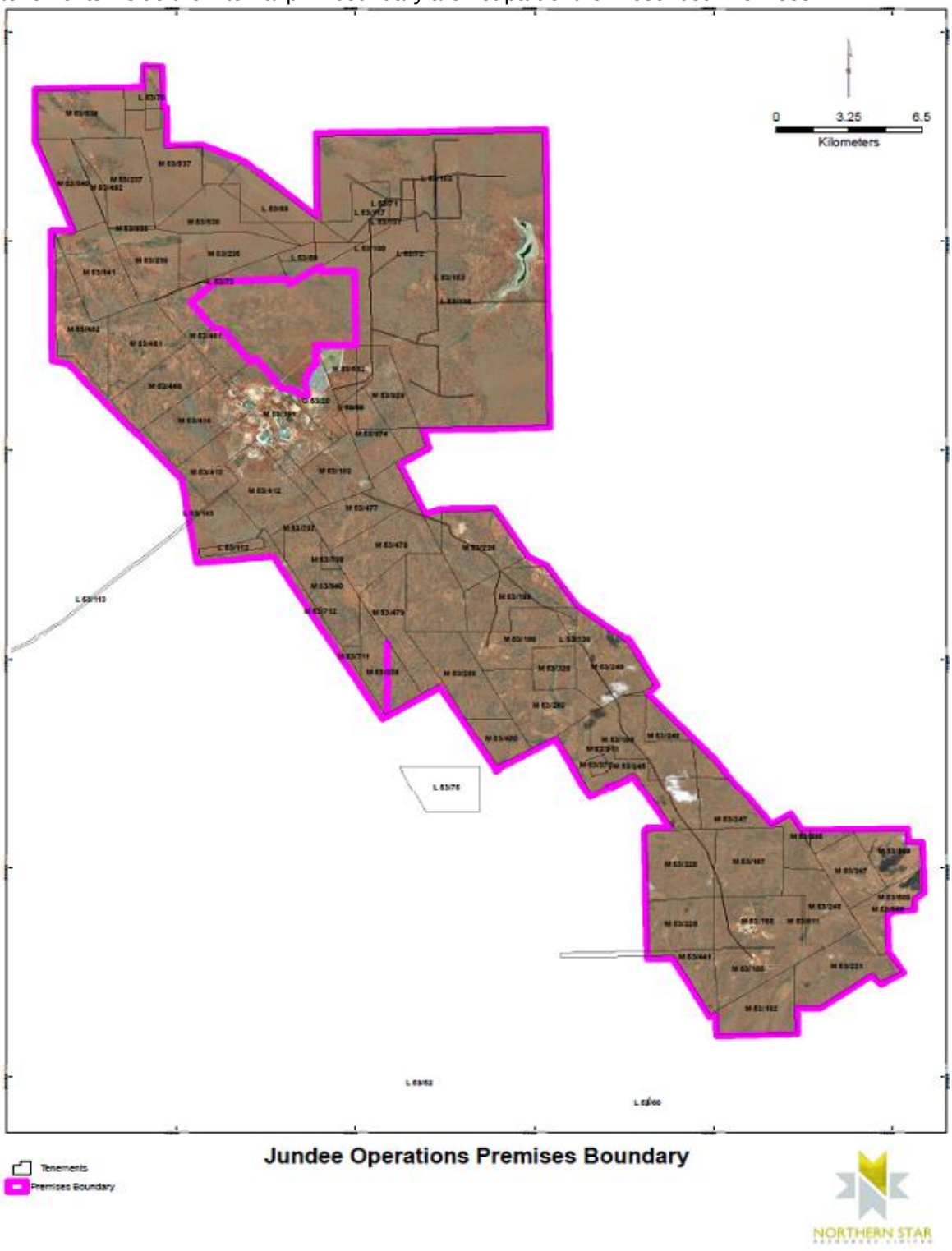
Table 5.3.1: Notification requirements			
Condition or table (if relevant)	**Parameter**	**Notification requirement**	**Format or form[1]**
2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
3.1.4	Calibration report	As soon as practicable.	None specified
3.4.1	Exceedance of the groundwater limits specified in Table 3.4.1.	Within 21 days of becoming aware of the results.	N1

Note 1: Forms are in Schedule 2

Schedule 1: Maps

Premises map

Figure 1: Prescribed Premises Boundary - Jundee Operations.
The Premises is shown in the map below. The pink line depicts the Premises boundary. Mining tenements inside the internal pink boundary are not part of the Prescribed Premises.



Map of storage locations

Figure 2: Location of Jundee Operations' containment infrastructure.
The locations of the storage areas defined in Table 1.3.1 are shown below.

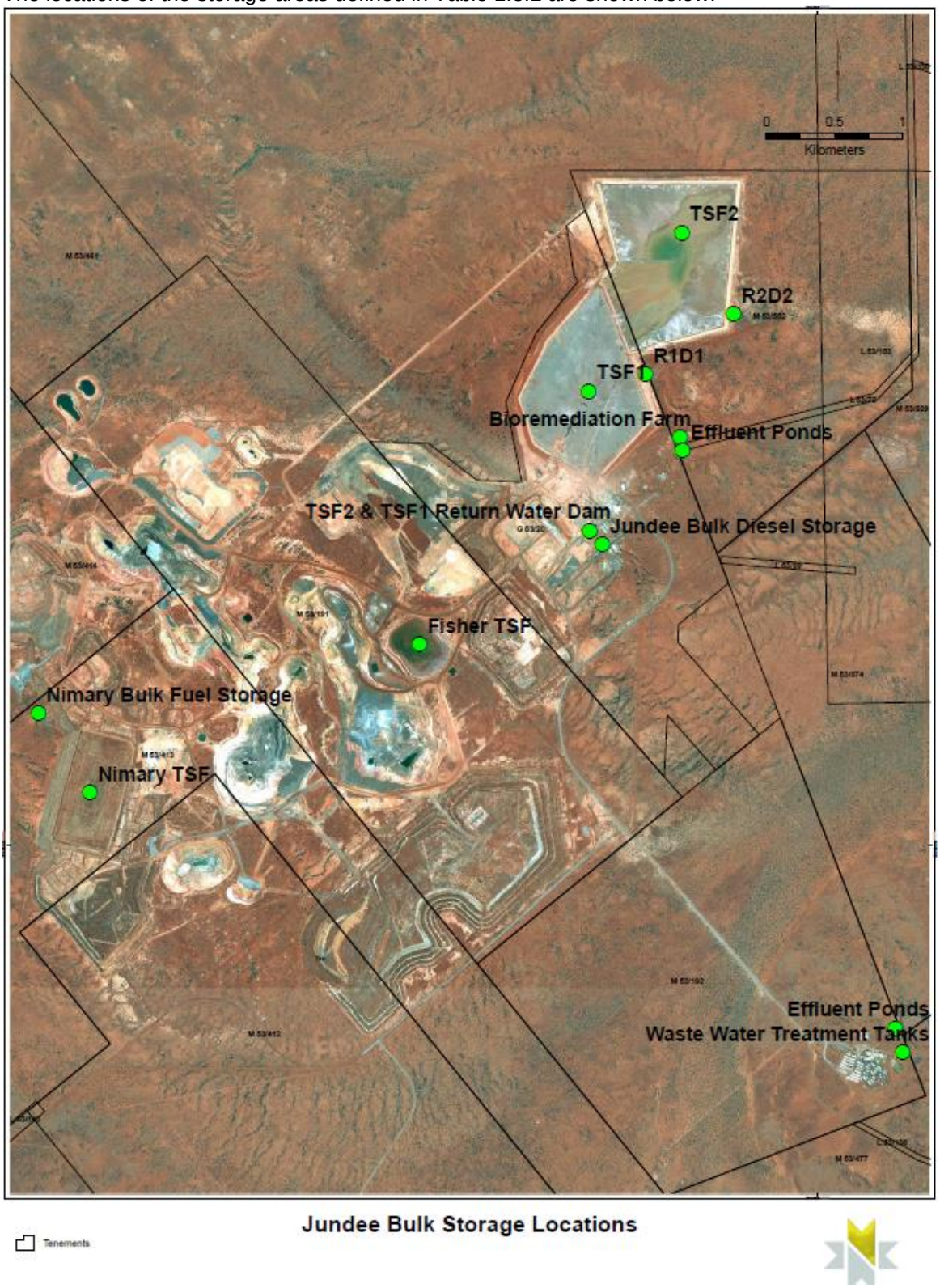


Figure 3: Location of containment infrastructure at Jundee Village. (These village storages are also shown on previous Figure 2).

Map of emission points

Figure 4: Map showing Jundee Emission Points to Air.
The locations of the emission points defined in Table 2.2.1 is shown below.

Figure 5: Mine dewater discharge point. (Barton Level 4 dam not shown as it is in the Underground Mine.)
The location of the emission point in condition 2.3.1 and monitoring point for Table 3.2.1) is shown below.

Map of monitoring locations

Figure 6: TSF1 and TSF 2 groundwater monitoring bores location, also including location of the Bioremediation Landfarm.
The locations of the monitoring points defined in Tables 3.2.1 and 3.2.2 are shown below.

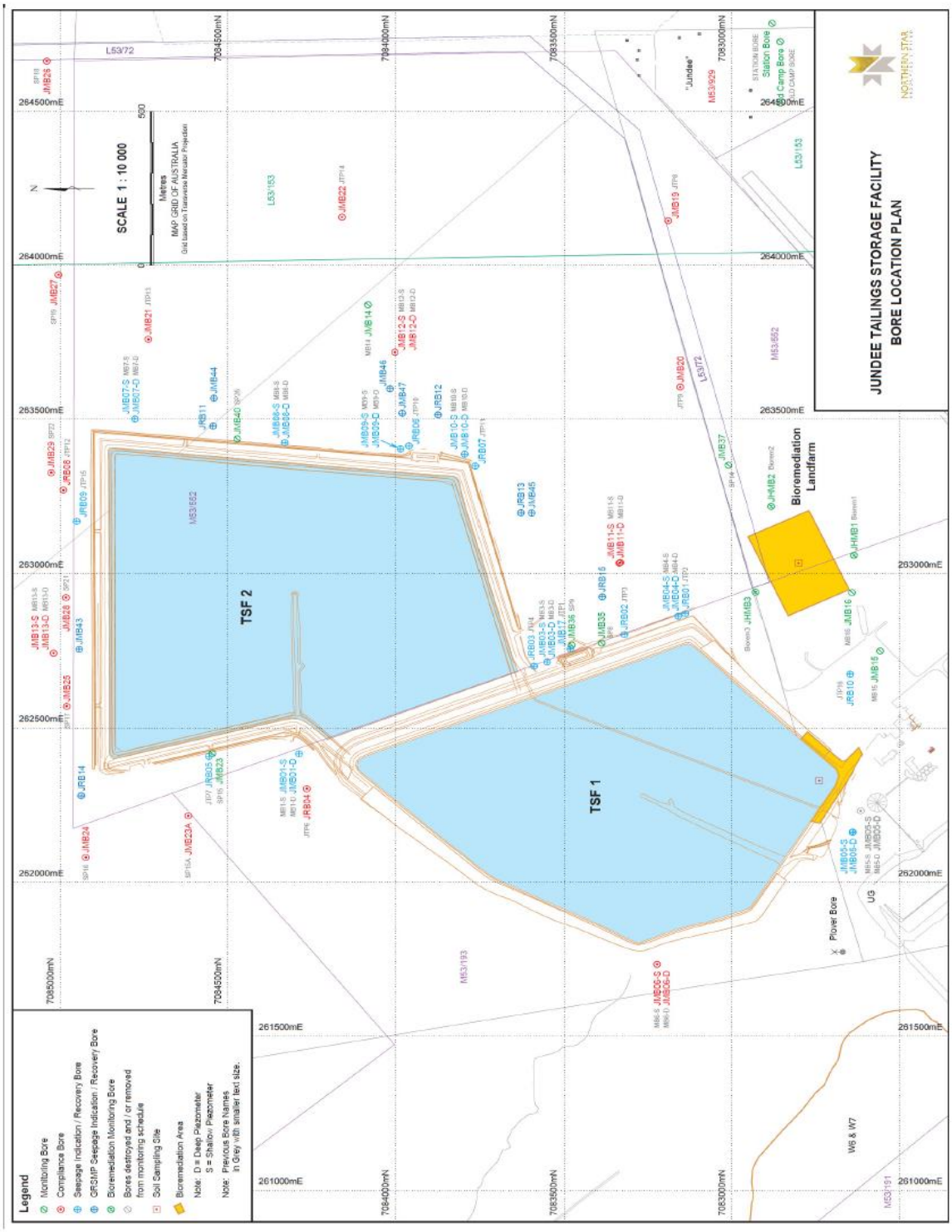


Figure 7: Fisher In-pit TSF groundwater monitoring bores' location.
The locations of the monitoring points defined in Table 3.2.1 are shown below.

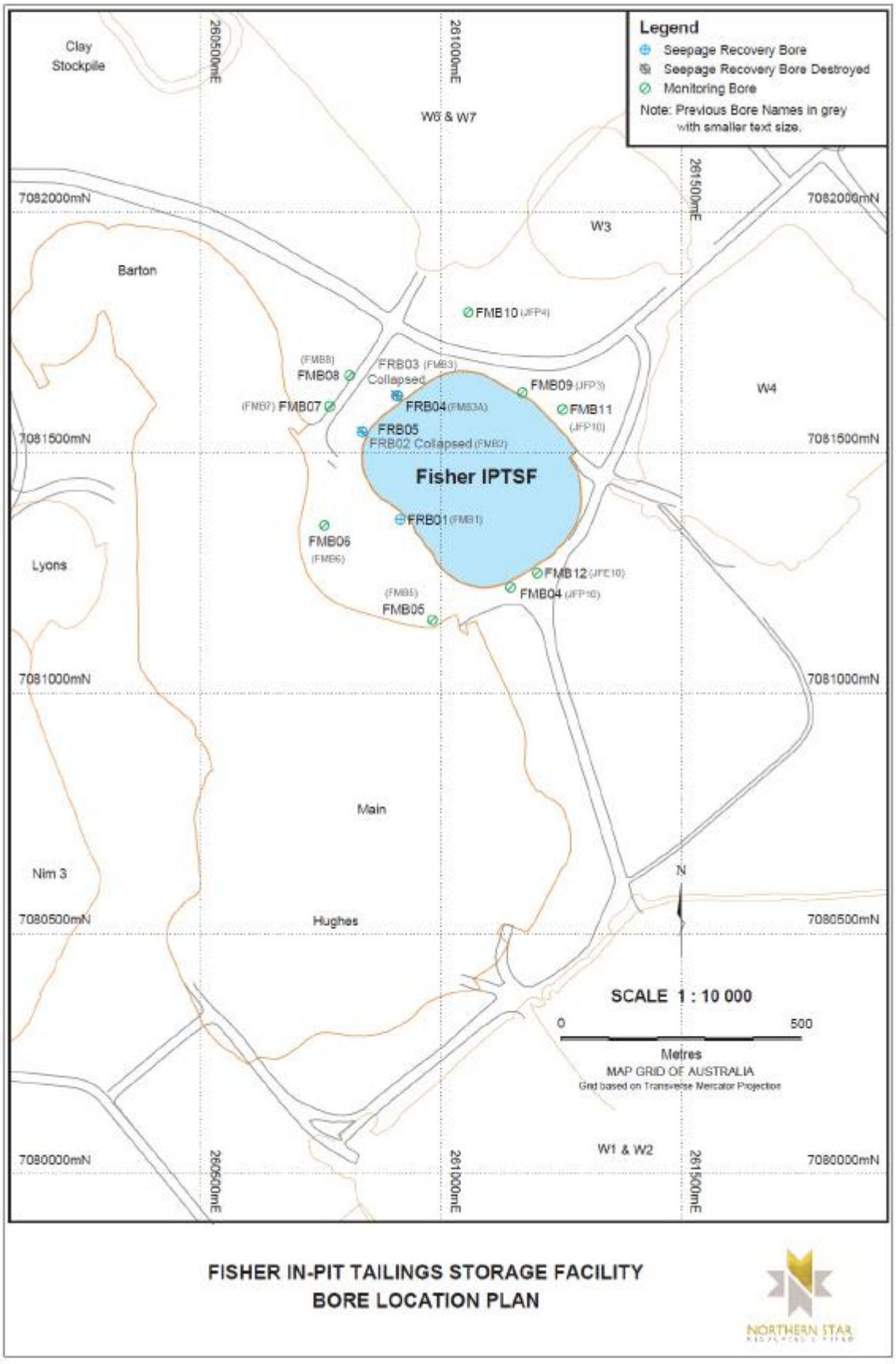
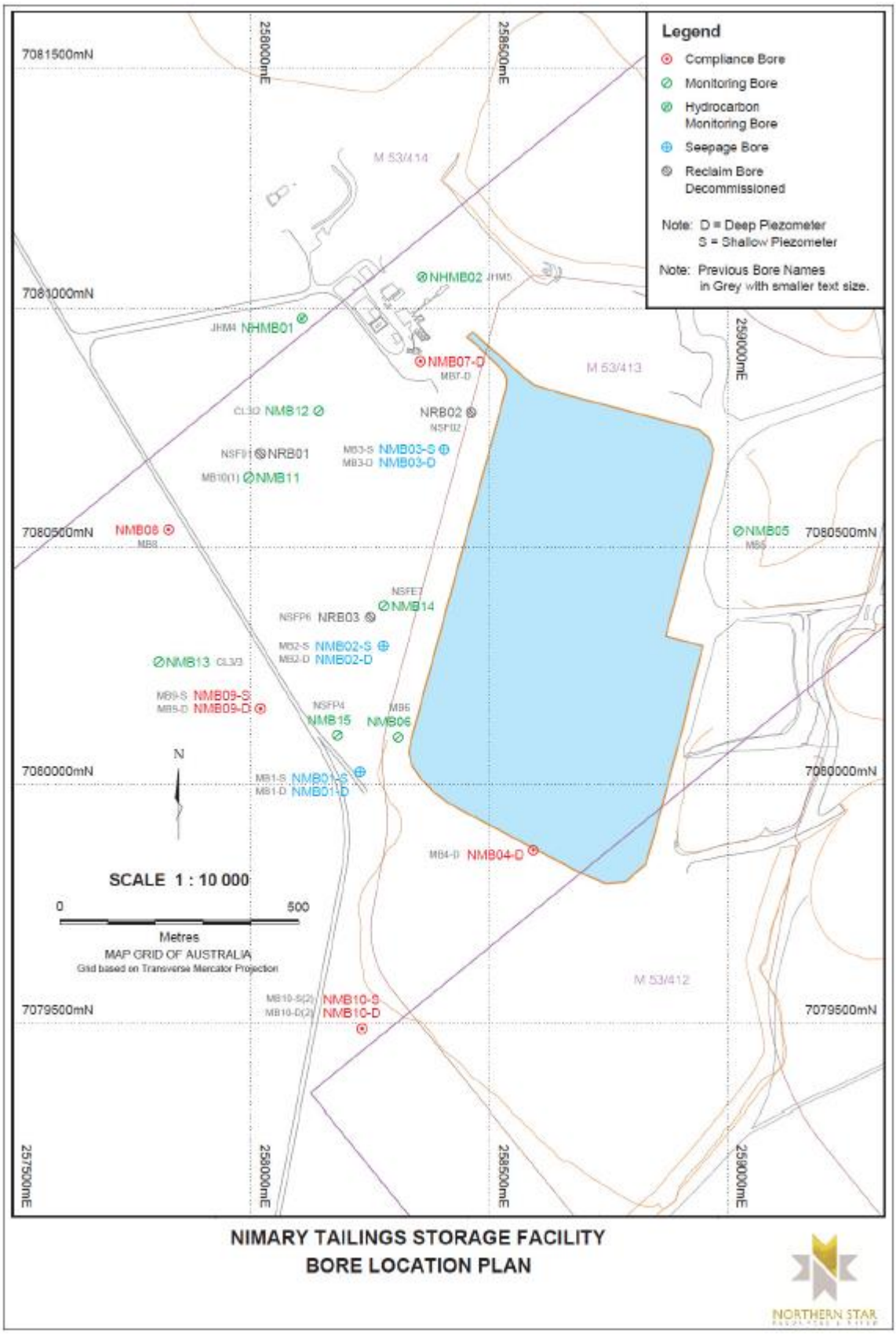


Figure 8: Location of Nimary TSF groundwater monitoring bores



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.

ANNUAL AUDIT COMPLIANCE REPORT PROFORMA

SECTION A

LICENCE DETAILS

Licence Number:	Licence File Number:
Company Name: Trading as:	ABN:
Reporting period: _____ to _____	

STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS

1. Were all conditions of the Licence complied with within the reporting period? (please tick the appropriate box)

Yes ☐ Please proceed to Section C

No ☐ Please proceed to Section B

Each page must be initialled by the person(s) who signs Section C of this Annual Audit Compliance Report (AACR).

Initial:

SECTION B

DETAILS OF NON-COMPLIANCE WITH LICENCE CONDITION.

Please use a separate page for each Licence condition that was not complied with.

a) Licence condition not complied with:	
b) Date(s) when the non compliance occurred, if applicable:	
c) Was this non compliance reported to DER?:	
☐ Yes ☐ Reported to DER verbally Date _____ ☐ Reported to DER in writing Date _____	☐ No
d) Has DER taken, or finalised any action in relation to the non compliance?:	
e) Summary of particulars of the non compliance, and what was the environmental impact:	
f) If relevant, the precise location where the non compliance occurred (attach map or diagram):	
g) Cause of non compliance:	
h) Action taken, or that will be taken to mitigate any adverse effects of the non compliance:	
i) Action taken or that will be taken to prevent recurrence of the non compliance:	

Each page must be initialled by the person(s) who signs Section C of this AACR

Initial:

SECTION C

SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report (AACR) may only be signed by a person(s) with legal authority to sign it. The ways in which the AACR must be signed and certified, and the people who may sign the statement, are set out below.

Please tick the box next to the category that describes how this AACR is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact the licensing officer for your premises.

If the licence holder is		**The Annual Audit Compliance Report must be signed and certified:**
An individual	□	by the individual licence holder, or
	□	by a person approved in writing by the Chief Executive Officer of the Department of Environment Regulation to sign on the licensee's behalf.
A firm or other unincorporated company	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A corporation	□	by affixing the common seal of the licensee in accordance with the *Corporations Act 2001*; or
	□	by two directors of the licensee; or
	□	by a director and a company secretary of the licensee, or
	□	if the licensee is a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A public authority (other than a local government)	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
a local government	□	by the chief executive officer of the licensee; or
	□	by affixing the seal of the local government.

It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give information on this form that to their knowledge is false or misleading in a material particular. There is a maximum penalty of $50,000 for an individual or body corporate.

I/We declare that the information in this annual audit compliance report is correct and not false or misleading in a material particular.

SIGNATURE: _____ SIGNATURE: _____

NAME:
(printed) _____ NAME:
(printed) _____

POSITION: _____ POSITION: _____

DATE: _____/_____/_____ DATE: _____/_____/_____

SEAL (if signing under seal)

Licence: L6498/1995/11 Licensee: Northern Star Resources Ltd
Form: N1 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 any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of Northern Star Resources Ltd	
Date	

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Northern Star Resources Ltd

Licence: L6498/1995/11

Registered office: Level 1
388 Hay St
SUBIACO WA 6008

ACN: 092 832 892

Premises address: Jundee Operations
SHIRE OF WILUNA
WILUNA WA 6646
Mining tenements: G53/20, L53/52, L53/60, L53/68 - L53/73, L53/75, L53/99, L53/100, L53/102, L53/112, L53/113, L53/117, L53/136 - L53/138, L53/142, L53/143, L53/153, L53/169, L53/174, M53/155, M53/156, M53/182, M53/191, M53/192, M53/196 - M53/199, M53/221, M53/226, M53/228 - M53/230, M53/235 - M53/237, M53/245 - M53/250, M53/326, M53/347, M53/372, M53/412 - M53/414, M53/441, M53/446, M53/451, M53/452, M53/461, M53/477 - M53/480, M53/492, M53/535 - M53/541, M53/552, M53/588, M53/589, M53/611, M53/707, M53/708, M53/711, M53/712, M53/836, M53/874, M53/895, M53/911, M53/929, M53/935, M53/940, M53/966, PL34.

Issue date: Thursday, 21 November 2013

Commencement date: Friday, 22 November 2013

Expiry date: Thursday, 21 November 2024

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Louise Lavery
Licensing Officer

Decision Document authorised by: Tim Gentle
Delegated Officer

Contents

1 Purpose of this Document

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

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	5	3 000 000 tonnes per annual period
	6	3 000 000 tonnes per annual period
	52	42.21 MW
	54	150m^3 per day
	64	600 tonnes per annual period
	73	10 000m^3
Application verified Application fee paid	Date: 27/6/16 Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes☒ No☐	

Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☐ No☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes☐ No☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

Jundee Operations (Jundee) is an operational gold mine recently acquired by Northern Star Resources from Newmont Asia Pacific. The Jundee Process Plant is currently fed with ore from three underground mines. Surface mining was suspended indefinitely in 2007, following depletion of viable surface stocks.

Jundee is located approximately 55 km north-east of the township of Wiluna and is situated on the Jundee, Lake Violet and Millrose Pastoral Leases. Land use in the Jundee area is a mixture of mining and pastoral enterprise. The major pastoral properties with a direct relationship are Barwidgee/Yandal, Millrose, Lake Violet and Jundee stations. Northern Star is the leaseholder of Jundee which continues to be sublet to Millrose Station.

Jundee comprises two historically separate operations called Jundee and Nimary. Following aggregation of the operations, the Nimary processing site was decommissioned in 2007 with final rehabilitation completed in 2010.

In 1995 a Notice of Intent was lodged with the Department of Mines for the Nimary Gold Project, on behalf of the Wiluna Joint Venture, headed by majority shareholder Eagle Mining Pty Ltd. The Nimary Gold Project comprised the Nim 1, Nim 2, Nim 3 and Nim 4 open pits.

Also in 1995, the adjacent Jundee Operations was commissioned by Great Central Mines Pty Ltd (GCM). Nimary and Jundee were immediate neighbours, separated by a tenement boundary with different owners. Two mills were constructed, one at Nimary and one at Jundee. In 1997 GCM acquired the Eagle/Nimary leases incorporating Nimary and Jundee as one operation.

In April 2000, GCM was acquired by Normandy Mining Limited (Normandy). In February 2002, Newmont Yandal Pty Ltd acquired Normandy. In July 2015 the site was acquired by Northern Star Resources. Currently the premises has a nominal rated throughput covered by the licence to process 3 000 000 tonnes of ore per annum. Processing of ore is through the Carbon in Pulp (CIP) and

Carbon in Leach (CIL) process, with tailings disposal to Tailings Storage Facilities (TSF) 2 and Fisher In-pit TSF. Underground mining commenced in 2007.

TSF1 was commissioned in October 1995 and was used until November 1999. Construction of TSF 2 commenced in February 1999 and was completed in June 1999. Deposition commenced into TSF 2 in November 1999 and this facility was used on a continuous basis until August 2004. TSF 2 has been used on a rotational basis since the commissioning of the Fisher In-pit TSF in August 2004. Fisher Pit was used continuously until October 2007. Tailings deposition is currently cycled between the Fisher Pit and TSF 2 with the aim of optimising water return by depositing into the Fisher Pit in the hotter summer months to help improve water recoveries.

The licence allows for the following activities at the Jundee Operations:

- Carbon in pulp (CIP) and carbon in leach (CIL) process plant and associated infrastructure;
- Tailings disposal into Tailings Storage Facilities (TSFs): TSF 2 and Fisher In-pit TSF;
- A bioremediation facility which utilises treated wastewater from the sewage treatment facility and may be used for the disposal and treatment of hydrocarbon contaminated soils and oily water removed from the minesite;
- Decommissioned TSF 1 for the treatment of contaminated soils and materials including sewage water; and
- Electrical power is generated on-site using six 2.2 MW gas engine generators, two 950kW gas engine generators, two 730 kW gas engine generators, one 900kW diesel engine generator and six 750 kW diesel engine generators. Additionally, three 750 kW diesel engine generators at Nimary.

September 2015 Amendment

This Licence was the result of an amendment sought by the Licensee to alter the freeboard limit for the Fisher In-pit TSF. It also includes a transfer of ownership and a conversion to a current format licence.

August 2016 Amendment

This amendment authorises the construction of 6 gas generators, a waste heat recovery unit and associated infrastructure as to increase the capacity of the power station to a total installed capacity of 42.2MW.

The new power station will comprise of the following major equipment:

- 6 x 11kV gas generators and auxiliaries
- 1 x HV Switchboard (10 tier)
- 6 x Generator Control Panels
- 1 x 415V MCC
- 1 x 11kV/415V Auxiliary Transformer
- 6 x Cooling System Radiators
- 1 x 10,000L Lube oil tank
- 1 x Gas Power Station Building – 35m x 18m
- 1 x Switch Room comprising HV Room / LV Room and Office

The waste heat recovery unit comprises:

- Exhaust collector system
- Exhaust heat exchanger module

- Exhaust collector skid
- Thermal governing skid
- Wet steam cycle module
- Organic Rankin cycle module
- Cooling system

Three redundant groundwater bores have also been removed from the monitoring requirement in Table 3.3.1. General conditions found to be inconsistent with DER's *Guidance Statement: Setting Conditions, October 2015* have also been removed from the Licence. The due dates for the improvement requirements under condition 4.1.1 have also been revised.

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**
General conditions	Previous licence conditions L1.2.1 - L1.2.3	**August 2016 Amendment** These conditions have been removed from the licence in accordance with the *Guidance Statement: Setting Conditions* as these general conditions are considered not enforceable.	General provisions of the *Environmental Protection Act 1986.* DER (2015) *Guidance Statement: Setting Conditions,* October 2015
Premises operation	L1.2.1 L1.2.5	**September 2015 Amendment** **Normal operation** <u>Emission Description</u> *Emission:* Spill of saline water, process slurry or tailings slurry or liquor from pipelines. Tailings pipelines transfer tailings to the TSFs and tailings return lines transfer decant water back (tailings liquor) back to the process plant. Borefield pipelines transfer saline water from the water borefield to the processing plant. *Impact*: A spill of saline water, process slurry or tailings outside of bunding may impact on surrounding vegetation dependent on location. The spill may also result in localised soil contamination. *Controls*: All overland pipelines containing either tailings, saline water, or tailings decant water are bunded and regularly inspected. Records are kept of inspections.	General provisions of the *Environmental Protection Act 1986*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Risk Assessment *Consequence*: Minor *Likelihood:* Unlikely *Risk Rating:* Moderate Regulatory Controls L1.2.1 was added to the Licence to ensure that the systems are in place to isolate pipelines transferring materials with saline, alkaline or cyanide constituents, and that these systems are implemented and maintained, and/or that pipelines containing these constituents have bunding capacity sufficient to contain spills. This condition replaces conditions W4(a) and W4(b) on the previous licence. L1.2.5 details that tailings pipelines, return water pipelines and borefield pipelines require scheduled inspections. L1.2.5 in part replaces previous licence conditions W6, W7(a), W7(b) and W7(c). Residual Risk Assessment *Consequence*: Minor *Likelihood*: Unlikely *Risk Rating*: Moderate	
	L1.2.2	**September 2015 Amendment** Containment infrastructure requirements are detailed in condition L1.2.2. DER's assessment and decision making in relation to the TSFs' operation including provision of freeboards and related ambient groundwater quality monitoring, is detailed in Appendix A.	
	L1.2.3 L1.2.4	**September 2015 Amendment**	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Condition L1.2.3 replaces condition W14 on the previous licence and has not been reassessed. Freeboard requirements for the effluent storage ponds in condition L1.2.4 address points (ii) and (iii) of previous licence condition W14. In 2012 the western embankment of the village effluent ponds was raised to ensure the ponds held capacity for a 1/100 year, 72 hour duration storm event.	
	L1.2.6	**September 2015 Amendment** Condition L1.2.6 details requirements for management of waste. It replaces previous licence conditions W10(b), W10(d), W10(e), W15, S1(a), S2(c), S2(d), S2(e) and has not been reassessed.	General provisions of the *Environmental Protection Act 1986.*
	L1.2.7, L1.2.8	**September 2015 Amendment** Conditions L1.2.7 and L1.2.8 replace conditions S1(b), S2(a) and S2(b) on the previous licence and have not been reassessed.	General provisions of the *Environmental Protection Act 1986.*
	L1.2.9	**August 2016 Amendment** **Construction - – New Gas Generators and Waste Heat Recovery Unit** Refer to Appendix B for DER's assessment and decision making for new construction works to install additional power station capacity, waste heat recovery unit and associated infrastructure.	General provisions of the *Environmental Protection Act 1986.*
Point source emissions to air including monitoring	L1.2.9, L2.2.1 L3.2.1 – L3.2.3	**August 2016 Amendment** **Construction and Operations – New Gas Generators** Refer to Appendix B for DER's assessment and decision making. **Normal Operation – Existing Power Generation** <u>Emission Description</u> *Emission:* Combustion gases (NOx, SOx and particulates) from diesel and	Ambient Air Assessment Criteria, National Environmental Protection Measure (Ambient Air Quality) NSW Protection of the Environment Operations

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		gas generators released to air via emission points A3 – A18 (refer Table 2.2.1). *Impact:* Reduced local air quality. The nearest sensitive receptor is 20 km away. *Controls:* Efficient low NOx burners are proposed to prevent the generation of NOx. Maintenance procedures are in place to optimise the combustion process. Risk Assessment *Consequence:* Insignificant *Likelihood*: Unlikely *Risk Rating:* Low Regulatory Controls The generators are an efficient design. L1.2.3 requires the equipment including emissions control measures to be maintained on a regular basis. No monitoring is prescribed. Residual Risk *Consequence*: Insignificant *Likelihood:* Unlikely *Residual Risk Rating:* Low	(Clean Air) Regulation 2010, Schedule 4
	L2.2.1, L4.1.1	**September 2015 Amendment** Two emission points to air (A1 and A2) have been identified as part of this amendment and added to the Licence. Further information was requested as per IR1 of Table 4.1.1, condition L4.1.1, to assist in determining the significance of these emissions. Pending this information, the requirement for monitoring can be assessed.	NSW Protection of the Environment Operations (Clean Air) Regulation 2010, Schedule 3

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		August 2016 Amendment IR1 (for air emission background information) was completed and hence the requirement under L4.1.1 has been removed from the Licence.	
Point source emissions to groundwater including monitoring	L2.3.1, L3.2.1	**September 2015 Amendment** Condition L2.3.1 authorises discharge of mine dewater to the main pit consistent with the volume limit for category 6. Monitoring condition L3.2.1 requires the volume and quality of this discharge to be monitored and replaces previous licence condition W13(a).	General provisions of the *Environmental Protection Act 1986.*
Monitoring general	L3.1.1 – L3.1.5	**September 2015 Amendment** Monitoring conditions L3.1.1- L3.1.5 have been included on the Licence as monitoring of inputs and outputs and ambient groundwater quality are included on the Licence. These conditions replace previous licence conditions W11(b), W11(c) and part of W16(a).	General provisions of the *Environmental Protection Act 1986.*
Monitoring of inputs and outputs	L3.3.1	**September 2015 Amendment** Condition L3.3.1 in part replaces previous licence conditions W13(a) and W13(b) (refer also to point source emissions to groundwater section above.). L3.2.1 also adds requirements to monitor tailings deposition, tailings return water and seepage recovery volumes and volume of mine dewater discharged.	General provisions of the *Environmental Protection Act 1986.*
Ambient environmental quality monitoring	L3.4.1	**September 2015 Amendment** DER's assessment and decision making in relation to the TSFs' operation including ambient groundwater quality monitoring, is detailed in Appendix A. Groundwater and soil monitoring to assess the performance of the bioremediation landfarm and the TSF 1 has been included in the licence in condition L3.3.1 and replaces the previous licence conditions W11(a) in part	Table A1, Appendix A of Schedule B5a – *Guideline on Ecological Risk Assessment*, Assessment of Site Contamination NEPM Saprolite Environmental

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		and W16(a). On the basis of data from the 2014 AER and 2015 AER, the requirement to monitor lead levels in soil has been removed from the licence as the lead concentrations are well below the ecological investigation level (EIL) for fresh or aged contamination for areas of ecological significance (this being the highest level of protection – refer Table A1 of Schedule B5a of the Assessment of Site Contamination NEPM). The EIL level is 110 mg/kg for lead, whilst 2014 Jundee data ranged from 7 – 22 mg/kg and 2015 data 7 – 12mg/kg. Similarly as no BTEX (benzene, toluene, ethyl benzene or xylene) or lead in groundwater was recorded above the level of detection and minimal levels of nitrogen and phosphorus in groundwater were detected, these parameters have been removed from Table 3.2.1. BTEX was not recorded above the level of detection in the soil samples so has also been removed from Table 3.2.2. Monitoring total recoverable hydrocarbons in soil and groundwater is sufficient to assess if the bioremediation areas are performing adequately. **August 2016 Amendment** Administrative corrections were made to the list of Fisher In-pit TSF monitoring bores to be sampled to remove redundant bores FMB06, FMB07 and FMB08. Note 3 was reinstated for Table 3.4.1 to specify that 90% of all bores must be sampled during the quarter.	(2015) *Annual Environmental Report to the Department of Regulation; Licence No.6498/1995/11 1 January to 31 December 2014*, March 2015 Saprolite Environmental (2014) *Annual Environmental Report to the Department of Regulation; Licence No.6498/1995/11 1 January to 31 December 2013*, March 2014
Improvements	L4.1.1	**September 2015 Amendment** Tasks IR2, 3, 4 of Table 4.1.1 relate to including monitoring of selenium as part of the metal analytical suite for ambient groundwater quality. Selenium has the potential to be biomagnified within food webs through uptake by plants or soil fauna, and so it is important to limit the discharge of this element into shallow soils to reduce risks of environmental harm taking place.	Licensee supplied information NSW *Protection of the Environment Operations (Clean Air) Regulation 2010,* Schedule 3

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		The risk of selenium entering local food webs locally is minimal provided the perched water table is maintained at depths greater than about 1 metre below the ground surface. Selenium is associated with saline groundwater in the goldfields, hence the inclusion of investigatory monitoring of this parameter. **August 2016 Amendment** A new IR1 has been added to the improvement table 4.1.1 for the Licensee to develop and submit to the CEO a commissioning plan for the new power station, prior to commissioning. Following a request by the Licensee dated 25 May 2016, DER has extended the due date for IR 4 to 30 November 2016.	ANZECC (2000) *Water Quality Guidelines for fresh and marine water quality,* Section 3 Aquatic ecosystems. Letter from Garry Mills, Northern Star Resources to DER, 25 May 2016
Information	L5.1.1 – 5.1.4 L5.2.1 - 5.2.3	**September 2015 Amendment** Conditions relating to the management of records and complaints, notification requirements and the submission of an annual audit compliance report and annual environmental report are included in the Licence. These replace previous licence conditions G2 (a), G2 (b), G2 (c) and G3.	General provisions of the *Environmental Protection Act 1986.*
	L5.3.1	**September 2015 Amendment** Condition L5.3.1 replaces previous licence conditions G1(a), G1 (b) and G1(c).	
Licence Duration	N/A	**August 2016 Amendment** An extension to the licence expiry date was made by separate amendment notice on 29 April 2016.	DER (2016) Amendment by Notice, 29 April 2016

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
13/08/2015	Proponent sent a copy of draft instrument	Corrections to tenements, capacities for category 6 and 73 provided, confirmation of infrastructure listed in Table 1.3.1 and edit to timeframe for submission of IR1 under Licence condition 4.1.1.	Comments adopted into the Licence and Decision Document where appropriate.
05/07/2016	Licensee sent a copy of draft instrument	Additional proposal to include assessment and approval of a 1.5MW waste heat recovery unit to capture heat from exhaust gases of the new gas generators.	Assessment of waste heat recovery unit included in decision document and licence.

6 Risk Assessment

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

Table 1: 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

Premises operation including ambient groundwater monitoring

Emission Risk Assessment – Operations

Emission Description

Emission: Seepage of tailings liquor from TSF 2 and the Fisher In-Pit TSF into groundwater raising the standing water levels of groundwater and altering groundwater quality surrounding the TSF.

Impact: Tailings seepage containing heavy metals, cyanide and elevated salinity as compared to background levels (Background TDS of 1000mg/L to 2000mg/L with seepage being in excess of 10000 mg/L) resulting in an alteration of groundwater quality. Groundwater mounding due to seepage also has the potential to impact adjacent vegetation through inundation of vegetation root systems.

Controls: Jundee Operations operates a network of seepage recovery bores (refer to Table 3.4.1 of the Licence) to reduce groundwater mounding attributable to TSF 2 and to the Fisher In-pit TSF. Nimary TSF is decommissioned and tailings deposition to TSF 1 is currently not occurring.

Jundee has also prescribed internal performance targets and triggers with associated management actions to increase seepage recovery in response to monitoring data, if required as part of their Groundwater Recovery Seepage Management Plan (see also Regulatory Controls below).

Risk Assessment

Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls

A monitoring program for ambient groundwater depth and quality surrounding TSF 1 and TSF 2, Fisher In-pit TSF and decommissioned Nimary TSF is required by Licence condition L3.4.1.

Works approval W5164/2012/1 for the stage 6 embankment raise required Jundee Operations to develop a Groundwater Recovery Seepage Management Plan (GRSMP) to manage seepage associated with TSF 2 operations. The GRSMP, dated August 2013, was submitted to DER in 2013. The objective of this plan is to prevent impact to vegetation from rising groundwater levels. A vegetation survey conducted as part of the GRSMP has ascertained that the root profile of the locally dominant species *Acacia aneura* and *Acacia pruinocarpa* did not extend beyond the first metre below ground level. Hence a standing water level (SWL) limit of 1m bgl has been placed on the Licence as part of condition L3.4.1.

Groundwater quality limits for pH, total dissolved solids (TDS) and weak acid dissociable cyanide concentration are also included in Table 3.4.1 of condition 3.4.1. If a result is recorded in excess of the limits notification requirements to DER are included in Licence condition 5.3.1.

It should be noted that over the life of L6498/1995/11 the TDS limit has been gradually increased in response to increasing salinity of the groundwater surrounding the TSFs, however the limit of TDS of 14,000 mg/L is unchanged from the existing Licence. The groundwater quality limits have been included on the Fisher In-Pit TSF monitoring bores.

Residual Risk

Consequence: Moderate
Likelihood: Unlikely

Risk Rating: Moderate

References

ANZECC (2000) *Water Quality Guidelines for fresh and marine water quality,* Section 3 Aquatic ecosystems.

Newmont Jundee Operations (2013) *Groundwater Recovery Seepage Management Plan*, August 2013.

Emission Risk Assessment – Emergency Operation

Emission Description

Emission: Release of supernatant liquors or tailings from Fisher In-pit TSF from overtopping during high rainfall event.

Impact: Tailings solids and liquors containing heavy metals and cyanide released to land. Localised soil contamination and potential to impact adjacent vegetation and fauna.

Controls: An engineering assessment of the freeboard requirements for Fisher In-Pit TSF was conducted (Coffey 2014). This included a survey of the tailings beach levels and existing capacity. The freeboard required for a 1 in 100 year, 72 hour duration storm event was calculated (250mm). The engineering assessment concluded that a 300 mm freeboard for the TSF was low risk of overtopping, providing the earth bund surrounded the TSF is maintained to a height of at least one metre (section 6, Coffey 2014).

The one metre perimeter containment bund surrounds the Fisher In-pit TSF to prevent stormwater ingress from adjacent areas and to also provide emergency storm containment.

Daily visual inspections of freeboard are conducted.

Risk Assessment

Consequence: Moderate
Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls

Licence condition L1.2.2 requires that the containment bund surrounding Fisher In-pit TSF is maintained to a height of at least one metre.

The requirement to maintain a total freeboard of 300 mm is included on the Licence as part of condition L1.2.4.

Condition L1.2.5 requires daily visual inspections to confirm freeboard capacity is available. A requirement to complete an annual survey of the operating level/capacity of the Fisher In-pit TSF has also been included in Table 1.2.3, condition L1.2.5.

Residual Risk Assessment

Consequence: Moderate
Likelihood: Unlikely
Risk Rating: Moderate

References

Australian National Committee on Large Dams (ANCOLD) (2012) *Guidelines on Tailings Dams: Planning, Design, Construction, Operation and Closure*, May 2012.

Coffey (2014) *Northern Star Resources Jundee Gold Operations Fisher Pit TSF Freeboard Assessment Report*, 23 October 2014.

Appendix B

Point source emissions to air including monitoring

Power Generation

The emissions to air from point sources at Jundee Operations has altered with the proposal to install 6 x 3MW gas generators and one 1.5MW waste heat recovery unit. The installation of the additional gas generation may allow for decommissioning of existing diesel generators, resulting in a further reduction in overall emissions from the current operation. The Licensee intends not to operate the 18MW in its entirety, rather install the additional capacity to provide for greater redundancy capacity (Northern Star Resources 2016). It is also the Licensee's intent to decommission some diesel generators following installation and commissioning of the new power station

NOx emissions from the diesel generators are typically an order of magnitude larger than gas (in the range of 5000 – 8000 mg/m^3).

The new gas generators are an efficient design. Expected NOx emissions are equal to, or less than 500 mg/m^3 for each (Zenith Pacific 2016).

Abnormal Operation

Emission Description
Emission: Combustion gases (NOx, CO, CO_2, CH_4) in excess of design criteria from gas generators via waste heat recovery stack or individual stacks. The gas generators are able to operate in open (vent from individual unit) or closed cycle (vent via common exhaust via waste heat recovery heat exchanger). Refer to Figure 9 following for further detail of the process flow.

Impact: Reduced local air quality. The design criterion for NOx emissions from the new gas generators is estimated at equal to, or less than 500mg/Nm^3 (Zenith Pacific 2016). In the absence of any Western Australian criteria, Schedule 4 of the NSW Protection of the Environment Operations (Clean Air) Regulations has been used as a reference. The emission concentration limit for NOx emissions from new stationary combustion engines in NSW is 450mg/m^3.

There are no adjacent receptors. The nearest population is at the accommodation camp for the mine which is located 5 km away from the power station. The nearest sensitive receptor is Wiluna, 50 km south-west from the Premises.

Controls: No specific emissions abatement is proposed. Regular maintenance will be conducted to ensure the generators are operating as per design.

Risk Assessment
Consequence: Insignificant, the nearest sensitive receptor is 50 km away
Likelihood: Unlikely, maintenance procedures are in place
Risk Rating: Low

Regulatory Controls
Quarterly emissions monitoring by stack testing has been imposed to validate emissions and maintenance of the combustion process for the first twelve months of operation for the new generators. Following results that indicate that the operation of the generators is well managed, the requirement for monitoring will be removed from the Licence as per the requirements for the existing gas generators. The monitoring requirements are detailed in condition L3.2.1.

Residual Risk
Consequence: Insignificant
Likelihood: Unlikely
Residual Risk Rating: Low

References

Northern Star Resources (2016) Licence Amendment Application L6498/1995/11, 27 May 2016

Schedule 4 of *NSW Protection of the Environment Operations (Clean Air) Regulations 2010*

Zenith Pacific Pty Ltd (2016) Jundee Gold Mine, 18MW Power Station Project, Facility Description, Document No: JU004 –DOC-001, 9 May 2016

Figure 9: Waste Heat Recovery Process flow diagram showing location of exhaust inputs from gas generators and final exhaust point to air