Government of Western Australia
Department of Environment Regulation

Works Approval

Environmental Protection Act 1986, Part V

Works Approval Holder: Nagrom Mining Pty Ltd

Works Approval Number: W5736/2014/1

Registered office: Suite 13, 8 Welshpool Road,
East Victoria Park WA 6101

ACN: 154 081 339

Premises address: Tabba Tabba Tantalite Project
Mining tenements M45/354, M45/376 and M45/375
Marble Bar 6760
as depicted in Schedule 1.

Issue date: Thursday, 9 July 2015

Commencement date: Monday, 13 July 2015

Expiry date: Thursday, 12 July 2018

The following category/s from the *Environmental Protection Regulations 1987* cause this Premises to be a prescribed premises for the purposes of the *Environmental Protection Act 1986*:

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: premises on which – (a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; (b) tailings from metallic or non-metallic ore are reprocessed; or tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	50 000 tonnes or more per year	Not more than 100 000 tonnes per year

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

.....
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Works Approval Conditions

1 General

1.1 Interpretation

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

1.1.2 In the Works Approval, unless the contrary intention appears:

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

'annual period' means the inclusive period from 1 April until 31 March in the following year;

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

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

'CEO' for the purpose of correspondence means;
Manager Licensing (Resources Sector (North))
Department of Environment Regulation
Locked Bag 33, Cloisters Square
PERTH WA 6850
Telephone: (08) 9333 7510
Facsimile: (08) 9333 7550
Email: industry.regulation@der.wa.gov.au;

'code of practice for the storage and handling of dangerous goods' means document titled "Storage and handling of dangerous goods: Code of Practice" published by the Department of Mines and Petroleum, as amended from time to time;

'commissioning' means the process of operation and testing that verifies the works and all relevant systems, plant, machinery and equipment have been installed and are performing in accordance with the design specification set out in the works approval application;

'dangerous goods' has the meaning defined in the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007*;

'environmentally hazardous material' means material (either solid or liquid raw materials, materials in the process of manufacture, manufactured products, products used in the manufacturing process, by-products and waste) which if discharged into the environment from or within the premises may cause pollution or environmental harm. Note: Environmentally hazardous materials include dangerous goods where they are stored in quantities below placard quantities. The storage of dangerous goods above placard quantities is regulated by the Department of Mines and Petroleum;

'mbgl' means metres below ground level;

'mg/L' means milligrams per litre;

'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;

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

'Schedule 1' means Schedule 1 of this Works Approval unless otherwise stated;

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

'Works Approval' means this Works Approval numbered W5736/2014/1 and issued under the Act; and

'Works Approval Holder' means the person or organisation named as the Works Approval Holder on page 1 of the Works Approval.

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

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

1.2 General conditions

1.2.1 The Works Approval Holder shall construct the works in accordance with the documentation detailed in Table 1.2.1:

Table 1.2.1: Construction Requirements[1]

Document	Parts	Date of Document
Works Approval Application Form	All	4 July 2014
Tabba Tabba Tantalite Project Works Approval Supporting Document May 2015	All including appendixes	5 May 2015

Note 1: Where the details and commitments of the documents listed in condition 1.2.1 are inconsistent with any other condition of this works approval, the conditions of this works approval shall prevail.

1.2.2 The Works Approval Holder, except where storage is prescribed in section 1.3, shall ensure that environmentally hazardous materials are stored in accordance with the Code of Practice for the Storage and handling of dangerous goods.

1.2.3 The Works Approval Holder shall undertake commissioning in accordance with the commissioning plan, Section 9 of "Works Approval Supporting Document May 2015, Nagrom Mining Pty Ltd".

1.2.4 The Works Approval Holder shall commission the Tabba Tabba Tantalite Project processing plant for a period not exceeding 3 months.

1.3 Premises operation

1.3.1 The Works Approval Holder shall ensure that all pipelines containing environmentally hazardous materials are either:
(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.

2 Emissions

2.1 General

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

2.2-2.4 Point source emissions to air, surface water and groundwater

There are no specified conditions relating to point source emissions to air, surface water or groundwater in this section.

2.5 Emissions to land

There are no specified conditions relating to emissions to land in this section.

2.6 Fugitive emissions

2.6.1 The Works Approval Holder shall use all reasonable and practical measures to prevent and where that is not practicable to minimise dust emissions from the Premises.

2.6.2 The Works Approval Holder shall ensure that no visible dust generated by the activities on the Premises crosses the boundary of the Premises.

2.7-2.8 Odour and Noise

There are no specified conditions relating to odour or noise in this section.

3 Monitoring

3.1 General monitoring

3.1.1 The Works Approval Holder shall ensure that:
(a) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
(b) 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 Works Approval Holder shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Works Approval is calibrated in accordance with the manufacturer's specifications.

3.2-3.4 Monitoring of point source emissions to air, surface water and groundwater

There are no specified conditions relating to monitoring of point source emissions to air, surface water or groundwater in this section.

3.5 Monitoring of emissions to land

There are no specified conditions relating to monitoring of emissions to land in this section.

3.6 Monitoring of inputs and outputs

There are no specified conditions relating to monitoring of inputs and outputs in this section.

3.7 Process monitoring

There are no specified conditions relating to process monitoring in this section

3.8 Ambient environmental quality monitoring

3.8.1 The Works Approval Holder shall undertake the monitoring in Table 3.8.2 according to the specifications in that table.

Table 3.8.2: Monitoring of ambient groundwater quality

Monitoring point reference	Parameter	Units	Averaging period	Frequency
TTMB-EX1 TTMB-1 TTMB-3 TTMB-5	Standing Water Level (SWL)[1]	mbgl	Spot sample	At least one sampling event prior to deposition of tailings to establish baseline
	pH[2]	pH units		
	Total Dissolved Solids (TDS)[2], hardness, chloride, sulphate, carbonate, bicarbonate, nitrate, potassium, calcium, magnesium, aluminium, antimony, arsenic, barium, bismuth, boron, cadmium, chromium, cobalt, copper, fluoride, iron, lead, lithium, manganese, mercury, molybdenum, nickel, niobium, phosphorus, selenium, tantalum, thallium, thorium, tin, uranium, vanadium, zinc.	mg/L		

Note 1: Standing water level shall be determined prior to collection of water samples.
Note 2: An exemption from NATA laboratory analysis is allowed for pH and TDS only given geographical remoteness of the sample site and the short holding time of these parameters

3.9 Meteorological monitoring

There are no specified conditions relating to meteorological monitoring in this section.

4 Improvements

There are no specified improvement conditions in this section.

5 Information

5.1 Reporting

5.1.1 The Works Approval Holder shall submit a compliance document to the CEO, following the construction of the works and prior to commissioning of the same.

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

5.1.3 The Works Approval Holder shall submit a commissioning report for the Tabba Tabba Tantalite Project process plant to the CEO within 1 month of the completion of commissioning.

5.1.4 The Works Approval Holder shall ensure the report includes:
(a) a list of any original monitoring reports submitted to the Works Approval Holder from third parties for the commissioning period;
(b) a summary of the environmental performance of the Tabba Tabba Tantalite Project process plant as installed, against the design specification set out in the Works Approval application;
(c) a review of performance against the Works Approval conditions; and
(d) 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.

5.2 Notification

5.2.1 The Works Approval Holder shall ensure that the parameters listed in Table 5.2.1 are notified to the CEO and are in accordance with the notification requirements of the table.

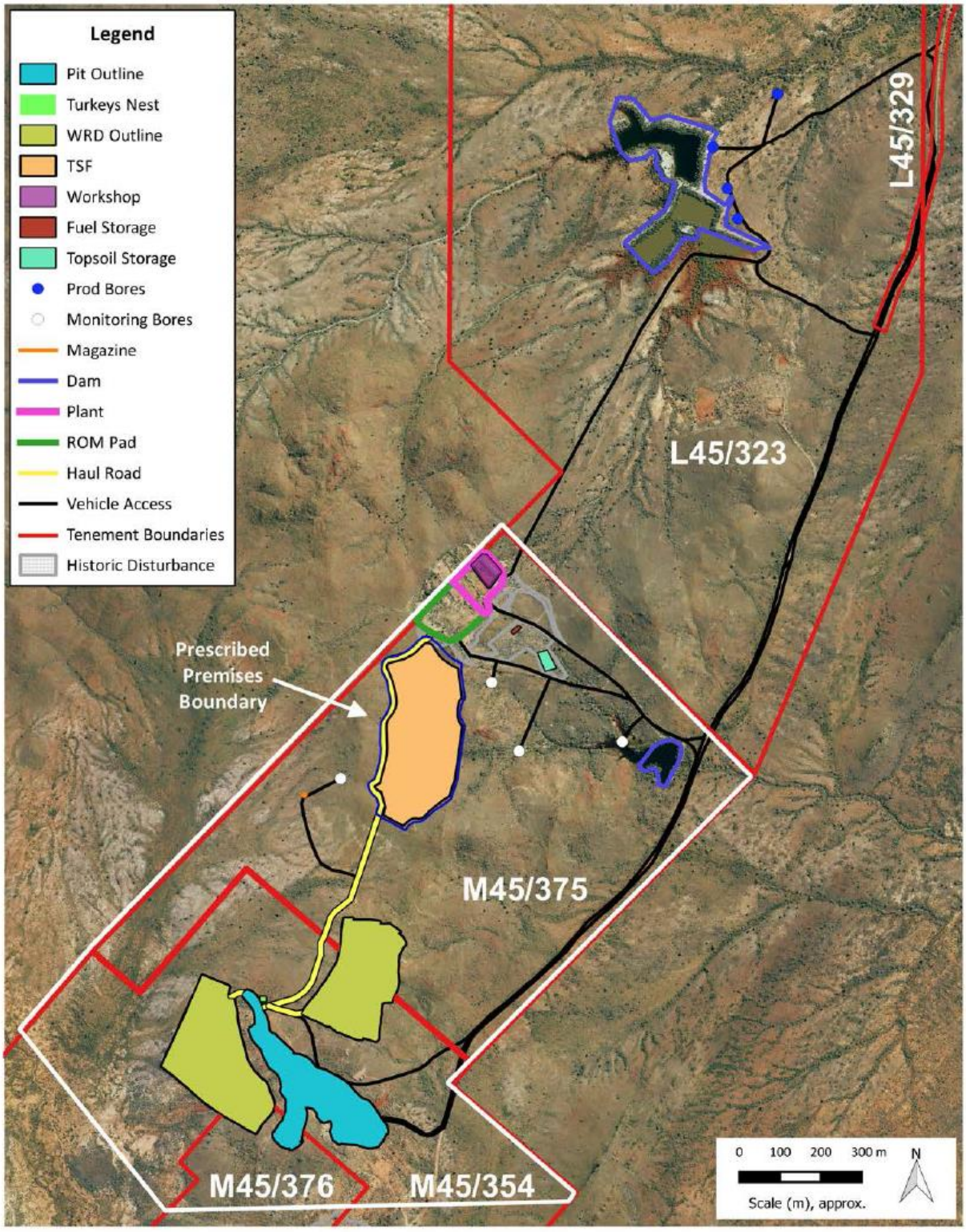
Table 5.2.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement	Format or form
1.2.4	Commencement of commissioning	7 days prior to start	None specified
	Completion of commissioning	7 days after completion	

Schedule 1: Maps

Premises map

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



Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Nagrom Mining Pty Ltd

Works Approval: W5736/2014/1

Registered office:	Suite 13, 8 Welshpool Road, East Victoria Park WA 6101
ACN:	154 081 339
Premises address:	Tabba Tabba Tantalite Project Mining tenements M45/354, M45/376 and M45/375 Marble Bar 6760
Issue date:	Thursday, 9 July 2015
Commencement date:	Monday, 13 July 2015
Expiry date:	Thursday, 12 July 2018

Decision

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

Decision Document prepared by:	Cathy Scheib Licensing Officer
Decision Document authorised by:	Alana Kidd Manager Licensing

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application for a works approval or licence, 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.

Works approval and licence conditions
DER has three types of conditions that may be imposed on works approvals and licences. They are as follows;

Standard conditions (SC)

DER has standard conditions that are imposed on all works approvals and licences regardless of the activities undertaken on the Premises and the information provided in the application. These are included as the following conditions on works approvals and licences:

Works approval conditions: 1.1.1-1.1.4, 1.2.1, 1.2.2, 5.1.1 and 5.1.2.

Licence conditions: 1.1.1-1.1.4, 1.2.1-1.2.4, 5.1.1-5.1.4 and 5.2.1.

For such conditions, justification within the Decision Document is not provided.

Optional standard conditions (OSC)

In the interests of regulatory consistency DER has a set of optional standard conditions that can be imposed on works approvals and licences. DER will include optional standard conditions as necessary, and are likely to constitute the majority of conditions in any licence. The inclusion of any optional standard conditions is justified in Section 4 of this document.

Non standard conditions (NSC)

Where the proposed activities require conditions outside the standard conditions suite DER will impose one or more non-standard conditions. These include both premises and sector specific conditions, and are likely to occur within few licences. Where used, justification for the application of these conditions will be included in Section 4.

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**
	05	Not more than 100 000 tonnes per year
Application verified Application fee paid	Date: 28 August 2014 Date: 17 September 2014	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes☐ No☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☐ No☒	Referral decision No: N/A 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 ☒	
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

Nagrom Mining Pty Ltd (Nagrom) is preparing to commence mining and processing operations at the Tabba Tabba project; located approximately 50 kilometres southeast of Port Hedland in Western Australia. The project has an estimated Life-of-Mine of two years. Historical mining occurred at the project area prior to the 1940s. The project lies on M45/354, M45/376 and M45/375. Water abstraction and mine access will also occur on tenements L45/323 and L45/329 but these are not within the defined Prescribed Premises boundary. The tenements are owned by Global Advanced Metals Wodgina Pty Ltd. Nagrom has an agreement with the tenement holder to operate on its tenements.

The Tabba Tabba project (the Project) is located within the Talga land system, characterised by hills and ridges of greenstone and chert with stony plains supporting hard and soft spinifex grasslands. Soils local to the project area have a generally alkaline pH with surface soils (0-10cm) ranging in pH from 7.9 – 8.7 and sub-surface soils (10-20cm) pH 7.6 – 8.7. The results of the flora survey ([1]PEK 2013) indicate that there should be no significant impacts to the environmental and conservation values of the vegetation and flora of the area by this project. *Calotropis procera* has been identified on site which is a declared (C3) weed under the *Biosecurity and Agriculture Management Act 2007*. Nagrom have proposed a number of management strategies including implementation of a weed eradication and or/control program where weeds are identified. Nagrom has re-designed the project footprint to ensure that it represents only a small impact to two species of conservation significance, the Western Pebble-mound Mouse (DEC Priority 4) and Northern Quoll (*Dasyurus hallucatus*) (Endangered *EPBC Act 1999*, Rare (Schedule 1) *Wildlife Conservation Act 1950*) ([2]AES 2013). Nagrom has assessed the need to refer to the Commonwealth and states that this was not required.

The Project includes open pit mining, the construction of two Waste Rock Dumps (WRD), a tailings storage facility (TSF), processing plant, explosive magazine, and access and haul roads. The pit will be mined below the water table. Excess mine water will be stored in in-pit sumps and used for processing or dust suppression. Water will be pumped from the sumps to a High Density Polyethylene (HDPE) lined Turkeys Nest pond. The pond will enable settlement of contained sediment prior to use for either dust suppression or re-use in processing. The project requires 432 kL/day of water for ore processing and dust suppression which will be supplied either from the mine void in-pit sumps, the water supply borefield located on L45/323, or from TSF decant water return. The bores will be required to produce up to 110,000 kL/yr for the two years of operation.

The processing plant will be of modular design based on a maximum throughput of 30 tonnes per hour (tph) with operations on a 12-hr day-shift roster. Processing of tantalite bearing ore from the pegmatite (see Appendix A for process flow-sheet) will consist entirely of gravity extraction means with primary equipment including:

- Jaw and cone crushing, Screening, Trommel, Jigs, Ball mill and Spirals;
- Tailings thickener and TSF; and
- Outdoor concentrate drying pad.

The main environmental risk identified during the assessment was seepage of tailings pore water potentially containing elevated elements of environmental concern and/or in excess of known baseline groundwater concentrations (e.g. boron, manganese, lithium, aluminium, copper). To address this, Nagrom revised the TSF design to fully line the dam to achieve a higher level of containment. Other environmental risks to be managed under this Works Approval include storage and transport of environmentally hazardous materials and dust emissions.

References

[1]PEK Enviro (PEK 2013). Level 1 Flora and vegetation Survey – Tabba Tabba Project. Prepared for Nagrom Pty Ltd in June 2013. PEK Enviro, Bunbury WA.
[2]Australasian Ecological Services (AES 2013). Tabba Tabba Fauna Assessment Desktop and Level 1 On-Site Survey, Draft report prepared for Nagrom Pty Ltd in June 2013. Australasian Ecological Services, Wanneroo WA.

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.

OSC = Optional standard condition
NSC = Non-standard condition

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	L - Licence conditions proposed (Appendix B)		**Construction and operation** Conditions concerning construction requirements and for storage and handling of environmentally hazardous materials are included as standard in works approvals. DER's assessment and decision making are detailed in Appendix B.	Application supporting documentation General Provisions of the *Environmental Protection Act 1986* *Environmental Protection (Unauthorised Discharges) Regulations 2004*
	W1.2.3	OSC	**Commissioning** OSC1.2.3 ensures that commissioning occurs in accordance with the commissioning plan included in the application supporting documentation.	
	W1.2.4	OSC	The commissioning period is anticipated to take approximately 2 weeks, so the commissioning period of 3 months specified in OSC1.2.4 will allow sufficient time for commissioning including contingencies and reporting. Nagrom Mining will require a licence to operate beyond the 3-month commissioning period authorised by this Works Approval.	
Premises Operation	W1.3.1 L – Licence conditions proposed (Appendix C)	OSC	DER's assessment and decision making are detailed in Appendix C.	

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Emissions general	W – 2.1.1 L – Licence conditions proposed	OSC	**Construction including commissioning** OSC 2.1.1 has been added to the Works Approval since OSC 2.6.2 relating to fugitive emissions applies. **Operation** Nagrom Mining will require a Licence to operate beyond the 3-month commissioning period authorised by this Works Approval. Conditions relating to operation will be applied including recording and investigating exceedances of descriptive or numerical limits or targets specified in the emissions section of the licence.	N/A
Point source emissions to air including monitoring	W – no conditions L – no conditions proposed	N/A	**Construction including commissioning** No significant point source emissions to air are expected during the construction works. No specified conditions relating to point source emissions to air or the monitoring of such emissions are included in the Works Approval. **Operation** Power will be supplied via diesel generators located on site. For processing, there will be two stand-alone diesel generators (1 x operational and 1 x stand-by) located alongside the processing plant. The main generator set will be of nominal 550 KVA capacity while a standby unit will be marginally smaller at 400 KVA. Both primary crusher and secondary crushing units have their own installed and independent diesel generators of 260 kW (primary crusher) and 220 kW (secondary crusher). The water supply pump and bore pumps will be powered by a separate and independent 75 KVA generator set located alongside the water dam. Overall the power generation capacity is below the threshold design capacity in Schedule 1 of the *Environmental Protection Regulations, 1987*. No Licence conditions are therefore proposed at this stage.	Application supporting documentation *Environmental Protection (Unauthorised Discharges) Regulations 2004*

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			As part of the National Pollutant Inventory (NPI) and the National Greenhouse and Energy Reporting Scheme (NGERS), quantities of air emissions produced by the project will be estimated and reported annually by Nagrom.	
Point source emissions to surface water including monitoring	W – no conditions L – no conditions proposed	N/A	**Construction including commissioning** No point source emissions to surface water are authorised by this Works Approval. No specified conditions relating to point source emissions to surface water or the monitoring of such emissions are included in the Works Approval. The Tabba Tabba project area lies within: • *The Pilbara Surface Water Proclamation Area* under the *Rights in Water and Irrigation Act, 1914*; and • The Coastal Catchment within the Port Hedland Coast Basin. There are no lakes, rivers or other permanent water bodies within the project area. Surface water flow in the project area only occurs after heavy rainfall. Minor surface water drainage lines within the project area generally flow in a north easterly direction towards the Tabba Tabba Creek. Surface water diversion around the plant, hydrocarbon storage/usage and TSF areas is included in the project design. **Operation** Since no point source emissions to surface water are proposed for this Project, no Licence conditions relating to point source emissions to surface water or the monitoring of such emissions are proposed at this stage.	Application supporting documentation *Environmental Protection (Unauthorised Discharges) Regulations 2004*
Point source emissions to groundwater including monitoring	W – no conditions	N/A	**Construction including commissioning** No point source emissions to groundwater are authorised by this Works Approval. No specified conditions relating to point source emissions to groundwater or the monitoring of such emissions are included in the Works Approval.	N/A

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
	L – no conditions proposed		Potential diffuse impacts to groundwater are considered under the ambient quality monitoring section below. **Operation** Since no point source emissions to groundwater are proposed for this Project, no Licence conditions relating to point source emissions to groundwater or the monitoring of such emissions are proposed at this stage. Potential diffuse impacts to groundwater will be monitored during operations under ambient environmental monitoring conditions as proposed below.	
Emissions to land including monitoring	W – no conditions L – no conditions proposed	N/A	<u>Wastewater management</u> Due to the small scale of the operations, there will be one portable chemical toilet on site which will be regularly emptied by an approved contractor. Grey water from the crib room will be collected and directed to the TSF. **Construction including commissioning** There are no emissions to land authorised under this Works Approval. No conditions relating to emissions to land are included in this Works Approval. **Operation** Since no emissions to land are proposed for this Project, no Licence conditions relating to emissions to land or the monitoring of such emissions are proposed at this stage.	N/A
Fugitive emissions	W 2.6.1 W 2.6.2	OSC OSC	**Construction including commissioning** DER's assessment and decision making are detailed in Appendix D. **Operation**	*Environmental Protection (Unauthorised Discharges) Regulations 2004*

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
	L – Licence conditions proposed		<u>Dust management</u> DER's assessment and decision making are detailed in Appendix D. <u>Putrescible and industrial waste management</u> All waste products will be removed from site on a regular basis and disposed of at the appropriate landfill facilities at the Port Hedland Waste Management Site. All waste shall be stored on site in such a way as to ensure no wind-blown waste will enter the environment.	
Odour	W – no conditions L – no conditions proposed	N/A	**Construction including commissioning** There are no odour impacts expected during the works authorised. The closest residence is Wallareenya homestead, about 18 km from the Tabba Tabba Project but this is not anticipated to be impacted by the operation. No specified conditions relating to odour are included in the Works Approval. **Operation** <u>Wastewater management</u> Due to the small scale of the operations, no significant odour emissions are anticipated. There will be one portable chemical toilet on site which will be regularly emptied by an approved contractor. Grey water from the crib room will be collected and directed to the TSF. <u>Putrescible and industrial waste management</u> All waste products will be removed from site on a regular basis and disposed of at the appropriate landfill facilities at the Port Hedland Waste Management Site. As such, odour during operation is not expected to be an issue and no licence conditions are proposed at this stage.	Application supporting documentation
Noise	W – no conditions	N/A	**Construction including commissioning** Noise emissions during construction may be expected due to vehicle movement	Application supporting

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
	L – no conditions proposed		and earthmoving equipment. However these are not expected to be significant and Wallareenya homestead, the closest residence is about 18 km from the Tabba Tabba Project. Nagrom Mining is required to comply with the *Environmental Protection (Noise) Regulations 1997*. No additional conditions are required to be added to this Works Approval. **Operation** Noise may be expected during operations but given the separation distance of 18 km to the nearest sensitive receptor and since Nagrom Mining is required to comply with the *Environmental Protection (Noise) Regulations 1997* no additional Licence conditions are proposed at this stage.	documentation *Environmental Protection (Noise) Regulations 1997*
Monitoring general	W3.1.1 – 3.1.2 L – Licence conditions proposed		**Construction including commissioning** General monitoring conditions have been included on the Licence to support the monitoring relating to ambient groundwater quality (W3.8.1). **Operation** The general monitoring conditions included in the Works Approval will be added to the Licence to ensure that all monitoring is conducted in accordance with relevant standards.	*Australian Standard AS/NZS 5667.11 – Water Quality – Sampling – Guidance on the sampling of groundwaters*
Monitoring of inputs and outputs	W – no conditions L – no conditions proposed	N/A	**Construction including commissioning** No monitoring of inputs or outputs is required under this Works Approval. **Operation** No conditions requiring the monitoring of inputs and outputs are proposed for the Licence at this stage.	N/A
Process monitoring	W – no conditions L – Licence	N/A	**Construction including commissioning** No process monitoring is required under this Works Approval. **Operation**	N/A

DECISION TABLE

<table>
<tr><th>Works Approval / Licence section</th><th>Condition number
W = Works Approval
L= Licence</th><th>OSC or NSC</th><th>Justification (including risk description & decision methodology where relevant)</th><th>Reference documents</th></tr>
<tr><td></td><td>conditions proposed</td><td></td><td><u>Naturally occurring radioactive materials</u>
Naturally occurring low levels of uranium (U) and thorium (Th) are known to be present in the ore, as is common with pegmatite mineralisation. Indicative levels in the ore and in the tailings are below the level of concern and are detailed in the table below. Natural radioactivity levels become more concentrated in the product/concentrate (approximately 1.03 Bq/g) and regulation of this material, its storage and transport is within the jurisdiction of the Radiological Council and Department of Mines and Petroleum. DER's jurisdiction relates to waste, emissions and discharges on the Prescribed Premises. In order to ensure that natural variation in U and Th levels in the ore do not result in elevated levels of U and Th being emitted on the Premises, Nagrom have undertaken to monitor the tailings, through process monitoring. This monitoring will be included on the operating Licence and may be reviewed if levels remain consistently low over a reasonable period.
<table>
<tr><th></th><th>ThO_2</th><th>ThO_2</th><th>U_3O_8</th><th>U_3O_8</th><th>Total Specific Activity</th></tr>
<tr><td></td><td>ppm</td><td>Bq/g</td><td>ppm</td><td>Bq/g</td><td>Bq/g</td></tr>
<tr><td>PEGMATITE FEED</td><td>3.5</td><td>0.01</td><td>10.5</td><td>0.11</td><td>0.12</td></tr>
<tr><td>TAILINGS</td><td>7.5</td><td>0.03</td><td>2.0</td><td>0.02</td><td>0.05</td></tr>
</table></td><td></td></tr>
<tr><td>Ambient quality monitoring</td><td>W 3.8.1</td><td>OSC</td><td>Construction including commissioning
Groundwater levels within the project area are between 9 and 17 m below surface with water being relatively fresh (200 to 700 mg/L TDS), and neutral to very slightly acidic (pH 6.3 to 7.6). The TSF area is underlain by an unconfined fractured bedrock aquifer. Limited baseline data indicates that the groundwater within the local Tabba Tabba region contains naturally elevated levels of boron and iron, with relatively high levels of lithium and fluoride.

Four groundwater monitoring bores comprising multi-level piezometers are to be</td><td></td></tr>
</table>

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
	L – Licence conditions proposed		installed as part of the works (one pre-existing): • TTMB-1 and TTMB-3 downstream of the TSF in the direction of surface-/ground-water flow, close to the TSF; • TTMB-Ex1 (existing monitoring bore) downstream of the TSF on the creekline confluence; and • TTMB-5 upstream of the TSF in the direction of surface-/ground-water flow and close to the emergency spillway. OSC3.8.1 has been added to the Works Approval to ensure baseline groundwater is analysed prior to the deposition of tailings. Establishing a detailed baseline is important since: • Observed changes to groundwater during operation of the TSF will be an indicator of liner seepage or failure and require management actions; and • Natural elevation of elements could be wrongly attributed to operations without an accurate baseline. **Operation** Conditions requiring quarterly groundwater monitoring – including a standard suite of water quality parameters and metals plus additional environmentally harmful elements that may be elevated in the pegmatite ore (e.g. tin (Sn), bismuth (Bi), thallium (Tl), vanadium (V), uranium (U), thorium (Th))– will be included in the operational licence for the site.	
Meteorological monitoring	W – no conditions L – no conditions proposed	N/A	No specific meteorological monitoring is required under the Works Approval and no conditions are proposed for the Licence at this stage. The climate of the Tabba Tabba project area is semi-arid, characterised by seasonal periodic rainfall and high evaporation rates. The nearest official meteorological station is located at Port Hedland, approximately 57 km northwest of the survey area.	Application supporting documentation

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Improvements	W – no conditions	N/A	No improvements are specified in this Works Approval.	N/A
Information	W5 L – Licence conditions proposed	N/A	Conditions relating to submission of a compliance report are included as standard in the Works Approval. Conditions relating to record keeping, reporting and notification will be added to the operational Licence.	N/A
Works Approval duration	N/A	N/A	The Works Approval duration has been determined as 3 years.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
29/092014	Application advertised in West Australian	None received	N/A
09/03/2015	Application referred to interested parties listed: Department of Mines and Petroleum Department of Water	 None received None received	 N/A N/A
01/07/2015	Proponent sent a copy of draft instrument	Reply received 3 July 2015 stating that Nagrom had no comments on the draft.	N/A

6. Risk Assessment

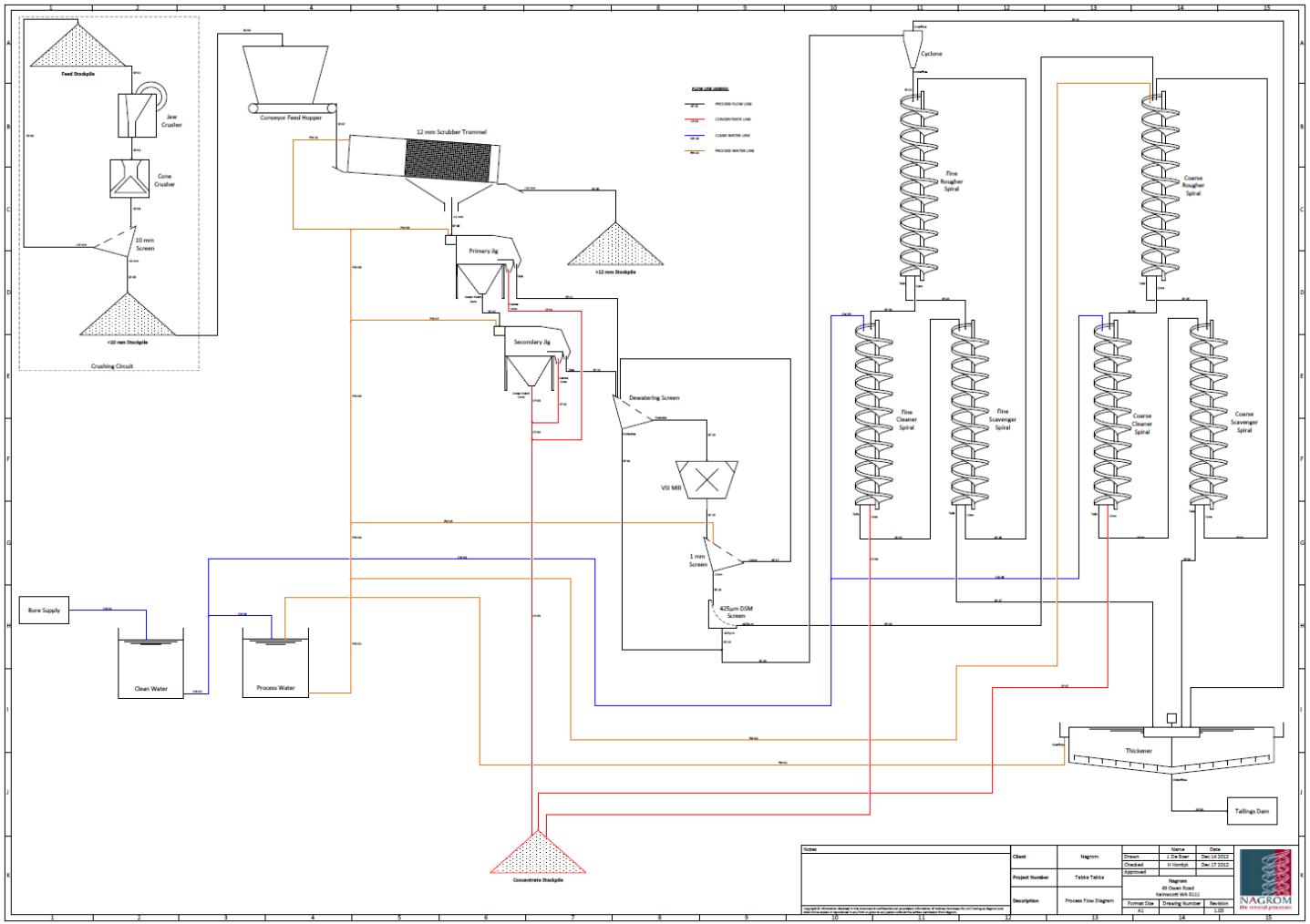
Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

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

Processing Flow Chart



Appendix B

General Conditions

Construction including commissioning

Emission Description

Emission: Stormwater contaminated with hydrocarbons or elevated sediment loading.
Impact: Localised alteration of the environment including soil contamination and increased sediment in run-off.
Controls: Nagrom proposes the following controls:

- The processing plant and the workshop will be constructed within a concrete bunded area. The bunds will be regularly inspected for cracks or leakage. All surface water runoff from the plant area will be directed to the TSF.
- A bulk-fuel storage facility will be installed next to the workshop area with fuel stored in one 110,000 litre, double-skinned, self-bunded, inter-connected tank. A reinforced concrete apron and spillage containment system will be set up adjacent to the tank for vehicle refuelling and tank refilling. All bulk hydrocarbons (with the exception of bulk diesel) will be stored in concrete bunded areas adjacent to the workshop. Storage areas will be capable of containing 110% of the largest container stored and 25% of the aggregate of all containers stored. Bulk fuel storage will be less than 1000m^3 or more in aggregate.
- Waste oil will be stored in a tank and removed from site for recycling by a licensed collection service. Oil filters and hydrocarbon contaminated rags will be collected in drums or bins and removed from site using the same recycle service.
- Spill equipment will be maintained at site. In the event of a spill, the contaminated soil will be collected and disposed of at a designated bioremediation facility off-site.
- Erosion preventative measures will be taken on any disturbed watershed surfaces. These may consist of one or more of the following: contour ripping of slopes, diversion bunds, spoon drains, and rock armouring. If erosion breakouts occur, remedial action will be taken.
- A sequence of diversion drains that will be incorporated into the haul road will collect run-off from limited catchment areas and discharge through various saddles. These will intercept and divert storm flows from the western catchment into valleys located west of the TSF. The drains will be constructed with a 1(v):100(h) gradient to the invert, with a minimum depth of 0.5m, falling to silt collection pits at the point of discharge. Diversion drains are also included in the profile of the access roads to divert run-off from other small catchment areas.

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

Regulatory controls
Standard condition W1.2.2 ensures that environmentally hazardous materials are stored and managed appropriately. No further regulatory controls have been added to the Works Approval since the controls proposed by Nagrom appear adequate to ensure that stormwater will not become contaminated from activities on the premises or contribute increased sediment loading to the local surface-water environment during construction and commissioning.

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

Operation

Standard general conditions will be added to the Licence which will include:

i. the need to operate and maintain pollution control equipment;
ii. appropriate storage of environmentally hazardous materials;
iii. recovery of spills of environmentally hazardous materials outside of containment systems; and
iv. prevention of contamination of stormwater or the treatment of contaminated or potentially contaminated stormwater prior to discharge from the Premises.

Appendix C

Premises operation
Pegmatite (ore), waste rock and tailings samples were assessed for the potential generation of Acid Rock Drainage (ARD) at a NATA accredited laboratory. It was determined that all the materials were non-acid forming. Mine waste samples are reported as elevated in bismuth (Bi) but this is considered to be 'fixed' within crystal lattices and is reported to have low environmental mobility. Some samples were also reported as enriched in tin (Sn) and thallium (Tl). Both Sn and Bi may be toxic to microorganisms but have low mobility.

Generated tailings are to be deposited in an above-ground TSF. The location of the TSF is underlain by medium-highly weathered granite with assumed vertical permeabilites of the in-situ TSF footprint of $1x10^{-6}$ to $1x10^{-8}$ m/s. The results of a range of leaching tests indicated that the material represents a 'mining residue with low hazard' in-line with the Department of Water's Water Quality Protection Note 27, requiring containment which meets a hydraulic conductivity of 1×10^{-9} m/s.

The TSF design comprises an above ground, cross-valley facility requiring the construction of three embankments to a crest level of 111.50 m reduced level (RL) with the entire basin and the upstream face of the embankments to be lined with welded 1.5mm HDPE. The design includes construction of two saddle embankments of 2.0 m and 1.5 m in height to the north and south of the 175 m long main embankment which is a height of approximately 9.5 m above ground level. Excess tailings pore water will be collected by a system of underdrainage pipes on the HDPE liner while any leakage or groundwater will be collected beneath the liner in the perimeter seepage collection trench at the upstream toe of the main embankment. The TSF will be located on M45/375 and will occupy an area of approximately 6.6 ha. The application supporting documentation includes a TSF design ([1]Coffey, 2015) and scope of works ([2]Coffey, 2015) detailing the QA/QC procedures for the installation of the HDPE liner to the basin of the TSF.

The estimated storage capacity of the TSF design is 211,000 tonnes (t) based on a deposited tailings dry density of 1.4 t/m³, a tailings beach slope of 1(v):100(h) and a 0.5 m freeboard. TSF wall raises would be subject to a separate approval.

References
[1]Tabba Tabba Tantalite Project: Alternative TSF Design: HDPE Lined. Coffey, 4 May 2015 Ref: MINEWPER00079AX-AC

[2]Nagrom Pty Ltd Tabba Tabba Project. Tailings Storage Facility Construction Scope of Works for Lined TSF. Coffey, 4 May 2015. Ref: MINEWPER00079AX-AD SOW LINED TSF

Construction including commissioning
Emission Description
Emission: Environmentally harmful materials transported in pipelines including tailings during the commissioning period. Emission would occur if pipelines rupture and or leak.
Impact: Localised alteration of the environment including potential for soil, surface water or groundwater contamination and impacts to vegetation.
Controls: All pipelines will be regularly checked during commissioning for signs of stress which could result in a failure. Typically all pipelines will be inspected on a shift basis, however further pipeline details were not outlined in the works approval supporting documentation.

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

Regulatory controls
OSC 1.3.1 has been added to the Works Approval to ensure adequate bunding of pipelines or automatic cut-outs are constructed or installed since no bunding of pipelines or automatic cut-outs were proposed in the works approval application.

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

Operation and emergency situations
Emission Description
Emission: Environmentally harmful materials transported in pipelines including tailings being spilt to the surrounding environment, if pipelines rupture and/or leak.
Impact: Localised alteration of the environment including potential for soil, surface water or groundwater contamination and impacts to vegetation.
Controls: All pipelines will be required to have adequate bunding or automatic cut-outs in the event of a pipeline failure. Pipelines will require regular checks for signs of stress which could result in a failure.

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

Regulatory controls
Since OSC 1.3.1 has been added to the Works Approval to ensure adequate bunding of pipelines or automatic cut-outs are constructed or installed, the correct infrastructure will be in-place for operations. Premises operation conditions will be included on the licence, including conditions relating to bunding of pipelines or automatic cut-outs and regular visual inspections of pipelines.

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

Emission Description
Emission: Deposition of tailings in the TSF. Seepage of tailings pore water potentially containing elevated elements of environmental concern and/or in excess of known baseline concentrations (e.g. boron, manganese, lithium, aluminium, copper).
Impact: Seepage from the TSF entering the groundwater system causing mounding and potential groundwater contamination. The TSF area is underlain by an unconfined fractured bedrock aquifer with groundwater levels being shallowest beneath the drainage line. Groundwater is relatively fresh (200 to 700 mg/L TDS), and neutral to very slightly acidic (pH 6.3 to 7.6).
Controls: The TSF basin and the upstream face of the embankments is to be lined with welded 1.5mm HDPE. Excess tailings pore water will be collected by a system of underdrainage pipes on the HDPE liner whilst any leakage or groundwater will be collected beneath the liner in the perimeter seepage collection trench at the upstream toe of the main embankment. The TSF will be operated to minimise the decant pool and water will be returned to the process if required. The HDPE liner will be installed under a QA/QC procedure.

Risk Assessment

Consequence: Moderate
Likelihood: Rare
Risk Rating: Low

Regulatory controls
The works approved under this Works Approval include installing a TSF liner that meets a hydraulic conductivity of 1 x 10^{-9} m/s. Compliance documentation certifying that the liner has been correctly installed will be supplied under condition W5.1.1 and W5.1.2. This will ensure the ongoing operation of the TSF presents minimal risk to groundwater from seepage. Groundwater monitoring bores both upstream and downstream of the TSF will provide surveillance of the groundwater and of TSF/liner performance.

Conditions regarding containment infrastructure inspections and groundwater monitoring will be added to the Licence to ensure risks to groundwater are minimised and monitored.

Residual Risk
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Emission Description
Emission: Deposition of tailings in the TSF. Emission would occur if the TSF overtopped or embankments failed.
Impact: Localised alteration of the environment including potential for soil, surface water or groundwater contamination and impacts to vegetation.
Controls: Stormwater diversion drains will be constructed to intercept and divert storm flows from the western catchment into valleys located west of the TSF. A TSF emergency spillway will be constructed at a level of 110.8 m RL through a saddle in the ridge to the South West although the TSF is designed to contain in excess of a 100 AEP (annual exceedance probability), 72 hour duration storm. A floating decant pontoon will be established if considered necessary based on TSF performance. A Dam Failure Consequence Category of 'very low' was assigned using the ANCOLD '*Guidelines on the Consequence categories for dams*' (2012).

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

Regulatory controls
Conditions specifying tailings deposition to specified containment infrastructure with specific construction requirements, regular and recorded inspections, and a specified freeboard will be added to the licence to reduce the likelihood of an overtopping event. Under regulation by the Department of Mines and Petroleum (DMP), the geotechnical stability of the TSF will be assessed and monitored.

Residual Risk
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Appendix D

Fugitive emissions

Construction and Commissioning

Emission Description

Emission: Dust will potentially be generated during clearing, land disturbance and construction activities.

Impact: Dust emissions can be harmful to human health and the environment. Total suspended particles (TSP) can impact amenity and smother vegetation while particulate matter smaller than 10 micrometres in diameter (PM_{10} or $PM_{2.5}$) can cause respiratory impacts. The closest residence is Wallareenya homestead, about 18 km from the Tabba Tabba Project.

Controls: The following measures will be used to control dust at the project site:

- Water mist sprays on the crushing circuit to reduce dust generation;
- Use of water trucks on haul roads for dust suppression; and
- Implementation of a site maximum speed limit for all vehicles of 50 km/h; and minimisation of unnecessary movement of vehicles.

Risk Assessment

Consequence: Minor
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls

OSCs 2.6.1 and 2.6.2 have been added to the Works Approval to ensure that dust emissions are minimised during construction and that no visible dust crosses the premises boundary given that the premises boundary is very close to the plant, ROM pad and TSF.

Residual Risk

Consequence: Minor
Likelihood: Unlikely
Risk Rating: Moderate

Operation

Emission Description

Emission: Dust may be generated by mining activities including crushing and the movements of vehicles and machinery. Dust may also be generated from tailings deposited in the TSF.

Impact: Dust emissions can be harmful to human health and the environment. Total suspended particles (TSP) can impact amenity and smother vegetation while particulate matter smaller than 10 micrometres in diameter (PM_{10} or $PM_{2.5}$) can cause respiratory impacts. The closest residence is Wallareenya homestead, about 18 km from the Tabba Tabba Project.

Controls: Dust generated from the surface of the TSF is likely to be an insignificant source of dust with the major sources of dust being mining activities including crushing and vehicle/machinery movements. Wet deposition of tailings and daily visual inspections of the TSF will ensure that dust generation is minimised and monitored. The short 2-year life-of-mine will ensure that the TSF will be covered/capped following operations and there is not a significant period of time for the tailings to dry and become airborne. In addition, the TSF is of limited size (6.6 ha). Other controls during operations include:

- Water mist sprays on the crushing circuit to reduce dust generation;
- Use of water trucks on haul roads for dust suppression;

- Implementation of a site maximum speed limit for all vehicles of 50 km/h; and minimisation of unnecessary movement of vehicles; and
- Implementation of two dust monitoring campaigns throughout the life of the project over 30-day periods as per AS/NZS 3580.10.1.

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

Regulatory Controls
In keeping with the Works Approval conditions applied, conditions requiring adequate management of fugitive dust emissions arising on the Premises will be included in the operational licence for the site.

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