



Works Approval

Environmental Protection Act 1986, Part V

Works Approval Holder: Ramelius Resources Ltd

Works Approval Number: W5843/2015/1

Registered office: Level 1,
 130 Royal Street
 EAST PERTH WA 6004

ACN: 001 717 540

Premises address: Burbanks Treatment Plant
 M15/1273, M15/1370, M15/1369, G15/10, G15/11, G15/12, G15/13 and
 G15/25 of L15/110.
 COOLGARDIE WA 6430
 as depicted in Schedule 1.

Issue date: Thursday, 9 July 2015

Commencement date: Monday, 13 July 2015

Expiry date: Sunday, 12 July 2020

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
05	Processing or beneficiation of metallic or non-metallic ore.	50 000 tonnes per year	180 000 tonnes per annual period

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 July until 30 June in the following year;

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

'CEO' for the purpose of correspondence means;
Manager Licensing (Resources South)
Department of Environment Regulation
Locked Bag 33
CLOISTERS SQUARE 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;

'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;

'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;

'Stage 7' means construction of the first 2.5 metre embankment raise to RL 436.5 m at TSF1;

'Stage 8' means construction of the second 2.5 metre embankment raise to RL 436.5 m at TSF2;

'Stage 9' means construction of the third 2.5 metre embankment raise to RL 439 m at TSF1;

'Stage 10' means construction of the fourth 2.5 metre embankment raise to RL 439 m at TSF2;

'Works Approval' means this Works Approval numbered W5843/2015/1 and issued under the *Act*;



'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 Requirements¹		
Document	Parts	Date of Document
Ramelius Milling Services – TSF1 and TSF2 Combined Raise Design Report, Burbanks Mill, Coolgardie. Coffey Mining Pty Ltd.	All	7 November 2014
Email correspondence from Stephen Day, Approvals Manager, Ramelius Resources: "FW: Burbanks Treatment Plant, Coolgardie - Completed Form P4 - AIN : wtm9kk"	All	20 April 2015
Email correspondence from Stephen Day, Approvals Manager, Ramelius Resources: "FW: Burbanks Treatment Plant, Coolgardie - Completed Form P4 - AIN : wtm9kk"	All	7 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.

1.3 Premises operation

There are no specified conditions relating to Premises operation in this section.

2 Emissions

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

3 Monitoring

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

4 Improvements

There are no specified conditions relating to improvements in this section.



5 Information

5.1 Reporting

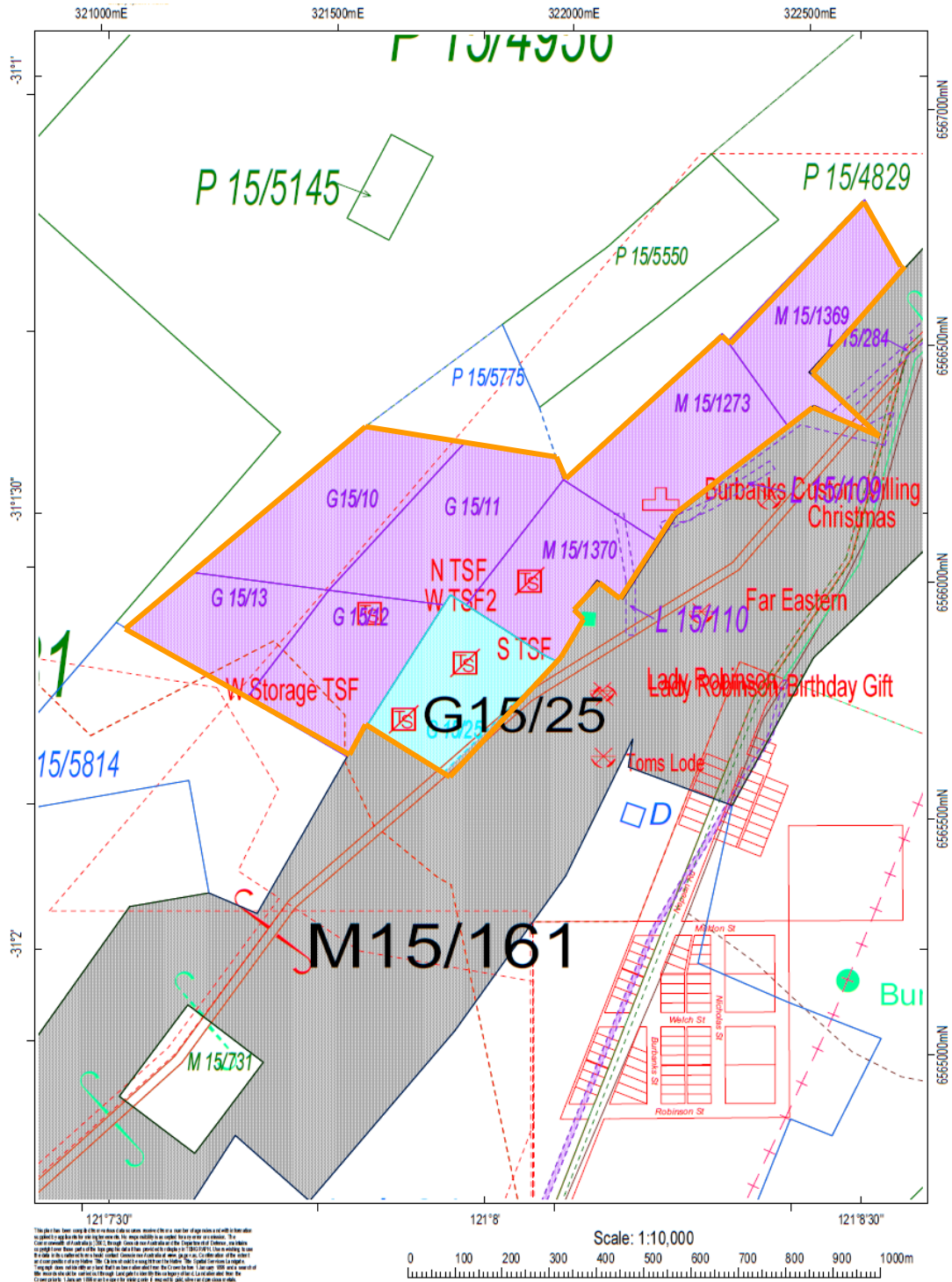
- 5.1.1 The Works Approval Holder shall submit a compliance document to the CEO, following the construction of each of Stage 7 to Stage 10 inclusive and prior to commissioning of the same.
- 5.1.2 The compliance document shall:
- (a) certify that the works were constructed in accordance with the conditions of the works approval;
 - (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.



Schedule 1: Maps

Premises map

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





Decision Document

Environmental Protection Act 1986, Part V

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ACN: 001 717 540

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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 and legal requirements and that the Works Approval and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:

Clarrie Green
Licensing Officer

Decision Document authorised by:

Danielle Eyre
Senior Manager, Resource Industries



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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.

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 <input checked="" type="checkbox"/>	
	New Licence <input type="checkbox"/>	
	Licence amendment <input type="checkbox"/>	
	Works Approval amendment <input type="checkbox"/>	
Activities that cause the premises to become prescribed premises	Category number(s)	Assessed design capacity
	05	180 000 tonnes per year
Application verified	Date: 19 May 2015	
Application fee paid	Date: 2 June 2015	
Works Approval has been complied with	Yes <input type="checkbox"/>	No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Compliance Certificate received	Yes <input type="checkbox"/>	No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Commercial-in-confidence claim	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the <i>Environmental Protection Act 1986</i> ?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Is the proposal subject to Ministerial Conditions?	Yes <input type="checkbox"/>	Referral decision No:
		Managed under Part V <input type="checkbox"/>
		Assessed under Part IV <input type="checkbox"/>
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the <i>Environmental Protection Act 1986</i>)?	Yes <input type="checkbox"/>	Ministerial statement No:
		EPA Report No:
	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Department of Water consulted	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is the Premises within an Environmental Protection Policy (EPP) Area	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If Yes, include details here, eg Site is subject to SO ₂ requirements of Kwinana EPP.		



3 Executive summary of proposal and assessment

Ramelius Resources Ltd (Ramelius) operate the Burbanks Treatment Plant, located eight kilometres south of Coolgardie, on mining tenement M15/1273 and general lease tenements M15/1273, M15/1370, M15/1369, G15/10, G15/11, G15/12, G15/13 and G15/25 of L15/110.

The process at the site involves treating ore from mining operations in the Coolgardie area. The processing plant includes two stages of crushing, ball milling and a carbon in pulp circuit of a nominal 180,000 tonnes per year capacity. The main concern at the site is dust emissions produced from the activities and seepage from the twin paddock style Tailings Storage Facilities 1 and 2 (TSF1 and TSF2) into the local groundwater.

Ramelius propose to raise the embankments of TSF1 and TSF2 by 15 m to the ultimate crest height of RL 449 m using an upstream construction technique. The raised facility is estimated to provide an additional 2.3 million tonnes of tailings storage, corresponding to an additional storage life of 12.6 years at current production rates. A staged approach will be used to lift the two TSF's to allow for continuous operation (Table 1). As the lifts encroach further into the TSF paddock of TSF1, the TSF will become too narrow to enable effective management of tailings deposition and supernatant pool development. Therefore the final lift of five metres will involve combining both TSFs.

Table 1: Construction stages for TSF lifts

Stage	Active Cell	Crest RL (mAHD)
7	TSF1	436.5
8	TSF2	436.5
9	TSF1	439.0
10	TSF2	439.0
11	TSF1	441.5
12	TSF2	441.5
13	TSF1	444.0
14	TSF2	444.0
15	Combined	449.0

The current TSF height in which the Licence L8382/2009/2 permits tailings deposition to is RL 431.5m. Therefore a licence amendment will be required prior to operation of the TSFs at a height of RL 436.5 m. As the proposal requires an approximate 13 year construction phase and a significant lift height, the works approval will be granted for a period of five years for the construction of Stages 7 to 10. However, this decision document assesses the impacts for all proposed lifts with any future Stages to be permitted under licence amendments.



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	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
General conditions	W1.2.1 – 1.2.2 L1.2.1 – 1.2.5	N/A	<p>Construction Standard general conditions have been applied to the Works Approval that require Ramelius to construct the embankment lift in accordance with commitments outlined in application documents.</p> <p>Operation OSC1.2.1 – 1.2.5 will remain in the Licence.</p>	<p>Application supporting documentation</p> <p>Environmental Protection (Unauthorised Discharges Regulations, 2004).</p>
Premises operation	W1.3 L1.3.1 – 1.3.4	N/A NSC	<p>Construction No premises operation conditions have been applied to the Works Approval. DER's assessment of the embankment lift's impacts on seepage to groundwater are detailed in Appendix A.</p> <p>Operation Current licence conditions relating to monitoring and maintaining containment infrastructure including the TSFs will remain on the Licence. Further information on the annual water balance of the TSFs (OSC1.3.4) will also assist in identifying the rate of seepage.</p>	<p>Application supporting documentation</p> <p>General provisions of the <i>Environmental Protection Act 1986</i></p>
Emissions general	W2 L2.1.1	OSC	<p>Construction No emissions and discharge limits have been applied to the works approval.</p> <p>Operation The Licensee will be required to record and investigate the exceedance of any descriptive or numerical limit and/or target.</p>	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
Point source emissions to air including monitoring	W2 L2.2	N/A	Construction and operation No point source emissions to air are anticipated during the construction of the TSFs.	General provisions of the <i>Environmental Protection Act 1986</i>
Point source emissions to surface water including monitoring	W2 L2.3	OSC	Construction and operation There are no anticipated point source emissions to surface water as a result of construction or operation of the TSF lifts.	Application supporting documentation General provisions of the <i>Environmental Protection Act 1986</i> Environmental Protection (Unauthorised Discharges Regulations, 2004).
Point source emissions to groundwater including monitoring	L2.5.1 L3.5.1	OSC	Construction and operation No emissions to groundwater are anticipated as a result of constructing the TSF embankment lifts or through the operation of the above-ground TSF. Standing water levels around the TSFs suggest that the base of the TSFs do not intercept groundwater.	Environmental Protection (Unauthorised Discharges) Regulations 2004.
Emissions to land including monitoring	L2.4	N/A	Construction and operation No emissions to land are anticipated as a result of constructing or operating the TSFs.	General provisions of the <i>Environmental Protection Act 1986</i>
Fugitive emissions	W2	OSC	Construction <u>Emission Description</u> <i>Emission:</i> Dust generated by earthmoving equipment and additional vehicle movements.	General provisions of the <i>Environmental Protection Act 1986</i>



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
	L2.6.1 – 2.6.2	NSC	<p><i>Impact:</i> Reduction in local air quality and the potential for dust to deposit on nearby local flora. No priority flora has been witnessed near to the TSFs with the closest Priority species located approximately 2.2 km west of TSF1.</p> <p><i>Controls:</i> In order to control the dust emissions during construction of the facility water trucks will be used to suppress dust on high traffic areas and on the tailings surface. The material used for the embankment construction will be moisture conditioned in the borrow area before being transported and compacted at the TSFs.</p> <p><u>Risk Assessment</u> <i>Consequence:</i> Insignificant <i>Likelihood:</i> Unlikely <i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u> Ramelius controls are expected to adequately manage dust emissions during construction.</p> <p>Operation Optional standard dust conditions have already been applied to the Licence (OSCs 2.6.1 and 2.6.2) and adequately regulate the generation of dust at Burbanks.</p>	
Odour	W2 L2.7	N/A	<p>Construction and operation No conditions relating to odour have been applied to the Works Approval as construction is not expected to generate significant odour emissions. The deposition tailings is also not expected to generate significant odours and therefore no additional odour conditions will be added to the Licence.</p>	General provisions of the <i>Environmental Protection Act 1986</i>
Noise	W2 L2.8	N/A	<p>Construction Noise is likely to be generated by increased vehicle movements and earth moving during construction. However, noise is not anticipated to interfere with the amenity of the nearest human receptor during either construction or</p>	<i>Environmental Protection (Noise) Reulgations 1997</i>



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
			operation. Operation Insignificant volumes of noise are anticipated during operation of the TSFs.	
Monitoring general	W3 L3.1.1	N/A OSC	Construction No monitoring conditions have been applied to the Works Approval. Operation OSC 3.1.1 will remain on the Licence to ensure that all samples are collected in accordance to the relevant Australian Standards and are submitted to a laboratory with NATA accreditation.	Australian Standard AS/NZS 5667.1 – Water Quality Sampling – Guidance on the Design of sampling, programs, sampling techniques and the preservation and handling of sample.
Monitoring of inputs and outputs	W3 L3.6	N/A	Construction and operation No input or output monitoring will be included on the Licence or Works Approval as a result of the TSF embankment lifts.	General provisions of the <i>Environmental Protection Act 1986</i> .
Process monitoring	W3 L3.7	N/A	Construction There are no specified conditions relating to process monitoring for the works approval. Operation A process monitoring condition will be added to the Licence to require Ramelius to record the volumes of tailings deposited to the TSF.	N/A
Ambient quality monitoring	W3 L3.8.1 – 3.8.2	N/A OSC	Construction No ambient quality monitoring will be required through the Works Approval. Operation Local groundwater contains elevated levels of salts in the range of 3,000 to 32,000 mg/L Total Dissolved Solids (TDS). Saline groundwater mounding has	Australian Standard AS/NZS 5667.1 – Water Quality Sampling – Guidance on the Design of sampling,



DECISION TABLE				
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			<p>the potential to result in vegetation death in the event that mounding intercepts the root zone. In May 2014, standing water level ranged between approximately 6.5 and 15 metres below ground level (mbgl), with a gradual rising trend across the 2013/14 monitoring period. Groundwater monitoring conditions (including standing water level targets) will remain on L8382/2009/2 and are expected to adequately monitor seepage from both TSFs.</p> <p>No further changes to monitoring requirements or ambient quality limits are proposed for the Licence following the construction of the TSFs embankment lift.</p>	programs, sampling techniques and the preservation and handling of sample.
Meteorological monitoring	W3 L3.8	N/A	Construction and operation There are no meteorological monitoring requirements under this Works Approval or Licence.	N/A
Improvements	W4 L4	N/A	No improvement conditions are proposed for this project.	N/A
Information	W5.1.1 – 5.2.2	OSC	Ramelius will be required under the Works Approval to submit a compliance document certifying that each stage of works were constructed in accordance with the Works Approval. Future embankment lifts will be carried out under Licence amendments and these compliance information conditions will therefore be transferred across to the Licence.	N/A
Licence Duration	N/A	N/A	As the proposal requires an approximate 13 year construction phase and a significant lift height, there is a high level of uncertainty surrounding the predicted and actual performance of the TSFs and the impacts to groundwater. Therefore the works approval will be granted for a period of five years for the construction of Stages 7 to 10. Stages 11 to 15 may be permitted under licence amendments following an assessment of impacts to groundwater through the review of Licence L8382/2009/1 Annual Environmental Reports.	N/A



5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
19/05/2015	Application referred to interested parties listed: Department of Mines and Petroleum	No comments received.	N/A
02/07/2015	Proponent sent a copy of draft instrument	No comments received.	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

Premises Operation

The most significant environmental risk to arise from TSFs in general is that of seepage and subsequent groundwater mounding/contamination. Groundwater surrounding the TSFs is saline with a TDS concentration ranging from 3,000 to 32,000 mg/L. Therefore groundwater beneath the TSFs is likely to be able to support any stygofauna populations.

Tailings can be characterised as saline at approximately 30,000 mg/L with Weak Acid Dissociable cyanide (WAD CN) at 100 mg/L. Although in-situ tailings are expected to create a barrier to groundwater, a rapid increase in TSF height has the potential to increase the hydraulic pressure on tailings and lead to rises in groundwater levels, salinity and cyanide concentration.

Invertebrates can be sensitive to cyanide exposure with lethal effects occurring between 0.03 and 0.10 mg/L of free cyanide. However, the effects of cyanide at these concentrations are variable between species. There are no known rare species of stygofauna or Priority vegetation species in the proximity of the TSFs.

Emission Risk Assessment – Operations

Emission Description

Emission: Seepage from TSF1 and TSF2 resulting in groundwater mounding and contamination.

Impact: Rising standing water levels into the root zone of native vegetation is likely to result in significant vegetation death due to the high salt content of groundwater. There is also the potential that aquatic invertebrates within the vicinity of the TSFs may be impacted by an increase in WAD CN concentrations as a result of seepage.

Controls: In order to control groundwater levels and potential contamination from discharges to groundwater, Ramelius propose to:

- operate a multiple spigot discharge method to maximise the drying cycle of the tailings slurry;
- utilise incidental rainfall that falls within the TSFs in the process facility and in preference to alternate water sources to ensure that the supernatant pond size minimised; and
- collect seepage water intercepted by the under drainage system for later re-use in the processing facility.

Risk Assessment

Consequence: Moderate

Likelihood: Possible

Risk Rating: Moderate

Regulatory Controls

Standing water level targets (OSC3.8.1) will remain on the Licence to encourage Ramelius to manage seepage from the TSFs. Due to the 'possible' likelihood of seepage intruding on vegetation root zones and impacting stygofauna populations, a standing water level limit of 4 mbgl will be applied at all monitoring bores. DER will closely monitor standing water levels to ensure that the risk to local vegetation does not increase during tailings deposition to TSF1 or TSF2.

Residual Risk

Consequence: Moderate

Likelihood: Unlikely

Risk Rating: Moderate