

Decision Document

Environmental Protection Act 1986, Part V

Proponent:	Galaxy Resources Ltd
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Works Approval: L8469/2010/2

- Registered office: Suite 8/18 Kearns Crescent ARDROSS WA 6153
- ACN: 071 976 442
- Premises address:Mt Cattlin Ravensthorpe Spodumene Project
Part of Mining Lease M74/244
Being Lot 31 on Plan 224145 and Lot 127 on Plan 145763
RAVENSTHORPE WA 6346
- Issue date: Thursday, 3 October 2013
- Commencement date: Monday, 14 October 2013
- Expiry date: Saturday, 13 October 2029

Decision

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

Decision Document prepared by:

Neville Welsh Senior Licensing Officer

Decision Document authorised by:

Tim Gentle Manager Licensing – (Resources Industries) Delegated Officer



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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.

2 Administrative summary

Administrative details Works Approval New Licence Application type Licence amendment \boxtimes Works Approval amendment Assessed design Category number(s) capacity Activities that cause the premises to become prescribed premises 1 000 000 tonnes per 5 annual period Application verified Date: 10 April 2016 & 03 May 2016 Application fee paid Date: Not applicable N/A Works Approval has been complied with Yes No No N/A🖂 Compliance Certificate received Yes Commercial-in-confidence claim Yes No🖂 Commercial-in-confidence claim outcome Not applicable Yes No🖂 Is the proposal a Major Resource Project?



Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the <i>Environmental Protection Act 1986</i> ?	Yes⊠	No	Decision date: 22/09/2008 Managed under Part V 🛛 Assessed under Part IV 🔲	
Is the proposal subject to Ministerial Conditions?	Yes	No⊠	Ministerial statement No: N/A	
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 Departmen	No⊠ nt of Wate	er consulted Yes 🛛 No 🗌	
Is the Premises within an Environmental Protection Policy (EPP) Area: Yes No				
Is the Premises subject to any EPP requirements? Yes No				

3 Executive summary of proposal and assessment

Prescribed Premise Summary

Galaxy Resources Ltd (Galaxy) is licensed for a mining and processing facility for the production of Spodumene a lithium aluminium silicate (LiAI (Si_2O_6), comprising 6.0% Li₂O), and tantalum oxide (Ta_2O_5). The project is located at Mt Cattlin two kilometres northwest of the Ravensthorpe town site on Mining Lease M74/244 and is 100% owned by Galaxy. The project is located on Lot 31 on Plan 224145 and Lot 127 on Plan 145763, Old Newdegate Road at Ravensthorpe.

The Ravensthorpe Spodumene Project has been assessed as a "prescribed premises" under category number 5, within Schedule 1 of the Environmental Protection Regulations 1987 (EP Regs) that includes the mining and processing of Spodumene and Tantalite on the agricultural land west of Floater Road and South of Old Newdegate Road. Any expansion of the operations outside the existing approved footprint will require additional works approvals or amendments to the licence.

Category 5 is described as: 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
- (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.

The Ravensthorpe Spodumene Project has the capacity to extract 1,000,000 tonnes of ore per year to produce 150 kilo tonnes per annum (ktpa) Spodumene concentrate and 364 tonnes per annum (tpa) tantalite.

During operation, dewatering occurs on site and the water extracted is pumped to a storage pond for use in the process. As this water is not discharged into the environment, the operation does not meet the threshold of a Category 6 prescribed Premises (Mine dewatering) under Schedule 1 of the EP Regs.

Power supply is from a diesel-fired power station. As the installed generating capacity is less than 10MW (max 6MW of power generated) it does not trigger the threshold for Category 52 prescribed premises under Schedule 1 of the EP Regs.

DER has completed an "amend to extend project" aimed at extending licence expiry dates of many part V licences in the state. As part of this project, the expiry date of licence L8469/2010/2 was extended from 13 October 2018 to 13 October 2029. This will be reflected in this amendment.



Prescribed activities

The Premises commenced operation in October 2010, but has been in care and maintenance since July 2012. Since July 2012 the company has retained their Part V licence to allow operations to recommence. At the time of this assessment, the process plant is being prepared to resume operations.

The infrastructure on the premises includes:

- open pit;
- waste rock dump;
- primary/Spodumene concentrator;
- tailings storage facility (TSF) and associated pipelines;
- dust suppression dam;
- reverse osmosis plant (waste will be directed to the Raw/Process Water Pond);
- production bores;
- associated pipelines and storage pond, power station (5 MW diesel-fired);
- offices;
- workshop;
- stores;
- laboratory; and
- access roads.

Dewatering occurs on site and the water extracted is pumped to a storage pond for use in the process when the Premises operate. Dewatering continues while the plant is in care and maintenance, and water is also abstracted from monitoring bore MB03 due to a rising water level in this bore.

No employee camp is based at the mine site as most personnel commute from the surrounding Ravensthorpe district.

Licence amendment summary

This Licence amendment is sought by the Licence Holder to include extension of the expiry date, assessment of a temporary tailings stockpile area (TTSA) to store dry tailing, assessment of the process plant to include Reflux Clarifiers and Lithium Belt Filter; and converting the licence into the most up to date DER licence format. Only those emissions associated with this amendment will be assessed the remaining emissions will not be reviewed and reassessed at this time.

This assessment includes a review of the associated works approval W4533/2009/1 issued to extend the TSF lift timeframe and include reflux classifiers into the process plant circuit. Works Approval W4533/2009/1 will remain active following this licence amendment as it contains conditions for staged construction of TSF lifts and monitoring during construction.

Other relevant approvals

Part IV Approvals

The Ravensthorpe Spodumene Project was referred to the Environmental Protection Authority (EPA) on 22 September 2008. The EPA determined in relation to the proposal; "Not assessed – Managed under Part V of the EP Act (Clearing)" The environmental factors considered were noise, dust and clearing. The Western Australian Appeals Convenor did not receive any public appeals against the EPA's decision.

Part V Approvals:

Works Approval (W4533/2009/1) for construction of the processing plant and Tailings Storage Facility (TSF) was granted on 22 June 2009 and amended in July 2010 with partial compliance certificate submitted on 15th September 2010. Further amendment to the works approval was granted on 11th October 2010 to remove the requirement for spill trays and covers on all conveyors and further amendment to the works approval was granted on 24 May 2012 to extend its duration to 2018 to



facilitate the remaining lifts to Cell 1 of the TSF plus further amendment was granted 17 January 2013 to install an additional reflux classifier into the processing plant.

The operating licence L8469/2010/1 was issued on 14 May 2010 with an amendment to the licence granted 24 May 2012 to update the TSF Operating Manual version which had been updated. The mine officially went into care and maintenance in July 2012; however the operating licence was still reissued on 3 October 2013 (L8469/2010/2) to allow recommencement of operations when suitable. As at April 2016, the mine and process plant is being prepared for start-up and operations to recommence.

Operations must also comply with the following guidelines and regulations:

- Environmental Protection Act 1986 (EP Act);
- Contaminated Sites Act 2003;
- Environmental Protection (Controlled Waste) Regulations 2004 (Controlled Waste Regs);
- Environmental Protection (Unauthorised Discharges) Regulations 2004;
- Environmental Protection (Noise) Regulations 1997 (Noise Regulations);
- Environmental Protection Regulations 1987; and

Other DER activities:

As part of the National Pollution Inventory, quantities of air emissions will be estimated and reported annually to the DER. This will include emissions from various activities on-site including blasting, vehicle movements, processing and wind erosion (dust). GMM must ensure they undertake reporting in accordance with the National Greenhouse and Energy Reporting Regulations 2008.

Dewatering is occurring on site, however water is stored in a storage dam and re used in the processing and thus is not prescribed.

Emissions from the power station (black smoke) can be regulated under the Environmental Protection (Unauthorised Discharges) Regulations 2004 (UD Regs).

Clearing of native vegetation is managed under the clearing provisions of the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. As it is a mining tenement, this is managed by DMP.

Cell 2 of the TSF will require an application to DER. The construction of Cell 2 will occur in the future, beyond the duration of the active works approval, and to ensure that appropriate management is occurring prior to the approval.

Department of Mines and Petroleum (DMP):

The Department of Mines and Petroleum (DMP) are the primary agency for managing the following statutory requirements of mining proposals in Western Australia;

- Mining Act 1978 and regulations (mining lease, mining proposals and programme of works);
- Mine Safety and Inspection Act 1994 and Mine Safety and Inspection Regulation 1995 (mine safety);
- Dangerous Goods Safety Act 2004;
- Dangerous Goods Safety (Explosives) Regulations 2007;
- Dangerous Goods Safety (General) Regulations 2007;
- Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007;
- Health Act 1911; and,
- Land Administration Act 1997.

DMP are the primary agency for managing the landform aspects of tailings facilities in respect to geotechnical and structural integrity, safety and the long term rehabilitation of the site. Approval from the DMP for the Ravensthorpe Spodumene Project Mining Proposal (MP) (ID 22377) was received on 4 November 2009.

Galaxy has a current clearing permit (CPS 3045/1) for the project, issued by DMP.

The Mining Tenement was granted by DMP on 24th December 2009.



Department of Water

Three licences to construct bores or wells were obtained from the Department of Water (DoW) (numbered CAW167437(1), CAW169547(1) and CAW170586(1)).

A Groundwater Abstraction Licence (GWL167439(1) to abstract 1,095,000 kL/year was obtained from the Department of Water (DoW). This duration of this licence is 28 August 2009 to 28 August 2019.

Estimated water requirements for the project are 4.27 gigalitres per year GL/yr when operating. A reliable return water supply to the treatment plant's process water tanks will be supplemented by return (decant) water from the TSF.

Extraction of groundwater for the project water requirements near Cattlin Creek may impact the water levels of the catchment. These impacts are managed through the DoW and a groundwater abstraction operating strategy.

Emissions of significance

The main emissions associated with the Ravensthorpe Spodumene Project are considered to be point source air emissions from the diesel fired power plant, fugitive dust and noise emissions from caused during mining operations, blasting, ore haulage activities and at the crushing and screening plant, light emissions at night affecting neighbours and local fauna, discharges to land from TSF causing hydrological impacts to groundwater plus waste management and contaminated stormwater.

The operation is within 2 kilometres of residence and the town of Ravensthorpe and the previous licence and works approval decisions have been taken into consideration and DER has determined the Licence Premises Risk Assessment (LPRA) as Moderate risk.



4 Decision table

All applications are assessed in line with the *Environmental Protection Act1986*, 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	
Interpretation	L1.1.2, 1.1.3 and 1.1.4	 Operation Conditions 1.1.2, 1.1.3 and 1.1.4 have been reviewed to ensure that terminology used within the Licence is referenced to the appropriate definitions where applicable, that any reference to a standard or guideline is to the most current version of that standard or guideline. Definitions under Condition 1.1.2 that are not used within the Licence, including those definitions linked to conditions which have been removed (addressed in the sections below) have been deleted. Additional definitions have been inserted for the following: To accurately define the DER's contacts. To accurately define relevant operational areas within the Premises which are subject to specific regulatory controls. To accurately define the Premises boundary. 	General provisions of the <i>Environmental</i> <i>Protection Act</i> 1986 <i>Guidance</i> <i>Statement:</i> <i>Regulatory</i> <i>Principles</i> <i>Guidance</i> <i>Statement:</i> <i>Setting Conditions</i>	
General conditions	N/A	 Operation Licence conditions 1.2.1, 1.2.2, 1.2.3, 1.2.4 and 1.2.5 in the previous version of the Licence have been deleted. No other conditions of relevance have been identified and the 'general conditions' section of the Licence has been removed. The conditions were removed for the following reasons: Condition 1.2.1: is an explanatory statement and not a condition, the intent of the statement is covered by the general provisions of the Act. Condition 1.2.2: there is no specified pollution control, monitoring equipment or maintenance schedule which the condition clearly relates to, where infrastructure is required to control or monitor emissions it is specified within conditions under the 'Premises operation' and section of the Licence. 	General provisions of the <i>Environmental</i> <i>Protection Act</i> 1986 <i>Environmental</i> <i>Protection</i> (Unauthorised <i>Discharges</i>) <i>Regulations</i> 2004	



DECISION TABLE				
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents	
		 Condition 1.2.3: the provisions of the condition were not clear or enforceable. No substances requiring specific regulatory controls have been identified for the prescribed activities undertaken at the Premises. Condition 1.2.4: the storage and remediation of spills of relevant materials can be effectively regulated by the general provisions of the <i>Environmental Protection Act 1986</i> and the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>. No substances requiring specific regulatory controls have been identified for the prescribed activities undertaken at the Premises. Condition 1.2.5 the prevention of stormwater is unclear as it does not specify what stormwater infrastructure is required to be constructed and maintained or what if any specific management actions are required. 	Guidance Statement: Regulatory Principles Guidance Statement: Setting Conditions	



DECISION TABLE				
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents	
Premises operation	L1.3.1 - 1.3.9	Operation Existing conditions L1.3.1 to L1.3.9 have not been reviewed or reassessed at this time but will be considered following Compliance Inspection and/or 24 months of operation at the Premises once the amended licence has been issued.	General provisions of the Environmental Protection Act 1986	
	L1.3.10	New condition 1.3.10 has been included to the licence to reference the documentation submitted as part of the amendment being assessed. See Appendix A for more details.	Guidance Statement: Regulatory Principles Guidance Statement: Setting Conditions	
Emissions (general)	L2.1 to L2.8	 Operations Amendments to emissions conditions, and removal of the emissions section, are for: Condition 2.1.1 in the previous licence version has been deleted; there are no descriptive or numerical limits or targets specified in the emissions section of the Licence. Sections 2.2-2.5 & 2.7 in the previous licence version have been deleted; the sections contained no conditions. Conditions 2.6.1 in the previous licence version remains in the amended licence but will be reviewed following Compliance Inspection or after 24 months of operation. Condition 2.6.2 in the previous licence version has been deleted; see the fugitive emissions (dust) section of this Decision Document. Conditions 2.6.3 and 2.6.4 in the previous version of the licence have been deleted; the conditions are replaced by condition 1.2.5 and are addressed in the fugitive emissions (dust) section of this Decision Document. Condition 2.8.1 in the previous licence version remains as it references the most recent Noise Management Plan completed in June 2011. 	General provisions of the <i>Environmental</i> <i>Protection Act</i> 1986 <i>Guidance</i> <i>Statement:</i> <i>Setting Conditions</i>	



Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Fugitive Emissions (Dust)	L2.6.1	 Construction The construction of Reflux Classifiers and Lithium Filter belts occur within the plants closed production circuit then emissions will remain unchanged and are adequately addressed by the Premises conditions currently imposed on the licence. Construction dust for TTSA and process circuit improvements is short term and the emission is unlikely to occur with minor consequences providing an overall emission risk rating of moderate. Fugitive dust will be managed in accordance with latest version of Galaxy Airborne Material Management Plan with no additional licence conditions required. Operation The emission of dust may arise at the Premises from the following activities: Activities of crushing, screening and conveying raw material to be processed; Open areas and trafficable areas causing dust lift off; and, Speed of vehicles traversing the mine site and process areas. This licence amendment is not assessing the fugitive emissions (dust) at this time and the previous licence conditions adequately address management of dust from the mines activities. 	General provisions of the <i>Environmental</i> <i>Protection Act</i> 1986 <i>Guidance</i> <i>Statement:</i> <i>Regulatory</i> <i>Principles</i> <i>Guidance</i> <i>Statement:</i> <i>Setting Conditions</i>



DECISION TABLE

Worko	Condition	lustification (including viole description & desision mathedals with a relevant)	Deference
Approval /	number	Justification (including risk description & decision methodology where relevant)	documents
Licence	W = Works Approval		
section	L= Licence		
Noise	L2.8.1	Construction	General
		Construction of the TTSA and the reflux classifiers and Lithium filter belts will see noise emissions remain unchanged and are adequately addressed by the Premises operation conditions currently imposed on this licence.	provisions of the Environmental Protection Act 1986
		Noise emissions during construction must comply with the <i>Environmental Protection</i> (<i>Noise</i>) <i>Regulations 1997</i> and also managed using the Ravensthorpe Spodumene Project Operational Noise Management Plan version June 2011 as conditioned in the licence. The likelihood of these construction emissions is assessed as unlikely to occur and the consequences are minor and the emissions risk is therefore Moderate.	Environmental Protection (Noise) Regulations 1997
		Operation	
		 The emission of noise may arise at the Premises from the following activities: Activities of crushing, screening and conveying raw material to process plant; Process plant motors, pumps and machinery bearing; Open areas and trafficable areas causing dust lift off; and, Speed of vehicles traversing the mine site and process areas. This licence amendment is not assessing the noise emissions at this time and the previous licence conditions adequately address noise caused by the mine activities by ensuring an Noise Management Plan (June 2011) has been implemented which meets the requirements of the Noise Regulations. 	



DECISION TABL	3		
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Monitoring (general)	L3.1.1 to L3.1.5 L3.2 to L3.5 & L3.9 L3.6 & L3.7 L3.8	 Operation Amendments to monitoring conditions are for: Sections 3.1.1 and L3.1.5 in the previous licence version remain in the amended licence as adequate to address the standards of monitoring, the frequency of monitoring, the methods of monitoring, and the calibration requirements for the monitoring. Conditions L3.2 to L3.5 and L3.9 in the previous licence have been deleted; the sections contained no conditions. Conditions L3.6 & L3.7 in the previous licence shall remain in the amended licence as they adequately address the monitoring of inputs, outputs and process and have not been assessed at this time. Conditions L3.8 has been amended to remove the target standing water level of greater than 5 metres BGL to a limit of 3 metres BGL. In line the Redundant condition operational procedure for describing targets. 	General provisions of the <i>Environmental</i> <i>Protection Act</i> 1986 Operational Procedure IR-OP-02 Redundant Conditions.



DECISION TABLE

Works	Condition	Justification (including risk description & decision methodology where relevant)	Reference
Approval /	number		documents
Licence	W = Works Approval		
Section		Oneration	Canaral
Improvement	L4.1.1	Condition L4.1.2 from the previous licence has been deleted because it references the original IR2 requirement which was received by DER and is no longer required.	provisions of the Environmental Protection Act
		Condition L4.1.1 from the previous licence will remains in this amended licence as there is a requirement for a new Improvement condition requiring "Temporary Tailing Stockpile Area Management Plan" to be created within 4 months of the licence being issued. See assessment below;	1986 Guidance Statement:
		Original Improvement program documents required by references IR1 and IR2 have been received and are being reviewed by DER. In the meantime, the licence holder has commenced a seepage recovery strategy following the detailed investigations. Therefore IR1 and IR2 document requirement has been removed from this amended licence.	Regulatory Principles Guidance Statement: Setting Conditions
		TTSA emissions assessment – Construction and Operations <i>Emissions:</i> Dry tailings stored in the TTSA become saturated by stormwater and release contaminants to land caused by stormwater infiltration mixing with local groundwater.	
		<i>Impact:</i> Quality of water being reduced impacting beneficial users and the environmental receptors of local groundwater. Local groundwater will discharge to Cattlin Brook which is critical water resource to protect in this locality.	
		<i>Controls:</i> The TTSA will be constructed with dimensions of 50m by 300m and shaped of compacted clay with a slope to the north and northwest. Stockpile area will be scarified; moisture conditioned and compacted to a depth of 200mm forming a low permeability base. An underdrainage system incorporating herring bone drains and carrier drain will collect water from the base of the TTSA. Water will be diverted to and collected from a sump located at the north end of the TTSA for recovery to the process water circuit. There will be no discharge to the environment from the TTSA. 6 groundwater bores will monitor water levels and groundwater quality 2 monthly during construction and operations and reported annually. The TTSA will operate for first 12 months when energy and the months of the treatment of	



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:Rare Rare Risk Rating:LowRegulatory controls: A new improvement condition will be added to the licence requiring the preparation of a TTSA management plan confirming monitoring of seepage plus the proposed decommissioning and rehabilitation of the TTSA in a final report format.A new condition will be added to the licence amendment to ensure construction of the TTSA and process circuit changes are completed as represented in the application for licence amendment plus the Amendment to Processing Circuit and Temporary Tailings Storage mining proposal documents.A new condition requiring compliance certificate be submitted to DER confirming construction will also be included in the Information records of the licence amendment.Risk assessment: Consequence: Minor Likelihood:Rare Risk Rating:Low	



DECISION TABLE

Information L	_5.1 to L5.3	Operation Administrative amendments to renumber conditions chronologically and substitute the term 'shall' for 'must' have been made.	General provisions of the
		 Condition 5.1.2 in the previous version of the licence has been deleted. A lack of awareness of Licence conditions by a Licensee and their representatives is not a defence to offences under the <i>Environmental Protection Act 1986</i>. New Condition 5.1.6 and 5.1.7 have been included to receive a compliance document when the construction works for the reflux classifiers, Lithium belt filters and temporary tailings stockpile area walls have been constructed. See Appendix A for risk assessment of process circuit and Temporary stockpile storage area. Condition Table 5.2.1 in the previous licence version will be renumbered once the amendment has been finalised Condition Table 5.3.1 require any limit under the Licence being exceeded to be reported as soon as practicable. This will facilitate a prompt review of the risk posed 	Environmental Protection Act 1986 Guidance Statement: Regulatory Principles Guidance Statement: Setting Conditions
		by the limit being exceeded and any response required. The row seeking notification of target exceedance, plus form ET1 in Schedule 1 have been removed.	
Licence N Duration	N/A	The previous version of the licence was granted until 13 October 2018. DER has completed an "amend to extend project" aimed at extending licence expiry dates of many licences throughout WA. As part of this project, the expiry date of this licence was extended from 13 October 2018 to 13 October 2029. All residual risk assessments have identified emission risks at the Premises being Low to Moderate.	General provisions of the <i>Environmental</i> <i>Protection Act</i> 1986 <i>Guidance</i> <i>Statement</i> .



5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
2/06/2016	Proponent sent a copy of draft instrument	Minor administrative amendments	Amendments made



6 Risk Assessment

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

Table 1:	Emissions	Risk	Matrix
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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

Background

Galaxy Resources Pty Ltd (Galaxy) commenced mining activities at the Mt Cattlin Spodumene Project in March 2010.

The site operations ceased in July 2012 and went onto a care and maintenance phase. Since that time only essential care and maintenance work has been undertaken at Mt Cattlin.

In September 2015, Galaxy signed a Joint Venture (JV) agreement with General Mining Corporation Limited (GMM) with GMM managing the site and its operations. GMM intend to recommence operations at Mt Cattlin in 2016 and the licence will remain with Galaxy.

Proposed works

With the recommencement of operations, the licence holder proposes minor changes to the existing process circuit to improve plant efficiency and increase output of lithium and tantalum with reduced mica content. Two additional structures are proposed, both within the existing plant area and connected to the existing plant. These two structures are designed to house:

• Three (3) reflux classifiers, associated pumps hoppers and piping located adjacent to the existing thickener. Reflux Classifiers were previously approved in the current Works Approval (W4533/2009/1) but not built. The construction will only reconfigure the plant circuit.

• Two (2) filter belts located near the DMS and product loadout areas which will remove water from product and improve water usage efficiency

All process plant changes will be within the existing plant footprint and disturbed area and a process flow diagram is included in Diagram 1.

In addition, it has been identified that the dried tailings retained in the existing TSF contain significant grades of lithium which were not recovered for export by the original ineffective fines process circuit. A reclamation project has been designed to recover and retreat this high value product. To extract the lithium from the tailings, Galaxy propose to construct a temporary tailings stockpile area (TTSA) using the clay materials located on the site of the proposed TSF Cell 2 (immediately adjacent to and to the east of the existing TSF Cell 1). The stockpiled clays will be reshaped and compacted to form a pad to stockpile the tailings. The tailings will then be partially reclaimed from the TSF utilising a truck and excavator single pass mining method.

All tailings to be deposited in the TTSA will be well drained. Selective mining will identify tailings that are too soft (fine) or wet to reclaim, with these products ultimately left within the TSF. The material targeted for reclamation represents the coarse free draining component of the original tailings product. The reclamation procedure will be sufficiently flexible and as such the risk(s) saturated tailings may pose is largely eliminated.

A minimum of 500 mm of tailings will be left in place across the TSF basin and 300 mm on the upstream embankment face to ensure that the underlying low permeability layers and under drainage system are not compromised during the mining and subsequent re-filling of the TSF.

Issues relating to a block riser pipe which is a critical component for the correct functioning of the under drainage system of the TSF will be rectified post the extraction of the tailings product.

When the reclamation of tailings is completed a drainage slot will be excavated in the remaining TSF tailings, sloping towards the decant tower (to the maximum extent possible), to promote the flow of water to the decant tower when the facility is re-commissioned. In addition, the underdrainage system can also be used to reclaim water back to the plant until the decant system is fully operational.

Following completion of the work outlined, the stockpiled tailings will be fed into the process circuit and returned to the existing TSF. The only change in tailings product will be the removal of Spodumene (lithium).

It is anticipated that the TTSA will be built to stockpile 158,000bcm (205,400 tonnes) and utilised for a period of up to 12 months.



No additional changes are proposed to the existing infrastructure. Assessment and Management

Surface water

There will be no material change to existing surface water patterns by the construction of the temporary tailings stockpile area (TTSA). At the north and south end of the temporary tailings stockpile and other places where the tailings will not be stockpiled against the mine waste, a low bund of approximately 1.5 m in height of compacted low permeability material will be constructed to contain storm water that may infiltrate the tailings along with the actual tailings product.

An underdrainage system will be provided to the stockpile to collect water from the base of the stockpile. This drainage system will comprise a carrier drain discharging northwards and located on one side of the stockpile and a series of herringbone drains at approximately 20 m centres draining to the carrier. Water will be collected in a sump at the north end of the stockpile for recovery.

In the northwest corner of the temporary tailings stockpile area, a rock-lined drain will be constructed to a lower level north of the pad which will act as a water retention structure to retain any tailings water that drains from the stockpiled tailings and rainfall that falls on the pad. This collected water will be pumped back to the process plant and used in the circuit or pumped into the water truck and used for dust suppression.

Groundwater

Prior to digging test pits in the TSF, the phreatic surface was unknown and a report was completed by Galaxy consultants by considering an event where a substantial quantity of water would need to be pumped to the pit. It estimated that potentially up to 25,000kL may need to be pumped.

As part of this analysis, the water that was perched within the blocked toe drain was laboratory tested and determined that the salinity was higher than that of the pit water, but that the salinity is lower than that of the local groundwater which is saline to hyper-saline.

Subsequent to the consultant's report, it was determined during the digging of test pits within the TSF that the phreatic surface was below the maximum planned tailings extraction depth and that no water would need to be extracted or pumped.

Given any water now emanating from the stockpile would be the result of a storm event, it is likely that this water will not be saline and hence present minimal concern. Regardless, the salinity of any recovered water will be lower than that of the local groundwater which is saline to hyper-saline.

Even under the worst case scenario pump volumes contained within the report, the water level within the pit will remain below the original pre-mining static water level of 229 m AHD. The pit will, therefore remain a groundwater sink and so the pit water will not flow back into the surrounding groundwater.

Assessment of previous seepage that occurred during the former operations has been investigated by company's consultants and further modelling undertaken showed that if the TSF is recommissioned, groundwater levels near MB03 could rise to the ground level two years after recommissioning but can be controlled by pumping from the bore. MB03 is actively pumped and this will be continued by GMM to ensure groundwater levels are >5m BGL. In addition, the refurbishment of the riser pipe and under drainage in the northeast corner of the TSF will reduce the potential for seepage.

In addition to the tailings reclamation, the underdrainage system of the existing TSF will be remediated and piezometers installed on the embankment crest to monitor the phreatic surface within the embankment in the area where downstream seepage was observed in 2014.

Dust

During tailings reclamation, dust suppression measures will be used where exposed tailings are found to be dry and desiccated. If required, the surface of the temporary tailings stockpile will be sprayed with a polymer emulsion to reduce dust generation.

Dust generation will be managed in accordance with Galaxy Airborne Material Management Plan.



Noise

Assessment of the proposed tailings stockpiling and transport to the processing plant with excavator and articulated trucks during the day period is predicted to comply with the daytime 'assigned levels'. The assessment concluded that the proposed night operation of the Mt Cattlin processing plant and tailings stockpiling and movement during the day period will comply with the requirements of the Environmental Protection (Noise) Regulations 1997 (as amended) at all times.

The use of 'broadband' alarms on mobile equipment remains a key aspect of noise management for the Mt Cattlin operation, reducing the potential for 'annoyance' at noise sensitive receptors.

Monitoring

Galaxy currently monitor the six TSF bores four-monthly while the project is in care and maintenance, and this will increase to bi-monthly when operations resume in accordance with the requirements of the DER and DoW licences.

Galaxy will continue four-monthly water quality sampling of both the pit and toe drain be while the project is in care and maintenance, and increased to bi-monthly when operations resume. Any water extraction from the TSF will be metered to enable the pit water balance to be updated if required. Regular surveys of the pit water level will occur to monitor the effect of pumping water from the TSF.

Water supply pipelines and the tailings discharge and return water pipelines will be inspected by site staff during operation as set down by licence or tenement conditions (minimum once daily).

Galaxy will continue to take photographs on a six monthly basis at the seven established vegetation photographic monitoring points, five downstream of the TSF, and two east of the project adjacent to Cattlin Creek (as required by the Groundwater Licence Operating Strategy).

Rehabilitation and Closure

The Project has an approved Mine Closure Plan (MCP) (Reg ID 47826). A revised MCP will be submitted to the DMP in conjunction with the AER in October 2016 and will include the additional infrastructure proposed in this MP.

Rehabilitation and closure works associated with the additions to the processing plant, pipelines and road will be consistent with that described in the approved MCP (Reg ID 47826).

As the temporary tailings stockpile pad will be constructed from stockpiled (heaped) clay overburden which ultimately will be utilised for TSF wall raises or embankments, little rehabilitation work will be undertaken except for removal of the rock-lined drain and reshaping the pads by pushing down the retaining bunds around the pad and the water retention pond. This will ensure that the stockpiled clay resource returns to a free draining heap for rainfall runoff.

In the event that the site is put on care and maintenance, or in the event of unforeseen mine closure within this time, the stockpile will be either sprayed with a dust suppressing agent (if the closure time is anticipated to be short); or the stockpile will be encapsulated with the stockpiles construction material current located on either side of the proposed stockpile.

Process Circuit emissions - Operation

As the Reflux Classifiers and Lithium Filter belts are within the plants closed production circuit then waste emissions will remain unchanged and are adequately addressed by the Premises operation conditions currently imposed on the licence. Noise emissions from newly installed plant equipment during operations shall be managed using the Ravensthorpe Spodumene Project Operational Noise Management Plan version June 2011. Fugitive dust will be managed in accordance with latest version of Galaxy Airborne Material Management Plan. The emission risk has been assessed as moderate where emissions are unlikely to occur and the consequences from these emissions are minor. The amended licence conditions therefore adequately address the operations of the Premises.







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Diagram 2: Design of Mt Cattlin Temporary Tailings Storage Area (TTSA)





Diagram 3 – View of clay stockpile where the TTSA will be built.



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