

Amendment Report

Licence Number L8469/2010/2

Licence Holder Galaxy Lithium Australia Limited

ACN 130 182 099

File Number: DER2014/001110-1

Premises Ravensthorpe Spodumene Project

Newdegate-Ravensthorpe Rd

RAVENSTHORPE WA 6346

Lot 31 on Plan 224145 and Lot 127 on Plan 145763

(part of Mining Tenement M74/244)

Date of Report 30 June 2020

Decision Revised licence granted

Rebecca Kelly Senior Manager, Resource Industries INDUSTRY REGULATION

An officer delegated by the CEO under section 20 of the EP Act

1. Definitions and interpretation

Definitions

In this Amendment Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition			
AACR	Annual Audit Compliance Report			
ACN	Australian Company Number			
Amendment Report	refers to this document			
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations			
CEO	means Chief Executive Officer.			
	CEO for the purposes of notification means:			
	Director General Department Administering the <i>Environmental Protection</i> Act 1986 Locked Bag 33 Cloisters Square PERTH_WA_6850			
	info@dwer.wa.gov.au			
Delegated Officer	an officer under section 20 of the EP Act			
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.			
DWER	Department of Water and Environmental Regulation			
EPA	Environmental Protection Authority			
EP Act	Environmental Protection Act 1986 (WA)			
EP Regulations	Environmental Protection Regulations 1987 (WA)			
EP(Noise) Regulations	Environmental Protection (Noise) Regulations 1997 (WA)			
EP(Unauthorised Discharges) Regulations	Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)			
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)			

Term	Definition
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
Licence Holder	Galaxy Lithium Australia Limited
Minister	the Minister responsible for the EP Act and associated regulations
mtpa	million tonnes per annum
NEPM	National Environmental Protection Measure
Noise Regulations	Environmental Protection (Noise) Regulations 1997 (WA)
NSW Criteria	means the ambient dust deposition criteria adopted by NSW EPA as defined in Approved methods for the modelling and assessment of air pollutants n New South Wales, 2017.
Occupier	has the same meaning given to that term under the EP Act.
PM	Particulate Matter
PM ₁₀	used to describe particulate matter that is smaller than 10 microns (µm) in diameter.
PM _{2.5}	used to describe particulate matter that is smaller than 2.5 microns (µm) in diameter.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Report applies, as specified at the front of this Amendment Report.
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act, with changes that correspond to the assessment outlined in this Amendment Report.
Risk Event	as described in Guidance Statement: Risk Assessment

2. Amendment Description

The following guidance statements have informed the assessment and decision outlined in this Amendment Report:

- Guidance Statement: Regulatory Principles (July 2015)
- Guidance Statement: Setting Conditions (October 2015)
- Guidance Statement: Licence Duration (August 2016)
- Guidance Statement: Decision Making (February 2017)
- Guidance Statement: Risk Assessment (February 2017)
- Guidance Statement: Environmental Siting (November 2016)

2.1. Purpose and scope of assessment

On 17 September 2019 the Licence Holder submitted an application for licence amendment to commence 24 hour operations 7 days per week at the Ravensthorpe Spodumene Project. No increase in the premises production or design capacity is proposed. No new infrastructure is proposed to be constructed on the premises.

1. The scope of this Amendment Report includes assessment of potential environmental and public health impacts associated with proposed changes to premises operations. As part of the assessment, the Delegated Officer has also considered recommendations for licence amendment based on the findings of DWER's environmental compliance inspection at the premises in December 2019 where these relate to management of emissions and discharges from 'primary activities' and 'directly related activities' as defined in DWER's Guidance Statement: Risk Assessments (February 2017).

The Amendment Report identifies other activities which are not specifically regulated under the EP Act Part V licence conditions (L8469/2010/2) and regulatory framework for the same.

The application for licence amendment was advertised on DWER's website on 14 April 2020 for community consultation. Comments were also invited from Direct Interest Stakeholders. Two submissions received from community are considered in the assessment. See Table 10 of this Amendment Report for detail on DWER's response to issues raised in these submissions.

2.2 Noise emissions

2.2.1 Review of Noise emissions modelling

The Licence Holder has undertaken acoustic modeling of noise emissions for the proposed night time operations. The findings were submitted in a report titled *Environmental Noise Assessment (Ref: 24632-3-19046) – Mt Cattlin Operations: Night Operations – prepared for Galaxy Lithium Australia Limited*, authored by Herring Storer Acoustics and dated September 2019. The scope of assessment did not include potential emissions from the existing tophammer drilling units capable of emitting noise with tonal characteristics which may be unacceptable during proposed night time operations.

The premises has a number of highly noise sensitive receptors to the south west, south and south east (Ravensthorpe town site) as depicted in Figure 1. It is noted that receptors R1, R4 and R5 have been acquired by the Licence Holder. Receptors R6 and R8 are considered most significant. Table 2 notes the noise sensitive receptors considered in the noise emissions modelling.

Table 2: Key noise sensitive receptors

Reference in Figure 1	Description	Distance from nearest major noise source
R2	S- Rural residences, shearing shed	1200m
R9	S- Residence near R2 (since 2012)	1200m
R3	SSE- Ravensthorpe Daw St	1200m
R8	SSE- Ravensthorpe Daw St (North)	900m
R6	SSE- Ravensthorpe Carlisle St (North)	800m
R10	SSW- Rural residence	2080m



Figure 1: Location of noise sensitive receptors

The HSA Report considers that following noise mitigation measures will be implemented during operation:

- use of wheeled dozer on waste dumps at night;
- provision of nominated acoustic barrier bunds to main haul roads with line of sight to

- the southern receptors;
- no operation of track dozers or top-hammer drills in the night period, to avoid generating 'tonal' noise emissions due to the relatively low background noise encountered during parts of the night-time period.
- Waste tipping and spreading to be carried out on the north side of acoustic barriers, shielding noise emissions to the Ravensthorpe town site and the southern receptors;
- Maintaining acoustic bund immediately south of modular crushing circuit at RL181 to top of bund (eastern 2/3 rd) and RL178 to top of bund remaining western 1/3.

The findings of the HSA Report were reviewed by DWER technical experts. It was found that:

- The methodology and inputs of the noise modelling conducted by HSA in September 2019 seem appropriate and reliable. The modelled noise emission results and the assessed noise impact and noise compliance also seem reasonable and reliable.
- The proposed noise mitigation measures all seem effective in reducing the noise emissions from the proposed night-time operations.
- Having implemented all proposed noise mitigation/management measures, noise from the proposed night-time operation is capable of complying with the assigned noise levels, as concluded by HSA. However, the night-time noise compliance will be just achieved without any margin at several receptors (R6, R9 and R10) at the worst-case weather conditions in a couple of operation scenarios.

The Department's assessment of the HSA report concluded that there may be a risk of non-compliance with the assigned noise levels as specified in the *EP* (*Noise*) *Regulations* and recommended that the Licence Holder be required to conduct noise verification monitoring when the proposed night operation is in place.

2.2.2 Review of Operational Noise Management Plan

As part of the assessment, DWER requested an updated operational noise management plan from the Licence Holder. The *Galaxy Mt Cattlin Operations- Operational Noise Management Plan, Doc Number 02-HSE-PLA-0015, Revision: 02, dated 13 November 2019* (Galaxy ONMP) was received by the Department on 15 January 2020 and has been considered in this assessment.

The Galaxy ONMP notes that:

- receptors R2 and R6 are the preferred location for noise verification monitoring due to their proximity to operations.
- the crushing plant is the major noise source from the processing operation. An acoustic bund has been constructed on the southern side of the crushing plant, extending to 12m above ground level to provide noise attenuation to southern and eastern directions.
- higher noise emissions to Ravensthorpe mine site are associated with operation of mobile equipment closest to the town site (such as dump trucks, track dozers) operating at the southern edge of the waste dump particularly during morning temperature inversion conditions.

The Licence Holder has committed to following noise mitigation measures in the ONMP:

- Mine planning to utilize stockpiles as barriers to key receptors and mine development positioning mining operations with the face away from key receptors to maximize acoustic barrier effect;
- Mining in areas that have lower acoustic impact on occasions where 'worst case' conditions for predicted noise emission impact on receptors or exceedance of specified noise emission levels are expected to be high;

- Control of air blast emissions to key receptors through best practice shot timing and appropriate use of stemming;
- Replacement of excavator horns with an alternative 'quiet' signal;
- Fitting only broadband reversing alarms to mobile equipment;
- Construction of acoustic barrier bunds at the southern edge of the mining area;
- Use of haul road acoustic bunds on the receptor side of exposed haul roads, to minimise haul truck noise propagation to Ravensthorpe town site;
- Dumping of waste rock behind acoustic barriers to control noise emissions during night time operations;
- Use of haul truck routes with acoustic barriers on the receptor side during night time operations;
- Use of wheel dozers to minimise generation of track noise during night time operations;
- Consideration of wind conditions in daily operational planning;
- Regular liaison with local residents to obtain feedback as to the impact of mining operations and improvement opportunities;
- Verification measurement of noise emissions from equipment to update the acoustic model:
- Annual monitoring of noise sources (changed or new equipment on site) and noise emissions at key receptor locations;
- Monitoring of noise emissions during initial significant phases of mining and blasting events to assist with compliance verification; and
- Blast monitoring near key residential receptor locations.

The Galaxy ONMP includes following commitments pertaining to noise monitoring:

- Monitoring shall include 'attended monitoring' during forecast low wind conditions by a
 person trained in measurement of noise, utilizing NATA calibrated sound measuring
 equipment and field calibrated during the monitoring period;
- Attended monitoring will be complimented by use of temporary statistical noise loggers, including web based systems which permit real time remote access to data;
- Change Event Monitoring will be undertaken at the two receptors under representative low wind conditions within two weeks of commencing operations in a newly developed area:
- Quarterly noise emissions monitoring will be undertaken;
- Every six months acoustic model verification monitoring will be undertaken. Verification measurements will be undertaken at locations representative of key receptors R6, R9 and R10 (if occupied).

The Licence Holder has committed to following contingency measures:

- Reduction or relocation of mining equipment;
- Use of additional acoustic bunds to mitigate noise to the receptor;
- Mining of specific areas under selected wind conditions if noise emissions from mining cause exceedances during 'worst case' weather conditions.

2.2.3 Review of DWER's Complaints records (noise emissions) and compliance inspection outcomes

Environmental compliance inspection was undertaken at the premises on 10 December 2019 by DWER's Compliance and Enforcement Directorate. Noise complaints received associated with Mt Cattlin operations, including activities not specifically regulated through this Licence, were reviewed as part of compliance verification. The Department's review identified that 10 incidents associated with air blast overpressure exceedance events were previously reported subsequent to which the Licence Holder appointed an independent expert to review of blasting

procedures. No air blast overpressure exceedances have been recorded since July 2019. Licence Holder's Blast Management Plan was reviewed by the Department's inspectors and operational performance against commitments in the Blast Management Plan was verified.

The compliance inspection recommended improvement opportunities for managing blasting operations on site which include:

- changing stemming heights on all blast holes within the South East pit to ensure air blast overpressure confinement;
- review the blast Management Plan and ensure that the risk assessment for blasting addresses controls for environmental compliance for blasting;
- communicating all tasks for the improved Blast Management Plan to site personnel and where required include in their job task description;
- using daily weather predictions to fire the blast when the prevailing winds are most favourable (within standard firing times) to reduce the potential of post blast dust and fume that may drift from the mine boundaries;
- creating a blasting database so that all results can be easily evaluated by the blast designer, including environmental blast measurements (airblast overpressure and blast vibration);
- Ensure that all blasts are monitored at the assigned blast monitoring location, and that all persons assigned to setting up and monitoring have undertaken adequate training to do the job to the required standards;
- Investigate the use of a remote blast monitoring system to ensure all blasting events are captured; and
- Ensure a Fume Management Plan is implemented, and training delivered to all personnel involved.

The Department's environmental compliance inspection also noted following actions implemented by the Licence Holder:

- the requirement for broadband reverse alarms was added to the vehicle hygiene certificate, which is required for site access; Gatehouse staff assess all vehicles prior to access to the site, with vehicles that do not meet the licence criteria refused entry.
- the licensee also ensures that all contractors are given written instruction that all mobile mining equipment on site is fitted with only broadband style reversing alarms.
- silent horns are now being utilised on excavators and dump trucks to further improve operational controls surrounding noise emissions from mining vehicles.

2.2.4 Key considerations in assessment of noise emissions:

The Delegated Officer has considered the information presented in the noise modelling report, technical advice received from DWER's Environmental Noise Branch and notes the following:

- The HSA Report identifies that the most significant individual noise generating operation is expected to be tipping and pushing of waste on the southern edge of the waste dump on the premises. Construction and operation of the waste dump on mine sites does not meet the definition of Category 5 as specified in Schedule 1 of the EP Regulations and is not considered a 'primary activity' as per the Guidance Statement: Risk Assessments (February 2017). Accordingly specific regulatory controls cannot be placed via Part V licence conditions.
- Ore extraction and associated blasting does not meet the definition of Category 5 as specified in Schedule 1 of the EP Regulations and is not considered a 'primary activity'

as per the *Guidance Statement: Risk Assessments (February 2017)*. Accordingly specific regulatory controls cannot be placed via Part V licence conditions.

- Any unreasonable noise emissions from the prescribed premises, on account of
 activities not specifically authorised under the EP Act Part V licence, are still subject to
 EP (Noise) Regulations 1997. Potential amenity impacts may also be subject to
 general provisions of the EP Act. Any non-compliance with EP Regulations or
 unreasonable emissions and environmental harm will be investigated in accordance
 with the Department's Compliance and Enforcement Policy (as updated).
- The Galaxy ONMP notes that an environmental incident reporting procedure (EMP016) and a community contact/ complaints register (EMP 027) has been established to manage any complaint response. The Galaxy ONMP notes that in the event of ongoing complaints detailed noise monitoring will be carried out to identify any significant noise contributors and noise emission levels at receptors.
- The noise emissions modelling undertaken for proposed night time operations indicates that having implemented all proposed noise mitigation/management measures, noise from the proposed night-time operation is capable of complying with the assigned noise levels however the night-time noise compliance will be just achieved without any margin at several receptors (R6, R9 and R10) at the worst-case weather conditions in some operating scenarios. Accordingly noise emissions verification monitoring will be required.

2.3 Air Emissions (Dust)

Operations such as blasting, drilling, mining, crushing and screening plant, tailings storage facilities, stockpile of materials are key sources of fugitive dust emissions associated with general mining activities. The *Airborne Material Management Plan (as amended August 2018), Document No. GLA-MTC-AMMP-Rev2-0917*, authored by Galaxy Lithium Australia Ltd has been considered in this assessment. Visible dust emissions can impact amenity of receptors.

The Department's environmental compliance inspection in December 2019 assessed the effectiveness of the AMMP in the context of managing the risk of fugitive dust emissions, including activities such as blasting and drilling which are not prescribed for the purpose of this licence. Improvement opportunities were identified in terms of managing blasting practices on site noting that delaying firing times until favorable wind conditions prevailed is the required control in managing fugitive dust emissions from the premises.

The Licence Holder has following controls in place to manage fugitive dust emissions from the premises:

Table 3: Fugitive dust management measures at the premises

Dust source	Control
Crushing screening	Multi-zone atomizing sprays, dust suppressants, hoods and
	covers
Haul roads/ unsealed roads	Water carts, dust suppressants
Loading	Minimising drop height
	Preconditioning shot- wet down face prior to loading material
	Considering wind direction
Stockpiles	Water cannons
Mining and open areas	Water carts, open areas minimised
Top soil clearing	Undertake during winter, precondition soil, cap with fresh
	water
Rehabilitation works	Discontinue work during N/NW winds

The Licence Holder has also developed 'Fugitive Dust Ranking Standard' which includes instructions to operators based on 'visual' observations of dust emissions. However the internal instructions do not specifically identify operating conditions / weather conditions when certain activities will not be undertaken or demonstrate proactive measures.

The Licence Holder has advised that none of the exploration and resource development drill holes in the future NW pit waste material have encountered any recognizable fibrous or asbestiform mineralization within the host rocks and, based on the local geology, the likelihood of occurrence of such material in the NW pit is low. A localised small occurrence of asbestiform material was identified in the SW pit (mining has now ceased in that pit and tailings are now being deposited into it).

DWER has consulted the Department of Mines Industry Regulation and Safety (DMIRS) and has received following advice:

- Galaxy have provided information to DMIRS on the location of fibrous (asbestiform) material located in the SW pit.
- The localised occurrence of asbestiform material in the SW pit was mined under stringent conditions. The wetted material was taken to the waste dump and encapsulated in uncontaminated material. Mining at the SW pit has now ceased and the SW pit is now an in-pit tailings storage facility, so the area of the pit where the asbestiform material was encountered will be buried.
- Air quality monitoring carried out at the mine for mine worker occupational health and safety purposes has not detected any airborne asbestiform or fibrous materials.

As DMIRS has responsibility for regulating fibrous and asbestiform materials under the *Mine Safety and Inspection Act 1994*, the issue of management of asbestiform materials is not considered further in this risk assessment.

2.3.1 Review of Ambient Air Monitoring

The Licence Holder implemented an ambient dust monitoring program to identify potential impacts associated with premises operations. This comprised:

- a high volume (Hi- Vol) air sampler fitted with a PM₁₀ size selective head, located in the Ravensthorpe town site. Hi- Vol samples were collected over 24 hours period every 6 days in accordance with AS/NZS 3580.9.6:2016.
- A network of dust deposition gauges located around the premises boundary (operational monitors), in the Ravensthorpe town site and surrounding areas, and a site located approximately 17km north east of the open pit mining operation (background monitor). Dust deposition samples are collected over a calendar month period in accordance with AS/NZS 3580.10.1:2016.

PM₁₀ monitoring in Ravensthorpe town site commenced in July 2018 and dust deposition monitoring commenced in October 2018. See Figure 2 for location of dust deposition gauges.

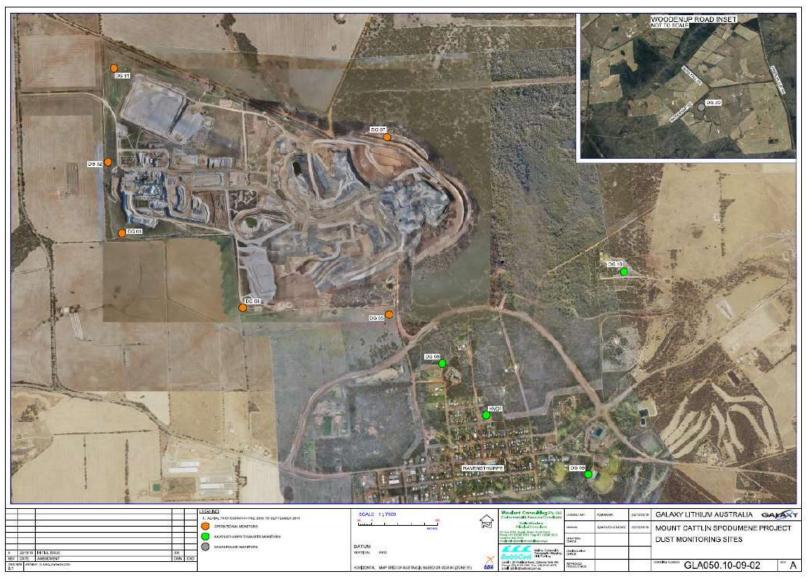


Figure 2: Location of dust deposition gauges- Ravensthorpe Spodumene Project

The Licence Holder has submitted a third party report titled *The Annual Dust Monitoring Review, Version 1.2* authored by Environmental Technologies & Analytics and dated 2019 (the ETA Report) which reviews the monitoring data collected by the Licence Holder's ambient air monitoring program.

Figure 3 shows the trend in PM_{10} monitoring results as presented in the ETA Report. Key observations in the ETA Report are:

- PM₁₀ concentrations measured at the Ravensthorpe town site meet the 50 μg/m³ NEPM standard (24-hour average).
- The annual average PM_{10} concentration calculated from the available data was determined to be 15 $\mu g/m^3$ which is below the NEPM standard of 25 $\mu g/m^3$ (annual average).
- The highest PM₁₀ concentration (24-hour average) of 40 μg/m³ was recorded on 18 January 2019 (sample end date) and dust from the prescribed premises may have potentially contributed under the strong north westerly winds that prevailed for some of the sampling period.
- The second highest PM₁₀ concentration (24-hour average) of 20 μg/m³ was recorded on 13 December 2018 (sample end date) and cannot be attributed to dust from the premises operations given the absence of north westerly oriented winds over the sampling period.

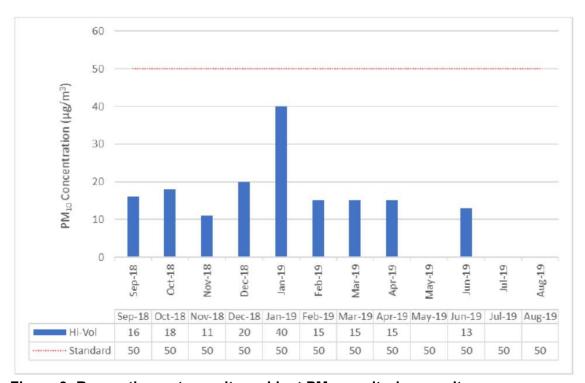


Figure 3: Ravensthorpe town site ambient PM₁₀ monitoring results

Composition analysis of the Hi-Vol samples was undertaken for select trace metal species (Beryllium, Cadmium, Manganese, Hexavalent chromium and Lithium). Table 4 includes a summary of trace monitoring results as presented in the ETA Report.

Table 4: Ambient monitoring Hi-Vol trace metals results presented in ETA Report

Trace Metal	Maximum Concentration 24-h Average (μg/m³)	No. Results > LoR	LoR (µg/m³)
Beryllium	0	0	0.0004
Cadmium	0.0006	3	0.0005
Manganese	0.006	47	0.001
Hexavalent chromium	0.001	1	0.0004
Lithium	0.003	15	0.001

The ETA Report also noted that beryllium, cadmium and hexavalent chromium concentrations were not generally found to be present above limit of reporting (laboratory analysis) and routine analysis is of limited value.

Figure 4 presents the annual average amount of deposited dust measured during the 2019 AER period at each of the monitoring sites compared to the performance target of 4 g/m²/month (NSW criteria). The results show that the level of dust deposition measured at the Ravensthorpe town site meet the performance target of 4 g/m²/month.

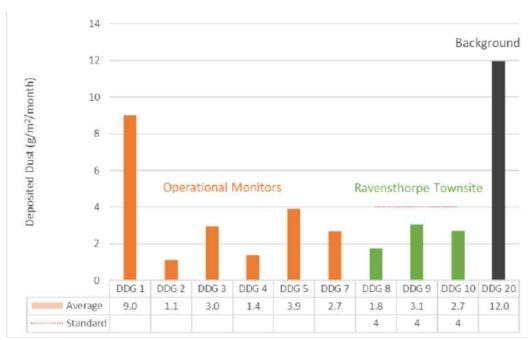


Figure 4: Annual average dust deposition rates during 2019

Note: DDG8 had only 8 samples as monitoring equipment was unavailable between Feb-April 2019. DDG10 and DDG 20 were not established until October 2018.

The ETA Report notes that dust deposition measurements at Ravensthorpe town site monitors suggest that these monitoring locations are impacted by regional dust sources, as indicated by the comparatively higher result recorded in June 2019 at DDG 9 (located approximately 2km south east of the premises) compared to DDG8 (approximately 1km south east of the premises).

2.3.2 Review of DWER's Complaints records (dust emissions) and compliance inspection outcomes

DWER's complaints database has a record of 7 complaints relating to dust emissions from the premises were received between September 2017 and October 2019. It is noted that the Licence Holder has undertaken some consultation with the community subsequent to the dust event on 29 August 2019, which was attributed to dust lift off from the paddock style tailings storage facility (TSF) on the premises. This TSF has since been capped and tailings deposition into the in-pit TSF on the premises has commenced.

DWER's environmental compliance inspection at the premises, in December 2019, identified that the 'temporary' tailings stockpile that has existed at the premises since 2015 needs to be managed to prevent dust emissions. The inspection found that the Licence Holder does not intend to reprocess tailings from this stockpile anymore and as such it is hence not considered a 'temporary' measure to stockpile tailings. The licence holder has indicated that this stockpile will be embedded in the waste rock landform.

Considering the ongoing risk of fugitive dust emissions from the premises operations and proximity to Ravensthorpe town site the Delegated Officer is of the view that the scope of the ambient air monitoring program should be reviewed in consultation with DWER and the program should be extended at least for another 12 months.

2.4 Consolidation of Licence

As part of this amendment package DWER has consolidated the licence by incorporating changes made under the following Amendment Notices 1 through to Amendment Notice 6 as summarized in Table 6. In consolidating the licence, the CEO has:

- updated the format and appearance of the Licence;
- deleted the redundant AACR form set out in schedule 1 of the previous licence and advise the Licensee to obtain the form from the Department's website;
- deleted redundant conditions pertaining to Amendment Notice 4 (TSF Embankment Lift). The Licence Holder advised on 4 March 2020 that they don't intend to construct the TSF lift as the SW in-pit TSF was authorised via Amendment Notice 6;
- revised licence condition's numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- corrected clerical mistakes and minor errors.

Previously issued Amendment Notices will remain on the DWER website for future reference and will act as a record of DWER's decision making.

3. Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 5.

Table 5: Relevant approvals

Legislation	Number	Approval
Mining Act 1978 (WA) (Department of Mines, Industry Regulation and Safety)	Registration Id: 22377 and 26415 (TSF) plus subsequent Amendments	Ravensthorpe Spodumene Project was granted mining approval on 4 November 2009 and Mining Tenement M74/244 was granted on 24 December 2009.
Environmental Protection Act 1986 (WA) (delegated to Department of Mines, Industry Regulation and Safety)	Native Vegetation Clearing Permit CPS #3045/5- Granted 22/08/2009 expiring on 31/07/2024.	Approval to clear 15 ha within part of Mining Tenement M74/244.
Environmental Protection Act 1986 (WA) (DWER)	Environmental Protection Authority approval Part IV design capacity: (2 Mtpa)	Not assessed Part IV up to 2 Mtpa design capacity
Rights in Water and Irrigation Act 1914 (WA) (DWER)	GWL167439(5) CAW167437(1) - CAW169547(1) - CAW170586(1) -	Process plant – 1.095 GL/yr Construct wells Construct wells Construct wells

4. Amendment history

Table 6 provides the amendment history for L8469/2010/2.

Table 6: Licence amendments

Instrument	Issued	Amendment			
W4533/2009/1	19/06/2009	New works approval for premises construction			
W4533/2009/1	8/07/2010	Works approval amendment (removal of Phase 2)			
W4533/2009/1	11/10/2010	Works approval amendment (removal of spill trays under conveyors)			
L8469/2010/1	14/10/2010	New licence issued for premises operation			
L8469/2010/1	7/07/2011	Licence amendment (noise management requirements)			
L8469/2010/1	24/05/2012	Licence amendment (TSF manual revision)			
W4533/2009/1	24/05/2012	Works approval amendment (extension to expiry for TSF lifts)			
W4533/2009/1	17/01/2013	Works approval amendment (reflux classifier)			
L8469/2010/2	3/10/2013	Licence reissue			
L8469/2010/2	4/09/2014	Licence amendment (groundwater management and conversion to latest DER licence format).			
L8469/2010/2	29/04/2016	Amendment Notice 1 granted to extend expiry date to 13 October 2029			
L8469/2010/2	02/06/2016	Licence amendment application to include construction of			
		temporary tailings stockpile area and inclusion of reflux classifiers and lithium belt filter into the wet process plant circuit.			
L8469/2010/2	27/03/2018	Amendment Notice 2 granted to increased throughput capacity,			
		remove construction Compliance Report requirements plus			
		reference new acoustics reports and monitoring, minor changes to			
		premise operation conditions, minor changes to monitoring of			
		inputs and outputs and replace Premises maps in Schedule 1. This			

		amendment includes the transfer of Licence from Galaxy Resources Limited to Galaxy Lithium Australia Limited.
L8469/2010/2	21/06/2018	Amendment Notice 3 granted to increase throughput capacity to 2.0 Mtpa, construct, install and commission the feed upgrade circuit, ultrafine dense mass separation (DMS) circuit including a wet high intensity magnetic separator (WHIMS) for tantalite recovery, secondary float re-liberation circuit including a dewatering screw classifier and upgrades to the product circuit.
L8469/2010/2	25/01/2019	Amendment Notice 4 granted to include TSF cell 1 wall lift 3 to final RL height of 280.3m.
L8469/2010/2	04/04/2019	Amendment Notice 5 granted to include ROM crusher and optical sorter circuits, 6m high noise barrier on ROM and Premises southern boundary realignment.
L8469/2010/2	03/07/2019	Amendment Notice 6 granted to include SW in-pit TSF.

5. Location and receptors

Table 2 lists the relevant noise sensitive land uses in the vicinity of the Prescribed Premises. Table 7 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 7: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Kondinin-Ravensthorpe Groundwater Area (GWA)	Ravensthorpe Mt Cattlin Spodumene project is part located in the GWA
Groundwater Production Bores	There are no other registered groundwater users within 3 km of the Mt Cattlin Spodumene project.
Mt Cattlin Creek	Directly east of prescribed premises
Remnant native vegetation (Habitat for threatened fauna species)	Directly east of prescribed premises
Esperance Coastal Hydrographic Catchment	Ravensthorpe Mt Cattlin Spodumene Project is located in the Cattlin Creek catchment bounded by Jerdacuttup River and Phillips River.
Native Title Claims	Ravensthorpe Mt Cattlin Spodumene Project is located in the; Single Noongar Claim (Area 1) – Cth claim Wagyl Kaip – NNTT registered Southern Noongar – NNTT registered
Clearing Regulation - Environmentally Sensitive Areas (ESA's)	Premises is located 5.4 km south and 8.6 km north east of restricted clearing Environmentally Sensitive Area.
Parks and Wildlife managed lands and water	Overshot Nature Reserve located 2 km north north-west of the Mt Cattlin Spodumene project. Vacant Crown Lands located immediately east of the project.
Ecological communities (TEC's and PEC's)	Closest Threatened Ecological Community (TEC) is located 1.3km south of the prescribed Premises boundary and 3km south east of the TSF. Priority Ecological Community (PEC) is 6.7km east.
Threatened / Priority Flora	Threatened flora located 4km northeast of the prescribed Premises boundary (eastern boundary).

	Priority flora located 3.7km south east of the southern boundary.
Threatened / Priority Fauna	Closest Threatened fauna recorded immediately east in the vacant crown lands from the Prescribed Premises boundary.

6. Risk assessment

Table 8 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 8: Risk assessment for proposed amendments during operation

Risk Event								
Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls	Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Night time operations: Operation of the crushing and screening plant Unloading, loading and storage of material Vehicle movements	Noise	Air/windborne pathway causing amenity impacts. A number of residences are located in proximity of the premises.	As committed in the ONMP. See details in Section 2.3.2 of this Amendment Report.	Moderate	Possible	Medium	Section 2.2 outlines the Delegated Officer's reasoning and decision making.	New Conditions regarding noise emissions verification monitoring. Conditions specified in Amendment Notice 5 which restricted operating period for the ROM crusher circuit and the ROM optical sorter circuit have been removed to authorise 24 hour operations. New condition which limits night time operations for a trial period of 8 months. Extending this authorisation will be contingent on demonstration of compliance with the Environmental Protection (Noise) Regulations. Compliance will be measured against Environmental Protection (Noise) Regulations. Any breaches will be investigated as per DWER's Enforcement Policy.

Risk Event								
Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls	Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
	Fugitive Dust	Air/windborne pathway causing amenity impacts and potential health impacts. A number of residences are located in proximity of the premises.	See section 2.4 for details on operational controls. Ambient air monitoring undertaken (Hi-Vol) to measure PM10 concentrations at Ravensthorpe town site. Dust deposition monitoring undertaken.	Moderate	Possible	Medium	Section 2.3 outlined the Delegated Officer's reasoning and decision making.	Improvement Requirement IR 1 has been specified requiring proposal for ongoing ambient air monitoring program to be submitted within 2 months of the date of grant of this amendment. The proposal to be developed in consultation with DWER, with the Licence Holder to commence ambient monitoring within 3 months of submission of the proposal.
Blasting, drilling operations, excavation at the mining pits	Dust and noise	are regulated by I provisions of the I	Blasting and drilling are not prescribed for the purpose of this licence and are outside the scope of the risk assessment. These activities are regulated by DMIRS. Potential unreasonable dust emissions or environmental harm will be investigated in accordance with provisions of the EP Act and DWER's Compliance and Enforcement Policy. Activities on the premises are also subject to Environmental Protection (Noise) Regulations. Any breach will be investigated in accordance with DWER's Compliance and Enforcement Policy. See section 2.1, 2.3.4 and 2.4.3 of this amendment report for details.					

Risk Event								
Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls	Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Discharge of contaminated stormwater from 'Dam 4' into Cattlin Creek	Contaminated stormwater may contain elevated concentrations of metals and metalloids (including lithium/ hydrocarbons/ suspended solids).	Direct discharge into Cattlin Creek which is an ephemeral creek. Potential reduction in surface water quality.	Surface water monitoring is undertaken.	Moderate	Possible	Medium	Potential for overtopping of Dam 4 and discharge to the creek identified during DWER compliance inspection	Discharge of contaminated surface water/ stormwater into Cattlin Creek is not authorised under the licence. EP (Unauthorised Discharge) Regulations apply. Previous licence required submission of a surface water management plan which was submitted by the Licence Holder in January 2019. The document submitted did not comment on discharge into the creek as being a planned operational strategy. Improvement. IR2 of Condition 4.1.1 requires further work to be undertaken.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

7. Consultation

The application for licence amendment was advertised on the Department's website on 14 April 2020. The comment period ended on 1 May 2020. Comments were also invited from Direct Interest Stakeholders including DMIRS and the Shire of Ravensthorpe.

Table 9: Summary of consultation

Method	Comments received	DWER response
Electronic	Shire of Ravensthorpe confirmed no objection to the proposal for licence amendment.	Comment noted.
Electronic	Two submissions were received from community. Key concerns raised are summarized below:	The Delegated Officer has considered issues raised in the submissions and provides following response:
	 Noise emissions: The applicant has proposed earthern bunds as a key noise reduction measure for night time operations. The southern face and the height levels at present as noted in the consultant's report are misleading. The 290mt, 280mt, 270mt and 260mt levels of the waste dump are still not shaped and the bunds to the east are not present. Conditions at present do not provide noise barrier and machinery can be heard all day. Engine noise, tipping rocks is also an issue. Noise generated by 24 hours operations cannot be managed by Galaxy. The blasting has been terrible and caused damage to several homes which Galaxy has taken no responsibility for. 	 Noise emissions: EP Act Part V licensing process regulates primary activities, and ancillary activities, on prescribed premises where they meet the threshold and the description in Schedule 1 of the EP Regulations. Category 5: Processing and beneficiation of metallic or non-metallic ore does not apply to ore extraction activities (including blasting, drilling, waste rock management). Accordingly, these activities cannot be managed through EP Act Part V licensing process. DMIRS has the regulatory responsibility for approvals and management of these mining activities. Noise emissions from activities that are not 'prescribed' for the purpose of EP Act Part V licence (blasting, drilling, vehicle movement on site etc) are still required to comply with the EP (Noise) Regulations. Any complaints received are recorded in DWER's incident and complaints management system and investigated by DWER's Compliance and Enforcement directorate. Compliance with EP (Noise) Regulations and any commitments given in the operator's noise management plan are also verified during scheduled compliance inspections at the premises. Any non-compliance is

Method	Comments received	DWER response
Method	Comments received	investigated and an action consistent with DWER's Enforcement policy is taken. See section 2.2.3 of this Amendment Report for details. DWER's compliance inspection at the premises in December 2019 identified improvement opportunities for management of blasting. An updated Blast Management Plan was submitted by Galaxy to C&E subsequently. Submission of a Blast Management Plan is also a required by DMIRS. Consideration of financial compensation pertaining to any damages on account of blasting operations on the premises is outside the scope of the EP Act Part V licensing process. The Licence Holder is encouraged to engage with the community to address any concerns. • Licence Amendment Notice 5, granted on 15 January 2019, authorised construction of the ROM optical sorter unit and the ROM two stage crusher circuit. Conditions 1.2.8-1.2.10, 1.2.12 of the consolidated licence (this amendment) retain the infrastructure requirements from Amendment Notice 5. This includes requirement for constructing the noise bund. Condition 5.1.6, 5.1.7 require submission of a compliance report certified by an engineer upon completion of construction. This licence amendment authorises 24x7 mineral processing operations at the premises subject to requirements specified in Conditions 1.2.13, 1.2.14 and 1.2.15. These conditions require notification to CEO of the intent to commence night time operations, conditional approval of night time operations for an 8 month trial period and requirement to ensure compliance with EP (Noise) Regulations. Requirements for night time noise verification monitoring are specified via conditions 3.6.1-3.6.3.
		Implementation of a complaints management system is also required. The Licence Holder's ONMP includes commitments regarding source monitoring, quarterly ambient noise monitoring, changes to operational practices and community consultation. See section 2.2.2 of this Amendment Report for details.

Method	Comments received	DWER response
	Prevailing westerly winds will continue to blow mica and dust over the town site. Rehabilitation/ Visual amenity Rehabilitation to the southern face has yet to be completed and is a visual amenity issue. Consideration should be taken to the close location of the mine pit to the Ravensthorpe townsite and the impact it has on the residents. The ugly sight of the mine spoils this pristine area and nothing has yet been done by Galaxy to revegetate the area.	 Fugitive dust emissions from premises operations are considered in detail in section 2.3 of this Amendment Report. Investigation of previous dust complaints associated with premises were linked to the paddock style TSF which has now been capped. Galaxy's Airborne Materials Management Plan has been considered in this assessment. See section 2.3 of this Amendment Report. This licence requires continuation of the ambient air monitoring (Hi Vol and Dust Deposition Gauges) to assess ongoing impacts of fugitive dust from operations. Improvement Requirement 1 (IR1) has been specified requiring a proposal for continuing the ambient air monitoring. Scope of the ambient air monitoring proposal has been detailed in IR1. Rehabilitation/ Visual amenity This matter has been referred to DMIRS which has responsibility for managing rehabilitation / revegetation on mine sites. The issue is outside the scope of EP Act Part V licensing process.
Electronic	 Comments were received from DMIRS on 6 May 2020. Key aspects summarised below: Mining proposal (Reg ID 82027) for changes to the Mt Cattlin operation including expansion to the Dowling Pit (NW Pit), development of North West rock landform, backfill of the 2 NE pit, construction of rejects stockpile south of the processing plant and relocation of an existing Turkey's nest is under assessment. Acceptability of the 24x7 mining and processing at the Mt Cattlin operations was not considered as part of the Mining proposal REG ID 82027. DMIRS received a number of phone calls and correspondence from Ravensthorpe residents between July and October 2019 expressing 	Noted. Potential impacts from noise and dust have been addressed in this Amendment Report.

Method	Comments received	DWER response
	concerns particularly in regards to the increased noise and dust that will be generated by the proposal for 24 hour operations (further information provided below).	
Electronic	In response to DWER's request, on 11 May 2020, DMIRS provided a copy of the Memo addressed to HSE Manager- Galaxy Lithium Australia Limited dated 4 November 2019. DMIRS received 11 complaints between May 2019 and April 2020 in relation to the premises operations. One other complaint was received by DMIRS since November 2019. Following were key issues raised in complaints received by DMIRS in relation to Galaxy's proposal for 24x7 operations. • Increasing dust over the town and potential health impacts; • Accuracy of dust deposition gauges and representativeness of monitoring data for weather conditions; and • Current level of noise emissions and potential for increase in noise levels due to 24x7 operations and associated amenity impacts	The issues raised are consistent with community submissions received by DWER during the public advertising period of this licence amendment application. This amended licence grants approval for a trial period of 24 hour operations limited to 8 months. Conditions have been included requiring independent noise monitoring to ensure noise emissions do not exceed strict night time levels stipulated by the Environmental Protection (Noise) Regulations. Galaxy are also required to install noise bunds to ensure that the requirements of the Environmental Protection (Noise) Regulations are met at all times. A further condition requires a program of ongoing air quality monitoring for 12 months, with the adequacy of the air quality monitoring program to be reviewed by DWER technical experts prior to commencement.

8. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a licence amendment will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

8.1 Summary of amendments

Table 10 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 10: Licence amendments

Condition No.	Proposed amendments	
1.2.13	Condition requiring notification to CEO prior to commencing night time operations.	
1.2.14	Condition authorising night time operations and limiting the duration to 8 months from the date of commencement.	
1.2.15	Condition specifying that noise attenuation infrastructure must be maintained to ensure compliances with EP Noise Regulations 1997 at all times.	
3.3.2, 3.3.3	Administrative correction. Requirement relating to maintenance of operational freeboard in SW in-pit TSF and maintenance of SW in-pit TSF perimeter bund are now stated as separate conditions. These were previously included in Table 3.3.1-Process Monitoring.	
3.5.1	Ambient environmental monitoring - added as a separate condition to ensure it is specific and enforceable. Previously the requirement was included in Table 2.1.1 under fugitive dust management requirements and referred to AMMP.	
	Requirement for characterisation of deposited minerals in dust deposition gauges installed near Ravensthorpe town site and the background DDG added.	
3.6.1-3.6.3	Specified actions- ambient noise monitoring- night time operations	
IR1	Improvement Requirement- Ambient air monitoring	
IR2	Improvement Requirement- Contaminated stormwater management	
	Removal of previous condition requiring operations in accordance with ONMP 2017 (now outdated). An updated version has been considered in this assessment. Monitoring requirements have been specified in the licence. The Licence Holder must comply with EP (Noise) Regulations.	
	Removal of previous conditions restricting operating times of the crushing plant and optical crusher circuit.	
	Removal of previous conditions authorising TSF embankment wall lift as per Amendment Notice 4. The Licence Holder has confirmed that this is no longer required.	

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Application for licence amendment and supporting information received 17 September 2019		DWER Records
2	Galaxy Mt Cattlin Operations: Operational Noise Management Plan, Revision 02, Doc No. 02-HSE-PLA- 0015, dated 13 November 2019	Galaxy ONMP	DWER Records (A1860723)
3	Galaxy Resources Mt Cattlin Project: Annual Dust Monitoring Review Final Report Version 1.2, authored by Environmental Technologies & Analytics, December 2019	ETA Report	DWER Records (A1860724)
4	Galaxy FDR Standard- Mining Area	FDR standard	DWER Records (A1860725)
5	Fibrous Material Management Awareness Training (PowerPoint slides)		DWER Records (A1860755)
6	Mt Cattlin Operations Airborne Contaminants Reports, authored by Minetech (Occupational hygiene consultant), dated August 2018, December 2018, March 2019, July 2019		DWER Records
7	Examination of dust fallout gauge deposits by optical microscopy, authored by UQ Materials Performance, dated October 2019		DWER Records (A1860762)
8	Galaxy- Risk based Hygiene management plan and Risk Assessment- Fibrous materials		DWER Records
9	Correspondence from SGC Safety titled <i>Occupational hygiene response</i> to <i>DWER</i> , dated 23 December 2019		DWER Records (A1860765)
10	Guidance Statement: Regulatory principles	DER 2015	accessed at www.dwer.wa.gov.au
11	Guidance Statement: Setting conditions	DER 2015	
12	Guidance Statement: Licence duration.	DER 2016	
13	Guidance Statement: Risk Assessments	DWER 2017	
14	DER, November 2016. Guideline: Decision Making	DWER 2019	

Appendix 2: Summary of Licence Holder comments

Condition	Summary of Licence Holder comment	DWER response
	Previous licence condition 1.2.2 specified list of equipment authorised for operation during night time. Licence Holder requested alternative wording to be consistent with the HSA Noise modelling report.	The previous condition was beyond the scope of Category 5. Accordingly this condition has been deleted. In addition previous condition requiring broadband style reversing alarms on mobile mining equipment has also been deleted as it is beyond the scope of Category 5.
	Rewording of condition regarding commencement of night time operations and the duration for the same.	Condition 1.2.13 added requiring notification prior to commencing night time operations. Condition 1.2.14 added to allow for an 8 months trial period. Condition 3.6.3 (noise verification monitoring) requires submission of the report (pursuant to condition 3.6.1, 3.6.2- noise verification) no later than 60 days from the date of commencement of night time operations.
1.2.5	Prefer not to be restricted on where tyres can be stored due to operational amendments/pit developments, tyre storage may be relocated which would result in having to amend the licence. Restriction of 25 tyres satisfactorily manages any risk.	Noted. The condition was placed on the licence via Amendment Notice 2 granted on 27 March 2018. The Delegated Officer notes the intent of the request is to allow for operational flexibility and has amended condition text for Condition 1.2.5 to state that no more than 25 tyres are to be stored at any one time at any location awaiting final disposal via burial at the Waste Dump.
1.2.8-1.2.12	Remove these conditions from the Licence as construction compliance documents relating to works authorised under Licence Amendment Notice 5 have been submitted.	The Delegated Officer notes that, in response to DWER's request for clarification of construction compliance documents, the Licence Holder's Environmental Advisor responded on 22 May 2020 and confirmed that the compliance document for Amendment Notice 5 (optical sorter) has not yet been submitted as commissioning process is yet to be completed. Accordingly, the Delegated Officer has determined that it is appropriate for conditions 1.2.8-1.2.12 to remain on the licence L8469.
	Remove conditions relating to construction of SW in-pit TSF and installation of associated groundwater monitoring bores MB9-MB12 as	Noted. Conditions deleted from the draft.

Condition	Summary of Licence Holder comment	DWER response
	construction compliance documents for these have been submitted to the Department and the infrastructure is now operational.	
1.2.15	Reword or remove the condition as corresponding text in Amendment report requires that evidence of noise attenuation installed be provided which is not mentioned in the condition text.	Incorrect referencing in Amendment Report Table 10 corrected. Condition text amended to state 'noise attenuation infrastructure'.
3.3.2	Reduce the SW in-pit TSF operational freeboard required to be maintained from 2 metres below lowest part of pit crest to 1m.	The Delegated Officer notes that this request is outside the scope of the licence amendment application for 24x7 operations. The consultant's comments states that the in-pit TSF has been designed for 1m freeboard. The Delegated Officer has considered documents available in record pertaining to Amendment Notice 6 which authorised the SW in-pit TSF and notes that: • The Licence Holder has not provided a TSF Design Report or a TSF operations manual to verify this statement; • The specification for 2 metre freeboard was accepted by the Licence Holder through the consultation process for draft conditions pertaining to Amendment Notice 6.
		The Delegated Officer notes that there are operational and environmental risks associated with a reduction TSF freeboard which need to be considered in detail prior to considering the Licence Holder's request any further. It is recommended that the Licence Holder pursues this change to TSF operations via a subsequent licence amendment and provides further details on: TSF design parameters including capacity determination; Water balance; Geophysical and geochemical characteristics of tailings; Information on how reduced freeboard will impact the lateral seepage and any environmental receptors; and Evidence that proposed change is consistent with the in-pit TSF operating strategy and is authorised by the Department of Mines, Industry Regulation and Safety.

Condition	Summary of Licence Holder comment	DWER response
Table 3.4.1	Paddock style TSF has been decommissioned. Remove groundwater monitoring requirements specified for MB01, MB02,MB03,MB04,MB05 and MB06	The Delegated Officer notes that the paddock style TSF was capped in late 2019 and the SW in-pit TSF is operational. It can be expected that tailings consolidation and seepage from the paddock style TSF may still continue to impact local groundwater quality and standing water levels for some time. The Delegated Officer considers that ambient groundwater quality monitoring requirements specified in Tale 3.4.1 are still relevant for the purpose of managing environmental risks associated with premises operations.
IR1	Reword to only require compliance with Airborne Materials Management Plan and to require that effectiveness of the monitoring program is reviewed annually by an air quality specialist and results to be submitted to the Department annually.	The Delegated Officer has considered the report titled <i>Annual Dust Monitoring Review Final report Version 1.2</i> dated December 2019 authored by <i>Environmental Technologies and Analytics</i> . Review of current ambient air monitoring program has identified improvement opportunities. There are no visual indicators of fugitive dust emissions during night time operations. Given the complaints history and proximity to receptors, the Department needs information to verify robustness of the ambient air monitoring implemented. Information requirements specified in IR1 are targeted addressing remaining uncertainties and to ensure that data collected is complete, representative and verifiable to inform assessment of environmental risks associated with premises operations.
5.1.5-5.1.6	Remove reporting conditions and update condition numbers.	These reporting conditions relate to submission of compliance document pertaining to works authorised under Amendment Notice 5 (optical sorter units). The Licence Holder has advised by email that construction compliance documents for these works have not been submitted. The reporting conditions cannot be deleted from the licence until compliance documents are received.
	Remove reporting conditions relating to submission of construction compliance documents for the in-pit TSF.	Noted. Draft updated.
Schedule 2- Noise Barrier relocation onto the ROM Pad	Remove the figure as no barrier is required.	The figure pertains to works authorised under Amendment Notice 5 (optical sorter unit) for which construction compliance document has not been submitted. Noise barrier was assessed to be a required control measure at the time. Condition 1.2.15 on this amended licence provides operational flexibility to the Licence Holder to use other noise attenuation methods provided the Licence

Condition	Summary of Licence Holder comment	DWER response
		Holder has demonstrated compliance with assigned noise levels specified in the <i>Environmental Protection (Noise) Regulations</i> 1997.
		The request will be considered once construction compliance documents for Amendment Notice 5 are submitted.