



<b>Licence Number</b>	L8469/2010/2
<b>Licence Holder</b>	Galaxy Lithium Australia Limited
<b>ACN</b>	130 182 099
<b>File Number:</b>	DER2014/001110
<b>Premises</b>	Mt Cattlin Project RAVENSTHORPE WA 6346  Lot 31 on Plan 224145 and Lot 127 on Plan 145763 (part of Mining tenement M74/244) Newdegate- Ravensthorpe Road RAVENSTHORPE WA 6346
<b>Date of Amendment</b>	03 July 2019

## Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B (9) of the EP Act.

**Tim Gentle**  
**MANAGER – RESOURCE INDUSTRIES**  
**REGULATORY SERVICES**

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

## Definitions and interpretation

### Definitions

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

**Table 1: Definitions**

Term	Definition
ACN	Australian Company Number
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	for the purpose of correspondence means; Chief Executive Officer Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 JOONDALUP DC WA 6919 Email: <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a> ;
Delegated Officer	an officer delegated under section 20 of the EP Act
DMIRS	means Department of Mines, Industry Regulation and Safety
DWER	means Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
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
m <sup>3</sup>	cubic metres
mbgl	metre(s) below ground level
mg/L	milligrams per litre
Mtpa	Million tonnes per annum
Mining Act	<i>Mining Act 1978 (WA)</i>
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>

RL	refers to the term 'Relative Level' and is the height or elevation above the point adopted as the site datum for the purpose of establishing levels.
TSF	Tailings Storage Facility

## Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B (9) of the EP Act.

Amendment Notice (6) assesses the infrastructure proposed and the operation of process tailing waste being deposited into a disused mine void referred to as SW Pit. The proposed licence amendment if granted will result in the decommissioning and encapsulation of the existing above ground Tailing Storage Facility (TSF).

This proposal will not lead to an increase in annual production capacity of 2.0 million tonnes per annum (Mtpa) or the annual tonnage of **TSF** waste to be deposited into SW Pit will remain at approximately 180,000 tonnes per annum.

The following Department of Water and Environmental Regulation (DWER) guidance statements have informed the decision made on this amendment;

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

## Amendment description

On 19 March, Galaxy Lithium Australia Limited (**GLAL**) submitted a licence amendment application (A1773797) which is the subject of this Amendment Notice. Supporting documents to the licence amendment application included project description (A1773800), infrastructure map (A1773799), key infrastructure and equipment, emissions and discharges and waste potential emissions risk assessment (A1773801), siting of receptors and geology and hydrogeology. A revised application making minor amendment to attachment 3A was received by the DWER on 20 March 2019 (A1773939).

The new key infrastructure and equipment to be assessed in this amendment include;

- SW Pit;
- Tailings disposal and decant water recovery system;
- Groundwater monitoring bores;
- SW Pit underdrainage system;
- Vibrating wire piezometer(VWP); and,
- SW Pit water recovery system (4 metre high rock decant structures built within the pit).

### SW Pit

The SW Pit is located east of the processing plant and has an area of approximately 7.6 ha with the pit floor depth of 57.7 m (RL 207.5 m). The SW Pit crest varies from RL 253 m to RL 265 m with the deepest point at RL. 207.5 m. Figure 1 shows an aerial image taken in January 2019 of the SW Pit in relation to the plant and the existing above ground TSF. Figure 2 shows the final SW Pit layout RL's. The proposed level of tailings deposition will be to RL 250 m giving a total storage capacity for tailings deposited into the SW Pit as approximately 600,000 m<sup>3</sup>. Figure 3 presents the storage capacity of the SW Pit at RL 250 m. The total capacity of the SW Pit is estimated to be 1,040,000 m<sup>3</sup> with a surface area of 4.3 ha as indicated by Figure 4. It is predicted that an excess of ~200,000 m<sup>3</sup> will be available for mine waste backfill or additional

tailings deposition by the end of mining, predicted to be 5 years, from RL 250 m to RL 255 m.



Figure 1: Aerial image of the SW Pit (January 2019)

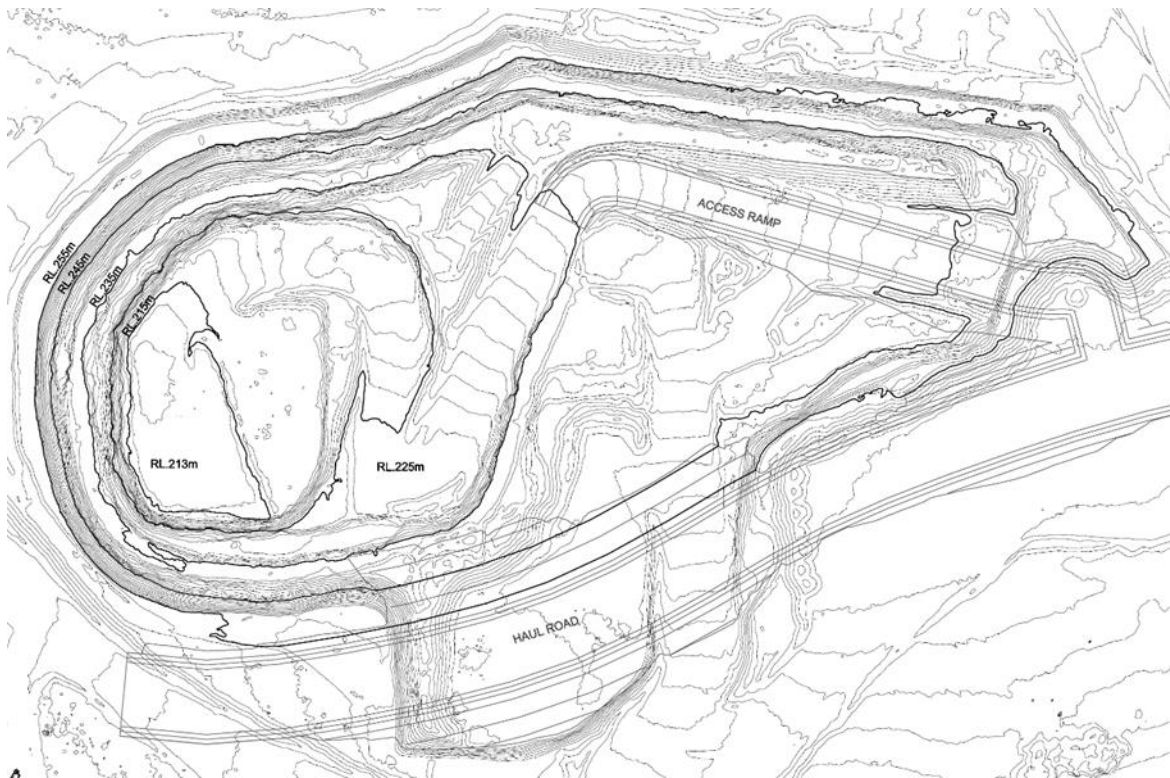
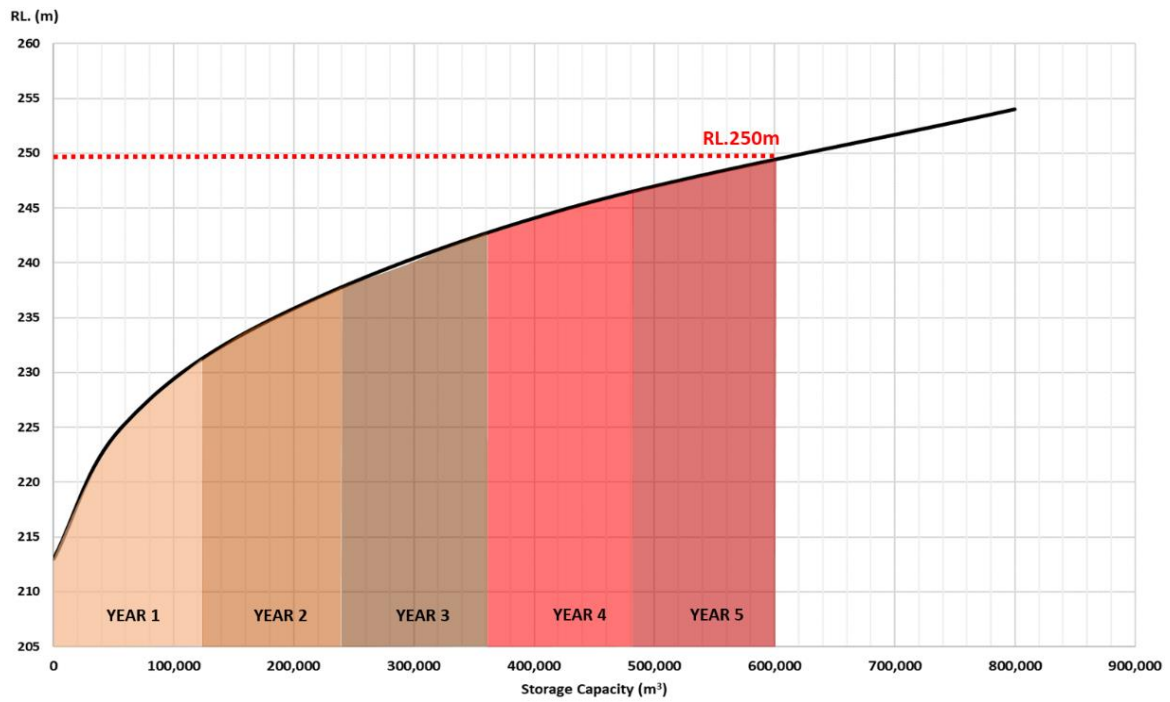
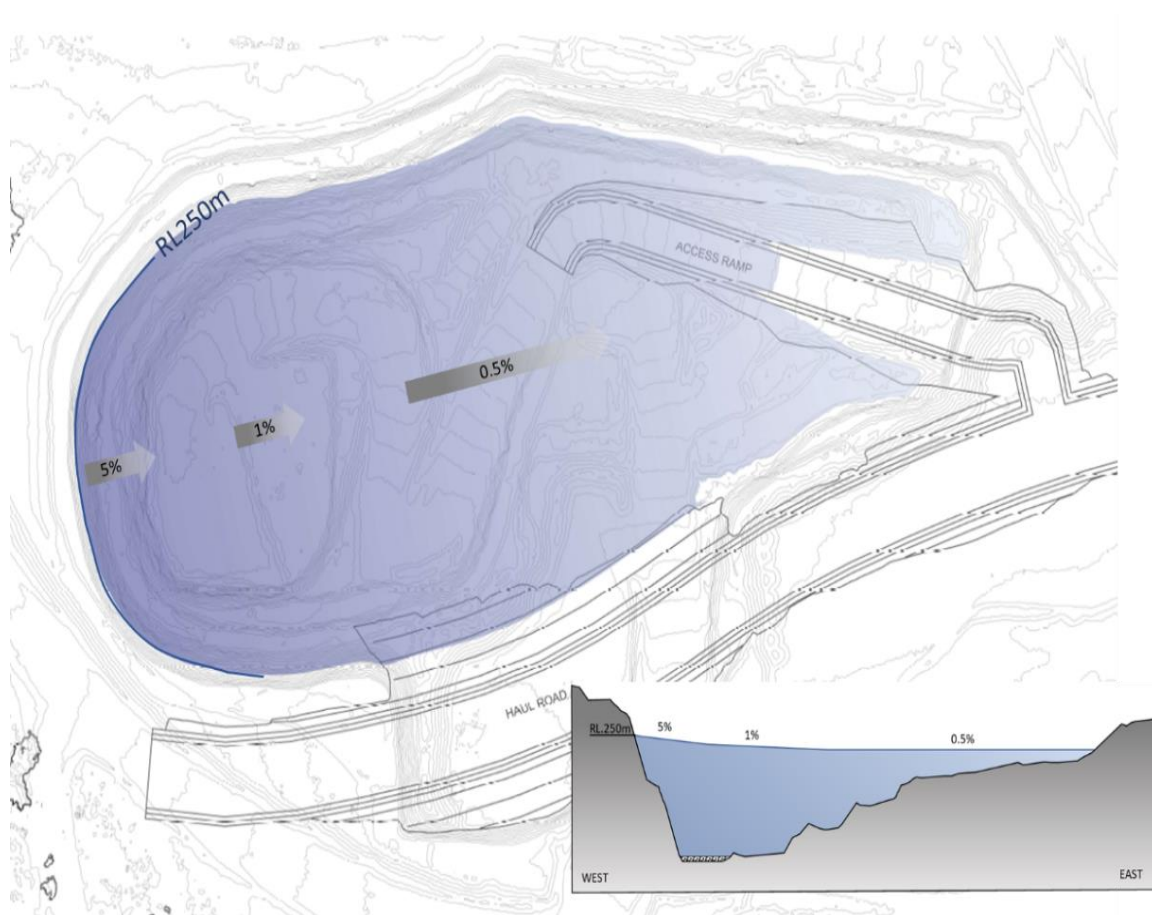


Figure 2: Final SW Pit layout in RL



**Figure 3 – SW Pit storage capacity**



**4 – Surface area at RL.250 m is 4.3 Ha**

**Figure**

## Tailing characteristics

The maximum tailings throughput at Mt. Cattlin has been approximately 180,000 tonnes/year with a projected Life of Mine (LoM) of 5 years, resulting in an expected total production of 900,000 tonnes. Hence, with an assumed dry density of 1.50 t/m<sup>3</sup>, the total storage capacity required for the LoM is approximately 600,000 m<sup>3</sup>.

Particle Size Distribution (PSD) analysis of the tailings is regularly carried out onsite at the mine laboratory. Table 2 summarises 14 testing results carried out over a month (February 2019) that indicates that the tailings comprises an average of 83% sand and 17% fines (<0.075mm). Figure 5 presents the Particle Size Distribution (PSD) curves highlighting the average depicted by the red curve.

% Passing (mm)	20190308-N	20190303-N	20190228-N	20190226-N	20190224-N	20190221-N	20190219-N	20190217-N	20190214-N	20190212-N	20190210-N	20190207-N	20190205-N	20190203-N	Average
13.2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
9.5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
6.3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2.0	99.1	98.5	97.8	99.3	99.6	99.7	98.1	97.9	99.8	99.2	99.5	99.1	99.7	99.4	99.1
1.0	79.4	83.3	76.1	82.0	89.1	89.2	78.5	77.5	78.0	85.2	85.9	84.7	89.1	85.0	83.1
0.36	52.0	52.3	41.4	55.9	70.5	69.1	55.4	54.8	2.6	61.7	63.3	59.1	63.8	68.2	55.0
0.075	10.4	14.2	27.1	15.6	24.8	20.2	17.2	17.2	0.0	18.9	19.5	14.6	18.6	18.9	16.9
0.038	0.4	6.3	12.3	5.6	9.0	3.6	6.5	7.9	0.0	7.1	7.6	5.7	7.4	6.1	6.1
SAND	89.6	85.8	72.9	84.4	75.2	79.8	82.8	82.8	100	81.1	80.5	85.4	81.4	81.1	83.1
FINES	10.4	14.2	27.1	15.6	24.8	20.2	17.2	17.2	0.0	18.9	19.5	14.6	18.6	18.9	16.9

Table 2: Particle Size Distribution (PSD) analysis.

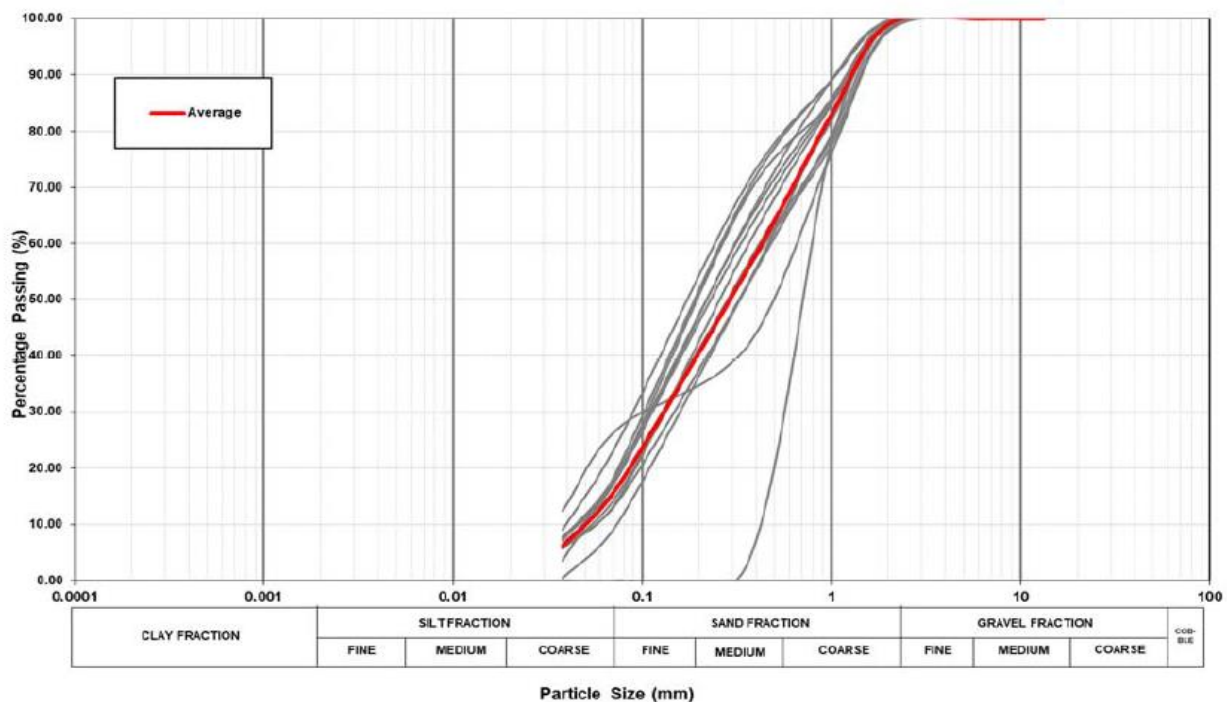
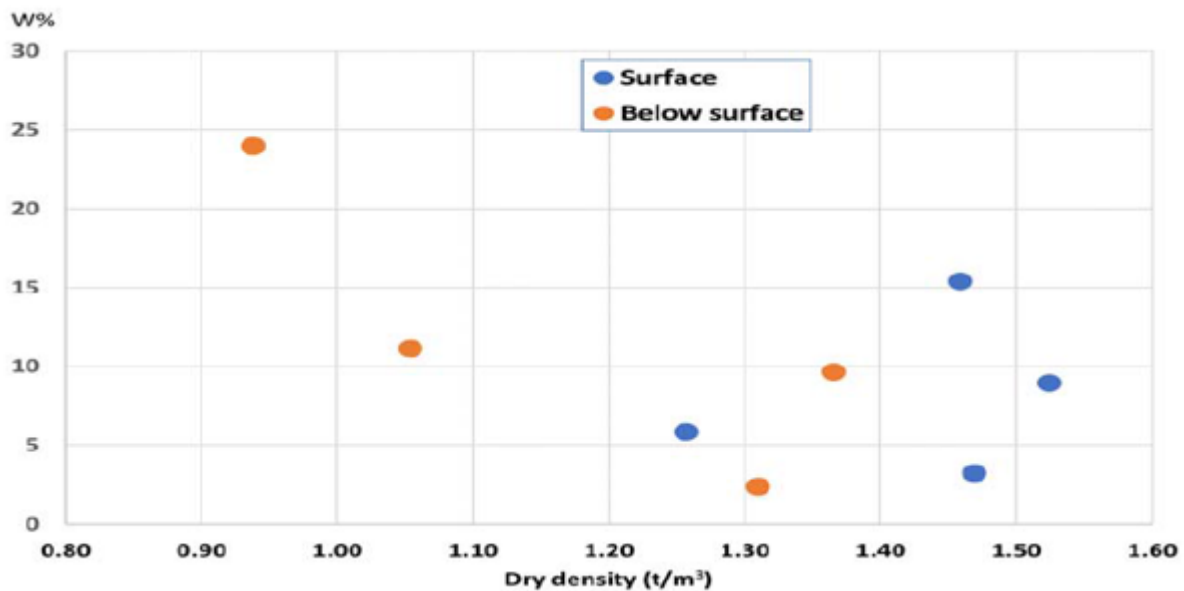


Figure 5: PSD results of the Mt Cattlin tailings

Tailings at Mt. Cattlin existing TSF have been deposited in a 50% solids slurry through a single mobile spigot (105.2mm ID or 87.8mm ID), located within the tailings beach and held ~2m above surface. As the tailings settle in a steep angle, creating humps instead of low angle beaches, the spigot has to be managed on a daily basis shifting its position between 10 and 20 metres apart and shaping the humped surface in such a way that the water flows to the centre of the facility to be recovered by a floating pump. In situ density tests were carried out on undisturbed samples extracted from the tailings surface and at shallow depths (from 300 mm to 500 mm deep). Figure 5 presents the results from these tests.



**Figure 6: Mt Cattlin deposited tailings dry density vs moisture content**

### Leachate quality

During the backfilling phase of the SW Pit, leakage would likely be smaller from the SW Pit than that from the existing TSF as the pit water level will be below the regional water table level and groundwater would be entering the pit as a local groundwater sink. This will remain constant until the SW Pit water levels increase as tailings are deposited to the regional groundwater level. Leachate seepage rate are expected to increase if wet tailings are deposited above the regional groundwater level of RL 235 m.

Leachate seepage from the SW Pit is likely to have a high salinity and may contain a number of chemical constituents such as boron, caesium, cobalt, lithium, rubidium, fluoride, nickel and molybdenum. This is because these elements are often present at high concentrations in lithium-caesium-tantalum pegmatites of the type present at the Mt Cattlin mine-site (Bradley *et al.*, 2017) and have the potential to be released into solution by mining and mineral processing activities.

Table 3 as follows is the observed existing TSF monitoring bore and TSF leachate metals concentrations but the existing SW Pit groundwater metal concentrations will need to be established.



**Table 3: TSF Monitoring Bore and existing TSF leachate metal concentrations**

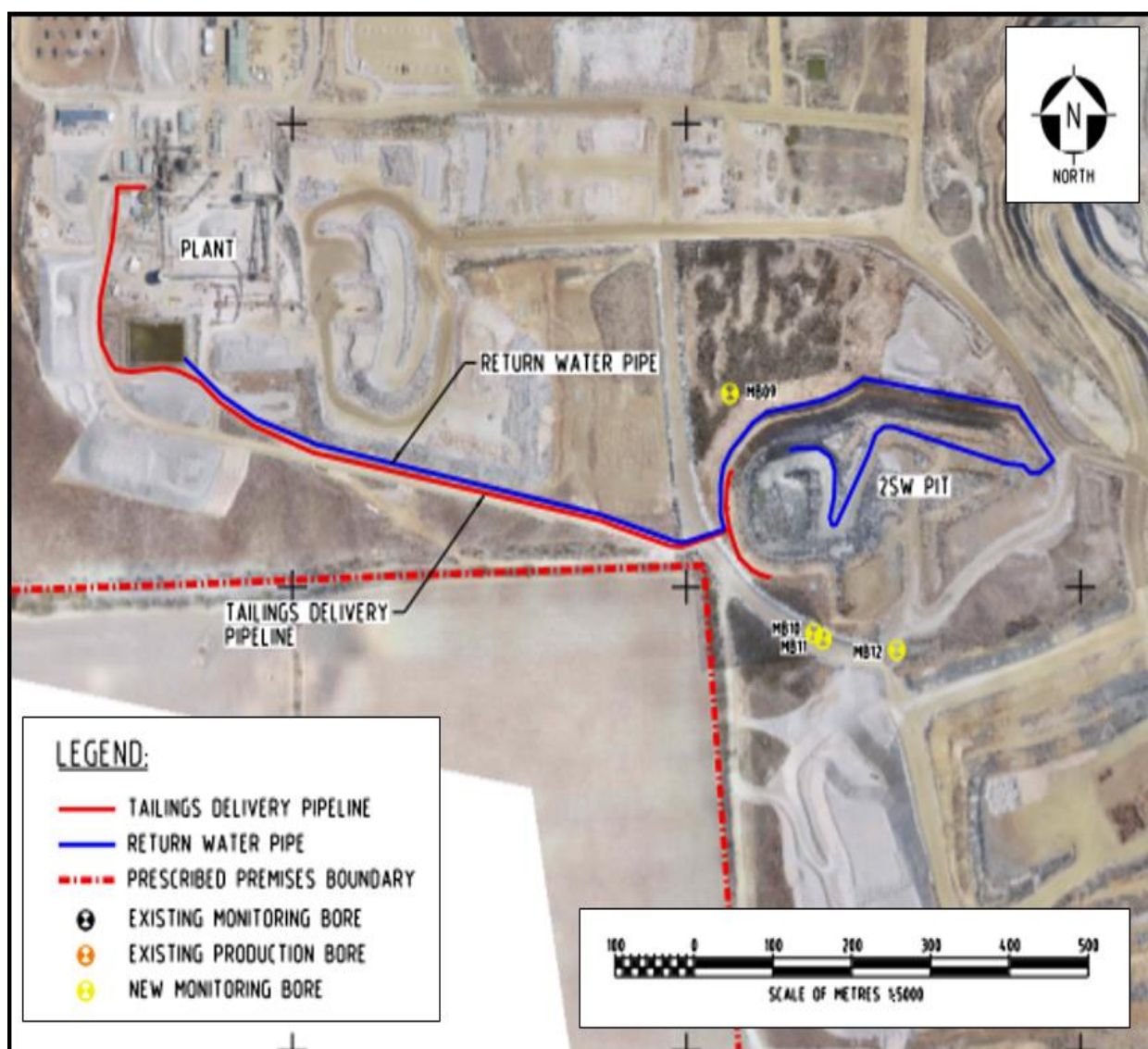
Date	Source	As	Cd	Co	Cu	Pb	Li	Ni	Zn	Cr (VI)	Cr (III)
27/04/2010	Monitoring bores	0.02	0.0004	0.011	0.027	0.001	0.284	0.095	0.062	0.013	0.007
4/02/2017	Monitoring bores	0.0026	0.00169	0.28	0.0082	0.0003	0.413	1.04	0.034	<0.01	0.0094
18/10/2017	Monitoring bores	0.0081	0.004	0.522	0.225	0.0108	0.518	1.39	0.159	<0.01	-
	TSF Sump	0.0998	0.00058	0.0008	0.0048	<0.0001	2.32	0.0073	0.003	<0.01	-
	TSF Decant	0.0759	0.0093	0.025	0.008	<0.0002	4.04	0.0451	0.017	<0.01	-
5/12/2017	Monitoring bores	0.016	0.0048	0.572	0.194	0.01	0.546	1.54	0.206	<0.01	-
	TSF Sump	0.113	0.0001	<0.001	0.004	0.008	2.69	0.008	<0.005	<0.01	<0.001
	TSF Decant	0.078	0.0057	0.026	0.006	<0.005	4.74	0.037	<0.025	<0.02	<0.005
28/02/2018	Monitoring bores	0.017	0.006	-	0.079	0.011	-	1.62	0.241	<0.01	-
	TSF Decant	0.1	0.0026	-	0.011	<0.005	-	0.036	<0.025	-	<0.005
	TSF Sump	0.03	0.0016	-	0.035	<0.005	-	0.036	<0.025	-	<0.005
3/05/2018	Monitoring bores	0.02	0.0053	0.568	0.102	0.01	-	1.48	0.216	-	0.06
	TSF Sump	0.113	0.0001	<0.001	0.006	<0.001	-	0.006	<0.005	-	<0.01
	TSF Decant	0.103	0.0049	0.014	0.009	<0.005	-	0.04	<0.025	-	<0.01
22/08/2018	Monitoring bores	0.018	0.0061	0.569	0.092	0.013	-	1.54	0.572	-	0.02
	TSF Decant	0.046	0.002	0.021	0.01	<0.005	-	0.067	<0.025	-	<0.01
21/11/2018	Monitoring bores	0.016	0.006	0.504	0.227	0.011	-	1.61	0.372	-	0.06
	TSF Decant	0.030	0.0014	0.011	0.011	<0.005	-	0.018	<0.025	-	<0.01
	TSF Sump	0.078	0.0007	0.001	0.006	<0.001	-	0.009	<0.005	-	<0.01
15/02/2019	Monitoring bores	0.016	0.0043	0.664	0.123	0.009	0.512	1.97	0.255	-	0.05
	TSF Decant	0.045	0.0014	0.010	0.006	0.006	4.83	0.025	<0.025	-	<0.01
	TSF Sump	0.091	0.0031	0.002	0.004	0.004	4.04	0.014	0.043	-	<0.01

## Tailings disposal and decant water return pipelines

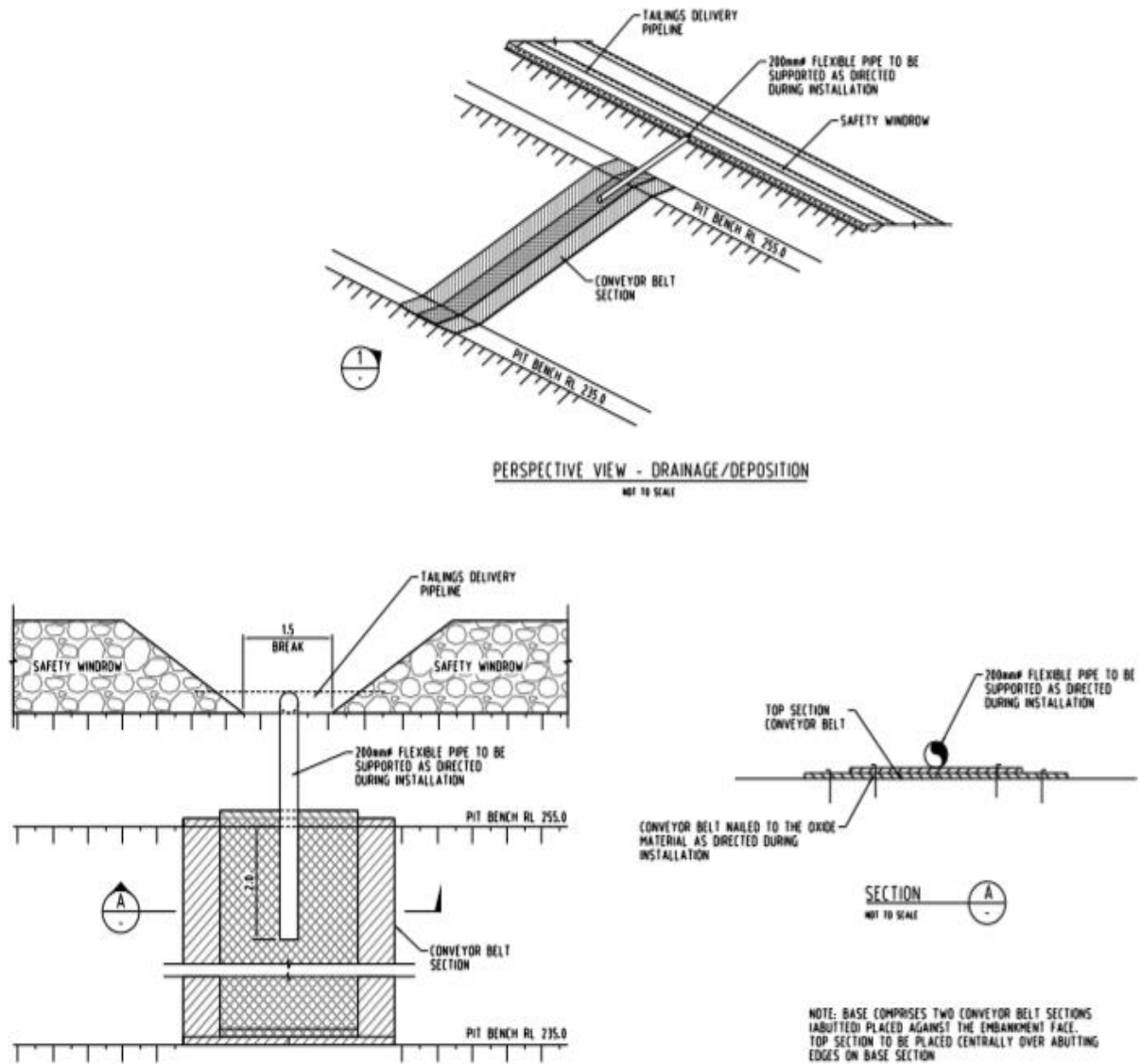
Tailings will be distributed via pipeline in an open 'V' trench from the Processing Plant to the SW pit where it will be deposited in to the pit by up to 5 spigots draped over the edge of the pit crest. Figure 7 provides the tailings discharge and water recovery route between the processing plant and the SW Pit.

Figure 8 below indicates the proposed design of the tailings deposition infrastructure at the SW Pit including the 'V' drain design. The spigots delivering tailings into the SW pit will be shortened as the tailings beach rises to maximum RL 250 m.

A pipeline returning decant water to the Processing Plant raw water pond will be situated in the same 'V' drain as the tailings deposition pipeline. The 'V' drain will provide secondary containment for the tailings and decant water pipelines. The pipelines will be monitored by telemetry and inspected daily during operations in compliance with the existing conditions of licence.



**Figure 7: Tailings delivery pipeline, Return water pipe, spigot locations and monitoring bore locations**



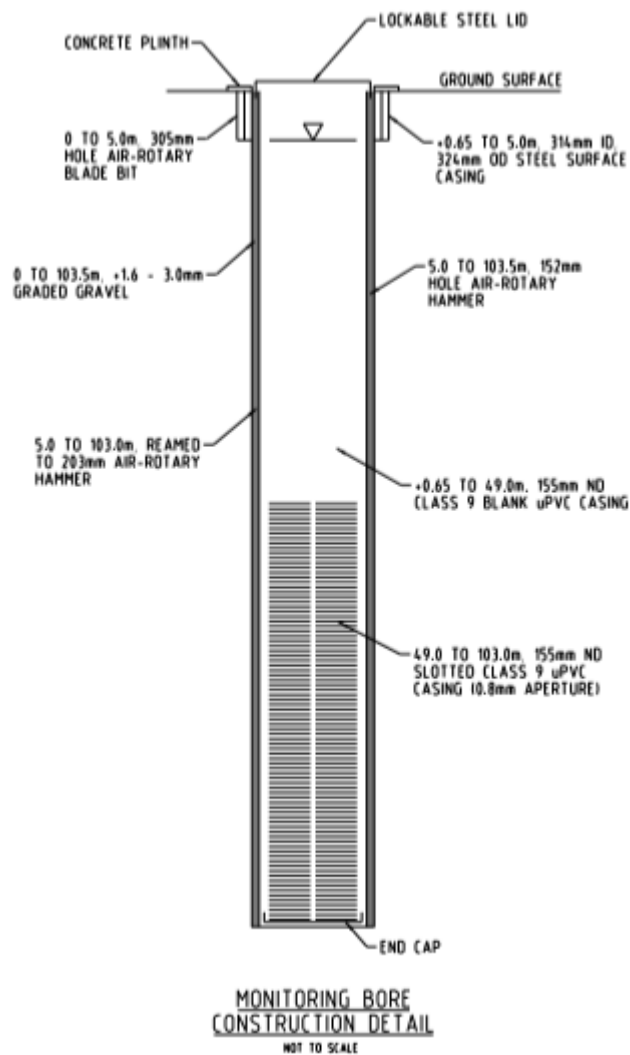
**Figure 8: Tailings deposition and 'V' drain design**

### **Groundwater monitoring bores;**

Four groundwater monitoring bores will be installed in different locations as presented in Figure 7 and indicated by identifiers MB9 to MB12. Three monitoring bores are targeting the northwest to southeast trending fracture zones and one monitoring bore in the shallow oxidation zone near the pit crest, to measure groundwater level and chemistry changes in both the deep fractured rock aquifer and the shallow weathered zone for potential seepage.

The monitoring bore construction design is indicated in figure 9 titled monitoring bore construction details as follows.

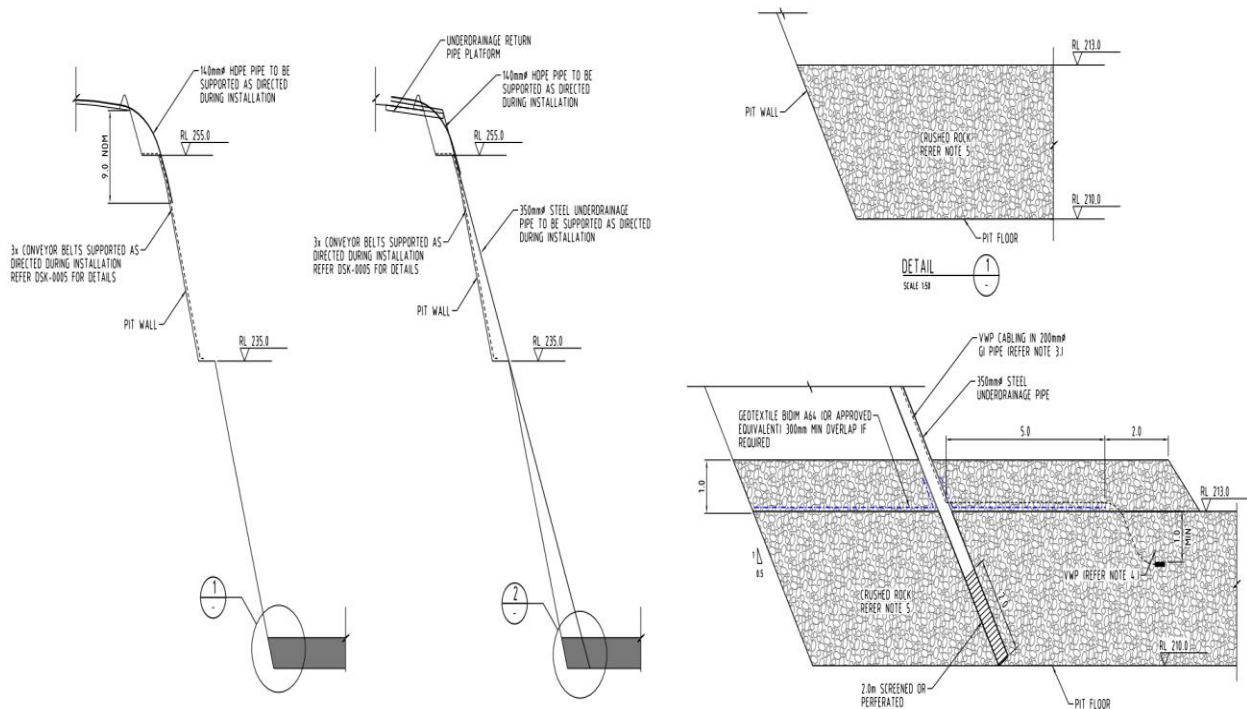
It shall be noted that the current mine plan envisages a waste dump at the southern portion of the SW Pit where MB 12 is located. This monitoring bore will either be protected and extended during the waste placement or re-drilled as the waste dump expands.



**Figure 9: Monitoring bore construction detail**

***SW Pit underdrainage system;***

The proposed design includes an underdrainage system within the lowest area of the SW Pit (RL. 210 m) comprising a 3 m thick layer of crushed rock that will filter water from the base of the tailings stack. The water will be pumped back to the surface of the tailings by a 350 mm □ steel pipe with a bore pump, where it can be recovered by the water recovery system. The underdrainage system will reduce the seepage through the walls of the pit and enhance the consolidation of the tailings stack. The construction design of the SW pit underdrainage system is depicted below in Figure 10.



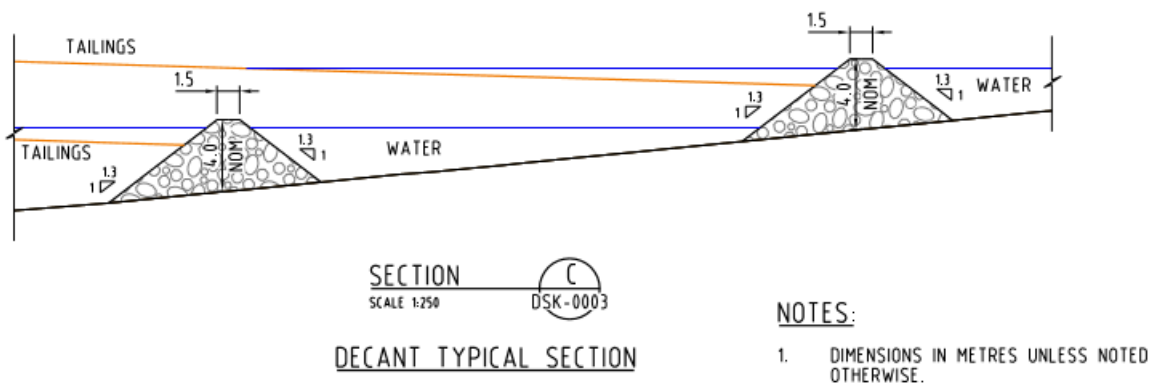
**Figure 10: Underdrainage SW pit design**

### Monitoring using vibrating wire piezometer (VWP)

Pore water pressure within the tailings deposited in the SW Pit will be monitored by a 700 KPa vibrating wire piezometer (VWP) placed on the floor beneath the filtering layer. VWP cable is to run through a 20 mm pipe attached to the underdrainage pipe at the crest of the pit where a readout box is to be set. The water level can also be monitored within the underdrainage pipe from this sump.

### SW Pit water recovery system (4 metre high rock decant structures)

The underdrainage system will reduce the seepage through the walls of the pit and enhance the consolidation of the tailings stack. Details of the underdrainage system are presented in drawings 201012-00739-CI-DSK-0004 included in Application supporting document Attachment 3A. The water recovery system consists of a series of 4 m high rock fills/decants (d50 = 350mm) sequentially built along the access ramp as the tailings deposition progresses (Figure 11). These rock fills will work as filters to a trailer/skid mounted pump which will transfer the water back to the process plant.



**Figure 11: Typical section of decant structures**

The decant structures may not be required if the surface of the tailings is managed in such a way that a beach is created dipping towards the access ramp and a sufficient large water pond is created to settle the fines and allow a direct suction device. Details of the water recovery system are presented in Attachment 3A. Tailings will be delivered from the process plant in 150 mm HDPE pipes split in at least 4 spigots with control valves distributed along the west and northwest side of the pit crest. The spigots will be attached to 6-7 m long flexible pipes (lay-flats).

Given the presence of oxide material at RL 235 m, the wall needs to be protected by conveyor belts attached to the wall from the berm at RL 255 m to the berm at RL 235 m to protect the surface from the erosion caused by the slurry. Details of the slurry delivery system are presented in drawings included in Attachment 3A.

## **Groundwater Hydrogeology**

The Mt Cattlin mine-site is underlain by volcanic and metasedimentary rocks that form part of the Ravensthorpe Greenstone Belt which have been folded into a southward plunging structure known as the Beulah Synform near the mine-site. These rocks have been intruded by flat-lying tabular-shaped pegmatite dykes that contain the lithium and tantalum mineralisation. The rocks that underlie the mine-site are mostly crystalline and have a negligible primary-porosity consequently, groundwater in these materials mostly occurs in fracture-zones within bedrock and probably also in localised zones within weathered regolith.

Information provided (Rockwater Consultants) suggest that the natural groundwater salinity near the mine-site is too high for use for stock water-supply or other purposes. Consequently, groundwater contamination from mining and mineral processing activities at the site would be unlikely to adversely affect groundwater use in the area.

Potential groundwater leakage from the proposed In-pit TSF will only occur after the water level in the tails exceeds the local water table level above RL 235 m. Observations of the low seepage rate of groundwater into the SW pit indicate that seepage rates when the water level rises above the local water table are likely to be very low. In the longer-term (post-closure) there is likely to be some groundwater flow through the deposited tailings. The salinity of the tails water is less than the ambient saline to hyper-saline groundwater indicating that there may be a slight freshening of the groundwater when leakage occurs. Metals and metalloids in the tailings leachate will be measured for comparison with the regional groundwater but are likely to be similar quality as the process plant water supply is from mine dewater of the fractured rock aquifer in close proximity to the SW Pit.

Groundwater monitoring around the existing TSF found slightly decreasing pH and salinity with no other adverse effects from metals and metalloids. The lack of groundwater environmental receptors and users in the vicinity of the mine, the low groundwater flow and small changes in the groundwater chemistry indicate that the effect of using the SW Pit as a TSF is likely to have minimal impacts on the local groundwater and nearby receptors.

## **Benefits of in-pit TSF**

The benefits of the SW pit being used as a tailings storage facility are;

- Reduced impacts in the landscape as the existing paddock TSF will not need to be raised and/or extended to construct the additional TSF cell 2;
- Opportunity to implement a more efficient underdrainage system reducing the seepage to the natural environment and enhancing the water recovery for mining purposes;
- Reduced evaporation loss of the supernatant;
- Reduced management of the spigots (fixed location) with reduced deposition risk;
- Potential flexibility in the water recovery system;
- No risk of TSF wall breach as the tailings will be below ground level;
- Early rehabilitation backfilling at closure; and

- Potential extra storage if extension of the LoM and/or for use as waste dump.

The **GLAL** throughput capacity of 2.0 Mtpa for Category 5 processing and beneficiation of metallic and non-metallic ore activities will not change due to this construction. Consideration of the second proposed TSF wall lift (4) approved in expired Works Approval W4533/2009/1 and reassessed in Amendment Notice 4 can be reassessed / deleted for information required by Improvement Condition 4.1.1, IR2 and IR3 of Amendment Notice 4.

DWER reviewed the **Application** and **supporting documentation** and confirmed the key infrastructure and equipment that will be assessed during construction, commissioning and operations. No clearing approval is required on the land where this proposal is located.

The emissions associated with the construction and operation of the SW in-pit TSF will be risk assessed in **this report** to determine impacts upon the environment and public health (see Table 10 & 11 below). The deletion of redundant conditions and renumbering of existing conditions is an administrative change, and therefore will not be assessed in **this report**. An amendment to include TSF monitoring bores construction report and the new bores in the existing monitoring program have been completed as part of **this report**.

## Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 3.

**Table 3: Relevant approvals**

Legislation	Number	Approval
<i>Mining Act 1978 (WA)</i> (Department of Mines, Industry Regulation and Safety)	Registration Id: 79096 ( WRL Extension, COS, In-Pit Tailings Deposition )	Ravensthorpe Spodumene Project was granted mining approval on 4 November 2009 and Mining Tenement M74/244 was granted on 24 December 2009.
<i>Environmental Protection Act 1986 (WA)</i> (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.
<i>Environmental Protection Act 1986 (WA)</i> (Department of Water and Environmental Regulation)	Environmental Protection Authority approval Part IV design capacity: (2 Mtpa)	Not assessed Part IV up to 2 Mtpa design capacity
<i>Rights in Water and Irrigation Act 1914 (WA)</i> (Department of Water and Environmental Regulation)	GWL167439(5) – expire 18/2/2026 CAW167437(1) - CAW169547(1) – CAW170586(1) -	Process plant – 1.095 GL/yr Construct wells Construct wells Construct wells

## Amendment history

Table 4 provides the amendment history for L8469/2010/2.

**Table 4 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 bund on ROM and Premise southern boundary realignment.
L8469/2010/2	03/07/2019	Amendment Notice 6 granted to include SW In-pit TSF.

## Location and receptors

Table 4 lists the relevant sensitive receptors in the vicinity of the primary activity with a location plan enclosed in Figure 12 of this report.

**Table 5: Receptors and distance from prescribed activity**

Residential and sensitive premises	Distance from Prescribed Premises
<i>Farm residence #1</i>	<i>Located 1.850 km north west of process plant and property owned by the Applicant.</i>
<i>Demountable accommodation #2</i>	<i>Located 2.160 km south south east of process plant</i>
<i>Residence #4</i>	<i>Located 3.430 km east of the process plant and property owned by the Applicant.</i>
<i>Farm residence #5</i>	<i>Located 2.215 km north west of process plant</i>
<i>Residence #6</i>	<i>Located 2.560 km south east of process plant.</i>
<i>Accommodation Camp #8</i>	<i>Located 2.620 km south east of process plant.</i>
<i>Farm residence #9</i>	<i>Located 1.975 km south of process plant.</i>
<i>Farm residence #10</i>	<i>Located 2.320 km south west of process plant.</i>
<i>Residential – Township of Ravensthorpe</i>	<i>Located ~ 2.650 km east southeast of process plant.</i>

Table 5 below lists the closest relevant environmental receptors in the vicinity of the prescribed Premises relevant to the proposed amendment.

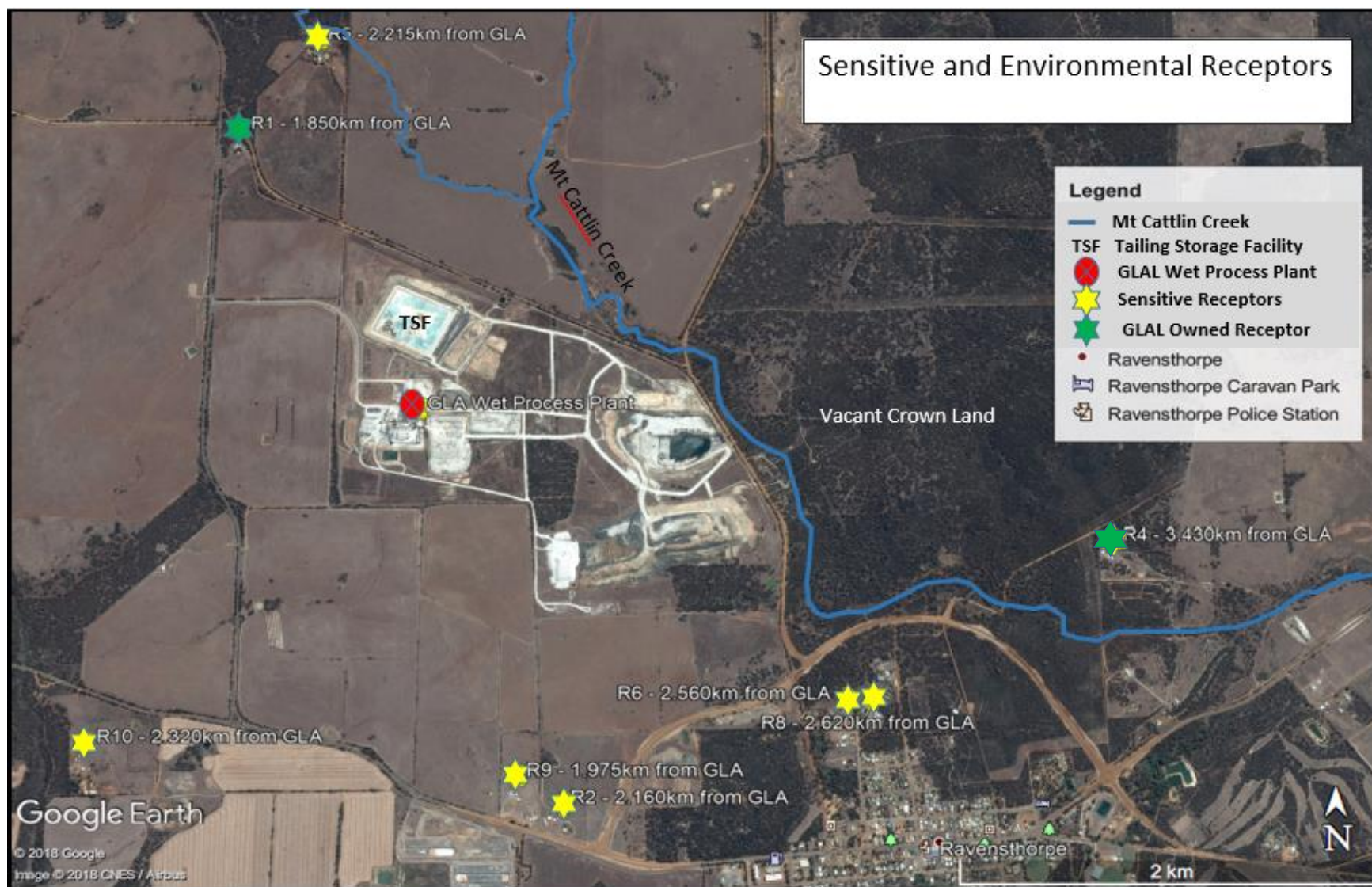
**Table 6: Environmental receptors and distance from activity boundary**

Environmental receptors	Distance from Prescribed Premises
<i>Groundwater Production Bores</i>	<i>There are no other registered groundwater users within 3 km of the Mt Cattlin Spodumene project.</i>
<i>Mt Cattlin Creek</i>	<i>Directly east of prescribed premises</i>
<i>Remnant native vegetation</i>	<i>Directly east of prescribed premises</i>



<i>(Habitat for threatened fauna species)</i>	
<i>Native Title Claims</i>	<i>Ravensthorpe Mt Cattlin Spodumene Project is located in the; Single Noongar Claim (Area 1) – Cth claim Wagyl Kaip – NNTT registered Southern Noongar – NNTT registered</i>
<i>Clearing Regulation – Environmentally Sensitive Areas (ESA's)</i>	<i>Premises is located 5.4 km south and 8.6 km north east of restricted clearing Environmentally Sensitive Area.</i>
<i>Parks and Wildlife managed lands and water</i>	<i>Overshot Nature Reserve located 2 km north north-west of the Mt Cattlin Spodumene project. Vacant Crown Lands located immediately east of the project.</i>
<i>Ecological communities (TEC's and PEC's)</i>	<i>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.</i>
<i>Threatened / Priority Flora</i>	<i>Threatened flora located 4km northeast of the prescribed Premises boundary (eastern boundary). Priority flora located 3.7km south east of the southern boundary.</i>
<i>Threatened / Priority Fauna</i>	<i>Closest Threatened fauna recorded immediately east in the vacant crown lands from the Prescribed Premises boundary.</i>
<b>Designated area</b>	<b>Distance from the Premises</b>
<i>Public Drinking Water Source areas</i>	<i>N/A</i>
<i>RIWI Act 1914 Kondinin-Ravensthorpe Groundwater Area (GWA) Esperance Coastal Hydrographic Catchment</i>	<i>Premises is located partially within the Kondinin-Ravensthorpe Groundwater Area. Project is located within the Esperance Coastal Hydrographic Catchment (boundary of Jerdacuttup River and Phillips River sub-management areas).</i>

Figure 12: Plan indicating location of sensitive and environmental receptors



## Risk Assessment Methodology

The risk assessment following utilizes the risk rating matrix as shown in Table 6, recently updated in accord with DER's *Guidance Statement: Risk Assessments (February 2017)*. The risk criteria used in the matrix below is further defined in Table 7 and 8 below.

**Table 7 Risk Rating Matrix**

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 8 following:

**Table 8: Risk criteria definitions (taken from DER's Guidance Statement: Risk Assessments)**

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> <li>onsite impacts: catastrophic</li> <li>offsite impacts local scale: high level or above</li> <li>offsite impacts wider scale: mid-level or above</li> <li>Mid to long-term or permanent impact to an area of high conservation value or special significance^</li> <li>Specific Consequence Criteria (for environment) are significantly exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Loss of life</li> <li>Adverse health effects: high level or ongoing medical treatment</li> <li>Specific Consequence Criteria (for public health) are significantly exceeded</li> <li>Local scale impacts: permanent loss of amenity</li> </ul>
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> <li>onsite impacts: high level</li> <li>offsite impacts local scale: mid-level</li> <li>offsite impacts wider scale: low level</li> <li>Short-term impact to an area of high conservation value or special significance^</li> <li>Specific Consequence Criteria (for environment) are exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Adverse health effects: mid-level or frequent medical treatment</li> <li>Specific Consequence Criteria (for public health) are exceeded</li> <li>Local scale impacts: high level impact to amenity</li> </ul>
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> <li>onsite impacts: mid-level</li> <li>offsite impacts local scale: low level</li> <li>offsite impacts wider scale: minimal</li> <li>Specific Consequence Criteria (for environment) are at risk of not being met</li> </ul>	<ul style="list-style-type: none"> <li>Adverse health effects: low level or occasional medical treatment</li> <li>Specific Consequence Criteria (for public health) are at risk of not being met</li> <li>Local scale impacts: mid-level impact to amenity</li> </ul>

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
		Environment	Public health* and amenity (such as air and water quality, noise, and odour)	
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> <li>• <b>onsite impacts:</b> catastrophic</li> <li>• <b>offsite impacts local scale:</b> high level or above</li> <li>• <b>offsite impacts wider scale:</b> mid-level or above</li> <li>• Mid to long-term or permanent impact to an area of high conservation value or special significance<sup>^</sup></li> <li>• Specific Consequence Criteria (for environment) are significantly exceeded</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of life</li> <li>• <b>Adverse health effects:</b> high level or ongoing medical treatment</li> <li>• Specific Consequence Criteria (for public health) are significantly exceeded</li> <li>• <b>Local scale impacts:</b> permanent loss of amenity</li> </ul>
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> <li>• <b>onsite impacts:</b> low level</li> <li>• <b>offsite impacts local scale:</b> minimal</li> <li>• <b>offsite impacts wider scale:</b> not detectable</li> <li>• Specific Consequence Criteria (for environment) likely to be met</li> </ul>	<ul style="list-style-type: none"> <li>• Specific Consequence Criteria (for public health) are likely to be met</li> <li>• <b>Local scale impacts:</b> low level impact to amenity</li> </ul>
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> <li>• <b>onsite impact:</b> minimal</li> <li>• Specific Consequence Criteria (for environment) met</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Local scale:</b> minimal to amenity</li> <li>• Specific Consequence Criteria (for public health) met</li> </ul>

<sup>^</sup> Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

\* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

"onsite" means within the Prescribed Premises boundary.

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 9 below:

**Table 9: Risk treatment table**

Rating of Risk Event	Acceptability	Treatment
<b>Extreme</b>	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
<b>High</b>	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
<b>Medium</b>	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
<b>Low</b>	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

## Risk assessment

Table 10 and 11 below describes the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. This table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

**Table 10: Risk assessment for proposed amendments during construction**

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
<b>Cat 5</b> Processing or beneficiation of metallic or non-metallic ore	Construction of SW In-pit Tails deposition Pipelines, Decant water pipes, 'V' drains, In-pit Decant Structures, underdrainage system, 5 monitoring bores and vehicle movements.	<b>Dust:</b> Release of particulate matter from construction activities including earthworks, vehicle movements and civil works.	<b>Nearby Residents:</b> Located greater than 1.8 km north west from SW Pit.	<b>Air:</b> Wind dispersion	Health and amenity impacts	Slight	Possible	Low	Dust generated during construction will be managed in accordance with latest version of Airborne Material Management Plan (AMMP) 2018 conditioned by the licence (2.1.1 & 2.1.2) that includes a stop activity clause during inclement weather conditions.
		<b>Local Flora species</b> Located greater than 1km east of SW Pit.	Impact to native vegetation health		Slight	Possible	Low	Water trucks will be utilized during construction activities plus speed limits imposed to reduce dust generation by vehicles and construction machinery on internal mine site roads and SW Pit area.  The general provisions of the EP Act will apply during construction activities.  The overall risk rating of construction dust impacting residence and local flora is assessed as "low" because dust generated during construction will be short term and sufficient distance from receptors.	
		<b>Noise:</b> Noise associated with equipment and machinery plus vehicles use during construction	<b>Nearby Residents:</b> Located greater than 1.8 km north west from SW Pit.	<b>Air:</b> Wind dispersion	Health and amenity impacts	Slight	Possible	Low	Noise generated during construction activities is expected to comply with the provisions of the Environmental Protection (Noise) Regulations 1997 (WA).  Controls imposed by the Licence Holder during construction will be implemented as described in the latest version of the Operational Noise Management Plan (ONMP) 2018.  The SW Pit underdrainage system, decant structures, "V" drains, pipelines and monitoring bore construction will take very short timeframes to construct.  New condition for a Compliance Report requiring the construction of In-pit TSF infrastructure.

**Table 11: Risk assessment for proposed amendment during commissioning and operation**

Risk Event					Consequence rating	Likely-hood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
Category 5 Processing or beneficiation of metallic or non-metallic ore	In-pit TSF	<b>Storm water runoff</b>	<b>Surface water and vegetation:</b> In-pit TSF is bunded to divert storm water away from tailings. Mt Cattlin Creek is located greater than 640 metres from SW Pit. Vegetation stands located on northern and southern edge of SW Pit at RL 255 m.	<b>Water:</b> Overland flow through the mine operations collecting sediments and particulates	Impacts of uncontaminated storm water on surrounding environment, surface water and vegetation	Moderate	Possible	Medium	Surface water management plan received by DWER and will be reviewed to ensure uncontaminated storm water diverted away from SW Pit and treated in detention basins to drop out sediments and particulates prior to discharge.  Conditions to ensure SW pit is bunded to divert storm water away from pit and collected in detention basins to remove sediment and particulates.
	In-pit TSF	<b>Storm water in pit</b>	<b>Groundwater:</b> Leachate in-pit	<b>Water</b>	Rainfall in-pit mixes with Tailings leachate. Most is recovered back to the process plant. Some mixing (dilution) with tailings seepage.	Slight	Rare	Low	Storm water received in the pit will be assessed with Tailings deposition
	Tailings deposition	<b>Waste:</b> Tailings leachate/seepage	<b>Groundwater:</b> Fractured Rock Aquifer located ~20 mbgl at RL 235m. Groundwater quality is saline to hypersaline (greater ~ 36,000 uS/cm to 49,000 uS/cm from previous	<b>Land:</b> Infiltration through the pit walls, floor into the soil profile and groundwater	Contamination of aquifer with metals and metalloids. Groundwater mounding or lateral seepage with negative impacts on roots of vegetation. Proposed storage from RL	Slight	Possible	Low	Groundwater quality is saline and unacceptable for domestic and livestock uses. Tailings leachate recovery will recycle water back to the raw water dam for reuse in the process plant.  The proposed in-pit TSF leachate recovery system and decant structures will require new licence conditions to be implemented by the Licence Holder.  The existing Licence conditions 3.4.1 and table 3.8.1 will be amended to include operation of 4 new monitoring bores with a Standing Water Level (SWL) limit of greater than 12 metres below ground level

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
			<i>annual reports on groundwater near existing above ground TSF).</i>					<i>(mbgl) for the new in-pit TSF monitoring bores. New condition will require monitoring of new bores to establish baseline water quality prior to tailings deposition. The water quality parameters of condition 3.4.1 and table 3.8.1 and monitoring frequency of 2 monthly will ensure groundwater quality monitoring is gathered to establish leachate water quality for SW Pit. Vegetation monitoring will be expanded to include the vegetation stands directly north and south of SW Pit.</i>	
		<b>Waste:</b> <i>Release of tailings or tailings decant process water (return water) due to pipeline failure</i>	<b>Terrestrial ecosystems:</b> <i>local soils, vegetation and surface water</i>	<b>Land:</b> <i>Direct discharge from pipeline failure</i>	<i>Contamination of soil, vegetation, and surface water with salt, metals or metalloids.</i>	<i>Moderate</i>	<i>Unlikely</i>	<i>Medium</i>	<i>The Licence Holder has committed to the following controls for all pipelines at GLAL operations;</i> <ul style="list-style-type: none"> <li><i>• Secondary containment to collect spills</i></li> <li><i>• Pressure sensors along pipelines.</i></li> <li><i>• Isolation valves installed at discharge pumps and return water pumps;</i></li> <li><i>• Telemetry system to alert plant personal of any ruptures, failures or leaks;</i></li> <li><i>• Daily inspections of pipelines will be conducted during operations.</i></li> </ul> <i>Existing Licence condition 1.2.11 manages pipelines at GLAL along with conditions 5.2.1 adequately controlling the reporting of environmental incidents, failures or malfunctions that occur during the annual reporting period.</i>
	<i>Overtopping of In-pit TSF</i>	<b>Waste:</b> <i>Uncontrolled release of tailings/ decant water</i>	<b>Terrestrial ecosystems:</b> <i>local soils, vegetation and surface water</i>	<b>Land:</b> <i>Direct discharge from overtopping of in-pit TSF</i>	<i>Contamination of surrounding soils with metals and metalloids, affecting soil and vegetation</i>	<i>Slight</i>	<i>Rare</i>	<i>Low</i>	<i>The overall risk rated is "low" based upon the commitment by GLAL not to exceed tailing deposition past RL 250 m. The SW pit depth is from RL 255 m (ground level) to RL 207.5m. A new condition will establish the maximum level that tailings will be deposited to be RL 250 m. Existing licence condition 1.2.6 requiring 300 mm freeboard during operations for the above ground TSF. This will be amended to include the deposition of tailings into the SW pit shall not exceed RL 250 m. Existing condition 3.3.1 Table 3.7.1 will be amended to ensure routine inspection of the in-pit TSF.</i>

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
	<i>TSF deposition and storage of tailings and decant water</i>	<b>Waste:</b> <i>Tailings and decant pond</i>	<b>Local fauna</b> <i>Birds and other Wildlife</i>	<b>Land:</b> <i>Direct ingestion (birds or fauna drinking the water)</i>  <i>Entrapment / death of fauna in the in-pit tailings</i>	<i>Moderate</i>	<i>Possible</i>	<b>Medium</b>	<p><i>The tailings decant water in the in-pit TSF and water storage facilities is saline, similar to seawater and is unattractive to local fauna for drinking purposes.</i></p> <p><i>The risk is reduced given that there is surface water at lower salinity in the area available for birds and fauna.</i></p> <p><i>The Licence Holder controls include;</i></p> <ul style="list-style-type: none"> <li><i>• Recycling TSF decant water back into the process water circuit;</i></li> <li><i>• Management of dams to maintain structural integrity with reduce supernatant pond sizes;</i></li> <li><i>• Maintaining fauna egress at the in-pit TSF, TSF, raw water and turkey nest dams (to allow fauna to escape).</i></li> </ul> <p><i>Existing licence condition 3.3.1 and Table 3.7.1 will be amended to include management controls to reduce risk to fauna of GLAL's in-pit TSF containment structures.</i></p>



## Decision

The potential emissions associated with the SW In-pit TSF during construction of in-pit underdrainage system, decant structures, 'V' drains, pipelines and monitoring bores are;

- Fugitive dust and nuisance noise during construction activities;
- Contaminated stormwater and waste generated from the commissioning and operation of the SW In-pit TSF;

The DWER has considered the overall risk of the emissions upon local receptors together with GLAL proposed management controls and determined the proposed amendment will not result in emissions which are unacceptable to public health or the environment and therefore grants the Licence amendment to complete construction of SW In-pit TSF plus administrative changes to the redundant conditions and renumbering or realignment of licence conditions.

The Licence is amended by;

- New condition 1.2.21 is an administrative condition explaining the infrastructure that will be constructed at the SW In-pit TSF plus new Condition 5.1.11 requiring compliance reporting once construction has been completed.
- Include new condition 1.2.22 to ensure baseline water quality monitoring is completed following the construction of MB9, MB10, MB11 and MB12.
- Amended Licence conditions 3.2.1 Table 3.7.1, 3.4.1 Table 3.8.1 to reference the SW In-pit TSF freeboard defined plus the pit bunds to divert storm water away from the SW Pit and describe the baseline water quality monitoring required for the new monitoring bores MB9, MB10, MB11 and MB12.
- Remove redundant conditions Improvement Condition 4.1.1, IR2 and IR3 from Amendment Notice 4 issued on 25 January 2019.
- Include plans of Infrastructure in Schedule 2 of Amendment Notice 6.

Changes to the Licence have been made in accordance with DWER administrative changes including the name, logo and contacts for the Department and redefining terms in the licence.

DWER determined the GLAL Premises risk remains unchanged following the completion of the infrastructure required to operate the SW In-pit TSF.

## Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 19 June and 28 June 2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

## Amendment

1. New conditions 1.2.21, 1.2.22 & in red text are administrative condition explaining what will be constructed at the SW pit plus describes what construction needs to be certified and a compliance certificate submitted to the CEO following commissioning and construction.
-

- 1.2.21 The License Holder must complete construction of SW pit infrastructure in accordance with the documentation listed in Table 1.2.18 and in the location depicted in Schedule 2 titled “SW In-pit TSF infrastructure”.

Document	Parts	Date of Document
Advisian - Worley Parsons Group – Report for Galaxy Lithium Australia Limited dated 20 June document reference 201012-00739- SS-REP-0001	Attachment 3A	June 2019
9. In Pit Deposition Design and Strategy	Section 9	
<u>Key Infrastructure</u>		
Underdrainage system	Section 9	June 2019
Water recovery system	Section 9	
Decant structures	Section 9	
V' drain and pipeline design	Section 9	
Monitoring Bores	Section 11.1	
Vibrating wire piezometer	Section 11.1	
<u>Appendix A – Drawings</u>		
201012-00739-CI-DSK-0003	Pg 32	June 2019
201012-00739-CI-DSK-0004	Pg 33	June 2019
201012-00739-CI-DSK-0005	Pg 34	June 2019
201012-00739-CI-DSK-0006	Pg 35	June 2019

- 1.2.22 The Licence Holder must ensure baseline water quality monitoring is completed 1 month following construction of monitoring Bores MB9, MB10, MB11 and MB12 in accordance with the specifications in accordance with Table 3.8.1 and prior to tailings deposition commencing.

- 5.1.11 The licence holder must within 30 days of each item of infrastructure required by condition 1.2.21 and table 1.2.18 being constructed:
- undertake an audit of their compliance with the requirements of condition 1.2.21; and
  - prepare and submit to the CEO an audit report of that compliance.
  - be signed by a person authorised to represent the licence holder and contains the printed name and position of that person within the company

2. Amended Licence conditions 3.2.1 Table 3.7.1, 3.4.1 Table 3.8.1 to reference the SW In-pit TSF and pit bunds to divert storm water away from the SW Pit.

### 3.2 Process monitoring

- 3.2.1 The Licensee shall undertake the monitoring in Table 3.7.1 according to the specifications in that table.

Monitoring point reference	Process description	Parameter	Units	Frequency	Method
Catchment Dam	Water storage	Distance between the water level and the top of retaining banks or structures at their lowest point	mm	(i) Daily when ore is being crushed, processed or beneficiated through the Processing Plant; and (ii) Weekly when ore is not being crushed,	Visual inspection
Raw Water Pond					
Dust Suppression Dam					

				processed or beneficiated through the Processing Plant.	
SW In-pit Tailings Storage Facility	Deposition and storage of tailings and water decant	tailings delivery lines;	-	(i) Daily when tailings deposition into the tailings storage facility is occurring; and (ii) Weekly when tailings deposition into the tailings storage facility is not occurring.	Visual inspection
		tailings free water recovery lines;			
		the trafficability to access roads and ramps;			
		embankment integrity (including checks for seepage);			
		embankment stability;			
		the operating condition of spigot points;			
		the rotation of spigotting areas;			
		the size of free water pond;			
		the position of free water pond;			
		the operational freeboard shall be at least 2 metres from lowest part of SW Pit crest,			
		any deceased fauna in the vicinity of tailings storage areas; and, SW In-pit TSF perimeter bund must divert stormwater away from the pit.			

### 3.4 Ambient environmental quality monitoring

3.4.1 The Licensee shall undertake the monitoring in Tables 3.8.1 according to the specifications in that table and record and investigate results that do not meet any limits specified.

Table 3.8.1: Monitoring of ambient groundwater quality						
Monitoring point reference and location as depicted in the Premises Map in Schedule 1	Parameter	Limit	Units	Averaging period	Frequency	
MB01, MB02, MB03, MB04, MB05 and MB06, MB09, MB10, MB11 and MB12	Standing water level	> 3	m(BGL)	Spot sample	(i) Monthly; and (ii) Daily when levels exceed the limit.	
		-	M(AHD)			
	pH <sup>1</sup>	-			(i) Four times per year (in November, February, May and	
	Electrical conductivity <sup>1</sup>		µS/cm			
	Total Dissolved		mg/L			

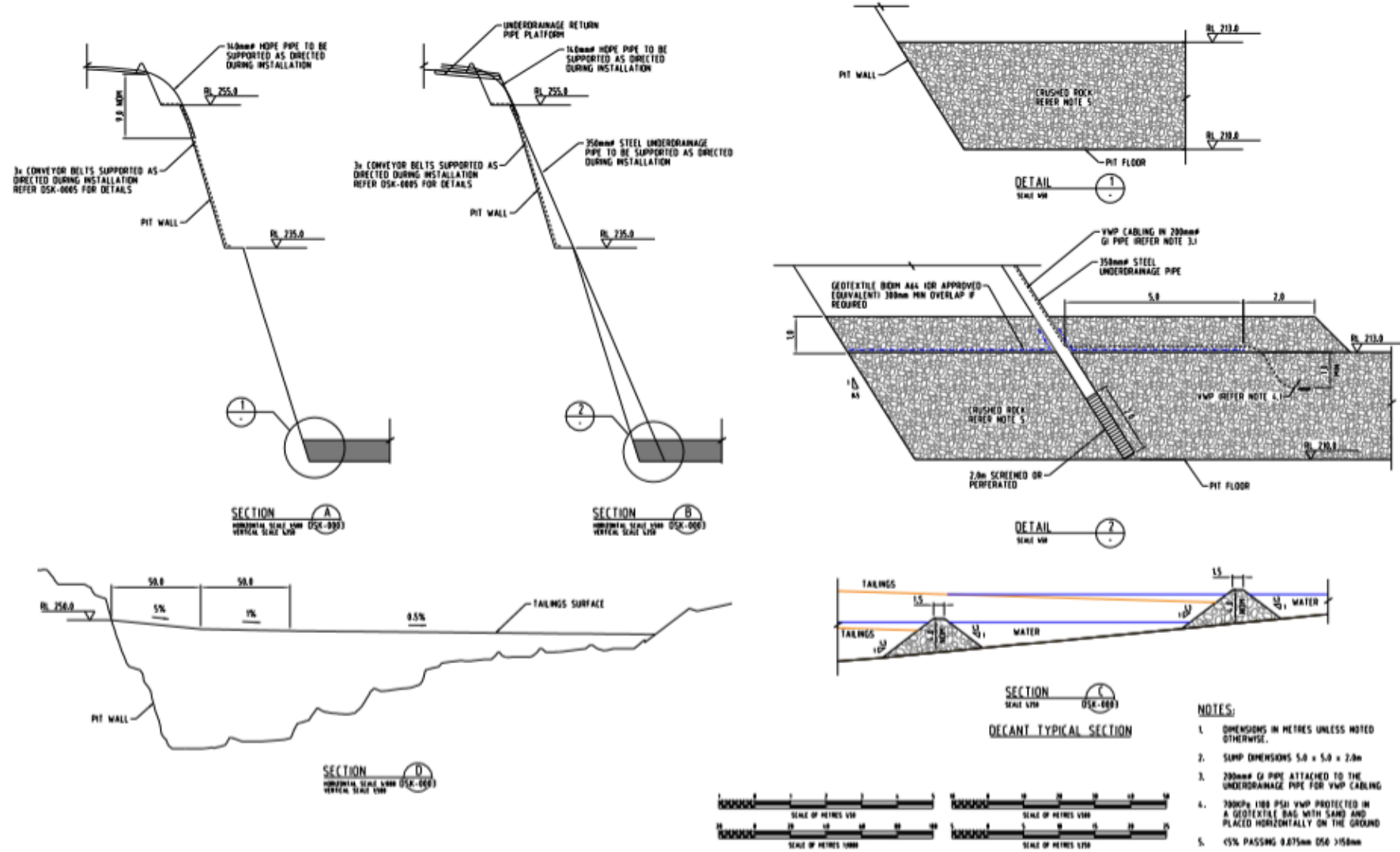
	Solids (TDS)				August) when tailings deposition into the tailings storage facility is occurring; and (ii) Three times per year (in October, February and June) when tailings deposition into the tailings storage facility is not occurring (iii) <b>Prior to deposition of tailings and following construction of monitoring bores MB9, MB10, MB11 and MB12, they will be sampled to establish baseline water quality then resume monitoring at frequency (i) or (ii) with SWL monitored monthly as tailings are deposited.</b>
	Sodium				
	Calcium				
	Potassium				
	Magnesium				
	Sulphate				
	Chloride				
	<b>Fluoride</b>				
	Aluminium				
	Arsenic				
	Cadmium				
	Cobalt				
	Chromium				
	Copper				
	Iron				
	Manganese				
	<b>Nickel</b>				
	Lead				
	Zinc				
	Barium				
	<b>Boron</b>				
	Chromium (III)				
	Mercury				
	<b>Molybdenum</b>				
	Antimony				
	Selenium				
	Tin				
	Vanadium				
	Uranium				
	Silicon				
	Calcium Carbonate				
	Total Nitrogen				
	Total Phosphate				
	<b>Lithium</b>				
	<b>Caesium</b>				
	<b>Rubidium</b>				
	Thallium				
	Bromide				
	Gross-alpha	-	Bq/L		
	Gross-beta				

Note 1: In-field non-NATA accredited analysis permitted.

3. Remove redundant Improvement Condition 4.1.1, IR2 and IR3 from Amendment Notice 4 issued on 25 January 2019.
4. Schedule 2 plans referenced by new licence condition 1.2.21 Table 1.2.18.

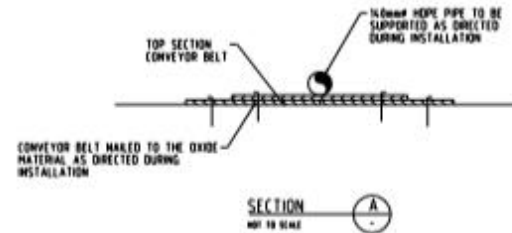
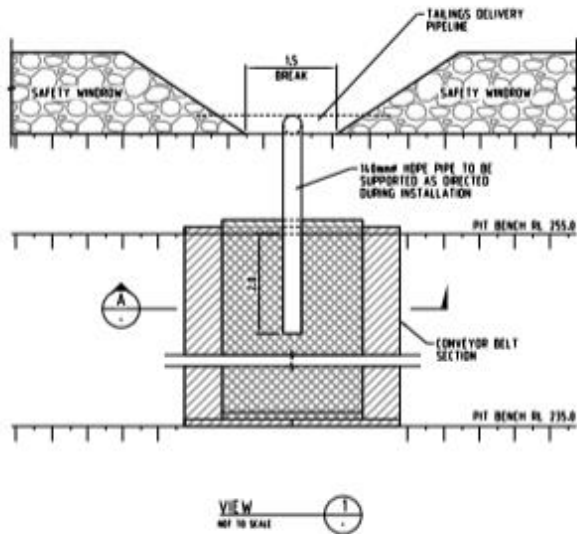
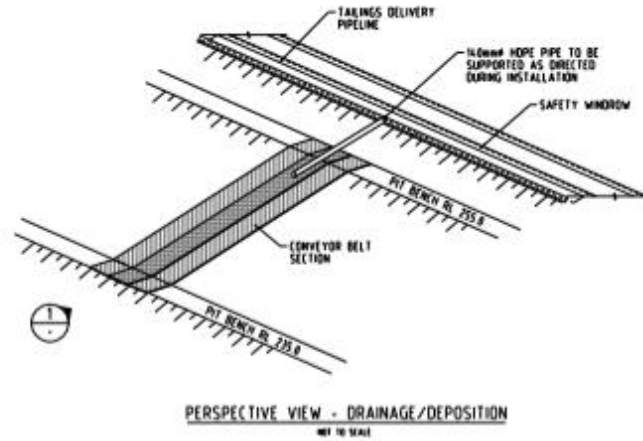
## Schedule 2

Plan 2010-00739-CL-DSK-0004 – SW Pit Tailing Storage Typical section sheet 1 of 2

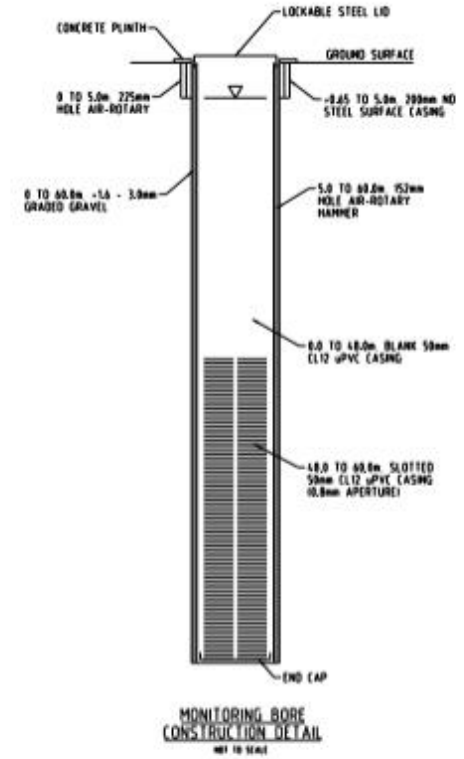


## Schedule 2

Plan 2010-00739-CL-DSK-0005 – SW Pit Tailing Storage Typical section sheet 2 of 2



NOTE: BASE COMPRISES TWO CONVEYOR BELT SECTIONS (ABUTTED PLACED AGAINST THE PIT WALL).  
TOP SECTION TO BE PLACED CENTRALLY OVER ABUTTING EDGES ON BASE SECTION

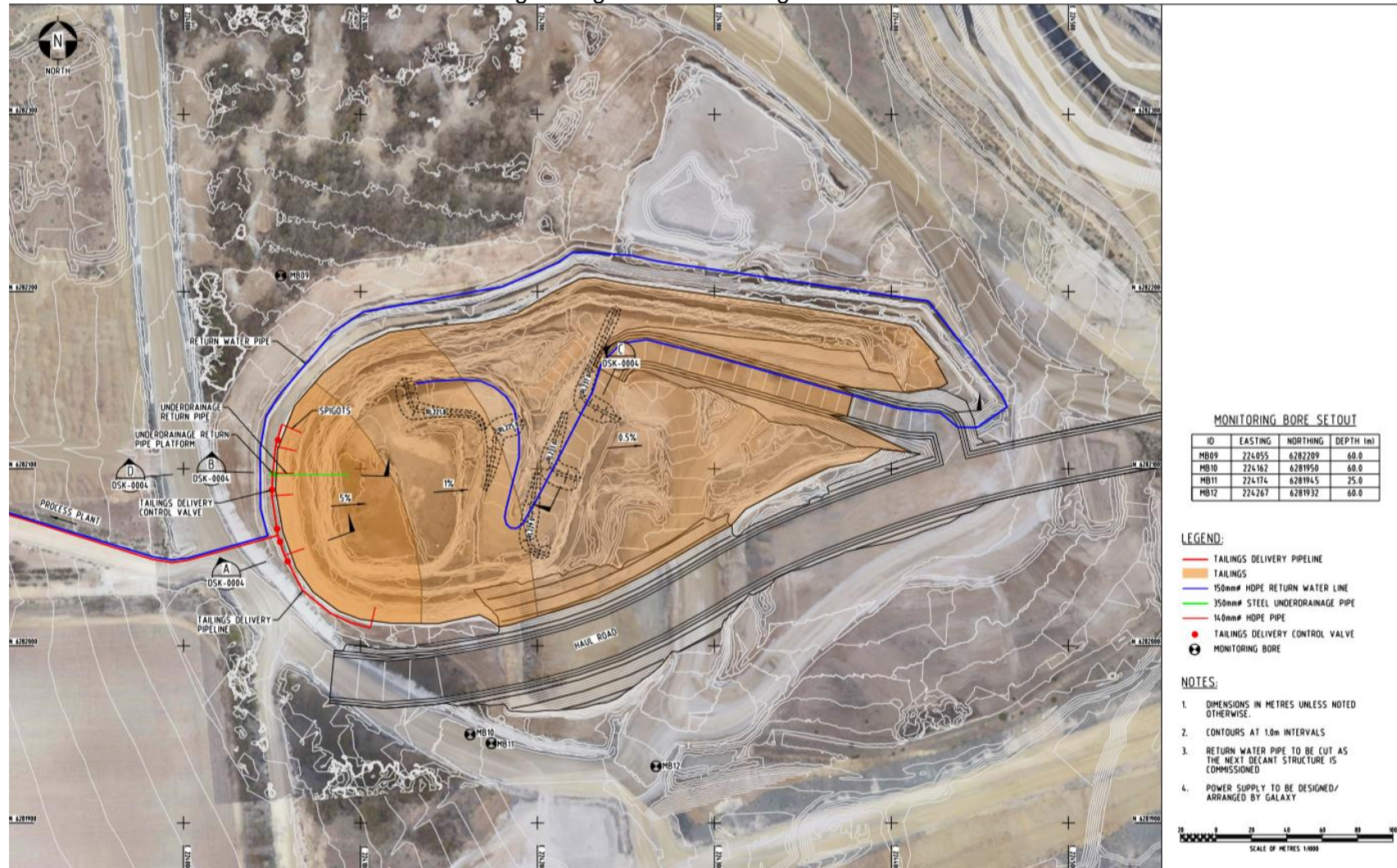


### NOTES:

1. DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.

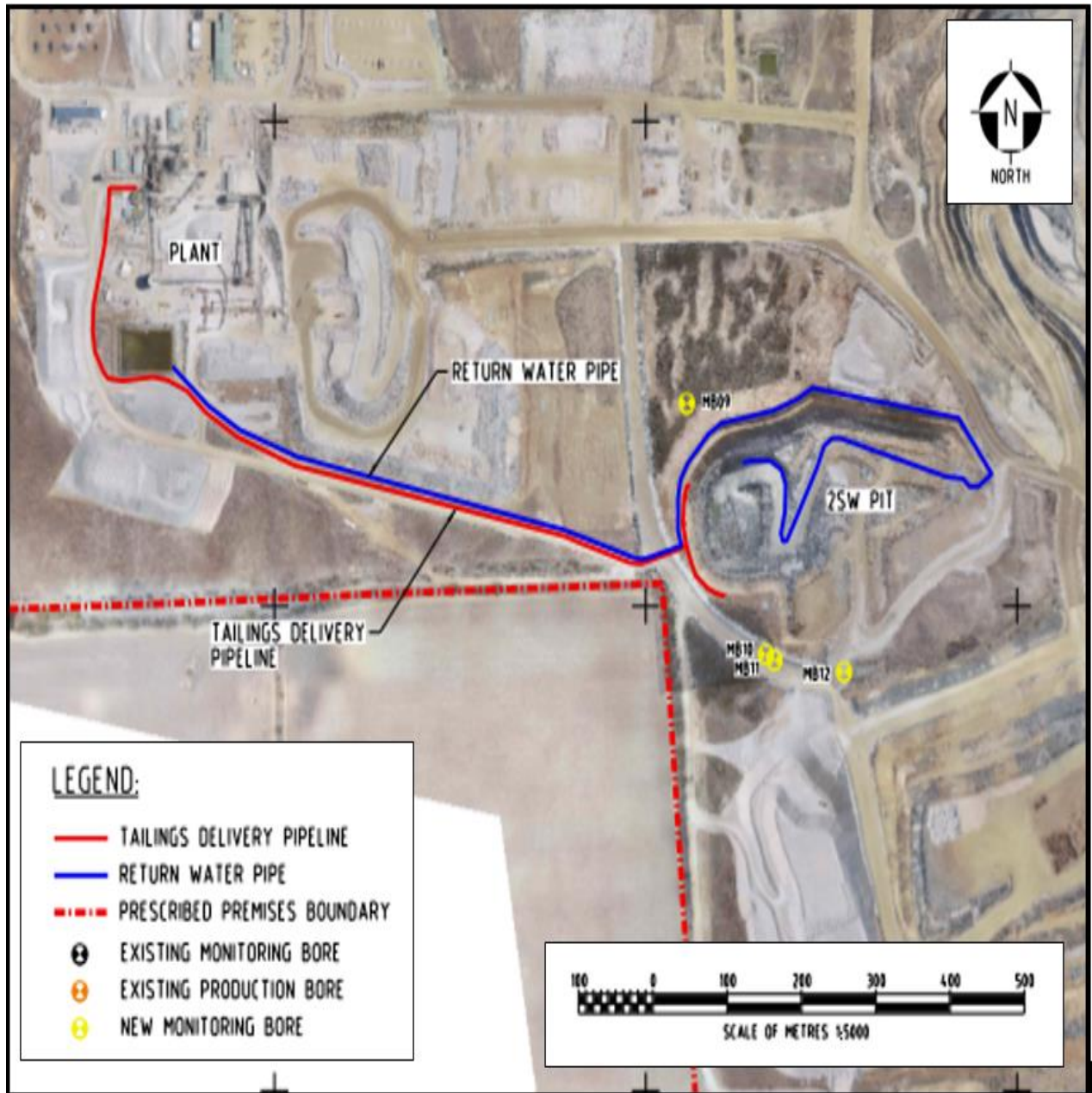
## Schedule 2

### Plan 2010-00739-CL-DSK-0003 – SW Pit Tailing Storage General Arrangement



## Schedule 2

Location of SW Pit Monitoring bores





## Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8469/2010/2 – Ravensthorpe Spodumene Project issued 3 October 2013 and amended 2 June 2016	L8469/2010/2	accessed at <a href="https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences">https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences</a>
2	Works Approval W4533/2009/1 – Ravensthorpe Spodumene Project amended 24 May 2012	W4533/2009/1	accessed at <a href="https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences">https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences</a>
3	Application for amendment of Licence L8469/2010/2 dated 20 March 2019	Application	DWER records A1773797
4	Supporting documentation to the application to amend Licence L8469/2010/2 dated 20 March 2019 Attachments 2, 3A, 6A & 7	Supporting documents	DWER records A1773799, A1773800 & A1773801
5	Advisian - Worley Parsons Group – Report for Galaxy Lithium Australia Limited dated 20 June document reference 201012-00739- SS-REP-0001	Supporting document	DWER record A1802438
6	Galaxy Lithium Australia Limited – Operational Noise Management Plan – 17 August 2018 – revision 5	ONMP	DWER record A1737713
7	Galaxy Airborne Material Management Plan (2010) revised September 2017, amended 20 August 2018 – reference GLA-MTC-AMMP-Rev 2.0-0917.	AMMP	DWER record A1737711
8	Amendment Notice 2 issued 27 March 2018, Amendment Notice 3 issued 20 June 2018, Amendment Notice 4 issued 25 January 2019, and, Amendment Notice 5 issued 4 April 2019 to Galaxy Lithium Australia Limited.	Amendment Notice 2, 3, 4 & 5	accessed at <a href="https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences">https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences</a>
9	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	DER 2015a	accessed at <a href="https://www.der.wa.gov.au/our-work/regulatory-framework">https://www.der.wa.gov.au/our-work/regulatory-framework</a>
10	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	DER 2015b	
11	DER, November 2016. <i>Guidance Statement: Environmental Siting</i> . Department of Environment Regulation, Perth.	DER 2016a	
12	DER, February 2017. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2017a	
13	DER, February 2017. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2017b	

## Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 18 June and 28 June 2019 for review and comment. The Licence Holder responded on 20 June and 2 July 2019 respectively with the following comments about the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
SW Pit tailing deposition capacity (Pg 4)	Capacity of SW Pit will be to RL 255 m with tailings deposition to RL 250 m being 15 metres above the fractured rock aquifer at RL 235 m.	Approval for SW Pit to have tailings deposited to RL 250 m initially with minimal groundwater impacts caused by tails deposition above the Fractured rock aquifer.
Update Figure 3 and 4 (Pg 6)	Update Figures to reflect the tailing deposition in SW Pit to RL 250 m.	Agreed and Figures updated
Typical leachate concentrations of metals and metalloids (Pg 8)	Generic Statement about lithium mines but should be specific details provided by Mt Cattlin mining conditions	Agreed that a statement be included as well as the existing TSF leachate and metalloid concentrations see section titled "Leachate quality" and table 3.
Extra monitoring bore MB12 (Pg 10)	Remove requirement for fifth monitoring bore near southern ephemeral watercourse.	Agreed that there is sufficient groundwater monitoring network with new bores MB9, MB10, MB11 and MB12 being constructed.
SW Pit underdrainage system (Pg 11)	The underdrainage system design was described in more detail following a redesign of this system	Accepted and description updated.
Update Figure 10 (Pg 11)	Updated Figure 10 showing the design of the SW pit underdrainage system	Agreed and figure updated
Table 3 update (Pg13)	Mining Act 1978 approval Id 79096 including WRL extension, COS, In-pit Tailings deposition updated in Table 3	The Mining Act approval No.79096 was provided by Applicant.
1.2.22 (Pg 24)	Remove RL 245 m from condition and replace with "300 mm from the pit crest" is appropriate enabling life of mine extra tailings deposition capacity into SW Pit, reducing future amendments and consistent with existing freeboard condition.	Approval for SW Pit to have tailings deposited to RL 250 m with freeboard of 2 metres below lowest crest level.
Schedule 2 Maps (Pg 27 to 30)	Update all Schedule 2 plans to reflect the redesign of infrastructure at the SW Pit.	Agreed that schedule 2 plans be updated.
Reference supporting document	Supporting Document titled Advisian - Worley Parsons Group – Report for Galaxy Lithium Australia Limited dated 20 June document reference 201012-00739- SS-REP-0001	The Advisian Report dated 20 June 2019 was provided by Applicant to support condition 1.2.21.
Relative Level (RL)	Clarification provided explaining the RL's to which mining approval was granted for in-pit tailing deposition.	Agreed and RL's throughout Licence Amendment have been updated.