Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L9037/2017/1
Licence Holder	Process Minerals International Ltd
ACN	063 988 894
File Number	DER2017/000308-1
Premises	Mount Marion Lithium Project Shire of Coolgardie Mining tenements M15/1000, M15/717 and on private land known as Hamptons Lease Area 53, portion of Lot 105 on Deposited Plan 40396, Volume 2668 Folio 420. As defined by the Premises maps attached to the Revised Licence
Date of Report	19/12/2023
Decision	Revised licence granted

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A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L9037/2017/1 is held by Process Minerals International Ltd (Licence Holder) for the Mount Marion Lithium Project (the Premises), located at Mining tenements M15/1000, M15/717 and on private land known as Hamptons Lease Area 53, portion of Lot 105 on Deposited Plan 40396, Volume 2668 Folio 420, Shire of Coolgardie.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L9037/2017/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 9 June 2023, the Licence Holder submitted an application to the department to amend Licence L9037/2017/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

1. An increase in approved throughput for the following categories:
   a. Category 5: from 3.5 Million tonnes per annum (Mtpa) to 5 Mtpa
   b. Category 12: from 100,000 tonnes per annum (tpa) to 200,000 tpa
   c. Category 73: 554 kiloliters (kL) diesel to 854 kL
2. Updating of conditions to reflect constructed infrastructure and changes in operation.

Table 1 below outlines the proposed changes to the existing Licence

Table 1: Proposed changes

Category	Current design/throughput capacity	Proposed design/throughput capacity	Description of proposed amendment
5 Processing or beneficiation of metallic or non-metallic ore	3.0 million tonnes per year	5.0 Million tonnes per year	Use of new and existing mobile crushing and screening plants in conjunction with new ore sorting modules to increase the throughput of material to the processing plant from low grade ore stockpiles. Increase in Coarse reject (tailings) material being discharged to waste rock dumps
6 Mine dewatering	650,000 tonnes (0.65 gigalitres) per year	No change to throughput	Changes in the pipeline routes and discharge points to send dewatering effluent to turkeys

			nests and allowance to use the dewater for dust suppression. Discharge of dewatering effluent into Ghost Crab in-pit TSF Discharge of RO Brine into Ghost Crab in-pit TSF
12 Screening etc. of material	100,000 tonnes per year	200,000 tonnes per year	Increase the approved throughput of existing mobile crushing and screening infrastructure to provide construction materials for road base etc. No construction required.
64 Class II putrescible landfill	2,000 tonnes per year	No change to throughput	Removal of landfill fence condition as per previous communication from DWER. The position of the landfill in the waste rock dump makes a fenceline unnecessary and bund to control windblown waste is to be used instead.
			Used tyres and rubber currently approved for disposal within mining waste dump on M15/1000 only. Licence holder is requesting approval to dispose of used tyres and rubber within all waste rock landforms on the premises.
73 Bulk storage of chemicals etc.	480 kL LNG 554 kL Diesel	480kL LNG 854kL Diesel	Operation of 3 additional diesel fuel tanks installed at fuel bay. The installation of these tanks has already taken place and only the operation will be assessed in this report.
85 Sewage facility	90 m^3/day	No change to throughput	Request to remove parameter limits on discharges to the irrigation field. Request to remove construction requirements for the WWTP

2.3 Water management (Category 6)

2.2.1 Previous risk assessments of dewatering and RO brine discharge

In 2019 an application to amend the licence L9037/2017/1 was received that included amendments to:

- Remove the discharge of RO brine from the reverse osmosis plant to Ghost Crab In-Pit TSF and construct pipelines to allow for the brine to be discharged to the northern and

central pits. This was due to the applicants concern that the RO brine would reduce the quality of the decant water from the Ghost Crab In-Pit TSF such that it would reduce the effectiveness of the RO plant in treating the decant for re-use in the beneficiation plant.

- Construct pipelines to allow for dewatering of the central and northern pits and discharge to whichever of these pits was not being mined and was available to receive water.

The risk assessment attached to the 2019 amendment assessed the construction of the pipelines to allow dewatering and the transport of RO brine as well as the potential impacts from the discharge to pits and the proposed use of the water for dust suppression at the premises.

The assessment found that the environmental risks from construction was low but the discharge to the pits of both RO brine and dewatering held a medium risk of groundwater mounding inundating the root zone of surrounding vegetation and the potential of contamination of soil by radioactive elements spreading to vegetation and fauna as high.

The risk of groundwater mounding as a result of discharge to the pits was managed by conditioning that the minimum vertical freeboard of 6 metres must be maintained below the lowest crest level at all times.

2.2.2 RO Brine and dewatering effluent discharge into Ghost Crab In-Pit TSF under this amendment

As detailed above the Ghost Crab In-Pit TSF was removed from the licence as a discharge point for the RO brine. It has become apparent however, with the application for this amendment, that the discharge to Ghost Crab In-Pit TSF has continued and the pipelines to the northern and central pits never constructed. It has also been incorrectly assumed by the licence holder that discharge of the dewatering effluent to Ghost Crab In-Pit TSF was assessed when there was an assessment for this discharge of dewatering effluent to other pits on the premises in 2019. This was not the case and therefore the discharge of dewatering effluent and RO Brine to the Ghost Crab in-pit TSF has been assessed as part of *this* amendment.

2.2.3 Proposed water management under this application

Interim water management

A pipeline is proposed to be run from the Process Water Turkeys Nest containing the water from the production bores (groundwater raw water) to the mining turkeys nest. This water has not been treated by the reverse osmosis plant and will be used for dust suppression within the interior processing and mining areas. It will be spread by watercarts. Phase 1 in Table 2 below is the interim water management proposed.

The current water balance for the premises is provided in Figure 1 shows the direction of the borefield water as only directed to the RO plant.

Future water management

The future water management actions, after the interim proposed action, are listed as Phase 2 – Phase 4 in Table 2 below. The construction of pipelines to carry out the water management for each stage is proposed under this application. It is noted that the estimated timing included in Table 2 is not in keeping with the timeframes of the application but is accepted by the delegated officer as an indication of development stages in water management on the premises.

Stage 2: Potable water is provided from the scheme water connection on the premises. As part of Stage 2, staging tanks will be constructed for storing the potable water for use in the

washdown bays, the fire suppression systems and the dust suppression of roads external to the processing and mining operational areas.

Stage 3: Water truck refill points will be established for the water processed by the Reverse Osmosis Plant (treated water) to be used for dust suppression on roads external to the processing and mining operational areas and the existing wash down pads. This will replace the potable scheme water used at these points to date.

Stage 4: Dewater from active mine pits (northern and central pits) will be piped to the beneficiation plant. It is also proposed that a portion of the dewater is redirected to the Ghost Crab In-Pit TSF, this amount would be approximately 16,000kL/year.

As mentioned above in 2019 the discharge of dewatering effluent into the northern or central pits (and for use in the beneficiation plant) have already been assessed by the department. Therefore, this will not be re-assessed as part of this amendment. The proposal to discharge dewatering effluent to Ghost Crab in-pit TSF has not previously been assessed and has therefore been included in this assessment.

Pipelines

The pipelines for dewater transport, as approved under previous amendments, are not constructed yet. Pipelines that are proposed under stages outlined above are to replace the ones proposed previously. The environmental impact associated with the construction of the pipelines is not considered to have increased with the re-routing of the construction area as the pipelines will still be constructed within mostly cleared areas and with the same requirements of installation in v-drains, and with telemetry and isolation valves.

Previous assessment of the pipelines covered the risk of spills of groundwater/dewatering and brine from the RO plant. With the connection of the Ghost Crab In-Pit TSF to the dewatering pipeline there is potential for the decant to transferred via this pipeline. Sufficient information to assess this risk is not available so the transport of decant anywhere other than the RO plant will not be authorised under this application.

Dust suppression

Although the removal of Condition 10 (which prevents the use of RO Brine and dewatering effluent for dust suppression activities) was not directly requested in the application and the works below do not clearly demonstrate the direction of dewatering effluent to dust suppression sources, it has been confirmed by the licence holder that there is an intent to use dewatering effluent for dust suppression as needed on the premises.

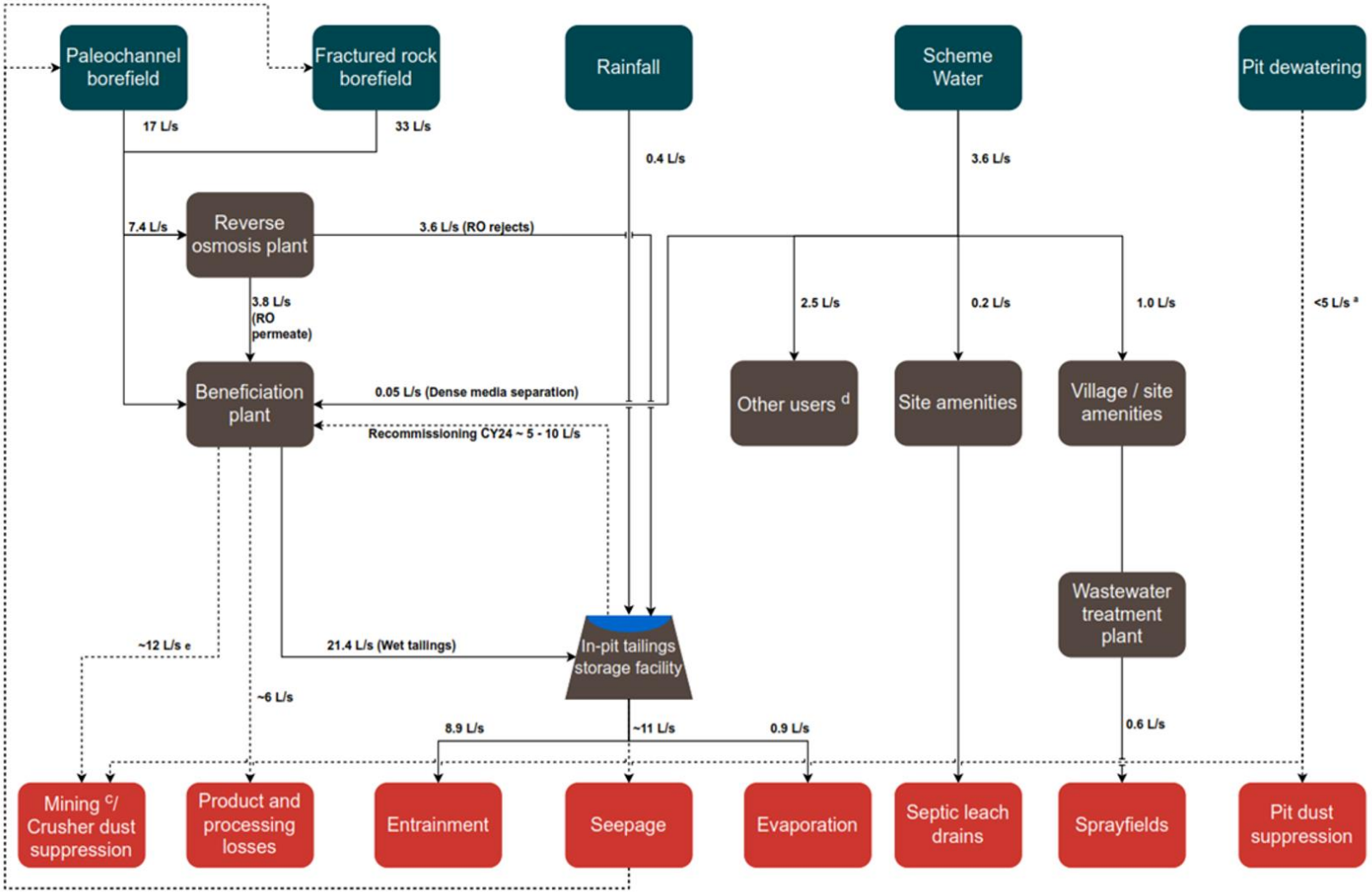
The risk from use of dewatering and RO brine as dust suppression was considered too high to be permitted without further information being provided for further assessment. Condition 10 was added: *The Licence Holder must not use dewater or RO Brine for dust suppression activities*, and another condition requiring the applicant to further analyze for radiological quality of the pit water and RO brine and data provided to DWER for assessment.

The report was provided and found to meet the requirements of the condition but as there was no further application to amend or remove Condition 10 at that time, the re-assessment of the discharge of dewatering in dust suppression has been included with this application. On re-assessment of the report provided in 2019, it was found to be sufficient to confirm the safety of human receptors on the premises but did not address environmental risk. Therefore, this activity is included as a detailed risk assessment in Section 3.3.

The use of RO Brine for dust suppression activities have not been assessed.

Table 2: Proposed phased pipeline construction

Phase	Priority - Timing	Pipeline	Description of works
1	Urgent – June 2023	Raw water (groundwater) sourced from the production bores.	Raw water is transported to the mining turkeys' nest (northern). The intention is to use raw water for dust suppression activities within interior processing and mining areas, via a watercart.
2	High – October 2023	Potable/scheme water sourced from the Kalgoorlie to Esperance pipeline	The purpose of Phase 2 is to ensure that potable water is prioritised to areas where it is required the most. Potable water is currently distributed to areas within the site, including offices and buildings. Additional potable water is required to supply the workshop, mining infrastructure and ancillary processes due to an increased water demand from current infrastructure. Potable water is an essential source, feeding the emergency response and fire suppression system throughout the site. The proposed plan will assist in alleviating pressure on the scheme water source and ensure that sufficient pressure is available for the fire suppression system. Water carts also require a source of potable water for exterior roads within the premises boundary and drilling operations. Staging tanks will be required to hold potable scheme water to fill the watercarts. Water spillage containment and sumps will be constructed to ensure no discharges to the surrounding environment. No additional pumps are proposed as part of this scope.
3	Medium – December 2023		RO processed water (permeate) will be distributed to new water cart fill-up points to be utilised on exterior roads within the premises boundary and the existing wash down pads. This will reduce the amount of potable water being used onsite for activities that do not require potable water and is a more efficient use of this water source. RO Brine will continue to be disposed of in accordance with approved licence conditions.
4	Low - June 2024		Dewatering from all pits is proposed to be returned to the beneficiation plant, with approximately 16,000kL/year directly discharged to the Ghost Crab In-Pit TSF alongside the RO Brine. This pipeline will be rerouted to suit future water use efficiency on site.



a- Pit dewatering volumes are estimated
b- Values represent data collected and average annualised over financial year 2023, peak values might be higher
c- Mining dust suppression upon licence approval
d- Includes site, amenities, construction and exploration uses

Figure 1: Mount Marion Operational Water Balance[b] Schematic Financial Year 2023

2.4 Crushing and screening

The Category 5 and Category 12 mobile crushing and screening equipment could be interchangeable, however, it is proposed to only utilise additional units of this equipment within the approved footprint for the respective category required. That is, units will be deployed for either Category 12 or Category 5 and will not switch between these activities. This will ensure that ore and construction materials are not mingled.

2.4.1 Category 5 with ore sorting

The treatment of ore and low grade ore by crushing screening and sorting at the low grade stockpile/plant area or the run of mine (ROM)/plant will enable the increased throughput in Category 5 activities (from 3 Mtpa to 5 Mtpa). The existing category 12 mobile crushing and screening plant will be utilized along with new ore sorting infrastructure prior to the beneficiation process as the upgrades to the fixed crushing and screening plant, approved in the 2022 amendment are optimized.

The ore sorting infrastructure will be new mobile equipment specific for the purpose. The ore sorting will be physical processes, such as screening, magnetic separation and gravity separation. Chemical separation techniques are not proposed. The product from the mobile equipment will be processed through the existing beneficiation plant via the existing ROM pad with feed rates remaining within the capacity of the beneficiation plant. The waste will be added to the waste ore/coarse ore rejects tailings stream.

2.4.2 Category 12

Category 12 activities will continue within the premises, in accordance with the licence, for processing of mine waste for use as construction material for construction projects. However, due to demand onsite an increase in the volume of throughput has been proposed (from 100 000 tpa to 200 000 tpa). No additional infrastructure is required to facilitate this increase in throughput as existing mobile plants have sufficient design capacity.

2.5 Tailings management

The tailings increase from the increased throughput will be primarily an increase in dry tailings as the use of All-in-6 filter belt has increased the proportion of coarse tails to the Waste landforms since the last assessment of the tailings discharge by DWER in Amendment Notice 1 provided in December 2017. The proportion of tailings produced and estimate volumes produced as a result of increased throughput are to be:

- Dry coarse reject (0.5 to 5 mm fraction) tailings (85%), 262,712 tonnes per year.
- Wet fine, <0.5mm fraction tailings (15%), 70,621 tonnes per year.

This is an increase of approximately 70% additional tailings to the current volume of tailings produced. The production pattern is expected to be 100% dry coarse reject tails approximately 80% of the time.

There are no changes proposed to the composition of coarse rejects tailings or wet tailings produced by Mt Marion processing operations. They are described in the Materials Characterisation report (Okane, 2022) as:

- chemically benign and of low risk of environmental harm. The fine tailings disposed of in Ghost Crab In-Pit TSF were not analysed however.
- The coarse reject material was bulk sampled in 2017 and were classified:
    - as non-acid forming,
    - Mineralogical assessment confirmed absence of detectable sulfide minerals,

with the sample comprised mostly of quartz and feldspars with minor spodumene.

- low risk of respirable dust,
- enriched in Be, Bi, Ce, Rb, Sb, Se, Sn, Ta, Te and Tl (Geochemical-Abundance Index >3) but likely to be in insoluble forms,
- leachate was alkaline and low salinity, environmentally significant metals were well below ANZECC livestock drinking water guidelines
- Thallium (Tl) was a potential risk due to high concentration but LEAF leach testing indicated very low levels mobilized at all pHs.
- Assessment for NORM indicated presence at levels low enough not to require management.

The discharge points of the tailings are not intended to be altered, the dry tailings will be disposed of to waste rock dumps through co-mingling of the tailings with waste rock and the wet fines tailings will be disposed of to the Ghost Crab in-pit TSF.

2.6 Disposal of tyres and rubber into Waste Rock Landforms (Category 64)

The disposal of tyres and rubber is limited to the 'mining waste dump' on M15/1000. No changes are proposed to the volume of tyres being disposed of or stored at the site, it is however, requested that the disposal be allowed at all waste rock landforms onsite. This will include:

- Waste Rock Landforms 1 – 5.
- Ghost Crab Pit Northern Waste Rock Landform.
- Ghost Crab Southern Waste Rock Landform.

2.7 Fuel bay (Category 73)

The installation of a further three 110,000 L fuel tanks was completed in April 2023 with notification provided to the department in June 2023. The fuel tanks were installed on hardstand with bunding and sumps for collection of contaminated water and spills. The tanks design is double skinned to provide further containment for spills.

2.8 Wastewater treatment (Category 85)

It is noted that the construction compliance report has not been provided for the WWTP infrastructure detailed on the licence but the application for later stages of the expansion project applied for under the works approval W6744/2022/1 have been completed since 14 March 2023. The construction report for this expansion of the WWTP includes reference to the extent of the existing sprayfield as meeting the licence condition of 3.3ha and infrastructure already constructed, including the infrastructure approved under the licence conditions.

There have been reports of non-compliance with the water quality limits for the effluent set by the licence conditions. However, the reporting of the effluent water quality from the WWTPs has been inconsistent in the details recorded over the previous 4 annual audit compliance reports. This has made the establishment of how the water quality has been non-compliant with the licence conditions difficult to ascertain. The last AACR provided the following non-compliance details, the values of any parameter that is compliant has not been provided.

Table 3: WWTP limit exceedances for 2022 from the AACR

Sample date	Analyte exceeded	Analyte Limit	Analyte result
16/02/2022	Total N	< 50mg/L	55mg/L
09/05/2022	Biological Oxygen Demand	<30mg/L	34mg/L
	E.coli	1000cfu/100ml	12000cfu/100ml
	Total N	<50mg/L	71mg/L
	Total P	<12mg/L	21mg/L
	Total suspended solids	<40mg/L	150mg/L
14/11/2022	Total suspended solids	<40mg/L	58mg/L

The previous years exceedances are believed to be the result of earlier infrastructure and therefore have not been included in this assessment.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 4 below. Table 4 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 4: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Mobilisation and placement of mobile crushing and screening plants and ore sorting technology Construction of pipelines has previously been assessed and proposal is not a significant alteration to pipeline routes. The diesel tanks have already been installed so risk from construction not addressed in this assessment	Air/windborne pathway	• the nearest receptor is the Woolibar Homestead, located approximately 20 km from the Premises • Control / lower vehicle speed limits during dust prone climatic conditions where practicable. • Routine maintenance and housekeeping practices to prevent dust build up. • Water will be applied to any roads or cleared areas that pose a dust risk. • Opportunistic inspections for dust emissions during installation. • If visible dust emissions are noted then an assessment of the source will be made and additional water will be applied to key source areas, or alternative treatments applied. • The potential for high-risk weather conditions for dust emissions (i.e. windy conditions) will be monitored and extra water applied in preparation.
Noise			• The nearest receptor is the Woolibar Homestead, located approximately 20 km from the Premises • Noise emissions will comply with the Environmental Protection (Noise) Regulations 1997. • Equipment will be regularly serviced and maintained. • Maximum sound power levels are specified for all equipment used in the construction • Construction will take place predominantly during daylight hours, thereby limiting noise emissions during the night
Hydrocarbons	Spills and leaks from equipment	Direct discharge to land. Contamination of	• Hydrocarbons will be stored within secondary containment which meets the requirements of Australian Standard (AS) 1940:2017 • Spill kits will be located close to the refuelling areas, mobile refuelling

Emission	Sources	Potential pathways	Proposed controls
		surface water from contact with soil.	facilities and workshop/storage areas. • Where an unintentional discharge occurs, it will be controlled, contained, and removed using spill kit materials or other absorbent materials. • Contaminated soils will be collected and disposed of to an appropriately licensed waste facility. • Where an unintentional discharge occurs, it will be reported internally as an environmental incident and larger spills with the potential to cause contamination will be reported externally to DWER. • Mobile equipment utilised in the construction will be operated and serviced in line with the manufacturer's specifications. • Servicing and refuelling of the equipment will be only undertaken within designated areas.
Commissioning and Operation			
Dust	Operation of mobile crushing and screening plants and ore sorting technology	Air/windborne pathway	• The nearest receptor is the Woolibar Homestead, located approximately 20 km from the Premises • Mobile screening plant fitted with shields and covers on transfer points. • Water trucks will be utilised to spray work area, roads and stockpiles during times when the screening plant is operational. • Daily inspection of plant area will include observation of dust assessment and walking of plant site perimeter. • Monitoring of operational and weather conditions to support dust management. • Incident reporting system.
Noise			• The nearest receptor is the Woolibar Homestead, located approximately 20 km from the Premises which is too far for the noise produced to breach the Environmental Protection (Noise) Regulations 1997 (Noise Regulations). • Noise emissions are to be managed in accordance with the Noise

Emission	Sources	Potential pathways	Proposed controls
			Regulations 1997 • Regular service and maintenance of equipment.
Hydrocarbons	Spills and leaks from equipment and storage containers.	Direct discharge to land. Contamination of surface water from contact with soil.	• Hydrocarbons will be stored within secondary containment which meets the requirements of Australian Standard (AS) 1940:2017 • Spill kits will be located close to the refuelling areas, mobile refuelling facilities and workshop/storage areas. • Where an unintentional discharge occurs, it will be controlled, contained, and removed using spill kit materials or other absorbent materials. • Contaminated soils will be collected and disposed of to an appropriately licensed waste facility. • Where an unintentional discharge occurs, it will be reported internally as an environmental incident and larger spills with the potential to cause contamination will be reported externally to DWER. • Mobile equipment utilised in the construction will be operated and serviced in line with the manufacturer's specifications. • Servicing and refuelling of the equipment will be only undertaken within designated areas.
Saline water Groundwater and dewater effluent	Use in dust suppression	Direct discharge to land. Contamination of surface water from contact with soil.	• Discharge of groundwater within internal mining and processing areas. • Site personnel are already required to wear P2 masks within mining and operational areas due to the particulates within the site. They will continue with this practice. • No dust suppression water will make it way to vegetated areas due to the stormwater controls implemented onsite. • Implement management strategies as detailed in Ground Water Operational Strategy • Turkey Nest constructed as pre requirements of prescribed in L9037, including lined with 1.5mm welded HDPE liner.

Emission	Sources	Potential pathways	Proposed controls
	Spills and leaks from pipelines		• Pipeline infrastructure will be bunded and located within v-drains reflective of current controls issued for the site. • Monitoring and inspections will be undertaken in accordance with conditions prescribed in L9037
	Overspray or surface flow from dust suppression		• Installation of bunding around the areas where ore is processed to ensure that stormwater passing through these areas do not flow to the surrounding environment. • Selection of processing locations to ensure no interaction with environmental receptors (all works are to be proposed for existing disturbance areas). • Regular inspection of bunded areas to ensure capacity is maintained. • Surface water management infrastructure, as required.
Water containing radionuclides	Dewater effluent and groundwater used in dust suppression. Overtopping of containment of dewatering effluent and groundwater.	Direct discharge to land. Contamination of surface water from contact with soil. Concentration of radionuclides in vegetation due to absorption of water and fauna through ingestion of water and vegetation, and surface contact with water.	• Discharge of groundwater within internal mining and processing areas. • No dust suppression water will make its way to vegetated areas due to the stormwater controls implemented onsite. • Implement management strategies as detailed in Ground Water Operational Strategy • Turkey Nest constructed as per requirements of L9037, including lined with 1.5mm welded HDPE liner.
Dewater effluent and RO brine	Discharge to the Ghost Crab In-Pit TSF	Increased water content of waste in TSF causing increased seepage	• The freeboard of Ghost Crab Pit will not exceed the level RL 374m (~ below 6 mbgl). This makes it unlikely to result in seepage entering the root zone or in overtopping of the pit.

Emission	Sources	Potential pathways	Proposed controls
		of leachate from the walls and base of TSF. Increased volume of material entering TSF causing filling of pit void causing overtopping.	• The standing water level is monitored around the TSF so that there will be warning of groundwater reaching the root zone. • The groundwater is pumped from the underground workings under the TSF reducing the groundwater level such that the seepage is not increasing surrounding groundwater standing water level.
Coarse Reject Tailings	Tailings stream from beneficiation plant	Spills from transport, incorrect disposal point. Contamination of surface water runoff.	Licence conditions requiring landforms containing coarse rejects to have drainage structures to contain any run-off or stormwater originating within the landform surface area.
Nutrient rich wastewater	Submerged aerated filter WWTP capacity 70m3/day and Sequence Batch Reactor WWTP capacity 20m3/day irrigating directly to ground.	Direct discharge to land. Stormwater runoff from irrigation area	Irrigation over a 3.5 ha area. It is noted by the Delegated Officer that the actual area was 3.3ha as provided by the compliance documents received for W6744/2022/1. The design parameters for the WWTP is to produce effluent of higher quality than the current licence limits.
Hydrocarbon contaminated water	Disposal of tyres and rubber in waste rock landforms	Surface runoff contacting tyres and rubber then entering surrounding vegetation	Disposal within waste rock dumps providing sufficient distance between waste and groundwater. Any contaminated runoff contained within waste rock dump

Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 5 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 5: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Woolibar Homestead	Approximately 20 km from beneficiation plant.
Aboriginal and other heritage sites	Registered heritage sites within the Premises are located within less than 100m of waste rock dumps proposed to be used for disposal of tyres and more than 1.3 kms east from the proposed ore sorting technology trial and infrastructure areas. Following the grant of a s18 application in March 2018, the licence holder engaged with the relevant stakeholders and undertook a cultural salvage of artefacts from the nominated s18 areas. All staff and contractors will be made aware of the heritage avoidance areas, as well as undertake cultural awareness training. The works associated with the installation and ongoing operation of the ore sorting technologies will not impact upon any registered or non-registered heritage sites.
Environmental receptors	**Distance from prescribed activity**
Yallari Timber Reserve	Greater than 4 km west of the TSF and processing areas of the premises.
Underlying groundwater (non-potable purposes)	Groundwater at the Mt Marion Lithium Mine is within the Goldfields Groundwater Area and includes shallow ephemeral lakes or unconfined aquifers that are saline or hypersaline. The site has recorded groundwater quality with a pH of 6.4 and with Total Dissolved Solids (TDS) concentrations of 30,000 milligrams per litre (mg/L) to 40,000 mg/L. Deeper regional aquifers in the area host hypersaline water quality, typically of 140,000 mg/L TDS (Aquaterra, 2008).
Threatened/Priority Flora or Fauna	None present within premises.
TECs/PECs	The nearest PEC is approximately 63km east of premises.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the Licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 6.

The Revised Licence L9037/2017/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 5, 6, 12, 57, 64, 73, 85, 85B.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 6. Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of Licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Mobile crushing and screening Ore sorting	Dust	Air/windborne pathway causing impacts to health and amenity	Native vegetation	Refer to Section 3.1	C = Slight L = Possible **Low Risk**	Y		
Operation								
Discharge of Dewatering effluent to Ghost Crab in-pit TSF. Discharge of RO Brine to Ghost Crab in-pit TSF	Seepage of leachate from Ghost Crab In-Pit TSF	Through pit walls to surrounding ground impacting groundwater quality and causing groundwater mounding. Impacting health of native vegetation	Groundwater aquifers and surrounding native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	N	Condition 1: Infrastructure and equipment requirements Condition 4: Authorised discharge points Condition 13: Groundwater monitoring bore SWL monitoring **Condition 7: Limit** **Condition 12:** **Discharge point monitoring** **Condition 14** **Tailings storage facility water balance** **Condition 25** **Annual Environmental Reporting**	The Delegated Officer considers the limit of 16,000 kl/year to the Ghost Crab In-Pit TSF to be sufficiently small a percentage of the total discharge to the pit that the environmental risk of groundwater mounding from the increased discharges to the TSF does not increase the risk rating of this activity. The licence holder has indicated that they have continued to discharge the brine from the reverse osmosis plant to the Ghost Crab In-Pit TSF but the decant is no longer being treated through the RO plant but being fed directly into the beneficiation plant processes. The reason for removing the discharge of brine to the TSF from the licence in 2019 was due to the licence holder wishing to only discharge brine to open pits. It was not in consideration of the alteration in the discharge composition. For this reason, the Delegated Officer does not consider the risk significantly altered from that assessed in the approvals prior to 2019. The Delegated Officer also notes that the monitoring results of the standing water levels in the bores near the Ghost Crab In-Pit TSF have not increased in metres below ground level. This indicates that mounding of the groundwater table is not occurring, possibly due the extraction of water from the underground workings beneath the Ghost Crab In-Pit TSF mitigating the impact from seepage from the TSF. It has been determined that additional regulatory controls are required to monitor and manage this risk event. Condition 7 Condition 7 outlines a volume limit of up to 16,000 kL/year of dewatering effluent to be discharged to the TSF as that has been the volume communicated during the assessment as what has currently been added to the TSF. It is sufficiently small that the Delegated Officer does not consider it to increase the risk from seepage significantly. If the licence holder requires greater quantities to be discharged to the in-pit TSF then the risk may require reassessment when that volume is known. Condition 12 Requirements to monitor the volume of tailings, dewatering effluent and RO Brine being discharged into Ghost Crab in-pit TSF has been added to the licence. This monitoring will allow better oversite over the discharges occurring within the TSF. The data will also support the calculations required for the new condition requiring a water balance for the TSF to be provided. Condition 13 A requirement to provide a water balance for the in-pit TSF have been added to the licence. This will provide data to support the management of this risk event and increases oversite into the TSFs water management. Condition 25 Given the increased monitoring and evaluation required for the future assessment of the environmental impacts from discharges to

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of Licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								the TSF an annual report was considered necessary.
Use of Dewatering effluent in dust suppression.	Saline water with potential radionuclide contamination	Direct discharge to land causing potential contamination of surface water and native vegetation. Impacting health of native vegetation and fauna through absorption/ingestion.	Native vegetation Native fauna ingesting surface water or vegetation.	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	**Specified actions conditions 16, 17, 18,19 and 20** **Conditions 5 and 6**	Refer to Section 3.3: Detailed risk assessment
Crushing and screening with ore sorting infrastructure– Cat 5	Dust	Air/windborne pathway causing impacts to health and amenity	Native vegetation	Refer to Section 3.1	C = Slight L = Possible **Low Risk**	Y	Condition 1 Infrastructure and equipment requirements	N/A
	Tailings – dry coarse reject	Direct discharge to land causing potential contamination of surface water and native vegetation.	Native vegetation Native fauna ingesting surface water or vegetation.	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **Condition 12** **Volumes of coarse rejects tailings**	The Delegated Officer considers the risk from increased throughput of the tailings produced as coarse reject material to not be altered from the original risk assessed. This is due to the material being discharged not being altered in nature, the points of discharge and method of discharge (co-mingling with waste rock material and use of some for construction) not being altered. The management of the waste rock landforms for containment of surface water runoff is conditioned (existing requirement). A requirement (condition 12) to record the volumes of coarse reject tailings being discharged to the waste rock landforms have been added to the license. This will provide a better understanding of the tailings streams produced by the beneficiation plant and where they are discharged to (i.e in-pit TSF for to waste rock dumps)
Increased throughput of the beneficiation plant with discharge of wet tailings to Ghost Crab in-pit TSF	Tailings – wet fine tailings	Direct discharge to land through overtopping of in-pit TSF.	Native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1: TSF Freeboard (existing requirement) Condition 12 – annual survey of freeboard (existing requirement)	The Delegated Officer considers the risk of overtopping from increased throughput of the tailings to the TSF is not expected to increase given the increase given the current levels of the tailings within the pit. The monitoring and reporting of the tailings level is considered sufficient to inform of any increased risk of overtopping. Existing regulatory controls are sufficient to manage this risk.
Crushing and screening – Cat 12	Dust	Air/windborne pathway causing impacts to health and amenity	Native vegetation	Refer to Section 3.1	C = Slight L = Possible **Low Risk**	Y	Condition 1 Infrastructure and equipment requirements	N/A
Operation of fuel storage tanks	Hydrocarbon spills and leaks	Direct discharge leading to soil contamination causing poor native vegetation health or death.	Native vegetation	Refer to Section 3.1	C = Slight L = Possible **Low Risk**	Y	N/A	N/A
Operation of WWTP	Irrigation of poorly treated effluent	Direct discharge leading to soil contamination causing poor native vegetation health or death; vigorous weed growth	Soil and vegetation adjacent to discharge area	Refer to Section 3.1	C = Likely L = Minor Medium Risk	N	Condition 1: Infrastructure and equipment requirements Condition 8: Emission Limit Condition 12: Emission Monitoring	. The licence holder has requested that the waste water treatment plant infrastructure is removed from the construction condition as it has been completed. No record of compliance documentation for this infrastructure being submitted can be found in the departments systems and therefore this infrastructure has not been removed from the construction condition. The licence holder requested the removal of the discharge quality limits for the treated WWTP effluent being discharge to the irrigation field. The Delegated Officer has found there is insufficient supporting information to demonstrate that the discharge is within acceptable risk. The Delegated Officer also notes that Environmental Compliance Report for the works approval W6744/2022/1 has been submitted. This is for an additional 50m^3 WWTP unit on the premises which

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of Licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
								will require a further amendment to the licence. Given the increased infrastructure that is required to be added to the licence in the near future, the suitability to remove the limits on the discharge of effluent to the irrigation field should be assessed in this future risk assessment.
Tyre and rubber disposal within all waste rock landforms on premises	Leachate	Groundwater	Groundwater	Refer to Section 3.1	C = Slight L = Rare **Low Risk**	Y	Condition 4: authorised discharge points	N/A

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment of distribution of water containing Naturally Occurring Radioactive Material (NORM) for dust suppression activities

Background

The licence holder has reviewed the risks from radionuclides to their workforce. The regulation of human exposure to radionuclides within their working environment is the responsibility of the Department of Mines, Industry Regulation and Safety (DMIRS). DMIRS have provided the licence holder with a partial exemption from Part 16(2) of the Mines Safety and Inspection Regulations, with conditions that include the requirement that the monitoring is conducted, as committed to in a NORM Assessment Report, and a Radiation Management Plan developed for the RO Plant and related areas. The monitoring and the Radiation Management Plan have been developed.

The information produced from the monitoring has been the basis of information provided to DWER for assessment of the use of dewatering effluent for dust suppression. This information was not adequate to assess the ecological impacts as the impacts on flora and fauna are not necessarily comparable to human impacts. The DWER therefore compared the results from monitoring to the ANZECC livestock drinking water guidelines (ANZECC 2000) to obtain a trigger level for investigation.

In 2019 the DWER noted that testing of water quality in production bores (PB01 and PB06) indicated radioactivity significantly in excess of the gross alpha and gross beta ANZECC trigger values of 0.5 Bq/L respectively (MRL, 2019). PB01 recorded a gross alpha activity of 19.7 Bq/L[1] and PB06 16 Bq/L whilst the gross beta activity was 4.3 Bq/L in PB01 and 20 Bq/L in PB06. The ANZECC trigger values are a screening tool to determine whether radionuclide concentrations are of concern. In monitoring undertaken in 2023, production bore PB 07, a production bore used for supplying groundwater to the premises, exceeded the ANZECC trigger levels for gross alpha and gross beta with 20.8 and 25.7 Bq/L respectively. At these levels the groundwater may present a risk if released to the environment.

Pit water quality is similar to water quality of groundwater surrounding the pits. Water quality testing taken from the pits in 2019 provided results indicating that pit water is saline (10 000 - 18 000 mg/L TDS) and metal/metalloid concentrations generally meet ANZECC livestock drinking water guidelines, with the exception of boron and uranium. One pit water sample indicated an elevated uranium concentration (1.5 mg/L compared to the ANZECC livestock drinking water guideline of 0.2 mg/L).

To address concerns regarding the impacts of using the water sourced form the production bores and the dewatering of the operational pits, the licence holder has investigated the ecological risks of the radionuclides within these water sources. A report was provided to the department on 28 September 2023 (On Site Technology 2023) which concluded that:

- the radiological risk associated with the use of various water sources as dust suppression water at the Mt Marion Lithium Mine is sufficiently low as to not pose a significant risk of adverse ecological impact from ionising radiation.
- the annual increase in ecological risk of using various water sources as dust suppression water is sufficiently low that annual monitoring will flag any unexpected departures from the predicted increase in soil radionuclide content well in advance of significant consequences. Thus, providing operational options for the timely mitigation

[1] Bq/L – Becquerels per litre. Becquerel is a unit of radioactivity, 1Bq = 1 disintegration per second.

of those departures.

- A review of the estimated dose rate every five years (as additional site specific data becomes available) will ensure that predicted dose rates for organisms are not being exceeded and provide operational options for the timely mitigation of any departure from predicted dose rates.

3.3.1 Risk of Impact from Radionuclides in Dust Suppression Water

In assessing the ecological risk to the environment at Mt Marion, the On Site Technology assessment used a screening level of 40µGy/h[2] for animals and 400µGy/h for plants. These screening levels are derived from "No Measurable Population Effect" based on IAEA[3], USDOE[4] and UNSCEAR[5] documents. These levels were considered appropriate by the consultant in the Australian context.

Within the *Guide for radiation protection of the environment* (ARPANSA 2015) the following are considered the endpoints that capture the range of ways a population may be affected by radiation:

- mortality (leading to changes in age distribution, death rate and population density)
- morbidity (reducing 'fitness' of individuals, making it more difficult for them to survive and reproduce)
- reproduction (by either reduced fertility or fecundity)
- cytogenetic alteration (by the induction of chromosomal damage).

Although the impact of radiation may be a very minor contributor to such population changes; it can also be hypothesized that radiation may aggravate population effects if the population is already under stress due to other factors. (ARPANSA 2015) Other stress factors that are likely to be present in the vicinity of a mine site are clearing of areas of habitat, interruption of water flow regimes over the landscape, increased fugitive dust and noise and the mining activities causing potential for incidental harm to individual organisms through unintended contact. These factors are added to by climate change impacts which is expected to be a measurable change in the environment over the expected 20 year mine life.

Controls

The controls proposed by the Licence Holder include the limiting of the areas where dust suppression is to be applied to the operational areas of the plant and mining operations including the haul roads and waste dumps. The assessment of potential impacts proposed by On Site Technology include the following monitoring regimes:

- annual monitoring of soil and water to confirm the predictive model is correct. That is, impacted soil activity should be approximately 4% higher than background activity within 2 years. The predictive model has the predicted added soil activity after 20 years of dust suppression water application ranging from 0.01 to 0.33Bq/g (over all scenarios) with an average of 0.12Bq/g compared to a background activity of 0.55Bq/g. Therefore, the predicted total soil activity after 20 years is 0.88Bq/g (maximum) or 0.67Bq/g (average) either of which are less than the regulatory activity

[2] µGy/h – microGrays per hour. Gray is the absorbed dose, i.e. the energy absorbed per unit mass of the material with which the radiation interacts.

[3] IAEA – International Atomic Energy Agency

[4] USDOE – United States Department of Energy

[5] UNSCEAR – United Nation Scientific Committee on the Effects of Atomic Radiation

of 1Bq/g. It is noted however that the 1Bq/g is the level related to human safety. Parameters to be monitored should include radon isotopes Ra^{226} and Ra^{228} and Pb^{210}.

- A site radon survey conducted on a regular basis for the first 12 months of dust suppression water application.
- Analysis of organisms of interest to determine concentration ratios for key organisms to be completes within 2 years. The organisms considered of most interest are:
    - Annelid
    - Arthropod
    - Insect
    - Grass
    - Lichen
    - Shrubs, including a halophyte
    - Trees

The point is also made that 'the analysis of radionuclides in environmental samples can be a costly and time consuming exercise'. From an estimate of the dose rate contribution from Ra^{226}, Ra^{228} and Pb^{210} compared to using all of the radionuclides listed in the study for the 95% upper confidence limit for a monitoring source, it is evident that the isotopes most critical to the estimation of ecological impact from radionuclides are Ra^{226}, Ra^{228} and Pb^{210}. Therefore, notwithstanding the uncertainty introduced by assumptions about the activity of other radionuclides (for example U^{234}, Th^{230}, Pa^{231} and Th^{227}), future resources and effort are best directed to Radium and Lead.

Risk assessment

The **consequence** of the emission has been assessed as being **minor** impact on the health of fauna and flora as the radionuclide levels in the water still exceeds the ANZECC guidelines though the modelling has indicated that the risk is not significant. The **likelihood** has been assessed as **unlikely** given the emission is low dosage but will potentially be in contact with vegetation and fauna over a wide area within the premises boundary for an estimated 20 years. The Delegated Officer therefore, considers the activity of dust suppression using the dewatering effluent to be **Medium risk** which means the risk is tolerable and is likely to be subject to some regulatory controls.

Conditions

To provide confirmation as to the impacts, or lack of impacts, of the dust suppression activity, monitoring and reporting **conditions 16, 17,18, 19 and 20** are placed in the licence requiring evaluation and reporting of results. **Condition 20** requires the development of a dust management plan if the monitoring under conditions 16 and 18 does not meet the criteria set out in condition 20. These actions are reflective of the advised actions provided by On Site Technology, the consultant for the licence holder (in their report titled: *Mt Marion Lithium Project: Potential environmental contamination and ecological impact from radionuclides in dust suppression water).*

A site radon survey has not been conditioned as the advice provided in the report from On Site Technology indicated that a survey or this parameter would be a means of assessing the actual and potential level of soil contamination. Soil monitoring is already conditioned and it is at the discretion of the licence holder to include radon monitoring in the soil monitoring plan to support direct sampling for radionuclides.

A condition (condition 6) requiring dewatering effluent to only be used for dust suppression within operational areas of the plant and mining operations have been added to the licence as proposed by the licence holder.

4. Consultation

Table 7 provides a summary of the consultation undertaken by the department.

Table 7: Consultation

Consultation method	Comments received	Department response
Local Government Authority advised of proposal (3/08/2023)	No comments received	NA
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (03/08/2023)	DMIRS replied on date 16/08/2023 refer to Appendix 1	Refer to Appendix 1
Licence Holder was provided with draft amendment on 1/12/2023	Comments were received on 15/12/2023. Refer to Appendix 1	Refer to Appendix 2

5. Conclusion

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

5.1 Summary of amendments

The multiple changes required in the licence emphasised that the conditions of the licence were not easily followed in the format of the granted licence. The Delegated Officer has determined to re-issue the licence in a new format to enable the emissions and discharges and their controls to be clearly identified and understood. The new format includes:

- The infrastructure descriptions with operational requirements have been consolidated from various conditions and the previous licence Schedule 2, Table 9, into Condition 1, Table 2 of the amended licence.
- A new authorised emissions table has been included that provides a clear record of the approved discharge points for the emissions.
- The construction conditions have been updated to remove infrastructure already constructed, where appropriate this infrastructure has been included in Table 2.
- Monitoring and reporting conditions have been updated to conform with standard conditions. This has included adding an annual reporting condition to reflect the monitoring required under the licence.

Table 8 provides a summary of specific amendments to the authorisations under the licence and will act as record of implemented changes..

Table 8: Summary of Licence amendments

Condition no.	Proposed amendments
New Cover page	Revised to current licensing format. Updated to include a table of the categories and their assessed throughputs. This replaces Table 8 in Schedule 2 of the current licence. The registered address of the licence holder has been updated as per the amendment

	application.
Explanatory notes – pages 2-4	Deleted as a redundant section of the licence (not consistent with current licence template). Strikethrough of wording not included in draft document to manage readability of document.
New History of approvals since issuing of L9037/2017/1	History of approvals for background to prior assessments and authorisations, added as per current licence template
Interpretation section	Wording updated to current licensing format. Intent of section remains unchanged.
Old Condition 1	Deleted as a redundant condition, new licence template no longer supports this condition. Authorised Emissions and discharges table included in new condition 4. Condition 1and Table 4 incorporates controls previously within Condition 1, Table 2 and the previous condition 9.
New Condition 1, Table 2 Infrastructure and equipment controls table	Contains contents from Schedule 2, Table 9 with amendments to reflect amendment application and new table format. Redundant infrastructure deleted. Contains operational requirements for dust supression sprays, landfill and pipeline v'drains from condition 6 and table 5 Where equipment from previous licence tables 5 and 9 are pollution control measures for other infrastructure they are added within the operational requirement column of the new Table 2. V drain requirements amended as per amendment application and located to the operational requirements of the pipelines. Ore sorting infrastructure operational requirements have been added to this table as per amendment application. Coarse reject (tailings) material – intent of old conditions 4 and 5 (I,e installation of drainage infrastructure for each landform to contain runoff from landform) have been reflected in this new condition. Old conditions 4 and 5 have been deleted as they are written in an old format. The intent of these conditions is captured in the new operational requirement in new table 2.
Condition 3	Amended to remove already constructed infrastructure (Mobile crushing and screening plants) and other amendments as per the amendment application.
Old Condition 4 and 5 Coarse Rejects Waste Surface Landforms	Deleted as per amendment application Requirement for capturing run-off or stormwater originating from landforms where coarse reject tailings have been co-mingled has been captured within new condition 1.
New Condition 4 and Table 4 Authorised discharge points	Details of previous conditions 1 and 9 have been transferred to this new condition. Amendments have been made to authorize - the discharge of dewatering effluent and RO Brine to Ghost Crab in-pit TSF. - The discharge of used tyres and rubber to all waste rock landforms - the use of dewatering effluent for dust supression activities; and - discharge points for coarse reject (tailings) material as per the amendment application.
New Conditions 5 and	Condition 5 Requires that vegetation not be impacted by use of the groundwater and dewatering

6	effluent in dust suppression. Condition 6 Provides area where dewatering effluent is restricted to for use in dust suppression.
Old Condition 6 (table 5) Infrastructure and equipment controls table	Deleted and details added to new condition 1 Table 2 V drain requirements amended as per amendment application and located to the operational requirements of the pipelines
Old condition 7 – treated effluent quality limits	Retained on licence as new condition 8.
New Condition 7	Limit to discharge quantity of dewatering effluent to Ghost Crab In-Pit TSF
Old Condition 8 TSF freeboard	Deleted and added to Condition 1, Table 2
Old Condition 9 Use of coarse reject (tailings) in construction.	Deleted and added to Condition 4, Table 4
Old Condition 10 Not to use dewater or RO brine for dust suppression	Deleted as per amendment application. The requirement to not use RO Brine for dust suppression activities remains and have been added to new condition 4.
Old Condition 11 Inspections – pipelines	Deleted and included in Condition 1,Table 2 as operational requirements for pipelines
New Condition 12 Discharge point monitoring	Disharge monitoring has been collated from previous licence with the addition of monitoring required to assess the radionuclides present in dewatering discharged for dust suppression. New requirements to monitor volumes of tailings discharged to the TSF, volume of dewater used for dust suppression, volumes of RO Brine discharge to TSF have also been added
Old Condition 12 and 13 Inspections - landfill	Deleted and included in Condition 1, Table 2 as operational requirements for the putrescible landfill.
New Condition 14 Tailings storage facility water balance.	Added to address gaps in knowledge as to the management of Ghost Crab In-Pit TSF.
Old Condition 14 Monitoring – Standards	Deleted and sample collection standard added to Table 6 and in condition 12

Old Condition 15 Monitoring frequency	Now condition 9 and in new format.
Old Condition 16 Monitoring equipment calibration	Now condition 11. Intent of condition remains the same
Old Condition 17 Standing water levels in bores.	Now condition 13 within the new format for monitoring of ambient groundwater.
Old Condition 18 Measurement of freeboard	Deleted and details included in condition 12, Table 6
New Condition 16-20 Specified actions	New Specified Action conditions Condition 16 and 17: conditions to require a site specific concentration ratio investigation and reporting within 2 years. Condition 18: condition requiring development of soil monitoring plan for the assessment of radionuclides within soils potentially impacted by groundwater and dewatering effluent. Condition 19: 5 yearly review of the estimated dose rate using the site -specific concentration ratios developed in condition 14. Condition 20: Submission of dust management plan in the event that the dose rate modelled under condition 15 exceeds the maximum and average radioactivity values.
Old Condition 19 Discharge monitoring	New condition 12, Table 6. No change to requirements
Condition 20 Discharge monitoring	Deleted and details added to Condition 12, Table 6. No change to requirements
Conditions 21 – 24 Record keeping	Updated to conditions 21 – 24 - new wording as per new licence template. Intent stays the same
New Condition 25 Annual environmental report	Standard annual reporting condition added to ensure consistent reporting of all parameters monitored with interpretation of results as necessary to assess the potential changes in discharges and emissions over time and potential environmental impacts from discharges and emissions.
Schedule 1 Maps	Figure 1 updated premises boundary and site layout Figure 2 Landfills location figure replaced with crushing and screening location figure. Landfills positions indicated in Figure 1 Figure 3 updated pipeline figure New Figure 4 added to depict areas where dust suppression using groundwater and dewatering effluent may be applied. Figure 5 previously figure 4 in Schedule 2
Schedule 2	Deleted. Table 8 moved to cover page of licence, Table 9 moved to Condition 1 of the

Primary activities	licence, Figure 4 moved to Schedule 1 with other figures.

References

1. Australian and New Zealand Environment and Conservation Council (ANZECC) 2000, Australian and New Zealand guidelines for fresh and marine water quality. Volume 3, Primary industries / Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand
2. Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2015, *Radiation Protection of the Environment*, Radiation Protection Series G-1, Yallambie, Victoria.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
6. DWER 2019, L9037/2017/1 Mount Marion Lithium Project amendment report dated Thursday, 19 September 2019, online at IR-T08 Amendment Notice (Major) template (der.wa.gov.au)
7. Okane 2021, *Memorandum: Mt Marion – Material characterisation gap analysis*, Christchurch, New Zealand
8. On Site Technology 2023, *Mt Marion Lithium Project: Potential environmental contamination and ecological impact from radionuclides in dust suppression water*, Osborne Park, Western Australia

Appendix 1: Summary of DMIRS comments on application

Application detail	Summary of stakeholders comment	Department's response
Increased throughput of category 5 activities	The increase is almost double and the tailings will be increasing. The licence amendment should include the following information: • New water balance (taking into account the actual tailings properties) • Seepage model • life of the facility with the new throughput • Revised geotechnical assessment of the facility integrity with current tailings properties	A new condition requiring a water balance to assess the inputs and outputs of the TSF has been added to the licence to assess the potential increases in seepage form the facility. The DWER understands that the assessment of the geotechnical integrity of the facility is to be carried out by DMIRS and the regulation of this aspect of the tailings management is to be administered under DMIRS legislation.
Inclusion of dewatering into the Ghost Crab In-Pit TSF	The TSF was not designed for dewatering discharge. If the company wants to discharge water into the TSF, they should provide a water balance and a seepage model that includes inflow of dewatering.	A condition will limit the dewatering discharge to no more than 16,000kL per year.
Mining proposal (REG ID 120019)	There is a mining proposal being reviewed by DMIRS for the increased throughput, pits and waste dump expansions.	This is noted by the Delegated Officer.
Advice regarding radionuclides in dewatering effluent.	Technical advice was provided regarding the details of the report from On Site Technology (2023). Including the comment regarding the results for modelling of woodlouse: Whilst these doses are not of significant concern, if workers were to receive them, they would be subject to regulatory scrutiny, such as annual monitoring. Agree that a review of the estimated dose rate every five years (as additional site specific data becomes available) will ensure that predicted dose rates for organisms are no being exceeded	This advice has been taken into consideration, especially as providing support for conditioning regular monitoring of radionuclides during the process of applying dewatering effluent for dust suppression..

Appendix 2: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition/Section of decision report	Summary of stakeholders comment	Department's response
Decision report section 2.4	The mobile crusher will not be utilised for both Category 5 and Category 12 when in position. This will ensure that ore and construction materials are not mingled.	The Delegated Officer has noted the information.
Conditions		
1, Table 2	Drive in sumps contain both water and sediment, sumps are ramped to allow machinery access to remove sediment when dry.	Delegated Officer has amended the wording of Table 2 to include the maintenance of the drive in sumps.
	Remove 'Tailings thickener (wet tailings)' to reflect "Thickeners" Having both "tailings' thickeners" and "thickeners" assumes these are different and can be confusing for future stakeholders.	The Delegated Officer has noted this and 'Tailings thickener (wet tailings)' has been removed.
3, Table 3 Wastewater treatment plant Infrastructure	Remove the 70m3 system from the table of items to be constructed. Remove the 20m3 system to be constructed. Reason: • The 70m3 system was part of a previous licence and should have been removed in previous versions of the licence. A compliance and commissioning report for the 70m3/day Submerged Aerated Filter WWTP was provided to DWER previously. • 20m3 was requested as part of the previous licence and is superseded by the 50m3 system, referred to as Stage 2 in the Works approval W6744 supporting document, with the inclusion of Category 54 to enable WWTP more than 100m3. Due to the timing of the W6744 approval, the system was able to be operated at the Stage 2 capacity. • A commissioning report for the additional 50m3/day WWTP Stage 2 expansion was provided to DWER on 22/09/2023. An assessment letter was provided from DWER to MinRes on 13/10/2023 (Attachment 3).	The Delegated Officer has noted the prior receipt of the compliance reports and the infrastructure has been removed from Table 3.

Condition/Section of decision report	Summary of stakeholders comment	Department's response
	Min Res requests if it is possible for the remaining conditions of W6744 for Stage 2 (TLO and compliance) and/or all conditions of Stage 3 can be transferred to this Licence? This would increase the Category throughput to 170m3/day MinRes understands that this would also require a change from Category 85 to Category 54, as approved in W6744. Reason • Stage 2 of the WWTP is currently operating in Time Limited Operations (TLO), in accordance with Condition 14 of W6744. • A Compliance report for Stage 3 of the WWTP was submitted to DWER 23 October 2023 (Attachment 4).	The Delegated Officer notes that the construction of the infrastructure has been completed during the period of the assessment of this application. No prior request has been made during the assessment period for the inclusion of this infrastructure for assessment in this licence amendment. As the assessment process is almost complete the Delegated Officer has determined that the addition of category 54 to the licence can not occur at this time. As this would require additional risk assessment and possible further changes to conditions. The licence holder is advised to submit another licence amendment for the addition of category 54 to the licence as soon as possible.
6	Figure 4 does not accurately reflect the current footprint or imagery of the premise and therefore does not allow dust suppression in all areas of the operation. Can we please replace Figure 4 with the new map provided. Suggested change: The licence holder must ensure dewatering effluent is only used for dust suppression activities within cleared areas as depicted in Schedule 1, Figure 4, excluding topsoil stockpiles and rehabilitation. Reason • Figure 4 in the draft licence appears to be based off an old aerial image of site. The updated figure provided covered the latest Mining Proposal footprint. • Dewatering for dust suppression will not be used on areas that have not been previously disturbed, topsoil stockpiles and rehabilitated areas.	The Delegated Officer agrees with the request and has amended the condition wording and inserted the updated Figure 4.
4 – 7, 12 and 14	Remove the term 'effluent' from 'dewatering effluent' in these conditions. Reason The term effluent may be confusing as a type of waste stream rather than	The department considers dewatering water being discharged to the environment as a waste stream. However, the word effluent may be removed and has been replaced with dewatering water.

Condition/Section of decision report	Summary of stakeholders comment	Department's response
	an expression of groundwater	
16	Remove the requirement for representative species from Condition 16 so it reads: The Licence Holder must develop site-specific concentration ratios for Ra 226, Ra 228, 210, Pb, gross alpha and gross beta. These ratios must be developed through monitoring in accordance with the guideline the IAEA Technical reports series No.486 (IAEA, 2019). Reason • The representation of species will be developed through this monitoring program • MinRes commit to developing a monitoring program in accordance with IAEA Technical reports series No.486 (IAEA, 2019).	The Delegated Officer agrees with this request as the monitoring report will be considered against the recommendations of the On Site Technology Report (2023) when it is developed and against the IAEA technical report No.486.
22 and 25	Replace reference to the number of days after the annual period a report is due with reference to the single date, 30 March each year, to reduce confusion.	The Delegated Officer agrees the single date will minimise confusion.
25	Can we please amend Table 8 to enhance the clarity of reporting requirements? Wording has been proposed.	Proposed wording has been adopted where acceptable.

Appendix 3: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)					
Application type					
Amendment to licence	☒	Current licence number:	L9037/2017/1		
		Relevant works approval number:		N/A	☒
Date application received		09/06/2023			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Process Minerals International Pty Ltd			
Premises name		Mount Marion Lithium Project			
Premises location		Mining tenements M15/1000, M15/717 and on private land known as Hamptons Lease Area 53, portion of Lot 105 on Deposited Plan 40296, Volume 2668 Folio 420			
Local Government Authority		Shire of Coolgardie			
Application documents					
HPCM file reference number:		DER2017/000308-1			
Key application documents (additional to application form):		Supporting Document: Licence amendment application Response o request for further information			
Scope of application/assessment					

Summary of proposed activities or changes to existing operations.		• **Increase in throughput:**
		  ○ Cat 5: from 3.5Mtpa – 5Mtpa
		  ○ Cat 12: from 100,000tpa – 200,000tpa
		  ○ Cat 73: 554 kL Diesel – 854kL
		• **Removal of items in Table 3**
		• **Condition 4 change of terminology**
		• **Amend some operational requirements in table of Condition 6**
		• **Removal of Condition 7 from Table 6**
		• **Amendments to conditions 11,12,20**
		• **Amendments to Schedule 2 Primary activities**
		• **Amendments to Schedule 2 Infrastructure and equipment in Table 9**
		• **Amendments to figures**
		• **Change of registered company address**			

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic and non-metallic ore	3.0 million tonnes per annum	5.0 Mtpa
Category 12: Screening of material	100,000 tonnes per annum	200,000tpa
Category 57: Used tyre storage	1,000 tyres	
Category 64: Class II putrescible landfill	2,000 tonnes per annum	
Category 73: Bulk storage of chemicals	480 kL LNG 554 kL Diesel	854 kL Diesel
Category 85: Sewage facility	90 m3/day	
Category 6: Dewatering	650,000 tonnes (0.65 gigalitres) per annum	
Category 85B: Water desalination plant	0.73 gigalitres per annum	

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	Referral decision No: Managed under Part V ☒ Assessed under Part IV ☐
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	General lease ☒ Expiry: Life of Mine Mining lease / tenement ☒ M15/1000 Expiry: 19/08/2030 M15/717 Expiry: 18/09/2036 Other evidence ☐ Expiry:

Has the applicant obtained all relevant planning approvals?	Yes ☐ No ☐ N/A ☐	Approval:PA12/2019 – development approval form Shire of Coolgardie Expiry date: not stated, approval date 20/12/2019
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☒ No ☐	CPS No: CPS 8632/2.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☒ No ☐	Licence/permit No: CAW208289, CAW208291, GWL200665(3) and GWL174427(4)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☒ No ☐	Name: Goldfields Type: Proclaimed Groundwater Area Has Regulatory Services (Water) been consulted? Yes ☐ No ☒ N/A ☐ Regional office: Swan Avon / Goldfields
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☐ No ☐ N/A ☒
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Mining Act 1978* *Dangerous Goods Safety Act 2004* *Radiation Safety Act 1975* (check this)
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	

Is the Premises a known contaminated site under the *Contaminated Sites Act 2003*?	Yes ☐ No ☒	NA