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	L8275/2008/2
Licence Holder	Rox (Murchison) Pty Ltd
ACN	633 617 455
File Number	APP-0027115
Premises	Youanmi Mine Mining Tenements M57/10, M57/51 and M57/135 SANDSTONE WA 6639
Date of Report	11 June 2025
Decision	Revised licence granted

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1. Decision summary

Licence L8275/2008/2 is held by Rox (Murchison) Pty Ltd (Licence Holder) for the Youanmi Mine (the Premises), located at Mining Tenements M57/10, M57/51 and M57/135 in the Shire of Sandstone.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during operation of the Premises. As a result of this assessment, Revised Licence L8275/2008/2 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 13 January 2025, the Licence Holder submitted an application to the department to amend Licence L8275/2008/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Add Kathleen Pit and Rebel Pit as dewatering discharge points;
- Construct and operate Category 6 dewatering infrastructure including pumps and pipelines;
- Increase the design capacity of Category 6 dewatering infrastructure to 2,345,000 tonnes per annum; and
- Replace two groundwater monitoring bores that are no longer serviceable.

The purpose of the amendments is to support dewatering of the Main Pit, United North Pit and underground mine. Mining is proposed to re-commence at the premises in the 2025-2026 financial year.

This amendment is limited only to changes to Category 6 activities from the Existing Licence. No changes to the aspects of the existing Licence relating to Category 63 have been requested by the Licence Holder. Table 1 outlines the proposed changes to the existing Licence.

Table 1: Proposed design capacity changes

Category	Current design capacity	Proposed design capacity	Description of proposed amendment
6	1,480,000 tonnes per annual period.	2,345,000 tonnes per annual period.	Increase design capacity and construct new dewatering infrastructure to facilitate new discharge points at Kathleen Pit and Rebel Pit
63	5,000 tonnes per annual period.	5,000 tonnes per annual period.	N/A

2.2.1 Amendments to dewatering infrastructure and discharge points

The licence holder is planning to re-commence mining at the premises with the development of new exploration declines to establish underground drilling platforms in late 2025. To facilitate these development activities, the existing Main Pit and United North Pit and underground mine workings need to be pumped dry. The licence holder aims to pump this mine water to the existing evaporation ponds (following refurbishment) and subsequently, subject to approval, to Rebel and Kathleen Pits (also referred to as the 'Northern pits').

Dewatering water balance

The current volume of water held within Main Pit, United North Pit and combined underground workings that the licence holder is planning to dewater is about 2,825,100 kL (AQ2 2024), which exceeds the existing annual licensed capacity provided by discharging into the evaporation ponds (see Table 2). The addition of Rebel and Kathleen pits as dewatering discharge points will add 865,000 kL capacity in the first year, which takes into consideration 126,000 kL removed via evaporation per year and maintenance of a 6 m freeboard from the pit crests. The licence holder is seeking an increase in Category 6 dewater discharge capacity to 2,345,000 kL to accommodate discharge into the Rebel and Kathleen pits (refer to Table 2). Dewatering volumes are anticipated to reduce to maintenance levels after the first year, once dewatering of the pits is complete and access is gained to underground developments.

Table 2 Summary of proposed Category 6 dewater discharge capacity

	Rebel Pit		Kathleen Pit	
	Elevation (mAHD)	**Volume (m3)**	**Elevation (mAHD)**	**Volume (m3)**
Pit crest level	466	446,000	468	619,330
Current water level	432	-4,014	431	-39,428
Maximum fill	460	304,865	462	477,642
Available capacity	N/A	300,850	N/A	438,200
Evaporation (annual)	N/A	62,000	N/A	64,700
Net annual capacity	N/A	362,850	N/A	502,000
Total combined pit capacity (first year)	N/A	N/A	N/A	865,000
Existing licensed capacity (evaporation ponds)	N/A	N/A	N/A	1,480,000
Total requested capacity (evaporation ponds and Northern Pits)	N/A	N/A	N/A	2,345,000

Water quality

Water in the source pits and underground mine is typically more saline than pit water in the proposed receiving pits. Groundwater salinity measured in mine site bores ranges from around 6,000 to 8,000 mg/L total dissolved solids (TDS). Salinity generally increases with depth and salinities of around 120,000 mg/L TDS were measured in deep (~670 m depth) underground workings. Pit water within Main Pit is saline with a recorded concentration of 39,800 mg/L TDS at 10 m depth and 64,000 mg/L TDS at 40m depth, while United North Pit has had a reading of 2,620mg/L TDS (Rockwater 2022).

The salinity of the receiving Northern pits is marginal to brackish, with a concentration of 1,290 mg/L TDS recorded in Rebel Pit and 1,375mg/L TDS recorded in Kathleen Pit.

Proposed infrastructure

The pumping system to dewater Main Pit, United North Pit and the existing underground developments will comprise a floating, pontoon-style pump powered by generators on the surface. Once the pits are dry, dewatering will continue from the existing flooded underground voids via dedicated pumping stations to dewater the Youanmi Deeps resource.

High density polyethylene (HDPE) pipelines are proposed to be installed either up the pit access ramp or down the pit wall to a fabricated distribution manifold allowing water to be split between the evaporation ponds and to the Northern pits. Additional cut-off valves will be installed to control discharge to the two separate Northern pits. Pipelines will be fitted with flow meters and control valves on each distribution leg to measure and control water flow.

Pipelines will be fully bunded to contain leaks or spills, directing water back to the pit, to the evaporation ponds or to collection sumps at strategic low points to contain any spilt water. A telemetric system will be installed to automatically turn off the pump if a leak is detected. Collection sumps on the pipeline routes will be sized to contain the maximum volume of water able to be pumped between a leak occurring and it being detected and the pump cutting out.

The construction timeframe for the proposed Category 6 infrastructure is about four weeks. Figure 1 shows the layout of the proposed infrastructure and activities.

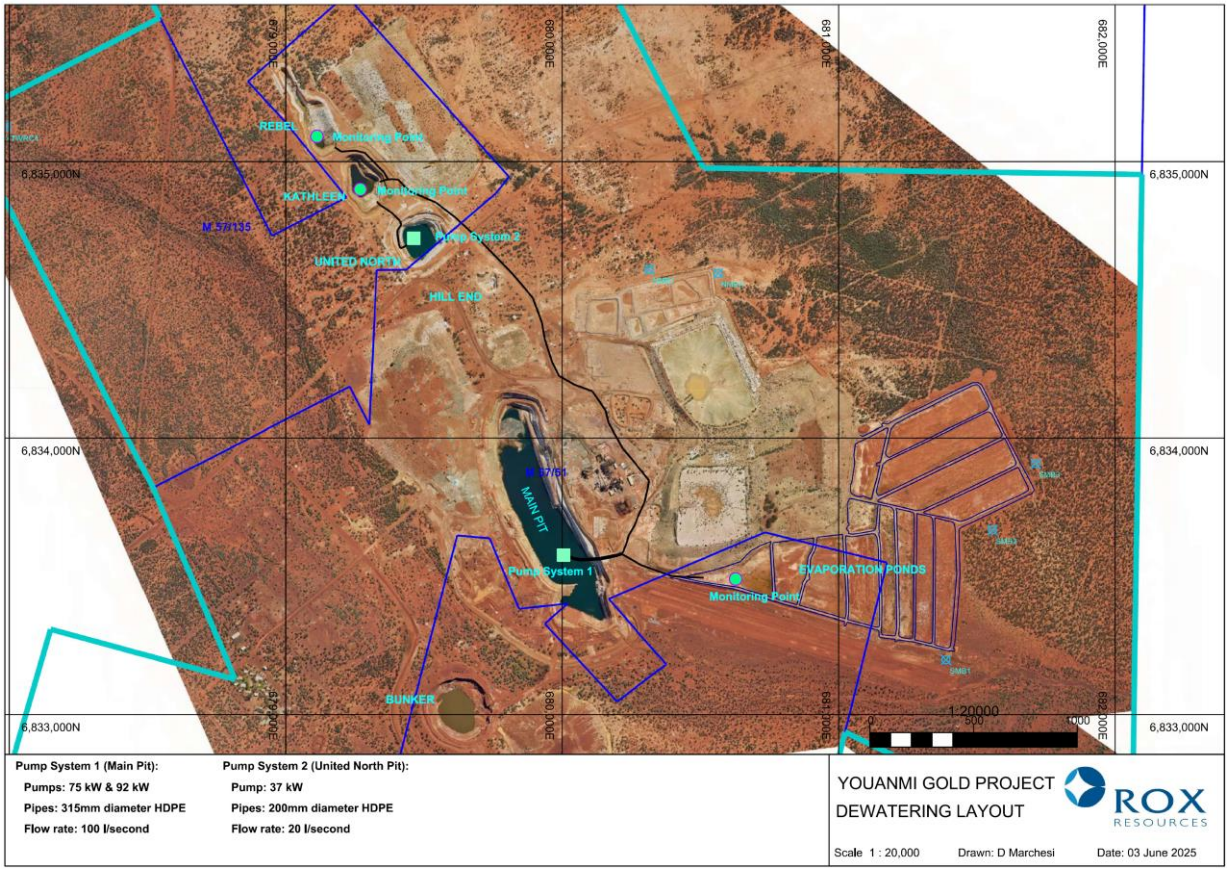

Figure 1 Map of Main Pit dewatering infrastructure and discharge water quality monitoring points

2.2.2 Amendments to groundwater monitoring infrastructure

Two of the bores specified in Table 9 of the existing licence, 94TWRC1 and 94TWRC2, are unserviceable given they are often dry or have low water levels. The licence holder therefore proposes to replace these two bores with the nearby bore 95TWRC4, which is closer to the Northern pits, as well as adding Bunker Bore, which lies adjacent Bunker Pit south of Main Pit.

The licence holder has also proposed adding Rebel Bore to the licence given it is immediately adjacent to Rebel Pit and provides an ideal monitoring point to assist management of potential impacts from dewatering into Rebel and Kathleen pits. Although not required as part of the licence conditions, the licence holder advises that they have routinely monitored 95TWRC4, Bunker bore and Rebel bore since June 2022.

3. Seepage modelling

A hydrogeological assessment report (AQ2 2024) was submitted to support the application that included analytical modelling to predict groundwater mounding around Kathleen and Rebel pits from the proposed discharge of mine dewater into the pits. The assessment found that by maintaining a 5 m freeboard from pit crest, discharge to Rebel and Kathleen pits will not result in the local water table rising above 6 m below the ground surface. In this scenario, the water table would rise to 9 m bgl at 1 m from the edge of the pit and steadily decline to a depth of 16 m bgl at 50 m from the pit edge.

The assessment also identified that discharge to the pits will result in some lateral migration of saline water into local shallow brackish aquifers. Seepage is predicted to migrate less than 100 m from the pits. The assessment concludes that this will have no significant impact on the local aquifers or groundwater users given:

- There are no local groundwater users in the predicted impact area;
- Following cessation of discharge to the pits, pit lake water levels will decline over time and the pits will revert to being groundwater sinks. Saline water that migrated into the local shallow aquifers will largely flow back to the pits; and
- A groundwater capture zone will develop around the planned Main Pit and underground mine during dewatering. This capture zone will extend beyond the northern Kathleen and Revel pits. As such, any seepage not intercepted by the northern pits once they revert to groundwater sinks will be intercepted by the cone of depression in the regional groundwater system around the Main Pit and underground mine.

The hydrogeological assessment report made the conclusion that impacts to native vegetation from mounding are unlikely due to the groundwater mounding model results and recommended that the water level in Rebel and Kathleen Pits does not go higher than 6 m from the pit crest.

4. 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 2020a).

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.

4.1 Source-pathways and receptors

4.1.1 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 3 below.

Table 3 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 3: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	Construction of new pipelines and pumping infrastructure between Main Pit, United North pit and underground developments to Kathleen and Rebel pits	Air/windborne pathway	• Dust suppression on roads and open areas using water carts - to maintain a damp running surface and prevent dust lift-off • Restricting movement of heavy vehicles to established roads and speed limits imposed for all vehicles - to reduce dust-generation
Mine pit water (comprising rainfall and groundwater)	Transfer of abstracted pit water from Main Pit, United North pit and underground developments to Kathleen and Rebel pits via HDPE pipelines	Unplanned leaks causing runoff and infiltration	• Bunded pipelines to contain a potential leak or spill • A telemetric system will be installed on the dewatering pipelines to automatically turn off the pump if a leak is detected. Collection sumps on the pipeline route will be sized to contain the maximum volume of water able to be pumped between a leak occurring and it being detected and the pump cutting out (Redundancy Time) • Pipelines will be inspected daily during operation • Leaks or spills will be controlled and contained immediately on detection, followed by clean up and remediation of impacted area as soon as possible Existing licence controls: • The first 200 m of pipeline, leaks are to be directed back to the mine pit • Directs water back to the main pit, to the evaporation ponds or to collection sumps at strategic low points to contain any spilt water
	Discharge of mine dewater into Kathleen and Rebel pits	Overtopping of pits causing runoff and infiltration	• Maintaining pit lake water levels below 6 m below ground level (bgl) • Installing level-indicators on the pit

Emission	Sources	Potential pathways	Proposed controls
		Seepage through pit base and walls causing impacted groundwater migration and mounding	ramps • Installing pit-lake level sensors and a telemetric system to automatically turn off the pump once the level in the pit/s reaches 6 mbgl; • Inspecting daily during operation, with pumping volumes and pit-lake levels recorded on the Inspection Log, to ensure safe and compliant water levels are maintained; and Existing licence controls: • Quarterly monitoring of groundwater bores • Pipelines fitted with flow meters

4.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020a), 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 4 below provides a summary of potential environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020b)).

Table 4: Sensitive human and environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Native vegetation Mulga shrubland with emergent Eucalyptus spp, and also a Mulga creek line (NVS 2022). No TEC or PECs have been recorded within or near the premises One Priority Flora species was recorded in a survey within the premises - *Calytrix hislopii* (P3)	Surrounding Kathleen and Rebel pits and proposed pipeline route. Six *Calytrix hislopii* (P3) populations with a total of 139 plants have been recorded about 740 meters northwest of the landfill.
Underlying groundwater (non-potable purposes) The main local aquifer in the immediate mine area is a fractured rock aquifer system associated with the northwest trending mineralised shear zones that host the Youanmi orebodies. Monitoring data from 2016 - 2023 indicates salinity generally ranges from 1,000 – 10,000 mg/L in bores around the evaporation ponds (SMB2, SMB3, NMB1 and NMB2). Bore SMB1	Monitoring data from 2016 - 2023 indicates depth to groundwater in bores west of Kathleen and Rebel pits is typically 26-27 m bgl (bores 94TWRC1 (Town Well), 94TWRC2 and 95TWRC2). Depth to groundwater in bores around the evaporation ponds generally ranges from 23 to 30 m bgl (bores SMB1, SMB2, SMB3, NMB1 and NMB2).

on the southern border of the evaporation ponds has had elevated TDS up to 100,000 mg/L but has reduced to around 40,000 mg/L in 2023. The following water quality measurements were reported by Rockwater (2022) at the various locations: • Main Pit - 39,800 mg/L TDS (10m depth) and 64,000 mg/L TDS (40m depth); • United North Pit: 2,620 mg/L TDS; • Rebel Pit: 1,290 mg/L TDS; • Kathleen Pit 1,375 mg/L TDS.	
Surface waters Ephemeral creek system	About 370 m to the west of Kathleen and Rebel pits an ephemeral creek system within a paleochannel can be identified on Geocortex to the southwest of the discharge pits, draining in a southeast direction. This creek likely flows in response to high-rainfall events. This creek and the two alluvial drainages that occur across the mine area drain to the south and then to the east into Lake Noondie, a saline playa about 20 km east of the premises.

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020a) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 4.1. 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 4.1), 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 5.

The Revised Licence L8275/2008/2 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. mine dewatering and Class I inert landfill activities.

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

Table 5. Risk assessment of potential emissions and discharges from the Premises during construction 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								
Construction of new pipelines and pumping infrastructure between Main Pit, United North pit and underground developments to Kathleen and Rebel pits.	Dust	**Pathway:** Air/windborne pathway resulting in deposition on native vegetation **Impact:** Death or decline in health of native flora species	Native vegetation surrounding pipeline route	Refer to Section 4.1.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	N/A
Operation								
Transfer of abstracted pit water from Main Pit, United North pit and underground developments to Kathleen and Rebel pits via HDPE pipelines	Mine pit water (brackish to saline) from Main Pit, United North Pit and underground mine	**Pathway**: Unplanned leaks causing direct discharge to ground, runoff, infiltration and root uptake by native flora species **Impact:** Death or decline in health of native flora species	Native vegetation surrounding pipeline route	Refer to Section 4.1.1	C = Slight L = Possible **Low Risk**	Y	Condition 1 – dewatering pipeline and bunding operational requirements Condition 2- construction requirements for dewatering pipelines and pumps Condition 9 – Authorised emissions added at Kathleen and Rebel pits	N/A
Discharge of mine dewater into Kathleen and Rebel pits		**Pathway**: Overtopping, causing runoff, infiltration and root uptake by native flora species **Impact**: Death or decline in health of native flora species	Native vegetation surrounding Kathleen and Rebel pits Ephemeral creek to the west of the pits	Refer to Section 4.1.1	C = Minor L = Rare **Low Risk**	Y	Condition 1 – Freeboard requirements and level sensors for Kathleen and Rebel pits Condition 2 – Installation of pit level sensors and level indicators in pits and telemetry systems on pumps/pipelines and construction requirements for dewatering pipelines and pumps Condition 13 – Dewatering discharge monitoring includes Kathleen and Rebel pits	N/A
		Pathway: Seepage through pit base and walls, causing changes to groundwater quality (e.g. increased salinity or heavy metals concentrations) and localised mounding of the groundwater table and root uptake by native flora species **Impact**: Death or decline in health of native flora species	Native vegetation surrounding Kathleen and Rebel pits	Refer to Section 4.1.1	C = Minor L = Unlikely **Medium risk**	Y	Condition 1 – Freeboard requirements and level sensors for Kathleen and Rebel pits Condition 2 – Installation of pit level sensors and level indicators Condition 13 – Dewatering discharge monitoring Condition 14 – Standing water level limit in nearby groundwater monitoring bores	N/A The Delegated Officer considers the risk event 'unlikely' with implementation of the licence holder proposed controls, noting that although the discharge is more saline than the receiving pit lake water, a freeboard of 6 mbgl would prevent the water table rising to the vegetation root zone. Once dewatering ceases Kathleen and Rebel pits are predicted to revert to groundwater sinks. Therefore, the Delegated Officer considers the proposed controls to be sufficient to mitigate the risk to an acceptable level.

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

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

4.3 Assessment of groundwater monitoring infrastructure amendments

The licence holder is proposing to replace groundwater monitoring infrastructure as detailed in section 2.2.2. The Delegated Officer has reviewed the location of the proposed replacement bores (95TWRC4 and Rebel bore) and considers their respective locations to be suitable to monitor potential impacts from seepage from the northern pits. The Delegated Officer has also agreed to add the proposed Bunker bore as a groundwater monitoring location near Bunker pit.

5. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website (17/02/2025)	None received	N/A
Licence Holder was provided with draft amendment on 30 May 2025	Applicant waived the 21 day consultation period on the 4 June 2025.	N/A

6. 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.

6.1 Summary of amendments

Table 7 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 7: Summary of licence amendments

Condition no.	Proposed amendments
1	Inclusion of new freeboard controls to mitigate overtopping and groundwater mounding from dewater discharge into Kathleen and Rebel pits
2	Inclusion of construction requirements for dewatering pipelines and discharge points (Kathleen and Rebel pits) Consolidation of existing pipeline bunding and telemetry requirements into 'Dewatering pipeline; infrastructure requirements
8	Increased designed capacity limit to 2,345,000 tonnes per annual period
9	Added Kathleen and Rebel pits as authorised emission points Added clarification that only seepage from the evaporation ponds is to be

	pumped back into the evaporation ponds
13	Added dewater discharge quality and flow rate monitoring points at Kathleen and Rebel pits
14	Inclusion of replacement groundwater monitoring bores
Schedule 1	Added Figure 5 – New dewatering infrastructure layout

References

1. AQ2 2024, *Technical Memorandum - Youanmi Gold Project - Northern Pits Hydrogeological Assessment*, prepared for Dan Marchesi at Rox Resources.
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020b, *Guideline: Environmental Siting*, Perth, Western Australia.
5. Native Vegetation Solutions 2022, *Targeted Threatened Flora Survey of the Grace Mining Proposal Area*.
6. Rockwater 2022, *Hydrological assessment of Mining and Infrastructure Areas – Youanmi Gold Mine,* report prepared for Rox Resources.