Amendment Report

Application for Licence Amendment

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

Licence Number	L7750/2001/10
Licence Holder	Evolution Mining (Mungari) Pty Ltd
ACN	002 124 745
File Number	2011/009482-1~7
Premises	Mungari Gold Project COOLGARDIE WA 6429 Legal description – Mining tenements M15/829 andM15/830 As defined by the Premises maps attached to the Revised Licence
Date of Report	6/10/2023
Proposed Decision	Revised licence granted

Melissa Chamberlain

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Melissa Chamberlain
A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES

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

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1. Decision summary

Licence L7750/2001/10 is held by Evolution Mining Pty Ltd (Licence Holder) for the Mungari Gold Project (the Premises), located at Mining tenements M15/829, M15/830, M15/1741, M15/1408, M15/1287, M15/688, L15/228, L15/246, L15/227 and M15/1407.

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 L7750/2001/10 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 Amendment summary

On 12 June 2023, the Licence Holder submitted an application to the department to amend Licence L7750/2001/10 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Operation of Tailings Storage Facility (TSF) Cell 3 Stage 2, constructed under works approval W6364/2020/1.

This amendment is limited only to changes to Category 5 activities from the Existing Licence. No changes to the aspects of the existing Licence relating to Category 6, 12 and 89 have been requested by the Licence Holder.

The Licence Holder operates the Mungari Gold Operation (MGO) which mines ore from one open pit (White Foil) and an underground mine (Frogs Leg).

TSF Cell 3 Stage 2 has been constructed adjacent to and to the west of TSF 1 and 2 and covers a total footprint of 118 hectares (ha). The embankment height for stage 2 has been constructed to a height of 349.1mRL with an operating height of 348.8mRL.

2.3 Compliance with W6364/2020/1

Part of The Department's assessment will include determining if the works have been completed in accordance with the conditions of Works Approval W6364/2020/1. The below Table 1: **Previously Provided Compliance Documents for Works Approval W6364/2020/1**is a summary of previously provided compliance documents for the Works. At the time of submission for this amendment the Time limited Operations authorising deposition of tailings to the TSF Cell 3 Stage 2 had not commenced.

Table 1: Previously Provided Compliance Documents for Works Approval W6364/2020/1

Condition(s)	Compliance Document	Compliant?
8 and 9	Well Construction Report – TSF Monitoring Bores 8 to 15 submitted October 2020	Yes
1 and 4	Critical Containment Infrastructure Report – TSF Cell 3 submitted May 2021	Yes

Condition(s)	Compliance Document	Compliant?
3 and 6	Environmental Compliance Report – TSF Cell 3 submitted June 2021	Yes
18 and 19	Time Limited Operations Compliance Report – TSF Cell 3 submitted December 2021	Yes
1 and 4	Critical Containment Infrastructure Report – TSF Cell 3 Stage 2 submitted January 2023.	Yes

2.4 Mining Proposal 85142

Mining Proposal 85142 was granted by the Department of Mines, Industry Regulation and Safety (DMIRS) under the *Mining Act 1978* on 15 July 2020 for the construction and operation of the TSF. TSF Cell 3 and 4 will cover a total footprint area of 197.1 ha. The anticipated tailings storage capacity of the new TSF is 25 million tonnes (Mt). Construction will be undertaken in ten stages over a ten-year period. Each stage will comprise an embankment lift, providing an annual tailings storage capacity of approximately 2.5Mt.

2.5 Aboriginal Heritage

The Project Area is located within the Native Title determination boundaries of the *Maduwongga* people (Tribunal file no. WC2017/001) and the *Marlinyu Ghoorlie* people (Tribunal file no. WC2017/007), granted under the *Native Title Act 1993* (Native Title Act) (National Native Title Tribunal, 2019). The Licence Holder maintains ongoing stakeholder engagement with these groups where relevant in relation to all current and future Projects in the area.

Several heritage sites are recorded on the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System. Recorded sites are shown in Figure 3 below.

2.6 Incident and complaints

Licence L7750/2001/10 allows treated water from wash pad sumps to be used for dust suppression or reused as wash down water within the Prescribed Premises Boundary. The Licence Holder utilises two oily water separators, located at White Foil and Frog's Leg site. At the time of this amendment, only the water from Frog's Leg oily water separator is used for dust suppression once diluted with groundwater from a nearby standpipe (Laatz, 2022).

As the Frog's Leg wash pad wastewater is utilised for dust suppression, additional treatment is undertaken to assist improving water quality, including:

- an oil tube skimmer to remove floating surface oils prior to reaching the separator;
- trailing addition of demulsifying agent 'Hybind 2002' to improve separator performance;
- regular separator servicing by OEM Ultraspin;
- contaminated wastewater tanks were replaced on 20 May 2021; and
- treated water is diluted with groundwater prior to use as dust suppression (Laatz, 2022).

As part of the 2021 Licence amendment, the Licence Holder requested the removal of the Total Recoverable Hydrocarbon (TRH) limit of 30mg/L as was originally specified in the Licence. At the time, the Licence Holder submitted historical data for TRH within water utilised for dust suppression on site, with calculations based on wastewater TRH values once diluted with groundwater prior to being used for dust suppression.

To allow for the removal of the limit form the licence, conditions were added to the licence to ensure this dilution factor is maintained during operations. 1,200L of wastewater is required to be diluted in a 20,000L water tank (1:15) (2021 WA).

Data from the 2022 and 2021 Annual Environmental Reports indicates the most recent results and are presented in Figure 1**: TRH Results for Oil Water Separators 2022 (AER)** and Figure 2**: TRH Results for Oil Water Separators 2021 (AER)** below.

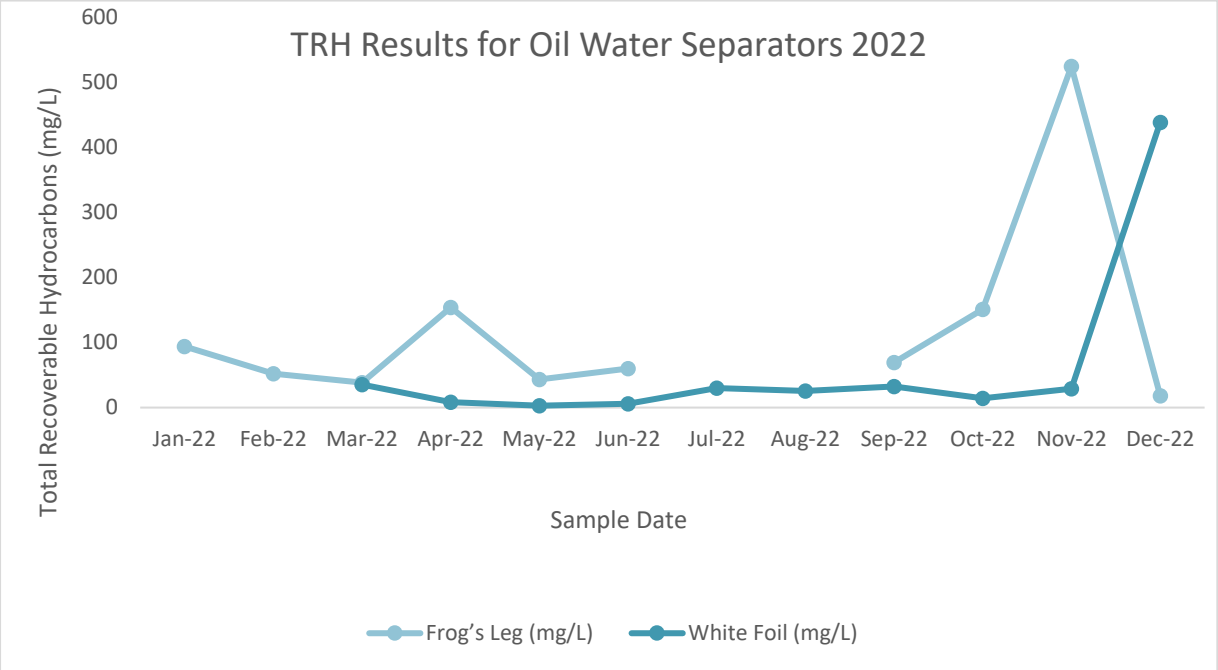

Figure 1: TRH Results for Oil Water Separators 2022 (AER)

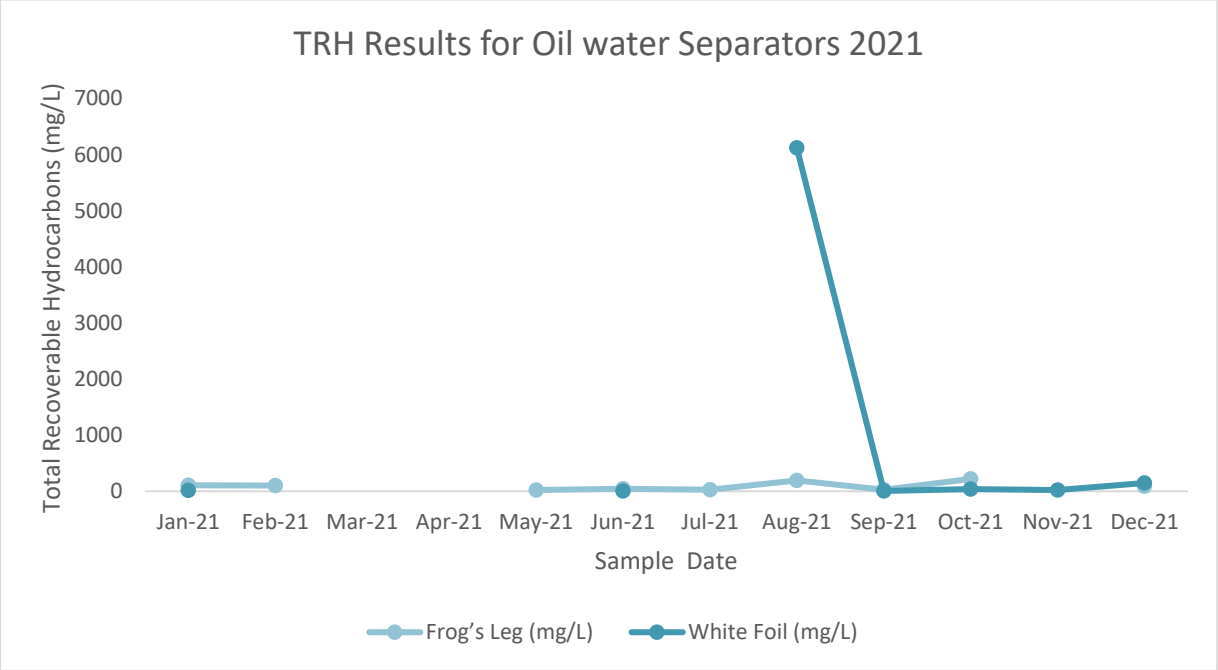

Figure 2: TRH Results for Oil Water Separators 2021 (AER)

These Figures show significant exceedances in September 2021 and October to December 2022. This water was utilised for dust suppression within the Prescribed Premises Boundary. White Foil oil/water separator wastewater is disposed of offsite by a licensed controlled waste contractor.

In February 2022 the Department sent notification to the Licence Holder inquiring about potential concerns regarding discharge of oily water for dust suppression. In response, the Licence Holder undertook an internal review (Laatz, 2022). This review confirmed the site is within its compliance requirements. No further action was taken by the Department.

Whilst the dilution was conditioned in the 2021 Licence amendment, no upper limit on the diluted groundwater (discharge water) was included. Due to the high levels of THR recorded since the 2021 amendment the Department believes there is potential for increased risk to the environment. In accordance with *Water Quality Protection Note 68* (WQPN 68) (DWER 2013), as is standard practice for the discharge of treated wastewater to the environment, the Delegated Officer will take the opportunity to affect a DWER initiated amendment and will place an upper limit on the diluted wastewater to be discharged as per WQPN 68. Existing licence conditions 27, 28 and 29 specify annual reporting and non-compliance reporting requirements, including notification and investigation of non-compliance with any limits specified on the licence.

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

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Operation			
Tailings and contaminated water	TSF Cell 3 Stage 2	Seepage through base and embankments of TSF to soil and groundwater	<u>Existing controls under Works Approval W6364/2020/1</u> • Low permeability (10^{-7} to 10^{-9} m/s) TSF base and embankments; • Upstream cut-off trenches; • Underdrainage basin collection system; • Three toe-drains along the upstream toe of the perimeter embankment; • Daily inspection of TSF, decant system, underdrainage, toe-drains, and seepage trench; and • Monitoring of TSF embankments,

Emission	Sources	Potential pathways	Proposed controls
			groundwater bores, TSF basin, standpipe piezometers and vibrating-wire piezometers (VWPs). <u>Existing controls under L7750/2001/1</u> • Licence Holder must manage TSF Cells such that a seepage collection and recovery system will be implemented should seepage occur; and • must maintain an annual water balance for each TSF including seepage recovery volumes. <u>No new controls proposed as part of this Licence amendment</u>.
	TSF Cell 3 Stage 2	Overtopping of TSF and direct discharge to land	<u>Existing controls under Works Approval W6364/2020/1</u> Sufficient stormwater storage capacity to accommodate all design storm events including Probable Maximum Precipitation (PMP). <u>Existing controls under L7750/2001/1</u> • The Licence Holder must manage TSF Cell 3 such that a minimum total freeboard of 500 mm or a 1 in 100 year / 72-hour storm event is maintained; • must ensure methods of operation minimize the likelihood of erosion of the embankment by wave action; and • Perform daily inspections of TSF embankment freeboard. <u>No new controls proposed as part of this Licence amendment.</u>
Tailings and contaminated water	Tailings and Decant Return Pipeline Corridor (TDRT)	Pipeline burst or leak and direct discharge to land	<u>Existing controls under Works Approval W6364/2020/1</u> • Pipelines constructed in containment trench. • Telemetered flow meters at process plant and at toe of TSF embankment. • Daily inspections of pipeline integrity. <u>Existing controls under L7750/2001/1</u> • Tailings pipeline required to be equipped with either: a) telemetry leak detect alarms and/or

Emission	Sources	Potential pathways	Proposed controls
			b) automatic cut-outs; and/or c) provide secondary containment infrastructure. <u>No new controls proposed as part of this Licence amendment.</u>

3.1.2 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 3 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)). The closest town of Kalgoorlie - Boulder is located approximately 18 km east of TSF Cell 3. Due to the distance, it will not be considered as part this risk assessment.

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from activity / prescribed premises
Aboriginal Heritage	10 reported heritage sies within 3km of the TSF Cell 3. Sites include scattered artifacts, mythological and ceremonial places. (DPLH Heritage register).
Environmental receptors	**Distance from activity / prescribed premises**
Inland water bodies	• Un-named salt lake - 0.5 km south • West Lake - 0.7 km west • Cattle Swamp - 2.1 km south • Kurrawan Lake - 1.5 km south • Kopai Lake - 2.2 km east • Greta Lake - 3.1 km northeast • Kurrawang White Lake - 5.8 km northeast
Priority flora	<u>Within 3km of TSF Cell 3</u> • *Calandrinia lefroyensis* – P1 • *Allocasuarina eriochlamys* subsp. *Grossa* - P3 • *Notisia intonsa* – P3 <u>Identified within the surrounding vegetation types</u> • *Eremophila praecox* – P1
Remnant native vegetation	<u>Four vegetation zones identified within the Premises:</u>

	• Mixed Eucalyptus Woodlands over sclerophyll shrublands. • *Eucalyptus Salubris* woodlands. • *Casuarina pauper* over sclerophyll shurblands. • *Eucalyptus oleosa* thicket over sclerophyll shrublands. No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) have been recorded in the Premises and none are located within 3 km of the premises.
Priority fauna	<u>Recorded sightings within Licence Premises</u> • *Leipoa ocellate* – malleefowl • *Tringa nebularia* common greenshank – migratory
Goldfields Groundwater area	<u>Groundwater depth</u> Monitoring results provided in the 2022 Annual Environmental Report (Evolution Mining, 2022) show that groundwater levels below TSF Cell 3 range from approximately 7 – 18 meters below ground level (mbgl). <u>Groundwater quality</u> Hypersaline with values across Mungari Gold Operations ranging 150,000 mg/L to 250,000 mg/L TDS <u>Groundwater Users</u> No nearby groundwater users within a 10 km radius.

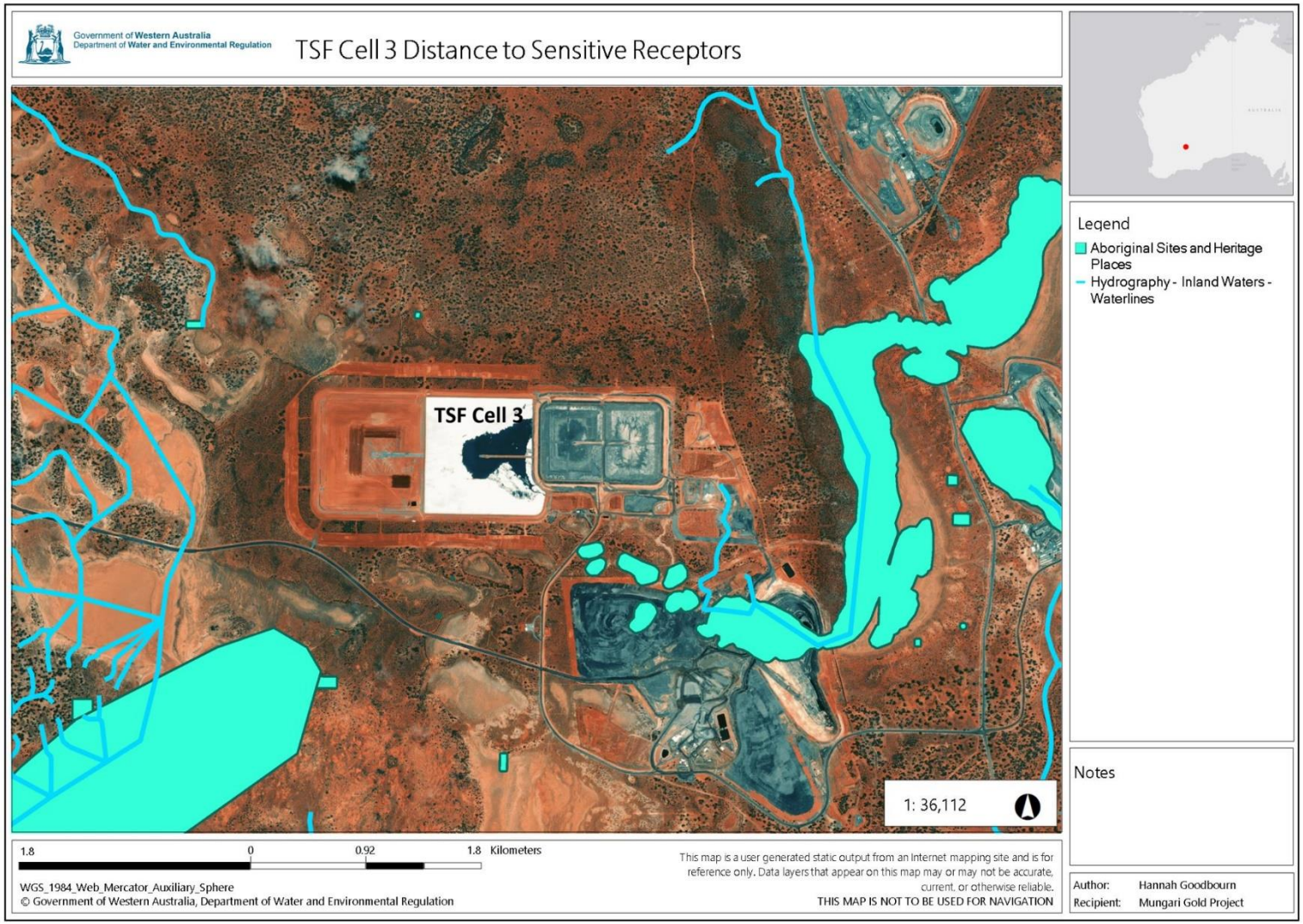

Figure 3: Distance to sensitive receptors

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 incomplete 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 4.

The Revised Licence L7750/2001/10 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises.

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

Table 4: Risk assessment of potential emissions and discharges from the Premises operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation								
Deposition and storage of tailings in TSF 3 Stage 2	Contaminated water/leachate	Seepage through base and embankments of TSF causing impacts to groundwater quality	Groundwater	Refer to Section 3.1.1	C = Moderate L = Possible **Medium risk**	Yes	<u>Existing conditions under L7750/2001/10</u> Condition 3 – containment infrastructure requirements Condition 5 – seepage recovery Condition 21 – monitoring of ambient groundwater quality Condition 22 – annual vegetation assessment <u>Updated existing</u> Condition 8 - to include TSF Cell 3 stage 2 operating heights.	See detailed risk assessment in section 3.3 below
		Seepage through base and embankments of TSF creating groundwater mounding and flow causing impacts to surface water quality and health of native vegetation	Surface water features (incl. salt lakes) Native vegetation					

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Deposition and storage of tailings in TSF 3 Stage 2	Tailings	Overtopping of TSF cells causing impacts to surface water quality, health of native vegetation and localised soil contamination	Soils Surface water features (incl. salt lakes) Native vegetation	Refer to section 3.1.1	C = Major L = Unlikely **Medium risk**	Yes	Existing conditions under L7750/2001/10 Condition 3 – containment infrastructure requirements Condition 4 – freeboard requirements Condition 6 – inspection of freeboard	N/A
Tailings and Decant Return Pipeline Corridor (TDRT)	Tailings and contaminated water	Pipeline burst or leak causing impacts to surface water quality, health of native vegetation and localised soil contamination	Soils Surface water features (incl. salt lakes) Native vegetation	Refer to section 3.1.1	C = Moderate L = Possible **Medium Risk**	Yes	Existing conditions under L7750/2001/10 Condition 1 – pipeline requirements (i.e., bunding and telemetry) Condition 6 - daily inspection of pipelines for integrity	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 for seepage

3.3.1 Summary of risk

This detailed risk assessment considers the potential for an increase in seepage of tailings water containing salts, enriched metals / metalloids and overland runoff of salts, metals / metalloids from disposal of tailings into TSF Cell 3 following the Stage 2 embankment raise.

Seepage of contaminated water through the base and embankments of Cell 3 may result in groundwater mounding around Cell 3 which could lead to decline in health or death of surrounding vegetation due to hypersaline water migrating into root zones. This may result in subsequent loss of transpiration drawdown, with potential to extend duration of high-water table conditions during which surface evaporation and accumulation of salts can occur over an extended period of time leading to surface scalding.

3.3.2 Source

Characterisation of Tailings to be deposited into TSF Cell 3

Chemical

Tailings are sourced from the Mungari Mill, which processes gold ore from the Frog's Leg underground mine and the White Foil open pit.

The tailings are made up of hypersaline water with TDS values recorded between 163,599 TDS from Frogs Leg tailings material and 171,448 TDS from White Foil tailings material (Talis, 2020). Arsenic (<0.052 mg/L), chloride (97,300 mg/L) and sulphate (3,450 mg/L) are highest concentration of chemical elements to be deposited into the TSF (Knight Piésold, 2013). Tailings characteristics are listed in Appendix 2: Tailings characteristics.

Tailings material is generally Non-Acid Forming, with geochemical testing indicating negligible acid producing potential and high acid buffering capacity (Talis, 2020). Net acid generating pH levels were pH 8.95 recorded from Frog's Leg tailings and pH 9.4 from White Foil tailings, above the pH 4.5 threshold considered potentially acid forming (Talis 2020). Total Sulphur values are high at 1.85% from Frog's Leg tailings and 1.4% from White Foil tailings.

Physical

Tailings from the Mungari Mill have a target solids content of 42-47% w/w and are classified as silty clay loam, non-plastic, grey and fine grained (Soilwater Consultants 2019). The tailings will be pumped into the TSF through multiple spigot discharge pipes which will systematically push the supernatant pond towards the decant inlets.

Estimated seepage

As part of Works Approval W6364/2020/1 Knight Piésold (2000) predicted a minor amount of seepage is likely to occur through the basin of the TSF. The whole TSF design is expected to produce seepage at a maximum rate of ~0.8 kiloliters (kL) per day with the operational toe drain and the pond is maintained according to the TSF Operating Manual (Knight Piésold, 2020).

Seepage will initially flow semiradial away from the TSF before becoming influenced by the regional hydraulic gradients and flow southeast towards the local surface water drainages and then towards the White Foil pit. The seepage flow pathway is presented in Appendix 3: Seepage Flow pathway

3.3.3 Pathway

Hydrogeology

TSF Cell 3 lies between the Kunanalling palaeochannel in the north and the Bonnie Vale palaeochannel in the south, which both merge in the northeast to form the Gidji/Kunanalling palaeochannel, which adjoins the Black Flag palaeochannel to form the Yindarlgooda North palaeochannel (Talis, 2020).

Weathered profiles in the region are comprised of saprolite, generally forming low permeability fractured rock aquifers. Aquifers of higher permeability occasionally exist at the transition zone between saprolite and fresh rock. Groundwater recharge occurs primarily through up-flowing hydraulic gradient from underlying aquifers. Recharge of the bedrock aquifer zones typically occur where bedrock outcrops intercept surface drainage areas (Talis, 2020).

Groundwater levels

Pre-mining groundwater monitoring data suggests that the shallow water table existed between 7.7 to 10 meters below ground level (mbgl) with a deeper groundwater level ranging from 13.6 to 17.8 mbgl (Talis, 2020). Groundwater mounding has occurred since tailings began being deposited.

Standing Water Levels (SWLs) around the TSF Cell 3 have been recorded since the beginning of 2022. Water levels ranged from approximately 8 -14.5 mbgl and is summarised in Figure 4:**: TSF Cell 3 and 4 Standing Water Levels**. Since commissioning, SWLs have remained stable surrounding TSF Cell 3 with some bores recording a slight decrease (Evolution Mining, 2023).

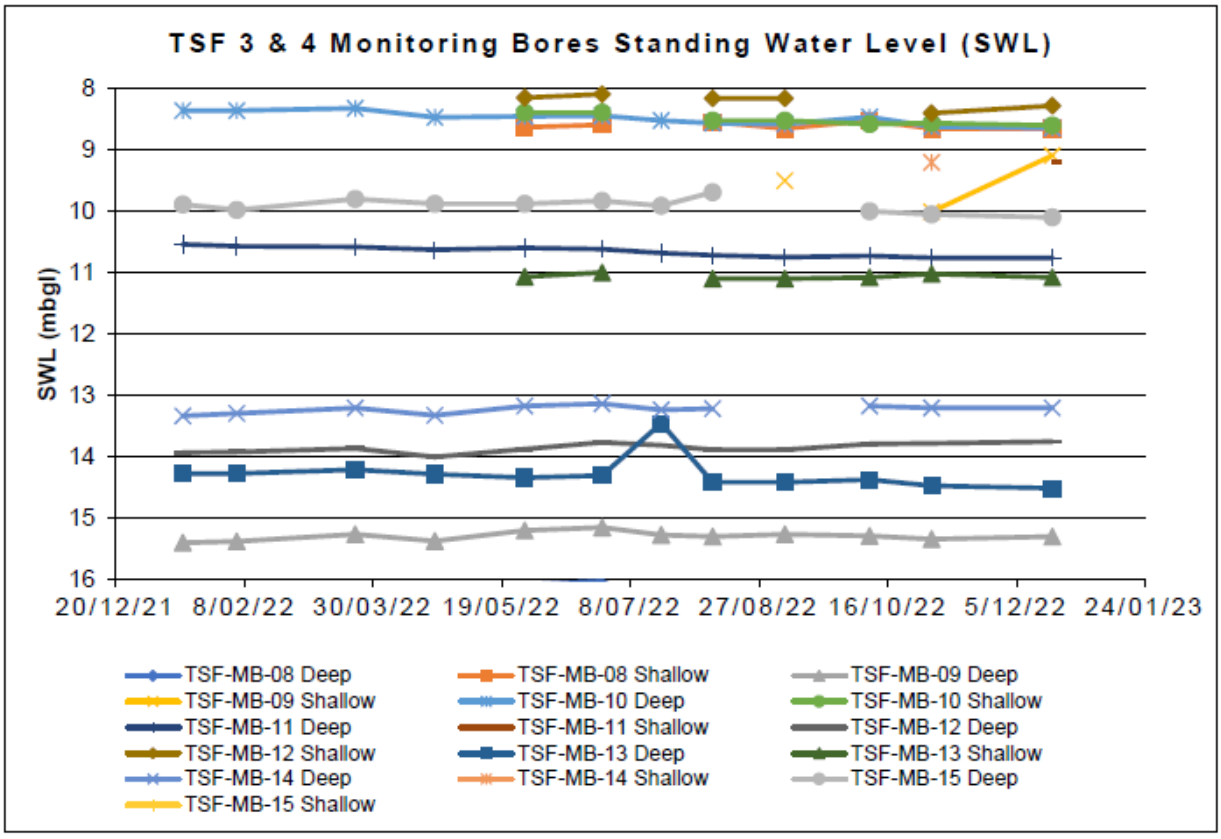

Figure 4: TSF Cell 3 and 4 Standing Water Levels

Groundwater quality

Since commissioning of TSF Cell 3, groundwater TDS levels have been within the average range of 50,000 mg/L – 150,000 mg/L with the 2022 period reporting between 43,440 mg/L – 148,984 mg/L and 2021 reporting 46,679 to 162,300 mg/L (Evolution Mining 2022). Groundwater monitoring results shown in Appendix 4: Groundwater Monitoring Results suggest that while bores experienced some fluctuation, they remain consistent with previous years.

Groundwater in the vicinity of the Mungari TSF is hypersaline, with Electrical Conductivity (EC) ranging between 65,880 – 229,807 µs/cm in 2022 and 17,000 – 236,800 µs/cm in 2021. pH in TSF generally indicated acidic to slightly alkaline ranging 2.69 to 10.33 and 2.48 to 9.47 in 2021. Throughout the 2022 reporting period, WAD CN levels remained below the licensed limit of 0.5 mg/L. All groundwater monitoring results are summarised in Appendix 4: Groundwater Monitoring Results.

Seepage recovery

Mitigation measures to lower the water table mound around the TSF, including low-rate pumping from bores and/or excavation and pumping of a seepage recovery trench, depending on the rise in the water table.

During the 2022 reporting period total seepage of 12,184 kL was captured and pumped back into the four TSFs. 11,920 kL of this total was via the seepage trench and 264 kL through the northern recovery bores (Evolution, 2023).

3.3.4 Seepage management and Recovery

Existing controls under works approval W6364/2020/1

Tailings are currently deposited sub-aerially along the perimeter embankment through HDPE spigot offtakes are installed at 25 m intervals along the distribution pipeline, of which a nominal 6-8 spigots are to be operational during a single deposition cycle that are sequentially opened in a cyclical manner around the facility (Talis 2020). Tailings slurry is transported from the process plant to TSF Cell 3 via a high-density Polyethylene (HDPE) pipeline from the process plant. Tailings slurry is to be delivered to the facility at a solid's concentration of approximately 42-47% (Knight Piésold, 2019).

Under W6364/2020/1 the Licence Holder constructed the TSF Cell 3 to reduce seepage by having:

- Low permeability TSF base and embankments;
- Upstream cut-off trenches;
- Underdrainage basin collection system;
- Three toe-drains along the upstream toe of the perimeter embankment;
- Daily inspection of TSF, decant system, underdrainage, toe-drains, and seepage trench; and
- Monitoring of TSF embankments, groundwater bores, TSF basin, standpipe piezometers and vibrating-wire piezometers (VWPs).

Since TSF construction, a number of additional seepage controls have been implemented. Controls include four seepage recovery bores located at the north side of the TSF, and an intercept trench located at the northwest corner of the TSF that includes a soak well which pumps captured water back to the TSF.

Existing conditions under L7750/2001/10

To prevent mounding of the groundwater from seepage impacting vegetation and surface water features:

- Tailings are only discharged into the TSF Cells which has been constructed with an in-situ compacted soil liner with a hydraulic conductivity of 5 x 10^{-8} m/s (95% UCL) and maximum hydraulic conductivity of 2 x 10^{-7} m/s;
- a SWL of 4 mbgl was applied to groundwater monitoring bores installed around the TSFs These new bores and corresponding limit already exist on the Licence and was added when the licence was amended to include Cell 3 with the most recent amendment;
- The licence holder has been instructed to implement seepage collection and recovery systems when seepage occurs;
- Continuous monitoring of volumes of tailings deposited and recovered from each TSF Cell;
- monthly ambient groundwater monitoring in and investigate results that do not meet any limit specified in the licence; and
- undertake an annual assessment of vegetation within the zone of influence of the TSF.

Department determinations

The addition of the operation of TSF 3 Stage 2 to the Licence is unlikely to pose an increased risk for seepage. Therefore, there is no change in the assessed risk profile for the premises and the existing and proposed seepage controls remain sufficient to mitigate risk associated with the applicant's proposed modification to the basin liner.

Due to the distance between the closest receptors and the TSF Cell 3, the consequence rating for impacts from seepage are considered "Moderate". Groundwater in the vicinity of the TSF is considered shallow, the likelihood is considered as "Possible". The Delegated Officer therefore considers the overall risk rating impacts of seepage is "Moderate".

The following licence conditions will be updated to include the addition of the new stage 2 lift:

- Condition 8, Table 3 - Inclusion of TSF Cell 3 (Stage 3) construction an Operating height.

4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Licence Holder provided draft for comment on 24/08/2023	See Schedule 1.	See Schedule 1.
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal 26/06/2023	N/A	N/A
Department of Planning Land and Heritage (DPLH), advised of proposal 26/06/2023	N/A	N/A
Marlinyu Ghoorlie (Traditional Owners) advised of the proposal on	N/A	N/A

26/06/2023		

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

Table 6 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 6: Summary of licence amendments

Condition no.	Proposed amendments
8	Inclusion of TSF Cell 3 (Stage 3) construction and Operating height.
20	Amended to include a 15mg/L limit on diluted water as per *Water Quality Protection Note 68*

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Evolution Mining (2022), *Annual Environmental Report*. Perth, Western Australia.
5. Evolution Mining (2023), *Annual Environmental Report.* Perth, Western Australia.
6. Knight Piésold Consulting (2019), *Feasibility Study Tailings Storage Faciltiy Cell 3 and Cell 4 Design Report.* East Perth, Western Australia.
7. Knight Piésold Consulting (2023), *Tailings Storage Facility – Cell 3 Stage 2 Construction Report.* East Perth, Western Australia.
8. Laatz, T (2022), *ICMS 64675 Response.* Kundana, Western Australia.
9. Talis Consultants 2020, *Mining Proposal Mungari TSF Expansion: Cells 3 and 4*, Perth, Western Australia.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
-	An amended prescribed premises boundary has been proposed in line with current operations. This change to the premises boundary will exclude the non-operational areas of the MGO, including the Frog's Leg Category 89 Landfill and part of the Frog's Leg Category 12 Screening area. Category 6 Mine Dewatering and part of the Frog's Leg Category 12 Screening area will remain for supporting Frog's Leg closure and rehabilitation activities, as well as other MGO active operations. This prescribed premises boundary amendment will also include Cutters Ridge in anticipation for its future addition into the Licence. Evolution Mining are currently preparing a Works Approval Application for a proposed tailings pipeline and in-pit TSF at Cutters Ridge. A pre-application scoping meeting has been held with DWER to discuss the proposed Works Approval. This prescribed premises boundary amendment will reduce future administration following construction of the proposed infrastructure and subsequent Licence amendment.	The Department requires Premise changes to be submitted as part of another licence amendment as the suggested changes would require further information and assessment which is unable to be carried out at this late stage.
2.6 Incidents and complaints Requests by the Department: • Please provided reason for the exceedance and actions taken to	MGO has utilised two oil-water separators, the O835 Cube Oil Water Separation System and the DOIL Electric Hydrocyclone Oil Separator, located at White Foil and Frog's Leg sites respectively. The oil/water separators enabled the wastewater to be reused for cleaning the bunded wash pad floors and for site wide dust suppression. Only the treated water from the Frog's Leg oil/water separator was utilised for dust suppression, once diluted with groundwater from a nearby standpipe. This activity posed minimal risk to the environment, with it only occurring within the active	While it is noted that Frog's leg is undergoing closure and rehabilitation, the department considers it necessary to maintain the current TRH limit at this time.

Condition	Summary of Licence Holder's comment	Department's response
rectify levels and prevent re-occurrence; • Please include description of process and quality control measures to ensure spike don't reoccur; and • Please confirm if oily water was used for dust suppression / discharged to the environment.	mining area inside the Prescribed Premises Boundary. White Foil oil/water separators' wastewater is disposed of offsite by licensed controlled waste contractor, Veolia. There have been no internal reports or recorded incidents of oily water discharged to the environment at MGO to the Environment Department, or entered within the online incident reporting database INX InControl. Evolution suggests removing the proposed inclusion of a TRH limit from oil water separators, as Frog's Leg has commenced closure and rehabilitation phase including the removal of infrastructure. Additionally, such condition is not consistent with similar Licences in the Goldfields. Evolution will continue to maintain an internal limit of 15 mg/L TRH at the MGO if diluted washbay wastewater used dust suppression use in the future, however, seek to have this condition removed from the Licence.	

Appendix 2: Tailings characteristics

Table 7: Tailings characteristics

Parameter	UoM	Measurement
Aluminium	mg/L	4.06
Arsenic	mg/L	<0.052
Calcium	mg/L	3700
Cadmium	mg/L	<0.0052
Cobalt	mg/L	0.158
Chromium	mg/L	<0.052
Copper	mg/L	0.332
Iron	mg/L	35.7
Potassium	mg/L	624
Magnesium	mg/L	2880
Manganese	mg/L	1.05
Sodium	mg/L	60000
Nickel	mg/L	<0.052
Lead	mg/L	<0.052
Selenium	mg/L	<0.52
Zinc	mg/L	<0.262
Chloride	mg/L	97300
Sulphate	mg/L	3450
WAD CN	mg/L	2.53
Total CN	mg/L	68.7
Bicarbonate Alkalinity as $CaC0_3$	mg/L	63
Electrical Conductivity 25°C	ps/cm	191000
Hydroxide Alkalinity as $CaC0_3$	mg/L	<1
Ionic Balance	%	3.91
Total Alkalinity as CaC03	mg/L	74
Total Anions	meq/L	2820
Total Cations	meq/L	3050
Total Dissolved Solids @180°C	mg/L	198000

Table 8: Mungari TSF Monitoring Bores Quarterly WAD and Total Cyanide

Bore ID	2022 Q3		2022 Q4		2023 Q1		2023 Q2	
	Total Cyanide (mg/L)	WAD Cyanide (mg/L)	Total Cyanide (mg/L)	WAD Cyanide (mg/L)	Total Cyanide (mg/L)	WAD Cyanide (mg/L)	Total Cyanide (mg/L)	WAD Cyanide (mg/L)
TSF-MB-02 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-03 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-03 Shallow	<0.040	<0.040	Dry	Dry	Dry	Dry	Dry	Dry
TSF-MB-04 Deep	0.273	<0.040	0.089	<0.040	0.062	<0.040	<0.040	<0.040
TSF-MB-04 Shallow	0.493	<0.040	Dry	Dry	Dry	Dry	Dry	Dry
TSF-MB-05 Deep	0.65	<0.040	0.711	<0.040	0.078	<0.040	0.837	<0.040
TSF-MB-05 Shallow	0.856	<0.040	0.92	<0.040	0.708	<0.040	1.08	<0.040
TSF-MB-06 Deep	0.797	<0.040	0.808	<0.040	0.224	<0.040	0.128	<0.040
TSF-MB-06 Shallow	0.312	<0.040	0.309	<0.040	Dry	Dry	Dry	Dry
TSF-MB-08 Deep	<0.040	<0.040	<0.040	<0.040	0.917	<0.040	<0.040	<0.040
TSF-MB-09 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-10 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-11 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-12 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-13 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-14 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-14 Shallow	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
TSF-MB-15 Deep	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040

Appendix 3: Seepage Flow pathway

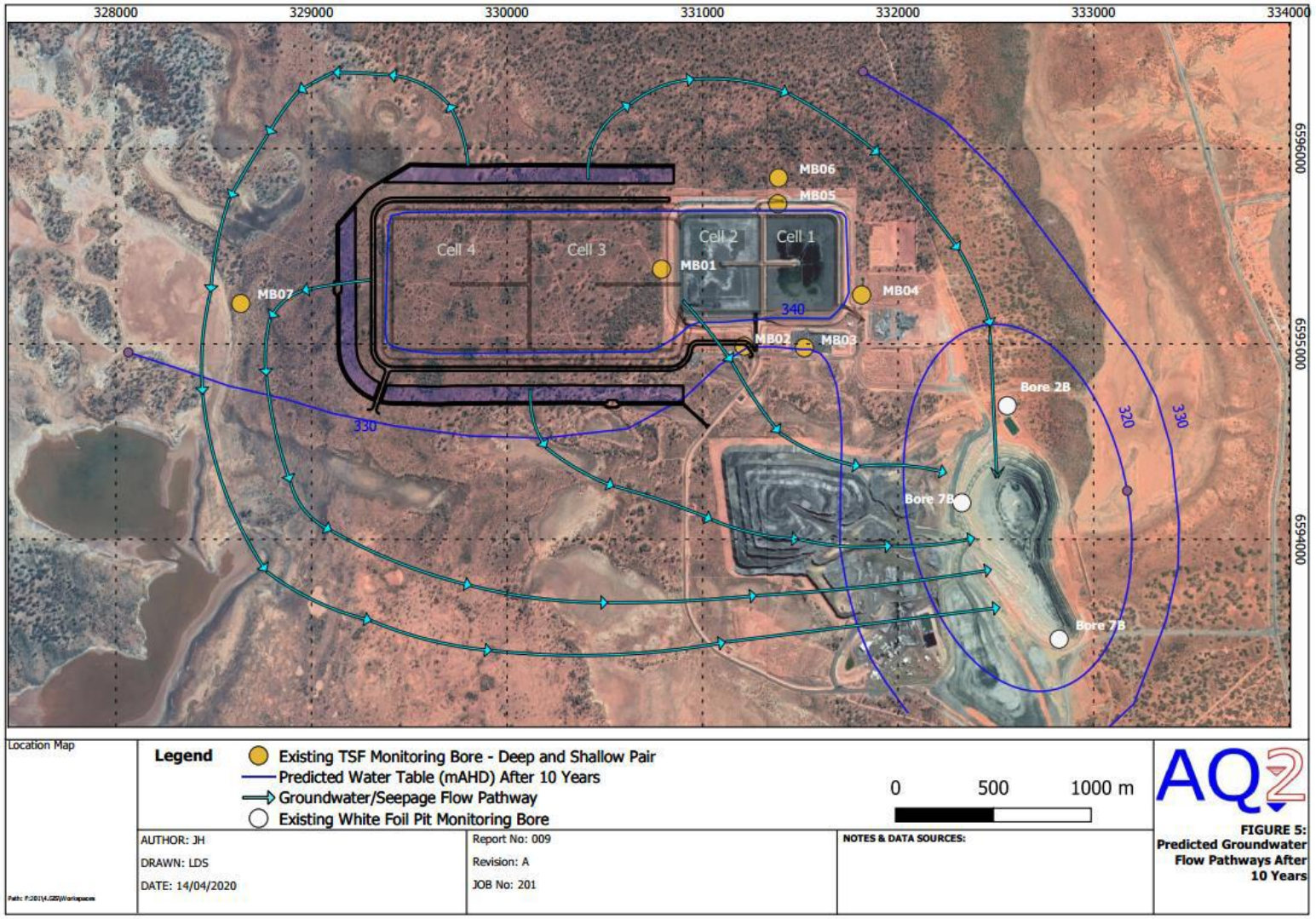

Figure 5: Seepage flow pathway for Life of Mine

Appendix 4: Groundwater Monitoring Results

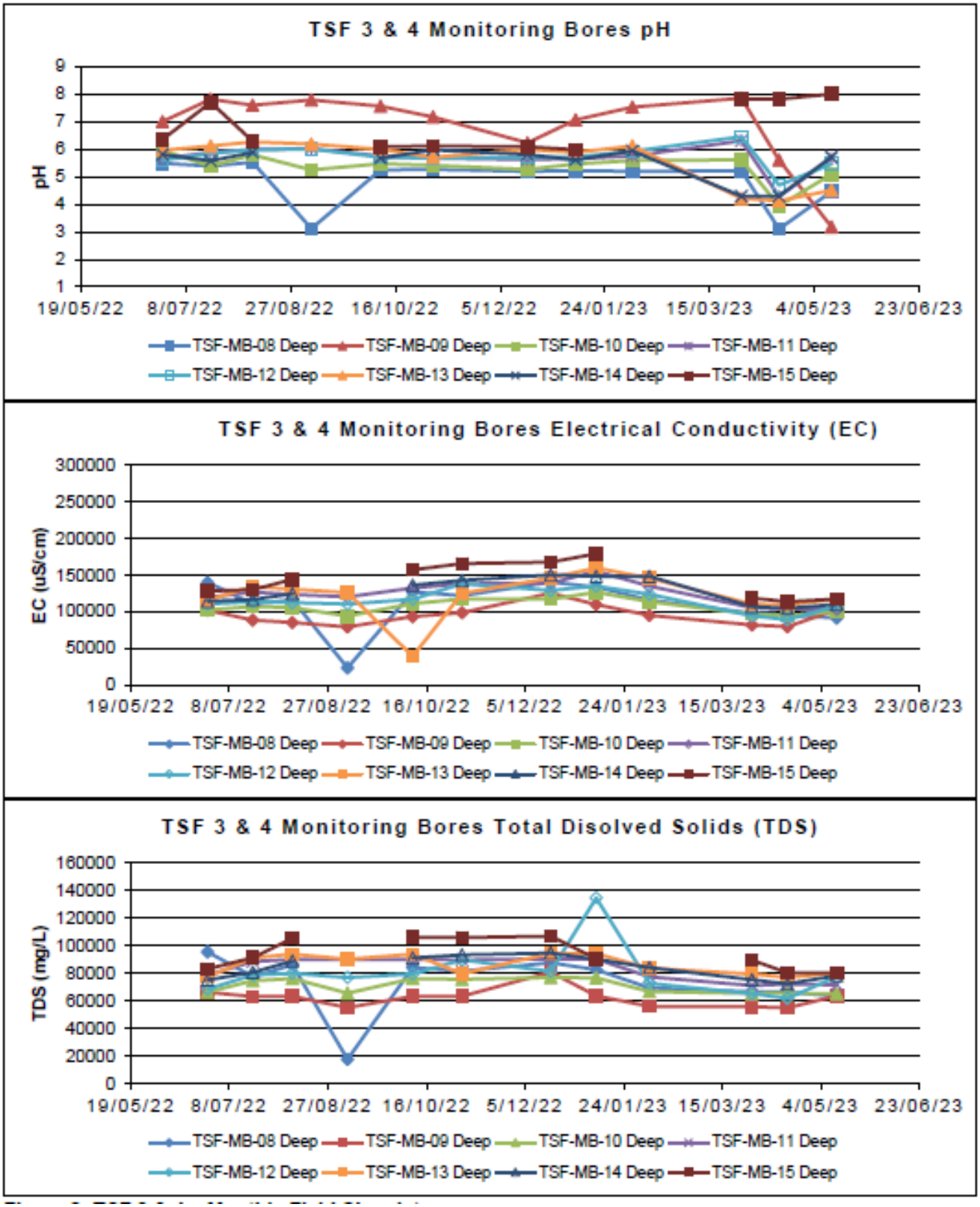

Figure 6: TSF 3 and 4 Monitoring bore results

Table 9: Mungari TSF Annual Multi-Element Groundwater Quality 2022

Bore ID	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	CO3 (mg CaCO3/L)	Cl (mg/L)	SO4 (mg/L)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Ni (mg/L)	Zn (mg/L)	Pb (mg/L)	Co (mg/L)
TSF-MB-02 Deep	314	5,630	35,200	249	<1	67,100	9,220	0.73	<0.021	<0.0021	<0.021	0.022	<1.05	5.68	0.126	<0.105	<0.021	0.046
TSF-MB-03 Deep	389	5,460	32,200	168	<1	63,000	10,000	4.38	<0.021	<0.0021	<0.021	0.022	<1.05	0.86	0.061	<0.105	<0.021	<0.021
TSF-MB-03 Shallow	642	2,710	24,200	243	<1	50,600	4,220	110	<0.021	<0.0021	<0.021	0.03	2.64	1.13	0.391	0.147	0.281	0.188
TSF-MB-04 Deep	3000	3,540	52,600	598	<1	86,300	3,790	20.2	<0.052	<0.0052	<0.052	<0.052	<2.62	20.1	0.235	<0.262	0.453	0.621
TSF-MB-04 Shallow	3180	3,070	53,900	590	<1	99,500	3,630	13	<0.052	<0.0052	<0.052	<0.052	4.54	24.6	0.278	<0.262	0.449	0.743
TSF-MB-05 Deep	3320	3,350	54,600	503	<1	95,100	3,810	12.5	<0.052	<0.0052	<0.052	<0.052	12.2	21.9	0.248	<0.262	0.489	0.659
TSF-MB-05 Shallow	1530	2,980	33,800	344	<1	63,600	3,810	31.6	<0.021	<0.0021	<0.021	0.038	<1.05	10.1	0.266	0.185	0.739	0.368
TSF-MB-06 Deep	401	4,040	23,300	142	<1	48,000	7,220	<0.21	<0.021	<0.0021	<0.021	<0.021	<1.05	1.82	0.25	0.148	<0.021	0.027
TSF-MB-08 Deep	336	2,860	16,600	132	<1	34,500	5,350	0.82	<0.010	<0.0010	<0.010	<0.010	<0.52	0.04	<0.010	<0.052	<0.010	<0.010
TSF-MB-09 Deep	987	3,330	21,100	170	<1	42,200	8,310	<0.21	<0.021	<0.0021	<0.021	<0.021	<1.05	0.806	0.083	0.164	<0.021	<0.021
TSF-MB-10 Deep	742	4,690	28,100	162	<1	53,600	8,790	0.84	<0.021	<0.0021	<0.021	<0.021	1.32	0.652	<0.021	<0.105	<0.021	<0.021

TSF-MB-11 Deep	449	4,190	23,600	137	<1	46,900	7,940	0.77	<0.021	<0.0021	<0.021	<0.021	<1.05	2.5	0.106	<0.105	<0.021	0.036
TSF-MB-12 Deep	401	5,570	28,700	172	<1	56,300	10,500	0.3	<0.021	<0.0021	<0.021	<0.021	<1.05	2.21	0.06	<0.105	<0.021	<0.021
TSF-MB-13 Deep	535	5,450	27,200	174	<1	53,600	11,600	<0.21	<0.021	<0.0021	<0.021	<0.021	<1.05	5.25	0.083	<0.105	<0.021	0.024
TSF-MB-14 Deep	730	4,960	38,000	263	<1	64,400	8,020	<0.21	<0.021	<0.0021	<0.021	<0.021	1.17	4.65	0.029	<0.105	<0.021	<0.021
TSF-MB-14 Shallow	314	5,630	35,200	249	<1	67,100	9,220	0.73	<0.021	<0.0021	<0.021	0.022	<1.05	5.68	0.126	<0.105	<0.021	0.046
TSF-MB-15 Deep	389	5,460	32,200	168	<1	63,000	10,000	4.38	<0.021	<0.0021	<0.021	0.022	<1.05	0.86	0.061	<0.105	<0.021	<0.021

Appendix 5: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
~~Works approval~~	☐				
~~Licence~~	☐	~~Relevant works approval number:~~		~~None~~	☐
		~~Has the works approval been complied with?~~		~~Yes ☐ No ☐~~	
		~~Has time limited operations under the works approval demonstrated acceptable operations?~~		~~Yes ☐ No ☐ N/A ☐~~	
		~~Environmental Compliance Report / Critical Containment Infrastructure Report submitted?~~		~~Yes ☐ No ☐~~	
		~~Date Report received:~~			
~~Renewal~~	☐	~~Current licence number:~~			
~~Amendment to works approval~~	☐	~~Current works approval number:~~			
Amendment to licence	☒	Current licence number:	L7750/2001/10		
		Relevant works approval number:	W6364/2020/1	N/A	☐
~~Registration~~	☐	~~Current works approval number:~~		~~None~~	☐
Date application received		12 June 2023			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Evolution Mining (Mungari) Pty Limited			
Premises name		Mungari Gold Project			
Premises location		Part mining tenements M15/829, M15/830, M15/1741, M15/1408, M15/1287, M15/688, L15/228, L15/246, L15/227 and M15/1407 Kundana Rd, Kalgoorlie 6430			
Local Government Authority		Shire of Coolgardie			
Application documents					
HPCM file reference number:		2011/009482-1~8			
Key application documents (additional to application form):		Attachment 1A: Proof of Occupier Status Attachment 1B: ASIC Company Extract			

	Attachment 1C: Authorisation to Act as a Representative of the Occupier Attachment 2: Premises Map Attachment 3B: Proposed Activities Attachment 5: Other Approvals Attachment 5: Other Approvals
Scope of application/assessment	
Summary of proposed activities or changes to existing operations.	Operation of TSF Cell 3 stage 2 which was completed under Works Approval W6364/2020/1

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 and beneficiation of metallic or non-metallic ore	More than 500,000 but no more than 2,000,000 tonnes per year Estimated 3,000,000 tonnes per year	No change proposed

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 ☒	**Not a significant proposal**
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	**Not a significant proposal**
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	**N/A**
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Mining lease / tenement ☒ Expiry: **14/03/2041**
Has the applicant obtained all relevant planning approvals?	Yes ☐ No ☐ N/A ☒	If N/A explain why? No planning approvals but Reg ID 85142 "Mungari TSF expansion: Cells 3 and 4 Mining Proposal" dated 5 June and approved 14/07/20

Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	CPS No: CPS 8797/1 **No clearing is proposed**.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	**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: **GWL105884**
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 Groundwater area Type: **Proclaimed Groundwater** Has Regulatory Services (Water) been consulted? Yes ☐ No ☐ N/A ☒ Regional office: **Goldfields**
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☐	Name: **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 ☒	**N/A**
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	**N/A**
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	**N/A**

Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☒ No ☐	Classification: **Awaiting classification Mining Tenements M15/830 and M15/688** **TRIM ID DEC13033** Date of classification: **To be determined**