

# **Decision Report**

## **Application for Works Approval**

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

Works Approval Number W6803/2023/1

**Applicant** Evolution Mining (Mungari) Pty Ltd

**ACN** 002 124 745

File number DER2023/000228

Premises Mungari Gold Project

COOLGARIDE WA 6429

Legal description

Mining tenements L15/228, L15/246, M15/688, M15/829,

M15/830, M15/1287, M15/1407 and M15/1741

As defined by the coordinates in Schedule 2

Date of report 18 August 2023

**Decision** Works approval granted

# 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

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W6803/2023/1 has been granted.

## 2. Scope of assessment

#### 2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <a href="https://dwer.wa.gov.au/regulatory-documents">https://dwer.wa.gov.au/regulatory-documents</a>.

#### 2.2 Application summary and overview of premises

On 31 March 2023, Evolution Mining (Mungari) Pty Ltd (Evolution Mungari; the applicant) submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction, commissioning and time-limited operations of Mungari Mill Upgrades and associated infrastructure relating to category 5 Processing of metallic and non-metallic ore at the premises. The premises is approximately 22 km west of the City of Kalgoorlie-Boulder and 20 km northeast of the township of Coolgardie in the Goldfields region of Western Australia.

The current operation consists of the White Foil Open Pit Project, the Frog's Leg Underground Project, the Cutters Ridge Open Pit Project and also comprises the Mungari Mill and the Mungari tailings storage facility (TSF). All ore produced from Mungari Gold Operations (MGO) is processed through Mungari Mill and tailings are deposited into the Mungari TSF under existing licence L7750/2001/10.

Other prescribed activities on Mungari gold Project include the dewatering of up to 5,000,000 kL from the White Foil and Frog's Leg pits to the Pope John Pit. There are two category 89 landfills located within the Frog's Leg and White Foil waste dumps.

The premises relates to the category and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6803/2023/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6803/2023/1.

#### 2.2.1 Description of proposed activities

Mungari Gold Operations extracts oxide, transitional and fresh ore from open pits and underground mines in the region, which is then processed at the Mungari Processing Plant (Mungari Mill). The Mungari Mill upgrade will allow for the increased throughput to 5.0 million tonnes per annum (Mtpa). Proposed works pertain to mining tenement M15/830. A summary of the proposed activities is included in Table 2 and Appendix 1 and will be located as shown in Figure 1.

Ore treated at the plant will include ore from the existing operations mines, Frog's leg, RHP, Raleigh and Kundana underground mines and Paradigm open pit. Increasing mill throughput will also allow for future additional mining areas to become economically viable following the expansion such as Rayjax, Hornet and Castle Hill (additional ore sources are not assessed or authorised under this approval).

The additional tailings produced at the processing plant will be distributed approximately evenly between the existing TSF cells 3 and 4 (constructed under works approval W6364/2020/1) and a new in-pit TSF "Cutters Ridge in-pit". The expected tailings output for proposed activities is between 4.2 and 5.0 Mtpa. The existing tailings storage facility cells 3 and 4 can accept up to 2.5 Mtpa. A separate works approval will be submitted at a later time for the Cutters Ridge In-pit TSF pipeline infrastructure to accommodate for the increase in tailings production.

Each tailings storage facility will have a deposition rate of 2.1 to 2.5 Mtpa, with the combined facilities being able to accept the expected output of tailings once all approvals are in place.

Using the most recent life of mine plan for Mungari, the planned remaining capacity for the life of the existing TSF Cells 3 and 4 are shown in Table 1 below.

Table 1: Capacity for TSF cells 3 and 4

Financial Year	Remaining storage capacity at end of FY (Mt)
FY23	21.24
FY24	19.34
FY25	17.44
FY26	15.54
FY27	13.44
FY28	11.34
FY29	9.34
FY30	7.34
FY31	5.54
FY32	3.73
FY33	1.93
FY34	0.13

Equipment requiring construction is listed in Table 2. Other associated services will be installed alongside the equipment listed in Table 2. Figure 1, Figure 2 and Figure 4 show the general arrangement and process flow diagram of the Mungari Mill processing plant after the expansion.

A detailed description of the infrastructure to be constructed has been given in Appendix 1.

Table 2: Equipment required for construction

Processing Area	New Equipment
Crushing	Primary crusher
	Coarse ore stockpile
Grinding	SAG mill
	Hydrocyclones
	Horizontal screen
Gravity Concentration	Concentrators
	Leach reactor
	Vibrating screens
Leach and Adsorption	Leach and adsorption tanks
	Screens
Elution Circuit	Acid wash and elution column
	LPG fired solution heater (LP gas fuel source)
Electrowinning and Smelting	2 cell electrowinning circuit and return tank
	LPG fired tilting furnace
Carbon Regeneration	Carbon regeneration kiln & screen
Services	Associated pumps and tanks to increase water flow to the process
Tailings Surge Tank and Pipeline	Post-process output and pre-tailings pipeline input surge tank for tailings

#### 2.2.2 Proposed construction timeframe

Construction will be undertaken in the project area over an approximate one-year period. Table 3 provides the indicative construction schedule, subject to approvals.

**Table 3: Indicative Processing Plant construction schedule** 

Construction Area	Planned Commencement	Planned Completion
Site Establishment	~Q1 2024	~Q1 2024
Sitewide Bulk Earthworks	~Q1 2024	~Q3 2024
Concrete	~Q2 2024	~Q4 2024
SMP	~Q3 2024	~Q1 2025
E&I	~Q3 2024	~Q2 2025

#### 2.2.3 Commissioning

#### 2.2.3.1 Environmental Commissioning

An Environmental Commissioning Plan was submitted by the applicant. Table 4 lists the equipment that requires commissioning as part of the processing plant.

Table 4: Equipment required for environmental commissioning

Processing/Mining Area	New Equipment
	Fogging systems for the new crusher.
Crushing	Water sprays and skirting on new conveyor systems.
Reagents	Cyanide solution tank and pipelines.
Tailings	Final tailings hopper tank.

#### 2.3 Other relevant approvals

#### 2.3.1 Department of Mines, Industry Regulation and Safety (DMIRS)

Mungari Gold Operations will be contemporaneously seeking approval for a mining proposal under the *Mining Act 1978*.

A mining proposal has been submitted to the Department of Mines, Industry Regulation and Safety (DMIRS) and was approved on 23 June 2023. (REG ID 117914).

#### 2.3.2 Aboriginal heritage

The premises overlaps with five Aboriginal Sites and Heritage places originally under the *Aboriginal Heritage Act 1972* (AH Act). DWER contacted the Department of Planning, Lands and Heritage (DPLH) regarding this application on 6 June 2023.

DPLH advised on 26 June 2023 that a review of the information and premises boundary coordinates against the Register of Places and Objects, as well as the DPLH Aboriginal Heritage database, found that the proposed Eastern Waste Landform Area intersects with Aboriginal heritage place ID 18384 (Kopai Lakes). The status of Aboriginal heritage place ID 18384 (Kopai Lakes) has been determined to not meet section 5 of the AH Act and "Therefore, based on the information held by DPLH, no approvals under the AH Act are required".

The premises is covered by Native title claims Marlinyu Ghoorlie (WC2017/007) and Maduwongga (WC2017/001). DWER requested comment from claimants regarding the proposed activities. No comments have been received to date.

Evolution Mining currently have Native Title agreements in place with both the Marlinyu Ghoorlie people and the Maduwongga people. Ongoing consultation is undertaken with both groups in relation to all upcoming projects including the Mungari Mill Upgrade.

Kurrawang Aboriginal Community is located 9.51 km from the premises. DWER contacted the Kurrawang Aboriginal Community regarding this application on 7 June 2023. The Kurrawang Aboriginal Community advised on 4 July 2023 that they had some concerns regarding the application, these concerns and the Department's responses have been addressed in Appendix 2: Summary of Kurrawang Aboriginal Community stakeholder comments received.

It is noted that the Works Approval Holder is required to meet its obligations under the AH Act which is a separate regulatory process to that of applying for a works approval under Part V of the EP Act. The granting of the works approval does not remove the obligation which Evolution Mungari has under the under the AH Act.

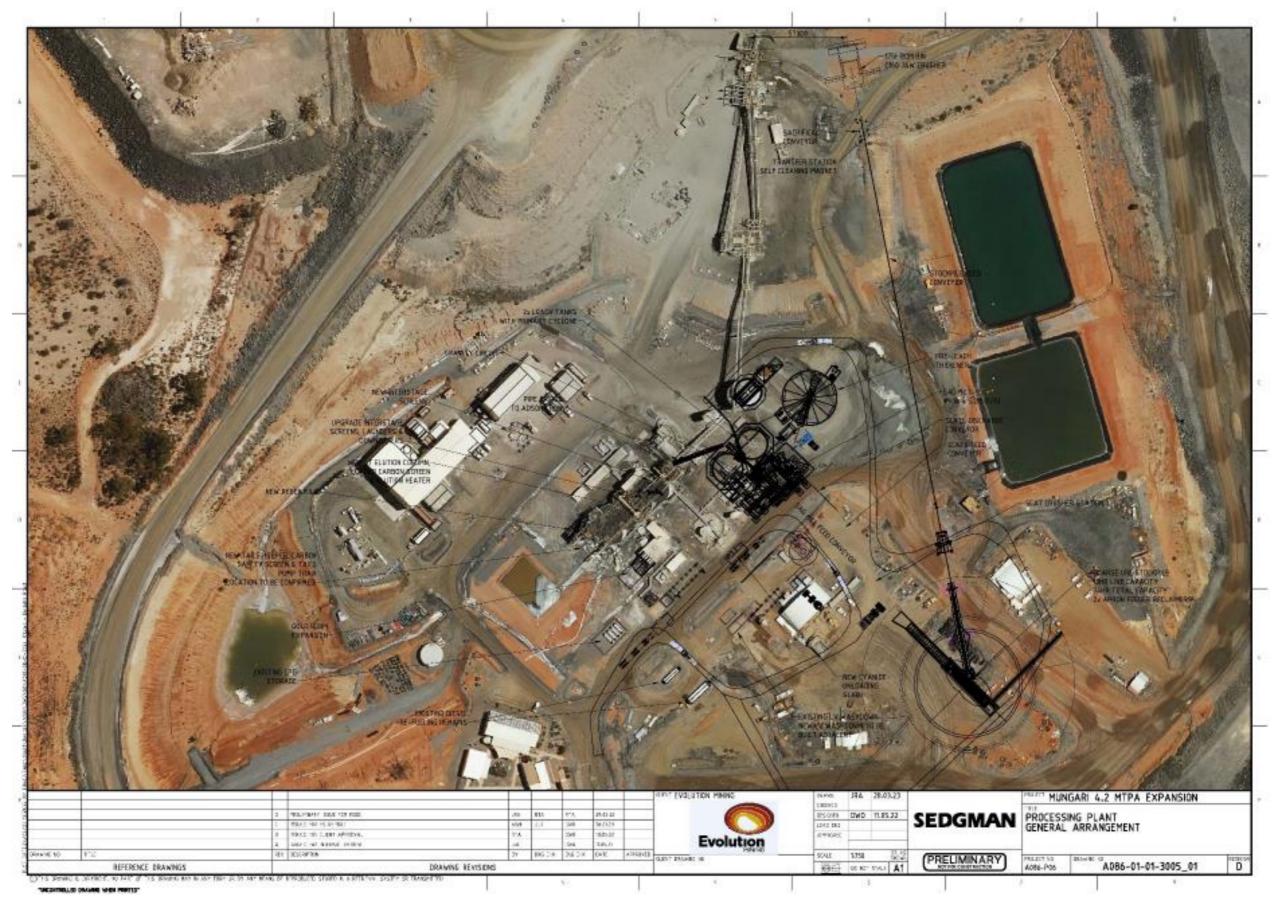


Figure 1: Mungari Upgraded Processing Plant General Arrangement

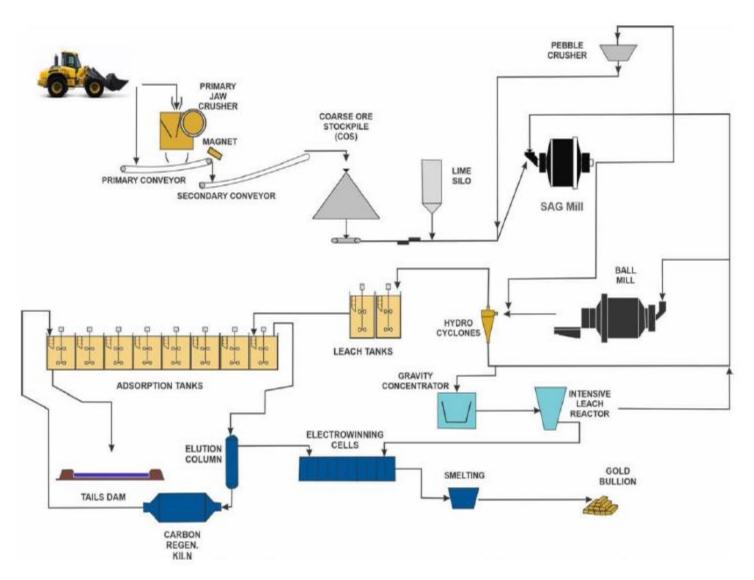


Figure 2: Simple Process Diagram with Existing and Proposed Equipment for the Mungari Expansion Project

#### 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 construction and operation which have been considered in this decision report are detailed in Table 5 below. Table 5 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Given that there are no nearby sensitive human receptors, noise, as an emission, has been excluded from the risk assessment. The applicant is required to comply with the *Environmental Protection (Noise) Regulations 1997* and the *Mining Act 1978*. Noise can also disrupt fauna. A fauna Management procedure exists on site. No evidence of significant fauna species has been observed during site surveys, including no evidence to show the presence of mallefowl, the arid bronze azure butterfly or the inland hairstreak.

**Table 5: Proposed applicant controls** 

Emission	Sources	Potential pathways	Proposed controls			
Construction	Construction					
Dust	Construction and upgrade to Mungari Mill upgrade, new primary crusher and coarse ore stockpile.  Earthworks.	Air / windborne pathway	The applicant has committed to ensure that:  Dust will be controlled on an as-needs basis by application of water from a water cart. A water cart will be available on site for this purpose.  Implementing a progressive rehabilitation program will also reduce the risk of dust generation.  Dust suppression measures using water sprays and other means will be used in the event that:  • High levels of dust are observed.  • Strong winds and dry conditions make dust generation likely; or  • Complaints about dust are received.  If necessary, options for dust suppression fitted to infrastructure in the processing plant include:  • Wet dust scrubber at crushing and screening stations;  • Insertable dust collector on sealed fine			

Emission	Sources	Potential pathways	Proposed controls
			ore bin;
			Dust collector bag house at crushers;
			Water fogging system for new crusher;
			Water sprays at end of conveyor onto main ore stockpile; and
			Skirtings on conveyors.
Commissionir	ng and Operation (incl	uding Time-limi	ited operations)
	crushing/ mills/ screening, conveyors / transfer points.  Loading of material onto the haul trucks.  The movement of vehicles.  Wind erosion from surfaces such as the waste dump, the ROM pad and roads.	windborne pathway	Dust will be controlled on an as-needs basis by application of water from a water cart. A water cart will be available on site for this purpose.  Implementing a progressive rehabilitation program will also reduce the risk of dust generation.  Dust suppression measures using water sprays and other means will be used in the event that:  • High levels of dust are observed.  • Strong winds and dry conditions make dust generation likely; or  • Complaints about dust are received.  If necessary, options for dust suppression fitted to infrastructure in the processing plant include:  • Wet dust scrubber at crushing and screening stations;  • Insertable dust collector on sealed fine ore bin;  • Dust collector bag house at crushers;
			<ul> <li>Water fogging system for new crusher;</li> <li>Water sprays at end of conveyor onto main ore stockpile; and</li> <li>Skirtings on conveyors.</li> </ul>
Air emissions	Gas (LPG) Fuel fired burning equipment (including kilns)	Air / windborne pathway	The applicant has committed to:  Regular dust suppression of dust producing areas; and  Assaying of ore and waste samples to determine dust composition if required.
Contaminated	Runoff contaminated stormwater from ore	Overland runoff during	The applicant has provided a stormwater management map, showing stormwater pond

Emission	Sources	Potential pathways	Proposed controls
stormwater	stockpiles into surrounding environment	high rainfall events potentially causing flow into adjacent environment	and diversion channels and Surface Water Management Plan.  Mitigation measures proposed by the applicant include:  • Adequate uncleared buffer zones retained between disturbed areas and natural drainage lines;  • Upstream surface water diversion;  • Minimising disturbance and vehicle movements through the existing tracks;  • Storage areas (chemicals, hydrocarbons etc.) located away from, or bunded off from, external surface water flows and flooding;  • Sediment laden surface water runoff captured by earth bunding around the perimeter of infrastructure areas, and either discharged (slowly allowing settling) or evaporated / infiltrated on site; and  • Bunding including the retaining embankment of the TSF, will be well compacted in layers to limit sediment run-off from face erosion.  • Site inspections and regular informal visual checks to ensure appropriate mitigation measures and controls are implemented, and that they are operational and effective.
Spills / leaks of hydrocarbons and chemicals	Storage of chemicals (new cyanide tank and new caustic dosing pump)  Hydrocarbons spills or leaks from vehicle and equipment use, or maintenance activities.	Leaching through soil profile to groundwater	<ul> <li>The applicant has advised that in the event of a chemical spill:</li> <li>The source will be stopped immediately and the spill will be contained with additional bunding from the spill kit that will be in the vicinity;</li> <li>Any contaminated soil will be removed and disposed of appropriately by the service crew;</li> <li>Soil and water sampling will be carried out by the Mungari Environment Department to assess the extent of the contamination. Incident reports will be provided in accordance with Section 72 of the Environmental Protection Act 1986;</li> <li>A Spill Management Procedure exists onsite;</li> </ul>

Emission	Sources	Potential pathways	Proposed controls
			Chemicals and reagents should be stored in areas with a holding capacity of 110%;
			<ul> <li>All chemicals and reagents storage areas are required to have spill kits and all chemicals are required to be correctly labelled. Monitoring and housekeeping is carried out regularly;</li> </ul>
			<ul> <li>Pumps and pipelines are inspected and serviced regularly;</li> </ul>
			<ul> <li>Chemical management is included in inductions, training and awareness onsite;</li> </ul>
			<ul> <li>Chemicals may be disposed of offsite by an external provider;</li> </ul>
			<ul> <li>Significant chemical spills leading to environmental harm are reported to relevant authorities within one business day; and</li> </ul>
			<ul> <li>Trained Emergency Response Team onsite.</li> </ul>
			Groundwater monitoring under existing licence
			There are no ground water monitoring bores around the current mill.
Tailings	Operation of a new dual stage pumping		The applicant has advised that in the event of a tailings spill:
	system and associated pipelines.		<ul> <li>Bunding and v-drains will assist to contain the spill and the isolation valves will be turned on by the person inspecting the pipeline;</li> </ul>
			<ul> <li>Repairs will be carried out on the pipeline and any bunding that may have been damaged will be reconstructed to the standard by the service crew;</li> </ul>
			<ul> <li>Earthmoving equipment will be used by the service crew to remove contaminate soil. Soil sampling will be carried out by the Mungari Environment Department to assess the extent of the contamination;</li> </ul>
			Incident reports will be provided in accordance with Section 72 of the Environmental Protection Act 1986 should any environmental harm occur; and
			Rehabilitation of the affected area will be carried out by Environmental

Emission	Sources	Potential pathways	Proposed controls
			Department if required.
			Groundwater monitoring under existing licence:
			There are 14 groundwater monitoring bores located around the TSF. The licence holder monitors:
			<ul> <li>Standing water level, pH, total dissolved solids, electrical conductivity on a monthly basis;</li> </ul>
			<ul> <li>WAD CN, Total CN on a quarterly basis; and</li> </ul>
			<ul> <li>Ca, Mg, Na, K, CO<sub>3</sub>, CI, SO<sub>4</sub>, AI, As, CD, Cr, Cu, Fe, Mn, Ni, Zn, Pb, Co on an annual basis</li> </ul>

#### 3.1.2 Receptors

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

Table 6 and Figure 3 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 2020)).

The nearest human receptors are the Kurrawang Community located approximately 9.51 km southeast of the premises. The nearest town is Coolgardie townsite that is 20 km southwest of the premises, and Kalgoorlie-Boulder township that is located 22 km east of the premises. Given the distance of those receptors from the premises, they will not be considered as receptors under the scope of this assessment.

Table 6: Sensitive environmental receptors and distance from prescribed activity

Human / environmental receptors	Distance from prescribed activity
Underlying groundwater (non-potable purposes)	Groundwater depth
	The depth to the regional water table ranges from less than 5 m in some playa-lake environments to more than 40 m in elevated areas.
	Groundwater quality
	Groundwater in this area is mainly saline to hypersaline. The salinity ranges around 150,000 mg/L to 250,000 mg/L.
	Nearby groundwater users
	There are no known other groundwater users within 2km of the proposed activities.
Surface water	Unnamed salt lake 0.5 km south
	West Lake 0.7 km west

	Cattle Swamp 2.1 km south
	Kurrawang Lake 1.5 km south
	Kopai Lake 2.2 km east
	Greta Lake 3.1 km northeast
	Kurrawang White Lake 5.8 km north east
Native vegetation, flora and fauna.	Four vegetation zones identified with Premises:
	<ul> <li>Mixed Eucalyptus Woodlands over sclerophyll shrublands;</li> <li>Chenopod shurblands; and</li> <li>Acacia open shrubland.</li> </ul>
	Priority flora <i>Notisia intonsa</i> found within Premises boundary. (No Threatened or Priority flora were identified within the survey area during a detailed flora / vegetation survey) undertaken by Botanic Consulting (Botanica 2021)
Fauna	Botanic 2021 survey identified a total of 264 terrestrial vertebrate fauna taxa within a 40km radius of the survey area, consisting of 149 bird, 32 mammal, 76 reptile and six amphibian taxa.
	Botanica 2021 survey found the following significant fauna species potentially occurring in the area:
	Grey Falcon (Threatened);
	Malleefowl (Threatened); and
	Peregrine Falcon.
Aboriginal Sites and Heritage Places:      Kopai Lakes     Park Dam 03     Piira Tukurr     Pulyinyaminya Cave     Mungari 5 (X06)	<ul> <li>Within premises boundary</li> <li>200m west of the premises boundary</li> <li>0.57km southwest of the premises boundary</li> <li>1.91km west of the premises boundary</li> <li>0.76km southwest of the premises boundary</li> </ul>

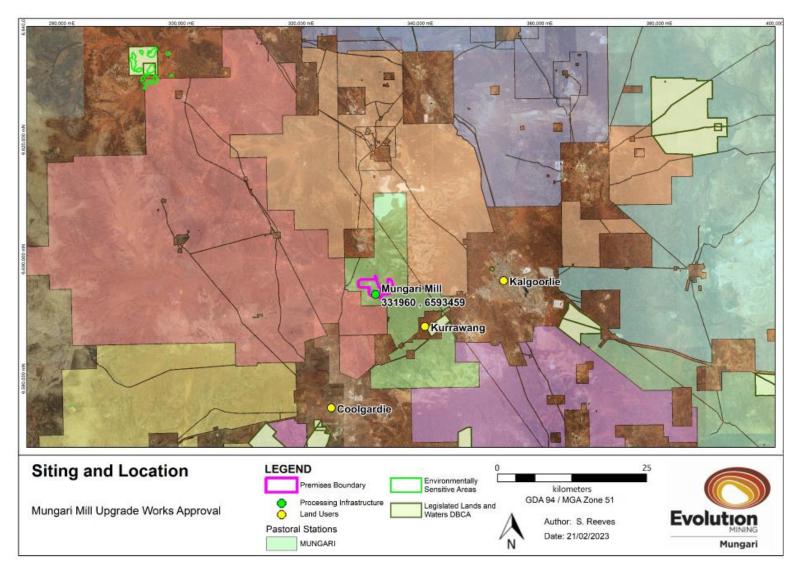


Figure 3: Distance to sensitive receptors

#### 3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source 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 applicant 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 applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 7.

Works approval W6803/2023/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 7 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. Category 5 activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 7: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk events	Risk events						Conditions <sup>2</sup>	
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	Applicant controls sufficient?	of works approval	Justification for additional regulatory controls
Construction								
Construction and installation of upgrade to Mungari Mill and associated equipment.  Earthmoving and land clearing activities to prepare site.	Dust	Air / windborne pathway causing impacts to health and amenity	Priority vegetation within the premises boundary.	Refer to Section 3.1	C = Slight L = Unlikely <b>Low Risk</b>	Y	Condition 1 – Design / construction requirements  Condition 4 - 7 – Commissioning requirements  Condition 8 -10 – Time limited operation requirements	Minimal dust emissions may be generated from site preparation works including earthworks/ clearing activities and the installation of the equipment and transportation on roads during the construction period. The controls proposed by the applicant are sufficient to manage the impacts of dust associated with the construction works.
Commissioning and Operati	ion (including tir	me-limited-operation	s operations)					
Commissioning of ore processing plant and associated infrastructure  Stockpiles of ore, crushing/mills/screening, conveyors / transfer points	Dust	Air / windborne pathway causing impacts to ecosystem	Priority vegetation within the premises boundary.	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Condition 1 – Design / construction requirements  Condition 4 - 7 – Commissioning requirements  Condition 8 - 10 – Time limited operation requirements  Condition 11 – dust suppression	The applicant has demonstrated sufficient measures to control the impacts of dust associated with the operations on sensitive receptors.  Applicant's proposed controls have been conditioned within the works approval.  An additional condition has been included in the works approval indicating that hypersaline water is not to be used on nearby native vegetation.

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Risk events					Risk rating <sup>1</sup>	A	On dition 2	
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of works approval	Justification for additional regulatory controls
	Sediment laden stormwater	Overland runoff of contaminated stormwater from ore stockpiles.  Causing potential ecosystem disturbance or impacting nearby surface water quality.	Surface water features (including salt lakes)	Refer to Section 3.1	C = Minor L = Unlikely <b>Medium Risk</b>	Y	Condition 1 – Design / construction requirements	The likelihood of impacts to the offsite environment is unlikely based on the applicant's proposed controls. The applicant's controls will be conditioned.
Tailings: final tailings hopper tank, pumping systems and association pipelines.	Tailings.	Pipeline burst or leak causing direct discharge to land potentially causing ecosystem disturbance or impact to soil, groundwater or surface water quality.	Surface water features (including salt lakes) Native vegetation Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely <b>Medium Risk</b>	N	Condition 1 – Design / construction requirements Condition 4- 7 - Commissioning requirements Condition 8 – 10 – Time limited operation requirements	Unintended spillages or leakages of tailings have the potential to enter and contaminate the nearby environment.  The applicant's controls will be conditioned within the works approval.  An additional condition was included in the works approval to specify that any pipelines containing tailings must be:  Be constructed according to the relevant Australian standards  Equipped with telemetry with leak detect alarms; and / or  Equipped with automatic cutouts in the event of a pipe failure; and / or  Provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

Risk events					Risk rating <sup>1</sup>	Amuliaant	Conditions 2	
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of works approval	Justification for additional regulatory controls
Storage of chemicals (new cyanide tank and new caustic dosing pump)	Chemicals	Spills, leaks discharges causing groundwater or soil contamination issues.	Surface water features (including salt lakes) Native vegetation Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 – Design / construction requirements  Condition 5 – Commissioning requirements  Condition 10 – Time limited operation requirements	Unintended spillages or leakages of hydrocarbons and chemicals from vehicle and equipment use, and storage on site have the potential to enter and contaminate the nearby environment.  The applicant's controls will be conditioned within the works approval.

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

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

## 4. Consultation

Table 8 provides a summary of the consultation undertaken by the department.

**Table 8: Consultation** 

Consultation method	Comments received	Department response
Application advertised on the department's website on 7 June 2023	None received	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal 7 June 2023	None received	N/A
Department of Planning, Lands and Heritage (DPLH) advised of proposal on 7 June 2023	<ul> <li>"A review of the following information (W6803/2023/1 Maps, Premises Map) and premises boundary coordinates against the Register of Places and Objects, as well as the DPLH Aboriginal Heritage database, concludes that the proposed Eastern Waste Landform Area intersects with Aboriginal heritage place ID 18384 (Kopai Lakes). The status of Aboriginal heritage place ID 18384 (Kopai Lakes) has been determined to not meet section 5 of the Aboriginal Heritage Act 1972 (AHA). Therefore, based on the information held by DPLH, no approvals under the AHA are required".</li> <li>"Please note, that the Aboriginal Heritage Act 1972 (AHA) is the relevant legislation through which to seek approvals and manage potential impacts to Aboriginal cultural heritage, however, any activities conducted on or after 1 July 2023 will need to be compliant with the Aboriginal Cultural Heritage Act 2021 (ACH Act). As such, we commend that proponents familiarise themselves with its requirements relating to any ground disturbing works".</li> </ul>	The department recommends Evolution Mungari address comments from DPLH  It is noted that the Works Approval Holder is required to meet its obligations under the AH Act which is a separate regulatory process to that of applying for a works approval under Part V of the EP Act. The granting of the works approval does not remove the obligation which Evolution Mungari has under the under the AC Act.

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Kurrawang Aboriginal Community was advised of the proposal on 7 June 2023	Comments received on 4 July 2023.  Refer to Appendix 3.	Refer to Appendix 3.
Maduwongga Aboriginal Corporation was advised of the proposal on 7 June 2023	None received	N/A
Marlinyu Ghoorlie was advised of the proposal on 19 July 2023	None received	N/A
Applicant was provided with draft documents on 8 August 2023	<ul> <li>Comments received on 10 August 2023:</li> <li>Draft Decision Document:         <ul> <li>2.3.1 The White Foil Project: Mungari Mill Upgrade mining Proposal (REG ID 117914) was approved by the Department of Mines, Industry Regulation and Safety (DMIRS) on 23 June 2023.</li> <li>Appendix 3 – There are no known sensitive fauna ecosystems in proximity to the Mungari Mill. The existing 300 metre buffer to undisturbed ecosystems are unchanged by the proposed upgrade</li> </ul> </li> <li>The following clarifications were requested:         <ul> <li>Condition 1 – Can you please confirm that all infrastructure displayed in Figure 2 may be constructed, even if not specifically listed in Table 1 (e.g., pre-leach thickener).</li> <li>Condition 1 – Can you please confirm that not all components of infrastructure listed in Table 1 must be constructed (e.g. chemical storage area, may be constructed without a new cyanide storage tank).</li> </ul> </li> </ul>	<ul> <li>The Department has updated the Decision Report with the additional information provided.</li> <li>Condition 1 has been updated to include the pre-leach thickener. And the Table 9 of the Decision Report and Figure 1 of the Works Approval will be sufficient in covering the works that is required.</li> <li>Table 1 authorises construction of infrastructure as was requested in the works approval application. If it has been determined that some infrastructure is no longer required, that infrastructure can be removed from Table 1 prior to finalising the works approval, or you may elect to notify the department in the Environmental Compliance Report (required under condition 2) that some</li> </ul>

infrastructure is no longer required, or may be constructed at a later date (provided the works approval is still active). Further Environmental Compliance Reports would be required to be submitted if that infrastructure is constructed at a later date, and separate licence amendments to transfer ongoing operation of that infrastructure to the licence. Please note, the above advice applies where the department considers there has been no change to the risk profile of potential emissions assessed under the works approval. It is not recommended this approach be taken for any pollution control equipment that is required to be constructed under the works approval. For changes to construction of pollution control infrastructure, the department recommends you apply for an amendment to the works approval, as it is likely the risk profile of emissions assessed under the works approval would change.

#### 5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

#### References

- 1. Botanica Consulting 2021, White Foil Project Detailed Flora / Vegetation Survey and Basic Fauna Survey, February 2021
- 2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
- 3. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
- 4. DWER 2020, Guideline: Risk Assessments, Perth, Western Australia.

## **Appendix 1: Additional figures and tables**

Table 9: Detailed description of proposed infrastructure and activity

Infrastructure	Activity
Area 10 - Crushing	A new run of mine (ROM) bin (10BIN10) has been sized to receive ore from a CAT 993 (or equivalent) front-end loader and will have a live capacity of 175 t.
	Raw material will be crushed by a newly installed primary jaw crushing circuit.
	Oversize material will report to the jaw crusher. Undersize material and jaw crusher product will discharge directly to the crusher discharge conveyor, then the stockpile feed conveyor and onto the coarse ore stockpile.
Area 20 – Grinding	The coarse ore stockpile (COS) will have a live capacity of 5,250 t, which is equivalent of 10 hours of mill operation.
	The current ball mill only grinding circuit will be converted to a semi-autogenous ball mill crushing circuit. Semi-autogenous grinding (SAG) mill discharge will be pumped to the new primary cyclone cluster.
	The SAG and ball mills will operate in closed circuit with the cyclones.
Area 25 – Gravity	The proposed Mungari feed ore is amenable to gravity recovery, with the gravity circuit designed to recover 53.7% of the gold. Gravity feed will be directed to parallel scalping screens, with a 2mm aperture, before being fed to one of two parallel 40-inch diameter centrifugal concentrators. The oversize material from the screen will be returned to the SAG mill feed. Concentrate from the centrifugal concentrators will be directed to an intensive leach reactor, which operates in batch mode.
Area 30 – leaching and adsorption	Cyclone overflow will feed new pre-leach thickener to achieve an underflow density of 55% w/w solids, with the addition of flocculant. Thickened slurry is pumped to the leach tanks.
	Two new large capacity leach tanks will be installed, complete with an oxygen sparging system, supplied from the liquid oxygen storage facility. The tanks will operate in a series with a combined residence time of 12.8 hours.
	The existing leach tanks will be converted to adsorption tanks to bring the total number of adsorption tanks to eight. Loaded carbon from Adsorption Tanks 1 or 2 will gravitate to one of two elution columns.
	The existing leach tanks will be upgraded with increased capacity interstage screens and slurry transfer launders.
Area 40 - Elution	A 4.0 t single column split Anglo-American Research Laboratories (AARL) elution circuit will be installed which will operate in parallel to the existing elution circuit. The two circuits combined will have a total average weekly carbon movement of 56t. The design carbon loading ins 3,290 g/t Au. The projected carbon barren assay is 50 g/t Au. Each cycle should result in 10,023g Au stripped from carbon.
	A new carbon regeneration kiln will be installed to operate in parallel with the existing kiln. Barren carbon will be hydraulically transferred from the elution column at the conclusion of the cool down stage to either the regeneration kiln on directly to the final adsorption stage. The design allows for every batch of carbon to be regenerated, but actual regeneration frequency will be based on operating experience and the actual carbon loading profile.
Area 45 – Gold Room	The existing gold room will be upgraded an expanded to incorporate additional electrowinning cells and a replacement of smelting furnace. The new electrowinning cells will operate in parallel to the current cells to service the new

Infrastructure	Activity
	elution column. Leach liquor from the intensive leach reactor in the gravity circuit will still be pumped to the existing gravity electrowinning cell.
Area 50 - Tailings	Tailing slurry from a final adsorption tank will be passed over a single carbon safety screen and then to a tails hopper. A new dual stage pumping system will pump the tailings to either the existing tailings dam or the in-pit tailings disposal at Cutters Ride. Each pipeline will be equipped with a duty set of dual stage pumps with a common standby set being shared between the two lines.
Area 55 – Tailings Storage Facility	Deposition of the slurry into the existing dam will be via peripheral spigotting systems located on the dam wall. For the in-pit tailings at Cutters Ridge, slurry will be deposited via a single pipeline directed into the pit. Excess water, separating the slurry will pool in the centre of the tailings dam and the in-pit tailings. This water will be recycled back to the process water dam by the submersible decant pumps for re-use in the process as make up water.
	(The in-pit tailings disposal is not part of this assessment and will be submitted as part of a new works approval application).
Area 60 - Reagents	The aspects of Area 60 – Reagents that are changing for the Mungari plant expansion include:
	<ul> <li>Sodium cyanide – a new cyanide storage tank will be installed to double the storage capacity of cyanide on site.</li> </ul>
	<ul> <li>Sodium hydroxide – a new caustic dosing pump will distribute sodium hydroxide to the new elution column and electrowinning cells.</li> </ul>
	<ul> <li>Hydrochloric acid – hydrochloric acid is used in the elution circuit to acid wash loaded carbon. It is pumped to the elution column by a positive displacement pump. A second pumps will be installed in parallel to the existing pump to service the new elution column.</li> </ul>
	<ul> <li>Oxygen distribution – the existing oxygen plant, which is a hiring unit from BOC, will be supplemented with a parallel 45kL vessel, two vaporisers and two oxygen dosing panels.</li> </ul>
	<ul> <li>Flocculant – a new flocculate storage and delivery system will be installed to supply flocculant to the pre-leach thickener. Flocculant will be delivered to site as a dry powder and store din a hopper. The powder will be fed to a flocculant mixing tank, where potable water is added to produce a 0.25% weight per volume (w/v) solution. The solution is stored in a storage tank, before being pumped to the thickener.</li> </ul>
Services	Changes to the services as part of the expansion work include:
	<ul> <li>Raw water – will be sourced from the existing raw water dam. An additional distribution piping network will be installed to service the new major equipment items added in the expansion.</li> </ul>
	<ul> <li>Process water – process water will be sourced from the existing TSF decant line and stored in the process water dam. Additional piping will be installed to supply process water to the new equipment, which will be serviced by new duty/standby pumps.</li> </ul>
	<ul> <li>Gland water – the existing gland water pumps will be repurposed in the plant upgrade. One pair of duty / standby pumps will service the pumps in the leaching and gravity circuits.</li> </ul>
	Potable water - a second potable water tank of equal capacity to the existing tank will be installed with a duty / standby pumping system.

Infrastructure	Activity
	<ul> <li>Fire water and wash down – new fire water lines will be connected to the existing fire water ring main to service the new plant areas with fire water.</li> </ul>
	<ul> <li>Plant air – the existing plant air system will be relocated for the construction and installation of new equipment in the plant expansion. New air receivers will be located adjacent to the new crushing station / SAG mill.</li> </ul>

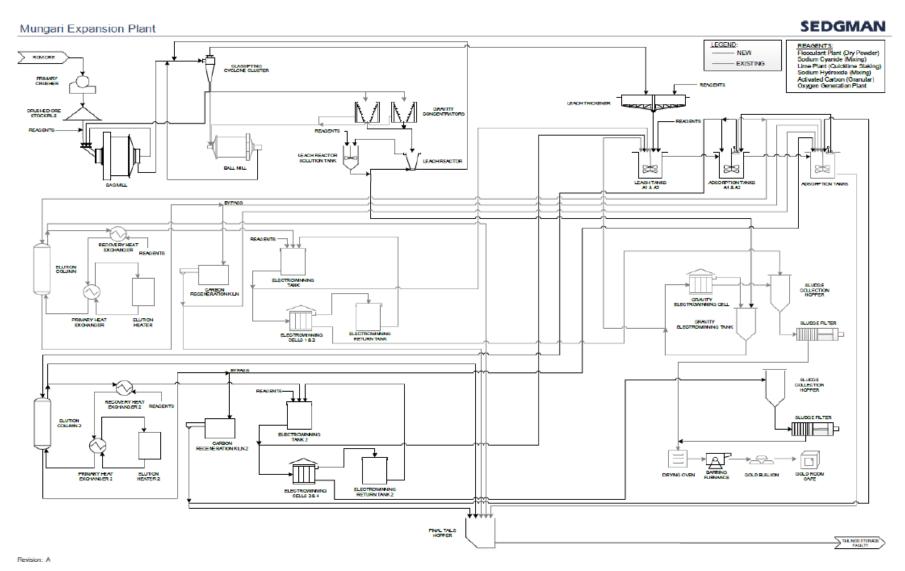


Figure 4: Overall Mungari Plant Expansion Process Flow Diagram

# **Appendix 2: Summary of Kurrawang Aboriginal Community stakeholder comments received**

DWER line item ref	Short description	Summary of stakeholder comments	Department's response
1	Concerns regarding impacts to water and air.	"What environmental impacts will it have on water and air?"	Water: There is a potential impact of contaminated stormwater runoff, with runoff contaminated from ore stockpiles into the surrounding environment including surface water or groundwater. The applicant has provided a stormwater management map, showing stormwater pond diversion channels and a surface water management plan. This also includes a number of mitigation measures to prevent contamination. A condition has also been included on the works approval to manage potential impacts to water.
			There are potential impacts to water from spills / leaks of hydrocarbons and chemicals from the storage of chemicals or spills from vehicles. The applicant has provided a number of measures to prevent contamination from occurring including bunding, spill kits and regular maintenance and these controls have been conditioned in the works approval.
			There are also potential impacts to water from tailings from spills / leaks. The applicant has provided a number of management controls to prevent contamination such as bunding, v-drains and isolation values and these are already a requirement on the existing licence. There are also 14 groundwater monitoring bores under the existing licence.
			Air: There is a potential of impacts to air quality from air emissions from the gas (LPG) fuel fired burning equipment (including kilns) and dust emissions. The applicant has committed to regular dust suppression and assaying of ore and waste samples to determine dust composition if required. The Department has considered the distance to receptors and considers that the proposed controls will be sufficient in managing impacts to air quality.
2	Concerns regarding dust impacts.	"Dust pollution increase, what is their solution (could Kurrawang or residents provide dust suppression").	There is a potential for dust emissions from the stockpiles of ore, mills, crushing and screening activities, the applicant has provided a number of controls such as use of a water cart to reduce dust generation and implementing a progressive rehabilitation program. The controls proposed have been conditioned in the works approval and the Department considers that the controls proposed by the applicant are sufficient in managing the impacts of dust associated with the activities.

Works approval: W6803/2023/1

DWER line item ref	Short description	Summary of stakeholder comments	Department's response
3	Concerns regarding water usage and associated impacts.	"How much water will the mill require? How will they by pulling out of the ground compared to current methods amounts, has there been an environmental study on the impacts to our lands, nature etc"?	Water usage: The proposed upgrades to the Mungari Mill will result in an increase in the amount of water that is used in their process. However, the Applicant has not requested to increase their current groundwater licence approval. Evolution Mining (Mungari) Pty Ltd have a current Groundwater Licence GWL 105884(8) with an allocation of 5,000,000 KL.  Given the groundwater is saline to hypersaline, vegetation within the premises area will likely use water sources in the unsaturated zone above the saline water table, and therefore won't be impacted by the upgrade activities.
4	Concerns regarding impacts to fauna and flora.	"There is a protected species in the Kurrawang Nature Reserve right on our border, I've seen this little lizard in a garden in Kurrawang before. Increase in water usage and noise and road train ground disturbances. What are the implications to wildlife and native plants"?	Protected species: There were three significant fauna species identified that could potentially occur within the area. A fauna site visit was carried out in November 2020. No evidence of significant fauna species has been observed during site surveys, including no evidence to show the presence of mallefowl, the arid bronze azure butterfly or the island hairstreak. The applicant has advised that there is a Fauna Management Procedure on site.  Noise Given the distance to sensitive receptors is 9.51km, noise as an emission has been excluded from the risk assessment. However, the applicant is required to comply with the Environmental Protection (Noise) Regulations 1997, and the Mining Act 1978.  Noise can also disrupt fauna, and the applicant has advised that there is a Fauna Management Procedure on site to manage this risk. The existing 300 metre buffer to undisturbed ecosystems is unchanged by the proposed upgrades.  Road train, ground disturbances: Please note that these activities are outside the scope of the works approval assessment.  Native plants: The applicant has proposed clearing of native vegetation as part of this project. Clearing of native vegetation has been assessed by the Department of Mines, Industry Regulation and Safety (DMIRS), the clearing permit was granted on 09/03/2023, Clearing Permit CPS5404/4.

# **Appendix 3: Application validation summary**

SECTION 1: APPLICATION SUMMARY					
Application type					
Works approval	$\boxtimes$				
Date application received		31/03/2023			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Evolution Mining (Mungari) Pty Ltd			
Premises name		Mungari Gold Project			
Premises location		L15/228, L15/246, M15/688, M15/829, M15/830, M15/1287, M15/1407 & M15/1741			
Local Government Authority		Shire of Coolgardie			
Application documents					
HPCM file reference number:		DER2018/001042-9~10			
Key application documents (additional to application form):		Environmental Commissioning Plan Additional Information Emissions and discharges Proof of Occupier Authorization to act as representation of occupier Air Quality Screening assessment			
Scope of application/assessment					

#### Works approval

Construction of Processing and beneficiation of metallic or nonmetallic ore activities:

Expansion of Mungari Mill Processing plant upgrades or replacements of existing equipment and associated infrastructure and installation of new additional equipment and associated infrastructure as shown below:

- 1. Crushing: primary crusher and coarse ore stockpile
- 2. Grinding: SAG Mill, hydrocyclones, horizontal screen
- 3. Gravity Concentration: concentrators, leach reactor, vibrating screens
- 4. Leach and adsorption: leach and adsorption tanks, screens
- 5. Elution Circuit: acid wash and elution column, LPG fire solution heater (LP gas fuel source).
- 6. Electrowinning and smelting: 2 cell electrowinning and return tank, LPG fire tilting furnace
- 7. Carbon regeneration: carbon regeneration kiln and screen
- 8. Service: associated pumps and tanks to increase water flow to the process
- 9. Tailings surge tank and pipeline: post-process output and pre-tailings pipeline input surge tank for tailings.

Also increasing the prescribed premises boundary to include M15/830.

# Category number/s (activities that cause the premises to become prescribed premises) Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed 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.	Proposed – 5,000,000 tonnes per annum (on current licence).	

#### Legislative context and other approvals

Summary of proposed activities or

changes to existing operations.

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 □	Mining lease / tenement ⊠ Expiry:

Has the applicant obtained all relevant planning approvals?	Yes □ No □ N/A ⊠	Mining tenement REG ID 106244
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ⊠ No □	CPS No: 5409/4 A Clearing Permit was submitted to DMIRS and approved on 9 March 2023
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 □	Application reference No: GWL105884(8)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes □ No ⊠	N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	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 □	Explosives and Dangerous Goods Act 1961 Heritage of Western Australia 1990 Mines Safety and Inspection Act 1995 Native Title Act 1973 Occupational Safety and Health Act 1984 Rights in Water and Irrigation Act 1914
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 or suspected contaminated site under the Contaminated Sites Act 2003?	Yes ⊠ No □	Classification: possibly contaminated – investigation required (PC–IR)