Decision Report

Application for Works Approval

Part V Division 3 of the Environmental Protection Act 1986

Works Approval Number W6566/2021/1

Applicant Evolution Mining (Mungari) Pty Ltd

ACN 002 124 745

File number DER2021/000244

Premises Mungari Gold Mine

Kundana Road

KALGOORLIE WA 6430

Mining tenements:

L15/391, M15/1831 (partial), M15/1827 (partial), L15/387

(partial), M15/829 (partial), M15/830 (partial)

Date of report 8 August 2021

Decision Granted

Lauren Edmands MANAGER – RESOURCE INDUSTRIES

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 W6566/2021/1 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 https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary and overview of premises

On 27 April 2021, 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 and time limited operations of dewatering pipelines at the premises (Figure 1) including:

- a 13.58km pipeline from the Rayjax Open Pit, discharging into the Northern Transfer Pond at the Mungari Mill. Water will then be discharged to Pope John pit (also managed by Northern Star under Kundana Gold Mine licence L9190/2019); and
- a 1.73km pipeline from Cutters Ridge Haul Road (connecting to Rayjax Mungari pipeline) discharging into the Cutters Ridge Open Pit; and
- Dewatering into Cutters Ridge Open pit as a new discharge location.

The premises relates to the categories and assessed design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6566/2021/1. 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 W6566/2021/1.

The applicant currently operates under licence L7750/2001/10, proposed for amendment following pipeline construction and completion of the works approval. The works approval includes the addition of three tenements L15/391, M15/1831 (partial) and L15/387 (partial) to the premises boundary.

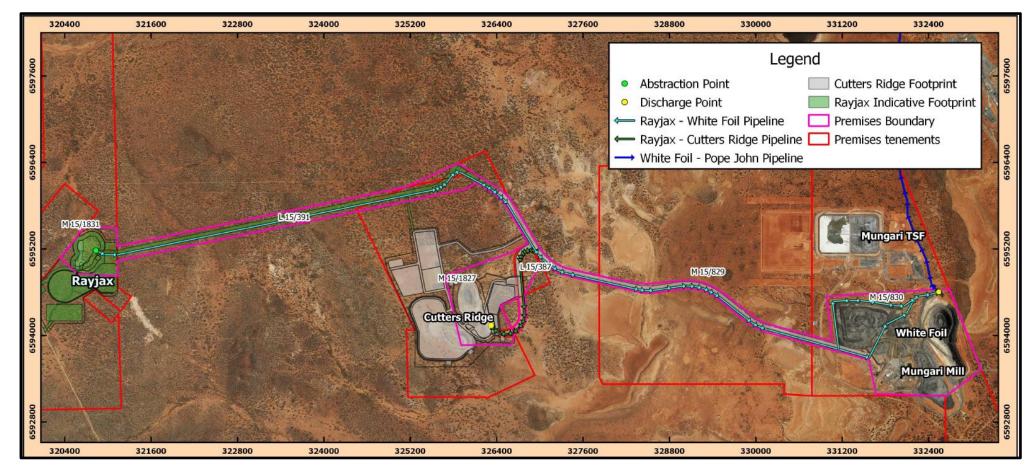


Figure 1 Proposed pipeline construction, new tenements and discharge location (Cutters Ridge open pit). Note: "White Foil Dam" is also referred to as the "Northern Transfer Pond"

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 time limited operations which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the proposed control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction	n		
Dust	Construction of new dewatering pipelines	Air/windborne pathway causing impacts to adjacent native vegetation	No controls listed for construction phase
Time limited	operations		
Dust	Vehicle movements during pipeline checks	Air/windborne pathway causing impacts to adjacent native vegetation	 "Use appropriate dust suppression techniques on the track" Daily observations within work area. Revegetation.
Rupture of pipeline causing hypersaline water discharge to land	Operation of new dewatering pipelines	Direct discharge onto soil and native vegetation	 Earthen bunding constructed with a capacity of 12,875kL to contain the length of pipelines An inspection is required for visual integrity and leak detection 12 hourly if pipeline flow rates or equal to or exceed 4L/s; or 24 hourly when flow rates are below 4L/s Includes isolation valves and flow metres Shut down if a leak detected If a spill occurs, contaminated material is removed and buried to reduce impact on vegetation; Saline water management procedure Constructed to meet Australian/New Zealand (AS/NZS) standards: AS/NZS 2033:2008: Installation of polyethylene pipe systems; AS/NZS 4129:2008 Fittings for polyethylene pipes for pressure applications; AS/NZS 4130:2009 Polyethylene pipes for

Emission	Sources	Potential pathways	Proposed controls
			pressure applications; o AS/NZS 4131:2010 Polyethylene compounds for pressure pipes and fittings.
Hypersaline mine dewater	Dewatering discharge into Cutters Ridge Open Pit (new	Seepage of hypersaline pit lake water through pit walls, leading to mounding of hypersaline groundwater into the root zone of the surrounding native vegetation, causing stress or death.	No controls proposed. The applicant indicates "Groundwater modelling conducted by AQ2 (2019) determined that both the Rayjax and Cutters Ridge pits have inflows, (also referred to as sinks or wells) and due to the very low specific yield (drainable porosity) of the material, outflows/seepage is not considered to occur." For further discussion see section 3.3.
Overtopping of pit hypersaline water	discharge point)	Direct discharge onto soil and native vegetation causing topsoil contamination and plant stress or death	 No controls proposed. The applicant indicates that quantity dewatered into Cutters Ridge pit will be 0.42% of the total pit volume over the 12 month life of mine. For further discussion see section 3.3.

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 2 and Figures 2 and 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)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Inland water bodies (salt lakes)	 The pipeline intersects un-named salt lake systems Kurrawang Lake is 580m south of the pipeline. Cattle Swamp Lake is 1.5km south of the pipeline
Adjacent native vegetation	Within prescribed premises boundary
Groundwater	~17m BGL (AQ2, 2019)
Heritage receptors	Distance from prescribed activity
Aboriginal heritage place ID 34415	The pipeline intersects the heritage area buffer

"Pulyinyaminya Cave"	See Section 4 – Consultation for further discussion	
Aboriginal heritage place ID 846 "Piira tukurr"	500m south of the pipeline	



Figure 2 Sensitive environmental receptors – salt lakes

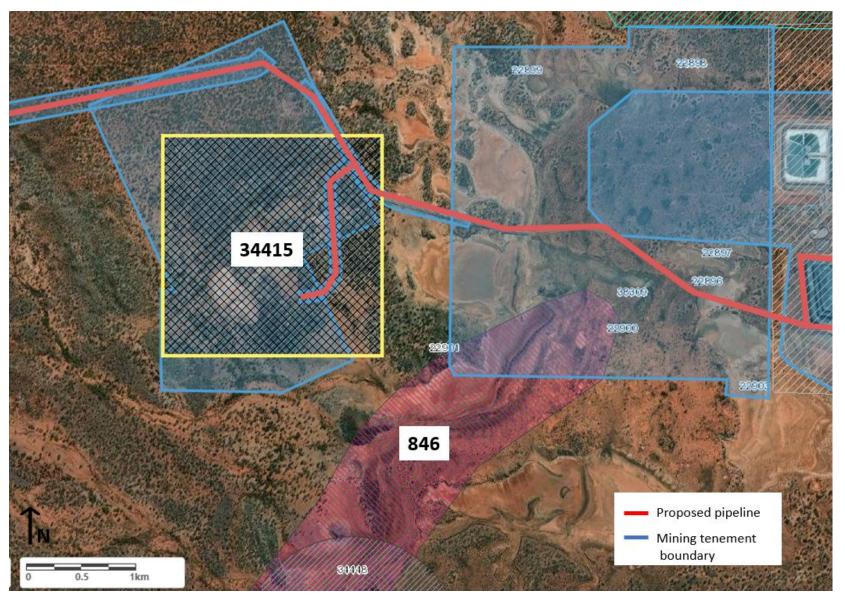


Figure 3 Sensitive Aboriginal heritage receptors – Place ID's 34415 and 846

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 in-complete 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 3. Works approval W6566/2021/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment 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. dewatering 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 3: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events			Risk rating ¹					
Sources / activities	Potential emission	Potential pathways and impact	Receptors Applicant controls		C = consequence L = likelihood	Conditions ² of works approval	Justification for additional regulatory controls	
Construction	Construction							
Construction of new dewatering pipelines	Dust	Air/windborne pathway causing impacts to adjacent native vegetation	Adjacent native vegetation	Refer to Section 3.1	C = Slight L = Unlikely Low risk	N/A	N/A	
Time Limited Operations								
Vehicle movements during pipeline checks	Dust	Air/windborne pathway causing impacts to adjacent native vegetation	Adjacent native vegetation	Refer to Section 3.1	C = Slight L = Unlikely Low risk	N/A	N/A	
Operation of new dewatering pipelines	Hypersaline mine dewater	Rupture of pipeline causing hypersaline water discharge to land soil, native vegetation and salt lakes	Adjacent native vegetation Salt lakes (pipeline directly intersects) Sensitive aboriginal heritage receptors Groundwater (~17m bgl)	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	Condition 1 – construction requirements for pipeline and earthen bund Conditions 2, 3, 4, 14 -16-compliance reporting and commencement Condition 7 – pipeline inspection Condition 8 – spill recovery and removal	The applicant proposed controls will be placed on the works approval as regulatory controls. DWER will also place compliance reporting requirements on works approval. Due to the nearby sensitive aboriginal heritage receptor, the pipeline route is strictly to be constructed along the approved route only. Any variations to the pipeline route must approved by DWER prior to construction via a works approval amendment.	
Dewatering discharge into Cutters Ridge Open Pit (new discharge point)	Hypersaline mine dewater	Seepage of hypersaline pit lake water through pit walls, leading to mounding of hypersaline groundwater into the root zone of	Adjacent native vegetation Groundwater (~17m bgl)	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Condition 6 – emission limits to Cutters Ridge Pit and Northern Transfer Pond	See Section 3.3	

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Risk events				Risk rating ¹			
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	Conditions ² of works approval	Justification for additional regulatory controls
		the surrounding native vegetation, causing stress or death					
	Hypersaline mine dewater	Overtopping of pit hypersaline water	Adjacent native vegetation Groundwater (~17m bgl)	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Condition 6 – emission limits to Cutters Ridge Pit and Northern Transfer Pond Condition 7 – operational requirements for Cutters Ridge Pit (including freeboard) Condition 9 – Monitoring during time limited operations	See section 3.3

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.

3.3 Risk Assessment – dewatering to Cutters Ridge Pit

The applicant proposes a maximum discharge limit to Cutters Ridge Pit of 315,360kL/year. The quantity dewatered into Cutters Ridge pit will be 0.42% of the total pit volume over the 12 month life of mine.

Groundwater modelling¹ by AQ2 (2019) indicates that the pit will have inflows from the surrounding aquifer and that seepage (i.e. outflows) are not expected to occur. The modelling indicates that due to low permeability, inflow into Cutters Ridge Pit is likely to be "low to moderate", and could range between less than 5L/s to 13L/s (though these figures are indicated by AQ2 to be uncertain).

DWER technical assessment

The modelling approach used by AQ2 consultants is technically sound, but would produce results with a high level of uncertainty. This is due to the assumptions made in the analytical solution that was used to model water level changes and flow rates, uncertainties associated with the fractured nature of the aquifer, and uncertainties associated with determining the evaporation rate of hypersaline water. The conclusion drawn by the consultants that groundwater would continue to flow into the pit during the dewatering program may not be valid due to the low rate of evaporation from the hypersaline pit lake.

However, this is unlikely to be a significant issue at this site. This is because of the absence of groundwater-dependent receptors near the mine void, and the likelihood that hypersaline groundwater would flow back towards the pit after dewatering ceases.

DWER outcome

As a degree of uncertainty exists with respect to water inflows into the pit, maximum discharge to Cutters Ridge Pit of 315,360kL/year will be placed on the licence as a regulatory control. Emissions are inclusive of, not in addition to, the emission limit approved under the current licence L7750/2001/10 (category 6: 5,000,000 tonnes per year dewatering approved).

Discharge to the Northern Transfer Pond (also known as White Foil Dam) is approved under L7750/2001/10 and so will not be restricted by the emission limit placed on Cutters Ridge Pit (see condition 6 of the associated licence).

Freeboard requirements for Cutters Ridge Pit will also be placed on the licence as a control to prevent risks to adjacent native vegetation from pit overflow.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response		
Application advertised on the department's website on 9/7/21	None received	N/A		
Local Government Authority (Shire of	None received	N/A		

¹ Modelling included information derived from advancing a bore (CUT MB01) in the vicinity of Cutters Ridge Pit and extrapolating inflows from the associated permeability information.

Consultation method	Comments received	Department response
Coolgardie) advised of proposal on 9/7/21		
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal 9/7/21	None received	N/A
Department of Planning, Lands and Heritage (DPLH) advised of proposal on 9/7/21	DPLH provided comment on 28/7/21 and indicated that whilst the proposed pipeline intersects with the public buffered boundary of Aboriginal Heritage place ID 34415, it does not intersect with the actual place location and consequently approvals under the <i>Aboriginal Heritage Act 1972</i> are not required. DPLH also confirmed that the applicant has previously liased with DPLH in regards to the site (Pulyinyaminya Cave).	N/A
Applicant was provided with draft documents on 9/7/21	See Appendix 1	See Appendix 1

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. AQ2 2019 Technical Memo, Hydro-Investigations Cutter's Ridge, Rayjax and Ridgeback Deposits (Appendix C of application document) DWER reference: DWERDT444075
- 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.
- 5. Evolution Mungari 2021 Rayjax Dewatering Works Approval Application DWER reference: DWERDT444075

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

Condition	Summary of applicant's comment	Department's response
Condition 6 Table 2	Applicant requests update of name – 'White Foil Dam' is now named 'Northern Transfer Pond'	Name updated
Condition 6 Table 2	Applicant requests removal of reference to L7750/2001/10 from emission limits associated with Cutters Ridge Pit, as not currently in operational licence.	Reference will remain unchanged, as this text indicates that the volume of discharge to Cutters Ridge Pit is included within, not in addition to, the total dewatering volume authorised for the premises.
Condition 7	Applicant requests removal, for safety reasons, the requirement of pit markers in Cutters Ridge Pit to indicate freeboard and that this will instead by determined by survey.	The requirement for pit markers has been removed, but a requirement for minimum vertical freeboard will remain on the works approval.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY						
Application type						
Works approval	\boxtimes					
		Relevant works approval number:		Non e		
		Has the works appropried with?	proval been	Yes □	Yes □ No □	
Licence		Has time limited of the works approvation acceptable operat	l demonstrated	Yes □	□ No □ N/A	
		Environmental Co Critical Containme Report submitted?	ent Infrastructure	Yes □] No □	
		Date Report receiv	ved:			
Renewal		Current licence number:				
Amendment to works approval		Current works approval number:				
		Current licence number:				
Amendment to licence		Relevant works approval number:		N/A		
Registration		Current works approval number:		Non e		
Date application received		27/4/21				
Applicant and Premises details	S					
Applicant name/s (full legal name	e/s)	Evolution Mining (Mungari) Pty Ltd				
Premises name		Mungari Gold Mine				
	L15/391, M15/1831 (partial), M15/1827 (partial), L15/387 (partial), M15/829 (partial), M15/830 (partial)					
Premises location	(Existing L7750 licence has the following tenements: M15/829, M15/830, M15/1741, M15/1408, M15/1287, M15/688, L15/228, L15/246, L15/227 and M15/1407)					
Local Government Authority	Shire of Coolgardie					
Application documents						
HPCM file reference number:	DER2021/000244					

Geochemical characterisation report AQ2 hydrogeological investigation Key application documents (additional Spectrum Flora and Vegetation Survey to application form): Botanica Flora and Vegetation Survey Pheonex Fauna Survey Report Scope of application/assessment Works approval Construction of: a 13.58km pipeline from the Rayjax Open Pit, discharging into the Northern Transfer Pond at the Mungari Mill, to be discharged to Pope John pit (managed under L7323/1998/12 Kundana Gold Mine licence, replacement licence L9190/2019/1- also managed by Northern star); and a 1.73km pipeline from Cutters Ridge Haul Road (connecting to Rayjax - Mungari pipeline) discharging into the Cutters Summary of proposed activities or Ridge Open Pit (new pit for discharge). changes to existing operations. To support dewatering operations at the Rayjax Project. No change to total discharge is proposed. The works approval aims to precede an amendment to L7750/2001/10 to include dewatering activities into the current operational licence. Time limited operations: Time limited operational phase involving abstraction and discharge of groundwater from Rayjax pit to Mungari, and Cutters Ridge pit. Category number/s (activities that cause the premises to become prescribed premises) Table 1: Prescribed premises categories Prescribed premises category Proposed production or Proposed changes to the and description design capacity production or design capacity (amendments only) More than 100,000 tonnes but Category 6 – Mine dewatering: not more than 500,000 tonnes premises on which water is per year extracted and discharged into the environment to allow mining of ore Legislative context and other approvals Has the applicant referred, or do they Referral decision No: intend to refer, their proposal to the Yes □ No ⊠ Managed under Part V □ EPA under Part IV of the EP Act as a significant proposal? Assessed under Part IV □ Does the applicant hold any existing Ministerial statement No: Part IV Ministerial Statements Yes □ No ⊠ **EPA Report No:**

relevant to the application?

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 □	Certificate of title □ General lease □ Expiry: Mining lease / tenement ⊠ Expiry: Other evidence □ Expiry:
Has the applicant obtained all relevant planning approvals?	Yes □ No □ N/A ⊠	Approval: Expiry date: If N/A explain why? Approval under the <i>Mining Act</i> 1978 – planning approval not required
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ⊠ No □	CPS No: No additional clearing is required to construct the dewatering pipeline from Rayjax to Mungari as the v-drain will follow within the Rayjax and Cutters Ridge Haul Road disturbance footprint and remain within the approved disturbance footprint of CPS 9242 (pending approval) and CPS 8549/2.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes □ No ⊠	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ⊠ No □	Application reference No: Licence/permit No: GWL178353(4)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ⊠ No □	Name: Goldfields Groundwater Area Type: RIWI Has Regulatory Services (Water) been consulted? Yes □ No □ N/A □ Regional office: RIWI Goldfields Groundwater Area

Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes □ No ⊠	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes □ No □ N/A □
Is the Premises subject to any other Acts or subsidiary regulations (e.g. Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx)	Yes ⊠ No □	Mining Act 1978
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: Awaiting classification Date of classification: N/A