# Application for Licence Amendment

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

| | |
|---|---|
| **Licence Number** | L8151/2005/2 |
| **Licence Holder** | Round Oak Jaguar Pty Ltd |
| **ACN** | 060 620 751 |
| **File Number** | 2012/006866-2 |
| **Premises** | Jaguar Operation<br>Mining Tenements M37/44, M37/515, M37/1132, M37/1153, M37/1228, M37/1230, M37/1257, M37/1290 and M37/1301<br>LEONORA WA 6438 (as depicted in Schedule 1) |
| **Date of Report** | 18 May 2023 |
| **Decision** | Revised licence granted |

Kang Tam
Digitally signed by Kang Tam
Date: 2023.05.18 12:00:41 +08'00'

**A/SENIOR ENVIRONMENTAL OFFICER, INDUSTRY REGULATION**
**REGULATORY SERVICES**

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

# Table of Contents

# 1. Decision summary

Licence L8151/2005/2 is held by Round Oak Jaguar Pty Ltd (Licence Holder) for the (the Premises), located on Mining Leases M37/44, M37/1153 and M37/1132, within the Shire of Leonora.

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 L8151/2005/2 has been granted.

# 2. Scope of assessment

## 2.1 Regulatory framework

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

## 2.2 Application/Amendment summary

On 30 December 2022 the Licence Holder submitted an application to the department to amend Licence L8151/2005/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The licence holder requested an increase in capacity from 500,000 to 800,000 kilolitres (kL)/annum for existing Category 6 Mine Dewatering activities as summaries in Table 1.

**Table 1: Proposed throughput capacity changes**

| Category | Current throughput capacity | Proposed throughput capacity | Description of proposed amendment |
|---|---|---|---|
| 6 | 500,000 | 800,000 | Additional capacity required to dewater Jaguar mine to Teutonic pit. |

The Jaguar Operation comprises the Jaguar, Bentley and Triumph underground copper-zinc deposits. Currently, only the Bentley deposit is undergoing active mining operations, including dewatering to lower the water table and allow for mining of ore. The proposed amendment is to provide the additional capacity required to dewater the Jaguar pit to enable reentry. An overview of underground deposit locations is provided in Figure 1. It is noted that a mining proposal is not yet required, and the licence holder has indicated that once the Jaguar pit is sufficiently dewatered. a geotechnical assessment will be undertaken to determine feasibility of project.

The Jaguar underground mine operated between 2007 – 2014, with mine dewater transported via pipeline from the mine to Teutonic Bore Pit (TB Pit). The licence holder is seeking to enter the mine commencing in 2023. This will allow for mining of 400,000 tonnes of ore from the Jaguar underground mine over 2 years.

The initial stage of dewatering the underground mine will require a volume of water (~800,000kL) to be discharged to TB Pit, exceeding the current Jaguar licence limit for category 6 activities, necessitating a licence amendment. This de-watering will take place utilising the existing de-watering pipes and V-drains installed for the historic operations. This amendment is limited only to changes to Category 6 activities from the Existing 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 2020b).

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 proposed 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 |
|---|---|---|---|
| Leaks from dewatering infrastructure | Dewatering operations from Jaguar underground mine to Teutonic Bore open cut pit | Discharge to land and potential overland runoff causing impacts to ecological health | No additional licence holder proposed controls, existing licence controls applicable. |
| Dewatering effluent – overtopping of pit | Dewatering operations from Jaguar underground mine to Teutonic Bore open cut pit | Overland runoff potentially causing ecosystem disturbance or impacting surface water quality | No additional licence holder proposed controls, existing licence controls applicable. |
| Seepage of saline dewatering effluent | Dewatering operations from Jaguar underground mine to Teutonic Bore open cut pit | Overland runoff potentially causing ecosystem disturbance or impacting surface water quality | No additional licence holder proposed controls, existing licence controls applicable. |

### 3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020b), 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 2020a)).

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

| **Human receptors** | **Distance from prescribed activity** |
|---|---|
| N/A | N/A |
| **Environmental receptors** | **Distance from prescribed activity** |
| Native vegetation<br>• Open low Mulga woodland (*Acacia aneura*) | Native vegetation is present throughout the proposed activity footprint. The nearest native vegetation is located approximately 75 metres east of the TB pit. |
| Priority flora<br>• *Stenanthemum patens* (Priority 1)<br>• *Lysiandra baekeoides* (Priority 3)<br>• *Heigenia exilis* (Priority 4) | Three priority flora species are present within and around the prescribed premise (within 2 km or less).<br>The closest priority flora, *Lysindra baekeoides (Priority 3)*, could be located within metres of the dewatering pipeline. |
| Groundwater aquifer<br>• Groundwater quality is considered brackish/marginally saline (total dissolved solids concentrations between 1,000 to 3,000 mg/L).<br>• Analytical data on the composition of mine dewater at Bentley Mine and groundwater at Jaguar Mine was not provided. | Historical groundwater monitoring events from the nearby Teutonic Bore open pit to be between 22 metres below ground level (mbgl) to 28 mbgl, though they may be affected TSF seepage and active abstraction for mine use.<br>Groundwater level at a discontinued potable water production bore (Teutonic Creek Bore) is about 25 to 26 mbgl.<br>Groundwater flow direction is generally from the north (Teutonic bore area) to the south (Bentley area), with a groundwater divide north of the Teutonic Bore open pit. The Teutonic Bore open pit acts as a sink with evaporation drawing groundwater towards the pit.<br>A review of the WIN database indicated that several private bores are located within 1 km of the premises boundary. It is unknown if groundwater use includes stock watering or other sensitive land uses. |
| **Cultural receptors** | **Distance from prescribed activity** |
| Aboriginal heritage places<br>• There are 14 Aboriginal heritage places listed within the prescribed premise.<br>• Of which, only five are registered sites. | Distance of dewatering infrastructure less than 1 km. The two closest sites to proposed discharge location are.<br>• Teutonic Hill (FS2) - Ngurrie Dreaming (21932) – approximately 400 metres north east of discharge location<br>• Teuronic Bore Quarry 2 (2591) – approximately 900 metres west of discharge location |

## 3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020b) 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 L8151/2005/2 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 6 activities.

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]<br>C = consequence<br>L = likelihood | Licence Holder's controls sufficient? | Conditions[2] of licence | Justification for additional regulatory controls |
|---|---|---|---|---|---|---|---|---|
| **Source/Activities** | **Potential emission** | **Potential pathways and impact** | **Receptors** | **Licence Holder's controls** | | | | |
| **Operation** | | | | | | | | |
| Discharge of mine dewater from Jaguar to TB pit<br><br>Increased discharge of dewatering from 500kl to 800 kl | Saline mine dewater leaks from dewatering infrastructure | **Pathway:** Leakage from pipeline infrastructure<br>**Impact:** Discharge to land and potential overland runoff, resulting in ecological disturbance | Native vegetation, including priority flora<br>Aboriginal heritage place | Refer to Section 3.11 and Table 2 | C = Minor<br>L = Unlikely<br>***Medium Risk*** | Yes – existing licence controls sufficient | Condition 1.3.3<br>Condition 1.3.5 | The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to control for leaks from pipeline infrastructure resulting in a discharge to land from nearby environmental receptors.<br>Additional regulatory controls are not required, as the pipeline infrastructure proposed are already existing and have been assessed as part of the wider dewatering pipeline network at the premises.<br>Further discussion of risk assessment is included in section 3.3. |
| | Saline mine dewater leak– Overtopping of pit | **Pathway:** Overtopping of TB pit<br>**Impact:**<br>Discharge to land and potential overland runoff, resulting in ecological disturbance | Native vegetation<br>Aboriginal heritage places | Refer to Section 3.11 and Table 2 | C = Major<br>L = Rare<br>***Low Risk*** | Yes – existing licence controls sufficient | Condition 2.1.1<br>Condition 2.4.1<br>Condition 3.4.1<br>Condition 5.2.1 | The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to control for overtopping resulting in a discharge to land from nearby environmental receptors.<br>Additional regulatory controls are not required.<br>The inspection frequency of the Jaguar mine is currently weekly, as a conservative measure proposed by the Licence Holder.<br>Further discussion of risk assessment is included in section 3.3. |
| | Seepage of saline dewatering effluent | **Pathway:** Seepage and infiltration of mine dewater<br>**Impact:** Discharge to | Native vegetation<br>Groundwater | Refer to Section 3.11 and Table 2 | C = Slight<br>L = Possible<br>***Low Risk*** | Yes – existing licence controls sufficient | Condition 2.1.1<br>Condition 2.4.1<br>Condition 3.4.1 | The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to control for seepage resulting in impact to nearby |

| Risk Event | | | | | Risk rating[1]<br>C = consequence<br>L = likelihood | Licence Holder's controls sufficient? | Conditions[2] of licence | Justification for additional regulatory controls |
|---|---|---|---|---|---|---|---|---|
| **Source/Activities** | **Potential emission** | **Potential pathways and impact** | **Receptors** | **Licence Holder's controls** | | | | |
| | | groundwater, potentially resulting in mounding of water table, surface expression of groundwater and degradation of groundwater quality. | Users | | | | Condition 3.7.1<br>Condition 5.2.1 | environmental receptors.<br>Further discussion of risk assessment is included in section 3.3. |

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

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 discharge

The purpose of this amendment is to increase the approved dewatering capacity dewatering of jaguar pit. The dewatering pipeline infrastructure is already in place for this new discharge location, with alignment detailed in Figure 1.

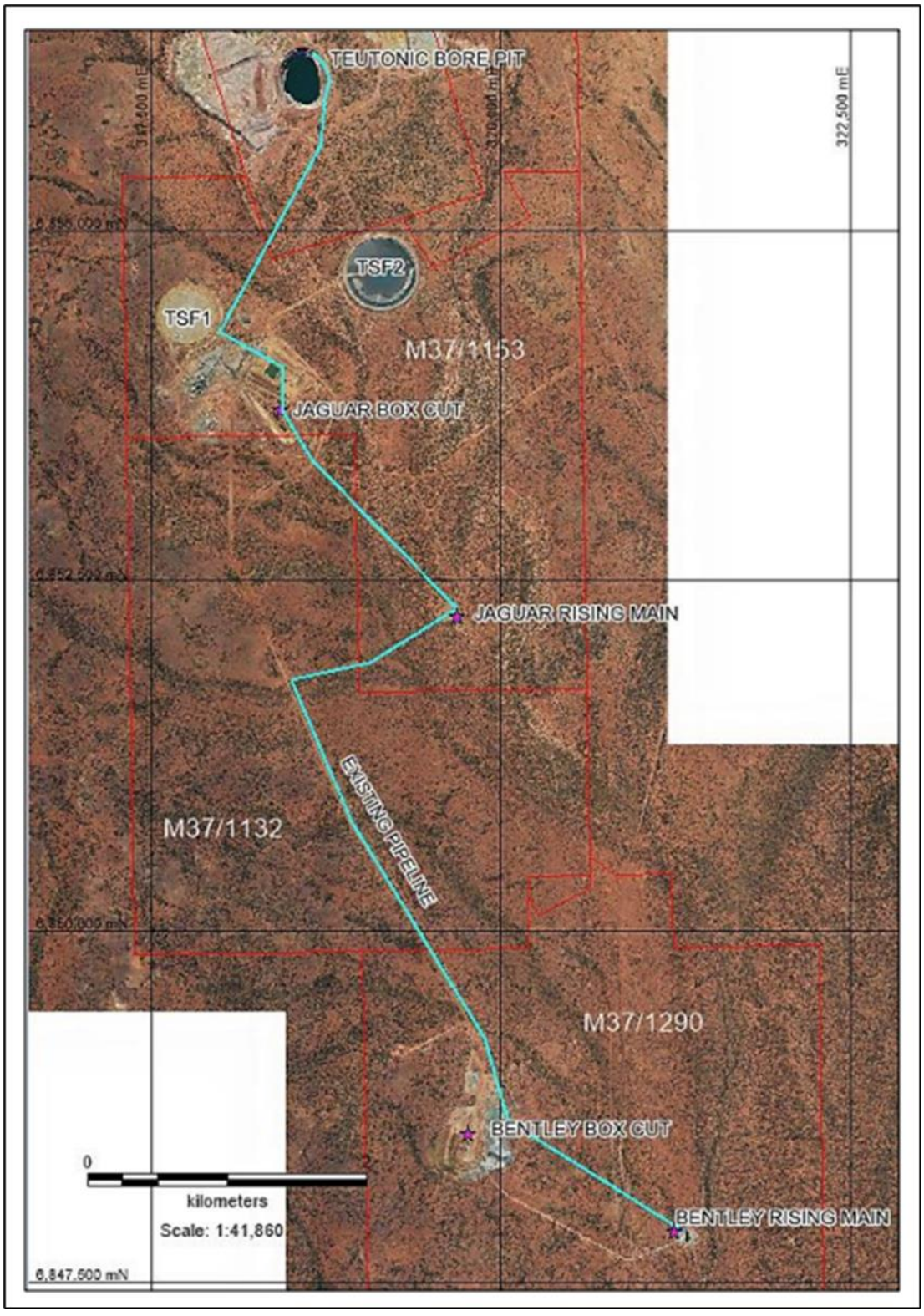


**Figure 1: Mining Deposits and Existing Dewatering Infrastructure**

### 3.3.1 Emissions

The emission of concern is mine dewater from the Jaguar pit.

Water quality analysis from the Jaguar Boxcut indicates the water is pH neutral (~7.4), slightly saline (TDS 6,000 – 7,000) and does not have significantly elevated metal concentrations.

### 3.3.2 Receiving Environment

Water quality analysis from the TB Pit indicates the water is pH neutral (~7.4), slightly saline (TDS ~5,000) and has slightly elevated concentrations of Zinc (35mg/L) and Cadmium (0.35mg/L).

Based on the above, it is considered that the source water is unlikely to impact the receiving environment, and therefore existing monitoring conditions of the licence are considered suitable to manage the risk of contamination or the TB pit.

### 3.3.3 Water Balance Summary

The initial estimated dewatering discharge of 800,000kL for the 2023 months represents the volume currently anticipated in the section of the mine to be dewatered, plus a gradual increase of groundwater inflows into the newly dewatered section of the mine (Table 5). The 208,340kL estimated for 2024 onwards, represents the net balance between mine dewatering and water for use mining processes, based on historical data from 2009-2011 annual groundwater reports. The total estimated dewatering volume required for this campaign is 1,921,360kL compared to a currently available capacity in the TB pit of 2,631,514kL, allowing a margin of approximately 710,154kL. The final estimated surf water level (SWL), assuming continuing concurrent dewatering from Bentley for the entire duration (worst case) is approximately 15mbgl, compared to the licence “target” level for SWL of 6mbgl.

Water balance calculations estimate that the water level would increase from the current 436.25 metres with respect to Australian Heigh Datum (mAHD) to 446.25 mAHD in the first year of dewatering operations, to 455.25 mAHD at the currently anticipated cessation of operations. 464.25 mAHD represents the current licence “target” applicable to Jaguar operations and 470.25 mAHD approximates the lowest elevation of the pit rim.

Based on the above, it is considered highly unlikely that water levels will increase above the current licence “target” of 470.25 mAHD, and existing monitoring conditions are considered adequate to manage this risk.

**Table 5: Water Balance Table**

| Year | Volume to be discharged to TB Pit (KL) | Initial SWL in mAHD | Change in pit level required to accommodate discharge volume (metres) | Anticipated SWL at end of year in mAHD | TB pit crest level in mAHD | SWL in Meters below ground level in mAHD |
|---|---|---|---|---|---|---|
| *2023* | *800.000* | *436* | *9.75* | *446.25* | *470.2* | *23.95* |
| *2024* | *208,340* | *446.25* | *2* | *448.75* | *470.2* | *21.45* |
| *2025* | *208.340* | *448.75* | *2.5* | *451.25* | *470.2* | *18.95* |
| *2026* | *208.340* | *451.25* | *2* | *453.25* | *470.2* | *16.95* |
| *2027* | *208,340* | *453.25* | *2* | *455.25* | *470.2* | *14.95* |

# 4. Consultation

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

**Table 6: Consultation**

| Consultation method | Comments received | Department response |
|---|---|---|
| Local Government Authority advised of proposal 17 March 2023 | No comments received | N/A |
| Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal on 17 March 2023 | No comments received | N/A |
| Watarra Aboriginal Corporation advised of proposal on 17 March 2023 | No comments received | N/A |
| Licence Holder was provided with draft on 17 April 2023. | No comments received | N/A |

# 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.

In addition, the Delegated Officer noted that the condition numbering and format should be reviewed and revised to current licensing formats, in a future amendment to licence L8151/2008/2.

## 5.1 Summary of amendments

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

**Table 7: Summary of licence amendments**

| Condition no. | Proposed amendments |
|---|---|
| Not applicable | Updated table in prescribed premises category description with revised category 6 capacity of 800,000 tonnes per year. |
| Not applicable | Updated the table describing the licence history in the ‘Premises description and licence summary’ section. |

# References


1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.

# Appendix 1: Application validation summary

| SECTION 1: APPLICATION SUMMARY | | | |
|---|---|---|---|
| **Application type** | | | |
| Amendment to licence | ☒ | Current licence number: | L8151/2005/2 |
| | | Relevant works approval number: | N/A |
| Date application received | | 30 December 2022 | |
| **Applicant and Premises details** | | | |
| Applicant name/s (full legal name/s) | | Round Oak Jaguar Pty Ltd | |
| Premises name | | Jaguar Operations | |
| Premises location | | Mining Leases:<br>M37/44<br>M37/1153<br>M37/1132 | |
| Local Government Authority | | Shire of Leanora | |
| **Application documents** | | | |
| HPCM file reference number: | | DWERDT705666 | |
| Key application documents (additional to application form): | | *Attachment 2: Jaguar Operations Location*<br>*Attachment 2a: Jaguar GDE*<br>*Attachment 3D: Priority Flora in Operations Area*<br>*Attachment 3E: Baseline conditions* | |
| **Scope of application/assessment** | | | |
| Summary of proposed activities or changes to existing operations. | | *Licence amendment*<br>Jaguar Operations is proposing to re-enter the existing Jaguar underground mine, at the currently operational Jaguar Operations.<br><br>Re-entry will require dewatering of some of the underground mine, to the currently licensed mine dewater discharge point at Teutonic Bore open pit.<br><br>This additional de-watering will exceed the currently licensed dewatering volume listed on license L8151/2005/2, hence request for licence amendment to provide approval for capacity increase. | |

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

**Table 1: Prescribed premises categories**

| Prescribed premises category and description | Proposed design capacity | Proposed changes to the production or design capacity (amendments only) |
|---|---|---|
| Category 5(c ): Tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam | 3,200,0000 tonnes per year | No change |
| Category 6: Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore | 800,000 kL/annum | Yes – currently licensed at 500,000 tonnes |
| | | |
| | | |
| | | |

**Legislative context and other approvals**

| | | |
|---|---|---|
| Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal? | Yes ☐ No ☒ | Referral decision No: N/A<br>Managed under Part V ☐<br>Assessed under Part IV ☐ |
| Does the applicant hold any existing Part IV Ministerial Statements relevant to the application? | Yes ☐ No ☒ | Ministerial statement No: N/A<br>EPA Report No: N/A |
| Has the proposal been referred and/or assessed under the EPBC Act? | Yes ☐ No ☒ | Reference No: N/A |
| Has the applicant demonstrated occupancy (proof of occupier status)? | Yes ☒ No ☐ | Certificate of title ☐<br>General lease ☐ Expiry:<br>Mining lease / tenement ☒ Expiry: 30 January 2026<br>Other evidence ☐ Expiry: |
| Has the applicant obtained all relevant planning approvals? | Yes ☐ No ☐ N/A ☒ | Approval: N/A<br>Expiry date: N/A |

| | | |
|---|---|---|
| Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal? | Yes ☐ No ☒ | CPS No: N/A<br>Clearing permit not required |
| 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<br>Licence/permit No: N/A<br>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: N/A<br>Licence/permit No: GWL159028 (7)<br>Licence allocation: 2,200,000 kL |
| Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)? | Yes ☐ No ☒ | Name: N/A<br>Type: N/A<br>Has Regulatory Services (Water) been consulted?<br>Yes ☐ No ☐ N/A ☒<br>Regional office: N/A |
| Is the Premises situated in a Public Drinking Water Source Area (PDWSA)? | Yes ☐ No ☒ | Name: N/A<br>Priority: P1 / P2 / P3 / N/A<br>Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)?<br>Yes ☐ No ☐ N/A ☒ |
| Is the Premises subject to any other Acts or subsidiary regulations? | Yes ☒ No ☐ | • Mining Act 1978<br>• Dangerous Goods Safety Act 2004 |
| 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 ☐ | M37/1153, M37/44, M37/1301<br>Classification: contaminated – restricted use (C–RU)<br>Date of classification: 22 March 2021 |