# Amendment Report

## Application for Licence Amendment

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

| | |
|---|---|
| **Licence Number** | L5529/1988/12 |
| **Licence Holder** | Mt Magnet Gold Pty Ltd |
| **ACN** | 008 669 556 |
| **File Number** | DER2016/001228-1 |
| **Premises** | Mt Magnet Gold<br>MOUNT MAGNET WA 6623<br>M58/30, M58/79, M58/121, M58/136, M58/172, M58/181, M58/185, M58/186, M58/187, M58/191, M58/193, M58/202, M58/205 and M58/234 |
| **Date of Report** | 3 June 2022 |
| **Decision** | Granted |

Michael Greenslade
Digitally signed by Michael Greenslade
Date: 2022.06.03 13:46:55 +08'00'

**MANAGER, RESOURCE INDUSTRIES**
**INDUSTRY REGULATION**
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

# Table of Contents

# 1. Decision summary

Licence L5529/1988/12 is held by Mt Magnet Gold Pty Ltd (Licence Holder) for the Mt Magnet Gold (the Premises), located within multiple mining tenements. 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 L5529/1988/12 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises.

# 2. Scope of assessment

## 2.1 Regulatory framework

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

## 2.2 Application summary

On 20 October 2021, the Licence Holder submitted an application to the department to amend Licence L5529/1988/12 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). An underground mining operation is being developed beneath the Galaxy group of pits (Figure 1) and near the historical Hill 50 underground mine. Phase 1 will include development beneath the Mars Pit and phase 2 under the Saturn Pit. Consequently, the following amendments for dewatering activities are being sought:

- Increase dewatering throughput from currently licenced 1,500,000 to 3,100,000 tonnes per annual period ( Table 1);
- Additional dewatering emission points including Brown Hill Pit, Hesperus Pit, Windbag Pit, Saturn Pit, Titan Pit (Figure 3):
    - Emission sources amended to include Mars underground mine, Saturn underground mine, Perseverance Pit, Reno Pit and Vegas Pit.
    - Saturn and Titan Pit to be used for dewater discharge in phase 1 and dewatered in phase 2.
- Surface water run-off will also be diverted to Brown Hill and Windbag Pit;
- Franks Tower Pit replaced with Stellar Pit for dewatering:
    - Emission sources amended to include Bartus, Bartus South, Blackhole, Britannia well and Qasar abandoned pit lakes (Appendix 1, Figure 7).
    - Milky Way Pit to be used as a back up for dewatering to Stellar Pit.
- O'Meara Pit removed as a dewatering emission point;
- Vegas Pit to receive peak stormwater flow, which can then overflow into the Reno Pit, in place of the Milky Way and Stellar Pit;

The applicant has stated they will use existing pipeline infrastructure as part of this amendment, where no additional pipeline construction is proposed.

Table 1 provides a summary of total proposed dewatering discharge, for which the applicant has requested an increase to throughput.

**Table 1: Proposed dewatering discharge**

| Source of dewater | Dewatering discharge point | Peak Annual Discharge (ML/yr) |
|---|---|---|
| Mars (phase 1) and Saturn (phase 2) underground<br>Perseverance Pit, Reno Pit and Vegas Pit | Brown Hill Pit, Hesperus Pit, Windbag Pit<br>Saturn Pit, Titan Pit (phase 1) | 1,480 |
| Eridanus underground (316 ML/yr)<br>Shannon underground (158 ML/yr)<br>Bartus, Bartus South, Blackhole, Britannia well and Qasar abandoned pit lakes (170 ML/yr) | Stellar Pit, with backup to Milky Way Pit | 644 |
| St George (545 ML/yr)<br>Hill 60 (110 ML/yr) | Ruby Queen & Blackcat South | 655 |
| 10% contingency | | 278 |
| **Total** | | **3057** |

This amendment is limited only to changes to Category 6 activities from the existing Licence. No changes to the aspects of the existing Licence relating to Category 5 or 64 have been requested by the Licence Holder. Table 2 below outlines the proposed throughput changes to the existing Licence.

**Table 2: Proposed throughput capacity changes**

| Category | Current throughput capacity | Proposed throughput capacity |
|---|---|---|
| 6 | 1,500,000 tonnes per annual period | 3,100,000 tonnes per annual period |

## 2.3 Administrative amendment

A construction and compliance report for conditions 1.3.11 and 1.3.12 was received by the department on 26 January 2022 (DWER reference DWERDT554732) and was determined to meet the condition requirements (see correspondence from DWER on 10 February 2022). As the pipelines for which this condition was written have now been constructed, DWER will remove conditions 1.3.11 and 1.3.12 from the licence. Note that the Licence Holder will need to submit a licence amendment application for future construction of any additional pipelines. All existing pipelines will need to meet the on-going operational requirements listed in condition 1.3.7; whereby pipelines are equipped with telemetry systems and pressure sensors to detect leaks and equipped with automatic cut-outs in the event of pipeline failure or provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

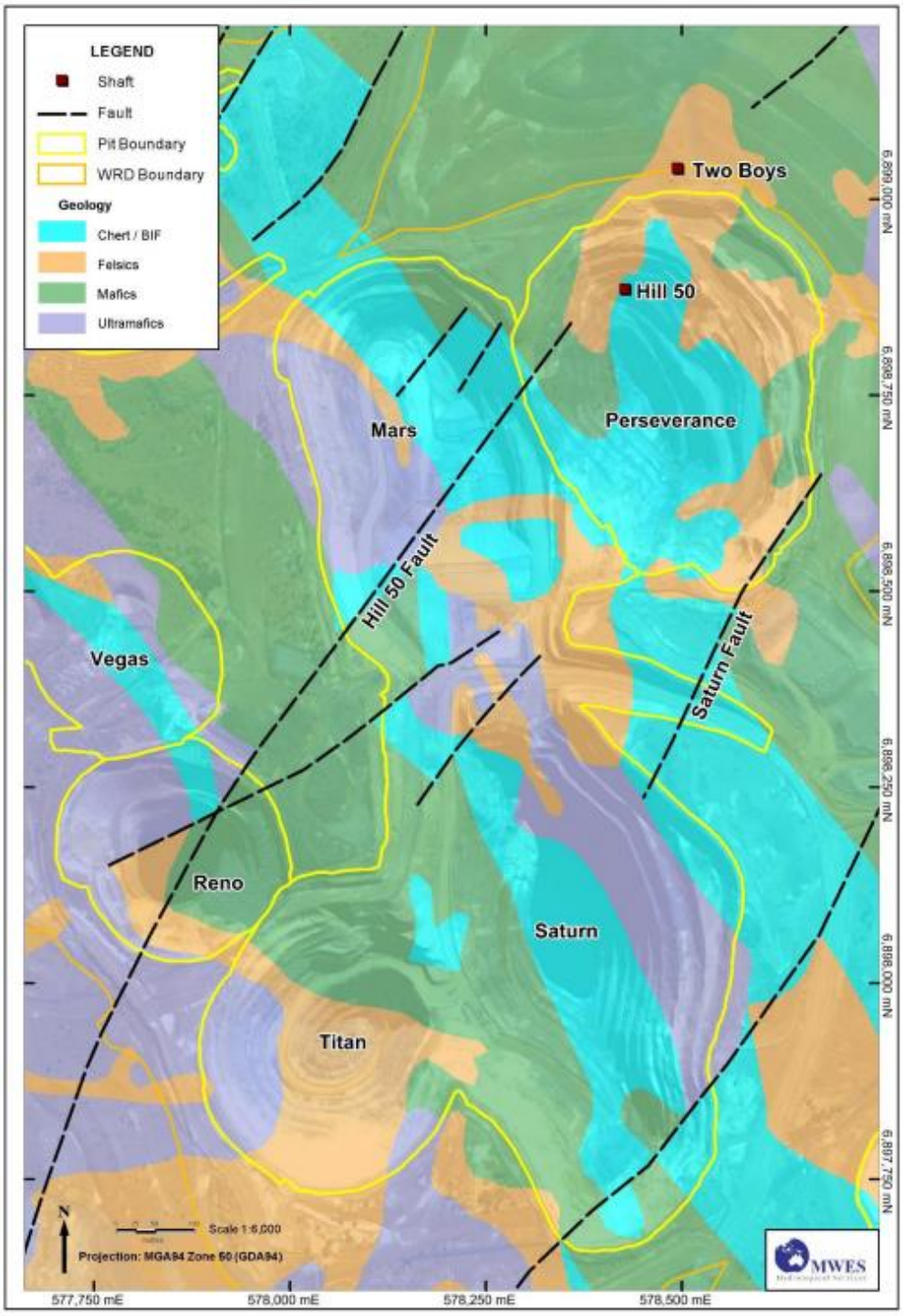


**Figure 1: Galaxy Pits Location and Geology**

# 3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

## 3.1 Source-pathways and receptors

### 3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 3 below. Table 3 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

**Table 3: Licence Holder controls**

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| **Operation** | | | |
| Dewater effluent in pit<br>(metalloids, nitrate) | Brown Hill Pit<br>Hesperus Pit<br>Windbag Pit<br>Saturn Pit<br>Titan Pit<br>(dewater source from Mars underground mine, Saturn underground mine, Perseverance Pit, Reno Pit and Vegas Pit) | Seepage to groundwater through unlined pit and migration to PDWSAs | Applicant proposed controls<br>• MMG have committed to zero seepage from all discharge points proposed for addition in this licence amendment. To achieve this the applicant intends to maintain the pit lake level below the surrounding groundwater level to prevent seepage.<br>• Installation of one groundwater monitoring bore southwest of Windbag pit, and bore south of Hesperus pit is proposed to monitor groundwater flow direction.<br>For further detail see section 3.3. |
| | | Discharge of dewater via pit overtopping | Existing licence controls<br>Condition 1.3.8 – maintain 2m freeboard (currently licensed emission points)<br>Applicant proposed controls<br>Maintain 2m freeboard |
| Dewater effluent in pit<br>(metalloids, nitrate) | Stellar pit<br>(dewater source from Bartus, Bartus South, Blackhole, Britannia well and Qasar abandoned pit lakes) | Seepage to groundwater through unlined pit and migration to PDWSAs | Existing licence controls<br>Condition 1.3.8 - Stellar Pit is currently licensed to receive surface water run-off only. Current controls only allow Stellar Pit to receive surface water if the pit is also being actively pumped out.<br>Applicant proposed controls<br>• MMG have committed to zero seepage from all discharge points proposed for addition in this licence amendment. To achieve this the applicant intends to maintain the pit lake level below the surrounding groundwater level to prevent seepage.<br>• Installation of one groundwater monitoring bore to the west of Stellar |

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| | | | pit is proposed.<br>For further detail see section 3.3. |
| | | Discharge of dewater via pit overtopping | Existing licence controls<br>Maintain 2m freeboard (currently licensed emission points)<br>Applicant proposed controls<br>Maintain 2m freeboard |
| Potentially contaminated stormwater | Reno Pit<br>Vegas Pit | Seepage to groundwater through unlined pit and migration to PDWSA's | Existing licence controls<br>None<br>Applicant proposed controls<br>Directly pumped to the process water dam or via the Ruby Queen Transfer Pit for gold processing and mining operations. |
| | | Pit overtopping | Existing licence controls<br>Maintain 2m freeboard (for pits currently licensed to receive stormwater – Milky Way and Stellar Pit).<br>Applicant proposed controls<br>Following a storm event, this water can be transferred to the Saltwater Dam or via the Ruby Queen Transfer Pit for gold processing and mining operations.<br>Reno and Vegas pits will not be used for storage of mine dewater. |
| Dewater effluent<br>(metalloids, nitrate) | Rupture of dewatering pipelines | Direct discharge to soil, surface water and infiltration to groundwater | Existing licence controls<br>Condition 1.3.7 – all pipelines equipped with telemetry systems, automatic cut-outs and secondary containment |

### 3.1.2 Receptors

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

Table 4 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)).

DWER notes that there are a number of Aboriginal Heritage sites within proximity of proposed dewater discharge to Stellar pit (Figure 8), the closest being Boolgardie site ID 4417, 300m west of Stellar pit. Whilst, these are not considered included within the risk assessment of this report, the applicant should note that under the *Aboriginal Heritage Act 1972* consent is required from

the Minister for Aboriginal Affairs for any activity which could negatively impact Aboriginal heritage sites.

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

| **Human receptors** | **Distance from prescribed activity** |
|---|---|
| Town of Mount Magnet | Immediately adjacent to the premises boundary (mining tenement M58/202) (Figure 2)<br>1.7km south-east of Black Cat South Pit (closest dewatering emission point) |
| **Heritage receptors** | **Distance from prescribed activity** |
| Boolgardie heritage site ID 4417<br>(ceremonial, male access only) | Within prescribed premises<br>300m west of Stellar pit |
| Boolgardie Road heritage site ID 4450<br>(ceremonial, male access only) | Within prescribed premises<br>780m west of Stellar pit |
| Boolgardie Walkway heritage site ID 15824 | Within prescribed premises<br>900m west of Stellar pit |
| Boolgardie Circles heritage site ID 12831<br>(circular mounds) | Within prescribed premises<br>1.2km west of Stellar pit |
| **Environmental receptors** | **Distance from prescribed activity** |
| Public Drinking Water Source Area (PDWSA) P1 and P2<br>The Mount Magnet Water Reserve consisting of Genga and Lennonville Water Reserve<br>(Figure 3) | The Lennonville Water Reserve (P1) borders on the northern side of the premises boundary.<br>The Genga Water reserve (P1 and P2) is within the premises boundary.<br>The Stellar pit is the closest dewatering emission point, located 700m east of the P1 Genga water reserve.<br>Other pits proposed for dewatering are at the following distances from the PDWSA:<br>• Windbag Pit: 1.3km east<br>• Brown Hill: 1.6km east<br>• Titan Pit: 1.8km east<br>• Saturn Pit: 2.1km east<br>• Hesperus Pit: 2.6km east<br>• Ruby Queen Pit (currently licensed emission point): 3.9km east<br>• Black Cat South (currently licensed emission point): 4.6km east<br>See further information in sections 3.1.3 and 3.3.2. |
| Groundwater | Groundwater flow at site is generally to the south. |

| | |
|---|---|
| East Murchison Groundwater Area<br><br>Rights in Water and Irrigation Act *(RIWI Act 1914)* | Fifteen groundwater monitoring events undertaken for the sites currently licensed monitoring network took place from September 2020 to November 2021. Groundwater depth ranged between 17 – 39 metres below ground level (m bgl).<br><br>Groundwater depth was recorded as 29.20m bgl and 27.80m bgl for bore completion reports for MWMB05 and MWMB06, which are the closest monitoring bores to the Stellar Pit (~1km south-west) |
| Surrounding native vegetation | Surrounding native vegetation may be impacted by seepage and rising groundwater levels.<br><br>Acacia burrowsiana – priority 3 flora directly adjacent to Saturn and Titan pit |

### 3.1.3 Public Drinking Water Source Protected Area

The Mount Magnet Water Reserve is a PDWSA, proclaimed under the Country Areas Water Supply Act 1947 (*CAWS Act)* and consists of the Genga and Lennonville water reserves. The premises partially lies within the Genga water reserve to the west, and borders on the Lennonville water reserve on the northern boundary (Figure 2).

The southern part of Genga, and the Lennonville water reserve are classified as priority 1 areas (P1) by the department. As set out in the department's Water Quality Protection Note No. 25, *Land use compatibility tables for public drinking water source areas* (DOW, 2016), P1 areas are managed to ensure there is no degradation of the drinking water quality source, with the objective of risk avoidance, consistent with the preventative risk-based framework of the Western Australian Government.

The northern part of Genga water reserve is classified as a priority 2 area (P2), which are managed to maintain or improve the quality of the drinking water source with the objective of risk minimisation.

The Drinking Water Source Protection Plan (DWSPP) (DWER, 2019) for the Mount Magnet water reserve reports on activities and risks to water quality within the Mount Magnet water reserve and discusses management strategies to minimise identified risks. The DWSPP does not specifically refer to groundwater impacts through seepage from mining activities.

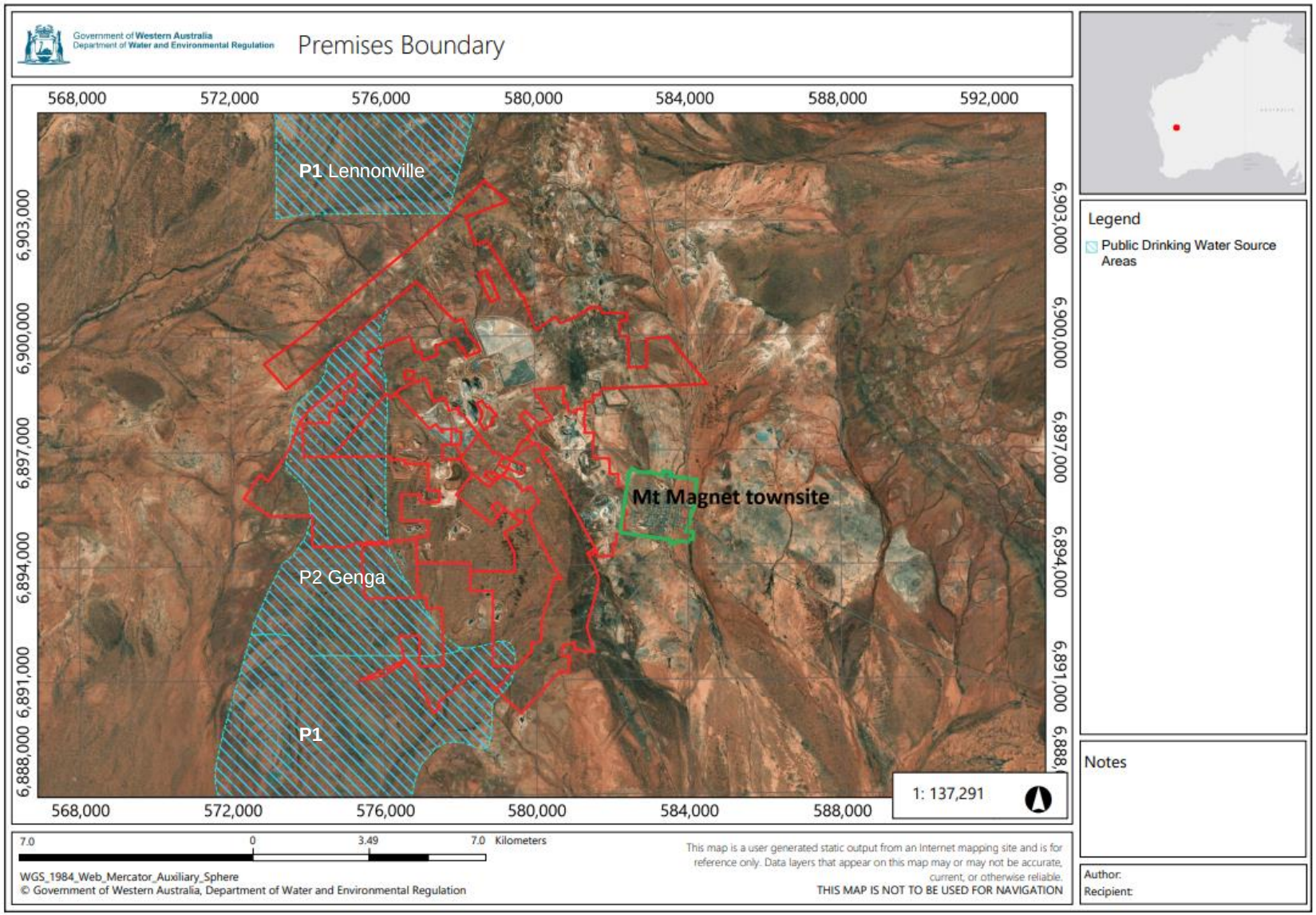


**Figure 2: Distance to sensitive receptors**

L5529/1988/12

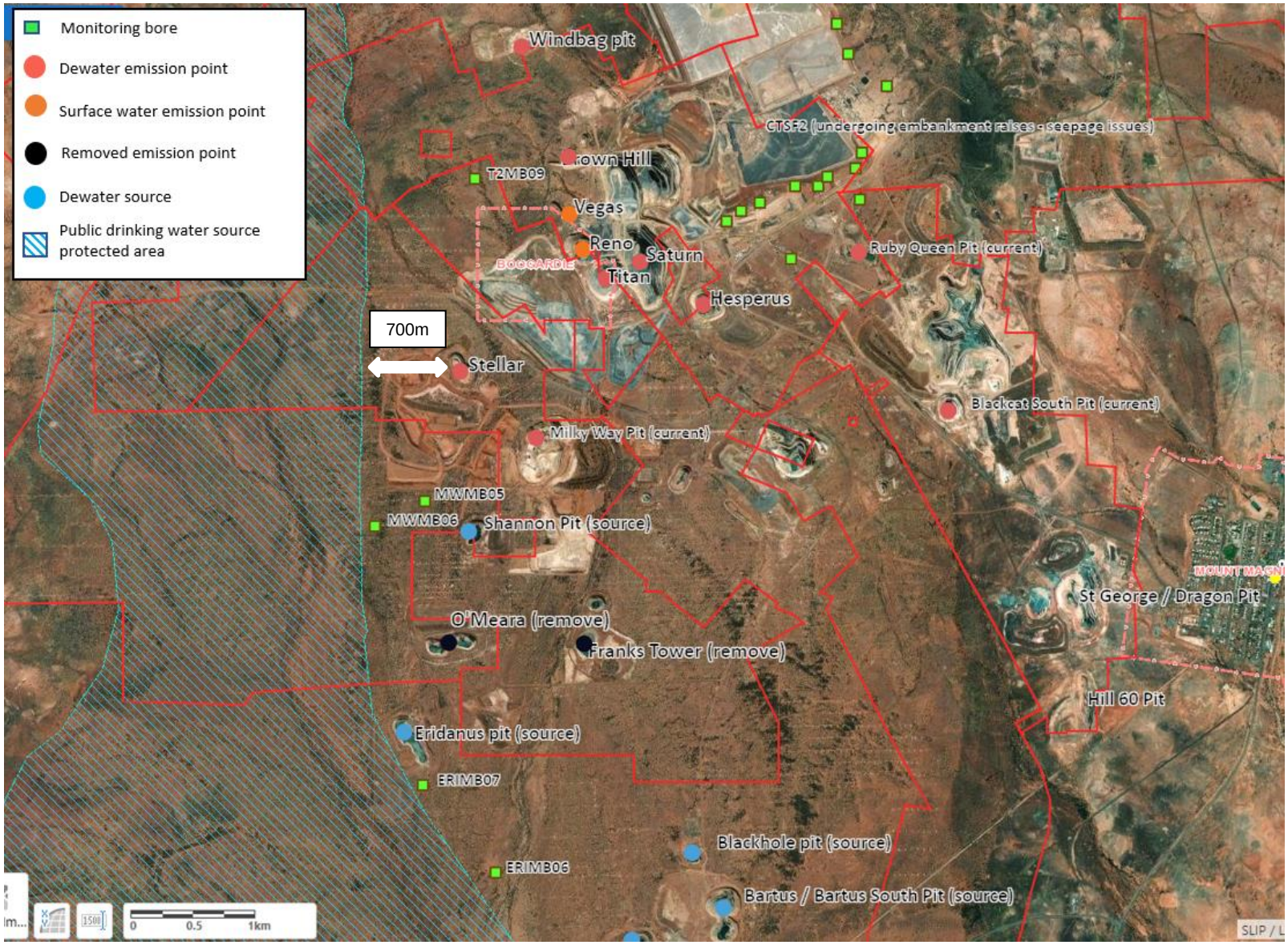


**Figure 3: Dewatering points in relation to sensitive receptors**

L5529/1988/12

## 3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The Revised Licence L5529/1988/12 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 5. Risk assessment of potential emissions and discharges from the Premises during construction and operation**

| Risk Event | | | | | Risk rating[1] C = consequence L = likelihood | 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 dewatering effluent into:<br>Brown Hill pit<br>Hesperus pit<br>Windbag pit<br>Saturn pit<br>Titan pit | Dewater effluent in pit<br>(metalloids, nitrate) | Seepage to groundwater through unlined pit and migration to PDWSAs | Public drinking water source protected area (Windbag pit closest at 1.3km east of PDSWA) | Refer to Section 3.1 | C = Major<br>L = Unlikely<br>**Medium** | <u>Modification to existing conditions</u><br>1.3.8 – containment infrastructure modified to include new pits, pit lake level to be maintained below surrounding groundwater level<br>2.2.1 – emission points modified to include new pits<br>3.2.1 – annual monitoring modified to include new pits and additional analytes<br>3.4.1 – monitoring of wells southwest of Windbag pit and south of Hesperus pit (as required for installation by new condition 1.3.13)<br><u>New conditions</u><br>1.3.13 – construction of groundwater monitoring bores south-west of Windbag pit and south of Hesperus pit<br>1.3.14 – groundwater monitoring well construction reporting | Refer to section 3.3 |
| | | Discharge of dewater via pit overtopping | Adjacent native vegetation | Refer to Section 3.1 | C = Moderate<br>L = Unlikely<br>**Medium** | <u>Modification to existing conditions</u><br>1.3.8 – pit lake level to be maintained below the surrounding groundwater level | Refer to section 3.3 |
| Discharge of dewatering effluent into the Stellar Pit | Dewater effluent in pit<br>(metalloids, nitrate) | Seepage to groundwater through unlined pit and migration to PDWSAs | Public drinking water source protected area 700m east of PDSWA | Refer to Section 3.1 | C = Major<br>L = Unlikely<br>**Medium** | <u>Modification to existing licence conditions</u><br>1.3.8 – containment infrastructure modified to include new pit, pit lake level to be maintained below surrounding groundwater level<br>2.2.1 – emission points modified to include new pits<br>3.2.1 – quarterly monitoring of dewater discharge to Stellar pit | Refer to section 3.3 |

| Risk Event | | | | | Risk rating[1]<br>C = consequence<br>L = likelihood | Conditions[2] of licence | Justification for additional regulatory controls |
|---|---|---|---|---|---|---|---|
| **Source/Activities** | **Potential emission** | **Potential pathways and impact** | **Receptors** | **Licence Holder's controls** | | | |
| | | | | | | 3.4.1 – monitoring of wells southwest of Windbag pit and south of Hesperus pit (as required for installation by new condition 1.3.13)<br>4.2.1 – modification to include quarterly water balance monitoring of Stellar pit in the annual reporting requirements<br><u>New conditions</u><br>1.3.13 – construction of two groundwater monitoring (targeting different aquifers) west of Stellar pit<br>1.3.14 – groundwater monitoring well construction reporting<br>3.5.2 – quarterly water balance monitoring for Stellar pit | |
| | | Discharge of dewater via pit overtopping | Adjacent native vegetation | Refer to Section 3.1 | C = Moderate<br>L = Unlikely<br>**Medium** | <u>Modification to existing conditions</u><br>1.3.8 – pit lake level to be maintained below the surrounding groundwater level | Refer to section 3.3 |
| Diversion of surface water run-off into Reno and Vegas Pit | Potentially contaminated stormwater (hydrocarbons etc.) | Seepage to groundwater through unlined pit and migration to PDWSA's | Public drinking water source protected area | Refer to Section 3.1 | C = Moderate<br>L = Rare<br>**Medium** | <u>Modification to existing licence conditions</u><br>1.3.8 – modified to include Reno and Vegas pits, requiring that any surface water run off be pumped to the process water dam or via the Ruby Queen Transfer pit for gold processing and mining operations | The applicant proposed controls will be placed on the licence as regulatory controls. |
| | | Discharge of dewater via pit overtopping | Adjacent native vegetation | Refer to Section 3.1 | C = Minor<br>L = Unlikely<br>**Medium** | <u>Modification to existing licence conditions</u><br>1.3.8 – modified to include minimum 2m freeboard | To prevent risk of overtopping, a requirement for 2m freeboard has been placed on the licence as a regulatory control. |

| Risk Event | | | | | Risk rating[1]<br>C = consequence<br>L = likelihood | Conditions[2] of licence | Justification for additional regulatory controls |
|---|---|---|---|---|---|---|---|
| **Source/Activities** | **Potential emission** | **Potential pathways and impact** | **Receptors** | **Licence Holder's controls** | | | |
| Rupture of dewatering pipelines | Dewater effluent<br>(metalloids, nitrate) | Direct discharge to soil, surface water and infiltration to groundwater | Public drinking water source protected area<br>Adjacent native vegetation | Refer to Section 3.1 | C = Moderate<br>L = Unlikely<br>**Medium** | <u>Existing licence conditions</u><br>1.3.7 - all pipelines equipped with telemetry systems, automatic cut-outs and secondary containment | The applicant has stated they will use existing pipeline infrastructure as part of this amendment, where no additional pipeline construction is proposed.<br>Existing licence controls are considered sufficient to mitigate risk associated with pipeline rupture. |

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

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

## 3.3 Detailed risk assessment

### 3.3.1 Source Water Chemistry

#### Dewatering to the Stellar Pit

Water chemistry from the source pits has been provided by the applicant and given in Appendix 2. Stellar pit is proposed to receive dewater from sources listed in Table 6 below.

**Table 6: Stellar pit – proposed dewater sources**

| Proposed Emission point | Proposed source of dewater |
|---|---|
| Stellar Pit | • Eridanus & Shannon underground mines<br>• Bartus/Bartus South pits,<br>• Blackhole pit<br>• Britannia well pit<br>• Quasar abandoned pit lakes |

Results for one sample (taken June 2021) have been provided for each of the pits, including the Stellar Pit (receiving mine dewater). As the Stellar Pit is only 700m east from the PDSWA (Figure 3), results from the source pits have been compared to the 2021 drinking water guidelines. Arsenic, nitrate and antimony were found to exceed drinking water criteria for some of the source pits. A summary of exceedances is provided in Table 7 below. No results exceeded health criteria for water currently within the Stellar Pit.

June 2021 sampling indicated source pit waters are brackish to saline with salinities ranging from 1,800 to 11,000mg/L total dissolved solids. Water currently in the Stellar Pit was recorded with salinity of 450mg/L (fresh).

MWES (2022) has estimated that dewatering to Stellar pit will cause seepage outflows from the Stellar pit at 20$m^3$/day. The current capacity of the Stellar pit is 3.7 million $m^3$ (inclusive of 2m freeboard).

**Table 7: Summary of source pit exceedances (for discharge to Stellar Pit)**

| Analyte | 2021 drinking water guidelines (health) | Source Pit exceedance | Concentration |
|---|---|---|---|
| Arsenic | 0.01mg/L | Bartus Pit<br>Britannia Well Pit<br>Qasar Pit | 0.28mg/L<br>0.9mg/L<br>0.011mg/L |
| Nitrate | 50mg/L | Eridanus Pit<br>Shannon underground mine | 180mg/L<br>210mg/L |
| Antimony | 0.003mg/L | Bartus pit<br>Shannon underground mine | 0.019mg/L<br>0.011mg/L |

#### Dewatering to Hesperus Pit, Titan Pit, Saturn Pit, Brown Hill Pit and Windbag Pit

Water chemistry from the source pits has been provided by the applicant and is given in Appendix 2. Brown Hill, Hesperus, Windbag, Saturn and Titan pits are proposed to receive dewater from sources listed in Table 8 below.

**Table 8: Brown Hill, Hesperus, Windbag, Saturn and Titan - proposed dewater sources**

| Proposed Emission point | Proposed source of dewater |
|---|---|
| Brown Hill Pit<br>Hesperus Pit<br>Windbag Pit | • Mars and Saturn underground mines<br>• Perseverance pit lake<br>• Saturn pit lake<br>• Titan pit lake<br>• Reno and Vegas pit lakes |
| Saturn Pit[1]<br>Titan Pit[1] | • Water from dewatering Mars underground |

Note 1. These are only proposed as emission points for mining at Mars underground during phase 1. Saturn, including lateral leakage from Titan, will become a discharge point during phase 2 of mining.

Results for one sample (taken June 2021) have been provided for each of the pits, including the receiving pits. As the Windbag Pit is only 1.3km east from the PDSWA (Figure 3), results have been compared to 2021 drinking water guidelines. The water currently in the receiving pits exceeded criteria for arsenic, boron, molybdenum, selenium and nitrate (summarised in Table 9 below). June 2021 sampling indicates water currently in the receiving pits range between 620 – 12,000mg/L total dissolved solids, the most saline being the Windbag Pit (the second closest pit to the PDSWA[1], being 1.3km east).

June 2021 sampling indicated source pit waters are brackish to saline with salinities ranging from 980 to 7,100mg/L total dissolved solids. A summary of drinking water guideline (health) exceedances is given in Table 9 below. Selenium was detected slightly above the health limit guideline for the Vegas, Reno, Saturn and Titan pits. Nitrate was detected at above the health limit in Saturn and Titan pits. Antimony was above the limit for the Saturn pit.

**Table 9: Summary of source and receiving pit exceedances**

| Analyte | 2021 drinking water guidelines (health) | Pit exceedance | Concentration |
|---|---|---|---|
| **Source pit exceedances** | | | |
| Antimony | 0.003mg/L | Saturn Pit | 0.005mg/L |
| Nitrate | 50mg/L | Saturn Pit<br>Titan Pit | 55mg/L<br>54mg/L |
| Selenium | 0.01mg/L | Vegas Pit<br>Reno Pit<br>Saturn Pit<br>Titan Pit | 0.01mg/L<br>0.014mg/L<br>0.03mg/L<br>0.025mg/L |
| **Receiving pit – current water chemistry** | | | |
| Arsenic | 0.01mg/L | Windbag Pit | 0.023mg/L |

[1] The closest pit to the PDSWA being the Stellar Pit, located only 700m east.

| | | | |
|---|---|---|---|
| Boron | 4mg/L | Windbag Pit<br>Hesperus Pit | 5.5mg/L<br>5.0mg/L |
| Molybdenum | 0.05mg/L | Hesperus Pit | 0.15mg/L |
| Selenium | 0.01mg/L | Titan Pit<br>Saturn Pit | 0.025mg/L<br>0.03mg/L |
| Nitrate | 50mg/L | Titan Pit<br>Saturn Pit | 54mg/L<br>55mg/L |

The applicant has suggested that the water chemistry for the proposed Mars and Saturn underground dewatering sources is expected to be similar to mine water pumped from the historical Hill 50 mine. From limited records, the Hill 50 mine water is brackish at ~7,000mg/L TDS. Other analytes taken from historical records are summarised in Table 10 below, showing elevated levels of sulfate and nitrate (144mg/L as compared to the drinking water health criteria 50mg/L).

The applicant has also suggested that water for the proposed Mars and Saturn underground dewatering may also be similar to Two Boys Shaft and the Saturn pit lake (Appendix 2 - Table 15). The Two Boys shaft sample was taken from 185m below the top of the shaft and is suggested to represent water from significant depth in the proposed underground mine area. Results from the Two Boys and Saturn areas is compared with the Australian Drinking Water Guidelines in (Appendix 2 - Table 15). There were no exceedances of drinking water guidelines in the Two Boys Shaft and elevated levels of nitrate, antimony and selenium from the Saturn pit lake.

**Table 10: Historical Hill 50 discharge water chemistry (1987 – 1993)**

| Analyte | Results (mg/L) |
|---|---|
| Cu | <0.01 |
| Zn | <0.01 |
| CN (total) | 0.05 |
| Ca | 240-340 |
| Mg | 230-390 |
| K | 27 |
| Cl | 3000-4800 |
| $HCO_3$ | 120-130 |
| $SO_4$ | 770-1200 |
| $NO_3$ | 144 |
| $SiO_2$ | 24 |

The available capacity for each of the new proposed emission points are summarised in the applicant's table below (Table 11). Note that the available water storage level has been calculated to the top of the spill point and has not included an allowance for 2m freeboard.

**Table 11: Current capacity of proposed new emission points**

| Emission Point Pit | Latest Water Level (mAHD) | Date | Available Storage Above Water Level (ML) | Comments |
|---|---|---|---|---|
| Brown Hill | 440.1 | 1/6/2021 | 201 | To also be used for storage of surface water runoff |
| Windbag | 421.0 | 27/3/2021 | 414 | |
| Hesperus | 367.8 | 18/3/2021 | 2,264 | |
| Saturn | 299.0 | 1/3/2021 | 3,789[1] | Minor recycle to dewatering operations at Mars. Saturn will not be used when phase 2 underground mining operations commence. |
| Titan | 313.3 | 31/3/2021 | 1,346[1] | |
| | | **Total** | **8,014** | |

Note 1: To the top of the spill point between the Saturn and Titan pits.

### 3.3.2 Pathway and receptor

Seepage from Stellar Pit has highest the potential to infiltrate and contaminate groundwater and the Mount Magnet water reserve, being only 700m east. The licence holder has indicated that "The Stellar Pit was the one pit that could promote seepage as the pit was small and there was more chance the pit lake could be filled to a level that may be temporarily above the surrounding groundwater level" (MWES, 2022).

Seepage from the other emission points proposed also has the potential to contaminate the water reserve, particularly the other points close to the PDSWA, being:

- Windbag Pit: 1.3km east
- Brown Hill: 1.6km east
- Titan Pit: 1.8km east
- Saturn Pit: 2.1km east

#### Geological and hydrogeological factors

Advice from the department's hydrogeologists indicates that in the Mt Magnet mining area, groundwater flow takes place both in basement rocks and in permeable regolith materials that overlie the basement rocks. Basement rocks in the Mt Magnet mining area mostly consist of highly altered ultramafic rocks of the Boogardie Formation (Anand *et al*., 2003). Bedrock in the area is cut by a large number of faults with a south-west to north-east direction. The altered ultramafic and volcanic rocks in the area generally have a very low hydraulic conductivity. Groundwater flow in these rocks is therefore likely to take place predominantly in the fractured zones.

Alluvial sediments in creeks contain groundwater that is locally fresh to saline, and groundwater also occurs in palaeochannels within bedrock near some of the mine pits. This is particularly the case near the Stellar pit, where a palaeochannel contains a 10 to 20 metre thickness of potentially permeable sediments (Anand *et al*., 2003). This feature is likely to transport groundwater flow in a south-westerly direction (Figure 5), but it is not known if there is a hydraulic connection between this feature and the modern alluvial channel that contains the fresh groundwater that forms the Mt Magnet town water supply. However, there is a risk that this palaeochannel could be a significant conduit for groundwater flow away from the Stellar pit.

The magnitude of risk depends on the water elevation within Stellar Pit. If the elevation of the pit lake lies below the base of the palaeochannel sediments, then groundwater flow out of the Stellar pit is unlikely in these materials.

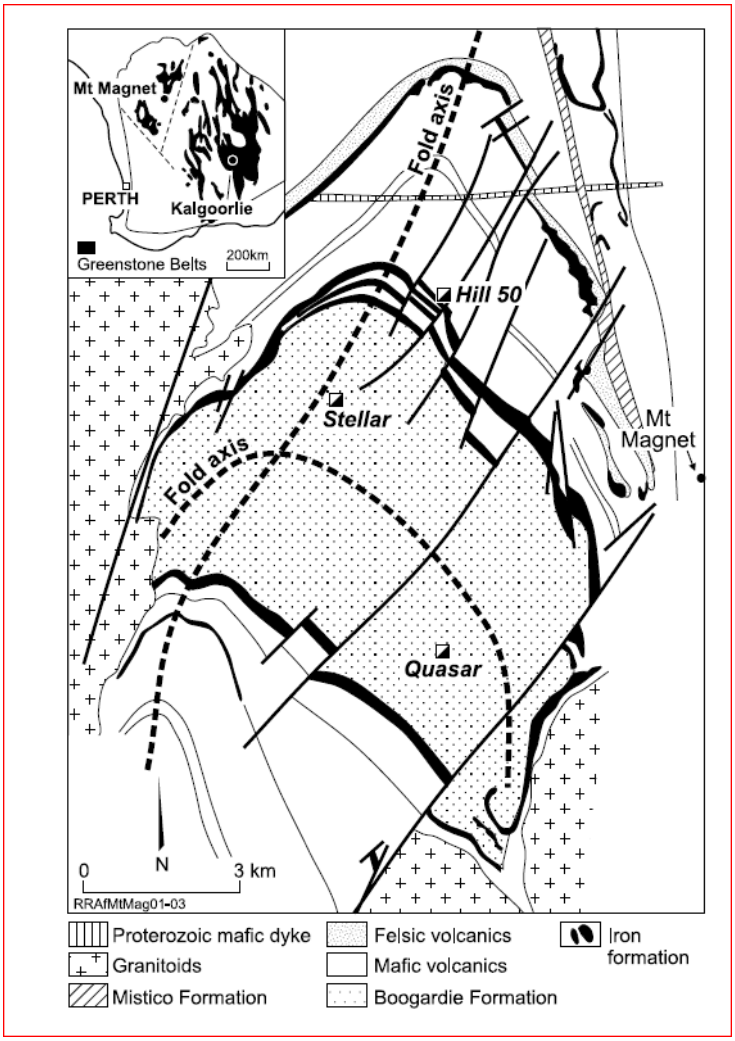


**Figure 4: Basement geology in the Mt Magnet mining area (Anand et al., 2003)**

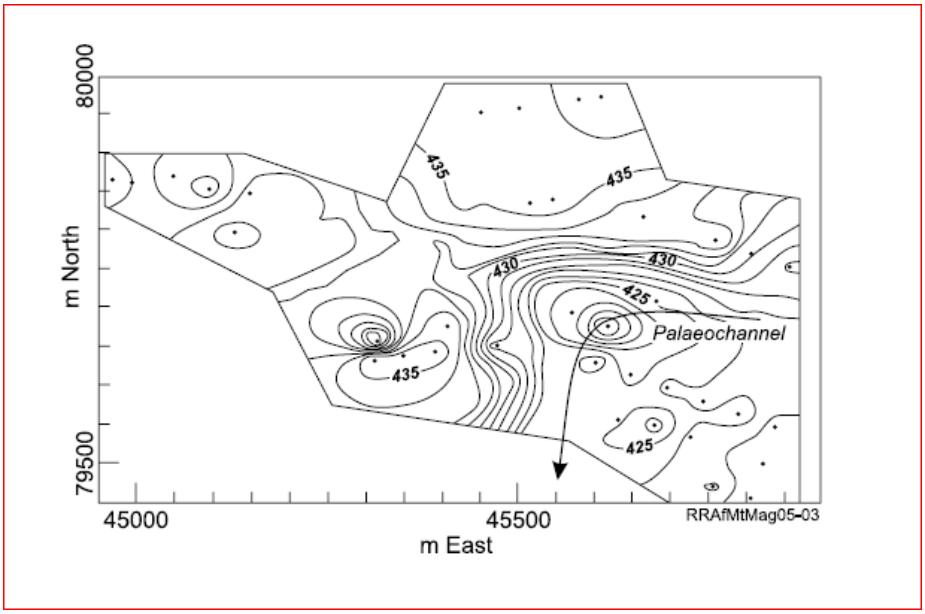


**Figure 5: Contours showing the elevation (in metres AHD) of deeply eroded basement rocks near the Stellar pit. This shows the position of a westward to south-westward trending palaeochannel that has been incised into the surface of the basement rocks (Anand et al. 2003)**

Advice from the department's hydrogeologists indicates the overall likelihood of seepage impacting the PDWSA to be low. This is due to:

(i) The limited hazard associated with the dewatering effluent:

Apart from locally elevated nitrate concentrations and salinity, the seepage of water from pit lakes that receive groundwater discharge is not considered to be a hazard for the PDWSA.

(ii) The long groundwater travel times between sources and receptors:

The distances between the pit lakes and the PDSWA are sufficiently large to allow transported concentrations of chemical constituents to be attenuated by natural processes within the groundwater flow system.

### 3.3.3 Applicant proposed controls

Mount Magnet Gold have committed to zero seepage from all discharge pits proposed for this amendment. This is proposed by keeping the pit lake to a level that is below the surrounding groundwater level, thereby maintaining groundwater inflow only to each pit. This will be managed by:

- comparing the level of the emission pit lake with the groundwater level in existing and proposed monitoring bores and adjacent pit lakes;
- water levels in emission pits are to be monitored each quarter and the surrounding bores biannually;
- the surrounding bores will be sampled at a lower frequency as the applicant suggests "it takes time for water levels to respond through the low permeability sediments surrounding each pit, while pit water levels react relatively quickly according to how much water is pumped into or out of each". They propose a review to sampling frequency after the scheme has been in operation over the first 12 months.
- Proposed monitoring bores are shown in Figure 6 below. The applicant have targeted structural features (i.e. higher permeability areas which may allow preferential groundwater flow) as below:
    - Southwest of the Windbag Pit along an inferred fault zone and near the contact between mafic and chert/ banded iron formation rocks;
    - South of the Hesperus Pit along an inferred fault zone and in a region of potentially fractured felsic rocks; and
    - West of the Stellar West Pit along a contact between felsic and ultramafic rocks.

Additionally, for the Stellar pit Mount Magnet Gold indicate:

- That should Stellar Pit reaches capacity (3.7 million $m^3$), the water will be directed to the Milky Way Pit (currently licensed emission point);
- The pit will be actively pumped to maintain water levels below a 2m freeboard;
- That groundwater flows from west to east, away from the PDSWA area and towards Stellar Pit;
- Installation of a monitoring bore west of Stellar pit to monitoring groundwater flow direction;

DWER notes that allowing Stellar Pit to reach capacity would contradict the previously mentioned commitment for zero seepage and maintaining pit lake levels below the surrounding groundwater level;

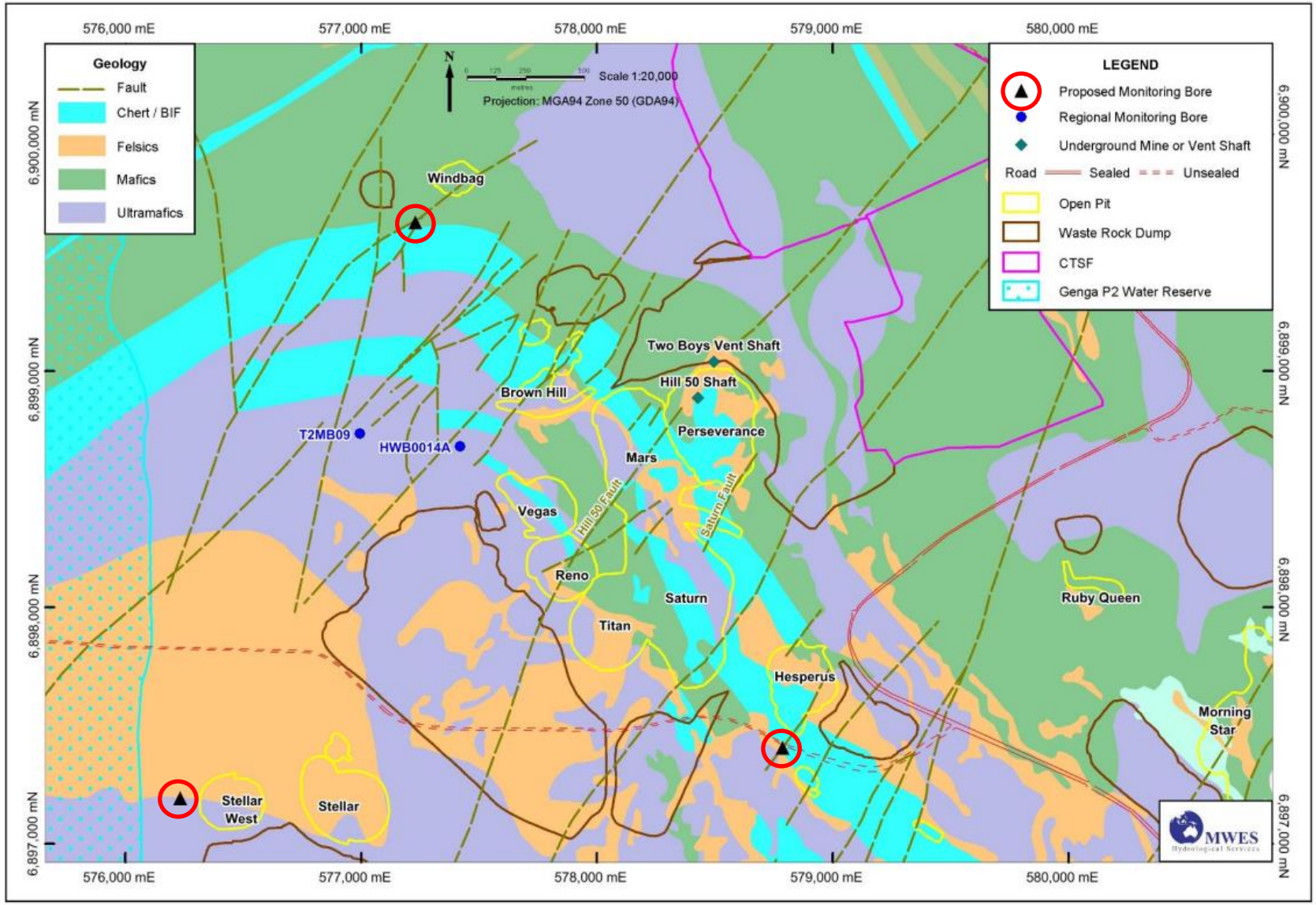


**Figure 6: Proposed monitoring bore locations**

L5529/1988/12

### 3.3.4 DWER assessment

Advice from the department's hydrogeologists suggests a low likelihood of mine dewater seepage impacting the P1 and P2 PDSWA. This is due to the limited hazard associated with the dewatering effluent and the long groundwater travel times between sources and receptors.

The Delegated Officer therefore considers the likelihood of seepage impacting the PDWSAs to be "unlikely". As the consequence rating for impacts to the PDWSA remains "major", this gives an overall risk rating of "medium". Consequently, the following controls will be placed on the licence:

**Table 12: DWER regulatory controls (seepage)**

| Condition/control | Justification |
|---|---|
| Modification to containment infrastructure<br><br>Modification of condition 1.3.8 | The condition has been modified to remove pits no longer proposed for discharge (O'Meara and Franks Tower) and include new pits proposed for discharge (Brown Hill, Hesperus, Windbag, Saturn, Titan, Reno, Vegas, Stellar).<br><br>The applicant proposed control to mitigate seepage by keeping the pit lake water level below the level of surrounding groundwater has been placed on the licence as a regulatory control. |
| Installation of new groundwater monitoring bores<br><br>New condition 1.3.13 – monitoring bore installation | Construction of additional monitoring bores (as proposed by the applicant) has been placed on the licence as a regulatory control. Locations proposed are along south-west, north-east trending fault lines (i.e. potential for increased groundwater flow) nearby proposed dewatering locations.<br><br>Whilst the applicant has proposed one monitoring bore west of the Stellar pit, DWER requires that two monitoring bores be installed to the west of the Stellar Pit (one additional bore):<br>• one targeting the potential shallow paleochannel aquifer west of Stellar Pit; and<br>• another targeting the deeper aquifer.<br>As Stellar pit is only 700m east of the PDSWA, DWER requires monitoring of any shallow aquifers which may be present. |
| Monitoring of point source emissions to groundwater<br><br>Modification of condition 3.2.1 | The licence currently includes provision for monitoring of point source emissions to groundwater for dewater discharge to existing pits. The condition has been modified to remove pits no longer proposed for discharge (O'Meara and Franks Tower) and include new pits proposed for discharge (Brown Hill, Hesperus, Windbag, Saturn, Titan, Reno, Vegas, Stellar).<br><br>• water level monitoring for the new pits have been included within the existing quarterly monitoring requirements;<br><br>• water quality monitoring for the new pits (apart from Stellar pit) has been included within the existing annual monitoring requirements;<br><br>• as Stellar pit is only 700m east of the PDSWA, quarterly water quality monitoring for dewater discharge has been conditioned;<br><br>The analytes proposed for water quality monitoring have been modified to include antimony, boron and nitrate, which were found to be elevated in the water samples reported to DWER (as per Appendix 2 - Table 15). |

| | |
|---|---|
| Ambient environmental quality monitoring<br>Modification of condition 3.4.1 | Condition 3.4.1 has been modified to include monitoring for the bores proposed by the applicant for installation.<br>Applicant proposed biannual monitoring for monitoring wells installed southwest of Windbag pit and south of Hesperus pit has been placed on the licence as a regulatory control.<br>As Stellar pit is only 700m east of the PDSWA, quarterly water quality monitoring for monitoring wells installed west of Stellar pit has been conditioned. |
| Water balance monitoring<br>New condition 3.5.2 | As Stellar pit is only 700m east of the PDSWA, a requirement for quarterly water balance monitoring has been placed on the licence. |

# 4. Consultation

Table 13 provides a summary of the consultation undertaken by the department.

**Table 13: Consultation**

| Consultation method | Comments received | Department response |
|---|---|---|
| Application advertised on the department's website (14/01/2022) | None received | N/A |
| Local Government Authority advised of proposal (14/1/2022) | None received | N/A |
| Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (14/1/2022) | None received | N/A |
| Licence Holder was provided with draft amendment on 12/05/2022 | Updated premises description provided.<br>Updated Figures 2, 3, 10 provided as requested by DWER.<br>Stellar pit capacity provided as requested by DWER. | The premises description and figures have been updated in the licence. |

# 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.

DWER notes that there are a number of Aboriginal Heritage sites within proximity of proposed dewater discharge to Stellar pit, the closest being Boolgardie site ID 4417, 300m west of Stellar pit. Under the *Aboriginal Heritage Act 1972* consent is required from the Minister for Aboriginal Affairs for any activity which could negatively impact Aboriginal heritage sites. Particularly, for

installation of groundwater monitoring bores to the west of Stellar pit, the Licence Holder is advised to consult with the Department of Planning, Lands and Heritage for any approvals which may be required under the *Aboriginal Heritage Act 1972*.

## 5.1 Summary of amendments

Table 14 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 14: Summary of licence amendments**

| Condition no. | Proposed amendments |
|---|---|
| Cover page | Updated to reflect throughput amendment.<br>Updated to include mining tenements previously omitted from the licence cover by administrative error (within prescribed premises as depicted in Schedule 1) |
| 1.3.8 | Modified to remove Franks Tower and O'Meara pit and to include Brownhill, Windbag, Hesperus, Saturn, Titan and Stellar pits for dewater discharge. Reno and Vegas pits added to allow surface water discharge. |
| 1.3.11 and 1.3.12 | Conditions deleted as construction/compliance has now been met |
| 1.3.11 (new) | New condition for construction of new groundwater monitoring wells |
| 1.3.12 (new) | New condition for reporting on construction of new groundwater monitoring wells |
| 2.2.1 | Modified to remove Franks Tower and O'Meara pit and to include Brownhill, Windbag, Hesperus, Saturn, Titan and Stellar pits for dewater discharge. Reno and Vegas pits added to allow surface water discharge. |
| 3.1.2 | Modified to include a definition for biannual monitoring |
| 3.2.1 | Modified to include new monitoring requirements for new dewater discharge pits |
| 3.4.1 | Modified to include new monitoring requirements for new groundwater monitoring wells (constructed as per new condition 1.3.13) |
| 3.5.2 | New condition for monitoring of water balance within Stellar pit |
| 4.2.1 | Modified to include Stellar pit water balance monitoring within annual reporting requirements |
| Schedule 1 | Modified to include new maps to reflect modified dewatering source and emission points |

# References


1. Anand, R.R., King, J.D. and Robertson, I.D.M., 2003. *Mt Magnet district, Western Australia*. CRC LEME technical paper which is available from web site www.crcleme.org.au.
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. MWES 2022 – Response to second information request by DWER (DWER reference A2095769)

# Appendix 1: Figures

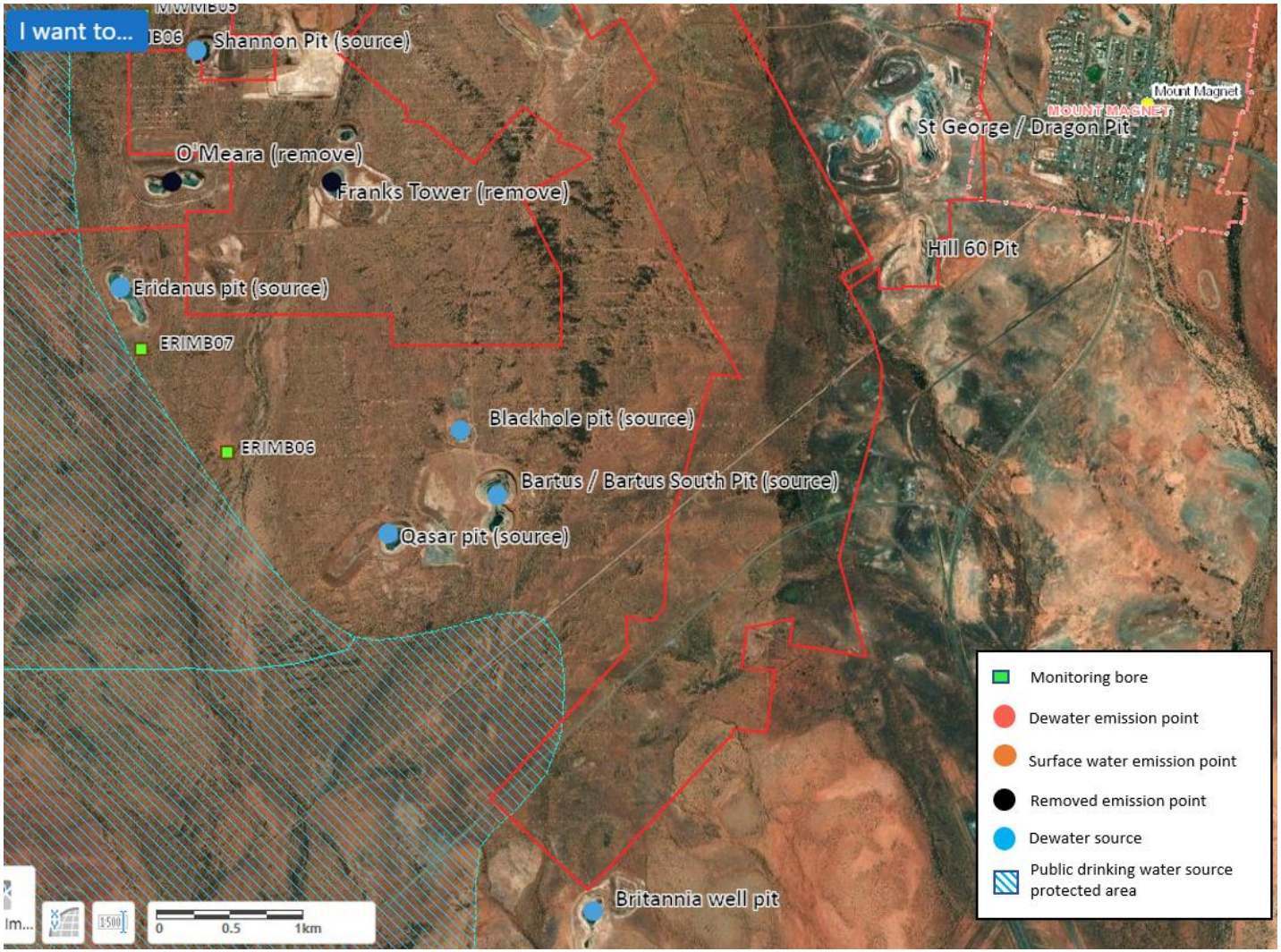


**Figure 7: Dewater source points**

L5529/1988/12

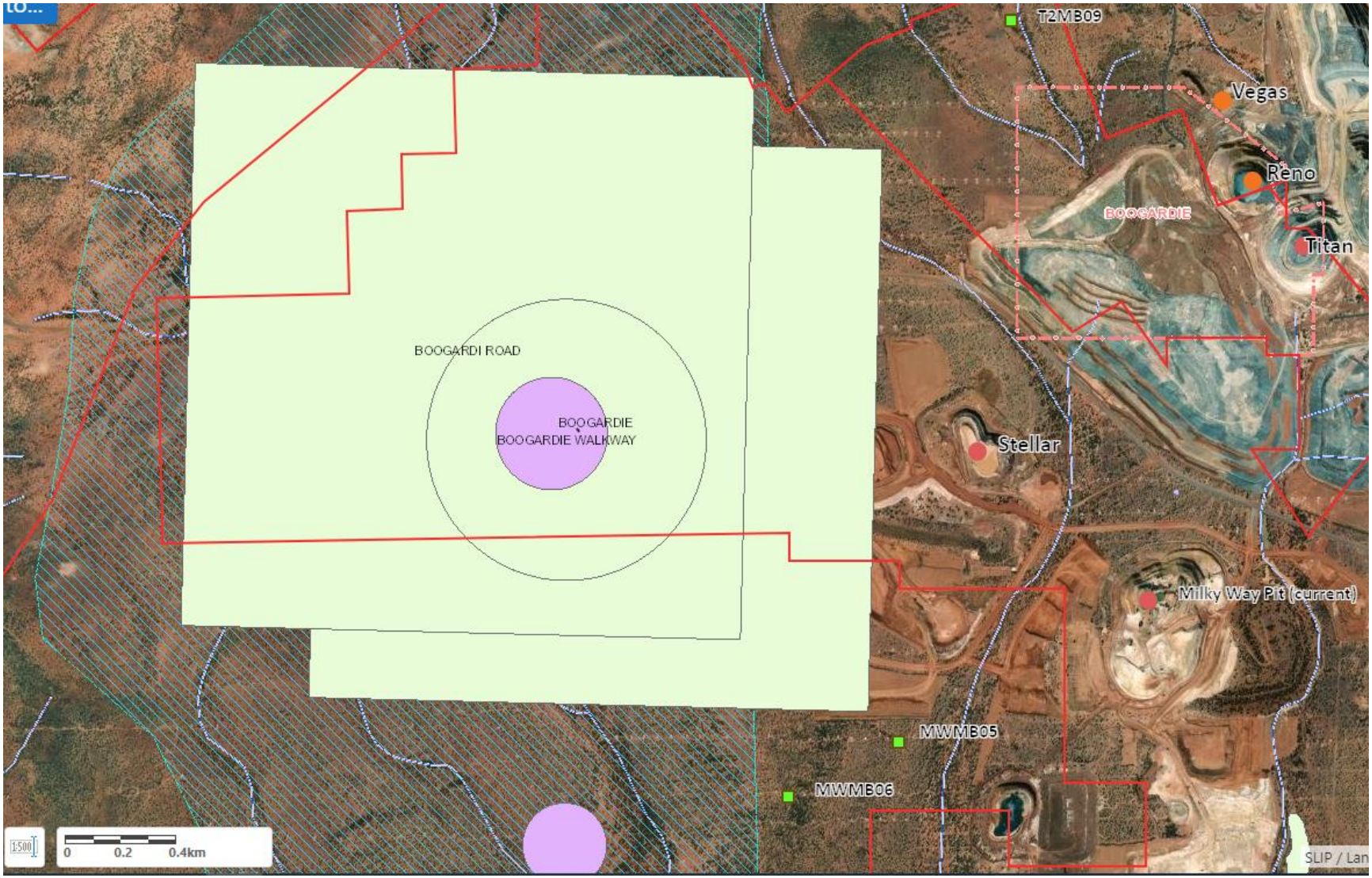


**Figure 8: Aboriginal Heritage Sites**

## Appendix 2: Dewater chemistry

**Table 15: Dewater source and emission point chemistry**

| ADWG 2021 - Health (mg/l) Limit | | | | 1.5 | 50 | | 0.01 | 0.1 | 0.003 | 4 | 0.06 | | 0.002 | | 0.05 | 0.05 | | 2 | | 0.01 | 0.5 | 0.001 | 0.05 | 0.02 | 0.01 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADWG 2021 - Health (mg/l) Half Limit Trigger[1] | | | | 0.75 | 25 | | 0.005 | 0.05 | 0.0015 | 2 | 0.03 | | 0.001 | | 0.025 | 0.025 | | 1 | | 0.005 | 0.25 | 0.0005 | 0.025 | 0.01 | 0.005 | |
| ADWG 2021 - Aesthetic (mg/l) Limit | | <6.5 or >8.5 | 600 | | | 0.2 | | | | | | NL | | NL | | | NL | 1 | 0.3 | | 0.1 | | | | | 3 |
| Site | Date | pH(lab) | TDS | F | NO3 (N) | Al | As | Ag | Sb | B | Be | Bi | Cd | Cr3 | Cr6 | Cr (Total) | Co | Cu | Fe | Pb | Mn | Hg | Mo | Ni | Se | Zn |
| **SOURCES** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mars Pit | 16/06/2015 | 8.0 | **2600** | | **72** | -0.01 | 0.004 | -0.001 | | 0.99 | | -0.001 | 0.0005 | | -0.001 | | 0.004 | 0.001 | -0.01 | -0.001 | **0.44** | -0.00005 | 0.008 | **0.012** | **0.013** | 0.013 |
| Perseverance Pit | 16/06/2021 | 7.6 | **7100** | -0.5 | -2.5 | -0.01 | -0.001 | -0.001 | -0.001 | 1.5 | -0.0005 | -0.001 | -0.0001 | -0.005 | 0.002 | -0.001 | 0.003 | -0.001 | -0.01 | -0.001 | **0.23** | -0.00005 | 0.006 | 0.004 | 0.002 | 0.022 |
| Two Boys Vent Shaft | 12/05/2020 | 7.6 | **8000** | -0.5 | -2.5 | -0.01 | -0.001 | -0.001 | -0.001 | 1.4 | -0.0005 | -0.001 | -0.0001 | -0.01 | -0.001 | -0.001 | -0.001 | -0.001 | **1.4** | -0.001 | **0.38** | -0.00005 | 0.01 | **0.01** | -0.001 | 0.64 |
| Reno Pit | 16/06/2021 | 8.1 | **1600** | 0.5 | **46** | -0.01 | 0.002 | -0.001 | **0.003** | 1.2 | -0.0005 | -0.001 | -0.0001 | -0.005 | 0.003 | 0.001 | -0.001 | -0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | 0.012 | 0.002 | **0.014** | 0.002 |
| Saturn Pit | 16/06/2021 | 8.2 | **6200** | -0.5 | **55** | -0.01 | 0.002 | -0.001 | **0.005** | 1.6 | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | -0.001 | -0.001 | -0.001 | -0.01 | -0.001 | 0.02 | -0.00005 | **0.041** | 0.002 | **0.03** | 0.004 |
| Titan Pit | 16/06/2021 | 8.3 | **6000** | -0.5 | **54** | -0.01 | 0.002 | -0.001 | **0.003** | 1.7 | -0.0005 | -0.0001 | -0.0001 | -0.005 | -0.001 | 0.002 | -0.001 | -0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | **0.043** | -0.001 | **0.025** | 0.003 |
| **EMISSION POINTS** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blackcat South Pit | 16/06/2021 | **8.7** | **8500** | **1.4** | **47** | 0.01 | **0.012** | -0.001 | **0.006** | **4.6** | -0.0005 | -0.001 | 0.0002 | -0.005 | -0.001 | 0.001 | 0.002 | 0.001 | -0.01 | -0.001 | 0.023 | -0.00005 | 0.011 | **0.017** | **0.007** | 0.008 |
| Brown Hill Pit | 16/06/2021 | 7.6 | **620** | 0.2 | 4.6 | -0.01 | -0.001 | -0.001 | -0.001 | 0.08 | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | -0.001 | -0.001 | 0.002 | 0.01 | -0.001 | -0.005 | -0.00005 | -0.001 | 0.001 | -0.001 | 0.003 |
| Hesperus Pit | 16/06/2021 | **8.6** | **9300** | -1 | -5 | -0.01 | **0.009** | -0.001 | **0.004** | **5** | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | -0.001 | -0.001 | -0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | **0.15** | 0.001 | **0.006** | 0.002 |
| Milky Way Pit | 14/06/2021 | 8.1 | **4400** | 0.5 | **31** | -0.01 | **0.009** | -0.001 | **0.004** | 0.72 | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | -0.001 | -0.001 | -0.001 | -0.01 | -0.001 | 0.008 | -0.00005 | **0.028** | **0.01** | **0.023** | 0.004 |
| Ruby Queen Pit | 19/06/2021 | 8.2 | **5200** | **0.9** | **72** | -0.01 | **0.009** | -0.001 | **0.022** | **2.4** | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | 0.001 | 0.002 | 0.001 | -0.01 | -0.001 | 0.071 | -0.00005 | 0.014 | 0.008 | 0.004 | 0.091 |
| Saturn Pit | 16/06/2021 | 8.2 | **6200** | -0.5 | **55** | -0.01 | 0.002 | -0.001 | **0.005** | 1.6 | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | -0.001 | -0.001 | -0.001 | -0.01 | -0.001 | 0.02 | -0.00005 | **0.041** | 0.002 | **0.03** | 0.004 |
| Titan Pit | 16/06/2021 | 8.3 | **6000** | -0.5 | **54** | -0.01 | 0.002 | -0.001 | **0.003** | 1.7 | -0.0005 | -0.0001 | -0.0001 | -0.005 | -0.001 | 0.002 | -0.001 | -0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | **0.043** | -0.001 | **0.025** | 0.003 |
| Vegas Pit | 16/06/2021 | 8.3 | **980** | 0.3 | **40** | -0.01 | **0.009** | -0.001 | **0.002** | 0.73 | -0.0005 | -0.0001 | -0.0001 | -0.005 | -0.001 | 0.002 | -0.001 | -0.001 | -0.01 | -0.001 | 0.007 | -0.00005 | 0.006 | 0.001 | **0.01** | 0.003 |
| Windbag Pit | 18/06/2021 | **8.7** | **12000** | -1 | 6.3 | -0.01 | **0.023** | -0.001 | -0.001 | **5.5** | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | -0.001 | -0.001 | 0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | 0.005 | 0.001 | 0.004 | 0.002 |
| **SOURCES FOR FRANKS TOWER EMISSION POINT REPLACEMENT** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bartus Pit | 15/06/2021 | **8.6** | **7000** | -1 | 15 | 0.01 | **0.28** | -0.001 | **0.019** | **3.7** | -0.0005 | -0.001 | -0.0001 | -0.005 | 0.001 | 0.004 | -0.001 | 0.002 | -0.01 | -0.001 | -0.005 | -0.00005 | **0.044** | 0.001 | **0.009** | 0.01 |
| Black Hole Pit | 15/06/2021 | 8.5 | **1800** | -0.5 | **31** | -0.01 | 0.003 | -0.001 | -0.001 | 1.1 | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | 0.004 | -0.001 | 0.002 | -0.01 | -0.001 | 0.04 | -0.00005 | 0.005 | 0.002 | 0.002 | 0.007 |
| Britannia Well Pit | 15/06/2021 | **9.2** | **1800** | 0.4 | 5.1 | -0.01 | **0.9** | -0.001 | **0.003** | **2.3** | -0.0005 | -0.001 | -0.0001 | -0.005 | -0.001 | 0.003 | -0.001 | -0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | 0.004 | -0.001 | 0.003 | 0.002 |
| Eridanus Pit | 19/06/2021 | 8.1 | **3900** | -0.5 | **180** | -0.01 | **0.008** | -0.001 | **0.003** | 0.75 | -0.0005 | -0.001 | -0.0001 | 0.006 | -0.001 | 0.006 | 0.004 | 0.001 | -0.01 | -0.001 | 0.02 | -0.00005 | 0.011 | 0.004 | **0.005** | 0.003 |
| Lone Pine Pit | 12/03/2021 | **8.6** | **2000** | | **44** | -0.005 | 0.002 | -0.0005 | 0.001 | 0.84 | | -0.0005 | -0.00005 | | -0.001 | 0.007 | -0.0005 | 0.001 | -0.01 | -0.0005 | -0.003 | -0.000025 | 0.004 | 0.002 | 0.002 | 0.005 |
| Quasar Pit | 15/06/2021 | 8.4 | **11000** | -1 | **43** | -0.01 | **0.011** | -0.001 | **0.002** | 1.9 | -0.0005 | -0.001 | -0.0001 | 0.006 | -0.001 | 0.006 | -0.001 | 0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | **0.03** | 0.003 | **0.008** | 0.003 |
| Shannon Pit | 20/06/2021 | 7.6 | **3700** | -0.5 | **260** | -0.01 | **0.005** | -0.001 | **0.01** | 1 | -0.0005 | -0.001 | -0.0001 | 0.006 | -0.001 | 0.006 | -0.001 | 0.002 | 0.01 | -0.001 | 0.071 | -0.00005 | 0.024 | 0.007 | 0.004 | 0.072 |
| Shannon UG Mine | 28/04/2021 | 8.1 | **5300** | 0.3 | **210** | 0.02 | **0.006** | -0.0005 | **0.011** | 1.4 | -0.00025 | -0.0005 | -0.00005 | -0.0025 | -0.001 | 0.004 | -0.0005 | 0.004 | 0.02 | -0.0005 | 0.038 | -0.000025 | **0.025** | 0.009 | 0.003 | 0.014 |
| Stellar Pit | 15/06/2021 | 7.8 | 250 | 0.2 | 22 | -0.01 | 0.003 | -0.001 | **0.003** | 0.25 | -0.0005 | -0.0001 | -0.0001 | -0.005 | 0.001 | 0.001 | -0.001 | -0.001 | -0.01 | -0.001 | -0.005 | -0.00005 | 0.003 | 0.003 | 0.003 | 0.003 |

Note 1: Although not part of the drinking water guidelines, this trigger level is a useful guide to values that may be approaching the guideline limit

# Appendix 3: Application validation summary

| SECTION 1: APPLICATION SUMMARY | | | | | |
|---|---|---|---|---|---|
| **Application type** | | | | | |
| Amendment to licence | ☒ | Current licence number: | L5529/1988/12 | | |
| | | Relevant works approval number: | | N/A | ☐ |
| Date application received | | 20/10/2021 | | | |
| **Applicant and Premises details** | | | | | |
| Applicant name/s (full legal name/s) | | Mt Magnet Gold Pty Ltd | | | |
| Premises name | | Mt Magnet Gold | | | |
| Premises location | | M58/30, M58/79, M58/121, M58/136, M58/172, M58/181, M58/185, M58/186, M58/187, M58/191, M58/193, M58/202, M58/205 and M58/234 | | | |
| Local Government Authority | | Shire of Mt Magnet | | | |
| **Application documents** | | | | | |
| HPCM file reference number: | | DER2016/001228-1 | | | |
| Key application documents (additional to application form): | | Supporting documentation with water balance summary | | | |
| **Scope of application/assessment** | | | | | |
| Summary of proposed activities or changes to existing operations. | | Licence amendment<br>Amendment to category 6 dewatering emission points<br>Increase of throughput from 1,500,000 tonnes per annual period to 3,100,000 tonnes per annual period | | | |

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

**Table 1: Prescribed premises categories**

| Prescribed premises category and description | Assessed production or design capacity | Proposed changes to the production or design capacity (amendments only) |
|---|---|---|
| Category 6 - dewatering | 1,500,000 tonnes/year | 3,100,000 tonnes/year |

| 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:<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:<br>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 ☐ | Certificate of title ☐<br>General lease ☐ Expiry:<br>Mining lease / tenement ☐ Expiry:<br>Other evidence ☐ Expiry: |
| Has the applicant obtained all relevant planning approvals? | Yes ☐ No ☐ N/A ☒ | Approval:<br>Expiry date:<br>If N/A explain why?<br>Exempt under the *Mining Act* |
| 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>No clearing is proposed. |
| 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:<br>Licence/permit No:<br>GWL151513(8) MMG are submitting an addendum to the Operating Strategy of the licence to include changes to operational requirements |
| Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)? | Yes ☐ No ☒ | No, however there is a nearby Mount Magnet Water Reserve (Country Area Water Supply) Public Drinking Water Source Protected Area<br>Name: The Mount Magnet Water Reserve consisting of Genga and Lennonville Water Reserve<br>Type: Proclaimed Groundwater Area<br>Has Regulatory Services (Water) been consulted?<br>Yes ☐ No ☐ N/A ☐<br>Regional office: Mid-West Gascoyne |
| Is the Premises situated in a Public Drinking Water Source Area (PDWSA)? | Yes ☒ No ☐ | The Lennonville Water Reserve (P1) borders on the northern side of the premises boundary. The northern part of the Genga Water Reserve (P2) lies within the premises boundary, while the P1 area of this reserve lies |

| | | |
|---|---|---|
| | | approximately 5 km south of the premises boundary.<br>Priority: P2<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 (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*) | Yes ☒ No ☐ | *Mining Act*<br>*Dangerous Goods Act* |
| 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<br>Date of classification: 29/3/2017 |