Government of Western Australia
Department of Water and Environmental Regulation

# Amendment Report

## Application for Licence Amendment

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

| | |
|---|---|
| **Licence Number** | L9056/2017/1 |
| **Licence Holder** | Pilgangoora Operations Pty Ltd |
| **ACN** | 616 560 395 |
| **File Number** | DER2017/000318-1 |
| **Premises** | Pilgangoora Lithium – Tantalum Project<br>Mining tenements M45/1256, M45/511, M45/333, L45/417, L45/454, L45/614, G45/350, G45/351<br>MARBLE BAR WA 6760<br>As defined by the premises maps attached to the revised licence |
| **Date of Report** | 27 May 2025 |
| **Decision** | Revised licence granted |

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**Alana Kidd**
**MANAGER, GREEN ENERGY**
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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# 1. Decision summary

Licence L9056/2017/1 is held by Pilgangoora Operations Pty Ltd (the licence holder, wholly owned by Pilbara Minerals Limited) for the Pilgangoora Lithium-Tantalum Project (the premises), located in Marble Bar, WA.

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 L9056/2017/1 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 summary

On 1 August 2024, the licence holder submitted an application to the department to amend licence L9056/2017/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Inclusion of infrastructure constructed under works approvals W6051/2017/1, W6443/2020/1 and W6766/2022/1; and
- Expansion of prescribed premises boundary to include mining tenements M45/333, M45/511, L45/454, L45/614, G45/350 and G45/351 (Figure 1) to align with boundaries of W6051/2017/1, W6443/2020/1 and W6766/2022/1.
- Category 5:
    - Increase total production of processing ore from 2,000,000 to 6,000,000 tonnes per annum including 1,000,000 of mobile crushing;
    - Increase tailing deposition to 1,800,000 tonnes per annum; and
    - Changes to tailings facility bore locations.
- Add new Category 6 mine dewatering, for discharging up to 256,000 tonnes per annum and move the authorised discharge point 100 metres to the west of Pilgangoora Creek.
- Category 52 - increase electrical power generation from 15.7 to 20.9 MW.
- Category 54 – incorporate stage 1 and 2 of the wastewater treatment plant (WWTP) increasing the processing capacity from 150 to 275 $m^3$ per day and increasing the irrigation area to 7.36ha.
- Category 64 increase the landfill cell from 20,000 to 25,000 tonnes per annum.

This amendment is for addition of category 6 and changes to categories 5, 52, 54 and 64 activities including minor administrative changes to licence figures. No changes to category 73 has been requested. Table 1 below outlines the proposed changes to the existing licence.

**Table 1: Proposed design or throughput capacity changes**

| Category | Current design/throughput capacity | Proposed design/throughput capacity | Description of proposed amendment |
|---|---|---|---|
| 5 - Processing or beneficiation of metallic or non-metallic ore. | 2,000,000 tonnes per annum<br>Including tailings deposition up to1,680,000 tonnes per annum. | 6,000,000 tonnes per annum | Increase throughput capacity to 5,000,000 tonnes per annum<br>Include tailings deposition to 1,800,000 tonnes per annum<br>Include mobile crushing throughput to 1,000,000 tonnes per annum. |
| 6 – Mine dewatering | N/A - new category | 256,000 tonnes per annum | Discharge mine dewater from the central pit and southern pit to one discharge point at Pilgangoora Creek. |
| 52 – Electrical power generation | 15.7 MW | 20.9 MW | Increase electric power generation capacity to include the 10 diesel generators operating at 100% maximum efficiency. |
| 54 – Sewerage facility | 150 $m^3$ | 275 $m^3$ | Increase wastewater treatment discharge to 275m3 per day over a spray field totalling 7.36ha. |
| 64 – Putrescible landfill | 20,000 tonnes per annum | 25,000 tonnes per annum | Increase the existing land fill cell to 25,000 tonnes per annum. |

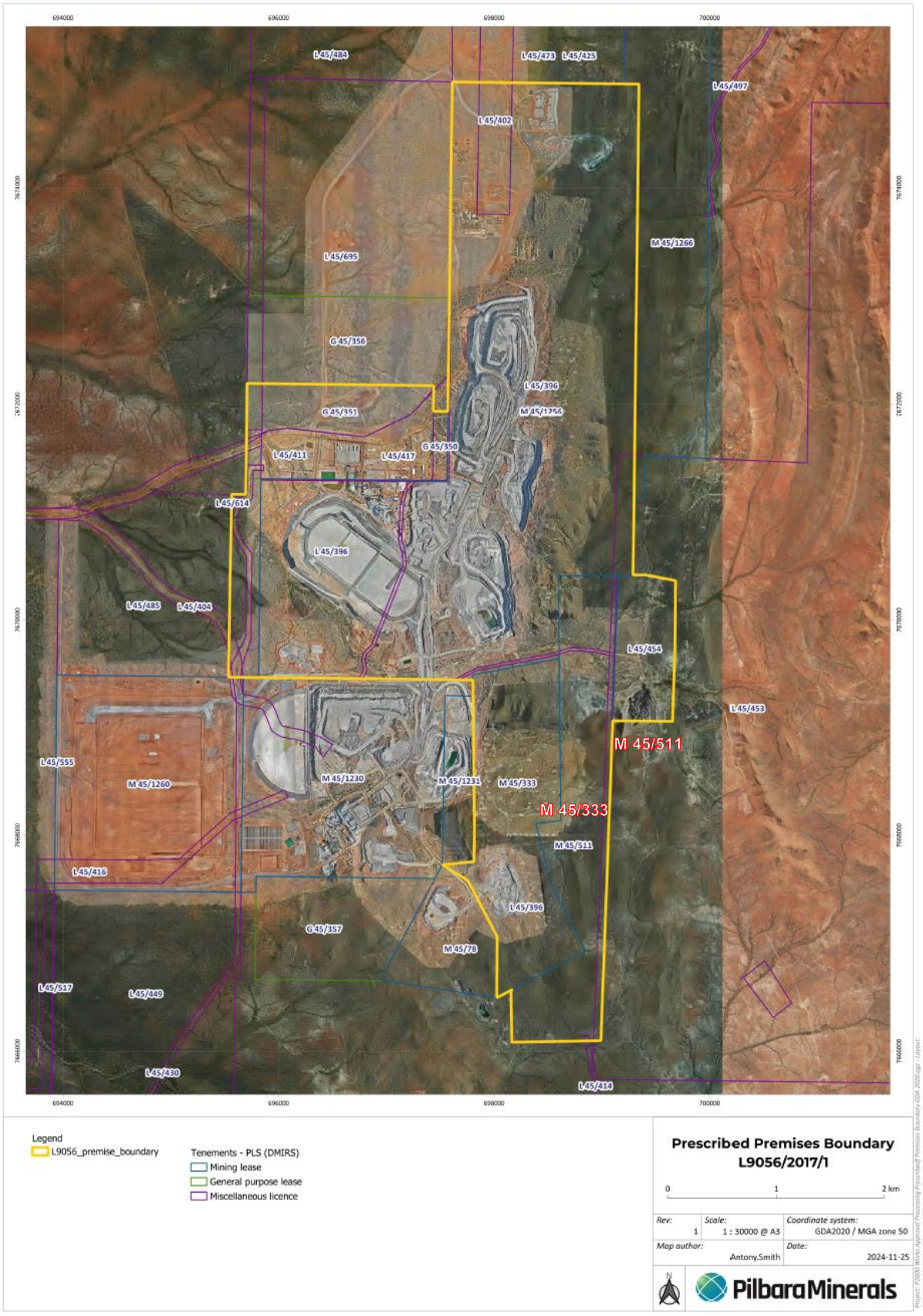


**Figure 1 Revised prescribed premises boundary (outlined in yellow)**

### 2.2.1 Category 5 activities

The applicant proposes to incorporate infrastructure completed under works approval W6051/2017/1 and consequently increase the overall category 5 production/design capacity from 2,000,000 tpa to 6,000,000 tpa. The infrastructure proposed for inclusion within the licence for ongoing operation are summarised below:

- Additional crushing and ore sorting circuit (COSC) with a design capacity of 5,000,000 tpa, including:
    - ROM bin;
    - primary crushing;
    - ore sorting hall;
    - ore sorting waste material (two stock piles);
    - secondary crushing; and
    - stormwater infrastructure.
- Stage 2 processing plant infrastructure including:
    - stage 2 heavy media separation and primary rejection
    - wet screener;
    - two stages of dense media separation;
    - four vibrating feeders;
    - stage 1 feed preparation screener;
    - four stage 1 cyclones;
    - concrete bunding with containing capacity equivalent to 110% of the capacity of the largest tank;
    - electric sumps installed in concrete flooring; and
    - isotainers, mixing tanks and storage tanks located on a concreted bunded area.
- Incorporation of mobile crusher/screener. This was included within the works approval under category 70[1]. The 1,000,000 tpa ore crushing and screening infrastructure is proposed to be included within category 5.

Given increased processing of ore, tailings deposition to the tailings management facility (TMF) will increase from 1,680,000 to 1,800,000 tpa. A summary is included in Table 2 below.

[1] For noting, inclusion under category 70 within works approval W6051/2017/1 was an administrative error. Category 70 is for screening etc of material with a design/production capacity of more than 5,000 but less than 50,000 tonnes per year. This infrastructure should have been included originally under category 12 for screening etc. of material for more than 50,000 tonnes per year.

**Table 2: Summary of changes to prescribed premises category 5**

| Primary Activity/Prescribed Premises | Component of Prescribed Premises changes | Total proposed premises production and design capacity |
|---|---|---|
| **Category 5: Processing and beneficiation of metallic or non-metallic ore** | **Processing Plant (Stage 1, Stage 2 and COSC Components)**<br>5,000,000 tonnes per annum<br>**Tailings deposition:**<br>1,800,000 tonnes per annum | 6,000,000 tonnes per annum |
| | **Mobile Crushing Facility (previously category 70)**<br>1,000,000 tonnes per annum | |

### 2.2.2 Category 6 activities

The applicant proposes to add category 6 for dewatering 256,000 tonnes per annum to the licence and incorporate dewatering infrastructure constructed under works approval W6443/2020/1. Works approval W6443/2020/1 risk assessed and granted authorisation of a discharge volume consisting of 256,000 tonnes per annum from the central pit following uncontrollable events (e.g. cyclones or significant rainfall events). In addition, the applicant proposes to undertake the following.

- Move the discharge point authorised under W6443/2020/1 100 metres to the west of Pilgangoora Creek (Figure 2) and construction of the associated additional pipeline. The licence holder has indicated that they would use the same controls and conditions in works approval W6443/2020/1 for the changes to the discharge point and pipeline.
- Construct a dewatering pipeline from an off-site operation (owned by the same operator) to facilitate dewatering from an adjacent premises (south pit under L9036/2017/1), that will discharge to the same point at Pilgangoora Creek (Figure 3). The adjacent premises is the Ngungaju Lithium Operations (NLO), operated under Part V licence L9036/2017/1 and held by Pilgangoora Operations Pty Ltd.
- Any discharge will only occur post cyclone or heavy rainfall event, where the central and south pit discharge will combine prior to discharge to Pilgangoora Creek. The two discharge pipelines (from Central and South pits) will converge into a single discharge point/location, but the actual discharge from each source may be released separately.
- Change the discharge of 256,000 tonnes to approximately 150,000 tonnes from the central pit (L9056/2017/1) and 106,000 tonnes from the south pit (L9036/2017/1).
- To increase the increase of the flow rate from 50L/s to 150L/s.

The licence holder provided an August 2024 surface water south pit sample representative of the proposed dewater quality, and central pit water quality samples taken from 2022 to 2024. The licence holder has indicated that the central pit water samples were not representative of the likely discharge as rainwater dilution will occur. The data is outlined in Table 3.

Table 3 demonstrates that water quality is below ANZECC criteria for established parameters other than for nitrate.

**Table 3: South pit and Central pit water quality**

| Analyte | Unit | Surface water South Pit sample 18/08/2024 | Surface water Central Pit sample average [3] | [1]Criteria ANZECC Livestock | [2]Criteria ANZECC Freshwater |
|---|---|---|---|---|---|
| pH Value | pH Unit | 8.16 | 7.59 | NE | 6.5 – 8.5 |
| Electrical Conductivity @ 25°C | µS/cm | 1810 | 3.601 | NE | NE |
| Total Dissolved Solids @180°C | mg/L | 1280 | | 4000 | NE |
| Total Hardness as CaCO3 | mg/L | 591 | <1 | NE | NE |
| Carbonate Alkalinity as Carbonate | mg/L | <1 | <1 | NE | NE |
| Bicarbonate Alkalinity as Bicarbonate | mg/L | 148 | 123.45 | NE | NE |
| Hydroxide Alkalinity as $CaCO_3$ | mg/L | <1 | <1 | NE | NE |
| Carbonate Alkalinity as $CaCO_3$ | mg/L | <1 | <1 | NE | NE |
| Bicarbonate Alkalinity as $CaCO_3$ | mg/L | 122 | | NE | NE |
| Total Alkalinity as $CaCO_3$ | mg/L | 122 | 101.45 | NE | NE |
| Silicon as $SiO_2$ | mg/L | 28.3 | 32.4 | NE | NE |
| Sulfate as $SO_4$ - Turbidimetric | mg/L | 303 | 864 | 1000 | NE |
| Chloride | mg/L | 177 | 159.45 | NE | NE |
| Calcium | mg/L | 90 | 179.63 | 1000 | NE |
| Magnesium | mg/L | 89 | 110 | 600 | NE |
| Sodium | mg/L | 125 | 97.38 | NE | NE |
| Potassium | mg/L | 6 | 11.31 | NE | NE |
| Lithium | mg/L | 1.97 | 5.7 | NE | NE |
| Nitrate as $NO_3$ | mg/L | 397 | 583.89[4] | 400 | 0.7 |
| Total Anions | meq/L | 20.2 | 78.2 | NE | NE |
| Total Cations | meq/L | 17.4 | 57.8 | NE | NE |
| Ionic Balance | % | 7.32 | | NE | NE |

Note: NE = Not established

[1]National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3 Primary Industries, 2000, ANZECC and ARMCANZ (ANZECC 2000).

[2]National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 2 Freshwater Ecosystems, 2000, ANZECC and ARMCANZ (ANZECC 2000).

[3]Average sample data from 2019 to 2024.

[4]Sample skewed from one high sample (3210 mg/L) out of nine sample events, noting that two addition samples (480 and 430 mg/L) exceed 400 mg/L.

### 2.2.3 Category 52 activities

The applicant proposes to increase the current prescribed electric power generation from 15.7 MW to 20.9 MW. The licence holder utilises a solar farm for electricity generation in daylight and engages 10 existing diesel generators at night and as required. When the diesel generators operate at maximum efficiency they generate up to 20.9 MW. The licence holder has requested that this power generation is authorised within the licence.

### 2.2.4 Category 54 activities

The applicant proposes to incorporate stages 1 and 2 of the sequence batch reactor (SBR) wastewater treatment plant (WWTP) and two spray fields:

- stage one: 1.69 hectares with 18 sprinklers (built as 6 larger sprinkler heads); and
- stage two: 2.63 hectares with 26 sprinklers (Figure 4),

as constructed under works approval W6051/2017/1. The additional infrastructure will support the increase to the licensed category 54 capacity from 150 $m^3$ to 275 $m^3$ per day, and irrigation fields from the existing 3.04 to 7.36 hectares (3.04 + 1.69 + 2.63).

The stage two SBR WWTP proposed for incorporation into the licence includes:

- 200 kL balance tank (note built as 2x 50 kL);
- 200 kL treated effluent / irrigation tank (note built as 3x 50 kL);
- 50 kL sludge thickening tank;
- Flow meters to be installed at influent inlet point and effluent egress point; and
- Internal berm installed inside the spray field fence line capable to prevent surface water runoff from irrigation area.

The WWTP has been constructed to meet the following water quality emissions standards:

- Biochemical oxygen demand <20 mg/L
- Total suspended solids <30 mg/L;
- Total nitrogen <30 mg/L;
- Total phosphorus <7.5 mg/L;
- Chlorine residual >0.2 - 2 mg/L;
- pH 6.5 - 8.5; and
- E.coli <1,000 cfu/100 mL.

No nutrient loading calculations were provided by the applicant.

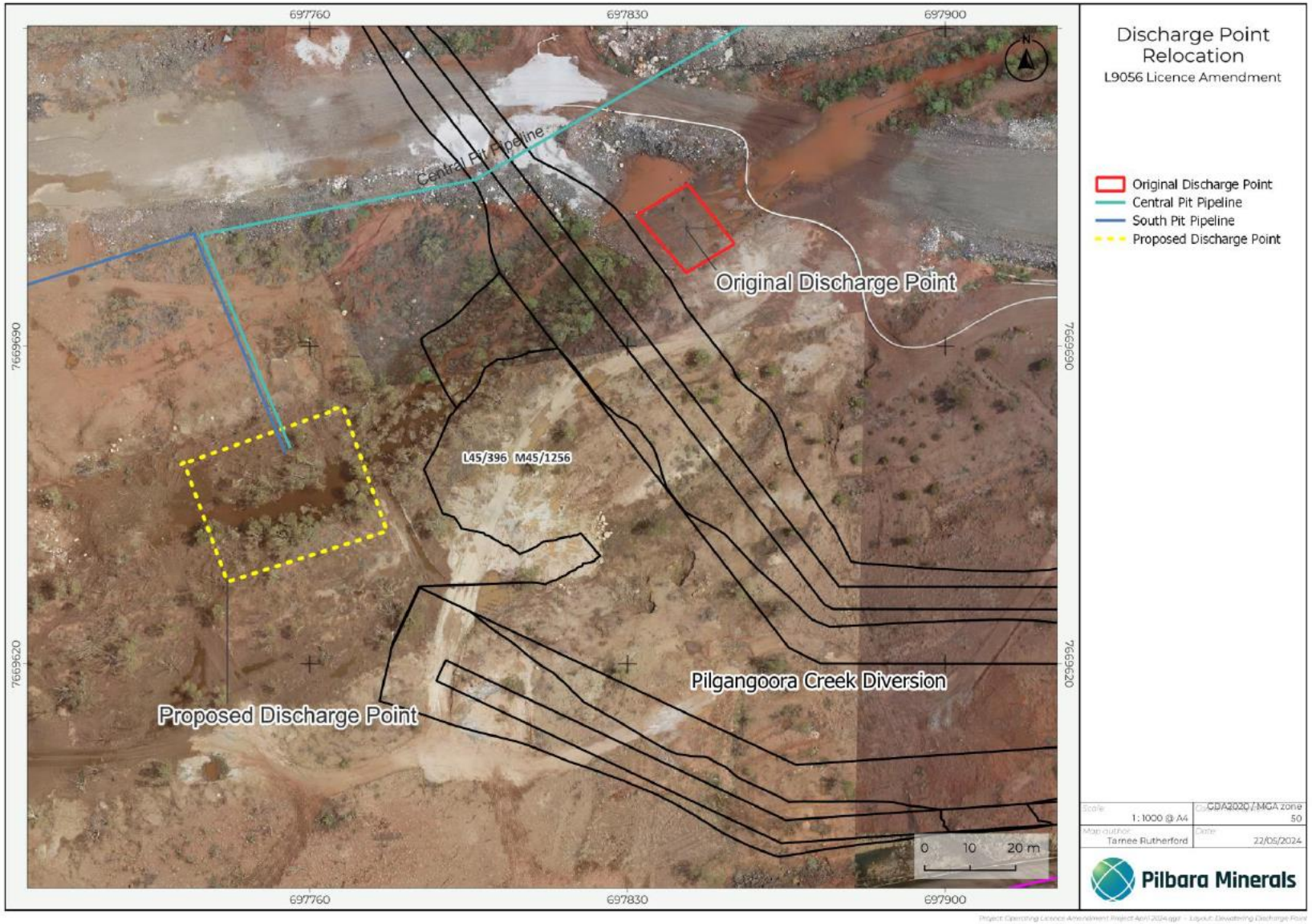


**Figure 2: Dewatering discharge point relocation**

Licence: L9056/2017/1

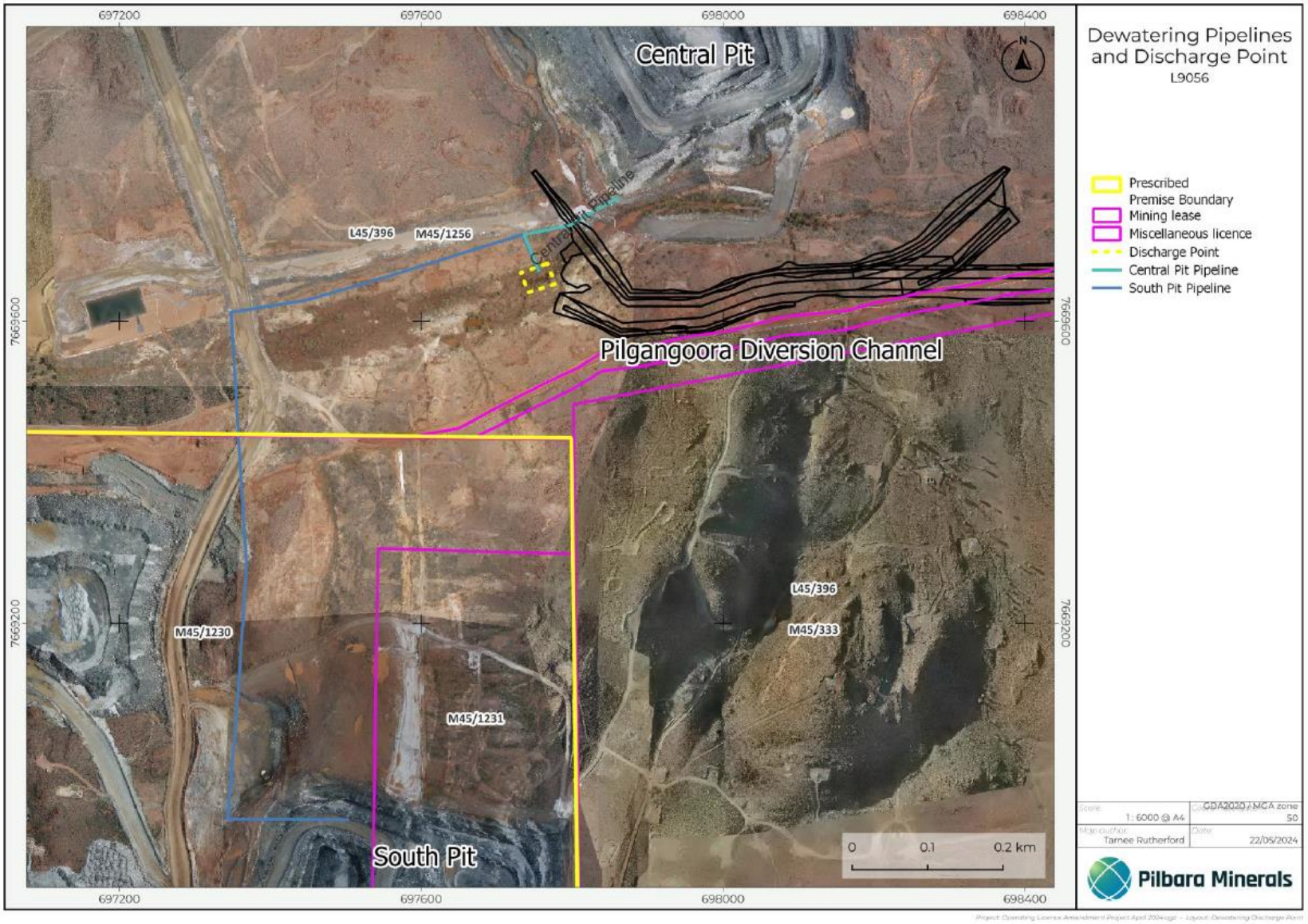


**Figure 3: Pipeline from off-site "south pit" and additional pipeline route from the central pit**

Licence: L9056/2017/1

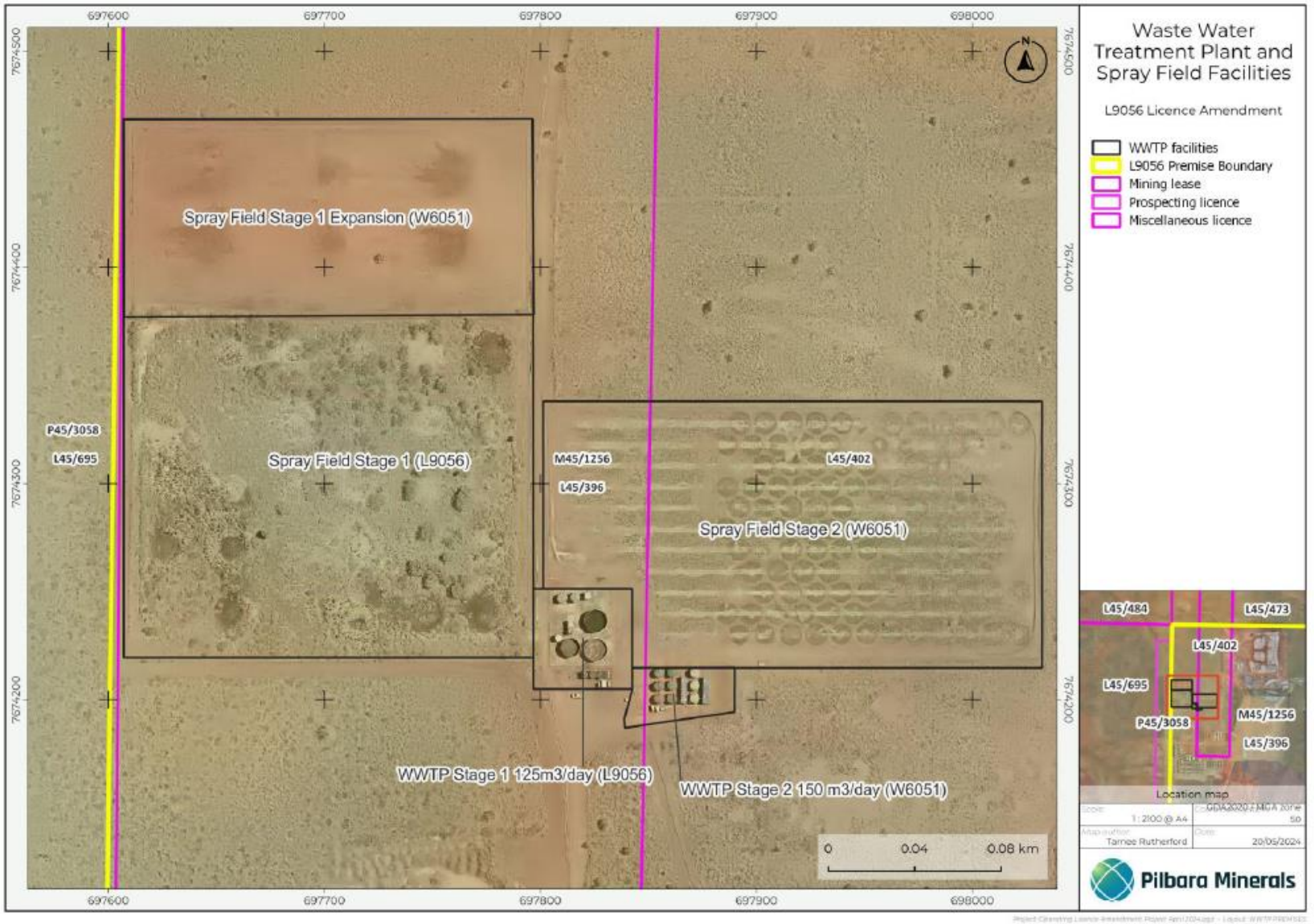


**Figure 4: Wastewater treatment plants and spray fields**

Licence: L9056/2017/1

### 2.2.5 Category 64 activities

The licence holder proposes to increase the category 64 prescribed premises throughput from 20,000 to 25,000 tonnes per annum. The licence holder owns adjacent Ngungaju Lithium Operations and associated camp site (Tambrah Camp). It is proposed to accommodate off-site putrescible waste from the Tambrah Camp. There is no proposed change to landfill design as the applicant indicates there is sufficient capacity available within the landfill design to allow for this additional volume in the short term, with approximately 13,000 $m^3$ of storage capacity remaining (8 months of operations). The applicant has indicated that a new works approval for an additional landfill will be submitted in 2025.

### 2.2.6 Removal of condition 23

The licence holder proposes to remove condition 23 from the licence which requires a report detailing a review of the ambient groundwater monitoring strategy and seepage control infrastructure for the tailings management facility. Pilgangoora submitted a report to the department on 9 December 2022 (DWER ref A2149423) to meet the requirements of condition 23. The department reviewed this report and responded on 19 January 2023 (DWER ref A2150909) that the requirements of the condition were generally met but outstanding information and proposed controls were required.

Given that removal of condition 23 has implications for on-going seepage management, this amendment request will be risk assessed further in section 2.4.2 of the decision report.

### 2.2.7 Other requested amendments

#### Groundwater monitoring bore amendments

The licence holder proposes to modify licenced monitoring requirements for groundwater bores as follows:

- remove groundwater monitoring bore PWB005 (96 m deep screened 12- 96 mBGL) and replace it with monitoring bore PMB045 (12 m shallow bore screened 6 - 9 mBGL and 102 m deep bore screened 96-102 mBGL). Bore PWMB005 will be disturbed within the next 6 months due to the expansion; and
- remove groundwater monitoring bore TMFMB006 (50 mBGL, screened 6 mBGL – 50 mBGL) located south southwest of the tailings mine facility). The licence holder proposes that the continued monitoring of nearby bore PMB003 (96 mBGL screened interval 12.96 mBGL) located south of the tailings mine facility), would be sufficient.

#### Prescribed premises boundary update

The licence holder has requested that the licence boundary for L9056/2017/1 incorporates the areas outlined in works approvals W6051/20171, W6766/2022/1, and W6443/2020/1.

#### Update of figures

The licence holder has requested administrative amendments to the licence including updating Figure 6 removing bores PM002, PMB020 and Obs01 that no longer exist and refer the ambient groundwater monitoring to Figure 6 rather than Figure 4.

## 2.3 Works approvals – compliance overview

### 2.3.1 Works approval W6051/2017/1

**Category 54 activities - WWTP and spray field**

Environmental Compliance Reports were submitted to the department February 2023 (stage 1) and May and June 2023 (stage 2) for new infrastructure for the wastewater treatment plant

(WWTP) and spray fields. The department determined that the works approval holder was compliant with minor changes to stage 1 sprinklers and stage 2 WWTP containments. Environmental commissioning begun for all components in July 2023. Environmental Commissioning Report was submitted in February 2024, with minor non-compliances for exceedance of commissioning duration and missed monthly monitoring for chlorine residual. A time limited operations report has not been submitted to date.

**Category 5 activities -Stage 2 Processing plant**

In November 2023 the licence holder submitted an Environmental Compliance Report and in July 2024 then submitted a time limited operations report demonstrating that the following infrastructure for the processing plant stage 2 was constructed and capable of processing 3 million tonnes per annum (Mtpa) consisting of:

- Wet screener;
- Two stages of Dense Media Separation;
- Four vibrating feeders;
- Stage 1 Feed Preparation Screener;
- Four Stage 1 Cyclones;
- Plant to be constructed on a concrete pad and concrete bunded with a containment capacity equivalent to 110% of the capacity of largest tank;
- Electric sump pumps installed in the concrete flooring to collect and pump any spilled material back into the process stream; and
- Isotainers, mixing tanks and storage tanks will be located on a concrete bunded area with plinths within the Processing Plant area.

**Category 5 activities -Stage 1 Mobile crushing plant**

An Environmental Compliance Report was submitted in October 2024 for a mobile crushing and screening plant. The delegated officer determined that the screening plant and associated dust suppression infrastructure were constructed meeting the requirements of works approval W6051/2017/1.

### 2.3.2 Works approval W6766/2022/1

**Category 5 activities - crushing and ore sorting circuit**

Under works approval W6766/2022/1 the P680 Crushing and Ore Sorting Circuit (COSC) with an assessed ore processing capacity of 5,000,000 tpa was constructed. An Environmental Compliance Report was submitted in August 2024. The department considered that the COSC, stormwater drains, and sediment ponds were constructed meeting the requirements of the works approval W6766/2022/1. It was noted that the concrete aprons were not installed under the rejected material stockpiles. The works approval holder indicated that they would be stored on the same rock substance and unlikely to increase contamination. The delegated officer agreed that this would not increase the risk to public health, public amenity or the environment. By the time the licence holder applied for the licence amendment, the time limited operation report was not submitted. The licence holder provided the time limited operations report on 28 January 2025.

### 2.3.3 Works approval W6443/2020/1

**Category 6 activities- Mine dewatering**

Under works approval W6443/2020/1 the dewatering pipeline and discharge point (Figure 2 and Figure 3) were constructed and authorised for 256,000 tonnes per annum. An Environmental Compliance Report was submitted December 2022. There was one variation to the construction where the pipeline was placed following the natural contour of the ground rather than placed within a bund. The works approval holder indicated that the chosen location reduced the total disturbance, minimised the required clearing for the installation and made a containment bund

redundant. Any leaks or spills from the pipeline would either runoff back into the pit, or into the natural creek line which is the approved discharge location.

The delegated officer considered the water quality from the central and south pits (Table 3) and that water quality is likely to be diluted when discharged after a significant rainfall event and determined that the variation in construction would require further risk assessment for operational risk to public health, public amenity and the environment. The delegated officer considered that the mine dewatering pipeline and associated infrastructure were constructed sufficiently meeting the requirements of the works approval W6443/2020/1.

No time limited operation was authorised for the dewatering activity.

## 2.4 Review of tailings management facility seepage

### 2.4.1 Review of Tailings Management Facility Seepage (TARP)

The applicant submitted Pilbara Minerals Tailings Management Facility Seepage (TARP) – Trigger Action Response Plan (November 2024) to demonstrate controls and mitigation actions to manage groundwater levels around Cell 1 and Cell 2 of the TMF.

Two aquifers underlie the Pilgan TMF, a thin alluvial aquifer typically less than 10 m in depth overlying the Pilbara Fractured Rock Aquifer (PFRA), with the rock's permeability enhanced by fracturing, dissolution, and chemical weathering. Natural groundwater recharge primarily occurs through the infiltration of rainfall or streamflow during rainfall events, however TMF seepage now represents a significant contribution to groundwater recharge. Groundwater flows towards the Pilgangoora Creek to the west-northwest. In the western and southern areas, groundwater levels have risen by up to 9 metres due to seepage from the TMF.

The applicant has indicated that they have undertaken the following seepage mitigation measures for Pilgan TMF.

- Capping with an impermeable clay layer to minimise water infiltration.
- Installation of TMF monitoring bores.
- Installation of underdrainage recovery system.
- Installation of an infiltration trench for shallow groundwater (alluvium aquifer) recovery.
- SEEP/W modelling.
- Undertaking electromagnetic surveys to locate and manage potential seepage points and to identify suitable locations for additional seepage recovery bores.
- Construction and operation of seepage recovery bores to actively reduce groundwater mounding and surface expression consisting of: PWB004 operational since July 2018, PWB026 operational since November 2023, PWB038, PWB039, PWB040 and PWB041 recently constructed in 2024 and expected to be operational from February 2025.

Seepage (SEEP/W) modelling undertaken by ATC Williams indicated that:

- To manage the surface expression of groundwater mounding, it is proposed to excavate seepage interception trenches at the northern and southeastern sides of Cell 2.
- If seepage migration continues to occur beneath the seepage recovery trenches, installing a series of seepage recovery bores to drawdown ground water levels in strategic location is recommended.
- The rise in groundwater level is not considered to have a significant impact on the overall geotechnical stability of the TMF, as the buttressing effect of the extensive outer shell of competent waste rock prevents the development of potential failure through the inner embankment.

A water balance for Pilgan TMF for 2024 indicated that of the water entering the TMF, 29.4% was recovered or evaporated, 30.9% was retained within tailings dam and 39.5% seeped to groundwater. It is expected in theory that the additional recovery bores should lead to declining groundwater levels.

The applicant provided a three-tier trigger action and response for the supernatant pond. The following controls were outlined.

**Table 4: Applicants TARP controls for Pilgan TMF cell**

| Feature | Controls |
|---|---|
| Tailing discharge at a minimum of 50% solids concentration rate. | Flow meter monitoring<br>Daily inspection<br>Drone monitoring<br>Water balance |
| Decant infrastructure to remove the supernatant water to Process Water Dam to keep the water level as low as practically possible | |
| Evidence of cracking, washout or erosion within TMF perimeter walls. | Daily inspection<br>Daily drone monitoring |
| Standing Water Level (SWL) of monitoring bores and Piezometers are maintained within the threshold limit. | Monthly bores standing water level readings<br>VWP telemetry monitoring<br>INX database<br>Pilgan TMF - Monitoring Bores<br>TMFMB01; TMFMB02; PMB001; PWE033; PWB005; TMFMB03; TMFMB04; TMFMB05; TMFMB06; PMB022, PMB021, WELL 5 and PWBMB004<br>(The department notes that PWB005 and TMFMB06 are proposed to be removed as part of this amendment). |
| Maintain the environmental quality of receiving waters by avoiding significant impacts from seepage | |
| Prevent any surface expression of seepage and/or groundwater | Monthly inspections and depth to groundwater contouring and mapping. |

### 2.4.2 Condition 23 review

Licence amendment issued on 1 August 2022 determined that a detailed review of the suitability and effectiveness of the seepage infrastructure and monitoring network based on results of geological and geophysical investigations were to be undertaken and were conditioned as condition 23. The licence holder submitted a report reviewing their current ambient groundwater monitoring strategy and seepage control infrastructure for the tailings management facility on 9 December 2022. The department requested further information on 19 January 2023.

The licence holder has provided additional information on 14 August 2024. Contaminated Sites Branch (CSB) has provided technical advice on the submitted information and determined the following:

- The geophysical investigations that have been undertaken near the tailings facility have indicated that seepage is taking place uniformly from the southern toe of the facility. The department has no objections to the locations of the additional monitoring/seepage bores that have been proposed by Pilgangoora (Bores PWB038, PWB039, PWB040 and PWB041). Given the large extent to which groundwater mounding is taking place near the tailings mining facility, it is recommended that a nest of two monitoring bores (PMB048 and PMB049) are installed at the location of at least one of these sites to

enable the vertical component of groundwater flow to be adequately characterised near the toe of the tailings facility. It is recommended that the nest of monitoring bores consists of a shallow bore that is screened over a 3-metre interval below the current water table in shallow regolith, and a deeper bore that is screened over the same depth interval in fractures in the underlying bedrock.

- The revised ecotoxicological proposal that was prepared by Professor Peter Cook of the University of WA is supported by the department. Another research angle that would be worth pursuing at the Pilgangoora mine site, would be to use phyto-mining techniques to prevent lithium contamination in seepage from the TMF causing offsite environmental impacts. This may be possible, as research that has been undertaken by the Centre for Mined Land Rehabilitation at the University of Queensland has indicated that some Australian native plant species (particularly Atriplex and *Tecticornia* species) are capable of bioaccumulating large amounts of lithium from contaminated soil and water (for more information about this, refer to Nkrumah and van der Ent, 2023). This vegetation could then be periodically harvested to remove lithium contamination from soil in areas affected by seepage from the TMF. Consequently, it may be possible to grow a vegetation barrier near the toe of the TMF at the Pilgangoora site that would prevent lithium migrating in seepage to more sensitive offsite environmental receptors. For further information about this issue, it is recommended that the proponent and Professor Cook contact Dr Philip Nkrumah at the University of Queensland (at the following email address: p.nkrumah@uq.edu.au ).
- Due to the large extent to which groundwater mounding has taken place near the tailings facility, the department considers that it is likely that the seepage rate from the facility has been underestimated, most likely due to errors in determining the recovery rate of water from the facility and because the rate of evaporation from the facility has probably been overestimated. However, as the number of lifts for the tailings mine facility have now been reduced from 9 to 3, and because the facility is expected to only be operational for a further 3 years, the department considers that it is not necessary to measure the evaporation rate on an ongoing basis for this facility.
- Given the short operational life of the tailing storage facility (a further 3 years), the department does not recommend that additional modelling is undertaken to estimate the potential impacts that further tailings lifts would have on this facility. The department does, however, recommend that groundwater modelling that is carried out for new tailings management facilities at the Pilgangoora mine site is reported to the department in accordance with the requirements that are outlined in the Australian Groundwater Modelling Guidelines

**The delegated officer has considered the TARP and determined to remove condition 23, but will regulate the following requirements:**

- **a lithium mass balance calculation on a quarterly basis from groundwater data**.
- **that a nest of monitoring bores consisting of a shallow bore that is screened over a 3-metre interval below the current water table in shallow regolith, and a deeper bore that is screened over the same depth interval in fractures in the underlying bedrock is installed and monitored (Bores PMB048 and PMB049).**

## 2.5 Discharge water quality assessment

### 2.5.1 Category 6 activities- Mine dewatering

The licence holder indicated that dewatering activities from the central pit and southern pit to a discharge point at Pilgangoora Creek is for emergency water discharge only under significant rainfall events. The existing water quality data outlined in Table 3 is not indicative of the water quality of any discharge expected under a post significant flood event, as water is likely to be significantly diluted in both the south and central pits with rainwater.

The licence holder currently monitors the south and central pits water quality monthly for flow, electrical conductivity and pH, and annually for a wider array of parameters (see control Table 5). Surface water monitoring (see control Table 5) is undertaken by the licence holder up and down stream of the proposed discharge point on Pilgangoora Creek and sampled during flow events and / or at least annually.

The discharge to Pilgangoora Creek is a combined flow from the south and central pits and it is noted that nitrate levels from both pits are elevated (Table 3). These levels are likely to be diluted during a significant rainfall event.

**Noting that and any emission to the environment may attract fees the delegated officer considered the licence holders sampling programs for the pits and Pilgangoora Creek and trigger level management and determined that:**

- **water quality should be sampled at the discharge point and up and down stream of Pilgangoora Creek to confirm nitrate levels remain under ANZECC livestock guidelines, ensuring downstream systems are not impacted post any discharge event;**
- **applicant controls for sampling, trigger levels and management actions are conditioned to manage the risk of impact on downstream ecosystems and livestock use; and**
- **the requested increase in flow rate does not increase the risk with current controls in the licence including the total annual volume. This will allow a faster discharge in case of excessive rainfall.**

### 2.5.2 Category 54 activities - WWTP and spray field

The premises is near Marble Bar that has an average of 361 mm per year with most of the rainfall falling between December to April period, linked to the Northern Australia cyclone season. Evaporation rates exceed rainfall monthly with mean daily evaporation rates ranging from 5.4 to 12.7 mm per day, indicating that hydraulic conductivity is not an issue for irrigation to land (BoM 20024).

Based on the applicant's WWTP water quality emission criteria for total nitrogen (30 mg/L), total phosphorus (7.5 mg/L), the proposed 7.36 hectares of irrigation to land and daily WWTP capacity of 275 $m^3$ (kL). The following nutrient loads have been calculated.

- Total nitrogen 8.25 kg/day (3,011.25 kg/year)
- Total phosphorus 2.06 kg/day (752.81 kg/year)

The irrigation area consists of arid native vegetation that is unlikely to uptake and utilise the nitrogen and phosphorus. The rates of irrigation in the long term are likely to contaminate soil through the accumulation of nutrients within the topsoil. It is unlikely that nutrients applied would leach below the ground as the evaporation rates are high throughout the year. An existing soil berm exists around the irrigation areas to prevent surface water runoff from storm events. The existing licence conditions requires vegetation health to not decline, and that healthy vegetation is maintained over the irrigation areas. The delegated officer has considered these existing conditions suitable.

**The delegated officer advises that future wastewater disposal practices should consider evaporation ponds as an appropriate alternative wastewater disposal method for high evaporation areas over irrigation to land to prevent soil contamination.**

# 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 5 below. Table 5 also details the proposed control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

## Table 5: Licence holder controls

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| **Construction – Category 6** | | | |
| Dust from works | Construction of discharge pipeline | Air/wind dispersal | No controls |
| Noise | | Air/wind dispersal | No controls |
| Sediment and hydrocarbon laden stormwater | Stormwater migrating through construction areas | Overland runoff | Conditions 1 and 2 of existing works approval W6443/2020/1. Including:<br>Contaminated stormwater is retained on site or directed to managed surface diversions.<br>Hydrocarbons and chemicals and bunded, spill response kits close to construction area, staff trained to use spill kits, harmful chemicals stored securely, covered on impervious bunded areas. |
| **Operation** | | | |
| **Category 6** | | | |
| Mine dewatering activity:<br>• Elevated metals and metalloids (e.g. Arsenic, Boron, Chromium Cr III, Nickel and Vanadium)<br>• Elevated nutrients (e.g. Nitrate)<br>• Elevated radioactive contaminants (e.g. Gross alpha and Uranium)<br>Erosion at discharge | Mine dewatering from central and south pits | Mine dewater discharged to environment:<br>Direct discharge to Pilgangoora Creek | • Drainage and containment structures<br>• Visual inspection of pipeline every 12 hours during dewatering.<br>• Maximum of 256,000 tonnes per annum<br>• Only released during significant rainfall events (cyclonic events)<br>• Mine dewater only proposed to be discharged following uncontrollable events (e.g. cyclones or significant rainfall events).<br>• Mine dewater quantities of less than 256,000 tonnes per year proposed to be discharged to Pilgangoora Creek.<br>• Dewatering pump is fitted with cumulative flow meter to measure flow rate and discharge volumes.<br>• Pilgangoora Creek outfall facility specifications:<br>  • Layer of riprap is installed to protect the receiving Pilgangoora Creek bank from erosion and scouring<br>  • Only benign, non-acid forming (NAF) mine waste material used for rock armouring; and<br>  • Diffuser arrangement at the end of the pipeline to spread the flow of mine dewater prior to release on the Pilgangoora Creek bed. |

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| | | | • Scour protection at the outlet to dissipate mine dewater flow is expected to return to natural velocities within 200 m from the outlet.<br>• Controlled surface water discharge points will be constructed in a manner to minimise the discharge impact so that erosion and scouring is minimised. The applicant notes that the initial discharge location is naturally rocky and as a result not prone to erosion or scouring<br>• The diversion channel is conceptualised as a rock-cut channel capable of conveying 1:100 year rainfall event. At these flood levels, the water flow will be approximately 2 m deep with velocities of 3-4 m/s. Natural velocities in the stream at the diversion outlet are around 1.2-1.6 m/s.<br>Controls as per time limited operations in W6443/2020/1 including:<br>• If water levels in the open pit (Centra/South Pit) exceed safe operating conditions, options will be investigated to preferentially pump mine dewater to the site processing ponds for utilisation in the processing plant or transfer to the Iron Stirrup Pit (open pit). Note: The Iron Stirrup Pit routinely fills up during high rainfall events and has reduced storage capacity as a result.<br>Administrative controls:<br>• Mine dewater discharge processes will be incorporated into the existing operational Environmental Management Plan and Surface Water Management Plan. These procedures and processes will be developed in line with regulatory approvals and requirements and relevant personnel will be trained accordingly. Procedures will cover roles and responsibilities, key tasks, risks and controls, incident management and document review.<br>• Collection of run-off in Central Pit sumps will allow settling of sediment prior to discharge to the environment.<br>Mine dewatering:<br>• The proposed maximum flow rate for mine dewater being discharged to Pilgangoora Creek is controlled by pump capacity and is expected to be 50 L/s.<br>• Mine dewater discharge to the Pilgangoora Creek will follow high rainfall events as opposed to be added to peak flows as they are occurring.<br>• Mine sampling undertaken monthly for pH, electrical conductivity and flow, annual sampling for total dissolved solids, dissolved major anions ($SiO_2$), dissolved metals, lithium, nitrate, major cations and anions including calcium, magnesium, sodium, potassium, chloride, sulphate, alkalinity, and hardness, Bicarbonate as $HCO_3$ and carbonate as $CO_3$.<br>Pilgangoora Creek monitoring:<br>Continue the monitoring regime under the existing Surface Water Management Plan, which includes:<br>• Pilgangoora Creek upstream and downstream samples taken during flow events (parameters are: pH, |

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| | | | electrical conductivity, total dissolved solids, total suspended solids, major cations (sodium, potassium, calcium and manganese), major anions (chloride, carbonate, bicarbonate, sulphate), total nitrogen, total phosphorus, soluble lithium, total recoverable hydrocarbons), with samples analysed at an accredited National Association of Testing Authorities (NATA) laboratory;<br>• Fixed point monitoring of the creek banks and beds is undertaken annually at each monitoring location (this includes photographs and observations of changes to the creek, recording of sediment deposition and/or erosion); and<br>• Recording the maximum annual creek depth at each monitoring point.<br>• Trigger actions when downstream is greater or equal to 10 % variation in water quality upstream including: resampling, remedial actions (removal or treatment) of contamination source. Diversion of runoff from contamination source, investigation of any impacts to receptors, and corrective actions, continued monitoring until variation between up and down stream water quality is below 10%.<br>• Contingency management if discharge cannot occur, the discharge is then directed to the 5 ML turkey nest (constructed raw water dam). |
| | | Mine dewater discharged to environment including pipeline leak/rupture | • Visual inspection every 12 hours when dewatering in operation for pipeline leakage or breach.<br>• Dewatering pipeline anchored at regular intervals to restrict movement in the event of a significant rainfall event. |
| **Category 5** | | | |
| Dust | Operation of COSC<br>Operations of expanded process infrastructure<br>Processing of material through a mobile crushing and screening | Air/wind dispersal | • Equipped with a functioning dust suppression system<br>• Water sprays on all transfer points and a deluge system on the ROM bin<br>• All large dry screens incorporate water sprays and/or dust covers.<br>• Stockpiles from the COSC, employ the use of luffing radial stackers providing dust minimisation by keeping the discharge height ~ 500mm above the top of the stockpile.<br>• Dust suppression using water trucks.<br>• The maximum stockpile height is 12 m.<br>• No dust generated in process plant as it is a wet plant process. |
| Noise | | | No controls |

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| Hydrocarbons and chemicals | plant ore. | Discharges to land | No changes to existing controls including:<br>• The crushing, screening and ore sorting facilities all have full concrete clean-up slabs beneath them. In addition, bunding is provided under the primary crushing building, ore sorting building and for all hydraulics related to the secondary cone crusher to allow wet clean-up.<br>• All fuel spills will be cleaned up immediately |
| Contaminated / sediment laden stormwater | Rainfall ingress to operational areas | Overland runoff | No changes to existing controls including:<br>• Stormwater diversion designed to ensure uncontaminated stormwater runoff is directed away from processing and material stockpile areas into earthen sedimentation ponds.<br>• Upstream site rainwater catchment for the area will be minimised with an increase in the surrounding waste landform / southern ROM pad.<br>• The remaining catchment area will be recovered by a southern side cut-off drain against the life of mine TSF toe. This drain reports to the overall site sediment catchment structure via an engineered culvert on the new mine haul road (used to transit waste materials from both circuits)<br>• Sediment ponds to be operated and maintained as per L9056. |
| **Category 52** | | | |
| Air emissions of nitrogen oxides, sulfur oxides, carbon monoxide and volatile organic compounds | Operation of power station diesel generators | Air /wind dispersal | No new controls |
| Noise | | | No controls |
| **Category 54** | | | |
| Odour | Treatment of sewage from the stage 2 WWTP | Air / wind dispersal | No controls |
| Leaks, spill and overtopping of containments and pipelines. | | Direct discharge to land | • Minimum separation distance of 100 m to all drainage lines/ water courses<br>• Existing licence controls.<br>• The WWTP will have contingency storage capacity for up to 2 days of normal flow if discharge is suspended |

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| | | | while any problems are fixed |
| Hydraulic overloading from direct discharge to land | Irrigation of nutrient, salt and contaminated rich wastewater from the WWTP to an expanded irrigation area | Direct discharge to land and runoff from during a rainfall event | • Irrigation in high evaporation area.<br>• Minimum separation distance of 100 m to all drainage lines/watercourses |
| Contamination of land from elevated levels of aluminium, arsenic, copper, chromium, zinc, boron, lithium, phosphorus and nitrate into the environment | | | • Regular sampling and analysis.<br>• Existing licence controls. |
| **Category 64** | | | |
| Dust | Increase in landfill volume | Air / wind dispersal | • Survey and the site location recorded prior to closure of each landfill site.<br>• The landfill site will be surrounded by a man proof fence, or bunds at least 2 m tall on three sides to minimize wind-blown rubbish as well as to prevent surface water runoff entering the trench.<br>• Landfill operated following the general provisions outlined in the Environmental Protection (Rural Landfill) Regulations 2002. |
| Noise | | | • Landfill operated following the general provisions outlined in the Environmental Protection (Rural Landfill) Regulations 2002. |
| Odour | | | • Trenches covered a minimum of once per fortnight with soil material.<br>• Landfill operated following the general provisions outlined in the Environmental Protection (Rural Landfill) Regulations 2002. |
| Windblown waste | | Direct discharge to land and air/wind dispersal | • Trenches covered a minimum of once per fortnight with soil material.<br>• The landfill site will be surrounded by a man proof fence, or bunds at least 2 m tall on three sides to minimize wind-blown rubbish as well as to prevent surface water runoff entering the trench.<br>• Landfill operated following the general provisions outlined in the Environmental Protection (Rural Landfill) Regulations 2002.<br>• Volume of waste disposed of into the landfill will be recorded and reported in the AER to DWER. |

| Emission | Sources | Potential pathways | Proposed controls |
|---|---|---|---|
| Leachate to groundwater | | Direct discharge through landfill cell base. | • Minimum 5 m depth between the base of the landfill and the water table.<br>• Landfill locations located more than 800 m from any watercourse.<br>• Landfill operated following the general provisions outlined in the Environmental Protection (Rural Landfill) Regulations 2002.<br>• Volume of waste disposed of into the landfill will be recorded and reported in the AER to DWER. |

### 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.

There are no nearby human environmental receptors. The closest Aboriginal Community is Woodstock, located ~49 km south of the site. The closest town is Marble Bar, located 84 km to the east of site.

Table 6 below provides a summary of heritage and environmental receptors that may be impacted because of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

**Table 6: Sensitive human and environmental receptors and distance from prescribed activity**

| **Sensitive receptors** | **Distance from prescribed activity** |
|---|---|
| South Hedland | Located more than 70 km north of the premises. Distance of premises to closest sensitive land use is sufficient to inform that project activity impacts are not foreseeable.<br><br>This receptor is not considered to be impacted during construction or operations and therefore not further considered in the risk assessment. |
| Residential premises | Wallareenya Homestead located more than 30 km north of the premises. Indee Station located more than 30 km northwest of the premises. Distance of premises to residential premises is sufficient to inform that project activity impacts are not foreseeable. These receptors are not considered to be impacted during construction or operations and therefore not further considered in the risk assessment. |
| **Aboriginal Heritage** | **Distance from prescribed activity** |
| Registered Aboriginal Heritage Site<br><br>Tulkuwarrana site ID: 7135 | Tulkuwarrana site intersects with proposed prescribed premises boundary expansion (mining tenements M 45/333 and M 45/511). Refer to Figure 5, Appendix 1.<br><br>Whole M45/1256 is located within the buffers of Pilgangoora Historic Aboriginal Camp – a lodged site. Closest registered site is PILGANGOORA 1 – a quarry, within approximately 3.5km from proposed circuit.<br><br>Direct risks posed to Aboriginal Heritage sites are regulated under Aboriginal Heritage Act 1972. Applicant is reminded of its obligations under the Aboriginal Heritage Act 1972 |
| **Environmental receptors** | **Distance from prescribed activity** |
| Flora<br><br>Three priority 3[2] species including:<br>• *Euploca mutica* (previously named *Heliotropium muticum* and identified in a 2016 survey by MMWC | *Euploca mutica* is located adjacent to the wastewater irrigation spray field and responds to disturbance.<br><br>The Pilgan project's impact on flora and vegetation has already been assessed and approved under Mining Proposal REG ID 117446 and Clearing Permits CPS 8175/3 and 10388/1 are current and remain in place. |

[2] Priority 3 species are poorly known species that are known from several locations and are not under imminent threat are but do not meet the adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey (DBCA, 2023).

| | |
|---|---|
| Environmental Pty Ltd)<br>• *Rothia indica* subsp. *australis*; and<br>• *Triodia chichesterenisis*. | |
| Threatened and priority fauna | A level 1 fauna survey was conducted over most of the application area in June 2015 by MMWC Environmental Pty Ltd. The same area was again subject to a single-phase level 2 terrestrial vertebrate survey in February 2016 by 360 Environmental Pty Ltd. Areas within L 45/388, L 45/414 and L 45/413 were not included in fauna surveys. Given the size of areas surveyed in the vicinity (over 1,600 hectares), it is reasonable to suggest that areas not covered by the fauna survey will offer similar habitat types (DMIRS 2018).<br><br>A total of 15 conservation significant species (including Priority species) were identified during the review of the database searches as potentially occurring in the survey area. Of these, one was recorded during the Level 2 survey, two were recorded during the Level 1 survey and eight species were considered Possible and four were considered Unlikely to occur in the survey area.<br><br>The following conservation significant species were recorded in the survey area:<br>• Rainbow Bee-eater (*Merops ornatus*) listed under the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act);<br>• Pilbara Leaf-nosed bat (*Rhinonicteris aurantia* – VU) listed under the EPBC Act; and<br>• Western Pebble-mouse (*Pseudomys chapmani* – P4) listed under the Wildlife Conservation Act 1950 (WA) (360 Env 2016).<br><br>Two Gane's blind snake (Pilbara), *Anilios ganei* (P1) located immediately south of the Central Pit were sighted in 2005 (DWER Geocortex).<br><br>A level 1 Short Range Endemic (SRE) was conducted over most of the application area in 2016 by Bennelongia Environmental Consultants. At least 23 species belonging to eight SRE groups were recorded. No listed and no confirmed SRE species were collected (Bennelongia 2016).<br><br>The proposed Category 6: Mine dewatering activities are to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events) to the Pilgangoora Creek line. Given the relatively short and infrequent period of discharge, impacts to the listed threatened and priority fauna are likely to be minimal. These receptors are therefore not further considered in the risk assessment. |
| Pilgangoora Creek | Located within the vicinity of Category 6 (mine dewatering) activities, cutting through the southern end of the Central Pit. Pilgangoora Creek is the proposed final discharge point for mine dewater stored within the Central Pit. Primary drainage line (the larger of the two drainage lines) that flows from east to west near the southern boundary of M45/1256 (Pilbara 2020a and DWER Geocortex). The creek is ephemeral and only flows following periods of significant rainfall. It is understood that most of the annual streamflow occurs from January to March after which they usually recede and dry up by June or July. A few small, disconnected pools may remain throughout the year if recharged by groundwater and the level remains above the creek bed (Pilbara 2020b).<br><br>Located within the vicinity of Category 6 (mine dewatering) activities, cutting through the southern end of the Central Pit. Pilgangoora Creek is the proposed final discharge point for mine dewater stored within the Central Pit.<br><br>Primary drainage line (the larger of the two drainage lines) that flows from east to west near the southern boundary of M45/1256 (Pilbara 2020a and DWER Geocortex).<br><br>The creek is ephemeral and only flows following periods of significant rainfall. It is understood that most of the annual streamflow occurs from January to March after which they usually recede and dry up by June or July. A few small, disconnected pools may remain throughout the year if recharged by groundwater and the level |

| | |
|---|---|
| | remains above the creek bed (Pilbara 2020b). Livestock and wildlife use Pilgangoora Creek for drinking water. |
| Groundwater | Premises located within the Pilbara Groundwater Area proclaimed under Rights in Water and Irrigation Act 1914.<br><br>Groundwater quality information supplied by the licence holder in 2017, stated that groundwater is approximately 9.5 metres below ground level (mbgl) (Pilbara 2017). Groundwater flow direction is towards the west, away from the groundwater divide and locally towards Pilgangoora Creek.<br><br>The licence holder supplied an average standing water level (SWL) of 5.47 mbgl between January to August 2020 for the ground monitoring bore located immediately south of the central pit (PMB001) (Pilbara 2020c).<br><br>Groundwater is considered fresh to brackish with 500-1,000 mg/L TDS (DWER Geocortex).<br><br>Groundwater pH is neutral (pH 7.8 to 7.9) (Pilbara 2020).<br><br>The main beneficial uses of the groundwater system in the vicinity of the project are mining and livestock drinking water. Groundwater is also used to produce potable water for the project by reverse osmosis treatment (Pilbara 2020a) |
| Groundwater Dependent Ecosystems (GDE) | The nearest significant GDE (i.e. a GDE with moderate or higher potential for interaction with subsurface groundwater) to the premises, as identified in the GDE Atlas, is the Chinnamon Creek system (GRM 2017).<br><br>This ecosystem is located approximately 2 km south of the premises and 4.6 km south-south-west of the proposed Category 6: Mine dewatering activities (DWER Geocortex).<br><br>The proposed Category 6: Mine dewatering activities are to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events). Given the relatively short and infrequent period of discharge, impacts to the GDE are likely to be minimal. This receptor is therefore not further considered in the risk assessment |
| Subterranean fauna | Bennelongia Environmental Consultants completed a Level 1 subterranean fauna assessment in August 2016, followed by targeted stygofauna assessment for the Pilgangoora Creek dewatering drawdown impact area in September 2016. Results of this survey have confirmed that all species have been identified outside of the impact zone of the premises (Pilbara 2020a).<br><br>The proposed Category 6: Mine dewatering activities are to allow the discharge of excess mine dewater associated with uncontrollable events (cyclones or significant rainfall events) to the Pilgangoora Creek line. Given the relatively short and infrequent period of discharge, impacts to subterranean fauna are likely to be minimal. These receptors are therefore not further considered in the risk assessment. |

## 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 considers 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 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 7.

The revised licence L9056/2017/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. mining, and campsite activities.

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

## Table 7. Risk assessment of potential emissions and discharges from the premises during construction and 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** | | | | |
| **Category 6 – Mine dewatering** | | | | | | | | |
| **Construction** | | | | | | | | |
| Source:<br>• Mobile equipment (e.g. light vehicles, heavy equipment, generators and dewatering pumps)<br>Activities:<br>• Maintenance and servicing activities<br>• Storage and use of hydrocarbons and chemicals | Hydrocarbons and chemicals | Spills or leaks to ground, overflow during filling and/or breach of containment.<br>Reduced quality or contamination of soil, sediment, groundwater and/or surface water<br>Reduced native vegetation health | Surface water (Pilgangoora Creek)<br>Groundwater<br>Land/Soil<br>Native vegetation | Refer to Table 5: Licence holder controls | Mid-level onsite impacts, low level offsite impacts<br>C = Moderate<br>The risk event could occur at some time<br>L = Possible<br>**Medium Risk** | Y | Condition 25 | The Delegated Officer notes that the general provisions of the EP Act, *Environmental Protection (Unauthorised Discharges) Regulations 2004* (UDRs), the *Dangerous Goods Safety Act 2004* and associated regulations assist to regulate hydrocarbon and chemical emissions during construction and operation.<br>Furthermore, the delegated officer notes that the construction of the pipeline and discharge point were previously risk assessed in W6443/2017/1. The licence holder has utilised the existing works approval controls. The delegated officer determined that there are no changes to the existing assessed emission profile and considers the risk assessment to be medium. |
| Source:<br>• Contaminated stormwater<br>Activities:<br>• Stormwater migrating through construction areas | Sediment (e.g. sand) and hydrocarbon (e.g. diesel) laden stormwater | Overland runoff<br>Reduced quality or contamination of soil, sediment, groundwater and/or surface water<br>Increased turbidity in surface water<br>Reduced native/riparian vegetation health or native/riparian vegetation death | Surface water (Pilgangoora Creek)<br>Groundwater<br>Land/Soil<br>Native/Riparian vegetation | Refer to Table 5: Licence holder controls | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event could occur at some time<br>L = Possible<br>**Medium Risk** | Y | Condition 26 | The Delegated Officer notes that the general provisions of the EP Act, *Environmental Protection (Unauthorised Discharges) Regulations 2004* (UDRs), the *Dangerous Goods Safety Act 2004* and associated regulations assist to regulate sediment and hydrocarbon emissions during construction and operation.<br>Furthermore, Condition 5 of existing licence L9056/2017/1 requires stormwater likely to be contaminated with hydrocarbons and other contaminants to be directed to an oil water separation system prior to discharge to the environment or re-use onsite.<br>The delegated officer considers existing controls from the licence and works approval, and other regulations regulate sediment and hydrocarbon sufficient to manage the risk. |
| **Operation** | | | | | | | | |
| Source:<br>• Mine dewater<br>Activities:<br>• Mine dewatering from Central Pit and South Pit direct discharge | Mine dewater:<br>• Elevated metals and metalloids (e.g. Arsenic, Boron, Chromium Cr III, Nickel and Vanadium)<br>• Elevated nutrients (e.g. Nitrate)<br>• Elevated radioactive contaminants (e.g. Gross alpha and Uranium) | Mine dewater discharged to environment and Pilgangoora Creek, increasing erosion, scouring, and sedimentation within creek bed.<br>Reduced quality or contamination of creek bed, groundwater and/or surface water<br>Increased turbidity in surface water<br>Reduced riparian vegetation health or riparian vegetation death | Pilgangoora Creek (surface water, creek bed structure and sediment)<br>Groundwater<br>Riparian vegetation<br>Downstream livestock drinking water | Refer to Table 5: Licence holder controls | Mid-level onsite impacts, low level offsite impacts<br>C = Moderate<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Medium Risk** | N | Condition 5<br>Condition 17<br>Condition 18<br>Condition 24 | The delegated officer considered the licence holder's controls including central and south pit and Pilgangoora Creek water quality monitoring programs, Pilgangoora Creek water quality trigger actions and the existing south and central pit water quality (see Table 3) and considered the risk to receptors to be medium. The delegated officer considered the high nitrate levels of the pits, the potential impacts to receptors and that discharged mine water would be significantly diluted from rainfall and risk to be medium.<br>The delegated officer determined that the licence holder's controls to be insufficient to manage the risk and considered that any discharge to the environment could attract licence fees. The delegated officer determined to regulate water quality monitoring of the Pilgangoora Creek discharge from the combined south and central pits discharge including the requirement for submitting a report to the CEO should trigger levels be exceeded when monitoring Pilgangoora Creek to manage the risk of contamination to Pilgangoora Creek and the effects to downstream receptors of the resource.<br>Furthermore, the delegated officer considered that the licence holders' controls reduced the risk and would be conditioned within the licence. |
| Source:<br>• Mine dewater<br>Activities:<br>Spills, leaks and ruptured of pipeline from mine dewatering from Central Pit and South Pit | | | | | Mid-level onsite impacts, low level offsite impacts<br>C = Moderate<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Medium Risk** | Y | Condition 27 | The delegated officer considered the licence holder's controls including, visual inspection of the pipeline, pipeline anchored to restrict movement, and/or surface runoff is to mine pits and determined the risk to be medium. The delegated officer determined that the licence holder's controls were appropriate to manage the risk and were conditioned in the amended licence. |

| 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** | | | | |
| **Category 5 – Processing or beneficiations of metallic or non-metallic ore** | | | | | | | | |
| Source: Tailings management facility from increased throughput of the mobile crushing and screening plant and ore processing plant.<br>Activities:<br>• Screening, crushing, unloading and loading activities at the mobile crushing and screening plant.<br>• Screening, crushing, grinding, processing operations of the ore processing plant to produce lithium and tantalum.<br>• Raw and process water ponds<br>• Tailing pipelines and storage facilities | Noise | Air / wind dispersal causing impacts to amenity and disruption to nocturnal fauna. | Fauna adjacent with mine site | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No controls | The delegated officer has considered that there are no residences or sensitive land uses within 30 km of the premises. The increased production is not considered to increase the existing mining operations noise to impact sensitive receptors. The risk has been assessed as low with no controls required. |
| | Sediment laden stormwater from operational areas, stockpiles and access roads. | Surface runoff causing impacts to surrounding seasonal creeks due to poor quality water, impacting on downstream waterways. | Seasonal creek 400 metres of crushing and screening plant, groundwater within 10 metres of the surface. | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event will probably not occur in most circumstances<br>L- Unlikely<br>**Medium Risk** | Y | Existing licence controls | The delegated officer considered the increased production and the existing controls within the licence and considered the risk of contaminated stormwater causing contamination to land to be medium. The delegated officer considered the previous risk assessment in W6051/2017/1 and L9056/2017/1 to be reasonable and conditions were appropriate to manage the risk of contaminated stormwater. The delegated officer determined that there was no increase in emissions from production increase and that no further controls were required to manage the risk. |
| | Spills and leaks of hydrocarbons from plant and equipment | | | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event will probably not occur in most circumstances<br>L- Unlikely<br>**Medium Risk** | Y | Existing licence controls | The delegated officer considered the increase production and the existing controls within the licence and considered the risk of spills and leaks from hydrocarbon plant, storage and equipment causing contamination to land to be medium. The delegated officer considered the previous risk assessment in W6051/2017/1 and L9056/2017/1 to be reasonable and conditions were appropriate to manage the risk of spills and leaks from hydrocarbons. The delegated officer determined that there was no increase in emissions from production increase and that no further controls were required to manage the risk. |
| | Dust | Air / wind dispersal causing impacts to amenity and health of adjacent flora (photosynthesis reduction) and fauna | Fauna and flora adjacent and within mine site | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event could occur at some time<br>L = Possible<br>**Medium Risk** | Y | Condition 5 | The delegated officer considered the licence holders controls to suppress dust from the processing of ore, and stockpiles and the existing dust controls within the licence and determined the risk of dust emissions to the environment to be medium. The delegated officer considered the natural dust tolerance of vegetation species should prevent vegetation impacts. Noting that there are also no Declared Rare Flora, Threatened Ecological Communities or Priority Ecological Communities within or in a 30 km radius of the premises.<br>The licence holder controls were considered appropriate and conditioned to minimise the risk. |
| | Overflow of raw and contaminated pond water, noting lithium is highly soluble. | Direct discharge to land and infiltration into soils contaminating soil and affecting ecosystem health. | Terrestrial ecosystems and groundwater adjacent to the ponds and tailings storage. | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event will probably not occur in most circumstances<br>L- Unlikely<br>**Medium Risk** | Y | Existing licence controls | The delegated officer considered the increased production and the existing controls within the licence and considered the risk of contamination of the soil and ecosystem health from overflow of raw and contaminated process water to be medium. The delegated officer considered the previous risk assessment in W6051/2017/1 and L9056/2017/1 to be reasonable and appropriate to manage the risk of pond overflow and that there was no increase in emissions. The delegated officer determined that no further controls were required to manage the risk. |
| | Failure of pipeline or pipeline joint causing discharge to land. | Direct discharge causing contamination of soil, inhibiting vegetation growth and survival. | Vegetation adjacent to tailings pipeline alignment. | Refer to Table 5: Licence holder controls and existing licence | Mid-level onsite impacts, low level offsite impacts<br>C = Moderate<br>The risk event will probably not occur in most circumstances<br>L- Unlikely<br>**Medium Risk** | Y | Existing licence controls | The delegated officer considered the increase production and the existing controls within the licence and considered the risk of failure of pipes causing contamination to land to be medium. The delegated officer considered the previous risk assessment in W6051/2017/1 and L9056/2017/1 to be reasonable and conditions were appropriate to manage the risk of pipeline failure. The delegated officer determined that there was no increase in emissions from production increase and that no further controls were required to manage the risk. |
| **Category 52 - Electric power station** | | | | | | | | |

| 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** | | | | |
| Increased operation of diesel generator, generating emissions from stacks | Air emissions of nitrogen oxides, sulfur oxides, carbon monoxide and volatile organic compounds | Air / wind dispersion affecting amenity. | Nearest human receptor 30 km away. | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No additional controls | No sensitive receptors present within 30 km of the mine site. The delegated officer considers 5 km to be sufficient separation distance for emission generated by power stations.<br>The delegated officer has determined that the existing conditions in L9056/2017/1 for the monitoring of generator stack emissions are sufficient to monitor and report emission changes for fees and emission reporting. |
| | Noise | Air / wind dispersion affecting amenity of nocturnal fauna | Fauna adjacent with mine site | Refer to Table 5: Licence holder controls | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No additional controls | The delegated officer considered that noise from the extra running of the power generators will not increase existing noise levels from power generation or increase noise levels from existing mining activities. |
| **Category 54 – Sewerage facility** | | | | | | | | |
| Operation of the WWTP | Odour | Air / wind dispersal impacting amenity | Nearest human receptor 30 km away. | Refer to Table 5: Licence holder controls | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No conditions | The delegated officer has considered that there are no residences or sensitive land uses within 30 km of the premises. The increased WWTP production is not considered to increase the odour levels to sensitive receptor. The risk has been assessed as low with no controls required. |
| | WWTP leaks, spills, ruptures and overflowing of tanks and pipes | Direct discharge contaminating soils, ground and surface waters and killing native vegetation | Native vegetation adjacent to WWTP, soil and ground and surface waters. Groundwater within 10 metres of the surface. | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event will probably not occur in most circumstances<br>L- Unlikely<br>**Medium Risk** | Y | Existing conditions | The delegated officer considered the increased WWTP containments and the existing controls within the licence and considered the risk of contamination of the soil and ecosystem health from spills, leaks, ruptures and overtopping to be medium. The delegated officer considered the previous risk assessment in W6051/2017/1 and L9056/2017/1 to be reasonable and appropriate to manage the risk of wastewater irrigation and that there was no change to the existing emissions and risk. The delegated officer determined that the licence holder's controls and existing controls were appropriate to manage the risk of spills, leaks, ruptures and overtopping. |
| Disposal of treated effluent to spray field | Excessive hydraulic conductivity | | Native vegetation within and adjacent to spray field, soil and ground and surface waters. Groundwater within 10 metres of the surface. | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | Existing conditions | The delegated officer has considered that irrigation is to occur within the spray fields only, and that evaporation exceeds rainfall and irrigation throughout the year. The increase WWTP production is not considered to increase the likelihood of excessive hydraulic conductivity to sensitive environmental receptors. The risk has been assessed as low with no additional controls required. |
| | Excessive nutrients and contaminants to land | | | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event will probably occur in most circumstances<br>L= Likely<br>**Medium Risk** | Y | Existing conditions<br>Condition 5 | The delegated officer considered the increased WWTP irrigation and the existing controls within the licence and considered the risk of contamination of the soil and ecosystem health from excessive nutrients and contaminates to be medium. The delegated officer considered the previous risk assessment in W6051/2017/1 and L9056/2017/1 to be reasonable and appropriate to manage the risk of wastewater irrigation and that there was no change to the existing emissions and risk. The delegated officer determined that the licence holder's controls and existing controls were appropriate to manage the risk of excessive contaminates to land. |
| **Category 64 – Putrescible landfill** | | | | | | | | |

| 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 of landfill facility from increased active trench/cell. | Dust | Air / wind dispersion affecting amenity | Nearest human receptor 30 km away. | Refer to Table 5: Licence holder controls | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No controls | The delegated officer considered the increase in the landfill facility and considered the distance to the closest human receptor to be 30 kms from the landfill facility. The delegated officer considered that there were no sensitive receptors to the landfill facility for dust, odour and noise and determined the risk to be low and that controls to manage risk were not appropriate. |
| | Noise | Air / wind dispersion affecting amenity | Nearest human receptor 30 km away. | Refer to Table 5: Licence holder controls | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No controls | |
| | Odour | Air / wind dispersion affecting amenity | Nearest human receptor 30 km away. | Refer to Table 5: Licence holder controls | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event may only occur in exceptional circumstances<br>L = Rare<br>**Low Risk** | Y | No controls | |
| | Windblown waste | Discharge to land from waste disposal, ingested by fauna | Adjacent terrestrial ecosystems | Refer to Table 5: Licence holder controls and existing licence | Onsite impact minimal<br>C=Slight<br>The risk event could occur at some time<br>L = Possible<br>**Low Risk** | Y | Existing controls | The delegated officer considered the increase in land fill size and the existing controls within the licence and considered the risk of windblown waste ingested by fauna to be low. The delegated officer considered the previous risk assessment in L9056/2017/1 to be reasonable and conditions were appropriate to manage the risk of windblown waste. The delegated officer determined that there was no increase in emissions from an increase in land fill size and that no further controls were required to manage the risk. |
| | Leachate to groundwater | Direct discharge to ground contaminating soil and groundwater | Groundwater dependent ecosystems, subterranean fauna. | Refer to Table 5: Licence holder controls and existing licence | Low level impacts onsite, minimal impacts at local scale.<br>C = Minor<br>The risk event could occur at some time<br>L = Possible<br>**Medium Risk** | Y | Existing controls | The delegated officer considered the increase land fill size and the existing controls within the licence and considered the risk of leachate to groundwater contaminating the groundwater ecosystems to be medium. The delegated officer considered the previous risk assessment in L9056/2017/1 to be reasonable and conditions were appropriate to manage the risk of leachate to groundwater. The delegated officer determined that there was no increase in emissions from an increase in land fill size and that no further controls were required to manage the risk. |

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

# 4. Consultation

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

**Table 8: Consultation**

| Consultation method | Comments received | Department response |
|---|---|---|
| Local Government Authority Shire of East Pilbara advised of proposal 21 October 2024 | No comments were received. | The Delegated Officer notes this information. |
| Department of Mines, Energy, Industry Regulation and Safety (DEMIRS) advised of proposal 21 October 2024 | No comments were received. | The Delegated Officer notes this information. |
| Department of Planning Lands and Heritage advised of the proposal on 21 October 2024 | No comments were received. | The Delegated Officer notes this information. |
| Nyamal Aboriginal Corporation advised of the proposal on 21 October 2024 | No comments were received. | The Delegated Officer notes this information. |
| Wallareenya Station advised of proposal 21 October 2024 | No comments were received. | The Delegated Officer notes this information. |
| Licence Holder was provided with draft amendment on 4 April 2025 and responded on 28 April 2025. | Refer to Appendix 1 | Refer to Appendix 1 |

# 5. Decision

The delegated officer has determined to grant the amendment to licence L9056/2017/1. Including:

- the addition of category 6 and increased production / throughput to categories 5, 52, 54 and 64 activities incorporating infrastructure constructed under works approvals W6051/2017/1, W6443/2020/1 and W6766/2022;
- to change of premise boundaries to align with works approvals W6051/2017/1, W6443/2020/1 and W6766/2022;
- removed condition 23 requirements for seepage control strategy reporting, and
- minor administrative changes.

The delegated officer considered the short time operational life of the tailing's storage facility (a further 3 years), and the TARP and agreed to remove condition 23 but will regulate a quarterly lithium mass balance of the groundwater data and new nested monitoring bore (PMB048 and PMB049).

Based on the risk assessment the delegated officer considered the key risks were associated with dewatering discharge and an increase in throughput of ore. The delegated officer determined construction, operation, monitoring and reporting controls were required to ensure the level of risk was maintained, including an expanded surface and groundwater monitoring and reporting regime.

# 6. 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.

## 6.1 Summary of amendments

Table 9 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 9: Summary of licence amendments**

| Condition no. | Proposed amendments |
|---|---|
| Title page | Addition of category 6, changes to categories 5, 52, 54, and 64.<br>Addition of mine tenements L45/454, L45/614, G45/350 and G45/351. |
| Definitions Table 1 | Addition of Environmental Compliance Report, significant rainfall event, suitably qualified engineer.<br>Removal of terms not used in the licence. |
| Emissions Condition 1 Table 2 | Inclusion of Pilgangoora Creek Mine dewater discharge, update of irrigation figures. |
| Discharge of emissions Condition 2 Table 3 | Inclusion of Pilgangoora mine dewater discharge, update of figures references. |
| Emission limits Condition 3 Table 4 | Inclusion of Mine dewater discharge to Pilgangoora Creek and maximum flow rate. |
| Infrastructure and equipment Condition 5 Table 7 | Inclusion of infrastructure and operational requirements for processing plant, mobile crusher, Pilgangoora Creek discharge, wastewater treatment plant, spray fields and landfill. |
| Monitoring Condition 12 Table 9 | Update of monitoring bores for ambient groundwater monitoring and reference to Figure 6.<br>Update of terms referred to in notes to align with definition table. |
| Monitoring Condition 16 | Update of terms referred to in (g) to align with definition table. |
| Monitoring Condition 17 | Update of terms referred to in (g) to align with definition table. |
| Monitoring Condition 17 Table 12 | Inclusion of Pilgangoora Creek discharge and Pilgangoora Creek monitoring. |
| Monitoring Condition 18 | Inclusion of Pilgangoora Creek reporting requirements.<br>Update of terms referred to in the condition to align with definition table. |
| Annual Environmental Reports Condition 24 Table 12 | Inclusion of lithium mass balance reporting and Pilgangoora discharge and Pilgangoora Creek monitoring requirements. |
| Condition 23 | Removed requirements for seepage management. |
| Works Condition 25 | Inclusion of Pilgangoora Creek discharge point and pipeline construction. |
| Condition 26 | Inclusion of stormwater management during construction. |

| | |
|---|---|
| Infrastructure and equipment Condition 27 | Inclusion of design and construction requirements for the Pilgangoora Creek discharge point and pipeline construction. |
| Compliance reporting Condition 28 and 29 | Inclusion of infrastructure construction and installation reporting requirements. |
| Schedule 1 Figure 3 | New premises boundary map. |
| Schedule 1 Figure 6 | New bore and surface water monitoring points map. |
| Schedule 1 Figure 8 | Pilgangoora discharge location and pipeline location map. |
| Schedule 1 Figure 9 | Wastewater treatment spray field locations map. |
| Schedule 1 Table 13 | Updated premises boundary coordinates. |

# References


1. Bennelongia 2016, *Supporting Information – Pilgangoora fauna survey undertaken for Pilbara Minerals*, Bennelongia Environmental Consultants, Perth, Western Australia
2. Bureau of Meteorology (BoM) 2024, *Climate statistics for Marble Bar*, Climate statistics for Australian locations, Canberra, Australian Capital Territory
3. Department of Biodiversity, Conservation and Attractions (DBCA) 2023, *Conservation Category Definitions for Western Australian Fauna and Flora*
4. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DMIRS 2018, DMIRS comments on 2018 works approval amendment, DWER records A1636358
7. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
8. GRM 2017, *Groundwater Resource Management (Groundwater) Operating Strategy for Pilgangoora Project*, Perth, Western Australia.
9. Pilbara 2017, *Pilbara Minerals Supporting Information - Groundwater levels*, Perth, Western Australia
10. Pilbara Minerals (2024) *Tailings Management Facility Seepage TARP November 2024*, Pilbara Minerals Perth.
11. Pilbara Minerals 2024, *Surface Water Management*, Pilbara Minerals, Perth, Western Australia
12. Pilbara 2020, *Pilbara Minerals, Quarterly Monitoring Results for Ambient Groundwater*, Perth, Western Australia
13. Pilbara 2020a, *Supporting Information Pilbara Minerals, Vegetation and Fauna Assessment*, Perth, Western Australia.
14. Pilbara 2020b, Pilbara Minerals, 2020, Surface Water Management, West Perth, Western Australia.
15. *MMWC. 2016. Pilgangoora Project Area Flora, Vegetation and Fauna Assessment V2 – July 2016.* Unpublished report prepared for Pilbara Minerals Limited, July 2016.

# Appendix 1: Additional figures

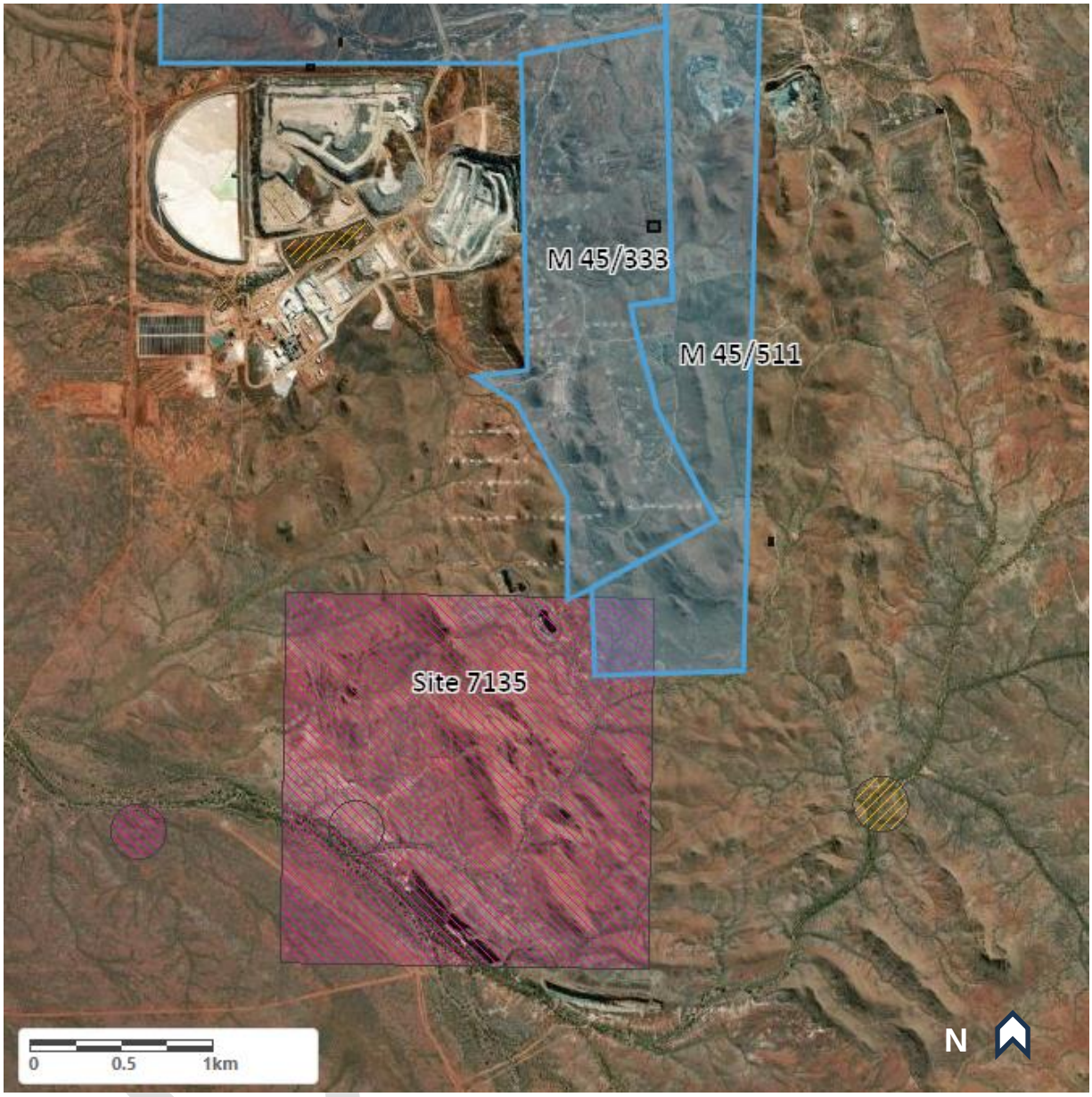


**Figure 5 Aboriginal Heritage Site intersecting with proposed prescribed premises**

# Summary of Licence Holder's comments on risk assessment and draft conditions

### Table 10: Licence Holder's comments

| Condition | Summary of Licence Holder's comment | Department's response |
|---|---|---|
| **Licence comments** | | |
| Cover page | Premises do not include the additional mining tenements that reflect the additional areas of activity sought in accordance with submitted shapefile. Add additional tenure L45/454, L45/614, G45/350 and G45/351 | The delegated officer notes this and will add the tenements. |
| Condition1 Table 2 Authorised Emissions table | Figure 5 should be Figure 9 for references to the spray field locations. | The delegated officer agrees. |
| Condition 4 Waste acceptance | The end of the condition does not list a Table number reference. | The delegated officer notes the typo and will add Table 5. |
| Condition 5 Table 6 Infrastructure and equipment controls | (a) Licence holder seeks clarification if a spray/sprinkler system breakdown is a reportable event.<br>(b) Licence holder seeks clarification on the height limit of 12 metres on stockpiles, which stockpiles do they refer to.<br>(c) Licence holder requests that the term drainage line is removed from dot point 2 for mobile screener to ensure that constructed internal drainage to the sediment ponds are not included. | (a) The delegated officer confirms it is not a reportable event but an operational requirement.<br>(b) The delegated officer can advise the height of stockpiles are a wind emission control and apply to all stockpiles that generate dust, this would include pre and post processing ore, waste and concentrate stockpiles.<br>(c) The delegated officer agrees.<br>(d) The delegated officer notes this and will update. |
| Condition 5 Table 6 Infrastructure and equipment controls_ TMF Cell 1 Monitoring | The licence holder requests an additional amendment for the removal of eight to six piezometers that are monitored for determining phreatic surface within the tailings. As two piezometers have become unserviceable. | The delegated officer does not agree with this request as it is out of the scope of the original amendment and advises the licence holder to include this change in the next licence amendment application. |
| Condition 5 Table 6 Infrastructure and equipment controls_TMF Cell 1and Cell 2 pipelines | The licence holder requests an additional amendment to remove audible alarms for all pipelines. As the existing pipeline pressure monitoring provides visual alerts to operators for leaks and pump failure. Thus, there is no change to the risk. | The delegated officer agrees the risk remains the same and agrees to remove the condition for audible alarms with pressure monitoring of pipelines remaining in control room. |
| Condition 10 and condition 24 – Table 12 | The licence holder requested to remove lithium mass balance calculation requirements associated with condition 23.<br>They stated that quarterly lithium mass balance does not provide a meaningful measure of potential pollution or contamination. | The delegated officer does not agree to remove this condition as per section "*2.4.2 Condition 23 review*" from this amendment report. |
| Condition 12 Table 8 Ambient groundwater | The licence holder requested the following changes.<br>• Removal of TMFMB03 as it is scheduled for | The department does not agree that TMFMB03 has similar groundwater levels reading as PMB001. In the hydrograph provided by the licence |

| Condition | Summary of Licence Holder's comment | Department's response |
|---|---|---|
| monitoring | destruction and PMB001 is suitable replacement.<br>• PMB048 and PMB049 has been drilled and will be renamed to TMFMB008_S and TMFMB008_D. | holder, there is a difference of 40 m in some dates.<br>The department recommends applying for a new licence amendment where the bore replacement can be risk assessed.<br>The department agrees to rename bores PMB048 and PMB049. |
| Condition 14, Table 6 | It is stated that WWTP has both moving bed reactors and sequencing batch reactors.<br>The licence holder requested to specify that Stage 2 WWTPs are sequencing batch reactor (SBR) systems. | The delegated officer agrees. |
| Condition 17 Table 11 Pilgangoora creek monitoring | The licence holder requested that continuous flow monitoring of the discharge point is changed to during or after significant rainfall event. It is considered that creek flow will only occur when a significant event occurs. | The delegated officer agrees to change volume from continuous to when discharging. |
| Condition 18 Pilgangoora Creek reporting | The licence holder has indicated that the condition is not clear where the case may be that a 10% variation does not exceed the livestock drinking water quality values in the ANZECC guidelines. Licence holder requests that reporting occurs only when upstream monitoring site is above the ANZECC guidelines and greater than 10% variation downstream. | The delegated officer does not agree but will update the condition reporting requirements. Reporting requirements downstream will not be required if the 10% variation from upstream results to downstream results remains under the livestock drinking water quality values in the ANZECC guidelines. |
| Condition 16 (a) | The licence holder requested to remove construction requirement of divert clean surface water around construction areas. This because they consider it is counter-productive to disturb areas unnecessarily while laying the pipeline. | The delegated officer agrees. |
| Condition 27 – Table 13 | The licence holder requested to remove bunding requirement and only use during construction. This is because the bunding could lead to higher environmental impact than leaving the ground undisturbed. | The delegated officer agrees. |
| Schedule 1, Figure 4 Landfill location | Licence holder requested to change landfill location in accordance with design and risk assessed expansion of Monster WRL landfill. | The department does not agree with these proposed changes. This because the request is out of scope from the original amendment application. |
| Figures update and minor changes | Licence holder requested maps updates and minor corrections | The department updated accordingly. |
| Decision report , section 2.5.1 | Licence holder requested to increase discharge flow from 50 L/s to 150 L/s, as per previous communication with the department on 4 November 2025. | The delegated officer agrees as per section 2.5.1. |