



Application for Works Approval

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

Works Approval Number	W2999/2025/1
Applicant	Greenmount Resources Pty Ltd
ACN	607 613 650
File number	APP-0028527
Premises	Karlawinda Gold Project Legal description – Mining Lease – M52/1070 CAPRICORN WA 6642 As defined by the premises map in Schedule 1 of the attached to the issued works approval
Date of report	15 April 2026
Decision	Works approval granted

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Application summary	1
2.3 Overview of the premises	2
2.4 Description of proposed activities	4
2.4.1 Karlawinda Processing Plant Expansion	4
2.4.2 Water Treatment Systems	5
2.4.3 Tailings Storage Facility	7
2.4.4 Mine dewatering activities	9
2.4.5 Wastewater Treatment Plant expansion	11
2.4.6 Power generation	13
3. Risk assessment	15
3.1.1 Emissions and controls	15
3.1.2 Receptors	24
3.2 Risk ratings	26
3.3 Detailed risk assessment for seepage from TSF2	35
3.3.1 Source	35
3.3.2 Pathway	37
3.3.3 Seepage Management and Monitoring	39
3.3.4 DWER Assessment and Regulatory Controls	41
4. Consultation	45
5. Conclusion	47
References	47
Appendix 1: Summary of applicant’s comments on risk assessment and draft conditions	50
Table 1: TSF2 embankment raises and storage capacities	9
Table 2: Water balance results for KEP life of mine	10
Table 3: WWTP pond dimensions	12
Table 4: Proposed applicant controls	15
Table 5: Sensitive human and environmental receptors and distance from prescribed activity	24
Table 6: Risk assessment of potential emissions and discharges from the premises during construction and operation	27
Table 7: Water Balance Analysis (Cell A)	36

Table 8: Water Balance Analysis (Cell B).....	36
Table 9: DWER regulatory controls (seepage)	42
Table 10: Consultation	45
Figure 1: Premises layout map showing locations of key infrastructure (Capricorn Metals Ltd, 2025)	3
Figure 2: Existing and proposed processing plants at the Premises (Source, Capricorn Metals, 2025)	4
Figure 3: Simplified process diagram (PP1 and PP2) (Source, Capricorn Metals Ltd, 2025).....	5
Figure 4: Location of existing and proposed WTS infrastructure	6
Figure 5: TSF2 layout.....	8
Figure 6: Wastewater treatment process overview. Source: Greenmount Resources Pty Limited.	12
Figure 7: Water balance for WWTP upgrade.....	13
Figure 8: Current direction of groundwater flow (shown by blue arrows) (Source, Capricorn Metals Ltd, 2025)	37
Figure 9: Groundwater monitoring bore suite (Source, Capricorn Metals Ltd, 2025)	38
Figure 10: Proposed monitoring bore network for seepage investigation program (Source, EMM Consulting, 2025).....	40

1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W2999/2025/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary

On 11 April 2025, Greenmount Resources Pty Ltd (the applicant) submitted an application for a works approval under section 54 of the *Environmental Protection Act 1986* (EP Act).

This application is to undertake construction works for the Karlawinda Expansion Project (KEP) and seeks authorisation to:

- **Category 5: Processing or beneficiation of metallic or non-metallic ore:**
 - Expansion of the Karlawinda Processing Plant increasing annual throughput capacity from 4.4 to 7 million tonnes per annum (Mtpa); and
 - Construction of second Tailings Storage Facility (TSF) to provide total storage volume of approximately 27 Mt of tailings over 5.5 years.
- **Category 6: Mine dewatering:**
 - Increase dewatering discharge from 187,338 tpa to 3.8 Mtpa with approval being sought to discharge water as dust suppression.
- **Category 52: Power generation:**
 - Increased electric power generation from 18 megawatts (MW) capacity to 23.5 MW capacity in aggregate energy sources (natural gas).
- **Category 85: Sewage facility:**
 - Increase design capacity of the sewage facility from 78 m³/day to 100 m³/day. For noting: although the applicant applied for a design capacity of 95 m³/day, the assessed production capacity is 100 m³/day, and this value has been adopted for the purposes of this assessment.

The premises relates to the categories 5, 6, 52 and 85 and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W2999/2025/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W2999/2025/1.

2.3 Overview of the premises

The applicant holds Licence L9324/2022/1 to operate an open-cut gold mine at the Karlawinda Gold Project (the Premises), located in the Shire of Meekatharra approximately 56 kilometres south-east of Newman. Gold-bearing ore is currently mined from the Bibra and Southern Corridor pits and processed via a three-stage crushing circuit and carbon-in-leach (CIL) plant following delivery to the run-of-mine (ROM) pad. Tailings are deposited in the existing Tailings Storage Facility (TSF1), constructed from mine waste rock as an integrated waste landform.

The applicant proposes to expand the project through the development of an additional mining void (Berwick Pit), installation of a second three-stage crushing and ball mill circuit utilising the existing processing methodology, and construction of a second Tailings Storage Facility (TSF2) with a capacity of approximately 27 Mt over 5.5 years. As part of the expansion, processing capacity will increase to 7 Mtpa.

The prescribed premises boundary and detailed site layout showing the location of the proposed expansion infrastructure are shown in Figure 1.

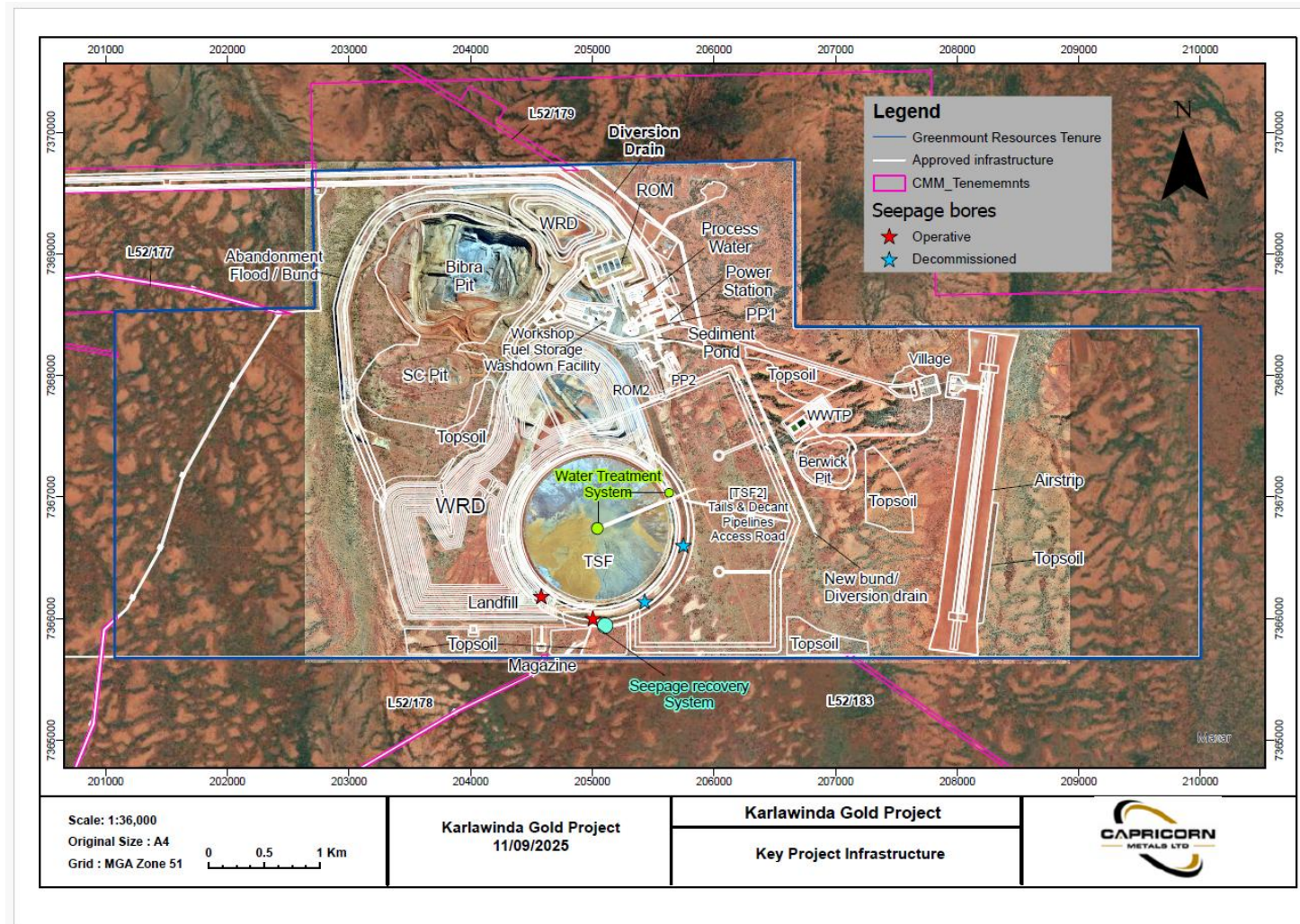


Figure 1: Premises layout map showing locations of key infrastructure (Capricorn Metals Ltd, 2025)

Works approval: W2999/2025/1

2.4 Description of proposed activities

2.4.1 Karlawinda Processing Plant Expansion

2.4.1.1 Existing Processing Plant (PP1)

PP1 processes up to 4.4 Mtpa of ore delivered to the existing ROM pad via primary, and if needed based on ore hardness, secondary and tertiary crushing, before feeding a ball mill in closed circuit with cyclones and a gravity circuit. Gravity recoverable gold is recovered, with cyclone overflow directed to an eight-tank CIL circuit. Gold recovery occurs via carbon adsorption, electrowinning and smelting, with carbon regeneration undertaken onsite. Under this amendment, tailings generated from PP1 will be pumped via dedicated pipelines for deposition to TSF2.

2.4.1.2 Proposed Second Processing Plant (PP2)

PP2 will replicate the PP1 processing flowsheet and operate in parallel, increasing total processing capacity to 7 Mtpa. Ore from the Berwick Pit ROM pad will undergo three-stage crushing, ball milling and gravity recovery, with cyclone overflow reporting to an expanded CIL circuit comprising four additional leach tanks integrated into the existing gold recovery infrastructure.

Concentrate from the PP2 gravity circuit will be treated in an intensive leach reactor, with gold recovery via electrowinning using existing elution and carbon regeneration facilities. Tailings generated from PP2 will be pumped via a standalone tailings delivery system to the existing TSF1.

The location of the existing PP1 and the proposed second Processing Plant (PP2) is presented in Figure 2.

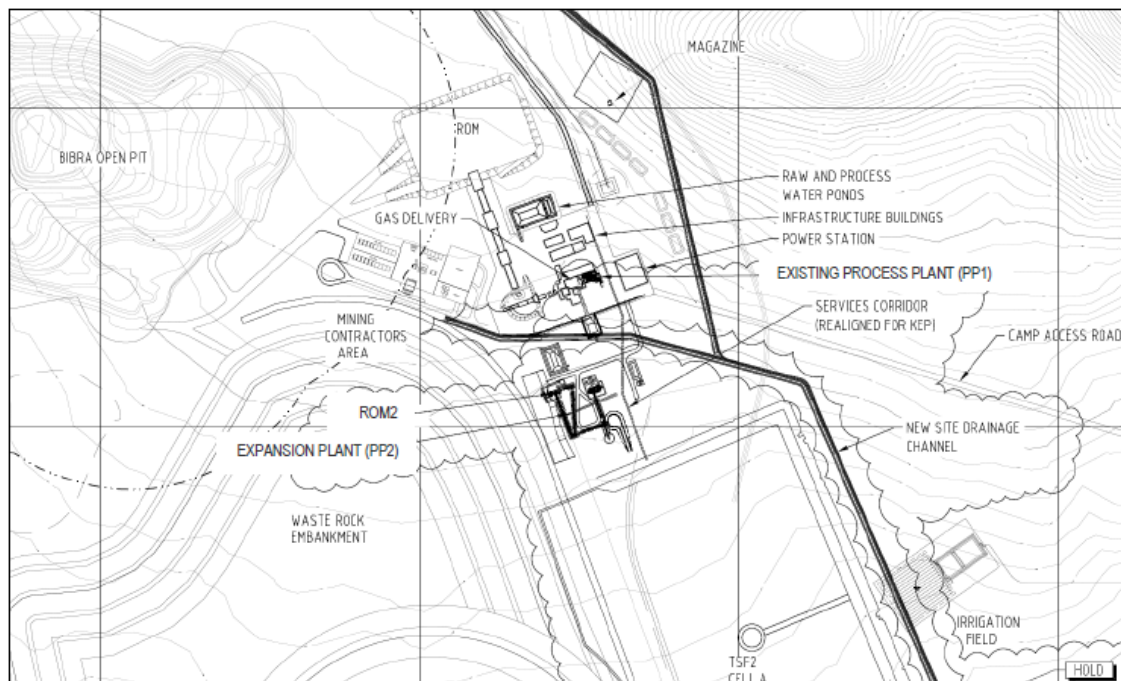


Figure 2: Existing and proposed processing plants at the Premises (Source, Capricorn Metals, 2025)

A simplified process diagram for the existing PP1 and PP2 is presented in Figure 3.

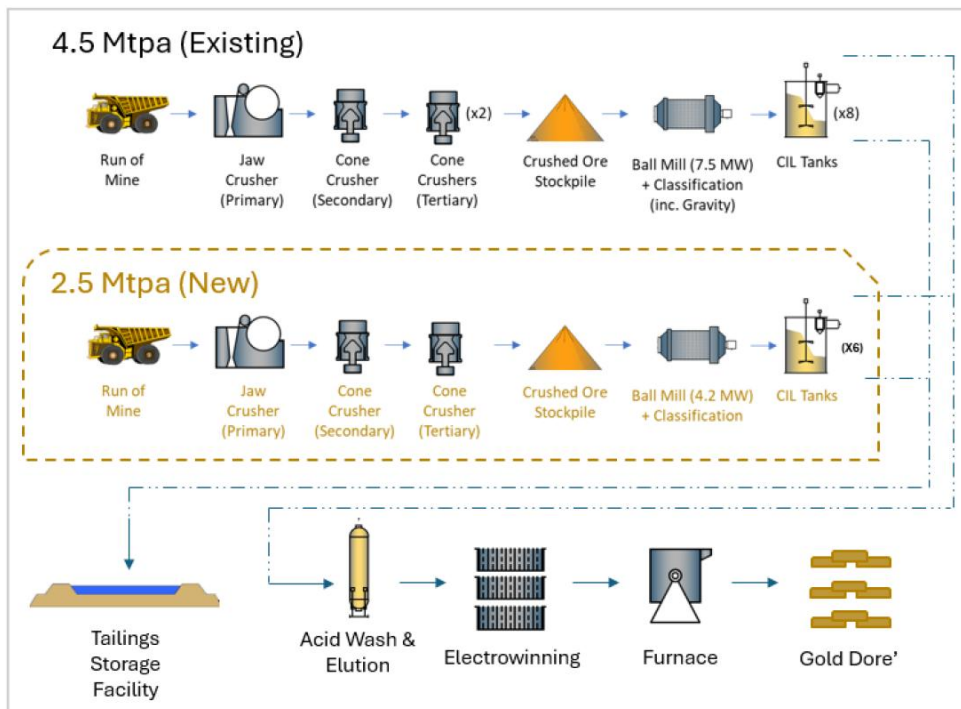


Figure 3: Simplified process diagram (PP1 and PP2) (Source, Capricorn Metals Ltd, 2025)

2.4.2 Water Treatment Systems

The applicant has treated tailings decant water at TSF1 with hydrogen peroxide and ferrous sulphate since 2023, following the identification of recurrent elevated copper concentrations. A Water Treatment System (WTS) was implemented to reduce copper concentrations in return water, comprising two carbon tanks installed on 25 April 2024, to further reduce copper concentrations in return water, with a dedicated chemical mixing station installed at the decant pond on 14 July 2024.

As decant water quality at TSF2 is expected to be comparable to TSF1, the applicant proposes to implement an additional WTS at the TSF2 decant pond. The existing carbon tank capacity is sufficient to treat decant water from both TSF1 and TSF2. The applicant has advised that the effectiveness of onsite treatment is subject to ongoing review, and TSF2 will implement the same system as TSF1 or any improved treatment system in use at the time treatment is required.

All pipelines associated with the WTS will be located within earthen bunds or contained within TSF2 infrastructure. Pipelines will be inspected as part of routine day and night shift inspections, consistent with existing TSF1 inspection requirements. Bunding for pipelines located outside the TSF footprint will provide secondary containment to prevent discharge to the surrounding environment. These controls will be conditioned on the works approval.

All WTS infrastructure will be located within the TSF area. Chemical storage volumes at the treatment area will remain below 1,000 m³ at all times; therefore, Category 73 under Schedule 1 of the EP Regulations is not applicable. The location of the existing and proposed WTS infrastructure is shown in Figure 4.

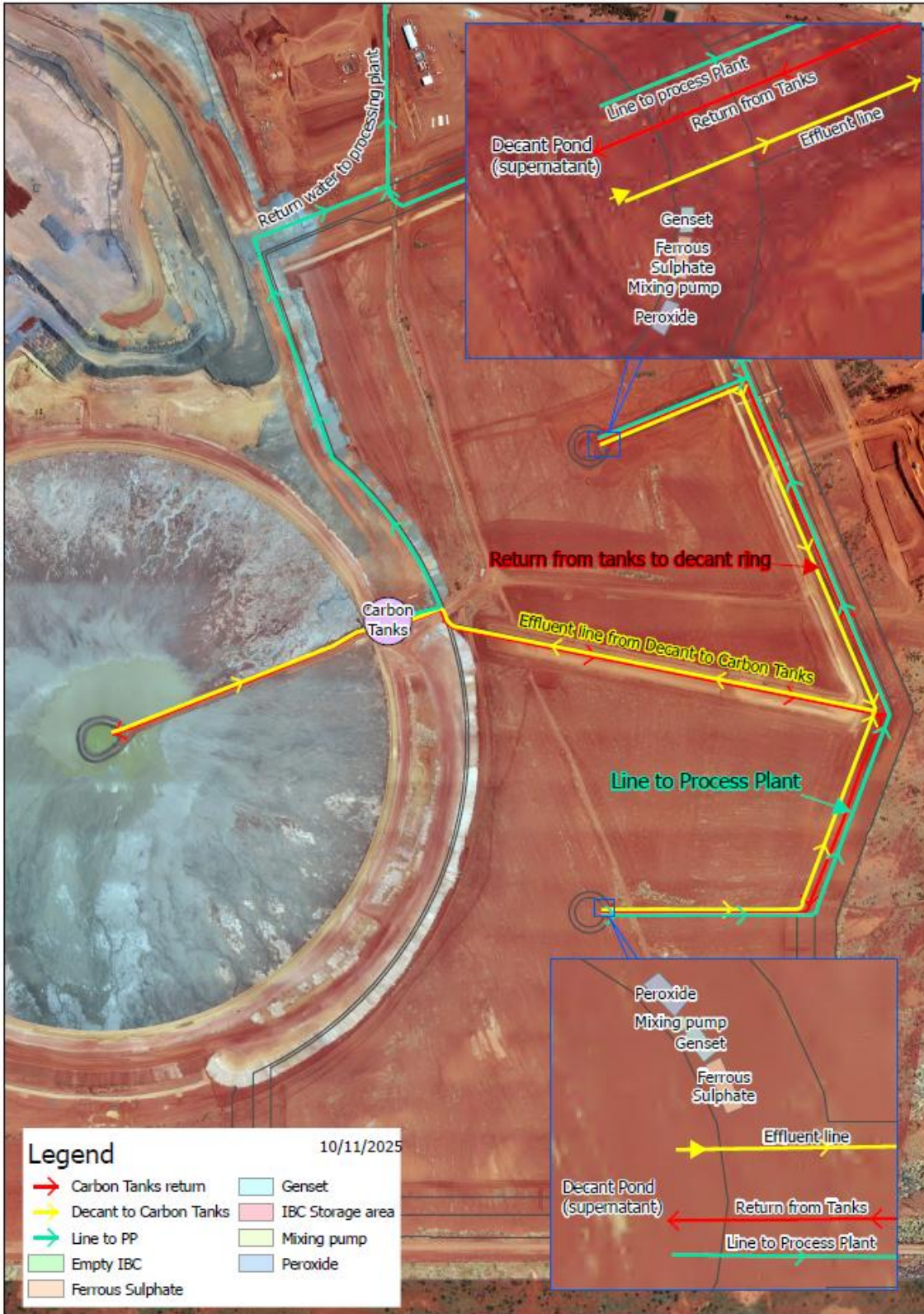


Figure 4: Location of existing and proposed WTS infrastructure

2.4.3 Tailings Storage Facility

As part of this amendment, the applicant proposes to construct a new above-ground, paddock-style Tailings Storage Facility (TSF2) comprising two cells (A and B), utilising mine waste rock sourced from the proposed Berwick Pits. The western boundary of TSF2 will be constructed adjacent to and east of the existing TSF1 and the North Waste Rock Dump, as shown in Figure 5. The facility, including the basin area, will have a footprint of approximately 103 hectares (ha). TSF2 has been designed to provide a total storage capacity of approximately 27 Mt of tailings over a projected operational life of 5.5 years, based on a maximum tailings discharge rate of up to 4.5 Mtpa. This additional facility will enable tailings deposition to be cycled between TSF1 and TSF2 to optimise the tailings rate of rise and achieve improved in-situ densities.

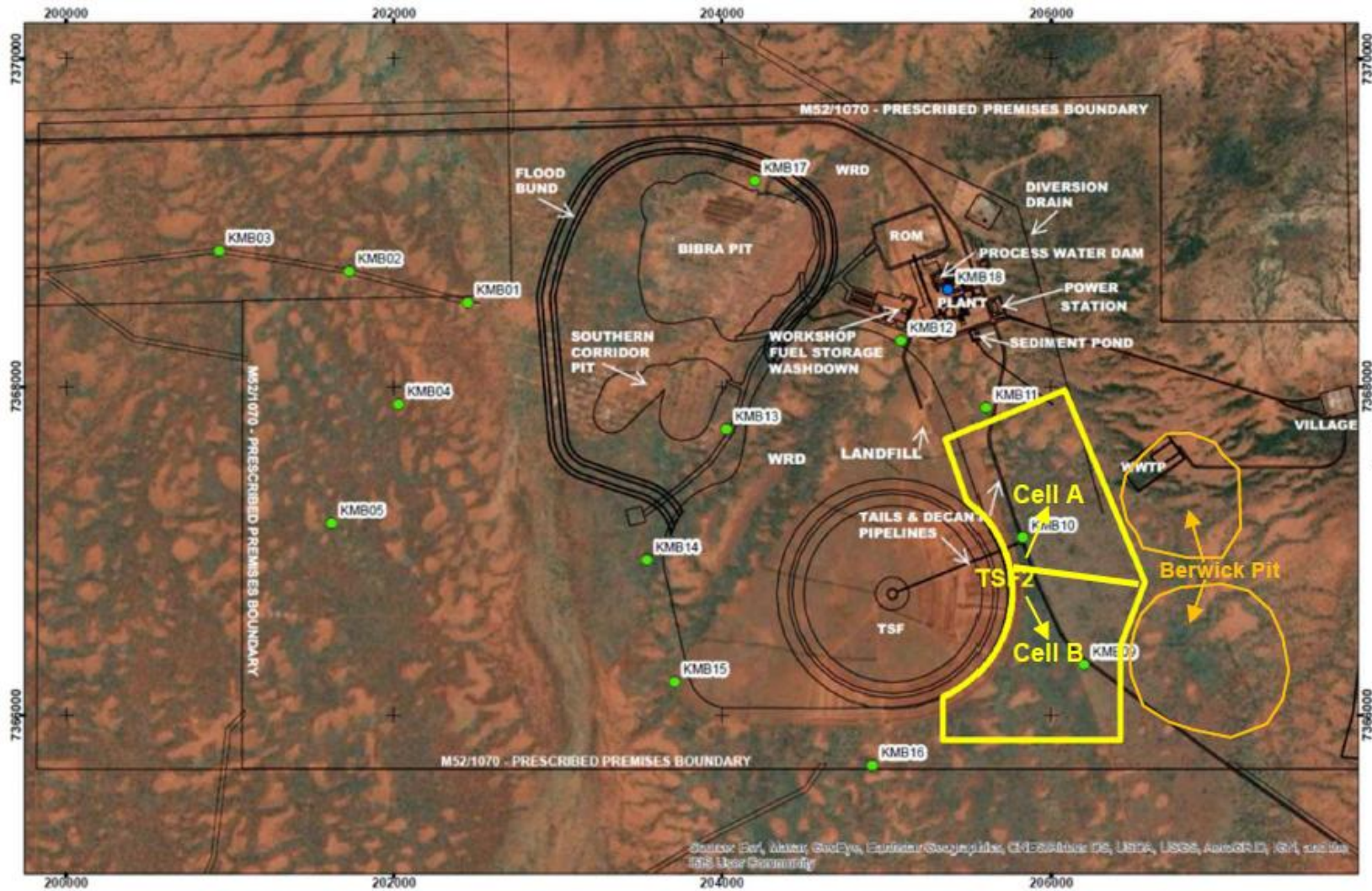


Figure 5: TSF2 layout

Works approval: W2999/2025/1

2.4.3.1 TSF Basin Design and Preparation

The TSF2 basin will incorporate a compacted in-situ clay liner across the entire 214 ha footprint, designed to achieve a minimum permeability of 1×10^{-7} m/s, verified through QA/QC testing at each construction stage. Seepage reduction measures for TSF2 will be implemented during Stage 1 (starter embankment) construction, including a cut-off trench underneath the upstream toe of the perimeter embankment, excavated to refusal on cemented laterite gravel (Wiluna Hardpan) or nominally 1.5 to 2.5 m deep with a 4 m wide base and 1(V):1(H) side slopes, and subgrade improvement within the TSF basin. Acid-forming potential testing confirmed all waste rock is Non-Acid Forming (NAF), with no Potentially Acid Forming (PAF) material present. The applicant has advised that any ore identified as PAF during processing will be treated with lime to raise pH during cyanide leaching and will be contained within the TSF.

2.4.3.2 Embankment design and raises

The perimeter embankment will be constructed in four stages to its final crest level of RL598.0 m, as detailed in Table 1. The upstream section of the embankment will consist of low-permeability, roller-compacted clayey/silty material to minimise seepage, while the downstream section will be built from traffic-compacted NAF waste rock sourced from the Berwick Pits.

The starter embankments for Cells A and B will be constructed initially to RL594.0 m, providing footprints of 98 ha and 116 ha with cumulative storage of 16.5 Mt. Stages 3 and 4 will involve an embankment raise of 4 m for both cells to RL598.0 m, increasing cumulative storage to 27.1 Mt. The total combined footprint area for TSF2 (Cells A and B) will be 214 hectares, reflecting the full development area of the facility. At completion, TSF2 will reach approximately 17 m in height at its highest point (Cell B), with upstream and downstream slopes of 1(V):2(H) and 1(V):3(H). The crest width will be 31.5 m initially, expanding to 36 m after all raises. Each cell will commence operations as soon as approved, with both cells operating on a rotational basis. For further detail on tailings characterisation, seepage management, water balance analysis and DWER regulatory controls, see Section 3.3.

Stage	Storage capacity (months)	Embankment Crest Elevation RL (m)	Footprint area (ha)	Cumulative Storage Volume (mm ³)	Cumulative Storage Capacity (Mt)
1 (Cell A)	16.5	594.0	98	4.4	6.2
2 (Cell B)	27.5	594.0	116	11.8	16.5
3 (Cell A)	13	598.0	90	15.2	21.1
4 (Cell B)	16	598.0	103	19.4	27.1

Table 1: TSF2 embankment raises and storage capacities

2.4.4 Mine dewatering activities

The applicant is seeking an increase in mine dewater discharge capacity from 187,338 tpa to 3.8 Mtpa to accommodate higher groundwater inflows associated with the KEP. This increase is required due to the development of the Southern Corridor and Berwick pits, which intersect the Lower Dolomite aquifer. Pump testing has confirmed bore yields up to 50 L/sec (≈ 1.5 GL/year).

Groundwater modelling has been updated following a hydrogeological drilling and testing program at the proposed Berwick pit during 2025. The revised model indicates lower permeability in the Berwick area, resulting in less dewatering required to achieve the mine plan vertical advance rate. Based on this updated assessment, mine dewatering volumes will be below future operating water demand, meaning there will be no excess water requiring storage.

The applicant initially proposed to operate Cell A of TSF2 as a temporary water storage dam, consistent with the approval granted by the Department of Mines, Petroleum and Exploration (DMPE) under section 4.5.2.4 of the Mining Proposal (Registration ID: 500217). This was intended to manage dewatering volumes predicted in the original water balance. During the works approval assessment, the applicant removed this activity from the scope after hydrogeological test work at the Berwick Pit showed lower permeability and reduced inflows, and a revised water balance confirmed all abstracted water can be reused onsite, eliminating the need for temporary storage in Cell A. The updated water balance (Table 2) demonstrates that dewatering volumes range from 4.2 GL in 2026 to 2.4 GL in 2033, while total site water demand remains at approximately 5 GL/year. This results in a consistent water deficit, requiring additional supply volumes of 0.8–2.6 GL/year to meet processing and dust suppression needs.

All water abstracted will be reused onsite for operational requirements, including process water, dust suppression, potable water, and construction activities. Make-up water will be sourced from existing groundwater supply bores under Groundwater Licence GWL201659 (5 GL/year), supported by an approved Groundwater Operating Strategy.

Table 2: Water balance results for KEP life of mine

Summary	2025	2026	2027	2028	2029	2030	2031	2032	2033
Processing plant throughput (Mt)	4.7	5.4	6.3	6.8	6.8	6.7	6.6	6.5	6.6
Dewatering volume P90 (GL)	3.7	4.2	3.7	2.9	3.3	3.1	3.2	2.4	2.4
Surplus volume (GL)	0	0	0	0	0	0	0	0	0
Additional supply volume (GL)	1.3	0.8	1.3	2.1	1.7	1.9	1.8	2.5	2.6
Total licence volume required (GL)	5	5	5	5	5	5	5	5	5

2.4.4.1 Dust Suppression Water Use

The applicant proposes to increase dust suppression water use to 410,000 tpa (0.4 GL/year), up from the currently approved 186,338 tpa (0.2 GL/year). This increase reflects the expanded mining footprint and safety requirements. Water will be sourced from mine dewatering activities associated with the Southern Corridor and Berwick pits, which intersect the Lower Dolomite aquifer.

Dust suppression will be applied across all mining activity areas, including the South Waste Dump, North Waste Dump, mining void (Bibra Pit), ROM pad, haul roads, and associated access routes, with additional dust suppression applied on access roads leading to and from the camp site as required.

2.4.4.2 Mine dewater quality

Mine dewater currently used for dust suppression is abstracted from the Bibra Pit and transferred via closed pipelines to the Mining Turkeys Nest, which has a storage capacity of 969 m³ and is lined to prevent infiltration to ground. Water quality results from the November 2024 sampling event indicate that mine water from Bibra Pit (located adjacent to Southern Corridor Pit and east of Berwick pit) contains elevated concentrations of metals and metalloids, including arsenic (up to 110 µg/L), zinc (13.3 µg/L), and boron (up to 570 µg/L). These concentrations exceed ANZECC/ANZG aquatic ecosystem guideline values.

2.4.5 Wastewater Treatment Plant expansion

2.4.5.1 Existing Wastewater Treatment Plant (WWTP)

The existing WWTP at the premises treats wastewater generated from the accommodation village. The WWTP is designed for a capacity of approximately 78 m³ per day, based on servicing up to 260 personnel at an average wastewater generation rate of 300 litres per person per day. Current sewage flows are reported at 45–50 kL/day, including wastewater from the mine administration building. The applicant currently has authorisation to discharge up to 78 m³ per day to a dedicated 3-hectare evaporation and irrigation field.

To date, treated wastewater has not been discharged to the irrigation area because evaporation has been sufficient to manage low pond volumes. However, water quality results from the 2025 Annual Environmental Report for L9324/2022/1 indicate exceedances of licence limits (Condition 5, Table 2) for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and Total Nitrogen, with occasional exceedances for Total Phosphorus. All *E. coli* results were below licence limits. These findings suggest a deterioration in water quality within the ponds over time.

2.4.5.2 WWTP upgrade

The observed decline in water quality highlights the need for an upgraded wastewater treatment system to ensure compliance with licence limits. The upgrade is also required to accommodate the KEP, which will increase camp capacity from 300 to 500 personnel, resulting in higher wastewater volumes.

The upgraded WWTP will:

- Have a production capacity of 100 kL/day, designed for 95 kL/day to allow for minor operational losses;
- Include two concrete sedimentation basins, one primary pond, and one evaporation pond;
- Be constructed entirely within the existing fenced area;
- Relocate the irrigation field to a reduced area of 1.3 hectares; and
- Continue to use evaporation as the primary effluent disposal method, with the irrigation field as a secondary contingency measure.

Effluent from the upgraded WWTP will be treated to a secondary level of treatment (Category C) in accordance with the *National Water Quality Management Strategy (NWQMS) Australian Guidelines for Sewerage Systems – Effluent Management* (ARMCANZ and ANZECC 1997). Treated effluent will meet the specifications detailed in Table 2 of the licence [L9324/2022/1](#) and will be discharged to the fenced evaporation ponds.

2.4.5.3 Wastewater treatment process

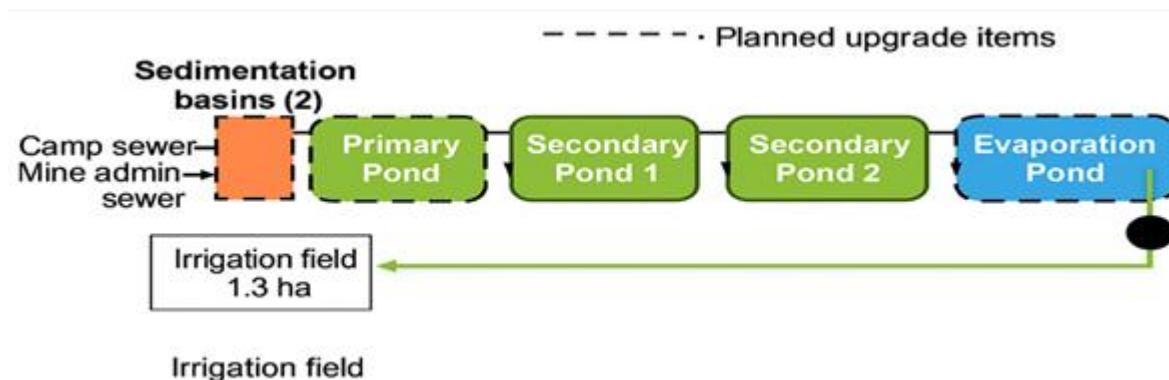


Figure 6 illustrates the process flow of the proposed WWTP upgrade. Wastewater from the

camp and mine administration is first directed through six grinder pumps, which transfer solids to the WWTP. The treatment process begins with two concrete sedimentation basins that remove solids, fats, oils, and greases. From there, flow enters a new primary pond that is 1.7 m deep designed to improve Biochemical Oxygen Demand (BOD) reduction. The two existing secondary ponds (each 1.0 m depth) provide final nutrient removal, particularly for total nitrogen (TN). The process concludes with a new evaporation pond that is 1,145 m², which serves as the primary disposal method, while a 1.3-hectare irrigation field remains as a secondary contingency option. The upgraded facility is expected to achieve approximately 92% BOD removal and 64% TN reduction at a modelled treatment capacity of 450 kL/day.

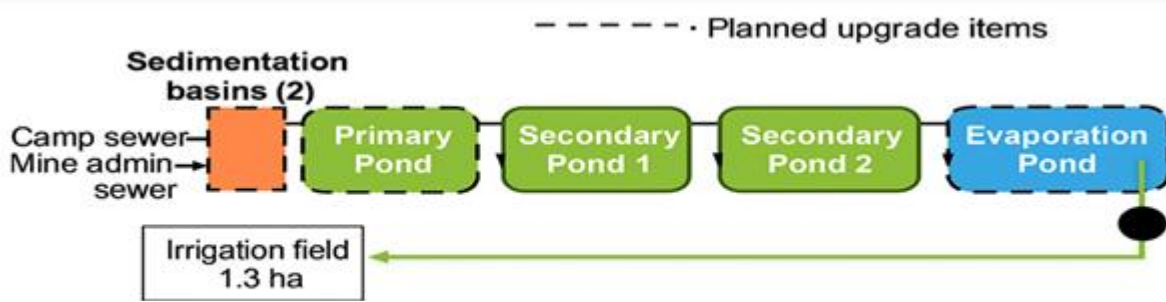


Figure 6: Wastewater treatment process overview. Source: Greenmount Resources Pty Limited.

The new primary facultative pond and the final evaporation pond will be lined with 2.0 mm High-Density Polyethylene (HDPE) featuring a double-sided textured finish, ensuring durability and minimising seepage risk.

2.4.5.4 WWTP Design and construction details

Geotechnical investigations test pits detailed the soil profile around the wastewater treatment ponds as in-situ soils comprising silty sandy gravel over sandy, gravelly clay ferricrete and are considered by the applicant as suitable for compacted earth embankments, consistent with the existing WWTP design. All ponds will be HDPE-lined to prevent effluent infiltration, and embankments will be constructed at a 1V:3H grade with a 4.0 m crest width for maintenance access and safe egress. The dimensions and construction details for each pond, including depth, volume, and lining specifications, are provided in Table 3 below.

Table 3: WWTP pond dimensions

Name	Treatment	Planned Construction	Lining	TOB Length (m)	TOB Breadth (m)	Water Depth H (m)	Pond Volume (m ³)
Primary Pond	Primary	New	HDPE Lined	83	25	1.7	2330
Secondary Pond 1	Secondary	Existing (no change)	HDPE Lined	79	67	1.0	4535
Secondary Pond 2	Secondary	Existing (no change)	HDPE Lined	61	67	1.0	3425
Evaporation Pond	Evaporation	New	HDPE Lined	52	25	1.0	935

Figure 7 presents the monthly water balance for the upgraded WWTP. The combined surface area of the treatment ponds (approximately 11,700 m²) results in significant evaporation losses during the hotter months (October to March), during which evaporation is the primary effluent disposal mechanism at an average inflow of approximately 95 kL/day. From March to

September, surplus treated effluent is managed via controlled irrigation, with the irrigation area increased to 1.3 ha and the application rate limited to 5 mm/day (approximately 65 kL/day) to comply with nutrient loading limits and Health Department requirements.

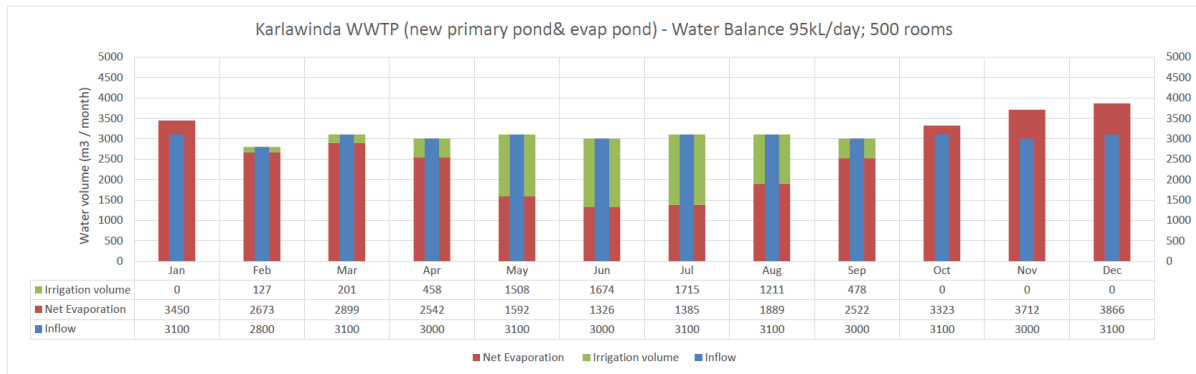


Figure 7: Water balance for WWTP upgrade

2.4.6 Power generation

The premises currently operates a thermal power station comprising one 2 MW QSK78 diesel generator and eight 2 MW HSK78 gas generators, providing a total installed fuel-based generation capacity of 18 MW. The diesel generator is maintained exclusively for emergency and backup use and is not operated during normal conditions. The applicant advised that diesel generation will be limited to approximately one hour per month, with a maximum of 50 operating hours per year, such that emissions from diesel use are intermittent and short-duration. Although its operational use is infrequent, the diesel generator forms part of the existing infrastructure and is therefore included in the installed capacity summary.

As part of the KEP, the applicant proposes to expand the operational capacity by replacing one existing 2 MW HSK78 gas generator with an MTU20V gas generator and installing two new 2.5 MW gas generators within the existing engine hall, which contains two spare bays and requires no structural expansion. These upgrades will increase the total installed production capacity of the thermal power station to 23.5 MW, comprising seven 2 MW HSK78 gas generators, three 2.5 MW MTU20V gas generators, and the existing 2 MW diesel generator.

The applicant has also proposed the installation of a Battery Energy Storage System (BESS) to support power system stability during generator load changes and solar PV variability. The BESS does not generate electricity using fuel and is therefore not a prescribed activity under Category 52. The 23.5 MW installed capacity is based solely on gas and diesel fired generation.

The department notes that the applicant’s supporting document refers to a temperature-adjusted (“derated”) capacity of approximately 21.5 MW; however, this value reflects reduced generator performance under extreme ambient temperatures and is used for internal engineering design rather than regulatory assessment. The department assesses the fuel-based electricity generation infrastructure operating at full capacity over a 24-hour period, and not the derated capacity. On this basis, the total installed production generation capacity for the premises is 23.5 MW, which includes the existing 2 MW diesel generator.

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. Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction, commissioning and operation which have been considered in this decision report are detailed in Table 4 below. Table 4 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 4: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of TSF2, PP2 expansion works, WWTP pond upgrades, installation of generators, vehicle movements on unsealed roads, and installation of WTS2	Air / windborne pathway	<p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> • Vehicle speed limits will be applied during construction to reduce dust generation, with speeds limited to 20 km/h at PP2 and the WWTP, and 40 km/h at TSF2; • All vehicles and mining equipment will remain on designated haul roads; • During strong winds, topsoil stripping and spreading activities will be restricted if dust cannot be adequately controlled; • Dust suppression will be undertaken using three water carts (50 m³ each) for mine areas and one Moxy cart (20 m³) for access roads.

Emission	Sources	Potential pathways	Proposed controls
Contaminated/ Sediment laden stormwater	Stormwater with sediments from disturbed soils, stockpiles and earthmoving activities.	Overland runoff during rainfall event	<p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> Downstream slopes of TSF2 must be armoured with suitable inert fresh waste rock to reduce sediment-laden runoff; and A 0.5 metre deep sediment and stormwater trench, with a minimum base width of 1 metre, must be installed around TSF2, with all collected runoff directed to a sedimentation pond.
Hydrocarbon and other chemical reagent	Hydrocarbon and chemical spills, leaks or seepage from equipment, refuelling, maintenance or storage	Overland runoff during rainfall event	No additional controls proposed by applicant.
Operation			
Dust	<p><u>Processing Plant:</u> Operation of upgraded processing plant, ROM pad activities, stockpiling and vehicle movements</p> <p><u>TSF2:</u> Deposition of tailings into TSF2</p>	Air / windborne pathway	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> Condition 5 (Table 2) (Item 1): Operational requirements for ore processing activities: <ul style="list-style-type: none"> - requires the operation and maintenance of dust suppression measures to control emissions from processing facilities and stockpile management; and - dust suppression sprays used in the tipping area of the crusher during tipping / crushing activities. <p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> Dust suppression will be undertaken using three water carts (50 m³ each) for mine areas and one Moxy cart (20 m³) for access roads; Water is applied during ore handling at the ROM pad; Dust suppression will be undertaken using a DRS Dust Stop system with foam application at the crushing circuit, supported by secondary water sprays at transfer points; The dust suppression system must be visually inspected

Emission	Sources	Potential pathways	Proposed controls
			<p>daily by site personnel and inspected monthly by the equipment manufacturer, in accordance with manufacturer specification; and</p> <ul style="list-style-type: none"> Following completion of tailings deposition, the TSF will be rehabilitated to reduce dust generation.
<p>Contaminated Stormwater (containing tailings and tailings liquor, hydrogen peroxide and ferrous sulphate or hydrocarbons)</p>	<p><u>Processing Plant:</u> ROM pad, process plant and stockpiles area runoff Vehicle movements on the ROM pad</p> <p><u>TSF2:</u> Deposition of tailings into TSF2</p> <p><u>Power Station:</u> Operation of HV gas engine power station and intermittent operation of diesel generators</p>	<p>Overland runoff from Processing Plant area, TSF 2 during high during rainfall events</p>	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> Condition 5 (Table 2), Item 1: Operational requirements for ore processing activities for the maintenance of stormwater diversion and flood protection around operational areas. <p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> Downstream embankment slopes of TSF2 must be maintained with suitable inert fresh waste rock to prevent the generation of sediment-laden runoff during rainfall events; Maintain a perimeter sediment and stormwater trench around TSF2 with a minimum depth of 0.5 metres and a minimum base width of 1 metre, ensuring all collected runoff is directed to a sedimentation pond; Stormwater is diverted around the processing plant and workshop infrastructure areas; Run-off from disturbed surface areas within the plant are directed to an unlined sedimentation pond; Ore processing activities are conducted within bunded, hardstand areas; and All chemical reagents are stored within tanks in appropriately bunded facilities whereby 110% of the largest vessel is contained and 25% of the total volume is contained according to Australian Standards AS1940 and AS1692.

Emission	Sources	Potential pathways	Proposed controls
Tailings supernatant water (containing elevated concentrations of chromium, arsenic, copper and WAD cyanide)	<u>TSF2:</u> Deposition of tailings into TSF2	Vertical infiltration and lateral migration through base and embankment wall	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> • <u>Condition 5 (Table 2) (Item 1):</u> Operational requirements for ore processing activities: <ul style="list-style-type: none"> - for tailings to be discharged sub-aerially and cyclically into the TSF in layers ≤300 mm thick enabling density and strength through drying cycles; and - Spigotting carried out such that the supernatant pond is maintained within and around the rock ring decant. • <u>Condition 5 (Table 2) (Item 4):</u> Operational requirements for TSF deposition: <ul style="list-style-type: none"> - Daily visual inspections of tailings deposition; and - Tailings deposition through multiple spigots to keep the supernatant pond centralized and reduce seepage pressure on embankments. • <u>Condition 5 (Table 2) (Item 6):</u> Operational requirements for decant system and pond: <ul style="list-style-type: none"> - Decant pond water must be reclaimed and reused in the processing plant; and - Pool area equal to approximately 5 ha (5% of tailings area). • <u>Condition 7 (Table 4):</u> Emissions and discharge limits for the supernatant pond; • <u>Condition 8 (Table 5):</u> Routine monthly discharge monitoring of the supernatant pond; and • <u>Condition 10 (Table 6):</u> Routine quarterly groundwater monitoring to monitor changes to groundwater quality in response to seepage of the TSF.
Tailings supernatant water (containing elevated concentrations of chromium, arsenic, copper and WAD cyanide)	<u>TSF2:</u> Deposition of tailings into TSF2	Vertical infiltration and lateral migration through base and embankment wall	

Emission	Sources	Potential pathways	Proposed controls
<p>Tailings slurry with potentially acid forming (PAF) material</p>	<p><u>TSF2</u>: Deposition of tailings into TSF2</p>	<p>Overtopping of TSF2 Overland runoff during rainfall event Seepage of leachate through base and embankments of TSF2 into soil and groundwater.</p>	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> • <u>Condition 5 (Table 2) (Item 1)</u>: Operational requirements for ore processing activities for tailings to be discharged sub-aerially and cyclically into the TSF in layers ≤300 mm thick enabling density and strength through drying cycles; • <u>Condition 10 (Table 6)</u>: Routine monthly groundwater monitoring to monitor changes to standing water levels will continue to be undertaken around TSF1 and TSF2; and <u>Condition 10 (Table 6)</u>: Routine quarterly groundwater monitoring to monitor changes to groundwater quality in response to tailings deposition to the TSF. <p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> • TSF2 has been designed to temporarily store rainfall from a 1:100-year annual exceedance probability (AEP) 72 hour event; • Maintain a minimum operational and total embankment freeboard of 0.3m and 0.5m respectively; • Operate the tailings storage facility so that the supernatant pond remains at least 100 m from the embankment under normal operating conditions; and • Daily visual inspections of the: <ul style="list-style-type: none"> - internal embankment freeboard to confirm freeboard capacity is available; - tailings deposition; and - tailings decant pond to determine pond size and location.

Emission	Sources	Potential pathways	Proposed controls
<p>Tailings slurry with potentially acid forming (PAF) material</p>	<p><u>TSF2:</u> Deposition of tailings into TSF2</p>	<p>Overtopping of TSF2 Overland runoff during rainfall event Seepage of leachate through base and embankments of TSF2 into soil and groundwater</p>	<ul style="list-style-type: none"> • Full basin compaction across the footprint of the TSF to achieve permeability of 1×10^{-7} m/s, verified by QA/QC and permeability testing; • Seepage cut-off trench will be constructed underneath the perimeter embankments that acts as a low-permeability barrier to restrict potential seepage migration; • Eight deep and shallow groundwater monitoring bores will be installed downstream of TSF2 to track groundwater flow and mounding; • Phreatic surface of embankments will be monitored using vibrating wire piezometers (VWP), with eight new VWPs to be installed internally within TSF2; • VWP piezometer water level readings must be recorded daily and downloaded monthly; and • Incorporation of TSF2 in the existing Seepage Management Plan.
		<p>Seepage through the soil profile to groundwater from pipeline leaks or ruptures.</p>	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> • <u>Condition 5 (Table 2), Item 5:</u> Operational requirement for the Tailings delivery and decant return water pipelines: <ul style="list-style-type: none"> -Maintain pipeline flow sensors and telemetry; -Groundwater monitoring bores must be maintained; and -Tailings delivery and water return pipes and containment corridor to be visually inspected twice every 24 hours for any visible leakage or damage. <p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> • All tailings and associated return water pipelines are maintained within an unlined V trench to ensure all solids and liquors are captured and not released to the environment; and • Tailings delivery and water return pipelines shall be inspected on a daily basis.

Emission	Sources	Potential pathways	Proposed controls
Contaminated process water (containing hydrogen peroxide and ferrous sulphate)	Operation of the Water Treatment Systems (WTS) at TSF 1 and TSF2	Seepage through the soil profile to groundwater Overland runoff during significant rainfall events.	<u>Applicant's controls:</u> <ul style="list-style-type: none"> • Decant water will be treated with hydrogen peroxide and ferrous sulphate to reduce dissolved copper concentrations prior to reuse; • Carbon tanks will be used to remove copper from treated decant water; • All WTS pipelines will be located within earthen bunds or contained within TSF infrastructure to provide secondary containment; • Pipelines will be inspected as part of routine day and night shift inspections, consistent with existing TSF1 inspection requirements; and • Bunding for pipelines located outside the TSF footprint will provide containment to prevent discharge to the surrounding environment.
Mine dewater (containing elevated metals/metalloids)	Mine dewatering discharge to turkeys nest	Overtopping, overland runoff, and seepage to groundwater	<u>Existing controls in Licence L9324/2022/1:</u> <ul style="list-style-type: none"> • Condition 5 (Table 2), Item 13: Operational requirements for the mining turkey nest: <ul style="list-style-type: none"> - Maintain the HDPE liner on the turkey nest; and - Maintain a 300 mm freeboard.
	Transport of mine dewater from Berwick and Southern Corridor pits to turkeys nest via pipelines	Seepage through the soil profile to groundwater from pipeline leaks or ruptures	<u>Existing controls in Licence L9324/2022/1:</u> <ul style="list-style-type: none"> • Condition 5 (Table 2), Item 12: Operational requirements for dewatering pipelines: <ul style="list-style-type: none"> - Undertake weekly visual inspections of the dewatering pipelines to check for damage, ruptures and/or leaks; and - Flow meter to be maintained on pipeline discharge point to measure cumulative volumes (tonnes or m³) of mine dewater discharged.

Emission	Sources	Potential pathways	Proposed controls
Mine dewater (containing elevated metals/metalloids)	Discharge of mine dewater for dust suppression activities	Overland runoff from wetted down operational areas and roads	No controls proposed by applicant.
Raw or untreated sewage	Operation of sewage pipes, grinder pumps and holding tank	Seepage through the soil profile to groundwater from pipeline leaks or ruptures	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> • <u>Condition 5 (Table 2), Item 10: Operational requirement for WWTP primary and secondary stabilisation ponds:</u> <ul style="list-style-type: none"> - Daily inspections of fencing and pipelines integrity and damage; and - Maintain pipeline bunding and visual inspection of any leaks.

<p>Treated wastewater</p>	<p>Discharge of treated wastewater into a series of evaporation ponds or to irrigation field</p>	<p>Overland runoff during rainfall event Overtopping of evaporation ponds Seepage to groundwater from pond base or irrigation field</p>	<p><u>Existing controls in Licence L9324/2022/1:</u></p> <ul style="list-style-type: none"> • <u>Condition 5 (Table 2), Item 10:</u> Operational requirement for WWTP and ponds: <ul style="list-style-type: none"> - Effluent discharge quality must be monitored quarterly in accordance with the parameters specified in Table 5; Maintain pipeline flow meters and mechanical pump used to discharge treated effluent. Wastewater treated before being discharged to a dedicated evaporation / irrigation field; and WWTP effluent treated to effluent quality criteria prior to discharge. • <u>Existing condition 5 (Table 2), Item 11:</u> Operational requirement for the Irrigation Field: <ul style="list-style-type: none"> - monthly inspections of fencing integrity and damage; and - daily inspections of any pooling of treated effluent when irrigation system is operating; and • <u>Existing condition 8 (Table 5):</u> Quarterly monitoring of treated wastewater quality at the WWTP irrigation tank in accordance with parameters specified in Table 5. <p><u>Applicant's controls:</u></p> <ul style="list-style-type: none"> - Evaporation pond embankments will be constructed with a grade of 1V:3H using specified earthworks materials to ensure structural stability and maintain required freeboard; - Embankments constructed using compacted earthworks materials to specification for structural integrity; - Existing stabilisation ponds (primary and secondary) are HDPE lined; - New primary and final evaporation pond will be lined with 2.0mm HDPE lining with double-sided textured finish; - WWTP will include alarms for the aerobic treatment tank air blower and discharge pump. - Irrigation area will be fenced to restrict access; and - Irrigation area located away from drainage lines to reduce runoff risk.
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Emission	Sources	Potential pathways	Proposed controls
Emissions to air – NO _x , SO ₂ , CO, particulate matter and unburned hydrocarbons	Operation of HV gas engine power station and intermittent operation of diesel generators	Air/windborne dispersion	<u>Applicant controls:</u> <ul style="list-style-type: none"> • Maximum of nine gas generators operating at any one time; • Diesel generators will be run for 1 hour a month up to 50 hours per year; • Generators rotated to allow for regular scheduled maintenance; • Daily visual inspections of the power station; • Sample ports on each stack installed in accordance with AS4323.1; and • Premises registered to report air emissions to the National Pollutant Inventory annually.

3.1.2 Receptors

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

Table 5 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

Table 5: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Sylvania homestead	Approximately 18 km north-east of the prescribed premises. Ruled out due to distance from premises activities.
Environmental receptors	Distance from prescribed activity
Surface water Lake Disappointment (Savory Creek) System (Nationally Important Wetland)	The premises is situated within the East Murchison Surface Water Area, proclaimed area under the <i>Rights in Water and Irrigation Act 1914 (RIWI Act)</i> , and the Savory Creek Wild River Area, classified as Priority 1 (P1) for its near-pristine condition and high environmental value. This classification indicates minimal human disturbance, with natural watercourses and riparian zones largely intact. Savory Creek is an intermittent drainage system conveying episodic flows to Lake Disappointment, where a sandbar maintains a persistent pool. The intact wild-river condition supports natural hydrogeomorphic processes, water quality, and ecological function within the broader Lake Disappointment–Savory Creek system, comprising seasonal channels and saline basins. Two ephemeral drainage lines traverse the Premises, conveying southward runoff toward Savory Creek approximately 7 km downgradient. Distances from proposed infrastructure to the nearest drainage line are: <ul style="list-style-type: none"> • TSF2 – 550 m west; • WWTP – 495 m south-west; • Power station – 480 m north-west; • Upgraded processing plant – 90 m north-east; and • Water Treatment Systems – 600m south-west.
Threatened and Priority (P) Flora	<ul style="list-style-type: none"> • <i>Eremophila pilosa</i> P1 (EPBC Act), approximately 700 m south-west outside from the prescribed premises boundary. • <i>Eremophila rigida</i> P3 (EPBC Act), recorded within the prescribed premises boundary. • <i>Rhagodia sp. Hamersley</i> (M. Trudgen 17794) P3 (EPBC Act), recorded within the prescribed premises. <p>(Source: Flora Survey undertaken by 360 Environmental, 2016).</p>

<p>Threatened and Priority (P) fauna</p>	<ul style="list-style-type: none"> • <i>Macroderma gigas</i> (Ghost Bat) – P4 (Biodiversity Conservation Act (2016), EPBC Act) • <i>Falco hypoleucos</i> (Grey Falcon) – P4 (EPBC Act) • <i>Haliastur sphenurus</i> (Whistling Kite) – Marine (EPBC Act) • <i>Anthus novaeseelandiae</i> (Australasian Pipit) – Marine (EPBC Act) • <i>Cuculus pallidus</i> (Pallid Cuckoo) – Marine (EPBC Act) • <i>Coracina novae-hollandiae</i> (Black-faced Cuckoo-shrike) – Marine (EPBC Act) • <i>Merops ornatus</i> (Rainbow Bee-eater) – Migratory: Marine (EPBC Act) <p>(Source: Fauna Survey undertaken by 360 Environmental, 2016).</p>
<p>Groundwater</p>	<p>The premises is situated within the East Murchison Groundwater Area which is a proclaimed area under the RIWI Act.</p> <p>Regional groundwater flows southwards towards the Savory Creek system.</p> <p>During the August 2025 groundwater monitoring event, groundwater depths at the premises ranged from 6.60 metres below ground level (mbgl) to 36.02 mbgl, with shallowest groundwater present south of TSF1 and TSF2 gradually deepening to the north, northwest.</p> <p>Field groundwater pH ranged from 6.67 to 9.11; however, the majority of measurements were between pH 7 and 8, indicating predominantly neutral to slightly alkaline conditions. Field total dissolved solid (TDS) concentrations ranged from 272 mg/L to 490 mg/L which is considered to be fresh and suitable for most uses, including drinking water.</p> <p>The nearest operating groundwater bore is located approximately 5 km from the prescribed premises (Guildford bore, ref. no. 120511289) and is used for livestock drinking water supply.</p>
<p>Native Vegetation</p>	<p>Adjacent to the new TSF2, WWTP, upgraded processing plant and power station.</p>

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 0. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 0), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 6.

Works approval W2999/2025/1 that accompanies this decision report authorises construction, commissioning and time-limited operations. The conditions in the issued works approval, as outlined in Table 6 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. Category 5, 6, 52 and 85 activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 6: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Category 5: Processing or beneficiation of metallic or non-metallic ore, Category 6: Mine dewatering, Category 85: Sewage facility and Category 52: Power generation.								
Source: Karlawinda expansion project Activities: Construction of TSF 2 TSF2 construction, PP2 installation works, WWTP pond construction, power station generator installation, vehicle movements, and WTS2 installation	Dust	Pathway: Air/windborne dispersion Impacts: Impacts to adjacent remnant vegetation, conservation significant fauna and flora species through dust deposition.	Surrounding native vegetation Conservation significant fauna species Conservation significant flora species	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	N	Condition 1: Dust management Condition 4 - Infrastructure and equipment requirements non-critical containment infrastructure)	Water carts are the only control proposed; additional regulation is required to ensure all dust-generating activities are adequately wetted down. <u>DWER controls</u> Condition 1 has been added to strengthen dust control requirements during construction and minimise impacts to surrounding environmental receptors.
Stormwater with sediments from disturbed soils, stockpiles and earthmoving activities.	Contaminated/ Sediment laden stormwater	Pathway: Direct discharge to land via runoff during rainfall events Impacts: Increase in suspended solids causing ecosystem disturbance and reduced surface water quality	Native vegetation Conservation significant flora Savory Creek drainage lines	No controls proposed.	C = Slight L = Unlikely Low Risk	N	Condition 3 – Critical Containment Infrastructure: TSF2 surface water management Condition 4 - Infrastructure and equipment requirements non-critical containment infrastructure): WTS2	The applicant has proposed armouring of downstream embankment slopes with suitable inert fresh waste rock to minimise erosion and reduce the generation of sediment-laden runoff during rainfall events. <u>DWER controls</u> Additional regulatory controls are required to contain contaminated stormwater within the WTS area and capture it in sumps to prevent discharge.

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Hydrocarbon and chemical spills, leaks or seepage from vehicle/equipment use, refuelling, maintenance or storage	Hydrocarbon contaminated wastewater	Pathway: Overland runoff during high rainfall events Impacts: Overland runoff may disturb ecosystems, degrade surface water quality, and impact native vegetation/conservation significant flora	Native vegetation Conservation significant flora Savory Creek drainage lines	No controls proposed.	C = Slight L = Unlikely Low Risk	N	Condition 4 - Infrastructure and equipment requirements non-critical containment infrastructure): PP2 and WTS2	No controls were proposed by the applicant to manage the risk of hydrocarbon and chemical releases associated with PP2. <u>DWER controls</u> Bunded storage (110%) and spill kits are required to minimise spill risks and prevent land contamination.
Operation (including time-limited-operations operations)								
Category 5: Processing or beneficiation of metallic or non-metallic ore								
Source: Karlawinda expansion project Activity: Operation of upgraded processing plant, ROM pad activities, stockpiling and vehicle movements	Dust	Pathway: Air/windborne dispersion Impacts: Dust deposition affecting remnant vegetation and conservation-significant flora and fauna.	Native vegetation Conservation significant flora and fauna	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	Y	Condition 4 - PP2 and associated infrastructure Conditions 14 and 15: Reporting Condition 23 – TLO requirements/ limits Conditions 32 and 33 – TLO compliance reporting	The delegated officer considers existing licence controls, combined with additional works approval requirements, are sufficient to manage dust emissions.
	Spills/leaks of contaminated process water (metalloids, cyanide, processing plant reagents) Contaminated stormwater	Pathway: Direct discharge to land via runoff during rainfall events. Impacts: Increased suspended solids causing ecosystem disturbance and reduced surface water quality	Native vegetation Conservation significant flora Savory Creek drainage lines	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	Y	Condition 23 – TLO requirements/ limits Conditions 32 and 33 – TLO compliance reporting	The delegated officer considers the diversion drains, sedimentation pond, and bunded hardstand areas are sufficient to manage stormwater runoff.

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Source: Karlawinda expansion project Activity: Deposition of tailings into TSF2	Dust lift off (dry tailings)	Pathway: Air/windborne dispersion Impacts: Reduced native vegetation health or native vegetation death that may represent habitat for threatened fauna.	Native vegetation Conservation significant flora and fauna	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Condition 23 – TLO requirements and limits: TSF2 Stages 1 to 4 Conditions 32 and 33 – TLO compliance reporting	Although dust controls are not listed in the table, TSF dust lift-off is managed through existing operational requirements that minimise exposed dry tailings, including maintaining 500 mm freeboard (1% AEP allowance), keeping the pond ≥100 m from embankments, and daily inspections of pond size, location and seepage conditions.
	Stormwater contaminated with tailings and tailings liquor	Pathway: Direct discharge to land to soil and surface water via runoff during rainfall events. Impacts: Contamination to soil and surface water bodies in the vicinity of TSF2.	Native vegetation Savory Creek drainage lines (550m from TSF2)	No controls proposed by applicant.	C = Moderate L = Unlikely Medium Risk	N	Condition 23 –TLO requirements and limits: TSF2 Stages 1 to 4, and tailings/decant pipelines Conditions 32 and 33 – TLO compliance reporting	Despite no explicit controls being proposed, the works approval conditions (freeboard, pond setback, decant recovery, and daily/post-rainfall inspections) effectively manage runoff of contaminated stormwater. Additional surface-water controls, pipeline trenches and bunding further minimise off-site discharge.
	Tailings supernatant water (containing elevated concentrations of chromium, arsenic, copper and WAD cyanide)	Pathway: Vertical infiltration and lateral migration through base and embankment wall. Impacts: Groundwater mounding and deterioration of groundwater quality resulting in vegetation stress, and degradation of nearby drainage lines.	Native vegetation Groundwater used for livestock drinking Savory Creek drainage lines (550m from TSF2) Conservation significant fauna	Refer to Section 3.1	C = Major L = Possible High Risk	Y	Condition 23 – TLO requirements and limits: TSF2 Stages 1 to 4 and WTS1 and WTS2 Conditions 32 and 33 – TLO compliance reporting	The delegated officer considers the increased tailings deposition to present significant risks to groundwater, Savory Creek drainage lines and fauna. While no bird deaths have been observed to date, ongoing supernatant monitoring will enable early detection of rising contaminants. The delegated officer has also considered the operation of a second WTS to address elevated copper, with WTS1 and WTS2 operational requirements conditioned on the works approval.

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Source: Karlawinda expansion project Activity: Deposition of tailings into TSF2	Tailings slurry with potentially acid forming (PAF) material	Pathway: Overtopping and runoff of PAF tailings during extreme rainfall, with potential ingestion by fauna. Impact: Soil and sediment contamination, vegetation stress, and fauna health impacts (including potential mortality), with toxicity risks to nearby surface water	Native vegetation Groundwater used for livestock drinking Savory Creek drainage lines (550m from TSF2) Conservation significant fauna	Refer to Section 3.1	C = Major L = Unlikely High Risk	Y	Condition 3 –TSF2 Stages 1 to 4 Condition 24 – Authorised emission/discharge points Condition 23 – TLO requirements and limits: TSF2 Stages 1 to 4 Conditions 32 and 33 – TLO compliance reporting	The applicants proposed controls of maintain an operational freeboard, the limits on pond proximity to embankments, decant recovery targets, minimisation of stored water, and mandatory inspection regime provide direct and enforceable controls that manage the risk of overtopping of TSF2 during rainfall events.
		Pathway: Acidic leachate from PAF tailings slurry can infiltrate through the TSF base and embankments into soil and groundwater. Impact: Groundwater mounding and deterioration of water quality, mobilising metals/metalloids, with soil contamination causing vegetation stress, habitat degradation, and risks to livestock water supplies.		Refer to Section 3.1	C = Major L = Possible High Risk	N	Refer to section 3.3 – detailed risk assessment	Refer to section 3.3 – detailed risk assessment
		Pathway: Seepage to groundwater from pipeline leaks and runoff of tailings slurry during rainfall. Impacts: Soil and groundwater contamination with salts, metals and metalloids, with potential acid generation increasing metal mobility and causing vegetation decline.		Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 23 – TLO requirements and limits: tailings/ decant return water pipelines Conditions 32 and 33 – TLO compliance reporting	The delegated officer considers existing licence controls and additional measures sufficient to manage pipeline failure, noting containment trenches, flow sensors and daily inspections ensure any release is captured onsite and prevented from off-site migration.

Works approval: W2999/2025/1

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Source: Karlawinda expansion project Activity: Operation of the Water Treatment Systems (WTS) at TSF 1 and TSF2	Contaminated process water (containing hydrogen peroxide and ferrous sulphate)	Pathway: Seepage to groundwater from pipeline or tank failures, and runoff of contaminated process water during rainfall. Impact: Chemical contamination of soil, groundwater and surface water leading to soil degradation and vegetation decline.	Native vegetation Groundwater used for livestock drinking Savory Creek drainage lines (600m from WTS's)	Refer to Section 3.1	C = Slight L = Possible Low Risk	Y	Condition 23 – TLO requirements and limits: WTS1 and WTS2 Conditions 32 and 33 – TLO compliance reporting	The delegated officer considers the applicant's controls sufficient to manage runoff and seepage risks from contaminated process water containing hydrogen peroxide and ferrous sulphate.
	Contaminated stormwater (containing hydrogen peroxide and ferrous sulphate)	Pathway: Direct discharge to land to soil and surface water via runoff during rainfall events. Impact: Contamination of groundwater and surface water bodies in the vicinity of the water treatment systems	Conservation significant fauna			N	<u>Condition 23 – TLO requirements and limits: WTS1 and WTS2</u> Conditions 32 and 33 – TLO compliance reporting	<u>DWER controls</u> The delegated officer has included an additional regulatory control requiring contaminated stormwater to be fully contained within bunding or sumps to prevent environmental discharge.
Category 6: Mine Dewatering								
Source: Mine dewatering from Berwick and Southern Corridor pits Activity: Mine dewatering discharge into turkeys nest	Mine dewater (containing elevated metals/metalloids)	Pathway: Overtopping of turkeys nest and runoff during high rainfall; seepage to groundwater from liner failure. Impact: Contamination of soil and groundwater, degradation of drainage lines, vegetation impacts, and risks to livestock water supplies.	Native vegetation Groundwater used for livestock drinking Savory Creek drainage lines Conservation significant flora/fauna	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	N/A	The delegated officer considers the existing freeboard and HDPE-liner controls under Licence L9324/2022/1 sufficient to manage the risks of both overtopping and seepage.

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
<p>Source: Mine dewatering from Berwick and Southern Corridor pits</p> <p>Activity: Transport of mine dewater from Berwick and Southern Corridor pits to turkeys nest via pipelines</p>	Mine dewater (containing elevated metals/metalloids)	<p>Pathway: Direct discharge to land via pipeline leaks or spills</p> <p>Impacts: Direct discharge to land causing contamination of soil, impact to health of vegetation and degradation of nearby surface water quality.</p>	<p>Native vegetation</p> <p>Groundwater used for livestock drinking</p> <p>Savory Creek drainage lines</p>	Refer to Section 3.1	<p>C = Moderate</p> <p>L = Unlikely</p> <p>Medium Risk</p>	Y	N/A	The delegated officer considers the existing controls under the licence to be adequate for managing the risk of mine dewater pipeline failure.
<p>Source: Mine dewatering from Berwick and Southern Corridor pits</p> <p>Activity: Discharge of mine dewater for dust suppression activities within the premises (via water carts)</p>	Mine dewater (containing elevated metals/metalloids)	<p>Pathway: Overland runoff from wetted down operational areas and roads</p> <p>Impacts: Contaminated runoff may degrade soil quality, vegetation health and impact surface water in ephemeral drainage lines.</p>	<p>Native vegetation</p> <p>Savory Creek drainage lines</p> <p>Conservation significant flora</p>	No controls proposed.	<p>C = Moderate</p> <p>L = Unlikely</p> <p>Medium Risk</p>	N	<p><u>Condition 2: Dust suppression</u></p> <p><u>Condition 24 – Authorised discharge point for mine dewatering effluent</u></p> <p><u>Condition 25 – requirement to monitor dewater quality</u></p>	<p>Approximately 410,000 tpa (0.4 GL/year) of mine dewater from the Southern Corridor and Berwick pits will be used for dust suppression across operational areas. This water contains elevated metals and metalloids that exceed ANZECC/ANZG guideline values.</p> <p><u>DWER controls</u></p> <p>The applicant has proposed no controls to manage risks to native vegetation from contaminated process water. Accordingly, an additional regulatory control has been included to ensure dewatering effluent is applied to avoid overspray onto vegetation, along with an authorised discharge point for dust-suppression use within the premises.</p>

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Category 85: Sewage facility								
<p>Source: Operation of sewage facility at increased throughput</p> <p>Activity: Operation of sewage pipes, grinder pumps and holding tank</p>	Raw or untreated sewage	<p>Pathway: Direct discharge to land from sewage pipeline, grinder pump or holding-tank failure, and overland runoff during rainfall events.</p> <p>Impact: High nutrient loading may contaminate soil and groundwater, impacting vegetation health and livestock water supplies, while overland runoff may degrade surface water quality in nearby drainage lines.</p>	<p>Native vegetation</p> <p>Groundwater used for livestock drinking</p> <p>Savory Creek drainage lines</p>	Refer to Section 3.1	<p>C = Minor</p> <p>L = Unlikely</p> <p>Medium Risk</p>	Y	<p>Condition 23 – TLO requirements and limits: WWTP infrastructure upgrade</p> <p>Conditions 32 and 33 – TLO compliance reporting</p>	The delegated officer considers the controls under the existing licence to be sufficient for managing the risk associated with a pipeline or holding tank failure. No further regulatory controls required.
<p>Source: Operation of sewage facility at increased throughput</p> <p>Activity: Storage of treated wastewater in a series of evaporation ponds</p> <p>Discharge of treated wastewater to irrigation field</p>	Treated wastewater	<p>Pathway: Overtopping of evaporation ponds during high-rainfall events or inadequate freeboard, and seepage or runoff from the irrigation field into surrounding soil and groundwater.</p> <p>Impact: High nutrient loading (nitrogen and phosphorus) may contaminate soil and groundwater, degrade nearby surface water quality, and impact the health of surrounding native vegetation.</p>	<p>Native vegetation</p> <p>Groundwater used for livestock drinking</p> <p>Savory Creek drainage lines</p> <p>Conservation significant flora/fauna</p>	Refer to Section 3.1	<p>C = Minor</p> <p>L = Unlikely</p> <p>Medium Risk</p>	Y	<p><u>Condition 23 – TLO requirements and limits: WWTP infrastructure upgrade and treated irrigation area</u></p> <p><u>Condition 26 – emissions and discharges monitoring</u></p> <p>Conditions 32 and 33 – TLO compliance reporting</p>	<p>The Delegated Officer considers the risk of pond overtopping to be adequately managed through operational controls that limit hydraulic loading, maintain freeboard, ensure HDPE-lined ponds and stable embankments, and require daily inspections with immediate rectification of defects. The applicant's controls for the irrigation area are also considered sufficient to manage seepage and runoff risks.</p> <p><u>DWER controls</u></p> <p>Given the change in treatment processes and increased wastewater throughput, an additional condition requiring monitoring of the WWTP has been included to further reduce seepage-related impacts.</p>

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient ?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Category 52: Power generation								
Source: Operation of HV gas engine power station and intermittent operation of diesel generators	Emissions to air – NOx, SO2, CO, particulate matter and unburned hydrocarbons	Pathway: Air/windborne dispersion Impact: Impact to health of native vegetation and conservation significant flora/fauna species.	Native vegetation Conservation significant flora/fauna	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Condition 23 - TLO requirements and limits: Power generation infrastructure <u>Condition 26 – Authorised discharge/emission points</u> Conditions 32 and 33 – TLO compliance reporting	The Delegated Officer considers the applicant’s proposed air-emission controls adequate and has included them as operational requirements in the works approval. Air-quality monitoring has not been required, given the absence of nearby human receptors. <u>DWER controls</u> A condition has been included on the works approval to specify the authorised discharge location for emissions to air at the premises.
	Contaminated stormwater (hydrocarbons)	Pathway: Direct discharge to land to soil and surface water via overland runoff during rainfall events. Impact: Contamination of groundwater and surface waterlines	Savory Creek drainage lines Groundwater used for livestock drinking	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Condition 23 - TLO requirements limits: Power generation infrastructure <u>Condition 26 – Authorised discharge/emission points</u> Conditions 32 and 33 – TLO compliance reporting	The power station is located about 480 m from the nearest drainage line; however, the applicant’s source-based controls; banded fuel and chemical storage to Australian Standards, spill-response equipment, and daily inspections to identify and rectify integrity issues are considered sufficient to prevent contaminated stormwater from discharging to land or surface water.

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

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

3.3 Detailed risk assessment for seepage from TSF2

3.3.1 Source

3.3.1.1 Tailings characterisation

TSF2 will receive oxide, laterite and fresh tailings in a proposed blend ratio of 1:22:77. Previous geochemical testing (GCA, 2018) classified the oxide-ore and primary-ore tailings (fresh tailings) component as Potentially Acid Forming (PAF) due to pyrite content (0.71% sulphide-S). As the blend comprises approximately 77% fresh tailings, the majority of material deposited to TSF2 is expected to be PAF.

The applicant's geochemical test work focused on ore rather than the processed tailings, resulting in uncertainty regarding the geochemical behaviour of the tailings themselves. Given the strong correlation between ore mineralogy and tailings composition, the department considers there to be a risk of acid mine drainage associated with tailings deposition in TSF2, as pyrite oxidation can generate acidic conditions and mobilise metals. PAF tailings may oxidise when exposed to oxygen, producing acidic and metalliferous leachate.

3.3.1.2 Assessment of Predicted Seepage Rate for TSF2

A seepage rate of $\sim 6 \times 10^{-2} \text{ m}^3/\text{day}/\text{m}$ has been estimated using the SLIDE model. This value is consistent with simplified analytical calculations but is subject to uncertainty due to the limited hydraulic conductivity dataset and anticipated changes in tailings density and permeability as deposition progresses. The estimate is therefore considered an order-of-magnitude indication only, and actual seepage characteristics are expected to evolve throughout the operational life of the TSF.

3.3.1.3 Water Balance Analysis for TSF2

Water balance analysis for TSF2 Cell A (Table 7) and Cell B (Table 8) indicate that water inputs from tailings slurry and rainfall are offset by decant recovery and evaporation, with water recovery rates of approximately 60 per cent. For both cells, the balances indicate a net operating water deficit across the assessment period, indicating that reclaimed water is not expected to fully meet site demand and that additional water from mine dewatering is anticipated to contribute to overall site water requirements under the assessed operating scenario.

Table 7: Water Balance Analysis (Cell A)

PROJECT : TSF2 Design		Date	2-Feb-25										
CLIENT : Capricorn Metals Ltd (CMM)		Job No	PER2024-002										
LOCATION : Kariakanda Gold Project (KGP), Capricorn, WA		File	PER2024-002-TAL										
SUBJECT : WATER BALANCE TOTAL TAILINGS STREAM CALENDAR YEAR - TSF2 CELL A FINAL STAGE		Subject	Water Balance										
		Revision	0										
INFLOWS													
Month													
Days per month													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Rainfall (mm)	45.8	34	118.4	19	0	8.8	0	0	0	0	1.6	4.8	232.4
Average Daily Rainfall (mm)	1.5	1.2	3.8	0.6	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.2	
Tailings Dam Storage Area (m2)	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000
Runoff Coefficient Tailings	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Catchment Area above Storage (m2)	0	0	0	0	0	0	0	0	0	0	0	0	0
Runoff Coefficient Catchment	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Pool Area (m2)	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500
Runoff Coefficient Pool	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Running Damages (m2)	116,626	116,626	116,626	116,626	116,626	116,626	116,626	116,626	116,626	116,626	116,626	116,626	116,626
Rainfall Inflow Total Volume (m3/day)	865.2	546.2	1714.4	294.3	0.0	131.7	0.0	0.0	0.0	0.0	23.9	89.9	
SLURRY WATER													
Tonnes per year													
Total tonnes per month	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	4,500,000
% Solids	46	46	46	46	46	46	46	46	46	46	46	46	46
Tailings Output Solids (tpd)	12,096.8	13,274.9	12,096.8	12,500.0	12,096.8	12,500.0	12,096.8	12,096.8	12,500.0	12,096.8	12,500.0	12,096.8	5,282,609
Volume of Water (m3/day)	14,200.8	15,962.9	14,200.8	14,673.9	14,200.8	14,673.9	14,200.8	14,200.8	14,673.9	14,200.8	14,673.9	14,200.8	
OTHER WATER INFLOWS													
m3/day													
PH Dewatering	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Water Inflow Total (m3/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL INFLOW (m3/day)	14,884	16,123	15,919	14,968	14,201	14,806	14,201	14,201	14,674	14,201	14,698	14,201	5,388,927.27
TOTAL INFLOW (m3/month)	460,776	488,479	493,264	448,746	446,217	444,167	440,217	440,217	443,217	440,217	443,936	442,372	
OUTFLOW-LOSSES FROM TAILINGS DAM													
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC TOTAL													
EVAPORATION (from pond and beaches)													
Evaporation Rate (mm)													
Pen Factor													
Monthly Dam Evaporation Rate (mm)													
Average Daily Evaporation Rate (mm)													
Pool Area & Running Damages (m2)													
Daily Evaporation Loss/Outflow (m3/day)													
EVAPO-TRANSPIRATION (from drying tailings)													
EvaPO-transpiration Rate (mm)													
EvaPO-transpiration Rate (t/ha2)													
Average Daily EvaPO-transpiration Rate (mm)													
Area Transpiring (m2)													
Daily Transpiration Loss (m3/day)													
SEEPAGE													
Downstream Embankment (m3/day)													
Upstream Embankment (m3/day)													
Seepage Rate m/sec													
Dam Floor (m3/day)													
Total Seepage Outflow (m3/day)													
RETENTION													
Tailings Output (tpd)													
Calculated Ave. Inlets Dry Density (t/m3) and MC													
Volume Retained in Tailings (m3/day)													
TOTAL OUTFLOW-LOSSES FROM TAILINGS DAM													
BALANCE INFLOW-OUTFLOW-LOSSES (m3/day)													
BALANCE INFLOW-OUTFLOW-LOSSES (m3/month)													
RETURN WATER TO THE PLANT (if available)													
Total Water Return per month (balance of inflow-outflow for planning)													
Volume of Water (m3/day) estimated at													
Average water return													
Summary of Water Balance													
Water shortfall (makes up water) or excess of requirements (m3/day)													
Total water in excess of requirements (m3/month)													
Total water in excess of requirements (m3/year) =													

Table 8: Water Balance Analysis (Cell B)

PROJECT : TSF2 Design		Date	2-Feb-25										
CLIENT : Capricorn Metals Ltd (CMM)		Job No	PER2024-002										
LOCATION : Kariakanda Gold Project (KGP), Capricorn, WA		File	PER2024-002-TAL										
SUBJECT : WATER BALANCE TOTAL TAILINGS STREAM CALENDAR YEAR - TSF2 CELL B FINAL STAGE		Subject	Water Balance										
		Revision	1										
INFLOWS													
Month													
Days per month													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Rainfall (mm)	45.8	34	118.4	19	0	8.8	0	0	0	0	1.6	4.8	232.4
Average Daily Rainfall (mm)	1.5	1.2	3.8	0.6	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.2	
Tailings Dam Storage Area (m2)	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000	1,030,000
Runoff Coefficient Tailings	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Catchment Area above Storage (m2)	0	0	0	0	0	0	0	0	0	0	0	0	0
Runoff Coefficient Catchment	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Pool Area (m2)	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500
Runoff Coefficient Pool	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Running Damages (m2)	105,339	105,339	105,339	105,339	105,339	105,339	105,339	105,339	105,339	105,339	105,339	105,339	105,339
Rainfall Inflow Total Volume (m3/day)	730.0	504.7	1697.2	312.9	0.0	144.9	0.0	0.0	0.0	0.0	25.4	76.3	
SLURRY WATER													
Tonnes per year													
Total tonnes per month	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	4,500,000
% Solids	46	46	46	46	46	46	46	46	46	46	46	46	46
Tailings Output Solids (tpd)	12,096.8	13,274.9	12,096.8	12,500.0	12,096.8	12,500.0	12,096.8	12,096.8	12,500.0	12,096.8	12,500.0	12,096.8	5,282,609
Volume of Water (m3/day)	14,200.8	15,962.9	14,200.8	14,673.9	14,200.8	14,673.9	14,200.8	14,200.8	14,673.9	14,200.8	14,673.9	14,200.8	
OTHER WATER INFLOWS													
m3/day													
PH Dewatering	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Water Inflow Total (m3/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL INFLOW (m3/day)	14,831	16,178	16,088	16,867	14,201	14,819	14,201	14,201	14,674	14,201	14,700	14,201	5,397,438.30
TOTAL INFLOW (m3/month)	462,847	497,017	498,719	448,808	440,217	444,566	440,217	440,217	443,217	440,217	441,088	442,589	
OUTFLOW-LOSSES FROM TAILINGS DAM													
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC TOTAL													
EVAPORATION (from pond and beaches)													
Evaporation Rate (mm)													
Pen Factor													
Monthly Dam Evaporation Rate (mm)													
Average Daily Evaporation Rate (mm)													
Pool Area & Running Damages (m2)													
Daily Evaporation Loss/Outflow (m3/day)													
EVAPO-TRANSPIRATION (from drying tailings)													
EvaPO-transpiration Rate (mm)													
EvaPO-transpiration Rate (t/ha2)													
Average Daily EvaPO-transpiration Rate (mm)													
Area Transpiring (m2)													
Daily Transpiration Loss (m3/day)													
SEEPAGE													
Downstream Embankment (m3/day)													
Upstream Embankment (m3/day)													
Seepage Rate m/sec													
Dam Floor (m3/day)													
Total Seepage Outflow (m3/day)													
RETENTION													
Tailings Output (tpd)													
Calculated Ave. Inlets Dry Density (t/m3) and MC													
Volume Retained in Tailings (m3/day)													
TOTAL OUTFLOW-LOSSES FROM TAILINGS DAM													
BALANCE INFLOW-OUTFLOW-LOSSES (m3/day)													
BALANCE INFLOW-OUTFLOW-LOSSES (m3/month)													
RETURN WATER TO THE PLANT (if available)													
Total Water Return per month (balance of inflow-outflow for planning)													
Volume of Water (m3/day) estimated at													
Average water return													
Summary of Water Balance													
Water shortfall (makes up water) or excess of requirements (m3/day)													
Total water in excess of requirements (m3/month)													
Total water in excess of requirements (m3/year) =													

Works approval: W2999/2025/1

IR-T13 Decision report template (short) v3.0 (May 2021)

3.3.2 Pathway

3.2.2.1 Local Hydrogeology and Subsurface Conditions

CMW Geosciences 2024 geotechnical investigation of the proposed TSF2 site confirmed that the subsurface profile comprises an upper layer of Gravelly Clayey Sand (average thickness ~1.4 m) overlying Ferricrete, which was encountered from depths of 0.4–2.0 m to at least 15 m below ground level. These conditions present potential seepage pathways if not adequately managed.

At a regional scale, groundwater occurs within two fractured dolomite aquifers, with flow directed south toward the Savory Creek system. Local flow has been altered by mounding beneath TSF1, and a similar mound is expected to develop beneath TSF2 once deposition commences, potentially exacerbating seepage migration toward sensitive receptors

The groundwater mound beneath TSF1 will progressively decay as tailings in this facility dry out. However, this general pattern of groundwater flow will be maintained when tailings deposition in TSF2 commences, and a new groundwater mound forms beneath this facility. Due to this groundwater flow pattern, it is likely that only groundwater from beneath the northern cell of TSF2 will flow towards the mine pit. The current groundwater flow directions and mounding effects are illustrated in Figure 8.

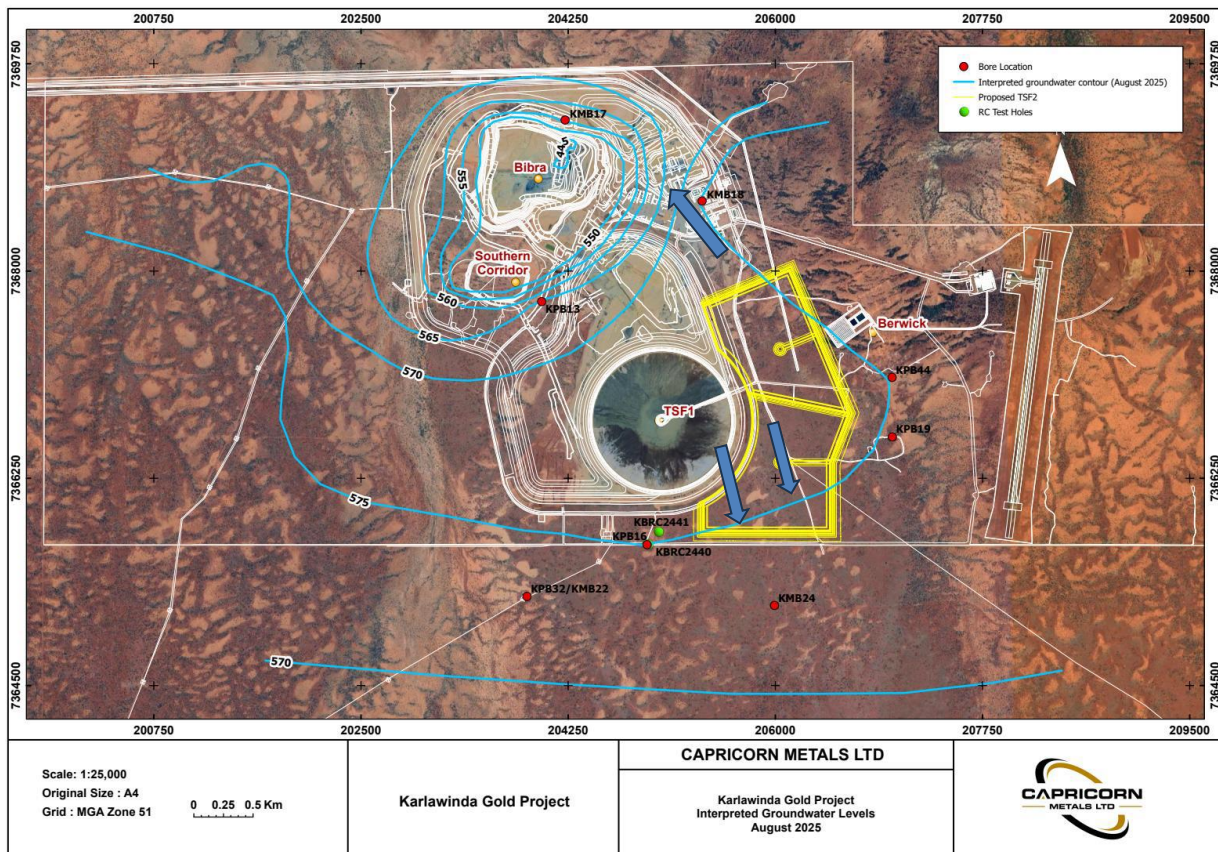


Figure 8: Current direction of groundwater flow (shown by blue arrows) (Source, Capricorn Metals Ltd, 2025)

3.2.2.2 Groundwater levels

Groundwater in the vicinity of TSF2 is shallow (6–8 m bgl). Monitoring bores installed in 2024 south of the TSF2 footprint provide limited trend data but will be essential for detecting future seepage movement toward Savory Creek. Given the presence of nearby sensitive receptors, including Savory Creek and localised native vegetation, the potential impacts to these receptors have been further considered in Section 3.3.4 of this report. Figure 9 below shows the

monitoring bore network.

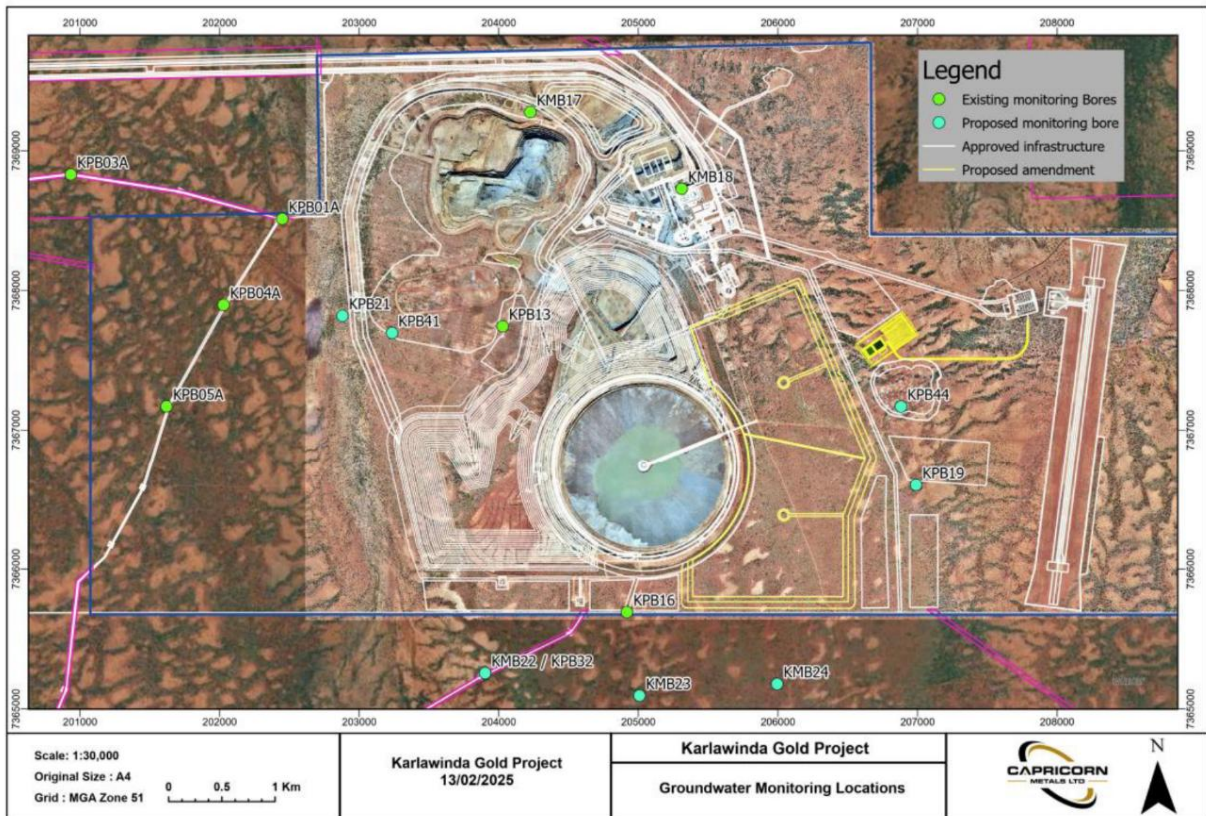


Figure 9: Groundwater monitoring bore suite (Source, Capricorn Metals Ltd, 2025)

3.2.2.3 Geochemical behaviour and oxidation potential

The department notes that acid-forming tailings which are allowed to oxidise are at increased risk of producing acidic and/or metalliferous seepage, thereby elevating the potential impacts of any seepage that migrates through the TSF base or embankments.

Technical advice provided by the internal technical experts indicates that there is uncertainty around how fast the PAF tailings will oxidise as the static tests that were undertaken could not determine the rate at which ferromagnesian minerals in the tailings would neutralise the acidity that would be produced by the oxidation of sulfide minerals.

This limitation means the long-term geochemical behaviour of the tailings remains uncertain and can only be resolved through kinetic testing conducted over an extended operational period. On this basis, it is likely that the works approval will include conditions requiring long-term kinetic testing of PAF tailings during time-limited operations to better characterise seepage chemistry and inform ongoing regulatory controls.

3.2.2.4 Existing seepage from TSF1

Monitoring data from TSF1 indicates elevated concentrations of metals and metalloids in both supernatant water and adjacent groundwater, with copper and arsenic exceedances against ANZECC guideline values. The 2024–2025 Annual Environmental Report (AER) recorded copper concentrations in decant water ranging from 2.1 mg/L to 22 mg/L, significantly above the licence limit of <1 mg/L. Groundwater monitoring also identified copper exceedances at bore KMB18 (0.002 mg/L and 0.0016 mg/L) and KPB41 (0.021 mg/L). As discussed under section 2.4.2, the applicant currently treats the TSF1 decant water using ferrous sulphate and hydrogen peroxide, supported by two carbon absorption tanks.

Chromium concentrations in groundwater averaged 0.0074 mg/L during the reporting period, while arsenic consistently exceeded ANZECC guideline values at bore KPB16 and was detected in decant water at 1.4 mg/L and 3.3 mg/L during March and April sampling events. The trend analysis graph provided in the ambient groundwater chemistry data during operations from 2020 to 2025 demonstrates a progressive increase in groundwater arsenic concentrations at KPB16 since TSF1 commenced operation in 2020, is a strong indicator of metalliferous seepage occurring from TSF1. Given that groundwater flow is directed southward due to mounding beneath TSF1, KPB16 is likely situated along a preferential seepage pathway, although the full extent and direction remain uncertain.

Noting radial seepage is likely to be occurring from TSF1 and that seepage is likely to occur once TSF2 commences operation, the cumulative impacts of two TSF's are considered in the risk assessment of seepage occurring as a result of the new TSF. These findings confirm active seepage pathways in the vicinity of TSF1. With TSF2 planned immediately east of TSF1, there is a cumulative risk to groundwater quality that warrants stringent seepage management and monitoring controls.

3.3.3 Seepage Management and Monitoring

3.3.3.1 Targeted seepage and investigation monitoring program

To address uncertainty regarding existing seepage pathways, the applicant proposes:

- installation of eight nested monitoring bore locations (Sites 1-8), each comprising shallow and deep screens;
- conversion of existing RC test holes KBRC2441 (Site 1) and KBRC2440 (Site 8) to nested monitoring bores (already completed);
- completion of a ground-based EM geophysical survey to identify conductive anomalies consistent with seepage movement.

These measures will inform any additional monitoring required to characterise subsurface flow.

This network also includes the conversion of existing RC test holes KBRC2440 and KBRC2441 into nested groundwater monitoring bore sites, with one shallow and one deep bore at each location, to enable comparison of arsenic concentrations with KPB16 and improve understanding of groundwater conditions in the vicinity of TSF1 and TSF2. The locations of Sites 1–8, including the existing converted monitoring bores (Sites 1 and 8) and the newly required nested monitoring bores (Sites 2–7), are illustrated in Figure 10.

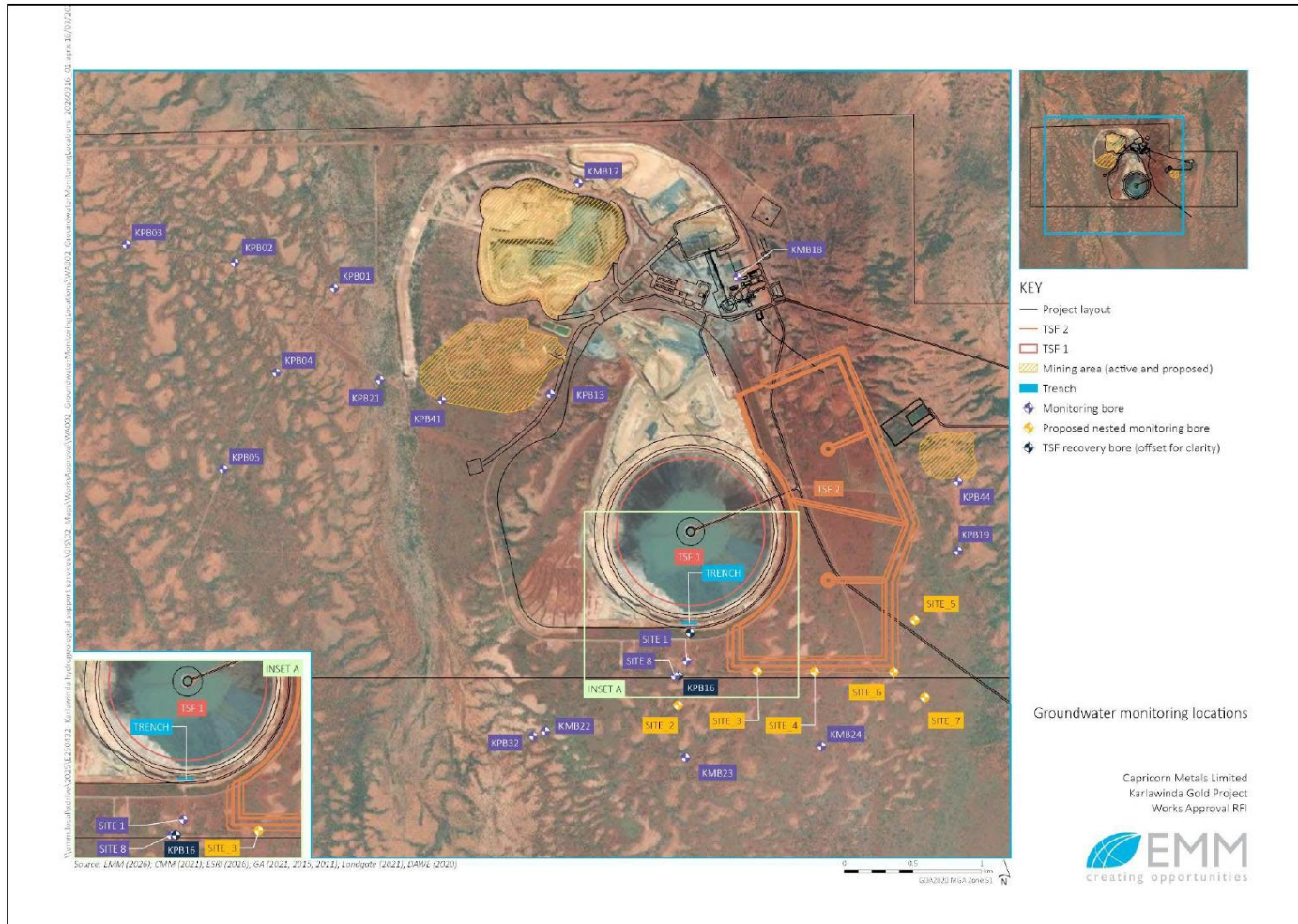


Figure 10: Proposed monitoring bore network for seepage investigation program (Source, EMM Consulting, 2025)

3.3.3.2 TSF2 seepage management

The applicant is proposing the following controls for mitigating the risk of seepage from TSF2 impacting nearby environmental receptors:

- the foundation layer of the TSF will be compacted to achieve a minimum permeability value of 1×10^{-7} m/s;
- QA/QC permeability testing will be performed to confirm the permeability of the foundation upgrade;
- inclusion of a cut-off trench under the embankment;
- groundwater monitoring bores downstream of TSF2;
- installation of eight VWPs internally within TSF2;
- optimising water returns to the plant;
- minimising the size of the water pond; and
- incorporation of TSF2 in the existing Seepage Management Plan.

3.3.4 DWER Assessment and Regulatory Controls

In consideration of the TSF's proximity to sensitive environment receptors (Table 5 of this report), these receptors are at risk of impacts from seepage once TSF2 becomes operational. On this basis, the consequence rating for seepage impacts is considered '**major**'.

Groundwater to the south of the TSF is shallow (approximately 6–8 mbgl), providing a limited attenuation zone for seepage and increasing the likelihood of groundwater mounding once tailings deposition begins. These shallow areas also align with the direction of existing mounding from TSF1, making groundwater levels a key determinant of potential seepage migration.

In consideration of:

- High PAF content (77%) of tailings to be deposited into TSF2;
- evidence of ongoing metalliferous seepage from TSF1 and the cumulative risk created by constructing TSF2 immediately adjacent to TSF1; and
- the water-balance assessment indicating a return-water rate of only ~60%.

The department considers there to be a high risk of tailings seepage further contaminating soil and groundwater quality and potentially impacting Savory Creek. The likelihood is therefore considered '**possible**'.

The applicant stated that seepage recovery bores were not considered for TSF2 on the basis that groundwater modelling indicates seepage would flow toward the mine void. However, as outlined in Section 3.3.2, groundwater south of TSF2 flows towards Savory Creek, not solely toward the mine void. The overall risk rating for seepage impacts to nearby receptors is considered '**high risk**'. DWER will apply additional regulatory controls to manage seepage as detailed in Table 9.

Table 9: DWER regulatory controls (seepage)

Condition/control	Justification
<p><u>TSF2 Critical Containment infrastructure construction requirements</u></p> <p>Condition 3 (Table 1) – Seepage recovery trench system and vibrating wire piezometers</p>	<p><u>Seepage Recovery Trench System</u></p> <p>Past seepage at TSF1 shows that prevention measures alone are not fully reliable. With TSF2 located on the premises boundary, any uncontrolled seepage would quickly migrate offsite and beyond operational control. A downstream seepage recovery trench provides a necessary secondary barrier to intercept seepage before it leaves the site, reducing the risk of offsite impacts.</p> <p><u>Vibrating Wire Piezometers</u></p> <p>The applicant has proposed installation of eight piezometers to give an early warning for seepage (and for assessment of stability etc.). Installation and monitoring of piezometers have been placed on the works approval regulatory controls.</p>
<p><u>Specified actions</u></p> <p>Condition 6 – Geophysical investigation and Seepage Management and Recovery plan</p>	<p><u>Geophysical investigation</u></p> <p>The geophysical investigation is required to determine the existing extent of seepage from TSF1 and to inform the siting of additional groundwater monitoring bores. Radial seepage is likely to be occurring from TSF1, and seepage is expected to occur once TSF2 commences operation. With TSF2 proposed immediately east of TSF1, there is a cumulative risk to groundwater quality that cannot be adequately characterised by point-based monitoring alone. The investigation supports identification of active seepage pathways and ensures appropriate seepage management and monitoring controls are implemented to prevent offsite impacts.</p> <p><u>Seepage Management and Recovery Plan</u></p> <p>A Seepage Management and Recovery Plan (Plan) is required to manage the elevated risk of seepage associated with TSF1 and the proposed TSF2, noting that groundwater contamination is already occurring at the premises and that TSF2 is located in close proximity to the Savory Creek system. Given the cumulative seepage risk posed by the two facilities and the location of TSF2 near the boundary of the prescribed premises, a structured and integrated framework is necessary to ensure seepage is detected, managed and recovered in a timely manner. The Plan provides assurance that seepage will be controlled within the premises and will not result in offsite impacts to groundwater quality, native vegetation or the Savory Creek drainage system.</p>
<p><u>Tailings characterisation</u></p> <p>Conditions 7 and 8 – Kinetic acid-based accounting test during TLO and reporting</p>	<p><u>Acid-Mine Drainage Investigation</u></p> <p>The static tests did not determine acid-neutralisation rates, leaving uncertainty around how quickly the tailings will oxidise and the severity of any acid generation over time. This makes it difficult to fully assess the future risk of acidic and/or metalliferous seepage from the TSF. To address this, the applicant will be required to undertake long-term kinetic testing during time-limited operations so the long-term behaviour of the tailings can be better understood and the risk of acidic and/or metalliferous seepage can be reduced in the future.</p>

Condition/control	Justification
<p><u>Tailings characterisation</u></p> <p>Conditions 9 and 10 – Kinetic leach testing during TLO and reporting</p>	<p><u>Kinetic Leach testing</u></p> <p>Noting that the underlying and surrounding groundwater use is agricultural—with the potential for future livestock consumption—and that there is uncertainty around the groundwater/surface-water connection to the nearby drainage line to the south, kinetic leach testing is required. This testing will characterise the leaching behaviour of Contaminants of Potential Concern and provide an indication of how groundwater quality may deteriorate when seepage occurs.</p>
<p><u>Infrastructure and equipment requirements during time limited operations</u></p> <p>Condition 21– Decant water recovery system</p>	<p><u>TSF2 decant water recovery system</u></p> <p>This condition has been included to minimise the risk of groundwater contamination arising from seepage from TSF2. The TSF2 water balance indicates that a substantial volume of water is likely to remain within deposited tailings under average operating conditions, increasing seepage potential, particularly given the high proportion of potentially acid forming (PAF) tailings and shallow groundwater south of TSF2. Requiring the decant water recovery system to be operated will maximise recovery and minimise retained water to reduce pore water pressures, limit seepage through the TSF foundation and embankments, and support effective containment performance throughout operations.</p>
<p><u>Groundwater monitoring</u></p> <p>Condition 5 – groundwater monitoring well construction</p> <p>Condition 11 – groundwater monitoring prior to time limited operations</p> <p>Conditions 7, 29, 30 and 31 – groundwater monitoring, limits and reporting</p>	<p><u>Groundwater monitoring well construction</u></p> <p>The applicant has proposed the installation of eight new nested groundwater monitoring bores, based on advice from CMW Consulting, to improve spatial coverage and characterise groundwater flow directions and vertical gradients to the south of TSF1 and TSF2. Installation of these monitoring bores has been included on the works approval as a regulatory control.</p> <p>DWER notes that the results of the EM survey will assist in identifying appropriate locations for any additional monitoring bores required to further strengthen the seepage-assessment framework, improve detection coverage, and track the development and migration of any seepage plume from TSF2.</p> <p><u>Groundwater monitoring prior to time limited operations</u></p> <p>Baseline groundwater monitoring is required to establish existing groundwater quality and groundwater level conditions prior to the commencement of activities associated with TSF2. Baseline groundwater monitoring is required to define existing groundwater conditions, account for existing contamination and seepage from TSF1, and provide a reference against which potential impacts from TSF2 can be identified and managed to prevent cumulative and offsite impacts.</p> <p><u>Groundwater monitoring during time limited operations</u></p> <p>Trigger levels and limits</p> <p>The most recent annual monitoring report and groundwater data provided for the last five years identified exceedances of the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZG, 2018) default guideline values for the protection of freshwater aquatic ecosystems for several parameters, indicating an increased risk of contamination to the receiving environment.</p>

Condition/control	Justification
	<p>The department notes that there are currently no trigger levels or limits specified on the licence for contaminants monitored in groundwater at the Tailings Storage Facility (TSF) bore network, with limits historically applied only to the tailings supernatant pond. Noting these exceedances, the formalisation of groundwater trigger levels and limits is required to strengthen compliance assessment, trend evaluation and environmental risk management.</p> <p>Trigger levels and limits for arsenic, chromium, copper, cyanide and zinc have been established in accordance with ANZG (2018), with triggers aligned to 95 per cent species protection values and limits aligned to 90 per cent species protection values to provide early warning and a clear compliance boundary.</p> <p>Additionally, to protect adjacent native vegetation and nearby drainage lines associated to Savory Creek, DWER has placed a standing water level limit of 4m bgl on the works approval. A trigger for management action at 6m bgl has also been conditioned.</p> <p>Additional parameters</p> <p>The parameters listed below have been added to manage and assess potential groundwater contamination arising from seepage from TSF2 at the premises, and to support early detection and effective regulatory response along identified groundwater pathways.</p> <p><i>Antimony and Tellurium</i></p> <p>Based on available information on the geological setting and mineralogy of the Karlawinda mine site, DWER's internal technical experts have recommended that antimony and tellurium be included in the groundwater monitoring analytical suite as elements of environmental concern. In the absence of national livestock drinking water guideline values, conservative regulatory limits have been derived using 10 times the Australian drinking water guideline values where available. Accordingly, a regulatory limit of 30 µg/L has been applied for antimony. As no Australian drinking water guideline exists for tellurium, an interim WHO guideline value of 10 µg/L has been adopted, resulting in a regulatory limit of 100 µg/L for groundwater at the premises.</p> <p><i>Boron</i></p> <p>Boron has not historically been included in the monitoring suite; however, its inclusion is considered appropriate given the nature of the regulated activities and the potential for boron to be mobilised and discharged to the receiving environment. The ANZG, 2018 identify boron as a toxicant of concern and provide default guideline values for the protection of freshwater aquatic ecosystems. In the absence of baseline data, ongoing monitoring is required to characterise background conditions, identify potential trends, and support early detection of any emerging risk.</p> <p><u>Groundwater monitoring limit exceedances</u></p> <p>Given the identified high risk of groundwater contamination from TSF2 seepage and the presence of sensitive environmental receptors, conditions requiring the recording, investigation, corrective action and timely reporting of exceedances are necessary to ensure emerging impacts are managed promptly. These requirements provide a clear and enforceable mechanism to assess the significance of</p>

Condition/control	Justification
	exceedances, confirm containment performance and implement corrective measures before off-site impacts occur. Mandatory reporting to the CEO, supported by detailed information on impacts, investigations and preventative actions, is necessary to enable effective regulatory oversight and minimise the likelihood of pollution or environmental harm.

4. Consultation

Table 10 provides a summary of the consultation undertaken by the department.

Table 10: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 7 July 2025.	None received	N/A
Department of Mines, Petroleum and Exploration (DMPE) advised of proposal on 7 July 2025 and 1 October 2025	<p>The DMPE provided a response on 13 October 2025 advising that:</p> <ul style="list-style-type: none"> • DMPE's primary closure objective is to ensure mine features are physically safe, geotechnically stable, geochemically non-polluting, capable of supporting an agreed post-mining land use, and do not create unacceptable State liability; • DMPE will continue to review the Mine Closure Plan (MCP) throughout the life of mine, including the management of potential acid and metalliferous drainage (AMD) from potentially acid forming (PAF) tailings; • Radial seepage from TSF1 was known at the time of mining proposal approval, and DMPE considers the approval of the TSF2 design to remain valid; • A third-party technical review of the TSF2 Design Report was undertaken as part of the Mining Proposal assessment, and LGIRS will regulate TSF stability during operations; • Clearing Permit CPS 10252/1 was granted on 24 August 2023, and the amendment application (CPS 10252/2) is 	The department notes the comments provided by DMPE and has considered these matters during the assessment of the application and will continue to consider these matters through ongoing regulation of the premises.

	<p>currently under assessment; and</p> <ul style="list-style-type: none"> DMPE considers the proposed activities at the Karlawinda Gold Project to be acceptable and will continue to regulate the site. 	
<p>Karlka Nyiyaparli Aboriginal Corporation (KNAC) advised of proposal on 7 July 2025</p>	<p>The KNAC provided a response on 28 July 2025 and advised that had not been consulted by the applicant in relation to the Works Approval application, despite being listed as a relevant stakeholder in the supporting documentation. The following concerns were also raised:</p> <ul style="list-style-type: none"> KNAC had not been given the opportunity to review the most recent Mining Proposal (MP) or MCP; there has been insufficient consultation regarding closure design and post-mining transition; potential impacts of excess water discharge to the TSF on tailings storage; and KNAC queried whether the department intends to establish a trigger or threshold limit for boron concentrations. 	<p>The Department notes advice from KNAC that consultation with the applicant has not occurred. Consultation with relevant Aboriginal Corporations is the responsibility of the applicant in accordance with obligations under the <i>Aboriginal Heritage Act 1972</i>.</p> <p>The applicant is encouraged to engage directly with the Aboriginal Corporation to discuss the proposal and address any outstanding matters. The Department's role does not extend to undertaking consultation on behalf of applicants.</p> <p>The department notes the comments raised by the KNAC in relation to the MP and MCP is the responsibility of the applicant and is regulated separately by DMPE in accordance with its own legislative and approval processes. The department's role does not extend to facilitating consultation between the DMPE and the Aboriginal Corporation.</p> <p>The department notes the comment regarding potential impacts from excess water discharge. This matter has been addressed following a change in the scope of the application, with Cell A of TSF2 no longer proposed to be used as a temporary water storage dam. The updated water balance demonstrates that all water will be reused on site for operational requirements, and no excess water discharge is proposed.</p> <p>The department notes the query regarding boron concentrations. This matter has been addressed through the inclusion of boron in the groundwater monitoring analytical suite, to enable assessment of baseline conditions, trend analysis and early detection of any potential groundwater impacts.</p>

Local Government Authority advised of proposal on 7 July 2025	The Shire of Meekatharra replied on 6 August 2025 advising that the application was considered at the Shire's Ordinary Council meeting on 26 July 2025, and that Council resolved not to oppose the application.	The department notes the comments provided by Shire of Meekatharra.
Applicant was provided with draft documents on 27 February 2026.	Refer to Appendix 1.	Refer to Appendix 1.

5. Conclusion

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

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

Condition/ Section of Decision Report	Summary of applicant’s comment	Department’s response
Works Approval		
Condition 3 (Table 1): Critical containment infrastructure design and construction requirements – (Item 3(j)) – installation of discharge spigots at nominal 20 m intervals along the tailings distribution pipeline	The applicant advised that discharge spigots will be installed at nominal 40–50-metre intervals along the tailings distribution pipeline located on the upstream perimeter embankment crest. The applicant noted that this spigot spacing is intended to achieve higher in situ tailings densities, increased water returns, and maintenance of embankment stability.	Table 1, Item 3 has been updated to reflect the applicant’s additional information regarding discharge spigot spacing. This amendment does not change the risk assessment or the conclusions of the decision report.
Condition 3 (Table 1): Critical containment infrastructure design and construction requirements – (Item 8) TSF2 surface water management The department requested that the applicant advise on the sediment and stormwater controls proposed for surface water management, and to provide a figure detailing these controls.	The applicant advised that a sediment and stormwater catchment trench will be installed around TSF 2, with runoff directed to a sedimentation pond, as detailed in Attachment 6.	Condition 3 (Table 1), Item 8 and Condition 23 (Table 6) have been amended to require construction and ongoing maintenance of a sediment and stormwater trench around TSF2 with runoff directed to a sedimentation pond (Figure 7).
Condition 4 (Table 2): Table 2: Design and construction/installation requirements - Second processing plant (PP2) and associated infrastructure The department requested that the applicant advise on the dust collection systems proposed for installation as part of the PP2 works.	The applicant advised that the DRS-supplied Dust Stop dust suppression/collection system currently installed at PP1 will be replicated at PP2.	Condition 4 (Table 2) has been updated to specify the dust suppression and collection systems required to be installed for the crushing circuit and transfer points. The operational requirements for PP2 relating to the dust suppression and collection system under Condition 23 (Table 6) have been updated to align with the specified dust control system.
Table 2: Design and construction/installation requirements - Treated wastewater irrigation area The Department requested that the applicant provide an updated figure illustrating the WWTP upgrade, including treatment ponds and the treated wastewater irrigation area.	The applicant provided Figure 1: WWTP and Irrigation Field in Attachment 1, as requested.	Figure 6 of Schedule 1: Maps in the works approval has been updated accordingly.

<p>Condition 24 (Table 7): Table 7: Authorised emission/discharge points</p> <p>The department requested that the applicant provide an updated map for Figure 1 showing the new location of the treated wastewater irrigation field.</p>	<p>The applicant provided Figure 1: WWTP and Irrigation Field in Attachment 1.</p>	<p>The department updated Table 7 to reference Figure 6, which reflects the updated location of the treated wastewater irrigation field.</p>
<p>Schedule 1: Maps – Figure 5: Proposed additional groundwater monitoring bores at TSF1 and TSF2</p> <p>The department requested that the applicant provide an updated figure showing the locations of the proposed additional groundwater monitoring bores (Sites 1–8) and all existing groundwater monitoring bores at the premises.</p>	<p>The applicant provided Figure 2: Groundwater monitoring bores in Attachment 2.</p>	<p>Following submission of Figure 2 to update Figure 5, the department notes that the figure demonstrates that two of the eight nested groundwater monitoring bores proposed under Table 3, being existing RC test holes KBRC2440 (Site 8) and KBRC2441 (Site 1) have already been converted to nested groundwater monitoring bores. Accordingly, only the remaining nested monitoring bores (Sites 2–7) are required to be newly installed. Table 3 has been amended to remove Sites 1 and 8.</p> <p>Tables 5 and 10 have been updated to reflect this change, with Sites 1 and 8 now listed under existing groundwater monitoring wells. Monitoring bore names have also been updated to align with the revised Figure 5, including removal of the “A” suffix (e.g. KPB01A amended to KPB01) to ensure consistency across figures, tables and monitoring requirements. Section 3.3.3.1 and Figure 10 of the decision report have been updated to reflect the revised groundwater monitoring bore network.</p>
<p>Schedule 3: Premises boundary coordinates</p> <p>The department requested that the applicant provide the GPS coordinates for the premises boundary in GDA2020 format.</p>	<p>The applicant provided the GPS coordinates for the premises boundary in GDA2020 format.</p>	<p>Table 12 of Schedule 3 has been updated with the GPS coordinates for the premises boundary.</p>
<p>Decision Report</p>		
<p>Section 2.4.1.2: Proposed Second Processing Plant (PP2)</p>	<p>The applicant advised that the proposed PP2 configuration has been updated to include six CIL tanks instead of four and provided an updated Figure 3 (Simplified process diagram).</p>	<p>The department has reviewed the updated information and confirms that Figure 3 of the Decision Report has been updated to reflect the PP2 CIL circuit comprising six tanks, operating in parallel with the existing eight-tank CIL circuit. This amendment clarifies the process configuration only and does not change the scope of activities assessed or the conclusions of the risk assessment.</p>
<p>Section 2.4.2: Water Treatment Systems</p> <p>The applicant advised that treatment commenced in 2023; however, the Water Treatment System (WTS)</p>	<p>The applicant advised that chemical treatment of tailings decant water using hydrogen peroxide and ferrous sulphate commenced in October 2023. A permanent WTS, comprising two carbon adsorption tanks, was subsequently installed on 25</p>	<p>Section 2.4.2 was updated to clarify the timing of chemical treatment commencement and subsequent installation of the WTS, consistent with the applicant’s confirmation.</p>

<p>was installed in 2024. The department sought confirmation that 2024 is the correct installation year.</p>	<p>April 2024 to further reduce copper concentrations.</p>	
<p>Section 2.4.3.2: Embankment design and raises</p> <p>The department requested the applicant provide storage capacities in months for each stage of construction of TSF2.</p>	<p>The applicant provided an updated TSF2 Design Report (Rev 3), which includes storage capacities in months for each stage of TSF2 construction.</p>	<p>Table 1 of the decision report was updated to include this information.</p>
<p>Section 2.4.4.3: Wastewater treatment process</p>	<p>The applicant advised that the WWTP irrigation area has been increased from 0.3 ha to 1.3 ha to comply with the Department of Health 5 mm/day irrigation limit, with the updated design provided in Attachment 2: Karlawinda WWTP Works Approval – Rev B.</p>	<p>The department notes that the increase in the irrigation field size does not alter the environmental risks associated with the discharge of treated wastewater from the WWTP, as the assessed treatment capacity and discharge volumes remain unchanged. Section 2.4.4.3 and Figure 6 have been updated in the decision report to reflect this change.</p>
<p>Section 2.4.4.4 Figure 7: Water balance for WWTP upgrade</p> <p>The department requested an updated water balance for the WWTP upgrade that accounts for rainfall inputs, stormwater inflows, and available freeboard during peak inflow and extreme rainfall events.</p>	<p>The applicant advised that the WWTP design (Attachment 2, Rev B) has been assessed against a 1-in-10-year, 72-hour rainfall event and maintains 500 mm freeboard for each treatment pond. No stormwater infiltration into the sewer system is expected, and the WWTP irrigation area has been increased to 1.3 ha to comply with the Department of Health's 5 mm/day irrigation limit.</p>	<p>The department has reviewed the updated WWTP information provided in Attachment 2 (Rev B) and is satisfied that the design appropriately addresses rainfall, freeboard and irrigation requirements. Section 2.4.4.4 has been updated accordingly with this additional information.</p>
<p>Table 4: Proposed applicant controls for dust (construction)</p> <p>The department requested that the applicant advise of the vehicle speed limits proposed to be implemented at the premises to reduce dust generation.</p>	<p>The applicant advised that vehicle access to construction areas is restricted, with speed limits of 20 km/h at PP2 and the WWTP, and 40 km/h at TSF2 during construction. Additional dust suppression is undertaken through the frequent use of water carts.</p>	<p>Table 4 of the decision report has been updated to include the vehicle speed limits.</p>
<p>Table 4: Proposed applicant controls for Contaminated/ Sediment laden stormwater (construction and operation)</p> <p>The department requested confirmation of completion of landform armouring relevant to the management of sediment-laden runoff from construction activities, noting that this requirement is reflected in Licence L9324/2022/1, and requested submission of an Environmental Compliance</p>	<p>The applicant advised that landforms are still under construction and not yet finalised. Where completed to final design, landforms have been armoured with competent rock for stormwater management.</p>	<p>Armouring of landforms with competent rock was originally included as an applicant control under Works Approval W6143/2018/1 to manage sediment mobilisation from disturbed soils and earthworks near the Savory Creek system. This requirement was subsequently carried forward into Licence L9324/2022/1, and confirmation of its implementation was sought from the applicant.</p> <p>For this assessment, the Department has considered the current TSF2 proposal and supporting design documentation, which identifies rock armouring of TSF2 embankments as an erosion control measure to reduce sediment-laden runoff during rainfall</p>

<p>Report, if applicable.</p>		<p>events. Accordingly, Table 4 includes armouring of TSF2 embankments as a sediment-runoff control, with Condition 3 (Table 1) and Condition 23 (Table 6) amended to require installation during construction and ongoing operational maintenance, respectively.</p>
<p>Table 4: Proposed applicant controls for dust (operation)</p> <p>The department notes that the applicant has not specified what corrective actions would be implemented in the event of dust control failure, nor outlined any contingency measures to verify and maintain the effectiveness of dust controls. The Department requested that the applicant provide further detail.</p>	<p>The applicant referred to Attachment 4 (Filenote – KGP & KEP Dust Suppression System) and advised that, in the event of the primary dust suppression system failing, a secondary system of water sprays at transfer points will be activated. Ongoing monitoring of the dust suppression system will be undertaken through daily inspections and maintenance by site personnel, with additional monthly inspections conducted by the equipment manufacturer (DRS).</p>	<p>The department notes that the applicant has provided additional information regarding dust suppression through Attachment 4, including the use of a secondary dust suppression system and routine inspection and maintenance regimes. The applicant's dust control measures in Table 4 have been updated accordingly. While specific trigger criteria or escalation measures have not been detailed, the Department considers that the combination of primary and secondary dust suppression systems, supported by regular inspections and manufacturer oversight, is sufficient to manage dust emissions during operation.</p>
<p>Table 4: Proposed applicant controls for dust (operation)</p> <p>The department requested that the applicant provide detail on the proposed dust collection system, including their key components and how they would control dust emissions.</p>	<p>The applicant referred to Attachment 4 and advised that the DRS Dust Stop dust suppression system has been successfully used at PP1 to manage dust emissions, and that additional dust suppression or collection systems could be retrofitted in the future if dust impacts are not adequately controlled.</p>	<p>The department notes that Attachment 4 provides detail on the DRS Dust Stop dust suppression/collection system and its key components. The dust collection system control has been updated with this additional information.</p>
<p>Section 3.3.1.3 Water Balance Analysis for TSF2</p> <p>The Department requested that the applicant provide an updated water balance for TSF2 Cells A and B that reflects the current proposal for both cells to be used for tailings deposition.</p>	<p>An updated water balance for TSF2 Cells A and B has been provided (Appendix H) to reflect the current proposal for both cells to be used for tailings deposition only.</p>	<p>The Department has reviewed the updated water balance for TSF2 Cells A and B and is satisfied that it reflects the current deposition proposal and demonstrates a net water deficit, with no requirement for temporary water storage. Section 3.3.1.3 has been updated to reflect the water balance analyses for TSF2 Cell A and Cell B, and Tables 7 and 8 have been updated in the report accordingly.</p>