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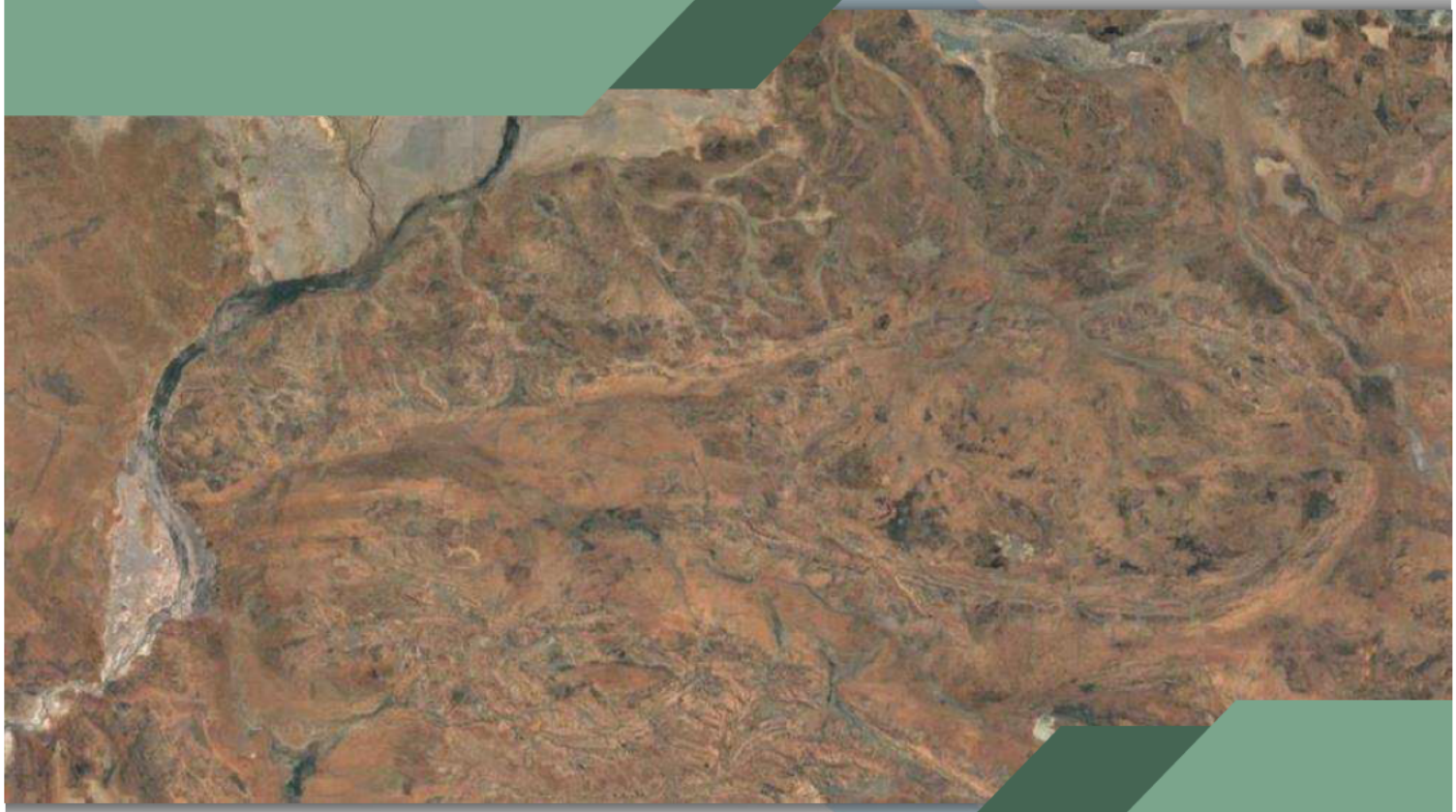

BROWNS RANGE RARE EARTHS PROJECT

WORKS APPROVAL APPLICATION SUPPORTING DOCUMENT CATEGORY 5 AND CATEGORY 52

15 January 2026

Prepared by:

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Prepared for:

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Disclaimer:

ACKNOWLEDGEMENT OF COUNTRY

Preston Consulting acknowledges the Traditional Owners of the lands on which it works, in particular the Whadjuk People of the Noongar Nation and, the Jaru and Tjurabalan People, the Traditional Owners of the land on which the activity is proposed. Preston Consulting pays its respects to Aboriginal and Torres Strait Islander Peoples Past and Present, and recognise their continuing connection to land, waters, sky, culture, and community.

DOCUMENT CONTROL

Document Title	Works Approval Application – Browns Range Project	
Document Number	NML-BRP-WAA-01	
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INTRODUCTION

Northern Minerals Limited (Northern Minerals) is developing the Browns Range Project (the Project), a heavy rare earth elements mine and ore processing facility in the Kimberley region of Western Australia (WA). The Project is located approximately 160 kilometres (km) southeast of Halls Creek, WA near the Western Australia / Northern Territory border (Figure 1).

The Project lies within Mining Leases and Miscellaneous Licences issued or pending under the *Mining Act 1978* (Mining Act).

The Project was assessed by the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* (WA; EP Act), and Ministerial approval was issued on 20 October 2014 (Ministerial Statement (MS) 986). Three changes to the Project have since been approved under Section 45C of the EP Act, with the most recent being in 2024. This works approval application is aligned with the current approved MS 986.

The Project will be classified as a Prescribed Premises under Category 5 (processing or beneficiation of metallic or non-metallic ore) and Category 52 (electric power generation), of Schedule 1 of the Environmental Protection Regulations 1987 (EP Regulations). The proposed prescribed activities are:

- Ore processing and tailings deposition infrastructure; and
- Onsite power generation infrastructure.

This Works Approval Supporting Document has been developed to provide additional information to support a Department of Water and Environmental Regulation (DWER) Application form: Works Approval/Licence/Renewal/ Amendment/Registration v16, 2022 (DWER, 2022).

This document includes the attachments (as required by the application form) to support the works approval application:

- Attachment 1A & 1B (Proof of occupier status, Australian Securities and Investment Commission (ASIC) company extract);
- Attachment 2 (Premises map);
- Attachment 3A & 3B (Environmental commissioning plan and Proposed activities);
- Attachment 5 (Other approvals and consultation documentation);
- Attachment 6A (Emissions and discharges);
- Attachment 7 (Siting and location); and
- Attachment 8 (Category checklist (tailings storage facilities)).

ATTACHMENT 1A: PROOF OF OCCUPIER STATUS

Department of **Mines, Petroleum and Exploration**
GOVERNMENT OF WESTERN AUSTRALIA

eMiTS MINERAL TITLES ONLINE

MINING TENEMENT SUMMARY REPORT

MINING LEASE 80/650 **Status: Live**

TENEMENT SUMMARY

Area: 10,458.06121 HA **Death Reason :**
Mark Out : 21/11/2024 12:01:00 **Death Date :**
Received : 29/11/2024 10:05:00 **Commence :** 09/09/2025
Term Granted : 21 Years **Expiry :** 08/09/2046

CURRENT HOLDER DETAILS

Name and Address
NORTHERN MINERALS LIMITED
MCMAHON MINING TITLE SERVICES PTY LTD, C/- MCMAHON MINING TITLE SERVICES PTY LTD, PO BOX 6301, EAST PERTH, WA, 6892, [redacted]

DESCRIPTION

Locality: BULARA
Datum: Datum situated at GDA 94 co-ordinates in Zone 52
7,917,612.363 mN 492,976.383 mE
Boundary: From Datum GDA 94 co-ordinates in Zone 52
7,917,613.352 mN 496,488.192 mE 7,912,624.812 mN
496,489.130 mE 7,912,624.999 mN 497,690.001 mE
7,911,146.936 mN 497,690.001 mE 7,911,150.500 mN
496,493.200 mE 7,899,172.216 mN 496,491.670 mE
7,899,171.801 mN 494,737.505 mE 7,901,015.930 mN
494,736.981 mE 7,901,013.688 mN 489,473.959 mE
7,903,933.561 mN 489,471.950 mE 7,903,933.198 mN
488,850.000 mE 7,906,545.679 mN 488,850.002 mE
7,906,546.060 mN 489,470.822 mE 7,908,391.087 mN
491,224.816 mE 7,913,354.899 mN 491,222.478 mE
7,913,354.900 mN 490,559.999 mE 7,916,119.998 mN
490,560.001 mE 7,916,119.998 mN 492,976.157 mE
BACK TO DATUM

Area :

Type	Dealing No	Start Date	Area
Granted		09/09/2025	10,458.06121 HA
Applied For		21/11/2024	10,459.00000 HA

SHIRE DETAILS

Shire	Shire No	Start	End	Area
HALLS CREEK SHIRE	3920	29/11/2024		10,458.06121 HA

RENT STATUS

Due For Year End 08/09/2026: [redacted]
Due For Year End 08/09/2027:

Created 17/09/2025 10:13:56 Requested By: Richard Barker/Page 1 of 2

ATTACHMENT 1B: ASIC COMPANY EXTRACT

ASIC
Australian Securities & Investments Commission

Australian Company

NORTHERN MINERALS LIMITED
ACN 119 966 353

Extracted from ASIC's database at AEST 15:11:42 on 25/11/2024

Company Summary	
Name:	NORTHERN MINERALS LIMITED
ACN:	119 966 353
ABN:	61 119 966 353
Registration Date:	31/05/2006
Next Review Date:	31/05/2025
Former Name(s):	NORTHERN URANIUM LIMITED
Status:	Registered
Type:	Australian Public Company, Limited By Shares
Locality of Registered Office:	WEST PERTH WA 6005
Regulator:	Australian Securities & Investments Commission

Further information relating to this organisation may be purchased from ASIC.

ATTACHMENT 2: MAP OF PRESCRIBED PREMISES

Figure 1 provides the regional location of the Project and the extent of the Prescribed Premises boundary. Figure 2 shows the proposed location of the Processing Plant, Tailings Storage Facility and potential emission points.

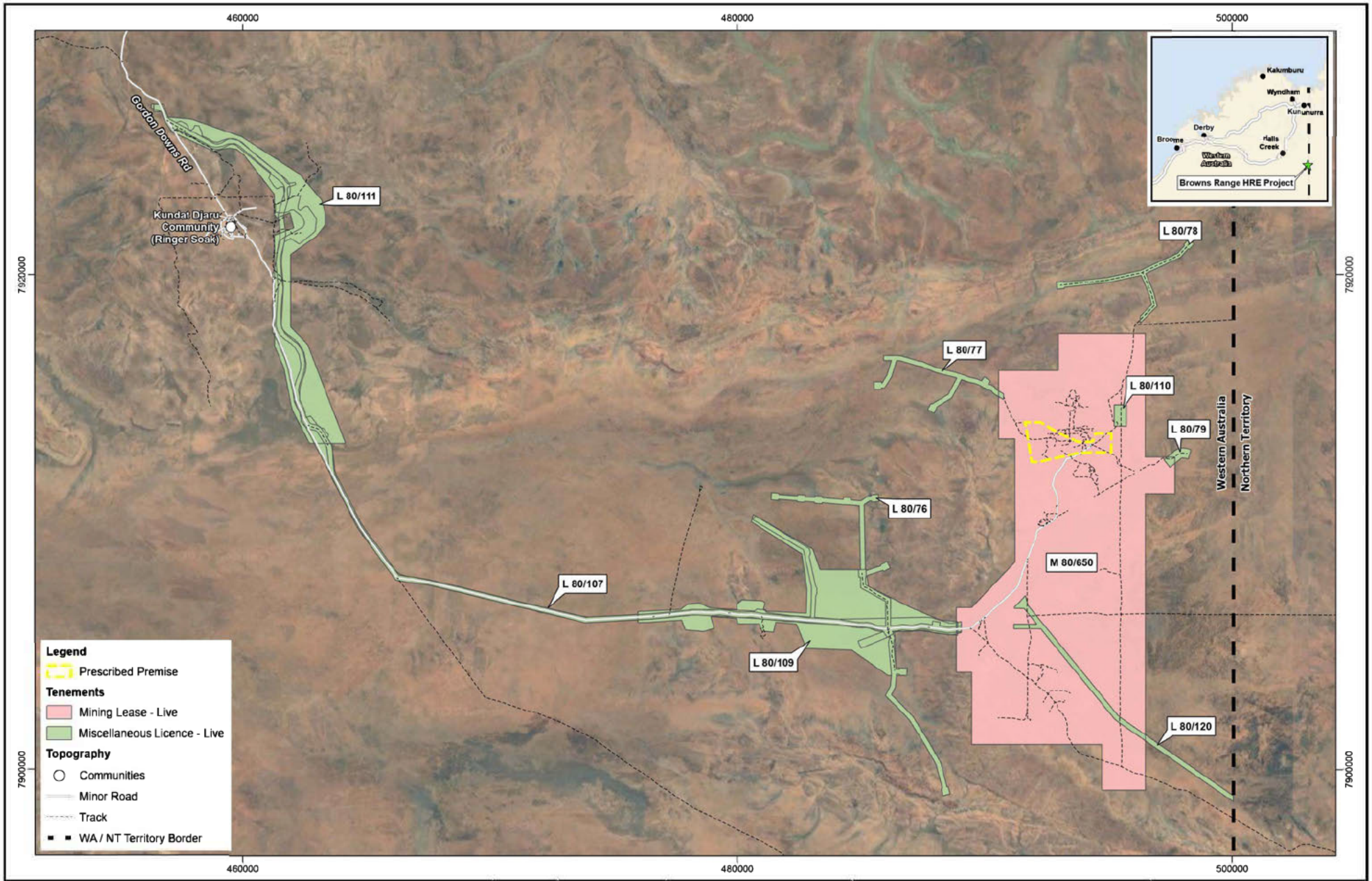

Figure 1: Regional location of the Project

N

0 1.5 3km

Scale 1:200,000
MGA94 (Zone 52)

NORTHERN MINERALS

Regional Location and Prescribed Premise

Figure: a2969_BR_WorkAp_PPPG_F001_01_LocPrescPrem

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Date: 12/12/2025

Page: A4

Rev: A

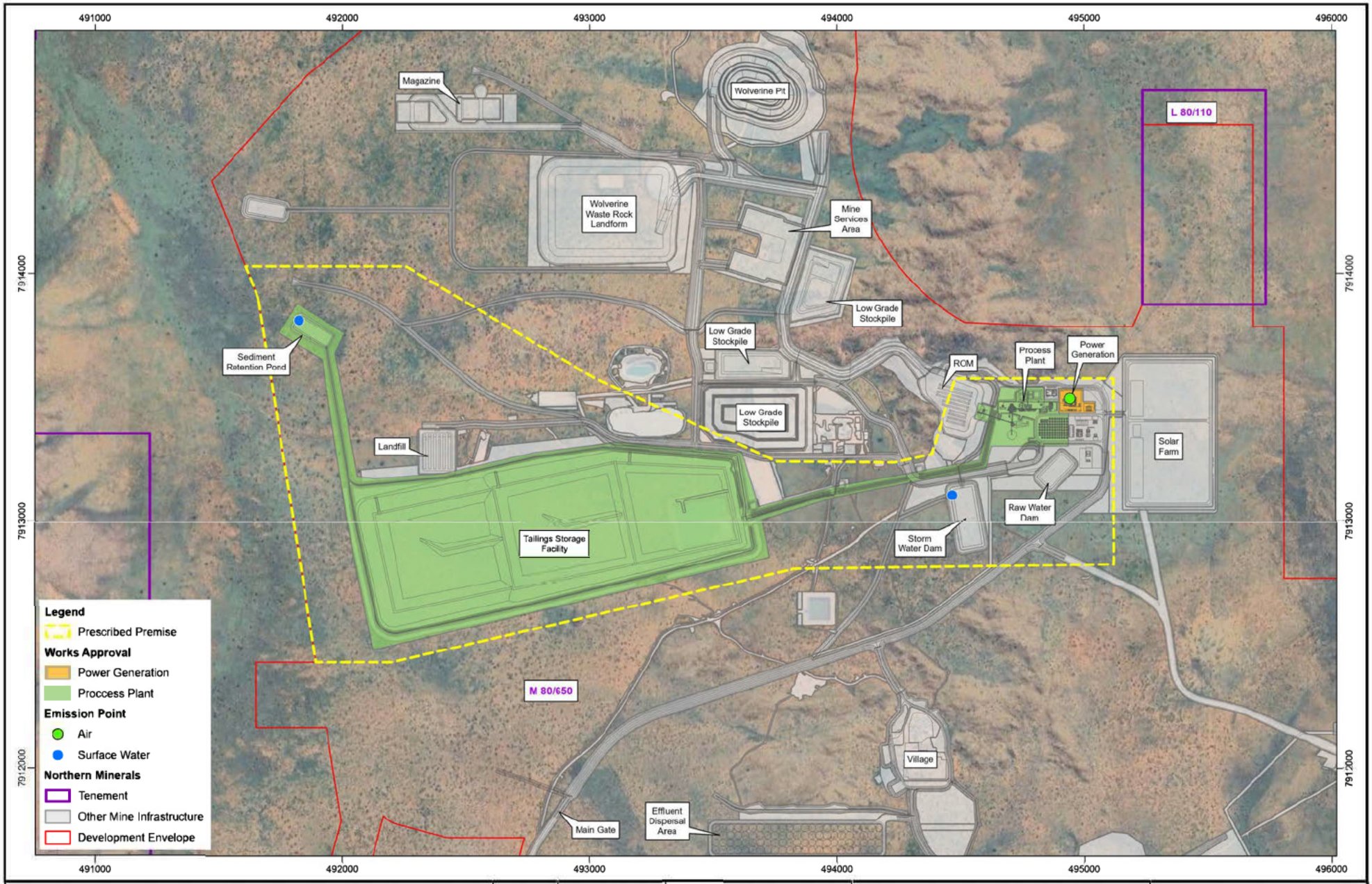


Figure 2: Map of Processing Plant and TSF locations within the Prescribed Premises

N

0 150 300m

Scale 1:20,000
MGA94 (Zone 52)

NORTHERN MINERALS

Site Layout

Figure: a2969_BR_WorkAp_PPPG_F002_01_SiteLay

[redacted]

Date: 6/01/2026

Page: A4

Rev: B

ATTACHMENT 3A: ENVIRONMENTAL COMMISSIONING PLAN

The scope of on-site environmental commissioning includes the following activities:

- Filling chemical and fuel storage facilities;
- Testing then operating the power plant; and
- Process Plant testing and operation, including deposition to the Pilot TSF and new Cell 1.

NTU will utilise an experienced commissioning contractor to develop a technical commissioning plan and procedures and appoint a commissioning manager to oversee the works. The commissioning team will be involved in power plant and process plant design reviews to de-risk commissioning and operational activities.

Table 1 presents a proposed sequence of commissioning activities relevant to environmental parameters.

Validation monitoring will be undertaken during environmental commissioning as outlined in Table 2, to demonstrate that infrastructure will perform according to manufacturer's specification. Validation monitoring will ensure the equipment and treatment process is operating effectively.

It should be noted that during environmental commissioning, processing waste and tailings discharged to the TSF may on occasions have variable contaminant concentrations. This is unavoidable but short-term (approximately six months) and monitoring will occur frequently during this period (see above). As the TSF will be fully lined and with underdrainage seepage management, environmental impacts are not expected.

It is proposed that environmental commissioning and TLO be assessed as part of this WAA, with the licence being implemented at the end of TLO (separate application).

Table 1. Preliminary Commissioning Planning

Sequence	Activity	Estimated Duration	Inputs	Outputs
Pre-commissioning				
1.	Install water supply pipeline	2-3 months		nil
2.	Fill raw water pond	1 -2 days	Raw water	nil
3.	Fill power station diesel fuel tanks	1 week	Diesel fuel	Potential unplanned release of diesel
4.	Power station static testing for leaks before energising	1 - 2 days	Less flammable synthetic ester transformer oil such as Envirotemp 360 Fluid and coolant (transformer fluid).	Potential unplanned release of coolant, non-hazardous transformer fluid.
5.	Test diesel powered generators	24 hours	Diesel fuel	Electricity, diesel combustion fumes
6.	Process Plant construction verification: • confirmation of correct installation; • alignment checks; • megger testing; and • point to point testing.	1 – 2 months	nil	nil
Dry commissioning				
7.	Power Plant – energize under controlled conditions.	1-2 weeks	Diesel, oil, coolant, transformer fluid (see above), water.	Air emissions (NOx, CO, particulates), noise, commissioning fluids discharges (unplanned).
8.	Process plant - Confirm that the equipment is mechanically and electrically complete and ready to operate.	1-2 months	Nil	Nil
9.	Process plant - Confirm equipment motor direction, interlocks and system start up, shutdown and isolation.			
10.	Process plant - Construction engineers check electrical, mechanical system with NTU process trainers and operators.			
Wet commissioning				

Sequence	Activity	Estimated Duration	Inputs	Outputs
11.	Process plant - Water is introduced into the circuit and pumped around to ensure pipes, flanges and equipment do not leak.	1.5 months	Water	Potentially contaminated commissioning water.
12.	Process plant - Test and confirm conveyors are ready to accept material.		Nil	Nil
Time Limited Operations (process plant commissioning and power plant)				
1.	Power Plant - Operate diesel generators (hybrid with solar).	180 days	Diesel, oil, coolant, transformer fluid (see above), water.	Air emissions (NOx, CO, particulates), noise, commissioning fluids discharges (unplanned).
2.	Process plant - Ore and reagents are fed into the process.		Reagents, see Section 3B.3, Table 5.	Dust, Tailings and Rare Earth Concentrate (product). Potentially process slurry and reagents in the event of unplanned releases.
3.	Process plant - Tune control loops and confirm process control philosophy.			
4.	Process plant - Ramp up to nameplate capacity. NTU operators to be trained on how to start up and shut down the process and develop an understand how changes influence the steady state process.			

Table 2. Emissions management and monitoring during commissioning and TLO

Activity	Emissions/discharges	Controls	Monitoring
Earthworks and clearing vegetation	Dust	• Progressive clearing to minimise area open. • Water carts to dampen trafficable areas and stockpiles.	Daily inspections and visual assessment of dust emissions.
Storage and handling of hydrocarbons	Diesel (unplanned), oil, air emissions.	Fuel storage facility designed and constructed in accordance with AS1940:2017 and DG Licence, including: • Tank transfer points are self-bunded; • Tank installed in earthen bunds with HDPE-lined transfer areas; • Tank filling points with automatic shut-off when full. • Fire protection; • Emergency Response plan and training; and • Electronic incident and hazard reporting management system. Implement NTU Hydrocarbon Management Standard.	Monthly inspections of bulk fuel and chemical storage facilities.
Storage and handling of chemicals	Chemicals (unplanned).	Chemical storage facilities designed and constructed as per Australian Standard1940:2017. • Spill kits and incident response training. Implement NTU Chemicals Management Standard.	Monthly inspections of bulk fuel and chemical storage facilities.
Commission power plant.	Air emissions (Nox, CO, particulates), noise. Commissioning fluids (hydrocarbons, chemicals) discharges (unplanned).	• Self-bunded diesel generators, concrete-bunded transformers. • Provide environmental awareness and spill response training to commissioning personnel. • Introduce fuel under controlled conditions using drip trays and with spill kits. • Ensure emergency response equipment and procedures are active. Perform scenario tests.	• Continual visual monitoring and daily inspections by commissioning personnel. • Real-time alarms for abnormal emissions or leaks. • Confirm spill kits are accessible and stocked.
Wet commissioning Process Plant	Potentially contaminated commissioning water.	• Water will be either re-issued in the process via the process water dam or pumped into the TSF.	Continual visual monitoring by commissioning personnel.
TLO (initial operational checks)	Dust	• Water carts to dampen trafficable areas and stockpiles. • Water sprays/misters are designed for the crusher and conveyor transfer points.	Daily site inspections and visual assessment of dust emissions.

Activity	Emissions/discharges	Controls	Monitoring
		• Crushed ore conveyor reports to a bin via an enclosed transfer chute during normal operations. • Emergency stockpile - Crushed ore stockpile stacker will be fitted with a head-chute with water sprays at the head-end to minimise dust generation during stockpiling. Stockpile will be reclaimed by front-end loader to the crushed ore bin.	Weekly maintenance inspections of dust suppression equipment at the ROM and crusher.
	Tailings - planned	Discharged to engineered tailings storage facility designed and operated as per Tailings Storage and Permitting Report (Appendix 1).	**Daily** inspections of: • Pipelines during wet and process commissioning; • Tailings and water levels versus freeboard; • Visual TSF integrity; and • Size and location of decant pond. **Monthly**: • Survey embankment pins; • Embankment piezometer water level; • Water level and volume; • Water volume; • Tailings level and volume; and • Monitoring bores – water level. **Quarterly**: Monitoring bores water quality TSF Water balance assessment **Automatic daily:** • Pipeline telemetry systems and pressure sensors; • Tailings; • Solids tonnes; • Water tonnes or m^3; • Average flow;

Activity	Emissions/discharges	Controls	Monitoring
			• Decant outflow m^3; and • Underdrainage outflow m^3.
	Process slurry (unplanned).	Concrete bunding within the process plant with purpose-designed process water pond and event pond to contain spills so that they can be returned to the process. Emergency stop buttons throughout the plant.	Continual visual monitoring by commissioning personnel. Automated plant process control system that continuously monitors plant performance including malfunctions and leaks through a series of level alarms.
	Rare Earth Concentrate (unplanned).	Radiation and radioactive waste management will be in accordance with the site registration under the *Radiation Safety Act 1975* (RS Act), see Attachment 5.	Inspections and monitoring in accordance with an approved Radiation Management Plan under the RS Act.
	Tailings and Decant return (unplanned).	Tailings and Decant return pipelines equipped with operating telemetry systems and pressure sensors to allow detection of leaks and failures. Earth bunded tailings delivery and decant return pipelines, with catchpits in the event of spills.	Pipeline telemetry systems and pressure sensors. Daily inspections of pipelines during wet and process commissioning.
TLO (power generation)	Air emissions (Nox, CO, particulates), noise. Commissioning fluids (hydrocarbons, chemicals) discharges (unplanned).	Procure and manage diesel generators as per Australian Standard AS/NZS 3010. Implement controlled fuelling procedures. Install solar farm as soon as practicable to convert the power station to hybrid system.	Daily inspections include checks for leaks. Real-time alarms for abnormal emissions or leaks. Monthly checks of spill kit contents.

ATTACHMENT 3B: PROPOSED ACTIVITIES

3B.1 - PROJECT OVERVIEW

The proposed activities are designed to be developed in and around existing infrastructure within M80/650 that were used for a Pilot Project (refer to licence L9009/2016/1). A summary of existing and proposed infrastructure is provided in Table 3. Prescribed activities that are proposed in this application for the full-scale Project are discussed in detail in the following sections.

Table 3 Existing and Proposed Infrastructure and Activities.

Infrastructure	Existing	Proposed	Explanation
Relevant to this Works Approval Application			
Process Plant	✓	✓	The Pilot Plant included beneficiation and hydrometallurgical processing. A new beneficiation plant is proposed to replace the Pilot Plant.
Process water pond		✓	New.
Process plant event pond(s)	✓	✓	The Pilot Plant had a beneficiation event pond and a hydrometallurgical event pond. A new event pond is proposed for the full-scale Process Plant.
Raw water dam		✓	A turkey's nest was used during the Pilot Project. A new raw water dam is proposed to support the full-scale Process Plant.
Chemical storage facility	✓	✓	New enlarged fuel and reagent storage.
Tailings Storage Facility (TSF)	✓	✓	The Pilot Project TSF will be encapsulated within the new full-scale TSF
Sediment Retention Ponds (SRP)	✓	✓	Pilot Project: SRPs at Wolverine WRL, Gambit West WRL and Pilot TSF. Proposed SRP: Replace Wolverine WRL, retain Gambit West and replace TSF.
Power generation	✓	✓	Diesel power was used for the Pilot Project and continues during care and maintenance. A hybrid diesel/solar power plant is proposed for the full-scale Project.
Not included in this Works Approval Application			
Wastewater treatment Plant		✓	Approved in W2943/2025/1
Putrescible landfill	✓	✓	Approved in W2943/2025/1
Mobile Crushing and Screening		✓	Approved in W2943/2025/1
Wolverine pit	✓	✓	Expanding to full-scale and using open cut and underground mining.
Gambit West pit and waste rock landform (WRL)	✓		No further mining of Gambit West is proposed.

Infrastructure	Existing	Proposed	Explanation
Wolverine WRL	✓	✓	Expanding the Pilot Project Wolverine WRL to full-scale.
Run of Mine (ROM) pad	✓	✓	A new ROM is proposed. The Pilot Project ROM location will be repurposed for a low-grade ore stockpile.
Mine dewatering	✓	✓	Mine dewatering will increase and be used onsite for construction and dust suppression. Discharge of mine water to the environment is not required.
Evaporation pond	✓		The Pilot Project evaporation pond will remain in place until the Pilot Plant is decommissioned.
Stormwater dam		✓	New.
Surface water Diversion drains	✓	✓	New.

3B.2 - Prescribed Premises Categories

This application has been submitted to obtain approval under Part V of the EP Act for the development of a Power Plant, Process Plant, TSF and associated supporting infrastructure (the Works). The relevant prescribed premises category under the EP Regulations and production details for the proposed Works are included in Table 4.

Note that ancillary infrastructure to support the full-scale Project was approved under works approval W2943/2025/1, for prescribed categories 12, 54 and 89. These activities are not discussed in this application.

Table 4: Prescribed premises category and production details

Category	Category capacity	Design capacity	Expected throughput
5: Processing or beneficiation of metallic or non-metallic ore: premises on which (a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; or (b) tailings from metallic or non-metallic ore are reprocessed; or (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	50,000 tonnes or more per year	700,000 tonnes per year	650,000 tonnes per year estimated maximum. 565,000 tonnes per year average.
52: Electric Power Generation: premises (other than premises within category 53 or an emergency or standby power generating plant) on which electrical power is generated using a fuel	10 MW or more in aggregate (using a fuel other than natural gas).	14 MW	11 MW

3B.3 – PROCESS PLANT

DESIGN AND CONSTRUCTION

The Pilot Plant that operated under L9009/2016/1 is not compatible with the processing method proposed for the full-scale Project and cannot be retrofitted or expanded to suit. Hence a new full-size beneficiation process plant will be constructed for the Project, as illustrated in Figure 3. The Process Plant is located approximately 300 m east of the Pilot Plant. Heritage sites to the west, hills to the north and lower than 1 in 100-year flood level elevation to the south of the selected process plant location are notable plant-positioning constraints. The Process Plant will be split within the following areas:

- Crushing and Scrubbing / Screening;
- Sample Crushing;
- Grinding;
- Magnetic Separation;
- Flotation;
- Concentrate Dewatering and Bagging;
- Tailings Thickening and Disposal;
- Reagent Storage;
- Power Distribution;
- Services; and
- Buildings and Infrastructure.

Supporting infrastructure will include a laboratory, bulk diesel storage, workshop, stores, medical/ERT facility, administration building, crib room, ablutions, septic system, light vehicle workshop facility, bagged concentrate storage area, geologist core storage area, raw water dam, storm water dam. Turkeys nest and standpipe near gambit west will be used to collect dust suppression water for the site.

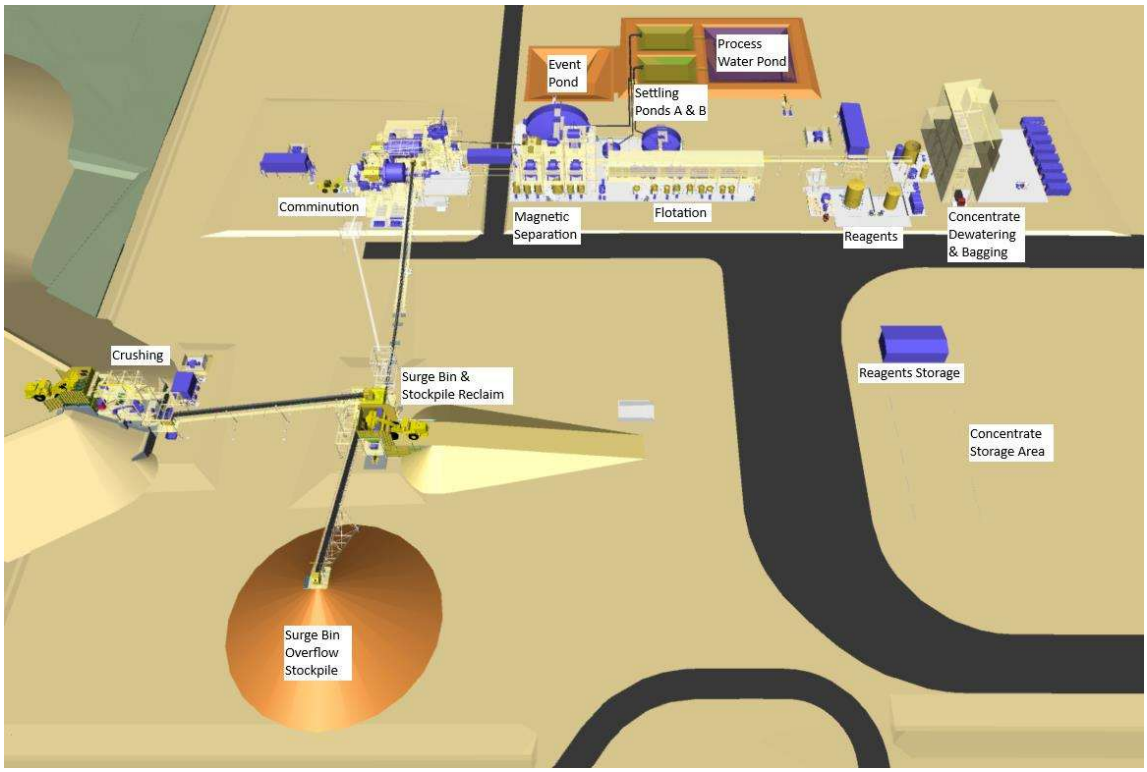


Figure 3: Process Plant layout

PROCESS DESCRIPTION

The process plant will process up to 650,000 tpa of ore, producing approximately 17,500 tpa of concentrate at an average grade of 25% TREO over the 10-year (approximate) life of mine. The beneficiation plant will receive ROM ore trucked from the Wolverine mine to the ROM pad. A front-end loader will reclaim the ore from ROM pad stockpiles to feed the primary crusher. Primary crushed ore will report to a surge bin from where it will be fed to the Semi-Autogenous Grinding (SAG) mill. There is proposed to be an emergency stockpile to take excess from the surge bin.

Further comminution of ore will be via closed circuit SAG mill and ball mill. High gradient wet magnetic separation will produce a magnetic concentrate of approximately 4% TREO from the milled slurry at a nominal ROM feed grade of 0.88% TREO. The magnetic concentrate will be further upgraded by several stages of flotation to produce a final concentrate slurry with a TREO content of 25%. The concentrate will then be dewatered via a plate and frame pressure filter to produce a filter cake. The filter cake will be dried in a spiral flash dryer then bagged using a semi-automated bagging system ready for transportation to a third party for refining and sale.

The Process Plant will produce two slurry tailings streams that report to separate cells within the TSF. The magnetic separation tailings stream will be thickened prior to disposal into the magnetic tailings cell with decant returning back to the process plant without treatment. The flotation tailings will report directly to the flotation tailings cell. Further details surrounding decant return is discussed in Seepage and Water Management. To prevent fatty acid flotation collector contamination of the process water system, decant water will be evaporated and not returned to the plant.

A high-level schematic of the Process Plant flowsheet is shown in Figure 4.

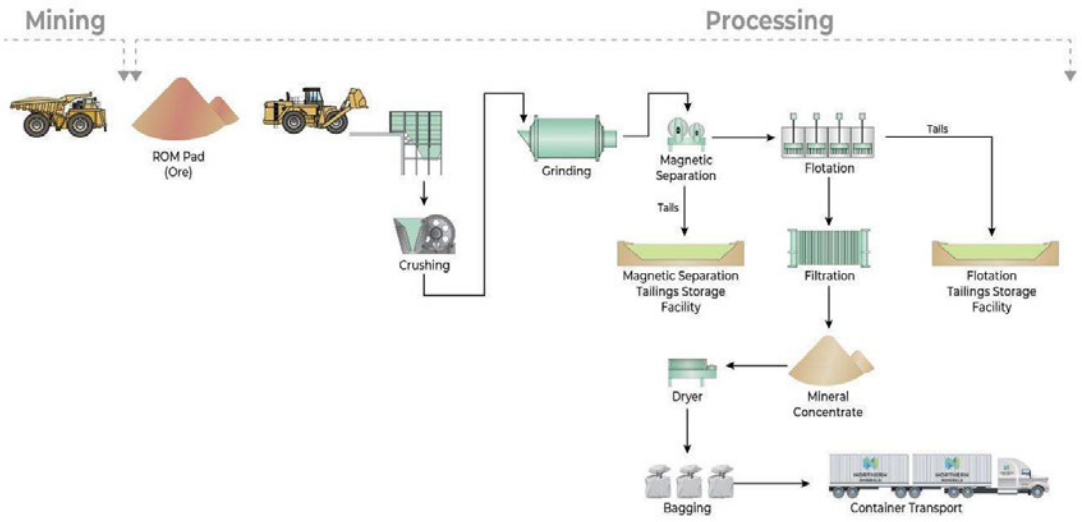


Figure 4: Process plant flowsheet schematic

WATER MANAGEMENT INFRASTRUCTURE

Stormwater in the Process Plant area and surrounding infrastructure will be managed by a combination of elevated terraces, stormwater cut-off drains, drainage channels and a stormwater dam.

The water management system will comprise an external (e.g. non-contact water diversion drains) and internal water system (e.g. culverts, stormwater dam). Figure 5 shows predicted flood depths in a 1 in 100 AEP, with the surface water design implemented. All stormwater falling outside the Process Plant area is considered external (non-contact) and the water falling within the plant area is considered internal (contact). Modelling results indicate the process plant would not be impacted.

The external water management system will comprise a stormwater cut-off channel that collects the surface water falling within the surrounding catchment area to the north of the process plant. The channel diverts this water around the east side of the works to the south side of the raw water and stormwater dam before discharging the unimpacted water into the environment away from the plant and supporting infrastructure.

All stormwater falling within the boundary of the external cut-off channel and plant area will form part of the internal storm water management system. The plant terraces have been raised and designed with a 1:150 cross-fall to minimise standing water. Rainwater will be collected on the raised terraces through an interconnected network of drainage channels that gravity flow into the 13,700 m^3 stormwater dam (discussed in the section below). All stormwater channels will be unlined and designed for a 1:100-year return, 0.25-hour peak flow period.

Key surface water control structures are summarised in the sections below. Outfall arrangements are required to ensure that capacity is restored after rainfall events, and emergency outfalls are provided in the case of events greater than the design criteria. The Surface Water Management

Infrastructure is shown in Figure 6. Surface water control structure designs are further detailed in the SWMP (WSP, 2023; Appendix 5).

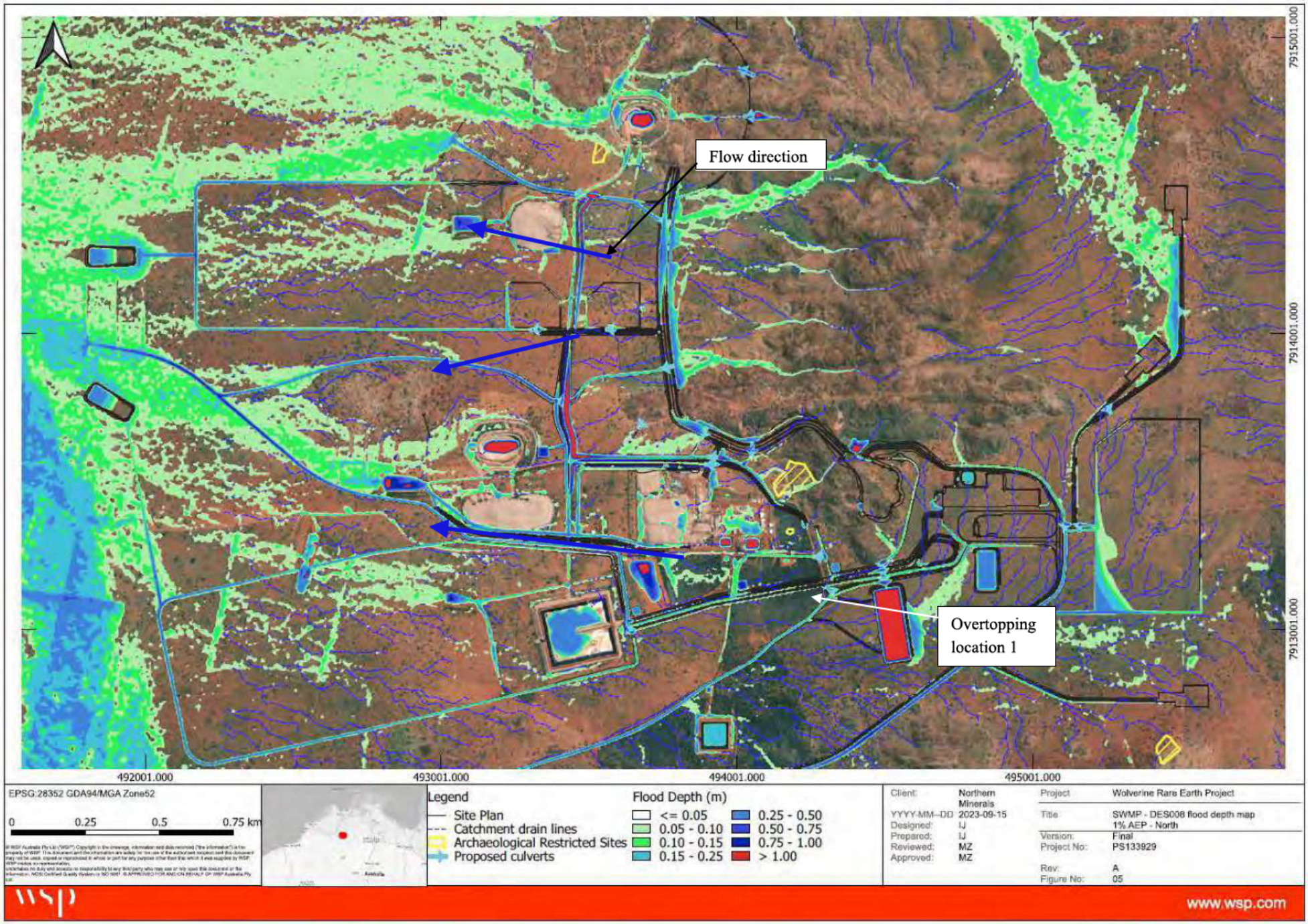


Figure 5: Modelled 1 in 100-year event flood depths

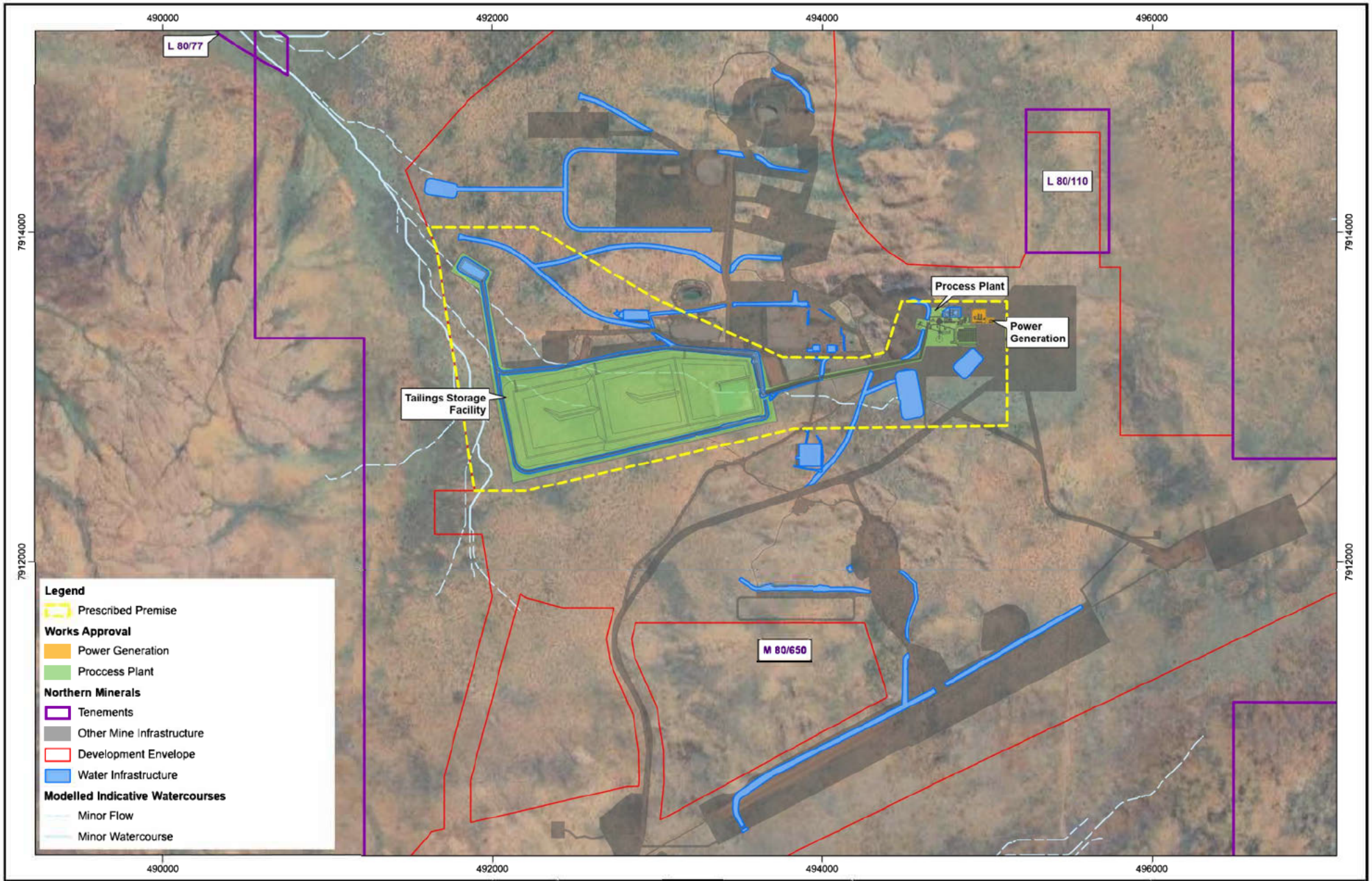


Figure 6: Surface Water Management Infrastructure

Stormwater Pond

The stormwater pond has a dual function. The primary purpose to act as a sediment retention pond, capturing fine sediment laden runoff from the ROM Pad and process plant area. The stored water will also be re-used in the process plant.

The stormwater pond has been designed to contain a 1:20-year return period, 24-hour storm event, which equates to a design volume of 43,400 m^3 to the spillway. The pond contains an overflow spillway that has been designed for a 1:100-year return, 0.25-hour storm period based on a 'flow-through' philosophy. The stormwater pond will be excavated a depth of 3 m below ground level. The pond crest will have a 500 mm freeboard for normal flow and 300 mm for through flow (via the spillway) during high storm water events. Water from the stormwater pond will be pumped at a controlled flowrate back to the process water settlement ponds via the storm water pump. Settled solids will be periodically cleaned out of the stormwater pond.

The stormwater pond has been designed as a Type D sediment basin (International Erosion Control Association; IECA, 2018) as shown in Figure 7. If the stormwater pond overtops (event greater than 1 in 20 year) then the water will flow into the clean water drain and exit the site.

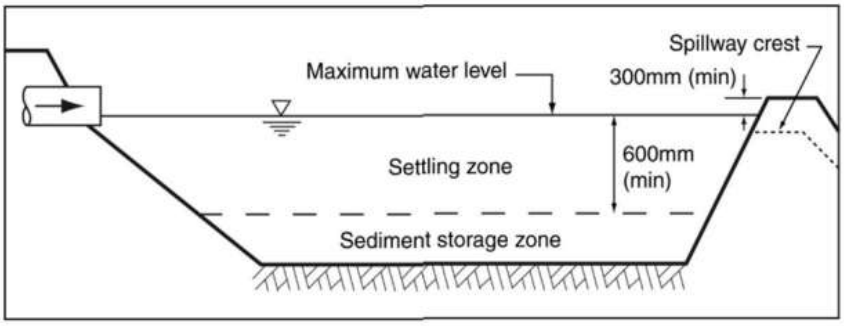


Figure 7: Typical Type D basin (IECA, 2018)

Raw Water Dam

Water will be pumped directly from the production bore(s) in the borefield to the HDPE-lined raw water dam, located at the southern side of the process plant (see Figure 5). Raw water is proposed to be used for process and potable purposes. The raw water dam has a design volume of 18,550 m^3 to the spillway. This equates to eight days process plant supply with 4,000 m^3 left of unpumpable reserve at the bottom.

Process Water Ponds

Process water ponds are planned to be located on the north side of the process plant, adjacent to the thickeners. Process water will be reclaimed from the magnetic separation tailings cell and thickener overflow streams which report to a duty/standby 385 m^3 settling pond before gravitating to the 1,000 m^3 process water pond. Process water conveyance to settling ponds will be via above ground pipelines. Figure 8 shows the layout.

Periodically the duty settling pond will be taken out of service for removal of settled solids. A dedicated suction line through the wall of the process water pond will supply three process water pumps providing distribution to the process plant. Re-use of process water will be maximised to minimise the site raw water consumption.

The Process Plant will have a negative process water balance, and raw water will be added to the process water pond to maintain a desired pond water level.

The three ponds will be lined with 1.5 mm HDPE and will include freeboard capacity for a 1-in-20-year 72-hour rain event. In the event of a larger event, the process water ponds will overflow to the west into drainage channels and report to the Stormwater Pond.

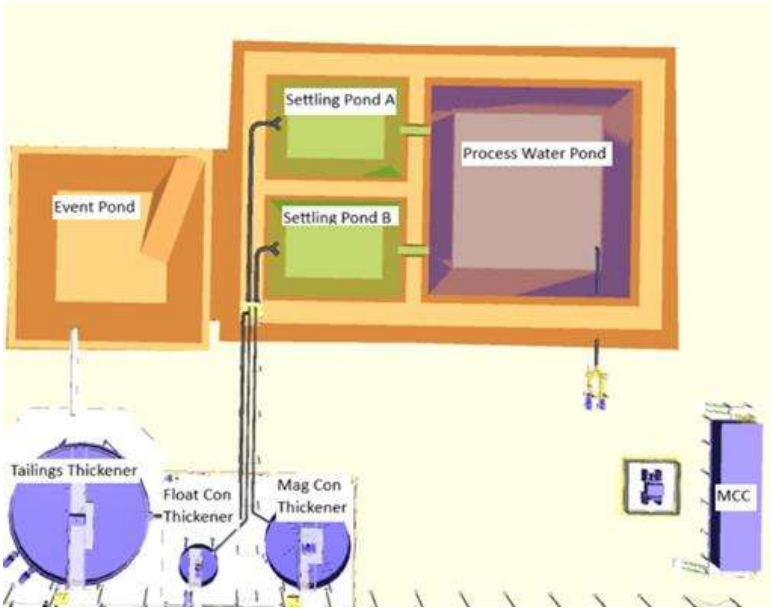


Figure 8: Ponds and thickeners layout

Event Pond

The single-cell event pond will be located down gradient of the thickener circuit of the Process Plant. It provides capacity to contain the contents of the largest thickener tank, for use during tank maintenance or in the event of a spill. It will be lined with 1.5 mm HDPE and will include freeboard capacity for a 1-in-20-year 72-hour rain event. The channel from the thickener circuit to the event pond will be concrete.

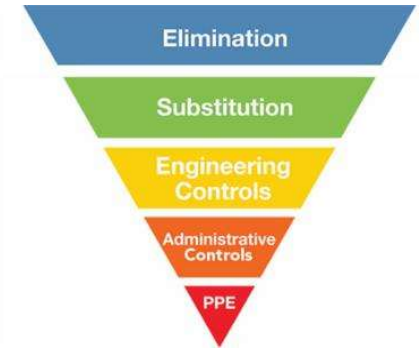
In the event of a larger than 1-in-20-year rain event, the event pond will overflow to the west into drainage channels and report to the Stormwater Dam.

DUST MANAGEMENT INFRASTRUCTURE

The key sources of dust emissions during construction and TLO will be:

- Earthmoving,
- Vehicle traffic on unsealed roads,
- Ore stockpiling/reclamation at the ROM, and
- Crushing.

Industry-standard dust suppression methods will be implemented using a hierarchy of controls depicted below.



Elimination – The Project disturbance footprint has been designed to be as small as practicable to support safe operations. Clearing will be progressive to minimise the duration that areas are left open prior to being developed.

Substitution – The dust-generating activities are essential to developing and operating an extractive mine, hence cannot be substituted.

Isolation – This relates to isolating the hazard from people and other sensitive receptors. The nearest community is Kundat Djaru (Ringer Soak) located 35 km away. Native vegetation, including a culturally sensitive Boab tree, are adjacent to the facility. The Concentrate bagging facility, which would come online during time-limited operations, is designed to be fully enclosed and fitted with dust extraction filters.

Engineering Controls – Water sprays/misters are designed for the crusher and conveyor transfer points. Conveyor transfer points are designed to be enclosed. The crushed ore stockpile stacker will be fitted with a head-chute with water sprays at the head-end to minimise dust generation during stockpiling. Water carts fitted with boom sprayers and side-sprayers will dampen trafficable areas and ore stockpiles.

Administrative Controls – Allocation of water carts for dust suppression will be based on planned locations of activities and the weather forecast. Dust levels will be visually assessed and water carts re-allocated where required. Occupation Health and Safety dust monitoring and controls will be developed and implemented.

PPE – Appropriate dust masks are expected to be required for workers in the Concentrate Bagging Facility, in accordance with a Radiation Management Plan.

REAGENTS STORAGE

To account for the road closures cutting off access to site during the wet season, a two-month storage capacity for bulk delivered reagents (sodium silicate, caustic soda and sulphuric acid) will be provided over and above the typical storage requirements of an operating plant.

Reagent delivery transfer points and storage tanks will be located in concrete bunding. Reagents that are stored in intermediate bulk containers (IBC) or flexible IBC will be stored in sea containers then relocated to concrete bunded areas for use. Dosing to the Process Plant will be automated via above-ground bunded piping.

Reagent storage volumes are presented in Table 5. Storage facility designs are described below.

Table 5: Reagent storage designs and volumes

Reagent	Annual consumption (tpa)	Description	Storage capacity
Fatty Acid	356	100% Solution, IBC in covered storage	160 m³
Sodium Silicate	291	44% Solution in tank.	70 m³
Caustic Soda	266	50% Solution in tank	70 m³
Sulphuric Acid	195	98% Solution in tank	35 m³
Magnafloc 155 (flocculant)	60	Powder in Bulka bags in covered storage	40 m³
Magnafloc 1425 (coagulant)	42	100% Solution, IBC in covered storage	20 m³

3B.4 – TAILINGS STORAGE FACILITY

The Pilot TSF was constructed to the east of the Pilot Plant in accordance with W6007/2016/1 in late 2017. The initial construction phase of the TSF was completed as per the approved design (Knight Piésold, 2016; Appendix 3) and comprises a single-celled paddock style facility with embankments constructed from coarse waste rock and compacted earth. An embankment lift on the TSF was completed in January 2020. The construction report was approved on 13 January 2021, shortly before the facility was placed in care and maintenance. The existing Pilot TSF has approximately 3 m freeboard available capacity.

This application seeks approval to expand the Pilot TSF within M 80/650 to accommodate an increase in throughput and will comprise a total of three cells (General Arrangement shown in Figure 9) to be constructed and operated according to the detailed design report (Knight-Piésold, 2025; Appendix 1) and any subsequent Operating Manual. The existing Pilot TSF is to be encapsulated by the eastern cell (Cell 1) of the expanded TSF. For completeness, details of the final TSF design have been included in this section and the TSF Design Report provided in Appendix 1.

Information provided in the following sections is summarised from Knight-Piésold, 2025 (Appendix 1) and has been cross-checked with the Application form annex: Category checklist (tailings storage facilities) provided in Attachment 8. For full details, please refer to Appendix 1.

CONCEPTUAL SITE MODEL

A conceptual site model (CSM) for the TSF is presented in Table 6. The CSM was informed by the Project Risk Assessment and is consistent with DWER's example in the works approval TSF category checklist.

Table 6: TSF Conceptual Site Model.

Source / Activities	Potential emissions, pollutants, or contaminants of concern	Potential pathway	Potential receptors	Potential impacts	Proposed controls and contingencies
TSF cells (deposition of tailings)	TSF-Cells supernatant potentially containing concentrations of substances with environmental significance such as aluminium (Al), manganese (Mn), selenium (Se), fluoride (Fl), iron (Fe) and molybdenum (Mo).	Seepage / infiltration.	Underlying Browns Range metamorphics groundwater (~11-17 m below top of casing - bTOC) low salinity (~brackish 450 – 1,100 TDS)	Localised groundwater contamination	Groundwater modelling, underdrainage, groundwater monitoring bores and recovery bores (if required), specified management triggers and contingency actions.
			Nearest groundwater users located at Ringer Soak, 35 km away in Gardiner Sandstone aquifer.	Nil.	
		Groundwater mounding, seepage expression.	Native vegetation adjacent to TSF. Ephemeral drainage lines. Surface water (nearest is Sturt Creek located 43 km north-west of the TSF).	Reduced local surface water quality, and ecosystem disturbance.	
Decant pipeline and/or tailings delivery pipeline failure	Decant water potentially containing concentrations of substances with environmental significance such as Al, Mn, Se, Fl, Fe and Mo.	Direct discharge Infiltration into soil or groundwater	Surface water (nearest is Sturt Creek located 43 km north-west of the TSF).	Nil.	Pipeline flow meter telemetry, auto cut-offs, visual monitoring. Clean up response, reporting, spill containment measures.
			Native vegetation adjacent to TSF.	Reduced vegetation health, and potential loss of vegetation in some areas.	Vegetation monitoring post-spill, siting of infrastructure.
Stormwater	Sediment-laden runoff. Potentially contaminated stormwater.	Overland runoff.	Surface water (nearest is Sturt Creek located 43 km north-west of the TSF).	Nil.	Stormwater infrastructure, diversion drains and sediment retention ponds, TSF cut-off trench, embankment upstream toe drain, monitoring.

Source / Activities	Potential emissions, pollutants, or contaminants of concern	Potential pathway	Potential receptors	Potential impacts	Proposed controls and contingencies
			Native vegetation adjacent to TSF.	Reduced vegetation health.	Vegetation health monitoring after noted sedimentation incident.
Overtopping of TSF- due to insufficient freeboard capacity.	Tailings potentially containing Al, Mn, Se, Fl, Fe and Mo.	Unplanned direct discharge of tailings into the environment.	Underlying groundwater.	Localised reduced groundwater quality.	Engineered design containment exceeds a 1 in 100-year 72-hour event. Managing water balance, monitoring and maintaining adequate freeboard, emergency response capabilities.
			Surface water (nearest is Sturt Creek located 43 km north-west of the TSF.	Ecosystem disturbance / wildlife poisoning.	
			Native vegetation adjacent to TSF and beside Blue Creek.	Reduced vegetation health, and potential loss of vegetation in some areas.	
Tailings water	Al, Mn, Se, Fl, Fe and Mo in tailings water (Tailings water is less than 6,000 mg/L TDS)	Birds or bats coming in contact with tailings water	Birds or bats	Poisoning of birds or bats	Daily inspections, fauna egress installed, trained fauna handlers.
Dust (dried tailings) lift-off from the surface of the TSF, or embankments	Dust (dried tailings) potentially containing toxic materials.	Windblown dust transport through air then deposition.	Native vegetation adjacent to TSF	Potential impact to health of native vegetation from dust deposition and / or dust containing toxic material deposited on soil.	Visual monitoring for dust lift-off from TSF. Contingency measures (increase moisture content in tails beach, consider applying dust suppressant, ceasing dust-generating activities involving tails, where required)

General Design Specifications

The TSF will be designed and operated in accordance with:

- Australian National Committee on Large Dams (ANCOLD), "Guidelines on Tailings Dams, Planning, Design, Construction, Operation and Closure" Revision 1, July 2019;
- Australian National Committee on Large Dams (ANCOLD), "Guidelines on the Consequence Categories for Dams", October 2012;
- DMPE (was DMP) "Code of Practise – Tailings storage facilities in Western Australia", 2013; and
- DMPE (was DMP) "Guide to the Preparation of a design report for tailings storage facilities (TSFs)", August 2015.

The full-scale TSF will consist of three adjacent closed paddock cells formed by earth fill embankments as designed by Knight Piesold (2025, Appendix 1), to be developed in five stages. Figure 9 shows the TSF at the final Stage 5. Each stage will be timed to suit storage and freeboard requirements and the availability of suitable mine waste for construction material.

Table 7: TSF Details

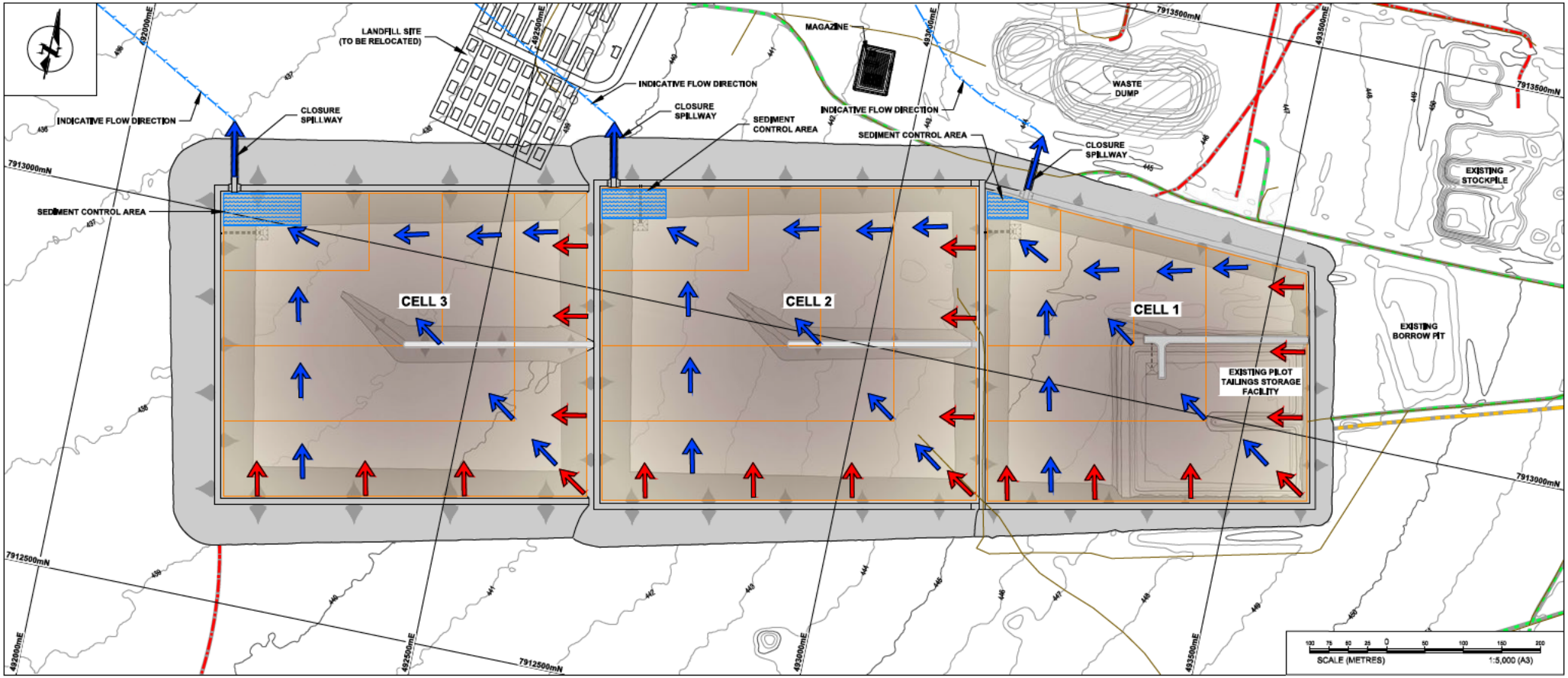
Total Area (ha)	79.4 ha
Design	Design: Paddock (refer to Appendix 1 (Knight Piésold, 2025) for more information).
	Max. Height: Embankment crest elevations and storage details for each stage are shown in Appendix 1.
	Construction Method: Downstream.
	Discharge Method: Upstream spigot deposition of tailings from spigot offtakes situated on the embankment crest. The supernatant pond is to be maintained at the decant location (centrally), remote (where practicable) from the main embankments.
	Lining: Composite liner of HDPE and compacted soil subgrade to reduce seepage. Compacted soil subgrade comprising primarily in situ soils, scarified and re-compacted throughout basin area to form a 200 mm soil subgrade. Where in situ materials are unsuitable for soil subgrade, low permeability material (Zone A) will be imported to provide the soil subgrade (300 mm). 1.5 mm smooth HDPE geomembrane liner above compacted soil subgrade for the entire basin area.
	Embankment: Multi-zoned earthfill embankment, utilising upstream low permeability zone. Upstream face lined with textured HDPE geomembrane. Downstream raise construction methods for all raises. Upstream toe cut-off trench through residual/transported material.
	Stormwater capacity: short duration 1% Annual Exceedance Probability (AEP), 72-hour duration storm event superimposed over 10% AEP, wet season rainfall (90 days, 100% runoff, no evaporation).
	Freeboard (i) 0.3 m above maximum tailings elevation, or (ii) 0.8 m above maximum design stormwater elevation.
	Underdrainage: Branch drains and finger drains throughout the TSF basin area, water collected from the tailings mass and discharged to a collection sump, pumped to the supernatant pond.

Staging and Storage Capacity

Over the 10-year (approximate) LOM, a total of approximately 5.95 million tonnes (Mt) of tailings is expected to be produced and will be separated into two tailings streams (Flotation tailings and

Magsep tailings). Embankment crest elevations and storage details for each stage are listed in Table 8. Figure 9 to Figure 11 shows the general arrangement for each stage of construction.

Flotation tailings will be stored in Cell 1 and the Magnetic Separation tailings will be stored in Cell 2 (then later in Cell 3). Cell 1 will provide capacity for 10 years of Flotation tailings deposition at 0.1 Mtpa, Cell 2 and Cell 3 will each provide five years of capacity for the Magnetic Separation tailings deposition at 0.53 Mtpa (Table 8).



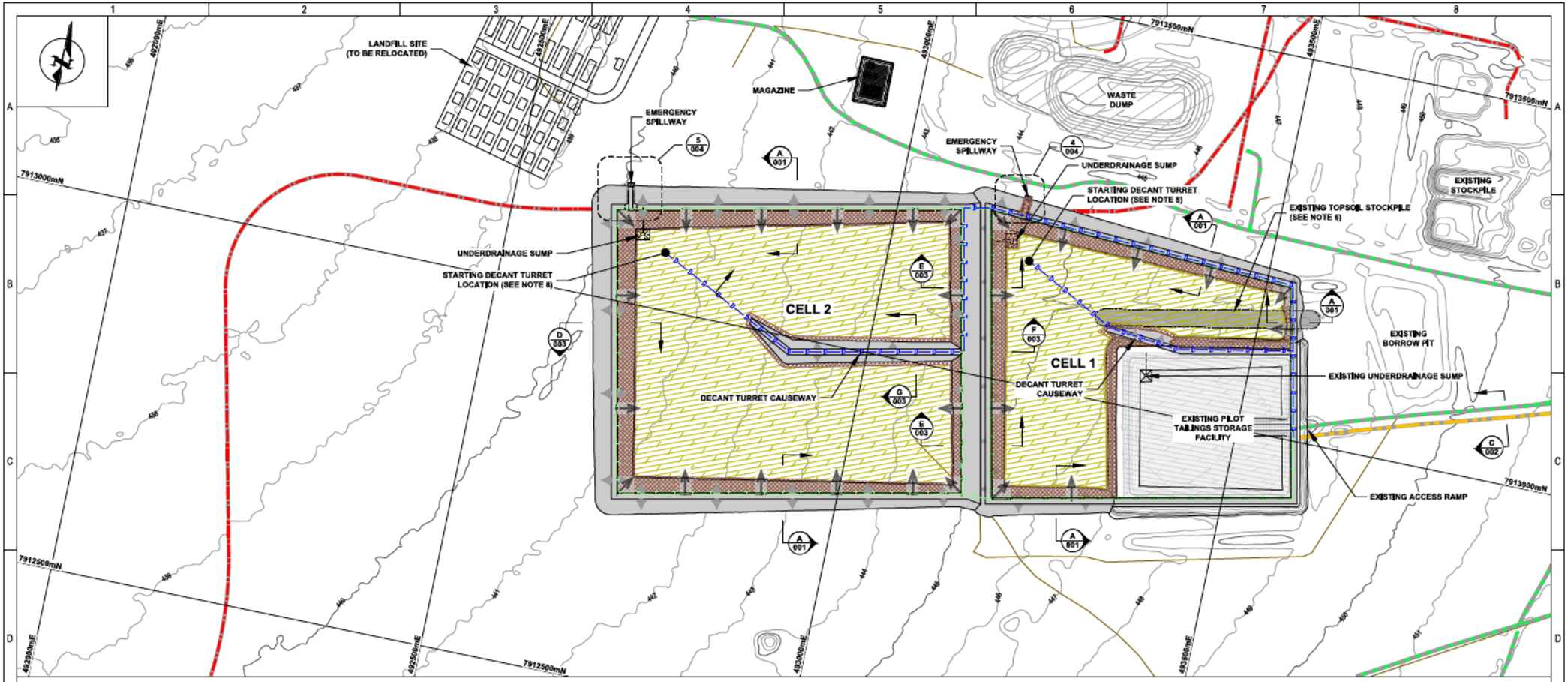
LEGEND:

- EXISTING ROADS/TRACKS
- HAUL ROAD
- LIGHT VEHICLE ACCESS ROAD
- TAILINGS AND DECANT RETURN TRENCH (TDRT)
- TAILINGS BEACH
- FLOW DIRECTION
- DEPOSITION LOCATION (SEE NOTE 6)
- SEDIMENT CONTROL AREA

NOTES:

1. 1m CONTOUR INTERVALS SHOWN. TOPOGRAPHY DATA PROVIDED BY NML.
2. SITE LAYOUT PROVIDED BY NML, NOVEMBER 2022. FINAL PITS AND DUMPS SHOWN.
3. SITE AS-BUILT SURVEY DATA PROVIDED BY NML, DECEMBER, 2021.
4. PILOT TAILINGS STORAGE FACILITY AS BUILT DATA PROVIDED BY NML, OCTOBER, 2021.
5. FINAL STAGE TAILINGS STORAGE FACILITY SHOWN.
6. TAILINGS DEPOSITION TO BE MODIFIED IN THE FINAL STAGES TO PUSH SUPERNATANT POND TO NORTH WESTERN CORNER OF FACILITY.
7. ENGINEERING COVER PROFILE PROVIDED ON FIGURE 10.2.
8. EMBANKMENT CREST, DOWNSTREAM EMBANKMENT FACE AND TAILINGS BEACH TO BE COVERED WITH TOPSOIL AND REVEGETATED.
9. SEDIMENT CONTROL AREA WITH EPHEMERAL PONDING ADJACENT TO CLOSURE SPILLWAY.

Figure 9: Full scale TSF design



LEGEND:

- EXISTING ROADS/TRACKS
- HAUL ROAD
- LIGHT VEHICLE ACCESS ROAD
- TAILINGS AND DECANT RETURN TRENCH (TDRT)
- DECANT RETURN PIPELINE
- TAILINGS DISTRIBUTION PIPELINE
- DEPOSITION LOCATION (INDICATIVE)
- EXISTING PILOT TSF SMOOTH HDPE GEOMEMBRANE
- EXISTING PILOT TSF TEXTURED HDPE GEOMEMBRANE
- SMOOTH HDPE GEOMEMBRANE
- TEXTURED HDPE GEOMEMBRANE

NOTES:

1. 1m CONTOUR INTERVALS SHOWN. TOPOGRAPHY DATA PROVIDED BY NML.
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3. SITE AS-BUILT SURVEY DATA PROVIDED BY NML, DECEMBER, 2021.
4. PILOT TAILINGS STORAGE FACILITY AS BUILT DATA PROVIDED BY NML, OCTOBER, 2021.
5. STAGE 1 TAILINGS STORAGE FACILITY SHOWN.
6. TOPSOIL STOCKPILES WITHIN THE FACILITY FOOTPRINT TO BE RELOCATED DURING CONSTRUCTION.
7. PROVISIONS FOR TURRET ABSTRACTION SYSTEM TO BE ALLOWED FOR DURING OPERATION.
8. TURRET TO BE RELOCATED DURING OPERATION AS THE SUPERNATANT POND MIGRATES TO ITS FINAL LOCATION.

SCALE (METRES) 100 75 50 25 0 50 100 150 200 — 1:5,000 (A3)

Knight Piésold CONSULTING — DWG NO. 801-241-A3000-100

DRAWING No.	DESCRIPTION
WP1-EW-DS-1570-004	EMBANKMENT SECTIONS AND DETAILS - SHEET 4
WP1-EW-DS-1570-003	EMBANKMENT SECTIONS AND DETAILS - SHEET 3
WP1-EW-DS-1570-002	EMBANKMENT SECTIONS AND DETAILS - SHEET 2
WP1-EW-DS-1570-001	EMBANKMENT SECTIONS AND DETAILS - SHEET 1

REFERENCE DRAWINGS

REV.	DRN	DATE	REVISIONS	CHK.	DATE
D	TK	10/09/2024	ISSUED FOR PERMITTING - SEPTEMBER 2024	AMM	10/09/2024
C	PRK	16/06/2023	ISSUED FOR PERMITTING - JUNE 2023	AMM	16/06/2023
B	AS	22/12/2022	REISSUED FOR PERMITTING	AMM	22/12/2022
A	AS	20/10/2022	ISSUED FOR PERMITTING	AMM	20/10/2022

NORTHERN MINERALS

WOLVERINE RARE EARTH PROJECT

ISSUED FOR PERMITTING

DO NOT SCALE FROM DRAWINGS

NORTHERN MINERALS LIMITED
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ENG. MANAGER		
PROJ. MANAGER		
PROF. ENG.	S.MCKEAN	10/09/2024
PROJECT ENG.	A.MOLLAN	10/09/2024
PROCESS ENG.		
D.O. MANAGER		
SECT LEADER		
CHECKED	A.MOLLAN	10/09/2024
DRAWN	T.KUMARA	10/09/2024
APPROVAL	SIGNATURE	DATE

NORTHERN MINERALS LIMITED
WOLVERINE RARE EARTH PROJECT
TAILINGS STORAGE FACILITY
GENERAL ARRANGEMENT PLAN - STAGE 1

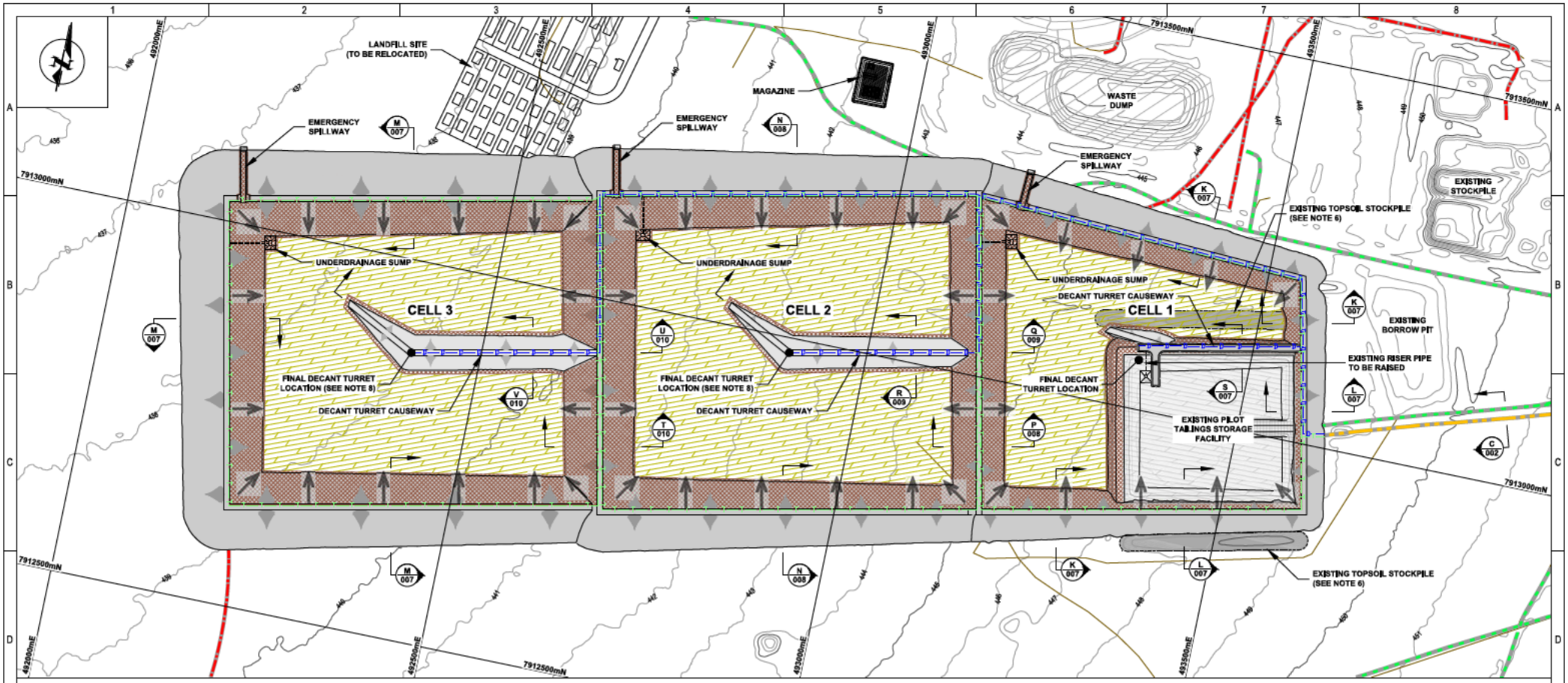
PLANT No — AREA No 1570

DWG NO. WP1-EW-GA-1570-004

SHEET A3 | SITE COORDINATES GDA 94 DATUM, MGA ZONE 52, DRAWING UNITS METRES | SCALE 1:5,000 U.O.S. | REVISION D

Cad File No: Q:\PE801-00241 Browns_Range_Rare\00-Engineering Drawings\01-Preliminary Drawings\A3000-TSF\ 801-241-A3000-100__0.dwg
Plot Date: 10 September, 2024 - 3:35 PM

Figure 10: TSF General Arrangement Plan (Stage 1)



LEGEND:

- EXISTING ROADS/TRACKS
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- DECANT RETURN PIPELINE
- TAILINGS DISTRIBUTION PIPELINE
- DEPOSITION LOCATION (INDICATIVE)
- EXISTING PILOT TSF SMOOTH HDPE GEOMEMBRANE
- EXISTING PILOT TSF TEXTURED HDPE GEOMEMBRANE
- SMOOTH HDPE GEOMEMBRANE
- TEXTURED HDPE GEOMEMBRANE

NOTES:

1. 1m CONTOUR INTERVALS SHOWN. TOPOGRAPHY DATA PROVIDED BY NML.
2. SITE LAYOUT PROVIDED BY NML, NOVEMBER 2022. FINAL PITS AND DUMPS SHOWN.
3. SITE AS-BUILT SURVEY DATA PROVIDED BY NML, DECEMBER, 2021.
4. PILOT TAILINGS STORAGE FACILITY AS BUILT DATA PROVIDED BY NML, OCTOBER, 2021.
5. FINAL STAGE TAILINGS STORAGE FACILITY SHOWN.
6. TOPSOIL STOCKPILES WITHIN THE FACILITY FOOTPRINT TO BE RELOCATED DURING CONSTRUCTION.
7. PROVISIONS FOR TURRET ABSTRACTION SYSTEM TO BE ALLOWED FOR DURING OPERATION.
8. TURRET TO BE RELOCATED DURING OPERATION AS THE SUPERNATANT POND MIGRATES TO ITS FINAL LOCATION.

SCALE (METRES) 100 75 50 25 0 50 100 150 200 — 1:5,000 (A3)

Knight Piésold CONSULTING

DWG NO. 801-241-A3000-101

DRAWING No.	DESCRIPTION	REV.	DRN	DATE	REVISIONS	CHK.	DATE	S.L.	DATE
WP1-EW-DS-1570-010	EMBANKMENT SECTIONS AND DETAILS - SHEET 8								
WP1-EW-DS-1570-009	EMBANKMENT SECTIONS AND DETAILS - SHEET 7								
WP1-EW-DS-1570-008	EMBANKMENT SECTIONS AND DETAILS - SHEET 6	D	TK	10/09/2024	ISSUED FOR PERMITTING - SEPTEMBER 2024	AMM	10/09/2024		
WP1-EW-DS-1570-007	EMBANKMENT SECTIONS AND DETAILS - SHEET 5	C	PRK	16/06/2023	ISSUED FOR PERMITTING - JUNE 2023	AMM	16/06/2023		
WP1-EW-DS-1570-002	EMBANKMENT SECTIONS AND DETAILS - SHEET 2	B	AS	22/12/2022	REISSUED FOR PERMITTING	AMM	22/12/2022		
		A	AS	20/10/2022	ISSUED FOR PERMITTING	AMM	20/10/2022		

REFERENCE DRAWINGS

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ENG. MANAGER		
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PROF. ENG.	S.MCKEAN	10/09/2024
PROJECT ENG.	A.MOLLAN	10/09/2024
PROCESS ENG.		
D.O. MANAGER		
SECT LEADER		
CHECKED	A.MOLLAN	10/09/2024
DRAWN	T.KUMARA	10/09/2024
APPROVAL	SIGNATURE	DATE

NORTHERN MINERALS LIMITED
WOLVERINE RARE EARTH PROJECT
TAILINGS STORAGE FACILITY
GENERAL ARRANGEMENT PLAN - FINAL STAGE

PLANT No | AREA No 1570

DWG NO. WP1-EW-GA-1570-005

SHEET	SITE COORDINATES	SCALE	REVISION
A3	GDA 94 DATUM, MGA ZONE 52 DRAWING UNITS METRES	1:5,000 U.O.S.	D

Cad File No: Q:\PE801-00241 Browns_Range_Rare\00-Engineering Drawings\01-Preliminary Drawings\A3000-TSF\ 801-241-A3000-101__0.dwg
Plot Date: 10 September, 2024 - 3:35 PM

Figure 11: TSF General Arrangement Plan (Final Stage)

Table 8: TSF Staged Embankment Construction

Stage	Cell	Tailings stream	Crest elevation (mRL)	Spillway inlet elevation (mRL)	Maximum embankment height (m)	Tailings capacity (months)	Cumulative dry tailings storage capacity (Mt)	Total footprint (ha)
1	1	Flotation	450.6	450.1	6.6	18	0.86	38.3
	2	Magsep	448.4	447.9	8.4			
2	1	Flotation	452.0	451.5	8.0	18	1.72	41.8
	2	Magsep	451.6	451.1	11.6			
3	1	Flotation	453.0	452.5	9.0	24	2.88	47.0
	2	Magsep	454.8	454.3	14.8			
4	1	Flotation	454.1	453.6	10.1	36	4.60	69.0
	3	Magsep	449.1	448.6	12.1			
5	1	Flotation	454.9	454.4	10.9	24	5.75	76.3
	3	Magsep	453.1	452.6	15.6			

CONSTRUCTION OVERVIEW

A compacted soil subgrade will be constructed over the entire TSF basin area, comprising either reworked in situ material or imported (locally sourced) low permeability soil. A 1.5 mm HDPE liner will be installed over the subgrade within the TSF basin.

Cell 1 will encapsulate the Pilot Project TSF (existing TSF). This will be achieved by trimming off the existing coarse construction material from the existing TSF batters and replacing it with finer material that won't puncture the liner. New HDPE liner will be poly-welded to the existing TSF liner to form a continuous barrier with the base of the new Cell 1.

Downstream embankment raise construction methods will be used throughout operation.

Construction Materials

The TSF design has been classified into zones, with each zone being constructed with suitable material (refer to Table 1.1 in KP 2025, Appendix 1). Figure 12 provides an example of construction material zones within TSF embankments. See Appendix 1 for more detail and design drawings.

The zones include:

- Zone A – low permeability zones, e.g. on the TSF basin and inner embankment surface;
- Zone B – transitional fill between embankment Zones A and C;
- Zone C – structural fill (including C1 by mining fleet), e.g. construct embankments;
- Zone D – fill;
- Zone E – medium-coarse rock for erosion protection material;
- Zone F – sand or gravel for use in drainage/filter areas, such as TSF underdrainage; and
- Zone G – coarse rock for erosion protection e.g. in TSF emergency spillway.

Waste rock from open pit and underground early mining above 120 mBGL was identified to be NAF material (MBS), 2024It will be segregated for use in construction, including construction of TSF embankments. PAF waste material will not be used as TSF embankment construction material. Further information about the geochemical characteristics of the embankment

construction materials is available in MBS (2024; Appendix 7) and the Project MDCP (Appendix 8)

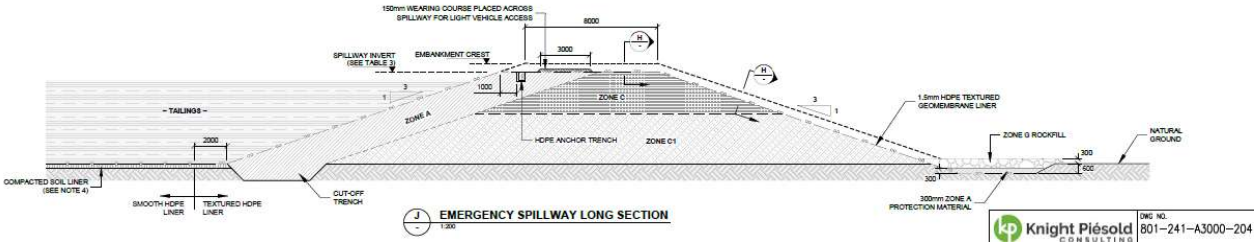


Figure 12: Construction material zones example.

OPERATION

The deposition of tailings into the TSF will be sub-aerially using a combination of spigots at regularly spaced intervals from the embankment. The tailings delivery pipeline will run from the Process Plant to the embankment crest in an earth-bunded pipeline corridor. Densities are expected to range around 43% solids for Magnetic Separation tails and around 32% solids for Flotation Tails.

The tailings will initially be deposited into the TSF from the TSF embankment at the low point of the TSF basin (along the northwestern corner of each cell), in such a way as to encourage the formation of beaches over which the slurry will flow in a laminar non-turbulent manner. Supernatant from the magnetic separation tails cells will be pumped via floating pontoons (decant turret) back to the process plant (Figure 13). A degree of segregation of the tailings will occur against the embankment, promoting dewatering of the tailings through the embankment toe drain and thus promoting stability, consolidation and reducing basin drainage. Tailings deposition will then be moved either side of this initial point to line the basin area whilst controlling the location of the supernatant pond. As Cell 1 fills, tailings will flow into the current freeboard in the Pilot TSF filling that void and eventually encapsulating the entire Pilot TSF.

The TSF has a minimum flood storage capacity equivalent to a 1% Average Exceedance Probabilities (AEP) storm event superimposed over the 10% AEP wet season. The flood storage capacity will be well in excess of the design capacity. On this basis it is not expected that overtopping of the embankment will occur.

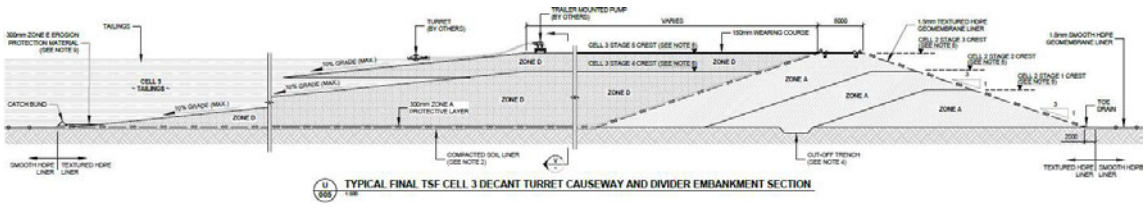


Figure 13: Decant lines and pump locations.

TAILINGS CHARACTERISATION

Knight Piesold conducted physical testing of flotation and Magnetic Separation tailings, summarised in Table 9.

Table 9: Tailings Characteristics (source: KP 2025).

Parameter	Value	
	Flotation	Magnetic Separation
Tailings % Solids	32%	43%
In Situ Density (minimum)*	1.22	0.9
In Situ Density (maximum)*	1.39	1.39
Water released		
Supernatant	79.0%	37.7%
underdrainage	3.5%	12.8%

* Outcomes of tailings density/consolidation modelling.

Geochemical information in this section is sourced from MBS (2024; Appendix 7) for the Wolverine deposit (the sole source of tailings).

Tailings geochemical assessment was carried out by MBS in 2023 on two tailings solid and supernatant samples (from the magnetic separation and float waste streams) from the Wolverine deposit material to determine the potential for direct plant growth or use as a cover material if required at closure.

The results and findings are summarised in the following sections.

MINERALOGY

The mineralogy of the tailings is consistent with the mining and processing of the materials. The tailings are expected to contain small amounts of rare earths due to some likely inefficiencies of the separation process, however, no rare earths were detected within the magnetic separation or float separation tails. Further detail on the mineral composition of the samples is provided below:

- The magnetic separation tailings comprised mostly (75%) of silicate mineral, quartz with 1% as garnet. Clays minerals accounted for 15%, with majority of the reported clay identified as Illite/muscovite. No carbonate minerals were detected within the tailings sample, with amorphous content accounting 8%. The remaining 1% comprised of iron oxide, magnetite; and
- The float separation tailings comprised mostly (68%) of silicate mineral, quartz, with 1% as garnet. Clays minerals accounted for 19%, with majority of the reported clay identified as Illite/muscovite. No carbonate minerals were detected within the tailings sample with amorphous content accounting 9%. The remaining 3% comprised of iron minerals, iron phosphate, hematite and magnetite.

ACID AND METALLIFEROUS DRAINAGE POTENTIAL

Tailings samples analysed were considered NAF with little to no acid generation capacity or acid neutralising capacity:

- The two tailings solid samples contained very low total sulfur (0.01%) and very low total carbon (0.01% and 0.02%);

- Both tailings solid samples reported low ANC (1 kg H_2SO_4/t and 2 kg H_2SO_4/t) which corresponds with the lack of carbonate minerals identified in the XRD; and
- Both solid samples reported a slightly negative NAPP of -2 kg H_2SO_4/t and -0.6 kg H_2SO_4/t with a very slightly acidic to neutral NAG pH (pH 6.1 and 7.3).

COMPOSITION

Mineral deposits by their nature are anticipated to have some elements present in concentrations above the average crustal abundance. They do, however, provide a useful screening tool for identifying elements requiring further assessment by more specific test methods including leachates.

Composition by Four Acid Digest

The enrichments in tailings solid samples consisted of REE which is expected from materials sourced from this area. Examination of the total element concentrations and the corresponding GAI values indicated the following:

- Both tailings solid samples reported significant geochemical enrichment for Yttrium (229 mg/kg and 385 mg/kg, GAI of 3) and Ytterbium (27 mg/kg and 37 mg/kg, GAI of 3); and
- No other geochemical enrichments were reported.

Composition by Aqua Regia Digest

To determine environmentally significant elemental concentrations, the tailings samples were analysed following aqua regia digest. These concentrations are typically lower than the total elemental concentrations (four-acid digest) as they represent concentrations that may have long-term environmental influence. The concentrations were compared to the DBCA guidelines (DEC, 2010) and the National Environmental Protection Council (NEPC) 2013 guidelines.

Examination of the elemental concentrations indicated the following:

- Both tailings solid samples reported total chromium (8.7 mg/kg and 51.6 mg/kg) exceeding EIL (DEC, 2010) for chromium VI (1 mg/kg); and
- No samples reported any other exceedances for either guideline.

Note that total chromium was compared to and exceeded the chromium IV guideline, however, the chromium present is most likely to be in the reduced form of chromium (III), not chromium (VI).

Radionuclide Assessment

Naturally occurring radiation levels in tailings samples were low and do not classify under any relevant criteria, being well below the levels of activity (exemption limits) which would trigger possible further assessment. Additional information on radiation at the Project is provided in Section TSF Monitoring and Management.

Leachability

<u>Dilute Acid Leachate Analysis</u>

Dilute Acid Leachate Analysis can provide an indication of metals and metalloids that may be leachable over extended periods if moderately acidic conditions (approximately pH 3.5) were to

prevail. However, it is unlikely that tailings will be exposed to acidic conditions as they are classified as NAF. The following results are for information purposes only, as the likelihood of acidic conditions being present is low.

Dilute acetic acid leachate results for the tailings samples indicated:

- Aluminium concentrations of 1.5 and 2.0 mg/L exceeded the non-potable underground use guideline (DER, 2014) of 0.2 mg/L for both tailings solid samples, respectively; and
- Iron concentrations of 2.1 and 10.6 mg/L exceeded the non-potable groundwater use guideline (DoH, 2014) of 0.3 mg/L for both tailings solid samples, respectively.

Tailings Decant Analysis

Highly soluble elements in the tailing's mixture will preferentially favour the tailings decant liquid over the solid, therefore analysis of the decant can be used to identify potential elements that are likely to leach from the tailings solid under wet conditions. Table 10 outlines the relevant guideline exceedances.

The magnetic tailing decant liquid is acidic (pH of 3.9) with moderate salinity (Total Dissolved Solids (TDS) of 570 mg/L) and very low alkalinity (<5 mg $CaCO_3$/L). Aluminium, manganese and selenium concentrations in the magnetic separation tailings decant were elevated at or above livestock drinking water (selenium) or non-potable use groundwater guideline (manganese, aluminium) levels, indicating a high-level potential for leaching of these elements to the environment under wet conditions. The proportion of these soluble elements is expected to drop rapidly post closure as aluminium and iron presence is driven by presence of colloidal clay material and total selenium concentration in the sample was <0.1 mg/kg — indicating that ongoing selenium solubility and risk is not a significant concern for the environment.

The float tailing decant liquid is slightly alkaline (pH 8.5) with moderate salinity (TDS of 595 mg/L) and moderate alkalinity (150 mg $CaCO_3$/L). Fluoride, aluminium, iron, and molybdenum concentrations in the flotation separation tailings decant were elevated above guideline levels. It is suspected that the flotation tailings contain colloidal clay material due to the unusually elevated iron content for the alkaline material. Colloidal clays may also interfere with the fluoride measurement, as the fluoride can bind to clays, resulting in an artificially elevated concentration.

Table 10: Tailings Decant Guideline exceedances

Sample ID	Fluoride	Al	Fe	Mn	Mo	Se
Magnetic Decant	0.2	3,595	53	5,251	0.07	20
Float Decant	3.2	305	9,475	59	181	2.5
LDW* (ANZECC, 2000)	2	5,000	No limit	N/G	150	20
NPUG (DER,2014)	15	200	300	5000	500	100

* Livestock Drinking Water Guideline

Cation Exchange Capacity and Particle Size Distribution

Cation exchange capacity is an important property for productive agricultural soils as it plays a major role in retention of essential plant nutrients. A summary of the cation exchange for both tailings samples is provided in Table 11. Both tailings' samples were also analysed for particle size distribution and is presented in Table 12.

Table 11: Cation Exchange Capacity of Tailings Samples

Parameter		pH	CEC	Ca	Mg	Na	K	Al	ESP
Units			**Cmol(+)/kg**						**%**
Magnetic Solid		5.3	2.5	0.42	0.69	0.08	1.32	0.08	3
Float Solid		9.0	3.6	0.39	0.44	1.23	1.51	0.08	35
Rating	Low		<5	<5	<1	<0.3	<0.5	<0.1	<6 (non-sodic)
	Medium		5-10	5-10	1-5	0.3-1.0	0.5-2.0	0.1-1.0	6-15 (Mod. Sodic)
	High		>15	>10	>5	>1.0	>2.0	>1.0	>15 (Highly Sodic)

Table 12: Particle Size Distribution of Tailings Samples

Sample	Sand % (0.02 mm – 2 mm)	Silt % (0.002 mm – 0.02 mm)	Clay % (<0.002 mm)	Texture
Magnetic Solid	38.75	51.17	10.07	Sandy Loam
Float Solid	48.67	43.48	7.85	Loamy Sand

The acidic nature (pH 5.3) of the magnetic separation tailings provides increased risk for uptake of heavy metals to plants, however, the low aluminium cation exchange (0.08 cmol(+)/kg) indicate there is a low risk for uptake of aluminium. In contrast, the flotation tailings are alkaline (pH 9.0) with an equivalent aluminium cation exchange. Both samples have low salinities, suitable for plant growth.

Low calcium and magnesium cations in both tailings samples indicate poor soil structure which is not effective with exchanging air and water during wetting and drying cycles, and therefore not ideal growing media for plants. Elevated sodium cation concentration (1.24 cmol(+)/kg) reported for the flotation tailings sample will also contribute to a poor soil structure, whereas the magnetic separation tails reported a very low sodium cation concentration contributing to a more suitable soil structure. The potassium cation exchange (1.32 and 1.51 cmol(+)/kg) are rated medium for both samples which also contribute towards a more ideal soil structure.

The ESP for the magnetic separation tailings is 3% and considered non-sodic, however, the ESP for the float tailings is 35% and is considered highly sodic. Due to the high sodicity, the float tails may be prone to spontaneous dispersion.

Based on the particle size distribution, both tailings samples have similar distributions with most of the material between 0.002 - 2 mm. Both tailings materials are considered clay-poor with a loamy sand texture.

SEEPAGE AND WATER MANAGEMENT

Several seepage control and underdrainage collection features have been integrated into the TSF design in order to reduce seepage losses through the base of the TSF and increase the settled

density of the deposited tailings. These consist of the following components (see drawing WP1-EW-DS-1570-002 in KP 2025, Appendix 1):

- Cut-off trench;
- Compacted soil subgrade;
- HDPE geomembrane liner;
- Basin underdrainage collection system (see drawing WP1-EW-GA-1570-006 in KP 2025, Appendix 1); and
- Embankment upstream toe drain.

Cell 1 has been designed as an evaporation pond during operation as the supernatant is unsuitable for processing, therefore no decant abstraction is required. Supernatant water will be removed from Cell 2 and Cell 3 via a decant turret abstraction system located along an access causeway constructed over the course of operation. Solution recovered from the decant system will be pumped back to the plant for re-use in the process circuits.

The TSF has been designed to comply with standard specified by Australian National Committee on Large Dams (API; 2019a), Global Industry Standard on Tailings Management (GISTM) (Global Tailings Review; 2020) and Department of Mines and Petroleum (now Department of Mines, Petroleum and Exploration - DMPE) (2013) guidelines and standards.

A pipeline containment trench will be constructed to provide secondary containment of the decant return and tailings delivery pipelines between the Process Plant and the TSF (see drawing WP1-EW-DS-1570-002 in KP 2025, Appendix 1). Secondary containment pits will be constructed along the pipeline containment trench. Pits will be of sufficient capacity to capture three hours of tailings discharge as a contingency for leaks in transfer pipelines. Catch pits can also serve to hold tailings in the event of a pipe blockage, so the pipeline can be flushed and drained by manual valves into the catch pits (or TSF).

The TSF underdrainage system has been designed to reduce seepage through the basin and embankment, increase tailings density and increase tailings strength adjacent to the embankment. The system consists of two interconnected drainage networks (see drawing WP1-EW-GA-1570-006 and drawing WP1-EW-DS-1570-005 in KP 2025, Appendix 1):

- Branch Drains - Corrugated, perforated tubing (with filter sock), surrounded by sand, wrapped in geotextile; and
- Finger Drains - Corrugated, perforated tubing (with filter sock), surrounded by sand and wrapped in geotextile.

Branch drains will feed directly to the underdrainage collection sump. Finger drains will connect to branch drains or to the embankment toe drain. Toe drains flow to the underdrainage collection sump, from which the solutions will be pumped back to the tailings beach/supernatant pond.

The proposed TSF seepage control measures (basin lining and underdrainage collection system) are considered appropriate for the expected geochemistry of the tailings solids and supernatant liquor. The design report includes seepage assessment (Section 7.8 in KP 2025), geotechnical and geochemical investigations as appendices.

STORMWATER MANAGEMENT

Sufficient design capacity is available to contain 1% AEP storm events.

Emergency Spillway

An emergency spillway will be available at all times in each cell during TSF operation, constructed through the embankment to provide controlled discharge in the event of emergency overflow to protect the integrity of the embankments (see drawing WP1-EW-DS-1570-004 in KP 2025). The closure spillway will be located in the northwestern corner of each cell directing runoff from the encapsulated TSF into existing drainage lines downstream and will be constructed to ensure all rainfall runoff from the TSF will safely discharge after operation ceases, thus forming a fully water-shedding structure.

Sediment Retention Ponds

Two dedicated sediment retention ponds are included in the TSF design:

- Sediment retention pond 1 – Temporary TSF with a capacity of 7,064 m^3, required due to the staging of the construction of the TSF; and
- Sediment retention pond 2 – Permanent TSF with a capacity of 7,265 m^3

The sediment retention ponds are provided to collect sediment from runoff from the external embankments of the TSF and WRL. Each surface water control structure requires outfall arrangements to ensure that capacity is restored after rainfall events, and emergency outfalls are provided in the case of events greater than the design criteria. The outfall arrangement adopted for the sediment retention ponds is a rock filter wall which allows the pond to freely drain at a slow rate limited by the hydraulic conductivity of the selected geotextile lining which surrounds a permeable rock wall. The base of the sediment retention pond is graded towards the rock wall. A typical sediment retention pond is shown in Figure 14.

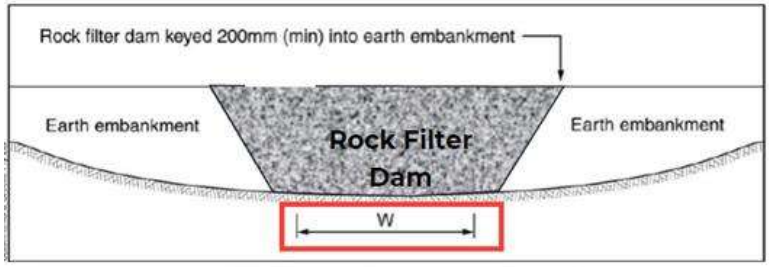


Figure 14: Typical sediment retention pond

TSF MONITORING AND MANAGEMENT

A monitoring programme for the TSF will be developed to monitor for any potential issues which may arise during operations including:

- Monitoring bores and surface water sampling stations downstream of the TSF embankment;
- Standpipe and vibrating wire piezometers in the TSF embankment to monitor the phreatic surface; and
- Survey pins to check for embankment movement.

TSF GROUNDWATER MONITORING DATA

Groundwater monitoring data has been collected since the commencement of the Project, and in some cases since 2014. No permanent natural surface water bodies are present near the Project.

Six groundwater monitoring bores (see Table 13) were installed in 2016 - 2017 to monitor groundwater conditions for the Pilot Project TSF that operated from 2018 to 2022. Groundwater depths and analytical results have been provided to DWER as part of the Annual Environment Report required by licence L9009/2016/1.

Table 13: TSF Groundwater Monitoring Bore Summary

Group	Location	ID	Depth of bore [1]	Purpose
1	Hydraulically upgradient of TSF (control)	MB01S	10	TSF - Shallow seasonal perched water (typically dry)
		MB01D	40	TSF – Deeper aquifer
2	Hydraulically down/cross gradient of TSF	MB02S	10	TSF - Shallow seasonal perched water (typically dry)
		MB02D	40	TSF – Deeper aquifer
3		MB03S	10	TSF - Shallow seasonal perched water (typically dry)
		MB03D	40	TSF – Deeper aquifer

[1] Meters below top of bore casing (m bTOC)

Groundwater in these bores (if present) is monitored monthly with the monitoring requirements varying from monthly field screening to biannual laboratory analysis of up to 40 analytes. The following provides a summary of:

- General groundwater characteristics at the location of the TSF:
  - Depth to groundwater;
  - pH;
  - Total Dissolved Solids (TDS);
- Key analytes present in the tailings of the existing Pilot Plant TSF and proposed TSF:
  - Manganese (Mn);
  - Molybdenum (Mo); and
  - Uranium (U).

Key analytes provide evidence of baseline concentrations and indicators if leaching of tailings occurs from the existing or proposed TSFs.

Groundwater characteristics

The following Figure 15 to Figure 17 present depth to groundwater, pH and TDS results. The below summary has been provided, based on interpretation of the above noted figures:

- **Depth to Groundwater:**
  Depth to groundwater for the deeper bores range from 9.78 m (MB01D) to 19.51 m bTOC (MB03D). The depth to groundwater trend remains relatively steady with a slight decrease in groundwater depth. The decrease is also seen among the greater groundwater monitoring bore network and aquifers. This is likely attributed to rainfall and less likely the TSF, which hasn't had tailing deposited into it since 2022.
  Depth to groundwater for the shallower bore's ranges from 3.75 m bTOC (MB02S) to dry at ~11 m bTOC (all bores). The depth to groundwater trend indicates a temporary perched water body may form d rainfall infiltration and accumulation.
  There appears to be no significant change to the depths to groundwater during the period of the Pilot Plant TSF operation. This indicates the existing TSF is unlikely to be impacting the depth to groundwater.
- **pH:**
  pH results range from 6.38 (MB02D) to 8.15 (MB03D). pH is typically averaging a value of 7.2 with some variability in measurements noted to be likely from in instrument and/or human field screening method variability.
  There appears to be no significant change to pH during the period of the Pilot Plant TSF operation. This indicates the existing TSF is unlikely to be impacting the groundwater pH.
- **TDS:**
  TDS results range from 59.47 (MB03S) to 1,403 ml/L (MB01D). TDS values between monitoring bores varies. This maybe from a variable influence from infiltrating rainwater (low TDS) to groundwater (higher TDS). Despite this TDS difference between groundwater monitoring bores, there appears to be no significant change of TDS values during the period of the Pilot Plant TSF operation. This indicates the existing TSF is unlikely to be impacting the groundwater TDS.

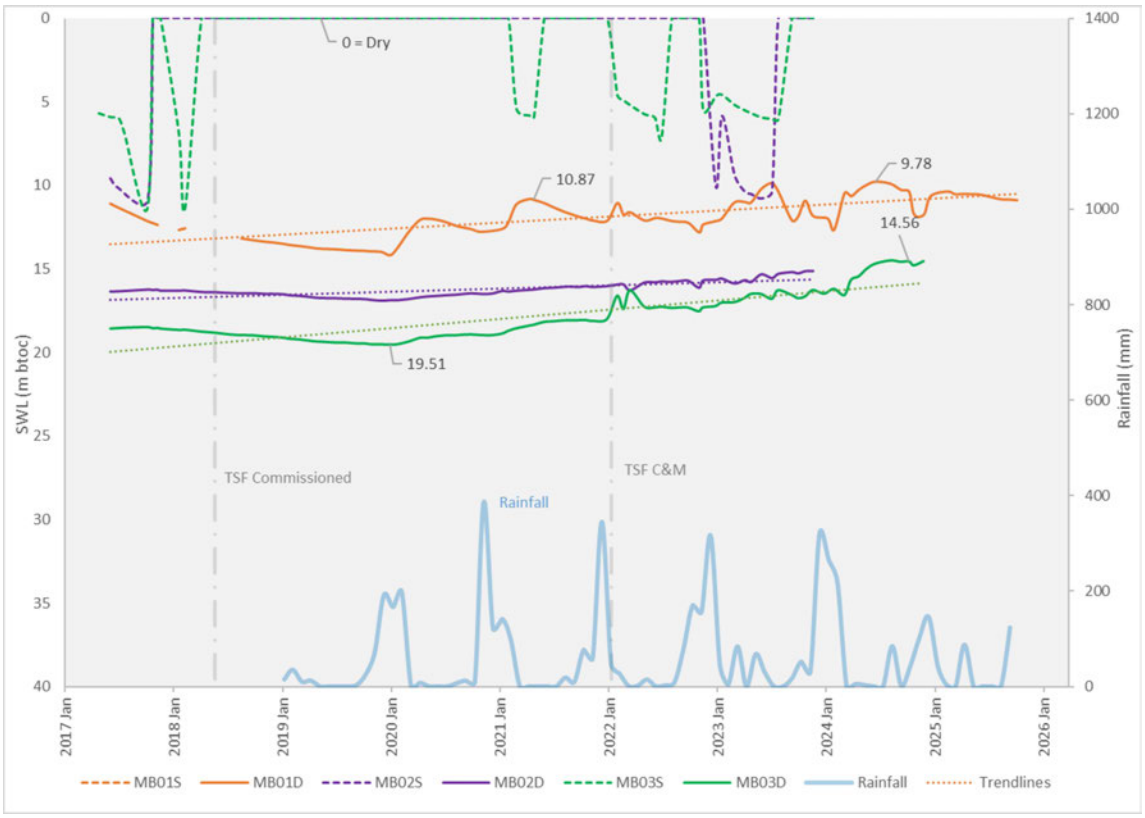


Figure 15: TSF Groundwater Monitoring Bores – Depth to Groundwater

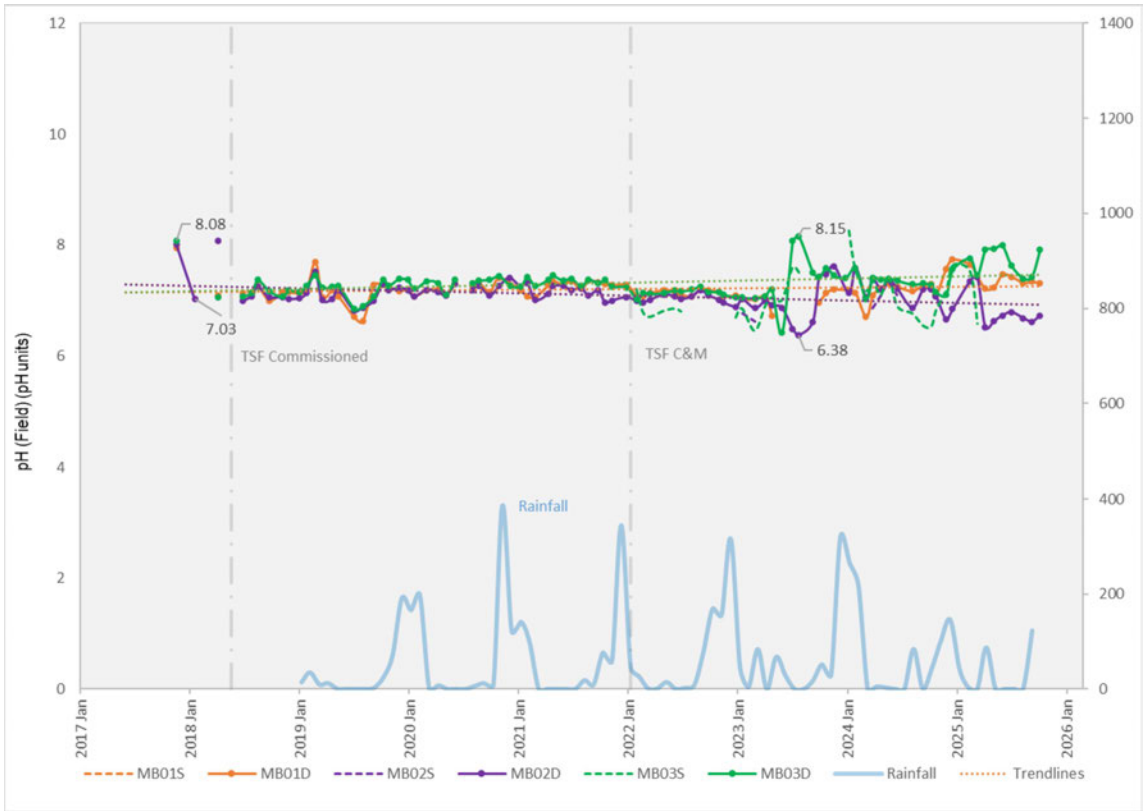


Figure 16: TSF Groundwater Monitoring Bores – pH

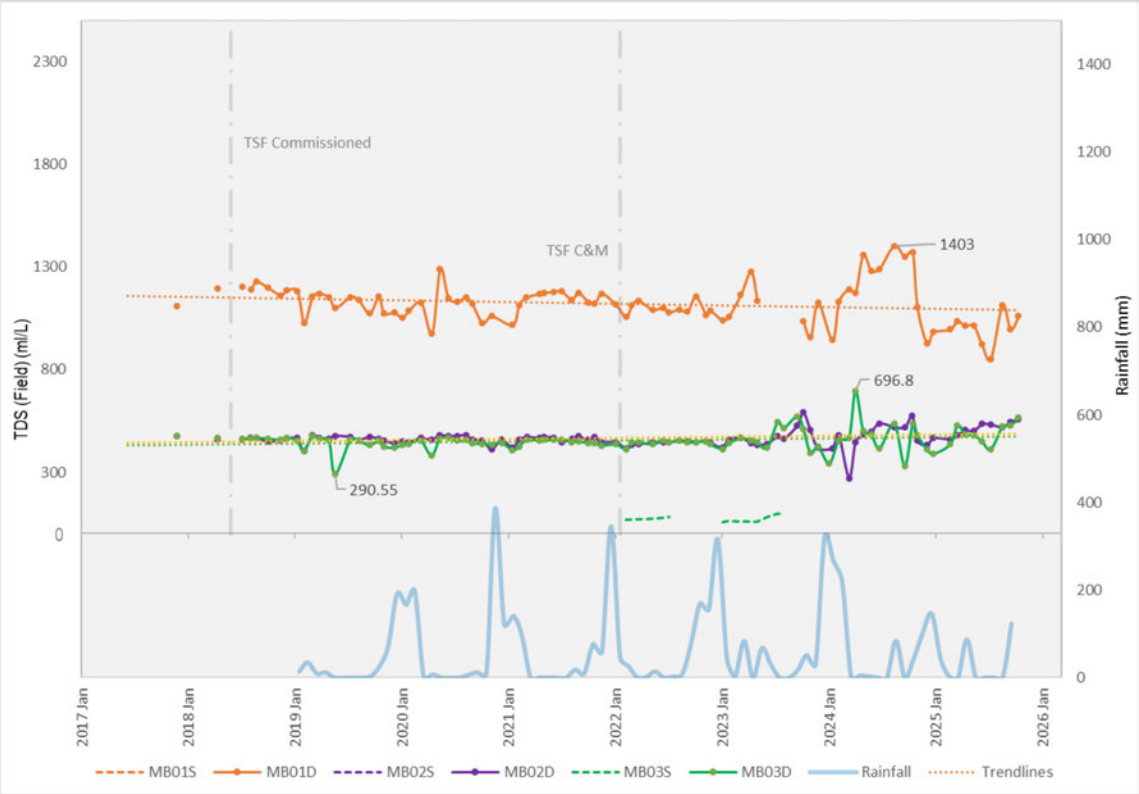


Figure 17: TSF Groundwater Monitoring Bores – TDS

Key Analytes Found in tailings

The following Figure 18 to Figure 20 presents Mn, Mo and U results. The below summary has been provided, based on interpretation of the above noted figures:

- **Mn:**
  Mn results range from the laboratory limit of reporting (LOR) of <0.001 mg/L (multiple bores) to 1.6 ml/L (MB02D). Mn values between monitoring bores varies indicating a variability in the groundwater conditions, possibly a characteristic of an aquifer present primarily in fractured variable rock (in comparison with a homogeneous formation). Despite this Mn difference between some groundwater monitoring bores, there appears no increase of Mn tends during the period of the Pilot Plant TSF operation. This indicates the existing TSF is unlikely to be impacting the groundwater.
- **Mo:**
  Mo results range from the laboratory limit of reporting (LOR) of <0.001 mg/L (multiple bores) to 0.004 ml/L (multiple bores). It is noted an anomalous result of 0.009 mg/L was recorded in 2025 (MB03D), however as it was unusually high and an isolated result, it is not considered for interpretation (it is presented for transparency). Mo values between monitoring bores are generally consistent. There appears to be no significant increase of Mo values during the period of the Pilot Plant TSF operation. This indicates the existing TSF is unlikely to be impacting the groundwater.
- **U:**
  U results range from the laboratory limit of reporting (LOR) of <0.001 mg/L (multiple bores) to 0.002 ml/L (MB03D). U values between monitoring are generally at or marginally above laboratory LOR. There appears to be no significant increase of U values

during the period of the Pilot Plant TSF operation. This indicates the existing TSF is unlikely to be impacting the groundwater.

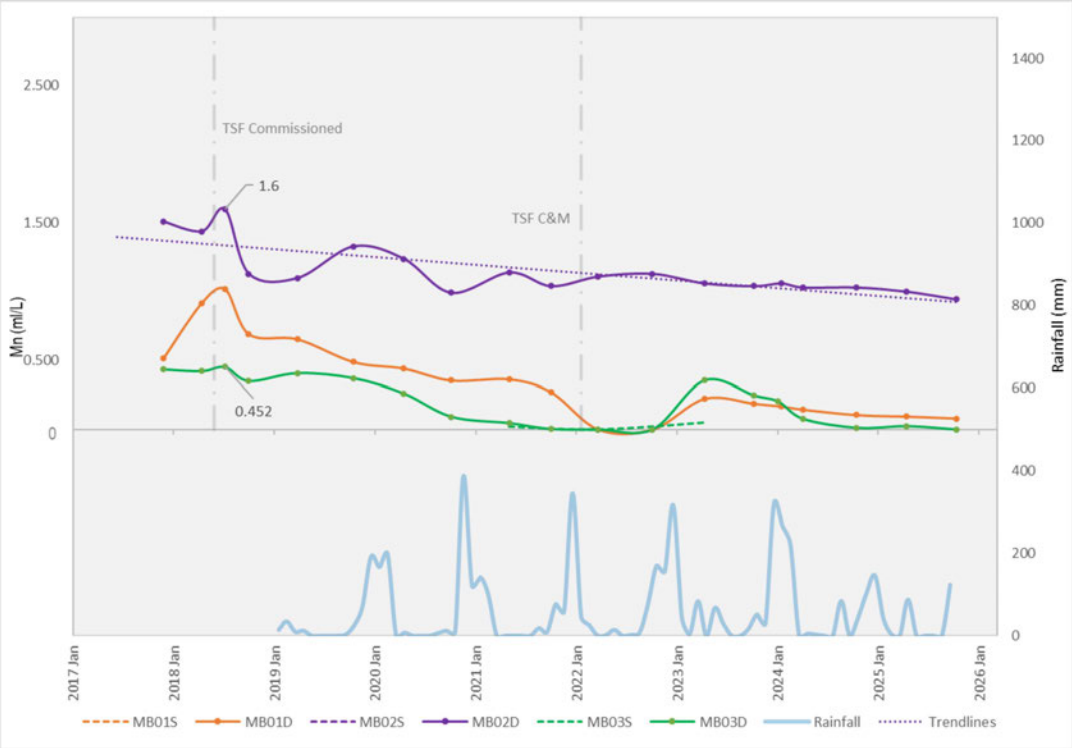


Figure 18: TSF Groundwater Monitoring Bores – Manganese

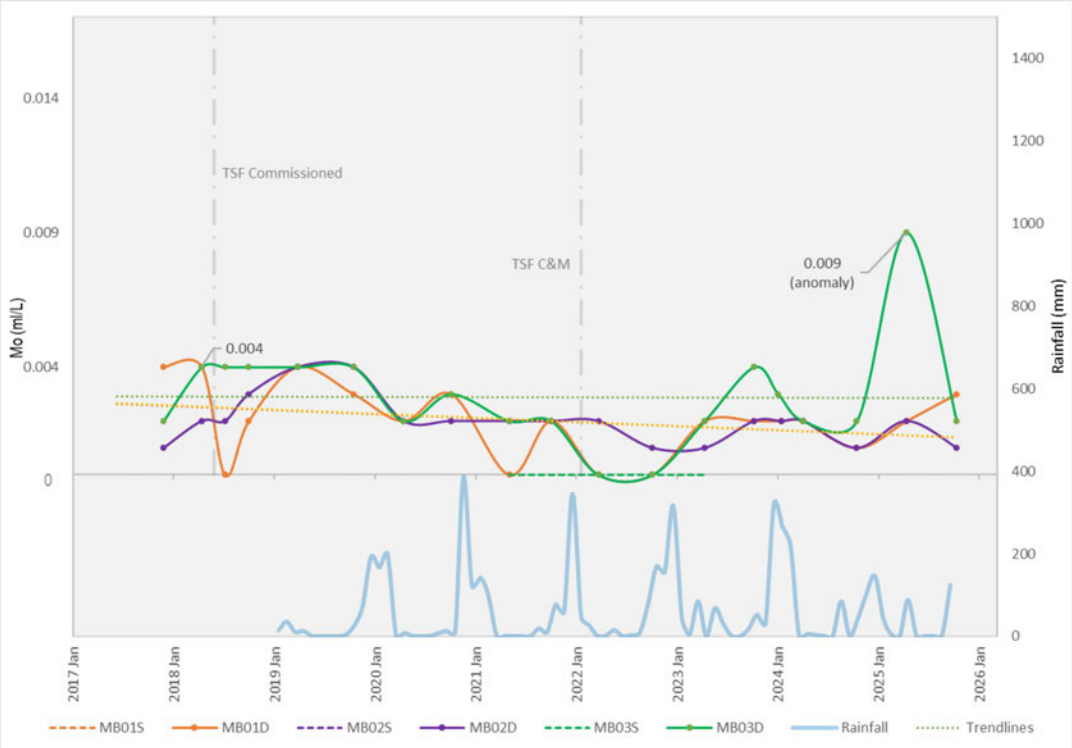


Figure 19: TSF Groundwater Monitoring Bores – Molybdenum

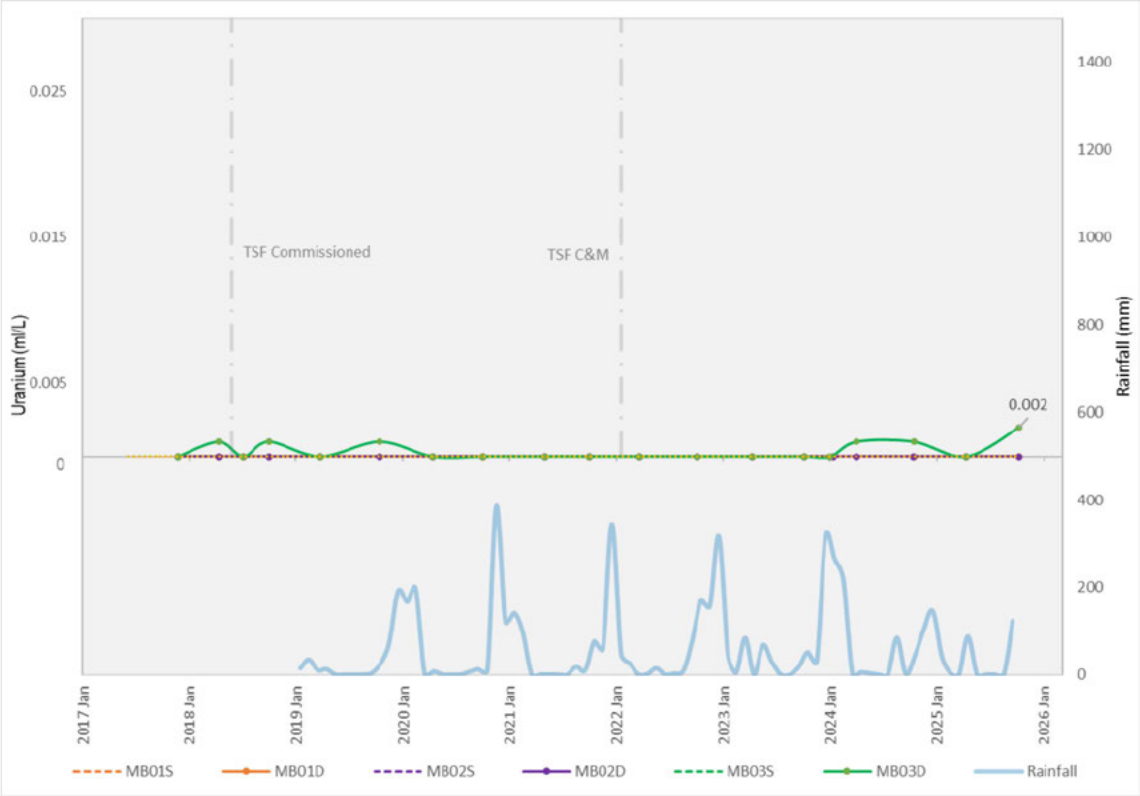


Figure 20: TSF Groundwater Monitoring Bores – Uranium

TSF Inspections

Routine shift inspections by the Processing Department and Environmental Department are expected at the TSF.

Table 14 outlines the maintenance requirements for each component of the TSF. Alterations to the programme due to emergency situations or annual reviews should be conducted regularly. For more detailed information regarding the TSF inspection program, refer to Appendix 1.

Table 14: TSF inspection and maintenance program

Area	Monitoring Requirement	Frequency
Pipeline	Inspect pipeline for pipe bursts, leaking joints; Inspect offtake (s) for blockages, failure etc. Repair and/or replace as necessary; Relocate take-off (s) to new location and check that flow at new location is acceptable; and Inspect pipeline corridor for signs of potential damage.	Daily
	Carry out maintenance on valves and fittings as recommended by suppliers.	As recommended
Tailings	Inspect level of tailings versus embankment crest level; Inspect tailings for general gradient; Inspect discharge location for erosion or damage; and Repair as appropriate.	Daily

Area	Monitoring Requirement	Frequency
Decant	Inspect decant pond and location; and Adjust discharge location to maintain pond around decant tower.	Daily
	Inspect decant for damage or debris.	Weekly or after significant rain events
Embankment	Check general structural integrity and visual signs of seepage through embankment.	Daily
	Visual inspection for slips, erosion problems including around survey pins, tension cracks etc. Problems to be referred to qualified geotechnical engineer for assessment.	Weekly
Underdrainage System	Covered by tailings.	N/A
Toe Drains	Covered by tailings.	N/A
Instrumentation	Inspect all instrumentation and repair / replace as required.	Frequency as per instrument instructions
General	General inspection of tailings facility and all structures Geotechnical audit and report.	Annually
	General assessments of dust emissions.	Daily

3B.5 Power Station

The Project will require a power station for electricity supply. NTU has selected the 11 MW hybrid solar battery energy storage system (BESS)/diesel generator configuration to include the maximum practical and economic quantity of renewable energy in the electricity supply solution. Inclusion of renewable energy, in the form of solar, is intermittent and non-dispatchable in nature, and imposes a requirement for increased flexibility in the storage and delivery of fuel for electricity firming. A hydrocarbon fuel supply is required to meet the electricity demand not met by renewable energy generation and so is required for generation of firming electricity when the renewable energy generation is either underperforming or out of service.

The diesel power station will be located adjacent to the Process Plant area (see Figure 2). In conjunction with the solar farm, it will be sized and configured to supply all electricity requirements to the mine, Process Plant and camp in case the solar system is unable to meet demand. The Project is targeting a renewable energy contribution of up to 44% (i.e. 56% of the power requirement will be provided by the diesel power station).

Design

The diesel power station will comprise fourteen (14) containerised diesel generators of nominal size of 1 Megawatt (MW) each, generating at 400 Volts (V; equivalent to N+1). The generator voltage will be stepped up to 11 kilovolts (kV) and connected to the power station main 11 kV switchboard.

The general arrangement is shown in Figure 21. Note that there will be a single day tank for diesel (not 3 as are shown in Figure 21).

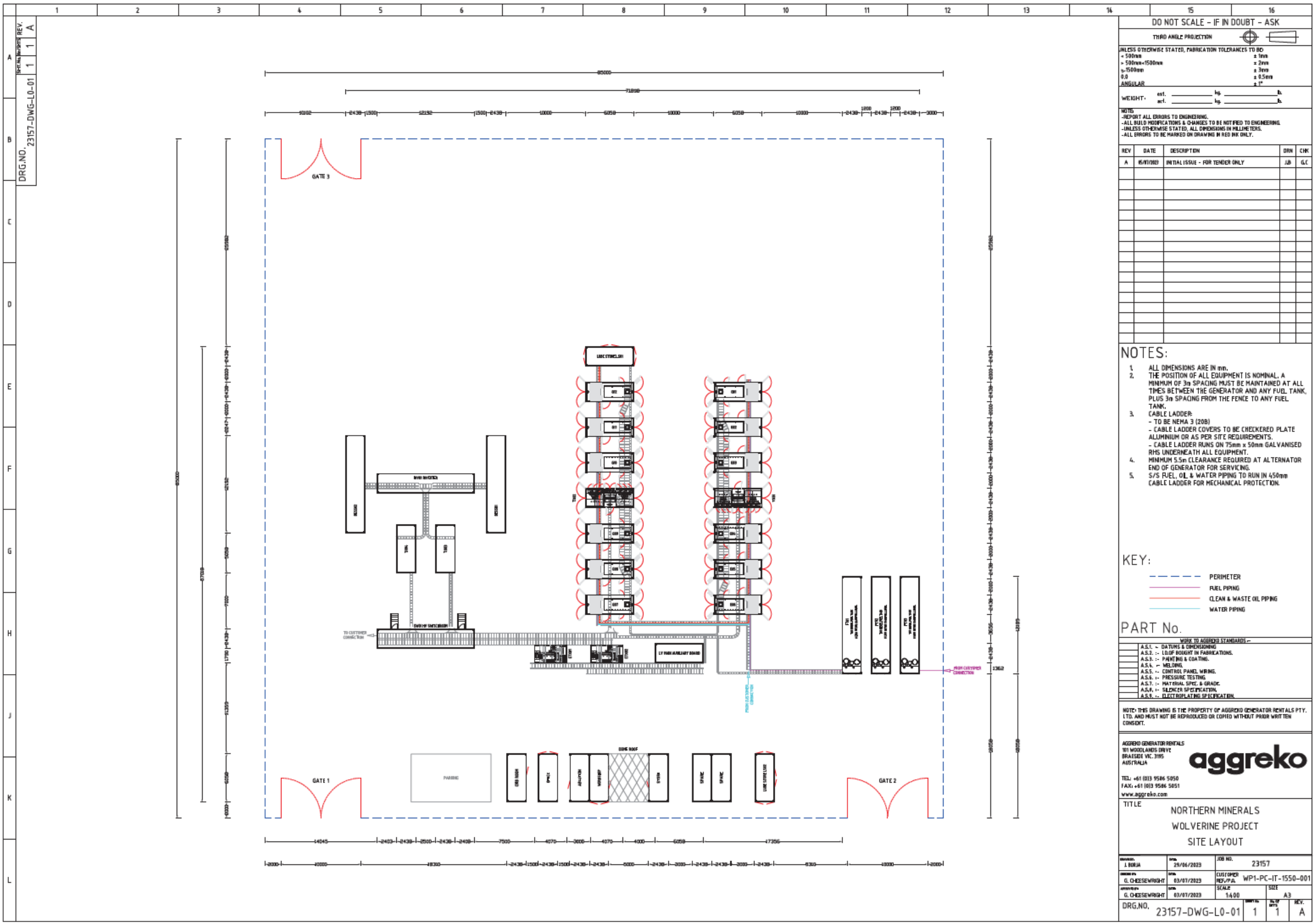


Figure 21: Proposed layout of power station

OPERATION

The hybrid solar/diesel power station integrates solar photovoltaic (PV) generation and conventional diesel engines to provide a flexible and reliable electricity supply. The solar farm (not subject to this application) has a capacity of 14.5 MW and supplies energy directly into the electricity network during daylight hours. The hybrid station incorporates battery energy storage system (BESS) rated at 10 MW with 10 MWh of energy storage.

The availability of solar power varies daily and seasonally due to weather conditions and the solar irradiance cycle, so the diesel generators and energy storage system will be used to maintain supply stability and meet continuous demand.

The diesel generators operation will be coordinated by a control system that monitors real-time demand, solar generation levels and battery status. Diesel generators can be ramped up or down independently, allowing for modular operation that optimise fuel efficiency while minimising emissions.

Electricity from the power station will be reticulated to the mine site facilities at 11 kV via feeder circuits from the power station main switchboard to locations in the process plant, accommodation camp, administration areas, TSF and mine via underground lines (except underground workings will be fed by an overhead feeder line).

Prefabricated, transportable switch rooms will be used to house the switchboards and motor control centres (MCC) for the process plant. Process plant transformers for each switch room will be located in fenced compounds adjacent to the switch room. Process plant transformers are generally 1-2 MVA, oil immersed 11/0.4kV units provided with oil temperature and level protection, and a pressure relief device to trip the load on a transformer fault.

DIESEL STORAGE

Diesel storage facility will be located adjacent to the Power Station (known as Independent Power Producer (IPP) fuel farm, see Figure 2). Fuel will be stored in self-bunded tanks, providing two months of fuel to support operations during the wet season road closures. The facility will be bollarded and/or earth-bunded to prevent vehicle collisions.

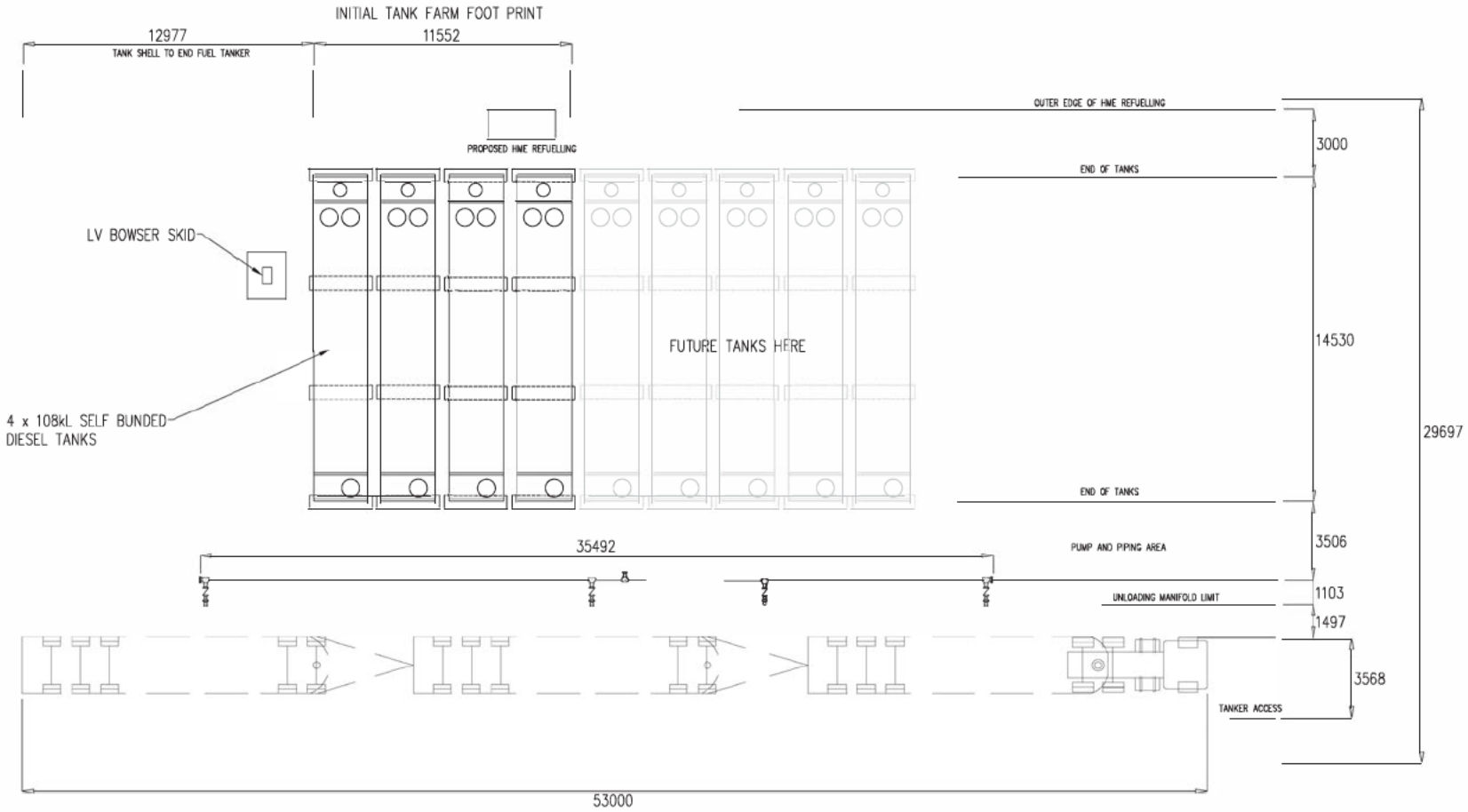
The total diesel storage capacity at the IPP fuel farm will be 900 kL and will consist of up to nine (9) self-bunded storage tanks of capacity around 100 kL each, connected by parallel piping (Figure 22). The piping and pumping system will allow storage tanks to be operated as one large tank, or as individual tanks when road conditions allow for a lower stock holding. Delivery will be by road trains, with the decanting point specifically configured with a four-point connection manifold sized for this purpose.

The facility will include a light vehicle bowser, and a heavy mining equipment fill arm. The light vehicle bowser will be a standard commercial bowser with internal pumping unit and meter. The heavy mining equipment fill arm will have a pump and meter to facilitate fuel deliveries into mining equipment working near the IPP.

All transfer points will be constructed with compacted material underlain with HDPE liner to contain spills. A system emergency stop button with audible alarm will be installed at the

delivery/unloading area. Fire extinguishers and spill kits will be in place at fuel loading and unloading areas.

Tank fuel levels will be monitored by Smartdip gauging system and will be fitted with high level/audible alarm float switches and an automatic overfill pump stop system.



0 2 4 6 8 10M

SCALE 1:100

DO NOT SCALE DIMENSIONS IN MM DRAWING PRACTICE TO AS1100							RAV DG SERVICES Pty Ltd ABN: 0417 872 873 EMAIL: ravbase@bigpond.com PROJECT ENGINEERING AND MANAGEMENT			
	1	07.12.23	MODIFY TANK FARM LAYOUT AND CAPACITY				DRAWN DATE 17.08.2023	DRAWN BY RAV	SCALE 1:100	PLOTTED DATE
	NO.	DATE	BY REVISION	APP'D No.	REFERENCE DRAWINGS	DWG. No.	AD REF:			

NORTHERN MINERALS LIMITED
WOLVERINE RARE EARTH PROJECT

MSA FUEL FARM FOOTPRINT

DRAWING No.	SIZE	REVISION
RAV-NMW-0602	A1	1

Figure 22: Layout of bulk diesel storage facility for power plant

Fuel from the storage tanks will be supplied to the power station day tank via a metered pump and above-ground pipe system. The above-ground pipe will be bunded. The day tank will be fitted with two independent overfill protection devices – e.g., high-level float switches that de-energise the supply pump.

3B.6 - TIME LIMITED OPERATIONS

Once construction and environmental commissioning is complete, a period of 180 days TLO is being sought to allow sufficient time to transition the operations under a Licence.

ATTACHMENT 5: OTHER APPROVALS AND CONSULTATION

5.1 - OTHER APPROVALS

Environment Protection and Biodiversity Conservation Act 1999

The Project has been referred three times under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and determined to be 'not a controlled action'. The third referral in 2025 was determined not to be a controlled action if carried out in a particular manner.

Part IV, Environmental Protection Act 1986

Northern Minerals referred the Browns Range Project to the EPA on 2 May 2013. The Project was assessed by the EPA under Part IV of the EP Act and Ministerial approval was issued on 18 August 2014 (MS 986). Three changes have since been approved under Section 45C of the EP Act. This works approval application is aligned with the scope of the current approved MS 986.

Part V, Environmental Protection Act 1986

DWER issued Northern Minerals with a Works Approval for a Stage 1 Pilot Plant (W6007/2016). The pilot plant was constructed to approximately 10% of the scale of the full-scale plant originally proposed for the Project. A Licence (L9009/2016/1) was issued on 11 July 2018 to operate the Pilot Plant.

A Landfill Facility was constructed under works approval (W5837/2015/1) and commissioned in November 2017 when Environmental Registration R2457 was issued by DWER. The Landfill was included in L9009/2016/1 in 2018 as a Category 89 Landfill Facility.

W2943/2025/1 approved an expansion of the landfill, a wastewater treatment plant and mobile crushing and screening facilities to support early-works construction activities. The Prescribes premises boundary for these works is the same boundary as the development envelope specified in MS 986 to allow free movement of the mobile crushing and screening facilities.

An amendment to L9009/2016 will be required to include the operation of the Works in this works approval application.

Mining Act 1978

The Browns Range Rare Earths Project, Pilot Project Mine Development and Closure Proposal (MDCP) Reg ID 204417 was approved by DMPE via Approvals Statement AS-234527 v1.00 on 24 October 2025.

A MDCP application for the full-scale Project, inclusive of the activities in this application, was submitted to DMPE on 31 October 2025. Northern Minerals will notify DWER when the Approvals Statement is released.

Rights in Water and Irrigation Act 1914

Groundwater licence GWL 177452 is in place for the Project, most recently updated to version 8 on 3 November 2025 to reflect a new mining lease.

Dangerous Goods Safety Act 2004

Northern Minerals holds Dangerous Goods Licence DGS022373 for storage of diesel and processing reagents relating to the Pilot Project. A new or amended dangerous goods licence will be applied for to reflect storage requirements and materials required for the full-scale Project.

Aboriginal Heritage Act 1972

None of the Works require the disturbance of any registered Aboriginal Heritage sites.

Radiation Safety Act 1975

Approvals for the Pilot Project required the Browns Range Project site to be registered under the *Radiation Safety Act 1975* (WA; RS Act) with the Government of Western Australia Radiological Council (Radiological Council) as a premises in which radioactive substances are used, stored or manufactured (registration number RS 73/2012 22222 and RX 76/2018 29487).

Two management plans were developed by NTU and approved by the WA Department of Energy, Mines, Industry Regulation and Safety (now Department of Local Government, Industry Regulation and Safety - LGIRS):

1. Radioactive Waste Management Plan (RWMP) approved on 19 December 2019 and remains current. The RWMP details how radioactive waste generated by the Pilot Plant will be managed during all phases of the Project; and
2. Radiation Management Plan (RMP) version 5 approved by DEMIRS on 23 November 2022. The RMP establishes the systems for the management, measurement and control of radiation impacts to workers, the public and dispersion to the environment. The RMP is a live document which is revised when radiation risks change or there are changes to radioactive materials on site. Revisions must be approved by the Radiological Council and LGIRS prior to implementation.

NTU is currently revising the above plans to reflect the beneficiation-only processing method and resultant changes in the radiological risk profile for tailings and HRE concentrate product.

Product transport will be contracted to a third-party transport company that is appropriately licenced by LGIRS and the Radiological Council. The transport company will be required to implement their approved Transport Management Plan to identify and manage the risks during HRE concentrate transport from the Project to Eneabba using public road networks.

5.2 - Stakeholder Consultation

5.2.1 Developing a Stakeholder Engagement Strategy

Northern Minerals has a consultation strategy which identifies key external stakeholders and determines how they will be impacted by the Project and what influence they have over its implementation. The aim of such extensive consultation is to develop productive relationships that ensure the Project is underwritten by sustainable agreements and necessary statutory

approvals. The consultation strategy has also been developed to secure the approvals necessary for the construction and operation of the Project.

Commonwealth, State, and Local Government authorities have been briefed on the Project in its entirety to ensure any issues, concerns, or suggestions are identified and, where appropriate, addressed or responded to by Northern Minerals.

The following Government Stakeholders have been consulted (Appendix 2):

- Commonwealth Authorities:
  - Department of Climate Change, Energy, the Environment and Water (DCCEEW);
  - Department of Industry, Science and Resources (DISR);
- State Authorities:
  - Department of Biodiversity, Conservation and Attractions (DBCA);
  - DMPE;
  - DWER;
  - Department of Regional Development;
  - Main Roads WA;
  - DoH;
  - Environmental Protection Authority; and
  - Kimberley Development Commission.
- Local Authorities
  - Shire of Wyndham – East Kimberley
  - Shire of Halls Creek; and
  - Shire of Broome.

Northern Minerals recognises that individuals, companies, and communities may also be interested in the impacts of the Project. The following corporate and community stakeholders were deemed to be relevant to this Project and have been consulted (Appendix 2):

- Jaru Aboriginal Corporation (JAC) Registered Native Title Body Corporate (RNTBC);
- Tjurabalan Native Title Land Aboriginal Corporation (TNTLAC) RNTBC;
- Kundat Djaru (Ringer Soak) community;
- Halls Creek Community;
- Regional Development Australia (RDA) - Kimberley;
- Civil Aviation Safety Authority (CASA); and
- The Flora Valley and Gordon Downs pastoral lease holder, Heytesbury Cattle Company.

This Works Approval application will be advertised for public comment as per DWER's standard procedure.

ATTACHMENT 6A: EMISSIONS AND DISCHARGES

Table 15 details all potential emissions and discharges expected during construction, commissioning and operation of the Prescribed Premises. The closest sensitive receptor (Ringer Soak Community) is located approximately 30 km from the Works and therefore will not be affected.

Table 15: Potential emissions and discharges from the Prescribed Premises

Source of emission or discharge	Emission or discharge type	Volume and frequency	Proposed Controls
Construction			
Vehicle movements, pumps, generators and construction machinery.	Noise.	Exact noise emissions are unable to be quantified however they are not expected to be excessive given the simple process and small scale of the activities. Noise is unlikely to impact receptors as the nearest sensitive receptor is approximately 30 km away (Ringer Soak Community).	**Management**: • All construction work will comply with the Environmental Protection (Noise) Regulations 1997 (Noise Regulations). • Equipment will be regularly serviced and maintained. **Monitoring:** • Complaints from receptors investigated and remedial actions implemented as required. • Maintain an incident reporting system.
Vehicles movements, excavation, movement and storage of earthen material and dust lift from cleared surfaces.	Dust.	Exact dust emissions are unable to be quantified however they are not expected to be excessive given the small scale of the activities. Dust is unlikely to impact receptors as the nearest sensitive receptor is approximately 30 km away (Ringer Soak Community).	**Management**: • Implement Dust Management measures including: o Water trucks for dust suppression on unsealed roads and open areas. o Watering of open and exposed areas, including construction material stockpiles. o Speed limits applied on site. o Ground cover retained or revegetated where appropriate. o Adaptive management implemented as required to address monitoring trends. **Monitoring:** • Implement visual dust monitoring, particularly during high-risk weather conditions for dust emissions (i.e. windy conditions). • Complaints from receptors investigated and remedial actions implemented as required. • Maintain an incident reporting system.
Storage and use of hydrocarbons or other chemicals.	Leaks or spillages.	Unintentional discharge only.	**Management**: • Hydrocarbons and chemicals will be stored within bunded areas and handled in accordance with AS 1940 *The storage and handling of flammable and combustible liquids*. • Spill kits will be located at points where hydrocarbons are stored or transferred. • Any spills will be controlled, contained and cleaned up in accordance with an internal procedure. • Service trucks will be equipped with spill response equipment for refuelling of mobile equipment in the field. • All dangerous goods and hazardous substances will be isolated from other incompatible chemicals through: o Physical separation distances; o Barriers; and/or

Source of emission or discharge	Emission or discharge type	Volume and frequency	Proposed Controls
			○ Combination of distance and barriers. • Refuelling of light vehicles (and most heavy vehicles, where possible) undertaken at designated refuelling bays. **Monitoring:** • Spill kits will be regularly checked and replenished if required. • Maintain an incident reporting system.
Cleared areas and TSF embankment.	Sediment-laden stormwater runoff.	No planned discharge. There are no permanent water bodies within the Project area. Intermittent seasonal flow in the ephemeral drainage lines that traverse the site generally travels in a westerly direction. Stormwater runoff is expected to be minimal due to the sandy soils at the premises that have high infiltration.	**Management**: • Areas will not be disturbed until they are required to be used, and the area to be disturbed will be minimised where practicable. • Cleaning and maintenance of stormwater drains. **Monitoring**: • The site will be inspected for erosion after significant rainfall events. • Stormwater drainage will be inspected on a regular basis. • Maintain an incident reporting system.
Construction waste / litter.	Windblown rubbish.	Unintentional discharge only.	**Management**: • Bins available and sealed or placed in a manner to restrict fauna access and windblown rubbish. • Staff and contractors involved in construction inducted on site with clear expectations set around waste management. • In the event that rubbish does escape the confines of the site, staff and/or contractors will collect rubbish on a campaign basis (as required). • Waste will be disposed of at a licenced landfill facility. **Monitoring:** • Regular visual site inspections. • Maintain an incident reporting system.
Commissioning/Operations			
Diesel Storage Area, Reagent Storage area and throughout prescribed premises	Leaks or spillages of hydrocarbons or other chemicals.	Unintentional discharge only.	**Management**: • Hydrocarbons and chemicals will be stored within bunded areas and handled in accordance with AS 1940 *The storage and handling of flammable and combustible liquids*. • Spill kits will be located at points where hydrocarbons are stored or transferred. • Any spills will be controlled, contained and cleaned up in accordance with an internal procedure. • Service trucks will be equipped with spill response equipment for refuelling of mobile equipment in the field.

Source of emission or discharge	Emission or discharge type	Volume and frequency	Proposed Controls

			• All dangerous goods and hazardous substances will be isolated from other incompatible chemicals through:
			  ○ Physical separation distances;
			  ○ Barriers; and/or
			  ○ Combination of distance and barriers.
			• Refuelling of light vehicles (and most heavy vehicles, where possible) undertaken at designated refuelling bays.
			Monitoring:
			• Spill kits will be regularly checked and replenished if required.
			• Maintain an incident reporting system.

Power Station, Process Plant and TSF operation	Noise.	Exact noise emissions are unable to be quantified however they are not expected to be excessive given the simple process and small scale of the activities. Noise is unlikely to impact receptors as the nearest sensitive receptor is approximately 30 km away (Ringer Soak Community).	**Management**: • All operational activities will comply with the Environmental Protection (Noise) Regulations 1997 (Noise Regulations). • Equipment will be regularly serviced and maintained. **Monitoring:** • Complaints from receptors investigated and remedial actions implemented as required. • Maintain an incident reporting system.
Process Plant	Dust.	Dust emissions are not expected to be excessive given the dust mitigation measures included in the design (Section 3B.3).	**Management**: • Implement dust management controls as per Section 3B.3 **Monitoring:** • Dust monitoring in accordance with OHS requirements and the Radiation Management Plan (relating to Concentrate bagging and storage). • Opportunistic inspections for dust emissions will be undertaken. • If visible dust emissions are noted then an assessment of the source will be made, and additional control measures (e.g., water) will be applied to key source areas. • Weather conditions will be monitored to identify potential high-risk conditions (i.e. windy conditions). Additional control measures will be considered for high-risk weather conditions. • An incident reporting system will be maintained to assist in managing environmental incidents such as excessive dust emissions.
	Sediment-laden stormwater runoff (emission point in Figure 2).	No planned discharge. Stormwater pond designed to contain 1:20 year ARI. There are no permanent water bodies within the Project area.	**Management**: • Management of stormwater as per Section 3B.3. • Cleaning and maintenance of stormwater and sediment drains and ponds. **Monitoring**:

Source of emission or discharge	Emission or discharge type	Volume and frequency	Proposed Controls
		Intermittent seasonal flow in the ephemeral drainage lines that traverse the site generally travels in a westerly direction. Stormwater runoff is planned to be captured within the stormwater management system.	• The stormwater management infrastructure will be inspected against design criteria after significant rainfall events. • Maintain an incident reporting system.
	Leaks or spillage of ore or waste material.	Unintentional discharge only.	**Management:** • Control, contain and clean up any leaks or spillages • Management of stormwater as per Section 3B.3. • Cleaning and maintenance of stormwater and sediment drains and ponds. **Monitoring:** • The stormwater management infrastructure will be inspected against design criteria after significant rainfall events. • Maintain an incident reporting system.
Tailings and decant pipelines	Leaks or spillage of tailings or decant water.	Unintentional discharge only.	**Management:** • Control, contain and clean up any leaks or spillages • Management of stormwater as per Section 3B.3 and 3B.4. • Cleaning and maintenance of stormwater and sediment drains and ponds. **Monitoring:** • The stormwater management infrastructure will be inspected against design criteria after significant rainfall events. • Maintain an incident reporting system.
TSF	Tailings seepage.	Unintentional discharge only.	**Management:** Seepage control and underdrainage collection features include (refer to Section 3B.4 for more information): • Cut-off trench. • Compacted soil subgrade. • HDPE geomembrane liner. • Basin underdrainage collection system. • Embankment upstream toe drain. **Monitoring:** As required by Approvals Statement and Tailings Operating Manual, including:

Source of emission or discharge	Emission or discharge type	Volume and frequency	Proposed Controls
			• Monitoring bores and surface water sampling stations downstream of the TSF embankment. • Standpipe and vibrating wire piezometers in the TSF embankment to monitor the phreatic surface. • Survey pins to check for embankment movement.
	Tailings spillage due to embankment failure.	Unintentional discharge only.	**Management:** • TSF constructed and operated in accordance with Detailed Design Report (Appendix 1) and Tailings Operating Manual • Comply with Approvals Statement issued under the *Mining Act 1978* (when approved). **Monitoring:** Regular inspections and maintenance completed, as required by Approvals Statement and Tailings Operating Manual.
	Tailings overtopping the embankment.	Unintentional discharge only.	**Management:** • TSF constructed and operated in accordance with Detailed Design Report (Appendix 1) and Tailings Operating Manual, including maintaining freeboard and emergency spillway • If storm is greater than TSF design criteria, rainfall and supernatant water which cannot be stored in supernatant pond will discharge into emergency spillway. • The spillway channel is designed to discharge downstream of the embankment toe into a drainage channel reporting to a sediment retention pond (SRP) shown in Figure 2. **Monitoring:** • Regular inspections and maintenance completed, as required by Tailings Operating Manual.
	Tailings lift-off surface dust	Dust emissions are not expected to be excessive given the dust mitigation measures included in the design (Section 3B.3).	**Management:** • Implement dust management controls as per Section 3B.3 **Monitoring:** • Implement visual dust monitoring, particularly during high-risk weather conditions for dust emissions (i.e. windy conditions). • Complaints from receptors investigated and remedial actions implemented as required. • Maintain an incident reporting system.
Power Plant	Air emissions from stacks (emission point in Figure 2)	Continuous per generator, when operating at 41'C: NOx 14 g/kWh Particulate Matter 0.05 g/kWh CO 0.32 g/kWh	**Management:** • Hybrid solar power solution proposed to minimise emissions • Industry-standard best-practice design • Implement maintenance schedule **Monitoring:**

Source of emission or discharge	Emission or discharge type	Volume and frequency	Proposed Controls
			Validation monitoring of emissions during commissioning to ensure emissions are within design parameters.

MONITORING METHODS AND LOCATIONS

A proposed monitoring regime for the process plant and TSF operations is provided in Table 16. Parameters are discussed further in the following sections where required.

Table 16: Proposed monitoring during operations

Monitoring Point[1]	Parameter	Units	Averaging period	Frequency
Groundwater				
Control MB13 S & D **TSF** MB03 S & D MB10 S & D MB11 S & D **Process Plant** MB12 S & D	**Field measures**[2] Standing water level pH TDS	m bTOC pH units mg/L	Spot sample	Monthly
	Metals • Fluoride • Aluminium • Iron • Manganese • Molybdenum • Selenium	mg/L	Spot Sample	6-monthly: April and October
	Full TSF suite as per Table 12 in L9009/2016/1 dated 29/10/2021		Spot Sample	Annually
Dust				
TSF	Visual	-	In accordance with WHS Regulations	
ROM	TSP, PM_{10} personnel exposure	-		
Concentrate Bagging Facility - internal	Airborne dust	mg/m^3	In accordance with RS Act registration and WHS Regulations	
	Gamma Radiation	Bq/g		
Geotechnical Performance				
Survey Pins	Embankment Stability	x,y and z coordinates	Spot Sample	Monthly
Piezometers	Water level	m bTOC	Spot Sample	Monthly
TSF	Geotechnical audit	n/a	Annual	Annually
TSF	**Water Balance** Site rainfall Evaporation Tailings return water volumes Seepage recovery volumes Volume of tailings deposited	m^3	Monthly	Annual
Tailings pipelines				
Delivery Decant return	Leaks - visual	n/a	Inspection	Daily
	Flow rate	kL/day	Daily	Continual automated with telemetry for leak detection
Radiation Management (regulated under RS Act site registration)				

Note 1: Indicative location shown in Figure 15
Note 2: In-field non-NATA accredited measurement

Groundwater

Figure 15 shows standing water levels in groundwater monitoring bores for the Pilot Project TSF from 2017 to 2025. Standing water level in deep bores range from 10-20 m below top of casing. Shallow monitoring bores intermittently contain water then dry out, likely reflecting the wet/dry season cycles.

Groundwater monitoring is proposed downstream of the expanded TSF and new process plant. As was the case for the Pilot Project, monitoring bores will be paired shallow/deep bores

Groundwater in the Browns Range Metamorphic geology is estimated to generally flow westward/south-west from the north-east as shown in groundwater contours in Figure 27 (NTU, 2018). Therefore, groundwater bores to monitor for potential seepage from the TSF will be located southwest/south of the full-scale TSF. Indicative locations are as shown in Figure 27. Existing MB01 and MB02 adjacent to the Pilot Project TSF will be decommissioned because they are in the footprint of the TSF expansion. New monitoring bores MB11 and MB12 will replace them. A new monitoring bore will be installed south of the processing plant (MB13), and an additional upstream/control monitoring bore (MB14) will be established to the E/NE of the processing plant.

Groundwater monitoring bores will be paired, with one deep and one shallow bore at each monitoring location to intersect the shallow and deep aquifers (Appendix 6). They will be constructed as per the *Minimum Construction Requirements for Water Bores in Australia* (National Uniform Drillers Licensing Committee 2020).

As described in Section Tailings Characterisation, several metals are highly soluble, hence are found in the tailings decant. Elevated levels of these metals are therefore useful indicators of potential TSF seepage to groundwater. Groundwater monitoring to date has included these metals providing a reasonable baseline dataset. An example for Manganese is shown in Figure 18 and Molybdenum is shown in Figure 19.

There is no evidence of seepage from the Pilot Project TSF to date, based on metals monitoring. Further, monitoring of the full suite of parameters required by L9009 Table 15 indicates there has been no groundwater contamination to date, suggesting no TSF seepage.

The proposed groundwater monitoring analytical suite in Table 16 has been developed based on monitoring conducted to date, risk to the environment and monitoring requirements currently in L9009 Table 12.

Dust

Due to the distance to sensitive environmental receptors, dust monitoring will focus on occupational health and safety risks and will be managed in accordance with *Work Health and Safety Regulations 2022*. In addition, visual dust monitoring will be used to assess the effectiveness of dust suppression controls designed into the ROM, crusher, process plant and TSF.

Radiation risks associated with dust will be managed in accordance with the *Radiation Safety Act* via an approved Radiation Management Plan.

ATTACHMENT 7: SITING AND LOCATION

7.1 LOCAL AND REGIONAL CONTEXT

The Project is located approximately 160 km southeast of Halls Creek, WA near the WA/ Northern Territory Border (Figure 1).

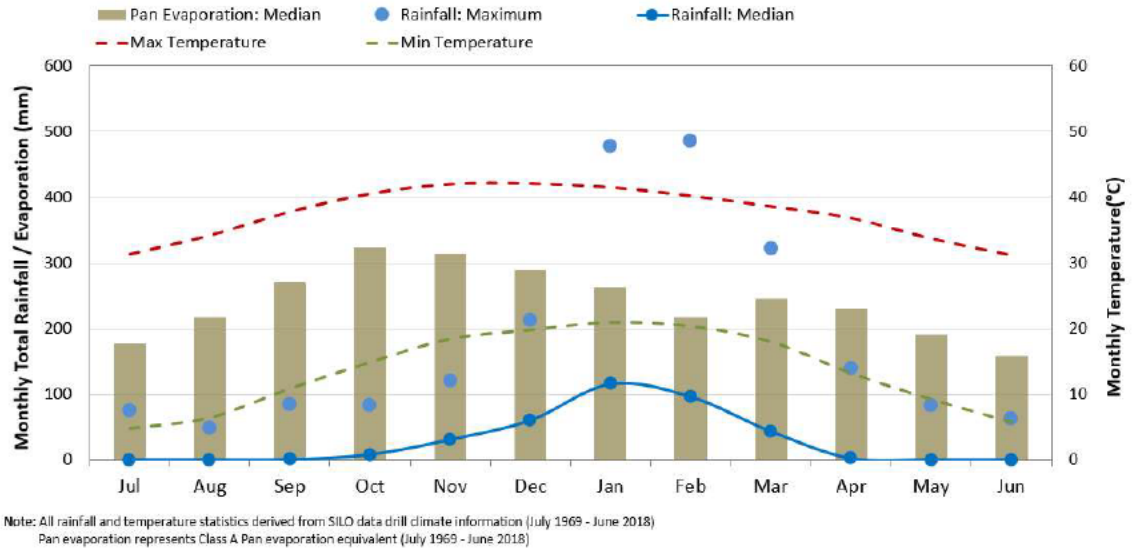
The Project is located at the northern edge of the Tanami Desert. It lies within the Tanami bioregion, as defined by the Interim Bioregions of Australia (IBRA) classification system (Graham, 2001). The majority of the Tanami bioregion extends eastward into the central Northern Territory, but a small portion of the bioregion extends westward into WA. The Tanami bioregion is composed of three sub-regions: Tanami 1, Tanami 2 and Tanami 3. Tanami 1, where the Project is located, is the largest of the three sub- bioregions.

The Prescribed Premises are located within Mining Act tenure on unallocated Crown Land and the Gordon Downs pastoral lease. A significant amount of environmental baseline information has been collected for the Project throughout the Mining Act process, and a summary of baseline information is provided below.

7.2 CLIMATE

The Project is located on the edge of the Tanami desert and is semi-arid. Average annual pan evaporation is in the order of 3,000 mm/year and average monthly evaporation exceeds median rainfall throughout the year (Figure 24). Rainfall is associated with tropical monsoonal activity or the passage of cyclones between November and March, with several high intensity rainfall events likely each year. While the average annual rainfall is approximately 449 mm (July 1970 to June 2018), long term annual rainfall for the Project shows a relatively high level of inter annual variability ranging from a minimum of 144 mm (1991-92) to a maximum of 1011 mm (2000-01) (Golder, 2019). Monthly rainfalls can exceed 400 mm and daily rainfalls of over 100 mm have been recorded on site several times (20% Annual Exceedance Probability).

The Browns Range weather station has recorded daily climate data since December 2012. Figure 23 presents a climate summary for Browns Range. Figure 24 presents the previous years (2023) monthly rainfall in comparison to average monthly rainfall to date (2012 to 2023). Table 17 presents 2023 monthly rainfall against SILO (Scientific Information for Land Owners) climate statistics.



Note: All rainfall and temperature statistics derived from SILO data drill climate information (July 1969 - June 2018)
Pan evaporation represents Class A Pan evaporation equivalent (July 1969 - June 2018)

Figure 23: Climate summary for Browns Range (SILO) (Golder 2019)

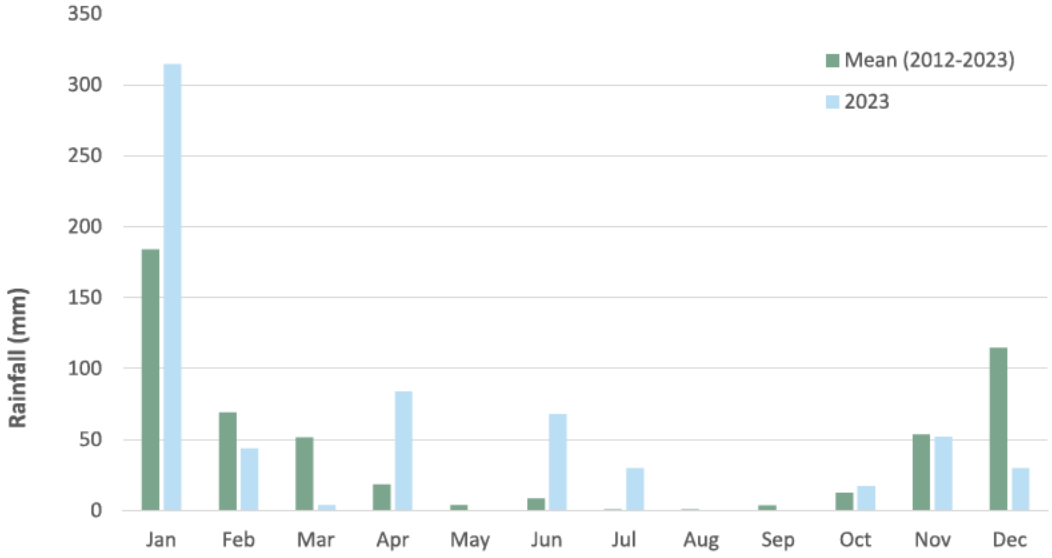


Figure 24: Browns Range Weather Station 2023 monthly rainfall and monthly rainfall average from 2012.

Table 17: Estimated long term averages (SILO) and rainfall for Browns Range Weather Station 2023

Month	SILO Climate Statistics (Golder 2019)		Browns Range 2023
	Average Rainfall (mm)	Median Evaporation (mm)	Rainfall (mm)
January	120.1	262	314
February	140.9	218	43
March	69.9	245	4
April	17.1	229.8	84
May	9.3	190.6	0
June	5.3	157.4	68
July	5.3	176	30
August	2.1	217.8	0

Month	SILO Climate Statistics (Golder 2019)		Browns Range 2023
	Average Rainfall (mm)	Median Evaporation (mm)	Rainfall (mm)
September	6.7	270	0
October	17.5	323.6	17
November	35.6	313.6	52
December	68.9	288.4	30
Annual	**499**	**2925**	**642**

7.3 GEOLOGY

The Browns Range Dome is located immediately north of the Proterozoic Tanami-Arunta Block, and within the Proterozoic Birrindudu Basin. The Project is located on the western side of the Browns Range Dome, formed by a granitic core intruding the Neoarchean to Paleoproterozoic Browns Range Metamorphics, which in turn are unconformably overlain by the Birrindudu Group lithologies. Figure 25 illustrates the regional geology at Browns Range.

The Browns Range Metamorphics are a clastic detritus deposited between ca. 3.1 Ga and 2.5 Ga from erosion of Mesoarchean granitic source (Nazari-Dehkordi et al., 2018), and are represented by metamorphosed arkoses, arenites, siltstone and minor calc-silicate rocks along the western margin of the dome, and orthogneiss and schist units to the south. These rocks experienced greenschist metamorphism at ca. 1.83 Ga (Crispe et al., 2007) and are relatively depleted in sodium, calcium and phosphorus.

The Browns Range Dome and its aureole of metamorphics form an inlier that is surrounded by the Mesoproterozoic Gardiner Sandstone, which forms part of the Birrindudu Basin sequence. The Birrindudu Group dominantly comprises marine siliciclastic rocks ranging from Paleoproterozoic to Neoproterozoic in age (Hendrickx et al., 2000).

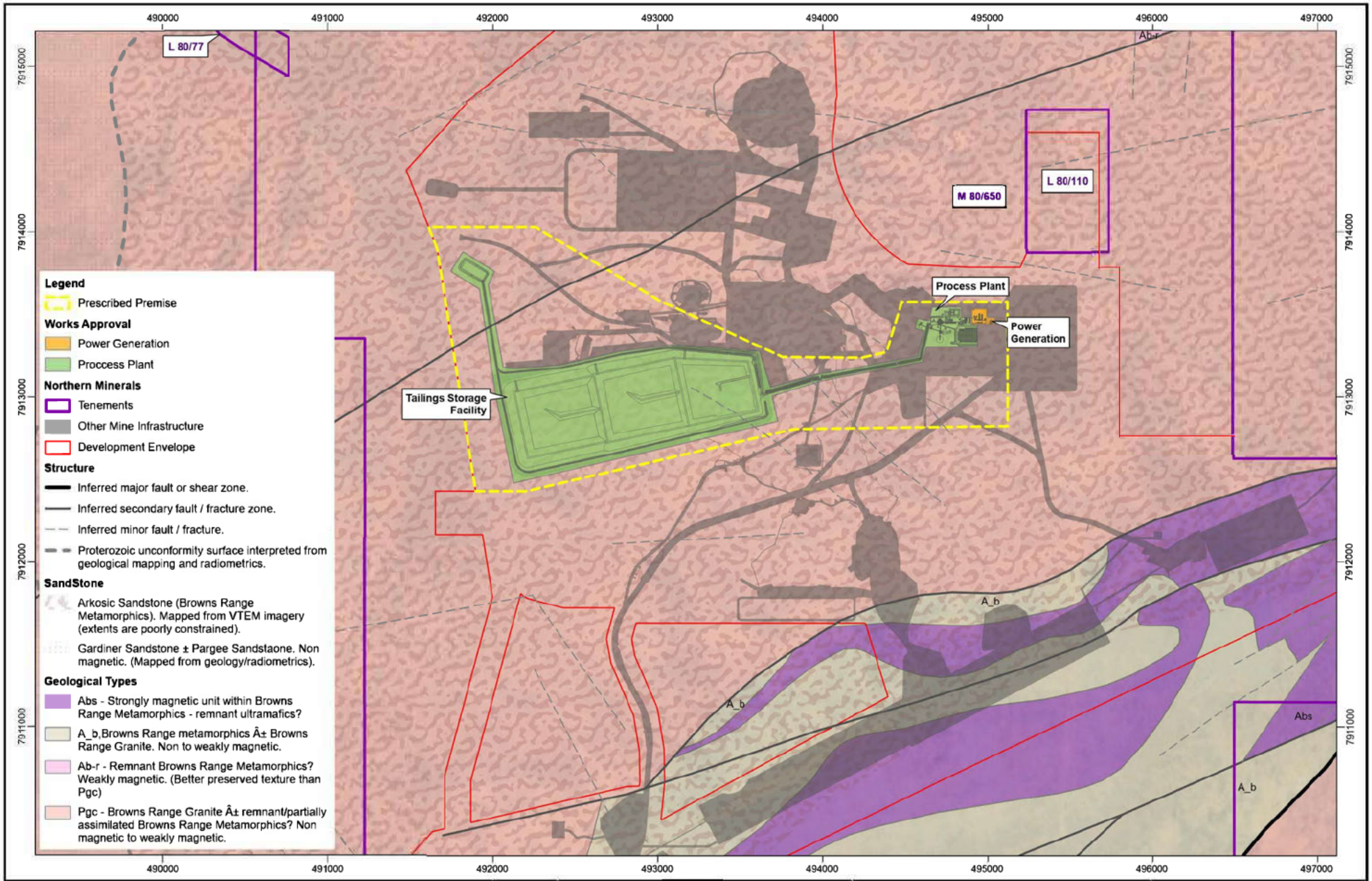


Figure 25: Geology of the Project Area

7.4 HYDROLOGY

Surface Hydrology

There are no permanent water bodies within the Project area. Intermittent seasonal flow in the ephemeral drainage lines that traverse the site generally travels in a westerly direction. Topography at the Project area is generally subdued, with an average gradient of about 1%. The Project site lies within the Sturt Creek catchment, which flows to the southwest, ultimately discharging into Lake Gregory (Paruku), 280 km downstream of the site. The main water course of Sturt Creek is located approximately 45 km west-northwest of the site and is classified as an ephemeral system. Sturt Creek is classified as a 'wild river' (a river that is undammed and lies in a largely unmodified catchment with intact biological and hydrological processes). Lake Gregory is recognised as an important wetland and a significant site for waterbirds.

The Lake Gregory system is one of high importance to local aboriginal people. It is part of the Paruku Indigenous Protected Area, which was declared in 2001 (DEC, 2009).

Northern Minerals conducted surface water sampling during the 2012-2013, 2013-2014 and 2014-2015 wet seasons. Samples were collected prior to the development of the Pilot Plant. Water samples were taken at two locations each wet season by means of rising stage samplers deployed in ephemeral creek lines. As would be expected, the water recovered during seasonal flow events generally has low to very low salinity. The water has a near-neutral pH and variable suspended solid concentrations. The water has low sulphate concentrations. Concentrations of dissolved metals are low and the dominant anion in surface water is bicarbonate (Golder Associates, 2014).

Flood Study

Northern Minerals commissioned a flood study of the Project area to consider the implications of existing climatic and hydrologic conditions on the design and implementation of the Project. Neither the proposed Process Plant nor the proposed TSF lie within the predicted 1 in 100-year flood zones (Figure 26).

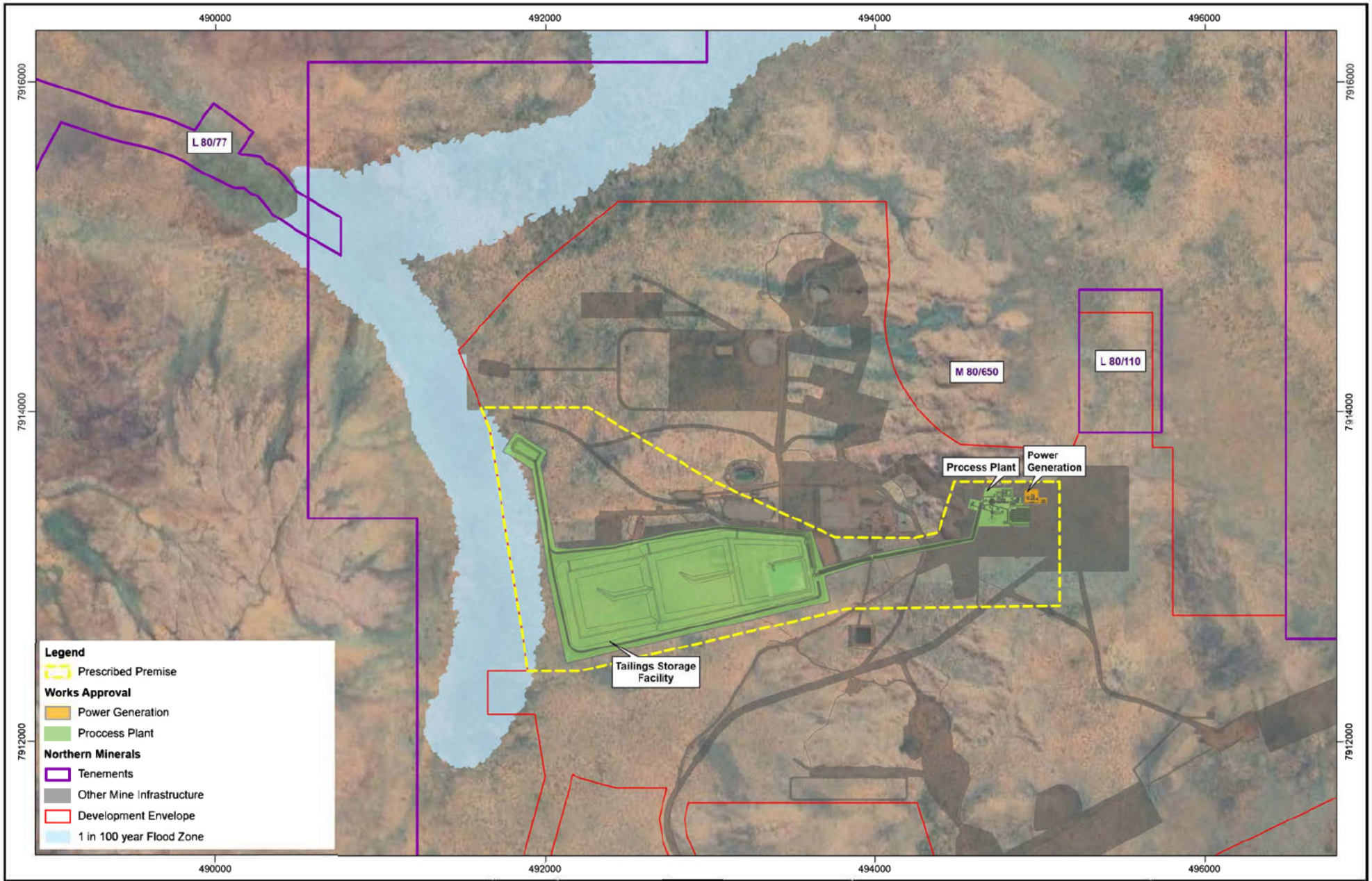


Figure 26: 1 in 100 Year Flood Zone

N

0 200 400m

Scale 1:30,000
MGA94 (Zone 52)

NORTHERN MINERALS

1 in 100 Year Flood Zone

Figure: a2969_BR_WorkAp_PPPG_F006_01_100yrfld

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Date: 12/12/2025

Page: A4

Rev: A

Groundwater Hydrology

Baseline studies conducted for the Project Area have identified three water bearing stratigraphic units in the area. The main water bearing zones at the Project are:

- Browns Range Metamorphics fractured rock aquifer: A thick sequence of metamorphosed sediments with limited primary porosity. The unit is confined to semi-confined by overlying transported sediment and in situ weathered materials. Localised zones of high hydraulic conductivity are associated with secondary structures (e.g. faults, shears, joints). A shear zone trending in a general NW-SE direction has been identified near BRAWD009, as shown in Figure 27;
- Gardiner Sandstone fractured rock aquifer: The Gardiner Sandstone outcrops at the western margin of the Mining area and extends westward from the outcrop. East of the outcrop, this unit is largely absent from the Project area. The sandstone comprises medium-grained quartz and lithic arenites. The unit is deep and regionally extensive. Some recharge occurs via outcropping zones of the Gardiner Sandstone unit; and
- Unconfined alluvial aquifer: This unit is mainly localised along drainage lines and saturated conditions in this layer are present only during and immediately following the wet season. Some seasonal leakage is likely from the alluvial aquifers to underlying fractured rock aquifers.

Overall, annual recharge to the fractured rock aquifers is expected to be low: in the order of 1% to 3% of annual precipitation.

The depth to groundwater in the Project area is variable, ranging from about 5 m to more than 25 m below ground surface, and reflects (in a subdued way) surface topography of the area. Static water levels in boreholes were observed to be shallower than the depths of water strike during drilling, which is an indication that the fractured aquifers are confined or semi-confined. The groundwater flow direction is from east to west or southwest, at an estimated hydraulic gradient of 0.001.

Groundwater quality at the site is generally fresh to brackish. There is one part of the mining tenement area (remote from any proposed mining or water abstraction activities) which is known to have much higher salinity in the order of 20,000 mg/L. Groundwater pH ranges from slightly acidic to slightly alkaline.

Dissolved metals concentrations are generally low and, with the exceptions of localised areas where the groundwater is naturally saline, the water is suitable for watering of livestock. The nearest DWER registered bore is located over 20 km from the Project.

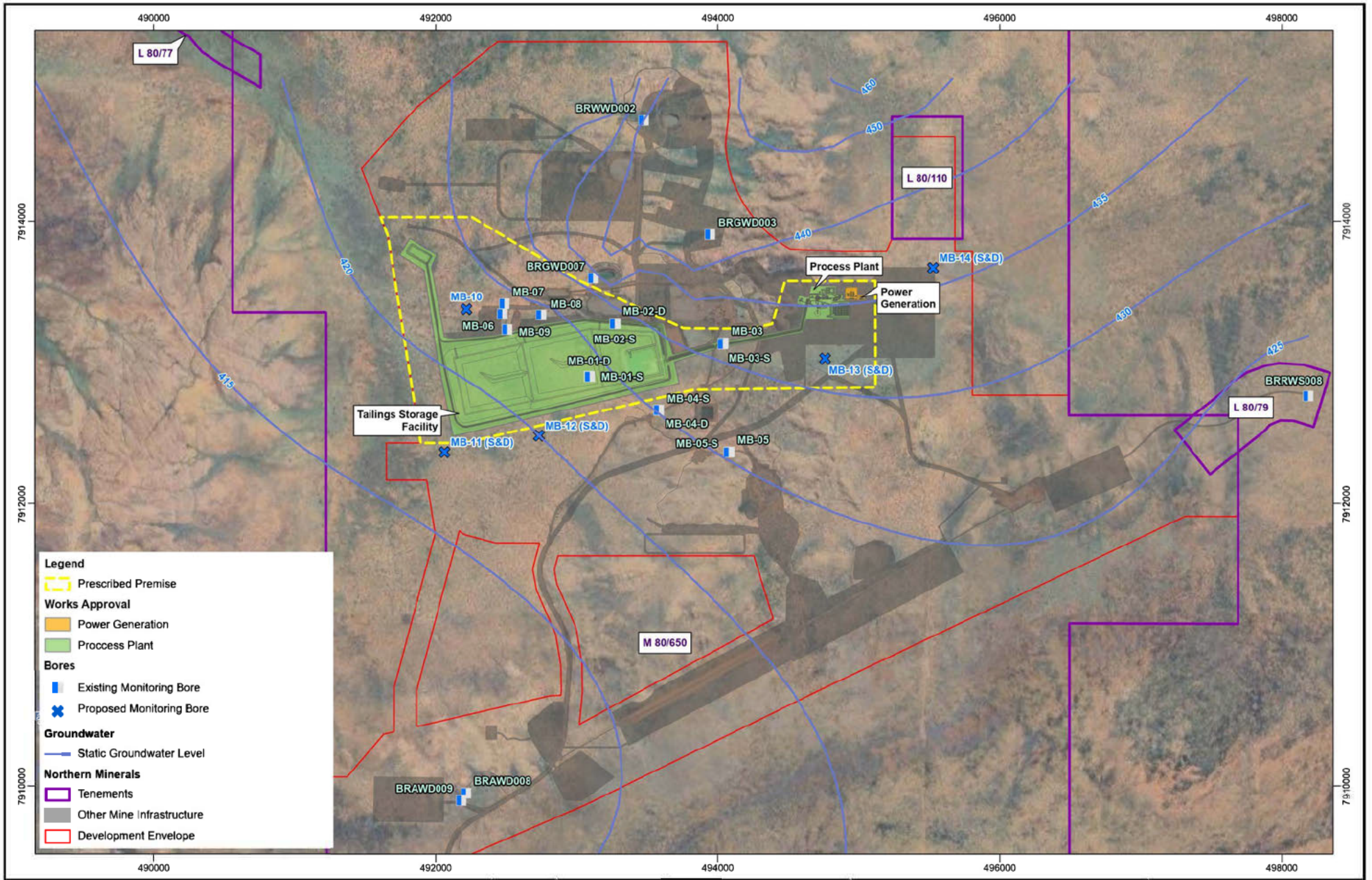

Figure 27: Groundwater bore network and indicative groundwater contour plan

N

0 250 500m

Scale 1:35,000
MGA94 (Zone 52)

NORTHERN MINERALS

Groundwater bore network and indicative groundwater contours

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Date: 6/01/2026

Page: A4

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7.5 LAND USE

Traditional Owners

The Project lies wholly within the registered Jaru Native Title Determination (WAD45/2012) and Tjurabalan Native Title Determination (WC95/74; WAS160/97) areas. The Project lies within the lands held by the Jaru people, with the exception of the mine access road on L80/76 and associated infrastructure to the west of the Project passing through both Tjurabalan and Jaru lands. Consultation has occurred with the Traditional Owners throughout the development of the Project and will continue regarding the significance of the proposed disturbance and to determine what if any mitigation measures are required.

Since 2010 Northern Minerals has conducted two heritage surveys with the Tjurabalan group, and ten heritage surveys with the Jaru Group. These surveys were conducted with suitably qualified Anthropologists / Archaeologists and provide approvals for work using "Cleared", "Cleared with conditions", and "Not cleared" directions.

To date Northern Minerals and the Traditional Owners have identified four artefact sites that lie in or nearby the planned Wolverine open pit mine. Working with expert archaeologists, the JAC Prescribed Body Corporate (PBC) board, and Traditional Owner survey team members, Northern Minerals and the Traditional Owners have reached an agreement to undertake salvage of the artefacts located within the Wolverine pit area. These salvage operations will be conducted with representatives of the group by qualified archaeologists, and the artefacts will be safely stored until able to be returned.

Post - European Settlement

The first non-indigenous exploration of the region occurred in the mid-1800's. Traditional hunting and gathering continued into the late 19th century. The land was used for cattle drives and other pastoral purposes which increased from the 1880's to the 1920's. In 1997, a pastoral station (Soakage Creek Station) was established at the site of the Gordon Downs pastoral lease. Project tenements overlie the Gordon Downs pastoral lease. Within the Project area the dominant land uses are customary Aboriginal uses and pastoral land uses (Northern Minerals, 2014).

Aboriginal Community

The nearest settlement to the Browns Range Project is Kundat Djaru (also known as Ringer Soak), located approximately 34 km to west - southwest of the proposed mine. The Aboriginal community of Ringer Soak was established in the mid-1980's on land excised from the Gordon Downs pastoral station. The land on which the township lies and a parcel of land lying mainly to the south of it have been formally gazetted as Crown Reserve 37670 under the *Aboriginal Affairs Planning Authority Act 1972*. The community is incorporated as the Kundat Djaru Aboriginal Corporation (Northern Minerals, 2014).

7.6 ENVIRONMENTAL ASSETS

The closest DBCA Parks and Wildlife Service (PWS) managed lands include the Ord River Regeneration Reserve, located approximately 100 km north-west of the Project and the Wolfe Creek Meteorite Crater National Park, approximately 120 km to the west-southwest.

No conservation reserves are located within the Prescribed Premises. The closest proposed protected area is the Gardiner Range proposed conservation area, located south and west of the Project.

Vegetation

A detailed flora and vegetation survey was conducted by Mattiske Consulting Pty Ltd (Mattiske) in 2023 (Appendix 4). The survey included the areas proposed for infrastructure under this WAA. None of the vegetation associations identified represents a Threatened Ecological Community (TEC) or a Priority Ecological Community (PEC).

The areas in which the prescribed premises boundary will be sited are characterised by two vegetation communities; G2 and W9 as shown in Figure 28 and Table 18. The vegetation communities G2 and W9 are widespread within and outside the Project area (Mattiske, 2023).

Table 18: Vegetation Association Descriptions within the prescribed premises boundary

Project Feature	Vegetation Description	Image of Typical Vegetation
Processing Plant and FST	Vegetation Map Code: G2 Structural: *Corymbia opaca, Eucalyptus brevifolia, Eucalyptus pruinosa* mid open woodland over *Gossypium australe, Acacia sericophylla, Halgania solanacea* var. *solanacea* over *Aristida inaequiglumis, Eulalia aurea, Eriachne obtusa, Triodia epactia* mid open hummock grassland. Statistically associated species: *Aristida holathera* var. *holathera, Chrysopogon fallax, Eragrostis eriopoda, Zornia muelleriana* subsp. *congesta, Goodenia armitiana, Corymbia opaca, Paraneurachne muelleri, Eucalyptus brevifolia*.	

Project Feature	Vegetation Description	Image of Typical Vegetation
Processing Plant	Vegetation Map Code: W9 Structural: *Eucalyptus brevifolia, Corymbia aspera, Corymbia abbreviata* low open woodland over *Grevillea wickhamii, Grevillea refracta* subsp. *refracta, Acacia monticola* tall sparse shrubland over T*riodia bitextura, Acacia adoxa var. adoxa, Acacia hilliana* low sparse to open hummock grassland Statistically associated species: *Acacia adoxa var. adoxa, Eriachne obtusa, Aristida holathera var. holathera*	

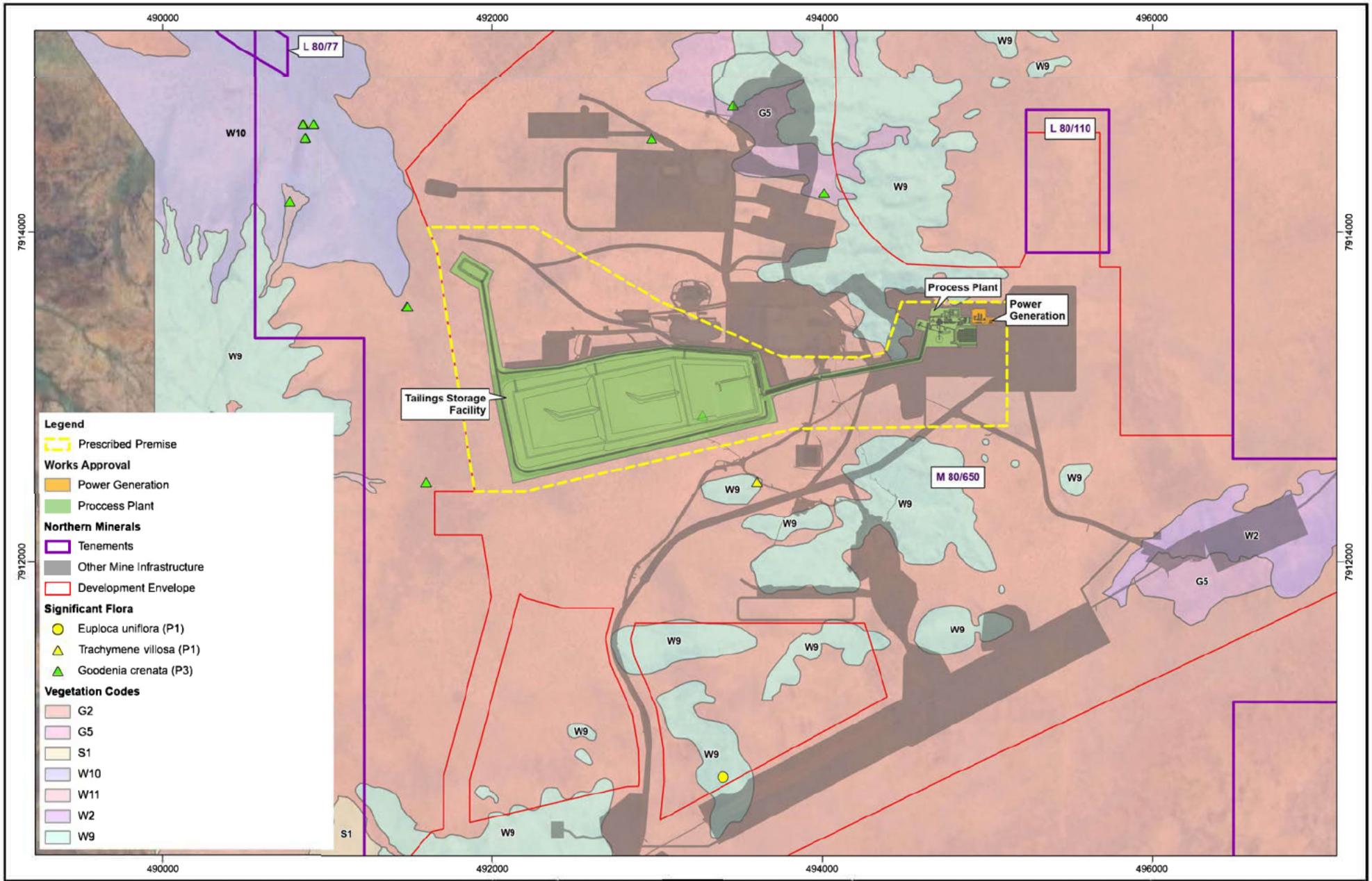

Figure 28: Vegetation associations in prescribed premises

Significant Flora

No threatened flora species pursuant to pursuant to Part 2, Division 1, Subdivision 2 of the *Biodiversity Conservation Act 2016* (BC Act) (WA) and as listed by DBCA (2023), or pursuant to section 179 of the EPBC Act were recorded within the survey area (Mattiske, 2023).

Two novel taxa and four priority taxa were recorded. The priority taxa were:

- *Euploca uniflora* (P1);
- *Goodenia crenata* (P3);
- *Goodenia modesta* (P3); and
- *Rhamphicarpa australiensis* (P3).

Since phrase names are yet to be assigned to the two novel taxa, they are hereinafter referred to as:

- *Stylidium aff. cordifolium* (P1); and
- *Stylidium sp. nov* (P1).

Of these priority taxa, one was found in the development footprints of the Processing Plant and TSF; *Goodenia crenata*.

The ability of *Goodenia crenata* (P3) to grow in recently disturbed areas, in combination with its broad distribution across three IBRA regions, suggests that any impacts to this taxon associated with the proposed Processing Plant and TSF are likely to be minimal.

Introduced Flora Species

A total of nine introduced (weed) species were recorded within the area surveyed by Mattiske in 2023. One of these, **Calotropis procera* is a declared pest organisms pursuant to section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act). The remaining eight taxa are permitted under section 11 of the BAM Act. *Calotropis procera* was not found in the development footprints of the Processing Plant and TSF.

Significant Fauna

In 2023, Bamford Consulting Ecologists (BCE) was engaged to consolidate all past surveys, repeat database searches, and conduct targeted field investigations (BCE, 2023; Appendix 4). Twenty-three species of conservation significance were returned from the database review but many of these are considered unlikely to occur in the area regularly or in large numbers, and therefore the Project area is unlikely to be important in maintaining their populations.

This includes seven species considered to be vagrants, and ten species considered to be irregular visitors. Vagrants include the Night Parrot and while the Project area is within the priority (but not high priority) area for surveys for this species (DBCA, 2024), it lacks key environmental features likely to support the species (such as species rich herbfields important for foraging; although long-unburnt spinifex favoured for roosting could be present). Two of the ten species considered to be irregular visitors have been recorded (the Gouldian Finch and Glossy Ibis).

The remaining six significant fauna species are considered to be regular visitors or residents. Four of these species, the Brush-tailed Mulgara, Greater Bilby, Spectacled Hare-Wallaby and Lakeland Downs Mouse, have been recorded during surveys.

Fauna Habitat

The area of habitat loss is small within a regional context for the Prescribed Premises. The main vegetation types are widespread and therefore proportional loss is negligible to minor. Two fauna habitat types were found to occur within the Processing Plant and TSF footprints, as shown in Figure 29 including 'Shrublands of acacia, grevillea and hakea over triodia hummock grassland on sandy to sandy-loam plains, some areas contain scattered eucalypts and Desert Walnut' and 'Open woodland over shrubs and hummock grassland on rocky slopes and adjacent gravelly and heavy soil flats'.

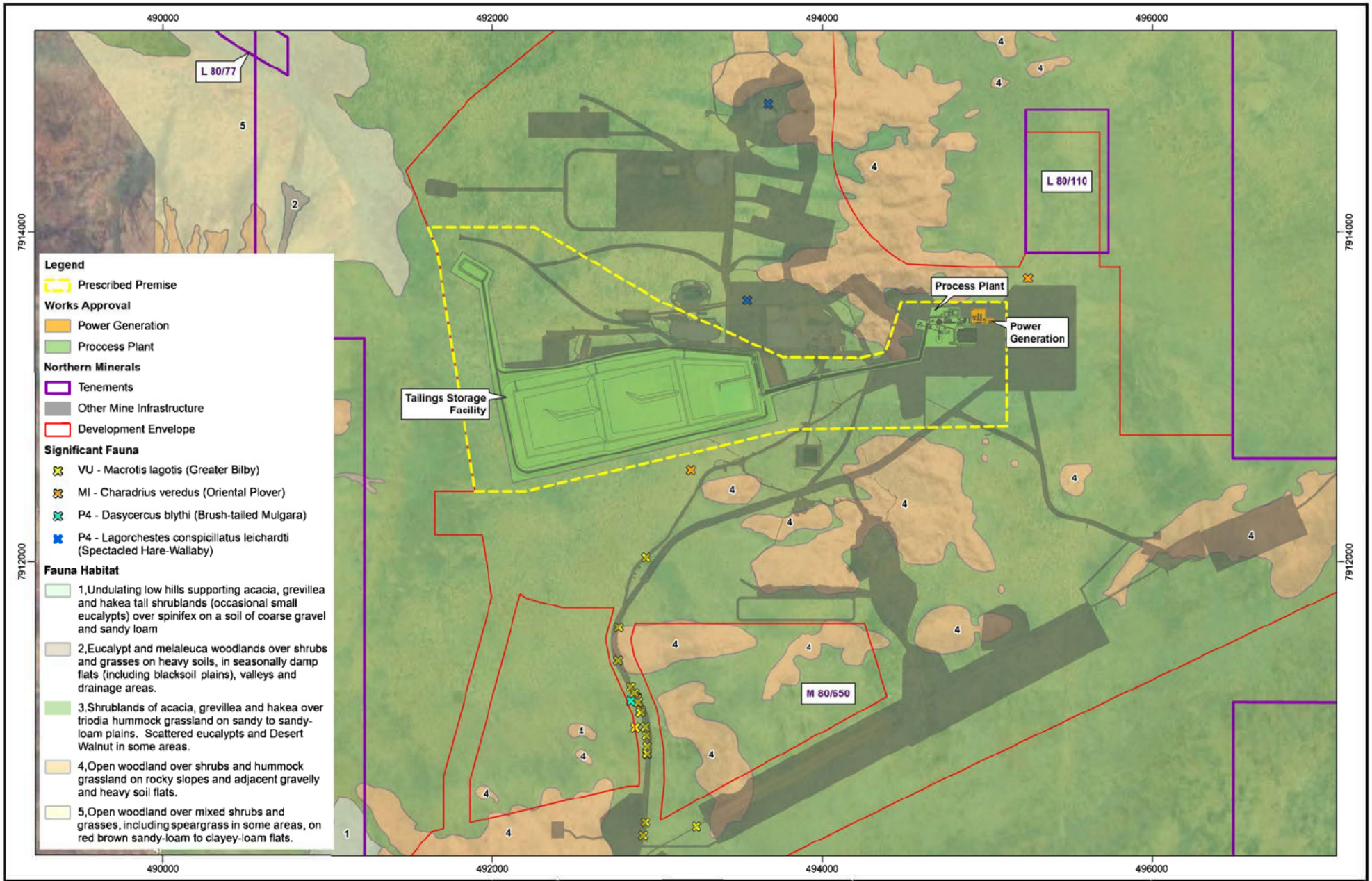

Figure 29: Fauna habitat and significant fauna records

GLOSSARY

Term	Meaning
ACN	Australian Company Number
AEP	Annual Exceedance Probability
AH Act	*Aboriginal Heritage Act 1972*
Al	Aluminium
ANCOLD	Australian National Committee on Large Dams
ANZECC	Australian and New Zealand Environment and Conservation Council
API	Application Programming Interface
ASIC	Australian Securities and Investment Commission
BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
BCE	Bamford Consulting Ecologists
BESS	Battery energy storage system
bTOC	Below Top of Casing
CASA	Civil Aviation Safety Authority
Cmol	Centimole
CO	Carbon monoxide
Coagulant	Magnafloc 1425
CSM	Conceptual site model
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DISR	Department of Industry, Science and Resources
DMPE	Department of Mines, Petroleum and Exploration
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
Environmental Protection Regulations 1987	EP Regulations
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Fe	Iron
Fl	Fluoride
Flocculant	Magnafloc 155
GISTM	Global Industry Standard on Tailings Management
Golder	Golder Associates

Term	Meaning
ha	Hectare
IBC	Intermediate bulk containers
IBRA	Interim Bioregions of Australia
IECA	International Erosion Control Association
IPP	Independent Power Producer
JAC	Jaru Aboriginal Corporation
kg	Kilograms
kL	Kilolitre
km	Kilometres
kV	Kilovolts
LGIRS	Department of Local Government, Industry Regulation and Safety
LoM	Life of Mine
LOR	Limit of Reporting
m	metre
m^3	Cubic metres
Mattiske	Mattiske Consulting Pty Ltd
MBS	Martinick Bosch Sell Pty Ltd
MCC	Motor control centres
MDCP	Mine Development Closure Plan
Mg/kg	Megagrams per kilogram
mg/L	Milligrams per litre
Mining Act	*Mining Act 1978*
ML	Megalitre
mm	millimetres
Mn	Manganese
Mo	Molybdenum
mRL	Meters relative level
MS	Ministerial Statement
Mt	Megatonnes
MW	Megawatts
MWh	Megawatts per hour
NA	Not applicable
NEPC	National Environmental Protection Council
Noise Regulations	*Environmental Protection (Noise) Regulations 1997*
Northern Minerals	Northern Minerals Limited
NOx	Nitrogen Oxide

Term	Meaning
P	Priority
PBC	Prescribed Body Corporate
PEC	Priority Ecological Community
Product	Dust, Tailings and Rare Earth Concentrate
Project	Browns Range Rare Earths Project, a heavy rare earth elements mine and ore processing facility in the Kimberley region of WA
PV	Photovoltaic
PWS	DBCA Parks and Wildlife Service
Radiological Council	Government of Western Australia Radiological Council
RDA	Regional Development Australia
Ringer Soak	Kundat Djaru community
RIWI Act	*Rights in Water and Irrigation Act 1914*
RMP	Radiation Management Plan
RNTBC	Registered Native Title Body Corporate
ROM	Run of mine
RS Act	*Radiation Safety Act 1975*
RWMP	Radioactive Waste Management Plan
SAG	Semi-Autogenous Grinding
Se	Selenium
SILO	Scientific Information for Land Owners
SRP	Sediment Retention Ponds
STP	Standard temperature and pressure
TDS	Total Dissolved Solids
TEC	Threatened Ecological Community
the Works	Development of a Processing Plant, TSF and associated supporting infrastructure
TLO	Time limited operations
TNTLAC	Tjurabalan Native Title Land Aboriginal Corporation
tpa	Tonnes per annum
TSF	Tailings Storage Facility
U	Uranium
V	Volts
WA	Western Australia
WAA	Works Approval Application
WRL	Waste rock landform

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APPENDICES

The following Appendices have been provided with this electronic submission:

Appendix 1: TSF Permitting Report

Appendix 2: Stakeholder Consultation Register

Appendix 3: Pilot Plant TSF & Evap Pond Design

Appendix 4: Detailed Flora and Vegetation Assessment

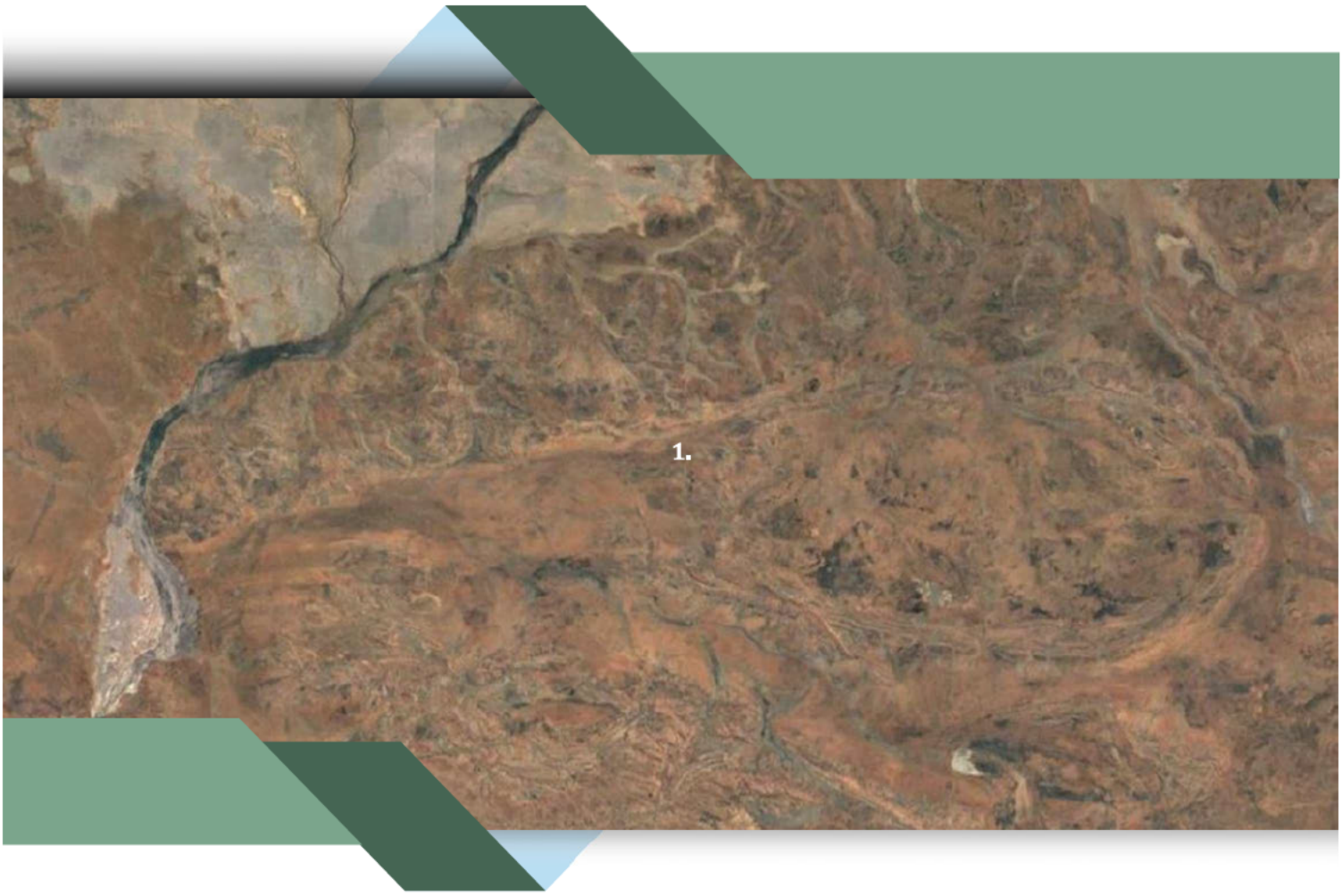
Appendix 5: Surface Water Management Plan

Appendix 6: Groundwater Monitoring Plan

Appendix 7: Browns Range Project Ore Sorted Rejects and Tailings Geochemistry Report

Appendix 8: Browns Range Project – Stage 1 Pilot Plant MDCP

Appendix 9: Construction Environmental Management Plan



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