

Environmental Assessment Report

MMG Australia Limited

**Bobadil Tailings Storage
Facility Stage 11 and 12**

Embankment Raises

Rosebery, Tasmania

November 2024



ENVIRONMENT PROTECTION AUTHORITY

Environmental Assessment Report

Proponent	MMG Australia Limited (MMG)
Proposal	Bobadil Tailing Storage Facility Stage 11 and Stage 12 Embankment Raises
Location	Murchison Highway, Rosebery
Class of Assessment	2B
PCE No.	11514
Permit Application No.	DA 2024/00032
myDAS Folder No.	23/1516
myDAS Document No.	D24-202010

Assessment Process Milestones

Date	Milestone
23 October 2023	Notice of Intent lodged
12 May 2023	Class of Assessment
6 November 2023	Guidelines Issued
5 July 2024	Permit Application submitted to Council
11 July 2024	Referral received by the Board
20 July 2024	Start of public consultation period
19 August 2024	End of public consultation period
31 October 2024	Date draft conditions issued to proponent
8 November 2024	Statutory period for assessment ends

Glossary/Acronyms

Term	Detail
AHT	Aboriginal Heritage Tasmania
Air EPP	Environment Protection Policy (Air Quality) 2004
ANC	Acid neutralising capacity
AMD	Acid and metalliferous drainage
ANCOLD	Australian National Committee on Large Dams
AS/NZS	Australian/New Zealand Standards
Board	Board of the Environment Protection Authority
BO	Bobadil Outflow
Conservation Assessments	Conservation Assessments means the Environment Unit of the Environment, Heritage & Land Division of the Department of Natural Resources & Environment.
DMP	Dust Mitigation Plan
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMPCA	<i>Environmental Management and Pollution Control Act 1994</i>
EMPCS	Environmental Management and Pollution Control System
EPN	Environment Protection Notice
EPBCA	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FMP	Fire Management Plan
GHG	Greenhouse gases
GCL	Geosynthetic Clay Liner
GPS	Global Positioning System
KLC	Kinetic leach column
LUPAA	<i>Land Use Planning and Approvals Act 1993</i>
mAHD	metres Australian Height Datum
MMG	Minerals and Metals Group Limited Australia
MRT	Mineral Resources Tasmania
NAF	Non-acid forming
NAG	Net Acid Generating
NAPP	Net Acid Producing Potential
NATA	National Association of Testing Authorities
NCA	<i>Nature Conservation Act 2002</i>
NGER	<i>National Greenhouse and Energy Reporting Regulations 2008</i>
NMD	Neutral metalliferous drainage
NOI	Notice of Intent
NRE Tas	Department of Natural Resources and Environment, Tasmania
PAF	Potentially Acid Forming
PAMDF	Potentially Acid or Metalliferous Drainage Forming

PEV	Protected Environmental Values
PC	<i>Phytophthora cinnamomi</i>
PM ₁₀	Particulate Matter 10 micrometres or less in diameter
QAQC	Quality assurance and quality control
QCP	Quarry Code of Practice (EPA 2017)
RL	Reduced Level
RMPS	Resource Management and Planning System of Tasmania
SD	Sustainable development
SOP	Standard Operating Procedure
TMO	Tasmanian masked owl
TSF	Tailings Storage Facility
TSP	Total Suspended Particulates
TSPA	<i>Threatened Species Protection Act 1995</i>
VVP	Vibrating wire piezometers

Report Summary

This report provides an environmental assessment of the Bobadil Tailings Storage Facility Stage 11 and Stage 12 Embankment Raises by MMG Australia Limited (MMG).

The proposal involves raising the height of the Bobadil tailings storage facility (Bobadil TSF) embankment in two Stages, known as Stage 11 and Stage 12, each increasing the embankment height by 2m. The TSF is located north of Rosebery off the Murchison Highway in western Tasmania and the upstream embankment raises will increase the tailings storage capacity of the Bobadil TSF by 2.24 million tonnes.

This report has been prepared based on information provided in the Environmental Impact Statement (EIS). Relevant government agencies and the public were consulted, and their submissions considered as part of the assessment.

Appendix 1 contains a table of the proponent's proposed management measures.

Appendix 2 contains the environmental permit conditions

Table of Contents

1. Approval Process.....	7
2. SD Objectives and EIA Principles	8
3. The Proposal	9
4. Project Rationale and Alternatives	17
5. Public and Agency Consultation.....	18
6. Evaluation of Key Environmental Issues	19
6.1 Key Issue 1: Natural values.....	19
6.2 Key Issue 2: Air quality	26
6.3 Key Issue 3: Water quality.....	33
6.4 Key Issue 4: Groundwater	38
6.5 Key Issue 5: Construction material and acid and metalliferous drainage potential of waste rock and tailings.....	41
7. Evaluation of Other Environmental Issues.....	47
7.1 General conditions.....	47
7.2 Issue 1: Waste management.....	48
7.3 Issue 2: Dangerous goods and environmentally hazardous materials	48
7.4 Issue 3: Greenhouse gas emissions, ozone depleting substances and climate change.....	49
7.5 Issue 4: Decommissioning and rehabilitation.....	50
7.6 Issue 5: Noise and blast control	51
8. Issues not assessed by the Board.....	54
8.1 Issue Aboriginal and Historic Heritage:	54
9. Report Conclusions	55
10. Report Approval.....	56
11. References.....	57
12. Appendices.....	58
Appendix 1: Table of proponent management measures.....	59
Appendix 2: Permit conditions – Environmental.....	60

I. Approval Process

The Board of the Environment Protection Authority (the Board) received a Notice of Intent on 28 April 2023 for the Bobadil TSF Embankment Raise Stage 11, with the EIS Guidelines issued on 9 June 2023. A revised Notice of Intent was received on 23 October 2023 to include the Stage 12 raise, with the EIS Guidelines reviewed and reissued on 6 November 2023.

An application for a permit under the *Land Use Planning and Approvals Act 1993* (LUPAA) in relation to the proposal was submitted to West Coast Council on 5 July 2024.

This proposal is defined as a 'level 2 activity' under clause 3(b), Schedule 2 of the *Environmental Management and Pollution Control Act 1994* (EMPCA), being a waste depot designed to receive more than 100 tonnes of waste per year.

Section 25(1) of EMPCA required the West Coast Council to refer the application to the Board for assessment under the Act. The application was received by the Board on 11 July 2024.

The Board required that information to support the proposal be provided in the form of an Environmental Impact Statement (EIS), prepared in accordance with the Guidelines issued by the Board on 6 November 2023. One draft of the EIS was submitted to the EPA for review against the Guidelines before it was finalised and accepted on behalf of the Board on 16 July 2024.

The final EIS was submitted to Council with the permit application. The EIS was released for public inspection for 28 days on 20 July 2024, closing on 19 August 2024. Advertisements were placed in *The Advocate* and on the EPA website. The EIS was also referred to relevant government agencies for comment. No public representations were received.

2. SD Objectives and EIA Principles

The proposal must be considered by the Board in the context of the objectives of the Resource Management and Planning System of Tasmania (RMPS), and the Environmental Management and Pollution Control System (EMPCS). Both sets of objectives are specified in Schedule 1 of the EMPCA.

The functions of the Board are to administer and enforce the provisions of the EMPCA, and to use its best endeavours to further the RMPS and EMPCS objectives. The Board must assess the proposal in accordance with the Environmental Impact Assessment Principles defined in Section 74 of the EMPCA.

3. The Proposal

MMG Limited Australia operate the underground Rosebery Mine, which primarily extracts zinc. The proposal involves two embankment raises of 2 metres each to the existing MMG Bobadil tailings storage facility (TSF). The facility has been operating since 1974 and is located approximately 3 kms north of Rosebery and within MMG’s mining lease 28M/1993. The embankment raises will be constructed using an upstream construction method which utilises the existing tailings beach and embankment to provide the foundation for the successive embankment raise. The raises will be located within the existing TSF footprint.

The materials required for the raises will be sourced from two existing on-site borrow pits located adjacent to the Bobadil TSF. Access to these borrow pits is via existing internal roads.

Works will require clearing an area of 1.48 ha of native vegetation to expand the footprint of the Northern Borrow Pit, from which approximately 200,000 m³ of rockfill will be extracted. Raising the current spillway will require approximately 2,000 m³ of clay material, to be sourced from within the existing footprint of the Southern Borrow Pit. No vegetation removal is required to access the clay material.

A period of 12 to 18 months of tailings deposition is required following the Stage 11 raise to provide sufficient material and consolidation time for construction of the Stage 12 raise. Each of the stages will be undertaken in two sub-Stages, Stage 11A and 11B and Stage 12A and 12B. The duration of the construction phase for each of the raises is expected to be around nine months. Upon completion, the Bobadil TSF will have a crest elevation reduced level (RL) of 205m and an increased tailings storage capacity of approximately 2.24 million tonnes, which equates to an additional 33 months of tailings deposition.

There is an existing landfill site directly adjacent to the TSF, which is used for the disposal of lead and zinc contaminated material from the mine and will continue to operate during construction of the raises.

The existing decant pond, polishing pond and discharge infrastructure will continue to be used, with treated water discharged to Lake Pieman. No changes are proposed to the operation of the TSF, which involves sub-aerial deposition of tailings via spigot pipelines.

This report is an assessment of the construction of the Bobadil TSF Stage 11 and Stage 12 embankment raises and ongoing operation of the facility. According to the EIS, no further embankment raises are proposed.

The main characteristics of the proposal are summarised below. A detailed description of the proposal is provided in Section 2 of the EIS.

Summary of the proposal’s main characteristics

Activity

The activity is for the expansion and intensification of an existing waste depot to enable deposition of an additional 2.24 million tonnes of tailings.

Location and planning context

Location	The Bobadil TSF is located approximately 3 kms north of the Rosebery township, accessed via two gravel roads from the MMG Rosebery Mine, off the Murchison Highway, West Coast Tasmania, as shown in Figure 1 below.
Land zoning	Rural Zone and Utilities Zone under the <i>Land Use Planning and Approvals Act 1993</i> - West Coast Local Provisions Schedule, and Permanent Timber Production Zone Land under the <i>Forest Management Act 2013</i> .
Land tenure	Crown Land - Sustainable Timber Tasmania. Department of State Growth – State Rail Network.
Mining lease	28M/1993, expired on 1 May 2024, pending renewal by Mineral Resources Tasmania (MRT).

Lease area	4906 hectares.
Bond	A \$77.7 million dollar bond for mining lease 28M/1993 is in place. The amount is under review by MRT as part of the mining lease renewal process.

Activity site

Land Use	<p>The land use includes the existing Bobadil tailings storage facility (TSF), polishing ponds, Northern Borrow Pit, Southern Borrow Pit and landfill.</p> <p>The Melba Railway Line (formerly part of the Emu Bay Railway) intersects the site and is located along the western length of Bobadil TSF for approximately 1.8km (Figure 2). The train line is used for transporting minerals and is no longer for public use.</p> <p>The Farrell - Rosebery transmission lines (110 v) and the Farrell – John Butlers lines (220 v) run in a north-south direction, located approximately 400 m east of the Northern Borrow Pit.</p>
Topography	<p>Bobadil TSF is located at an elevation of between 170 – 200 m. The Southern Borrow Pit is located at an elevation of 210 m and the Northern Borrow Pit is between 290 – 340 m in elevation. Bobadil TSF is located near a series of hills and valleys bound to the west by Lake Pieman, approximately 1 km north of Karlson’s Knob and approximately 2 km northwest of Mount Black.</p>
Geology	<p>The geology of the Bobadil TSF and Southern Borrow Pit is predominantly characterised by Cenozoic cover sequences comprised of Pleistocene glacial and glaciogene deposits. The underlying geology of the Northern Borrow Pit is dominated by siliciclastic sandstone, siltstone and shale of the Stitt Quartzite.</p>
Soils	<p>The project area is split into three Land Systems. The majority of Bobadil TSF is situated within the Tullah Land System characterised by dark organic soils, the Northern Borrow Pit is within the Rosebery Land System characterised by brownish yellow and pale brown soils and the Southern Borrow Pit is within the Pieman River Land System characterised by gradational soils with a thin surface layer of peat.</p>
Hydrology	<p>Lake Pieman is to the west and below the level of the TSF. Slip Creek is an east-west oriented ephemeral creek located on the southern margin of the site.</p> <p>Existing surface water bodies in the project area include:</p> <ul style="list-style-type: none"> • The tailings pond (Operational Pond); • The polishing pond; and • The decant pond. <p>All surface water, including seepages, internal drains, and some runoff from a trial cover are collected in existing toe drains which report to the Bobadil polishing pond. Water from the polishing pond is discharged directly to Lake Pieman via a licensed discharge point, Bobadil Outflow.</p> <p>The groundwater system beneath Rosebery is typified by a deep fractured aquifer overlain by surficial glacial deposits. Groundwater is interpreted to flow from Mount Black northwards to Lake Rosebery and westwards towards the Bobadil TSF and Lake Pieman.</p>
Natural Values	<p>Flora</p> <p>A field survey conducted in 2022 identified 3 native vegetation communities within the study area. A total of 68 species of vascular plants were recorded, including two introduced species, one of which is a declared weed.</p> <p>No threatened communities listed under the <i>Nature Conservation Act 2002</i> (NCA) or threatened vascular plant species listed under the <i>Tasmanian Threatened Species Protection Act 1995</i> (TSPA) or the <i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i> (EPBCA) were recorded.</p>

	<p>Fauna</p> <p>Species listed under the TSPA and/or EPBCA may utilise the study area, including wedge-tailed eagles, masked owls, grey goshawks, swift parrots, blue-winged parrots, Tasmanian devils and spotted-tailed quolls. Trees within the study area with a diameter greater than 1m and those with potential hollows were also recorded.</p>
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Location region

Climate	Rainfall for Rosebery frequently exceeds 2,000mm per annum, with the winter months (June – August) experiencing more frequent and heavier rainfall. The mean daily maximum and minimum temperatures range from 24°C to 11°C in January and from 11°C to 4°C in August. Dominant winds tend to come from the north and southwest.
Surrounding land zoning, tenure and uses	<p>The land surrounding the site is zoned Rural, Utilities and Environmental Management. Bobadil TSF is within and surrounded by Permanent Timber Production Zone Land. Rosebery township is located approximately 3 km to the south-east of Bobadil TSF, with some residences located within 1.6 km of the TSF.</p> <p>Lake Pieman is under the tenure of the Hydro-Electric Corporation.</p> <p>The Mount Kershaw Regional Reserve is located 1.8 km to the north of the TSF. A 547ha mining lease owned by MMG is located to the south-west of Bobadil, on the western side of the Pieman River.</p>
Species of conservation significance	<p>The following listed fauna species are known to occur in the local area:</p> <ul style="list-style-type: none"> • Grey goshawk • Tasmanian devil • Wedge-tailed eagle • Spotted-tailed quoll • Tasmanian masked owl • Swift parrot • Blue-winged parrot. <p>In addition, the horned orchid (<i>Orthoceras strictum</i>) is known to occur in the area.</p>

Proposed infrastructure

Major equipment	<p>Major equipment to be used on site during construction includes:</p> <ul style="list-style-type: none"> • 8 – 10 excavators (14 t to 50 t) • 5 – 7 dump trucks (25 t to 40 t) • Dump truck watercart • 2 rollers • Dozer • Telehandler • Fuel Truck • Grader • Service Truck.
Other infrastructure	<p>Tailings are conveyed to the Bobadil TSF by a gravity fed flume. The slurry is then pumped from a low level receival pond to the top of the TSF, from where it is discharged via pipeline spigots into the TSF.</p> <p>A small, mobile workshop is proposed to be located within the activity area, to be used for servicing and maintaining construction vehicles.</p>

	No additional off-site infrastructure is required for the embankment raises or operation of the TSF.
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Inputs

Water	No additional water is required.
Energy	The main energy required is fuel for construction machinery.
Other raw materials	Rock and clay for embankment construction. Lime as required for water quality management during operation of the TSF.

Wastes and emissions

Liquid	<p>Wastewater from the Rosebery mine effluent treatment plant (ETP) is mixed with the tailings and transported via a flume to the TSF. Tailings supernatant, wastewater and TSF seepage is directed to the Bobadil polishing pond via a gravity decant and channel system before discharge to Lake Pieman.</p> <p>In the event of a flood, supernatant from the TSF will discharge via a spillway into a drainage line to the Pieman River.</p>
Atmospheric	During construction there is likely to be dust generated from clearing and preparation of the Northern Borrow Pit, as well as activities associated with movement of vehicles and machinery, and excavation and stockpiling of soil and construction materials, including tailings. During operations, dust is likely to be generated from vehicle movements and from the surface of the tailings dam under certain meteorological conditions.
Solid	<p>Potentially Acid Forming (PAF) rock encountered during the borrow excavations.</p> <p>General waste (e.g., general refuse, waste tyres and machinery servicing waste).</p> <p>Disposal of around 17 tonnes/month of lead contaminated material from the mine to the Bobadil TSF landfill.</p>
Controlled wastes	Waste engine oil and contaminated soil from the mobile workshop.
Noise	There will be noise emissions from earthmoving equipment, machinery and vehicles during construction. Blasting will be required at the Northern Borrow Pit. During the operational phase there will be minor noise emissions from sources such as pumps, trucks and maintenance activities.
Greenhouse gases	Greenhouse gases (predominantly carbon dioxide) will be generated during the construction phase. During the operational phase, greenhouse gas emissions will continue to be generated by vehicles, pumping of tailings, and machinery and plant used during maintenance activities.

Construction, commissioning and operations

Proposal timetable	Construction is proposed to commence in late 2024. Stage 12 construction will commence approximately 12-18 months after completion of Stage 11 to allow for consolidation of the tailings.
Construction hours	Daylight hours, 7 days a week.
Operating hours (ongoing)	The Bobadil TSF will continue to operate 24 hours per day, 7 days per week using automatic process controls and remote monitoring.

Other key characteristics

Bobadil TSF is one of two tailings dams used by MMG Rosebery for treatment and disposal of tailings waste from its mining operations. The other TSF is referred to as 2/5 Dam TSF.

A deformation analysis will be undertaken as part of the dam safety evaluation for detailed design of the embankment raises. Dam safety falls under the jurisdiction of the *Water Management Act 1999* and the *Water Management (Safety of Dams) Regulations 2015*.

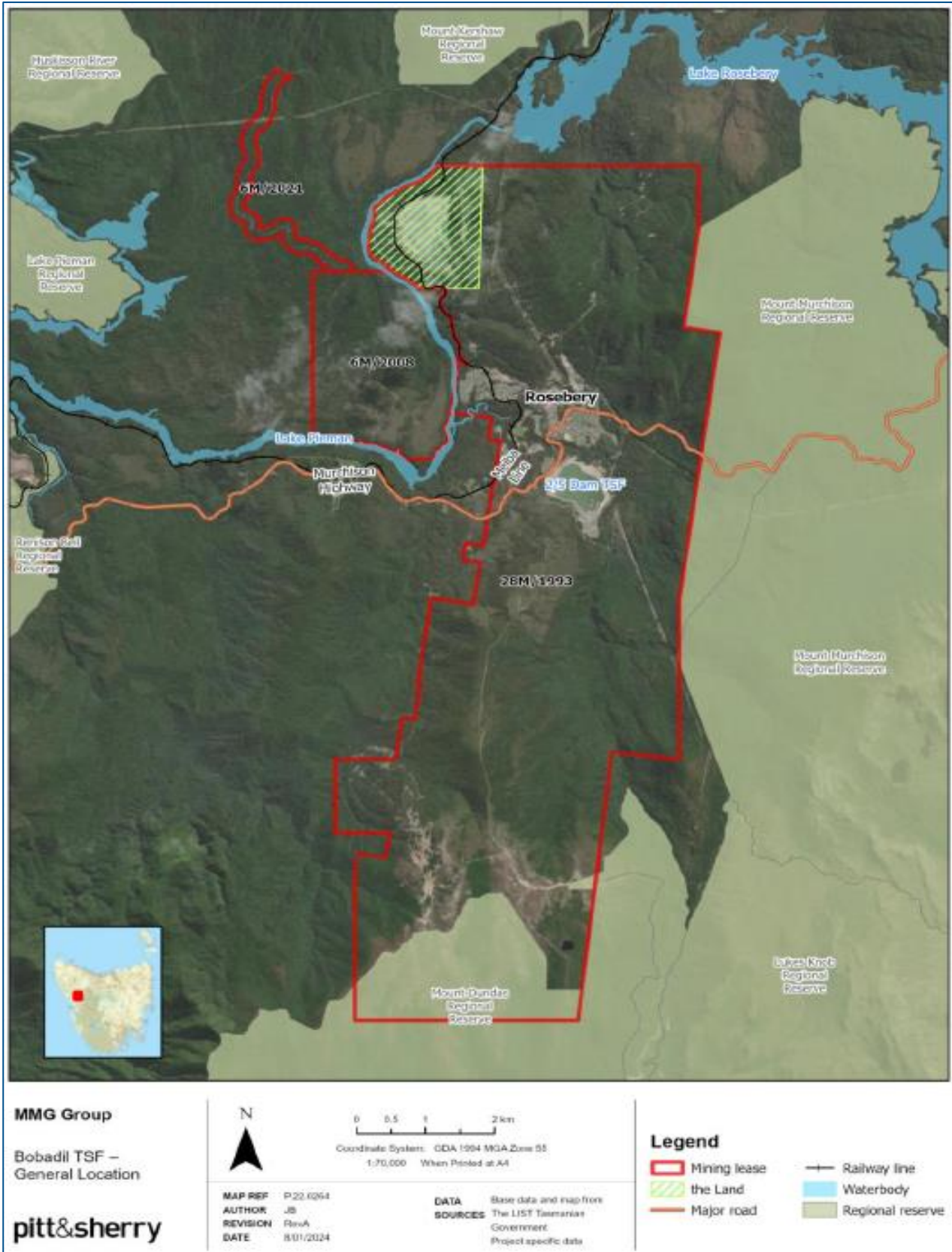


Figure 1: Regional location (Fig. 1 of the EIS). The Activity Area is shown as “the Land”.



Figure 2: Site plan showing the extent of the Activity Area, shown as ‘the Land’ (Fig. 2 of the EIS).

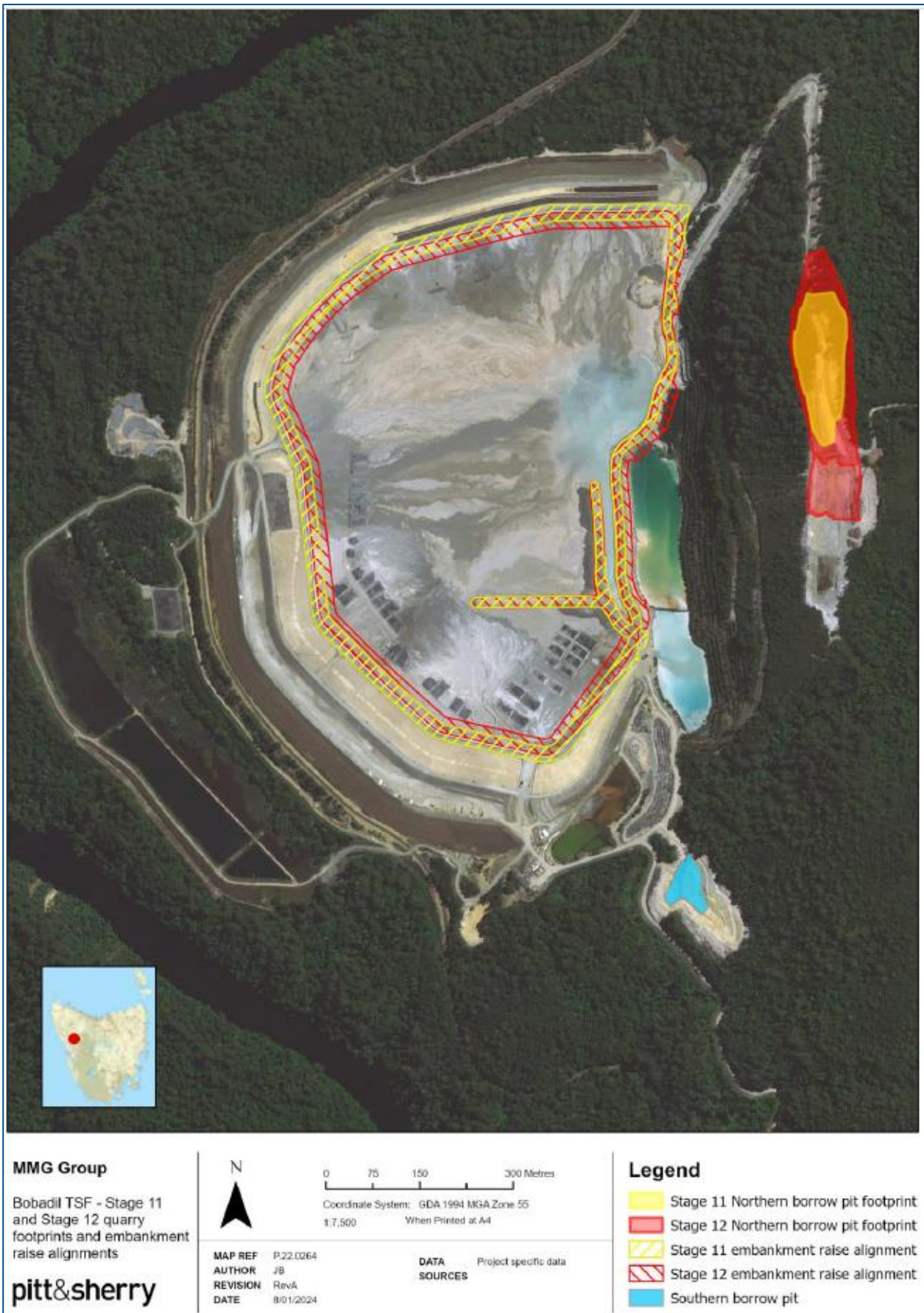


Figure 3: Process overview (Fig. 5 of the EIS)

4. Project Rationale and Alternatives

According to the EIS, the Rosebery Mine has sufficient tailings capacity to continue operations until 2025. Based on current through put, the Mine will have to cease operations after this time. The purpose of the proposal is to provide additional tailings storage capacity, translating to 33 months of tailings deposition, until a longer term tailings storage solution is resolved.

According to the EIS, the mine directly employs 530 workers and contractors, with an additional 20-25 workers required for the construction phase. The EIS states that a delay in the embankment raises could result in the mine ceasing operations, which would have significant socio-economic impacts at a local and regional scale.

Alternatives to the proposed embankment raises are detailed in the EIS, and summarized as follows:

Construction of a new tailings storage facility (TSF #3)

A new TSF is proposed for South Marionoak, however the period for approval, commissioning and construction of this facility is likely to go well beyond 2025. Therefore, interim measures are required to provide the Rosebery Mine with sufficient tailings capacity, including this proposal, as well as changes to the operation of 2/5 Dam TSF.

Alternative tailings storage methods

Deposition of cemented tailings paste fill into the underground workings. This method relies on the availability of sufficient void volumes, which are created by the removal of waste rock and transporting and storing this rock, including PAF, at the surface. This method however is not considered feasible. Tailings would still need to be stored at a surface, even if all waste rock was removed from underground and paste fill was the only method used for filling the voids.

De-pyritised filtered tailings, produced by reducing the moisture content of the tailings using a filter plant, is currently under review. The tailings can then be stockpiled, resulting in a reduced storage footprint or used to fill voids underground. Further studies are required to determine the feasibility of this method.

Increase mine cut-off grades to minimise tailings generation (closure)

The option to increase ore grades to reduce tailings generation is not considered a feasible solution as this practice is generally implemented just before mine closure.

Sell Rosebery Mine

This is considered a last resort and does not align with MMG Rosebery's long term goal of being a leader in the mining industry.

5. Public and Agency Consultation

No public submissions were received during the public consultation period.

The EIS was also referred to several government agencies with an interest in the proposal. Submissions were received from the following:

- Conservation Assessments (CAS), Natural Resources and Environment Tasmania
- Water Management and Assessment Branch, Natural Resources and Environment Tasmania
- Aboriginal Heritage Tasmania, Department of Heritage and Cabinet
- Mineral Resources Tasmania (MRT)
- Work Safe Tasmania, Department of Justice.

The following individuals also provided specialist advice on the EIS:

- Regulatory Officer, Environment Protection Authority
- Scientific Officer (Air), Environment Protection Authority
- Scientific Officer (Water), Environment Protection Authority
- Scientific Officer (Noise), Environment Protection Authority.

The proponent has also undertaken a public consultation process, involving pop-up shops and community workshops. It is noted that this consultation process was not specific to the Bobadil embankment raises, but covered a range of development, closure and operational issues across the Rosebery mine site.

6. Evaluation of Key Environmental Issues

Five key environmental issues were identified for detailed evaluation in this report:

- Natural values
- Air quality
- Water quality
- Groundwater
- Construction materials and acid and metalliferous drainage potential of waste rock and tailings.

These issues are discussed in the following sub sections.

6.1 Key Issue 1: Natural values

6.1.1 Description

Section 5.1.1 and Appendix B of the EIS describe the ecological conditions of the site. A general flora and fauna survey of the area to be cleared was undertaken over 3 days in September 2022. A separate, targeted orchid survey was undertaken at the end of January 2023 during the flowering period. All areas of suitable eagle nest habitat within 1km of the study area were searched for eagle nests in April 2023. Masked owl call detection surveys were conducted from September 2023 to November 2023 following field assessments of hollow bearing trees. The area was also surveyed for suitable habitat for the Tasmanian devil (*Sarcophilus harrisi*) and the spotted-tailed quoll (*Daryurus maculatus*). Survey methodologies are detailed in Appendix B of the EIS.

Vegetation communities and flora

The proposal will result in removal of 1.48 hectares of native vegetation to expand the Northern Borrow Pit, comprising:

- *Eucalyptus obliqua* forest over leptospermum (WOL) – 0.02 ha
- *Eucalyptus obliqua* over rainforest (WOR)- 0.94 ha
- *Eucalyptus obliqua* forest with broad-leaf shrubs (WOB) – 0.52 ha.

The EIS states that no vegetation communities listed under the NCA or the EPBCA occur within the Northern Borrow Pit expansion area. While not stated in the EIS, the proponent has advised vegetation removal associated with the Northern Borrow Pit expansion will be undertaken in two stages, correlating with the two raises.

No flora species listed under the schedules of the TSPA or the EPBCA were identified within the proposed disturbance area. Targeted surveys were conducted for the horned orchid (*Orthoceras strictum*) in late January 2023 in areas of potential habitat in the vicinity of the Northern Borrow Pit, with no evidence of the orchid detected. The EIS stated that it is considered unlikely that this species is present.

Threatened fauna

Tasmanian masked owl (Tyto novaehollandiae castanops)

The Tasmanian masked owl (TMO) is listed as endangered under the TSPA and vulnerable under the EPBCA. The TMO is known to occur in the local area, with the proposed development located within the core range for this species. Songmeters were deployed during the masked owl breeding season as described in Section 5.1 of the EIS, with the results indicating the Northern Borrow Pit falls within an occupied masked owl territory.

According to the EIS, the infrequent number of recordings suggests a low frequency of visitations to the area¹ and it is unlikely that masked owls used the area for nesting during the 2023 breeding period.

¹ Three screech calls were recorded on 27 Sept 2023 and one screech call on 20 Oct 2023.

Twelve hollow bearing eucalyptus trees were mapped; seven within and five immediately adjacent to the Northern Borrow Pit disturbance footprint (see Figure 4). The EIS states that these trees were unlikely to support suitable masked owl nesting habitat (described as trees with hollows with an opening greater than 15 cm) based on ground and drone inspections.

The EIS concludes that given the results of the habitat tree assessment and songmeter data, the development of the borrow pit, including removal of the 12 hollow bearing trees outside the core masked owl breeding period, is unlikely to significantly impact the species.



Figure 4: Potential masked owl habitat trees (Fig. 15 of the EIS)

Tasmanian wedge-tailed eagle (Aquila audax subsp. fleayi) and white-bellied sea-eagle (haliaeetus leucogaster).

The project area includes suitable habitat for the wedge-tailed eagle, listed as endangered (EPBCA and TSPA) and the white-bellied sea-eagle, listed as vulnerable (TSPA). There is a known eagle's nest (#2734) located to the south of the TSF, approximately 1.4 km from the proposed embankment works and 1 km from the Southern Borrow Pit. Given this separation distance, the EIS states that no impacts to this nest are anticipated and no management measures are deemed necessary. In April 2023, an aerial eagle nest search of suitable nesting habitat was undertaken within 1km of Bobadil TSF, including the Northern Borrow Pit, with no new nests identified.

The project will result in minor loss of potential eagle breeding habitat and the EIS concludes that no deleterious or significant impacts to wedge-tailed eagles or their habitat are anticipated as a result of the proposed works. No specific conclusions are made in the EIS in regard to the white-bellied sea-eagle, other than noting very little viable habitat for this species exists within the Northern Borrow Pit expansion area.

Grey goshawk (Accipiter novaehollandiae)

The project area is within the core range of the grey goshawk, listed as endangered under the TSPA. A suspected grey goshawk nest was identified in a blackwood tree within 450 m of the Southern Borrow Pit during the on-ground survey. This nest appeared to be inactive at the time of survey, with no signs of use evident. The EIS states that no direct or indirect impacts to the nest are anticipated as a result of the proposal.

Swift parrot (Lathamus discolor) and blue-winged parrot (Neophema chrysotoma)

The swift parrot is listed as endangered (TSPA) and critically endangered (EPBCA) and the blue-winged parrot is listed as vulnerable under the EPBCA. Both species use hollow bearing trees for nesting. The removal of 12 hollow bearing trees has the potential to impact nesting individuals, and available nest habitat. The EIS notes that while Bobadil TSF is outside the recognised important breeding area for swift parrot, there have been recent (2023) recorded observations of breeding within 5km of the site. However, based on an analysis of Tasveg 4.0 mapping data, suitable swift parrot foraging habitat is considered largely absent within 10km of the potential nesting trees. The EIS suggests it is unlikely that this species would utilise the 12 trees for nesting and is unlikely to be impacted by the development.

The nearest blue-winged parrot records on the Natural Values Atlas are located 80 km to the south of Bobadil. Given the lack of records within the vicinity of Bobadil, the EIS considers it unlikely that the blue-winged parrot would be nesting in the area. The EIS does state that there remains the possibility, albeit very low, that swift parrots and blue-winged parrots may be impacted by the proposal through the removal of hollow bearing trees.

Tasmanian devil (Sarcophilus harrisii) and Spotted-tailed quoll (Dasyurus maculatus)

The Tasmanian devil is listed as endangered under the TSPA and the EPBCA, with spotted quolls listed as rare (TSPA) and vulnerable (EPBCA). The site is considered to provide suboptimal habitat for devils and is located outside the areas which support important populations and key sites for quolls (Figure 5, Appendix B). The Natural Values Assessment (Appendix B) notes it is likely that the site is utilised by these species for foraging and that it may represent part of one or more female home ranges for quolls.

The EIS states that no evidence of devil or quoll denning or foraging was observed during the site survey, with habitat mapped as sub-optimal.

The EIS nevertheless considers it likely the area would be used for foraging, and possibly denning, and concludes that the removal of 1.48 hectares of vegetation will result in the minor loss of foraging and potentially denning habitat. Direct impacts to the species as the result of clearing operations therefore cannot be ruled out.

Weeds and pathogens

An isolated population of blackberry (*Rubus fruticosus*), listed under the *Biosecurity Act 2019* and the *Biosecurity Regulations 2022*, was recorded near the dam wall. The EIS notes that declared and environmental weeds may be spread at the site as a result of earth moving activities.

The EIS reports that six positive soil samples were returned during a recent survey for *Phytophthora cinnamomi* (PC). PC attacks the roots of plants and may result in the death of the infected plant, depending on their sensitivity, with many Tasmanian vegetation communities being susceptible to PC. According to the EIS it is not currently possible to eradicate the pathogen from infected areas, with PC confirmed at various locations within and surrounding the TSF. The EIS recommends that the entire site be considered PC positive, including access roads and borrow areas. The EIS states that the proposed works may result in PC being distributed more widely across the site and the surrounding areas as a result of soil movement on vehicles, machinery and boots.

Geoconservation

There is an area of Western Tasmanian Blanket Bog immediately south of the proposed Northern Borrow Pit expansion area. The EIS states that no impacts to this geoconservation site are anticipated (see EIS Figure 17).

6.1.2 Management measures

Management measures for natural values are listed below and further detailed in Section 5.3.1 of the EIS.

Vegetation communities and flora

Areas proposed for clearance will be clearly demarcated with marking tape and/or virtual demarcation by GPS prior to work commencing.

Rehabilitation of disturbed areas will be undertaken as soon as practicable.

Threatened Fauna

Tasmanian masked owl (Tyto novaehollandiae castanops)

A suggested management measure is to avoid direct impacts to large diameter trees (>1 m Diameter at Breast Height, DBH) wherever possible.

The 12 potential habitat trees will ideally be removed outside of the combined masked owl, blue-winged parrot and swift parrot breeding period, with vegetation removal to take place between 1 March and 31 August.

The following measures will be taken to reduce any potential impacts to masked owls, accounting for variability in the breeding season:

- A suitably trained bird observer will be on site to supervise tree clearing works. If a masked owl is observed exiting a tree, all works will cease within 150 m of the tree and Conservation Assessments in Natural Resources and Environment Tasmania will be contacted for advice.
- Clearing operations will commence by first removing smaller adjacent trees to flush out any birds using tree hollows for nesting. Works will cease and Conservation Assessments contacted if trees are being used for nesting as evidenced by physical signs or flushed birds.

Where removal of potential nesting trees cannot be undertaken outside of the breeding season, the following additional measures are proposed:

- Pre-clearance inspection of trees for physical evidence of nest hollows being utilised (regurgitated pellets, whitewash, feathers).
- A bird observer will be present to visually inspect the hollows for the presence of birds while the trees are tapped firmly.
- Physical inspection of hollows will be undertaken if warranted and safe to do so.
- Conservation Assessments will be contacted for advice if masked owls are observed.

Swift parrot (Lathamus discolor) and blue-winged parrot (Neophema chrysotoma)

The presence of swift parrots and the blue-winged parrots will be assessed as part of the same pre-clearance protocols applied to the masked owl. In addition, the EIS recommends the potential presence of swift parrots and blue-winged parrots be investigated following advice from Conservation Assessments to confirm whether any observations have been recorded in proximity to the site during the active breeding season.

Tasmanian wedge-tailed eagle (*Aquila audax subsp. fleayi*) and white-bellied sea-eagle (*Haliaeetus leucogaster*).

No management measures are proposed for the Tasmanian wedge-tailed eagle and white-bellied sea-eagle.

Grey Goshawk

No management measures are proposed in the EIS. The Natural Values Report recommends that the existing nest be avoided by a minimum 100 m buffer.

Devils and quolls

In view of the possibility that devils and quolls may utilise the area proposed for clearing, the following will be undertaken:

- Pre-clearance surveys in accordance with the NRE Tas survey and advice guidelines, to confirm that no active den sites are disturbed within 50 m of the works area. If any potential den is discovered, a den activity assessment will be undertaken prior to den decommissioning.
- Traffic will be generally restricted to daylight hours, to reduce the potential impact of roadkill.
- Speed limits of 25 km/h will be applied to all internal roads during the proposed development.

Weeds & Hygiene

A weed and hygiene management plan will be prepared and implemented in accordance with the NRE Tas guidelines.

The Bobadil TSF will be designated a *P. cinnamomi*-positive site, with hygiene restrictions and washdown provisions outlined in the weed and hygiene management plan, with a particular focus on PC management.

All machinery working in the area will be washed down thoroughly before being used at any other site. According to the EIS, the Filter Plant washdown facility requires modification, or alternatively, a supplementary washdown station will be required at Bobadil. Phytoclean is currently being applied to light vehicles once they leave Bobadil and this will be extended to other road users until the required upgrades are in place.

Vegetation (specifically PC host plants, i.e., native woody species) along Flume Road will be sprayed with herbicide (avoiding pasture grasses and ferns) to prevent PC host plants from colonising and becoming infected by road splash in wet weather.

6.1.3 Public and agency comment and responses

NRE provided the following comments:

- The proposal is unlikely to impact the Tasmanian mask owl, provided specific pre-clearance mitigations are developed and implemented.
- The proposal is unlikely to impact the existing eagle nest or nests within 1 km of the proposed development, based on the findings of the aerial surveys undertaken on 5 April 2023. If vegetation clearing is not undertaken by 5 April 2025, a new nest survey is recommended.
- Clearing of vegetation with suitable nesting and or foraging habitat for swift parrots should be avoided during the breeding season (September to February), if the species is breeding in the area. Information on breeding locations is available from CAS.
- Pre-clearance devil den surveys for all areas mapped as suboptimal denning habitat is supported.
- A permanent buffer of 150 m is recommended around the identified grey goshawk nest.

Geoconservation

No management measures have been proposed.

6.1.4 Evaluation

Vegetation communities and flora

The potential for the proposal to impact threatened vegetation communities and flora species is considered low, given the lack of observed threatened vegetation communities and the low risk of potential threatened flora species being present within the Northern Borrow Pit expansion area.

The EIS states that construction activities, such as temporary storage of machinery and stockpiling of excavated material, will use designated cleared areas to avoid impacting native vegetation.

A previous natural values assessment (MMG Rosebery Bobadil – Tailings Storage Facility Lift 11 and Closure Flora and Fauna Habitat Assessment, NorthBarker Ecosystem Services, 17 Oct 2022) mapped an approximate 0.70 hectare patch of *Eucalyptus brookeriana* wet forest, located towards the south-eastern edge of the polishing pond and south of the TSF dam wall. This community is listed as threatened under the NCA and critically endangered under the EPBCA. *E. brookeriana* trees provide foraging habitat for the Swift Parrot.

No impacts are anticipated to this vegetation community, which is located approximately 500m west of the Southern Borrow Pit.

Threatened Fauna

Tasmanian Masked owl, (Tyto novaehollandiae castanops), swift parrot (Lathamus discolor) and blue-wing parrots (Neophema chrysotoma).

The results of the ecological assessment presented in the EIS suggest that, while it is unlikely that the 12 hollow bearing trees proposed for removal will be used as breeding habitat, the possibility remains that masked owls, swift parrots and blue-winged parrots may use these tree hollows for nesting. Songmeters were deployed to survey areas within 150 m of the proposed works footprint, in accordance with Conservation Assessments recommendations. While the results of this survey indicate infrequent use of the area by TMOs, calls were recorded on two separate occasions and therefore the future use of potential nesting trees within the area to be cleared, and the surrounding 150 m², cannot be discounted.

The commitment to undertake the clearing works outside of the combined breeding season of TMOs, swift parrots and blue-winged parrots is supported and required by Condition **FF1**. However, the proponent has indicated that clearing of vegetation within the breeding season cannot be entirely ruled out. While the basis for this is not clearly stated in the EIS, it is presumed to be related to scheduling, and the programming of works during the drier summer period.

Clearing will require Director approval and must be undertaken in accordance with the Avian Fauna Clearance Plan required under Condition **FF2**.

It is recognized that TMO's may also breed out of season. To mitigate the risk of disturbance to any nesting TMOs within the proposed works footprint or 150 m from the proposed works, condition **FF2** requires the development of an Avian Fauna Clearance Plan. The plan is to include the results of preclearance surveys and specific vegetation clearance measures, including the presence of a suitably qualified observer on site during clearing and the cessation of all works within 150 m of a TMO, swift parrot or blue-winged parrot seen exiting a tree.

While Condition **FF2** will ensure appropriate measures are contained in the Avian Fauna Clearance Plan to minimise the risk of disturbing a breeding TMO, swift parrot or blue-winged parrot, the condition also requires further advice from Conservation Assessments and/or consideration of additional measures, with any case presented to the Director requesting clearing during the breeding season. The measures outlined in Condition **FF2** are supported by Conservation Assessments and are in line with those described in the EIS.

Note, additional survey requirements specific to the swift parrot are required in the Avian Fauna Clearance Plan (Condition **FF2**).

The commitment to clear a maximum of 1.48 hectares of native vegetation and to avoid impacts to trees with a diameter at chest height of greater than 1m (which provide potential habitat for hollow nesting species), as part of future design and location of construction works, is supported. However, it is considered unlikely the 12 large trees located within and immediately adjacent to the expansion area could be retained.

To help reduce the potential for impacts to habitat for threatened species beyond the area proposed for clearing, Condition **FF3** requires the boundary of the clearance area to be delineated by exclusion fencing,

² CAS recommends a 150 m buffer from proposed works for nesting TMOs.

or an alternative approved method. To protect large trees identified for retention, a 15 m buffer must be established as described in Condition **FF3**.

Tasmanian wedge-tailed eagle (*Aquila audax subsp. fleayi*) and white-bellied sea-eagle (*Haliaeetus leucogaster*).

Given the distance to the nearest nest, it is considered unlikely that the proposed works will disturb any associated breeding pair.

Note, nest surveys are considered current for only 2 years. Condition **FF4** therefore requires an eagle nest survey of all suitable habitat within 1 km of the proposed works be undertaken, if vegetation clearing for the Northern Borrow Pit does not commence by April 2025.

Grey goshawk (*Accipiter novaehollandiae*)

It is agreed that no direct or indirect impacts to the suspected grey goshawk nest, located approximately 450 m from the existing Southern Borrow Pit, are anticipated as a result of the proposal.

Tasmanian devil (*Sarcophilus harrissii*) and spotted-tailed quolls (*Dasyurus maculatus*)

The loss of foraging habitat on local devil and quoll populations is unlikely to result in a significant impact given the suboptimal habitat characteristics and the alternative habitat available in the surrounding area. However, vegetation clearance could disturb denning devils and or quolls. Condition **FF5** therefore requires pre-clearance surveys for Tasmanian devil and quoll dens to be undertaken in line with NRE guidelines up to 30 days before any native vegetation clearance. A pre-clearance report must be supplied to the Director and a 50 m buffer must be included around any den identified, with a Den Decommissioning Plan provided to the Director for approval before any disturbance is allowed to proceed.

Weeds & Hygiene

The entire Bobadil TSF, including the flume access road and the internal road network, is considered a *Phytophthora cinnamomi* (PC) positive area for management purposes and there is a risk that the pathogen will be translocated around the site as a result of the proposed construction works and on-going operation of the facility.

To mitigate the potential spread of PC, Condition **OPI** requires preparation and implementation of a Weed and Pathogen Management Plan, reflecting the requirements of NRE Tasmania's (2015) *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania*, and incorporating the proposed PC management measures, including the upgraded vehicle washdown network. The Plan will also ensure that any declared weeds on site are appropriately managed.

Condition **FF6** is also required to ensure appropriate machinery washdown is undertaken.

6.1.5 Conditions

The proponent will be required to comply with the following conditions:

- FF1** Protection of threatened species potential habitat
- FF2** Avian Fauna Clearance Plan
- FF3** Vegetation clearing works
- FF4** Survey and Management of Tasmanian wedge-tailed eagle (*Aquila audax subsp. fleayi*) and white bellied sea eagle (*Haliaeetus leucogaster*)
- FF5** Survey and Management of Tasmanian devil (*Sarcophilus harrissii*) and Spotted-tailed Quoll (*Dasyurus maculatus*) dens
- FF6** Machinery washdown
- OPI** Weed and Disease Management Plan

6.2 Key Issue 2: Air quality

6.2.1 Description

The nearest sensitive receptors are located approximately 1.6 km south of the southern boundary of the proposed works (Figure 5).

According to the EIS, the proposal has the potential to increase dust emissions during construction. The EIS states that earthworks and heavy vehicle movements³ are likely to result in fugitive dust emissions if adequate mitigations are not put in place, however the impacts to sensitive receptors are considered minimal, based on the separation distances, high rainfall and low wind speeds typical of the area.

The meteorological conditions for the site are summarised in the EIS Section 5.4.1.1. The EIS notes that dust emissions may occur in dry and windy conditions and on-going implementation of the Dust Mitigation Plan (MMG 2020) is required to minimise off-site dust emissions.

Other construction activities that have the potential to generate dust include:

- Vegetation clearing for the Northern Borrow Pit; and
- Drilling, blasting, crushing and screening of approximately 200,000m³ of rockfill from the Northern Borrow Pit.

A Construction Dust Risk Assessment (EIS Section 5.4.1.2) was prepared following the *Guidance on the assessment of dust from demolition and construction* by the Institute of Air Quality Management (IAQM, 2023). According to the EIS, impacts to human health were not considered as there are no human receptors within 250 m of the site boundary (relevant assessment criteria). The assessment concluded that construction activities would pose a medium risk to ecological receptors (native vegetation) if no mitigation measures were applied.

Section 5.4.1.2 of the EIS describes the air quality monitoring currently undertaken for the mine, in accordance with Environment Protection Notice (EPN) No. 7153/3. It includes high volume air samplers (HVAS) (total suspended solids (TSP), particulate matter sub 10 micron, (PM₁₀) and metals), dust deposition monitoring and meteorological stations.

The nearest air quality monitoring stations to Bobadil are between 1.7 to 1.9 km to the south of the TSF (see Figure 25 of the EIS). Table 8 of the EIS provides a summary of the air quality assessment criteria, in accordance with the Environment Protection Policy (Air Quality) 2004 (Air EPP) and EPN No. 7153/3.

Monitoring results from the HVAS indicate that the compliance limits (condition A2, EPN No. 7153/3) for TSP (0.090 mg/m³ annual average), PM₁₀ (0.150 mg/m³ 24-hour average) and lead as TSP (0.0015mg/m³ 90 day average)⁴ have not been exceeded for the past 7 years.

Dust deposition as measured by dust deposition sampler has also not exceeded the compliance limit (condition A3, EPN No. 7153/3) of 4.0 g/m² at any of the (6) monitoring stations (see Figure 25 of the EIS).

Dust complaints received by MMG are summarised in Table 10 of the EIS. The complaints relate to dust pick-up from the surface of the TSF in 2018 over a 2 month period while the TSF was not in operation; during which a total of 11 complaints were received. Subsequent measures were implemented by MMG, including the establishment of a TSF sprinkler system.

No complaints have been received since 2018.

Dust at Bobadil TSF is currently managed in accordance with MMG's Dust Mitigation Plan (DMP) (MMG 2020), as required under EPN No. 7135/3. According to the EIS, real time data on dust emissions is also

³ According to the EIS the following will be undertaken:

- Excavation and haulage of 2,000m³ of clay material;
- Excavation, haulage and stockpiling of 200,000 m³ of rock material;
- Excavation and movement of 41,000 m³ of tailings from Bobadil TSF; and
- Surface ripping, filling of low points and grading of the western TSF buttress.

⁴ Compliance limits associated with condition A2, EPN No. 7153/3 only apply to PM₁₀, TSP and lead.

collected via monitoring equipment (DustTrak units) and sent automatically via email to relevant personnel who initiate mitigation measures as detailed in the DMP, when relevant trigger levels are reached⁵. Mitigation measures include water carts, application of sprinklers and alterations to or cessation of operations.

Air Dispersive Modelling was undertaken for current and future scenarios to assess the potential impacts of the embankment raises in accordance with the methodology detailed in Section 4 of Appendix E of the EIS.

The current scenario reflects the existing conditions, while the future scenario includes the changes in terrain, land use and emissions profile resulting from the Stage 11 embankment raise. Appendix E states that separate air dispersive modelling was not undertaken for the Stage 12 raise, and that the Stage 11 modelling is a conservative representation of the Stage 12 raise.

According to the EIS, the 2 m increase in height for the Stage 12 raise will not significantly impact the wind erosion emissions from the surface of the TSF, due to the smaller dry surface area following completion of the stage.

For both scenarios, the results of the modelling indicate that, for the discrete sensitive receptors (see Table 20 and Figure 21 of Appendix E for the discrete receptor locations⁶) the cumulative dust concentrations (TSP, PM₁₀, PM_{2.5} and deposited dust) and concentrations of cadmium, lead, zinc, arsenic, manganese and nickel are below the relevant assessment criteria (Air EPP and relevant EPN No. 7153/3 limits). Note, Tables 24 and 25 indicate that the arsenic 3-minute average concentration exceeds the Air EPP Schedule 2 design criteria at the HVAS AD2.1 Core Shed site. However, as this site is within MMG land (Figure 21 of Appendix E), the Schedule 2 design criteria have not been exceeded.

The concentrations for TSP, PM₁₀ and PM_{2.5} however are predicted to exceed the Schedule 2 Air EPP design criteria beyond the boundary of the activity area along the Pieman River and the access to the Bobadil TSF (see Tables 22 and 23 and Figures 28 to 31 of Appendix E).

According to the EIS, these results do not represent non-compliance with Schedule 2 of the Air EPP, as the design criteria are based on human health, and the receptors along the Pieman River and access to Bobadil are ecological in nature, with no residences nearby.

The EIS states that there is very little difference between the current and future modelled scenarios, and that any change to air quality when compared to the current conditions is likely to be insignificant. It is also argued that the modelling results are conservative as the assessment does not factor in the mitigation measures already in place and includes a larger TSF surface area than the final concept design.

The air quality impact assessment also considers several upset conditions (see Table 32, Appendix E for further information), including;

- TSF sprinkler failure,
- cessation of tailing deposition, and
- mine closure.

The above scenarios would potentially result in drying of the TSF surface and increase the risk of dust generation and visible plumes under certain meteorological conditions. In the case of sprinkler failure, back up surface treatment systems are cited as the response. The EIS states that long term cessation of tailings deposition could be corrected with additional sprinklers to assist in retaining surface moisture and the application of a polymer tailings cover until a solution is found.

Mine closure effectively results in the cessation of tailings deposition. This would require implementation of the Mine Closure Plan and longer term mitigation measures to manage dust emissions until a stable cover is established.

⁵ For a 15-minute averaging period, the inspection trigger level is 250 $\mu\text{g}/\text{m}^3$, while the mitigation trigger level is 400 $\mu\text{g}/\text{m}^3$.

⁶ The discrete sensitive receptors include HVAS sampling sites, schools, caravan park, Football club swimming pool, and 'dwelling closest to Bobadil TSF'.

The EIS concludes that the potential impact to sensitive receptors from dust is likely to be minimal given the meteorological conditions and the separation distances (greater than 1.6 km).

6.2.2 Management measures

The avoidance and mitigation measures to be applied during the construction phase are described in Section 5.4.3 of the EIS and include:

- implementation of the dust management system;
 - The dust management system is centred on the early identification of adverse conditions to provide early warning of high-risk conditions and allow for implementation of measures such as relocation of tailings spigots and watering of unpaved high traffic areas.
- update the existing Dust Mitigation Plan (MMG 2020)(DMP) required under Condition A6 of EPN No. 7153/3 for construction of Stage 11 and Stage 12, and operation of the facility, including ongoing monitoring.
- watering of haul roads and borrow pit areas;
- application of dust suppressant chemicals (e.g. DustWorx); and
- on-going air quality monitoring in accordance with EPN No. 7153/3. The existing monitoring network will be used to manage air quality with results used to determine the adequacy of construction and operational mitigation measures.

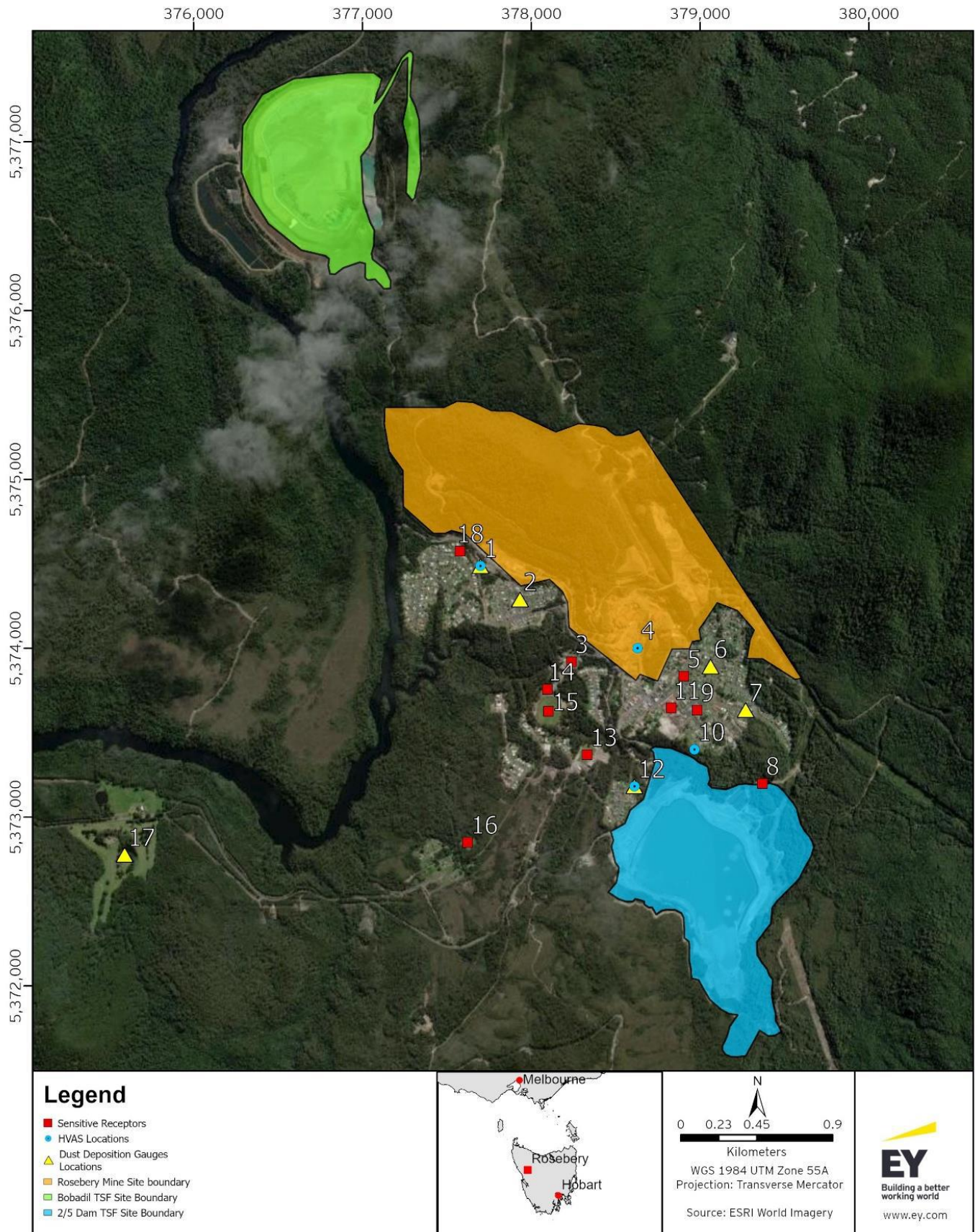


Figure 5: Sensitive receptors (Figure 21 of Appendix E of the EIS)

6.2.3 Public and agency comment and responses

No public or agency comments were received.

6.2.4 Evaluation

The application of the measures outlined in the EIS, including watering roads and pits, application of dust suppressants and the use of tailings spigots and TSF sprinkler systems are considered to be appropriate, noting that no complaints have been received since implementation of these measures in 2018.

Construction of the raises will nevertheless result in potential for increased dust emissions, in particular from excavation and movement of tailings and rock fill material. The potential for impacts to sensitive receptors to the south of the TSF, will likely be highest when conditions are hot and dry, and the wind is blowing from a northerly direction.

Condition **A1** is therefore imposed to ensure that measures are applied appropriately such that dust is controlled to the extent necessary to prevent environmental nuisance. Condition **A2** requires control of dust from vehicle movements, and Condition **A3** requires that dust produced by the operation of crushing and screening equipment be controlled.

According to the EIS, dust is managed in accordance with the DMP. A copy of the DMP was not included in the EIS, with the Plan last revised in 2020 following a review of the Rosebery Mine air quality monitoring network. Condition **A4** therefore requires an updated Dust Mitigation Plan to be submitted to the Director before commencement of construction. The revised plan is to include the avoidance and mitigation measures outlined in the EIS for both the construction and operational phases of Bobadil TSF, taking into account Stages 11 and 12, the management of the Northern and Southern Borrow Pits and updates to the air monitoring network, as discussed below.

Concentrations above the Air EPP design criteria (Schedule 2) for PM₁₀ 24-hour average for current and future scenarios are predicted along the Pieman River and access road to Bobadil (Appendix E, Figures 30 and 31). While the EIS contends that these are not exceedances of Schedule 2 of the Air EPP, they clearly are, as the respective PM₁₀ 24-hour average concentration (0.050 mg/m³) is exceeded beyond the boundary of The Land (now referred to as the activity area).

The EIS and Appendix E of the EIS nevertheless contend that no human receptors are within the areas of exceedance. This conclusion, however, is based on the locations of the sensitive receptors as shown in Figure 21 of Appendix E of the EIS and described in Table 20, and not the full extent of residences within and surrounding Rosebery. Specifically, while the location marked as 18 on Figure 21 is described as the “dwelling closest to Bobadil TSF”, the assessment does not take into account the residences along Baillieu Street.

The air dispersion modelling however, shows the maximum PM₁₀ 24-hour average ground level concentration at receptors along Baillieu Street exceeds the Air EPP Schedule 2 design criteria (Figure 6). Note, this equates to an exceedance in only one 24-hour period of the model duration (1 year). It is noted that the second highest 24-hour period is below the criterion (Figure 6).

Appendix E of the EIS similarly notes that while the cadmium and arsenic 3-minute average exceeds the Schedule 2 Air EPP design criterion beyond the boundary of the activity area (Tables 24 and 25 of Appendix E), it does not exceed it at sensitive receptors.

As Appendix E of the EIS only shows the 99.9th percentile 24-hour cadmium contour concentrations (Figures 32 and 33), and not the 3-minute average contours⁷, one cannot assess whether the Air EPP design criteria for cadmium, or for that matter arsenic, are exceeded at the receptors along Baillieu Street.

In the least, Figures 32 and 33 of Appendix E show that the current trigger levels for cadmium (24-hour average, 99.9th percentile contour - EPN No. 7135/3, Table 1 Condition A2) are exceeded along Baillieu Street.

⁷ The Schedule 2 Air EPP design criteria for cadmium is a 3-minute average value.

The arguments above apply to both current and future scenarios, as there is very little difference between the two. In this sense, the proposed Stage 11 and Stage 12 works are unlikely to materially change the air quality conditions at or beyond the boundary of the Activity Area from that currently experienced.

While the modelling indicates Baillieu Street and the immediate surrounds may be at risk of being impacted by dust, including metals, the modelling is conservative, and this risk is considered low, with exceedances only resulting from maximum predicted values (i.e. 100th percentile for PM₁₀ and 99.9th percentile for metals).

With the implementation of an updated Dust Mitigation Plan (Condition **A4**), in combination with Conditions **A1**, **A2** and **A3**, the risk will be further reduced.

Given the area of modelled exceedance however, as illustrated in Figure 6, it is considered prudent to require installation of an air monitoring station on or near Baillieu Street (Condition **A5**). A dust deposition gauge in combination with a real time dust monitoring station (e.g. Dust Master Pro) is required to be installed prior to the commencement of construction (Condition **A5**). The final location must be determined in consultation with the EPA.

The level of dust fallout must not exceed the monthly dust deposition limits and trigger levels shown in condition **A6**, consistent with the dust deposition limits and trigger levels required by EPN No. 7153/3.

The Dust Master Pro, while not a reference method for PM₁₀ and hence unable to be used for compliance, will provide real time dust data and therefore a useful indication of PM₁₀ 24-hour average levels. Importantly, it will provide a mechanism for timely management responses to any increase in dust emissions.

A High Volume Air Sampler (HVAS) is also required to be installed on or near Baillieu Street within 6 months of the date of this permit to allow for regulation against PM₁₀ compliance limits (Condition **A5**). The HVAS will also allow for the sampling and regulation of metals, as PM₁₀ (lead as TSP). The 6-month timeframe acknowledges the logistics and planning required to install this instrumentation.

Exceedances of trigger levels and non-compliances must be reported and investigated in accordance with Condition **A6**, **A7** and **A8**.

Note, Condition **A7** HVAS compliance and trigger levels are different from those detailed in Table I, Condition A2 of EPN No. 7153/3. In January 2022, the EPA Board issued a statement updating air pollutant Air EPP design criteria in response to changes in NEPM standards. These changes are not reflected in EPN 7153/3 (issued in 2011).

Relevant updates reflected in Condition **A7** include arsenic (1 year average), cadmium (24 hour and 1 year average), copper (24 hour average), lead (1 year average), manganese (24 hour and 1 year average), zinc (24 hour and 1 year average), and PM₁₀ (24 hour and 1 year average).

Note, the new limits contained in Condition **A7** will just apply to the monitoring station established on or near Baillieu Street. On-going air quality monitoring at the other stations (Figure 21 of Appendix E of the EIS) will continue to be in accordance with EPN No. 7153/3 (Conditions A2, A3 and A4). Southern Industrial Regulation section of the EPA has advised that the changes to the Air EPP design criteria and NEPM standards will be addressed via a revision of EPN No. 7153/3.

The updated Dust Management Plan will nevertheless reflect these changes, including the additional monitoring stations (Condition **A4**).

Note, the modelling presented in the EIS was undertaken in accordance with the new NEPM standards and updated Schedule 2 Air EPP design criteria.

Condition **M1**, Attachment 2, details specific monitoring and reporting requirements.

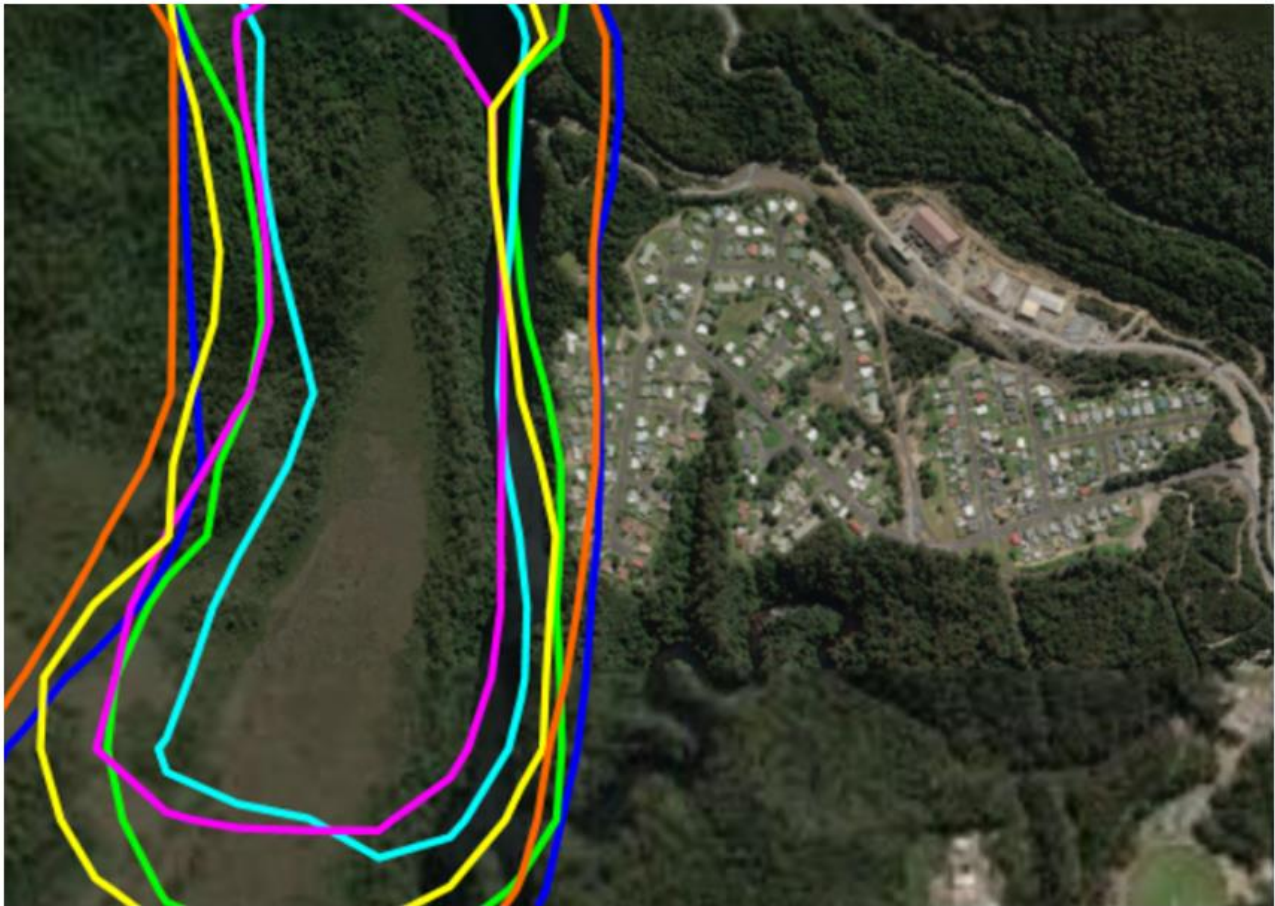


Figure 6 Maximum and second largest 24 hour PM₁₀ concentrations for current and future scenarios in the vicinity of Baillieu Street.

Legend:

- Orange – 50 ug/m³ contour line for maximum 24 PM₁₀ concentrations for the Current scenario including background
- Dark blue – 50 ug/m³ contour line for maximum 24 PM₁₀ concentrations for the Future scenario including background
- Yellow – 50 ug/m³ contour line for second largest 24 PM₁₀ concentrations for the Current scenario including background
- Green – 50 ug/m³ contour line for second largest 24 PM₁₀ concentrations for the Future scenario including background
- Pink – 50 ug/m³ contour line for maximum 24 PM₁₀ concentrations for MMG alone for the Current scenario
- Cyan – 50 ug/m³ contour line for maximum 24 PM₁₀ concentrations for MMG alone for the Future scenario

6.2.5 Conditions

The proponent will be required to comply with the following conditions:

- A1** Control of dust emissions
- A2** Dust emissions from traffic areas
- A3** Control of dust emissions from crushing and screening plant
- A4** Dust Mitigation Plan
- A5** Air monitoring station - Baillieu Street
- A6** Dust Deposition Sampling - Baillieu Street
- A7** High Volume Air Sampling - Baillieu Street
- A8** Reporting of Monitoring
- M1** Monitoring requirements

6.3 Key Issue 3: Water quality

6.3.1 Description

Existing environment

Bobadil TSF is located in the Lake Pieman catchment, encompassing the towns of Rosebery and Tullah. The Protected Environmental Values (PEV's), which apply to the Lake Pieman estuary, include the protection of aquatic ecosystems from which fish can be harvested and recreational water quality and aesthetics. For further details regarding the catchment and the PEV's refer to Section 5.2.1 of the EIS.

According to the EIS, Rosebery mine site waste water is primarily discharged through Bobadil TSF. In addition to tailings, the Bobadil TSF receives all surface water (stormwater) from within the TSF, and all wastewater and solids from the Rosebery mine effluent treatment plant (ETP), (which includes 2/5 Dam TSF water, mine water and stormwater from the Rosebery mine). Once within the TSF, wastewater, including TSF decant water, is directed to the polishing pond via a gravity decant system, before being discharged to Lake Pieman via the Bobadil Outflow.

The emergency spillway, crest width of 20 m and 0.6 m below the current crest height, is designed to pass a probable maximum precipitation flood in accordance with ANCOLD Guidelines. The EIS states the TSF has 0.5 m freeboard below the spillway invert level that is adequate for a 1 in 100, 72-hour storm event.

New emergency spillways will be constructed to be 0.6 m below the design crest height for each raise, with the Stage 11 spillway invert level at RL 202.4 m, and the Stage 12 invert at RL 204.4 m. The flow path for the spillway will remain unchanged (see Figure 3 of the EIS).

A clean water diversion drain located along the eastern perimeter of the TSF intercepts stormwater from the upper catchment and diverts it to Slip Creek. The key surface water features for Bobadil TSF are shown in Figure 7.

Groundwater is discharged to the surface as seeps. Four seeps are currently monitored in accordance with EPN No. 7153/3⁸. These seeps are expressed to the surface some way down gradient from the TSF (see Figure 8, Section 6.4 of this report) some of which mix with shallow groundwater. Further information on these seeps is provided in Section 6.4 of this report.

A number of seeps occur directly from the TSF embankment and are collected via the decant channel and directed to the polishing pond for treatment, where neutralisation and precipitation occurs, prior to discharge via the Bobadil Outflow.

The seeps are a combination of internal drainage pipes installed within the embankments to lower the phreatic surface, and individual seepage expressions from the embankments. Seep flow rates are monitored monthly (pipes and V-notch weirs) in accordance with dam surveillance reporting requirements.

The quality of the seeps was monitored between April 2020 and November 2022. See Appendix C of the EIS for further details, including Figure 2 for a location of the seep monitoring points⁹.

According to the EIS, seepage from the Bobadil TSF into the decant channel has been recorded between 0.01 L/s and 7 L/s¹⁰.

Results of the monitoring of the TSF embankment seepage quality (expressions and pipes) are presented as box whisker plots in the EIS (Figure 20) and summarised as follows:

- All median pH values are less than 6.5, with VW01, CW04 and BDSP01 having pH median values of 3.29, 3.55, and 3.23;
- The Mn concentrations are well above 10 mg/L except for VW2;

⁸ Table 5 of Attachment 2 of EPN No. 7153/3 shows a requirement for 5 seeps to be monitored. One seep, BD4 is no longer monitored, as it no longer exists due to expansion of the TSF.

⁹ Note, BDSP refers to pipes out of the embankment, WB refers to the western buttress with collection pipes and seepage expressions, and VW and CW are flow monitoring points. Individual seepage expressions are monitored as composites via V-notch weirs primarily at BDSP01 V-notch, BDSP03 V-notch, and CW01-04.

¹⁰ Note, it is unclear if this includes all seepage from expressions and drainage pipes prior to entering the polishing pond.

- Median Zn concentrations are well over 1 mg/L except for VW2;
- Manganese (Mn), zinc (Zn), sulfate (if not precipitated as gypsum through the addition of lime), and to a lesser degree cadmium (Cd), represent elements of concern.

The polishing pond consists of six cells which treat wastewater via pH neutralisation and precipitation of soluble metals. Between 500kg – 1000kg of lime is added to the ponds as required, and usually only when the dosing of lime at the Rosebery mill effluent treatment plant (ETP) has not sufficiently neutralised the wastewater. The pH of the polishing pond is monitored via Programmable Logic Controllers and an alarm is activated when it is outside the discharge criteria set by EPN No. 7153/3 (compliance limit of 6.5, investigation trigger level (95th Percentile) of pH 6.7).

The discharge limits for the Bobadil Outflow are currently regulated under Condition M4, Table 3 of EPN No. 7153/3.

Bobadil Outflow water quality results are presented in Section 5.2.1 of the EIS, with exceedances summarised as follows:

- 2017-2018 monitoring period; two weekly field electrical conductivity (EC) values exceeded the EPN limit discharge criteria of 2,000 uS/cm. Both were below 2500 uS/cm. Elevated values occurred during winter, when stormwater inputs were greatest, and during summer, when sulphate rich mine water and carbonate rich process water contributed a large proportion of the total flow.
- 2018-2019 monitoring period:
 - Total petroleum hydrocarbon (TPH) (1 value at 0.25 mg/L) exceeded the EPN limit of 0.05 mg/L.
 - Total cyanide (1 value 0.84 mg/L) exceeded the EPN limit of 0.2 mg/L; and
 - Total phosphorus (1 value of 1.2 mg/L) exceeded the EPN limit of 1.0 mg/L.
- 2019-2020 monitoring period; during a period of high rainfall in August 2019, pH levels in the TSF declined, with the continuous pH meter recording <6.5, with a minimum hourly aggregated reading of 6.2 on 20 August 2019. Other exceedances included:
 - A total zinc concentration of 1.4 mg/L, exceeding the EPN limit of 1.0 mg/L; and
 - EC values (between 2,004 μ S/cm and 2,082 μ S/cm) in March 2020.

Contributing factors to the exceedances included high rainfall, reduced capacity in Bobadil TSF and short-circuiting between cells in the polishing pond due to an accumulation of sludges. Remedial actions included dredging the ponds and cleaning and repairing stormwater drains.

No exceedances have been reported since 2020 (2020 to 2023). According to the EIS, the low metal concentrations recorded from the Bobadil Outflow are largely attributable to maintenance of the pH in the TSF.

Appendix C of the EIS provides further details on the current water management practices for Bobadil TSF.



Figure 7 Bobadil TFS Surface Water (EIS fig. 18)

Results of an analysis of the potential impacts of the embankment raises on the management of surface water and seepage are summarised as follows (see EIS Section 5.2.2 and Appendix C of the EIS):

- The extent of the operational pond and the decant outflow will be similar (the decant invert will be maintained at the current relative level).
- Rainfall runoff is expected to be marginally reduced due to the reduced surface area of the TFS post embankment raises.
- Seepage volumes are not expected to increase as a result of the proposed raises.
 - A seepage assessment was conducted using the numerical modelling software, SEEP/WV, for the Western Embankment to estimate maximum seepage flux rates from Stages 10, 11 and 12. The Western Embankment section is considered the highest risk.

- Modelling indicates a marginal increase in total peak flow for seepage and drainage combined for future raises, with total peak flow rates varying between 1.27 – 1.31 m³/day/m from Stage 10 – 12.
- Total peak seepage¹¹ (excluding drainage contribution) is expected to remain the same or slightly decrease.
- Seepage flow data from January 2017 is presented in Figures 4 and 5 of Appendix C. Overall, the data indicates that seepage flow rates have either remained steady or decreased following the Stage 9 and Stage 10 raises.

The EIS concludes that the proposed raises will not result in any new surface water emissions and that there will be minimal change to the current water flows and characteristics. The EIS states the water treatment system in place is best practice and managed to ensure water quality is maintained at the Bobadil Outflow.

According to the EIS, stormwater at the Northern Borrow Pit will be managed by directing all water from excavation phases for the Stage 11 and Stage 12 area to the Stage 10 area, to pool in low points within the quarry before dispersing into the natural environment via an existing diversion drain (Figure 8 of the EIS). All water from the current stockpile area (topsoil and surface soil) is captured by the decant channel (Figure 10 of the EIS).

No information was provided in relation to the management of water from the Southern Borrow Pit.

According to the EIS, the water quality of Lake Pieman is influenced by numerous sources, including TSF groundwater inflows and Bodabil Outfall discharge, along with inflows from Lake Rosebery, runoff from residential areas, the TasWater treated sewage discharge, and mining discharges from other licenced mine sites (four operating mines as well as abandoned mines scattered throughout the catchment). Separating out the impact on Lake Pieman from Bodabil TSF is not feasible.

6.3.2 Management measures

The existing management measures for surface water and discharge at Bobadil TSF are undertaken in accordance with EPN No. 7153/3 and include treatment of wastewater in the Bobadil polishing pond and monitoring of end-of pipe emissions (Bobadil Outfall).

Management measure 6 of the EIS states that an updated Surface Water Monitoring Plan will be prepared in consultation with the EPA before construction.

All works will be undertaken in accordance with an Erosion and Sediment Control Plan to minimise potential impacts off-site. Measures will include installation of sediment traps and temporary cut-off drains.

6.3.3 Public and agency comment and responses

No public or agency comments were received.

6.3.4 Evaluation

For each Stage 11 and 12 raise it is noted that the spillway will be raised, with the decant invert maintained at the current level. With no significant change in TSF area, the volume of water to be managed with the future embankment raises is therefore likely to be similar to the current scenario. Further, there is no proposed change in the management of the TSF, including inputs from other sources (ETP effluent).

¹¹ Represented in the model as total groundwater seepage from the downstream edge of the Western Buttress to the upstream edge of the Polishing Pond.

It is agreed there is likely to be minimal change to the current water flows, characteristics and management practices from the proposed raises. The current infrastructure, in particular, the outfall, polishing pond and collection channels (decant channel etc.) are considered appropriate.

The seepage modelling predicted little change in seepage rates. While only a simplified 2D model, it is agreed that it is unlikely that there will be a significant change in seepage flow as a result of the embankment raises. The pond elevation will increase however it is noted that the future embankment raises will be located further from the perimeter embankment and drains, due to the upstream construction methodology. It is agreed that the amount of seepage is likely to be lower when compared to Stage 9 (embankment near the perimeter).

Should new seeps occur, the current infrastructure is in place to collect and direct these to the polishing pond. No additional infrastructure or alterations are required.

The ongoing monitoring at Bobadil, including real time pH monitoring and associated Programme Logic alarm system, and treatment via the polishing pond, are considered appropriate. Monitoring locations, parameters and frequency as required by Condition E4 EPN No. 7153/3 are appropriate, and required by Condition **MI**. Note, Condition **MI** no longer requires monitoring of dam seepage at location BD4¹².

No ongoing water quality monitoring of the TSF embankment seeps is required, as all are directed to the polishing pond, as noted above. Condition **EI** ensures that wastewater from the Bobadil TSF may only be discharged from the current Bobadil Outfall.

Condition **E2** establishes discharge limits for the Bobadil Outfall. The limits are based on site specific parameters and are the same as those contained in EPN No. 7153/3 (condition M4). According to the EPA water specialist, the current emission limits as required by EPN No. 7153/3 (condition M4) are protective of the receiving environment and require no change. Condition **M2** is included to ensure that monitoring samples are handled appropriately.

The Bobadil polishing pond provides residence time for precipitation of soluble metals before discharge to the receiving environment. It is noted that no exceedances have occurred since 2020 when remedial actions such as sludge removal were undertaken. Regular maintenance to ensure maximum residence times are maintained is important, and is required by Condition **WMI** (see Section 6.5 below).

It is noted that there is likely to be stockpiling of potentially acid forming materials from the Northern Borrow Pit above ground (see Section 6.5 of this report). No detail however was provided in the EIS with regard to capture and potential treatment of runoff and seepage from temporary stockpiles, despite an AMD risk. Management of this, including development of an appropriate stockpile area to minimize AMD risk is addressed in Section 6.5.

To ensure appropriate erosion and control measures are in place for development and operation of the borrow pits, including appropriately sized sediment basins, standard stormwater conditions **E3** (Stormwater) and **E4** (perimeter drains) are imposed. The management of the Northern and Southern Borrow Pits, including surface run-off, is also further addressed in Section 6.5, with a requirement for the development of an approved Borrow Pit Management Plan.

Condition E3 of EPN 7153/3 requires water quality monitoring of Lake Pieman. This is ongoing and no change to this condition is required.

6.3.5 Conditions

The proponent will be required to comply with the following conditions:

- E1** Nominated Discharge Location
- E2** Discharge Limits and Investigation Trigger Levels for Bobadil Tailings Pond discharge (BO) to the Pieman River

¹² BD4 no longer exists due to expansion of the TSF.

- E3** Stormwater
- E4** Perimeter drains or bunds
- M2** Samples and measurements for monitoring purposes
- WMI** Mine Tailings and Bobadil Tailings Storage Facility

6.4 Key Issue 4: Groundwater

6.4.1 Description

Existing environment

A groundwater assessment was commissioned for the proposed embankment raises and is included as Appendix D of the EIS. The assessment is based on past hydrogeological studies, revised to include more recent data collected from new bores drilled in 2020.

The EIS describes the groundwater flow system under Rosebery as a deep fractured aquifer, which contains the mine voids. This is covered by weathered material and surficial glacial deposits up to 40m thick with varying permeability, upon which the TSF was constructed (Appendix D, Section 2.6). The depth to groundwater at Bobadil is between 2 m and 25 m (see EIS Figure 22). Seasonal fluctuation is generally between 1 m and 3 m.

Groundwater is known to discharge to Lake Pieman from the Bobadil TSF directly via the glacial till aquifer and flows generally in an east to west direction. There is an existing groundwater mound, and the long term phreatic surface may lie within the tailings volume rather than below the base of the TSF. See EIS Section 2.3.3 for more information regarding groundwater hydrogeology.

According to the EIS, the closest registered groundwater user (bore) is 31 km from the facility.

Groundwater quality is discussed in Section 5.3.1 of the EIS. Monitoring of the groundwater, including groundwater seeps downgradient from the TSF, is currently undertaken in accordance with EPN No. 7153/3. The location of the groundwater monitoring bores and seeps is shown in Figure 8 below.

According to the EIS, the water quality in the bore located up gradient from the TSF and screened in the bedrock aquifer has elevated levels of some metals (zinc, arsenic, manganese), which may be indicative of naturally elevated concentrations. The bores down gradient of the TSF have a low median sulphate concentration (12 mg/L), which is taken to indicate that there is limited seepage from the TSF into the bedrock aquifer (see Table 7 of the EIS for a summary of groundwater quality monitoring data).

According to the EIS, the glacial till aquifer up gradient from the TSF was not contacted and therefore water quality data was not available for this aquifer. The shallow bores downgradient of the TSF however have a median sulphate concentration of 555 mg/L and elevated metal concentrations, suggestive of TSF seepage.

Groundwater that expresses at the surface is observed as four seeps, shown as 'groundwater seepage monitoring location' in Figure 8. Water quality monitoring results from 2015 to 2023 are presented in Table 7 and Figure 24 of the EIS, summarised as follows:

- Cu (mean 0.021 mg/L¹³), Fe (mean 3.16 mg/L), Pb (mean 0.014 mg/L), Mn (mean 5.20 mg/L) and Zn (mean 0.063 mg/L) are generally elevated.
- Seeps BD3 and BD5 have pH in the range of 6 to 8, with seeps BD1 and BD2 ranging between 4 and 5.
- Total zinc values in BD1 and BD2 are elevated as compared to seeps BD3 and BD5, with a maximum zinc concentration of 3.7 mg/L.
- Sulphate concentrations in BD3 and BD5 ranged from 530 mg/L to 700 mg/L, which is in the range of discharge from Bobadil (500 – 900 mg/L). Concentrations in seep BD2 are lower, <60 mg/L, suggesting the seep receives some clean catchment inflow.

¹³ Assumed to be a mean across all four seeps (Table 7 of the EIS). Assumption applies to all metals listed.

According to the EIS, the impacts to groundwater quality and flows from the Stage 11 and Stage 12 embankment raises will not be significant, based on the following:

- There have been no sustained rises in groundwater level corresponding to historical TSF raises over the past 5-10 years (see Figure 2.8 through to Figure 2.15 of Appendix D of the EIS).
- While there may be a change in groundwater gradients within the TSF material from the Stage 11 and Stage 12 raises, this will likely not significantly change the gradient in the shallow and deep aquifers, and will not increase seepage rates from the TSF to the groundwater system. According to Appendix D of the EIS, seepage rates are limited by the permeability of the tailings and glacial till.
- No significant changes to groundwater flow direction or magnitude is anticipated, as water levels upgradient of the TSF are significantly higher (>315 mAHD vs 203 mAHD).
- No impacts to groundwater chemistry are anticipated.

6.4.2 Management measures

Management Measure 7 in the EIS proposes an updated Groundwater Monitoring Plan to reflect the existing bore network (noting that some bores have been decommissioned/stopped flowing).

6.4.3 Public and agency comment and responses

No public or agency comments were received.

6.4.4 Evaluation

It is evident that TSF seepage currently impacts the glacial till aquifer, with subsequent discharge to Lake Pieman.

The EPA water section advised that a review of the Groundwater Monitoring Plan is required in order to establish if additional bores are needed to better monitor groundwater contaminant concentrations and aquifer characteristics.

The EPA water section also recommends that an assessment of mass loads for the contaminants of concern discharging from the TSF via groundwater into Lake Pieman be undertaken. Additional bores may also be required to allow for such an assessment, including modelling of mass loads discharging into Lake Pieman. This data will be used to inform future regulation of the site.

Condition **M3** requires development and submission of a Groundwater Monitoring Plan and Report, consistent with the requirements outlined above. Note, the Groundwater Monitoring Plan referred to under Management Measure 7 does not appear to be a comprehensive plan, rather a sample collection and data management procedure document. Condition **M3** therefore requires a full Groundwater Monitoring Plan be developed for the site.

Condition **MI** requires monitoring of the current Bobadil bores. Note, monitoring requirements may be updated following submission the Groundwater Monitoring Plan and Report. Condition **MI** allows for any update required by the Director.

Condition E5 of EPN 7153/3 requires groundwater monitoring at established locations across the mine site. Ongoing monitoring will continue as per Condition E5 of EPN No. 7153/3.

The on-going capture and treatment of seepage water from the Bobadil TSF embankments is addressed in Section 6.3 of this report.


6.4.5 Conditions

The proponent will be required to comply with the following conditions:

M3 Groundwater Monitoring Plan and Report



MMG Group
 Bobadil TSF –
 Groundwater Monitoring
 Locations


	0 0.1 0.2 0.4 km Coordinate System: GDA 1994 MGA Zone 55 1:10,000 When Printed at A4															
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REVISION	RovB		Government													
DATE	12/06/2024		Project specific data													


Legend
 Groundwater monitoring bore
 Groundwater seepage monitoring location

Figure 8 – Groundwater monitoring bores and groundwater seepage locations, from Figure 23 EIS

6.5 Key Issue 5: Construction material and acid and metalliferous drainage potential of waste rock and tailings

6.5.1 Description

This section addresses the geological and geochemical characterisation of construction materials from the Northern Borrow Pit, and disposal of material not geochemically suitable for construction. The potential impacts associated with the embankment raises and potential for acid and metalliferous drainage (AMD) from tailings deposition and operation of the facility are also addressed.

Approximately 200,000 m³ of rockfill is required for construction of the embankment raises; around 90,000 m³ for Stage 11 and 110,000 m³ for Stage 12, which is proposed to be sourced from an extension to the Northern Borrow Pit.

Approximately 1,000 m³ of clay material, for each raise, sourced from the existing Southern Borrow Pit. Further, approximately 21,000 m³ for Stage 11 and 20,000 m³ for Stage 12 of compacted tailings, sourced from within the Bobadil TSF footprint (see Figure 5, Appendix A) is also required.

Table 2 of the EIS provides a complete list of construction materials with associated volumes.

A geochemical study of the proposed construction materials, as sourced from the Northern Borrow Pit, is discussed in Section 5.6.2 of the EIS, with a full report including geochemical test results and borrow pit geology provided in Appendix H of the EIS.

A geochemical model of the Northern Borrow Pit was developed for the Stage 10 raise (Figure 36 of the EIS), which identified the presence of potentially acid forming (PAF) material.

An additional 6 diamond drill boreholes were established and sampled from the area proposed for extraction for the current proposal (Figure 4 of Appendix H). Sixty samples were collected for analysis from these boreholes.

Geochemical test work was completed by ALS Laboratory in Brisbane and consisted of analysis for NAPP (total S for MPA, ANC by titration), NAG pH, NAG acidity (4.5, 7.0) and paste pH. Twenty five out of 60 samples were also assessed by kinetic NAG test to understand the time lag to acid onset and leachate characteristics.

The majority of samples (68%, 41 out of 60) were classified as non-acid forming (NAF) rock, with the remaining classified as PAMDF (Potential Acid or Metalliferous Drainage Forming) material (32%, 19 samples).

PAMDF materials were classified if:

- NAG pH ≤ 4.5 ; or
- NAG (pH 7.0) ≥ 5 kg H₂SO₄/tonne.

Twelve of the 19 samples identified to be PAMDF were classified as PAF under the traditional Australian Minerals Industry Research Association (AMIRA) classification (Table 2 of Appendix H).

According to the EIS, the rock within the Northern Borrow Pit extension generally has a low potential to form acid metalliferous drainage and is suitable for construction.

It is noted from Appendix H that weathering is shallow (1 – 3 m), with partial weathering extending to 10 to 15 metres. Within this zone some leaching of carbonate minerals has occurred, which appears to have reduced the ANC. Callaghan (2024) (as referenced in Appendix H) subsequently noted that PAMDF (PAF low capacity) materials were more commonly associated with this partially weathered zone.

According to Appendix H, there is a reduced potential for PAMDF¹⁴ material below the depth of partial oxidation (see also Table 2 of Appendix H).

¹⁴ Note, 3 of the 18 samples identified as PAMDF were found at depths below the partially weathered zone (Table 2 of Appendix H).

According to the Northern Borrow Pit block model, the weathered / partially weathered zone represents up to 10,000 m³. The capacity of the Northern Borrow Pit is approximately 400,000 m³ of material, providing a substantial amount of potentially NAF material for construction purposes (200,000 m³ required).

Acid generation occurred in 13 of the 25 samples analysed as part of kinetic NAG testing¹⁵. Of these 13 samples, lag times for acid onset ranged from 5 to 149 weeks (Appendix H).

The EIS proposes the following geochemical criteria for TSF embankment raise construction materials:

- Materials classified as NAF by the PAMDF classification system¹⁶ will be used;
- Materials classified as PAMDF with a NAG pH >4.5 and NAG (pH 7.0) <10 kg H₂SO₄/tonne are proposed to be used for construction if blended with NAF material, such that the blended material NAG (pH 7.0) value is <5 kg H₂SO₄/tonne.
- Materials with a NAG pH ≤4.5 will not be used for construction.

Note, the majority of kinetic test samples (15) had a NAG pH <4.5 and hence would not be suitable for construction (Appendix H).

According to the EIS, PAMDF material not suitable for construction will be stockpiled separately from all other materials in a manner which contains all stormwater runoff before final disposal, either by:

- deposition on the floor of the TSF as lining material below the geomembrane liner;
- deposition under water within the TSF as soon as practicable after completion of Bobadil TSF Stage 11 and Stage 12 construction works (but not placed over the geomembrane liner); or
- At the 3 Level Waste Rock Dump operated in accordance with EPN. 8815/2.

NAG liquor assays indicated elevated concentrations of metals from samples where NAG pH < 4.5 (as example, Cu up to 0.17 mg/L, Zn up to 1.7 mg/l, Ni up to 0.2 mg/L, Mn up to 3.7 mg/L) (Appendix A of Appendix F of Appendix H).

Samples that were either identified as NAF or PAMDF but suitable for blending (i.e. NAG pH >4.5 and NAG (pH 7.0) <10 kg H₂SO₄/tonne), exhibited low concentrations of metals (as example, Cu up to 0.001 mg/L, Zn below LOR¹⁷, Ni below LOR, Mn up to 0.021 mg/L) (Appendix A of Appendix F of Appendix H).

Tailings Geochemistry

An assessment of the tailings geochemistry and acid and metalliferous drainage potential for Bobadil TSF was undertaken, with the results presented in Appendix G and summarised in Section 5.6 of the EIS.

The assessment considered historic tailings, with results presented from previous work undertaken on samples collected back to 2014.

The tailings currently stored within Bobadil TSF are not homogenous in their chemistry, particularly in depth profile, reflecting differing geologies mined at the time.

In summary, there has been an overall increase in ANC values with an associated change in classification of tailings from, historically, PAF to, currently, a mixture of UC (Uncertain), PAF-low capacity (PAF-LC) and non-acid forming (NAF), reflecting a general increase in ANC (29–54 kg H₂SO₄ t⁻¹ in 2014 to 95-154 kg H₂SO₄ t⁻¹ in 2021-2023) (Table 14 of the EIS).

The sulphide content of the tailings has remained relatively similar, ranging from 5.5 to 9.7 percent, with only the most recent tailings samples (2021 to 2023) showing significantly lower levels, 2.3 to 3.3 percent.

Kinetic leach column tests of tailings collected from Bobadil TSF in 2014 showed neutral paste pH (7.0–9.2) conditions were maintained for over 6 years, despite a classification of PAF high risk. According to

¹⁵ 18 of the 25 samples were classified as PAMDF according to Acid Base Accounting results.

¹⁶ PAMDF materials were classified if either the following criteria were found:

- NAG pH ≤4.5; or
- NAG (pH 7.0) ≥5 kg H₂SO₄/tonne.

¹⁷ Note, the results table did not provide any figures for the respective samples, which was assumed to represent below the LOR.

Appendix G, the lack of formation of acid leachate may, in combination with the presence of significant neutralising materials, be due to surface passivation. At circum-neutral pH conditions, the tailings nevertheless formed neutral metalliferous drainage, with Pb, Mn, and Zn identified as the key elements of concern.

The EIS notes that while the contemporary tailings are on average NAF or PAF-low capacity, and unlikely to give rise to acid drainage, neutral metalliferous drainage (Mn, Zn and Pb) may still be expected when tailings are undersaturated or subject to water inflow (i.e., an ongoing source of oxygen).

According to Appendix G, future tailings may revert back to PAF.

6.5.2 Management measures

Construction rock management

A Standard Operations Procedure (SOP) is proposed to manage rock excavated from the Northern Borrow Pit (Management Measure 10). The components of the SOP, discussed in Section 5.6.2 of the EIS, are summarised as follows:

A sample and analysis plan will be developed to ensure representative sampling is undertaken evenly across the blast drill plan. Blasted materials will be sampled at a nominal frequency of one sample per 2,000 tonnes.

Geochemical testing for NAG pH and NAG acidity (pH 4.5 and 7.0) will be undertaken for classification purposes.

Blast materials will not be moved away from their excavation area until they have been classified as either NAF or PAMDF (not suitable for construction).

PAMDF materials that have a neutral and metalliferous drainage (NMD) risk can be used for construction if the sample has a NAG pH >4.5 and a NAG acidity (pH 7.0) <10kg H₂SO₄/t equivalent, and only if blended with NAF materials such that total the calculated NAG acidity (pH 7.0) is <5kg H₂SO₄/t.

PAMDF materials not suitable for blending will be managed and disposed of by one of the following pathways:

- On the floor of the TSF below the geomembrane liner;
- Under water within the TSF after completion of the Stage 11 and 12 construction works (not placed over the geomembrane liner; and
- At the 3 Level waste rock dump at the mine site operated in accordance with EPN No. 8815/2.

Performance monitoring will be undertaken including:

- One representative sample per blast taken from the recent embankment materials as a composite sample from 5-10 locations to confirm materials are NAF; and
- Visual assessment of the embankment materials associated with the Bobadil TSF Stage 11 and Stage 12 embankment raises to confirm whether any AMD effects are present (e.g., salt formation, Fe-staining).

A Works as Executed (WwE) report will be compiled at the completion of the Bobadil TSF Stage 11 and Stage 12 raises. This is a requirement of Dam Safety.

TSF Management

An end of pipe tailings geochemistry monitoring program is ongoing (see Section 3.4 of Appendix G for details).

A network of settlement and movement monitors will be used to monitor the embankment on a daily basis.

6.5.3 Public and agency comment and responses

No public comments were received.

The Section Head, Water License and Dam Administration (Water Management and Assessment Branch) notes that the proposal meets the requirements of the ANCOLD Guidelines, and can be approved from a safety perspective, subject to any conditions that the Minister responsible for the *Water Management Act 1999* may impose to ensure the safety of the proposed works.

6.5.4 Evaluation

While the bulk of the material within the Northern Borrow Pit is classified as NAF, PAMDF material is known to occur within the weathered/partially weathered top layers and is likely to be excavated during the construction phase. PAMDF material may also be found at depth, however the lower lithologies within the pit were generally associated with higher ANC.

The geochemical assessment presented in the EIS used a classification system for PAMDF materials that differs from the more traditional AMRIA classification, in which material is classified as PAF, NAF and Uncertain (UC) based on NAG pH and NAPP values. NAPP values represent a theoretical maximum, calculated as the difference between Maximum Potential Acid (MPA) and Acid Neutralising Capacity (ANC). UC classifications result where there is inconsistency between NAG pH and NAPP¹⁸, i.e. the titrated acid generation value vs theoretical acid generation value.

The proposed PAMDF classification captures material that will generate acid (i.e. NAG pH ≤ 4.5) but also provides an indication of material that is likely to generate neutral metalliferous drainage (i.e. NAG (pH 7.0) ≥ 5 kg H₂SO₄/tonne).

Attachment A of Appendix C of Appendix H of the EIS provides a comparison of the proposed PAMDF classification system against the AMIRA classification system, as applied to 130 samples from the Bobadil Stage 10 raise.

All samples identified as PAF under the AMIRA system were identified as PAMDF, with a NAG pH ≤ 4.5 , and appropriately identified as likely to generate acid. As noted in the EIS, all samples with a NAG pH ≤ 4.5 will not be used in construction. This is considered important, ensuring that no acid generating material will be used, and is required by Condition **CNI**.

A number of samples (18) were identified as NAF under the proposed PAMDF system, but UC under the AMIRA system. All of these samples however were characterized by a NAG pH > 4.5 (non acid generating under titrating conditions), and only a very slight positive NAPP (0 to 1.68 kg H₂SO₄/tonne)¹⁹. Noting that the NAPP is a theoretical calculation, a further analysis of the results shows that the NAG (pH 7.0) was less than 5 kg H₂SO₄/tonne for all of these samples. Such samples could be considered suitable for construction purposes, with only very slight potential for neutral metalliferous drainage.

In contrast, 10 samples identified by the AMIRA system as NAF, were actually identified as PAMDF under the proposed system. All of these samples had a NAG (pH 7.0) ≥ 5 kg H₂SO₄/tonne, indicating a greater likelihood for neutral metalliferous drainage.

Based on the comparison of classification systems, the proposed system is considered suitable for the purpose of determining appropriate construction materials (see Definition PAMFD, Permit Part B).

The proposed Standard Operating Procedure with respect to management of materials from the Northern Borrow Pit for construction purposes, Section 4.3 of Appendix H, is generally considered appropriate.

¹⁸ For PAF materials, NAG pH is less than 4.5 (titrated acid value) and the NAPP is correspondingly positive (theoretical maximum acid is greater than theoretical maximum neutralizing capacity). NAF is the opposite and UC is where there is an inconsistency between titrated acid generation value and theoretical acid generation value.

¹⁹ Of typical concern are UC samples with a NAG pH < 4.5 (ie demonstrated acid generation under titrating conditions).

The proposal to blend PAMDF materials characterised by a NAG pH >4.5 and NAG (pH 7.0) < 10 kg H₂SO₄/tonne with non PAMDF materials to achieve a net NAG (pH 7.0) < 5 kg H₂SO₄/tonne, as illustrated in the calculations in Table 4 of Appendix H, is considered appropriate.

This would provide a greater degree of flexibility for construction purposes, noting the partially oxidized upper layers of the pit are more likely to contain NMD (neutral metalliferous drainage) materials where NAG (pH 7.0) is greater than 5 kg H₂SO₄/tonne.

According to Appendix H, the proposed PAMDF limit of NAG (pH 7.0) < 5 kg H₂SO₄/tonne was based on data available in 2015, to limit material that may contribute NMD. Results of ongoing preliminary kinetic work (Appendix F of Appendix H) provides some further information on leaching potential.

The risk posed by Mn and Zn leaching from non-PAMDF classified materials is very low, further supporting the application of the PAMDF classification scheme for the rock types examined.

Four of the preliminary samples (BD0055, BD056, BD065 and BD066, Table 1 of Appendix F of Appendix H) fall into the category of potential rock for blending (i.e. classified as PAMDF NAG pH >4.5 and NAG (pH 7.0) between 5 and 10 kg H₂SO₄/tonne). NAG liquor assay results show that concentrations of NMD metals of concern (e.g. Zn, Mn and Ni) from these samples are very low (max Mn 0.01 mg/l with all results for Zn and Ni below the LOR²⁰), suggesting such samples are likely to be low risk and would be suitable for blending.

It should also be noted that the proposal to blend to achieve a blast blend of NAG (pH 7.0) < 5 kg H₂SO₄/tonne, from a theoretical point of view, is in practice no different to utilising only material with a NAG (pH 7.0) < 5 kg H₂SO₄/tonne in the first place, as illustrated by Table 4. It is just a matter of scale.

If any concern exists, it lies in improper blending and the occurrence of large volumes of higher NMD material clumped together. As noted above however, based on the few samples analysed to date the risk of NMD could be considered to be low.

It is therefore agreed that the proposed blending, as described in Section 4.3 of Appendix H, can be undertaken, at least initially (Condition **CN2**).

It is noted in Appendix F of Appendix H of the EIS that further work is currently being undertaken to specifically test the metalliferous and acid leach behaviour of potential construction material classified as PAMDF. According to Appendix F of Appendix H, at the time of writing (report dated May 2024), the testing will be carried out for 6 months, and therefore should be completed around November 2024. This test work will provide greater certainty in leachate characteristics than NAG liquor assays.

Condition **CN2** allows the Director to alter the proposed blending requirements should the results of the further testing indicate a change is required due to an increased NMD risk.

The proposal to stockpile PAMDF not suitable for construction purposes, for example acid generating material (NAG pH < 4.5), to be disposed of after completion of Stages 11 and 12 is in principle acceptable. Note however, each stage will take approximately 9 months to complete, with 18 months in between each stage. Test work has shown that the lag time to acid generation is predicted to be as short as 5 weeks (Table 5 of Appendix H). While such tests are undertaken in ideal oxidative conditions, there is a risk to the surface water and groundwater environment should stockpiling and storage not be undertaken appropriately.

Condition **CN3** requires a Bobadil Borrow Pit Management Plan be developed before excavation of the Northern Borrow Pit commences. The Plan may be a revised version of Appendix H of the EIS, “*Northern Borrow Pit Management Plan: AMD*”, containing the Standard Operating Procedures (SOP). The update is to include methods of storage to ensure that groundwater and surface water systems are not compromised, including development of a suitably impermeable clay base under the stockpile area. It is also to include details on the collection and treatment of all surface runoff and leachate/stockpile seeps.

²⁰ There is no number in the respective cell of the Table. The assumption is that the values were below the LOR, as suggested by a mention of phosphorous being below the LOR in all cases, and hence removed from the table.

The Bobadil Borrow Pit Management Plan is to also include detail on management of stormwater from the Southern Borrow Pit during works.

While the EIS suggests that management of the tailings to minimise potential for AMD will continue, no specific tailings or TSF management measures were provided. It is noted however that several spigot systems are employed to improve pond control and coverage, and that a sprinkler system has been established to further increase the wetted area of the TSF, as necessary. Both of these measures are important in maintaining saturated tailings, thereby limiting the potential for AMD generation. Furthermore, the kinetic work undertaken on tailings from Bobadil TSF in 2014, classified as high risk PAF, found lag times to acid generation greater than 6 years.

Given the above, it is agreed that the continual operation of the TSF and tailings is sufficient to limit the risk of AMD generation, particularly recognising the more recent geochemical status of the tailings as NAF to low risk PAF.

Condition **WMI** requires all tailings be placed in an approved TSF.

Condition **WMI** also requires regular maintenance of the polishing pond to ensure appropriate residence times are maintained.

6.5.5 Conditions

The proponent will be required to comply with the following conditions:

- CN1** PAMDF materials not permitted for construction
- CN2** Construction materials
- CN3** Bobadil Borrow Pit Management Plan
- WMI** Mine Tailings and Bobadil Tailings Storage Facility

7. Evaluation of Other Environmental Issues

In addition to the key issues, the following environmental issues are considered relevant to the proposal and have been evaluated in this Section:

1. Waste management
2. Dangerous goods and environmentally hazardous materials
3. Greenhouse gas emissions, ozone depleting substances and climate change
4. Decommissioning and rehabilitation
5. Noise and Blast Control

7.1 General conditions

The following general conditions will be imposed on the activity:

- G1** Activity Area
- G2** Access to and awareness of conditions and associated documents
- G3** Incident response
- G4** Proposed change to activity
- G5** Change of responsibility
- G6** Change of ownership
- G7** Notification prior to commencement
- G8** Annual Monitoring Review and Management Report
- G9** Amendment of required plans and reports

7.2 Issue 1: Waste management

7.2.1 Potential impacts

Waste management is discussed in EIS Section 5.7, which states the construction of Stage 11 and Stage 12 embankment raises will generate negligible general waste (wastewater, tailings and waste rock are addressed in Sections 6.3 and 6.5 of this report).

An existing approved landfill area is located at Bobadil TSF (Figure 2 of this report) and currently regulated under condition WM3 of EPN No. 7153/3. The waste disposed at the landfill consists of lead contaminated material (e.g. filter cloths, poly pipes, contaminated wood and nonrecyclable steel). It is noted in the Annual Monitoring Review Report 2023-2024 that this landfill is reaching capacity and alternative waste management options are being investigated.

The Bobadil TSF was also used to dispose of geofabric bags filled with fine solids from filtered treated mine water effluent, generated during the period when Bobadil TSF Stage 9 was full.

7.2.2 Management measures proposed in EIS

The EIS states that any solid or liquid waste generated at the site will be managed in accordance with existing legislation and conditions (EPN No. 7153/3) and the MMG Rosebery Non-mineral Non-hazardous Waste Management Procedures.

7.2.3 Public and agency comment

No public or agency comment received.

7.2.4 Evaluation

On-going operation of the facility is in accordance with the existing MMG Rosebery Site Non-mineral Non-hazardous Waste Management Procedure. Advice from the Regulator is that the current waste management system is adequate and the existing management measures are satisfactory.

Condition **WM2** provides for the site landfill (contaminated waste) and identifies the items approved for burial at the landfill. This condition requires that an inventory be kept of all wastes disposed of on the Activity Area, including the quantity and nature of the waste, and for the details to be included in the Annual Monitoring Review and Management Report. Condition **WM2** also requires a closure plan be developed for the landfill site, noting it is reaching its full capacity.

Other information relevant to waste management is included as under **O11**, which requires wastes to be managed in accordance with the best practice hierarchy of waste management.

7.2.5 Conditions

The proponent will be required to comply with the following conditions:

WM2 Contaminated Landfill Waste Management

Other information:

O11 Waste management hierarchy

7.3 Issue 2: Dangerous goods and environmentally hazardous materials

7.3.1 Potential impacts

Section 5.8 of the EIS states that there are currently no permanently stored dangerous goods (e.g. chemicals, fuels and/or oils) at Bobadil TSF. Fuels and oils are brought onto the site only as needed to refuel vehicles, and for maintenance of fixed equipment. The proponent has advised that mobile refuelling of plant equipment will occur within the Activity Area as part of the Stage 11 and 12 embankment raises.

A mobile workshop is also proposed for routine servicing and maintenance of vehicles. The EIS states that a small volume of hydrocarbons will be contained at the workshop. It is anticipated the workshop will generate waste oil, lubricants, tyres and, potentially, contaminated soils from spills. The location of the maintenance workshop has not been confirmed in the EIS however it is proposed that the site chosen will be inspected for signs of contamination prior to placement of the facility.

Explosives are required for blasting at the Northern Borrow Pit.

7.3.2 Management measures proposed in EIS

The EIS states that the storage and handling of hazardous materials will be in accordance with MMG Rosebery's Hazardous Material Management Procedure (not supplied) and EPN 7153/3 conditions H1-H4.

The workshop storage facility will be contained within a bund and spill kits will be available onsite.

Following removal of the maintenance workshop, the area will be visually inspected for signs of contamination. Any contaminated material will be removed, e.g. by scraping and will be disposed of in a suitable location.

7.3.3 Public and agency comment

No public or agency comments received.

7.3.4 Evaluation

The provision of appropriate bunding and storage is supported and will be required by Condition **H1**. Condition **H2** provides for the storage of hazardous materials held in volumes of less than 250L. Spill kits are provided for under Condition **H3**. Condition **H4** requires implementation of measures to prevent environmental impacts during mobile refuelling. Condition **G3** is included and requires the person responsible to take action in the event of an environmental incident.

Note, the above conditions are standard conditions. While they are reflected in EPN 7135/3, they have been included in this permit due to recent updates to condition wording.

7.3.5 Conditions

The proponent will be required to comply with the following conditions:

- H1** Storage and handling of hazardous materials
- H2** Hazardous materials (< 250 litres)
- H3** Spill kits
- H4** Handling of hazardous materials – mobile
- G3** Incident response

7.4 Issue 3: Greenhouse gas emissions, ozone depleting substances and climate change

7.4.1 Potential impacts

Section 5.9 of the EIS discusses greenhouse gas emissions in relation to the Stage 11 and Stage 12 embankment raises.

Construction of the raises will result in an increase in generation of greenhouse gases (GHGs), primarily as a result of the fuel required to power the plant machinery. Following construction, the ongoing operation of the facility will also generate additional GHGs due to the increased height of the facility and the pumping effort required to transfer slurry from the low level receival pond to the new pumping height.

See Section 5.9 for the further information and the calculation details for the GHG assessment.

7.4.2 Management measures proposed in EIS

The use of locally won materials, including sourcing rock, gravel and clay from the Northern and Southern Borrow Pits and using tailings to line the dam will assist in minimising generation of emissions associated with haulage during the construction phase.

7.4.3 Public and agency comment

No public or agency comments were received.

7.4.4 Evaluation

MMG Rosebery comply with the reporting requirements of the Commonwealth *National Greenhouse and Energy Reporting System Act 2007*, the *National Greenhouse and Energy Reporting Regulations (NGER) 2008* and the associated (NGER) Scheme annual reporting. MMG Rosebery have a GHG emission strategy and performance targets in place.

No specific conditions are required.

7.5 Issue 4: Decommissioning and rehabilitation

7.5.1 Description

TSF Closure

The goal of TSF closure, as identified in the EIS, is to form a stable landform that meets the end land use objectives and minimises AMD potential.

According to the EIS, the final cover system is yet to be decided and will be informed by the outcome of the cover trials being undertaken as part of the Stage 10 raise.

The EIS states that the MMG Rosebery Mine Closure Plan (2018), which includes the findings of the Bobadil TSF Closure Plan (2016), applies to the site.

Northern Borrow Pit

The closure design of the Northern Borrow Pit has not been determined, with the EIS stating the final design is contingent on the final operational use of the pit void. Various closure options and assumptions are presented in the Mine Closure Plan and listed in Section 7 of the EIS. The final design will be informed by the operational use of the pit void, e.g. pit lake or backfill and cap.

Southern Borrow Pit

The EIS notes that the planned rehabilitation of the Southern Borrow Pit is detailed in the Borrow Pit Management Plan required as a condition of EPN 10504/1 for the Bobadil Stage 10 Embankment Raise.

7.5.2 Management measures proposed in EIS

The EIS states that approximately 7, 500m³ of topsoil and 12, 500m³ of surficial soil will be stockpiled within the existing footprint for closure and rehabilitation activities associated with the entire facility (refer to EIS Figure 10).

No new management measures are proposed for decommissioning and rehabilitation of the existing borrow pits.

7.5.3 Public and agency comment

No public or agency comments were received.

7.5.4 Evaluation

There are existing conditions in EPN 7153/3 to enable regulation of the decommissioning and rehabilitation of the TSF as well as the Northern and Southern Borrow Pits. Condition DC3 of EPN 7153/3 requires a Mine Closure Plan which must, as a minimum, include provision for final closure/remediation of all tailings and sediment collection dams; and measures to ensure maintenance of the tailings dam. Condition DC5 of EPN 7153/3 includes the requirement for the mine to be rehabilitated both concurrently during the operational phase and upon permanent cessation of the activity. Condition DC6 of EPN 7153/3 prescribes the submission of a Decommissioning and Rehabilitation Plan in accordance with any guidelines provided by the Director.

These conditions apply to the entire mine site and it is not considered necessary to duplicate the conditions in this permit.

The following conditions however, are applied as they relate specifically to proposed works, and or represent updated conditions.

The stockpiling of overburden generated from the expansion of the Northern Borrow Pit is supported and required under Condition **DC1**. Notification of cessation of the activity is a standard condition required under Condition **DC2**. If the activity is suspended temporarily, Condition **DC3** provides for preparation and implementation of a Care and Maintenance Plan and is the contemporary version of Condition DC4 of EPN 7153/3.

Condition **DC4** requires preparation of an Early Closure Plan, in the event that unanticipated early closure of the Bobadil TSF occurs.

Note, it is understood that due to geotechnical issues, Bobadil TSF cannot be used as a water holding facility on closure. To ensure the geochemical integrity of the TSF is maintained in perpetuity, an alternative tailings cover has been trialed on the Stage 10A and 10B upstream embankment raise, and is described as a GCL-based barrier system (Section 7, option 2 in EIS). At this stage, this cover system is considered appropriate, and is required to be employed for closure (Condition **DC 5**).

Note, it is understood that the final TSF closure design is subject to ongoing monitoring of the performance of the trial cover constructed during the Stage 10 embankment raise. Condition **DC 5** therefore allows for a case to be presented to the Director for a change in closure system, should further work indicate an alternative system is better able to maintain ongoing geochemical integrity.

7.5.1 Conditions

The proponent will be required to comply with the following conditions:

- DC1** Stockpiling of surface soil
- DC2** Notification of cessation
- DC3** Temporary suspension of activity
- DC4** Early Closure Plan
- DC5** Bobadil Tailings Storage Facility Cover System

7.6 Issue 5: Noise and blast control

7.6.1 Description

A noise modelling assessment was undertaken for environmental noise, ground vibration and air blast overpressure in relation to the construction of the Stages 11 and 12 embankment raises. The results are discussed in Section 5.5 of the EIS and a full copy of the report is included as Appendix F of the EIS.

Noise emissions

Noise emissions are expected from drilling, blasting, excavation, crushing and screening of materials from the quarry expansion. Truck loading, haulage, placement and compaction of materials and the operation of plant will also generate noise emissions.

No potential impacts to the nearest sensitive receptors, located 1.6km to the south of the proposed development are expected from environmental noise generated during the construction and operational phases. The modelling shows predicted noise levels to be below 30 dBA, which is well below the existing noise levels in the Rosebery community (see EIS Figure 34). The noise management criterion of 65 dBA over a 15-minute timeframe was applied for operational times between 0700 and 1800 hrs on weekdays and 0800 to 1600 hrs on Saturdays. The criterion was reduced to 60 dBA for operational periods outside these times. The technical report notes these values were adopted from the noise monitoring plan used during construction works for the 2/5 Dam and are derived from established guidelines. For further details see Appendix F of the EIS.

The EIS states that works would occur during daylight hours, 7 days a week and that works may also occur outside of the operational times outlined above.

Ground vibration and air blast overpressure

The EIS states that between 8-10 blasts will be required for each raise, initially fortnightly then monthly. These will be entirely within the Northern Borrow Pit. The noise technical report notes that the predicted ground vibration and air blast overpressure levels are well below criteria levels at the nearest residents for a charge mass/delay of 80 kg, with predicted levels for ground vibration below 2 mm/s and predicted air blast over pressure expected to be well below 110 dB (Lin Peak).

Continuous noise and vibration monitoring is undertaken by MMG at the site, with the location of monitoring stations shown in Figure 34 of the EIS. The noise monitoring data from years 2020 to 2023 is presented in Table 11 of the EIS and indicates that noise levels were below 60 dBA at all locations monitored (presented as an average annual noise level, 15-minute Ln statistics).

7.6.2 Management measures

Noise management

No additional noise mitigation measures associated with the construction phase are proposed in the EIS, with existing mitigation measures to be continued, including:

- Maintaining a noise complaints line for complaints from community members, including investigation, mitigation and reporting as necessary.
- Ongoing continuous noise monitoring in accordance with Condition N1 of EPN No. 7153/3.

Ground vibration and air blast overpressure

A blast management plan for the Northern Borrow Pit is proposed as a management measure in the EIS. It is proposed that an initial charge mass/delay of 80kg limit for any blast be applied. The EIS states that EPA approval would be requested for an increase in charge mass, with any application based on the blast monitoring results of 2 blasts to demonstrate compliance. The noise technical report states that a mass charge of up to 150 kg/delay is potentially viable however TSF embankment stability is not addressed and would need to be considered.

7.6.3 Public and agency comment and responses

No public or agency comments were received.

7.6.4 Evaluation

Noise emissions, ground vibrations and air blast over pressure are unlikely to cause a nuisance, given the separation distance from the nearest sensitive receptors, for both during the construction of the raises and the operation of the TSF

The Southern Industrial Regulation section supports the inclusion of Condition **B1**, the standard condition limiting blasting from Monday to Friday (excluding public holidays). The preparation of a Blast Management Plan for the Northern Borrow Pit in accordance with the recommendations of the technical report (Appendix F) is supported and required under Condition **B2**. Condition **B3** is a standard condition which

sets the noise and vibration limits, in accordance with the acceptable standards in the Quarry Code of Practice (QCP), 3rd edition 2017.

The on-going operation of the noise complaints line can be regulated under Condition NI of EPN 7153/3, which requires continuous noise monitoring at established locations outside of the Activity Area.

7.6.5 Conditions

- B1** Blasting times
- B2** Blast Management Plan
- B3** Blasting - noise and vibration limits

8. Issues not assessed by the Board

The following issue has been raised during the assessment process but is not the responsibility of the Board under the EMPCA.

I. Aboriginal and Historic Heritage

8.1 Issue Aboriginal and Historic Heritage:

8.1.1 Potential impacts

An Aboriginal Heritage Assessment was prepared in May 2023 - refer to Section 5.13 and Appendix I (confidential) of the EIS. The study area for the assessment covered the disturbance footprint associated with the expansion of the Northern Borrow Pit. Based on the results of the desk top assessment and field survey, the EIS concludes that it is very unlikely the proposed development will have any adverse impacts on Aboriginal cultural heritage values given there are no registered sites within 5 km of Bobadil TSF and none were identified during the field survey.

8.1.2 Management measures proposed in EER/EIS

AHT states that works should be guided by an Unanticipated Discovery Plan.

8.1.3 Public and agency comment

No public comments were received. Advice from Aboriginal Heritage Tasmania (AHT) notes the survey of the site undertaken as part of the Aboriginal Heritage Assessment and that while the report was still under review by AHT, AHT state they believe there is a low likelihood of Aboriginal heritage being impacted, and that works should be guided by an Unanticipated Discovery Plan.

8.1.4 Conclusion

Aboriginal heritage is protected under the *Aboriginal Relics Act 1975*, which specifies the requirements in the event of Aboriginal heritage being uncovered at the site.

The following Legal Obligation is included in the permit:

LO2 Aboriginal relics requirements.

9. Report Conclusions

This assessment has been based on the information provided by the proponent, MMG Australia Limited, in the permit application DA 2024/00032 and the case for assessment (the EIS).

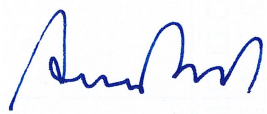
This report incorporates specialist advice provided by EPA scientific and regulatory staff, the Department of Natural Resources and Environment Tasmania, and other government agencies.

It is concluded that:

1. the RMPS and EMPCS objectives have been duly and properly pursued in the assessment of the proposal; and
2. the assessment of the proposal has been undertaken in accordance with the Environmental Impact Assessment Principles; and
3. the proposal is capable of being managed in an environmentally acceptable manner such that it is unlikely that the RMPS and EMPCS objectives would be compromised, provided that the Permit Conditions - Environmental No. 11514 appended to this report are imposed and duly complied.

10. Report Approval

Environmental Assessment Report and conclusions, including environmental conditions, adopted:



Andrew Paul

CHAIRPERSON, BOARD OF THE ENVIRONMENT PROTECTION AUTHORITY

Meeting date: 5 November, 2024

II. References

North Barker Ecosystem Services (2022) MMG Rosebery Bobadil-Tailings Storage Facility Lift II and Closure Flora and Fauna Habitat Assessment (dated 17 October 2022), Hobart, Tasmania

MMG Rosebery Annual Monitoring Review and Management Report 2023-2024 (dated 30 September 2024)

12. Appendices

Appendix 1 Table of proponent management measures

Appendix 2 Permit conditions

Appendix I: Table of proponent management measures

Table I: Proponent management measures (Table 20 of EIS)

Number	Action	Timing
1	Pre-clearance devil den surveys will be undertaken to confirm that no active den sites are disturbed within 50 m of the works area	Pre-clearance
2	Vehicles accessing the project site will keep to formed tracks/roads and traffic would be generally restricted to daylight hours	Construction and operation
3	Speed limits of 25 km/h will be applied to all internal roads during the proposed development	Construction and operation
4	Pre-clearance measures of potential habitat trees for masked owl, swift parrot and blue-winged parrot will be undertaken, prior to clearance. Additional measures will be implemented if the trees cannot be removed outside of the combined core breeding periods for the Tasmanian masked owl, swift parrot and blue-winged parrot (1 March to 31 August)	Pre-clearance
5	A weed and hygiene management plan, with particular focus on PC management, will be prepared and implemented to avoid new introductions of weeds and to prevent further spread of weeds and disease	Construction and operation
6	An updated surface water monitoring plan will be prepared in consultation with the EPA	Prior to construction
7	An updated groundwater monitoring plan will be prepared in consultation with the EPA	Prior to construction
8	Update the existing Dust Mitigation Plan (DMP) and continue to adaptively implement it for construction of Stage 11 and Stage 12, and operation of the facility, including ongoing monitoring	Prior to construction
9	A blast management plan will be developed for the Northern Borrow Pit, prior to any site works	Prior to construction
10	A standard operating procedure (SOP) will be developed for the management of PAF and NAF materials in the Northern Borrow Pit	Prior to construction
11	The site for the mobile maintenance workshop will be visually inspected for signs of contamination after removal. If present, any contaminated material will be removed.	Construction and operation

Appendix 2: Permit conditions – Environmental

PERMIT PART B
PERMIT CONDITIONS - ENVIRONMENTAL No. 11514

Issued under the *Environmental Management and Pollution Control Act 1994*

Activity: **The operation of tailings storage facility (ACTIVITY TYPE: Inert Waste Depots)**
BOBADIL TAILINGS STORAGE FACILITY, MURCHISON HIGHWAY
WEST COAST TAS 7470

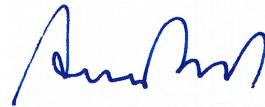
The above activity has been assessed as a level 2 activity under the *Environmental Management and Pollution Control Act 1994*.

Acting under Section 25(5)(a)(i) of the EMPCA, the Board of the Environment Protection Authority has required that this Permit Part B be included in any Permit granted under the *Land Use Planning and Approvals Act 1993* with respect to the above activity.

Municipality: **WEST COAST**
Permit Application Reference: **DA 2024/00032**
EPA file reference: **23/1516**

Date conditions approved: 7 November 2024

Signed:



CHAIRPERSON, BOARD OF THE ENVIRONMENT
PROTECTION AUTHORITY

DEFINITIONS

Unless the contrary appears, words and expressions used in this Permit Part B have the meaning given to them in **Schedule 1** of this Permit and in the EMPCA. If there is any inconsistency between a definition in the EMPCA and a definition in this Permit Part B, the EMPCA prevails to the extent of the inconsistency.

ENVIRONMENTAL CONDITIONS

The person responsible for the activity must comply with the conditions contained in **Schedule 2** of this Permit Part B.

INFORMATION

Attention is drawn to **Schedule 3**, which contains important additional information.

Table Of Contents

Schedule 1: Definitions.....	5
Schedule 2: Conditions.....	7
Maximum Quantities.....	7
Q1 Regulatory limits	7
General.....	7
G1 Activity Area.....	7
G2 Access to and awareness of conditions and associated documents.....	7
G3 Incident response.....	7
G4 Proposed change to activity.....	7
G5 Change of responsibility.....	8
G6 Change of ownership.....	8
G7 Notification prior to commencement.....	8
G8 Annual Monitoring Review and Management Report.....	8
G9 Amendment of required plans and reports.....	9
Atmospheric.....	9
A1 Control of dust emissions.....	9
A2 Dust emissions from traffic areas.....	9
A3 Control of dust emissions from crushing and screening plant	9
A4 Dust Mitigation Plan.....	9
A5 Air Monitoring Station - Baillieu Street.....	10
A6 Dust Deposition Sampling - Baillieu Street.....	10
A7 High Volume Air Sampling - Baillieu Street.....	11
A8 Reporting of Monitoring.....	12
Blasting.....	13
B1 Blasting times.....	13
B2 Blast Management Plan.....	13
B3 Blasting - noise and vibration limits.....	13
Construction.....	14
CN1 PAMDF materials not permitted for construction.....	14
CN2 Construction materials	14
CN3 Bobadil Borrow Pit Management Plan.....	14
Decommissioning And Rehabilitation.....	15
DC1 Stockpiling of surface soil.....	15
DC2 Notification of cessation.....	15
DC3 Temporary suspension of activity.....	15
DC4 Early Closure Plan.....	15
DC5 Bobadil Tailings Storage Facility Cover System.....	16
Effluent Disposal.....	16
E1 Nominated Discharge Location.....	16
E2 Discharge Limits and Investigation Trigger Levels for Bobadil Polishing Pond discharge (BO) to the Pieman River.....	16
E3 Stormwater.....	17
E4 Perimeter drains or bunds.....	18
Flora And Fauna.....	18
FF1 Protection of threatened species potential habitat.....	18
FF2 Avian Fauna Clearance Plan.....	18
FF3 Vegetation clearing works.....	19
FF4 Survey and Management of Tasmanian wedge-tailed eagle (.....	19
FF5 Survey and management of Tasmanian devil (.....	19
FF6 Machinery washdown.....	20

Hazardous Substances.....	20
H1 Storage and handling of hazardous materials.....	20
H2 Hazardous materials (< 250 litres).....	21
H3 Spill kits.....	21
H4 Handling of hazardous materials - mobile.....	21
Monitoring.....	21
M1 Monitoring requirements.....	21
M2 Samples and measurements for monitoring purposes.....	21
M3 Groundwater Monitoring Plan and Report.....	22
Operations.....	22
OP1 Weed and Disease Management Plan.....	22
Waste Management.....	23
WM1 Mine Tailings and Bobadil Tailings Storage Facility.....	23
WM2 Contaminated Landfill Waste Management.....	23
Schedule 3: Information.....	24
Legal Obligations.....	24
LO1 EMPCA.....	24
LO2 Aboriginal relics requirements.....	24
LO3 Storage and handling of dangerous goods, explosives and dangerous substances.....	24
Other Information.....	24
OI1 Waste management hierarchy.....	24
OI2 Release of Relevant Information.....	24

Attachments

Attachment 1: Activity Area (modified: 29/10/2024 12:09).....	1 page
Attachment 2: Air Quality Monitoring Schedule (modified: 06/11/2024 09:09).....	1 page
Attachment 3: Water Quality Monitoring Schedule (modified: 06/11/2024 09:10).....	2 pages

Schedule 1: Definitions

In this Permit Part B:-

95th Percentile means the value at which the relevant parameter is exceeded by no more than 5 percent of all sample results over a twelve month period.

Aboriginal Relic has the meaning described in section 2(3) of the *Aboriginal Heritage Act 1975*.

Activity means any environmentally relevant activity (as defined in Section 3 of EMPCA) to which this document relates, and includes more than one such activity.

Activity Area means the area to be used for the Activity when these conditions take effect, as depicted in Attachment 1.

Authorized Officer means an authorized officer under section 20 of EMPCA.

Conservation Assessments means the The Environment Unit of the Environment, Heritage & Land Division of the Department of Natural Resources & Environment.

Construction means activities associated with the construction phase of the activity, including but not limited to, activities associated with the clearance of vegetation, site works to create a level site, rock breaking, installation of fences and other infrastructure whether on land or in water.

Devil Survey Guidelines And Management Advice means the document titled Survey Guidelines and Management Advice for Development Proposals that may impact the Tasmanian devil (*Sarcophilus harrisii*) Version 1 dated August 2023 by the Environment Strategic Business Unit, Department of Natural Resources and Environment, Tasmania

Director means the Director, Environment Protection Authority holding office under section 18 of EMPCA and includes a delegate or person authorised in writing by the Director to exercise a power or function on the Director's behalf.

EMPCA means the *Environmental Management and Pollution Control Act 1994*.

Environmental Harm and **Material Environmental Harm** and **Serious Environmental Harm** each have the meanings ascribed to them in Section 5 of EMPCA.

Environmental Impact Statement means the document titled *Bobadil TSF Stage 11 and Stage 12 Embankment Raises Environment Impact Statement* prepared by Pitt & Sherry 4 July 2024.

Environmental Nuisance has the meanings ascribed to it in Section 3 of EMPCA.

EPA Board means the Board of the Environment Protection Authority established under section 13 of EMPCA and includes a delegate or person authorised in writing by the EPA Board to exercise a power or function on the EPA Board's behalf.

EPA Guide to Eagle Nest Searching and Nest Activity Areas means the document titled *Guide to Eagle Nest Searching and Nest Activity Checks*, by the EPA Tasmania version 1, dated May 2023 and any amendment to or substitution of this document

NAG means net acid generating.

PAMDF means potentially acid or metalliferous drainage forming material with a NAGpH of less than or equal to 4.5 or NAG (pH7.0) greater than or equal to 5kg of H₂SO₄/tonne.

Person Responsible is any person who is or was responsible for the environmentally relevant activity to which this document relates and includes the officers, employees, contractors, joint venture partners and agents of that person, and includes a body corporate.

Planning Authority means the Council(s) for the municipal area(s) in which the activity area is situated.

Pollutant has the meaning ascribed to it in section 3 of EMPCA.

Reporting Period means the financial year.

Weed means a plant species that has, or is likely to have, an adverse impact on the environment because of the introduction, spread or increase in population size of the species in an area; and includes a declared weed as defined in the *Biosecurity Act 2019* and subordinate regulations.

Weed And Disease Guidelines means the document titled *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania*, by the Department of Primary Industries, Parks, Water and Environment, dated March 2015, and any amendment to or substitution of this document.

Schedule 2: Conditions

Maximum Quantities

Q1 Regulatory limits

- 1 The activity must not exceed the following limits :
 - 1.1 1,000,000 tonnes per year of waste received (not including material for recycling).

General

G1 Activity Area

The activity must be confined to the Activity Area.

G2 Access to and awareness of conditions and associated documents

A copy of these conditions and any associated documents referred to in these conditions must be held in a location that is known to and accessible to the person responsible for the activity. The person responsible for the activity must ensure that all persons who are responsible for undertaking work within the Activity Area, including contractors and sub-contractors, are familiar with these conditions to the extent relevant to their work.

G3 Incident response

If an incident causing or threatening environmental nuisance, serious environmental harm or material environmental harm from pollution occurs in the course of the activity, then the person responsible for the activity must immediately take all reasonable and practicable action to minimise any adverse environmental effects from the incident.

G4 Proposed change to activity

- 1 The person responsible must notify the Director in writing prior to implementing any change to the activity authorised by this document that may cause or increase the emission of a pollutant or which may result in environmental harm or environmental nuisance (even temporarily). A change includes, but is not limited to, any of the following:
 - 1.1 an increase in the discharge of a pollutant, or the location of its discharge.
 - 1.2 the construction, installation, alteration or removal of any structure or equipment used in the course of carrying out the activity.
 - 1.3 any clearance of native vegetation or earthworks.
 - 1.4 a change in the quantity or characteristics of materials used in carrying out the activity.
- 2 The notification must be in an approved form and include the following:
 - 2.1 details of the proposed change;
 - 2.2 an assessment of the environmental impacts that may result from the change;
 - 2.3 any relevant approvals held by the person responsible; and
 - 2.4 any advice from the relevant planning authority to the effect that approval is not required.
- 3 The person responsible must provide additional information as requested by an Authorized Officer.
- 4 The proposed change must not be implemented until the Director has confirmed in writing that they are satisfied that no other approval or variation of this document is required.

- 5 For the avoidance of doubt, a notification of a proposed change under this provision is not required if the proposed change is part of a referral to the EPA Board for assessment under sections 24, 25 or 27 of EMPCA.

G5 Change of responsibility

If the person responsible for the activity intends to cease to be responsible for the activity, that person must notify the Director in writing of the full particulars of any person who will become the person responsible for the activity, before such cessation.

G6 Change of ownership

If the owner of the Activity Area changes or is to change, then, as soon as reasonably practicable but no later than 30 days after becoming aware of the change or intended change in the ownership of the Activity Area, the person responsible must notify the Director in writing of the change or intended change of ownership.

G7 Notification prior to commencement

- 1 The Director must be notified in writing of the commencement of construction works for the Stage 11 raise before that raise occurs.
- 2 The Director must be notified in writing of the commencement of construction works for the Stage 12 raise before that raise occurs.

G8 Annual Monitoring Review and Management Report

- 1 Unless otherwise specified in writing by the Director, an Annual Monitoring Review and Management Report, covering a 12 month review period from 1 July of the preceding year to 30 June of the following year, must be submitted to the Director each year within three months of the end of the reporting period. The Annual Monitoring Review and Management Report must be made publicly available by the person responsible for the activity.
- 2 The Annual Monitoring Review and Management Report must be compiled for the activity using the ISO 14001 Environmental Management System (EMS) Framework to demonstrate continual improvement and compliance with legal requirements (including these conditions) and must include, but not be limited to:
 - 2.1 an Executive Summary;
 - 2.2 a review of environmental aspects and impacts register against environmental controls and documentation;
 - 2.3 a review of activity compliance and annual external compliance audit against these conditions;
 - 2.4 environmental planning, including objectives and targets relating to the review period and details of the forward environmental planning and forecasting process, including strategic issues for the activity, for but not limited to the management period;
 - 2.5 a review of environmental commitments and process changes (including annual tonnage) for, but not limited to, the management period;
 - 2.6 a review of the monitoring requirements contained within these conditions for the review period, including a detailed comparative review of monitoring locations, including discharge and ambient monitoring points that illustrate significant trends. Include a review of the accuracy of the sampling procedures, sampling schedule, sample locations and test methods applied;
 - 2.7 environmental performance, including incident management and community complaints and the corrective and preventative processes implemented;
 - 2.8 any approvals or written notifications received in relation to these conditions;

- 2.9 a summary of any rehabilitation works carried out during the period and an estimate of current remediation liabilities; and
- 2.10 an inventory of wastes disposed of on the activity area during the previous 12 months, including details of the quantity of each waste and the location of its disposal.

G9 Amendment of required plans and reports

- 1 The plans and reports required by these conditions must be amended to address any matter required by the Director, as advised by notice in writing.
- 2 Amended plans and reports must be resubmitted within the timeframe that the Director specifies.

Atmospheric

A1 Control of dust emissions

Dust emissions from the activity area must be controlled to the extent necessary to prevent environmental nuisance beyond the boundary of the activity area.

A2 Dust emissions from traffic areas

Dust emissions from the activity area used by vehicles must be limited or controlled by dampening or by other effective measures.

A3 Control of dust emissions from crushing and screening plant

- 1 Dust produced by the operation of all crushing and/or screening plant must be controlled by the use of one or more of the following methods to the extent necessary to prevent environmental nuisance:
 - 1.1 the installation of fixed water sprays at all crushers and/or screening plant and at all necessary points where processed material changes direction due to belt transfer;
 - 1.2 the installation of dust extraction equipment at all crushers and/or screening plant and at all necessary points where processed material changes direction due to belt transfer;
 - 1.3 the enclosure of the crushing and/or screening plant and the treatment of atmospheric emissions by dust extraction equipment; or
 - 1.4 any other method that has been approved in writing by the Director.

A4 Dust Mitigation Plan

- 1 Unless otherwise approved by the Director in writing, prior to the commencement of construction activities, an updated Dust Mitigation Plan (the plan) must be submitted to the Director for approval. This requirement will be deemed to be satisfied when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
- 2 Without limitation, the plan must include details of the following:
 - 2.1 a description of the dust management system in place at the activity for the identification of adverse weather conditions and high risk activities for dust generation, including management responses to real time continuous PM₁₀ and PM_{2.5} dust monitoring;
 - 2.2 a description of the air quality monitoring network incorporating the air monitoring station required by these conditions;

- 2.3 the dust mitigation measures to be applied during construction of the Stage 11 and Stage 12 embankment raises, including but not limited to, the Northern Borrow Pit, the Southern Borrow Pit, and the Bobadil Tailings Storage Facility; and
- 2.4 the dust mitigation measures to be applied during the operational phase.
- 3 Once approved the person responsible must act in accordance with the approved plan.
- 4 The person responsible may apply to the Director to vary or substitute the Dust Mitigation Plan. Any variation or substitution of the plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice.

A5 Air Monitoring Station - Baillieu Street

- 1 Unless otherwise approved in writing by the Director:
 - 1.1 the proposed location of an air quality monitoring station (the station) on, or in the vicinity of, Baillieu Street, Rosebery must be provided to the Director for approval within three (3) months of the date on which these conditions take effect;
 - 1.2 the location of the air quality monitoring station must be in accordance with AS/NZS 3580.1.1:2016 *Methods for sampling and analysis of ambient air Part 1.1: Guide to siting air monitoring equipment*;
 - 1.3 without limitation the station must include a dust deposition gauge, a real-time continuous PM₁₀ and PM_{2.5} dust monitor and a high volume air sampler (HVAS) as approved by the Director;
 - 1.4 the dust deposition sampler and a real-time continuous PM₁₀ and PM_{2.5} dust monitor must be established and operational prior to the commencement of construction activities; and
 - 1.5 the high volume air sampler must be established and operational within six (6) months of the date on which these conditions take effect.

A6 Dust Deposition Sampling - Baillieu Street

- 1 Dust deposition sampling measurements and analyses must be consistent with the requirements of AS/NZS 3580.1.1:2016 *Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method*.
- 2 Monthly deposition measurements must be adjusted to account for the background deposition rate. For each sampling month, the background is defined as the minimum of the dust loadings recorded at all of the site in the network during that month.
- 3 Monthly monitoring must continue until the Director provides approval to remove the station or cease monitoring.
- 4 The person responsible for the activity must investigate each exceedance of the dust deposition compliance limits and trigger levels, specified in Table 1 as soon as it is reasonably possible to do so after becoming aware of the event. The investigation must determine the likely cause(s) of the exceedance and identify and implement any reasonable remedial actions required to prevent it from reoccurring. A record must be kept of these actions and must be made available to the Director upon request.
- 5 The level of dust fallout attributable to the activities within the Activity Area must not exceed the limit specified in column 2 of Table 1.

6 Table 1 Dust Deposition Gauges Compliance Limits and Trigger Values

Column 1	Column 2	Column 3
Parameter	Compliance Limit	Trigger Level
Deposited Dust	2.0 g/m ² /month as an annual average above background at/or beyond the Activity Area boundary.	2.0 g/m ² /month as an increase above background at/or beyond the Activity Area boundary (monthly trigger level).
Deposited Dust	4.0 g/m ² /month as an annual average at/or beyond the Activity Area boundary.	4.0 g/m ² /month as total deposition experienced at/or beyond the Activity Area boundary (monthly trigger level).

A7 High Volume Air Sampling - Baillieu Street

- 1 High volume air sampling measurements must be in accordance with *AS/NZS 3580.9.3:2015 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler Gravimetric method* and *AS/NZS 3580.9.9:2017 Methods for sampling and analysis of ambient air - determination of suspended particulate matter - PM10 high volume sampler with size selected inlet - Gravimetric method*.
- 2 The concentration levels, attributable to activities within the activity area, must not exceed the limits specified in column 2 of Table 2.
- 3 The person responsible for the activity must investigate each exceedance of the high volume air sampler compliance limits and trigger values, specified in Table 2, as soon as it is reasonably practicable to do so after becoming aware of the the event. The investigation must determine the likely cause(s) of the exceedance and identify and implement any reasonable remedial actions required to prevent it from reoccurring. A record must be kept of these actions and must be made available to the Director upon request.

4 Table 2 High Volume Air Sampling (HVAS) Compliance Limits and Trigger Levels

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Pollutant	Compliance Limit	Unit	Averaging Period	Trigger Level	Unit	Averaging Period
Total Suspended Particulates (TSP)	0.090	mg/m ³	1 year	0.15	mg/m ³	24 hours
Particulate Matter (PM ₁₀)	0.050	mg/m ³	24 hours	0.05	mg/m ³	24 hours
Particulate Matter (PM ₁₀)	0.025	mg/m ³	1 year	-	-	-
Arsenic (as PM ₁₀)	0.000015	mg/m ³	1 year	0.00003	mg/m ³	24 hours
Cadmium (as PM ₁₀)	0.00003	mg/m ³	24 hours	0.000003	mg/m ³	24 hours
Cadmium (as PM ₁₀)	0.000005	mg/m ³	1 year	-	-	-
Copper (as PM ₁₀)	0.001	mg/m ³	24 hours	0.001	mg/m ³	24 hours
Lead (as TSP)	0.0015	mg/m ³	90 day	0.0087	mg/m ³	24 hours
Manganese (as PM ₁₀)	0.0003	mg/m ³	24 hours	0.0003	mg/m ³	24 hours
Manganese (as PM ₁₀)	0.00015	mg/m ³	1 year	-	-	-
Zinc (as PM ₁₀)	0.050	mg/m ³	24 hours	0.015	mg/m ³	24 hours
Zinc (as PM ₁₀)	0.002	mg/m ³	1 year	-	-	-

A8 Reporting of Monitoring

- 1** Any exceedance of air quality compliance limits or trigger levels specified in conditions A6 and A7 is to be reported to the Director within 24 hours of the data becoming available.
- 2** Monthly internal reports must be compiled, and must be made available to the Director upon request, providing the most up-to-date monitoring data including:
 - 2.1** tabulated meteorological, high volume air sampler, and dust and metal deposition results for the month;
 - 2.2** running annual averages of the deposition increment above background;
 - 2.3** monthly deposition isopleths or graphs of total deposition and increment above 'background'; and
 - 2.4** any supporting data analysis necessary to aid interpretation of the dataset.
- 3** The Annual Monitoring Review and Management Report must provide:
 - 3.1** tabulated high volume air sampler, and dust and metal deposition results for the entire year, showing intermediate values as well as final monitoring results;

- 3.2 tabulated annual averages of the deposition increment above background, supported by deposition isopleths or graphs;
- 3.3 monthly deposition isopleths or graphs of total dust and metal deposition and increment above 'background';
- 3.4 summaries of all exceedences occurring within the reporting year, describing the results of any investigations undertaken and the mitigation measures that were adopted in response; and
- 3.5 any supporting data analysis or description necessary to aid interpretation of the dataset.

Blasting

B1 Blasting times

Blasting within the activity area must take place only between the hours of 1000 hours and 1600 hours Monday to Friday. Blasting must not take place on Saturdays, Sundays or public holidays unless prior written approval of the Director has been obtained.

B2 Blast Management Plan

- 1 Unless otherwise approved by the Director in writing, prior to the commencement of blasting, the person responsible must submit a Blast Management Plan to the Director for approval. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
- 2 The plan must be consistent with Section 5.5.3 of the Environment Impact Statement.
- 3 Without limitation, the plan must include details of the following:
 - 3.1 blasting locations;
 - 3.2 blasting schedule;
 - 3.3 blasting details, including mass charge; and
 - 3.4 commitment to reporting any exceedance of blast limits imposed by these conditions.
- 4 Once approved the person responsible must act in accordance with the approved plan.
- 5 The person responsible may apply to the Director to vary or substitute the Blast Management Plan. Any variation or substitution of the plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice.

B3 Blasting - noise and vibration limits

- 1 Blasting within the activity area must be carried out in accordance with blasting best practice environmental management (BPEM) principles, and must be carried out such that, when measured at the curtilage of any residence (or other noise sensitive premises) in other occupation or ownership, airblast overpressure and ground vibration comply with the following:
 - 1.1 for 95% of blasts, airblast overpressure must not exceed 115dB (Lin Peak);
 - 1.2 airblast overpressure must not exceed 120dB (Lin Peak);
 - 1.3 for 95% of blasts ground vibration must not exceed 5mm/sec peak particle velocity; and
 - 1.4 ground vibration must not exceed 10mm/sec peak particle velocity.

- 2 All measurements of airblast overpressure and peak particle velocity must be carried out in accordance with the methods set down in *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration*, Australian and New Zealand Environment Council, September 1990.

Construction

CN1 PAMDF materials not permitted for construction

Unless otherwise approved in writing by the Director, no materials classified as PAMDF with a NAGpH of less than or equal to 4.5, are permitted to be used for construction purposes.

CN2 Construction materials

- 1 Unless otherwise approved in writing by the Director, only material classified as non PAMDF are permitted to be used for construction purposes.

1.1 Notwithstanding, material classified as PAMDF maybe used for construction purposes under the following conditions:

- 1.1.1 the material has a NAGpH > 4.5 and $\text{NAG}(\text{pH } 7.0) < 10 \text{ kg H}_2\text{SO}_4/\text{tonne}$ and only if the material is blended with non PAMDF material such that the final blended material has a NAGpH > 4.5 and $\text{NAG}(\text{pH } 7.0) < 5 \text{ kg H}_2\text{SO}_4/\text{tonne}$.

CN3 Bobadil Borrow Pit Management Plan

- 1 Unless otherwise approved in writing by the Director and prior to the commencement of construction activities a Bobadil Borrow Pit Management Plan must be submitted to the Director for approval. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
- 2 Without limitation, the plan must include details of the following:
 - 2.1 methods for storage of PAMDF material to ensure groundwater and surface water systems are not comprised, as a minimum including:
 - 2.1.1 material must be stockpiled on a compacted clay base;
 - 2.1.2 all surface runoff and leachate from the stockpiled area must be collected and appropriately treated;
 - 2.2 management of surface run-off from the Northern Borrow Pit and Southern Borrow Pit;
 - 2.3 details of any proposed monitoring to ensure downstream receiving environment water quality is not compromised.
- 3 Once approved the person responsible must act in accordance with the approved plan.
- 4 Unless otherwise approved in writing by the Director, construction must not commence until the Bobadil Borrow Pit Management Plan is approved in writing by the Director.
- 5 The person responsible may apply to the Director to vary or substitute the Bobadil Borrow Pit Management Plan. Any variation or substitution of the plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice.

Decommissioning And Rehabilitation

DC1 Stockpiling of surface soil

Prior to commencement of extractive activities on any portion of the activity area, surface soils must be removed in that portion of the activity area to be disturbed by the conduct of the activity and stockpiled for later use in rehabilitation of the activity area. Topsoil must be kept separate from other overburden and protected from erosion or other disturbance.

DC2 Notification of cessation

Within 30 days of becoming aware of any event or decision which is likely to give rise to the permanent cessation of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to cease or has ceased.

DC3 Temporary suspension of activity

- 1** Within 30 days of becoming aware of any event or decision which is likely to give rise to the temporary suspension of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to suspend or has suspended.
- 2** During temporary suspension of the activity the Activity Area must be managed and monitored by the person responsible for the activity to ensure that emissions from the Activity Area do not cause serious environmental harm, material environmental harm or environmental nuisance.
- 3** If required by the Director, a Care and Maintenance Plan for the activity must be submitted to the Director for approval, by a date specified in writing by the Director. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
 - 3.1** The plan must be prepared in accordance with any reasonable guidelines provided by the Director.
 - 3.2** Once approved the person responsible must act in accordance with the approved Care and Maintenance Plan.
 - 3.3** The person responsible may apply to the Director to vary or substitute the Care and Maintenance Plan. Any variation or substitution of the plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice.
- 4** Unless otherwise approved in writing by the Director, if the activity on the Activity Area has substantially ceased for 2 years or more, rehabilitation of the Activity Area must be carried out in accordance with the requirements of these conditions as if the activity has permanently ceased.

DC4 Early Closure Plan

- 1** An Early Mine Closure Plan (the Plan) must be submitted to the Director for approval within 12 months of the date on which these conditions take effect, or by a date otherwise specified in writing by the Director. A revised Plan must be submitted to the Director every 5 years from that date. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.

- 2 The Plan must identify and address each of the early closure scenarios that may necessitate a different set of closure management responses and describe the steps and procedures that will be undertaken to ensure that the facility is closed in such a manner as to be geochemically stable and that the integrity of the dam is not compromised.
- 3 The Plan must be prepared in accordance with any guidelines issued by the Director, and with reference to the Leading Practice Sustainable Development Program for the Mining Industry series related to mine closure and completion, published by the Australian Government, Department of Industry, Innovation and Science, any revisions or supplements to this series, and in accordance with the Minerals Council of Australia Strategic Framework for Mine Closure.
- 4 The Plan must include details of the financial provisions for early closure, determined in accordance with accepted accounting standards, and an itemised estimate of the probable costs of rehabilitation works.
- 5 The person responsible may apply to the Director to vary or substitute the Plan. Any variation or substitution of the Plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice.

DC5 Bobadil Tailings Storage Facility Cover System

Unless otherwise specified in writing by the Director, a geosynthetic clay liner-based barrier cover system as described in section 7 of the Environmental Impact Statement as Option 2, must be installed for closure of the Bobadil Tailing Storage Facility.

Effluent Disposal

E1 Nominated Discharge Location

- 1 Unless otherwise specified in writing by the Director, potentially contaminated wastewater must only be discharged from the activity area from the nominated discharge point as shown on Attachment 1:
 - 1.1 Bobadil polishing pond discharge to the Pieman River (BO).

E2 Discharge Limits and Investigation Trigger Levels for Bobadil Polishing Pond discharge (BO) to the Pieman River

- 1 The concentrations in effluent of parameters listed in Column 1 of Table 3 must comply with the limits specified in Column 3 and Column 4 of Table 3 at the point at which it is discharged into the Pieman River, when measured in the units specified in Column 2 of Table 3.
- 2 If the concentrations in effluent of parameters listed in Column 1 of Table 3 do not comply with the levels specified in Column 5 of Table 3 (Investigation Trigger Level) at the point at which it is discharged to the Pieman River when measured in the units specified in Column 2 of Table 3, then, an investigation into the possible reason for the exceedance must be conducted and a report summarising the outcomes of all such investigations submitted to the Director in the MMG Rosebery Mine Annual Monitoring Review and Management Report.

3 Table 3 Discharge Limits and Investigation Trigger Levels for Bobadil Polishing Pond discharge (BO) to the Pieman River

Column 1	Column 2	Column 3	Column 4	Column 5
Parameter	Unit of Measurement	Maximum Limit	Minimum Limit	Investigation Trigger Level (95th Percentile)
pH	pH unit		6.5	6.7 (min)
Conductivity	microsiemens	2000		1700 (max)
Total Suspended Solids	mg/L	50		25 (max)
Cd (Total)	mg/L	0.01		-
Cu (Total)	mg/L	0.30		0.15 (max)
Fe (Total)	mg/L	8.0		4 (max)
Pb (Total)	mg/L	0.72		0.25 (max)
Mn (Total)	mg/L	10		5 (max)
Zn (Total)	mg/L	1.0		0.6 (max)
SO ₄	mg/L	1500		1000 (max)
Weak-Acid Dissociable Cyanide	mg/L	0.05		0.025 (max)
CN (Total)	mg/L	0.20		0.1 (max)
Hg (Total)	mg/L	0.001		0.0005 (max)
Total Nitrogen	mg/L	10		5.5 (max)
Total Phosphorus	mg/L	1.0		0.5 (max)
Ammonia-N	mg/L	5.0		3 (max)
Total Petroleum Hydrocarbons	mg/L	0.05		-

E3 Stormwater

- 1** Polluted stormwater that will be discharged from the activity area must be collected and treated prior to discharge to the extent necessary to prevent serious or material environmental harm, or environmental nuisance.
- 2** Notwithstanding the above, all stormwater that is discharged from the activity area must not carry pollutants such as sediment, oil and grease in quantities or concentrations that are likely to degrade the visual quality of any receiving waters outside the activity area.
- 3** All reasonable measures must be implemented to ensure that solids entrained in stormwater are retained within the activity area. Such measures may include appropriately sized and maintained sediment settling ponds or detention basins.

E4 Perimeter drains or bunds

- 1 Perimeter cut-off drains, or bunds, must be constructed at strategic locations within the activity area to prevent surface run-off from entering the area used or disturbed in carrying out the activity. All reasonable measures must be implemented to ensure that sediment transported along these drains, or bunds, remains within the activity area. Such measures may include provision of strategically located sediment fences, appropriately sized and maintained sediment settling ponds, vegetated swales and detention basins.
- 2 Drains, or bunds, must have sufficient capacity to contain run-off that could reasonably be expected to arise during a 1 in 20 year rainfall event. Maintenance activities must be undertaken regularly to ensure that this capacity does not diminish.

Flora And Fauna**FF1 Protection of threatened species potential habitat**

Unless otherwise approved in writing by the Director, clearing works for the expansion of the Northern Borrow Pit must be undertaken between 1 March to 31 August.

FF2 Avian Fauna Clearance Plan

- 1 At least 30 days prior to the commencement of vegetation removal for the Northern Borrow Pit expansion, or by a date specified in writing by the Director, an Avian Fauna Clearance Plan prepared by a suitably qualified person must be submitted to the Director for approval.
- 2 No clearing may occur for the expansion of the Northern Borrow Pit until the Avian Fauna Clearance Plan has been approved by the Director in writing.
- 3 The Avian Fauna Clearance Plan must outline the pre-clearance protocols that will be adhered to in accordance with the Environmental Impact Statement including but not limited to:
 - 3.1 a suitably qualified bird observer must be on site to supervise tree clearing works;
 - 3.2 if a Tasmanian masked owl, swift parrot or blue-winged parrot is observed utilising or exiting a tree, all works must cease within 150 m buffer of the tree, the Director must be notified, and Conservation Assessments contacted for advice. Works must not recommence without written permission of the Director.
- 4 The Avian Fauna Clearance Plan must provide the results of pre-clearance surveys to assess whether Tasmanian masked owls are present within the footprint for expansion of the Northern Borrow Pit and a 150 m buffer around that footprint. The surveys must include:
 - 4.1 where practical and safe, a physical inspection of trees for evidence of nest hollows being utilised by masked owls; and
 - 4.2 acoustic monitoring to determine the presence of Tasmanian masked owls; and/or
 - 4.3 another survey method approved in writing by the Director.
- 5 If clearing is proposed within the swift parrot breeding season, the Avian Fauna Clearance Plan must include:
 - 5.1 written advice from Conservation Assessments about the likelihood of swift parrot breeding in and adjacent to the area proposed for clearing if within the swift parrot breeding season; and
 - 5.2 the results of surveys that allow an assessment of whether swift parrots are present within and adjacent to the area proposed for clearing. Suitable methods for surveys may include bud surveys and/or acoustic monitoring.

FF3 Vegetation clearing works

- 1 Unless otherwise approved in writing by the Director, prior to commencement of clearing works, the responsible person must:
 - 1.1 delineate the boundary of the area to be cleared with flagging tape or other similar method approved in writing by the Director; and
 - 1.2 install exclusion fencing or other similar method approved in writing by the Director, to establish a minimum 15 m buffer zone around trees with a diameter at chest height >1m identified for retention.
- 2 Unless otherwise approved in writing by the Director, the exclusion method outlined in condition FF3.1 must be maintained until the extraction of material from the quarry is complete.
- 3 There must be no disturbance of the vegetation outside of the area approved for clearing.
- 4 The activity must be conducted in a manner that does not cause degradation or disturbance (including sedimentation) to the vegetation identified for retention.

FF4 Survey and Management of Tasmanian wedge-tailed eagle (*Aquila audax subsp. fleayii*) and white bellied sea eagle (*Haliaeetus leucogaster*).

- 1 No vegetation clearing or other activities that are likely to disturb breeding Tasmanian wedge-tailed eagles or white bellied sea eagles may occur after 5 April 2025 until:
 - 1.1 a new eagle nest survey has been undertaken of the Activity Area and within 1 km of the Activity Area, and the results provided to the Director; and
 - 1.2 the Director provides written approval that the vegetation clearing or other activities may occur.
- 2 Unless otherwise authorised in writing by the Director the eagle nest surveys must be undertaken between March and June and otherwise in accordance with the EPA Guide to Eagle Nest Searching and Nest Activity Areas.

FF5 Survey and management of Tasmanian devil (*Sarcophilus harrissii*) and spotted tailed quoll (*Dasyurus maculatus*) dens

- 1 At least 30 days prior to commencement of any vegetation removal or by a date specified in writing by the Director:
 - 1.1 a pre-clearing survey must be undertaken by a suitably qualified person for Tasmanian devil and spotted tailed quoll dens.
 - 1.2 the survey must be undertaken in accordance with the Devil Survey Guidelines And Management Advice; and
 - 1.3 a report outlining the findings of the survey, including offset considerations, must be submitted to the Director; and
- 2 Director approval in writing is required prior to the commencement of any vegetation removal.
- 3 Where any Tasmanian devil or spotted tailed quoll den cannot be conserved, a Den Decommissioning Plan must be provided to the Director for approval in writing, at least 30 days prior to any vegetation removal within 50 metres of the den.
 - 3.1 Vegetation within 50 metres of the den must not be removed until approval is provided in writing by the Director.
 - 3.2 The den must not be decommissioned until approval is provided in writing by the Director.
- 4 Once approved the person responsible must act in accordance with the approved plan.

- 5 Management and mitigation measures to reduce impacts to identified devil dens must be undertaken in accordance with the Devil Survey Guidelines And Management Advice and the Den Decommissioning Plan.

FF6 Machinery washdown

Prior to entering the Activity Area, machinery must be washed in accordance with the Weed and Disease Guidelines, or any subsequent revisions of that document.

Hazardous Substances

H1 Storage and handling of hazardous materials

- 1 Unless otherwise approved in writing by the Director, all environmentally hazardous materials, including all chemicals, fuels, and oils, held within the activity area in volumes exceeding 250 litres must be stored and handled in accordance with the following:
 - 1.1 Any storage facility must be contained within a spill collection bund with a net capacity of whichever is the greater of the following:
 - 1.1.1 at least 110% of the combined volume of any interconnected vessels within that bund; or
 - 1.1.2 at least 110% of the volume of the largest storage vessel; or
 - 1.1.3 at least 25% of the total volume of all vessels stored in that spill collection bund; or
 - 1.1.4 the capacity of the largest tank plus the output of any firewater system over a twenty minute period.
 - 1.2 All activities that involve a significant risk of spillages, including the loading and unloading of bulk materials, must take place in a bunded containment area or on a transport vehicle loading apron.
 - 1.3 Bunded containment areas and transport vehicle loading aprons must:
 - 1.3.1 be made of materials that are impervious to any environmentally hazardous material stored within the bund;
 - 1.3.2 be graded or drained to a sump to allow recovery of liquids;
 - 1.3.3 be chemically resistant to the chemicals stored or transferred;
 - 1.3.4 be designed and managed such that any leakage or spillage is contained within the bunded area (including where such leakage emanates vertically higher than the bund wall);
 - 1.3.5 be designed and managed such that the transfer of materials is adequately controlled by valves, pumps and meters and other equipment wherever practical. The equipment must be adequately protected (for example, with bollards) and contained in an area designed to permit recovery of any released chemicals;
 - 1.3.6 be designed such that chemicals which may react dangerously if they come into contact have measures in place to prevent mixing; and
 - 1.3.7 be managed such that the capacity of the bund is maintained at all times (for example, by regular inspections and removal of obstructions).

H2 Hazardous materials (< 250 litres)

- 1 Unless otherwise approved in writing by the Director, each environmentally hazardous material, including chemicals, fuels and oils, stored within the activity area in discrete volumes not exceeding 250 litres, but not including discrete volumes of 25 litres or less, must be stored within containment areas or spill trays which are designed and maintained to contain at least 110% of the volume of the largest container.
- 2 Bunded containment areas and spill trays must be made of materials that are impervious to any environmentally hazardous materials stored within the bund or spill tray.

H3 Spill kits

Spill kits appropriate for the types and volumes of materials handled within the activity area must be kept in appropriate locations and maintained in a functional condition to assist with the containment of spilt environmentally hazardous materials.

H4 Handling of hazardous materials - mobile

- 1 Where mobile containment of environmentally hazardous materials is utilised for the fuelling or servicing of mobile or fixed plant within the activity area, all reasonable measures must be implemented to prevent unauthorised discharge, emission or deposition of pollutants:
 - 1.1 to soils within the boundary of the activity area in a manner that is likely to cause serious or material environmental harm;
 - 1.2 to groundwater;
 - 1.3 to waterways; or
 - 1.4 beyond the boundary of the activity area.
- 2 Reasonable measures may include spill kits, spill trays/bunds or absorbent pads, and automatic cut-offs on any pumping equipment.

Monitoring**M1 Monitoring requirements**

- 1 Unless otherwise specified in writing by the Director, monitoring must be undertaken in accordance with the Air Quality Monitoring Schedule and Water Quality Monitoring Schedule at Attachments 2 and 3, respectively as follows:
 - 1.1 the items listed in Column 1 must be sampled or tested at the locations listed in Column 2 for the parameters listed in Column 3 at the frequencies listed in Column 5 using the techniques listed in Column 6; and
 - 1.2 resultant monitoring data must be reported to the Director in accordance with the requirements set out in Column 7 and in the units listed in Column 4.

M2 Samples and measurements for monitoring purposes

- 1 Any sample or measurement required under these conditions must be taken and processed in accordance with the following:
 - 1.1 sampling and measuring must be undertaken by a person with training, experience, and knowledge of the appropriate procedure;
 - 1.2 the integrity of samples must be maintained prior to delivery to a testing facility;
 - 1.3 sample analysis must be conducted by a testing facility accredited by the National Association of Testing Authorities (NATA), or a testing facility approved in writing by the Director, for the specified test;

- 1.4 details of methods employed in taking samples and measurements and results of sample analysis, and measurements must be retained for at least three (3) years after the date of collection; and
- 1.5 sampling and measurement equipment must be maintained and operated in accordance with manufacturer's specifications and records of maintenance must be retained for at least three (3) years.

M3 Groundwater Monitoring Plan and Report

- 1 Unless otherwise approved by the Director in writing, within 6 months of the date of issue of this permit a Groundwater Monitoring Plan must be submitted to the Director for approval. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
- 2 Without limitation, the plan must include details of the following:
 - 2.1 a review of the adequacy of the current groundwater monitoring bore network to monitor groundwater contaminant concentrations and aquifer characteristics, allowing for assessment of mass loads discharging from the Bobadil tailings storage facility to groundwater and the downstream receiving environment;
 - 2.2 removal of decommissioned bores and location of any new bores;
 - 2.3 details on proposed parameters, frequency of sampling and reporting of results.
- 3 Once approved the person responsible must act in accordance with the approved plan.
- 4 The person responsible may apply to the Director to vary or substitute the Groundwater Monitoring Plan. Any variation or substitution of the plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice.
- 5 Unless otherwise approved in writing by the Director, within two (2) years of the date of issue of this permit a Groundwater Monitoring Report must be submitted to the Director for approval. This report must include:
 - 5.1 an assessment of the mass loads for the contaminants of concern discharging from the tailings storage facility to groundwater and the downstream receiving environment (Lake Pieman);
 - 5.2 an evaluation of the environmental impacts of the activity on the downstream receiving environment; and
 - 5.3 recommendations for any proposed measures to reduce mass loads of the contaminants of concern for operational and site closure phases of the activity; and
 - 5.4 Once approved the person responsible must implement the recommendations in the Groundwater Monitoring Report.

Operations

OP1 Weed and Disease Management Plan

- 1 Unless otherwise approved in writing by the Director, within three (3) months on which this permit takes effect, or by a date otherwise specified in writing by the Director, a Weed and Disease Management Plan must be submitted to the Director for approval. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
- 2 The plan must be consistent with the Weed and Disease Guidelines, or any subsequent revisions of that document.

- 3 The person responsible must not implement the Weed and Disease Management Plan until the Director has approved the plan. Once approved the person responsible must act in accordance with the approved plan.
- 4 In the event that the Director, by notice in writing to the person responsible, either approves a minor variation to the approved plan or approves a new plan in substitution for the plan originally approved, the person responsible must implement and act in accordance with the varied plan or the new plan, as the case may be.

Waste Management

WM1 Mine Tailings and Bobadil Tailings Storage Facility

- 1 All tailings, generated from processing operations, which are not to be placed underground as backfill material, including paste backfill, must be placed in an approved tailings storage facility.
- 2 Bobadil Polishing pond maintenance including removal of accumulated sludge must be undertaken regularly to ensure the overall treatment capacity of the pond system is maintained.

WM2 Contaminated Landfill Waste Management

- 1 Preferentially, materials contaminated with hazardous materials from mining operations, must be disposed of underground in stopes as backfill. Only the following wastes may be buried at the contaminated landfill site within the Bobadil Tailings Storage Facility:
 - 1.1 filter cloths;
 - 1.2 general non-recyclable materials (redundant poly pipe, redundant hoses);
 - 1.3 sulphide concentrate and tailings residues; and
 - 1.4 any other material approved in writing by the Director.
- 2 An inventory must be kept of all wastes disposed of on the activity area, including details of the quantity, nature of the waste, and locations deposited. The annual inventory of wastes disposed of on the activity area must be included in the Annual Monitoring Review and Management Report required by these conditions.
- 3 Unless otherwise approved in writing by the Director, within twelve (12) months on which this permit takes effect, a Landfill Closure Plan for the contaminated landfill site within the Bobadil Tailings Storage Facility must be submitted to the Director for approval. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition.
- 4 The person responsible must not implement the Landfill Closure Plan until the Director has approved the plan. Once approved the person responsible must act in accordance with the approved plan.
- 5 In the event that the Director, by notice in writing to the person responsible, either approves a minor variation to the approved plan or approves a new plan in substitution for the plan originally approved, the person responsible must implement and act in accordance with the varied plan or the new plan, as the case may be.

Schedule 3: Information

Legal Obligations

LO1 EMPCA

The activity must be conducted in accordance with both the conditions in this document and the obligations of the *Environmental Management and Pollution Control Act 1994* (EMPCA) and subordinate regulations. The conditions of this document do not replicate legislated obligations; therefore, you should ensure you are aware of your obligations under EMPCA and subordinate regulations.

LO2 Aboriginal relics requirements

- 1 Aboriginal relics, objects, sites, places and human remains regardless of whether they are located on public or private land, are protected under the *Aboriginal Heritage Act 1975*.
- 2 Unanticipated discoveries of Aboriginal heritage must be reported to Aboriginal Heritage Tasmania on **1300 487 045** as soon as possible.

LO3 Storage and handling of dangerous goods, explosives and dangerous substances

- 1 The storage, handling and transport of dangerous goods, explosives and dangerous substances must comply with the requirements of relevant State Acts and any regulations thereunder, including:
 - 1.1 *Work Health and Safety Act 2012* and subordinate regulations;
 - 1.2 *Explosives Act 2012* and subordinate regulations; and
 - 1.3 *Dangerous Goods (Road and Rail Transport) Act 2010* and subordinate regulations.

Other Information

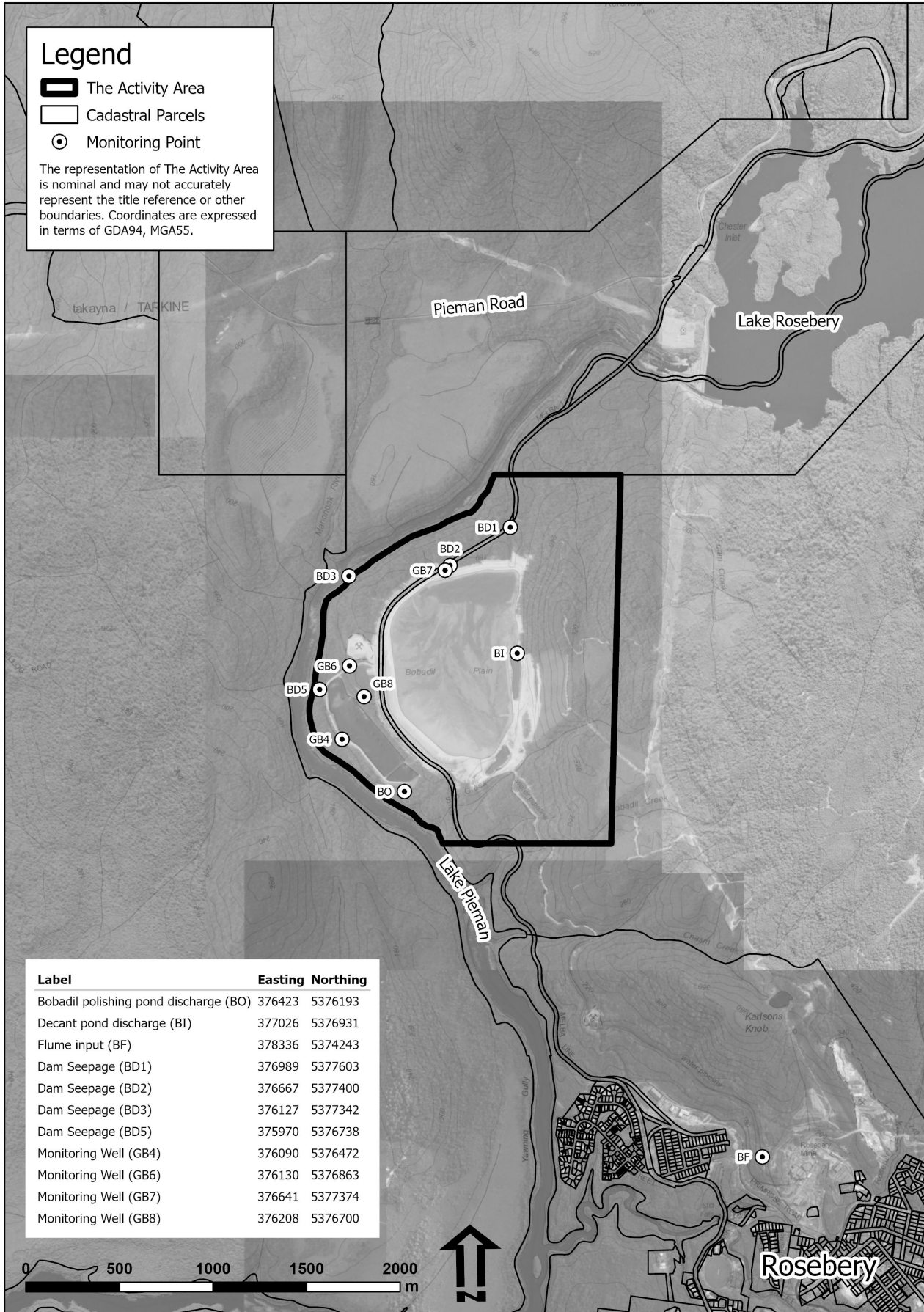
OI1 Waste management hierarchy

- 1 Wastes should be managed in accordance with the following hierarchy of waste management:
 - 1.1 waste should be minimised, that is, the generation of waste must be reduced to the maximum extent that is reasonable and practicable, having regard to best practice environmental management;
 - 1.2 waste should be re-used or recycled to the maximum extent that is practicable; and
 - 1.3 waste that cannot be re-used or recycled must be disposed of at a waste depot site or treatment facility that has been approved in writing by the relevant planning authority or the Director to receive such waste, or otherwise in a manner approved in writing by the Director.

OI2 Release of Relevant Information

Under the provisions of section 23AA of EMPCA relevant information relating to monitoring of environmental impacts required under these conditions may be subject to publishing or public release by the Director.

Attachment 1: Activity Area



ATTACHMENT 2 - AIR QUALITY MONITORING SCHEDULE

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Item	Sampling locations	Parameter	Unit of measure	Frequency	Sampling or testing technique	Reporting requirements
Dust Deposition Gauge (DDG)	Baillieu Street as approved in accordance with condition A5.	Total Solids	g/m ² /month	Monthly	Refer to the relevant and current ASNZS standard for sampling and analysis	Results to be included: a) as required in the Annual Monitoring Review and Management Report; and b) if requested by the Director.
		Total Insoluble matter and total soluble matter	g/m ² /month			
		Deposited Cd, Zn, Pb, Cu, As, Mn	µg/m ² /month			
		Total Solids above background	g/m ² /month		By calculation	
High Volume Air Sampling (HVAS)	Baillieu Street as approved in accordance with condition A5.	Initial weight	g	Every six (6) days for 24 hours.	Refer to the relevant and current ASNZS standard for sampling and analysis	The following information must be provided with the sample results: <ul style="list-style-type: none"> • Filter ID • Date exposed • Total hours • Measurement type (PM₁₀ or TSP) • Total corrected volume of air Results to be included: a) as required in the Annual Monitoring Review and Management Report; and b) if requested by the Director.
		Total weight				
		Total suspended particles & PM ₁₀	mg/filter			
		As, Cd, Cu, Mn, Zn (as PM ₁₀) Pb (as TSP)	µg/filter			
		Initial flow rate	m ³			
		Final flow rate				
		Average flow rate				
		Total corrected volume of air				
		Total suspended particles & PM ₁₀	mg/m ³			
		As, Cd, Cu, Mn, Zn (as PM ₁₀) Pb (as TSP)	mg/m ³			
Weather	Weather station (378749E 5374030N)	Wind speed, wind direction, standard deviation of wind direction (sigma theta), temperature, relative humidity, rainfall			Continuous records	Results to be included: a) as required in the Annual Monitoring Review and Management Report; and b) if requested by the Director.

For the purposes of the Table of Air Quality Monitoring Schedule the following definitions apply:

PM₁₀ means particulate matter with a diameter of 10 micrometres or less

TSP means total suspended particles

Symbol	Key
Zn	Zinc
Cu	Copper
Pb	Lead
Cd	Cadmium
As	Arsenic
Mn	Manganese

ATTACHMENT 3 - WATER QUALITY MONITORING SCHEDULE

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	
Item	Sampling locations – see Appendix I	Parameter	Unit of measure	Frequency	Sampling or testing technique	Reporting requirements	
Bobadil polishing pond discharge	BO	Flow	L/min	Continuous	Flowmeter	Results to be included: a) quarterly within 30 days of the monitoring period; and b) as required in the Annual Monitoring Review and Management Report; and/or c) as otherwise required by the Director.	
		Temperature	°C		Temperature probe		
		pH	pH units	Continuous and Weekly	Field test/laboratory		
		Electrical Conductivity	µS/cm				
		Dissolved oxygen	mg/L or % saturation	Weekly	Grab sample/field test		
		Total Suspended Solids	mg/L				
		Al, Fe, Mn, Zn, Cu, Pb, Cd, Ca, Mg, SO ₄ , F, Cl, Hg, WAD CN, Tot CN (total and dissolved metals)					
		Alkalinity (CaCO ₃)	mg/L CaCO ₃				
		Total N, Total P, Ammonia, TPH	mg/L	Weekly and Monthly			
		TPH	mg/L	6 Monthly	Grab sample		
Bobadil decant pond discharge & Bobadil flume input	BI & BF	pH	pH units	Monthly	Field test/laboratory		
		Electrical Conductivity	µS/cm		Grab sample		
		Total Suspended Solids	mg/L				
		Al, Fe, Mn, Zn, Cu, Pb, Cd, Ca, Mg SO ₄ , F, Cl, WAD CN, Tot CN (total and dissolved metals)	mg/L				
Dam seepage	BD1	Flow rate	L/min	Quarterly	Flowmeter		
	BD2	pH	pH units		Field/laboratory		
	BD3	Electrical Conductivity	µS/cm				
	BD5	Total Suspended Solids	mg/L		Grab sample		
		Al, Fe, Mn, Zn, Cu, Pb, Cd, Ca, Mg SO ₄ , F, Cl, WAD CN, Tot CN (total and dissolved metals)	mg/L				
Groundwater Bores	GB4	pH	pH units	Six monthly	Field/laboratory		
	GB6	Electrical Conductivity	µS/cm				
	GB7	Total Dissolved Solids	mg/L		Grab sample		
	GB8	Al, Fe, Mn, Zn, Ni, Cu, Pb, Cd, As, Ca, Mg, SO ₄ , F, WAD CN, Tot CN (total and dissolved metals) NO ₃ , Tot N, Tot P, TPH, BTEX	mg/L				
		Alkalinity, Acidity	mg/L CaCO ₃				

For the purposes of the Table of Water Quality Monitoring Schedule the following definitions apply:

Flow Meter means an instrument that measures and records a flow or level of liquid and includes any ancillary device attached to or incorporated into the instrument

Continuous measurement means automatic ongoing measurement at all times

Field test/ on-site test means either *in situ* testing or analysis of samples immediately with appropriate instrumentation

Grab sample means a discrete sample collected in a manner that ensures it is a representative sample

Symbol	Key
Al	Aluminium
Fe	Iron
Mn	Manganese
Zn	Zinc
Cu	Copper
Hg	Mercury
Pb	Lead
Cd	Cadmium
Ca	Calcium
Mg	Magnesium
Ni	Nickel
As	Arsenic
NO ₃	Nitrate
SO ₄	Sulphate
Cl	Chloride,
F	Fluoride
WAD CN	Weak-Acid Dissociable Cyanide
Tot CN	Total Cyanide
Tot N	Total Nitrogen
Tot P	Total Phosphorus
TPH	Total Petroleum Hydrocarbons



ENVIRONMENT PROTECTION AUTHORITY