

Environmental Impact Statement
Project Specific Guidelines
For
MMG Australia Ltd
South Marionoak Tailings Storage
Facility
Rosebery, Tasmania

August 2021



ENVIRONMENT PROTECTION AUTHORITY

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General Information for the Proponent

Purpose

The *Environmental Management and Pollution Control Act 1994* (EMPC Act) requires the Board of the Environment Protection Authority (the Board) to provide guidance to the proponent about what should be included in the case for assessment.

These project specific guidelines have been prepared based on a Notice of Intent (NoI) for the proposed South Marionoak Tailings Storage Facility (TSF) by MMG Australia Ltd (MMG).

The Board will assess environmental aspects of the proposal. The relevant Planning Authority (West Coast Council) will assess planning aspects in accordance with the *Land Use Planning and Approvals Act 1993* (LUPA Act). The Board has authorised EPA Tasmania to undertake administrative tasks and establish the information base to inform decision making on its behalf.

These guidelines provide information on preparing an Environmental Impact Statement (EIS) for an activity being assessed by the Board under the EMPC Act.

Information solely for the purpose of assessment under the relevant Planning Scheme should be supplied to the Planning Authority either:

- as required under s54 of the LUPA Act, where the planning application has commenced the environmental assessment process; or
- where it is intended to submit an EIS (draft or final) with the planning application, a combined planning and environmental report can be prepared. However, the information required for the Board's assessment must be distinguished from that supplied for the purposes of the LUPA Act.

Risk Based Assessment

The EIS should be prepared using a risk-based approach. Not all issues nominated in these guidelines will have the same degree of relevance to all proposed activities. The level of detail provided on each issue should be appropriate to the level of significance of that environmental issue to the proposal.

As well as the issues identified in the guidelines, other significant matters may emerge during preparation of the EIS from environmental studies, public comments, or other sources, which will need to be factored into the EIS. The assessment process may also change the understanding of the level of risk associated with some of the issues. This may in turn change the level of detail needed in the EIS.

After the public consultation phase, additional information may be requested from the proponent in response to public and government agency submissions. This generally takes the form of a supplement to the EIS.

Objectives of the EIS

The EIS should provide:

- Information for individuals and groups to gain an understanding of the proposal, the need for the proposal, the alternatives, the environment that it could affect, the positive and negative environmental impacts that may occur and the measures that will be taken to maximise positive outcomes, and minimise any adverse environmental impacts, including specific management measures.
- A basis for public consultation and informed comment on the proposal.

- A framework against which decision makers, particularly the Board and the relevant Planning Authority, can consider the proposal and determine the conditions under which any approval might be given.
- A demonstration that the proposal is consistent with the objectives of the relevant laws and policies, including the Tasmanian Resource Management and Planning System (RMPS) and the Environmental Management and Pollution Control System (EMPCS).

Structure and Formatting of the EIS

The following points should be considered when writing the EIS:

- The title page should include the proponent's name, the activity name, the proposal address or location, the EIS version number (where relevant) and the month and year of publication.
- The main text of the EIS should be written in a clear and concise style that is easily understood by the general reader.
- Assertions and assumptions should be supported by adequate argument and/or evidence, and evidence relied upon should be referenced.
- Technical terminology should be avoided as far as possible. The detailed technical data and supplementary reports necessary to support the main text should be included in appendices.
- All sources of information should be referenced, and the style of referencing should be consistent throughout. An indication should also be given about how current the information is and how its reliability was tested. In particular, the degree of confidence attached to any predictions should be indicated.
- Where necessary, to enhance understanding of the proposal, information should be presented in maps, plans, diagrams, and photographs. These must be of high quality and reproducible in monochrome with all text and relevant features clearly visible. Maps and plans should include a north arrow and scale.
- When spatial information (including maps, plans, grid coordinates and heights) is provided or referred to, the coordinate reference system¹ must be specified. The following coordinate reference systems should be used:
 - Horizontal – Geocentric Datum of Australia 1994 Map Grid of Australia Zone 55 (GDA94 MGA55) (Geocentric Datum of Australia 2020 (GDA2020) is the new official datum for recording the horizontal location of spatial information in Australia, but is not yet fully implemented in Tasmania)
 - Vertical – Australian Height Datum (Tasmania) (AHD83)
- Any sensitive information, as covered by Section 23 of the EMPC Act, should be provided in a separate, confidential appendix. A comment should be made in the EIS that the information has been provided in this way. The EIS should provide clear justification for placing any information in a confidential appendix.
- Specific management measures must be clearly identified in the text and included in the summary table referred to in Section 9 of these guidelines.
- Where appropriate, information provided in other sections should be referenced to minimise duplication.

¹ Information on coordinate reference systems used in Tasmania can be found on the DPIPWE website (<https://dPIPWE.tas.gov.au/land-tasmania/geospatial-infrastructure-surveying/geodetic-survey/coordinate-height-and-tide-datums-tasmania>).

Submission of draft and final document

Close consultation with EPA Tasmania while preparing the EIS is recommended. It is advisable for the proponent to submit a draft EIS to EPA Tasmania for review before it is finalised. Please note that a draft document may be rejected without detailed review if it is incomplete, contains significant formatting or typographical errors, or does not comply with the Project Specific Guidelines. More than one draft may be necessary before the document is considered suitable for public release.

The EIS is to be submitted in electronic format (such as Microsoft Word), and suitable for publishing on the internet (PDF format). Printed copies may also be required at public consultation stage.

Once the proposal is advertised for public comment, copies of the EIS must be made available to the public on request, in either printed or electronic format. The EIS will also be available on the EPA website.

Commonwealth environmental assessment

The Australian Government will also have a role in the environmental assessment and approval of the proposal in addition to Tasmanian requirements. Approval under the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is required for an action which has, will have, or is likely to have, a significant impact on a matter of national environmental significance (MNES) or on Australian land.

On 12 July 2021, the Commonwealth determined under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), that the proposal is a controlled action. The relevant controlling provisions are:

- Listed threatened species and communities (sections 18 & 18A)

Information on the EPBC Act can be obtained from the Australian Government Department of Agriculture, Water and Environment website, or by calling 1800 803 772.

The Australian and Tasmanian Governments have signed a bilateral agreement for environmental impact assessment under section 45 of the EPBC Act, which accredits the Tasmanian assessment process. This applies when a proposal is determined to be a controlled action under the EPBC Act and is being assessed under the bilateral agreement.

The EIS should specifically describe the implications of the proposal for the relevant EPBC Act controlling provisions. It must also contain a summary table showing that it addresses the matters specified in Schedule 4 of the *Commonwealth Environment Protection and Biodiversity Conservation Regulations 2000*.

False or misleading statements

Under section 43A of the EMPC Act, the EIS must not include information that is known to be false or misleading; and nothing should be omitted if it is known that without it the EIS would be false or misleading.

Contents of the EIS

Executive Summary

An executive summary of the EIS should be included to provide a clear and concise overview of the proposal, its environmental implications, the approvals process, and the function of the EIS in the context of the approvals process.

For larger EISs, it is recommended that the executive summary be written as a stand-alone document, able to be provided on request to interested parties who may not wish to read or acquire the full EIS.

Table of Contents

A table of the contents of the report with reference to the relevant page numbers. It should also contain a list of figures and tables.

List of Abbreviations

A list of the abbreviations, acronyms and, if relevant, a glossary of terms used in the EIS.

Key Issues to be addressed

While the EIS should evaluate all potential effects of the proposal, it should be principally focused on the key issues identified in the table below. The level of detail provided on other issues should be appropriate to the level of significance of that issue for the proposal. Variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitations, if any, of available information which may influence the conclusions of the environmental assessment should be discussed.

The key issues identified for this proposal, which should be the focus of the EIS, are:

| Key Issues |
|--|
| 1. Tailings Geochemistry and Acid and Metalliferous Drainage Potential |
| 2. Ground Water Quality |
| 3. Surface Water Quality |
| 4. Biodiversity and Natural Values |

The minimum survey requirements and studies required in relation to these key issues are provided in the relevant sections of these guidelines.

Other matters deemed to be significant or matters that emerge as significant from environmental studies, public comments or otherwise during preparation of the EIS, should not be excluded from consideration.

The following guidelines may be of use in preparing the EIS:

- Commonwealth of Australia, 2010, Survey Guidelines for Australia’s Threatened Birds
- Commonwealth of Australia, 2011, Survey Guidelines for Australia’s Threatened Mammals
- Commonwealth of Australia, 2013, EPBC Act Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance
- Australian Government Department of Industry, Innovation and Science, Leading practice sustainable development program for the mining industry. [Leading Practice Handbooks for sustainable mining | Department of Industry, Science, Energy and Resources](#)
- The international GARD Guide developed by INAP, the International Network for Acid Prevention. http://www.gardguide.com/index.php?title=Main_Page

All discussions and conclusions should include a full justification based on best available information, including relevant conservation advices, recovery plans, threat abatement plans and guidance

documents, if applicable. Commonwealth documents regarding listed threatened species and ecological communities and listed migratory species can be found at: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

I. Introduction

Provide information on the following:

- Title of the proposal.
- Proponent details:
 - Name of proponent (legal entity);
 - Name of proponent (trading name);
 - Registered address of proponent;
 - Postal address of proponent;
 - ABN;
 - ACN (where relevant).
- Contact person's details:
 - Name;
 - Telephone;
 - Email address.
- Activity operator details (if the operator will be a different entity to the proponent).
- General background information on the proponent, such as relevant development and operational experience.
- General background information on the proposal, including location, objectives, current status and an overview of the principal components.
- Brief description of anticipated establishment costs, likely markets for the product, and the possibilities for future expansion.
- Examination of how the proposal relates to any other approved or proposed projects in the region affected.
- Applicable environmental legislation, standards, and guidelines (such as policies, regulations, and industry codes of practice).
- Other relevant Commonwealth, State and Local Government policies, strategies, and management plans with which the proposal would be expected to comply.
- Details of any proceedings against MMG Ltd. under a Commonwealth, State or Territory environmental law.
- Details of MMG's environmental policy and planning framework.

2. Proposal Description

General note

Where the proposal is to be subject to a permit application under the LUPA Act, the proposal description and specification of the site must be consistent with the intended or current permit application. Any works or activity that are for the purpose of the proposal (e.g. access works) must be included.

Provide a full description of the proposal, including construction, commissioning, operational and decommissioning phases, as well as any infrastructure and off-site ancillary facilities required for the proposal.

Provide detailed description of key physical components of the proposal, including function, composition, size, capacity, operational life, technical and performance requirements, inter-relationships and method of construction, operation, and maintenance.

The information listed below should be provided.

2.1 Definition of the land

Provide a definition of The Land on which the activity will take place. The boundary must be consistent with any intended or current permit application under the LUPA Act. Information requirements will vary depending on how The Land is defined.

See: Spatial and visual information requirements for detailed mapping instructions.

2.1.1 Existing defined boundary

If 'The Land' is delineated by an existing defined boundary, the definition of The Land may be indicated by:

- Cadastral boundaries (Title Reference, Property ID), e.g. Title Reference I36529/I.
- Lease boundaries (Mining Lease, Crown Lease, Marine Farming Lease), e.g. Mining Lease 9011P/M.

2.1.2 Other boundary

If The Land is not delineated by an existing defined boundary, it may be necessary to define a new boundary by reference to specific topographic features and or surveyed grid coordinates. A boundary survey may be requested during the assessment process if it is required to adequately identify The Land. In this case:

- Provide a plan which clearly shows the boundary of The Land in relation to topographic features or grid coordinates.
- Provide the boundary of The Land in a geospatial vector format (shapefile or DXF).

2.2 Project components

Describe, with maps and diagrams showing locations, all the physical components required for the proposal to function up to closure, including:

- The design of proposed TSF embankments ² including:
 - The proposed staging of embankment lifts until closure;
 - The hydrological and geotechnical basis for design of embankments and their foundations (where necessary cross-referencing information presented in relevant parts of Section 6);
 - Describe the design permeability of the embankments, estimated seepage, and how the design of the embankment will minimise potential for seepage with reference to predicted permeability; and
 - Embankment footprints (for each stage).
- Embankment cross sections (showing final section and levels for each stage of development and including any upstream embankment raises).

² Note that a separate approval for dam works may be required from DPIPW Dam Safety, in accordance with the *Water Management Act 1999*.

- Description and plan of decant tower, decant pond, spillway and maximum extent of inundation for each stage.
- With reference to geotechnical / hydrogeological data and groundwater risk (see Section 6.2) describe the permeability of the proposed impoundment area floor, and works (such as liners), required to achieve specific permeabilities.
- Leachate seepage collection systems.
- Polishing Pond design and footprint.
- Tailings effluent discharge alignment, outfall location and design.
- Tailings pipeline network, capacity, pumping rates, including pipeline alignments, corridors, pumping stations and tailing deposition systems.
- Systems to ensure pipeline integrity.
- Physical control systems to monitor for leakage from, or failure of, TSF or pipeline, including (but not limited to):
 - Pipeline leak detection and control instrumentation;
 - Decant level and freeboard monitoring;
 - Embankment seepage monitoring; and
 - Control facilities and instrumentation (e.g. piezometers).
- Pipeline bridge across Lake Pieman, including any services, pollution control measures, pedestrian or vehicle crossing to be incorporated into the design.
- Permanent access roads and tracks.
- Infrastructure to control surface water runoff including cut off drains, runoff collection basins, watercourse diversions, and stormwater discharge points.
- Infrastructure for communications, power supply (and generation if relevant).
- Any major items of equipment and on-site facilities not listed above.
- Storage areas for raw materials and hazardous goods or chemicals.

Detailed technical information on design of major items of equipment may be included in appendices.

2.3 Construction

Describe all the activities required to construct the proposal, including:

- A step-by-step description and timetable for significant construction activities until closure.
- Details of any pre-construction works, including:
 - Diversions or other works to existing utilities or infrastructure;
 - Diversions or other works to existing creeks, drainage lines or water bodies.
 - Temporary or permanent removal of vegetation; and
 - Stockpiling of soil, vegetation and other materials.
 - Proposals for use or disposal of cleared vegetation, such as timber sale, habitat creation, closure material.
- Site preparation works.
- Proposed ground preparation for embankment and impounded area including excavation requirements and any blasting needed.
- Geotechnical and geochemical investigation, including for potential borrow areas.
- A plan of the worst-case construction footprint including borrow areas with all areas quantified.
- A description of construction infrastructure including site offices temporary working areas, construction access roads, laydown areas, temporary stockpiles including maps showing locations.
- Estimates of the quantities of raw materials required for construction, providing details on:

- The location of any on-site and/or off-site borrow areas;
 - Material type sought (e.g. clay, rock, and filter material)
 - How the materials will be extracted and conveyed to site; and
 - Estimated reserves, material properties and suitability for their proposed use.
- A management plan for any Potentially Acid Forming (PAF) or Non-Acid Forming (NAF) with Near Neutral Metalliferous Drainage (NNMD) potential materials that may be won from borrow areas but not suited for specific uses within the TSF construction.
 - Nature, capacity, and location(s) of construction equipment required on-site.
 - Description and plans of systems to manage stormwater during construction including details of drainage control measures such as cut-off drains and sediment settling ponds.
 - Number, type, origin, destination, and route for construction vehicle movements, including a breakdown for over-dimension and heavy vehicles.
 - The number of workers required for the main stages of construction, sources of labour, transport of workers to and from the site, accommodation, and support servicing requirements.
 - Proposed hours per day and days per week of construction activities.
 - Details identification of areas to be rehabilitated following temporary use during construction (borrow areas, temporary access roads etc) and description of proposed rehabilitation measures.
 - Areas from which construction activity will be excluded.

2.4 Commissioning

Provide a description of major commissioning activities following construction of the TSF. This should include indicative durations, the sequencing of major steps and the point at which commissioning is deemed complete.

2.5 Operation and maintenance

The description should include:

- The proposed lifetime of the TSF, with a description of development phases.
- A step-by-step description of operational processes supported by explanatory diagrams and flow charts where appropriate. State where such processes have been used in Australia or elsewhere previously and provide performance data.
- Details of assumptions on production capacity and rates for relevant processes including peak rates, daily average rates, maximum tailings rise rate, and annual production rates on which the TSF designs and anticipated lifetime are based.
- The anticipated physical, mineralogical, and chemical properties of the tailings, including settling properties and PAF content based on static and kinetic testing (with reference to the requirements of 6.1).
- How tailings are transported to the TSF and proposed operational monitoring and control systems.
- The method of tailings deposition, including:
 - Distribution of spigot locations; and
 - Subaqueous or subaerial deposition.
- How deposition method will address:
 - Management of potential for Acid and Metalliferous Drainage (AMD);
 - Anticipated changes to ore processing and tailings composition over time;
 - Construction of embankment raises;

- Permeability and geotechnical and geochemical stability of tailings; and
- The relationship between tailings deposition management strategies and final closure concept(s) (see Section 8).
- Description and quantitative analysis of the water balance, including:
 - All water inputs to TSF from tailings, precipitation, and surface-groundwater interactions;
 - Storage volumes and residence times;
 - Volumes of all planned discharges to surface water, infiltration to groundwater, evaporation, seepage and any decant water returns;
 - Potential for spillway discharges; and
 - Effect of changing precipitation and evaporation rates due to climate change over the life of the TSF based on appropriate IPCC climate change scenarios (see Section 8 in relation to closure assumptions).
- Description of the proposed function and anticipated performance of the polishing pond in removing pollutants.
- Description of any active measures to control pollution and acid generation such as the addition of alkali reagents (such as lime) and flocculants.
- Operational systems (including management arrangements, equipment etc) for monitoring for and responding to pollution incidents (with reference to the monitoring, leak detection and control instrumentation listed in Section 2.1).
- Description of any changes to operations required during embankment raises.
- Description of all major sources of noise, dust, waste or emissions (gas, liquid, solid) not described above.
- Operational energy requirements.
- The hours of operation for the proposal (hours per day and specific days per week) including any seasonal variations.
- Operational vehicle traffic.
- Maintenance requirements (e.g. frequency of maintenance activities, equipment access, shutdowns, etc.) and design life for all major components.

A Draft Tailings Management Plan should be included as an appendix which describes management arrangements to address relevant issues within the EIS. This will form the basis for an operational Tailings Management Plan.

2.6 General location map

Provide a general location map (e.g. 1:25,000 scale or better as appropriate) identifying the following features:

- The location of the proposal site.
- Topographical features, aspect and direction of drainage.
- Geological mapping of the proposal footprint.
- Road access to and from the site.
- Location of waterbodies and drains (including ephemeral).
- The distance(s) to any nearby sensitive uses (such as residences).
- Electricity transmission lines / substations.
- Definition of the land on which the activity will take place by means of land title information, mining lease boundaries, map coordinates or other means.
- Surrounding land tenure.

- Surrounding land use (identify areas of conservation or recreational significance).
- Surrounding land zoning in the local government planning scheme.
- Locations of historical workings.

2.7 Site plan

Site plans are required which identify:

- The proposal site including the project components listed in Section 2.2 and borrow areas retained during operation (see Section 2.3).
- The layout and total footprint of construction activities described in Section 2.3.

Boundary information must be consistent with any intended permit application under the LUPA Act. Coordinates of the land should be provided.

2.8 Off-site infrastructure

Describe any new infrastructure or off-site ancillary infrastructure needed for the proposal including how the proposal will be connected to the existing processing plant at Rosebery, and any proposed changes to processing of tailings required for the proposal.

3. Project Rationale and Alternatives

Using estimates of resources, production rates and mine life for MMG Rosebery, describe the rationale for the proposal and explain the consequences of taking no action.

Describe the alternative means to achieve the aims of the proposal that were considered during its development, including:

- Alternatives to above ground tailings storage that have been considered (such as underground disposal of tails or use of tails for underground paste backfill).
- Alternative locations for a new TSF that have been considered, including Natone Creek.
- Potential raises or alterations to existing TSFs that are not currently approved.
- Other alternative technologies, materials, design options or management practices to those proposal with different environmental consequences.

This section must evaluate the alternatives identified above. This evaluation must include:

- Description of environmental, social, economic, cost, and technical criteria used to assess the suitability of alternatives.
- Detailed description of the environmental, social, economic, cost, and technical aspects of each option examined in relation to the assessment criteria.
- Assessment (providing appropriate evidence) of each alternative against the above criteria, including the short, medium, and long-term advantages and disadvantages of each and the reasons why each alternative was discounted in favour of the proposal.
- Description how any consultation with the community or other stakeholders influenced the selection process.

Alternatives should have regard to best practice environmental management, including those measures listed under section 4(2) of the EMPC Act.

4. Public Consultation

Provide details of the nature and results of public consultation undertaken by the proponent during project planning and preparation of the EIS, as well as any proposals for further public consultation during and beyond project implementation.

Early community engagement often leads to better outcomes for all and is strongly encouraged. The Board has produced a guide to community engagement which is available on the EPA website at: <http://epa.tas.gov.au/assessment/assessment-process/guidance-documents>.

The following agencies provided comments on the Notice of Intent:

- *DPIPWE Conservation Assessments and Wildlife Management (CAS)* - CAS provided advice on issues related to biodiversity and natural values which has been incorporated into Section 6.4 of these guidelines.
- *Hydro Tasmania - Commercial, Climate and Environment* - Hydro Tasmania provided several comments relating to the coverage of surface and groundwater issues which have been incorporated into Sections 6.1 to 6.3 of these guidelines. It also requested that it is provided with a copy of the Stakeholder and Community Engagement Plan once developed to identify Hydro Tasmania's role and timeline from hereon.
- *Mineral Resources Tasmania (MRT)* - MRT responded that it had no specific comments on the proposal.
- *Department of Premier and Cabinet (DPAC) Tasmanian Climate Change Office* – DPAC responded that it had no material issues relating to climate change.

5. The Existing Environment

Describe the proposed site location and provide an overview of the existing environment, which may be affected by construction, and operation of the proposal, including areas associated with any ancillary activities.

Include details of salient features of the existing environment and, where appropriate, include maps, plans, photographs, diagrams, or other descriptive detail.

The following details should be included.

5.1 Planning aspects

Provide a summary of the planning aspects of the proposal and proposal site, including:

- If a permit is required for the proposal under the LUPA Act provide:
 - Use Class of the proposed activity under the applicable Planning Scheme.
 - Permissibility of the activity under the applicable Planning Scheme.
- Information on land tenure and property boundaries on which the proposal is located, with certificate of title details.
- Land zonings for the proposal footprint and surrounding areas.
- Any rights of way, easements and covenants affecting the proposal footprint.
- Land use and planning history of the proposal footprint, including the potential for site contamination³, present use and any existing buildings and significant structures.
- A description of land use and ownership in the vicinity of the proposal and those areas which may be affected by the proposal, including:
 - The location and nature of industrial facilities;
 - Any sensitive uses⁴ or residential zones within applicable attenuation distances including the location of individual residences, schools, hospitals, caravan parks and similar sensitive uses, and the location of any tourist or recreation facilities or routes (such as camping areas, picnic areas, walking tracks, historic routes); and
 - Any proposed or potentially sensitive uses within this distance of the proposal footprint, which have been or are likely to be granted approval under the local planning scheme, should also be considered.

5.2 Environmental aspects

Avoiding unnecessary repetition with the more detailed 'Existing conditions' descriptions in Section 6, provide a summary of the environmental aspects of the proposal site, including:

- A description of the general physical characteristics of the proposal footprint and surrounding area.
- A description of natural processes of importance for maintenance of the existing environment (e.g. fire, flooding, etc).
- Any existing conservation reserves located on or within 500 metres of the proposal footprint.

³ Information on potentially contaminating activities and contaminated site assessment can be found online at <http://epa.tas.gov.au/regulation/contaminated-sites>.

⁴ Defined in the State Planning Provisions as 'a residential use or a use involving the presence of people for extended periods except in the course of their employment such as a caravan park, childcare centre, dwelling, hospital or school.'

- Any high-quality wilderness areas identified in the *Tasmanian Regional Forest Agreement* in the vicinity of the proposal.
- Information on species, sites or areas of landscape, aesthetic, wilderness, scientific or otherwise special conservation significance which may be affected by the proposal. Relevant information resources include the LIST (www.thelist.tas.gov.au) and the Natural Values Atlas (<https://www.naturalvaluesatlas.tas.gov.au>).
- An assessment of the vulnerability of the proposal footprint to natural hazards (e.g. flooding, seismic activity, fire, landslips, or strong winds).
- Any available ambient monitoring results in the vicinity of the proposed development (in tabular or graphical form). The results may be summarised (e.g. as annual averages) if the summary will provide adequate information.

5.3 Socio-economic aspects

Briefly describe the existing social and economic environment that may be affected by the proposal, which may include information on the following:

- A summary of the social or demographic characteristics of the population living in the vicinity of the proposal footprint, identifying any special characteristics which may make people more sensitive to impacts from the proposal than might otherwise be expected.
- A summary of the characteristics of the local and regional economy.

6. Potential Impacts and Their Management

Guide to preparing this section

While some details of the proposal may not be finalised at the time the EIS is submitted, the information in the document should be as up to date as possible. Where information is unavailable or details have not yet been finalised, estimates and the range of alternative options should be provided. However, sufficient technical detail must be provided to enable an appropriate level of assessment. For each potential impact the following should be discussed.

Existing conditions

Describe in detail the features of the existing environment affected by the impacts discussed in this section.

Performance requirements

Identify the environmental performance requirements to be achieved for each environmental impact and provide evidence to demonstrate that these can be complied with. These may be standards or requirements specified in legislation, codes of practice, state policies, national guidelines (including relevant recovery plans and conservation advices) or as determined by agreement with the assessing agencies. Industry best practice standards should be referred to where appropriate. **Unsupported assertions that performance requirements will be achieved will not be considered adequate.**

Potential impacts

Outline the short-term and long-term potential environmental, social, and economic impacts of the proposal (positive and negative) through all stages, including construction, operation, and closure, in the absence of special control measures. Any foreseeable variations in impacts during the start-up and operational phases should be identified.

Include an analysis of the significance of the relevant impacts. When determining significance of impacts to MNES, the EIS should refer to the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance*.

The level of detail provided on each issue should be appropriate to the level of significance of that environmental issue to the proposal.

The evaluation of potential impacts should identify **plausible worst-case consequences**, the vulnerability of the affected environment to the potential impacts, and the unpredictability or reversibility of the impacts. Potential cumulative impacts of this proposal in light of other activities underway or approved also need to be addressed. Interactions between biophysical, socio-economic, and cultural impacts should be identified.

Predictions and evaluations of impacts should be based on scientifically supportable data. Direct, indirect, cumulative, and facilitated impacts should all be identified. The methodologies used or relied on should be referenced, together with the relevant research and investigations supporting them. Assumptions, simplifications, and scientific judgements should be stated clearly, and the nature and magnitude of uncertainties should be clearly defined. Where relevant, the choice of a particular methodology over alternative methodologies should be explained. Where impacts are not quantifiable, they should be adequately described.

Where positive benefits are claimed it will generally be appropriate to explain what measures are to be taken to ensure that those positive outcomes are realised and sustained.

Avoidance and mitigation measures

Describe the measures proposed to avoid or mitigate potential adverse environmental impacts (having regard to best practice environmental management as defined in EMPCA in order to achieve the environmental performance requirements (such as through pollution control technology or management practices). The extent to which they will overcome the anticipated impacts should be specified. The ongoing management and monitoring measures, and the party responsible for each measure. Where there are clear, alternative avoidance or mitigation measures for a particular adverse environmental impact, the alternatives should be reviewed and the preferred option justified. Discussion of the achievability of the measures, including affordability, should be included.

Where pollution control equipment and/or treatment processes are key factors in achieving satisfactory environmental performance, contingencies in the event of breakdown or malfunction of the equipment or processes should be discussed. It should be demonstrated that the maintenance of pollution control equipment can be provided for without causing performance requirements to be exceeded.

Where measures to control environmental impacts are necessary, but will not be undertaken by the proponent, the means by which the proponent will ensure that the necessary measures are implemented should be identified (e.g. lease conditions, trade waste agreement, contractual arrangement or other binding third party commitment). **Mitigation measures over which the proponent has no control will generally not be considered adequate.**

Specific measures can be presented in the form of a management plan, such as an Environmental Management Plan (EMP) that sets out the framework for management, mitigation and monitoring of relevant impacts of the action, including any provisions for independent environmental auditing. The EMP needs to address the project phases (construction, operation, decommission) separately.

Assessment of net impacts

An assessment of the overall impacts of the development on the environment after allowing for the implementation of proposed avoidance and mitigation measures. This should include an evaluation of the significance of impacts, the potential for emissions to cause environmental and health impacts and comparison with state, national and international regulations and standards. Any net benefits likely to result from the proposal should be identified.

Discuss the impacts of the proposal in terms of the constraints or benefits it may place on the current or future use of land within the proposal site and surrounding area as a result of environmental impacts or emissions, including impacts on other uses, particularly sensitive uses.

Offsetting unavoidable adverse impacts

If adverse residual environmental impacts from the proposal are considered unavoidable despite the adoption of best practice environmental management avoidance and mitigation measures, then proposals to offset such impacts should be detailed. For example, if the loss of conservation values, community assets or amenities is considered unavoidable, measures to compensate for those losses should be proposed in proportion to the loss. Any offset actions proposed must be demonstrated to be 'real' actions. That is, **the offset actions must have a measurable and relevant benefit which would otherwise not have occurred.**

Offsetting for significant residual impacts to MNES

Describe the residual impacts on MNES that are likely to occur as a result of the proposed action in its entirety, after proposed avoidance and/or mitigation measures are considered. If applicable,

this should include the reasons why avoidance or mitigation of impacts cannot be reasonably achieved.

If residual impacts are proposed to be offset provide an offset package to compensate for residual impacts to MNES. This should consist of an offset proposal and key commitments and management actions for delivering and implementing the proposed offset (e.g. an Offset Management Plan). Note, an offset management plan should be prepared as a separate document and attached as an appendix to the documentation.

Offsets must deliver an overall conservation outcome that improves or maintains the ongoing viability of the species and ecological communities, as compared to what is likely to have occurred if neither the action nor the offset had taken place. The proposed offset must meet the requirements of the Commonwealth *EPBC Act Environmental Offsets Policy* (October 2012) available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

The *Offset Assessment Guide* can be used as a guide to calculate the area of offset required to adequately compensate for the residual impacts of the project, it is available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy. The offset proposal will be assessed based on the information provided in the offsets proposal using the offsets assessment guide.

Offsets required by the State can contribute to offset obligations under the EPBC Act if those offsets also meet the requirements of the *EPBC Act Environmental Offsets Policy*.

6.1 Key Issue 1. Tailings Geochemistry and Acid Metalliferous Drainage (AMD) Potential

6.1.1 Assessment requirements

Scope

For construction, operation and closure phases, assess, with the support of appropriate geochemical analysis, the potential for AMD formation, mobilisation of contaminants and creation of pathways to the environment from potentially oxidisable sulphide minerals within tailings, construction materials and the geology of the proposal footprint. This assessment should consider the influence of the following:

- The effect of different tailings deposition and management methods proposed.
- The effect of changing phreatic surface within the TSF.
- Rate of oxidation of PAF materials in the tailings.
- The effects of any disturbance to settled tailings.
- The effect of characteristics of changing tailings mineralogy on rates of acidification.
- The effect of lime addition to the tailings.

The findings of the AMD assessment will inform the assessment of potential impacts on groundwater (Section 6.2), surface water (Section 6.3) and closure concept(s) (Section 8).

Method

Sampling

AMD testing should be based on sufficient sampling to build a clear picture of AMD risks. Describe:

- Sampling methodology for tailings, construction materials and the geology of the proposal footprint (including borrow areas).
- Sources of samples and rationale for selection.

- Number of samples of each class or lithology.
- Mineralogical description of samples.

Geochemical assessment of tailings should be based on sufficient sampling of suitable representative materials resulting from current production, and expected future changes in tailings geochemistry, to give a reliable assessment of the characteristics of the range of tailings likely to be received by the proposed TSF during its lifetime.

Testing

The assessment should include sufficient geochemical testing to show the acid forming potential of the materials to be deposited over the life of the TSF. This should include:

- Detailed description of testing methodology.
- Materials mineralogical characteristics.
- Results of static testing / Acid Base Accounting (ABA) based on best practice.
- Results of kinetic testing to predict long-term oxidation and acid generation rates and estimate lag times.

Modelling and assessment

Based on the results of the testing above and the proposed approach to handling and storage of tailings (see Section 2), describe the potential for the tailings to generate AMD during operation and after closure. This should include:

- Metals, metalloids, acidity, salinity and other chemical elements or ions of potential environmental concern.
- Potential for leaching of these elements and emissions of AMD from the TSF to the receiving environment.
- The estimated quantity and quality of decant water discharged from the TSF via the decant tower, embankment seepage, and groundwater infiltration.
- How the geochemistry of the tailings entering the TSF may change through the life of the mine.
- Description of the proposed best practice environmental management measures to minimise potential for AMD formation during construction, operation and after closure.
- Description of detection, collection and treatment plans for potential seepage contaminated with AMD.

The findings of the geochemical testing should be incorporated into the modelling and assessment of impacts on groundwater (Section 6.2) and surface water (Section 6.3).

6.2 Key Issue 2. Groundwater

6.2.1 Assessment requirements

Scope

For construction, operation and closure phases, using the results of geochemical testing described in Section 6.1 where relevant, discuss any potential impacts of the proposal on groundwater. This should include:

- Potential impacts on the quality, flows and recharge of local groundwater resulting from the presence of the TSF including local groundwater interaction with the water within the tailings.
- Potential impacts on the quality of groundwater by contamination from construction activities.
- Potential impacts on groundwater interactions with Lake Pieman including potential for groundwater to act as a pathway for transport of contaminants into Lake Pieman.

Method

The assessment should include, as a minimum:

- Description of sensitive groundwater uses and values.
- Based on the anticipated permeabilities for the embankment and impoundment floor design (see Section 2.2), the predicted rate of seepage to groundwater from the TSF.
- A conceptual groundwater model for regional and local aquifer flows.
- The estimated quantity and quality (including anticipated concentrations and mass loads of potential pollutants) of groundwater migration from the TSF.
- A map showing the location of any existing and proposed groundwater bores.
- Ambient groundwater quality survey results of the existing receiving environment.
- Any numerical modelling of groundwater necessary to understand the effects of the proposal on groundwater inside and outside the TSF footprint.
- Details of proposed groundwater monitoring and reporting program building on MMG's existing / historical groundwater monitoring activity.

Information on groundwater in Tasmania is available at: <http://wrt.tas.gov.au/groundwater-info>

6.2.2 Legislative and policy requirements

Demonstrate that the proposal is consistent with the objectives and requirements of all relevant water management policies and legislation, including the *Water Management Act 1999* and the *State Policy on Water Quality Management 1997*.

While geotechnical assessment of the existing and proposed structures will inform this section the geotechnical assessment and subsequent design of the facilities will be assessed separately under the *Water Management Act 1999*.

6.3 Key Issue 3. Surface Water

6.3.1 Assessment requirements

Scope

For construction, operational and closure phases, using the results of geochemical testing described in Section 6.1 where relevant, describe any potential impacts of the proposal on surface water (quality and flow), including:

- Potential impact of alterations of flow and distribution of local drainage including on McKimmie Creek.
- Potential Impact on the condition of aquatic and riparian habitat including those of McKimmie Creek and Lake Pieman.
- Potential impacts on water quality and ecology of the local aquatic receiving environment (including McKimmie Creek and Lake Pieman) from:
 - Sediment laden runoff;
 - AMD contaminated runoff;
 - TSF Embankment seepage;
 - Discharge of effluent from proposed outfall (using an appropriate dispersion model);
 - Discharges from TSF to spillway during stormwater events; and
 - Any other discharges to the local aquatic receiving environment.

Method

The assessment must include:

- Detailed description of the existing aquatic receiving environment, including:
- Recent ambient water quality and flow data (including McKimmie Creek and Lake Pieman).
- Description of aquatic and riparian ecology (see Section 6.4).
- Description of quantity and composition (including annual mass loadings) of any planned or potential effluent discharges to the receiving environment, including:
 - Discharges via decant tower and polishing pond to outfall (including modelling to show sufficient residence time in polishing pond to meet required effluent quality);
 - Discharges via spillway; and
 - Embankment seepage.
- How physical pollution control measures (see Section 2) will limit pollutant levels.
- Appropriate modelling of the effects of discharge of tailings effluent, to determine dispersion of effluent within Lake Pieman and anticipated impacts to the receiving environment. This assessment should include modelling of any concurrent discharges from MMG's Bobodil TSF and 2/5 Dam TSF.
- Risk assessment of pollution resulting from failure of containment of tailings:
 - Being piped from the mill to the TSF (including a failure at the Lake Pieman pipeline crossing);
 - Being deposited into the TSF; and
 - Stored within the TSF.
- Estimation of runoff volumes and available detention capacity/times and the rainfall intensity data used in the design of stormwater management structures.
- Details of any anticipated discharges to municipal sewerage system (including tankered waste).
- Details of an appropriate surface water monitoring and reporting program building on MMG's existing monitoring programs.
- Assessment of how differing climate change scenarios (see water balance in Section 2.5), would influence potential pollution impacts from the TSF.

6.3.2 Legislative and policy requirements

Define the Protected Environmental Values (PEVs) potentially affected by the proposal.

Demonstrate that the proposal is consistent with the objectives and requirements of relevant water management policies and legislation including the *Water Management Act 1999*, the *State Policy on Water Quality Management 1997*, the *State Stormwater Strategy 2010*, and the *Inland Fisheries Act 1995*.

Demonstrate that the proposal will not prejudice the achievement of any water quality objectives set for water bodies under the *State Policy on Water Quality Management 1997* (see <http://epa.tas.gov.au/policy-site/Pages/Water-Quality-Policy.aspx>). Where water quality objectives have not yet been set, consult EPA Tasmania to identify the baseline water quality data required to enable the water quality objectives to be determined.

Water Management Act

The proposal will include “dam works” within the meaning of Part 8A of the *Water Management Act 1999*, which will need to be considered by the Minister in accordance with Section 165F of the Act.

In order for the Minister to be able to make a final determination when the proposal is referred, all relevant geotechnical assessments, dam safety hazard category assessments, design drawings and works specifications, and a Dam Safety Emergency Management Plan relevant to any of the “dam works” associated with the proposal should be included either within or as addendums to the final EIS.

These documents must comply with the *Water Management (Safety of Dams) Regulations 2015* and the relevant Guidelines produced by the Department. Any referral to the Minister in the absence of this information will most likely result in a Notice being issued for further information which would add additional time to the assessment process.

6.4 Key Issue 4. Biodiversity and natural values

6.4.1 Assessment requirements

Scope

For construction, operation, and closure phases, describe potential impacts of the proposal on biodiversity and natural values, including:

- Impacts of clearing and disturbance on native vegetation communities and flora species, including weed invasion, habitat loss and fragmentation, altered hydrology/ hydrogeology and disease introduction. In particular, this should describe impacts on rare and threatened species, communities, and habitats listed under the relevant Schedules of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA), *Nature Conservation Act 2002* (NCA) and the *Threatened Species Protection Act 1995* (TSPA), including:
 - Flora species with potential to occur within 5000 m of the proposal (Natural Values Atlas) and, including *Deyeuxia densa* (heath bentgrass) and *Orthoceras strictum* (horned orchid) and also *Corunastylis nuda* (tiny midge-orchid) and *Micrantheum serpentinum* (western tridentbush) (all listed as Rare under the TSPA) and the EPBC listed plants including but not limited to Native Wintercress (*Barbarea australis*) (endangered) and Scrambling Groundfern (*Hypolepis distans*) (endangered); and
 - Tasmanian Forests and Woodlands dominated by black gum or Brookers Gum (*Eucalyptus ovata* / *E. brookeriana*) – Critically Endangered (EPBC) (Abbreviated as ‘WBR’ in TASVEG 4.0⁵). In view of the small size of patches in which this community is generally mapped, ground surveys are required to afford a higher level of confidence in attribution of community type than can be achieved by aerial survey.
- Impacts on avifauna from loss of habitat or disturbance by proposed activities on foraging, breeding, nesting, or migratory behaviour. In particular, this should describe impacts on rare and threatened species, migratory species, communities and habitats, listed under the relevant Schedules of the EPBCA and the TSPA potentially present, including but not limited to:
- Wedge-tailed-eagle (*Aquila audax fleayi*) (WTE) – Endangered (TSPA/EPBC). DPIPWE Conservation Assessment Service (CAS) advise that a WTE nest is within 300 m of the proposed TSF, within 500 m of the proposed bridge and pipeline and very close to a proposed vehicle access track with a high potential to result in disturbance to breeding and adverse effects to habitat critical to the survival of the species;
- Tasmanian Masked owl (*Tyto novaehollandiae castanops*) – Endangered (TSPA), Vulnerable (EPBC). The Nol identified the proposal footprint as core habitat for Masked Owl with high likely presence of suitable hollow-bearing trees and foraging habitat. Masked Owl would be particularly susceptible to the clearance of such habitat;

⁵ Department of Primary Industries, Parks, Water and Environment. *Threatened Native Vegetation Communities 2020*, Released February 2021. Tasmanian Vegetation Monitoring and Mapping Program, Natural and Cultural Heritage Division

- Tasmanian azure kingfisher (*Ceyx azureus diemenensis*) – Endangered (TSPA/EPBC). The Nol indicated that ‘suitable habitat is present within the pipeline corridor where it crosses the Pieman River’ with potential for disturbance and/or loss of habitat resulting from the proposal;
- Grey goshawk (*Accipiter novaehollandiae*) - Endangered (TSPA). Based on a verified record within 3 km of the proposal footprint, and potentially suitable nesting habitat occurring in the proposal footprint, it is likely that the proposal footprint is used for foraging and/or nesting, with potential for disturbance and or loss of habitat resulting from the proposal; and
- Swift Parrot (*Lathamus discolor*) – critically endangered (EPBC). Based on potentially suitable foraging habitat occurring within the proposal footprint, it is likely that the proposed footprint may be used for foraging and/or nesting, with potential for disturbance and or loss of habitat resulting from the proposal.
- Impacts on terrestrial fauna from loss or fragmentation of foraging and breeding habitat, impacts to dens, changes to food resources, changes in land use and fire regimes, disturbance of foraging or breeding, and mortality due to increased vehicle movements resulting from the proposal. In particular, this should describe impacts on rare and threatened species, migratory species, communities and habitats, listed under the relevant Schedules of the EPBCA and the TSPA potentially present, including:
 - Tasmanian devil (*Sarcophilus harrisi*) - Endangered (TSPA/EPBC). Evidence (prints and scats) was recorded in the proposal footprint. The Nol refers to ‘targeted surveys’ for Tasmanian devil dens and asserts that most of the proposal footprint represents ‘suboptimal habitat’ but with the possibility of natal dens remaining; and
 - Spotted-tailed quoll (*Dasyurus maculatus maculates*) - Endangered (TSPA/EPBC) Any other EPBC or TSPA listed species discovered during the survey work undertaken in preparation of the EIS.
 - Any other EPBC, NCA, TSPA or listed community or species discovered during the survey work undertaken in preparation of the EIS.
 - Impacts on the habitat and ecology of watercourses due to changes of drainage pattern, flow, or water quality, including freshwater ecosystems of high conservation management priority using the Conservation of Freshwater Ecosystem Values.
 - Impacts to listed threatened species and ecological communities as a result of dam seepage or a major dam failure, including species likely to occur downstream in the Pieman River catchment such as Australian Grayling (*Prototroctes maraena*) – Vulnerable (EPBC) (see Section 6.11).
 - Impacts on sites of geoconservation significance or natural processes (such as fluvial or coastal features), including Western Tasmanian Blanket Bogs, and sites of geo-conservation significance listed on the Tasmanian Geoconservation Database which underlie much of the proposal footprint, from:
 - Loss within the proposal footprint including the TSF, polishing ponds and borrow areas;
 - Damage due to track formation, trampling and vehicular passage; and
 - The potential for migration and/or introduction of pests, weeds and plant and animal diseases as a result of the proposal.
- Impacts on the extent, integrity or natural values of areas or habitats of conservation significance, with reference to the management objectives of the reserve(s) and the reserve management plan(s) (if any).
- Impacts on high quality wilderness areas identified in the Tasmanian Regional Forest Agreement (Tasmanian RFA) which may be affected by the proposal.
- Other species, sites or areas of landscape, aesthetic, wilderness, scientific, geodiversity or otherwise special conservation significance.

Method

General requirements for Biodiversity and natural values assessment

For the assessment of Biodiversity and natural values:

- The EIS must present baseline flora and fauna survey data which provides detailed, representative coverage of the total disturbance area as defined in response to Section 2 of these guidelines.
- Flora and fauna surveys must be undertaken by a suitably qualified person and, as a minimum, comply with the requirements of the document *Guidelines for Natural Values Assessments* published by the Department of Primary Industries, Parks, Water and Environment (DPIPWE) (<http://dPIPWE.tas.gov.au/conservation/development-planning-conservation-assessment/survey-guidelines-for-development-assessments>, the Commonwealth of Australia, 2011, Survey Guidelines for Australia's Threatened Mammals, and other relevant guidelines.
- The methodology for surveys should be developed in consultation with the Agency.
- Survey effort and baseline data evaluation should be consistent with the *Guidelines for Natural Values Assessments* and adequate to inform the assessment of impacts as described in the scope above and any other effects predicted in the EIS. Further effort is required to survey and characterise areas of the TSF footprint not previously accessed because of 'extremely dense scrub'.
- The assessment should include:
 - Details of surveys undertaken, including survey effort, coverage, timing, and an assessment of the adequacy of the surveys;
 - Mapping of existing vegetation types and locations of threatened species adequate to inform the statements made as part of the impact assessment;
 - Information detailing known/recorded populations and known or potential habitat, including habitat in the area surrounding the proposed action;
 - Details on whether any impacts are likely to be unknown, unpredictable, or irreversible;
 - Where impacts cannot be avoided, details of proposed measures to mitigate and/or offset adverse impacts on biodiversity and nature conservation values;
 - Details of proposed rehabilitation of disturbed areas following the completion of construction activities, including any proposed seed collection and progressive rehabilitation program; and
 - Description of any ecological monitoring proposed in advance of and during construction.
- The assessment of Biodiversity and Natural Values must be subject to a peer review (which should include a site-based evaluation) by a suitably qualified and experienced independent third-party.

Native vegetation communities and flora species

The assessment of native vegetation communities and flora species must include:

- Survey of those areas not covered by preliminary work presented in the NOL (see above).
- Conclusive evidence for the presence or absence of the EPBC listed community Tasmanian Forests and Woodlands dominated by black gum or Brookers Gum (*Eucalyptus ovata* / *E. brookeriana*) / (corresponding to the TPCA listed community *Eucalyptus brookeriana* wet forest (WBR). This should include additional survey work or, if appropriate, technical details such as annotated imagery, of how the frequency of canopy eucalypts was determined, and some

description of the visual criteria used in differentiating *E. brookeriana* canopies from other eucalypt species (i.e. distinctive canopy colour supported by field validation, capacity to see leaf shape or other distinctive morphological features). Vegetation community mapping should map out small patches of *E. brookeriana* dominated vegetation from the surrounding matrix. Assess whether this ecological community is likely to occur between the project area and Lake Pieman, and, if so, undertake surveys and assess impacts to the ecological community in those areas.

- Detailed reporting of any aerial surveys of vegetation communities undertaken in support of the EIS, including annotated photographs to support conclusions on vegetation community definitions.
- Threatened flora surveys of all the proposal footprint conducted at appropriate times of the year to detect threatened flora, including spring and summer flowering plants.

Avifauna

The assessment of avifauna must include:

- A survey for additional WTE nests, in areas of moderate to high nesting habitat suitability, based on data extracted from the WTE Nesting Habitat Model (represented by a grid score of >5), in the proposal footprint and an area 1 km from its boundary.

CAS notes that breeding eagles are particularly sensitive to aircraft approaching the nest. Helicopters are perceived as a greater threat than fixed wing aircraft, and may be attacked by eagles, risking both eagle and aircraft. In line with accepted practice, searches for eagle nests must be undertaken outside the breeding season (the timing of which should be confirmed with DPIPWE or the Forest Practices Authority for the year in question).

- A targeted Grey Goshawk nest search carried out in mature trees within the proposal footprint. If an active nest is discovered, disturbance within 100 m of the nest should be avoided and CAS should be contacted for further advice.
- A survey for Masked Owl roost/nest including:
 - An audio recording survey to minimise the risk of a potential Masked Owl roost/nest being overlooked.
 - For all potential nest trees, checking for signs of nesting (regurgitated pellets, whitewash, feathers at the base of the tree within the tree's dripline). Lack of these signs does not indicate an absence of nest but the presence of any of these signs can strongly indicate a nest hollow.
 - Tree tapping (firmly, with a hammer, heavy stick etc) to see if a bird is flushed from the hollow.
 - Broadcast (playback) surveys as advised for related species in the Survey Guidelines for Australia's Threatened Birds (Commonwealth of Australia, 2010).
 - Where necessary, additional survey methods may include use of cameras, manual observation at sunset and/or song meters. Note that that lack of vocalisation from call back cannot be taken as proof of absence (as masked owls can be notoriously silent even when known to be present).
- A survey for Swift Parrot (*Lathamus discolor*) – critically endangered (EPBC).
- A survey of appropriate methodology and timing for Tasmanian azure kingfisher on the riparian corridors potentially affected by the proposal, and elsewhere within 1 km along banks of Lake Pieman.
- Proposed mitigation and management measures to avoid disturbance to avifauna including restrictions to work within breeding seasons.

Terrestrial fauna

The assessment of terrestrial fauna must include:

- Tasmanian Devil surveys carried out in accordance with the Tasmanian Devils - Devil Survey Guidelines and Advice ([http://www.dpipwe.tas.gov.au/Documents/Devil Survey Guidelines and Advice.pdf](http://www.dpipwe.tas.gov.au/Documents/Devil%20Survey%20Guidelines%20and%20Advice.pdf)).
- Assessment of quality and extent of Tasmanian Devil breeding and foraging habitat
- Description of how any potential Tasmanian Devil den sites found to exist within the site will be managed, in accordance with the *Tasmanian Devil Survey Guidelines and Management Advice for Development Proposals* (the Devil Guidelines) available at: <http://dpipwe.tas.gov.au/conservation/development-planning-conservation-assessment/survey-guidelines-for-development-assessments>.
- Spotted-tailed quoll surveys (applying the Australian Survey Guidelines for Australia's Threatened Mammals (DSEPAC 2011)⁶).
- Mapping of suitable denning habitat to assist in determining a site layout that minimises impacts on devils and quolls.
- Analysis of roadkill risk for any phase where anticipated construction and operational traffic increases night-time (i.e. between one hour before dusk to one hour after dawn) traffic by more than 10% on Pieman Road or Helilog Road due to the proposal and analysis of roadkill risk on all new roads/tracks proposed, identifying high-risk roadkill areas.
- Description of roadkill mitigation measures implemented in accordance with the Devil Guidelines, including description of how staff movements, to and from the proposal footprint will be managed to minimise potential impacts to nocturnal, native fauna along prescribed access roads.

Habitat and ecology of watercourses

The assessment of habitat and ecology of watercourse impacts must include:

- Assessment to identify any freshwater ecosystems of high Conservation Management Priority Potential using the Conservation of Freshwater Ecosystem Values (CFEV) database. The scope of investigation should encompass the vicinity of the proposed development where there is likelihood of alteration to the existing environment.
- A survey for Australian Grayling (*Prototroctes maraena*) – vulnerable (EPBC Act), consistent with Survey guidelines for Australia's threatened fish: Guidelines for detecting fish listed as threatened under the EPBC Act (DSEWPC, 2011) should assessment of habitat indicate potential presence.

Geoconservation

The assessment of impacts on sites of geo-conservation significance must include:

- Detailed mapping and description of soils and geomorphology within the proposal footprint including validation from geomorphological survey and soils investigations.

Pests, weeds and plant and animal diseases

The assessment of impacts of *pests, weeds and plant and animal diseases* significance must include:

⁶ Australian Survey Guidelines for Australia's Threatened Mammals (DSEWPAC 2011) (<https://www.environment.gov.au/system/files/resources/blc6b237-12d9-4071-a26e-ee816caa2b39/files/survey-guidelines-mammals.pdf>)

- Mapping of weed occurrences particularly for areas to be disturbed by the proposal.
- Preparation of a Weed and Pathogen Management Plan, in accordance with the Department of Primary Industries, Parks, Water and Environment - Weed and Disease Planning Hygiene Guidelines – Preventing the spread of weeds and diseases in Tasmanian , for any activities with potential to import weeds or pathogens to the proposal footprint or spread them within it.

6.4.2 Legislative and policy requirements

Regard should be given to the Australia’s Biodiversity Conservation Strategy 2010-2030, the draft Tasmania’s Nature Conservation Strategy and Threatened Species Strategy for Tasmania, *Nature Conservation Act 2002*, *Forest Practices Act 1985*, *Forest Practices Regulations 2017*, the Forest Practices Code 2015 and Policy for Maintaining of the Permanent Native Forest Estate 2017.

All surveys should refer to relevant survey guidelines, including an assessment of the adequacy and appropriateness of the surveys with respect to these guidelines. Documents regarding listed threatened and migratory species can be found at: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

Assessments relating to EPBC Act listed threatened species and ecological communities should address the relevant Recovery Plans, Threat Abatement Plans and Approved Conservation Advice.

6.5 Air Quality

6.5.1 Assessment requirements

Scope

For construction, operation and closure describe potential impacts of the proposal on the local and regional air environment, including the impact of fugitive dust emissions on nearby sensitive human receptors and fauna.

Method

The air quality assessment must:

- Identify and characterise sources of potential dust generation during construction and operation of the proposed tailings storage facility.
- Identify sensitive receptors.
- With reference to climatic conditions, discuss any potential environmental impact of fugitive dust emissions from the proposal at sensitive receptors.
- Describe measures to reduce potential impact of dust movement from the site during construction and operation of the proposal.

6.5.2 Legislative and policy requirements

Consideration should be given to the requirements of the Tasmanian Environment Protection Policy (Air Quality) (see <http://epa.tas.gov.au/policy-site/Pages/Air-Quality-EPP.aspx>).

6.6 Noise emissions

6.6.1 Assessment requirements

Scope

For construction and operation describe impacts of the proposal on ambient noise levels and noise impacts on nearby sensitive human receptors and fauna.

Method

The noise assessment must include:

- Identification and description of all major sources of noise.
- A map of the location of all major sources of noise.
- Estimated sound power levels for all major noise sources for both construction and operation.
- Assessment of sound power levels and air over-pressure for any blasting activities required.
- Estimated noise levels resulting from the activity at nearby noise sensitive receptors.

6.6.2 Legislative and policy requirements

Consideration should be given to the requirements of the Tasmanian *Environment Protection Policy (Noise) 2009* (see [http://epa.tas.gov.au/policy/statutory-policies/state-policies-and-environment-protection-policies/environment-protection-policy-\(noise\)-2009](http://epa.tas.gov.au/policy/statutory-policies/state-policies-and-environment-protection-policies/environment-protection-policy-(noise)-2009)).

6.7 Waste management

6.7.1 Assessment requirements

Scope

Except for tailings (which are addressed in Section 2, 6.1, 6.2 and 6.3 as relevant), for construction and operation and closure phases, describe the impacts of waste generated by the proposal.

Method

The assessment of waste impacts must describe:

- The source, nature and quantities of all wastes, (liquid, atmospheric or solid) likely to arise, including sludges / residues, by-products from the various processing stages and general refuse.
- All waste streams other than tailings (including their physical and chemical composition).
- Methods and facilities proposed to collect, store, reuse, treat or dispose of each waste stream should be identified.
- Maintenance requirements for only waste facilities.
- The source, nature, quantity, and method of treatment, storage, and disposal for any controlled wastes.

6.7.2 Legislative and policy requirements

Waste management measures must be in accordance with the following hierarchy of waste management, arranged in decreasing order of desirability:

- Avoidance.
- recycling/reclamation.
- re-use.
- treatment to reduce potentially adverse impacts.
- disposal.

Controlled waste is defined in the EMPC Act and associated regulations. A non-exhaustive listing of categories of Controlled waste can be found on the internet at <http://epa.tas.gov.au/regulation/identify-a-material-as-a-controlled-waste>

6.8 Dangerous goods and environmentally hazardous materials

6.8.1 Assessment requirements

Scope

For construction, operation and closure phases, describe the impacts of the proposal in relation to dangerous goods and environmentally hazardous materials (any substance or mixture of substances of a nature or held in quantities which present a reasonably foreseeable risk of causing serious or material environmental harm if released to the environment and includes fuels, oils, waste and chemicals).

Method

The assessment of waste impacts must describe:

- The nature, quantity and storage location of all environmentally hazardous materials including Dangerous Goods (as defined in the Australian Code for the Transport of Dangerous Goods by Road and Rail) that will be used during the construction and operation of the proposal.
- A map showing the location of temporary and permanent storage areas for fuels, oils, and other dangerous goods or chemicals.

- The measures (such as bunded areas or spill trays) to be adopted to prevent or control any accidental releases of dangerous goods and environmentally hazardous materials.
- Contingency plans for when control measures/equipment breakdowns or accidental releases to the environment occur, including proposed emergency and clean-up measures and notification procedures.
- Identify any safety management requirements for the protection of human health and safety affecting the community.
- Particular reference should be made to the management of fuels, lubricants, processing inputs (reagents etc.) required for equipment during construction, processing and maintenance activities.

6.9 Greenhouse gases and ozone depleting substances

6.9.1 Assessment requirements

Scope

For construction, operation and closure phases describe the impacts of the proposal in relation to Greenhouse Gases and ozone depleting substances.

Method

The assessment of greenhouse gas and ozone depleting substances must describe:

The direct and indirect effects of the proposal on greenhouse gas production and ozone depleting substances and any greenhouse benefits of the proposal

- Provide an estimate of scope 1, scope 2 and total greenhouse gas emissions, energy production, and energy consumption for a year of operation. Calculators are available on the Australian Government Clean Energy Regulator website. Discuss potential annual variation that may occur. Scope 1 emissions should include greenhouse emissions associated with vegetation removal and soil disturbance.
- Demonstrate that the development will use cost-effective greenhouse best practice measures to minimise future greenhouse gas emissions.
- Include details of proposed measures to minimise emissions and the anticipated effectiveness of these measures. Where less emissions-intensive options are not adopted, provide sufficient justification and/or mechanisms to offset greenhouse gas emissions.
- Provide a competent estimate for 'whole of life' greenhouse gas emissions for the proposed development.
- Discuss impacts of the proposal in terms of the evolving national response to climate change and greenhouse gas emissions and the targets set in the Climate Change Action Plan 2017-2021.

6.9.2 Legislative and policy requirements

Discuss impacts of the proposal in terms of the evolving national response to climate change and greenhouse gas emissions and the targets set in the *Climate Change State Action Act 2008* and *Climate Smart Tasmania: A 2020 Climate Change Strategy*. Proponents will need to determine whether they are required to report to the Commonwealth under the *National Greenhouse and Energy Reporting Act 2007*.

6.10 Socio-economic issues

Scope

For construction, operation and closure phases discuss the social and economic impacts of the proposal.

Method

Details may include the following:

- An estimate of total capital investment for the proposal and where that capital will be expended (particularly in relation to the source of large capital items of processing equipment).
- Operational expenditures and revenues.
- The impacts on local and State labour markets for both the construction and operational phases of the proposal. The number and nature of direct and indirect jobs arising from the proposal must be detailed. Skills and training opportunities should also be discussed.
- The impacts on upstream/downstream industries, both locally and for the State.
- The extent to which raw materials, equipment, goods and services will be sourced locally.
- A qualitative assessment of impacts on present and potential future local social and community amenity values affected by the proposal, including recreational, cultural, health and sporting facilities and services. Any proposals to enhance or provide additional community services or facilities should be described.
- Community demographic impacts (changes to cultural background, occupation, incomes).
- Impacts on land values, and demand for land and housing.
- Impacts on the local, regional, state and national economies.
- Any publicly funded subsidies or services to be relied upon for the construction or operation of the proposal.
- Any impacts on Local, State and Federal Government rate, taxation and royalty revenues.

The extent to which socio-economic considerations need to be described depends on the nature and extent of any negative impacts or risks to the environment from the proposal.

Modest proposals with relatively low level and localised environmental impacts or risks may only need details of intended capital expenditure, operational expenditures, revenues, and employment (distinguishing between direct and indirect employment) and a qualitative discussion of other socio-economic aspects of particular relevance.

Proposals with higher level or broader scale environmental impacts will need a more comprehensive analysis of economic and social benefits to allow the Board to assess the benefits and adverse impacts of the proposal. This may include an explanation of the methods used to model impacts and describe the manner and results of engagement with the local community to determine their needs and aspirations in relation to the proposal.

6.11 Hazard analysis and risk assessment

A key part of the assessment of hazard and risk will be the assessment of risk of embankment failure and its consequences required under the *Water Management Act 1999* (see section 6.3.2). Provide a detailed summary of the risks and consequences of embankment failure as they relate to the environmental matters discussed in these guidelines.

Provide a preliminary analysis (appropriate to the scale of the proposal) of the potential for other major hazard events (such as an explosion, major tailings spill, fire) to occur and proposed safeguards

to prevent such an occurrence. The preliminary analysis should systematically identify all potential major hazards (internal and external) to people and the environment associated with the construction, operation, maintenance and decommissioning of the proposal.

6.12 Fire risk

Discuss the potential fire risk associated with the proposal, including:

- Consideration of fire within the site, fire escaping from the site and the impact of wildfire originating outside the development and the environmental impacts that could result from such an event.
- The objectives and management principles to be adopted to prevent and respond to potential fire events.
- Where a fire response plan is appropriate, it should be fully integrated with other relevant documents, such as a Tasmania Fire Service Local Area Fire Management Plan, a Forestry Tasmania Fire Management Plan and a Parks and Wildlife Service Fire Action Plan for relevant districts.

6.13 Infrastructure and off-site ancillary facilities

Discuss impacts of the proposal on any significant off-site or infrastructure facilities (including increased use of existing infrastructure, such as roads, ports and quarries), identify measures to avoid and mitigate any possible adverse impacts and assess the overall impacts following implementation of the proposed avoidance and mitigation measures. For example, upgrading or re-routing of roads, rail or other services required as a result of the proposal, should be detailed.

Identify roads and other infrastructure to be used by vehicles for the proposal (during both construction and operation). Potential environmental impacts associated with construction and use of such infrastructure should be assessed.

6.14 Cumulative and interactive impacts

Where relevant, this section should contain an assessment of the potential cumulative impacts of the proposal in the context of existing and approved developments in the region, if such impacts have not been addressed in previous sections.

Specifically, the assessment should:

Describe the cumulative impacts (in relation to the key issues identified in Section 6.3.1) the Proposal would have in combination with any other TSF proposed by MMG in the catchment of Lake Pieman, as well as any proposed future works to existing tailings facilities.

Other proposals which have been formally proposed, and for which there is sufficient information available to the proponent to allow a meaningful assessment of their impacts, should also be considered in that assessment. Uncertainties about potential impacts in such cases should be identified.

Interactions between biophysical, socio-economic and cultural impacts of the proposal should be discussed.

6.15 Environmental Impacts of Traffic

Identify the construction and operation traffic routes on new and existing roads, the volume and nature of traffic, timing of traffic flows, current usage of these roads and change in traffic volumes predicted as a result of the proposal.

Environmental impacts associated with current and altered traffic flows and usage should be discussed (such as noise and dust impacts on other roads users and residences adjacent to roads). The assessment should focus on roads within the land defined by the proposal but also indirect impacts on public roads.

The assessment of roadkill impacts on fauna should be presented in the section on Biodiversity and Natural Values in response to Section 6.4 of these guidelines, using the traffic data described above.

7. Monitoring and Review

Provide a summary of all monitoring, review and reporting programs described within Section 6 and include a map showing the location of all monitoring sites and a table of proposed monitoring including location, parameters and frequency.

Note that description of monitoring proposals within the relevant parts of Section 6 should be designed to meet the following objectives:

- Monitoring compliance with emission standards and other performance requirements identified in the EIS.
- Assessing the effectiveness of the performance requirements and environmental safeguards in achieving environmental quality objectives.
- Assessing the extent to which the predictions of environmental impacts in the EIS have eventuated.
- Assessing compliance with management measures defined in the EIS.

8. Site Decommissioning and Closure

Describe an on-going, staged approach to decommissioning and rehabilitation throughout the proposal life, including a conceptual closure plan, describing:

- Details of proposed TSF closure strategies including mechanisms to reduce the long-term potential for AMD formation and transport of contaminants and any ongoing water quality management requirements (with reference to the relevant parts of the EIS, responding to Sections 6.1, 6.2, 6.3 above).
- The decommissioning and removal of the pipe bridge, any pipelines and other infrastructure and details of any infrastructure to remain post closure.
- Any proposed staging of rehabilitation through the life of the TSF, including rehabilitation of borrow areas and other areas used solely for construction.
- Details of proposed cover strategies, cross referencing embankment construction and tailings management described in response to Section 2, including a preliminary post closure water balance for closure concept(s).
- Details of the proposed final landform and revegetation to support post mining land use.
- Details of the approximate quantities, types and sources of suitable cover materials required for TSF closure including any rock, clay and soils, with reference to the descriptions of borrow areas described in response to Section 2).
- Details of monitoring and maintenance required to ensure the long-term performance and integrity of rehabilitated structures/areas including the monitoring and maintenance required to ensure the long-term performance and integrity of the TSF.
- Provision of cost estimates for both unexpected early and planned final closure.
- Assessment of how differing climate change scenarios would influence the long term behaviour of the TSF closure concept(s).

9. Management systems

Provide an outline of the management systems which will be employed to implement the measures described in the EIS. Include, as relevant:

- Proposed environmental policies, environmental management systems, and environmental management plans.
- Organisational structure and environmental responsibility within that structure for the proposal.
- An outline Construction Environment Management Plan, summarising management arrangements required for the implementation of mitigation during the construction phase.

Provide a consolidated management measures table listing all management measures detailed throughout the EIS. Measures must be sequentially numbered, unambiguous statements of intent. For each measure, the table must specify when it is to be implemented and refer to the section of the EIS where the measure is detailed.

10. Conclusion

Describe the proposal and draw together the critical environmental, social and economic impacts of the proposal, both positive and negative. Present a balanced overview of the net impacts of the proposal, and the extent to which any adverse impacts can be satisfactorily avoided, mitigated, remediated or compensated and positive impacts promoted and sustained.

The conclusion should also describe how the proposal meets and furthers the objectives of relevant Commonwealth and State legislation, policies, plans and strategies. This should be done by itemising the RMPS and EMPCS objectives and providing a commentary about how the proposal addresses each of the objectives.

With regard to matters of national environmental significance, conclusions regarding the environmental acceptability of the proposal must be made. This should include discussion on compliance with the principles of Ecologically Sustainable Development (ESD) and the objects and requirements of the EPBC Act. To assist the proponent, the *National Strategy for Ecologically Sustainable Development* (1992) is available on the following web site: <https://www.environment.gov.au/about-us/esd/publications/national-esd-strategy>.

11. References

This section should provide details of authorities consulted, reference documents etc.

12. Appendices

As a means of improving readability of the EIS document, detailed technical information which supports the EIS should be included in appendices. The salient features of the appendices should be included in the main body of the EIS. Care should be taken to avoid inconsistencies between technical content of Appendices and the EIS itself, unless carefully explained.

13. Glossary

AMD - Acid and Metalliferous Drainage arising from the oxidation of sulphide minerals. For the purposes of this document also includes Near Neutral Metalliferous Drainage.

DPEMP – Development Proposal and Environmental Management Plan

EMPC Act – Environmental Management and Pollution Control Act 1994

EMPCS - Environmental Management and Pollution Control System objectives to be found in Schedule I of the EMPC Act

EPBC Act - Environment Protection and Biodiversity Conservation Act 1999 (Cth)

EPBC Regulations – Environment Protection and Biodiversity Conservation Regulations 2000 (Cth)

JAMBA/CAMBA - Japan-Australia and China-Australia Migratory Bird Agreements

Nol – Notice of Intent

PAF - Potentially Acid Forming

RMPS – Resource Management and Planning System of Tasmania objectives to be found in Schedule I of the EMPC Act

Tasmanian RFA - Tasmanian Regional Forest Agreement

TSF – Tailings Storage Facility

Appendix A: Other issues and agency contacts

In addition to a permit under the LUPA Act and the EMPC Act, there may be other legal requirements to allow your proposal to proceed. These may include other permits, licences, or landowner consent. You may also need to contact other Government agencies to obtain information for the purpose of assessment under the LUPA Act or the EMPC Act. The following list identifies some of the key agencies you may need to contact:

Note: your proposal may be referred to other agencies in the process of preparing guidelines. Should assessments or approval outside of the Board's responsibilities be required, the respective agency will engage with you to progress them.

Natural values including flora, fauna, and geoconservation values, or permits to deal with threatened species:

Conservation and Assessments Section

Telephone: (03) 6165 4395

Email: conservationassessments@dpipwe.tas.gov.au

Website: www.dpipwe.tas.gov.au

Historic cultural heritage, including State-level site listings, impacts and permits as required under the Historic Cultural Heritage Act 1995:

Heritage Tasmania

Telephone: (03) 6165 3700

Email: enquiries@heritage.tas.gov.au

Website: www.heritage.tas.gov.au

Note: Where works are proposed in or in close proximity to a heritage place entered on the Tasmanian Heritage Register or likely to be of heritage significance to the whole of Tasmania, and a permit is required under the *Land Use Planning and Approvals Act 1993*, the proposal will be referred to Heritage Tasmania by the planning authority. There may also be additional sites listed under local planning schemes, impacts on which are assessed by the relevant planning authority.

Aboriginal heritage, including desktop assessment, artefact survey requirements, permits:

Aboriginal Heritage Tasmania

Telephone: (03) 6165 3152

Email: aboriginal@heritage.tas.gov.au

Website: <http://www.aboriginalheritage.tas.gov.au>

Note: your proposal will be referred to Aboriginal Heritage Tasmania (AHT) on submission or referral to the Board. If Aboriginal Heritage matters are identified, AHT will engage directly with the proponent regarding relevant assessments and approvals.

Parks and reserves, including where any proposal may impact on land managed by the Parks & Wildlife Service:

Parks and Wildlife Service

Telephone: 1300 827 727



Website: www.parks.tas.gov.au and www.thelist.tas.gov.au

Crown land, including where any proposal may impact on land owned by the Crown:

Crown Land Services

Telephone: (03) 6233 6413

Email: cls.enquiries@dpipwe.tas.gov.au

Website: www.parks.tas.gov.au

State roads, including where any proposal requires works on or access from a State-managed road asset:

State Roads

Telephone: (03) 6166 3369

Email: permits@stategrowth.tas.gov.au

Website: www.transport.tas.gov.au