

Environment Effects Act 1978

SCOPING REQUIREMENTS

For

FINGERBOARDS MINERAL SANDS PROJECT ENVIRONMENT EFFECTS STATEMENT

March 2018



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List of Abbreviations

Kalbar Resources Ltd	the proponent
AH Act	Aboriginal Heritage Act 2006
CHMP	Cultural Heritage Management Plan
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
EE Act	Environment Effects Act 1978
EES	Environment Effects Statement
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMS	Environmental Management System
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
FFG Act	Flora and Fauna Guarantee Act 1988
IAU	Impact Assessment Unit (within DELWP)
km	kilometre
MRSD Act	Mineral Resources (Sustainable Development) Act 1990
MNES	Matters of national environmental significance
RAP	Registered Aboriginal Party
SEPP	State Environment Protection Policy
TRG	Technical Reference Group

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1 Introduction

In light of the potential for significant environmental effects, on 18 December 2016 the Victorian Minister for Planning (the Minister) determined under the *Environment Effects Act 1978* (EE Act) that Kalbar Resources Ltd (the proponent) should prepare an environment effects statement (EES) for the Fingerboards Mineral Sands Project (the project¹). The purpose of the EES is to provide a sufficiently detailed description of the proposed project, assess its potential effects on the environment² and assess alternative project layouts, designs and approaches to avoid and mitigate effects. The EES will inform and seek feedback from the public and stakeholders and enable the Minister to issue an assessment of the project under the EE Act at the conclusion of the process. The Minister's assessment will then inform statutory decision-makers responsible for the project's approvals.

The *Scoping Requirements for the Fingerboards Mineral Sands Project EES* (scoping requirements) set out the specific matters to be investigated and documented in Kalbar's EES.

While the scoping requirements are intended to cover all significant matters the EES will need to address any others that emerge during the EES investigations, as well as address other issues relevant to key statutory decisions such as the mining approvals under the *Mineral Resources (Sustainable Development) Act 1990*.

1.1 The project and setting

The proponent proposes to develop the project on an approximate area of 1,675 hectares within the eastern part of the Glenaladale mineral sands deposit in East Gippsland (Figure 1). The site is located near the Mitchell River and approximately two kilometres (km) south of Glenaladale, 4 km south-west of Mitchell River National Park and 20 km north-west of Bairnsdale, Victoria (Figure 2).

The proposal includes the development of an open pit mineral sands mine, two mining unit plants, wet concentrator plant (comprising mineral separation processing and tailings thickening and disposal plant), water supply infrastructure, tailings storage dam and additional site facilities (i.e. site office, warehouse, workshop, loading facilities and fuel storage). The proposed mining methods involve open pit mining to extract approximately 170 million tonnes of ore over a projected mine life of 20 years to produce 6 Mt of mineral concentrate. Heavy mineral concentrate, separated into magnetic and non-magnetic concentrates, are proposed to be transported via road, rail or a combination of both for export overseas.

The power demand for the mining unit plants and wet concentrator plant is estimated at 3,600 kVA, likely to be supplied from the electricity grid (with some upgrades likely required) and up to 3 gigalitres of water per annum.

1.2 Minister's requirements for this EES

The Minister's decision to require an EES included the procedures and requirements applicable to its preparation, in accordance with section 8B(5) of the EE Act. These requirements included the following matters for the EES to examine:

- effects on biodiversity and ecological values within and near the site, and associated with adjacent road reserves and riparian areas, including native vegetation, listed ecological communities and species of flora and fauna under the *Flora and Fauna Guarantee Act 1988* and other habitats and vulnerable and protected species;
- effects on surface water and groundwater hydrology, quality, availability for other uses and the aquatic ecology of water environments;

¹ Under the EPBC Act, projects are considered as "actions". For the purposes of this document the term "project" also means "the action".

²For the purpose of assessment of environmental effects under the EE Act, the meaning of 'environment' includes physical, biological, heritage, cultural, social, health, safety and economic aspects (*Ministerial Guidelines*, p. 2).

- effects on the land uses and landscape values of the site and surrounding areas, including the implications with respect to the Mitchell River National Park;
- effects on land stability, erosion and soil productivity associated with the construction and operation of the project, including rehabilitation works;
- effects on Aboriginal and non-Aboriginal cultural heritage values in the vicinity of the project site;
- potential effects of project construction and operation on air quality and noise on nearby sensitive receptors (especially residents);
- both positive and adverse socio-economic effects, at local and regional scales, potentially generated by the project, including indirect effects of the project construction workforce on the capacity of local community infrastructure; and
- solid and liquid waste that might be generated by the project during construction and operation.

These scoping requirements provide further detail on the specific matters to be investigated in the EES in the context of *Ministerial guidelines for assessment of environmental effects under the EE Act 1978* (Ministerial Guidelines).

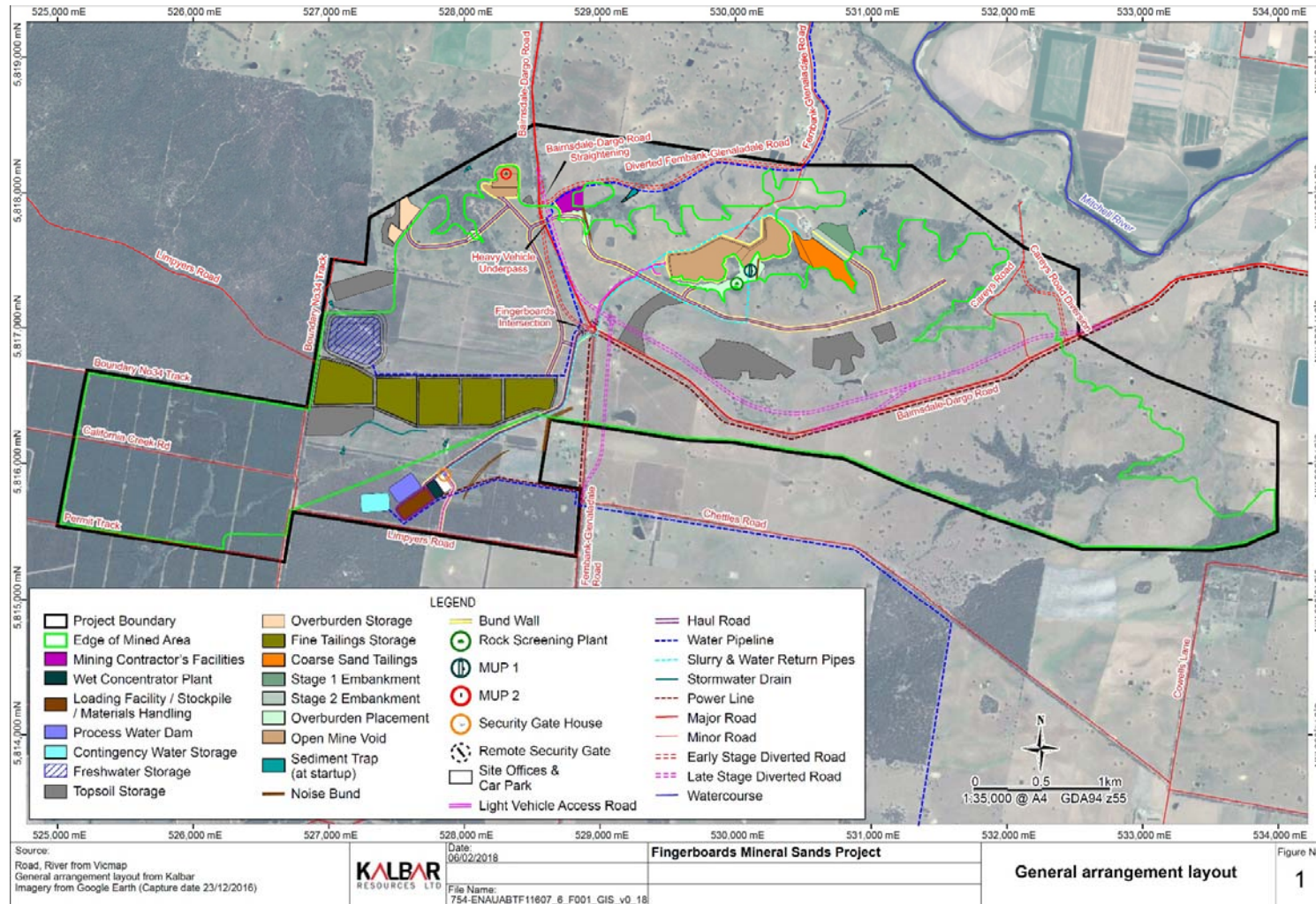


Figure 1: Project site and updated arrangement layout (source: Kalbar Resources, 2018).

2 Assessment process and required approvals

2.1 What is an EES?

An EES is prepared by the project's proponent to describe the project and its potential environmental effects. An EES should enable stakeholders and decision-makers to understand how the project is proposed to be implemented and the likely environmental effects of doing so. An EES has two main components.

1. The EES main report – An integrated, plain English document that sets out an analysis of the potential impacts of the project. The main report draws on technical studies, data and statutory requirements such as specific limits for surface water and groundwater quality and waste discharge to the environment, and should clearly identify which components of the scope are being addressed throughout.
2. The studies that inform the EES – Technical reports on expert investigations and analyses that provide the basis for the EES main report. They will be exhibited in full, as appendices to the main report.

The potential impacts that require technical studies are set out in Section 4 of this document.

2.2 The EES process

The proponent is responsible for preparing the EES, including conducting technical studies and undertaking stakeholder consultation. The Department of Environment, Land, Water and Planning (DELWP) is responsible for managing the EES process. This EES process has the following steps:

- preparation of a draft study program and draft schedule by the proponent (completed);
- preparation and exhibition of draft scoping requirements by DELWP on behalf of the Minister (completed) with public comments received during the advertised exhibition period;
- finalisation and issuing of scoping requirements by the Minister (current step);
- review of the proponent's EES studies and draft documentation by DELWP and a technical reference group (TRG) as well as peer review for key EES studies³;
- completion of the EES by the proponent;
- review of the complete EES by DELWP to establish its adequacy for public exhibition;
- exhibition of the proponent's EES and invitation for public comment by DELWP on behalf of the Minister;
- appointment of an inquiry by the Minister to review the EES and public submissions received, conduct public hearings and provide a report to the Minister; and finally
- following receipt of the inquiry report, the Minister provides an assessment of the project inform for decision-makers.

Further information on the EES process can be found on the department's website⁴.

Technical reference group

DELWP has convened a TRG, comprised of representatives of relevant state government agencies and departments and relevant local councils to advise it and the proponent on:

- applicable policies, strategies and statutory provisions;
- the scoping requirements for the EES;
- the design and adequacy of technical studies for the EES;
- the proponent's public information and stakeholder consultation program for the EES;
- responses to issues arising from the EES investigations;
- the technical adequacy of draft EES documentation; and
- coordination of statutory processes.

Consultation

³ For critical EES studies peer review by an external, independent expert may be deemed appropriate (by DELWP in consultation with the TRG).

⁴ www.delwp.vic.gov.au/environmental-assessment.

The proponent is responsible for informing and engaging the public and stakeholders to identify and respond to their issues in conjunction with the EES studies. Stakeholders include potentially affected parties, the local community and interested organisations and individuals, as well as government bodies. Under its EES consultation plan the proponent informs the public and stakeholders about the EES process and associated investigations and provides opportunities for input and engagement during the EES investigations. The consultation plan is reviewed and amended in consultation with DELWP and the TRG before it is published on the DELWP website. The final plan will:

- identify stakeholders;
- characterise public and stakeholders' interests, concerns and consultation needs and potential to provide local knowledge and inputs;
- describe consultation methods and schedule; and
- outline how public and stakeholder inputs will be recorded, considered and/or addressed in the preparation of the EES.

Approvals coordination with the EES process

The project may require a range of approvals under Victorian legislation. DELWP coordinates the EES process as closely as practicable with the approvals procedures, consultation and public notice requirements. Figure 3 outlined the steps in the EES process and the parallel coordination of statutory processes.

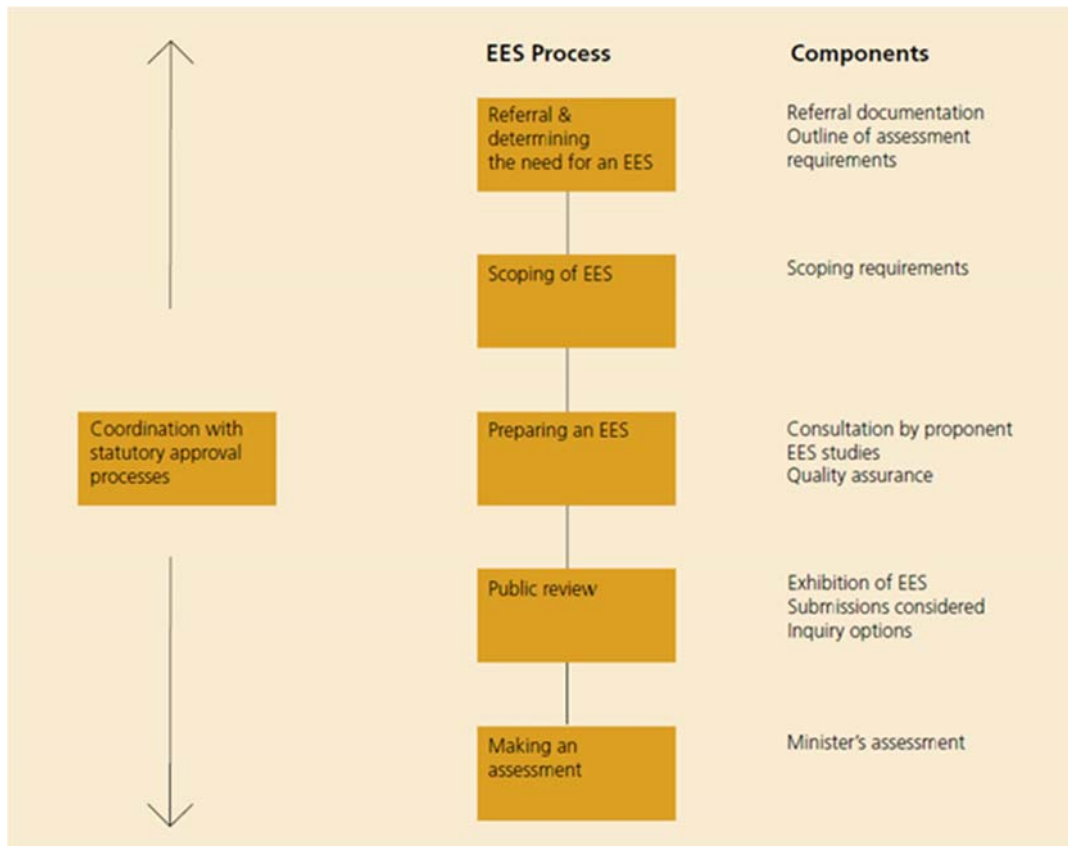


Figure 3: Coordination of statutory assessment and approvals processes.

Building, works and development of land associated with a mining project (within the Mining Licence area) are exempt from the permit requirements under the local planning scheme (i.e. the East Gippsland and Wellington Planning Schemes), providing the project is assessed via an EES and Minister's Assessment under the EE Act prior to statutory decisions being made under the *Mineral Resources (Sustainable Development) Act 1990* (MRDS Act).

To facilitate the integrated consideration of issues and the timely completion of required approval processes, it is recommended that the EES include a draft work plan prepared in-line with requirements under the MRSD Act.

The EES will not address any approvals which may be required for specific uses of the rehabilitated land that might be proposed following conclusion of mining.

2.3 Accreditation of the EES process under the EPBC Act

The project was also referred to the Australian Government under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate for the Commonwealth Minister for the Environment and Energy determined on 6 July 2017 that the project is a 'controlled action', as it is likely to have a significant effect on the following matters of national environmental significance (MNES), which are protected under Part 3 of the EPBC Act:

- Ramsar wetlands (sections 16 and 17B);
- listed threatened species and communities (sections 18 and 18A);
- listed migratory species (sections 20 and 20A); and
- nuclear actions (sections 21 and 22A).

The EES is an accredited assessment process under the EPBC Act through a Bilateral Assessment Agreement that exists between the Commonwealth and State of Victoria. The Commonwealth Minister or delegate will decide whether the project is approved, approved with conditions or refused under the EPBC Act, after having considered the Minister for Planning's assessment under the EE Act. Note that what are generally termed 'effects' in the EES process corresponds to 'impacts' defined in section 82 of the EPBC Act.

3 Matters to be addressed in the EES

3.1 General approach

The EES should assess the environmental effects⁵ arising from all components and stages of the project. The assessment should include:

- the potential effects on individual environmental assets – magnitude, extent and duration of change in the values of each asset – having regard to intended avoidance and mitigation measures;
- the likelihood of adverse effects and associated uncertainty of available predictions or estimates;
- further management measures that are proposed where avoidance and mitigation measures do not adequately address effects on environmental assets, including specific details of how the measures address relevant policies; and
- the likely residual effects, including on relevant MNES, that are likely to occur after all proposed measures to avoid and mitigate environmental effects are implemented.
- An analysis on the acceptability of effects on all MNES.

Further advice on the approach to be adopted in preparing the EES is provided in Section 4.

3.2 General content and style of the EES

The content of the EES and related investigations is to be guided by these scoping requirements and the Ministerial Guidelines. To facilitate decisions on required approvals, the EES should address statutory requirements associated with approvals that will be informed by the Minister's Assessment, including relevant decision-making under the EPBC Act. The EES should also address any other significant issues that emerge during the investigations.

Ultimately it is the proponent's responsibility to ensure that adequate studies are undertaken and reported to support the assessment of environmental effects and that the EES has effective internal quality assurance in place. Close consultation with DELWP and the TRG during the investigations and preparation of the EES will be necessary to minimise the need for revisions prior to authorisation of the EES for public exhibition.

The main EES report should provide a clear, well-integrated analysis of the potential effects of the proposed project, including proposed avoidance, mitigation and management measures, as well as relevant alternatives. Overall, the main report should include the following:

- an executive summary of the potential environmental effects of the project, including potential effects on identified MNES outlined in section 4;
- a description of the entire project, including its objectives, rationale, key elements, associated requirements for new infrastructure and use of existing infrastructure;
- a description of the approvals required for the project to proceed, and its relationship to relevant policies, strategies, guidelines and standards;
- a description of relevant alternatives capable of substantially meeting the project's objectives that may also offer environmental or other benefits (as well as the basis for the choice where a preferred alternative is nominated);
- descriptions of the existing environment, where this is relevant to the assessment of potential effects;
- appropriately detailed assessments of potential effects of the project (and relevant alternatives) on environmental assets and values, relative to the "no project" scenario, together with an estimation of likelihood and degree of uncertainty associated with predictions;

⁵Effects include direct, indirect, combined, consequential, short and long-term, beneficial and adverse effects.

- intended measures for avoiding, minimising, managing and monitoring effects, including a statement of commitment to implement these measures;
- predictions of residual effects of the project assuming implementation of proposed environmental management measures;
- any proposed offset measures where avoidance and mitigation measures will not adequately address effects on environmental values, including the identified MNES, and discussion of how any offset package proposed meets the requirements of the *EPBC Act Environmental Offsets Policy* as it relates to MNES;
- responses to issues raised through public and stakeholder consultation;
- evaluation of the implications of the project and relevant alternatives for the implementation of applicable legislation and policy, including the principles and objectives of ecologically sustainable development and environmental protection; and
- a description of the environmental performance regime and track record of the proponent, including relevant experience in delivering and operating similar projects, as well as the organisation's health, safety and environmental policies.

The proponent must also prepare a concise non-technical summary document (hard copy A4) for free distribution to interested parties. The EES summary document should include details of the EES exhibition, public submission process and availability of the EES documentation.

3.3 Project description

The EES is to describe the project in sufficient detail both to allow an understanding of all components, processes and development stages, and to enable assessment of their likely potential environmental effects. The project description should canvass the following:

- Contextual information on the project, including its objectives and rationale, its relationship to relevant statutory policies, plans and strategies (if relevant), including the basis for selecting the area proposed to be mined within the broader mineral sands deposit and implications of the project not proceeding.
- Land use activities (including beneficial and sensitive uses) in the project area and vicinity, supported by plans and maps where applicable.
- Details of all the project components, to the extent practicable, including:
 - location, footprint, layout and access arrangements during site establishment, construction and operation;
 - design, methods, staging and scheduling of the proposed mining, including direction and timing of mining across the site and its operational life, volumes to be mined (overburden and ore), total production and production rate and timing of expected decommissioning, closure and rehabilitation;
 - function and design principles and capacity of main components of works, including overburden handling, ore extraction (including reagents to be used), mineral separation, tailings management and electricity supply and use;
 - water resources for operational use, including details on storage provisions, daily and annual use (including an operation and post-closure water balance);
 - necessary works directly associated with the project, such as an infrastructure and services upgrade and relocation, or augmentation of existing plant and facilities, including potential construction of roads and other linear services required for transporting ore and heavy mineral concentrate on and off-site;
 - proposed construction techniques and extent of areas to be disturbed during site establishment and construction, including total area expected to be cleared, particular requirements for traffic and floodwater management, dust and noise management, as well as for sensitive environmental locations;
 - solid waste, wastewater and hazardous material generation and management during operation, including transportation and storage of hazardous material on-site and off-site;
 - lighting, safety and security requirements during site establishment, construction, operation, decommissioning and site rehabilitation;

- hours of operation, workforce requirements (total work force) and recruitment policies during construction, operation, decommissioning and site rehabilitation; and
- approach to be taken regarding mine site rehabilitation, including progressive rehabilitation and mine-closure.

3.4 Project alternatives

The EES should document the proponent's consideration of relevant alternatives, including the "no project" scenario, and include an explanation of how specific alternatives were shortlisted for evaluation within the EES. The EES should investigate and document the likely environmental, social and economic effects of the alternatives, particularly where these offer a potential to achieve beneficial environmental, social and economic outcomes and are capable of meeting the objectives of the project. The discussion of relevant alternatives should include:

- the basis for selecting the area proposed to be mined within the broader boundaries of the exploration licence, in the context of the concept mine plan, including alternatives for the layout and staging of the mine;
- the site selection process for any ancillary infrastructure/facilities, including the processing facilities;
- the technical feasibility and environmental implications of alternative construction, mining, ore processing, tailings management and site rehabilitation methods; and
- relevant alternatives for electricity, water, gas and fuel supply, transport of products and workers and solid and liquid waste disposal.

Where appropriate, the assessment of environmental effects of relevant alternatives is to address the matters set out in the subsequent sections of this document. The depth of investigation of alternatives should be proportionate to their potential to minimise potential adverse effects as well as meet project objectives.

3.5 Applicable legislation, policies and strategies

The EES will need to identify relevant legislation, policies, guidelines and standards, and assess their specific requirements or implications for the project, particularly in relation to required approvals, including (but not limited to):

- *Environment Effects Act 1978*;
- *Environment and Protection Biodiversity Conservation Act 1999* (Cth);
- *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act) and associated regulations and guidelines⁶;
- *Environment Protection Act 1970* (EP Act), *Environment Protection (Industrial Waste Resource) Regulations 2009*, as well as relevant State Environment Protection Policies (SEPPs) and related documents including SEPP (Groundwaters of Victoria) and SEPP (Waters of Victoria)⁷, SEPP (Prevention and Management of Contamination of Land), SEPP (Ambient Air Quality), SEPP (Air Quality Management) and Environment Protection (Industrial Waste Resource) Regulations;
- *Public Health and Wellbeing Act 2008* (PHW Act);
- Noise from Industry in Regional Victoria (NIRV) 2011, EPA Publication No. 1411 and Applying NIRV to the proposed and existing industry EPA Publication No. 1413;
- Protocol for Environmental Management: Mining and extractive industries, EPA Publication No. 1191, December 2007 (PEM);
- *Planning and Environment Act 1987* (P&E Act), and relevant provisions in the East Gippsland and Wellington Planning Schemes;

⁶As noted in Section 2.2, the project does not require permits under the East Gippsland and Wellington Planning Schemes because of an exemption provided under the MRSD Act. Notwithstanding this, in preparing the EES the proponent should have regard to relevant elements of the planning scheme that relate to the draft evaluation objectives.

⁷New SEPP (Waters) may be the relevant policy. This is due for finalisation in mid-2018. It will incorporate and include SEPPs Groundwater of Victoria and Waters of Victoria.

- *Water Act 1989*;
- *Catchment and Land Protection Act 1994* (C&LP Act);
- *Conservation, Forests and Land Act 1987* (CF&L Act);
- *Crown Land (Reserves) Act 1978*;
- *Climate Change Act 2017*;
- *Land Act 1958*;
- *Flora and Fauna Guarantee Act 1988* (FFG Act);
- *Wildlife Act 1975*;
- *Forests Act 1958*;
- *National Parks Act 1975*;
- *Radiation Act 2005* and relevant regulations;
- *Road Management Act 2004*;
- *Aboriginal Heritage Act 2006* (amended 2016) and Aboriginal Heritage Regulations 2007;
- *Traditional Owners Settlement Act 2010*;
- *Heritage Act 1995*;
- *Heritage Rivers Act 1992*; and
- *Native Title Act 1993* (Cth).

The proponent will also need to identify and address other relevant policies, strategies, subordinate legislation and related management or planning processes that may be relevant to the assessment of the project and relevant roadside management strategies under the East Gippsland and Wellington Planning Schemes. These include, but are not limited to:

- Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines (2013);
- Preparation of Work Plans and Work Plan Variations using RRAM – Guidelines for Mining Projects (2017);
- Guidance Material for the Assessment of Geotechnical Risks in Open Pit Mines and Quarries;
- Management of Water in Mines and Quarries;
- Management of Tailings Storage Facilities;
- Community Engagement Guideline for Mining and Mineral Exploration;
- Rehabilitation and Environmental Aspects of Mining and Extractive Work Plans;
- ANZMEC/MCA Strategic Framework for Mine Closure (2000);
- Mine Rehabilitation Leading Practice Sustainable Development Program for the Mining Industry (2016);
- Mine Closure Leading Practice Sustainable Development Program for the Mining Industry (2016);
- Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Radiation Protection Series;
- DEDJTR Rehabilitation Plans and Other Environmental Aspects of Work Plans (2004);
- CSIRO Guidelines for Open Pit Slope Design (2009);
- Australian Groundwater Modelling Guidelines (2012);
- ARPANSA Radiation Protection of the Environment Guide G-1 (2015);
- East Gippsland Regional Catchment Strategy (2013);
- West Gippsland Regional Catchment Management Strategy;
- East Gippsland Waterway Strategy (2013);
- West Gippsland Waterway Strategy (2014);
- Gippsland Lakes Ramsar Site Management Plan (2015);
- Gippsland Regional Forest Agreement (2000);
- Protecting Victoria's Environment – Biodiversity (2037); and
- EPBC Act policy statements, conservation advices, threat abatement plans and recovery plans for nationally listed threatened species and ecological communities and nationally listed migratory species.

3.6 Consultation

The proponent is responsible for informing and consulting with the public and stakeholders throughout the preparation and exhibition of the EES, in accordance with a suitable EES consultation plan (Section 2.2). The

EES should document the process and results of the consultation undertaken by the proponent during the preparation of the EES, including:

- issues raised and suggestions made by stakeholders or members of the public; and
- the proponent’s responses to these issues, in the context of the EES studies and the associated consideration of mitigation measures.

The EES should also provide an outline of a program for community consultation, stakeholder engagement and communications proposed for implementation of the project, including opportunities for local stakeholders to engage with the proponent to seek responses to issues that might arise during project implementation.

3.7 Draft evaluation objectives

The project will need to consider a balance of economic, social and environmental outcomes that contribute to ecologically sustainable development and provide a net community benefit over the short and long-term through its assessment of the project against the evaluation objectives.

Table 1 includes draft evaluation objectives that identify desired outcomes in the context of potential project effects and relevant legislation. During the development of the EES the proponent can consider refining the objectives and proposed evaluation framework, as well as develop specific assessment criteria to assist the evaluation of effects.

The framing of the draft objectives reflects the key subject matters to be investigated for the EES, relevant legislation and policies (Section 3.5), the objectives and principles of ecologically sustainable development and environmental protection, as well as environmental issues identified by the proponent in the referral documentation.

The level of effort applied to the investigation, management and mitigation of issues in the context of the draft evaluation objectives should be proportionate to the significance of potential adverse effects (Section 4). The proponent should consult closely with DELWP Impact Assessment Unit and the TRG throughout the preparation of the EES to ensure that the investigation of issues is undertaken soundly and appropriately targeted.

Table 1: Draft evaluation objectives.

Draft evaluation objective	Key legislation
Resource development – To achieve the best use of available mineral sands resources, in an economic and environmentally sustainable way, including while maintaining viability of other local industries.	MRSD Act
Biodiversity – To avoid or minimise potential adverse effects on native vegetation, listed threatened and migratory species and ecological communities, and habitat for these species, as well as address offset requirements for residual environmental effects consistent with state and Commonwealth policies.	MRSD Act, FFG Act, P&E Act, Wildlife Act, CF&L Act, Radiation Act, EPBC Act
Water, catchment values and hydrology – To minimise effects on water resources and on beneficial and licensed uses of surface water, groundwater and related catchment values (including the Gippsland Lakes Ramsar site) over the short and long-term.	MRSD Act, EP Act, C&LP Act, Radiation Act, SEPPs, Water Act, EPBC Act
Amenity and environmental quality – To protect the health and wellbeing of residents and local communities, and minimise effects on air quality, noise and the social amenity of the area, having regard to relevant limits, targets or standards.	MRSD Act, EP Act, SEPPs, PEM, P&E Act, Road Management Act, Radiation Act, PHW Act, EPBC Act

Draft evaluation objective	Key legislation
<p>Social, land use and infrastructure – To minimise potential adverse social and land use effects, including on, agriculture (such as dairy irrigated horticulture and grazing), forestry, tourism industries and transport infrastructure.</p>	<p>MRSD Act, P&E Act, CF&L Act, Forests Act, PHW Act, EPBC Act</p>
<p>Landscape and visual – To avoid adverse effects on the landscape and recreational values of the Mitchell River National Park and minimise visual effects on the open space areas.</p>	<p>MRSD Act, P&E Act, National Parks Act, EPBC Act</p>
<p>Cultural heritage – To avoid or minimise adverse effects on Aboriginal and non-Aboriginal cultural heritage.</p>	<p>AH Act, Heritage Act, P&E Act, Heritage Rivers Act, Traditional Owners Settlement Act, Native Title Act, EPBC Act.</p>
<p>Rehabilitation – To establish safe progressive rehabilitation and post-closure stable rehabilitated landforms capable of supporting native ecosystems and/or productive agriculture that will enable long-term sustainable use of the project area.</p>	<p>MRSD Act, C&LP Act, Radiation Act, Water Act, EPBC Act.</p>

3.8 Environmental Management Framework

The EES will need to outline a transparent framework with clear accountabilities for managing and monitoring environmental effects and hazards associated with construction, operation, decommissioning, rehabilitation and post-closure phases of the project in order to achieve acceptable environmental outcomes (Section 5).

4 Assessment of specific environmental effects

Preparation of the EES document and the necessary investigation of effects should be consistent with the principles of a systems approach and proportionality to risk, as outlined in the Ministerial Guidelines (p. 14). A risk-based approach should be adopted during the EES studies, so that a greater level of effort is directed at investigating and managing those matters that pose relatively higher risk of adverse effects. The following sections set out specific requirements for the assessment of effects, using the following structure for each draft evaluation objective.

Effects must include discussion of all potential direct, indirect, on-site and off-site effects as result of the proposed action. The description and assessment of effects must not be confined to the immediate area of the proposed action but must also consider the potential of the proposed action to impact on adjacent areas that are likely to contain habitat for MNES, including conservation reserves, and along proposed transportation routes and facilities used for off-site storage of heavy mineral concentrate.

Key issues or risks that the project poses to the achievement of the draft evaluation objective. In addition to addressing the highlighted issues, the proponent might undertake an appropriate environmental risk assessment.

Priorities for characterising the existing environment to underpin predictive impact assessments having regard to the level of risk. Any risk assessment by the proponent could guide the necessary data gathering.

Design and mitigation measures that could substantially reduce and/or mitigate the risk of significant effects.

Assessment of likely effects through predictive studies or estimates of effects that are reasonably likely, as well as evaluation of their significance, having regard to their likelihood.

Approach to manage performance measures that are proposed to manage risks of effects, assuming that identified design and mitigation measures are applied, to achieve appropriate outcomes. This should inform the assessment of likely residual effects (assuming proposed measures are implemented) and consideration of relevant environmental offsets where applicable.

4.1 Resource development

Draft evaluation objective

To achieve the best use of available mineral sands resources, in an economic and environmentally sustainable way, including while maintaining viability of other local industries.

Key issues

- Opportunity for development of a known mineral sands resource.
- Efficient and environmentally sustainable mining of available resources.
- Best use of land's resources considering environmental, agricultural and forest values.
- Potential impacts on the existing local industries, businesses and landholders.
- Impact of commodity price fluctuation on project sustainability.

Priorities for characterising the existing environment

- Identify the extent, nature and development potential of the ore body, and composition of heavy mineral concentrate, including radiological content and activity levels.
- Identify the composition of tailings and waste material, including radiological content and activity levels.
- Identify opportunities for local workers and suppliers of goods and services that could support the project.
- Describe local industries in the vicinity of the project which could be affected by the construction, operation, decommissioning and rehabilitation of the project, including agriculture and forestry.

Design and mitigation measures

- Describe alternative mine configurations to access mineral sands reserves (including location of the project's infrastructure) and strategies for management and disposal of tailings and waste material to avoid and minimise impacts and potential sterilisation of future reserves.
- Describe off-site activities including transportation and storage of heavy mineral concentrate;
- Describe methods and strategies to demonstrate the radioactivity of tailings and waste materials stays within environmentally acceptable exposure levels.
- Describe alternative methods of site preparation which could optimise site rehabilitation, including potential for future productive land uses.
- Outline measures to enhance potential benefits to local and regional businesses and minimise potential adverse effects to local land-uses and businesses.

Assessment of likely effects

- Assess the project feasibility including the predicted economic costs and benefits from construction and operation of the project, including capital investment, operating expenditure, employment and business opportunities, taxes and royalties to the regional, state and national economies, and the temporary and permanent impacts on agriculture, forest resources, tourism and businesses.

Approach to manage performance

- Describe key elements of the proposed mine work plan to enable monitoring of efficient resource recovery.

4.2 Biodiversity

Draft evaluation objective

To avoid or minimise potential adverse effects on native vegetation, listed threatened and migratory species and ecological communities, and habitat for these species, as well as address offset requirements for residual environmental effects consistent with state and Commonwealth policies.

Key issues

- Direct loss of native vegetation and any associated listed threatened flora and fauna species and communities known or likely to occur in the project site, such as Herb-rich Forest, Plains Grassy Forest, Plains Grassy Woodland, Valley Grassy Forest, Plains Grassy Wetlands and Aquatic Herbland.
- Loss of, degradation, modification or hydrological alteration to any associated ecological communities listed as threatened under the EPBC Act, including but not limited to: Gippsland red gum (*Eucalyptus tereticornis* subsp. *mediana*) grassy woodland and associated native grassland; Seasonal herbaceous wetlands (freshwater) of the temperate lowland plains
- Loss of, or degradation to habitat for flora and fauna species listed as threatened under the EPBC Act, the FFG Act and/or DSE Advisory List, including but not limited to: Giant burrowing frog (*Heleioporus australiacus*), New Holland mouse (*Pseudomys novaehollandiae*), Long-nosed potoroo (*Potorous tridactylus tridactylus*), Regent honeyeater (*Anthochaera phrygia*), Dwarf kerrawang (*Commersonia prostrata*), Gaping leek-orchid (*Prasophyllum correctum*), Swamp everlasting (*Xerochrysum palustre*), Dwarf galaxias (*Galaxiella pusilla*), Australian grayling (*Prototroctes maraena*), Australian painted snipe (*Rostratula australis*), Growling grass frog (*Litoria raniformis*), Green and golden bell frog (*Litoria aurea*), Australasian bittern (*Botaurus poiciloptilus*); and any other protected species.
- Indirect loss of vegetation or habitat quality resulting from hydrological change, edge effects, habitat fragmentation or other disturbance impacts, that may support any listed species or other protected fauna, including those specified above.
- Direct loss or degradation of habitat for fauna listed as migratory under the EPBC Act including but not limited to little tern (*Sterna albifrons*), red-necked stint (*Calidris ruficollis*) and the sharp-tailed sandpiper (*Calidris acuminata*).

- The potential for adverse effects on biodiversity values of the Gippsland Lakes Ramsar wetland of international importance including, but not limited to: Green and golden bell frog (*Litoria aurea*), Growling grass frog (*Litoria raniformis*), Australian painted snipe (*Rostratula australis*), Australian grayling (*Prototroctes maraena*), Dwarf kerrawang (*Commersonia prostrata*), Swamp everlasting (*Xerochrysum palustre*), Metallic sun-orchid (*Thelmyitra epipactoides*), Red-necked stint (*Calidris ruficollis*), Black swan (*Cygnus altratus*), Sharp-tailed sandpiper (*Calidris acuminata*), Chestnut teal (*Anas castanea*), Musk duck (*Biziura lobata*), Fairy tern (*Sterna nereis*), Little tern (*Sterna albifrons*).
- Potential for other indirect significant effects on biodiversity values including but not limited to these effects associated with changes in hydrology (including surface and ground water changes), hydrogeology, water quality (i.e. on water dependent ecosystems), contaminants and pollutants (including nuclides), dust emissions, weed, pathogen and pest animal, and risk of significantly increasing mortality of FFG and EPBC Acts listed species resulting from mine-related activities (e.g. road traffic).
- Potential for indirect significant effects on biodiversity values as a result of off-site activities including transportation and storage of heavy mineral concentrate;
- The availability of suitable offsets for the loss of native vegetation and habitat for relevant listed threatened species, ecological communities and migratory species under the EPBC Act and /or FFG Act.

Priorities for characterising the existing environment

- Characterise the distribution and quality of native vegetation, terrestrial and aquatic habitat and any wildlife movement in the area, taking into account the potential changes in composition due to recent bushfires, that could be impacted by the project.
- Identify the existing or likely presence of any species listed under the EPBC Act, FFG Act and DELWP Advisory List, as well as declared weeds, pathogens and pest animals⁸.
- Identify and characterise any groundwater dependant ecosystems that may be affected, in particular by mine dewatering. This characterisation is to be informed by relevant data, literature and appropriate seasonal or targeted surveys.
- Describe the biodiversity values that could be affected by the project, including:
 - native vegetation and any ecological communities listed under the EPBC Act and FFG Act;
 - presence of, or suitable habitats for, native flora and fauna species, in particular species listed under the EPBC Act, FFG Act, and DELWP Advisory List; and
 - use of the site and its environs for movement by the EPBC Act, FFG Act, and DELWP Advisory List listed fauna species.
- Describe the existing threats present to biodiversity values, including:
 - direct removal of individuals or destruction of habitat;
 - disturbance or alteration of habitat conditions (e.g. habitat fragmentation, changes to water quantity or quality, fire hazards, etc.);
 - threats to mortality of listed threatened fauna; and
 - the presence of any declared weeds, pathogens and pest animals within and in the vicinity of the project area.

Design and mitigation measures

- Identify potential and proposed design options and measures which avoid or minimise significant effects on native vegetation and any listed ecological communities or flora and fauna species and their habitat.
- Describe further potential and proposed design options and measures which could avoid or minimise the risk of spills or failure of the mine infrastructure (i.e. transportation spills, tailing storage facility, pipe and pump network).

⁸ Note that targeted surveys for MNES must be undertaken in accordance with current Departmental guidelines and policy statements.

Assessment of likely effects

- Identify and assess likely direct and indirect effects of the project and relevant alternatives on native vegetation, ecological communities and flora species, in particular any species listed under the FFG Act.
- Identify and assess likely direct and indirect effects of the project and relevant alternatives on native fauna and their habitat, including listed (FFG Act/EPBC Act) threatened and migratory species and communities, relative to existing hazards and risks where relevant.
- Identify and assess likely effects of the project and relevant alternatives on any groundwater dependant ecosystems and EPBC Act listed ecological communities, in particular due to mine dewatering.

Approach to manage performance

- Describe and evaluate proposed measures to further mitigate and manage residual effects of the project on biodiversity values, including a proposed offset strategy that sets out and includes evidence of the offsets that have been secured or are proposed to satisfy Victorian offset requirements.
- Describe and evaluate the approach to develop contingency measures to be implemented in the event of adverse residual effects (direct and indirect) on flora, fauna and ecological community values requiring further management.
- Identify any further methods proposed to manage risks and effects on other biodiversity values and native vegetation, including as part of the EMF (see section 4.9)

Commonwealth offsets

- Describe and evaluate proposed measures to manage and offset predicted residual effects of the project on biodiversity values (MNES) protected under the EPBC Act.
- Include a proposed offset package and an Offset Management Plan (OMP) that sets out proposed environmental offsets to compensate for predicted residual impacts on MNES, ensuring they meet Commonwealth requirements.
- Describe how the offset will be secured, managed and monitored, including management actions, responsibility, timing, performance measures and the specific environmental outcomes to be achieved.
- Outline the key commitments and management actions for delivering and implementing a proposed offset package through the OMP.

4.3 Catchment values

Draft evaluation objective

To minimise effects on water resources and on beneficial and licensed uses of surface water, groundwater and related catchment values (including the Gippsland Lakes Ramsar site) over the short and long-term.

Key issues

- The potential for adverse effects on the functions, values, beneficial and licensed uses of surface water due to the project's activities, including water extraction, interception or diversion of flows, discharges from operational areas or saline water intrusion.
- The potential for adverse effects on the functions, values and beneficial uses of groundwater due to the project's activities, including water extraction, interception or diversion of flows, discharges from mining and other operational areas or saline water intrusion.
- The potential for adverse effects on nearby and downstream water environments (including the Mitchell and Perry Rivers, King and Wellington Lakes, and Gippsland Lakes Ramsar wetland of international importance overall) due to changed water quality, flow regimes or waterway conditions during construction, operations, rehabilitation, decommissioning and post-closure.
- Ore, product, overburden, tailings and mining by-products management, in the context of potential water quality impacts including those arising from sedimentation, release of radionuclides, other contaminants and pollutants, tunnel erosion, acid sulphate soils, acid/metalliferous drainage formation, and salinity.
- Potential erosion, sedimentation and landform stability effects during construction, operations, rehabilitation, decommissioning and post-closure.

Priorities for characterising the existing environment

- Identify and characterise the relevant groundwater and surface water environments, including the protected beneficial uses and values, existing drainage functions and behaviours and catchments, including that of the Gippsland Lakes Ramsar site.
- Characterise existing sedimentation within the Mitchell and Perry River systems including the physical and chemical properties of river bed sediments.
- Identify existing groundwater and surface water users and allocations in the broader area, including downstream of the site.
- Characterise the interaction between surface water and groundwater within the project site and the broader area.
- Provide a sufficient hydrogeological characterisation (e.g. a model) of the current allocations, extractions and uses of groundwater or surface water (e.g. town drinking water supply, irrigation use, stock and domestic use and environmental flows) in the broader area, including downstream of the site.
- Characterise the physical and chemical properties of the project area soils including the potential environmental risks (e.g. potential for erosion, salinity, nutrients and acidification).

Design and mitigation measures

- Identify and evaluate configuration of mining activities and related landforms, which could avoid or minimise significant effects on water environments, including the Mitchell and Perry Rivers and King and Wellington Lakes, and the Gippsland Lakes Ramsar site.
- Describe further potential and proposed design options and measures which could avoid or minimise significant effects on beneficial uses of surface water, groundwater and downstream water environments, accounting for climate risks and the potential effects of climate change, during the project construction, operations, rehabilitation, decommissioning and post-closure.
- Outline and assess measures for the management of soils to minimise potential adverse effects on local hydrology and water quality associated with project area soils.

Assessment of likely effects

- Develop a water balance model to quantify the project's demand (both quantity and quality) on groundwater and/or surface water resources, including volume to be extracted, stored and released during the construction, operations, rehabilitation, decommissioning and post-closure phases of the project.
- Use appropriate methods, including modelling, to identify and evaluate effects of the project and relevant alternatives on groundwater and adjacent surface water and floodplains environments, including:
 - the likely extent, magnitude and duration of groundwater level drawdown in the vicinity of water supply bores during construction and operation, and the expected timing and scale of recovery of groundwater levels post-closure (spatial and temporal groundwater modelling);
 - the potential for mounding and migration of groundwater from the backfilled tailings material along the mine path during operations, decommissioning and post-closure (including predicted volume, timing and water characteristics, where relevant);
 - changes to groundwater and surface water quality at all project phases, including effects from drawdown and rebound of groundwater levels in the vicinity of water supply bores, present contaminants (including radionuclides), as well as downstream and upstream effects on ecological values (e.g. groundwater dependent ecosystems, EPBC Act listed communities and the Gippsland Lakes Ramsar site);
 - changes to availability of surface water and groundwater for beneficial and licenced users in the immediate and wider vicinity of the project due to predicted extraction groundwater or surface water for operational use accounting for climate risks and the potential effects of climate change;
 - potential erosion, sedimentation and landform stability effects of the project including the direct impact of mining on waterways and their subsequent rehabilitation; and

- risks associated with potential acid forming materials (soil and rock) which may be disturbed or exposed by mining activities.

Approach to manage performance

- Describe any further methods that are proposed to manage risks of effects on groundwater and surface water environments and catchment values, including as part of the EMF (see section 5).

4.4 Amenity and environmental quality

Draft evaluation objective

To protect the health and wellbeing of residents and local communities, and minimise effects on air quality, noise and the social amenity of the area, having regard to relevant limits, targets or standards.

Key issues

- The potential for diminished social wellbeing due to exposure to dust, air pollution, noise, vibration, lighting, radiation, hazardous materials and public safety (including fire) and transport hazards during construction, operation, decommissioning and rehabilitation of the project.
- The potential for public health risks that could arise from elevated levels of airborne pollutants and noise during construction, operation, decommissioning and rehabilitation of the project.

Priorities for characterising the existing environment

- Describe the physical and chemical characteristics of overburden, ore, product, tailings and mining by-products to be removed during mine development and operations including specific aspects relevant to air quality.
- Identify dwellings and any other potentially sensitive receptors (e.g. community centres, schools, recreation facilities, agricultural and tourism businesses, etc.) that could be affected by the project potential effects on air quality, noise or vibration levels.
- Identify flora and fauna that could be affected by the project potential effects on air quality, noise or vibration levels.
- Monitor and characterise background levels of air quality in accordance with PEM requirements, including air pollution indicators (dust, PM₁₀, PM_{2.5}, crystalline silica, metals, and greenhouse gas emissions from equipment) in the context of the dispersive soils within the project area, noise and vibration in the vicinity of the project, including adjacent sensitive receptors and along potential transport routes.
- Characterise background radiation levels within the project site and the broader project area.
- Evaluate the existing road/rail conditions and traffic (type, volume and timing) conditions on key proposed transport routes for the project.
- Evaluate the existing port facilities for storage of heavy mineral concentrate.
- Evaluate the existing fire hazards in the vicinity of the project.

Design and mitigation measures

- Identify potential and proposed design responses and/or other mitigation measures to avoid, reduce and/or manage any significant effects for sensitive receptors, during the project construction, operation, rehabilitation, decommissioning and post-closure, arising from:
 - specified air pollution indicators;
 - noise, vibration and lighting;
 - adverse changes to the background radiation levels in the vicinity of the project (including the radionuclide content of vegetation, surface water and groundwater);
 - dislocation due to severance causing reduced access to farm land and/or disruption to social networks and community facilities; and
 - public safety hazards.

Assessment of likely effects

- Predict likely atmospheric concentrations of particulate matter and other relevant Class 1, 2 or 3 indicators in surrounding areas during mine construction, operation and rehabilitation, using an air quality impact assessment undertaken in accordance with the PEM. The air quality impact assessment is to also include an assessment using the SEPP (Ambient Air Quality) environmental objectives.
- Assess any effects of dust emissions on Lindenow Valley primary industry and local water supplies (both water network reservoirs and privately own rain water tanks).
- Assess likely noise increases, vibration and lighting impacts at sensitive receptors in the vicinity of the project and along the proposed transport route.
- Assess likely radiation effects associated with the project during operations, rehabilitation, decommissioning and post-closure.
- Assess likely traffic volume increase in the vicinity of the project and along proposed transport routes.
- Assess likely effects to the social cohesion, health and well-being of the communities in the vicinity of the project.
- Assess potential safety hazards to the public arising from the project.

Approach to manage performance

- Measures to manage other potentially significant effects on amenity, environmental quality, health and social wellbeing (including stability of mining landforms), should also be addressed in the EES, including a framework for identifying and responding to any emerging issues.

4.5 Social, land use and infrastructure

Draft evaluation objective

To minimise potential adverse social and land use effects, including on agriculture, dairy, irrigated horticulture, tourism industries and transport infrastructure.

Key issues

- The potential for dislocation due to severance causing reduced access to farm land, businesses, social networks, community facilities and the Mitchell River National Park.
- Potential for adverse effects on the existing and future land and beneficial uses, including agricultural, dairy, irrigated horticulture, forestry, tourism and local businesses.
- The potential for changes to the existing infrastructure in the project area and in its vicinity, particularly the proposed changes to water supply and irrigation network, power transmission lines and local and regional roads or rail.
- Potential damage to local and regional road surfaces along transport routes and increased risk to road safety on transport routes.

Priorities for characterising the existing environment

- Characterise the existing and planned land use and the existing beneficial uses within and in the vicinity of the proposed project.
- Describe the existing infrastructure for water supply, irrigation, wastewater collection and power supply in the project area and in its vicinity.
- Characterise the current traffic conditions (including site access) and road infrastructure (including arterial and municipal roads) and road users in terms of capacity, condition and structural integrity, travel times, safety and accessibility.
- Describe proposed transport routes and infrastructure, its ability to accommodate traffic generated by the project, as well as other predicted future demands.
- Describe existing emergency response infrastructure and resources.
- Characterise the social structure of the local communities including population, demographics, employment, infrastructure, community groups, housing/accommodation availability, etc.

- Describe community attitudes to the existing environment and the potential changes brought by mining and associated operations.

Design and mitigation measures

- Outline and assess design and mitigation measures that address the potential for adverse land use effects during construction, operations, rehabilitation (including progressive rehabilitation), decommissioning and post-closure, including the proposed principles for sustainable land use set for rehabilitation of soils and landforms post-mining.
- Identify the proposed transport routes' impacts on road safety and operational performance of the existing road infrastructure, considering all project vehicle types, traffic volumes and movements and need for installation of any proposed mine infrastructure along or across the public road network during the project construction and operations.
- Outline the required transport infrastructure upgrades and additional road maintenance regime to address adverse impacts of the project construction and operation (e.g. road, rail and port).
- Describe and evaluate the proposed traffic management and safety principles to address changed traffic conditions during both construction and operation of the project, covering (where appropriate) road safety, temporary or permanent road diversions, different traffic routes, hours of use, vehicle operating speeds, types of vehicles and emergency services provisions.
- Outline measures to minimise potential adverse effects on local communities and infrastructure.
- Outline measures to minimise potential adverse effects to local businesses and to enhance potential benefits to local and regional businesses.

Assessment of likely effects

- Assess the potential effects on communities living within or near the project area in terms of potential for dislocation, severance or disrupted access to social networks, community facilities and valued places.
- Assess the potential effects on the land use in the vicinity of the project, in terms of the extent, duration, likelihood and implications of effects.
- Assess the potential economic effects (beneficial and adverse) which could result from the project, including opportunities for business and for existing businesses.
- Assess the potential effects on workforce development opportunities in the local and wider region as a result of the project.
- Evaluate the consistency of the project with the policies and provisions of the East Gippsland and Wellington planning schemes and other relevant land use planning strategies.

Approach to manage performance

- Describe any further measures that are proposed to mitigate, offset or manage social, land use and economic outcomes for communities living within or in the vicinity of the project area, as well as proposed measures to enhance beneficial outcomes, including in the context of the EMF (see section 4.9) in view of the project's expected long-term operations life.

4.6 Landscape and visual

Draft evaluation objective

To avoid adverse effects on the landscape and recreational values of the Mitchell River National Park and minimise visual effects on the open space areas.

Key issues

- The potential for effects on the landscape and recreational values of the Mitchell River National Park and visual amenity and character of region from the project.

Priorities for characterising the existing environment

- Characterise the visual character and associated landscape values of the project site including in the context of the Mitchell River National Park.
- Describe changes to the landscape (including from vegetation clearance and likely changes to landform) and associated visual effects, as well as public views from roadways used by tourist traffic and other significant vantage points, in particular on the Mitchell River National Park.

Design and mitigation measures

- Outline and evaluate the proposed mine design options, staging of works and management measures that could mitigate project effects on landscape and visual amenity during mining.
- Describe and evaluate the potential and proposed measures to restore and rehabilitate the landscape and visual amenity values of the project site after mining.

Assessment of likely effects

- Assess the effects of the project and relevant alternatives on landscape and visual amenity values of the project site and the Mitchell River National Park, including with respect to views from public vantage points and where possible representative local residences during construction, operation, rehabilitation, decommissioning and post-closure.

Approach to manage performance

- Describe and evaluate plans to monitor effects on landscape and visual amenity values and implement contingency management measures, including in relation to:
 - the configuration and staging of works and rehabilitation; and
 - progressive reinstatement and rehabilitation activities, including a landscape shaping reflective of the pre-mining landscape and preliminary identification of land use options.
- Describe any further measures that are proposed to manage risks to landscape and associated recreational values for communities living in the vicinity of the project that are to be included in the EMF (see section 5).

4.7 Cultural heritage

Draft evaluation objective

To avoid or minimise adverse effects on Aboriginal and non-Aboriginal cultural heritage values.

Key issues

- The potential for adverse effects on known and unknown Aboriginal and non-Aboriginal cultural heritage values, including those of the heritage listed Mitchell River.
- The potential for permanent loss of significant heritage values.

Priorities for characterising the existing environment

- Identify and characterise Aboriginal cultural heritage sites or areas of sensitivity within the project area, particularly in the vicinity of Mitchell River, in accordance with the requirements for the cultural heritage management plan (CHMP) under the AH Act.
- Identify and document known and previously unidentified places and sites of historic and cultural heritage significance within and adjoining the project area, including any areas of significant archaeological interest, in accordance with the Guidelines for Conducting Archaeological Surveys (Heritage Victoria, 2008) as updated in 2013.

Design and mitigation measures

- Describe and evaluate potential and proposed design and construction method mitigation to address effects on Aboriginal and historic cultural heritage, particularly in the vicinity of Mitchell River.

Assessment of likely effects

- Assess potential effects of the project and relevant alternatives on:

- identified sites or places of aboriginal cultural heritage significance; and
- sites and places of historic and cultural heritage significance, having regard to the Guidelines for Investigating Historical Archaeological Artefacts and Sites (Heritage Victoria, 2012).

Approach to manage performance

- Outline and evaluate proposed additional measures to manage risks of effects on:
 - sites and places of Aboriginal cultural heritage significance, within the framework of a draft CHMP⁹; and
 - sites and places of historic and cultural heritage significance, including as part of the EMF (see section 5).

4.8 Rehabilitation

Draft evaluation objective

To establish safe progressive rehabilitation and post-closure stable rehabilitated landforms capable of supporting native ecosystems and/or productive agriculture that will enable long-term sustainable use of the project area.

Key issues

- Mine operation will change topography, soil profiles, surface water flow, hydrology and drainage, as well as changed vegetation cover.
- Long-term mining activities can affect sustainable agriculture, forestry and tourism associated with the Mitchell River National Park.
- Adequate overburden and soil availability for the rehabilitation of the project area to ensure the post-mining topography can be reconfigured to pre-mining topography, or as close as practical to enable productive land-uses to be re-instated.
- Appropriate design criteria required to avoid long term landform degradation. Consideration to be given to slope geometry, upper soil profile characteristics (physical/chemical) and surface drainage and erosion mitigation.
- Intensive management and/or amelioration of dispersive soils may be required to prevent long-term degradation of the rehabilitated landform.

Priorities for characterising the existing environment

- Describe the existing topography, soil profiles, drainage, plant-soil-water interactions and vegetation cover within the project area, in particular in the proposed mine footprint over the proposed mine life.
- Describe current agricultural and horticultural practices in the project area, including key factors influencing sustainable cropping and outputs.
- Characterise the relevant physical and chemical properties of overburden and topsoil materials to be used in rehabilitation.

Design and mitigation measures

- Provide a draft rehabilitation framework that incorporates:
 - proposed storage and management of stockpiled topsoil and subsoils;
 - representative geotechnical cross-sections of rehabilitated areas;
 - proposed management of surface water and groundwater flows, including flood risks, and consideration of restoring natural drainage and restoration of disturbed waterways;
 - design criteria relating to landform and soil profile reconstruction;
 - principles of establishing sustainable vegetation cover, including consideration of habitat suitable for listed threatened species and communities or potential for productive land uses;
 - propose fire management measures;

⁹Refer to EES Advisory Note: Aboriginal Cultural Heritage and the Environment Effects Process for further advice.

- consideration of landscape and visual values from the Mitchell River National Park vantage points and tourist tracks; and
- a plan for progressive rehabilitation and mine closure.

Assessment of likely effects

- Assess best practice methods for storage and management of stockpiled topsoil and subsoils, restoring soil profiles, drainage and productivity, as well as landscape rehabilitation in the context of back-filling of the mine voids and decommissioning of other earth structures.
- Assess levels of certainty of successful outcomes from the proposed design and mitigation measures and consequential performance management measures.
- Assess potential risks from radiation on the environment, biodiversity values and human health.

Approach to manage performance

- Outline and evaluate the proposed performance requirements for rehabilitation, including monitoring and auditing of performance.
- Design criteria to be developed to ensure rehabilitation is appropriate for the intended end land-use (agricultural and native areas) and does not result in long term degradation. Consideration to be given to soil profile characteristics (physical/chemical), horizon depths, maximum slope geometry, factor of safety, plant-soil-water interactions for targeted vegetation communities.
- Prepare a draft mine rehabilitation and closure plan with strategies for progressive rehabilitation, appropriate design criteria, completion criteria/monitoring methodologies and contingency measures for unplanned/forced closure.
- Outline the proposed agreements with landowners with respect to the proposed changes to land use over the period of mine construction, operation, rehabilitation, decommissioning and post-closure.

5 Environmental management framework

Inadequate management of environmental effects during project construction, operation, decommissioning, rehabilitation and post-closure could result in a failure to meet statutory requirements or sustain stakeholder confidence.

The proponent needs to provide a transparent environmental management framework (EMF) for the project in the EES with clear accountabilities for managing and monitoring environmental effects and hazards associated with construction, operation, decommissioning, rehabilitation and post-closure phases of the project in order to achieve acceptable environmental outcomes.

The EMF should describe the baseline environmental conditions to be used to monitor and evaluate the residual environmental effects of the project, as well as the efficacy of applied environmental management and contingency measures. The framework should include:

- the context of required approvals and consents, in particular requirements for the mine work plan;
- any existing or proposed environmental management system to be adopted;
- organisational responsibilities and accountabilities for environmental management;
- a register of environmental risks associated with the project which is to be maintained during project implementation (including matters identified in preceding sections in these directions as well as other pertinent risks);
- the environmental management measures proposed in the EES to address specific issues, including commitments to mitigate adverse effects and enhance environmental outcomes;
- the proposed objectives, indicators and monitoring requirements, including for managing or addressing:
 - social, health and wellbeing outcomes and community engagement
 - biodiversity values, including offsets and establishing a sustainable vegetation cover
 - maintenance of the ecological character of the Gippsland Lakes Ramsar site
 - groundwater and/or surface water resources usage and stormwater runoff
 - geotechnical and geochemical landform stability, including potential erosion and sedimentation
 - solid and liquid waste, including recycling and handling of potentially hazardous or contaminated waste, including radioactive materials
 - noise, vibration, and emissions to air, including dust and greenhouse gases
 - aboriginal and cultural heritage values
 - traffic during construction and operation
 - disruption of and hazard to the existing infrastructure
 - requirements for protection of the environment from radiation
 - site rehabilitation, including handling of topsoil, tailings and mining by-products
 - fire management and emergency response;
- arrangements for management of and access to baseline and monitoring data, to ensure the transparency and accountability of environmental management and to contribute to the improvement of environmental knowledge
- the procedures for monitoring or verifying compliance with performance requirements and review of the effectiveness of the environmental management framework for continuous improvement; and
- procedures for auditing and reporting of performance including compliance with relevant statutory conditions and standards.

The EMF should outline:

- the relevant environmental management plans for construction, operation, decommissioning and rehabilitation phases of the project;

- a program for community consultation, stakeholder engagement and communications during the construction, operation, decommissioning and rehabilitation of the project, including opportunities for local stakeholders to engage with the proponent to seek responses to issues that might arise if the project is undertaken.