REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE *ENVIRONMENT EFFECTS ACT 1978*

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Department of Planning and Community Development (DPCD) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once DPCD is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:

- a brief description of potential changes or risks to environmental assets resulting from the project;
- available information on the likelihood and significance of such changes;
- the sources and accuracy of this information, and associated uncertainties.

- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A CD or DVD copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 2MB.**
- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address

Minister for Planning
GPO Box 2392
MELBOURNE VIC 3001

Couriers

Minister for Planning
Level 20, 1 Spring Street
MELBOURNE VIC 3001

Version 3: January 2007

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@dpcd.vic.gov.au is encouraged. This will assist the timely processing of a referral.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	Gippsland Iron Pty Ltd Gippsland Iron Pty Ltd is a wholly owned subsidiary of Eastern Iron Limited ('Eastern Iron').
Authorised person for proponent: Position: Postal address: Email address: Phone number: Facsimile number:	Greg De Ross Managing Director PO Box 956, Crows Nest, NSW, 1585 gregdeross@easterniron.com.au (02) 9906 7551 (02) 9906 5233
Person who prepared Referral: Position: Organisation: Postal address: Email address: Phone number: Facsimile number:	Nick Baker Planner Planning and Property Partners Pty Ltd Level 2, 91-93 Flinders Lane, Melbourne VIC 3000 baker@pppartners.com.au (03) 8626-9080 (03) 8626-9001
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	**Planning and Property Partners Pty Ltd** • Planning Consultants; • Environmental and Planning Law; and • Project Management. **Earth Systems Consulting Pty Ltd** • Flora and Fauna; • Water Quality; • Geochemistry and Waste Rock Management; • Air, Noise and Vibration; • Mine Closure and Rehabilitation; and • Environmental Management and Monitoring. **Ethos NRM Pty Ltd** • Native Vegetation and Offsets.

	Engenium Pty Ltd • Project Management and Engineering; and • Mine Operations. **Mining One Pty Ltd** • Mine Planning and Design. **AECOM Australia Pty Ltd** • Surface Water; and • Traffic and Transportation. **Tim Stone Pty Ltd** • Cultural Heritage

2. Project – brief outline

Project title:

Nowa Nowa Iron Project (5 Mile Deposit)

Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context)

The Nowa Nowa Iron Project (5 Mile Deposit) ('the Project') is located approximately 7 km north of the township of Nowa Nowa, which is situated on the Princes Highway between Bairnsdale and Orbost in East Gippsland, Victoria (refer **Attachment 1**, Figure 1.1). The site is wholly within the Tara State Forest (Crown land) which is primarily managed for timber harvesting within the vicinity of the proposed works.

The proposed open pit, Waste Rock Dump (WRD) and Temporary Low Grade Ore Stockpile generally lie adjacent to (or partially on) the existing Nowa Nowa-Buchan Road, near to its intersection with Tomato Track. The proposed mine access road and infrastructure area is located along the ridge associated with the existing Tomato Track, and accessed via the Bruthen-Buchan Road.

The Project lies within the Boggy Creek catchment which flows into Lake Tyers. General location and regional plans showing the location of the Project and surrounding land uses are provided in **Attachment 1**, Figures 1.1 and 1.2.

The mine footprint is centred at approximately E 598317, N 5830711 (AMG, Zone 55). The most northerly point is located at E 597108, N 5832145, with the most westerly point nearby at E 597077, N 5831690. The footprint's most southerly point is located on the proposed diversion of the Nowa Nowa-Buchan Road at E 599102, N 5829590, which travels north east to reach the footprint's most easterly point at E 599499, N 5829727.

Short project description (few sentences):

The Project is a greenfield development of a high grade magnetite/hematite deposit generally referred to as '5 Mile'. The Project involves an open cut mining operation from a single pit with dry processing at the site to upgrade the material to a saleable product. It is anticipated that the Project will produce up to 1 Mt of ore per annum, over an initial mine life of 8-10 years. The mine will be operated using a mining contractor and local employees (i.e. no onsite accommodation).

It is proposed to transport the processed ore by road to the existing South East Fibre Exports (SEFE) wharf at the Port of Eden in Edrom, NSW ('the Port'). The main transport route between the mine and the Port is via the Princes Highway. The material will be temporarily stockpiled before being loaded onto 50-60,000t vessels and exported to international markets.

A Waste Rock Dump (WRD) is proposed to be developed adjacent to the open pit to store waste rock. Ore will be hauled from the open pit to the Run of Mine (ROM) pad and processed via dry Low Intensity Magnetic Separation (dry LIMS). Low grade ore produced in the dry LIMS process will be temporarily stockpiled adjacent to the open pit and either reprocessed later in the mine life, sold or placed in the pit (subaqueous) on closure.

The site will be fully rehabilitated at closure with the removal of all mine infrastructure and revegetation with native species. Water levels in the open pit will rebound leaving a water resource for potential use.

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):

The objectives of the Project are:

- to develop the resource in a sustainable manner which is responsive to the environmental features and community values surrounding the site;
- to maximise the efficient use of existing infrastructure including road and port facilities;
- to provide employment opportunities within the local community during construction and operation;
- to diversify the local and regional economy in light of a downturn in the forestry industry;
- to develop the resource so that capital investment is appropriate to the life of the mine; and
- to safely and securely close the site in line with community and other stakeholder expectations.

In meeting these objectives, the Proponent aims to:

- provide up to 120 FTE jobs within the local and regional economy;
- directly spend up to $700 Million in the State and regional economy over a 10 year period;
- provide additional flow on benefits to the local economy in terms of services and employment;
- be innovative in its response to managing environmental influences;
- communicate effectively with the local community and stakeholders during both construction and ongoing operation; and
- coordinate effective mine closure and rehabilitation strategies post development.

Background/rationale of project (describe the context / basis for the proposal, e.g. for siting):

The magnetite deposits at the site were first drilled and characterised by the Victorian Department of Mines in the 1950s and according to the Department of Environment and Primary Industries; 'represent the largest iron ore deposits in the State'. However, in context to iron ore developments operating in other States, the production volumes and overall life of the Project are relatively small. Instead, it is the sites access to existing infrastructure, including road and port facilities, which provides an opportunity for the Project to be commercially viable, in large part by minimising the level of capital expenditure required.

On 14 February 2012 Eastern Iron exercised its option to purchase 100% of the Project from Waygara Mines Pty Ltd ('Waygara'). As part of the agreement, Eastern Iron acquired Exploration License 4509 ('EL 4509') and all available data relating to previous drilling undertaken by Waygara and the Victorian Department of Mines. Eastern Iron has since transferred EL4509 to wholly owned subsidiary Gippsland Iron Pty Ltd.

Eastern Iron commenced further exploration drilling in 2012 which included compiling previous drill data to resource standards and conducting metallurgical testing of drill core material. Based on recent and historical drilling records, Eastern Iron has announced a total resource estimate of 9.6 Mt at the '5 Mile' deposit (ASX Announcement, 12 June 2013).

The mineralised body at '5 Mile' occurs below a variable thickness of younger sediments and volcanic rocks and as such is largely unweathered. Primary mineralisation consists predominantly of magnetite with haematite becoming more common at depth. The mineralisation is also quite massive and at the 40% Fe lower cut-off there is little internal waste once the overburden is removed.

As a result of the positive exploration results, and the availability of existing infrastructure proximate to the site, the Proponent is now seeking approval to develop the resource for commercial production. This development is further supported by the continuing global demand for iron ore.

The design of the Project is based on a triple-bottom line approach to environmental, social and economic factors to ensure a sustainable approach to mine development and closure.

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

A *Project Description and Proposed Mine Plan* is provided at **Attachment 1** and provides a detailed overview of the proposed Project. The main components of the Project are summarised below and depicted on the *'Infrastructure and Layout Plan'* at Figure 1.3, **Attachment 1**.

The main components of the Project include the:

- Open Pit;
- Mine Infrastructure (includes the ROM pad, processing plant and Mine Operations Centre(MOC));
- Waste Rock Dump;
- Temporary Low Grade Ore Stockpile;
- Water Storage Infrastructure;
- Mine Access and Haul Roads; and
- Ancillary Infrastructure.

These components are discussed individually as follows.

Open Pit

- The extent of the open pit comprises a total area of approximately 25 ha.
- Mining rates are proposed at an upper limit of 4 Mt per annum, including waste rock and ore. It is anticipated that this will produce up to 1 Mt of ore per annum, over an initial mine life of 8-10 years.
- The majority of material in the pit will be mined using drill and blast methods, however, some material near surface will be free-dug.
- Ore will be hauled from the open pit to the ROM pad for processing.

Mine Infrastructure

- Mine Infrastructure includes the Run of Mine (ROM) pad, processing plant (Crushers) and Mine Operations Centre (MOC), which collectively comprise a total area of approximately 13 ha.
- These components are located along an existing ridge (generally within the vicinity of Tomato Track) extends between the 5 Mile Deposit and Bruthen-Buchan Road.
- During construction, selected waste rock material (i.e. overburden) will be used as a source of fill to construct the ROM pad, stockpile areas, laydowns and roads.
- The processing plant comprises a two stage crushing and screening circuit to produce a -10mm product which is then processed via dry LIMS.
- The MOC includes the administration offices, workshops, stores, parking areas, first aid and emergency response facilities. It also includes water and fuel storage areas.
- A manned security hut has also been incorporated on the mine access road as the first accessible point to the site for staff, visitors and deliveries. It will also restrict any unauthorised public access.

Waste Rock Dump (WRD)

- Approximately 24 Mt of waste rock will be generated over the life of the mine.
- Waste rock will be managed based on its geochemical characteristics to enable a safe and stable site on closure (see **Attachment 6**).
- A WRD covering a maximum extent of approximately 29 ha will be developed adjacent to and upstream of the open pit for disposal of approximately 22.8 Mt of waste rock.

- Other waste rock will be temporarily stored with the low-grade ore to enable final in-pit disposal below a permanent water cover on closure.

Temporary Low Grade Ore Stockpile

- The low grade ore rejected from the dry LIMS process will be temporarily stockpiled adjacent to and upstream of the open pit during the life of the mine.
- The maximum extent of the stockpile is approximately 17 ha.
- The low grade ore may be re-evaluated for potential processing later in the mine life (subject to approval) or sold. Any material remaining at surface on mine closure will be placed in the open pit for disposal under a permanent water cover.

Water Storage Infrastructure

- Three water storages will capture site surface water runoff and facilitate mine water supply during operations. The three water storages are as follows:
    - Operations Water Storage - located immediately downstream of the open pit on Tomato Creek. The Operations Water Storage has a maximum surface area of 3.5 Ha and a nominal volume of 154ML.
    - Sediment Control Dam - located downstream of the open pit and mine infrastructure on Gap Creek, upstream of the confluence with Harris Creek. The Sediment Control Dam has a maximum surface area of 1.12 Ha and a nominal volume of 30ML.
    - Clean Water Storage - located downstream of the Operations Water Storage and mine infrastructure on Tomato Creek, upstream of the confluence with Harris/Gap Creek. The Clean Water Storage has a maximum surface area of 1.69 Ha and a nominal volume of 49ML.

Mine Access and Haul Roads

- The mine access road is proposed to join the sealed Bruthen – Buchan Road and is nominally expected to be 10 metres wide and approximately 1 km in length.
- The haul road between the open pit, processing plant, WRD and temporary low grade ore stockpile is proposed to be 20 metres wide.
- Minor access roads will be constructed to access the water storages and magazine storage facility. These roads are proposed to be 10 metres wide with a combined length of approximately 1.5 km.
- All roads will be formed, unsealed roads constructed from locally won gravel with the bulk of the material coming from pre-strip activities.
- A sealed asphalt section is proposed for the mine access road at its intersection with the Bruthen - Buchan Road. The sealed section will nominally extend for 100 metres into the site to protect the road from potential damage from the turning movement of loaded haulage trucks and limit the amount of gravel brought onto the arterial road.

Ancillary Infrastructure

- A Magazine Storage Facility is proposed to the north of the mine infrastructure to store explosives. Design and location criteria for the Magazine Storage Facility were identified based on relevant Australian legislation, standards and guidelines, as well as consultation with WorkSafe Victoria. The facility will be securely fenced to prevent public access.
- Water treatment infrastructure will include a potable water treatment plant to supply the Project workforce and a wastewater treatment plant to treat sewage and other wastewaters (e.g. kitchen, etc.). The treatment plants are included as part of the broader Mine Infrastructure design (refer to Figure 6.2 of **Attachment 1**).
- The Project will require a maximum of approximately 1.2-1.5 MW of power during operations which will be provided by a series of diesel fuelled generator sets.

Ancillary components of the project (e.g. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

The ancillary component of the Project are summarised below and further described as part of the *Project Description and Proposed Mine Plan* at **Attachment 1.**

Nowa Nowa-Buchan Road Realignment

The footprint of the proposed open pit, WRD and Temporary Low-Grade Ore Stockpile impact the existing alignment of Nowa Nowa-Buchan Road, affecting approximately 1.8 kilometres of its length. The Nowa Nowa-Buchan Road is a gravel road, used predominantly for forestry activities.

In order to maintain through traffic between Forests Road (in the south) and Bruthen-Buchan Road (in the north), it is proposed to divert the Nowa Nowa-Buchan Road around the eastern side of the mine footprint, partly utilising the existing 5 Mile Road. The proposed diversion has been designed to avoid steep grade changes along its length and to ensure ongoing heavy vehicle use (i.e. forestry) can be safely maintained.

Road Upgrades – Bruthen Buchan Road

The only road upgrade required for the Project is the intersection treatment for the mine access road and Bruthen-Buchan Road. This includes the provision of turning and deceleration lanes in both directions.

Detailed design guidance for the intersection is provided as part of the *Traffic Impact Assessment* at **Attachment 7**.

Key construction activities:

The key construction activities and approximate sequencing are outlined as follows:

- Clear vehicle access into the site (generally within the vicinity of Tomato Track);
- Clear a laydown area at the site of the ROM pad and set up temporary offices and services;
- Construction of drainage channels, sediment control dams;
- Construction of water supply storages;
- Mobilise earthworks equipment and commence progressive clearing of the open pit, WRD and temporary low grade ore stockpile areas;
- Clear and strip the mine access road and MOC;
- Commence mine pre-strip activities by removing overburden and commence bulk earthworks activities of the permanent access roads, infrastructure pads and laydowns;
- Completion of the Bruthen-Buchan Road intersection and rehabilitation of Tomato Track;
- Construction of the MOC including all services, buildings and infrastructure;
- Construction of the processing plant;
- Decommissioning of temporary infrastructure; and
- Construction of the ROM pad.

Key operational activities:

The key operational activities are outlined as follows:

Mining

- The resource will be mined by conventional open pit mining methods. The majority of the material will be mined using drill and blast methods, however, some material near will be free dug.
- The main mining fleet will include 100 -120 tonne class hydraulic excavators loading 85-120 tonne capacity off-road dump trucks. Other machinery will include graders, loaders and blasthole drills.
- Ore will be excavated and hauled to the ROM pad stockpile for crushing and processing, waste rock will be placed in the WRD or Temporary Low-Grade Ore Stockpile.
- Mining capacity is expected to be sufficient to maintain ore mining at an average of approximately 1Mt of ROM ore per annum.
- Mining will progress below the current water table, with the pit dewatered to allow mining. Water will be pumped from in pit sumps and / or out of pit dewatering bores with water being transferred to the Operations Water Storage for reuse.
- Waste movement is likely to vary year-to-year depending on localised strip ratios to maintain ore mining at the designed rate. Total material movement is expected to be approximately 33 Mt comprised of 9.5Mt ore and 24Mt of waste, with a life of mine waste to ore ratio of 2.3:1.

Processing

- ROM ore is to be crushed by a two stage crushing and screening circuit to -10mm and processed via dry Low Intensity Magnetic Separation (dry LIMS) to produce a +58% Fe product.

- The dry LIMS process feeds the crushed ore over rotating drum magnets to produce an upgraded magnetic product and a low-grade, less magnetic (haematite) ore product. Approximately 80% of the feed will report to the magnetic product and 20% to the low-grade ore stockpile.
- The process does not require any chemical reagents and water use is limited to dust suppression.

Waste Rock and Low Grade Ore Management

- Waste rock will be removed during mining and hauled from the open pit to the WRD or Temporary Low Grade Ore Stockpile, depending on its geochemical classification.
- The WRD is to be constructed in thin-layer 'horizontal lifts' from the base upward, with compaction and moisture content optimised to minimise air entry. Waste rock is to be strategically placed in the WRD accordingly to its geochemical classification (see Geochemical and Management Strategies at **Attachment 6**).
- Low Grade Ore will be hauled from the process plant and temporarily stockpiled adjacent to the open pit during operations.
- Drainage from these areas will be collected and reused in mine operations (see 'Water Management' below).
- The Low Grade Ore will either be re-evaluated for processing later in the mine life, sold, or placed in the pit under a permanent water cover on closure.

Transport

- The upgraded iron product will be transported approximately 234 km by road to the SEFE wharf and ship loader on the south side of Two Fold Bay at the Port of Eden in Edrom, NSW ('the Port').
- All roads associated with the transport route are approved for B-Double use, with the majority of the transport route between the mine and the Port via the Princes Highway.
- B-Doubles are proposed to be operated on the transport route, 24 hours a day Monday to Friday, with additional daylight operations on weekends (if required).

Water Management

Water around the site will be managed as follows (see *Surface and Ground Water Baseline and Assessment* at **Attachment 5** for further details):

- The Operations Water Storage will be used to hold drainage from the waste rock dump, temporary low grade ore stockpile, open pit, ROM pad and groundwater from pit dewatering during operations by pumping from sumps at each drainage collection location. The Operations Water Storage is designed to ensure no discharge of water during operations.
- The Sediment Control Dam will be used to allow suspended sediments to settle. Excess water in the Sediment Control Dam will be allowed to overflow via the spillway to release environmental flows to the downstream receiving environment, where possible.
- The Clean Water Storage will be used to capture clean water to supplement site water resources. Excess water in the Clean Water Storage will be allowed to overflow via the spillway to release environmental flows to the downstream receiving environment, where possible.
- Water for operational use will be preferentially abstracted from the Operations Water Storage to keep the water level as low as possible. If the storage is dry, water will be abstracted from the Sediment Control Dam and, ultimately, from the Clean Water Storage, if both are dry. In the extremely unlikely event that insufficient water is available at the site, additional water will be purchased / sourced from off site and trucked to the mine.
- During extreme storm events, pumping from the various sumps will be managed so as to ensure that the Operations Water Storage cannot exceed capacity. Excess drainage at the sumps will be discharged into the open pit, if required.

Key decommissioning activities (if applicable):

Final end land use decisions will be determined through ongoing stakeholder consultation and negotiations with DEPI as the relevant public land manager. It is expected that disturbed lands will be graded to match contours of adjacent topography (wherever possible) and revegetated in line with existing vegetation communities, with the aim of returning the area to timber production.

The key decommissioning / post closure activities for individual project components are as follows:

Open Pit

- Any waste rock requiring sub-aqueous disposal for geochemical stability and any low-grade ore remaining on mine closure are to be backfilled into the base of the pit to remain well below the permanent water level in the pit.
- Backfilling is to be conducted in a manner that prevents the backfill materials from becoming perched on benches above the base of the pit.
- Once completed, the open pit will be allowed to flood via groundwater rebound and the capture of rainfall and surface water runoff from upstream of the open pit.
- The pit is to be flooded as quickly as practical on mine closure. In addition to the inflow of catchment drainage and groundwater, active filling by pumping water from the three water storages may be necessary to ensure that the pit lake fills within a relatively short timeframe.
- The post-closure water balance indicates that the pit lake will remain permanently at a high level at or slightly above the natural groundwater table and close to the overflow level into Tomato Creek in the long term.

Mine Infrastructure

- The plant and ancillary facilities will be dismantled, and removed from site. Materials may be sold, removed off-site for recycling, or transported to an appropriate disposal facility.
- Soil testing will be undertaken to identify soil contamination (if necessary).
- Any building materials, foundations or soil contaminated by metals, hydrocarbons or other contaminants will be remediated and/or removed from site and disposed of in an appropriate dumping facility.
- All exposed soil will be graded, ripped to reduce compaction, spread with topsoil (if necessary) and revegetated with native plant species.

Waste Rock Dump

- The WRD will be progressively rehabilitated over the life of the Project.
- Suitable waste rock and clay from decommissioned sediment control dams will be placed over the final WRD to limit infiltration of water and maximise the collection of clean catchment water into the mine pit lake.
- Stockpiled topsoil will be spread along the final contour and the WRD revegetated with native plant species.
- Any seepage or water runoff from the WRD will be drained into the pit lake.

Temporary Low Grade Ore Stockpile

- Any material remaining in the stockpile on mine closure is to be backfilled into the base of the pit and the pit lake allowed to fill to ensure a permanent water cover.
- The site of the stockpile is to be fully rehabilitated after removal of the material and revegetated with native plant species.

Water Storage Infrastructure

- Active filling of the pit lake may be required post-closure by pumping water from the three water storages to ensure that it fills within a relatively short timeframe. Where it is determined that these storages are no longer required:
    - the Operations Water Storage is to be decommissioned but the structure retained as a wetland to passively treat overflow from the pit lake.
    - The Clean Water Storage downstream of the Operations Water Storage will be decommissioned, but the structure retained as an additional wetland to polish water draining from the decommissioned Operations Water Storage.
    - The Sediment Control Dam is to be decommissioned and the former channel reinstated if no alternative use for the dam is identified.

Mine Access and Haul Roads

- The Mine Access and Haul Road between the ROM pad and open pit will be maintained on mine closure. Access roads to the decommissioned Operations Water Storage and Clean Water Storage are also proposed to be maintained.
- Public access is not proposed to the pit lake, subject to agreement with DEPI as the relevant public land manager.
- Access and Haul Roads no longer required will be ripped, rehabilitated and revegetated.

Ancillary Infrastructure.

- The Magazine Storage Facility will be removed from site, the area regraded to match contours of adjacent topography (wherever possible), and revegetated with native plant species.

Is the project an element or stage in a larger project?

☒ No ☒ Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

Is the project related to any other past, current or mooted proposals in the region?

☒ No ☒ Yes If yes, please identify related proposals.

Other than noting that Eastern Iron continues to hold tenure of EL4509 which, subject to further exploration, may or may not reveal other mineral deposits that are capable of being developed for commercial purposes.

4. Project alternatives

Brief description of key alternatives considered to date (e.g. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

The proposal is a greenfield development and must therefore be considered in the context of 'Project' or 'No Project'.

In the 'No Project' scenario, the iron ore resources at Nowa Nowa (being the largest known in the State) will remain undeveloped. It is considered that this scenario runs contrary to the stated purpose of the *Mineral Resources (Sustainable Development) Act* 1990 which seeks:

> *"…to encourage mineral exploration and economically viable mining and extractive industries which make the best use of, and extract the value from, resources in a way that is compatible with the economic, social and environmental objectives of the State."*

In the 'Project' scenario, the location of the ore body is defined and, therefore, it is the siting of the other project components, as well as the proposed transport route, which could be considered in the alternative.

Key alternatives in relation to the location and design of these components were investigated as part of a detailed 'Scoping Study' prepared by *Engenium Pty Ltd*. The investigations have been advanced as part of the ongoing Definitive Feasibility Study (DFS) for the Project.

A detailed assessment of Project alternatives is provided in **Attachment 4**, however, these are summarised as follows:

Ore Processing Alternatives

Ore processing alternatives considered as part of the DFS include:

1. No Processing - Export mined ore as a Direct Shipping Ore (DSO) product;
2. Wet Low Intensity Magnetic Separation (wet LIMS); and
3. Dry Low Intensity Magnetic Separation (dry LIMS).

These alternatives are briefly summarised as follows:

DSO Product

The initial pit optimisation indicated that a DSO product, whilst potentially viable, would require considerable effort in grade management to ensure that the shipped saleable product is always +52%Fe in order to meet market requirements. Accordingly, the Proponent determined that this option presents an unreasonable commercial risk for the Project and therefore cannot be pursued.

Wet LIMS

Initial metallurgy test work indicated that the wet LIMS process will produce the highest grade Fe product. However, during operations, the Project would require in excess of 300 ML of water per annum. The wet LIMS process would also produce a tailing that would need to be stored within an engineered Tailings Storage Facility (TSF), with resultant risk to downstream water quality in circumstances of dam failure.

Dry LIMS

The dry LIMS process was found to strike the most appropriate balance between environmental and commercial considerations, on the following basis:

- the shipped product is always +52%Fe;
- there is no requirement for a TSF;
- the process does not require water other than for dust suppression, therefore reducing the overall Project water demand by 45% (when compared to the wet LIMS process); and
- the capital and operating costs associated with the process are appropriate to the life of the mine.

Waste Rock Dump and Temporary Low Grade Ore Stockpile Alternatives

Three potential configurations of the Waste Rock Dump and Temporary Low-Grade Ore Stockpile were considered feasible and are described at Section 5.1 of **Attachment 4**. Each arrangement had various advantages in terms of distance from the open pit (haul distances), available surface area for expansion, height requirements and drainage requirements.

The proposed mine layout will ensure that water quality risks are minimised through implementing the following planning strategies:

- During operations, runoff from the WRD and Temporary Low-Grade Ore Stockpile should passively report to the open pit in the absence, failure or lack of capacity of other runoff management measures; and
- Post-closure, runoff and seepage from any mine materials not backfilled into the open pit should passively report to the open pit.

No further investigation of alternative locations for the WRD and/or Temporary Low-Grade Ore Stockpile is therefore considered necessary on the basis that any alternative location would fail to meet the planning strategies described above and increase the risk of downstream water quality impacts in the short and long-term.

Transport and Shipping Alternatives

There are three broad options that could be used to transport product from the mine to the port, being road, pipeline or rail. The options could be used as a single form of transport, or any combination of the three as multi-mode transport solutions.

As part of the Scoping Study and ongoing DFS, the following port facilities have been considered for the export of product:

1. Port of Melbourne or Geelong;
2. Crib Point (Port of Hastings);
3. Port Anthony;
4. Multi-Purpose Wharf, Edrom, NSW; and
5. South East Fibre Exports (SEFE) Wharf, Edrom, NSW.

These are summarised as follows:

Port of Melbourne or Geelong

This option relies on loading the ore into shipping containers at the mine site and transporting by road to an intermodal or storage facility in Bairnsdale (or similar). Containers would then be transferred to rail and transported to the Port of Melbourne or Geelong before being loaded onto suitable size vessels and exported.

This option would, however, require additional material handling and require road transport through a number of towns and built up areas that are not otherwise impacted by the use of the SEFE wharf. Furthermore, preliminary investigations indicate that the rail line from Bairnsdale to Melbourne/Geelong would require significant upgrades to handle the freight loads envisaged.

Crib Point (Port of Hastings)

This option relies on transporting the ore by road to an intermodal or storage facility in Bairnsdale (or similar). The product would then be transferred to rail and transported to the Port of Hastings before being loaded onto suitable size vessels and exported.

Whilst the Port of Hastings provides deep water anchorage and existing rail facilities, it does not maintain a suitable ship loader for the bulk loading of product. Consistent with the option above, preliminary investigations indicate that the rail line from Bairnsdale to the Port of Hastings would require significant upgrades to handle the freight loads envisaged.

Port Anthony

This option relies on transporting the ore from the mine site to Port Anthony and stockpiled. Ore would then be loaded onto barge vessels and transhipped to vessels off-shore for export.

This option would however require additional material handling and require road transport through a number of towns and built up areas that are not otherwise impacted by the use of the SEFE wharf.

Multi-Purpose Wharf, Edrom, NSW

This option relies on transporting the ore from the mine site to the multi-purpose wharf and cargo storage area on the south side of Two Fold Bay, Edrom, NSW. Ore would be stockpiled in the cargo storage area and transported to the wharf once a ship was berthed.

This option would require significant additional material handling due to the absence of a ship loader at the wharf. Further, wharf restrictions dictate that 50-60,000t vessels are unable to berth at the wharf and, therefore, the number of shipments required per annum would increase when compared to those contemplated at the SEFE wharf.

South East Fibre Exports (SEFE) Wharf, Edrom, NSW

Eastern Iron entered into a Memorandum of Understanding with SEFE in 2012 for the co-sharing of their existing site in Edrom, NSW including the wharf side facilities. Under this scenario, being the proposed transport means for the Project, the material will be transported by road and stockpiled at the site before being loaded onto 50-60,000t size vessels.

The majority of the transport route between the mine and the SEFE site is via the Princes Highway, therefore avoiding towns and built up areas. Furthermore, the SEFE site has an existing wharf (bulk) loader with sufficient capacity to cater for Project demands, one of few on the eastern seaboard of Australia.

Route options between the mine site and the SEFE wharf, being the proposed option, were also considered at **Attachment 4**. These options are limited by the fact that the majority of the transport route is via the Princes Highway.

Power supply alternatives

Initial consultation with SP Ausnet commenced in June 2012 to determine whether mains connection could be provided to the mine site, based on either of the following three options:

1. Connection to the existing 22 kV overhead power line that runs past the mine entrance on Nowa Nowa-Buchan Road;
2. Connection to an existing 66 kV overhead power line near the Nowa Nowa township by installing a new 22 kV underground power cable to the mine site; or
3. Connection to the same 66 kV overhead power line utilising the existing 22 kV infrastructure.

According to SP Ausnet, the existing 22kV power line adjacent to the mine site is unlikely to be relied upon due to the inherently weak network and low fault levels in the area. Budget estimates were provided for Options 2 and 3, however these represented approximately one third of the total capital cost of the Project. Given the relatively short mine life of 8-10 years, these options were not considered feasible for the Project.

On-site generation is therefore proposed to provide Project power requirements. The Proponent proposes the use of diesel fuelled generator sets at the current time, however further investigations are being undertaken in relation to alternative fuel sources including Compressed Natural Gas (CNG) and biofuels.

Water Supply

The water requirements for the Project are relatively low, although water will be required for dust suppression during construction and operation. Potential water sources identified for the Project include surface water and ground water. However, it has been determined that the control of both surface and ground water on site to mitigate environmental risk will allow sufficient water to be captured and recycled during construction and operations to supply project water needs. No additional water supply will therefore be needed for the Project.

Brief description of key alternatives to be further investigated (if known):

Further investigations in relation to key alternatives are limited to the proposed power supply. Whilst the power requirement is relatively low and able to be provided by on-site diesel generators, the Proponent is investigating the use of Compressed Natural Gas (CNG) or biofuels as an alternative to diesel.

The use of an alternative fuel source will not influence the overall Project footprint or the number of generators required, but instead provides an opportunity to reduce greenhouse gas emissions and provide efficiencies in terms of power generation.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

Port Facilities

It is proposed to transport the ore by road to the existing port at SEFE in Edrom, NSW. The material will be temporarily stockpiled before being loaded onto 50-60,000t vessels and exported to international markets.

Approvals associated with the use of the existing Port facilities at SEFE are subject to the requirements of NSW legislation and are therefore beyond the Minister's ambit of discretion under the *Environmental Effects Act* 1978.

Transport Depot

The haulage contract between the mine and the Port is intended to be operated by a local contractor who may, or may not, maintain a suitable transport depot within the vicinity of Orbost or Newmerella.

In circumstances where the contractor does not maintain existing facilities, or requires approval for an expansion, separate planning approval will be required from the East Gippsland Shire Council in accordance with the requirements of the *Planning and Environment Act* 1987 and East Gippsland Shire Planning Scheme. These processes provide an appropriate framework for the proper consideration of any hypothetical Transport Depot, including processes for public consultation.

6 Mile and 7 Mile Deposits

The Proponent has previously identified the potential development of the 6 Mile and 7 Mile iron deposits, also held within EL4509. However, there is insufficient knowledge available at this point in time for either of these deposits to be included within the overall scope of the Project. Furthermore, the Project is in no way dependent on these other resources.

Reprocessing of Low-Grade Ore

Preliminary metallurgical test work indicates that the low-grade ore produced in the dry LIMS process contains approximately 17-48% Fe, comprised predominantly of the mineral hematite.

Whilst the development of the 5 Mile deposit is in no way dependent on the reprocessing of the low-grade ore, this material has the potential to be evaluated for reprocessing later in the mine life. However, to do so would require wet-processing and, therefore, consideration of a range of economic and environmental factors including, but not limited to:

- Market conditions and iron prices;
- Additional infrastructure requirements;
- Additional water supply/source;
- Tailings management; and
- Potential downstream water quality impacts.

By way of example, reprocessing the low-grade ore would require additional infrastructure and wet-processing to upgrade the material to a saleable product and, therefore, significantly increase the Project's water requirement. However, no reliable surface or groundwater resource has been identified in the region to satisfy the anticipated demand.

The reprocessing, if ever pursued, would also produce a tailing that would need to be carefully managed. Tailings would either need to be placed in the open pit (subject to mine scheduling) or in an engineered Tailings Storage Facility (TSF). The risk associated with a failure in the TSF, or tailings oxidation, has the potential to significantly impact on water quality at the site and downstream.

Simply, these same risks do not exist for the project description forming the basis of this referral, and is a key driver for the selection of dry LIMS processing as part of the Project.

Given that there are significant uncertainties associated with the potential future reprocessing of the low-grade ore, it is entirely inappropriate to include this option as part of the project description. No re-processing of the low-grade ore can be undertaken using the proposed dry LIMS process or infrastructure and, accordingly, it is relevant insofar as the Project is concerned, that issues associated with water usage and tailings management for any future reprocessing of the low-grade ore are entirely separate to the Project.

Further approvals will therefore be required if this option is in fact pursued. This would include, at a minimum, referrals under the *Environment Effects Act* 1978 and *Environment Protection and Biodiversity Conservation Act* 1999, and approval for increased water allocations under the *Water Act* 1989.

Having regard to the varied considerations of future reprocessing above, there is no inevitably of reprocessing actually eventuating or, of any cumulative effects.

6. Project implementation

Implementing organisation (ultimately responsible for project, ie. not contractor)**:**

Gippsland Iron Pty Ltd

Gippsland Iron Pty Ltd is a wholly owned subsidiary of Eastern Iron Limited (Eastern Iron). The financial and technical resources of Eastern Iron will be available to Gippsland Iron Pty Ltd for the approval and development of the project.

Implementation timeframe:

A preliminary Project execution schedule is being prepared as part of the DFS, which is due for completion before the end of 2013. The proponent will be in a position to proceed to mining (subject to completion of the DFS), upon receipt of all relevant approvals.

Based on current timeframes, the Proponent is aiming to obtain all relevant approvals and commence detailed design/procurement and construction in the second half of 2014.

The Construction Phase, including clearance and pre-strip activities, is expected to take approximately 8-10 months. Accordingly, the Proponent is aiming to deliver the first shipment of product in the second or third quarter of 2015.

The Project mine life is estimated at 8-10 years subject to mining rates and further exploration success.

Proposed staging (if applicable):

No staging of the Project is proposed.

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

☐ No ☒ Yes If no, please describe area for investigation.

If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

The proposed open pit, Waste Rock Dump (WRD) and Temporary Low Grade Ore Stockpile generally lie adjacent to (or partially on) the existing Nowa Nowa-Buchan Road, near to its intersection with Tomato Track. The mine access road and infrastructure area is proposed to be located along the ridge associated with the existing Tomato Track, and accessed via the Bruthen-Buchan Road. Maps of the proposed site and surrounds are provided in **Attachment 1**, Figures 1.1-1.3.

The Carrabungla (Ca) and Collins (Cs) land systems underlie the proposed mine site. These land systems comprise short, steep slopes on silicic volcanic rocks. Low to moderate rainfall acting on slow-weathering rocks in a landscape with moderate and steep slopes leads to a low rate of soil formation but a high rate of natural erosion. The soils, therefore, tend to be stony, shallow and acidic and have little profile differentiation. Topsoils have a weak crumb structure, while subsoils are usually apedal (single grained or massive) and earthy. In protected pockets the soils are often deeper and have clayey subsoils.

The mine site is located on Gap Creek and Tomato Creek, which drain into Harris Creek at a junction near the proposed mine access road. Harris Creek flows into Yellow Waterholes Creek upstream of Boggy Creek which then flows into Lake Tyers near the township of Nowa Nowa, approximately 15 km downstream of the mine site (refer drainage map, Figure 2.1 of **Attachment 5**).

Lake Tyers forms part of the Gippsland Lakes Ramsar Site, however, it is separate from the other lakes in the Gippsland Lakes system. The creeks draining the mine site are ephemeral with little to no flow during dry periods and high flow / energy events during periods of high rainfall.

The vegetation cover of the site primarily consists of native eucalypt forest, with most areas regenerating after recent (10 years) of historic logging (~60 years; refer section 12). Shrubby Dry Forest (Least Concern) dominates vegetation cover. Several exotic weeds have been observed at the site.

There are no significant physical features at the site. No buildings occur on the site. The closest built structures are farmhouses associated with the hamlet of Wairewa, and properties on Bruthen-Buchan Road, both of which are located approximately 4 km from the site.

The footprint of the proposed open pit, WRD and Temporary Low Grade Ore Stockpile impact the existing alignment of Nowa Nowa-Buchan Road, affecting approximately 1.8 kilometres of its length. The Nowa Nowa-Buchan Road is a gravel road, used predominantly for forestry activities. In order to maintain through traffic between Forests Road (in the south) and Bruthen-Buchan Road (in the north), it is proposed to divert the Nowa Nowa-Buchan Road around the eastern side of the mine footprint, partly utilising the existing 5 Mile Road.

Photos of the site and the downstream environment are provided at **Attachment 8** and **Attachment 9**.

Site area (if known):

The mine footprint, including construction buffers and bushfire management zones, covers a total area of approximately 146 hectares. This footprint includes all Project components, including access roads and the proposed diversion of the Nowa-Nowa Buchan Road.

Route length (for linear infrastructure) …… (km) **and width** …….. (m)

Current land use and development:

The site is wholly within the Tara State Forest (Crown land) which has been primarily managed for timber harvesting within the vicinity of the proposed works. The Department of Environment and Primary Industries (DEPI) is the relevant public land manager.

Description of local setting (e.g. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):

Adjoining land surrounding the mine site also forms part of the Tara State Forest (Crown land) which has been primarily managed for timber harvesting as described above.

The accessibility of the mine site is high with the site directly adjacent to the Bruthen-Buchan Road (sealed). A number of unsealed forestry tracks intersect the Project area including Tomato Track. The existing Nowa Nowa-Buchan Road is a gravel road used predominantly for forestry

activities.

An existing 22 kV transmission line runs parallel to Bruthen-Buchan Road past the mine access road. This line will not be affected by the development of the Project. No other significant infrastructure in the vicinity of the site.

No residences or urban centres occur within or directly adjacent to the site. The closest residences identified to the site are isolated farmhouses associated with the small settlement of Wairewa (south-east) and agricultural properties on Bruthen-Buchan Road (west of the site). These residences located over 4 km from the site. The next closest settlement area to the Project is Nowa Nowa which is located approximately 7 km to the south.

The closest major urban centre is Lakes Entrance which occurs approximately 25 km southwest from the Project. Other Townships in the broader area include Orbost (30 km east) and the smaller township of Buchan (18 km north).

Planning context (e.g. strategic planning, zoning & overlays, management plans):

The site is affected by the East Gippsland Planning Scheme ('the Planning Scheme'). The East Gippsland Shire Council is the responsible authority for administering the Planning Scheme.

Pursuant to the Planning Scheme, the Project falls within the land use category of '*Earth and Energy Resources Industry*' and is more particularly defined as '*Mineral Extraction*.' The definition of 'Mineral Extraction' (clause 74) is: "*Land used for extraction of minerals in accordance with the Mineral Resources (Sustainable Development) Act 1990."*

The site is predominantly within the Public Conservation and Resource Zone (PCRZ); affected by the Bushfire Management Overlay (BMO); and partially affected by the Erosion Management Overlay (EMO) in accordance with the relevant provisions of the Planning Scheme. The existing Nowa Nowa - Buchan Road is located within the Road Zone, Category 1.

In accordance with these controls, 'Mineral Extraction' is a permitted land use once a planning permit is in place.

At a strategic level, the following provisions of the East Gippsland Planning Scheme are relevant to the consideration of the proposal:

State Planning Policy Framework (SPPF)

Clause 12 of the Planning Scheme has regard for Victoria's environmental, landscape and biodiversity values. Clause 13 of the SPPF relates to Environmental Risks and requires that:

> *'Planning should adopt a best practice environmental management and risk management approach which aims to avoid or minimise environmental degradation and hazards. Planning should identify and manage the potential for the environment, and environmental changes, to impact upon the economic, environmental or social well-being of society'.*

Clause 14 of the Planning Scheme outlines State level strategic policy with regard to Natural Resource Management and recognises:

> *'Planning is to assist in the conservation and wise use of natural resources including energy, water, land, stone and minerals to support both environmental quality and sustainable development'.*

Of particular relevance to the proposal is Clause 14.03 of the Planning Scheme which has regard for resource exploration and extraction. Accordingly, the objective of Clause 14.03 seeks:

'To encourage exploration and extraction of natural resources in accordance with acceptable environmental standards and to provide a planning approval process that is consistent with the relevant legislation'.

Strategies of relevance to the Project at Clause 14.03 include, inter alia:

- *Protect the opportunity for exploration and extraction of natural resources where this is consistent with overall planning considerations and application of acceptable environmental practice.*

Clause 17 of the Planning Scheme outlines the State's policy with regard to Economic Development. Clause 17 relates to the proposal in a general sense and recognises that:

'Planning is to provide for a strong and innovative economy, where all sectors of the economy are critical to economic prosperity'.

Clause 18 of the Planning Scheme outlines policies relevant to Transport and includes the following strategy, inter-alia:

- *Ensure careful selection of sites for freight generating facilities to minimise associated operational and transport impacts to other urban development and transport networks.*

Municipal Strategic Statement (MSS)

The Local Planning Policy Framework (LPPF) sets out the Municipal Strategic Statement (MSS) and the local planning policies for the municipality. The East Gippsland Planning Scheme identifies local policy positions regarding land use and development within the East Gippsland Shire.

Relevantly, Clause 21.06 relates to Natural Resource Management. Clause 21.06-4 maintains the following stated objective, inter-alia:

'To encourage exploration for and development of mineral resources in appropriate areas'.

Particular Provisions

Particular provisions outlined in the Planning Scheme that are of relevance to the proposal include Clause 52.08 – Earth and Energy Resources Industry which seeks, inter alia:

'To encourage land to be used and developed for exploration and extraction of earth and energy resources in accordance with acceptable environmental standards.'

Local government area(s):

East Gippsland Shire Council

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity (cf. general description of project site/study area under section 7):

The key environmental assets and sensitivities in the Project area and vicinity include:

Downstream recreational areas and wetlands

A portion of the Gippsland Lakes Ramsar site, specifically Lake Tyers, is located approximately 15 km downstream of the proposed mine site. Lake Tyers is a popular recreational area, being used by (for example) anglers, bird watchers and water sport enthusiasts. Notably, Lake Tyers is separate from the other parts of the Gippsland Lakes System.

Forests and ecological values

The Project is located within the Tara State Forest, which is primarily managed for timber harvesting and conservation purposes. Most of the Project area has been harvested at one point in time over the last 60 years. The mine site intersects two bioregions, East Gippsland Uplands (EGU) and East Gippsland Lowlands (EGL). The dominant vegetation type within the area is Shrubby Dry Forest and Lowland Forest, with Damp Forest and very small patches of Riparian Forest.

No EPBC Act protected species or ecological communities have been recorded in or near to the proposed Project location (within 2 km). The Tara State Forest is managed for the protection of three FFG Act owl species, although no owls or their habitat were observed within the Project area as part of recent surveys.

9. Land availability and control

Is the proposal on, or partly on, Crown land?

☐ No ☒ Yes If yes, please provide details.

The proposed mine footprint is located entirely on Crown Land and intersects two Crown Allotments, SPI5~B\PP3326 Allotment 6 and SPI23~A\PP3326 Allotment 23. A plan showing the land tenure is provided in **Attachment 1**, Figure 1.2.

Current land tenure (provide plan, if practicable):

The Department of Environment and Primary Industries (DEPI) is the relevant public land manager for all areas impacted by the proposed mine site. However, parts of the site are allocated to Vic Forests for timber harvesting under the current Timber Release Plan for the area.

In accordance with the East Gippsland Forest Management Plan, the site is partially located within the Special Management Zone and Special Protection Zone (refer Figure 5.1, **Attachment 11**). The purposes of these zones are as follows:

- the Special Management Zone (SMZ) will be managed to conserve specific features, while catering for timber production under certain conditions; and
- the Special Protection Zone (SPZ) will be managed for conservation, and timber harvesting will be excluded. It forms a network designed to complement conservation reserves.

Land to the west of the existing Nowa Nowa – Buchan Road is located in the SMZ and covers the majority of the Project components. Land to the east is located in the SPZ and is impacted by the open pit, WRD, Temporary Low-Grade Ore Stockpile and diversion of the Nowa Nowa – Buchan Road. Significant areas within the relevant SPZ have already been cleared by Vic Forests.

In accordance with the East Gippsland Regional Forest Agreement 1997, mining may be permitted within areas of SMZ or SPZ.

All areas affected by the Project are held by the Proponent under EL4509.

Intended land tenure (tenure over or access to project land):

The Proponent has made an application for Mining Licence (MIN 5571) to facilitate the development of the Project in accordance with the requirements of the *Mineral Resources (Sustainable Development) Act* 1990.

Other interests in affected land (e.g. easements, native title claims):

Native Title

On 22 October 2010 the Federal Court recognised that the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) hold Native Title (VID482/2009) over much of Gippsland. On the same day, the State entered into an agreement with the GLaWAC under the Traditional Owner Settlement Act 2010.

The GLaWAC is recognised as the sole holder and representative body of these native title rights and interests on behalf of all Gunai / Kurnai people. The agreement and the native title determination affect undeveloped Crown land within the Gippsland region, including the Project area.

Eastern Iron maintains an existing Native Title Agreement with GLaWAC for its exploration activities under EL4509. Eastern Iron has commenced negotiations associated with entering into a Native Title Agreement (NTA) for the development of the Project and these negotiations are well advanced. The parties are aiming to reach agreement on the terms of any NTA by the end of 2013.

10. Required approvals

State and Commonwealth approvals required for project components (if known):

Commonwealth

The Project will be referred to the Minister for the Environment in accordance with the *Environment Protection and Biodiversity Act* 1999 for a decision as to whether it is a 'controlled action'.

Victoria

Key approvals required for the Project include:

- Grant of a Mining Licence, Work Plan and Work Authority pursuant to the *Mineral Resources (Sustainable Development) Act* 1990.
- Native Title Agreement (NTA) with the GLaWAC pursuant to the *Native Title Act* 1993.
- Approval from Southern Rural Water for 'take and use' of surface water, works licence for dam construction, and groundwater extraction pursuant to the *Water Act* 1989.
- Approval from East Gippsland Catchment Management Authority for licencing works on waterways pursuant to the *Water Act* 1989.
- Permits for the removal of native vegetation and/or fauna on public land pursuant to the *Flora and Fauna Guarantee Act* 1998 and/or *Wildlife Act* 1975 (if required).
- Approval of a Cultural Heritage Management Plan pursuant to the *Aboriginal Heritage Act* 2006 and its associated regulations.
- Approval for the use of the land under the *Crown Land (Reserves) Act* 1978.
- Approved planning permit pursuant to the *Planning and Environment Act* 1987 (subject to the Minister's decision on this referral).

Have any applications for approval been lodged?

☐ No ☒ Yes If yes, please provide details.

The Proponent has made an application for Mining Licence (MIN 5571) to facilitate the development of the Project in accordance with the requirements of the *Mineral Resources (Sustainable Development) Act* 1990. The application has been subject to public notice and no objections have been received.

Eastern Iron has commenced negotiations associated with entering into a Native Title Agreement (NTA) for the development of the Project and these negotiations are well advanced. The parties are aiming to reach agreement on the terms of any NTA by the end of 2013.

A Cultural Heritage Management Plan (CHMP) is underway for the Project and identified as no. 12457. The CHMP will proceed to a complex assessment to determine the place extent of one identified cultural heritage site. The complex assessment will proceed subsequent to the Minister's decision on this referral.

Approval agency consultation (agencies with whom the proposal has been discussed):

- Department of the Environment (Commonwealth)
- Department of Environment and Primary Industries
- Department of Transport, Planning and Local Infrastructure
- Department of State Development, Business and Innovation
- East Gippsland Shire Council
- VicRoads
- Regional Development Victoria
- Southern Rural Water
- East Gippsland Catchment Management Authority
- East Gippsland Water

Other agencies consulted:

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

A risk-based approach was adopted to identify the key potential effects of the Project – including both 'threats' and 'opportunities'. A full risk assessment (including detailed methodology) is provided at Section 3 of the proposed *Environmental Management Plan* (**Attachment 2**) and summarised below.

The purpose of the risk assessment was to ensure potential risks associated with the Project are identified and addressed through the development of appropriate management and mitigation measures to minimise adverse Project risks. Risks are assessed based on the proposed project design (refer Section 3 of this form and **Attachment 1**). Risks associated with the various alternatives considered in the Project planning process are considered separately in **Attachment 4**.

The methodology for this Risk Assessment is based upon *AS/NZS ISO31000 Risk Management — Principles and Guidelines, 2009* and *ISO31010 Risk Management – Risk Assessment Techniques, 2009*. The risk assessment is initially conducted for the development scenario assuming implementation of Project 'controls' (risk avoidance/control measures integrated into the preferred Project design as outlined in **Attachment 1**), but prior to any additional management and mitigation measures. The aim of this approach is to identify the most significant potential risks in the absence of additional mitigation. Following the assessment of the initial risk ranking,

additional measures are identified to avoid or minimise the identified risks according to the level of risk, and a revised risk ranking is provided for residual risks. Definitions of likelihood, consequence and controls are provided in the *Environmental Management Plan* at **Attachment 2**.

For each of the identified risks, a semi-quantitative evaluation of the level of the risk exposure for each risk identified was conducted by allocating a 'Level of Likelihood' and 'Level of Consequence' to each of the risks. The threat and opportunity risk matrices below where then used to evaluate level of risk exposure.

Risk Matrix (Threats)

Likelihood		Consequence (Adverse)				
		1	2	3	4	5
		Negligible	Minor	Moderate	Major	Extreme
5	Certain	Medium	Medium	High	Very High	Very High
4	Almost certain	Medium	Medium	High	High	Very High
3	Likely	Low	Medium	Medium	High	High
2	Unlikely	Low	Low	Medium	Medium	High
1	Rare	Low	Low	Low	Medium	Medium

Risk Matrix (Opportunities)

Likelihood		Consequence (Beneficial)				
		1	2	3	4	5
		Negligible	Minor	Moderate	Major	Extreme
5	Certain	Medium	Medium	High	Very High	Very High
4	Almost certain	Medium	Medium	High	High	Very High
3	Likely	Low	Medium	Medium	High	High
2	Unlikely	Low	Low	Medium	Medium	High
1	Rare	Low	Low	Low	Medium	Medium

The detailed economic, environmental and social risk assessment results table for each phase of the Project is provided at Section 4 of **Attachment 2**. Key results are summarised below.

<u>Risk assessment results – prior to mitigation</u>

After project design and control, and prior to mitigation, no 'Very High' risks were identified for the Project. A number of 'High' risks (including both threats and opportunities) prior to mitigation were identified, with the remainder being either 'Medium' or 'Low'.

The risk exposure levels for all adverse risks were able to be reduced through the implementation of management and mitigation measures. Having regard for the *Ministerial Guidelines for Assessment of Environment Effects*, the key adverse risks for the Project prior to mitigation are primarily associated with:

- Downstream water quality and hydrology;
- Ecology;
- Traffic; and
- Cultural heritage.

Risk assessment results – post mitigation

Following the implementation of the proposed management and mitigation measures outlined in the Environment Management Plan at **Attachment 2**, the risk assessment indicates that no 'Very High' adverse risks will occur as a result of the Project. Two 'High' risks remain for the Project which are associated with:

1. native vegetation and habitat loss within the mine footprint; and
2. impacts on cultural heritage.

These are discussed individually below.

Ecology

Residual ecological risks remaining for the Project are primarily associated with the vegetation clearance. The risk of 'Native vegetation and fauna habitat loss' remains 'High' post mitigation due to the unavoidable need to clear the vegetation within the Project footprint. Notably, the risk assessment did not take into account offsets. Residual ecological risks associated with native vegetation clearance are expected to be offset in accordance with Victorian legislation, resulting in an overall 'net gain' for biodiversity conservation (refer Section 12).

Notwithstanding the need to clear large areas of native vegetation, the vegetation is identified as being disturbed as a result of previous timber harvesting activities and is predominantly of an EVC identified as being of 'Least Concern' in the bioregion. No EPBC Act or FFG Act species or communities have been recorded (from databases or field surveys) at the mine site, including targeted surveys of the Colquhoun Grevillea.

Cultural Heritage

The risk associated with impact on cultural heritage values will occur due to the impact of the Project on one Aboriginal site identified in the vicinity of the mine access road. This site consists of a scatter of stone artefacts and the potential impacts of this site will be appropriately assessed and managed through the development and implementation of a Cultural Heritage Management Plan approved by GLaWAC, being the Registered Aboriginal Party for the area (see Section 15).

The design of the Project incorporates significant management and mitigation measures to minimise risk to the downstream environment during all phases of the Project. This includes no discharge of potentially affected water during operations. Additional post-design management and mitigation measures are incorporated so that there are no 'high' risks to the downstream water quality environment in terms of 'likelihood' and 'magnitude' of effects over time. This is discussed further in Section 13.

It is not anticipated that the Project will result in potential significant effects in noise and/or traffic conditions as all roads associated with the transport of product are approved for B-Double use, with the majority of the transport route via the Princes Highway. Further, all roads have historically been used for forestry related traffic and the level of traffic contemplated by the Project is within the operational design capacity of the existing road network. Matters associated with traffic and transport are addressed at Section 15 of this referral and at **Attachment 2** and **Attachment 7**.

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

☐ NYD ☐ No ☒ Yes If yes, answer the following questions and attach details.

What investigation of native vegetation in the project area has been done? (briefly describe)

An investigation of native vegetation occurring in the project area has been conducted by Ethos NRM with the methodology and results provided in **Attachment 8**, Annex 1. This study included:

- Data and literature review;
- Field survey including Habitat Hectares Assessment of 17 sample sites and Tomato Track / Bruthen-Buchan Road Intersection;
- EVC Mapping of a 1100 ha area including the proposed mine site and surrounding areas; and
- Estimation of native vegetation loss and offset requirements.

A detailed data and literature review of the ecological community and vegetation records occurring in the broader region of the proposed Project area and downstream was conducted as part of the *Flora, Fauna and Ecological Characteristics and Assessment* (**Attachment 8**) and the *Aquatic and Wetland Ecology Study* (**Attachment 9**). An overview field assessment was also conducted for both of these studies.

These studies also assessed suitable habitat for species identified by the Department of the Environment, Protected Matters Search Tool. A brief summary of these results is as follows:

- No EPBC Act species or ecological communities have been recorded within the mine site or surrounding 2 km of habitat;
- The EPBC Act Protected Matters Search Tool indicates that the listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland community (Critically Endangered) may occur in the greater region (>5 km), but not within the mine site;
- Four modelled Rare FFG Act communities have been mapped within 2 km of the mine site. All of these four communities are within one remnant patch of Warm Temperate Rainforest. However, this patch is not located within the mine site;
- Overall, it appears that the Study Area has few areas of vegetation that are reliant on subsurface or subterranean groundwater since groundwater depths range from 37 to 50 m. The most likely areas of Groundwater Dependent Ecosystems (GDEs) are within and along the three main ephemeral creeks of the mine site and the greater Study Area. However, due to the depth of the water table in the area, it is therefore highly unlikely that groundwater dependent ecosystems (GDE) occur in the direct vicinity of the mine site (refer Section 13).

What is the maximum area of native vegetation that may need to be cleared?

☐ NYD Estimated area…146…….(hectares)

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

☐ N/A ☒ NYD……. approx. (if applicable)

It is noted that parts of the site are identified as being within designated areas of Vic Forests current Timber Release Plan. The area and/or designation of these areas for timber harvesting are currently unknown.

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

☐ NYD ☒ Preliminary/detailed assessment completed. If assessed, please list.

Two bioregions intersect the vegetation study area; East Gippsland Uplands (EGU) covers the majority of the Study Area, with a smaller area occurring within the East Gippsland Lowlands (EGL).

Five Ecological Vegetation Classes (EVCs) were identified during the field survey of the mine site and broader Study Area. Four EVCs were identified within the mine site and will be directly affected by the Project. These EVC's are listed in the table below, with Shrubby Dry Forest dominating vegetative cover in the area and also within the mine footprint. Warm Temperate Rainforest was identified in the Study Area, but will not be impacted by the mine footprint or other Project components.

Vegetation affected (ha)	EVC no.	EVC (Bioregion)	Bioregional Conservation Status	Mine site EVC cover / contribution (approx.)
145.79	21	Shrubby Dry Forest (EGL, EGU)	Least Concern	75 %
	16	Lowland Forest (EGL, EGU)	Least Concern	20 %
	29	Damp Forest (EGL, EGU)	Least Concern	3 %
	18	Riparian Forest (EGL)	Depleted	4 %

EGL: East Gippsland Lowlands; EGU: East Gippsland Uplands

Have potential vegetation offsets been identified as yet?

☒ NYD ☐ Yes If yes, please briefly describe.

As per the Environmental Management Plan at **Attachment 2**, Eastern Iron is committed to completion of supplementary vegetation surveys and reporting to update the habitat hectares assessment and calculation of offsets in accordance with the recent *Reforms to Victoria's Native Vegetation Permitted Clearing Regulation* (DEPI, 2013). Based on the outcomes of these supplementary flora studies, a *Biodiversity Offset Strategy* will be developed for the Project in consultation with DEPI.

Further vegetation (habitat hectare) assessments are underway for Spring 2013, when cryptic species are likely to be flowering. The current habitat hectare estimates prepared by Ethos NRM (**Attachment 8**, Annex 1) will be updated as part of this process.

Other information/comments? (e.g. accuracy of information)

The *Flora, Fauna and Ecological Characteristics and Assessment* (**Attachment 8**) and *Preliminary Vegetation Quality Assessment & EVC Mapping – Nowa Nowa Iron Project* (**Attachment 8, Annex 1**) are limited by the fact that some flora and fauna species are only identifiable or onsite during particular periods of the year (e.g. flowering/ migratory seasons). Additionally, since the survey area for the above studies is such a large area, only a portion could be ground-truthed for EVC distribution. This is a common problem/limitation for any flora and fauna study of a large area.

These limitations/restrictions will be addressed in the Spring 2013 vegetation (habitat hectare) assessments. Survey methodology for the Spring surveys has been prepared in accordance with the recommendations of representatives of DEPI. The results from these field surveys are expected to be available by the end of November 2013 and will be provided to DTPLI to inform the Minister's decision on the EES Referral.

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done? (provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

An assessment of flora species occurring in the proposed Project area has been conducted by Ethos NRM with the methodology and results provided in the *Preliminary Vegetation Quality Assessment & EVC Mapping – Nowa Nowa Iron Project* (**Attachment 8, Annex 1**). This investigation included:

- Data and literature review; and
- Field survey including flora species list.

An assessment of native fauna and an overview assessment of flora and ecological community records occurring in the proposed Project area and in the catchment downstream of the Project, and have been conducted by Earth Systems with the methodology and results provided in the *Flora, Fauna and Ecological Characteristics and Assessment* (**Attachment 8**) and *Aquatic and Wetland Ecology Study* (**Attachment 9**). These investigations included:

- Detailed data and literature review, covering a 10 km radius zone around the mine site;
- Detailed fauna survey including for diurnal and nocturnal species within a 1250 ha *Study Area* encompassing the proposed mine site and immediate surrounding habitat. A total of 127 hours of surveys have been undertaken, including:
    - Diurnal point counts of all vertebrate fauna observed (72 points arranged in a grid);
    - Diurnal transect searches (vegetation, trees, under rocks/logs, leaf litter and bare ground were searched for evidence of vertebrate fauna);
    - Nocturnal fauna surveys using call playback, call recognition, point spotlight search, transect spotlighting and dusk and dawn watches;
    - Incidental records of all vertebrate fauna seen or heard within the Study Area and not seen during formal diurnal or nocturnal fauna surveys; and
    - Forest owl targeted surveys.

Statistical analyses make it clear that survey effort was sufficient to detect all forest owl species of potential concern.

Targeted surveys for the Colquhoun Grevillea (*Grevillea celata*) were undertaken in October 2013 in accordance with the methodology prescribed by the DEPI. No evidence of the Colquhoun Grevillea was found at or near the mine site.

Additional Spring (2013) vegetation surveys are underway and will be undertaken by Ethos NRM. These surveys aim to identify any species not flowering during the first surveys and to provide detailed analysis of vegetation loss and offset requirements. The results from these field surveys are expected to be available by the end of November 2013 and will be provided to DTPLI to inform the Minister's decision on the EES Referral.

Have any threatened or migratory species or listed communities been recorded from the local area?

☐ NYD ☐ No ☒ Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

A summary of the findings of the *Flora, Fauna and Ecological Characteristics and Assessment* (**Attachment 8**) with regards to threatened or migratory species is provided below.

Regional Biodiversity

Database and literature searches indicate that within a 10 km zone around the mine site:

- No EPBC Act threatened mammals have been recorded in the region;
- 196 bird species have been recorded in the region; most are common and widespread except for:
  - Two EPBC Act threatened species were recorded in 1977 (Australian bittern *Botaurus poiciloptilus* and swift parrot *Lathamus discolor*);
- Three FFG Act listed species (masked, sooty and powerful owl, *Tyto novaehollandiae novaehollandiae, T. tenebricosa tenebricosa* and *Ninox strenua*) have been recorded in the region;
- 12 species of reptile have previously been recorded in the region but only one is recognised by the DEPI Advisory list (lace monitor *Varanus varius*; DSE 2013: Advisory List of Threatened Vertebrate Fauna);
- 14 species of the class Amphibia have been recorded in the region, only one being a nationally significant species; the EPBC Act Vulnerable green and golden bell frog (*Litoria aurea*); and
- No significant fish or invertebrates have been recorded in the region.

The overview field assessment of the 10km zone found:

- Fifty-two species of bird and 16 mammal species were observed during the overview assessment of the region, and of these:
  - No EPBC or FFG Act listed species were observed at any time, however one DEPI-listed species was observed in forested areas within the region.
  - All other fauna species were common and/or widespread within Victoria and/or Australia.

Study Area Biodiversity

Databases and literature searches of the Study Area (encompassing a 1250 Ha area that includes the mine site and surrounding habitat) indicated:

- No EPBC Act listed species have been recorded within the mine site or Study Area;
- One FFG Act listed species (sooty owl) has been recorded within the Study Area, but not within the mine site;
- Two DEPI recognised species, the slender wire-lily (*Laxmannia gracilis*) and southern toadlet (*Pseudophyrne semimarmorata*), have been recorded within the broader Study Area, but only the wire-lily was recorded within the mine site (in 1980; DSE 2005 Advisory List of Rare or Threatened Plants in Victoria); and
- It is unlikely that additional FFG or EPBC Act listed flora or fauna species inhabit the mine site due to previous logging, insufficient habitat characteristics and poor connectivity with source populations.

Field flora surveys of the Study Area indicated:

- No EPBC Act or FFG Act threatened flora species (or preferred habitat) were identified at any time during the survey; and
- Colquhoun grevillea (or preferred habitat) was not found within the mine site during targeted spring surveys.

Fauna surveys of the Study Area indicated:

- No EPBC Act species were observed (or evidence found) at any time during surveys;
- One FFG Act listed species, the masked owl, was observed 1.2 km east-north-east of the mine site;
- Despite extensive searches of the habitat, including the Warm Temperate Rainforest patch to the south-east of the mine site, evidence of owl nests or roosts was not found;
- It is likely that the three threatened owl species hunt in the Study Area, but do not nest or roost in the Study Area or nearby. Analyses indicates that surveys were sufficient to detect all three species, if they were present in areas searched;
- A DEPI-listed Near Threatened species, the brown treecreeper (*Climacteris picumnus victoriae*) was observed on numerous occasions within the Study Area;
- The DEPI-listed Endangered lace monitor was observed twice and scratched trees indicating its presence were found throughout the Study Area;
- The DEPI-listed Critically Endangered Martin's toadlet (*Uperoleia martini*) was heard on one occasion, during a particularly heavy rainfall event, on the southern boundary of the Study Area, along the Nowa Nowa-Buchan Road (outside mine site);
- All mammals detected were common and widespread native species (i.e. not listed), in addition to three introduced species.

Summary:

No EPBC or FFG Act species or communities have been recorded (from databases or current studies) at the mine site. The EPBC Act Green and Golden Bell Frog recorded in the 5 km surrounding the Project is unlikely to occur within the mine site due to insufficient or unsuitable habitat. Additionally, nocturnal and diurnal surveys failed to detect any sign of this or other EPBC or FFG Act threatened frog species (e.g. Giant Burrowing Frog *Heleioporus australiacus*).

Initial flora surveys did not identify any Colquhoun grevillea (or its preferred habitat) within the mine site. Targeted surveys were subsequently undertaken in October 2013 in accordance with the methodology prescribed by DEPI. No evidence of the Colquhoun Grevillea was found at the mine site. Refer to Annex 2 of **Attachment 8.**

The FFG Act Warm Temperate Rainforest community has been confirmed as being present near the mine site, near to the proposed Nowa Nowa – Buchan Road diversion. This community will not be impacted by the Project.

The three FFG Act listed owl species (refer table below) have never been recorded using the habitat within the mine site, and no evidence of breeding or roosting habitat was found within or surrounding the mine site during the extensive field surveys undertaken for the Project. It is however likely that all three species use the broader area as potential hunting grounds and breed and roost in higher quality habitat to the south.

Several DEPI-listed species (flora and fauna) were identified using the habitat within the Project site (DSE 2013: Advisory List of Threatened Vertebrate Fauna; DSE 2005 Advisory List of Rare or Threatened Plants in Victoria). The table below provides listed species and communities recorded at the mine site or nearby (recent surveys are identified by the year 2013).

Common Name	Scientific Name	Recorded at Project (mine) Site (year)	Recorded in the 5 km Surrounding Project Site (latest year)
EPBC Act			
Green and golden bell frog	*Litoria aurea*		1993
Colquhoun grevillea	*Grevillea celata*		2002
FFG Act			
Warm Temperate Rainforest community			Present
Yellow-wood	*Acronychia oblongifolia*		1976
Masked owl	*Tyto novaehollandiae novaehollandiae*		2013
Powerful owl	*Ninox strenua*		2007
Sooty owl	*Tyto tenebricosa tenebricosa*		2007
DEPI (not Data Deficient status)			
Wallaby bush	*Beyeria lasiocarpa*	2013	
Gippsland stringybark	*Eucalyptus mackintii*	2013	
Forest red box	*Eucalyptus polyanthemos longior*	2013	
Bolwarra	*Eupomatia laurina*		1992
Rough Blown-grass	*Lachnagrostis scabra*		1976
Slender wire-lily	*Laxmannia gracilis*	1980	
Twin-flower Tea-tree	*Leptospermum emarginatum*		1984
Paperbark tea-tree	*Leptospermum trinervium*	2013	
Creeping Loosestrife	*Lysimachia japonica*		1976
Austral tobacco	*Nicotiana suaveolens*	2013	
Smooth geebung	*Persoonia levis*	2013	
Heath Platysace	*Platysace ericoides*		2000
Rough-fruit pittosporum	*Pittosporum revolutum*		1996
Birch pomaderris	*Pomaderris betulina betulina*		1940
Golden pomaderris	*Pomaderris aurea*		1984

Wooly-head pomaderris	*Pomaderris eriocephala*		1984
Spicy everlasting	*Ozothamnus argophyllus*		1940
Brown treecreeper	*Climacteris picumnus victoriae*	2013	
Spotted quail-thrush	*Cinclosoma punctatum*		1993
Lace monitor	*Varanus varius*	2013	
Martin's toadlet	*Uperoleia martini*		2013
Southern toadlet	*Pseudophryne semimarmorata*		1977

It is possible that other threatened species inhabit the mine site and surrounding habitat but have never been recorded in the area, particularly due to their cryptic nature. An assessment of threatened species habitat requirements and the likelihood of their presence within the mine site found that no (additional) threatened species were "likely" to inhabit the area. "Likely" is defined as a species having habitat requirements met, threatening processes are low and that it is likely that they are detected in the future. However, the field surveys found that the habitat is too disturbed, structural components are absent (e.g. adequate shrub cover) and threatening processes are too frequent and/or in high numbers (e.g. introduced predators, logging activities) for many threatened species.

However, it was found that six threatened fauna species have the "potential" to inhabit the mine site and surrounding habitat (see table below). "Potential" is defined as having most habitat requirements met and the species may infrequently use the habitat and/or may disperse into the area, given threatening processes are minimised.

The table below lists EPBC Act and FFG Act listed terrestrial fauna that have the potential to inhabit the vegetation of the mine site and surrounding 5 km, but have never been recorded within mine site or within 5 km.

Common Name	**Scientific Name**	**Conservation Status**	**Last recorded 10 km radius of mine site (year)**	**Likelihood / Justification**
Black-faced monarch	*Monarcha melanopsis*	EPBC Act Migratory / Marine	1993	Potential: Habitat is present, but rare in southern parts of range; may fly over
Greater glider	*Petauroides volans*	DEPI VU	2000	Potential: Habitat present, may be present in low densities
Long-nosed potoroo	*Potorous tridactylus tridactylus*	EPBC Act VU, FFG Act L, DEPI NT	Never recorded	Potential: Rare species, habitat probably of insufficient quality to permit constant/resident populations, very susceptible to introduced predators (which are common in mine site)
Southern brown bandicoot	*Isoodon obesulus obesulus*	EPBC Act EN, FFG Act L, DEPI NT	Never recorded	Potential: Some habitat may be present, local populations known in greater Gippsland area; however likelihood of occurrence limited by presence of predators and insufficient ground cover

Spot-tailed quoll	*Dasyurus maculatus maculatus*	EPBC Act EN, FFG Act L, DEPI EN	Never recorded	Potential: Possible visitor; at least one individual was found near Bruthen (dead on road) in 2010 and Nowa Nowa region in 2013
White-footed dunnart	*Sminthopsis leucopus*	FFG Act L DEPI NT	1978	Potential: Habitat may be present, but probably be of insufficient quality to sustain population

Key: EN: Endangered; VU: Vulnerable; L: Listed; NT: Near Threatened

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (e.g. loss or fragmentation of habitats) Please describe briefly.

Loss/fragmentation of habitat:

- Vegetation loss will occur within the proposed mine footprint.

Vegetation may be indirectly impacted by one or a combination of increased:

- Exposure to light and altered microclimate on clearance edges;
- Exposure to weeds and parasites carried by wind and increased traffic;
- Erosion and sediment transport; and/or
- Dust pre- and post-construction and/or increased risk of fire.

Native fauna may be indirectly impacted by the Project by one or a combination of:

- Removal of foraging and/or breeding habitat;
- Intolerance of human activities;
- Increased competition for resources;
- Increased exposure to introduced species (including native); and/or
- Increased predation from introduced species and humans.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

☐ NYD ☐ No ☒ Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing) Comment on likelihood of effects and associated uncertainties, if practicable.

No significant communities or EPBC Act species are expected to be impacted by the Project, based on previous and current survey results.

No species or communities are expected to be subject to a 'major or extensive impact', as no genetically important populations of species listed or nominated for listing have been identified in the vicinity of the mine site.

Flora

The following regionally significant (DEPI Advisory List) species may be removed and/or indirectly impacted by Project activities:

- Slender wire-lily;
- Wallaby bush;
- Gippsland stringybark;
- Forest red box;
- Paperbark tea-tree;
- Austral tobacco; and
- Smooth geebung.

There is not expected to be a major or long-term impact on these species because there will only be direct loss of individual plants occurring within the mine site (if they occur) and the populations of these species are secure elsewhere in the Nowa Nowa region or in Victoria (hence their inclusion on the DEPI Advisory List). Some species may also be common locally. For example, Forest Red Box was a dominant canopy species of the Shrubby Dry Forest EVC, which is the most widespread EVC recorded in the Study Area. Hence no major or long term impact for the populations of these species is expected. Some of these species may also be able to re-establish in the area following revegetation. Furthermore, potential impacts on regional biodiversity related to the loss of individuals of these species will also be offset in accordance with Victorian legislation, resulting in an overall 'net gain' for biodiversity conservation.

Fauna

Foraging habitat

The following three species are protected under the FFG Act and have the potential to use the mine site as foraging habitat:

- Masked owl
- Powerful owl
- Sooty owl

The masked owl was seen nearby the Project area (approximately 1.2km east-north-east of the mine site) but it is likely that the other FFG Act owl species forage in the broader area. It is expected that there is a pair of each species (intermittently) using the Project and surrounding area. No breeding habitat was located within the Project area and therefore only a small portion of the owls' foraging habitat will potentially be removed. These species are highly mobile, having large territories (~10 - 30 km^2), and removal of a small portion of their foraging grounds is unlikely to result in a long term or significant impacts on the territorial pairs or greater populations.

These three owl species have very particular breeding (tree hollow) requirements and will only use one breeding, and one to several roost trees over the entirety of their ~3000 ha territory (see for example Kavanagh & Bamkin 1995, Schedvin et al. 2003, Loyn et al. 2001 etc.). These species will habitually return to these hollows and therefore leave very distinctive evidence of use (e.g. pellets) which were not found in the Study Area. Additionally, owls will call from these trees most nights (on dusk) when leaving on their nightly hunt. Given that over 38 hours of nocturnal field surveys were undertaken for the Project, owls would have been heard, if they were roosting or nesting nearby (i.e. their calls can be heard up to 1.5 km in distance). The absence of calling during the field surveys supported the finding that no current breeding habitat or roosting sites were identified within or near the Study Area.

A summary of potential Project impacts for the three owl species is as follows;

- Survey results suggest a single pair of each species (intermittently) use the Project and surrounding area
- Vegetation clearance will result in removal of a small portion of their foraging grounds (as above, breeding habitat not impacted)
- Increased human activity, territorial pair likely to flee and / or avoid the area (but may habituate)
- May avoid artificial lighting, but may also use it to hunt animals attracted by the light

Foraging and Potential Breeding Habitat

The following two species are of regional conservation significance in accordance with DEPI Advisory Lists as their populations are declining in some regions, but are stable elsewhere in Victoria and/or Australia:

- Lace monitor
- Brown treecreeper

A summary of potential Project impacts for these two species is as follows:

- Brown treecreeper;
  - » Observed on four occasions in the Study Area
  - » No evidence of nests, but suspected to breed in or near mine site
  - » Most susceptible to:
    - Removal of breeding and/or foraging habitat
    - Increased human activity, individuals likely to temporarily flee and avoid area (but may habituate as they are often found in disturbed habitat)
- Lace monitor;
  - » Observed on two occasions in the Study Area
  - » No evidence of breeding, but territories are very large
  - » Most susceptible to:
    - Removal of breeding and/or foraging habitat
    - Increased human activity, individuals likely to temporarily flee and avoid area (but may habituate)

It is likely that foraging habitat will be removed, but both species are highly mobile, and are likely to find foraging grounds elsewhere. Removal of habitat for Project activities is not expected to significantly impact on the local or regional population.

The lace monitor occurs in relatively low population densities, being one to three individuals over 1,000 to 3,000 ha and their large territories typically cover highly degraded habitat. Brown treecreepers also occur in highly degraded and fragmented forest in East Gippsland, and elsewhere across Victoria (e.g. box iron-bark forests; see Kavanagh et al. 2007 for example). Removal of a small proportion of the foraging grounds for these two species is therefore unlikely to significantly impact on their foraging activities.

There may be temporary displacement, but these species are able to readily habituate to (human-caused) disturbance, since all species forage in highly disturbed/fragmented and degraded habitat. It is also possible that these species will habituate to the mining activities and take advantage of the cleared areas to hunt.

Is mitigation of potential effects on indigenous flora and fauna proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Eastern Iron's commitments to management and mitigation of potential effects on indigenous flora and fauna are outlined in the *Environmental Management Plan* at **Attachment 2**. Key measures include:

- Minimise area required for Project footprint;
- Progressively remove vegetation subject to the sequencing of development/mining;
- Offset the loss of native vegetation through the protection or improvement/revegetation of native vegetation elsewhere in consultation with the DEPI (and Victorian legislation);
- Implement the *Environmental Management Plan* and existing management plans for the area (including injured wildlife protocols and biodiversity management strategy) in conjunction and consultation with DEPI;
- Cooperate with DEPI regarding weed and introduced animal control measures;
- Minimise noise, light and vibration emissions wherever possible, including frequencies beyond human hearing.
- Develop and implement a rehabilitation and closure plan that allows for the progressive rehabilitation of disturbed habitat over the Project life, and monitor and assess the success of the plan against predefined criteria.

Other information/comments? (e.g. accuracy of information)

DEPI have only processed flora and fauna data in the VBA up to 2011, and therefore records provided by DEPI to be used in the assessment were only current to 2011.

Species that have not been recorded previously or during recent surveys are not included in the species lists above. For a full discussion of species that *may* be present (based on habitat requirements, etc.) see **Attachment 8** and **Attachment 9**.

13. Water environments

Will the project require significant volumes of fresh water (e.g. > 1 Gl/yr)?

☐ NYD ☒ No ☐ Yes If yes, indicate approximate volume and likely source.

The Project will require water during the construction and operations phases. Design indicates that approximately 180 ML will be required for construction over 8-10 months. During operations, overall consumption will be approximately 164 ML/year (accounting for recycling onsite).

Will the project discharge waste water or runoff to water environments?

☐ NYD ☒ No ☐ Yes If yes, specify types of discharges and which environments.

The Project has been designed to prevent waste water discharges from the mine site during operations through the development of an Operations Water Storage. Sediment control dams will also control runoff during construction and operations. At closure, the Project will be rehabilitated to ensure water meets ambient water quality requirements.

The potential for the project to discharge waste water or runoff to water environments has been assessed in detail in the *Surface and Ground Water Baseline and Assessment* at **Attachment 5**. The design of the Project and management of water aims to minimise the risk of any significant hydrology, hydrogeology and surface and groundwater quality impacts during construction, operations and post-closure. The key principles underpinning the site water management strategy include:

- Minimise the surface and groundwater catchments and catchment area potentially impacted by the Project.
- Where possible, allow for the release of unaffected water from the Project for downstream environment flows during construction, operations and post-closure.
- Maximise the long-term geotechnical stability of Project facilities during construction, operations and post-closure.
- Maximise the long-term geochemical stability of geological materials during operations and post-closure (refer to **Attachment 6**).
- Maintain and re-use all potentially affected drainage on-site during construction and operations.
- Post-closure, all potentially affected drainage will be captured and managed to ensure that water released from the pit lake achieves downstream environmental objectives.

Features of the proposed Project design to note with regard to management of waste water and runoff include:

- Use of a dry Low Intensity Magnetic Separation (LIMS) process for processing of ore. The dry and reagent-free process will significantly reduce the Project's water requirements during operations.
- Constraining the Project footprint to the Boggy Creek catchment (only) to limit potential hydrology/water quality impacts to this catchment alone (ie. avoiding potential impacts to the Hospital Creek catchment).
- Location of the WRD upstream of the pit to allow drainage to be captured in the pit post-closure, providing opportunity for passive water treatment (in the pit lake) and minimising possible requirements for active water treatment.
- Location of the Temporary Low-Grade Ore Stockpile upstream of the pit to allow drainage to be captured during operations, with excess drainage associated with extreme storm events allowed to discharge into the open pit.
- Backfilling of the open pit with potentially sulfidic waste rock and low grade ore (if unsold) post-closure to allow for a permanent water cover (minimum of 2 m depth) to prevent sulfide oxidation.
- Filling of the open pit with water post-closure and allowing the pit lake to overflow into Tomato Creek with a positive water balance.

- Construction of three water storages to capture site surface water runoff and facilitate mine water supply during operations. The three water storages are as follows:
    - Operations Water Storage, located immediately downstream of the open pit on Tomato Creek.
    - Sediment Control Dam, located downstream of the open pit and mine industrial area (MIA) on Gap Creek.
    - Clean Water Storage, located downstream of the Operations Water Storage and MIA on Tomato Creek, upstream of the confluence with Harris/Gap Creek.
- The Operations Water Storage will be used to hold drainage from the WRD, Temporary Low-Grade Ore Stockpile, open pit, ROM pad and stockyard and groundwater from pit dewatering (eg. water with potentially elevated salinity, dissolved metals and/or acidity) during operations by pumping from sumps at each drainage collection location.
- Post-closure, the Operations Water Storage will be partially decommissioned as a polishing wetland to passively treat overflow from the pit lake.
- The Sediment Control Dam will be used to hold drainage from the proposed Project facilities (excluding the open pit, WRD, Temporary Low-Grade Ore Stockpile, ROM pad and stockyard) located in the Gap Creek catchment and allow settlement of suspended sediments, before release.
- All Project facilities will be arranged such that all drainage (excluding the open pit, WRD, Temporary Low-Grade Ore Stockpile, ROM pad and stockyard) will be directed into Gap Creek upstream of the Sediment Control Dam.
- Post-closure, the Sediment Control Dam is to be decommissioned and the site rehabilitated if no alternative use for the dam is identified.
- The Clean Water Storage will be used to capture clean water to supplement site water resources. It will also provide another level of protection for the downstream environment in the extremely unlikely event of a failure in the Operations Water Storage.
- Post-closure, the Clean Water Storage is to be partially decommissioned as a polishing wetland (in addition to the decommissioned Operations Water Storage) to passively enhance water quality from the flooded open pit.
- Post-closure, if groundwater inflows are not determined to be sufficient, one or all three water storage dams will be used to provide water to assist with the rapid filling of the open pit so as to minimise the period that any sulfidic wallrock and backfilled mine materials are exposed.
- During construction, sewage will be removed from the Project by vacuum truck and transported to a waste water treatment plant.
- An on-site waste water treatment plant will be used to treat sewage during operations, and treated waste water will be recycled for use onsite via the Operations Water Storage.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

☒ NYD ☒ No ☒ Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

Potential impacts on water environments are assessed in **Attachment 5** and **Attachment 9**. Waterways potentially impacted by the Project include the three ephemeral creeks located in the vicinity of the Project footprint: Gap Creek, Tomato Creek and Harris Creek. These creeks eventually drain into Boggy Creek and will be directly impacted by the siting of the Project components (refer **Attachment 1**, Figure 1.3).

The maximum surface area for the three water storages are as follows (brackets indicate maximum length of creek affected):

- Operations Water Storage, 3.5 Ha (509 m)
- Sediment Control Dam, 1.12 Ha (354 m)
- Clean Water Storage, 1.69 Ha (430 m)

The water storages are limited to Tomato and Gap Creeks, and are upstream of the confluence with Harris Creek. Harris Creek is only affected by the crossing of the mine access road, however a culvert will be installed as part of the road design to maintain stream flow.

Lake Tyers, which forms part of the Gippsland Lakes Ramsar Wetland Site, is located approximately 15 km downstream of the proposed mine site. The Project has been designed to minimise the risk of impacts on downstream water quality and hydrology, and will be managed and monitored to ensure no significant effects on Lake Tyers (refer **Attachment 5** and **Attachment 9**).

Are any of these water environments likely to support threatened or migratory species?

☐ NYD ☐ No ☒ Yes If yes, specify which water environments.

An assessment of the likelihood of water environments downstream of the Project to support threatened or migratory species has been conducted as part of the *Aquatic and Wetland Ecology Study* at **Attachment 9**.

Water environments at the mine site

Threatened species

No threatened species have been found within the ephemeral creeks at the mine site, or in the surrounding vegetation. It is highly unlikely that any (exclusively) aquatic species exist in the water environments of the mine site as the creeks are dry for most of the year, and temporary pools only form after very heavy and lengthy downpours. Furthermore, no threatened aquatic species have been recorded in the creeks downstream of the mine site, or Lake Tyers itself, which may act as source populations for the creeks at the mine site. In addition, aquatic freshwater species would be unlikely to be able to use Lake Tyers as a refuge when the creeks upstream are dry due to the saline conditions of Lake Tyers for most of the year. Lake Tyers was found to be equivalent to sea water in summer and layered fresh and brackish water in winter (see **Attachment 5**).

Amphibians may use the creeks, but no threatened amphibians were heard or seen using the creeks of the mine site during extensive field surveys (totalling approximately 127 hours, refer **Attachment 8**).

The last threatened amphibian to be recorded near to the mine site's creeks (~700 m north of Harris Creek) was in the 1960s. Masked owls, brown treecreepers and lace monitors may use the habitat in and around the ephemeral creeks, but they are highly mobile species, with large home ranges. Therefore, impact on these water environments is unlikely to affect any threatened terrestrial, amphibious or aquatic species.

Migratory species

Migratory species have not been recorded at the mine site (during previous or current studies). The poor quality habitat and unreliable/intermittent water sources are unlikely to attract any migratory species.

Water environments in creeks directly downstream of mine site (<50 m from waterway between the mine site and Lake Tyers)

No threatened aquatic, semi-aquatic or amphibious species have been recorded using the creeks of the mine site or downstream in the field surveys or database searches conducted as part of **Attachment 8** and **Attachment 9**. The following historical records were identified close to Lake Tyers:

- Green and golden bell frog (*Litoria aurea;* EPBC Act listed) museum specimen from 1965 for Nowa Nowa wetlands, northern arm of Lake Tyers; and
- Southern toadlet (*Pseudophryne semimarmorata;* DEPI listed) museum specimen from 1962 for mouth of Lake Tyers.

No other threatened aquatic, semi-aquatic or amphibious species have been recorded directly downstream of the mine site.

Water environments in downstream region (within 20 km of Lake Tyers)

The Gippsland Lakes Ramsar Site is known to support a wide range of species. However, the overview field survey of the broad downstream region identified:

- No EPBC Act threatened species;
- Three bird species protected under Migratory and Marine EPBC Act statuses;
  - Eastern great egret (*Ardea modesta*, FFG Act; Vulnerable DEPI);
  - White-bellied sea-eagle (*Haliaeetus leucogaster*, FFG Act; Vulnerable DEPI); and
  - Cattle egret (*Ardea ibis*).
- A pod of 4 to 6 Burranun dolphins (*Tursiops australis,* Nominated for listing under the FFG Act; Endangered DEPI; not within Lake Tyers)

Literature and data reviews of the broad downstream region identified:

- Three nationally significant ecological communities were identified by the EPBC Act search as having been modelled within the downstream region, however, no field records are available to verify their presence or distribution in the area.
- Six FFG Act ecological communities have been modelled as occurring in the Gippsland Lakes Ramsar Site, namely:
  - Coastal Moonah Woodland;
  - Dry Rainforest (Limestone) Community;
  - Four different types of Warm Temperate Rainforest.
- 24 Ecological Vegetation Classes (EVCs), most of which (18 EVCs) are considered to cover an area less than 50% of their pre-European extent (i.e. R, D, VU, EN);
- The following threatened species have been identified as occurring within the entire Gippsland Lakes Ramsar Site (ie inclusive of Lake Wellington system; Lake Victoria; Lake King system; Lake Bunga; Lake Tyers; Macleod Morass and Lake Reeve system).
  - 50 threatened flora species (EPBC Act, FFG Act, DEPI);
  - 94 significant bird species (EPBC Act, FFG Act, DEPI);
  - 21 threatened mammals (EPBC Act, FFG Act, DEPI); and
  - 17 reptile and 18 amphibian species (EPBC Act, FFG Act, DEPI); and
- No threatened fish or invertebrates (29 common fish and three invertebrates).

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

☒ NYD ☒ No ☒ Yes If yes, please specify.

Lake Tyers is located approximately 15 km downstream of the Project and forms part of the Gippsland Lakes system, which is listed under the Ramsar Convention. The main lakes of the Gippsland Lakes system are Lake Wellington, Victoria and King, which are linked to the sea by an artificial entrance at Lakes Entrance.

Significantly, Lake Tyers is situated to the east of the Lakes Entrance area and does not have connectivity to the other lakes in the Gippsland Lakes system. Lake Tyers is also listed in 'A Directory of Important Wetlands in Australia'.

It is not anticipated that the Project will result in potential significant environmental effects to Lake Tyers. The design of the development, as well as the management and mitigation measures proposed, ensures that the residual risk of downstream water quality impacts is appropriate.

Residual risks to Lake Tyers have been evaluated in the Project risk assessment in **Attachment 2**. This assessment identified that following mitigation, the likelihood of any significant adverse impacts on aquatic habitat in Lake Tyers (Gippsland Lakes Ramsar Site) is considered 'highly unlikely'. This low likelihood is due to the implementation of design controls and management / mitigation measures including:

- Dry processing of the ore;
- Zero waste water discharge during operations;
- Maintaining environmental flow;
- Provision of sediment controls;
- Safety and stability at closure being fundamental to project design;
- Management of waste rock based on its geochemical characteristics;
- Progressive rehabilitation and revegetation of the site; and
- Ongoing ambient monitoring.

Could the project affect streamflows?

☐ NYD ☐ No ☒ Yes If yes, briefly describe implications for streamflows.

The proposed Project is located at the top of the Tomato and Gap Creek catchments. The Project has been designed to limit potential Project impacts to downstream surface water flows including avoidance of interruption to surface water flows in Harris Creek. The Project intercepts a maximum catchment area of approximately 4.7 km^2 but, a short distance downstream, flows into much larger catchments (eg. Yellow Waterholes and Boggy Creeks) limiting the potential downstream hydrology impacts. Maximum reductions to the downstream catchment areas are summarised as follows:

- Approximately 2.5 km downstream of Project, the Project represents a 3 % reduction of the Yellow Waterholes and Tea Tree Creek catchment area.
- Approximately 5 km downstream of the Project, the Project represents a 1.8 % reduction of the Boggy Creek catchment area.
- Approximately 15 km downstream of the Project, the Project represents a 1.7 % reduction of the Boggy Creek catchment area at Nowa Nowa (where the Boggy Creek flows into Lake Tyers).

Potential hydrological impacts are further described at **Attachment 5**. Modelling of water flow indicates that the likely maximum reduction of water flow in Boggy Creek at Nowa Nowa (where the Boggy Creek flows into Lake Tyers) will be approximately 1.7% at any point in time during operations. However, on average, the overall reduction in flow on an annual basis will be approximately 0.8% of flow. After decommissioning of dams at closure the residual impact on flow is likely to be lower than 0.4% of flow.

The flow regime for Boggy Creek is highly variable ranging from no flow to as much as 185 m^3/s at Nowa Nowa. Annual flow in Boggy Creek can also vary significantly from year to year with modelling indicating that flow can vary by as much as a factor of 5 from average conditions. In this context a 1.7% reduction in flow during certain periods of operation is not considered significant.

Accordingly, it is likely that the Project will impact on localised stream flows at the mine site, however, it is unlikely to have significant long term environmental effects on the regional catchment of Boggy Creek given that the creeks at the mine site are ephemeral, dry for most of the year, and environmental flows will be discharged from the Clean Water Storage and Sediment Control Dam (water quality permitting). Harris Creek is affected by the crossing of the mine access road, however a culvert will be installed as part of the road design to maintain stream flow.

Could regional groundwater resources be affected by the project?

☐ NYD ☒ No ☐ Yes If yes, describe in what way.

Hydrogeology indicates a fractured rock aquifer with limited connectivity. Dewatering of the open pit will be required during the operations phase via pit dewatering bores and / or open pit sumps to allow mining to occur below the level of the water table. The water table will rebound at closure.

Baseline groundwater quality monitoring indicates the water quality will be near neutral (pH 6.48-7.58) and have moderate conductivity. Dissolved metals are very low. Groundwater quality within the Project area is discussed in further detail in **Attachment 5**.

Groundwater from pit dewatering will be used for Project water supply during the construction and operations phases. This water will be stored in the Operations Water Storage, which will be managed to prevent discharge of water during the construction and operations phases. Water quality permitting, groundwater from pit dewatering may also be blended with water in the Sediment Control Dam (to maintain environmental flows and offset upstream capture of surface water) if operations water supply from the Operations Water Storage is sufficient.

Any effect on groundwater is expected to be localised to the area surrounding the open pit during operations. It is unlikely that this will impact on regional groundwater resources more broadly, as no beneficial groundwater users have been identified within 4 km of the site.

Piezometric levels in the Project area range from approximately 37 to 50 m below ground level. Groundwater discharge / contribution to local streamflows appears not to occur in the Project area. Regionally, discharge of aquifer units closer to the surface may occur as baseflow in the lower reaches of the rivers and smaller creeks flowing over the coastal plains (eg. potentially Boggy Creek) (DSE, 2010). Additional groundwater discharge may also occur to the Gippsland Lakes and other estuarine bodies (e.g. Lake Tyers) (DSE, 2010). However, such areas do not occur in the direct vicinity of the mine site.

It is therefore highly unlikely that groundwater dependent ecosystems (GDE) occur in the Project area. Some vegetation in the lower reaches of Boggy Creek and around Lake Tyers may use groundwater. However, this is approximately 15 km downstream of the Project area and groundwater levels are unlikely to be impacted by the proposed Project in this area.

Potential impacts on groundwater resources are further described at **Attachment 5**.

Could environmental values (beneficial uses) of water environments be affected?

☐ NYD ☒ No ☐ Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies)

As outlined in the sections above, no beneficial uses of water environments are expected to be significantly affected. Potential impacts on beneficial uses of water are assessed in detail in **Attachment 5** and **Attachment 11**.

The primary beneficial use of water downstream of the proposed mine site is related to recreational use of Lake Tyers (located 15 km downstream of the mine site) and associated beneficial uses for aquatic ecosystems. The creeks downstream of the mine site leading to Lake Tyers also provide beneficial uses for aquatic ecosystems, however, these values are limited by the ephemeral nature of the creeks.

The level of impact on downstream water quality and quantity from the Project development during operations and at closure will be very low due to the design and operation of the site. The Project has been designed to minimise the risk of impacts on downstream water quality and hydrology, and will be managed and monitored during construction, operations and post-closure, to ensure no significant effects on beneficial uses of water occur. Further to the management and monitoring measures proposed, the Project drains into much larger catchments (e.g. Yellow Waterholes and Boggy Creeks) only a short distance downstream of the Project (approximately 2.5 km), limiting the potential for significant impacts to downstream beneficial water use.

Could aquatic, estuarine or marine ecosystems be affected by the project?

☐ NYD ☐ No ☒ Yes If yes, describe in what way.

Potential impacts on aquatic and wetland ecosystems (including estuaries) are assessed in detail in **Attachment 9**.

As described above, the waterways expected to be impacted by the Project are the three ephemeral creeks located in the vicinity of the Project footprint: Gap Creek, Tomato Creek and Harris Creek. These creeks will be directly impacted by the siting of the mine footprint. (refer **Attachment 1**, Figure 1.3). The creeks are ephemeral and dry for most of the year, and occur at the very top of their respective catchments. Harris Creek is only affected by the crossing of the mine access road, albeit that a culvert will be installed to maintain stream flow. Only a small reach of Gap Creek and Tomato Creek will be directly affected with drainage from the site restored post closure.

Lake Tyers, which forms part of the Gippsland Lakes Ramsar Wetland Site, is located approximately 15 km downstream of the proposed mine site. The Project has been designed to minimise the risk of impacts on downstream water quality and hydrology in Boggy Creek, and will be managed and monitored to ensure no significant effects on Lake Tyers (refer **Attachment 5** and **Attachment 9**).

Accordingly, it is not expected that aquatic, estuarine or marine ecosystems will be impacted beyond the proposed mine footprint.

Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term?

☒ No ☐ Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable.

The most sensitive aquatic environment downstream of the Project is expected to be Lake Tyers which forms part of the Gippsland Lakes Ramsar Site. The potential for 'extensive or major effects on the health or biodiversity' of this estuary is considered highly unlikely due to the following factors:

- The mine has been designed to control downstream impacts during construction, operations and closure with management of mine wastes for secure, long term geochemical stability.
- Lake Tyers occurs 15 km downstream of the proposed mine site.
- The Project will result in a maximum 1.7 % reduction of the Boggy Creek catchment area at Nowa Nowa (where the Boggy Creek flows into Lake Tyers), and the hydrology of other creeks which feed Lake Tyers, such as Ironstone Creek, will not be affected by the Project.
- The habitat of the downstream region (including Boggy Creek and Lake Tyers) is already being compromised by a combination of factors such as weed infestation, introduced animals, vegetation removal, salinity, alterations to nutrient cycles and dredging. For example, altered nutrient and sediment loads from previous habitat clearance and agriculture inputted into the lakes and wetlands have created secondary problems, including regular algal blooms in Lake Tyers (Webster et al. 2001).

- A detailed monitoring program will be implemented to monitor water quality and flow downstream of the Project in accordance with Victorian legislative requirements.

Further details in relation to this assessment are provided by **Attachment 5** and **Attachment 9**.

Is mitigation of potential effects on water environments proposed?

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

Eastern Iron's commitments to management and mitigation of potential effects on water environments are outlined in the *Environmental Management Plan* at **Attachment 2** and include:

Hydrology

- Where possible, water will be reused on-site to minimise the potential requirement for fresh water use. All water used during operations will be recycled where possible, including recycling of vehicle wash down water (80% recycled) and potable water (90% reused in operations).
- Use of dry LIMS for processing of ore. The dry and reagent-free process will significantly reduce the Project's water requirements during operations.
- The Operations Water Storage will be used to hold drainage from the WRD, Temporary Low-Grade Ore Stockpile, open pit, ROM pad and stockyard and groundwater from pit dewatering (eg. water with potentially elevated salinity, dissolved metals and/or acidity) during operations by pumping from sumps at each drainage collection location.
- The Operations Water Storage is designed to prevent discharge to downstream environments during operations.
- Where possible, preferential use of groundwater from open pit dewatering bores for the Project construction and operations water requirements.
- If water quality permits, any excess water from the Clean Water Storage and the Sediment Control Dam will be released via the spillways as environmental flows, where possible. Based on the conceptual water balance for the Project (Annex A, **Attachment 5**), it is estimated that under operating conditions environmental flows would be released on:
    - Approximately 20% of days to Gap Creek from the Sediment Control Dam.
    - Approximately 30% of days to Tomato Creek from the Clean Water Storage.
- If water quality permits, any excess groundwater extracted from open pit dewatering bores during operations may blended in the Sediment Control Dam to permit release of environmental flows to the receiving water catchments.
- Post-closure, the open pit will be allowed to fill with water and overflow to Tomato Creek. The Operations and Clean Water Storages will be decommissioned and converted to polishing wetlands that are expected to release flows to Tomato Creek.
- Post-closure, if no beneficial use is identified, the Sediment Control Dam will be decommissioned to allow surface water flows in Gap Creek to be released from the Project site.
- Stream flows will be monitored at key locations downstream of the Project during the construction and operations phases of the proposed Project. Post-closure, monitoring of stream flows at key locations downstream of the proposed Project will be conducted until completion criteria are achieved.

Turbidity/Sediment

- Construction of a Sediment Control Dam.
- Sequencing of construction activities to reduce erosion potential during the high rainfall months (winter to spring) and account for the implementation and deployment of erosion and sediment control measures.
- Vegetation clearance will be minimised, and vegetation will be preserved in areas where construction will occur at a later date.
- Vegetation on steep slopes and riparian corridors will be preserved where possible.
- Grading of the Process Plant and Administration areas to drain towards the Sediment Control Dam to allow for settling of sediment prior to discharge from site. A surface water diversion drain will direct drainage back to the Sediment Control Dam.

- Where practicable, access / haul roads will be graded to drain towards the Sediment Control Dam to allow for settling of sediment prior to discharge from site.
- Construction/Installation of surface water management infrastructure (eg. cut-off/diversion drains, velocity dissipation devices, culverts) where appropriate to minimise and control surface water flow over disturbed areas.
- Location of the WRD and Temporary Low-Grade Ore Stockpile upstream of the open pit and, during operations, capture drainage from these structures in sumps for pumping to the Operations Water Storage.
- Geotextiles and natural matting will be used where appropriate to assist with erosion control on steep slopes (ie. 3:1 or greater) where erosion potential is particularly high.
- Minimisation of dust (eg. water application to unsealed road surfaces).
- Installation of sediment control measures downstream of construction works and disturbed land areas (eg. silt fences, sediment basins, sediment traps, fibre rolls).
- Progressive revegetation of disturbed land areas, giving priority to high risk erosion areas such as steep slopes and sites close to rivers and creeks.
- Monitoring of Project and downstream water quality during construction, operations and post-closure (until completion criteria are achieved) to ensure that downstream environmental objectives are achieved.

Alkalinity / Acidity, Metals and Salinity

- Characterisation of Project geological materials and management strategies to ensure the long-term geochemical stability.
- Monitoring of Project and downstream water quality during construction, operations and post-closure (until completion criteria are achieved) to ensure that downstream environmental objectives are achieved.
- Alkaline water from any concrete batching during construction will be stored on-site in a HDPE lined pond or pumped to the Operations Water Storage for re-use.
- Water will be released from the Clean Water Storage and the Sediment Control Dam, water quality permitting, to minimise the potential for evaporative concentration in the water storages.
- For extreme storm events during operations, pumping from the various sumps will be managed so as to ensure that the Operations Water Storage cannot exceed capacity. Excess drainage at the sumps upstream of the open pit (upper Tomato Creek and upper Gap creek) will be allowed to discharge into the open pit, if required.
- Post-closure water would only be released from site if applicable water quality environmental objectives can be achieved. Passive treatment of water (ie. engineered wetland systems) will be installed on Tomato Creek (in the decommissioned Operations and Clean Water Storages) to lower potential salinity and dissolved metals concentrations in drainage from the WRD and open pit, if required.

Other information/comments? (eg. accuracy of information)

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?

☐ No ☒ Yes If yes, please attach. (refer **Attachment 11**)

Is the project to be located either within or near an area that is:

- **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?**

☐ NYD ☒ No ☐ Yes If yes, provide plan showing footprint relative to overlay.

- **Identified as of regional or State significance in a reputable study of landscape values?**

☐ NYD ☒ No ☐ Yes If yes, please specify.

- **Within or adjoining land reserved under the *National Parks Act 1975* ?**

☐ NYD ☒ No ☐ Yes If yes, please specify.

- **Within or adjoining other public land used for conservation or recreational purposes?**

☐ NYD ☒ No ☐ Yes If yes, please specify.

The Project area is located within the Tara State Forest. The area is primarily managed by DEPI for timber harvesting. There are no designated recreation areas within or adjoining the Project Area (e.g. picnic, camping, walking tracks).

Is any clearing vegetation or alteration of landforms likely to affect landscape values?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

The Project will involve vegetation clearance and landform alteration. However, this is not expected to significantly affect landscape values as:

- The area is currently managed for timber harvesting and cleared areas (ie. vast logging coupes) are common in the area.
- The site is surrounded by the Tara State forest and is not visible from any residential areas, with the nearest residences located approximately 4 km away.
- The mine infrastructure, open pit, WRD and Temporary Low-Grade Ore Stockpile are well setback from public roads, other than the Nowa Nowa – Buchan Road which is primarily use for forestry activities.
- The site will be progressively rehabilitated and revegetated.

Is there a potential for effects on landscape values of regional or State importance?

☐ NYD ☒ No ☐ Yes Please briefly explain response.

No landscape values of regional or State importance have been identified within or adjacent to the Project area. The site is entirely within the Tara State Forest and habitats in the area have been harvested and/or degraded by timber harvesting or associated activities, which has led to significant fragmentation of vegetation in the area.

Is mitigation of potential landscape effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Eastern Iron's commitments to management and mitigation of potential landscape effects are

outlined in the *Environmental Management Plan* at **Attachment 2** and include:

- Restrict land disturbance and vegetation clearance to areas directly required for Project infrastructure;
- Disturbed land will be progressively rehabilitated and revegetated;
- Ensure a Rehabilitation and Closure Plan is developed for the proposed mine site including completion criteria for post-closure rehabilitated areas that are agreed through consultation with the relevant public land manager (DEPI).

Other information/comments? (eg. accuracy of information)

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils

Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

Geomorphological, soil and geological investigations indicate that there are no acid sulphate soils or highly erodible soils on site. This information was obtained from extensive mineral exploration data and site investigations. Furthermore, a report prepared by the Soil Conservation Authority (Russell, 1983) covering the Boggy Creek catchment identifies the soil type as lithosols which are skeletal soils with shallow, stony soil profiles.

The land is considered relatively stable with no excessive slopes and no identified active geological structures (e.g. fault zone) proximal to the site.

Are there geotechnical hazards that may either affect the project or be affected by it?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

All Project structures will be designed and built with the required geotechnical engineering inputs to mitigate any geotechnical hazards. This includes pit slopes, project buildings, engineered dams and roads.

Water storages will be subject to a works licence from Southern Rural Water (where necessary) in accordance with the *Water Act* 1989.

Other information/comments? (eg. accuracy of information)

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

☐ NYD ☐ No ☒ Yes If yes, provide estimate of traffic volume(s) if practicable.

Road transport associated with the Project may include traffic associated with construction activities, transportation of the ore product to SEFE, the provision of supplies (fuel and the like), and the movement of the workforce.

The potential increase in traffic volumes on the existing road network is assessed in the *Traffic Impact Assessment* at **Attachment 7**. Trip generation and distribution calculations were undertaken for both the construction and operational phases of the project, and include workforce vehicles arriving to and departing the mine site. These indicate that the mine is likely to increase traffic volumes on the surrounding road network by up to:

- 128 light vehicles and 6 heavy vehicle trips per day during the construction phase; and
- 216 light vehicles and 368 heavy vehicle trips per day during the operational phase.

The operational vehicle numbers assume a maximum of 1 Mt of product is exported in a given year. Therefore, this represents the highest potential impact, given that mining rates over the life of mine are expected to average 800,000t per annum.

In the average operating scenario, the Project is expected to generate approximately 296 heavy vehicle trips per day. However, these will be distributed over the length of the route between the mine site and the Port. Therefore, up to 148 heavy vehicles trips per day would be expected on the mine – depot run, and depot – port run, respectively.

All roads associated with the transport route are approved for B-Double use, with the majority of the route along the Princes Highway. The Princes Highway is a designated arterial highway, suitable for freight generating uses such as the Project.

The *Traffic Impact Assessment* concludes that the existing road network is able to accommodate the increase in traffic attributable to the Project and that no upgrades are required, other than those proposed at the intersection of the mine access road and Bruthen-Buchan Road.

Impacts on travel times attribute to the Project are expected to be negligible as the traffic volumes are well below the operational design capacity of the road. Further, they will be managed though the implementation of a 'Truck Driver Code of Behaviour' which will require drivers to allow traffic to pass.

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

Potential impacts on amenity associated with the Project are expected to be limited as the mine site is approximately 4 km from the nearest residences.

Air Quality and Noise: A separate *Air Quality, Noise and Vibration Study and Monitoring Plan* is located at **Attachment 13** and has been prepared for the Project. The results of the study indicate that there is unlikely to be any significant generation of nuisance dust, exhaust, noise or vibration resulting from the mine site at sensitive receptors such as residential properties or within local townships.

Light Pollution: The mine site is proposed to operate 24 hours per day, 7 days per week. As a result, light emissions from the operation during the night have the potential to be a nuisance to local residents. However, as there are no sensitive receptors (residences, tourist areas) with a

direct sight line to the Project (or within 4 km), there is not anticipated to be any significant impact from light pollution.

Visual Amenity: There are no sensitive receptors (e.g. towns, tourist sites, scenic view points) with a direct view of the mine site. The Project is not anticipated to have a significant impact on the visual amenity of the local area or region.

Odours: There are no activities proposed as part of the Project with significant potential to generate odours. Sewage generated at the site will be treated via an on-site treatment plant and water reused in the operations process.

Traffic conditions: The *Traffic Impact Assessment* at **Attachment 7** indicates that potential impacts for the local community could include an increase in traffic related noise and an increase in dust and debris on the road network from mining related vehicles. These amenity impacts can be appropriately managed through the implementation of a 'Truck Driver Code of Behaviour' which provides guidance/restriction on the following:

- Use of engine brakes;
- Dropping of dust;
- Load security;
- Allowing traffic to pass;
- Mass limits;
- Travelling through towns and/or school crossings;
- Fatigue management; and
- Night operations.

Adherence to such a code will assist in improving the safety of the truck drivers, the amenity of the local community and all other road users. Similar codes have successfully been developed and implemented for forestry uses in the area.

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the hazards and possible implications.

The Project has been designed to avoid potential health and safety hazards. The most significant potential exposure of communities to health or safety hazards associated with the Project will be the increased risk of traffic accidents associated with the increase in vehicle traffic, including heavy vehicles. If managed effectively, this risk is likely to be low as the transport route for the Project is approved for B-Double use, managed by VicRoads and by-passes most residential areas. Risks associated with road traffic are addressed in the *Traffic Impact Assessment* at **Attachment 7**.

Other potential community health and safety risks and effects (e.g. associated with air quality, water quality, unauthorised access to Project facilities and hazardous materials) are suitably managed through Project design and are not anticipated to be significant. Potential air quality effects of the Project are considered in the *Air Quality, Noise and Vibration Study and Monitoring Plan* at **Attachment 13** and are not expected to be significant.

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

☐ NYD ☒ No ☐ Yes If yes, briefly describe potential effects.

No residences will be displaced as a result of the Project.

The majority of the workforce will be sourced locally as no accommodation will be constructed for the Project (no FIFO workforce). It is likely that employees will reside in Nowa Nowa and Lakes Entrance as the closest settlements to the site, however additional accommodation may be sought in the townships of Orbost, Bairnsdale, Bruthen and/or Buchan.

Given that the majority of employees are already likely to reside in these areas, it is not anticipated that there will be an influx of people associated with the Project that will place an unsustainable demand on existing health or community services.

These matters are addressed in detail at **Attachment 12**.

Are non-residential land use activities likely to be displaced as a result of the project?

☐ NYD ☐ No ☒ Yes If yes, briefly describe the likely effects.

Non-residential land use activities associated with the mine site are outlined in the *Land and Water Use Study* **Attachment 11** and key land uses potentially displaced are summarised as follows:

Forestry: The proposed mine site is located within the Tara State Forest, which is primarily managed for timber harvesting.

Nowa-Nowa Buchan Road: As outlined in the *Traffic Impact Assessment* at **Attachment 7**, a 1.8 km section of the unsealed Nowa Nowa-Buchan Road will be impacted by the open pit, WRD and Temporary Low-Grade Ore Stockpile.

Other minor land uses:

- Recreation activities such as hiking, bird-watching and mountain biking are undertaken in the surrounding area (and particularly around Mt Nowa Nowa and Lake Tyers). However, they are limited near the mine site as the area is a logging area and there are no designated recreational or tourism areas (such as picnic areas, camping areas, walking tracks) in the vicinity.
- Apiculture is practiced within the Tara State Forest, with a number of small clusters of beehives observed in the forest proximal to the mine site.

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the potential effects.

Potential effects on non-residential land use activities are assessed in the *Land and Water Use Study* at **Attachment 11**. No significant potential impacts on the land use of local residents/ communities or social groups are expected as the mine site is approximately 4 km from the nearest residences and is rarely used for non-industrial activities, if at all.

Forestry: It is unlikely that the Project will significantly impact on the forestry industry given the vast area managed for timber production in the surrounding area. Furthermore, the timber currently occupying the site is of little commercial value. At closure, it the mine site is expected to be rehabilitated and revegetated with the aim of returning the land to timber production where possible.

Nowa-Nowa Buchan Road: In order to maintain through traffic between Forests Road (in the south) and Bruthen-Buchan Road (in the north), it is proposed to divert the Nowa Nowa-Buchan Road around the eastern side of the mine footprint, partly utilising the existing 5 Mile Road. It is not anticipated that this will affect existing road users given the relatively low volume of traffic and continued maintenance of through traffic between the north and south.

Other minor land uses: Minor impacts on apiculture in the local area may occur due to the vegetation loss resulting from the Project; however, given that the area is currently actively managed for forestry activities and the surrounding area is densely forested this impact is not expected to result in any significant reduction in overall productivity of beekeeping activities in the area.

Is mitigation of potential social effects proposed?

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

Eastern Iron's commitments to mitigation regarding potential social effects are outlined in the *Environmental Management Plan* at **Attachment 2** and summarised as follows:

- Implement the social monitoring program outlined in the *Environmental Management Plan*;
- Implement the *Stakeholder Engagement Plan* (**Attachment 3**), including engagement with local communities and service providers;
- Contribute to community development and social cohesion through involvement in local events and business forums;
- Manage public health and safety risks in accordance with relevant legislation, design and operational procedures;
- Manage traffic in accordance with the measures outlined in the *Traffic Impact Assessment* (**Attachment 7**);
- Implement appropriate management and mitigation measures to protect downstream water quality and hydrology as per the *Environmental Management Plan* (**Attachment 2**); and
- Mine site lighting, vibration, air quality and noise will be managed and monitored as per standard Victorian regulations and guidelines.

Other information/comments? (eg. accuracy of information)

15. Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

☒ No If no, list any organisations that it is proposed to consult.

☒ Yes If yes, list the organisations so far consulted.

Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC)

What investigations of cultural heritage in the project area have been done? (attach details of method and results of any surveys for the project & describe their accuracy)

Dr. Tim Stone, as Cultural Heritage Advisor for the Project, conducted a standard assessment (surface survey) of the proposed mine site with participation from representatives from GLaWAC, in their role as the Registered Aboriginal Party. The results of the study are outlined in the *5 Mile Deposit Area: Aboriginal Cultural Heritage Management Plan Interim Report* at **Attachment 10**.

The study was undertaken in accordance with the legislative requirements for a standard assessment and fieldwork was conducted by two qualified archaeologists, with participation from three GLaWAC representatives.

Is any Aboriginal cultural heritage known from the project area?

☒ NYD ☒ No ☒ Yes If yes, briefly describe:

Any sites listed on the AAV Site Register

According to the Victorian Aboriginal Heritage Register (VAHR), no listed sites occur within the mine footprint. The closest sites are located approximately 2 km east from the mine footprint.

Sites or areas of sensitivity recorded in recent surveys from the project site or nearby

The results of the surface survey are outlined at **Attachment 10**, and summarised as follows:

- Two Aboriginal sites were identified in the vicinity if the mine footprint. Both are Aboriginal campsites represented by scatters of stone artefacts located on ridgetops in the vicinity of the confluence of Harris, Tomato and Gap creeks. Only one of these sites (Harris Creek 1) will be impacted by the location of the mine access road.

- The only other part of the mine footprint with Aboriginal site potential is the proposed Mine Infrastructure area, which follows a ridgeline between Tomato and Gap Creek. However, no Aboriginal cultural heritage was located on this landform, despite high ground surface visibility along Tomato Track.

Sites or areas of sensitivity identified by representatives of Indigenous organisations

As above. Representatives of GLaWAC participated in the surface survey (see **Attachment 10**).

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

☐ NYD ☒ No ☐ Yes If yes, please list.

Is mitigation of potential cultural heritage effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

Eastern Iron's commitments to mitigation regarding potential cultural heritage effects are outlined in the *Environmental Management Plan* at **Attachment 2**. A key commitment is to conduct further fieldwork and consultations to prepare an approved *Cultural Heritage Management Plan* for the Project in consultation with GLaWAC prior to Project commencement. This will include a complex assessment (subsurface excavation) to determine the place extent of the Harris Creek 1 site and further consultations with GLaWAC to agree on mitigation for potential cultural heritage effects.

Other information/comments? (eg. accuracy of information)

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

☐ Electricity network. If possible, estimate power requirement/output …….

☐ Natural gas network. If possible, estimate gas requirement/output ……..

☒ Generated on-site. If possible, estimate power capacity/output ……1.2-1.5MW (Operations)

☐ Other. Please describe.

Please add any relevant additional information.

It is estimated that the Project will require a maximum of approximately 1.2-1.5MW of power during operations. Power requirements during construction will be significantly less. At this stage, it is assumed that this will be provided by on-site diesel generators. Eastern Iron is investigating the potential for alternative fuel sources to be used for on-site generation including Compressed Natural Gas (CNG) and biofuels.

What are the main forms of waste that would be generated by the project facility?

☐ Wastewater. Describe briefly.

☐ Solid chemical wastes. Describe briefly.

☒ Excavated material. Describe briefly. The primary waste material excavated is waste rock.

A statistical summary of static geochemical parameters for the analysed waste rock materials from the 5 Mile deposit is provided in the following table.

Parameter	Units	All waste rock		
		Min.	Mean	Max.
Total sulfur	wt%	<0.01	0.35	2.6
Maximum potential acidity (MPA)	kg H_2SO_4/t	<0.3	10.8	78
Acid neutralising capacity (ANC)	kg H_2SO_4/t	2.10	53.6	913
Net acid producing potential (NAPP)	kg H_2SO_4/t	-910	-42.9	71.5
pH of oxidation (NAG_{pH})	–	2.4	–	11.4

The geochemical assessment (**Attachment 6**) identified the following categories of waste rock:

- Category A: Non acid forming (NAF) materials not requiring special management. Most waste rock from all lithologies falls into this category. This totals approximately 18.5 Mt or 77% of the waste rock.
- Category B: Potentially acid forming (PAF) materials with marginal to low acid producing potential requiring specific consideration for disposal. A small proportion of hangingwall volcanics (<10%) and footwall sediments (~25%) fall into this category (total approx. 2.7 Mt). This totals approximately 2.7 Mt or 11.3% of the waste rock.
- Category C: Potentially acid forming (PAF) materials with moderate acid producing potential requiring special management. A small proportion of footwall sediments (~25%) fall into this category. This totals approximately 1.2 Mt or 5% of the waste rock.
- Category N: Potentially acid consuming materials that can be used to assist with management of Category B and C materials. Footwall limestone and a small proportion of footwall sediments (~25%) fall into this category. This totals approximately 1.6 Mt or 6.7% of the waste rock.

☒ Other. Describe briefly. General wastes will be produced on site, such as wastes from the kitchen and administration facilities. A limited amount of hazardous waste (i.e. hydrocarbons, batteries etc.) will also require disposal.

Please provide relevant further information, including proposed management of wastes.

Waste Rock Management

Waste rock will be managed according to management categories. The geochemical properties of the various waste rock categories are outlined in the table below. Management of these materials is discussed below and further detail is provided in **Attachment 1** and **Attachment 6**.

Management category	Geochemical classification criteria	Geochemical properties		
		AMD potential	NMD potential	Salinity potential
Category N	NAPP < –40 kg H_2SO_4/t AND Sulfur < 0.6 wt%	Potentially acid consuming	Very low potential for NMD generation	Very low potential for salinity generation

Category A	NAPP < 0 kg H_2SO_4/t AND Sulfur < 0.3 wt%	Non acid forming (NAF)	Very low potential for NMD generation	Very low potential for salinity generation
Category B	NAPP < +10 kg H_2SO_4/t AND Sulfur > 0.3 wt% AND < 0.6 wt%	Potentially acid forming (PAF) – marginal	Low potential for NMD generation	Low potential for salinity generation
Category C	NAPP > +10 kg H_2SO_4/t OR Sulfur > 0.6 wt%	Potentially acid forming (PAF)	Moderate potential for NMD generation	Moderate potential for salinity generation

A geochemical classification layer will be developed for the mine block model and a management category assigned to each block based on analysis of sulfur and acid neutralising capacity. This classification layer will facilitate scheduling and selective management of waste rock materials.

Category A waste rock (non-acid forming) can be used for construction. Any Category A waste rock that is not required for construction activities, and Category B and Category N waste rock, will be placed in the WRD.

The WRD will be constructed on the eastern side (up-gradient) of the open pit (**Attachment 1**, Figure 1.3) in upper Gap Creek. It is intended that the WRD will be a stable long-term structure and will be rehabilitated at the end of mine life. The WRD has been strategically placed up-gradient from the open pit to ensure all runoff and seepage from the facility reports to the pit after mine closure.

A total of 24 Mt of waste rock will be produced by the mining operation over the mine life. Approximately 22.8 Mt (comprising 18.5 Mt of Category A, 2.7 Mt of Category B, and 1.6 Mt of Category N materials, minus construction materials) will be stored in the WRD, which will be built up over approximately 10 years at an average waste production rate of 2.3 Mt per annum. Pre-mining, the waste rock has an average density of 2.75 t/m^3, and is expected to have a bulking factor of approximately 40% once placed in the WRD.

Category C waste rock will be temporarily stockpiled with the low-grade ore upstream of the pit in upper Tomato Creek during operations. Category C which comprises approximately 5% of the waste rock is potentially acid forming (PAF) if exposed to atmospheric oxygen, with a total sulfur content of greater than 0.6 wt. %. On mine closure, this temporarily stockpiled material will be backfilled into the open pit for permanent safe storage under a permanent water cover (minimum 2 m) to provide a low oxidising environment. During operations, drainage from this stockpile will be maintained on-site in the Operations Water Storage and treated, if required, prior to re-use in the Project water supply.

Specific management measures during operations and post-closure for the various management categories of waste rock are as follows:

- The WRD will be constructed from only Category A, B and N waste rock materials in a location upstream of the open pit in Gap Creek.
- To maximise the long-term geochemical stability of the WRD, it will be constructed in thin horizontal lifts from the base of the dump upward, with compaction and moisture content optimised to minimise air entry. This will involve truck dumping with subsequent flattening and compaction (with optimum moisture content) of each layer (1–2 m) prior to placement of the next layer on top. Traditional end-dumping construction methods are to be avoided, as such methods are well known to produce internal dump structures that enhance sulfide oxidation and pollution discharge.
- In the WRD, Category B waste rock will be encapsulated within Category A and N materials by strategic placement so as to avoid positioning the Category B materials close to the edge of the dump. A minimum 10 m buffer of Category A/N materials will be placed between the dump edges and the Category B material. This encapsulation approach isolates the Category B material in engineered cells to minimise oxygen and water infiltration.

- Category N materials, with excess neutralising capacity, will be placed strategically to optimise in situ neutralisation. The acid-neutralising layers will be located so as to intercept and neutralise seepage.
- Each lift of the waste rock dump will be compacted and graded such that all drainage is directed eastward (upstream) into Gap Creek and contained in a pond/sump for pumping to the Operations Water Storage for treatment (if necessary) and reuse in ore processing and dust suppression. Drainage will include engineered drains and rock armouring where necessary. Final surfaces will have reclaimed topsoil applied to assist revegetation.
- In the event that runoff exceeds sump/pump capacity, excess drainage from the waste rock dump will report to the open pit.
- On closure, the WRD will be completed with a cover system using suitable waste rock and clay from decommissioned water storages (primarily the Sediment Control Dam) to limit infiltration of water and maximise the collection of clean catchment water.

Management of Other Wastes

It is proposed that all general waste will be removed from site. No tip will be constructed.

As the processing methodology for the Project does not require any chemical or biological processes to be employed (with the only additive being water to control dust and moisten the product) there will be limited hazardous materials present on site. All hazardous waste (i.e. hydrocarbons, batteries etc.) will be removed from site and disposed of appropriately.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

☒ Less than 50,000 tonnes of CO_2 equivalent per annum

☐ Between 50,000 and 100,000 tonnes of CO_2 equivalent per annum

☐ Between 100,000 and 200,000 tonnes of CO_2 equivalent per annum

☐ More than 200,000 tonnes of CO_2 equivalent per annum

Please add any relevant additional information, including any identified mitigation options.

The Project is expected to produce Scope 1 (direct) GHG emissions from a number of sources during construction and operation. The majority of Scope 1 emissions associated with the Project are likely to occur as a result of land clearing (and vegetation decomposition), fossil fuel usage for transportation and mining activities, ore transport to Port Eden, onsite usage of haulage trucks, mobile equipment and vehicles, and onsite electricity generators (diesel). Other Scope 1 emissions can result from waste disposed in landfill and wastewater treatment. Emissions associated with vegetation loss for the Project is expected to be offset by native vegetation offsets as well as mine site revegetation activities on closure.

The initial estimated Scope 1 greenhouse gas emissions during Project operations is approximately 26,436 tCO_2e per year (refer to Table 17.1 of **Attachment 2** for a breakdown), which includes mine site emissions and the transport of product to the Port of Eden. In addition, potential emissions due to vegetation clearing are estimated at 72,805 tCO2e, which would occur during construction phase. Some or all of these emissions are expected to be offset by native vegetation offsets as well as mine site revegetation activities on closure.

The methodology used to estimate the emissions above are provided in **Attachment 2**. The expected energy consumption during the construction phase is not yet known, and therefore further minor emissions may occur during construction such as due to fuel usage by construction vehicles and equipment.

No significant Scope 2 emissions are expected to be produced by the Project as all on-site electricity requirements are expected to be met by generators.

Scope 3 emissions are indirect GHG emissions which occur as a result of sources not owned or controlled by Eastern Iron, for example embodied emissions from concrete and steel use in the Project and emissions from shipping of product.

Greenhouse gas emissions management and mitigation measures for the Project will be implemented following the guidelines and requirements of:

- *National Greenhouse and Energy Reporting (NGER) Regulations 2008 (made under the National Greenhouse and Energy Reporting (NGER) Act 2007) and Carbon Pricing Mechanism under the Clean Energy Act 2011.*
- *Victorian EPA's Protocol for Environmental Management – Greenhouse Gas Emissions and Energy Efficiency in Industry (2002).*
- *Federal Government's Energy Efficiency Opportunities (EEO) Act 2006.*

A *Greenhouse Gas Emissions and Energy Saving Plan* meeting the requirements of the above will be prepared as part of the final Construction and Operations Environmental Management Plans (EMPs). These plans, along with the GHG inventory, will be in alignment to the reporting requirements under *NGER Act 2007*, *Clean Energy Act 2011*, or other mandatory reporting requirements that may be in place when the Project commences.

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

☒ No ☒ Yes If yes, briefly describe.

All potential significant environmental effects are discussed above.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects? (if not already described above)

☒ Siting: Please describe briefly

Evaluation of Project Alternatives at **Attachment 4** discusses the rationale behind the siting of the Project, selected to minimise or avoid environmental and social impacts. These considerations include, but are not limited to:

- Mine layout designed to avoid impact to surface water flows in Harris Creek (ie. water storages located on Gap and Tomato Creeks upstream of confluence with Harris Creek).
- Mine layout limited to the greater Boggy Creek catchment to avoid potential impacts to surface water flows in Hospital Creek catchment.
- Project designed to avoid significant vegetation and habitat (ie. areas of Warm Temperate Rainforest).
- Siting of the Project in a location where use of existing tracks / roads is feasible.
- The WRD has been strategically placed up-gradient from the open pit to ensure all runoff and seepage from the facility reports to the pit after mine closure.
- Locating the Temporary Low Grade Ore Stockpile in the larger catchment, minimising the Project footprint post-closure, and maximising runoff into the pit post closure.

- Locating the Temporary Low Grade Ore Stockpile at the base of a valley adjacent to the pit (and topographically higher) to minimise energy requirements for transfer of any material remaining in the stockpile to the pit post-closure.

Please refer to **Attachment 4** for further details.

☒ Design: Please describe briefly

Evaluation of Project Alternatives at **Attachment 4** and the *Environmental Management Plan* at **Attachment 2** discuss a number of elements of Project design to minimise or avoid environmental and social impacts. These include:

- Use of a dry LIMS ore processing method.
- No establishment of a Workforce Accommodation Camp.
- Transport route to Port is predominantly via Princes Highway, therefore by-passing residential areas.
- Project designed to avoid water quality impacts on downstream recreational areas.

Please refer to **Attachment 2** and **Attachment 4** for further details.

☒ Environmental management: Please describe briefly.

The *Environmental Management Plan* at **Attachment 2** outlines Eastern Iron's commitments to ensure environmental and social risks associated with the Project are appropriately managed and mitigated during the construction, operations, decommissioning and closure of the Project.

A series of sub-plans are provided within the *Environmental Management Plan*. Each sub-plan outlines relevant legislation and requirements and standards for environmental management, as well as prescribing a number of management strategies and commitments. It also outlines a number of environmental monitoring strategies. The *Environmental Management Plan* will be a dynamic document to be continually revised based on relevant legislation and best practices in management.

☐ Other: Please describe briefly

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

☐ NYD ☒ No ☐ Yes If yes, briefly describe.

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

☐ No ☒ Yes If yes, please list here and attach if relevant.

A series of environmental studies have been commissioned to demonstrate that the Project will not result in significant environmental effects in space or time. A list of environmental studies undertaken to date, and included as attachments to this referral include:

- Attachment 4 - Evaluation of Project Alternatives
- Attachment 5 - Surface and Ground Water Baseline and Assessment
- Attachment 6 - Environmental Geochemical Assessment of Waste and Ore
- Attachment 7 - Nowa Nowa Iron Project Traffic Impact Assessment
- Attachment 8 - Flora, Fauna and Ecological Characteristics and Assessment
- Attachment 9 - Aquatic and Wetland Ecology Desktop Study
- Attachment 10 - 5 Mile Deposit Area: Aboriginal Cultural Heritage Management Plan Interim Report
- Attachment 11 - Land and Water Use Study
- Attachment 12 - Socioeconomic and Health Baseline and Evaluation
- Attachment 13 - Air Quality, Noise and Vibration Study and Monitoring Plan

Has a program for future environmental studies been developed?

☐ No ☒ Yes If yes, briefly describe.

Eastern Iron's commitments to further environmental studies for the Project are outlined in the *Environmental Management Plan* at **Attachment 2**. It is expected that, at a minimum, the following technical environmental studies will be conducted for the Project prior to project commencement:

- A Cultural Heritage Management Plan will be completed prior to Project commencement (refer interim plan at **Attachment 10** for the proposed work program). It is intended that this will work will commence subsequent to the Minister's decision on the referral.
- A detailed Habitat Hectare Assessment of the proposed mine footprint will be undertaken in November 2013 in accordance with the recent Reforms to Victoria's Native Vegetation Permitted Clearing Regulation (DEPI, 2013). These surveys will also seek to detect any herbaceous species not visible during field surveys in Autumn 2013, to contribute to a more comprehensive list of flora at the site.
- If suitable habitat is identified during the Spring (November) surveys, targeted species will be undertaken for any necessary threatened flora species in consultation with regulators (unlikely based on results to date).
- Based on the outcomes of the supplementary flora studies, a Biodiversity Offset Strategy will be developed for the Project in consultation with DEPI.

21. Consultation program

Has a consultation program been conducted to date for the project?

☐ No ☒ Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

Consultations conducted to date are summarised in the *Stakeholder Engagement Plan* at **Attachment 3**. Subsequent to the decision to proceed with permitting for the Project in late 2012, Eastern Iron has actively engaged with government and the community as summarised below:

Government Departments and Agencies: Eastern Iron, and its representatives, have consulted the following government departments and agencies in relation to the design of the Project and regulatory requirements:

- Department of Environment (Commonwealth)
- Department of State Development, Business and Innovation
- Department of Environment and Primary Industries
- Department of Transport, Planning and Local Infrastructure
- East Gippsland Shire Council
- VicRoads

- Southern Rural Water
- East Gippsland Catchment Management Authority

Eastern Iron has incorporated the advice of the abovementioned agencies into the final design of the Project and is committed to working with government through the relevant approval processes.

Other Approvals: The Proponent has made an application for Mining Licence (MIN 5571) in accordance with the requirements of the *Mineral Resources (Sustainable Development) Act* 1990. The application was subject to public notice in regional and State newspapers and invited submissions over a period of 21 days. No objections or submissions were received during the public notice period.

Gurnaikurnai Land and Water Aboriginal Corporation (GLaWAC): GLaWAC is the Prescribed Body Corporate (PBC) for the purposes of the *Native Title Act* 1993 and holds Native Title over much of Gippsland, including the Project area. It is also the Registered Aboriginal Party for the Project area under the *Aboriginal Heritage Act* 2006. Eastern Iron maintains an existing Native Title Agreement with GLaWAC for its exploration activities under EL4509. Eastern Iron has commenced negotiations associated with entering into a Native Title Agreement (NTA) for the development of the Project and these negotiations are well advanced. The parties are aiming to reach agreement on the terms of any NTA by the end of 2013.

As part of this process, Eastern Iron and its representatives have engaged in cultural heritage awareness programs with GLaWAC and organised site visits to communicate the proposed Project and welcome any feedback. Eastern Iron has also engaged Cultural Heritage Advisor, Dr. Tim Stone, to prepare a Cultural Heritage Management Plan (CHMP) pursuant to the Aboriginal Heritage Act 2006. As part of this process, GLaWAC has been continually consulted on the preparation of the CHMP. Representatives of GLaWAC were also in attendance at the field surveys undertaken to date.

Other Stakeholder Consultation: Eastern Iron, and its representatives, have also engaged with the following parties who have a demonstrated interest in the Project:

- Local residents within Nowa Nowa;
- Local businesses within Nowa Nowa, Lakes Entrance and Bairnsdale;
- Councillors and Members of Parliament;
- W-Tree Promotion and Progress Association;
- Service and infrastructure providers; and
- Emergency services.

Has a program for future consultation been developed?

☐ NYD ☐ No ☒ Yes If yes, briefly describe.

A program for future consultation has been developed and is described in the *Stakeholder Engagement Plan* at **Attachment 3**. Eastern Iron will continue to engage with community and other stakeholders in accordance with DPI's *Community Engagement Guidelines for Mining and Mineral Exploration in Victoria* (2008) and other relevant guidelines and legislation.

Formal public consultation with the local community is planned to commence in the week of 11 November 2013. This will include the establishment of an information centre in Nowa Nowa, Lakes Entrance and Orbost at varying times for members of the local public to engage with representatives of Eastern Iron. This will run for a period of two weeks, with additional times planned for early 2014.

Authorised person for proponent:

I, ...**Mr Greg De Ross**.....(full name),
.....**General Manager, Eastern Iron Limited & Director, Gippsland Iron Pty Ltd** .....(position),
confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature _____

Date 8·11·13

Person who prepared this referral:

I, ...**Nick Baker** .....(full name),
.....**Planner, Planning and Property Partners Pty Ltd**.....(position),
confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature _____

Date 8·11·13