

# Expert Evidence for Fingerboards Mineral Sands Project, Glenaladale, Victoria (Independent Advisory Committee)

Prepared for:

**Kalbar Operations Pty Ltd**

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Author:

**Aaron Organ**

## DOCUMENT CONTROL

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<b>Assessment</b>	Expert Witness Statement
<b>Address</b>	Fingerboards Mineral Sands Project, Glenaladale, Victoria
<b>Project number</b>	7308
<b>Project manager</b>	Aaron Organ (Director / Principal Ecologist)
<b>Report reviewer</b>	Andrew Hill (Director / Principal Ecologist)
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<b>Client</b>	Kalbar Operations Pty Limited
<b>Bioregion</b>	Gippsland Plain, East Gippsland Lowlands
<b>CMA</b>	East Gippsland, West Gippsland
<b>Council</b>	East Gippsland Shire

## 1 AUTHOR'S EXPERTISE

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I am a Director and Principal Ecologist at Ecology and Heritage Partners Pty Ltd and work from 292 Mt Alexander Road, Ascot Vale, Victoria. I have 25 years' experience working in the environmental field, including 21 years in an environmental consultant capacity. I have previously worked as a field ecologist in East Gippsland Victoria, and have worked as a ranger in Queensland and Victoria, having extensive experience in National Park and Reserve management throughout Australia. I have an extensive working knowledge of terrestrial ecology throughout Victoria, and have either managed or played an important role in providing environmental advice on a large number of major infrastructure projects such as proposed pipelines, and road and rail developments, many throughout East Gippsland. I have been a lead author and/or co-author for over 500 projects and have provided expert advice to a range of clients. Some of these projects include a large number of proposed wind farms in Victoria, South Australia and Tasmania, long-term flora and fauna monitoring throughout the Illawarra escarpment New South Wales, and several mineral sands projects in Victoria, including the Donald Mineral Sands Project (EES), WIM150 Mineral Sands Project (EES), Ouyen Mineral Sands Project (EES) and WIM100 Mineral Sands Project (EES).

## 2 AUTHOR'S STATEMENT

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I, Aaron Organ of Ecology and Heritage Partners Pty Ltd, have prepared this Statement of Expert Evidence pertaining to the proposed Fingerboards Mineral Sands Project, located in Glenaladale, East Gippsland, Victoria. The proceeding statement is based on the findings of a series of ecological investigations undertaken by staff at Ecology and Heritage Partners Pty Ltd over the past four years. I was involved in previous site assessments in 2018 and 2019, and was the lead author of the detailed ecological investigations report for the EES. I can confirm the following:

- 1) There are no departures from the findings or opinions expressed in the previous detailed ecological investigations report and Biodiversity Offset Management Strategy (Ecology and Heritage Partners 2020a, 2020b);
- 2) There are no changed circumstances or assumptions since the earlier report was prepared, and therefore the opinions expressed in the earlier report remain current;
- 3) Access was not permitted across a property located in the north east of the project area and therefore detailed onsite ecological investigations could not be undertaken and the ecological values accurately documented. However, a detailed desktop analysis and a visual assessment from the adjoining properties were undertaken;
- 4) I have relied on the surface and groundwater studies (i.e. Water Technology Pty Ltd and EMM Consulting Pty Ltd, respectively) that have been completed as part of the EES to assess the potential impacts to terrestrial and aquatic ecological values within and surrounding the project area; and
- 5) Ecology and Heritage Partners has not undertaken detailed vegetation assessments at properties to determine the eligibility and suitability of vegetation to fulfil the Commonwealth offsets requirement for the project, nor have we undertaken detailed site assessments at properties to quantify the offset credits that can be generated to fulfil the State offsets for the project (i.e. under the *Guidelines for the*

*removal, destruction or lopping of native vegetation* (DELWP 2017). Offset investigations have been undertaken over the past 6 months by an ecological consultant local to the project area.

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have to my knowledge been withheld from the inquiry.

## 3 INTRODUCTION

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### 3.1 Background

I have been instructed by White and Case on behalf Kalbar Operations Pty Ltd (herein referred to as Kalbar) to prepare an expert witness statement relating to the Environmental Effects Statement (EES) prepared for the proposed Fingerboards Mineral Sands Project pursuant to the *Environment Effects Act 1978* (Victoria). The project involves mining of mineral sands from the Fingerboards resource, which lies within the more extensive Glenaladale deposit in East Gippsland, Victoria. Specifically, Kalbar are proposing the development of a mineral sands mine, mining unit plants, wet concentrator plant, water supply infrastructure, tailings storage facility and additional site facilities, such as a site office, warehouse, workshop, loading facilities and fuel storage. Proposed mining methods involve open pit mining to extract approximately 170 million tonnes (Mt) of ore to produce 8 Mt of heavy mineral concentrate over a projected mine life of 20 years.

### 3.2 Scope

The purpose of the expert witness statement is to review and summarise the findings of the detailed ecological investigations and the Biodiversity Offset Management Strategy undertaken as part of the EES (Ecology and Heritage Partners 2020a, 2020b). The previous investigations documented the terrestrial and aquatic flora and fauna values [including Groundwater Dependent Ecosystems (GDEs)] within the broader 'project locality' (i.e. within a 10-kilometre radius of the project area) and the project area (i.e. areas potentially disturbed by the project activities), and identified direct and indirect impacts on these values associated with the project.

A comprehensive assessment of the implications under Commonwealth, State and local environmental legislation and policy has also been undertaken for the project, and I have provided responses to the relevant (i.e. biodiversity) submissions received as part of the EES.

In summary, I have been instructed (letter dated 15 September 2020) by White and Case to undertake the following:

- Provide a description of my background and relevant expertise;
- Briefly describe and summarise the Ecology and Heritage Partners biodiversity investigations undertaken as part of the EES; and,
- Review the submissions that are relevant to my area of expertise and respond to any issues raised.

### 3.3 Project Area and Surrounds

The project area is located approximately 22 kilometres west of Bairnsdale in East Gippsland, Victoria (37°47' S, 147°20' E). The project area encompasses approximately 1,675 hectares of land within the East Gippsland Shire Council municipality and is located within a transitional zone between the Gippsland Plain (91% of the project area) and East Gippsland Lowlands bioregions. The project area also extends across the management boundaries of the East and West Gippsland Catchment Management Authorities (CMAs) (Figure 1).

The key land uses within the project area include grazing (sheep and cattle), hobby farms, a disused gravel quarry, and rural residential properties. A timber plantation is present within the western section of the

project area, encompassing approximately 450 hectares. The project area contains two residential dwellings, a range of agricultural infrastructure (e.g. water tanks, sheds, fences and channels) and additional built structures including a communication tower, powerlines and underground telecommunications cables. The eastern section of the project area is traversed by two main roads, namely Fernbank-Glenaladale Road and Bairnsdale-Dargo Road. Local roads, farm access tracks and plantation tracks are also present within the project area.

Under the East Gippsland Planning Scheme, the predominant zoning is Farming Zone (FZ1). The Bairnsdale–Dargo Road is zoned Road Zone Category 1 (RDZ1). Planning Overlays relating to ecological values within the project area include:

- An Environmental Significance Overlay (ESO1-51) - this overlay covers approximately 1.5 hectares of land within the Limpyers Road reserve, in the western section of the project area. The overlay aims to protect flora species of conservation significance ('listed' species) and is applied to the local road reserve network, covering a broader area of 1,446 hectares and extending up to 11 kilometres south-east of the project area. In addition, Limpyers Road is part of a wildlife corridor network that links vegetation in the Providence Ponds area to the Gippsland Lakes (as a recognised value of ES051).
- A Vegetation Protection Overlay (VPO1) - this overlay covers the ESO (51) area on site, which is concentrated around Bairnsdale-Dargo Road and Fernbank Glenaladale Road. VPO1 recognises medium or high roadside conservation values along identified roads. The overlay covers a broader area of 16,505 hectares within the municipality and aims to protect native vegetation within the Tambo-Bairnsdale road network.

According to DELWP's NatureKit (DELWP 2021a), the study area occurs within the Gippsland Plain and the East Gippsland Lowland bioregions. It is located within the jurisdiction of the East Gippsland and West Gippsland Catchment Management Authorities (CMA) and the East Gippsland Shire municipality.



## 4 METHODS

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### 4.1 Background Review

The following reports relating to the project were reviewed as part of the preparation of this expert witness statement:

#### Post the exhibition of the EES (Kalbar 2020)

- Targeted Gaping Leek-orchid survey for the Proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria (Ecology and Heritage Partners Pty Ltd 2021).

#### Prior to the exhibition of the EES (Kalbar 2020)

- Detailed Ecological Investigations for the Proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria (Ecology and Heritage Partners Pty Ltd 2020a).
- Biodiversity Offset Management Strategy for the Fingerboards Mineral Sands Project, Glenaladale, Victoria. (Ecology and Heritage Partners Pty Ltd 2020b).
- The Environment Effects Statement for the Proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria (Kalbar Operations Pty Ltd 2020).
- Environmental Baseline Report (Coffey Environments Australia Pty Ltd 2015).
- Fingerboards Mineral Sands: Surface Water Assessment – Site Study (Water Technology 2020a).
- Fingerboards Mineral Sands: Surface Water Assessment – Regional Study (Water Technology 2020b).
- Fingerboards Project Water Supply Options Study: Technical Groundwater Assessment (EMM 2020).

Documents prepared by the CMAs relating to the management of environmental values within the municipality and catchments, including:

- East Gippsland Roadside Vegetation Strategy (East Gippsland Shire Council 2012).
- East Gippsland Forest Management Plan (East Gippsland Shire Council 1995).
- East Gippsland Regional Catchment Strategy 2013-2019 (EGCMA 2013).
- West Gippsland Native Vegetation Plan 2003 (WGCMA 2003).
- West Gippsland Regional Catchment Strategy 2013-2019 (WGCMA 2012).
- West Gippsland Waterway Strategy (WGCMA 2014).

I have reviewed all of the submissions that are relevant to my area of expertise and provided a response to the specific issues raised by submitters.

### 4.2 Desktop Assessment

The following biological database and other information sources were accessed or reviewed as part of the preparation of my expert witness statement:

- The DELWP Native Vegetation Information Management (NVIM) Tool (DELWP 2021b) and the DELWP NatureKit (DELWP 2021a) for:

- Modelled data for location risk, remnant vegetation patches, scattered trees and habitat for rare or threatened species; and,
- The extent of historic and current Ecological Vegetation Classes (EVCs).
- The Victoria Biodiversity Atlas (VBA) (DELWP 2018a). Flora Information System (FIS) (Viridans 2013a) and Atlas of Victorian Wildlife (AVW) (Viridans 2013b) for previously documented flora and fauna records within the project locality;
- The Commonwealth Department of Agriculture, Water and Environment (DAWE) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DAWE 2020);
- The online resource Planning Maps Online to ascertain current zoning and environmental overlays (DELWP 2021d);
- Aerial photography of the study area;
- Relevant environmental legislation and policies, including relevant section of the East Gippsland Shire local planning scheme (i.e. Clause 52.17 – Native vegetation, planning scheme overlays, ESOs and VPO).

### 4.3 Detailed Field Investigations

Desk-based and detailed field surveys were used to assess environmental conditions and identify ecological values within the project area. While a description of these investigations are provided in the detailed ecological investigations completed for the project (Ecology and Heritage Partners 2020a), a summary of the assessments undertaken as part of the project (all undertaken by Ecology and Heritage Partners) is provided:

- Vegetation surveys completed by two qualified Botanists over a five-day period between 6 and 10 June 2016, a three-day period between 19 and 21 March 2018, and a five-day period between 10 and 14 October 2018;
- Terrestrial fauna surveys completed by two qualified Zoologists over a five-day period between 24 and 28 October 2016 (excluding the subsequent collection of deployed remote cameras on 11 November 2016), a three-day period between 19 and 21 March 2018, and a five-day period between 10 and 14 October 2018;
- Targeted flora surveys and updated vegetation mapping completed by two qualified Botanists over two five-day survey events between 24 and 28 October 2016, and 7 and 11 November 2016;
- Targeted Giant Burrowing Frog and additional nocturnal surveys were undertaken over 4 nights between 27 and 30 November 2018;
- Aquatic ecology assessment completed by a qualified Aquatic Ecologist over a three-day period between 6 and 8 June 2016. Targeted aquatic surveys for the nationally threatened Australian Grayling, Dwarf Galaxias and other aquatic species were undertaken between 27 and 29 November 2018;
- Additional flora and fauna assessments completed by two qualified Botanists at the proposed Bairnsdale rail siding and the road upgrade at Racecourse Road roundabout on 11 January 2019;
- Groundwater Dependent Ecosystem (GDE) modelling and risk assessment (largely desktop assessment and a brief field assessment of potential GDEs along Moilun Creek);



- Targeted Powerful Owl and Masked Owl surveys (spotlighting, call playback) were undertaken over four nights between 26 and 29 August 2019;
- An assessment of several potential offset sites (approximately eight properties) directly adjacent to the project area, together with an assessment of properties in areas north and north west of the project was undertaken on 5 and 6 September 2019;
- An additional assessment of the ecological values, including an assessment of the extent and quality of vegetation in the area of the proposed rail siding option at Fernbank East and along Cowells Lane was undertaken on 5 and 6 September 2019 to further refine the extent of proposed vegetation impacts at this location;
- An additional targeted Gaping Leek-orchid survey was undertaken along the Gippsland railway line reserve on 6 November 2020. A Senior Botanist at Ecology and Heritage Partners and Mick Bramwell (DELWP representative from the East Gippsland regional office) undertook the targeted surveys along the Gippsland railway line reserve, including within the area of the proposed rail siding that dissects the railway reserve.

The above surveys were undertaken across over 2,000 hectares, encompassing areas of public land (road reserves), Kalbar owned land and private property where landowners had granted access.

It is relevant to state that based on the results of the initial site surveys, and after feedback from the Technical Reference Group and discussions with DELWP, additional surveys were undertaken for several significant species that have a potential to occupy habitats within or adjacent to the project area (as outlined in the dot points above), including Gaping Leek-orchid, Giant Burrowing Frog, Powerful Owl, Masked Owl, Australian Grayling and Dwarf Galaxias.

Vegetation assessments, targeted surveys for significant flora and fauna species, and impact assessments were undertaken in accordance with the relevant Commonwealth and State survey guidelines and policies (e.g. DSE 2004; Australian Government 2011, DEWHA 2010a, 2010b, 2010c, SEWPaC 2010; DELWP 2011; DoE 2013; SEWPaC 2010, 2011, 2013; BirdLife 2017; DELWP 2017).

Since the exhibition of the EES, I have also undertaken an updated assessment to determine the extent of native vegetation impacts as part of the detailed designs of the proposed haul road and rail siding.

## 5 RESULTS

### 5.1 Key Ecological Values

The key ecological values recorded during the field assessments conducted by Ecology and Heritage Partners between 2016 and 2020 are summarised below (Table 1). Detailed results of the ecological values within the study area are outlined within the detailed ecological investigations report (Ecology and Heritage Partners 2020a). The majority (~90%) of land surveyed within the project area is classified as modified and disturbed (including the timber plantation). The remaining areas support native vegetation, which is concentrated around roadsides and the dissecting gullies.

**Table 1.** Key ecological values within the project area (Ecology and Heritage Partners 2020a).

	Description of ecological values
Species diversity	<ul style="list-style-type: none"> <li>A diverse assemblage of plants and animals, with 178 flora species (46 introduced) and 117 terrestrial fauna species (108 native species and nine introduced species) recorded during the field surveys.</li> </ul>
Remnant vegetation	<ul style="list-style-type: none"> <li>245.59 hectares of remnant vegetation represented by 11 Ecological Vegetation Classes (EVCs): <ul style="list-style-type: none"> <li>Aquatic Herbland (EVC 653) (Endangered) (1.03 ha)</li> <li>Box Ironbark Forest (EVC 61) (Vulnerable) (7.51 ha)</li> <li>Dry Valley Forest (EVC 169) (Endangered) (0.86 ha)</li> <li>Lowland Forest (EVC 16) (Vulnerable) (22.24 ha)</li> <li>Lowland Herb-rich Forest (EVC 877) (Depleted) (13.80 ha)</li> <li>Plains Grassy Forest (EVC 151) (Endangered) (60.93 ha)</li> <li>Plains Grassy Wetland (EVC 125) (Endangered) (0.31 ha)</li> <li>Plains Grassy Woodland (EVC 55) (Endangered) (47.05 ha)</li> <li>Riparian Shrubland (EVC 19) (Endangered) (1.15 ha)</li> <li>Sedge Wetland (EVC 136) (Vulnerable) (3.03 ha)</li> <li>Valley Grassy Forest (EVC 47) (Vulnerable) (87.68 ha)</li> </ul> </li> <li>1,401 large trees (in patches and scattered), consisting predominately of large old eucalypts.</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>34.1 hectares of land classified by the Victorian Department of Environment, Land, Water and Planning (DELWP) as a 'Current Wetland'.</li> <li>The Gippsland Lakes Ramsar site, located within five kilometres of the project area (i.e. to the east of the proposed Bairnsdale rail option).</li> </ul>
Listed ecological communities	<ul style="list-style-type: none"> <li>14.06 hectares of the nationally significant (EPBC Act-listed) Gippsland Red Gum (<i>Eucalyptus tereticornis</i> subsp. <i>mediana</i>) Grassy Woodland and Associated Native Grassland (GRGGW) ecological community.</li> <li>47.05 hectares of the State significant (Victorian <i>Flora and Fauna Guarantee Act 1988</i> [FFG Act] listed) Forest Red Gum Grassy Woodland ecological community.</li> </ul>
Listed flora species	<ul style="list-style-type: none"> <li>The known occurrence of four State significant flora species: <ul style="list-style-type: none"> <li>Slender Wire-lily <i>Laxmannia gracilis</i></li> <li>Blue Mat-rush <i>Lomandra glauca</i> s.s.</li> <li>Slender Tick-trefoil <i>Desmodium varians</i></li> <li>Sandfly Zieria <i>Zieria smithii</i> subsp. <i>smithii</i></li> </ul> </li> <li>The potential occurrence of three nationally significant flora species: <ul style="list-style-type: none"> <li>Swamp Everlasting <i>Xerochrysum palustre</i></li> <li>Dwarf Kerrawang <i>Commersonia prostrata</i></li> <li>Gaping Leek-orchid <i>Prasophyllum correctum</i></li> </ul> </li> <li>The potential occurrence (moderate or high likelihood) of several State significant species within the project area.</li> </ul>

Description of ecological values	
Listed fauna species	<ul style="list-style-type: none"> <li>○ The known occurrence of two Nationally significant fauna species (Grey-headed Flying-fox <i>Pteropus poliocephalus</i> and Australian Grayling <i>Prototroctes maraena</i>).</li> <li>○ The potential use of the project area of four fauna species of national significance:               <ul style="list-style-type: none"> <li>○ Swift Parrot <i>Lathamus discolor</i> (rare visitor)</li> <li>○ Painted Honeyeater <i>Grantiella picta</i> (vagrant visitor)</li> <li>○ Giant Burrowing Frog <i>Heleioporus australiacus</i> (low likelihood)</li> <li>○ Dwarf Galaxias <i>Galaxiella pusilla</i> (low likelihood)</li> </ul> </li> <li>○ The known occurrence of one State significant fauna species (Yellow-bellied Sheathtail Bat <i>Saccolaimus flaviventris</i>) and potential occurrence of additional State significant fauna species (e.g. Masked Owl <i>Tyto novaehollandiae novaehollandiae</i>, Powerful Owl <i>Ninox strenua</i>).</li> <li>○ The known occurrence of two regionally significant fauna species (Emu <i>Dromaius novaehollandiae novaehollandiae</i> and Eastern Long-necked Turtle <i>Chelodina longicollis</i>) and the potential occurrence of a small number of additional regionally significant species.</li> </ul>
Significant sites	<ul style="list-style-type: none"> <li>● Four designated conservation reserves within 10 kilometres of the project area:               <ul style="list-style-type: none"> <li>○ Mitchell River National Park;</li> <li>○ Providence Ponds Flora and Fauna Reserve;</li> <li>○ Fernbank Nature Conservation Reserve; and,</li> <li>○ Saplings Morass Flora and Fauna Reserve.</li> </ul> </li> </ul>

### 5.1.1 Additional Gaping Leek-orchid Surveys

As outlined above, an additional targeted Gaping Leek-orchid survey was undertaken at the proposed Fernbank East railway siding on 6 November 2020. Gaping Leek-orchid was not detected during the targeted surveys within the project area. Similarly, no specimens were recorded at either reference site, potentially due to the dense biomass observed at each site making detection difficult, and the time since last fire. Two individuals of Gaping Leek-orchid were recorded at the Lindenow South reference site in 2019, with the site last burnt in 2016. There is potential that an extant population persists at the two reference sites, although it is highly unlikely (given the degraded nature and weedy condition of the vegetation) that the species occurs within infrastructure footprint. As such, the species is unlikely to be impacted by the project.

## 5.2 Key Threatening Processes

The construction and operational phases of the project will involve activities and associated processes that will, or have the potential to, lead to the loss, reduction or reduced viability of ecological values within the project area and project locality. Proposed actions including land clearing, the development of roads, pipelines and powerlines, disturbance to waterbodies, use of vehicles/ machinery and a general increase in human activity are associated with the following key threatening processes:

- Vegetation removal and habitat loss;
- Habitat fragmentation and edge effects;
- Direct fauna mortality;
- Loss of hollow-bearing trees;
- Loss and degradation of aquatic habitat;
- Proliferation of weed and pest species; and,
- Noise, dust and light.

Cumulative impacts and specific impacts on ecologically significant values have also been considered, and are discussed along with a detailed description of the key threatening processes within the detailed ecological investigations report (Ecology and Heritage Partners 2020a).

## 6 IMPACTS, RISKS AND MITIGATION

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Impacts on ecological values within the study area, risks and mitigation measures are discussed in the detailed ecological investigations report (Ecology and Heritage Partners 2020a). A brief summary of the impacts, risks and mitigation measures is provided below.

### 6.1 Direct Impacts

Direct impacts of the project include:

- Loss of native vegetation
  - The proposed activity will result in the removal of 166.52 hectares of remnant vegetation, 417 Large Trees in patches of native vegetation and 533 scattered trees (374 scattered large trees and 159 scattered small trees) within the surveyed sections of the project footprint, noting that areas within the footprint remain unsurveyed. Due to the nature of the proposed activity, areas of vegetation that will be directly affected by the project will be completely removed;
- Direct fauna mortality;
- Loss of hollow-bearing trees; and,
- Loss and degradation of aquatic habitat.

### 6.2 Indirect Impacts

Indirect impacts of the project include:

- Impacts to aquatic habitat outside of the project area, including changes in water quality and sedimentation;
- Impacts to groundwater dependent ecosystems;
- Impacts to the Mitchell River;
- Habitat fragmentation and edge effects;
- Proliferation of weed and pest species
- Noise, dust, light and spills;

### 6.3 Residual Impacts

Following the implementation of measures to avoid and minimise impacts on ecological values discussed below and in the detailed ecological investigations report (Ecology and Heritage Partners 2020a), the following residual impacts are likely to occur within the surveyed sections of the project footprint:

- Removal of a total of 160.30 hectares of remnant vegetation separated into patches (excluding 6.10 hectares of DELWP mapped 'current wetlands') and an additional 461 scattered trees. The majority of the vegetation is highly modified and isolated (i.e. not large consolidated areas of remnant habitat);

- Removal of 1.74 hectares (out of a total of 14.06 hectares within the project area) of the nationally significant GRGGW ecological community;
- Removal of 14.54 hectares (out of a total of 47.05 hectares within the project area) of the State significant Forest Red Gum Grassy Woodland ecological community;
- Removal of three State significant flora species (Slender Wire-lily (33 plants), Blue Mat-rush (three plants) and Sandfly Zieria (10 plants));
- Removal of known habitat for the following fauna species of State and regional significance:
  - Grey-headed Flying Fox – remnant woodland and forest
  - Yellow-bellied Sheath-tail Bat - 461 scattered trees and 160.30 hectares of remnant vegetation
  - Masked Owl - 461 scattered trees and 160.30 hectares of remnant vegetation
  - Emu - Forest and woodland, wetland/ aquatic habitat and disturbed land
  - Eastern Long-necked Turtle – wetland/ aquatic habitat
- Removal of potential habitat for a range of flora and fauna species of national, State and regional significance;
- Removal of hollow-bearing trees used by a range of fauna species; and,
- Potential reduced flows to Mitchell River following surface water extraction which may lead to localised impacts to the aquatic values along the River.

## 6.4 Risk

A risk-based assessment was completed to compare the likelihood and consequences of impacts associated with the project between the standard mitigation and additional mitigation scenarios, allowing for the identification of residual impacts (i.e., the impacts that remain assuming the effective implementation of all proposed avoidance, mitigation and management measures). Standard mitigation includes features of the project design that enable compliance with applicable standards, and/or industry standard measures. Additional mitigation (if any) is required to reduce the risk to an acceptable level, or as far as practicable, for major, high and moderate risks. The assessment focussed on reviewing impacts on defined ecological values. The results of significant impact assessments have also been incorporated into the risk assessment, with impacts assessed for each ecological community and species of conservation significance known or likely to occur within the project area.

The risks to areas of ecological value outside the project footprint (i.e. areas indirectly impacted by the proposal), including downstream waterways (i.e., Mitchell River) and wetlands (Gippsland Lakes), were assessed as Low.

Assuming the implementation of appropriate (standard and additional) mitigation measures and the potential for ecological values to be restored through rehabilitation, the long-term impact on most defined ecological values in the context of the project locality and bioregion is Low to Moderate (i.e. localised impacts).

The post mitigation significant impact assessment assigned a High-risk rating to the following ecological communities identified as having the potential to be significantly impacted by the proposed activity:

- Matter of NES:
  - GRGGW ecological community.
- State and regionally significant values:
  - Forest Red Gum Grassy Woodland ecological community.



## 7 IMPACT AVOIDANCE AND MINIMISATION

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As outlined in the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017) a project should be designed to take into consideration the three-step approach, which is:

- Avoid environmental impacts;
- Minimise impacts; and,
- Where impacts cannot be avoided or minimised, compensate for the residual impacts using other mitigation measures such as offsets.

These principles have been followed, where possible, for the project.

### 7.1 Avoidance and Minimisation

As outlined in the previous detailed ecological investigations report (Ecology and Heritage Partners 2020a) and in the EES (Kalbar Operations Pty Ltd 2020), several measures have been undertaken to avoid ecological values, including:

#### Haul roads:

- Realignment of proposed haul roads (i.e. reduced road length and width) and pipelines. As part of the rail siding option at Fernbank East, it was originally proposed to use Fernbank-Glenaladale Road as haulage route. However, this route was not chosen due to the requirement to upgrade the road which would have required the removal of roadside vegetation. In addition, the proposed haulage road alignment to the preferred rail siding location at Fernbank East was altered to run through private property and not along Chettles Road (see Figures 6m, 6aee, 6af, 6ag and 6ah in Ecology and Heritage Partners 2020a) due to the requirement to upgrade that road, and the resultant removal of high quality vegetation. This has resulted in the avoidance of several hectares of native vegetation and several Large Trees.
- Road length, alignment and width has been designed to maximise the avoidance of native vegetation. The width of the road corridor will be confined to approximately 20 metres.
- Road to rail siding alignments have been designed to avoid native vegetation and will avoid known populations and suitable habitat for the nationally significant Gaping Leek-orchid. The proposed location of the rail siding into the existing railway is highly degraded (supports a modified understorey), although an overstorey comprising mature eucalypts is present.

#### Process infrastructure:

- Process infrastructure has been located to avoid native vegetation removal:
  - Wet Concentrator Plant (WCP) (located in the Blue Gum plantation away from identified native vegetation);
  - Loading facility, stockpile, materials handling (located in the Blue Gum plantation away from identified native vegetation);
  - Process and contingency water storage (located in the Blue Gum plantation away from identified native vegetation);

- Temporary Tailings Storage Facility (TSF) located on Steenhodt block, which is a burnt Blue Gum plantation, to minimise clearance of native vegetation); and,
- Access roads to WCP and offices located on private land (through Blue Gum plantation) to avoid any clearance of native vegetation along Limpyers Road.

#### Water infrastructure:

- Water infrastructure has been located to avoid native vegetation removal:
  - Fresh water storage (located on Steenhodt block, which is a burnt Blue Gum plantation, to minimise clearance of native vegetation);
  - Pipelines (two supply main and pump station options from the Mitchell River have been considered and the option near the northern boundary of project area has been strategically located to avoid the removal of native vegetation).
  - Pipelines will be directionally drilled where necessary to avoid native veg removal.
  - Sediment storages will primarily be located in areas to avoid native vegetation removal and future inundation.

#### Other avoidance measures:

- Changed mine area/plan to avoid the State Park located to the west.
- Overburden and topsoil dumps have been located to avoid native vegetation;
- Avoidance of native vegetation removal adjacent to Boundary No34 Track (east-west) and Boundary No34 Track (north-south);
- Careys Lane diversion alignment specifically avoids some native vegetation; and,
- Avoidance of infrastructure and waste dumps within gullies.

## 7.2 Mitigation Measures

Mitigation measures including avoidance, mitigation at the planning level and specific mitigation measures to avoid and minimise impacts on ecological values within the study area are outlined in the detailed ecological investigations report (Ecology and Heritage Partners 2020a).

These measures range from planning level design to avoid impacts on native vegetation to specific measures for each ecological value potentially impacted by the mine and are given in detail as part of the EES.

Residual impacts after the implementation of measures to avoid and minimise impacts on ecological values, will be offset according to State and Commonwealth requirements. The required offsets are detailed within the detailed ecological investigations report and Biodiversity Offset Management Strategy (Ecology and Heritage Partners 2020a, 2020b).

## 7.3 Environmental Management

As outlined in the EES, it is understood that Kalbar is committed to implementing practices that prevent, minimise, mitigate or remediate any negative impacts on the environment. A detailed Environmental

Management Framework (EMF) will be implemented to manage the impacts of project construction, operations and closure (including decommissioning, rehabilitation and post-closure).

A component of the EMF will be the preparation of a Biodiversity Management Plan or other equivalent management documents that will include, where appropriate, procedures for:

- Detailed design of mitigation measures;
- Staff and contractor inductions to address the location of sensitive ecological values and their roles and responsibilities in the protection and/or minimisation of impacts to all native biodiversity;
- Pre-clearing surveys and fauna salvage/ translocation where practical;
- Vegetation clearing protocols;
- Contingency measures to manage the potential unexpected discovery of listed flora and fauna species during construction and operation of the project; and,
- Rehabilitation and restoration measures for incorporation into a Rehabilitation Plan, including the establishment of:
  - Rehabilitation protocols;
  - Weed control measures;
  - Pest management measures; and
  - A flora and fauna monitoring program to better understand and manage impacts and rehabilitation actions to flora and fauna.

The Biodiversity Management Plan will be important for enacting the 'avoid and mitigate' principles during the construction and operational phases and will include clear objectives and actions including, where appropriate:

- Minimising human interferences to flora and fauna;
- Minimising vegetation clearing/disturbance;
- Minimising impact to threat-listed species and communities; and,
- Ongoing monitoring of impacts on flora and fauna.

It is understood that a project Environmental Management Plan will be prepared and include several key sub-plans:

- Significant / Threatened Species Conservation Management Plans (including for the Gaping Leek-orchid, Swamp Everlasting and Dwarf Kerrawang);
- Significant Flora Salvage and Translocation Plan;
- Weed Management Plan;
- Disease and Biocontrol Plan;
- Land Rehabilitation and Restoration Plan;
- Construction Noise Management Plan; and
- Construction Environmental Management Plan.

## 8 BIODIVERSITY OFFSETS

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### 8.1 Commonwealth

There will be a requirement to offset the proposed removal of 1.74 hectares of the EPBC Act-listed Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland (GRGGW). Based on a desktop and field assessment and an assessment of potentially suitable areas in the surrounding area (i.e. within the geographical distribution of GRGGW) there are suitable offset sites available that meet the of required offset for the project (e.g. the estimate is in the order of 8-10 hectares of GRGGW based on the preliminary analysis in the EPBC Act offset calculator) (Ecology and Heritage Partners 2020b).

A suitable offset site located in Lindenow South has been assessed on ground (September 2020) and supports approximately 40 hectares of this EPBC Act-listed GRGGW. Discussions with the landowner regarding the establishment of an offset site on the property are continuing. Once the offset site is confirmed, a detailed Offset Management Plan will be prepared and outline specific management actions to protect and enhance the vegetation at the site to compensate for the removal of GRGGW as part of the project (i.e. the objective of management actions will be to expand and improve the quality of the native vegetation at the site over time).

### 8.2 State (Guidelines)

Based on the extent of vegetation losses within the surveyed sections of the project footprint, the project falls under the Detailed Assessment Pathway and the State offset requirement is 1.001 General Habitat Units (GHU) with a minimum Strategy Biodiversity Value of 0.253, along with 704 Large Trees and Species Habitat Units (SHUs) for the following species (DELWP 2017):

- |                           |              |                          |              |
|---------------------------|--------------|--------------------------|--------------|
| • Australian Grayling     | 29.022 SHUs  | • Slender Violet-bush    | 66.713 SHUs  |
| • Flinders Pygmy Perch    | 57.384 SHUs  | • Slender Wire-lily      | 102.384 SHUs |
| • Sticky Wattle           | 91.822 SHUs  | • Star Cucumber          | 28.253 SHUs  |
| • Yellow-wood             | 38.066 SHUs  | • One-flower Early Nancy | 97.589 SHUs  |
| • Thick-lip Spider-orchid | 46.310 SHUs  | • Limestone Blue Wattle  | 87.710 SHUs  |
| • Purple Diuris           | 97.984 SHUs  | • Thin-leaf Daisy-bush   | 56.891 SHUs  |
| • Bushy Hedgehog -grass   | 102.384 SHUs | • Forest Red-box         | 94.130 SHUs  |
| • Rough-grain Love-grass  | 98.544 SHUs  | • Heath Spider-orchid    | 40.354 SHU   |

Although a high proportion of the SHUs that are required for the project are likely to be available on the Native Vegetation Offset Register (NVOR), given that the mine will occur over 15 years, the security and payment of offsets will occur in stages (i.e. prior to the removal of vegetation in Years 1, 5, 8, 12, 15). The staging of the offset payments, in accordance with the Guidelines, would need to be discussed and approved by DELWP.

A preliminary assessment of the additional offsets under the Guidelines has been completed as part of the additional desktop assessment of the property located at 2705 Bairnsdale-Dargo Road, Glenaladale, and although no additional target significant species have been triggered, the proposed vegetation removal

requires an additional offset for 12 target species ranging from 34.446 SHUs and 137.302 SHUs (Table 2). This includes two additional species that were not triggered as part of the proposed development: Golden Pomaderris (137.302 SHUs) and Silky Kidney-weed (135.388 SHUs). There is also a requirement to offset an additional 141 Large Trees, with a total of 845 Large trees for the entire project.

Detailed site assessments of at least 10 properties that support native vegetation and that are eligible to be used as offsets are known to (based on desktop analysis) generate the required SHUs were undertaken in September and October 2020 (Ethos NRM in prep.). It is understood that negotiations with prospective landowners continues and at least the required offsets at Year 5 can be generated at four properties and by purchasing a small proportion of the offsets via the Native Vegetation Offset Register.

**Table 2.** State offsets for the proposed removal of native vegetation.

Species	Required offsets for the project within the study area (excluding 2705 Bairnsdale-Dargo Road) *	Estimated additional credits required for vegetation removal at 2705 Bairnsdale-Dargo Road ^	Total estimated offsets required for the entire project
Australian Grayling	29.022	0	29.022
Flinders Pygmy Perch	57.384	0	57.384
Sticky Wattle	91.822	36.844	128.666
Yellow-wood	38.066	0	38.066
Thick-lip Spider-orchid	46.310	0	46.310
Purple Diuris	97.984	36.828	134.812
Bushy Hedgehog -grass	102.384	37.094	139.478
Rough-grain Love-grass	98.544	36.844	135.388
Slender Violet-bush	66.713	36.956	103.669
Slender Wire-lily	102.384	37.103	139.487
Golden Pomaderris	0	137.302	137.302
Star Cucumber	28.253	0	28.253
One-flower Early Nancy	97.589	36.843	134.432
Limestone Blue Wattle	87.710	34.446	122.156
Thin-leaf Daisy-bush	56.891	34.931	91.822
Forest Red-box	94.130	36.844	130.974
Silky Kidney-weed	0	135.388	135.388
Heath Spider-orchid	40.354	0	40.354

**Note:** \*Detailed information on the impact assessment and required offsets is outlined in the detailed ecological investigations report and the Offset Management Strategy for the project (Ecology and Heritage Partners 2020a, 2020b).

^An accurate assessment of the actual required offsets for the proposed removal of native vegetation at 2705 Bairnsdale-Dargo Road, Glenaladale will be determined after detailed site assessments are completed and prior to any vegetation removal.

### 8.3 Grassy Eucalypt Woodland Restoration Project

As part of the project Kalbar will progressively rehabilitate disturbed areas as the active mining face advances. It is also committed to undertaking a comprehensive restoration project across 200 hectares (i.e. former Blue Gum plantation) adjacent to Limpyers State Forest. This area will be direct seeded with site indigenous species

associated with the GRGGW / Forest Red Gum Grassy Woodland ecological community. Over the long-term this will provide habitat for a range of flora and fauna species and form part of a larger connected area of habitat.

The Grassy Eucalypt Woodland Restoration Project is not anticipated to contribute to the required offsets under the EPBC Act for the proposed removal of 1.74 hectares of GRGGW and 14.54 hectares of State significant (FFG Act-listed) Forest Red Gum Grassy Woodland ecological community, or fulfil any of the required State offsets under the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017). Kalbar's commitment to restore this area is additional to its biodiversity offset obligations under the EPBC Act and State native vegetation Guidelines (DELWP 2017). The project will be the largest restoration project for a woodland with a grassy understorey in Australia.

As part of the project, there is an opportunity for significant flora species (e.g. Dwarf Kerrawang, Slender Wire-lily, Blue Mat-rush, Slender Tick-trefoil, Sandfly Zieria and Purple Diuris) to be reintroduced into this area to expand existing populations.



## 9 RESPONSES TO SUBMISSIONS

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The key biodiversity concerns raised within the EES submissions made by State government agencies and regulators, local government, local residents and other submissions are summarised below (Table 3). I have grouped these as best as possible in relevant themes and have responded accordingly (Table 3).

**Table 3.** Key biodiversity issues raised in the EES submissions and responses.

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
521	DELWP Forest and Regions Gippsland	Detailed onsite ecological assessments at 2705 Dargo-Bairnsdale Road, Glenaladale not undertaken.	<p>Access was not granted during the ecological investigations to one property (2705 Dargo-Bairnsdale Road) located in the north west of the project area (approximately 106 hectares) (see Chapter 8, Section 8.2.2 of the EES). Potential biodiversity values in this area were identified and assessed using a combination of high resolution aerial imagery (current and historical), ecological vegetation class (EVC) models, and photos taken from the adjoining property to the south and from Bairnsdale-Dargo Road reserve to the east.</p> <p>Approximately 49.925 hectares of native vegetation comprising two EVCs: Plains Grassy Forest (49.621 hectares) and Plains Grassy Woodland (0.304 hectares) has been mapped across 2705 Dargo-Bairnsdale Road, Glenaladale. Given the spatial context, and the size and condition of the patch, the mapped area of Plains Grassy Woodland would not constitute the EPBC Act-listed Gippsland Red Gum (<i>Eucalyptus tereticornis</i> subsp. <i>mediana</i>) Grassy Woodland and Associated Native Grassland (GRGGW) (DEWHA 2008, 2010c).</p> <p>A total of 123 Large Trees are estimated to occur within patches of native vegetation and an accurate onsite assessment of Large Trees will need to be undertaken prior to any vegetation removal for the project. Forty-eight scattered large trees are identified from aerial photography and photos taken from the adjoining properties were assessed as being large, scattered trees.</p> <p>Three small farm dams are present within study area. However, no areas classified by DELWP as a 'Current Wetland' exist, and the study area does not form part of a Ramsar wetland. Several significant flora and fauna species have been documented within the local area and there is a potential for a small number of these species to occur within the study area.</p> <p>Given the occurrence of the four state significant flora species in similar habitats within the project area (i.e. Blue Mat-rush, Sandfly Zieria, Slender Tick-trefoil and Slender Wire-lily), there is a potential that one or more of these species occur within the unsurveyed area. A targeted flora survey will be conducted in this area prior to any proposed disturbance, together with detailed habitat hectare (vegetation) assessments to accurately determine</p>	<p>Desktop ecological assessment: 2705 Dargo-Bairnsdale road. Ecology and Heritage Partners Pty Ltd 2020b.</p> <p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Appendix 9 – Desktop Assessment: 2705 Bairnsdale-Dargo Road, Glenaladale.</p> <p>Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020). Chapter 8, Section 8.22.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>the extent and quality of native vegetation in this area and confirm the number of large trees present.</p> <p>As part of the ongoing project planning process, detailed protection and mitigation measures will be developed and presented in a Biodiversity Sub-plan (or similar document) relating to the construction and operational phases of the project.</p> <p>Finally, a preliminary assessment of the required offsets under the Guidelines has been completed, and although no additional target significant species have been triggered, the proposed vegetation removal requires an additional offset for 12 target species ranging from 34.446 and 137.302. This includes two additional species that were not triggered as part of the proposed development: Golden Pomaderris (137.302 SHUs) and Silky Kidney-weed (135.388 SHUs). There is also a requirement to offset an additional 141 Large Trees, with a total of 845 Large trees for the entire project.</p>	
		Provision of the appendices associated with the DELWP NVR report not included.	Noted. The detailed Native Vegetation Removal (NVR) Report has been provided to DELWP regional office.	-
		Feasible opportunities to avoid and minimise impacts on native vegetation have not been adequately assessed. Examples given of avoidance and minimisation are not acceptable.	<p>The technical report outlines the quantum of proposed native vegetation impacts and outlines measures that will be undertaken to further avoid, mitigate, rehabilitate, and offset the proposed losses. Project options are outlined in the EES Alternatives Chapter (CH04). Given the mine layout proposed and the sequencing of the mining it is extremely difficult to avoid the small, modified patches of native vegetation along the gullies and across the project footprint.</p> <p>The Alternatives Chapter (CH04) (i.e. Section 4.9.1, Table 4.7 and Section 4.11, Table 4.9) outlines the decision making process that led to the preferred surface water infrastructure alignment (i.e. proposed new pump station location) and the preferred transport mode option (i.e. Fernbank East rail siding location) being chosen. One of the main considerations in the selection of the preferred surface water infrastructure alignment and the preferred transport mode option was that the preferred options propose to have a reduced ecological impact compared with the other options considered.</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a. Section 8.1.1 – Avoidance.</p> <p>Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020). Chapter 4 – Section 4.9.1 Surface Water Infrastructure and Section 4.11 Transport. Chapter 12 – Section 12.4.5 Mitigation Plans. Attachment H – Mitigation Register.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>There have been multiple alterations to the development footprint over several years, that has resulted in the avoidance of impacts to native vegetation. This includes the realignment of proposed haul roads (i.e. reduced road length and width) and pipelines. Road length, alignment and width has been designed to maximise the avoidance of native vegetation (i.e. the width of the road corridor will be confined to approximately 20 metres in areas to avoid native vegetation).</p> <p>Road to rail siding alignments have been designed to avoid native vegetation and will avoid known populations and suitable habitat for the nationally significant Gaping Leek-orchid.</p> <p>Process infrastructure has been located to avoid native vegetation removal. For example, the Wet Concentrator Plant (WCP), the loading facility, and the process and contingency water storage will all be located in the Blue Gum plantation away from native vegetation.</p> <p>The access roads to WCP and offices located on private land (through Blue Gum plantation) to avoid any clearance of native vegetation along Limpyers Road.</p> <p>As outlined above, water infrastructure has been located to avoid native vegetation removal.</p> <p>Other measures include changed mine area/plan to avoid the State Park located to the west, Careys Lane diversion alignment that specifically avoids native vegetation, and infrastructure and waste dumps will not be located within gullies.</p> <p>Consistent with Section 12.4.5 and Table 12.8 of the EES (Kalbar 20202), the proposed risk treatment to be prepared and implemented to minimise impacts to native vegetation during the operational phase of the project include:</p> <ul style="list-style-type: none"> <li>• The preparation of a site plans showing boundaries of the site, existing native vegetation and the native vegetation to be removed.</li> <li>• Description of native vegetation to be removed.</li> <li>• Staff and contractor inductions to address the location of sensitive ecological values and their roles and responsibilities in the protection and/or minimisation of impacts to all native biodiversity.</li> <li>• Vegetation management and clearing protocols.</li> </ul>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<ul style="list-style-type: none"> <li>• Weed control measures, pest management measures, and flora and fauna monitoring program.</li> </ul> <p>In addition, detailed Biodiversity (Mitigation Identifier TE28) and Rehabilitation (Mitigation Identifier TE09 and TE11) Sub-plans will be prepared as part of the overarching Environmental Management Framework. These plans will include various protection and management actions, including specific management requirements for significant species and communities, species salvage and relocation / translocation, native vegetation management, weed management, disease and biocontrol and land rehabilitation and restoration.</p> <p>Finally, prior to each stage of the project all biodiversity offsets will be sourced and secured in accordance with the <i>Guidelines for the removal, destruction or lopping of native vegetation</i> (DELWP 2017) and to DELWPs satisfaction (see identifier TE03 in the Mitigation Register of the EES).</p>	
		<p>Only 7 of the 16 species requiring Species Habitat Units (SHU) have credits available for purchase from the Native Vegetation Offset Register (NVOR). Evidence that the offsets for all species can be secured must be given.</p>	<p>In accordance with the State <i>Guidelines for the removal, destruction or lopping of native vegetation</i> (DELWP 2017) clearing of native vegetation will not proceed at any stage of the project until the required biodiversity offsets have been secured.</p> <p>Based on the extent of vegetation losses within the surveyed sections of the project footprint, the project falls under the Detailed Assessment Pathway and the State offset requirement is 1.001 General Habitat Units (GHU) with a minimum Strategy Biodiversity Value of 0.253, along with 704 Large Trees and Species Habitat Units (SHUs) for the following species.</p> <p>Given the mining operations will be staged over several years (as outlined in a works plan), offsets will be secured over time, prior to each stage commencing and vegetation removal occurring. A breakdown of the GHUs and SHUs required for each stage is provided in the detailed biodiversity report and the Offset Management Strategy prepared for the project (Ecology and Heritage Partners 2020a, 2020b).</p> <p>Although the project has a large offset requirement under the Guidelines (i.e. SHUs for multiple species and comparatively large number of SHUs for most of these species), based</p>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>on available information, there is a high level of confidence Kalbar can meet the offset obligations under the Guidelines for the project.</p> <p>Several potential offset sites where modelled habitat for multiple species occurs over the property were assessed from roadsides on 6 and 7 September 2019 to obtain information on the suitability of each site, and to determine known and potential threats that would need to be managed. Kalbar has subsequently engaged a local ecological consultant to undertake detailed site assessments (September and October 2020) across at least 10 properties that support native vegetation and that are eligible to be used as offsets (Ethos NRM in prep.). It is understood that negotiations with landowners continues and all of the required offsets at Year 5, and a large proportion of the required offsets up to Year 8 of the project, can be generated at four properties and by purchasing a comparatively smaller number of the SHUs via the Native Vegetation Offset Register.</p>	
		<p>Location of the Fernbank East railway siding and threatened flora and vegetation communities at risk. The current impact assessment in this area is inadequate as Kalbar has not demonstrated that an alternative site cannot be achieved that avoids impacts to these values along the railway reserve.</p>	<p>Detailed ecological site investigations (over multiple days and years) have been undertaken at the proposed Fernbank East railway siding. This included targeted surveys for the nationally significant Gaping Leek-orchid which were undertaken within the proposed rail siding area and broader project footprint between 24 – 28 October 2016, 7 – 11 November 2016, 10 – 14 October 2018, and 5 and 6 November 2019 (Ecology and Heritage Partners 2020).</p> <p>An additional targeted Gaping Leek-orchid survey was undertaken at the proposed Fernbank East railway siding on 6 November 2020 by a Senior Botanist familiar with the appearance of the species. A representative from DELWP (Mick Bramwell, DELWP East Gippsland) was present at the time of the surveys and aided with searching for Gaping Leek-orchid within the project area and at a reference site (where a population of the species is known to exist) within the Gippsland railway line, approximately 600 meters south west of the project area. The reference site was visited to examine the diagnostic features of the species and to confirm whether the species was flowering during the field survey prior to undertaking the survey within the study area. An additional reference site located approximately 20 kilometres south west of the study area was visited, as it is known to support the largest population of Gaping Leek-orchid across its range. Gaping Leek-orchid was not observed flowering at either reference site, potentially due to the dense biomass observed at each site making detection difficult, and the time since last fire. Two individuals</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 1.4 – Project Area and Surrounds</p> <p>Section 4.3 – Ecological Field Surveys</p> <p>Section 5.2.2 – Flora Species</p> <p>Section 5.3.4 - Significant Sites Outside the Project Area</p> <p>Section 8.1.1 – Avoidance</p> <p>Appendix 5 – EPBC Act Significant Impact Assessment</p> <p>Targeted Gaping Leek-orchid survey for the Proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria. Ecology and Heritage Partners Pty Ltd 2021.</p>



Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>of Gaping Leek-orchid were recorded at the Lindenow South reference site in 2019, with the site last burnt in 2016.</p> <p>Whilst it is acknowledged that the actual railway reserve (not including the small area within the project area where the rail siding is proposed to connect to the existing railway line) supports high quality native vegetation (EPBC Act-listed ecological community) and significant flora species (e.g. Gaping Leek-orchid, Purple Diuris), the project will not directly or indirectly impact any of these significant ecological values at this location. There will be a small loss of highly degraded native vegetation (lacks a shrub layer and the understorey is highly disturbed and dominated by exotic grasses and weeds) associated with the connection of the rail siding to the existing railway line. Other than this small area the entire rail siding is proposed to be located in a paddock comprising exotic vegetation (crop and pasture grass). It is important that measures are in place to prevent indirect impacts to native vegetation along the Gippsland Railway reserve, Cowells Lane and at Saplings Morass Flora and Fauna Reserve.</p> <p>Multiple options for the location of the new siding were considered in the vicinity of the preferred site (as presented in Chapter 4 – Project Alternative, Section 4.11 Transport, EES). Kalbar considered the presence of the Gaping Leek-orchid, Saplings Morass Flora and Fauna Reserve, rail gradients, amenity impacts on residents and several ephemeral wetlands and watercourses before selecting the proposed site. The preferred transport mode alternative is road transport to an existing rail siding at Bairnsdale and rail to Port of Melbourne. This option will result in a greater impact on ecological values compared with the proposed Fernbank East railway option, including:</p> <ul style="list-style-type: none"> <li>• Loss of 1.37 hectares of native vegetation (including areas of the Endangered Plains Grassy Woodland EVC) for upgrade of the Princes Highway roundabout,</li> <li>• Loss of 1.9 hectares of native vegetation (including areas of the Endangered Plains Grassy Woodland EVC) for upgrade of the Princes Highway and Racecourse Road intersection to a roundabout.</li> <li>• Loss of 22 large trees for upgrade of the Princes Highway roundabout.</li> <li>• Loss of three large trees for upgrade of the Princes Highway and Racecourse Road intersection to a roundabout.</li> </ul>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>With respect to the Fernbank East railway location an area within the railway reserve has been fenced off as a protected significant native vegetation site. Based on the detailed rail siding and haul road design plans areas of high quality native vegetation will be avoided during the construction and operation of the rail siding and associated loading facilities. In addition, the preparation of a detailed Biodiversity Management Plan will specifically include protection, management, monitoring, and compliance and auditing requirements to ensure ecological values along the Gippsland Railway reserve are not impacted throughout the life of the project. There are opportunities for Kalbar to undertake ongoing land management actions such as ecological burns for biomass management and ongoing weed control along the rail reserve in consultation with DELWP, East Gippsland Catchment Management Authority and V/Line to ensure ecological values are maintained, and where possible, enhanced.</p>	
		<p>Planning scheme considerations of environmental assets, particularly in relation to the Environmental Significance Overlay (ESO1-38 and ESO1-51) and Vegetation Protection Overlay (VPO1) under the East Gippsland Planning Scheme.</p>	<p>The project area is covered by an Environmental Significance Overlay (ESO1-38, ESO1-51 and ESO2) and a Vegetation Protection Overlay (VPO1) (VPO1 covers a broader area of 16,505 hectares within the municipality and aims to protect native vegetation within the Tambo-Bairnsdale road network) (Figure 2). The ESO1-38 relates to the environmental values along the Mitchell River, ESO1-51 relates to ecological values along roadsides throughout the area, and ESO2 pertains to high quality agricultural land (i.e. the Mitchell River floodplain). The following responses to ESO1-38, ESO1-51 and VPO1 are provided, while a response to ESO2 is not provided as this is outside my area of expertise.</p> <p><u>Environmental Significance Overlay (ESO1-38)</u></p> <p>The statement of environmental significance states the following:</p> <p><i>‘that the overlay areas comprise Sites of Biological Significance containing specific values as listed in Table 1 and representing either: rare or threatened species; restricted, rare or threatened vegetation communities; vegetation which is important as a corridor; high species richness; or other unusual biological features. The sites include suitable habitat for either the local population or the local occurrence of a species or community’.</i></p> <p>The decision guidelines for the ESO1 state the following:</p> <p><i>‘Before deciding on an application, in addition to the decision guidelines in Clause 42.01-4, the responsible authority should consider whether works and development pose a</i></p>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p><i>threat to ecological sustainability of values listed for that area and whether such threats can be adequately managed through adoption of any relevant management practices listed below:</i></p> <ul style="list-style-type: none"> <li>• <i>Reduce or limit the extent of inappropriate clearing and harvesting of native vegetation.</i></li> <li>• <i>Undertake revegetation with appropriate indigenous species to offset any loss of environmental values resulting from the works or development.</i></li> <li>• <i>Fence areas of remnant native vegetation and revegetated areas so as to protect and limit further degradation to environmental values.</i></li> <li>• <i>Develop a land management plan or works program encompassing a range of management practices implemented over a period of time.</i></li> <li>• <i>Any relevant management practices as listed in the table below (i.e. in the ESO)'.</i></li> </ul> <p>The following statement of environmental significance is provided for Site 38 in ESO1 (site name Mitchell River) specifically states:</p> <ul style="list-style-type: none"> <li>• Australian Bass <i>Macquaria novemaculeata</i>, Australian Grayling <i>Prototroctes maraena</i> and Broadfin Galaxias <i>Galaxias brevipinnis</i>.</li> </ul> <p>Australian Grayling was recorded during the targeted surveys, while Australian Bass and Broadfin Galaxias were not.</p> <p>The new pump station (i.e. at the end of the preferred surface water infrastructure alignment) is proposed to be located in an area covered by ESO1-38 and ESO2. However, the proposed pump station will not contradict the environmental objectives nor the decision guidelines of ESO1-38 or ESO2. In addition, while minor changes in groundwater and surface flows, and changes in water chemistry are predicted to occur along the Mitchell River as a result the project, is not likely to significantly impact the ecological values along the Mitchell River.</p> <p>The key management practices outlined in ESO1-38 are to: 1) Encourage landholders to exclude stock from streambanks and to fence vegetation remnants, and 2) Encourage revegetation of riparian areas including parallel plantings on freehold land.</p>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>Opposite the project area, there is limiting fencing to restrict stock from accessing the banks of the Mitchell River and a lack of vegetation cover along the riparian corridor. Consistent with the management practices outlined in the ESO-38, there are opportunities to enhance the ecological values along the riparian corridor of the Mitchell River adjacent to the project area as part of the project. Kalbar are encouraged to undertake early revegetation of the gullies in the areas between the dams and the mining lease boundary, including areas along the Mitchell River. Dams proposed to be constructed as part of the project should remain on site until vegetation downstream has matured to ensure soils are stabilised to prevent erosion and sedimentation into the Mitchell River, and to enhance the ecological values in this area.</p> <p><u>Environmental Significance Overlay (ESO1-51)</u></p> <p>The statement of environmental significance and the decision guidelines outlined in ESO1 are consistent with that provided above. However, the statement of environmental significance for Site 51 in ESO1 (site name Lindenow) specifically relates to:</p> <ul style="list-style-type: none"> <li>• Dwarf Kerrawang <i>Rulingia prostrata</i>, Gaping Leek-orchid <i>Prasophyllum correctum</i>, Purple Diuris <i>Diuris punctata</i>, Woolly Waterlily <i>Philydrum lanuginosum</i>, Plains Grassy Woodland, Gippsland Plains Grassland, and wildlife corridor.</li> </ul> <p>With the exception of Purple Diuris which along the Gippsland Railway reserve to the east of the proposed Fernbank East rail siding location, no other significant species were detected within the roadside reserves and other areas covered by the ESO. The project will result in the impacts to the Plains Grassy Woodland community along the road reserves of Bairnsdale – Dargo Road, Fernbank Glenaladale Road, within the Limpyers Road reserve (approximately 1.5 hectares of native vegetation), and a small area of native vegetation (low quality Plains Grassy Woodland) along Cowlles Lane where the haul road is proposed to dissect the road reserve. The fauna habitat corridor along Bairnsdale – Dargo Road will also be removed.</p> <p>As part of the project Kalbar is committed to undertaking a comprehensive restoration project where 200 hectares of degraded land will be direct seeded with site indigenous species associated with the GRGGW community. There is an opportunity for significant</p>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>species such Dwarf Kerrawang, Purple Diuris and Woolly Waterlily to be reintroduced into this area to expand existing populations.</p> <p>The restoration project, together with additional habitat enhancement measures that Kalbar propose to undertake such as fencing of native vegetation to protect and limit further degradation of environmental values, revegetation adjacent to existing roadside remnants and to improve habitat connectivity, and the preparation of Land Management Plans (that includes actions such as weed management, pest animal control) are consistent with the 'management practices' stated under ESO-51.</p> <p><u>Vegetation Protection Overlay (VPO1)</u></p> <p>The statement of nature and environmental significance of vegetation to protected:</p> <p><i>'Significant areas of native vegetation are located along roadsides within Government road reserves. These areas are often important remnants of native vegetation that previously extended over adjacent private land now generally cleared for agriculture or rural style residential development.</i></p> <p><i>Remnant roadside vegetation provides important fauna habitat and wildlife corridors, often linking larger areas of remnant native vegetation. Remnant roadside vegetation also contributes significantly to landscape and aesthetic values in rural areas.</i></p> <p><i>Conservation and enhancement of these areas is important to and generally supported by the local community'.</i></p> <p>The decision guidelines in the VPO state the following:</p> <p><i>'The following decision guidelines apply to an application for a permit under Clause 42.02, in addition to those specified in Clause 42.02 and elsewhere in the scheme which must be considered, as appropriate, by the responsible authority:</i></p> <ul style="list-style-type: none"> <li>• <i>The extent to which the vegetation sought to be removed or cleared contributes towards the need to:</i> <ul style="list-style-type: none"> <li>- <i>Conserve and enhance areas of high conservation value roadside vegetation.</i></li> <li>- <i>Conserve and enhance fauna habitat and habitat corridors.</i></li> </ul> </li> </ul>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<ul style="list-style-type: none"> <li>- <i>Protect and enhance the visual amenity and landscape quality in areas of natural beauty and rural areas.</i></li> <li>• <i>The need to assess alternative options regarding the removal of vegetation to better achieve the Overlay objectives.</i></li> <li>• <i>The need to undertake revegetation with appropriate indigenous species to offset any loss of environmental values resulting from the works or development.</i></li> <li>• <i>The need to have regard to the Roadside Management Plan, (East Gippsland Shire Council, 1995) and as updated from time to time’.</i></li> </ul> <p>The project will result in the removal of several hectares of native vegetation along the road reserves of Bairnsdale – Dargo Road and Fernbank Glenaladale Road, and small areas (i.e. less two hectares combined) along Chettles Road, Cowlles Lane and Limpyers Road. The vegetation within the roadside reserves provide habitat for a range of native flora and fauna species.</p> <p>As stated above, Kalbar is committed to undertaking a comprehensive restoration project where 200 hectares of degraded land will be direct seeded with site indigenous species associated with the GRGGW community. The restoration project, together with security of the required vegetation offsets under the State Guidelines will be undertaken to compensate for the proposed removal of native vegetation covered by the VPO.</p>	
358, 113	West Gippsland Catchment Management Authority, and Wellington Shire Council	Perry River Catchment ‘Chain of Ponds’. Four sites located along Honeysuckle Creek and its tributary were included in the inventory and condition assessment exercise. Two flora species classified as rare and vulnerable in Victoria have been recorded along Honeysuckle Creek.	A detailed assessment of the aquatic values were undertaken along Honeysuckle Creek and its tributary that occur with the project area (i.e. Sites 23, 24, 25, 30 and 31) (Ecology and Heritage Partners 2020a). Although quite degraded due to past land use practices (i.e. previous clearing and pine plantations), and currently subject to ongoing threatening processes such as erosion, weed invasion and presence of introduction herbivores such (e.g. European Rabbit and Sambar Deer), all of the aquatic habitats (waterbodies or ponds) along these chain of ponds were assessed as being of moderate to good habitat quality. However, compared with other chain of ponds to the west and south of the project area, this area is of lower quality and would not typically be subject to restoration and habitat enhancement activities (i.e. not a priority area).	Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a. Section 5.1.3 – Existing Environment. Appendix 4.3 – Aquatic Habitat Assessments. Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020). Chapter 8, 9 and 11.



Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>It is important to note that the number of mapped ponds shown in Submission 358 is inaccurate, and based on a recent site inspection many of the mapped ponds are farm dams and others are a result of water ponding behind fill that has been place across low-lying areas for road crossings. Indeed, Frood <i>et al.</i> (2018) state in their report that:</p> <p><i>‘In addition it should be noted that a number of small sites mapped as ponds on the HVP mapping require on-ground confirmation, as a small proportion of these represent features such as blackberry patches, small grassy clearings or area of shadow, which can be difficult to distinguish accurately from ponds on the aerial imagery, especially when they are immersed with pine plantations.’</i></p> <p>Frood <i>et al.</i> (2018) identified one species, Grey Scentbark <i>Eucalyptus ignorabilis</i> s.s. (rare in Victoria) along the southern boundary of the project area (i.e. Site 30) (Figure 5 in Ecology and Heritage Partners 2020a). However, this species was not detected during the field surveys and the specimen may no longer be present at this location and the species is not likely to be impacted by the project. Eastern Bitter-cress <i>Cardamine microthrix</i> (vulnerable in Victoria) was also recorded from Honeysuckle Creek approximately three kilometres to the south of the project area (Frood <i>et al.</i> 2018). This species was not detected within the project area during the detailed ecological investigations and there is a low likelihood that the project will impact this species.</p> <p>Measures such as appropriate channel design, revegetation and stock exclusion will be undertaken to ensure that ecological values along Honeysuckle Creek and its tributary are reinstated after the area has been disturbed. It is my understanding that a detailed Waterway Landscape Plan / Rehabilitation Plan that incorporates key ecological features (e.g. open pools, revegetation using plant species associated with the former Ecological Vegetation Classes at the site) will be prepared for this area and other drainage lines across the project area. As shown in the Post-closure Land Use Zones Figure (i.e. Figure 11.3 and Figure 11.4 of the EES) Honeysuckle Creek and its tributary will be extensively rehabilitated (i.e. channel and riparian vegetation, valley slope).</p>	
268, 734		Grassy vegetation within the Fernbank Railway siding.	See response to DELWP’s submission (521) above. In summary, although the railway reserve outside of the project area supports high quality native vegetation and significant	Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>flora species, the project will not directly or indirectly impact any of these significant ecological values at this location.</p> <p>Multiple options for the location of the new siding were considered in the vicinity of the preferred site. Kalbar considered the presence of the Gaping Leek-orchid, Saplings Morass Flora and Fauna Reserve and several ephemeral wetlands and watercourses before selecting the proposed site.</p>	<p>Section 4.3 – Ecological Field Surveys.</p> <p>Section 5.2.2 – Flora Species.</p> <p>Section 5.3.4 - Significant Sites Outside the Project Area.</p> <p>Section 8.1.1 – Avoidance.</p> <p>Table 26 – Risk Assessment.</p> <p>Targeted Gaping Leek-orchid survey for the Proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria. Ecology and Heritage Partners Pty Ltd 2021.</p>
319, 408, 417, 429, 546, 673, 813	Lakes Entrance Community Landcare	Gippsland Lakes RAMSAR Wetlands of International Importance – concerns that the mine footprint and tailings dam will not maintain the ecological character of the tributaries the RAMSAR wetlands. Lack of detail in the EES about the dam’s construction.	<p>The proposed development (including the proposed tailings dam) will not result in a Ramsar site being destroyed or substantially modified, nor will it result in impacts to the critical components, critical processes and critical services and benefits of the Gippsland Lakes Ramsar site (SEWPaC 2010). The temporary tailings storage facility (TSF) is proposed to be located approximately 3.7 kilometres south west of the Mitchell River (Figure 4.4. in the EES).</p> <p>The development will largely be confined to the project area, with offsite / indirect impacts avoided or minimised. Therefore, given the context of the project area and based on the hydrological investigations completed for the project, a substantial and measurable change</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020.</p> <p>Section 5.2.4.1 – RAMSAR wetlands.</p> <p>Section 8.1.2 – Planning (impacts to Ramsar wetland not expected).</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
	Birdlife East Gippsland		<p>in the hydrological regime of the Gippsland Lakes Ramsar site (e.g. a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland), is not predicted to occur. Furthermore, it is highly unlikely that any of the Limits of Acceptable Change (LAC) as outlined in Table 4.1, Page 119-124 in SEWPaC (2010) will be met or exceeded because of the project.</p> <p>The project will not result in significant impacts (i.e. under the significant impact guidelines under the EPBC Act) to the Mitchell River that flows into the Gippsland Lakes Ramsar site, and therefore is not anticipated to impact the habitat or lifecycle of native species that rely on this important wetland.</p> <p><u>Groundwater</u></p> <p>As stated in Chapter 9 of the EES, the design, construction, monitoring and rehabilitation of the TSF will comply with the Department of Economic Development, Jobs, Transport and Resources: Technical Guideline Design and Management of Tailings Storage Facilities. The facility will be up to 90 hectares in area and constructed with engineered cells with a low permeability clay base, a decant system, and sumps and drains to capture infiltration under the cells. Given the geotechnical properties of the fines tailings (i.e. very low permeability), seepage beneath the temporary TSF is not expected to have a measurable effect on groundwater levels.</p> <p>As outlined in Section 9.2.8 of the EES the following will be undertaken as part of the groundwater monitoring program for the project:</p> <ul style="list-style-type: none"> <li>• Ongoing quarterly sampling of water quality in six designated shallow groundwater monitoring bores, including bores at the contractor’s work area and processing plant and three bores at the temporary TSF; and analysis for pH, salinity, dissolved metals, radionuclides, major cations and anions, nutrients, and hydrocarbons.</li> <li>• Continuous recording (via data loggers) of groundwater levels in water supply bores drawing on the Latrobe Group Aquifer in a minimum of five monitoring bores, and in three shallow groundwater monitoring bores surrounding the temporary TSF.</li> </ul>	<p>Appendix 5 – Significant Impact Assessment (Table 5.4).</p> <p>Section 11 – Legislative implications. Table 27 - requirements for RAMSAR wetlands.</p> <p>Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020).</p> <p>Chapter 9.2 – Groundwater.</p> <p>Chapter 9.3 – Surface water (e.g. Page 9-115).</p>
	Bendigo District Environmental Council			

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p><u>Surface water</u></p> <p>As stated in Chapter 9, Section 9.3.6.1 (Page 9-115) of the EES, all risks associated with surface water impacts were assessed as low or very low, except for one moderate risk for impacts to the Perry River catchment, due to a structural failure of the temporary TSF. I understand that a TSF failure would be a rare event, and the Perry River catchment and Gippsland Lakes Ramsar site are highly unlikely to be impacted given the standards required for design and operation of such a facility.</p> <p>The temporary TSF lies mostly within the Perry River catchment. If a structural failure were to occur, material in the facility would be discharged from the site, down the ephemeral tributary of Honeysuckle Creek to the Perry River. Although ecological impacts would be significant, such structural failures are rare, and the overall risk to the biodiversity values within the Perry River catchment is low. The risk of structural failure of the temporary TSF would be eliminated after Year 5 of operations when the facility is decommissioned.</p> <p>As outlined in Section 9.3.9 of the EES the following will be undertaken as part of the surface water monitoring program for the project:</p> <ul style="list-style-type: none"> <li>• Analysis of surface water quality during construction, operations, closure and post-closure.</li> <li>• Analysis of water quality discharged from water storages at least daily during discharge and for a minimum of five days at upstream and downstream sampling locations following cessation of discharge. Monitoring at the point of discharge, the nearest accessible point to receiving waters and (if applicable), upstream of the water storage.</li> <li>• Annual audit of the freshwater storage dams, temporary TSF and other water management dams to assess the integrity of the structures.</li> <li>• Weekly visual inspections of the freshwater storage dams, temporary TSF and other water management dams to identify any areas of poor structural integrity.</li> </ul>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
408	Birdlife East Gippsland	Concerns that the bird surveys conducted by Ecology and Heritage Partners did not account for resource utilisation of bird species across the entire year and are inadequate for cryptic species.	Detailed information on documented bird records was undertaken during the desktop assessment. A comprehensive list of bird species recorded during the detailed site surveys is provided in Appendix 3.1 of the detailed ecological investigations report. Although 3 x 30-minute diurnal bird surveys were completed at 13 assessed primary survey sites across the project area in October 2016 and October 2018, general observations (incidental sightings) throughout the entire survey period (i.e. over multiple seasons and years) were undertaken to obtain a detailed bird list for the project area. As such, outside of the primary survey sites, hundreds of hours of incidental observation hours were undertaken over all seasons across multiple years. Despite extensive bird surveys undertaken across the project area there is the potential that a small number of additional bird species may occupy habitats within the study area as residents, or visitors on a frequent or infrequent basis.	Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.  Section 2.2.2.2 – Terrestrial Fauna Surveys. Table 3 – diurnal bird surveys.
		Loss of wetland habitat for bird species.	<p>Whilst the project will result in the removal of suitable terrestrial (forest and woodland) and wetland habitats, there are unlikely to be any significant impacts to significant and/or migratory waterbirds listed under the EPBC Act or under listed as threatened under DELWP's Threatened Species Advisory List (DSE 2013).</p> <p>Wetland habitats within the project area comprise small waterbodies (degraded dams, and ponds along the ephemeral drainage lines) and are principally used by common species. Painted Snipe and Australasian Bittern, and associated habitats are highly unlikely to be impacted by the project.</p> <p>As outlined above, the project will not result in significant impacts to the Mitchell River that flows into the Gippsland Lakes Ramsar site, and therefore is not anticipated to impact the habitat or lifecycle of waterbirds that rely on this important wetland.</p> <p>There are opportunities to enhance wetland habitat as part of the restoration of existing waterbodies within the project area surrounding areas. The restoration / enhancement and creation of additional wetlands for common waterbirds.</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 4.3.2.1 – General Terrestrial Fauna and Habitat Assessments (Table 3).</p> <p>Section 7 – Impact Assessment</p> <p>Section 9 – Risk Assessment</p> <p>Appendix 5 – Significant Impact Assessment.</p>
79, 575, 663, 673, 744, 745, 766, 781, 813		Environmental impacts to the Mitchell River, the Gippsland	The project may have a localised impact to Mitchell River through water extraction, changes in base flows from groundwater, and minor changes to the water chemistry along the Mitchell River (Water Technology 2020a, 2020b, EMM 2020). Mitchell River currently	Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
		Lakes and river system health and aquatic flora and fauna.	<p>experiences a range of threatening processes associated with the agricultural activities (horticultural activities) that occur in the local area and that are adjacent to the River.</p> <p>The significant impact assessment completed in accordance with the significant impact assessment guidelines for matters of national environmental significance (i.e. the Gippsland Lakes Ramsar site, Australian Grayling) determined with a high level of confidence that the Gippsland Lakes Ramsar site will not be significantly impacted by project-related changes to aquatic habitat, and alteration of water quality, flows and availability. The project will not result in the Ramsar site being destroyed or substantially modified, nor result in impacts to the critical components, processes and services/benefits of the Gippsland Lakes. That is, minor changes in groundwater and surface flows, and changes in water chemistry are predicted to occur along the Mitchell River (adjacent to the project area), and are not expected to have impacts on marine sub-tidal aquatic beds, coastal brackish or saline lagoons, fringing wetlands, threatened fauna species (such as the Australian Grayling), frogs and waterbirds, threatened wetland flora, waterbird breeding and fisheries resource values.</p>	<p>Section 4.3 – Ecological Survey Methods.</p> <p>Section 4.3.2.1 – General Terrestrial Fauna and Habitat Assessments.</p> <p>Section 4.3.3.1 – General Aquatic Fauna Assessments.</p> <p>Section 4.3.3.2 – Aquatic Ecology Surveys.</p> <p>Section 4.8.4 – Groundwater Dependent Ecosystem Assessment.</p> <p>Section 5.1.5.2 – Aquatic Fauna Habitat.</p> <p>Section 7.3.4 – Loss and Degradation of Aquatic Habitat</p> <p>Section 7.4.1 – Aquatic Habitats Outside of the project area</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p> <p>Appendix 5 – Significant Impact Assessment.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
120, 429, 488, 502, 568, 575, 663, 813		<p>Loss of ecological connectivity – concerns that the assessments were too desk-based and that the field assessments were not comprehensive enough.</p> <p>Concerns about adequacy and validity ecological assessment. Concerns that results were diminished or minimised.</p> <p>EES Technical Studies have not comprehensively surveyed the area so the full ramification is unknown.</p>	<p>As outlined in Section 4.3 of the detailed ecological investigations report (Ecology and Heritage Partners 2020a), terrestrial and aquatic surveys were undertaken over several days, seasons and years, and throughout various habitat types across the project area (i.e. to account for ecological spatiality and temporality). As such, the ecological data are adequate to document the existing ecological conditions within the project area. Targeted flora and fauna surveys were undertaken in accordance with the minimum survey requirements for species, including several significant species listed under the EPBC Act. All areas supporting native vegetation were assessed, and fauna habitat assessments were undertaken across all habitats to assess the type, extent, and quality of habitat across the project area, and to document the fauna species using these habitats.</p> <p>Based on the results of the initial site surveys, and after feedback from the Technical Reference Group and discussions with DELWP, additional surveys were undertaken for several significant species that have a potential to occupy habitats within or adjacent to the project area, including Gaping Leek-orchid, Giant Burrowing Frog, Powerful Owl, Masked Owl, Australian Grayling and Dwarf Galaxias.</p> <p>The empirical ecological data were used to undertake a Risk and Impact Assessment for the project, and the survey type, extent and duration are adequate to assess the known and potential impacts to ecological values (e.g. significant species and ecological communities) associated with the project, including the significance of impacts under relevant Commonwealth (EPBC Act) and State environmental legislation and policy.</p> <p>In summary, the ecological surveys and results, and the Risk and Impact Assessment presented in the detailed ecological investigations report are adequate to fulfil the relevant Scoping Requirements for the project.</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 4.3 – Ecological Survey Methods</p> <p>Section 5.1 – Ecology and Biodiversity of the study area</p> <p>Section 9 – Risk Assessment</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p> <p>Appendix 5 – Significant Impact Assessment</p> <p>Targeted Gaping Leek-orchid survey for the Proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria. Ecology and Heritage Partners Pty Ltd 2021.</p>
157, 268, 319, 365, 375, 408, 413, 417, 429, 481, 484, 488, 522, 534, 568, 638, 652, 673, 712, 733, 734, 763, 765, 777,		<p>Removal of/impacts to native vegetation, including the large mature trees (hollow-bearing), impacts to habitat connectivity and fragmentation.</p>	<p><u>Vegetation removal</u></p> <p>The State <i>Guidelines for the removal, destruction or lopping of native vegetation</i>’ (DELWP 2017) were followed in all assessments of native vegetation within the study area. There will be opportunities to further avoid impacts to native vegetation and scattered trees as the alignment and final siting of the project is refined.</p> <p><u>Hollow-bearing trees</u></p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 5.1.5.3 – Connectivity of Habitat</p> <p>Section 5.2.1 – Ecological Communities</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
812, 813, 837, 875		Impacts to Gippsland Red-gum Plains Grassy Woodlands EVC.	<p>It is well known that hollow-bearing trees are critically important for the persistence of a diversity of fauna species (i.e. used for breeding, sheltering, and foraging). Given that it takes many years (often &gt;80-100 years) for trees to form hollows, there is considerable timeframe to replace hollows across the landscape, and therefore retention of hollow-bearing trees is a priority.</p> <p>A large number of nest boxes will be installed in suitable locations within and outside of the infrastructure footprint to provide habitat for fauna. This is outlined in the Mitigation Register relating to terrestrial and aquatic biodiversity (Kalbar 2020):</p> <ul style="list-style-type: none"> <li>• TE02: Prior to clearing, nest boxes will be installed in areas of potential habitat adjacent to the project footprint to compensate for the removal of hollow-bearing trees and impacts on hollow-dependant fauna known or potentially present (Yellow-bellied Sheathtail-bat, Powerful Owl, Masked Owl and Eastern Pygmy Possum).</li> <li>• TE30: All remaining areas of ecological value near the project area and infrastructure options area will be managed under the supervision of a suitably qualified ecologist to enhance habitat features and compensate for those lost; including installing nesting boxes and logs, and other large woody debris relocated from cleared areas.</li> </ul> <p>While the installation of nest boxes across the project area and surrounding areas will provide habitat for a range of fauna, they will only partially compensate (i.e. not like for like) for the removal of hollow-bearing trees.</p> <p><u>Habitat connectivity and fragmentation</u></p> <p>With the exception of the large, contiguous patches of native vegetation within road reserves and the dissecting gullies, other areas of native vegetation in the project area do not constitute a wildlife corridor as such (i.e. not contiguous with larger areas of habitat in the local area). However, they are likely to act as a means of connectivity, providing habitat and facilitating the movement of species throughout the landscape. The project area therefore contributes to the role that remnant native vegetation in the local area has in conserving fauna. Although there will be severance of habitat associated with the project, as the mine will be staged over several years, there will be an expectation and a commitment by Kalbar to progressively rehabilitate areas. A primary objective of the restoration process will be to create corridors of vegetation (e.g. along drainage lines and</p>	<p>Section 7.3.3 – Loss of Hollow-bearing Trees.</p> <p>Section 7.4.3 – Habitat Fragmentation and Edge Effects.</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p> <p>Section 10 – Residual Impacts.</p> <p>Appendix 7 – Commonwealth EPBC Act Offset Calculations for GRGGW. Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020).</p> <p>Chapter 12 – Environmental Management Framework.</p> <p>Attachment H – Mitigation Register.</p>



Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>roadsides) that connect to larger areas of retained vegetation within and outside of the project area (e.g. along roadsides such as Limpyers Road, Cowells Lane, the Gippsland railway reserve).</p> <p><u>Forest Red Gum Grassy Woodland ecological community</u></p> <p>As outlined in the detailed ecological investigations report and Biodiversity Offset Management Strategy (Ecology and Heritage Partners 2020a, 2020b) there will be a requirement to offset the proposed removal of 1.74 hectares of the EPBC Act-listed GRGGW. A suitable offset site located in Lindenow South has been assessed on ground and supports approximately 40 hectares of this EPBC Act-listed GRGGW. Discussions with the landowner regarding the establishment of an offset site on the property are continuing. Once the offset site is confirmed, a detailed Offset Management Plan will be prepared and outline specific management actions to protect and enhance the vegetation at the site to compensate for the removal of GRGGW as part of the project (i.e. the objective of management actions will be to expand and improve the quality of the native vegetation at the site over time).</p> <p>As part of the project Kalbar will progressively rehabilitate disturbed areas as the active mining face advances, and is committed to undertaking a comprehensive restoration project where 200 hectares will be direct seeded with site indigenous species associated with the GRGGW community. Over the long-term this will provide habitat for a range of flora and fauna species. The Grassy Eucalypt Woodland Restoration Project it not anticipated to contribute to the required offsets under the EPBC Act for the proposed removal of 1.74 hectares of GRGGW and 14.54 hectares of State significant (FFG Act-listed) Forest Red Gum Grassy Woodland ecological community. Kalbar’s commitment to restore this area (i.e. across the Blue Gum plantation) is additional to its biodiversity offset obligations under the EPBC Act and State <i>Guidelines for the removal, destruction or lopping of native vegetation</i>’ (DELWP 2017). The project will be the largest restoration project for a woodland with a grassy understorey in Australia. The site will be located adjacent to Limpyers State Forest and once established will increase habitat available for a suite of flora and fauna species.</p>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
95		Mitigation measures for impacts to biodiversity are not specific enough.	<p>Specific mitigation measures are provided against each likely and potential impact in the detailed ecological investigations report (Ecology and Heritage Partners 2020a), and outlined in the Mitigation Register for the project (Attachment H, Kalbar 2020). Detailed Biodiversity (Mitigation Identifier TE28) and Rehabilitation (Mitigation Identifier TE09 and TE11) Sub-plans will be prepared as part of the overarching Environmental Management Framework (Chapter 12 of the EES). These plans will include various protection and management actions, including specific management requirements for significant species and communities, species salvage and relocation / translocation, native vegetation management, weed management, disease and biocontrol and land rehabilitation and restoration.</p> <p>The Environmental Management Framework detailed in Chapter 12 of the EES contains several relevant mitigation measures that I confirm are appropriate for the project. These include:</p> <ul style="list-style-type: none"> <li>• Site plan showing boundaries of the site, existing native vegetation and the native vegetation to be removed.</li> <li>• Staff and contractor inductions to address the location of sensitive ecological values and their roles and responsibilities in the protection and/or minimisation of impacts to all native biodiversity.</li> <li>• Pre-clearing surveys and fauna salvage/translocation where practical.</li> <li>• Vegetation management and clearing protocols.</li> <li>• Contingency measures to manage potential unexpected discoveries of significant flora and fauna species.</li> <li>• Fauna management.</li> <li>• Wetland and aquatic habitat management.</li> <li>• Pest plant and animal management, and annual surveys.</li> <li>• Weed control measures, pest management measures, and flora and fauna monitoring program.</li> </ul>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p> <p>Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020).</p> <p>Chapter 12 – Environmental Management Framework.</p> <p>Attachment H – Mitigation Register.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<ul style="list-style-type: none"> <li>Offset management (to satisfy state and Commonwealth government offset requirements).</li> </ul> <p>As part of the approval conditions for the project, Kalbar will be required to undertake ongoing survey, monitoring, and reporting against key performance requirements (see Chapter 12.4.11 of the EES) (Kalbar 2020).</p> <p>A series of procedures will be implemented to continually monitor and evaluate project compliance, and will include ongoing site inspections to verify that management commitments and mitigation actions are being undertaken appropriately.</p>	
268, 488, 516, 521, 638, 663, 673, 763, 777, 837		Impacts to significant flora and fauna species and ecological communities.	<p>As outlined above, terrestrial and aquatic surveys were undertaken over several days, seasons and years, and throughout various habitat types across the project area. Targeted flora and fauna surveys were undertaken in accordance with the minimum survey requirements for species, including several significant species listed under the EPBC Act.</p> <p>A detailed impact assessment was undertaken for the project and was continually updated based on feedback from the relevant agencies (including DELWP regional and head office) as part of the Technical Reference Group. All known and potential impacts associated with the project on significant flora and fauna species and listed ecological communities have adequately been assessed as part of the EES. A detailed significant impact assessment relating to all significant species and ecological communities known to, or likely to reside within the study area was undertaken and is provided in Appendix 5 of the detailed ecological investigations report (Ecology and Heritage Partners 2020a).</p> <p>I am confident that all ecological risks have been identified and the ecological impact assessment adequately addresses the known or likely impacts to significant flora and fauna species and listed ecological communities. Mitigation measures, management actions and the compliance, auditing and reporting requirements that will be implemented should the project proceed are appropriate.</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 4.8.2 – Vegetation and Flora Surveys.</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p> <p>Section 9 – Risk Assessment.</p> <p>Appendix 5 – Significant Impact Assessment.</p>
638		Impacts to Grey-headed Flying-fox.	<p>An individual Grey-headed Flying-fox was recorded on 26 August 2019 within the project area. An existing population of Grey-headed Flying-fox exists adjacent to the Mitchell River in Bairnsdale. The species is capable of nightly flights of up to 50 kilometres from roost sites to forage on the nectar and pollen of native and introduced plant species. Owing to</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 5.2.3.1 – Fauna Species.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>the large foraging range and nomadic nature of this species, individuals are likely to regularly fly over, and temporarily reside within the project area to forage on eucalypts. There are no camp sites present within the project area.</p> <p>The project area does not support an important population of Grey-headed Flying-fox and the species will not be significantly impacted by the project.</p> <p>The proposed removal of suitable foraging habitat for Grey-headed Flying-fox habitat (including scattered remnant trees) will not lead to long-term decrease in the size of a population, reduce the area of occupancy of the species, fragment an existing population into two or more populations, adversely affect habitat critical to the survival of a species, disrupt the breeding cycle of the species, or impact either species to the extent that they are likely to decline.</p> <p>The species is highly mobile and is capable of accessing habitats in the locality, region, and other parts of the State.</p>	<p>Section 10 – Residual Impacts.</p> <p>Appendix 5 – Significant Impact Assessment (Table A5.3).</p>
167, 417		Likelihood of Giant Burrowing Frog occupying habitat within the project area and impacts to this species associated with the project.	<p>Submission 167 states that there is new information regarding habitat use by Giant Burrowing Frog. The submission provides information that the species has recently been confirmed calling (via acoustic monitoring) at one site on three occasions between 7 and 13 May 2020 from pools along Stony Creek (within a cleared landscape), located 4.5 kilometres north of the project area. However, no evidence is provided (e.g. call recording, locality description, detailed habitat information and site photos). Specific information regarding the site and the proximity to other areas of suitable habitat for the species is required to ascertain how this may or may not be similar, and/or be relevant to the habitat features present within the project area.</p> <p>The project area supports dams and ephemeral streams that have the potential (albeit low to moderate) to support breeding activity for Giant Burrowing Frog. Despite targeted surveys for this species during suitable conditions, no individuals were detected within the project area. The project will result in the removal ephemeral tributary streams and adjoining vegetation which provides potential breeding and non-breeding habitat for this species (albeit very low likelihood given the highly modified nature of the habitat and the atypical habitat in which the species is typically associated with). Potential habitat within the project area is modified and the species has not been recorded within the project area.</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 4.2 – Consultation.</p> <p>Section 4.3 – Ecological Field Surveys.</p> <p>Section 4.3.2.1 – General Terrestrial Fauna and Habitat Assessments.</p> <p>Section 4.3.2.2 – Targeted Giant Burrowing Frog surveys.</p> <p>Appendix 5 – Significant Impact Assessment.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			As a precaution, additional targeted surveys for the species (active searching, installation of song metres over multiple days after significant rainfall) may be undertaken as part of the post-approval conditions placed on the project and outlined in the detailed Biodiversity Sub-plan (including Significant / Threatened Species Conservation Management Plans).	
575		Impacts to the Gippsland Lakes Burrunan Dolphins from runoff and contamination.	<p>As outlined above, the proposed development will not result in a Ramsar site being destroyed or substantially modified, nor will it result in impacts to the critical components, critical processes and critical services and benefits of the Gippsland Lakes Ramsar site (SEWPaC 2010). This includes any potential impacts to the Gippsland Lakes Burrunan Dolphins.</p> <p>The development will largely be confined to the project area, with offsite / indirect impacts avoided or minimised. Therefore, given the context of the project area and based on the hydrological investigations completed the project, a substantial and measurable change in the hydrological regime of the Gippsland Lakes Ramsar site (e.g. a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland), is highly unlikely.</p> <p>The proposed development will not result in significant impacts to the Mitchell River that flows into the Gippsland Lakes Ramsar site, and therefore the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected.</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 8.1.2 – Impacts to Gippsland Lakes RAMSAR Site Monitoring.</p> <p>Section 9 – Table 26. Downstream waterways risk assessment.</p>
268, 335, 484, 488, 734, 763		Offsets are inadequate and do not account for in situ habitat loss.	<p>As outlined above, a detailed assessment of native vegetation proposed to be impacted along with the biodiversity offsets for the project have been undertaken. Offsets required for the proposed removal of native vegetation are in accordance with the Commonwealth EPBC Act and the State <i>Guidelines for the removal, destruction or lopping of native vegetation</i> (DELWP 2017). The detailed ecological investigations report and Offset Management Strategy provide information on how Kalbar intend to secure offsets for the project (i.e. via an on-title security agreement such as a Trust for Nature Covenant or a Section 69 Agreement under the <i>Conservation, Forests and Lands Act 1987</i>).</p> <p>A suitable offset site located in Lindenow South has been assessed on ground and supports approximately 40 hectares of this EPBC Act-listed GRGGW. Discussions with the landowner regarding the establishment of an offset site on the property are continuing. Once the</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 8.2 – Specific Mitigation Measures.</p> <p>Ecology and Heritage Partners Pty Ltd 2020b. Biodiversity Offset Management Strategy.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>offset site is confirmed, a detailed Offset Management Plan will be prepared and outline specific management actions to protect and enhance the vegetation at the site to compensate for the removal of GRGGW as part of the project (i.e. the objective of management actions will be to expand and improve the quality of the native vegetation at the site over time).</p>	
484, 663, 673		Impact of bushfires not considered.	<p><u>Mt Ray – Boundary Track fire 2014</u></p> <p>The most recent bushfire (Mt Ray – Boundary Track fire 2014) burnt over 90% of the project area. Bushfires, like other stochastic events such as drought and floods, can change the floristic composition and structure, alter habitat conditions, and influence the presence of certain flora species and fauna habitat occupancy and use. That is, ecological systems are dynamic and change on temporal and spatial scales.</p> <p>The detailed ecological surveys were undertaken between 2016 and 2018, two years after the bushfire, and at a time when vegetation was continuing to regenerate, and when all, or most, fauna species had dispersed back into the project area. The vegetation had sufficiently regenerated to accurately document the type, extent and quality of vegetation communities (i.e. Ecological Vegetation Classes), and to identify individual flora and fauna species, including any significant species. Consequently, the conditions under which the surveys were undertaken (i.e. sufficient duration and over multiple years and seasons) provide an accurate representation of the ecological values across the project area, and to determine known and likely impacts to significant species and ecological communities (i.e. to adequately address the EES scoping requirements for the project).</p> <p>Vegetation assessments were undertaken in accordance with the habitat hectare method (DSE 2004), which is the approach / standard required by DELWP when assessing native vegetation (at any time of the year) and determining offsets required for a project under the <i>Guidelines for the removal, destruction or lopping of native vegetation</i> (DELWP 2017). The habitat hectare assessments were undertaken a couple of years after the Mt Ray fire to accurately document the extent and quality of native vegetation, including at a time when the various flora species and lifeforms were visible.</p> <p>In summary, the ecological Risk and Impact Assessment completed for the project is accurate, and there are no limitations in the results and conclusions reached in the detailed</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 1.3 – EES Scoping Requirements. Table 1.</p> <p>Section 1.4 – Project Area and Surrounds.</p> <p>Section 4.8.2 – Vegetation and Flora Surveys.</p> <p>Section 9 – Risk Assessment.</p> <p>Appendix 5 – Significant Impact Assessment.</p>

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
			<p>ecological investigations report (Ecology and Heritage Partners 2020a) with respect to the 2014 bushfire that occurred across the project area.</p> <p><u>2019/20 East Gippsland bushfires</u></p> <p>The 2019/20 bushfires burnt more than 1.2 million hectares were burnt across Victoria — making it the largest bushfire since 1939, where 1.5–2 million hectares were destroyed Huf and Mclean 2020). According to DELWP the fires impacted at least 60 per cent of over 50 national parks and nature reserves in Victoria, and these areas will continue to regenerate and recover over many years.</p> <p>The edge of the East Gippsland fires were approximately 20-30 kilometres to the east north east of the project area (Sarsfield) and many fauna species (i.e. birds, microbats, large mammals and reptiles) that are capable of traversing cleared environments (paddocks, food production areas) and dispersing large distances that were displaced by the bushfires may have temporarily occupied habitats within the project area. This is particularly the case for some species (e.g. Grey-headed Fly-fox, Glossy Black Cockatoo, and woodland / forest dependent birds) that may have used habitat resources within the project area over the past 12 months since the bushfires.</p> <p>However, the 2019/20 bushfires have not resulted in an elevated importance or significance of native vegetation, fauna habitat or the conservation status of flora and fauna species known to or likely to occur within the project area. The detailed ecological Risk and Impact Assessment completed for the project does not change as a result of the recent bushfires (i.e. remains valid and current).</p>	

Submission No.	Name	Ecological Issue	Response	Relevant Report and Section
870		Concerns about common native species not addressed in the EES such as wombats, echidnas, common native rats	<p>A detailed description of the existing environment, including a comprehensive assessment of flora and fauna values has been provided. It is acknowledged that a diversity of locally common flora and fauna species will be impacted by the project. The emphasis of the Risk and Impact assessment is to determine the extent of likely and potential impacts to species that are threatened under Commonwealth EPBC Act, and the State FFG Act and threatened species advisory lists. Notwithstanding this, the detailed ecological investigations report assesses the direct and indirect impacts to common fauna species associated with the project (e.g. direct mortality, loss of habitat and displacement, removal of large trees, including hollow-bearing trees, noise and light impacts, increased susceptibility from threatening processes such as introduced plants and animals).</p> <p>As part of the approval conditions for the project, Kalbar will be required to undertake ongoing survey, monitoring, and reporting against key performance requirements, including impacts to local wildlife associated with the project (see Chapter 12.4.11 of the EES) (Kalbar 2020).</p>	<p>Appendix-A005_Detailed Ecological Investigations. Ecology and Heritage Partners Pty Ltd 2020a.</p> <p>Section 5.1.2 –Species.</p> <p>Section 8.2 – Specific Mitigation Measures. Table 25.</p> <p>Section 10 – Residual Impacts.</p> <p>Appendix 2.1 and 3.1 – Flora and Fauna Results.</p> <p>Fingerboards Mineral Sands Project Environment Effects Statement (Kalbar 2020).</p> <p>Chapter 12 – Environmental Management Framework.</p> <p>Attachment H – Mitigation Register.</p>



## 10 CONCLUSION

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Desk-based and detailed field surveys were used to assess environmental conditions and identify ecological values within the project area. While a description of these investigations are provided in the detailed ecological investigations completed for the project (Ecology and Heritage Partners 2020a), a summary of the assessments undertaken as part of the project is provided:

Following the implementation of measures to avoid and minimise impacts on ecological values discussed below and in the detailed ecological investigations report (Ecology and Heritage Partners 2020a), the following residual impacts are likely to occur within the surveyed sections of the project footprint:

- Removal of a total of 160.30 hectares of remnant vegetation separated into patches (excluding 6.10 hectares of DELWP mapped 'current wetlands') and an additional 461 scattered trees. The majority of the vegetation is highly modified and isolated (i.e. not large consolidated areas of remnant habitat);
- Removal of 1.74 hectares (out of a total of 14.06 hectares within the project area) of the nationally significant GRGGW ecological community;
- Removal of 14.54 hectares (out of a total of 47.05 hectares within the project area) of the State significant Forest Red Gum Grassy Woodland ecological community;
- Removal of three State significant flora species (Slender Wire-lily (33 plants), Blue Mat-rush (three plants) and Sandfly Zieria (10 plants));
- Removal of known habitat for the following fauna species of State and regional significance:
  - Grey-headed Flying Fox – remnant woodland and forest
  - Yellow-bellied Sheath-tail Bat - 461 scattered trees and 160.30 hectares of remnant vegetation
  - Masked Owl - 461 scattered trees and 160.30 hectares of remnant vegetation
  - Emu - Forest and woodland, wetland/ aquatic habitat and disturbed land
  - Eastern Long-necked Turtle – wetland/ aquatic habitat
- Removal of potential habitat for a range of flora and fauna species of national, State and regional significance;
- Removal of hollow-bearing trees used by a range of fauna species; and,
- Potential reduced flows to Mitchell River following surface water extraction which may lead to localised impacts to the aquatic values along the River.

There will be a requirement to offset the proposed removal of 1.74 hectares of GRGGW. A suitable offset site located in Lindenow South has been assessed on ground (September 2020) and supports approximately 40 hectares of this EPBC Act-listed GRGGW. Discussions with the landowner regarding the establishment of an offset site on the property are continuing. Once the offset site is confirmed, a detailed Offset Management Plan will be prepared and outline specific management actions to protect and enhance the vegetation at the site to compensate for the removal of GRGGW as part of the project.

Based on the extent of vegetation losses within the surveyed sections of the project footprint, the project falls under the Detailed Assessment Pathway and the State offset requirement is 1.001 General Habitat Units (GHU) with a minimum Strategy Biodiversity Value of 0.253, along with 704 Large Trees and Species Habitat Units (SHUs) for the following species (DELWP 2017). Although a high proportion of the SHUs that are required for

the project are likely to be available on the NVOR, given that the mine will occur over 15 years, the security and payment of offsets will occur in stages (i.e. prior to the removal of vegetation in Years 1, 5, 8, 12, 15). The staging of the offset payments, in accordance with the Guidelines, would need to be discussed and approved by DELWP.

Detailed site assessments of at least 10 properties that support native vegetation and that are eligible to be used as offsets are known to (based on desktop analysis) generate the required SHUs were undertaken in September and October 2020 (Ethos NRM in prep.). It is understood that negotiations with prospective landowners continues and at least the required offsets at Year 5 can be generated at four properties and by purchasing a small proportion of the offsets via the Native Vegetation Offset Register.

The extent of vegetation removal has been reduced through the avoidance of native vegetation during the design of the mine layout and planning for infrastructure options. Further avoidance, for example of removal of some large trees and areas of EVCs (e.g. Plains Grassy Woodland), can be achieved if the preferred transport and pump station options are used, and through micro-siting of infrastructure during construction and operations.

The project will largely be confined to the project area, with offsite / indirect impacts avoided or minimised. Therefore, given the context of the project area and based on the hydrological investigations completed for the project, a substantial and measurable change in the hydrological regime of the Gippsland Lakes Ramsar site (e.g. a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland), is highly unlikely. The project will not result in significant impacts (i.e. under the significant impact guidelines under the EPBC Act) to the Mitchell River that flows into the Gippsland Lakes Ramsar site, and therefore is not anticipated to impact the habitat or lifecycle of native species that rely on this important wetland.

Specific mitigation measures are provided against each likely and potential impact in the detailed ecological investigations report (Ecology and Heritage Partners 2020a), and outlined in the Mitigation Register for the project (Attachment H, Kalbar 2020). Detailed Biodiversity (Mitigation Identifier TE28) and Rehabilitation (Mitigation Identifier TE09 and TE11) Sub-plans will be prepared as part of the overarching Environmental Management Framework (Chapter 12 of the EES). These plans will include various protection and management actions, including specific management requirements for significant species and communities, species salvage and relocation / translocation, native vegetation management, weed management, disease and biocontrol and land rehabilitation and restoration.

Finally, as part of the approval conditions for the project, Kalbar will be required to undertake ongoing survey, monitoring, and reporting against key performance requirements (see Chapter 12.4.11 of the EES) (Kalbar 2020). A series of procedures will be implemented to continually monitor and evaluate project compliance, and will include ongoing site inspections to verify that management commitments and mitigation actions are being undertaken appropriately.

## 11 REQUIRED INFORMATION

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### Name and Address

This report has been prepared by Aaron Organ, Director of Ecology and Heritage Partners, 292 Mt Alexander Road, Ascot Vale, Ph: (03) 9377 0100, aorgan@ehpartners.com.au

### Area of Expertise

Aaron Organ is an expert ecologist, with skills in all the major ecological environments of south-eastern Australia. He has expertise in the workings of ecological systems, both under natural conditions and when affected by unnatural disturbance regimes such as weed invasion and impacts of development projects. He has also considerable experience in the application and practical implementation of current Commonwealth and State environmental legislation and Government Policy.

### Expertise to make the Report

Aaron Organ has considerable knowledge of the native flora and fauna in south eastern Australia, including in areas throughout central Victoria. Relevant experience includes:

- Completed over 500 flora and fauna investigations/assessments.
- Aaron has also prepared over 200 ecological assessment reports for residential development throughout Victoria.

A selection of past VCAT and Panel appearances include:

- 2020: Proposed Addition of Nine Dwellings to the Existing Development at 114 Hanna Street, Noble Park, Victoria (VCAT)
- 2019: Proposed Emergency Fire Station at 109-115A Yan Yean Road, Plenty, Victoria (VCAT)
- 2019: Proposed telecommunication tower at 20 Settlement Road, Wesburn (VCAT)
- 2019: Proposed residential development at 22 Wood Street, Preston (VCAT)
- 2019: Proposed Inverleigh Wind and Solar Farm (Panel)
- 2018: Proposed residential development at 11 Tarella Drive, Chelsea (Panel)
- 2017: Proposed retirement development at 527 Stoney Point Road and 182 Wooleys Road, Bittern (VCAT)
- 2015: Amendment C187 to the Whittlesea Planning Scheme. Wollert Precinct Structure Plan (PSP 1070) (Panel)
- 2015: Yaringa Boat Harbour Expansion, Yaringa, Victoria – (Panel)
- 2015: Proposed residential development at 134-166 Aspinall Street, Golden Square, Victoria – (VCAT)
- 2015: Amended Permit Associated with the use and development of the land for a Place of Worship – 171 – 197 Harkness Road, Melton West, Victoria – (VCAT)

- 2014: Proposed Development Plan Overlay and Planning Permit Applications for a Proposed Residential Development at 370A Riddell Road, Sunbury, Victoria – (VCAT).
- 2014: Proposed Kilmore – Wallan Bypass. VicRoads (Panel)
- 2014: Proposed residential development at 107 Gipps Street, Port Fairy (VCAT)
- 2014: NBN Fixed Wireless Telecommunications Facility at 49D Eddy Avenue, Mt Helen, Victoria – Clayton Utz Lawyers (VCAT)
- 2014: Proposed residential development at 10 Fullarton Drive, Paynesville, Victoria – Hall & Wilcox Pty Ltd (VCAT)
- 2013: Statement of Expert Evidence: 1 Hobbs Road Wyndham Vale, Victoria. Amendment C171 - Ballan Road Precinct Structure Plan (PSP 40)
- 2013: Statement of Expert Evidence: Review of time stamped data for Amendment C172 - Ballan Road, Wyndham Vale (PSP 92)
- 2013: Statement of Expert Evidence: 305-315 Craigieburn Road East, Wollert, Victoria. Wollert Developments Pty Ltd. (VCAT)
- 2013: Proposed Planning Scheme Amendment C164 - 275 Racecourse Road, Sunbury – Hume City Council (Panel)
- 2013: Western Highway Duplication - Section 3, Ararat to Stawell, Victoria – DLA Phillip Piper (Panel).
- 2013: Cherry Tree Wind Farm – Maddocks Lawyers (VCAT)
- 2012: Western Highway Duplication - Section 2, Beaufort to Ararat, Victoria – DLA Phillip Piper (Panel).
- 2012: Proposed Peninsula Link Freeway Service Centres, 83 Sages Road Baxter, Victoria – Rigby Cook Lawyers Pty Ltd (VCAT)
- 2011: Western Highway Duplication - Section 1, Burrumbeet to Beaufort, Victoria – DLA Phillip Fox (Panel)
- 2011: Old Warrandyte Road, flora and fauna review and Panel hearing, Donvale – Norton Rose Australia Pty Ltd. (Panel)
- 2010: Marquands Road and Leakes Road (Lot 9), Truganina, Truganina South Precinct Structure Plan – Stockland (Panel)
- 2010: Proposed Eastern Golf Course relocation to 'Windsor Park', 215–217 Victoria Road, Yering, Victoria – for Best Hooper (VCAT)
- 2010: Truganina South Community Precinct Structure Plan – for Central Equity and Stockland Limited (Panel)
- 2010: Craigieburn R2 Precinct Structure Plan – for Peet Limited (Panel)
- 2010: Proposed Mortlake Wind Farm – for Accionia Oceania Limited (Panel)
- 2009: Grenda Vehicle Storage Depot, Springvale Road, Keysborough - for Urbis Pty. Ltd. (VCAT)
- 2009: 1280 Boneo Road, Cape Schanck, development a proposed barn – for Hansen Planning Services (VCAT)

- 2008: Proposed Donald Mineral Sands Project. Donald Mineral Sands (Panel)
- 2009: Melton Planning Scheme Amendment C65 – 489-555 Robinsons Road South Precinct (Marksx Property), Truganina (Panel)
- 2008: Amendment C88 to the Bass Coast Shire Planning Scheme - Silverleaves, Phillip Island (Panel)
- 2008: Proposed residential subdivision at 30-80 Seymour Road, Viewbank – for local landowner (VCAT)
- 2008: Proposed medium density development located on the corner of 1587-1589 Point Nepean Road and 1-1A Chatfield Avenue, Rosebud – for Fulcrum Town Planning Pty. Ltd. (VCAT)
- 2008: Residential development at 2 Rowe Street, Alphington – for Rob Wignall Architects (VCAT)
- 2008: Officer Service Centres, Officer – for Clayton UTZ Pty. Ltd. (VCAT)
- 2007: Anglesea Golf Club proposed Amendment C32 – for TGM Group Pty. Ltd. (Panel)
- 2007: Medium density housing at 2 Ramptons Road, Eltham – for Nillimbik Shire Council (VCAT)
- 2007: Medium density unit development in Frankston (adjacent to Kananook Creek) – for Gary Testro Lawyer (VCAT)
- 2007: Single dwelling development at 683 Great Ocean Road, Eastern Views, Victoria – for SJB Planning Pty. Ltd (VCAT)
- 2006: Constructio02n of a dwelling at 8 Charlotte Court, Warrandyte - for Glossop Town Planning Pty. Ltd. (VCAT)
- 2005: Dollar Wind Farm, Gippsland – for Freehills Lawyers (Panel)

#### Author's Declaration

I, Aaron Organ, have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Tribunal.



----- Date: 02/02/2021

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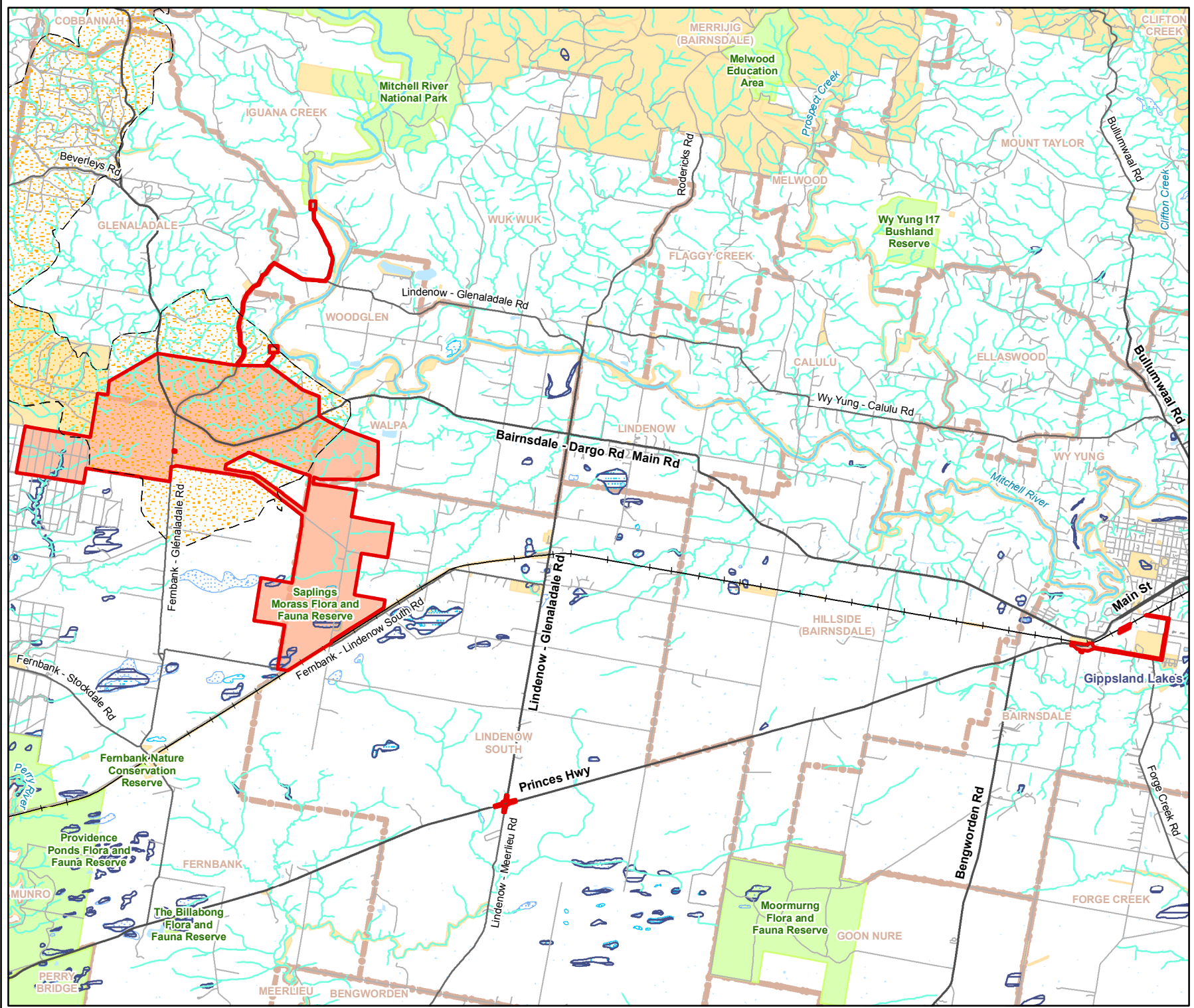


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## FIGURES

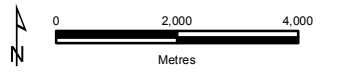
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- Legend**
- Project Area
  - Railway
  - Major Road
  - Collector Road
  - Minor Road
  - Proposed Road
  - Minor Watercourse
  - Major Watercourse
  - Permanent Waterbody
  - Land Subject to Inundation
  - Wetland/Swamp
  - Current Wetlands (DELWP)
  - Parks and Reserves
  - Ramsar wetland
  - Crown Land
  - Localities
  - Approximate Extent of 2014 Bushfire

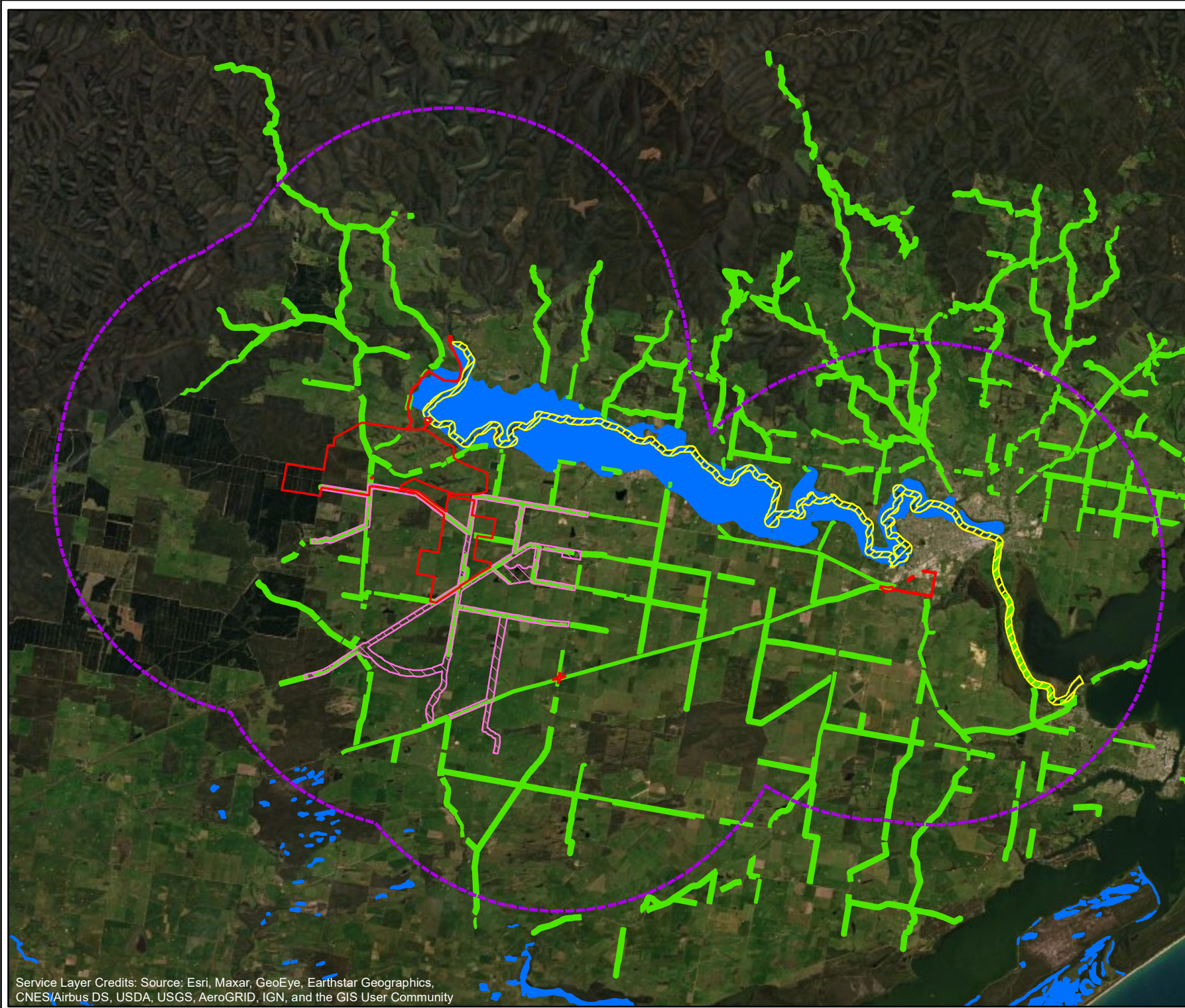


**Figure 1**  
**Location of the project area**  
*Fingerboards Mineral Sands Project: Flora and Fauna Assessment*



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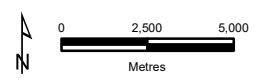




- Legend**
- Project Area
  - 10km Locality Buffer
  - Planning Overlay**
  - ESO1-38
  - ESO1-51
  - ESO2
  - VPO1



**Figure 2**  
**Extent of ESOs and VPOs related to the Project Area within the Project Locality**  
*Fingerboards Mineral Sands Project: Flora and Fauna*



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