



FINGERBOARDS MINERAL SANDS PROJECT

Risk treatment plan:

Biodiversity

Risk treatment plan: Biodiversity

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1. Scope

This risk treatment plan is for the control of mining hazards with the potential to adversely impact native flora or fauna, including threatened ecological communities and protected migratory species. A 'mining hazard' means any mining activity that may pose a risk to the environment, over and above the environmental disturbance authorized within the Fingerboards mining licence area under the approved work plan and for which appropriate offsets have been obtained. This risk treatment plan applies to all stages of project implementation (construction, operations, decommissioning and closure).

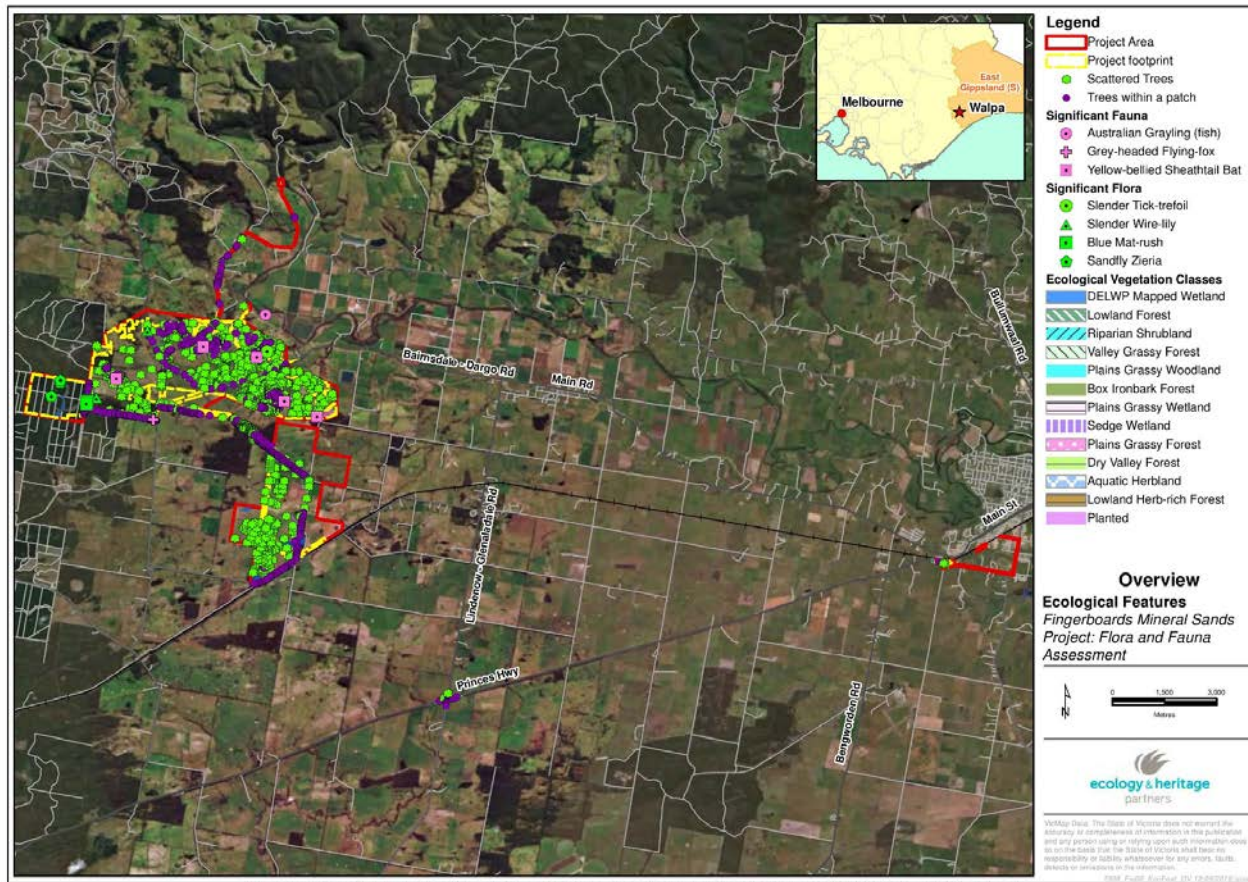
The controls described in this risk treatment plan apply to activities carried out within the Fingerboards mining licence area. Mining related impacts on biodiversity that could arise outside the mining licence area – for example, fauna interactions with mine vehicles or impacts arising from land clearing required for support infrastructure (such as a rail siding), are not addressed in this plan. Biodiversity hazards outside the mining licence area are addressed in separate management plans developed under the project's Planning Scheme Amendment and Incorporated Document.

2. Key sensitive receptors

Key sensitive receptors considered in this plan include biota and habitats outside the mining licence area which could be indirectly impacted by project activities. These include:

- Downstream waterways (eg Mitchell River) and wetlands (Gippsland Lakes), and
- Groundwater dependent ecosystems outside the mining licence area,
- Remnant native vegetation and pastures adjoining the mining licence area which are currently not significantly impacted by weeds or plant pathogens.

This risk treatment plan also identifies control measures aimed at minimizing impacts on flora and fauna within the mining licence area, for example by avoiding remnant vegetation or habitat trees where practicable and by exercising care during ground disturbance, to enable salvage and relocation of fauna that may be present within areas approved for disturbance. Significant flora and fauna locations are shown in Figure 2.1. The locations of waterway and wetland habitats and of vegetation assessed as being potentially at risk from changes in hydrological regimes are shown in Figure 2.2 and Figure 2.3. More detailed mapping and discussion about biodiversity values in the Fingerboards project area is available in technical reports prepared for the Fingerboards Environmental Effects Statement (EHP, September 2019; Austral, May 2019).



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Figure 2.1: Overview of significant flora and fauna locations (EHP, 2020)

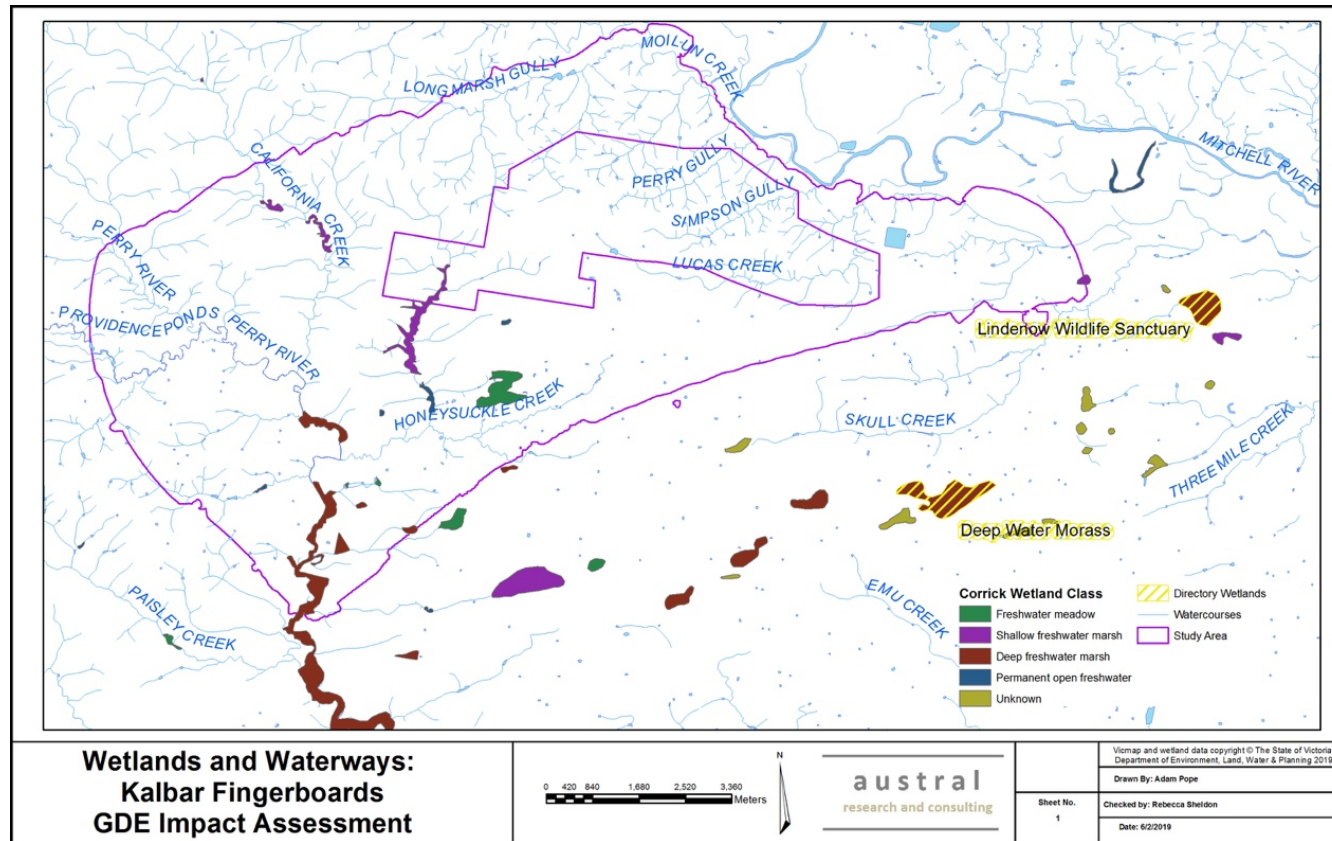


Figure 2.2: Sensitive receptor locations (groundwater dependent ecosystems associated with wetlands and waterways) (Austral, May 2019)

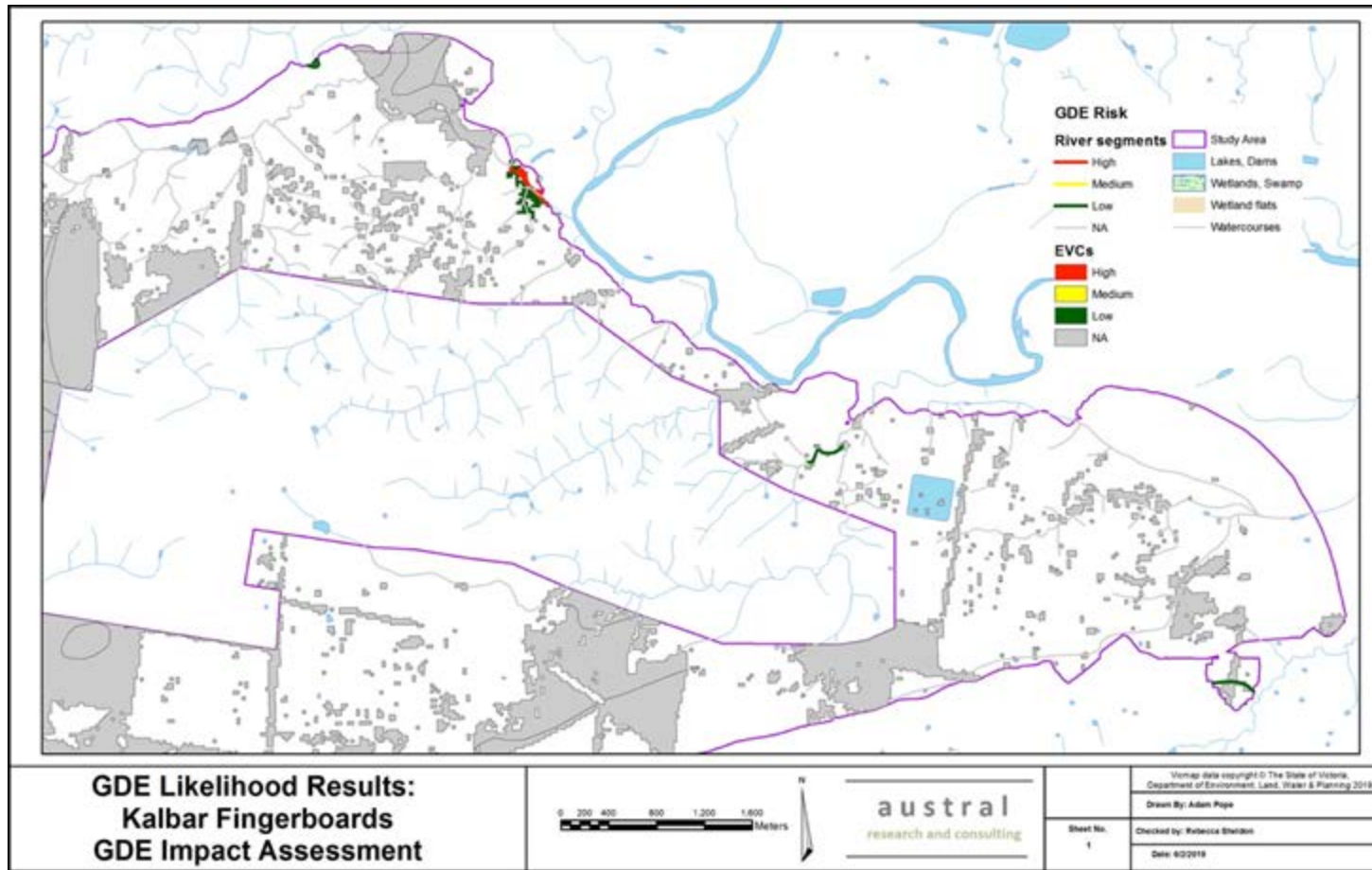


Figure 2.3: Map of GDE risk from potential groundwater mounding near Fingerboards mining licence area (Austral, May 2019)

3. Inherent risk

In this risk treatment plan ‘inherent risk’ means the likelihood and consequence of a risk event, assuming that standard controls specified in Attachment A of the Fingerboards Risk Management Plan are implemented.

Table 3-13-1: Summary of inherent risks - biodiversity

#	Details of risk event	Phase	Consequence	Likelihood	Inherent risk rating
1	Runoff from stockpiles or disturbed / rehabilitated areas: Sedimentation increases water turbidity and harms aquatic species.	C,O,CL	Moderate	Unlikely	Medium
2	Runoff from stockpiles or disturbed / rehabilitated areas: Increase in nutrients or oxygen demand harms aquatic species.	C,O	Minor	Unlikely	Low
3	Discharge from contact water dams (via spillway): Sedimentation increases water turbidity and harms aquatic species	O,CL	Moderate	Rare	Medium
4	Release of stored water as a result of failure of contact water dam(s): Sedimentation increases water turbidity and harms aquatic species	O, CL	Moderate	Rare	Medium
5	Discharge from sediment ponds or contact water dams (via spillway): Increase in nutrients or oxygen demand harms aquatic species	O	Unlikely	Rare	Low
6	Discharge from contact water dams (via spillway): Sedimentation increases water turbidity and harms aquatic species Discharge from TSF or process water dam (via spillway): Sedimentation increases water turbidity and harms aquatic species	O	Moderate	Rare	Medium
7	Release of stored water as a result of failure of contact water dam(s): Sedimentation increases water turbidity and harms aquatic species Release of tailings as a result of failure of TSF or process water dam overtopping event: Sedimentation increases water turbidity and harms aquatic species	O	Major	Rare	Medium
8	Release of turbid water as a result of process water dam overtopping event: Sedimentation increases water turbidity and harms aquatic species Release of tailings or turbid water as a result of TSF or process water dam overtopping event: Sedimentation increases water turbidity and harms aquatic species	O	Moderate	Rare	Medium
9	Discharge from TSF or process water dam (via spillway): Increase in metals or radionuclides or change in receiving water pH harms aquatic species	O	Minor	Unlikely	Low
10	Release of tailings as a result of failure of TSF embankment: Increase in metals or radionuclides or change in receiving water pH harms aquatic species	Ø	Major	Rare	Medium

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#	Details of risk event	Phase	Consequence	Likelihood	Inherent risk rating
11	Release of tailings or turbid water as a result of TSF or process water dam overtopping event: Increase in metals or radionuclides or change in receiving water pH harms aquatic species	O	Moderate	Rare	Medium
12	Altered site hydrology results in increased rate of erosion in natural drainage lines downstream of project: Sedimentation increases water turbidity and harms aquatic species	O, CL	Moderate	Unlikely	Medium
13	Runoff from septic effluent disposal fields: Increase in nutrients or oxygen demand harms aquatic species	C, O	Minor	Unlikely	Low
14	Capture of water in mine contact water dams: Reduced frequency / magnitude of flow down drainage lines results in modifications to riparian systems along drainage lines - Mitchell system	O, CL	Minor	Possible	Medium
15	Capture of water in mine contact water dams: Reduced frequency / magnitude of flow down drainage lines results in modifications to riparian systems along drainage lines - Perry system	O, CL	Minor	Possible	Medium
16	Capture of water in mine contact water dams: Reduced flow in Mitchell harms aquatic ecology	O, CL	Insignificant	Rare	Low
17	Capture of water in mine contact water dams: Reduced flow in Mitchell reduces water available to irrigators and other water users	O, CL	Insignificant	Rare	Low
18	Winter fill water extraction from Mitchell River: Reduced flow in Mitchell harms aquatic ecology	C, O	Minor	Unlikely	Low
19	Seepage from TSF: Groundwater mounding affects vegetation health	O	Minor	Rare	Low
20	Seepage from process water dam or freshwater storage dam: Groundwater mounding affects vegetation health	O	Minor	Rare	Low
21	Seepage from tailings in mine void: Groundwater mounding affects vegetation health	O, CL	Minor	Unlikely	Low
22	Extraction of groundwater from the Latrobe Group aquifer: Groundwater drawdown to Latrobe Group aquifer and reduced availability for licensed users or ecosystem support.	O	Minor	Unlikely	Low

#	Details of risk event	Phase	Consequence	Likelihood	Inherent risk rating
23	Extraction of groundwater from the Latrobe Group aquifer: Groundwater drawdown transmitting to overlying Seaspray Group Aquifer, Boisdale Aquifer and surficial alluvial aquifers and reduced availability for licensed groundwater users or ecosystem support.	O	Minor	Unlikely	Low
24	Water erosion in drainage channels: Vegetation / ecosystem damage	C, O, CL	Minor	Unlikely	Low
25	Wheel-generated dust and lift off from disturbed areas and stockpiles: Adverse impacts on vegetation health / productivity / marketability	C, O, CL	Minor	Unlikely	Low
26	Operation of machinery and materials handling: Noise disrupts / displaces terrestrial fauna	C, O, CL	Insignificant	Possible	Low
27	Vehicle movements: Weeds or pathogens are introduced or spread through contact with vehicles moving about the site	C, O, CL	Minor	Possible	Medium
28	Imported materials: Weeds or pathogens are introduced or spread in materials brought to site	C, O, CL	Minor	Unlikely	Low
29	Ground disturbance: Ground disturbance encourages weed establishment	C, O, CL	Moderate	Likely	High
30	On-site vehicle collision with fauna: Fauna injury or fatality	C, O, CL	Insignificant	Likely	Medium
31	Emissions from fixed plant: Modified fauna behaviour / displacement or disruption of fauna	C, O	Insignificant	Possible	Low
32	Emissions from mobile plant: Modified fauna behaviour / displacement or disruption of fauna	C, O, CL	Insignificant	Unlikely	Low
33	Wastes or contaminated materials abandoned on site at closure: Potential radiation exposure to people or animals	O, CL	Minor	Unlikely	Low
34	Physical barriers to movement of terrestrial fauna: Interference with movement / interaction of fauna populations	C, O	Minor	Possible	Medium
35	Physical barriers to movement of aquatic fauna: Interference with movement / interaction of fauna populations	C, O	Minor	Rare	Low
36	Trenching: Fauna entrapment	C, O	Minor	Unlikely	Low

#	Details of risk event	Phase	Consequence	Likelihood	Inherent risk rating
37	Establishment of water storages, TSE : Fauna entrapment	C, O	Minor	Unlikely	Low
38	Unauthorised clearing / disturbance: Loss / damage to terrestrial flora, vegetation, ecosystems, habitats	C, O	Moderate	Unlikely	Medium
39	Unauthorised clearing / disturbance: Loss / damage to aquatic flora, vegetation, ecosystems, habitats	C, O	Moderate	Unlikely	Medium
40	Fire / explosion initiated by project activity: Damage to vegetation/ fauna	C, O, CL	Major	Rare	Medium
41	Fire / explosion initiated by external source: Loss of life/ecosystem harm/property damage	C, O, CL	Major	Possible	High
42	Inappropriate storage of putrescible wastes: Increase in vermin, feral animals	C, O	Minor	Unlikely	Low
43	Inappropriate storage of putrescible wastes: Injury to fauna or livestock	C, O	Minor	Unlikely	Low

Note: 'C' = construction; 'O' = operations; 'CL' = decommissioning and closure

4. Objectives

The objectives of this risk treatment plan are:

- to avoid or minimise adverse effects on native vegetation, listed threatened and migratory species and ecological communities, and habitat for these species, and
- to prevent loss or damage to native flora or fauna beyond that authorised under the Fingerboards work plan.

5. Compliance standards

Compliance standards for this risk treatment plan arise from requirements contained in the following legislation and guidelines:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
- *Environment Effects Act 1978*
- *Planning and Environment Act 1987*
- Guidelines for the Removal, Destruction or Lopping of Native Vegetation (pursuant to the Victoria State Planning Policy Framework)
- *Flora and Fauna Guarantee Act 1988*
- *Catchment and Land Protection Act 1994*
- *Wildlife Act 1975* and Wildlife Regulations 2013

6. Acceptance criteria

Acceptance criteria are the measures which, if attained, are the basis for concluding that the control measures described in this plan have been effective in achieving the plan objectives. The following acceptance criteria have been defined as the basis for assessing the success of biodiversity risk control measures included in this risk treatment plan:


- Site operator complies with legislative requirements relating to the control and management of declared noxious weeds and pest animals.
- The mining operation does not contribute to the spread or proliferation of soil-borne plant diseases.
- The mining operation does not alter catchment hydrology in a way that adversely affects the health or viability of groundwater dependent ecosystems in areas surrounding the mining licence area.
- The mining operation does not alter surface water or groundwater in a way that compromises beneficial uses (including ecosystem functions) of downstream receiving waters.
- Native vegetation is not removed prior to securing required offsets and approvals.
- Disturbance of native vegetation and native fauna habitats does not exceed the disturbance authorized under the Fingerboards workplan (as summarised in Table 6-1 

Table 6_16-1: Biodiversity values within the Fingerboards mining licence area



Biodiversity value	Disturbance within mining licence area
Remnant native vegetation	160.30 ha
Scattered trees	461 trees
Gippsland Red Gum (<i>Eucalyptus tereticornis</i> subsp. <i>mediana</i>) Grassy Woodland and Associated Native Grassland ecological community	1.74 ha
State significant Red Gum Grassy Woodland ecological community	14.54 ha

The expected specific habitat unit offset requirements (flora) for the whole of the Fingerboards Project is expected to be:

EHP, Sticky wattle – 92.054 SHU	Rough-grain Love-grass – 98.532	Slender Wire-lily – 102.403 SHU
Yellow-wood – 38.170 SHU	Slender violet-bush – 67.568 SHU	Thin-leaf Daisy bush- 57.395 SHU
Thick-lip Spider orchid – 48.867 SHU	Star cucumber – 28.189 SHU	Forest Red-box – 94.446 SHU
Purple diuris – 98.059 SHU	One-flower early Nancy – 97.586 SHU	Gaping Leek-orchid – 0.048 SHU
Bushy Hedgehog-grass – 102.403 SHU	Limestone blue wattle – 86.671 SHU	Heath Spider-orchid – 40.749 SHU

Note: The SHU offset requirements include impacts arising both inside and outside the proposed mining licence area. The SHU values shown in the table are the maximum estimated offset requirements.

7. Controls to address biodiversity hazards

Biodiversity impact assessments conducted for the Fingerboards project identified a range of mining-related hazards with the potential to result in adverse effects on flora, fauna or ecological systems. These included:

- Vegetation clearing, ground disturbance, earthworks and excavation
- Movements of machinery, materials and vehicles
- Altered hydrology
- Altered water quality.

Controls required to manage hazards associated with altered hydrology and altered water quality are mainly described in the Fingerboards Water Risk Treatment Plan (*insert document reference number here when EMS numbering system is finalised*), although some are repeated in this risk treatment plan. Controls that rely on rehabilitation of land disturbed by mining are addressed in the Fingerboards Mine Rehabilitation Plan, which is cross referenced in this risk treatment plan. Table 7-1 lists the key controls that will be implemented to limit biodiversity impacts associated with mining activities within the Fingerboards mining licence area.

Table 7-1: Biodiversity hazard controls and associated performance measures

#	Details of controls	Performance measures
TE01	Vegetation removal will proceed only when applicable approvals and permits are obtained.	Ground disturbance permit system is in place and audited; vegetation disturbance does not exceed disturbance authorised through work plan
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-dependent fauna known or potentially present (yellow-bellied sheathbill, powerful owl, masked owl and eastern pygmy possum)	Records of nest box installation; records of hollow-bearing trees removed (or targeted for clearing).
TE03*	Appropriate offsets will be secured in accordance with state and Commonwealth legislation and policy.	Offsets secured and approved by administering authorities.
TE04	Extent of clearance and buffers around no-go areas will be clearly defined to avoid disturbance within areas to be retained.	Physical demarcation of 'no-go' areas; spatial database of no-go area established and used in assessing ground disturbance permit applications.
TE05	Access tracks and roads will be clearly marked to prevent establishment of secondary tracks and disturbance to adjacent vegetation. Existing roads to be used where practicable.	Approved mine plans; signage in place.
TE06*	Where practicable, access / haul roads that will experience heavy usage will not be established adjacent to areas of high ecological sensitivity.	Approved mine plans
TE07	Parking areas, stockpiles, machinery depots and site buildings will be located in areas of low ecological value (such as blue gum plantations).	Approved mine plan; as-built records

#	Details of controls	Performance measures
TE08	Large trees adjacent to the mine path but within the project area footprint will be retained and clearly marked and Tree Retention Zones will be identified.	Tagging or other physical demarcation of trees to be retained; trees to be retained area recorded in spatial database of 'no-go' areas.
TE09	Areas will be revegetated following the mine rehabilitation plan, to: <ul style="list-style-type: none"> • Increase overall native vegetation cover in the project area • Increase native vegetation patch size • Increase habitat connectivity • Exclude stock from areas of native vegetation 	Performance measures are described in the Fingerboards Mine Rehabilitation Plan.
TE10	Disturbed areas will be revegetated to recreate pre-existing vegetation communities, where possible, increasing habitat value and visual amenity while reducing the likelihood for establishment and proliferation of weeds or risks associated with soil erosion.	Performance measures are described in the Fingerboards Mine Rehabilitation Plan.
TE11	Revegetation of mined areas will include: <ul style="list-style-type: none"> • Planting of a range of locally occurring native shrubs, trees and groundcover plants in consultation with DELWP to recreate the target vegetation community. • Inclusion of rocks, logs, dead trees, and stumps in the restoration and rehabilitation works for fauna habitat. • Maintenance of plantings through a Rehabilitation Plan. • Management of weeds and pest animals. 	Performance measures are described in the Fingerboards Mine Rehabilitation Plan.
TE12	Staff/contractor inductions will incorporate an environmental component signed off by a suitably qualified representative (e.g., site environmental advisor/specialist).	Induction records.
TE13*	Sensitive areas, such as those with fauna habitat, will be checked for fauna by a suitably trained ecologist or other qualified environmental specialist prior to construction and operational activities commencing.	Ground disturbance permit system is in place and audited
TE14*	Pre-clearing activities will remove the understorey and smaller non-hollow-bearing trees to disturb fauna and encourage them away from the clearing area.	Standard operating procedures for ground disturbance documented and
TE15*	Animals disturbed during clearing works will be relocated, with appropriate authorisation under the <i>Wildlife Act 1975</i> .	Fauna relocation records.
TE16	All trenches will have graded sides to avoid fauna entrapment and allow animals to escape.	Design specification, workplace inspection records
TE17	Appropriate speed-limits will be applied in areas containing remnant native vegetation to reduce the risk of fauna mortality from vehicle strike.	Work instructions; signage in place; incident records
TE18	Traffic movements will be minimised during the night, dusk and dawn periods in remnant native vegetation areas, where possible.	Work instructions; mining schedule

#	Details of controls	Performance measures
TE19*	Hollow-bearing trees will be retained around project infrastructure, where construction permits.	Tagging or other physical demarcation of trees to be retained; trees to be retained area recorded in spatial database of 'no-go' areas
TE20*	Pre-clearance survey and supervision of large hollow-bearing tree felling activities will be carried out by a suitably qualified zoologist.	Ground disturbance permit system is in place and audited
TE21*	Salvaged or artificial hollows will be installed (under the supervision of an ecologist) in retained vegetation adjacent to the project footprint where hollow-bearing trees are lost.	Records of cleared hollow-bearing trees; records of replacement hollow installation.
TE22	Isolation and fragmentation of habitat will be minimised when planning activities with potential to remove vegetation.	Approved mine plan; rehabilitation records
TE23	Appropriate erosion and sediment control strategies will be implemented to prevent gully erosion in areas adjoining the project footprint.	Performance measures related to water erosion and sediment control are described in the Fingerboards Water Risk Treatment Plan.
TE24	No-go zones will be established around waterbodies adjoining the project footprint to prevent any disturbance to the biodiversity values present within these areas.	Physical demarcation of 'no-go' areas; spatial database of no-go area established and used in assessing ground disturbance permit applications.
TE25	Strategies to control sediment runoff (and reduce the potential for increased turbidity in downstream aquatic habitats) and reduce the potential for spills will be implemented during construction and operations.	Performance measures related to water erosion and sediment control are described in the Fingerboards Water Risk Treatment Plan.
TE28*	Fauna salvage and relocation / translocation procedure will be developed and implemented to supported the biodiversity risk treatment plan.	Documented fauna salvage and relocation procedures; records of fauna salvage / relocation; permits to relocate fauna
TE29*	Use of underpasses/culverts and overpasses will be investigated to maintain permeability for ground dwelling species and arboreal marsupials where access roads and linear infrastructure bisect or cross native vegetation.	Approved mine plans
TE31	Fauna escape features and refuges (including ramps and damp sandbags) will be provided around remnant patches adjacent to the operational area of the project.	Photographic records / fauna relocation records (part of internal clearing permit system)

#	Details of controls	Performance measures
TE33	Appropriate speed limits will be applied on unsealed roads and tracks to limit dust generation.	Performance measures related to air quality are described in the Fingerboards Airborne and Deposited Dust Risk Treatment Plan
TE34*	Construction machinery, vehicles and pedestrians will be confined to formed tracks and designated areas, where possible.	Work instructions, mine plan
TE35	Excessive noise or vibration emitting equipment or machinery will be located away from sensitive ecological values. Where relocation is not feasible, control measures such as mufflers or baffles will be employed.	Maps of locations requiring special noise control; work instructions; noise monitoring results
TE36	Lighting systems will be designed and used in a way that minimises potential impacts on fauna, particularly nocturnal species (mammals such as possums, gliders and bats, and birds); including, where applicable, use of light shields and directional lighting to avoid interference with foraging or roosting activities.	Equipment supply contracts and specifications; complaints register
TE37*	Project infrastructure and activities will be microsituated to avoid native vegetation. For example, if vegetation of high quality is identified during pre-clearance surveys, where possible, the location will be adjusted to avoid it.	Detailed mine plans; microsite survey records
TE38	Limits of clearing sensitive areas (e.g., listed species habitat) will be marked to avoid unnecessary vegetation and habitat removal.	Approved mine plan; disturbance does not exceed amounts listed in Table 6-1.
TE39*	All trenches and other excavations will be checked daily and any trapped animals removed by a suitably qualified zoologist before any works commence.	Daily inspection records; fauna handling procedures
TE45/ LUP03	Biosecurity procedures to avoid introduction and spread of weeds, pests and diseases into the project area and surrounding areas.	Standard operating procedures for weed hygiene and pathogen control; audit records; weed survey results.
TE46	Disturbed areas will be revegetated to increase habitat value and visual amenity while reducing the likelihood for establishment and proliferation of weeds.	Performance measures are described in the Fingerboards Mine Rehabilitation Plan.
TE47*	Revegetation of mined areas will include management of weeds and pest animals.	Performance measures are described in the Fingerboards Mine Rehabilitation Plan.
TE49	Construction machinery will not be permitted to access Cowells Lane to avoid potential indirect impacts to swamp everlasting, native vegetation and low-lying areas within the infrastructure options area.	Work instructions; compliance audits during construction phase

#	Details of controls	Performance measures
TE50*	The extent of native vegetation cover and habitat connectivity within and adjoining the project area will be increased through restoration as part of progressive rehabilitation.	Approved mine rehabilitation plan; rehabilitation records; annual environmental report.
TE51	Faunal habitat features, such as logs and hollows, will be created as part of habitat restoration works.	Approved mine rehabilitation plan and procedures; rehabilitation records; annual environmental report
TE52*	Populations of listed or rare native plant species from ecological vegetation categories within the project area will be increased through targeted recovery programs.	Revegetation species lists; rehabilitation records; annual environmental report
TE53	Prior to any proposed disturbance in unsurveyed areas, a detailed flora survey will be undertaken.	Ground disturbance procedures; survey records.

Note: Mitigation actions followed by an asterisk are 'additional mitigation actions'. All others are 'standard mitigation actions'.

Table Table 7-2: Additional Controls identified in the EES process

#	Details of controls	Performance measures
1	Development of a GDE management plan will be prepared prior to construction as part of the biodiversity risk treatment plan and environmental management plan.	
2	Development of a faunal management plan – this plan has been developed	
3	Prior to construction, targeted species surveys will be considered as part of the pre-clearance process for fauna	

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8. Residual risk assessment

The risk ratings for events contributing to biodiversity hazards – once standard and additional mitigation actions have been put in place – are summarised in Table 8.1.

Figure 8.1: Residual risk ratings – biodiversity

#	Details of risk event monitored	Phase	Consequence	Likelihood	Residual risk rating
1	Runoff from stockpiles or disturbed / rehabilitated areas: Sedimentation increases water turbidity and harms aquatic species		Moderate	Unlikely	Medium
2	Discharge from contact water dams (via spillway): Sedimentation increases water turbidity and harms aquatic species	O, CL	Moderate	Rare	Medium
3	Release of stored water as a result of failure of contact water dam(s): Sedimentation increases water turbidity and harms aquatic species	O, CL	Moderate	Rare	Medium
4	Discharge from process water dam (via spillway): Sedimentation increases water turbidity and harms aquatic species Discharge from TSF or process water dam (via spillway): Sedimentation increases water turbidity and harms aquatic species	O	Moderate	Rare	Medium
5	Release of stored water as a result of failure of contact water dam(s): Sedimentation increases water turbidity and harms aquatic species Release of tailings as a result of failure of TSF or process water dam	O	Moderate	Rare	Medium
6	Release of turbid water as a result of process water dam overtopping event: Increase in metals or radionuclides or change in receiving water pH harms aquatic species Release of tailings or turbid water as a result of failure of TSF or process water dam	O	Moderate	Rare	Medium
7	Altered site hydrology results in increased rate of erosion in natural drainage lines downstream of project: sedimentation increases water turbidity and harms aquatic species	O, CL	Moderate	Rare	Medium
8	Capture of water in mine contact water dams: Reduced frequency / magnitude of flow down drainage lines results in modifications to riparian systems along drainage lines - Mitchell system	O, CL	Minor	Unlikely	Low
9	Capture of water in mine contact water dams: Reduced frequency / magnitude of flow down drainage lines results in modifications to riparian systems along drainage lines - Perry system	O, CL	Minor	Unlikely	Low
16	Wheel-generated dust and lift off from disturbed areas and stockpiles: Adverse impacts on vegetation health / productivity / marketability	C, O, CL	Minor	Unlikely	Low

#	Details of risk event monitored	Phase	Consequence	Likelihood	Residual risk rating
17	Vehicle movements: Weeds or pathogens are introduced or spread through contact with vehicles moving about the site	C, O, CL	Minor	Unlikely	Low
18	Imported materials: Weeds or pathogens are introduced or spread in materials brought to site	C, O, CL	Minor	Unlikely	Low
19	Ground disturbance: Ground disturbance encourages weed establishment	C, O, CL	Minor	Possible	Medium
20	On-site vehicle collision with fauna: Fauna injury or fatality	C, O, CL	insignificant	Likely	Medium
21	Physical barriers to movement of terrestrial fauna: Interference with movement / interaction of fauna populations	C, O	Minor	Unlikely	Low
22	Physical barriers to movement of aquatic fauna: Interference with movement / interaction of fauna populations	C, O	Minor	Rare	Low
23	Trenching: Fauna entrapment	C, O	Minor	Unlikely	Low
24	Establishment of water storages, TSF : Fauna entrapment	C, O	Minor	Unlikely	Low
25	Unauthorised clearing / disturbance: Loss / damage to terrestrial flora, vegetation, ecosystems, habitats	C, O	Minor	Unlikely	Low
26	Unauthorised clearing / disturbance: Loss / damage to aquatic flora, vegetation, ecosystems, habitats	C, O	Minor	Unlikely	Low
27	Fire / explosion initiated by project activity: Damage to vegetation/ fauna	C, O, CL	Major	Rare	Medium
28	Fire / explosion initiated by external source: Loss of life/ecosystem harm/property damage	C, O, CL	Major	Possible	High

Note: 'C' = construction; 'O' = operations; 'CL' = decommissioning and closure


9. Monitoring

Monitoring required to check the effectiveness of biodiversity hazard controls is summarised in Table 9-1

Table 9-19-1: Proposed monitoring for biodiversity hazard controls

#	Aspect to be monitored	Details of monitoring
1	Compliance with ground disturbance permit system	Number of permits issued; results of system audits. Monthly audits to be conducted during construction phase of project, then 6-monthly audits thereafter.
2	Offset implementation	Vegetation condition; species diversity; similarity to target analogue system(s); effectiveness of access controls; weed occurrence in offset areas targeted for ecosystem enhancement. Annual review of offset land for at least first 5 years of project – required frequency of reviews to be reassessed at Year 5.
3	Weed and pathogen hygiene	Results of weed and pathogen hygiene procedure audits (monthly during construction phase of project, then 6-monthly thereafter); and annual weed surveys
4	Vegetation condition	Twice yearly assessment of vegetation health in areas identified as 'groundwater dependent ecosystems'
5	Fauna occurrence	Incident reports: fauna injury / mortality (roadkill, etc); use of nest boxes; feral animal sightings.
6	Watercourse health	2-yearly AUSRIVAS (or equivalent) assessment of biophysical condition of ephemeral drainage lines (Perry Gully; Simpsons Gully; Lucas Creek; Long Marsh Gully; Moilun Creek and unnamed tributary of Honeysuckle Creek).
7	Rehabilitation success	Monitoring actions are described in the Fingerboards Mine Rehabilitation Plan

10. Reporting

Table 10-140-1: Biodiversity performance and compliance reporting 

#	Aspect being reported	To whom will the information be reported? At what frequency?	How will the information be used?
1	Compliance with ground disturbance permit system	Event based-reporting of non-compliances to environmental superintendent and construction / mine manager. Monthly reporting to Fingerboards management team; quarterly reporting to Community Reference Group; annual environmental compliance reporting to ERR, DELWP, EPA and EGCMA.	To demonstrate effectiveness of ground disturbance permit system in ensuring compliance with work plan; to inform contractor performance assessment; to inform site induction / training procedures.
2	Offset implementation	Annual reporting to Fingerboards management team and Community Reference Group; annual environmental compliance reporting to ERR, DELWP, EPA and EGCMA.	To track progress of ecosystem enhancement; to check security of offset areas.
3	Weed and pathogen hygiene; pest animals	Event based-reporting of non-compliances to environmental superintendent and construction / mine manager. Monthly reporting to Fingerboards management team; quarterly reporting to Community Reference Group; annual environmental compliance reporting to ERR, DELWP, EPA and EGCMA.	To demonstrate effectiveness of weed / pathogen hygiene procedures; to inform contractor performance assessment; to guide weed and feral animal control programmes and ensure compliance with reporting of prohibited /noxious weeds or restricted pests
4	Vegetation condition	Twice yearly reporting to Fingerboards management team and Community Reference Group; annual environmental compliance reporting to ERR, DELWP, EPA and EGCMA.	To inform future revisions of the Fingerboards site hydrological model and water balance; to check predictions of baseline impact assessments.
5	Fauna occurrence	Monthly reporting to Fingerboards management team; quarterly reporting to Community Reference Group; annual environmental compliance reporting to ERR, DELWP, EPA and EGCMA.	To demonstrate effectiveness of fauna protection measures and inform feral animal control programmes.
6	Watercourse health	Annual reporting to Fingerboards management team and Community Reference Group (three watercourses each year – to be assessed alternately); annual environmental compliance reporting to ERR, DELWP, EPA and EGCMA.	To demonstrate effectiveness of off-stream impact management (site water and erosion management).

#	Aspect being reported	To whom will the information be reported? At what frequency?	How will the information be used?
7	Rehabilitation success	Annual reporting to Fingerboards management team and Community Reference Group; annual environmental compliance reporting to ERR, DELWP, EPA and EGCSMA.	Refer Fingerboards Mine Rehabilitation Plan for additional detail on rehabilitation monitoring and reporting.

11. References

Austral Research and Consulting, 2019. Groundwater Dependent Ecosystem Impact Assessment, May 2019.

Department of Environment, Land, Water and Planning, 2017a. Protecting Victoria’s Environment – Biodiversity 2037.

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East Gippsland Shire Council, 2012. East Gippsland Roadside Vegetation Strategy.

Ecology and Heritage Partners, 2020a. Offset Management Strategy for the proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria, April 2020.

Ecology and Heritage Partners, 2020b. Detailed Ecological Investigations for the proposed Fingerboards Mineral Sands Project, Glenaladale, Victoria, April 2020.

12. Kalbar reference documents

[To be completed when EMS is developed]

Table 12-1: Kalbar reference documents

#	Document
1	
2	
3	