DRAFT - Construction Environmental Management Plan

Warburton Mountain Bike Destination

Table of Contents

1.0 Introduction

This Construction Environmental Management Plan (CEMP) is the primary mechanism for environmental management during construction of the Warburton Mountain Bike Destination (the project).

This CEMP identifies the project construction activities that have the potential to impact on the physical, biological, social and cultural aspects of the environment and establishes the process by which these will be managed and monitored.

1.1 Background

This CEMP has been prepared as part of an environment effects statement (EES) that assesses the potential for the project to have significant effects on the environment. A separate Operations Environmental Management Plan (OEMP) has been prepared as part of the EES also. The technical studies undertaken as part of the EES process have identified specific mitigation measures and performance monitoring requirements associated with the construction of the project, to manage the potential environmental effects identified in the assessments.

Yarra Ranges Council has identified mountain biking as an opportunity for tourism growth within the region, which would also support the region and the health and well-being of its residents. The project would create iconic trails eligible for International Mountain Bike Association Gold Level Ride Centre status which would position Warburton as an internationally significant mountain biking destination.

The project objectives are to:

- Facilitate tourism growth and associated positive economic and jobs growth in the Yarra Valley region
- Create iconic mountain bike trails eligible for International Mountain Bike Association Gold Ride Centre status
- Create spectacular riding experiences that have a competitive advantage over existing mountain bike destinations and leverage Warburton's beautiful township, rural valley and surrounding forested slopes
- Enhance the health and well-being of the community
- Maintain the significant biodiversity and heritage values within the project area and provide opportunities for the community to connect with and appreciate their importance.

1.2 Project overview

The project is a proposed world class mountain biking destination centred around Warburton, approximately 70 kilometres east of Melbourne as shown in Figure 1-1. A significant informal network of mountain bike trails exists within the region and there is evidence of increasing use of these trails by local and visiting riders. Mountain biking in this locality started around 15 years ago and was concentrated in the Yarra State Forest, in the vicinity of Mount Tugwell.

The project consists of up to 177 kilometres of mountain bike trails providing a range of mountain bike experience to suit all levels of riding as shown in Figure 1-2. The project also includes a new Visitor's Hub and main trail head at the Warburton Golf Course and other trail heads at Mount Tugwell, Mount Donna Buang and Wesburn Park.

The northern section of the trail network is located to the north of the Warburton Highway within the Yarra Ranges National Park. The southern section of the trail network is located to the south of the Warburton Highway within the Yarra State Forest.

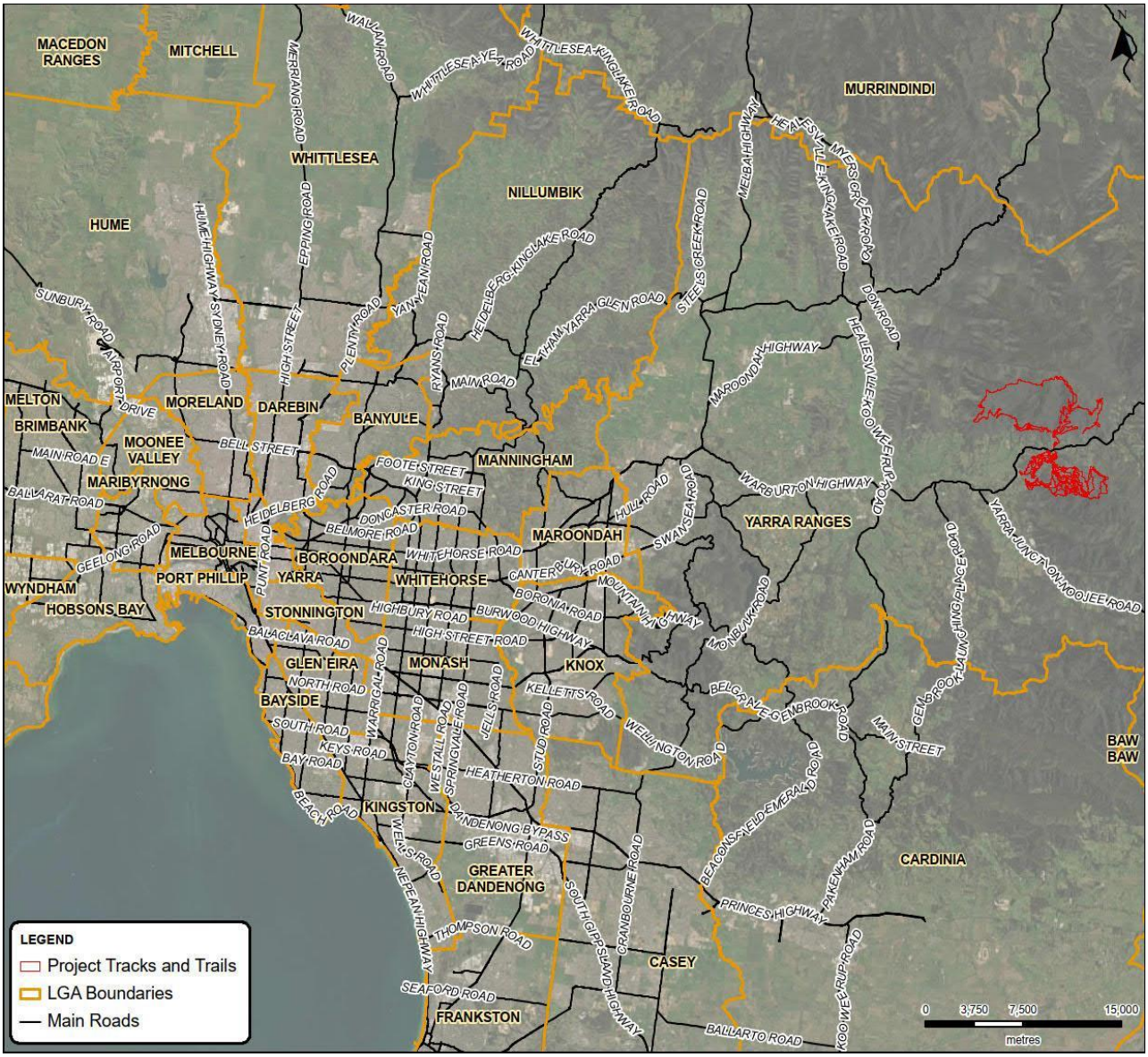


Figure 1-1 Warburton Mountain Bike Destination location

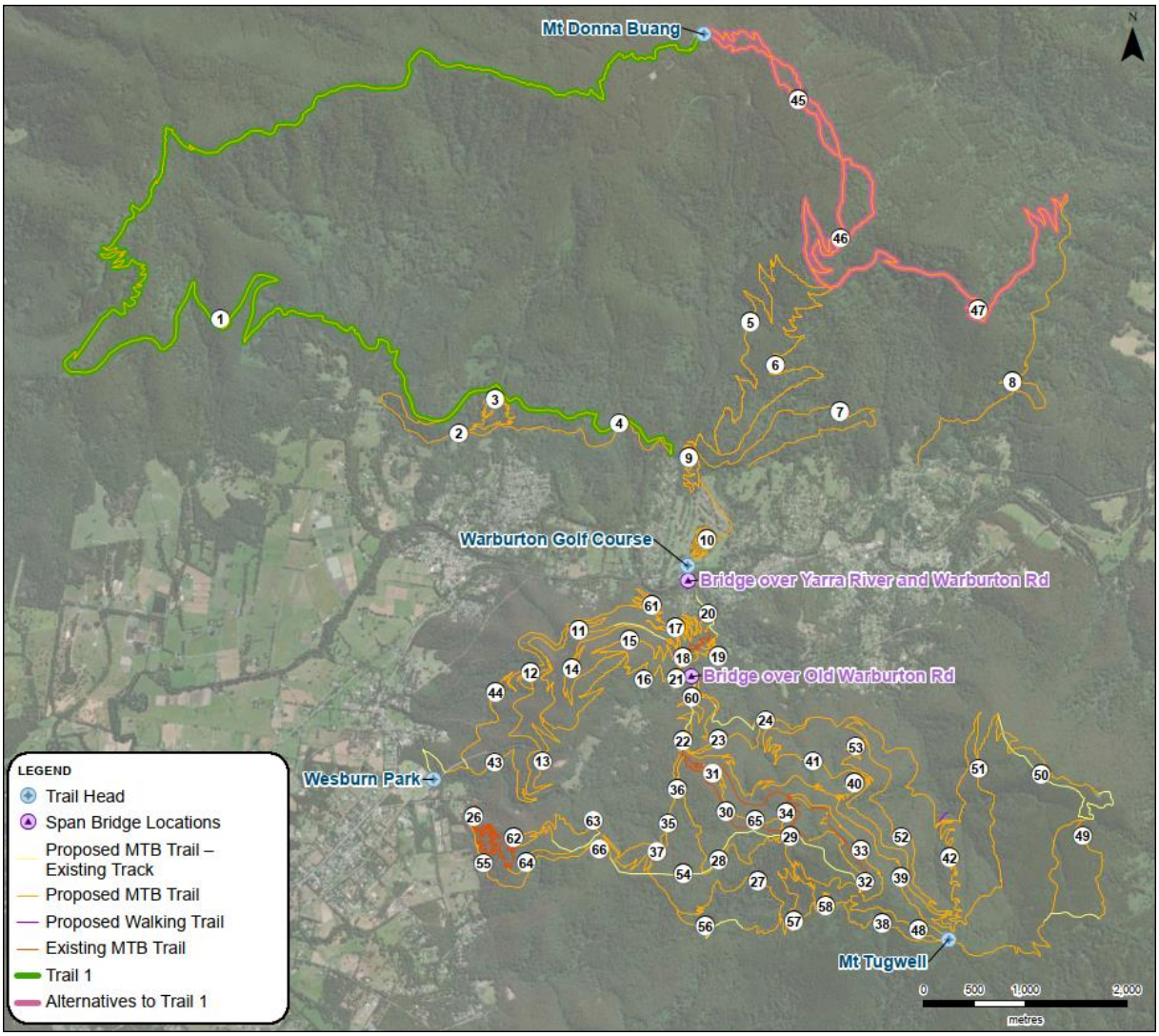


Figure 1-2 Project overview

1.3 CEMP objectives

This CEMP sets out the processes to manage potential environmental effects identified through the EES process associated with construction of the project. It also identifies actions required to comply with applicable environmental legislation, policy and standards. The CEMP has been prepared based on typical construction activities envisaged for the development (refer to Section 4.0).

The CEMP objectives are to:

- Minimise the risk of harm to human health and the environment from construction activities as far as reasonably practicable
- Continuously improve environmental management practices
- Ensure that commitments to mitigation of effects identified during EES preparation are implemented
- Ensure compliance with applicable environmental legislation policy and standards
- Provide personnel involved in project construction with the guidance and tools to support effective environmental management.

The CEMP addresses:

- Yarra Ranges Council's Environment Strategy
- Roles and responsibilities
- Scope of construction activities

- Mitigation measures, monitoring and contingency measures
- Induction and training
- Emergency and incident response
- Environmental auditing and verification
- Stakeholder consultation.

1.4 Process for CEMP reviews and updates

In accordance with the Planning Scheme Amendment and Incorporated Document, the CEMP requires approval of the Minister for Planning.

This CEMP is a dynamic document that will be updated during the construction period in response to:

- Modifications to construction methods
- Identification of new environmental risks
- Results of environmental monitoring
- Environmental incidents, non-conformances and audit findings
- Feedback from stakeholders
- Identified opportunities for improvement.

Additionally, the CEMP will be reviewed at least every six months following commencement of construction to verify that the CEMP remains fit for purpose.

Provided environmental management standards are maintained or improved, changes to the CEMP will be approved by the Yarra Ranges Council Warburton Mountain Bike Destination Project Manager. Any material changes to the CEMP that elevate environmental risks or provide a lower level of assurance will require the approval of the Minister for Planning.

All pages of the CEMP are to be clearly marked with the CEMP version number and the approval date.

Parks Victoria and DELWP will be advised of updates to the CEMP when they occur.

2.0 Environment Strategy

Environmental management throughout Yarra Ranges Council operations, including the delivery of the Warburton Mountain Bike Destination, is guided by the Yarra Ranges Council's Environment Strategy 2015-2025. The vision outlined in the Environment Strategy is presented in Figure 2-1.

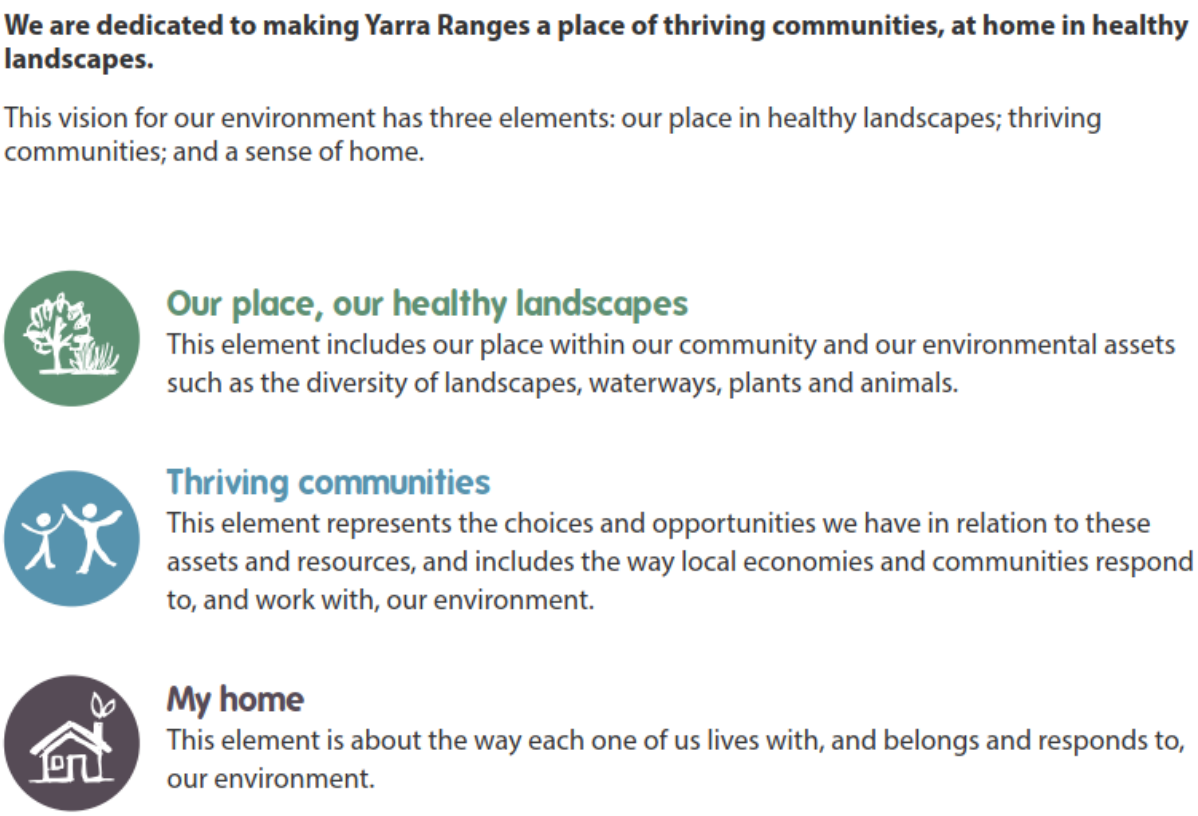


Figure 2-1 Yarra Ranges Council Environment Strategy Vision

3.0 Roles and responsibilities

Effective environmental management requires roles and responsibilities to be clearly specified. This section defines the roles and responsibilities for environmental management during project construction.

Implementation of the CEMP is the responsibility of the Yarra Ranges Council Warburton Mountain Bike Destination Project Manager. Yarra Ranges Council is partnering with experienced mountain bike trail developers for the construction of the project. These appointed contractors would be responsible for ensuring that construction works are carried out in accordance with the CEMP and that any subcontractors they engage also comply with the CEMP. The responsibilities in relation to environmental management are presented in Table 3-1.

Table 3-1 Roles and responsibilities for environmental management

Role	Responsibilities
Yarra Ranges Council CEO	• Overall responsibility for environmental management for the project • Provision of adequate Yarra Ranges Council resources to support effective environmental management
Yarra Ranges Council Warburton Mountain Bike Destination Project Manager	• Overall implementation of the CEMP • Ensuring that environmental obligations are specified in contract arrangements with construction contractors. • Oversight of environmental management performance of contractors involved in project construction • Establishment of environmental auditing and reporting processes • Facilitation of environmental training for Yarra Ranges Council personnel involved in project construction • Periodic reviews of the CEMP and approval of updates to the CEMP.
Yarra Ranges Council environmental representative	• Establishment of environmental monitoring programs and review of monitoring data • Maintaining the environmental risk register for the project • Implementation of stakeholder engagement during project construction including liaison with regulatory agencies and land managers • Implementation of an environmental audit program to verify compliance with the CEMP • Investigation and close out of environmental incidents and complaints • Notifying the Registered Aboriginal Party or appropriate Victorian Government agencies in the event of an unexpected find
Contractor construction manager	• Project management • Day to day stakeholder communication • Day to day implementation of the CEMP • Ensuring that construction personnel have received environmental induction training • Quality assurance and reporting • Responding to incidents and complaints relating to construction of the project
Contractor site supervisor	• On-site supervision of construction activities and implementation of site environmental controls and monitoring • Monitoring implementation of CEMP requirements in the field • Daily toolbox talks that highlight environmental management aspects as appropriate • Completing daily inspection reports
Arborist	• Provide induction training on identifying significant tree species and tree protection • Provide induction training in Myrtle Beech wound management, pruning and application of anti-fungal agents • Provide induction training in structural root zone and root protection methods • Provide induction training for identification of hazardous trees • Inspection of significant or hazardous trees prior to, during and after works as required • Responding to incidents and complaints that relate to tree management

Role	Responsibilities
	• Collecting data to inform offset reconciliation requirements in the event of additional trees needing to be removed or considered consequentially lost
Ecologist (Biodiversity advisor)	• Participation in micro-siting for designated ecological sensitive areas • Provide induction training to identify significant species, habitat and protection • Provide induction training to identify known weed species • Provide induction training to identify potential groundwater seeps/springs • Inspection of areas of environmental sensitivity prior to, during and after works, as required • Responding to incidents and complaints that relate to biodiversity
Heritage advisor	• Participation in micro-siting for designated heritage sensitive areas • Provide induction training for identification of heritage features • Inspection of identified areas of archaeological potential prior to, during and after works • Responding to incidents and complaints that relate to heritage
Geotechnical/ geomorphological advisor	• Assessment of risk and remediation measures in in the event of a large-scale failure which has resulted in significant damage to the trail and natural landform • Advising on geotechnical or geomorphological issues as required • Responding to incidents and complaints that relate to geotechnical hazards
Noise and vibration advisor	• Advising on the duration of noise monitoring prior to construction if works are planned to occur outside of normal working hours to confirm the applicable noise criteria • Assessing whether works outside of normal hours comply with EPA Publication 1834 • Responding to incidents and complaints that relate to noise and vibration
Independent auditor	• Undertaking independent audit of CEMP implementation

4.0 Construction activities

This section details the construction activities to be undertaken for the project covered by this CEMP.

The following references provide guidance on sustainable mountain bike trails and have informed the project design and the proposed methods of construction:

- Australian Mountain Bike Trail Guidelines, Mountain Bike Australia, 2019
- Bike Parks: IMBA's Guide to New School Trails, International Mountain Bicycling Association, 2014
- Managing Mountain Biking: IMBA's Guide to Providing Great Riding, International Mountain Bicycling Association, 2007
- Trail Solutions: IMBA's Guide to Building Sweet Singletrack, International Mountain Bicycling Association, 2004
- Victorian State Public Land Mountain Bike Guidelines, Parks Victoria, 2020.

Details on the mitigation and contingency measures for potential construction impacts are discussed in Section 6.0.

4.1 Overview of activities

The scope of the CEMP encompasses the network of up to 177 kilometres of trails and the supporting infrastructure. The main project components are as follows:

- The mountain bike trail network, consisting of:
  - Upgrade of existing mountain bike trails – approximately 12 kilometres (seven per cent of project length)
  - New mountain bike trails – up to 155 kilometres (87 per cent of project length)
  - Existing vehicle roads and tracks to be incorporated into the mountain bike trail network - approximately 10 kilometres (six per cent of project length)
- Two new bridges, as follows:
  - Yarra River Bridge (shared use), crossing over the Yarra River, Warburton Highway and Dammans Road
  - Old Warburton Road Bridge (mountain bike use only), crossing over Old Warburton Road
- New Visitor's Hub and main trail head at the Warburton Golf Course, new trail head facilities at Mount Tugwell, Mount Donna Buang and Wesburn Park (which includes an additional 120 car parking spaces). An additional network access point to the network will be at Dee Road, which is an established access point for the O'Shannassy Aqueduct Trail.

Table 4-1 below summarises the proposed trail network, providing indicative lengths, proposed trail difficulty ratings and the type of trail experience. This also includes Trails 45-47 with a combined length of approximately 15 kilometres that are proposed as an alternative to Trail 1.

Table 4-1 Trail network summary

No.	Length (m)	Notes	Trail style	Proposed trail difficulty rating
1	22540	Drop-a-K - Descends from top of Mount Donna Buang to golf course.	Wilderness	Intermediate
2	4534	Undulating trail running parallel to O'Shannassy Aqueduct linking to Dee Rd car park and then to Drop-a-K.	Adventure	Intermediate
3	2580	Loop trail located between Trail 1 and 2.	Adventure	Intermediate
4	92	Short link between Trail 1 and 2.	Adventure	Intermediate
5	5586	Gravity trail from Mount Donna Buang Rd down to O'Shannassy Aqueduct.	Gravity	Intermediate / Difficult

No.	Length (m)	Notes	Trail style	Proposed trail difficulty rating
6	4700	Gravity trail from Mount Donna Buang Rd down to O'Shannassy Aqueduct.	Gravity	Difficult
7	4006	Loop trail, starting and finishing on O'Shannassy Aqueduct.	Adventure	Easy / Intermediate
8	4888	Easy descending trail from Mount Donna Buang Rd down to O'Shannassy Aqueduct.	Flow	Easy
9	1975	Loop trail located on private property (Eco Lodge) above golf course.	Adventure / Flow	Easy
10	3804	Golf course loop. Concept only.	Adventure / Flow	Easy
11	5806	First loop on Mount Little Joe.	Adventure / Flow	Easy
12	2829	Second loop on Mount Little Joe.	Adventure	Easy
13	4488	Third loop on Mount Little Joe.	Adventure	Easy
14	4720	Loop to summit of Mount Little Joe.	Adventure / Flow	Easy / Intermediate
15	1921	Descending trail on the north/east face of Mount Little Joe.	Gravity	Intermediate
16	1549	Descending trail on the east face of Mount Little Joe.	Gravity	Difficult
17	2606	Climbing link from old Warburton Chalet into trail network.	Adventure	Easy
18	805	Descending trail through Backstairs corridor.	Gravity - existing hand-built trail (some features to be re-built)[1]	Difficult
19	794	Descending trail through Backstairs corridor.	Gravity - existing hand-built trail (some features to be re-built)	Intermediate
20	1431	Descending trail through Backstairs corridor.	Flow	Intermediate
21	503	Access linkage between Backstairs trail junction and vehicle track.	Adventure	Easy
22	2790	Climbing linkage from Old Warburton Rd crossing up to Edwardstown Rd.	Adventure	Intermediate
23	1305	Descending trail from Edwardstown Rd to Old Warburton Rd crossing.	Flow	Intermediate
24	2647	Descending trail from Edwardstown Rd to Old Warburton Rd crossing.	Flow	Easy
26	5144	Existing mountain bike trail - Hey Hey My My	Adventure - existing hand-built trail (some features to be re-built)	Intermediate
27	7462	Main climbing trail to summit of Mount Tugwell.	Adventure	Intermediate
28	4636	Descending style descending trail from summit of Mount Tugwell.	Flow	Intermediate

[1] Note that some features will be rebuilt on existing trails to bring them in line with current design standards.

No.	Length (m)	Notes	Trail style	Proposed trail difficulty rating
30	3031	Gravity descent from summit of Mount Tugwell using mix of new and existing mountain bike trails (Top Track).	Gravity - existing hand-built trail (some features to be re-built)	Difficult
31	580	Alternate end section on 30.	Gravity - existing hand-built trail (some features to be re-built)	Difficult
32	1665	Gravity descent from summit of Mount Tugwell using mix of new and existing mountain bike trails.	Gravity - existing hand-built trail (some features to be re-built)	Difficult
33	3266	Gravity descent from summit of Mount Tugwell using mix of new and existing mountain bike trails (Matt's Track).	Gravity - existing hand-built trail (some features to be re-built)	Intermediate
34	645	Linkage trail between 30 and 32.	Gravity - existing hand-built trail (some features to be re-built)	Difficult
35	1701	Linkage from Edwardstown Rd into Mineshaft Hill area.	Adventure	Intermediate
36	149	Linkage between Trails 28 and 35.	Adventure	Intermediate
37	416	Linkage between Trails 27 and 35.	Adventure	Intermediate
38	1575	Linkage between summit of Mount Tugwell and Tugwell trail head.	Adventure	Intermediate
39	5208	Long climbing trail, from Edwardstown Rd to Mount Tugwell trail head, parallel below Mount Bride Rd.	Adventure	Easy / Intermediate
40	1109	Link trail between 40 and 42.	Flow	Easy
41	5848	Descending trail below Mount Bride Rd.	Flow	Easy
42	5410	Long descending trail from Tugwell trail head wrapping around onto Mount Bride.	Wilderness	Intermediate / Difficult
43	2479	Gentle descending trail into Wesburn Rec Reserve. Uses portion of old tramway.	Adventure	Easy
44	2592	Climbing trail out of Wesburn Rec Reserve.	Adventure	Easy
45	4060	Alternative to Trail 1. Commences at the summit of Mount Donna Buang, moderate with steep sections it flows down the southern fall of the ridgeline joining up with Trails 5 and 6.	Wilderness	Difficult
46	5511	Alternative to Trail 1. Commences at the summit of Mount Donna Buang, moderate with steep sections winds down the northern fall of the ridgeline, under Mount Victoria, joining up with Trails 5 and 6.	Wilderness	Intermediate
47	5617	Alternative to Trail 1. Commences at Mount Donna Buang Rd, moderate with steep sections, joining up with Trail 8.	Adventure	Easy

No.	Length (m)	Notes	Trail style	Proposed trail difficulty rating
48	1283	Forms a loop between the summit of Mount Tugwell and the Mount Tugwell trail head on Mount Bridge Rd.	Adventure	Intermediate
49	7043	Climbs to the top of Mount Bride, before a flowing descent and short climb to reach Groom Hill. Descends from Groom Hill to eventually merge onto Trail 42.	Wilderness	Difficult
50	2821	Less challenging option to Trail 49, avoiding summits of Mount Bride and Groom Hill, eventually merging onto Trail 49.	Wilderness	Intermediate / Difficult
51	4059	Descending trail starting at Mount Tugwell shuttle drop-off on Mount Bride Rd and finishes on Trail 42.	Gravity	Difficult
52	3754	Starts at Mount Tugwell shuttle drop-off and merges onto Trail 42, 4 km and 400 m of descent	Flow	Intermediate
53	1320	Short descending link trail, starting at junction of 40 and 41, and dropping down onto 52.	Flow	Easy / Intermediate
54	1170	Continues from Trail 29, repurposes the steep and deeply eroded lower section of Cemetery Track.	Air flow / Gravity	Extreme
56	1598	Climbing trail that short cuts some of the more meandering parts of Trail 27.	Adventure	Difficult
57	713	Climbing trail that short cuts some of the more meandering parts of Trail 27.	Adventure	Difficult
58	211	Climbing trail that short cuts some of the more meandering parts of Trail 27.	Adventure	Difficult
59	136	Walking track link down to La La Falls from Trail 42.	Not applicable	Walking track
60	529	Climbing trail near Old Warburton as an optional A-line climb on Trail 22, follows an existing management vehicle track.	Adventure	Difficult
61	1567	Contingency trail providing exit onto Warburton-Lilydale Rail Trail just near Trail 11 start.	Adventure	Easy
62	678	Extends Hey Hey My My to the top of Mineshaft Hill, where it also links into Trail 63.	Adventure / Flow	Intermediate
63	2184	A loop trail that connects Mineshaft Hill with Old Warburton Road and Edwardstown Road.	Adventure	Intermediate
64	785	Descending trail from Edwardstown Rd/Cemetery Track, connecting directly to the top of the descending portion of Trail 26.	Flow	Intermediate
65	1359	Descending trail between existing trails 30 and 33, above Mount Bridge Rd, and connecting into the end of Trail 31.	Gravity	Difficult

No.	Length (m)	Notes	Trail style	Proposed trail difficulty rating
66	306	Existing motorbike trail. Provides short connection between 54 and 55, allowing riders to bypass the trail head / junction area at Cemetery Track / Edwardstown Rd.	Gravity	Difficult

4.2 Construction organisation

Trail construction is generally undertaken in teams of three to four people. Each team has all the equipment, vehicles and machinery required to operate independently. Up to eight teams would be dispersed across the different trail extents at any one time, each with a 1.6-tonne mini-excavator and dual cab ute with trailer. The mini excavator is left on-site, and crew transport tools and fuel into the works area by vehicle or power carrier.

The conditions at Warburton are reasonably good for trail construction:

- Soils are deep and loamy with good clay content
- Rock availability is limited
- Topography ranges from gentle to steep side slopes, but are generally moderate
- There are numerous existing roads and four-wheel drive tracks, providing reasonably good construction access
- Climate is moderate. Summers are mild to hot, while winter can be cold and wet with infrequent snow falls at higher altitudes. Some stand-down days should be expected in summer due to Total Fire Ban or Code Red fire conditions, while in winter wet weather is likely to require standing down from time to time.

With good conditions for trail construction, it is estimated that an experienced team of professional trail builders would complete between 60 and 100 metres of trail per day.

Construction of the Yarra River Bridge and Old Warburton Road Bridge is anticipated to take up to approximately six months.

Construction of the main trail head is expected to take approximately three months, with works at other trail heads lasting a number of weeks.

Coordination with VicForests will be undertaken to ensure that construction activities are not planned in the same area and at the same time as timber harvesting activities.

4.3 Trail design methodology

The process for designing the mountain bike trail network assessed in the EES followed two broad stages – conceptual design and detailed design (also called ground-truthing).

In the conceptual stage, trails were planned and mapped out based on a sound understanding of the on-ground conditions, knowledge of access points into the trail and the aspirations of the project with regard to user experience, difficulty and trail sustainability.

In the detailed design stage, which extended through to the end of EES development, each conceptual trail alignment was carefully investigated in the field, with the final alignment (within a 20-metre corridor) walked, mapped with GPS and flagged with coloured flagging tape. The detailed design walkovers resulted in some changes to conceptual alignments in response to on-ground conditions. At some locations, the terrain offered unexpected challenges which forced the trail to be modified for environmental, safety, budgeting or other reasons. At other locations, where constraints were not identified, the terrain offered unexpected opportunities, which encouraged the trail alignment to be modified to maximise the experience of the user by making the most of the existing terrain (and thereby avoiding the need for significant excavation or soil disturbance).

During ground-truthing, the following design principles were considered:

- Where practicable, align trails on old benches/old roads/water races or other disturbance corridors, which are reasonably common in areas that have a history of mining or logging.

- Minimise the use of switchback corners as much as possible by drawing out traversing sections as far as possible and using the available space and terrain as much as possible. Switchback corners are difficult to build and maintain, and generally have a broader construction footprint.
- Where switchback corners can't be avoided, avoid stacking numerous switchback corners on top of each other. This can be done by drawing out the traversing sections between switchbacks as far as possible and deliberately offsetting the switchbacks. Stacked switchbacks create a broad area of disturbance and also create increasingly difficult drainage problems as they constantly discharge water flow onto the trail/switchback located directly below.
- Where practicable, connect the proposed trails to or follow short sections of existing management vehicles only (MVO) tracks. MVO tracks are useful to break up long sections of single track, provide rests and overtaking opportunities for riders and provide construction and emergency access.
- Where possible maintain a buffer from private properties and in particular seek to ensure that nearby private dwellings are not clearly visible from trails.
- Each trail must be designed according to the proposed Trail Difficulty Rating, especially with regard to the maximum allowable trail gradient:
    - Easy – maximum 15%, average 7% or less
    - More Difficult – maximum 20% or greater, average 10% or less
    - Very Difficult – maximum 20% or greater, average 20% or less
    - Extremely Difficult – maximum 40% or greater, average 20% or greater
- Use a clinometer to measure gradient.
- Avoid excessively steep and excessively flat areas where possible. Ideal side slopes range from 10 – 50%.
- Design the trail to maximise exposure to changing aspects and vegetation communities. This helps to keep the trail interesting and appealing.
- Design the trail to be constantly changing – no straight lines, no constant unrelenting climbs or descents. On climbs, include some flat and downhill sections, applying the Climb-Rest-Climb protocol. On descents, vary the gradient and include occasional short flat or uphill sections.
- Use the terrain to its maximum. The final shape and feel of the trail is dictated by the terrain, so any interesting shapes or features that are present in the landscape (including both natural and man-made) were capitalised on where possible.
- Demarcating environmental values will be done using a range of techniques, proportionate to the sensitivity of values being protected, the level of risk and the location. Typically, flagging tape protocols will be used as outlined below, although other measures such as star pickets may be used where higher levels of protection are needed.
- Flagging tape protocols:
    - Use flagging tape tied to trees/vegetation to mark the approximate centreline of the trail
    - Each piece of flagging tape should be visible from the adjacent piece. In dense vegetation use more flagging tape. In sparse vegetation, use less
    - Three pieces of tape attached to the same tree/branch indicates a sharp corner (either a switchback or a bermed corner)
    - Flagging tape will be removed following the completion of construction
- GPS protocols:
    - A high accuracy GPS was used to record the approximate centreline of trail alignments
    - Waypoints were captured at appropriate locations, including for:
        - Waterway crossings, designating the type of treatment to be used
        - Views or possible lookouts
        - Intersections with MVO tracks
        - Switchback corners

- Rock features.

4.4 Trail construction methodology

This section outlines how trails will be further refined and then constructed following project approval. A critical part of this process is the procedure for micro-siting which will find the exact alignment for each trail within the 20-metre corridor covered by the Specific Controls Overlay in the Yarra Ranges Planning Scheme. This procedure is described in Section 4.4.1.

Subsequent sections provide further information on the following construction aspects:

- Standard excavation trail
- Elevated structures
- Rock armouring
- Raised embankments
- Retaining walls.

4.4.1 Micro-siting procedure

This procedure has been developed to outline the requirements of micro-siting of the project trail alignments prior to construction, in order to avoid and minimise impacts of mountain bike trails on biodiversity and heritage values (refer to Attachment 1 for values to be addressed by micro-siting). Micro-siting will occur within the 20-metre corridor subject to the Specific Controls Overlay as specified in the Yarra Ranges Planning Scheme. The specific trail alignments determined through micro-siting will be recorded spatially using Collector for ArcGIS (or equivalent), physically marked in the field where necessary and the trail builders will be informed.

Micro-siting is the process where trail builders and technical specialists walk the approved ground-truthed trail alignment to review and inspect the proposed alignment, make any required minor changes to the alignment to avoid (no impact) and minimise impacts on environmental and cultural heritage values and decide on the specific construction treatments that will be required. Micro-siting, within the approved corridor, helps to further minimise impacts on specifically identified environmental or cultural heritage values.

The key values or issues to be addressed by micro-siting are:

- Flora species and vegetation communities:
  - Avoidance of Cool Temperate Rainforest (CTR), Cool Temperate Mixed Forest (CTMF) and Myrtle Beech canopy, roots and trunk
  - Avoidance of rare or threatened flora
  - Avoidance of large trees and canopy trees
  - Minimisation of encroachment into Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) areas
  - Achieve sufficient separation from any hazardous trees
  - Weed invasion into relatively weed free areas.
- Waterway values:
  - Avoidance of platypus burrows
  - Avoidance of threatened crayfish habitat (Curve-tail Burrowing Crayfish)
  - Consideration of drainage issues
  - Minimisation of interactions with groundwater dependent ecosystems, seeps/springs and associated vegetation communities
  - Optimisation of waterway crossing locations.
- Fauna habitat:
  - Avoidance of high quality Leadbeater's Possum habitat in thicket vegetation
  - Avoidance of Mount Donna Buang Wingless Stonefly habitat

- Avoidance of Tubercle Burrowing Crayfish habitat
- Avoidance of roost or nest sites for forest owls and arboreal mammals
- Avoidance of lyrebird mounds
- Avoidance of ground-dwelling fauna burrows (e.g. wombat).

- Historic heritage sites:
  - Mines
  - Tramways
  - Water races
  - Heritage-listed sites
  - Areas of archaeological potential.
- Aboriginal cultural heritage sites
- Existing forest and park assets
- Third party assets
- Private property.

4.4.1.1 Spatial review of values

The spatial data (maps) for each trail will be reviewed for the existence of values that require consideration through micro-siting in accordance with Attachment 1. This review will be undertaken by the contractor construction manager and the Yarra Ranges Council Project Manager. Based on the presumed values identified during the spatial survey, the required attention through micro-siting, the level of micro-siting required and the specialist personnel required to participate on-ground will be determined.

Each value has been allocated a nominal 'level' of micro-siting (see Table 4-2). Each level of micro-siting will be overseen on-ground, by appropriately trained and experienced personnel, this includes the trail construction crew through to ecology and heritage experts.

Table 4-2 Levels of micro-siting

	LEVEL 1	LEVEL 2	LEVEL 3
Definition	Obvious issues	More complicated issues	High value sites or complex issues
Personnel required on-ground	Trail construction crew Council project manager	Trail construction crew Council project manager Council specialists (e.g. Arborist)	Trail construction crew Council project manager Technical specialists (e.g. Ecologist/ heritage advisor) Relevant land managers (e.g. DELWP, Parks Victoria)

4.4.1.2 Pre-start Trail Review

Following the spatial review, a Pre-start Trail Review (PSTR) will be undertaken for every trail, with the purpose being to inspect the approved ground-truthed alignment of the trail before construction starts and make any final decisions about the exact alignment and any construction treatments to be applied. The PSTR will be undertaken by the contractor construction manager, contractor site supervisor, Yarra Ranges Council Project Manager and technical specialists where appropriate.

A pro-forma (see Attachment 2) will be used to record the outcomes of the PSTR, which will be signed off by representatives of the trail construction company and approved by the Yarra Ranges Council Project Manager on completion, with a copy provided to Yarra Ranges Council. This pro-forma will capture details such as trail name and number, personnel present, date and any high significance values that are known along the trail.

Spatial data will be collected in Collector for ArcGIS (or equivalent) to document the spatial extent of any alignment changes or treatments determined during the PSTR. This will include alignment changes, 'no-go zones' for avoidance of high cultural heritage or environmental values, and

construction treatments. In some cases, this may include photographs which can be used to document the existing conditions of any key sites before construction. This spatial data will be provided to the relevant land manager.

Any decisions made during the PSTR will be marked up on-site. This will typically be done using highly visible flagging tape or bunting. Different colours of highly visible flagging tape and bunting will be used to indicate alignment changes and 'no go zones'.

4.4.1.3 Micro-siting of trail alignment

In response to the PSTR, minor changes will be made to the trail alignment as required by the trail construction crew, in consultation with relevant personnel and in accordance with the procedure for the relevant value type (refer Attachment 1). These changes must not result in the trail alignments moving beyond the boundary of the Specific Controls Overlay as specified in the Yarra Ranges Planning Scheme.

Any changes made to the trail alignment will be recorded spatially and be consistent with the PSTR approved by the Yarra Ranges Council Project Manager.

4.4.1.4 Monitoring, evaluation and review

Implementation of the micro-siting procedure will be monitored in accordance with the project Quality Plan by the Yarra Ranges Council Project Manager, with appropriate evaluation points throughout construction to ensure the process is achieving its stated purpose. This will include verification that the outcomes of the PSTR documented in the pro-forma are implemented during construction.

Periodic review will be undertaken by both the contractor construction manager and Yarra Ranges Council Project Manager, with any changes required made to ensure continuous improvement.

4.4.2 Standard trail excavation

Broadly speaking, the process of constructing a standard excavation mountain bike trail is as follows:

- Each day prior to commencing work, review the micro-sited trail alignments up to 100 to 200 metres ahead of the excavator, both visually on the ground and also using the ArcGIS platform or equivalent, which includes all the approved trail alignments, known construction treatments and known environmental issues.
- Clear the construction corridor of vegetation. The construction corridor is defined as the horizontal corridor from the top of the upslope batter to the toe of the downslope batter (between 1.2 and 3.3 metres wide) and the vertical corridor to about 2.5 metres high (sufficient to allow passage of the excavator). Clearing of the construction corridor is usually undertaken manually using motorised tools such as brush cutters, chainsaws and hedge trimmers and hand tools like loppers, hand saws and secateurs. Large trees do not need to be removed, as the trail can be routed to avoid them, however, it is likely that small boughs and limbs may need to be removed. All vegetation that is removed is cut into small pieces and used to cover the exposed soil of previous trail section or dispersed throughout the surrounding area – no large windrows or stockpiles will be formed. At this stage, all vegetation is removed except for ground covers, herbs and grasses (which are left in place for later removal by the excavator).
- Cut the bench using cut and fill technique. The topsoil and mineral earth removed from the inner side of the bench are used to build up the outer edge of the bench. The excavator works forwards, cutting the bench ahead of it and then moving forward onto the bench. The bench must be wide enough and stable enough for the excavator to operate safely on. Using a rubber-tracked mini-excavator with a minimum track width of about 900 millimetres, the bench is generally constructed at 1.2 metres width. Note that the cut material (i.e. the spoil) may be moved locally forward or backwards along the trail to areas where fill material is required. Overall, cut and fill is always balanced, with no fill material removed off-site. On steeper slopes, the outer edge of the bench may need to be retained. In mountain bike trail construction this is generally done using dry stone rock walls, built from rock sourced during the construction of the bench.
- Different hill slopes will require differing amounts of excavation, with the overall width of impact varying between 1.2 metres and 3.3 metres. The depth of excavation will vary by location with the maximum expected to be around 0.8 metres (with the majority of trail excavation being less than 0.4 metres). Cut material will need to be transported along the trail from steeper trail cross slope areas. Naturally occurring rock will be used to protect the toe of the fill batter and stabilise steeper slopes where available and appropriate.

- Define the ride line by placing rocks, logs and other obstacles as necessary that are to be sourced from the trail construction area. Large obstacles work best and will be manoeuvred into place by the excavator. The ideal ride line is generally on the inner side of the bench, at the toe of the upslope batter, where the soil is firm and compacted. Obstacles are manually and deliberately placed to control rider speed and position riders towards the inside of the bench, away from the soft outer edge.
- Clean up the trail tread, removing loose rocks and roots, compacting the tread, back sloping the batter and managing drainage (for example, ensuring the trail is outsloped where practical). This step is undertaken manually by trail labourers working behind the excavator.

The trail is now complete. The trail should be rested for as long as possible before allowing riders to use it. This allows the trail tread to settle and harden before being subjected to use.

This process above describes the typical methodology for 80-90% of mountain bike trails.

In some instances where it is not safe, possible or desirable to use an excavator, the trail can be cut by hand. The process remains the same as described above, but the bench is cut by hand instead of by excavator. One of the key benefits of hand-constructed trails is a narrower construction footprint as the bench doesn't need to be cut wide enough to allow the passage of the excavator.

Photo examples of trail excavation:

4.4.2.1 Rock armouring

Rock armouring is a technique used to harden the trail surface. It is often used on steep gradients, where the soil will likely be displaced by water or trail users, leading to erosion. It can also be used on high traffic areas or areas where soils are unstable.

Rock armouring is usually carried out as follows:

1. Mark out the area to be rock armoured.
2. Collect suitable rocks. Ideally, these are uncovered and placed off to the side during standard trail construction, for usage later on. Rocks should be as large as is practical –generally recommended that all rocks be 'microwave' sized as a minimum. Rocks should ideally be 'plate' shaped, with flat upper and lower surfaces, but this is not always possible. The amount of rock needed is not large; these will be sourced from within the constructed area to the extent possible; however, small amounts of rock may need to be imported for targeted rock armouring works.
3. Excavate soil from the area to be rock armoured, to the approximate depth of the rocks to be used. Dispose of spoil appropriately, keeping some in reserve for packing in around rocks.
4. Beginning from the bottom and working uphill, place rocks into the excavated trench, locking them together and packing each one in place before moving onto the next. The goal is to ensure that the upper surface of the rock-armoured section is as flat and uniform as possible, (although sometimes it may be desirable to make it uneven or rough). Rocks should not be placed in uniform rows, as this causes the gaps/joins to line up, creating potential traps for water and wheels.
5. Once all rock armouring is complete, use any left-over soil/rocks to pack in around the edges of the rock armouring.

If rock armouring is performed correctly, it will resist erosion and last for many years.

If in situ/locally sourced rocks from the trail are not readily available, an alternative option is to use adjustable rock matting (ARM). It will be embedded into the ground in sheets to provide a continuous level tread surface with the adjacent tread of the trail. Rock armouring will not be used for crossing waterways.

Photo examples of rock armouring:

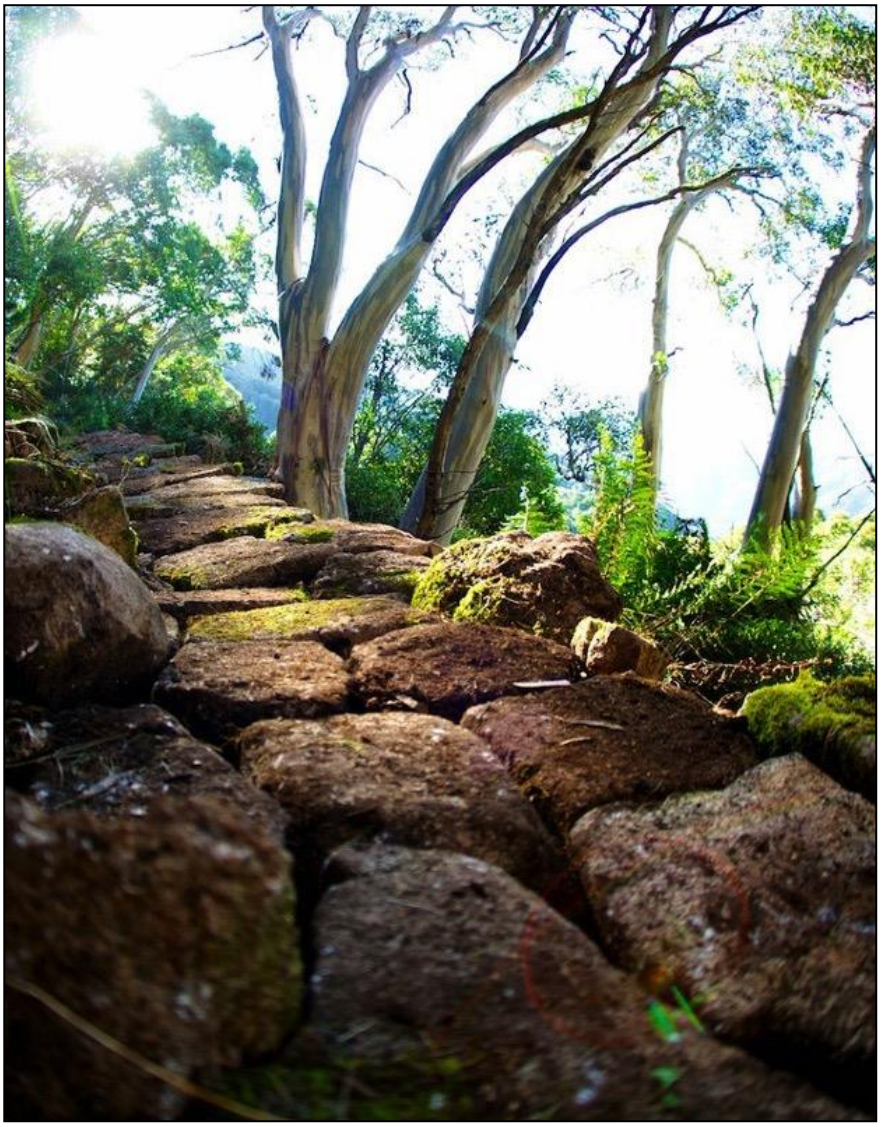


Photo examples of Adjustable Rock Matting (ARM):

4.4.2.2 Raised embankment

Raised embankments may be necessary in trail sections that are often wet and boggy, or to improve rideability, through changing the vertical alignment.

Essentially this technique uses extra ‘fill’ material to build the trail tread up higher. The fill material is usually sourced from another area where there is an excess of material and moved along the trail to where it is required. In some instances, fill material can be imported to the location from an external source, but this is often impractical in trail construction due to the limited access points, the long linear distances of importing along the trail, and the potential to introduce additional biosecurity risks.

Raised embankments are generally used where the ground surface is not suitable for typical cut and fill benching techniques. Examples include:

- Areas with soft, boggy ground
- Areas where tree roots run along the tree surface
- Areas that are very flat with no/little cross-slope to effect drainage.

Raised embankments should be constructed so that they do not impede the flow of surface water or they should have suitable drainage structures (e.g. pipes/culverts) placed at the bottom of the fill material. They should also be constructed so as not to cause root rot to any nearby Myrtle Beech trees. An arborist will be required to assess this risk as part of the pre-construction assessment.

Rocks can be placed at the toe of the embankment to stabilise the batters and protect the bottom section of the embankment from erosion.

Where there is sufficient room, rocks can also be placed at the top of the embankment to direct riders into a preferred ‘ride line’.

Photo examples of raised embankment:

4.4.2.3 Rock walling

Rock walling is used from time to time to retain the upper or lower batters, usually in areas with excessively steep side slopes.

Rock walling used in standard trail construction is less than 500 millimetres high and is constructed using boulders/rocks sourced during standard trail construction. These rock walls are constructed with the assistance of an excavator, as the trail is being constructed. The excavator cuts a trench/pad for the boulders to sit in and can also be used to move/manipulate the heavier rocks into position. These retaining walls don't use concrete or other imported materials as a general rule, and being less than 1 metre high, don't require any specific engineering requirements.

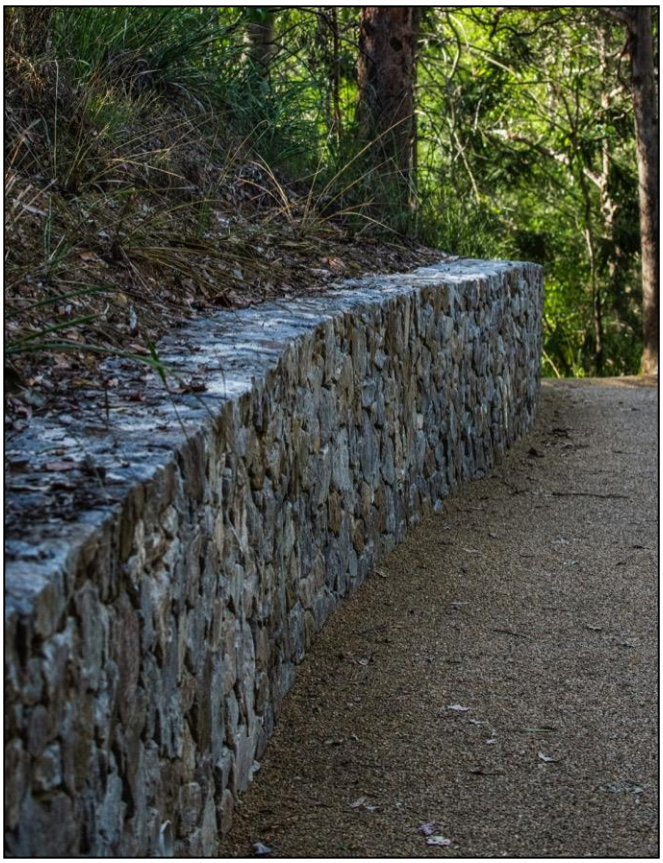
Photo examples of rock walling:

4.4.2.4 Retaining walls

Retaining walls over 1 metre are much less common on mountain bike trails. They are more commonly used on wider trails, for example, high volume walking tracks or shared-use trails. Retaining walls greater than 1 metre high require the use of imported materials, such as concrete, rock, geofabric and aggregate and require certification by a qualified engineer.

Retaining walls will be constructed using local rock from the trail construction area where possible, brought in along existing trails by a power carrier. If a retaining wall was required in a remote location, it will be brought in by helicopter to avoid surface impacts beyond the trail impact area.

Photo examples of retaining walls:



4.4.2.5 Low-level bridges

Low-level bridges (sometimes called boardwalks) are typically used where the trail crosses over a waterway or area of soft or boggy ground.

A variety of different decking materials can be used. The most commonly used materials are timber, Fibre Reinforced Plastic (FRP) mesh, or steel mesh. The use of mesh decking allows light and water to penetrate through the bridge, thus minimizing the impact on the vegetation below.

Typically, low level bridges should be less than 1 metre above the ground[2] to avoid the requirement for handrails. Handrails can be a crush hazard for mountain bike riders' fingers. Sometimes a handrail can be avoided by slightly adjusting the location of a bridge and thus reducing the height of the drop off. In the instance of a low-level bridge being greater than one metre above the ground, the implementation of a handrail will be required.

Environmentally sensitive designs are available for timber and FRP low level bridges through sensitive areas, where it is desirable to avoid excessive excavation (such as typically occurs for normal bridge/boardwalk construction techniques using post and concrete footings). Key design parameters are:

- Footings are hydraulically driven to refusal, requiring minimal impact and excavation
- Maximum span lengths of 5 metres allow the bridges to span the majority of the small streams encountered, without the need for any footings within the defined waterway channel
- Efficient use of materials. Given the remote locations of the bridges, all materials will likely need to be carried in by hand along the trail, so there is a need to prioritise strength over weight.

Low level bridges on mountain bike trails should be designed and placed so as to be as short, straight and level as possible. The entry and exit should ideally be straight and in-line with the bridge. The trail design should naturally slow riders on their approach to the bridge, ensuring that they don't enter at high speeds. Rock armouring (either natural or ARM) for 3 to 5 metres at the entry and exit of the bridge is generally recommended – it helps manage any abrasion that may result from heavy braking and can also help to shed mud/dirt off tyres before crossing the bridge.

Designs for waterway crossings will be finalised in consultation with Melbourne Water as part of the approvals process for licences required for works on waterways.

[2] Measured from the top of the decking surface down to the ground.

Photo examples of low-level bridges:

4.5 Bridge construction

Existing clearings on either side of the proposed Yarra River Bridge and Old Warburton Road Bridge will be used as laydown areas. Pre-fabrication of bridge components is anticipated to occur primarily off-site at the council's existing Yarra Junction Depot. These will be trucked to the adjacent bridge laydown areas, and then assembled into position using a crane.

No works are proposed within the Yarra River. The Yarra River Bridge pylons will be constructed on the crest of the existing river channel to avoid alterations to existing flood conveyance or behaviour.

To allow for safe construction of the bridges overhead, road closures of Old Warburton Road, Warburton Highway and Dammans Road may be required for a few hours at a time. Road closures will be minimised to the extent possible to avoid disruption for the nearby community and are anticipated to be required on two or three occasions when craning large bridge elements overhead.

To facilitate the installation of the Yarra River Bridge, one span of existing overhead power lines currently adjacent to the proposed bridge location will require undergrounding. This work will be undertaken by AusNet and will require temporary closure of one lane of traffic, with the level of disruption expected to be the same as during typical maintenance works. The works will be

undertaken within the existing easement, where the wire will be dropped down the existing pole and installed within a trench between the two poles. The rest of the powerline will remain unchanged.

4.6 Visitor's Hub and trail head construction

The construction activities for the car park at the new Visitor's Hub and main trail head to the south of Warburton Golf Course will consist of site establishment (compound/fencing), geotechnical investigations, earthworks (topsoil strip and levelling), installation of drainage, car park surfacing and marking, and landscaping. Other facilities installed will include a shuttle bus shelter, toilet and shower facilities, picnic tables, comprehensive visitor information that is related to the mountain bike trails and bike wash bays. Significant material deliveries will enter the site from the west, avoiding the need to travel through the town centre.

At the Mount Tugwell trail head a new car park, bus turn around bay, bike hygiene station, toilets and picnic area are proposed to be installed. The area will require clearing of existing vegetation to prepare the site for grading, although the site has been selected to minimise the need to remove trees. The gravel road surface and car parks will be installed. The toilet block and picnic area shelter will be preassembled off-site, and delivered to site by truck, requiring minimal works on-site.

No significant works are proposed at Mount Donna Buang, where the existing facilities are expected to be utilised for shuttle bus drop-off services. Minor upgrades to signage, car park surfacing and delineation, public shelter and toilets are planned to ensure facilities are adequate for increased visitor numbers. A bike hygiene station is proposed to be installed to assist with the management of weeds, pests and pathogens. Stormwater flow is planned to be improved to reduce sediment transfer off the site.

A map of the construction site will be prepared prior to the commencement of construction to show the site boundaries, no-go zones, access points, spill kit locations and sediment control locations. This map will be displayed at the construction site office.

4.7 Ancillary infrastructure and upgrades

A construction compound that will support construction activities will be located at the council's Yarra Junction Depot (or at contractor yards where appropriate). The depot will be used to store equipment/materials, for the staging and preassembly of parts, and as the project offices.

The following principles will apply to the construction works to minimise impacts and disturbance:

- Any on-site storage and structure erection works will be minimised and undertaken at the existing council depot where possible.
- Structural components will be prefabricated off-site at the depot whenever practicable to expedite site assembly works.
- An allowance has been made for helicopter delivery of critical components, and truck deliveries of strategic materials will be used only as required.
- Construction teams will carry in each day's water, food and materials and carry out rubbish/waste.
- Works will be conducted during daylight hours so lighting will not be required.
- Laydown areas for the two main bridges over Warburton Highway and Old Warburton Road already exist, and no vegetation clearing will be required.

Signposts (for example, arrows, information, maps, trail identification numbers) will be installed along trails by hand using an auger and drill.

Road upgrades of Mount Bride Road and Edwardstown Road will be undertaken by DELWP to improve the road surface. The roads are currently gravel, and these are anticipated to be resurfaced with gravel to improve the overall road strength for shuttle vehicles. No widening or sealing of the existing roads will be required.

4.8 Weed and pest management

A weed and pest management will ensure the trail operator meets their obligations under *the Catchment and Land Protection Act 1994 (Vic)* ("CaLP Act") to control weeds and pest animals.

The Victorian Government's Invasive Plants and Animals Policy describes a four-tiered approach to managing invasive species:

- Prevention is the most cost-effective form of weed control as weeds are absent and monitoring is the control method
- Eradication of any new introduced species (smaller number of localised populations) is also good value as once eradicated; prevention is the control method
- Containment of rapidly increasing or abundant species (many populations) is worthwhile to manage the impacts of a weed on weed free areas
- Asset based protection is the most appropriate control method when a weed is widespread and abundant.

Each weed species has a different ecology and phenology. Therefore, the best approach to control the spread of a weed and ultimately eradicate it differs from species to species. Methods such as application of weed spray, hand removal of weeds and cut and paint will be used to manage and control weeds.

Seven weed species that are present in the vicinity of the project are declared noxious weeds under the CaLP Act:

- Spear Thistle *Cirsium vulgare*
- Common Blackberry *Rubus fruiticosis agg.*
- Cut-leaf Bramble *Rubus laciniatus*
- Ragwort *Jacobaea vulgaris,*
- Hemlock *Conium maculatum*
- Tutsan *Hypericum androsaemum*
- Asparagus Fern *Asparagus scandens.*

Appropriate waste management techniques such as fitting waste containers with secure lids at all times and disposing of waste in appropriate waste receptacles will be used to ensure pest animal species are not attracted to the site.

Hygiene protocols will be implemented to minimise the risk of pathogen introduction and weed spread during construction (Attachment 5).

5.0 Risk assessment

An environmental risk assessment has been completed to identify environmental risks associated with construction of the project. The risk-based approach was integral to the EES as required by section 3.1 of the Scoping Requirements and the *Ministerial guidelines for assessment of the environmental effects under the Environment Effects Act 1978*.

Specifically, the EES risk assessment:

- Provided a consistent evaluation tool that is used for all assessments to systematically rate the key issues associated with the project.
- Identified key risks associated with the project that may require further examination through the detailed impact assessments
- Informed project development and/or development of measures to avoid, mitigate and mange environmental impacts.

This risk assessment method used during the EES will continue to be used during project implementation to monitor and evaluate environmental risks. The method is outlined in Section 5.1.

5.1 Risk assessment method

The risk assessment process adopted is consistent with AS/NZS ISO 31000:2018 Risk Management Process. The following tasks were undertaken to identify, analyse and evaluate risks:

- Use existing environmental conditions and identify applicable legislation and policy to establish the context for the risk assessment
- Develop likelihood and consequence criteria and a risk matrix
- Consider construction, operational and decommissioning activities in the context of existing conditions to determine risk pathways
- Identify standard controls and requirements to mitigate identified risks
- Assign likelihood and consequence ratings for each risk to determine risk ratings considering design, proposed activities and standard mitigation.

5.1.1 Assigning a consequence level

Consequence refers to the outcome of an event affecting an asset, value or use. Table 5-1 presents the consequence framework describing the consequence levels from ‘insignificant’ to ‘severe’. The consequence criteria have been developed in the form of project-wide criteria rather than discipline specific, to enable a consistent assessment of consequences across a range of potential environmental effects.

Consequence criteria is assigned based on the maximum credible consequence of the risk pathway occurring. Where uncertainty regarding consequences existed, a conservative approach to assessing risk has been adopted.

Consequence criteria considered the following characteristics:

- Spatial extent of impact
- Duration and reversibility of potential impacts
- Sensitivity and significance of the receiving environment
- Magnitude, or severity of potential impact.

Each risk pathway will be assigned a level of consequence taking into account the guidance in Table 5-1. That consequence level, together with the likelihood level will be used to determine a risk rating in accordance with the risk matrix presented in Section 5.1.3.

Table 5-1 Guide to consequence levels

Level	Criteria
Insignificant	● No detectable changes or very short-term and localised. ● Readily reversible (insignificant) impact (<1 year for recovery). ● Resilient or highly disturbed receiving environment or population. ● No impact to native vegetation or habitat. ● No impact to Cool Temperate Rainforest, Mount Donna Buang Wingless Stonefly or Leadbeater's Possum. ● Heritage: No observable impact to heritage, sites remain intact and unaffected. ● Social: No measurable impact to local character, amenity and access to public space/facilities. General community support, no impact to economy. ● Transport: Existing transport services unaffected and transport infrastructure can comfortably accommodate the project. Transport safety unaffected. ● Surface water / groundwater: No detectable changes to water levels, flow or quality with no measurable effect on assets, values or uses. ● Geotechnical hazards: No detectable changes to land stability/erosion.
Minor	● Short-term localised detectable changes. ● Impact likely to be readily reversible (within 5 years for recovery). ● Resilient or disturbed receiving environment or population. ● No impacts on critical habitats such as Cool Temperate Rainforest, Mount Donna Buang Wingless Stonefly or Leadbeater's Possum. ● Heritage: Low degree of disturbance or low degree of observable impact to locally significant heritage. No impact to state or nationally significant heritage. ● Social: Low degree of impact to local character, amenity and access to public space/facilities. Individual opposition to project, short term isolated economic issues. ● Transport: Existing transport services experience isolated and short-term disruption and transport infrastructure can accommodate the project. Transport safety not materially affected. ● Surface water / groundwater: Changes to water levels, flow or quality with isolated and short-term effect on assets, values or uses. ● Geotechnical hazards: Changes to land stability/erosion with isolated and short-term effect on assets, values and uses.
Moderate	● Short or medium-term detectable changes at a number of locations within the study area. ● Impact likely to be medium-term and reversible (5–10 years for recovery). ● Undisturbed receiving environment or population. ● Short-term, localised impacts on critical habitats such as Cool Temperate Rainforest, Mount Donna Buang Wingless Stonefly or Leadbeater's Possum. ● Heritage: Limited degree of impact to heritage of state or local significance. ● Social: Limited degree of impact to local character, amenity and access to public space/facilities, some community resistance, economic pressure on community. ● Transport: Existing transport services experience minor but ongoing disruption or transport infrastructure can accommodate the project except for occasional short periods. Transport safety reduced somewhat but safety levels are satisfactory. ● Surface water / groundwater: Changes to water levels, flow or quality with moderate effect on assets, values or uses. ● Geotechnical hazards: Changes to land stability/erosion with moderate effect on assets, values or uses.
Major	● Long-term changes that are significant regionally. ● Impact likely to be medium to long-term and potentially irreversible (> 10 years to recover). ● Sensitive receiving environment or population. ● Material impacts on critical habitats such as Cool Temperate Rainforest, Mount Donna Buang Wingless Stonefly or Leadbeater's Possum. ● Heritage: High degree of impact to heritage of State or local significance. ● Social: High degree of impact to local character, amenity and access to public space/facilities. Vocal community conflict, declining economic stability. ● Transport: Existing transport services experience significant and ongoing disruption or transport infrastructure is strained for extended periods due to the project. Transport safety reduced with the potential for injuries. ● Surface water / groundwater: Significant changes to water levels, flow or quality with assets, values or uses significantly compromised. ● Geotechnical hazards: Significant changes to land stability/erosion with assets, values or uses significantly compromised.
Severe	● Permanent changes that are significant at a Victorian or Commonwealth level. ● Impact likely to be long-term and irreversible. ● Highly sensitive receiving environment or population.

Level	Criteria
	• Significant impacts on critical habitats such as Cool Temperate Rainforest, Mount Donna Buang Wingless Stonefly or Leadbeater's Possum. • Heritage: Very high degree of heritage destruction or loss of heritage values. • Social: Very high degree of impact to local character, amenity and access to public space/facilities. Public backlash, economic distress. • Transport: Existing transport services cease to function, and transport infrastructure is constantly overextended due to the project. Transport safety reduced with the potential for fatalities. • Surface water / groundwater: Extensive changes to water levels, flow or quality with assets, values or uses irreversibly compromised. • Geotechnical hazards: Extensive changes to land stability/erosion with assets, values or uses irreversibly compromised.

5.1.2 Assigning a likelihood level

'Likelihood' refers to the chance of an event and the chance of the identified consequence occurring. The likelihood criteria range from 'rare' where the event and consequence may occur only in exceptional circumstances to 'almost certain' where the event and consequence is expected to occur in most circumstances. Likelihoods are assigned for the maximum credible consequence according to the levels presented in Table 5-2.

Table 5-2 Guide to likelihood levels

Level	Description
Rare	The event could occur but only in exceptional circumstances
Unlikely	The event could occur but is not expected in the course of normal circumstances
Possible	The event may occur in the course of normal circumstances
Likely	The event will probably occur in the course of most normal circumstances
Almost Certain	The event is expected to occur in the course of most normal circumstances

5.1.3 Risk matrix

Risk is defined as combination of the likelihood of an event occurring and the consequence of that event occurring. A risk rating was determined by these factors using the risk matrix in Table 5-3.

Table 5-3 Risk matrix

		Consequence level				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood level	Rare	Very Low	Very Low	Low	Medium	Medium
	Unlikely	Very Low	Low	Medium	Medium	High
	Possible	Very Low	Low	Medium	High	High
	Likely	Low	Medium	High	High	Very High
	Almost certain	Low	Medium	High	Very High	Very High

When risks are rated as medium or above, the impacts associated with the risk pathway are assessed in an increasing level of detail and will prompt further exploration of potential mitigation and management actions to reduce the overall impact.

5.2 Risk register

The risk register containing the results of the risk assessment conducted as part of EES preparation is provided in Attachment 3. The risk register will be updated during the project construction phase in response to additional information that becomes available on the environmental risks in accordance with the internal environmental verification process (refer to Section 9.1).

6.0 Environmental management measures

This section describes the environmental management measures identified through the EES and the proposed monitoring and reporting mechanisms to be implemented during the construction phase.

6.1 Biodiversity

The existing environment and an assessment of potential impacts to biodiversity are discussed in EES **Technical Report A: Biodiversity and Habitats**. This section summarises the objectives to manage impacts relating to the construction phase and the mitigation and contingency measures to be applied.

6.1.1 Background

The project will involve creating an extensive narrow trail network through a mountainous forested landscape that will result in soil disturbance, waterway crossings and removal of native understorey vegetation. The residual impacts on native vegetation will equate to up to 37 hectares of understorey vegetation removal depending on the preferred trail development scenario. No tree removal is required for trail construction, and long-term tree health decline is unlikely to occur provided sensitive construction techniques are implemented.

The key ecological values identified that are subject to residual construction impacts are Leadbeater's Possum, Cool Temperate Rainforest and Cool Temperate Mixed Forest threatened communities, Mount Donna Buang Wingless Stonefly, significant flora and fauna, aquatic ecosystems, groundwater dependent ecosystems (GDEs), native vegetation and migratory species.

Trails have been sited to avoid as much habitat for significant species as possible and further micro-siting will be undertaken prior to removal of vegetation. Avoiding structural habitat fragmentation and maintaining key habitat connectivity was considered particularly important for Leadbeater's Possum.

Specific areas of potential impacts on Mount Donna Buang Wingless Stonefly habitat (soil disturbance) or sources of indirect impacts to habitat through soil compaction and sedimentation include sections of Trail 1 between Mount Donna Buang and Ben Cairn, sections of alternative Trail 45 in the catchment of Ythan Creek and sections of alternative Trail 46 in the catchment of Cement Creek. Micro-siting trail works between Mount Donna Buang, Mount Victoria and Ben Cairn and installing elevated structures in headwater habitats will minimise impacts to this species.

Impacts on Cool Temperate Mixed Forest and Cool Temperate Rainforest are largely confined to an area between the summit of Mount Donna Buang, Mount Victoria and Ben Cairn in the Yarra Ranges National Park. It is proposed to hand build all trails that intersect these communities to minimise the construction footprint as hand-built trails have been demonstrated to require less disturbance than machine-built trails.

Potential impacts to GDEs are considered in terms of native vegetation removal within GDEs as well as impacts to existing groundwater flow pathways e.g. exposure of new seeps / springs which negatively impact ecosystem health. Potential impacts to GDEs are expected to be minimal in magnitude, highly localised and short in duration. Springs will be identified prior to construction and appropriate treatments will be implemented to protect the springs and down-gradient discharging environments.

Where native vegetation impacts cannot be avoided or minimised, State biodiversity offsets will be required to compensate for the loss of biodiversity, of up to approximately 264 species habitat units for 13 species (Trail 1 scenario) or approximately 240 species habitat units for 13 species (Trail 45 to 47 scenario).

6.1.2 Objectives

The environmental management objective for biodiversity is: *Avoid, and where avoidance is not possible, minimise potential adverse effects on native vegetation and animals (particularly listed threatened species and their habitat and listed ecological communities), as well as address offset requirements consistent with state and Commonwealth policies.*

Specific objectives for each biodiversity mitigation measure are described in Section 6.1.4.

6.1.3 Relevant legislation, policy and standards

Table 6-5 lists the key legislation, policies, guidelines and standards relevant to biodiversity. A detailed description of the applicable legislation and policies and their implications on the project is provided in **Technical Report A: Biodiversity and Habitats**.

Table 6-1 Relevant legislation, policy and guidelines - biodiversity

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* ('EPBC Act') • *Flora and Fauna Guarantee Act 1988 (Vic)* ('FFG Act') • *Water Act 1989 (Vic)* • *Environment Protection Act 2017 (Vic)* - Environmental Reference Standard (ERS) - General Environmental Duty • *Planning and Environment Act 1987* - Yarra Ranges Shire Planning Scheme • *Catchment and Land Protection Act 1994* • *Fisheries Act 1995* • *Wildlife Act 1975* • *National Parks Act 1975* • *Protection of Cruelty to Animals Act 1968* • *Yarra River Protection (Wilip-gin Birrarung murron) Act 2017*
Guidelines and advisory documents	• DELWP 2017. *Guidelines for the removal, destruction or lopping of native vegetation* • Commonwealth of Australia 2013. *Matters of National Environmental Significance. Significant impact guidelines 1.1*. • DSE 2013. *Advisory List of Threatened Vertebrate Fauna in Victoria* • DSE 2009. *Advisory List of Threatened Invertebrate Fauna in Victoria* • DEPI 2014. *Advisory list of rare or threatened plants in Victoria* • EPA Victoria 2003. *Guidelines for Environmental Management – Rapid Bioassessment methodology for rivers and streams* • White, et al. 2018. *Advisory list of environmental weeds in Victoria* • Parks Victoria 2002. Yarra Ranges National Park Management Plan. • DEE 2018. National Recovery Plan for Macquarie Perch (*Macquaria australasica*) • Victorian Government 2010. National Recovery Plan for the Tall Astelia *Astelia Australiana* • DELWP 2016. National Recovery Plan for the Spotted-tailed Quoll *Dasyurus maculatus* • Doran N 2001. Burrowing Crayfish Group Recovery Plan 2001-2005 • Koehn J & Clunie P 2010. National Recovery Plan for the Murray Cod *Maccullochella peelii peelii*. • Macfarlane, M.A., Smith, J. & Lowe, K. 1997. Leadbeater's Possum Recovery Plan. • Saunders, D and Tzaros, C 2011. National Recovery Plan for the Swift Parrot *Lathamus discolour*. • DEPI 2014. Action Statement No. 62 Leadbeater's Possum *Gymnobelideus leadbeateri*. • DSE 2003. Action Statement No. 125 Mount Donna Buang Wingless Stonefly *Riekoperla darlingtoni*. • DSE 2009. Action Statement No. 238 Human activity which results in artificially elevated or epidemic levels of Myrtle Wilt within Nothofagus dominated Cool Temperate Rainforest.

6.1.4 Mitigation and contingency measures arising from the EES

Table 6-2 lists the mitigation and contingency measures for potential biodiversity impacts.

Table 6-2 Mitigation and contingency measures – biodiversity

Mitigation measure ID	Timing	Mitigation and contingency measures
General		
BM01	During construction	**Independent auditing**

Mitigation measure ID	Timing	Mitigation and contingency measures
		Objective: To ensure environmental objectives and approval conditions are met Undertake independent auditing of trail construction against environmental objectives and approval conditions. Independent auditors will have power to stop work / use of trails should the project be non-compliant. A suitably qualified ecologist will be present during micro-siting and construction activities in sensitive areas.
BM02	Prior to commencement of construction	**Update environmental issues on GIS** **Objective**: To ensure all trail alignments and environmental issues are updated All trail alignments and all known site-specific environmental issues will be incorporated into the GIS platform which will be accessible by construction crew on-site at all times.
BM03	Prior to commencement of construction	**Procedures for demarcating environmental values** **Objective**: To ensure no-go zones and environmental values are demarcated Follow procedures for flagging of the final trail alignment and demarcating environmental values to be avoided e.g. 'no-go zones' during works (refer to Section 4.3). Biodegradable tape will be preferentially used with any other non-biodegradable markers removed from site.
BM04	Construction	**Management of potential impacts to biodiversity values** **Objective**: To ensure environmental objectives and approval conditions are met The CEMP sets out the requirements and processes for the project with regards to the management of potential impacts to biodiversity values. Follow the CEMP monitoring, reporting, auditing and complaint management processes (refer to Sections 9.0 and 10.2).
BM05	During construction	**Natural materials** **Objective**: To minimise the use / removal of natural materials from the site Minimise use / removal of natural materials such as rocks, woody debris, fallen timber, organic litter during construction of trails. Natural materials will not be collected from outside of the trail construction area. Any material removed must be retained on-site nearby.
BM06	During construction	**Chemicals, fuel and waste management** **Objective**: To avoid and manage the potential for spills Implement standard controls for chemicals, fuel and waste management including procedures for spill containment and clean-up as per SWM10.
BM07	Prior to commencement of construction	**Environmental induction** **Objective**: To minimise risks to biodiversity by providing an induction on biodiversity values for construction workers Compulsory in-person environmental induction and assessment for construction phase workers. Induction to cover all biodiversity values present in the project area. An environmental advisor with appropriate ecological qualifications will be appointed to assist with inductions and to provide ecological advice throughout the course of the project.
BM08	Construction	**Emergency Management Plan** **Objective**: To manage fire risks from the project

Mitigation measure ID	Timing	Mitigation and contingency measures
		An Emergency Management Plan will be implemented. The plan will include measures to manage fire risk from project activities including compliance with any requirements under the Forests (Fire Protection) Regulations 2014 for construction and operational activities in Fire Protected Areas.
BM09	During construction	**Landform stability** **Objective**: To maintain landform stability and avoid / minimise landslips, erosion and sedimentation. Measures to maintain landform stability include the following: • Incorporate management measures outlined in GTM01, GTM02 & GMT03 • Rock armoured surfaces to be constructed on steep gradients to minimise erosion as per GTR03 • Rock walls and / or retaining walls constructed from local rock where possible to stabilise steep slopes and batters (rock is not to be collected from surrounding areas) • If a retaining wall is required in a remote location, it will be brought in by helicopter where necessary to avoid surface impacts beyond the trail impact area • Remediation of areas where landslips and/or erosion and sedimentation could occur as a result of the trail.
BM11	Construction	**Existing tracks** **Objective**: To minimise erosion and sedimentation issues associated with existing tracks Existing vehicle roads and tracks e.g. Cemetery Track to be incorporated into the trail network. Upgrades associated with incorporating these tracks will reduce existing erosion and sedimentation issues.
BM12	Construction	**Existing trails** **Objective**: To minimise erosion and sedimentation issues associated with existing trails Existing mountain bike trails in the vicinity of Mount Tugwell will be incorporated into the trail network. Upgrades associated with incorporating these trails will reduce existing erosion and sedimentation issues.
BM13	During construction	**Trail closure** **Objective**: To minimise erosion and sedimentation issues or safety hazards associated with extreme weather Trail closure during periods of extreme weather as per SWM15 and in accordance with the Emergency Management Plan and any additional directions required under the Forests Act.
BM14	Prior to commencement of construction	**Micro-siting – existing contours** **Objective**: To minimise soil disturbance issues through following existing contours Pre-construction trail micro-siting in accordance with the existing contours, to make the most of the existing terrain and minimise the need for significant excavation or soil disturbance.
BM16	Construction	**Biodiversity observations** **Objective**: To collect relevant data on biodiversity finds Document and deal with biodiversity finds, including to collect relevant data for:

Mitigation measure ID	Timing	Mitigation and contingency measures
		1) Significant flora observations 2) Significant fauna observations 3) Nests / burrows / roosts used by native fauna 4) Injured / killed / displaced / trapped fauna 5) GDEs, seeps / springs and associated vegetation communities / species. Observations of the above will be entered into the GIS platform and records of significant flora, significant fauna and threatened ecological communities will be periodically uploaded to the VBA. Where there is potential for harm of threatened species, works will be stopped until the risk of harm has been removed.
BM17	At construction completion	**Vegetation regeneration** **Objective**: To allow vegetation regeneration within the construction footprint Allow and assist native vegetation to regenerate within construction footprint to a 30 to 60 centimetre wide tread width.
BM19	Prior to and during construction	**Vegetation removal** **Objective**: To avoid removal of vegetation to the minimum extent possible Removal of vegetation will be to the minimum extent required, according to variable trail construction footprint which is a function of slope class. Accidental / excessive clearing will be remediated through assisted regeneration or additional offsets.
Pests, weeds and pathogens		
BM20	Construction	**Pest animal program** **Objective**: To manage pest animals The project will support existing pest animal programs conducted by working with public land managers. Support will be implemented for the entire life of the project i.e. as long as the trails remain in use.
BM22	Construction	**Weed management program** **Objective**: To manage weeds A comprehensive weed management program will be implemented along and in the immediate vicinity of trails. The program will be developed in consultation with land managers and will continue for as long as the trails remain in use.
BM23	Prior to commencement of construction	**Environmental induction - weeds** **Objective**: To minimise risks to biodiversity by providing an induction on high threat environmental weeds for construction workers Construction staff trained as part of site induction to identify high threat environmental weeds within the project area and to implement procedures to minimise risk of spread. Training will include distribution of fact sheets, Yarra Ranges Weed ID guide and CaLP Act obligations.
BM24	During construction	**Ground surface disturbance** **Objective**: To avoid disturbance to the ground surface in areas known to contain invasive weeds and pathogens (including Myrtle Wilt) wherever possible In high risk areas a suitably qualified ecologist will accompany trail crew to identify weed species and key areas to avoid. High risk areas will be mapped prior to construction.
BM25	During construction	**Hygiene protocols**

Mitigation measure ID	Timing	Mitigation and contingency measures
		Objective: To minimise impacts to biodiversity by implementing hygiene protocols Implement appropriate hygiene procedures for weeds / pathogens throughout the trail alignment (Attachment 5).
BM26	Prior to commencement of construction	**Environmental induction - pathogens** **Objective**: To minimise risks to biodiversity by providing an induction on pathogens for construction workers Construction staff trained as part of site induction to identify signs of plant pathogens e.g. Myrtle Wilt and to implement procedures to minimise risk of spread (Attachment 5).
BM28	During construction	**Fill material quality** **Objective**: To minimise introduction of weeds and pathogens Any fill material introduced to the site must be certified clean and be weed and pathogen free and exhibit similar properties to natural soils e.g. pH, drainage, texture (Attachment 5). In addition, any fill material introduced to the State Forest will be undertaken according to DELWP FFM procedures. Fill areas will be monitored for germination of weeds.
BM29	During construction	**Minimise fill material** **Objective**: To minimise the introduction of fill material Minimise the introduction of fill material for the construction and ongoing management of the trail.
BM30	Prior to construction	**Environmental induction - pests** **Objective**: To minimise risks to biodiversity by providing an induction on pest animals for construction workers Construction staff trained as part of site induction to identify pest animals and signs of their presence to inform pest management program e.g. locating traps near feral cat sightings. This data will be recorded in the GIS platform for the project.
Aquatic ecosystems		
BM31	During construction	**Waterway crossings** **Objective**: To minimise impacts to aquatic ecosystems by elevating crossings All waterway crossings are to be elevated by installing small bridges on raised pedestals either side of the waterway. All other waterway crossings will involve bridges or boardwalks where deemed appropriate. These structures will ensure that any water and sediments are absorbed along the trail edge and not draining into the waterway.
BM32	Prior to commencement of construction	**Micro-siting – waterway crossings** **Objective**: To minimise impacts to aquatic ecosystems by narrowing crossing locations Trail micro-siting to identify narrowest practicable crossing location where waterway crossing required as per SWM01.
BM33	During construction	**Works on waterways** **Objective**: To minimise impacts to waterways during construction Construction of all waterway crossings, whether permanent waterways or intermittent, must follow Melbourne Water requirements for works on waterways & crossings and is to be supervised and certified by a suitably qualified person.

Mitigation measure ID	Timing	Mitigation and contingency measures
BM35	During construction	**No-go zones – waterways** **Objective**: To avoid impacts to waterways during construction All waterways are designated no-go zones during construction unless works are required directly in / adjacent to waterway.
BM36	During construction	**Yarra River works** **Objective**: To avoid impacts to the Yarra River during construction No instream works within Yarra River to minimise disturbance and alterations to existing conditions.
BM37	During construction	**Timing of construction – waterways** **Objective**: To minimise impacts to waterways during construction Works in proximity to waterways will not occur during wet months (e.g. June – September) unless conditions are such that land degradation and surface water management problems can be avoided or appropriate mitigation measures implemented. Where practicable, all waterway crossings will be constructed during no or low flow conditions.
BM38	Prior to commencement of construction	**Micro-siting – wet boggy ground** **Objective**: To minimise impacts to water dependent ecosystems by avoiding wet or boggy ground Micro-siting to avoid areas of wet or boggy ground where possible, including areas where vegetation changes suggest such conditions may be present (i.e. thickets, sedges, rushes, mosses etc.)
BM39	During construction	**Wet or boggy ground** **Objective**: To minimise impacts to water dependent ecosystems by rock armouring or elevating the trail Where wet or boggy ground is present and unavoidable, use suitable rock armouring to harden and reinforce the trail or elevate trail using boardwalk or another appropriate engineered/design solution.
Cool Temperate Rainforest (CTR) / Cool Temperate Mixed Forest (CTMF)		
BM40	Prior to commencement of construction	**Micro-siting – CTR / CTMF** **Objective**: To avoid and minimise impacts to CTR / CTMF Trail micro-siting in consultation with a suitably qualified ecologist to avoid where possible and minimise the final trail alignment through CTR / CTMF and avoid areas showing signs of Myrtle Wilt.
BM41	Prior to commencement of construction	**Micro-siting – Myrtle Wilt** **Objective**: To avoid spread of Myrtle Wilt pathogens Micro-siting to avoid areas showing signs of Myrtle Wilt.
BM42	During construction	**Disturbance to Myrtle Beech** **Objective**: To minimise impacts to Myrtle Beech Where areas containing Myrtle Beech cannot be avoided, minimise disturbance within the drip line of all Myrtle Beech trees using a design/engineered solution.
BM43	Prior to commencement of and during construction	**Pruning of Myrtle Beech** **Objective**: To minimise pruning impacts to Myrtle Beech Where pruning or wounding of Myrtle Beech trees and / or roots is likely to occur trail crews will be trained in pruning methods and application of anti-fungal agents to prevent the spread of Myrtle Wilt.

Mitigation measure ID	Timing	Mitigation and contingency measures
BM44	During construction	**Fill material – CTR / CTMF** **Objective**: To minimise impacts to CTR / CTMF No imported fill material (including gravel, rock and soil) is to be used within CTR / CTMF.
BM45	Prior to commencement of construction	**Environmental induction – CTR / CTMF** **Objective**: To minimise impacts to Myrtle Beech, CTR and CTMF by providing an induction for construction workers Construction phase staff trained as part of site induction to identify Myrtle Beech, CTR and CTMF.
BM46	During construction	**Maintaining ground surface gradients within CTR / CTMF** **Objective**: To minimise changes to existing ground surface gradients within CTR / CTMF No machinery excavation is to be undertaken within CTR / CTMF. Where soils are damp and boggy, trail must be elevated using boardwalk or another appropriate engineered/design solution.
BM47	During construction	**Hand building trails within CTR / CTMF** **Objective**: To minimise trail construction impacts within CTR / CTMF Trail construction and maintenance is to be undertaken using hand tools only within CTR / CTMF.
BM48	Prior to commencement of construction	**Micro-siting – Myrtle Beech drip line** **Objective**: To avoid and minimise impacts to Myrtle Beech individuals Micro-site to avoid the drip line of Myrtle Beech including scattered individuals outside of mapped CTR / CTMF.
Groundwater dependent ecosystems		
BM49	During construction	**Management of GDEs** **Objective**: To minimise impacts on GDEs Implement measures outlined in GWM01 to manage potential impacts to GDEs / seeps / springs.
BM50	Prior to commencement of construction	**Environmental induction – GDEs** **Objective**: To minimise impacts to GDEs by providing an induction for construction workers Construction staff trained as part of site induction to identify GDEs, seeps / springs and associated vegetation communities / species.
Leadbeater's Possum (LBP)		
BM51	Prior to commencement construction	**Environmental induction – LBP** **Objective**: To minimise impacts to LBP by providing an induction for construction workers Construction staff trained as part of site induction to identify high quality LBP habitat indicators. Training will include distribution of fact sheets including notes and photos.
BM52	During construction	**LBP habitat management** **Objective**: To minimise removal of vegetation within suitable LBP habitat Removal of vegetation within suitable Leadbeater's Possum habitat will be subject to the following constraints: 1) In the National Park no removal of trees, including mid-storey trees, with > 10 cm DBH,

Mitigation measure ID	Timing	Mitigation and contingency measures
		2) In State Forest where there is a stand of single age *Eucalyptus* sp. and mid-storey (i.e. regrowth following bushfire), trees < 20 cm DBH may be removed, 3) No removal of dense stands of montane thickets (comprising Bottlebrush *Callistemon* spp. and / or Tea-tree *Leptospermum* spp.) anywhere in the project area. Minor pruning of these species may occur at the edges of these thickets.
BM53	Prior to commencement of and during construction	**Micro-siting – LBP** **Objective**: To avoid and minimise impacts to LBP habitat Supervision and guidance by a suitably qualified ecologist will be provided during the construction phase within LBP habitat to identify any additional potential LBP habitat and assist with micro-siting.
Mount Donna-Buang Wingless Stonefly (MDBWS)		
BM54	Prior to commencement of construction	**Micro-siting – MDBWS** **Objective**: To avoid and minimise impacts to MDBWS habitat Micro-siting to align trail as close as possible to the verge of Mount Donna Buang Road as per SWM01 within potential range of MDBWS.
BM55	During construction	**Construction timing – MDBWS** **Objective**: To avoid impacts to MDBWS critical life cycle stages Construction of the trails within potential range of Mount Donna Buang Wingless Stonefly is to be undertaken between December and February to avoid disruption to critical life cycle stages.
BM56	During construction	**Minimise habitat disturbance – MDBWS** **Objective**: To minimise impacts to MDBWS habitat Any work within the potential range of the species must minimise habitat disturbance e.g. soil compaction and sedimentation by elevating the trail to cross waterways, bogs, damp areas or seasonal drainage lines within the mapped suitable habitat zone. Any elevated trail must be constructed to maintain natural light levels.
BM57	During construction	**Sediment management from Mount Donna Buang Road – MDBWS** **Objective**: To minimise impacts to MDBWS habitat Construction of the trails within potential range of MDBWS would be managed to decrease sediment from Mount Donna-Buang Road or surrounds flowing into the adjacent springs downstream of the road as per SWM07.
BM58	During construction	**Minimise sedimentation – MDBWS** **Objective**: To minimise impacts to MDBWS habitat Minimise sedimentation into permanent or ephemeral waterbodies within potential range of the species through appropriate procedures for erosion and sedimentation as per SWM02.
BM59	During construction	**Minimise pollution – MDBWS** **Objective**: To minimise impacts to MDBWS habitat Within potential range of MDBWS, minimise pollution from trail construction that can soak into soil through implementing appropriate procedures for leaks / spills as per SWM02 & SWM10.
BM60	During construction	**Minimise groundwater impacts – MDBWS** **Objective**: To minimise impacts to MDBWS habitat

Mitigation measure ID	Timing	Mitigation and contingency measures
		Ensure trail construction does not interrupt flow rate of ground water within or upslope of potential range of the species.
BM61	Prior to commencement of construction	**Environmental induction – MDBWS** **Objective**: To minimise impacts to MDBWS by providing an induction for construction workers Construction phase staff trained as part of site induction to identify MDBWS habitat indicators. Training will include distribution of fact sheets including notes and photos.
Other significant flora and fauna		
BM62	During construction	**Habitat trees** **Objective**: To minimise impacts to habitat trees No removal of existing habitat trees unless deemed hazardous in which case treatment of these trees will be discussed with land manager, arborist and ecologist e.g. habitat pruning of tree. Any hazardous tree considered for removal will be assumed to be a habitat tree unless deemed otherwise.
BM63	During construction	**Habitat for epiphytic / lithophytic species** **Objective**: To minimise impacts to suitable habitat for epiphytic / lithophytic species Minimise disturbance to suitable habitat for epiphytic / lithophytic species e.g. avoid use of boulders covered with bryophytes and / or ferns.
BM64	Prior to the commencement of construction	**Environmental induction – significant flora** **Objective**: To minimise impacts to significant flora by providing an induction for construction workers Construction staff informed as part of site induction regarding potential presence of significant flora species (including epiphytic / lithophytic species) in order to minimise risk of damage to species or suitable habitat.
BM65	Prior to the commencement of construction	**Environmental induction – rare or threatened flora** **Objective**: To minimise impacts to rare or threatened flora by providing an induction for construction workers Construction staff trained as part of site induction to identify rare or threatened flora. Training will include distribution of fact sheets including notes and photos.
BM66	Prior to the commencement of construction	**Micro-siting – significant flora** **Objective**: To avoid and minimise impacts to significant flora Micro-siting of the final trail alignment in high risk areas to avoid significant flora in consultation with a suitably qualified ecologist on-site during a seasonally appropriate period for the target species. High risk areas will be identified through mapping.
BM67	During construction	**Native vegetation removal** **Objective**: To minimise removal of native vegetation Native vegetation (trees including mid-storey species) removal is subject to the following constraints: 1) No trees (including mid-storey trees) with DBH > 10 centimetres are to be removed in the National Park (unless condition 3) applies). 2) Within State Forest trees < 20 centimetres DBH in single age stands of *Eucalyptus* spp. and mid-storey (i.e. regrowth following bushfire) may be removed. 3) Excluding areas of suitable habitat for Leadbeater's Possum, any small dead trees (< 20 centimetres DBH) within 2 metres of the trail may require

Mitigation measure ID	Timing	Mitigation and contingency measures
		removal if significant defects are identified. Such trees will be felled and kept nearby as habitat logs (coarse woody debris).
BM68	Prior to the commencement of construction	**Environmental induction – trees** **Objective**: To minimise impacts to trees by providing an induction for construction workers Construction staff trained as part of site induction in tree protection methods, SRZ and root protection methods and identification of hazardous trees.
BM69	Prior to the commencement of and during construction	**Micro-siting – trees** **Objective**: To avoid and minimise impacts to trees Minimise impacts to trees through micro-siting and adequate implementation of sympathetic mitigation measures. Refer to Table 6-3: Tree damage.
BM70	During construction	**Recording of tree impacts** **Objective**: To record potential impacts to trees Capture relevant data where direct tree impacts are possible, where tree root protection is required, or where hazardous tree removal or excessive pruning is required.
BM71	Prior to the commencement of construction	**Micro-siting – dense vegetation** **Objective**: To avoid and minimise impacts to dense vegetation Trail micro-siting to avoid existing stands of dense vegetation, particularly mid-storey vegetation between 1 to 5 metres in height, wherever possible.
BM72	During construction	**Large trees** **Objective**: To avoid impacts to large hollow-bearing canopy trees All large hollow-bearing canopy trees (dead and alive) are to be retained with no substantial works encroachment that will compromise the health and viability of such trees.
BM73	During construction	**Construction hours** **Objective**: To avoid and minimise disturbance to fauna No construction activities at night.
BM74	Prior to the commencement of construction	**Micro-siting – borrows / nests / roosting sites** **Objective**: To avoid and minimise impacts to native fauna burrows / nests / roosting sites Microsite final trail alignment to avoid, minimise and appropriately buffer any burrows / nests / roosting sites for native fauna identified during construction activities. This includes, but is not limited to: 1) Lyrebird display mounds, 2) Forest owl nesting or roosting sites, 3) Platypus burrows, 4) Curve-tail Burrowing Crayfish and Tubercle Burrowing Crayfish burrows, 5) Ground-dwelling native fauna burrows e.g. wombat 6) Rocky outcrops with cracks and crevices 7) Research sites e.g. LBP monitoring plots. Any burrows / nests / roosting sites for native fauna will be mapped to GIS platform as per finds procedure outlined in BM16.
BM75	During construction	**Slow-start construction measures** **Objective**: To enable fauna time to disperse Construction activities, particularly in proximity to the Yarra River or sensitive areas within Yarra Ranges National Park, to use slow-start

Mitigation measure ID	Timing	Mitigation and contingency measures
		construction measures to enable both aquatic and terrestrial fauna time to disperse.
BM76	During construction	**Fauna entrapment** **Objective**: To avoid and minimise impacts to fauna from entrapment Any structures that could trap fauna must be covered, checked and an egress point provided.
BM77	During construction	**Noise, vibration and air quality management** **Objective**: To avoid and minimise impacts to biodiversity from noise, vibration and air quality Management of potential impacts from noise, vibrations and air quality as outlined in NM01 to NM06 and AM01 to AM07. In addition to these measures, project activities should minimise amount of equipment / machinery in use at any one time to reduce intensity of noise, vibrations and / or reduced air quality.
BM78	Prior to commencement of construction	**Environmental induction – fauna habitat** **Objective**: To minimise impacts to fauna by providing an induction for construction workers Construction staff trained as part of site induction to identify signs of native fauna habitation including, but not limited to: 1) Lyrebird display mounds 2) Roosting or nesting sites for forest owls 3) Platypus burrows 4) Habitat indicators for Curve-tail Burrowing Crayfish and Tubercle Burrowing Crayfish 5) Burrows used by ground-dwelling fauna e.g. wombats. Training will include distribution of fact sheets including notes and photos.

6.1.5 Other mitigation and contingency measures

A range of other mitigation and contingency measures have been identified for implementation during construction as set out in Table 6-3.

Table 6-3 Other mitigation and contingency measures – biodiversity

Aspect	Project phase	Requirements
Fauna		
Fauna management and reporting	During construction	• If during site works any fauna species are identified and require relocation, an accredited Wildlife spotter/catcher will manage these fauna relocations. • Any fauna that is injured or killed during construction will be promptly reported to Council and DELWP as an environmental incident. • Native fauna will not be fed by employees. No food scraps to be left on-site. • If any FFG Act listed fauna species are found that could be harmed during construction, cease work and inform DELWP and Council. • In the event that a koala is encountered within works areas, works will cease to allow the koala to move on of its own accord.
Fauna habitat	During construction	The alignment of the trail should not result in increased visibility to existing nest boxes or occupied tree hollows.
Aquatic fauna	During construction	Any works to waterways (bridges or boardwalks) must not impede or alter stream flow or create barriers to fish migration.

Aspect	Project phase	Requirements
Flora		
Trail alignment	Prior to commencement of construction	• Rest stops and viewing areas along the trail are to use existing cleared areas and breaks in vegetation to minimise vegetation removal. • Align trails on the high side of significant trees, especially on steeper side slopes. Tree roots are usually closer to the surface on the downhill side of the tree, so by routing the trail on the uphill side of the tree, there is less chance of impact on tree roots. • Large specimen eucalypt trees – Where practical, route the track to maximise the viewing opportunity for such trees, without substantially altering the understorey around their bases.
Minimise vegetation removal	During construction	• Localised patches of Sphagnum – Minimise disturbance to such patches by minor re-routing, where practical (but recognising that the patches are likely to be resilient to small-scale disturbance). • Lichen, moss and filmy fern sites – Manage rock outcrops that support this flora as carefully as possible to minimise the risk of stripping such flora during works. • No vegetation to be cut, removed or damaged outside of the trail construction corridor. • Where logs are cross-cut and a section removed, where possible place the cut section back against the original log to maintain continuity of the local habitat.
Tree damage	Prior to commencement of construction	• Personnel working on-site must be made aware of the importance of tree protection requirements and measurements through regular discussions, as part of site meetings and included in 'Toolbox Talks' where this information can be easily disseminated. The information is to include avoiding collision with tree parts, working under branches and reducing damage to tree roots. The information can be relatively simple and procedural, such as looking out for collision with a tree part, the use of spotters and to be in accordance with the Australian Standard for protection of trees on development sites (AS4970 – 2020). • Appropriate locations are to be chosen for storage of materials and equipment. This includes the parking of vehicles, equipment, sheds/portable toilets and materials.
	During construction	• The operator of powered equipment will position the powered equipment with caution as to avoid impacts or damage to trunks or limbs from the slewing action of the powered equipment. • An arborist (AQF level or higher) is to attend the site during times where excavation works are known or expected to have a high possibility of tree impacts. • Construction methodology that is sympathetic to tree roots is to be utilised throughout construction. Care will be taken when constructing trails so that the roots and trunks of large trees are not damaged by machinery or earthworks. • Where the structural root zones of trees cannot be avoided, then a design solution will need to be implemented to reduce the impact on tree root zones. - Design solutions include: - Raised embankment; - Tree root protection sleeve; - Low level bridge / boardwalk.

Aspect	Project phase	Requirements
Soil management	During construction	Minimise the movement of soil, gravel and water between catchments. In this case, there will be on-site localised shifting of soil and vegetation, minimising the need to import materials and ensuring that imported material is not contaminated.
Phytophthora cinnamomi (PC) management	Prior to commencement of and during construction	• High-risk PC to be identified prior to construction. High risk PC sites are defined as: - Sites where PC infestation has been identified (suspected or confirmed) - Sites where plant species known to be susceptible to PC have been identified. • High-risk PC sites will be identified and recorded on the contractor GIS platform. • High risk PC site management prescriptions include: - All excavators or other plant/machinery to be washed down 100 m prior to entry - All excavators or other plant/machinery to be washed down at exit of site - Boots to be washed down at exit of site every day on finishing - Mountain bikes, E-mountain bikes and motorbikes used for transportation to construction sites should be left outside the high-risk PC site - No work to be undertaken in very wet conditions - No machinery/equipment in contact with soil to be moved outside of site without washdown. - No soil or rock to be imported from high-risk PC areas. • In any areas showing symptoms of PC, where practicable re-route the trail to avoid area, by traversing upslope/above the area (i.e. avoiding the infected site and potentially infected soil downslope). • In any areas with species of known susceptibility to PC (e.g. grasstrees), where practicable re-route the trail to avoid area, by traversing downslope/below the area.
Machinery and equipment hygiene	Prior to commencement, during and at completion of construction	• Prior to bringing excavators and other plant/machinery on-site and upon departure from the project, machinery and equipment will be washed down at a commercial washdown facility or washdown facility at Yarra Ranges Council works depot. • Field washdown sites to be set-up in an appropriate area and used as required (e.g. high-risk PC area). • Boots, clothing and other personal items belonging to workers to be maintained in a clean and generally soil/mud free condition. Workers to be encouraged to clean boots daily. • Mountain bikes, E-mountain bikes and motorbikes used for transportation to construction sites to be maintained in a clean and generally soil/mud free condition. Motorbikes are not permitted off-road within the Yarra Ranges National Park unless authorised by Parks Victoria. • All excavators and other plant/machinery washdowns to be documented using checklist

6.1.6 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-4.

Table 6-4 Monitoring and reporting – biodiversity

Action	Measures
Biodiversity	

Action	Measures
Objective	To prevent impacts to threatened flora and fauna and implement contingency measures where required in a timely manner
Performance indicators	• No impact on native vegetation outside of the immediate construction corridor. • Areas of vegetation disturbance minimised and existing vegetation adjacent to the works protected. • Disturbed areas stabilised or revegetated. • No reports of injury or death of fauna. • No increase in the presence of weeds, pathogens or pests. • No complaints received regarding native flora or fauna. • No non-conformances raised at site audits regarding native flora or fauna. • Personnel responsible for the construction will be adequately trained in identifying significant flora and fauna, habitat and weeds and appropriate measures are adopted to avoid locations or minimise impacts during construction.
Monitoring (Parameters, location and frequency)	Prior to starting construction daily or if at a new site, record visual inspections and observations of: • Presence of fauna in the work area and their condition (i.e. healthy, injured, disturbed, distressed) • Presence of significant flora, fauna or nests/burrows/roosts used by native fauna • Presence of weeds or pathogens, such as Myrtle Wilt • Presence of GDEs, seeps / springs and associated vegetation communities / species • Excavator and plant/machinery washdowns, if undertaken.
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances are to be documented and reported to Yarra Ranges Council and rectified in a timely manner. • Yarra Ranges Council will notify the relevant land manager and regulatory authorities responsible for secondary approval where required.
Contingency measures	• If an incident occurs or a complaint is registered, the following procedure will be followed: - Cease works and report any breaches of the CEMP or other environmental issues to Yarra Ranges Council. - Undertake an investigation of any non-compliance or other environmental issue and determine appropriate course of action to remedy impacts in consultation with an ecologist or arborist. - Notify relevant regulatory authority if non-compliance is associated with any secondary approvals. • Transport injured fauna to an appropriate veterinarian or carer as soon as possible and in accordance with the *Prevention of Cruelty to Animals Act 1986*.
Responsibilities	Fauna and flora management is the responsibility of the site supervisor. All staff and sub-contractors are responsible for attending the project induction and reporting environmental incidents and complaints to their supervisor including the nature and circumstances in which the incident happened (by an immediate verbal/email notification and completion of relevant incident notification forms).

6.2 Surface water, groundwater and geotechnical hazards

The existing environment and an assessment of potential impacts to surface water, groundwater and geotechnical hazards are discussed in EES **Technical Report B: Surface Water, Groundwater and Geotechnical Hazards**. This section summarises the objectives to manage impacts relating to the construction phase and the mitigation and contingency measures to be applied.

6.2.1 Background

The project is set in a mountainous area with many waterways that may be impacted as a result of the installation of trail heads or trails. Project construction activities have the potential to impact surface water and groundwater and present geotechnical hazards.

The main impact identified is the potential for increased sedimentation of waterways during construction and changes to surface water hydrology during trail network construction and operation. Construction activities that may cause increased sedimentation to waterways include: the clearing of

vegetation, machinery disturbing the soil, removal of rocks and roots decreasing soil stability, compaction of trail surfaces increasing runoff and construction of trails without appropriate erosion controls in place.

6.2.2 Objectives

The environmental management objective for surface water, groundwater and geotechnical hazards is: *To maintain the functions and values of groundwater, surface water and floodplain environments and minimise effects and risk of harm on water quality and beneficial uses.*

Specific objectives for each surface water, groundwater and geotechnical hazard mitigation measure are described in Section 6.2.4.

6.2.3 Relevant legislation, policy and standards

Table 6-5 lists the key legislation, policies, guidelines and standards relevant to surface water, groundwater and geotechnical hazards. A detailed description of the applicable legislation and policies and their implications on the project is provided in **Technical Report B: Surface Water, Groundwater and Geotechnical Hazards**.

Table 6-5 Relevant legislation, policy and guidelines - surface water, groundwater and geotechnical hazards

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* ('EPBC Act') • *National Environment Protection Council Act 1994 (Commonwealth)* ('NEPC Act') • *Flora and Fauna Guarantee Act 1988 (Vic)* ('FFG Act') • *Water Act 1989 (Vic)* • *Environment Protection Act 2017 (Vic)* - Environmental Reference Standard (ERS) - General Environmental Duty • *Heritage Rivers Act 1992 (Vic)* • *Yarra River Protection (Willip-gin Birrarung murron) Act 2017(Vic)* • *Safe Drinking Water Act 2003 (Vic)* • *Planning and Environment Act 1987* - Yarra Ranges Shire Planning Scheme
Guidelines and advisory documents	• Ministerial Guidelines for Groundwater Licensing and the Protection of High Value Groundwater Dependent Ecosystems 2015 • EPA Victoria 2006 Guidelines for Hydrogeological Assessments (Water Quality) • EPA Victoria 2014 The clean-up and management of polluted groundwater • EPA Victoria 1991 Construction techniques for sediment pollution control • EPA Victoria Publication 1834 2020 Civil construction and demolition guide • EPA Victoria Publication 1287 2009 Guidelines for risk assessment of wastewater discharges to waterways • EPA Victoria Publication 1894 2020 Managing soil disturbance • EPA Victoria Publication 1895 2020 Managing stockpiles • EPA Victoria Publication 1896 2020 Working within or adjacent to waterways • EPA Victoria Publication 1897 2020 Managing truck and other vehicle movement • EPA publication 604.2 2021 Guideline for environmental management (GEM) – Rapid bioassessment methodology for rivers and streams. • Landslide Risk Management Guidelines 2007 – Australian Geomechanics Society, Vol. 42 No 1 March 2007 • Waterway Determination Guidelines (DNRE 2002)

6.2.4 Mitigation and contingency measures arising from the EES

Table 6-6 lists the mitigation and contingency measures for potential surface water, groundwater and geotechnical hazard impacts.

Table 6-6 Mitigation and contingency measures – surface water, groundwater and geotechnical hazards

Mitigation measure ID	Timing	Mitigation and contingency measures
Surface water		
SWM01	Prior to commencement of construction	**Undertake micro-siting prior to construction** **Objective**: Appropriate selection of waterway crossing method to protect downstream values • Avoid crossing if practical • Install an elevated structure (i.e. bridge or boardwalk) where *Water Act* definition of a waterway is met (defined bed and banks and/or natural channel fed by spring or absorbent soil). • Install rock armouring when gully is present but no other indication of waterway as per *Water Act* definition, or if there is signs of wet/unstable soil or changes to vegetation that signal higher water concentration that is likely to impact trail surface stability. Review all crossing points identified by the Surface Water Impact Assessment which do not have a crossing type assigned. As required in sensitive areas, as per the CEMP, relevant appropriately qualified technical specialist staff would be used on site to undertake micro-siting. The existing conditions of the waterway at the crossing point would be fully documented as per *Water Act* definition. Take geo-referenced photographs of crossings that intersect the VicHydro waterway layer (where no evidence of a waterway is observed at the crossing point). Melbourne Water can attend regular site inspections before, during and after construction to confirm that all waterways have been appropriately identified. Where multiple crossings are located within a small area, there may be risk of greater disturbance than for a single crossing – care must be taken to ensure the solution minimises the cumulative effects.
SWM02	During construction	**Erosion and sediment controls** **Objective**: To minimise erosion and sedimentation impacts to waterways Follow EPA publications: • EPA publication 1894 Managing soil disturbance • EPA publication 1895 Managing stockpiles • EPA publication 1896 Working within or adjacent to waterways • EPA publication 1897 Managing truck and other vehicle movement Soil and sediment management: • Identify suitable locations for material stockpiles (if required) prior to construction and ensure appropriate sediment controls are in place prior to stockpiling. Stockpiles will be located away from waterways and protected from prevailing wind where necessary to prevent wind-blown particles from increasing sedimentation of waterways. • Plan construction works to provide for the progressive and timely stabilisation and rehabilitation of disturbed areas as required. • Balanced cut and fill construction is to be used wherever possible. No spoil is to be spread down slope, minimising damage to adjacent vegetation below the trail. • Where the trail runs alongside a waterway, excavated spoil material will not be placed such that it enters the waterway or impedes natural drainage. • No borrow pits to be established within 50 m of a waterway or any areas of significant vegetation. • Rock armouring to be used on the entry and exit to any low-level bridges or boardwalks and on some steep sections of trail chutes and may be used on sections of boggy ground.

Mitigation measure ID	Timing	Mitigation and contingency measures
		• Topsoil will be retained in stockpiles on any cleared areas not required for construction of the trail tread or batter slopes. Materials will be reused on the site where possible. • In areas of high erodibility soils cut batters must be near vertical, and where possible retained by logs or rock facing. Site by site assessment on the requirement for retaining walls will be required. Batters will be stabilised appropriately to reduce potential slippage and erosion. Appropriate silt control mechanisms will be applied where necessary to control and minimize scour and silt movement. • Upon achieving practical completion of a trail, the trail is to remain closed for a period of 4-12 weeks (depending on weather, time of year and other variables) to allow for 'curing' of the trail surface. All sediment control measures (i.e. silt fences) to remain in place during this curing period. • Cut batters to be less than 2 m in vertical height • Silt fences to be installed on all grade reversal outlets within 50 m of a waterway where access allows. • All trails to be consistent with International Mountain Bicycling Association trail construction guidelines, especially: - The Half Rule - 10% Average Guideline - Maximum Sustainable Trail Grades - Grade Reversals - 5% outslope as appropriate • Maintain all erosion and sediment controls in effective working order as required throughout the construction period. • Vehicle entry and exists will be via designated areas only. • Identify all designated 'no go zones' on the plans. • Construction activities creating any soil disturbance to cease during extreme rainfall events (i.e. greater than 25 mm in 24 hours). • Materials stockpiled on-site will be stored in a designated storage location with silt fencing on down slope areas where the stockpiles are within 30 m of a waterway. • Coir logs or silt fences will be maintained on slopes below bare soil areas at drainage flow path outlets, where it is within 30 m of a waterway. • Ensure all temporary erosion and sediment controls are removed and relevant notifications undertaken at the completion of works or when sufficient ground cover for stabilisation is achieved. Waterway Crossings • Where a waterway crossing is required, identify the narrowest practicable location. • Low level bridges must be designed to cope with peak flows for the catchment they are located in and must not impede flow in any way. • Low level bridges must be Building Code of Australia (BCA) compliant. • Approaches to waterway crossings will as much as possible be at right angles to the waterway and minimise the length of track within the immediate riparian zone. • Rock armouring to be used as appropriate on either side of bridge/boardwalks to prevent soil being carried onto the bridge/boardwalk. • Works near waterways will be scheduled appropriately. For example, works will be timed to coincide with periods of low flow and completed quickly. Works will be stopped if conditions are not suitable, such as during and after heavy rain. • Any removal of fallen timber within the waterway must be to the minimum extent necessary and any material removed must be retained on-site, downstream from the crossing point. Drainage

<table>
<tr><th>Mitigation measure ID</th><th>Timing</th><th>Mitigation and contingency measures</th></tr>
<tr><td></td><td></td><td>

If areas of erodible soils are found in trail surface, the area must be armoured with rock, gravel or low erodibility soils (also see GTM02 and GTM03).
Drainage must be installed on approaches to waterway crossings so that where possible a 30 m buffer of vegetation is achieved to act as a filter strip.
All drainage must direct water onto vegetation and not exposed fill material.
Unless the trail tread is out-sloped (i.e. it drains to the lower side of the track) and no table drain is required on the upper side, cross drains/water bars/grade reversals must be installed at no greater distance apart than shown below:

<table>
<tr><th>Trail gradient</th><th>Maximum drain spacing</th></tr>
<tr><td>1-5%</td><td>70 m</td></tr>
<tr><td>6-10%</td><td>40 m</td></tr>
<tr><td>11-20%</td><td>30 m</td></tr>
<tr><td>>20%</td><td>20 m</td></tr>
</table>
Monitoring of trails under active construction:

Daily visual inspections of works site and all erosion and sediment control devices.
Inspection of all erosion and sediment control devices following significant rainfall events.

Corrective actions to control erosion:

Repair/maintain existing drainage, erosion and sediment control devices.
Clean up or rehabilitate any impacts and exposed areas.
Install additional erosion and sediment control devices where issues have been identified.
Consider the deployment of alternative erosion and sediment control devices where issues have been identified with the existing devices.
Ensure all personnel involved in the deployment and maintenance of erosion and sediment control measures are appropriately trained in their use and deployment.
Communicate changes with all relevant staff.

Drinking Water Catchments

Ensure adequate portable toilets are available to construction crews, particularly in drinking water catchments, and that these toilets are maintained appropriately
Daily pre-start risk assessment and education of construction crew about works in a drinking water catchment.

</td></tr>
<tr><td>SWM03</td><td>Prior to commencement of construction</td><td>
Streamside buffers

Objective: To provide adequate buffer to minimise sedimentation of waterways

Apply a 20 m streamside buffer to minor waterways running parallel to track (<60 ha catchment)
Apply a 30 m streamside buffer for larger waterways running parallel to track (>60 ha catchment)

</td></tr>
<tr><td>SWM04</td><td>During construction</td><td>
Use of tracking machines

Objective: Avoid direct and downstream impacts to waterways during construction

Follow EPA publication 1897 Managing truck and other vehicle movement

</td></tr>
</table>

Mitigation measure ID	Timing	Mitigation and contingency measures
		• Works will be scheduled to avoid tracking machines through waterways which contain water at all times. • Temporary bridges will be used during construction to traverse waterways, so that there is no need to take the machines through the waterway itself.
SWM05	During construction	**Elevated crossing design** **Objective**: Appropriate crossing design to protect downstream values A 'Works on Waterways Permit' / 'Consent for Minor Waterway Work' will be obtained from Melbourne Water as appropriate and elevated crossing designs will be installed in accordance with permit requirements, including the following: • The minimum deck height of crossings would be set above the top of bank by at least 0.3 m. The final deck heights at each location will be determined based on hydraulic assessment and designed in accordance with the stated SWM02 mitigation measures. • The typical elevation indicates minimum raising of the profile at either side of the channel and encroachment within the channel of supports and rock retaining wall. Bridge abutments will be positioned beyond the channel shoulder and there will be no restriction in channel cross section. • If required by Melbourne Water, rock work protection is to extend underneath, upstream and downstream of the bridge to protect the waterway. Protection upstream and downstream will be proportionate to scale of impact. Minimum 0.5 m either side of deck profile unless agreed with Melbourne Water. • Drawings will consider Melbourne Water crossing guidelines and specify rock beaching and erosion protection requirements on the crossing drawings. Minimum rock sizes will be determined based on hydraulic flow conditions and shear forces expected to be encountered at these sites.
SWM06	During construction	**Water quality monitoring of waterways** **Objective**: To monitor effectiveness of mitigation measures A waterway monitoring program will be developed in consultation with Melbourne Water. The key potential stressor to waterways for the project is sedimentation and therefore turbidity is the key metric of interest. In addition, monitoring of macroinvertebrates will provide evidence of any longer-term project effects. Subject to consultation outcomes with Melbourne Water, the monitoring program will have the following key features: • Monitoring scopes in alignment with the ANZG (2018) guidelines for water quality monitoring (covering such aspects as spatial extent, parameter selection, scale, duration, frequency, cost effectiveness of the monitoring program) • Macroinvertebrate monitoring in selected waterways to provide evidence of any longer-term effects. The monitoring program will cover the construction and operations phases of the project, and be 'adaptive' – i.e. be responsive to the results to optimise the monitoring effort. During construction and operation, the following principal activities will be undertaken, subject to consultation with Melbourne Water. • Twice daily monitoring will be undertaken upstream and downstream of waterway crossing construction where water is present at the time of construction. This monitoring will include visual observation and measurements using a handheld turbidity meter. Observations and measurements will be recorded. • Should monitoring indicate that corrective or remedial actions are required at a construction site, actions will be undertaken by the construction crew or Yarra Ranges Council (e.g., installation of hay bales, coir logs or star pickets to minimise sediment movement). The corrective actions will be recorded, including the location of the actions taken.

Mitigation measure ID	Timing	Mitigation and contingency measures
		• Macroinvertebrate monitoring will be undertaken in accordance with EPA Publication 604.2 Guideline for Environmental Management: Rapid bioassessment methodology for rivers and streams prior to and during the construction phase (and then in the early stages of the operations phase). The monitoring event prior to construction commencement will establish background conditions. Monitoring will be undertaken at sites in the Yarra River upstream and downstream of tributaries which may be impacted by the project and in selected tributaries which have the highest risk of impact (tributaries with a high number of crossings: Britannia, Four Mile and Scotchmans Creeks).
SWM07	During construction	**Adhere to Stonefly no-go zones** **Objective**: To avoid water quality or hydrological changes to Stonefly habitat • Avoid track placement in identified stonefly no-go zones • Establish no-go zones in the vicinity of Sites WP1 and WP2 (as identified by Tsyrlin, 2019)
SWM08	During construction	**Design and construction of trail heads** **Objective**: To avoid sedimentation impacts to surface water values Follow EPA publications 275, 1893 and 1896 (particularly for trail head at golf course) to reduce erosion risk to Yarra River.
SWM10	During construction	**Spill management** **Objective**: Minimise the likelihood and impact of a spillage and establishing controls to contain and clean-up • Follow EPA publication 1698 Liquid storage and handling guidelines (EPA 2018) • Australian Standard AS 1940- Storage and handling of flammable and combustible liquids to be adhered to. • All storage and transport of chemicals will be undertaken in accordance with the relevant Australian standards. • Current safety data sheets (SDS) will be kept on-site wherever hazardous materials are being stored. • A register of all chemicals and SDS for these chemicals will be held on-site. • Spill kits will be present on-site during these works. • All personnel will be trained in spill response procedures and in the use of spill kits. • If a spill occurs works will stop immediately, and emergency procedures enacted if required. • All regulated and hazardous waste will be stored in a bunded area as far as practical from the waterways. • The quantity of materials being stored on-site will be minimised. • Machinery will be used and serviced as per manufacturer's instructions. • Vehicles will not be washed down on-site. • Plant will not undergo maintenance or cleaning where contaminants could be released to any waters. • Machinery will be refuelled at locations where the risk of environmental harm in the event of a spill is minimised, as specified in the refuelling protocol. • Refuelling of machinery will conform with the following: - Occur away from waterways (at least 10 metres) - Fuelling activity to be supervised at all times • Machinery will be maintained to minimise the leakage of oil, fuel, hydraulic and other fluids. During the servicing of machinery, the Contractor will use management measures to capture and contain oils, fuels, hydraulic and other fluids so as to minimise contamination of the servicing area.

Mitigation measure ID	Timing	Mitigation and contingency measures
		• Surface coating treatments will be undertaken in a manner that avoids or minimises release of chemicals to the environment and contact with the public. Unless otherwise stated in the contract, no pre-coating of aggregates shall be conducted on-site. • Toilet facilities utilised will be the existing park facilities. An additional port-a-loo facility will be maintained and used on-site, with the amenity maintained, transported and used on-site in accordance with manufacturers' and suppliers' specifications. • All waste material will be removed from the site before removing any erosion and sediment control measures. • All hazardous materials will be removed from site and disposed of appropriately.
SWM11	During construction	**Design of septic systems** **Objective**: Minimise the likelihood and impact of elevated nutrient and pathogen loading to surface water Septic systems will be designed consistent with Yarra Ranges Council / land manager codes.
Groundwater		
GWM01	Prior to and during construction	**Spring management** **Objective**: Identify springs and establishing appropriate treatments to protect groundwater and down-gradient discharging environment. Prior to construction, record evidence of spring activity, location, quantification of flow and quality (if possible), photographic record etc, to establish a baseline in spring activity. Daily inspection of the trails and current work area will be undertaken during construction to identify new spring activity, which may have resulted from bench excavations that exposed new spring eyes, or springs that weren't flowing due to prevailing climate conditions. Where identified the springs need to be documented and characterised. Where identified, trail micro-siting, or trail treatments, e.g. armouring, may be required to control erosion. Treatments are documented in the micro-siting procedure (Attachment 1) and SWM01, SWM02 and SWM09. Where a new spring has emerged as a result of the excavations, or unexpectedly through climate variation, an assessment will be made regarding: • Potential treatments to control sedimentation and erosion • Impact to behaviour of nearby springs, and need for treatment, e.g. diversion of discharge to same area. When treated, inspection and maintenance are undertaken during the remainder of the construction phase to assess effectiveness of the treatment.
GWM02	During construction	**Spill management** **Objective**: Minimise the likelihood and impact of a spillage and establish controls to contain and clean-up. Implement measures to manage risks associated with storage and handling of hazardous substances and spill / control / clean-up measures as per SWM10.
GWM03	Prior to commencement of construction	**Design of septic systems** **Objective**: Minimise the likelihood and impact of elevated nutrient and pathogen loading to groundwater. New septic facilities will be sited and designed consistent with Yarra Ranges Council / land manager codes and SWM11.

Mitigation measure ID	Timing	Mitigation and contingency measures
GWM04	Prior to commencement of construction	**Contamination assessment** **Objective**: To identify (and manage) contamination prior to its disturbance by construction. A Phase 1 Environmental Site Assessment will be undertaken for those areas where a potentially contaminating land use (existing or historical) has been identified, and where structures require excavations greater than 2 m below the surface. In the unlikely event that the Phase 1 Environmental Site Assessment identifies that the project will intersect with potentially contaminating materials, a Phase 2 Detailed Site Investigation will be undertaken to manage any contaminated materials.
Geotechnical hazards		
GTM01	Prior to commencement, during and at completion of construction	**Slope stability management** **Objective**: Reduce and manage the occurrence of slope instability during excavation works for trail construction. • Plan construction works to provide for the progressive and timely stabilisation and rehabilitation of disturbed areas as required • Rock armouring to be used on some steep sections of trails • Site by site assessment on the requirement for retaining walls will be required • Batters will be stabilised appropriately to reduce potential slippage and erosion • Cut batters to be less than 2 m in vertical height • Construction activities creating any soil disturbance to cease during extreme rainfall events • Works near waterways will be scheduled appropriately. For example, works will be timed to coincide with periods of low flow and completed quickly. Works should be stopped if conditions are not suitable, such as during and after heavy rain • Avoid excessive excavation when working near waterways or gully systems • Inspection of completed sections of the trail will be undertaken following heavy rainfall events to observe potential slope failures of newly formed batters. • If a large-scale failure has occurred which has resulted in significant damage to the trail and natural landform, an inspection will be undertaken by a geotechnical specialist to assess the risk and remediation measures.
GTM02	Prior to commencement and during construction	**Slope stability management - vegetation** **Objective**: Reduce and manage the occurrence of unstable soil and erosion caused by vegetation removal. • Vegetation removal will be limited to what is required within the construction corridor • The trail route will be designed to avoid large trees so that removal is not necessary • Where unstable, soft soil is exposed through vegetation removal, rock armouring can be used to promote stability and limit erosion.
GTM03	During construction	**Trail formation management** **Objective**: Reduce and manage the risk of poor trail formation resulting in ineffective drainage leading to instability and erosion • Ensure trail tread is compact • Use rock armouring to protect areas of the trail subject to erosion • Use of raised embankments to promote effective drainage where the trail is flat

Mitigation measure ID	Timing	Mitigation and contingency measures
		• Preferred method of drainage from the trail is grade reversal and out sloping trail head but culverts and water bars may be used from time to time • All drainage must direct water onto vegetation and not exposed fill material • Trail design and construction is to minimise any changes to surface water flows • Periodic inspections of the trail following heavy rainfall events to assess the effectiveness of the trail drainage and observe areas subject to erosion or unfavourable water flow downslope of the trail. Remediation to prevent further impact will be required.
GTM04	Prior to commencement and during construction	**Rockfall hazard management** **Objective**: Reduce and manage the risk of rockfalls below or above the trails • Removal of loose boulders from the batter face during construction. These can be used as rock armouring at the base of the batter slope • Loose material should be removed from any exposed rock faces adjacent to the trail during construction • A geotechnical inspection of exposed rock faces with a height >2 m to assess the need for permanent rockfall protection such as rockfall mesh • Ensure that boulders placed on the out slope as part of the construction process are secure and not likely to roll down the slope.

6.2.5 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-7.

Table 6-7 Monitoring and reporting – surface water, groundwater and geotechnical hazards

Action	Measures
Surface water	
Objective	To prevent contaminant spills or sediment entering waterways and implement contingency measures where required in a timely manner
Performance indicators	• No visual evidence of any contaminants or uncontrolled release entering the waterways • All spill related environmental incidents are closed out in a timely manner • No evidence of erosion onsite or sediment/sediment laden runoff entering the downslope waterways • No complaints received regarding erosion and sediment control • No non-conformances raised at site audits regarding erosion and sediment control • Personnel responsible for the selection, design, review and monitoring of temporary and permanent erosion and sediment control measures will be adequately trained so that best available erosion sediment control measures are adopted during construction.
Monitoring (Parameters, location and frequency)	• A waterway monitoring program will be developed in consultation with Melbourne Water. The key potential stressor to waterways for the project is sedimentation and therefore turbidity is the key metric of interest. In addition, monitoring of macroinvertebrates will provide evidence of any longer-term project effects. Subject to consultation outcomes with Melbourne Water, the monitoring program will have the following key features: - Monitoring scopes in alignment with the ANZG (2018) guidelines for water quality monitoring (covering such aspects as spatial extent, parameter selection, scale, duration, frequency, cost effectiveness of the monitoring program) - Macroinvertebrate monitoring in selected waterways to provide evidence of any longer-term effects.

Action	Measures
	- The monitoring program will cover the construction and operations phases of the project and be 'adaptive' – i.e. be responsive to the results to optimise the monitoring effort. • Macroinvertebrate monitoring will be undertaken in accordance with EPA Publication 604.2 Guideline for Environmental Management: Rapid bioassessment methodology for rivers and streams prior to and during the construction phase. The monitoring event prior to construction commencement will establish background conditions. Monitoring will be undertaken at sites in the Yarra River upstream and downstream of tributaries which may be impacted by the project and in selected tributaries which have the highest risk of impact (tributaries with a high number of crossings: Britannia, Four Mile and Scotchmans Creeks). • During construction, undertake daily visual observations at: - Plant and equipment storage areas to ensure the efficacy of the bunds - Works site and all erosion and sediment control devices - Visual monitoring for leakage or exposure of hazardous materials • During construction at waterway crossings, where water is present, undertake twice daily monitoring upstream and downstream of the waterway crossing. Collect visual assessments and measurements using a handheld turbidity meter. Log records of measurements and observations (**SWM06**). • Following significant/heavy rainfall events, undertake inspections of: - All erosion and sediment control devices
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or other environmental issues are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	• Should monitoring indicate that corrective or remedial actions are required at a construction site, actions will be undertaken by the construction crew or Yarra Ranges Council (e.g., installation of hay bales, coir logs or star pickets to minimise sediment movement). The corrective actions will be recorded, including the location of the actions taken. • In the event of a spill: - Replace depleted spill kits - Re-train staff in the use of spill kits and the correct handling of materials to minimise exposure to hazardous materials. • Seek advice on corrective measures from a suitably qualified person • Repair/maintain existing drainage, erosion and sediment control devices • Clean up or rehabilitate any impacts/exposed areas • Install additional or alternative erosion and sediment control devices where issues have been identified • Ensure all personnel involved in the deployment and maintenance of erosion and sediment control measures are appropriately trained in their use and deployment. • Communicate changes to controls with all relevant staff.
Responsibilities	Management and maintenance of erosion and sediment control devices is the responsibility of the site supervisor. All staff and sub-contractors are responsible for reporting environmental incidents and complaints to their supervisor including the nature and circumstances in which the incident happened (by an immediate verbal/email notification and completion of relevant incident notification forms).
Groundwater	
Objective	To protect groundwater, down-gradient discharging environments and groundwater dependent ecosystems and implement contingency measures where required in a timely manner
Performance indicators	• No impact to behaviour of nearby springs • All spill related environmental incidents are closed out in a timely manner • No complaints received regarding impacts to springs • No non-conformances raised at site audits regarding spring management.
Monitoring (Parameters,	Prior to construction, record evidence of spring activity, location, quantification of flow and quality (if possible), photographic record etc, to establish a baseline in spring activity.

Action	Measures
location and frequency)	Daily inspection of the trails and current work area will be undertaken during construction for the identification of new spring activity, which may have resulted from bench excavations that exposed new spring eyes, or springs that weren't flowing due to prevailing climate conditions. Where identified the springs need to be documented and characterised.
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or other environmental issues are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	Where springs are identified, trail micro-siting, or trail treatments, e.g. armouring, may be required to control erosion. Where a new spring has emerged as a result of the excavations, or unexpectedly through climate variation, an assessment will be made regarding: • Potential treatments to control sedimentation and erosion • Impact to behaviour of nearby springs, and need for treatment, e.g. diversion of discharge to the same area. • The corrective actions will be recorded, including the location of the actions taken. • Communicate changes to controls with all relevant staff.
Responsibilities	Management of groundwater springs is the responsibility of the site supervisor. All staff and sub-contractors are responsible for attending the project induction and reporting environmental incidents and complaints to their supervisor including the nature and circumstances in which the incident happened (by an immediate verbal/email notification and completion of relevant incident notification forms).
Geotechnical hazards	
Objective	To prevent geotechnical hazards and implement contingency measures where required in a timely manner
Performance indicators	• No visual evidence of loose boulders on batter faces • No evidence of slope failures • No complaints received regarding slope failures or geotechnical hazards • No non-conformances raised at site audits regarding geotechnical hazards • Personnel responsible for the selection, design, review and monitoring of slopes will be adequately trained so that geotechnical incidents are avoided.
Monitoring (Parameters, location and frequency)	• During construction, where exposed rock faces with a height >2 m are present, a geotechnical inspection should be undertaken to assess the need for permanent rockfall protection such as rockfall mesh • Following significant/heavy rainfall events, undertake inspections of: - Completed sections of the trail to observe potential slope failures of newly formed batters (**GTM01**) - Effectiveness of the trail drainage and observe areas subject to erosion or unfavourable water flow downslope of the trail (**GTM03**).
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or other environmental issues are to be documented and reported to Yarra Ranges Council and rectified in a timely manner. • Yarra Ranges Council will notify the relevant land manager and regulatory authorities responsible for secondary approval where required.
Contingency measures	• Should inspections indicate that corrective or remedial actions are required at a construction site, actions will be undertaken by the construction crew. The corrective actions will be recorded, including the location of the actions taken. • Seek advice on corrective measures from a suitably qualified person • Repair/maintain existing drainage, erosion and sediment control devices • Clean up or rehabilitate any impacts/exposed areas • Install additional controls where issues have been identified • Communicate changes to controls with all relevant staff.
Responsibilities	Management of geotechnical hazards is the responsibility of the site supervisor. All staff and sub-contractors are responsible for attending the project induction and reporting environmental incidents and complaints to their supervisor including the

Action	Measures
	nature and circumstances in which the incident happened (by an immediate verbal/email notification and completion of relevant incident notification forms).

6.3 Heritage

The existing environment and an assessment of potential impacts to Aboriginal cultural heritage and historic heritage are discussed in EES **Technical Report C: Cultural Heritage**. This section summarises the objectives to manage impacts relating to the construction phase and the mitigation and contingency measures to be applied.

6.3.1 Background

Construction activities can impact registered and/or unidentified Aboriginal cultural heritage places, intangible cultural heritage values, archaeologically sensitive landforms including waterways, mountain tops, ridgelines, gentle sloping hills and flood plains, or listed and/or unlisted historic heritage sites. The excavation works for the project have the potential to alter the landscape and impact sensitive landforms which are likely to contain potential for Aboriginal cultural heritage or listed heritage sites.

A Cultural Heritage Management Plan (CHMP) 15276 is currently in preparation for the project, which will provide management measures to avoid and minimise impacts to cultural heritage. The CHMP identified no previously registered Aboriginal cultural heritage places within the project area. Due to the landform characteristics such as steep erosional slopes and thick undergrowth, the project area is likely to have been unsuitable for occupation, and not conducive for the deposition and accumulation of archaeological material.

The Historic Survey Report identified a total of five listed heritage sites within the project area with the potential to be impacted, including three listed on the Victorian Heritage Inventory (VHI) and two Heritage Overlay (HO) sites. There are currently a large number of unlisted heritage sites such as water races, tramways and mining huts which are traversed by the project, and therefore also have the potential to be impacted during construction works. Micro-siting of the trails will assist in mitigating impacts to unlisted heritage sites such as water races, tramways and mine sites and to areas of archaeological potential. The design and construction of trails in these areas will be undertaken to minimise impacts to the ground surface, and archaeological monitoring of works will be undertaken.

6.3.2 Objectives

The environmental management objective for heritage is: *To avoid, or minimise where avoidance is not possible, adverse effects on Aboriginal and historic cultural heritage.*

Specific objectives relevant to each heritage mitigation measure are described in Section 6.3.4.

6.3.3 Relevant legislation, policy and standards

Table 6-8 lists the legislation, policies, guidelines and standards relevant to cultural heritage for the project. A detailed description of the applicable legislation and policies and their implications on the project is provided in **Technical Report C: Cultural heritage**.

Table 6-8 Relevant legislation, policy and standards - heritage

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* ('EPBC Act') • *Environment Effects Act 1978* • *Aboriginal Heritage Act 2006* - Aboriginal Heritage Regulations 2018 • *Heritage Act 2017* - Heritage Regulations 2017 • *Traditional Owners Settlement Act 2010* • *Planning and Environment Act 1987* - Yarra Ranges Shire Planning Scheme • *Yarra River Protection (Wilip-gin Birrarung murron) Act 2017*

6.3.4 Mitigation and contingency measures arising from the EES

Table 6-9 lists the mitigation and contingency measures for potential heritage impacts.

Table 6-9 Mitigation and contingency measures – heritage

Mitigation measure ID	Project phase	Mitigation and contingency measures
MM- HM01	Prior to commencement, during and at completion of construction	**CHMP management conditions** **Objective**: To avoid or minimise impacts on Aboriginal cultural heritage Comply with all management conditions and contingencies of CHMP 15276. Management measures (not confirmed at this stage) are likely to include inductions to construction crews undertaking ground-disturbing works, compliance checks before, during and after the project construction. The CHMP also includes contingency plans in the case of unexpected finds.
MM- HM02	Prior to commencement of construction	**Intangible cultural heritage** **Objective**: To avoid or minimise impacts on intangible Aboriginal cultural heritage Complete the Cultural Values Recording report.
MM- HM03	Prior to commencement and during construction	**Historic heritage sites – Victorian Heritage Inventory (VHI)** **Objective**: To avoid or minimise impacts on VHI sites To mitigate potential harm to VHI sites, the following protocol must be followed: • Flag or mark where works are restricted to protect places or sites, including no-go zones. • Limit works to the removal of vegetation if possible. This must be inspected by a suitably qualified and experienced archaeologist after vegetation clearance is complete. • If limiting works to vegetation clearance is not possible the second preference is to build up the ground over the VHI site extent. Sourcing of earth for this purpose is subject to the same mitigation measures referred to in this table. • If ground-disturbing works are proposed within the bounds of VHI sites, consent approval will be obtained from Heritage Victoria prior to their commencement.
MM- HM04	Prior to commencement and during construction	**Heritage overlay sites** **Objective**: To avoid or minimise impacts on HO sites An amendment to the Planning Scheme is currently in preparation that, if approved, will satisfy the requirement for a planning permit for Heritage Overlays. Where an area of archaeological potential has been identified within the bounds of a Heritage Overlay, the mitigation strategies for 'Unknown historic heritage sites and identified areas of archaeological potential' still apply (HM05). If archaeological features are uncovered during works within a Heritage Overlay, HM05 applies.
MM- HM05	Prior to commencement and during construction	**Unknown historic heritage sites and identified areas of archaeological potential** **Objective**: To avoid or minimise impacts on unknown historic heritage sites and identified areas of archaeological potential To mitigate possible impact to unknown historic sites and identified areas of archaeological potential, the following protocol will be followed. The Areas of Archaeological Potential and Points of Archaeological Potential are shown in the project ArcGIS. *Inductions*

Mitigation measure ID	Project phase	Mitigation and contingency measures
		All workers involved in developing the trail must undertake a heritage induction prior to commencing works. This induction will be presented by a suitable experienced and qualified archaeologist. The induction will include the following topics: • A brief history of the area and types of sites that are present • The existence of the EES and the management conditions • Landforms and artefacts that may be present that will indicate an archaeological site • The contingency measures that need to be followed in the case of an unexpected find *Areas of Archaeological Potential* Areas of identified archaeological potential will be subject to the following protocol. • All works must be conducted according to the micro-siting procedure • Limit works to the removal of vegetation if possible. This must be inspected by an archaeologist after vegetation clearance is complete • If works cannot be limited to vegetation removal and ground-disturbing works must take place, the works must be supervised by an archaeologist • If archaeological features are uncovered during works, the contingency protocol must be followed. *Point of Archaeological Potential – Tramway* • All works must be conducted according to the micro-siting procedure • Limit works to the removal of vegetation if possible. This must be inspected by an archaeologist after vegetation clearance is complete • If works cannot be limited to vegetation removal and ground-disturbing works must take place, the works must be supervised by a suitably qualified and experienced archaeologist • If archaeological features are uncovered during works, the contingency protocol must be followed *Contingencies* The following contingency measures will be undertaken if archaeological features or artefacts are found during construction works. • Stop works if archaeological features are uncovered during construction works • Recording the features/artefacts by a suitably qualified and experienced archaeologist • Using the micro-siting procedure to realign the trail if possible • Submission of a site card to Heritage Victoria (HM03 will then apply) • Abide by all conditions on HV site card

Details of the unexpected finds protocol are outlined in this report's **Attachment 6 – Unexpected finds protocol.**

6.3.5 Other mitigation and contingency measures

A range of other mitigation and contingency measures have been identified for implementation during construction as set out in Table 6-10.

Table 6-10 Other mitigation and contingency measures – heritage

Aspect	Project phase	Requirements
Aboriginal cultural heritage		
CHMP	During construction	A copy of the approved CHMP must always be held on-site.
Communication protocol	During construction	With the exception of publicly available information, there shall be no communication or public release of information concerning Aboriginal cultural heritage without the written permission of the Registered Aboriginal Party. No on-site photographs or information concerning Aboriginal cultural heritage is to be circulated to the media or via social media without the written permission of the Registered Aboriginal Party.

6.3.6 Monitoring and reporting

The monitoring parameters, location, and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-11.

Table 6-11 Monitoring and reporting – heritage

Action	Measures
Objective	To prevent harm to items of Aboriginal cultural heritage and historic heritage and implement contingency measures where required in a timely manner
Performance indicators	• No harm to cultural heritage places • Adherence to conditions in the CHMP • Adherence to conditions in heritage permits and consents
Monitoring (Parameters, location and frequency)	• Inspect excavation areas for potential archaeological artefacts at heritage sites and in areas of archaeological potential • Undertake compliance inspections by Wurundjeri representatives during construction to ensure works comply with the conditions and contingency plan contained within the CHMP.
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists • Any non-conformances are to be documented and reported to Yarra Ranges Council and rectified in a timely manner • Any items of cultural heritage encountered must be reported to the Aboriginal Party and/or appropriate Victorian government agencies. The discovery of cultural heritage artefacts or archaeological artefacts must be reported to Yarra Ranges Council through a formal reporting process.
Contingency measures	• When an unanticipated discovery is made, personnel will immediately stop work in the vicinity of the discovery (**MM- HM05**). Follow the unexpected finds protocol (see Attachment 6 – Unexpected finds protocol) and submit a site card to Heritage Victoria (**MM-HM03**) • Notify the Council's environmental representative • For Aboriginal heritage items, follow the contingency plan in the CHMP. The Yarra Ranges Council environmental representative will notify the Aboriginal Parties • The significance of Aboriginal cultural heritage will be emphasised to staff during toolbox meetings or daily prestart meetings.
Responsibilities	All staff and sub-contractors have a duty of care to protect cultural heritage and will be required to attend the project induction.

6.4 Transport

The existing environment and an assessment of potential impacts to transport are discussed in EES **Technical Report F: Transport**. This section summarises the objectives to manage impacts relating to the construction phase and the mitigation and contingency measures to be applied.

6.4.1 Background

Project construction and operation vehicles have the potential to impact the surrounding transport network, ultimately affecting network users and the community and businesses within the area.

The main potential impact during project construction will be lane and road closures during construction of the Yarra River Bridge and Old Warburton Bridge. These works could result in increased network congestion and could disrupt residential, business and emergency vehicle access as well as public bus operations. Due to the modest scale of construction activities, the potential construction traffic and transport impacts are temporary and manageable through the implementation of appropriate mitigation measures, including a Traffic Management Plan (TMP) and a stakeholder communication plan.

6.4.2 Objectives

The environmental management objective for transport is: *To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.*

Specific objectives relevant to each transport mitigation measure are described in Section 6.4.4.

6.4.3 Relevant legislation, policy and standards

Table 6-12 lists the key legislation, policies, guidelines and standards relevant to the traffic and transport impact assessment. A detailed description of the applicable legislation and policies and their implications on the project is provided in **Technical Report F: Transport**.

Table 6-12 Relevant legislation, policy and standards – traffic and transport

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *Road Management Act 2004 (Vic)* - Road Management Act (General) Regulations 2016 - Road Management Act (Works and Infrastructure) Regulations 2015 • *Transport Integration Act 2010 (Vic)* • *Road Safety Act 1986 (Vic)* - Road Safety Road Rules 2017 - Road Safety (Traffic Management) Regulations 2009
Guidelines and advisory documents	• AS1742.3 2009 – Traffic control for works on road • Austroads – Guide to Road Design Part 4: Intersections and Crossings • Towards Zero 2016-2020 – Victoria's Road Safety Strategy and Action Plan

6.4.4 Mitigation and contingency measures arising from the EES

Table 6-13 lists the mitigation and contingency measures for potential traffic and transport impacts.

Table 6-13 Mitigation and contingency measures – traffic and transport

Mitigation measure ID	Project phase	Mitigation and contingency measures
MM-TP1	Prior to commencement and during construction	**Traffic Management Plan (TMP)** **Objective**: To minimise traffic impacts Prior to the commencement of construction (excluding preparatory works), a TMP will be developed and implemented to minimise disruption to existing land uses, traffic, car parking, on-road public transport, pedestrian and bicycle movements and existing public facilities during construction. The TMP will be developed in consultation with the relevant road management authorities and will include: • A program, to monitor impacts of construction activities on all modes of transport. Where monitoring identifies adverse impacts, practicable mitigation measures will be developed and implemented • Consideration of cumulative impacts of other major projects occurring concurrently in the local area • Route options for construction vehicles travelling to and from the construction sites, recognising sensitive receptors and minimising the use of local streets where practicable

Mitigation measure ID	Project phase	Mitigation and contingency measures
		• Pre-construction on-site checks to assess route options for safety and clearance to potential obstructions, such as wires, structures and trees for oversize and/or overmass (OSOM) vehicles • Survey to document the condition of pavements and other road infrastructure such as bridges and culverts prior to construction commencement for roads that are not B-Double approved including: - Mayer Bridge - Dammans Road - Old Warburton Road - Mount Bride Road • Measures to minimise disruption due to road and lane closures including limiting the number and duration of road closures and planning closures to occur outside of peak traffic periods. Temporary alternative routes will be identified during road closures to maintain local access to properties. Warburton Highway and Old Warburton Road will not be closed at the same time and no more than one road closure will occur each day to minimise any impact. Road closures must consider emergency situations such as bushfire season. Management measures will include detours as required for the following roads: - Warburton Highway - Old Warburton Road - Dammans Road • Management of Lilydale-Warburton Rail Trail partial closure by maintaining connectivity for road and footpath users in accordance with relevant design standards and in consultation with landholders and other relevant third parties • Localised and temporary speed limit reduction for personnel and construction vehicles in the vicinity of works sites • Traffic management measures including localised and temporary speed limit reduction and signage as appropriate • Traffic management and controllers to restrict vehicles entering Mayer Bridge during heavy vehicle movements • Traffic management measures to manage the risk associated with heavy vehicles, including over dimensional vehicle movement • Consultation with PTV and private bus operators to inform them of transport changes anticipated as a consequence of construction • Measures, developed in consultation with emergency services to ensure emergency services access is maintained, especially during any public road closures • Provision of safe access points to laydown areas and site compounds • Provision of segregated access points for construction vehicles and public vehicles where appropriate • Protocols to give the community and other stakeholders adequate notice of any anticipated changes to transport conditions • Specified working hours and the periods within which heavy goods vehicles can access the works sites and deliveries made

Mitigation measure ID	Project phase	Mitigation and contingency measures
		• Minimisation of dirt and debris on roads by measures such as street sweeping, covering vehicle loads and vehicle cleaning • Minimisation of the need to transport waste from the site by reuse of materials wherever possible. The TMP will include specific measures for discrete components or stages of the works as appropriate. The above list is indicative and further measures may be identified during the development of the TMP.
MM-TP2	During and at completion of construction	**Stakeholder communication plan** **Objective**: To minimise traffic impacts on stakeholders through consultation Prior to commencement of the construction works and any temporary road or lane closures, stakeholder consultation should be carried out and advanced notice given to affected residents, businesses or industries and emergency services. This includes measures such as letter notification to inform residents and businesses of upcoming works and road closures. Stakeholder engagement and communications strategies should be established in the TMP to be prepared for the project. Stakeholders may include Councils, road authorities, bus operators, business operators and residents among others. At the end of the construction phase, a close-out meeting between Yarra Ranges Council and relevant road authorities (VicRoads and DELWP) should occur to discuss and manage the restoration of roads to prior existing (or improved).
MM-TP4	At completion of construction	**Improvement works** **Objective**: To avoid or minimise road infrastructure impacts • The need for construction restoration of the road pavement, bridges, and culverts within the study area will be assessed and where required assets will be restored to the existing or better than existing condition if damage has occurred. The need for restoration will be based on pre and post construction surveys. • The road surface conditions along Cemetery Track and Edwardstown Road will be surveyed pre and post construction and restored to existing condition or better where required • Subject to the results of the Road Safety Audits undertaken at various locations in the study area, improvements may be required prior to project opening.

6.4.5 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-14.

Table 6-14 Monitoring and reporting – transport

Action	Measures
Objective	To minimise potential adverse transport impacts and implement contingency measures where required in a timely manner
Performance indicators	• No validated complaints received by members of the public. • No unforeseen impacts of construction activities on vehicles, cyclists, pedestrians or public transport. • Safety maintained for vehicles, cyclists, pedestrians and public transport users. • Works are undertaken according to the approved TMP.
Monitoring (Parameters,	• Monitor impacts of construction activities on all modes of transport, daily. • Pre-construction on-site checks to assess route options for safety and clearance to potential obstructions, such as wires, structures and trees for OSOM vehicles.

Action	Measures
location and frequency)	• Survey and monitoring of road pavement, bridges and culvert condition prior to commencement and at completion of construction, particularly along Cemetery Track and Edwardstown Road (**MM-TP4**).
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or environmental issues are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	• If complaints are received, the issue should be investigated and rectified as required. • If the road pavement condition survey indicates that construction has damaged the road, the pavement will be restored to the existing or better than existing condition.
Responsibilities	Traffic impact management is the responsibility of the site supervisor

6.5 Land use, noise, air quality and visual

The existing environment and an assessment of potential impacts to land use, noise, air quality and visual are discussed in EES **Technical Report D: Land Use and Planning**. This section summarises the objectives to manage impacts relating to the construction phase and the mitigation and contingency measures to be applied.

6.5.1 Background

Project construction and operation have the potential to impact the existing land use and surrounding sensitive receptors such as residences, community buildings, outdoor recreation and public open spaces. During construction, land use changes are considered to have minor land use and amenity impacts, including from noise, air quality and visual. The land occupancy is temporary, with construction anticipated to last for approximately 18 months, and may be staged.

Noise associated with trail construction activities may be audible in the vicinity of the activity areas for up to a week as work crews move along the proposed trail network. During construction of bridges, trail heads and Visitor's Hub, noise may also be audible in the vicinity of activity areas, the duration of impact is likely to last between weeks to months.

During construction dust generating activities such as site clearing, vehicle movements, erosion of soil stockpiles and freshly exposed areas could generate dust emissions. Due to the magnitude of works and proximity of sensitive receptors, construction of the Visitor's Hub has the greatest potential for dust impacts. However, the air emissions from construction of the Visitor's Hub are not considered significant and are unlikely to impact human health.

It is not anticipated that material visual and landscape amenity impacts will occur during construction due to minimal removal of vegetation and the small-scale nature of construction activities.

6.5.2 Objectives

The environmental management objective for land use, noise, air quality and visual is:

- *To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.*

Specific objectives relevant to each mitigation measure are described in Section 6.5.4.

6.5.3 Relevant legislation, policy and standards

Table 6-15 lists the legislation, policies, guidelines and standards relevant to the land use, noise, air quality and visual impact assessment. A detailed description of the applicable legislation and policies and their implications on the project is provided in **Technical Report D: Land Use and Planning**.

Table 6-15 Relevant legislation, policy and standards - land use, noise, air quality and visual

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *National Environment Protection Council Act 1994 (Commonwealth)* • *Environment Protection Act 2017 (Vic)* - Environmental Reference Standard (ERS) - General Environmental Duty • *Aboriginal Heritage Act 2006 (Vic)*

Type	Applicable legislation, policy and guidelines
	- Aboriginal Heritage Regulations 2007 • *Planning and Environment Act 1987 (Vic)* • *Water Act 1989 (Vic)* - By-law No. 1 Water Supply • *Yarra River Protection (Willip-gin Birrarung murron) Act 2017(Vic)* • *Heritage Act 2017 (Vic)* • *Flora and Fauna Guarantee Act 1988 (Vic)* • *Catchment and Land Protection Act 1994 (Vic)* • *Wildlife Act 1975 (Vic)* • *Road Management Act 2004 (Vic)* • *Land and Compensation Act 1986 (Vic)* • *Conservation Forests and Lands Act 1987 (Vic)* • *Crown Land (Reserves) Act 1978 (Vic)* • *Forests Act 1958 (Vic)* - Forests (Recreation) Regulations 2010 • *National Parks Act 1975 (Vic)* • National Parks (Park) Regulations 2003
Guidelines and advisory documents	• EPA Publication 1826.4, 2021, Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues • EPA Publication 1254, 2008, Noise Control Guidelines • EPA Publication 1834, 2020, Civil construction, building and demolition guide • EPA Publication 1961, 2021, Guide to assessing and managing air pollution in Victoria (GAMAPV)

6.5.4 Mitigation and contingency measures arising from the EES

Table 6-16 lists the mitigation and contingency measures for potential land use, noise, air quality and visual impacts.

Table 6-16 Mitigation and contingency measures – land use, noise, air quality and visual

Mitigation measure ID	Stage	Mitigation measure
Land use		
LP01	Prior to and during construction	**Minimising amenity impacts** **Objective**: To avoid or minimise land use impacts Minimise amenity impacts through the proposed measures and consultation with affected landowners and stakeholders.
Noise		
NM01	During construction	**Managing noise and vibration from construction activities** **Objective**: To manage construction noise and vibration in accordance with Section 4.3.3 of EPA Publication 1834. Develop a plan to manage noise during construction in consultation with the EPA, including the following general good practice techniques: • Undertake preparatory work off-site where there is low potential for impacting people (e.g. formwork, cutting or prefabrication of materials off-site prior to transporting to the construction site) • Connect to the electricity grid as early as possible to avoid the use of diesel generators • Restrict areas where mobile plant can operate so that it is away from people who could be affected by noise • Locate site vehicle access and waiting areas away from people who could be affected by noise • Plan vehicle movements to avoid manoeuvres and idling at location nearest to nearby people • Minimise the number of noise-emitting equipment in use at once

Mitigation measure ID	Stage	Mitigation measure
		• Use quieter equipment or methods. This may require considering: - buying or leasing quieter equipment - avoiding metal-to-metal and metal-to-stone contact - installing mufflers - reducing throttle and turning off equipment when not in use - placing things down rather than throwing - educating drivers to use driving practices that minimise noise • Use low-noise saw blades • Use electrical equipment rather than equipment driven by a diesel generator • Use low-noise emitting generators • Use effective alternatives to 'beeper' alarms (e.g. broadband alarms, proximity sensors) • Avoid using reversing alarms by designing site layout to avoid reversing (e.g. drive-through for parking and deliveries) • Maintain equipment by: - inspecting regularly and maintaining equipment to ensure good working order - checking machines with enclosures, including doors and door seals and that the door closes properly against seals - maintaining air lines on pneumatic equipment so they do not leak • Maintain vehicles by: - considering good working conditions of mufflers - securing loose parts that may rattle • Limit noise caused by people on-site by: - avoiding yelling and shouting on-site (note: if people on-site need to shout to hear each other over the site ambient noise, it is possible the noise level may be putting their hearing at risk) - minimising the use and volume of any electrical amplified sound-reproducing equipment, for example radios, stereos, televisions or public address systems. • Plan transport and haulage routes to minimise the number of trucks/vehicles. Where there are large numbers of truck movements, consider truck route and truck waiting protocols (e.g. engines on/off and restart requirements) • Implement substitute methods taking into consideration: - alternatives to rock-breaking work methods, such as hydraulic splitters for rock and concrete, hydraulic jaw crushers, chemical rock and concrete splitting, and controlled blasting such as penetrating cone fractures. The suitability of alternative methods should be considered on a case by case basis, including what potential risks they involve - alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electrical generator located away from nearby people. • In terms of vibration, any works that are required to be undertaken within the safe working distances should be assessed further. • Include a review program for verification that the described good practice measures are in place and adhered to, and managed in accordance with EPA publication 1834.
NM02	During construction	**Baseline noise monitoring** **Objective:** To undertake noise monitoring prior to construction if works are planned to occur outside of normal working hours to confirm the applicable noise criteria, and respond to exceedances. Noise monitoring will be undertaken at the nearest noise sensitive residential properties to any out-of-hours works.

Mitigation measure ID	Stage	Mitigation measure
		A response plan will be developed to manage potential impacts if nominated criteria are exceeded, including: • Actions taken to rectify the exceedance • Actions to minimise risk of reoccurrence • Name of the person(s) responsible for undertaking the required actions • The duration of the monitoring will be determined by a suitably qualified acoustic consultant.
NM03	During construction	**Helicopter noise** **Objective**: To minimise noise impacts from helicopters Helicopters may be required for the construction of long bridge spans at the Yarra River and Old Warburton Road bridges and have the potential to cause adverse noise impact to the local community. The following mitigation measures have been developed with reference to Section 4.3.2 of EPA 1834 and Section 16 of EPA Publication 1254.2: <u>Community consultation</u> • Residents and community stakeholders that may be impacted will be informed at least 24 hours prior to the event of helicopter operations being conducted to support bridge construction works. • Works notification may include letter drops, specific notifications and individual briefings. • All noise complaints will be investigated and monitoring undertaken where necessary. <u>Hours of operation:</u> • Helicopters will only be used during normal working hours as defined in EPA Publication 1834 (Monday to Friday 7am to 6pm, Saturday 7am to 1pm).
Air quality		
AM01	Construction	**Dust suppression** **Objective**: To minimise air quality impacts from dust Implement dust suppression at construction areas as required using water sprays, water carts or other devices on unpaved work areas, spoil and aggregate stockpiles during the loading and unloading of dust generating materials
AM02	Construction	**Restrict vehicle movements** **Objective**: To minimise air quality impacts from dust generated from moving vehicles and plant After arrival at the project site, vehicles, plant and equipment will remain within the construction footprint and on designated roads and tracks
AM03	Construction	**Cover construction loads** **Objective**: To minimise air quality impacts from loss of loads Cover construction vehicles with potential for loss of loads (such as dust or litter) when using public roads
AM04	Construction	**Monitoring of weather conditions** **Objective**: To minimise air quality impacts during extreme weather conditions generating dust Monitor weather conditions for extreme heat and/or wind events using systems such as the Bureau of Meteorology forecasts and modify works if conditions are likely to result in air quality impacts at sensitive receptors

Mitigation measure ID	Stage	Mitigation measure
AM05	Construction	**Exhaust emissions** **Objective**: To minimise air quality impacts from exhaust emissions Vehicles and equipment will be maintained as per manufacturer's specifications to ensure minimal exhaust emissions
AM06	Construction	**Rehabilitation** **Objective**: To minimise air quality impacts from land clearance generating dust Land clearance will be minimised during construction to reduce the likelihood of wind-blown dust. Rehabilitate as soon as practicable
AM08	Construction	**Visual dust monitoring** **Objective**: To undertaken visual dust monitoring for proactive management of dust For trails under active construction, undertake air quality monitoring on a daily basis by visual observation for dust and emission plumes on-site associated with construction works and vehicles.
Visual		
LM05	Construction	**Minimising visible construction areas** **Objective**: To avoid or minimise visible construction areas and equipment • The approach to trail construction will be one that minimises the requirement for storage areas and new clearings within the Yarra Ranges National Park and Yarra State Forest not associated with the final trails themselves. The focus will be on non-intrusive methods of construction, use of small machinery that can utilise the mountain bike trails under construction, and material transfer via helicopter or on foot. • Construction equipment, stored materials and other visible elements will be located away from views from sensitive visual receptors. Should such equipment or stored materials be located in visually prominent locations for any reasonable period of time, screening measures such as hoarding or temporary plantings, and practices will be incorporated to ensure sites are kept tidy.

6.5.5 Other mitigation and contingency measures

A range of other mitigation and contingency measures have been identified for implementation during construction as set out in Table 6-17.

Table 6-17 Other mitigation and contingency measures – land use, noise, air quality and visual

Aspect	Project phase	Requirements
Noise and vibration		
Notification and work planning	Prior to commencement and during construction	• Notify nearby residents where necessary approximately 2 weeks prior to the commencement of works, including the duration and extent of works. • No works will occur on Sundays or public holidays. • Signage and notification to be installed so that park patrons are aware of the site activities. • Where works outside standard contract hours and/or those specified in EPA Publication 1834 are required, permission will be sought from Yarra Ranges Council to undertake these works. The following information will be provided to Yarra Ranges Council to allow a risk assessment to be undertaken: - Proposed activities and equipment - Reasoning for out of hours works - Proposed mitigation measures

Aspect	Project phase	Requirements
Hours of work	During construction	• Plant and equipment used on-site will be used only during normal working hours.
Air quality		
Dust and particulate matter	During construction	• Pre-emptive measures to limit dust generation on-site will be implemented. • No burning of material is to be undertaken at any time. • Keep finished trails shut until enough rain has fallen on them to allow for compaction to minimise dust due to bike traffic. • Ensure trucks transporting fine materials are covered and fitted with tight tailgates.
Machinery emissions	During construction	• Manage vehicle diesel emissions by avoiding or minimising queuing in streets approaching the worksites or adjacent to other sensitive areas • Minimise queuing of construction vehicles and idling for excessive periods (e.g. more than five minutes). • Shut down construction plant and equipment idling for excessive periods (i.e. longer than five minutes) where possible.

6.5.6 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-18.

Table 6-18 Monitoring and reporting – land use, noise, air quality and visual

Action	Measures
Noise	
Objective	To minimise disturbance to surrounding land users for noise and implement contingency measures where required in a timely manner
Performance indicators	• No validated complaints received by members of the public. • Works are being undertaken within the specified timeframes. • Plant is operating correctly and not generating a level of noise greater than that specified by the manufacturer.
Monitoring (Parameters, location and frequency)	• Daily checks of plant to ensure it is well maintained and in correct working order (**NM01**). • If works are planned to occur outside of normal working hours, noise monitoring at the nearest noise sensitive residential properties will be undertaken prior to construction to confirm the applicable noise criteria for evening and night-time works (**NM02**).
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or other environmental issues are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	• If complaints about noise are received, the offending construction activity should immediately cease until the issue is resolved satisfactorily. • Corrective actions may include repair or replacement of defective plant, or undertake noise monitoring and control measures where noise levels exceed the relevant criteria.
Responsibilities	Noise management is the responsibility of the site supervisor
Air quality	
Objective	To monitor for dust and implement contingency measures where required in a timely manner
Performance indicators	• No visible dust emissions during works. • No complaints received by members of the public. • No dust emissions which cause notices, infringements notices or stop work order.
Monitoring (Parameters, location and frequency)	• During construction, undertake daily visual observations and monitoring for: - Dust and emission plumes on-site associated with the construction works and vehicles - Weather conditions (refer to **AM04**).
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or other environmental issues are to be documented and reported to Yarra Ranges Coucnil and rectified in a timely manner.
Contingency measures	• If complaints about dust or air quality are received, the offending construction activity should immediately cease until the issue is resolved satisfactorily. • Corrective actions may include ceasing works temporarily during high wind conditions, watering, mechanical sweeping, establishing additional temporary ground covers or other ESC measures (refer to **AM01**).
Responsibilities	Air quality management is the responsibility of the site supervisor

6.6 Socio-economic

The existing environment and an assessment of potential socio-economic impacts and benefits are discussed in EES **Technical Report E: Socio-economic**. This section summarises the objectives to manage impacts relating to the construction phase and the mitigation and contingency measures to be applied.

6.6.1 Background

The project has the potential to bring substantial economic and social benefits to the local and regional economy through direct and indirect expenditure from visitors and local residents and associated job

and wealth creation and through the increasing health and wellbeing of those people that use the mountain bike trails.

The construction of trails will mean construction teams will be working on land bisecting or adjacent to some local resident's properties, which may disrupt private residences directly or indirectly for a temporary period of time. The Warburton Golf Club will also be directly impacted by the construction of one trail (Trail 10) through the course and the construction of the proposed main trail head.

6.6.2 Objectives

The environmental management objective for socio-economic issues is: *To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.*

Specific objectives relevant to each mitigation measure are described in Section 6.6.4.

6.6.3 Relevant legislation, policy and standards

Table 6-19 lists the legislation, policies, guidelines and standards relevant to the socio-economic impact assessment. A detailed description of the applicable legislation and policies and their implications on the project is provided in **Technical Report E: Socio-economic**.

Table 6-19 Socio-economic legislation, policy, guidelines and criteria

Type	Applicable legislation, policy and guidelines
Legislation and policy	N/A
Guidelines and advisory documents	● Homes for Victorians, 2017 ● Yarra Ranges Planning Scheme 31/07/2018 VC148 - 21.04-1 – Residential, Objective 2 – Housing Diversity - 21.04-1 – Residential, Objective 4 – Green Wedge Residential ● General Provisions Local Law 2012 – (No 1 of 2012) ● Yarra Ranges Integrated Transport Strategy

6.6.4 Mitigation and contingency measures arising from the EES

Table 6-20 lists the mitigation and contingency measures for potential socio-economic impacts.

Table 6-20 Mitigation and contingency measures – socio-economic

Mitigation measure ID	Project phase	Mitigation measure
MM-SM1	Construction	**Minimise disruption of construction on residents** **Objective**: To minimise the impact of the construction of trails and trail heads on residents ● Develop construction schedules in partnership with residents whose properties are bisected by, or within 100 m of a trail, through phone or face-to-face discussions in the first instance and subsequent letter-drops confirming plans. ● Place temporary fencing along trail construction sites to clearly demarcate safe areas for residents where construction bisects a property ● Ensure daily communication is conducted between residents and construction teams for residents where construction bisects a property ● Create a clear mechanism for residents to raise complaints or concerns, ideally through a single point of contact at Council.
MM-SM6	Construction	**Maintain access, safety and enjoyment of other recreation users** **Objective**: To maintain access, safety and enjoyment of other recreation users ● Establish appropriate signage at trail heads and popular trails to advise riders of the mountain bike code of conduct (always give way) and to ride on open marked trails only ● Use choke points/slowing techniques before points of intersection with other trails
MM-SM7	Construction and operation	**Minimise impacts to liveability for Warburton residents from increased traffic**

Mitigation measure ID	Project phase	Mitigation measure
		Objective: To ensure that increased traffic does not impact liveability in Warburton Yarra Ranges Council will complete the recommendations set out in the Yarra Ranges Integrated Transport Strategy (2020-2040) and the Local Movement and Transport Report as important mitigation strategies. In particular, this includes: ● Develop and implement a Traffic Management Plan to minimise disruption during all stages of construction. ● Develop and implement a stakeholder communication plan to ensure that appropriate consultation and advanced notice is provided prior and during construction. ● Undertake a Road Safety Audit to ensure that roads, intersections and the Lilydale-Warburton Rail Trail are designed and constructed to provide safe vehicle movements during both construction and operation. ● Undertake improvement works where necessary based on the pavement conditions survey. ● Establish an Emergency Access Plan.
MM-SM9	Construction and operation	**Maintain Warburton residents' access to appropriate community infrastructure** **Objective**: To ensure that the project does not diminish Warburton residents' access to appropriate community infrastructure ● Proposed community infrastructure works, including toilet upgrades at Mount Donna Buang and construction of toilets at the Mount Tugwell and Golf Club trail heads, will be completed as priorities in accordance with project staging. ● Monitor the impact of the project on dog walkers at Wesburn Park and provide additional areas elsewhere if necessary. ● Work with relevant authorities to ensure that CFA capacity and medical emergency capacity are assessed to ensure that essential emergency management services are maintained. ● An Emergency Management Plan will be prepared and approved before use of the land for the project commences to ensure that risks to life are reduced and managed appropriately. The Emergency Management Plan will include specific bushfire response measures developed in consultation with the Country Fire Authority,

6.6.5 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-18.

Table 6-21 Monitoring and reporting – socio-economic

Action	Measures
Objective	To minimise potential adverse socio-economic effects at local and regional scales and implement contingency measures where required in a timely manner
Performance indicators	• No validated complaints received by members of the public. • Works are not being undertaken outside the specified timeframes.
Monitoring (Parameters, location and frequency)	• Works are being conducted within specified timeframes. • Daily communication with residents where construction bisects a property.
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances or complaints are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	• If complaints are received, the offending construction activity should immediately cease until the issue is resolved satisfactorily.

Action	Measures
Responsibilities	The Yarra Ranges Council Project Manager and Contractor construction manager are responsible for ensuring socio-economic impacts are minimised.

6.7 Bushfire

This section summarises the objectives relating to bushfire prevention and response during the construction phase and the mitigation and contingency measures to be applied.

6.7.1 Background

Bushfires pose a significant risk to human safety, for both the construction personnel working on the trails but also local residents and other workers. The project is located in bushland that is classified as having a high bushfire risk. The main hazards related to bushfire are the risk of works on-site being an ignition source for a bushfire and the risk of a bushfire in the region impacting on-site works. Ignition sources could include:

- Hot works during the construction of trails or bridges
- Presence of petrol-powered machines with hot exhausts
- Workers smoking on-site.

6.7.2 Objectives

The environmental management objective relevant to bushfire is:

- *To put in place plans to minimise and respond to bushfire risks.*

6.7.3 Relevant legislation, policy and standards

Table 6-22 lists the key legislation, policies, guidelines and standards relevant to bushfire prevention.

Table 6-22 Relevant legislation, policy and guidelines - bushfire

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *Country Fire Authority Act 1958 (Vic)* • Country Fire Authority Regulations 2014 • *Forests Act 1958* • Forests (Fire Protection) Regulations 2014

6.7.4 Mitigation and contingency measures arising from the EES

Table 6-23 lists the mitigation and contingency measures for potential bushfire risks which were raised through the EES process. These measures relate to the biodiversity assessment.

Table 6-23 Mitigation and contingency measures – bushfire

Mitigation measure ID	Project phase	Mitigation measure
BM08	During construction	**Emergency Management Plan** **Objective**: To manage bushfire risks from the project An Emergency Management Plan will be implemented. The plan will include measures to manage bushfire risk from project activities including compliance with any requirements under the *Forests (Fire Protection) Regulations 2014* for construction and operational activities in Fire Protected Areas.

6.7.5 Other mitigation and contingency measures

A range of other mitigation and contingency measures have been identified for implementation during construction as set out in Table 6-17.

Table 6-24 Other mitigation and contingency measures – bushfire

Aspect	Project phase	Requirements
Appropriate chemical handling and fire suppression equipment	During construction	• All chemical storage and handling will be in accordance with material SDS, with appropriate firefighting equipment (e.g. specific fire extinguisher types) identified in the SDS to be maintained on-site. • Adequate fire suppression equipment should be on-site as per the requirements of Regulation 111 of the Country Fire Authority Regulations 2014. • Fire extinguishers to be kept in all vehicles, as well as the project site office. • Fuel to be stored in appropriate storage containers. • Fuel storage to be limited to less than 100 litres on construction sites.
Work methodology	During construction	• No burning of any substances, including wooden debris or products, will be undertaken as part of this project. • An adequate water supply to be available where any hot works or machinery is operating. • Smoking to be prohibited on construction sites and any butts to be disposed of appropriately.
Working during the fire season	During construction	• Ensure that each team has at least one team member who has been trained in basic bushfire awareness with the appropriate skills to undertake fire weather monitoring and calculation of the Forest Fire Danger Index (FFDI). • At the start of each working week (or some other agreed schedule) provide reports to relevant land managers (i.e. DELWP or PV depending on work locations) stating the trails being worked on, their location and the number of personnel working on each. Report to provide contact details for key personnel including Project Manager and Team Leaders. • At the start of each working week, check the weather forecast and note any potential high-risk days (i.e. high-risk days are those with high temperatures and high winds. They generally only occur during the hot summer months or during periods of drought) • On the day before any anticipated high-risk days, check to see if a Total Fire Ban (TFB) has been called for the area. Local fire bans will be checked to see if they are in place (phone 1800 020 440), with any project works that pose a high fire risk not performed during this time (e.g. on-site refuelling, etc.). • If a TFB day has been called, contact Yarra Ranges Council immediately to discuss whether it is safe/appropriate to work. • During the fire season, each team must have the following equipment on hand at all times: - Viable, functioning, two-way communications – e.g. mobile phone, UHF radio or satellite phone. Each team needs to be able to contact each other team and external contacts and each team needs to be contactable - One filled and operational knapsack pump or charged air-water extinguisher (not less than 9L capacity) - Two rake hoes - Weather instruments capable of measuring temperature, wind speed and humidity - Fire weather log book. • During the fire season, the following weather monitoring protocols apply: - At arrival to site in the morning and after main rest breaks, check weather observations and calculate FFDI and record in fire weather log book; - If the FFDI is equal or greater than 12 (High), consider implementing protocols below as per TFB day. • Prior to starting chainsaw work:

Aspect	Project phase	Requirements
		- Ensure that the immediate area has been manually cleared of twigs, leaves, scrub and other flammable material - Ensure that the knapsack is on hand, filled and ready for use.
Total Fire Ban Days		• If Yarra Ranges Council approves work to go ahead, then the following rules must be applied: - Only work in areas with good communication including mobile phone reception - Only work in areas with quick/easy access where vehicles can be parked close by - No operating excavators, chainsaws, brushcutters, or any other machinery/equipment that could conceivably emit sparks during operation - Generally, all work should be conducted with hand tools only - Ensure all workers have adequate sun protection - Ensure all workers work to the conditions and drink plenty of water. • On TFB days, the following weather monitoring protocols apply: - At arrival to site in the morning and after any rest breaks, check weather observations and calculate FFDI and record in fire weather log book - If the FFDI is equal or greater than 20 (High), consider suspending operations and leaving site.

6.7.6 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-25.

Table 6-25 Monitoring and reporting – bushfire

Action	Measures
Objective	To minimise bushfire risk and implement contingency measures where required in a timely manner
Performance indicators	• Bushfire risk is not increased due to project works. • Works at the site are not impacted by bushfire risk or fire management. • Adequate fire protection equipment on-site. • No machinery which could cause a spark to be operated on TFB days.
Monitoring (Parameters, location and frequency)	• Monitoring of fire bans. • Monitoring of planned burns. • Weather monitoring: - During the fire season, check weather observations, calculate FFDI and record in fire weather log book on arrival to site in the morning and after main rest breaks (e.g. lunch). - On TFB days, weather monitoring frequency to increase to after any rest break.
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists and the fire weather log book. • Any non-conformances or other environmental issues are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	• If a TFB day has been called, contact Yarra Ranges Council immediately to discuss whether it is safe/appropriate to work in the event of high FFDI calculated. - If the FFDI is equal or greater than 12 (High), consider implementing protocols as per TFB day. - If the FFDI is equal or greater than 20 (High), consider suspending operations and leaving site. • If activities spark a fire, immediately implement fire suppression methods and contact emergency services. • Evacuate the site.

Action	Measures
Responsibilities	Bushfire prevention and response is the responsibility of the site supervisor. All staff who are required to perform tasks that may impact or be impacted by bushfire during their work are responsible for implementing appropriate bushfire control measures.

6.8 Waste

This section summarises the objectives to manage wastes relating to the construction phase and the mitigation and contingency measures to be applied.

6.8.1 Background

Overall, given the modest size of construction there will be minimal waste generation caused by these activities. For the construction of the trails, the fill material generated will be reused on-site so there will not be spoil that requires disposal. Other sources of construction waste will include timber, plastic and wood. The quantities of these materials will be minor and they will be recycled or disposed of as appropriate.

6.8.2 Objectives

The environmental management objectives relevant to waste are:

- *To maintain the functions and values of groundwater, surface water and floodplain environments and minimise effects on water quality and beneficial uses.*
- *To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.*

6.8.3 Relevant legislation, policy and standards

Table 6-26 lists the key legislation, policies, guidelines and standards relevant to waste management.

Table 6-26 Relevant legislation, policy and guidelines - waste

Type	Applicable legislation, policy and guidelines
Legislation and policy	• *Environment Protection Act 2017 (Vic)* - Environmental Reference Standard (ERS) - General Environmental Duty • Environment Protection Regulations 2021

6.8.4 Mitigation and contingency measures arising from the EES

Table 6-27 lists the mitigation and contingency measures for potential waste impacts which were raised through the EES process. These measures relate to the surface water and transport assessments.

Table 6-27 Mitigation and contingency measures – waste

Mitigation measure ID	Project phase	Mitigation measure
SWM10	During construction	• Follow EPA publication 1698 Liquid storage and handling guidelines (EPA 2018) • All regulated and hazardous waste will be stored in a bunded area as far as practical from the waterways. • All waste material will be removed from the site before removing any erosion and sediment control measures. • All hazardous materials will be removed from site and disposed of appropriately.
MM-TP1	During construction	• Minimisation of the need to transport waste from the site by reuse of materials wherever possible.

6.8.5 Other mitigation and contingency measures

A range of other mitigation and contingency measures have been identified for implementation during construction as set out in Table 6-28.

Table 6-28 Other mitigation and contingency measures – waste management

Aspect	Project phase	Requirements
Reducing waste	Prior to commencement of construction	• All opportunities to reduce resource consumption will be taken following the waste hierarchy of control: avoid, reduce, reuse, recycle, recover and dispose waste material. • Materials and products with recycled content will be proposed for the works wherever these are cost and performance competitive and they are environmentally preferable to the non-recycled alternative. • The correct quantities of material for the works will be procured to limit waste and excess materials.
Waste management	During construction	• The site will be kept in a clean and tidy state throughout the works. • All food waste will be carried out of the Yarra Ranges National Park and state forest construction locations daily. • Appropriate waste receptacles will be provided at the site compound, including recycling bin/s. All waste containers must be fitted with secure lids at all times to ensure native fauna and/or pest species are not attracted to the site. • Waste oil will be sent to approved recyclers. • Waste and containers not able to be recycled will be disposed of at a licensed landfill site. • There will be no removal of soil as part of this project.
Waste management	At construction completion	• The works site will be left in a clean and tidy state following the completion of works. • All waste will be removed from site at the completion of works and disposed of appropriately.

6.8.6 Monitoring and reporting

The monitoring parameters, location and frequency to evaluate environmental performance and initiate contingency measures where required is set out in Table 6-29.

Table 6-29 Monitoring and reporting – waste

Action	Measures
Objective	To minimise and appropriate dispose of wastes and implement contingency measures where required in a timely manner
Performance indicators	• No validated complaints received by members of the public. • Waste is being separated and disposed of into the appropriate receptacle. • No contamination of soil, water or air as a result of inappropriate waste management. • The site is maintained in a clean and tidy state throughout the project activities. • Continuous improvement of waste avoidance, reduction and recycling throughout the project.
Monitoring (Parameters, location and frequency)	• Daily visual inspection of waste collection areas and general site housekeeping. • Daily visual inspection to ensure that waste is being separated into recyclable and non-recyclable (i.e. disposal) receptacles appropriately.
Reporting	• Information pertaining to inspections, monitoring and pre-emptive measures will be recorded within daily inspection checklists. • Any non-conformances are to be documented and reported to Yarra Ranges Council and rectified in a timely manner.
Contingency measures	• If complaints about waste are received or an incident occurs, the waste management system will be investigated and rectified as required. • Corrective actions may include repair or replacement of defective waste receptacles, providing additional waste receptacles, or undertaking clean-up activities.
Responsibilities	Waste management is the responsibility of the site supervisor. All staff are responsible for implementing appropriate waste management measures.

7.0 Induction and training

Prior to participation in project construction, all staff members including Yarra Ranges Council staff, contractors and subcontractors will be required to attend a project induction.

Key items within the project induction will be:

- Project location – review the location of the trails to be constructed
- Project scope of works – review the scope of works, including schedules, resources, equipment, container/compound locations, days/hours of work, productivity targets and reporting milestones
- Discussion of key environmental issues and procedures for monitoring and control, including (but not limited to):
    - Legal and environmental approvals obligations
    - Field identification of flora species and the mechanisms to avoid impacts on key species, including fact sheets of significant flora and weed species
    - Field identification of significant fauna species and habitat and the mechanisms to avoid impacts on key species, including platypus, threatened crayfish, Leadbeater's Possum and Mount Donna Buang Wingless Stonefly
    - Locations of listed heritage sites, areas of archaeological potential and identification of historic heritage features
    - Locations of areas of significant Aboriginal cultural heritage and identification of cultural heritage sites
    - Unexpected finds procedure in the event of identifying historic heritage features (Attachment 6) or Aboriginal cultural heritage places
- CEMP requirements for environmental management
- Health and Safety Management Plan (including key project contacts, evacuation plan, Safe Method Work Statements)

Representatives from Yarra Ranges Council, PV and DELWP will be present at the induction and may choose to include organisation-specific induction material. Content on key environmental issues will be provided by the technical specialists.

At the completion of the project induction training, all staff members will be required to sign an attendance form acknowledging that they have been informed of their environmental management responsibilities. Records of induction and training will be kept in a register, including the type and topic of training undertaken, dates, names and trainer details.

This training is one of the key mechanisms by which we will ensure that environmental issues and ameliorative measures identified in the CEMP are clearly understood by all staff members. In addition to the project induction, job-specific environmental management training relevant to the role will be provided if and when required.

Any new staff members arriving throughout the duration of the project will be required to undertake project induction with the site supervisor, contractor construction manager and Yarra Ranges Project Manager. Daily toolbox meetings will be held to highlight relevant environmental and safety issues.

8.0 Emergency and incident response

8.1 Emergency and incident response procedures

Emergency and incident responses will vary depending on the nature of the incident.

Any environmental incidents in relation to the project will be managed through the project's Emergency Management Plan and the Yarra Ranges Council Complaint Policy. The Emergency Management Plan would be developed with consideration of the existing Yarra Ranges Council Municipal Emergency Management Plan and Parks Victoria Yarra Ranges National Park Emergency Management Plan. This would include adherence of emergency response planning, such as park closures.

Incidents will be escalated within Yarra Ranges Council in accordance with Council procedures and to regulatory agencies in accordance with legal requirements. Landowners or land managers potentially affected by incidents will be informed as soon as practicable by Yarra Ranges Council.

When reporting environmental incidents, the following information will be recorded:

- The name and contact details of the reporting person
- The date and time the environmental incident occurred
- The activity that was being undertaken when the incident occurred
- How the incident occurred
- Any containment measures put in place to reduce or contain environmental harm
- An assessment of the amount of environmental harm that occurred
- Details of stakeholders potentially affected.

Environmental incidents will be investigated to ensure that appropriate follow up actions are taken where required to prevent recurrence. The status of follow-up actions will be monitored and once all planned follow up actions have been completed the incident will be closed. All corrective actions will be recorded in an incident register that will be managed by Yarra Ranges Council.

Emergency situations including in relation to fire, flood, storm and extreme heat will be managed in accordance with the Emergency Management Plan. For each high-risk emergency, procedures would be established to prevent or mitigate environmental impacts arising from the emergency or from the response.

Council's representatives will be verbally notified of an incident within two hours of the responsible person becoming aware of the incident, and in writing within 24 hours. All notifications to authorities (e.g. Department of Environment, Land, Water and Planning) will be undertaken by Yarra Ranges Council.

Environmental incidents and emergencies have been identified within the individual environmental risk management plans above. However, proactive environmental risk management measures should be undertaken wherever possible, if events such as extreme rainfall or flooding are forecast.

Some examples of environmental risk responses are provided below in Table 8-1.

Table 8-1 Examples of environmental risk responses

Incident	Mitigation measure	Reporting
Failure of erosion and sediment control (ESC) devices following rainfall event or flooding	Re-instatement of ESC devices	Report to Yarra Ranges Council
Contamination of waterway with suspended solids or chemicals	Deploy spill-kit/containment measures (e.g. silt boom, rock check dam, etc.)	Report to Yarra Ranges Council
Non-compliance detected during monitoring program (e.g. water quality)	Cease operations and perform root-cause analysis	Report to Yarra Ranges Council
Identification of cultural heritage aspects during excavation	Cease operations and follow cultural heritage reporting procedure	Report to Yarra Ranges Council
Noise or air quality complaints	Record complaint in on-site complaints register and inform Council	Report to Yarra Ranges Council
Injury to fauna during site works	Transport injured fauna to an appropriate veterinarian or carer as soon as possible.	Report to Yarra Ranges Council, DELWP and Parks Victoria
Damage to vegetation	Cease operations in vicinity of impacted vegetation. Attempt to stabilise damage, engage with ecologist or arborist	Report to Yarra Ranges Council, DELWP and Parks Victoria
Bushfire	Evacuate site, and if adequate time secure site (including removal of petrol products if possible)	Report to Yarra Ranges Council

8.2 Emergency contacts

Emergency contacts for the project are listed in Table 8-2.

Table 8-2 Emergency contacts

Emergency contact	Phone number
Fire brigade / police / ambulance	000
Country Fire Authority District	8739 1300
Environment Protection Authority pollution hotline	1300 372 842
Wildlife Victoria wildlife emergencies	8400 7300
Melbourne Water	131 722
Parks Victoria Information Centre	13 19 63
DELWP Fire Regional Duty Officer	1300 782 980
DELWP Yarra District Duty Officer	5965 9907 0417 325 970
Poisons Information	13 11 26

9.0 Environmental auditing and verification

9.1 Internal environmental verification

Regular surveillance of construction work sites is a critical means to verify that environmental management is effective and to achieve compliance with the CEMP. Construction staff will use daily checklists to verify site controls are being adhered to. Refer to Attachment 4 for an example checklist.

The daily checklists, in addition to site inductions, other daily toolbox observations and monitoring data, will form the basis of the internal environmental verification process. The Yarra Ranges Council environmental representative will review these documents to check compliance with the CEMP on a monthly basis. In the event of non-compliances, the environmental representative will seek rectification and record them in a non-compliance register.

The effectiveness of the CEMP will be reviewed by the Yarra Ranges Council Project Manager at least every six months and may be also updated in response to:

- Modifications to construction methods
- The currency of the risk register including identification of new environmental risks
- Results of environmental monitoring
- Environmental incidents, non-conformances and audit findings
- Feedback from stakeholders
- Identified opportunities for improvement.

9.2 Independent audit

Compliance with the CEMP would be verified through periodic independent environmental audits coordinated by Yarra Ranges Council. An audit would be conducted prior to the commencement of construction to verify all relevant environmental/social documentation and approvals are in place for construction activities. Audits would be conducted at least annually thereafter by suitably qualified and experienced environmental auditors that are otherwise not involved in the project's construction. Audits would be conducted following the completion of construction to assess the effectiveness of rehabilitation works.

Environmental audits would gather information through:

- Interviews with staff and contractors
- Reviews of documentation
- Observation of practices.

Audit reports would be submitted to Yarra Ranges Council, DELWP and Parks Victoria by the environmental auditor. Reports would record details of any nonconformances identified during the audit and corrective actions required to address the nonconformance. For each corrective action, the responsible person and target completion date would be specified.

Yarra Ranges Council would publish a summary of the results of each environmental audit report on the Council website within three months of the environmental audit report being finalised. The focus and frequency of audits would be reviewed annually in the light of audit results.

10.0 Stakeholder consultation

Yarra Ranges Council seeks to ensure stakeholders, the local community and authorities are satisfied by the manner in which construction activities and tasks are managed. Stakeholder consultation would be undertaken in accordance with the Communications and Community Engagement Plan which is to be developed.

10.1 Notification of construction activities

Prior to commencement of construction and during construction works, Council would consult with and notify land managers, landowners and occupiers, and the local community on works which have the potential to cause disruption or disturbance.

10.1.1 Land managers

Council would provide periodic briefings for Yarra Ranges Council partner agencies (Parks Victoria, DELWP and Melbourne Water) on construction progress through the project steering committee.

Partner agencies would be provided with up-to-date construction information, including the location, schedule, and dates of proposed works. The agencies would be updated in the event of any changes to the construction schedule.

A designated contact for each land manager would be consulted with to ensure the orderly transmission of information between Yarra Ranges Council and the partner agency.

10.1.2 Directly affected landowners and occupiers

Yarra Ranges Council would maintain consultation prior to and during construction with residents whose properties are bisected by, or within 100 metres of a trail to develop construction schedules, through phone or face-to-face discussions in the first instance and subsequent letter-drops confirming plans. During construction, construction teams would maintain daily communication for residents where construction bisects a property.

Nearby residents would be notified of construction works where necessary approximately 2 weeks prior to the commencement of works, including information on the duration and extent of works. Residents and community stakeholders that may be impacted by noise from helicopters would be informed at least 24 hours prior to the event.

10.1.3 General community information

During project construction, regular updates on progress would be made available to the general community through the following means:

- Regular updates on the construction program on the Yarra Ranges Council website
- Provision of contact information on the Yarra Ranges Council website for any enquiries.

10.2 Complaint management

Responding to stakeholder complaints would be undertaken in accordance with the Yarra Ranges Council Complaint Policy. This policy sets out procedures that:

- Provide a standardised approach to managing complaints

- Provide a framework for the management of complaints and feedback with a view to continually improving services, systems and capabilities
- Increase the level of satisfaction by resolving issues in an effective, fair, respectful and professional manner
- Ensure all statutory requirements are satisfied, and escalation options are communicated clearly.

The procedures under Yarra Ranges Council Complaint Policy require that:

- Complaints are recorded in a register including the date and time of the complaint, details of the complainant (if known) and the nature of the complaint
- The complainant be contacted directly (where possible) to discuss and better understand the concerns raised
- An investigation of the complaint is undertaken proportionate to the nature and the severity of the issues raised in the complaint
- A written response is provided to the complainant to communicate the findings in relation to the investigation of the complaint and details of any actions taken by Yarra Ranges Council in response to the issues raised.

Attachment 1 – Values for consideration in micro-siting

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Vegetation and trees					
Cool Temperate Rainforest (CTR) / Cool Temperate Mixed Forest (CTMF) / Myrtle Beech Canopy	Minimise impacts on CTR/CTMF and places where Myrtle Beech sub-canopy/canopy occur. Avoid and minimise spread of Myrtle Wilt by avoiding or minimising wounding of Myrtle Beech trees.	Level 3	- Known occurrences are identified through EVC mapping (Biosis) and through Myrtle Beech sub-canopy mapping (World Trail for Trail 1). - Trail alignment to avoid areas where possible within the trail corridor. - Where avoidance not possible, appropriate trail construction methods to be utilised such as narrowing of footprint, hand-building and/or elevated structures. - Where pruning or wounding of Myrtle Beech trees/roots is likely to occur trail crews will be trained in pruning methods and application of anti-fungal agents.	Ecologist to provide training at induction to identify CTR and CTMF and Myrtle Beech canopy (relevant for Yarra Ranges NP and very small area of State Forest). Arborist to provide training in Myrtle Beech wound management.	Biosis Habitat Zone mapping
Rare or threatened flora	Avoid and protect known rare or threatened species (e.g. Tree Geebung, Orchids). Detect and avoid any un-detected significant species (e.g. Round-leaf Pomaderris).	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Known sites/high risk areas for rare or threatened flora were identified spatially during ecology surveys. - Ecologist to walk trail alignment in high risk areas with trail crew and visually identify any rare or threatened flora species with consideration of seasonality. - Align trail away from known/identified sites/areas/individual specimens of rare of threatened species (buffer distance will be driven by species lifeform). - If rare or threatened species identified, exclusion zones marked (using different colour flagging tape or bunting). - Photograph and spatially capture locations.	- Develop species fact sheets for trail crews (hard and soft copy). - Training (high-level) for identifying rare or threatened flora to be provided by ecologist at induction. - Fact sheets (including notes and photos) to be included in WMBD Construction Team Handbook.	Biosis – Ecology values / VBA Biosis – Threatened flora – point data

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Trees (large trees and canopy trees) – direct impact/removal	Avoid removing any large trees. Avoid removing or pruning more than 1/3 of the foliage of 'canopy trees' – i.e. trees that are reproductively mature and greater than 3 m tall.	Level 1, progressing to Level 2 if technical specialist (arborist) advice required	- Align trails to avoid large trees and canopy tree removal/excessive pruning - If trail has to be aligned near large trees, use protection methods provided through arborist training at induction. - If those methods are unable to protect a tree, engage arborist to provide on-site advice. - Identify, photograph and spatially capture locations where direct large tree or canopy tree impacts are possible.	- Training for tree protection methods to be provided by ecologist and arborist at induction.	Biosis Benchmark large tree mapping
Trees – consequential loss through SRZ/TPZ encroachment	Protect the structural root zone (SRZ) of large trees and canopy trees to ensure encroachment into TPZ and SRZ does not cause tree decline.	Level 1	- Align trail away from SRZ, where possible. - Identify, photograph and spatially capture locations where Tree Root Protection will be required. - Refer to Standard Drawing WTMSTD-0280-YV for Tree Root Protection Methods.	- Arborist to provide training in SRZ and root protection methods at induction.	N/A
Trees – direct removal / treatment to manage hazardous tree risk	Avoid trail alignment in areas of obvious tree hazards. Identify areas where special hazardous tree management will be required. Identify any additional trees to be accounted for in offset requirements ('as constructed' assessment).	Level 1, progressing to Level 2 and 3 if technical specialist (arborist/ ecologist) advice required	- Trail to be aligned to avoid obvious tree hazards. - Where this is not possible an arborist will be consulted regarding most appropriate approach for treatment of hazardous trees. - If hazardous tree removal or excessive pruning is required then ecologist to be consulted on 'tree values' (hollow-bearing status) and need for additional offsets.	- Training for identification of hazardous trees to be provided by arborist at induction.	N/A

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Weed invasion into relatively weed free areas	Avoid spread of weed species during trail construction.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Known sites/high risk areas for weed species area identified spatially (e.g. road/forest track edges, Donna Buang summit, Scotchman's Creek, Wesburn Park). - Ecologist to visit weed source areas with trail crew where construction may enter these areas and visually identify any weed species and key areas to avoid. - Avoid trail alignment in areas of known/identified weed species. - If weed species identified, exclusion zones marked (using different colour flagging tape or bunting). - Follow up inspections 6 and 12 months after construction to detect weed spread.	- Training for identifying known weed species to be provided by ecologist at induction. - Weed species factsheets (including notes and photos) to be included in WMBD Construction Team Handbook. - Yarra Ranges Weed ID Guide will be provided to all trail crews.	Location-based. Certain high risk areas will be indicated (via polygon). Areas of note include Mt Donna Buang, Scotchman's Creek, Mt Tugwell, roadsides, Wesburn Park, golf course, O'Shannassy Aqueduct area).
Epiphytic/lithophytic species	Minimise impacts on flora species that grow on rocks	Level 1, progressing to Level 2 and 3 if technical specialist (arborist/ ecologist) advice required	- Avoid the use of boulders covered with bryophytes and / or ferns in trail construction - Photograph and spatially capture locations	Training for identification of Epiphytic/lithophytic species	N/A

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Waterway crossings (minor tributaries and major streams)					
Platypus burrows	Avoid impacts on platypus burrows at any larger creeks or waterways.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Ecologist to walk trail alignment and proposed larger waterway crossing sites with trail crew, visually identify platypus burrows. - Apply an appropriate buffer to platypus burrows if detected. - Photograph and spatially capture locations.	- Training for identification of platypus burrows to be provided by ecologist at induction. - Fact sheets (including notes and photos) to be included in WMBD Construction Team Handbook.	1:25,000 hydro layer (publicly available) or other relevant layer sourced from Melbourne Water – w be used to look at lower reaches of streams and set an elevational threshold to define high risk areas.
Threatened crayfish habitat (Curve-tail Burrowing Crayfish) – species associated with floodplains	Minimise impacts on crayfish habitat.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Ecologist to inspect key larger gullies and waterways with trail crew to visually identify signs of crayfish habitat. - Micro-site around crayfish chimneys and provide guidance to avoid deep excavation near potential habitat. - Photograph and spatially capture locations.	- Training for identification of crayfish habitat indicators to be provided by ecologist at induction. - Fact sheets (including notes and photos) to be included in WMBD Construction Team Handbook.	N/A
Groundwater dependent ecosystems (GDEs), seeps/springs and associated vegetation communities / species	Avoid and minimise impacts on seeps, springs and associated vegetation communities and species (Mountain Tea-tree / Lemon Bottlebrush thickets and Stonefly habitat).	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Ecologist to inspect these areas and advise on alignments to minimise impacts and installation of elevated structures. - Photograph and spatial capture locations.	- Training for identification of seeps, springs and thickets.	Location-based. Particular sections of trails are known to have these (e.g. 1, 45, 46) – similar to weeds.
Fauna and habitat					

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
High quality Leadbeater's Possum habitat in thicket vegetation	Ensure total avoidance of high quality Leadbeater's Possum habitat in Mountain Tea-tree / Lemon Bottlebrush thickets and at/near translocation sites and nest boxes.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Known sites/areas of high quality Leadbeater's Possum habitat identified spatially and should have been avoided during trail design but any works near these areas will need to be micro-sited. - Ecologist to walk trail alignment with trail crew, visually identify any works locations near high quality Leadbeater's Possum habitat. - Trail alignment to avoid areas of known/identified high quality Leadbeater's Possum habitat. - Photograph and spatially capture locations.	- Training for identification of high quality Leadbeater's Possum habitat indicators to be provided by ecologist at induction. - Factsheets (including notes and photos) to be included in WMDB Construction Team Handbook.	Leadbeater's Possum VBA record (DELWP 2020) Leadbeater's Possum nest box (Parks Victoria, unpub. Data) Leadbeater's Possum record (Zoos Victoria, unpub. Data) Confirmed Leadbeater's Possum sites (DELWP 2021b)
Donna Buang Wingless Stonefly	Avoid and minimise impacts on Wingless Stonefly habitat.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist / Eddie Tsyrlin)	- Known sites/areas of Wingless Stonefly habitat identified spatially by Eddie Tsyrlin in locations between Donna Buang and Mount Victoria/Ben Cairn areas. - Ecologist to walk trail alignment with trail crew, visually identify Wingless Stoneyfly habitat and advise on avoidance and installation of elevated structures. - Photograph and spatially capture locations.	- Training for identification of Wingless Stonefly habitat indicators to be provided by ecologist at induction. - Species ID Summary (including notes and photos) to be included in WMBD Construction Team Handbook.	Biosis – Ecology values / VBA Expert reporting from Eddie Tysrlin

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Tubercle Burrowing Crayfish – species associated with hillslopes in wet forests	Minimise impacts on crayfish habitat.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Ecologist to inspect key potential habitat areas to visually identify signs of crayfish habitat. - Micro-site around crayfish chimneys and provide guidance to avoid deep excavation near potential habitat. - Photograph and spatially capture locations.	- Training for identification of crayfish habitat indicators to be provided by ecologist at induction. - Fact sheets (including notes and photos) to be included in WMBD Construction Team Handbook.	No current spatial data source. Could be modelled if required.
Roost / nest site for forest owls and arboreal mammals	Minimise disturbance of roost sites for forest owls and arboreal fauna.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Any roost sites of native fauna to be avoided as much as possible. - Ecologist to provide guidance on identification with trail crew, visually identify roost sites. - Apply an appropriate buffer depending on species. - Photograph and spatially capture locations.	- Training for identification of roost sites to be provided by ecologist at induction. - Fact sheets (including notes and photos) to be included in WMBD Construction Team Handbook.	N/A – observational
Lyrebird mounds	Avoid Lyrebird mounds.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Ecologist to walk trail alignment with trail crew to provide general guidance on identifying Lyrebird mounds. - Apply appropriate buffer to active Lyrebird mounds.	- Training for identification of lyrebird mounds to be provided by ecologist at induction. - Species ID Summary (including notes and photos) to be included in WMBD Construction Team Handbook.	N/A – observational
Ground-dwelling fauna burrows (e.g. wombat)	Avoid burrows, dens, fallen logs.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (ecologist)	- Ecologist to walk trail alignment with trail crew to provide general guidance on identifying ground-dwelling fauna burrows. - Apply appropriate buffer to active burrows.	- Training for identification of burrows to be provided by ecologist at induction. - Species ID Summary (including notes and photos) to be included in WMBD Construction Team Handbook.	N/A – observational
Historic/European Heritage					

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Mines	Protect historic mine sites.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (heritage specialist)	- Locations where trails intersect with mines will be reviewed against a table of management requirements. - Where required under the historic heritage assessment, a heritage advisor will undertake evaluation of the trail location and advise the trail construction team regarding appropriate micro-siting locations. - Where an unexpected mine site is identified, works will stop and the appropriate management measure and statutory requirements will be implemented before works can continue at that location.	- Training for identification of mine sites to be provided by historic heritage technical specialist at induction.	Biosis – Heritage Values (all)
Tramways	Protect historic tramway sites.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (heritage specialist)	- Locations where trails intersect with tramways will be reviewed against a table of management requirements. - Where required under the historic heritage assessment, a heritage advisor will undertake evaluation of the trail location and advise the trail construction team regarding appropriate micro-siting locations. - Where an unexpected tramway site is identified, works will stop and the appropriate management measure and statutory requirements will be implemented before works can continue at that location.	- Training for identification of tramway sites to be provided by historic heritage technical specialist at induction.	Biosis – Heritage Values (all)

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Water Races	Protect historic water race sites.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (heritage specialist)	- Locations of potential conflict between trails and historic features are identified and specific requirements recommended for each. - Locations where trails intersect with water races will be reviewed against a table of management requirements. - Where required under the historic heritage assessment, a heritage advisor will undertake evaluation of the trail location and advise the trail construction team regarding appropriate micro-siting locations. - Where an unexpected water race site is identified, works will stop and the appropriate management measure and statutory requirements will be implemented before works can continue at that location.	- Training for identification of water race sites to be provided by historic heritage technical specialist at induction.	Biosis – Heritage Values (all)
Heritage-listed sites	Protect heritage-listed sites.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (heritage specialist)	- Locations of potential conflict between trails and historic features are identified and specific requirements recommended for each. - Locations where trails intersect with heritage-listed sites will be reviewed against a table of management requirements. - Where required under the historic heritage assessment, a heritage advisor will undertake evaluation of the trail location and advise the trail construction team regarding appropriate micro-siting locations.	TBC	Biosis – Heritage Values (all)

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Areas of archaeological potential	Protect unlisted historic heritage sites	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (heritage specialist)	- Locations of potential conflict between trails and historic features are identified and specific requirements recommended for each. - Locations where trails intersect with unlisted heritage sites will be reviewed against a table of management requirements. - Where required under the historic heritage assessment, a heritage advisor will undertake evaluation of the trail location and advise the trail construction team regarding appropriate micro-siting locations. - Where an unexpected heritage site is identified, works will stop and the appropriate management measure and statutory requirements will be implemented before works can continue at that location.	TBC	Biosis – Heritage Values (all)

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
Aboriginal Cultural Heritage					
Aboriginal Cultural Heritage sites	Protect Aboriginal cultural heritage sites.	Level 3, progressing to Level 1 when deemed appropriate by technical specialist (heritage specialist)	- This requirement for monitoring is determined by the Registered Aboriginal Party (RAP) as part of consultation during the CHMP. Previous discussions have indicated that no monitoring will be required but a few Elders and field crew have mentioned so it may come up again. Meeting for CHMP conditions is booked for August. - - Locations where trails intersect with Aboriginal Cultural Heritage sites will be reviewed against a table of management requirements. - Where required under the CHMP, a heritage advisor and/or RAP will undertake evaluation of the trail location and advise the trail construction team regarding appropriate micro-siting locations. - Where unexpected Aboriginal cultural heritage is identified, works will stop and the appropriate management measure and statutory requirements will be implemented before works can continue at that location.	- Training for identification of cultural heritage sites to be provided by cultural heritage technical specialist / Traditional Owner at induction.	TBC (sensitive spatial data)
Existing Forest and Park Asset					
	Protect existing forest and park assets (e.g. other trails, roads, Dee Road carpark, O'Shannassy Aqueduct Trail, Mt Donna Buang Summit).	Level 1	- Known forest and park assets identified spatially. - Invite appropriate land manager to be present and provide advice during micro-siting.	N/A	TBC
Third Party Assets					

VALUE / POTENTIAL IMPACT	PURPOSE OF MICRO-SITING	LEVEL OF MICRO-SITING	NOTES / PROCEDURE	TRAINING	SPATIAL DATA SOURCE
	Protect existing third party assets.	Level 1	- Known third party assets identified spatially. - Invite appropriate land manager to be present and provide advice during micro-siting.	N/A	TBC
Private Property					
	Protect private property.	Level 1	- Known private property boundaries identified spatially. - Invite relevant private property landholder to be present and provide advice during micro-siting.	N/A	TBC

Attachment 2 – Pre-Start Trail Review Proforma

Pre-start Trail Review

Trail name/number: _____

Date: _____

Weather observations: _____

Site description: _____

Works to be conducted in an area of significant biodiversity or heritage values: Y / N

Item/Value	Alignment change / No go zone required	Alignment treatment required	Flagging tape/bunting mark-up colour

Spatial data of final alignment recorded: Y / N

Photographs of existing conditions taken: Y / N

Sign-off

Name	Organisation/Role	Signature	Date

Attachment 3 – Risk Register

Drafting note: To be compiled from EES Technical Reports when final

Attachment 4 - Environmental management checklists

Daily inspection checklist

Date of inspection: _____

Inspection conducted by: _____

Weather observations: _____

Site description (Trail/location): _____

Works to be conducted in an area of significant biodiversity or heritage values: Y / N

Presence of significant flora/fauna/habitat or other observations: _____

_____

_____

Item	Complies (Y/N)	Corrective actions / maintenance required	Corrective action completed (signature/date)
Biodiversity			
GIS maps checked for significant biodiversity values			
Presence of significant flora species checked			
Presence of epiphytic / lithophytic species checked (i.e. plants growing on rocks)			
Vegetation to be retained, including tree roots, is adequately protected			
No hazardous tree removal or excessive pruning is required			
Presence of fauna in works vicinity checked			
Sufficient buffer has been applied to fauna burrows, fallen logs, crevices, nests or dens			
Structures that could trap fauna are covered, checked and an egress point provided			
Presence of weeds or pathogens checked			
Presence of GDEs seeps / springs and associated vegetation communities / species checked			
Vehicle and plant wash down checklist completed			

Item	Complies (Y/N)	Corrective actions / maintenance required	Corrective action completed (signature/date)
Surface water management			
Sediment controls are installed in adequate locations to minimise sediment runoff			
Sediment controls are functioning well and in good condition			
Sediment controls are clear of debris			
There are enough sediment controls			
Stockpiles are managed to minimise sediment runoff and dust emissions			
Surfaces left in a roughened condition to encourage infiltration and minimise runoff			
There are no erosion issues			
There are no identified water quality issues (e.g. sediment runoff, turbid water, algal blooms, oil sheens)			
Roads and vehicles are managed to minimise mud tracking			
Bunds and storage areas are away from drainage lines and well maintained			
A spill kit is available and well stocked			
Hazardous materials			
Storage is in accordance with the manufacturer's specifications and the relevant SDS with consideration of chemical compatibility			
Oils, fuel and other chemicals are stored in sufficiently sized bunded areas and there is no evidence of leakage or damage			

Item	Complies (Y/N)	Corrective actions / maintenance required	Corrective action completed (signature/date)
Correct warning signs and emergency telephone contact numbers are in place			
Heritage			
GIS maps checked for significant heritage values			
Hard copy of unexpected finds procedure is available that includes pictures of potential artefacts			
Noise and air quality			
Dust suppression of exposed surfaces and stockpiles is adequate			
Vehicles and plant are operated and maintained to manufacturers' specifications			
Vehicles and plant are turned off when not in use			
Traffic			
Vehicles are using defined and managed roads			
Vehicles and plant are parked / stored in dedicated areas			
No impacts of construction activities on vehicles, cyclists, pedestrians or public transport			
Waste management			
The site is clean and tidy			
Bins and receptacles are in a clean and tidy condition and free from offensive odour			
Reusable and recyclable materials are separated and reused on-site or sent for offsite reuse			
Stakeholder consultation			
Works been communicated to stakeholders where required			
Occupational health and safety			

Item	Complies (Y/N)	Corrective actions / maintenance required	Corrective action completed (signature/date)
Induction training for all employees carried out where necessary and records updated			
OH&S equipment (e.g. first aid kits and fire extinguishers) provided in appropriate locations			
Appropriate Personal Protective Equipment provided and being used by all workers			
Site facilities (toilet, lunchroom, drinking water, first aid) are provided and meet all requirements			

Checklist reviewed by: _____ Date: _____

Comments: _____

_____

_____

Surface water monitoring record sheet

Date	Time	Location (Trail, waterway, upstream/downstream)	Turbidity reading (NTU)	Observations / action required	Inspected by (initials)

Washdown checklist

CLEANING/INSPECTION CHECKLIST FOR UTILITY/4WD				
Date:		Location:		
Vehicle:		Registration/ID:		
Area	Contamination point	Inspected	Cleaned	Method
Engine bay	Front grill			
	Radiator and other cooling cores or fins			
	Grill or recess under wipers			
Cabin	Footwells			
	Carpets and mats			
	Seats			
Wheels and arches	Tyre treads			
	Wheel arches			
	Mud flaps and brackets			
Tray	Body of tray (especially any recesses)			
	Mats and toolboxes			
	Around fuel tank caps			
Under carriage	Chassis and undercarriage			
	Fuel Tank			
Attachments	Bull bar			
Cleaning method: Mechanical (M), Compressed Air (CA), Vacuum (V), High Pressure Water (HPW), Low Pressure Water (LPW)				
Inspected by:		Signature:		
Cleaned by:		Signature:		

CLEANING/INSPECTION CHECKLIST FOR EXCAVATOR				
Date:		Location:		
Vehicle:		Registration/ID:		
Area	Contamination point	Inspected	Cleaned	Method
Engine bay	Engine bay floor			
	Fan shroud and radiator cores			
	Air filters (shake/tap filters to determine if clean)			
	Glacier plate (near radiator)			
Cabin	Footwells			
	Carpets and mats			
	Seats			
Excavation body	Hollow section chassis channels			
	Channels for hydraulic hoses from driven motor			
	Counterweight void spaces			
	Removable track adjuster guards and lubrication points			
	Turret pivot area			
	Arms/booms - pivot points			
Bucket/Blade	Between teeth of adapters			
	Wear plates			
Rear blade (Stabiliser)	Wear plates			
	Hollow section arms			
	Hollow section blade			
Cleaning method: Mechanical (M), Compressed Air (CA), Vacuum (V), High Pressure Water (HPW), Low Pressure Water (LPW)				
Inspected by:		Signature:		
Cleaned by:		Signature:		

Fire weather log book

Location: ____

Recorded by: ____

Date	Time	Temperature (°C)	Wind speed (km/hr)	Relative Humidity (%)	FFDI

Attachment 5 – Construction hygiene protocol

Protocol for hygiene during construction

1. Objective

To implement hygiene measures that minimise risk of pathogen introduction and weed spread during construction.

2. Scope

This protocol applies to construction works associated with the Warburton Mountain Bike Destination.

The protocol targets the introduction of pathogens (*Phytophthora cinnamomi*, myrtle wilt and chytrid fungus) and invasive plants (weeds) into new areas especially those with susceptible threatened species and threatened ecological communities.

3. Responsibilities

The site supervisor is responsible for ensuring that this protocol is implemented.

The site supervisor is responsible for ensuring that all construction personnel attend the project induction before commencement of work where the requirements of the protocol are explained.

All construction personnel are to comply with the requirements of this protocol.

4. Requirements

Hygiene refers to specific measures to prevent the spread of pathogens and invasive plants by removing seeds, spores, contaminated soil, water, and organic materials from machinery, vehicles, equipment, footwear and clothing.

The requirements for construction personnel clothing and footwear and for vehicles, machinery and equipment are set out below.

Construction personnel

- Maintain boots, clothing and other personal items in a clean and generally soil and mud free condition.
- Check boots, clothing and other personal items for soil and plant material and other debris.
- Establish boot-cleaning stations, to be used prior to entry of works sites each day within the Yarra Ranges National Park.

Vehicles, machinery and equipment

- Prior to allowing entry of vehicles, machinery and equipment to enter a works site in a natural area not accessible to public vehicles, undertake checking and appropriate cleaning.
- Cleaning to take place at a depot or designated location, not on the edge of the road in the national park.
- If machinery and equipment have been working in high risk locations, treat them with Phytoclean prior to entering the project area.
- Clean machinery and equipment before moving between the national park and the state forest areas and vice versa.
- Check the exterior and interior of vehicles, machinery and equipment for soil, plant material and other debris.
- Remove soil, plant material and other debris from the interior using a vacuum or dustpan and brush, with particular focus on the cabin floor, floor mats and pedals.
- Remove large clods of dirt and soil from the exterior using a stiff brush or crowbar.
- Wash the exterior at a commercial washdown facility, washdown facility at the Yarra Ranges Council works depot or appropriately established field washdown site.
- Record details of checking and cleaning of vehicles, machinery and equipment.
- After the project construction is completed, all vehicles, machinery and equipment should be cleaned down before entering other sites.

5. Training

Details of the construction hygiene protocol are to be communicated to construction personnel at the project induction.

Attachment 6 – Unexpected finds protocol

Protocol for unexpected historic heritage finds

1. Objective

To ensure that any unexpected historic heritage finds are evaluated and suitably protected.

2. Scope

This protocol applies to construction works associated with the Warburton Mountain Bike Destination

The protocol applies to the unexpected discovery of previously undocumented archaeological sites during construction works that may contain an artefact, deposit or feature which is 75 or more years old with potential to provide information of past activity in the area.

This protocol does not cover discovery of Aboriginal heritage artefacts, which are addressed under mitigation and contingency measures arising from the Cultural Heritage Management Plan prepared for the project.

3. Responsibilities

The site supervisor is responsible for ensuring that this protocol is implemented.

The site supervisor is responsible for ensuring that all construction personnel attend the project induction before commencement of work where the requirements of the protocol are explained.

All construction personnel are to comply with the requirements of this protocol.

The heritage advisor is to provide heritage advice as set out in this protocol.

4. Requirements

Unexpected historic heritage finds may include works, structures, buildings or movable objects, particularly associated with historic gold mining and forestry activities in the vicinity of the project.

Examples of artefacts that may be found during construction works are displayed in Table 1.

The requirements to be followed upon discovery of items suspected to have historic heritage value are set out below.

Construction personnel

- Stop work, protect item and inform the contractor site supervisor and the Yarra Ranges Council environmental representative
- Establish a ‘no-go zone’ around the item. Use high visibility fencing, where practical.
- Inform all site personnel about the no-go zone.
- Contact heritage advisor to seek advice (send photos if appropriate)
- Comply with the advice of the heritage advisor in relation to protection of the find.

Heritage advisor

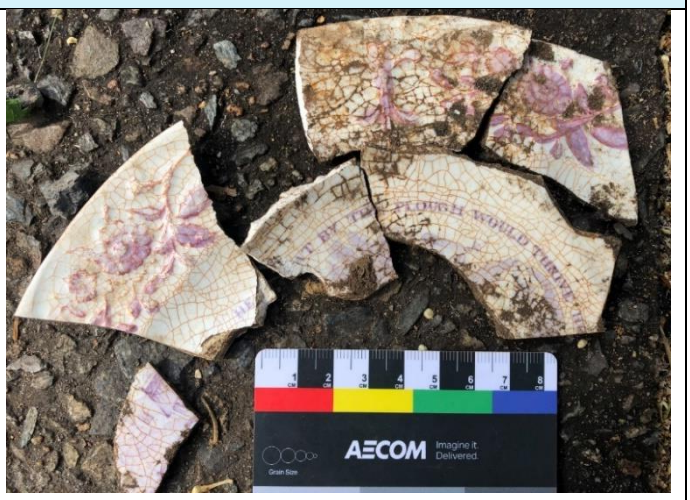
- Notify Heritage Victoria of the find in accordance with the *Heritage Act 2017*
- Undertake an evaluation of the item that has been identified and document advice to the construction team regarding legal obligations and management.
- Provide advice on any permits or consents required under the *Heritage Act 2017* in relation to the find
- Provide advice on the recommencement of construction works including any required measures to protect the find.

5. Training

Details of the unexpected historic heritage finds protocol are to be communicated to construction personnel at the project induction.

Table 10-1 Artefact examples

Type of find	Action	Example
Sandstone and Brick		
In situ single course sandstone blocks – likely to be kerb and/or guttering *OR* *In situ* single course of bricks or other stone material – likely to be kerb and/or guttering	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	 
Former Road Surfaces		
Bitumen Road Surfaces	- There is NO requirement to stop works for these finds. Works can continue.	
In situ macadam road base (appears as pressed stone and clay – former road base, may be in association with single course sandstone blocks – likely to be kerb and/or guttering)	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	

Type of find	Action	Example
Objects - General		
Individual Glass Bottles – Whole	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	
Metal objects		
Individual pieces of metal with **NO** identifiable markings (such as Makers Marks or other writing) Individual pieces of metal with identifiable features (such as Makers Marks or other writing)	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	
Timber objects		
Timber – Single Posts, fragments, etc, may contain whole bolts or nails (these are likely to relate to former fence lines or have been included in the fill layer for the road) Timber – writing, etching or unusual features	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	
Agricultural, mining and related infrastructure		

Type of find	Action	Example
Yard areas, post holes, water troughs, ancillary agricultural or mining-related structures Open pits, open drains and conduit infrastructure Enclosed brick/sandstone drains (diameter greater than 0.3 m) (does not include concrete pre-cast pipes)	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	 
Other		
Artefacts – unusual, rare or not sure (NOT fragments of glass, ceramic, concrete or plastic) Any object or feature that has not been mentioned in the Reference Sheet	- Contractor to stop works. - Contractor to take photographs, with a scale, of the feature, including a general location photo. - Contractor to notify the project Heritage Advisor and supply all information. Works should cease until appropriate advice is provided.	