



Mount Buller Sustainable Water Security Project – Off-stream Storage Ecological Rehabilitation Plan

FINAL REPORT

Prepared for the Mount Buller and Mount Stirling Alpine Resort Management Board

3 April 2020

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Document information

Report to:	Mount Buller and Mount Stirling Alpine Resort Management Board
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Biosis project no.:	29065
File name:	29065.Mt.Buller.WSP.Eco.Rehab.Plan.FIN02.20200401.docx
Citation:	Biosis 2020. Mount Buller Sustainable Water Security Project – Off-stream Storage: Ecological Rehabilitation Plan. Report for Mount Buller and Mount Stirling Alpine Resort Management Board. Goddard M and Harvey A, Biosis Pty Ltd, Melbourne. Project no. 29065.
Cover photo:	Looking east from Mount Buller summit carpark towards construction of water storage, 11 March 2020

Document control

Version	Internal reviewer	Date issued
Draft version 01	AJH	1/12/2016
Draft version 02	GHD	1/12/2016
Final version 01	AJH	8/12/2016
Final version 02	MG/AJH	3/4/2020

Acknowledgements

Biosis acknowledges the contributions of the following:

- Alpine Flora: Liz MacPhee, who provided expert advice regarding rehabilitation in the Australian Alps and assisted in drafting this plan.
- Tract: Rebecca Finn and Mark Reilly, who prepared the landscape design components of Version 1 of this plan.
- Mount Buller and Mount Stirling Alpine Resort Management Board: Louise Perrin and Andrew Wood.

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Abbreviations

Alpine Bogs	Both the EPBC Act threatened ecological community (Alpine Sphagnum Bogs and Associated Fens) and the FFG Act threatened community (Alpine Bog Community)
DAWE	Australian Government Department of Agriculture, Water and the Environment
DELWP	Victorian Government Department of Environment, Land, Water and Planning
DEPI	Victorian Government Department of Environment and Primary Industries, now DELWP
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
DoEE	Australian Government Department of the Environment and Energy, now DAWE
ERP	Ecological Rehabilitation Plan
EVC	Ecological Vegetation Class
FFA	Flora and Fauna Assessment
FFG Act	Victorian <i>Flora and Fauna Guarantee Act 1988</i>
HEMAMP	Hydrological and Ecological Monitoring and Adaptive Management Program
PCF	The approved Project Construction Footprint for the Mount Buller Water Storage
project	The Mount Buller Sustainable Water Security Project, including the water storage and ancillary infrastructure
rehabilitation area	The 8.60 hectares of the PCF that will be temporarily disturbed during the construction process and not occupied by permanent infrastructure but subject to post-construction rehabilitation
RMB	Mount Buller and Mount Stirling Alpine Resort Management Board
water storage	The approved 100-megalitre water storage at Mount Buller

1. Introduction

1.1 Project background

The Mount Buller and Mount Stirling Alpine Resort Management Board (RMB) is constructing the Mount Buller Sustainable Water Security Project (the project). The project includes a 100-megalitre water storage facility and ancillary infrastructure within a 10.347-hectare Project Construction Footprint (PCF) in the Mount Buller Alpine Resort.

Government approvals for the project require that the PCF be rehabilitated in accordance with the endorsed Ecological Rehabilitation Plan (ERP). The Victorian Government Department of Environment, Land, Water and Planning (DELWP) issued a planning permit for the project in January 2018 (Planning Permit PA1600138; Appendix 1). The Australian Government Department of the Environment and Energy (DoEE, now the Department of Agriculture, Water and the Environment or DAWE) approved the project with conditions in June 2018 (EPBC Act Approval 2014/7303; Appendix 1).

Condition 11 of Planning Permit PA1600138 states the following:

Before the commencement of the use hereby permitted by this permit, all landscaping and rehabilitation works as shown on the endorsed Ecological Rehabilitation Plan report (including the attached Landscape Masterplan), dated 8 December 2016, and prepared by Biosis and Tract, must be implemented and completed to the satisfaction of the Responsible Authority. Any dead or diseased trees must be replaced to the satisfaction of the Responsible Authority.

Condition 11 of EPBC Act Approval 2014/7303 states the following:

Within one (1) month following completion of construction, or following approval by the Minister as required under condition 9, the approval holder must commence rehabilitation of the project area in accordance with the Ecological Rehabilitation Plan.

Construction of the project commenced in October 2019 and is anticipated to finish in May 2020. In March 2020, the RMB commissioned Biosis Pty Ltd (Biosis) to update the Ecological Rehabilitation Plan (ERP). The update is in response to:

- A lack of seed available for revegetation and therefore a need to revise resourcing and planting requirements (e.g. by increasing tubestock plant numbers).
- A reduction in the total area of native vegetation cleared for the project, thereby reducing the total revegetation effort required. The RMB anticipates that approximately 0.46 hectares (9%) of the 5.278 hectares of native vegetation within the PCF before construction will not have been removed by the time construction is complete (A. Wood, Projects Engineer, RMB, pers. comm., April 2020).
- A refining of timelines as construction has commenced and continued.

1.2 Related documents

Two technical reports are relevant to the current rehabilitation plan: a Flora and Fauna Assessment (FFA) and a Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP). The FFA outlines the pre-construction condition of the PCF (Biosis and GHD 2016). The HEMAMP specifies the requirements for monitoring and managing Alpine Bogs that are downslope of the PCF and was updated in 2019 to reflect improvements made during two years of baseline monitoring (Biosis 2019).

1.3 The rehabilitation area

The project is within the Mount Buller Alpine Resort at a site known as the 'Control Centre'. The site is located on a gently to moderately sloping plateau, 700 metres east of the Mount Buller summit and 250 metres west of Mount Buller village. The PCF covers an area of 10.347 hectares. Upon construction completion, approximately 1.75 hectares of the PCF will be permanently occupied by new or existing infrastructure, such as the water storage body, tanks, pipes, pumps, the Summit Road and associated access tracks. Most of the remaining 8.60 hectares will have been temporarily disturbed during the construction process and subject to post-construction rehabilitation. These 8.60 hectares are collectively known as the rehabilitation area.

Approximately 5.29 hectares of the rehabilitation area will be revegetated using three different revegetation treatments (or rehabilitation zones), as outlined in Section 2. Re-establishment of native vegetation within these zones will replace native vegetation removed during the construction phase. The remaining 3.31 hectares of the rehabilitation area will be treated with amenity landscaping, as detailed in Section 4. Amenity landscaping will provide passive recreational and educational opportunities near the new water storage and will assist in satisfying key rehabilitation requirements e.g. by ensuring that no bare ground is left exposed.

1.3.1 Ecological values

The FFA identifies the following key ecological values within the PCF (Biosis and GHD 2016):

- 5.278 hectares of native vegetation (comprising 5.194 hectares of Alpine Grassy Heathland and 0.085 hectares of Alpine Woodland), most of which will be removed for construction of the project.
- Habitat supporting small populations of Broad-toothed Rat *Mastacomys fuscus mordicus* (EPBC Act: vulnerable; FFG Act: threatened) and Alpine Bog Skink *Pseudemoia cryodroma* (FFG Act: threatened).

1.3.2 Landscape context

Key ecological values in the surrounding landscape outside the PCF (and therefore not directly affected by the water storage) include:

- 2.853 hectares of the Alpine Bog ecological community (EPBC Act: endangered; FFG Act: threatened) downslope and north of the PCF (as at 2019, when baseline HEMAMP monitoring was completed).
- Core and non-core habitat for Mountain Pygmy-possum *Burramys parvus* (EPBC Act: endangered; FFG Act: threatened) approximately 200 metres from the PCF (at its nearest point).

The HEMAMP defines a program for monitoring and managing the Alpine Bogs downslope of the PCF to ensure that their pre-construction extent and condition are maintained (Biosis 2019). Importantly, this ERP responds to the requirements of the HEMAMP.

Mountain Pygmy-possum has been the subject of an ongoing monitoring, management and revegetation program at Mount Buller since the discovery of the species there in 1996. Implementation of this ERP will result in the creation of a new interpretive area to raise awareness of this species and its habitat.

1.3.3 Engineering considerations

All rehabilitation works, but particularly works around the water storage embankment, will be designed with geotechnical stability, surface water management and erosion minimisation as a priority. These are both a rehabilitation and an engineering requirement – they are as important for successful rehabilitation of the PCF as they are for the structural integrity of the water storage infrastructure. This means that all ground preparation (topography reshaping, drainage, sediment controls and positioning of natural features such as boulders) will be designed and engineered in accordance with project construction parameters.

1.4 Aims of this document

The aims of this ERP are to:

- Define the performance criteria against which rehabilitation of the PCF will be assessed.
- Explain the requirements for successful rehabilitation of the PCF, including resourcing, planting and ongoing management requirements.
- Specify a robust and repeatable monitoring protocol, which will gather data to allow revegetation and habitat creation to be assessed against the performance criteria.
- Outline how amenity landscaping will contribute to overall rehabilitation of the PCF.
- Propose a timeline for rehabilitation of the PCF, with milestones.

1.5 Performance criteria

The performance criteria outlined below will be used to assess the short-term and long-term outcomes of the rehabilitation. The HEMAMP refers to post-construction years as Impact Year 1 (Year 1; June 2019 to May 2020), Impact Year 2 (Year 2; June 2020 to May 2021) and so on (Biosis 2019). Where relevant, this ERP refers to these same time periods. Construction of the project is expected to finish in May 2020 (i.e. end of Year 1). Revegetation will begin in autumn 2021 (i.e. end of Year 2).

1.5.1 Short-term outcomes

Before the first significant snowfall of 2020, the RMB will ensure that an erosion resistant ground condition has been achieved by construction contractors and is maintained within the rehabilitation area. The ground condition within the rehabilitation area will be considered erosion resistant if:

- There is no bare soil.
- Mulch, jute mesh and other sediment controls are properly in place and functional.

1.5.2 Long-term outcomes

Within ten years of construction commencing (before October 2029), the following outcomes will have been achieved within the PCF:

- No overall loss of key pre-construction ecological values:
 - A dense cover of native vegetation will be established over at least 5.278 hectares of the rehabilitation area, meaning that there will be no net decrease in the area of native vegetation within the PCF as a result of construction of the project.
 - As a result of the revegetation works, there will be no net decrease in the area of habitat for Broad-toothed Rat or Alpine Bog Skink within the PCF.
- The rehabilitation area will be linked with ecological values in the broader landscape outside the PCF:
 - A new interpretive site for Mountain Pygmy Possum will be created within the PCF (no habitat for this species exists within the PCF).
 - There will be improved connectivity of native vegetation outside the PCF as a result of revegetation of areas of the PCF that currently support introduced vegetation.

2. Rehabilitation requirements

This rehabilitation plan has been prepared with close reference to the following key documents:

- The Rehabilitation Field Guide for the Australian Alps (MacPhee 2013).
- The Australian Alps Rehabilitation Manual (Good 2006).
- The Vegetation Management Plan for Mount Buller Ski Field (Biosis 2013; Biosis 2018).
- The Revegetation and Habitat Restoration Plan for Mountain Pygmy-possum on Mount Buller (Biosis 2007).

These documents are invaluable sources of information and provide more details about specific rehabilitation and management techniques.

2.1 Resourcing requirements

2.1.1 No bare ground

This rehabilitation plan is formulated with the fundamental rehabilitation principle of 'NO BARE GROUND'. Within the rehabilitation area, the protection of soil and the control of sediment movement will be imperative so that the project does not affect surrounding ecological communities, such as Alpine Bogs. Soil will remain covered and protected at all times post-construction.

To assist in maintaining no bare ground, resources that are removed from the PCF during construction should, as far practicable, be re-used in the rehabilitation process and in the amenity landscaping (see Section 4). Resources are identified as:

- Topsoils and sods from zones that have a low or negligible weed load. If re-used, topsoils and sods will provide a suite of microflora for planted rehabilitation species and will improve rehabilitation outcomes. More specific details of sod and soil storage can be found in the Rehabilitation Field Guide (MacPhee 2013). In summary, topsoils and/or sods must be:
 - Stockpiled in areas that have no weeds
 - Periodically watered
 - Protected from wind erosion.
- Vegetation removed within the PCF during construction, such as tree trunks, branches and shrub canopies, and fine litter scraped from the surface of the PCF, such as bark, twigs and leaf litter. These materials will augment introduced mulches within the rehabilitation area. When re-used, they will provide micro-climates for seedling establishment and recruitment and contribute to re-establishing the soil seedbank. The retention of carbon in this form will improve ecological function and rehabilitation outcomes.
- Rocks and boulders extracted from the PCF during construction. Rocks and boulders of all sizes are essential for the creation of habitat for a range of vertebrate and invertebrate fauna, including Alpine Bog Skink and Broad-toothed Rat. Rocks also provide microclimates for the establishment of planted seedlings.

2.1.2 Rehabilitation zones

The rehabilitation area has been divided into three rehabilitation zones (Figure 1), which have been defined according to their current ecological values and their future management requirements based on the ecological and recreational outcomes intended for each zone.

The three zones are defined as follows:

- **Zone A:** This zone currently has sections of Sub-alpine Woodland (EVC 43) and Alpine Grassy Heathland (EVC 1004). Zone A covers approximately 1.99 hectares of the PCF. This zone is currently classified as having 'high' ecological values and will require the highest level of ecological rehabilitation. Rehabilitation of Zone A will focus on establishing dense and diverse native vegetation equivalent to the pre-construction EVC and on creating fauna habitat with logs, rocks and boulders.
- **Zone B:** This zone currently has some sections of Alpine Grassy Heathland (EVC 1004) but has been previously disturbed, which is evident from the presence of introduced vegetation and bare ground. Zone B covers approximately 2.52 hectares of the PCF. This zone is currently classified as having 'medium' ecological value. The rehabilitation of Zone B will focus on protecting soil by the use of mulches, increasing native vegetation cover by planting indigenous heath species and inhibiting the potential spread of introduced species into Zone A from surrounding areas.
- **Zone C:** This zone currently consists mostly of introduced vegetation over disturbed areas (ski slopes, tracks and set down areas). Zone C covers approximately 0.78 ha of the PCF. This zone is currently classified as having 'low' ecological value. The rehabilitation of Zone C will focus on protecting and buffering higher value areas by preventing soil erosion and limiting the spread of introduced species.

Collectively, Zones A, B and C cover 5.29 hectares of the rehabilitation area. Re-establishment of native vegetation within these zones will replace the 5.278 hectares of native vegetation removed during the construction phase.

Resourcing requirements will vary for each rehabilitation zone (as outlined below) but the following general principles apply:

- All plant material will be sourced from Mount Buller (i.e. local genetic provenance).
- A maximum of 15,000 tubestock can be produced and planted per year, meaning that planting will need to continue for several years.
- Tubestock estimates are maximum numbers based on a planting density of approximately 1- 4 plants per square metre (varying according to the rehabilitation zone), but do not take into account mortality of plantings, natural regeneration of plants or areas of native vegetation that are now expected to be retained within the PCF.
 - The survival of plantings is expected to be similar to that of other large revegetation projects at Mount Buller, where an annual mortality rate of 8-13% has been observed since the mid-2000s (L. Perrin, Environmental Services Manager, RMB, pers. comm., April 2020).
 - Natural regeneration of plants is expected from the seedbank stored in the topsoil/mulch and from tubestock that are planted, become established and reproduce.
 - Approximately 0.46 of native vegetation is expected to have been retained within the PCF by the time construction is complete (A. Wood, Projects Engineer, RMB, pers. comm., April 2020).

Overall, natural regeneration of plants and the retention of some native vegetation is expected to outweigh tubestock mortality rates, therefore greatly reducing the total number of tubestock required in the long-term. Tubestock requirements will be monitored annually (refer to Section 3).

- Seed quantity estimates are based on a rate of 15 grams per square metre for native Snow Grasses *Poa* spp. and 5 grams per square metre for native forb mix. However, seed quantities cannot be guaranteed given the variable seeding rates of alpine plants and therefore the difficulty in securing large quantities of viable seed of local provenance.
- Indicative species for revegetation have been selected based on the following:
 - They are characteristic of the pre-construction native vegetation: Sub-Alpine Woodland and Alpine Grassy Heathland.
 - They are relatively easily propagated compared with some other alpine and sub-alpine species (subject to environmental conditions).
 - They are regarded as colonising species for Sub-Alpine Woodland and Alpine Grassy Heathland. In earlier revegetation years, there will be a preference for planting species that are relatively quick to establish, reproduce and set seed, in order to accelerate natural regeneration across the rehabilitation area.
- Substitute species may be used where appropriate and where local genetic provenance can be ensured. Propagation of alpine plants is seasonally variable and depends on environmental conditions from year to year, meaning that the availability of tubestock for any given species cannot be guaranteed until the spring/summer before planting. Substitute species will be of the same local lifeform.
- Where topsoil is absent and if tubestock are not already fertilised, a small handful (about 10 grams) of slow release organic fertiliser may be introduced to the base of a planting hole.
- During the construction phase, all exposed soil must be covered as soon as practicable with jute mesh (if required) and weed free organic mulch.
- Organic mulch in the form of straw bales will be required for all zones. Rice, sorghum and sugarcane mulch are all suitable for Mount Buller as any crop or weed seed potentially in the mulch will not persist in sub-alpine conditions. Small bales should be used for ease of handling and will cover 20 square metres. Straw mulch can be secured with jute mesh, stored logs and canopies of any removed vegetation.

Table 1 summarises the resources required for rehabilitation of each zone. The table has been updated to reflect the lack of large quantities of viable seed available for revegetation and therefore the need for increased numbers of tubestock.

Table 1 Resources required for all zones

Zone	Tubestock Planting Density	Total Number of Tubestock Required ¹	Supplementary Seed ² (if available)	Straw Bales Required	Other Resources ³ (if required)
A 1.99 ha	High (4 plants/sq m)	79,600	50 kg native forbs and 150 kg Snow Grasses	1000	796 kg slow release organic fertiliser
B 2.52 ha	Medium (2 plants/sq m)	50,400	350 kg Snow Grasses	1260	504 kg slow release organic fertiliser
C 0.78 ha	Low (1 plant/sq m)	7800	Sterile Rye Corn (if required) and 70 kg Snow Grasses	400	78 kg slow release organic fertiliser
TOTALS		137,800 tubes		2660 bales	1378 kg

Notes to Table 1:

1. Tubestock of local genetic provenance can be produced at a maximum rate of 15,000 plants per year. Tubestock estimates are maximum numbers based on the planting density for the zone, but do not take into account mortality of plantings, natural regeneration of plants or areas of native vegetation retained within the PCF following construction.
2. The inherently variable seeding rates of alpine plants has meant that it has not been feasible to collect the large quantities of viable seed recommended in Version 1 of the ERP. Tubestock quantities have therefore been increased from 25,080 to 79,600 for Zone A, from 7000 to 50,400 for Zone B and from 3000 to 7800 for Zone C.
3. Fertiliser is not likely to be required, given that adequate amounts of topsoil have been retained and stockpiled during construction. Tubestock will be prepared and delivered with a 3-month slow release fertiliser incorporated into the potting mix. In addition, tubestock will be soaked in a seaweed-based plant and soil conditioner before planting.

Specific requirements for Zone A

- Excavated material will be stockpiled and re-used in Zone A. This will need to be clearly defined by the project manager. Stockpiling areas for Zone A should be clearly identified prior to any excavation or vegetation removal.
- Within areas that are currently Sub-Alpine Woodland, three vegetation strata will be rehabilitated: tree canopy, shrub layer and grass sward. Within areas that are currently Alpine Grassy Heathland, two vegetation strata will be rehabilitated: medium shrub layer and herbaceous grass/forb layer.
- If available, seed of native Snow Grasses and mixed native forbs will be sown between planted tubestock to augment the rehabilitation of Zone A,
- Table 2 provides an indicative list of the plant species to be used for revegetation of Zone A and approximate maximum numbers of tubestock for each species, which gives an indication of the approximate ratios of tubestock required for various lifeforms. Table 3 outlines the supplementary seed that may be used, if available.

Table 2 Tubestock required for Zone A

Indicative Species	EVC Type	Number of Tubestock	Propagation Method
Alpine Baeckea <i>Baeckea gunniana</i>	Alpine Grassy Heathland	4350	Cuttings
Alpine Grevillea <i>Grevillea australis</i>	Alpine Grassy Heathland	10,000	Cuttings
Alpine Mint-bush <i>Prostanthera cuneata</i>	Alpine Grassy Heathland	10,000	Cuttings
Alpine Rice-flower <i>Pimelea alpina</i> *	Alpine Grassy Heathland	6000	Cuttings
Alpine Star-bush <i>Asterolasia trymalioides</i>	Alpine Grassy Heathland	3000	Cuttings
Alpine Podolobium <i>Podolobium alpestre</i>	Sub-alpine Woodland	5000	Seed
Small-leaf Bramble <i>Rubus parvifolius</i> *	Sub-alpine Woodland	1000	Cuttings
Snow Gum <i>Eucalyptus pauciflora</i>	Sub-alpine Woodland	100	Seed
Alpine Pepper <i>Tasmannia xerophila</i> *	Alpine Grassy Heathland and Sub-alpine Woodland	5000	Cuttings
Alpine Rusty-pods <i>Hovea montana</i>	Alpine Grassy Heathland and Sub-alpine Woodland	10,000	Seed
Dusty Daisy-bush <i>Olearia phlogopappa</i> var. <i>flavescens</i>	Alpine Grassy Heathland and Sub-alpine Woodland	6000	Seed and Cuttings

Indicative Species	EVC Type	Number of Tubestock	Propagation Method
Kerosene Bush <i>Ozothamnus cupressoides</i>	Alpine Grassy Heathland and Sub-alpine Woodland	6000	Seed and Cuttings
Orange Everlasting <i>Xerochrysum subundulatum</i>	Alpine Grassy Heathland and Sub-alpine Woodland	3000	Seed
Snow Grasses <i>Poa</i> spp. (e.g. <i>ensiformis</i> , <i>fawcettiae</i> , <i>hiemata</i> , <i>hothamensis</i>)*	Alpine Grassy Heathland and Sub-alpine Woodland	10,000	Seed
Snow/Sub-alpine Beard-heath <i>Acrothamnus montanus/maccraei</i> *	Alpine Grassy Heathland and Sub-alpine Woodland	150	Cuttings

* Culturally significant species (Zola and Gott 1992) may be the focus of interpretive signage (refer to Section 4).

Table 3 Supplementary seed for Zone A (if available)

Indicative Species	EVC Type	Amount of Seed (kg)
Alpine Wallaby-grass <i>Rytidosperma nudiflorum</i>	Alpine Grassy Heathland	10
Alpine Yam-daisy <i>Microseris lanceolata</i> *	Alpine Grassy Heathland	5
Billy-buttons <i>Craspedia</i> spp. (e.g. <i>adenophora</i> , <i>aurantia</i>)	Alpine Grassy Heathland	15
Granite Buttercup <i>Ranunculus graniticola</i>	Alpine Grassy Heathland	5
Slender Snow-daisy <i>Celmisia pugioniformis</i>	Alpine Grassy Heathland	10
Common Trigger-plant <i>Stylidium armeria</i>	Alpine Grassy Heathland and Sub-alpine Woodland	5
Snow Grasses <i>Poa</i> spp. (e.g. <i>ensiformis</i> , <i>fawcettiae</i> , <i>hiemata</i> , <i>hothamensis</i>)*	Alpine Grassy Heathland and Sub-alpine Woodland	150

* Culturally significant species (Zola and Gott 1992) may be the focus of interpretive signage (refer to Section 4).

Specific requirements for Zone B

- Most of Zone B is Alpine Grassy Heathland with some areas of introduced vegetation. As far as practicable, Zone B material should be stockpiled separately from Zone A material to minimise the movement of weed seed to Zone A.
- Two vegetation strata will be rehabilitated: low shrub layer and herbaceous grass/forb layer.
- Zone B will be rehabilitated using tubestock at lower planting densities than in Zone A and, if available, seed of native Snow Grasses covered with organic mulch.
- Native Snow Grasses, such as Horny Snow-grass *Poa fawcettiae*, will be required in large quantities as tubestock and seed (if available) to rehabilitate Zone B. Use of Snow Grasses will allow for weed management with specific herbicides that target broad-leaved (dicotyledonous) species.
- Table 4 outlines the tubestock required for Zone B. Tubestock of dominant heath species should be preferentially planted in areas of connectivity with existing native vegetation and areas where the angle of repose of slopes is greater than 30 degrees.

Table 4 Tubestock required for Zone B

Indicative Species	Number of Tubestock	Propagation Method
Alpine Baeckea <i>Baeckea gunniana</i>	3500	Cuttings
Alpine Grevillea <i>Grevillea australis</i>	6000	Cuttings
Alpine Mint-bush <i>Prostanthera cuneata</i>	4900	Cuttings
Alpine Rice-flower <i>Pimelea alpina</i> *	4500	Cuttings
Alpine Rusty-pods <i>Hovea montana</i>	6000	Seed
Alpine Star-bush <i>Asterolasia trymalioides</i>	2000	Cuttings
Kerosene Bush <i>Ozothamnus cupressoides</i>	2500	Seed and Cuttings
Alpine Podolobium <i>Podolobium alpestre</i>	2000	Seed
Dusty Daisy-bush <i>Olearia phlogopappa</i> var. <i>flavescens</i>	5000	Seed and Cuttings
Alpine Pepper <i>Tasmania xerophila</i> *	4000	Cuttings
Snow Grasses <i>Poa</i> spp. (e.g. <i>ensiformis</i> , <i>fawcettiae</i> , <i>hiemata</i> , <i>hothamensis</i>)*	10,000	Seed

* Culturally significant species (Zola and Gott 1992) may be the focus of interpretive signage (refer to Section 4).

Specific requirements for Zone C

- Zone C includes parts of the PCF that are highly disturbed and have low ecological value in regard to vegetation or habitat. The primary goal of rehabilitation in this zone is to inhibit the spread of exotic species into other zones and to protect soil from erosion by the use of organic mulch.
- Hard stand areas, tracks, roads, stockpiles and other construction areas must be formed and banded so that soil, seed and sediment are retained within Zone C. Sediment control must be in place across all possible gradients and discharge areas.
- All bare ground must be covered with mulch as soon as practicable after disturbance. Areas where the angle of repose of slopes is greater than 30 degrees must be mulched and secured with jute mesh soil saver.
- Two vegetation strata will be established: low shrub layer and herbaceous grass/forb layer.
- Most of Zone C will be rehabilitated using native Snow Grasses, such as Horny Snow-grass *Poa fawcettiae*. Native Snow Grasses will be planted as tubestock (which will themselves contribute seed over time) but may be supplemented with seed (if available) covered with organic mulch. Tubestock of low shrubs will also be required.
- Table 5 outlines the tubestock required for Zone C. Tubestock will be preferentially planted in jute mesh in areas where the angle of repose of slopes is greater than 30 degrees.
- If deemed necessary to control gross sediment movements, Sterile Rye Corn may be sown as a 'living mulch'.

Table 5 Tubestock required for Zone C

Indicative Species	Number of Tubestock	Propagation Method
Alpine Rice-flower <i>Pimelea alpina</i> *	1000	Cuttings
Alpine Rusty-pods <i>Hovea montana</i>	1000	Seed
Snow Grasses <i>Poa</i> spp. (e.g. <i>ensifformis</i> , <i>fawcettiae</i> , <i>hiemata</i> , <i>hothamensis</i>)*	5000	Seed
Kerosene Bush <i>Ozothamnus cupressoides</i>	800	Seed and Cuttings

* Culturally significant species (Zola and Gott 1992) may be the focus of interpretive signage (refer to Section 4).

2.1.3 No-go zones and signage

The delineation of the PCF must be clearly identified with signs, temporary fences and roads before construction commences and while construction continues. The delineation of the PCF needs to be included in the induction process for all construction personnel. No works, whether rehabilitation works or otherwise, are to extend beyond the PCF. It is very important that all staff know the location and requirements of the different rehabilitation zones, to minimise potential contamination of the 'clean' zones with propagules of introduced plant species. Signs, temporary barrier fencing and maps can be used to make this clear to all personnel involved.

2.2 Planting requirements

Successful rehabilitation is highly dependent on the coordination of multiple resources, including plants and planting, and is often dependent on overcoming complex logistical issues. The following paragraphs outline the requirements for successful planting and, ultimately, successful rehabilitation of the PCF.

2.2.1 Ground preparation

General principles

Within the construction parameters, the following principles will guide the preparation of the rehabilitation area for revegetation:

- Reshape the topography so that it is integrated with the surrounding landscape and has as many natural features as possible, whilst retaining stability and minimising erosion.
- Design drainage lines to slow movement of water across the rehabilitation area, distribute sediment-free flows towards downslope Alpine Bogs and mimic pre-construction hydrology.

These basic principles of ground preparation will assist in re-establishing natural processes and in the recruitment of seedlings and germination of seed. They will ultimately contribute to habitat creation within the rehabilitation area.

Reshaped topography and natural features

Wherever possible, the topography should be re-shaped to:

- Reduce all angles of batters to less than 30 degrees.
- Reduce all lengths of batters to less than 10 metres.
- Rip compacted spoil/soil to a depth of at least 30 centimetres (preferably up to 60 centimetres).

Natural features (micro-niches, depression and soil surface roughness) will be incorporated into the topography (whether steep or flat) to act as habitat and 'resource sinks' – places where surface water slows down and collects and deposits resources in the form of sediment, seed and organic materials. Natural features can be achieved by:

- Running the teeth of an excavator bucket across the contour.
- Leaving small depressions (by hand or machine) that are stable but act as micro-niches.
- Placing boulders and rocks in the landscape where water can potentially collect.
- Covering ground with organic mulches and vegetation removed from the site during construction.

Rocks and boulders will form an integral part of habitat (re-)creation for Alpine Bog Skink, Broad-toothed Rat and an interpretive site for Mountain Pygmy-possum. They will be preferentially placed across contours and drainage lines to serve a dual function as habitat and as a resource sink to minimise erosion and promote re-establishment of native vegetation.

Drainage and sediment controls

For all batters longer than 10 metres and with an angle of repose greater than 30 degrees, it is recommended that cross drains be formed across contours of the slopes to minimise erosive processes and maximise water infiltration.

Cross drains act as small collection areas for water, soil, seed and any other biota that may move down gradient at a site. They are usually installed in areas where rocky slopes are to be stabilised. The aim of the cross drains is to collect water on the site and promote its movement through the rock slope rather than over the top of the slope.

Cross drains can be formed using a shovel and mattock in a spoon shape or a small excavator and must have a higher lip at the front. They can be 5 to 8 metres apart and are designed to capture any runoff, leaf litter and/or sediment, which will accelerate the rate of recruitment on the slope face.

Drains should be U-shaped. The depth and width will depend on the angle of slope and whether constructed by machine or mattock, but they need to be proportional to the expected surface flows. They should be designed to accommodate 1 in 100 year flows. Frequent small drains are preferred to widely spaced, large drains. Drains should have 1-2% grade angled into a slope.

While the aim of cross drains is to slow and hold water until it has percolated into the subsoil, they may need to discharge water at times. If water must be discharged, it should be discharged into existing intact vegetation and/or the environmental watering system for Alpine Bogs. Discharge points should not exceed a 2% fall and should distribute water over a broad area. Cleanable sediment traps (straw bales and/or sediment fence fabric) must be installed at all discharge points. Sediment traps should be made of straw bales and/or silt fence fabric anchored with stakes or star pickets.

2.2.2 Tubestock management

It is imperative that tubestock is from local provenance, is well grown and is primed for planting when put in the ground. For the planting of tubestock to be successful, it is essential that healthy and vigorous plants be used. Grasses should be tillering rapidly and have over 10 blades. Forbs need to have strong rhizomatous or rosette growth (depending on their natural growth form). For shrubs and trees, a sturdy stem is desirable as this will provide the plant with adequate carbohydrate to withstand transplant shock.

Plants with elongated internodal spaces and/or pale leaves should be avoided because these are signs that the plant has been produced with inadequate light and/or lacks chlorophyll. It is recommended that tubestock have root systems that are actively growing (i.e. have white tips), fill their container and not in too tight a spiral arrangement. These issues can be overcome by using known reputable nurseries for plant production.

All nursery tubestock needs care to ensure it remains in good condition for the best results when it is planted out. All tubestock to be planted must be 'hardened off' for 4-6 weeks in a holding bay at an equivalent altitude to the planting site. The holding bay for the tubestock must:

- Be in full sun. If high temperatures are experienced (i.e. in summer), the plants may need some protection. A removable 30% shade cloth cover is ideal but should be used sparingly as it defeats the purpose of the hardening off process.
- Be in a weed free site. If weeds are present at the holding site, they should be treated with an appropriate herbicide prior to the site being used as a holding bay. Weed matting, jute mesh and/or geotextile are all suitable. A 2-metre weed-free buffer around the holding bay is essential to stop weed seed infiltrating tubestock.
- Be open to some wind. This helps to harden the plants as well as regulate the temperature of the black plastic tubes.
- Have a good spray watering system, which reaches all the tubes. This needs to be checked twice weekly to ensure the system is working and tubestock is receiving enough water for the conditions.

- Be placed in 10 centimetres of gravel or elevated on tables to lift the plants off the ground. Bricks and boards can also be used temporarily.

Tubestock must not be:

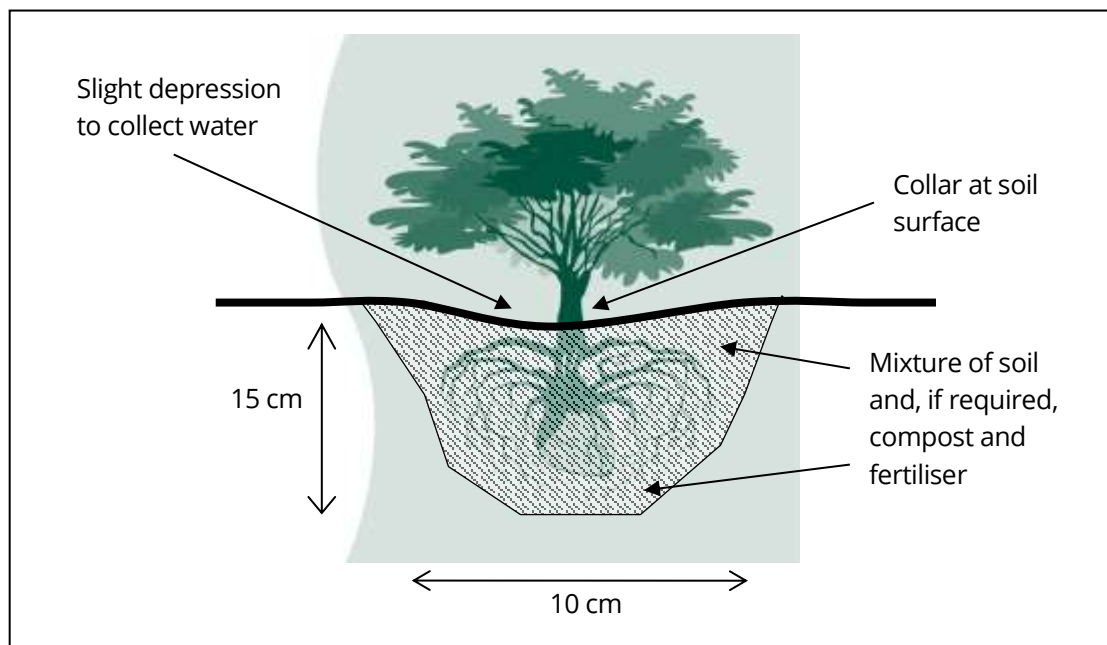
- Sited near buildings or any structure that will radiate heat.
- Ignored. It is important to check the tubes that are on the outside edge, as these will dry out more quickly.
- Over watered. As part of the hardening off process, the tubestock must not be wet all the time.

2.2.3 Planting technique

Approximately 1-4 tubestock will be planted per square metre to assist in establishing a dense cover of native vegetation. This will be crucial for habitat (re-)creation for Alpine Bog Skink and Broad-toothed Rat.

Tubestock must be planted properly and with care so that they have the best chance of survival. In an alpine or sub-alpine environment, a standard planting hole for tubestock is dug to an approximate depth of 15 centimetres and width of 10 centimetres. Large materials, such as rocks, are removed from the planting hole as they risk trapping air within the hole. If planting on the side of steep slopes, use a small deep hole that has a front lip for catching water and not too big a face at the back of the planting hole, otherwise this will collapse onto the plant.

If soil is inadequate for planting, reputable compost can be used to augment planting. It is very important that no pathogens are introduced in the compost. A mixture of compost (if required) and slow release fertiliser mixed with the soil from the hole will provide a fertile, aerated substrate for successful seedling establishment.



Where necessary, fertiliser addition to each hole will occur at the rate of approximately 10 grams (two tea spoons) per hole. Fertilisers need to be mixed with compost or local soils on back filling of the hole. These fertilisers protect against phytotoxic response by the seedlings. Direct incorporation into the planting holes reduces the amount of available nutrients to weed species during the site rehabilitation phase.

Planted tubestock may need to be mulched after planting and before watering in. One straw bale can spread as a 10-centimetre deep layer over approximately 20 square metres. Straw needs to be wetted down after it has been spread to help secure it and 'stick' it to the ground. Straw can also be secured with wood thatch and native plant material removed from the rehabilitation zone prior to construction. Thatch needs to be spread thicker in areas exposed to prevailing winds.

If jute mesh soil saver is required (e.g. in areas where mulch cannot be secured), it is important that it is anchored properly. Matting can be anchored by digging a trench at least 20 centimetres deep at the top of the batter that the matting will be used on. The matting is then rolled around a star picket or long stick and placed in the trench. The trench can then be back filled and the mat rolled down the slope. It needs to have the edges placed so that the prevailing wind pushes the edge of the matting down. Segments of jute mesh should overlap each other by at least 10 centimetres and be pinned with the appropriate pins for the soil type.

Plants should be watered on the day of planting at a rate of 4-5 litres per plant. This pushes soil around the root system preventing air pockets forming. The initial watering in phase is very important because lack of water is one of the most common reasons for death amongst seedlings. Inaccessibility of sites can often mean watering in is not possible. Where this may be the case, tubestock should be soaked overnight in water containing a seaweed-based plant conditioner (at the manufacturer's recommended concentration) to reduce planting shock and improve survival.

2.2.4 Seeding technique

The following factors need to be considered for the seeding component of this rehabilitation plan:

- It is imperative that the seed picked and sown is of known provenance and has a high level of viability.
- Sites need to be weed free before sowing seed for native grasses, forbs and/or shrubs.
- To assist in weed control, only broad leaved native species should be used in areas that are predominantly invaded by introduced grasses and only native grasses should be sown in areas that are predominantly invaded by broad leaved weeds. Selective herbicides can then be used for weed control.
- Only sow seed where there is some organic layer (soil or compost) for the seedlings to establish in.
- Use a thin layer of organic mulch to cover the soil and seed. Mulch that is too thick will inhibit seed germination.
- After covering seed with an organic mulch, water in the seed with a fine spray. Seed may wash away if water is applied too vigorously.
- Only sow seed on slopes with gradients less than 25% to reduce the loss of seed through gravity.

2.2.5 Timing of planting and seeding

There are two seasons a year for planting and seeding in the sub-alpine areas of Australia: autumn (mid-March to mid-May) and spring (late September to late November). Of these, autumn is considered the best time to plant. Mid-winter and mid-summer are not suitable as it is usually too cold and snowy or too hot and dry. If planting is done out of these seasons, more maintenance (e.g. watering) will be required and it will make the rehabilitation more expensive and more likely to fail.

Since construction of the water storage is planned over spring, summer and autumn of 2019/2020 (Year 1), autumn 2021 (end of Year 2) would be the most suitable time to commence planting and seeding of the rehabilitation area. Further planting, including replacement planting and/or seeding, will be required in subsequent autumn periods (see Section 2.3).

2.2.6 Grazing protection

Grazing of tubestock and germinating seedlings can result in the failure of rehabilitation. Rabbits, deer and native herbivores are present at Mount Buller and may graze on the planted tubestock and/or seedlings. It is recommended that tubestock and seedlings be monitored for at least 6 months and up to 12 months for any grazing damage. This will give tubestock and seedlings time to further harden off and become less palatable to herbivores.

A small amount of grazing can be tolerated. However, if the grazing pressure is causing high rates of seedling mortality, tubestock must be protected using browsing deterrents and/or biodegradable tree guards where applicable. If possible, temporary fences (possibly electric) may be more cost effective and provide better protection to seedlings emerging from sown seed. The chosen technique will be at the discretion of the project manager.

2.2.7 Weed management

Zones B and C have existing areas of introduced vegetation. These introduced species and their propagules will need to be managed as part of the rehabilitation process. After disturbance, it is common for many weed species to respond positively and to start spreading and out-competing native species. The use of mulch, targeted planting, selective herbicides and heat (if appropriate) will be the main tools used to control the spread of weeds during the construction process.

The following recommendations will further actively control weeds in the rehabilitation area after construction disturbance:

- Only sods with little or no weeds present in them will be re-used in the rehabilitation.
- All excavated weed infested soil and sods will be stockpiled together (not mixed with 'clean' soil or sods) or taken off-site (to avoid contaminating 'clean' zones).
- Bare ground will be covered by organic mulch as soon as practicable after exposure.
- Any weeds remaining within the rehabilitation area will be controlled prior to planting and seeding work. Mechanical control methods (e.g. manual removal of weeds or treatment with heat) will be taken preference over chemical control but chemical control may be necessary.
- Native Snow Grass seed (where available) will be sown in areas with broadleaf weeds and weeds controlled with a selective herbicide (e.g. Fusilade) as part of the ongoing maintenance program (see Section 2.3).

2.2.8 Personnel

It is important for this project that there is a suitably qualified and experienced site supervisor employed that can coordinate all aspects of the rehabilitation, including planting crews. Multiple planting crews of 6-10 people need to be used for each rehabilitation zone so that the rehabilitation is completed before the first frosts and very cold temperatures of 2021 (end of Year 2 and beginning of Year 3).

It is also essential that the rehabilitation needs of the site, such as storage of organic materials, maintenance of access tracks and final topography shaping are included and integrated into the construction phase. This will require the cooperation and acknowledgment of the managers and staff of the construction contractor.

2.3 Ongoing management requirements

2.3.1 Short-term maintenance and management

Watering

Where feasible, additional watering of tubestock may be required if follow up rain does not occur within 4 weeks of planting.

Monitoring of grazing

Seedlings will need to be monitored closely in the first few weeks after planting to assess whether there is any grazing damage occurring. It is recommended that contingency measures be in place for the application of browsing deterrents and/or installation of biodegradable tree guards.

Sediment controls

The persistence of mulch and other sediment control measures will need to be monitored in the first 12 months, particularly after heavy rain and strong winds.

2.3.2 Long-term maintenance and management

Weed control

Weed control in the first 5 years is imperative for successful rehabilitation, otherwise weeds will proliferate and out-compete newly establishing native seedlings. Weeds that are close to newly planted seedlings may need to be removed by hand or treated with a selective herbicide. Ultimately, weed management of the rehabilitation area should be incorporated into the existing resort-wide weed control program and funded accordingly.

Fence and tree guard maintenance and removal

Any tree guards should be removed within 2 years of planting e.g. by the end of autumn 2023 (end of Year 4) for tubestock planted in autumn 2021 (Year 2).

Replacement planting

All seedlings that did not survive in the first planting should be replaced in the following planting seasons, unless the rehabilitation manager considers that seedling establishment is futile and a different approach is needed. While replacement seedlings may be the same species or local lifeform as the original seedling, other species may be used if they are of local provenance and characteristic of the pre-construction native vegetation type.

Fertiliser augmentation

Plant health and growth rates need to be monitored. This is of particular importance in areas where a known soil deficiency exists. Yellow shoots, pale leaf laminas or retarded growth are often an indicator of a deficiency of a macro element (nitrogen, phosphorous or potassium). Additional slow release organic fertiliser may be applied if required. It is usually one of these elements that are insufficient in soils as opposed to any of the trace elements.

Re-mulching

If mulch is very thin or no longer present in any given area, re-mulching with weed free straw will be required as soon as possible. Re-applications of mulch should continue on a regular basis until seedlings are sufficiently mature to provide their own biomass i.e. until the no bare ground principle is self-sustaining.

3. Monitoring

Monitoring of the rehabilitation area will take place annually in late spring or early summer, commencing in Year 3 (the first spring/summer after planting and seeding) and finishing no earlier than Year 7 (depending on rehabilitation success). Monitoring will collect both qualitative and quantitative data.

3.1 Qualitative monitoring: inspections and photo points

Annual inspections will focus on:

- The presence of bare soil or potential for bare soil to establish, by:
 - Examining the stability of earthworks and drainage lines.
 - Inspecting the condition of mulch, jute mesh and other sediment controls e.g. sediment fences and straw bales.
 - Recording disturbance and grazing by herbivores.
 - Noting areas of seedling mortality and/or poor seed germination.
- The creation of habitat for Alpine Bog Skink and Broad-toothed Rat by:
 - Active searches for the species or traces (e.g. scats or tunnels) of the species in the rehabilitation area.
 - Setting up camera traps if appropriate.

A photographic record of annual inspections will be collected at permanent photo point locations throughout the PCF. Photo monitoring points will provide valuable information to assess gross changes to vegetation over time.

3.2 Quantitative monitoring: mortality and cover estimates

During annual inspections, the following parameters will be visually estimated for each rehabilitation zone:

- Average percentage mortality of tubestock planted in the last year.
- Average percentage cover of native perennial vegetation and introduced perennial vegetation.

As revegetation progresses and more vegetation becomes established, sub-sampling may be required to estimate these parameters. These estimates will assist in determining the following:

- Ongoing resourcing requirements, such as the numbers and types of tubestock that may be needed for planting in the subsequent autumn or locations where weed management should be targeted.
- The progress in re-establishing native vegetation, habitat and habitat connectivity (which are key long-term performance criteria).

3.3 Monitoring reports

Annual monitoring reports will summarise the results of all rehabilitation monitoring. Monitoring and reporting will ensure that rehabilitation of the PCF remains adaptive, so that appropriate resourcing is provided to the ERP each year. For example, drought, flood, fire and/or increased herbivory (e.g. from deer) may require more tubestock or tubestock of substitute species to be sourced in a given year. Equally, the extent of natural regeneration and established plantings will reach a point where only in-fill and replacement planting is needed, meaning that plant propagation and tubestock production can be reduced. Monitoring in late spring or early summer will ensure that resources for rehabilitation are scaled up or down as required.

4. Amenity landscaping

This Section was first prepared for Version 1 of the ERP by Tract Consultants Pty Ltd, in consultation with Biosis and the RMB. It has been updated to reflect changes that have occurred during detailed design and construction.

While the majority (5.29 hectares) of the rehabilitation area is designated for habitat restoration and revegetation, this ERP also outlines carefully sited amenity, recreational and place-making features over the remainder of the rehabilitation area. They ensure that the water storage project is an ecologically sustainable attraction, not just a functional asset.

4.1 Site context

There are two major existing destinations in the vicinity of the rehabilitation area – the Mercedes lift (formerly ABOM lift, beside the Control Centre) and the existing gravel summit carpark (Figure 2).

The Mercedes lift station and maintenance/storage facility sit directly to the east of the water storage facility. The Mercedes lift is one of the more popular ski lifts and, throughout winter, skiers and snowboarders constantly pulse out of the top station, making it a highly trafficked area. There is also the possibility that the Mercedes lift could operate in summer to service the needs of sightseers, walkers and mountain bike riders.

The Summit Road, a gravel road to the south of the water storage facility, leads to the gravel summit carpark that sits directly to the west of the water storage facility. In summer, this area is a destination for visitors hiking to the Mount Buller summit. The popular Summit Nature Walk cuts through the carpark and provides pedestrian access to the summit from the Mount Buller village.

The water storage sits between these two destinations. The opportunity exists to tie the entire precinct together and develop it as an additional and important recreational destination at Mount Buller.

4.2 Challenges and opportunities

4.2.1 A small recreational footprint

Since the majority of the PCF is dedicated to habitat restoration and revegetation, the aim of any amenity works will be to create high-quality but small and focused areas dedicated to passive recreation and education.

4.2.2 Maximising habitat values

Rehabilitation zones have taken precedence over opportunities for recreation, identity and place-making. Recreational and place-making features:

- Are sympathetic to the overall need to restore dense native vegetation cover and (re-)create habitat for Alpine Bog Skink, Broad-toothed Rat and other fauna.
- Have been designed to complement revegetation and habitat creation works where possible.

4.2.3 Place-making opportunities

The water storage project provides an opportunity to create a destination with its own visual and functional identity and, with that, a series of places for people. The design considers places to stop, to rest, to orient oneself, to interpret the site's history, ecological values and function and to enjoy the spectacular scenery.

4.2.4 Interpretation opportunities

Along with recreational pursuits, the opportunity exists for the water storage setting to provide opportunities for visitors to learn about the site's cultural history, alpine fauna and flora, the purpose for the water storage facility itself, and climate change and its impact on alpine regions. Interpretation opportunities may be included at points along walking trails and viewpoints/lookouts, similar to existing interpretive panels along trails at Mount Buller.

4.2.5 Summer and winter recreation

Winter activities within the rehabilitation area will include skiing and snowboarding. Topography reshaping and placement of natural features such as rocks and boulders (see Section 2.2) will provide added interest for skiers and snowboarders. Summer activities would cater for hikers and visitors looking for a greater understanding of the culture and environment of Mount Buller, a trail or mountain biking experience or an afternoon BBQ and place to view the scenery.

4.3 Landscape Master Plan

A Landscape Master Plan has been created to address the need to manage the challenges and opportunities of the water storage project (Figure 3).

4.3.1 Blending into the landscape

More than half of the PCF will be subject to ecological rehabilitation (revegetation and habitat creation). To further blend the engineered structure into the landscape, topography shaping across the batters will create a more nuanced landform, to provide subtle grade changes, to distribute sediment-free surface water to downslope Alpine Bogs and to minimise erosion by managing runoff (see Section 2.2).

4.3.2 Trails, tracks and trailheads

Access along the south side of the water storage is designed as an upgraded gravel road. This road terminates at the summit carpark. The gravel carpark is home to an important trailhead to the summit. Trailhead amenities including seating, interpretive signage, a map, shelter, bike racks and a summer-time BBQ will be located here.

The carpark also provides a link to the existing Summit Nature Walk to the north-east. Outcrops of logs and boulders along the Summit Nature Walk trail and throughout the batter will be functional (acting as 'resource sinks', as documented in Section 2), provide fauna habitat and act as educational and recreational features in summer and winter.

4.3.3 Interpretation

There is significant opportunity to provide additional interpretive signage along the Summit Nature Walk and at the trailhead. Rocks and boulders placed adjacent to the water storage will form an integral part of habitat (re-)creation for Alpine Bog Skink, Broad-toothed Rat and an interpretive site for Mountain Pygmy-possum. An interpretive panel will be provided with the aim of raising awareness of these species and their habitat. Similarly, the viewpoint/lookout near the summit carpark may feature information about the water storage facility and the effects of climate change on alpine regions.

4.3.4 Safety and security

An all year round security fence will surround the water storage facility and address water safety. Taller, winter-only fencing will be temporarily installed for the winter months to prevent snow-seekers from accidentally accessing the water storage.

5. Timeline

The timeline outlined in Table 6 uses the same time periods as the HEMAMP (Biosis 2019). That is, Year 1 (referred to as Impact Year 1 by the HEMAMP) is taken to be winter to autumn of the year of construction, with the construction phase taking place in the spring, summer and autumn of Year 1. Revegetation will therefore commence in autumn of Year 2.

As shown in Table 6, many of the tasks shown in Year 2 (e.g. planting, maintenance, management and monitoring tasks) will be repeated again in Year 3 and will be repeated annually thereafter until monitoring indicates that the long-term outcomes (performance criteria) of the ERP have been achieved. The long-term outcomes are expected to be achieved within ten years of construction commencing (before October 2029).

Table 6 Rehabilitation timeline

Calendar Year	2019										2020										2021									
ERP/HEMAMP Year	Baseline				Year 1										Year 2										Year 3					
Month	F	M	A	M	J	S	O	N	D	J	F	M	A	M	J	S	O	N	D	J	F	M	A	M	J	S	O	N	D	
Collect seed	X	X	X								X	X	X								X	X	X							
Collect cutting material		X		X							X		X								X		X							
Engage plant producer(s)		X	X	X																										
Begin plant propagation				X										X										X						
Sow grass and forb seed					X										X										X					
Order straw						X																								
Liaise with project managers on rehabilitation areas						X			X	X	X	X	X																	
Check on tubestock production with nurseries							X	X	X							X	X	X								X	X	X		
Construct holding bay (HB)																		X	X											
Deliver straw to PCF									X	X																				
Hard landscaping (boulder placement and amenities)										X	X	X	X																	
Rehabilitate and secure PCF										X	X	X	X	X																
Engage planting crews																			X	X									X	
Deliver tubestock to HB																				X	X									
Plant, sow and mulch																						X	X	X						
Monitor, maintain and manage																											X	X	X	

6. Conclusion

This Ecological Rehabilitation Plan outlines the revegetation, habitat creation and amenity landscaping within the Project Construction Footprint for the Mount Buller water storage project. This plan aims to achieve the following key performance criteria:

- Soil will remain covered and protected throughout the rehabilitation area at all times.
- There will be no overall loss of key pre-construction ecological values (cover of native vegetation and habitat for Alpine Bog Skink and Broad-toothed Rat).
- A new interpretive site for Mountain Pygmy Possum will be created within the PCF (no habitat exists for this species within the PCF).
- There will be improved connectivity of native vegetation outside the PCF as a result of revegetation of areas of the PCF that currently support introduced vegetation.

Importantly, the rehabilitation program described herein makes the most of the recreational and place-making features of the water storage without compromising the overall goal of ecological restoration.

Figures

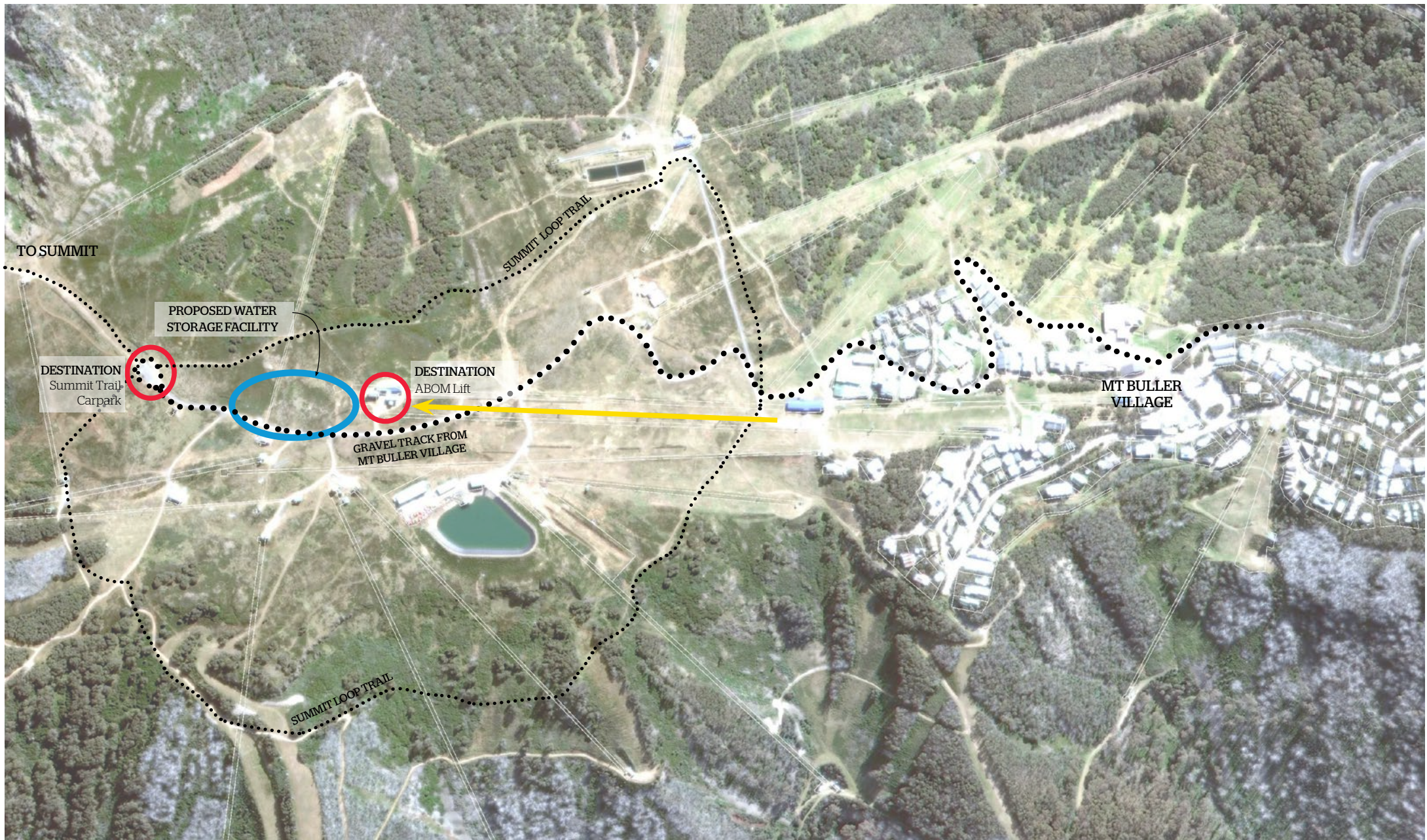


Figure 2 Landscape Master Plan Context Plan

Mt Buller Sustainable Water Security Project

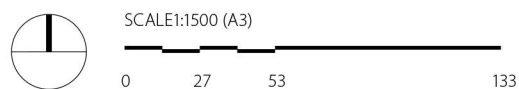
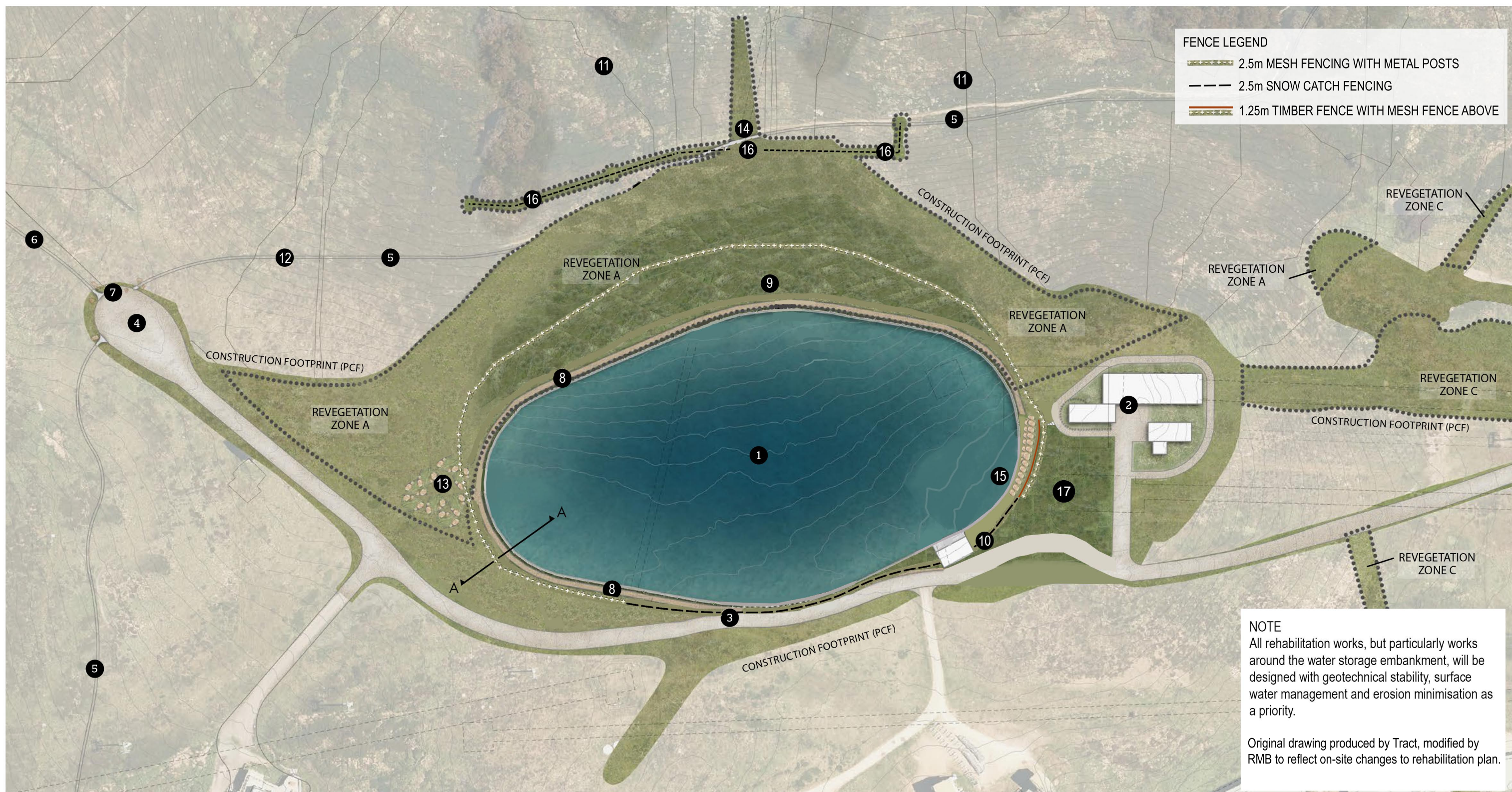
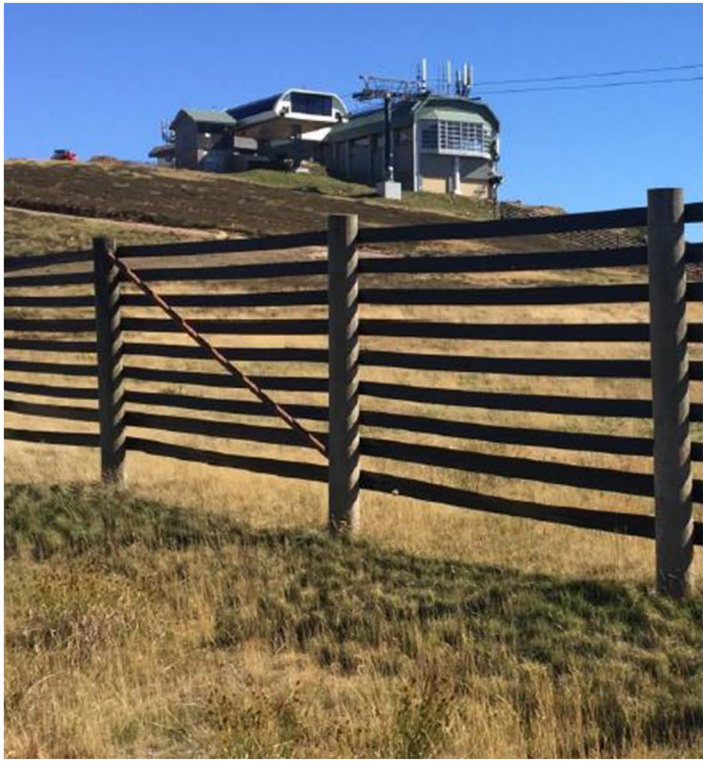


Figure 3 Landscape Master Plan
Mt Buller Sustainable Water Security Project



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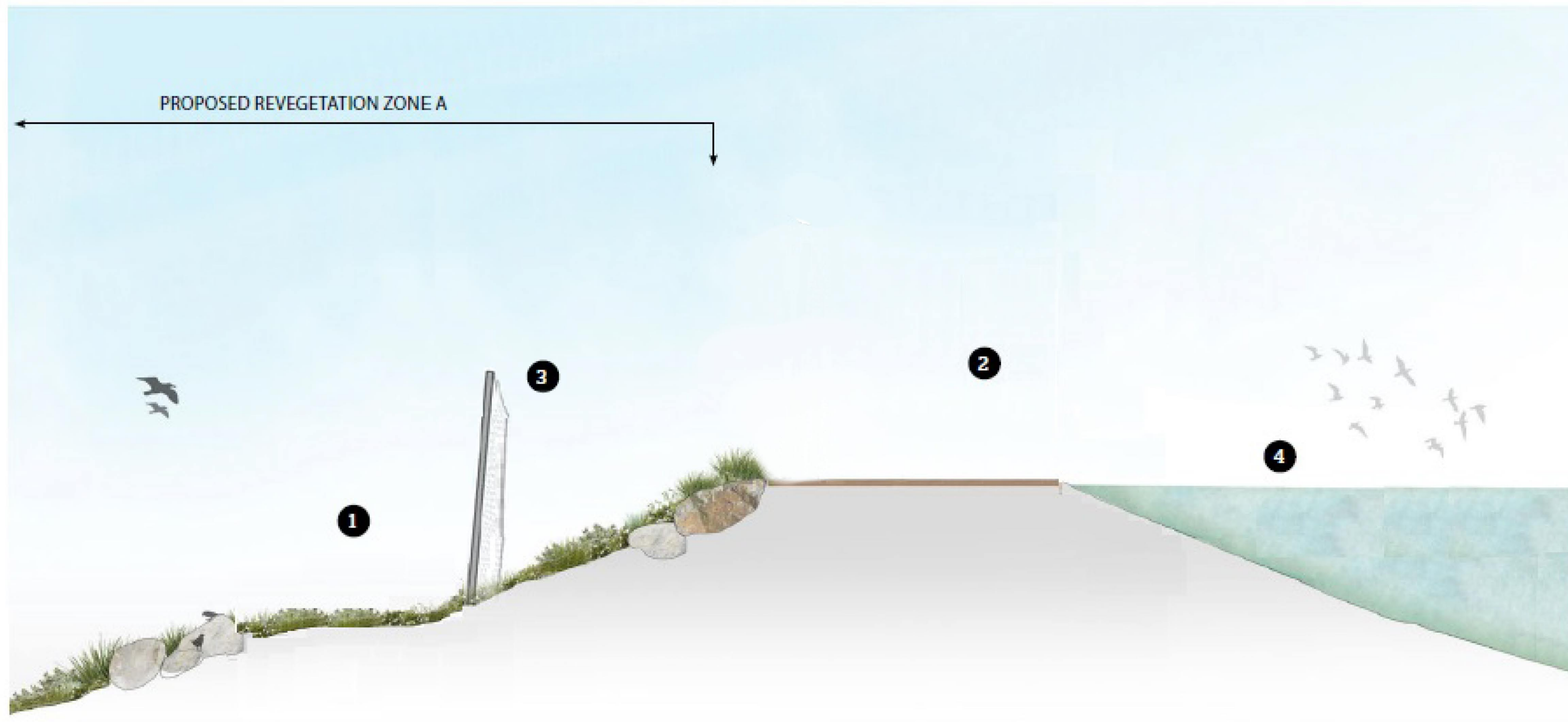


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- 9 SAFETY FENCING (2.5m)
- 12 INTERPRETIVE SIGNAGE ALONG SUMMIT
NATURE TRAIL WILL FOCUS ON DIFFERENT
ASPECT OF ALPINE CULTURE / ENVIRONEMNT
- 13 INTERPRETIVE ROCK HABITAT DISPLAY PROVIDING SHELTER
FOR ALPINE BOG SKINK, BROAD-TOOTHED RAT AND BOGONG
MOTHS (SEE PHOTO)
- 15 RETAINING WALL

Figure 4 Reference Photos

Mt Buller Sustainable Water Security Project



- ❶ EMBANKMENT LAND FORMING TO CREATE RESOURCE SINK IN SUMMER AND WINTER SKIWAY
- ❷ LAKESIDE MAINTENANCE TRAIL
- ❸ POST AND MESH FENCE SIMILAR TO SUN VALLEY
- ❹ WATER STORAGE FACILITY

NOTES

All rehabilitation works, but particularly works around the water storage embankment, will be designed with geotechnical stability, surface water management and erosion minimisation as a priority.

Original drawing produced by Tract, modified by RMB to reflect on-site changes to rehabilitation plan.

Figure 5 Section A-A

Mt Buller Sustainable Water Security Project

PROJECT_DRG NO 0316-0738-01_D003-04

REV 06 DRWN JM(RMB)

APPROV KA(RMB) DATE 03.04.2020

References

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Appendices

Appendix 1 Project approvals

PLANNING PERMIT

Permit No.: PA1600138

Alpine Resorts Planning Scheme

Responsible Authority: Minister for Planning

ADDRESS OF THE LAND:

(PART) CROWN ALLOTMENT 5A SECTION A PARISH OF
CHANGUE EAST,
MT BULLER ALPINE RESORT
MT BULLER

THE PERMIT ALLOWS:

Use of the land for a water storage facility (utility
installation) and associated native vegetation
removal in accordance with the endorsed plans

THE FOLLOWING CONDITIONS APPLY TO THIS PERMIT

Additional documents/reports

1. Before the commencement of any works, including vegetation removal and bulk excavation (but excluding works necessary to be undertaken specifically to address the environmental risk assessment requirements of condition 1a), the following documents or reports must be submitted to and be to the satisfaction of the Secretary (Secretary as constituted under Part 2 of the *Conservation, Forests and Lands Act 1987*) of Department of Environment, Land, Water and Planning (DELWP) and the Goulburn Broken Catchment Management Authority (CMA). When approved, the document(s) will be endorsed and will then form part of the permit. Three copies (including an electronic copy) must be provided. The document(s) must include the following:
 - a) An environmental risk assessment based on the detailed design for the project. The risk assessment must include an assessment of environmental and geotechnical risks from construction and operation of the project infrastructure including the risks to the Alpine Bog associated with changes to hydrology and the environmental watering program.
2. Before the commencement of any works, including vegetation removal, bulk excavation, (but excluding works necessary to be undertaken specifically to address the environmental risk assessment), the following documents or reports must be submitted to and be approved by the Responsible Authority. When approved, the document(s) will be endorsed and will then form part of the permit. Three copies (including an electronic copy) must be provided. The document(s) must include the following:
 - a) The Hydrological and Ecological Management and Monitoring Program (HEMAMP) dated 28 April 2017, and prepared by Biosis and GHD, must be updated to incorporate the findings and recommendations of the environmental risk assessment as required by condition 1a of this permit.

- b) The detailed offset management plan, as required by condition 20 of this permit;
- c) Evidence that the offsets have been secured, in accordance with condition 21 of this permit;
- d) The Site Environmental Management Plan (SEMP), dated December 2016, and prepared by Environmental Resources Management Australia (ERM), must be updated to include revised construction timeframes.

Endorsed Plans

- 3. The use and native vegetation removal as shown on the endorsed plans must not be altered without the written consent of the Responsible Authority.
- 4. All construction is to remain within the Project Construction Footprint (PCF) as identified and approved to help limit the potential effects to biodiversity values to those already identified, to the satisfaction of the Responsible Authority. (Any measures to reduce other risks must not result in a larger PCF).
- 5. Once the works and native vegetation removal have started, they must be continued and completed to the satisfaction of the Responsible Authority.
- 6. All buildings and works associated with the permitted use and native vegetation removal must be maintained in good order and appearance to the satisfaction of the Responsible Authority.

All External Activities to Cease

- 7. Without the prior written consent of the Responsible Authority, no earthworks, site restoration, revegetation or other related outdoor construction activities may commence prior to the end of the declared snow season and all such activities must cease prior to the start of the snow season.

Hydrological and Ecological Management and Monitoring Program (HEMAMP) and Ongoing Monitoring Report

- 8. The endorsed Hydrological and Ecological Management and Monitoring Program (HEMAMP), as required by this permit, must be implemented and completed to the satisfaction of the Department of Environment, Land, Water and Planning (DELWP) Secretary (Secretary as constituted under Part 2 of the *Conservation, Forests and Lands Act 1987*). A monitoring report, together with its independent review (commissioned by the proponent at no cost to DELWP), and revisions to the HEMAMP must be submitted to the DELWP Secretary annually, until the DELWP Secretary formally advises the permit holder in writing that the monitoring reports are no longer required. The HEMAMP must address risks that are identified in response to Condition 1a of this permit, as well as advice from DELWP (Environment) in the context of annual monitoring reports.
- 9. The Mount Buller and Mount Stirling Resort Management Board (RMB) must inform the Land Manager (DELWP) of known major risks or failure to effectively implement the HEMAMP and of the risk management systems that it has in place to address those risks.

Landscaping and Rehabilitation Plan

- 10. All existing vegetation to be retained as shown on the endorsed plans must be suitably marked and photographed (with a copy provided to the Responsible Authority) before any development starts on the site and that vegetation must not be removed, destroyed or lopped without the written consent of the Responsible Authority.
- 11. Before the commencement of the use hereby permitted by this permit, all landscaping and rehabilitation works as shown on the endorsed Ecological Rehabilitation Plan report (including the attached Landscape Masterplan), dated 8 December 2016, and prepared by Biosis and Tract, must be implemented and completed to the satisfaction of the

Responsible Authority. Any dead or diseased trees must be replaced to the satisfaction of the Responsible Authority.

12. Should the water storage facility not be completed or is decommissioned in the future, the land must be reinstated and rehabilitated to the satisfaction of the Responsible Authority.

Geotechnical

13. The proposed works must be undertaken in accordance with the recommendations (Sections 4.1 and 4.2) of the endorsed 'Geotechnical Risk Assessment' report, dated December 2016, and prepared by GHD, to the satisfaction of the Responsible Authority.

Site Management, Stockpiling, Material Storage and Waste

14. Stockpiles of soil, building materials or waste are not to be located on top of areas of native vegetation.
15. All earth-moving equipment and other machinery must be cleaned of soil and plant material before entering and leaving the site to prevent the spread of weeds and pathogens.
16. All stockpiling and building material storage, fencing and signage must ensure safe pedestrian access.
17. All materials and waste must be appropriately managed, contained and removed, to the satisfaction of the Responsible Authority.

Site Environmental Management Plan

18. All construction activity and site rehabilitation works must be conducted in accordance with the endorsed Site Environmental Management Plan (SEMP), dated December 2016, and prepared by Environmental Resources Management Australia (ERM) or as revised, to the satisfaction of the Responsible Authority. All contractors working on the site must be provided with a copy of the endorsed SEMP and must retain a copy of the SEMP on-site at all times during the construction period.

Department of Environment, Land, Water and Planning (Hume Region)

19. Before the commencement of any works, the permit holder must advise all persons undertaking the vegetation removal or works on site of all relevant permit conditions and associated statutory requirement or approvals.
20. Before the commencement of any works, including vegetation removal, bulk excavation and site preparation works, a detailed offset management plan including proposed management activities, monitoring, reporting, funding and management arrangements, must be submitted to and be approved by the Responsible Authority.
21. Before the commencement of any works, including vegetation removal, bulk excavation and site preparation works, evidence that the required offset (including the approved alternative specific offset component) has been secured, must be provided to the satisfaction of the Responsible Authority. The offsets must be secured with an ongoing Crown land offset agreement to the satisfaction of the DELWP Secretary and in accordance with the offset rules of the Native Vegetation Credit Register. If more permanent arrangements come into place, the agreement will be updated to reflect these arrangements.
22. To offset the removal of 6.177 hectares of native vegetation the permit holder must secure a native vegetation offset, in accordance with the Permitted clearing of native vegetation – Biodiversity assessment guidelines and the Native vegetation gain scoring manual (Department of Environment and Primary Industries 2013) as specified below.

23. A general offset of 1.102 general biodiversity equivalence units with the following attributes:
- a) Be located within the Mt Buller/Mt Stirling Alpine Resort or Goulburn Broken Catchment Management Authority boundary.
 - b) Have a strategic biodiversity score of at least 0.774.
24. The specific offsets required must contribute a gain of:
- a) 7.446 specific biodiversity equivalence units for Alpine Bog Skink.
 - b) 7.212 specific biodiversity equivalence units for Snow Aciphyll.
 - c) 7.896 specific biodiversity equivalence units for Mountain Aciphyll.
 - d) 8.332 specific biodiversity equivalence units for Mountain Daisy.
 - e) 2.312 specific biodiversity equivalence units for Alpine Marsh Marigold.
 - f) 8.400 specific biodiversity equivalence units for Carpet Sedge.
 - g) 6.442 specific biodiversity equivalence units for Broad-leaf Flower-rush.
 - h) 5.650 specific biodiversity equivalence units for Sticky Fleabane.
 - i) 7.337 specific biodiversity equivalence units for Fog Club-sedge.
 - j) 8.391 specific biodiversity equivalence units for Tussock Woodrush.
 - k) 6.636 specific biodiversity equivalence units for Veined Plantain.
 - l) 8.468 specific biodiversity equivalence units for Gunn's Alpine Buttercup.
 - m) 1.274 specific biodiversity equivalence units for Felted Buttercup.
 - n) 6.059 specific biodiversity equivalence units for Mossy Knawel.
 - o) 1.218 specific biodiversity equivalence units for Alpine Stackhousia.
 - p) 7.172 specific biodiversity equivalence units for Green Billy-buttons.
 - q) 5.955 specific biodiversity equivalence units for Mountain Wallaby-grass.
 - r) 0.796 specific biodiversity equivalence units for Planarian.
25. All works must be undertaken in accordance with the Site Environmental Management Plan (SEMP) – December 2016, and prepared by Environmental Resources Management Australia (ERM) or as revised in conjunction with the Responsible Authority.
26. All contractors working on the site must be provided with a copy of the SEMP for ongoing guidance and works prescriptions during the construction period.
27. All proposed actions in the endorsed Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP), or as revised are to be undertaken to the satisfaction of the Responsible Authority.

Cultural Heritage Management Plan

28. Where it is suspected that works may impact on Aboriginal cultural heritage objects or places, works must be undertaken in accordance with the approved Cultural Heritage Management Plan CHMP 12912, to the satisfaction of the Responsible Authority.

AusNet

29. The applicant must enter into an agreement with AusNet Electricity Services Pty Ltd for supply of electricity to each lot on the endorsed plan.

30. The applicant must enter into an agreement with AusNet Electricity Services Pty Ltd for the rearrangement of the existing electricity supply system.
31. The applicant must enter into an agreement with AusNet Electricity Services Pty Ltd for rearrangement of the points of supply to any existing installations affected by any private electric power line which would cross a boundary created by the subdivision, or by such means as may be agreed by AusNet Electricity Services Pty Ltd.
32. The applicant must provide easements satisfactory to AusNet Electricity Services Pty Ltd for the purpose of "Power Line" in the favour of "AusNet Electricity Services Pty Ltd" pursuant to Section 88 of the Electricity Industry Act 2000, where easements have not been otherwise provided, for all existing AusNet Electricity Services Pty Ltd electric power lines and for any new power lines required to service the lots on the endorsed plan and/or abutting land.
33. The applicant must obtain for the use of AusNet Electricity Services Pty Ltd any other easement required to service the lots.
34. The applicant must adjust the position of any existing AusNet Electricity Services Pty Ltd easement to accord with the position of the electricity line(s) as determined by survey.
35. The applicant must set aside on the plan of subdivision Reserves for the use of AusNet Electricity Services Pty Ltd for electric substations.
36. The applicant must provide survey plans for any electric substations required by AusNet Electricity Services Pty Ltd and for associated power lines and cables and executes leases for a period of 30 years, at a nominal rental with a right to extend the lease for a further 30 years. AusNet Electricity Services Pty Ltd requires that such leases are to be noted on the title by way of a caveat or a notification under Section 88 (2) of the Transfer of Land Act prior to the registration of the plan of subdivision.
37. The applicant must provide to AusNet Electricity Services Pty Ltd a copy of the plan of subdivision submitted for certification that shows any amendments that have been required.
38. The applicant must agree to provide alternative electricity supply to lot owners and/or each lot until such time as permanent supply is available to the development by AusNet Electricity Services Pty Ltd. Individual generators must be provided at each supply point. The generator for temporary supply must be installed in such a manner as to comply with the Electricity Safety Act 1998.
39. The applicant must ensure that all necessary auditing is completed to the satisfaction of AusNet Electricity Services Pty Ltd to allow the new network assets to be safely connected to the distribution network.

Goulburn Murray Water

40. All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (Environment Protection Authority, 1991).
41. No buildings or works may be erected or carried out within 30 metres of a waterway.
42. The proposed water storage facility should be Bunded and be fully lined with 2mm High-Density Polyethylene (HDPE).
43. The proposed water storage facility will be classed as 'Hazardous' due to wall height (21 metres) and volume (100ML). Therefore, prior to commencement of site preparation works, a construction and operating licence (works licence) must be obtained.

Permit Expiry

44. The permit will expire if:

- a) The use does not start within four (4) years of the date of this permit.
- b) The use is discontinued for a period of two (2) years.
- c) The native vegetation permitted to be removed is not removed within two (2) years of the date of this permit.

45. In accordance with section 69 of the *Planning Environment Act 1987*, the Responsible Authority may extend:

The commencement date referred to if a request is made in writing before the permit expires or within six (6) months afterwards.

Date Issued:

18/1/18

Signature for the responsible authority

Note: Under Part 4, Division 1A of the Planning and Environment Act 1987, a permit may be amended. Please check with the responsible authority that this permit is the current permit and can be acted upon.

Notes:

- If protected flora listed under the Flora & Fauna Guarantee Act 1988 (FFG Act) is to be removed a permit issued in accordance with the FFG Act must first be obtained.
- The permit holder must consult with Hume Region biodiversity staff in relation to impacts on the Flora and Fauna Guarantee (FFG) and Environmental Protection and Biodiversity Conservation (EPBC) listed species - Broad toothed Rat. Agreed measures should be developed to minimise and mitigate the impact of the proposed development on this species, prior to works starting. Agreed measures should be to the satisfaction of the DELWP (Hume Region) and the Responsible Authority to be notified when this has occurred.

Goulburn Murray Water

- The proposed water storage facility will be classed as 'Hazardous' due to wall height (21 metres) and volume (100ML). Therefore, prior to commencement of site preparation works, a construction and operating licence (works licence) must be obtained. Applications can be made by contacting Goulburn Murray Water on 1800 013 357 or by following the link the <http://www.g-mwater.com.au/customer-services/forms>
- If water is to be taken and used for dust suppression, application must be made to GMW. Applications for a Licence to Take and Use Water can be made to Goulburn Murray Water's Diversion Operations on 1800 013 357.

IMPORTANT INFORMATION ABOUT THIS PERMIT

WHAT HAS BEEN DECIDED?

The responsible authority has issued a permit. (Note: This is not a permit granted under Division 5 or 6 of Part 4 of the **Planning and Environment Act 1987**.)

CAN THE RESPONSIBLE AUTHORITY AMEND THIS PERMIT?

The responsible authority may amend this permit under Division 1A of Part 4 of the **Planning and Environment Act 1987**.

WHEN DOES A PERMIT BEGIN?

A permit operates:

- * from the date specified in the permit; or
- * if no date is specified, from -
 - (i) the date of the decision of the Victorian Civil and Administrative Tribunal, if the permit was issued at the direction of the Tribunal; or
 - (ii) the date on which it was issued, in any other case.

WHEN DOES A PERMIT EXPIRE?

1. A permit for the development of land expires if –
 - * the development or any stage of it does not start within the time specified in the permit; or
 - * the development requires the certification of a plan of subdivision or consolidation under the **Subdivision Act 1988** and a plan is not certified within two years of the issue of a permit, unless the permit contains a different provision; or
 - * the development or any stage of it is not completed within the time specified in the permit, or, if no time is specified, within two years after the issue of the permit or in the case of a subdivision or consolidation within five years of the certification of the plan of subdivision or consolidation under the **Subdivision Act 1988**.
2. A permit for the use of land expires if -
 - * the use does not start within the time specified in the permit, or if no time is specified, within two years of the issue of the permit; or
 - * the use is discontinued for a period of two years.
3. A permit for the development and use of land expires if -
 - * the development or any stage of it does not start within the time specified in the permit; or
 - * the development or any stage of it is not completed within the time specified in the permit, or, if no time is specified, within two years after the issue of the permit; or
 - * the use does not start within the time specified in the permit, or, if no time is specified, within two years after the completion of the development; or
 - * the use is discontinued for a period of two years.
4. If a permit for the use of land or the development and use of land or relating to any of the circumstances mentioned in Section 6A(2) of the **Planning and Environment Act 1987**, or to any combination of use, development or any of those circumstances requires the certification of a plan under the **Subdivision Act 1988**, unless the permit contains a different provision-
 - * the use or development of any stage is to be taken to have started when the plan is certified; and
 - * the permit expires if the plan is not certified within two years of the issue of the permit.
5. The expiry of a permit does not affect the validity of anything done under that permit before the expiry.

WHAT ABOUT REVIEWS?

- * The person who applied for the permit may apply for a review of any condition in the permit unless it was granted at the direction of the Victorian Civil and Administrative Tribunal, in which case no right of review exists.
- * An application for review must be lodged within 60 days after the permit was issued, unless a notice of decision to grant a permit has been issued previously, in which case the application for review must be lodged within 60 days after the giving of that notice.
- * An application for review is lodged with the Victorian Civil and Administrative Tribunal.
- * An application for review must be made on the relevant form which can be obtained from the Victorian Civil and Administrative Tribunal, and be accompanied by the applicable fee.
- * An application for review must state the grounds upon which it is based.
- * A copy of an application for review must also be served on the responsible authority.
- * Details about applications for review and the fees payable can be obtained from the Victorian Civil and Administrative Tribunal.



Approval

Mt Buller Sustainable Water Security Project – Off-stream Storage, Victoria (EPBC 2014/7303)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted	Mount Buller and Mount Stirling Alpine Resort Management Board
proponent's ABN	44 867 982 534
proposed action	To construct and operate a 100 megalitre capacity off-stream water storage and ancillary infrastructure within the Mt Buller Alpine Resort Ski Area, Victoria [See EPBC Act referral 2014/7303].

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approve


conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 1 June 2068.

Decision-maker

name and position	James Barker Assistant Secretary Assessments and Governance Branch
signature	
date of decision	25 / 6 / 2018

Conditions attached to the approval

Disturbance areas

1. The approval holder must only undertake the action in the **project area** shown in Annexure A.
2. For the life of the approval, the approval holder must achieve the following outcomes (relative to baseline monitoring and control sites):
 - a. no **direct impacts** to **Alpine bogs**;
 - b. no more than a 10 per cent (0.090 hectare) reduction in the total combined area of **indirectly affected areas** of **Alpine bogs**;
 - c. no more than a 10 per cent reduction in the total 'bog-dependent' native flora **species richness** of **indirectly affected areas** of **Alpine bogs**;
 - d. no more than a 10 per cent increase in the cover of 'non-bog dependent' species within **indirectly affected areas** of **Alpine bogs**; and
 - e. no more than a 10 per cent reduction in the average cover of sphagnum moss (*Sphagnum* spp) within **indirectly affected areas** of **Alpine bogs**.

Pre-disturbance surveys

3. The approval holder must undertake **pre-disturbance surveys** in the **project area** to identify any new or new occurrences/extent of **EPBC Act** listed threatened species or ecological communities. **Pre-disturbance surveys** must be supervised by a **suitably qualified person** and undertaken in accordance with the **Department's survey guidelines** in effect at the time of the survey or other equivalent survey methodology approved by the **Department**.
4. If new or new occurrences/extent of **EPBC Act** listed threatened species or ecological communities not previously identified are found in the **project area** during **pre-disturbance surveys** or during **construction**, the approval holder must:
 - a. immediately cease work;
 - b. notify the **Department** in writing within 48 hours of finding the **EPBC Act** listed threatened species and/or ecological communities; and
 - c. not **re-commence** or **commence the action** without written agreement from the **Minister**.
5. If new or new occurrences/extent of **EPBC Act** listed threatened species or ecological communities not previously identified are found in the **project area** during **pre-disturbance surveys** or during **construction**, the approval holder must outline in writing the number or extent and quality of the **EPBC Act** listed threatened species and ecological communities present, and how potential impacts to these **EPBC Act** listed threatened species and/or ecological communities will be avoided, mitigated and/or compensated for, for the **Minister's** approval. Once approved, the approved avoidance, mitigation and/or compensation measures must be implemented.

Hydrological and Ecological Monitoring and Adaptive Management Program

6. The approval holder must implement the **Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP)** for the life of the approval. If monitoring results indicate that the outcomes in condition 2 has not been achieved or is not likely to be achieved, the approval holder must:
 - a. investigate why the outcome has not or will not be achieved
 - b. advise the **Department** within 14 days of receiving the monitoring results (including a summary of the provision of the investigation required under condition 6a); and
 - c. develop corrective actions, revised monitoring, mitigation, management measures and/or compensation measures to be included in the **HEMAMP**.
7. Any revised measure(s) to be included in the **HEMAMP** required under condition 6, must be peer reviewed by a **suitably qualified expert**. The peer review must be submitted to the **Minister** together with the revised **HEMAMP**, and a statement from the **suitably qualified expert** stating that the peer review adequately evaluated measures proposed.
8. Within three (3) months following the third anniversary of **commencement of the action**, the approval holder must assess the effectiveness of the monitoring, mitigation, and management measures in the **HEMAMP** in achieving the outcome in condition 2(b). The assessment must be undertaken by a **suitably qualified independent expert**. The findings of the assessment must immediately be made publicly available on the approval holder's website, and be provided to the **Department** within five (5) days of publishing.
9. If the **Minister** at any time is not satisfied that the outcomes in condition 2 have been achieved or are likely to be achieved, the **Minister** may (in writing) require the approval holder to submit a new plan or program for the **Minister's** approval to reduce, mitigate, remediate or compensate impacts to **Alpine bogs**, within a designated timeframe. The **Minister** may request that the plan or program be prepared or reviewed by a person designated or agreed to by the **Minister**. If the **Minister** approves the plan or program, then the approved plan or program must be implemented.

Note: To avoid doubt, any proposed compensation measures must be additional to that required under condition 12.

Ecological Rehabilitation Plan

10. Information obtained during **pre-disturbance surveys** required under condition 3 must be used to inform the implementation of the **Ecological Rehabilitation Plan**. Any changes to the plan must be submitted to the **Department** for the **Minister's** written approval prior to the **commencement** of the rehabilitation works.
11. Within one (1) month following completion of **construction**, or following approval by the **Minister** as required under condition 9, the approval holder must **commence** rehabilitation of the **project area** in accordance with the **Ecological Rehabilitation Plan**.

Offset Areas

12. Prior to the **commencement of the action**, to compensate for the potential reduction in the total combined area of up to 0.090 ha of **indirectly affected areas** of **Alpine bogs**, the approval holder must **legally secure** 0.381 hectares of **Alpine bogs** at Mt Stirling as identified in the **Offset Strategy**, or another offset agreed to by the **Minister** in writing.

13. Within three (3) months of **legally securing** the offset required under condition 12, the approval holder must submit an Offset Management Plan, for the written approval of the **Minister**. Once approved, the approved Offset Management Plan must be implemented for the life of this approval. The Offset Management Plan must:
- a. be prepared by a **suitably qualified expert**
 - b. provide the **Department** with a written description and map to clearly define the location and boundaries of the offset area(s). This must be accompanied with the **offset attributes** and **shapefiles**
 - c. include timeframes and key milestones for implementation of offsets.
 - d. detail management actions and regeneration and revegetation strategies to be undertaken on the offset area(s) to improve and extend the ecological quality of **Alpine bogs**, including:
 - i. a discussion of how measures outlined take into account relevant **conservation advice** and are consistent with the measures in relevant **recovery plans** and **threat abatement plans**
 - ii. a description and timeframe of measures that will be implemented to improve the condition and extent of **Alpine bogs** within the offset area(s);
 - iii. performance and completion criteria for evaluating the management of the offset areas, and criteria for triggering remedial action;
 - iv. a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;
 - v. a description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise; and
 - vi. details of who is responsible for monitoring, reviewing and implementing the plan.

Administrative conditions

14. Within 20 business days after the **commencement of the action**, the **approval holder** must advise the **Department** in writing of the actual date of **commencement of the action**.
15. The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.
16. Within one (1) month of every 12 month anniversary of **commencement**, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions and any monitoring results required. Any monitoring program results or peer-reviews must be publicly available on the approval holder's website and remain on the approval holder's website for the life of the approval. Documentary evidence providing proof of the date of publication and details of non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published.

17. Upon the direction of the **Minister**, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.
18. If, at any time after five (5) years from the date of this approval, the approval holder has not **commenced** the action, then the approval holder must not **commence** the action without the written agreement of the **Minister**.
19. Unless otherwise agreed to in writing by the **Minister**, the approval holder must publish all reports and agreements referred to in conditions 7, 8, 10, and 13 on their website. Each report and agreement must be published on the website within one (1) month of being approved by the **Minister**.

Definitions

Alpine bogs means the **EPBC Act** listed threatened ecological community *Alpine Sphagnum Bogs and Associated Fens*.

Commencement of the action (also **commence**, **re-commence**, **commenced**) means the first instance of **construction**.

Conservation advice means a conservation advice approved by the Minister under the **EPBC Act**.

Construction means the erection of a structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, or repair; preliminary site preparation work which involved breaking of the ground; clearing vegetation; the laying of pipes and other prefabricated materials in the ground, and any associated excavation works; but excluding the installation of fences and signage.

Department means the Australian Government Department administering the **EPBC Act**.

Department's survey guidelines means Survey Guidelines for Australia's Threatened Frogs, Threatened Birds, Threatened Fish, Threatened Mammals, Threatened Reptiles and Threatened Bats: <http://www.environment.gov.au/epbc/guidelines-policies.html>

Direct impact means any clearing such as the cutting down, felling, thinning, logging, removing, poisoning, ringbarking, uprooting or burning of native vegetation, but does not include measure for weed, pest management.

Ecological Rehabilitation Plan refers to the document titled '*Mount Buller Sustainable Water Security Project – Off-stream Storage Ecological Rehabilitation Plan. Final Report. 8 December 2016*', or subsequent versions as approved by the **Minister**.

EPBC Act is the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP) refers to the document titled '*Mount Buller Sustainable Water Security Project – Off-stream Storage Hydrological and Ecological Monitoring and Adaptive Management Plan. Final Report. 21 September 2017*'.

Indirectly affected areas refers to 0.898 hectares of **Alpine bogs** 4.2, 6, 8, 9, 10, 11.2 and 12 as shown in Annexure B and occurring in the catchment area that may be **indirectly impacted** by the action.

Legally secure/securing means to secure a legal agreement under section 18B of the *Victorian Crown Land (Reserves) Act 1978* or the *Victorian Planning and Environment Act 1987*, to provide enduring protection for the site against development incompatible with conservation.

Minister means the Commonwealth Minister administering the **EPBC Act** and includes a delegate of the Minister.

Mountain Pygmy-possums means the **EPBC Act** listed species Mountain Pygmy-possum (*Burramys parvus*).

Offset attributes means an '.xls' file capturing relevant attributes of the offset area, including:

- i. **EPBC Act** reference number;
- ii. physical address of the offset area;
- iii. coordinates of the boundary points in decimal degrees;
- iv. **EPBC Act** listed threatened species that the offset compensates for;
- v. any additional protected matters that are benefiting from the offset; and
- vi. size of the offset in hectares.

Offset Strategy refers to the document titled *Mount Buller Sustainable Water Security Project – Off-stream Storage EPBC Act Offset Strategy. Draft Report. 5 October 2017*.

Pre-disturbance surveys means surveys that are undertaken within the **project area** to determine the occurrence of any **EPBC Act** listed threatened species (or their habitat) and/or ecological communities prior to the **commencement of the action**.

Project area is the area shown in Annexure A and described as 'project construction footprint'.

Recovery plans means a recovery plan made or adopted by the **Minister** under the **EPBC Act**.

Shapefiles means an Esri compatible file containing '.shp', '.shx' and '.dbf' files and any other relevant file extensions capturing attributes including at least the **EPBC Act** reference number and **EPBC Act** protected matters present at the relevant site.

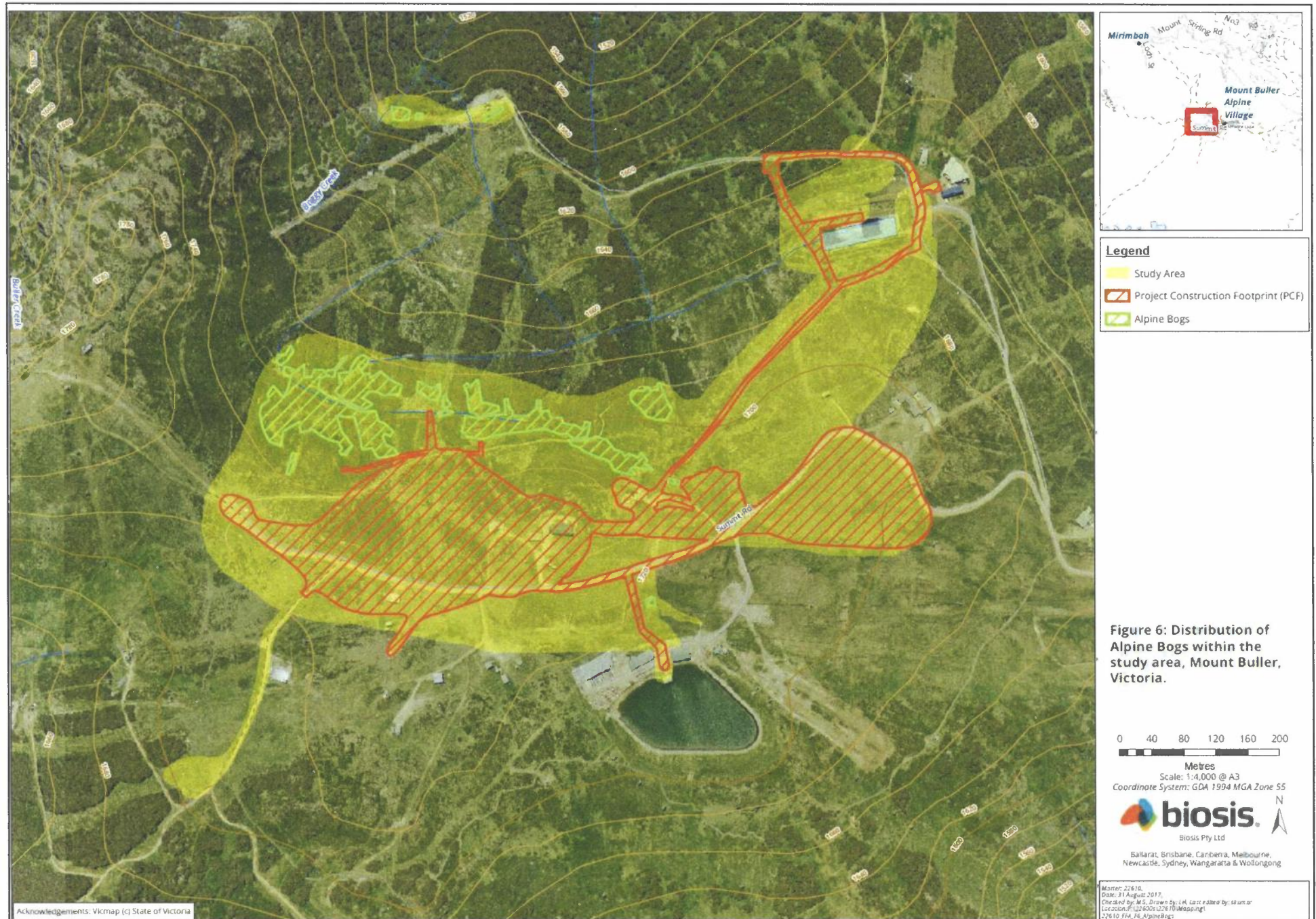
Species richness means the number of different species represented in the **indirectly affected areas**.

Suitably qualified independent expert means a person who is approved by the **Department**, and who is independent, is not an employee of the approval holder, and who has relevant tertiary qualifications and a minimum of five years demonstrated experience relevant to the review of management plans, strategies or monitoring programs.

Suitably qualified expert means a person with tertiary qualification and a minimum of five years demonstrated experience relevant to the nominated subject matter/s and who can provide authoritative assessment advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.

Threat abatement plans means a threat abatement plan made or adopted by the **Minister** under the **EPBC Act**.

Annexure A: Project area and distribution of Alpine Bogs



Annexure B: Indirectly impacted Alpine bogs

