

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

REFERRAL FORM

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

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

It will generally be useful for a proponent to discuss the preparation of a Referral with the Impact Assessment Unit (IAU) at the Department of Environment, Land, Water and Planning (DELWP) before submitting the Referral.

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

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once IAU is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
 - a brief description of potential changes or risks to environmental assets resulting from the project;
 - available information on the likelihood and significance of such changes;
 - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A CD or DVD copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 2MB as they will be published on the Department's website.**

- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

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

Postal address

**Minister for Planning
GPO Box 2392
MELBOURNE VIC 3001**

Couriers

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

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

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	Mt Buller Mt Stirling Alpine Resort Management Board
Authorised person for proponent:	Andrew Evans
Position:	Board Member, Mt Buller Mt Stirling Alpine Resort Management Board
Postal address:	Alpine Central, Summit Road, Mt Buller Victoria 3723
Email address:	aevens@redc.net.au
Phone number:	03 5777 7201
Facsimile number:	03 5777 6219
Person who prepared Referral:	Alicia Burnett
Position:	Senior Planner
Organisation:	Environmental Resources Management Australia Pty Ltd
Postal address:	PO Box 266 South Melbourne VIC 3205
Email address:	alicia.burnett@erm.com
Phone number:	(03) 9696 8011
Facsimile number:	(03) 9696 8022
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	<p>Environmental Resources Management Australia Pty Ltd</p> <ul style="list-style-type: none"> - Impact Assessment and Planning - Environmental Construction Management <p>Biosis Pty Ltd</p> <ul style="list-style-type: none"> - Ecology - Cultural Heritage <p>GHD Pty Ltd</p> <ul style="list-style-type: none"> - Engineering - Site Options Assessment - Geotechnical Assessment - Visual Impact Assessment <p>Tract Consultants Pty Ltd</p> <ul style="list-style-type: none"> - Landscape Design <p>Douglas Partners</p> <ul style="list-style-type: none"> - Geotechnical Assessment (Peer Review) <p>Aither</p> <ul style="list-style-type: none"> - Options Assessment (Peer Review)

2. Project – brief outline

Project title: Mt Buller Sustainable Water Security Project – Off-stream Storage
Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context)

The project is located in the Mt Buller Alpine Resort, approximately 33 kilometres east of Mansfield and 150 kilometres northeast of Melbourne, Victoria. The proposed site (known as the 'Control Centre') is located on a gently to moderately sloping plateau 700 metres east of the Mt Buller summit (Figure 1).

The proposed site is located on Crown land that is permanently reserved for the purpose of the Mt Buller Alpine Resort (the Resort), known as Crown Allotment 5A, Section A (SPI 5A~A\PP2370), Parish of Changue East, County of Wonangatta. The Mt Buller Mt Stirling Alpine Resort Management Board (RMB) is the public land manager for the Resort, including the project area. The project area is within the ski field area, within a Comprehensive Development Zone Schedule 2 (Alpine Recreation). The Project Construction Footprint (PCF) is within the:

- Victorian Alps Bioregion
- Goulburn River Basin
- Management area of Goulburn Broken Catchment Management Authority
- Management area of DELWP's Hume Region
- The Mt Buller Ski field area.

The study area for most investigations extends beyond the Project Construction Footprint (PCF) to encompass areas that may be indirectly affected by construction and operation of the proposed water storage (refer Figure 2). For some investigations, such as the Options Assessment or the Landscape and Visual Impact Assessment, the study area extended far beyond the PCF to incorporate much of the surrounding landscape.

The proposed PCF covers an area of 10.347 hectares. The proposed permanent and temporary construction footprint of the project would be located between the final section of the unsealed Mt Buller Summit Road and the Summit Nature Walking Track (refer Figure 2). The PCF includes areas for roads, stockpile areas and extensions of variable shape and length for ancillary infrastructure leading to and from the water storage. The PCF incorporates a section of the Mt Buller Summit Road and areas currently occupied by the Boggy Creek ski lift and a number of buildings (including the Control Centre building). Once constructed and the disturbed areas have been rehabilitated, approximately 1.75 ha of the PCF would be permanently occupied by new or existing infrastructure. Table 1 provides the main coordinates of the outer PCF boundary.

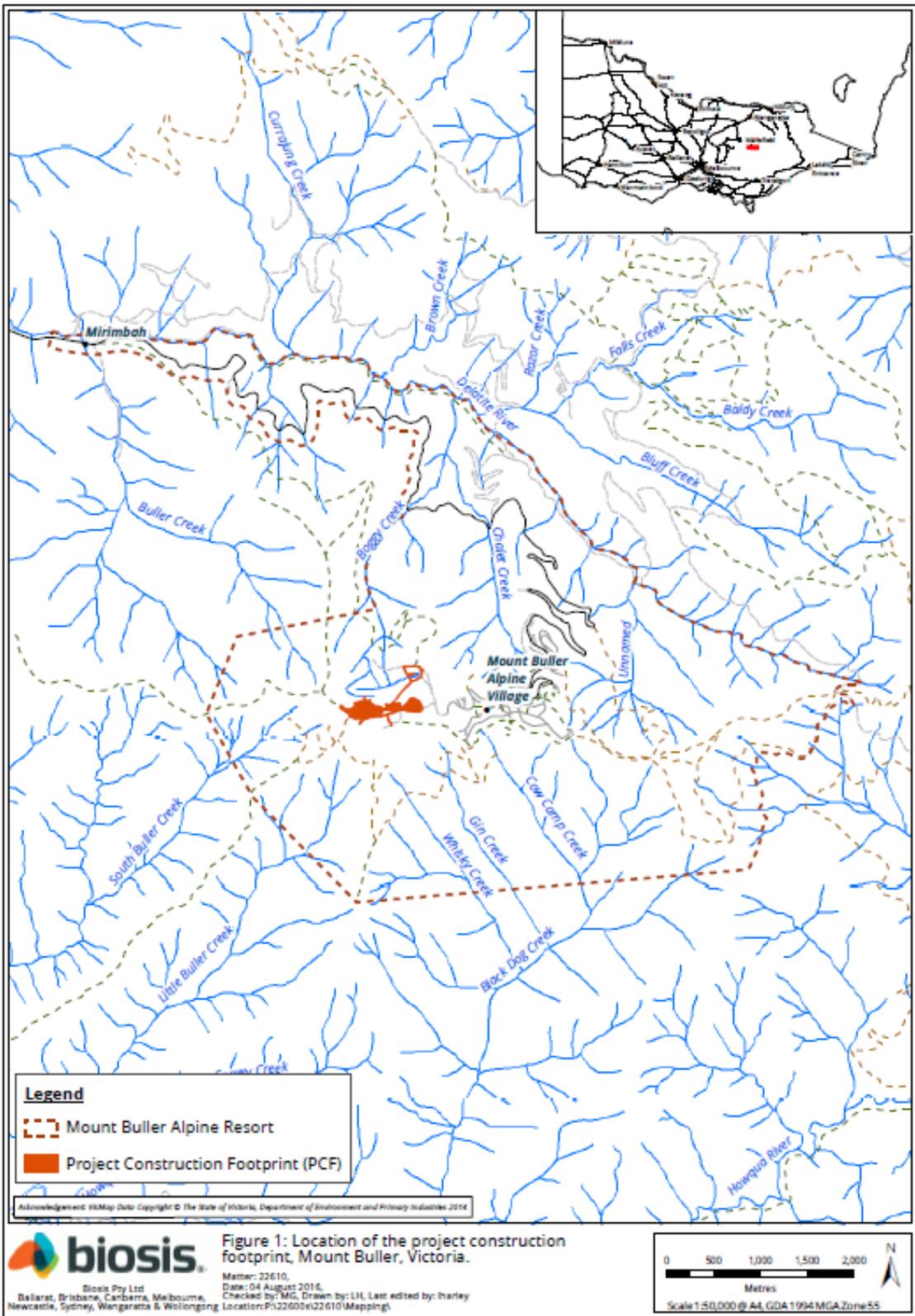


Figure 1: Locality
Source: Mount Buller Sustainable Water Security Project - Off-Stream Storage. Flora and Fauna Assessment. Biosis Pty Ltd
Figure 1: Locality

ID	X Coordinate	Y Coordinate	System
1	449394.6688	449394.6688	AGD_1966_AMG_Zone_55
2	449431.2563	449431.2563	AGD_1966_AMG_Zone_55
3	449437.6588	449437.6588	AGD_1966_AMG_Zone_55
4	449503.801	449503.801	AGD_1966_AMG_Zone_55
5	449645.2679	449645.2679	AGD_1966_AMG_Zone_55
6	449545.1942	449545.1942	AGD_1966_AMG_Zone_55
7	449649.4101	449649.4101	AGD_1966_AMG_Zone_55
8	449653.1072	449653.1072	AGD_1966_AMG_Zone_55
9	449665.3391	449665.3391	AGD_1966_AMG_Zone_55
10	449714.1424	449714.1424	AGD_1966_AMG_Zone_55
11	449718.1963	449718.1963	AGD_1966_AMG_Zone_55
12	449718.8692	449718.8692	AGD_1966_AMG_Zone_55
13	449699.2503	449699.2503	AGD_1966_AMG_Zone_55
14	449795.6226	449795.6226	AGD_1966_AMG_Zone_55
15	449837.5657	449837.5657	AGD_1966_AMG_Zone_55
16	449854.4185	449854.4185	AGD_1966_AMG_Zone_55
17	449904.1729	449904.1729	AGD_1966_AMG_Zone_55
18	449887.3103	449887.3103	AGD_1966_AMG_Zone_55
19	449933.582	449933.582	AGD_1966_AMG_Zone_55
20	450151.834	450151.834	AGD_1966_AMG_Zone_55
21	450069.8404	450069.8404	AGD_1966_AMG_Zone_55
22	450241.9513	450241.9513	AGD_1966_AMG_Zone_55
23	450285.9505	450285.9505	AGD_1966_AMG_Zone_55
24	450289.6865	450289.6865	AGD_1966_AMG_Zone_55
25	450264.2468	450264.2468	AGD_1966_AMG_Zone_55
26	450167.6087	450167.6087	AGD_1966_AMG_Zone_55
27	449943.0315	449943.0315	AGD_1966_AMG_Zone_55
28	450010.1259	450010.1259	AGD_1966_AMG_Zone_55
29	450054.6819	450054.6819	AGD_1966_AMG_Zone_55
30	450176.7915	450176.7915	AGD_1966_AMG_Zone_55
31	450244.2489	450244.2489	AGD_1966_AMG_Zone_55
32	450276.3827	450276.3827	AGD_1966_AMG_Zone_55
33	450250.8719	450250.8719	AGD_1966_AMG_Zone_55
34	450107.9509	450107.9509	AGD_1966_AMG_Zone_55
35	450037.0638	450037.0638	AGD_1966_AMG_Zone_55
36	449904.1487	449904.1487	AGD_1966_AMG_Zone_55
37	449946.0473	449946.0473	AGD_1966_AMG_Zone_55
38	449892.5158	449892.5158	AGD_1966_AMG_Zone_55
39	449814.9505	449814.9505	AGD_1966_AMG_Zone_55
40	449645.0694	449645.0694	AGD_1966_AMG_Zone_55
41	449602.96	449602.96	AGD_1966_AMG_Zone_55
42	449623.623	449623.623	AGD_1966_AMG_Zone_55
43	449554.2979	449554.2979	AGD_1966_AMG_Zone_55
44	449499.767	449499.767	AGD_1966_AMG_Zone_55
45	449497.3093	449497.3093	AGD_1966_AMG_Zone_55
46	449403.0056	449403.0056	AGD_1966_AMG_Zone_55

Short project description (few sentences):

The Mt Buller Sustainable Water Security Project – Off-Stream Storage would involve construction of a 100 Mega litre (ML) water storage facility, as well as ancillary infrastructure, works and landscaping, within the existing ski field area of Mt Buller, close to the existing Control Centre building.

The project includes the following:

- Vegetation removal and salvage for post-construction revegetation
- Decommissioning of existing infrastructure, including:
 - Boggy Creek T-Bar and lift towers
 - Underground fuel tank

- Water supply and communications services (to be replaced)
- Construction of a water storage facility (100 ML) and associated infrastructure, including:
 - Pipelines and tanks
 - Pumps
 - Environmental watering system
 - Connections and reconnections to existing services
- Construction of fencing and pump house
- Ecological rehabilitation
 - Landscaping and re-instatement of native vegetation
 - Creation of new habitat for Mountain Pygmy-possum
 - Re-creation of habitat for Broad-toothed Rat, Alpine Bog Skink and other fauna.

3. Project description

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

The Resort is one of the most accessible alpine resorts in Australia. Located within a sensitive environment with significant conservation and biodiversity, scenic, tourism and recreational values, the alpine and sub-alpine environment as a whole is a valuable resource forming an important part of the Australian landscape. In addition to being an area of environmental and landscape significance, the Resort is a recreation asset for Victorians and provides significant economic benefits, particularly for the local region.

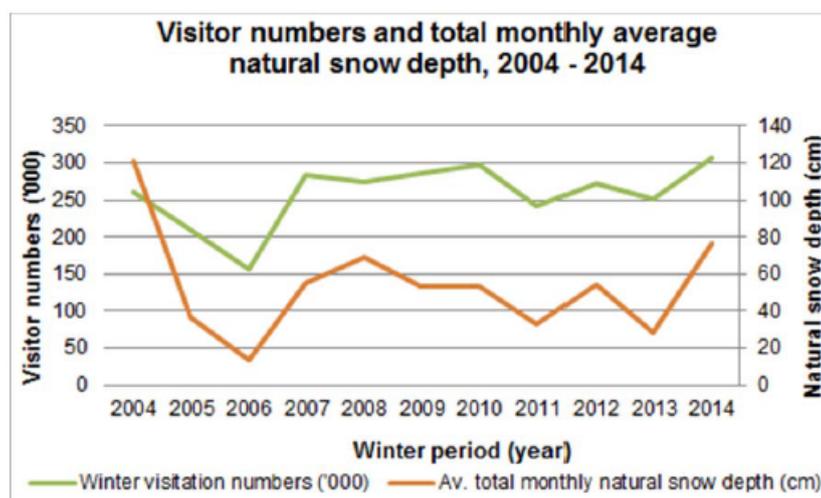
The recently published Victorian Alpine Resorts Economic Contribution Study 2016/2017 highlights the following points which assist in understanding Mt Buller's economic and recreational (in terms of visitation) role in Victoria:

- Mt Buller/Mt Stirling had 323,932 visitors for winter 2016 and 106,883 visitors for summer 2016/2017 (total visitors 430,815).
- Mt Buller/Mt Stirling value added \$304 million and 3036 jobs for Victoria in both summer and winter (\$270 million and 2695 jobs and \$43 million and 430 jobs in Summer)
- Mt Buller had a higher percentage of lower income households (less than \$35,000, in both seasons) than all alpine resorts (with an exception of Mt Baw Baw).

The Mt Buller Sustainable Water Security Project – Off Stream Storage project has been found to have a Net Present Value of \$111 million with a benefit cost ratio of 2.26.

The Mt Buller Mt Stirling Resort Management Board (RMB) are required to provide services including water supply, fire protection and snow making under the provisions of *the Alpine Resort (Management) Act 1997* (refer Annex N - Mt Buller Mt Stirling Resort Management Board and its obligations under the *Alpine Resort (Management Act) 1997*). Under the *Alpine Resort (Management) Act 1997* (the Act) the RMB are also required to develop and promote, or facilitate the development or promotion by others the use of alpine resorts in accordance with the object of the Act.

In addition to the provision of potable water to support the mountain's population (both visitor and residents), sufficient water is also required to support fire-fighting and emergency response and snow making. Given the recreational and economic benefits provided by Mt Buller to Victoria (particularly economic benefits to the region) it is relevant to consider the relationship between snow depth and visitor numbers, as shown in the graph below (Graph 1). In this regard, the importance of snow making to the visitation of the mountain (as well as a requirement under the *Alpine Resorts Management Act 1997*), should be recognised.



Source: *Winter Visitors at Victorian Alpine Resorts*, Alpine Resorts Co-Ordinating Council, January 2014; Mt Buller & Mt Stirling Alpine Resort Management Board advice, 18 September 2014.

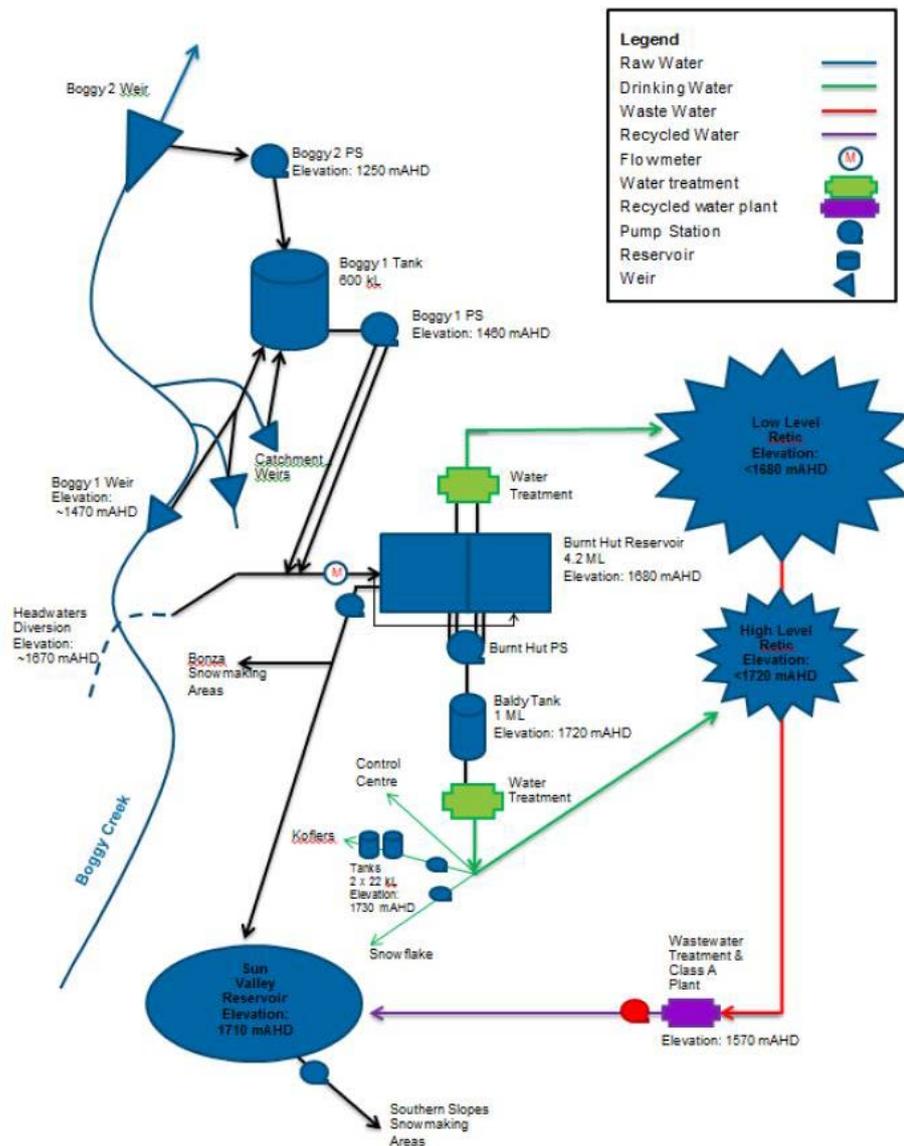
Graph 1: Visitor Numbers and Total Monthly Average Natural Snow Depth

Water security is not a new problem to the Resort, with investigations into potential water supply augmentation options being undertaken since the 1990s. The Mt Buller Master Plan (2010) and the Alpine Resorts Strategic Plan (2012) both acknowledge that water supply is an issue for Mt

Buller. These documents also propose an increase in the total visitor numbers for Mt Buller and Mt Stirling Alpine Resorts, particularly outside the winter period, to support diversification and in recognition of projected shorter snow seasons, increased variability and seasonality. During summer, an increase in visitors, will place more stress on the already untenable water supply arrangement. The revised water supply demand balance figures (refer Annex AAAAA The Mt Buller Sustainable Water Security Project – Off Stream Storage July 2014) assumes an increase in potable demand of 32% in summer and 20% in winter. To put the increased visitation into perspective, visitation figures from the Mt Buller Annual Report 2014-2015 had a total number of 300,437 visitors in the winter season (2014-2015) and 82,723 visitors in summer season (2014/2015).

Existing water supply and treatment infrastructure and extraction arrangements

A schematic of the existing water infrastructure is outlined below.



Mt Buller Water Supply System Schematic
Source: GHD Options Summary 2016

The Resort is licenced to extract water through Take and Use Licences issued by Goulburn-Murray Water, pursuant to the *Water Act 1989*. Water supply is required for potable, snow making and firefighting uses. The licences allow a total water volume of 700ML/year, diverted in the Winter Months at a maximum diversion rate of 8 ML/day. The time restriction relating to the 'winter-fill requirement', is a standard condition in accordance with current government policy, to provide for environmental flows over the 'summer' months.

Due to the winter fill restriction, in order to ensure there is sufficient water outside allowable

extraction times, there must be sufficient water storage to extract and store water for use when extraction is not to occur.

It is noted that the Water Licence for Mt Buller is currently under review with Goulburn Murray Water, due to a change in the standard Winter Fill months (to July-October from May-October) and increase in the daily maximum extraction amounts (from 4ML to 8ML). The revised water licences also formalise the allocation of water and result in Mt Buller being allocated 695ML of water, with the rest (5ML) being provided to Mt Stirling and Mirimbah. Mt Buller are seeking to revert their current water licence conditions relating to Winter Fill times to allow for earlier extraction, having regard to the obligations of Mt Buller Mt Stirling Resort, and as such no change to the assumptions and modelling have been made.

When operational, the Class A Recycled Water Treatment Plant provides recycled water for snow making, which is allowed to be discharged onto the mountain, with the exception of the Boggy Creek catchment area (as Boggy Creek provides the extraction point for the primary source of potable water for Mt Buller and as such cannot accept Class A Recycled Water). Refer Figure 10 for a map of the Snow Making and Boggy Creek Catchment area.

The water provided by the Class A Recycled Water Treatment Plant is a 'supplementary' water source, noting the supply is unreliable, in that it relies on visitation numbers to provide the water. In the past, the Class A Recycled Water Treatment Plant provided an average of 87ML per annum; however the actual water provided each year varied significantly, dependant on visitation levels and the operation of the plant.

Operation of the Class A Recycled Water Treatment Plant was suspended in 2015, due to concerns over maintenance, operational costs and environmental compliance. It is noted that the key investigative reports which form the basis of the Mt Buller Sustainable Water Security – Off-Stream Storage project are based on figures which assume the Class A Recycled Water Treatment Plant is operational. The RMB have advised that they are currently reviewing the Class A Recycled Water Treatment Plant, and given the significant challenges around access to water for Mt Buller and the considerable investment made in that infrastructure, RMB hope that they can recommence the Class A Recycled Water Treatment Plan in future. In this regard it has been determined that it is not required to review and update the technical reports to reflect a non-operational Class A Recycled Water Treatment Plant, as it is preferred to be operational in future. Refer Figure 10 for a map of the Snow Making and Boggy Creek Catchment area.

The current annual average water extraction to meet combined potable and snowmaking water demand is around 450 ML/year. Under the existing licence, the total volume permitted to be used at Mt Buller is each year (695 ML/year). This is adequate to supply the current annual average potable and snowmaking demand, and forecast annual demand by 2035 (686 ML/year) (refer Table 2 overleaf).

Currently the demand for potable water between November and April ('summer' months) is estimated to be 33 ML per annum. The existing potable water storage (5.8 ML in total) provides just over 13% of the capacity currently required (excluding growth) to meet current potable demands for the 'summer' months. In the past, in order to provide potable water in summer, a temporary licence exemption has been granted by Goulburn Murray Water which allows summer extraction from Boggy Creek. This practice is undesirable as it removes water from environmental flows and the continuance of the temporary exemption to the licence condition cannot be relied upon into the future. The exemption has only been provided as a temporary solution to provide water to the Mt Buller community while a permanent water storage solution is being implemented.

The project would require the upgrade of raw water supply infrastructure (a new 0.15 ML storage (break) tank and booster pumps at Burnt Hut storage, a new 200 mm diameter transfer pipeline from the break tank to the water storage). While the maximum diversion rate under the licence is 8 ML/day, actual diversion rates from Boggy Creek will be affected by factors such as streamflow, water licence conditions and the quantity of water in the raw and recycled water storages. Modelling undertaken for the purposes of assessing project water yield and reliability assumed an average diversion of 2.5 ML/day with a maximum of 4 ML/day.

Water balance modelling

Water supply and demand modelling has been undertaken for the Resort (refer Annex AAAAA,

Mt Buller Water Security Project – Off Stream Storage July 2014 and Annex P, Supply Demand Strategy for Mt Buller, Mt Stirling and Mirimbah Water Supply Systems 2013). Factors such as rainfall (wet vs dry periods), evaporation, potable and snowmaking water consumption data, projected increases in summer and winter visitation rates, recycled water reuse, as well as changes in snowmaking technology and snowmaking area have been considered when evaluating the reliability of water supplies. Modelling undertaken for the Water Supply Demand Strategy (Annex P) indicated that a storage volume of between 100 and 150 ML is required under a medium growth scenario, and depending on the need to meet future peak demands in low inflow years. A review of data and modelling undertaken in Annex AAAAA, Mt Buller Water Security Project – Off Stream Storage July 2014 and Peer Reviewed within Annex AAA, Peer Review of Mt Buller Water Supply Option, confirmed the water reliability benefits associated with an additional 100 ML storage.

Snowmaking water demand is influenced by a range of factors such as operational preferences, suitability of weather conditions, application rates per hectare, the area available for snowmaking and the degree of automation. Initial estimates of snowmaking water demand (Annex P – Water Supply Demand Strategy for Mt Buller, Mt Stirling and Mirimbah Water Supply Systems) (up to 8 ML/ha and 700 ML/year) were revised downwards, primarily due to lower application rates per hectare (3.75 to 4.81 ML/ha) and refinements to the application areas (as advised by Buller Ski Lifts Pty Ltd) (refer to Annex AAA Letter of Options Assessment – additional explanation for further detail as to how and why the figures were refined).

Water balance modelling was used to confirm the yield and reliability of the supply system. Due to the lack of long term historical daily stream flow and demand data, a weekly water balance over a 3 year period was established. The water balance model was configured as a conceptual 'bucket type' system which incorporated gross inflows and outflows to the key water storages. Individual sub-catchments, demand zones or linkages between these sub-systems were not examined or modelled (Refer Annex P – Water Supply Demand Strategy for Mt Buller, Mt Stirling and Mirimbah Water Supply Systems).

Current and future water demand for potable and snow making uses

The primary purpose of the water storage at Mt Buller is to provide a sub-daily balance between inflows and outflows (ie outflows for snowmaking can be as high as 20 ML/d-30 ML/d whilst maximum surface (raw) water inflows are assumed to be 4 ML/d), as well as providing potable water for the summer period. The drawdown and filling profile is therefore aimed at having water storages filled by the end of the winter fill period and well as having storages refilled immediately after commencement of the winter fill period, prior to early season snowmaking water requirements.

The table below summarises the current and estimated annual demand:

Table 1 Modelled Water Licence Figures

Total Volume of water licenced for Mt Buller Resort	Assumed Maximum diversion rate per day
695 ML (Winter Fill extraction only)	4ML/day

Source: RMB and GHD

Table 2 Current and Estimated Future Annual Average Demand - Medium Growth Scenario (in ML)

Type and Season	2013	2025 Estimate	2035 Estimate	Available Raw/Potable Storage	Assumed Maximum Extraction Rate
Potable Demand					
May-October	134	161	161	5.8 or 13% of Summer Demand	4ML/day
November – April	33	44	44		
Total Potable	167	205	205		4ML/day (Winter Fill)
Snow Making Demand					
May – October	283	413	481		
Grand Total Demand (Winter & Summer)	450	618	686		

The project would create new water storage which would allow adequate water to be diverted during the 'winter' months to supply the Resort during the 'summer' months in accordance with diversion licence conditions.

Emergency supply

The water storage would also provide a resource of water to support firefighting. Currently there is a minimal supply of water for firefighting within the village, or for a larger bushfire response, stored at the Burnt Hut Reservoir. This supply at Burnt Hut is pumped from Boggy Creek by an electric system drawn from the grid. However, despite diesel backup systems the water reliability of a water supply for a protracted firefighting campaign is at best considered low. Although there is no regulatory requirement for RMB to store a minimum volume of water on site, it has been recommended that Mt Buller store a minimum volume of 10 ML of water at the Resort at all times in order to meet firefighting requirements and enable emergency response to bushfire events (including an opportunity to support helicopter fire fighting for regional fires). This is equivalent to 2 months' worth of current summer demand. This volume could be potable or recycled water (provided it is suitably treated and precautions are taken) (refer section 3.1.4 Annex AAAAA – Mt Buller Water Security Project – Off Stream Storage). Water balance modelling has assumed that a 10 ML reserve volume would be maintained in the raw water storage (as it is preferable to store the emergency water in the raw water storage area to avoid concerns regarding the use of recycled water for snow making, having regard to Australian Guidelines for Water Recycling Managing Health and Environmental Risks (Phase 1) (NRMMC, EPHC and AHMC, 2006)).

In summary, the proposed water storage would respond to Mt Buller's ongoing water access issue and provide a reliable water resource supply throughout the year, in particular for summer potable water, snow making and as a fire-fighting resource

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

As outlined in the aims/objectives of the proposal above, the project has been established to provide a long term and practical solution to the water supply and storage issue for the Resort.

Historically water was supplied to the Resort via an aqueduct and a series of headwater diversions on Boggy Creek which directed water into the Burnt Hut Reservoir. This arrangement is no longer utilised. Water is currently extracted from lower down Boggy Creek via two weirs and a series of pumps (refer Mt Buller Water Supply System Schematic pg 7 of this document).

The project should be understood in the context of RMB's obligations under the *Alpine Resorts (Management) Act 1997* (refer Annex N - Mt Buller Mt Stirling Resort Management Board and its obligations under the *Alpine Resorts (Management) Act 1997*). In short, the *Alpine Resorts (Management) Act 1997* specifies that Victoria's alpine resorts are primarily to be used for alpine recreation and tourism in all seasons of the year. The Mt Buller Mt Stirling Resort Management Board (RMB) are required to promote alpine resorts, attract investment, perform its functions in an environmentally sound way, prepare and implement a Strategic Management Plan (refer Annex O- Mt Buller and Mt Stirling Management Plan 2013-2018) (SMP 2013-2018) and to provide water supply, fire protection and snow making services. Under the provisions of the Act a Minister and public authority must take all reasonable steps to give effect to the Strategic Management Plans.

The Mt Buller Sustainable Water Security Project – Off Stream Storage Project stems from the SMP 2013-2018 (Annex O) which identified the following key commitment:

- *Develop an additional water storage facility for snowmaking and potable water supply as detailed within the Resort's Water Supply Demand Strategy'*

The SMP 2013-2018 was endorsed by the Minister for Environment and Climate Change and gazetted on 13 November 2013.

Given the gazetted SMP 2013-2018 (Annex O) specifies commitment to develop an additional water storage facility in accordance with the Water Supply Demand Strategy 2013 (Annex P) and that the Water Supply Demand Strategy 2013 specifies a water storage facility of 100-150ML would be required to meet Summer and Winter demand in the medium term (and up to 175ML would be required to maximise availability of water).

As such, developing a water storage facility of at least 100ML for Mt Buller should be recognised as an endorsed position of the Victorian Government.

A number of different strategic solutions to respond to the potable water supply constraints were considered as part of the Mt Buller Water Supply Demand Strategy 2013 (Annex P) undertaken by GHD or have been previously considered by the RMB, or were discussed and reviewed by GHD and the RMB at the commencement of the project. These considerations included both on and off mountain responses. The following criteria were used:

- Compliance with winter fill extraction
- Project construction footprint (including environmental impact)
- Requirement to meet peak potable water demand
- Requirement to meet peak snowmaking water demand
- Assist with bushfire management
- Capital cost
- Operating cost
- Energy use and greenhouse gas emissions
- Technical feasibility.

Refer to Annex A for the Options Assessment Summary by GHD 2016, Annex AA for the Options Assessment Report 2014 and Annex AAA for the Peer Review of Mt Buller Water Supply Options Assessment 2017 for additional detail. The Options Assessment by GHD (Annex A and AA) includes summary of work undertaken prior to the endorsed Mt Buller Mt Stirling Strategic Management Plan 2013-2018 (Annex P) (broad consideration of options) and more specific work post the SMP 2013-2018 (review and confirmation of supply options, followed by a consideration of locations for an on-mountain water storage facility).

Ultimately, while the Water Supply Demand Strategy suggested additional storage of up to 150ML was appropriate for the medium term and that additional storage of up to 175ML would maximise the availability of potable and snow making water, it was determined that a new 100 ML on-mountain storage response was the most appropriate option. A target storage capacity of 100 ML was chosen by the RMB as this capacity was considered to be of sufficient size to cater for potable water demand and a large proportion of snowmaking demand, feasible in terms of being appropriately located within the landscape, and economically viable to construct.

The storage would allow the RMB to divert water during 'winter' months only, in accordance with the condition of their extraction licence and in addition to a potable water supply, could also provide an adequate, gravity fed supply which could be used for firefighting and provide a raw water supply for potable water supply and snowmaking on catchment areas and/or when additional snowmaking is desirable within the Resort.

On site storage is considered to be the best way to manage the inherent variability in climate and streamflow associated with the Mt Buller region, without the environmental impacts that an on-stream storage option would provide.

Once an on-mountain water storage option was determined to be the best solution, GHD and the RMB commenced consideration of the location of the water storage facility. A Multi Criteria Assessment (MCA) approach was developed jointly by GHD and the RMB and was used to inform the selection of a suitable site for the off-stream storage. The MCA objectives cover a broad range of Aspects. These can be categorised as follows:

- Land Use Planning
- Environment and Heritage
- Social
- Economic
- Ski Resort utility
- Technical & Engineering
- Construction
- Operational
- Bushfire Management.

Refer to Annex AA for the Options Assessment Report by GHD for additional detail.

The Control Centre site was determined as the preferred site for the 100ML off stream storage as:

- The area of direct impact to native vegetation was previously estimated to be similar between sites. A rationalisation of the construction footprint has resulted in a reduction in the area of vegetation likely to be directly impacted by the project (5.278 ha of native vegetation consisting of 5.194 ha of Alpine Grassy Heathland (EVC 1011) and 0.085 ha of Sub-alpine Woodland (EVC 43). There is potential for the construction of the Control Centre storage to result in indirect (hydrology related) impacts to the downslope alpine bog vegetation. A range of mitigation measures including an environmental watering system to be operated in conjunction with a Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP) has been designed to address the indirect impacts. The monitoring and management plan would integrate groundwater and ecological information, and facilitate adaptive management of site and the mitigation of impacts.
- There is significant geotechnical complexity associated with both sites, however the geotechnical risks, and the risks associated with failure to achieve a 100 ML storage during the construction phase are considered to be lower at the Control Centre site
- The potential impacts on skiable terrain, connectivity and Resort functionality are significantly lower at the Control Centre site. Construction at the Control Centre/control site would require decommissioning of the Bogy Creek T bar (something which has been proposed in the Resort Master Plan), and
- The construction costs associated with the Control Centre site are expected to be lower than Tirol due to the smaller quantities of rock to be handled and processed.

The review and assessment processes undertaken as part of the options assessment have identified a range of risks which would need to be addressed in the project planning, design, construction and operational phases of the project.

Refer to Annex AA for the Options Assessment Report by GHD for additional detail on the strategic water supply and storage dam siting options which have been considered.

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

Broadly speaking, the project entails the construction of a water storage facility, with associated infrastructure, to be located within the ski field area of Mt Buller, near the Control Centre building. The project construction footprint (PCF) is 10.347ha.

Concept design details of the project are below, with the numbers within the table referring to those numbers within Figure 2. Additional details on construction tasks and scheduling are provided in Annex B – Design Summary, prepared by GHD.

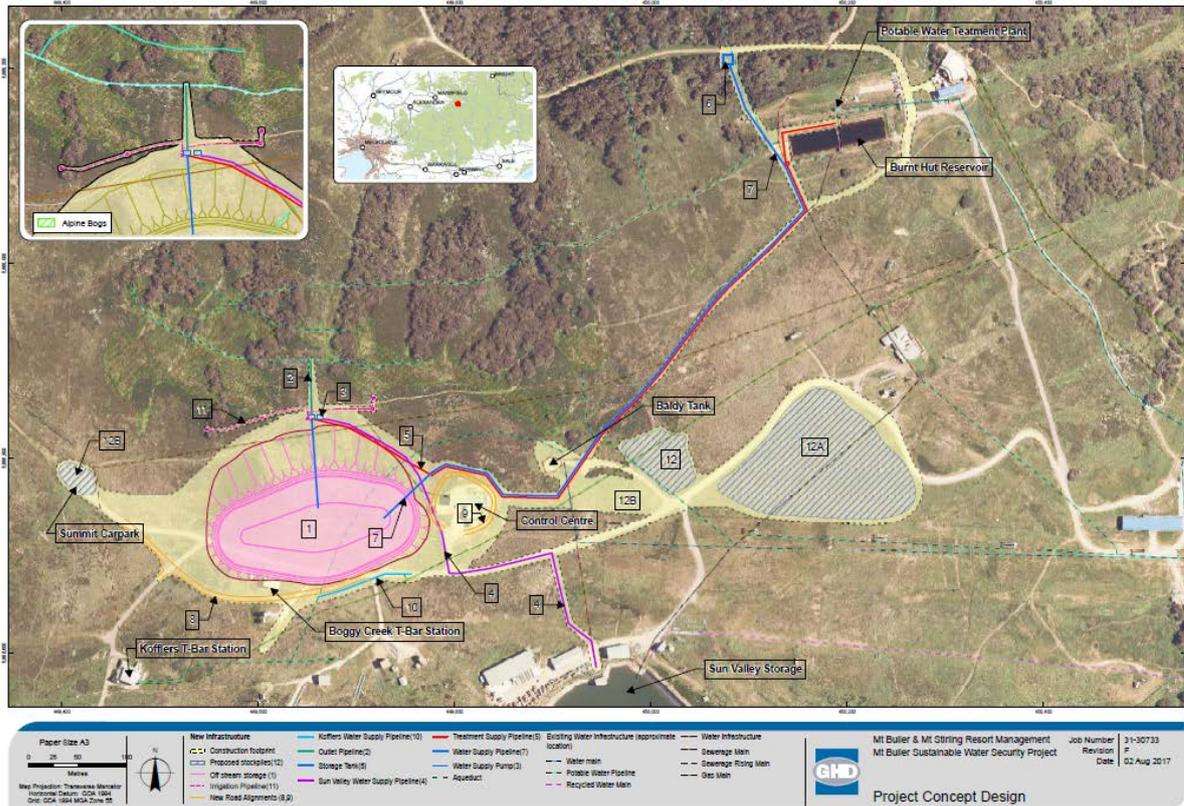


Figure 2 Project Concept Design
Source: GHD Annex B

Infrastructure	Site location, requirement and description	Concept design engineering and construction details
Water Storage (1)	The proposed off stream storage is located north of the final stretch of the unsealed Summit Road over the existing Boggy Creek Ski Lift alignment and extends north down the hillside to the Summit Nature Walk Track. The site is located on a gently to moderately sloping plateau directly east of the Mt Buller summit. The site area slopes downhill to the north with the slopes steepening as they approach the valley below.	<p>Summary of storage infrastructure components:</p> <ul style="list-style-type: none"> • A cut to fill oval shaped storage with a maximum embankment height of about 21 m on the northern side and an average depth (top of embankment to finished floor level) of 11 m. Area approximately 4.60 hectares. • Total volume of excavation including topsoil is estimated to be 78,350 m³. Total volume of fill is estimated to be 56,800 m³. • Topsoil and waste material (approximately 21,550 m³) is proposed to be used for rehabilitation and landscaping around the storage dam. • Underdrainage works (below the dam liner) involving construction of drainage trenches, placement of geotextile and drainage pipework, placement of drainage media and conditioned fill • HDPE lined • Inlet and outlet structures • Drainage and collection system – includes discharges to aqueduct (see storage drainage)
Storage drainage (2)	A discharge drainage pipeline extends down the hillside north of the Summit Nature Walk Track and connects to the existing aqueduct.	Pipeline approximately 55 m in length. Trench dimensions approximately 500 mm wide and 1 m deep.
Storage transfer pump station (3)	The proposed pump station is situated on the northward facing slope immediately to the north of storage next to the existing summit walking track.	<p>Pump station (above ground building, approximately 5 m x 6 m) includes two pumps (4 ML/day capacity):</p> <ul style="list-style-type: none"> • Transfer to treatment plant and reticulation system (RMB supply) • Transfer to Sun Valley Reservoir (Buller Ski Lifts snow making supply infrastructure requirements)
Sun Valley Pipeline (4)	From the proposed storage transfer pump station a new pipeline installed within a new trench will deliver water from the new storage to the existing Sun Valley Reservoir.	250 mm diameter trunk main approximately 460 m long. 7 ML/d capacity. Trench approximately 500 mm wide and 1 m deep.

Raw water supply pipeline to treatment plant and low level reticulation network (5)	<p>From the proposed storage transfer pump station a new pipeline installed within a new trench will deliver raw water from the new storage to the existing treatment infrastructure and low level reticulation network located at Burnt Hut.</p> <p>The pipeline is located around the steep slope on which the Control Building is constructed and then traverses across and down the slope towards the existing treatment plant. The proposed pipeline alignment coincides with an existing vehicular access track and location of existing water supply services to the existing Baldy Tank. Where feasible the pipeline would be co-located with the raw water supply pipeline (7) to minimise excavation activities. A small underground break tank prior to connection to the reticulation will be required so that the low level system is not over pressured.</p>	<p>200 mm diameter trunk main approximately 819 m long. Trench approximately 500 mm wide and 1 m deep.</p> <p>Connection into the low level treatment plant (hypochlorite and UV treatment systems located at Burnt Hut)</p> <p>Estimated 10 kL underground break tank prior to connection to the treatment plant and reticulation system.</p>	
Raw water supply break tank and booster pump station (6)	A new break tank and booster pump station is located below Burnt Hut Reservoir, uphill of the Grimus access track. The above ground break tank and pump station will connect to the existing raw water supply infrastructure from Boggy Creek to Burnt Hut.	<p>New break tank – 150 kL Booster pumps – 4ML/d</p> <p>Above ground pump station and tank structure – approx. 10 m x 10 m</p>	
Raw water supply pipeline from booster pump station to new water storage (7)	A new raw water pipeline installed within a new trench will run along a similar alignment as the raw water supply pipeline to the treatment and reticulation network (5). Where feasible the pipeline would be co-located with the above pipeline to minimise excavation activities.	New 200 mm diameter transfer pipe from the Break Tank to the new storage - 4 ML/d capacity and approximately 766 m in length. Trench approximately 500 mm wide and 1 m deep.	
Summit carpark access road re-alignment (8)	Approximately 1 km of the existing access road to the Summit carpark will be impacted by the project. Approximately 200 m of the existing access road intersects the proposed storage location and a new access track will be constructed.	<p>Estimated 5 m wide gravel access track with associated widening for connections to existing access tracks.</p> <p>The realigned gravel access roads would be used for all construction and operational access.</p>	

	The new road will divert from the intersection with the access track to Federation and Southside Chairlift and extend in a westerly direction north of the Howqua chairlift before connecting into the existing summit access road near Pendergast Hut.	<ul style="list-style-type: none">
Control Centre access road (9)	An access road will be construction around the control centre building to facilitate construction of the pipelines and future access for on-going maintenance.	<ul style="list-style-type: none"> Estimated 5 m wide gravel access track connecting into existing access tracks.
Connection and re-connection of existing services (10)	The concept design plan indicates various existing services located within the proposed construction footprint. Not all of these services will be impacted by the project. However, the confidence level associated with the spatial accuracy of the existing services information is considered low and during functional and detailed design further assessment will be required to determine the required services connections within the proposed footprint.	<p>Current services reconnection includes:</p> <ul style="list-style-type: none"> Potable water supply to the Kofflers T-bar station. Trench approximately 300 mm wide and 1 m deep. Re-alignment of existing wastewater/sewage main near Summit Nature Walk Track below the storage. Trench approximately 500 mm wide and 1 m deep. <p>Underground power supplied from existing network to service new pump stations, monitoring and control infrastructure</p>
Environmental watering system (11)	The design of an environmental watering system downslope of the storage would allow water from the storage and/or internal storage drainage water to be distributed across the contour above the Alpine bog community in response to a need to artificially water these communities as and when required in accordance with a project specific Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP).	<p>The system is designed to gravity feed water via a series of regulating pits (1 m x 1 m) connected via a network of underground and above ground distribution pipes. Valves will control the volume of water being delivered by each discharge pit. If necessary (e.g. if overflow from the water storage is excessive), the valves will allow for excess water to be discharged to the downslope aqueduct.</p> <p>The system is expected to be operated using a combination of manual and automated controls.</p>

<p>Stockpile areas (12)</p>	<p>The concept design assumed a number of handling activities to ensure the final embankment material would meet the engineering design requirements and be a well-mixed uniform material. To minimise the variability in the embankment fill material it is proposed to stockpile all excavated materials before placement into the embankment is commenced. This will be re-assessed during detailed design as the properties of the individual materials are further assessed.</p> <p>Depending on the final operation of the stockpiles, it is likely that three stockpiles will be developed:</p> <ul style="list-style-type: none"> • A main stockpile area for general embankment fill will be located on a gently sloping area north of the Holden Express ski traverse, south of Tirol (12A). • Two smaller stockpiles for the top soil and the excess / waste excavated materials will be located in the area surrounding Baldy Tank (12/12B). 	<p>Based on the areas identified as suitable for the stockpiling it is expected that the main stockpile will reach a maximum height if about 5 m, allowing for 3 to 1 batters, assuming only the main construction material is stockpiled in this area and the topsoil and waste is stockpiled in the smaller stockpile areas.</p> <p>Topsoil and waste material (approximately 21,550 m³) is proposed to be used for rehabilitation and landscaping around the storage dam.</p>
<p>Construction phase support infrastructure and footprint</p>	<p>To facilitate the construction of the various infrastructure a number of construction phase impacts have been assessed and allowed for in determining the PCF. These include:</p> <ul style="list-style-type: none"> • Access between sites and construction equipment movements • Temporary building sites • Material stockpiles 	<p>Aspects such as site access, amenities, location and management of equipment storage and stockpile areas would be determined during detailed design in conjunction with a construction contractor. and formalised in a construction phase environmental management plan.</p>
<p>Landscape Master Plan</p>	<p>A landscape master plan has been prepared to identify potential landscaping and supporting infrastructure which will blend of the storage into the surrounding landscape. The landscape plan also introduces opportunities for indigenous planting in the area and the establishment of habitat for indigenous fauna.</p>	<p>Refer to Annex H for the Ecological Rehabilitation Plan which has the updated Landscape Master Plan.</p>

Refer to Annex B – Design Summary and Annex H - Ecological Rehabilitation Plan for additional details of the project.

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

Ancillary components of the project (also considered in this referral and included within the PCF) include:

- Stockpile areas (used during construction and rehabilitated after construction)
- Summit carpark access road re-alignment
- Control Centre access road upgrade
- Connection and re-connection to existing services.

Key construction activities:

Preliminary works undertaken by GHD have recommended that the project will be constructed in the following stages:

- Preliminary works
- Site establishment
- Stockpile area and preparation works
- Relocate haul/access road around pond
- Storage Pond preparation works
- Storage Pond excavation works
- Storage Pond underdrainage works
- Storage Pond embankment works
- Site rehabilitation
- Demobilisation.

A key consideration of the construction activities related to the development is a construction schedule for the project, to ensure construction during the snow season is avoided (noting such construction is not permissible under the Alpine Resorts Planning Scheme). A proposed construction schedule has been developed as part of a preliminary Site Environmental Management Plan (SEMP)(Annex C - SEMP).

Construction equipment is expected to include bulldozers, heavy and light excavators (including low impact spider excavator), a grader, articulated dump trucks, compactors, a front-end loader, telehandler, water cart, service and employee vehicles. Refer Annex C-SEMP and Annex B-Design Summary for additional construction information.

A range of siting, design and construction measures are proposed in order to mitigate identified geotechnical risks (landslides, slope instability and soil erosion) associated with excavation works such as pipeline trenches, cut excavation and stockpile creation. These measures include:

- Additional site specific investigations (test pitting) to identify any hazardous site conditions
- Restrictions on the depth and extent of trenching, and the length of time that any one trench is kept open.
- Use of “trench blockers” (water stop barriers) to avoid / minimise preferential water flows within trenches. Battering of trench walls if springs are encountered
- Drainage of surface waters to avoid ponding, concentration or erosion
- Operational controls associated with the conduct of construction and inspection activities prior to, during and following wet weather
- Geotechnical advice, monitoring and inspection in relation to permanent and temporary excavation and stockpile batter angles, and the break (water storage) tank near Burnt Hut.

The construction and operation of the environmental watering system for the Alpine Bog areas has also been considered in the review of geotechnical risks. A range of specific risk mitigation measures (in addition to the measures outlined above) include:

- Location of watering infrastructure 20 m or more below (downslope) of the toe of the water storage
- Placement of water distribution pipelines above ground
- Monitoring and control of water discharge rates, groundwater levels
- Frequent inspection and repair of any leaks

Additional information on geotechnical risk assessment and mitigation is provided in Section 14.

Key operational activities:**Water Supply System**

(numbers provided below correspond to items in Figure 2)

The water supply system would operate as follows:

- Raw (untreated) water would continue to be extracted from the Boggy Creek using existing weirs, pipework and Boggy Creek pump stations 1 and 2. The maximum licensed extraction rate would continue to be 4 ML/day
- Water would be pumped uphill to a new raw water supply break tank and booster pump station (6) located adjacent the Grimus access track
- The pump station and a new pipeline (7) would convey water uphill from the break tank to the water storage
- A discharge pipeline from the storage would supply water via gravity to one of two pumps in a new pump station located at the northern toe of the storage embankment (3)
- When required for snowmaking, raw water would be pumped to the Sun Valley storage via a new pipeline (4)
- When required for potable water, water would be pumped via a new supply pipeline (5) to the existing Burnt Hut reservoir.
- Raw water transferred to the Burnt Hut reservoir would be treated to potable (drinking water) standard and then distributed throughout the Mt Buller Resort using existing reticulation systems.

It is anticipated that the supply system would be automatically controlled and operated via a SCADA system utilising information from a series of sensors (level and flow indicators on weirs, tanks, storage, pump stations).

The supply system is expected to operate on a daily basis (during allowable extraction timeframes) to provide water for potable and snow making uses. Operating hours would be determined by factors such as water availability in the catchment, potable and snow making water demand, tank and storage levels and other maintenance and operational considerations. During the summer period (excluding Winter Fill times) only the raw water supply pump transferring water from the storage dam to the Burnt Hut reservoir would operate.

Water Storage

The water storage facility will operate continuously, and be subject to regular and ongoing monitoring and maintenance. The storage levels would be maintained in order to ensure that an adequate supply of water is available to meet summer time potable water demands, as water can only be extracted during the winter months.

The RMB will establish an operating plan which documents operational arrangements and provides a framework for operational decisions throughout the year. This would include aspects such as:

- Forecasting water availability and communicating outcomes to water users and other stakeholders
- A water accounting process which provides operators with information about inflows, demands and water availability
- Operational triggers to provide clarity to water users about resource allocation and other water sharing arrangements

The operating plan, triggers and decision-making would be informed by the SCADA system monitoring tools.

HEMAMP (Annex G)

A Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP) has been developed to mitigate any indirect impacts on downslope Alpine Bogs, which are an ecological community listed as threatened under Commonwealth and Victorian legislation. The project has been designed so as to avoid any direct impact on the Alpine Bogs.

The HEMAMP specifies the monitoring protocols and operational requirements of the water storage facility in relation to the watering system (not in relation to the broader operations of the project). The HEMAMP includes the following essential components:

- Control of environmental weeds (which the RMB already conducts within the resorts)
- Environmental watering of Alpine Bogs, which will be achieved through a simple watering system. If water is required to maintain the Alpine Bog in accordance with the HEMAMP, it will be provided in priority to all other water demands within the resort.

Ecological Rehabilitation Plan (Annex H)

The Ecological Rehabilitation Plan provides details on the maintenance program for the revegetated land. These include:

Short Term

- Watering
- Monitoring of grazing
- Sediment controls.

Long Term

- Weed control
- Fence and tree guard maintenance and removal
- Replacement planting
- Fertiliser augmentation
- Re-mulching.

Refer to HEMAMP within Annex G.

Refer to Ecological Rehabilitation Plan within Annex H

Key decommissioning activities (if applicable):

The following would need to be decommissioned to allow for the water storage facility:

- Boggy Creek T-Bar and lift towers.
- An underground fuel tank.
- Decommissioning and re-alignment of water supply and communications services

It is anticipated that structures located within the PCF would be decommissioned as part of project preliminary works. Decommissioning of the Boggy Creek T-Bar and lift towers would include aspects such as recovery of cable and parts, and the progressive removal or severance of towers from their base. Recovered metal would be transported off site for reuse and/or recycling.

An existing underground fuel storage tank is used to power the equipment associated with the Boggy Creek T-Bar. It would be decommissioned in accordance with EPA Victoria (2015) Document 888.4, the Australian Standard *AS4976-2008 Removal and disposal of underground petroleum storage tanks*, as well as relevant safety and dangerous goods legislation. This tank would be decommissioned in accordance with standard practice which includes tank decanting and removal, accompanied by soil sampling and an assessment of potential contamination. The tank site and adjoining Boggy Creek T-Bar building will ultimately be excavated as part of the storage dam footprint. Any contaminated soil would be removed from site and disposed of at an appropriately licensed treatment facility.

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

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

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

- No Yes If yes, please identify related proposals.

In July 2014, a Planning Application was lodged (Planning Application 2014/002775) seeking planning permission for water storage and associated infrastructure, including native vegetation removal at Mt Buller Alpine Resort. Following formal referral (pursuant to s. 55 of the *Planning and Environment Act 1987*) from the former Department of Environment and Primary Industries (DEPI) this application was placed on hold, to allow considerations of matters raised within the referral.

Work was then undertaken as how to best respond to the concerns identified. Based on a completed Native Vegetation Offset Strategy and fully developed Hydrological and Ecological Management Adaptive Management Program (Annex G - HEMAMP), the Project Construction Footprint (PCF) has been minimised, with the key driver for minimisation being how the project's impact on native flora and fauna could be reduced, whilst still meeting expectations in terms of design outcomes, geological considerations and feasibility requirements. It should be noted that the Project Construction Footprint has been with proposed native vegetation removal reduced by more than 10% when compared to the original design submitted under Planning Application 2014/002775. Planning Application 2014/002775 was formally withdrawn in August 2016, and has been superseded with the current project which is subject to this EES Referral and is currently being considered under Planning Application No. PA1600138.

In August 2014, the project was referred to the Australian Government Minister for the Environment due to the potential for the project to have significant impacts on Matters of National Environmental Significance (MNES) listed under the EPBC Act (EPBC Referral 2014/7303). In September 2014, the Australian Government Department of the Environment (now the Department of the Environment and Energy) decided under Section 75 of the EPBC Act that the project would be a controlled action due to its potential impact on the following MNES listed under Sections 18 and 18A of the EPBC Act:

- Alpine Sphagnum Bogs and Associated Fens (Alpine Bogs) ecological community (endangered)
- Mountain Pygmy-possum *Burramys parvus* (endangered)
- Smoky Mouse *Pseudomys fumeus* (vulnerable)
- Blue-tongued Orchid *Pterostylis oreophila* (critically endangered)
- Alpine Tree Frog *Litoria verreauxii alpina* (endangered).

As such, the project requires approval under the EPBC Act and must be assessed by way of preliminary documentation. The preliminary documentation has been prepared and submitted to the Department of the Environment and Energy for consideration. It relates to the revised project footprint (not the larger footprint which was the subject of the 2014 planning application). A request for further information has now been received for the application, and is currently being considered and responded to. The EPBC Act approval for the project is further considered in section 10.

4. Project alternatives

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

Nine different strategic solutions to respond to the potable and snow making water supply constraints were considered as part of the Water Supply Demand Strategy 2013 (Annex P), or were considered by GHD and the RMB. It is noted that developing an additional Water Storage Facility for snow making and potable water supply as detailed within the Resort's Water Supply Demand Strategy is a key commitment of the SMP 2013-2018 (Annex O) which was gazetted on 13 November 2013.

The project alternatives and their considerations are included below. Refer to Annex A for the Options Assessment Summary, Annex AA for the Options Assessment Report and Annex AAAA for the Letter of Options Assessment – additional explanation, all by GHD for background information.

The following criteria were used to assess the suitability of project alternatives:

- Compliance with winter fill extraction
- Project construction footprint (including environmental impact)
- Requirement to meet peak potable water demand
- Requirement to meet peak snowmaking water demand
- Assist with bushfire management
- Capital cost
- Operating cost
- Energy use and greenhouse gas emissions
- Technical feasibility.

The Water Supply Demand Strategy (Annex P) indicated that, based on the current water supply and use arrangements, a storage of between 100 and 150 ML capacity was required, depending upon the need to meet future peak demands in low inflow years, based on a medium term scenario. The RMB chose a target storage capacity of 100 ML as this capacity was considered to be of sufficient size to cater for potable water demand and a large proportion of snowmaking demand, feasible in terms of being located within the landscape, and economically viable.

Strategic Option 1: (The Project which is the subject of this referral): New on mountain off-stream storage

Option 1 involves construction of a new 100 ML capacity on mountain, off-stream water storage facility within the Resort (the proposed Project). This option would be consistent with the previous investigations undertaken at the Resort (which indicated that a storage of 100 ML was required), and would require the identification of an appropriate storage site.

This option would enable the RMB to divert water from Boggy Creek during winter in compliance with current licencing requirements, and to store sufficient water for the summer period. It would also enable the RMB to meet the peak water demands over winter months, and facilitate additional snowmaking. The option is considered to provide the greatest level of year round water security for the Resort and is considered feasible.

The option would require significant capital investment in new and ancillary infrastructure. It would be necessary to relocate a range of existing services on the mountain. A significant construction footprint would be necessary, and this would require the consideration and implementation of a range of impact mitigation measures.

If appropriately sited, the storage could provide a gravity fed supply of water for firefighting purposes, which is independent of electricity supply. This option could resolve supply constraints and is technically feasible. An assessment of potential sites for a new on-mountain off-stream storage was undertaken and is considered in more detail at the end of this section.

Strategic Option 2: Expand Sun Valley on mountain storage

This option would provide additional on mountain storage capacity by augmenting the current Sun Valley storage (70 ML capacity). The Sun Valley storage has a number of significant geotechnical constraints. Its lining has been recently remediated to address some of these issues. Expansion of the storage would require a significant capital investment in ancillary infrastructure and the storage itself. Because of its design and location, it would not be feasible to achieve an additional 100 ML of capacity.

The storage contains Class A recycled water and is an important part of the Resort's strategy to recycle water and minimise extraction from waterways, however the water provided from the Recycled Water Plant should be recognised as a supplementary, rather than a primary and reliable water supply. Recycled water would not be suitable for potable purposes and would not be suitable for snowmaking use in the Boggy Creek and Delatite River catchments.

Because of the natural slope and the required embankment slopes at the Control Centre site, a 20 -30 ML reduction in storage capacity would not significantly alter the storage or overall project construction footprint. Consequently, an extension of the Sun Valley storage in the order of 20 to 30 ML would not significantly influence the currently anticipated project impacts.

The option would not resolve supply constraints because:

- It could not store an additional 100 ML
- It does not assist with meeting peak potable water demands

It is unlikely to meet all snowmaking demands because of geographic constraints on the use of recycled water in the Boggy Creek catchment and the unreliability and limitation of water which can be provided by this source.

In addition to the geographical and geotechnical issues associated with Sun Valley, further analysis undertaken within the Flora and Fauna Report (Annex E – Flora and Fauna Report) shows Sun Valley is located within very close proximity to preferred habitat of the Mountain Pygmy-possum, with the Mountain Pygmy-possum Management Area running along the southern end of the existing dam (refer Figure 6). This is a significant barrier to any future extension of Sun Valley.

Finally, it is noted that it is not considered feasible to retain Sun Valley as a recycled water storage facility in winter and use Sun Valley for potable water storage during the summer months as has previously been suggested due to constraints over timing of extraction, questions surrounding the need to drain and clean the dam, health concerns related to the use of a water storage for both recycled water and potable water and noting if that option was feasible additional storage would still be required to meet the overall 2030 demand scenario and assumption.

Strategic Option 3: Demand management/water efficiency measures

This option would require a range of measures to manage and reduce consumption at the Resort. Measures would be expected to include:

- Improvements in the metering of flows throughout the Resort and the reconciliation of supply and demand in order to identify usage and potential losses within the water supply system
- Investigation followed by maintenance and repairs to any infrastructure identified as contributing to system losses (for example leaking supply pipework)
- Installation and retrofitting of water saving devices and more efficient technologies
- Restrictions on the use of potable water, and
- Public and Resort staff education programs.

This option may result in improvements in water use efficiency and contribute to a reduction in demand, however it is expected to be relatively expensive and time consuming to implement for the volume of water likely to be saved. The water savings which might be achieved are unlikely to be large enough to avoid having to implement other measures. Assuming peak potable demand in winter is ~1 ML/day, savings associated with this measure would not assist in meeting peak potable or snow making water demands.

It is considered very unlikely that the cumulative impact of this initiative would, on its own, provide an adequate solution. Unintended consequences of this approach would also need to be considered, as a reduction in potable water use may affect the operability of the recycled water plant and the volume of recycled water available for snowmaking.

The option would not resolve supply constraints primarily because it would not allow peak potable and snowmaking water demands to be met, but also because it would not assist in improving water supplies for bushfire management.

Strategic Option 4: Increase Boggy Creek surface water extractions

Option 4 assumes an increase in extractions from Boggy Creek by altering the licence extraction arrangements to allow summertime extraction, and extractions above 4 ML/day during periods of high demand in winter.

No additional storage would be required, but the current extraction infrastructure (currently only capable of extracting at the average rate of 2.5 ML/day) would require upgrading (new power supply, offtake and pumping equipment). If the licence were amended to allow routine diversion of water during the summer months, this could potentially improve the long term water reliability to summer residents, businesses and visitors especially in years where winter flows (and existing storages) are low. This option would only be a partial solution for supply during 'summer' months and would rely on adequate and consistent rainfalls. During extended dry periods in summer it is unlikely that Boggy Creek could provide sufficient supply (regardless of licence limits or pumping capacity). Existing on-mountain storage is only sufficient for around 1 month of summertime potable water demand.

Catchment yields in winter would also not be able to meet peak demands (at times greater than 20 ML/day) and supply infrastructure would also be unable to meet this demand without significant investment.

There may be significant ecological and hydrological impacts on the Boggy Creek in the vicinity of the extraction point and downstream, particularly during 'summer' months. Increased extractions during very high flow periods could be technically feasible and environmentally acceptable assuming the water was able to be stored. The option is contradictory to current government policy (winter fill requirement) and so regulatory approval is considered unlikely.

Whilst this option may not require significant changes in the infrastructure footprint (only an upgrade of existing infrastructure), it would not assist in improving water supplies for bushfire management.

This option would not resolve supply constraints, primarily because it faces significant supply risks in summer and it does not meet winter peak snowmaking demand. Regulatory approval of extractions during 'summer' months is also considered unlikely especially as the offtake is in the head of the catchment.

Strategic Option 5: Additional extraction from the Howqua/Delatite River without a storage

This option proposes additional surface water extraction and pumping from the Howqua or Delatite River catchments to increase the volume of water supplied to the Resort. These rivers would generally have sufficient flow to address the catchment yield issues associated with Boggy Creek. The option assumes that it is possible to obtain an appropriate water licence and allocation to facilitate this option. This option also assumes that no large storage is constructed. In order to meet peak water demands it would be necessary to pump large quantities of water (up to 10 ML/day) a considerable distance and also a considerable elevation (up the mountain).

This option would require significant capital investment and impose substantial ongoing operating costs on the Resort. The footprint of the required infrastructure (break tanks, pipelines, pumps, power supply) would be relatively large when compared with the alternatives. The Howqua River catchment is largely outside of the Resort in the Alpine National Park. The option would incur a number of technical challenges (for example geotechnical conditions), and the energy use associated with pumping would result in relatively high levels of greenhouse gas emissions.

This option may assist in improving water supplies for bushfire management, however it is contingent upon a reliable and uninterrupted supply of electricity (which cannot be guaranteed in a bushfire event).

The option could resolve supply constraints but is not preferred because of the very high capital and operating costs associated with meeting peak snowmaking demand..

Strategic Option 6: Alternative source – groundwater

Option 6 would see the continued use of the existing extraction licence and water storage facilities. It would then look to supplement the existing water supply with water from groundwater sources. This option assumes that a suitable groundwater resource would be available for exploitation, and that a large and extensive network of bores, pumps and pipelines could be constructed in order to transfer groundwater to the Resort.

Preliminary work (refer Annex Q – Hydrogeological and Hydrological Assessment) suggests that the groundwater resource is likely to be connected to surface water systems and that the conjunctive management of these two water resources would be required, potentially resulting in restrictions on groundwater extraction/supply during the summer period. In addition, the fractured aquifer system may not yield the volumes required during the summer season and peak winter demand. Because of this it is unlikely that the option is viable from a regulatory or technical perspective for the entire water supply demand. It may be feasible as an augmentation to the existing supply.

In order to meet peak flow demands associated with snowmaking, the option would require an extensive network of bores and ancillary infrastructure (pipes, pumps, valves, large storage tanks or a small reservoir, power supply). These flow demands would incur very high capital and

operating costs. Footprint impacts and greenhouse gas emissions would also be significant when compared to other options.

This option may assist in improving water supplies for bushfire management, however it is contingent upon a reliable and uninterrupted supply of electricity (which cannot be guaranteed in a bushfire event).

The option would not address the supply constraints associated with peak snowmaking demands. It has a high degree of technical and regulatory uncertainty due to the volumes of water that would need to be extracted, and it would incur significant capital and operating costs.

Strategic Option 7: Alternative source – stormwater/rainwater harvesting

This option would involve harvesting rainwater and/or stormwater within and/or below the Resort. Although this approach would allow the maximum use of natural resources, the volumes able to be harvested would not meet the current or projected snowmaking water demands. Rainwater harvesting would require buildings to be retrofitted with gutters, as well as collection and storage systems. There are practical issues associated with snow collecting on rooves and gutters and with the installation and operation of the collection system in an environment which freezes.

Stormwater could contribute to the snowmaking supply, but would be unsuitable for potable use without regulatory issues being addressed and significant investment in treatment and storage. Electricity costs may be moderate but would depend upon pumping and treatment requirements. Treatment costs (both capital and operating) would be significant. The option relies on appropriate climatic conditions (adequate rainfall). Low rainfall periods would impact the viability of this option.

The small and dispersed harvesting and storage locations, as well as the uncertainty of supply during the bushfire season means that this option would be unlikely to assist in improving water supplies for firefighting.

This option would not resolve supply constraints due to the technical issues and costs associated with reliably meeting potable water quality requirements, and the inability to meet snowmaking volume demand.

Strategic Option 8: 'Off mountain' storage

A 100 ML 'off mountain' storage would potentially have the following advantages over an 'on-mountain' storage:

- Provide access to a larger and more reliable water supply catchment
- Allow dam construction on a site with 'simpler' geological and geotechnical characteristics
- Avoid development in sensitive alpine ecosystems containing rare or threatened flora and fauna species, and/or species with a naturally limited range
- Avoid or reduce visual impacts, and
- Avoid impacts upon ski resort utility.

The disadvantages of an 'off mountain' storage as compared to an 'on mountain' storage would be:

- Environmental impacts (larger project footprint for infrastructure (potentially large area for native vegetation removal), higher energy demand and associated greenhouse gas emissions) and capital costs of ancillary infrastructure required to transfer the water up the mountain (pumps, power supply, water pipeline, intermediate storages)
- Significant operating costs (and greenhouse gas emissions) associated with power supply and the operation of pumping equipment (particularly during periods of peak demand).
- This option would require the purchase or lease of land on which to construct the reservoir as no suitable sites exist within the Resort. Land in the Merrijig area where a storage would need to be constructed is in short supply and relatively expensive.

An appropriately sized storage could potentially meet peak snowmaking and potable water demand but it would be necessary to pump significant quantities of water (up to 10 ML/day) over a substantial elevation, in order to deliver it to the Resort.

This option may assist in improving water supplies for bushfire management, however it is

contingent upon a reliable and uninterrupted supply of electricity (which cannot be guaranteed in a bushfire event).

This option could resolve supply constraints and is technically feasible, however it was considered inferior to Option 1 (the Project) due to the significant additional capital and operating costs associated with transferring stored water to the Resort.

Strategic Option 9: Do nothing

The 'do nothing' option assumes no new infrastructure or modifications to existing infrastructure, no demand reduction strategies, or changes to the current diversion licences.

This option would mean that:

- Water would need to be diverted during summer under an exemption or modification to the extraction licence, which limits environmental flows to Boggy Creek. This is not considered a desirable or reliable long term solution. This in turn limits the growth of summer tourism, the capacity to respond to bushfires, and overall reliability of the Resort water supply.
- Water use for snow making during peak periods would continue to be limited because of the maximum diversion rate and limited storage capacity. Increased snowmaking in current areas or expansion into new areas would not be possible. This would be expected to limit visitation and the development potential of winter tourism.

This option would not resolve the current water supply constraints. The constraints would persist and worsen as demand for water grows. The current water supply constraints for firefighting purposes would also remain in place. Reference should be made to the obligations of RMB under the Act (refer Annex N), which requires RMB to provide water supply, fire fighting and snow making services.

Combination of options

A number of options may potentially allow peak potable water demands to be met.

Only direct pumped extraction from the Howqua or Delatite River catchments, or a storage option would allow peak snowmaking demands to be met. A storage option at an altitude above the Resort also has the potential to assist with bushfire management.

Because of the natural slope and the required embankment slopes at the Control Centre site, a 20 -30 ML reduction in storage capacity would not significantly alter the storage or overall project construction footprint. Multiple storage dams would require multiple stockpiling and construction footprint (both for the storage facilities themselves and piping and associated infrastructure) and as such would likely result in a much higher overall project construction footprint and environmental impacts. Multiple storages would also likely result in more complex construction considerations, noting construction is required to occur in summer and having incomplete construction during a winter season is highly undesirable.

Demand management and water efficiency measures are always likely to have relevance in the management of the Resort water supplies, and should be implemented as part of good practice, and as part of any new development in the village. However in this case these measures are not a long term substitute for the provision of a reliable and at times high volume water supply.

From a supply perspective, some of the other options (for example groundwater supply or surface water extraction from other locations) may prove useful in augmenting water supplies and could potentially be used in combination with a storage. Given the peak water demands, cost and uncertainties with the reliability of supply for these options, it has been concluded that the use of these options in combination with a storage would not significantly reduce the required (100 ML) storage volume.

Taking into account all of the above, "Strategic Option One: New on-mountain off-stream storage" is the best suited solution for the long term water supply at Mt Buller.

The below provides the assessments undertaken to identify a suitable site for a storage facility.

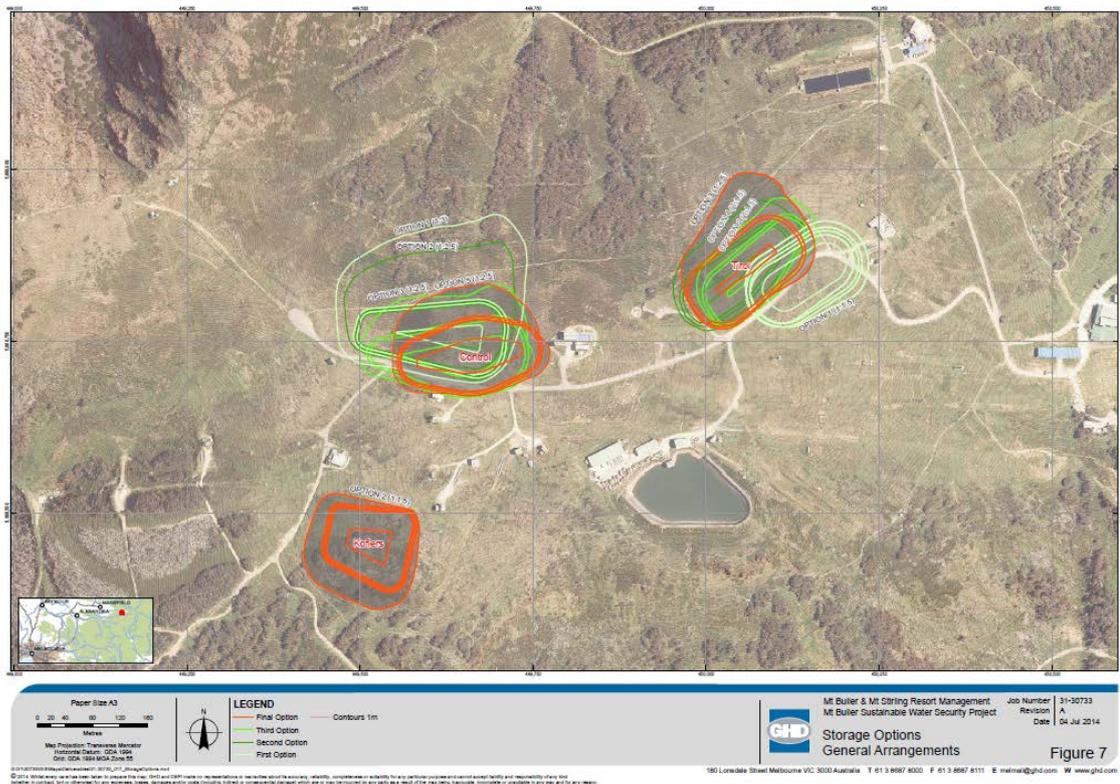
Off-Stream Storage Site Options Assessment

In order to select a site for a water storage facility, a Multi-Criteria Assessment (MCA) was developed to identify a suitable site for the off-stream storage. This MCA utilised a range of considerations associated with land use planning, environment, heritage, social, economic, ski resort utility, technical and engineering, construction, operations and bushfire management considerations.

A series of detailed assessment criteria and descriptors for the MCA were developed in conjunction with the RMB, based on relevant planning and strategy documents, and from RMB organisation specific objectives. Key criteria for the Project were identified as:

- Impact to native vegetation
- Geotechnical suitability and risk to achieving 100 ML storage volume
- Impact to existing skiable terrain, connectivity and Resort functionality, and
- Storage construction cost.

Three potential sites were identified for consideration based on the criteria above. The potential sites are known as 'Tirol', 'Koflers' and 'Control Centre'. These are shown below, and additional information can be obtained from Options Assessment Report Annex AA.



Site Options

Source: GHD Options Assessment Report 2014

The next stage of the site selection process was undertaken following a series of more detailed geotechnical, hydrogeological and ecological investigations, in conjunction with a preliminary concept design process for the sites known as Tirol and Control Centre (as Koflers emerged as the last preference). This concept design considered a larger footprint than the first stage in order to take account of storage construction methodology, and the need to install and relocate ancillary infrastructure. Following these investigations, the MCA was reviewed to ensure that the preferred site remained preferred in light of the additional information which had been gained.

More recently, the concept design of the preferred site has been refined and updated as a result of further investigations and the need to avoid, minimise and mitigate potential impacts associated with hydrological changes and vegetation removal. The current proposal has achieved a smaller construction footprint (approximately a 10% reduction). Reductions in footprint were achieved by increasing the proposed height of stockpiles and constraining construction areas to a minimum.

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

No key alternatives are to be further investigated, noting the wide range of alternatives that have been investigated to date.

5. Proposed exclusions**Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:**

There are no ancillary activities or further project stages proposed for exclusion from this assessment.

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

Mt Buller and Mt Stirling Alpine Resort Management Board.

Implementation timeframe:

Date	Action
December 2014	Pre-construction groundwater monitoring around Alpine Bogs commenced.
January 2018 – February 2018	Pre-construction stage (Year 0) climatological, surface water and ecological monitoring of Alpine Bogs will commence and pre-construction groundwater monitoring will continue as part of HEMAMP.
February 2018 – August 2018	Collection of indigenous plant material and propagation of indigenous plants in preparation of post-construction ecological rehabilitation.
September 2018 – October 2018	Preliminary works, such as installation of erosion control measures, identification of services, decommissioning of infrastructure and removal and salvage of native vegetation.
October 2018 – March 2019	Construction of the water storage and ancillary infrastructure.
January 2019 – February 2019	Construction stage (Year 1) climatological, hydrological and ecological monitoring of Alpine Bogs as part of HEMAMP.
February 2019 – April 2019	Landscaping, revegetation and rehabilitation of the project construction footprint.
April 2019 – May 2019	Year 1 monitoring, maintenance and management of revegetated areas.
November 2019 and each November for 4 years thereafter	Monitoring, maintenance and management of revegetated areas for Years 2 to 6.
January 2020 – February 2020 and annually thereafter	Post-construction stage (Year 2 and onwards) climatological, hydrological and ecological monitoring of Alpine Bogs as part of HEMAMP for the lifetime of the water storage.

Proposed staging (if applicable):

No staging is proposed, but it should be noted that the construction season in the Victorian Alpine Resorts is November to May.

7. Description of proposed site or area of investigation**Has a preferred site for the project been selected?**

No Yes If no, please describe area for investigation.
 If yes, please describe the preferred site in the next items (if practicable).

Refer Figure 1 and Figure 2.

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

The proposed location (referred to as the Control Centre) is within the Mt Buller Alpine Resort ski area, north of the final section of the unsealed Mt Buller Summit Road. It extends over the existing Boggy Creek ski lift alignment and northwards to the Summit Nature Walk track. The site is located on a gently to moderately sloping plateau 700 m east of the Mt Buller summit. The site area slopes downhill to the north with the slopes steepening as they approach the valley below.

The land forms part of the ski field, and existing skifield and resort infrastructure, as well as some buildings, are scattered around the precinct.

The hydrogeology of the PCF and surrounds is complex. The regional geology generally consists of Tertiary basalt overlaying Devonian granite. Within the PCF, both the granite and the older volcanic basalt represent fractured rock aquifers that store groundwater and transmit it via joints and fractures within the rock mass. Surface expression of groundwater occurs approximately 250 metres downhill from the Mt Buller Summit Road in an area that supports Alpine Bogs. This water collects in a decommissioned aqueduct, which flows slowly north west and ultimately joins Boggy Creek, in the upper reaches of the Delatite River catchment.

The PCF is within the ski field, meaning that there is existing infrastructure within the PCF and that large areas of the PCF have been subject to previous disturbance (Figure 7). The 10.347-hectare PCF supports 5.278 hectares of mostly low-lying native vegetation (Figure 8). The remainder of the PCF is covered by predominantly introduced vegetation, small areas of exposed rock and existing infrastructure, including the Mt Buller Summit Road, Control Centre building and Control Centre access road (Photo 1 south looking up to the project land and 2 looking at the Control Centre Building and across the project land, Figure 4).

Site area (if known): 10.347 hectares (Project Construction Footprint)

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

Current land use and development:

The PCF is located on Crown land that is permanently reserved for the purpose of the Mt Buller Alpine Resort. The RMB is the public land manager and the land forms part of the Mt Buller ski field precinct.

Existing built infrastructure within and immediately adjoining the PCF includes:

- The Control Centre building – which houses BSL offices and a ski lift station
- Boggy Creek T-Bar station and associated infrastructure
- Numerous underground pipelines (water and sewer) and power cables to service the adjoining buildings and adjacent areas

Much of the land has been subject to previous disturbance and contains part of the Summit Carpark Access Road, part of the Boggy Creek T-bar, walking paths and ski runs. An existing tank and underground infrastructure, as well as the Boggy Creek T-bar would be decommissioned as part of the project.

In winter the area forms part of the ski field. . In summer the existing walking track and access road are used by visitors to gain access to the summit.

The area also contains the existing potable water storage for the Resort, although these lie outside the PCF, but within the broader ski field precinct.

Description of local setting (eg. adjoining land uses, road access, infrastructure, proximity to

residences & urban centres):

The surrounding land also forms part of the Mt Buller ski field precinct and contains ski field infrastructure and ski runs (which also serve as walking paths in summer).

Within close proximity to the subject land is the Control Centre building. To the south-east is the existing Sun Valley Reservoir, and to the north-west is the existing potable water storage, Burnt Hut Reservoir is to the north-east.

Mt Buller Village is located approximately 1km at its closest point from the storage facility Mt Buller Village is developed with a number of accommodation and retail uses and some community and operational uses.

The proposed storage location is visible from a number of viewpoints on the northern side of the Resort and from elevated locations such as the Mt Buller summit. A description of existing landscape characteristics and additional information on viewing locations is presented in Annex I. It should be noted that the water storage facility would be within the ski field precinct which already contains ski field infrastructure (including Burnt Hut Reservoir and Sun Valley Dam).

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

The Alpine Resorts Planning Scheme provides a number of policy directions and land use and development controls which are directly relevant. A summary of the relevant policies are outlined below, however additional information can be gathered by referring to Annex D – Updated Planning Report.

In general, the key considerations which are relevant to the proposal relate to:

- Environmental considerations, removal of native vegetation and offsetting requirements (Clause 12, Clause 21.05 and Clause 52.17).
- Protecting the landscape values of Mt Buller and minimising detrimental visual impacts (Clause 11, 21.05)
- Environmental risk including bushfire and geotechnical considerations (erosion, landslip) (Clause 13, 21.05)
- Protection of Delatite and Howqua catchments which occupy part of Mt Buller and protection of Boggy Creek waterway (Clause 14)
- Aboriginal Cultural Heritage (Clause 15, Clause 21.05, Clause 22.05)
- Economic development, specifically the desire to support year-round tourism on Mt Buller, as well as acknowledging the broad economic benefits Mt Buller Resort provides to the regional economy (Clause 17, 21.05)
- Recreational values, in particularly accessibility of alpine recreation (Clause 11, Clause 21.05)
- Ensure there is sufficient provision of required infrastructure (Clause 19, Clause 21.05)

In addition to the policies outlined above, the following zones, overlays and particular provisions apply to the land.

Comprehensive Development Zone schedule 2 (Alpine Recreation) (CDZ2)

The purpose of the CDZ2 includes:

- To identify areas associated with the development and use of an alpine resort on which passive and active recreation occur.
- To enable the development and the use of the land which is in accordance with sound environmental management and land capability practices, and which takes into account the significance of the environmental resources.
- To minimise impacts on significant landscapes.
- To minimise impacts on areas of significant vegetation.
- To minimise impacts on habitat and habitat corridors for indigenous fauna.

Pursuant to Clause 1 of Schedule 2 to the Zone, **a permit is required to use the land for a utility installation.**

Pursuant to Clause 3.1 a permit is required to construct a building or construct or carry out works unless the buildings and works are exempt. As articulated through the Goulburn Murray Water

Referral dated 18 November 2018, a works licence is required for the proposed dam, pursuant to the *Water Act 1989*. Pursuant to Clause 62.02-1 of the Alpine Planning Scheme, any requirement in the scheme relating to the construction of a building or the construction of carrying out of works... does not apply to buildings and works associated with a dam if a licence is required to construct the dam or to take and use water from the dam under the *Water Act 1989*.

Therefore, despite Clause 3.1 of the CDZ2 and given the provisions of Clause 62.02-1, no planning permit is required for buildings and works associated with the project.

Overlays:

Environmental Significant Overlay schedule 1 (Burrmys parvus (Mountain Pygmy-possum)) (ESO1)

The Statement of environmental significance for the ESO1 is as follows:

“Statement of environmental significance The Mountain Pygmy-possum (*Burrmys parvus*) is the only Australian mammal restricted to the alpine and sub-alpine environment. It was discovered in 1966 as a living animal at Mt Higginbotham, Victoria.

The Mountain Pygmy-possum (*Burrmys parvus*) is listed as threatened on Schedule 2 of the *Flora and Fauna Guarantee Act 1988*... The Department of Sustainability and Environment has mapped the habitat of the Mountain Pygmy-possum (*Burrmys Parvus*) throughout the Alpine Resorts. The habitat requires conservation and protection from inappropriate development.”

Pursuant to Clause 42.01-2 of the Environmental Significance Overlay and Clause 3 of Schedule 1 to the Environmental Significance Overlay **a permit is required to remove vegetation.**

Design and Development Overlay schedule 3 (Mount Buller Ski Fields) (DDO3)

The DDO3 includes the following Design Objectives:

To ensure that development within the Mt Buller ski fields creates and enhances the identifiable individual resort character by: -

- Siting comfortably within the alpine landscape by being responsive to the topography and harmonising with the natural features of the landscape.
- Using built form, materials and finishes, including colours that are consistent with the natural alpine environment and that will achieve long lasting durability.
- Designing built form and finishes to respond to year round climatic conditions.
- To ensure development is not visually intrusive when viewed from key public vantage points within the Village, from Mt Buller Access Road and surrounding ski fields.
- To ensure buildings within the ski fields are visually attractive and functionally effective all year round, particularly at key interfaces with the Village such as the Village Square, Helicopter Flat and in proximity to lease sites having frontage to the ski fields.
- To minimise the visual impact of snowfield infrastructure and facilities upon the landscape values of the Resort.
- To ensure development avoids and minimises impacts upon indigenous vegetation, fauna and natural features.
- To ensure that development is visually attractive all year round.

Pursuant to Clause 43.02-2 and Clause 2 of Schedule 3 of Design and Development Overlay, a planning permit is required to construct a building or construct or carry out works, however due to the exemptions within Clause 62.02-1 as outlined above, no planning permit is required under the provision of the DDO3.

Erosion Management Overlay Schedule 1 (Management of Geotechnical Hazard) (EMO1)

The purpose of the EMO1 includes:

- To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- To protect areas prone to erosion, landslip or other land degradation processes, by minimising land disturbance and inappropriate development.

Pursuant to Clause 44.01-1 and Clause 2 of Schedule 1 of Erosion Management Overlay **a planning permit is required to remove vegetation.**

A detailed consideration of the Geotechnical Risks is undertaken within the ‘Soils’ section of this report.

Bushfire Management Overlay 1 (BMO1)

The purpose of the Bushfire Management Overlay – Schedule 1 includes:

- To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.
- To identify areas where the bushfire hazard warrants bushfire protection measures to be implemented.
- To ensure development is only permitted where the risk to life and property from bushfire can be reduced to an acceptable level.

Pursuant to Clause 44.06-1 no planning permit is required for the proposed utility installation, as the works do not trigger a permit and also because the proposed works would be for a utility installation (and not a use which is occupied by people). It is noted that the application is supported by the CFA as it provides additional water resources to support fire-fighting.

Clause 52.17 Native Vegetation Removal

The purpose of the Clause 52.17 Native Vegetation includes:

- To ensure permitted clearing of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity. This is achieved through the following approach:
 - Avoid the removal of native vegetation that makes a significant contribution to Victoria's biodiversity.
 - Minimise impacts on Victoria's biodiversity from the removal of native vegetation.
 - Where native vegetation is permitted to be removed, ensure that an offset is provided in a manner that makes a contribution to Victoria's biodiversity that is equivalent to the contribution made by the native vegetation to be removed.
- To manage native vegetation to minimise land and water degradation.
- To manage native vegetation near buildings to reduce the threat to life and property from bushfire.

Pursuant to 52.17-2 **a planning permit is required to remove, destroy or lop native vegetation, including dead native vegetation.**

Other Regulatory Controls, Strategic Documents and Policies

The *Alpine Resorts (Management) Act 1997* provides the management framework for all Victorian alpine resorts.

Refer Annex N for a more detailed breakdown of the RMB's obligations under the *Alpine Resorts (Management) Act 1997*.

Pursuant to Section 1A of the *Alpine Resorts (Management) Act 1997* the Object of the Act is to make provision in respect of alpine resorts -

- (a) *for the development, promotion, management and use of the resorts on a sustainable basis and in a manner that is compatible with the alpine environment, having regard to—*
- i. *environmental and ecological considerations, in particular, climate change; and*
 - ii. *economic considerations; and*
 - iii. *cultural heritage considerations, in particular, Indigenous cultural heritage considerations;*
- and*
- (b) *for the use of the resorts—*
- i. *primarily for alpine recreation and tourism; and*
 - ii. *in all seasons of the year; and*
 - iii. *by persons from varied cultural and economic groups.*

Alpine Resorts Strategic Plan 2012

The Alpine Resorts Strategic Plan 2012 identifies the following key objectives:

Objective 1 – Enhancing the visitor experience and developing resorts

Objective 2 – Delivering resort services and infrastructure efficiently and accountably

Objective 4 – Respecting the alpine environment
 Objective 5 – Broadening access opportunities
 Objective 6 – Regulatory reform

The Strategic Plan 2012 also goes through the individual resorts. The strategy articulates that one of the key barriers or constraints for Mt Buller is the lack of water, both potable and for snow-making.

Mt Buller and Mt Stirling Management Plan 2013-2018 (Annex O)

The *Strategic Management Plan 2013-2018* by the Mt Buller and Mt Stirling Alpine Resort Management Board articulates the direction provided by the *Alpine Resorts Strategic Plan 2012* for Mt Buller and Mt Stirling, in accordance with the requirements of S.56 of the *Alpine Resorts (Management) Act 1997*, noting it builds upon the direction of the Alpine Resorts Strategic Plan.

Pursuant to Section 56H of the *Alpine Resorts (Management) Act 1997* (emphasis added):
Land managers and other Authorities to take Strategic Management Plan into account

In carrying out a function involving land management or land use planning—

- (a) on behalf of the Crown; or*
- (b) under an Act—*

a Minister, public authority, committee of management of reserved Crown land, municipal council or the Council must take all reasonable steps to give effect to the Strategic Management Plan for an alpine resort.

It is noted that the Mt Buller and Mt Stirling Management Plan 2013-2018 identifies that a key objective is to provide safe and reliable water and waste water, and waste removal facilities and services. A Key Commitment of this Management plan is to 'develop an additional water storage facility for snowmaking and potable water supply as detailed within the Resort's Water Supply Demand Strategy'. This project contributes to the realisation of that commitment.

Mt Buller Master Plan 2010

The development of the Mt Buller Master Plan 2010 (the Master Plan) is consistent with Objective 6 of the *Alpine Resorts Strategic Plan 2012*.

The Master Plan is underpinned by five key elements:

- Accessibility
- Community
- Amenity
- Activation
- Sustainability

Various projects and improvements are proposed as part of the Master Plan, including the development of Horse Hill, a Gondola from Horse Hill Gateway to the Village, supporting an active Village for summer and winter activities and continuing to support a sustainable alpine environment.

The Master Plan makes numerous references to this specific project. This in part allows for the project to be understood in terms of the future directions and ensures that there is a clear and articulated direction for Mt Buller, both in terms of its development and the projection of its natural environment, and the subject project is consistent with this.

Hume Regional Growth Plan

The Hume Regional Growth Plan identifies the local economic significance of the Alpine Resorts, as follows:

“Alpine resorts have the potential to offer a range of tourism activities throughout the year. Supporting further development of year-round attractions will contribute to the long-term viability of alpine resorts and help diversify the region’s tourism product, with winter tourism under threat from the potential impacts of climate change, which will reduce the average snow cover and number of snow days. The fire hazard presented by the environments within which alpine resorts are located will need to be considered when planning for the further development of these resorts.”

In addition to recognising the economic contributions by the Alpine Resorts, the Hume Regional Growth Plan recognises the environmental values of the area, not only in terms of protecting the natural environment, but also in terms of natural resource management, as follows:

“The waterways (rivers and wetlands) of the Hume Region are highly significant environmental and economic assets, providing water supply to one of Australia’s major food-producing areas. Along with providing water for the environment, these waterways also feed major water storages and significant irrigation infrastructure that supply water to settlements, industries and farms, particularly in the food bowl area in the north west of the region. Major rivers, such as the Murray River, water bodies and significant wetland complexes provide opportunities for nature-based and recreational tourism, which may be enhanced by environmental watering programs, such as those related to the outcomes of the Murray-Darling Basin Plan.

The Hume Region has rich and diverse environmental and heritage assets. These include snow-covered mountains, alpine areas, lush river valleys, forests and woodlands, granite outcrops and floodplains. They also include a myriad of cultural heritage, including both Aboriginal and historic places and objects. Cultural landscapes are important for their heritage and environmental values as well as their scenic beauty. Environmental and heritage assets contribute to the economic success of the region, enhance liveability for its residents and provide an attraction for visitors and tourists.”

Local government area(s):

None, Mount Buller Alpine Resort is unincorporated Crown land and is not part of any Municipality. However, the Crown land is surrounded by the Shire of Mansfield.

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity

(cf. general description of project site/study area under section 7):

The key environmental assets of the PCF and broader study area relate to the alpine and sub-alpine ecological values supported within and around the PCF. The broader area supports one ecological community and three species that are listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act).

Environment within the Project Construction Footprint

The key environment asset within the PCF is the 5.278 hectares of native vegetation, all of which provides habitat for native fauna, including Broad-toothed Rat *Mastacomys fuscus mordicus* (EPBC Act: vulnerable; FFG Act: threatened) and Alpine Bog Skink *Pseudemoia cryodroma* (FFG Act: threatened).

This native vegetation and fauna habitat would need to be removed for construction of the project. The native vegetation and habitat for rare and threatened species would be offset in accordance with an Offset Strategy (Annex F). In addition to the provision and management of offsets, at least 5.278 hectares of native vegetation and habitat for Broad-toothed Rat and Alpine Bog Skink would be re-instated within the PCF as part of the post-construction Ecological Rehabilitation Plan (ERP).

Environment within the Broader Study Area

Key ecological values in the broader study area (and therefore with potential to be indirectly affected by the proposed development) include:

- 2.007 hectares of the Alpine Bog ecological community (EPBC Act: endangered; FFG Act: threatened) downslope of the PCF
- Potential non-core habitat for Mountain Pygmy-possum *Burramys parvus* (EPBC Act: endangered; FFG Act: threatened).

Hydrological monitoring of downslope Alpine Bogs through groundwater bores has been ongoing

since late 2014. Hydrological data has been used to model the catchment areas of downslope Alpine Bogs (refer Figure 9). The modelling and associated mapping shows that the water storage and earth embankment would be outside the catchment area of approximately half of the downslope Alpine Bogs (comprising 1.097 hectares). These Alpine Bogs are not likely to be affected by the project.

The water storage and its earth embankment would be within the catchment areas of the remaining 0.910 hectares of Alpine Bogs (Bogs 4.2, 6, 8, 9, 10, 11.2, 12 and 13 shown in Figure 9). The water storage and earth embankment footprint occupies 11% of the catchment area of Bog 13. This is not considered to be a significant impact on the recharge capacity of Bog 13. At 23.398 hectares, the catchment area of Bog 13 is one order of magnitude larger than the catchment area for any of the other bogs and yet Bog 13 is one of the smallest of the Alpine Bogs on the northern slopes of Mount Buller, covering only 0.012 hectares. Therefore, Bog 13 is unlikely to be significantly affected by the proposed water storage. Refer Figure 9 for a map of the Catchment areas of Alpine Bogs in the study area.

The water storage and earth embankment footprint would impact on 30-51% of the catchment areas of Alpine Bogs 4.2, 6, 8, 9, 10, 11.2 and 12 (comprising a total of 0.898 hectares of Alpine Bogs). This has the potential to significantly impact on the recharge capacity of these Alpine Bogs and has potential to cause drying of the Alpine Bogs. Construction of the project without implementation of appropriate mitigation measures (as outlined in the HEMAMP) would therefore potentially result in indirect impacts to 0.898 hectares of downslope Alpine Bogs. The HEMAMP aims to limit these indirect impacts to no more than 0.090 hectares (10% of unmitigated impacts).

Preferred Mountain Pygmy-possum habitat at Mount Buller is categorised as Type I or Type II according to its core values (Figure 6). The PCF avoids patches of preferred habitat (Type I and Type II) and potentially important links between these patches. Construction and operation of the proposed project will not result in the loss of Mountain Pygmy-possum habitat. A minimum 200-metre buffer exists between the PCF and preferred Mountain Pygmy-possum habitat (Figure 6). This exceeds the 30-metre buffer requirement of the Mount Buller Mountain Pygmy-possum Recovery Plan.

9. Land availability and control

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

No Yes If yes, please provide details.

The Mt Buller Alpine Resort is a Crown Land Reserve managed by the Mt Buller Mt Stirling Alpine Resort Management Board (CA 5A, SPI 54~A\PP2370, Parish of Changue East, County of Wongangatta.

Current land tenure (provide plan, if practicable):

Mt Buller is Crown land (reserved) managed by the Mt Buller and Mt Stirling Alpine Resort Management Board (RMB), as established under S.4 of the *Alpine Resorts (Management) Act 1997*. The RMB is deemed to be a Committee of Management, responsible for managing, improving, maintaining and controlling all Crown land, including having responsibilities for infrastructure and services. The RMB reports to the Victorian Government Minister for Energy, Environment and Climate Change.

The ski field area (which includes the project land) is subject to an Alpine Lease to Buller Ski Lifts Holdings Pty Ltd, Dealing No. AK995893T.

Pursuant to Recital E of the Lease, the primary purpose and objective of managing and operating the Alpine Resort is intensive alpine tourism development for recreation and tourism. It is noted that the lease does not restrict or prohibit the project and Buller Ski Lifts have been consulted heavily as part of the project.

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

There is no proposed change in land tenure as part of this project.

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

There are no easements or native title claims relevant to the subject land.

10. Required approvals**State and Commonwealth approvals required for project components** (if known):**Commonwealth Approvals:***Environmental Project and Biodiversity Conservation Act 1999 (EPBC Act)*

In August 2014, the project was referred to the Australian Government Minister for the Environment due to the potential for the project to have significant impacts on Matters of National Environmental Significance (MNES) listed under the EPBC Act (EPBC Referral 2014/7303). In September 2014, the Australian Government Department of the Environment (now the Department of the Environment and Energy) decided under Section 75 of the EPBC Act that the project would be a controlled action due to its potential impact on the following MNES listed under Sections 18 and 18A of the EPBC Act:

- Alpine Sphagnum Bogs and Associated Fens (Alpine Bogs) ecological community (endangered)
- Mountain Pygmy-possum *Burramys parvus* (endangered)
- Smoky Mouse *Pseudomys fumeus* (vulnerable)
- Blue-tongued Orchid *Pterostylis oreophila* (critically endangered)
- Alpine Tree Frog *Litoria verreauxii alpina* (endangered).

As such, the project requires approval under the EPBC Act and must be assessed by way of preliminary documentation. The preliminary documentation has been prepared and submitted to the Department of the Environment and Energy for consideration. It is anticipated that the preliminary documentation will be published for public comment in late 2017. The preliminary documentation outlines the following:

- The project has potential to indirectly impact upon 0.898 hectares of Alpine Bogs downslope of the PCF but successful implementation of mitigation measures described in the Hydrological and Ecological Monitoring and Adaptive Management Program will minimise indirect impacts to no more than 0.090 hectares. Residual indirect impacts would be offset by securing and managing 0.381 hectares of equivalent quality Alpine Bogs at Mount Stirling as a direct offset.
- The project is unlikely to have a direct impact on Mountain Pygmy-possum, given that the PCF contains no suitable habitat for the species and that the species is highly unlikely to disperse through the PCF. Potential indirect impacts on Mountain Pygmy-possum (e.g. from noise, lighting and sedimentation) would be limited, given the 200-metre buffer between the PCF and preferred Mountain Pygmy-possum habitat, and would be further minimised through construction controls (e.g. limiting construction timing to daylight hours and installing erosion control measures).
- The project will have no impact on Smoky mouse, Blue-tongued Orchid and Alpine Tree Frog, given that these species have not been observed within the PCF and have no historical records within 5 kilometres of the PCF.

State Approvals*Aboriginal Heritage Act 2006*

The *Aboriginal Heritage Act 2006* provides for the protection and management of Victoria's Aboriginal cultural heritage. A Cultural Heritage Management Plan (CHMP) has been prepared and approved by the Taungurung Clans Aboriginal Corporation on 30 November 2016, in accordance with the requirements of the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2007*. It is noted that the conditions within the approved CHMP are readily met by the project and cultural heritage will be managed in accordance with the approved CHMP.

Crown Land (Reserves) Act 1978

An agreement is required under Section 18B of the *Crown Land (Reserves) Act 1978* to allow for the land on Mt Stirling to provide offsets as required under the Biodiversity Assessment Guidelines (DEPI 2013). This offset security mechanism has been put forward by DELWP.

Refer to Annex F for the approved Native Vegetation Offset Strategy for additional information.

Flora and Fauna Guarantee Act 1988 (FFG Act)

The project would require the removal of native vegetation from public land, including whole specimens of 38 flora species that are protected on public land under the FFG Act. The 38 species are:

- Alpine Baeckea *Baeckea gunniana*
- Alpine Cotula *Cotula alpina*
- Alpine Grevillea *Grevillea australis*
- Alpine Groundsel *Senecio pectinatus* var. *major*
- Alpine Mint-bush *Prostanthera cuneata*
- Alpine Yam-daisy *Microseris lanceolata*
- Ashen Billy-buttons *Craspedia coolaminica*
- Billy Buttons *Craspedia* spp.
- Candle Heath *Richea continentis*
- Common Cotula *Cotula australis*
- Common Triggerplant *Stylidium armeria*
- Crimson Billy-buttons *Craspedia crocata*
- Dusty Daisy-bush *Olearia phlogopappa* var. *flavescens*
- Dusty Daisy-bush *Olearia phlogopappa* var. *phlogopappa*
- Fireweed Groundsel *Senecio linearifolius*
- Green Billy-buttons *Craspedia jamesii*
- Kerosene Bush *Ozothamnus cupressoides*
- Leafy Daisy *Brachyscome rigidula*
- Mother Shield-fern *Polystichum proliferum*
- Mountain Baeckea *Baeckea utilis* s.s.
- Mountain Beard-heath *Acrothamnus hookeri*
- Mountain Clubmoss *Lycopodium fastigiatum*
- Mountain Daisy-bush *Olearia algida*
- Mountain Fireweed *Senecio gunnii*
- Mountain Forest Billy-buttons *Craspedia* sp. 1
- Necklace Fern *Asplenium flabellifolium*
- Onion Orchid *Microtis* spp.
- Orange Everlasting *Xerochrysum subundulatum*
- Pale Everlasting *Coronidium scorpioides* 'rutidolepis s.s.' variant
- Peat Moss *Sphagnum* spp.
- Slender Snow-daisy *Celmisia pugioniformis*
- Snow Aciphyll *Aciphylla glacialis*
- Snow Daisy *Celmisia* spp.
- Snowfield Groundsel *Senecio pinnatifolius* var. *alpinus*
- Sticky Billy-buttons *Craspedia adenophora*
- Swamp Heath *Epacris paludosa*
- Violet Fleabane *Erigeron bellidioides*
- An unidentified daisy species *Brachyscome* spp.

The project will therefore require a permit to 'take' protected flora (a protected flora permit) and will therefore be required. Such a permit would not normally be applied for or granted until a planning permit is granted for the project under the *Planning and Environment Act 1987*.

Planning and Environment Act 1987 (PE Act)

A planning permit is required for the use of a water storage facility (utility installation) and associated infrastructure and removal of native vegetation at the Mt Buller Alpine Resort under the following provisions of the Alpine Resorts Planning Scheme:

- Comprehensive Development Zone 2

- Environmental Significant Overlay 1 (*Burramys parvus* (Mountain Pygmy-possum))
- Erosion Management Overlay 1 (Management of Geotechnical Hazard)
- Clause 52.17 Native Vegetation Removal.

It is noted that no planning permit is triggered for buildings and works (and as such the permit triggers relate to the use and the removal of native vegetation only), as pursuant to Clause 62.02-1 of the Alpine Resorts Planning Scheme:

“Any requirement in this scheme relating to the construction of a building or the construction or carrying out of works, other than a requirement in the Public Conservation and Resource Zone, does not apply to:

- *Buildings and works associated with a dam if a licence is required to construct the dam or to take and use water from the dam under the Water Act 1989.”*

A licence is required pursuant to the *Water Act 1989* (refer below) which provides a statutory mechanism for additional consideration of the project, including specific consideration of the buildings and works component (notwithstanding the buildings and works elements are a relevant consideration pursuant to the relevant policies and as it relates to the removal of native vegetation).

Planning Application PA1600138 was lodged in August 2016 and is currently under consideration.

Water Act 1989

As confirmed by Goulburn Murray Water as part of their referral response on 18 November 2016, the project would require a works licence pursuant to Section 67 of the *Water Act 1989*, as the wall height of the dam would be 21metres, with a volume of 100ML.

It is noted that the Works Licence stage provides an additional statutory trigger (in addition to any conditions on a planning permit) for consideration of the project. However, unlike a planning permit which is considered from a conceptual design stage, the Works Licence would allow additional consideration from a detail design perspective. This is of particular relevance having regard to the comments within the Geotechnical Peer Review (Annex J):

“Given the preliminary nature of the risk assessment and the concept stage design, the control measures and recommendations given in the GHD report are necessarily broad. It will be necessary to update the risk assessment during the detailed design process to ensure that all relevant risks are identified and the design addresses those risks.”

Have any applications for approval been lodged?

No Yes If yes, please provide details.

Planning Permit Application No. PA1600138 was lodged in August 2016 for the project (use the land for a utility installation and for the removal of vegetation including native vegetation).

The application has been referred and completed advertising in both summer and winter seasons. There have been no objections received.

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

As part of the development of the project and the planning application itself, a number of discussions have been held with approval and referral agencies, as follows:

- Department of Environment, Land, Water and Planning:
 - Development Approvals and Urban Design
 - Hume Region
 - Impact Assessment

Other agencies consulted:

- Goulburn Murray Water
- CFA
- Taungurung Clans Aboriginal Corporation
- Alpine Resorts Co-Ordinating Council
- Mansfield Shire Council

- Mt Buller Chamber of Commerce
- Mansfield Secondary College
- North East Victoria Tourism Board
- AusNet
- Department of the Environment and Energy (Commonwealth Government)

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

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

There is potential for the project to have significant environmental effects on the following environmental values:

- Native vegetation, including habitat for rare or threatened flora and fauna species
- Water environments, including a threatened ecology community
- Landscape values and soils
- Social environments.
- Landslip/storage failure

This section considers environmental effects under 'worst case' scenarios involving no mitigation measures. Mitigation measures will be implemented and are outlined in more detail in following sections. Refer to Annex E – Flora and Fauna Report for additional information, and Annex F for the Native Vegetation Offset Strategy and Letter of Approval of Alternative Offset Strategy.

Native Vegetation

The project would result in the removal of up to 6.177 hectares of native vegetation, including 5.278 hectares of native vegetation within the PCF and 0.898 hectares of downslope Alpine Bogs, which will be indirectly impacted if no mitigation measures are successfully implemented. This native vegetation provides habitat for rare or threatened species.

Thirty-seven species listed as rare or threatened under DELWP's Advisory Lists are relevant to the project:

- Seventeen species listed as rare or threatened under DELWP's Advisory Lists were recorded within the PCF during the flora and fauna assessment for the project (Annex E). Two of these species, Alpine Bog Skink *Pseudemoia cryodroma* and Broad-toothed Rat *Mastacomys fuscus mordicus*, are also listed as threatened under the FFG Act and, in the case of Broad-toothed Rat, as vulnerable under the EPBC Act.
- An additional 18 species listed as rare or threatened under DELWP's Advisory Lists have modelled habitat within the PCF, although they were not recorded during the flora and fauna assessment (Annex E). Three of these 18 species, Alpine Tree Frog *Litoria verreauxii alpina*, Mountain Daisy *Brachyscome* sp. 3 and Mountain Pygmy-possum *Burramys parvus*, are listed as threatened under the FFG Act. Alpine Tree Frog and Mountain Pygmy-possum are also listed under the EPBC Act.
- A further two species listed as rare or threatened under DELWP's Advisory Lists are considered likely to occur within the PCF, despite not being recorded during the flora and fauna assessment or having modelled habitat present. These two species are considered likely to occur because there is suitable habitat within the PCF and there are records of the species from the local area.

These 37 rare and threatened species are provided in the following table, along with their conservation statuses, whether they were recorded within the PCF, the proportion of their total important habitat that would be removed by the project and whether they require offsets in accordance with the Biodiversity Assessment Guidelines. Note that important habitat modelling for rare or threatened species is provided by DELWP and is intended as a tool for assessing impacts on and determining offsets for rare or threatened species.

Species	EPBC Act, FFG Act and Advisory List Statuses	Presence within PCF	Total Modelled Important Habitat Removed	Specific Offset Required?
Alpine Bog Skink <i>Pseudemoia cryodroma</i>	Not listed, Threatened, Endangered	Recorded and modelled	0.017%	Yes
Alpine Marsh-	Not listed, Not	Modelled only	0.006%	Yes

marigold <i>Psychrophila introloba</i>	listed, Rare			
Alpine Pennywort <i>Schizeilema fragoseum</i>	Not listed, Not listed, Vulnerable	Considered likely to occur but not modelled or recorded	<0.005%	No
Alpine Sedge <i>Carex blakei</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Alpine Stackhousia <i>Stackhousia pulvinaris</i>	Not listed, Not listed, Rare	Modelled only	0.009%	Yes
Alpine Sundew <i>Drosera arcturi</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Alpine Tree Frog <i>Litoria verreauxii alpina</i>	Vulnerable, Threatened, Critically endangered	Modelled only	<0.005%	No
Broad-leaf Flower-rush <i>Carpha nivicola</i>	Not listed, Not listed, Rare	Modelled only	0.016%	Yes
Broad-toothed Rat <i>Mastacomys fuscus mordicus</i>	Vulnerable, Threatened, Endangered	Recorded and modelled	<0.005%	No
Carpet Sedge <i>Carex jackiana</i>	Not listed, Not listed, Rare	Recorded and modelled	0.009%	Yes
Cliff Cudweed <i>Euchiton umbricola</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Dusty Daisy-bush <i>Olearia phlogopappa</i> var. <i>flavescens</i>	Not listed, Not listed, Rare	Recorded and modelled	<0.005%	No
Eichler's Buttercup <i>Ranunculus eichlerianus</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Felted Buttercup <i>Ranunculus muelleri</i>	Not listed, Not listed, Vulnerable	Modelled only	0.005%	Yes
Fog Club-sedge <i>Isolepis montivaga</i>	Not listed, Not listed, Rare	Recorded and modelled	0.026%	Yes
Green Billy-buttons <i>Craspedia aurantia</i> subsp. <i>jamesii</i> (syn. <i>C. jamesii</i>)	Not listed, Not listed, Rare	Modelled only	0.010%	Yes
Gunn's Alpine Buttercup <i>Ranunculus gunnianus</i>	Not listed, Not listed, Rare	Recorded and modelled	0.013%	Yes
Lilac Berry <i>Trochocarpa clarkei</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Lilac Bitter-cress <i>Cardamine</i>	Not listed, Not listed,	Recorded only	<0.005%	No

<i>lilacina s.s.</i>	Vulnerable			
Mat Cudweed <i>Euchiton traversii</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Milfoil Speedwell <i>Veronica nivea</i> (syn. <i>Derwentia nivea</i>)	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Mossy Knawel <i>Scleranthus singuliflorus</i>	Not listed, Not listed, Rare	Recorded and modelled	0.019%	Yes
Mountain Aciphyll <i>Aciphylla simplicifolia</i>	Not listed, Not listed, Rare	Recorded and modelled	0.005%	Yes
Mountain Daisy <i>Brachyscome</i> sp. 3	Not listed, Threatened, Vulnerable	Modelled only	0.024%	Yes
Mountain Pygmy-possum <i>Burrhamys parvus</i>	Endangered, Threatened, Critically endangered	Modelled only	<0.005%	No
Mountain Wallaby-grass <i>Rytidosperma oreophilum</i>	Not listed, Not listed, Rare	Recorded and modelled	0.033%	Yes
Mountain Willow-herb <i>Epilobium sarmentaceum</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Mueller's Bent <i>Agrostis muelleriana</i>	Not listed, Not listed, Rare	Recorded and modelled	<0.005%	No
Planarian <i>Spathula tryssa</i>	Not listed, Not listed, Vulnerable	Modelled only	5.925%	Yes
Snow Aciphyll <i>Aciphylla glacialis</i>	Not listed, Not listed, Rare	Recorded and modelled	0.014%	Yes
Snow Coprosma <i>Coprosma nivalis</i>	Not listed, Not listed, Rare	Recorded and modelled	<0.005%	No
Spinning Gum <i>Eucalyptus perriniana</i>	Not listed, Not listed, Rare	Modelled only	<0.005%	No
Sticky Fleabane <i>Pappochroma nitidum</i> (syn. <i>Erigeron nitidus</i>)	Not listed, Not listed, Rare	Recorded and modelled	0.036%	Yes
Thick Bent-grass <i>Deyeuxia crassiuscula</i>	Not listed, Not listed, Rare	Recorded and modelled	<0.005%	No
Tussock Skink <i>Pseudemoia pagenstecheri</i>	Not listed, Not listed, Vulnerable	Considered likely to occur but not modelled or recorded	<0.005%	No
Tussock Woodrush <i>Luzula alpestris</i>	Not listed, Not listed, Rare	Recorded and modelled	0.006%	Yes
Veined Plantain <i>Plantago</i>	Not listed, Not listed, Rare	Recorded and modelled	0.011%	Yes

<i>alpestris</i>				
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Of the 37 rare or threatened species relevant to the project, five are listed under the FFG Act and/or EPBC Act, but the project would not result in the loss of populations of these species. The five species are:

- Alpine Bog Skink (FFG Act: threatened), which is widespread across the Victorian Alps. Without the mitigation measures described in the Ecological Rehabilitation Plan (ERP; Annex H) and Offset Strategy (Annex F), the project would result in the loss of 5.278 hectares of suitable habitat for Alpine Bog Skink. However, Alpine Bog Skink within and around the PCF are not considered to belong to a genetically important population that would be necessary for the continued breeding, dispersal or genetic diversity of the species. Furthermore, implementation of mitigation measures outlined in the ERP and Offset Strategy (and described below) would result in the project having no long-term impact on Alpine Bog Skink.
- Alpine Tree Frog (EPBC Act: vulnerable; FFG Act: threatened), which is considered likely to be extinct on Mount Buller. The subspecies was not observed within the PCF during the flora and fauna assessment and has no historical records within 5 kilometres of the PCF. It is therefore highly unlikely that the project would impact on Alpine Tree Frog.
- Broad-toothed Rat (EPBC Act: vulnerable; FFG Act: threatened), which is widespread across the Victorian Alps and further afield. Without the mitigation measures described in the Ecological Rehabilitation Plan (Annex H) and Offset Strategy (Annex F), the project would result in the loss of 5.278 hectares of suitable habitat for Broad-toothed Rat. Broad-toothed Rat within and around the PCF are not considered to belong to a genetically important population that would be necessary for the continued breeding, dispersal or genetic diversity of the species. Furthermore, implementation of mitigation measures outlined in the ERP and Offset Strategy would result in the project having no long-term impact on Broad-toothed Rat.
- Mountain Daisy (FFG Act: threatened) is restricted to the Snowy Plains and Bogong and Dargo High Plains, approximately 50 kilometres from the PCF. The species was not observed within the PCF during the flora and fauna assessment and has no historical records from Mount Buller. It is therefore highly unlikely that the project would impact on Mountain Daisy.
- Mountain Pygmy-possum (EPBC Act: endangered; FFG Act: threatened) has a very restricted Victorian distribution across three genetically distinct wild populations, one of which occurs on Mt Buller. No suitable habitat for the species is within the PCF (Figure 6). The PCF is around 200 metres from the nearest preferred habitat (at its closest point) and the species is highly unlikely to disperse across the PCF, where there is low protective cover. While Mountain Pygmy-possum near the PCF belong to a genetically important population that is necessary for the continued breeding, dispersal or genetic diversity of the species, the project is highly unlikely to impact upon this population.

In accordance with the Biodiversity Assessment Guidelines and policy guidance from DELWP regarding Alternative Specific Offset Arrangements, specific offsets will be provided for all impacts on 0.005% or more of modelled important habitat for rare or threatened species (Annex F). For example, the proposed 261-hectare offset site at Mt Stirling, as documented in the Offset Strategy (Annex F), would secure in perpetuity:

- 64.686 specific units of habitat for Alpine Bog Skink
- 12.603 specific units of habitat for Alpine tree Frog
- 41.778 specific units of habitat for Broad-toothed Rat
- 21.257 specific units of habitat for Mountain Daisy
- 64.828 specific units of habitat for Mountain Pygmy-possum.

These offsets exceed the offset requirements for the project, as detailed in the Biodiversity Impacts and Offset Requirements (BIOR) report issued by DELWP (Annex F). The BIOR report indicates that the offset requirements for Alpine Bog Skink, Alpine Tree Frog, Broad-toothed Rat, Mountain Daisy and Mountain Pygmy-possum habitat are 7.446, 0, 0, 8.332 and 0 specific units of habitat respectively.

Figure 2: Mountain Pygmy-possum habitat at Mount Buller

An assessment on the potential for 'significant' impact on Victoria's Biodiversity has also occurred as part of the consideration of the Planning Application, refer to Annex R – Impact on Victoria's Biodiversity.

Water Environments

Alpine Bogs are groundwater dependent ecosystems, restricted to permanently wet sites, and can therefore be considered aquatic ecosystems. They are listed as a threatened community under the FFG Act and as an endangered ecological community under the EPBC Act. Alpine Bogs occur nearby but outside the PCF. In total, 2,149 hectares are present at Mt Buller, of which 2,007 hectares occur downslope of the PCF. No Alpine Bogs will be directly affected or removed by the project. There is potential for indirect impacts on 0.898 hectares of downslope Alpine Bogs through changes to hydrology (drying of groundwater sources), caused by the footprint of the water storage and embankment.

It is unknown as to whether the duration of this impact will be short, medium or long term. Nevertheless, the Offset Strategy provides (Annex F) native vegetation offsets for this potential impact on Alpine Bogs, as a precautionary measure in case impact mitigation measures fail and the potential impact materialises. Offsets for impacts on Alpine Bogs would be provided in accordance with the Victorian Biodiversity Assessment Guidelines and EPBC Act Offsets Policy.

Impacts to 0.898 hectares of Alpine Bogs amounts to approximately 41.79% of the Alpine Bog ecological community at Mt Buller, 1.46% within the Goulburn Broken Catchment and 0.02% in Victoria. This is potentially an extensive or major effect at a local scale but not at a regional or State level.

A mitigation program for Alpine Bogs has been developed; refer to Annex G – Hydrological and Ecological Monitoring and Adaptive Management Program.

Landscape Values and Soils

The Mt Buller Alpine Resort is bordered in part by the Alpine National Park. The PCF would be approximately 1 kilometre from the border of the Alpine National Park at its closest point.

The Alpine Resort Planning Scheme and the Hume Regional Growth Plan does not specifically identify the PCF has having landscape values of regional significance and no Significant Landscape Overlay applies to or nearby the PCF. Nevertheless, the land is recognised as being within a broader area which contains landscape values (and as such Clause 12.04-2 is considered relevant) and as such a Visual Impact Assessment has been undertaken to consider the potential for detrimental impacts on the landscape. Refer to Annex I – Landscape and Visual Impact Assessment.

The visual impact assessment has shown that the project would not be visible from the Alpine National Park due to distance and topography (Annex I). Therefore, neither the construction nor the operation of the project would have extensive or major effects on landscape values of the Alpine National Park or broader area, noting the PCF is within a Managed Landscape area, which is characterised by being within the skifield and comprising skifield and village infrastructure, including existing water storages.

Any effects on the local landscape will be mitigated through extensive post-construction revegetation and rehabilitation (as defined in the ERP), which will reinstate 5,278 hectares of native vegetation and result in no net loss of native vegetation within the PCF.

Extensive or major effects on land stability, acid sulphate soils or highly erodible soils are unlikely over the short term, noting the recommendations of the Geotechnical Risk Assessment (Annex J- Geotechnical Risk) and additional considerations to occur at Detail Design stage. Refer to Section 14 of this referral for additional information.

There is a very low risk of acid sulphate soils occurring within the PCF, refer Section 14 of this referral and Annex J- Geotechnical Risk.

Social Environments

The project is unlikely to have a significant effect on social environments. Temporary closure of the Mount Buller Summit from the Mount Buller Village to the summit carpark would be required

for one summer during the construction period for the project. The Summit Road would be re-aligned, resulting in a small reduction to ski field terrain. In addition, the project would require decommissioning of the Boggy Creek T-Bar (although this was already planned to occur and its removal is supported by Buller Ski Lifts). The effects on social environments from these activities is not likely to be significant.

13. Water environments

Will the project require significant volumes of fresh water (eg. > 1 GI/yr)?

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

It is noted that the realisation of the project will not change the existing allowable volume of water to be extracted as per the existing licence issued by Goulburn Murray Water.

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

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

Runoff and overflow from the water storage will be discharged into downslope Alpine Bogs, after being appropriately filtered of sediments, as part of the environmental watering regime for Alpine Bogs (refer to section 3). Drainage around the periphery of the water storage has been designed to direct run-off along the natural flow paths towards downslope Alpine Bogs, with priority given to the Alpine Bogs considered most likely to experience reductions in surface or groundwater flows. The storage embankment has also been designed to incorporate an internal drainage system to control groundwater pressure. Groundwater seepage under the footprint of the water storage will be collected and redistributed to priority Alpine Bogs downslope through the environmental watering system of pipes and discharge pits, installed during construction with the aim of maintaining the hydrological regime of the downslope Alpine Bogs for the lifetime of the water storage.

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

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

There is potential for indirect impacts on 0.898 hectares of downslope Alpine Bogs due to changed hydrological regimes caused by the water storage, but this indirect impact will be limited to a maximum of 0.090 hectares through successful implementation of the HEMAMP (involving environmental watering).

There has been no long-term flow monitoring of the Boggy Creek which is an unregulated waterway and a tributary of the Delatite River (a sub-catchment of the Goulburn River).

The proposal does not seek to alter the annual licensed diversion volume permitted by the G-MW water licence for the Mt Buller resort, in accordance with the diversion limits which have been developed for the Delatite River.

Extraction of water from the Boggy Creek will be limited to the winter fill period when flows in the creek are generally at their greatest. Implementation of the proposal would mean that no water extraction would be undertaken in the summer time when waterway flows are generally at their lowest. The retention of summertime flows in the Boggy Creek, and to some extent the broader Delatite River catchment, is considered to be beneficial to the aquatic ecosystems present.

It should be noted that a large proportion of the water extracted from Boggy Creek for snowmaking purposes would be used within the Boggy Creek catchment. Water from snowmelt would therefore be returned to the same catchment and in the non-extraction period would continue to discharge to the Delatite River.

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

NYD No Yes If yes, specify which water environments.

Alpine Bogs are likely to provide habitat for Broad-toothed Rat *Mastacomys fuscus mordicus* (EPBC Act: vulnerable; FFG Act: threatened). While Boggy Creek is not known to support Barred

Galaxias Galaxias fuscus (EPBC Act: endangered; FFG Act: threatened) or Stonefly *Thaumatoperla flaveola* (FFG Act: threatened), these species are known to occur more than 5 kilometres away in other headwaters of the Delatite River catchment.

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

NYD No Yes If yes, please specify.

Could the project affect streamflows?

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

The Project could potentially affect streamflows into downslope Alpine Bogs and into Boggy Creek.

Streamflows into Alpine Bogs will be maintained through environmental watering under the HEMAMP. The RMB is committed to the project meeting environmental needs, as a first priority. This means that demands for environmental water for Alpine Bogs will take priority over other demands, such as demands for potable water or snowmaking, for the lifetime of the water storage facility.

It is noted that there is no proposal to extract more water than allowed under the existing water licence, and the historical practice of summer extraction would cease.

Could regional groundwater resources be affected by the project?

NYD No Yes If yes, describe in what way.

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

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

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

NYD No Yes If yes, describe in what way.

Alpine Bogs are groundwater dependent ecosystem, restricted to permanently wet sites, and can therefore be considered aquatic ecosystems. Alpine Bogs occur nearby but outside the PCF. In total, 2.149 hectares are present at Mt Buller, of which 2.007 hectares occur downslope of the PCF. No Alpine Bogs will be directly affected by the project.

There is potential for indirect impacts on 0.898 hectares of downslope Alpine Bogs through changes to hydrology (drying), caused by the footprint of the water storage and embankment, if mitigation measures outlined in the HEMAMP are not successfully implemented.

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

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

The duration of any indirect impact on downslope Alpine Bogs, whether short, medium or long term, is unknown.

If the mitigation measures proposed by the HEMAMP were to totally fail, indirect impacts to 0.898 hectares of Alpine Bog would amount to approximately 41.79% of the Alpine Bog ecological community at Mt Buller, 1.46% within the Goulburn Broken Catchment and 0.02% in Victoria. This is potentially an extensive or major effect at a local scale but not at a regional or State level.

Is mitigation of potential effects on water environments proposed?

NYD No Yes If yes, please briefly describe.

A number of design considerations will mitigate impacts on Alpine Bogs. Runoff and overflow from the water storage will be discharged into downslope Alpine Bogs, after being appropriately filtered of sediments, as part of the environmental watering regime to maintain the Alpine Bogs. The

environmental watering system has been designed with valves, which will control the volume of water being delivered by each discharge pit. If necessary (e.g. if overflow from the water storage is excessive), the valves will allow for excess water to be discharged to the downslope aqueduct. A detailed HEMAMP has been developed and updated in April 2017 in response to comments from DELWP (refer Annex G).

Drainage around the periphery of the water storage has been designed to direct run-off along the natural flow paths towards downslope Alpine Bogs, with priority given to the Alpine Bogs considered most likely to experience reductions in surface or groundwater flows. The storage embankment has also been designed to incorporate an internal drainage system to control groundwater pressure. Groundwater seepage under the footprint of the water storage will be collected and redistributed to priority Alpine Bogs downslope through the environmental watering system of pipes and discharge pits, installed during construction with the aim of maintaining the hydrological regime of the downslope Alpine Bogs for the lifetime of the water storage.

The HEMAMP provides for additional mitigation measures that will conserve the downslope Alpine Bogs. Under the HEMAMP, environmental watering and weeding of Alpine Bogs will be informed by rigorous annual monitoring and triggered by defined performance criteria. Environmental watering will be achieved through a simple but effective watering system and water will be provided to the Alpine Bog in priority to all other water demands within the Resort. Ongoing weeding will ensure that atypical and introduced flora species do not invade the Alpine Bogs.

These measures would minimise the indirect impacts on Alpine Bogs. The expected 'worst case scenario' outcome after implementation of these mitigation measures would be 0.090 hectares of Alpine Bog indirectly affected, which is approximately 4.2% of the Alpine Bog ecological community at Mt Buller, 0.15% within the Goulburn Broken Catchment and 0.002% in Victoria. This is not considered to be an extensive or major effect on Alpine Bog ecosystems.

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

Investigations relating to aquatic environments around the PCF have been extensive and will continue as part of the HEMAMP (Annex G). There is a high level of confidence in the accuracy of information presented here.

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?

No Yes If yes, please attach.

Please refer to Annex I - Landscape and Visual Impact Assessment and Annex H - Ecological Rehabilitation Plan. Please note that the Landscape Masterplan included in Annex I has been superseded by the more recent Ecological Landscape Plan within Annex H, which was undertaken as part of a response to a request for further information issued as part of the Planning Application process. The Visual Impact Assessment element of Annex I continues to be relevant.

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

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

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

The subject land is covered by Environmental Significance Overlay – Schedule 1 *Burrmys parvus* (Mountain Pygmy-possum) and relates to the significance of that species. The ESO1 does not contain any landscape value considerations.

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

NYD No Yes If yes, please specify.

Whilst no specific studies formally identify the land as holding landscape value, the precinct is broadly acknowledged as having landscape values within state and local policy included in the Alpine Resorts Planning Scheme.

The Hume Regional Growth Plan Background Report identifies Mt Buller and the surrounding areas as being of “Potential areas of scenic landscape amenity”. The Hume Regional Growth Plan recommends additional work is undertaken to investigate what areas do have scenic landscape amenity and to formally recognise that value within the Planning Scheme, however that work is yet to be completed. As such, it is reasonable to rely on the existing State and Local Policy and the findings of the Landscape and Visual Impact Assessment (Annex I).

The objective of Clause 12.04-2 of the State Planning Policy Framework within the Alpine Resorts Planning Scheme is “to protect landscapes and significant open spaces that contribute to character, identity and sustainable environments”.

Clause 21.05-2 Mt Buller Resort Strategic Statement - Vision – Strategic Framework within the Alpine Resorts Planning Scheme includes the following policy:

“to conserve and protect the natural environmental systems and landscape values within and adjacent to the Mt Buller Alpine Resort so as to minimise disturbance to flora and fauna communities and to areas of high scenic quality or visual sensitivity.

Clause 21.05-3 contains Objectives – Strategies and Implementation policies. The Environmental and Landscape Values includes an overview, as follows:

*“The Resort is in a sensitive alpine environment that has significant conservation, scenic, tourism and recreational values. The sub-alpine environment as a whole is a valuable resource forming an important part of the Australian landscape. Protection of the environment aids the maintenance of biodiversity and provides important habitat for flora and fauna within the Resort. The Mountain Pygmy-possum (*Burrmys parvus*) is listed as a threatened species in the Flora and Fauna Guarantee Act 1988 (Schedule 2) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.*

Further, Objective 4 of Tourism and Recreation is also relevant, as follows:

“To ensure that development in the ski fields is appropriate to its intended use and does not adversely impact upon the environmental and landscape values of the Resort.
Strategies

- *Encourage the development and management of skifield terrain and facilities will be encouraged within the skifields as shown on the Strategic Land Use Framework Plans.*
- *Ensure that the skifields will be used and developed primarily for providing facilities for snow based recreational activities.*
- *Ensure that the environmental and visual impact of potential future lift stations and associated infrastructure in the skifields is minimised by careful siting and design.*
- *Ensure any development within the skifields is in accordance with the Skifields Management Plan that is prepared to the satisfaction of the Responsible Authority and the Mt Buller and Mt Stirling Alpine Resort Management Board.*

The Landscape and Visual Impact Assessment (Annex I) provides a detailed review of the potential for landscape and visual impacts.

Significantly, it has been identified that the PCF is within the Managed Landscape area of Mt Buller, sited within the Skifield Development area which contains skifield and village infrastructure, including existing water storage facilities.

The values of the landscape are considered to be from the PCF looking out towards the surrounding Alpine National Park, and in this regard the proposed water storage facility would not impact the significant views out beyond the skifield. This is discussed in more detail below.

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

NYD No Yes If yes, please specify.

Much of the broader area is surrounded by the Alpine National Park.

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

NYD No Yes If yes, please specify.

The land of Mt Buller Resort is public land (Crown Land (reserved)), managed by the Mt Buller Mt Stirling Resort Alpine Management Board.

The Alpine Resort (Management) Act 1997 specifies that the land is to be used primarily for alpine recreation and tourism in all seasons of the year and by persons from varied cultural and economic groups (S.1A(b)). The purpose of the use of the land is considered significant when considering the potential impact on the landscape. See discussion below regarding expectations of alpine report and modifications to landscapes.

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

NYD No Yes If yes, please briefly describe.

The PCF is identified as being within a 'Managed Landscape', meaning a landscape which has been modified (as is part of the ski field) and is managed, as opposed to the 'Natural Landscape' which surrounds the more intensely developed areas of the Mt Buller Resort. Consideration has been given to the values within winter (snow) and summer.

In the foreground the view is dominated by ski related infrastructure. This includes buildings scattered at different orientations, ski lifts (consisting of loading stations, support poles, cables and chairs) running at different angles, water storage dams and snow fences. There are also cleared areas for roads and ski runs which make up the ski areas. The only population centre within the study area is Mt Buller village. It is important to note that when coming to an alpine resort, visitors expect to see a modified landscape. Visitors have an understanding that the land is used as a ski area, and in this regard visitors accept infrastructure and modifications to the land within the ski field. As long as the infrastructure is treated in an appealing way, it can be used to enhance visitors experience.

The landscape beyond the foreground consists of rolling mountains with large areas of Alpine meadow dotted with copses of Snow Gums. The summit of Mt Buller is at an elevation of 1,805 metres. Its elevation and openness give a feeling of 'wide-open' landscape with wide views of the Alpine region extending for very long distances in all directions. The extensive open views of the Alpine National Park in the middle ground and background dwarf the individual and the specific landscape features within it.

The project would modify the landscape. The Ecological Rehabilitation Plan (Annex H) outlines the extensive considerations as to how the land would be rehabilitated post construction. These mitigation, revegetation and rehabilitation measures are outlined in more detail within the section below.

Setting aside the mitigation, revegetation and rehabilitation measures, it is significant to note that the foreground view of the landscape will not be significantly altered in its character (which is of a modified landscape). The foreground view is one of ski related infrastructure, including other existing storage dams, ski lifts, buildings and fences. Therefore, whilst the project would be a visible change it would not be considered to alter the landscape character or values and would be considered to respond to the visitor experience as per the Ecological Rehabilitation Plan detailed within Annex H.

Furthermore, the project would not impact the landscape beyond the foreground to the 'Natural Landscape' views of rolling mountains and the Alpine National Park.

In this regard, while there would be changes to the landscape, these changes would not be considered to affect landscape values as the changes would occur within the foreground of an existing modified landscape.

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

NYD No Yes Please briefly explain response.

As outlined above, the landscape of the immediate PCF is one of the ski field and other infrastructure and development, and in this regard the changes would be consistent with this landscape.

Is mitigation of potential landscape effects proposed?

NYD No Yes If yes, please briefly describe.

Given the site is within the ski field, and noting the importance of Mt Buller not only in terms of its landscape and environmental values, but also its alpine recreational values for Victorians, considerable thought has gone into how the water storage facility can be used as an opportunity to respond to the landscape and contribute to the recreation opportunities and minimise visual interruption and detrimental impacts on the landscape.

Rehabilitation, revegetation and habitat creation

The Ecological Rehabilitation Plan (Annex H) is demonstrative of this approach, which combines an opportunity to rehabilitate and revegetate the land, provide additional habitat and also incorporate appropriate recreation and interpretive opportunities.

The Ecological Rehabilitation Plan specifies the revegetation proposed. The revegetation has regard to the existing EVC's of the relevant revegetation zone, and takes the opportunity to increase native vegetation cover by planting indigenous heath species and inhibiting the spread of introduced species.

The long term outcomes are specified by the Ecological Rehabilitation Plan:

- No overall loss of key pre-construction ecological values:
 - A dense cover of native vegetation will be re-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 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:

- New habitat for Mountain Pygmy Possum will be created within the PCF (no habitat currently 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.

Recreation, place making and amenity

In addition to the revegetation opportunities which mitigate the impacts to the landscape, amenity landscaping is also proposed, which provides recreational and interpretive benefits to the Resort and respond to the localised landscape as a 'Managed Landscape'.

The 'Control Centre' location is currently a thoroughfare where hikers, bikers, skiers and snowboarders pass through on their way to other locations. 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.

In this regard, the recreation, place making and amenity elements of the Landscape Masterplan are considered to provide benefit to the localised 'Managed Landscape' in that they improve the immediate amenity, support place interpretation and enhance recreation opportunities.

The Landscape Masterplan includes the following elements (these are taken from the ERP in Annex H):

Blending into the landscape

The project would create visual change, with a large area used for construction. 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. Refer to Annex H for the Ecological Rehabilitation Plan which includes the Landscape Masterplan, and the photomontages in the Landscape and Visual Impact Assessment within Annex I (noting the Concept Landscape Plan within Annex I – Landscape and Visual Impact Assessment has been superseded by the Landscape Masterplan within Annex H – Ecological Rehabilitation Plan).

It is also pertinent to note that while the Project Construction Footprint covers an area of 10.347ha, only 1.75ha would be permanently occupied by new or existing infrastructure. The remaining 8.60ha will be temporarily disturbed during the construction process and subject to post-construction rehabilitation.

Trails, tracks and trailheads

A lakeside trail would surround the water storage. In places, it will be located near the edge of the water body and in other places it will veer away from the edge to provide a different recreational experience.

The trail along the south side of the lake is designed as part of the gravel road. On the north, east and west side of the lake the trail will be a narrow (maximum 1.2 metres wide) path designed to meander unobtrusively through the landscape. It will wind its way down the batter in a series of switchbacks and join up with the existing Summit Nature Walk. Outcrops of logs and boulders along the trail and throughout the batter will be functional, provide fauna habitat and act as educational and recreational features in summer and winter.

The gravel carpark at the end of the summit car park road is home to an important trailhead to the Summit.

Trailhead amenities including seating, interpretive signage, a map, shelter, bike racks and summer-time BBQs will be located here.

Interpretation

There is significant opportunity to provide interpretive signage along the trails and at the trailheads. Each segment of trail will focus on a different aspect of alpine and sub-alpine culture

and environment. The Summit Nature Walk may feature additional Indigenous cultural history. The trail along the eastern side of the water storage may feature information about alpine and sub-alpine flora and fauna, while the viewing deck may feature information about the water storage facility and the effects of climate change on alpine regions.

Safety

Opportunities exist to allow visitors to get close to the water's edge to interact with the water. An all year round decorative 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.

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

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

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

Soils

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

NYD No Yes If yes, please briefly describe.

A Geotechnical Risk Assessment (Annex J) and a Peer Review of the Geotechnical Risk Assessment (Annex K) has been completed for the project.

The subject land is within an EMO and the potential for effects on land stability and geotechnical hazard and risk has been a key consideration for the project. Extensive geotechnical investigations were undertaken for the concept design stage from November 2013 to March 2014. Investigations have primarily focussed on the storage location. Additional details on the geotechnical hazards identified are provided within the section below, or refer to Annexes J and K for additional detail.

The geotechnical risk assessment undertook a qualitative (screening) risk assessment in accordance with the requirements of the EMO. The results of the qualitative risk assessment indicate that all the hazards identified have an initial risk rating of between "Very Low" and "Very High".

Based on the mitigation measures to be implemented in the design and specified for the construction of the Mt Buller Off-Stream Storage Project, the residual risk to and from the proposed project has been assessed qualitatively as "Very Low", "Low" or "Moderate" for all reviewed geohazards, providing all control measures are implemented. Risk control and mitigation measures are listed in the following section.

The residual risks associated with the above qualitative screening process which were considered to be "Moderate" were subsequently assessed in a more detailed semi-quantitative process (as per the EMO / Planning Scheme requirements). The "Moderate" hazards requiring further assessment were:

- Slope instability of the break tank cutting (due to the consequence of a failure on project infrastructure ie. an un-retained or unsupported section of the excavation failing and impacting the tank)
- Construction of pipeline trenches through a historical landslide zone – this is during

construction only and not during operation when no geotechnical hazard will be present
Environmental watering system due to the historical instability which has given rise to
springs (construction and operation)

This additional and more detailed assessment process concluded that these residual risks were
"acceptable" in terms of risk to life.

The EMO does not require that geotechnical risks to the environment are assessed. In recognition
that geotechnical failures may also have an impact on environmental assets, a series of
geotechnical hazards to the environment (native vegetation, habitat, listed species, waterways
and visual amenity) were also qualitatively assessed. The risk mitigation and control measures
are essentially the same as those previously proposed (outlined in the section below). It was
concluded that the risk to environmental assets in areas adjoining the project site were "Very Low"
to "Low". A different assessment method was adopted with differing failure types (small and large
scale failures) and consequence criteria due to the differing nature of environmental assets to
property and people (environmental assets being generally over a larger and broader area).

All geotechnical risks to people, property or the environment were identified as having a "Low" or
upon further assessment "acceptable" level of risk. It should be noted that whilst the qualitative
and semi quantitative assessment processes utilise different terminology an "acceptable" level of
risk could be equated to a "low" level of risk.

Based on the results of the qualitative and semi quantitative assessments undertaken, and the
risk mitigation measures proposed, there are no geotechnical risks identified which would
preclude the construction and operation of the water storage and ancillary infrastructure in the
currently proposed locations.

Risks associated with storage dam construction and operation are to be assessed during the
detailed design stage of the project via a separate process overseen by DELWP, and in
accordance with ANCOLD and ICOLD guidelines. This separate quantitative and probabilistic
process determines whether the level of risk to life, property and the environment is acceptable.
Risks must be determined as "acceptable" in order for the storage to be constructed.

A review of the CSIRO Australian Soil Resource Information System indicates that there is an
extremely low risk of encountering acid sulphate soils (ASS). Geotechnical investigations indicate
that the carbonaceous mudstone which is present on the storage dam site may contain
disseminated pyrite. Pyrite may potentially oxidise upon exposure and produce acid. This hazard
will be assessed at the detailed design stage by targeted sampling and laboratory testing, and if
necessary management measures to avoid / mitigate ASS (such as the addition of lime to
neutralise any acid) would be developed. The risk of encountering acid sulphate soils is
considered low.

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

NYD No Yes If yes, please briefly describe.

A hazard analysis was undertaken to determine potential geohazards (Annex J – Geotechnical Risk). The following hazards were identified:

- Large and small shallow translational / rotational landslides (pre and post construction) in existing historical landslide zones
- Small and medium translational slides (during construction of pipe trenches)
- Slope instability at stockpile sites (during construction)
- Slope instability of trenches (during construction of pipelines)
- Erosion along backfilled trenches due to springs (construction)
- Slope instability from the cutting of material to create the break (storage) tank site (construction)
- Slope instability due to excavations for infrastructure – pump station, aqueduct outlet, (construction)
- Slope instability due to environmental watering system (construction and operation)

The control measures to mitigate the risks for each piece of infrastructure are listed below. Mitigation measures associated with risks associated with the dam structure will be detailed and incorporated into the storage design at the detailed design stage in accordance with ANCOLD guidelines.

Storage dam site

- Engineering design and slope stability assessment would be undertaken during detailed design to confirm the batter angles for the storage excavation based on parameters obtained from further laboratory testing
- During construction the excavation batter angles would be constructed at or below angles recommended by geotechnical engineer for permanent and temporary slopes
- Excavation works are to be halted during and immediately following adverse weather
- Cut excavations are to be inspected by a geotechnical engineer at regular intervals during construction
- The storage embankment batter angles are to be designed with FoS of >1.5
- The storage is to be fully lined with the inclusion of an under liner drainage system to collect leakage in order to minimise the risk of embankment internal erosion
- The outer face of the fill embankment would be protected from erosion by the use of vegetation, rock armour or erosion protection matting, or a combination of these methods.

Stockpile areas

- Stockpiles would not go beyond their designated boundaries (particularly at the Control Centre Carpark)
- Adequate under stockpile drainage is to be installed at the eastern stockpile area.

Pipelines

- Excavation angles would be constructed at or below angles recommended by a geotechnical engineer for both temporary and permanent batter slopes
- Works are to be halted in adverse weather
- Restrict lengths of open trenches through the landslide zone to 10 m in excavated length.
- Cut excavations are to be inspected by a geotechnical engineer at regular intervals

- Localised flattening of batters would be undertaken where trenches intersect springs
- Trenches are to include impermeable water stops to prevent erosion along backfilled trenches in the event that the trench intersects springs.

Pump station to north of proposed storage location

:

- Excavation angles are to be constructed at or below angles recommended by a geotechnical engineer for both temporary and permanent batter slopes
- Works are to be halted in adverse weather
- Cut excavations are to be inspected by a geotechnical engineer at regular intervals
- Works are to be positioned away from existing springs and areas of instability.

Aqueduct outlet

- Excavation angles are to be constructed at or below angles recommended by a geotechnical engineer for both temporary and permanent batter slopes
- Works are to be halted in adverse weather
- Cut excavations are to be inspected by a geotechnical engineer at regular intervals
- Works are to be positioned away from existing springs and areas of instability.

Environmental watering system

- Excavation angles are to be constructed at or below angles recommended by a geotechnical engineer for both temporary and permanent batter slopes
- Works are to be halted in adverse weather
- Cut excavations are to be inspected by geotechnical engineer at regular intervals. Localised flattening of batters would be undertaken where trenches intersect springs
- Trenches are to include impermeable water stops to prevent erosion along backfilled trenches in the event that the trench intersects springs
- Water inflow volumes into the bog areas would not exceed the water flow entering the areas prior to construction. Careful management of the water flow will be undertaken
- Regular and thorough maintenance checks of structures and pipelines would be undertaken
- Leaking pipes or pits would be repaired immediately
- Any watering would only be undertaken in accordance with a project specific Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP) based on pre-determined trigger levels and associated monitoring.

Operational life of constructed infrastructure

- Regular and thorough maintenance checks of structures and pipelines would be undertaken
- Leaking pipes, tanks or storage would be repaired immediately
- Erosion protection measures would be used to prevent or halt any erosion
- The project area would be monitored for stability and movement on a regular basis (before and after snow season). If areas of movement or instability are observed a geotechnical engineer would be consulted immediately.

General mitigation methods

General mitigation methods associated with works associated with good hillside practice would also be followed across the project area. These practices would include:

- Minimising the extent of vegetation cleared during construction and reinstatement of vegetation post construction, where possible;
- Enduring adequate drainage of water across the site
- Construction is to be completed over the summer period
- Visual inspection of the storage is to be undertaken before and after snow season in order to identify any deterioration
- All cut excavations are to be inspected by a geotechnical engineer or engineering geologist during construction
- Any water seepages or leaks noticed around the storage location or associated infrastructure would be investigated and repaired as soon as practical
- No excavations into or at base of steep slopes (slopes greater than 2H:1V) would be undertaken without inspection and approval by a geotechnical engineer or engineering geologist
- Erosion protection works would be applied to batters to prevent erosion and to promote revegetation.

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

The independent geotechnical peer review undertaken (Annex K) noted that the risk assessment would be updated during the detailed design process, and recommended a number of additional investigations be undertaken at this stage.

12. Native vegetation, flora and fauna

Native vegetation

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

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

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

A detailed Flora and Fauna Assessment of the PCF and surrounding study area was undertaken in 2013 and 2014 by qualified ecologists (FFA Report Annex). The assessment included native vegetation mapping and vegetation quality assessments in accordance with:

- The Permitted clearing of native vegetation - Biodiversity assessment guidelines (an incorporated document within the Victoria Planning Provisions)
- Ecological Vegetation Class (EVC) benchmarks published by DELWP
- DELWP's Vegetation Quality Assessment Manual.

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

NYD Estimated area is 6.177 hectares, which includes 5.278 hectares of native vegetation within the PCF and 0.898 hectares of downslope Alpine Bogs, which will be indirectly impacted if no mitigation measures are successfully implemented.

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

N/A approx. percent (if applicable)

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

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

The following EVCs would be affected:

- 5.194 hectares of Alpine Grassy Heathland (EVC 1004), within the PCF
- 0.085 hectares of Sub-alpine Woodland (EVC 43), within the PCF
- 0.898 hectares of Sub-alpine Wet Heathland (EVC 210), which is synonymous with Alpine Bogs downslope of the PCF (this figure is a 'worst case scenario' that assumes that no mitigation measures are successfully implemented).

Have potential vegetation offsets been identified as yet?

NYD Yes If yes, please briefly describe.

Data for 6.177 hectares of native vegetation impacts (including removal of vegetation within the PCF and the expected indirect impacts to native vegetation outside of the PCF) were submitted to DELWP for preparation of a Biodiversity Impact and Offset Requirements (BIOR) Report in accordance with the Biodiversity Assessment Guidelines. The BIOR Report prescribes the following offset requirements:

- A general offset of 1.102 general units, with a minimum strategic biodiversity score of 0.774.
- Specific habitat offsets for 18 rare or threatened species (see section 11 for species requiring offsets).

Finding and securing specific offsets in Victoria's alpine resorts is challenging due to issues of:

- Restricted species distribution
- Land tenure (alpine resorts are public land)
- Limited survey effort away from developed areas in the resorts, thereby compromising the accuracy and completeness of DELWP's habitat importance maps
- Taxonomic revisions not captured in the database records used to construct DELWP's habitat models, thereby compromising the accuracy of habitat importance maps.

An Offset Strategy that proposes an alternative offset arrangement has been prepared and approved by DELWP (Annex F). This strategy demonstrates that a proposed offset area of 261 hectares, encompassing the summit and upper slopes of Mt Stirling, would provide the following:

- An offset area that meets DELWP's offset eligibility criteria
- An excess in general biodiversity equivalence units (GBEUs) to meet the general offset requirements for the project
- Modelled important habitat for all of the 18 species requiring specific offsets
- An excess of specific biodiversity equivalence units (SBEUs) for 17 of the 18 species requiring specific offsets, if surveyed habitat from field assessments is accepted in addition to modelled habitat
- A shortfall of SBEUs for one of the species requiring specific offsets, Fog Club-sedge *Isolepis montivaga*.

Sufficient specific offsets for Fog Club-sedge are available at an offset site at Falls Creek Alpine Resort. The RMB proposes to secure the shortfall in offsets for Fog Club-sedge at Falls Creek, subject to an agreement being reached with the Falls Creek Alpine Resort Management Board. DELWP has indicated that this would be an appropriate means of securing the shortfall in offsets.

The Mt Stirling offset site is currently Crown land that forms part of the Mt Stirling Alpine Resort and is within a Public Park and Recreation Zone. The offset site would be secured by implementation of an agreement (e.g. under Section 18B of the Victorian *Crown Land (Reserves) Act 1978*) resulting in nature conservation being the primary land management objective within the offset area.

Other locations within the Mt Buller and Mt Stirling Alpine Resorts or the offset program being scoped by Falls Creek Alpine Resort provide alternative options to secure the shortfall in specific offsets for Fog Club-sedge.

The Letter of Approval of Alternative Offset Strategy from DELWP is included within Annex F.

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

Information relating to native vegetation is considered accurate. A total of 5.278 hectares of remnant patch vegetation would be directly removed for construction of the water storage and ancillary infrastructure. For the purposes of determining offset requirements, a further 0.898 hectares of native vegetation which may be indirectly impacted by the project has been assumed lost for the purpose of calculating offsets for the project, to account for the potential drying of downslope Alpine Bogs, which may occur if all mitigation measures fail. Measures for mitigating impacts on native vegetation and associated habitat for flora and fauna are outlined in the Offset Strategy (outlined above; Annex F), Ecological Rehabilitation Plan (ERP; Annex H) and Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP; Annex G).

Ecological Rehabilitation Plan

The Ecological Rehabilitation Plan (ERP; Annex H) provides a protocol for rehabilitating the PCF through landscaping, revegetation and habitat creation after construction of the water storage. Within five years of construction, the following outcomes will have been achieved within the PCF under the ERP:

- No overall loss of key pre-construction ecological values:
 - A dense cover of native vegetation (mostly Alpine Grassy Heathland) will be re-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 before and five years after construction.
 - 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:
 - New habitat for Mountain Pygmy Possum will be created within the PCF (no habitat currently exists within the PCF) through strategic placement of rocks and boulders salvaged during construction.
 - 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.

All revegetation will take place using indigenous species appropriate to the pre-construction

Ecological Vegetation Classes (EVCs) that existed within the PCF. Indigenous species will be sourced from seed, cuttings and sods salvaged from the PCF before construction. There is a high level of confidence that the ERP will result in no net loss of habitat for Alpine Bog Skink or Broad-toothed Rat within the PCF. As part of the ERP, at least five years of rehabilitation monitoring will take place to ensure that these outcomes are met.

Hydrological and Ecological Monitoring and Adaptive Management Program

Mitigation measures defined in the HEMAMP (environmental watering and weeding) are designed to minimise the risk of any indirect impacts on Alpine Bogs. The HEMAMP was updated in April 2017 to incorporate comments received from DEWLP and the Arthur Rylah Institute, which suggested that monitoring and management be simplified. Environmental watering will be achieved through a watering system installed during construction and water will be provided to the Alpine Bog in priority to all other water demands within the Resort. Ongoing weeding will ensure that atypical and introduced flora species do not invade the Alpine Bogs.

The expected 'worst case scenario' outcome after successful implementation of these mitigation measures would be the indirect loss of 0.090 hectares of Alpine Bog, which is equal to 10% of the unmitigated impacts on downslope Alpine Bogs (0.898 hectares). This accounts for uncertainty associated with the complex hydrogeology of the area and the response of the Alpine Bogs to this hydrogeology. If the loss of 0.090 hectares of Alpine Bog eventuates, it is likely to be a long-term impact, given that regeneration of characteristic Sphagnum Moss and underlying peat can take many years or decades and may not occur if soils no longer become waterlogged. An area of 0.090 hectares of Alpine Bog amounts to approximately 4.2% of the Alpine Bog ecological community at Mt Buller, 0.15% within the Goulburn Broken Catchment and 0.002% in Victoria. This is not considered to be an extensive or major effect on Alpine Bog ecosystems (Annex E).

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done?

(provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

A detailed Flora and Fauna Assessment of the PCF and surrounding study area was undertaken in 2013 and 2014 by qualified ecologists (Annex E).

The assessment was undertaken in early summer and mid-autumn, which is considered a suitable time of year for conducting ecological surveys in alpine areas. The timing of the field assessment was appropriate for detection of the majority (but not all) of the significant flora and fauna species known or predicted to occur within 5 kilometres of the PCF (within the local area).

Additional species may have been recorded if the field assessment had been undertaken in mid-summer, when more ephemeral flora species are flowering and alpine fauna are particularly active. However, the timing of the field assessment is not a significant limitation to this assessment of the overall biodiversity values of the site.

Targeted surveys for significant flora or fauna species, such as flora quadrat surveys or fauna trapping, were not undertaken as part of the field assessment. The desktop assessment suggested that targeted surveys may be required for certain significant fauna species with potential to occur within the PCF, including:

- Mountain Pygmy-possum *Burramys parvus*
- Broad-toothed Rat *Mastacomys fuscus mordicus*
- Alpine Bog Skink *Pseudemoia cryodroma*.

The need for targeted surveys for these species was ruled out for the following reasons:

- The PCF contains no Mountain Pygmy-possum habitat (D. Heinze, pers. comm., 4 June 2015) and while individuals may occasionally disperse through the atypical habitat of the PCF to reach more optimal habitat, it is likely to be a very infrequent occurrence.
- The general fauna survey techniques employed were considered sufficient to detect the presence of Broad-toothed Rat and Alpine Bog Skink. Indeed, the general fauna survey confirmed the presence of Broad-toothed Rat and Alpine Bog Skink within the PCF.

The absence of targeted surveys from this assessment is not considered to significantly constrain the conclusions reached within this report, due to the records obtained during the field assessment, the detailed habitat assessments undertaken and the detailed information available on the presence of species in the local area from databases, such as the Victorian Biodiversity Atlas, and numerous other sources including extensive field surveys over many years within the Resort.

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

NYD No Yes If yes, please:

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

Species Listed as Threatened under the EPBC Act and/or FFG Act

The following threatened species have been recorded or are predicted to occur within 5 kilometres of the PCF:

- Alpine Bog Skink *Pseudemoia cryodroma*
- Alpine Tree Frog *Litoria verreauxii alpina*
- Austral Moonwort *Botrychium australe*
- Australian Painted Snipe *Rostratula australis*
- Blue-tongue Greenhood *Pterostylis oreophila*
- Broad-toothed Rat *Mastacomys fuscus mordicus*
- Brown Toadlet *Pseudophryne bibronii*
- Clover Glycine *Glycine latrobeana*
- Greater Glider *Petauroides volans*
- Grey-headed Flying-fox *Pteropus poliocephalus*
- Growling Grass Frog *Litoria raniformis*
- Guthega Skink *Liopholis guthega*
- Long-footed Potoroo *Potorous longipes*
- Mignonette Leek-orchid *Prasophyllum morgani*
- Mountain Pygmy-possum *Burramys parvus*
- Powerful Owl *Ninox strenua*
- Smoky Mouse *Pseudomys fumeus*
- Spot-tailed Quoll *Dasyurus maculatus maculatus* (SE mainland population)
- Spotted Tree Frog *Litoria spenceri*
- Swift Parrot *Lathamus discolor*

Broad-toothed Rat *Mastacomys fuscus mordicus* was detected within the PCF on the basis of indirect signs for the species (scats, tunnels and runs). Alpine Bog Skink *Pseudemoia cryodroma* was seen within the PCF. All other threatened species listed above are considered unlikely or highly unlikely to occur within the PCF, generally due to lack of suitable habitat.

Migratory Species Listed under the EPBC Act

The following migratory species have been recorded or are predicted to occur within 5 kilometres of the PCF:

- Black-faced Monarch *Monarcha melanopsis*
- Fork-tailed Swift *Apus pacificus*
- Latham's Snipe *Gallinago hardwickii*
- Rufous Fantail *Rhipidura rufifrons*
- Satin Flycatcher *Myiagra cyanoleuca*
- White-throated Needletail *Hirundapus caudacutus*
- Yellow Wagtail *Motacilla flava*.

No migratory species were recorded within the PCF during the Flora and Fauna Assessment.

Threatened Ecological Communities Listed under the EPBC Act and/or FFG Act

Two significant ecological communities are known within 5 kilometres of the PCF:

- Alpine Bogs, known as Alpine Sphagnum Bogs and Associated Fens (endangered) under the EPBC Act and as the Alpine Bog Community (threatened) under the FFG Act.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (listed as critically endangered under the EPBC Act).

No significant ecological communities occur within the PCF, although Alpine Bogs occur immediately downslope of the PCF (refer to section 13). White Box *Eucalyptus albens*, Yellow Box *Eucalyptus melliodora* and Blakely's Red Gum *Eucalyptus blakeyi* are lowland species, rarely found at elevations higher than 500 metres ASL. The presence of this grassy woodland and derived native grassland community within or near the PCF (which is higher than 1630 metres ASL) could therefore be discounted. The field assessment confirmed this.

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

The following threatening processes may be exacerbated by the project if no mitigation measures are implemented:

- Habitat loss and fragmentation (Broad-toothed Rat and Alpine Bog Skink)
- Habitat change and resource depletion due to weeds (Broad-toothed Rat, Alpine Bog Skink and Alpine Bogs)
- Climate change (Alpine Bogs)
- Tourism and other human infrastructure (Alpine Bogs).

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

NYD No Yes If yes, please:

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

The following threatened species and threatened ecological community would potentially be affected by the project:

- Alpine Bogs
- Alpine Bog Skink
- Broad-toothed Rat

As outlined in Section 11, there is potential for 0.898 hectares of Alpine Bog to be indirectly impacted if mitigation measures are not implemented. This amounts to approximately 0.02% of the Alpine Bog ecological community in Victoria, which is not considered to be a significant area in the context of the overall area of the Alpine Bog community in Victoria.

Broad-toothed Rat is widespread across the Victorian Alps and further afield. Without mitigation measures, the project would result in loss of 5.278 hectares of suitable habitat for Broad-toothed Rat. Broad-toothed Rat within and around the PCF are not considered to belong to a genetically important population that would be necessary for the continued breeding, dispersal or genetic diversity of the species.

Alpine Bog Skink is widespread across the Victorian Alps. Without mitigation measures, the project would result in loss of 5.278 hectares of suitable habitat for Alpine Bog Skink. However, Alpine Bog Skink within and around the PCF are not considered to belong to a genetically important population that would be necessary for the continued breeding, dispersal or genetic diversity of the species.

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

NYD No Yes If yes, please briefly describe.

Considerable effort has been invested in designing measures to avoid, manage and mitigate impacts on indigenous flora and fauna. Through an iterative process, the results of which are

shown in Annex B – Design Summary and Figure 7, the design of the project has been refined to:

- Avoid all direct impacts on Alpine Bogs.
- Reduce proposed native vegetation removal by more than 10%.
- Minimise removal of habitat for Broad-toothed Rat and other fauna.
- Increase the minimum buffer between the PCF and preferred Mountain Pygmy-possum habitat from 70 metres to 200 metres.

There are three main programs that have been developed to further mitigate potential effects on indigenous flora and fauna. These are the Ecological Rehabilitation Plan (ERP; Annex H), Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP; Annex G) and Offset Strategy (Annex F).

The ERP provides a protocol for rehabilitating the PCF through landscaping, revegetation and habitat creation after construction of the water storage. Within five years of construction, the following outcomes will have been achieved within the PCF under the ERP:

- No overall loss of key pre-construction ecological values:
 - A dense cover of native vegetation (mostly Alpine Grassy Heathland) will be re-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 when measured five years after construction.
 - 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:
 - New habitat for Mountain Pygmy Possum will be created within the PCF (no habitat currently exists within the PCF) through strategic placement of rocks and boulders salvaged during construction.
 - 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.

All revegetation will take place using indigenous species appropriate to the pre-construction Ecological Vegetation Classes (EVCs) that existed within the PCF. Indigenous species will be sourced from seed, cuttings and sods salvaged from the PCF before construction. There is a high level of confidence that the ERP will result in no net loss of habitat for Alpine Bog Skink or Broad-toothed Rat within the PCF. As part of the ERP, at least five years of rehabilitation monitoring will take place to ensure that these outcomes are met.

The HEMAMP (Annex G) provides a protocol for monitoring and managing Alpine Bogs that are downslope of the PCF and that are likely to be indirectly affected by the water storage altering local hydrology. Under the HEMAMP, annual monitoring of climate, hydrology and ecology at Alpine Bogs in control and impact sites will inform adaptive management of the Alpine Bogs. Adaptive management will consist of proactive and reactive environmental watering and weeding. Adaptive management will achieve outcomes that meet the following performance criteria, which aim to maintain the status quo within the Alpine Bogs at the impact sites, relative to the control sites:

- The 'extent' criterion – no more than a 10% reduction in the total combined area of the affected Alpine Bogs, relative to control sites.
- The 'composition' criterion – no more than a 10% reduction in the total 'bog-dependent' native flora species richness of the affected Alpine Bogs, relative to control sites.
- The 'encroachment' criteria – no more than a 10% increase in the cover of 'non-bog-dependent' species within affected Alpine Bogs, relative to control sites, and weed cover will not exceed 5%.
- The 'structure' criterion – no more than a 10% reduction in the average cover of sphagnum moss (*Sphagnum* spp.) within the affected Alpine Bogs, relative to control sites.

The Offset Strategy proposes an alternative specific offset arrangement, to offset removal of native vegetation and habitat for rare and threatened species. Importantly, the Offset Strategy proposes to meet the offset requirements of a 'worst case scenario' that assumes that the ERP and HEMAMP are ineffective. This is despite the high level of confidence that the outcomes and performance criteria of the ERP and HEMAMP will be achieved. The Offset Strategy demonstrates that a proposed offset area of 261 hectares at Mt Stirling could provide an excess

in general biodiversity equivalence units (GBEUs) to meet the general offset requirements for the project and an excess of specific biodiversity equivalence units (SBEUs) for 17 of the 18 species requiring specific offsets. The Offset Strategy has been approved by DELWP and the approval letter is included within Annex F.

A fence will be constructed around the water storage and it is not considered likely that the water storage will pose risk to fauna (noting experiences from other water storages facilities such as the one at Mt Hotham). Nevertheless, subject to detail design, measures to allow animals (and humans) an opportunity to climb up the dam liner in case they accidentally fall in are likely to be included.

Figure 7: Comparison of original and revised project construction footprint.

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

Investigations relating to indigenous flora and fauna that could be effected by the project have been extensive. There is a high level of confidence in the information presented here.

15. Social environments

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

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

The water storage facility may support an increased number of visitors, which may cause an increase in traffic, which will be managed through the resorts existing traffic management procedure (noting the RMB are required to provide services in the nature of roads and transport under the S. 38(1)(d)).

While it is not expected that significant volumes of road traffic will be created during construction, some change in the volume of traffic will occur. Given construction will occur during the 'summer' months where visitation is lower, the increase is not considered to be significant, with the exception of when events are held at Mt Buller, which attract higher levels of visitation than are typical during the summer season.

As specified within the SEMP, a Traffic Management Plan will be prepared and implemented if required by the RMB.

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

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

The resort has minimal permanent population, particularly during the green season when construction is to occur. Care will be taken to avoid conflict occurring between construction and any events, which occur on mountain.

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

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

As above.

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

NYD No Yes If yes, briefly describe potential effects.

As above.

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

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

Minor realignment of an existing road and small reduction of ski field terrain to occur from the project, as well as decommissioning of Boggy Creek T-Bar (which was already planned to occur and its removal is supported by Buller Ski Lifts).

It is noted that the minor impact to recreational area would be mitigated through landscaping, as shown within the Ecological Landscape Plan within Annex H through supporting additional recreation opportunities in the form of ski-recreation, walking paths and passive recreation opportunities around the water storage facility.

Temporary closure of the Mount Buller Summit from the Mount Buller Village to the summit carpark would be required for one summer during the construction period for the project. The Summit Road would be re-aligned, resulting in a small reduction to ski field terrain. In addition, the project would require decommissioning of the Boggy Creek T-Bar (although this was already planned to occur and its removal is supported by Buller Ski Lifts). The effects on social environments from these activities is not likely to be significant and RMB will manage the construction impacts as part of their responsibilities.

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

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

Is mitigation of potential social effects proposed?

NYD No Yes If yes, please briefly describe.

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

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

No If no, list any organisations that it is proposed to consult.
 Yes If yes, list the organisations so far consulted.

Consultation has been undertaken with the Taungurung Clans Aboriginal Corporation, which is the Registered Aboriginal Party for the region, under the Victorian *Aboriginal Heritage Act 2006*

What investigations of cultural heritage in the project area have been done?

(attach details of method and results of any surveys for the project & describe their accuracy)

CHMP 12912: Mt Buller Off-stream Storage Dam Project (GHD 2014)

Refer to Annex M for copies of the original CHMP (GHD 2014) and the amended CHMP (Biosis 2016).

A mandatory Cultural Heritage Management Plan (CHMP 12912) was undertaken for the project by GHD on behalf of the Mount Buller and Mount Stirling Alpine Resort Management Board (RMB) in 2014. Construction of a building or carrying out of works in an alpine resort is considered a high impact activity if the construction of the building or the carrying out of works would result in significant ground disturbance (r.47 of the Victorian Aboriginal Heritage Regulations 2007). The Activity Area lies within designated areas of cultural heritage sensitivity associated with a named waterway (Boggy Creek) and the high plains landform, under r.23 and r.30 of the Regulations. A high impact activity undertaken within a designated area of sensitivity would trigger a mandatory CHMP under s.46(a) of the Victorian *Aboriginal Heritage Act 2006*.

The CHMP investigation comprised a desktop assessment, an archaeological ground survey of the Activity Area and archaeological subsurface testing. The investigation was directed by Sharne Thomas (GHD), who is a qualified archaeologist and is listed as a Heritage Advisor by Aboriginal Victoria for the purposes of the Victorian Aboriginal Heritage Act 2006. The investigation was undertaken in consultation with, and with the participation of the Taungurung Clans Aboriginal Corporation (TCAC), which is the Registered Aboriginal Party (RAP) for the region.

The desktop assessment showed that no Aboriginal heritage places had been recorded within or close to the Activity Area and that the nearest Aboriginal place lies 2.5 kilometres from the Activity Area. A number of archaeological studies had been previously undertaken in the wider region surrounding the Activity Area including a previous CHMP approved in 2010 for the Northside Precinct Redevelopment (CHMP 11467) which includes part of the present Activity Area. The desktop assessment showed that the Activity Area had been partly disturbed by previous ground works, including the installation of ski runs and associated infrastructure.

No additional Aboriginal cultural heritage was recorded during the ground survey or the subsurface testing for CHMP 12912. The subsurface testing for the investigation comprised two 1 metre x 1 metre test pits and 44 shovel test pits, which systematically tested all of the areas of potential cultural heritage sensitivity. The CHMP evaluation concluded that no Aboriginal places would be impacted by the proposed development, and that it was unlikely that any undetected Aboriginal places would be impacted by the works. As a management task, the CHMP requires that a cultural heritage induction should be provided for works contractors, in line with standard requirements by the TCAC RAP for CHMPs in their country. This is to inform works contractors of their obligations under the Act and the procedures for the reporting of any cultural heritage found under the contingencies provisions of the CHMP.

CHMP 12912 was evaluated by the TCAC, as RAP for the region, and was approved by the RAP on 31st July 2014. The evaluation notice stated that the submitted CHMP met the standards

prescribed under the Victorian Aboriginal Heritage Act 2006 and was presented in the approved format. The approved CHMP was lodged with the Victorian Aboriginal Heritage Register.

CHMP 12912 Amendment: Mt Buller Sustainable Water Security Project - Off-stream Storage (Biosis Pty Ltd 2016)

As a result of proposed changes to the project development footprint and designs following the approval of CHMP 12912, the RMB commissioned Biosis Pty Ltd to prepare an amendment of the approved CHMP under s.66A of the Victorian *Aboriginal Heritage Act 2006*. The CHMP Amendment was undertaken in consultation with the TCAC, as RAP for the region, who evaluated and approved the original CHMP in 2014. The CHMP amendment was prepared by Martin Lawler (Biosis Pty Ltd) who is a qualified archaeologist and is listed as a Heritage Advisor by Aboriginal Victoria for the purposes of the Victorian Aboriginal Heritage Act 2006.

The amendments reflected changes to the development footprint and designs in order to minimise impacts to native vegetation. The Activity Area of the amended CHMP corresponds to the revised PCF and current design of the project. (The original CHMP related to the PCF of the original design subject to the now superseded planning application). Updated searches of the Victorian Aboriginal Heritage Register showed that no Aboriginal cultural heritage places or areas of sensitivity had been identified within or surrounding the Activity Area since the submission of the original CHMP in July 2014.

The amended Activity Area for the proposed works is largely the same as that of the original approved CHMP with the removal of two outlying parts of the development footprint and the addition of two small areas to the original Activity Area. The amended Activity Area is 10.35 hectares in area, and is smaller than the previously approved area of 18.9 hectares. Because the amended Activity Area had been investigated under the original CHMP, there was no requirement to undertake additional field investigation for the amended CHMP.

The cultural heritage assessment, including the results of the previous CHMP fieldwork and consultation with the RAP for the amendment, showed that the amended design is unlikely to impact on undetected Aboriginal cultural heritage. At the request of the RAP and in consultation with the RMB, the amended CHMP included two additional management tasks. These are:

- The use of species native to Mount Buller, where possible, as part of the Site Environmental Management Plan and Rehabilitation Plan; and
- On-site Cultural Heritage Interpretation and Education Facilities, to be developed jointly by the RMB and TCAC.

The amended CHMP 12912 was submitted to the TCAC for evaluation. The TCAC approved the CHMP amendment on 30 November 2016. The evaluation notice stated that the submitted CHMP met the standards prescribed under the Victorian *Aboriginal Heritage Act 2006* and was presented in the approved format. The approved CHMP amendment was lodged with the Victorian Aboriginal Heritage Register.

Assessment of accuracy

The proposed development has been the subject of a detailed cultural heritage investigation undertaken for CHMP 12912 in 2014, which included a ground survey and subsurface testing undertaken by archaeologists in consultation with the RAP. Ground surface visibility for the survey was noted as being poor apart from areas of exposed tracks, but the survey demonstrated the extent of previous ground disturbance. The subsurface testing, comprising two 1m x 1m test pits and 44 shovel test pits, provided good coverage of all areas of potential including the proposed water storage area.

The original CHMP was evaluated by the RAP and was shown to meet the standards required for CHMPs under the Victorian *Aboriginal Heritage Act 2006*. The CHMP was approved by the RAP and lodged with the Victorian Aboriginal Heritage Register. A CHMP amendment was undertaken in 2016 following the decision to alter the design of the works. The CHMP amendment has updated the background searches and reassessed the cultural heritage potential of the Activity Area. The results of this assessment confirmed that the proposed works will not impact any

Aboriginal cultural heritage places and are unlikely to impact any undetected Aboriginal places. The CHMP amendment was evaluated by the RAP and formally approved in 2016.

The preparation of the original CHMP assessment in 2014 and its further reassessment under a CHMP amendment in 2016 together provide a high level of confidence in the findings of the evaluation report.

Is any Aboriginal cultural heritage known from the project area?

NYD No Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby
- Sites or areas of sensitivity identified by representatives of Indigenous organisations

Through the CHMP process a search of the Aboriginal Cultural Heritage Register Information System (ACHRIS) indicated that the Activity Area lies within designated areas of cultural sensitivity associated with Waterways (Boggy Creek) and High Plains, defined under the Aboriginal Heritage Regulations 2007 (r.23 and r.30). These are regional landforms which have potential for Aboriginal cultural heritage and which have been mapped with the specific purpose of triggering the requirement for a mandatory CHMP if a high impact activity is proposed within those areas. The broad designated areas of regional sensitivity are not intended to show where Aboriginal places are most likely to be found, however, and each CHMP must determine specific areas of potential based on detailed investigations.

The results of the desktop assessment and ground survey for CHMP 12912 did not identify any areas of sensitivity for Aboriginal places and concluded that much of the area had low potential for undetected Aboriginal cultural heritage because of the nature of the landforms and the extent of previous disturbance. Comprehensive subsurface testing did not detect any Aboriginal cultural heritage.

Representatives of the RAP participated at each stage of the investigation and formal consultation was undertaken between the archaeologists, the RAP and RMB to discuss the results of each stage of investigation. No areas of sensitivity for undetected Aboriginal cultural heritage were identified by the RAP. This also agrees with the results of the assessment undertaken for CHMP 11467 in 2010, which overlapped with part of the present CHMP Activity Area, and which concluded that the area had been disturbed and had low potential for undetected Aboriginal cultural heritage.

The desktop assessment for CHMP 12912 showed that within the geographic region surrounding the Activity Area a total of 23 Aboriginal cultural heritage places have been previously recorded. All recorded places are lithic artefact distributions, mostly found along ridgelines or level areas near waterways.

No Aboriginal cultural heritage places have been recorded within the Activity Area or in its vicinity. The nearest registered place (VAHR 8123-0003) lies approximately 2.5 kilometres to the east of the Activity Area and is a literature reference to a 'suitable campsite' consisting of edge-ground axes and grinding stones. The exact location of the site described is uncertain.

An updated search of the Victorian Aboriginal Heritage Register (VAHR) through ACHRIS was undertaken for the CHMP amendment on 15 September 2016. The updated search indicated that no additional Aboriginal places had been recorded either within the Activity Area or within the geographic region of the approved CHMP.

No Aboriginal cultural heritage places have been recorded during the course of the assessment.

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

NYD No Yes If yes, please list.

There are no historical places recorded on the Heritage Register or the Heritage Inventory lying within or adjacent to the Activity Area.

The project would not be visible from any registered heritage places.

Is mitigation of potential cultural heritage effects proposed?

NYD No Yes If yes, please briefly describe.

No impacts will be caused to recorded Aboriginal cultural heritage places and there is a low potential of harm to undetected Aboriginal heritage. For this reason, there is no requirement for specific mitigation measures, however the approved amended CHMP does contain management actions.

The approved CHMP amendment (2016) (Annex M) provides certain management requirements to offset any potential harm to undetected cultural heritage. These comprise:

- (1) A Cultural Heritage Compliance Induction for all contractors.
- (2) The use of species native to Mount Buller for the Site Environmental Management Plan and Rehabilitation Plan and the use of sterilised construction machinery to avoid contamination.
- (3) On-site Cultural Heritage interpretation and educational facilities, to be jointly developed by RMB and the TCAC.

The CHMP also contains a set of contingencies for the following:

- (1) Dispute resolution
- (2) Discovery of Aboriginal cultural heritage during works
- (3) Unexpected discovery of human remains
- (4) Reporting discovery of Aboriginal cultural heritage
- (5) Management of Aboriginal cultural heritage
- (6) Reviewing compliance

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

16. Energy, wastes & greenhouse gas emissions

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

- Electricity network. If possible, estimate power requirement/output **Unknown at this stage.**
- Natural gas network. If possible, estimate gas requirement/output
- Generated on-site. If possible, estimate power capacity/output
- Other. Please describe.
- Please add any relevant additional information.

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

- Wastewater. Describe briefly.
- Solid chemical wastes. Describe briefly.
- Excavated material. Describe briefly.
Possibly – material that cannot be reused in the construction of the dam due to the material being unsuitable from a geotechnical safety perspective may be waste, although it is likely to be reused elsewhere on mountain.
- Other. Describe briefly.
If contaminated soil is found as a result of the underground diesel storage tank removal, this material will be removed off-site and managed in accordance with relevant legislation and guidelines.
- Please provide relevant further information, including proposed management of wastes.

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

- Less than 50,000 tonnes of CO₂ equivalent per annum
Please note this is an estimate only.
- Between 50,000 and 100,000 tonnes of CO₂ equivalent per annum
- Between 100,000 and 200,000 tonnes of CO₂ equivalent per annum
- More than 200,000 tonnes of CO₂ equivalent per annum
- Please add any relevant additional information, including any identified mitigation options.

17. Other environmental issues

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

- No Yes If yes, briefly describe.

The realisation of the project would cease the historic and undesirable practice of summer extraction from Boggy Creek.

18. Environmental management

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

- Siting: Please describe briefly

A Multi-Criteria Assessment (MCA) was used to select the site of the water storage. This is described further in Section 4.

- Design: Please describe briefly

The RMB has considerably refined the design of the proposed project to:

- Avoid all direct impacts to Alpine Bogs.
- Reduce proposed native vegetation removal by more than 10%.
- Minimise removal of habitat for Broad-toothed Rat, Alpine Bog Skink and other fauna.

- Increase the minimum buffer between the PCF and preferred Mountain Pygmy-possum habitat from 70 metres for the original PCF to 200 metres for the current revised PCF.

The results of this redesign process (refer Figure 7 to see modifications to PCF) are the primary means by which environmental effects have been avoided and/or minimised for the proposed water storage. The results have been achieved through an iterative process, involving (but not limited to):

- Realignment and narrowing of pipelines and access corridors.
- Moving stockpile locations to existing disturbed areas of non-native vegetation in preference to areas of native vegetation.
- Reducing the overall size of the PCF by almost one hectare.

Environmental management: Please describe briefly.

The HEMAMP, ERP and SEMP are described in Section 11, 12 and 13 and are available in Annex G, H and C respectfully.

Other: Please describe briefly

The approved Native Vegetation Offset Strategy is outlined in Section 13 and is available in Annex F.

Add any relevant additional information.

Landscape and Visual Impact Assessment within Annex I.

19. Other activities

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

NYD No Yes If yes, briefly describe.

20. Investigation program

Study program

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

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

Has a program for future environmental studies been developed?

No Yes If yes, briefly describe.

A Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP) (Annex G) has been developed. This will involve ongoing annual monitoring of the climate, hydrology and ecology of Alpine Bogs at control and impact sites from at least one year before construction, continuing for the lifetime of the water storage. The aim of this monitoring will be to inform adaptive management of Alpine Bogs at downslope impact sites.

Annual monitoring of the Mountain Pygmy-possum *Burramys parvus* population at Mount Buller will continue in accordance with the Mountain Pygmy-possum Recovery Plan.

Monitoring of revegetation and habitat creation within the PCF will take place annually as part of the Ecological Rehabilitation Plan (Annex H) for at least five years post-construction. This monitoring will ensure that the Ecological Rehabilitation Plan's aims and performance criteria are met.

Consultation program

Has a consultation program conducted to date for the project?

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

Ongoing consultation has occurred since the inception of the project, through Mt Buller's existing communications, primarily via email as part of their Resort updates to stakeholders and interested persons.

Formal notification of the current planning occurred for two weeks beginning on the 14 February 2017. Notification occurred through notices onsite, email correspondence to existing stakeholders and a notice in the Mansfield Courier. No objections were received.

Informal notification of the current planning application took place on 14 September 2016 for two weeks, with email notification and signs up in the Village and onsite. No objections were received. This informal notification occurred to ensure notification of the application occurred during the snow season, as it was noted that the formal notification of the application was unlikely to occur until the snow season was over.

In addition to the formal notification and consultation process, letters of support have been provided by the following organisations:

- Alpine Resorts Co-ordinating Council on 5 July 2016
- Buller Ski Lifts on 4 July 2016
- CFA on 6 July 2016
- Mt Buller Club Lodge Working Group on 1 July 2016
- GMW on 6 July 2016
- Mansfield Mt Buller High Country Reservations on 1 July 2016
- Mansfield Secondary College on 4 July 2016
- Mt Buller Chamber of Commerce on 1 July 2016
- Mt. Buller Ratepayers Association on 6 July 2016
- Tourism and Transport Forum Australia on 1 July 2016
- Tourism North East on 5 July 2016
- Victorian Snowsports Association on 1 July 2016.

Has a program for future consultation been developed?

NYD No Yes If yes, briefly describe.

Regular project updates from the RMB will be provided via Mt Buller's existing communications stream (email Newsletter).

List of Figures

- A. Figure 1: Locality
- B. Figure 2: Project Concept Design
- C. Figure 3: Design Summary
- D. Figure 4: Project Land
- E. Figure 5: Mt Buller Strategic Land Use Framework Plan
- F. Figure 6: Mountain Pygmy-Possum
- G. Figure 7: Comparison of proposed native vegetation removal for original and revised project construction footprints
- HI. Figure 8: Native Vegetation within the project construction footprint
- JK. Figure 9: Catchment Areas of Alpine Bogs in the Study Area
- L. Figure 10: Snow Making Catchment Area

List of Annexes

1. Annex A– Options Assessment

- A. Options Summary, prepared by GHD (2016);
- AA. Options Report, prepared by GHD (2014);
- AAA. Peer Review of Mt Buller Water Supply Options, prepared by Aither (2017);
- AAAA. Letter of Options Assessment - additional explanation, prepared by GHD (2017);
- AAAAA. Mt Buller Water Security Project – Off Stream Storage, July 2014, prepared by GHD (2014);

2. Annex B – Design Summary, prepared by GHD (2017);

3. Annex C – Site Environmental Management Plan, prepared by ERM (2016);

4. Annex D – Updated Planning Report, prepared by ERM (August 2017)

5. Annex E – Flora and Fauna Report, prepared by Biosis (2016);

6. Annex F– Native Vegetation Offset Strategy

- F. Native Vegetation Offset Strategy, prepared by Biosis (2017)
- FF. Letter of Approval of Alternative Offset Strategy, prepared by DELWP (2017);

7. Annex G – Hydrological and Ecological Monitoring and Adaptive Management Program, prepared by Biosis and GHD (2017);

8. Annex H – Ecological Rehabilitation Plan, prepared by Biosis and Tract (2016);

9. Annex I – Landscape and Visual Impact Assessment, prepared by GHD (2016) [please note the Landscape Masterplan included within Annex B of this report has been superseded by the Landscape Masterplan within Annex H];

10. Annex J – Geotechnical Risk

- J. Geotechnical Risk Assessment, prepared by GHD (2016);
- JJ. Geotechnical Risk Assessment Updated Letter, prepared by GHD (2017);

11. Annex K – Geotechnical Peer Review, prepared by Douglas Partners (2017);

12. Annex L – Letters of Support, prepared by various (compiled by Mt Buller Mt Stirling Resort Management Board);

13. Annex – Cultural Heritage Management Plan

- M. Cultural Heritage Management Plan 12912 Letter of Amendment Approval
- MM. Cultural Heritage Management Plan 12912 Notice of Approval Amendment
- MMM. Cultural Heritage Management Plan 12912, Amended 2016, prepared by GHD and Biosis (2016);

14. Annex N – Mt Buller Mt Stirling Resort Management Board and its obligations under the *Alpine Resorts (Management) Act 1997*, prepared by ERM (2016);

15. **Annex O – Strategic Management Plan 2013-2018, prepared by Mt Buller and Mt Stirling Alpine Resort Management Board (2013);**
16. **Annex P –Supply Demand Strategy for Mt Buller, Mt Stirling and Mirimbah Water Supply Systems, prepared by GHD (2013);**
17. **Annex Q – Hydrogeological and Hydrological Assessment, prepared by GHD (2014);
and**
18. **Annex R – Impact on Victoria’s Biodiversity, prepared by Biosis (2017).**

Authorised person for proponent:

I,(full name),
.....(position), confirm that the information
contained in this form is, to my knowledge, true and not misleading.

Signature _____

Date

Person who prepared this referral:

I,(full name),
.....(position), confirm that the information
contained in this form is, to my knowledge, true and not misleading.

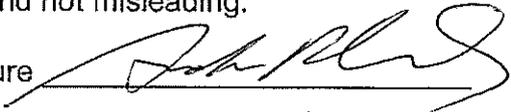
Signature _____

Date

Authorised person for proponent:

I, ANDREW EVANS.....(full name),

DIRECTOR.....(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature 

Date 7/8/17

Person who prepared this referral:

I, Alicia Burnett.....(full name),

Senior Planner.....(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature 

Date 7/8/17