Statement of Environmental Effects

Snowmaking Infrastructure Upgrades, Beginner Bowl

Thredbo Alpine Resort
Kosciuszko National Park

Project No. 23014MO

March 2024

Document Control

Revision	Date	Revision Type	Author	Approved by
A	15.01.2024	Draft	J.Best	C.Chalk
0	19.02.2024	Final	C.Chalk	K.Delpit
1	22.03.2024	ToS updated as per NPWS email 22/03/2024	-	C.Chalk

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Contents

Figures

Tables

1 Introduction

This Statement of Environmental Effects (SEE) has been prepared to support the Development Application (DA) for the Snowmaking Infrastructure Upgrades, Beginner Bowl (hereinafter referred to as the Development).

1.1 Application Details

Table 1: Application Details

Application Details	
Applicant	Kosciuszko Thredbo Pty Ltd (KT)
ABN	95 000 139 015
Applicant Address	1 Friday Drive, Thredbo NSW 2625
Development Address	Thredbo Alpine Resort, Kosciuszko National Park, 2 Friday Drive, Thredbo NSW 2625
Lot/Plan	876/DP1243112
Local Government Area	Snowy Monaro Regional Council
Zoning	Zone C1 – National Parks and Nature Reserves
Planning Instrument	*State Environmental Planning Policy (Precincts – Regional)* 2021 (Precincts – Regional SEPP)
Integrated Development	Not applicable
Consent Authority	Department of Planning, House and Infrastructure
Type of Development	Snowmaking infrastructure
Summary of works	Installation of snowmaking infrastructure Earthworks (trenching and excavation) Rehabilitation works

1.2 Supporting Documentation

Document	**Title**	**Author/Prepared by**	**Document Reference**
Cost Estimate Report	Cost Estimate Report, Snowmaking Infrastructure Upgrades, Beginner Bowl	Kosciuszko Thredbo Pty Ltd	19/02/2024
Site Environmental Management Plan	Site Environmental Management Plan, Snowmaking Infrastructure Upgrades, Beginner Bowl	Kosciuszko Thredbo Pty Ltd	Rev 0
Geotechnical Assessment	Proposed Snowmaking Replacement Works at Beginner Bowl, Friday Flat, Thredbo NSW	Asset Geotechnical Engineering Pty Ltd	7381-R1 Rev 1
Plan	Site Plan	Kosciuszko Thredbo Pty Ltd	Rev 1
Plan	Long Section Overview, Snowmaking Upgrades Beginner Bowl	Kosciuszko Thredbo Pty Ltd, KO	RevA
Plan	SM-BabyBowlLongsection-SHt1	Kosciuszko Thredbo Pty Ltd, KO	Rev0

2 Site Context and Analysis

2.1 Site Location

The Development site is located in Thredbo, within the southern part of KNP, approximately 35 km south-west of Jindabyne in the Snowy Monaro Regional Council Local Government Area (LGA) (refer Error! Reference source not found.). Within the context of the resort, the site is located within the Beginner Bowl at Friday Flat, on land formally described as Lot 876/DP1243112 (**Figure 2**).

2.2 Present and Previous Land Uses

The Development site comprises the existing Beginner Bowl ski area. The snowmaking infrastructure is located on the skiers right of the ski terrain. The site is heavily disturbed comprising snowmaking infrastructure, vehicle access road and mix of exotic and native vegetation. The land uses surrounding the site include vegetation, snowmaking infrastructure, recreational infrastructure, lifting facilities and Friday Flat base building (retail, offices, food and beverage).

2.3 Site Suitability

The site is considered suitable for the proposed Development given the following:

- the site is heavily disturbed;
- the site is a key ski area for first timers, as such the provision of reliable snow cover is critical for winter operations;
- the site does not contain any conservation significant flora or fauna species.

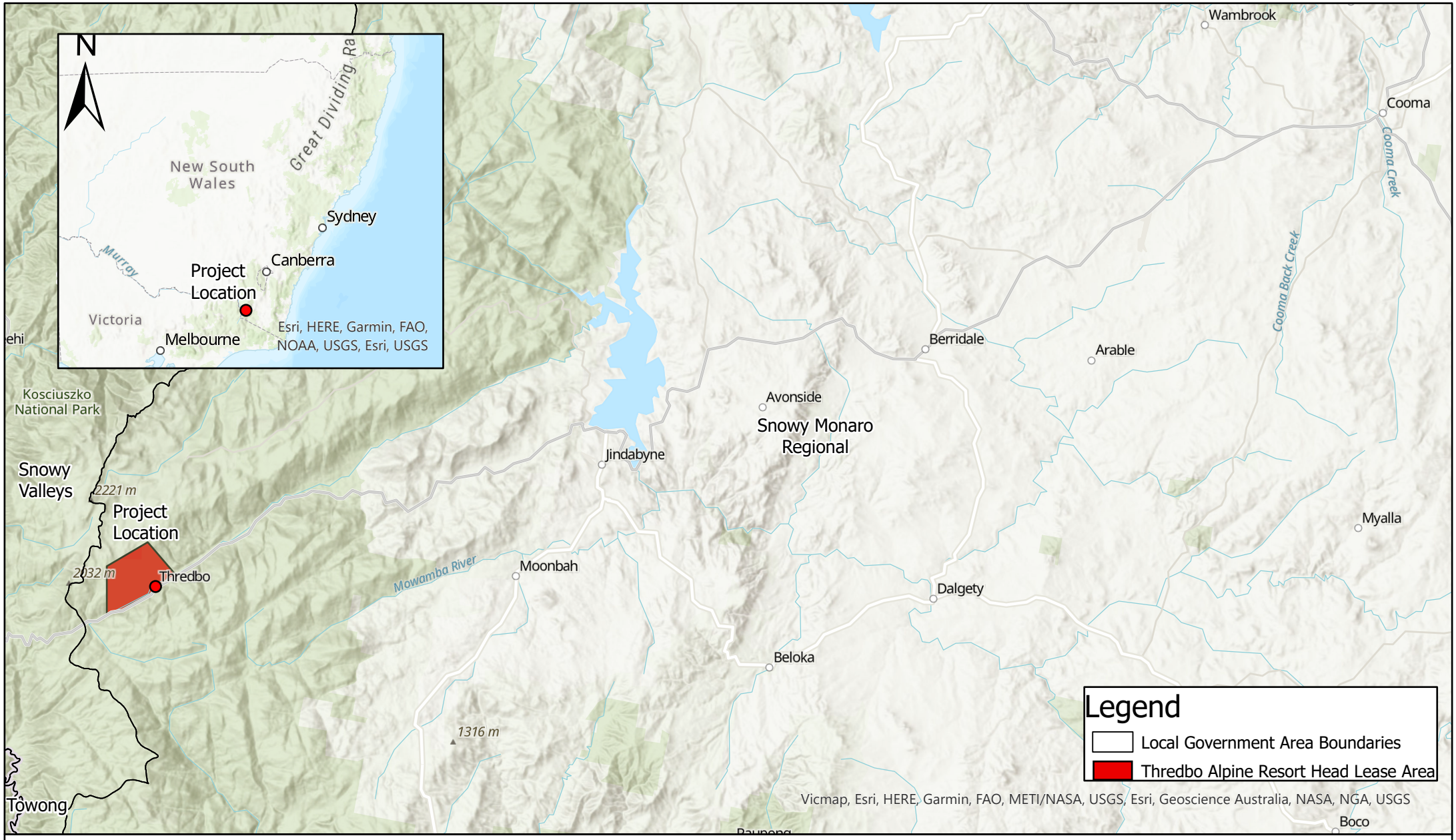
Statement of Environmental Effects

Snowmaking Infrastructure Upgrades, Beginner Bowl

Thredbo Alpine Resort
Kosciuszko National Park

Project No. 23014MO

February 2024



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Kilometers

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

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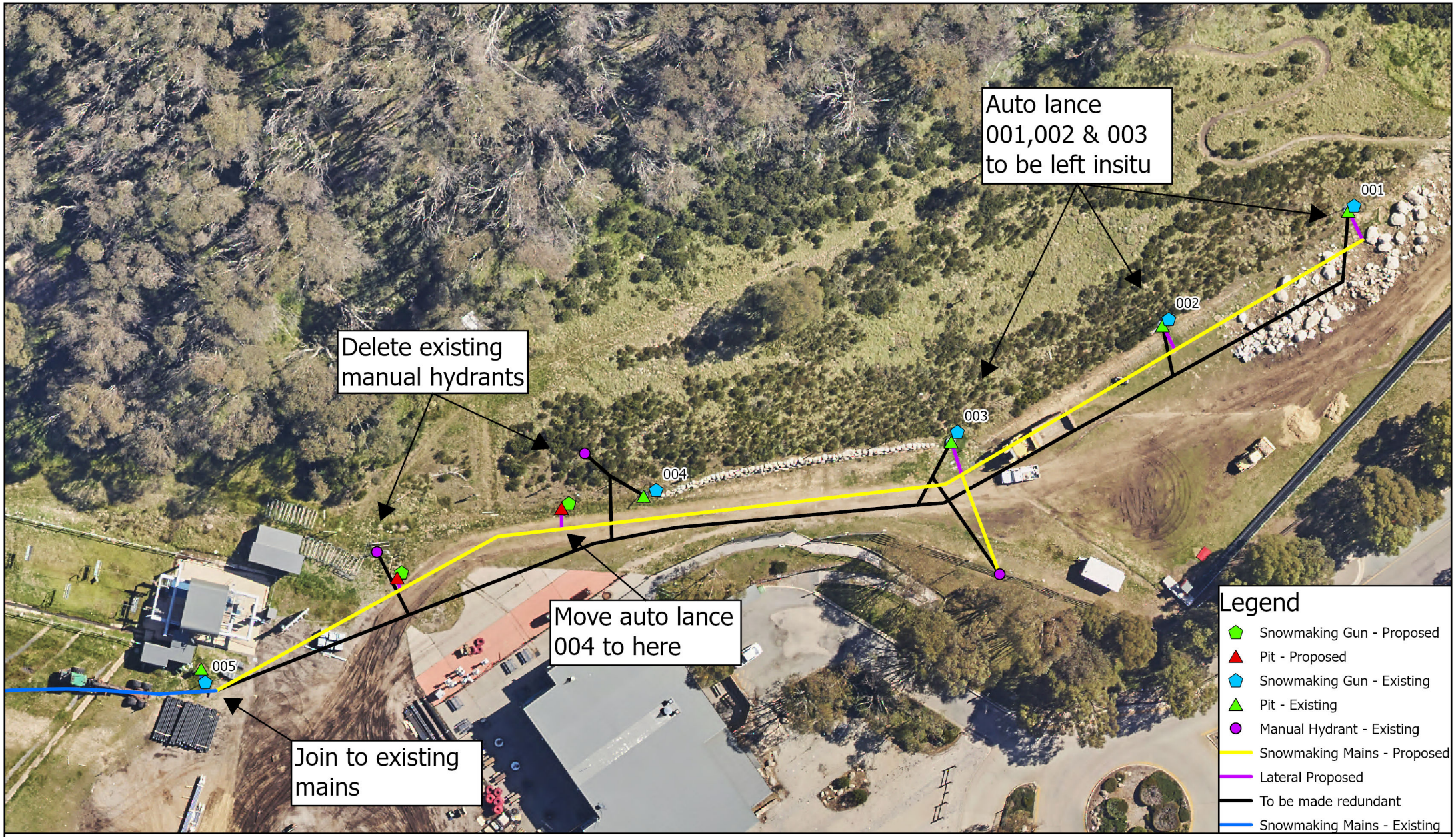
THREDBO

FIGURE 1: REGIONAL SITE CONTEXT

Revision: A

Date: 7/06/2022

Produced By: KO



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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

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THREDBO

SITE PLAN

Project: Snowmaking Upgrades
Beginner Bowl

Revision: 1

Date: 1/11/2023

Produced By: BB

3 Project Description

3.1 Background

KT operate a snowmaking system which provides air and water via pipes to a network of snowmaking guns to produce snow across the resort. The existing infrastructure within the site comprises lance guns which rely on the supply of air, water, electricity and dialog.

3.2 Purpose of the Development

The purpose of the Development is to replace existing snowmaking infrastructure that is nearing the end of its design life. The upgraded infrastructure will increase the efficiency of artificial snowmaking and enhance snow cover in the locality. In response to the challenges posed by the sustainability of natural snow fall within a changing climate, artificial snowmaking improves seasonal length and viability and is considered critical infrastructure for the operation of the resort.

Plate 1: Manual hydrant to be made redundant & installation of lance gun and pit SE of hydrant

Plate 2: Existing manual hydrant to be made redundant & relocate auto lance (004) near sign

Plate 3: Relocate auto lance 004 downslope from retaining wall

Plate 4: Snowmaking mains replacement within disturbed ski slope / access road

Plate 5: Lateral replacement to existing pit (003)

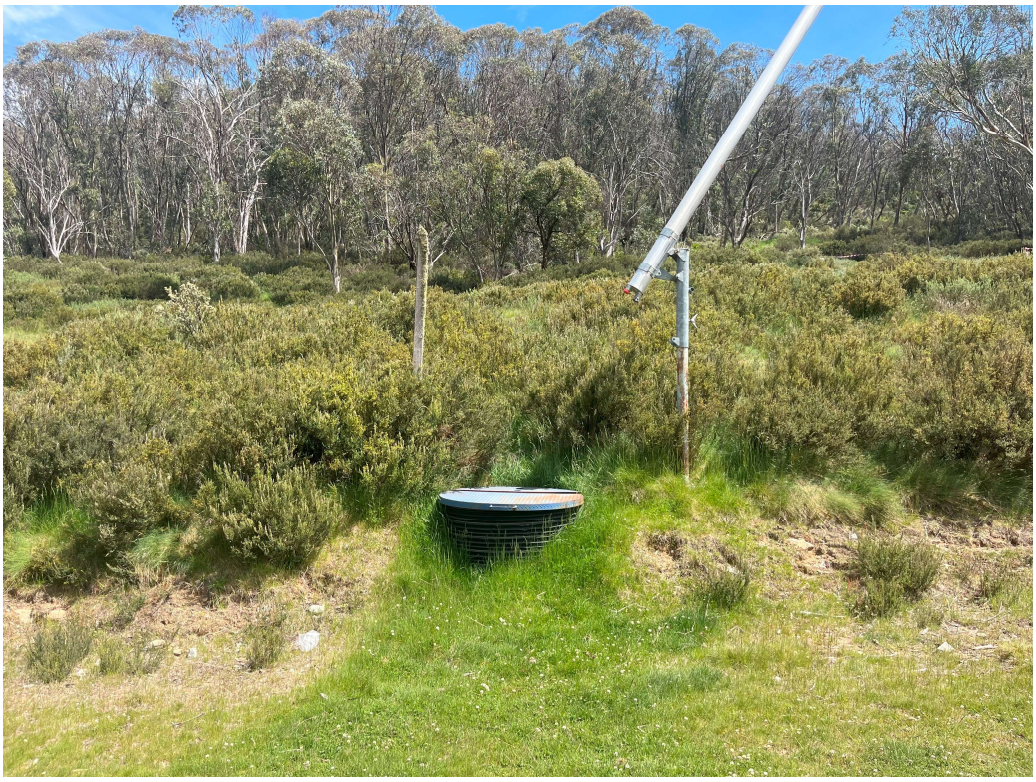

Plate 6: Lateral replacement to existing pit (002)

Plate 7: Lateral replacement to existing pit (001)

Plate 8: Snowmaking mains replacement within disturbed corridor

3.3 Scope of Works

3.3.1 Replacement of snowmaking mains and laterals

The replacement of snowmaking mains within a common trench will include air and water pipes, and power and dialog cable (refer Snowmaking Trench Cross Section in **Appendix A**). The common trench will be approximately 0.8 m wide x 1 m deep. The construction corridor for the mains is approximately 10 m wide.

The installation of laterals off the new snowmaking mains will be required to tie into existing and new pits (refer Snowmaking Laterals Connection Plan in **Appendix A**). Laterals to existing pits will include air and water pipe, and power and dialog cable. The lateral trench will be approximately 0.60 m wide x 0.6-0.8 m deep. The construction corridor for laterals is approximately 3 m wide.

Pipe specifications are outlined in **Table 2**.

Table 2: Pipe specifications

Pipe	Water	Air
Mains	150NB	150NB
Laterals	50NB	50NB

3.3.2 Snowmaking Guns and Pits

Snowmaking guns and pits 001, 002 and 003 will be left insitu. Snowmaking gun 004 will be relocated closer to the ski run to enable more efficient snow cover. One new snowmaking guns and steel pit will be installed between guns 004 and 005.

3.3.3 Redundant snowmaking infrastructure

To minimise environmental impacts, the existing snowmaking mains and laterals will be left in situ and made redundant, unless they interfere with the new infrastructure. Two existing manual hydrants between 004 and 005 will be made redundant.

3.4 Project Timing

The construction will be carried out during the general "summer construction period" (end of long weekend October to end of April the following year) during the 2024/25 summer. It is estimated to require a construction duration of about two weeks.

3.5 Construction Activities

Pre-construction activities involve site preparation works, which will include:

- Establishment of site boundary, including marking out proposed route; and
- Installation of environmental safeguards i.e. fencing, signage and erosion and sediment controls where required.

The proposed construction program will comprise the following:

- Excavation and trenching to prepare ground for pipe laying and installation of cables;
- Laying of new pipe and cables in common trench and laterals;
- Removal of two existing manual hydrants;
- Excavation and installation of new pits and lances, where required; and
- Backfilling and compaction of excavations.
- Progressive rehabilitation of disturbed areas.

Post-construction activities will comprise:

- Stabilisation and rehabilitation work in accordance with the Rehabilitation Management Plan;
- Removal of erosion and sediment controls;
- Demobilisation of plant and machinery; and
- Site clean-up.

3.6 Construction Management Details

Construction management details are provided in the Site Environmental Management Plan (SEMP) (**Appendix C**).

3.7 Operational Details

The Development will not change access to ski slopes once operational. The snowmaking infrastructure will operate as required during the winter season.

4 Legislation and Planning Instruments

4.1 Legislative Review

4.1.1 Commonwealth

4.1.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act provides a legal framework to protect and manage nationally and internationally important aspects of the Australian environment. The EPBC Act is administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW). Under Part 3 of the EPBC Act, a person must not undertake an action (e.g. a development) that will have, or is likely to have, a significant impact on a protected matter (MNES), without approval from the Australian Government Minister for the Environment.

An EPBC Act referral to the Commonwealth Environment Minister is not recommended as the Development is unlikely to have a significant impact on any MNES or Commonwealth land, refer **Section 6.8**.

4.1.2 State

4.1.2.1 Environmental Planning and Assessment Act 1979 (EP&A Act)

The EP&A Act is the primary piece of legislation governing development within NSW. DPE assesses development proposals within NSW alpine resort areas where the Minister for Planning is the consent authority under Part 4 of the EP&A Act. *National Parks and Wildlife Act 1974* (NPW Act)

The NPW Act governs the establishment, protection, conservation and management of national parks, including the conservation of objects, places or features (including biological diversity) of cultural value within the landscape.

Aboriginal Cultural Heritage

Section 87 of the NPW Act provides that a person who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution if they later unknowingly harm an object without an Aboriginal heritage impacts permit (AHIP).

A due diligence assessment is provided in **Section 6.7.2**.

4.1.2.2 Biodiversity Conservation Act 2016 (BC Act)

The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ESD.

The BC Regulation sets out threshold levels for when the BOS will be triggered. The threshold has two elements:

- whether the amount of native vegetation being cleared exceeds the area threshold; and
- whether the impacts occur on an area mapped on the Biodiversity Values Map (BVM).

If clearing and other impacts, including biodiversity impacts prescribed by Clause 6.1 of the BC Regulation, exceed either trigger, the BOS applies.

The BOS also applies when:

- the 'test of significance' in section 7.3 of the BC Act identifies that the development or activity is likely to significantly effect threatened species or ecological communities, or their habitats;
- or the works are carried out on a declared area of outstanding biodiversity value.

If the BOS is not triggered, the test of significance detailed in section 7.3 of the BC Act must be used to determine whether a local development is likely to significantly affect threatened species.

The Development will not trigger the BOS. A test of significance assessment is provided in **Section 6.3**.

4.2 Planning Framework

4.2.1 Environmental Planning and Assessment Act 1979

4.2.1.1 Matters for consideration (Section 4.15)

(1) Matters for consideration – General	**Evaluation**
(a) the provisions of—	
(i) any environmental planning instrument	The Precincts – Regional SEPP is the only environmental planning instrument which applies to the site for this proposal. An assessment against the relevant sections of the Precincts – Regional SEPP have been addressed in the section below**.**
(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	Not applicable. There are no draft Environmental Planning Instruments that are applicable to the Development.
(iii) any development control plan	Not applicable. There are currently no development control plans applicable to the site.
(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4	Not applicable. There are no planning agreements applicable to Thredbo under the Precincts – Regional SEPP.
(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph)	The DA and supporting information has been prepared in accordance with the relevant requirements of the EP&A Regulation.
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	The likely impacts of the Development on the natural and built environment, and social and economic impacts in the locality have been assessed in **Section 6.5.**
(c) the suitability of the site for the development	The suitability of the site for the Development is described in **Section 2.3.**

(d) any submissions made in accordance with this Act or the regulations	Consideration will be given to submissions made.
(e) the public interest.	The Development is consistent with the aim and objectives of Chapter 4 of the Precincts – Regional SEPP. The Development will augment Thredbo's snowmaking capacity, help to sustain visitation and contribute economic viability of the resort whilst minimising environmental impacts. Therefore, the Development is considered to be within the public interest.

4.2.1.2 Integrated Development

Integrated development requires development consent and one or more of the approvals outlined in Section 4.46 of the EP&A Act. A review of the *Development referrals guideline* (DPIE 2021) has been undertaken to inform this Application. The Development is not integrated development.

4.2.2 Environmental Planning Instruments

4.2.2.1 State Environmental Planning Policy (Precincts – Regional) 2021

Development in NSW alpine resort areas are governed by Chapter 4 (Kosciuszko National Park and alpine resorts) of the Precincts – Regional SEPP. The aim of Chapter 4 is to protect and enhance the Alpine Region by ensuring development is managed with regard to the principles of ecologically sustainable development, including the conservation and restoration of ecological processes, natural systems and biodiversity.

Chapter 4, Relevant Sections	**Evaluation**
Section 4.7 Land Use Table	In accordance with the Land Use Table in Section 4.7 of the Precincts – Regional SEPP, 'snowmaking infrastructure' is permissible development with consent within the Thredbo Alpine Resort.
Section 4.24 Flood Planning	There is no defined flood planning area, flood planning level or reference to adopted mapping under the Precincts – Regional SEPP. No further consideration is required.
Section 4.25 Earthworks	
(1) The objective of this section is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.	The Development is consistent with the objective.
(2) Development consent is required for earthworks in the Alpine Region unless— (a) the earthworks are exempt development under this Chapter or another environmental planning instrument, or (b) the earthworks are ancillary to—	This SEE forms part of the DA seeking Development Consent for the proposal.

Chapter 4, Relevant Sections	Evaluation
(i) development permitted without consent under this Chapter, or (ii) development for which development consent has been given.	
(3) In deciding whether to grant development consent for earthworks, or for development involving ancillary earthworks, the consent authority must consider the following matters— (a) the likely disruption of, or adverse impact on, drainage patterns and soil stability in the locality of the development, (b) the effect of the development on the likely future use or redevelopment of the land, (c) the quality of the fill or the soil to be excavated, or both, (d) the effect of the development on the existing and likely amenity of adjoining properties, (e) the source of any fill material and the destination of any excavated material, (f) the likelihood of disturbing relics, (g) the proximity to, and potential for adverse impacts on, a waterway, drinking water catchment or environmentally sensitive area, (h) appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	(a) Unlikely. (b) The effect of the Development is not anticipated to impact upon the future use or redevelopment of the land. (c) The quality of the soil required to be excavated is not likely to change as it will be temporarily stockpiled onsite and reused to backfill excavations. (d) Refer **Section 6.5.** (e) Imported fill material will be sourced from NPWS approved locations. Any excess spoil from excavation works will be transported to an approved location, either within the resort or off-site to a licenced facility. (f) Unlikely, refer **Section 6.8** (g) Adverse impacts unlikely, the site is not located within waterfront land, refer **Section 6.2** (h) Refer to **Section** Error! Reference source not found.**.**
Section 4.28 Consideration of master plans and other documents	
(1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	
(a) the aim and objectives of this Chapter set out in section 4.1,	The Development is consistent with the objectives of Chapter 4, as demonstrated in this report.
(b) (Repealed)	-
(c) a conservation agreement under the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth that applies to the land,	Not applicable.
(d) the Geotechnical Policy —Kosciuszko Alpine Resorts published by the Department in November 2003,	Refer to **Appendix D**
(e) for development in the Perisher Range Alpine Resort— (i) the Perisher Range Resorts Master Plan, published by the National Parks and Wildlife Service in November 2001, and	Not applicable.

Chapter 4, Relevant Sections	Evaluation
(ii) the Perisher Blue Ski Resort Ski Slope Master Plan adopted by the National Parks and Wildlife Service in May 2002.	
(2) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider—	
(a) a master plan approved by the Minister under section 4.26 that applies to the land, or	The Development is consistent with the Snowy Mountains Master Plan.
(b) if a master plan has not been approved—a draft master plan prepared under section 4.26 that is intended to apply to the land and has been published on the NSW planning portal.	Master Plan has been approved.
Section 4.29 Consideration of environmental, geotechnical and other matters	
(1) In deciding whether to grant development consent to development in the Alpine Region, the consent authority must consider the following—	
(a) measures proposed to address geotechnical issues relating to the development,	Refer to the Geotechnical Assessment and Form 4 provided in **Appendix D**.
(b) the extent to which the development will achieve an appropriate balance between— (i) the conservation of the natural environment, and (ii) taking measures to mitigate environmental hazards, including geotechnical hazards, bush fires and flooding,	The proposed geotechnical measures will not result in any significant impacts on the conservation of the natural environment. No measures to mitigate bush fires and flooding are required.
(c) the visual impact of the proposed development, particularly when viewed from the land identified as the Main Range Management Unit in the Kosciuszko National Park Plan of Management,	The visual impacts are considered acceptable. The infrastructure is not visible from the Main Range Management Unit.
(d) the cumulative impacts of development and resource use on the environment of the Alpine Subregion in which the development is carried out,	The Development will not result in any significant adverse impacts on the environment.
(e) the capacity of existing infrastructure and services for transport to and within the Alpine Region to deal with additional usage generated by the development, including in peak periods,	The Development will not impact on the capacity of the existing infrastructure and services for transport. The works comprise upgrades of existing snowmaking infrastructure.
(f) the capacity of existing waste or resource management facilities to deal with additional waste generated by the development, including in peak periods.	The Development will not impact upon the capacity of existing waste or resource management facilities.

Chapter 4, Relevant Sections	Evaluation
(2) For development involving earthworks or stormwater draining works, the consent authority must also consider measures to mitigate adverse impacts associated with the works.	The Development will involve earthworks. Measures to mitigate potential impacts are outlined in the SEMP (**Appendix C**).
(3) For development the consent authority considers will significantly alter the character of an Alpine Subregion, the consent authority must also consider— (a) the existing character of the site and immediate surroundings, and (b) how the development will relate to the Alpine Subregion.	The Development is consistent with the existing land uses within the site and surrounds. The Development will not alter the character of Thredbo.

4.3 Plans and Policies

4.3.1 South East and Tablelands Regional Plan 2036

The *South East and Tablelands Regional Plan 2036* (Regional Plan) provides directions for land use planning for the South-east and tablelands region. The Regional Plan promotes well planned, efficient and sustainable development that complements the area's natural and cultural values.

The Development is consistent with the Regional Plan as it will increase the efficiency of Thredbo's artificial snowmaking operations. Artificial snowmaking improves seasonal length and viability, which may allow the winter visitation period to be maintained or potentially extended.

4.3.2 Snowy Mountains Special Activation Precinct Master Plan 2022

The *Snowy Mountains Special Activation Precinct Master Plan* (DPE 2022) (Snowy SAP Master Plan) is a 40-year plan that sets out the vision, principles, and precinct-wide performance criteria to support the planning controls in three Environmental Planning Instruments (EPIs). It aims to facilitate a safe and sustainable increase in the amount and variety of year-round recreation and accommodation offerings.

The protection of the natural, cultural, and social values of KNP is a primary focus of the Snowy Mountains Special Activation Precinct. KT aims to protect and enhance these values through ecologically sustainable development. Appropriate measures have been incorporated into the design, construction and operational phases to minimise environmental impacts.

4.3.3 Kosciuszko National Park Plan of Management 2006 (KNP PoM)

The *Kosciuszko National Park Plan of Management 2006* (KNP POM) outlines objectives and management strategies to guide the long-term management of values within specific areas of KNP. The Development will improve the quality of the resort experience for guests by improving the quality of snow cover. The potential impacts on key environmental values have been avoided, mitigated and/or managed appropriately through the implementation of appropriate controls. The Development is consistent with the relevant management objectives of the KNP POM.

4.3.4 Geotechnical Policy Kosciuszko Alpine Resorts 2003

The *Geotechnical Policy Kosciuszko Alpine Resorts* (DIPNR 2003) (Geotechnical Policy) applies to the Development as the site is located within the "G" area of the Geotechnical Policy Map, Thredbo (G5), refer **Section 6.1** for details.

5 Assessment Method

5.1 Desktop Assessment

A desktop assessment was carried out to identify relevant environmental values, that potentially occur within the Development area. Database and information sources utilised in the desktop assessment are listed below. The relevant database search results are provided in **Appendix B**.

- Aboriginal Heritage Information Management System Web Services (NSW Government 2023e)
- Biodiversity Values Map and Threshold Tool (NSW Government 2023b)
- Protected Matters Search Tool (DCCEEW 2023)
- NSW BioNet (NSW Government 2023f)
- Water Management (General) Regulation 2018 hydroline spatial data 1.0 (NSW Government 2023c)
- NSW Planning Portal Spatial Viewer (NSW Government 2023a)
- Bush fire prone land mapping tool (RFS 2023).

5.2 Preliminary Site Assessment

A preliminary site assessment was undertaken by KT Project personnel and various technical consultants to validate the desktop assessment results, inform the design process and ensure appropriate environmental controls are implemented to avoid, mitigate and/or management potential impacts on environmental and cultural values.

Representatives from DPE and NPWS inspected the site on 11 October 2023. No matters were raised during the site inspection.

5.3 Technical Assessments

The following technical assessments have been undertaken to inform the Development:

- Geotechnical Assessment and Form 4 (AssetGeoEnviro 2023) (**Appendix D**).

6 Impact Assessment

6.1 Geotechnical Considerations

The Development will have 'minimal or no geotechnical impact' on the site, based on the relatively shallow depths of excavation required, the lack of obvious signs of hillside instability observed or expected, and previous test pitting observations by the undersigned in the area. AssetGeoEnviro (2023) therefore determined that a geotechnical report prepared in accordance with the Geotechnical Policy is not required. A completed Form 4 – Minimal Impact Certification and recommendations for construction are provided in **Appendix D**.

Figure 3: Geotechnical Policy Review, NSW Planning Portal Spatial Viewer (2023)

6.2 Water

The Development is not located within 40 m of a watercourse (waterfront land), therefore a waterfront land and riparian corridor assessment is not required. Appropriate environmental controls will be implemented during construction to manage surface water runoff. Refer to the Erosion and Sediment Control Plan in the SEMP (**Appendix C**) for details.

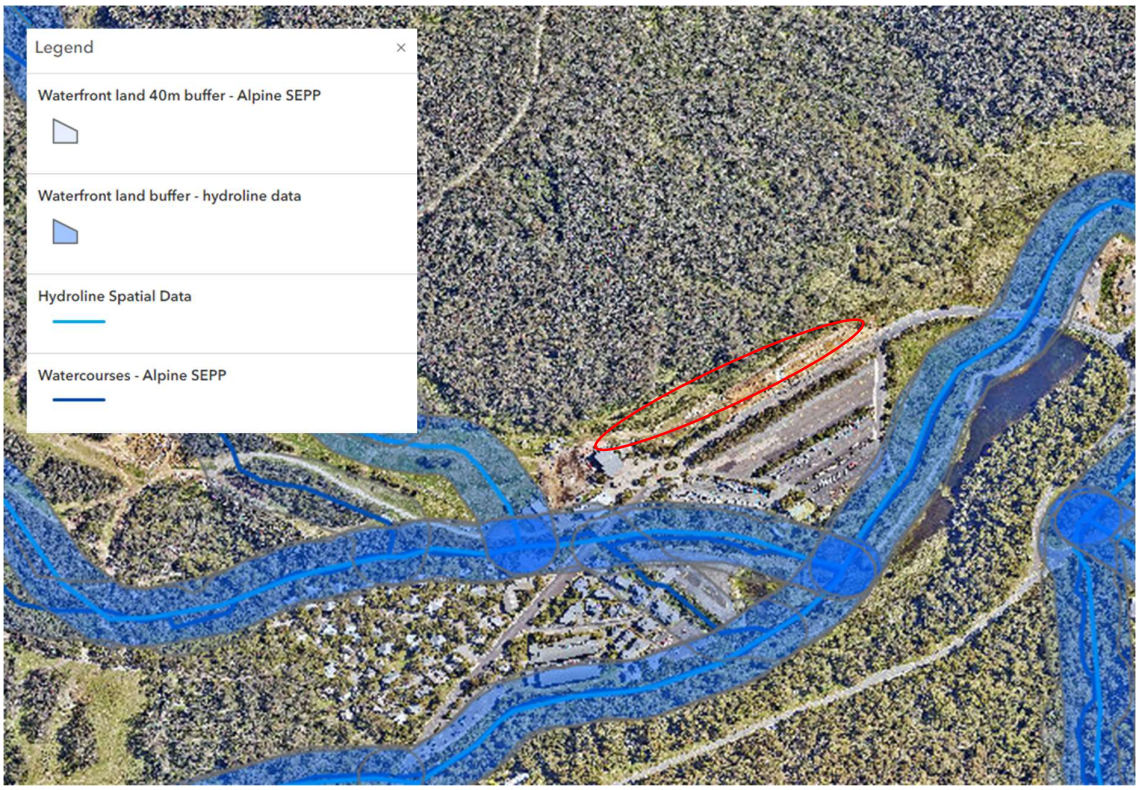

Figure 4: Waterfront Land Review

6.3 Biodiversity

The existing land is predominantly disturbed and devoid of trees. The species listed in Table 3 were identified onsite 12 December 2023.

Table 3: Species identified onsite

Native	Exotic
Bossiaea foliosa (Leafy Bossiaea)	*Acetosella vulgaris* (Sorrel)
Cassinia monticola (Cassinia)	*Agrostis capilaris* (Brown top bent grass)
Hakea macrocarpa (Small Fruit Hakea)	*Festuca nigrescens* (Chewings Fescue)
Hovea montana (Alpine Hovea)	*Juncus effusus* (Soft Rush)
Oleria phlogopappa (Dusty Daisy Bush	*Lolium perenne* (Perennial Ryegrass)
Ozothamnus secundiflorus (Cascade Everlasting)	*Taraxacum* (Dandelion)
Poa fawcettiae (Smooth Blue Snow grass)	*Trifolium repens* (White clover)

6.3.1 BVM Threshold Tool

The BVM and Threshold Tool (NSW Government 2023b) identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. A review of the BVM and Threshold Tool was undertaken on 10 November 2023 which identified the Development site does not comprise land mapped on the BVM. As such, the Development cannot trigger the BVM threshold.

Figure 5: Biodiversity Values Map and Threshold Tool

6.3.2 Area Clearing Threshold

The Development will require some minor clearing of grass and ground covers/shrubs (predominantly exotic species). No tree removal is required. The Development will not trigger the area clearing thresholds.

6.3.3 Conservation Significant Communities and Species

The NSW BioNet desktop search results identified various State and Commonwealth conservation significant flora species, Endangered Ecological Communities and fauna species records occur within the 10x10 km search area around the Development site (**Appendix B**).

The PMR (**Appendix B**) identified 3 TECs, 42 threatened species and 10 migratory species or their habitat 'may occur', 'are known to occur' or are 'likely to occur' within the 5 km search area.

An assessment of the Development against the 'test of significance' (Section 7.3 of the BC Act) is provided in **Table 4**.

Table 4: Test of Significance

Test of Significance	Comment
(1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats—	
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,	The disturbance footprint is approximately 180 m^2, within a highly modified environment, providing very limited suitable habitat for native fauna species (refer to site photos). Some minor grass and groundcovers/shrub clearing is required. It is noted some of the flora species identified within the locality provide suitable habitat for conservation significant species such as the *Mastacomys fuscus* (Broad-toothed Rat). Given the minor amount of native vegetation to be impacted, it is concluded the Development is unlikely to have an adverse effect on the life cycle of any conservation significant species

	such that a viable local population of the species is likely to be placed at risk of extinction. The Development is unlikely to adversely affect habitat connectivity or any other biodiversity value of conservation significance.
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity— (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,	There are no endangered ecological communities or critically endangered ecologically communities within the site or immediate surrounds.
(c) in relation to the habitat of a threatened species or ecological community— (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,	Refer comment against (a). A minor amount of native vegetation which is considered suitable habitat for threatened species such as the Broad-toothed Rat will be removed as part of the Development. The Development is unlikely to cause an area of habitat to become fragmented or isolated from other areas of habitat in the locality. The removal of native vegetation proposed is unlikely to impact on the long-term survival of conservation significant species such as the Broad-toothed Rat.
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	Not applicable. The site and immediate surrounds do not comprise any land declared an area of outstanding biodiversity value.
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The Development is not part of a key threatening process outlined in Schedule 4 of the BC Act, nor is it likely to increase the impact of a key threatening process.

The site assessment confirmed the Development is located within a heavily modified environment, predominately devoid of native trees and shrubs due to the existing ski run and associated infrastructure. A minor amount of native vegetation that provides suitable habitat for conservation species such as the Broad-toothed Rat will be impacted by the Development.

The assessment concludes the Development is unlikely to result in a significant impact on any Commonwealth or State listed communities, threatened flora and fauna, or migratory species identified in the desktop and site assessment. Appropriate controls will be implemented prior to, during and post construction in accordance with the SEMP (**Appendix C**).

6.4 Socio-economic

The Development will improve snow cover in the locality, creating more reliable skiing and snowboarding conditions for guests. Without the replacement of older infrastructure, KT's

snowmaking operations would be compromised which could impact on the resort's ability to provide better snow conditions for guests early and later in the winter season, as well as quality snow throughout the season.

The economic impacts generated by the Development will be positive in terms direct investment into the resort and the generation of short-term construction jobs, however these are anticipated to be nominal given the scale and timing for construction works.

6.5 Built Environment and Visual Amenity

The Development will replace existing snowmaking infrastructure, with the majority of infrastructure being located underground. The impacts on the built environment and amenity are considered acceptable.

6.6 Air Quality, Noise and Vibration

There is potential for dust emissions to be generated from truck movements, and during earthworks. Construction will take place during off-peak visitation periods and complete within 2-3 weeks, therefore unlikely to result in any adverse noise and vibration impacts. Appropriate environmental controls will be implemented in accordance with the SEMP (**Appendix C**) during construction.

6.7 Cultural Heritage

6.7.1 European Heritage

The Development site is located within KNP, forming part of the Australian Alps National Parks and Reserves (AANP) which were included on the National Heritage List under the EPBC Act on 7 November 2008. The Development will not result in any adverse impacts on European cultural heritage.

6.7.2 Aboriginal Cultural Heritage

To establish due diligence for the Development, an assessment against the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010) has been undertaken below.

1) **Will the activity disturb the ground surface or any culturally modified trees?**

Response: The Development will result in minor ground disturbance within a highly disturbed area. No native trees will be cleared for the Development. There are no culturally modified trees within the Development site.

2) **Are there any:**
    a. **relevant confirmed site records or other associated landscape feature information on AHIMS? And/or**
    b. **Any other sources of information of which a person is already aware? And/or**
    c. **landscape features that are likely to indicate presence of Aboriginal objects?**

Response: A search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken on 10 November 2023. The search results (**Appendix B**) identified no Aboriginal sites are recorded within close proximity of the site.

Several historical assessments have been undertaken within the resort including Friday Flat and immediate surrounds by Past Traces Heritage Consultants (2017), NGH Environmental (2017), Iron Bark (2013), and URS Australia Pty Ltd (2004; 2005). All studies provide an indication that the ski slope areas have low archaeological potential due to the level of disturbance associated with the previous ski slope work. The studies also concluded that given the steepness and exposed aspect/lack of sheltering tors, the ski slopes are unlikely to have been favourable campsite locations.

The Development site is located in a highly disturbed environment, which has been subject to previous disturbance for the construction of the existing ski slope and installation of snowmaking infrastructure. Previous disturbance has comprised extensive earthworks, vegetation clearing and removal and disturbance to topsoils and soil profiles, thus removing potential for Aboriginal sites to remain within the Development location. There are no landscape features within the Development site that would indicate the presence of Aboriginal objects due to the previous disturbance. As such, it is considered the Development has low potential to impact on unrecorded Aboriginal objects or sites. In accordance with the Due Diligence process, there is no requirement to move onto Step 3 and no AHIP is required.

3) **Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?**

Response: Not applicable.

4) **Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?**

Response: Not applicable.

Summary: All reasonable steps have been undertaken to ensure the Development fulfils the requirements of the Aboriginal Cultural Heritage Due Diligence Process. Potential impacts from the Development on objects or sites of Aboriginal Cultural Heritage significance are considered unlikely. Therefore, an independent impact assessment for Aboriginal heritage and archaeology is not required. In the unlikely event that Aboriginal objects are discovered, all works will cease and the Unexpected Finds Procedures outlined in the SEMP will be followed (**Appendix C**).

6.8 Matters of National Environmental Significance

MNES that may occur in, or relate to the search area are provided in the EPBC Act Protected Matters Report (**Appendix B**). A summary of the PMR is provided below.

Matters of National Environmental Significance	Comment
World Heritage Properties	Not applicable.
National Heritage Places	No impacts proposed.
Wetlands of International Importance	No impacts proposed.
Great Barrier Reef Marine Park	Not applicable.
Commonwealth Marine Area	Not applicable.
Listed Threatened Ecological Communities	No impacts proposed.
Listed Threatened Species	No impacts proposed.
Listed Migratory Species	No impacts proposed.

7 Conclusion

This application is seeking development approval to replace existing snowmaking infrastructure that is nearing the end of its design life. As demonstrated in this SEE, the Development is consistent with the EP&A Act, BC Act, Precincts-Regional SEPP and Snowy SAP Master Plan. This SEE has assessed the potential impacts of the Development on the human, built and natural environment of the Development site and surrounds. The Development has been designed to improve the operation of the snowmaking system whilst minimising impacts on the surrounding environment.

The Development aims to support the recreational benefits that Thredbo presents. Artificial snowmaking improves seasonal length and viability, which may allow the winter visitation period to be maintained or potentially extended. As climate conditions change, this type of development will continue to play an important step in Thredbo's winter operations. The Development is therefore considered critical infrastructure and within the public interest.

8 References

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NSW Government 2022a, ePlanning Spatial Viewer, Friday Drive Thredbo 2625, viewed December 2023, https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

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Past Traces 2018, Aboriginal Cultural Heritage Due Diligence Assessment – Replacement of Merritts Chairlift Thredbo Alpine Resort.

URS Australia Pty Ltd 2004, Statement of Environmental Effects for the Proposed Vegetation Removal, Ski Slopes, Thredbo.

URS Australia Pty Ltd 2005, Statement of Environmental Effects for the Proposed Works on the Tower 10 Ski Run, Thredbo.

9 Appendices

Appendix A Plans

Scale: 1:711

8 4 0 8 16 24 32

Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

N

THREDBO

LONGSECTION OVERVIEW

Project: Snowmaking Upgrades
Beginner Bowl

Revision: A

Date: 15/11/2023

Produced By: KOS

	START TRENCH & DRAINAGE POINT 1								DRAINAGE POINT 2					TRENCH END
DATUM R.L 1355														
TRENCH DEPTH	1.00	0.80	1.00	1.00	1.00	0.80	0.60	0.60	0.60	0.80	1.00	1.00	1.00	1.00
DESIGN SURFACE	1364.648	1364.910	1365.326	1365.745	1365.467	1365.161	1365.110	1365.009	1364.929	1365.327	1365.848	1366.600	1367.171	
EXISTING SURFACE	1365.648	1365.710	1366.326	1366.745	1366.467	1365.961	1365.710	1365.609	1365.529	1366.127	1366.848	1367.600	1368.171	
CHAINAGE	0.00	15.00	30.00	45.00	60.00	75.00	90.00	105.00	120.00	135.00	150.00	165.00	177.00	

SCALE:
HORIZONTAL 1:500
VERTICAL 1:500

NOTES:
1. TRENCHING IN THE NOMINATED DEPTH OF 1.0M FOR SNOWMAKING TRENCH, VERTICAL CUTS MAY BE CARRIED OUT IF SIDEWALLS REMAIN STABLE DURING PIPE CONSTRUCTION

2. FOR SECTIONS DEEPER THAN 1.5M, BENCHING MUST BE CARRIED OUT TO ACHIEVE AN OVERALL TEMPORARY BATTER SLOPE NO STEEPER TAN 1H:1V AND WITH MAXIMUM INDIVIDUAL BENCH HEIGHTS OF 1.5M

Rev	Date	Description
0	15/11/23	Original for DA

Itemref	Quantity	Title/Name, designation, material, dimension etc		Article No./Reference	
Designed by K O'SULLIVAN	Checked by R NURIDIN	Approved by - date R NURIDIN - 11/12/2023	File name SM-Long.dwg	Date 11/12/23	Scale 1:500 @ A3

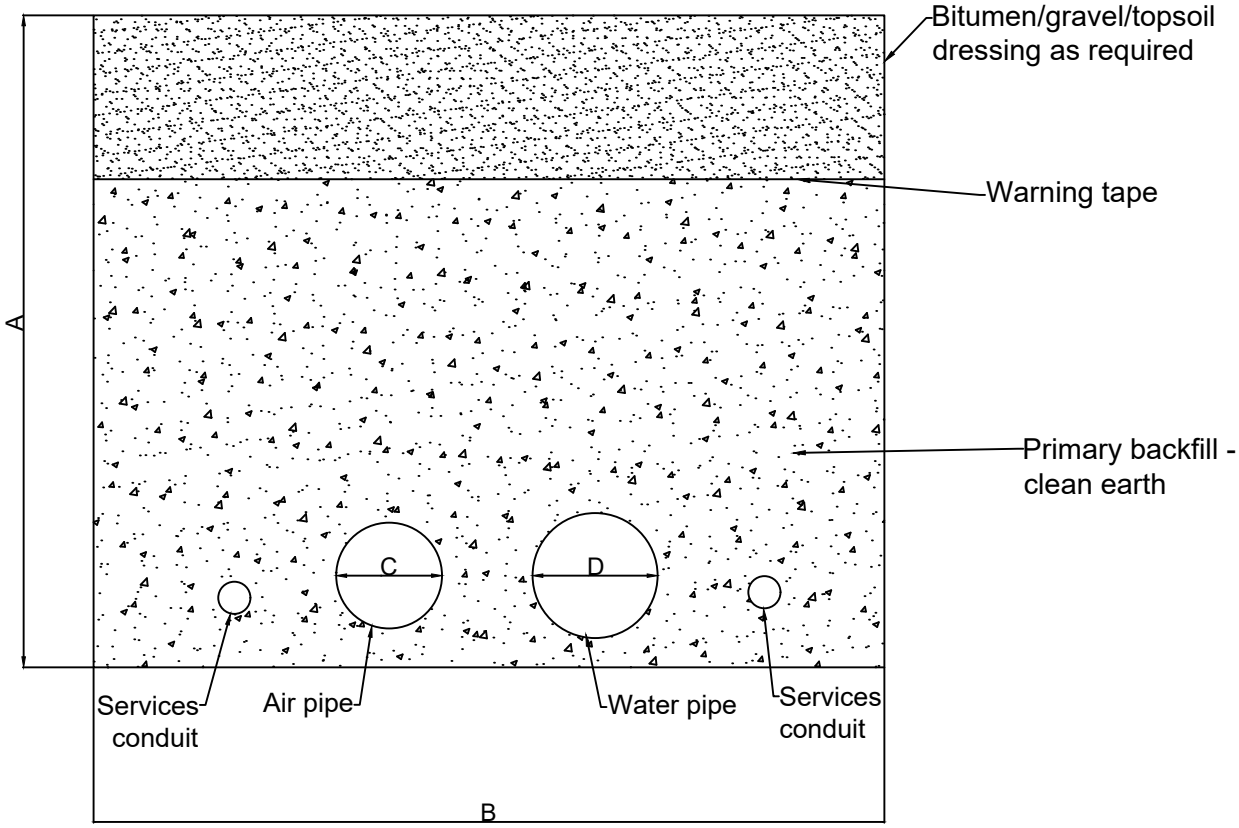
THREDBO

SNOWMAKING UPGRADES
Beginner Bowl

Longsections

SM-BabyBowlLongsection | Edition 0 | Sheet 1/1

Trench Dimensions		
Location	Dimension	Size
A	Trench Depth	1000mm
B	Trench Width	800mm
C	Air Pipe Diameter	150NB
D	Water Pipe Diameter	150NB



NOTES

1. Services Separation Distances within trench, trench depth and trench width as per AS 3000 - Electrical Installations and AS 3500 - Plumbing and Drainage
2. Electrical marker tape will be installed above electrical and communications services as per AS 3000

DRAWING
Snowmaking Trench Cross Section

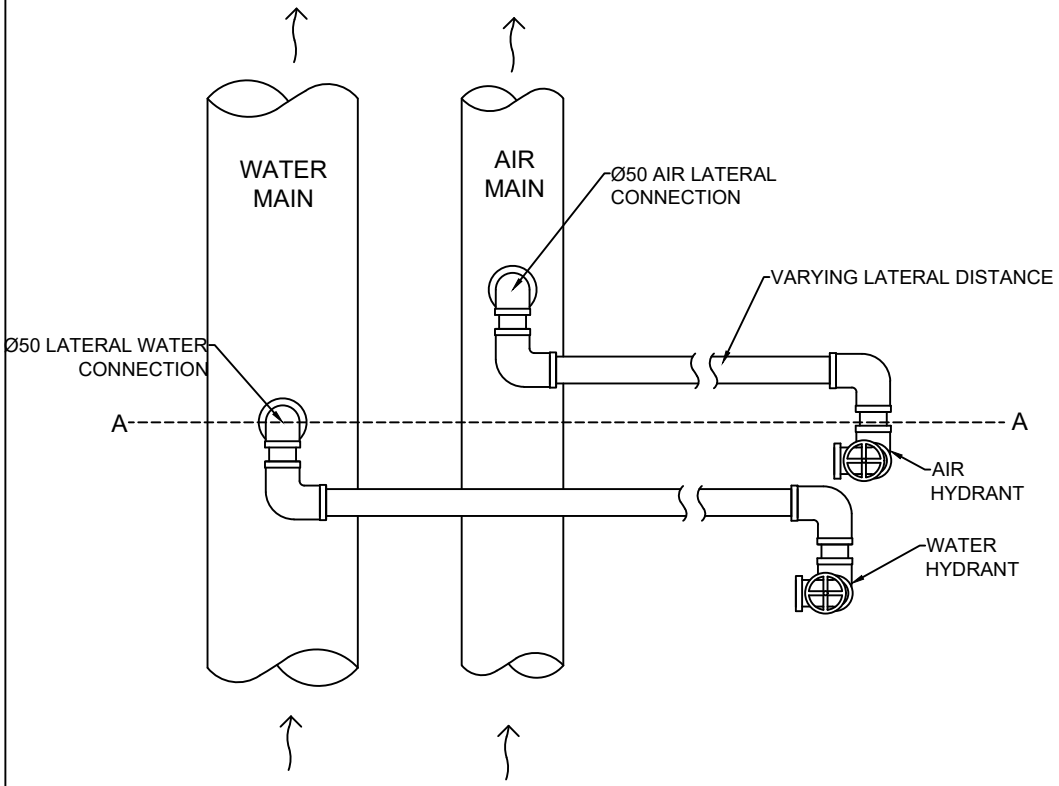
PROJECT
Snowmaking Installation

THREDBO

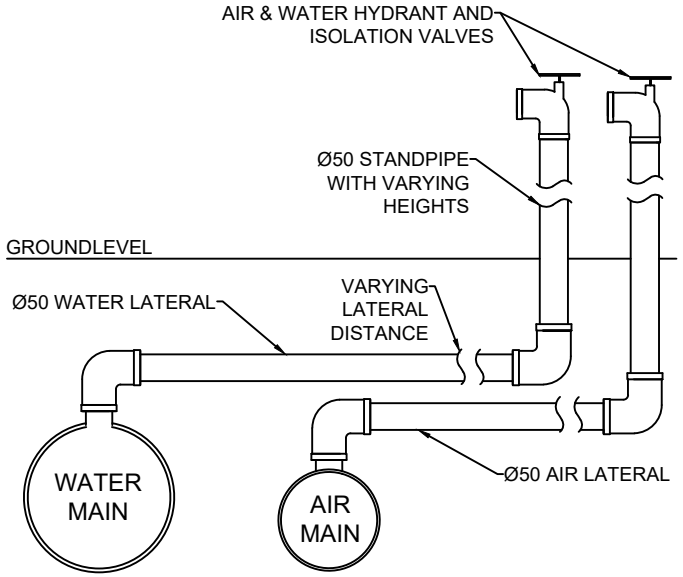
REV	DATE	DESCRIPTION
1	21/02/24	Original for DA

DESIGNED BY K. O'Sullivan	CHECKED BY R.Nuridin
SCALE NTS	FILE NAME Snowmaking Trench Cross Section.dwg
SHEET 1/1	

TOP VIEW



CROSS SECTION A



NOTES

1. Services Separation Distances within trench, trench depth and trench width as per AS 3000 - Electrical Installations and AS 3500 - Plumbing and Drainage
2. Electrical marker tape will be installed above electrical and communications services as per AS 3000

DRAWING
Snowmaking Laterals Connection

PROJECT
Snowmaking Installation

THREDBO

REV	DATE	DESCRIPTION
1	15/03/23	Original for DA

DESIGNED BY K. O'Sullivan	CHECKED BY R. Nuridin
SCALE NTS	FILE NAME Snowmaking Trench Cross Section.dwg
SHEET 1/1	

WITH CENTRALIZED AIR – AUTOMATICALLY ADJUSTABLE

Snow producer for slope sections with water and air supply and a data cable. The lance is connected to an adjustable valve in the pit for supply purposes.

PROPERTIES

– **8 flow combinations**
– 2 possible nozzle configurations
– Nucleator with wear-resistant ruby insert
– Nozzles with wear-resistant ceramic insert
– 24 V distributor with integrated step switching below the lance head
– Camlock bayonet locks for water and air
– Water filter with seamless WEDGE WIRE insert in stainless steel
– Mechanical structure with plug connections

_HEIGHT OF DROP

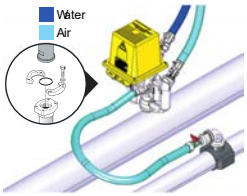
– 4 m/7 m/10 m

TECHNICAL DATA			TLVK0004		
Weight					
Plug-in base	**P**	kg	22,2		
Fixed column	**P1**	kg	12,5		
Revolving column	**P2**	kg	26		
Lance support	**P3**	kg	18,6		
Water filter	**P8**	kg	6,3		
Height of drop			**4m**	**7m**	**10m**
Lance pipe	**P4**	kg	14,0	27,6	42,3
Lance head					
Distributor D8	**P6**	kg	8,0		
Lance head TL8	**P7**	kg	6,4		
Dimensions TL8					
Height of drop			**4m**	**7m**	**10m**
Operating position – top (15°)	**H1**	mm	4500	7170	10060
Operating position – bottom (30°)	**H2**	mm	4242	6657	9230
Maintenance position	**H3**	mm	1517	1274	1010
Electrical data					
Drive motor voltage (head)		V	24		
Drive motor power (head)		W	52		
Heating		W	60		
Water					
Water pressure	**min**	bar	15		
Water pressure	**max**	bar	60		
Nozzle configuration					
Nucleator		no.	3		
Fixed nozzles		no.	3		
Switchable nozzles		no.	9		
Settings		no.	8		

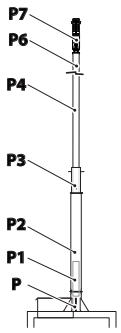
NB: Hoses of type 2SN can be used in a pressure class of PN80 if screwings with thread and union nut are used instead of Camlock connections.

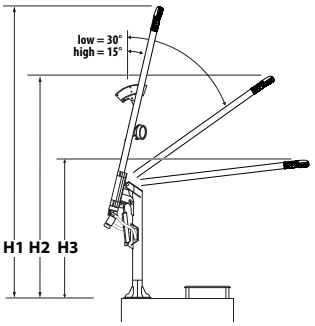
NB: Subject to technical modifications

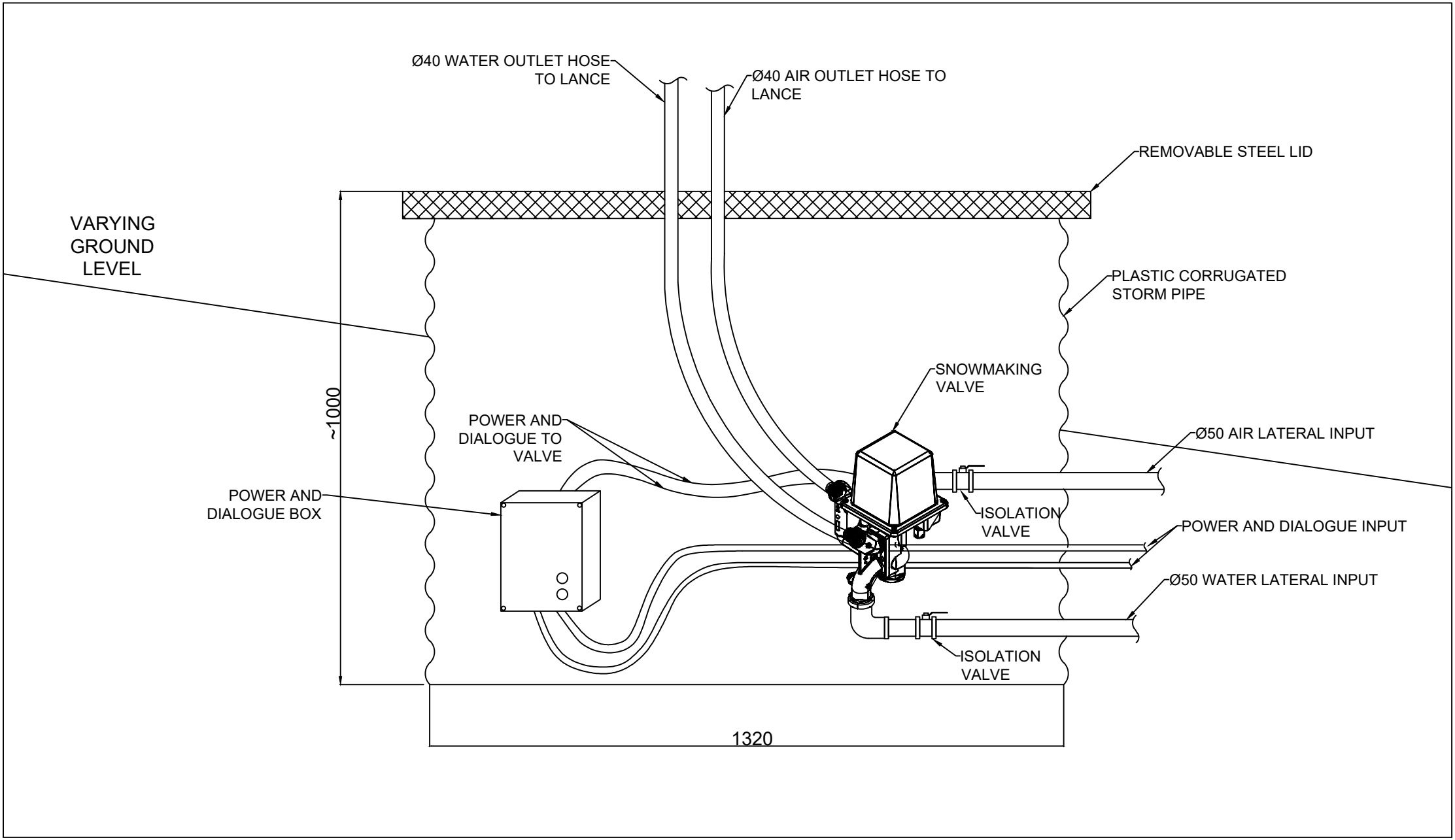
YB valve	Meteo	Headlight
Valve is included	Optional	Optional



Illustrations are symbolic and may contain optionals subject to additional charges.







NOTES

1. Services Separation distances within pit, and incoming trench as per AS 3000 - Electrical Installations and AS 3500 - Plumbing and Drainage
2. Height, width and depth of pit may vary to suit pit location, ground level and slope.

DRAWING

Snowmaking Pit Cross Section

PROJECT

Snowmaking Installation

THREDBO

REV	DATE	DESCRIPTION
0	15/03/24	Original for DA

DESIGNED BY K. O'Sullivan	CHECKED BY J. Batson
SCALE NTS	FILE NAME Snowmaking Pit.dwg
SHEET 1/1	

Appendix B Desktop Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Beginner Bowl

Client Service ID : 838643

Chloe Chalk

Thredbo Alpine Resort
Thredbo New South Wales 2625

Attention: Chloe Chalk

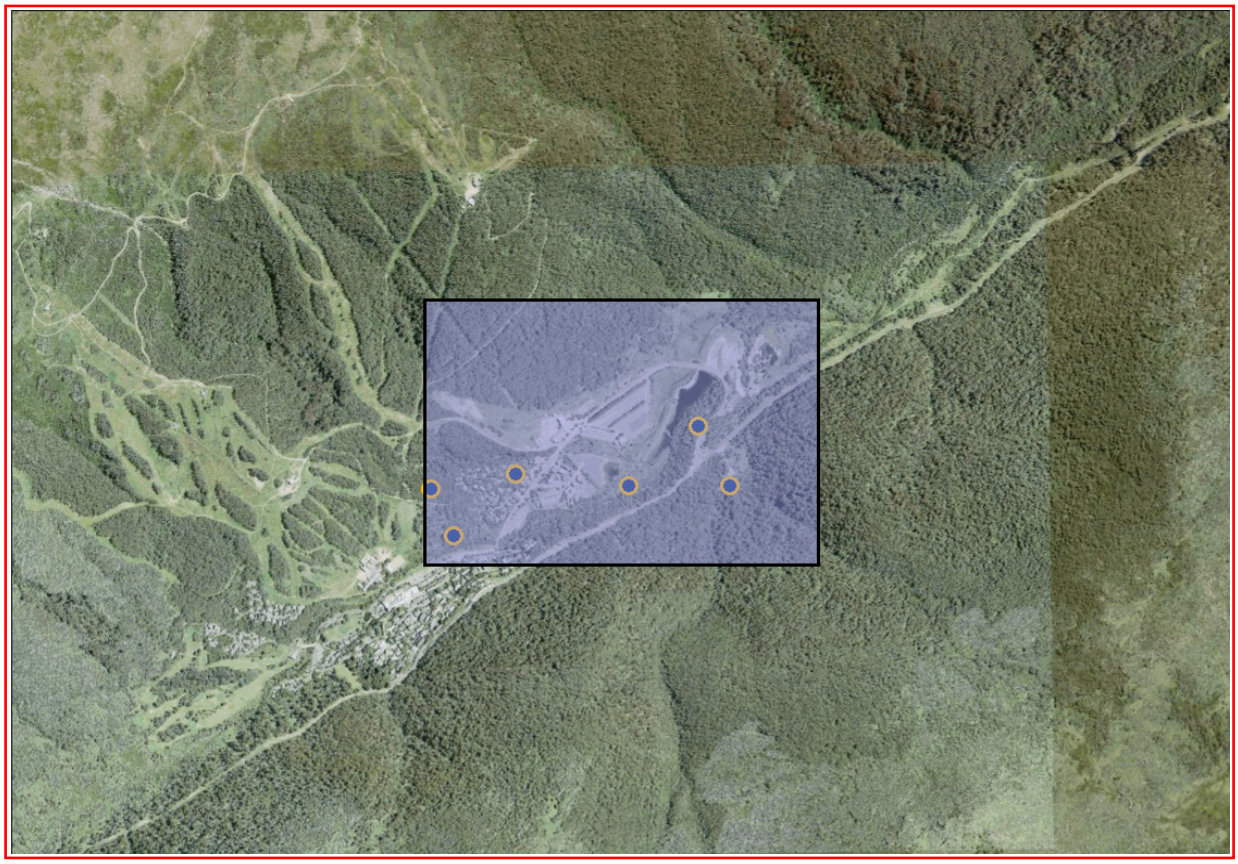
Email: chloe_chalk@evt.com

Date: 10 November 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -36.5035, 148.3058 - Lat, Long To : -36.4949, 148.3213, conducted by Chloe Chalk on 10 November 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

6	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 13-Dec-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance (Ramsar	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	42
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [Resource Information]

Name	State	Legal Status	Buffer Status
Historic			
Snowy Mountains Scheme	NSW	Listed place	In feature area
Natural			
Australian Alps National Parks and Reserves	ACT	Listed place	In feature area

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site	In buffer area only
Barmah forest	200 - 300km upstream from Ramsar site	In buffer area only
Blue lake	Within 10km of Ramsar site	In feature area
Gunbower forest	300 - 400km upstream from Ramsar site	In buffer area only
Hattah-kulkyne lakes	500 - 600km upstream from Ramsar site	In buffer area only
Nsw central murray state forests	200 - 300km upstream from Ramsar site	In buffer area only
Riverland	700 - 800km upstream from Ramsar site	In buffer area only
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream from Ramsar site	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status

Community Name	Threatened Category	Presence Text	Buffer Status
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community known to occur within area	In feature area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum			
Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae			
Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma			
Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pycnoptilus floccosus			
Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Stagonopleura guttata			
Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
CRUSTACEAN			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area	In buffer area only
Euastacus rieki Riek's Crayfish [83155]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
Galaxias supremus Kosciuszko Galaxias [87878]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Galaxias terenasus Roundsnout Galaxias [87175]	Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In buffer area only
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
Litoria verreauxii alpina Alpine Tree Frog, Verreaux's Alpine Tree Frog [66669]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
MAMMAL			
Burramys parvus Mountain Pygmy-possum [267]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Pseudomys fumeus](#)			
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area	In feature area
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
PLANT			
[Argyrotegium nitidulum](#)			
Shining Cudweed [82043]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Calotis glandulosa](#)			
Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area	In feature area
[Colobanthus curtisiae](#)			
Curtis' Colobanth [23961]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Glycine latrobeana](#)			
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area	In feature area
[Haloragis exalata subsp. exalata](#)			
Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Leucochrysum albicans subsp. tricolor](#)			
Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area
[Pimelea bracteata](#)			
[8125]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Prasophyllum bagoense](#) Bago Leek-orchid [84276]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Prasophyllum petilum](#) Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
[Pterostylis oreophila](#) Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Ranunculus anemoneus](#) Anemone Buttercup [14889]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Rytidosperma pumilum](#) Feldmark Grass [66716]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Thesium australe](#) Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Viola improcera](#) Dwarf Violet [3879]	Endangered	Species or species habitat may occur within area	In feature area
[Xerochrysum palustre](#) Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
[Cyclodomorphus praealtus](#) Alpine She-oak Skink [64721]	Endangered	Species or species habitat known to occur within area	In feature area
[Liopholis guthega](#) Guthega Skink [83079]	Endangered	Species or species habitat known to occur within area	In feature area
[Liopholis montana](#) Mountain Skink [87162]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pseudemoia cryodroma Alpine Bog Skink, Alpine Bog-skink [84408]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Kosciuszko	National Park	NSW	In feature area

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
Southern RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix C Site Environmental Management Plan

Site Environmental Management Plan

Snowmaking Infrastructure Upgrades, Beginner Bowl

Project No. 23014MO

Thredbo Alpine Resort
Kosciuszko National Park, NSW

February 2024

Document Control

Version	Issue Date	Summary	Author	Approved by
A	19.01.2024	Draft	J.Best	C.Chalk
0	21.02.2024	Final	C.Chalk	K.Delpit

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Contents

Figures

Tables

1 Introduction

This Site Environmental Management Plan (SEMP) has been prepared for implementation by Kosciuszko Thredbo Pty Ltd (KT) (and its contractors) for the Snowmaking Infrastructure Upgrades on the Beginner Bowl ski area (the Project).

The Project site is situated in Thredbo Alpine Resort (Thredbo), approximately 35 kilometres (km) south-west of Jindabyne, New South Wales.

1.1 Purpose

This SEMP has been developed to outline how construction activities for the Project are to be managed in order to maintain and protect the environmental values of the Project site and surrounds.

1.2 Objective

The objectives of this SEMP are to:

- Provide mitigation measures to minimise the potential for environmental harm and/or environmental nuisance.
- Provide guidance for the development of detailed construction environmental management plans.
- Ensure all Project Personnel understand individual roles and responsibilities.
- Provide corrective actions to be implemented in the event of environmental harm and/or environmental nuisance. and
- Ensure Project personnel understand incident and emergency response procedures.

2 Reference Documentation

2.1 Summary of Statutory Requirements

The Development will be carried out in accordance with the applicable legislative requirements outlined in the following Acts and subordinate legislation:

- *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*
- *Biodiversity Conservation Act 2016*
- *Environmental Planning and Assessment Act 1979*
- *Environmentally Hazardous Chemicals Act 1985*
- *Heritage Act 1977*
- *National Parks and Wildlife Act 1974*
- *Protection of the Environment Operations Act 1997*
- *Waste Avoidance and Resource Recovery Act 2001*
- *Water Management Act 2000*
- *Work Health and Safety Act 2011.*

2.2 Approvals

The Development will be carried out in accordance with the Development Consent. No other environmental approvals are required.

2.3 Supporting Documents

Document	Title	Prepared by	Reference
Approval	Development Consent	-	-
SEE	Statement of Environmental Effects, Snowmaking Upgrades, Beginner Bowl	Kosciuszko Thredbo Pty Ltd	Rev 0
Geotechnical Assessment	Proposed Snowmaking Replacement Works at Beginner Bowl, Friday Flat, Thredbo NSW	Asset Geotechnical Engineering Pty Ltd	7381-R1 Rev 1
Procedure	Construction Site Incident and Emergency Procedures Thredbo Village	Kosciuszko Thredbo Pty Ltd	1.1
Procedure	Emergency Response Spill Procedure	Kosciuszko Thredbo Pty Ltd	1
Procedure	Standard Operating Procedure: Use and Maintenance of Wash Down Bay (KT055)	Kosciuszko Thredbo Pty Ltd	March 2019

2.4 Guidelines

- Guideline for the Preparation of Environmental Management Plans (DIPNR 2004)
- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004)
- Managing Urban Stormwater: Soils and Construction, Volume 2A, Installation of services (NSW DECC 2008)

2.5 Procedures & Policies

The following Kosciuszko Thredbo procedures and guidelines apply to the Project:

- Construction Site Incident and Emergency Procedures Thredbo Village, version 1.1
- Emergency Response Spill Procedure, version 1
- Standard Operating Procedure: Use and Maintenance of Wash Down Bay 2019
- Bushfire Danger Period Policy, version 2

3 Project Description

3.1 Construction Activities

Pre-construction activities involve site preparation works, which will include:

- Establishment of site boundary, including marking out proposed route; and
- Installation of environmental safeguards i.e. fencing, signage and erosion and sediment controls where required.

The proposed construction program will comprise the following:

- Excavation and trenching to prepare ground for pipe laying and installation of cables;
- Laying of new pipe and cables in common trench and laterals;

- Removal of two existing manual hydrants;
- Excavation and installation of new pits and lances, where required; and
- Backfilling and compaction of excavations.
- Progressive rehabilitation of disturbed areas.

Post-construction activities will comprise:

- Stabilisation and rehabilitation work in accordance with the Rehabilitation Management Plan;
- Removal of erosion and sediment controls;
- Demobilisation of plant and machinery; and
- Site clean-up.

3.2 Construction Corridor and Disturbance Footprint

Item	Dimensions
Construction corridor	Snowmaking mains – 10 m from edge of ski run Snowmaking laterals – 3 m
Snowmaking mains trench dimensions	0.8 m wide x up to 1.0 m deep
Snowmaking laterals trench dimensions	0.6 m wide x 0.8 m deep
Construction footprint, lance pits	3 x 3 m wide x 1 deep

4 Construction Management Details

4.1 Construction Timing

The construction will be carried out during the general “summer construction period” (end of long weekend October to end of April the following year) in 2024/2025. It is estimated to require a construction duration of 2-3 weeks. Works must not commence when snow is located in the project area corridor and machinery must not be used to remove snow from areas containing native vegetation.

4.2 Site Access

The Development site is accessible via Friday Drive. Construction is not anticipated to impact on the existing transport network.

4.3 Vehicles, Machinery and Equipment

The Development may require (but not limited to) the following machinery, plant and equipment:

- 4WD vehicles and utilities;
- Excavator;
- Front-end / skid-steer loader;
- Telehandler;
- Snow groomer with summer tracks;
- Utility Terrain Vehicles (UTV);
- Tipper trucks; and
- Delivery trucks;
- Welding machines.

4.4 Adverse Weather Contingencies

Adverse weather events (e.g. high winds, thunderstorms, heavy rain, hail, snow, bushfire and high temperatures) have the potential to negatively impact upon construction activities. To ensure appropriate consideration of such events, the Project and Construction Manager will monitor weather conditions throughout the construction period. The Bureau of Meteorology (BoM) Thredbo AWS station provides daily weather observation data for the resort. The NSW Rural Fire Service website 'Fires Near Me' includes information on current bush fires and other incidents, as well as warnings for fires which may affect your location.

If adverse weather events are anticipated and/or occur during construction, contingencies will be implemented, and arrangements will be made to postpone construction activities.

The Construction Manager / Site Project Manager will be responsible for notifying construction staff of any impending adverse weather, and to implement appropriate controls onsite, such as:

- Erecting wind breaks or covering stockpiles to prevent materials being blown away.
- Evaluate temporary sediment and erosion controls to ensure they are adequately installed to withstand adverse weather events.
- Discontinue use of plant and machinery.
- Secure materials and equipment.
- Protect open excavations.

4.5 Stockpiles and Material Storage Areas

4.5.1 Site Compound

No site compound will be required within the construction corridor. Amenities will be available at Friday Flat for construction staff.

4.5.2 Stockpile Sites

Temporary stockpiles will be required within the construction corridor to effectively manage materials during the works. Two temporary stockpiles are likely required in the beginner bowl. One will be along the 'Syds snow runner', and the other adjacent to the base of the 'Easy does it Chairlift'. Soil will be separated so that it can be used during rehabilitation works. The main stockpile sites are identified in **Appendix A.**

All stockpiles will be managed in accordance with the environmental controls in Section **6.2** and the Erosion and Sediment Control Plan (**Appendix B**).

4.5.3 Material Storage Areas

No site compound will be required within the construction corridor. Amenities will be available at Friday Flat for construction staff.

4.6 Work Hours

The working hours for construction will be outlined in the Development Consent.

5 Environmental Management

5.1 Roles and Responsibilities

The Project team structure is provided in **Figure 1**.

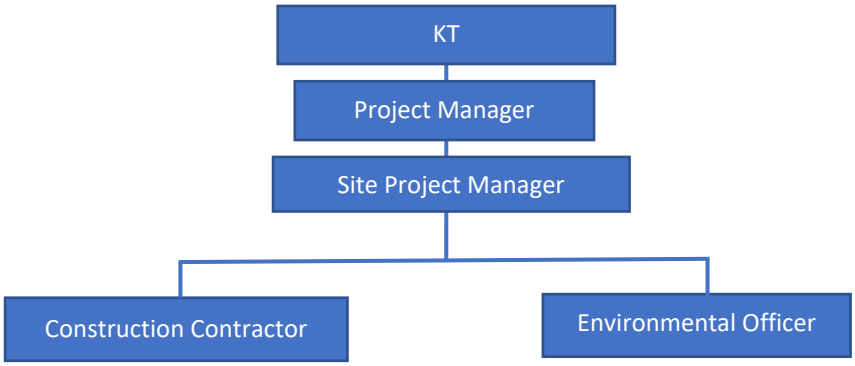


Figure 1: Project Team Structure

The roles and responsibilities are outlined in **Table 1**.

Table 1: Roles and Responsibilities

Role	Responsibilities
Project Manager	• Ensure the SEMP is made available, communicated, maintained and understood by all Project staff. • Responsible for the overall management of the construction and operation of the Project. • Ensure the SEMP is updated with applicable conditions of approval following the provision of Development Consent from Department of Planning and Environment (DPE). • Ensure that the requirements of the SEMP and sub-plans have been addressed in all contractor environmental management documentation. • Review of incidents, non-conformances and non-compliance. • Ensuring Project personnel and contractors are adequately trained and qualified to fulfil their roles.
Site Project Manager	• Implement and maintain the SEMP. • Ensure all Project personnel comply with the requirements of the SEMP. • Report any incidents, non-conformances to the Project Manager.
Environmental Officer	• Oversee all works which are part of the Project on behalf of KT. • Ensure compliance with all environmental protection measures detailed in the SEMP, supporting management plans and conditions of approval. • Ensure all environmental controls are in place and adequately functioning during construction. and • Conduct construction inspections and complete reporting requirements e.g. progress reports, environmental incidents, non-compliance, corrective action and auditing.
All Personnel	• Comply with requirements of this SEMP. • Report any actual or potential environmental incidents to the Construction Manager immediately. • Identify and report non-conforming or potentially hazardous work practices, equipment, machinery or products. • Only perform tasks for which they are trained and competent. • Assist with environmental incident investigations and applying corrective actions. • Ensure all machinery, plant and equipment are in good working order and condition prior to use.

Construction Contractor	• Comply with SEMP and legislative requirements. • Construction contractor to develop and implement management plans in accordance with this SEMP, conditions of approval and contractual obligations.

5.2 Communication and Consultation

5.2.1 Training and Awareness

All Project staff will be made aware of the site-specific environmental controls through a site induction, and pre-start meetings / toolbox talks prior to the commencement of construction.

The site induction will cover the following key aspects:

- Roles and responsibilities.
- Overview of environmental risks and specific locations of environmental and/or cultural heritage significance.
- The scope of legislative requirements and other licences and approvals.
- Communication and notification requirements e.g. procedures for notifying and reporting incidents and complaints.
- Environmental management and controls stipulated in this SEMP.
- Workplace health and safety issues.
- Emergency preparedness and response.
- Procedures for notifying and reporting incidents and complaints.

5.2.2 Key Contacts

Key contacts for the Project are provided in **Table 2**. Prior to commencement of works, contact details (name and contact number) will be provided for Project personnel.

Table 2: Key Project Personnel Contact Details

Company / Agency	Role / Reason	Contact
Department of Planning, Housing and Infrastructure (Alpine Resorts Team)	Development approval and compliance	(02) 6456 1733
National Parks and Wildlife Service (NPWS)	Flora, fauna, archaeology	(02) 6450 5600
Environment Protection Agency (EPA)	Water, noise, air pollution and regulation	131 555
NSW Soil Conservation Service	Soil erosion and sediment control	02 9842 8300
Thredbo Medical Centre	General medical attention	(02) 6457 6254
Fire and Rescue Thredbo, NSW	Incident / emergency	(02) 6457 6144
NSW Police	In case of fire, medical or police emergency	000
NSW Fire and Rescue		
NSW Ambulance		

5.2.3 Consultation

KT is committed to ensuring effective communication and consultation is undertaken to inform the development of this SEMP and ensure it is implemented on-site as per the Project roles and responsibilities in **Section 5.1.** Where required, communication with key external stakeholders such as DPE and NPWS will be undertaken. A summary of the key consultation activities is provided in **Table 3**.

Table 3: Summary of Consultation Activities

Consultation Activity	Communication Method	Frequency
Internal	Site inductions	Prior to commencement of works
	Pre-start meetings and toolbox talks	Daily
	Reports to Project Manager identifying project progress, any environmental incidents, and review of any complaints or enquiries	Weekly
External	Face-to-face meetings, phone and email correspondence with relevant Government Departments / Agencies	As required
	In-writing notifications to Government Departments / Agencies and relevant parties	As required

5.2.4 Notification Protocols

A summary of the key notification protocols is provided in **Table 4.** Notification requirements will be updated as required.

Table 4: Regulatory Agency Notification Protocols

Party to Notify	What to Notify	When to Notify	Responsibility to Notify Regulatory Agency
DPE	Commencement of construction	DPE will be notified in writing at least 48 hours prior to the commencement of construction.	Site Project Manager
NPWS	Details of any material suspected of being a European or Aboriginal culturally significant site, relic or artefact.	Immediately upon discovery of any archaeological/culturally significant site or relic that are encountered. NSW Police to also be notified immediately upon discovery of human remains.	Site Project Manager
NSW Environmental Protection Agency	Details of pollution incident – who, what, when, where, how, any other supporting information and evidence (e.g. photos)	Immediately upon identification of pollution incident causing or threatening material harm to the environment, in accordance with ***KT's Construction site Incident and Emergency Procedures Thredbo, version 1.1***.	KT Environmental Manager

5.3 Environmental Incident and Emergency Response

All Project personnel are required to follow KT's **Construction site Incident and Emergency Procedures Thredbo Village.** The procedure will be available on-site and all Project staff will be trained on their implementation through the site induction. The procedure classifies examples of emergencies and incidents and provides specific procedures for response to such events. The procedure also outlines general site management principles, incident reporting and notification requirements and provides an emergency contacts list.

In the event of an environmental incident, emergency or near-miss, the following steps should be taken:

1) **STOP** works in the area and if safe to do so ensure the safety of personnel within the vicinity.
2) **NOTIFY** relevant persons e.g. emergency services or Construction Manager.
3) **ISOLATE** the risk or hazard e.g. turn off machinery/plant, implement immediate site controls, set up exclusion zone. and
4) **REPORT** and notify relevant persons (e.g. Project Manager, regulatory agencies).

Environmental incident and near-miss reporting requirements are detailed in **Section 7.3**. Contact details for key Project personnel and emergency services are provided in **Table 2**.

External contractors are required to prepare and implement an emergency and incident response procedure. The contractor will be responsible for responding to any environmental emergency caused by any action (or inaction) of the contractor's staff, including notification requirements to external parties such as EPA and Fire, Fire and Rescue NSW.

6 Environmental Controls

6.1 General

- Ensure works are conducted by suitably qualified and trained personnel.
- Ensure all site environmental management controls relevant to that stage of work are implemented in accordance with the approved plans and conditions of consent.
- Provide approved plans and relevant documentation in the site office or other suitable location so that they are easily accessible by all construction staff.

6.1.1 Site Establishment

- Establishment of site boundary with temporary fencing, rope or flagging to clearly delineate the construction corridor and "no-go" areas.
- Erection of site signage and pedestrian/traffic controls.
- Installation of erosion and sediment controls.

6.1.2 Machinery and Storage

- All equipment, machinery and vehicles used during construction of the Project must be cleaned prior to entry into the Park and prior to site mobilisation to ensure they are free of mud and vegetative propagules.
- Equipment, machinery, and vehicles must be regularly maintained and manoeuvred to prevent the spread of exotic vegetation.

- Storage of equipment, machinery, vehicles and material is to be restricted to existing disturbed areas (i.e. at the stockpile, formed roads and within the construction corridors) and avoid undisturbed areas.
- All vehicles and machinery entering Thredbo must adhere to the **Standard Operating Procedure: Use and Maintenance of Wash Down Bay, March 2019 (KT055).**

6.2 Soil and Water Quality

6.2.1 Erosion and Sediment Control

Refer to Erosion and Sediment Control Plan in **Appendix B**.

6.2.2 Soil and Stockpile Management

- All stockpiles will be constructed and managed in accordance with *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park* (OEH 2017) and Erosion and Sediment Control Plan (**Appendix B**).
- Temporary stockpile sites within the construction corridor should adhere to the following criteria (Landcom 2004; OEH 2007):
  - not exceed 2 m in height, have a slope <50% (26°)
  - be at least 2 m from vegetation, concentrated water flows, roads, publicly accessible areas or hazardous areas
  - avoid impacts to native vegetation and be located on disturbed areas
  - located directly adjacent to the works
  - located on relatively flat ground, where possible
  - in areas with sufficient room to accommodate the volume of material being stockpiled
  - be contained by appropriate erosion and sediment controls.
- Any excess excavated material will be removed from site and transported to the designated soil stockpiles sites as shown in the plans.

6.2.3 Material Sourcing

Authorisation from NPWS is to be sought where imported gravel or fill material is required, unless the material is sourced from the following NPWS approved locations:

- McMahons Earthmoving quarry, located on Alpine Way, Crackenback NSW; or
- Kraft Earthmoving / Snowy Mountains Sand and Gravel quarry located on Kosciuszko Road, Jindabyne NSW.

6.3 Flora and Fauna

6.3.1 Vegetation and Habitat

Vegetation and Habitat		
Objective	To ensure compliance with legislative requirements and protect existing native vegetation. Minimise impacts to native vegetation. No impact to native vegetation beyond the construction corridor.	
Mitigation Measures		**Timing**
All clearing (shrubs/ground covers) must only occur within approved development corridor. No mature tree removal is to occur. The construction corridor is to be clearly identified with flagging tape to mark no-go/no clearing zones prior to construction. Clearing should remove habitats in stages to allow movement of fauna away from disturbed areas.		Vegetation clearing

All vegetation must be checked for fauna habitats and fauna by the Environmental Officer immediately prior to removal. Vegetation with active nests must not be removed until the young have left the nest. If fauna is present, then the NPWS must be contacted to assist with mitigation actions.	Vegetation clearing
All disturbance should be kept to the minimum required to achieve the proposal.	Vegetation clearing; construction
All machinery to be used during the construction phase should be limited to the existing disturbed areas and access tracks.	Vegetation clearing & construction
Progressive rehabilitation is to be undertaken in accordance with the Rehabilitation and Monitoring Plan. All rehabilitation should be undertaken in accordance with the *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (DECC 2007).	Construction & post-construction
Performance Criteria	No damage to site fencing. No damage to native vegetation (including vehicle tracks) associated with unauthorised access.
Corrective Actions	Fencing to be repaired / reinstated by appointed contractor. Entry points for unauthorised access to be identified and access restricted through fencing or other appropriate barriers.

6.3.2 Native Fauna

Native Fauna Management		
Objective	To minimise potential impacts to native fauna, their breeding places and habitat.	
Mitigation Measures		**Timing**
No wombat burrows were identified within the site. If any wombat burrows need to be impacted by the proposal a wombat management plan should be developed for the proposal in consultation with NPWS.		Prior to vegetation clearing works & prior to construction
If trenches and excavations are to be left open overnight, fauna escape ramps should be installed to enable fauna to escape. Open trenches and excavations should be inspected regularly for the presence of any fauna that may have fallen in.		Trenching & excavation
Maintain a clean and tidy work area to ensure animals are not attracted to the site, including provision of covered bins during proposed works.		Construction
Performance Criteria	No death or injury to fauna as a result of on-site activities. No disturbance outside the approval disturbance area.	
Corrective Actions	Review and implement suitable strategies to dissuade fauna from coming to site. Contact NPWS / LAOKO if injured fauna is identified as a result of site activities.	

6.3.3 Exotic Species

Exotic Species Management		
Objective	To reduce the risk of introducing invasive/pest species.	
Mitigation Measures		**Timing**
All relevant weed species that occur within the construction corridor and associated staging and stockpile sites must be treated prior to works commencing to ensure these weeds are not spread further at the site or within KNP.		Prior to vegetation clearing & prior to construction
If an area of vegetation proposed for removal includes any relevant weed species then the vegetation must be removed completely from site, not spread out within the existing vegetation or used in rehabilitation and stabilisation works.		Prior to vegetation clearing & prior to construction
All machinery and equipment used during construction must be cleaned prior to entry into KNP and prior to site mobilisation to ensure the machinery is free of mud, vegetative propagules, and pathogens. This includes machinery that may have been working in an area of the resort that contains weeds and is preparing to be redeployed in the construction corridor and associated stockpile and staging areas.		Construction

All vehicles and machinery entering Thredbo must adhere to the Standard Operating Procedure: Use and Maintenance of Wash Down Bay, March 2019 (KT055). The wash down bay is located at the Thredbo Waste Transfer Station for use by KT staff and contractors.	Construction
All machinery and equipment must be stored on existing disturbed areas (i.e. at the stockpile and staging areas proposed on the ski slopes) and should not be stored on native vegetation.	Construction
All machinery to be regularly maintained and manoeuvred to prevent the spread of weeds and pathogens.	Construction
Performance Criteria	No introduction of invasive species as a result of construction activities.
Corrective Actions	Review existing biosecurity procedures (e.g. clean down procedure) and implement additional controls if required.

6.4 Air Quality

Air Quality Management		
Objective	To minimise potential impacts on sensitive receivers from dust and other air pollution from construction activities.	
Mitigation Measures		**Timing**
Dust generation will be managed through typical dust suppression that will include covering stockpiled spoil, minimising ground disturbance and covering loads.		Vegetation clearing & construction
Plant and equipment to be maintained and operated in an efficient manner to reduce air pollution.		Construction
Vehicles are to adhere to speed limits to minimise dust general and potential spill of hauled materials.		Construction
All vehicles carrying spoil or rubble to/from site should be covered to prevent the escape of dust or other material. Covers are to be adequately secured.		Construction
Performance Criteria	No complaints received in relation to air pollution.	
Corrective Actions	If complaints are received, the following steps should be taken: • Investigate specific cause of complaint. • Review site activities/processes and identify the source of air emissions. • Implement immediate corrective actions on-site e.g. water site, replace equipment deemed to be poorly maintained. • If required, implement administrative controls e.g. additional staff training, alter construction methods or timing for undertaking dust generating activities.	

6.5 Noise and Vibration

Noise and Vibration Management		
Objective	To ensure that noise and vibration from construction activities does not cause environmental nuisance in the locality.	
Mitigation Measures		**Timing**
Awareness training and information will be provided to project personnel in relation to minimising noise pollution as much as practicable when in close proximity of sensitive receivers.		Site induction
Selection of the most appropriate plant and equipment to minimise noise generation.		Prior to construction
Construction works will be undertaken during standard work hours.		Construction
Appropriate noise management strategies will be implemented for construction works and operation of plant in accordance with the Australian Standard AS 2436-		Construction

2010 *Guide to noise and vibration control on construction, demolition and maintenance sites.*		
Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly.		Construction
All plant will be maintained in accordance with the manufacturer's requirements.		Construction
Performance Criteria	No construction related noise and vibration complaints received. No unreasonable noise or vibration.	
Corrective Actions	If complaints are received, the following steps should be taken: • Investigate specific cause of complaint. • Review site activities/processes and identify the source of the noise emissions. • Implement immediate corrective actions e.g. swap out noisy equipment. • If required, implement administrative controls e.g. additional staff training or change work hours to minimise noise.	

6.6 Fuels, Chemicals and Hazardous Substances

Fuels, Chemicals and Hazardous Substances		
Objective	Eliminate the potential for release of fuels, chemicals and hazardous substances to the environment.	
Mitigation Measures		**Timing**
Spill kits will be available onsite**,** and all site personnel will be made aware of their locations in the site induction.		Construction
In the event on an on-site spill, construction staff will follow KT's Construction Site Incident and Emergency Procedures*.*		Construction
Hazardous substances, toxic materials or dangerous goods must not be stored or processed on-site at any time without prior approval from the DPE Secretary or nominee.		Construction
Fuel and chemicals will be appropriately stored and handled in accordance with relevant Australian Standards.		Construction
Appropriate controls will be implemented when refuelling Project vehicles and machinery.		Construction
Performance Criteria	No fuel, chemical or hazardous substance spills.	
Corrective Actions	Corrective actions will be taken in accordance with the **Construction Site Incident and Emergency Procedures Thredbo Village, 2021/2022***,* including: immediate spill response, implementation of any necessary control measures as directed by authorities. Where required, an investigation will be undertaken to determine the root cause.	

6.7 Traffic and Access

Traffic and Access Management		
Objective	Minimise impacts on existing road network. Minimise impacts to pedestrians and bike riders.	
Mitigation Measures		**Timing**
Traffic and construction vehicle access will be managed as per regular daily operation in the resort.		Construction
All Project vehicles and machinery to adhere to speed limits and signage and stay within construction corridor.		Construction
Appropriate signage, fencing or demarcation to be installed to manage access to and around the construction corridor.		Construction
Performance Criteria	No significant impacts to existing road network or users. No complaints in relation to traffic or vehicle operators.	
Corrective Actions	If complaints are received, traffic management procedures will be reviewed and amended (if necessary).	

6.8 Waste

6.8.1 Waste Storage and Disposal

The following waste receptacles will be provided for the storage and disposal of waste associated with the construction of the Project:

- General litter bins for waste such as food waste and non-recyclable plastic.
- Recycling bins for waste such as carboard packaging, paper, recyclable plastic.
- KT's waste transfer facility (materials to be segregated for re-use, recycling etc.).

Excess spoil from excavations will be taken off-site and placed within the resort's existing stockpile area located at the carpark adjacent to the Thredbo Waste Transfer Station for re-use within the resort.

6.8.1.1 Licenced Waste Facilities

Any waste that cannot be reused within the resort will be transported off-site. There are two licenced waste facilities within proximity to Thredbo, including:

- Jindabyne Landfill, 6013 Kosciuszko Road, Jindabyne NSW
- Cooma Landfill, 8448 Monaro Highway, Cooma NSW.

Waste Management		
Objective	Minimise construction waste as much as practicable. Reduce the impact of waste on-site and beyond the site boundary.	
Mitigation Measures		**Timing**
All waste shall be managed and disposed of in accordance with the legislative requirements and the Waste Classification Guidelines (DECCW 2009).		Construction
Where possible, construction materials will be salvaged for reuse to divert waste from landfill.		Construction
All receptacles will be in good condition.		Construction
All waste transportation vehicles will be covered appropriately to ensure waste cannot spill, leak or escape onto the road or wash into stormwater drains.		Construction
Ensure that the waste is being transported to a place that may be lawfully used as a waste facility.		Construction
Excavated soils to be reused for backfilling where possible.		Construction
Performance Criteria	No litter or waste material to be released from site in an uncontrolled manner.	
Corrective Actions	• Investigate cause of inappropriate waste disposal/management. • Review on-site waste handling facilities and implement corrective actions e.g. change in receptacle size and/or waste management signage. • If required, implement administrative controls e.g. additional waste management training for staff.	

6.9 Cultural Heritage

6.9.1 Unexpected Finds Procedure

Where unexpected items of potential archaeological, built or Aboriginal cultural heritage significance are discovered, Project personnel will follow the below procedure:

- **STOP:** Stop work and leave the site or item where it is.
- **NOTIFY:** Notify the Project Manager and NPWS to arrange for representatives to inspect the site. If human remains are found, the NSW Police must also be notified.

- **MANAGE:** Management may involve securing the find by erecting a no-go zone.
- **REPORT:** The Project Manager will complete any reporting requirements, as directed by NPWS.

6.10 Bushfire Protection

The construction contractor would be responsible for determining relevant requirements for the site and ensuring staff are aware of bushfire avoidance, evacuation, and management measures e.g. prior to undertaking works the construction contractor should confirm that there is no current total fire ban or Kosciuszko National Park fire ban as this may place restrictions of activities such as use of plant or machinery in grass/bush settings.

The **Construction Site Incident and Emergency Procedure** outlines procedures for responding to fire and bushfire incidents or emergencies. This procedure is made available to all construction staff. In the event of a bushfire, Kosciuszko Thredbo (the head lessee) would implement the resort-wide Bushfire Evacuation Plan. The plan has been designed to assist management and emergency services to protect life and property in the event of a bush fire or other emergency.

7 Monitoring and Reporting

7.1 Environmental Monitoring

The Environmental Officer will conduct monitoring during all project phases (pre-construction, during construction and post-construction) to ensure compliance with this SEMP, associated management plans and conditions of approval.

The Environmental Officer will undertake weekly inspections utilising the **Site Environmental Management Measures Report**.

7.2 Weekly Environmental Reporting

The Environmental Officer will provide copies of the **Site Environmental Management Measures Report** to the Project Manager on a weekly basis. All records will be stored within KT's files and distributed to relevant persons / regulatory authorities as required.

7.3 Environmental Incident Reporting

All incidents and near misses will be managed in accordance with KT's **Construction site Incident and Emergency Procedures Thredbo Village, version 1.1**. The document provides procedures for responding to incidents and emergences, reporting and notification requirements and emergency contacts.

The following information should be recorded:

- Time and date of the incident / near miss.
- A description of the incident / near miss.
- A sequence of events that led to the incident / near miss occurring.
- Person/s involved in the incident / near miss (including witnesses).
- Written statements from person/s involved (as applicable).
- Details of corrective actions.

The **Environmental Incident Report Form** should be completed for all environmental incidents. All parts of the form must be completed in accordance with KT's incident procedure and following the instructions within the form. The form must be signed by the person making the report and the Project Manager/person in charge of the site/activity.

7.4 Non-conformance

A non-conformance is the failure to comply with the requirements of this SEMP and supporting management plans. Non-conformances identified via site inspection or during day-to-day activities will be documented on the **Site Environmental Management Measures Report** (or similar contractor's form) and closed out in subsequent inspections. The Environmental Officer is responsible for investigation and managing corrective and preventative actions in the event of non-conformance or a situation likely to cause environmental harm.

7.5 Corrective Actions

Corrective actions should be prioritised on the following hierarchy of controls:

1. **Elimination** – can activities and processes be eliminated to reduce the risk of reoccurrence?
2. **Substitution** – can activities be substituted with another activity of lesser risk?
3. **Isolation** – can you isolate the hazard from any person exposed to it?
4. **Engineering controls** – can you reduce the risk of reoccurrence through engineering changes?
5. **Administrative controls** – can a change in work practices, additional training or additional checks reduce the risk?
6. **Personal Protective Equipment (PPE)** – can PPE be worn to protect personnel from harm?

The Construction Manager will be responsible for managing the implementation of corrective actions on-site.

7.6 Complaints Management

Should complaints be received from the public in relation to the Project they will be recorded using the **Complaints Form** (or similar contractor's form). The Project Manager will be responsible for investigating, recording and closing out any complaints received. All records will be stored within KT's files and distributed to relevant persons / regulatory authorities as required.

8 Record Keeping and Review

8.1 Document Control

All Project related documentation will be maintained within KT's Project file. Documents stored within the file include (but not limited to) the following:

- Copies of relevant planning approvals and documents, licences and permits.
- All completed induction forms and visitor sign-on register.
- Records of routine environmental inspections.
- Records of any environmental incidents, complaints, non-conformances and no-compliances.

8.2 SEMP Review

This SEMP is a live document and will undergo reviews and amendments as necessary. Reviews will generally be undertaken –

- If there is a change in the scope of the Project.
- Prior to commencement of construction to ensure any relevant conditions of consent and/or other approval, licence or permit requirements are incorporated.
- If there is a need to improve environmental controls to protect environmental values.
- If there is an increase or introduction of a new environmental risk or impacts.
- At the end of a Project to allow for improvements in subsequent Projects.

9 References

AssetGeoEnviro 2023, Geotechnical Assessment for Snowmaking Upgrades – Beginner Bowl, Friday Flat.

Department of Environment and Climate Change (DECC) 2007, Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park, NSW Government.

Department of Environment and Climate Change (DECC) 2009, Interim Construction Noise Guideline, July 2009, https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/09265cng.pdf?la=en&hash=EF4576FD79DBB25D5AC22DFA1A883A2BADA1F77B

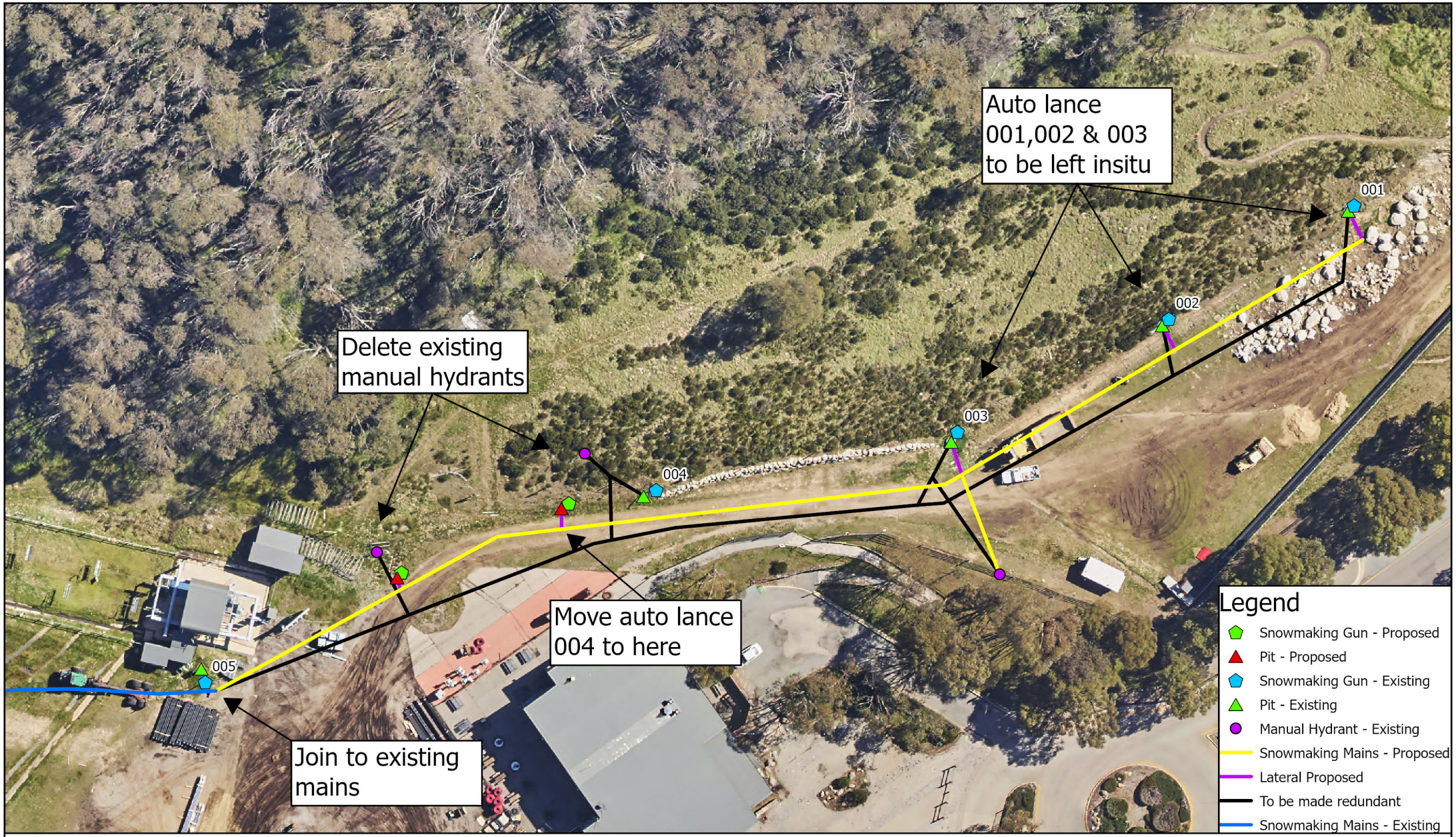
Department of Infrastructure, Planning and Natural Resources (DIPNR) 2004*, Guideline for the Preparation of Environmental Management Plans*, https://www.planning.nsw.gov.au/~/media/Files/DPE/Guidelines/guideline-for-the-preparation-of-environmental-management-plans-2004.ashx?la=en

Department of Planning & Environment (DPE) (2017) *What to include with your development application*, version January 2017, https://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/65E2BA89886F426991525FF25707A9A9.ashx

Office of Environment and Heritage (OEH) 2017, *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, version 1.0, October 2017*, NSW National Parks and Wildlife Service.

10 Appendices

Appendix A Plans



Scale: 1:711

8 4 0 8 16 24 32 Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

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THREDBO

SITE PLAN

Project: Snowmaking Upgrades
Beginner Bowl

Revision: 1

Date: 1/11/2023

Produced By: BB

0 4.5 9 18 27 36 Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

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THREDBO

STOCKPILE AND MATERIAL STORAGE LOCATION WASTE TRASFER FACILITY

Revision: A

Date: 14/09/2023

Produced By: KOS

Appendix B Erosion and Sediment Control Plan

Erosion and Sediment Control Plan

Snowmaking Upgrades, Beginner Bowl

PURPOSE

The purpose of this Erosion and Sediment Control Plan is to outline the intentions and fundamental principles that will be followed in the planning and implementation of erosion and sediment control (ESC) measures for the project during construction.

OBJECTIVES

To minimise potential impacts from construction works to receiving waters.

To reduce the potential for erosion and sediment moving offsite.

SCOPE OF THIS PLAN

Given the nature and scale of the Development, it is not practicable to specifically locate all erosion and sediment controls on a plan. This document identifies appropriate controls specific to project activities to prevent sedimentation and pollution of receiving waters and minimise potential impacts on vegetation communities with and adjacent to the site.

GUIDELINES

- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004)
- IECA Best Practice Erosion and Sediment Control
- Erosion and Sediment Control: A field Guide for Construction Site Managers (Catchments & Creeks Pty Ltd, 2012)

EROSION AND SEDIMENT CONTROLS

Implementation of appropriate controls and locations will be the responsibility of the construction contractor. Controls to be installed prior to any construction work (where required) and retain in place until exposed areas of soil or vegetation are stabilised/rehabilitated.

SITE ESTABLISHMENT

- Implement sediment control measures prior to any construction work and retain in place until exposed areas of soil or vegetation are stabilised/rehabilitated.

STOCKPILES AND STORAGE OF MATERIALS

- Soil stockpiles to be managed in accordance with the Soil Stockpile Guidelines.
- Refer **Attachment A** for recommended controls, including installation notes and examples.

TRENCHING

- Installation of services into common trench.
- Schedule trenching works for periods when rainfall is low.
- Minimise the area of soil disturbed and exposed to erosion. Ensure trench widths and depths are the minimum necessary, including installation notes and examples.

- Divert up-slope clean water away from trenches.
- Conserve topsoil for backfilling and rehabilitation works.
- Progressively rehabilitate disturbed land immediately post construction.
- Maintain ESCs during works until the site has been stabilised
- When excavating, place excavation soil on upslope of trench to divert water from away from the trench line.
- Excavation soil is not to be placed on roads, in areas of concentrated runoff.
- Limit the time trenches are left open and avoid trenching when the risk of adverse weather is high.
- Refer **Attachment A** for recommended controls, including installation notes and examples.

EXCAVATION AND BACKFILLING

- Ensure excavation depths and widths are the minimum necessary.
- Leave excavations open for the minimum practical time.
- Divert surface water away from excavation openings.
- Where excavations are to be left open overnight, provision shall be made so that any fauna entering the excavations can escape.
- Clean excavated material may be temporarily stockpiled on-site for reuse for backfilling, landscaping and rehabilitation works. Any unused material must be removed off-site and disposed of at an authorised site.
- Excavations are to be properly guarded and protected to prevent them from being dangerous.
- Imported fill material shall only be obtained from authorised locations.
- Refer **Attachment A** for recommended controls, including installation notes and examples.

PROGRESSIVE REHABILITATION AND STABILISATION

- All exposed areas shall be progressively stabilised/rehabilitated as soon as possible in accordance with the Rehabilitation and Monitoring Plan (KT 2023).
- Only weed-free or natural thatch/litter should be used in sediment control activities.
- All ESCs will remain in place until all exposed areas of soil are stabilised and/or revegetated.
- All landscaping and rehabilitation should be undertaken in accordance with the *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (DECC 2007) and approved Rehabilitation Plan and Landscape Plan.

MONITORING

During construction, all ESCs are to be checked regularly to ensure they remain in good working order at all times (e.g. prior to forecast rain, daily during extended periods of rainfall and after significant rainfall events). Regular monitoring and maintenance will be the responsibility of the construction contractor. The Environmental Officer will undertake weekly inspections of controls for the duration of construction.

PERFORMANCE INDICATORS

No significant sediment deposition observed leaving the site.

CORRECTIVE ACTIONS

If sediment is observed leaving the site, identify the source and amend the ESCs on-site to ensure appropriate controls are in place. If required, additional ESCs to be installed.

ATTACHMENT A – CONTROL INSTALLATION AND CONSTRUCTION NOTES

Control	Project Activity	Location	Purpose	Timing	Standard Drawing Reference[1]
Sediment fence	Excavation, trenching and stockpiling	Downslope side of any excavations; wetter areas; downslope of earth stockpiles; need to be placed following contours where possible.	To prevent sediment run-off by filtering medium to coarse-grained sediment from runoff	Install prior to, or in conjunction with earthworks. Retain in place until exposed areas of soil are stabilised.	Sediment fence (SD 6-8)
Straw bale filter fencing[2]	Excavations and trenching	Drier areas of excavation, across or at the toe of slope, where required.	To prevent sediment run-off (suitable for low flows of water)	Install prior to, or in conjunction with earthworks. Retain in place until exposed areas of soil are stabilised.	Straw bale filter (SD 6-7)
Straw bales[2]	Cross-slope excavations	To be installed on the uphill side of excavations running cross-slope, where required.	Divert water around and away from excavation works. Suitable for low flows of water to reduce water velocity.	Install prior to, or in conjunction with earthworks. Retain in place until exposed areas of soil are stabilised.	Straw bale filter (SD 6-7)
Temporary geofabric filter pond	Dewatering excavation	Where required, on flat area away from drainage lines/watercourses and native vegetation. Equipment and pumping operation to be confined to construction corridor.	To capture sediment and pollutants and prevent them leaving the filter pond	In the event water enters an excavation and its required to be pumped out prior to recommencement of works	Control installation notes provided below. Refer to best practice guidelines such as IECA.
Earth bank/ flow diversion banks	Excavation and trenching for pipe laying	Running across grade (parallel with surrounding contours). Upslope or downslope of the trench or excavation, where required.	Prevent polluted stormwater from accumulating by directing water around and away from the excavation.	Install prior to, or in conjunction with excavation works. Excavated topsoil can be stripped and used to form flow diversion banks either upslope and/or downslope of soil disturbance.	Earth bank (low flow) (SD 5-5)

Trench breakers (such as sandbags)	Trenching for pipe laying	Across the trench invert during trenching, where required.	Reduce erosion and flow velocity	During trenching, where required.	-

[1]Landcom 2004; NSW DECC 2008 & IECA Best Practice Erosion and Sediment Control (BPESC) document

[2]All straw bales used for sediment and erosion control or rehabilitation must be weed free.

CONTROL INSTALLATION NOTES

Cross Drainage and Sediment Barriers

The recommended spacing for cross drainage and sediment barriers is provided below:

Slope Grade (%)	Cross Drain / Sediment Barrier (m)
5-10	15-20
10-15	10-15
15-25	8-10
>25	5-8

Source: NPWS 2007; Parr-Smith and Polley (1998)
Note: To calculate the grade of a slope: (rise/run) x 100 = slope grade

Trench breakers

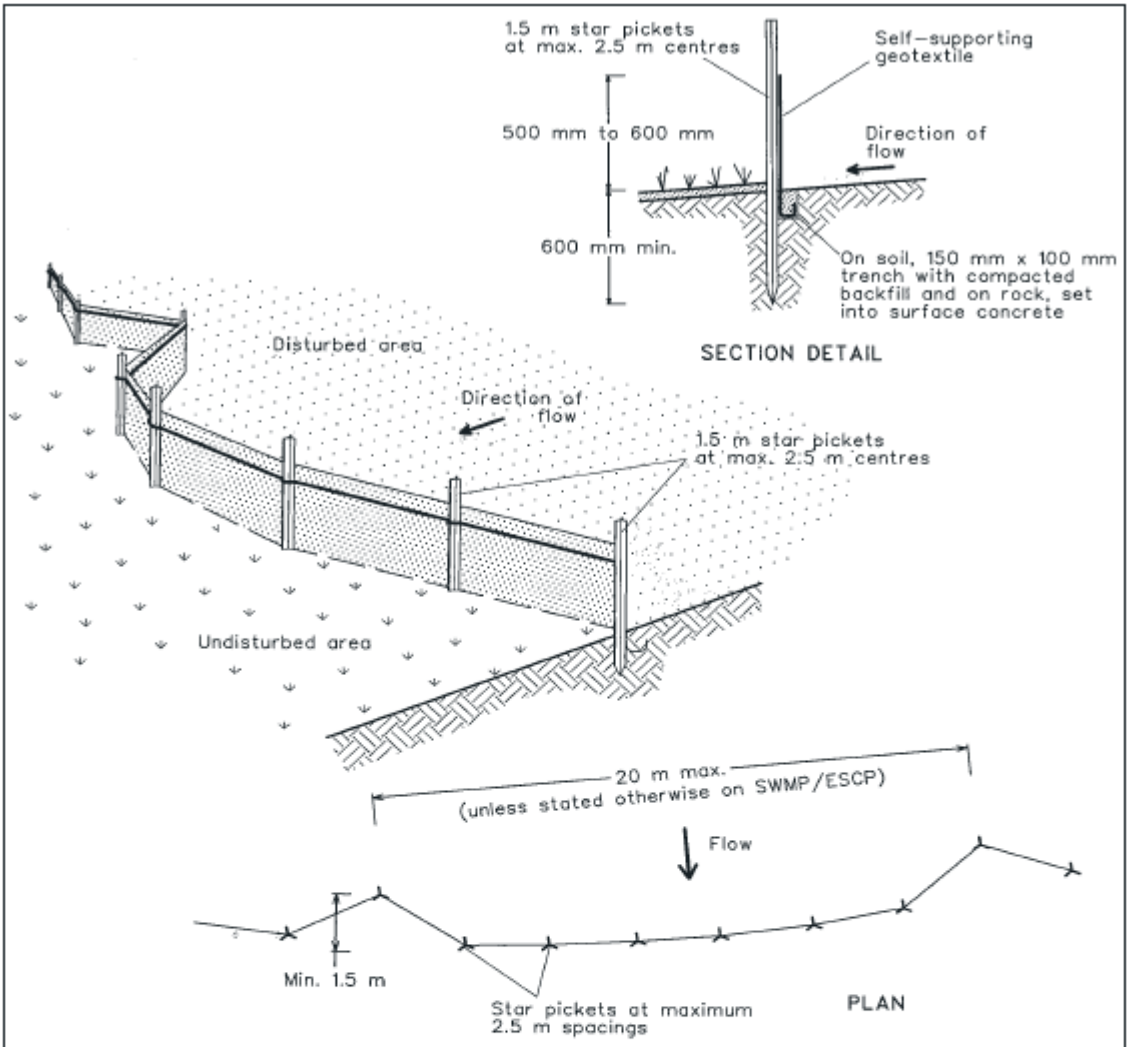
Construction notes:

- Trench breakers may comprise soil or straw bales (or a combination).
- The recommended spacing of trench breakers to be determined on-site according to the slope and potential for subsurface flow, refer to table above for recommended spacing.

Temporary geofabric filter pond

Construction notes:

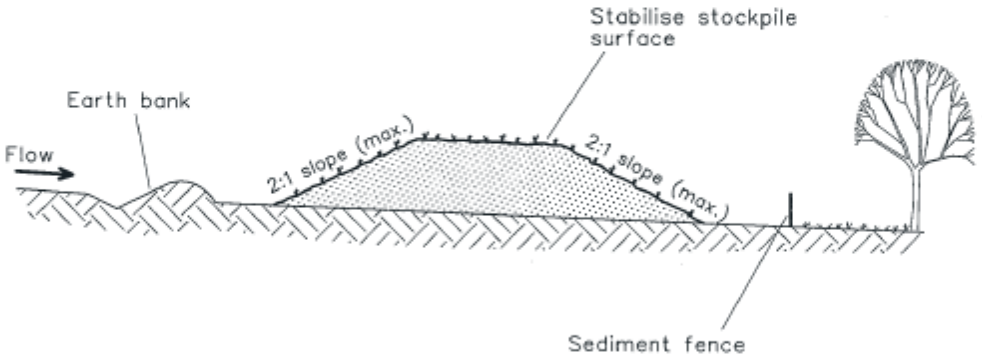
1) Where practicable, locate the filter dam at least 50 m from the edge of a waterbody.
2) Suitably clear and prepare the surface where the filter dam will be installed.
3) Arrange straw bales to form an enclosure and securely anchor each bale with at least one (1) star picket or stake.
4) Securely attach the filter fabric to the straw bales and reinforce with stakes. If more than one sheet of fabric is used, then overlap within a minimum of 600 mm at all joints.



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

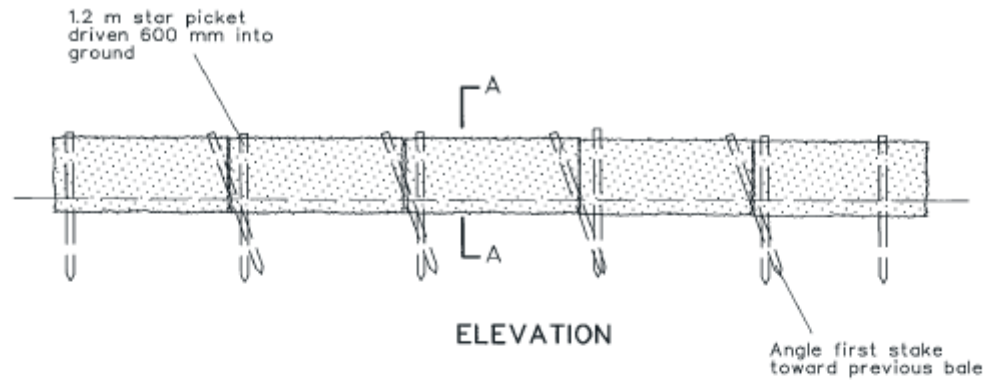
SEDIMENT FENCE **SD 6-8**

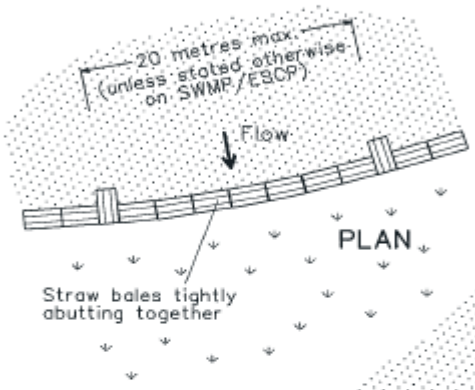


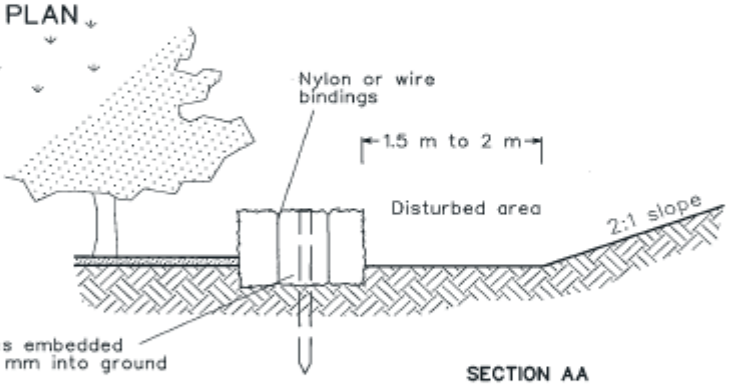
Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES **SD 4-1**



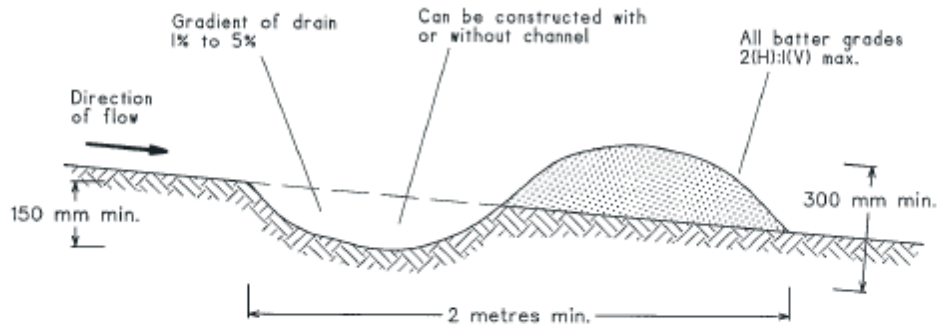




Construction Notes

1. Construct the straw bale filter as close as possible to being parallel to the contours of the site.
2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. Straws are to be placed parallel to ground.
3. Ensure that the maximum height of the filter is one bale.
4. Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickets are used and they protrude above the bales, ensure they are fitted with safety caps.
5. Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.
6. Establish a maintenance program that ensures the integrity of the bales is retained - they could require replacement each two to four months.

STRAW BALE FILTER **SD 6-7**



NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) **SD 5-5**

Appendix C Environmental Schedules

THREDBO ENVIRONMENTAL SERVICES

Record of complaint

Sheet _____of_____

Project: _____ Date / Time: _____

Received by: _____ Reference Number: _____

Complainant details:	Witness details:

Nature of complaint:

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..... Complainant sign:

Action taken:

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Kosciuszko Thredbo Pty Ltd

Environmental Incident Reporting Form

Confidential document after first entry

The purpose of this form is to report any incident that may have resulted in Environmental harm on Kosciuszko Thredbo Pty Ltd premises. Remember to be succinct, stick to the facts and do not make assumptions. Only record information you know to be correct.

The only persons authorised to contact external agencies eg EPA in relation to environmental incidents are the Kosciuszko Thredbo General Manager and Environmental Services Manager or their approved delegates.

Return completed form to the Environmental Services Manager as soon as practicle, on completion of the Environmental incident.

Date of Incident:	**Time of incident:**
Reported by:	**Department:**

Location of Incident

EXACT location of the incident (include landmarks and features, nearest cross street etc to make it easier to identify later)		
Site:	Building:	Room:

Description of incident

Provide description and extent of incident: …… …… …… …… ……
Have relevant photos been taken and attached? Yes ☐ No ☐
If 'No', provide sketch and attach to the rear of this document.
What was the estimated duration of the incident?

Type of incident

☐ Spill (including fuel,oil,waste material or other polluting substance)	☐ Erosion and sedimentation incident	☐ Contaminated water discharge
☐ Noise emission/complaint	☐ Unauthorised/accidental damage to heritage item	☐ Unauthorised/accidental vegetation removal or harm
☐ Air Emission	☐ Wildlife habitat/nesting area disturbed	☐ Other (specify)

Environmental Incident Reporting Form

Level of incident

Level	Example
☐ Minor	eg. No material has escaped the site or caused material harm to the environment – it is easy to clean up without additional assistance.
☐ Major	eg. Material has escaped the site causing pollution downhill/downstream areas, which will require clean up involving other agencies and/or additional resources not available to local site management. Damage has occurred or is likely to occur to the environment.

Hazardous Material Spilt

☐ Petroleum based products/ Hydrocarbons	☐ Chemicals domestic or industrial grade
☐ Biological waste / Clinical and related waste	☐ PCB insulating liquids
☐ CFC containing equipment	☐ Paints or paint products
☐ Radioactive waste	☐ Other (specify)
Detail type/ingredient spilt: (UN, MSDS details)	
Detail concentration of material spilt:	
Detail quantity of material spilt:	

Type of Spill

☐ Spilt onto ground	☐ Spilt into stormwater drain
☐ Spilt into waterway	☐ Poured down sink
☐ Poured down sewer	☐ Released into atmosphere
☐ Caused odour	☐ Caused fire/explosion
☐ Caused infectious contamination	☐ Other (specify)

Immediate Actions

Was spill contained? Yes ☐ No ☐
Detail immediate actions/controls measures taken to rectify or contain the incident …… …… …… …… …… …… …… ……

Environmental Incident Reporting Form

Corrective Actions

Detail corrective clean up action taken

……

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Disposal

Detail disposal method/plans and location

……

……

……

Recommended follow up and preventative actions

Detail recommendations

……

……

……

Persons present at Incident

Were there any witnesses to the accident? Yes ☐ No ☐ If 'Yes', please provide names

……

……

Declaration

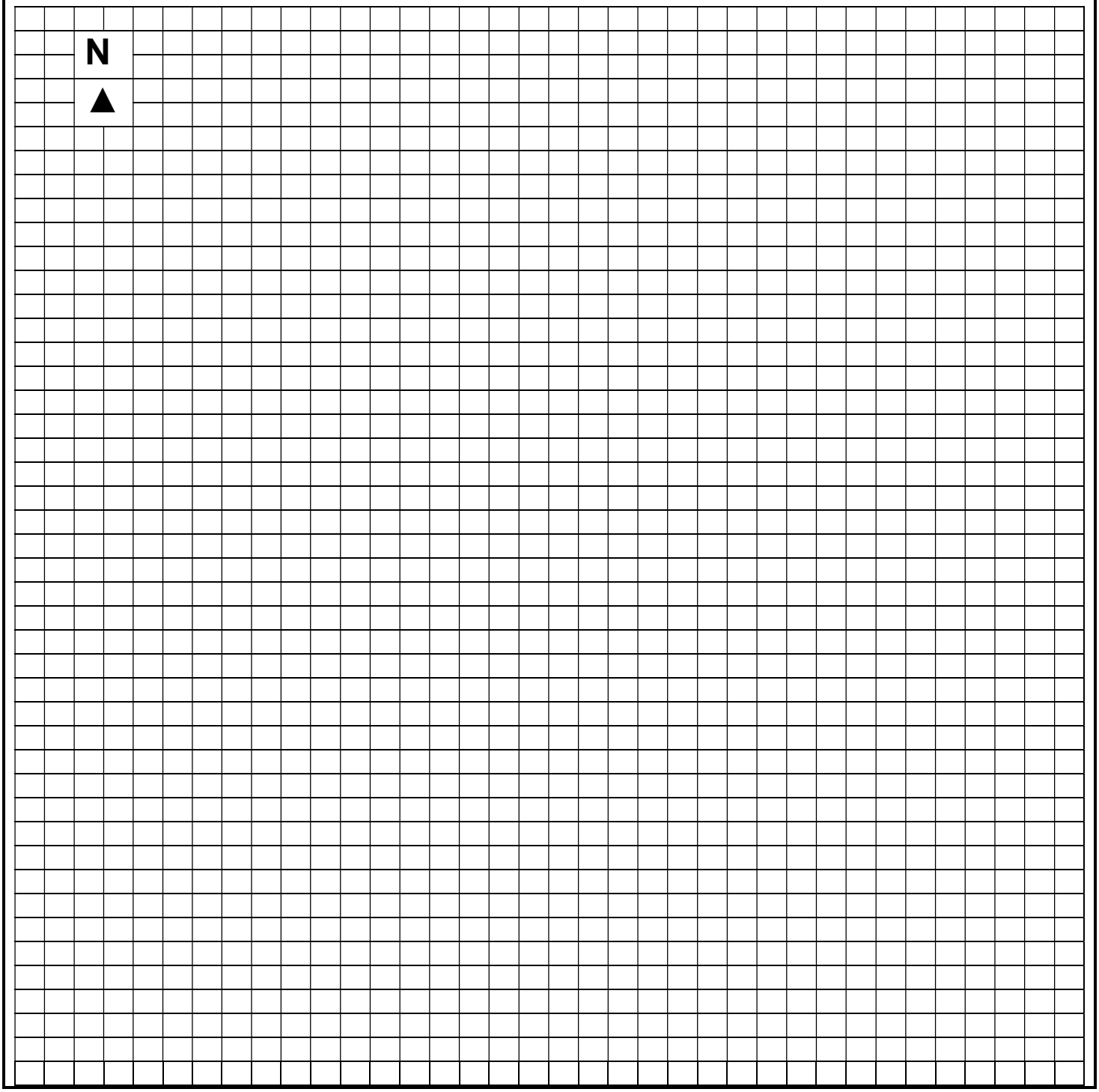
The information and answers given above are true in every detail and no information has been withheld.

Departmental Supervisors Name	
Departmental Supervisors signature	*Date*

Departmental Managers Name	
Departmental Managers signature	*Date*

Environmental Incident Reporting Form

Diagram: (do not scale)



Created By: Paul Corcoran
Created Date: 24 Mar 2009
Review Date: 24 Mar 2017
Reviewed Date: 7th January 2020, by E Diver

Appendix D Rehabilitation Plan

Installation of Snowmaking Infrastructure & Associated Works
Thredbo

Beginner Bowl

Detailed Rehabilitation and Monitoring Plan

Table of Contents

1 Introduction

This rehabilitation and monitoring plan has been prepared to detail the rehabilitation required for all areas disturbed by the construction works associated with the development. The rehabilitation activities consist of stabilisation and revegetation works.

1.1 Aims and Objectives

The aim of this plan is to achieve successful rehabilitation of all areas disturbed by the works with full vegetation coverage to achieve an erosion resistant state. The objectives of this rehabilitation plan are:

- Detail the rehabilitation works required by the proposal for all disturbed areas;
- Set out the schedule for the rehabilitation activities;
- Provide information on plant species and planting ratios; and
- Dictate the maintenance and monitoring of the disturbed and rehabilitation areas.

2 Rehabilitation Program

2.1 Rehabilitation Areas

The areas to be rehabilitated consist of all areas disturbed as a component of the works. These areas include the mains pipeline trench, laterals trenches, pits, material storage areas and any disturbed areas adjacent to the works area. The development areas are shown in Appendix 1.

2.2 Rehabilitation and Stabilisation

The rehabilitation and stabilisation works will be consistent with the Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park (NPWS). The works are to be carried out by Kosciuszko Thredbo Pty Ltd (KT) staff or suitable contractor on KT's behalf. Methods will consist of:

Timing	Procedure	Methods
Pre-construction	Establish construction corridor	• Mark out construction corridor to limit damage to adjacent areas
	Treatment of weeds	• Treat weeds within disturbance area to ensure they are not spread further using methods relevant to the weed species being treated
	Identify trees to be removed	• Clearly identify any trees to be removed with flagging tape and inspect for nests / fauna
	Implement Site Environmental Management Measures	• Erosion & sediment controls to be put in place prior to construction
	Cleaning of machinery	• Ensure all machinery to be used on construction site is cleaned at wash down bay to prevent spread of weed species in resort
	Identify "No Go" areas	• Identify & mark "No Go" areas to clearly delineate sensitive areas to be avoided
	Identify set down areas	• Identify appropriate plant & equipment set down areas for short term placement of machinery & materials avoiding sensitive area's
During Construction	Minimise disturbance & stay within construction corridor	• Minimise disturbance to adjacent native vegetation

		• Limit movement of construction equipment to construction area and nominated set down areas
	Regularly maintain site environmental management measures	• Conduct regular inspections and maintenance of sediment and erosion controls
	Sod cutting, collection & storage	• Native forbs and grasses are the most appropriate for sodding • Where sod collection is possible, cut sods to a depth of 10-20cm (leaving a layer of intact topsoil underneath) and to a size of 30cm^2 • Store sods collected on geofabric adjacent to the construction area • Sod storage time to be kept to a minimum and sods to be utilised as soon as possible after cutting and storage • Monitor sods and environmental conditions and water if necessary
	Soil removal	• Place topsoil & subsoil separately • Adhere to Soil Stockpile Guidelines for Resort Areas of KNP
	Soil replacement	• All excess soil gained from trail construction works is to be spread over the disturbed areas prior to rehabilitation • Ensure subsoil and topsoil are replaced in correct order
Post Construction	Direct seeding	• Areas of open ski slope that have been disturbed by the works and are dominated by EXOTIC species are to be seeded using a 1:1 mix of Chewings fescue & *Poa fawcettiae* • Areas of open ski slope that have been disturbed by the works and are dominated by NATIVE species are to be seeded using only 100% native Poa endemic to the area • Seeding rate: Slope grade <40% use 15-20g/m^2 Slope grade >40% use 20-30g/m^2 • Broadcast Dynamic Lifter @ 100g/m^2 • Weed free rice straw mulch to be applied over seed to protect soil and provide a favourable environment for establishment
	Sod replacement	• Utilise sod replacement in disturbed areas where possible particularly in areas of native vegetation in accordance with “Rehabilitation Guidelines for the Resort Areas of KNP” – Section C.1.4
	Stabilise disturbed areas	• Spread weed free rice straw on slope grades <40% @ 1 bale per 25m^2 and weigh down using native thatch / litter gained from works. Jute mesh may be used if thatch amount insufficient • Install Jute mesh (or similar) over straw on batters & embankments >500mm height & with a slope >40% (Grade% = Rise/Run x 100) • Direct seed at rates listed above to stabilise disturbed areas including batters & embankments

	Planting native tube stock	• Plant native tube stock in areas of native vegetation • Plant shrubs at 3 plants/m^2 • Plant *Poa* at 5 plants/m^2 • Refer to Appendix 2 for suitable rehabilitation species • Water crystals & organic fertiliser may be used at label rates: • *Water crystals:* 5gm pre-hydrated crystals (crystals must be hydrated for at least 2hrs prior to planting) • *Fertiliser:* 1 x Typhoon Native fertiliser tablet per plant placed next to or below roots
	Watering	• If required, water rehabilitation areas to assist in seed germination, shrub establishment and straw retention
	Weed control	• Monitor all areas disturbed by the works (including areas adjacent to the works) for signs of weed infestation • Treat weeds with methods appropriate to weed species being treated including low pressure spot spraying and hand removal techniques • Limit off-target damage by only spraying in the appropriate conditions • Weed monitoring & control is to be conducted on an on-going basis and included in annual resort weed control activities

2.3 Monitoring

Weekly inspections of the construction area will be carried out by the Environmental Officer during the construction phase as per the Site Environmental Management Plan (SEMP). These inspections are to ensure that all site environmental management measures are in place and in good working order. On-going monitoring will occur as per the Rehabilitation & Monitoring schedule.

2.4 Schedule

Site stabilisation and rehabilitation works shall commence, as soon as possible, following the completion of each section of work to minimise exposed areas. The maintenance works associated with the rehabilitation areas are to be undertaken on an on-going, as required basis throughout each summer season. The schedule for the rehabilitation works is provided in the table below. The appointed Environmental Officer for the project is responsible for ensuring that all preparation, works, monitoring and reporting are carried out to the required standard. The works will be carried out by KT staff or an appointed contractor.

Rehabilitation and monitoring schedule

AREA	PROCEDURE	TIMING
Mains pipeline trench **Laterals trenches**	Site Preparation	During construction
	Seeding and planting tube stock	During construction and ongoing annually until adequate groundcover has been achieved
	Mulching	During construction and ongoing annually until adequate groundcover has been achieved
	Maintenance (incl. weed control & replacement planting)	Ongoing annually as required (between November and May)
	Monitoring	**Weekly** during construction as per SEMP **Monthly** post construction for the first 12 months to monitor for erosion, sediment control and plant establishment **Annually** once stabilisation has been achieved, between November & May each year up until the date 5 years after the issue of a final occupation certificate with results recorded against photo points identified in Appendix 3 of this plan. At the completion of the 5 years, general monitoring & maintenance will continue. **Monitoring** will be conducted by way of site inspection with triggers for action detailed in Section 2.5 - Maintenance & Mitigation

2.5 Maintenance & Mitigation

In the event that monitoring indicates initial rehabilitation efforts are not effective (minimal grass / shrub establishment or declining coverage), additional management actions may be required. Management actions will be determined following 3 consecutive months of poor establishment or declining survival rates of native species planted. If deemed necessary, this period will be brought forward to implement the additional actions required. The management actions are to consist of one or more of the following:

Area	Maintenance trigger	Action
All areas disturbed by construction works including Mains pipeline trench and Laterals trenches	Poor grass & shrub establishment <75% native species coverage	• Additional direct seeding in areas of open non-native vegetation • In-fill planting of native tube stock • Grazing control by use of tree guards where appropriate
	Presence of weeds	• Weeds to be controlled annually include, but not limited to, Milfoil, St John's Wort, thistle & Juncus • Spot spray using low pressure sprayer

		• Use of hand removal techniques where appropriate
	Identification of erosion & unstable areas	• Installation of Jute mesh, brush matting & mulching • Installation of hay bale and sediment fencing control measures • Maintenance of sediment retention pits, water bars and drains • Carry out additional planting & re-vegetation works as per Rehabilitation table
	Presence of sediment & debris	• Remove build-up of sediment from sediment retention pits and pipe inlets & outlets as required
Drains Water bars Sediment retention pits	Presence of sediment & debris Identification of damage	• Inspection of drains, water bars & sediment retention pits particularly after heavy rainfall • Removal of sediment and debris to prevent blockages / overflow and limit sedimentation of vegetation • Regular inspection to identify damage to system and maintenance

Additional planting & re-vegetation works are to be carried out as per the Rehabilitation table. If it is found that after 12 months of monitoring the rehabilitation efforts are not effective, KT will liaise with NPWS to determine the most appropriate action. The 12-month period will allow time for the rehabilitation area to establish prior to any further intervention.

3 Exotic Species

All areas disturbed by the works are to be monitored on an ongoing basis for the occurrence of any exotic flora and evidence of exotic fauna (scats and tracks). In the event of the detection of exotic species, appropriate control works are to be scheduled as required as set out below.

Exotic flora

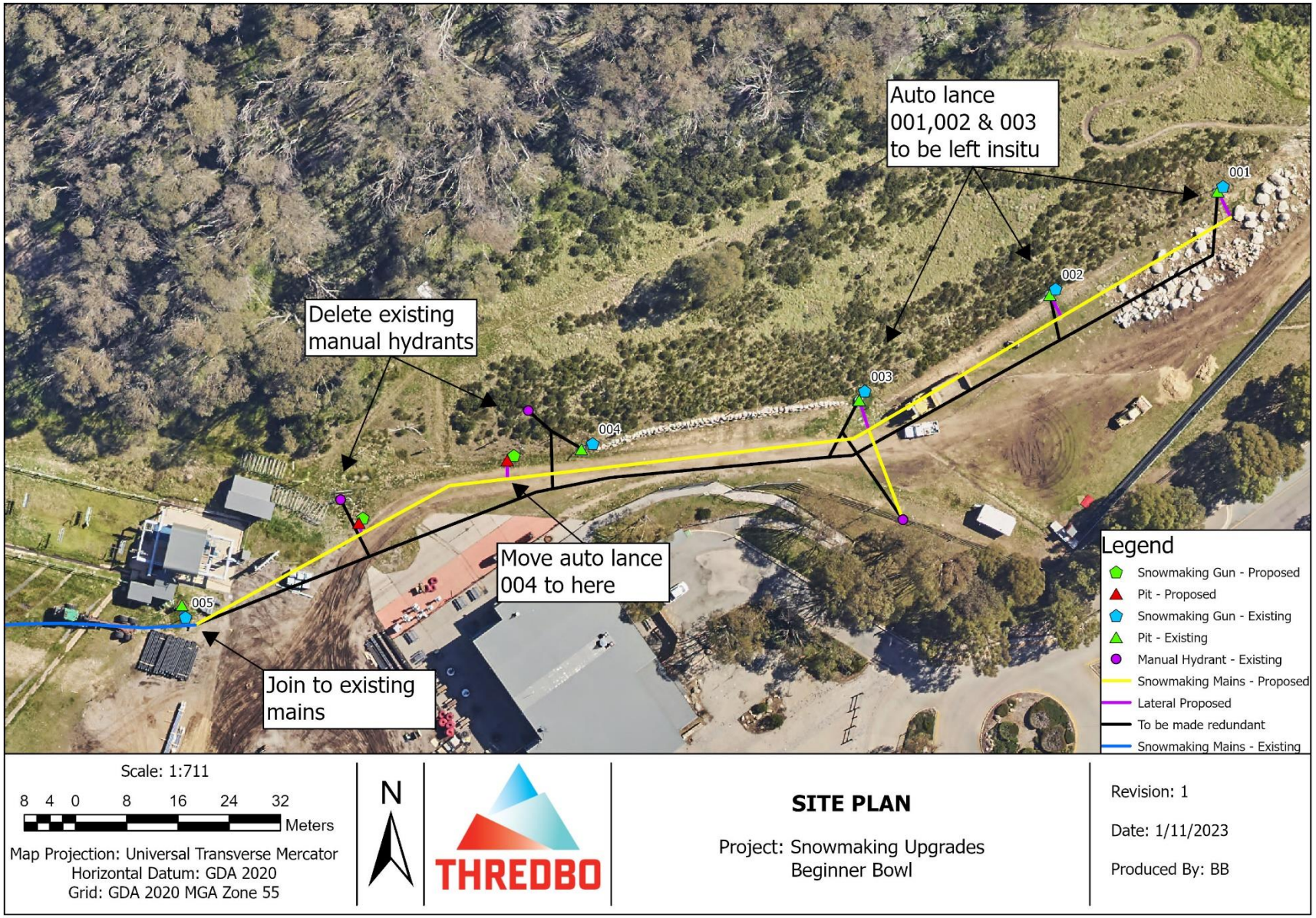
The control of exotic flora is to be undertaken using either spot spraying or hand removal techniques. The spraying activities are to be undertaken using appropriate herbicide for the species being treated and techniques for the conditions on the day. All control activities are to be undertaken prior to plant seed set.

Exotic fauna

The control of exotic fauna is to be undertaken in cooperation with NPWS as a resort wide program targeting the control of cats, foxes and rabbits. The cat and fox trapping program is undertaken by KT during the winter months in the village and on the lower slopes of the resort. Rabbit control programs are conducted in autumn and spring by KT staff also targeting these areas. Feral deer, cat, fox and dog control is undertaken by NPWS outside of the KT lease area.

4 Appendices

4.1 Appendix 1 – Development Area Map



4.2 Appendix 2 – Rehabilitation Species

The following is an extract from the publication; Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park (NPWS 2007). The table represents some of the recommended species for revegetation activities within Thredbo at the development site altitude.

Rehabilitation Species List: Thredbo & Bullocks Flat

This appendix provides a list of species known to be successful in rehabilitation, and which would be suited to the Kosciuszko resorts. It does not provide a definitive list of species found in each resort.

Form	Species	Common Name	Community	Propagation and Seed Collection Notes	Direct Seeding
Forbs					
	Craspedia jamesii	James's Billy-button	TAHa, STG	Seed or division	Y
	Craspedia lamicola	Shiny-leaf Billy-button	TAHa, STG	Seed or division	Y
	Craspedia leucantha	Pale Billy-button	SAH, TAHa	Seed or division	Y
	Craspedia maxgrayi	Woolly Billy-button	TAHa, STG	Seed or division	Y
	Helichrysum scorpioides	Button Everlasting	TAHa, W	Seed	Y
	Podolepis robusta	Alpine Podolepis	TAHa, STG	Seed	Y
	Senecio linearifolius	Fireweed Groundsel	SAH, W, SR	Seed	Y
	Stylidium graminifolium	AlpineTrigger-plant	TAHa, STG, H, B, W, SAH, SG	Seed	Y
Grasses, rushes					
	Carex hebes	Dryland Sedge	TAHa, STG	Seed or division	Y
	Poa costiniana	Prickly Snow-grass	STG, F, B, TAHa, H, SAH	Seed or division	Y
	Poa ensiformis	Sword Tussock-grass	W, SAH, SR	Seed or division	Y
	Poa fawcettiae	Smooth-blue Snow-grass	TAHa, STG	Seed or division	Y
	Poa hiemata	Soft Snow-grass	TAHa, SG	Seed or division	Y
Shrubs					
	Acacia obliquinervia	Mountain Hickory Wattle	SAH	Seed (collect in March)	Y
	Cassinia monticola	Cassinia	W, SG		
	Grevillea australis	Royal Grevillea	H, SAH	Tip cutting	
	Hakea microcarpa	Small-fruit Hakea	SAH, W		Y
	Ozothamnus ellipticum	Kerosene Bush	B, H	Soft cutting	
	Ozothamnus secundiflorus	Cascade Everlasting	H, SAH	Soft cutting	
	Podolobium alpestre	Alpine Shaggy-pea	H	Seed (collected in March)	
		Prostanthera cuneata	Alpine Mint-bush	H	Cuttings
Trees					
	Eucalyptus dalrympleana	Mountain Gum	W	Seed	Y
	Eucalyptus delegatensis	Alpine Ash	W	Seed	Y
	Eucalyptus pauciflora	Snow Gum	W	Seed (available all year). 3 weeks cold treatment at 4° recommended.	Y
	Eucalyptus stellulata	Black Sally	W	Seed (available all year). 3 weeks cold treatment at 4° recommended.	Y

Key to Communities:

TAHa	Tall Alpine Herbfield *Celmisia –Poa* alliance	H	Heath (alpine)
TAHb	Tall Alpine Herbfield *Brachyscome-Austrodanthonia* alliance	F	Fen
SAH	Short Alpine Herbfield	B	Bog
FMa	Feldmark *Epacris-Chionohebe* alliance	STG	Sod Tussock Grassland
FMb	Feldmark *Coprosma – Colobanthus* alliance	W	Woodland
		SAH	Sub-alpine heath
		SR	Subalpine Riparian and wet areas
		SG	Subalpine Grassland and dry, treeless areas

4.3 Appendix 3 – Photo Monitoring Points

Photo Point	Description	Coordinates	Photo
PH1	Easy Does It chairlift bottom station looking towards Beginner Bowl	617,370 5,959,929	
PH2	Beginner Bowl access adjacent to Friday Flat Bistro	617,409 5,959,954	
PH3	Beginner Bowl looking upslope	617,473 5,959,961	

Scale: 1:711

8 4 0 8 16 24 32 Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

N

THREDBO

PHOTO POINTS

Project: Snowmaking Upgrades
Beginner Bowl

Revision: 1

Date: 31/10/2023

Produced By: BB

Appendix D Geotechnical Assessment

assetgeoenviro

Suite 2.06 / 56 Delhi Road
North Ryde NSW 2113
02 9878 6005
assetgeoenviro.com.au

Our ref: 7381-R1 Rev 1
7 December 2023

Kosciuszko Thredbo Pty Ltd
1 Friday Drive
Thredbo NSW 2625

Attention: Chloe Chalk

Dear Chloe,

Proposed Snowmaking Replacement Works at Beginner Bowl, Friday Flat, Thredbo NSW
Geotechnical Assessment

1. Introduction

This report presents the results of a geotechnical assessment for Proposed Snowmaking Replacement Works at Beginner Bowl at Friday Flat, Thredbo NSW (the Site). The assessment was commissioned on 9 October 2023 by Chloe Chalk of Kosciuszko Thredbo Pty Ltd, on behalf of Kosciuszko Thredbo Pty Ltd. The work was carried out in accordance with the proposal by AssetGeoEnviro (Asset) dated 08 October 2023, reference 7381-P1.

Documents supplied to us for this investigation comprised:

- Site Plan of Snowmaking Upgrades at Beginner Bowl, Friday Flat (prepared by: Kosciuszko Thredbo Pty Ltd; dated: 1 November 2023; Revision: 1).

We understand that the project involves trenching and installing snowmaking services (air and water) in a main line (100NB) and a lateral line (50NB).

It is understood that the snowmaking main trenches will be approximately 0.8m wide x 1m deep and the lateral trenches will be approximately 0.6m wide x 0.6-0.8m deep.

A portion of the site is mapped within an area designated as “G” as defined in the maps accompanying DIPNR’s “Geotechnical Policy – Kosciuszko Alpine Resorts”, November 2003, and therefore a geotechnical report is required to accompany the development application as per the requirements of the Geotechnical Policy.

2. Scope of Work

The main objectives of the site inspection were to assess the site conditions and to provide a Form 4 certification with design recommendations.

The following scope of work was carried out to achieve the project objectives:

- A review of existing regional maps and reports relevant to the Site held within our files.
- Visual observations of surface features.
- Engineering assessment and reporting.

This report must be read in conjunction with the attached "Important Information about your Geotechnical Report" in Appendix A. Attention is drawn to the limitations inherent in site investigations and the importance of verifying the subsurface conditions inferred herein.

3. Regional Topography & Site Geology

The regional topography comprises moderately to steeply sloping terrain flanking the north-easterly flowing Thredbo River, with ground slopes over the land flanking the river generally ranging from 10º to 30º and some locally steeper sections, and more gentle slopes over the river shoulders. Numerous drainage depressions and watercourses flow towards the river, with some of the persistent watercourses to the north of the river carved several metres into the underlying granite bedrock. Side slopes to creeks and watercourses are typically steeper at 20 to 35º, and typically include numerous granite boulders and cobbles.

The 1:250,000 Tallangatta Geological Map indicates the site is underlain by Silurian aged intrusive granite.

4. Site Observation

The proposed snowmaking replacement lies on a gently sloping area that slopes to the southeast at less than about 3º to 5º towards Friday Drive and is situated at the toe of a moderate slope of about 22º to 26º up to the northwest which flattens out to about 10º to 12º before again increasing to about 22º to 25º. The slope to the northwest of the proposed work is partially supported by granite stone retaining wall in the central part. The proposed installation of snowmaking replacement would be around the toe of a moderate slope to the north, which is approximately 22º to 26º from horizontal.

A shallow surface drain has been cut within the gently sloping Beginners Bowl, near the toe of the moderate flanking slope.

The slope to the north is covered with thin grass and shrubs. Occasional small granite boulders could be seen in the area. The subsoil profile is assessed to comprise residual soils and completely weathered granite with some granite boulders within the soil mass, and possibly extending into less weathered granite bedrock, based on our previous investigations in the area.

There are no major structures located upslope of the proposed snowmaking works. At the time of inspection, no sign of obvious ground movement or tension cracks were observed behind the granite stone retaining wall or the adjacent slope.

5. Discussions and Recommendations

The prosed work is anticipated to involve minor trench excavation around the toe of the slope. We have observed that part of the slope is retained by a granite stone wall. Geofabric is visible behind the granite wall, which was installed for erosion protection of the retained materials.

The proposed works will have 'minimal or no geotechnical impact' on the site, based on the relatively shallow depths of excavation required, the lack of obvious signs of hillside instability observed or expected, and previous test pitting observations by the undersigned in the area. We therefore consider that a geotechnical report prepared in accordance with the Geotechnical Policy for Kosciuszko Alpine Resorts (2003) is not required. A completed Form 4 – Minimal Impact Certification is provided on the second page of this report.

The following recommendations are provided for the development:

- Based on our site observations and previous test investigations in the area, we expect that due to previous site disturbance and observed slopes, the site is Class 'P', in accordance with AS2870-2011 'Residential slabs and footings'.
- Trenches for snowmaking services should be located away from the granite boulder retaining wall to avoid potential instability during excavation. We recommend that the snowmaking and associated trenching should be located at least 2m from the toe of the wall.
- Excavation for the trenches is anticipated to be predominantly within soils of variable nature including completely weathered granite and cobbles and boulders. Excavation could be achieved by suitably sized excavator.
- Excavation sides may be cut vertically for the trenches, up to maximum 1m depth. Excavation for the concrete boxes may also be cut vertically up to maximum 1.6m depth due to the limited lateral extent.
- Filling may comprise the excavated soils provided they are not too wet and do not contain too much organic matters that prevents achieving reasonable compaction levels. The fill should be placed in layers not more than 0.2m loose thickness and compacted using wheel roller on an excavator or other suitable compaction equipment (e.g. whacker-packer). Compaction should continue until no further subsidence or compression of the compacted surface is observed.

6. Limitations

In addition to the limitations inherent in site investigations (refer to the attached Information Sheets), it must be pointed out that the recommendations in this report are based on assessed subsurface conditions from limited observations.

This report may have included geotechnical recommendations for design and construction of temporary works (e.g. temporary batter slopes or temporary shoring of excavations). Such temporary works are expected to perform adequately for a relatively short period only, which could range from a few days (for temporary batter slopes) up to six months (for temporary shoring). This period depends on a range of factors including but not limited to: site geology; groundwater conditions; weather conditions; design criteria; and level of care taken during construction. If there are factors which prevent temporary works from being completed and/or which require temporary works to function for periods longer than originally designed, further advice must be sought from the Geotechnical Engineer.

This report and details for the proposed development should be submitted to relevant regulatory authorities that have an interest in the property (e.g. Department of Planning) or are responsible for services that may be within or adjacent to the site for their review.

Asset accepts no liability where our recommendations are not followed or are only partially followed. The document "Important Information about your Geotechnical Report" in Appendix A provides additional information about the uses and limitations of this report.

Please do not hesitate to contact the undersigned if you have any questions regarding this report or if you require further assistance.

For and on behalf of
AssetGeoEnviro

Mark Bartel
BE, MEngSc, GMQ, CPEng, RPEQ/NER(Civil), DEP/PRE (NSW)
Managing Director | Senior Principal Geotechnical Engineer

Encl: Important Information about your Geotechnical Report
Site Photos
Department of Planning & Environment Form 4

Document Control

Distribution Register

Copy	Media	Recipient	Location
1	Secure PDF	Chloe Chalk	Kosciuszko Thredbo Pty Ltd
2	Secure PDF	Mark Bartel	Asset Geotechnical Engineering

Document Status

Rev	Revision Details	Author	Reviewer		Approved for Issue		
			Name	Initials	Name	Initials	Date
0	Initial issue	A. Tucho	M. Bartel	*MAB*	M. Bartel	*MAB*	27 November 2023
1	Client comments	A. Tucho	M. Bartel		M. Bartel		7 December 2023

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ISO 14001:2015
ISO 45001:2018 AS/NZS 4801:2001

Site Photos

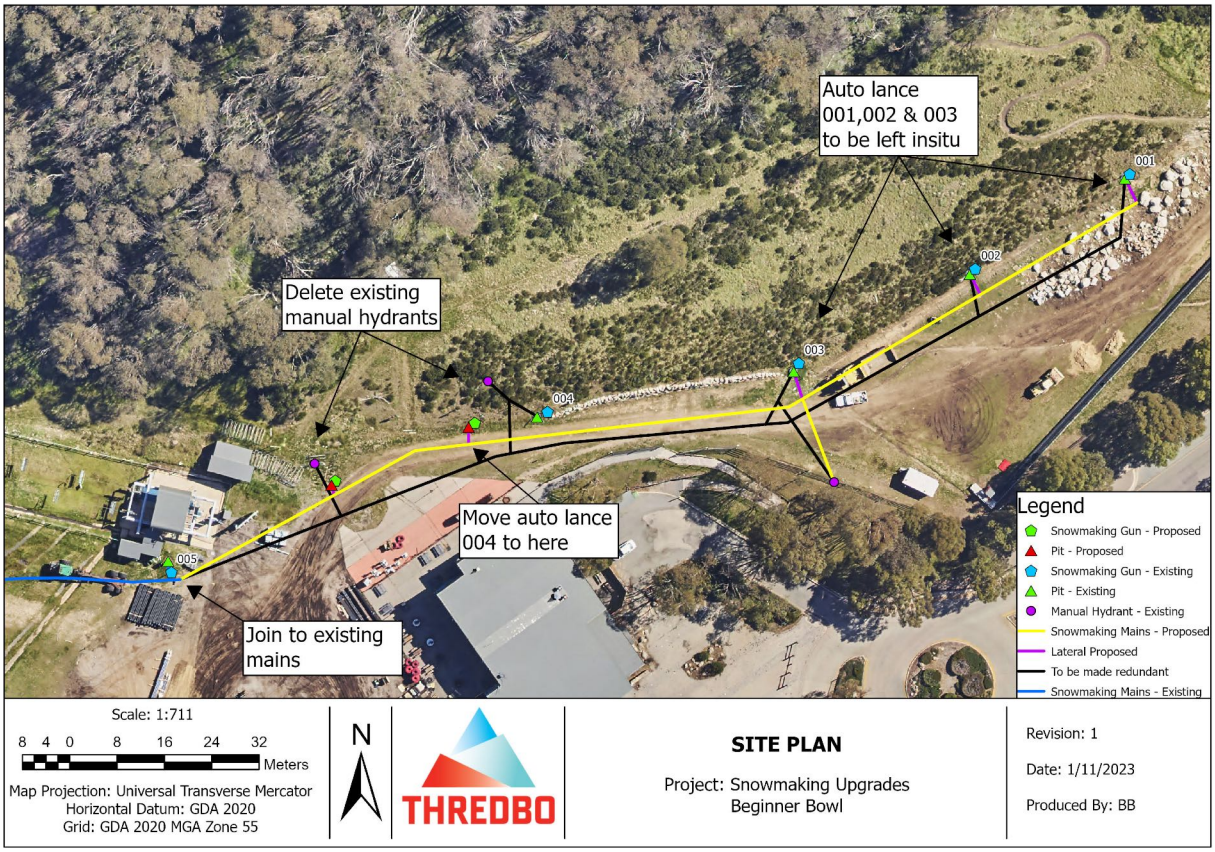

Photo 1: Schematic of the proposed replacement of snowmaking work supplied by Kosciuszko Thredbo Pty Ltd

Photo 2: Location of proposed snow making replacement, looking southwest

Photo 3: Location of proposed snow making replacement and existing granite stone wall, looking northwest

Photo 4: Location of proposed snow making replacement, looking southwest

Photo 5: Sloping ground just north of proposed snow making replacement, looking northeast.

Important Information about your Geotechnical Report

Scope of Services

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client and Asset Geotechnical Engineering Pty Ltd ("Asset"), for the specific site investigated. The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

The report should not be used if there have been changes to the project, without first consulting with Asset to assess if the report's recommendations are still valid. Asset does not accept responsibility for problems that occur due to project changes if they are not consulted.

Reliance on Data

Asset has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps, and plans. Asset has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, Asset will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented, or otherwise not fully disclosed to Asset.

Geotechnical Engineering

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g., a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

Limitations of Site Investigation

The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behavior regarding the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

Therefore, the recommendations in the report can only be regarded as preliminary. Asset should be retained during the project implementation to assess if the report's recommendations are valid and whether changes should be considered as the project proceeds.

Subsurface Conditions are Time Dependent

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. Asset should be kept appraised of any such events and should be consulted to determine if any additional tests are necessary.

Verification of Site Conditions

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that Asset be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience, and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

Reproduction of Reports

 Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included to minimize the likelihood of misinterpretation from logs.

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. Asset assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Asset or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

Data Must Not Be Separated from The Report

The report presents the site assessment and must not be copied in part or altered in any way.

Logs, figures, drawings, test results etc. included in our reports are developed by professionals based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Report Recommendations not Followed

Where the recommendations of the report are not followed or are only partially followed, there may be significant implications for the project (e.g., commercial loss, property loss or damage, personal injury, or loss of life). Consult Asset if you are not intending to follow all the report recommendations, to assess what the implications could be. Asset does not accept responsibility where the report recommendations have not been followed or have only been partially followed.

Other Limitations

Asset will not be liable to update or revise the report to consider any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

Form 4 – Minimal Impact Certification

DA Number: _____

This form may be used where minor construction works which present minimal or no geotechnical impact on the site or related land are proposed to be erected within the "G" line area of the geotechnical maps.

A geotechnical engineer or engineering geologist must inspect the site and/or review the proposed development documentation to determine if the proposed development requires a geotechnical report to be prepared to accompany the development application. Where the geotechnical engineer determines that such a report is not required then they must complete this form and attach design recommendations where required. A copy of Form 4 with design recommendation, if required, must be submitted with the development application.

Please contact the Alpine Resorts Team in Jindabyne for further information - phone 02 6456 1733.

To complete this form, please place a cross in the appropriate boxes ☐ and complete all sections.

1. Declaration made by geotechnical engineer or engineering geologist in relation to a nil or minimal geotechnical impact assessment and site classification

I,

Mr [x] Ms ☐ Mrs ☐ Dr ☐ Other ☐

First Name	Family Name
Mark	Bartel

OF

Company/organisation

Asset Geotechnical Engineering Pty Ltd (trading as AssetGeoEnviro)

certify that I am a geotechnical engineer /engineering geologist as defined by the "Policy" and I have inspected the site and reviewed the proposed development known as

Proposed Snowmaking Replacement Works at Beginner Bowl, Friday Flat, Thredbo NSW

As a result of my site inspection and review of the following documentation

(List of documentation reviewed)

Site Plan of Proposed Snowmaking Upgrades at Beginner Bowl; prepared by: Kosciuszko Thredbo Pty Ltd; 1 November 2023; Revision 1

I have determined that;

- ☒ the current load-bearing capacity of the existing building will not be exceeded or adversely impacted by the proposed development, and
- ☒ the proposed works are of such a minor nature that the requirement for geotechnical advice in the form of a geotechnical report, prepared in accordance with the "Policy", is considered unnecessary for the adequate and safe design of the structural elements to be incorporated into the new works, and
- ☒ in accordance with AS 2870.1 Residential Slabs and Footings, the site is to be classified as a type

(insert classification type)

Class P

- ☒ I have attached design recommendations to be incorporated in the structural design in accordance with this site classification.

I am aware that this declaration shall be used by the Department as an essential component in granting development consent for a structure to be erected within the "G" line area (as identified on the geotechnical maps) of Kosciuszko Alpine Resorts without requiring the submission of a geotechnical report in support of the development application.

2. Signatures

Signature

Mark Bartel

Chartered professional status

CPEng 35641 NER (Civil)

Name

Mark Bartel

Date

7 December 2023

3. Contact details

Alpine Resorts Team
Shop 5A, 19 Snowy River Avenue
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Facsimile: 02 6456 1736
Email: alpineresorts@planning.nsw.gov.au