DA 24/16834 - Snowmaking factory, Friday Flat, Thredbo

Applicant response to request for additional information

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1 Overview

This document has been prepared in response to the DA 24/16834 - Snowmaking factory, Friday Flat, Thredbo - request for additional information issued by the Department of Planning, Housing and Infrastructure (DPHI) on 17 December 2024.

It should be noted that some of the items outlined in DPHI's RFI will be addressed in detailed design at the construction certificate stage. Section 36(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) states:

A consent authority may not request additional information in relation to building work or subdivision work if the information is required to accompany an application for a construction certificate or subdivision works certificate.

2 RFI Matters

2.1 Operational matters

2.1.1 Describe snow making process and whether any additives are required.

The model Snowpro260 machine (snow factory) makes plate-ice which is used as snowmaking for ski slopes such as Friday Flat. The process works as follows; water trickles across a number of hollow vertical steel plates that are chilled by refrigerant flowing through them. During this process, the water freezes on the external face of the plates in a thin layer then the refrigeration cycle is reversed causing the ice to drop off the plates. This ice collects in a hopper, is chopped to size (4 – 7mm particles) and then metered into a low-pressure air system. Hence the product is blown out of the unit and distributed to the ski slope in 100 mm nominal diameter buried plastic piping. The cycle is started again, repeating the whole cooling/freezing/thawing process. Because the process of making plate-ice is quite simple and involves few moving parts, no additives are required.

The process is slow but continuous, the production rate of the snow factory is up to 120 t/24 hr period. Snow discharged onto the slope is made in piles in order to minimise the losses due to effects of sun, wind and the relatively warm ground. Once enough snow has been made in a series of small piles, it is spread onto the slope and allowed to sit for approximately 3 days prior to skiing.

2.1.2 Describe if any waste or by products (during snow making and / or cleaning)

There will be a minimal quantity of excess water wasted during the defrost cycle only – required only before a major service. No waste products are expected during normal operation of the snow factory. The process of cooling water from the inlet temperature (e.g. at approx. 10°C) to form ice naturally involves the rejection of some "waste" heat. Such heat is emitted at the roof-top cooling condenser fan unit. The refrigeration process is a closed loop ammonia (NH3)-based system and as such remains the most energy efficient and environmentally benign means of producing ice commercially.

2.1.3 Any ongoing maintenance requirements and expectations. For instance - washing, cleaning, changing parts, oils, lubricants etc.

The Snowpro260 and its individual components require routine inspections, tests and maintenance at intervals varying from daily (during operation) through to annual and 5-yearly.

The manufacturer outlines comprehensive maintenance requirements for all the components, including:

- room ventilation and heating
- water pumps
- discharge screw conveyors
- rotary valves
- water tank
- plate ice maker
- liquid separator
- condenser fan unit
- blowers
- gas warning system
- oil cooler
- safety valves.

For example:

- daily, weekly and monthly operational inspections
- 3-monthly inspections, replacement of filters if required
- periodic servicing of compressors
- replacement of bearings as required
- lubrication of motor and screw conveyor bearings
- cleaning and maintenance will occur out of winter season.

During operation, when excessive ice build-up is noticed, the defrost cycle will be run. The manufacturer advises such defrost cycles (lasting a few hours) can be expected to be required once every 1 to 2 weeks during operation.

2.1.4 Whether operational emissions from the facility

There are no emissions from the facility during normal operation (other than noise and heat). Kosciuszko Thredbo purchases 100% renewable energy sourced electricity which will be used to power the Snowpro260. Hence the additional carbon-equivalent emissions attributable to this development is minimised.

2.1.5 Operational noise levels (dBA) from the facility

Noise measurements from a similar installation in Winterberg (Germany) operating at full load are indicated in **Figure 1**. It should be noted that background noise levels vary from location to location and vegetation may act as sound attenuation in some instances. For informative purposes, when reviewing the noise levels from the Wintenberg installation, once located approximately 70 m from the snow factory noise levels can be expected around 47 dB(A). This noise level is comparative to a quiet residential area, refrigerator, library, conversation at home (IAC Acoustics 2025, https://www.iacacoustics.com/blog-full/comparative-examples-of-noise-levels; Centre for Hearing and Communication n.d. https://noiseawareness.org/info-center/common-noise-levels/).

Sensitive receptors within the locality are located more than 120 m from the snowmaking unit, refer **Figure 2**.

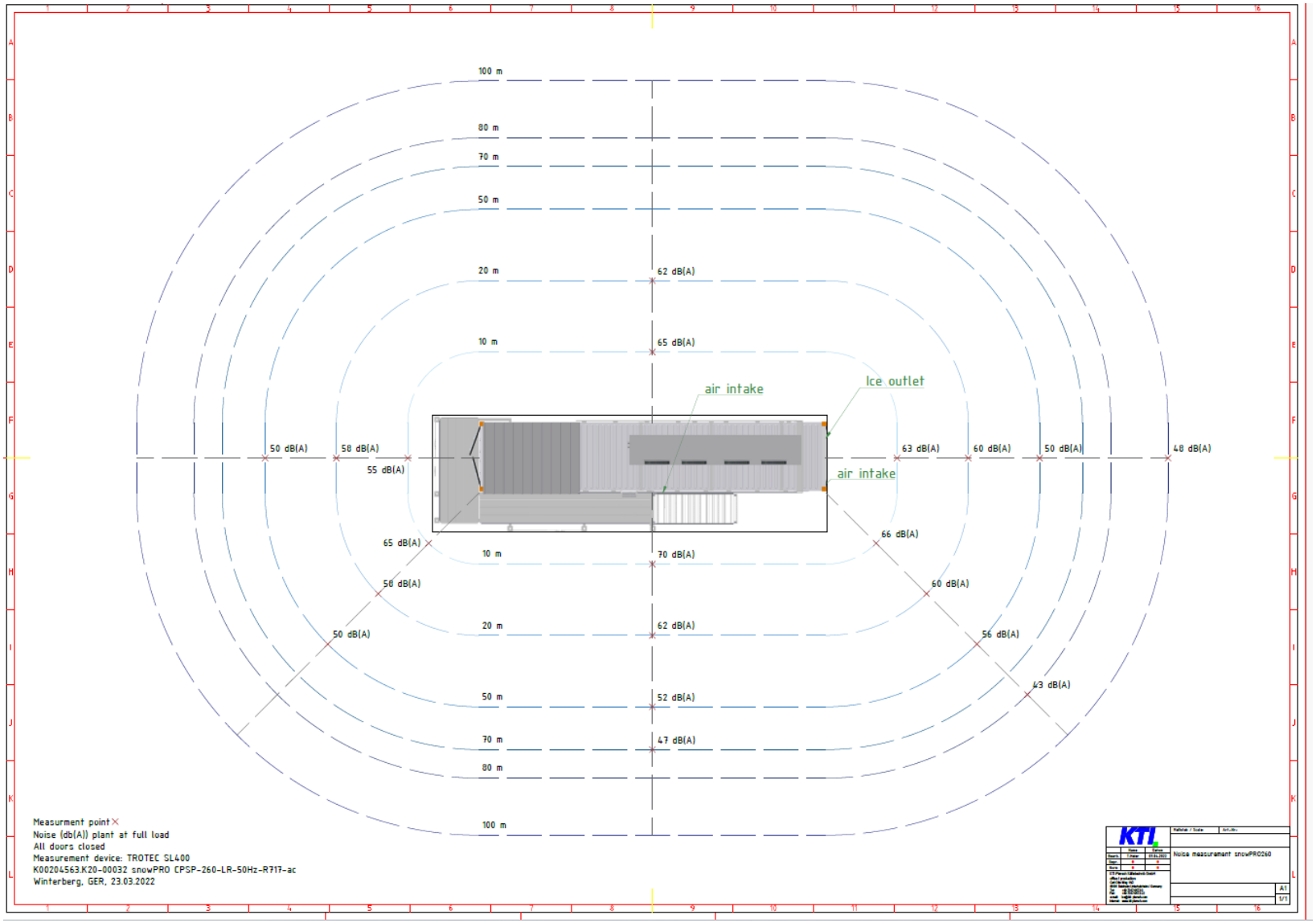
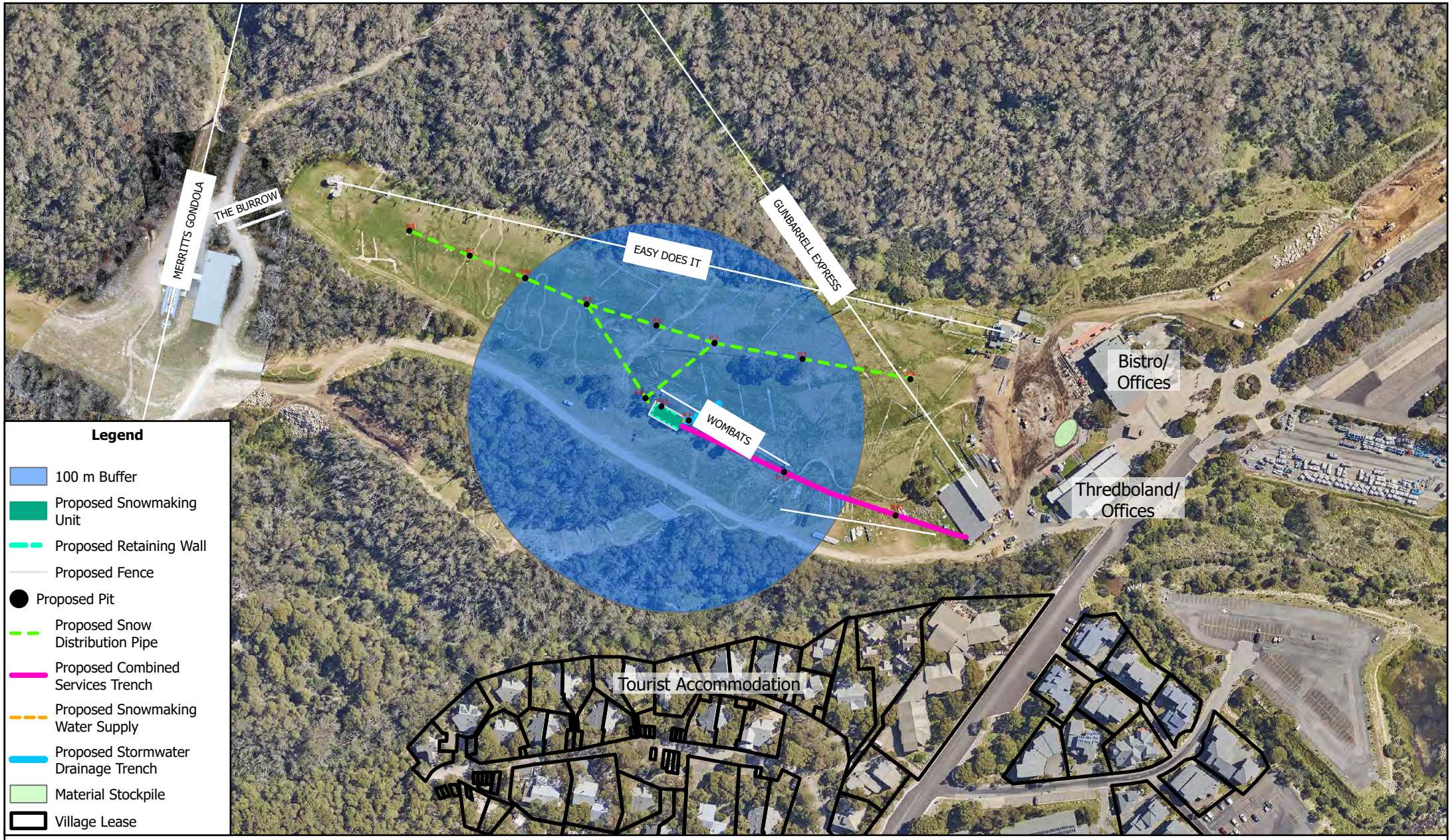


Figure 1: Manufacturer's noise measurements



Scale: 1:2,735

0 15 30 60 90

Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

THREDBO

Figure 2: Sensitive Receptors

Project: Thredbo Snowmaking Unit 1

Revision: A

Date: 22/01/2025

Produced By: JB

2.1.6 Describe hours of operation

The hours of operation will vary depending on operational requirements, the accumulation of any natural snow and the prevailing nighttime temperatures suited to traditional snowmaking.

Except for this first year, operation is expected to start from the last week of April and run 24 hours per day until the slope has enough snow cover for skiing on the winter season opening weekend. When conditions permit, the use of traditional (weather-dependent) snowmaking, this facility will be shutdown. Hence this development supplements the existing snowmaking system, the latter to be used in preference due to the lower associated operating costs and the quality of snow made.

2.1.7 Whether any external lighting is proposed and any requirements

There will be an external LED lighting installed on the external southern face of the snowmaking unit (facing Gunbarrel highway) so that adequate lighting is available to gain access to the ground level entry door and safe access to the stairway and upper gantry landing. An additional LED light will be installed on the upper western face of the snowmaking unit (uphill side) to provide sufficient lighting to the snow distribution pipe delivery manifold and upper gantry level access platform.

2.1.8 Maximum water usage (per event / per day / per season) and existing water extraction license provisions

2.1.8.1 Maximum water usage

Water demand for ice production is up to 5.0 Cubic Meter Per Hour (m^3/h).

2.1.8.2 existing water extraction licence provisions

The existing water extraction licence details are available on the Water NSW website, available to the public. The extraction licence provisions are summarised below:

- WAL reference: WAL43959
- Work Approval Number: 10WA119676 + 10WAL121849
- Licence Number: 10AL124233 + 10AL121848
- Purpose of Use: Snowmaking
- Water source: Thredbo River snowmaking diversion pond
- Extraction type: as required
- Annual allocation (volume entitlement): 605 ML

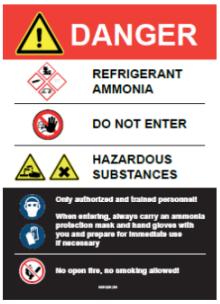
The 2024 Winter Season usage was approximately 268ML (44.3% of the allocation).

2.1.9 What public health matters have been considered

The unit will be secured with locked doors, partially fenced to prevent fall from retaining wall, and will clearly sign posted. The fencing will consist of 100UC Galvanised posts and timber sleeper stacked horizontally with 200mm spacing between sleepers. All operational staff will be trained prior to operation of the unit and made aware of the risks and hazards associated with operating the unit – e.g. working with refrigerant ammonia. A Thredbo specific operating manual will be developed outlining management measures in relation to operating materials and substances. The unit will be routinely maintained and serviced in accordance with the manufacture's recommendations to ensure safe operation.

Examples of signage that will be placed on the unit are provided in **Table 1**. A complete list of signage will be prepared at the construction certificate stage.

Table 1: Examples of signage to be installed on unit

Location & Description	Sign Example
Access door (outside) Danger: refrigerant ammonia	
Fans or air-cooled condenser (next to fan grills) Warning: rotating fan blades	
Ice blower outlet Danger: risk of injury	 

2.1.10 What safe work matters have been considered

The unit will be installed as per the manufacturer's specification. A Thredbo specific operating manual will be developed prior to operation of the unit. The plan will cover matters such as emergency and safety equipment, protective measures for operating materials and substances (refrigerant), storage and handling systems (e.g. material safety data sheets), servicing requirements, personal protective equipment etc. A copy of the operating manual will be provided to all operational staff. All staff responsible for operating, testing or maintaining the unit will be trained appropriately.

Fire protection measures will be installed as per industry codes. Informative and warning signage will be installed on the unit as per the manufacturer's recommendations.

An emergency management plan will be prepared in consultation with the local emergency services organisation (Fire & Rescue NSW). The plan will address matters such as: types of emergencies, response actions, raising alarm, terminating emergency, compatibility with incident management plans, administration of plan, hazardous material manifest, key personnel and contact details, site layout plan.

SafeWork NSW (and others) were consulted during the concept phase with the following requirements being identified:

- Code of practice for hazardous chemicals and AS/NZS 2022 Anhydrous ammonia - Storage and handling
- The placarding and manifest requirements according to WHS Regulation 2017
- Anhydrous ammonia safety information prepared by WHSQ
- Guidance material on emergency planning for ammonia refrigeration systems, also provided by WHSQ
- Safe Work Australia exposure standards for ammonia
- Code of Practice, Victoria – Ammonia Refrigeration
- Pressure vessel registration (AS4343) and inspection requirements (AS3788)
- Platforms, walkways, stairs and ladders to comply with AS1657
- Hazardous area classification according to AS/NZS IEC 60079.10
- Electrical installation according to the wiring rules (AS/NZS 3000).

A connection to potable water will be installed within the combined services trench, refer Site Plan, Rev H and trench-cross section SM-911 Rev 0. The potable water service will be suppled via 25 mm PE100 pipe, PN 12.5.

A pair of insulated pipes will also be installed within the combined services trench, refer to trench cross-section SM-911 rev 0 for details. These insulated pipes will be installed for future potential heat recovery uses.

2.2 Construction corridor, snowmaking pipe plans and supporting information

2.2.1 Provision of section plans at key locations to review extent of construction corridor

From the aerial imagery it appears the previous construction corridor (shown on Site Plan, Rev G) was located through tree islands. The corridor has been removed from the updated Site Plan to avoid confusion. The infrastructure has been predominately located within the highly disturbed ski slopes to minimise disturbance to native vegetation in the locality.

To address one of the RFI items in Section 2.4.1 (re liquid disposal), an overflow connection (stormwater pipe, 100 mm PVC) will be installed and connect into the existing stormwater network. The buried pipe will pass through the trees indicated in **Figure 3**. The distance between the two trees pictured either side of the alignment is 9 m. The trench width is 450 mm. The construction corridor will be be reduced to 3m through the trees with no encroachment with tracks of excavator, refer Drawing No. Trenching Method 3m Corridor. The arm a of the excavator to reach in and extract soil, then stockpile away from trees. Manual excavation of stormwater pipe will used when trenching under the Wombats carpet.

Figure 3: General alignment for stormwater trench

The additional disturbance will not alter the conclusion of biodiversity impact assessment in Section 5.3.2 of the SEE, Rev 3 which states:

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.

2.2.1.1 Construction corridor

The construction corridor is detailed below:

- Distribution pipes, combined services trench, dialog cable, water trench (excludes stormwater trench through tree island) – 10 m construction corridor
- Stormwater trench – 3 m construction corridor when trenching through tree island
- Pits – 3 x 3 m construction corridor
- Snowmaking unit and retaining wall – immediate vicinity required to carry out the works.

Cross-sections for trenching methods within both 3m and 10m corridors are provided.

The existing pits adjacent to proposed pits 5-8 will be removed and backfilled. The laterals shown to these pits will be capped in the same position and buried.

2.2.2 Cross section for trenching methods – location of excavator (and reach), location of sods/stock pile, etc.

The known secondary stockpile locations have been identified in the Site Environmental Management Plan. All temporary stockpile locations will be located within the construction corridor (highly disturbed environment) and managed in accordance with the SEMP and protocols in the *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, version 1.0* (OEH 2017).

Typical section plans for trenching methods are provided.

2.2.3 Location of above and below ground services shown on plan

Refer to Services Plan, Rev A.

2.2.4 Provide details of all pipes/hoses for the dispersal of snow for the whole area that will utilise snow from the facility and supported distribution map

Discharge of ice product from the snow factory will be via 100 mm nominal diameter plastic pipe (PE/PVC etc.) The majority of the distribution piping will be buried in the ground with access pits located near to where the piles of snow are to be made. At the desired access pit, a short section of flexible plastic 100 mm bore tubing is used to transition from the underground pipe to a limited run of above-ground plastic pipe. The last length of pipe is typically propped up (on wooden stakes or short poles) so the discharged ice forms a pile. Once the pile reaches the optimum size, the pipe is shifted slightly to form the next adjacent pile. The 6 m lengths of plastic pipe are quite light, hence are easily moved and setup by hand.

Snow will be distributed over Friday Flat ski area as required, refer Snow Distribution Map.

2.2.5 Provide pumping details – size, electric, diesel back up. To clarify and provide information

The snow factory produces low volumes of snow/hr but can operate 24h/day in the lead up to (and during at least the early part of) the winter season. The existing snowmaking pumping system (electrically powered pumps) will be used to fill the mountain pipe network thus providing enough stored water and head pressure to supply continuous operation of the Snowpro260 for extended periods. For example, one hour of pumping at a reduced capacity of approx. 28% rated flow (or around 4,200 litre/min) will provide enough stored water volume for two days continuous operation of the Snowpro260 at full capacity. Such pump line-filling operation would be carried out at night to take advantage of off-peak electricity tariffs.

2.2.6 Where are pipes and hoses stored when not in use?

A pipe rack located on the side of the snow factory will be used to store a limited number of 6 m lengths of 100 mm plastic pipe used to distribute snow above ground. The majority of distribution piping is permanently buried below the ground surface, see **Section 2.2.4**.

2.2.7 How are pipes and hoses set up and / or moved during snow making events – manual or machine set up?

The snowmaking hoses and pipes will be manually set up, refer **Section 2.2.4** for further details.

2.3 Geotechnical matters

- *The Form 4 provided by AssetGeoEnviro dated 13 November 2024 is unsigned. Review with the geotechnical consultant.*
- *Provision of the referenced*
    - *Product Specifications Sheet by KTI-Plersch Kältetechnik GmbH; ref 10057536; dwg: 00; dated: 03.04.2023* Copy of drawing 10057536 attached.
    - *Installation site contour map*
- *Clarify cut/ fill requirements with supporting cross section diagrams – report refers to a 1.2 metre high retaining wall. Details of the proposed retaining walls or battered slope bordering the facility is to be provided.*

A revised Geotechnical Assessment and Form 4 has been provided.

The plan referenced *Product Specifications Sheet by KTI-Plersch Kältetechnik GmbH; ref 10057536; dwg: 00; dated: 03.04.2023* has been provided.

Cut and fill details provided in Drawings Cut and Fill – Plan, Rev 1 and Cut and Fill – Section, Rev 1.

Details of the proposed retaining wall are provided in Drawing No. *2024 1018A RETAINING WALL* prepared by Practical Engineering Solutions P/L.

2.4 Building matters

2.4.1 Floor plans and facility components

Provide a floor plan of each level of the shipping containers and information about all of the components both in and on the facility

- *Specifications for all components both in and on the facility.*
- *Details of all equipment and machinery within the facility.*
- *Details of cooling units / air conditioning units.*
- *Is any bunding proposed within the facility.*
- *Are any sumps or liquid disposal required.*

Specifications and details of equipment and machinery are provided in the supporting document *SnowPro 260 All-weather snowmaking project*. The diagram shows the layout on each container floor along with descriptions. Refer to item 12 in the document for details of the roof-top air-cooled refrigeration condenser.

There is no bunding proposed within the facility, but a drain point is provided approximately in the middle of the base container floor for the drainage of water. The pipe will connect into the existing stormwater network, refer Site Plan, Rev H and typical trench-cross section for details.

Detailed specifications and plans will form part of the Construction Certificate documentation.

2.4.2 BCA considerations

Provide a BCA report for consideration and what fire safety measures would be within the facility.

The NSW Planning & Environment Guideline “What to include with your development application (DA)” states:

Building classification and Building Code of Australia (BCA)
Preliminary consideration should be given to the BCA. Include in your SEE:

- the classification of the building/structure with details of the method used to determine this
- information on the proposed fire safety measures and any performance measures that may be relied on under the BCA.

In accordance with the Guideline, preliminary consideration of the BCA has been given to inform the proposal.

A summary of preliminary BCA considerations and proposed fire safety measures in relation to the proposal is provided below:

- Building class: Class 10
- Proposed fire safety requirements: fire services as per class 10 requirements e.g. but not limited to Fire indicator panel, smoke detectors, fire extinguishers
- Stairs, handrails and balustrades will comply with the safe movement and access provisions of BCA 2022, Volume 2.

A detailed BCA compliance assessment and fire safety requirements for the snow factory will be provided at the Construction Certificate stage.

2.4.3 Details of the slab and strip footing for the facility

Details are provided in the Drawing package 2024 1018A prepared by Practical Engineering Solutions P/L.

3 Supporting documentation

Documentation supporting this application is listed in **Table** 2. Documents to be superseded are listed in the 'comments' column.

Table 2: Supporting documentation

Document	Title / Description	Author/ Prepared by	Date	Document Reference	Comments
Plan	Services Plan	Kosciuszko Thredbo Pty Ltd, JB	22/01/2025	Rev A	-
Plan	Site Plan	Kosciuszko Thredbo Pty Ltd, JB	22/01/2025	Rev H	Supersede Rev G
Plan	Cut and Fill – Plan	Kosciuszko Thredbo Pty Ltd, Jack Barr	23/01/2025	Rev 1	-
Plan	Cut and Fill - Section	Kosciuszko Thredbo Pty Ltd, Jack Barr	23/01/2025	Rev 1	-
Plan	Stormwater Trench	Kosciuszko Thredbo Pty Ltd, Jack Barr	16/01/2025	Rev 1	-
Plan	Buried services – trench GA	Kosciuszko Thredbo Pty Ltd, RMN	27/09/2024	SM-911r0, Rev 0	-

Document	Title / Description	Author/ Prepared by	Date	Document Reference	Comments
Plan	SNOW DISTRIBUTION MAP.1	Kosciuszko Thredbo Pty Ltd, Jack Barr		Rev 1	-
Plan	Trenching Method.1	Kosciuszko Thredbo Pty Ltd, Jack Barr	16/01/2025	Rev 1	-
Plan	Trenching Method.2	Kosciuszko Thredbo Pty Ltd, Jack Barr	16/01/2025	Rev 1	-
Plan	Trenching Method 3m Corridor	Kosciuszko Thredbo Pty Ltd, Jack Barr	16/01/2025	Rev 1	-
Plan	snowPRO 260 snoPRO CPSP-260-LR-50Hz-R717-ac	KTI, juergen.ruf	03/04/2023	10057536	-
Structural Plan	Proposed Concrete Slab to Support Ice Making Factory at Friday Flat – Thredbo NSW	Practical Engineering Solutions P/L	06/11/2024	2024 1018A COVER PAGE	-
Structural Plan	Proposed Concrete Slab to Support Ice Making Factory at Friday Flat – Thredbo NSW	Practical Engineering Solutions P/L	06/11/2024	2024 1018A SPECIFICATIONS	-
Structural Plan	Proposed Concrete Slab to Support Ice Making Factory at Friday Flat – Thredbo NSW	Practical Engineering Solutions P/L	06/11/2024	2024 1018A SLAB PLAN	-
Structural Plan	Proposed Concrete Slab to Support Ice Making Factory at Friday Flat – Thredbo NSW	Practical Engineering Solutions P/L	06/11/2024	2024 1018A SECTIONS	-
Structural Plan	Proposed Concrete Slab to Support Ice Making Factory at Friday Flat – Thredbo NSW	Practical Engineering Solutions P/L	06/11/2024	2024 1018A RETAINING WALL	-
Specifications	Snowpro260 All-weather snowmaker project	KTI; Kosciuszko Thredbo Pty Ltd	10/01/2025	-	-
Geotechnical Assessment	Proposed Installation of Snowmaking Unit, Friday Flat, Thredbo NSW Geotechnical Assessment	Assetgeoenviro		7604-R1-Rev 3	Supersede Rev 2
Form 4 Geotechnical Policy	Form 4 – Minimal Impact Certification	Assetgeoenviro		-	Supersede Form 4 dated 13/11/2024