Our ref: DA 24/448 (PAN-401018)

Andrew Harrigan
Property and Development Manager
Kosciuszko Thredbo Pty Ltd
PO Box 92
THREDBO NSW 2625

30 May 2024

Subject: Request for Information – DA 24/448 (PAN-401018) – Sonnblick Lodge Demolition, 10 Bobuck Lane, Thredbo

Dear Mr Harrigan,

The Department of Planning, Housing and Infrastructure (the Department) refers to the above development application for the proposed demolition of Sonnblick Lodge at 10 Bobuck Lane, Thredbo.

The Department notified relevant public authorities and neighbouring land owners from 25 January 2024 until 8 February 2024. The Department received one public submission and comments from the National Parks and Wildlife Service (NPWS). Copies of the comments are enclosed for your consideration.

Geotechnical review

As part of the assessment of DA 24/448, the Department commissioned an independent technical review the geotechnical information that you provided from ACT Geotechnical Engineers.

The review was considered necessary to ensure that appropriate assessment had been undertaken and detailed in your documentation to demonstrate the geotechnical risks associated with the site and the development had been duly considered. It also sought to ensure recommendations provided in relation to the proposal detailed suitable technical and management controls that followed best practice and complied with the Department's Geotechnical Policy.

The outcome of the review is attached for your information. The review did not endorse the sufficiency of the geotechnical information provided with the application and did not support the risk assessment undertaken by your consultant. On the basis of the matters of non-compliance and inadequate geotechnical investigation identified in the independent review, the Department is not satisfied that the geotechnical report is adequate in relation to the DA, or that the development will

be carried out in accordance with the Department's Geotechnical Policy. Accordingly, the Minister for Planning and Public Spaces (the Minister), as the consent authority, considers that additional information is necessary to properly consider the DA.

The Minister requests pursuant to section 36 of the *Environmental Planning and Assessment Regulation 2021* (E&PA Regulation) that the Applicant provides a response to the matters raised in the submissions, the concerns raised in **Attachment A** and the Geotechnical review (**Attachment B**).

Please note the Department is yet to receive comments from the Building Surveyor at the Department. A subsequent letter will be sent to you in due course requesting consideration of any additional advice received and assessment issues raised by the Department.

The additional information must be given to the Department within 90 days from the date of this letter, being **22 August 2024.** Should you require an extension to the timeframe, you are requested to contact the Department and set out your request for an extension in writing.

Since lodgement of the DA, 132 days have elapsed in the assessment period under Part 4 Division 4 of the EPA Regulation.

If you have any enquiries in relation to the above, please note that your enquiry must be directed to the Department and not the independent geotechnical consultancy firm. Please contact Meg D'souza, A/Senior Planning Officer, on 6650 7197 or email via alpineresorts@planning.nsw.gov.au if you have any queries.

Yours sincerely,

Erin Murphy
Team Leader, Alpine Resorts
Regional Assessments

Attachment A

Site survey and demolition plan

A detailed site survey and demolition plan must be provided. These documents can be combined, and they must be based on an accurate site survey plan and show:

- Site boundaries and adjoining development
- Site levels
- The location of development which is to be demolished or removed, including both the building and any handstand, stairs, retaining walls etc
- Noting that some of the walls of the lodge form the retaining walls for the site, clearly indicate extent of wall demolition and retaining wall retention
- Location, width depth and top and bottom levels of retaining walls to be retained
- Location and species of any vegetation proposed to be removed
- Proposed Sediment and Erosion control measures
- Proposed landscaping and treatment of the land
- Proposed methods of draining the land

Attachment B

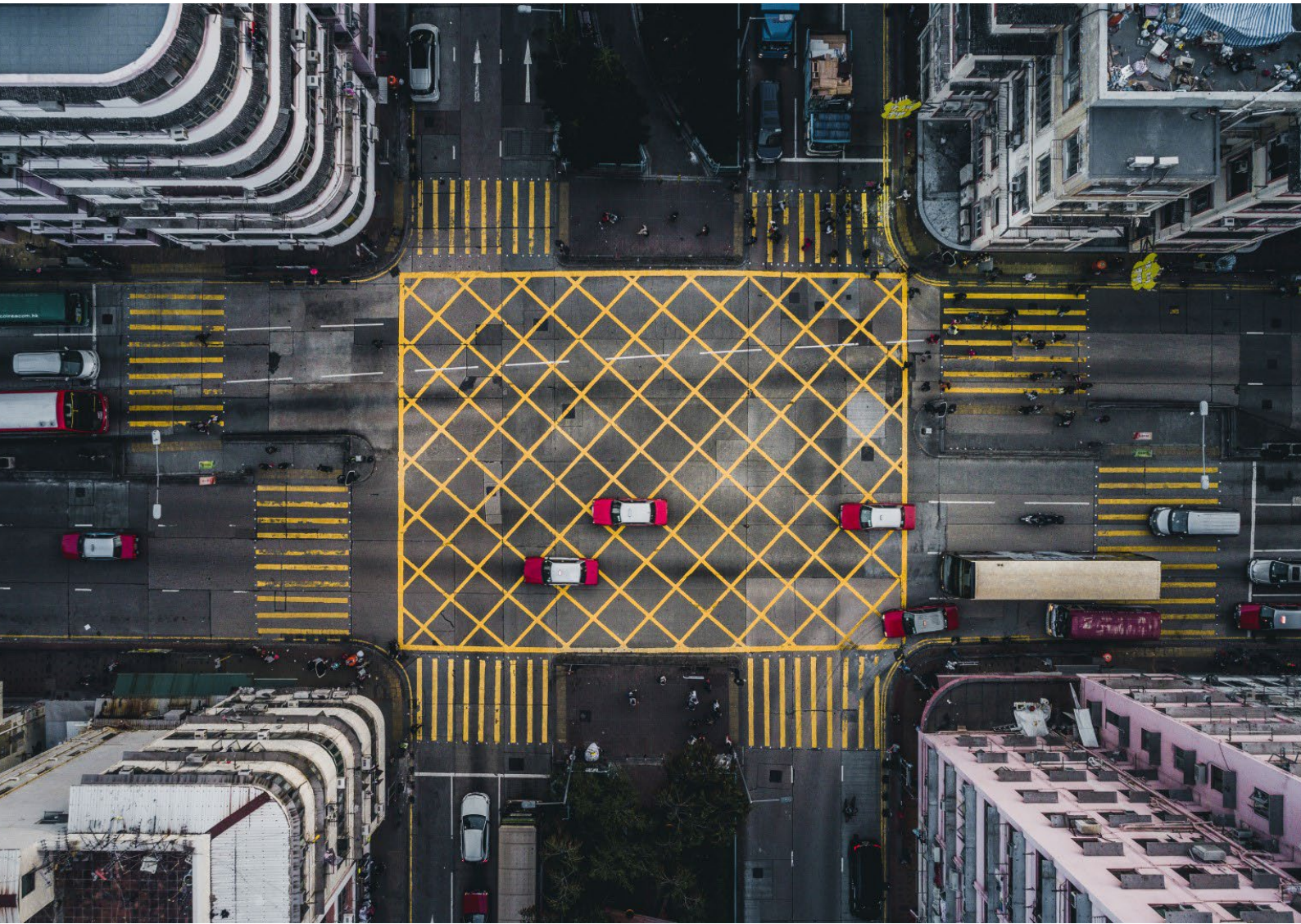
Sonnblick Lodge

Geotechnical Review of DA 24/448

Department of Planning, Housing and Infrastructure

21 May 2024

→ **The Power of Commitment**



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1. Introduction

1.1 Purpose of this report

This report presents our independent technical review of the geotechnical documentation submitted by the applicant (Kosciusko Thredbo Pty Ltd) for the demolition and future development Sonnblick Lodge, located at 10 Bobuck Lane, Thredbo, NSW 2625. The existing lodge is a three-storey structure, cut into a steep slope below Bobuck Lane.

The Department of Planning, Housing and Infrastructure (The Department) commissioned GHD to undertake this review on 1 May 2024 (Ref: PO 45428599), PROC7134). The Department's Geotechnical Policy Kosciuszko Alpine Resorts 2003 (hereafter referred to as The Geotechnical Policy) states that a geotechnical report is required to be lodged with a development application (DA) if the DA involves the demolition of any buildings identified to be located with the areas designated "G" on the geotechnical maps for the Kosciusko Alpine Resort Areas. The Sonnblick Lodge site is located within the "G" zone. We understand that following demolition there is a possibility that the site could remain vacant for a few years or more.

The Department requires a review of the suitability and adequacy of the geotechnical documentation provided as part of the DA in relation to assessing and addressing the geotechnical risks associated at 10 Bobuck Lane (The Site).

It is important to note that this report primarily assesses compliance of the supplied geotechnical documentation with The Geotechnical Policy. At this stage GHD has not undertaken a site visit to observe site conditions. This report does not provide comment on technical matters such the appropriateness of reported geotechnical parameters because the geotechnical investigation undertaken at the site has not adequately investigated all sub-surface materials that will be encountered by the development and no laboratory testing has been provided.

1.2 Scope and limitations

This report satisfies Item 1 of the scope of work for this project, comprising a preliminary review of the application and related geotechnical information, and compilation of a report that details additional geotechnical information / or site management details required to progress with the assessment of the geotechnical aspects of the application. At this stage of the project GHD has not carried out a site visit.

This report: has been prepared by GHD for Department of Planning, Housing and Infrastructure and may only be used and relied on by Department of Planning, Housing and Infrastructure for the purpose agreed between GHD and Department of Planning, Housing and Infrastructure as set out in section 1.1 and 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Department of Planning, Housing and Infrastructure arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

1.3 Information Reviewed

The Department provided GHD with the following information for this assessment:

Table 1 Reference Information

File / Document Name	Description	Abbreviated reference used in this report
DA 24-448 - Sonnblick Lodge Demolition - Slope Instability Assessment.PDF Proposed Demolition and Redevelopment, Sonnblick Lodge - 10 Bobuck Lane, Thredbo, NSW Geotechnical Investigation and Slope Stability Risk Assessment	Geotechnical report prepared by ACT Geotechnical Engineers Pty Ltd dated 26 April 2022 (ref: OB/C14191)	ACT Report
DA 24-448 - Sonnblick Lodge Demolition - Demolition Work Plan.PDF Proposed Demolition and Redevelopment, Sonnblick Lodge - 10 Bobuck Lane, Thredbo, NSW Demolition Work Plan	Demolition Work Plan by ACT Geotechnical Engineers Pty Ltd, (ref: OB/C14191 v2)	Demolition Work Plan
DA 24-448 - Sonnblick Lodge Demolition - SEE.PDF	Statement of Environmental Effects by NGH Pty Ltd	SEE Report
DA 24-448 - Sonnblick Lodge Demolition - ESCP.PDF	Erosion and Sediment Control Plan by Kosciusko Thredbo Pty Ltd	Erosion and Sediment Control Plan

While we have examined the abovementioned documents, the primary focus of this review has been on the geotechnical information presented in the ACT Report.

2. Background

Based on discussions with The Department and the information provided, The Site comprises a 340 m^2 area located on Lot 802 DP1119757, at 10 Bobuck Lane, in Thredbo, NSW. The existing lodge is three storeys high with the lower two levels constructed on cut terraces formed on the hillside during construction. The upper two levels are timber clad whereas the lower level is masonry and stone clad. The ACT report states the slope is inclined at 35° to 40°. The ACT report also states excavation spoil may have been placed on the downslope portion of the site below the lodge.

The ACT Report describes a number of site observations suggestive of active landslide processes. For example, at the rear of the lodge (i.e. the downslope side), the report described the ground surface as exhibiting:

- *"small-scale soil heaving and rupturing"* as well as: *"'lumpy', indicating that slumps may have occurred in the past".*
- *"The site has been cut into a slope and four masonry retaining walls support the cut batters. The retaining walls comprises stone and mortar, and are possibly not properly engineered.".*
- *"Multiple tension crack on the asphalt road pavement on the outer lane of Bobuck Lane. The cracks are to 10mm wide and running to 6m long. One tension crack in front of the driveway to 2.5m long"*
- *"Cracking of the concrete pavement of the driveway."*
- *"Signs of the distress of the masonry retaining wall below the Bobuck Lane."*
- *"Moist soils behind the masonry driveway retaining wall and at the toe of level 1 retaining wall".*

Cracks up to 20 mm wide were noted in the retaining walls. One of the retaining walls (RW2), that supports the lodge basement was not inspected or reported on in the ACT Report. The reasons for this are not stated in the report.

The Demolition Work Plan states that the site could be vacant for 12 to 24 months following demolition however, we understand this period could be longer depending on the approval process. The report includes the following statements pertinent to potential landslide hazards at the site:

- *"The external basement walls to the building are retaining walls. There are also four retaining walls external to the building that support driveway and Bobuck Lane carriageway. The walls are from 0.5 to 2.5m heigh and comprise boulders and mortar."*
- *"The buildings, paths, roadways, and other items surrounding the site shows signs of deterioration and unsoundness of the main structure, such as external cracking. Retaining wall had cracking through the mortar. Site erosion removed the material below the basement rock façade."*

All building structures will be demolished and removed from site, including footings and retaining walls. The Demolition Work Plan does not mention how the soil materials on site will be retained following demolition.

The ACT report makes reference to two historical reports GHD have not yet been provided. These include a report by Arup Geotechnics dated May 1998 and a report by Coffey Partners International dated March 1999. The ACT report states that Arup identified the following hazards with *"significant assessed risks for the site"*, as follows:

- *"Deep seated slip beneath existing retaining walls at cut face and fill below Bobuck Lane."*
- *"Erosion and undermining of the slope at the rear of the site".*

The associated risks for these hazards were not provided in the ACT Report. The Arup report apparently also includes a map showing a 2m high and 30m long concave landslide scarp approximately 25m south (i.e. upslope) of Sonnblick Lodge.

It should also be noted that The Site is located a short distance (less than 30 m) from the site of the 1997 Thredbo Landslide.

It is unclear when the ACT Report was prepared because the covering page is dated April 2022 and the subsequent report cover is dated April 2023, suggesting the report could potentially be more than two years old. It is not known whether the observations noted in the report remain valid or whether conditions have deteriorated.

The Erosion and Sediment Control Plan produced by Kosciusko Thredbo Pty Ltd outlines the procedures proposed to manage erosion, sediment control following demolition. The measures proposed include coir logs, earthen bunds, rock check dams and sediment fences.

3. Compliance with The Geotechnical Policy for the Kosciuszko Alpine Resorts

3.1 Background

The Geotechnical Policy for the Kosciuszko Alpine Resorts provides a clear and rigorous framework to manage geotechnical risks associated with developments in Kosciuszko Alpine Resort areas. One of the key objectives of the policy is to ensure geotechnical and related structural matters are adequately investigated and documented by applicants prior to the lodgement of any development application. By following the controls and requirements in the policy, developments are only able to be carried out if geotechnical and related structural engineering risks are identified and can be effectively addressed.

This section of the report uses a stepwise structure to assess compliance of the ACT Report with the various requirements set out in The Geotechnical Policy. For ease of reading, each requirement in the policy is reproduced in italics. Note that this section of the report also addresses the issues regarding the risk assessment carried out for the project because the risk assessment is an essential part of The Geotechnical Policy.

The 1997 Thredbo landslide, in which 18 persons were killed, highlighted the challenges faced from building upon steep slopes and led to the development of the Australian Geomechanics Society Landslide Risk Management guidelines, published in 2007 and now commonly referred to as AGS (2007). The suite of guidelines is recognised nationally (Australia) and internationally as world-leading practice. The reader of this report is encouraged to consult the freely available Landslide Risk Management (LRM) resources which can be accessed at: https://landsliderisk.org/.

The ”Practice Note Guidelines for Landslide Risk Management” (AGS 2007c), provide technical guidance in relation to the processes and tasks undertaken by geotechnical practitioners who prepare LRM reports including appropriate methods and techniques. The Practice Note is a statement of what constitutes good practice by a competent practitioner for LRM, including defensible and up to date methodologies and provides guidance on the quality of assessment and reporting, including the outcomes to be achieved and how they are to be achieved. The AGS (2007) guidelines superseded the earlier AGS (2000) guidelines (now obsolete) that are referenced in the Geotechnical Policy.

3.2 Compliance with Section 4.1 (a)

Section 4.1(a) of The Geotechnical Policy states the geotechnical report must contain:

> *An assessment of the risk posed by all reasonably identifiable geotechnical hazards which have the potential to either individually or cumulatively impact upon people or property upon the site or related land to the proposed development in accordance with the guidelines set out in ‘Landslide Risk Management Concepts and Guidelines’ first published in the Australian Geomechanics Journal, Vol. 35 No.1, March 2000 (guidelines).*

As noted in Section 3.1, the AGS (2000) guidelines referenced in the Geotechnical Policy are obsolete and were replaced by AGS (2007c). The risk assessment presented in the ACT report has not been carried out in accordance with (AGS 2007c) and therefore in GHD’s opinion **does not comply with the Geotechnical Policy** intent. There are numerous missuses of procedures and terminology and the nature of the landslide hazards on the site has not been effectively communicated. The main non-compliances are discussed further below.

Firstly, the title of the ACT Report; “Geotechnical Investigation and Slope Stability Risk Assessment”, and the other terminology used throughout the report (i.e. *“slope instability risk assessment”)* is not consistent with terminology used in AGS (2007c). It is also misleading because it could be misinterpreted that stability assessments have been carried out for the site, which is not the case. AGS (2007c) uses the terms: “Risk Analysis” to describe the process whereby risks are calculated and “Risk Assessment” is the process by which estimated risks are evaluated against Tolerable Risk Criteria for loss of life and property loss. In engineering terms, “stability” has a very different meaning.

The ACT Report does not adequately describe or assess the geotechnical hazards at the site (i.e. the landslide types and mechanisms). For example, the source / location of hazards, size and volume characteristics of the hazards are not described. Furthermore, no geomorphic mapping is presented, despite a "Large Scale Transitional Slide" being listed as one of the identified hazards. The types of hazards will typically depend on the geotechnical model for the site. As will be discussed in the following sections of this report (see Section 3.6), the ACT Report has not prepared an adequate geotechnical model of the site which has prevented a thorough understanding of hazards at the site.

'Surface Erosion' is also listed in the ACT Report as a potential hazard. Erosion is not considered a landslide type according to internationally accepted schemes such as Cruden and Varnes (1996) or Hungr (2014).

AGS (2007c) states that the hazard assessment must address areas upslope from the site, downslope from the site and across the slope adjacent to the site where these may affect the site. The ACT Report has not addressed these potential hazards. Hazards relating to other lodge sites above the site and the road infrastructure (i.e. fills and cuts) along Alpine Way as well as the potential for hazards on the natural slopes above the Alpine Way need to be assessed.

The ACT Report states that the risk estimation method in the report is 'qualitative' *"based on the guidelines provided in the Australian Geomechanics Journal Vol 42 March 2007"*. This statement contradicts the AGS (2007c) guidelines, which make it very clear that risks to loss of life must be assessed quantitatively. There is no qualitative process in AGS (2007c) by which risks to loss of life can be assessed. Despite this, the ACT Report states it used *"a matrix approach to determine the risk level of each hazard based on the likelihood and consequences of each hazard occurring"*. The ACT report included the matrix used in the assessment in the appendix of the report. The matrix is an extract from AS/NZS 4360:2004 ('Risk Management'). This matrix is not used in AGS (2007c). **As a result, the estimated risks to loss of life do not conform with standard AGS methodology and terminology and therefore cannot be evaluated against AGS (2007c) which is a requirement of the policy.**

Despite listing a number of potential landslide hazards, the ACT Report doesn't provide any advice or commentary on how the risks associated with the hazards will be mitigated. Instead, the ACT Report provides generic advice on batter slopes and the design of retaining walls. This advice is seemly aimed at managing construction related geotechnical hazards within the lot itself. These recommendations would not conceivably reduce the likelihood of a 'large scale', deep seated landslide originating from either within The Site or upslope of The Site. Furthermore, based on the information provided in the available reports it reasons that steep, unsupported cuts in fill and colluvial soil will be exposed following the demolition of the retaining walls. It is unclear how this material will be retained while The Site sits vacant for an unspecified period.

Regardless of the non-complaint risk assessment discussed above, the ACT Report has not demonstrated whether landslide risks can be appropriately managed and therefore it is not clear whether the site is suitable for potentially prolonged periods of vacancy or future development. **In this regard, the ACT Report does not satisfy the Geotechnical Policy requirements outlined in Section 3.7 of this report.**

3.3 Compliance with Section 4.1 (b)

Section 4.1(b) of The Geotechnical Policy states the geotechnical report must contain:

> *"Section 4.1(b) "Plans and sections of the site and related land from survey and field measurements with contours and key features identified, including the locations of the proposed development, buildings/structures on both the subject site and adjoining site, stormwater drainage, sub-surface drainage, water supply and sewerage pipelines, trees and other identifiable geotechnical hazards"*

The ACT Report contains a basic site plan (Figure 2 in the ACT Report) showing the location of previous investigations and the singular borehole drilled by ACT Geotechnical Engineers. The plan does not present contours or mapped slope angles. The plan does not present the location or potential source areas any landslide hazards and geomorphic features discussed in the ACT Report, nor does it show the mapped location of the landslide reported in the Arup report. The plan does not show the location or details of road infrastructure along Bobuck Lane such as culverts, retaining walls or fills, nor does it show the location of tenson cracks discussed in the ACT Report.

The plan therefore does not comply with Section 5.2.2 of AGS (2007c).

The ACT Report presents a hand drawn cross section (Figure 4 in the ACT Report). There are many features of this section that do not comply with the Geotechnical Policy or AGS (2007c). The key issues are summarised below:

– The section is vertically exaggerated which does not comply with Section 5.2.5 of AGS (2007c).
– It is unclear whether the section has been prepared using survey data.
– Limited landslide hazards or processes are shown on the section.
– The section does not extend upslope of Bobuck Lane where the large landslide feature is reported to have been mapped by Arup.
– Slope angles are not annotated.
– Only one third party historical borehole (adjacent to Bobuck Lane) on the section encountered bedrock. Consequently, the nature of the rock profile (i.e. depth, weathering, strength etc) below the majority of the site is not known.

The section and plan (i.e. Figures 2 and 4 in the ACT Report) provide little to no context in which to relate site observations, mapping, ground conditions and landslide hazards to The Site and its setting within the landscape. **These plans do not comply with the Geotechnical Policy**.

3.4 Compliance with Section 4.1 (c)

Section 4.1(c) of The Geotechnical Policy states the geotechnical report must contain:

> *"Details of all site inspections and site investigations and any other information used in preparation of the geotechnical report. A site inspection is required in all cases. Site investigation may require subsurface investigation; appropriate investigation may involve boreholes and/or test pit excavations or other methods necessary to adequately assess the geotechnical/geological model for the site. At Thredbo, reference may be made to the suite of existing geotechnical data and regional studies held by Kosciuszko Thredbo Pty Ltd, as part of the information to be used in assessing the site. Where similar information data exists for the other Kosciuszko Ski Resorts then this information may be similarly used in assessing the site"*

One of the main deficiencies of the ACT Report is the scope of the geotechnical investigation carried out. Only one (1) push tube sample was obtained near the south-east corner of the site below Bobuck Lane. The push tube terminated at a depth of 1.5 m due to refusal. It is unclear whether the push tube reached bedrock. No boreholes or test pits were carried out. The ACT report has therefore relied heavily on historical boreholes, however as discussed in Section 3.3, very few of these boreholes reached bedrock, therefore the subsurface geological profile has a high degree of uncertainty associated with soil thicknesses and bedrock information.

Owing to the fact that no boreholes were undertaken, no groundwater wells (standpipe piezometers) have been installed and no other groundwater testing has been conducted. There is therefore no information on groundwater conditions at the site and how this may impact slope stability, excavations and future site drainage requirements.

The geotechnical investigation undertaken has not "*adequately assessed the geotechnical/geological model for the site*", which is a core requirement of The Geotechnical Policy. In GHD's opinion, **the report therefore does not comply with Section 4.1(c) of The Geotechnical Policy**. The inadequate investigation has prevented the development of both a rigorous geotechnical/geological model and a demonstration of a sound understanding of landslide hazards, which ultimately has led to non-compliances with other parts of The Geotechnical Policy (i.e. Sections 4.1(a), 4.1(c) and 4.1(e)).

3.5 Compliance with Section 4.1 (d)

Section 4.1(d) of The Geotechnical Policy states the geotechnical report must contain:

> *"Section 4.1(d) Photographs and/or drawings of the site and related land adequately illustrating all geotechnical features referred to in the geotechnical report, as well as the locations of the proposed development".*

The ACT Report partially complies with Section 4.1(d). Limited site photographs were presented showing some but not all geotechnical features referred to in the ACT Report. Only two of the retaining walls referred to in the report had photographs provided. No photographs of the push tube samples were provided, which is considered unusual for a geotechnical report. No photographs of hazards referred to in the report upslope of the lodge were provided nor were any broad scale photographs showing the position of the current lodge in the landscape. Ideally a plan should have been presented showing the location of the proposed development with respect to the geotechnical hazards identified.

3.6 Compliance with Section 4.1 (e)

Section 4.1(d) of The Geotechnical Policy states the geotechnical report must contain:

> *"Section 4.1(e) Presentation of a geological model of the site and related land showing the proposed development, including an analysis of sub-surface conditions, taking into account thickness of the topsoil, colluvium and residual soil layers, depth to underlying bedrock, and the location and depth of ground-water"*

The key compliance issues relating to the development of a geological model are summarised below:

– The ACT Report does not contain a section / heading titled "geological model". Instead, Section 1.3 of the ACT Report states that compliance with Section 4.1 (e) of the Geotechnical Policy is addressed by a table in Section 4.1 of the ACT Report which summarises conditions encountered in the single push tube sample collected at the site. This table is not a geological model, but rather a summary of the soil units encountered in the test pits.
– Section 4.1 also states that: "*Figure 4 is a subsurface section through the site, showing the geotechnical model of the site as found by the investigation borehole and basing on the previous studies "*. The hand drawn section (Figure 4 in the ACT Report) is not a geotechnical model, but rather an interpretive cross section.
– As discussed above, an adequate geological model has not been able to be prepared due to the limited geotechnical investigation carried out at the site.

The International Association for Engineering Geology and the Environment (IAEG 2022) define an Engineering Geological Model (EGM) as:

> *"a comprehensive knowledge framework that allows for the logical evaluation and interpretation of the geological, geomorphological and hydrogeological conditions that could impact a project and their engineering characteristics. The EGM comprises both conceptual and observational components and may consist of a number of interrelated models and approaches. The Geological Model, the Geotechnical Model and a Geohazard Assessment are outputs from the EGM knowledge framework."*

The ACT Report does not present a geological model and therefore does not comply with Section 4.1 (e) of the Geotechnical Policy. Typical components that should be included in a geological model are presented in Figure 4.

One of the reasons an appropriate geological model has not been able to be developed is the limited (one push tube sample), surficial site investigation carried out at the site. Consequently, the thickness of colluvial soil at the site is not known and no information on the nature of the bedrock is presented. The model also lacks any meaningful information on groundwater because no groundwater monitoring or testing was carried out.

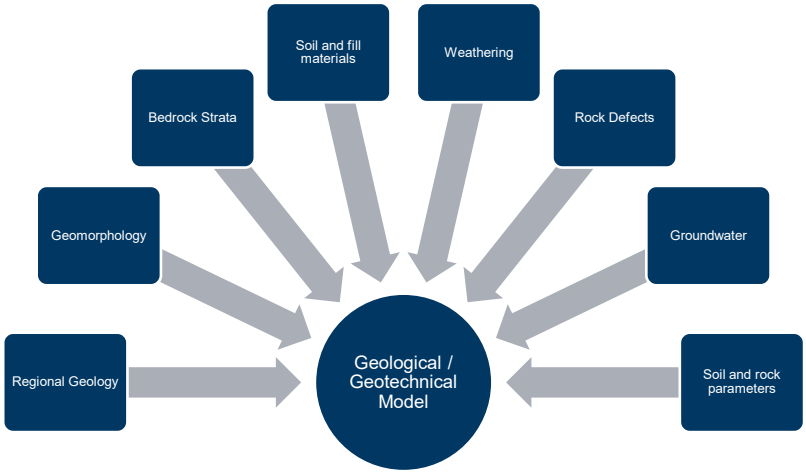

Figure 1 ***Typical components of a geological model***

3.7 Compliance with Section 4.1 (f)

Section 4.1(f) of The Geotechnical Policy states the geotechnical report must contain:

"Section 4.1(f) A conclusion as to whether the site is suitable for the development proposed to be carried out either conditionally or unconditionally. This must be in the form of a specific statement that the site is suitable for the development proposed to be carried out, subject to the following conditions:"

(i) Conditions to be provided to establish the design parameters, including but not limited to;

- footing levels and supporting rock quality,
- degree of earth and rock cut and fill,
- recommendations for excavation batters,
- parameters, bearing capacities, and recommendations for use in the design of all structural works including all footings, retaining walls, surface and sub-surface drainage,
- recommendations for the selection of building structure systems consistent with the geotechnical assessment of risk, and
- signing of form 2 as the mechanism to check that these parameters have been interpreted correctly and incorporated into the structural design

(ii) Conditions applying to the detailed design to be undertaken for the construction certificate, including but not limited to;

- any structural design relating to geotechnical aspects of the proposal is to be checked and certified by a suitably qualified and experienced geotechnical engineer,
- any other design conditions the geotechnical engineer preparing the geotechnical report believes are required in the design phase in order to ensure the design will achieve the "acceptable risk management" level as defined in this policy for potential loss of both property and life, and
- signing of form 2 as the mechanism to check that these design conditions have been interpreted correctly and incorporated into the structural design.

(iii) Conditions applying to the construction phase, including but not limited to;

- constructed works which require inspection and/or signoff by a suitably qualified and experienced geotechnical engineer. The report must highlight and detail the inspection regime to provide the builder with adequate notification for all necessary inspections,
- any other construction conditions including works methodology and temporary works that the geotechnical engineer preparing the geotechnical report believes are required in the construction phase to ensure the design will achieve the "acceptable risk management" level as defined in this policy for potential loss of both property and life, and
- signing form 3 as the mechanism to verify that the above methodology and inspections have been completed in accordance with the report.

(iv) Conditions regarding ongoing management of the site/structure, including but not limited to;

- any conditions that may be required for the ongoing mitigation and maintenance of the site and the proposal, from a geotechnical viewpoint.

The ACT Report includes the following statement aimed at addressing Section 4.1 (f) of the Geotechnical Policy:

> *"Provided that the demolition and earthworks are undertaken in accordance with accepted procedures for hillside construction, and treatments and mitigation measures are carried out to reduce the potential hazards (as recommended in Section 5.6 and Section 6), the risk is assessed to be "Very Low" to "Low" (See Table 2b). Therefore, it is assessed that the site is suitable for the proposed demolition (provided all the recommendations in our report are followed). "*

While the statement conforms to the required wording Section 4.1 (f), the basis and conditions supporting the statement do not comply with the Geotechnical Policy, namely:

– The risk assessment was not carried out in accordance with AGS (2007c), therefore the reported risk levels cannot be evaluated against the Departments risk criteria.
– Mitigation measures for the hazards assessed in the risk assessment have not been discussed or properly detailed. There is no analysis or explanation as to how the mitigation measures could effectively reduce the assessed risks at the site to tolerable levels.
– The recommendations provided in Section 6 of the ACT report are primarily aimed at the construction phase of a future development at an undetermined time in the future. No recommendations are provided to demonstrate how the site will remain at tolerable risk level during the ensuing years prior to redevelopment of the site.

– Given the site could remain vacant (undeveloped) for a few years (or more) it is unclear how the stability of the site will be monitored over this period. No recommendations for monitoring such as instrumentation and / or visual inspections have been provided.
– Owing to the inadequate site investigation, there is no geotechnical information on groundwater conditions at the site. The influence of groundwater on the stability of the site therefore remains uncertain and there is no data to inform potential stability assessments or subsurface drainage requirements.

The statement included in the ACT Report is therefore not considered to be valid given the current lack of geotechnical information available and the inappropriate use of AGS (2007c). In GHD's opinion **the ACT Report does not comply with Section 4.1 (f) of the Geotechnical Policy as non-compliance with other sections of the Geotechnical Policy as documented herein does not support the statement provided in Section 5.8 of the ACT Report.**

4. Discussion

This report has highlighted numerous instances of non-compliance with The Geotechnical Policy and AGS (2007c). One of the key deficiencies of the ACT Report is that an appropriate geological model was not developed because of the very limited (one push tube sample), surficial site investigation carried out at the site. This resulted in a cascading effect throughout the ACT Report whereby the majority of the requirements in the Geotechnical Policy were unable to be met because the geotechnical investigation only provided limited information on surficial soils at the site. The limited geotechnical information also prevented further assessments, interpretations and judgements on landslide hazards at the site.

The risk assessment presented in the ACT Report has not complied with the Australian Geomechanics Society Landslide Risk Management Guidelines (AGS 2007c). The assessment does not conform with standard AGS methodology and terminology and therefore has no context in relation to AGS (2007c) or the Geotechnical Policy and can't be used for risk evaluation against The Department risk criteria. The risk methodology presented in the ACT Report therefore does not comply with The Geotechnical Policy.

Its is also concerning that the results and finding of historical reports were not properly incorporated into the ACT Report, in particular the presence of a landslide feature upslope from the site. The ACT Report has not shown the location of this feature on any plans in the context of The Site or demonstrated how the risks associated with this hazard can be reduced to tolerable levels.

While we acknowledge that GHD has not visited the site, many of the observations noted in the ACT Report are suggestive of landslide activity, such as cracked retaining walls, tension cracks in Bobuck Lane and hummocky surface features on the slope downslope of the lodge. The causation of these features has not been adequately described or considered in the context of landslide hazards for The Site.

It is also unclear how the proposed mitigation measures could effectively reduce the assessed risks at the site to tolerable levels and maintain these risk levels while the site remains undeveloped for an undetermined period. For example, unsupported cuts in fill and colluvial soil will be exposed following the demolition of the retaining walls. It is unclear whether it is feasible to batter this material to the recommended batter angles given the steeply sloping nature of The Site. There are also boundary issues associated with this that may prevent achieving the recommended slope angles. While the Erosion and Sediment Control Plan outlines procedures to be followed to manage erosion and sediment runoff, these measures are unlikely to reduce the likelihood of the landslide hazards discussed in ACT Report. It must be recognised that owing to the current uncertainty about the stability of this site during the period it is left undeveloped, there may be implications for stability on adjacent sites and landslide hazards could adversely impact these structures as well.

The site is located less than 30 m from the site of the 1997 Thredbo Landslide. As discussed above, the Thredbo landslide, in which 18 persons were killed, highlighted the challenges faced from building upon steep slopes and led to the development of the Australian Geomechanics Society Landslide Risk Management Guidelines. It is therefore difficult to comprehend why a more thorough geotechnical investigation, including an assessment which complies with AGS (2007), as is a requirement of The Geotechnical Policy, has not been carried out for The Site. We recommend the ACT Report be rejected by The Department.

The Department requested GHD provide advice on additional geotechnical information (i.e. data gaps) that may be required to progress with the assessment of the geotechnical aspects of the application. The scope of a geotechnical investigation can depend on many factors but is commonly driven by the requirement to provide advice and design parameters to inform the design of in-ground structures such as footings, retention systems, drainage works, batter slopes and excavatability. In this instance the geotechnical investigation should have been focused on providing further information on the nature of geotechnical hazards at the site given the site could remain vacant for a few years or more. The single push tube sample to a shallow depth (1.5 m) which did not reach rock, did not provide any information on subsurface conditions that wasn't already known from historical investigations at the site.

Additional geotechnical investigations at the site will be required to satisfy the requirements of the Geotechnical Policy. The scoping of an investigation may depend on the future development plans for the site and is often an iterative process based on feedback from the project civil and structural designers. As GHD are not aware of the future development plans for the site, the following suggestions are aimed at developing a more robust geological model that can be used to inform the landslide risk assessment. These suggestions are indicative only and it is the responsibility of the geotechnical consultant engaged by the developer of the site to scope an appropriate investigation including geotechnical investigation aspects that may fall outside the Geotechnical Policy requirements but will be required regardless for detailed design and construction considerations. On completion of these additional works the geotechnical report prepared for the site will need to address the noncompliance matters outlined in this report.

Table 2 Indicative additional geotechnical investigations and assessments required at The Site

Investigation / assessment Method	Comments
Intrusive Geotechnical Investigation	– At least 2 x cored boreholes should be drilled to investigate ground conditions at the site. Preferably one borehole should be located near the Bobuck Lane frontage and the other should be located centrally within the lot or downslope of the existing lodge. It is likely this would require a small, difficult access drilling rig. Alternatively, the boreholes could be drilled following demolition or partial demolition of the lodge. – Boreholes should be cored at least 3 m into bedrock. – Inclinometer casing should be installed in at least one borehole for future monitoring. – All site investigations should comply with AS 1726:2017
Desk Study / Historical Data Review	The ACT Report states that previous studies at and near the site have been conducted by Coffey and Arup. The findings of these studies (i.e. risk assessments, landslide mapping etc) is not reported in the ACT Report. The updated / new report must include a thorough desk study of available data, including past observations and mapping of landslide instability. These observations should be consolidated on a geomorphic site plan and interpretive section in accordance with the Geotechnical Policy.
Groundwater monitoring	At least 1 x standpipe piezometer should be installed one of the boreholes for groundwater monitoring.
Geomorphological Mapping	Detailed geomorphological mapping of The Site as well as areas upslope of the site that may pose a hazard to The Site. Mapping should show the locations of all observed landslide hazards.
Landslide Risk Assessment	Landslide risk assessment for risk of loss of life and risk to property complying with AGS (2007c).
Monitoring	Updated / new geotechnical report to include a Trigger Action Response Plan (TARP) outing the monitoring of the site (visual and instrumentation), trigger levels and actions to ensure the risk levels at the site remain at tolerable levels throughout the period prior to redevelopment of the site.

The suggested number of boreholes discussed in Table 2 is indicative only. The investigations must result in a thorough understanding of site conditions allowing for confirmation of an initial conceptual geological model. Where anomalous ground conditions are encountered or uncertainty remains, additional boreholes will be required to allow the development of a credible and justifiable geological model. It is likely that additional investigations would be required to inform the detailed design of a future development.

5. Closure

We would like to thank The Department for the opportunity to assist you in this project and would be pleased to further assist you in the geotechnical risk management of this site, including review of any other geotechnical reports prepared for the site and site visits if required. Should you wish to discuss any of the above, please do not hesitate to contact [redacted]

6. References

AGS (2007c). Practice Note Guidelines for Landslide Risk Management, Australian Geomechanics Society. Australian Geomechanics, Vol 42, No1.

Baynes, F. J. and Parry, S. 2022. Guidelines for the development and application of engineering geological models on projects. International Association for Engineering Geology and the Environment (IAEG) Commission 25 Publication No. 1, 129 pp

Cruden D.M. & Varnes D. J. 1996. Landslide types and processes. In: Turner A.K.; Shuster R.L. (eds) Landslides: Investigation and Mitigation. Transp Res Board, Spec Rep 247, pp 36–75

Hungr, O., Leroueil, S. and Picarelli, L. 2014 The Varnes Classification of Landslide Types, an Update. Landslides, 11, 167-194

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→ The Power of Commitment

Ms Erin Murphy
Team Leader
Regional Assessments,
Department of Planning, Housing and Infrastructure

By email: Erin.Murphy@dpie.nsw.gov.au

Our reference: DOC 24/72883
EF 23/13685

Dear Erin,

DA referral – Sonnblick Lodge demolition, 10 Bobuck Lane, Thredbo – DA 24/448

We refer to the above development application (DA) forwarded to the National Parks and Wildlife Service (NPWS) for provision of comments in accordance with Chapter 4 of the *State Environmental Planning Policy (Precincts - Regional) 2021* (SEPP).

As requested, NPWS has reviewed the DA documentation. Based on that review, we make the following comments, having considered matters required by the *National Parks and Wildlife Act 1974*, the *Kosciuszko National Park Plan of Management 2006* (KNP PoM), the *Biodiversity Conservation Act 2016* (BC Act) and other relevant legislation. We request that the Department of Planning, Housing and Infrastructure (DPHI) consider our comments in its assessment.

1. Leasing/licensing and KNP PoM

1.1 NPWS Visitor Engagement & Revenue Branch (VERB) has advised that the proposed works are permissible under the head lease with Kosciuszko Thredbo Pty Limited (KT) for the Thredbo Alpine Resort. However, the demolition of an existing building is a matter requiring lessor's consent under the head lease. VERB has accepted the DA referral as a request for lessor's consent and will contact KT separately about the matter.

1.2 The relevant provisions of the KNP PoM have been considered and we believe that the proposed works are consistent with the management objectives for section 10.2 (Alpine Resorts Management Units), section 10.4 (Thredbo Management Unit) and section 11.6 (Environmental Quality).

2. BC Act

2.1 The proponent has demonstrated consideration of the BC Act in the DA. As proposed, NPWS concurs that the development does not trigger the Biodiversity Offset Scheme under the BC Act. We generally agree with the assessment provided in the BOS Evaluation Report for the development, although we note that the BOS Evaluation Report does not acknowledge the potential presence and impacts to the Broad-toothed Rat (*Mastacomys fuscus mordicus*), which is known to occur in the area and is listed as vulnerable under the BC Act and endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) as of 15 November 2023.

2.2 NPWS has considered the potential impacts of the development on the Broad-toothed Rat. We consider that adverse impacts to the species are unlikely, provided the Site Environmental Management Plan (SEMP) is updated as per our comments below and the measures in the SEMP are followed. Given potential impacts can be managed, we do not consider an amendment to the BOS Evaluation Report is required for this DA.

Notwithstanding, we do expect that all future DAs in Thredbo which impact suitable habitat for the Broad-toothed Rat will assess the potential impacts to the species, undertake a Test of Significance and include specific and relevant mitigation measures.

3. Environmental values of Kosciuszko National Park

3.1 In order to assist in minimising impacts of the proposed development on the environmental values of Kosciuszko National Park, NPWS recommends that DPHI address the general environmental management measures set out in paragraphs 3.2 to 3.3 in its consent conditions.

Protection of native vegetation

3.2 The statement in table 6.3 of the SEMP that: "[r]easonable and practicable native fauna management measures will be implemented to avoid environmental harm and nuisance to native fauna, known habitats and breeding places" is not adequate to address fauna protection measures that must be implemented for the development. The statement is subjective and does not provide for prescriptive and actionable fauna protection measures. NPWS recommends that the table is updated to include fauna egress measures from all open excavations and any other prescriptive and actionable fauna protection measures relevant to the scope of works.

Demolition and rehabilitation period

3.3 Excavation and construction works must cease by 30 April, with rehabilitation and stabilisation works able to continue until 31 May. NPWS is comfortable with DPHI extending these timeframes on an ad hoc basis where weather and site conditions allow, e.g. where:

(i) initial rehabilitation and stabilisation works can occur prior to snow accumulation; and

(ii) development related machinery and equipment traffic will not disturb wet ground.

4. Cultural values of Kosciuszko National Park

4.1 In order to avoid or mitigate impacts to the cultural values of KNP, NPWS recommends that DPHI address the measures set out in paragraphs 4.2 to 4.4 in its consent conditions.

Aboriginal cultural heritage

4.2 We note that the potential for impacts on Aboriginal cultural heritage has been addressed by the proponent in the statement of environmental effects accompanying the DA. We consider that the due diligence assessment has followed a suitable process. As works are on a previously disturbed site, we concur that the potential for impacts is unlikely.

4.3 In the event that an Aboriginal object is uncovered during completion of the works, we request that work ceases in the relevant area of the site and that the object is protected from harm. The NPWS must then be notified to arrange for assessment of the object.

Historic heritage

4.4 We note that the structure which is the subject of the DA is not listed as a heritage item in the SEPP. We do not consider that the development will impact any surrounding heritage items. No immediately neighbouring lodges are listed as heritage items.

5. Other matters

Miscellaneous considerations

5.1 We note that NPWS has also considered the following matters in its assessment:

(i) That there is no change proposed to stormwater drainage;

(ii) That there is no requirement for realigning water pipes to the subject site or altering mains water supply;

(iii) That the works have no public health components, including in relation to food safety; and

(iv) That there are no potential impacts of the proposed development on NPWS facilities, infrastructure and park management.

If you have any further enquiries about this matter please contact the NPWS Assessment Coordinator, Sarah Collum on 02 6450 5684 or at sarah.collum@environment.nsw.gov.au.

Yours sincerely

Kelsey Boreham
Principal Project Officer
Park Operations Projects, NPWS
31 January 2023

TALARA

TALARA SKI CLUB
28 Bobuck Lane, Thredbo NSW 2625
Registered office: 7 Mudies Rd, St Ives NSW 2075
Email: info@talara.com.au

Attn: Daniel James

Re: DA 24/448
Development Application for the Demolition of Sonnblick Lodge, Bobuck Lane, Thredbo NSW

I write on behalf of Talara Ski Club, 28 Bobuck Lane, Thredbo (Lot 812 DP 1119757). Talara Ski Club is a not for profit club lodge run by volunteers.

Talara Ski Club sits directly to the North and downslope of Sonnblick Lodge.
It shares a boundary with the site of the proposed demolition works.

Talara, along with neighbouring lodges was directly impacted by the Thredbo landslide in 1997 and subsequently undertook significant works to stabilise the foundations for the building on it's northern side. It is of huge importance to the club and its members that the building and it's structural integrity be assured of ongoing safety and security,

Given the following initial concerns, we would request additional time to review the documentation provided and lodge any further queries or concerns at a later date.

Existing retaining wall along the shared boundary
The shared boundary between Talara Ski Club and the Sonnblick Lodge site is defined by an aged concrete block retaining wall with what appears to be limited stormwater and drainage management behind and around it.
There is no reference to this wall or to the protection of Talara Ski Club, being in the direct fall line of works, in the documentation provided, and it is unclear whose boundary this currently sits on however as a built wall on the shared boundary it needs to be addressed and/or improved.

Stormwater / ground water management
Currently the ground water and stormwater, also potential snow melt, is insufficiently managed as it moves down the hill to the rear and sides of Talara Ski Club.

Landslip
We are very concerned about the risk of landslip during and post demolition as the weight on the soil is reduced, there is an increase of surface area for moisture and no clear documentation on the practical measures to mitigate risk of landslip during and post demolition.

Falling matter during demolition
Whilst a silt fence and earth bund / berm has been indicated in the documentation, there is no provision for structural secure and solid site fencing / protection for the rear of Talara Ski Club. The building is a lightweight timber structure and would be greatly

impacted by falling building materials or ground matter should it hit the Talara Ski Club building

Whilst we are supportive of the removal of dangerous structures and buildings with potential asbestos contamination, based on the above outlined concerns, we initially request the following at a minimum:

- Prior to any works commencing, a full dilapidation report prepared of Talara Ski Club and its external surrounds – this could include a survey of levels to measure movement at the beginning, during and the end of the demolition process as well as post demolition whilst the site is completely vacant.

- Soil and storm water management plan – for both demolition process and post-demolition vacancy – to ensure that the increased ground water run off that will ensue post demoltion is being managed and directed away from Talara Ski Club with no increased additional impact on the soil stability of the surrounds.

- A structural and geotechnical engineers assessment of the retaining wall at the shared boundary.

- Increased geotechnical measure to ensure the security of the site and of Talara Ski Club during demolition. and post demolition to ensure there is no impact on the downhill side of the club

- Notification to Talara Ski Club and surrounding buildings of commencement of works generally and of the asbestos in the building and when it is being removed to ensure that all apertures of our club are sealed.
- Sharing of a works plan for asbestos and assurance that it will only happen on a day with no wind and all building materials will be wetted down.

- Once down to foundations and retaining walls, geotechnical engineers reports to be regularly conducted and Talara Ski Club to be kept informed.

- Time frame of works overall from beginning to end – will this be conducted during the summer holiday period and how long will it take?

- Sufficient notice of start of works - as understandably this will have an impact on guests staying at the club due to noise, vibration and dust.

We trust you understand these initial concerns and our time constraints, and hope to have the opportunity to discuss this further

Kind Regards,

TALARA

Nadine Alwill
Chairperson, board of Talara Ski Club