

Before the Queenstown Lakes District  
Council

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In the matter of            The Resource Management Act 1991 (RMA)

And                            The Queenstown Lakes Proposed District Plan Stage 3; Stream  
18; Settlement Zone

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**Statement of evidence of Glenn Davis for Universal Developments (Hawea) Limited #3248**

29 May 2020

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**Submitter's solicitors:**

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**anderson  
lloyd.**

### **Qualifications and experience**

- 1 My full name is Glenn Alister Davis. I am Managing Director and Principal Environmental Scientist of e3Scientific Limited. I have been in this position since 2007. I have 20 years' postgraduate work experience in environmental management and hold a BSc in Ecology and MSc in Geography.
- 2 I have worked as a professional ecologist in the Queenstown Lakes District for the last 14 years and a further 2 years prior to this time from 1998 - 2000. I have worked on a wide range of projects for the agricultural and land development sectors and for Queenstown Lakes District Council (QLDC). In addition, I have also held a contract with Land Information New Zealand to support the assessment of discretionary activities on high country pastoral leases under the Crown Pastoral Lease Act. Many of these projects have triggered the Operative District Plan (ODP) indigenous vegetation site standard. I therefore have a sound working knowledge of the indigenous vegetation protection measures within the ODP.
- 3 In 2009 I was engaged by QLDC to commence the first stage of the process to identify, assess and include further areas of significant indigenous vegetation and significant habitats of indigenous fauna. I completed this first stage (initial identification) in collaboration with three other Queenstown based ecologists. In conjunction with QLDC I have implemented Stages 2, 3 and 4 of the Assessment Criteria. It is my understanding that the process for identifying SNAs in the district has now concluded with all identified SNAs now scheduled and operative in the district plan.
- 4 I have provided evidence on behalf of the Council in relation to Chapter 33 (Indigenous Vegetation & Biodiversity) of the Proposed District Plan and also provided evidence on behalf of the Council in relation to the Upper Clutha rezonings hearing stream of the Proposed District Plan.

### **Code of Conduct for Expert Witnesses**

- 5 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **Scope of evidence**

- 6 My evidence sets out my understanding of the existing ecological values across the subject site and is based on desktop review, my local knowledge of the area,

and ecological survey of part of the site that recently gained consent under the Housing Accords and Special Housing Area Act.

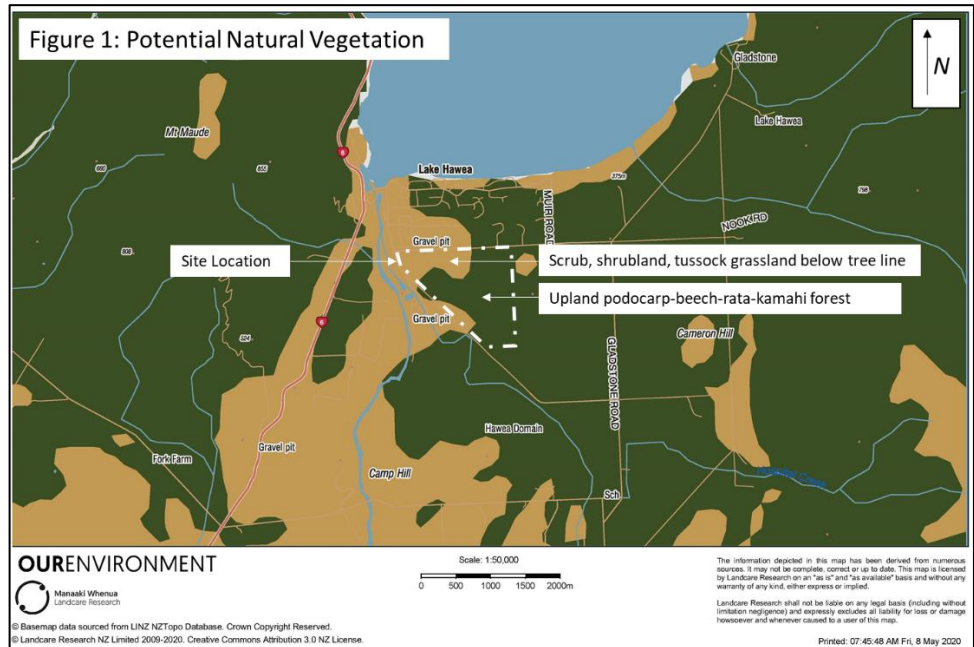
- 7 My evidence also sets out the findings of a Preliminary and Detailed Site Investigation undertaken by e3scientific Limited. This work was undertaken to consider the activity status of the proposed landuse change under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. I have also undertaken additional desktop investigation over the remaining area of the subject land to consider the likelihood of additional activities that may have impacted the soil quality of the site.
- 8 The key documents I have used, or referred to, in forming my view while preparing this brief of evidence are:
  - a) my ecological review, dated 30 May 2018;
  - b) a desktop peer review by Natural Solutions for Nature Ltd of my ecological review, dated 9 September 2019;
  - c) my response to the peer review, dated 24 September 2019; and
  - d) the Preliminary and Detailed Site Investigation (PSI/DSI) dated 24 August 2018 that was completed to assess if the sites soils were suitable for residential development and address the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS).
  - e) ORC Hazardous Activity and Industry List Register Query.

### **Executive Summary**

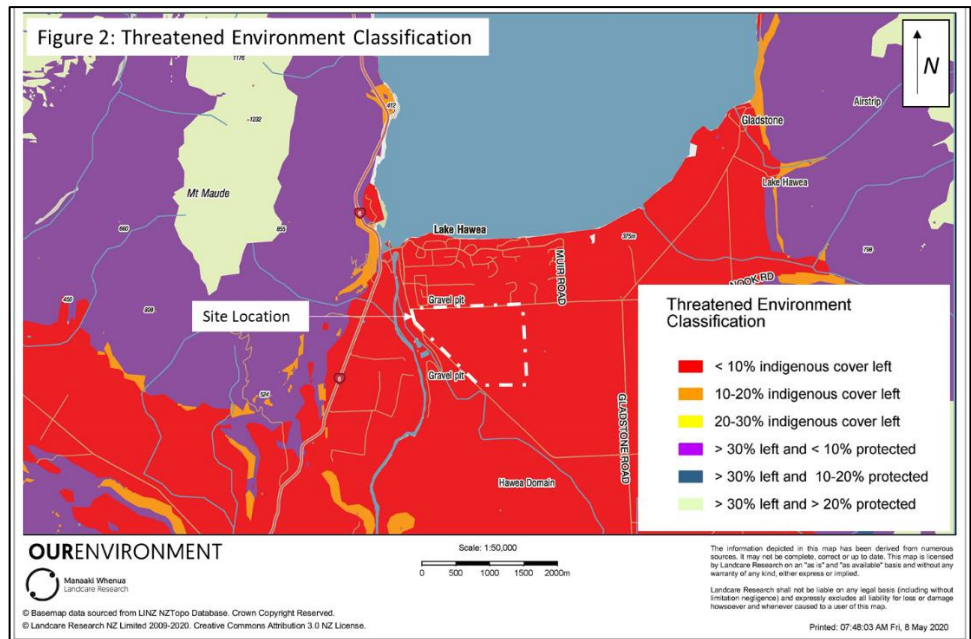
- 9 From an ecological perspective the majority of the Site assessed is severely degraded and consists of low production exotic grassland and planted and wilding coniferous trees. This vegetation does not represent 'indigenous vegetation' that would require resource consent under the clearance regime set out in the recently released Environment Court Order associated with Chapter 33 of the Proposed District Plan.
- 10 The soil quality associated with most of the Site is consistent with background concentrations and is suitable for residential activity.
- 11 A small area of landfill has been identified in the north east corner of the site that requires remedial work. The contents of the landfill will be removed as part of the development programme and has been consented by the district council. Consent conditions will ensure the landfill remedial work is undertaken in accordance with the NESCS and soil validation is completed to confirm the site is suitable for residential activity.

## Ecological Evidence

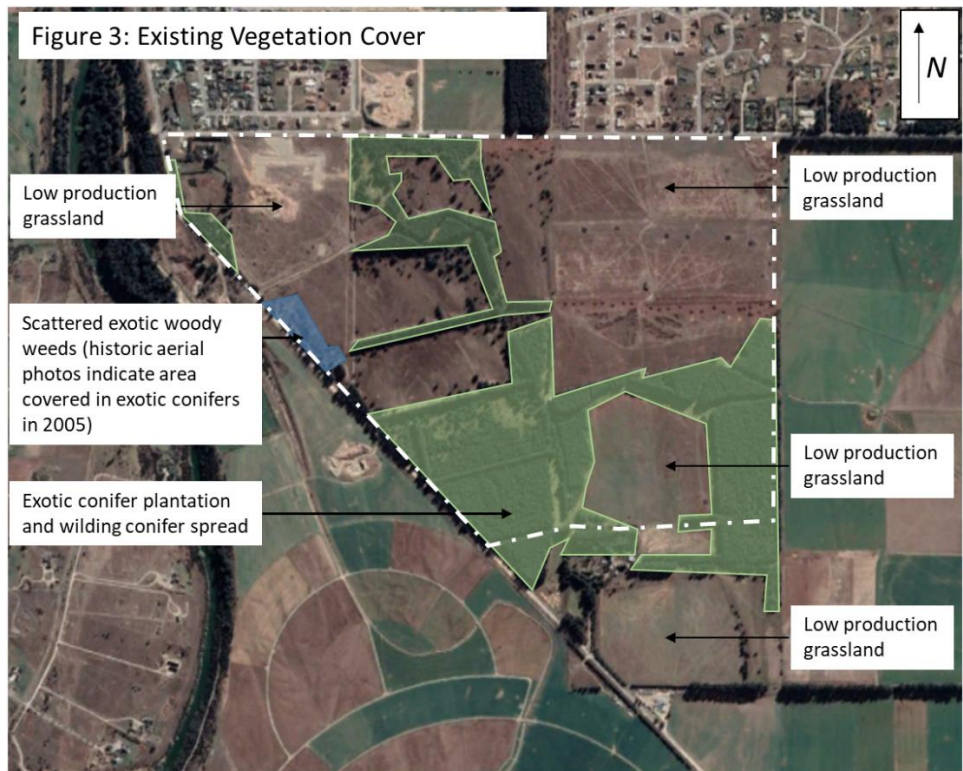
- 12 Figure 1 presents a plan showing the likely distribution of mature vegetation in the absence of human intervention. This plan is based on vegetation modelling undertaken by Landcare Research and indicates mature vegetation would most likely have consisted of upland podocarp-beech-rata-kamahi forest and scrub, shrubland and tussock grassland below the treeline.



- 13 Like much of the lowland environments of the Queenstown Lakes District the site has had a long history of disturbance and most of the indigenous vegetation has been removed. The loss of vegetation within lowland environments in the south of Lake Hawea is clearly shown in the threatened environment classification plan provided in Figure 2. This plan shows that the indigenous vegetation cover remaining in the lowland environments is less than 10% of the original cover.



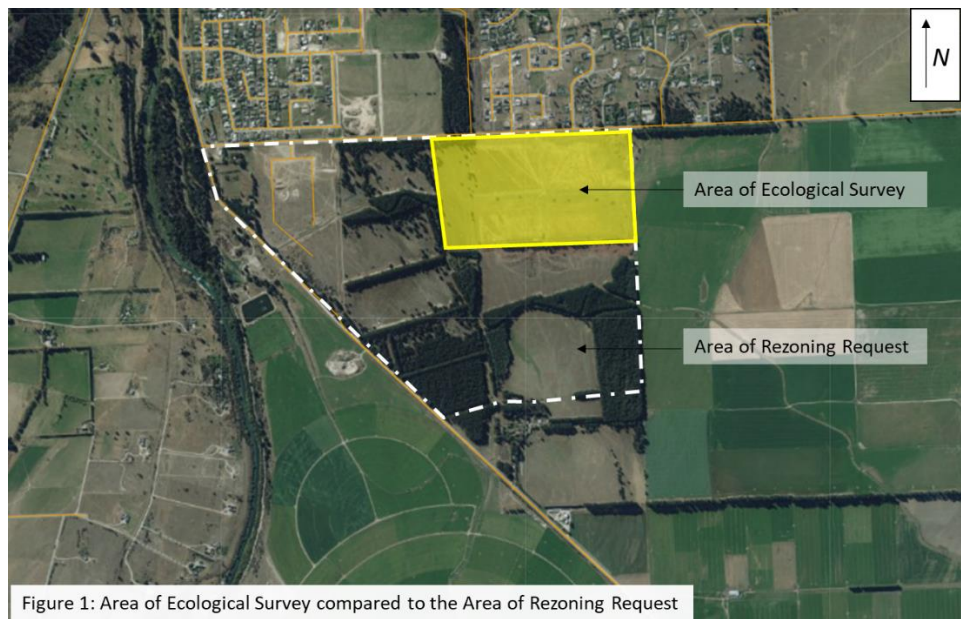
14 I completed a site walk over of the Special Housing Area and e3scientific staff also walked over much of the site during the fieldwork for the Preliminary and Detailed Site Investigation. The site visit confirmed the original vegetation has been entirely removed from the site. The vegetation cover is now dominated by low production introduced grassland and planted and wilding exotic conifers. The distribution of the existing vegetation is provided in Figure 3.



15 I note that the aerial photograph indicates there is an area to the west of the site (shown in blue shading on Figure 3) that appears to contain scattered shrubland.

I have reviewed historical aerial photography for this site and note that this area was covered in exotic conifers in 2005. These trees were felled by 2007 and this vegetation has subsequently regenerated on the land. The vegetation appears to be dominated by woody weeds including broom.

- 16 In summary, I can confirm that the site is covered in low production grassland and stands of planted and wilding exotic coniferous trees that are associated with the extensive pastoral activity and forestry that has occurred on the land.
- 17 In addition to the above, I provide the following evidence that sets out the findings of an ecological assessment undertaken by myself and e3scientific Senior Ecologist Rebecca Teele on the 25<sup>th</sup> of May 2018. The scope of this assessment was aligned with the Universal Developments Special Housing Area application. I provide Figure 1 below to show the area that was the subject of the assessment.



- 18 On the 25th May 2018 I completed a site walk over of the proposed 34-hectare SHA site, located on Cemetery Road, Hawea. The resulting ecological review document is provided in Appendix 1.
- 19 During my site walk over, I observed that the site was dominated by exotic pasture grasses and clover, with mature exotic conifer trees and hedgerows also present.
- 20 Native vegetation found on site included scattered individual kanuka (*Kunzea* species) and moss species in the north-eastern corner, and scattered *Carex breviculmis*, hard tussock (*Festuca novae-zelandiae*) and lichen at the eastern end;
- 21 Given the small number of native plants on site, and their scattered and isolated distribution, I determined the vegetation present did not constitute indigenous

vegetation based on the definitions of the Operative District Plan (ODP) or Proposed District Plan (PDP).

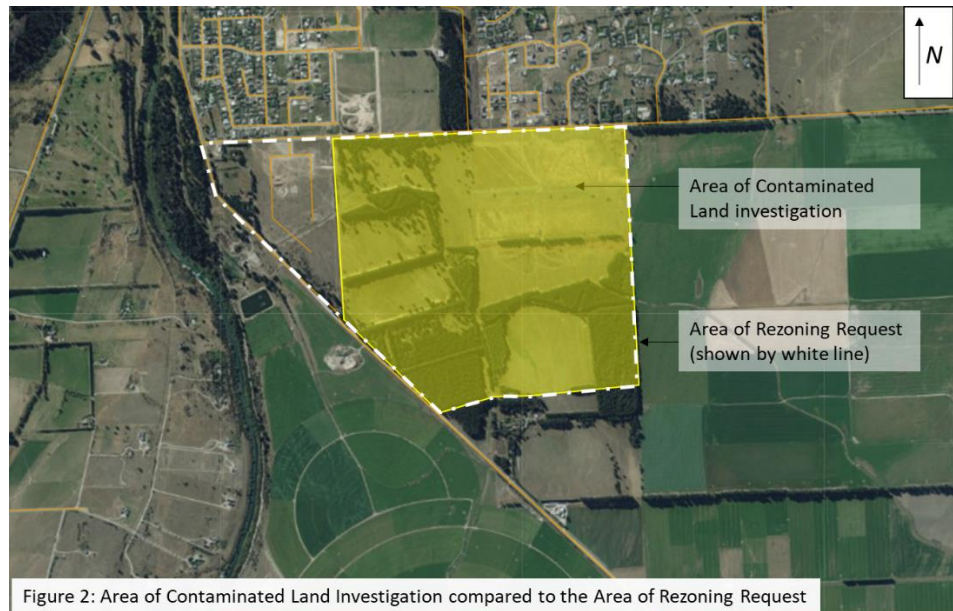
- 22 A desktop peer review of my Ecological Review was completed by Ms Dawn Palmer of Natural Solutions for Nature Ltd (NSN) and is provided in Appendix 2.
- 23 The peer review concluded that while a walk over was appropriate, there were information gaps. The information gaps were stated in the review as follows:
- (a) “It is unclear exactly how much of the 34-hectare site was traversed during the survey;
  - (b) The site is within Category 1 threatened land environments but no information has been provided with respect to this, nor has Mr Davis acknowledged the site’s value or context in terms of the widespread loss of vegetation and ecosystem function within these environments and the effects of the proposed SHA on this environment – adverse or beneficial.
  - (c) Mr Davis’s report did not include statements regarding the indigenous species one may anticipate at the site, or species whose presence may have influenced his assessment of the value of the vegetation present, only that there was very little and only scattered indigenous plants present.
  - (d) The e3 Scientific review does not make clear that all vegetation will be cleared from the site during the staged development so any remnants present, even if insignificant in terms of the PDP criteria, will be lost.
  - (e) A focused effort searching for indigenous, At-Risk or threatened species associated with these land environments is not stated.
  - (f) The review does not provide a species list for the area surveyed, nor does it clearly state that no threatened or At-Risk species are present although this is implied.
  - (g) The survey was undertaken in May when some species e.g. Leptinella and spring annuals may be more difficult to see particularly as last May followed a spring and summer of strong pasture growth (personal observation).”
- 24 To address the information gaps identified in the peer review, a second site visit was undertaken (on the 17th of September 2019) and subsequently a memo prepared. The memo is provided in Appendix 3.
- 25 In addressing the information gaps identified in the peer review, the memo expanded on the environmental context of the site and provided the results of the second walkover.

- 26 The second site visit observed the western end of the site to be “largely covered in exotic pasture grasses and haircap moss (*Polytrichum juniperinum*)” and “no cushion plants or tussock grassland were present and very little bare ground”. Further, *Leptinella serrulata* was not recorded during the second site visit.
- 27 In conclusion I found that the vegetation remaining on the site is dominated by introduced species, is not at all representative of vegetation that was originally present on the site and is not consistent with the definition of indigenous vegetation under the Operative District Plan or Proposed District Plan.
- 28 The additional ecological information provided to Ms Palmer was sufficient to satisfy her that an appropriate level of ecological review had been undertaken and had nothing further to add to the matter.
- 29 In summary, I conclude the Site that was assessed is severely degraded from an ecological perspective. The vegetation on the site does not represent 'indigenous vegetation' that would require investigation under the clearance regime set out in the recently released court order associated with Chapter 33 of the Proposed District Plan. I consider this conclusion can be extended to the majority of the site with only the scattered shrubland on the western boundary (shown in Figure 3) containing ecological values that would require detailed assessment.

#### **Contaminated Land Evidence**

- 30 I managed the Preliminary and Detailed Site Investigation (PSI/DSI) undertaken to address the provisions of the NES-CS and determine if the soils on the site were suitable for residential activity.
- 31 The area covered by the PSI/DSI is provided in Figure 2. My evidence sets out the findings of this investigation and provides commentary on the remaining area of the Site based on additional desktop assessment.





### *Findings of the Preliminary and Detailed Site Investigation*

- 32 In order to understand the contaminant sources on the property we completed an historical review of the landuse of the property including a review of historical aerial photographs, historic certificates of title and historic and current property information held by the Otago Regional Council. The historical review found the landuse history to include extensive pastoral farming activity and more recently plantation forestry. Some minor soil disturbance was noted within the 1955 historic aerial at the northeast corner of the site. The historic review did not reveal any infrastructure on the site such as woolsheds or sheep yards that are associated with HAIL activity.
- 33 The preliminary investigation also included a site inspection that was completed on the 2<sup>nd</sup> and 5<sup>th</sup> of February 2018.
- 34 The site inspection did note some minor landfilling/fly tipping in the northeast corner of the site. The visible contents of the landfill included wood, metal, corrugated iron, concrete bricks, car tyres and car seats. The site inspection also noted that the main farm hub and infrastructure is situated over 100 m south of the investigation boundary.
- 35 Through reviewing available information and the proposed residential use of the site, we considered it unlikely that the broad acre application of pesticides and heavy metals were present in soils that would exceed risk-based guidelines for residential activity. While the risk was considered low, residential landuse is a sensitive land use and characterisation of heavy metal and persistent pesticides as a result of broad-acre applications was considered appropriate to provide evidence of the suitability of the site for residential activity.

- 36 A soil sampling programme was designed to understand the impact of broad-acre applications of fertilisers and persistent pesticides on the soil quality of the site. Heavy metal concentrations in soils were characterised systematically across the site with a total of 60 samples analysed using a combination of laboratory and X-ray Fluorescence analytical techniques. The analytical results found that the heavy metal concentrations detected were within the natural variability of the site and representative of background concentrations. The results also show the heavy metal concentrations across the site are below the soil contaminant standards for residential activity.
- 37 With respect to persistent pesticides, I can confirm that the laboratory analysis did not detect concentrations above the laboratory limit of reporting and that the soils do not contain concentrations that present a risk to people under a residential landuse scenario.

*Preliminary Investigation Findings for the Wider Site*

- 38 In addition to the findings of the PSI/DSI I have also completed additional desktop analysis of the remaining areas of the Site.
- 39 Enquiries with the Otago Regional Council found no evidence of HAIL activities on the site. I provide this information in Attachment A.
- 40 Review of historical aerial photographs shows the landuse across the Site has predominantly been associated with extensive pastoral activity and more recently plantation forestry. It is my opinion that the majority of the site has not been the subject of activities that would result in an impact to soils that would present a risk to human health.
- 41 In summary, I find the majority of the Site is suitable for residential activity and will not require further investigation. Our research and investigation work has identified that removal of the farm landfill in the north east corner of the site is required. Remediation of the landfill will be adequately controlled through conditions associated with the approved SHA.

**Glenn Davis**

Dated this 29<sup>th</sup> day of May 2020

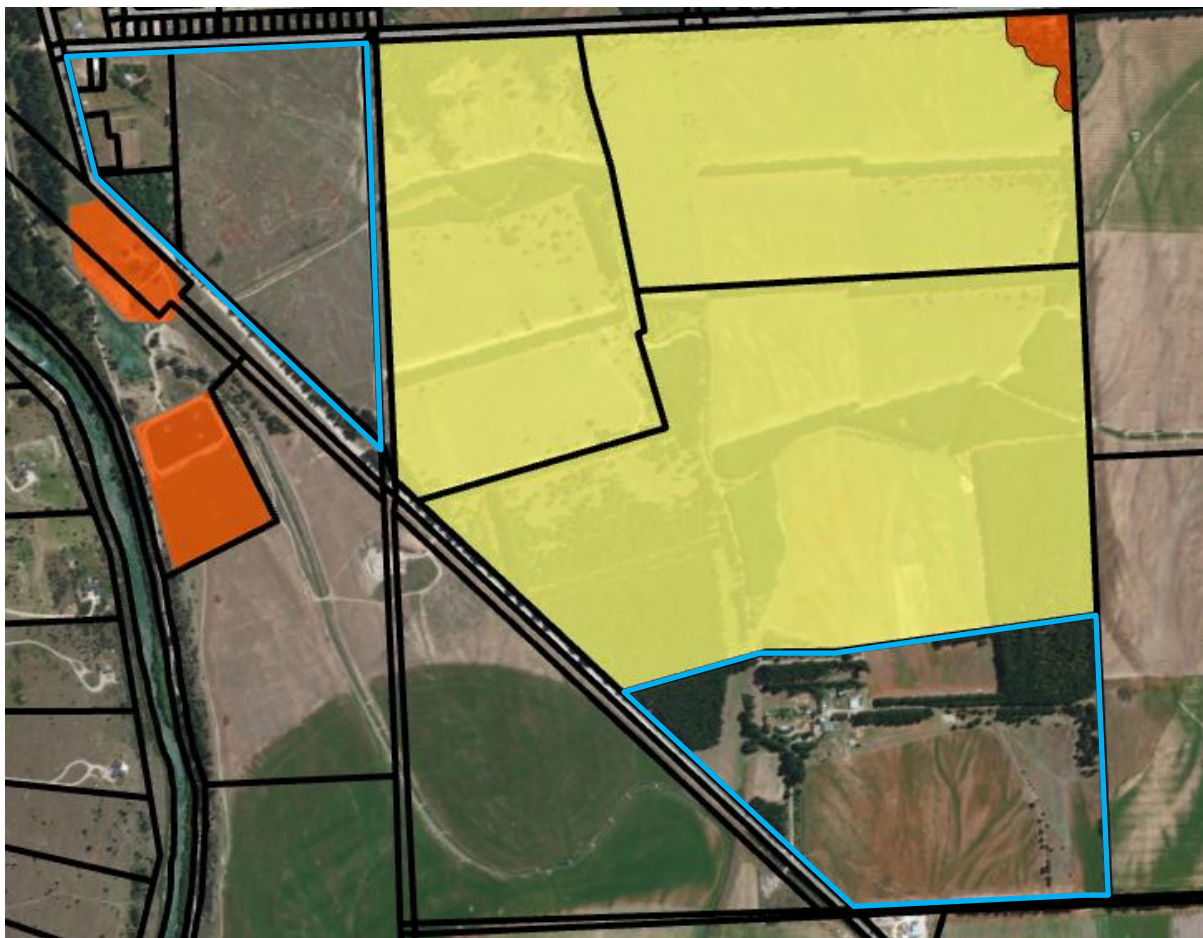
1 May 2020

Dear Fiona,

Thank you for your enquiry regarding information that the Otago Regional Council may hold regarding potential soil contamination at the properties indicated below:

Address	Legal Description
	Lot 2 DP 541414
	Lot 2 DP 477596
	Lot 2 DP 538397, Lot 1 DP 538397
	Lot 1 DP 8474, Lot 2 DP 8474
	Lot 1 DP304937

*Note: The areas bordered by the blue polygons in the image below, represent the land parcels listed in the above table.*



The Otago Regional Council maintains a database of properties where information is held regarding current or past land-uses that have the potential to contaminated land. Land-uses that have the potential to contaminate land are outlined in the [Ministry for the Environment's Hazardous Activities and Industries List \(HAIL\)](#).

Where investigation has been completed, results have been compared to relevant soil guideline values. The database is continually under development and should not be regarded as a complete record of all properties in Otago. The absence of available information does not necessarily mean that the property is uncontaminated; rather no information exists on the database. You may also wish to examine the

property file at the relevant City or District Council to check if there is any evidence that activities occurring on the HAIL have taken place.

I can confirm that:

The above land **does not currently** appear on the database.

If your enquiry relates to a rural property, please note that many current and past activities undertaken on farms may not be listed on the database, as they can be more difficult to identify. Activities such as use, storage, formulation, and disposal of pesticides, offal pits, landfills, animal dips, and fuel tanks have the potential to contaminated land.

Similarly, the long-term use of lead-based paints on buildings can, in some cases, cases cause soil contamination. The use of lead-based paint is generally not recorded on the database.

Please feel free to contact me if you have any other enquires, or you would like to discuss the matter further,

Regards,

**Joon van der Linde**

Senior Environmental Officer

The enclosed/attached information is derived from the Otago Regional contaminated land register and is being disclosed to you pursuant to the Local Government Official Information and Meetings Act 1987. This information reflects the Otago Regional Council's current understanding of this site, which is based solely on the information obtained by the Council and held on record. It is disclosed only as a copy of those records and is not intended to provide a full, complete or entirely accurate assessment of the site. Accordingly, the Otago Regional Council is not in a position to warrant that the information is complete or without error and accepts no liability for any inaccuracy in, or omission from, this information. Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

HAIL Status	
Verified HAIL	Information has been provided confirming, more likely than not, that an activity or industry described in the HAIL is being or has been undertaken on the site.
Unverified HAIL	Information has been provided that suggests an activity or industry described in the HAIL is or has been undertaken on the site; however, this information has not been verified.
Verified non-HAIL – more likely than not	It has been established, more likely than not, that an activity or industry described in the HAIL has not been undertaken on the site at the time of listing.

Contamination Status	
Contaminated for <Context>	The site has been investigated and results demonstrate that there are hazardous substances in or on the land at the site that have, or are reasonably likely to have significant adverse effects on the environment. <Context> refers to the current or proposed site use and/or on/off-site ecological receptors.
Managed for <Context>	The site has been investigated and results demonstrate that there are hazardous substances present at the site that have the potential to pose

	<p>risks to human health or the environment. However, those risks are considered managed for &lt;context&gt; because</p> <ul style="list-style-type: none"> <li>- The nature of the use of the site prevents human and/or ecological exposure to the hazard; and/or</li> <li>- The land has been altered in some way and/or restrictions have been placed on the way it used to prevent human and/or ecological exposure to the hazard.</li> </ul>
Acceptable for <Context>	The site has been investigated and results demonstrate that there are hazardous substances present at the site, but assessment indicates that any adverse effects or risks to human health are considered to be so low as to be acceptable for <context>.
At or Below Background Concentrations	The site has been investigated or remediated. The investigation or post-remediation validation results confirm that there are no hazardous substances above local background concentrations. Local background concentrations are those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterize the site.
Partially investigated	<p>The site has been partially investigated. Investigations have been conducted that –</p> <ul style="list-style-type: none"> <li>- Demonstrate there are hazardous substances present; however, there is insufficient information to quantify any adverse effects or risks to human health or the environment; or,</li> <li>- Do not adequately verify the presence or absence of contamination associated with all HAIL activities that have been undertaken on the site.</li> </ul>
Not Investigated	The soils at the site have not been subject to investigation. Contamination may have occurred but should not be assumed to have occurred.
New Information	New information has been received. This information is currently being assessed prior to assigning a site status.

30 May 2018

Universal Investments Hawea LP

Dear Tim,

## RE: Proposed Hawea Universal Developments Special Housing Area – Ecological Review

### 1.0 Introduction

On the 25<sup>th</sup> May 2018, e3Scientific Ltd (e3s) walked over the proposed 34-hectare SHA site just outside of Hawea, accessed from Cemetery Road (see Figure 1). The site was dominated by exotic pasture grasses and clover, and mature exotic conifer trees and hedgerows.

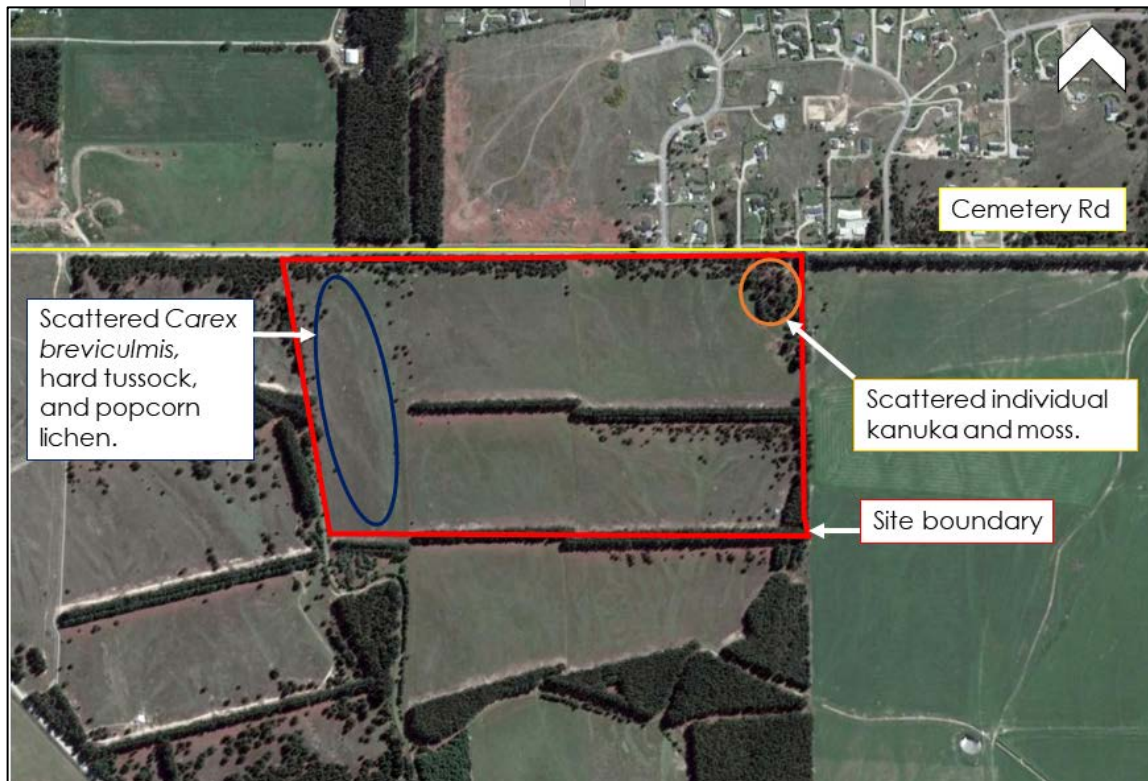
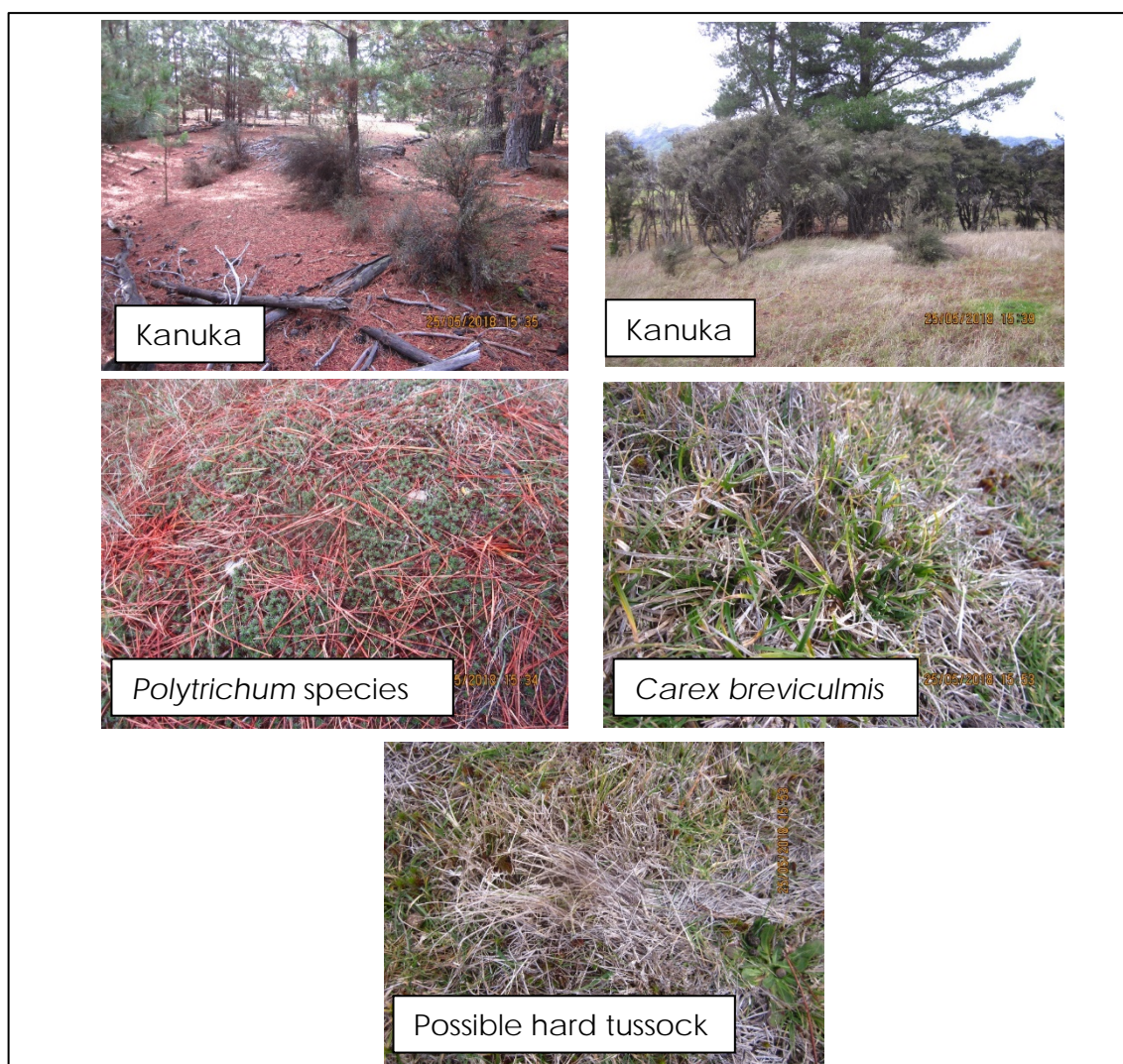


Figure 1: Site Location and distribution of indigenous plants observed on site.



**Plate 1: Photographs of the native plants observed on site.**

Given the small number of native plants remaining, and their isolated and scattered nature, they do not constitute 'indigenous vegetation' under the Operative and Proposed District Plan definitions. The native plants on site are too isolated and scattered to constitute a 'community' or native 'vegetation', nor are they 'important in terms of coverage, structure and/or species diversity'.

If you have any further questions, please contact Glenn Davis on 03 409 8664

Yours sincerely,

Glenn Davis  
Principal Environment Scientist

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**File Ref:** NSN 161/19 - SH190005

**To** Alicia Hunter Queenstown Lakes District Council

**From** Dawn Palmer Senior Ecologist, Natural Solutions for Nature Ltd

**Date** 9 September 2019

**Subject** SH190005 - Proposed Hawea Universal Developments Special Housing Area – Ecological Review

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### 1 Scope of Work

Natural Solutions for Nature Ltd (NSN) has been engaged by Queenstown Lakes District Council (QLDC) to provide an independent desktop peer review that confirms the suitability of the methods used in the preparation of the e3 Scientific Ecological Review, as well as its findings.

### 2 Plans and Documents Considered

In undertaking this review NSN has accessed the following from Council edocs:

- Ecological Review prepared by Glenn Davis of e3 Scientific dated 30 May 2018 and attached as Appendix F to the Special Housing Area application submitted by Universal Developments Hawea Ltd.
- Assessment of Environment Effects submitted with the Application reviewed for background and context;
- The Lake Hawea SHA Master Plan prepared by Williams & Co. dated 12/8/2019 and provided as Appendix H of the application.

### 3 Assessment Method

NSN has

- Read the ecological review and considered the methods used and its findings and considered this in the context of the application's AEE and Master Plan.
- Searched the publicly available aerial imagery of the site using
  - Google Earth Pro on 5 September 2019 and
  - Council's Mapping GIS website also on 5/9/2019.
- Identified the site's LENZ and threat classifications<sup>1, 2</sup>
- Undertaken a desktop comparison between the SHA site and other sites known to the author within N5.1c Land Environments on the Hawea Flats and Upper Clutha outwash plains to provide context for species that could have been present and potentially missed by the assessment.

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<sup>1</sup> <https://data.mfe.govt.nz/layer/52358-land-environments-new-zealand-lenz-level-4-polygons-2009/>

<sup>2</sup> <https://www.landcareresearch.co.nz/resources/maps-satellites/threatened-environment-classification/downloads>



#### 4 Limitations of this assessment

This assessment has been undertaken as a desktop peer review of the e3 Scientific Review, as such NSN is unable to verify the accuracy of the indigenous vegetation described in the e3 Scientific Review other than where illustrated in the Figures provided; in this regard, the NSN review takes the information presented at face value and identifies information gaps where present.

#### 5 Site Location

The land is described as Lot 2, DP 343855, Cemetery Road, Hawea.

#### 6 Review of Ecological Assessment

##### Vegetation

NSN notes that the site's ecological values were assessed during a walk over visit in May 2018 with the finding that the vegetation of the site was

*“dominated by exotic pasture grasses and clover, and mature exotic conifer trees and hedgerows”*

Mr Davis provided photographs of a grass he queried as *Festuca novae-zelandiae* (hard tussock), a small dry grassland sedge *Carex breviculmis*, and *Polytrichum* (dry grassland moss) species. He identified the presence of popcorn lichen in fescue grassland with *Carex breviculmis* in the western portion of Lot 2, and the grassland moss within the kanuka stand in the north-eastern corner. The aerial imagery suggests kanuka may also have been present on the southern side of the conifer shelterbelt on the mid-eastern boundary although the report does not confirm this.

The e3 Scientific Report concluded that:

*“Given the small number of native plants remaining, and their isolated and scattered nature, they do not constitute ‘indigenous vegetation’ under the Operative and Proposed District Plan definitions. The native plants on site are too isolated and scattered to constitute a ‘community’ or native ‘vegetation’, nor are they ‘important in terms of coverage, structure and/or species diversity’.”*

From Mr Davis's report, NSN concludes that the indigenous species recorded are not threatened or At-Risk species and that the very few indigenous species recorded were noted as being scattered and isolated in their distribution across the site. Mr Davis assesses that the indigenous plants present are insufficient to resemble a community, provide structural dominance (refer Rules 33.3.3.2 to 33.3.3.4); that they do not form an observable and influencing contribution to the vegetation character of the area affected by the proposed SHA. Therefore, one infers that the indigenous vegetation is insufficient to trigger consideration against the criteria for significance under Policy 33.2.1.8 of the Proposed District Plan.

The date of the aerial imagery included in the e3 Scientific Report is not stated. The imagery available from the Council website for Upper Clutha is dated 2018, (refer **Figure 1**). This imagery identifies the area of kanuka identified in the report prepared by Mr Davis. However, Google imagery provides more recent imagery (June 2019) shown in **Figure 2** along the eastern portion of the SHA; it shows that the kanuka identified by Mr Davis in his Figure 1 has been cleared along with conifer shelterbelts and some soil disturbance. It is

unclear how much more vegetation been cleared since August 2018 as coverage of the more recent imagery is limited. NSN notes that the AEE identified some fill material that may require remediation or removal from the north-eastern area.

NSN also notes that the Council website imagery suggests the vegetation in the western portion of the SHA may not be homogeneous with the balance of Lot 2. The image provided as **Figure 1** in this review suggests the western portion of the site may be drier; or may have been subject to a different land management regime. Given fescue tussock and dryland sedges were recorded in the western area, one wonders if a search of the site in spring may reveal a higher level of indigenous diversity than was recorded in May 2018; and in particular whether the presence of spring annuals such as *Leptinella serrulata*, an At-Risk and declining button daisy would be revealed.

The LENZ classification for the eastern and western areas of the proposed SHA is N5.1c while the central portion of the site is classified N1.1a; refer **Figure 3**. Both Environments have category 1 threat classifications with 0.2 percent of the indigenous vegetation remaining within N1.1a environments and 0.4 of that under protection, and 2.5 percent remaining, and 0.7 percent of the remaining indigenous vegetation protected within N5.1c environments. Retention of indigenous vegetation remaining in these areas is therefore a matter of National Importance where significant indigenous vegetation is present, and the clearance of final fragments requires a considered and cautionary approach.

Species both historically and currently associated with N5.1c environments in the Upper Clutha of which the author has personal knowledge include fescue tussock grasslands, kanuka, scabweed cushionfield species *Raoulia australis*, recently reclassified as At-Risk and declining. Other species include the very sweet-smelling dryland button daisy *Leptinella serrulata* (At-Risk, declining), Celadon mat daisy *Raoulia parkii* (At-Risk, declining), *Carex breviculmis*, subshrubs *Melicytus alpinus*, *Coprosma petriei* and native broom *Carmichealia petriei* (At-Risk, declining). Fescue tussockland in these environments are also associated with dwarf mingimingi *Leucopogon fraseri*, *Pimelea oreophila*, *Pimelea sericeovillosa* subsp. *pulvinaris* (Nationally vulnerable), *Raoulia apicinigra* and *Raoulia beauverdii* (At-Risk, naturally uncommon).<sup>3</sup> Long hair plume grass *Dichelachne crinita* is a species historically associated with these environments but which I have not personally recorded in my surveys of N5.1c environments within the Hawea Flats and Upper Clutha outwash plains.

Dryland button daisy can be difficult to see in competing grass swards particularly during the late autumn or winter; but the other species should be reasonably obvious if present.

However, the e3 Scientific ecological review was succinct and unequivocal in its assessment that the site does not support noteworthy indigenous vegetation; only three (3) vascular plants, one (1) species of lichen and moss were recorded.

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<sup>3</sup> Ward, C.M. (1994): Lindis, Pisa and Dunstan Ecological Districts – A Survey Report for the Protected Natural Areas Programme, Department of Conservation, Dunedin.



The information provided on this map is intended to be general information only. While considerable effort has been made to ensure that the information provided on this site is accurate, current and otherwise adequate in all respects. Queenstown Lakes District Council does not accept any responsibility for content and shall not be responsible for, and excludes all liability, with relation to any claims whatsoever arising from the use of this site and data held within.

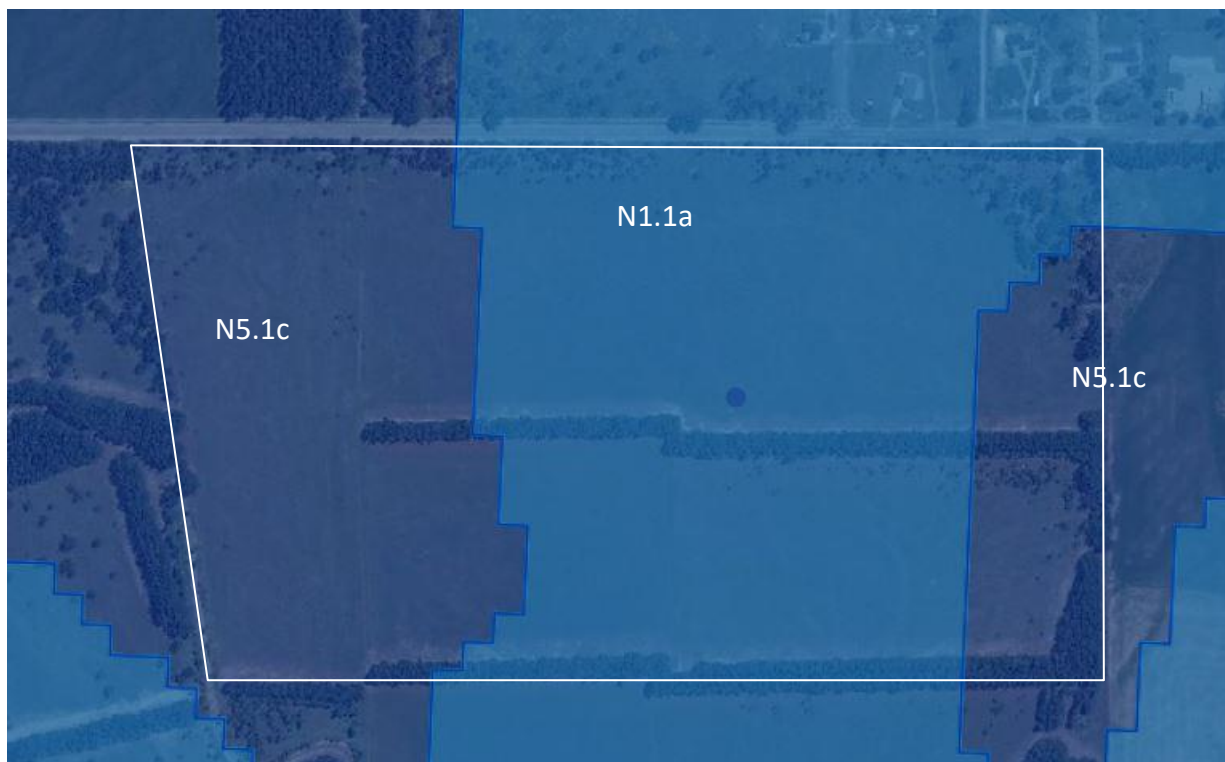
**QUEENSTOWN LAKES DISTRICT COUNCIL** Scale @A4 paper size - 1:4,000 0 0.2 0.4 km Map date: 5/09/2019

Map produced by Queenstown Lakes District Councils GIS viewer

**Figure 1:** QLDC Website Aerial imagery of the Proposed SHA, Cemetery Road, Hawea; Lot 2, DP 343855. Image dated 2018 and downloaded on 5/9/2019 suggests the western portion of Lot 2 (within the area identified) is drier and may have a vegetation type that varies from the balance of the Lot. Figure 1 of the Davis report identified *Carex breviculmis*, popcorn lichen and fescue tussock in the western area.



**Figure 2:** Google Imagery of the Proposed SHA, Cemetery Road, Hawea; Lot 2, DP 343855. Image downloaded 5/9/2019 shows clearance of shelterbelts and kanuka along the eastern boundary of Lot 2 in the imagery dated June 2019; the line of transition between imagery dates is marked with a dashed red line.



**Figure 3:** LENZ classification – Level IV; N5.1c and N1.1a land environments have category 1 threat classifications with less than 10 percent of the vegetation associated with the environments remaining. <https://data.mfe.govt.nz/sources/>

#### 7 Ecological Effects of the Proposal

Based on the information assessed, NSN concludes that the key ecological effects of the proposal are the total loss of the current vegetation cover under a residential subdivision.

Mr Davis assessed that the vegetation of the site was “dominated by exotic pasture grasses and clover, and mature exotic conifer trees and hedgerows” but he did not provide a species list detailing the species found, nor what percentage of the vegetation present was indigenous or exotic (Policy, 33.3.3.3); his review concludes that the structural dominance of the vegetation is comprised of conifers, kanuka, pasture grass and clover; from this one infers that the indigenous component of the vegetation contributes less than 50% of the ground cover (Policy 33.3.3.2) when measured cumulatively over the site (Policy 33.3.3.1).

The conclusions of Mr Davis’s Review are succinctly outlined in Section 6 above. His findings firmly conclude that the site contains only a small number of indigenous plants, isolated and scattered, and that these do not form a definable indigenous community or meet his unspecified criteria for indigenous ‘vegetation’.

The e3 Scientific Review was silent with respect to lizards or birds on the site; provision of this information may have been excluded from the brief provided to e3 Scientific.

Lizards of dry grasslands (e.g. McCanns skink – not threatened) may be present. The Review does not provide information regarding the weather on the day of the survey which may have influenced the detectability of lizards. My experience suggests that the number of skinks seems likely to be lower in clover dominated pasture swards compared to mixed browntop and short tussock, with subshrubs and rocky habitat.

Given the described condition of the site, it is reasonable to consider that a transition to residential gardens and managed public open spaces within the subdivision will likely provide improved habitat diversity and structure of benefit to native birds (e.g. bellbirds, silvereyes) compared to the current pasture.

## 8 Assessment of Relevant Provisions of the Proposed District Plan

Having reached the conclusion that:

- The indigenous plants present are insufficient to be considered as indigenous vegetation and
- The vegetation on site does not constitute an indigenous community
- The indigenous plants present do not contribute importantly to site
  - coverage,
  - structure or
  - diversity

no further assessment of the provisions of the District Plan (Operative or Proposed) was provided by the e3 Scientific Review.

NSN assesses the e3 Scientific Review against the relevant provisions of the Decisions Version (dated June 2019) of the Proposed District Plan as follows:

Plan Provisions	Theme	Comment on Relationship/ Assessment
Chapter 2 – Definitions:	Indigenous Vegetation – “vegetation that occurs naturally in NZ, or arrived in NZ without human assistance, including both vascular and non-vascular plants”	Scattered <i>Carex breviculmis</i> , hard tussock and popcorn lichen were noted in the western portion of Lot 2; Kanuka and moss <i>Polystrichum</i> were noted in the eastern portion of Lot 2; Google imagery indicates that kanuka has been cleared from the north eastern and eastern area of Lot2 since the Review was undertaken in May 2018. The e3 Scientific Review infers indigenous plants are only or mainly present where identified in Figure 1 and when considered as a cumulative cover over the affected area the plants do not comprise indigenous vegetation, or an indigenous community.
<b>33.2 Objectives and Policies</b>		
33.2.1	Indigenous biodiversity is protected, maintained and enhanced	The e3 Scientific review determines that there is insufficient indigenous vegetation to be considered anything other than a few plants and these are insufficient to enable recognition as a community. Refer notes in Sections 6 and 7 above.
33.2.1.5	Clearance that protects, maintains/ enhances biodiversity	n/a – refer Comment for 33.2.1
33.2.1.6: a- c	Avoid, remediate mitigate, adverse effects on indigenous biodiversity	n/a – refer Comment for 33.2.1

33.2.1.6: e	Offset residual adverse effects on indigenous vegetation and habitats of indigenous fauna	n/a – refer Comment for 33.2.1
33.2.1.7	Protect the habitats of indigenous fauna, particularly wetland birds	n/a – refer Comment for 33.2.1; no information has been provided regarding the presence or otherwise of lizards.
33.2.1.8	Determine the significance of the vegetation	n/a – refer Comment for 33.2.1; if the vegetation was not recognisable as an indigenous community, assessment of its representativeness, diversity, pattern and ecological context is rendered null except for discussion of the vegetation characteristically or historically associated with other nearby category 1 environments. The site is therefore rendered a representative of the loss associated with these environments. No threatened or At-Risk species were identified by the Review.
33.2.3	Objective - Land use and development maintains indigenous biodiversity values	Opportunities to incorporate indigenous vegetation associated with the environment into open space areas exists. Residential and open space plantings will likely improve structural and species diversity that will benefit native and exotic birds.
33.2.3.2	Encourage opportunities to remedy adverse effects through the retention, rehabilitation or protection of the same indigenous vegetation community elsewhere on the site.	Opportunities to incorporate indigenous vegetation associated with the environment into open space areas exists
<b>33.4</b>	<b>Rules – Clearance of Indigenous Vegetation</b>	
33.5.1	Clearance of Indigenous Vegetation less than 2.0 m	Kanuka in the north eastern and eastern portion of Lot 2 has been cleared, no information regarding the height of the vegetation was provided. Kanuka was assessed as scattered plants. Other native plants are reported as scattered isolated individual plants. It is inferred that the 34-hectare Lot 2 contains substantially less than a total of 10 hectares of indigenous vegetation and may not even have a total of 50 m <sup>2</sup> in total to clear. The rule appears to be nullified.

NSN has reviewed the Ecological Report provided by e3 Scientific and considers that methods used for assessment, being a walk-through survey was appropriate, however the following information gaps have been identified in the Review provided with the SHA application which are required in order to improve the robustness of the methodology and determine agreement with the Review's findings:

- a) It is unclear exactly how much of the 34-hectare site was traversed during the survey,
- b) The site is within Category 1 threatened land environments but no information has been provided with respect to this, nor has Mr Davis acknowledged the site's value or context in terms of the widespread loss of vegetation and ecosystem function within these environments and the effects of the proposed SHA on this environment – adverse or beneficial.
- c) Mr Davis's report did not include statements regarding the indigenous species one may anticipate at the site, or species whose presence may have influenced his assessment of the value of the vegetation present, only that there was very little and only scattered indigenous plants present.
- d) The e3 Scientific review does not make clear that all vegetation will be cleared from the site during the staged development so any remnants present, even if insignificant in terms of the PDP criteria, will be lost.
- e) A focused effort searching for indigenous, At-Risk or threatened species associated with these land environments is not stated.
- f) The review does not provide a species list for the area surveyed, nor does it clearly state that no threatened or At-Risk species are present although this is implied.
- g) The survey was undertaken in May when some species e.g. *Leptinella* and spring annuals may be more difficult to see particularly as last May followed a spring and summer of strong pasture growth (personal observation).

The site straddles two category 1 threatened land environments (N1.1a and N5.1c), and while some indigenous species were found to be present at the western and north-eastern and likely eastern boundary of the site, kanuka stands identified in Figure 1 of the e3 Scientific Review appear to have been cleared after the survey.

As the loss of site's existing, remnant indigenous biodiversity will occur under the proposed development within the category 1 environments, it would be prudent to have clarification with respect to the information gaps identified above.

## 10 Advice Notes

- Indigenous species historically associated with the N1 and N5.1c environments could be incorporated into the open space planting within the subdivision.

11 Recommendations in respect of the NSN Review

- a) Incorporation of indigenous vegetation associated with N1 and N5 environments be considered for incorporation within the Master Plan.
- b) Given the western area appeared to carry fescue tussock and dryland sedges, a search of the western portion of the site (refer my **Figure 1**) in spring may reveal a higher level of indigenous diversity than was recorded in May 2018; and in particular the presence of spring annuals such as *Leptinella serrulata*, an At-Risk and declining button daisy.
- c) If off-setting is required or recommended following the outcome of clarification on the points raised in Section 9 above, or a follow up survey of the site, then a contribution to weed control that secures a more intact site within the N1 or N5 environments on the outwash plains of the Upper Clutha would be appropriate.

DRAFT





Ref: 18052

24 September 2019

Tim Williams  
Williams & Co.

By email to: tim@williamsandco.nz

## **RE: SH190005 - Proposed Hawea Universal Developments Special Housing Area – Ecological**

### 1.0 Introduction

e3Scientific Limited has received an independent desktop peer review prepared by Dawn Palmer from Natural Solutions for Nature Ltd (NSN) on the suitability and methods used in the preparation of the Ecological Review for Universal Investments Hawea LP dated 30 May 2018. The following memo has been prepared to address the information gaps identified in this review.

### 2.0 Environmental Context

The site (LOT 2 DP 343855) Hawea Flats and low lying environments of the Upper Clutha are located within an environment with less than 10% of the original vegetation cover remaining. The specific area that has been identified by NSN is located on the western side of the site. This area is within the LENZ classification of N5.1c which has only 2.5 % of indigenous vegetation remaining with only 0.7 % formally protected. Any remaining indigenous vegetation within this environment is therefore potentially import.

The pre-settlement vegetation of the site has been mapped by Walker *et al.* (2003) as a kanuka – kowhai – halls totara woodland, however, the "Potential Vegetation" presented on the Our Environment website (<https://ourenvironment.scinfo.org.nz/maps-and-tools/app/>) indicates the site may have been covered in beech forest in the absence of human intervention.

There are no remaining examples of these communities that I am aware of on the outwash plains for the Upper Clutha. Kanuka woodland is present, however the co-dominant halls totara and kowhai have been removed from this community.

### 3.0 Response to Peer Review

The peer review raised some concern regarding the timing of the original site visit, as spring annuals such as *Leptinella serrulata* may not have been observed during the site visit in late Autumn.

The NSN report sets out the types of communities and species that are present on low lying outwash plains of the Upper Clutha. At Risk species noted by NSN include *Raoulia australis*, *Raoulia parkii*, *Raoulia beauverdii*, *Carmichealia petriei* and *Leptinella serrulata*, as well as the Nationally Vulnerable *Pimelea sericeovillosa* subsp. *pulvinaris* are associated with short tussock grassland and cushionfield communities.

In order to address the issues raised in the NSN report, e3Scientific ecologist Melissa Jager completed a detailed walkover of the western portion of the proposed subdivision on the 17 September 2019. The site walkover found the site is largely covered in exotic pasture grasses and haircap moss (*Polytrichum juniperinum*). No cushion plants or tussock grassland were present and very little bare ground was observed. The core species associated with cushion fields and tussock grassland communities are not present on this site and no *Leptinella serrulata* was encountered. A map showing the path taken during the site visit is attached to this memo (Appendix A).

e3Scientific is of the opinion that pastoral activity including the sowing of pasture grass and a slightly wetter environment has not been conducive to the development of cushionfields, short tussock grasslands or shrublands.

The NSN report also questions why lizards and birds were not considered. The rationale for not addressing faunal matters was due to the lack of suitable habitat to support lizards and birds.

Photos showing the habitat and vegetation is provided below.



**Plate 1: Photograph looking south over the site.**



**Plate 2: Photograph looking north over the site.**



**Plate 3: Close up photograph showing the density of the vegetation present.**

The vegetation communities present over the whole of the property will be cleared from the site during the proposed staged development. However, the site only contains a small number of native plants which are typically isolated and scattered. e3Scientific confirms that the vegetation remaining on the site is dominated by introduced species, is not at all representative of vegetation that was originally present on the site and is not consistent with the definition of indigenous vegetation under the Operative District Plan.

Please feel free to contact us should you require any further information or wish to discuss this memo in more detail.

Prepared By:

Melissa Jager  
Project Ecologist

Reviewed By:

Glenn Davis  
Managing Director

**Appendix A** – Map showing the route taken during the site visit on 17 September 2019.



*Base Map – Google Earth.*