

**BEFORE THE HEARINGS PANEL
FOR THE PROPOSED QUEENSTOWN LAKES DISTRICT PLAN**

IN THE MATTER of the Resource Management Act
1991

AND

IN THE MATTER of the Queenstown Lakes Proposed
District Plan

AND

IN THE MATTER of Hearing Submissions Seeking
Amendments to the Planning Maps
covering Queenstown and
Queenstown Rural (Excluding
Wakatipu Basin)

**STATEMENT OF EVIDENCE OF DAVID WINSTON RIDER
ON BEHALF OF**

**Jardine Family Trust
Remarkables Station Ltd
Homestead Bay Trustees Ltd**

(Submitter 715)

Dated 9th June 2017

1.0 QUALIFICATIONS AND EXPERIENCE

- 1.1 My full name is David Winston Rider.
- 1.2 I am the Senior Engineering Geologist/Geo-professional with RDAgritech Ltd. I hold a Bachelor of Science in Geology. I have been a practicing Engineering Geologist since 1997 and hold current memberships and affiliations with the following professional Organisations:
- (a) New Zealand Geotechnical society (NZGS);
 - (b) International Association of Engineering Geology (IAEG);
 - (c) International Society for Rock Mechanics (ISRM);
 - (d) International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE);
 - (e) New Zealand Society for Earthquake Engineering (NZSEE);
 - (f) Structural Engineering Society of New Zealand (SESOC); and
 - (g) Civil Engineering and Testing Association of New Zealand (CETANZ).
- 1.3 During the past 20 years I have been involved in Natural Hazard assessments, Geotechnical design and assessments, Wastewater design and assessments, Stormwater design and assessments. Tender preparations and assessments, contract document preparation and management, Resource consent applications and assessment of effects associated with the aspects of my scope. I am a practising Geo-professional in accordance with NZS4404:2010 and an inspecting engineer in accordance NZS4431:1989 and its amendments.
- 1.4 I have conducted several geotechnical hazard assessments within the existing Jack's point zone over the last 10 years and performed numerous geotechnical investigations and hazard assessments of the wider Jack's point subdivision area.
- 1.5 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note. This evidence has been prepared in accordance with it

and I agree to comply with it. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

2.0 EXECUTIVE SUMMARY

2.1 My Evidence is detailed in the Appended Natural Hazards Assessment Report dated 9 June (Appendix 1) and provides a review of the Natural Hazards information which addresses the natural hazards that potentially affect the site.

2.2 As my evidence states, there are several Natural Hazards Identified that potentially affect the site these are summarised as:

- Liquefaction
- Alluvial Fans floodwater dominated
- Alluvial Fans debris dominated

Reporting reviewed to date indicates that each hazard can be mitigated.

2.3 Where areas of the current plan change site have not had detailed natural hazard assessments completed at this stage, the list of potential hazards have been identified and it would be my expectation that these would be addressed as part of any specific consent process for these at the time of applications for development of the site.

2.4 It is my expectation that provided the QLDC assess these hazards in accordance with their Code of Practice for Subdivision and Land development and NZS4404:2010 then adequate mechanisms are in place for these hazards to be mitigated if they present adverse effects to the development.

3.0 SCOPE OF EVIDENCE

3.1 I have conducted a desktop review of the natural hazards information and reporting for the jacks point zone that we have on our files. This includes review of previous investigation and site walkover information for the site area.

4.0 ASSESSED HAZARD – Liquefaction

LIC 1

- 4.1 Site investigations for the approved Homestead Bay Subdivision on the lakefront portion of the site confirmed Liquefaction was a nil to low risk and we would concur with this finding for the areas mapped as LIC1 on the hazard maps.

LIC 2

- 4.2 Site investigations for the approved Homestead Bay Subdivision on the lake front portion of the site confirmed Liquefaction was a nil to low risk and we would concur with this finding. In addition to the findings, comment on lateral spreading at the lake edge was discussed and given the distance the proposed development was from the lake edge lateral spreading was considered to be nil to low of affecting the development.
- 4.3 I confirm this assessment is for the southern, southwest portions of the site near the lake edge. The proposed distances back from the Lake edge would indicate lateral spreading is unlikely to affect the proposed OSR zones. The OSR zone to the north/west side of the site is elevated on gravel terraces and the schist bedrock of Jacks Point hill, hence while this area is closer to the lake edge the underlying geology is not subject to lateral spreading or liquefaction.
- 4.4 RDAgritech's geotechnical investigations for Jacks point over the past year have identified only a small area subject to potential liquefaction manifesting at the surface. However the levels of settlement would still be classed within TC2 and minor areas of TC3 foundation style solutions.
- 4.5 The only potential areas of the development that may be subject to specific liquefaction engineering and designed foundations for structures is likely to be a small area in the western most portion of LOT6 DP 452315 (OSL)
- 4.6 I have sketched the approximate extent of area that could be subject to this hazard on the plan "Hazard Areas" in Appendix 1. It must be noted that standard investigation and design would be expected to mitigate this potential hazard hence this area is not precluded from development.

5.0 ASSESSED HAZARD – Alluvial Fan

ORC fan active bed

- 5.1 This hazard is confined to the deeply incised gully that is present in the southern end of the site, and shown in red below with black dots on the first image in the reporting of Appendix 1.
- 5.2 The deeply incised nature of the gully is providing active confinement of this bed loading and it is unlikely that the bed would aggregate out of the confined area available. I would recommend that should any earthworks or development be located within this gully that a full detailed investigation and assessment is conducted to determine the potential effects.
- 5.3 At this high level assessment stage we would encourage the gully channel to be retained as it is presently.

ORC fan recently active

- 5.4 This is shown as the orange with black dots above. Previous reporting by Fluent Solutions - Gary Dent addressed the alluvial fan hazard for the Jacks point plan zoning and I subsequently reviewed this reporting and concurred the hazard is unlikely to affect the site given the geological time scale for past "recent" activity with deposition during high lake levels.

Active, Floodwater dominated (regional scale)

- 5.5 This is indicated by the grey pink with white spots area on the second image in the reporting in Appendix 1. I note this area is showing question marks as to the boundary of its extent into the site.
- 5.6 I have marked up the area I consider to be more appropriate on the "Hazard Areas" plan in the report appendix third plan in Appendix 1. Shown as Area B
- 5.7 This hazard is typically a flooding triggered event with moderate sediment loading and shallow flow depths. The topographical contour of the site and pre-existing flow paths are likely to contain any potential from this hazard, with any flow passing through Area B and into the Jacks point subdivision

area. We understand that this hazard has been previously address by the developers of Jacks point, however we have not been able to obtain a copy of any related reporting by the close of evidential submission.

Active, Debris dominated (regional scale)

- 5.8 This is shown as the Red area in the second image of the reporting in Appendix 1 and is typically triggered by seismic or high rainfall events with the resulting debris typically not travelling very far as the topography flattens out. The presence of SH6 and its drainage channels are further expected to provide some form of protection from this potential hazard.
- 5.9 I have assessed the area to potentially encroach into the development and have shown this as area C on the “Hazard Areas” plan in appendix of the report in Appendix 1.
- 5.10 Once again while a high level assessment is provided here, mitigation options are available should detailed investigations at subdivision Consent applications confirm potential mitigation measures are required.

David Rider

9th June 2017

Appendix 1

Natural Hazards Assessment Report

9th June 2017