

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE  
WAIMAKARIRI DISTRICT COUNCIL**

**IN THE MATTER OF**

The Resource Management Act 1991 (**RMA** or  
**the Act**)

**AND**

**IN THE MATTER OF**

Hearing of Submissions and Further  
Submissions on the Proposed Waimakariri  
District Plan (**PWDP** or **the Proposed Plan**)

**AND**

**IN THE MATTER OF**

Hearing of Submissions and Further  
Submissions on Variations 1 and 2 to the  
Proposed Waimakariri District Plan

**AND**

**IN THE MATTER OF**

Submissions and Further Submissions on the  
Proposed Waimakariri District Plan by **Mark  
and Melissa Prosser**

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**EVIDENCE OF IAN DUNCAN MCPHERSON  
ON BEHALF OF MARK AND MELISSA PROSSER REGARDING STREAM 12  
REZONING OF LAND**

DATED: 5 March 2024

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## INTRODUCTION

- 1 My name is Ian Duncan McPherson.
- 2 I hold the qualifications of BE (Hons), M.A.Sc, DBS and am a Chartered Professional Geotechnical Engineer (CPEng).
- 3 I am a Technical Director for Ground Engineering for Aurecon in Christchurch, a position I have held for over 15 years. I have contributed to a number of land development projects across New Zealand. My previous work experience includes 46 years geotechnical engineering experience. I have assisted with the preparation, review and technical guidance of many geotechnical assessments for Resource Management Act (**RMA**) matters for public and private sector clients.
- 4 My role in relation to the Proposed Plan is an independent witness to Mark and Melissa Prosser (**the Submitters**) on behalf of Ohoka Farm Holdings Limited (**OFHL**) on geotechnical matters.
- 5 Although this is not an Environment Court proceeding, I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

## SCOPE OF EVIDENCE

- 6 In my evidence I address the following:
  - (a) The proposal to rezone the subject site to Large Lot Residential Zone;
  - (b) The relevant statutory planning provisions;
  - (c) The existing Natural Hazard Risk Assessment for the site, completed by Eliot Sinclair in 2021 and other readily available geotechnical investigations;
  - (d) My assessment of the geotechnical suitability of the Submitters' rezoning proposal under the proposed Waimakariri District Plan (**pWDP**).

- 7 In preparing my evidence I have reviewed the following documents and evidence:
- (a) Natural Hazards Risk Assessment, 2 Ashworths Road, Prepared for Ohoka Farm Holdings Limited, 502044, Eliot Sinclair, 19 July 2021 **(Natural Hazards Report)**;<sup>1</sup> and
  - (b) Mandeville North-East Development Area Outline Development Plan - 524072-W00001-DRG-US-0002, dated 28 November 2023 **(ODP)**.<sup>2</sup>

### **SUMMARY**

- 8 The Submitters are seeking the rezoning of approximately 73ha block of land situated directly north of Mandeville **(Site)** as part of the Waimakariri District Plan Review.
- 9 The Site has been zoned Rural Lifestyle Zone in the pWDP. The Submitters seek to have it rezoned Large Lot Residential **(LLR)** Zone.
- 10 Given this is a rezoning request, my evidence has focused on whether there are any significant or insurmountable geotechnical reasons that would impede the Site from being rezoned to Large Lot Residential under the pWDP.
- 11 I conclude that from a geotechnical perspective the site is suitable for residential rezoning and subsequent subdivision following appropriate engineering design.

### **THE PROPOSAL**

- 12 The Submitters are seeking to rezone 2 Ashworths Road to LLR Zone in the pWDP, with the above-mentioned ODP applied to the Site. The rezoning would enable development of the land down to a minimum allotment area of 2,500m<sup>2</sup>, with an average allotment area of 5,000m<sup>2</sup>. Accounting for the space required for civil infrastructure including roading, stormwater facilities and greenspace, an approximate yield of 115 households is anticipated.

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<sup>1</sup> The Natural Hazards Report is attached as Appendix 6 to the Submitters' submission on the pWDP.

<sup>2</sup> The ODP is included in the Graphic Attachment (page 21) at Appendix B of the statement of evidence of Fraser Miller which is filed together with my evidence for the Submitters.

## RELEVANT PLANNING PROVISIONS

- 13 Section 6 'Matters of National Importance' of the Resource Management Act (RMA) outlines that the use and development of land shall recognise and provide for the management of significant risks from natural hazards.
- 14 In addition, Section 106 of the RMA enables consent authorities the right to refuse to grant a subdivision consent if it considers there is a significant risk from natural hazards.

## GEOTECHNICAL ASSESSMENT

### Existing Geotechnical Documentation

- 15 Eliot Sinclair, on behalf of OFHL, have previously completed a geotechnical assessment to support subdivision consent of the site, summarised in their report *Natural Hazards Risk Assessment – 2 Ashworths Road, Ohoka, ref 502044* dated 19 July 2021.
- 16 The Natural Hazards Report is summarised below:
- (a) Eliot Sinclair have reviewed readily available geotechnical information, including the New Zealand Geotechnical Database, ECAN's Canterbury Maps and the Institute of Geological and Nuclear Sciences (GNS) Active Faults Database. The geology of the site is described as *'unweathered brownish-grey, variable mix of gravels/sands/silt/clay in low river terraces; locally up to 2m silt clay'*.
  - (b) A site walkover and twenty shallow hand auger and dynamic cone penetrometer tests were undertaken, which have typically identified a thin layer of surficial silt material, overlying natural sandy gravels.
  - (c) The quantity and type of investigations do not meet the requirements of Section 16.2 of the MBIE Guidelines (2012), as site specific deep (15m+ below ground level) geotechnical testing has not been undertaken. However, Eliot Sinclair have quoted the allowable exception when ground is known to be of acceptable quality from shallow depths.
  - (d) A natural hazard risk assessment has been undertaken in accordance with Section 106 of the Resource Management Act. The findings of the assessment are that the risk levels associated with Natural

Hazards are *'found to be acceptable or tolerable and can be managed as part of a future subdivision and developed with normal good practice design and development controls'*.

- (e) The overall summary of the report is that no risks associated with natural hazards were found that would be of concern to re-zoning the land and future residential development.

## **GEOTECHNICAL ASSESSMENT**

### **Review of available geotechnical investigations**

- 17 Acting under my supervision, staff at Aurecon have undertaken an updated review of the readily available geotechnical investigations. The site is surrounded by numerous well bore investigations, the logs of which are held on the Environment Canterbury Database. These wells, which are typically within 100m of the site boundary, indicate the area is underlain by silty, clayey and sandy gravels to an investigated depth of at least 30m. Two well investigations are present on the site to a depth of 12m below ground level, however no geotechnical log is available.
- 18 ECan Groundwater Monitoring bores in the vicinity of the site (i.e., <2km) indicate that long term groundwater levels are in the order of 1m to 1.5m below existing ground level. Groundwater will vary with seasonal changes and topography.
- 19 No additional geotechnical investigations in the vicinity of the site have been added to the New Zealand Geotechnical Database since Eliot Sinclair undertook their geotechnical assessment.
- 20 Aurecon has reviewed the available mapping on the Environment Canterbury GIS Map Viewer, including mapped liquefaction damage at the site from the Canterbury Earthquake Sequence. This information indicates liquefaction induced ground damage has occurred in the northern section of the site, mapped as 'sand boils?' and 'sediment?'.

### **Review of Natural Hazards Report**

- 21 I have reviewed the Natural Hazards Report undertaken by Eliot Sinclair, and note the following:
- (a) Groundwater has been identified at 3m to 5m below ground level within the Natural Hazard Report. Aurecon's review of available

groundwater data information indicates that the groundwater is likely to be significantly shallower, in the order of 1.0m below ground level.

- (b) The Natural Hazard Report has indicated that, based on the depth to groundwater being 3m to 5m below ground level and the presence of shallow gravel, there is a low risk of liquefaction. Despite the depth to groundwater being shallower than reported by Eliot Sinclair and the historical mapping of minor liquefaction during the Canterbury Earthquake Sequence, I consider that the overall seismically induced liquefaction hazard is low due to the identified shallow cohesive silty and underlying granular soils, and that any residual liquefaction risk can be readily accommodated at the subdivision development stage through suitable engineering design.

22 In addition, I note the site is not at risk from the following additional hazards:

- (a) Seismically induced slope stability due to a lack of significant existing slopes. Any future slopes associated with subdivision development should be assessed to ensure suitable stability.
- (b) Seismically induced rockfall due to the lack of a rockfall source.
- (c) Shallow or deep-seated land sliding.
- (d) Settlement due to the presence of soft ground, as investigations have identified a thin surficial silt cap overlying natural gravels to significant depths. However, given the likely depth to ground water and the limited thickness of compressible soils, consolidation settlement is assessed as low risk.

23 A flood hazard assessment has been undertaken separately by Mr Delegarza who has prepared a statement of evidence which is filed together with my evidence for the Submitters.

24 My assessment has considered the items required by Section 106 of the RMA and in my opinion the site is considered geotechnically suitable for rezoning to large lot residential and future subdivision. Further investigations and design will need to be carried out at the subdivision consent stage.

**CONCLUSION**

- 25 I have reviewed the Natural Hazards Report for the site provided by Eliot Sinclair, and additional available information as indicated in the Geotechnical Assessment section of this evidence. In my professional opinion, not to be construed as a guarantee, I conclude that from a geotechnical perspective the site is suitable for residential rezoning and subsequent subdivision following appropriate engineering design.
- 26 Thank you for the opportunity to present my evidence.

Ian McPherson  
5 March 2024