

**BEFORE INDEPENDENT HEARING COMMISSIONERS
IN CHRISTCHURCH**

TE MAHERE Ā-ROHE I TŪTOHUA MŌ TE TĀONE O ŌTAUTAHU

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the hearing of submissions on Private Plan Change 23
Whisper Creek, Spencerville to the Christchurch District Plan

**STATEMENT OF PRIMARY EVIDENCE OF NEIL JAMES CHARTERS ON
BEHALF OF CHRISTCHURCH CITY COUNCIL**

Dated: 14 April 2026

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EXECUTIVE SUMMARY

1. My full name is Neil James Charters. I am employed as a Principal at ENGEO. I have been employed by ENGEO in Christchurch since September 2010.
2. I have prepared this statement of evidence on behalf of the Christchurch City Council (the **Council**) in respect of matters arising from the submissions and further submissions on Private Plan Change 23 Whisper Creek, Spencerville to the Christchurch District Plan (the **District Plan; PPC23**).
3. This statement of evidence describes my opinions on the adequacy of the geotechnical report set out in Appendix C of the PC23 application.
4. The land is subject to liquefaction hazard, but not to a degree substantially greater than other areas of Christchurch, and likely within the realms of what can be mitigated using relatively standard geotechnical techniques.
5. I have highlighted a number of items that the applicant's expert should consider as part of this process in order to make their application more robust. The key item that is missing is an assessment of natural hazard risk as described in the new National Policy Statement on Natural Hazards. It is entirely appropriate that Landtech did not complete this in their reporting, but I recommend it is completed as part of the proponent's evidence. The assessment required judgement of likelihood and consequence of natural hazard and is appropriately done by the proponent rather than the consenting authority.
6. I have not relied upon others in forming these opinions.

INTRODUCTION

7. In preparing this evidence I have reviewed Landtech's geotechnical assessment provided as Appendix C to the Plan Change application.
8. I am authorised to provide this evidence on behalf of the Council.

Qualifications and experience

9. I hold the qualifications of a Master of Civil Engineering (Geotechnical – awarded with Distinction).

10. I have been practicing geotechnical engineering in Christchurch for over 20 years and have overseen numerous land development and infrastructure projects.
11. I am a Chartered Professional Engineer with a practice area of Geotechnical Engineering.

Code of conduct

12. While this is a Council hearing, I have read the Code of Conduct for Expert Witnesses (contained in the 2023 Practice Note) and agree to comply with it. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of evidence

13. My statement of evidence addresses the following matters:
 - (a) Engineering Geological Model (specifically the landforms and groundwater);
 - (b) Liquefaction Assessment; and
 - (c) Consideration of specifics of the proposed development.
14. I address each of these points in my evidence below.
15. The scope of my evidence does not include stormwater disposal, flooding or tsunami hazards. These need to be assessed by others as part of the application.

ENGINEERING GEOLOGICAL MODEL

16. Landtech completed a supplementary ground investigation to extend their knowledge of ground conditions beyond that gleaned from publicly available data. The total site area is approximately 170 hectares, and they have a total of 19 investigation points (11 Cone Penetration Tests (CPTs) and 8 Boreholes). This is a small amount of data on which to characterise a large area, and is somewhat lower than required in MBIE's recommended investigation density (Table 2.1 of Module 2), which would suggest that around 50 investigation points are required. However, the development area in this case is only approximately half of the site area and thus a total

of around 30 points would be required. Under the circumstances of relatively well known geology, I consider the investigation density marginally acceptable for current purposes, but further investigations will be required as part of the subdivision consent process, should the rezoning be supported.

17. The background section of the report states that the site is listed on Environment Canterbury's Listed Land Use Register as it may have had past landfilling activities. Against this background, a thorough review of historic aerial photographs to assess where this activity may have occurred would be prudent as part of engineering geological characterisation of the site.
18. Landtech have characterised the ground conditions with a specific focus on the CPT results. They have not presented an engineering geological model for the site based on landforms, as is recommended by the International Association of Engineering Geologists. Of particular note is the slope that separates the development area in the western part of the site from the low lying area in the eastern part of the site. This is referred to as a terrace in their conclusion, but no further description is provided in the report. I recommend that they consider this slope in more detail and describe elements such as its height, location, gradient and likely geomorphological formation in order to assess its impact on the proposed development.
19. The Landtech assessment of groundwater is limited. In Section 7.1 they describe two different groundwater levels of the site, but then present an average groundwater level without justifying whether this applies to the whole site, or the development area. Based on their Figure 3 showing groundwater level, it seems likely that they have significant conservatism in their estimation of 0.5 m groundwater depth in the development area. I recommend they consider this further and provide a range of groundwater levels for different parts of the site.
20. Landtech do not discuss how climate change or sea level rise may affect the groundwater level.
21. It is also very important to understand the variability in groundwater depths as if the site is indeed underlain by groundwater at 0.5 m depth then stormwater disposal will be extremely challenging. While outside the scope of my evidence, it is important that the impact of high groundwater levels on

stormwater disposal options is assessed as part of the plan change application process.

22. There is no discussion of slope instability hazard related to the slope that separates the upper and lower parts of the site. Depending on their engineering geological model of the site, the slope may be underlain by liquefiable soils and may be subject to loss of support during earthquakes. While not an insurmountable problem for the development, this may require a setback zone near the top of the slope where development is prohibited. This is not currently addressed in the Landtech report.
23. There is no assessment of hazards against the new National Policy Statement on Natural Hazards. While this was only released in December 2025, we consider it would be valuable for the applicant to complete this assessment as part of the evidence process.

LIQUEFACTION ASSESSMENT

24. Landtech have assessed liquefaction vulnerability at the return periods specified in the Building Code for Importance Level 2 structures (such as the houses that may ultimately be built on this land). For a proposal of this scale, we consider it would be worthwhile to complete a parametric analysis to assess the liquefaction vulnerability against the ground acceleration. This would provide insight as to whether there is a step change from the modest liquefaction vulnerability predicted at Serviceability Limit State (SLS) and the higher vulnerability at Ultimate Limit State (ULS). If this step change occurs close to SLS (i.e. with a return period close to 25 years), it may warrant further consideration and design of mitigation measures. Alternatively, if the step change occurs close to ULS (i.e. with a return period close to 500 years), it can probably be mitigated appropriately in the building foundations.
25. It is standard practice in Christchurch to compare the predicted liquefaction performance to the observations made during the 2010-2011 Canterbury Earthquake Sequence. While this is a rural area and may have a lower density of reports, or lower resolution aerial photographs, this would be a valuable exercise to ground truth the assessments and to provide more confidence in their reasonableness.

26. Landtech state at section 9.5 of their report that the land is “likely to be inundated with liquefaction ejecta following large earthquakes”. No detail of whether this is acceptable or what mitigation is required is offered.
27. Of the 11 CPTs completed across the site, three predicted moderate to severe, or major liquefaction vulnerability (CPTs 103994, 103995, 32129). While this may reduce with re-assessment of groundwater levels and consideration of fill to be placed, it does suggest that a reasonable portion of the site is vulnerable to significant liquefaction. Services and infrastructure that cross these areas will need to be designed accordingly. It also highlights significant variability in ground conditions that will need to be better understood as part of future more detailed investigations.

SPECIFIC ASPECTS OF THE PLAN CHANGE APPLICATION TO ASSESS

28. Given the effects (both positive and negative) of placing large volumes of fill on the ground surface on the liquefaction hazards, I consider it important that the geotechnical assessment is updated in light of the proposed earthworks plan provided as part of the application.
29. Section 10 of Landtech’s report states that their report scope excludes underground services. Where there is liquefaction hazard and high groundwater, underground services can be challenging to design and install so it is important that they are considered at this stage.

CONCLUSION

30. I consider that the land is subject to liquefaction hazard, but not to a degree substantially greater than other areas of Christchurch, and likely within the realms of what can be mitigated using relatively standard geotechnical techniques.
31. I have highlighted a number of items that the applicant’s expert should consider as part of this process in order to make their application more robust. Key items that are missing are
- a) an engineering geological model for the site, including assessment of groundwater levels; and
 - b) an assessment of natural hazard risk as described in the new National Policy Statement on Natural Hazards.

32. It is entirely appropriate that Landtech did not complete b) in their reporting, but I recommend it is completed as part of this application.
33. It is also important to understand the limitations of the Landtech report in that it is largely suitable to support a first screening of geotechnical conditions for plan change but is not intended to provide enough information to support subdivision consent or the design process. Significant numbers of extra geotechnical investigations will be required at this these later stages, should the project proceed.

Date: 14 April 2026

Neil Charters