

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

IN THE MATTER of the Resource Management Act 1991
(**RMA**)

AND

IN THE MATTER of the Proposed Waikato District Plan

BETWEEN **RANGITAHİ LIMITED**

Submitter [No. 343]

AND **WAIKATO DISTRICT COUNCIL**

Local Authority

**SUMMARY STATEMENT OF EVIDENCE OF
KENNETH JOHN READ FOR RANGITAHİ LIMITED**

HEARING 27D: COASTAL HAZARDS

(GEOTECHNICAL ENGINEERING)

7 MAY 2021

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INTRODUCTION

1. My name is Kenneth John Read. I provided evidence in reply (**EiR**), dated 16 April 2021, on Geotechnical Engineering matters related to Rangitahi Ltd's submission on the Proposed Waikato District Plan (**pWDP**) for the Coastal Hazards hearing.
2. I outlined my qualifications, experience and commitment to comply with the Environment Court Expert Witness Code of Conduct in my EiR.

SUMMARY OF EVIDENCE

3. I summarise my evidence as follows:

Coastal Erosion Hazards Assessment Precincts A, B and D

- (a) Coastal erosion has been considered in the preparation of geotechnical design reports prepared by Coffey Geotechnics in 2013 and CMW Geosciences in 2017 (Precinct A), 2018 (Precincts B and D) and 2020 (Precincts A and B).
- (b) This work comprised a series of walkover inspections and geomorphic mapping of the shoreline and associated coastal slopes.
- (c) The observations made with regard to coastal erosion were carried forward into the design of earthworks for the precincts concerned.

Coastal Slope Sensitivity to Climate Change Precincts A, B and D

- (d) Coastal slope sensitivity to climate change is not specifically mentioned or addressed in the geotechnical design reports for Precincts A, B and D.
- (e) However, in the process of assessing the slopes on the peninsular (including the coastal slopes) variation in soil moisture content and in particular increased saturation of soils was considered as this reduces the stability of slopes increasing the risk of a slip.
- (f) I consider that one of the effects of climate change may be increased rainfall and occurrence of extreme weather events. Therefore, those occasions where soil moisture may increase to the potentially

hazardous levels modelled in the geotechnical assessments may occur more often.

- (g) I therefore consider that the slope stability modelling carried out has allowed for potential geotechnical effects of climate change.

Geotechnical Hazard Zonation

- (h) In the Geotechnical Completion Reports prepared for Precincts A and B there are specific design zones variously denoted 'slope', 'coastal cliff' and 'retaining'.
- (i) In the CMW design report for Precinct D there are proposed 'building set-backs/building line" restrictions. I expect that these will be further developed by others who are providing geotechnical input to the earthworks on that Precinct.
- (j) The geotechnical reports referred to in my evidence recommend limitations be placed on development with the specific design zones presented. Notably that specific engineering advice and measures be required should development be proposed with these specific design zones in accordance with the recommendations in the Geotechnical Completion Reports.

Coastal Erosion Risk and Climate Change

- (k) On the basis of the coastal inspections and mapping carried out and incorporation of those finding into the reports and geotechnical recommendations I consider that the Coastal Erosion Risk has been addressed in the work undertaken and reports referred to in my evidence.
- (l) The slope stability assessments carried out incorporated allowance for periodic moisture increases in the soils which would promote instability. I consider this to model potential geotechnical effects of increased rainfall and extreme weather events that may occur as a result of climate change.
- (m) Specific design zones have been designated from the combination of the coastal mapping and slope stability assessment. I consider these

equivalent to the Coastal Sensitivity Area (Erosion) hazard area identified by the Councils Experts but with allowance for site specific features and variation.

- (n) I therefore consider that the potential geotechnical effects of climate change, as modelled by the Councils coastal scientists, have been addressed by the works undertaken to date and in the recommendations made in the reports referred to in my evidence.

Reply to s42 Rebuttal Report: Paragraphs 42 to 44

- (o) The coastal scientists Bronwen Gibberd and Jim Dahm have reviewed the specific design zones for Rangitahi (Precincts A and B), and agree that they extend over a similar area to the Coastal Erosion and Sensitivity Hazards Zones they have proposed.¹ Ms Gibberd further confirms that the assessment by CMW represents a more detailed site-specific investigation of potential slope instability than their coastal hazard assessment, and on that basis that she is comfortable that the potential coastal hazards have been provided for.² However, Ms Gibberd notes that the consent notices for Precincts A and B do not specifically reference coastal hazards (including sea rise), and development can potentially still occur within these areas without due consideration of coastal hazards.³
- (p) Kelly Nicolson, Senior Policy Planner for the Council, notes that “*the mitigation of coastal erosion [risk] through structural design of buildings is only one of the matters included in Rule 15.7.2.2 RDI.*”⁴ Ms Nicolson considers that where land could potentially be affected climate change over the next 100 year period, it is also important to allow for development that is designed to be adaptive (i.e. relocatable).⁵

¹ Statement of Rebuttal Evidence for Bronwen Beth Gibberd for the Waikato District Council (3 May 2021) at [3.5].

² Gibberd Rebuttal Evidence, at [3.6].

³ Gibberd Rebuttal Evidence, at [3.10].

⁴ Section 42A Report Rebuttal Evidence prepared by Kelly Nicolson (3 May 2021) at [43].

⁵ Section 42A Rebuttal Evidence, at [44].

- (q) In my experience risk management generally takes the form of the following strategies:

Avoidance – do not build in the hazardous area,

Mitigation – reduce the likelihood of the hazard being realised and/or the effects/costs of the hazard being realised,

Acceptance – accept the risk and costs of the consequences of the hazard being realised,

Transference – basically insure against the costs of the consequences of the hazard being realised.

- (r) The specific design zones presented in the Geotechnical Completion Reports essentially offer 'avoidance' or 'mitigation' strategies to address the risk of coastal hazards.

- (s) The provision in Rule 15.7.2.2 RDI which includes consideration of adaptive design (i.e. relocatable buildings) is an 'acceptance' of risk strategy. I do not consider that adaptive design is a necessary strategy to adopt for Precincts A, B and D. It is my considered opinion that adoption of the 'avoidance' and 'mitigation' strategies currently undertaken appropriately addresses the risks of coastal erosion and geotechnical effects of climate change as modelled by the coastal scientists.

Dated this 7th day of May 2021

Kenneth John Read