

10 March 2026

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by email: jerry.l@rislandnz.co.nz

Attention: Jerry Liu (Head of QS)

3 Pigeon Mountain Road, Half Moon Bay Landslide Hazard Risk Assessment (PC120)

We have been requested by Council to provide a Landslide Hazard Risk Assessment in accordance with Appendix 24 of Plan Change 120 (PC120) to support the resource consent application for the above project.

This letter should be read in conjunction with the following reports:

- “3 Pigeon Mountain Rd, Halfmoon Bay. Proposed Residential Development. Geotechnical Investigation Report” ref J00538AA rev0 dated 12 July 2022.
- “3 Pigeon Mountain Rd, Halfmoon Bay. Western Boundary Wall. Preliminary Design and Groundwater Assessment Report” ref J00538AB rev6 dated 19 February 2026.

The paragraph below is taken from the Geotechnical Interpretive Report (GIR) in assessing slippage in the discussion on “Geohazard Evaluation”

The general site slope gradient is approximately 1V:13H, much gentler than the 1V:4H criteria for slope stability analysis suggested in “Earthworks and Geotechnical Requirements” of the Auckland Council Code of Practice for Land Development & Subdivision. On the basis of our site observations and review of the geomorphology evident from aerial photographs, there are no indicators of slope instability at the site or in the general area.

PC120 now requires a more prescriptive Landslide Hazard Risk Assessment.

1. PC120: Landslide Hazard Risk Assessment

According to the Climate Change Scenarios Guideline (GD15, November 24), climate change considerations for Auckland indicate substantial shifts in temperature, rainfall, and sea level under future high-emissions scenarios. Under Shared Socioeconomic Pathway 5 (SSP5-8.5, high-emissions scenario), the mean annual temperature in Auckland is projected to increase by 3.5–3.8 °C by 2110. Additionally, high-intensity rainfall is expected to rise over a 100-year design life. For a 100-year Average Recurrence Interval (ARI) storm, rainfall is projected to increase by 13.6% for 1-hour events, 13.1% for 2-hour events, 11.5% for 6-hour events, 10.1% for 12-hour events, 8.6% for 24-hour events, and 6.1% for 120-hour events.

Sea-level rise is also projected to be substantial under the high-end SSP5-8.5 H+ scenario (83rd percentile), with mean sea levels in Auckland potentially increasing by approximately 1.69 m by 2126 (NZSeaRise, 2024). Collectively, these factors contribute to soil moisture deficits during dry periods and increased runoff during intense rainfall events, which may exacerbate slope instability.

Appendix 24 of PC120 outlines a process for carrying out a Landslide Hazard Risk Assessment following increasing levels of investigation and analysis. Level A starts with the assessing the Landslide Risk overlays within Auckland Council's Geomaps.

1.1 Level A Assessment

Figure 1 extracted from Auckland Council's GeoMaps shows that the risk of large-scale landslides is classified as Low under the Level A analysis (2025).

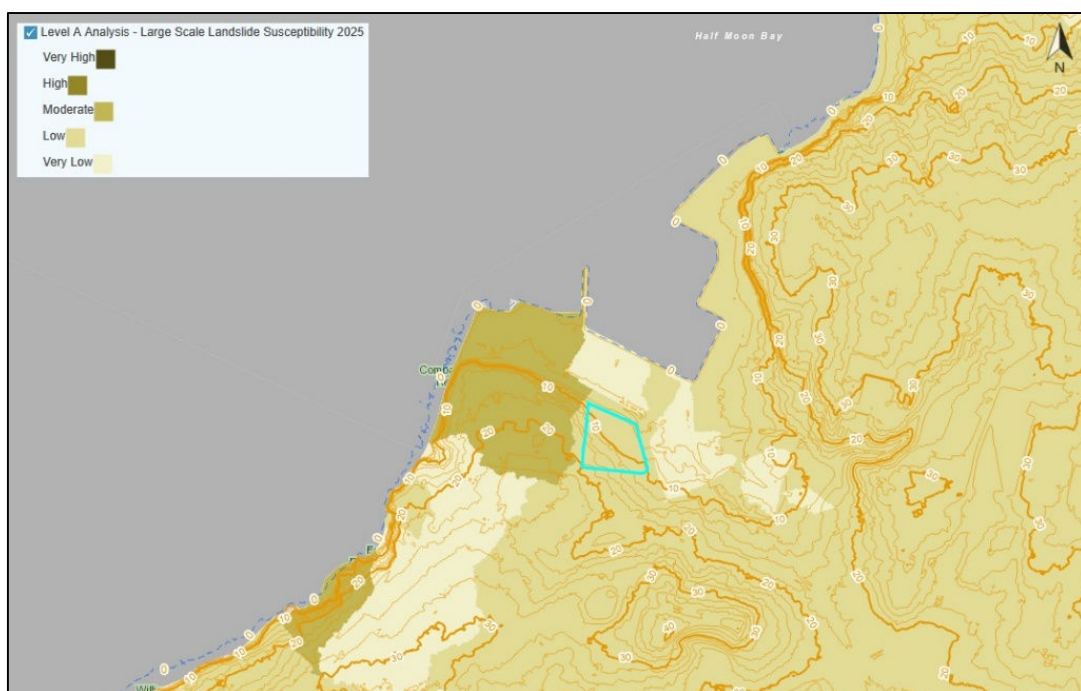


Figure 1: Large Scale Landslide Susceptibility 2025

Figure 2, shows the site location and shallow landslide susceptibility. According to GeoMaps the site exhibits a range of shallow landslide susceptibility from Very Low to Low.

A single pixel of Very High susceptibility is in close proximity to the site. Upon review of the contours, the aerial basemap and our observations onsite, this appears to be an anomaly in the automated classification criteria. The slope in this zone is relatively gentle, but there is a substantial two storey residential dwelling above a 2m retaining wall on the western boundary of the site. The change in contours appears to be a result of the influence of the neighbouring house on the Lidar contours and this has triggered the pixel of Very High Susceptibility.

In addition, the proposed development includes a new retaining wall along the western boundary (adjacent to the mentioned house). This wall has already been designed to preliminary design stage to maintain stability along the boundary and therefore implicitly mitigates any risk of shallow instability in meeting the building code requirements.

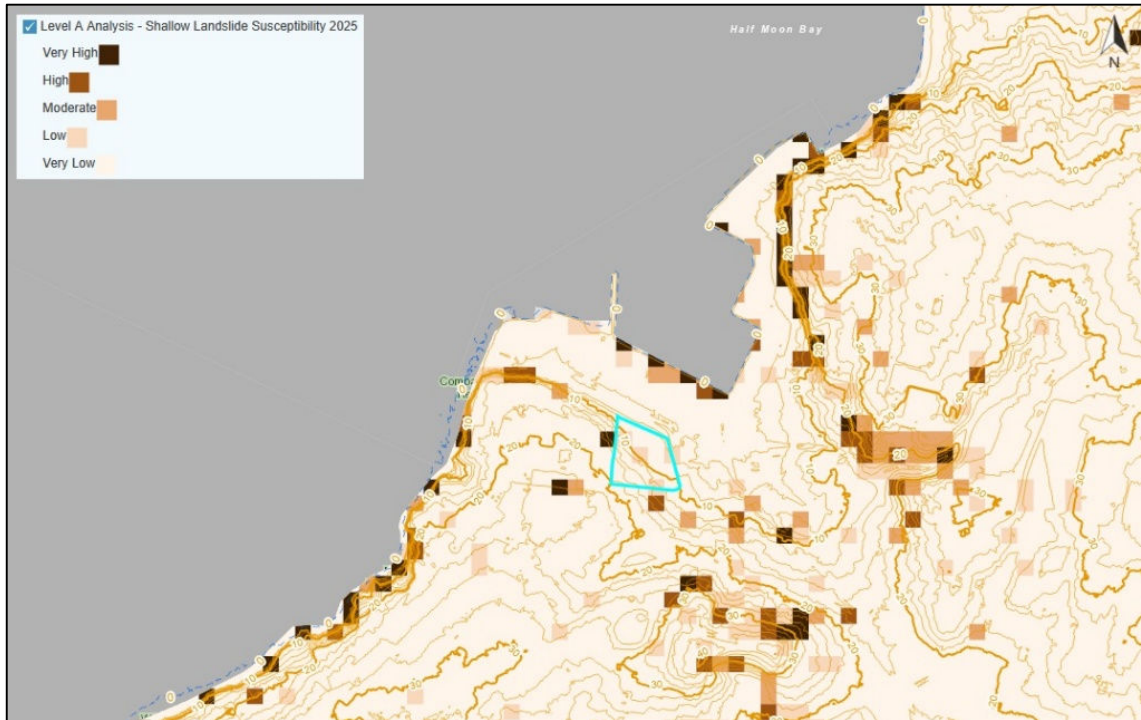


Figure 2: Shallow Landslide Susceptibility 2025.

2. Closure

The Level A desk study assessment in accordance with PC120, Appendix 24, indicates that the site has Very Low to Low risk of landslide susceptibility, and is therefore acceptable.

We trust this letter meets your requirements. Please contact the undersigned if you have any questions.

Yours Faithfully

Neil Jacka

Principal Engineer, CMEngNZ, CPEng, IntPE

Total Ground Engineering