

BOARD OF INQUIRY
HAUĀURU MĀ RAKI WIND FARM PROPOSAL

In the matter of the Resource Management Act 1991

And

In the matter of resource consent applications by Contact Wind Limited in respect of the Hauāuru mā raki Wind Farm Proposal

And

In the matter of notices of requirement and a resource consent application by Contact Energy Limited for transmission infrastructure related to the Hauāuru mā raki Wind Farm Proposal

**FURTHER REBUTTAL EVIDENCE OF HELEN LOUISE YORKE
RESPONDING TO THE EVIDENCE OF RJ KINNEY**

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Introduction

1. My name is **Helen Louise Yorke**. I am a senior member of Beca Carter Hollings & Ferner Power Systems section. My specialist area is High Voltage (HV) transmission lines.
2. I refer the Board of Inquiry to the statement of my qualifications and experience in my evidence in chief. I reaffirm my commitment to comply with the code of conduct for expert witnesses in the Environment Court.
3. The purpose of this brief of evidence is to respond to the evidence of Mr Robert Kinney for Ravensdown Fertiliser Co-operative Limited (Ravensdown). In his evidence Mr Kinney raises various issues in relation to the proposed transmission line, including the proximity of the line to the Ravensdown property and the risk of damage to the line from fly-rock caused by the use of explosives as part of the quarrying operations.
4. Mr Kinney's evidence is that fly-rock can travel up to 400m from the rock face and, as a result, Ravensdown seeks to have the proposed transmission line moved to the east to create a 500m buffer between the property boundary and the line.
5. I have read in draft the rebuttal brief of my colleague Mr Morten, of Beca AMEC, and note his view that damage to a transmission line is unlikely at a separation distance of 150m between the quarry face and the transmission lines, if standard blasting techniques are adopted.
6. As can be seen from the plan annexed as **Exhibit HY24**, the proposed corridor (indicated by the white lines) passes adjacent to the Ravensdown boundary. The closest point from the centre line of the corridor to the Ravensdown boundary is approximately 114m, although existing pine trees may form something of a buffer between the line and the quarry at that closest point. The centre line of the proposed corridor is approximately 300m from the present quarry face, based on the current area of the quarry as shown on the aerial photographs and included in Mr Kinney's evidence.

Potential effects of fly-rock

7. While contact between fly-rock shrapnel and the transmission lines has the potential to damage the lines, there are engineering features that can be used to reduce that risk. Polymer insulators could be used, for example, which would not be likely to shatter or have explosive failure if hit by fly-rock shrapnel. Minor damage to such insulators would not necessarily adversely impact on the operation of the insulator in the short term, though replacement would be recommended if damage occurred.

8. If fly-rock was to hit the conductors or earthwire and damage to a strand occurred, this would be unlikely to cause failure of the conductor. Again, though, the damaged section of conductor would require replacement during the next planned maintenance period. If any blasting operation caused fly-rock in close proximity to strike the transmission line then an inspection to ensure damage has not occurred would be recommended. Dust from quarrying operations may be an issue and in the first couple of years after the line has been constructed, it would be recommended that inspection of the insulators is carried out, to ensure no build up of dust on the insulator sheds – though it is unlikely that this will be a problem at the distance from quarrying operations proposed by Mr Morten.
9. In assessing the risk to the transmission line of fly-rock, it may also be relevant to note that the current rock face is approximately 235m to the nearest point on Waikaretu Valley Road, as shown on the plan annexed as **Exhibit HY24**. Mr Kinney's evidence is that quarrying has been carried out in an easterly direction, which indicates that in the past the quarry face must have been significantly closer to Waikaretu Valley Road than it is now. These distances are obviously well within the 500m buffer sought by Ravensdown.
10. Furthermore, the proposed location of the transmission line structures are on a ground contour approximately 50m above the ground level at the top of the quarry. In addition, the conductors and insulators will be approximately 9m to 25m above that ground level. In assessing the likely risk from fly-rock shrapnel to the transmission line then the vertical distance as well as the horizontal distance should be taken into account.

Problematic to move the transmission corridor to the east

11. In respect of the 500m buffer sought by Ravensdown, Mr Kinney asserts in his evidence that *"there are no particular landforms or physical barriers which would prevent constructing the line beyond 500m from the Ravensdown boundary"*, that is, that there are no barriers to moving the transmission corridor to the east.
12. In my evidence in chief I explained that Contact has applied for notices of requirement for the transmission corridor, and I described the work that went into identifying the most appropriate corridor route.
13. While Mr Kinney is broadly correct in that no landforms or physical barriers prevent the corridor being moved to the east, there is evidence (from the aerial photography) of surface broken rock and surface slips to the east of the corridor, which would be problematic for tower foundations and line design.

14. More importantly, though, I consider that there are strong reasons, in terms of adverse visual effects, why a more easterly transmission corridor is not appropriate at this point on the route. The Nikau Caves tourism operation, including a limestone visitor centre and café, is near the eastern edge of the proposed corridor, and the proposed alignment largely avoids potential adverse visual effects on that operation. Visual effects on members of the public driving along Waikaretu Valley Road have also been taken into account in arriving at the proposed alignment. Moving the corridor further east would increase the visual effects of the transmission lines on those locations. Further east again are a number of houses, which would experience adverse visual effects if the line were to be shifted significantly to the east.

Flexibility within the current corridor

15. The width of the proposed corridor allows some flexibility in the final placement of the transmission line. The process of finalising the alignment of the line will be subject to detailed design (including geotechnical investigations), and will take into account information received from landowners and surveyors.
16. As part of this process, consideration will be given to a number of matters, including the most appropriate way for the line to cross an existing stand of pine forest shown on the plan annexed as **Exhibit HY24**, the effects on the Ravensdown and other neighbouring properties, and effects on the houses and visitor centre further to the east.
17. Subject to detailed design it would be possible to build the line slightly to the east of the current indicated transmission alignment, within the corridor. My provisional view is that the line could be located so it is approximately 180 metres from the Ravensdown boundary at its nearest corner, as shown on **Exhibit HY24**. The feasibility of this alignment would need to be confirmed at the detailed design stage. Assuming that the alignment is feasible and standard blasting techniques are utilised as described in Mr Morten's evidence, I consider that the engineering features to mitigate against the chance of fly-rock, discussed at paragraphs 7 and 8 above, would not be necessary at that distance.

H L Yorke

Exhibit HY 24

Map showing the Ravensdown property and the proposed transmission corridor

