Before the Independent Hearing Commissioners at Porirua

under: the Resource Management Act 1991

in the matter of: submissions and further submissions in relation to Variation 1 to the proposed Porirua District Plan

and: **Radio New Zealand Limited**
Submitter 73

Rebuttal Evidence of Steve White for Radio New Zealand Limited

Dated: 3 March 2023

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REBUTTAL EVIDENCE OF STEVE WHITE FOR RADIO NEW ZEALAND LIMITED

INTRODUCTION

1 My full name is Stephen Charles White. I am a Transmission Engineer Specialist employed by Radio New Zealand Limited (*RNZ*).

2 I provided a statement of evidence on behalf of RNZ dated 24 February 2023 (*EiC*). My qualifications, experience and involvement with Variation 1 to the proposed Porirua District Plan (*Variation* 1) are contained in my EiC and I do not repeat those here.

SCOPE OF REBUTTAL EVIDENCE

3 My rebuttal evidence responds to the "*Statement of Primary Evidence of Martin Gledhill on Behalf of Kāinga Ora – Homes and Communities 24 February 2023"* (*Mr Gledhill's EiC*). Specifically, it deals with the following:

3.1 Overview of the detailed technical analysis undertaken by RNZ which informed its submission on Variation 1;

3.2 Specific responses to matters raised in Mr Gledhill's EiC;

3.3 Constructive discussions between myself and Mr Gledhill on technical matters.

OVERVIEW OF RNZ'S TECHNICAL ANALYSIS

4 RNZ's submissions on Variation 1 and associated material sought to communicate a complex technical situation in a way that was clear, understandable and useful for the planning and consent process. RNZ's technical assessments are based on rigorous and detailed analysis. The data and calculations supporting RNZ's submission are highly complex and include confidential details of RNZ's equipment and operations. RNZ is happy to share this supporting data and calculations with other parties where this would be useful, and has provided such information to Mr Gledhill.

5 As discussed in my EiC, health and safety risks associated with electromagnetic radiation (*EMR*) from RNZ's transmission towers is not well understood. RNZ considers the best way of ensuring public safety is through simple, clear restrictions on access and activities in areas that could be exposed to risk, including through planning instruments such as Variation 1. I emphasise that the primary reason for RNZ's submissions is to protect the safety of the public.

6 RNZ's approach to managing health and safety risks is to:

6.1 Define the EMR risks in a way that everyone, including non-technical people, can readily understand and use – hence the definition of the "zones" contained in **Appendix 1** to my EiC.

6.2 Where possible, mitigate EMR risks by *preventing* the construction of structures that would create high risks – the proposed boundaries mitigate the risks within the 528m to 1057m zone for inhabitants of those structures. The operative Porirua District Plan already effectively mitigates the risk in the 210m to 1027m zone by providing a height limit in this area of 10m (although this limit is not imposed because of EMR risks).

6.3 Further from the transmitter EMR risks are lower and RNZ's preference is to collaboratively mitigate the risks by requiring parties that are planning or undertaking construction in the "outer zone" to conduct their due diligence, engage with RNZ and ensure that they, their contractors and/or occupants are not placed at risk.

7 I wish to emphasise there is no set 'safe' height or distance. Every raised structure will be exposed to a differing degree of risk depending on the height and distance from the transmitter, local conditions, the shape of the structure, the materials used to construct the structure and any safety measures or features applied. Modern buildings typically contain a significant amount of metal wiring or cabling, which can provide a 'focus' for EMR, particularly if orientated vertically. Individual assessment of each site is required to determine the risk.

SPECIFIC RESPONSES TO MR GLEDHILL'S EIC

8 Mr Gledhill's primary concern was that RNZ's submissions did not provide sufficient technical material to support the distance and height controls proposed. RNZ have carried out a detailed analysis of the likely EMR levels at Titahi Bay. This has been provided, in confidence, to Mr Gledhill.

Requirement for detailed EMR assessments

9 Mr Gledhill considers that detailed EMR assessments must be completed by those with specialist knowledge and experience, and that this could add significant cost to any development.

10 I agree that these assessments should be completed with specialist knowledge and experience. RNZ has the tools and experience to assist with these assessments, but does not have the resources to carry out a large volume of assessments. As Mr Gledhill points out, there are other companies / software packages able to carry out this RF analysis. It may be possible for RNZ to work with these companies and larger agencies (such as Kāinga Ora) on

standardised processes to enable these assessments to be carried out efficiently. Certainly RNZ will be happy to provide technical information about the operation of its facilities to allow the appropriate calculations to be made. It is likely that the assessment process can be streamlined significantly as more applications are made.

11 I maintain the view that considerations to mitigate EMR risks should be conducted at a stage which is the least costly – the planning stage. This is particularly important given the potential safety risks.

12 RNZ is very willing to have discussions with Kāinga Ora, Porirua City Council, and other parties on the most efficient and cost-effective way of carrying out EMR assessments.

10m vs 11m

13 Mr Gledhill states it was not clear why a difference of one metre in building height, and increase from the current 10m to 11m should be so critical to RNZ's concerns.

14 The modelling I have carried out shows that EMR levels at 528m from the transmitter, and 11m from the ground in close proximity to a 200mm diameter grounded vertical element, are almost at the limit for safe public exposure. EMR levels closer to the transmitter at 11m are higher. I emphasise that lower height limits closer to the transmitter are required, but RNZ owns and has a designation over the land up to around 210m from the transmitter, and so has control over the nature and height of any structures within the area where the risk is greatest.

15 528m is the distance from the mast where an 11m high 200mm diameter vertical element is calculated to produce E Field at the top which is 94.4% of the NZS 2772.1:1999 Athermal General Public reference level limit and 98.9% of the ICNIRP 2020 Athermal General Public reference level limit. This distance from the mast also coincides with 1 wavelength at 567kHz (RNZ National AM Radio Service) from the mast, but this is not the main reason for selecting this distance.

16 Beyond 528m the risks associated with constructing an 11m tall structure are reduced. The primary concern beyond 528m is the construction of, or use of higher structures. The distance of 1,057m was selected as it is the distance from the mast where a 22m high vertical element (ie. twice the 11m height) is calculated to produce E Field at the top which is 95.6% of the NZS 2772.1:1999 Athermal General Public reference level limit and 100.2% of the ICNIRP 2020 Athermal General Public reference level limit. This distance from the mast also coincides with 2 wavelengths at 567kHz (RNZ National AM Radio Service) from the mast. I note that a greater risk is

associated with the use of cranes and other elevated structures that are usually taller than the building they are used to construct.

17 There are still EMR risks associated with buildings taller than 22m further than 1,057m from the mast. However, developers constructing buildings of this height are more generally alert to EMR risks and I consider 1,057m represents an appropriate limit to require height controls to protect public safety.

18 From a 'perfect safety' perspective, I would prefer lower height limits between 210m and 528m. The existing District Plan limit of 10m generally precludes three storey buildings with the majority of buildings within 528m of the mast beingcurrently one and two storey homes, with heights in the range of 4.5 to 7.0m. Here the 10m height limit has effectively resulted in a lower built-form environment, and RNZ is not aware of any current EMR issues arising from current structures, and so has not sought to reduce the height limit currently applying in the District Plan.

19 I am concerned that any increase in building height limit in between 210m and 528m will result in significantly more three storey buildings being constructed. The combination of increased built height and density increases the risk of EMR issues. I maintain the position expressed in RNZ's submission that a 10m height limit within the 528 metre radius is essential for the safety of occupants.

Local interference

20 In relation to local electronic interference with devices and complaints, RNZ has not had any significant complaints from around the Titahi Bay site for some years – other than wind noise while replacing the 220m mast. However, I note that this complaint put RNZ to considerable expense carrying out noise measurements and modelling around the site in the planning stages for the new 137m mast. It concluded that noise levels would be significantly lower with the new mast, and there have not been any complaints since the installation of the new mast. The lack of electronic interference complaints is likely to be partly due to the significant reduction in transmitter power and a move away from copper phone lines to fibre.

21 However, it is also RNZ's experience that a site experiences no issues from intensifying development nearby, until it does. An increase in building heights in the area inside 528m from the mast significantly increases the risk of issues arising as new people move into the area, and if they move into higher structures, will be exposed to higher field strengths than those experienced by current residents.

DISCUSSION WITH MR GLEDHILL

22 On 2 March 2023, I met with Mr Gledhill and Kāinga Ora to talk through EMR issues and RNZ's calculations. This was a constructive discussion and we maintain an open communication line with Mr Gledhill on the technical matters in RNZ's submission and provided subsequently. I consider there are now large areas of agreement between Mr Gledhill and myself on technical issues and hope to be able to provide a summary of agreed maters to the committee shortly.

23 I have not included further information on RNZ's technical calculations with this rebuttal evidence as it contains sensitive information. RNZ is happy to make arrangements to present this information to the Panel if that would assist.

CONCLUSION

24 RNZ welcomes the opportunity to engage with Kāinga Ora and other Titahi Bay neighbours to enable appropriate development of the area. I consider that part of being a good neighbour is working to allow appropriate development while protecting the health and safety of residents and maintaining RNZ's ability to safely and effectively operate its transmission site.

3 March 2023

Steve White