

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

AND

IN THE MATTER of submissions by the Waka Kotahi New Zealand Transport Agency (submitter 742, further submitter 1202) and KiwiRail Holdings Ltd (submitter 846, further submitter 1272) on the Proposed Waikato District Plan ("**Proposed Plan**")

**SUMMARY STATEMENT OF EVIDENCE OF STEPHEN GORDON CHILES ON
BEHALF OF WAKA KOTAHI NZ TRANSPORT AGENCY AND KIWIRAIL HOLDINGS
LIMITED**

NOISE AND VIBRATION

1. QUALIFICATIONS AND EXPERIENCE

1.1 My full name is Dr Stephen Gordon Chiles. I confirm I have the qualifications and experience described in my evidence in chief (EIC) dated 29 September 2020. I also confirm that in preparing this summary statement I have complied with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014).

2. SUMMARY OF EVIDENCE IN CHIEF

2.1 It is widely accepted nationally and internationally that sound and vibration from road and rail networks have the potential to cause adverse health and amenity effects on people living nearby. This has been documented by authoritative bodies such as the World Health Organisation ("**WHO**"),¹ including a relatively recent publication by WHO Europe in October 2018 ("**2018 WHO Guidelines**"), which sets out guidelines for managing environmental noise.²

2.2 In my experience, road and rail networks are particularly susceptible to reverse sensitivity effects. Roads and railways are generally an accepted part of our

¹ World Health Organisation, Guidelines for community noise, 1999; World Health Organisation, Burden of disease from environmental noise, 2011.

² World Health Organisation, Environmental noise guidelines for the European region, 2018.

environment, although my experience from investigating complaints on behalf of KiwiRail and Waka Kotahi is that many people do not appreciate the actual effects of living with road and rail sound and vibration when they choose to build new houses, or alter existing dwellings, near existing road and railway corridors. KiwiRail and Waka Kotahi continuously work to reduce existing sound and vibration exposure and to manage the effects of their operations on existing sensitive activities. However, due to the nature of their operations, KiwiRail and Waka Kotahi are unable to internalise all noise and vibration effects associated with their activities.

- 2.3 Adverse effects on new and altered buildings containing sensitive activities can be avoided and managed through well understood controls in district plans. In my opinion, it is critical that the Proposed Plan includes appropriate land use controls to manage the location of sensitive activities near road and rail corridors, to protect these users from adverse effects and in turn to manage potential reverse sensitivity effects on KiwiRail and Waka Kotahi. I am not aware of any acoustic or health justification to compound existing issues and allow more people to be subject to adverse health and amenity effects, when the new exposure can be avoided or otherwise appropriately mitigated.
- 2.4 For new buildings being constructed, or for alterations to existing buildings, near to the state highway and railway networks, it is relatively straight-forward to control internal sound and vibration through the building location, design and systems (like acoustic insulation and mechanical ventilation). In most cases, it is practical to achieve acceptable internal sound and vibration levels using such measures. Likewise, screening can be used in some cases to achieve reasonable external sound levels, which is important to provide for outdoor amenity associated with normal domestic activity. With careful design of building location, orientation and materials, future occupants of the building can be protected from the most significant adverse effects associated with state highway and railway sound and vibration.
- 2.5 In my opinion the submissions by KiwiRail and Waka Kotahi on the Proposed Plan, with the amendments set out in the attachment to the EIC of Mr Wood, seek appropriate and pragmatic rules that would manage the most significant adverse effects on new and altered sensitive activities near existing road and rail corridors. These rules are permitted activity standards that establish:
- (a) an “effects” area of 100m from the state highway carriageway or railway for noise sensitive activities, and an “effects” area of 40m from the state highway carriageway, and 60m from the railway, for vibration sensitive activities; and

- (b) noise and vibration standards for new or altered buildings containing sensitive activities within the relevant “effects” areas.

2.6 In my opinion, the proposed controls provide a pragmatic approach of allowing development near road and rail corridors, subject to reasonable site and building design. Rather than relying on the most restrictive option in terms of distance or internal noise levels, the criteria are set at a moderate level, which in my view will provide controls that ensure reasonable protection from adverse health effects for the majority of the population. I consider that this is appropriate.

3. SUMMARY OF REBUTTAL EVIDENCE

3.1 In my rebuttal evidence, I respond to matters raised by Mr Styles in his EIC in relation to:

- (a) the use of a 100 metre distance from both road and rail corridors to define the area over which permitted activity standards for noise affecting new and altered sensitive land uses apply; and
- (b) the use of 40 metre and 60 metre distances from road and rail corridors respectively, to define the area over which the permitted activity standards for vibration affecting new and altered sensitive land uses apply.

3.2 My rebuttal evidence confirms that the 100 metre distance for noise for road and rail is appropriate. In terms of the state highway, the reason for this is primarily because in terms of the geographic extent of noise from roads, there are numerous variables and in my opinion it is not practical to account for them all specifically in district plan rules.

3.3 When implementing the proposed provisions within 100 metres of a rail corridor, a specified noise level is necessary to ensure that, should the frequency or type of trains using the rail corridor change, any buildings containing sensitive activities in proximity to the corridor will be appropriately mitigated against any change in noise levels resulting from the change in operations on the corridor.

3.4 My rebuttal evidence also confirms that the 40 and 60 metre distances for road and rail respectively are appropriate for vibration effects. My rebuttal confirms (in agreement with Mr Styles) that 60 metres is not an appropriate limit for road traffic, and thus recommend this be reduced to 40 metres (as outlined in my EIC), and confirm that 40 metres is appropriate given the variability in vibration

levels from the state highway, which cannot be reliably predicted. In terms of rail, the 60 metre distance is an appropriate extent for the rail vibration effects area as it relates to the area where vibration levels above 0.3 mm/s $v_{w,95}$ are expected.

4. COMMENTS ON KĀINGA ORA REBUTTAL EVIDENCE

- 4.1 I have read the rebuttal evidence of Mr Stickney on behalf of Kāinga Ora dated 6 October 2020. I confirm that my position set out in my primary statement of evidence and rebuttal statement of evidence dated 6 October 2020 remains the same, subject to the additional comments as set out below.
- 4.2 In paragraph 3.4(a) of his evidence, Mr Stickney questions the meaning of the term 'notional boundary'. In addition to being a standard term used throughout New Zealand in the context of noise limits, this is a defined term in the Proposed Plan and is included in the National Planning Standards Definitions Standard. I am unaware of any ambiguity or uncertainty in relation to the term notional boundary in the context of noise limits.
- 4.3 Mr Wood has addressed how the rules apply to alterations in his summary statement and suggested some additional wording. I agree with that wording.
- 4.4 In paragraph 3.7 of his evidence, Mr Stickney sets out his opinion that the noise and vibration provisions sought by Waka Kotahi and KiwiRail are unduly complicated. I have provided advice to Waka Kotahi and KiwiRail in association with similar rules in numerous other district plans. In those districts, it has been common for councils and submitters to seek alternative compliance pathways to avoid the need to engage acoustics specialists where practicable. Waka Kotahi and KiwiRail have worked to develop alternative pathways to address such requests. In terms of managing noise and vibration effects arising from road and rail, the same outcomes could be achieved by simply specifying performance standards and not providing any alternative compliance pathways. While inclusion of the alternative pathways does add another layer to these provisions, I am not aware of it having any other downsides, and I consider that the additional drafting is appropriate to address the concerns raised by other plan users regarding compliance.
- 4.5 In section 4 of his evidence, Mr Stickney raises questions about the report by Acoustic Engineering Services, attached to the s32 assessment in Mr Wood's EIC. I oversaw that work by Acoustic Engineering Services on behalf of Waka Kotahi. Previously, Waka Kotahi has investigated costs of treating buildings based on indicative house designs. In 2013 Waka Kotahi commissioned Beca

and Marshall Day Acoustics to investigate costs based on typical house designs at different distances from roads.³ In response to questions about these costs Waka Kotahi more recently commissioned Acoustic Engineering Services in 2020 to review a sample of actual developments to estimate the costs of specific treatments. While numerous developments were reviewed, only a relatively small number were obtained that had sufficient information readily available to allow a robust estimation of costs. Mr Stickney is correct that this sample does not cover every permutation of site, development and alterations. In my opinion, it is simply not possible or practicable to provide costings for every situation in the manner suggested, particularly in the case of alterations. However, I am satisfied that the Acoustic Engineering Services report illustrates a representative range of costs.

5. SECTION 42A REPORT

5.1 I have read the revised section 42A report (dated 13 October 2020) and have the following comments:

- (a) Mr Mackie does not agree that the noise-sensitive activity provisions should be applied to the Business Zone. I still remain of the view as outlined in my EIC, and consider that the existing provisions relating to acoustic insulation in the Business Zone are inappropriate to control effects of both road and rail noise. Therefore, additional controls (as proposed by Waka Kotahi and KiwiRail) are necessary for the Business Zone.
- (b) Mr Mackie does not agree with the Outdoor Noise rule as proposed by Waka Kotahi, for reason that the alternatives (relating to the external road noise level, or alternatively there is a 3m noise barrier) should be the subdivision options for achieving building platforms, rather than contained within the noise rules. I acknowledge Mr Mackie's reasoning for this, but note my position as set out in my EIC remains unchanged.

Dr Stephen Chiles

Acoustician

15 October 2020

³ <https://nzta.govt.nz/assets/Highways-Information-Portal/Technical-disciplines/Noise-and-vibration/Research-and-information/Other-research/NZ1-8305016-Building-Acoustic-Mitigation-Case-Study.pdf>