

Before the hearing panel

In the Matter

The Resource Management Act

And

In the Matter

Far North District Council Plan Change
Noise and Vibration
Hearing 6 / 7

**Statement of Evidence of Peter Ibbotson on behalf of Far North District Council
Evidence submitted as part of right of reply**

(Acoustic)

Dated 15 November 2024

Introduction

1. My full name is Peter Alexander Ibbotson. I am an acoustic consultant at Marshall Day Acoustics. I hold a Bachelor of Mechanical Engineering with Honours from the University of Auckland.
2. I have been engaged in the field of acoustics for 21 years. I have been employed with Marshall Day Acoustics for the past 18 years. I am a shareholder of the company with responsibility for our Northland operations. Marshall Day Acoustics is a leading international acoustical consultancy with offices in New Zealand, Australia, China, Hong Kong and France.
3. I have been involved in many environmental sound assessment projects in New Zealand, Australia and the South Pacific. I have appeared as an expert and presented expert evidence in New Zealand at council resource consent hearings and Environment Court hearings, and in Supreme Court hearings overseas. I regularly provide advice on policy matters, typically within Northland.
4. Marshall Day Acoustics is instructed by the Far North District Council to provide advice on the Proposed District Plan. I provided advice on the initial plan review, as well as subsequent information during the hearing preparation process. I attended two days of the noise hearing, and reviewed another submission (Top Energy) via the recording made.
5. Although this is not a hearing before the Environment Court, I record that I have read and agree to and abide by the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023. This evidence is within my area of expertise, except where I state that I rely upon the evidence of other expert witnesses as presented to this Panel. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

Scope of Evidence

6. In this evidence I will provide information that I believe may assist the commissioners in their decision making. My evidence is on response to information provided in the hearing by others. I respond to each submitter in the following sections:

NZ Transport Agency Waka Kotahi

7. I understand that NZTA Waka Kotahi want to:
 - a. Provide a “*Noise Corridor Boundary Overlay – NCBO*” within which buildings containing noise sensitive activities would need to be adequately sound insulated to meet certain internal noise levels
 - b. Ensure that those buildings have mechanical cooling (air-conditioning) and ventilation systems to ensure that building inhabitants (e.g. residents, students) can remain “thermally comfortable” while windows remain closed (and noise levels remain suitably low).
8. Dr Chiles refers to various publications and research in his evidence. In particular he refers to the WHO guidelines for the European region (2018). He notes that these guidelines found evidence that traffic noise increases the risk of various health effects such as ischemic heart disease, hypertension, annoyance and sleep disturbance in the population. The guidelines state that there is high quality evidence that road traffic noise at a sufficiently high level of noise can increase the risk of ischemic heart disease, and moderate quality evidence that increasing traffic noise increases the prevalence of a highly annoyed population and the percentage highly sleep disturbed. The quality of evidence appears to be lower for other effects (hypertension, reading and oral comprehension in children).
9. While there will be differences between Europe and the Far North (most likely in terms of our roads and housing stock), the WHO research is essentially stating that noise levels above well-established thresholds (very

broadly around 55 dBA daytime and 45 dBA night-time) result in noise effects and an increase in human annoyance. As a consequence, the WHO recommends reducing the level of road traffic noise the population is exposed to. Essentially the research is “quantifying” what most people already know: that living next to very busy roads affects health and amenity, and that it is more enjoyable and healthier to live in a quieter environment.

10. The relief sought by NZTA intends to reduce the health and annoyance effects of road traffic noise on the population. The relief intends to achieve this by requiring new dwellings (and other noise sensitive activities) to be “sound insulated”. The rationale is that this would provide a better indoor environment for living (and other noise sensitive activities) and, presumably, reduce health risks and the number of highly annoyed people¹.
11. Questions were asked in the hearing about how the approach related to an RMA “effects” measure. The NZTA Noise Corridor Boundary Overlay – NCBO would set a noise threshold of 54 dB $L_{Aeq(24hr)}$ ² beyond which sound insulation would need to be assessed. It is my view that (in very broad terms) this represents a threshold beyond which noise effects and health risks will start to *materially increase*. For instance, according to the WHO data, it appears that traffic noise levels at slightly above this threshold could mean that the risk of “relative” ischemic heart disease risk would be around 5% higher than the general population³.
12. According to the WHO data quoted, it also appears likely that the percentage of the population that are “highly annoyed” will begin to increase more steeply as noise increases beyond the NZTA threshold. This is a well known and accepted phenomenon, and there have been several studies that have correlated noise to “% of population highly annoyed” over the years. Many nationwide reverse sensitivity measures (such as airport

¹ Dr Chiles refers to research reports¹ that may be useful in understanding this further in New Zealand – though they do not appear to be available yet.

² This equates to 57 dB $L_{Aeq(24 hr)}$ once a 3 dBA safety factor is included

³ This does not mean that traffic noise will cause heart disease, just that there will be a (small) increase in relative risk at that noise level. There is discussion in the WHO document about risk factors increasing further with increasing noise level.

noise contours and the controls proposed in the FNDC for the airports) are based on around the findings of these studies.

13. My advice to the hearing panel is to accept that road traffic noise can have health and amenity effects. These effects will be greater when dwellings are adjacent to high-volume, high-speed highways and lower when dwellings are further away. It is reasonable (though perhaps not certain) to assume that requiring a minimum standard of dwelling “façade sound insulation” might reduce these effects and risk factors.
14. The panel will obviously be balancing a range of matters in their decision making. One matter that was discussed in the hearing is the cost of dwelling construction in the Far North. NZTA have researched this matter⁴. These reports are accessible, and contain useful graphs, and the panel may wish to read them. The report dated 24 June 2024 concludes “*The average cost of acoustic upgrades was found to be \$21,000, with a standard deviation of \$16,000 (NZD, Q1 2024)*”⁵.
15. We have provided advice on relocatable dwellings near state highways in Whangarei since the sound insulation rules were introduced recently. We have also provided advice on dwellings near state highways in the Far North where NZTA have required sound insulation improvements across subdivisions. I have summarised our findings in **Appendix A**. There is variation in the required façade constructions, however in most cases improvements have comprised additional or multiple layers of higher-specification plasterboard. Lightweight buildings very close to state highways may require noise barriers on the property boundary, if they are to be practicably constructed.
16. In terms of noise modelling, questions were raised in the hearing about the political uncertainty of previous and future speed limits, and whether road

⁴ [Report on increases in cost of dwelling constructions due to sound insulation](#)

⁵ The study appears to include assessment and consulting costs in the total amount.

closures (Mangamukas) have affected the accuracy of the noise modelling. I have liaised with NZTA on this matter since the hearing. I have:

- a. **Reviewed the road traffic modelling methodology summary.** I do not have any significant concerns about the assumptions or process used.
- b. **Reviewed the proposed noise control boundary as provided to the the FNDC GIS.** I have carried out brief checks on the methodology and the outputs, but have not carried out a detailed review. From my checks I am fairly comfortable that the model output reflects the underlying road traffic parameters and is likely a fair estimation of where noise levels would likely be 54 dB $L_{Aeq(24\text{ hr})}$ currently (representing 57 dB $L_{Aeq(24\text{ hr})}$ with the 3 dBA NZTA safety factor applied).
- c. **Discussed the Mangamuka closure with NZTA.** They have advised me that the noise model is based on traffic data that broadly reflects the recent year(s) that the road was open (e.g. 2019, 2022) where the road carried around 1,100 to 1,300 vehicles per day⁶. My checking of the noise contours through the Mangamukas suggests they appear accurate for this road traffic volume. The use of the road has obviously been subject to considerable fluctuation over the past five years due to slips and covid, however it appears to me that the data used is a fair representation of possible use.

17. The panel will obviously need to balance a range of matters in deciding whether to grant the relief sought by NZTA. My advice is as follows:

- a. If the relief granted was provided in principle, the road traffic noise and rail noise standard NOISE-S5 requires careful drafting to ensure it is well integrated and that suitable criteria are applied to each source. During the right-of-reply period I have met with KiwiRail to discuss proposed sound insulation rule changes, and Ms

⁶ The road carried 1000 to 1300 vehicles per day (around 10 to 11% commercial vehicles) through 2014 to 2018 which was pre-covid and pre-closure.

Hepplethwaite and Dr Chiles have provided input and updates on these rules⁷. My comments on these rules are appended to my evidence in Appendix B. While the KiwiRail submission rules have been improved by this process and the NZTA requirements are now better integrated, I am still of the view that further mediation between FNDC, KiwiRail and NZTA would be necessary to resolve some outstanding matters.

- b. If the relief is granted, I support the use of a mapped GIS Noise Corridor Boundary Overlay to show where the controls apply. I consider it is a useful tool in advising landowners and developers that development constraints and costs will be incurred. I broadly support the calculated noise level that NZTA have submitted on, however if the panel prefer a simpler approach (e.g. setting a noise control boundary at a certain set distance from the road, perhaps related to speed and traffic volumes) then I still recommend this be mapped.
- c. Without better information, I remain somewhat uncomfortable about the implications and necessity of NZTA's proposed mechanical ventilation specification, specifically the requirement for six air-changes per hour (this has now been reduced to 1 air-change per hour as per the KiwiRail submission). I agree that if a dwelling requires sound insulation, then a suitable, effective (and ideally simple) air-conditioning and mechanical ventilation system will need to be provided. It is important however that the system is not over specified or cost prohibitive, and that it is specified appropriately for the Far North conditions. The matter is complex and potentially requires the expertise of an expert mechanical services engineer⁸. The changes to the rule sought by KiwiRail

⁷ Including Dr Chiles broad input from an NZTA perspective

⁸ I refer to this document: [AES Review of Ventilation System Requirements](#) commissioned by NZTA. In particular the conclusion: "*Ventilation provisions with a high air change rate may not be necessary to regulate thermal comfort in certain areas of New Zealand*" and "*High capital and*

through our recent discussions has improved the situation from my perspective, though have not resolved all my concerns.

KiwiRail

18. The KiwiRail submission proposes:

- a. To provide a rail “alert layer” which would apply to land within 100m of the rail line.
- b. To include rail provisions within the NOISE-S5 (i.e. within the current road section). This would:
 - i. Require noise sensitive activities within 100m of operational rail lines to be assessed for sound insulation requirements (and would consequentially require sound insulation measures to be included)
 - ii. Delete the existing road traffic noise provision (40 dB $L_{Aeq(24\text{ hr})}$) and apply a new table of “use specific” internal noise limits that would apply to both road and rail noise.
 - iii. Require an assumed external design noise level of 70 dB $L_{Aeq(1h)}$ at 12 metres from the rail line to be used in the assessment of rail noise.
 - iv. Provide a “standard construction schedule” which is intended to form a “deemed to comply” solution to address KiwiRail’s concerns.
 - v. Include a more prescriptive set of ventilation and air-conditioning requirements.

running costs were also identified as an issue with systems installed to meet both G4 and high airflow rate provisions (15 ACH) at Auckland Airport”. The document is very detailed.

19. My comments are:

Effects of Rail Noise

20. Like road traffic noise, rail noise and vibration can have effects on people. The evidence of Dr Chiles contains an appendix which provides a good summary of this. I note that the WHO guidelines still strongly recommend reducing rail noise to below similar thresholds to those used for road traffic noise, although the strength of the evidence for specific health effects (such as heart disease) appears lower (or not available).

Future Rail Development

21. There is no freight rail in operation in the Far North currently, and it is obvious from the evidence provided that there is some uncertainty about how rail might develop in the future between Whangarei and Otiria (or perhaps beyond). In our caucusing, KiwiRail have advised me that the rail line would be unlikely to reopen unless there was an obvious economic reason for doing so, and that if the rail line did reopen, there would be contracts in place for enough volume of freight to be shifted to justify reopening the line. KiwiRail have advised that this would mean that a reasonable volume of freight train movements per day/week would occur. Essentially, they have advised me that the line would not reopen for a small number of light trains to operate per week.

22. I understand that the development rail line north of Whangarei is on hold, and is now contingent on the larger Marsden Point Rail Link project. KiwiRail's press releases make reference to "forestry and other export goods" being transferred between the Far North and Northport via rail if both projects are completed at some stage in the future.

23. It is not possible to know what the future may hold, however KiwiRail make a fair case for protecting the rail line (and people from the rail line), on the

basis that it could potentially be used for significant movements in the long-term future.

Rail Sound Insulation Rules

24. It is important to ensure that any sound insulation rules are pragmatic and do not inflict unreasonable cost on those developing land in proximity to rail lines (where that cost may not result in an improvement in health and amenity). There is obviously considerable uncertainty about how the rail may develop in the future. KiwiRail propose to manage this by:
- a. Not requiring façade sound insulation measures to be implemented until the rail line becomes operational; and
 - b. From the date the rail line becomes operational, by applying potentially conservative sound insulation rules to dwellings and other noise sensitive activities constructed near the rail line.
25. The rule proposed by KiwiRail would include an assumed external design noise level of 70 dB $L_{Aeq(1h)}$ at 12 metres from the rail line. This is a relatively high level of noise and is potentially representative of two relatively large freight trains passing per hour. Noise levels from smaller, shorter trains may be lower⁹. As there is no certainty as to how the line may be developed in the future, it is not possible to advise whether this is an appropriate level of noise to assume for the protection of the future rail line. The design level may be appropriate (resulting in suitable levels of façade sound insulation), or it may be overly conservative (resulting in dwellings within 100 metres having to include unnecessarily high levels of façade sound insulation).
26. KiwiRail have also provided a “deemed to comply” schedule of dwelling constructions. Constructing the dwelling using these methods would avoid the need for an acoustic consultant to calculate the requirements. For most light-weight façade dwellings (e.g. fibre cement, weatherboard, etc) this will require:

⁹ I demonstrated this through my measurements on the railway line north of Whangarei: rail shunts to Fonterra do not occur regularly and are much quieter than 70 dB $L_{Aeq(1 hr)}$ at 12 metres

- a. Two layers of dense plasterboard (e.g. Gib Noiseline) will be needed to all walls (fixed on a resilient rail). Most standard dwellings are not constructed with a resilient rail between wall linings and framing, and only have one layer of standard plasterboard to walls.
- b. Two layers of dense plasterboard (e.g. Gib Noiseline) to ceilings. Most standard dwellings use a single layer of standard plasterboard to ceilings.
- c. Slightly thicker double-glazing glass than might otherwise be needed. Most dwellings might use 4mm/14mm/4mm double glazed units to achieve the thermal requirements of dwellings, where the KiwiRail schedule might require 6mm/14mm/4mm thick glass instead.¹⁰

27. My expectation is that the “deemed to comply” constructions would end up being what most parties would use if constructing dwellings. My calculations suggest that the alternative “acoustic design certificate” assessment method would result in heavier / more onerous constructions being required.

28. Because of the potential conservatism of KiwiRail’s approach, in my view it would be appropriate to provide a method for some on-site assessment of future rail noise, once the rail line become operational. KiwiRail appear resistive of that approach, presumably on the basis that initial freight movements may not be representative of future rail movements. However I consider it would offer a more accurate approach to determining the required level of sound insulation. This would require a redrafting of KiwiRail’s proposed rule, which has not been extensively discussed or agreed on.

29. There are some drafting matters in KiwiRail’s proposed rule that required improvement. Our caucusing has addressed some of these and an updated set of rules is attached in Appendix B of my evidence. Further meditation

¹⁰ This information is my experience only, I recommend reviewing these with a building design professional to confirm if anything is critical to decision making.

would be required to resolve the drafting of the rule, should the panel be minded to grant the relief in principle.

30. As with road traffic and airports, I am broadly in favour of sound insulation rules near rail provided they are pragmatic and cost efficient. In this case, due to the uncertainty of future rail activity, I am of the view that the rules as drafted have the potential to be overly conservative in their outcomes. I would be supportive of rules that allowed on site assessment, similar to that proposed for road traffic. If the rule does prove to be too conservative, I expect that some people wishing to build near the operating rail line may need to seek resource consent (on the basis that train noise levels are lower than the rule provides for). Of course, this cannot be known until the line begins operation.
31. Regarding mechanical ventilation and cooling provisions, I refer to my earlier comments.

Top Energy

32. I have listened to the recording of Top Energy's evidence and the associated questions. The evidence usefully discusses the amount of time that generators are likely to be operated for "scheduled maintenance of the generator" (around 5 hours) and for "planned maintenance" of the network (a total of 24 hours, typically over two daytime periods) and infrequent use for "variable network maintenance" for an additional 24 hours, perhaps every two to three years, possibly at night on occasion. To me these statements appear to be well grounded in the reality of operating an electricity distribution network.
33. The panel asked questions about the noise levels generators can emit. Generators can generate relatively high noise levels, though it varies appreciably with the model, the size and the noise control applied. I have measured noise levels from large emergency generators in the Far North which were of the order of 65 dB L_{Aeq} at around 45 metres (in one case) and around 61 dB L_{Aeq} at 60 metres (in another). This broadly indicates that exceedance of the proposed *Rural Production* zone noise rules (55 dB L_{Aeq}

daytime) could be expected within around 100 metres if large generators ran all day, and that the night-time zone rules could be breached at significantly greater distances if generators ran in the night period.

34. While generators are capable of emitting higher-than-ideal levels of noise, the effects of generator noise are obviously mitigated by the infrequent and short-term nature of their use. If generators were to run continuously for very long durations, noise could potentially be unreasonable. However generators do not run continuously, for the reasons stated by Top Energy. This significantly reduces their overall effect on amenity.
35. In my report that accompanied the S42A report, I noted that generators would operate for less than 12 hours per year for “testing and maintenance”. I was referring to the “testing and maintenance” of the generators themselves, rather than generators that might be used to support maintenance of the network. It was not my intention for a limit of 12 hours to be placed on the operation of these generators.
36. In my view there are three options to provide the relief sought to Top Energy.
 - a. **Accept the evidence put forth, and trust that generators will typically not be operated for maintenance purposes for more than around 50 to 60 hours per year, normally during daytime.** In this situation, a duration limit **would not be provided**. This is laissez-faire approach, based on trust in the network operator and other lifeline utilities. This is the approach recommended by Mr Badham.

OR

 - b. **Provide an annual limit on hours, but one that allows for the required level of use (as set out by Top Energy perhaps with a reasonable margin of safety).** This needs to be higher than 12 hours per year, likely up to 60 hours per year on some years. This provides more certainty over the extent of effects, and possibly could give Council the ability to reign in unreasonable “regular” generator use that is having a regular noise effect. Based on the

evidence of Top Energy, generator operation for more than 60 hours would seem to be an unlikely requirement, though an unusual event that justified emergency operation for longer than this may still be conceivable.

OR

- c. **Continue with the requirement to limit emergency generator testing to 12 or 48 hours per year.** On some years this would require retrospective resource consent which will incur costs. It may not provide any real benefit in terms of outcome – existing generators can be difficult and expensive to fit noise control measures to (assuming Council determined that this was required)

37. I am of the view that option a) will likely provide the same outcome as the option b). Neither option would obligate Top Energy to source quieter generators when installing new generators, unless the duration exceeded the annual limit on hours of operation. The only obligation to do so would be Section 16 of the RMA.

38. Top Energy have made a good case for the removal of the hourly limit and the amendments to note 8 suggested by Mr Badham seem appropriate. Importantly, the changes suggested would not allow peak load shedding or other “routine” generation operation and presumably such activity would still be subject to assessment against the zone limits. Top Energy provided clear evidence on why noise from generators requires exemption from assessment with the noise limits and I consider that this is likely the best option for relief.

Transpower

39. The Transpower submission and the evidence of Malcolm Hunt seek a night-time noise limit applied to any substation in any zone. The evidence provided is that (my broad summary):
- a. Existing operative night noise limits in many zones are 45 dB L_{A10} .
 - b. Three existing substation designations have a noise limit of 45 dB L_{A10}
 - c. Substations with large transformers (e.g. 200MVA) may comply with a 45 dB L_{Aeq} noise limit at distances of perhaps 100 metres, whereas distances of 200 to 300 metres may be required to comply with 40 dB L_{Aeq} .
 - d. Substation noise levels at 45 dB L_{Aeq} would not be “unreasonable”, as referenced by guidelines such as NZS6802 and the WHO guidelines.
40. In my view, a night-time noise level of 45 dB L_{Aeq} is the upper limit of noise for a rural or residential area. It provides an “acceptable” level of night-time amenity, but not an ideal one. In a rural environment, ambient and background noise levels may otherwise be very low, and the establishment of a new substation at 45 dB L_{Aeq} may represent an appreciable change in noise level and may mean that the substation noise dominates the night-time noise environment.
41. I agree with Mr Hunt that in many situations it may not be possible to establish a new substation 300 metres from the nearest dwelling (unless the area is remote). However one possible consequence of a more permissive noise limit of 45 dB L_{Aeq} could be that less care is paid in the selection, location and noise mitigation of transformers. than would otherwise be

required if resource consent (or a site designation) was required to exceed the zone noise limit¹¹.

42. However the evidence of Mr Hunt makes a fair case. In particular he notes that the underlying operative zone noise limit in many zones is decreasing, and that some Top Energy designations refer to a noise limit of 45 dB L_{A10} (which is likely to be very similar to 45 dB L_{Aeq} in the case of transformer noise)
43. I am somewhat undecided about Transpower's proposal. I believe that the **best outcome** is for substation noise to comply with the underlying zone limits through design, or seek a designation or consent to generate noise levels of up to 45 dB L_{Aeq} where there is not practicable option to comply. However I recognise that this could result in increased costs, and may increase the time taken to establish new Transpower substations.
44. The decision likely rests on whether the District Plan wishes to be more protectionist of the amenity of residents in rural or residential environments, or wishes to enable the development of new infrastructure without unnecessary consenting impediments.
45. Should the relief sought be accepted by Council, the proposed changes in Mr Hunt's evidence look to be structurally acceptable, though care needs to be taken to ensure that all cross referencing remains correct. There are small errors that should be easily fixed (e.g. proposed clause (g) if not cross referenced correctly in the text).

Waipapa Pine

46. The submission by Waipapa pine notes an important issue – that the proposed noise limits (55 dB L_{Aeq}) applying to *Open Space* and *Sport and Active Recreation* could place an unreasonable restriction on their operation without overall benefit to the community. They note that *Open Space* zone in particular on the western boundary provides no practical

¹¹ Transpower would still have obligations under the RMA to take the best practicable option to avoid noise exceeding a reasonable level. "Reasonable level" may be taken to be 45 dB L_{Aeq} however.

purpose as an area of the public to enjoy, but that it would be subject to a noise limit that could restrict the permitted operation of the sawmill.

47. Note that I raised this as a potential issue in my second report:

Noise limits applying to the three Open Space zones should be improved, but there remains some question on how to best provide for these zones.

- We have applied fairly stringent noise rules to the *Natural Open Space* zone. This would ensure a good level of amenity across *Natural Open Space* zones that have high character values, but it may constrain some activity adjacent to the boundary of these zones, even where no real effect may arise. An alternative would be to apply a higher noise limit at the site boundary on the basis that these sites are typically large and that noise levels across these sites would typically not be affected by activity near one boundary. This matter may benefit from further consideration by FNDC and by the commissioner panel. Note that it has been raised in part by submission **S463.084**.
- We have recommended more liberal limits be applied to the *Open Space* and *Sport and Active Recreation* zones than were notified. These zones do not require low noise levels to provide for community purposes and amenity – although it is important that there are some controls on noise levels across these sites. We have recommended a noise limit of 55 dB L_{Aeq} at all times. This still provides for a fairly high level of amenity in these zones (**S516.072**) but is less likely to significantly constrain nearby activities.

48. The issue raised by Waipapa Pine do need to be addressed. The noise rules that apply to *Open Space* and *Sport and Active Recreation* should not apply to Waipapa Pine, however the proposed relief suggested by Mr McPhee (to delete the noise rules associated with these zones entirely) could be the better option. A third option is to keep the rules, but exclude *Heavy and Light Industrial, Horticultural Processing and Orongo Bay* zones from compliance with those rules.

49. The latter has merit. *Open Space* and other outdoor areas that are adjacent to heavy or light industry activity do not have the same level of amenity expectations from users as, say, parks within town centres. While it would of course be ideal for parks and outdoor areas near industrial sites to have low noise levels, this is unlikely to be practical and is not likely to be expected by the public.

50. There are relatively few industrial areas across the Far North District. However some of these are proximate to *Open Space* and *Sport and Recreation Areas* and may be unreasonably constrained by them without

providing significant community benefit. The majority of *Open Space* type zones are well removed from industry and will not receive high noise levels.

51. **I favour the third option:** to keep the Open Space and Sport and Recreation noise rules, but to exclude the industrial zones from compliance with them.

This change may look something like this:

<u>Receiving zone</u>	<u>Noise rule</u>	<u>Matters of discretion if compliance not achieved:</u>
<p>Open space</p> <p>Sport and Active Recreation</p>	<p>a) <i>Noise generated in all zones, except Heavy and Light Industrial, Horticultural Processing and Orongo Bay zones</i></p> <p>Noise shall not exceed the following rating noise levels at any point within the receiving property boundary:</p> <p>All times: 55 dB LAeq</p>	<p>a. ambient noise levels and any special character noise from any existing activities, the nature and character of any changes to the sound received at any receiving site and the degree to which such sounds are compatible with the surrounding activities;</p> <p>b. type, scale and location of the activity in relation to outdoor activities within the zone;</p> <p>c. hours of operation and duration of activity;</p> <p>d. the temporary or permanent nature of any adverse effects;</p> <p>e. the ability to internalise and/or minimise any conflict with adjacent activities;</p> <p>f. any mitigation proposed, in accordance with the best practicable option approach (e.g. site layout and design, design and location of structures, buildings and equipment and the timing of operation);</p> <p>g. The effects on ongoing community activity, culture, wellbeing and amenity</p>

NZ Agricultural Aviation Association

52. The NZAAA seeks a specific rule in the NOISE chapter to specifically provide for agricultural aviation activities or an exemption based on use up to 30 days or 315 aircraft hours in any 12-month period (whichever is greater) or be retained in the exemptions to the Noise Standards.
53. I consider that this is an appropriate approach for agricultural aviation such as crop dressing, spraying or lifting. My view is that temporary aviation for rural purposes should be unencumbered by “noise limits” as the activity is typically short in duration and typically has limited noise effects.
54. While permanently established helicopter bases or airstrips that are used on a “daily basis” should have noise limits associated with them (even if those bases are primarily serving the agricultural industry), the use of aircraft temporarily on a farm (or other rural sites) should not have noise limits. The use of a duration limit of 30-days or 315-hours in any 12-month period appears to provide for this.
55. I understand temporary agricultural aviation activities are proposed to be provided for in the temporary activities chapter. The exact position of the rule within the District Plan is a planning matter for others to address.

Bentzen Farm Ltd and Setar Thirty Six Ltd

56. My overall view on the submission is that broad improvements have been made to the wording of NOISE-R7 and NOISE-S4. The submission raises a useful point regarding the “step” nature of the rule. I am of the view that helicopter noise should, in almost all cases, need to comply with the provisions of NZS6807:1994 to obtain resource consent (and that exceeding the NZS6807:1994 standard should typically be grounds to decline consent, unless there are extenuating or mitigating circumstances). I agree with the

submitter that it would be entirely appropriate to make activity that breaches NZS6807:1994 to be at least fully discretionary.

57. The structure of the rules is a matter for the submitter, the reporting planner and the Commissioner to consider. Overall I am in favour of a clearly written rule that does the following:

- a. Permits helicopter noise where the levels are very low.
- b. Where permitted noise levels cannot be met, that the rule requires helicopter activity to comply with NZS6807 guidelines to obtain consent. The rule should potentially require additional mitigation measures to be offered to mitigate noise effects (e.g. annual limits on movements) so that Council can consider these as part of their matters of restricted discretion.
- c. That helicopter operations applying to regularly breach NZS6807 should not generally be granted, unless there are significant extenuating or mitigating circumstances that make higher levels of aircraft noise acceptable to that community.
- d. That assigns clear and unambiguous activity status to the activity, depending on the noise limits achieved.

58. The submitters inclusion of a separate NOISE-RDIS section in my view makes the reading and interpretation of the rules somewhat more difficult, at least to non-expert readers of the Plan (such as myself). However the general approach of the rule appears broadly consistent with my recommendations. There was discussion in the hearing about potentially redrafting some parts of the rule (especially NOISE-RDIS XX) to ensure the purpose of the rule was very clear.

Horticulture NZ

59. The submitter provides brief summary evidence of a study that shows birds are present and feeding at sunrise. It is not clear if this is expert witness testimony.

60. As there is no evidence to the contrary, my recommendation is to accept the evidence provided and make the bird scaring rule consistent with others used around the country (half an hour prior to sunrise and half an hour after sunset). This will reduce amenity of neighbours, but appears to be a necessary part of horticulture operations which are important to the district.

Peter Ibbotson

15 November 2024

Attachment A – Brief summary of some recent sound insulation projects I have been involved in:

The following paragraphs briefly summarise recent projects I have been involved in (in the Far North and Whangarei) where it was necessary to achieve 40 dB $L_{Aeq(24\text{ hr})}$ indoors:

1. For a relocated old “villa” (weatherboard type) dwelling (23 metres from a 60km/hr road in urban Whangarei, road traffic volume of 18,790 vehicles per day), significant improvements were recommended. These included:
 - a. replacement of joinery with modern aluminium glazing systems (or secondary acrylic glazing)
 - b. two additional layers of plasterboard on the walls facing the road
 - c. replacement solid core doors with seals.

The updates were judged to be somewhat impractical to implement. However with a noise barrier alongside the road (within the property boundary) no changes to the wall construction was required. The noise barrier was constructed and subsequent measurements indicated that the internal noise limits were met.

2. For relocated cedar-weatherboard clad small houses (tiny homes) close to SH1 south of the Brynderwyns (c 9,500 vehicles per day, 100 km/hr, 13% heavy vehicles), it was necessary to construct a noise barrier to reduce incident noise on the façade. Even with this in place, three layers of plasterboard were required to the walls, and two layers of plasterboard were required to the ceiling.
3. For a new house build 20 metres from SH11 near Paihia/Waitangi (50 km/hr, 4% heavy vehicles) it was only necessary to substitute standard wall and

ceiling plasterboard linings for higher density plasterboard (e.g. 13mm Gib “Noiseline” vs standard plasterboard linings).

4. For a subdivision adjacent to SH10 in Coopers Beach (50 km/hr, 4,660 vehicles per day, 5% heavy vehicles), we forecast potential dwelling construction improvements that would be required for future constructions. Dwellings on allotments adjacent to the road were expected to require one to two layers of thicker denser plasterboard (e.g. 13mm Gib Noiseline) with slightly thicker-than-standard double glazing. Masonry dwellings were not expected to require significant façade improvements. Dwellings on allotments that were “one lot back” from the state highway were not expected to require any façade improvements.
5. For a premanufactured dwelling that was proposed to be located 20 metres from SH1 near Pamapurua (3672 vehicles per day, speed of 100km/hr, 6% heavy vehicles), two layers of thick dense plasterboard was required to the walls and ceiling, additional flooring layers were required and thicker-than-standard double glazing solutions were required. Because of the cost of the upgrades, the building was instead constructed greater than 60 metres from the state highway (behind a shed). The increase in distance meant that no specific façade improvements were required.
6. In all situations, the relocated dwellings were required to be provided with mechanical ventilation and air-conditioning as per the specification of the District Plan, or the relevant consent condition.

**Attachment B – KiwiRail / NZTA rules (post RoR mediation)
with my comments**

Attendees: Kenton Baxter (FNDC), James Witham (FNDC), Peter Ibbotson (Marshall Day), Stephen Chiles (Chiles Limited), Cath Heppelthwaite (Eclipse Group Ltd)

Date: 6 November 2024

Recovered: 11 November 2024

Agenda:

1. Definition of *operational rail line* . Since the hearing, we have thought further (red text) and put forward the following for discussion:

OPERATIONAL RAIL LINE

means a rail line (or part thereof) that has regular scheduled passenger or freight services; does not include maintenance activities or occasional / tourist activities (eg. steam train excursions) where KiwiRail Holdings Limited has notified-demonstrated to FNDC's satisfaction of the date that regular rail services will commence.
The rail line will then be deemed operational from the date notified by KiwiRail Holdings Limited and accepted by FNDC.

2. NOISE-P2 – wording (suitability of changes in my evidence?)
3. NOISE-S5 – use of habitable rooms vs noise sensitive activities; adding *hospitals* to definition of noise sensitive activities.

Kenton to has provided 'marae layer' in GIS form to KR.

4. NOISE-S5 – rule structure
5. NOISE-S5 work through rule details
6. NOISE-S5 matters of discretion
7. Rail Alert Overlay text

[others?]

Attachment A: Amendments Sought

Base text (black) Section 42A Appendix 1 Recommendation

Recommended amendments; red underline / strikethrough

Definitions

NOISE SENSITIVE ACTIVITY

means buildings or land that may be affected by noise and require a higher standard of amenity.

These include:

- a. residential or living activities;
- b. education facilities;
- c. health facilities;
- d. hospitals
- e. community facilities; and
- f. visitor accommodation.

NOISE-P2

Ensure noise sensitive activities proposing to locate:

Commented [P1]: Although KiwiRail will not intend this, the clause would allow KiwiRail to notify Council of a date well in advance of the rail line actually becoming operational (cynically, this could be the day after the Plan becomes operative...).

There is no requirement for KiwiRail to provide objective evidence that the rail line will actually operate from a specific date.

The above change requires KiwiRail to show FNDC that trains will start running from a specific date and for FNDC to accept that.

within the Mixed Use Zone, Light Industrial Zone, or and Air Noise Boundary: or on land near state highways or railways: or and Air Noise Boundary and in close proximity of regionally significant infrastructure within these areas are located, designed, constructed, maintained and operated in a way which will minimise adverse noise on community health, safety and wellbeing by having regard to: a. any existing noise [...]

NOISE-S5

NOISE-S5	Noise insulation standards for all noise sensitive activities	
<p><u>All zones within 40m of a State Highway</u></p> <p><u>All zones within 100m of an operational rail line</u></p>	<p>1. Any <u>habitable room in a</u> new building used for a noise sensitive activity, or an alteration to an existing building that changes its use to a noise sensitive activity, must be designed, constructed, and maintained to achieve a internal noise limits <u>set out in Table 1 by:</u> <u>-of 40dB LAeq(24h);</u></p> <p>2. <u>Compliance with (1) above shall be achieved based on an existing noise level with a 3 decibel addition allowing for future traffic increases and design uncertainty;</u></p> <p><u>A. 3. Compliance with (1) above shall be achieved if,</u> <u>pPrior to the construction of any building containing a habitable room, an acoustic design certificate from a suitably qualified acoustic engineer is provided to the Council stating the design will achieve compliance with this standard, or the certificate shows that <u>the noise at all exterior façades of that part of the building is no more than 15 dB above the relevant noise limits in Table 1 design noise level as determined in accordance with (2) above is less than 55 dB LAeq(24h) for road.</u></u></p> <p><u>When providing the acoustic design certificate the following applies:</u></p> <p><u>(i) For roads, the acoustic design certificate shall be achieved based on an existing traffic noise level with a 3 dB addition allowing for future traffic increases and design uncertainty;</u></p> <p><u>(ii) For rail, railway noise is assumed to be 70 LAeq(1h) at a distance of 12 metres from the track, and must be deemed to reduce at a rate of 3 dB per doubling of distance up to 40 metres and 6 dB per doubling of distance beyond 40 metres.</u></p> <p><u>OR</u></p> <p><u>B. For rail: is at least 50 metres from any railway network, and is designed so that a noise barrier completely blocks line-of-sight from all parts of doors and windows to all points 3.8 metres above railway tracks.</u></p>	<p>Matters of discretion are restricted to:</p> <p><u>a. effects in the ability of existing or permitted activities to operate or establish without undue constraint;</u> <u>b. any legal instruments proposed;</u> <u>c. mitigation of noise achieved through other means;</u> <u>d. any topographical or other site constraints;</u> <u>e. any alternative solutions proposed by a suitably qualified acoustic engineer to achieve appropriate amenity for present and future residents of the site;</u> <u>f. any existing noise generating activities and the level of noise that will be received within any noise sensitive building;</u> <u>g. the primary purpose and the frequency of use of the activity; and</u> <u>h. the ability to design and construct buildings accommodating noise sensitive activities with sound insulation and/or other mitigation measures to ensure the level of noise received within the</u></p>

Commented [PI2]: In broad terms I agree with this policy and the extension of it to railway and state highways, provided the requirements are proportionate to the risk / potential effects.

Note that the NOISE standard S5 does not really mandate "maintenance" of the sound insulation requirements: there would be no obvious way to do so. Presumably KiwiRail and NZTAs recommended NOISE-S5 satisfies the "maintenance" aspect.

Commented [SC3]: NZTA submission seeks for this distance to be replaced by a mapped overlay

Commented [PI4R3]: My opinion is that both/all "control boundaries" should be mapped, whether based on a noise model output (NZTA's relief) or some other approach (perhaps a specific distance from the road determined by Council). This column should be accurate and clear as to where the rules apply.

Commented [PI5]: Striking out "habitable spaces" is understood (the table broadly refers to the specific noise sensitive spaces in question), however note that some spaces in the table ("libraries", "marae", "places of worship") are still very broad descriptions. It is not necessary to sound insulate bathrooms or storage areas in libraries or marae to achieve 45 dBA internally, but the rule as written might require that. The intention of the rule is that the noise sensitive rooms within those buildings are sound insulated, not the whole building. In my view the rule should clearly state that.

Commented [SC6]: I note this format should probably be lower case letters based on other provisions

Commented [PI7]: Habitable room is still referenced here, but not in Clause 1 above

Commented [SC8]: Added by SC post-meeting

Commented [PI9]: This seems an appropriate way of determining when the sound insulation measures are required (if the noise reduction is 15 dB or less then a ...

Commented [PI10]: I believe this leaves the design approach to the acoustic engineer: measurements or noise model or combination, including the ability to ...

Commented [PI11]: This is potentially a conservative approach to noise level and does not leave any discretion to the acoustic engineer (unless a resource consent is sought of course). The noise level assumed (70 dB ...

Commented [PI12]: Need to ensure section referencing is correct. Goes from i) to ii) to B) to C) currently - I believe this requires more thought to ensure the sub-clause applications are really clear.

Commented [SC13]: In other plans this provision often includes an option for highways such as "all parts of the formed carriageway of the state highway."

Commented [PI14R13]: Agree that this could be useful for road, though a 3.8m high barrier above a road would likely only occur in very specific situations (large cuts, or large buildings between). ...

OR
 C. For rail: is a single-storey framed residential building with habitable rooms designed, constructed and maintained in accordance with the construction schedule in Schedule 'Z'.

Table 1: Internal noise limits for state highway and rail corridor noise

Building type	Occupancy/activity	Maximum internal railway noise level L _{Aeq} (1h)	Maximum internal state highway noise level L _{Aeq} (24h)
Residential	Sleeping spaces	35 dB	40 dB
	All other habitable rooms	40 dB	40 dB
Education	Lecture rooms/theatres, music studios, assembly halls	35 dB	35 dB
	Teaching areas, conference rooms, drama studios, sleeping areas	40 dB	40 dB
	Libraries	45 dB	45 dB
Health	Overnight medical care, wards	40 dB	40 dB
	Clinics, consulting rooms, theatres, nurses' stations	45 dB	45 dB
Cultural	Places of worship, marae	35 dB	35 dB

[4. Deleted]

2. 5. If windows must be closed to achieve internal noise limits Where design external noise levels in (1A2) above are greater than 55 dB L_{Aeq}(24 h) the building habitable rooms of the noise sensitive activity must be designed, constructed and maintained with cooling and mechanical ventilation system(s) that achieves the following requirements:

- i. Provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and
- ii. provides cooling that is controllable by the occupant and can maintain the inside temperature to below 25°C

(a) For habitable rooms for a residential activity, achieves the following requirements:

- i. provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and

building is minimised particularly at night.
 1. The extent of noncompliance with the noise and vibration standards.
 2. Effects on the health and wellbeing of people.
 3. The reverse sensitivity effects on the rail [or road] network, including the extent to which the activity will unduly constrain the ongoing operation, maintenance and upgrade of the rail [or road] network.
 4. The outcome of any consultation with KiwiRail [or NZTA].

Commented [PI15]: The “deemed to comply” constructions in Schedule Z are likely to represent what would actually be used, as other constructions (as determined by an acoustic engineer) may need to be heavier and more expensive to achieve the required internal noise levels especially closer to the rail line. The “deemed to comply” constructions are potentially the least conservative options based on the required external design noise level and the required internal design criteria.

In my view the main issue with the Schedule Z construction is likely to be the requirement to use a resilient rail on the walls of dwellings with lightweight façades (lightweight cladding is what most relocatable dwellings would use and may be used in many on-site builds). The additional plasterboard layers will add cost also.

Schedule Z does not mention the floor of a raised dwelling.

Commented [SC16]: Road criteria and title added to table by SC post-meeting

Commented [PI17]: I am of the view that the constructions require to meet this are quite onerous/heavy, potentially heavier than the Schedule Z “deemed to comply” constructions out to 100m.

Commented [PI26]: In my view, these matters of discretion should provide a gateway for a resource consent to be obtained without veto rights from KiwiRail. This is because Council need to be able to consider rail noise on a case-by-case basis, given the uncertainty over future rail noise levels and the inflexible nature of the rules proposed. A resource consent should be able to be obtained on its merits.

Commented [SC18]: Clause altered by SC post-meeting (apologies this should have been raised for discussion; it is in part a consequential change from removing the 55 dB in 1A)

Commented [PI19]: Check subsection x-ref if changed.

Commented [PI20]: The whole building, or just the spaces set out in Table 1, or just the habitable / noise sensitive spaces? Needs careful checking.

Commented [PI21]: There is a line in Table 1 for “Sleeping spaces” and one for “All other habitable rooms”. I assume this clause is intended to apply to sleeping spaces also. It would be preferable for the words to encompass both, so there is no potential confusion.

	<p>ii. <u>is adjustable by the occupant to control the ventilation rate in increments up to a high air flow setting that provides at least 1 air changes per hour; and</u></p> <p>iii. <u>provides relief for equivalent volumes of spill air;</u></p> <p>iv. <u>provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C; and</u></p> <p>v. <u>does not generate more than 35 dB LAeq(30s) when measured 1 metre away from any grille or diffuser. The noise level must be measured after the system has cooled the room to the temperatures in (2)(a)(iv) or after a period of 30 minutes from the commencement of cooling (whichever is the lesser).</u></p> <p><u>(b) For other spaces, is as determined by a suitably qualified and experienced person.</u></p> <p>[for (ii); air change no mechanical experts, some discussion on how 1 change per hour was ascertained vrs other figures for (v), Peter expressed some concern re: 35 dB LAeq(30s) in relation to high wall mounted heat pumps; doesn't want to preclude specific outcomes; an addition to the rule specifying when 35 dB LAeq(30s) applies (ie. after optimal temperature reached). See Waikato District Plan.</p> <p>6. Noise levels from ducted ventilation and cooling systems must be designed to within the design sound level range of NZS2107:2016 when measured as a time and space average over the room beyond 1 metre from any diffuser or outlet. If split system air-conditioning systems are used, an HVAC design certificate must confirm these are of good quality, suitable for noise sensitive applications, and include a "low noise" or "quiet" operation mode. [strike though 6 if 5(v) adopted]</p>	
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Commented [SC22]: Sentence added by SC post-meeting

Commented [PI23]: This is an improvement, allowing the measurement to be made when the heat pump is hopefully "maintaining the set point temperature" in the room. I still think it is likely an unnecessarily prescriptive clause that is unnecessarily overreaching into the design of people's dwellings, though I recognise that NZTA want people to choose thermal solutions that they will actually use (and not avoid using because they are too noisy). The clause is probably more likely to allow for high-wall heat pumps to be used, which I think is pragmatic.

Commented [PI24]: Why not also allow residential dwellings to have their ventilation and air-conditioning design determined by a suitably qualified person? Perhaps as an alternative.

Commented [PI25]: Although this is a non-prescriptive clause, I still consider it has merit in pragmatic mechanical design solutions. If this clause is used, it should not be a separate clause, rather it should be considered as a substitute for 5(v).

[Schedule 'Z' is proposed new text]

Commented [PI27]: See other comments on this schedule.

Schedule 'Z' Construction schedule for indoor noise control

Elements	<u>Minimum construction for noise control in addition to the requirements of the New Zealand Building Code</u>	
External walls	<u>Wall cavity infill of fibrous insulation, batts or similar (minimum density of 9 kg/m³)</u>	
	<u>Cladding and internal wall lining complying with either Options A, B or C below:</u>	
	<u>Option A - Light cladding: timber weatherboard or sheet materials with surface mass between 8 kg/m² and 30 kg/m² of wall cladding</u>	<u>Internal lining of minimum 17 kg/m² plasterboard, such as two layers of 10 mm thick high-density plasterboard, on resilient/isolating mountings</u>
	<u>Option B - Medium cladding: surface mass between 30 kg/m² and 80 kg/m² of wall cladding</u>	<u>Internal lining of minimum 17 kg/m² plasterboard, such as two layers of 10 mm thick high-density plasterboard</u>
	<u>Option C - Heavy cladding: surface mass between 80 kg/m² and 220 kg/m² of wall cladding</u>	<u>No requirements additional to New Zealand Building Code</u>
Roof/ceiling	<u>Ceiling cavity infill of fibrous insulation, batts or similar (minimum density of 7 kg/m³)</u>	
	<u>Ceiling penetrations, such as for recessed lighting or ventilation, shall not allow additional noise break-in.</u>	
	<u>Roof type and internal ceiling lining complying with either Options A, B or C below:</u>	
	<u>Option A - Skillion roof with light cladding: surface mass up to 20 kg/m² of roof cladding</u>	<u>Internal lining of minimum 25 kg/m² plasterboard, such as two layers of 13 mm thick high-density plasterboard</u>
	<u>Option B - Pitched roof with light cladding: surface mass up to 20 kg/m² of roof cladding</u>	<u>Internal lining of minimum 17 kg/m² plasterboard, such as two layers of 10 mm thick high-density plasterboard</u>
	<u>Option C - Roof with heavy cladding: surface mass between 20 kg/m² and 60 kg/m² of roof cladding</u>	<u>No requirements additional to New Zealand Building Code</u>
Glazed areas	<u>Aluminium frames with full compression seals on opening panes</u>	
	<u>Glazed areas shall be less than 35% of each room floor area</u> <u>Either, double-glazing with:</u> <ul style="list-style-type: none"> • <u>a laminated pane of glass at least 6 mm thick; and</u> • <u>a cavity between the two panes of glass at least 12 mm deep; and</u> • <u>a second pane of glass at least 4 mm thick</u> <u>Or, any other glazing with a minimum performance of Rw 33 dB</u>	
Exterior doors	<u>Exterior door with line-of-sight, to any part of the state highway road surface or to any point 3.8 metres above railway tracks</u>	<u>Solid core exterior door, minimum surface mass 24 kg/m², with edge and threshold compression seals; or other doorset with minimum performance of Rw 30 dB</u>
	<u>Exterior door shielded by the building so there is no line-of-sight to any parts of the state highway road surface or any points 3.8 metres above railway tracks</u>	<u>Exterior door with edge and threshold compression seals</u>

S416.041

Alert Layer

Overview

The Far North District is diverse with a range of rural and urban areas, made up of large tracts of rural land, small rural communities and

[...]

Council has responsibilities under the RMA to manage noise, however, it is important to note that some activities are exempt from the noise rules set out in this section as they are controlled by another Act or are controlled by section 16 and 17 of the RMA.

A Rail Alert Overlay has been applied which identifies the noise and vibration-sensitive area within 100 metres each side of the railway designation boundary as properties within this area may experience rail noise and vibration effects. No specific district plan provisions apply in relation to noise and vibration controls as a result of this Rail Alert Area unless the rail line becomes operative in which case Noise S5 will apply. The Rail Alert Overlay is to advise property owners of the potential noise and vibration effects should the rail line become operative but leaves with the site owner to determine an appropriate response.