



NOISE CHAPTER REVIEW

GORE PROPOSED DISTRICT PLAN GORE

PREPARED FOR
Gore District Council

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Review prepared by Styles Group for Gore District Council.

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1.0 Introduction

Gore District Council (GDC) has engaged Styles Group Styles to assist in the review and development of the Proposed District Plan (**PDP**) noise chapter (the **Chapter**) as part of the full review of the Gore District Plan.

This advice has been prepared following our review of the Draft District Plan (**DDP**) noise chapter¹ and our review of community feedback on the DDP noise chapter.

We have been involved with the project team in various stages of the development of the PDP and have input in a number of ways and with various members of the team. We have had input into the draft Chapter but we have not viewed the final notified version of the Chapter.

This advice sets out our key recommendations for the PDP Chapter, including:

- i. Recommendations to ensure compliance with the mandatory directions of the National Planning Standards (**NPS**), specifically the Noise and Vibration Metrics Standard (**NVMS**) and Definitions Standard as they relate to the assessment, measurement and management of noise and vibration.
- ii. Recommendations to control noise levels within and between zones
- iii. Recommendations to control noise levels of specific noise sources.

2.0 Overview

Noise-related conflicts generally arise where the level, character, timing or duration of noise associated with adjacent land use activities are incompatible with one another. In general terms, conflict typically arises where noise sensitive activities establish in proximity to noise generating activities (and vice versa).

We have recommended that the PDP zone chapters proactively manage the compatibility of land use activities using a combination of zone-based rules, standards and activity tables. This approach is designed to ensure that the permitted activities in each zone are fundamentally compatible, or are able to be designed to be generally compatible following the requirements of the noise chapter.

We have recommended that the noise chapter is used as a supplementary tool to manage land use compatibility, rather than the primary tool. The zone chapters should ensure that co-located activities are compatible with one another, while the noise chapter provides performance standards (e.g. maximum permitted noise levels between sites and acoustic treatment standards where necessary) to ensure that compatibility is maintained.

¹ We did not review the Draft Chapter prior to its release for public feedback.

2.1 Fundamental principles

We have recommended that the following fundamental principles are applied to the District Plan review for managing noise effects over the life of the next District Plan:

- 1) That the zone provisions provide clear direction on the land use activities that are anticipated and provided for in each zone, and those activities are compatible (or can practicably be made compatible) with one another.
- 2) The noise (and vibration) rules and standards in the noise chapter should give effect to the objectives and policies that have been developed for each zone, and the level of aural amenity anticipated in that zone.
- 3) The noise limits are appropriate for the land use activities that are anticipated and provided for in each zone, in accordance with contemporary best-practice.
- 4) Where compatibility between land uses requires additional mitigation or control, that those controls are carefully crafted to ensure expectations on noise makers and noise receivers are clear, and that the burden of mitigation is apportioned appropriately.
- 5) Where compatibility between land uses requires mitigation or control (effort and cost), the community and decision makers must have an understanding of the balance and cost of mitigation that is informing the decision-making process.
- 6) The District Plan must identify the most efficient way of protecting significant (legitimate) noise makers, from the encroachment of noise sensitive activities using measures such as noise control boundaries or buffer zones where these are necessary and justifiable. This includes major transport infrastructure, industries and regionally significant land use activities. The policy framework should also recognise the duties applying to the noise generators to avoid unreasonable noise levels under Section 16.

3.0 Compliance with the National Planning Standards

The PDP Chapter will need to meet the requirements of the NPS, including the mandatory directions of the *Noise and Vibration Metrics Planning Standard (NVMS)* for the measurement, assessment and management of noise (and vibration). The *Definitions Standard* also contains definitions for noise symbols and terms that must be adopted in the PDP if they are referred to.

3.1 Mandatory Direction 1 of the NVMS

Mandatory direction 1 requires that any rule to manage noise emissions in the PDP must adopt the noise measurement methods and symbols prescribed under the relevant New Zealand acoustical standards (NZAS). The direction requires (underlining our emphasis):

1. Any plan rule to manage noise emissions must be in accordance with the mandatory noise measurement methods and symbols² in the applicable New Zealand Standards incorporated by reference into the planning standards and listed below:

New Zealand Standard 6801:2008 Acoustics – Measurement of environmental sound

New Zealand Standard 6802:2008 Acoustics – Environmental noise

New Zealand Standard 6803:1999 Acoustics – Construction noise

New Zealand Standard 6805:1992 Airport noise management and land use planning – measurement only

New Zealand Standard 6806:2010 Acoustics – Road-traffic noise – New and altered roads

New Zealand Standard 6807:1994 – Noise Management and Land Use Planning for Helicopter Landing Areas- excluding 4.3 Averaging

New Zealand Standard 6808:2010 Acoustics – Wind farm noise

New Zealand Standard 6809:1999 Acoustics – Port noise management and land use planning

We have provided a set of recommendations to the Project Team to ensure that the PDP incorporates the relevant NZAS prescribed by the NVMS.

3.2 Mandatory Direction 2 of the NVMS

Mandatory direction 2 of the NVMS requires that:

2. Any plan rule to manage noise emissions must be consistent with the mandatory assessment methods in section 6 Rating Level and section 7 (L_{AFmax}) of New Zealand Standard 6802:2008 Acoustics – Environmental Noise (incorporated by reference into the planning standards), provided the type of noise emitted is within the scope of New Zealand Standard 6802:2008.

The noise chapter must adopt the procedures to derive a noise rating level set out in NZS6802:2008 Acoustics – Environmental Noise for the assessment of environmental noise. “Noise rating level” is defined in the Definitions Standard as “*A derived noise level used for comparison with a noise limit*”. In practice, this requires the adoption of a standardised assessment procedure, taking into account the NZS6802:2008’s prescribed adjustments for special audible character and duration.

We have provided recommendations to ensure the noise rating level process in NZS6802 is adopted and that the noise standards refer to “noise rating level”³ where appropriate.

² Terms includes noise metrics and symbols as defined within the Definitions Standard.

³ The derived noise level used for comparison with a noise limit in a plan or consent condition

3.2.1 Noise sources excluded from NZS6802:2008

NZS6802:2008 does not apply to noise that is managed by other acoustical standards, or impulsive sounds, including gunfire and blasting. Clause 1.2 *Applicability to Specific Sources* of NZS 6802:2008 identifies that the following noise sources are excluded from the scope of the Standard:

“In particular, assessment of specific sound including road or rail transport, flight operations of fixed or rotary winged aircraft associated with airports or helicopter landing areas, construction, port noise, wind turbine generators, and impulsive sound (such as gunfire and blasting).”

Further noise source exclusions in clause 1.2 of NZS6802:2008 include:

- Noise sources that are within the scope and subject of other New Zealand acoustical standards (including road traffic noise, port noise, airport noise, helicopter noise, wind turbine noise, construction noise).
- Structure-borne sound and vibration.
- Sound from rail-yards not attributable to vehicles on rails and sound from aircraft activities (except aircraft taxiing and in-flight).
- Light aircraft flight and ground movements not at airports.
- Impulsive sounds such as the noise from gunfire, and gas guns for bird scaring.

We have reviewed the chapter and provided recommendations to ensure noise sources are assessed in accordance with the correct acoustical standard.

3.3 Definitions standard

The *Definitions Standard* contains definitions for noise related symbols and terms that must be adopted in the PDP if they are referred to. If the District Plan includes any of the following definitions, they must be consistent with those set out in the Definitions Standard of the NPS. The Definitions Standard provides definitions for:

- | | |
|---------------------------|-----------------------------------|
| • Best practicable option | • Noise |
| • Habitable room | • Noise rating level |
| • L_{A90} | • Notional boundary |
| • L_{Aeq} | • Peak particle velocity |
| • $L_{AF(max)}$ | • Special audible characteristics |
| • L_{dn} | |
| • L_{peak} | |

3.3.1 Additional definitions

The Definitions Standard enables a local authority to include definitions for terms that are not defined in the *Definitions List*. Well-crafted and robust definitions are an integral part of a District Plan as they ensure plan rules can be administered efficiently and effectively.

We have worked with the Project Team during the review of the noise chapter to identify terms that will require definitions and to develop appropriate definitions for these terms that are appropriate for the Gore context.

4.0 Noise sources exempt from the noise standards

It is common for District Plans to identify a list of specific noise generating activities that are excluded from the need to comply with the maximum permitted noise levels. We refer to these activities as “exemptions” in this advice. This approach is designed to provide for the noise of activities that are anticipated and reasonable. Common examples include exclusions for lawn mowing, DIY work and normal household activities in a residential zone, and the seasonal or intermittent noise of animals, tractors, seasonal harvesting machinery and working dogs in rural zones.

We recommend that any determination to exempt an activity from compliance with the noise standards should be consistent with the principles below:

- i. The exclusions to the maximum permitted noise levels should be clear and certain, with the minimum degree of interpretation required (this may require use of clear and certain definitions for terms used in the exclusions)
- ii. Any exemption from an activity having to comply with the maximum permitted zone noise levels should only provide for zone-appropriate activities and industries, taking into account the presence of noise sensitive activities within the zone/ adjacent zones and the level, timing, duration and level of the noise source(s).
- iii. Any exemption from an activity having to comply with the maximum permitted noise levels should permit only the effects that could be reasonably anticipated in the zone.
- iv. The exclusions must not allow the generation of unreasonable levels of noise for other activities authorised in the zone
- v. The exclusions must be clear and robust and be able to be administered without ambiguity.

We have worked with the Project Team to prepare a set of exemptions for specific noise generating activities that are appropriate for the Gore context.

The exemptions do not exempt any person from the duty under Section 16 of the RMA to avoid “unreasonable” noise. We support the inclusion of a note in the Chapter to reiterate that:

Section 16 of the RMA places a general duty on all operators and occupiers to adopt the best practicable option to ensure noise (including vibration) emitted from any site does not exceed a reasonable level. What constitutes a "reasonable level" is not prescribed by the RMA. The Rules and Standards of this chapter and the zone chapters are designed for the permitted activities in each zone and may be used as a guide together with the relevant Objectives and Policies when considering whether the timing, duration, level and character of noise effects will be reasonable for activities that require resource consent.

5.0 Zone noise limits

The NPS prescribes a *Zone Framework Standard* that District Plans must follow. We understand the PDP will transition the operative District Plan zone framework into the more "fine-grained" zone framework set out below:

Zone group	Zone	Zone description
Residential	General Residential Zone (GRZ)	Areas used predominantly for residential activities with a mix of building types, and other compatible activities
	Large Lot Residential Zone (LRZ)	Areas used predominantly for residential activities and buildings such as detached houses on lots larger than those of the Low density residential and General residential zones, and where there are particular landscape characteristics, physical limitations or other constraints to more intensive development
	Medium Density Residential Zone (MDRZ)	Areas used predominantly for residential activities with moderate concentration and bulk of buildings, such as detached, semi-detached and terraced housing, low-rise apartments, and other compatible activities
Rural Zones	General Rural Zone (GRZ)	Areas used predominantly for primary production activities, including intensive indoor primary production. The zone may also be used for a range of activities that support primary production activities, including associated rural industry, and other activities that require a rural location
	Rural Lifestyle Zone (RLZ)	Areas used predominantly for a residential lifestyle within a rural environment on lots smaller than those of the General rural and Rural production zones, while still enabling primary production to occur
	Settlement Zone (SETZ)	Areas used predominantly for a cluster of residential, commercial, light industrial and/or community activities that are located in rural areas or coastal environments.
Open Space Zones	Sport and Active Recreation Zone (SARZ)	Areas used predominantly for a range of indoor and outdoor sport and active recreational activities and associated facilities and structures.

Zone group	Zone	Zone description
	Natural Open Space Zone (NOSZ)	Areas where the natural environment is retained and activities, buildings and other structures are compatible with the characteristics of the zone
Commercial and Mixed Use Zones	Town Centre Zone (TCZ)	Areas used predominantly for a range of commercial and community activities that service the needs of the residential catchment.
	Neighbourhood Centre Zone (NCZ)	Areas used predominantly for a range of commercial and community activities that service the needs of the residential catchment.
	Mixed Use Zone (MUZ)	Areas used predominantly for a compatible mixture of residential, commercial, light industrial, recreational and/or community activities.
Industrial Zones	General Industrial Zone (GIZ)	Areas used predominantly for a range of industrial activities. The zone may also be used for activities that are compatible with the adverse effects generated from industrial activities
	Light Industrial Zone (LIZ)	Areas used predominantly for a range of industrial activities, and associated activities, with adverse effects (such as noise, odour, dust, fumes and smoke) that are reasonable to residential activities sensitive to these effects
Special Purpose Zones	Māori Purpose Zone (MPZ)	Areas used predominantly for a range of activities that specifically meet Māori cultural needs including but not limited to residential and commercial activities.
	Airport Zone (AIRPZ)	Areas used predominantly for the operation and development of airports and other aerodromes as well as operational areas and facilities, administrative, commercial and industrial activities associated with airports and other aerodromes.
	Camp Columba Zone (CCZ)	Area used predominantly for regional camping facilities for school and other community camping groups.
	Field Days Zone (FDZ)	Area used for regional Field Day Events including a wide range of sporting, community, social, and corporate events such as conferences and concerts.

Table 1 provides a summary of the typical maximum permitted noise levels typically found in District Plans and a summary of the zones and land use activities that are generally appropriate in these noise environments.

Table 1 Summary of typical District Plan noise environments

External noise environment	Typical zones and locations	General level of effect and comments on suitability of noise sensitive activities
Very high noise environment Noise levels above 65 dB L_{Aeq} during the day and at night.	Industrial Zones and adjacent to very busy parts of the road and rail network, or very close to airports (generally within their boundaries)	The noise environment is generally incompatible with noise sensitive land use, and other land use activities requiring a good level of acoustic amenity to operate (for example, retail, offices or call centres). Noise sensitive activities and other sensitive commercial activities should ideally be precluded or very restricted (i.e. unless they are ancillary to an industrial activity or have a functional requirement to locate in this environment, for example, training facilities that are accessory to an industrial activity on the site).
High noise environment Noise levels from: 56 – 65 dB L_{Aeq} in the day 46 – 65 dB L_{Aeq} at night.	Adjacent to busy roads (State Highways), railways and within Light Industrial, Commercial and Mixed-Use Zones	The outdoor noise environment is generally incompatible with noise sensitive land use. Indoor spaces of noise sensitive activities would need to be acoustically treated from the external noise. This can be achieved by careful design of the building envelope and by providing fresh and cool air to the indoor spaces (so windows and doors can stay closed). Noise sensitive activities would ideally be precluded, unless they are located, designed and constructed in such a way that ensures the type of noise sensitive activity does not rely on outdoor areas as a key component of the use or amenity. For example, childcare centres with outdoor play areas would not be compatible. Residential activity would ideally be restricted to apartment-style living with a limited outdoor component.
Moderate noise environment Noise levels from 51-55 dB L_{Aeq} during the day and 41-45 dB L_{Aeq} at night.	Residential zones and rural zones where noise levels must be compatible with the presence of noise sensitive activities without the need for any acoustic treatment.	The external noise levels do not necessitate acoustic treatment of indoor spaces to achieve a reasonable level of noise indoors at night. The amenity in outdoor spaces is moderate / generally acceptable for rural and residential activity. Moderate-to-high annoyance effects are likely in a small proportion ($\leq 10\%$) of the population.
Low noise environment Noise levels no greater than 50 dB L_{Aeq} during the day and 40 dB L_{Aeq} at night.	Residential or rural zones well separated from roads and noise generating activities. Environments where a high level of acoustic amenity is desired.	The noise environment will be compatible with all noise sensitive activities. The noise environment will provide noise sensitive activities with a high degree of acoustic amenity, indoors and outdoors.

The NPS does not provide any direction on how a local authority must manage noise effects within and between the zones, nor does it prescribe numerical noise limits that must be adopted. The appropriate noise levels and noise performance standards for each zone should reflect the function and purpose of each zone and recognise and provide for the land use activities that are anticipated and provided for in each of the zones.

In general terms:

- A daytime noise limit of 55dB L_{Aeq} represents the uppermost acceptable level of noise for residential and rural zones where dwellings are not subject to acoustic treatment
- A night time noise limit of 45dB L_{Aeq} represents the uppermost acceptable level of noise for residential and rural zones where dwellings are not subject to acoustic treatment

We have worked with the Project Team to ensure that the maximum permitted noise levels received within the same zone or from any adjacent zone will be compatible for the receivers. Our recommendations for each of the zone groups are set out below.

6.0 Rural Zones

We understand that productive rural land use is an important part of the District's economy. The PDP will transition the single Rural Zone of the ODP into three distinct rural zones that each have a distinct function and purpose:

1. The General Rural Zone (**GRUZ**) is the largest rural zone in the District. The purpose of the zone is to provide for and protect rural production activities and other activities relying on the rural environment.
2. The Rural Lifestyle Zone (**RLZ**) will be applied to rural land on the fringe of urban settlements that does not contain class 1 or 2 high soils and has been identified as suitable for rural lifestyle living. Activities complementary to rural lifestyle living, such as agriculture, pastoral and horticulture activities and home occupations are provided for at a scale appropriate to protect amenity and character values.
3. The Settlement Zone (**SZ**) provides for townships located in rural environments that include a range of residential and small-scale non-residential activities. Subdivision down to 2000m² sites is provided for. The Mandeville Heritage Precinct is in the Mandeville Settlement Zone. This precinct provides for the existing heritage aviation and railway activities in this area.

We have worked with the Project Team to ensure the noise chapter delivers the rural amenity outcomes for each of the proposed rural zones. The noise limits are designed to deliver the following outcomes:

In the GRZ where the operation of productive rural land use and industries are prioritised:

- The recommended maximum permitted noise levels high enough to enable the efficient operation of productive rural activities and industries in the zone, but also to avoid

unreasonable noise effects on noise sensitive activities in the zones. The recommended noise limits are 55dB L_{Aeq} during the day and 45dB L_{Aeq} and 75dB L_{AFmax} at night, when measured and assessed at any notional boundary on an adjacent site.

- We recommend that the noise limits above are also applied to any notional boundary within the Rural Industry Precinct (PREC13). We understand that the land comprising PREC13 includes existing residential activity. The noise limits within the precinct should ensure an adequate level of acoustic amenity is provided for the residential receivers.
- We have recommended that the list of exemptions recognise and provide for seasonal and intermittent rural noise sources in the GRZ.

In the Rural Lifestyle Zone (where rural lifestyle living is prioritised) and the Settlement Zone (which includes dwellings on smaller allotments):

- The recommended maximum permitted noise levels prioritise a good level of aural amenity for noise sensitive activities in the zone. We have recommended noise limits of 50dB L_{Aeq} during the day and 40dB L_{Aeq} and 70dB L_{AFmax} at night when measured and assessed at the notional boundary of a dwelling on any other site.
- These noise limits are considered appropriate for the Settlement Zone taking into account the potential for smaller lot sizes (2000m²) and the need to achieve reasonable noise levels in the area at and immediately surrounding the dwelling.

7.0 Residential Zones

The PDP proposes three new residential zones:

1. The General Residential Zone (**GRZ**) provides for typical residential development at a density of 400 m² per residential unit.
2. The Medium Density Residential Zone (**MDRZ**), that will apply to land surrounding existing neighbourhood centres. A higher density of residential development is anticipated in this zone. We understand that the Gore Hospital will be zoned MDRZ (with a precinct overlay).
3. The Large Lot Residential Zone (**LLRZ**) is designed to provide a transition from urban to rural and provides large lot lifestyle living opportunities at a density of 2000m² per dwelling.

We have recommended noise limits of 50dB L_{Aeq} during the day and 40dB L_{Aeq} and 70dB L_{AFmax} at night when measured and assessed at the boundary of any other site in all of the residential zones.

8.0 The Open Space Zones

The PDP proposes two open spaces zones:

- The Natural Open Space Zone (**NOSZ**) that will include Dolamore Park (GDC owned scenic reserve of 95 hectares) and Croydon Bush (Department of Conservation reserve of 874 hectares)
- The Sport and Active Recreation Zone (**SARZ**) that will provide open space areas for a range of sport and recreation activities.

We have recommended noise standards that deliver the following outcomes:

1. We have not recommended noise levels to control the level of noise generated and received between sites that are commonly held within the NOSZ or SARZ. We understand that these zones are typically held under common ownership (i.e. Council or DoC) and therefore there may not be a need to manage noise levels between sites that are part of the same zone. The administering authority has control over the types of activities that can establish and operate.
2. We have recommended noise levels to control the noise levels generated from activities in the zones surrounding the NOSZ and received at the boundary of the NOSZ. The recommended noise level of 40 dB L_{Aeq} is designed to provide a high level of acoustic amenity for the natural open space areas within the NOSZ where a low level of anthropogenic noise is valued.
3. We have recommended interface noise levels to control the level of noise generated from activities in the SARZ and received at any boundary of a residential zone or notional boundary of a rural zone. The recommended noise levels are 5 dB higher than the noise levels otherwise authorised in the Residential Zones, the SETZ and MPZ. The noise levels of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night time are designed to provide for an elevated noise environment from organised sporting activities. There will still be a need to locate and design recreational activities/ facilities to achieve good separation distances between adjacent sites containing noise sensitive activities.
4. We recommend that the potential noise effects generated from an activity in the NOSZ and received at other adjacent zones is controlled by an interface noise standard that requires compliance with the noise standards applying at the receiving zone.

9.0 The Commercial Zones

The PDP proposes to zone commercial activity across three zones:

1. Town Centre Zone (**TCZ**)
2. The Local Centre Zone (**LCZ**)

3. The Neighbourhood Centre Zone (NCZ) 4. The Mixed-Use Zone (MUZ)

We understand that these zones will provide for a mix of residential and employment activities. Our background advice to Council has recommended that the zone chapters include controls to ensure the mix of noise sensitive and noise generating activities will be compatible. We have recommended this is primarily achieved by controlling the type and scale of noise sensitive activities that are permitted in the commercial zones.

We have recommended that noise sensitive activities with an “outdoor component” are precluded or restricted in terms of scale/type/use. For example, certain types of education facilities may be compatible in the Commercial Zones if they do not involve outdoor play areas (e.g. training facilities associated with trades). The controls should also require any residential dwellings to have a very limited outdoor living component.

We have recommended noise standards for the commercial zones that deliver the following outcomes:

- i. Require activities in the NCZ to comply with noise levels of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night time at any other site. We understand that the purpose of the NCZ is predominantly for small-scale commercial and community activities that service the needs of the immediate residential neighbourhood. These zones typically abut or are in very close proximity to residential dwellings in surrounding Residential Zones. We consider these noise levels are likely to be appropriate for the intensity and scale of NCZ activities, and proximity to residential activity. We also understand the NCZ permits noise sensitive land use. The recommended noise levels will not require noise sensitive activities in the NCZ to be acoustically treated.
- ii. Require activities in the TCZ, MUZ and LCZ to comply with noise levels of 60 dB L_{Aeq} anytime and 75 dB $L_{AF(max)}$ night time at any other site in the commercial zones. These noise levels are enabling for commercial activity. Noise sensitive activities in these zones will need to be acoustically treated.
- iii. Enable the commercial zones to generate slightly higher noise levels (5 dB higher than the noise levels otherwise authorised in the Residential Zones) at the zoning interface. The noise levels of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night time recognise the elevated noise environment that is likely to be present at the interface between the commercial and residential zones.

9.1 Acoustic treatment requirements for the Commercial Zones

We have recommended that all noise sensitive activities permitted in the TCZ, MUZ and LCZ are acoustically treated to achieve an indoor noise level of 35dB $L_{Aeq(15min)}$ bedrooms/ rooms used for sleeping and 40dB $L_{Aeq(15min)}$ in all other noise sensitive spaces.

We have recommended the standard refers to the terms “noise sensitive activities” and “noise sensitive spaces” and that the PDP includes the following definitions:

1. **Acoustic treatment-** *“Building modifications or improvements to reduce external noise levels inside a building. The primary means of Acoustic Treatment includes the provision of mechanical ventilation and cooling to enable occupants to remain thermally comfortable when windows and doors are closed to reduce external noise. In some cases where external noise levels are high, Acoustic Treatment means additional measures such as improved glazing and window frames, solid core doors, additional wall and / or ceiling linings and other specific building treatments”*
2. **Noise Sensitive Activities and associated noise sensitive space**

Noise sensitive activity	Noise sensitive space
Residential or living activities	Bedrooms/ sleeping areas and other habitable rooms
Visitor accommodation Care centres	Bedrooms/ sleeping areas and rooms used for activities such as socialising, learning, dining or resting
Child care facilities Educational facilities	Sleeping areas and classrooms and teaching areas, lecture rooms and theatres, music and drama studios or libraries.
Healthcare facilities	Overnight medical care/ wards and clinics, consulting rooms, theatres, nurses stations and other spaces that are required to be quiet.
Places of worship, Marae or papakāinga	Sleeping areas and rooms used as a place of worship or congregation
<i>Noise sensitive spaces excludes any bathroom, water closet, laundry, pantry, walk in wardrobe, corridor, hallway, lobby, stairwell, clothes drying area, garage or other space of a specialised nature occupied neither frequently nor for extended periods.</i>	

9.2 Recommended acoustic treatment rule

Our suggested acoustic treatment rule/ standard is below.

We have recommended that a defined term for “High Noise Environments” identifies the zones and locations where this rule applies.

NOISE-S2	Acoustic Treatment of noise sensitive spaces in High Noise Environments		
High Noise Environments (	1. The following internal <i>noise</i> levels shall be met for any new noise sensitive space or addition or alteration of a noise sensitive space in a High Noise Environment:		Activity status where compliance not achieved: Discretionary
	Room	Time	Internal design noise level

<i>Bedrooms or rooms used for sleeping</i>	10.00pm – 7.00am	35dB L _{Aeq} (15min)
All other noise sensitive spaces	At all times	40dB L _{Aeq} (15min)

2. The internal noise levels in the table above must be achieved based on the maximum level of noise permitted in the zone or from any adjacent zone, when measured and assessed at the building façade. Road noise shall be calculated based on measured or predicted noise levels plus 3dB.
Where external windows and / or doors are required to be closed to meet the internal design noise levels in (1), a mechanical ventilation and cooling system shall be installed that complies with the following requirements.
 - (a) Mechanical cooling to achieve an internal temperature no greater than 25 degrees celsius based on external design conditions of dry bulb 25.1 degrees celsius and wet bulb 20.1 degrees celsius;
 - (b) Mechanical ventilation to enable compliance with clause G4 of the New Zealand Building Code
 - (c) All mechanical ventilation and/or cooling systems must generate a noise level no greater than 35 dB L_{Aeq} when measured 2m from the diffuser at the minimum air flows required to maintain the design temperatures and air flows above once the room temperature has been achieved.

Notes:

1. Mechanical cooling must be provided for all habitable rooms (excluding bedrooms) provided that at least one mechanical cooling system must service every level of a dwelling that contains a habitable room (including bedrooms).
2. Compliance shall be demonstrated at the time of application for building consent. The application shall be accompanied by a statement prepared by a suitably qualified acoustic consultant that demonstrates the internal design levels will be achieved.
3. Any required acoustic treatment must be designed, constructed and maintained in an acoustically effective state.
4. Acoustic treatment is designed to provide for an adequate internal noise environment and will not mitigate noise levels received in outdoor living or play areas. Any resource consent application for a type of noise sensitive activity that is not otherwise permitted in the zone must include an assessment of effects on outdoor areas.

5. Any resource consent application for a noise sensitive activity in the Industrial Zones will require consideration of whether acoustic treatment of noise sensitive spaces can adequately mitigate noise effects. The design must be based on the maximum level of noise permitted to be generated and received from any other site in an industrial zone.

The aspects of the rule above that deal with mechanical ventilation and cooling have been adopted primarily from the Auckland Unitary Plan standards.

We recommend that these are reviewed by a suitably qualified and experienced mechanical engineer if there is doubt or if concern about the rules. The objective of these rules is to ensure that the occupants of buildings can remain inside and be cool and comfortable with windows and doors closed to keep external noise out. Any system would also have to meet the requirements of clause G4 of the New Zealand Building Code with windows and doors closed.

9.2.1 Assessment criteria for acoustic treatment standard

We recommend the rule / standard is accompanied by the following assessment criteria:

- i. The proposed measures to ensure ongoing land use compatibility with the permitted noise levels from adjacent sites.
- ii. The effectiveness of proposed acoustic treatment measures to manage noise levels permitted at the building façade.
- iii. Whether the measures will provide current and future residents with a reasonable level of indoor amenity and sleep protection at night.
- iv. The extent to which a reduced level of acoustic treatment may be acceptable due to mitigation provided by other means such as physical screening or separation distance and whether these measures can be relied on into the future.
- v. The extent to which the proposal may comprise the ability of adjacent existing or future permitted activities to operate or establish without undue constraint.

Where an alternative temperature control solution is proposed for a noise sensitive space requiring mechanical ventilation and cooling to achieve the specified internal design noise levels:

- i. Whether alternative solutions such as passive or mixed-mode cooling can provide a sufficient thermal comfort level that can be maintained having regard to ASHRAE (US) Standard 55:2013 - Thermal environmental conditions for human occupancy, CIBSE (UK) Technical Memorandum TM52:2013 – The limits of thermal comfort: avoiding overheating in European buildings, BS EN 15251:2007 – Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics.

9.3 The Industrial Zones

The PDP proposes two industrial zones:

1. The General Industrial Zone (**GIZ**)
2. The Light Industrial Zone (**LIZ**)

Our previous advice to the Project Team has recommended that any noise sensitive activities in the Industrial Zones are precluded or restricted in the Industrial Zones to ensure that noise generating activities are able to operate effectively without the potential for reverse sensitivity effects.

We have recommended industrial noise limits are designed to deliver the following outcomes:

The General Industrial Zone, where the operation of heavy industry is prioritised

- The recommended maximum permitted noise levels between sites in the GIZ are designed to enable the operation of heavy industrial activities that generate noise on a 24/7 basis. We have recommended noise limits of 70dB L_{Aeq} at any time when measured and assessed at the boundary of any other site in the GIZ.

The Light Industrial Zone, where the operation of industry is enabled

- The recommended maximum permitted noise levels between sites in the LIZ are designed to enable the operation of light industrial activities that generate noise on a 24/7 basis. The recommended noise limits are 5 dB lower than the GIZ noise limits.

We have recommended interface noise standards to deliver the following outcomes:

- i. Require the industrial activities to meet the maximum permitted noise levels in the Residential / Rural Zones. These interface noise limits only apply when the industrial zones are near to a residential or rural zone. The recommended noise levels of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night time recognise the elevated noise environment that is likely to be present at the interface between the industrial and residential zones
- ii. Require the noise levels from industrial activities to meet the maximum permitted noise levels applying at any other industrial, commercial or open space zone. This approach is designed to ensure that the permitted noise levels from the GIZ/ LIZ are compatible with the noise environment in other adjacent zones.

9.4 Precincts / Special Purpose Zones

We understand that Precincts and Special Purpose Zones are proposed for the:

- i. The Rural Industry Precinct (PREC13).
- ii. The Mandeville Aviation and Rail Precinct (PREC8)

- iii. Field Days SPZ
- iv. Camp Columba SPZ

9.4.1 The Rural Industry Precinct (PREC13).

We understand that the purpose of the Precinct is to provide for larger scale rural industry activities which are defined as “an industry or business undertaken in a rural environment that directly supports, services, or is dependent on primary production”.

We have recommended that the maximum permitted noise levels authorised in this precinct are consistent with the underlying General Rural Zoning. We have recommended noise levels of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night time when measured and assessed at the notional boundary of any residential dwellings inside or beyond the Precinct.

These noise levels represent the uppermost threshold for non-acoustically treated residential activity and are designed to ensure the noise environment is compatible with residential activity inside the precinct.

9.4.2 The Mandeville Aviation and Rail Precinct (PREC8)

We understand that the Mandeville Aviation and Rail Precinct applies to the Croydon Aviation Heritage Centre and associated airfield.

We understand that the residential lots adjacent to the precinct (in the yellow area) are subject to a private covenant requiring they have a hangar and are used in association with the airstrip. We have not reviewed the covenant.

We consider that the key noise outcomes for PREC8 are to ensure that the noise standards provides for the preservation, operation and display of aircrafts, rail vehicles, motorcars and motorcycles, steam machines, while ensuring the timing, level and duration of noise is reasonable for the noise sensitive receivers surrounding the Precinct.

We recommend the noise standards deliver the following outcomes:

- Provide for a reasonable level of aviation activities. We provide comment on the options to manage noise levels from aircraft later in this advice.
- We have recommended noise levels from all operational noise sources (except aircraft movements) comply with a noise level of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night time. These noise levels would apply when measured and assessed at the notional boundary of any residential dwellings inside or beyond the Precinct.
- Temporary activities within the Precinct are enabled subject to the temporary activity noise standards.

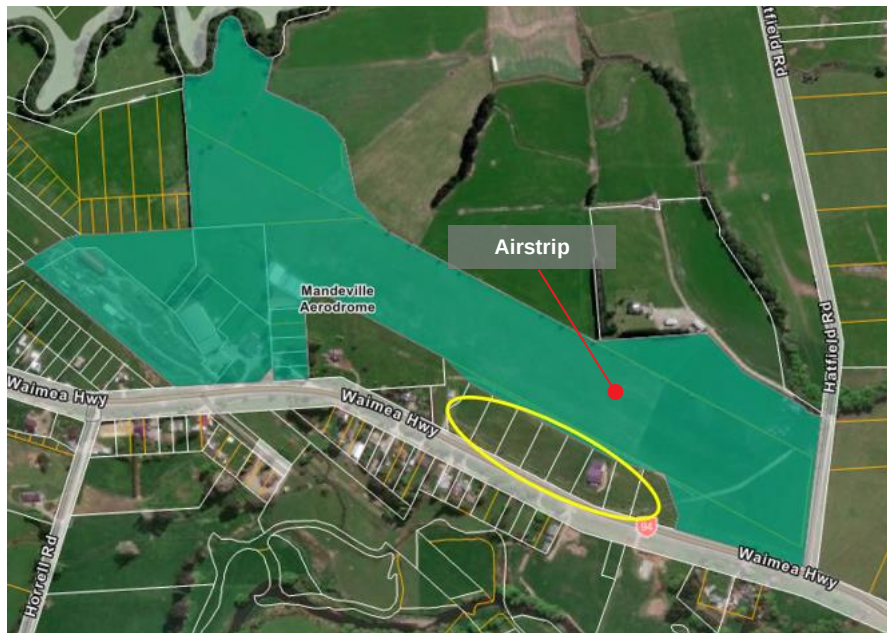


Figure 1 Mandeville Aviation and Rail Precinct

9.5 Field Days Special Purpose Zone and Camp Columba Special Purpose Zone

We understand the purpose of the CCZ is to:

“Enable the existing activity to continue to operate and expand to meet the needs of the District and wider region. Camp Columba offers camps and programmes which include overnight accommodation catering for groups including youth groups, Scouting New Zealand, the Health Foundation, church groups and sports teams. In the future, the camp seeks to engage with other family groups, secondary schools and adult groups”.

The purpose of the FDZ is to provide for field day events:

“The Fields Day Zone incorporates land at Waimumu used for the biennial field days since 1982. These three-day events are the second largest of their type in the country, and are nationally significant, attracting over 40,000 visitors, predominantly from throughout the South Island. The infrastructure and resources developed at the site enables a wide range of sporting, community, social, cultural and corporate events and exhibitions to take place between field day events, including concerts and conferences. Parts of the site when not being used for events are subject to agricultural activities, predominantly grazing by stock. The relative isolation of the site facilitates management of any adverse environmental effects of activities taking place there, for example, noise and glare. Large scale events generate significant volumes of traffic in the vicinity of the site.

We have recommended that:

- i. The temporary activities chapter recognise and provides for the temporary events in these zones
- ii. The noise chapter includes interface noise limits that will ensure noise levels from non-event days in these zones meet the noise levels that apply in any other adjacent zones.
- iii. The requirement for internal noise limits between sites in the CCZ and FDZ will depend on the nature of the land holding. Noise limits between sites that are commonly held in the CCZ and FDZ should be considered if the zones are comprised of multiple sites held in different ownership (or have the potential to be in the future). If the land is held in common ownership and unlikely to be fragmented, noise limits between sites in the same zone may not be required.

10.0 Recommendations to control specific noise sources

10.1 Airfields

The ODP does not control the noise levels from any land use activities undertaken within the Charlton Aerodrome or the Mandeville Airfield (the **facilities**). The ODP states that “*any land use activity or flight operations associated with use of the Charlton Aerodrome or the Mandeville Airfield*” are exempt from the noise standards.

We understand that the level of activity and number of flights from both facilities is generally very low.

The exemption in the ODP exempts the facilities from compliance with any noise standards that may constrain or limit their activities. It would theoretically enable the activities to operate and potentially develop without any noise constraint. We note that any District Plan exemption does not absolve the duty on the airfields to avoid “unreasonable noise” in accordance with s16 of the RMA.

However, the current exemption will not prevent or manage the potential noise conflicts that may arise in a scenario where the land surrounding the facilities is developed, and new dwellings are established on the adjacent land that is exposed to noise from the facilities. The level of noise at the new dwellings may give rise to annoyance and potential complaint(s) against the airfields. We refer to this scenario as “encroachment” and the noise conflict is typically referred to as “reverse sensitivity”.

Our earlier advice to Council identified that the PDP should recognise and provide for the future anticipated use of Gore’s Airfield for the next ten years, and possibly beyond. We recommended that consideration be given to the adoption of NZS6805:1992 *Airport Noise Management and Land Use Planning*, including the use of air-noise boundaries as a means of protecting the Gore Airfield from encroachment and potential reverse sensitivity effects.

We identified that NZS6805:1992 requires the development of air-noise boundaries to be informed by air noise exposure predictions for the airport, based on an average day calculated from all operations during the busiest three months of the year. This approach is designed to

set reasonable noise limits for the airports to comply with, (including for future operations) and to set defined noise contours across the surrounding land, within which noise-related planning controls would apply.

We have not been provided with information relating to the level, frequency and number of aircraft movements from the Airport Zone or the Mandeville Aviation and Rail Precinct (**MARP**), or information relating to whether the facilities are expected to grow in the future. The absence of air noise exposure predictions⁴ means that it is not currently possible to develop and apply NZS6805:1992's air-noise boundaries to establish noise control measures and compatible land use planning controls on the land surrounding the Gore Airfield (the **Airport Zone**) and the MARP.

We have reviewed a set of draft controls proposed by the Project Team. The proposed controls would rely on the operators of Gore Airfield and the MARP to implement ongoing aircraft noise monitoring. We note that the likely monitoring costs involved in the administration of the standard would be significant, and likely cost-prohibitive for both facilities. Additionally, without any air-noise contours in the District Plan, there would be no noise limits or noise-related performance standards to compare the measurement data to. We understand that both facilities have a relatively low level of use and have raised concerns that the controls may be ineffective or inefficient given the small scale and intensity of the facilities and the potentially high administrative costs involved.

We also understand that the Airport Zone and MARP are located in the context of rural zones that permit noise sensitive land use. We consider that the key focus of the controls should be to manage the noise levels (from aircraft and other activities) that may be received at noise sensitive activities *surrounding* the Site.

Our recommended options for the PDP to manage noise from the facilities are set out below. We note that the Airport Zone and MARP are distinct in terms of their role, purpose, function and use. Different approaches for each facility may therefore be required.

10.1.1 Option 1- Retain the ODP provisions in their current form

Option 1 retains the ODP current exemption to noise generated from “*any land use activity or flight operations*” within the Airport Zone and MARP. This exemption applies to:

- 1) To flight movements, which are typically infrequent and undertaken during the daytime period
- 2) To the noise from “any land use activity” which may generate noise levels on a 24/7 basis.

The benefits of Option 1 include:

- i. The facilities are able to operate without any constraint for noise reasons.

⁴ The data must be based on an average day calculated from all operations during the busiest three months of the year

- ii. The facilities may be able to be used for a range of noisy activities, which are also able to operate without any constraint for noise reasons.

The risks associated with Option 1 include:

- i. The life of the PDP is ten years and Gore is a growing district. The current level of aircraft movements at either facility may intensify. Option 1 does not provide any incentive to the operators of the facilities to manage the use and development of their facilities in a way that will ensure compatibility with adjacent land use, both now and in the future.
- ii. The surrounding land adjacent to the facilities may be developed for new noise sensitive land use (dwellings). If the level of activity at either facility changes or intensifies, dwellings may be exposed noise levels that may be unreasonable for noise sensitive land use. These effects may give rise to annoyance, incompatibility, conflict and ultimately, pressure on the facilities to reduce noise levels. We recommend that the Project Team undertakes a “vacant land” assessment to determine the permitted baseline applying to surrounding sites and whether there is a real risk of new dwellings being established in close proximity to the Airport Zone and MARP boundaries.

10.1.2 Option 2- Retain ODP exemption with changes

Option 2 would continue to exempt flight movements at the Airport Zone and MARP, while specifying operational noise limits for all other permanent land use activities undertaken on the Site.

The benefits of Option 2 include:

- i. Flight movements are continued to be exempt from noise limits. This approach is likely acceptable based on the current low level and infrequent nature of aircraft movements.
- ii. Operational noise limits for land-based noise sources will provide the surrounding land use activities will some protection from the noise effects of permanent land use activities that may establish and operate within the Airport Zone or MARP. This is likely to be a real issue if the activity tables for the Airport Zone or MARP are highly permissive, or if the facilities are likely to be used or developed for activities that generate high noise levels during the day and night. We recommend that the permanent land use activities comply with a noise level of 55 dB L_{Aeq} daytime and 45 dB L_{Aeq} and 75 dB $L_{AF(max)}$ night-time, when measured and assessed at any notional boundary outside the Airport Zone or MARP. These noise levels represent the uppermost threshold for residential dwellings that are not acoustically treated. The temporary activity noise standards would continue to enable special events within the MARP.

The risks of Option 2 include:

- i. Refer to risks in Option 1 above. The noise effects from aircraft movements may not be acceptable in the event that the facilities are expected to grow in the future and residential activity surrounding the facilities is expected to intensify.

10.1.3 Option 3 – Identify a buffer to manage potential encroachment

Option 3 relies on the creation of a buffer zone across the land adjacent to the MARP and Airport Zone. New noise sensitive land use (e.g. dwellings) would be restricted (i.e. not a permitted activity) inside the buffer zone.

The approximate location of the buffer would be designed to be at or beyond a modelled 55dB L_{DN} contour for future aircraft operations. The location would be estimated (as no data is available). We would recommend that the buffer approach is complemented by a control to preclude night flights for anything other than an emergency and potentially for other very reasons to enable very infrequent flights.

The benefits of Option 3 include:

- i. The facilities would be protected from the encroachment of new noise sensitive activities on adjacent land. This option would be very effective for the land surrounding the Airport Zone which is zoned rural and generally subject to a low intensity of development. As set out below, we note this option may be difficult for the MARP due to the intensity of existing residential development in the Settlement Zone, and potential new dwellings authorised on adjacent vacant land in the Rural Lifestyle Zone and Rural Zone. We recommend that the Project Team undertakes a vacant land assessment to understand whether the application of a buffer zone would be likely to affect the development of vacant land adjacent to the Airport Zone or MARP.

The risks of Option 3 include:

- i. If the buffer zone incorporates vacant sites, it may affect the ability to develop a residential dwelling as a permitted activity. This could potentially be addressed by a plan rule that identifies the specific lots which could develop a single residential dwelling as a controlled activity, subject to meeting acoustic treatment standards. The controls could provide a more restrictive activity status (such as discretionary or non-complying) for multiple dwellings, other forms of noise sensitive activities or subdivision. We expect that landowners affected by the buffer zone may have concerns relating to potential effects on development rights.
- i. The adjacent land already includes existing noise sensitive land use (particularly in the case of the MARP). The inclusion of a noise buffer in the PDP will not manage effects on existing noise sensitive receivers.

- ii. The buffer zone would be estimated only. It may not be large enough to accommodate all potential future growth or may be too small to include all affected land.

We have marked up plans of the Airport Zone and the MARP to show suggested locations for the buffer zone. These are attached as Appendix A.

10.1.4 Option 4 – Application of NZS6805:1992

Option 4 relies on the adoption of NZS6805:1992 and the use of air-noise boundaries as a means of protecting the airfields from encroachment and potential reverse sensitivity effects.

NZS6805:1992 uses air-noise boundaries as the basis for local authorities to establish noise control measures and compatible land use planning controls. This approach would involve defining the areas around the airport *“within which the current or future daily amount of aircraft noise exposure will be sufficiently high as to require appropriate land use controls, or other measures to avoid, remedy or mitigate any adverse effect on the environment, including effects on community health and amenity values whilst recognising the need to operate an airport efficiently”* (Clause 1.4.1.1 of NZS 6805).

The general approach of NZS6805 is to:

- a) Use noise modelling to prepare noise level contours for the airport using predicted flight movements for a period of 10-15 years into the future. These contours will often extend into the community.
- b) The contours are generally defined as the air-noise boundary (**ANB**) at a level of 65dB L_{DN} and the Outer Control Boundary (**OCB**) at 55dB L_{DN} .
- c) Require that these noise contours essentially form the noise limits that the airport will have to comply with.
- d) Generally prohibit or severely restrict the development of activities sensitive to aircraft noise inside the ANB.
- e) Require that any new or altered activities sensitive to aircraft noise that move inside the OCB are acoustically treated to ensure that the internal noise levels are reduced.

The benefits of Option 4 include:

- i. The opportunity to accurately futureproof the airfields from encroachment
- ii. Ensuring that noise sensitive land use adjacent to the airfields are located and designed to adequately mitigate noise effects. This ensures that occupants are provided with an adequate level of amenity and the potential for reverse sensitivity effects will be managed.

The risks/ downsides of Option 4 include:

- i. The considerable time and costs to complete the noise measurements, monitoring and modelling work
- ii. Introducing noise limits / monitoring requirements on the airfield.
- iii. Potential restrictions on the development on land inside the ANB and ONB.

Most New Zealand airports that are subject to air noise boundaries have had them developed according to the general principles of New Zealand Standard NZS6805:1992, albeit that most have a degree of customisation for the local situation. We also note that NZS6805 is designed for the management of noise from fixed-wing aircraft only.

We are able to assist in the development of the proposed standards for managing aircraft noise from the airfield, subject to Council confirming their proposed approach.

10.2 Rural aviation activities

We have reviewed DDP feedback from Southland Federated Farmers, Ballance and New Zealand Agricultural Aviation Association (NZAA). The feedback opposes the controls in the DDP noise chapter on the grounds the controls are overly restrictive and do not recognise and provide for agricultural aviation in the Gore District.

We note that is relatively common for District Plans to exempt the noise from aerial agricultural aviation activities, particularly in rural districts that seek to protect the function of productive rural land use. The basis for the exemption is typically based on:

- i. The relatively infrequent/seasonal nature of aircraft movements and generally large separation distances to noise sensitive receivers
- ii. The District Plan seeking to recognise and provide for activities that are important for the economic well-being of the District

We consider that the intermittent and seasonal nature of agricultural aviation activities warrants flexibility in terms of the noise standards. We consider that it would be prudent to target the exemption at take-offs and landings that are from or to the same property. This is a common feature of many similar exemptions in other District Plans.

We consider that the focus of the noise standard should be to control the noise effects from commercial helicopter depots/ airstrips that are likely to generate noise effects on a consistent basis.

We support a permitted activity status for noise levels from agricultural aviation (helicopters and fixed wing) where:

The take-off and landing is to or from a rural airstrip, a helicopter landing area or the Airport Zone.

Take off and landings do not occur for more 315 hours in any 12 month period.

Where the airstrip or helicopter landing area is separated by at least 500m from any notional boundary on a site not being serviced by the use of the airstrip.

A record of take offs and landing times and dates is maintained and available to the Council upon request.

10.2.1 Helicopter landing areas (other than for agricultural aviation)

Helicopter use is becoming increasingly popular as a transport mode to facilitate a number of activities. It is our experience that noise effects from helicopter movements associated with informal landing areas are becoming an increasing source of noise complaints (across New Zealand). We have recommended that the PDP controls the noise effects from the landing and take off of helicopters through the following control:

NOISE-R11	Noise from the take-off and landing of helicopters (Other than for <i>agricultural aviation</i>)	
All Zones except the Airport Zone	Activity status: Permitted Where:	Activity status where compliance not achieved: Restricted Discretionary
	1. The take-off and landing is to or from a <i>helicopter landing area</i> which: (a) Is separated from the <i>notional boundary</i> on another site by a minimum distance of 300m. (b) Is separated from any occupied building that does not contain a <i>noise sensitive activity</i> on another site in any zone by a minimum distance of 200m. 2. The flight path to the <i>helicopter landing area</i> is not within a horizontal distance of 250m of any <i>notional boundary</i> on any other site. 3. The number of <i>movements</i> to and from the <i>helicopter landing area</i> does not exceed: (a) 2 <i>movements</i> per day (b) 4 <i>movements</i> per week (c) 10 <i>movements</i> per month	Where: 1. Noise emissions from a take-off or landing of a helicopter do not exceed: (a) 40 dB L_{dn} and 70dB $L_{AF(max)}$ between the hours of 10pm and 7am when measured and assessed at a <i>notional boundary</i> in the General Residential Zone, Medium Density Residential Zone, Large Lot Residential Zone, Rural Lifestyle Zone, Neighbourhood Zone, Sport and Active Recreation Zone. (b) 50 dB L_{dn} and 70dB $L_{AF(max)}$ between the hours of 10pm and 7am when measured and assessed at a <i>notional boundary</i> in the General Rural Zone, Māori Purpose Zone, Settlement Zone, Open Space Zone or Special Purpose Zone – Field Days and Camp Columba. (c) 60 dB L_{dn} and 85dB $L_{AF(max)}$ between the hours of 10pm and 7am at any site in the Town Centre Zone, Local Centre Zone, Mixed Use Zone. (d) 65 dB L_{dn} at any site in the Industrial Zones. Notes: Noise levels from landing and take-offs must be measured and assessed in accordance with NZS6807:1994 <i>Noise Management and Land Use Planning for Helicopter Landing Areas</i>. When assessing noise from helicopter landing and take-off procedures in accordance with

NOISE-R11 Noise from the take-off and landing of helicopters (Other than for *agricultural aviation*)

NZS6807:1994 the following procedures shall be followed:

- I. The heights at which an aircraft is conducting a landing or take-off procedure shall be determined in accordance with Part 91.311 of the Civil Aviation Rules.
- II. No averaging of L_{dn} levels is permitted.
- III. The noise levels of any individual helicopter flight movement include all noise generated while the helicopter is taxiing or on the ground including idling for warm up, cool down or between an arrival and departures.

Matters of discretion:

1. The maximum number of flights proposed in any day, night, week or month.
2. The effects of the predicted noise levels across adjacent land and at any Notional Boundary or other occupied building, including the future establishment of any Notional Boundary that is anticipated or provided for by the plan.
3. The extent to which the noise effects are compatible with the development and outcomes anticipated by this chapter and the relevant zone chapter provisions.
4. The extent to which the activity will support rural production activities.
5. The proposed flight paths in relation to Noise Sensitive Activities.
6. Cumulative noise levels and effects from any other consented or permitted (and utilised) helicopter landing area in the vicinity of the proposal.
7. Proposed mitigation measures to minimise noise effects across adjacent land, including site layout, timing of operations, number of movements during the day or night, type(s) of helicopter and the flight procedure ((flight track/path, ground idling, hovering).

NOISE-R11	Noise from the take-off and landing of helicopters (Other than for <i>agricultural aviation</i>)
	8. Proposed consent conditions which provide for recording, monitoring, reporting and review of noise effects. Activity status when compliance not achieved with RDA1: Non-Complying

10.3 Small scale wind turbines

We have worked with the Project Team to develop a rule/ standard that controls the noise levels from small scale wind turbines.

We have recommended that the noise limits for small scale wind turbines are set 10dB lower than the permitted zone standards.

This noise limit is designed to provide receivers with an adequate level of noise amenity (experienced indoors and outdoors). In our experience, small scale turbines have the potential to generate high frequency noise from their gearbox and drive systems that is likely to give rise to annoyance and adverse amenity effects at noise sensitive receivers, and at noise levels much lower than the zone noise standards.

10.4 Wind farms

We recommend that the PDP includes a restricted discretionary activity status for wind farms where the lower noise limits for 'High Amenity' areas as defined in section 5.3.1 of NZS6808:2010 are achieved. We recommend that any resource consent application to apply the higher noise limit for "general amenity" should require resource consent as a discretionary activity.

Our recommended rule is set out below:

Activity status: Restricted Discretionary

Where:

At any wind speed, the $L_{A90(10min)}$ wind farm sound level must not exceed the background sound level by more than 5dB, or a level of 40dB $L_{A90(10min)}$ whichever is the greater when measured within the notional boundary on any property which is a noise sensitive location as defined in New Zealand Standard 6808: 2010 Acoustics – Wind farm noise.

Wind farm sound levels shall be measured and assessed in accordance with New Zealand Standard 6808: 2010 *Acoustics – Wind farm noise*.

We recommend that the PDP require any wind farm applicant to provide the following information:

Any resource consent application for a wind farm shall be accompanied by a noise contour map prepared by a suitably qualified expert showing the noise level contour

representing the maximum noise output of the wind farm. The contours must represent the limit that can be used to set the noise limit for the activity and shall be consistent with those used to assess the maximum level of effect that a resource consent might authorise.

The contours shall be supplied to the Council in digital print form (e.g. pdf) and a digital form in a coordinate system and format that is consistent with the Councils GIS mapping system, prior to the operation of any wind farm.

10.5 Noise and vibration from State-Highways and Rail

Waka Kotahi and KiwiRail's submissions on the DDP seek the inclusion of controls to mitigate noise effects from road and rail corridors.

Our previous advice to the Project Team recommended that:

- Any consideration of the need for road-traffic noise controls are informed by Waka Kotahi providing accurate computer noise modelling of the spatial extent of noise emissions arising from traffic on the Gore state highway network. This information will assist understanding of the road-traffic noise levels and extent of the effects areas through residential and rural zones.
- That KiwiRail's provides evidence to demonstrate the proposed rail noise effects area represents the appropriate distance to manage noise effects from the Gore rail network. Any controls applying to the receiving environment need to be drafted and applied based on a strong evidential basis of the effects, and covering only the land that is actually affected.
- Any request by the agencies for the PDP to incorporate controls to address vibration from road or rail corridors is accompanied by evidence that demonstrates such controls are necessary and appropriate in the Gore District.

The Whangarei District Council have recently settled appeals on their District Plan review that related to the control of noise sensitive activities near to the state highways and rail network. We have provided the Project Team with the 2023 decision of the Environment Court (NZEnvC 004) (the **Whangarei Decision**) that confirms the agreed implementation of rail and state highway noise controls in the Whangarei District. These controls are discussed below.

10.5.1 Road traffic noise

The road traffic noise controls in the Whangarei Decision are likely to be generally suitable for implementation in the Gore District. We recommend that noise effects from road traffic on state highways in noise sensitive activities in new buildings or alterations to existing buildings should be managed by:

The PDP including a mapped State Highway Noise Control Boundary overlay within the modelled 53dB noise contour (and up to a maximum width of 100m) from the state highway carriageway. We understand that Waka Kotahi have completed the noise effects modelling across NZ and should be able to provide Council's GIS team with a digital file showing the extent of the 53 dB $L_{Aeq(24hr)}$ contour across the District.

Requiring acoustic treatment in new or altered noise sensitive spaces within the mapped noise overlay. The Whangarei Decision includes including new permitted activity sound insulation requirements and an appendix containing alternative construction standards, a restricted discretionary activity, advice notes, compliance standards, and a notification rule.

We note that the Whangarei decision does not include provisions relating to vibration effects from traffic on State Highways. We do not consider controls for road-traffic vibration to be necessary on the basis that these effects are better managed at source.

10.5.2 Rail noise and vibration

KiwiRail have provided feedback on the DDP seeking a 70m noise effects area from the rail corridor. KiwiRail's feedback does not provide any information on the frequency or type of rail movements through the Gore District.

We suggest that KiwiRail needs to demonstrate that the noise and/ or vibration effects generated by the use of its network are great enough to justify noise and vibration controls in the PDP, and if the effects are great enough, what should the extent of the control area be. This information should include predicted noise level contours for the busiest typical and foreseeable hour of rail traffic on the lines.

We recommend that further information is sought from KiwiRail to demonstrate the proposed rail effects area represents the appropriate distance to manage noise effects from the Gore rail network. Any controls applying to the receiving environment need to be drafted and applied based on a strong evidential basis of the effects, and covering only the land that is actually affected.

We recommend that the PDP should only include controls where the information demonstrates that the frequency of movements warrants land use controls in the receiving environment. The controls adopted in the Whangarei Decision may be a suitable starting point where mitigation is required in the receiving environment. The Whangarei approach relies on a combination of:

Rail noise

1. **For areas of the rail network with a low level of movements / effects:** A *Rail Noise Alert Area* that identifies the 53 dB rail noise contour across adjacent noise sensitive zones. The purpose of the Alert Area is to identify that properties within the mapped overlay may experience rail noise. No District Plan rules or notification requirements apply within the Alert Area.
2. **For areas of the rail network with a high level of movements / effects:** A Rail Noise Control Boundary overlay within the modelled 53dB noise contour (and up to a maximum width of 100m) from the legal boundary of the rail corridor. Permitted activity sound insulation requirements (and an appendix containing alternative construction standards, a restricted discretionary activity, advice notes, compliance standards, and a notification rule) for new or altered noise sensitive activities within the Rail Noise Control boundary.

Rail vibration

3. **For all areas of the rail network:** A *Rail Vibration Alert Area* that identifies the vibration-sensitive area within 60m of each side of the rail corridor. The purpose of the Alert Area is to identify that properties within the mapped overlay may experience rail vibration. No District Plan rules or notification requirements apply within the Alert Area.

These suggestions are preliminary only. As above, we recommend that the development and refinement of road and rail noise controls are informed by the agencies providing evidence relating to the noise and/ or vibration effects from Gore network. This information should justify that any PDP noise and vibration controls are appropriate.

10.6 Education facilities and early childhood education facilities (ECE's)

Many District Plans are including activity specific noise standards that enable ECEs and educational facilities to operate in residential zones subject to operating in compliance with a day-time noise limit of 55dB L_{Aeq} .

Educational facilities are inherently noise sensitive. They should generally be discouraged from establishing in potentially noisy commercial or industrial areas.

Enabling them to operate in residential zones also enables them to operate in areas that are close to homes and schools.

We understand the DDP seeks to provide for educational facilities subject to permitted standards, including restricting the number of children to no more than 8. We note that the PDP noise limit of 55 dB L_{Aeq} would be enabling for an ECE of this scale to operate.

We support the inclusion of an activity specific rule that enables ECE's to operate in Residential Zones provided they comply with a noise level of 55dB L_{Aeq} . This noise limit is 5dB higher than the normal zone standard and would only apply between the hours of 7am and 6pm on weekdays only. A 5dB increase in the noise level would be subjectively noticeable, but not significant. At all other times the normal zone noise standards would apply.

10.7 Temporary Military Training Activities

The DDP includes three rules to manage noise levels from TMTA:

- NOISE-R4 controls noise from "fixed" TMTA.
- NOISE-R5 controls noise from TMTA involving mobile noise sources.
- NOISE-R6 controls noise levels from temporary TMTA involving mobile noise sources from TMTA involving live firing, firing of blank ammunition, and/or the use of explosives.

It is commonplace for District Plans to prescribe specific rules for TMTA. In general terms, TMTA provisions seek to recognise and provide for the unique and generally infrequent range

of activities undertaken by the Defence Force under the Defence Act 1990. We understand that TMTA typically range from office/ classroom-based activities to large scale military exercises and may involve Search and Rescue, bomb deactivation training, weapons firing and personnel movements. TMTA may be undertaken over a period of days or weeks on an intermittent or continuous basis, during both day and night. The Ministry of Defence (MoD) provide input to the development of District Plans across New Zealand with the objective of seeking consistent permitted activity standards for TMTA.

We have reviewed the NZDF's feedback on the DDP seeking the inclusion of their standard controls. We have recommended updates to the DDP noise chapter that would require:

- Noise levels from fixed TMTA to be controlled by the underlying noise standards. This recommendation is made on the basis that the noise levels proposed by NZDF are generally consistent with the Rural Zone noise limits and a separate rule is not necessary.
- TMTA involving mobile noise sources are subject to the recommended noise limits for construction work, except that the noise levels are not required to be measured and assessed in accordance with the construction noise standard. This recommendation is made on the basis that Mandatory Direction 1 of the NVMS requires any plan rule to manage noise emissions must be in accordance with the applicable New Zealand standard. NZS6803:1999 is only applicable to activities defined as construction work. TMTA mobile noise sources do not meet the definition of construction work in NZS 6803:1999 and the noise sources are within the scope of NZS6802:2008.
- TMTA involving firing activities comply with separation distances to a notional boundary or peak sound pressure levels where the minimum separation distance cannot be achieved.

10.8 Construction noise

We have recommended several amendments to the DDP construction noise standard. In summary, our recommendations are to ensure that rule includes the relevant construction noise limits (rather than simply referring to the noise limits in NZS6803:1999). The rule should also specify the correct location for the measurement and assessment of construction noise (i.e. 1m from the façade of any occupied building). This approach is designed to ensure that plan users do not need to hold a copy of NZS6803:1999 to understand the noise limits recommended by NZS6803:1999 and to determine compliance with the rule. At the time of preparing this advice, the price of NZS6803:1999 from Standards New Zealand is approximately \$170 including GST.

NOISE-Noise from construction work R2

All zones	Activity status: Permitted Where: Noise from construction work complies with the following limits in Table 1 when	Activity status where compliance not achieved: Restricted Discretionary Matters of discretion:
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measured and assessed at 1m from the façade of any building containing a Noise Sensitive Activity that is occupied during the work.

2. Noise from construction work complies with the following limits in Table 2 when measured and assessed at 1m from the façade of any other building that is occupied during the work.
3. The noise from construction shall be measured and assessed in accordance with NZS6803:1999 unless varied by any part of this Chapter.

Notes:

1. The duration of construction is defined by the duration of the entire project from start to finish, even though some large projects may only affect some receivers for shorter periods.
2. Short-term duration means up to 14 days of work.
3. Typical duration means up to between 15 days and 20 weeks of work.
4. Long-term duration means more than 20 weeks of work.
5. The measurement and assessment period for construction noise is 30 minutes. No adjustment for duration or averaging shall be applied.

1. The noise level, hours of operation, duration and nature of the noise;
2. Proximity and nature of nearby activities and the adverse effects and disruption they may experience from the noise;
3. The noise levels inside any affected building where the doors and windows of that building are normally closed;
4. Effects on character and amenity values on the surrounding environment, particularly for long term construction work;
5. Effects on the health and wellbeing of people;
6. Any noise reduction measures or mitigation.
7. Length of time for which the specified noise standard will be exceeded at any receiver(s);
8. Alternative methods to avoid or minimize noise effects

Table 1:

Time of week	Time period	Duration of work					
		1. Typical duration (dB)		2. Short-term duration (dB)		3. Long-Term duration (dB)	
		LAeq	LAF(max)	LAeq	LAF(max)	LAeq	LAF(max)
Weekdays	6.30am - 7.30am	60	75	65	75	55	75
	7.30am – 6.00pm	75	90	80	95	70	85
	6.00pm – 8.00pm	70	85	75	90	65	80
	8.00pm – midnight – 6.30am	45	75	45	75	45	75
	7.30am – 6.00pm	75	90	80	95	70	85

Saturdays	6.00pm – midnight – 7.30am	45	75	45	75	45	75
Sundays and Public holidays	7.30am – 6.00pm	55	85	55	85	55	85
	6.00pm – midnight – 7.30am	45	75	45	75	45	75

10.9 Construction vibration

The ODP does not control construction or operational vibration. Vibration effects typically arise most-often from construction activities. Land use activities generating operational vibration effects across the receiving environment are typically rare, and the wide variance in the nature of the specific activities, levels and effects means that it is difficult to craft a standard that would manage potential vibration effects from all potential sources.

It is common for District Plans to include limits for construction vibration. The limits are typically designed to avoid cosmetic building damage and / or to manage potential effects on the occupants of the building. There are no construction vibration limits in the DDP.

We recommend that the PDP includes a standard to manage construction vibration only. Mandatory direction 3 of the NVMPs requires any plan rule to manage damage to structures from construction vibration must be consistent with the metrics for peak particle velocity (PPV) in ISO-4866:2010 – *Mechanical vibration and shock*. Our recommended rule is set out below:

Noise-RX Vibration from <i>construction work</i>			
All zones	Activity status: Permitted		Activity status where compliance not achieved with PER1a: Non-Complying
	Where:		Activity status where compliance not achieved with PER1b: Restricted Discretionary
	- Vibration from any <i>construction work</i> does not exceed: Building damage - the limits set out in German Industrial Standard DIN 4150-3 (2016): <i>Vibrations in buildings – Part 3: Effects on structures</i> when measured in accordance with that standard on any structure not on the same site; and Amenity - the limits in the table below when measured in the nearest corner of the floor of any storey within a multi-storey building, or within 500mm of ground level at the foundation of a single storey building containing any <i>noise sensitive activity</i> that is occupied during the <i>construction work</i>.		Matters of discretion: - Management of effects from the activity with particular regard to: - The level, timing, duration and nature of the vibration - Proximity and nature of nearby activities and the adverse effects and disruption they may
	Receiver	Period	Peak Particle Velocity Limit millimeters/second

Occupied <i>noise sensitive activity</i>	Night-time 10.00pm to 7.30am	0.3 mm/s
	Daytime 7.30am to 10.00pm	2 mm/s
Other occupied buildings	At all times	2 mm/s

Notes:

1. All vibration measurements shall be undertaken in accordance with ISO-4866:2010 – Mechanical vibration and shock.
2. Construction vibration levels of 2mm/s PPV are easily felt by receivers in residential units or other buildings and may generate complaints, especially if the source or impending duration of the vibration is unknown.
3. A construction vibration limit of 0.3mm/s PPV is near the limit of perception for most people and compliance with such a limit would avoid sleep disturbance for most people. The low limit would likely mean that no *construction activity* involving tracked or heavy machinery could occur in proximity to any occupied *noise sensitive activity*.
4. The vibration levels in R3.1.a are only likely to be approached or exceeded where high-vibration *construction activities* are undertaken, such as piling, vibratory compaction or blasting.
5. The vibration levels in R3.1.b are only likely to be approached or exceeded where moderate to high-vibration *construction activities* are undertaken, such as piling or vibratory compaction within approximately 50-100m, or from heavy tracked plant within 20m, of a *noise sensitive activity* or for blasting during the day. The vibration limits applying at night are much lower and require greater separation distances or low-vibration activities to achieve compliance.

- experience from the vibration
4. The potential effects on buildings and structures
 5. Any proposed measures to manage or mitigate vibration levels and effects
 6. Length of time for which the vibration standard will be exceeded at any receiver(s);
 7. Alternative methods to avoid or minimise vibration effects.

Appendix A Indicative buffer zones for airfields

Note: These have been prepared without accurate information on existing and future aircraft types and number of flights. The buffer zones could potentially be reduced if the number of flights are relatively low and aircraft types are predominantly light. The buffer zones may need to be increased if future flight numbers are high and/ or aircraft types are noisy.

The suggested MARP buffer zone takes into account rail activity.

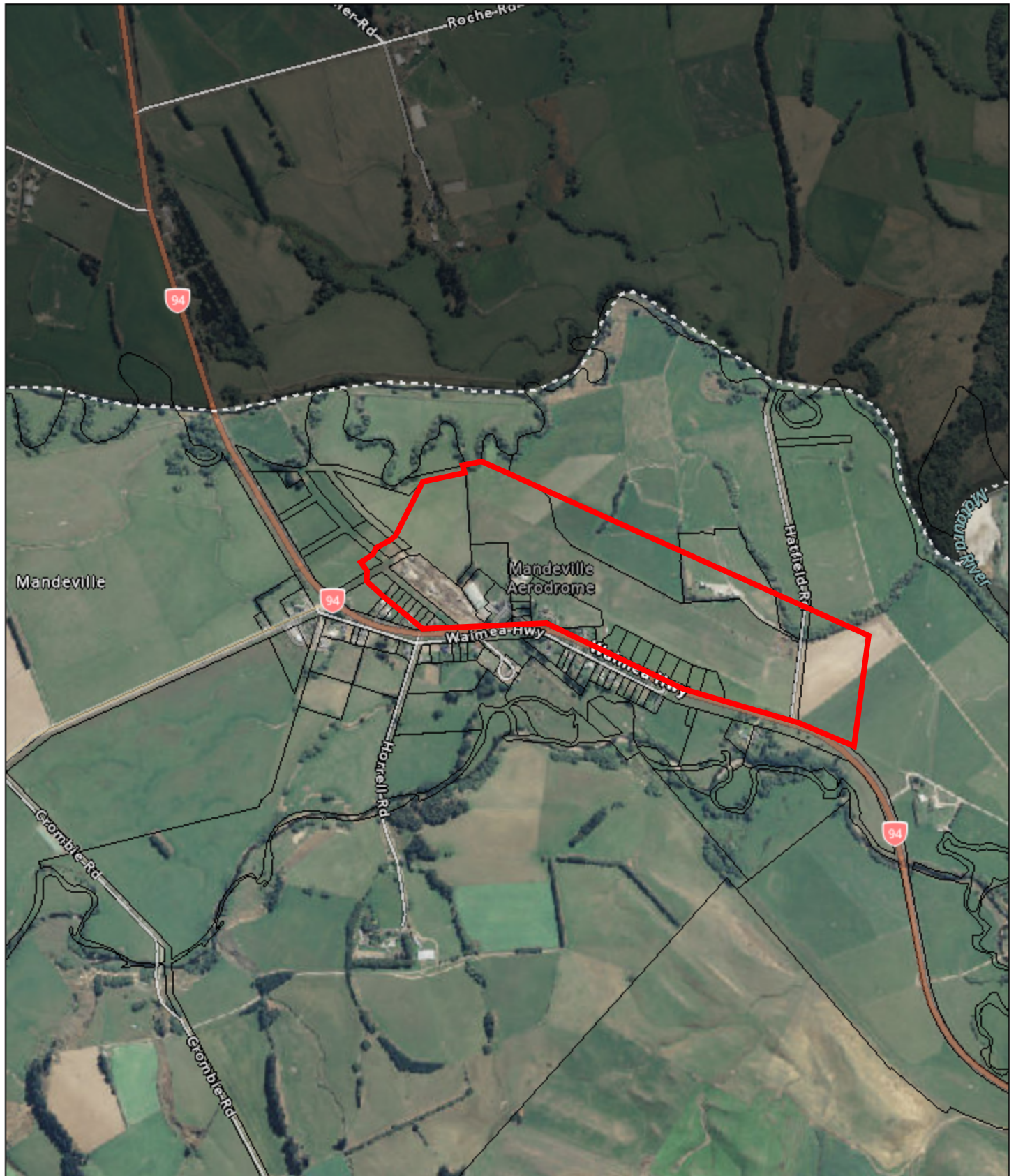
ArcGIS Web Map



8/3/2023, 8:56:32 AM

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0 1,000 2,000 4,000 ft
0 370 740 1,480 m

ArcGIS Web Map



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0 210 420 840 m

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