DRAFT

DISTRICT PLAN REVIEW

Topic 11: Noise and Vibration

Stage 1 Report

YOUR PLAN OUR FUTURE
TIMARU DISTRICT PLAN REVIEW

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TIMARU DISTRICT COUNCIL

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1 Introduction

Timaru District Council are reviewing the provisions of the Operative Timaru District Plan which is a process all territorial local authorities are required to periodically undertake to comply with Resource Management Act 1991 (RMA) requirements for such plans. Noise, which is defined within the RMA as including vibration, is an issue which, at times, comes to prominence due noise issues arising in the district, often driven by complaints. The District Plan noise provisions are relied upon by Council to ensure the District Plan achieves the social and environmental outcomes sought by the District Plan.

This report recommends a range of amendments and enhancements to the existing Operative District Plan that address noise issues identified below. This review aims to future-proof the District Plan by updating and strengthening the noise provisions and by adopting the latest standards and guidelines (where appropriate). This is also achieved by complying with the mandatory noise measurement requirements for district plans set out within the *National Planning Standard (Draft 2018*) and the sole applicable *National Environmental Standard (*Resource Management Act *[National Environmental Standards for Telecommunication Facilities]* Regulations 2008).

The overall aim is to review existing noise provisions and update them based on current industry best practice, New Zealand Standard, and any relevant requirements of the Resource Management Act [RMA] (and amendments) including remaining consistent with the applicable Canterbury Regional planning provisions, and the requirements of any *National Planning Standards* or *National Environmental Standards* relevant to the control of noise within district plans.

The review forms part of Council's widely publicised review of the existing District Plan. Recommendations for improvements in district plan noise provisions are intended to support rather than undermine the District's social, economic, and environmental vision, and to ensure that adverse impacts are avoided, or appropriately mitigated. This includes seeking to minimise impacts on parties potentially affected by noise and those who may be indirectly affected by people's reaction to noise [reverse sensitivity effects].

This District Plan noise and vibration review is being undertaken within the context of Council's wider statutory responsibilities. These include stewardship and protection of the environmental, social, economic, and cultural wellbeing of present and future generations within the District, and its statutory responsibilities in relation to the Treaty of Waitangi and tāngata whenua.

This review of District Plan noise and vibration provisions is intended to inform, and in part represent, Council's 'section 32' evaluation which is a process of evaluating alternatives, benefits and costs of any proposed district plan provisions as set out within section 32 of the Act.

2 Report Structure

Malcolm Hunt Associates have undertaken this review of the operative District Plan noise provisions based local and international research and enquiries undertaken in conjunction with Council staff. The reporting of our findings is being undertaken in two stages:

Stage 1 Report (this report) – This initial report defines noise and its effects, sets out the legislative basis to Council's role in managing the effects as a territorial Local authority, summarises the guidance set out in the relevant New Zealand Standards dealing with environmental noise, summarises the existing range of noise controls included in the operative District Plan, and sets out generic recommendations for the Proposed District Plan based on the recommendations of the relevant (current) NZ Standards and guidelines, and international 'best practice' in measuring and assessing the effects of noise in the environment.

The focus of the Stage 1 report is on the use of district plan noise controls that both enable reasonable levels of noise emissions from legitimate land use activities undertaken in the district, while protecting sensitive sites affected by the adverse effects of this noise.

This Stage 1 report sets out background information on the following topics which forms the context within which amended and expanded noise provisions have been developed for consideration within the proposed district plan;

- Noise as an environmental effect
- New Zealand & International Acoustic Standards
- National Environmental Standards
- National Planning Standards
- Effects of Noise
- Factors Affecting The Reaction To Noise
- Guideline Limits To Avoid Adverse Effects
- Recommendations For Protecting Health In NZ

A review has taken place of the noise provisions of the operative Timaru district plan with comments provided below in this report on the adequacy these provisions, together with suggested improvements and recommendations for possible incorporation into the Proposed District Plan (under development).

The discussions and generic recommendations set out below cover recommended permitted noise level limits for different zones reflecting the varying sensitivity to the effects of noise within the district plan zones and changes in noise sensitivity across times of the day. Comments and recommendations are provided the range of permitted activities within each type of zone. The recommendations outlined are generic in nature and do not include the actual proposed wording

policies, objectives, and rules.

e 2 Report – The Topic 11 Stage 2 report (under development) focusses on noise issues ssociated with strategic infrastructure and strategic transport networks. That companion report investigates and makes recommendations around land use planning and noise management in relation to the following important infrastructural assets and facilities located within the Timaru district;

- Roads and highways
- Timaru International Motor Raceway
- Fonterra
- Roading
- Redruth Landfill
- Stadiums and Events Centres
- Prime Port

The Stage 2 report reviews district planning methods and techniques to deal with potential "*Reverse Sensitivity*" effects of noise, in addition to the more direct effects of noise on amenity and well-being. This second report deals with planning measures to protect the efficient and effective operation of regionally significant infrastructure by avoiding or reducing operational constraints which can be created when inappropriate noise-sensitive activities establish on sites that are (or may be) affected by significant noise due to the operation of the above infrastructure assets and facilities. These type of noise effects are emerging within planning practice as important for district plans to deal with efficiently. This is clearly signalled within the relevant NZ Standards for transport noise and within the Canterbury Regional Plan (2013 Policy Statement).

3 Project Objectives

The review and update of the noise provisions of the Timaru District Plan is timely. Since the Timaru District Plan came into effect[1] the district has been developing, with various Plan Changes, resource consents, plan changes and subdivision consents being approved. These have allowed for use of land for noise-sensitive land uses over expanding areas, in addition to approved plan changes and resource consents which has allowed intensification of rural, commercial, and industrial activities in the district.

The Timaru Growth Strategy[2] refers to the population in residential areas of Timaru peaking at 28,230 in 2028 (current population 27,650) which signals only modest population growth. However, the Growth Strategy relies heavily on the proper functioning of commerce, industry, and transportation links.

[1] The Timaru District Plan (District Plan) was approved by the Timaru District Council on 22 February 2005 and was deemed to be operative on 8 March 2005.
[2] *Timaru District 2045 Draft Growth Management Strategy* May 2018.
https://www.timaru.govt.nz/services/planning/district-plan/district-plan-review/growth-management-strategy

Changes in work practices have also occurred over the years which has resulted greater flexibility in operating hours for some businesses which, coupled with increased traffic volumes on the highway and roading network, increases environmental noise effects experienced in many living areas throughout the district. Although much of the district is rural, there are new and emerging expectations around the protection of aural amenity in these quieter areas. In some cases, increased noise has resulted in perceived adverse noise effects, particularly on adjacent or nearby receiver sites. In addition to changes in the district, there have been important changes in the recommendations of the relevant NZ Standards and in international 'best practice' which have been considered within the findings set out below.

A key aim of this review is to better manage the effects of environmental noise within the district, consistent with Councils obligations under Section 31(1)(d) of the RMA to "*control the emission of noise and the mitigation of the effects of noise*" within its territory.

As explained below, our review finds the current operative District Plan uses a mixed approach to manage the effects of noise, with a stand-alone chapter (Part D 6.21) that addresses district-wide noise matters. Specific noise emission requirements are set out in the zone provisions based around permitted activity standards, setting noise limit that provide for a variable quality of acoustic environment appropriate to different parts of the District. As below, we consider the basic approach of the Operative Plan as workable as they form a reasonable platform from which to establish a new suite of district plan noise controls so that a fit-for-purpose, forward-thinking, pro-active Proposed District Plan can be developed.

4 Related Documents

This review has considered several information sources including the following documents and publications;

- Operative Timaru District Plan and maps [March 2005];
- Timaru District Council – District Plan Review. Topic 11: *Noise Discussion Document*, November 2016;
- Regional Policy Statement (Canterbury Regional Council - Regional Policy Statement 2013 Revised February 2017);
- Regional Coastal Environment Plan for the Canterbury Region (including maps);
- Timaru District Council - *Timaru District 2045 Draft Growth Management Strategy* May 2018.
- National Planning Standard (Draft 2018)
- Resource Management Act [National Environmental Standards for Telecommunication Facilities] Regulations 2008.

- *Guidelines for Community Noise* edited by Birgitta Berglund, Thomas Lindvall, Dietrich H Schwela. World Health Organization 1999

- *Guidelines for Night Noise Guidelines for Europe* [NNGfE]. World Health Organization Regional Europe Office. World Health Organization Regional Europe Office 2009

- *Exposure-response relationships for transportation noise* Miedema HM, Vos H. J Acoust Soc Am. 1998 Dec;104[6]:3432–3445;

- Noise sensitivity as a factor influencing human reaction to noise. Job RF Soames. Noise & Health. 1999;1[3]:57–68;

- *Synthesis of social surveys on noise annoyance.* Theodore J. Schultz. J. Acoust. Soc. Am. Volume 64, Issue 2, pp. 377-405 [1978]; [29 pages].

- Standards New Zealand – Acoustic standards [various, as listed below].

5 What Is Noise?

As noted above, the simplest definition is 'unwanted sound'. Apart from this reaction which is perception-based, there is no other simple distinction that can be made between 'sound' and 'noise'.

Psychologically, sound is perceived by the human body through physiological processes in the auditory brain. The complex pattern of received sounds is perceptually classified ('labelled') by the brain as noise, music, speech and so forth. Because it is unwanted, noise can affect the well-being of people and their subjective perceptions of the environment, particularly in urban areas where wide areas are affected by man-made noise sources.

The key players in the management of noise in the environment are:

- The noise producers;
- Regulatory authorities, Timaru District Council & Canterbury Regional Council;
- The noise receivers;

6 Resource Management Act

The Resource Management Act 1991 (RMA or the Act) defines "noise" as unwanted sound and includes 'vibration' within this definition.

District Plans are required to address adverse environmental effects, including noise. Noise control rules are included in most District Plans and Regional Coastal Plans, as provided for in the Second Schedule of the Act. Under s.31 of the Act, territorial authorities have the primary responsibility for managing the effects of land uses and noise [including the mitigation of noise]. Territorial authorities also have responsibility under the RMA to achieve integrated management of the effects of the use, development, or protection of land associated with natural and physical resources. This includes effects on amenity values that may be affected by noise.

The primary human response to noise in the environment is annoyance. However, not all noise annoyance is controlled via the RMA. Noise from aircraft not operating near the airport, or from vehicles operating on a public road are not subject to RMA control.

The aim of the RMA is to "promote the sustainable management of natural and physical resources". Sustainable management involves balancing the use of resources with the need to protect the environment and to provide for the needs of future generations. The term 'environment' includes people and communities and their ability to provide for their social and cultural well-being as well as for their health and safety.

To achieve the above aim the RMA sets up mechanisms to control the effects that activities may have on the environment, including noise.

District Plans typically limit noise from land use activities located on other sites in the area. The effect is a 'proximal' one, that is, the degree of effect relates to the proximity to the source of the noise, and therefore its sound level or intensity.

District Plan noise limits typically allow for some sound or noise to be emitted from permitted (or consented) activities to be emitted a reasonable level. This may cause audible sound to be detected outdoors within sensitive receiving environments (such as residential sites). Thresholds for "adverse effects" of noise received within these environments are required to be set at acceptable levels to protect human health and welfare (e.g. providing sleep protection). However, noise received up to, but not exceeding, these limits will result in some received sound that is clearly detectable outdoors, yet these effects usually do not represent a significant adverse effect.

The RMA does not require noise abatement simply because a sound is audible within sensitive receiver sites. Unless these sounds can be shown to be objectionable or cause significant adverse effects, the District Plan enables permitted land use activities to emit 'reasonable' levels of sound which can, in many cases, result in audible sound to be experienced at sensitive receiver sites. The allowable maximum level of this sound (as set out within District Plan permitted activity noise standards) would be sufficient to protect human health and welfare (such that, when this level of received noise is assessed in accordance with the appropriate Standards and procedures, the effects would be assessed as acceptable).

The RMA embraces sustainable management of natural and physical resources, focusing on the effects that land use activities have on the receiving environment.

Under the RMA 'noise' is defined as including vibration. The cross-boundary effects of vibration are *usually* not a major concern that needs to be controlled within a district plan; however, this is an environmental effect that arises from time to time [mainly due to industrial type activities or construction works] as is considered within the recommendations for future District Plan provisions set out below.

Section 16 of the RMA places a general duty on all occupiers to adopt the best practicable option to ensure noise emitted from any site does not exceed a reasonable level. What constitutes a "reasonable level" is not prescribed by the Act. However, the permitted day and night noise criteria set out within district plans are commonly adopted as a guide to reasonableness.

The RMA provides for Councils to control noise effects through;

- Provisions within district plan;
- Conditions attached to resource consents;
- Enforcement proceedings including: Abatement notices, enforcement orders and; excessive noise direction notices.

7 Standards & Guidelines

7.1 Introduction

The Operative Timaru District Plan refers to several acoustic standards for the measurement and assessment of environmental noise. Such standards perform an important role in ensuring a repeatable and reliable result when assessing compliance with noise limits and are key to Council's ability to monitor and enforce noise standards in the District Plan.

Standards are developed by expert committees with consensus required before being formally approved by the Standards Council in accordance with the Act. New Zealand Standards do not have any 'regulatory force' on their own unless cited as a means of compliance in a statutory document, such as in the District Plan, or within a condition of Resource Consent.

Acoustic standards can be viewed as the 'backbone' of District Plan noise provisions. Since 1977 Standards New Zealand have published sixteen New Zealand Standards guiding on the measurement and assessment of environmental noise. These Standards are well respected and have established legal status within district plans when they are incorporated by reference into district plans (Part 3 of the RMA). all material incorporated by reference in a plan has legal effect as part of that plan. Information included by reference that expires or is revoked only ceases to have legal effect if the Plan is changed in accordance with Part 1 of Schedule 1. This means that even if the standards referred to in the Plan are superseded by new standards, a plan change would be required to require the use of the new standards in resource consent applications.

It is trite to suggest the most recent versions of the relevant acoustic Standards should be referenced in the proposed District Plan. It would be considered inconsistent with best practice to do otherwise. As below the recently released (Draft) National Planning Standard mandates the inclusion of most of the current NZ noise standards as a means of standardising the content and format of district plans around New Zealand.

7.2 Superseded New Zealand Acoustic Standards

The following eight New Zealand standards are superseded and should be referred to within any new district plan :

NZS 6801:1977 *Methods of Measuring Sound*
NZS 6802:1977 *Assessment of Noise in the Environment*
NZS 6801:1991 *Measurement of Environmental Noise*
NZS 6802:1991 *Assessment of Environmental Noise*
NZS 6801:1999 *Acoustics–Measurement of Sound*
NZS 6802:1999 *Acoustics – Assessment of Environmental Sound*
NZS 6803P:1984 *The Measurement and Assessment of Noise from Construction, Maintenance and Demolition Work.*

7.3 Current New Zealand Acoustic Standards

The following eight New Zealand standards are the most recent and technically most appropriate standards for measuring, assessing, and mitigating environmental noise in New Zealand:

NZS 6801:2008 *Acoustics –Measurement of Environmental Sound*
NZS 6802:2008 *Acoustics –Environmental Noise*
NZS 6803:1999 *Acoustics – Construction Noise*
NZS 6805:1992 *Airport Noise Management and Land Use Planning*
NZS 6806:2010 *Acoustics – Road Traffic Noise – New and Altered Roads*
NZS 6807:1994 *Noise Management and Land Use Planning for Helicopter Landing Areas*
NZS 6808:2010 *Acoustics –Wind Farm Noise*
NZS 6809:1999 *Acoustics – Port Noise Management and Land Use Planning*

Recommendations set out within these Standards regarding methods of measuring and assessing noise, together with guidance provided regarding rule-setting to manage adverse effects are very relevant and are considered to represent best practice. The recommendations of all above (eight) NZ acoustic standards have been followed within the recommendations set out below regarding the noise provisions of the proposed Timaru District Plan.

7.4 International Standards

Standards New Zealand represents New Zealand as members of the International Organization for Standardisation [ISO] and the International Electro Technical Commission [IEC] which form the technical basis on which many standards developed in New Zealand are based. Through New Zealand's membership of these organisations New Zealand shares expertise and knowledge in several areas.

New Zealand acoustic standards for environmental noise identify the relevant international standards within the list "Related Documents" found within each relevant NZ Standard.

As below, the National Planning Standard requirements (CM-2) require the adoption of one international standard, DIN 4150-3 (1999) *Vibrations in buildings – Part 3: Effects on structures*. Whether or not any vibration rule needs to be included in the Proposed Timaru District Plan to manage building damage due to vibration from other land use activities (not applicable to public roads) is discussed within the recommendations below.

7.5 National Environmental Standards

The Timaru District Plan is a mandatory document and its contents must give effect to, and *cannot* be inconsistent with, the provisions of documents prepared at the regional and national level. New Zealand Standard should not be confused with a 'National Environmental Standard' [NES]. NES are specific regulations issued under Sections 43 and 44 of the RMA and apply nationally providing methodologies or requirements on environmental matters, although they may prescribe technical standards where appropriate. Both New Zealand Standards and NES have the common goal of providing a consistent approach and process throughout New Zealand – however there is a key difference. Under an NES, each regional, city or district council must enforce the same standard without variation, whereas New Zealand Standards can be adopted in whole or in part and can vary between regulators.

At the time of preparing this chapter there was one NES relating to noise but in the specific context

of *telecommunications facilities* NZS 6801:2008 and NZS 6802:2008 are cited in Clause 9[4] of the Resource Management Act [National Environmental Standards for Telecommunication Facilities] Regulations 2008.

A rule is recommended below which implements the NES within the proposed Timaru District Plan by establishing limits on noise arising from the operation of roadside telecommunications facilities and cabinets and received in the local environment.

7.6 National Planning Standards

In July 2018 Ministry for the Environment released the *Draft National Planning Standards*[3] which sets 18 draft national planning standards relevant to the various resource management policy statements and plans found in New Zealand. In relation to "District Plans" this Standard places requirements on any new district plan to adhere to a specified (generic) District Plan Structure (S-DP) which itself imposes specific "chapter" requirements covering the following:

1) Introduction and General Provisions (S-IGP)
2) Tangata Whenua (S-TW)
3) Strategic Direction (S-SD)
4) District Wide Matters (S-DWM)
5) Area Specific Matters (S-ASM)
6) Schedules, Appendices, Maps (S-SAM)

Noise is referred to under the heading of "District-wide Matters" within Section S-DWM "Draft District Wide Matters Standard". The requirement of this Standard (clause 31 page 40 of the draft) states "*If the following matters are addressed in the plan, they must be located in the Noise and light section*".

Where a 'Nosie and light" section is to be provided within a proposed plan, this section must contain (as a minimum);

a) Noise limits or "thresholds" to be set for each zone
b) Details to be provided of where sound insulation is required for sensitive activities
c) Limits to be set regarding the location of noise sensitives activities relative to noise generating activities.
d) There is a requirement to include (where appropriate) *"specific requirements for common significant noise and light generating activities*".

Clause 32 requires "*any noise related metrics*" to be consistent with the Noise and Vibrations Metrics Standard (CM-2). Appendix CM-2 sets out specific requirements for noise provisions of district plans as follows;

As specified within Table 30 (page 92) of the draft Planning Standard, rules to manage an emission of noise must be consistent with noise measurement methods in the New Zealand Standards listed as follows;

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[3] Ministry for the Environment. 2018. *Draft National Planning Standards*. Wellington: Ministry for the Environment. ISBN: 978-1-98-852562-4 (online) Publication number: ME 1364

NZS 6801:2008 *Acoustics –Measurement of Environmental Sound*
NZS 6802:2008 *Acoustics –Environmental Noise*
NZS 6803:1999 *Acoustics – Construction Noise*
NZS 6805:1992 *Airport Noise Management and Land Use Planning*
NZS 6806:2010 *Acoustics – Road Traffic Noise – New and Altered Roads*
NZS 6808:2010 *Acoustics –Wind Farm Noise*
NZS 6809:1999 *Acoustics – Port Noise Management and Land Use Planning*

The following is of note within the requirements of CM-2:

1) NZ Standard NZS 6807:1994[4] applied to assess noise from helicopter landing areas is not included within the list of NZ Standards required to be referenced within the proposed Timaru District Plan. This is an established Standard already adopted into many district plans and relied upon within those Plans (and within a great many conditions attached to resource consents) to assess the reasonableness of noise from helicopter landing areas. This Standard is considered workable and enforceable. We see no reason this Standard should not also be included in the proposed plan despite it not be mandatory under the National Planning Standard.

2) The NZ Standard that is widely applied to manage noise around airports and to guide on planning around airports, NZS6802:1992 is annotated in Table 30 with the words "measurement only". We consider these words in Table 30 to be somewhat superfluous as the text above Table 30 (CM-2, mandatory direction 3) already states *"Any plan rule to manage an emission of noise must be consistent with noise measurement methods in the New Zealand Standards listed in table 30"* [emphasis added].

The National Planning Standard recommends adopting the measurement methods of seven of the 8 current NZ standards dealing with environmental noise. The recommendations set out in this report for generic noise provisions to manage environmental noise effects within the Timaru district closely follow the above minimum requirements of the National Planning Standard.

As above, the recommendations set out within the eight current NZ Standards dealing with environmental noise are considered 'best practice' in terms of methods for measuring and assessing noise, together with guidance provided regarding rule-setting to manage adverse effects. We recommend compliance with the NZ National Planning Standard be achieved by following recommendation of all (eight) current NZ acoustic standards within the recommendations set out below for the proposed Timaru District Plan.

[4] NZS 6807:1994 *Noise Management and Land Use Planning for Helicopter Landing Areas*

8 Effects of Noise

8.1 Overview

To date, research into the effects of environmental noise[5], have been based on the annoyance it causes to humans, or the extent to which it disturbs various activities undertaken by people. This is because annoyance is the most commonly expressed reaction by those exposed to intrusive sound in the environment. At a biological level, noise is considered a non-specific stressor that may cause adverse effects on humans in the long term. Epidemiological studies suggest a higher risk of cardiovascular diseases, including high blood pressure and myocardial infarction [heart attacks], in people chronically exposed to high levels of road or air traffic noise[6]. In many cases noise occurring in the environment is simply intrusive, interfering with listening to television or radio or affecting the enjoyment of quiet outdoor areas around in the home or in parks or reserves.

The effects of environmental noise are usually expressed in terms of:

Annoyance – displeasure expressed due to noise

Speech interference - high levels of noise can make normal speech difficult to hear

Performance - some noises can make concentration difficult and interfere with tasks such as learning, checking fine details [such as any job with a large mathematical component or where the meaning of words is critical] or work where small, precise, movements or intense concentration is required;

Mental health [including noise-induced stress-related effects];

Sleep disturbance - in addition to fatigue and mental health effects, disrupted sleep patterns can leave people irritable, change their behaviour, and reduce their ability to work or perform tasks.

8.2 Noise Complaints

The clear majority of noise complaints in the community involve neighbours playing loud music or having noisy parties, particularly during the night and at weekends[7]. The number of noise complaints lodged annually with Timaru District Council are have been reported[8] as follows:

2013	550
2014	1039
2015	1016
2016	1011
2017	873
2018	522

The above data shows high variance in annual complaint records. This could be due to seasonal or

[5] 'environmental noise' excludes noise in the workplace, and effects on the hearing mechanism itself.
[6] *WHO Burden Of Disease From Environmental Noise - Quantification Of Healthy Life Years Lost In Europe*. World Health Organisation, Geneva, 2011.
[7] www.timaru.govt.nz/services/environment/noise-and-graffiti/noise-control/noise-in-your-neighbourhood
[8] Report by Councils CRM system July 2018 *Pers comm.* S.Hoogenraad, Enforcement Officer,Timaru District Council.

other effects. Although there is no ideal target for annual noise complaint rates, the Timaru data seems light compared to some centres (e.g. 799 noise complaints were registered with Rotorua Lakes Council noise control staff over a five-week period between December 1, 2016 to February 8, 2017[9]. Even without considering the 'complaint rate per 1,000 population', Timaru seems to have a low rate of noise complaints per capita.

The majority of noise complaints Council receive are usually dealt with under the "excessive noise" provisions of the RMA and do not usually involve assessment of district plan noise rules which are designed for land use compatibility planning and good urban design. Although not all noise complaints turn out to be reasonable, some complaints can trigger wider planning steps to control adverse noise effects of land use activities. Most Councils who have had to initiate noise abatement proceedings or enforce district plan noise rules have done so due to community concerns evidenced by complaints of excessive noise by neighbours.

8.3 Factors Affecting the Reaction To Noise

There are a range of factors which determine noise effects in various zones these include:

- **Time of day**

  The District Plan noise limits are set lower for night time reflecting people's increased sensitivity to noise during these hours. The current District Plan sets different time internals

- **Level of sound**

  The sound levels can range from loud sounds [exceeding the normal ambient sound level by 10 dBA or more] through to relatively low-level sounds. The level of sound depends on various factors and will change with the different types of noise sources across the different zones in the district.

- **Type of sound**

  The types of sounds can range from amplified music outside a cafe through to sounds from farm equipment in the rural zone or a person mowing their lawns. The types of sound in the residential area such as lawn mowers will be different from that found in rural areas which may include agricultural equipment or amplified sound being only three examples of many.

8.4 Guideline Limits To Avoid Adverse Effects

Published research reasonably demonstrates a strong linkage between exposure to environmental noise and the adverse effects of noise such as annoyance, sleep disturbance, and decreased learning performance in the classroom. However, for effects such as changes in the immune system and birth defects, the evidence is apparently limited [WHO 1999].

Our research confirms there have been no new substantive findings in respect of the threat that

[9] https://www.nzherald.co.nz/rotorua-daily-post/news/article.cfm?c_id=1503438&objectid=11797725

environmental noise poses to human health and welfare since the District Plan was first published. Most public health impacts of environmental noise were identified as far back as the 1960's with research in more recent times concentrating on the elucidation of the mechanisms underlying the known effects, such as noise induced cardiovascular disorders and the relationship of noise with annoyance and non- acoustical factors modifying health outcomes[10].

The Ministry of Health monitors protection of public health from environmental noise through reporting by *National Environmental Noise Service* [NENS] which it funds. NENS has been closely involved in developing and revising various New Zealand acoustic standards, including NZS 6802, a key Standard guiding on the assessment of noise referred to within the District Plan, and within the discussion below. Thus, to reasonably provide for the protection of health and amenity, recommendations for managing environmental noise should adhere to the guidance set out within NZS6802:2008.

Noise effects during night time periods are of specific concern in terms of people's health and welfare. The following table describes effects of different levels of night noise on the population's health with noise levels measured as $L_{night,outside}$ (Ref. WHO *Night Noise Guidelines For Europe* 2009)

Average night noise level over a year, $L_{night,outside}$	**Health effects observed in the population**
Up to 30 dB	Although individual sensitivities and circumstances may differ, it appears that up to this level no substantial biological effects are observed. $L_{night,outside}$ of 30 dB is equivalent to the no observed effect level (NOEL) for night noise.
30 to 40 dB	A number of effects on sleep are observed from this range: body movements, awakening, self-reported sleep disturbance, arousals. The intensity of the effect depends on the nature of the source and the number of events. Vulnerable groups (for example children, the chronically ill and the elderly) are more susceptible. However, even in the worst cases the effects seem modest. $L_{night,outside}$ of 40 dB is equivalent to the lowest observed adverse effect level (LOAEL) for night noise.
40 to 55 dB	Adverse health effects are observed among the exposed population. Many people have to adapt their lives to cope with the noise at night. Vulnerable groups are more severely affected.
Above 55 dB	The situation is considered increasingly dangerous for public health. Adverse health effects occur frequently, a sizeable proportion of the population is highly annoyed and sleep-disturbed. There is evidence that the risk of cardiovascular disease increases.

[10] *Noise Exposure and Public Health* Willy Passchier-Vermeer and Wim F. Passchier, Environmental Health Perspectives, Vol 108, Supplement l, March 2000.

Noise limits in New Zealand are based on $L_{Aeq(15\ min)}$ and L_{AFmax} which are widely adopted in District Plans across New Zealand. By limiting the 15 minute average sound level to 40 or 45 dB during night time, the 9 hour LAeq sound level would mostly measure well below 40 dB, except where transportation noise has an effect (transportation noise is largely unregulated by the District Plan).

Thus, the WHO *Night Time Noise Guidelines* criteria **$L_{night,outside}$ are mostly met within New Zealand urban areas away from transportation sources. There is insufficient evidence that the effects observed at levels during night time below 40 dB $L_{night,outside}$ are harmful.**

8.5 Recommendations For Protecting Health in NZ

New Zealand Standard NZS6802:2008 *Acoustics – Environmental Noise* (discussed below in the following Section) provides guidance on levels of outdoor environmental noise adequate to protect health.

The New Zealand acoustic standards series such as NZS6802 have since the 1977 versions provided recommended criteria or noise limits for the protection of Health and Amenity for "normal" or "average" populations. These recommended guideline limits are provided as guideline residential upper noise limit values using L_{AFmax} and L_{Aeq} in the latest 2008 version of NZS 6802. NZS6802:2008 warns against setting low noise limits which cannot be properly measured and assessed within the context of existing modest or high ambient sound levels [See, NZS6802:2008 clause 8.6.3].

It is for these reasons NZS6802:2008 states such limits when adhered to provide "reasonable" protection of health and amenity. The 2008 version of the standard introduced an evening period with limits between the day and night limits which has emerged as best practice, ensuring the decibel limit recognised the ambient sound climate in residential areas.

The following extract from Section 6 of NZS6802:2008 summarises the upper limits recommended for residential sites to avoid adverse noise effects;

> ***8.6.2*** *As a guideline for the reasonable protection of health and amenity associated with use of land for residential purposes, the noise limits in table 3 should generally not be exceeded at any point within the boundary of a residential site, for example, at any point within the notional boundary of a rural dwelling.*
>
> ***Guideline residential upper noise limits***
>
> | | |
> |---|---|
> | *Daytime(1)* | *55 dB $L_{Aeq(15\ min)}$* |
> | *Evening(1,2)* | *50 dB $L_{Aeq(15\ min)}$* |
> | *Night-time(1)* | *45 dB $L_{Aeq(15\ min)}$* |
> | *Night-time(1) Lmax* | *75 dB L_{AFmax}* |
>
> *NOTE–*
>
> *(1) The definition of times of day are a matter for the relevant local authority and should recognise that a period of not less than 8 hours needs to be provided for sleep to ensure at least the minimum acceptable degree of health protection.*
>
> *(2) Inclusion of an evening period and its hours of application are a matter for the relevant local authority.*
>
> *(3) This clause is not framed as a consent condition, rule or national environmental standard and should not be quoted for those purposes.*

Looking broadly across District Plans in NZ generally, daytime noise limits are commonly set at 50 to 55 dB $L_{Aeq[15\ min]}$ while night time limits of 40 to 45 dB $L_{Aeq[15\ min]}$ and 70 to 75 dB L_{AFmax} are commonly applied within residential receiving environments for the protection of health and amenity.

NZ Standard NZS6802:2008 acknowledges local authorities are free to consider making noise limits more or less stringent to suit their particular circumstances and requirements.

9 Summary Of Operative District Plan Noise Provisions

This section summarises the environmental noise provisions currently set out in the operative Timaru district plan.

9.1 Summary of Part B Existing Noise Provisions – Part B Pages B12-147: NOISE

Resource Management Issues, Objectives, Policies, Methods, Environmental Results

The overall noise "Issue" is described as;

Issue:

The adverse effects of noise are an issue in both urban and rural areas where noise may have an adverse effect on the health of people and communities and their enjoyment of the District, as well as an effect on natural values.

Objective:

Minimise the situations where there is conflict between noise emissions from land use activities and other more sensitive land uses.

Policy:

1. *To avoid or mitigate effects of noise on residential uses and other sensitive areas, by limiting noise emissions within residential, rural and natural areas, and by discouraging residential and other sensitive uses from locating close to land zoned or used for noisy activities.*
2. *To provide rules setting noise limits adequate for the protection of community health and welfare while enabling control of reasonable noise emissions from activities.*
3. *To rely on the statutory provisions of the Resource Management Act to address noise problems, where there is no suitable standard laid down by the District Plan or by conditions of a resource consent.*

Anticipated Environmental Outcomes

(1) A variable acoustic environment in different areas of the District with a high degree of separation of incompatible land uses.

(2) The health of people in communities is adequately protected from noise emissions

Comment:

The above objective, policies and anticipated outcomes are considered appropriate, but do not go far enough in dealing with "noise mitigation" (reflecting the RMA s.16 duty to adopt the best

practical options) and emerging issues such as "reverse sensitivity" noise effects (these are needed to be dealt with as part of Council's duties under s.31 of the RMA). These are matters to be dealt within in the Stage 2 report (in development).

A summary of the noise rules within each zone of the Operative District Plan are set put below.

9.2 Summary of Existing Noise Provisions – Part D

The following is a summary[11] of the noise objectives, policies, and rules found within the provisions of the operative Timaru district plan, as set out within the provisions applying to each zone;

9.2.1 Part D (1) Rural Zones

1.4.1 ISSUE	Conflicts occur between rural residential activities and other land uses in rural areas and some activities in adjoining zones including motorsports and industry where there are differing expectations about acceptable noise levels.
1.4.2 OBJECTIVE	Maintenance of a reasonably quiet rural environment while accommodating periodic intrusions.
1.4.3 POLICIES	(1) To provide for a moderate maximum noise level while allowing for reasonable normal seasonal agricultural and forestry use e.g. harvesting machinery.
	(2) To preserve the amenity values of the rural area, non-agricultural activities with a potential adverse noise impact, such as motorsports, powered aviation, range shooting, or entertainment facilities, will be required to obtain resource consents. Noise limits for noise received by occupants of rural dwellings will be set to avoid restrictions on normal agricultural and forestry activities. The activities of aircraft at the Richard Pearse Airport will also be subject to noise limits within the Airport Noise Boundary identified on Planning Map No 22. Controls on some noise sensitive activities including subdivision for rural living sites are also included to protect the functioning of the Airport. Subdivision for Activities Sensitive to Aircraft Noise within the Airport Noise Boundary shall be avoided. On occasions bird scaring devices can cause significant adverse effects. When considering whether the excessive or unreasonable noise provisions of the Act should be used, regard will be had to the time of day or night, location relative to property boundaries, nearby household units and the orientation of the device. (3) To generally exclude activities likely to result in high noise levels from or near to natural areas.
RURAL 1 ZONE (R1) & RURAL 2 ZONE (R2) Rules	5.22 Subject to 5.23, all activities shall be designed and conducted so that noise levels shall not exceed **50dBA L10** at the notional boundary of the nearest household unit on any other site between 7.00am and 10.00pm on any day, and **40dBA L10** and **70dBA Lmax** at all other times. Noise levels shall not exceed either: • **50dBA L10** at any point within the boundary of any Residential 1, 3

[11] Note: Emphasis and underlining within the quoted district plan text has been added by the author.

	or 5 Zone between 7.00am and 10.00pm on any day, and **40dBA L10** and **70dBA Lmax** at all other times; and • **55dBA L10** at any point within the boundary of any Residential 2 or Residential 4 Zone between 7.00am and 10.00pm on any day and **45dBA L10** and **75dBA Lmax** at all other times, unless specific noise limits are provided for the activity elsewhere in this Plan.
	Rules 5.23 – Timaru Airport Noise provisions See Stage 2 Report
	5.24 See General Rule 6.21 for measurement and assessment of noise, and standards for construction and maintenance noise
	5.25 Audible bird scaring devices may be operated in accordance with the following conditions: (1) At a frequency of not more than twelve events per hour. The term "events" includes clusters of up to three shots from gas operated devices or three multiple shots from firearms in rapid succession (subject to the following conditions); and (2) The sound from any bird scaring device shall not exceed **85dBC peak** or un-weighted level measured at the notional boundary of any household unit on any other site; and (3) Bird scaring devices shall be located as far as is practical away from adjoining residences and they shall be aligned to point away from adjoining residences.
RURAL 3 ZONE (R3)	5.18 Noise levels shall not exceed **50dBA L10** at the notional boundary of the nearest household unit on any other site between 7.00am and 10.00pm on any day, and **40dBA L10** and **70dBA Lmax** at all other times, unless specific noise levels are provided for the activity elsewhere in the District Plan. 5.19 See General Rule 6.21 for measurement and assessment of noise, standards for construction and maintenance noise 5.20 Audible bird-scaring devices (including firearms where used for this purpose) may be operated in accordance with the following conditions: (1) At a frequency of not more than twelve events per hour. The term "events" includes clusters of up to three shots from gas operated devices or three multiple shots from firearms in rapid succession (subject to the following conditions); and (2) The sound from any bird scaring device shall not exceed **85dBC peak** or un-weighted level measured at the notional boundary of any household unit on any other site; and (3) Bird scaring devices shall be located as far as is practical away from adjoining residences and they shall be aligned to point away from adjoining residences.
RURAL 4A ZONE (GERALDINE DOWNS)	6.5 Noise levels shall not exceed **50dBA L10** at the notional boundary of the nearest household unit on any other site between 7.00am and 10.00pm on any day, and **40dBA L10** and **70dBA Lmax** at all other times, unless specific noise levels are provided for the activity elsewhere in the District Plan. 6.6 See General Rule 6.21 for measurement and assessment of noise, standards for construction and maintenance noise. 6.7 Audible bird-scaring devices (including firearms) may be operated in accordance with the following conditions:

	(1) Not earlier than 7.00am and not later than 8.00pm. (2) At a frequency of not more than 12 events per hour. The term "events" includes clusters of up to three shots from gas operated devices or three multiple shots from firearms, in rapid succession (subject to the following 2 conditions): (3) The sound from any bird scaring device shall not exceed **85dBC peak** or un-weighted level measured at the notional boundary of any household unit on any other site; and Performance Standard 5.9 shall not apply to any audible bird scaring device which does not exceed **70dBC peak** or un-weighted level measured at the notional boundary of any household unit on any other site. (4) Bird scaring devices shall be located as far as is practical away from adjoining residences and they shall be aligned to point away from adjoining residences.
RURAL 4B ZONE (BLANDSWOOD)	5.7 Noise levels shall not exceed **50dBA L10** at the notional boundary of the nearest household unit on any other site between 7.00am and 10.00pm on any day, and **40dBA L10** and **70dBA Lmax** at all other times, unless specific noise levels are provided for the activity elsewhere in the District Plan. 5.8 See General Rule 6.21 for measurement and assessment of noise, standards for construction and maintenance noise. 5.9 Audible bird-scaring devices (including firearms) may be operated in accordance with the following conditions: (1) Not earlier than 7.00am and not later than 8.00pm. (2) At a frequency of not more than 12 events per hour. The term "events" includes clusters of up to three shots from gas operated devices or three multiple shots from firearms, in rapid succession (subject to the following 2 conditions): (3) The sound from any bird scaring device shall not exceed **85dBC peak** or un-weighted level measured at the notional boundary of any household unit on any other site; and Performance Standard 5.9 shall not apply to any audible bird scaring device which does not exceed **70dBC peak** or un-weighted level measured at the notional boundary of any household unit on any other site. (4) Bird scaring devices shall be located as far as is practical away from adjoining residences and they shall be aligned to point away from adjoining residences
RURAL 5 ZONE (R5)	5.19 Noise levels shall not exceed **50dBA L10** at the notional boundary of the nearest household unit on any other site between 7.00am and 10.00pm on any day, and **40dBA L10** and **70dBA Lmax** at all other times, unless specific noise levels are provided for the activity elsewhere in the District Plan. 5.20 See General Rule 6.21 for measurement and assessment of noise standards for construction and maintenance noise 5.21 Audible bird scaring devices (including firearms where used for this purpose) may be operated in accordance with the following conditions: (1) At a frequency of not more than twelve events per hour. The term "events" includes clusters of up to three shots from gas operated

	devices or three multiple shots from firearms, in rapid succession (subject to the following two conditions). (2) The sound from any bird scaring device shall not exceed **85dBC peak** or un-weighted level at the notional boundary of any household unit on any other sites. (3) If the sound emitted at the boundary or notional boundary does not exceed **70dBC peak** (or un-weighted) level then no restriction is necessary. If the sound emitted exceeds **70dBC peak** (or un-weighted) level, but does not exceed **85dBC peak** (or un-weighted) level, then no more than six such events are permitted per hour. (4) Bird scaring devices shall be located as far as is practical away from adjoining residences and they shall be aligned to point away from adjoining residences.

9.2.2 Part D (2) Residential Zones

2.2.1 OBJECTIVE	2.2.1.1 That as far as practical residential zones should be areas where people are able to find rest and relaxation with a minimum of interference from unwelcome noise.
2.2.2 POLICY	2.2.2.1 To only provide for those activities which are unlikely to add significantly to noise levels in residential areas.
Rules	No specific zone rules for all residential zones: (1) Residential 1 (Suburban Residential; Timaru, Temuka, Geraldine, Pleasant Point) (2) Residential 2 (High Density Residential; Timaru only) (3) Residential 3 (Townships, other than the four major towns) (4) Residential 4 (Low Density Residential; Timaru only) (5) Residential 5 (Future Residential; Timaru and Geraldine) (6) Residential 6 (Low Density at Gleniti)

9.2.3 Part D (3) Commercial Zones

3.1.2 POLICIES	3.1.2.3 To allow for more permissive *noise* and light levels in commercial areas than provided for in *Residential Zones* of the District while acknowledging that some restriction on noise levels is required where sensitive land uses share a boundary with a commercial activity. Lmax limits will apply at night time. 3.4.2.4 To set *more permissive minimum standards* of environmental effects such as noise and hazardous substances for commercial areas than for residential or natural areas of the District.
3.5.1 COMMERCIAL 1A (TIMARU) 3.5.2 COMMERCIAL 1B (TIMARU) 3.5.2.1 COMMERCIAL 1C	5.10 Noise levels from any activity shall not exceed the following unless specific noise levels are provided for the activity elsewhere in the Plan: **50 dBA L10** at the nearest Residential 1 Zone boundary between 7.00am and 10.00pm on any day, and **40 dBA L10** and **70 dBA Lmax** at all other times; and

(TIMARU) 3.5.3 COMMERCIAL 1 (TEMUKA) 3.5.4 COMMERCIAL 1 (GERALDINE) 3.5.5 COMMERCIAL 1 (PLEASANT POINT) 3.5.8 COMMERCIAL 3 ZONE	**55 dBA L10** at the nearest Residential 2 Zone boundary between 7.00am and 10.00pm on any day, and **45 dBA L10** and **75 dBA Lmax** at all other times.
3.5.6 COMMERCIAL 2 ZONE	*...as above, with an additional rule:* 5.12 Any loading dock shall be enclosed within buildings (other than the entrance/exit to the dock) and the entrance/exit door shall be kept closed where practicable so that noise is generally contained within a building during loading and unloading operations.
3.5.7 COMMERCIAL 2A ZONE	As above but with the following receiver site being specified: 6.8 Noise levels from any activity shall not exceed the following unless specific noise levels are provided for the activity elsewhere in this Plan: **50 dBA L10** at the nearest Residential 1 Zone boundary **and Lot 1 DP 60120 (The Trust)** between 7.00am and 10.00pm on any day and **40 dBA L10** and **70 dBA Lmax** at all other times; and **55 dBA L10** at the nearest Residential 2 Zone boundary between 7.00am and 10.00pm on any day, and **45 dBA L10** and **75 dBA Lmax** at all other times.

9.2.4 Part D (4) Industrial Zones

4.1.2 POLICIES	
	4.1.2.7 To allow for more permissive noise and light levels in industrial areas than provided for elsewhere in the District while acknowledging that some restriction on noise and light levels is required when sensitive uses, e.g. residential or natural areas, or the Rural 2 Zone adjoining Lot 3 DP 58403, share a boundary with an industrial area. Principal Reason Recognises that many industrial activities are inherently noisy
PERFORMANCE STANDARDS INDUSTRIAL L Zone DEFFERRED INDUSTRIAL Zone INDUSTRIAL H Zone	Noise All activities shall be conducted so as to ensure that noise arising from such activities does not exceed the following noise limits unless specific noise levels are provided for the activity elsewhere in this Plan: (a) At any point within the boundary of any Commercial Zone: At any time **65 dBA L10** On any day between 10.00pm and 7.00am the following day **75 dBA Lmax** (b) At any point within the boundary of any Residential 1 or Residential 3 Zone: 7.00am to 10.00pm **50 dBA L10** At all other times **40 dBA L10**

	On any day between 10.00pm and 7.00am the following day **70 dBA Lmax** (c) At any point within the boundary of any Residential 2 or Residential 4 Zone or at any point within the notional boundary of any dwelling in a Rural Zone: 7.00am to 10.00pm **55 dBA L10** At all other times **45 dBA L10** On any day between 10.00pm and 7.00am the following day **75 dBA Lmax**

9.2.5 Part D (5) Recreation Zones

5.1.3 METHOD	5.1.3.1 Control of the adverse effects of recreational activities through zoning, and listing of activities requiring a resource consent and performance standards in the three zones (see Rules for Recreation Zones; see Rural Zones - Noise 1.4).

9.2.6 Part D 6.21 General Rules - Rules Relating To Noise In All Zones

New Zealand Standard 6801:1991 *Measurement of sound* and assessed in accordance with the provisions of New Zealand Standard 6802:1991 *Assessment of environmental sound*.

EXEMPTIONS

Noise limits in any part of the Plan shall not apply:

(a) In any area or zone, to activities of a limited duration required by normal seasonal agricultural, horticultural and forestry practice, such as harvesting, provided that the activity shall be no louder than necessary, and shall comply with the requirements of section 16 of the Resource Management Act 1991.

(b) In any Residential Zone, to activities of a normal recreational nature, such as sporting events, that do not involve powered motorsport, powered aviation, gunfire or amplified music.

(c) In any part of the District, where the noise source is a warning device used by emergency services.

CONSTRUCTION NOISE

New Zealand Standard 6803P:1984. *The measurement and assessment of noise from construction, maintenance, and demolition work.*

HELICOPTER LANDING AREAS

Any proposed new activity within the scope of New Zealand Standard 6807:1994 *Noise management and land use planning for helicopter landing areas,* shall be a discretionary activity in all zones.

BLASTING

Vibration from a site due to blasting shall not exceed a peak particle velocity of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level should not exceed 10 mm/sec

at any time.

TEMPORARY MILITARY TRAINING ACTIVITIES

Temporary military training shall be conducted so as to ensure the following noise limits in table (n) below are not exceeded at any point within the notional boundary of any dwelling, residential institution, or education facility:

Time on any day	L_{10} dBA	L_{max} dBA
0600-0730	60	70
0730-1800	75	90
1800-2000	70	85
2000-0700 the following day	55	75

Provided the limits for impulsive noise arising from any use of explosives, ammunition or pyrotechnics at any time, shall not exceed a peak non-frequency-weighted sound pressure level of 120 dB which is approximately equivalent to a C-weighted Sound Exposure Level of 100 dB.

Provided further that a responsible person shall foster and maintain liaison between the Armed Services and the neighbouring community before and during the temporary military training activity.

Provided also that the above noise limits shall not apply on not more than two occasions in any period of 12 months where any exhibition or demonstration of military activities is open to the public and held between the hours of 10.00am and 5.00pm.

10 Review Of Existing Noise Provisions

The above Operative District Plan noise provisions have been assessed against widely the accepted approaches adopted within district plans applying within other districts, as well as recommendations of the relevant NZ Standards and international guidelines. The identified issues are described as follows;

10.1 General Matters

The range of noise policies, objectives and noise rules based on L_{A10} and L_{AFMax} noise limits included within the zone provisions of the Operative Timaru District Plan are considered reasonable but require updating and amending in terms of the units and applicable technical Standards, and in terms of incorporating further methods to mitigate noise effects.

From our review, we consider the Operative plan applies a simple noise rules regime that applies the appropriate levels of protection and acts appropriately to manage the adverse effects in the district. However, certain additions and enhancements warranted including within the Proposed Plan, as discussed below.

We consider the noise policies, objectives and specific limits set within the Operative district plan are generally appropriate but require expanding and upgrading. Looking at the relevant local and international guidance, existing district plan noise limits appear sufficient to protect the health and

welfare of the community (and to reasonably protect outdoor amenity around living areas). For this reason, we consider the actual decibel values adopted within the operative plan are considered reasonably well foundered. We do not therefore recommend wholesale changes having the effect of re-regulating noise levels in the environment. Whilst retaining the current decibel limits is preferred, we do recommend replacing the LA10 unit with the LAeq unit, and the adoption of a noise limit for the evening period, both as provided for within the relevant New Zealand Standard (NZS6802:2008).

The effects of such enhancements are summarised follows; Adopting an evening noise limit will ensure the district plan noise limits applying within the various zones will better reflect changes in daily noise patterns. It is known that small differences exist between the same sound measured using the L_{Aeq} unit versus the older L_{A10} unit, however the technical advantages of adopting the L_{Aeq} unit outweigh perceived disadvantages of retaining the older L_{A10} unit.

10.2 Noise Limits Applying Between Sites In The Same Zone

We have assessed the application of the current Operative plan noise rules that apply within and between each relevant zone. Specifically, we have examined;

(1) Whether the rules regime adequately protects permitted activities on adjacent sites within the same zone; and
(2) Whether sites on which noise sensitive uses may establish (as of right) are appropriately protected from noise from sites within adjacent zones where noise-making activities may legitimately take place.

Firstly, the following shaded table indicates which zones in the operative plan currently include rules to protect adjacent sites in the same zone:

	Assessment Result
Residential 1	
Residential 2+	
Commercial	
Industrial	
Rural 1 & 2	
Rural 3, 4A, 4B, & 5	

Colour Chart / Meaning

Yes, zone rules apply ☑
Not Applicable
No zone rules apply – assessment needed ☒

It appears some zones may not contain sufficient methods or rules to address the effects of noise from adjacent sites within the same zone. It is usually recommended district plan noise limits apply to noise emitted by non-residential activities to protect receivers on adjacent sites. The accepted approach is to apply these limits at levels according to whether the receiver site has a similar (non-residential) zoning, or whether the receiver site is residentially zoned (or contains a notional boundary to a rural dwelling). This approach is followed in some cases within the Operative plan noise rules and is generally supported however cells coloured yellow in the above table indicate zones where we consider noise management in the district would benefit from additional noise emission rules applying within adjacent sites in the same zone.

10.3 Noise Limits Applying In Adjacent Zones

We have assessed the ways in which the operative plan protects sensitive receiver sites from noise due to permitted activities within adjacent zones (note, the above colour chart applies);

Note: Horizontal axis = Zoning of Noise Emission site
Vertical axis = Zoning of Receiving Site

		Zoning Of NOISE EMISSION Site					
		Residential 1	Residential 2+	Commercial	Industrial	Rural 1 & 2	Rural 3, 4A, 4B, & 5
Zoning Of RECEIVING Site	Residential 1						
	Residential 2+						
	Commercial						
	Industrial						
	Rural 1 & 2						
	Rural 3, 4A, 4B, & 5						

Several cells in the above table (filled in grey colour) are not expected to be filled. For example, residential sites are not considered to be noise emission sites, so no recommendations apply in that case. The yellow cells indicate possible 'gaps' which should be looked into within the Proposed District Plan. For example, we consider commercially zoned sites should be permitted to emit noise up to 60 dBA onto adjacent sites within the commercial zone (so long as the existing requirements are met around meeting lower limits within residentially zoned sites).

The above 'gap' analysis has signalled some areas where the rules regime of the Operative district plan can be enhanced and expanded upon. This does not reflect poorly on the legal enforceability or integrity of the operative plan noise rules regime which remains generally well founded and appropriate.

10.4 Construction Noise

The standard referenced in Part D 6.21 to assess and control noise from construction activities is a 1987 Standard which is now out of date. As set out below in Section 10, the appropriate standard to reference is NZS 6803:1999 *Acoustics – Construction Noise* as this is the most technically appropriate standard for construction noise assessment.

10.5 Acoustic Insulation Of Dwellings

In cases where sensitive uses are provided for as discretionary or controlled activities, some form of district plan acoustic insulation provision is usually provided to ensure the indoor spaces (at least) are adequately protected from outdoor noise. This is the approach adopted widely within other district plans for dealing within inner city noise, noise effects adjacent to highways, ports and airports. This approach is also consistent with several NZ Standards (dealing with transportation noise) and other guidance. This matter is not considered in detail within this Stage 1 report. Reverse sensitivity matters such as acoustic insulation of sensitive receiving environments are more fully addressed within the Stage 2 report (including identifying what types of acoustic insulation

rules should be adopted into a district plan).

10.6 Temporary Military Training Activities

The nature and diversity of military training exercises mean these activities will not always be able to comply with noise limits for permitted activities set out in the District Plan. The current limits of the operative plan appear to be extracted from noise limits recommended within the construction noise standard, NZS6803:1999.

Carrying out military field training exercises in the Timaru district fulfils a need of the NZ Defence Force. Such field training exercises are usually welcomed within rural districts; however some temporary noise effects may be involved. Nosie mitted during training is short lived on any site and would not involve noise from live firing. The worst-case noise effects would be related to firing of blanks and pyrotechnics used during some training exercises.

It is considered that a new, more flexible sets of noise controls better suited to the range of activities undertaken (e.g. Fixed or mobile noise sources) may be more appropriate for the Proposed Plan to ensure adverse noise effects arising from military training exercises are avoided, remedied, or mitigated.

10.7 Helicopter Landing Areas

It is recommended the Proposed plan continue with the reference in the Operative plan to New Zealand Standard 6807:1994 *Noise management and land use planning for helicopter landing areas*. The current approach of the operative plan to treat all applications for helicopter landing areas as a discretionary activity in all zones can be supported on noise grounds.

10.8 Blasting

The current rules provide for controls over peak particle velocity which is considered unnecessary. Vibration effects at the limit of 5 mm/sec can damage structures. Yet this limit "...may be exceeded on up to 5% of the total number of blasts over a period of 12 months...". The actual blast limit quoted is (10 mm/sec) could result in substantial damage to some sensitive structures, in addition to noise disturbance. The existing vibration rule of the Operative plan seems more of a permission to emit significant noise and vibration effects, rather than a means of protecting people and structures from adverse effects.

We recommend a discussion as to whether the Proposed Plan needs prescribe any specific ground acceleration exceedance limits for blasting in the manner of the Operative plan. By applying discretionary status to applications for such activities, these potential adverse effects are more appropriately assessed on a site by site on this basis (and controls applied accordingly) rather than applying a blanket district-wide vibration rule of the type found within the Operative district plan.

10.9 Roads Zoned As Per Adjacent Zone

The Operative plan appears to treat roads as zoned according to the adjacent zone, but it is not clear why the full width of the road is zoned in this manner. In the case of a residential zoning of a road, this could cause unhelpful non-compliance issues for activities taking place on (say) commercial or industrial sites whom would most likely be relying on the width of the road for basic noise mitigation measure.

In our view, the either of the following options would rectify the currently identified anomaly;

(a) Compliance with noise limits not to be assessed within the road reserve (via inclusion within the range of already identified exemptions to district plan noise or via use of a term defined in the 'definitions' section which exempted compliance assessment within the road reserve); or
(b) Amending planning maps so that the underlying zoning of roads is deemed to be that of the immediately adjacent land extending out to the midpoint of the road.

10.10 Comments On Urban Noise Provisions

10.10.1 Noise Limits Applying To Residential Activities

As with many district plans, the Operative Timaru district plan does not consider district plan noise rules should apply to day to day domestic type activities typically undertaken on residential zones. Cases where unacceptable noise emissions arise from domestic activities on residential sites can be addressed using other methods (e.g. Issuing of excessive noise direction notices under s.327 of the RMA, or noise nuisance action under s.29(ka) of the health Act 1956).

The range of permitted uses within residential zones are considered generally compatible in noise terms with sensitive residential uses on adjacent sites. A key consideration is the temporary nature of domestic noise-making activities (such as lawn-mowing and home maintenance activities) and the general lowering of noise-making activities at night time. It is for this reason that district plan seeks to limit noise arising from non-residential activities received within residentially zoned sites.

One exemption is the control of noise from 'fixed plant' (e.g. heat pumps). As noise from fixed plant is amenable to mitigation (via acoustic screening by fencing, or locating away from site boundaries), an emerging trend is 5 dB lower noise limits applying to noise from fixed plant. This has been included within the recommendations below.

10.10.2 Residential 1 and 2 Noise Limits

The Operative plan sets out dual permitted noise standards for residentially zoned sites. The Operative district plan applies limits on noise from non-residential activities from other sites in the Residential 1 zone that are 5 dB more noise sensitive than the noise performance standards for non-residential noise received within sites within the Residential 2 zone.

While the district plan maps show the residential 2 areas are located closer to commercial and built-up areas (including alongside busy traffic routes), large areas of urban land zoned Residential 2 are located blocks away from busy roads and commercial areas. The resultant low ambient sound levels commonly experienced in backyards and other outdoor areas may indicate the 5 dB lower limits (equivalent to the Residential 1 limits) ought to be applied as the permitted activity noise limit for non-residential noise received within Residential 2 zoned sites.

The concept of two different residential permitted activity standards for non-residential noise received within residentially zoned sites should be re-considered in our view.

One option is to amend the zoning area over which the permitted activity Residential 2 noise standard applies. The area over which the 5 dB higher noise limits apply could be reduced in areas, so that it excludes quieter areas away from commercial sites or other sites with increased activity.

This will ensure the sites on which the 5 dB higher noise limits apply are those which experience significant ambient noise. In these areas the benefits of the lower Residential 1 noise limits (5 dB more stringent that the Residential 2 noise limits) would not be likely to be effective owing to the elevated ambient sound levels found within these areas.

In addition, it is worthwhile to consider those residential sites currently zoned Residential 1 which experience elevated levels of ambient noise. These are those Residential 1 zoned sites that lie within proximal distance to arterial roads, collector roads and state highways. While the assessment of noise effects within areas receiving significant nosier from roads is a matter to be considered in detail within the Stage 2 report, our draft recommendations to reduce the current area over which the Residential 2 noise limits apply are set out in the following annotated planning map of the Timaru urban area;

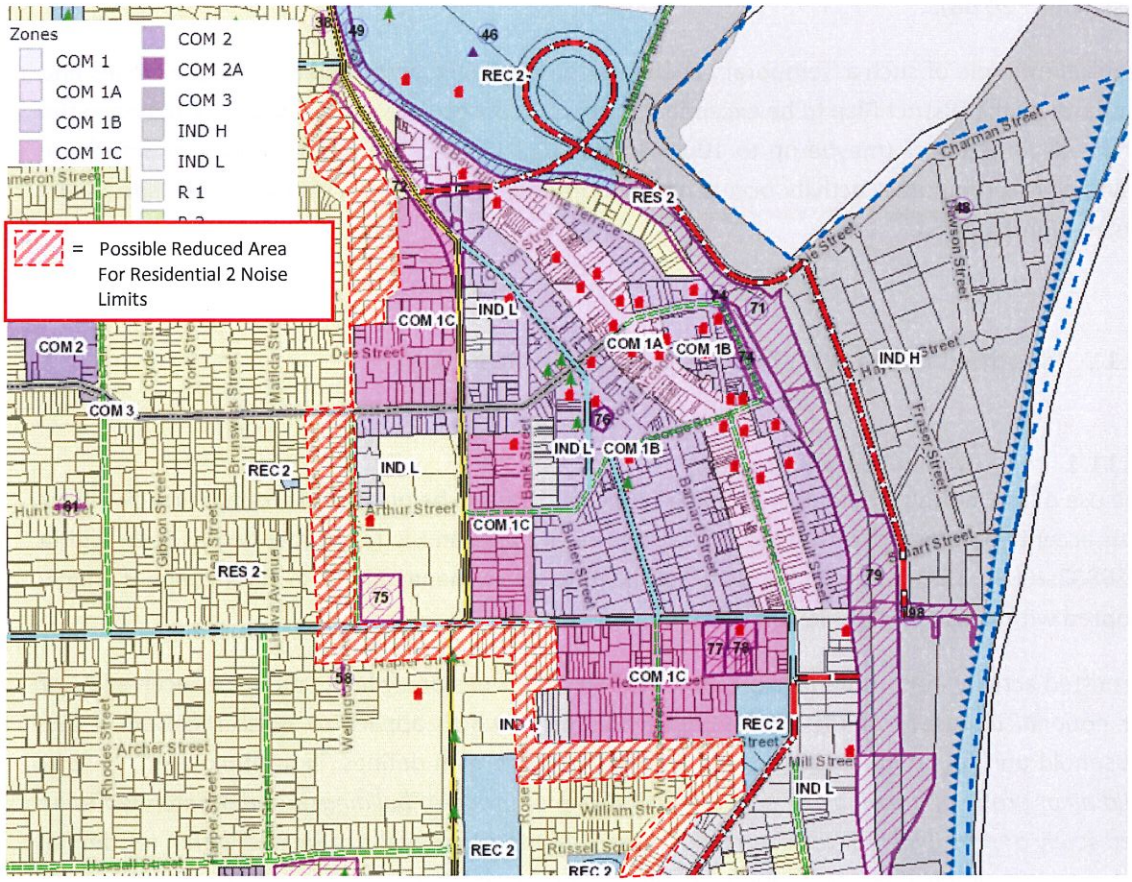

Figure 1 Possible Reduced Area For Residential 2 Noise Limits

10.10.3 Temporary events

Although Part D 6.21 exempts noise a normal recreational nature, such as sporting events (that do not involve powered motorsport, powered aviation, gunfire, or amplified music) from compliance with the district plan noise performance standards applying in the Residential Zone, this does not provide for the usual range of temporary noise effects associated with school galas, street parades, street markets and the like, often held for the benefit of the wider community.

Temporary activities include a wide range of temporary events, such as concerts, festivals, and

markets. Temporary events are varied in nature and scale; they could be one-off events or regular occurrences which are planned well in advance, they are usually relatively short in duration and often involve activities outside of normal working hours, such as evenings and weekends. Temporary activities are necessary to satisfy a wide range of social, cultural and economic needs and as such, should be provided for in a flexible manner while ensuring any adverse noise effects are appropriately managed and mitigated or avoided.

As part of the recommendations for district plan noise limits to protect sensitive sites, NZS6802:2008 recommendations also include an allowance for infrequent, temporary events to emit noise (exceeding the normally applying district plan noise limits) for limited time periods during daytime or night time, providing the exceedance is neither for extended periods, and that the exceedance of normally applying noise limits does not exceed a reasonable level (e.g. normal noise limit + 20 dB).

A typical example of such a 'temporary event' noise rule allows permitted activity noise rules and standards of the District Plan to be exceeded for up to 3 consecutive days in duration, between the certain daytime hours (maybe up to 10pm Sunday to Thursday, and 11pm Friday or Saturday), providing this temporary activity occurs on no more than one occasion on the subject site in any twelve-month period.

10.11 Identified Issues With Existing Rural Noise Provisions

10.11.1 Measurement Location

The use of the 'notional boundary' to identify the land area to be protected around rural dwellings is an acceptable method for managing noise in rural areas and is recommended as such within NZS6802:2008. The notional boundary approach to noise management in rural zones is widely adopted within district plans in New Zealand.

Permitted activity noise rules in the Rural 3 4A, 4B, & 5 zones apply limits on noise received "*...at the notional boundary of the nearest household unit*" which applies to noise received at any household unit found within any zone. As the Operative plan defines "household unit" as "*any building or group of buildings, or part of any building or group of buildings, used or intended to be used solely or principally for residential purposes*" this includes dwellings located within residential zones, a zone within which the notional boundary approach is not usually adopted.

Best practice (and the approach adopted within NZS6802:2008) is to apply limits on noise received within all parts of sites zoned for residential purposes (which should be protected to ensure good living conditions exist wherever land is zoned residential). Permitted activity noise rules in the Rural 3 4A, 4B, & 5 zones refer to noise limits applying within the boundary of any site Residential 2, for example.

Further wording issues arise regarding specifying the compliance location within noise rules of the Operative district plan "at the nearest household unit on another site" (e.g. Rule 5.22). While compliance would usually be assessed at the nearest sensitive site, the 'nearest' site may not

necessarily be the site most affected by noise. It is more prudent to refer to noise limits applying within "any" sensitive receiver site, whether this is the nearest receiver site or not.

Other 'locational' wording improvements include avoiding specifying a noise limit which applies "at the boundary". Specifying the compliance location in this precise manner is generally considered too prescriptive. Noise experts are seldom also versed in land surveying. Usually a more flexible approach is taken whereby noise limits whereby district plans commonly specify noise limits as applying "within any site" or "within the boundary of any site".

10.11.2 Rural Activity Exemption

An exemption applies under Part D 6.21 that allows noise due to seasonal agricultural, horticultural and forestry practice (provided that it is no louder than necessary and complies with section 16 of the RMA) to be exempted from compliance with the district plan noise rules. This approach is supported as this is commonly adopted in rural zone provisions within other district plans in New Zealand which is considered consistent with the approach of NZS6802:2008 and with the purpose and principles of the RMA.

10.11.3 Audible Bird Scaring Devices

Noise due to these devices appears to be variously regulated under the Rural zone noise rules. In some cases hours of operation are limited (Rural 4 and 5 zones) but in other cases no hours of operation apply (Rural 1, 2 and 3 zones). Noise effects of audible bird scaring devices during sensitive night time periods should be controlled in order to achieve the aims of the RMA and district plan. A consistent approach should be followed if the district plan is to apply a consistent protection against these adverse noise effects in rural areas. In addition, the term 'audible bird scaring devices' should be appropriately defined, including clarification of the circumstances under which firearms may be used as an audible bird scaring device.

11 Recommendations

This section summarises findings of the above review of the zone noise rules of Timaru District Plan (excluding provisions that apply to manging noise associated with strategic infrastructure which are dealt within the companion Part 2 report under development).

Recommendations are made for the Proposed District Plan based on the findings of the above review. The recommendations are designed to ensure the new plan remains consistent with NZ Standards and international guidelines. Where warranted, and where the costs and benefits can be justified, it is proposed to expand the scope of district plan noise provisions with the aim to ensure the District Plan noise provisions are 'fit for purpose' to deal with the planning challenges expected in the future.

The focus has not been so much on policies and objectives, but on noise limits applying within the various zones and standardising noise rules making them easier to interpret and check compliance with for both Council and other users of the District Plan. An over-riding concern for Council is that the rules regime be technically accurate and beyond legal challenge. This is ensured by closely following the recommendations of the relevant NZ Standards and published technical guidelines.

The recommendations made within this report for future district plan noise provisions are reasonably generic at this stage. Final draft wording of the recommended noise provisions is yet to be considered in any detail as this is a step taken later in the development of the Proposed district plan. Such decisions need to be made in the context of wider changes likely for the Proposed District Plan.

The recommendations for the Proposed district plan are summarised as follows;

11.1 New Zealand Standards and Related Noise Metrics

The Operative Timaru District Plan refers to NZ Standards *'NZS 6801:1991 Measurement of Environmental Noise'* and *'NZS 6802:1991 Assessment of Environmental Noise'*. In 2008 updated environmental noise standards for NZS 6801 and NZS 6802 were released.

These standards set out the units and equipment to be used for the consistent measurement of sound in the environment and describes methods to assess these measured levels. Importantly, these standards prescribe methods and procedures for the consistent assessment of noise when assessing compliance with noise limits.

The use of the 2008 updates of these 1991 standards is considered not only technically appropriate but necessary to ensure best practice is followed.

Consequently, we recommend removing references to any superseded NZ Standards including:

- NZS 6801:1991 *Measurement of Environmental Noise*
- NZS 6802:1991 *Assessment of Environmental Noise*

11.2 Sound Level Descriptors LAeq and LAFmax

One of the main consequences of updating NZS 6801 and NZS 6802 to the 2008 standards is a change in measurement descriptors which ensures these NZ Standards are consistent with units adopted internationally, e.g. within BS4142:1997[12] and ISO 1996-2:2007.

The L_{Aeq}, unit is defined as the *'time average sound level'*, denoted as $L_{Aeq[t]}$. It is vital the $L_{Aeq[t]}$ is quoted with an associated measurement period [t]. In New Zealand, a reference time period of 15 minutes has been adopted based on international guidance.

The current L_{10} noise descriptor no longer considered appropriate. This unit was originally adopted because it was thought this unit aligned reasonably well with the degree of annoyance experienced by a typical person. Furthermore, L_{10} could be determined from analogue sound level meters by the visual mean maxima estimation method acceptable at the time.

The use of the L_{Aeq} unit within noise rules and guidelines has become popular since the 1980's when this unit first became adopted within various published international guidelines (such as WHO Guidelines For Community Noise). The L_{Aeq} has been found to have a greater correlation to noise annoyance than L_{10}. As the L_{Aeq} level is unrelated to the statistical variation in sound levels, this

[12] BS 4142:1997 -- Method for rating industrial noise affecting mixed residential and industrial areas

allows the L_{Aeq} to be more accurately predicted, which is a considerable advantage over L_{10}. By its very nature, L_{Aeq}, is related to a specific time interval. By quoting a measured L_{Aeq} value, this reasonably accurately describe 'noise effects' within a sound environment, providing the measurement (or predictions) cover the range and variability of that sound environment.

In terms of differences between a sound level measured using L_{A10} and L_{Aeq}, it is generally accepted that 2-3 dB difference may be found for variable sounds (such as due to passing traffic) but would measure the same in the case of constant-type sound sources such as a fixed plant (for a truly constant sound $L_{A10} = L_{Aeq} = L_{90} = L_{AFMax}$).

The single event L_{AFmax} sound limit descriptor is retained within the 2008 version of NZ Standard NZS6802, which defines this unit as the maximum A-frequency weighted, Fast-time weighted sound pressure level in decibels. Its use is mainly to accompany LAeq night time limits as a means of controlling short-duration, single noise events (such as may cause sleep awakening within sensitive receiver sites during night time hours).

Recommendation:

- Adopt L_{Aeq} and L_{Amax} noise descriptors
- Adopt correct notional as 'value-unit-descriptor' i.e. **55 dB $L_{Aeq[15\ min]}$, 45 dB $L_{Aeq[15\ min]}$** and **70 dB L_{AFmax}.**

11.3 Noise Limits Applying With & Between Zones

Our analysis indicates the district plan could be enhanced by adding noise rules that apply within the same zone and between sites in adjacent zones, where none are currently in place. Guidance on which zone rules need updating in this regard are provided in the analysis above.

Recommendation:

Amend district plan noise rules within zone so that the cover all relevant situations where noise may affect sites within the same zone, and sites located within other zones.

11.4 Acoustic Insulation Of Dwellings

In most New Zealand centres nowadays new or altered habitable rooms accommodating Noise Sensitivity Activities located within busy urban centres or within commercial areas (or within areas affected by existing roads, port noise or airport noise) are required by the relevant District Plan provisions to be acoustically insulated.

Because the effective reduction of sound within habitable rooms will relies on keeping windows closed, there is also a requirement for ventilation to be provided so that the minimum requirements of the Building Code (G4) for natural ventilation are achieved.

Recommendation:

Enhanced management of the effects of noise requires the district plan include requirements for acoustic insulation of habitable rooms (to be applied in specific noise-affected areas). To deal effectively with acoustic insulation, the rules will need to consider ventilation requirements. These matters are considered in detail in the companion Stage 2 report.

11.5 Roads Zoned As Per Adjacent Zone

The current practice of the Operative district plan is to zone roads according to zonings on adjacent sites. Which zoning is applied to roads in areas along zone interfaces appears uncertain. The zoning of roads as noise sensitive residential type zones is not encouraged as this may cause unnecessary compliance issues where residential zoning applies at the street front boundary of commercial or industrial sites.

Recommendation:

It is recommended the need to zone roads be reviewed. If retained, we recommend no roads are zoned for residential purposes.

11.6 Residential 1 And 2 Noise Limits

We have identified that the 5 dB higher noise limits applied to non-residential noise received within sites zoned Residential 2 may not be appropriate within quiet areas in this zone.

Recommendation:

A review of the Residential 1 and 2 noise provisions is considered worthwhile, at least in terms of managing noise in residential areas in a consistent manner. This can be addressed by adjustments to the Residential 2 zone boundaries.

11.7 Measurement Location

The Operative plan refers to meeting noise limits at the 'nearest' receiver site, whereas the 'nearest' site may not necessarily be the site most affected by noise. It is more prudent to refer to noise limits applying within "any" sensitive receiver site, whether this is the nearest receiver site or not. Other 'locational' wording improvements include avoiding specifying a noise limit which applies "at the boundary". As the preferred wording is to apply noise limits that are to be complied with "within any site" or "within the boundary of any site".

Recommendation:

Revise wording of noise rules for the Proposed district plan to more closely following the wording recommendations of NZS6802:2008.

11.8 Audible Bird Scaring Devices

Although rules in the Operative district plan applying to noise arising from the use of audible bird scaring devices in rural areas are supported (both conceptually and in terms of the specific limits and controls included in the rules), some inconsistencies have been noted regarding the hours of operation of these devices that apply within different rural zones.

Recommendation:

A review of the applicable rules applying to noise from the use of audible bird scaring devices in rural areas should take place so that potential noise effects arising at sensitive receiver sites are managed in a consistent and workable manner.

11.9 Helicopter Landing Areas

NZS 6807:1994 *Helicopter Noise Management & Land Use Planning* is currently referred to within Part D 6.21. This standard provides guidance on managing noise from helicopter landing areas by

assessing helicopter noise on a 24-hour basis [using L_{dn}] with a separate consideration of the maximum levels due to any night time operations [using L_{AFmax}]. The standard allows for a relaxation of the limits by 5 dB where background sound levels [L_{95} under this standard] exceed threshold levels set in the standard. Under this standard, areas with high ambient sound levels may limit helicopter noise at levels of 50 dB L_{dn} +5dB (55 dB L_{dn}).

Section 9 of the RMA indicates it is within the powers of territorial local authorities to control the movement of aircraft in the air for the purposes of managing the effects of aircraft noise in the vicinity of landing areas. The RMA does not empower Council to control noise from overflying aircraft when aircraft are *en route* to a destination and not in the vicinity of the landing area.

NZS6807 is the most current and technically appropriate standard for the assessment of helicopter noise from landing areas in the District.

Recommendation:

Adopt reference to NZS 6807:1994 Helicopter Noise Management & Land Use Planning

11.10 Wind Farm Noise

NZS 6808:2010 Acoustics Wind Farm Noise was developed specifically for the measurement and assessment of sound from wind turbine generators and wind farms in New Zealand conditions.

The standard does not cover:

- Noise from small, domestic wind turbines
- Sound from mechanical or electrical systems connected to wind turbines used for other purposes [such as pumping or milling].

Although we are not aware of the potential for wind farms to develop in the Timaru district, we consider the Proposed district plan would be enhanced by the inclusion of this NZ Standard.

Recommendation:

Adopt reference to NZS 6808:2010 *Acoustics – Wind Farm Noise*

11.11 Temporary Events Noise

Temporary activities or events frequently occur within public open space [reserves], road reserves, and at community facilities such as churches, schools, or community halls. Examples include competitions, festivals, galas, carnivals, market days, entertainment events, promotional events, and other events of similar nature.

The operative District Plan does not provide for additional noise from "temporary activities" or provide any rules or guidance regarding noise from temporary events. Therefore, it is not always clear when resource consents are required for different activities or how effects should be managed. Where applied for, consents for these activities are considered on a case-by-case basis.

We recommend the district plan provide for noise from temporary activities held in public spaces as a permitted activity. In our view, such events on public land should require some form of resource consent as the wider public benefit may not arise where these events are held privately. A definition of 'temporary activity' would need to be added to the District Plan. A possible definition

could be any activity of short duration including sporting events competitions, festivals, galas, carnivals, market days, entertainment events, promotional events, or other events of similar nature

Recommendation:

Temporary Activities during the hours of 10am to 10 pm should be able to generate up to 75 dB LAeq(15 min) and 85 dB LAFmax at residential sites for any event not exceeding SIX hours in duration.

Outside the hours of Event, the applicable District Plan noise limits for the relevant zones shall apply.

A Management Plan should be submitted to Council not less than 30 days prior to the event setting out the methods by which compliance with the above limits will be achieved.

11.12 Telecommunications Equipment

Telecommunications systems consist of a core network for carrying signals between locations, and access networks linking the core to individual users and customers. As noted above, a National Environmental Standard [NES] has been approved by the government to assist in the implementation of its telecommunication objectives.

The NES includes controls over noise from telecommunications cabinets located in road reserves which should be adopted within any new district plan. Incorporating NES requirements into the revised District Plan will ensure consistent standards are applied to noise from these fixtures. Pursuant to s43B of the Resource Management Act 1991, no rule or resource consent can be more stringent than the national environmental standards for telecommunications facilities.

Recommendation:

It is recommended to Adopt the form of the noise rule consistent with the NES for telecommunications equipment as follows;

Noise from telecommunications cabinets located in road reserves shall be a permitted activity provided that the noise emission levels comply with Clause 9 of the Resource Management [National Environmental Standards for Telecommunication Facilities] Regulations 2008.

11.13 Definitions & Exemptions

An efficient method for dealing with exemptions to noise rules and to ensure the relevant NZ Standards are applied, is to employ a term (such as "Noise Emission Level") within the wording of District Plan noise rules. The definition of such a term can be an efficient method for dealing with technical details and concepts which would otherwise lengthen and complicate the wording of noise rules.

An example is:

*The **Noise Emission Level** from any non-residential activity shall not exceed the following limits at any point within any residentially zoned site or at any point within the notional boundary of a rural dwelling, other than a dwelling on the site to which this consent applies, during the following time frames:*

*Monday to Sunday 7am to 10pm.....**x** dB LAeq (15 min)*

*Monday to Sunday 10pm to 7am the following day.....**y** dB LAeq (15 min)*

*Daily 10pm to 7am the following day.....**z** dB LAFmax*

Note: '**x**', 'y', and '**z**' are the numerical noise limits to be confirmed within the current plan development process (being guided by current limits, where these exist).

Within the "Definitions" section of the District Plan the term **Noise Emission Level** may be defined as meaning a sound levels measured in accordance with the provisions of 'NZS *680: 2008 Acoustics – Measurement of environmental sound*, and assessed in accordance with the provisions of NZS 6802:2008 *Acoustics – Environmental noise*' but excludes;

- Noise generated as part of accepted farming practices within the Rural Zones.
- Noise generated as part of normal residential activities, excluding 'fixed plant' such as heat pumps.
- Noise from vehicles operating on public roads or trains on rail lines (including at railway yards, railway sidings or stations and level crossing warning devices).
- Noise from Temporary Events. Noise from these activities must comply with a specific Distinct Plan rule.
- Noise from Temporary Military Training Noise from Temporary Events. Noise from these activities must comply with a specific Distinct Plan rule.
- Aircraft taking off and landing at the Taieri Aerodrome during the period 7.00 am to 10.00 pm. Noise from this activity must comply with a specific Distinct Plan rule.
- Any warning device used by emergency services for emergency purposes.
- Noise from fixed plant that is used solely for emergency purposes. Examples of such equipment are standby generator sets that are used to supply electricity only at times of electrical supply failure, or for plant used only during life threatening situations such as smoke fans or sprinkler pumps and is not used to generate power for the national grid.
- Construction noise which shall be controlled and assessed in accordance with NZS 6803:1999 Acoustics – Construction noise.

11.14 NZS 6803:1999 Acoustics – Construction Noise

NZS 6803:1999 *Acoustics – Construction Noise* is the current and most technically appropriate standard for construction noise assessment. It is recommended a single rule apply to all construction activity which should be assessed in accordance with NZS6803:1999 and be required to comply with the L_{Aeq} and L_{AFMax} noise performance standards recommended within that Standard.

Recommendation:

Adopt NZS 6803:1999 *Acoustics – Construction Noise* for the measurement, assessment, and control of construction noise.

Remove any reference to superseded standards New Zealand Standard 6803 P:1984 *The Measurement and Assessment of Noise from Construction, Maintenance and Demolition Work*.

11.15 Noise from Temporary Military Training

These activities undertaken by the NZ Defence Force (NZDF) personnel are usually short lived on any site. However, these activities may result in noise emissions unable tom comply with permitted activity standards. A new rule is recommended to be developed (with input from NZDF) to ensure any adverse noise effects arising from military training exercises are avoided, remedied, or mitigated whilst allowing this type of training activity to take place (in at least some parts of the district).

Recommendation:

Develop new noise controls applying to military training activities taking place on any site for specified periods of time, not exceeding (say) 30 days. Elevated noise from training activities undertaken over longer time periods should be required to comply with District Plan noise performance standards.

11.16 Vibration

Limits on ground borne vibration are not considered essential in the Proposed district plan. Although vibration limits are currently set out in blasting rule (Rule 6.21.2.5) this rule is not supported as a permitted activity standard as it does not seem to suitably limit adverse effects associated with blasting. The effects of vibration at the limits set out in Rule 6.21.2.5 require a site-specific effects assessment in our view.

Recommendation:

As vibration effects causing nuisance or annoyance can be dealt with using available abatement / enforcement procedures available to Council or within conditions of consent, we do not recommend including specific controls on vibration within any Proposed district plan.

12 Summary

This Stage 1 report describes the existing noise provisions of the operative Timaru District Plan and sets out generic amendments and improvements for possible inclusion within the Proposed district plan under development by Council. This report is focused on the district wide noise provisions that apply to land use activities permitted within the various zones in the district.

A companion Stage 2 report (in development) focusses on noise issues associated with strategic infrastructure and strategic transport networks. That report focusses on possible district plan measures to enhance land use planning and noise management issues associated with the current and forecast operation of infrastructural assets and strategic transport facilities located within the Timaru district.

The aim of this Stage 1 report has been to revise the existing District Plan zone noise provisions in a manner that supports rather than undermines the District's social, economic, and environmental vision, and to enhance long term sustainability.

The key enhancements are based on adoption of the relevant recommendations from the 2008

New Zealand Standards and enhancement of the existing District Plan noise provisions to cover the following additional matters;

- Sound Level Descriptors LAeq and LAFmax
- Noise Limits Applying With & Between Zones
- Acoustic Insulation Of Dwellings
- Roads Zoned As Per Adjacent Zone
- Residential 1 And 2 Noise Limits
- Measurement Location
- Audible Bird Scaring Devices
- Helicopter Landing Areas
- Wind Farm Noise
- Temporary Events Noise
- Telecommunications Equipment
- Definitions & Exemptions
- NZS 6803:1999 Acoustics – Construction Noise
- Noise from Temporary Military Training
- Vibration

Incorporating the above amendments and additions into the Proposed district plan noise is recommended to enhance the protection of the environmental, social, economic, and cultural wellbeing of present and future generations within the District.

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Professional Qualifications:
Bachelor of Science [B.Sc.]
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Diploma in Public Health
RSH Diploma Noise Control Engineering.