

14 June 2024

Buller District Council  
6-8 Brougham St  
Westport 7866

**Attention: Rebecca Inwood**

## **PTTPP RESIDENTIAL RE-ZONING AND WESTPORT RIFLE RANGE - NOISE ASSESSMENT**

Dear Rebecca

### **Introduction**

1. Marshall Day Acoustics has been engaged by the Buller District Council, to provide a preliminary assessment of shooting noise from the existing Westport Rifle Range in relation to the proposed re-zoned residential boundaries around Alma Road, Westport. The proposed residential area is shown in Figure 1. We understand that both the Westport Pistol Club and Westport Rifle Club have made submissions on the pTTPP<sup>1</sup> requesting that adequate buffers are provided around the rifle range to ensure on-going use of the range.
2. The Westport Rifle Range includes three shooting activities: rifle range, pistol club and clay target range (shotguns). Noise emissions differ significantly from each of these activities and depend on the firearm being used, the ammunition, the shooter's orientation to a receiver and the presence of any barriers or screens.
3. Our comments in this review are based on previous project experience at club ranges around New Zealand. That is to say, ranges that are primarily used at weekends and potentially one or two days mid-week. Noise effects are likely to be different for ranges that have activities on most days of the week with a broader range of firearms and more shots being fired, such as commercial ranges or where police training may occur.

### **Regulatory Context**

4. Community response to shooting noise does not align with the 'typical' daytime permitted activity noise limit of 55 dB  $L_{Aeq}$  that is referenced in the pTTPP e.g. Rules NOISE R5 and R6.
5. pTTPP Rule NOISE-R2.14 exempts "rifle ranges" within the Rifle Range Protection Area from compliance with the zone noise standards. Additionally, gunshot noise is excluded from assessment against the methodology set out in NZS6802:2008<sup>2</sup> (as required by pTTPP Rule NOISE-R1) and therefore an alternative method of assessment is required to gauge potential community response.
6. Given the range of firearms in use, we highlight that the term "rifle ranges" referenced in Rule NOISE-R2.14 has a restricted meaning. If the intent is to exempt all shooting activities at the range, we recommend the description is expanded to include all firearms in use. For example, we note the operative District Plan uses the phrase with broader meaning "Recreational firearms target shooting" (Rule 7.9.5.1.2).
7. Neither the pTTPP nor the operative District Plan place any specific controls on noise generated by activities at the rifle range. If Council is of a mind to provide reverse sensitivity protection from new residential development in the form of a noise overlay or similar, in our view consideration should also be given to requiring the Rifle Range to appropriately manage noise generated at the site, for example in

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<sup>1</sup> Proposed Te Tai o Poutini Plan

<sup>2</sup> New Zealand Standard NZS 6802:2008 *Acoustics - Environmental Noise*

the form of a Noise Management Plan (NMP). A NMP might not stipulate specific noise limits, but should address factors that have a bearing on the noise effects such as operating times, the type of firearms that can be used, the number of anticipated competition days per year, any noise mitigation measures within firing sheds, etc.

### Assessment Methodology

8. There is no commonly accepted approach to assessing gunshot noise in New Zealand. However, our review of international guidance<sup>3</sup> and experience on other projects suggests that the maximum noise level metric,  $L_{AFmax}$ , is appropriate.
9. For this site, the rifle range will generate higher noise levels than either the pistol or clay target ranges. Our analysis is based on an assumed source noise level of 90 dB  $L_{AFmax}$  at a distance of 25 metres, taken from measurements of a .308 rifle averaged across several sites. Some of the firearms used at Westport are potentially capable of generating higher noise levels (.338), but we consider the .308 to represent a typical maximum for the purposes of this preliminary study. Further noise measurements at the Westport range will be required to confirm actual shooting noise levels.
10. We have provided preliminary shooting noise contours in Figure 1, and these assume uniform sound radiation in all directions – in practice, noise levels vary around the firearm and are typically highest in the shooting direction. The shape of the contour follows the variation in shooting positions at both the southern and northern extents of the range. The contours have the following radii:
  - i. 60 dB  $L_{AFmax}$ : 505 metres
  - ii. 55 dB  $L_{AFmax}$ : 745 metres
  - iii. 50 dB  $L_{AFmax}$ : 1060 metres
11. Downwind propagation has been assumed in general accordance with *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation*.

### Noise Contour Analysis and Recommendations

12. As a guide, we consider gunshot noise levels in the range 50 to 55 dB  $L_{AFmax}$  to be appropriate for residential amenity. In respect of community response for new residential development close to an established range, the upper value is generally appropriate i.e. 55 dB  $L_{AFmax}$  is appropriate. This translates as follows:
  - i. Between 50 to 55 dB  $L_{AFmax}$  - no specific noise mitigation is required. However, an advisory may be appropriate to inform new residential developments that shooting noise will be audible.
  - ii. Between 55 and 60 dB  $L_{AFmax}$  - some consideration of noise mitigation to new dwellings and their outdoor areas is appropriate. This would typically include the provision of mechanical ventilation so that windows can be closed to control noise inside (whilst achieving the fresh air requirements of the New Zealand Building Code) and localised screening to outdoor living areas so that shooting noise levels will be below 50 dB  $L_{AFmax}$ .
  - iii. Noise levels greater than 60 dB  $L_{AFmax}$  - new residential development should be discouraged.

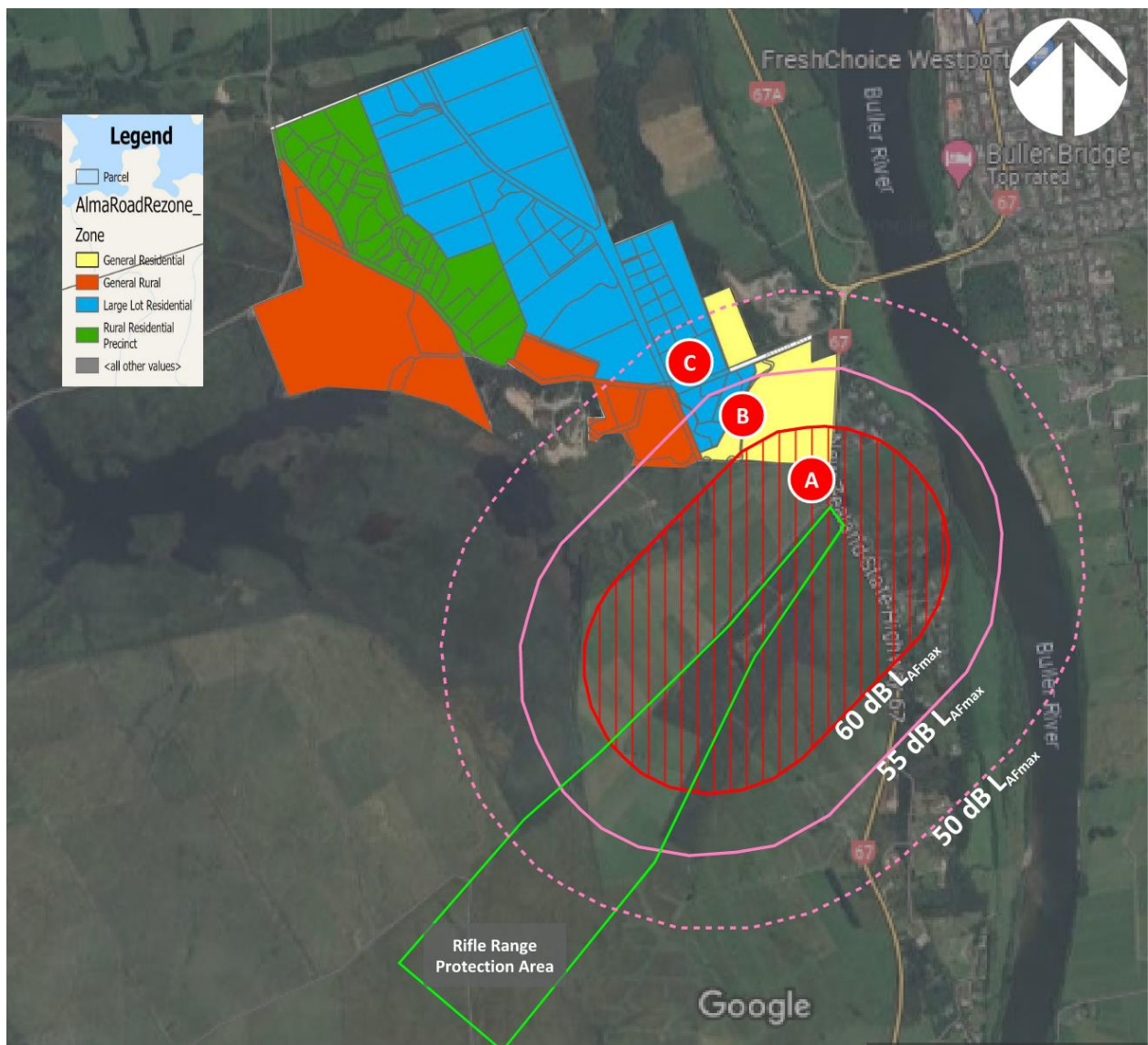
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<sup>3</sup> Shooting Noise Regulation Review of Various National Practices, V Desarnaulds et al, Proceedings of Internoise 98, Christchurch.

13. Based on preliminary shooting noise contours in Figure 1, we note the following:

- i. Refer Area A in Figure 1. A portion of the proposed General Residential Zone (yellow) falls under the 60 dB  $L_{AFmax}$  contour where residential development should be discouraged.
- ii. Refer Area B in Figure 1. A relatively large section of General Residential (yellow), Large Lot Residential (blue), and General Rural (red) zones fall between the 50 to 55 dB  $L_{AFmax}$  contours. New dwellings and their outdoor areas would require mitigation.
- iii. Refer Area C in Figure 1. Shooting noise will be audible in this area but no specific noise controls are required.
- iv. We note there are a number of existing dwellings within the noise contours.
- v. If the noise contour/overlay concept is to be adopted by Council, actual measurements on site will be required to refine the contour extents.

**Figure 1: Westport Rifle Range, proposed residential zoning and shooting noise contours**



**Site Information**

14. Appendix B is information provided for this study and lists the Westport Gun Club firearms, their usage and a site map. We understand that there are three clubs that operate from the range (with one currently in recess) including clay bird shooting. There are a range of firing locations, hours of activity, and weapons used
15. Appendix C contains further information provided from the Westport Range that arrived 14 June 2024, too late to incorporate into this assessment. As mentioned, further noise measurements at the Westport range will confirm actual shooting noise levels.

Yours faithfully

**MARSHALL DAY ACOUSTICS LTD**



**Jon Farren**  
**Principal Consultant**

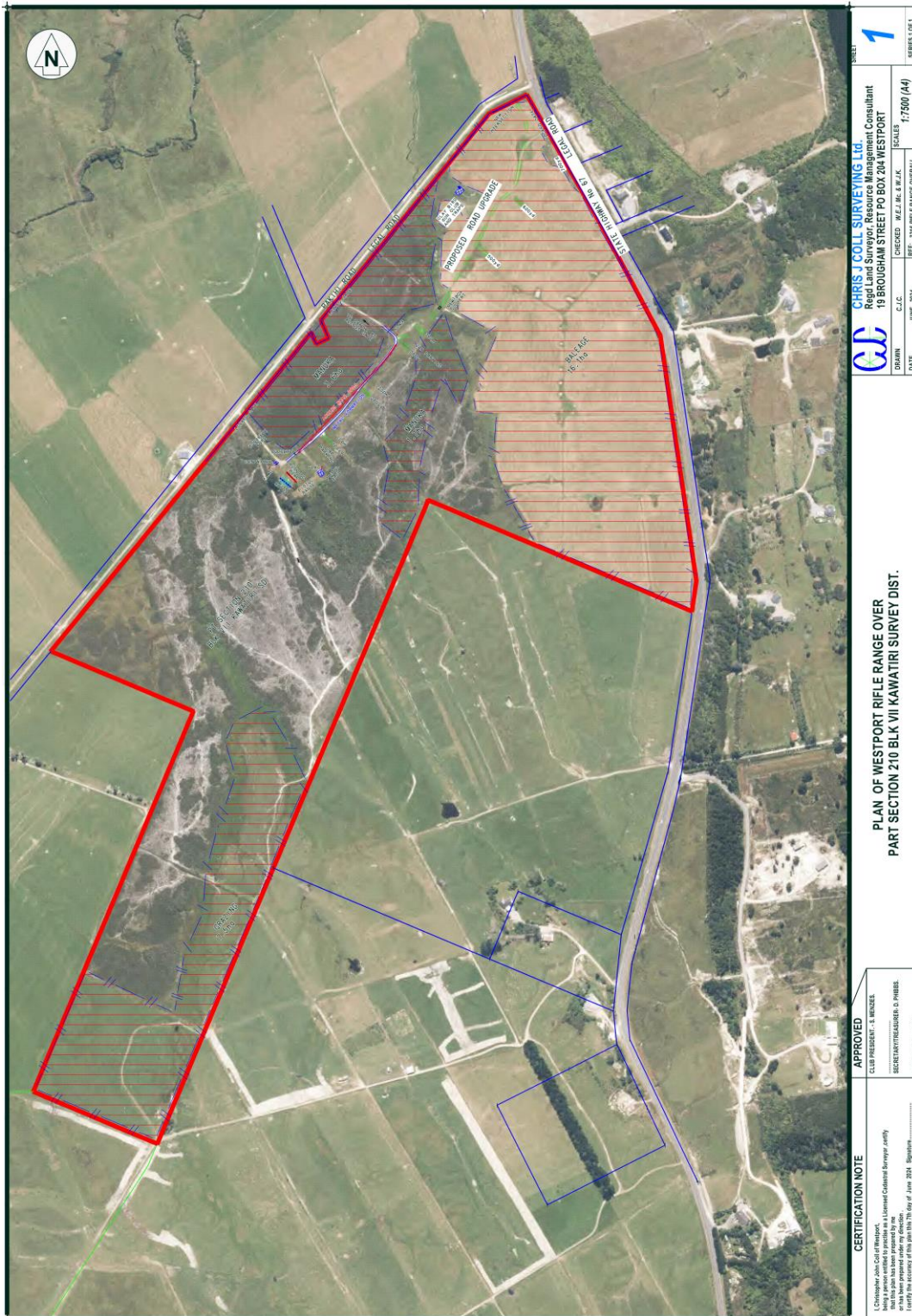
## APPENDIX A GLOSSARY OF TERMINOLOGY

<b>A-weighting</b>	<p>A set of frequency-dependent sound level adjustments that are used to better represent how humans hear sounds. Humans are less sensitive to low and very high frequency sounds.</p> <p>Sound levels using an “A” frequency weighting are expressed as dB <math>L_A</math>. Alternative ways of expressing A-weighted decibels are dBA or dB(A).</p>
<b><math>L_{Aeq}</math></b>	<p>The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.</p>
<b><math>L_{Amax}</math></b>	<p>The A-weighted maximum sound level. The highest sound level which occurs during the measurement period. Usually measured with a fast time-weighting i.e. <math>L_{AFmax}</math></p>
<b>Noise</b>	<p>A subjective term used to describe sound that is unwanted by, or distracting to, the receiver.</p>
<b>Notional boundary</b>	<p>A line 20 metres from any side of a dwelling, or the legal boundary where this is closer to the dwelling.</p> <p>This definition is from NZS 6802:2008.</p>



**APPENDIX B WESTPORT PISTOL CLUB INFORMATION 2024**

The following information was provided by the Westport Gun Club (7 June 2024):



- Firing Direction:** Direction of firing - to the southwest.
- Firing Positions:** We have 8 firing points in a line, all firing in the same direction (Southwest), against a certified bund. These are “Static” Firing positions and does not include internal club competitions where a shooter moves from target to target when conducting multi-target shooting within the range certified shooting area.

3. **Firearms:** We use a wide range of Pistol calibres ranging from .22LR through to .50 Cal. In effect it is anything from .22 , .9mm, .357, .44Mag, .4440, .45ACP, .50. Rifles used are .22, .4440, .357, 17HMR, .22Mag

- 7 metres IPSC Handgun.
- 7 metres IPSC Pistol Carbine/IPSC Mini Rifle.
- 50 metres IPSC Rifle.
- 8 metres IPSC Shotgun (Birdshot & Buckshot)
- 50 metres IPSC Shotgun (Lead solids slugs).
- 5 metres CAS Pistol.
- 7 metres CAS Shotgun.
- 13 metres CAS Rifle.
- 10 metres NRA pistol.

4. **Usage, restrictions, seasonal variations:**

- Its important to note there is no restrictions in the operative District Plan on hours of operation.
- The Pistol club shoots on Sunday mornings at a scheduled time of 0.930, set up and the range is open from 10am to 12.00. During Daylight Savings time of the year, we undertake night shoots for our club members who live out of the area, these shoots take place on a Wednesday or Thursday night with one of our local Range Officers & run for around 2 hours. Other evening shoots are arranged on a case-by-case basis and consideration of other shooting disciplines are reviewed to minimize disruption to other range users. Club members, who are certified range officers themselves, can and do use the range for practice shooting at any times in between at times that suit them. This could be morning, days, evening, there are no seasonal nor time restrictions as a live range in operation.
- Seasonal use is likely to increase even as other clubs are engaging with our clubs for potential future interclub matches etc.
- The Pistol club has other national Pistol New Zealand members attend the range, but currently do not hold scheduled competitions. We do, however, run internal competition shoots for our club members who would like to attend. It needs to be noted that at AGM's the club has a future plan to see more inter club liaisons.
- The NZDF or Police do not use the Pistol range, they have their own certified ranges, however they are welcome to attend as private individuals if they wish. The Pistol range does cater for the local branch of the NZCF, this activity is run under one of our Range Officers / Club Member.
- There are no limitations for the use of the Pistol range in relation to weather conditions as the Static Shooting positions are under cover.
- **Earth bunds:** The Pistol club has an earth "Back-Stop" at the Southwest end of the range, this has been regularly inspected and certified by the Police representative. The Pistol Club monitors the condition of the backstop and undertakes maintenance to ensure compliance with current regulations.
- **Range management, documented noise abatement procedures:** Neither the range standing orders, nor the operative District Plan requires noise abatement procedures.
- **Complaints:** No complaints have been received in relation to the Westport Pistol club to my knowledge. It needs to be noted that properties to the NE of the range have had no complaints covenants on title.

## APPENDIX C - FURTHER INFORMATION

The following information was provided by the Westport Gun Club (14 June 2024) and the Pistol Club but too late to be incorporated into this assessment:

The following calibres are used regularly:

12 gauge shotguns at the Claybird Clubhouse.

Rifles used over the whole range from the 100 yard mound to the 700 yard mound near the State Highway include :

- 6,7 and 8mm
- 0.338 Lapua Magnum
- 300WinMag
- 30-06
- 0.308
- 0.303
- 7mm Rem Mag
- 6.5mm CreedMore
- 6.5x284
- 0.22 Long Rifle
- 0.177

The loudest would be 0.338 Lapua Magnum and 300WinMag with muzzle break (not suppressed)

The smallest decibel output would be from the 0.22 Long Rifle and/or 0.177.

The Pistol Club uses calibres ranging from 0.22 to 0.45 with consequently varying sound signatures.

### **10. Description of individual ranges and Conditions of use:**

- The complex has one outdoor range:
- **The range is restricted to the firing of the following firearms:**

#### ➤ **Range 1: 50m Outdoor No Danger Area Range (NDA).**

##### **Restrictions:**

- [a] Pistols up to and including .50 Calibre with a muzzle velocity no greater than 1600fps.
- [b] Rifles firing Pistol Calibres up to and including .45 Calibre with a muzzle velocity no greater than 2148fps.
- [c] Rifles up to and including .22 LR with a velocity no greater than 1400fps.
- [d] Shotguns up to and including 12 Gauge with a muzzle velocity no greater than 1600fps.

##### **Conditions of Use: Range 1:**

- Down Range Shooting only.