

Monday, 31 July 2023
Reference: P191259LT1-R2.docm

Statutory Planning Officer
Shire of Serpentine Jarrahdale
6 Paterson Street,
Mundijong WA 6123

Attention: Mr David Quelch

Dear Mr Quelch,

394 Robertson Rd, Cardup (PA23/198), Environmental Noise Assessment – Peer Review

We have undertaken an acoustic review and appraisal of the following reports
Environmental Noise Assessment – Lot 60 Norman Road, Cardup by Lloyd George Acoustics,
dated 14/07/23, Ref: 22107634-01A [LGA1]

From our review we have the concerns:

- The Assigned level for the surrounding neighbours appears to be 2 dB too high
- The resulting noise emission criteria appear to be 7 dB too high
- The ground absorption coefficients appear to be unrealistically high, resulting in an underestimate of forecast noise levels
- No management measures have been discussed to limit the operation to only one stressing bed out of the proposed four stressing beds.
- An 'area source' has been used to model mobile equipment operations in the western yard area of the site. This implies that the equipment will always be equispaced around the yard. The applicant has not demonstrated how this is to be achieved
- There has been no discussion about reversing beepers or other potential noise sources used on mobile equipment at the site.
- The LGA modelling algorithm used to forecast environmental noise from the site was ISO 9613. LGA has not justified the departure from the commonly used CONCAWE algorithm.
- Use of shipping containers as a noise control method.

These concerns are discussed in detail overleaf.

It is for these reasons that we are unable to support the proposed activities and do not recommend their approval at this time.

Yours sincerely,



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1.0 Pre 7am noise sources

LGA state in their report¹ that 2 trucks and 2 telehandlers have been assessed during the pre 7am period.

There has been no discussion about whether the vehicles reverse during their operations, and whether they use reversing alarms. There is no discussion of other potential noise sources such as air brakes or movement alarms.

In addition, these noise sources have been modelled as 'area sources'. Such a modelling scenario will inevitably 'average' out the noise emissions from the activity and the site. If and when such equipment is operated near the Western residences then the 'area source' calculation will underestimate the overall L_{A10} noise emission from the site.

Were such modelling considered representative of activities at the site, i.e., all the mobile noise sources are equally dispersed, the applicant needs to demonstrate how the multiple trucks & telehandlers will be prevented from simultaneously co-locating to the western, or most sensitive part of the site.

2.0 Ground Absorption

LGA state in their report² that they have used a ground absorption factor of 0.1 for road areas, 0.8 for the site (broken ground) and 1.0 for vegetated areas.

I agree with the 0.1 absorption factor for roads.

The use of 0.8 for the site, being described by LGA as broken ground is considered inaccurate. ISO 9613-2:1996 itself specifically states³ that "*Tamped ground, for example, as often occurs around industrial sites, can be considered hard.*" The subject site clearly has mobile equipment continuously driving over the bare ground.

The true test for absorption is whether the ground is "*porous*"⁴ rather than 'broken'. It is my considered opinion that the site itself should have an absorption factor of 0 due to the heavy driving of mobile equipment over it.

This factor of 0 should also be applied to the water bodies visible in Figure 1 below.

Heavier bushland, in the bushland forever, can use an absorption factor of 1.0. The ground around Soldiers road, and within the neighbouring properties should be treated as 0.65. This is because dry areas, with minimal grass cover, would have lower absorption than 1.0. By way of example the aerial photo in Figure 1 demonstrates these dry areas.

¹ LGA Section 1, first bullet point Page 2

² LGA Section 3.3

³ ISO 9613-2:1996, Section 7.3.1 (a) page 6

⁴ ISO 9613-2:1996, Section 7.3.1 (a), (b) & (c) page 6



Figure 1 - Aerial photo of site (Ref google earth)

3.0 Assigned Levels

The controlling noise limit for emissions from the site is the Assigned Level. This is defined in the Environmental Protection (Noise) Regulations 1997 and is applicable at all potentially affected neighbours. The night-time L_{A10} Assigned Level is applicable for a defined subset of noise emissions from the site prior to 7am.

LGA state⁵ that the influencing factor for 440 Soldiers Rd (IF) is 3 dB. I believe this is incorrect, and the IF is actually 2 dB lower. Where the IF is reduced by 2 dB the overall forecast noise from the site will exceed the Assigned level by 2 dB and hence too high. Additional noise controls are needed, above and beyond that already recommended.

When the night-time Assigned Level is assessed against the Town planning scheme and structure plans it should be recorded as L_{A10} 36 dB not 38 dB. Likewise the daytime Assigned Level should be 46 dB. A summary of the calculations for the L_{A10} Assigned Level is given in Table 1 below.

Table 1 – Influencing Factors Calculation comparison for 440 Soldiers Rd – 15m from facade

Item	LGA Factor	Reverberate Factor	Comment
Transportation Factor	0 dB	0 dB	-
Commercial Premises within inner circle	0% = 0 dB	0% = 0 dB	-
Commercial Premises within outer circle	0% = 0 dB	0% = 0 dB	-
Industrial Premises within inner circle	0% = 0 dB	0% = 0 dB	-
Industrial Premises within outer circle	30% = +3.0 dB	12.3% = +1.2 dB	The Land Use maps identify industrially zoned land in and around the site. The current draft Town Planning Scheme 3, as well as the Metropolitan Regional scheme both identify Rural/'bushland forever' land to the immediate south of the proposed operations, refer Figure 2 Reference to these maps provides for the 12.3% area, rather than the 30% used by LGA. This lower percentage area reduces the LGA factor by -1.8 dB
TOTAL Influencing Factor	+3 dB	+1 dB	The total influencing factor is 1 dB. This is 2 dB lower than LGA due to the -1.8 dB difference outlined above.
Assigned level			
Night-time L_{A10}	(35+3 =) 38 dB	(35 + 1 =) 36 dB	The corresponding Assigned Level is then 2 dB lower than that presented by LGA
Daytime L_{A10}	(45+3 =) 48 dB	(45 + 1 =) 46 dB	

The revised influencing factor will alter the Assigned Levels for day, evening, and night-time operations. Each Assigned levels at 440 Soldiers Rd will 2 dB lower than those presented by LGA.

⁵ LGA Table 2-3, page 4

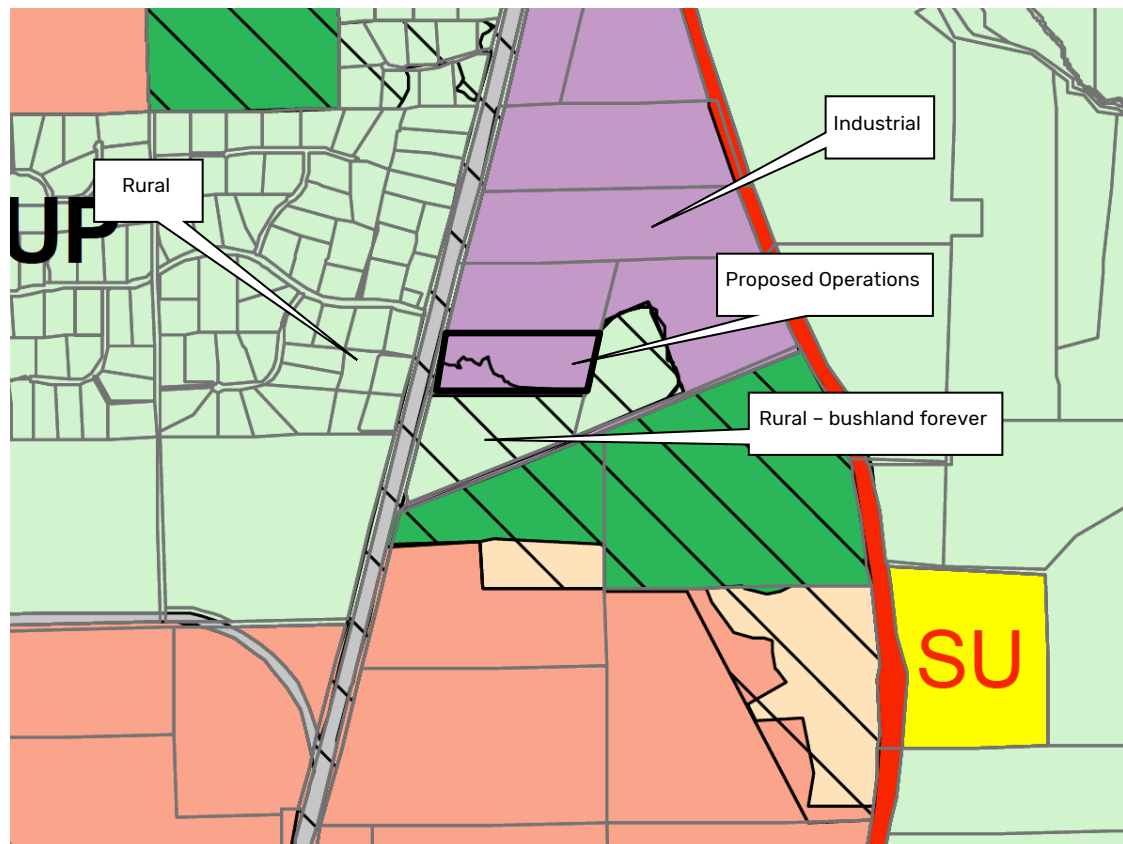


Figure 2 - Metropolitan Regional Scheme land zoning Map (Similar to Shire of S-J draft LPS 3)

4.0 Adjoining industrial activity

As the land to the north of Permacast is zoned industrial, it is likely that industrial neighbours will occupy this land. Example areas are shown in Figure 1 above.

Due to these industrial neighbours, no individual industrial operator would be allowed to *significantly contribute*⁶ to industrial noises at the nearest residences. This means that each industrial operation, including the Permacast operations must emit a noise no greater than 5 dB below the Assigned Level.

To prevent significant noise contribution at the nearby residences, each industrial neighbour has a revised noise emission criterion of:

$$L_{A10} \ 36-5 = 31 \text{ dB before 7am and}$$

$$L_{A10} \ 46-5 = 41 \text{ dB after 7am.}$$

These criteria are 7 dB lower than the Assigned Level criteria used by LGA and referenced in Table 1 above.

⁶ Environmental Protection (Noise) Regulations 1997, Regulation 7 (2)

5.0 Post 7am noise sources

The modelling scenarios have assumed that the stressing beds only operate after 7am, and do not operate simultaneously. It is noted that this is one of the dominant daytime noise sources so any simultaneous stressing operations would noticeably increase noise emission from the site.

The applicant is to demonstrate how they intend to prevent simultaneous stressing bed operations.

6.0 Modelling using ISO 9613

Noise modelling in Western Australia, as stated by DWER, is commonly undertaken using the CONCAWE algorithm⁷. In fact, the meteorological conditions used by LGA were developed for the CONCAWE algorithm.

Where LGA uses ISO 9613, they need to justify its use as outlined by DWER. LGA also needs to compare the forecast results with CONCAWE as part of that exercise.

7.0 Shipping containers used as noise barriers

The use of 40ft storage containers as the prime method of shielding noise to surrounding residential areas is questioned. Acoustically they have been shown to be sufficient to control noise.

We remain concerned about non-acoustic issues. The following list is not considered comprehensive, and we recommend other expertise be consulted:

- The shipping containers appear to be located so as to interfere with normal Permacast operations. This may cause their relocation to alternative locations, potentially compromising the noise control
- shipping containers, by their design, may be considered temporary and liable to be removed. They are designed to be transported. This means that they may not form a permanent solution
- Shipping containers may corrode more than a permanent, purpose-built noise barrier
- It is unclear if shipping containers can withstand high winds, especially when stacked
- The stacking of containers may create additional workplace hazards

We recommend that the applicant justify the use of these shipping containers to the satisfaction of the Shire, otherwise an alternative permanent solution is to be implemented.

⁷ Section 1.2, page 30, Draft Guideline - *Assessment of environmental noise emissions*, DWER, May 2021