



Project No: 181576

Noise Impact Assessment Proposed Tourist Accommodation and Function Centre 226 Gillards Road, Pokolbin, NSW

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INTRODUCTION

This report provides the results, findings and recommendations arising from an acoustical assessment of a function centre and tourist accommodation development at 226 Gillards Road, Pokolbin, NSW.

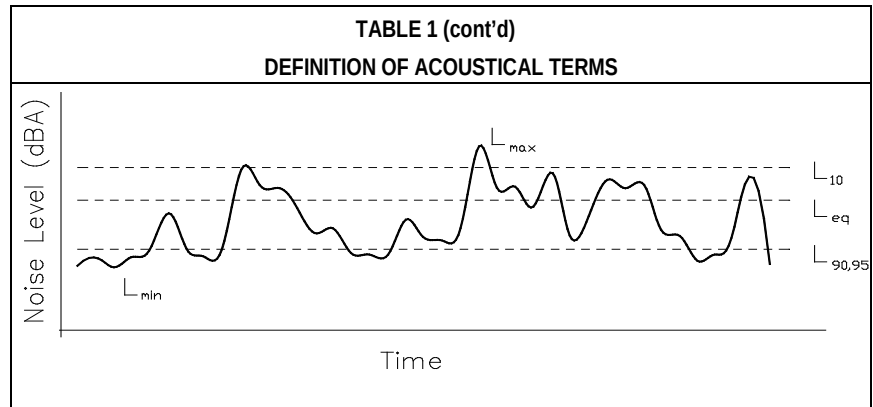
The assessment is to support a Development Application (DA) to Cessnock City Council (Council) and addresses acoustic issues raised by Council's as follows.

"The proposed tourist accommodation and function centre is located in an established vineyard/agricultural area. It is considered that there is the potential for conflict with respect to noise between the development and existing uses, taking into account human habitation and high level use of the function centre impacting on the rural amenity, as well as noise generated from agricultural activities (such as night time harvesting) on the accommodation.

Subsequently a Noise Assessment is required to support the application. Please be aware that Section 3.2.8 of Chapter E.3 of the DCP states that tourist development located adjoining/adjacent existing wineries shall be required to provide a report from a qualified acoustic consultant detailing measures to satisfy Council that noise levels would be acceptable."

Table 1 contains a glossary of commonly used acoustic terms and is presented as an aid to understanding this report.

TABLE 1 DEFINITION OF ACOUSTICAL TERMS	
Term	Definition
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A-Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L10	Average Maximum Noise Level - the level exceeded for 10% of the monitoring period.
L90	Average Minimum Noise Level - the level exceeded for 90% of the monitoring period and recognised as the Background Noise Level. In this instance, the L90 percentile level is representative of the noise level generated by the surrounds of the residential area.



BACKGROUND TO THE PROPOSAL

The proponent has advised that the proposal comprises a function centre that would cater for weddings and other functions and 72 services tourist accommodation Units.

An aerial view of the project site, noise logger location and nearest residential receivers is shown in **Figure 1**. A concept layout of the proposal is shown in **Figure 2**.

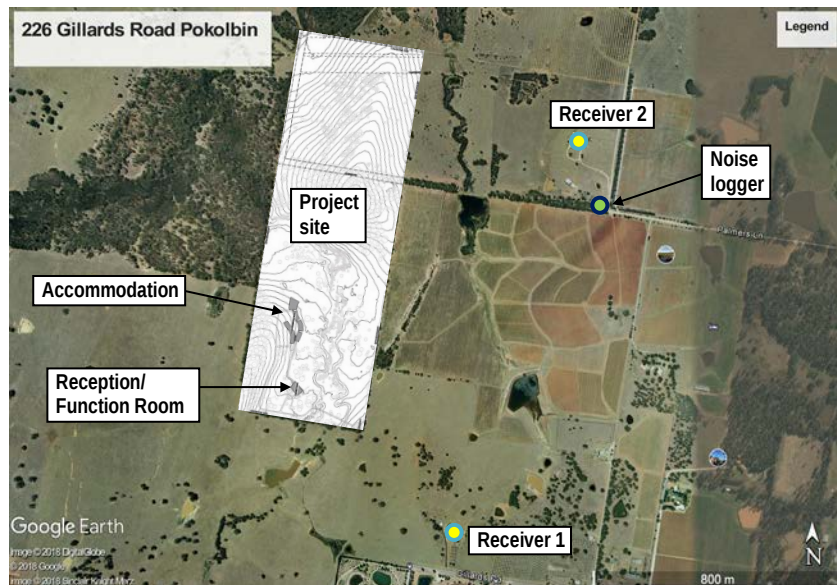


Figure 1 – Aerial view of project site (source: Google Earth)

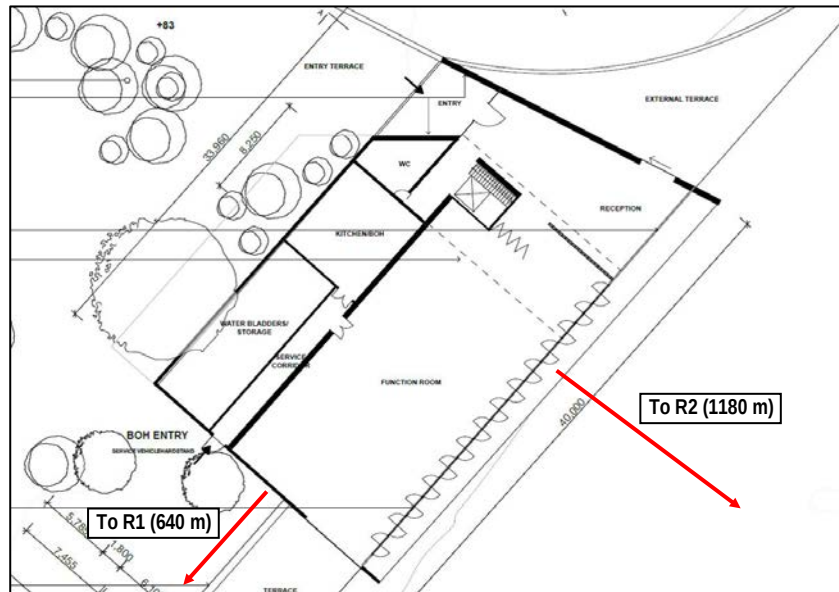


Figure 2 – Proposed reception / function centre

EXISTING ACOUSTIC ENVIRONMENT

Ambient noise levels were measured at the western end of Palmers Lane as indicated in Figure 1 from 1 – 8 February 2018 using a Svan 971 environmental noise logger. A photograph of the noise logger looking back towards the project site is attached to this report. The measurements were conducted in accordance with relevant EPA guidelines and AS 1055-1997 “Acoustics – Description and Measurement of Environmental Noise”. The noise logger used complies with the requirements of AS 1259.2-1990 “Acoustics – Sound Level Meters”, and has current NATA calibration certification.

The logger was programmed to continuously register environmental noise levels over the 15 minute intervals, with internal software calculating and storing Ln percentile noise levels for each sampling period. Calibration of the logger was performed as part of the instrument’s initialisation procedures, with calibration results being within the allowable ± 0.5 dB(A) range.

Ambient L_{Aeq} and background (L_{A90}) noise levels obtained from the loggers are summarised below in **Table 2**. Table 1 includes the background (L_{90}) levels and the Leq over the full day (11 hour, 7am-6pm), evening (4 hour, 6pm-10pm) and night (9 hour, 10pm-7am) periods.

TABLE 2 Ambient noise levels 1 – 8 February 2018					
Day		Evening		Night	
$Leq(15min)$	L_{90} (RBL)	$Leq(15min)$	L_{90} (RBL)	$Leq(15min)$	L_{90} (RBL)
48	31	48	35	41	28

The results are typical of a rural area where birds elevate the LAeq level in the evening relative to the day, and night time background levels are below 30 dB(A). The default minimum night time background level of **30 dB(A),L90** has been adopted in accordance with section 3.1.2 of the NSW Industrial Noise Policy (INP).

NOISE IMPACT CRITERIA

Function Centre

Premises which are licensed under the Liquor Act may be a source of offensive noise for neighbouring residents as a result of activities on the premises, mainly amplified music.

The Police Department, OLGR and EPA have agreed that the OLGR will accept primary responsibility for the control of noise from licensed premises. Following are the Standard Noise Conditions imposed by OLGR;

“The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz - 8 kHz inclusive) by more than 5 dB between 7.00 a.m. and 12.00 midnight at the boundary of any affected residence.

The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz - 8 kHz inclusive) between 12.00 midnight and 7.00 a.m. at the boundary of any affected residence.

Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00 a.m.”

R criteria specifically relate to noise in octave band centre frequencies. In order to accurately assess the potential impacts of noise from amplified music, frequency spectral data were taken from attended noise surveys archived in the Spectrum Acoustics technical database.

The database contains background noise levels measured in similar rural acoustic environments, in octave bands, with a Bruel & Kjaer Type 2260 Precision Sound analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Bruel & Kjaer Type

4231 Sound Level Calibrator prior to, and at the completion of measuring.

The background noise level used in this assessment for setting the OLGR criteria has been derived by adjusting a typical background octave band spectrum to match the adopted night time background L90 level of 30 dB(A). This will represent the worst case trading hours after 10pm.

By assessing potential impacts against the most stringent night time criterion, compliance at night will automatically imply compliance at all other times. The adopted background noise level and OLGR criteria for assessing noise emission from the proposed function centre are shown in **Table 3**.

TABLE 3 MEASURED NOISE LEVELS (L90) and OLGR CRITERIA (L10)										
		Octave Band Centre Frequency, Hz								
	dB(A)	31.5	63	125	250	500	1k	2k	4k	8k
L ₉₀	30	10	17	20	22	23	24	21	21	19
OLGR	35	15	22	25	27	28	29	26	26	24

Noise Impacts

The project is not industrial in nature, but Councils usually apply the NSW Noise Policy for Industry (NPI) intrusiveness criterion of “background + 5 dB” criterion for assessment of noise impacts on residential uses. The area is not a high traffic noise area and there are no significant permanent nearby industrial noise sources, so the NPI amenity criteria do not apply. Based on the adopted night time background noise level of 30 dB(A), L90 the applicable intrusiveness criterion is **35 dB(A), Leq(15min)**.

QUANTIFICATION OF NOISE SOURCES

The major source of noise from the site is considered to be that of live music played in the function room as indicated in Figure 3.

The adopted LA10 sound power level of typical DJ style music spectrum previously measured by Spectrum Acoustics is shown in **Table 4**. These levels are also typical of a small live band.

TABLE 4 Lw OF DJ MUSIC OR SMALL BAND (L10)									
		Octave Band Centre Frequency, Hz dB(A)							
	dB(A)	63	125	250	500	1k	2k	4k	8k
DJ Music	100	48	69	80	90	94	95	92	84

For the assessment of impacts on the development it has been assumed that an agricultural tractor with sound power level 105 dB(A) could be operating on rural properties to the east and west of the proposed tourist accommodation.

RESULTS AND DISCUSSION

Function Centre

For the calculation of impacts the noise source representing a DJ playing at a wedding, or similar function, (as an Leq 15 (min)) was considered to be located at the centre of the Function Room indicated in Figure 2. The walls of the function

The noise representing the entertainment was then theoretically propagated to both Receivers 1 and 2 taking into account the effects of hemispherical spreading (distance loss), barrier effects and atmospheric absorption, with results shown in **Tables 2 and 3**.

TABLE 2 CALCULATED SPL (as Leq 15 (min)) AT RECEIVER R1									
	Octave Band Centre Frequency, Hz								
Item	dB(A)	31.5	63	125	250	500	1K	2K	4K
Source Lw	100	48	69	80	90	94	95	92	84
Structure loss*		5	5	5	5	5	5	5	5
Atmospheric absorption		0	0	1	2	4	6	12	24
Distance Loss (640 m)		64	64	64	64	64	64	64	64
SPL @ receiver	27	<0	<0	10	19	21	20	16	<0
Criterion (OLGR)	35	15	22	25	27	28	29	26	26
Impact	0	0	0	0	0	0	0	0	0

* Nominal 5 dB through opening from Function Room to terrace.

TABLE 3 CALCULATED SPL (as Leq 15 (min)) AT RECEIVER R2									
	Octave Band Centre Frequency, Hz								
Item	dB(A)	31.5	63	125	250	500	1K	2K	4K
Source Lw	100	48	69	80	90	94	95	92	84
Atmospheric absorption		0	1	2	4	8	12	24	48
Distance Loss (1180 m)		69	69	69	69	69	69	69	69
SPL @ receiver	24	<0	<0	19	17	17	14	<0	<0
Criterion (OLGR)	35	15	22	25	27	28	29	26	26
Impact	0	0	0	0	0	0	0	0	0

Note: No structure loss due to bank of openable doors, assumed open.

The above tables of results show that noise emissions from the DJ/band within the Function Room would be well below the adopted

(minimum) noise criterion at the nearest receivers. Lower levels than those predicted would occur in practice, as the absorptive influence of the ground surface has not been included and an additional 5 – 10 dB attenuation would be expected.

Noise Impacts

The nearest agricultural land to the proposed accommodation units is a vineyard 300m east of the units. Allowing for differing orientations of harvesting machinery, and time at varying engine revs it is estimated that a harvester would be at full revs producing 105 dB(A) for approximately 5 minutes per 15 minute period. This results in a sound power level of approximately 100 dB(A), Leq(15min).

Allowing for a modest and nominal 5 dB atmospheric absorption, 5 dB ground absorption over the propagation path and distance loss for 300m gives a received sound pressure level of 32 dB(A) at the tourist accommodation. This is below the adopted criterion of 35 dB(A) and does not represent a significant noise impact. In practical terms, use of agricultural machinery at night is a relatively infrequent activity impacts would only be occasional.

RECOMMENDATIONS AND CONCLUSION

An acoustical assessment has been completed for a proposed function centre and serviced tourist accommodation development at 226 Gillards Road, Pokolbin, NSW. The results of the assessment have shown that the received noise as a result of noise emissions from the proposal and noise impacts on the proposal from agricultural activities will not exceed the adopted OLGR and NPI noise criteria. Accordingly, we see no acoustic reason why the proposal should not be approved.