

# MEMORANDUM



**220001 – Pilu, 80 Undercliff Road, Freshwater – Response to Council RFI – 28<sup>th</sup> April 2023**

**TO:** Giovanni Cirillo **DATE:** 5 May 2023  
**COMPANY:** -  
**EMAIL:** -  
**FROM:** Matthew Furlong  
**SUBJECT:** Pilu, 80 Undercliff Road, Freshwater – Response to Council RFI – 28<sup>th</sup> April 2023

## **CONFIDENTIALITY**

This document is confidential and may contain legally privileged information. If you are not a named or authorised recipient you must not read, copy, distribute or act in reliance on it. If you have received this document in error, please telephone our operator immediately and return the document by mail.

Pulse White Noise Acoustics Pty Ltd (PWNA) have been asked to respond to the alleged acoustic issues outlined in the Northern Beaches Council (Council) letter dated 28<sup>th</sup> April 2023 concerning DA2022/2281.

This letter references a Peer Review conducted by Rodney Stevens Acoustics (RSA) of our Acoustic Assessment.

PWNA prepared an Acoustic Assessment which accompanied the DA2022/2281 submission (reference: 220001 - *Pilu, 80 Undercliff Road, Freshwater – Acoustic Assessment – R3*, dated 17<sup>th</sup> January 2023).

RSA have undertaken a peer review of our report at the request of McKees Legal Solutions acting for a neighbouring residence located approximately 50m south of the restaurant.

As outlined in further detail below, this response is based on the following documents:

- Northern Beaches Council letter dated 28<sup>th</sup> April 2023 (in relation to DA2022/2281).
- External "Peer Review Report" prepared by RSA (dated 15<sup>th</sup> March 2023, Revision 0, reference R120176R1).

Councils' comments are shown below:

### **Environmental Health Referral Response (Acoustics)**

This DA seeks to formalise the use of the site and its existing improvements as a restaurant with ancillary event services being permitted. This DA also proposes to update the restaurant's operating hours for consistency with the existing liquor licence to 10am – 12am (midnight), Monday to Saturday and 10am – 10pm Sundays. It also seeks to increase the maximum patron occupancy of the restaurant to a maximum of 50 patrons in the pavilion and a maximum of 100 patrons indoors but which must not cumulatively exceed 130 patrons at any one time.

The restaurant includes an existing outdoor pavilion and terrace area. This area is proposed to be used for private wedding ceremonies. During a ceremony, the outdoor area is proposed to host up to 100 patrons with the majority standing.

One of the issues that such an arrangement presents which Environmental Health considers is noise implications.

The submitted Acoustic Report by PWNA Revision 3 17th January 2022 finds:

*Assessment Results and Recommendations*

*Predicted noise levels from the operation of the venue in full operation with Live Music between (all patrons and background music) has been predicted. To ensure compliance is achieved, the following recommendations must be implemented:*

*No more than 100 patrons in the venue at any one time, staff not included.  
Breakdown of patrons are as follows:*

- For general dining:*
  - Up to 100 patrons located inside.*
- No more than 50 permitted in the External Pavilion.*
  - Up to 20 patrons located outside.*
- For a wedding ceremony:*
  - 100 patrons outside in the middle and upper terrace for a short-term ceremony.*

*Operation hours are:*

- Monday to Saturday: 5:00am to 12:00am (midnight).*
- Sunday: 10:00am to 10:00pm.*

*Wedding ceremonies including the use of amplified music (assumed to be vocal and acoustic) and is permitted during the hours of 7:00am and 10:00pm. However, must be limited to 90 dBA Sound Power Level (or equal to 73 dBA @ 3m) when measured as a sound pressure level.*

*Background music is assumed to be 65 dBA for dining areas, all measured as a sound pressure level.*

*Pulse White Noise Acoustics Pty Ltd*

*All doors and windows are to remain shut after 10:00pm and not opened before 7:00am and anytime amplified music is used. Low level background music is permitted to be played with windows open.*

*Removal of glass or waste should be done internally and must not be externally of the premises after 10:00pm and before 7:00am.*

*A contact number must be displayed for the purposes of receiving any complaints if they arrive.*

*Signs must be displayed at all exits reminding patrons to be mindful of noise when leaving the premise.*

*A revised Plan of Management (PoM) is to be prepared based on the additional trading hours. The plan should be reviewed regularly to ensure any required updates are captured.*

*On the assumption the recommendations outlined are incorporated compliance with the acoustic project criteria outlined in section 5 above will be achieved.*

Subsequently, a peer review of the acoustic assessment report, submitted by way of objection has found:

#### **DISCUSSION**

*PWNA's methodology, establishment of noise criteria and noise levels used for calculation purposes are not satisfactory for the assessment of noise for this type of venue. The findings of PWNA's report show that under their proposed scenarios the licensed venue has the potential to comply with the noise criteria. This is based on the incorrect noise criteria used (Refer to Section 2.1). The noise levels used for the assessment of the licensed venue must be based on the AAAC guidelines.*

*It is our opinion that new noise assessment must be carried out. The noise criteria must be revised to reflect the correct time periods as per LG's requirements. The*

*new assessment should be based on the noise levels contained in the AAAC guidelines for activities taking place at the venue while operating at full capacity.*

*The resulting noise levels from the use of the licensed venue must be compared to the relevant noise criteria including sleep arousal, patrons and vehicle movements.*

*Clarification on the use of background music/PA system must be provided. It can be difficult to control noise from live performances taking place outdoors as musicians are likely to bring their own equipment that will not be connected to the in-house sound system. Details of the types of live performances allowed i.e., duets, string quartets, etc. must be provided, all instruments and microphones must be connected to the in-house sound system. The in-house system must be calibrated to ensure compliance to noise criteria. Any noise mitigation measures required for such performances must be clearly detailed.*

*Section 6.1.3 of PWNA's report provides a number of recommendations, these must be reviewed and updated.*

Council accepts that acoustic assessments on yet to be operated venues/areas are theoretical assessments usually to be certified at operational time and adjustments made if necessary to operations; however the issues raised in the Peer Review are considered relevant and necessitate a revised acoustic report.

We further note that we express concerns about any "outdoor " activity past 10pm any day due to neighbouring residential receivers and that restriction of activities inside the building and managing leaving guests (particularly following a wedding) will be difficult to manage and enforce. This is mainly in regard to "offensive noise" from potential shouting, yelling from an event which is sporadic and difficult to adequately manage.

Clause D3 Noise of the Warringah Development Control Plan states the following:-

**"Objectives**

- To encourage innovative design solutions to improve the urban environment.
- To ensure that noise emission does not unreasonably diminish the amenity of the area or result in noise intrusion which would be unreasonable for occupants, users or visitors.

**Requirements**

1. Noise from combined operation of all mechanical plant and equipment must not generate noise levels that exceed the ambient background noise by more than 5dB(A) when measured in accordance with the NSW Industrial Noise Policy at the receiving boundary of residential and other noise sensitive land uses."

It is considered that any supplementary or amended acoustic report which seeks to address the above issues be supported with detailed architectural plans that show proposed floor layouts where the maximum of 130 seats across the buildings will be achieved / maintained.

As shown above, Council's Environmental Health team have relied on an external Acoustic Peer Review conducted by RSA (Reference: R230176731R1, dated 15<sup>th</sup> March 2023). This Peer Review was commissioned by a resident located at 77 Undercliff Road through McKee Legal Solutions.

**Upon reviewing the RSA document, PWNA have found substantial and fundamental issues as well as inconsistencies in undertaking Acoustic Assessments by RSA. The Peer Review documents shows a lack of understanding of the correct methodology which is adopted by the Acoustic Consulting Industry in the state of New South Wales (NSW), and a misunderstanding in the application of the relevant noise criteria outlined currently in the NSW Noise Framework.**

A detailed review of the issues contained in the peer review conducted by RSA (RCA) are provided below.

### **Item 1 – Ambient Noise Assessment and Criteria**

#### **RSA Comment:**

#### **2.1 Ambient Noise Assessment and Criteria**

*Section 4 refers to the ambient noise levels recorded in accordance with the EPA's Noise Policy for Industry 2017 (NPI) and presents the results of the day, evening and night ambient noise levels.*

*Table 2 presents the octave band ambient noise levels for the day, evening and nighttime. The NSW liquor and Gaming (LG) criteria is referenced, however the results from table 2 do not reflect the correct times of day for this assessment. The L&G noise criteria refers to a daytime period from 7:00am to 12:00am (midnight) and night time period from 12:00am (midnight) to 7:00am. The correct time periods must be calculated and updated in this table.*

*Section 5 presents the noise criteria for the proposed changes to the licensed venue. EPA's Noise Policy for Industry 2017 (NPI) should only be used to assess noise emissions from mechanical, industrial and carpark activities.*

Section 5.1.2.3 presents the sleep disturbance noise criteria and concluded that a  $RBL + 15 \text{ dB} = 70 \text{ dB(A)}$  is to be used as the limiting noise criteria. The noise criteria presented is incomplete, the correct noise criteria in accordance with the NPfI Section 2.5 has to be assessed as follows:

- $L_{Aeq,15min} 40 \text{ dB(A)}$  or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- $L_{AFmax} 52 \text{ dB(A)}$  or the prevailing RBL plus 15 dB, whichever is the greater, a detailed maximum noise level

The correct noise levels and descriptor must be revised and presented in a revised report.

Section 5.1.3 presents the L&G noise criteria based on the ambient noise survey carried out. Table 5 presents the derived noise criteria for three time periods. This is not correct as the L&G guidelines require a day and night time, additionally the octave band frequency criteria must be presented in A weighted form as per AS1055 – 2018 and after the threshold of hearing correction has been applied. The noise criteria must be revised.

## PWNA Response

- No response is required to Paragraph 1.
- Paragraph 2:
  - As RSA undertake acoustic assessments in NSW, they should be aware that the determination of Rating Background Noise Levels (RBL's) in New South Wales is undertaken in accordance with the NSW EPA *Noise Policy for Industry (NPI) 2017* – a NSW EPA document.
  - As shown in the extract below, it is clear that the time periods assessed under the NPI are associated with the Day, Evening and Night periods. See extract below.

**Figure 1** Extract – NSW EPA Noise Policy for Industry (NPI) 2017 – Notes below Table 2.1

Noise Policy for Industry			
Active recreation area (e.g. school playground, golf course)	All	When in use	55
Commercial premises	All	When in use	65
Industrial premises	All	When in use	70
Industrial interface (applicable only to residential noise amenity areas)	All	All	Add 5 dB(A) to recommended noise amenity area

**Notes:** The recommended amenity noise levels refer only to noise from industrial sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as follows:

- rural residential – see Table 2.3
- suburban residential – see Table 2.3
- urban residential – see Table 2.3
- industrial interface – an area that is in close proximity to existing industrial premises and that extends out to a point where the existing industrial noise from the source has fallen by 5 dB or an area defined in a planning instrument. Beyond this region the amenity noise level for the applicable category applies. This category may be used only for existing situations (further explanation on how this category applies is outlined in Section 2.7)
- commercial – commercial activities being undertaken in a planning zone that allows commercial land uses
- industrial – an area defined as an industrial zone on a local environment plan; for isolated residences within an industrial zone the industrial amenity level would usually apply.

**Time of day is defined as follows:**

- day – the period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
- evening – the period from 6 pm to 10 pm
- night – the remaining periods.

(These periods may be varied where appropriate, for example, see A3 in Fact Sheet A.)

In the case where existing schools are affected by noise from existing industrial noise sources, the acceptable  $L_{Aeq}$  noise level may be increased to 40 dB  $L_{Aeq}(1hr)$ .

- Further to this, it is also the industry accepted practice that when conducting acoustic assessments for other NSW noise policies outside the NPI (like the NSW Liquor and Gaming), the methodologies outlined in the NSW EPA NPI for determining RBLs are adopted.
- RSA suggestion that the time periods reflected in the NSW EPA NPI 2017 are not suitable is incorrect.
- Furthermore, this suggestion by RSA about time periods being incorrect is not consistent with general industry practice. This is demonstrated by referencing other acoustic assessments by reputable acoustic consulting firms for licensed premises in NSW; see below.
  - ARUP Acoustic Consulting – 388 George Street, Sydney.
  - Renzo Tonin & Associates – 533-535 Princes Highway, Kirrawee.

**Figure 2 Extract – 388 George Street, Sydney – ARUP Acoustic Report**

Table 3:  $L_{A90}$  octave band attended noise survey results

Location	Time Period	dBL <sub>90, 15min</sub> – Octave band centre frequency (Hz) dBZ								
		31.5	63	125	250	500	1k	2k	4k	8k
NM1	Day	70	67	67	65	62	60	56	49	36
	Evening	63	63	64	62	59	56	52	44	33
	22:00hrs – 00:00hrs*	63	63	64	62	59	56	52	44	33
	Night	60	62	65	62	57	54	49	42	32

\*Calculated RBL for this time period is the same as the calculated RBL for the evening period

**Figure 3 Extract – 533-535 Princes Highway, Kirrawee – Renzo Tonin Acoustic Report**

**4.2 Project noise goals**

The octave band noise goals set out in Table 4 below have been established from measured noise levels set out in Section 4.1. The shorter time periods of 10pm-11pm and 11pm-12midnight have been used to assess varied operational scenarios during those specific time periods. The day and evening periods are consistent with the NSW EPA standard assessment time periods.

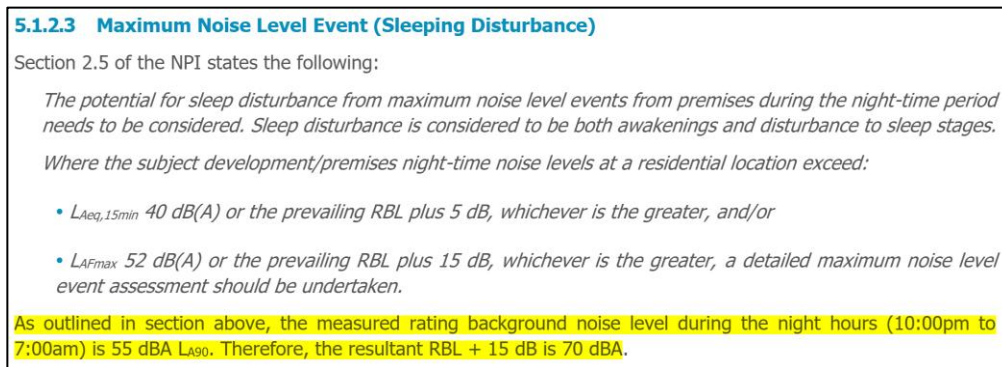
**Table 4: OLGR noise goals**

Assessment period	Octave band centre frequency - Hz (dBZ)								
	31.5	63	125	250	500	1k	2k	4k	8k
<b>Location A1, A2</b>									
Day (7am - 6pm)	64	66	59	55	51	52	48	41	31
Evening (6-10pm)	58	61	55	51	48	51	47	40	29
10-11pm	55	59	52	48	43	46	42	37	28
11-12pm	52	56	49	43	39	43	39	34	28

- As shown in the extracts above, Rodney Stevens Acoustic application of NSW Liquor and Gaming requirements and determination of RBLs are incorrect, as evident above.
- Therefore, Table 2 of the PWNA submission remains correct.

- Paragraph 3:
  - A lack of understanding of the site and associated development application is evident in the RSA comment. The site does not contain any “industrial” or “carparks”.
  - In relation to the mechanical plant, compliance is already achieved. Again, no alterations to this existing system are currently proposed.
  - No further comment required.
- Paragraph 4 & 5:
  - The criteria are not incomplete. Refer to the report and the extract provided below.
  - No further comment required.

**Figure 4      Extract – PWNA Pulu Acoustic Assessment**



- Paragraph 5:
  - In relation to the first two (2) sentences, PWNA have shown that RSA are fundamentally incorrect in their understanding of the correct methodology for licensed premises assessments in NSW. No further comment required.
  - In relation to their commentary around A-Weighting:
    - Like above, a lack of understanding is evident in their response. As per Figure 3 (ARUP report) and Figure 2 (Renzo Tonin Report) above, it is common industry knowledge that octave band assessments are done in a Z-weighting and have a broadband A-weighting applied for the overall level.
    - Nowhere in AS1055:2018 “Acoustics—Description and measurement of environmental noise” does it suggest that noise level spectrum data should be provided as A-weighted levels.
    - Based on this, RSA are incorrect in their statement.
    - No further comment required.
  - Regarding the threshold of hearing, RSA should refer to ISO 226 which shows the threshold of hearing in octave bands in Z-weighting (in line with commentary above).



- No further comment required.

## **Item 2 – Noise Impacts and Assessment**

### **RSA Comment:**

*Section 6 presents the noise levels generated by the licensed venue. The noise levels from patrons and music have been based on PWNA's data base and previous attended noise measurements. PWNA is a member firm of the Association of Australasian Acoustical Consultants (AAAC). It is unclear why the AAAC Licensed Premises Guideline v2 - Nov 2020 was not used for this assessment. The AAAC Licensed Premises Guideline v2 - Nov 2020 provides methodology for assessing licensed venues, it provides information to cover the following key areas:*

- *Patron sound level data which will be useful in predicting noise emissions from groups of people in various situations including, restaurants, small outdoor drinking/smoking areas, poker machine areas, beer gardens and nightclubs.*
- *Typical music sound level data within venues and measures to minimise and limit music noise breakout.*

*The AAAC guideline must be used for this assessment. All noise generating activities must be revised and the new outcomes must be presented. Figure 1 presents the layout of the existing venue, it can be seen that it has multiple internal and external areas. The scenarios presented in Section 6.1.2 provide insufficient information and are not representative of a real event. For example, the venue has 4 different external areas. Detailed scenarios, including the number of patrons, activities carried out and any other relevant noise generating activity i.e. live bands, DJs and the effect of door being open must be clearly detailed.*

*The venue is proposing to operate until 12:00am, there is no information regarding the closing procedures of the venue. It is likely that activities such as patrons leaving, cleaning and general closing will occur past 12:00am. The assessment does not look into this possibility.*

*A sleep disturbance assessment has not been carried out. The licensed venue will operate during part of the night time period with vehicles leaving the premises and the operation of the mechanical plants and equipment.*

*Tables 8 and 9 present the resulting noise levels at the southern receivers however the receivers to the north west have not been taken into consideration.*

*Additionally, the results presented in these tables are likely to change once the revised noise criteria and noise levels have been used.*

*The recommendations provided in Section 6.1.3 must be revised once the new assessment has been carried out.*

### **PWNA Response**

- Regarding paragraph 1:
  - RSA are correct in stating that PWNA is a member firm of the AAAC. PWNA also note that RSA are **not** a member of AAAC.
  - Furthermore, since RSA is not a member of the AAAC, it is unclear why they are suggesting that the AAAC Licensed Premise Guideline must be used.

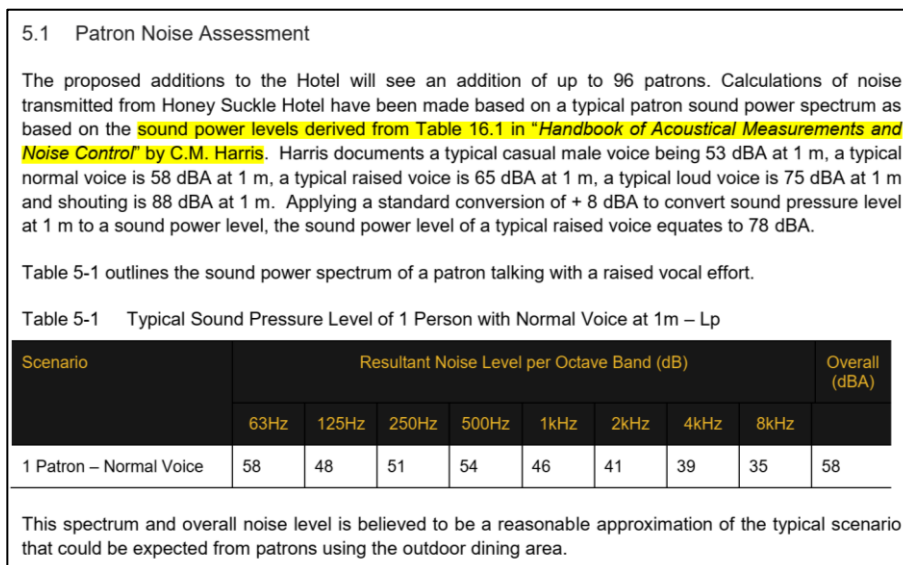
- The fact that PWNA are members of the AAAC does not mean that it is mandatory for this Guideline to be used for licensed premises assessments where relevant legislation (Council DCP, NSW Liquor and Gaming) does not specifically request its implementation. PWNA often does use the methodology in this document for the assessment of licensed premises where it is considered useful and relevant.
- Current the Northern Beaches Council DCP/LEPs and NSW Liquor and Gaming requirements do not request its use in the assessment of licensed premises, therefore no further comment on this point is required.
- Regarding paragraph 2:
  - Refer to the discussion above.
  - No further comments are required.
- Regarding Paragraph 3:
  - Refer to the comments above.
  - Furthermore, RSA contradict themselves in their assessment methodology. In numerous acoustic reports written by RSA, the AAAC guidelines have not been adopted. This is a double standard that potentially suggests a disingenuity in their approach to this peer review. See examples below.
  - Note: interestingly the RSA extracts shown below also show un-weighted octave band noise levels and not A-weighted octave band levels that the suggest should be used.

**Figure 5 Extract – Rodney Stevens Acoustics – 72 Laycock Street, Bexley – Acoustic Report**

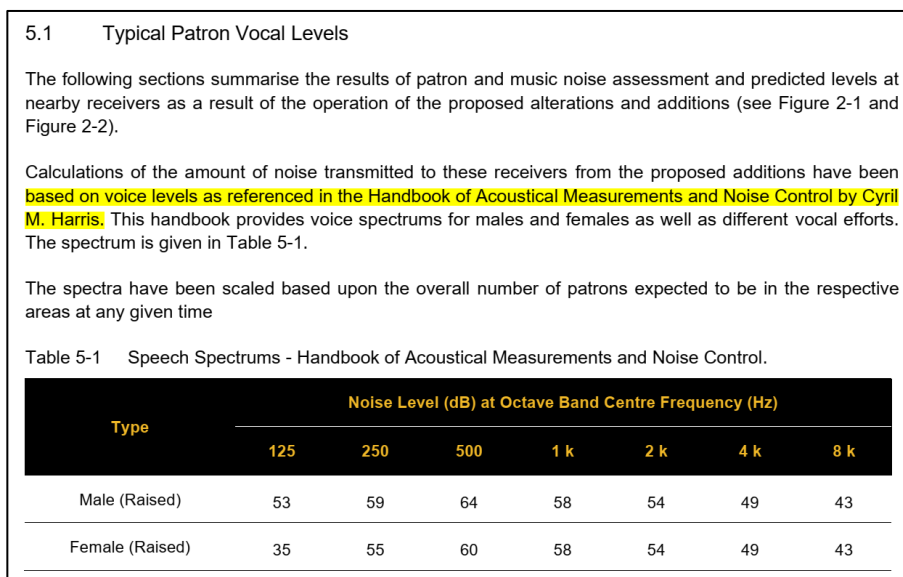
5.1 Typical Patron Vocal Levels								
Calculations of the amount of noise transmitted to these receivers from patrons at the proposed development have been based on voice levels as referenced in the <b>Handbook of Acoustical Measurements and Noise Control by Cyril M. Harris</b> . This handbook provides voice spectrums for males and females as well as different vocal efforts. The spectrum is given in Table 5-1.								
The spectra have been scaled based upon the overall number of patrons expected to be in the respective areas at any given time								
Table 5-1 Speech Spectrums - Handbook of Acoustical Measurements and Noise Control.								
Type	Noise Level (dB) at Octave Band Centre Frequency (Hz)							Overall dB(A)
	125	250	500	1 k	2 k	4 k	8 k	
Male (Raised)	53	59	64	58	54	49	43	64
Female (Raised)	35	55	60	58	54	49	43	62



**Figure 6 Extract – Rodney Stevens Acoustics – Lot 31 Wharf C, Honeysuckle Drive Newcastle – Acoustic Report**



**Figure 7 Extract – Rodney Stevens Acoustics – 72 Laycock Street, Bexley – Acoustic Report**



**Figure 8 Extract – Rodney Stevens Acoustics – 3020 Old Hume Highway, Berrima – Acoustic Report**

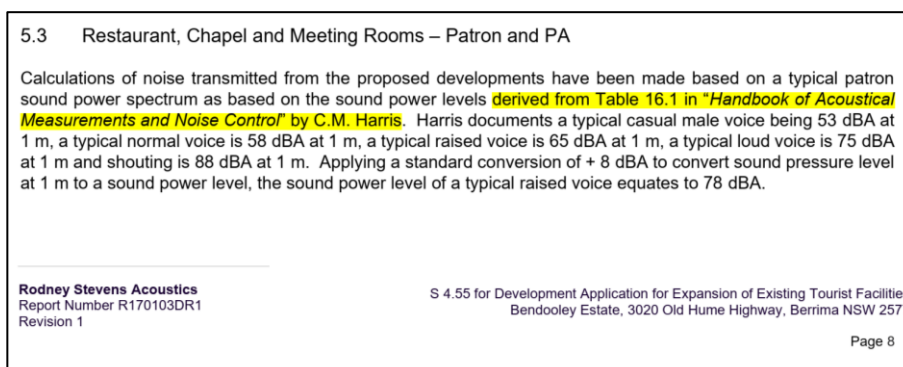


Table 5-1 outlines the sound power spectrum of a patron talking with a raised vocal effort.

Table 5-1 Typical Sound Power Level of 1 Person with Raised Voice - L<sub>w</sub>

Scenario	Resultant Noise Level per Octave Band (dB)								Overall (dBA)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
1 Patron – Raised Voice	58	59	69	76	74	68	64	55	67

- More importantly, the assumed noise levels adopted by PWNA for a single patron talking are higher in all cases than those adopted by RSA.
- No further comments are required.
- Regarding Paragraph 4:
  - RSA are directed to section 6.1.2 and 6.1.3 of the report. This is provided.
  - No further comments are required.
- Regarding Paragraph 5:
  - The comments from RSA are....
 

*"The venue is proposing to operate until 12:00am, the is no information regarding the closing procedures of the venue. It is likely that activities such as patrons leaving, cleaning and general closing will occur past 12:00am. The assessment does not look into this possibility."*
  - The Development Application seeks operation until 12:00am – Midnight (not after). An assessment of activities is not required after the venue has closed as there will not be any significant activity after closing time.
  - No further comments are required.
- Regarding Paragraph 6:
  - A Sleeping Disturbance assessment is not relevant to Activity Noise. The NSW EPA NPI is noticeably clear on this matter. RSA should refer to Section 1.2 of the NSW EPA NPI 2017. An extract is provided below for their convenience.

#### Noise Policy for Industry

##### 1.4.2 Existing noise sources

The application of the policy to existing sources of noise would occur where a modification is proposed that requires an amendment to the existing development consent or environment protection licence, or where the requirements in place for an existing licenced activity are being reviewed.

When applying the policy to existing operations, the scope for applying feasible and reasonable mitigation measures can be more limited than for new developments. Careful consideration of noise impacts and the **feasible and reasonable mitigation measures** available at these sites is needed, noting that the noise limits might not be the same as those for a greenfield site. The assessment and management of existing premises is dealt with in Section 6.

##### 1.5 What has been excluded from the policy?

The policy does not apply to:

- vehicles associated with an industrial premise that are on a public road
- transportation corridors (roadways, railways, waterways and air corridors)
- noise from sporting facilities, including motor sport facilities
- construction activities
- noise sources covered by regulations (domestic/neighbourhood noise)
- blasting activities
- shooting ranges
- internal or occupational noise within any workplace regulated by SafeWork NSW
- wind farms
- **amplified music/patron noise from premises including those licensed by Liquor and Gaming NSW.**

Other government policies, guidelines and legislation typically cover these noise sources.

- As a Sleeping Disturbance Assessment (formally referred to a *Maximum Noise Level Event Assessment* in the Policy) is a NSW EPA NPI 2017 requirement, it is not relevant in this assessment.
- No further comments are required.
- Regarding Paragraph 7:
  - Compliance is achieved at neighbouring properties within 25m of the site. The receivers RSA are referring to receivers which are located 80m to the west and 275m to the north.
  - Its unclear why RSA believe these receivers would be non-compliant when noise levels at the closest receivers is acceptable.
  - The current assessment assesses noise to the worst-case residential receivers.
  - Furthermore, no amendment to the assessment is required as per the discussion above. PWNA have undertaken the assessment correctly. The methodologies suggested by RSA are incorrect.
  - No further comments are required.

In summary, the Peer Review which has been conducted by RSA is fundamentally inaccurate. It suggests methodologies and reporting requirements which are inconsistent with best practice. Furthermore, their comments show a lack of understanding of the current NSW Noise Framework and its associated application.

Based on the fact that the acoustic assessment shows full compliance with the applicable assessment guidelines, the statements provided by RSA to the contrary are incorrect. The acoustic assessment undertaken by PWNA is fully compliant with the requirements of Northern Beaches Council.

Finally, a review of the information contained in the Objection from McKees Legal Solution notes that they have been engaged by the neighbours of 77 Undercliff Road, Freshwater. The assessment that RSA has conducted at no point discusses any impacts to the property located at 77 Undercliff Road, Freshwater. As such, it is not clear what the intended purpose of their Peer Review is. For reference, full compliance with current NSW Noise Policies and Noise Framework is achieved at 77 Undercliff Road, Freshwater.

Furthermore, we note inaudibility is only required after midnight under the current NSW Liquor and Gaming Requirements. The information outlined by McKees notes that events are audible at their location. We do not doubt this; however, a Background + 5dBA requirement (as required by NSW Liquor and Gaming) does not equate to inaudibility – it means 5dBA above the rating background noise level (RBL) for the relevant time-period. As such, noise from events may at times be audible and still be acceptable.

If you have any additional questions, please contact us should you have any further queries.

Regards,

A handwritten signature in blue ink, appearing to read 'M Furlong', is positioned above the printed name and title.

Matthew Furlong  
Principal Acoustic Engineer  
PULSE WHITE NOISE ACOUSTICS PTY LTD