Noise Impact Assessment of proposed Dog Breeding Facility
Lot 10 DP 775028, 38 Little Run Road, Wherrol Flat, NSW

J0550 R01v01

Revision 1

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CLIENT: Shasa Carthew
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PROJECT TITLE: Noise Impact Assessment of proposed Dog Breeding Facility
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Document Release History

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1 Table of Contents

1 Table of Contents 2
2 Introduction 3
2.1 Limitations 3
2.2 Reference Information 3
3 Proposal Description 4
3.1 Site Description 4
4 Existing Environment 6
4.1 Potentially Noise Affected Receivers 6
4.1.1 Residential Receivers 6
5 Criteria 7
5.1 Background Noise Levels 7
5.2 Operational Criteria 7
5.3 Offensive Noise 8
5.4 Sleep Disturbance 8
5.4.1 Sleep criterion per assessed reasonable most-affected residences 8
6 Noise Modelling – Site Emissions 8
6.1 Methodology and assumptions 8
6.1.1 Leq, 15min dB(A) Acoustic Descriptor Discussion 8
6.1.2 Modelled Operational Scenario – Night Period 9
6.1.3 Sleep Disturbance – Night Period 9
7 Noise Modelling Results 9
7.1 Meteorological Effects (Wind and temperature-inversion conditions) 9
7.2 Night Period LAeq noise level contributions 10
7.2.1 Night Period 10
7.3 Sleep Disturbance 11
7.3.1 Night period LAeq noise level contribution 11
7.3.2 Maximum noise level contribution 11
7.4 Offensive Noise Assessment 11
8 Recommendations 13
9 Conclusion 13

2 Introduction

Amenity Acoustics Pty Limited (Amenity Acoustics) was commissioned by *Shasa Carthew* (the client) to undertake the environmental Noise Impact Assessment (NIA) of the proposed *Dog Breeding* facility at Lot 10 in DP 775028, known as 38 Little Run Road, Wherrol Flat, New South Wales (NSW), and to create this report to accompany the Development Application (DA) submission to the Mid Coast Council (Council).

The aim of the NIA is to predict the facility noise level emissions – both L_{Aeq} and L_{Amax} – at the identified potentially most affected noise sensitive location(s) and assess predicted site noise contribution levels against the project specific site noise goals. In-principle noise attenuation advice shall be provided if required.

2.1 Limitations

This technical report has been prepared for the Client. The aim of the environmental noise impact assessment of the proposal was to address emitted operational noise levels. This proposal does not include detailed acoustic design of dog kennels.

Technical reports prepared by Amenity Acoustics are undertaken in good faith as a deliverable for a client contract and are reliant on the details, conditions, and limitations of a specific services proposal, from client provided information, and from measurements and analysis stated herein.

There is inherent uncertainty present in environmental noise assessments as all possible variations in environmental conditions, the ambient noise environment or source combinations cannot be accessed and therefore professional judgement is exercised in the investigation and interpretation of reported findings.

Amenity Acoustics accepts no responsibility for use by third parties of information or conclusions stated herein.

2.2 Reference Information

The supplied project information included drawings as listed in **Table 2.1**.

Table 2.1 – Client Supplied Site Drawings

Sheet	Rev	Title	Drawn By	Drawn
DR-00	DR1	Cover Sheet	Tim Cross Building Design & Drafting Services	28/03/2024
DR-01	DR1	Site & Roof Plan		28/03/2024
DR-02	DR1	Ground Floor		28/03/2024
DR-03	DR1	Elevations		28/03/2024

The supplied project information included correspondence as listed in **Table 2.2**.

Table 2.2 – Client Supplied Correspondence

Details	Created By	Dated
Email requesting an acoustic report to accompany the development application	Emily Nicolson, Senior Environmental Health Officer – Projects and Policies, Mid Coast Council	16/04/2024 12:07:26
Details on site operations	Shasa Carthew	27/05/2024 09:13

3 Proposal Description

3.1 Site Description

The proposed site location is Lot 10 in DP 775028, known as 38 Little Run Road, Wherrol Flat, NSW. The site location is shown in the aerial image and map of the surrounding area, **Figure 3.1,** and **Figure 3.2**, respectively.

The proposal is for a family run *Dog Breeding* facility to be sold to the public.

An extract of the proposed facility plan is shown in **Figure 3.3**.

The assessment is based on the following:

- The site a breeding establishment only – no boarding of dogs.
- Approximately 23 dogs on the property.
- The kennels are of an open design allowing for airflow. The pens are partially enclosed with bamboo screening, to allow for airflow.
- There is some variation in individual kennel occupancy configuration, with consideration to minimising emitted site noise by limiting the potential for vocalising events from the dogs. For example, keeping males away from females on heat or not housing dogs directly near each other that will bark at each other, or while playing.
- The representative configuration for the day period is summarised as follows:
    - 18 dogs outside during the day (8 am - 5 pm)
    - Mother dogs inside with newborn litters (litters are inside from birth until five weeks of age, then outside for three weeks until they go to their homes at eight weeks of age).
    - The general day-period operating scenario for the ‘exersise yard’ is that dogs are rotated in their in small groups. A worst-case scenario of six dogs per small group has been assumed.
    - Operational details include the following: daily cleaning; use of day exercising yards; monitoring health and wellbeing of animals, and; feeding and raising puppies.
    - There is ample parking on the property for the establishment. It is noted that it would be rare to have more than one client vehicle on the property at a time.
- The representative configuration for the worst-case night period is summarised as follows:
    - 14 dogs outside at night (5pm-8am)
    - Nine dogs inside in total at night:
        - three inside only dogs, that go outside to exercise and toilet.
        - four of the dogs sleep inside at night also.
        - Mother dogs inside with newborn litters (litters are inside from birth until five weeks of age, then outside for three weeks until they go to their homes at eight weeks of age).
- **Figure 3.1** shows the plan view of the representative allocation of the nine kennels and exercise yard.

Figure 3.1 – Extract of Sheet DR-00, showing representative dog locations [Source: Tim Cross Building Design & Drafting Services, Sheet DR-00, Rev DR1, Ground Floor, 28/03/2024]

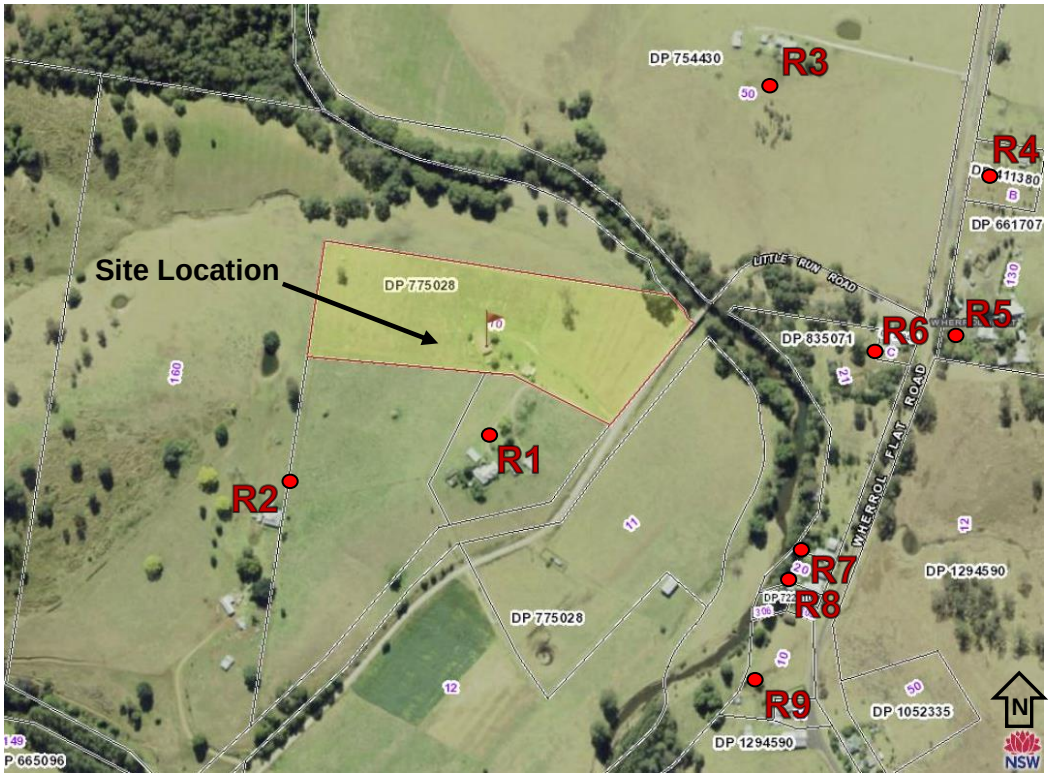

Figure 3.2 – Aerial image indicating site location (the shaded lot, enclosed by red boundary) and the assessed potentially affected receivers in the surrounding area

[Source: Six Maps, The NSW Land and Property Information Division of the Department of Finance and Services, 2024]

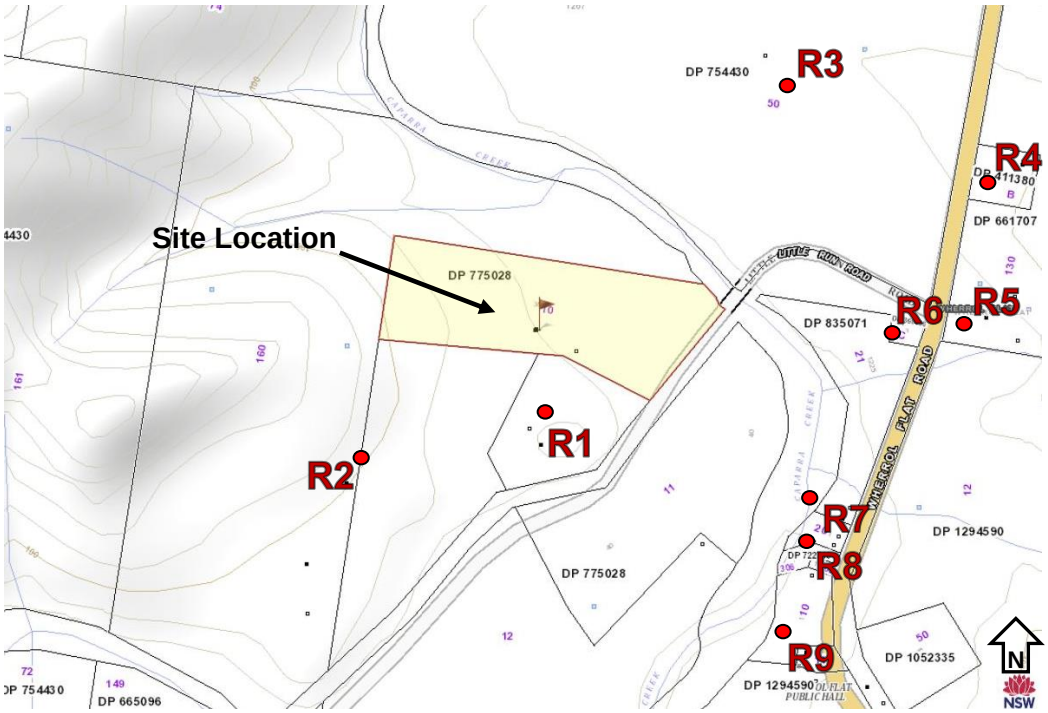

Figure 3.3 – Map indicating site location (shaded lot, enclosed by red boundary), assessed potentially affected receivers in the surrounding area [Source: Six Maps, The NSW Land and Property Information Division of the Department of Finance and Services, 2024]

4 Existing Environment

4.1 Potentially Noise Affected Receivers

4.1.1 Residential Receivers

The noise sensitive receivers potentially most affected from noise from the source under consideration are presented in **Table 4.1**. The receiver locations are shown in the aerial image and topographical map of the surrounding area, **Figure 3.1,** and **Figure 3.2,** respectively.

Table 4.1 – Assessed potentially noise affected receivers

Receiver ID	Type of receiver	Local Government Area (LGA)	Description
R1	Rural Residential	Mid-Coast Council	Lot 11 DP 775028, 40 Little Run Road, Wherrol Flat NSW
R2			Lot 160 DP 754430, 86 & 89 Little Run Road, Wherrol Flat NSW
R3			Lot 50 DP 754430, 1264 Wherrol Flat Road, Wherrol Flat NSW
R4			Lot B DP 411380, 1266 Wherrol Flat Road, Wherrol Flat NSW
R5			Lot 130 DP 661707, 1238 Wherrol Flat Road, Wherrol Flat NSW

Receiver ID	Type of receiver	Local Government Area (LGA)	Description
R6			Lot C DP 360406, 3 Little Run Road, Wherrol Flat NSW
R7			Lot 21 DP 835071, 1225 Wherrol Flat Road, Wherrol Flat NSW
R8			Lot 20 DP 835071, 1221 Wherrol Flat Road, Wherrol Flat NSW
R9			Lot 11 DP 1294590, 1205 Wherrol Flat Road, Wherrol Flat NSW

5 Criteria

5.1 Background Noise Levels

This assessment conservatively adopts a 5 dB stricter minimum assumed rating background noise levels as per Table 2.1 in the NPI[1]. The adopted day, evening, and night period background noise levels for this project, are 35 $L_{90,\,day}$ dB(A), 30 $L_{90,\,evening}$ dB(A), and 30 $L_{90,\,night}$ dB(A). These levels agree with representative levels in the following standards and guidelines:

- The adopted day, evening and night period background noise levels are also representative to that of the rural residential land-use receiver category[2] and *RU1 – Primary Production* planning zoning, with reference to Table 2.3 in the NPI of: Daytime RBL < 40 $L_{90,\,period}$ dB(A), Evening RBL < 35 $L_{90,\,period}$ dB(A), and Night RBL < 30 $L_{90,\,period}$ dB(A).
- The informative Appendix A of Australian Standard AS 1055.2[3], being the estimated day, evening, and night period average background sound pressure levels for residences in *'Areas with negligible transportation'* of 40, 35, and 30 $L_{90,\,period}$ dB(A).

5.2 Operational Criteria

In lieu of Council specific criteria for kennel acoustic compliance, this assessment adopts best practice NSW Council Development Control Plan criteria for addressing acoustical compliance controls of 'Animal boarding or training establishment, including boarding and/or breeding kennels for dogs and cats in rural areas.'

> Acoustical compliance
>
> Any building used for the housing of animals is to be soundly constructed and soundproofed to prevent any noise nuisance. Noise levels emitted from the premises are not to exceed 5dB(A) above the existing background levels. The occupation of the kennels will not be permitted until Council is furnished with a certificate from an Acoustic Engineer to this effect.

With reference to Table 2.1 in the NPI, the 'existing background levels' in this case are *conservatively* represented by the minimum day, evening, and night period project intrusiveness noise levels of $L_{eq,\,15min}$ dB(A) < $L_{90,\,period}$ + 5 dB(A) are:

[1] NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPI), EPA 2016/0524, October 2017, referred to as 'the policy.'
[2] A rural residential receiver area is described as an area with an acoustical environment that dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse.
[3] AS 1055.2, *Acoustics - Description and measurement of environmental noise*.

- Day period: **40 $L_{eq, 15min}$ dB(A)**
- Evening period: **35 $L_{eq, 15min}$ dB(A)**
- Night period: **35 $L_{eq, 15min}$ dB(A)**

5.3 Offensive Noise

An assessment of 'offensive noise' as defined in the Protection of the Environment Operations Act (1997), including assessment of the associated six questions as provided in the Noise Guide for Local Government (2013), has also been undertaken.

5.4 Sleep Disturbance

The NPI requires that the potential for sleep disturbance (considered to be both awakenings and disturbance to sleep stages) from maximum noise level events from premises during the night-time period needs to be considered.

The NPI requires that a detailed maximum noise level event assessment should be undertaken where the subject development/premises night-time noise levels at a residential location exceed one or both trigger levels:

- $L_{eq, 15\ min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{Fmax} 52 dB(A) or the prevailing RBL plus 15, whichever is the greater.

5.4.1 Sleep criterion per assessed reasonable most-affected residences

The sleep disturbance criterion for reasonable most-affected residential receivers in proximity to the site, equates to:

- **$L_{eq, 15\ min}$ 40 dB(A)**, and/or
- **L_{Fmax} 52 dB(A)**.

6 Noise Modelling – Site Emissions

6.1 Methodology and assumptions

Based on site specific circumstances – the topography of intervening terrain, meteorological conditions, ground types, foliage, existing and proposed infrastructure, buildings and structures, and attenuation factors – a 3D computer environmental noise model was created of predicted site activities using ISO 9613−2 (1996) outdoor propagation methodology. Modelling parameters included: temperature 10°C (winter), humidity 75%; per receiver, wind direction from source to receiver enhancements and temperature inversions – where applicable; and, rural, ground type of grass/rough pasture.

6.1.1 $L_{eq, 15min}$ dB(A) Acoustic Descriptor Discussion

The modelling of the site emitted noise as per the acoustic descriptor, $L_{eq, 15min}$ dB(A), as specified in **Section 5.3**, requires discussion. The $L_{eq, 15min}$ dB(A) descriptor represents the logarithmic sound energy average – energy equivalent – over any 15-minute period of the modelled site sound contribution that is received at an assessed receiver.

It is easy to conceptualise the logarithmic sound energy average of a constant mechanical noise source, fixed in one location, such as a continuously operating fan unit set at a constant speed; the fan makes one sound pressure level (SPL) continuously that also equals the cumulative logarithmic average over the period.

For short-term discontinuous noise sources that also vary in SPL over time, such as barking dogs, the received SPL over time is the logarithmic average cumulation of the acoustic contribution of each individual sound event.

When assessing annoyance from noise, humans are not able to process $L_{eq, 15min}$ contributions in their head taking account of all the variable components including event time duration, SPL level per event, frequency contribution per event and respective contribution to the ambient at that time.

The nature of dog barking is short-term, intermittent, discontinuous source events that also vary in sound pressure level per event. It is also unlikely that multiple dogs would result in barks of perfect acoustic synchronicity and always at maximum possible volume. The representative sound power level of a large barking dog (to adopt a worst-case scenario) was sourced from company databases and an international literature review, of a sound pressure at 95 dB at 1 m.

To provide Council with confidence in the potential site noise predictions, a Monte Carlo probability simulation methodology has been applied to the site modelling outcomes. In the simulation, the uncertain inputs (which of all the possible dogs may bark in any second, and if so, then at what loudness level) are described using probability distributions. The output (the predicted $L_{eq, 15min}$ dB(A)) also becomes a probability distribution. Each iteration is repeated 900 times (to represent each second in a 15-minute period) to result in the $L_{eq, 15min}$ dB(A). The output is then repeated ten times further to ensure a robust prediction and confidence in the likely received site noise contribution.

The emergent site noise levels were assessed at:

- 30 m offset skirtage from the assessed residential buildings for intrusive noise; and
- 1.5 m above floor level(s), 1 m outside windows on ground or higher floors for sleep disturbance.

6.1.2 Modelled Operational Scenario – Night Period

To show the emergent site noise levels that represents a worst-case operational scenario, night period dog barking noise was predicted as:

- 14 dogs outside, housed in the following yard occupancy:
    - Yard 5, 6 and 9 – 2 dogs each
    - Yard 6, 7 – 4 dogs each
- barking at 0.6 m high while located within the footprint of the enclosures
- All building element components were modelled as per site plans
- 1,800 mm high (1.8 m high) screens - such as a typically sized corrugated sheet-steel – have been modelled along each kennel façade that directly faces receiver R1.

6.1.3 Sleep Disturbance – Night Period

Emergent site noise for the sleep disturbance assessment was the worst-case modelled dog bark contribution from each externally housed dog within a kennel, at maximum volume, for the assessed enclosure configuration.

7 Noise Modelling Results

7.1 Meteorological Effects (Wind and temperature-inversion conditions)

Where required, the environmental noise model predicts the noise levels produced by the development in question in this impact assessment phase, having regard to noise-enhancing meteorological effects (such as wind, temperature inversions).

As per 'Fast Sheet D' of the policy, the potential of meteorological effects to increase noise levels has been assessed in this case using the conservative adoption of 'noise-enhancing meteorological conditions' approach of the NPI, applying given default meteorological parameters to predict the upper limit of impact. This conservative approach considers source-to-receiver wind vectors for all receivers and F class temperature inversions with wind speeds up to 2 m/s at night without an assessment of how often these conditions occur.

This approach is used to evaluate whether further analyses are warranted and whether a detailed approach is required. Detailed analyses of meteorological data are not required where there is little or no potential for impact, which indicated by an increase of > 3 dB.

The adoption of 'noise-enhancing meteorological conditions' approach were applied with the following outcomes:

- The proposed development operational hours include times within the night period.[4]
- The site area is a *non-arid area* (average annual rainfall ≥ 500 mm), with an annual average rainfall[5] of 1072.7 mm.[6]
- Temperature inversion lapse rates and source-to-receiver drainage-wind speed defaults do not apply in this case to the modelled residential receiver as the development is at a lower altitude than the residential receivers and/or there is intervening higher ground.
- Results of applying the 'noise-enhancing meteorological conditions' approach does not result in likely significant additional noise impacts (≤ 3 dB increase) at the modelled receivers.

As this environmental assessment has adopted, by default, noise-enhancing conditions, predicted noise levels under those meteorological conditions inclusive of the predicted increase shall be compared to the relevant project noise trigger level for impact assessment purposes.

7.2 Night Period L_{Aeq} noise level contributions

7.2.1 Night Period

The results of the modelled site L_{Aeq} noise level contribution over the worst-case night period assessed at the potentially worst affected receivers is shown in **Table 7.1**. The results of modelled site L_{Aeq} noise contribution at potentially noise affected receivers indicate predicted compliance to the noise criteria.

Table 7.1 – Scenario One – Night Period modelled site L_{Aeq} noise contribution at potentially noise affected receivers, $L_{eq,\ 15\ min}$, dB(A)

ID	Receiver Type	Criterion $L_{eq,\ 15\ min}$, dB(A)	Predicted Noise Level[1,2] $L_{eq,\ 15\ min}$, dB(A)	Compliance
R1	Rural Residential	35	34	Yes
R2			28	Yes
R3			31	Yes
R4			26	Yes
R5			26	Yes
R6			30	Yes
R7			27	Yes

[4] The 'night period' is from 22:00 to 07:00 Sunday night to Saturday morning or 22:00 to 08:00 Saturday night to Sunday mornings of the mornings of public holidays.
[5] The Decile 5 (median) rainfall (mm) is the preferred measure of 'average' or 'typical' rainfall.
[6] Bureau of Meteorology (BOM) monitoring station, the Taree Airport AWS, site number 060141.

ID	Receiver Type	Criterion $L_{eq,\ 15\ min}$, dB(A)	Predicted Noise Level[1,2] $L_{eq,\ 15\ min}$, dB(A)	Compliance
R8			23	Yes
R9			20	Yes

Note: 1. Non-compliance to adopted noise goals are shown in **red**.

7.3 Sleep Disturbance

7.3.1 Night period L_{Aeq} noise level contribution

In this case, the night period L_{Aeq} noise level contribution is 5 dB stricter than the night period sleep disturbance L_{Aeq} noise trigger level. As the predicted night period L_{Aeq} noise level contribution was shown to comply – refer **Table 7.1** – then the L_{Aeq} component of the sleep disturbance criteria is predicted to be met.

7.3.2 Maximum noise level contribution

The results of the modelled L_{Amax} site noise contribution at the potentially worst affected receivers for the worst-case night period are shown in **Table 7.2**. The results of modelled maximum site noise contribution at potentially noise affected receivers indicate predicted compliance to the L_{Amax} component of the sleep distance noise criteria.

Table 7.2 – Modelled maximum site noise contribution at potentially noise affected receivers, L_{max} dB(A)

ID	Receiver Type	Criterion L_{Amax} dB(A)	Predicted Noise[1,2] Level L_{max} dB(A)	Compliance
R1	Rural Residential	52	51	Yes
R2			51	Yes
R3			51	Yes
R4			42	Yes
R5			47	Yes
R6			48	Yes
R7			48	Yes
R8			46	Yes
R9			41	Yes

Note: 1. Non-compliance to adopted noise goals are shown in **red**.

7.4 Offensive Noise Assessment

An assessment of 'offensive noise' as defined in the Protection of the Environment Operations Act (1997) has been undertaken via assessment of the associated six questions as provided in Section 2.1.4 'Offensive noise test' of the *Noise Guide for Local Government* (NGLG, EPA 2013/0127).

Based on the results of the offensive noise test shown in **Table 7.3** below, the site emitted noise is not considered offensive. Furthermore, to assess the potential for noise offensiveness the potential for sleep disturbance (considered to be both awakenings and disturbance to sleep stages) has also been assessed (refer **Section 7.3**). The results of the modelled site noise contribution at the potentially worst affected receivers for sleep disturbance predict compliance to the sleep distance noise criteria and are therefore unlikely to be considered offensive.

Councils typically recognise that dogs bark for natural reasons and that in some instances the noise from a barking dog can be considered a nuisance as defined under the Companion Animals Act 1998 (the Act). Complainants can apply to the local court for a Noise Abatement Order. If the court is satisfied that the dog is causing offensive noise, or that the noise is likely to recur, it may order the owner to stop the noise within a specified time or prevent a recurrence.

Noise assessments are important in situations where the Protection of the Environment Operations Act 1997 (the POEO Act) and the Protection of the Environment Operations (Noise Control) Regulation 2008 (the Noise Control Regulation) are being applied. Depending on the circumstances, the Noise Control Regulation may require an assessment of a noise's audibility, time of occurrence, duration, or offensiveness.

Table 7.3 – Offensive Noise Test – Checklist of Considerations

Question	Response
Q1 - Is the noise loud in an absolute sense? Is it loud relative to other noise in the area?	No, the dog barking noise is not considered 'loud in an absolute sense.' Results of Section 7 show that the site emitted noise unlikely to 'be loud relative to the background noise' in the area. Although the site contribution noise may be barely audible to audible by neighbours, its volume is not likely to be considered annoying.
Q2: Does the noise include characteristics that make it particularly irritating?	No, from the relatively low predicted noise levels in comparison to the background noise in the area it is unlikely that any tones, impulses, or fluctuations in volume would be present.
Q3: Does the noise occur at times when people expect to enjoy peace and quiet?	Yes. The assessment included an assessment of evening and night period site noise emissions (Section 7.2), including a sleep disturbance assessment (Section 7.3.), that were **predicted to comply** to site noise goals.
Q4: Is the noise atypical for the area?	No. Predicted site activity noise is not considered 'new or unusual' for the area. The activity is understood to be consistent with the local environmental plan.
Q5: Does the noise occur often?	No. It is considered that barking activity would even potentially occur less frequently than that of other dogs in the site vicinity, as the site dogs are contained in an enclosed kennel and less directly exposed to triggering activity noise in the area than would other un-enclosed dogs.
Q6: Are a number of people affected by the noise?	No, only the rural residences noted in the assessment proximate to the site. It is noted that only 'one person needs to be affected by the noise for it to be deemed offensive,' however, typically 'councils have a policy of requiring a minimum number of complaints from different individuals before taking formal action' (NGLG).

8 Recommendations

It is recommended that 1,800 mm high (1.8 m high) screens - such as a typically sized corrugated fencing sheet-steel – be installed along each kennel façade that directly faces receiver R1.

9 Conclusion

An environmental noise impact assessment of worst-case night period operations, as well as potential sleep-disturbance, was undertaken of the proposed *Dog Breeding* facility at 38 Little Run Road, Wherrol Flat, NSW.

With the incorporation of the stated structural design – 1,800 mm high screens – and operational limitations as noted, the results of the modelled worst-case night period operational scenario indicate predicted compliance of the L_{Aeq} and maximum noise level contributions at the assessed potentially noise affected receivers.

Also, based on the results of the offensive noise test (**Table 7.3**), the site emitted noise is not considered offensive and the site is considered suitable for the proposed development.