Noise Impact Assessment for Environmentally Relevant Activity

Invetus Veterinary Laboratories
Wellcamp Airport, QLD 4350

Report 8154_1 ***19th October 2026***

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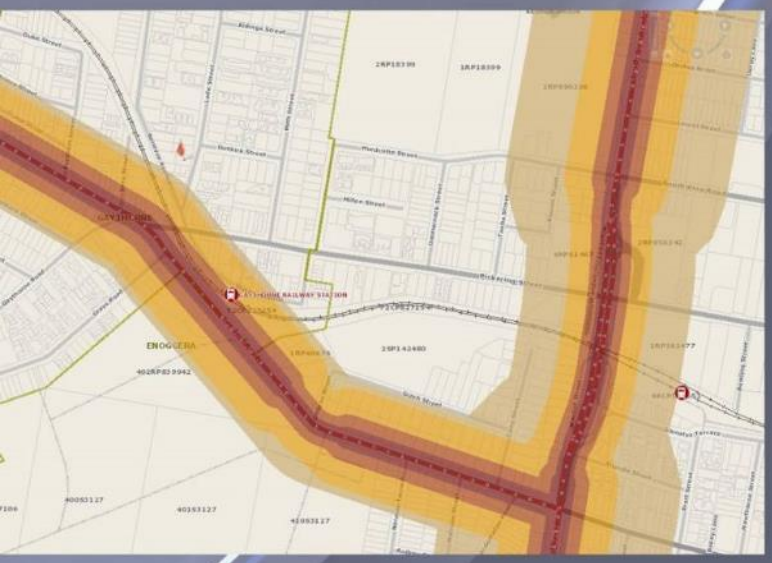





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Revision No	Issue Date	Revision Description	Author	Review
0	15/06/2026	Draft Report for Review	MD	MT
1	19/10/2026	Revised to address Council Information Request MCUI/2026/6891 (Item 2.1 – quarry noise)	MD	MT

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REPORT FOR **Wagner Corporation** *on behalf of Invetus Veterinary Laboratories*

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Executive Summary

An environmental noise assessment has been undertaken at the request of Wagner Corporation, on behalf of *Invetus Veterinary Laboratories*, for a proposed laboratory, kennels and associated infrastructure. The property is located on 'Road 3', Wellcamp Airport, which is part of Lot 8 on SP329720. The proposed development includes the construction of a kennel building, fenced yards, an office and laboratory building, roads and carparking on the vacant site.

The proposed hours of operation are not currently known, this assessment therefore assumes 24-hour operation.

The site is located within Toowoomba Regional Council and within the Charlton Wellcamp Enterprise Area Local Plan Area. The subject land is zoned High Impact Industry and is adjacent to Medium Impact industry to the northwest and High Impact Industry in all other directions. The nearest Rural zone is located approximately 1.1 km south east, on the opposite side of the Gore Highway (Toowoomba Bypass).

This Report aims to assess potential noise emissions from the proposal onto nearby sensitive receptors, with reference to the following:

- Toowoomba Regional Planning Scheme v28;
- Australian Standard AS1055:2018 - Acoustics-Description and Measurement of Environmental Noise;
- Department of Environment and Sciences *Noise Measurement Manual 2020*
- Environmental Protection (Noise) Policy 2008;
- Environmental Protection Act 1994.
- Department of Environment, Science and Innovation, *Guideline Application requirements for activities with noise impacts* v3.08 (2024)

This revision of the Report also addresses Item 2.1 of Toowoomba Regional Council's Information Request (MCUI/2026/6891, dated 20 August 2026), assessing noise from the nearby quarry operations onto the proposed kennels and outdoor yards (reverse amenity), as presented in **Section 5**.

Conclusions and Recommendations

It is concluded that:

- Cumulative noise emissions from the proposed development have been predicted to the closest sensitive uses. The prediction model incorporates several conservative assumptions which are intended to represent a worst-case-scenario in terms of noise emissions and assessment.
- Cumulative noise emissions from the proposed development are predicted to comply with the background creep criteria for continuous noise sources (the most stringent criteria) at all nearby residential receivers during all time periods.
- Cumulative noise emissions from the proposed development are predicted to comply with the Acoustic Quality Objectives at all nearby commercial receivers during all time periods.
- The precise model and location of air-conditioning plant is not yet known, however given the significant distance between the development site and closest sensitive uses, the relevant criteria are expected to be readily achieved.

- The proposed development can meet the noise emission requirements of Toowoomba Regional Council and the Queensland Government.
- Noise from the nearby quarry operations onto the proposed development has been assessed in response to Item 2.1 of Council's Information Request. In the absence of criteria specific to dogs or animals, ambient noise levels measured on site over seven days (conservatively attributed entirely to the quarry) do not exceed the EPP (Noise) outdoor AQOs significantly in terms of level or duration.
- Quarry noise levels at the outdoor quarters and yards are expected to be lower than measured, due to screening from the site cut, retaining wall and kennel building, and the outdoor acoustic environment is considered suitable for the proposed use.
- An outside-to-inside noise reduction of approximately 21–23 dB(A) is required to achieve the internal AQOs within the indoor quarters of the kennel building, which is readily achieved with standard insulated and lined construction.
- Measured noise levels are within or below the range of previous quarry noise predictions (50–60 dB(A)). With respect to noise, the proposed use is considered compatible with the ongoing operation of the quarry.

It is recommended that:

- The development be approved on the basis that noise emission compliance is predicted at all nearby sensitive uses.
- Air-conditioning equipment be chosen, located, screened (if necessary), and maintained to ensure ongoing compliance with the night time criteria of 29 dB(A) at the closest sensitive uses. A detailed assessment of air-conditioning plant noise may be undertaken at Building Approval stage, if required.
- The external walls, roof and openings of the indoor quarters of the kennel building be designed to achieve a combined noise reduction of R_w 29, with openings between the indoor and outdoor quarters capable of being closed. Detailed design may be confirmed at Building Approval stage.
- A communication protocol be established with the quarry operator(s) to receive advance notice of blasting, so that animals can be brought into the indoor quarters prior to scheduled blasts, where practicable.

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1. Introduction

1.1 The Development

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The proposed hours of operation are not currently known, this assessment therefore assumes 24-hour operation.

The site is located within Toowoomba Regional Council and within the Charlton Wellcamp Enterprise Area Local Plan Area. The subject land is zoned High Impact Industry and is adjacent to Medium Impact industry to the northwest and High Impact Industry in all other directions. The nearest Rural zone is located approximately 1.1 km south east, on the opposite side of the Gore Highway (Toowoomba Bypass).

This Report aims to assess potential noise emissions from the proposal onto nearby sensitive receptors, with reference to the following:

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The following **Plates** show the site layout and locality.

Plate 1.1: *Showing the site locality plan (Source: Wagner Corporation).*

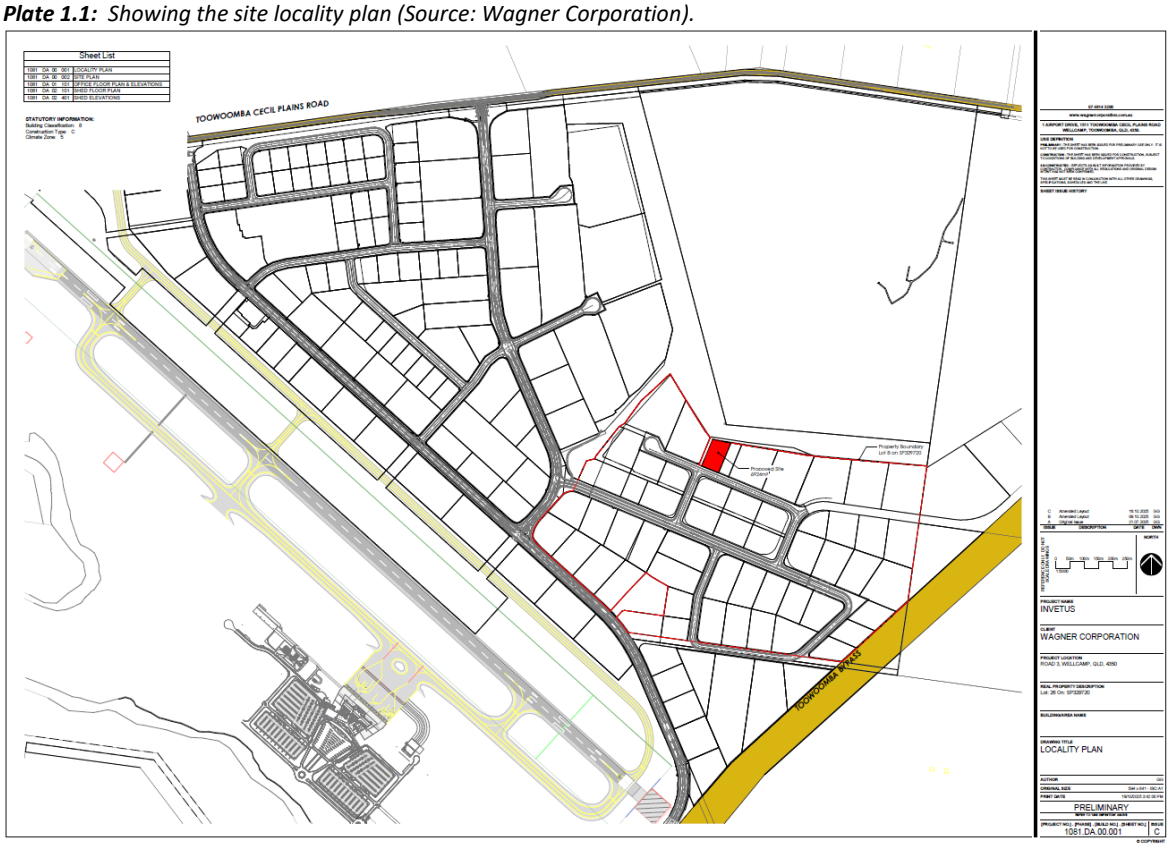


Plate 1.2: *Showing the site plan. (Source: Wagner Corporation).*

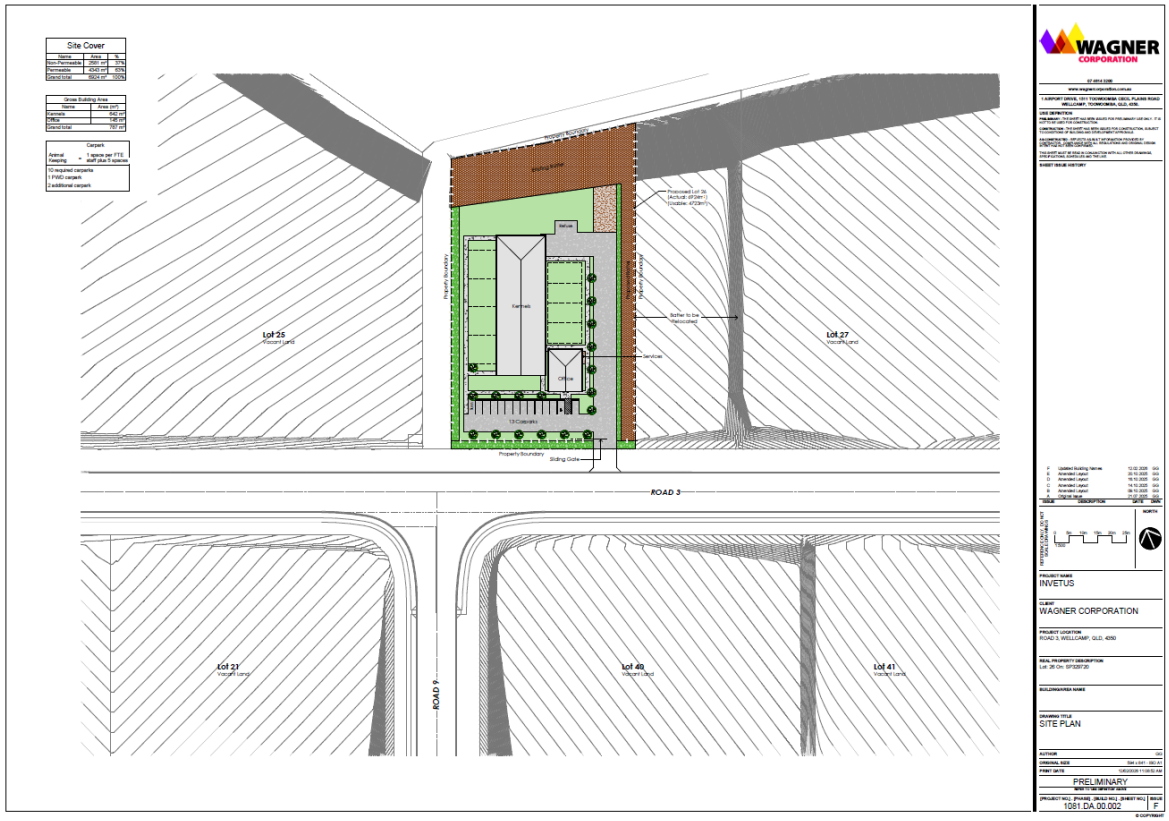


Plate 1.3: *Toowoomba Regional Council Zoning with approximate site location marked. (Source: Toowoomba Regional Planning Scheme v28).*



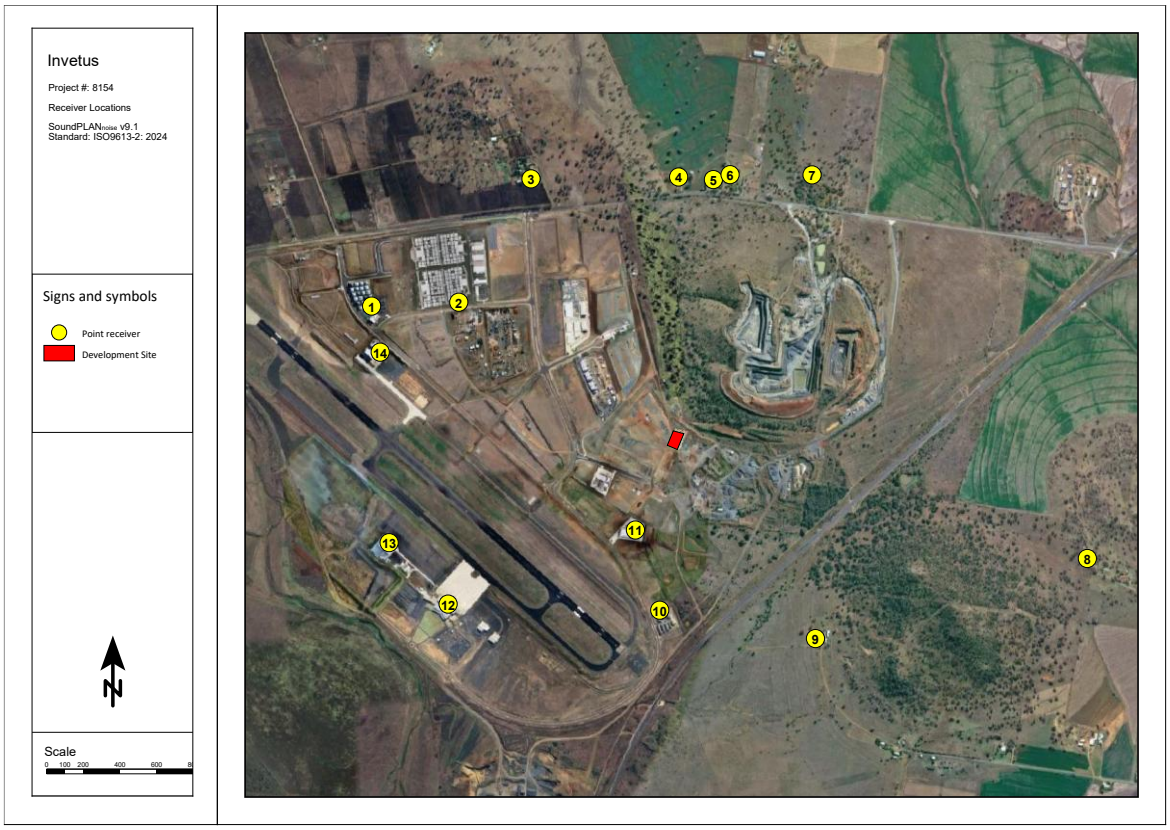
1.2 Sensitive Receivers

The closest sensitive uses to the proposed development have been identified using aerial imagery, site attendance, and Council mapping. Commercial receivers are identified with reference to the EP Regulation 2019 definition for commercial premises; "an office, shop or other premises where business or work, other than a manufacturing process, is carried out". Receiver points are positioned 1m from the most exposed façade of the closest sensitive uses and predicted noise levels are façade-affected. The sensitive receivers included in the noise model are presented in **Table 1.1** and are illustrated in **Plate 1.4**.

Table 1.1: Sensitive receivers

Receiver	Receiver Type	Description	X Position (UTM 56)	Y Position (UTM 56)
1	Residential	1511 Toowoomba Cecil Plains Road (dwellings)	380756.8	6952153.2
2	Residential	1511 Toowoomba Cecil Plains Road (demountable accommodation)	381231.8	6952174.5
3	Residential	1344 Toowoomba Cecil Plains Road (dwelling)	381625.5	6952847.7
4	Residential	1272 Toowoomba Cecil Plains Road (dwelling)	382430.1	6952858.1
5	Residential	1256 Toowoomba Cecil Plains Road (dwelling)	382619.7	6952843.9
6	Residential	1242 Toowoomba Cecil Plains Road (dwelling)	382710.6	6952870.7
7	Residential	1198 Toowoomba Cecil Plains Road (dwelling)	383157.6	6952869.6
8	Residential	168 Kim Road (dwelling)	384658.2	6950774.7
9	Residential	Residential Dwelling on Lot 13 on SP296105	383176.2	6950337.6
10	Commercial	RSPCA Toowoomba (office)	382327.1	6950492.5
11	Commercial	JRS (office)	382194.5	6950930.2
12	Commercial	Wellcamp Toowoomba Airport Terminal (office)	381173.6	6950525.5
13	Commercial	Menzies Aviation (office)	380852.2	6950861.2
14	Commercial	FTA Queensland (office)	380803.2	6951901.7

Plate 1.4: Receiver Locations



2. Noise Criteria

2.1 Toowoomba Regional Planning Scheme v28

2.1.1 Environmental standards Code

The Toowoomba Regional Council planning scheme sets out its general requirements for noise emissions in PO_8 of the Environmental Standards Code, as set out in **Table 2.1**.

Table 2.1: *Environmental Standards Code (in part)*

Noise	
PO_8 The generation of noise from the premises does not cause Environmental Harm or Nuisance to adjoining properties or other noise sensitive land uses. (a) Development: (i) is located in an appropriate zone; (ii) proposes best practice design and construction materials (in relation to noise attenuation); and (iii) proposes operational practices that will minimise noise nuisance for adjoining sensitive land uses.	$AO_{8.1}$ The development will achieve the following noise levels (when measured at the nearest sensitive receiver): (a) Background (L_{90}) + 5dB(A) for variable noise between the hours of 7:00 am to 10:00 pm (measured at the facade of the sensitive land use); (b) Background (L_{90}) + 3dB(A) for variable noise between the hours of 10:00 pm and 7:00 am (measured within bedrooms assuming open windows); (c) Background (L_{90}) for continuous noise sources (measured at the facade of the sensitive land use between 7:00 am and 10:00 pm and within bedrooms assuming open windows from 10:00 pm – 7:00 am); and (d) maximum limit LAmax 45dB(A) inside dwellings; and The development will achieve the Acoustic Quality Objectives listed within the *Environmental Protection (Noise) Policy 2008*. HOWEVER $AO_{8.2}$ Where a development is unable to meet noise levels specified in $AO_{8.1}$ an acoustic assessment has been undertaken by a suitably qualified and skilled person which demonstrates that the development will not result in environmental nuisance at any existing or likely future residential premises (within a 10 year planning horizon).

This criteria is similar to the particular criteria set out for Industrial uses, in the following sections.

It is expected that that Toowoomba Regional Council will request the proposed development demonstrate compliance with the Toowoomba Regional Planning Scheme. The site is located within the Charlton Wellcamp Enterprise Area Local Plan Area. The Land the proposed facility is located is zoned High Impact Industry and is adjacent to Medium Impact industry to the northwest and High Impact Industry in all other directions. Relevant parts of the planning scheme are presented in the following sections.

2.1.2 Charlton Wellcamp Enterprise Area Local Plan Code

The proposed development is located within the Charlton Wellcamp Enterprise Area Local Plan and the Local Area Plan Code applies. Part of the Code is reproduced in **Table 2.2** below.

Table 2.2: *Performance Outcome of the Charlton Wellcamp Enterprise Area Local Plan Code (in part).*

Site Layout	
PO_9 The site layout, building form and landscaping assists in minimising noise generation and spill lighting and screening unsightly open storage and other outdoor areas from public view.	$AO_{9.1}$ The site layout and building form maximises protection of surrounding sensitive land uses from adverse impacts by providing: (a) all or most building openings facing away from residential and community uses; (b) external lighting oriented away from residential and community uses; and (c) landscaping which complies with the Landscaping Code.
Building Scale and Appearance	
PO_{22} Development: (a) has a high quality appearance when viewed from the street, adjoining properties and public open space; and (b) minimises air quality, noise and odour impacts on the amenity of adjoining land.	No acceptable outcome is nominated.
Fences and Walls	
PO_{28} Fences and walls: (a) are finished and maintained to be visually attractive and to contribute to or blend with the site's landscaping; (b) where appropriate, are designed and detailed to provide visual interest to the streetscape; (c) are constructed of materials which are compatible with the buildings on the site; (d) can provide effective screening from any adjoining incompatible use; and (e) where appropriate, assist in highlighting entrances and paths.	$AO_{28.1}$ Retaining walls do not exceed a height of 2m and are landscaped or otherwise detailed so as not to appear to be a solid expanse or mass. $AO_{28.2}$ Solid fencing or walls or landscaped earth mounds are provided to screen views and/or buffer noise to any adjoining non-industrial use. *Note: Figure 12 Fencing for Industrial Areas provides examples of preferred and undesirable fencing in industrial areas.*
Environmental Performance - Environmental Management	
PO_{30} Development prevents or minimises the generation of any noise so that: (a) nuisance is not caused to adjoining premises or other nearby sensitive land uses; and (b) desired ambient noise levels in residential areas are not exceeded.	$AO_{30.1}$ Development achieves the noise generation levels set out in the Environmental Protection (Noise) Policy 2008.

2.1.3 High Impact Industry Zone Code

The proposed development is zoned High Impact Industry and the High Impact Industry Zone Code applies. Part of the Code is reproduced in **Table 2.3** below.

Table 2.3: *Performance Outcome of the High Impact Industry Zone Code (in part).*

Effects of development	
PO_5 Development prevents or minimises the generation of any noise so that: (a) nuisance is not caused to adjoining premises or other nearby sensitive land uses; and (b) desired ambient noise levels in residential areas are not exceeded.	$AO_{5.1}$ Development achieves the noise generation levels set out in the *Environmental Protection (Noise) Policy 2008.*

2.1.4 Industry Use Code

The proposed development is Industrial and the *Industry Uses Code* applies. Part of the Code is reproduced in **Table 2.4** below.

Table 2.4: *Performance Outcome of the Industry Uses Code (in part).*

Amenity	
PO_8 Development prevents or minimises the generation of any noise so that: (a) nuisance is not caused to adjoining premises or other nearby sensitive land uses; and (b) desired ambient noise levels in residential areas are not exceeded.	$AO_{8.1}$ Development achieves the noise generation levels set out in the *Environmental Protection (Noise) Policy 2008.*

2.2 State Noise Policies

2.2.1 Environmental Protection (Noise) Policy 2019

The *Environmental Protection (Noise) Policy 2019* establishes Acoustic Quality Objectives (AQO) to protect or enhance stated environmental values. The environmental values to be enhanced or protected under the policy are the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and the qualities of the acoustic environment that are conducive to human health and well-being, including ensuring a suitable acoustic environment for individual's to sleep, study and learn, to be involved in recreation including relaxation and conversation; and the qualities of the acoustic environment that are conducive to protecting the amenity of the community. The Policy is specifically not applicable to noise impacts from ordinary use of public roads.

It is noted that the Acoustic Quality Objectives (AQO) are to be progressively achieved over the long term, to meet the stated purpose of the Noise Policy:

a) identifying environmental values to be enhanced or protected; and
b) stating acoustic quality objectives for enhancing or protecting the environmental values; and
c) providing a framework for making consistent, equitable and informed decisions about the acoustic environment.

Noise management strategies are required to the extent it is reasonable to do so. It is therefore concluded that the AQO are not intended to be necessarily limiting criteria, as reasonableness and equity are fundamental precepts of the policy.

Application of the Noise Policy therefore requires consideration of the existing environment. It is also understood that the AQO are not intended to override Council Policy, where in force.

Plant and equipment such as air conditioning and pool pumps are assessed as continuous noise sources. The Acoustic Quality Objectives for residential buildings are presented in **Table 2.5** below.

Table 2.5: Acoustic Quality Objectives from EPP (Noise) (in part).

Type of Occupancy / Activity	**Recommended Acoustic Quality Objective**		
RESIDENTIAL BUILDINGS	**$L_{Aeq,adj,1hr}$**	**$L_{A10,adj,1hr}$**	**$L_{A01,adj,1hr}$**
Dwelling, outdoors, daytime & evening	50	55	65
Dwelling, indoors, daytime & evening	35 (*45)	40 (*50)	45 (*55)
Dwelling, indoors, night-time	30 (*40)	35 (*45)	40 (*50)
Commercial and retail activity (for indoors), when the activity is open for business.	45 (*55)	-	-

* the internal AQO has been converted to external value assuming 10 dB(A) of attenuation through open windows as per Locher et al, **"***Differences between Outdoor and Indoor Sound Levels for Open, Tilted, and Closed Windows",* International Journal of Environmental Research and Public Health, 2018.

2.2.2 Environmental Protection (Noise) Policy 2008

Council explicitly references the EPP (Noise) 2008, which sets recommended criteria for the control of background creep. The *Ennvironmental Standards Code* also presents criteria which corresponds with the the controlling background creep criteria. The criteria as set out in the EPP (Noise) 2008 is:

> To the extent that it is reasonable to do so, noise from an activity must not be—
>
> - for noise that is continuous noise measured by $L_{A90,T}$—more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or
> - for noise that varies over time measured by $L_{Aeq,adj,T}$—more than 5dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$

The overall criteria are the same as in the 2019 policy. The background creep criteria in the 2008 policy are presented in **Table 2.6**. below. Background creep criteria have been calculated with reference to the RBL background levels measured on site(discussed in **Section 3**).

Table 2.6: Background Creep Criteria from EPP Noise EPP (Noise) 2008.

Noise Source	**Descriptor**	**Noise Criteria**		
		Day	**Evening**	**Night**
Continuous Noise - measured by $L_{A90,T}$, is nil greater than existing background	$L_{A90,T}$	36	36	29
Noise that varies over time – Measured by $L_{Aeq,\ adj,T}$ is not more than 5 dB(A) greater than existing background	$L_{Aeq,adj,T}$	41	41	34

A summary of the assessment criteria applied is presented in **Section 2.4**.

2.3 Air Conditioning Equipment

State requirements are set out under the *Environmental Protection Act 1994* (EPA 1994); in that Act noise from air conditioning must not exceed the following noise levels when measured as the L_{A90} dB(A) level over a period of 15 minutes at an affected building:

- Between 10 pm and 7 am: 3 dB(A) above the background level;
- From 7 am to 10 pm: 5 dB(A) above the background level.

Nominal air-conditioning equipment is included in the noise prediction model. Detailed calculation of mechanical plant noise emissions can be conducted – if required – once all specific plant and installation can be determined. Given the significant distance between the development site and closest sensitive uses, it is expected that the applicable criteria can be readily achieved with consideration of the selection of plant, location and screening (if required). It is noted that the Act represents an ongoing legal obligation, and it is recommended that plant be maintained to ensure compliance at all times.

2.4 Noise Emission Criteria Summary

It is expected that noise emissions from the most significant sources at the proposed development will be generally continuous in nature. To ensure a robust assessment, predicted noise emissions from all sources at the site will be assessed against the EPP (Noise) 2008 Background Creep criteria for continuous noise at residential receivers, and against the AQO for commercial receivers. The assessment criteria are summarised in **Table 2.7** and are based on the Rating Background levels at ML2 as presented in **Section 3.2**.

Table 2.7: Assessment criteria applicable at the facade of the sensitive uses. Levels are in dB(A).

Receivers	Criteria	Descriptor	Day	Evening	Night
Residential (Receivers 1-9)	EPP (Noise) 2008, Controlling Background Creep – Continuous Noise	$L_{A90,T}$	36	36	29
Commercial (Receivers 10-14)	EPP (Noise) 2008/2019, Acoustic Quality Objectives	$L_{Aeq,adj,1hr}$	55*	55*	55*

* the internal AQO has been converted to external value assuming 10 dB(A) of attenuation through open windows as per Locher et al, **"***Differences between Outdoor and Indoor Sound Levels for Open, Tilted, and Closed Windows",* International Journal of Environmental Research and Public Health, 2018.

Demonstrating compliance with the EPP (Noise) 2008 criteria is considered to demonstrate that the noise emissions requirements of the Toowoomba Regional Council Codes are met.

Definition of terms used in this report are presented in **Appendix C**.

3. Ambient Noise Monitoring

3.1 Measured Ambient Sound Levels – ML1

Noise monitoring has been undertaken close to sensitive uses to the northwest of the proposed use in order to measure existing ambient noise levels in the locality. The first noise logger was located 1.5 metres above ground in a free-field environment near to receiver R2 (see **Section 1.2**), the nearest receiver to the northwest. The approximate measurement location of the noise logger in relation to the proposed development site is shown in **Plate 3.1** below.

Plate 3.1: *Showing the approximate noise measurement location (ML1) in relation to the subject site.*



The instrument was field calibrated before and after the measurement session and the instrument was found to be within 0.2 dB of the reference signal. All instrumentation used in this assessment holds a current calibration certificate from a certified NATA calibration laboratory. The following instruments were used to measure the ambient noise levels-

- Rion NL21 sound level meter;
- Larson Davis CAL200 Class 1 calibrator.

Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055 2018 - '*Acoustics-Description and measurement of environmental noise*. Ambient noise levels were recorded at 15-minute intervals between the 13th and 22nd of March 2025. Measured noise levels are presented graphically in **Figure 3.1** and the 7-day average ambient levels are presented in **Table 3.1**. Calculation of the Rating Background Level is presented in **Table 3.2**. Definition of terms used in this report are presented in **Appendix C**.

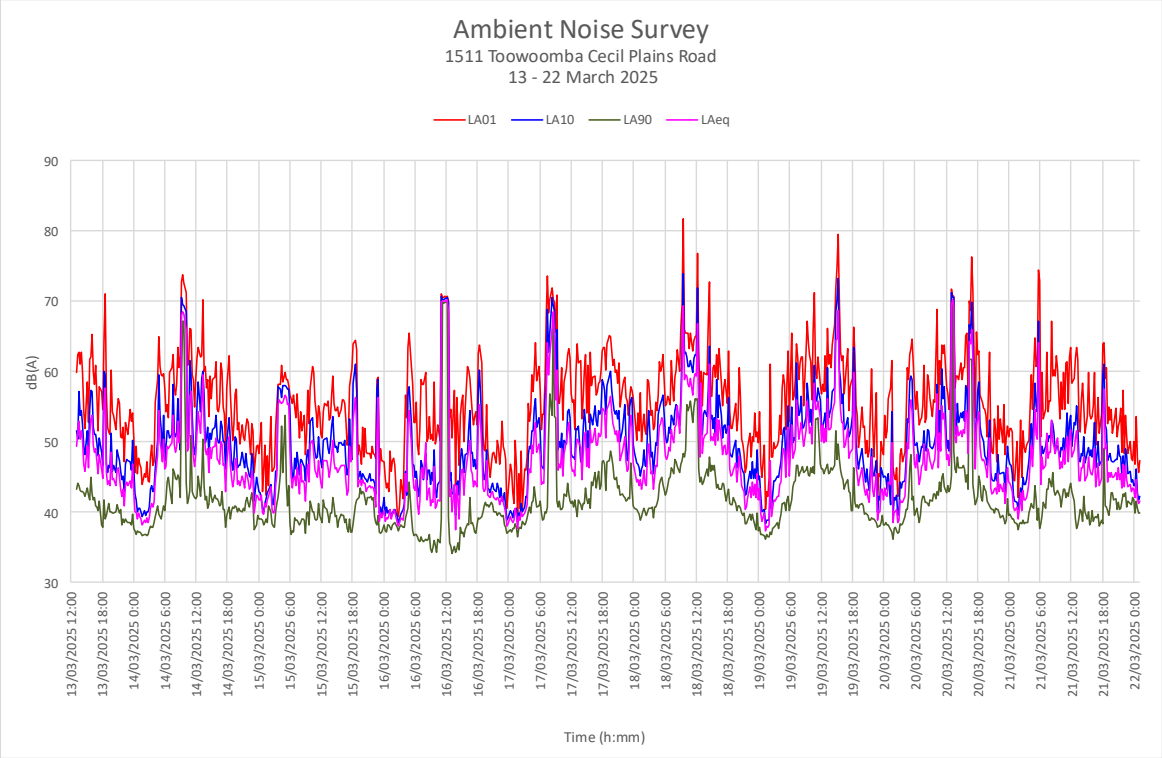


Figure 3.1: *Average ambient noise levels at ML1 (levels in dB(A), free field).*

The chart above shows periods of elevated background noise which may have been caused by machinery or vehicles idling close to the measurement location. Sound levels from these times are excluded from the RBL calculation presented in **Table 3.2**.

Table 3.1: Average ambient noise levels recorded at ML1 (levels in dB(A), free field).

Date	Day	Time of Day	Time period	L01	L10	L90	Leq
17 Mar	Monday	Day	7:00am – 6:00pm	70.1	54.2	43.9	57.5
		Evening	6.00pm – 10pm	64.5	55.7	45.6	53.2
		Night	10pm – 7.00am	59.2	44.3	39.1	45.0
18 Mar	Tuesday	Day	7:00am – 6:00pm	66.8	56.7	47.5	58.1
		Evening	6.00pm – 10pm	58.4	47.9	40.7	46.4
		Night	10pm – 7.00am	59.7	50.4	41.6	48.8
19 Mar	Wednesday	Day	7:00am – 6:00pm	69.0	55.9	46.3	56.9
		Evening	6.00pm – 10pm	61.4	48.9	40.6	50.1
		Night	10pm – 7.00am	59.0	45.6	39.0	45.4
20 Mar	Thursday	Day	7:00am – 6:00pm	70.5	54.7	45.5	59.9
		Evening	6.00pm – 10pm	62.6	49.0	41.9	48.3
		Night	10pm – 7.00am	61.4	46.5	39.2	47.3
21 Mar	Friday	Day	7:00am – 6:00pm	62.2	49.9	41.2	48.4
		Evening	6.00pm – 10pm	62.3	49.7	41.4	49.3
		Night	10pm – 7.00am	61.0	47.4	39.4	51.2
22 & 15 Mar	Saturday	Day	7:00am – 6:00pm	57.8	48.8	39.3	46.4
		Evening	6.00pm – 10pm	63.5	47.7	41.6	48.6
		Night	10pm – 7.00am	58.7	48.0	41.5	50.5
16 Mar	Sunday	Day	9:00am – 6:00pm	70.6	50.7	41.2	62.8
		Evening	6.00pm – 10pm	61.9	46.8	40.2	47.3
		Night	10pm – 9.00am	59.1	44.1	37.8	46.1
Average		**Day**		**67**	**53**	**44**	**58**
		Evening		**62**	**49**	**42**	**50**
		Night		**60**	**47**	**40**	**48**

Table 3.2: Rating Background Level (RBL) calculation (levels in dB(A), free field). Levels formatted as ~~*00.0*~~ have been excluded from the RBL calculation as they are atypically high.

Period	Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	RBL
Day	**7:00**	42.8	45.7	45.7	41.5	42.9	38.8		**41**
	8:00	~~*58.0*~~	46.7	46.0	41.2	44.2	38.9		
	9:00	~~*44.4*~~	47.6	45.7	42.1	42.6	38.7	35.0	
	10:00	41.0	~~*53.4*~~	46.0	42.9	42.3	40.2	35.3	
	11:00	42.7	~~*54.9*~~	~~*51.7*~~	44.3	42.6	39.7	~~*62.1*~~	
	12:00	41.4	~~*50.6*~~	45.9	43.3	41.9	40.1	~~*53.7*~~	
	13:00	40.7	44.5	46.1	~~*52.5*~~	38.8	39.6	34.7	
	14:00	41.6	46.2	47.6	46.6	40.3	40.5	35.7	
	15:00	41.4	46.1	47.7	45.8	39.0	39.0	37.1	
	16:00	44.3	43.5	44.2	~~*53.0*~~	39.4	39.2	39.2	
	17:00	47.8	41.2	41.0	42.9	40.8	42.5	40.8	
	ABL	**40.9**	**42.8**	**43.9**	**41.4**	**39.0**	**38.8**	**34.9**	
Evening	**18:00**	46.1	42.1	42.2	43.4	42.3	39.6	38.9	**40**
	19:00	47.8	41.2	41.0	42.9	40.8	42.5	40.8	
	20:00	45.3	40.6	40.0	40.9	41.7	42.2	41.1	
	21:00	43.1	39.1	39.1	40.2	41.0	42.0	40.2	
	ABL	**43.7**	**39.5**	**39.4**	**40.4**	**40.9**	**40.3**	**39.3**	
Night	**22:00**	48.0	41.9	39.3	38.6	39.7	42.1	39.5	**38**
	23:00	38.1	43.5	38.6	38.5	39.6	41.5	37.7	
	0:00	37.4	40.5	37.3	38.3	39.4	40.9	37.7	
	1:00	37.6	39.5	36.5	37.3	38.3	39.3	37.9	
	2:00	38.0	40.0	37.1	37.5	38.5	39.4	38.0	
	3:00	39.0	40.3	38.0	38.0	38.5	40.3	37.9	
	4:00	40.9	41.2	40.3	40.5	40.6	~~*46.7*~~	39.3	
	5:00	41.8	44.4	41.4	44.6	41.2	~~*45.6*~~	39.4	
	6:00	39.9	43.5	42.4	39.7	39.2	37.5	36.5	
	7:00							36.0	
	8:00							36.3	
	ABL	**37.5**	**39.9**	**36.9**	**37.4**	**38.5**	**38.6**	**36.3**	

3.2 Measured Ambient Sound Levels – ML2

Additional noise monitoring was undertaken close to the subject site, with the objective of measuring RBLs that are more reflective of the acoustic environment at the receivers to the southeast that are not within the industry zone. The measurement location was chosen as it is similar in distance from the Toowoomba Bypass as the closest dwelling to the southeast (the bypass is expected to be the most significant noise source at the measurement location, particularly during the night), and was on property accessible to the proponents. The noise logger was located 1.5 metres above ground in a free-field environment. The approximate measurement location is shown in **Plate 3.2**.

The instrument was field calibrated before and after the measurement session and the instrument was found to be within 0.1 dB of the reference signal. All instrumentation used in this assessment holds a current calibration certificate from a certified NATA calibration laboratory. The following instruments were used to measure the ambient noise levels-

- Rion NL21 sound level meter;
- Larson Davis CAL200 Class 1 calibrator.

Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055 2018 - '*Acoustics-Description and measurement of environmental noise*. Ambient noise levels were recorded at 15-minute intervals between the 20th and 28th of April 2025. Measured noise levels are presented graphically in **Figure 3.2** and the 7-day average ambient levels are presented in **Table 3.3**. Calculation of the Rating Background Level is presented in **Table 3.4**.

Plate 3.2: *Showing the approximate noise measurement location (ML2) in relation to the subject site.*



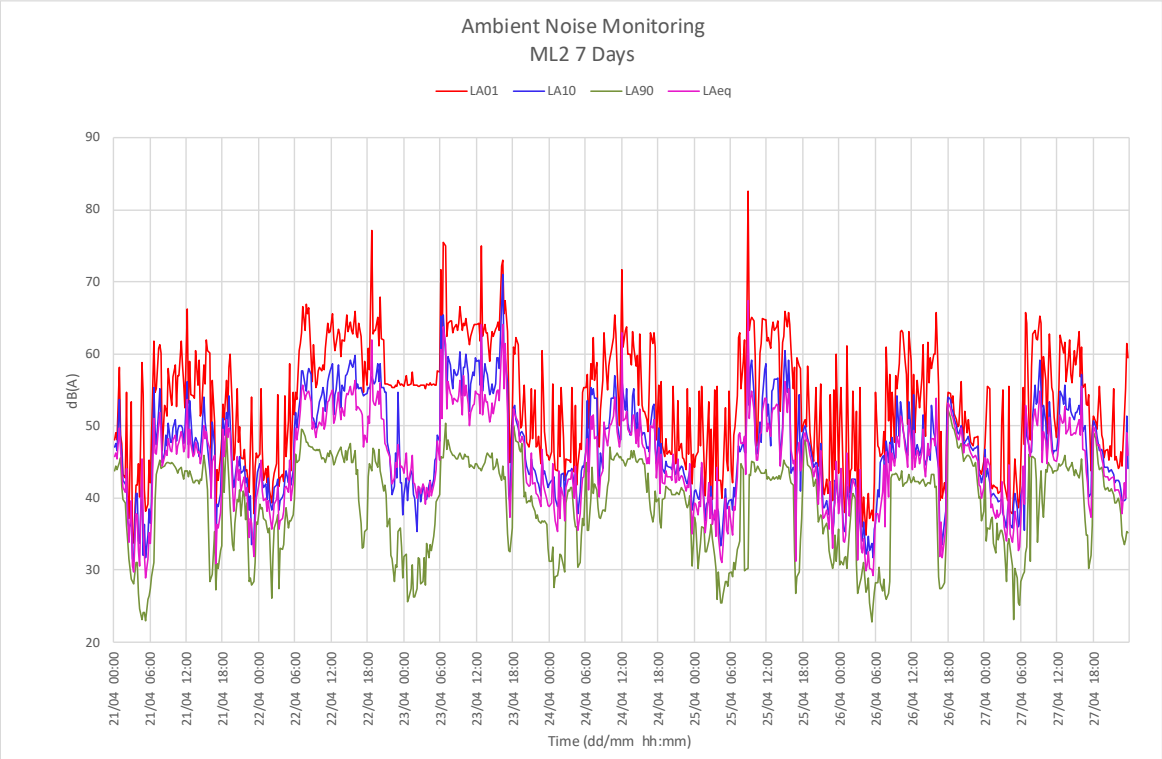


Figure 3.2: *Average ambient noise levels at ML1 (levels in dB(A), free field).*

As is evident in **Figure 3.2**, the measured noise levels at ML2 were affected by extraneous noise sources (e.g. adverse weather, construction machinery, etc). Importantly, the measured L_{A90} levels indicate lower nighttime background levels compared to ML1. Extraneous noise is excluded from the RBL calculation presented in **Table 3.3**.

Table 3.3: Rating Background Level (RBL) calculation for ML2 (levels in dB(A), free field). Levels formatted as ~~00.0~~ have been excluded from the RBL calculation as they are atypically high.

Period	Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	RBL
Day	**7:00**	44.3	~~48.9~~	~~46.9~~	42.0	36.3	27.1		**35**
	8:00	44.6	~~47.3~~	~~45.7~~	37.9	33.5	35.4		
	9:00	44.9	~~46.6~~	~~45.8~~	40.1	44.1	43.1	40.4	
	10:00	43.9	~~45.8~~	~~45.5~~	~~45.8~~	43.9	42.6	44.3	
	11:00	43.5	~~45.9~~	44.5	~~45.9~~	43.6	42.5	43.8	
	12:00	43.5	~~45.2~~	44.2	~~45.0~~	42.7	42.5	44.5	
	13:00	42.3	~~46.6~~	~~45.3~~	~~45.8~~	42.8	42.3	44.9	
	14:00	43.3	~~45.9~~	~~45.4~~	~~45.4~~	43.8	42.0	44.2	
	15:00	39.4	~~46.0~~	44.5	~~45.2~~	44.1	42.5	43.5	
	16:00	30.2	40.9	43.1	40.7	35.9	31.4	39.9	
	17:00	31.8	34.4	34.1	38.7	32.6	31.4	33.3	
	ABL	**31.8**	**35.1**	**37.7**	**38.2**	**33.5**	**31.4**	**38.6**	
Evening	**18:00**	~~45.5~~	~~44.6~~	~~48.7~~	38.1	~~46.7~~	~~50.9~~	~~47.2~~	**35***
	19:00	36.9	~~45.7~~	~~45.2~~	41.1	~~43.3~~	~~47.9~~	~~43.3~~	
	20:00	39.3	~~42.4~~	39.8	40.7	39.2	~~46.1~~	~~41.2~~	
	21:00	39.0	36.4	38.7	40.9	36.2	~~45.8~~	~~40.1~~	
	ABL	**37.3**	**36.4**	**38.8**	**38.1**	**36.5**	~~**45.9**~~	~~**40.4**~~	
Night	**22:00**	~~48.3~~	31.2	30.3	37.0	40.0	32.6	~~43.9~~	**29**
	23:00	~~46.1~~	33.1	33.3	35.7	35.9	33.3	38.8	
	0:00	~~44.3~~	38.4	29.0	30.8	34.0	31.1	37.4	
	1:00	~~41.6~~	35.9	27.7	30.2	34.5	33.6	35.1	
	2:00	32.7	32.7	29.7	32.9	34.5	37.7	35.5	
	3:00	29.7	32.8	30.5	~~41.2~~	30.6	28.5	32.7	
	4:00	24.7	36.2	33.2	34.9	26.8	28.6	30.3	
	5:00	24.9	37.8	39.1	34.8	28.6	25.1	27.5	
	6:00	31.8	~~45.8~~	~~46.8~~	39.0	30.0	28.8	30.0	
	7:00							39.1	
	8:00							~~42.0~~	
	ABL	**24.8**	**32.3**	**28.6**	**30.6**	**28.2**	**27.8**	**29.5**	

** Calculated evening RBL is 37 however 35 is applied as evening is not typically higher than day.*

The calculated RBLs for ML2 are lower during all time periods compared with ML1. The RBLs at ML2 are considered to be representative of the acoustic environment at nearby rural dwellings, particularly during the critical night time period. The RBLs for ML2 are therefore used as the basis of any assessment where background levels are used.

4. Noise Impact Assessment

4.1 Noise Sources

Expected noise sources from the proposed development have been predicted onto the surrounding sensitive uses using SoundPLAN v9.1 software and the prediction methodology ISO 9613-2: 2024. The noise model includes screening from structures and topography, with topographic information sourced from Queensland Government (1-metre). The significant sources of noise emission at the site are expected to include:

- Noise breakout from inside the kennels
- Noise from animals (e.g. dogs) in the outdoor yards
- Air-conditioning plant
- Truck movements, loading and unloading
- Car movements

Noise breakout from the kennels is expected to be the most significant source at the site, it is represented in the model as an industrial building with an internal sound pressure level that emanates from the walls, roofs, and openings of the buildings. A uniform internal sound pressure level is applied consistently throughout the interior spaces. The individual and group outdoor quarters are represented as openings through the building façade for direct noise propagation. The remaining solid wall and roof components of the external building envelope are assigned a sound reduction index of 15 R_w. This model configuration introduces is intended to present a conservative assessment, as the model intentionally omits the acoustic attenuation provided by the internal partitions and screening within the building layout itself.

The internal sound pressure level is based on a measurement at a previous kennel of 10 dogs socializing and barking regularly which resulted in a point source sound power level of 90 dB(A) Leq,15min. The average internal sound pressure level with approximately 70 dogs inside the kennel is calculated to be 81 dB(A) Leq,15min[1] assuming the space is reverberant. The resulting sound pressure level is adjusted by +5 dB to allow for any potential tonality or intermittency, and the result (86 dB(A)) was applied as the average sound pressure level throughout the proposed kennel.

Truck movements are modelled as a moving point source at a speed of 10km/hr with 2 movements per hour. Car movements are modelled as a moving point source at a speed of 10km/hr with 13 movements per hour, representing a situation where vehicles arrive or leave all 13 carparks during the same hour. A point source is positioned in the refuse area which is intended to represent noise from loading and unloading vehicles, including waste collection.

Mechanical plant is included to represent the air-conditioning that is expected to be included at the office building. It is not known whether the kennel building will be air-conditioned, however mechanical plant is included in order to present a worst-case scenario. The modelled noise sources are based on a nominal requirement of 50 watts of cooling/heating per cubic metre of enclosed space, equating to approximately 25 kW for the office building and 100 kW for the kennel

[1] Internal sound pressure level is calculated according to the formula $Lp = Lw - 10\log(V) + 10\log(T) + 14$ where Lw is the source sound power level (98 dB(A) for 70 dogs), V is the room volume (2500 m^3) and T is the reverberation time (2.0s based on absorption coefficient of 0.1). The formula is a simplified method sourced from ARUP's Strutt acoustic calculation software.

building. Mechanical plant is modelled as individual point sources representing 25 kW outdoor condenser units which are positioned in the services area of the office, and on each façade of the kennel building.

Other noise sources may exist at the site but are not expected to be significant relative to the modelled sources. Noise emissions from expected activities at the proposed development have been forecast using the environmental noise model detailed in **Appendix B**. The noise source levels used in the noise model are summarised in **Table 4.1** with noise sources positioned as presented in **Plate 4.1**.

Table 4.1: Source levels used in this assessment, dB Leq, rounded.

Source	Frequency Spectrum Leq dB(Lin)								Sum
	63	125	250	500	1000	2000	4000	8000	dB(A),L_{eq}
Noise breakout, kennel (internal SPL)	59	54	58	83	84	72	61	53	86
25 kW AC Outdoor Unit (Daikin REYQ8BYM9)	89	84	81	76	74	71	69	67	80
Car movement (13 vph @ 10kph)	78	85	79	76	79	80	76	73	85
Truck movement (2 vph @ 10kph)	102	96	92	90	90	86	82	79	94
Loading / Unloading	73	73	73	73	73	73	73	73	80

Plate 4.1: Location of noise sources



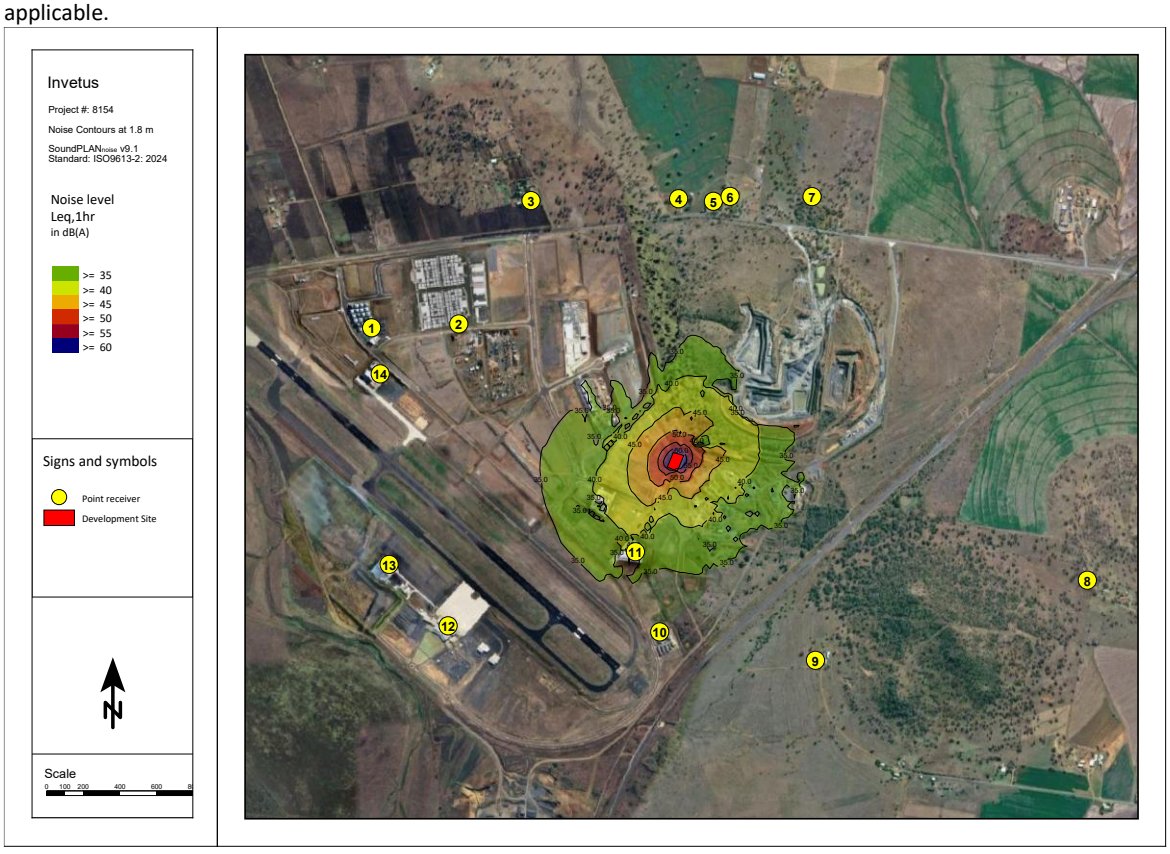
4.2 Predicted Noise Emissions & Assessment

The noise model predicts cumulative noise levels from all identified sources, which are located as described in **Section 4.1**. Predicted cumulative L_{Aeq} noise levels are assessed against the background creep criteria for continuous noise sources for residential receivers, and against the AQO for commercial receivers. This ensures a conservative assessment at residential receivers by assuming all sources at the site are continuous. Predicted noise levels and assessment is presented in **Table 4.3,** and visual noise contours are presented in **Plate 4.3.** Further details of the noise model are presented in **Appendix B**.

Table 4.3: Intrusive Noise Criteria noise assessment. Calculated cumulative sound levels in dB $L_{Aeq,adj,1hr}$, façade-affected.

Receiver	Receiver Type	Predicted Noise Level	Criteria			Assessment		
			Day	Evening	Night	Day	Evening	Night
1	Residential	23	36	36	29	Pass	Pass	Pass
2	Residential	27	36	36	29	Pass	Pass	Pass
3	Residential	25	36	36	29	Pass	Pass	Pass
4	Residential	23	36	36	29	Pass	Pass	Pass
5	Residential	22	36	36	29	Pass	Pass	Pass
6	Residential	19	36	36	29	Pass	Pass	Pass
7	Residential	12	36	36	29	Pass	Pass	Pass
8	Residential	19	36	36	29	Pass	Pass	Pass
9	Residential	28	36	36	29	Pass	Pass	Pass
10	Commercial	32	55	55	55	Pass	Pass	Pass
11	Commercial	38	55	55	55	Pass	Pass	Pass
12	Commercial	27	55	55	55	Pass	Pass	Pass
13	Commercial	26	55	55	55	Pass	Pass	Pass
14	Commercial	25	55	55	55	Pass	Pass	Pass

Plate 4.3: Noise contours at 1.8m above ground. Levels are in dB(A), Leq,1hr and include façade effects where applicable.



4.3 Discussion

Noise emissions from the proposed development have been predicted to the closest sensitive uses and are predicted to comply with the assessment criteria at all nearby sensitive uses during all time periods. The prediction model and assessment incorporates several conservative assumptions which are intended to represent a worst-case scenario and ensure a conservative assessment, these assumptions include;

- A low level of acoustic performance provided by the wall and roof systems of the kennel (15 R_w). It is expected that the wall and roof systems will readily meet or exceed this rating.
- All noise sources are modelled as operating simultaneously and predicted noise levels are cumulative of all sources.
- Assessment of all noise from the site as continuous noise, the most stringent criteria.

On this basis, it is considered that noise emission from the proposed development can meet the assessment criteria at the closest sensitive uses and be readily compliant with the noise emission requirements of Toowoomba Regional Council and the Queensland Government.

5. Reverse Amenity – Quarry Noise

5.1 Background

Toowoomba Regional Council issued an Information Request (reference MCUI/2026/6891, dated 20 August 2026) for the development application. Item 2.1 of the Information Request notes that the site is located within the separation area of the Extractive Resource Overlay, and that PO2 of the Overlay Code requires development to demonstrate that it is compatible with the operation of the extractive industry and does not introduce uses which would be sensitive to the impacts of extractive industry in the area. Council has requested that the applicant demonstrate how the proposed animal keeping and animal research activities, including the permanent housing of animals on site, can operate in conjunction with the existing quarry use on adjoining land.

This section addresses the noise component of Item 2.1, being noise from quarry operations received at the proposed development (reverse amenity). The scope of this assessment comprises:

- Measurement of ambient noise levels on site for approximately one week, to capture noise from quarry operations;
- Comparison of the measured noise levels with relevant noise criteria, in the absence of criteria specific to dogs or animals;
- Comparison of the measured noise levels with the quarry noise levels previously predicted at the site (50–60 dB(A) during the daytime, as noted in Council's Information Request); and
- Consideration of the building envelope performance required to achieve suitable internal noise levels within the kennel building.

Ground vibration, air blast overpressure and dust from quarry operations (including blasting) are outside the scope of this report and are addressed separately in the Reverse Amenity Assessment (Item 2.2 of the Information Request).

5.2 Assessment Criteria

There are no Queensland or Australian statutory noise criteria or guidelines that set acoustic objectives for dogs or other animals housed in kennels or animal research facilities. In the absence of animal-specific criteria, the Acoustic Quality Objectives (AQOs) of the *Environmental Protection (Noise) Policy* (refer **Section 2.2**) have been adopted for this assessment. The AQOs are intended to protect human health and wellbeing and the amenity of the community, and are therefore anthropocentric. They are nevertheless considered to provide reasonable guidance for the acoustic environment of animals housed at the site, being intended to protect rest, sleep and the amenity of outdoor areas.

The AQOs considered relevant to the outdoor quarters and yards, and to the indoor quarters of the kennel building, are presented in **Table 5.1**. The outdoor AQO for a dwelling (50 dB(A)) is applied as the primary outdoor criterion, with the outdoor AQO for a school or playground (55 dB(A)) provided as a secondary reference, being applicable to outdoor areas used for human activity and play during the day.

Table 5.1: Criteria adopted for quarry noise at the proposed development, from EPP (Noise) (in part).

Area of proposed development	Surrogate AQO (EPP (Noise))	Time period	$L_{Aeq,adj,1hr}$
Outdoor quarters and yards	Dwelling (for outdoors)	Day & evening	50
Outdoor quarters and yards	School or playground (for outdoors)	Day	55
Indoor quarters (kennel building)	Dwelling (for indoors)	Day & evening	35
Indoor quarters (kennel building)	Dwelling (for indoors)	Night	30

The building envelope performance required to achieve the internal criteria has been considered with reference to the principles of Australian Standard AS3671:1989 *Acoustics – Road traffic noise intrusion – Building siting and construction*.

5.3 Measured Ambient Sound Levels – ML3

Unattended noise monitoring was undertaken on the subject site to measure the existing acoustic environment, including noise from the nearby quarry operations. The noise logger (ML3) was positioned at the north-eastern corner of the site, at the top of the approximately 5 m high earth batter along the north-eastern boundary. This is the part of the site closest to, and most exposed to, the quarry. The microphone was located 1.4 metres above ground in a free-field environment. The quarry is located approximately 400 m to the north-east of the site and is elevated approximately 60 m above the site. The measurement location is shown in **Plate 5.1**.

Plate 5.1: *Showing the approximate noise measurement location (ML3) in relation to the subject site boundary (yellow) and quarry.*



The instrument was field calibrated before and after the measurement session and the instrument was found to be within 0.1 dB of the reference signal. All instrumentation used in this assessment holds a current calibration certificate from a certified NATA calibration laboratory. The following instruments were used to measure the ambient noise levels-

- Larson Davis 831C Class 1 sound level meter;
- Larson Davis CAL200 Class 1 calibrator.

Ambient sound pressure levels were measured generally in accordance with Australian Standard AS1055:2018 - '*Acoustics-Description and measurement of environmental noise*'. Ambient noise levels were recorded at 15-minute intervals between the 10th and 17th of September 2026. The $L_{Aeq,1hr}$ has been calculated as a rolling one-hour logarithmic average of four consecutive 15-minute L_{Aeq} values. Measured noise levels are presented graphically in **Figure 5.1** and are summarised by time period in **Table 5.2**.

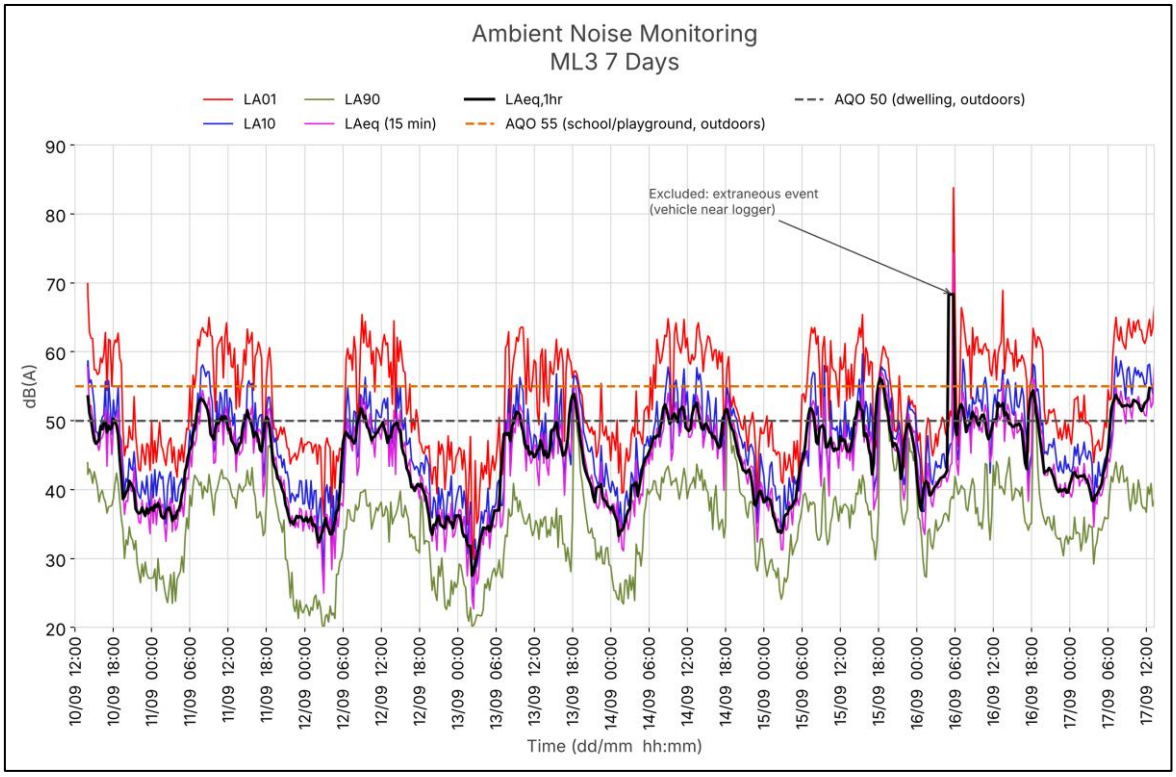


Figure 5.1: *Ambient noise levels at ML3 (levels in dB(A), free field), with outdoor AQOs shown for reference.*

A single extraneous event occurred at approximately 5:45am on 16 September 2026 (15-minute L_{Aeq} of 74 dB(A), resulting in an $L_{Aeq,1hr}$ of approximately 68 dB(A)). This event is not characteristic of quarry noise and was most likely caused by a vehicle or machinery operating close to the noise logger. It has been excluded from the analysis.

Table 5.2: Summary of measured $L_{Aeq,1hr}$ at ML3 (levels in dB(A), free field). Extraneous event excluded.

Time period	Range	LAeq,T	% of time above 50 dB $L_{Aeq,1hr}$	% of time above 55 dB $L_{Aeq,1hr}$
Day (7am – 6pm)	40 – 55	50	35%	0%
Evening (6pm – 10pm)	34 – 56	44	19%	4%
Night (10pm – 7am)	28 – 53	39	2%	0%

LAeq,T is the logarithmic average of the LAeq,15min from all intervals within the time period.

The measured $L_{Aeq,1hr}$ during the daytime was typically between 45 and 53 dB(A), with a maximum of 55 dB(A). The highest levels (other than the excluded event) occurred in the early evening, peaking at 56 dB(A) shortly after 6pm on 15 September 2026. Night-time levels were typically below 46 dB(A), increasing to approximately 52–53 dB(A) between 6am and 7am with the commencement of daytime activity in the area.

The measured levels include contributions from all noise sources in the locality, including road traffic on the estate roads and the Toowoomba Bypass, aircraft, other industrial activity and natural sources, in addition to the quarry. For the purposes of this assessment, all measured noise has conservatively been attributed to the quarry.

5.4 Assessment

5.4.1 Outdoor Quarters and Yards

Measured noise levels at ML3 are compared with the outdoor AQOs in **Figure 5.1** and **Table 5.2**. The measured $L_{Aeq,1hr}$ did not exceed the school or playground (outdoors) AQO of 55 dB(A) at any time during the day, and exceeded it by up to 1 dB(A) for less than two hours during a single evening. The dwelling (outdoors) AQO of 50 dB(A) was exceeded during approximately one third of daytime hours, by up to 5 dB(A). The measured levels at ML3 therefore do not exceed the outdoor AQOs significantly, in terms of either level or duration.

The measured levels are considered to overstate quarry noise levels experienced at the site, for the following reasons:

- All measured noise has been attributed to the quarry, whereas the measured levels include contributions from other sources (e.g. road traffic, aircraft, other industry and natural sources).
- The kennel site is cut into the natural ground, with an approximately 5 m earth batter along the north-eastern boundary. The noise logger was positioned at the top of this earth batter, while the kennel building and outdoor yards are located at the lower, cut level of the site. The cut and earth batter provide additional screening of the site from the quarry relative to the measurement location, and quarry noise within the site is therefore expected to be lower than measured at ML3.
- The outdoor quarters are located along the north-western and south-eastern elevations of the kennel building, while the north-eastern end of the building, facing the quarry, is a solid clad wall (refer **Appendix A**). The building itself will therefore provide additional screening to the outdoor quarters, particularly those on the north-western elevation.

On this basis, quarry noise levels at the outdoor quarters and yards are expected to generally comply with the dwelling (outdoors) AQO and to comply with the school or playground (outdoors) AQO. The outdoor acoustic environment at the site is considered suitable for the proposed outdoor quarters and yards.

5.4.2 Kennel Building – Indoor Quarters

The outside-to-inside noise reduction required to achieve the internal AQOs within the indoor quarters, based on the maximum measured $L_{Aeq,1hr}$ at ML3 (conservatively attributed entirely to the quarry), is presented in **Table 5.3**.

Table 5.3: Outside-to-inside noise reduction required for the indoor quarters. Levels in dB(A) $L_{Aeq,1hr}$.

Time period	Maximum measured external level (ML3)	Internal criterion (AQO)	Noise reduction required
Day & evening	56	35	21
Night	53	30	23

An outside-to-inside noise reduction of approximately 21–23 dB(A) is readily achieved by standard construction with external doors and openings closed. The kennel building is proposed to be constructed with Colorbond Spandek wall sheeting and Trimdek roof sheeting (refer **Appendix A**). Single-skin metal sheeting alone may not reliably achieve the required reduction, particularly at low frequencies, however metal cladding with insulation and an internal lining will readily achieve it. It is therefore recommended that:

- The external walls and roof enclosing the indoor quarters include insulation and an internal lining, such that the building envelope (including doors and openings when closed) achieves a minimum weighted sound reduction index of R_w 29 (being the night-time noise reduction requirement of 23 dB(A) plus a 6 dB allowance

for the difference between laboratory-rated and as-built performance, the low-frequency content of quarry noise, and the effect of room size and finishes on the noise reduction achieved);

- Openings between the indoor and outdoor quarters (e.g. dog doors) are capable of being closed; and
- Any natural ventilation openings to the indoor quarters are acoustically treated, or located on the south-western elevation away from the quarry. Mechanical ventilation would allow the building envelope to remain closed.

It is noted that the R_w 15 adopted for the kennel building envelope in **Section 4.1** is a deliberately low value used to ensure a conservative assessment of noise emissions from the kennel, and does not represent the expected performance of the building envelope.

5.4.3 Comparison with Previous Quarry Noise Predictions

The Reverse Amenity Advice Letter (Range Environmental, 15 July 2026), with reference to the 2016 noise assessment for Boral's Wellcamp Downs Quarry, identifies daytime quarry noise levels of 50–60 dB(A) at the site. Noise monitoring undertaken approximately 160 m south of the site in April 2025 (ML2, **Section 3.2**) measured ambient daytime levels of approximately 35 dB(A) L_{Aeq}, with a maximum hourly L_{Aeq} of 49 dB(A).

The levels measured at ML3 (daytime $L_{Aeq,1hr}$ typically 45–53 dB(A) and a maximum of 56 dB(A), conservatively attributed entirely to the quarry) are within or below the range of the previous predictions, and do not vary significantly from them. Nevertheless, as a sensitivity test, if the upper bound of the previous predictions (60 dB(A)) is adopted, the outside-to-inside reduction required to achieve the day and evening internal AQO of 35 dB(A) would be 25 dB(A). This remains achievable with the insulated and lined construction recommended in **Section 5.4.2**.

5.4.4 Blasting

Blasting at the Wellcamp Downs Quarry is undertaken approximately once every four weeks (Reverse Amenity Advice Letter). Air blast overpressure and ground vibration are addressed in the Reverse Amenity Assessment. As a management measure, it is recommended that the facility establish a communication protocol with the quarry operator(s) to receive advance notice of blasting, so that animals can be brought into the indoor quarters prior to scheduled blasts, where practicable.

5.5 Discussion

Noise from the nearby quarry operations has been measured on site over a period of seven days, and compared with the AQOs of the EPP (Noise) in the absence of criteria specific to dogs or animals. Conservatively attributing all measured noise to the quarry, the measured levels do not significantly exceed the outdoor AQOs in terms of level or duration, and quarry noise levels within the site are expected to be lower than measured due to screening provided by the site cut, earth batter and kennel building. The internal AQOs can be readily achieved within the indoor quarters with standard insulated and lined construction.

It is also noted that the noise generated by the dogs themselves is expected to be substantially higher than the quarry noise levels at the site. Measurements at a previous kennel indicated a sound power level of 90 dB(A) for a group of 10 dogs, and the internal sound pressure level within the proposed kennel is estimated at 81 dB(A) $L_{Aeq,15min}$ (**Section 4.1**). Quarry noise levels at the site are well below the levels the animals generate and are exposed to during normal kennel activity.

On this basis, it is considered that the proposed animal keeping and animal research activities can operate effectively and sustainably within the existing acoustic environment generated by the adjoining quarry, subject to the building envelope and management recommendations above. With respect to noise, the proposed use is considered compatible with the ongoing operation of the quarry.

6. Conclusions and Recommendations

It is concluded that:

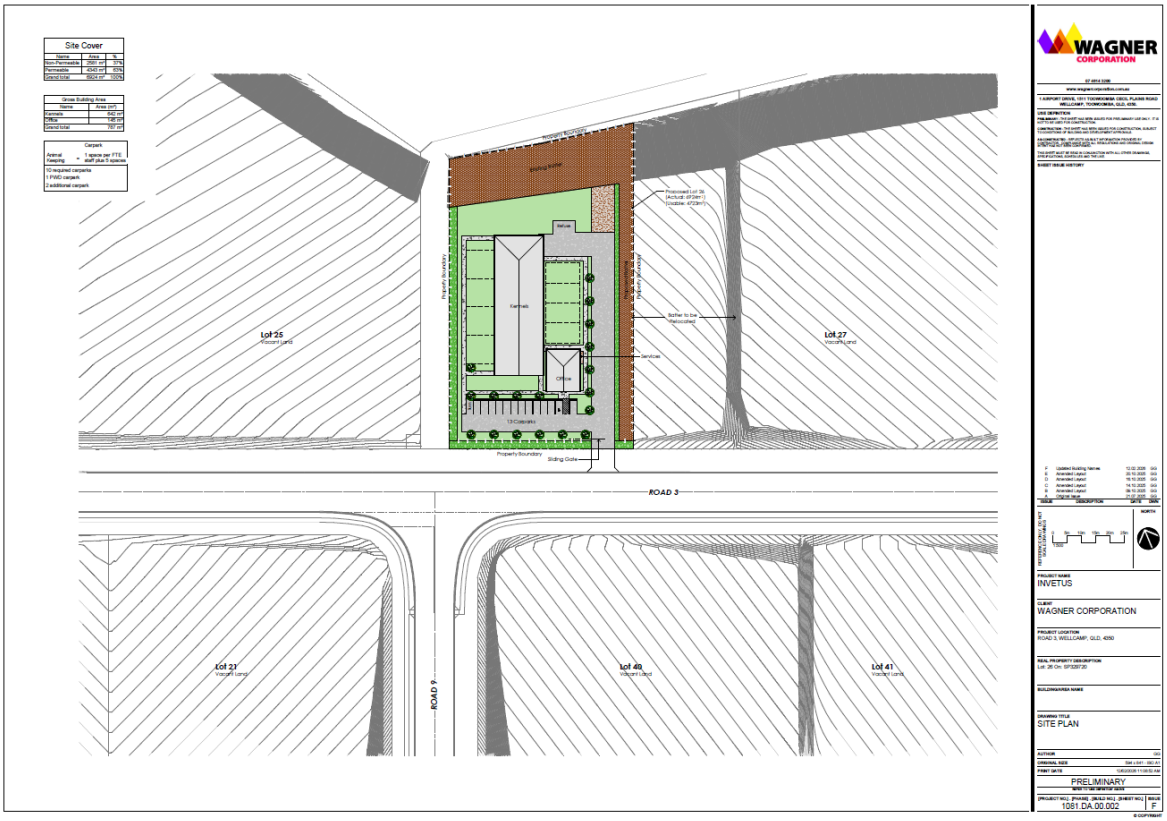
- Cumulative noise emissions from the proposed development have been predicted to the closest sensitive uses. The prediction model incorporates several conservative assumptions which are intended to represent a worst-case-scenario in terms of noise emissions and assessment.
- Cumulative noise emissions from the proposed development are predicted to comply with the background creep criteria for continuous noise sources (the most stringent criteria) at all nearby residential receivers during all time periods.
- Cumulative noise emissions from the proposed development are predicted to comply with the Acoustic Quality Objectives at all nearby commercial receivers during all time periods.
- The precise model and location of air-conditioning plant is not yet known, however given the significant distance between the development site and closest sensitive uses, the relevant criteria are expected to be readily achieved.
- The proposed development can meet the noise emission requirements of Toowoomba Regional Council and the Queensland Government.
- Noise from the nearby quarry operations onto the proposed development has been assessed in response to Item 2.1 of Council's Information Request. In the absence of criteria specific to dogs or animals, ambient noise levels measured on site over seven days (conservatively attributed entirely to the quarry) do not exceed the EPP (Noise) outdoor AQOs significantly in terms of level or duration.
- Quarry noise levels at the outdoor quarters and yards are expected to be lower than measured, due to screening from the site cut, retaining wall and kennel building, and the outdoor acoustic environment is considered suitable for the proposed use.
- An outside-to-inside noise reduction of approximately 21–23 dB(A) is required to achieve the internal AQOs within the indoor quarters of the kennel building, which is readily achieved with standard insulated and lined construction.
- Measured noise levels are within or below the range of previous quarry noise predictions (50–60 dB(A)). With respect to noise, the proposed use is considered compatible with the ongoing operation of the quarry.

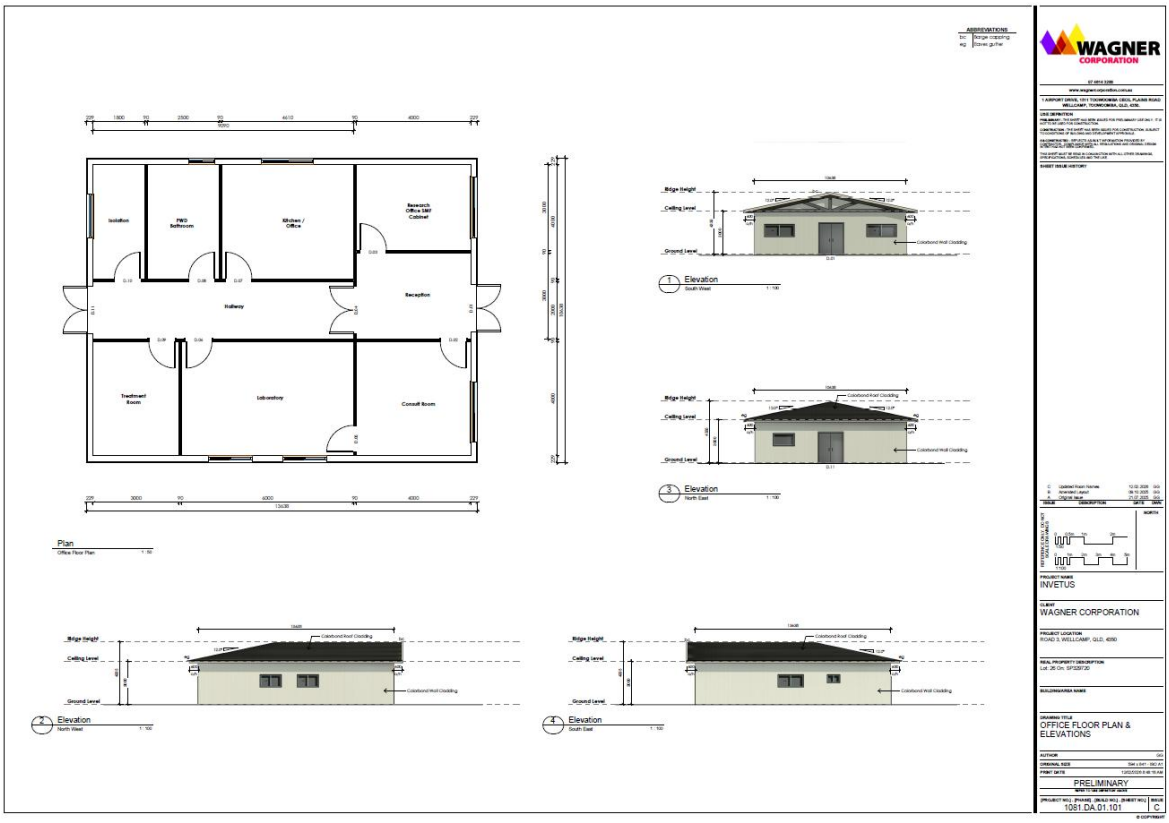
It is recommended that:

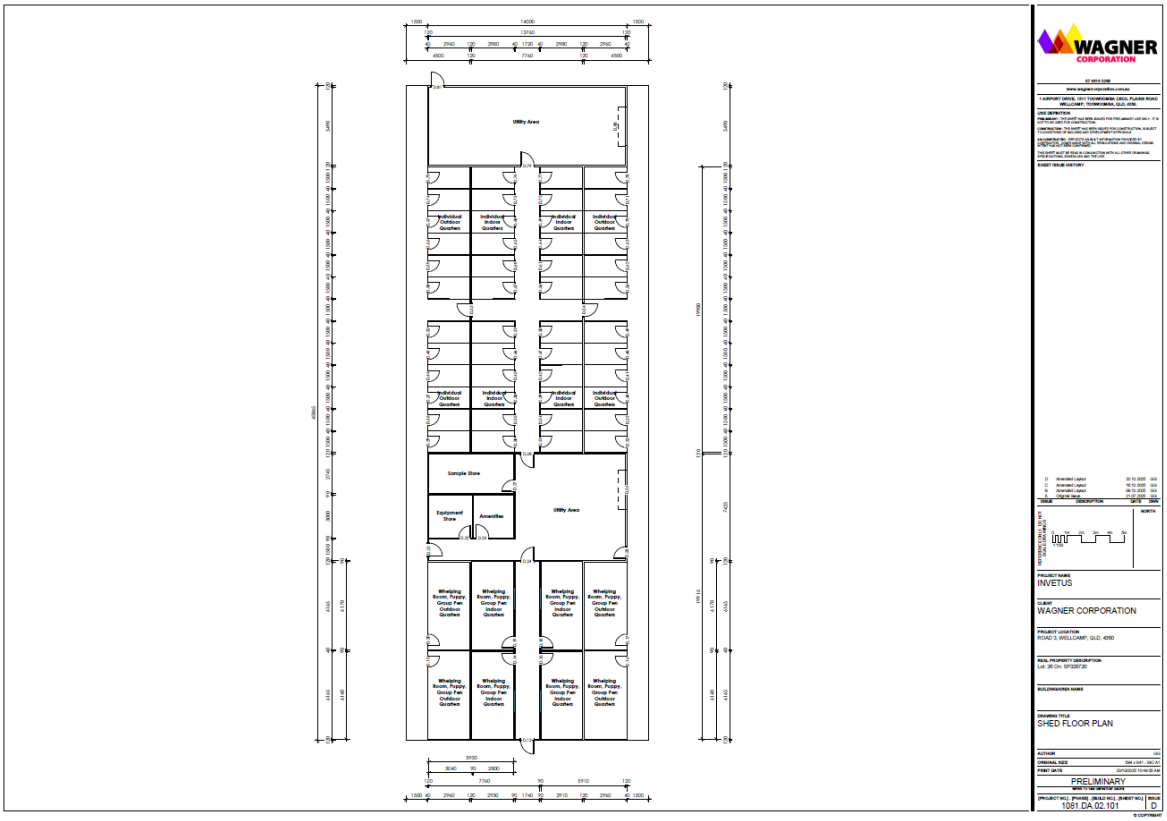
- The development be approved on the basis that noise emission compliance is predicted at all nearby sensitive uses.
- Air-conditioning equipment be chosen, located, screened (if necessary), and maintained to ensure ongoing compliance with the night time criteria of 29 dB(A) at the closest sensitive uses. A detailed assessment of air-conditioning plant noise may be undertaken at Building Approval stage, if required.
- The external walls, roof and openings of the indoor quarters of the kennel building be designed to achieve a combined noise reduction of R_w 29, with openings between the indoor and outdoor quarters capable of being closed. Detailed design may be confirmed at Building Approval stage.
- A communication protocol be established with the quarry operator(s) to receive advance notice of blasting, so that animals can be brought into the indoor quarters prior to scheduled blasts, where practicable.

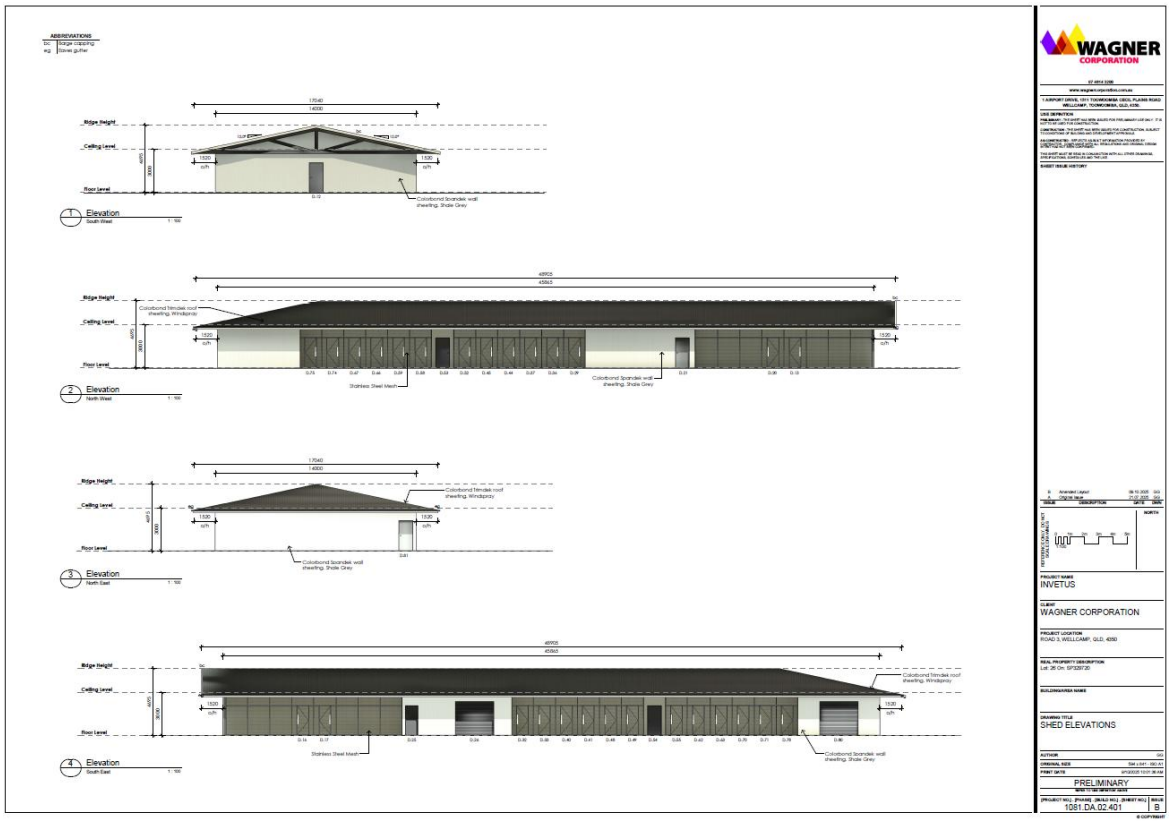
Appendix A: Plans






WAGNER CORPORATION
Isolation
PWD Bathroom
Kitchen / Office
Research Office SMP Cabinet
Reception
Hallway
Treatment Room
Laboratory
Consult Room
Plan
Office Floor Plan
1 Elevation
South West
3 Elevation
North East
2 Elevation
North West
4 Elevation
South East
INVETUS
WAGNER CORPORATION
OFFICE FLOOR PLAN & ELEVATIONS
PRELIMINARY
1081.DA.01.101
C


WAGNER CORPORATION
Utility Area
Individual Outdoor Gazebos
Individual Indoor Gazebos
Sample Store
Equipment Store
Amenities
Whelping Room, Puppy Group Pen Outdoor Gazebos
Whelping Room, Puppy Group Pen Indoor Gazebos
INVETUS
WAGNER CORPORATION
SHED FLOOR PLAN
PRELIMINARY
1081.DA.02.101
D


ABBREVIATIONS
Ridge Height
Ceiling Level
Floor Level
1 Elevation
South West
2 Elevation
North West
3 Elevation
North East
4 Elevation
South East
Colorbond Trimdek roof sheeting, Windspray
Colorbond Spandek wall sheeting, Shale Grey
Stainless Steel Mesh
WAGNER CORPORATION
INVETUS
WAGNER CORPORATION
ROAD 3, WELLCAMP, QLD, 4350
SHED ELEVATIONS
PRELIMINARY
1061.DA.02.401
B

Appendix B: Environmental Noise Model

Noise levels from the proposed development have been predicted onto the surrounding sensitive zone boundaries and uses. Noise levels are predicted using SoundPLAN v8.0 and the prediction methodology ISO 9613-2: 1996. Sound power levels used in the noise model have been sourced from the SoundPlan Emission Library, equipment specifications, previous measurements of similar equipment, and published technical papers.

All prediction models have limits to their accuracy of prediction. This is due to the inherent nature of the calculation algorithms that go into the design of the models, the assumptions made in the implementation of the model, and the availability of good source sound power data. Various researchers have suggested that an un-calibrated model has an accuracy of ±5 dB while a calibrated model has an accuracy of ±2 dB. Calibration means that the model has been established with reference to measured sound levels at a receiver, known source levels and tightly defined propagation variables (wind speed and direction, for example). Alternatively, a series of predictions with different programs but the same assumption variables can be used for verification purposes. In this case, the proposed development does not yet exist for the purposes of verification and the model is therefore considered to be un-calibrated.

B1 Sources and Receivers

Expected noise sources from the proposed development have been predicted onto the surrounding sensitive uses using SoundPLAN v9.1 software and the prediction methodology ISO 9613-2: 2024. The noise model includes screening from structures and topography, with topographic information sourced from Queensland Government (1-metre). The significant sources of noise emission at the site are expected to include:

- Noise breakout from inside the kennels
- Noise from animals (e.g. dogs) in the outdoor yards
- Air-conditioning plant
- Truck movements, loading and unloading
- Car movements

Noise breakout from the kennels is expected to be the most significant source at the site, it is represented in the model as an industrial building with an internal sound pressure level that emanates from the walls, roofs, and openings of the buildings. A uniform internal sound pressure level is applied consistently throughout the interior spaces. The individual and group outdoor quarters are represented as openings through the building façade for direct noise propagation. The remaining solid wall and roof components of the external building envelope are assigned a sound reduction index of 15 R_w. This model configuration introduces is intended to present a conservative assessment, as the model intentionally omits the acoustic attenuation provided by the internal partitions and screening within the building layout itself.

The internal sound pressure level is based on a measurement at a previous kennel of 10 dogs socializing and barking regularly which resulted in a point source sound power level of 90 dB(A) Leq,15min. The average internal sound pressure

level with approximately 70 dogs inside the kennel is calculated to be 81 dB(A) Leq,15min[2] assuming the space is reverberant. The resulting sound pressure level is adjusted by +5 dB to allow for any potential tonality or intermittency, and the result (86 dB(A)) was applied as the average sound pressure level throughout the proposed kennel.

Truck movements are modelled as a moving point source at a speed of 10km/hr with 2 movements per hour. Car movements are modelled as a moving point source at a speed of 10km/hr with 13 movements per hour, representing a situation where vehicles arrive or leave all 13 carparks during the same hour. A point source is positioned in the refuse area which is intended to represent noise from loading and unloading vehicles, including waste collection.

Mechanical plant is included to represent the air-conditioning that is expected to be included at the office building. It is not known whether the kennel building will be air-conditioned, however mechanical plant is included in order to present a worst-case scenario. The modelled noise sources are based on a nominal requirement of 50 watts of cooling/heating per cubic metre of enclosed space, equating to approximately 25 kW for the office building and 100 kW for the kennel building. Mechanical plant is modelled as individual point sources representing 25 kW outdoor condenser units which are positioned in the services area of the office, and on each façade of the kennel building.

Other noise sources may exist at the site but are not expected to be significant relative to the modelled sources. The noise source levels used in the noise model are presented in **Table B1** with noise sources positioned as presented in **Plate B1**. The nominal transmission loss spectrum for the kennel building walls and roof is presented in **Table B2**.

Table B1: Source levels used in this assessment, dB Leq, rounded.

Source	Frequency Spectrum Leq dB(Lin)								Sum
	63	125	250	500	1000	2000	4000	8000	dB(A),L_{eq}
Noise breakout, kennel (internal SPL)	59	54	58	83	84	72	61	53	86
25 kW AC Outdoor Unit (Daikin REYQ8BYM9)	89	84	81	76	74	71	69	67	80
Car movement (13 vph @ 10kph)	78	85	79	76	79	80	76	73	85
Truck movement (2 vph @ 10kph)	102	96	92	90	90	86	82	79	94
Loading / Unloading	73	73	73	73	73	73	73	73	80

Table B2: Transmission loss of shed and tower wall and roof systems, sound reduction index.

63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Rw (dB)	C	Ctr
0	4	6	10	15	19	13	13	15	-1	-4

[2] Internal sound pressure level is calculated according to the formula $Lp = Lw - 10\log(V) + 10\log(T) + 14$ where Lw is the source sound power level (98 dB(A) for 70 dogs), V is the room volume (2500 m^3) and T is the reverberation time (2.0s based on absorption coefficient of 0.1). The formula is a simplified method sourced from ARUP's Strutt acoustic calculation software.

Plate B1: Location of noise sources

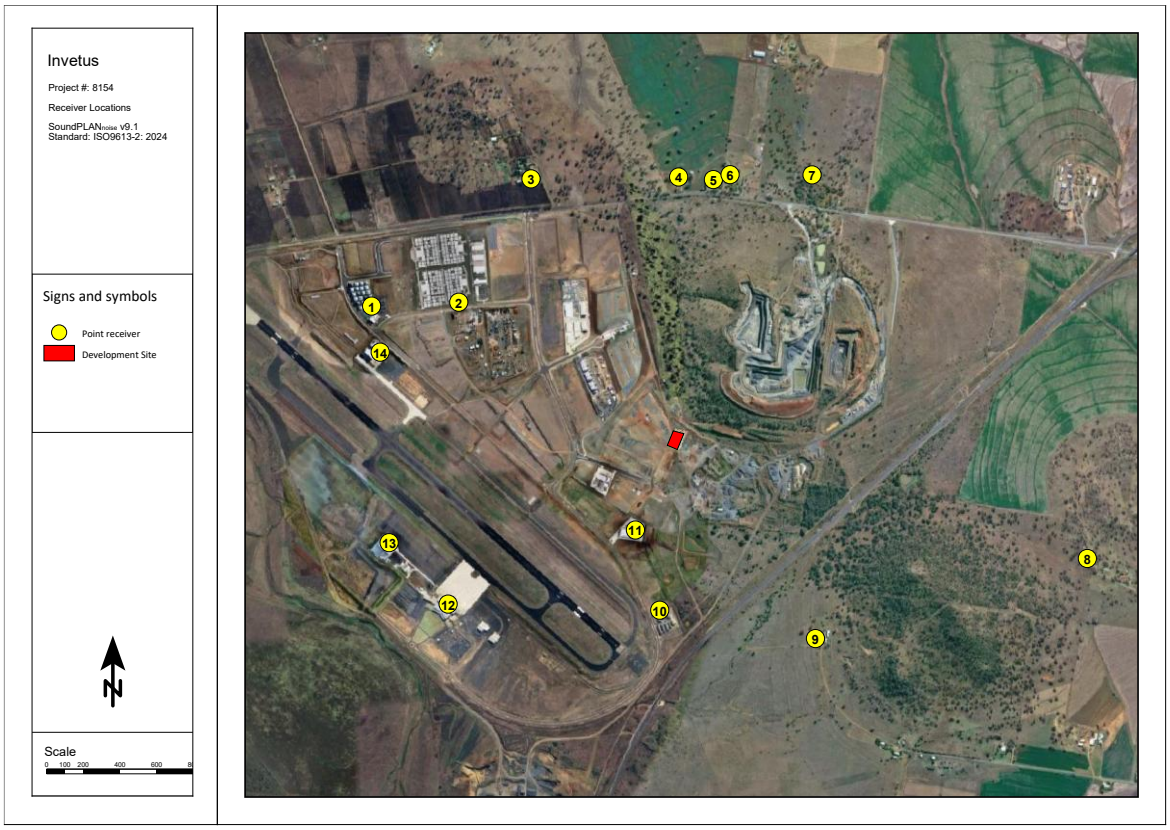


The closest sensitive uses to the proposed development have been identified using aerial imagery, site attendance, and Council mapping. Receiver points are positioned 1m from the most exposed façade of the closest sensitive uses and predicted noise levels are façade-affected. The sensitive receivers included in the noise model are presented in **Table B3** and are illustrated in **Plate B3**.

Table B3: Sensitive receivers.

Receiver	Receiver Type	Description	X Position (UTM 56)	Y Position (UTM 56)
1	Residential	1511 Toowoomba Cecil Plains Road (dwellings)	380756.8	6952153.2
2	Residential	1511 Toowoomba Cecil Plains Road (demountable accommodation)	381231.8	6952174.5
3	Residential	1344 Toowoomba Cecil Plains Road (dwelling)	381625.5	6952847.7
4	Residential	1272 Toowoomba Cecil Plains Road (dwelling)	382430.1	6952858.1
5	Residential	1256 Toowoomba Cecil Plains Road (dwelling)	382619.7	6952843.9
6	Residential	1242 Toowoomba Cecil Plains Road (dwelling)	382710.6	6952870.7
7	Residential	1198 Toowoomba Cecil Plains Road (dwelling)	383157.6	6952869.6
8	Residential	168 Kim Road (dwelling)	384658.2	6950774.7
9	Residential	Residential Dwelling on Lot 13 on SP296105	383176.2	6950337.6
10	Commercial	RSPCA Toowoomba (office)	382327.1	6950492.5
11	Commercial	JRS (office)	382194.5	6950930.2
12	Commercial	Wellcamp Toowoomba Airport Terminal (office)	381173.6	6950525.5
13	Commercial	Menzies Aviation (office)	380852.2	6950861.2
14	Commercial	FTA Queensland (office)	380803.2	6951901.7

Plate B2: Receiver Locations.



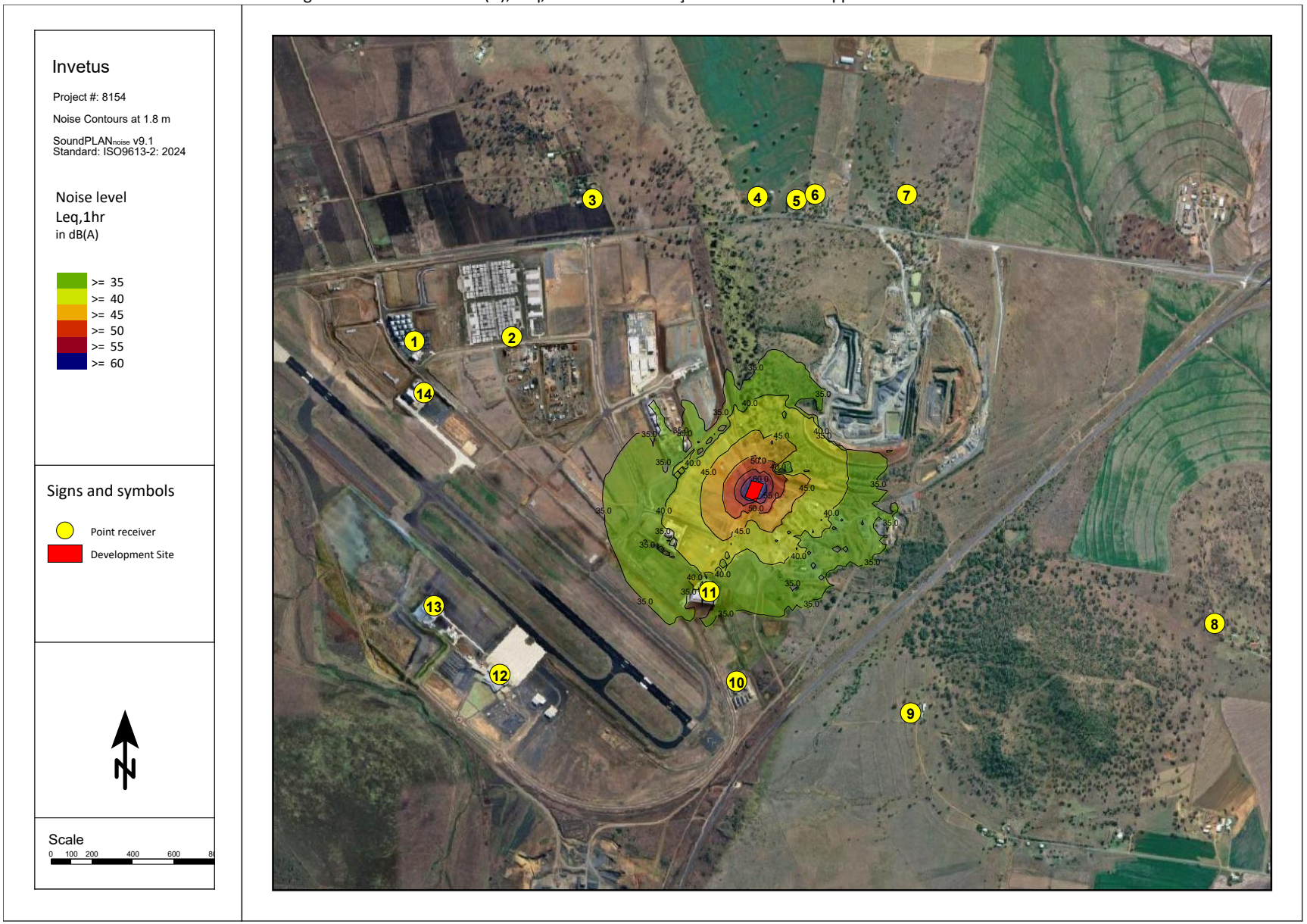
B2 Predicted Noise Emissions

The noise model predicts cumulative noise levels from all identified sources, which are located as described in **Section B1**. Predicted noise levels are presented in **Table B4**, visual noise contours are presented in **Plate B3**.

Table B4: Intrusive Noise Criteria noise assessment. Calculated cumulative sound levels in dB $L_{Aeq,adj,1hr}$, façade-affected.

Receiver	Receiver Type	Description	Predicted Noise Level
1	Residential	1511 Toowoomba Cecil Plains Road (dwellings)	23.2
2	Residential	1511 Toowoomba Cecil Plains Road (demountable accommodation)	27.3
3	Residential	1344 Toowoomba Cecil Plains Road (dwelling)	24.8
4	Residential	1272 Toowoomba Cecil Plains Road (dwelling)	22.7
5	Residential	1256 Toowoomba Cecil Plains Road (dwelling)	21.7
6	Residential	1242 Toowoomba Cecil Plains Road (dwelling)	18.6
7	Residential	1198 Toowoomba Cecil Plains Road (dwelling)	12.3
8	Residential	168 Kim Road (dwelling)	19.0
9	Residential	Residential Dwelling on Lot 13 on SP296105	27.9
10	Commercial	RSPCA Toowoomba (office)	31.8
11	Commercial	JRS (office)	38.2
12	Commercial	Wellcamp Toowoomba Airport Terminal (office)	26.6
13	Commercial	Menzies Aviation (office)	25.9
14	Commercial	FTA Queensland (office)	25.1

Plate B3: Noise contours at 1.8m above ground. Levels are in dB(A), Leq,1hr and include façade effects where applicable.



Appendix C: Definitions

Noise assessment terms used in this Report include-

Event maximum sound pressure level ($L_{A\%,adj,T}$), L01

The L01 level is calculated as the noise level equalled and exceeded for 1% of the measurement time, for example 9 seconds in any 15 minute interval. L01 is an appropriate level to characterise single events, such as from train bypass.

Average maximum sound pressure level ($L_{A\%,adj,T}$), L10

The "L10" level is an indicator of "steady-state" noise or intrusive noise conditions from traffic, music and other relatively non-impulsive noise sources. The L10 level is calculated as the noise level equalled and exceeded for 10% the measurement time, for example 90 seconds in any 15 minute interval. The measured L10 time-intervals for day/evening/night are arithmetically averaged to present the "average maximum" levels of the environment for day/evening/night. The level can be adjusted for tonality or impulsiveness.

Background sound pressure level ($L_{A90,T}$), L90

Commonly called the "L90" or "background" level and is an indicator of the quietest times of day, evening or night. The L90 level is calculated as the noise level equalled and exceeded for 90% the measurement time. The measured L90 time-intervals are arithmetically averaged to present the "average background" levels of the environment for day/evening/night. The level is recorded in the absence of any noise under investigation. The level is not adjusted for tonality or impulsiveness.

Rating Background Level (RBL)

The overall, single-figure, background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24-hour period used for the assessment of background level). This is defined as the median value of all the day evening or night assessment background levels.

Equivalent Continuous or time average sound pressure level ($L_{Aeq,T}$), Leq

Commonly called the "Leq" level it is the logarithmic average noise level from all sources far and near. The level can be adjusted for tonality.

Adjustments to levels

Under some circumstances, noise levels may be "adjusted" for tonal or impulsive characteristics by the addition of +2 or +5 dB. The adjustments are made in accordance with AS1055. Measured noise levels are not normally adjusted for the purposes of a traffic noise assessment.

Free-field level

A sound level that is measured at a distance of more than 3.5 metres from a wall or facade.