

Avondale Cage Free Farm Noise Impact Assessment



Project:	Avondale Cage Free Farm
Location:	Turallin, Millmerran, QLD
Client:	Property Projects Australia
Date:	January 2026

TOOWOOMBA REGIONAL COUNCIL

APPROVED DOCUMENT

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E. Kinnear

Assessment Manager



DOCUMENT CONTROL

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APPROVAL / SIGN OFF

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EXECUTIVE SUMMARY

Matrix Acoustics was commissioned by Property Projects Australia to re-assess the noise impacts of the operations of the Avondale Cage Free Farm, identified as Lot 2 RP79686 in Turallin, Queensland. This noise assessment has been undertaken due to changes in the Farm operations and layout. This assessment included noise modelling with the inclusion of new noise sources to demonstrate compliance with the noise limits set out in the Environmental Standards Code.

The noise impact from the proposed Avondale Cage Free Farm has been assessed and the predicted noise levels show compliance with the Toowoomba Regional Council Part 9 Other Codes, 9.3.4.2 Environmental Standards Code.

Noise monitoring was conducted as part of the initial assessment in May 2020. The recommended project criteria based on the monitored noise levels and in accordance with the Toowoomba Regional Council Part 9 Other Codes, 9.3.4.2 Environmental Standards Code are shown in Table E-1. These noise criteria have been adopted in this noise assessment.

Table E-1 *Recommended project noise criteria*

Time period criteria	Noise criteria (15 min)
Day (7am – 10pm) – Façade	35 L_{Aeq}
Night (10pm – 7am) – Internal – variable	28 L_{Aeq}
Night (10pm – 7am) – External - continuous	25 L_{Aeq}
Sleep disturbance - Internal	45 L_{AMax}

The noise model was developed based on measured noise emissions from the existing proponent's site east of Millmerran in May 2020 and other source data. The results of the noise model and assessment indicates that with the inclusion of the new noise sources and changes in the layout, the farm operation is likely to be in compliance with all project criteria for both day and night time periods, including the shoulder period in the morning where the site commences work prior to the 'day' period commencing.

As the project is able to demonstrate that noise impacts from the site are in compliance with the Environmental Standards Code, it is recommended that the noise impact component of the application be approved.

It is also recommended that noise monitoring requirements be included in the project site management plan. This could take the form of complaints monitoring or ongoing compliance monitoring.

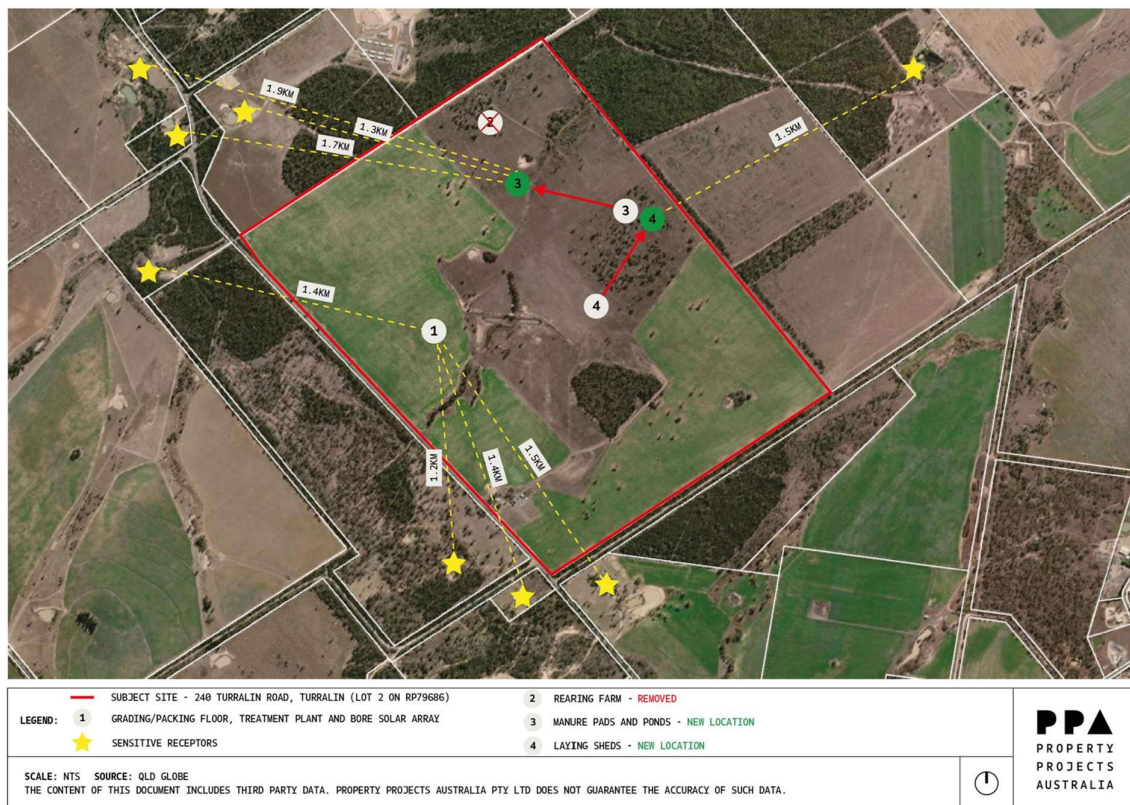


1 INTRODUCTION

Matrix Acoustics was engaged by Property Projects Australia to prepare an amendment of the exiting noise impact assessment for the Avondale Cage Free Farm. An initial assessment was undertaken in 2020, however, a revision was required to address the resulting noise impacts on nearby sensitive receptors, due to changes in the farm layout and operations.

The Avondale Cage Free Farm is located at Lot 2 on RP79686, Turrallin, Queensland. The proposed farm comprises the establishment of 12 laying sheds, together with associated infrastructure including a manure pad and ponds area, a packhouse/warehouse, and a solar array. Furthermore, the total number of birds housed within the layer sheds is proposed to be 840,000. Image 1-1 shows the comparison between the initial farm layout and the new farm layout along with the nearby sensitive receptors.

Image 1-1 *Comparison of changes on initial Farm layout*





2 PROJECT CRITERIA

2.1 NOISE CRITERIA SOURCE

Noise criteria for the project are determined under the Toowoomba Regional Council Part 9 Other Codes, 9.3.4.2 Environmental Standards Code Performance Outcome PO₈. This outcome is stated as:

The generation of noise from the premises does not cause Environmental Harm or Nuisance to adjoining properties or other noise sensitive land uses.

1) *Development:*

- a) *is located in an appropriate zone;*
- b) *proposes best practice design and construction materials (in relation to noise attenuation); and*
- c) *proposes operational practices that will minimise noise nuisance for adjoining sensitive land uses*

The Accepted Outcomes associated with this Performance Outcome are AO_{8.1} and AO_{8.2}.

AO8.1 The development will achieve the following noise levels (when measured at the nearest sensitive receiver):

- (a) Background (L90) + 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 (L90) + 3dB(A) for variable noise between the hours of 10:00 pm and 7:00 am (measured within bedrooms assuming open windows);*
- (c) Background (L90) 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 L_{Amax} 45dB(A) inside dwellings; and*

The development will achieve the Acoustic Quality Objectives listed within the Environmental Protection (Noise) Policy 2008.

HOWEVER

AO8.2 Where a development is unable to meet noise levels specified in AO8.1 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).

2.2 PROJECT SPECIFIC CRITERIA

During a meeting on the 28th May 2020 it was agreed with the Council representative that the assessment would be Based on AO8.1 and would not include reference to the Acoustic Quality Objectives. Compliance with points a through d would be sufficient for this project. These are reiterated:

- (a) Background (L90) + 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 (L90) + 3dB(A) for variable noise between the hours of 10:00 pm and 7:00 am (measured within bedrooms assuming open windows);

(c) Background (L90) 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 L_{Amax} 45dB(A) inside dwellings.

The first three criteria do not specify a performance metric. It is commonly assumed that, for preservation of amenity, L_{Aeq} is the preferred metric to be compared against the background noise levels. The L_{Aeq} as the criteria metric is adopted for this assessment, except for sleep disturbance which is defined as the L_{AMax}.

Time periods of assessment are typically based on 15 minute periods. This has also been adopted in absence of any other guidance within the Environmental Standards Code.



3 BACKGROUND NOISE MEASUREMENTS

Background noise monitoring was undertaken in May 2020 at the residential property located near the southern corner of the project area. Image 3-1 shows the noise monitor and weather station located on the western boundary of the residential property.

Image 3-1 *Noise monitor setup*



Table 3-1 shows the summary of the noise measurements undertaken at the residential dwelling.

Table 3-1 *Noise measurement summary*

Time period	L _{Amax}	L _{Aeq}	L _{A90}
24 Hour average	58	47	28
Day (7am – 10pm)	62	48	30
Night (10pm – 7am)	48	43	25

These noise levels are used to determine project specific noise criteria in accordance with the Environmental Standards Code.



4 RESULTING CRITERIA

Using the resulting Average Background noise level presented in Section 3, the project specific noise criteria have been determined based on the requirements of the Environmental Standards Code. The resulting criteria are shown in Table 4-1.

Table 4-1 *Project specific noise criteria*

Time period criteria	L _{A90}	Criteria	Criteria
Day (7am – 10pm) – Façade - variable	30	Bg +5	35 L _{Aeq}
Night (10pm – 7am) – Internal – variable	25	Bg +3	28 L _{Aeq}
Night (10pm – 7am) – External - continuous	25	Bg +0	25 L _{Aeq}
Sleep disturbance - Internal			45 L _{AMax}

The day time criterion is a façade measurement. This is a measurement conducted 1m from the most exposed façade of the sensitive receptor under investigation. This is measured as an L_{Aeq}. That is, the equivalent continuous A-weighted sound pressure level of the measurement period.

The first night time criterion is an internal measurement. It is typically taken in the centre of the most affected bedroom during the night time period. This is measured as an L_{Aeq}.

The second night time criterion is an external façade measurement that is taken 1m in front of the window of the most affected bedroom or sleeping area at the receptor under investigation. This is measured as an L_{Aeq}.

The sleep disturbance criterion is an internal measurement. It is typically taken in the centre of the most affected bedroom during the night time period. This is measured as an L_{AMax}. This metric is the highest fast-weighted, A-weighted reported measurement during the measurement period.

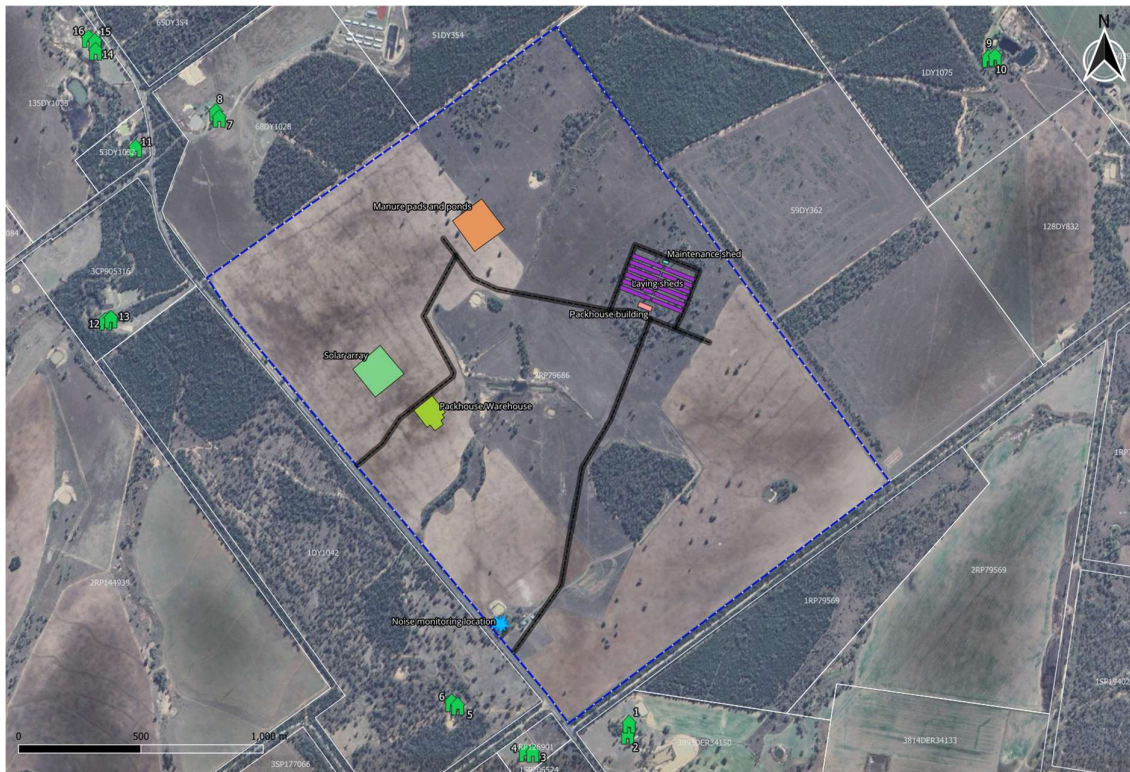
The adopted measurement period for this assessment is 15 minutes.



5 SENSITIVE RECEPTORS

The Avondale Cage Free Farm is located in an area surrounded by open field areas and residential dwellings. All buildings have been modelled as two-storey dwellings in order to adopt a conservative approach to the noise modelling. The nearest residential dwelling is located at approximately 125 m from the project boundary. Image 5-1 shows the modelled sensitive receptors.

Image 5-1 *Project sensitive receptors*





6 NOISE ASSESSMENT

6.1 NOISE PREDICTION METHOD

For the noise impact assessment, SoundPLAN 9.1 noise prediction software was used to predict noise levels at the nearest noise sensitive receptors. The model predictions were completed utilising the ISO9613-2:1996 “Acoustics – Attenuation of Sound during Propagation Outdoors – general method” algorithm.

The model calculates total noise levels at assessment locations from concurrent operation of multiple noise sources. It considers factors that influence noise propagation such as the lateral and vertical location of plant, source-to-receptor distances, ground effects, atmospheric absorption, topography of the site and surrounding area and applicable meteorological conditions.

The model was populated with 3-D topography of the project and surrounding area, extending out past the assessed noise sensitive receptors. Environmental model parameters were set to a temperature of 20°C and humidity of 80% for day time. For night time, temperature of 10°C and humidity of 60% were used in the model.

6.2 MODELLED SCENARIOS

The noise model was used to predict noise levels at the nearest sensitive receptors. The model predicted noise levels for the operation of the Farm at day and night time. The assessed activities and associated plant for each scenario are detailed in Table 6-1 along with the sound power levels (SWL), height of the noise source and percentage of duty for day and night time. Duty represents how intensive the activity is. A 100% duty means the activity or device is operating for the full durations of the assessment period.

The following sources were identified on site. These have been categorised according to area. Many sources have been modelled as continuous operation when, in practice, they will be operating for only a portion of each assessment period to adopt a more conservative noise modelling approach.

Table 6-1 *Modelled noise sources with day and night percentage of duty*

Area	Source	Type	Qty	Height (m)	Daytime Duty (%) per hour	Night time duty (%) per hour	Sound Power Level (dB(A))
Laying sheds	Fan Wall	Area source	12	8	100	100	71.5 (m ²)
	Cooling Pad Wall	Area source	12	8	100	100	63.5 (m ²)
	General Walls	Area source	12	8	100	100	54.3 (m ²)
	Roof area	Area source	12	8	100	100	51.3 (m ²)
	Manure conveyor	Area source	12	1-4	100	100	76.3 (m)
	Grain feed pipe	Line source	24	1-6	50	50	69.7 (m)
	Feed auger	Point source	24	1	50	50	71.9
Grading building	AC Finished product	Gree Modular	1	1	100	100	54.1
	AC Clean keys	Gree Scroll	1	1	100	100	74.3
	AC Grading floor	Gree Scroll - LMVIA	1	1	100	100	74.3



Area	Source	Type	Qty	Height (m)	Daytime Duty (%) per hour	Night time duty (%) per hour	Sound Power Level (dB(A))
	Pulp Chiller	Emerson ZX	2	1	100	100	54.1
	Pulp Storage	Emerson ZX	3	1	100	100	54.1
	AC Breakers & Pulp	Gree Lomo	2	1	100	100	54.1
	AC Elec & UPS	Gree Hyper	1	1	100	100	52.8
	AC Bins	Gree Ducted	4	1	100	100	74.3
	AC Office	Gree Ducted	1	1	100	100	74.3
	AC Amenities	Gree Scroll - LMVIA	1	1	100	100	74.3
Solar array	Inverter bank	Area source	1	1-3	100	0	67.7 (m ²)
Water Treatment Plan	Pumps	Point source	4	1	100	100	84.5
Light vehicles	Peak AM hour	Moving point source at 40 km/h	15	1	100	100	87.1
Trucks	Idling with refrigeration	Point	2	3	100	0	101
	Hen delivery	Moving point source	3	2	25	0	101
	Processed eggs	Moving point source	2	2	25	0	101
	Manure	Moving point source	2	2	25	0	101

A number of the source levels were measured at the proponent's existing site east of Millmerran. The sound power levels of equipment that was not available to be measured at site was obtained from manufacturer's data, or from the Matrix Acoustics noise library.

The objective of this impact assessment is to assess the period with the highest impact in each criteria time period. The assessment period has been assumed to be 15 minute in duration. The model presents the maximum noise emissions that could occur in a 15 minute period on site.

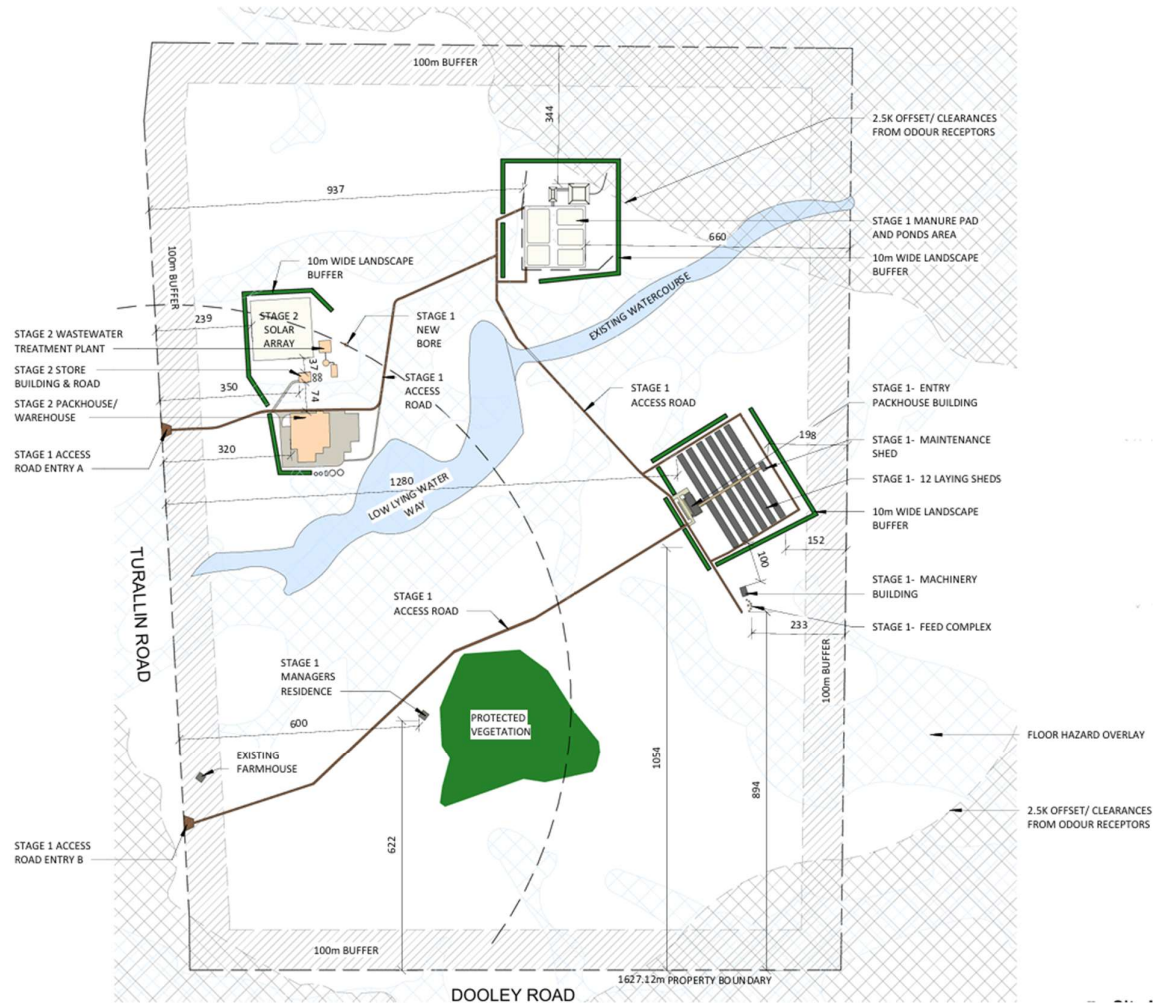
The maximum day time period has been modelled to include all laying sheds operating at full capacity, with three hen delivery trucks operating, two manure trucks operating, all manure conveyors operating, two trucks idling at despatch, and to trucks entering the processing site.

The maximum night time period has been taken to be the period between 6 and 7am where the majority of workers are arriving at site. There are no truck deliveries at this time.

Image 6-1 shows the latest Farm site layout that has been used as the basis for the location of the noise sources in the noise model.



Image 6-1 New Farm site layout





6.3 NOISE MODEL PREDICTED RESULTS

The calculation point for each receptor in the noise model is at the most exposed façade. The modelled scenarios, along with the SWL, quantity and % duty reported in Section 6.2 have been used in the noise model. Table 6-2 shows the results for all modelled receptors for the two modelled scenarios. All results show compliance with the project noise criteria.

Table 6-2 Noise modelling results

Building ID	Lot Plan	Floor	Direction	Day criterion LAeq	Day LAeq (15min)	Comply day time criterion?	Night criterion LAeq	Night LAeq (15min)	Comply night time criterion?
1	3893DER34150	GF	N	35	25.3	Yes	25	22.1	Yes
1	3893DER34150	F 1	N	35	26.7	Yes	25	22.6	Yes
2	3893DER34150	GF	NW	35	23.4	Yes	25	17.6	Yes
2	3893DER34150	F 1	NW	35	25.2	Yes	25	18.9	Yes
3	1RP126901	GF	NE	35	25.4	Yes	25	21.9	Yes
3	1RP126901	F 1	NE	35	27.2	Yes	25	22.4	Yes
4	1RP126901	GF	NE	35	26.4	Yes	25	21.8	Yes
4	1RP126901	F 1	NE	35	28.4	Yes	25	22.4	Yes
5	1DY1042	GF	E	35	26.2	Yes	25	22.3	Yes
5	1DY1042	F 1	E	35	27.5	Yes	25	22.7	Yes
6	1DY1042	GF	E	35	26.2	Yes	25	22.3	Yes
6	1DY1042	F 1	E	35	27.5	Yes	25	22.8	Yes
7	68DY1028	GF	SE	35	24.6	Yes	25	20.9	Yes
7	68DY1028	F 1	SE	35	25.9	Yes	25	22.0	Yes
8	68DY1028	GF	NE	35	24.6	Yes	25	21.0	Yes
8	68DY1028	F 1	NE	35	26.1	Yes	25	22.0	Yes
9	1DY1075	GF	SE	35	18.3	Yes	25	14.2	Yes
9	1DY1075	F 1	SE	35	22.0	Yes	25	17.9	Yes
10	1DY1075	GF	SW	35	22.7	Yes	25	21.4	Yes
10	1DY1075	F 1	SW	35	23.8	Yes	25	22.1	Yes
11	53DY1032	GF	E	35	22.6	Yes	25	17.8	Yes
11	53DY1032	F 1	E	35	23.9	Yes	25	18.4	Yes
12	3CP905316	GF	E	35	22.7	Yes	25	17.2	Yes
12	3CP905316	F 1	E	35	24.3	Yes	25	18.2	Yes
13	3CP905316	GF	E	35	22.8	Yes	25	17.3	Yes
13	3CP905316	F 1	E	35	24.4	Yes	25	18.4	Yes
14	135DY1033	GF	NE	35	20.2	Yes	25	16.5	Yes
14	135DY1033	F 1	NE	35	21.7	Yes	25	17.3	Yes



Building ID	Lot Plan	Floor	Direction	Day criterion LAeq	Day LAeq (15min)	Comply day time criterion?	Night criterion LAeq	Night LAeq (15min)	Comply night time criterion?
15	135DY1033	GF	E	35	20.3	Yes	25	16.6	Yes
15	135DY1033	F 1	E	35	21.9	Yes	25	18.1	Yes
16	135DY1033	GF	NE	35	19.9	Yes	25	16.2	Yes
16	135DY1033	F 1	NE	35	21.3	Yes	25	16.9	Yes

Image 6-2 and Image 6-3 present the noise contours that are predicted for day and night time operations. As it is observed in these images, noise levels are predicted to comply for both, day and night criteria at all modelled sensitive receptors.



Image 6-2 Predicted noise results for Day time farm operations

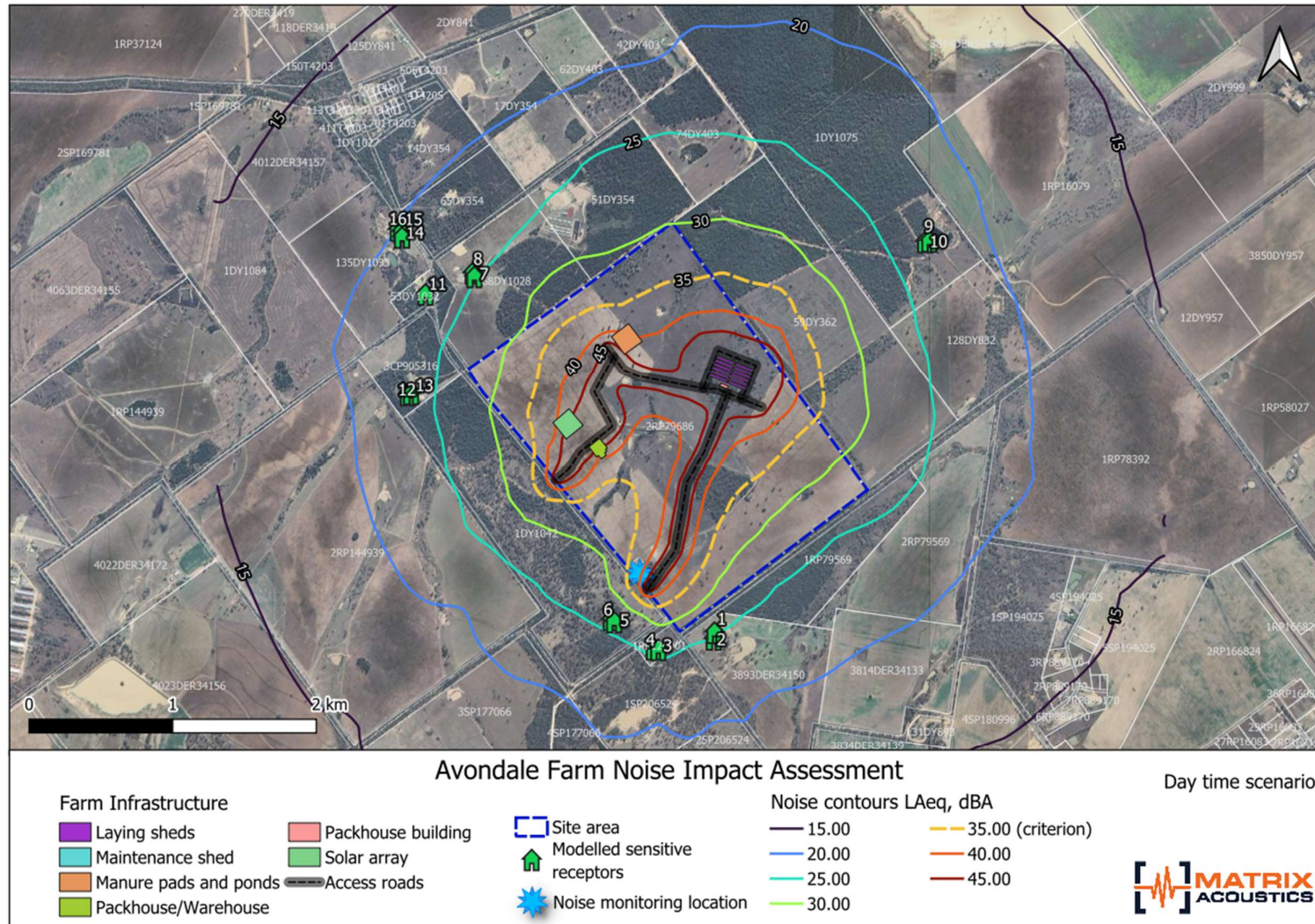
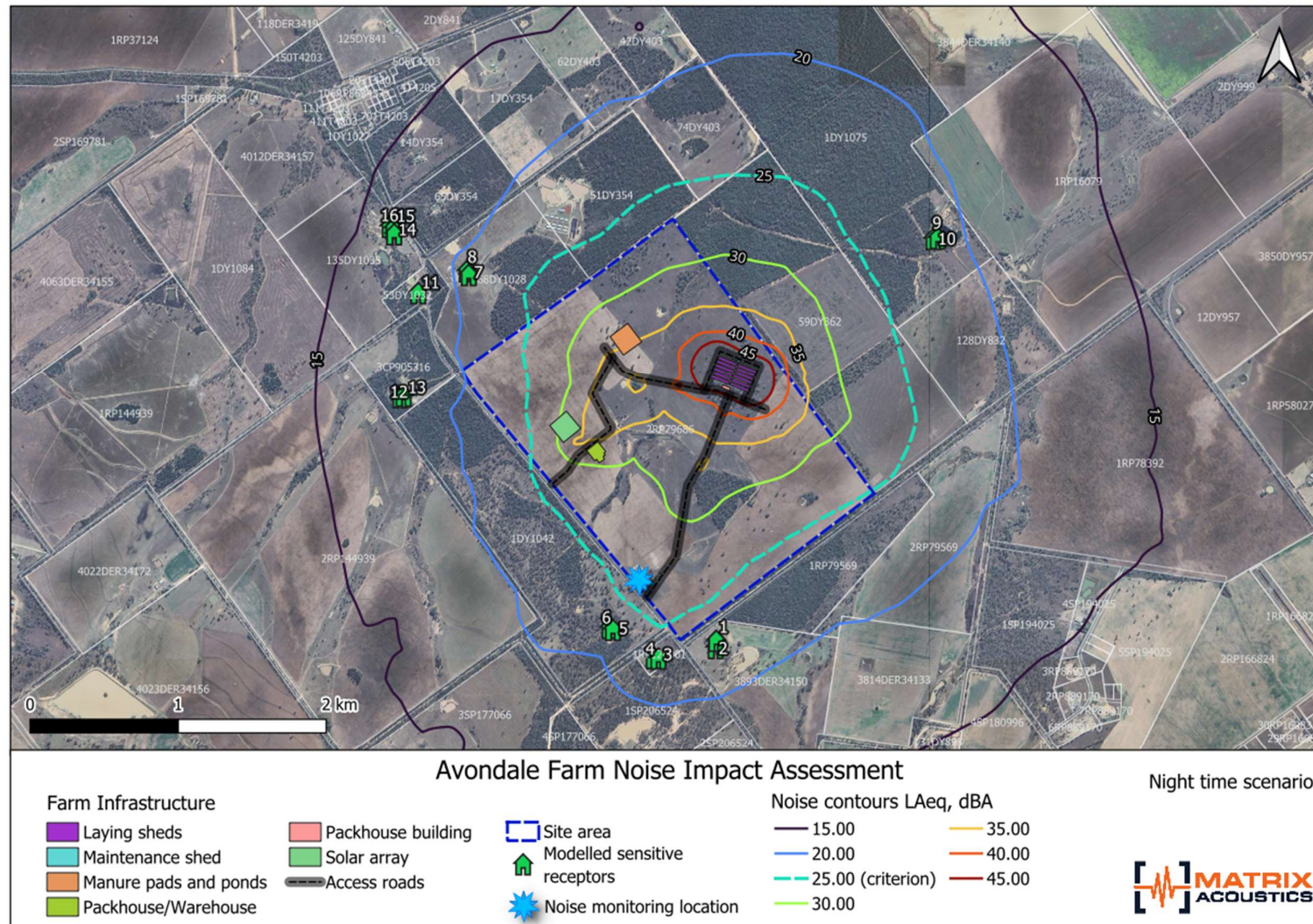




Image 6-3 Predicted noise results for Night time farm operations





7 CONCLUSION

An amendment of the noise impact assessment addressing the noise emissions from the Avondale Cage Free Farm has been undertaken due to changes in the Farm layout and operations. This noise assessment has found that the Farm operation is predicted to comply with the applicable noise criteria at any time of the day.

Background noise measurements from May 2020 were used to determine project criteria in accordance with the Toowoomba Regional Council Part 9 Other Codes, 9.3.4.2 Environmental Standards Code.

The noise criteria calculated in the previous report and adopted in this noise assessment is shown in Table 7-1.

Table 7-1 *Recommended project noise criteria*

Time period criteria	Noise criteria (15 min)
Day (7am – 10pm) – Façade	35 L _{Aeq}
Night (10pm – 7am) – Internal – variable	28 L _{Aeq}
Night (10pm – 7am) – External - continuous	25 L _{Aeq}
Sleep disturbance - Internal	45 L _{AMax}

A noise model was developed based on measured noise emissions from the existing proponent's site east of Millmerran and other source data. The results of the noise model and assessment indicates that with the inclusion of the new noise sources and changes in the layout, the farm operation is likely to be in compliance with all project criteria for both day and night time periods, including the shoulder period in the morning where the site commences work prior to the 'day' period commencing.

It is recommended that noise monitoring requirements be included in the project site management plan. This could take the form of complaints monitoring or ongoing compliance monitoring.