

ACOUSTIC REPORT

FOR

AMAROO RETREAT

20 December 2022

AES-890064-R01-2-20122022

DOCUMENT CONTROL

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EXECUTIVE SUMMARY

Amaroo Retreat proposes to increase its capacity from 60 to 85 and extend its outdoor dining area. Acoustic Engineering Solutions (AES) has been commissioned by Planning Outcomes WA (POWA) to update the acoustic report accordingly and assess if the proposed changes would comply with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

The existing acoustic model is updated to reflect the proposed changes and the following five worst-case operational scenarios are modelled:

- Scenario 1: All items of the mechanical plant are operating simultaneously with the kitchen activities. The indoor and outdoor speakers play low level music. Half of patrons are assumed to talk simultaneously.
- Scenario 2: Scenario 1 plus live music performance on the southern lawn area. This scenario is only for day-time of Monday to Saturday.
- Scenario 2A: Scenario 1 plus live music performance inside the restaurant building. This scenario is for evenings and for Sunday and public holidays.
- Scenario 3: Scenario 1 plus a delivery truck at a car-parking bay. This scenario occurs in short periods for daytime only of Monday to Friday excluding public holidays.
- Scenario 4: Closing a car door at a worst-case car-park bay. It represents very short events.

Seven closest residential premises are selected for the detailed assessment of noise impacts. Noise levels are predicted for worst-case meteorological conditions. The predicted worst-case noise levels are adjusted to account for their dominant characteristics and then assessed against the criteria set by the Regulations. The compliance assessment concludes that full compliance is achieved for the expanded Amaroo Retreat.

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1.0 INTRODUCTION

Amaroo Retreat proposes to increase its capacity from 60 to 85 and extend its outdoor dining area. Acoustic Engineering Solutions (AES) has been commissioned by Planning Outcomes WA (POWA) to update the acoustic report accordingly and assess if the proposed changes would comply with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

1.1 AMAROO RETREAT

Amaroo Retreat is located at 1200 Alison Street, Mt Helena. Figure 1 in APPENDIX A presents an aerial view of the subject site and surrounding area. The subject site is zoned as 'Rural' under the Metropolitan Region Scheme and surrounded by residential premises.

Figure 2 in APPENDIX A presents the site layout and Figure 3 is the project area plan. The site is located on the corner of Alison Street and Grigg Road within the suburb of Mount Helena. Amaroo Retreat is located on the north-western corner of the site (off Alison Street). Twelve car-parking bays are located to west of Amaroo Retreat including a disabled bay.

Figure 4 in APPENDIX A presents the floor plan and elevation views. The restaurant building is a single-storey building with an elevated floor, and has a kitchen, toilets, an indoor dining/bar area (see Figure 5) and two outdoor dining areas: an alfresco dining area (see Figure 6) and the west decking dining area. A cool room, preparation room and dry store are the new additions located to the east of kitchen.

The restaurant building has a metal roof with Bradford Ploymax Acoustic batts R2.5 insulation. All external walls are 92mm metal stud CFC Cladding walls with R2.5 insulation. The windows are glazed with 12mm glasses. The door to the alfresco dining area is a 12mm glass sliding door while the other doors are 40mm timber doors.

A sound system operates ten directional speakers: six (6) on the ceiling of the indoor dining area and four (4) on the wall under the alfresco roof, to provide low level background music during the hours of service. No speakers are installed in the west decking dining area. Live music (solo performance) will be played occasionally.

Amaroo Retreat services food and alcohol, and has a maximum capacity of 85 patrons plus five staff. Four days are planned to open in a week but the actual open days will be decided later. The open hours are from 8am and 10pm on Monday to Saturday and from 8am and 8pm for Sunday & Public Holidays.

J&J Richards (a private waste collection service) is contracted to collect waste at the existing bin area, as shown in Figure 3 in APPENDIX A, in every 2nd Wednesday morning after 7am.

2.0 NOISE CRITERIA

Noise management in Western Australia is implemented through the Environmental Protection (Noise) Regulations 1997 (the Regulations). The Regulations set noise limits which are the highest noise levels that can be received at noise-sensitive (residential), commercial and industrial premises. These noise limits are defined as ‘assigned noise levels’ at receiver locations. Regulation 7 requires that “noise emitted from any premises or public place when received at other premises must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind”.

Table 2-1 presents the assigned noise levels at various premises.

Table 2-1: Assigned noise levels in dB(A)

Type of Premises Receiving Noise	Time of Day	Assigned Noise Levels in dB(A) ¹		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Monday to Saturday	45 + Influencing factor	55 + Influencing factor	65 + Influencing factor
	0900 to 1900 hours Sunday and public holidays	40 + Influencing factor	50 + Influencing factor	65 + Influencing factor
	1900 to 2200 hours all days	40 + Influencing factor	50 + Influencing factor	55 + Influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + Influencing factor	45 + Influencing factor	55 + Influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises other than those in the Kwinana Industrial Area	All hours	65	80	90

For highly noise sensitive premises, an “influencing factor” is incorporated into the assigned noise levels. The influencing factor depends on road classification and land use zonings within circles of 100 metres and 450 metres radius from the noise receiver locations.

¹Assigned level L_{A1} is the A-weighted noise level not to be exceeded for 1% of a delegated assessment period.
 Assigned level L_{A10} is the A-weighted noise level not to be exceeded for 10% of a delegated assessment period.
 Assigned level L_{Amax} is the A-weighted noise level not to be exceeded at any time.

2.1 CORRECTIONS FOR CHARACTERISTICS OF NOISE

Regulation 7 requires that that “noise emitted from any premises or public place when received at other premises must be free of:

- (i) tonality;
- (ii) impulsiveness; and
- (iii) modulation.

when assessed under Regulation 9”.

If the noise exhibits intrusive or dominant characteristics, i.e. if the noise is impulsive, tonal, or modulating, noise levels at noise-sensitive premises must be adjusted. Table 2-2 presents the adjustments incurred for noise exhibiting dominant characteristics. That is, if the noise is assessed as having tonal, modulating or impulsive characteristics, the measured or predicted noise levels have to be adjusted by the amounts given in Table 2-2. Then the adjusted noise levels must comply with the assigned noise levels. Regulation 9 sets out objective tests to assess whether the noise is taken to be free of these characteristics.

Table 2-2: Adjustments for dominant noise characteristics

Adjustment where noise emission is not music. These adjustments are cumulative to a maximum of 15 dB.			Adjustment where noise emission is music	
Where tonality is present	Where Modulation is present	Where Impulsiveness is present	Where Impulsiveness is not present	Where Impulsiveness is present
+5 dB	+5 dB	+10 dB	+10 dB	+15 dB

2.2 VEHICLE NOISE

Regulation 3(a) states that *nothing in these regulations applies to the following noise emissions —*

- (a) *Noise emissions from the propulsion and braking systems of motor vehicles operating on a road.*

If it is open to public, a car park is considered to be a road and therefore vehicle noise (propulsion and braking) is not strictly assessed. However, noise from car door shutting still requires assessment, as this does not form part of the propulsion or braking systems.

2.3 WASTE COLLECTION

Regulation 14A provides requirements for waste collection and car park cleaning. Such activities can be exempt from Regulation 7 provided they are undertaken in accordance with regulation 14A(2) as follows:

- the works are carried out between:
 - 0700 hours and 1900 hours on any day that is not a Sunday or a public holiday; or
 - 0900 hours and 1900 hours on a Sunday or public holiday.
- the works are carried out in the quietest reasonable and practicable manner; and
- the equipment used to carry out the works is the quietest reasonably available.

If they are carried out outside the above specified hours, the works should be carried out in accordance with a noise management plan, excluding any ancillary measure, approved in writing by the local government authority CEO.

2.4 INFLUENCING FACTOR

Influencing factors vary from residence to residence depending on the surrounding land use. Traffic flows on roads in the vicinity of the subject site are insufficient for any of the roads to be classified as either major or secondary roads and therefore no transport factors apply.

Amaroo Retreat is located in a rural area, and its closest noise sensitive premises are the residences. Neither industrial nor commercial premises are present in the vicinity (within 450m in radius) of the closest residences. Therefore, the influencing factors for the closest residential premises are zeros.

3.0 NOISE MODELLING

3.1 METHODOLOGY

An acoustic model is developed using SoundPlan v8.0 program, and the CONCAWE^{2,3} prediction algorithms are selected for this study. The acoustic model is used to predict noise levels at the selected receiver locations and generate noise level contours for the area surrounding the subject site.

The acoustic model does not include noise emissions from any sources other than from Amaroo Retreat. Therefore, noise emissions from neighbouring premises, aircraft, road traffic, animals, birds, etc are excluded from the modelling.

3.2 INPUT DATA

3.2.1 Topography

Topographical data were provided by POWA and digitised to the acoustic model. Amaroo Retreat and its surrounding area are a rural area. Therefore, an absorptive ground is assumed.

The existing buildings including the restaurant building on the subject site are digitised to the acoustic model. The residential buildings and sheds on the surrounding area are not considered.

3.2.2 Noise Sensitive Premises

Seven neighbouring residential premises are selected for the detailed assessment of noise impact, as shown in Figure 1 in APPENDIX A. All of them are the ground receivers (1.5m above the ground).

3.2.3 Source Noise Levels

Table 3-1 presents the source sound power levels. The overall level of a music speaker was determined from the assumption of 60 dB(A) at 1 metre. The overall noise levels of mechanical plant were provided by POWA. The spectrum shapes were obtained from the AES database for similar equipment. The noises generated from the mechanical plant are expected to exhibit tonality. The sound power levels of a patron conversation and a solo performance were measured for the other AES projects. During the measurements, the

²CONCAWE (Conservation of Clean Air and Water in Europe) was established in 1963 by a group of oil companies to carry out research on environmental issues relevant to the oil industry.

³The propagation of noise from petroleum and petrochemical complexes to neighbouring communities, CONCAWE Report 4/81, 1981.

soloist played a guitar and sang a song in a garden with two directional speakers. The sound power level of car door shutting is presented in a L_{Amax} level.

Table 3-1: Sound power levels

Name	Octave Frequency Band Sound Power Levels in dB(A)								Overall dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
Kitchen Extraction Fan	48	62	71	69	66	69	63	53	76
Toilet Exhaust Fan	42	51	53	58	51	54	53	47	62
Reverse Cycle Air-Conditioner	34	51	60	61	63	60	56	51	68
Coolroom Compressor	35	52	61	62	63	61	57	52	71
Truck Refrigeration Unit	56	70	77	80	84	81	75	69	88
Patron Conversation	45	53	62	61	54	54	53	48	66
Music Speaker	49	56	56	60	63	61	59	53	68
Solo Performance	63	79	87	94	94	92	86	71	99
Car Door Shutting L_{AMAX}	72	80	82	81	81	78	72	68	88

Table 3-2 presents the noise level, which was measured over 5 minutes inside a busy restaurant kitchen for another project. The measured kitchen noise includes the contributions from exhaust hoods, cooking and boiling, (food order) conversations, vegetable cutting, fridge door opening and closing, and associated activities.

Table 3-2: Noise levels inside the kitchen

Name	Octave Frequency Band Noise Levels in dB(A)								Overall dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
Kitchen	40	54	67	73	76	80	75	68	83

3.3 METEOROLOGY

SoundPlan calculates noise levels for defined meteorological conditions. In particular, temperature, relative humidity, wind speed and direction data are required as input to the model. For this study the worst-case meteorological conditions⁴ are assumed, as shown in Table 3-3. Since evening and night have the same worst-case meteorological conditions, only the night-time noise levels are modelled.

Table 3-3: Worst-case meteorological conditions.

Time of day	Temperature Celsius	Relative Humidity	Wind speed	Pasquill Stability Category
Day (0700 --- 1900)	20 Celsius	50%	4 m/s	E
Evening (1900 --- 2200)	15 Celsius	50%	3 m/s	F
Night (2200 --- 0700)	15 Celsius	50%	3 m/s	F

3.4 NOISE MODELLING SCENARIOS

POWA advised:

- Amaroo Retreat has a maximum capacity of 85 patrons.
- Six speakers are installed on the ceiling of the indoor dining area and four speakers are installed on the wall under the alfresco roof. All speakers are directional speakers.
- No speakers are installed in the west decking (outdoor) dining area.
- Low level background music will play during opening hours.
- Live music (Solo performance) will play occasionally:
 - On the south lawn area, as shown in Figure 3 in APPENDIX A, during daytime (8am – 7pm) of Monday and Saturday; or
 - Inside the restaurant building (indoor dining area) during evenings (7pm to 10pm) or for Sunday and public holidays between 9am and 7pm.
- No live music will play during 8am and 9am on Sunday and public holidays.
- The kitchen exhaust fan will be located above the kitchen roof.
- The coolroom compressor condenser sits on the roof.
- The 5 toilet exhaust fans will be installed on the toilet ceiling with roof cowls.
- No noisy equipment operates in the preparation room and dry store.

⁴The worst case meteorological conditions were set by the EPA (Environmental Protection Act 1986) Guidance note No 8 for assessing noise impact from new developments as the upper limit of the meteorological conditions investigated.

- A Panasonic reverse cycle split air-conditioning system will be installed and its condenser sits on the ground close to the east wall of the restaurant building.
- The sliding door to the alfresco dining area and the west double entrance door to the west decking area are open during the open hours.
- The external Kitchen door will be generally open during the open hours.
- Deliveries happen on Monday to Friday between 9am to 5pm.
- No shouting and swearing are allowed in Amaroo Retreat.

Five worst-case operational scenarios are modelled as followings:

- Scenario 1: All items of the mechanical plant are operating simultaneously with the kitchen activities. The indoor and outdoor speakers play low level music. Half of the patrons are assumed to talk simultaneously (42 conversations: 15 indoor conversations and 27 outdoor conversations: 15 conversations in the alfresco outdoor dining area and 12 in the west decking dining area). The external Kitchen door is assumed to be fully open during the open hours.
- Scenario 2: Scenario 1 plus live music performance on the southern lawn close to the restaurant building, as shown in Figure 3 in APPENDIX A. The two live music speakers are not connected to the restaurant PA system and are assumed to be 1.5m above the ground. This scenario is only for day-time of Monday and Saturday between 8am and 7pm.
- Scenario 2A: Scenario 1 plus live music performance inside the restaurant building (indoor dining area). The PA system will be connected to the live music microphone. The two solo speakers are assumed to be 1.5m above the floor. This scenario is for evenings (7pm to 10pm) or for Sunday and public holidays between 9am and 7pm.
- Scenario 3: Scenario 1 plus a delivery truck at a parking bay. It is assumed that the delivery truck engine is switched off during its unloading but its refrigeration unit is operating. This scenario occurs in short periods (much less than 10% of time is expected at any 4-hour interval) during day-time only of Monday to Friday excluding public holidays.
- Scenario 4: Closing a car door at a worst-case car-park bay. It represents very short events.

All items of the mechanical plant are modelled as point sources. The kitchen exhaust outlet and coolroom compressor condenser are assumed to be 0.4m above the roof while the air-conditioner condenser is 0.8m above the ground. For scenario 1, the overall music level of each of the 10 speakers is assumed of 60 dB(A) at 1m.

The car-door closing is modelled as a point source. The barrier effect of car bodies is not considered in the model and the predicted noise levels will be higher than the actual levels at the car body shadow areas.

4.0 MODELLING RESULTS

4.1 POINT MODELLING RESULTS

Table 4-1 presents the predicted worst-case A-weighted overall noise levels. For scenario 4, the predicted noise levels are in L_{AMax} level. It shows that the predicted day and night-time noises are at very similar levels at each of the selected receivers for scenarios 1, 2A and 4.

Table 4-1: Predicted worst-case noise levels in dB(A).

Receivers	Scenario 1		Scenario 2	Scenario 2A		Scenario 3	Scenario 4	
	Day	Night	Day	Day	Evening	Day	Day	Night
R1	17.1	17.0	33.0	25.6	25.6	18.0	22.1	22.1
R2	13.0	13.0	34.7	14.8	14.8	23.2	23.6	23.6
R3	28.7	28.6	32.7	29.2	29.1	37.3	38.3	38.3
R4	11.7	11.7	31.1	13.3	13.3	13.2	16.3	16.4
R5	10.9	10.9	14.1	11.4	11.4	20.2	17.2	17.3
R6	1.1	1.1	12.8	3.3	3.3	12.6	5.5	5.5
R7	21.2	21.1	23.6	30.2	30.2	30.4	22.0	22.0

The noise sources in scenario 1 can be classified into three contributions: patron conversations, music from speakers and mechanical plant. Table 4-2 presents the predicted noise contributions. At R1 the conversations and music are in similar levels while at R3 and R7 the mechanical noise and conversations are at similar levels. At R2 and R4 to R6, the predicted noise levels are much below ambient noise levels and will be inaudible.

Table 4-2: Predicted noise contributions in dB(A).

Receivers	Predicted Noise Contributions for Scenario 1		
	Conversations	Music	Mechanical
R1	14.0	12.2	9.7

Receivers	Predicted Noise Contributions for Scenario 1		
	Conversations	Music	Mechanical
R2	8.6	0	10.7
R3	24.0	11.9	26.7
R4	4.0	0	10.5
R5	9.0	0	7.7
R6	0.0	0	0.0
R7	17.5	12.2	17.7

4.2 NOISE CONTOURS

Figure 7 to Figure 11 in APPENDIX B present the worst-case noise level contours at 1.5m above the ground. These noise contours represent the worst-case noise propagation envelopes, i.e., worst-case propagation in all directions simultaneously. Since the predicted day and night-time worst-case noise levels are at very similar levels, the noise contours represent day, evening and night-time noise emissions from Amaroo Retreat.

Figure 11 presents the noise level $L_{A_{Max}}$ contours. It indicates that for scenario 4 the 45 dB(A) $L_{A_{Max}}$ contour is kept within the subject site, and the noise level $L_{A_{Max}}$ received at any of the neighbouring premises is less than 45 dB(A).

5.0 COMPLIANCE ASSESSMENT

5.1 WASTE COLLECTION

POWA advised that the waste is collected by a private service in every second Wednesday morning after 7am.

Noise generated from the waste collection during those time periods is exempted from Regulation 7. No noise compliance assessment is required for the waste collection.

5.2 TONALITY ADJUSTMENT

According to Table 2-2, the predicted noise levels shown in Table 4-1 should be adjusted by:

- 5 dB if the noise received exhibits tonality; or
- 10 dB if the noise received is music; or
- 10 dB if the noise received exhibits impulsiveness.

For scenario 1, Table 4-1 shows that the predicted noise levels at R2 and R4 to R6 are very low (much lower than background noise levels) and will be inaudible. Table 4-2 indicates that at R1 the music is below conversations and ambient level and will be inaudible. At R3 and R7 the mechanical plant is the dominant noise source. Therefore, a 5dB adjustment applies to the predicted noise levels at R3 and R7. No tonality adjustment is required to the predicted noise levels at the other receivers.

For scenarios 2 and 2A, music is the most dominant source. Therefore, a 10dB adjustment should apply to the predicted noise levels at all of the receivers except for the noise level under 10 dB(A), which should be inaudible.

For scenario 3, the most dominant noise source is the refrigeration unit of a delivery truck. Therefore, a 5dB adjustment should apply to the predicted noise levels at all of the receivers.

Scenario 4 considers the car-door closing noise only. The car-door closing noise may exhibit impulsiveness and then a 10dB adjustment applies to the predicted noise levels at all of the receivers except for the noise level under 10 dB(A), which should be inaudible.

The assigned noise levels in Table 2-1 are given in integer numbers. To assess against with the assigned noise levels, the adjusted noise levels should also be rounded to integer numbers. Table 5-1 presents the adjusted worst-case A-weighted noise levels. The adjusted noise levels are expressed in ***Bold Italic***.

Table 5-1: Adjusted worst-case noise levels in dB(A).

Receivers	Scenario 1		Scenario 2	Scenario 2A		Scenario 3	Scenario 4	
	Day	Night	Day	Day	Evening	Day	Day	Night
R1	17	17	43	36	36	23	32	32
R2	13	13	45	25	25	28	34	34
R3	34	34	43	39	39	42	48	48
R4	12	12	41	23	23	18	26	26
R5	11	11	24	21	21	25	27	27
R6	1	1	23	3	3	18	6	6
R7	26	26	34	40	40	35	32	32

5.3 COMPLIANCE ASSESSMENT

Scenarios 1, 2 and 2A generate continuous noise emissions, and then their noise emissions should be assessed against the assigned noise levels L_{A10} . Delivery trucks visit the site in short periods on Monday to Friday, therefore, scenario 3 should be assessed against the assigned noise levels L_{A1} . Car door closing is a very short event. The noise from a car door closing is predicted in L_{Amax} level and the assigned noise levels L_{Amax} apply for scenario 4.

For Sundays and public holiday, Amaroo Retreat operates between 8am and 8pm. Therefore, scenarios 1 and 4 should be assessed for daytime (9am to 7pm), evening-time (7pm to 8pm) and night-time (8am to 9am).

5.3.1 Day-time Operations

Table 5-2 presents the day-time compliance assessment for Mondays to Saturdays between 8am and 7pm. It is shown that all of the adjusted noise levels do not exceed the day-time assigned noise levels at all receiver locations. This demonstrates that compliance is achieved for the day-time operations of Amaroo Retreat on Mondays to Saturdays.

Table 5-2: Day-time compliance assessment for Mondays to Saturdays.

Receivers	Assigned Levels L _{A10} in dB(A)	Adjusted Noise Levels in dB(A)		Assigned Levels L _{A1} in dB(A)	Adjusted dB(A) Scenario 3	Assigned Levels L _{Amax} in dB(A)	L _{Amax} in dB(A) Scenario 4
		Scenario 1	Scenario 2				
R1	45	17	43	55	23	65	32
R2	45	13	45	55	28	65	34
R3	45	34	43	55	42	65	48
R4	45	12	41	55	18	65	26
R5	45	11	24	55	25	65	27
R6	45	1	23	55	18	65	6
R7	45	26	34	55	35	65	32

5.3.2 Evening and Sunday Operations

As indicated in section 3.4, delivery will not happen on Sunday and public holidays and also during evenings and nights. Therefore, the assessment for scenario 3 is not required for evenings, Sunday and public holidays.

Table 5-3 presents the evening-time (7pm to 10pm) compliance assessment. It is shown that all of the adjusted noise levels do not exceed the evening-time assigned noise levels at all receiver locations. This indicates that compliance is achieved for the evening-time operations of Amaroo Retreat.

Table 5-3: Evening-time compliance assessment.

Receivers	Assigned Levels L _{A10} in dB(A)	Adjusted Levels in dB(A)		Assigned Levels L _{Amax} in dB(A)	L _{Amax} in dB(A) Scenario 4
		Scenario 1	Scenario 2A		
R1	40	17	36	55	32

Receivers	Assigned Levels L_{A10} in dB(A)	Adjusted Levels in dB(A)		Assigned Levels L_{Amax} in dB(A)	L_{Amax} in dB(A)
		Scenario 1	Scenario 2A		Scenario 4
R2	40	13	25	55	34
R3	40	34	39	55	48
R4	40	12	23	55	26
R5	40	11	21	55	27
R6	40	1	3	55	6
R7	40	26	40	55	32

Table 5-4 presents the day-time compliance assessment for Sunday and public holidays between 9am and 7pm. It is shown that all of the adjusted noise levels do not exceed the day-time assigned noise levels at all receiver locations. This indicates that compliance is achieved for the day-time operations on Sunday and public holidays.

Table 5-4: Sunday compliance assessment.

Receivers	Assigned Levels L_{A10} in dB(A)	Adjusted Levels in dB(A)		Assigned Levels L_{Amax} in dB(A)	L_{Amax} in dB(A)
		Scenario 1	Scenario 2A		Scenario 4
R1	40	17	36	65	32
R2	40	13	25	65	34
R3	40	34	39	65	48
R4	40	12	23	65	26
R5	40	11	21	65	27
R6	40	1	3	65	6
R7	40	26	40	65	32

5.3.3 Night-time Operations

Table 5-5 presents the night-time compliance assessment for Sunday and public holidays between 8am and 9am. It is shown that all of the adjusted noise levels are lower than the night-time assigned noise levels at all receiver locations. This indicates that compliance is achieved for the night-time operations of Amaroo Retreat.

Table 5-5: Night-time compliance assessment.

Receivers	Assigned Levels L_{A10} in dB(A)	Adjusted Levels in dB(A)	Assigned Levels L_{Amax} in dB(A)	L_{Amax} in dB(A)
		Scenario 1		Scenario 4
R1	35	17	55	32
R2	35	13	55	34
R3	35	34	55	48
R4	35	12	55	26
R5	35	11	55	27
R6	35	1	55	6
R7	35	26	55	32

The above assessments conclude that full compliance is achieved for the expanded Amaroo Retreat.

APPENDIX A AERIAL VIEW

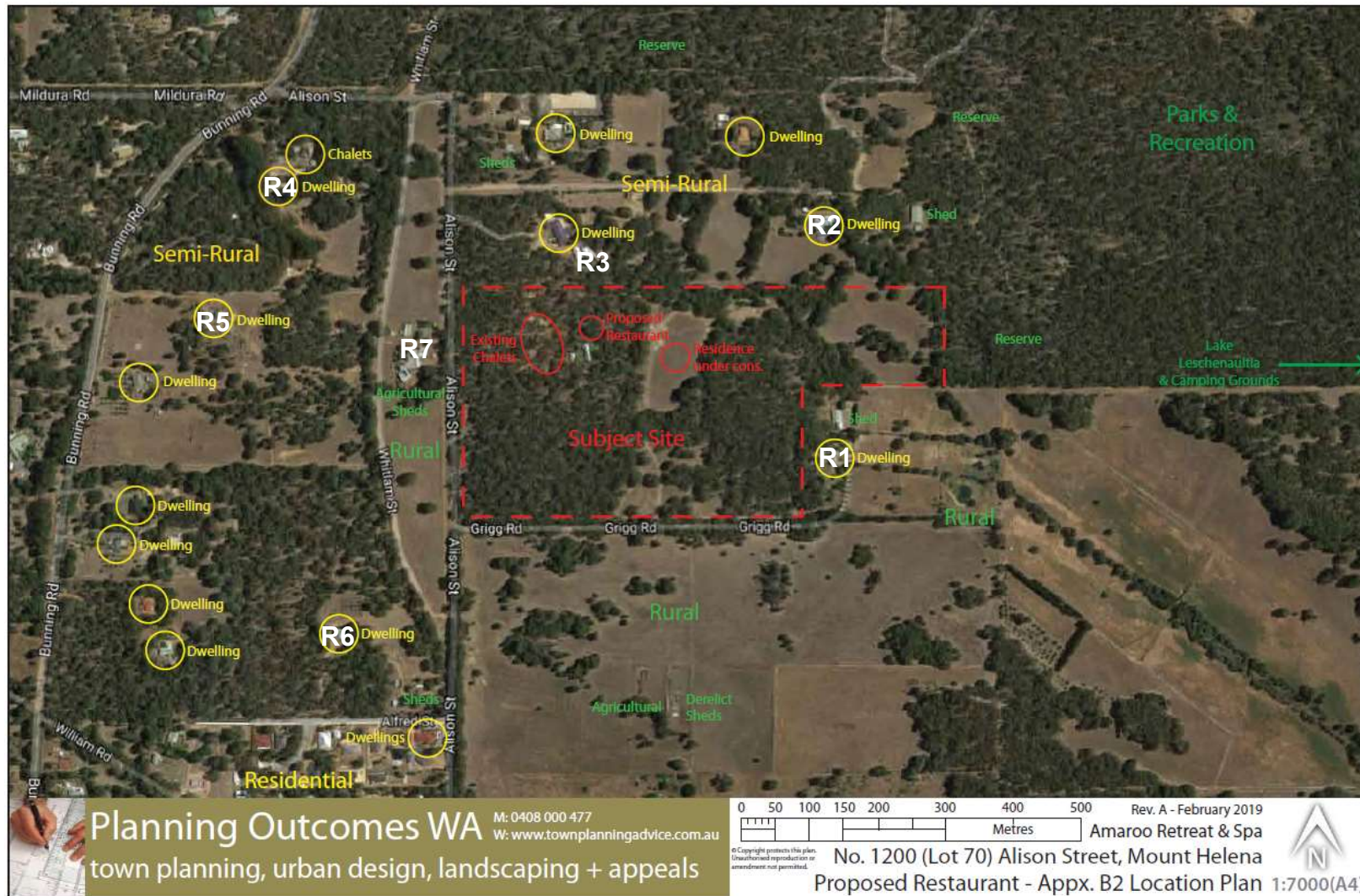


Figure 1: Aerial view of Amaroo Retreat and surrounding area.

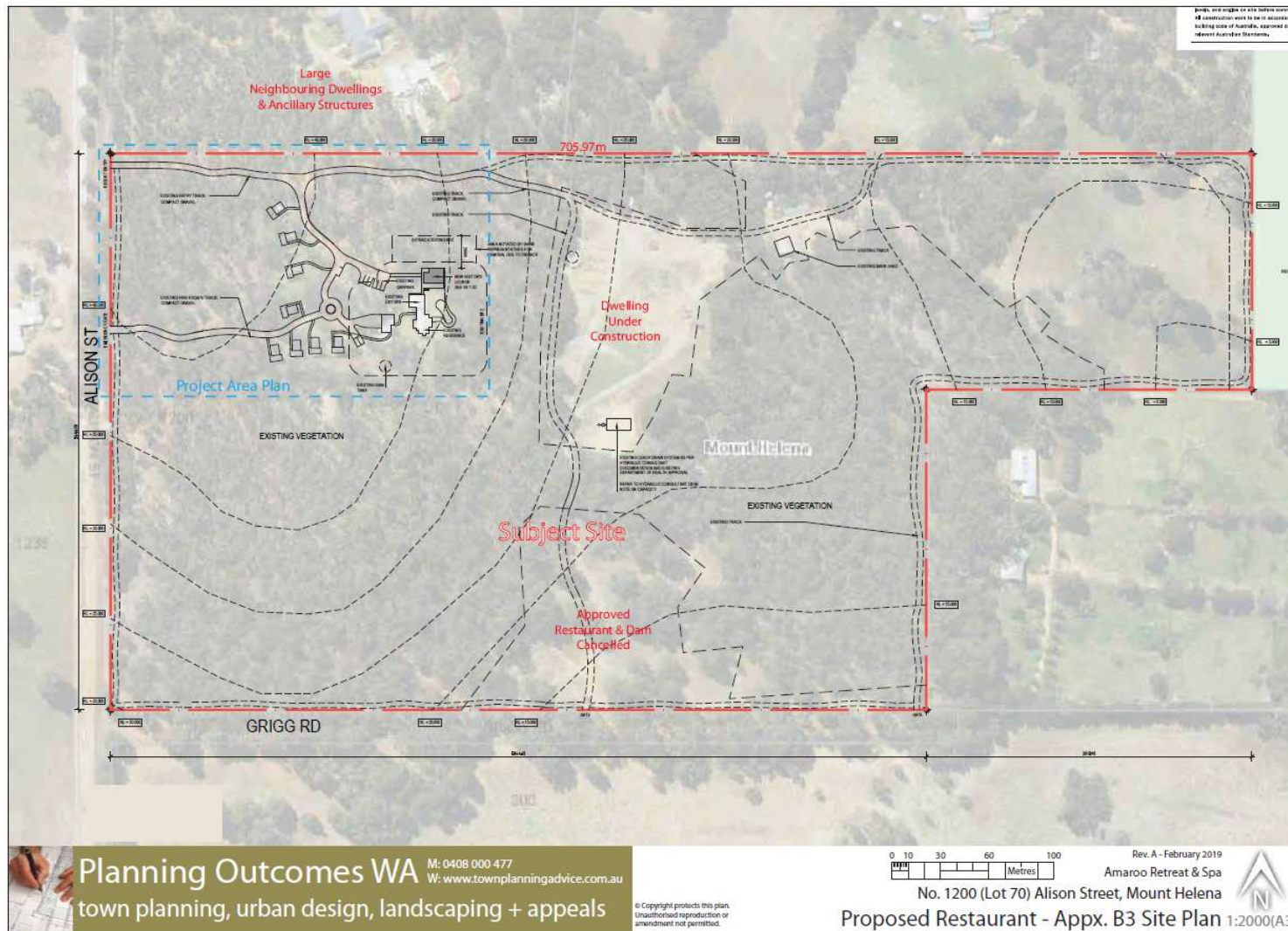
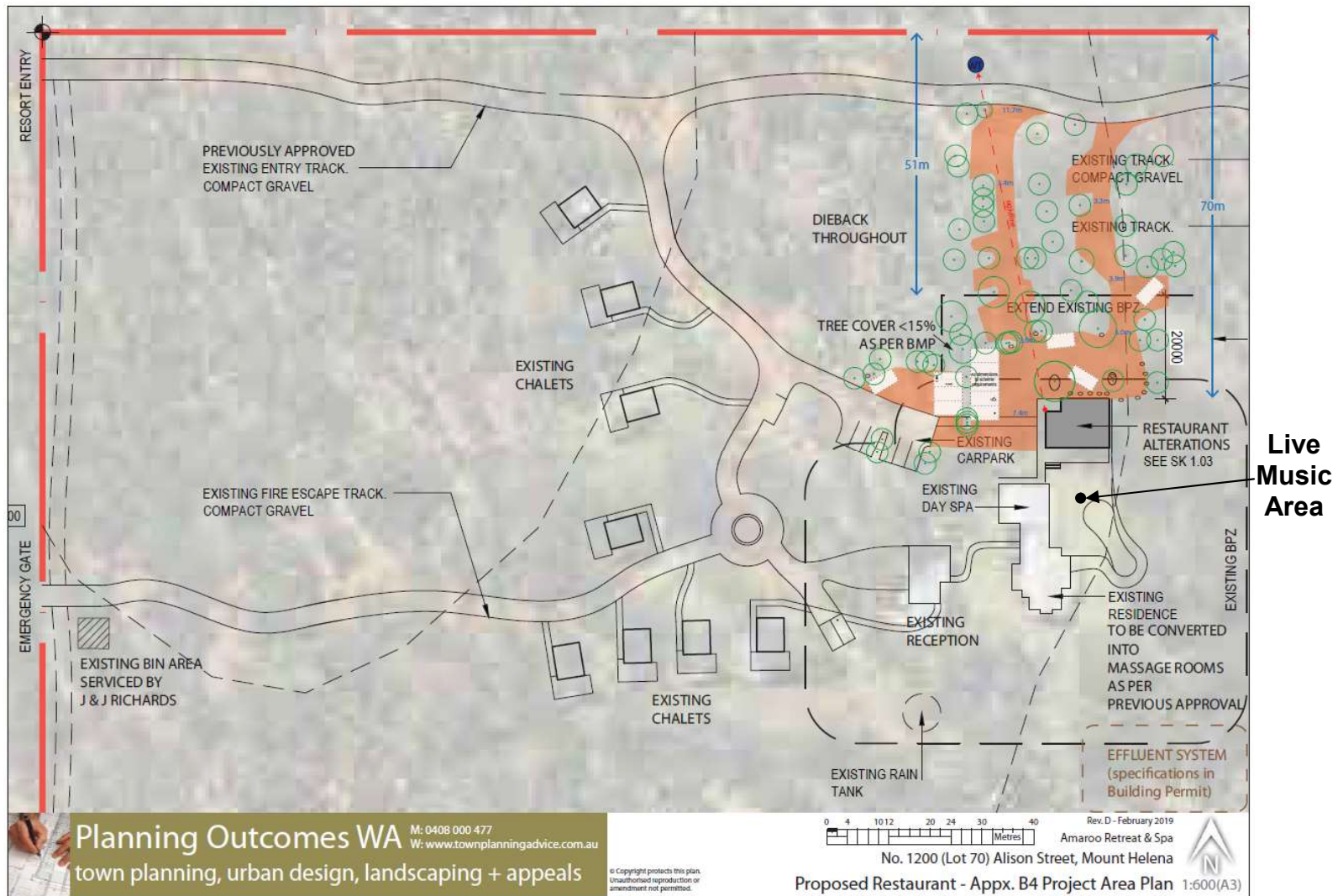


Figure 2: Site layout.



Live Music Area

Figure 3: Project area plan.



Figure 4: Floor plan and elevation views.



Figure 5: Photo of the bar.



Figure 6: Photo of the restaurant building.

APPENDIX B NOISE CONTOURS

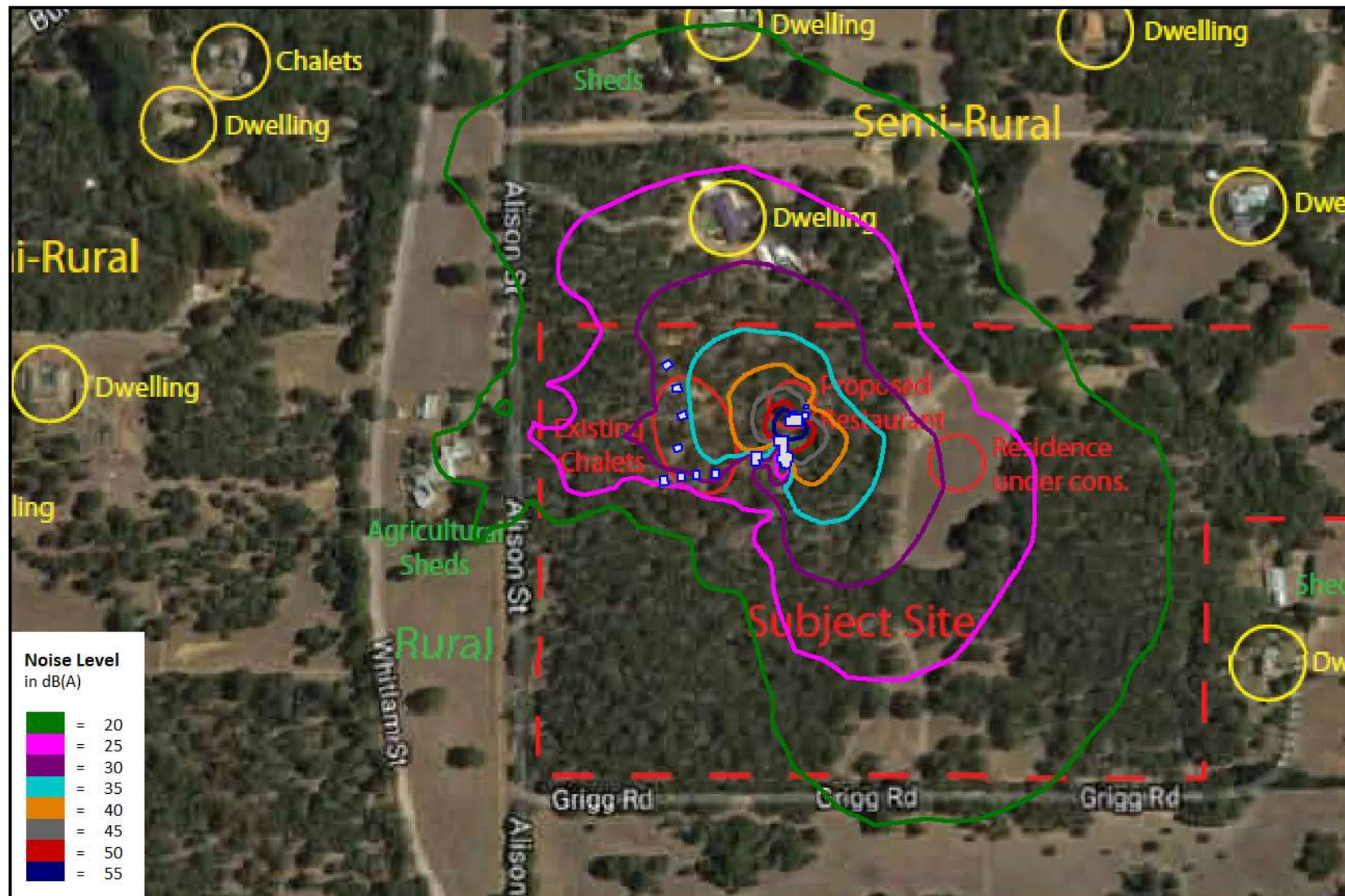


Figure 7: Worst-case noise level contours for scenario 1.

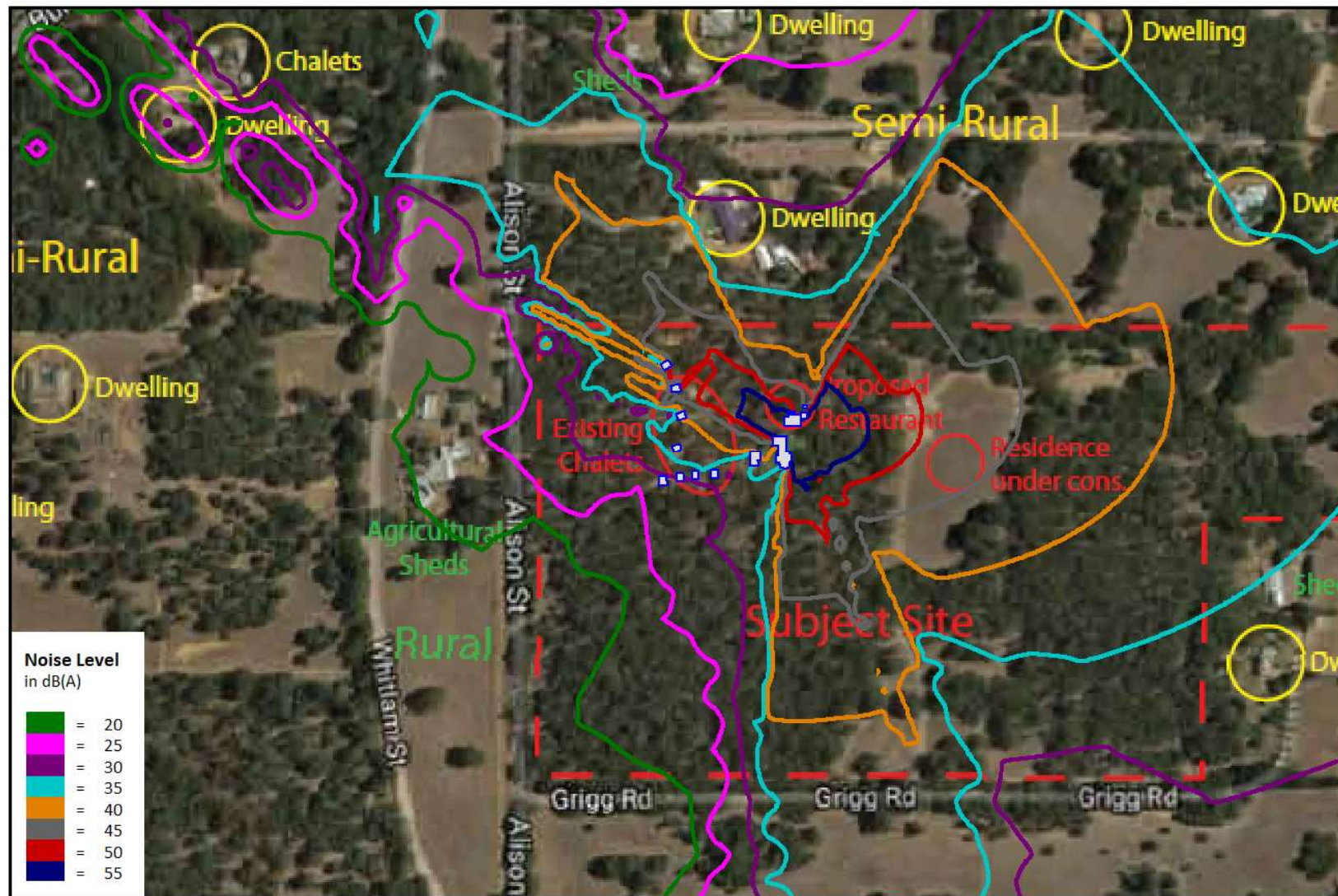


Figure 8: Worst-case noise level contours for scenario 2.



Figure 9: Worst-case noise level contours for scenario 2A.

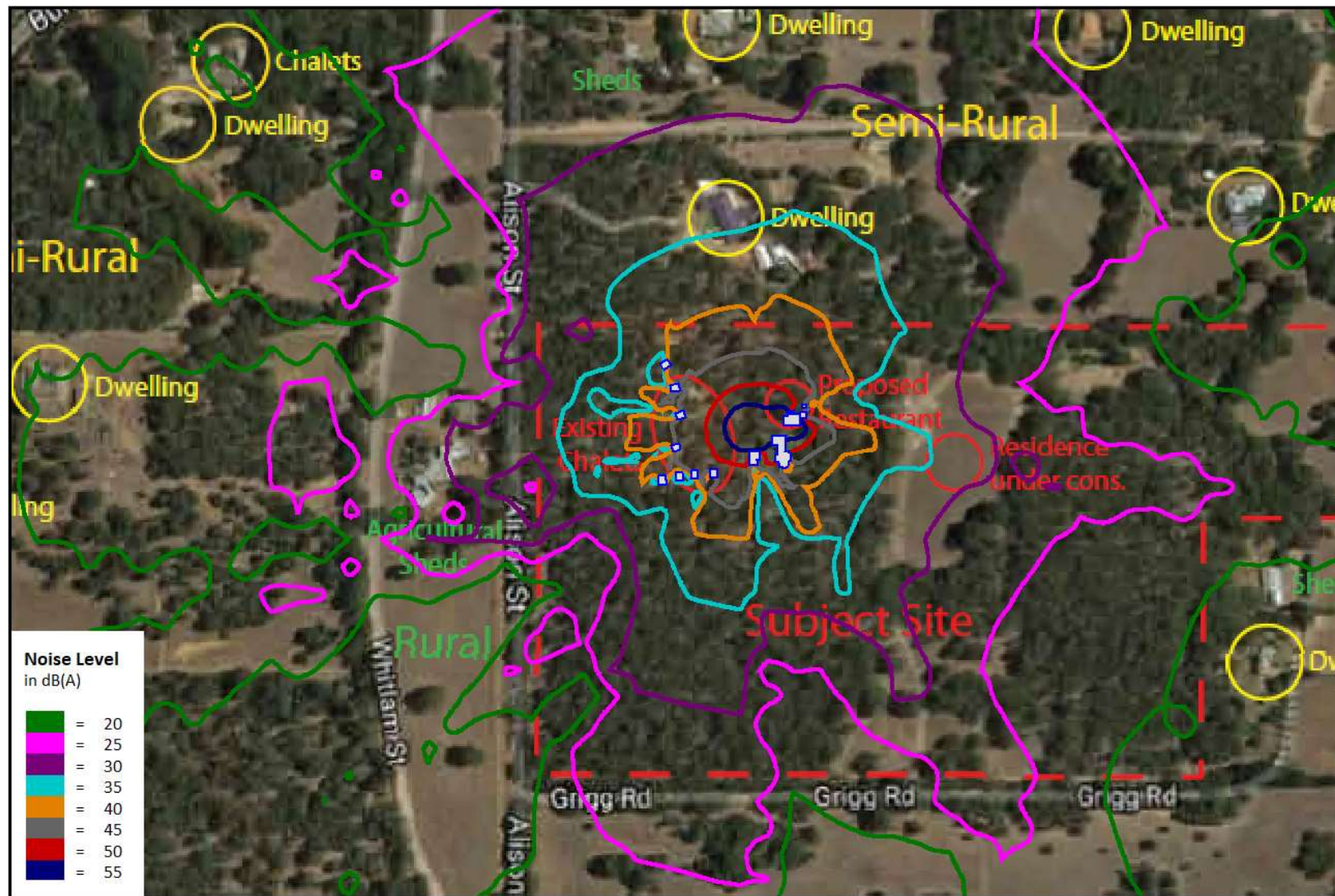


Figure 10: Worst-case noise level contours for scenario 3.

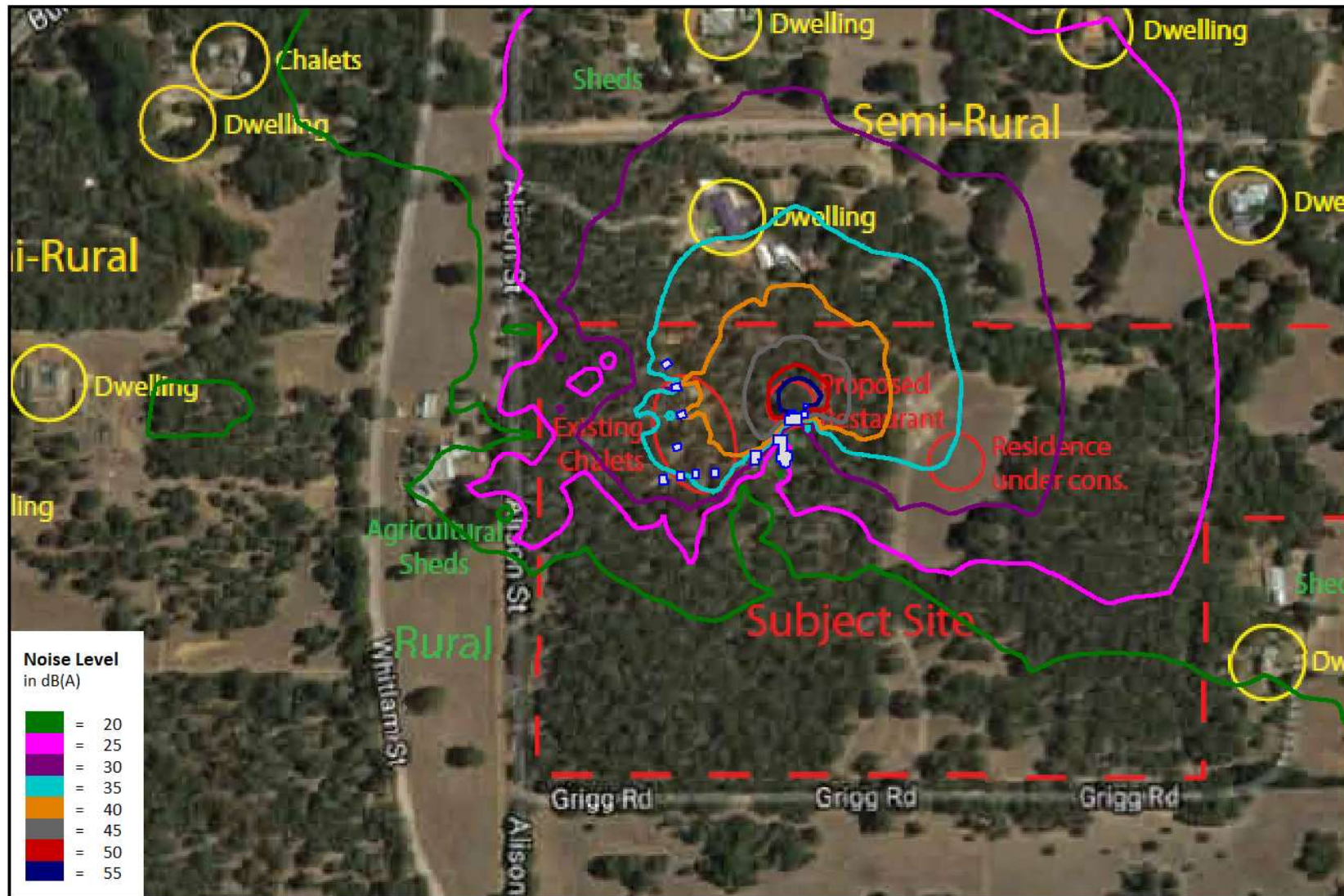


Figure 11: Worst-case noise level contours for scenario 4.