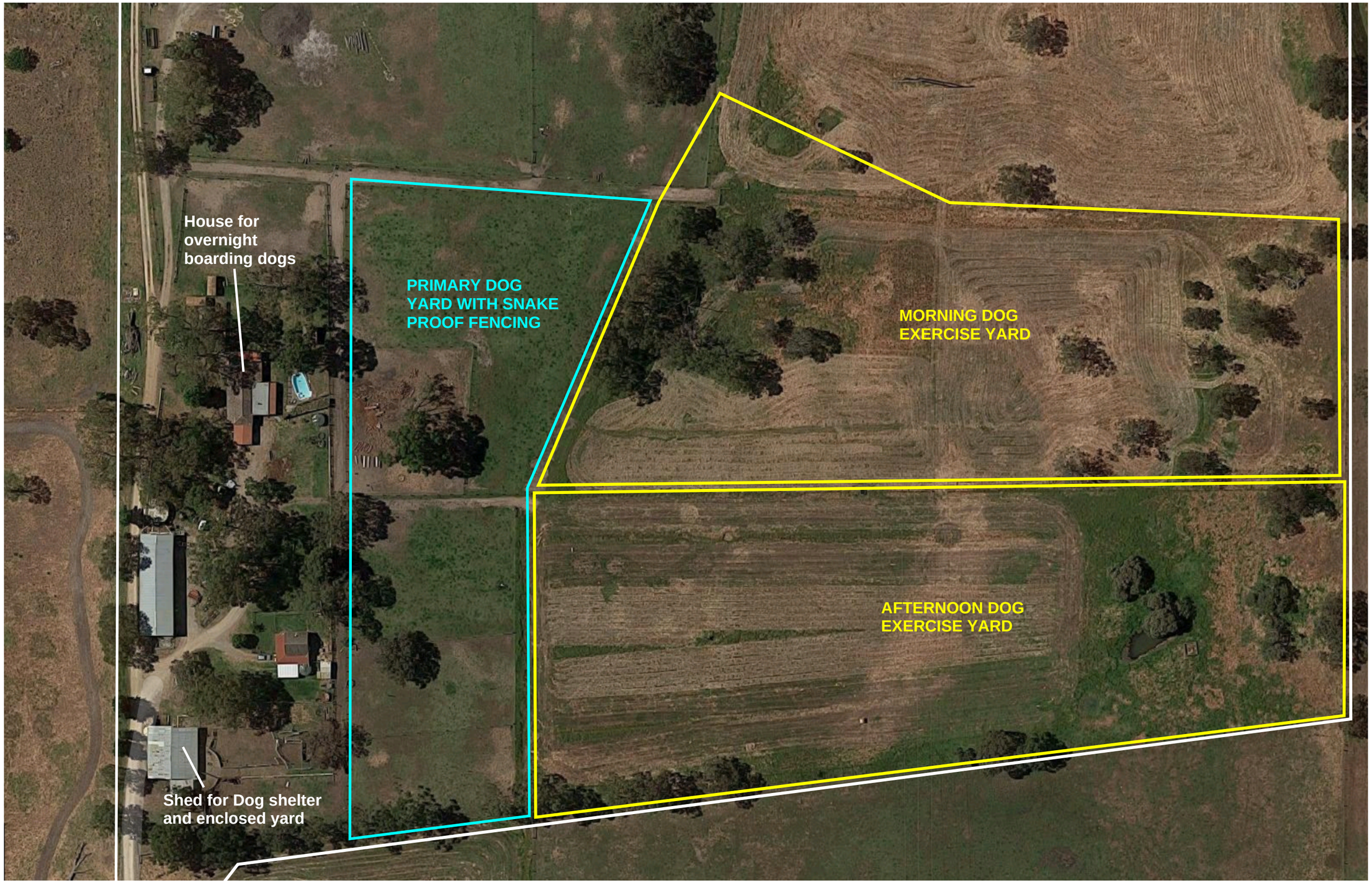

Issue	Date	Amendment
A	JULY 23	ISSUED FOR DEVELOPMENT APPROVAL

Planning Horizons
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PROPOSED INCREASED CAPACITY OF 'DOG KENNEL / DOG DAYCARE' AT LOT 2 (#302) LEIPOLD ROAD, OLDBURY

Title: **SITE PLAN**

NORTH

Job No.	Date	Scale (@ A3)
	JULY 23	1:500
Drawn	Drawing No.	Issue
	DA02	A

ACOUSTIC REPORT

FOR

DOGGY DAYS AND FARM STAYS

29 May 2023

AES-890317-R01-A-29052023

Acoustic Engineering Solutions
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DOCUMENT CONTROL

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Revision:	A
Date:	29 May 2023
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EXECUTIVE SUMMARY

Acoustic Engineering Solutions (AES) has been commissioned by Doggy Days and Farm Stays (DDFS) to prepare an acoustic report as a supporting document for the application of its extension from 15 dogs per day to 30 dogs per day. DDFS currently operates two days a week between 7am and 6pm with overnight boarding of ≤10 dogs, and proposes to operate 5 days a week excluding public holidays with overnight boarding of 15 dogs. This report presents an environmental noise assessment of the proposed DDFS extension. The aim of this assessment is to determine whether or not the proposed DDFS extension would comply with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

Site noise measurements were undertaken on Thursday 11th May 2023 to determine the sound power levels of dog barking and outdoor activities.

An acoustic model is created and four worst-case scenarios are modelled:

Scenario 1: All of the 30 dogs play the game of red ball chasing on Dam.
Scenario 2: All of the 30 dogs play the game of motorbike chasing in the primary dog yard.
Scenario 3: Eight (more than half) of 15 overnight boarding dogs bark simultaneously in the living area of the residential house.
Scenario 4: A car-door is closed in the customer's car-parking area.

Scenarios 1 and 2 represent two highest noise-generated day-time outdoor dog activities while scenario 3 is the worst-case evening/night-time dog activity.

Four closest residences are selected for the detail assessment of noise impacts. Noise levels are predicted for worst-case meteorological conditions, and then adjusted to account for their dominant characteristics according to the Regulations. The adjusted noise levels are assessed against the assigned noise levels set by the Regulations. The compliance assessment concludes that full compliance is achieved for the proposed DDFS extension.

TABLE OF CONTENTS

1.0 INTRODUCTION

Doggy Days and Farm Stays (DDFS) applies for its licence extension from 15 dogs per day to 30 dogs per day. An acoustic report is required to assess if the noise emissions from the proposed DDFS extension would comply with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

Acoustic Engineering Solutions (AES) has been commissioned by Doggy Days and Farm Stays to prepare the acoustic report. This acoustic report presents an environmental noise impact assessment of the proposed DDFS extension in accordance with the Regulations.

1.1 DOGGY DAYS AND FARM STAYS

Doggy Days and Farm Stays operates at 302 Leipold Road Oldbury. Figure 1 in APPENDIX A presents an aerial view of the DDFS site and surrounding area.

Currently DDFS cares 15 dogs for two days a week between 7am and 6pm with overnight boarding of ≤10 dogs. Some of the cared dogs are driven to the site by their owners while some are collected/dropped by a DDFS mini-bus from their homes.

DDFS proposes to care for 30 dogs between 7am and 6pm 5 days a week excluding public holidays with the maximum overnight boarding capacity of 15 dogs. DDFS will have 3 full-time staff. All of the dogs are trained when they are enrolled in DDFS. It will not be accepted if a dog does not meet the DDFS requirements/standards.

Figure 2 and Figure 3 in APPENDIX A present the site plan, indicating the primary dog play area and Magnesium Therapy Pool, and the residential house for dog overnight boarding. The residential house is the DDFS staff residential house. It is a single level building with double-brick walls and tile roof with an insulation layer above ceilings. During the evening and the night, the overnight boarding dogs will stay in the living room. The living room have two windows of 5mm clear glasses and two 35mm solidcore timber doors.

All dog play areas are fenced with steel-bar/mesh fences. A range of activities are on offer to the cared dogs including:

- Chasing frisbees, balls, motorbikes;
- Scenting Games;
- Treasure hunting;
- Lure Coursing;
- Magnesium Therapy Pool Swimming;
- Dam Swimming; and
- Sandpit digging.

Customer's car-parking area is in the south of the residential house.

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]		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
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	60 + Influencing factor
	1900 to 2200 hours all days	40 + Influencing factor	50 + Influencing factor	60 + 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

[1] Assigned 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.

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.

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 vehicle door closing still requires assessment, as this does not form part of the propulsion or braking systems.

2.3 INFLUENCING FACTOR

Four neighbouring residences surrounding the DDFS are selected for detail assessment of noise impacts, as shown in Figure 1 in APPENDIX A.

Influencing factor varies from residence to residence depending on the surrounding land use. Traffic flows on roads in the vicinity (<450m) of the selected receivers are insufficient for any of the roads to be classified as either the major or secondary roads. No commercial and industrial zones are presented in the vicinity (within 450m in radius) of the selected residences. Therefore, the influencing factors are zeros for all of the selected residences.

3.0 NOISE MEASUREMENTS

Site measurements were undertaken between 10am to 12pm on Thursday 11th May 2023, when it was calm sunny day with a temperature of approximately 22^0C.

Noise levels were recorded using a Nor139 Sound Level Meter (SLM). The SLM was calibrated using a SV33A Class 1 Sound Calibrator immediately before and after the measurements. No level difference was observed between the two calibrations.

3.1 SOUND POWER LEVELS

During the site measurements, 12 dogs and two staff were present. The sound power levels were measured under the following conditions:

- One dog was barking in isolation at a location far from the other dogs.
- Drone chasing (all of the 12 dogs).
- Treasure hunting (all of the 12 dogs).
- Red ball chasing on Dam (all of the 12 dogs).
- Dam swimming (all of the 12 dogs).

Table 3-1 presents the averaged sound power levels. For the above last 4 activities, 12 dogs were present but only some of them were barking simultaneously, and the number of simultaneous barking dogs varied. During the outdoor activities, dogs did not bark continuously. Table 3-1 shows that:

- Dog-baring noise is dominant at frequencies between 500Hz and 2KHz.
- The activity of red ball chasing on Dam generates highest noise.
- The activity of treasure hunting radiates the lowest noise.

Table 3-1: Measured sound power levels.

Names	Octave Frequency Band Sound Power Levels in dB(lin)									Overall
	32	63	125	250	500	1k	2k	4k	8k	dB(A)
One Dog Bark	63.9	63.8	61.3	66.2	100.3	96.8	89.6	68.6	64.4	**100.5**
Drone Chasing	73.0	77.8	70.4	72.2	87.6	98.5	92.8	77.8	69.3	**100.0**
Treasure Hunting	87.2	83.1	77.6	64.7	72.1	74.1	73.1	60.5	60.6	**78.1**
Red Ball Chasing	76.2	81.0	80.8	83.9	104.4	107.0	103.2	84.5	78.2	**109.6**
Dam Swimming	79.4	78.9	75.7	73.8	87.4	90.4	85.7	71.9	66.9	**92.7**

3.2 NOISE LEVELS

Noise was monitored at two locations, as shown in Figure 1 and Figure 2 in APPENDIX A:

P1: at the north side of Leipold Road; and
P2: at a gate of fenced primary dog yard.

At P1 the monitoring time was 15 minutes when the following activities of all 12 dogs were undertaken:

- Motorbike chasing;
- Red ball chasing on Dam;
- Treasure hunting and
- Dam swimming.

At P2 the monitoring time was 5 minutes when all of the 12 dogs chased two motorbikes in the primary dog yard.

During the monitoring, the SLM microphone was 1.5m above the ground and pointing to the dog activity area.

During the monitoring at P1 it was noticed that:

- Dog barking noise was inaudible.
- Aircraft noise was dominant for most time.
- Remote road traffic noise was audible.
- Local traffic was present intermittently.
- Bird noise was present sometimes.

During the monitoring at P2, the dog barking noise was dominant.

Table 3-2 summarises the logged A-weighted noise levels L_{Aeq}, L_{A1}, L_{A10} and L_{A90} at the two monitoring locations. At P1, dog barking noise was inaudible and the measured noise levels represent the day-time background levels in the area.

Table 3-2: Logged noise levels in dB(A).

Monitoring Locations	Monitoring Periods	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}
P1	11:50am – 12:05pm	48.6	58.9	51.7	31.7
P2	11:04am – 10:09am	65.7	80.2	60.5	42.2

4.0 NOISE MODELLING

4.1 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 DDFS site.

The acoustic model does not include noise emissions from any sources other than from the DDFS site. Therefore, noise emissions from aircraft, road traffic, birds etc are excluded from the modelling.

4.2 INPUT DATA

4.2.1 Topography

The ground contours were obtained from the Landgate. Averaged ground absorption of 0.8 is assumed.

The building and sheds on the subject site are digitised to the acoustic model.

4.2.2 Noise Sensitive Premises

Four neighbouring residences located within 1km from the subject site are selected for the detail assessment of noise impacts, as shown in Figure 1 in APPENDIX A. All of them are ground receivers at 1.5m above the ground.

4.2.3 Sound Power Levels

The measured sound power levels are shown in Table 3-1 while the sound power level L_{Amax} of a car-door closing is obtained from the AES database of 88 dB(A).

The measured sound power levels are for 12 dogs. The sound power levels for proposed 30 dogs are assumed to be increased proportionally to the rate of 30/12.

4.3 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

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

model. For this study the "default" worst-case meteorological conditions[4] are assumed, as shown in Table 4-1. Since the evening and the night have the same worst-case meteorological conditions, their predicted noise levels will be the same if the noise sources are the same.

Table 4-1: Worst-case meteorological conditions.

Time of day	Temperature Celsius	Relative Humidity	Wind speed	Pasquill Stability Category
Day (0700 --- 1900)	20^0 Celsius	50%	4 m/s	E
Evening (1900 --- 2200)	15^0 Celsius	50%	3 m/s	F
Night (2200 --- 0700)	15^0 Celsius	50%	3 m/s	F

4.4 NOISE MODELLING SCENARIOS

DDFS advised:

- It is proposed to operate between 7am and 6pm on Monday to Friday excluding public holidays.
- DDFS will have 3 full-time staff.
- Maximum number of 30 dogs is proposed with overnight boarding of 15 dogs.
- All of the dogs are trained when they are enrolled in DDFS. It is not accepted if a dog does not meet the DDFS requirements/standards.
- Some of the cared dogs are driven to the site by their owners while some are collected/dropped by a DDFS mini-bus from/to their homes.
- The daytime normal outdoor dog play area is in the front of the residential house.
- During the day, dogs take one-hour (per day) outdoor activities/exercises (half hour in the morning and half hour in the afternoon) in the primary dog yard. The outdoor activities/exercises include:
  - Chasing frisbees, balls, motorbikes;
  - Scenting Games;
  - Treasure hunting;
  - Lure Coursing;
  - Magnesium Therapy Pool Swimming;
  - Dam Swimming; and
  - Sandpit digging.

  Not all of the above activities occur within 30 minutes. Only two to three of the above occurs for each of the outdoor activities/exercises.

[4] Guideline: Assessment of Environmental Noise Emissions, Draft for Consultation, May 2021.

- During the day, all of the outdoor activities are attended by the DDFS staff to minimise dog barks.
- During the evening and the night, the overnight boarding dogs will stay in the living room of the staff residential house. The dogs are attended for all time to ensure that the dog barking is minimised during the evening and the night.
- Customer's car-parking area is located in the south of the residential house.
- No regular deliveries visit the DDFS site.

From the measured results, the game of red ball chasing on Dam generates the highest noises. For the worst-case operations, the following four worst-case scenarios are modelled:

Scenario 1: All of the 30 dogs play the game of red ball chasing on Dam.

Scenario 2: All of the 30 dogs play the game of motorbike chasing in the primary dog yard.

Scenario 3: Eight (more than 50%) of 15 overnight boarding dogs bark simultaneously in the living area of the residential house.

Scenario 4: A car-door is closed in the customer's car-parking area.

Table 3-1 shows that different activities generate different levels of noise emissions. Scenarios 1 and 2 represent two highest noise-generated day-time dog outdoor activities while scenario 3 is the worst-case evening/night-time dog activity.

As DDFS advised in the above, the total time of scenarios 1 or 2 should be less than 10% of any 4-hour period.

The overnight boarding dogs live with the DDFS staffs within the same house. The DDFS staffs advised that the dog barks rarely during the evening and night, and if it barks the total barking time is definitely less than 10% of any 4-hour period.

Scenario 4 represents short events of a car-door closing. The car-door close 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.

5.0 MODELLING RESULTS

5.1 MODEL CALIBRATION

The acoustic model is calibrated using the logged noise levels at P2. The predicted noise level is compared with the measured noise level L_{Aeq}.

5.2 POINT MODELLING RESULTS

Table 5-1 presents the predicted worst-case A-weighted overall noise levels. The predicted noise levels for scenario 3 are the evening/night-time noise levels in dB(A) while the others are the day-time noise levels. For scenario 4, the predicted noise levels are in L_{AMax} levels. The predicted noise levels for scenario 3 are below 6 dB(A). The highest worst-case noise level is predicted at R2 for scenario 1 but R1 for scenarios 2 and 4.

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

Receivers	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Day	Day	Evening/Night	Day
R1	36.2	44.6	0.0	23.8
R2	44.5	42.5	0.0	8.6
R3	41.3	40.0	4.0	15.5
R4	42.3	41.6	5.6	17.2

5.3 NOISE CONTOURS

Figure 4 to Figure 7 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.

6.0 COMPLIANCE ASSESSMENT

6.1 ADJUSTED NOISE LEVELS

The noises from dog barks and car-door close may exhibit implusiveness characteristics when being measured at close locations. According to Table 2-2, the predicted noise levels shown in Table 5-1 should be adjusted by 10dB if the noise received exhibits impulsiveness.

As shown in section 3.2, the day-time background noise level L_{Aeq} in the area is about 48 dB(A). The night-time background noise levels in the area are expected to be above 20 dB(A). For scenarios 3 and 4, the predicted day-time noise levels are much below background noise levels and will be inaudible, and their implusiveness characteristics will be masked. Therefore, no implusiveness adjustment applies to the predicted noise levels for scenarios 3 and 4.

Table 6-1 presents the adjusted worst-case A-weighted noise levels. The adjusted levels are expressed in ***Italic Bold***.

Table 6-1: Adjusted worst-case noise levels in dB(A).

Receivers	Adjusted Noise Levels in dB(A)			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
R1	***46.2***	***54.6***	0.0	23.8
R2	***54.5***	***52.5***	0.0	8.6
R3	***51.3***	***50.0***	4.0	15.5
R4	***52.3***	***51.6***	5.6	17.2

6.2 COMPLIANCE ASSESSMENT

As mentioned in section 4.4, scenarios 1 to 3 occur for less than 10% of any 4-hour period. Therefore, the assigned noise levels L_{A1} apply to scenarios 1 to 3. Car door closing is a short event. The noise from a car door closing is predicted in L_{Amax} level and the assigned noise levels L_{Amax} apply to scenario 4.

DDFS is open from 7am to 6pm for Monday to Friday excluding public holidays. Therefore, no assessment is required for Sundays and public holidays.

Table 2-1 shows that the night-time assigned noise level L_{A1} is 5 dB lower than the evening-time one while Table 5-1 shows that the predicted evening and night-time noise levels are the same. Therefore, the night-time compliance guarantees the evening-time compliance.

Table 6-2 presents a compliance assessment. It is shown that the adjusted noise levels are below the assigned noise levels at all receivers for all scenarios. This demonstrates that full compliance is achieved for the proposed DDFS extension.

Table 6-2: Compliance assessment.

Receivers	Day-time Limits L_{A1} in dB(A)	Adjusted in dB(A)		Night-time Limits L_{A1} in dB(A)	Adjusted in dB(A)	Limits L_{Amax} in dB(A)	L_{Amax} dB(A)
		S1	S2		S3		S4
R1	55	46.2	54.6	45	0.0	65	23.8
R2	55	54.5	52.5	45	0.0	65	8.6
R3	55	51.3	50.0	45	4.0	65	15.5
R4	55	52.3	51.6	45	5.6	65	17.2

APPENDIX A AERIAL VIEW

Figure 1: Aerial view of subject site and surrounding area.

Figure 2: Site view.

Figure 3: Residential house and dog swimming pool.

APPENDIX B NOISE CONTOURS

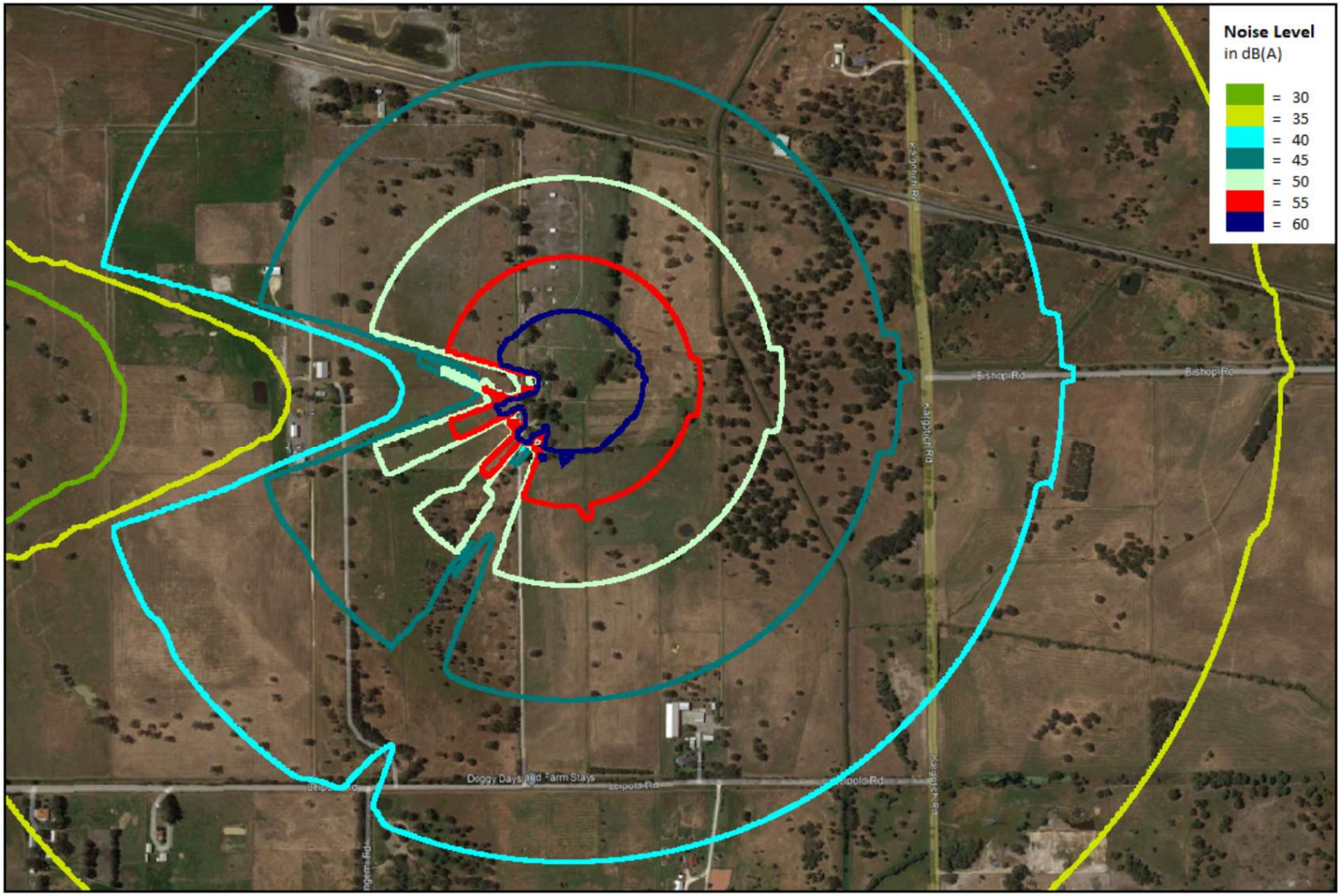

Figure 4: Worst-case day-time noise contours for scenario 1.

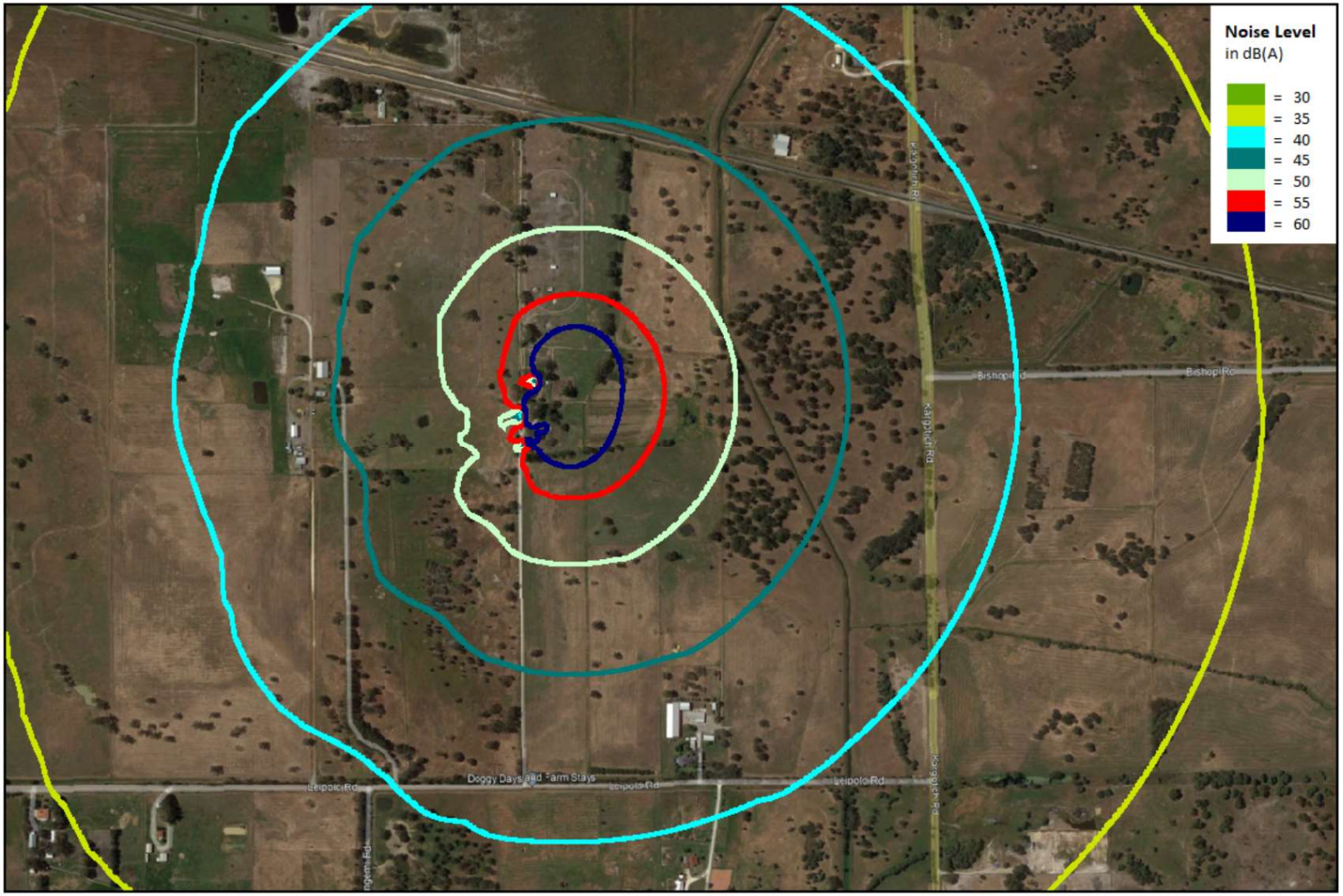

Figure 5: Worst-case day-time noise contours for scenario 2.

Figure 6: Worst-case evening/night-time noise contours for scenario 3.

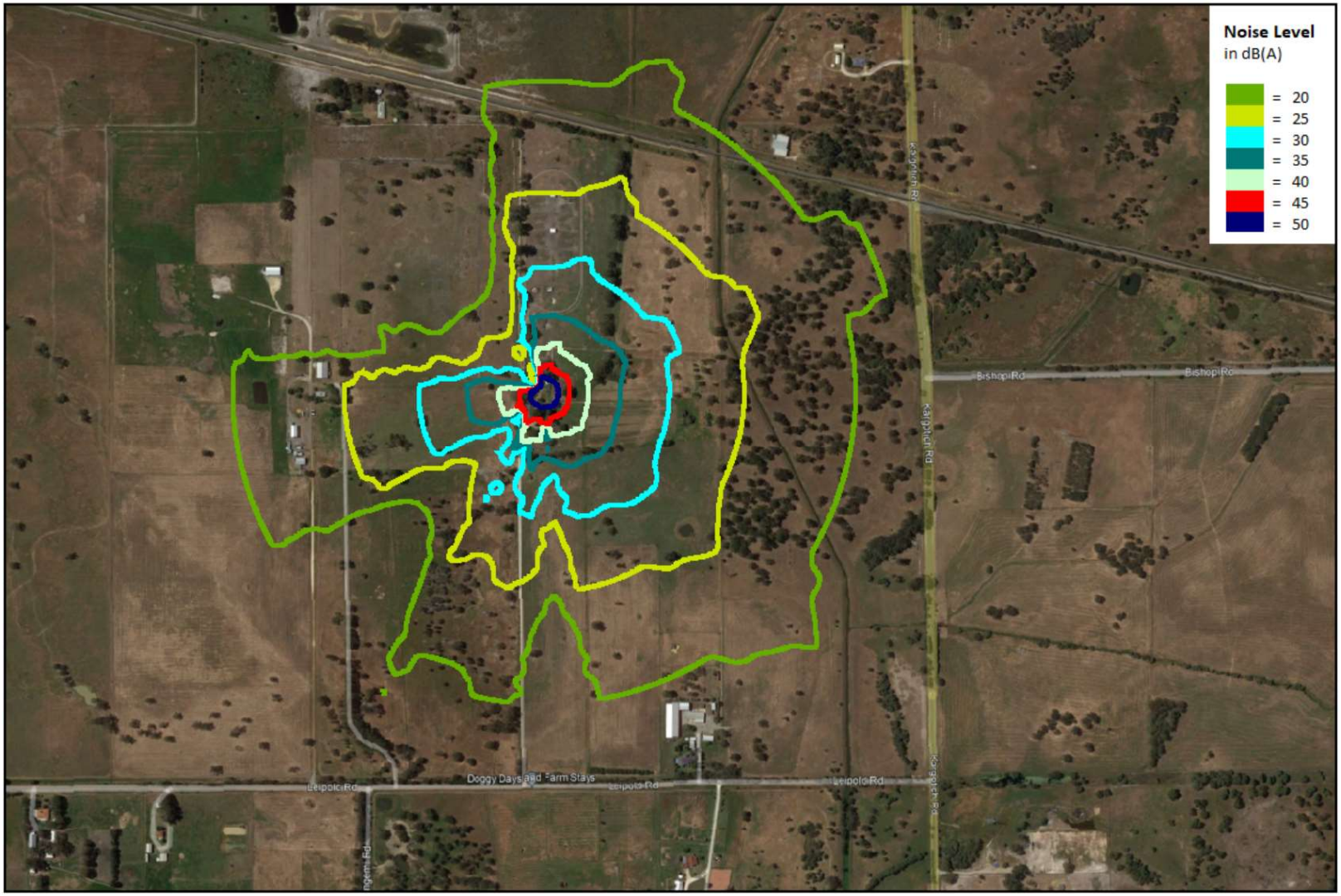

Figure 7: Worst-case day-time noise level L_{AMax} contours for scenario 4.