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Environmental noise assessment associated with the proposed change of use of land to keep 16 dogs at Irby Villa, Millgate, Whaplode, PE12 6RT

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CONTENTS Page No.

1 OBJECTIVES 3

2 CONCLUSIONS 3

3 RECOMMENDATIONS 4

4 BACKGROUND 4

5 POLICY, GUIDANCE AND STANDARDS 7

6 NOISE ASSESSMENT 9

7 DISCUSSIONS 13

REFERENCES 14

Appendix 1 – Glossary of terms 15

Appendix 2 – Noise instrumentation 16

Appendix 3 – Results of long-term noise monitoring at Monitoring Location A 17

Appendix 4 – Predicted Specific Noise Contours With Dogs Barking (1.5m above the ground) 18

Appendix 5 – Acoustic Barrier Minimum Specification 19

1 OBJECTIVES

1.1 To carry out an environmental *noise impact assessment associated with the proposed change of use of land to keep 16 dogs at Irby Villa, Millgate, Whaplode, PE12 6RT, in accordance with the South Holland District Council local plan supplementary guidance on the location of premises for the boarding and breeding of dogs and other animals (Reference 1) and other relevant standards and guidance.

1.2 To recommend solutions to any problems identified by the assessment.

2 CONCLUSIONS

2.1 Based on the unattended daytime noise monitoring on site at Monitoring Location A between 30th March – 4th April 2024:

- The typical background noise level during the daytime period (between 07:00 – 19:00 hours) is estimated as $L_{A90,12hours}$ 35 dB(A), which was the arithmetic average of the measured background noise levels ($L_{A90,15mins}$) measured on site between (07:00 – 19:00 hours) on the quietest day assessed (30th March 2024).

2.2 Using computer noise model predictions and based on the anticipated specific noise levels associated with dogs barking within a development housing 16 dogs (as specified within the South Holland District Council supplementary guidance – Reference 1), specific noise emissions from the use of the site for keeping dogs is shown to not exceed the typical background noise level specified in Section 2.1 ($L_{A90,12hours}$ of 35 dB(A)) when assessed in the outdoor amenity areas of the nearest noise sensitive receptors. This is deemed to be acceptable in accordance with the South Holland District Council supplementary guidance.

2.3 Acceptable internal and external noise levels in accordance with the WHO Guidelines (Reference 4) and British Standard 8233 (Reference 5) are shown to be achievable at the nearest residential receptors (even under circumstances where residents have windows partially open). With this in mind and provided the recommendations within this report are implemented this is deemed to be an acceptable noise situation.

*** See Appendix 1 for a Glossary of Terms**

3 RECOMMENDATIONS

3.1 In order to minimise the impact of noise emissions from keeping 16 dogs at Irby Villa the following recommendations should be adhered to:

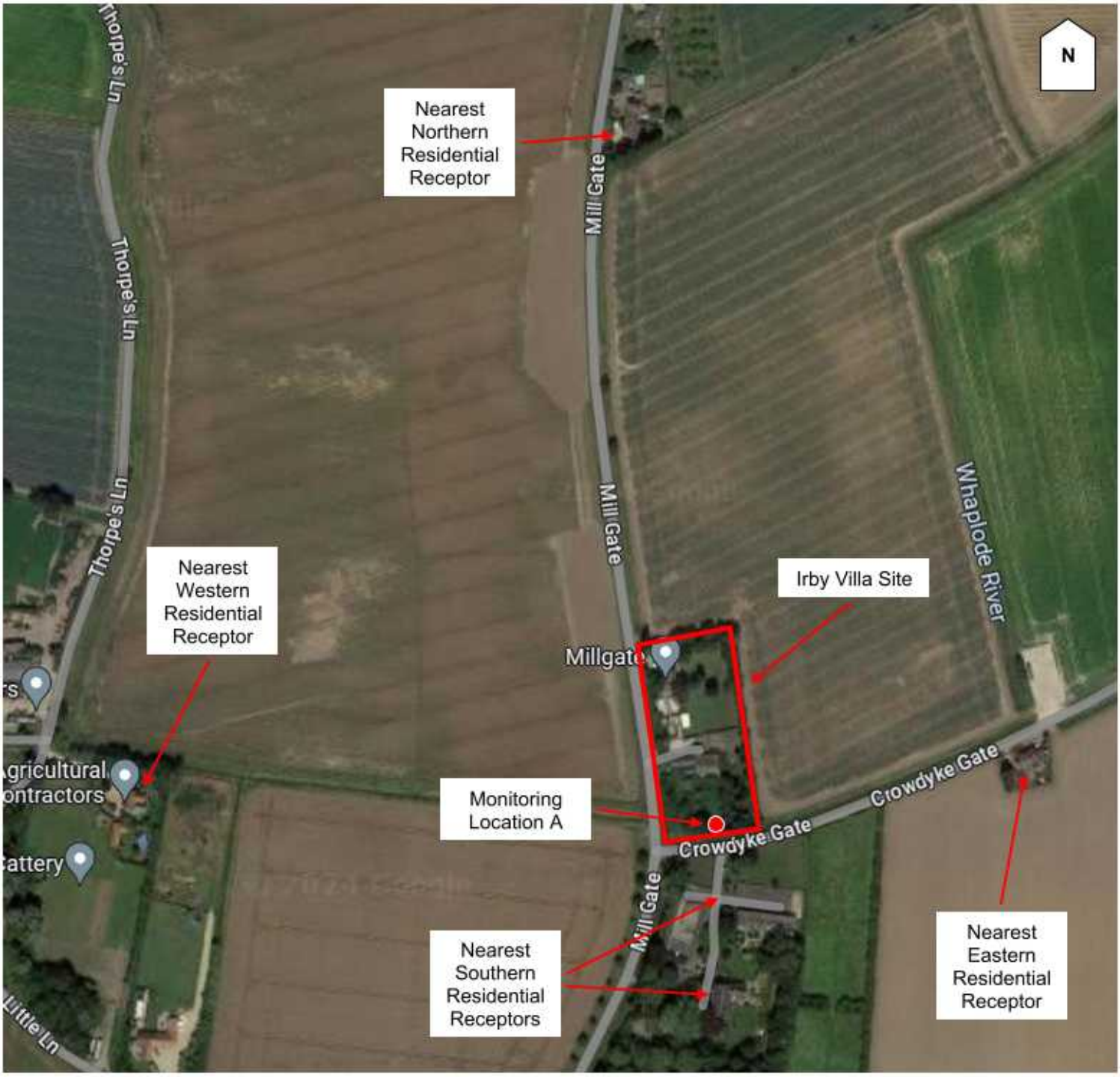
- Any dogs kept on site should be exercised and fed during the daytime only (07:00 – 19:00 hours). Outside of these periods the dogs should be kept inside the outbuilding that they are currently housed in during the overnight period.
- Any doors / openings serving the outbuilding the dogs are housed in overnight should be kept closed during the night-time period.
- Acoustic barriers of between 1.8 – 2.4m in height should be installed at strategic locations surrounding the outdoor exercise yard and also the outdoor runs on site. The location of the proposed barriers is shown in Drawing 4.2 and a minimum barrier specification is shown in Appendix 5.

4 BACKGROUND

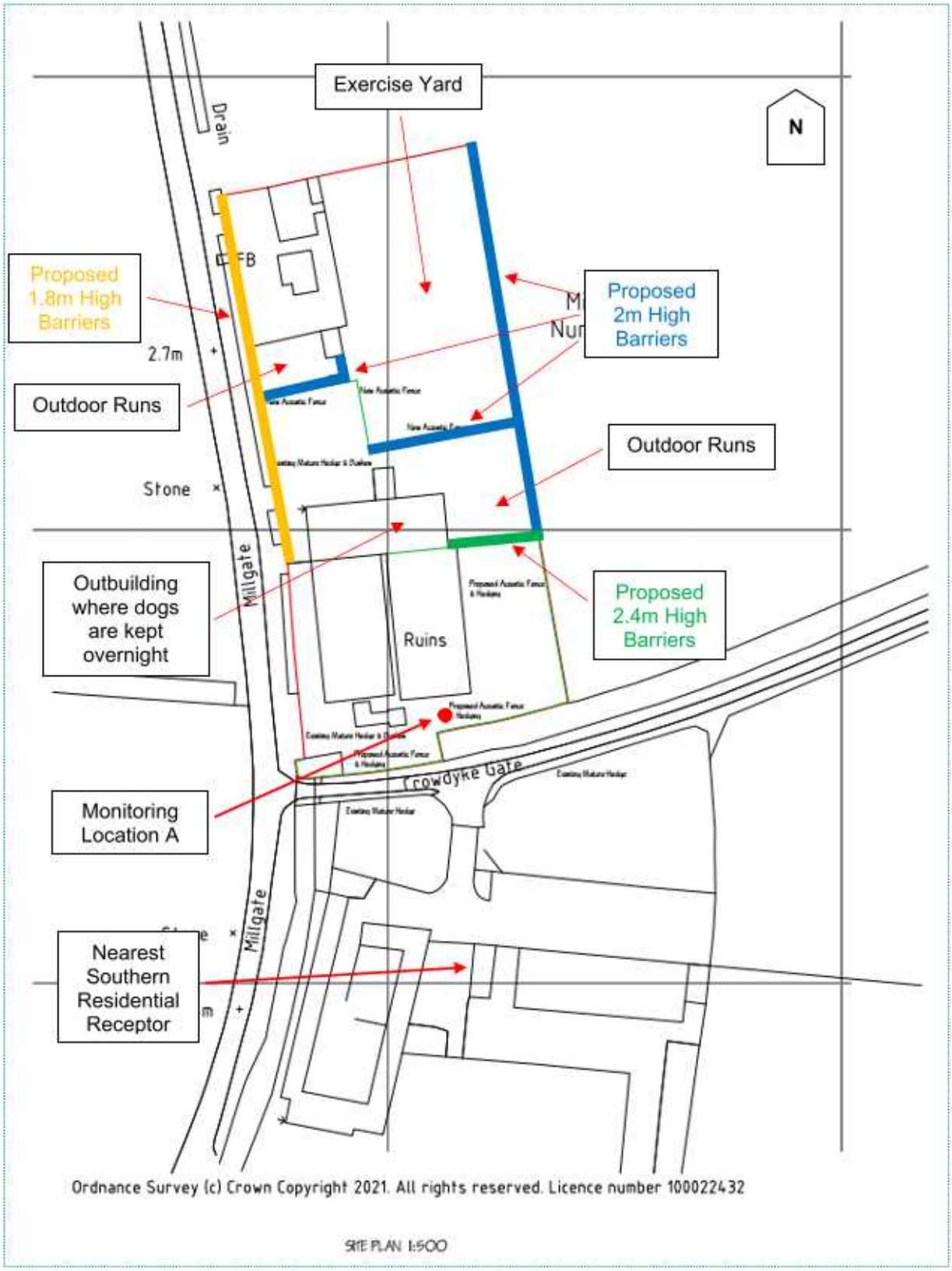
4.1 The occupiers of Irby Villa have applied for planning permission for the change of use of land to keep 16 dogs at Irby Villa, Millgate, Whaplode, PE12 6RT. The local planning authority have requested that an environmental noise assessment be carried out to determine if the proposed use of the site will result in acceptable levels of noise.

The location of the proposed site at Irby Villa, the location of the nearest residential receptors surrounding the site and the location of the long-term noise monitoring location used during the survey is shown in Drawing 4.1, whilst the location of the exercise yard and outdoor runs are shown in Drawing 4.2. Also shown in Drawing 4.2 are the location of the proposed acoustic barriers that have been recommended in Section 3.1.

4.2 Acoustic Associates (Peterborough) were instructed by the applicant to carry out an environmental noise assessment to assess the environmental noise impact of the proposed development.



Drawing 4.1 – Aerial view of Irby Villa and the nearest residential receptors



Drawing 4.2 – Site layout and location of proposed acoustic barriers

5 POLICY, GUIDANCE AND STANDARDS

5.1 South Holland District Council – Supplementary Planning Guidance: Location of Premises for the Boarding and Breeding of Dogs and Other Animals (Reference 1)

The South Holland District Council (SHDC) guidance deals with the issue of noise impact from animal boarding and breeding premises and provides a means of assessing the suitability of new proposals for boarding and breeding premises of this nature.

Based on assumptions relating to the number of dogs on site, noise emissions from facilities of this nature can be estimated.

The guidance states that in general a noise is liable to provoke complaints whenever it exceeds the background noise by a certain margin or when it attains a certain absolute level. Noise levels at or below the existing background noise level are unlikely to give rise to complaints.

Based on the above, the assessment objective shall be that the specific noise levels from the Irby Villa site do not exceed the background noise level when assessed at the nearest noise sensitive receptors surrounding the site.

The guidance covers the daytime period between 07:00 – 19:00 hours. It is assumed by the guidance that outside these periods dogs will be kept in insulated kennels.

5.2 World Health Organisation (WHO) Guidance (Reference 4).

The WHO has published guidelines for community noise, as shown in Table 1. This WHO document gives guidance for the levels of noise both inside and outside of dwellings.

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time Base (hours)	L_{Amax}, fast (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

Note: The 'daytime' and 'night-time' periods are generally referred to as 0700 to 2300 and 2300 to 0700 hours respectively.

Table 1 - World Health Organisation Noise Guidance Levels

5.3 British Standard BS 8233:2014 (Reference 5)

5.3.1 BS 8233 also gives guidance on indoor ambient noise levels, as shown in Table 2.

Activity	Location	Noise criteria	
		07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Table 2 - BS 8233: 2014 guidance indoor ambient noise levels for dwellings.

5.3.2 With respect to external noise in amenity areas, BS 8233 states the following:

For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

6 NOISE ASSESSMENT

6.1 Background Noise Monitoring

Long-term unattended noise monitoring equipment was set up at Monitoring Location A (see Drawings 4.1 and 4.2), towards the southern boundary of the site at Irby Villa. Noise was continuously monitored throughout the period from 09:50 hours on Saturday 30th March 2024 to 15:50 hours on Thursday 4th April 2024. The noise monitoring location was in free-field conditions at a height of approximately 1.5 metres above the ground. Weather conditions during the monitoring periods were mostly dry (some potential rain showers during the 6-day survey), temperatures ranged between 6°C to 14°C, with wind speeds below 5 m/s throughout the monitoring period (with the exception of the daytime period of Wednesday 3rd April 20024 when wind speeds are likely to have exceeded 5 m/s). Appendix 2 gives details of the noise instrumentation used. The long-term noise monitoring results from Location A are shown in graphical form in Appendix 3. Drawings 4.1 and 4.2 show the site layout and noise monitoring location.

6.2 Estimation of Daytime Background Noise Levels

The full results of the unattended monitoring at Monitoring Location A are shown in graphical form in Appendix 3. This shows the noise levels logged at 15-minute intervals in terms of average noise ($L_{Aeq,15minutes}$), maximum noise ($L_{Amax,15minutes}$) and background noise levels ($L_{A90,15minutes}$).

The typical background noise level during the daytime period (between 07:00 – 19:00 hours) is estimated as $L_{A90,12hours}$ **35 dB(A)**, which was the arithmetic average of the measured background noise levels ($L_{A90,15mins}$) measured on site between (07:00 – 19:00 hours) on the quietest day assessed (30th March 2024). This value has been used to represent the typical background noise level used as part of the assessment in accordance with the South Holland District Council local plan supplementary guidance (Reference 1).

6.3 Specific Noise Levels

During the site visits on 30th March and 4th April 2024 no periods of consistent, prolonged barking were witnessed, even during the dogs feeding time when only the occasional, isolated bark was heard.

The South Holland District Council local plan supplementary guidance states that when undertaken predictions a sound pressure level (L_{pA}) for a single adult dog barking can be assumed to be 65.6 dB(A) at a distance of 10m. This would correspond to a sound power level (L_{WA}) of 93.6 dB(A) for a single dog barking. The guidance also states that the number of dogs barking should be assumed to be 60% of the total number of dogs kept on site. As 16 dogs are proposed to be kept on site a total of 10 dogs have therefore been assumed to be barking

during any given period of time. For the purposes of the predictions 4 x dogs have been assumed to be barking in the exercise yard area and 3 x dogs have been assumed to be barking in each of the two areas on site where outdoor runs are located (see Drawing 4.2). The total sound power level (L_{WA}) for dogs barking on site has been assumed to be 103.6 dB(A). This sound power level has been input into a computer noise model of the site as area noise sources across the exercise yard and outdoor run areas. Specific noise levels associated with dogs barking could then be predicted at the nearest noise sensitive receptors surrounding the site.

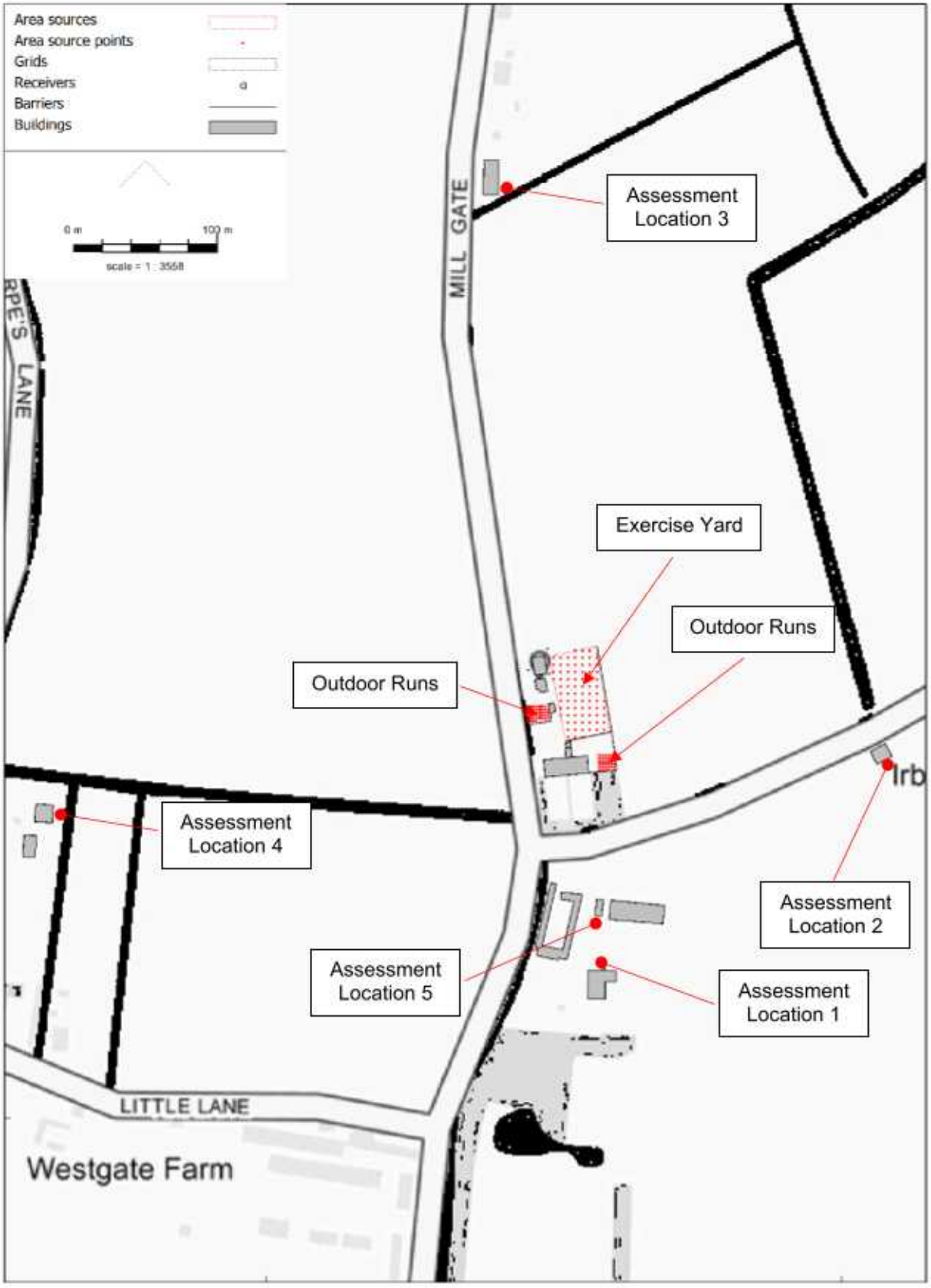
6.4 Computer Predictive Noise Model

A computer noise model of the site (see Drawing 6.1) was generated using proprietary iNoise software (Reference 2) which calculates noise emissions in accordance with ISO 9613-2 (Reference 3). Noise sources were then input into the computer noise model to represent dogs barking at the locations of the exercise yard and the two areas where outdoor runs are located on site. The computer noise model was then used to assess daytime noise emissions associated with dogs barking on the Irby Villa site.

For the purposes of these predictions the proposed acoustic barriers recommended within Section 3.1 of this report and shown in Drawing 4.2 have been assumed to be installed.

The computer noise model could then be used to predict daytime specific noise emissions at Assessment Locations 1-5 (see Drawing 6.1) within the outdoor amenity areas of the nearest residential receptors, approximately 3.5m from the rear of the building façades.

Daytime predictive noise contours are also shown at a height of 1.5m above the ground in Appendix 4.



Drawing 6.1 – Computer Noise Model Showing Location Of Noise Sources and Assessment Locations

6.5 Predicted Specific Noise Levels

Specific noise levels associated with dogs barking on the Irby Villa site have been predicted at Assessment Locations 1 – 5 and are shown below in Table 3. The daytime specific noise levels have been predicted at ground floor height (1.5m above the ground). Predictive noise contours at a height of 1.5m above the ground are shown in Appendix 4.

Assessment Location (see Drawing 6.1)	Predicted Specific Noise Level During The Daytime Period ($L_{Aeq,12hours}$) dB(A)
Assessment Location 1	35
Assessment Location 2	35
Assessment Location 3	35
Assessment Location 4	34
Assessment Location 5	31

Table 3 – Predicted Specific Daytime Noise Levels ($L_{Aeq,12hours}$)

6.6 South Holland District Council Local Plan Supplementary Guidance Assessment

With the proposed acoustic barriers (see recommendations section) installed it can be seen in Table 3 that the highest specific noise level measured within the outdoor amenity areas of the nearest residential receptors is 35 dB(A) ($L_{Aeq,12hours}$). This value is equal to the arithmetic average of the measured background noise levels ($L_{A90,15mins}$) measured on site between (07:00 – 19:00 hours) on the quietest day assessed (30th March 2024) at Monitoring Location A. This achieves the guidance levels in the South Holland District Council supplementary guidance whereby noise levels at or below the existing background noise level are unlikely to give rise to complaints. This is deemed to be an acceptable noise situation.

6.7 Assessment Of Internal Noise Levels At The Nearest Residential Receptor

The WHO Guidelines and BS 8233 offer guidance levels for acceptable noise levels inside living rooms and bedrooms during the daytime period of $L_{Aeq,16hour}$ <35 dB(A) (see criteria given in sections 5.2 and 5.3.1).

Internal levels are typically around 15 dB less than external façade levels with a partially open window. The predicted specific noise level at Assessment Location 5 (Annexed residential accommodation for Irby Hall - see Drawing 6.1) associated with dogs barking are approximately 42 dB(A) ($L_{Aeq,12hours}$) when assessed at the worst affected northern façade at bedroom window height (4.5m above the ground). Predicted Internal specific noise levels within the nearest residential receptor with a partially open window would therefore be approximately 27 dB(A)

dB(A) which achieves the criteria specified in the WHO and BS 8233 guidance. This is deemed to be an acceptable noise situation.

6.8 Assessment Of Outdoor Amenity Area Noise Levels

The WHO Guidelines offer guidance levels for acceptable daytime noise levels within outdoor amenity areas of $L_{Aeq,16hour}$ <50 dB(A) (see criteria given in sections 5.2). It can be seen in Appendix 4 that predicted specific noise levels within the outdoor amenity areas of the nearest residential receptors when dogs are barking are well below the WHO guidance criteria. This is deemed to be an acceptable noise situation.

7 DISCUSSIONS

7.1 Uncertainties

- Background noise monitoring was undertaken over a number of full days which is a reasonable sample length which reduces the uncertainties relating to the background noise levels assumed as part of the assessment.
- Specific noise emissions associated with dogs barking are based upon the guidance levels stated within the South Holland District Council supplementary guidance (Reference 1). Based on observations during the site visits on 30th March and 4th April 2024 (when very little barking was witnessed), it is likely that actual noise emissions from site could potentially be lower than predicted.
- Computer predictions to ISO 9613-2 carry an uncertainty of +/- 3 dB.

REFERENCES

1. *South Holland District Council - South Holland District Local Plan - Supplementary Planning Guidance*
   Location of premises for the boarding and breeding of dogs and other animals
   Noise Issues
   Adopted: December 1999
2. *DGMR Software. iNoise V2024 Enterprise*
3. *ISO 9613-2 Acoustics of sound during propagation outdoors, Part 2: General method of calculation;* ISO, 1996.
4. *World Health Organisation Guidance, Guidelines for Community Noise;* WHO, 1999.
5. *British Standard BS 8233, Guidance on sound insulation and noise reduction for buildings;* BSI, 2014.

Appendix 1 – Glossary of terms

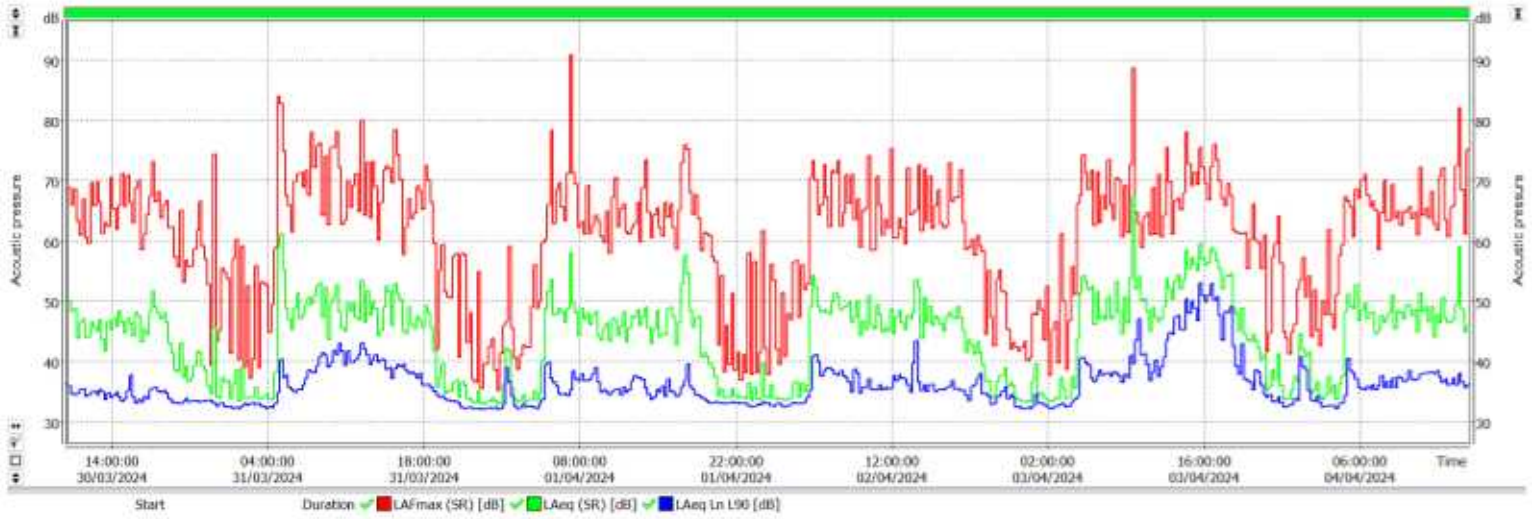
Sound Pressure	The variation of ambient pressure that is detected by the ear as sound.
Noise	Unwanted sound
deciBel (dB)	Ten times the logarithm of the square of the ratio of the Sound Pressure to a reference pressure (20 micro-Pascal's).
Sound Pressure Level (L_p)	The decibel version of the Sound Pressure.
A-Weighting	A frequency weighting which simulates the response of the ear. An A-Weighted Sound Pressure Level is denoted by L_{pA} and has units of dB(A)
$L_{Aeq,T}$	The value of the A-weighted sound pressure level, in decibels [dB(A)], of a continuous steady sound that within a specified time interval (T), for example 16 hours, has the same mean-square sound pressure as a sound that varies with time. Therefore, the average over a 16 hour period would be denoted as $L_{Aeq,16h}$
$L_{Amax,T}$	The maximum A-Weighted sound pressure level that was encountered during the measurement period.
$L_{A90,T}$	The A-Weighted sound pressure level that is exceeded for 90% of the time (T). This is usually used a measure of background noise.
Free Field	Where noise can propagate freely without any reflections from buildings etc.
Octave Band	A band of frequencies the upper limit of which is twice the lower limit. They are known by their centre frequency, e.g., 63, 125, 250, 500, 1000, 2000
Ambient Noise	Total sound in a given situation at a given time.
Residual Noise	The ambient noise remaining at a given position in a given situation when the specific noise is suppressed to a degree such that it does not contribute to the ambient noise.
Specific Noise Level	The dB $L_{Aeq,Tr}$ of the noise sources being assessed at a site.
Sound Power Level (L_{WA})	The noise level from the source in terms of sound power, in dB(A).
NPSE Critera	
NOEL	No Observed Effect Level
LOAEL	Lowest Observed Adverse Effect Level
SOAEL	Significant Observed Adverse Effect Level

Appendix 2 – Noise instrumentation

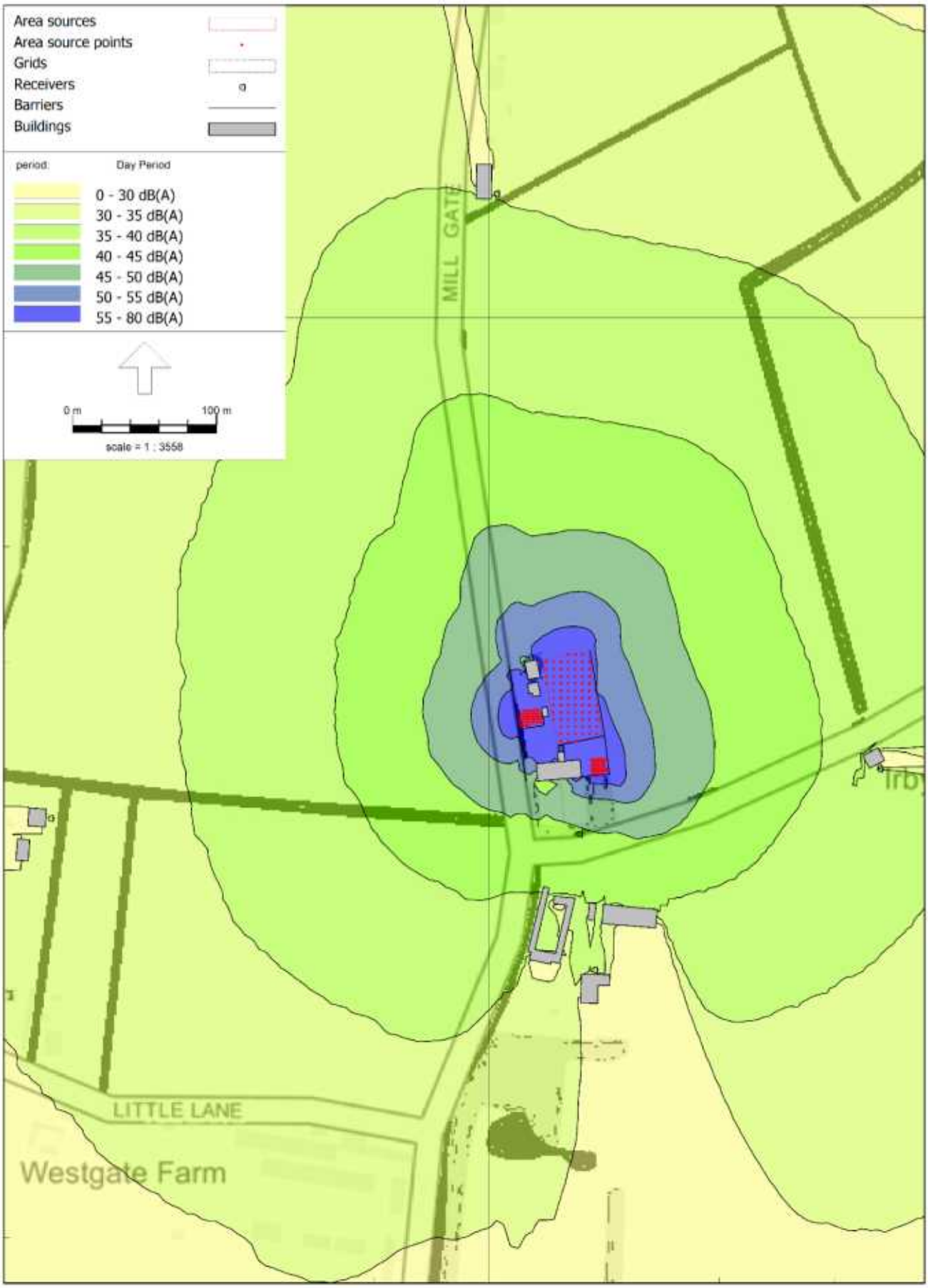
Type	Manufacturer	Description	Serial Number	Last Calibration Date	Calibration Certificate No.
Svan 971	Svantek	Sound level meter	28229	13/03/2023	1141321
GA 607	Castle	Sound level calibrator	043186	22/02/2024	1158111

The calibration of the instrumentation was checked at the start and end of the tests and there was no significant drift.

Appendix 3 – Results of long-term noise monitoring at Monitoring Location A



Appendix 4 – Predicted Specific Noise Contours With Dogs Barking (1.5m above the ground)



Appendix 5 – Acoustic Barrier Minimum Specification

Acoustic barrier specification

Any acoustic barrier should comprise of an impervious material, e.g. close-boarded timber and have a mass per unit area of at least 10 kg/m^2.

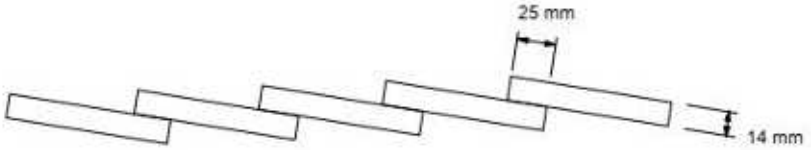
Any material can be used to construct the acoustic barrier, with a minimum surface density of 10 kg/m^2. This will give noise attenuation up to 20 dB.

It is advised that the minimum thickness of a wooden fence is at least 14mm and is overlapped as shown below.

Suitable Wooden Fence Configurations:



Plan Views



Note: All gaps should be sealed, including the area between the ground and bottom of the barrier.