



Measurement of Environmental Noise

Report Reference Number: 11554-1

For:

Rhian Williams

Project/Site Address

Agility Field, Caia Farm, Ryecroft Meadow, Old Wrexham Road, Wrexham, Wrexham County, LL12 8UA

Prepared by

John Ashe

Test Date

10th February 2021

Report Date

18th February 2021

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Measurement Survey
Undertaken By

Richard Stockdale



Report Completed By

John Ashe



2.0 – Objectives

E2 Consultants were instructed by Rhian Williams to prepare a noise assessment. The report has been compiled following a request from the planners and environmental health regarding the change of use from agricultural to a dog agility and hillside training field. This field can contain anything from 10 – 14 dogs + handlers (allowed for 2 per dog).

The methodology used for this assessment is BS4142 to assess the potential for noise impact on the occupiers of the nearby noise sensitive dwellings following the National Planning Policy Framework Planning Practice Guidelines on Noise and other guidance and if required provide measures to mitigate the noise levels, whether these be managerial controls or structural.

The noise levels measured have been considered and assessed against this national guidance to establish the acceptability of the development.

Details regarding the assessment methodology used, together with the results of the survey undertaken and the conclusions and recommendations, are presented within this report.

To determine noise impact, local planning authorities' decision-making should take account of the acoustic environment and consider:

- If a significant adverse effect is or likely to occur
- Whether or not a good standard of amenity can be achieved.

In line with the noise policy statement for England, this would include if the overall noise exposure is, or would be above or below the significant observed adverse effect levels and the lowest observed adverse effect level for the given situation.

These are listed below:

NOAEL (No observed adverse effect level) – This is the level of noise exposure below which no effect at all on health or quality of life can be detected

LOAEL (Lowest observed adverse effect level) – this is the level of noise exposure above which adverse effect on health and quality of life can be detected

SOAEL (Significant observed adverse effect level) – this is the level of noise above which significant effect on health and quality of life occur

At the lowest, when noise is not noticeable, there is no effect. As noise increases, it will cross the no observed effect level as it becomes noticeable. However, the noise has no adverse effect so long as the exposure is such that it does not cause any change in behavior or attitude. The table outlining the above is seen on the below page

Table 3.1 Guideline “Absolute” Sound Level1							
Absolute Sound Level	Absolute Level:	≤40dB	41 - 45dB	46 - 50dB	51 - 55dB	56 - 60dB	≥60dB
	Daytime Effect:2	NOAEL	NOAEL	NOAEL	LOAEL	SOAEL	SOAEL+
	Evening Effect:3	NOAEL	NOAEL	LOAEL	SOAEL	SOAEL	SOAEL+
	Night-time Effect:4	NOAEL	LOAEL	SOAEL	SOAEL	SOAEL	SOAEL+
	Effect / Impact Description:	No observed effect on health or quality of life.	Sleep disturbance in bedrooms with window open.	Speech intelligibility within living areas with windows open, resulting in moderate annoyance. Greater potential for sleep disturbance and adverse health impact.	Increased potential for sleep disturbance, including significant adverse health effects. Gardens and amenity spaces affected.	Significant adverse health effects likely to all habitable rooms. Occupants unable to open windows due to noise ingress and unable to enjoy garden/amenity areas.	High risk of significant adverse health impact. Unable to use garden and amenity space or have windows open for ventilation.
Mitigation Considerations:		A1 Use design, layout, and landscaping (DLL) to create and preserve areas of amenity and tranquillity to enhance the noise environment.	A2 Protect bedroom facades from noise through DLL. Provide minimum double-glazing with trickle vents to bedrooms.	A3 Protect habitable room facades from noise through DLL with greater protection for bedrooms. Provide higher-spec double-glazing with trickle-vents to all habitable rooms.	A4 Bedroom facades to be protected through DLL to bring below LOAEL. Provide higher-spec double-glazing with trickle vents to all habitable rooms. Protection of gardens and amenity space through DLL and acoustic fencing.	A5 Bespoke assessment of noise mitigation needs, including consideration of alternative to open window ventilation provision to protect internal noise environment and protection of garden/amenity areas through DLL to bring below LOAEL.	A6 Bespoke assessment of noise impact and mitigation, including DLL, protection of building envelope, and provision of alternative amenity space.
Planning Consideration:		No objection	No objection subject to Approved Plans and/or conditions to include satisfactory window specification to bedrooms with facades exposed to LOAEL noise.	No objection subject to Approved Plans and/or conditions to include satisfactory window specification to all habitable rooms with facades exposed to LOAEL noise.	Details of noise mitigation to be supplied as part of planning approval process. Conditions required to implement control measures within the noise report. Refusal if noise report is inadequate.	Details of noise mitigation to be supplied as part of planning approval process. Conditions required to implement control measures within the noise report. Refusal if noise report is inadequate.	Presumption against planning permission being granted, unless detailed noise impact assessment and approved mitigation measures implemented through conditions. Post completion verification of mitigation measures required.

3.0 – Site Description

An assessment has been requested to ensure that the noise levels produced by the of the land as a dog agility training field with the associated dog barking will not have an adverse impact on the dwellings seen in the site plan below just off Old Wrexham Rd.

The proposal is shown below (New field in red, existing field in brown and nearest dwelling in blue).



Activities on the site will take place within the hours of 8am to 4pm during weekdays and between 8am and 4pm on weekends in the months with less day light and in summer months operation from 7am to 8pm weekdays and 7am to 8pm on weekends.

The application site approximately measures 170 meters long and 90 meters wide running North/South with the nearest dwelling approximately 120m away from the centre of the field.

It is understood that the area will be booked for activities and group sessions that can accommodate 10-14 dogs plus 2 handlers per dog on the field.

4.0 – Microphone Position

The microphone was placed at the boundary of the nearest dwelling likely to be affected by the noise, as identified in the above image. Measurements had been taken during both the day with and without the dogs, as shown below.

Measurement Time	Location	Duration	Reading Reference
11/02/2021 11:17 – 12:47	Boundary of Dwellings	1 Hour 30 min	210211_0001
The microphone was placed at the nearest dwelling			

Measurement Time	Location	Duration	Reading Reference
11/02/2021 12:50 – 13:58	Field	1 Hour 8 min	210211_0002
The microphone was placed in the field with the dogs at 5 meters distance from the agility equipment with 2 handlers and 3 dogs			

5.0 – Uncertainties

The following points are noted to allow for and minimize where possible any uncertainties in the measurements taken.

- 1) A class one microphone has been used for the survey (**Norsonic 140 SLM – serial number 1405312**).
- 2) Weather conditions – 90% cloud cover.

	Before Measurements	After Measurements
Wind speed:	1m/s - NW	2m/s - NW
Humidity:	52%	52%
Temperature:	05°C	06°C
Barometric pressure:	1013mb	1013mb

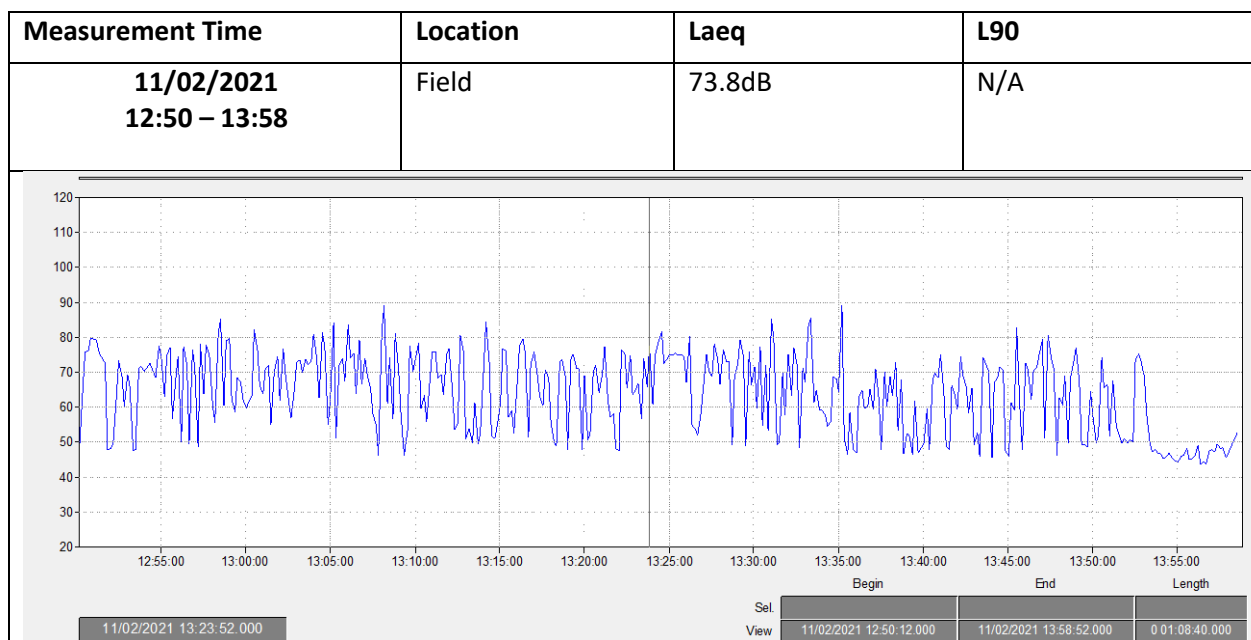
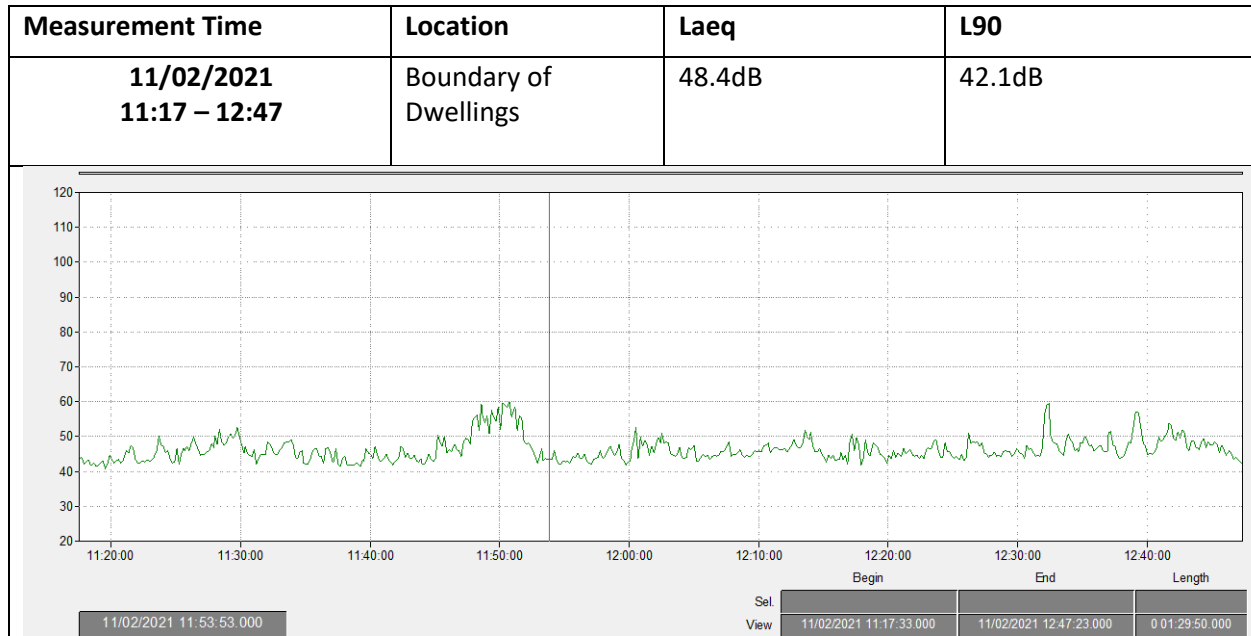
The weather during the day was noted as cloudy with winds of less than 5m/s with no prevailing directional component.

- 3) Noise levels at the time of the measurements were noted to be relatively constant, with no sudden increases or decreases in noise levels.
- 4) All results seen in this report will be rounded; for example, 82.5 will be rounded up to 83.

6.0 – Recommendations & Results

6.1 Data Collected

The data taken from the site is shown below:



6.1.1 – Noise generated.

As can be seen in the above measurements, the existing background noise levels for the rear of the dwellings is around average for this type of area.

To predict noise levels at the dwellings on the westerly edge of the proposal, worst-case levels with 3 dogs had been taken. This can be adjusted to obtain the levels for 10-14 dogs on the field as needed.

The noise levels take on site with 3 dogs and 2 handlers actively shouting instructions for the dogs was 74dB. This can be added as below to obtain the noise for 15 dogs.

$$10\log(10^{7.4} + 10^{7.4} + 10^{7.4} + 10^{7.4} + 10^{7.4}) = 81\text{dB @ 5m}^*$$

* The above assumes that all dogs and all handlers will be shouting at the same time which is in reality, is unlikely to happen.

During the measurements taken above. The existing field which was recently was also in use.

6.1.2 – Model Data

The below screenshot is from the CadnA software showing the input used for the sound power level of the dog barking along with the noise map.



As can be seen, the noise levels at the façade of the dwelling at 40dB at the closest dwelling to the dog with noise levels of up to 43dB within the first 8m of the garden.

6.1.3 – BS4142 Assessment

A BS4142 assessment cannot be carried out for this type of usage. The use of the standard in relation to sound from barking is explicitly excluded by the methodology and would produce unreliable results and would not be recognized by the noise policy statement for England.

However, a BS4142 assessment will instead be used along with guidance from the noise policy statement.

6.1.4 – Noise Assessment

Based on the noise levels taken from the model above, the noise levels at the façade of the buildings are a maximum of 40dB.

From BS8233, we can predict the internal noise levels within the dwelling by assuming windows open and a maximum reduction of 15dB. This means that the internal noise levels would be 25dB.

BS8233 states that internal noise levels should be the following:

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB Laeq (0700 – 2300)	-
Sleeping (Daying resting)	Bedroom	35 dB Laeq (0700 – 2300)	30dB Laeq (2300 – 0700) 45dB Lamax (2300 – 0700)

However, As stated above, by using the guideline “Absolute” Sound level table 3.1, the day time noise levels within the garden is NOAEL (No observed adverse effect)

Approximately 80% of the garden will be covered under the NOAEL, while the remaining will be fall under LOAEL. This 20% is the furthest away from the property and closest to the development.

Further, the effect on the dwelling compounding with the existing field are minimal. The noise at these dwellings from the new field is 25dB and would not add the current effects of the existing field.

7.0 – On Site Microphone Calibration

Microphone calibration: 114.0 dB 113.9dB = Drift of -0.1dB

(The drift value is within acceptable limits of +/-0.3dB)

8.0 – Technical Appendix

Class 1 Microphone: Norsonic 140 SLM

Calibrator: Norsonic 1251

SITE DATA:

Please see attached sheets sent with this document.

Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
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Certificate of Calibration and Conformance



CALIBRATION



0789

Certificate number: U32459

Test object: Sound Level Meter, BS EN IEC 61672-1:2003 Class 1 (Precision) and associated Frequency Analyser BS EN IEC 61260, Class 1

Producer : Norsonic

Type : 140

Serial No.: 1406414

Customer: E2 Specialist Consultants Ltd

Address: 3B South Park Way,
Wakefield 41 Business Park,
Wakefield. WF2 0XJ.

Contact Person: John Ashe

Method :

Calibration has been performed as set out in CA Technical Procedures TP01 & 02 as appropriate. These are based on the procedures for periodic verification of sound level meters as set out in BS EN IEC 61672-3:2006 and for electrical testing of frequency filters as set out in BS EN IEC 61260. Results and conformance statement are overleaf and detailed results are in the attached Test Report.

Tested

	Producer:	Type:	Serial No:	Certificate number
Microphone	Norsonic	1225	226969	32458
Calibrator*	Norsonic	1251	34494	U32457
Preamplifier	Norsonic	1209	20695	Included

Additional items that also have been submitted for verification
Wind shield Norsonic Nor1451 (ø 60mm)
Attenuator -
Extension cable -
These items have been taken into account wherever appropriate.

Instruction manual: Im140_1Ed6R3En Firmware version: v3.0.1842 The test object is a single channel instrument.

Conditions	Pressure	Temperature	Humidity
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	100.58 ±0.04 kPa	22.3 ±0.2 °C	41.9 ±0.7 %RH

Date received for calibration: 23/07/2019

Date of calibration: 31/07/2019

Date of issue: 31/07/2019

Engineer

Supervisor

Palanivel Marappan B.Eng (Hons), M.Sc

Darren Batten Tech IOA

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.
* The calibrator was complete with any required coupler for the microphone specified.

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Phone 01371 871030 Facsimile 01371879106



CALIBRATION



0789

Certificate number: U32457

Certificate of Calibration and Conformance

Test object: Sound Calibrator
Manufacturer: Norsonic
Type: 1251
Serial no: 34494

Customer: E2 Specialist Consultants Ltd
Address: 3B South Park Way,
Wakefield 41 Business Park,
Wakefield. WF2 0XJ.
Contact Person: John Ashe

Measurement Results:	Level	Level Stability	Frequency	Frequency Stability	Distortion
1:	114.11 dB	0.06 dB	1000.34 Hz	0.00 %	0.35 %
2:	114.10 dB	0.06 dB	1000.35 Hz	0.00 %	0.35 %
3:	114.11 dB	0.06 dB	1000.35 Hz	0.00 %	0.35 %
Result (Average):	114.11 dB	0.06 dB	1000.34 Hz	0.00 %	0.35 %
Expanded Uncertainty:	0.10 dB	0.02 dB	1.00 Hz	0.01 %	0.10 %
Degree of Freedom:	>100	>100	>100	>100	>100
Coverage Factor:	2.00	2.00	2.00	2.00	2.00

The stated level is relative to 20μPa. The level is traceable to National Standards.

The stated level is valid at reference conditions. The following correction factors have been applied during the measurement: Pressure: 0.0005 dB/kPa Temperature: 0.003 dB/°C Relative humidity: 0.000 dB/%RH Load volume: 0.0003 dB/mm³

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2019\NOR1251_34494_M1.nmf

Environmental conditions:	Pressure:	Temperature:	Relative humidity:
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	100.533 ± 0.040 kPa	22.1 ± 0.1 °C	42.5 ± 0.7 %RH

Date received for calibration: 23/07/2019
Date of calibration: 31/07/2019
Date of issue: 31/07/2019
Engineer

Supervisor

Palanivel Marappan B. Eng(Hons), M.Sc

Darren Batten TechIOA

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5B Chelmsford Road Industrial Estate
Great Dunmow, Essex, CM6 1HD
www.campbell-associates.co.uk
Phone: 01371 871030, Facsimile: 01371 879106



CALIBRATION



0789

Certificate of Calibration Floor Tapping Machine

Certificate number: U32450

Manufacturer: Norsonic
Type: 277
Serial no: 2775929

Client: E2 Specialist Consultants Ltd
3B South Park Way
Wakefield Junction 41 Business Park
Wakefield, WF2 0XJ

Contact Name: John Ashe

Method:

This certificate is issued against the requirements of Annex A of both BS EN ISO 16283-2:2015 and 140-6/7:1998 in respect of regular verification and also meet the requirements of UKAS publication LAB23 covering the verification of floor tapping machines used for building acoustics applications.

The machine was inspected for mechanical soundness and tested for electrical safety. It was cleaned and lubricated in accordance with the manufacturers instructions. The cams and hammer guides were inspected to ensure a free fall of the hammers. The mass of each of the hammers were measured in situ along with their curvature and diameter of the impact face. The machine was set up as per the manufacturers specification using the calibration gauge provided (where applicable) and checked for level, then the direction of fall of the hammer set was checked against the requirements of the standard. The time between successive hammer impacts was measured over a 30 second period and the mean and range of successive values calculated.

Environmental Conditions	Temperature	Relative Humidity
Reference Conditions:	23 °C	50 %RH
Measurement Conditions:	22.4 °C	53.5 %RH

Date received: 23 July 2019
Date of Calibration: 31 July 2019
Date of issue: 31 July 2019

Engineer:


Samuel Death - BSc (Hons)

Supervisor:


Darren Batten - Tech IOA

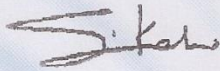
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Certificate of Competence in Environmental Noise Measurement

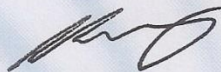
This is to certify that

John William Matthew Ashe

*has completed a course of instruction approved by the
Institute of Acoustics and designed to enable the candidate
to undertake environmental noise measurements in a
competent manner and has achieved a satisfactory
performance in the written and practical examinations
thereof and that this fact has been recorded in a
Register kept by the Institute for this purpose.*



Education Committee Chairman



Institute Secretary

Date 16 May 2014

Centre Leeds Metropolitan University

Reference Number EK161

*For the purposes of Credit Transfer or Professional Development this Certificate
may be considered to be equivalent to 25 points or hours*

The Institute of Acoustics Limited, 3rd Floor, St Peter's House, 45-49 Victoria Street, St Albans, Hertfordshire AL1 3WZ
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