BlueTreeAcoustics

11 Colley Road • Sheffield • S5 9GT
T: +44 (0)7594 293 486
E: admin@bluetreeacoustics.co.uk
W: www.bluetreeacoustics.co.uk

Vehicle maintenance workshop relocation, Kirkwood Mill, Sheffield Road, Penistone

BS4142:2014+A1:2019 Sound Assessment Report

Doc ref: 03647-130100

07/12/2021

On behalf of
Argo Feeds Ltd

Prepared by
Richard Watson BEng(Hons) CEng MIOA MAES MIEEE

CONTENTS

		Page
1.0	INTRODUCTION	3
2.0	EXISTING NOISE SOURCES	4
3.0	NOISE SURVEY	5
4.0	BS4142:2014+A1:2019 COMMERCIAL/INDUSTRIAL SOUND ASSESSMENT	6
5.0	SUMMARY AND CONCLUSIONS	18
6.0	DISCLAIMER	19
FIGURE 1 – SITE AERIAL VIEW AND APPROXIMATE MEASUREMENT LOCATIONS		21
FIGURE 2 – SITE PLAN OF PROPOSED OPERATION		22
FIGURE 3 – SITE AERIAL VIEW WITH OVERLAY OF SITE PLAN		23
FIGURE 4 – WORKSHOP BUILDING INDICATIVE LAYOUT PLAN		24
APPENDIX 1 – TECHNICAL UNITS AND INDICES		25
APPENDIX 2 – NOISE SURVEY DATA		26
APPENDIX 3 – WEATHER DATA		33

1.0 INTRODUCTION

1.1 Blue Tree Acoustics was instructed by Argo Feeds Ltd to carry out an acoustic assessment relating to the proposed relocation of their vehicle maintenance activities to a new purpose-built workshop building on their existing site operating at Kirkwood Mill, Sheffield Road, Penistone.

1.2 This sound assessment has been carried out by a suitably qualified person, and considers the potential sound impact of the Argo Feeds Ltd vehicle maintenance activities being relocated to a new workshop building to the south of the site.

1.3 *BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'* (BS4142:2014) is considered to be the most appropriate standard for assessing this type of sound and any potential impact on dwellings.

1.4 The sound impact assessment has included:

a) Inspection of the site and surroundings.

b) Monitoring of ambient and background sound levels in the area.

c) Measurements of sound generation within the existing Argo Feeds Ltd vehicle maintenance workshop area.

d) Consideration of the impact of vehicle movements associated with the proposed new location of maintenance activities, in accordance with *British Standard 4142:2014+A1:2019,* '*Methods for rating and assessing industrial and commercial sound*' (BS4142:2014).

e) Consideration of any sound control measures to reduce sound impact upon nearby noise-sensitive receptors.

1.5 A glossary of technical terminology and parameters used in this report is provided in Appendix 1.

2.0 EXISTING NOISE SOURCES

Road

2.1 Sheffield Road passes the site to the south, and the proposed workshop building location is approximately 35m from the road. The road is well-trafficked in the day, and traffic flows reduce into the night.

Commercial operations

2.2 There are various commercial and industrial units in this area of Penistone along Sheffield Road, including Martree Business Park, Laurence Works, and existing operations at the Argo Feeds Ltd premises.

3.0 NOISE SURVEY

3.1 Noise monitoring was undertaken by Blue Tree Acoustics to determine the existing ambient noise climate at nearby dwellings in the vicinity of the site. The measurement results are detailed in Appendix 2.

3.2 Unattended measurements were made from Saturday 16/10/2021 to Friday 22/10/2021 at the 2no distinct logging locations indicated in Figure 1. Location 1 was free-field, in the rear garden of 141 Sheffield Road. Location 2 was free-field, adjacent to 9 Longley Ings.

3.3 The unattended logging measurements were carried out using 2no Rion NA-28 Type 1/Class 1 integrating sound level meters. Each meter was within a valid period of laboratory calibration. A proprietary environmental windshield was fitted to each microphone, and the measurements were made with each microphone mounted on a tripod at approximately 1.5m above local ground level. Calibration checks were carried out both before and after the measurements, with no variance observed.

3.4 Attended source sound measurements were also made on Thursday 04/11/2021 in close proximity to Argo Feeds Ltd vehicle maintenance activity within the existing workshop area.

3.5 The attended source measurements were carried out using 1no Rion NL-52 Type 1/Class 1 integrating sound level meter. The meter was within a valid period of laboratory calibration. A proprietary environmental windshield was fitted to the microphone, and measurements of each sound source were made with the microphone positioned at each distance set out in Appendix 2. Calibration checks were carried out both before and after the measurements, with no variance observed.

3.6 Weather conditions during the noise surveys were generally dry and calm, with wind speeds <5m/s. Appendix 3 presents archival data from a local weather station for the survey periods. Sound level data obtained during periods with adverse weather conditions has been omitted from the assessment.

4.0 BS4142:2014+A1:2019 COMMERCIAL/INDUSTRIAL SOUND ASSESSMENT

4.1 The most relevant British Standard for assessing sound impact from commercial and industrial premises upon residential property is *British Standard 4142:2014+A1:2019* '*Methods for rating and assessing industrial and commercial sound*' (BS4142:2014). This requires the level of sound radiating from the proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature (in L_{Aeq}) to be compared with the existing Background Sound Level (L_{A90}) at any nearby residential property.

4.2 The scope of BS4142 states:

"1.1 This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

a) sound from industrial and manufacturing processes;

b) sound from fixed installations which comprise mechanical and electrical plant and equipment;

c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

d) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

1.2 This standard is applicable to the determination of the following levels at outdoor locations:

a) rating levels for sources of sound of an industrial and/or commercial nature;

and

b) ambient, background and residual sound levels, for the purposes of:

1) investigating complaints;

2) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

3) assessing sound at proposed new dwellings or premises used for residential purposes.

1.3 The determination of noise amounting to a nuisance is beyond the scope of this British Standard.

Sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems.

The standard is not intended to be applied to the rating and assessment of sound from:

a) recreational activities, including all forms of motorsport;

b) music and other entertainment;

c) shooting grounds;

d) construction and demolition;

e) domestic animals;

f) people;

g) public address systems for speech; and

h) other sources falling within the scopes of other standards or guidance.

The methodology set out in Clauses 7, 8, and 9 of this standard is not intended to be used to assess the extent of the impact at indoor locations. Internal sound levels can be taken into account as outlined in Clause 11.

The standard is not intended to be applied to the assessment of indoor sound levels.

The standard is not applicable to the assessment of low frequency noise."

4.3 The standard describes various methods for determining whether a correction or corrections should be applied to reflect the prominence of characteristic features in the industrial/commercial specific sound experienced at the assessment location. In subjective assessment, if the industrial/commercial sound has a tonal element that is just perceptible at the receptor, a 2dB penalty can be applied. If the tone is clearly perceptible, a 4dB penalty can be applied. If the tone is highly perceptible, a 6dB penalty can be applied. The standard also describes two objective methods for assessing tonal sound which may apply a penalty of up to 6dB.

4.4 Similarly, a penalty of 3dB can be applied for a sound that has impulsivity that is just perceptible. If the impulsivity is clearly perceptible, a 6dB penalty can be applied. If the impulsivity is highly perceptible, a 9dB penalty can be applied. The standard also describes an objective method for assessing impulsivity which may apply a penalty of up to 9dB.

4.5 If the sound has clearly identifiable on/off conditions during the reference period and this is readily distinctive against the residual acoustic environment during the reference period, a 3dB penalty for intermittency can be applied. No objective method is given in the standard for assessing intermittency.

4.6 Where characteristic features of the specific sound are neither tonal nor impulsive, nor intermittent, but are readily distinctive against the residual acoustic environment, a 3dB subjective penalty can be applied.

4.7 Therefore, depending on the circumstances, a total penalty of between 0 and 18dB could potentially be applied to allow for characteristic features of the industrial/commercial sound. However, BS4142:2014 does state that, if any single feature is dominant to the exclusion of others, then it may be appropriate to apply a reduced or zero correction for the minor characteristic. Also, the subjective prominence of the character of the specific sound at the noise-sensitive receptor should be considered, and the extent to which such characteristics will attract attention and/or be masked by residual sound at that location.

4.8 The level of the industrial/commercial sound measured or calculated in L_{Aeq} terms, plus any penalty as described above, provides the Rating Level.

4.9 BS4142 states that:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (…) from the rating level (…).

NOTE 1. More than one assessment might be appropriate.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*

d) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

NOTE 2. Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) *The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

   Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

   Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

NOTE 3 Consideration ought to be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. (…)

3) *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*

   i) *facade insulation treatment;*

   ii) *ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*

   iii) *acoustic screening."*

4.10 BS4142:2014 lists the following information to be reported when assessing sites to the standard.

Table 1: BS4142:2014+A1:2019 – Required information

a) Statement of qualifications, competency, professional memberships and experience directly relevant to the application of this British Standard of all personnel contributing to the assessment:	
Richard Watson BEng(Hons) Electroacoustics, Chartered Engineer, Member of the Institute of Acoustics, has undertaken many BS4142 assessments previously. Blue Tree Acoustics is a member of the Association of Noise Consultants (ANC).	
b) Source being assessed as follows:	
1) description of the main sound sources and of the specific sound;	Argo Feeds Ltd have over 40no powered vehicles and around 25no trailers. These are regularly modified, serviced, maintained, and repaired as needed to ensure they are fit for purpose and sufficiently safe.
2) hours of operation;	The existing site is in 24-hour use, with vehicle maintenance being undertaken as required day or night. It is proposed that the use of the proposed new workshop building be similarly unrestricted.

3) mode of operation (e.g. continuous, twice a day, only in hot weather);	Varying, but typically expected to be as set out below. a) Compressed air gun wheel replacement: Typically 2 minutes in 24 hours taking off wheels, and 2 minutes in 24 hours putting on wheels b) Air released from tyre: Typically 3 minutes in 24 hours c) Battery powered grinder: Typically 10 minutes in 24 hours d) Compressed air powered grinder: Typically 10 minutes in 24 hours e) Hammering (of disc): Typically 30 seconds in 24 hours f) Cab door shut: Typically 20no times in 24 hours g) Engine running: Typically 30 minutes in 24 hours h) Reversing bleeper: Typically 30 seconds in 24 hours i) Horn: 1no time in 24 hours j) Old shutter door: Not used in new development k) Modern shutter door: Typically 4no times in 24 hours A typical 'noisy' 15-minute period is considered to comprise 40 seconds of compressed air gun; 10 seconds of hammering wheel disc; 60 seconds of air compressed grinder; 60 seconds of air released from tyre.
4) statement of operational rates of the main sound sources (e.g. maximum load setting, 50% max rate, low load setting); and	N/A

5) description of premises in which the main sound sources are situated (if applicable).	Purpose-built workshop with concrete block and metal cladding walls, and metal cladding roof. Modern roller shutter doors.
c) Subjective impressions, including:	
1) dominance or audibility of the specific sound; and	Specific sound source will most likely be audible in gaps in traffic assuming no local events occurring, but not noticeable most of the time.
2) main sources contributing to the residual sound.	Road traffic noise and existing commercial activity.
d) The existing context (see Clause 4 and Clause 11), including an assessment of the sensitivity of the receptor:	
The sensitive receptors are dwellings.	
e) Measurement locations, their distance from the specific sound source, the topography of the intervening ground and any reflecting surface other than the ground, including a photograph, or a dimensioned sketch with a north marker. A justification for the choice of measurement locations should also be included.	

Location 1:

As presented in Figure 1 and Appendix 2. Access was granted to the garden of 141 Sheffield Road, with this garden being Location 1. This measurement location was accessible, secure, and is considered representative of any adjacent residential properties. Location 1 is at approximately 100m distance from the proposed workshop building.

Location 2:

As presented in Figure 1 and Appendix 2. Location 2 is adjacent to the house at 9 Longley Ings. This measurement location was accessible, secure, and is considered representative of the adjacent residential properties. Location 2 is at approximately 180m distance from the proposed workshop building.

f) Sound measuring systems, including calibrator or pistonphone used:

Unattended measurements:	**Location 1**	**Location 2**
1) type and/or model;	1no Rion NA-28 sound level meter, Class 1 / Type 1.	1no Rion NA-28 sound level meter, Class 1 / Type 1.
2) manufacturer;	Rion	Rion
3) serial number (S/N); and	01070579	30552175
4) details of the latest verification test including dates.	Calibrated on 29/07/2021 by ANV Measurement Systems Ltd.	Calibrated on 01/11/2019 by Pennine Instrument Services Ltd.
Attended source measurements:	**Existing workshop area on Thursday 04/11/2021**	
5) type and/or model;	1no Rion NL-52 sound level meter, Class 1/Type 1.	
6) manufacturer;	Rion	
7) serial number (S/N); and	01021309	
8) details of the latest verification test including dates.	Calibrated on 28/10/2021 by CMR Ltd.	

g) Operational tests:	
1) reference level(s) of calibrator, multi-function calibrator or pistonphone; and	94.0dB B&K 4230 (S/N 686445), calibrated on 28/07/2021 by ANV Measurement Systems Ltd.
2) meter reading(s) before and after measurements with calibrator, multi-function calibrator or pistonphone applied.	All 94.0dB pre-measurement All 94.0dB post-measurement
h) Weather conditions, including:	
1) wind speed(s) and direction(s);	Generally <5m/s, as supported by local weather station data presented in Appendix 3. Some measurement periods had higher wind speeds, and thus the corresponding sound level data has been discarded.
2) presence of conditions likely to lead to temperature inversion (e.g. calm nights with little cloud cover);	Temperature inversion improbable.
3) precipitation;	Generally no precipitation, as supported by local weather station data presented in Appendix 3. Some measurement periods did have rainfall, and thus the corresponding sound level data has been discarded.
4) fog;	None
5) wet ground;	None
6) frozen ground or snow coverage;	None
7) temperature; and	Around 12 degrees Celsius, but constantly varying. See Appendix 3 for local weather station data.
8) cloud cover.	Varying
i) Dates and Times of Measurements	
As set out in this report	
j) Measurement time intervals:	
As set out in this report	

k) Reference time interval(s).	
1 hour in the daytime; 15 minutes at night	
l) Measured sound level(s):	
1) residual sound level(s) and method of determination;	Residual sound levels measured as stated in Appendix 2.
2) ambient sound level(s) and method of determination;	Ambient sound levels as measured at Location 1 were typically 54dB $L_{Aeq,1hour}$ in the day and 48dB $L_{Aeq,15min}$ at night. Ambient sound levels as measured at Location 2 were typically 53dB $L_{Aeq,1hour}$ in the day and 45dB $L_{Aeq,15min}$ at night. See Appendix 2.
3) specific sound level(s) and method of determination;	Workshop activities during daytime and nighttime are similar, but as they occur at night, the potential impact would be higher – partly since background noise levels are lower, and partly since activity is assessed over a 15-minute period at night. The workshop typically has 2no members of staff, with 1no potentially loud activity taking place at a time. A typical 'noisy' 15-minute period is considered to comprise 40 seconds of compressed air gun; 10 seconds of hammering wheel disc; 60 seconds of air compressed grinder; 60 seconds of air released from tyre. This would generate an internal sound level of 89dB L_{Aeq} at 1m, which is a very high internal sound level. Considering the concrete block/insulated metal cladding walls and the insulated cladding roof, together with acoustic shutter doors and the distances to the dwellings, the resulting specific sound level becomes 25dB L_{Aeq} at Location 1 and 20dB L_{Aeq} at Location 2.

4) justification of methods; and	Measuring noise-generating activities at source and correcting for on-time and distance to sensitive receptors is standard acoustic practice, and is acknowledged in BS4142.
5) details of any corrections applied.	As set out above, no allowance for boundary barrier.
m) Background sound level(s) and measurement time interval(s) and, in the case of measurements taken at an equivalent location, the reasons for presuming it to be equivalent:	
15-minute measurements were made, as described in this report, with the representative nighttime background noise level being 37dB L_{A90} at Location 1 and 27dB L_{A90} at Location 2, as shown in Appendix 2.	
n) Rating level(s):	
1) specific sound level(s);	25dB at Location 1 20dB at Location 2
2) any acoustic features of the specific sound; and	3dB for impulsive characteristic possibility 2dB for possible tonal element
3) rating level(s).	30dB at Location 1 25dB at Location 2
o) Excess of the rating level(s) over the measured background sound level(s) and the initial estimate of the impacts:	
-7dB without any consideration of barrier to the edge of the boundary at Location 1 -2dB at Location 2 This is interpreted as being at the lowest category. BS4142:2014 states, *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*	
p) Conclusions of the assessment after taking context into account:	
Typically, low impact at night in BS4142 terms. In addition, the calculated specific sound level is at least 23dB below the ambient sound level at the assessment locations.	

q) The potential impact of uncertainty:
Measurements have been undertaken in accordance with relevant standards and guidelines to minimise measurement uncertainty. Class 1/Type 1 instrumentation has been used for all measurements. It is considered that the uncertainty of the measurement and calculation in this instance does not significantly alter the conclusion of the assessment. Clearly, it is possible that the highest noise event of hammering wheel discs could occur for a full 15-minute period, in which case the impact would be higher. However, that scenario is considered extremely unlikely, and the above assessment is considered reasonable.

4.11 The above assessment assumes that work is done within the workshop, with doors closed. It assumes insulated cladding panels, rather than uninsulated single skin cladding to upper walls and roof. The assessment also assumes a medium performance acoustic roller shutter door is used for each roller shutter door, such as the SoundSec 30 (https://www.safe-door.co.uk/docs/sound/sound-solutions-brochure.pdf). This is important, as the roller shutter door constitutes the majority of the building elevation facing Location 1.

4.12 It will be possible for minor works to be done in the workshop with a door open, but loud activities and activities at night should be done inside the building with the doors closed.

4.13 The potential noise impact of Argo Feeds Ltd vehicle maintenance activity at the new workshop location is considered to be low, but could be reduced further by providing barriers to shield properties to the west. Argo Feeds Ltd is considering this measure.

5.0 SUMMARY AND CONCLUSIONS

5.1 A sound assessment has been carried out relating to the proposed relocation of the Argo Feeds Ltd vehicle maintenance activities to a new purpose-built workshop building on their existing site operating at Kirkwood Mill, Sheffield Road, Penistone.

5.2 For a busy 15-minute period at night – which is the workshop activity with the highest potential impact – the results of the assessment show that the movement and maintenance of vehicles at the proposed new workshop location will generate a sound impact of -2dB at the nearest noise-sensitive receptor when assessed with regard to BS4142:2014+A1:2019. However, for the majority of the day, there will be no sound impact at all. It is considered that this impact is acceptable in BS4142:2014+A1:2019 terms.

6.0 DISCLAIMER

6.1 This document is limited to addressing the specific acoustic issues contained herein, and its content is based on drawings and information provided to date by our Client/their Design Team.

6.2 All findings, comments, recommendations, etc., in this document are for acoustic purposes only; any and all other considerations and requirements, e.g. structural, airflow, thermal, fire safety, CDM compliance, determination of whether materials are dangerous, hazardous, deleterious, etc. (non-exhaustively), are the responsibility of other such suitably qualified specialists to check and advise on.

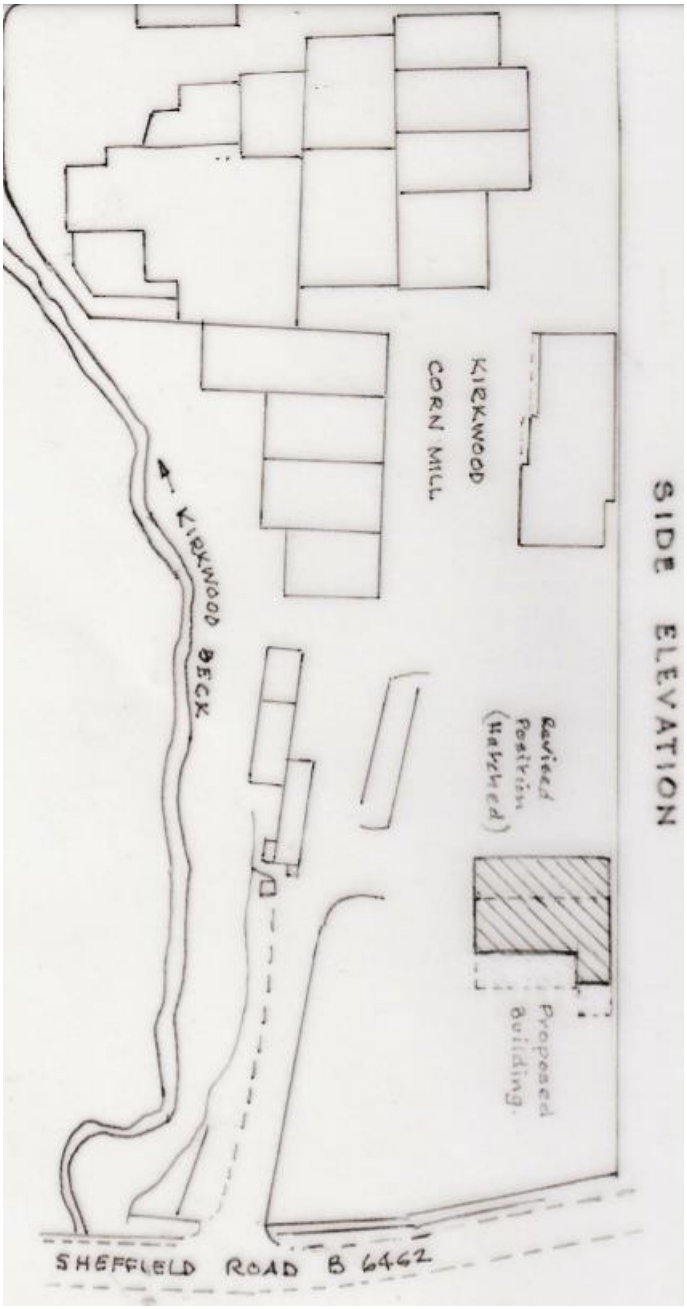
6.3 BTA's work may occasionally involve provision of acoustic performance advice and acoustic design recommendations that others may choose to regard as a "specification" under CDM 2015 (and thus others may occasionally choose to regard BTA to be a "Designer" under CDM 2015). Notwithstanding this, it is always the responsibility of others (Principal Designer) to approve/incorporate into their final design – or not – their final specification selections; although these may be based on BTA's acoustic performance advice, as BTA neither has control over how or whether BTA's acoustic advice is incorporated into the final design by others, nor any power to enforce that any such final specification selections made by others based on BTA's advice are appropriate in any regard beyond their acoustic performance qualities, it also remains the responsibility of others under CDM 2015 to ensure that any ancillary (non-acoustic) considerations in the course of selection, installation, maintenance, etc. of final specifications are advised upon by such relevantly qualified specialists (non-acoustic, and therefore non-BTA), and that any safety precautions identified in the course of their consideration by others are taken by others (the Principal Designer, Designers, Contractors, Client, etc.).

6.4 Products and materials that perform well acoustically tend to be heavier than standard products. Use of these products and materials may increase the weight of the element, and the CDM Principal Designer, Client, etc. must take care to ensure that this risk is mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe lifting and installation techniques, maintenance, etc. are used to reduce any remaining risk. Wherever BTA advises that works such as acoustic barriers are desirable to attenuate noise, care must be taken by the CDM Principal Designer, Client, etc. to ensure that the risks associated with constructing and maintaining bunds, walls, fences, etc. are mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe construction and installation techniques, maintenance, etc. are used to reduce any remaining risk.

6.5 This document has been prepared for the sole use, benefit, and information of our direct Client for the purposes agreed at the time of their formal instruction. The liability of BTA in respect of the information contained herein will not extend to any third party.

FIGURE 1 – SITE AERIAL VIEW AND APPROXIMATE MEASUREMENT LOCATIONS

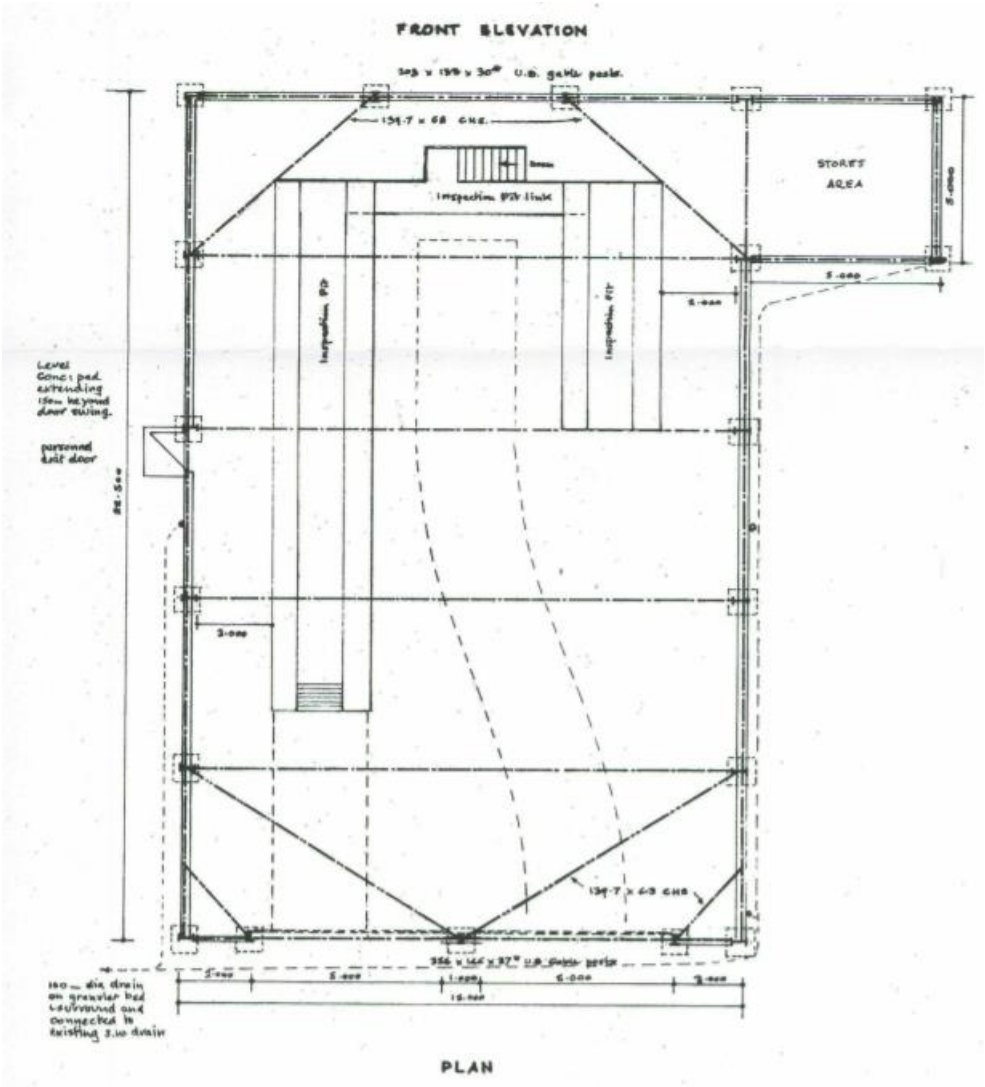
FIGURE 2 – SITE PLAN OF PROPOSED OPERATION



Email: admin@bluetreeacoustics.co.uk
Blue Tree Acoustics

FIGURE 3 – SITE AERIAL VIEW WITH OVERLAY OF SITE PLAN

FIGURE 4 – WORKSHOP BUILDING INDICATIVE LAYOUT PLAN



Email: admin@bluetreeacoustics.co.uk
Blue Tree Acoustics

APPENDIX 1 – TECHNICAL UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighing applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

L_{A90} This is the A-weighted sound level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

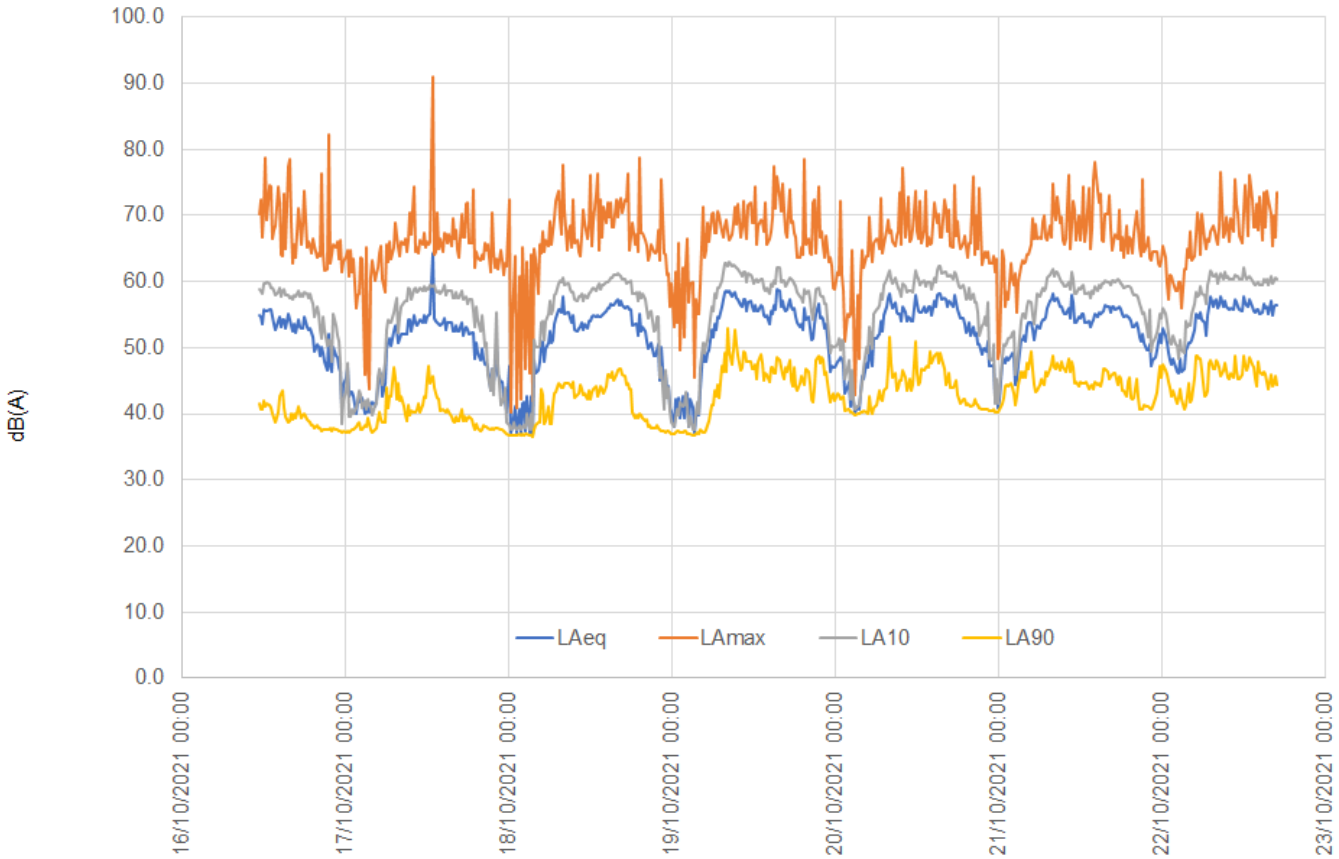
SEL The SEL is the single event level (also sometimes called the sound exposure level). This is commutable with L_{Aeq} using the following formula:

$SEL = L_{Aeq} + 10\log(t)$ where t is time in seconds.

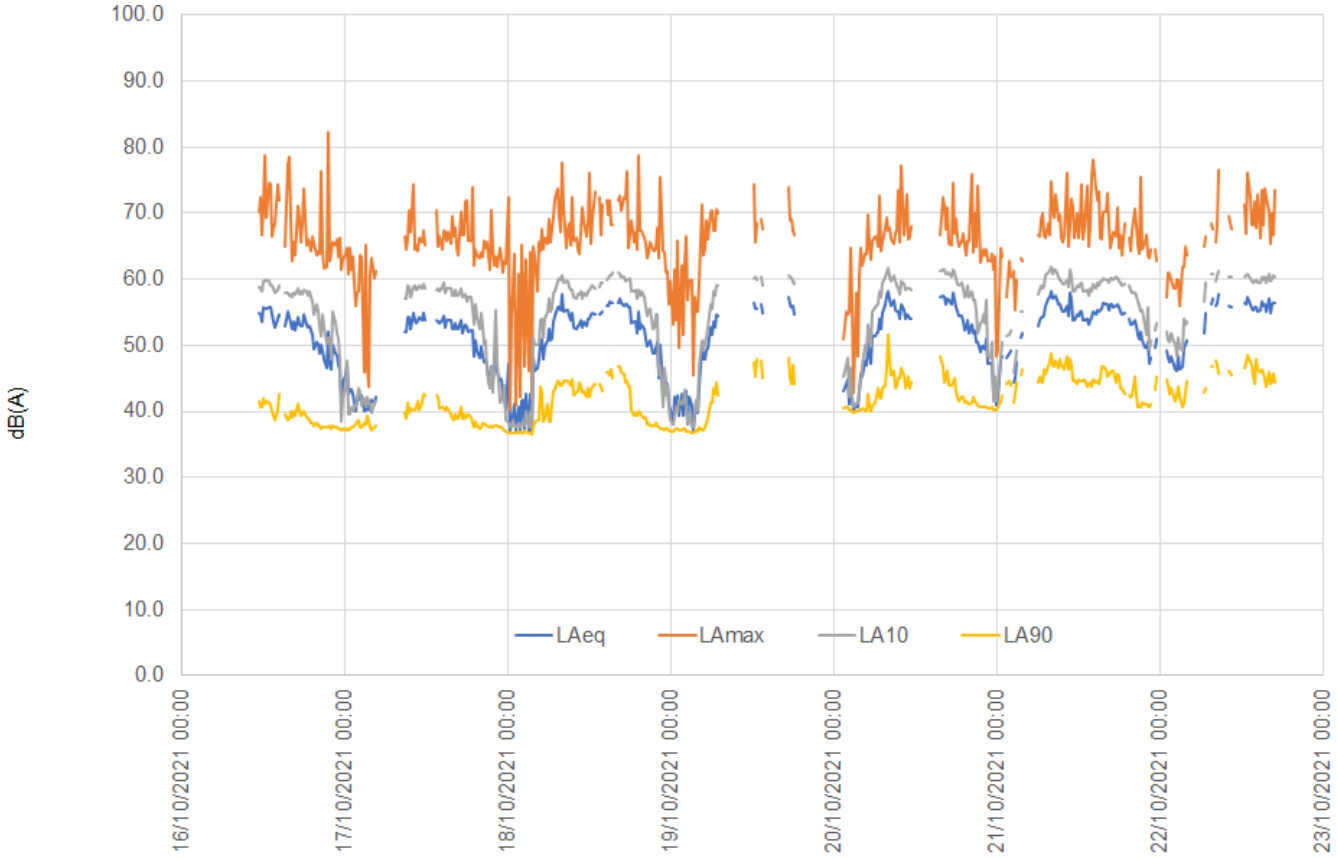
APPENDIX 2 – NOISE SURVEY DATA

Measurements described as 'free-field' conditions were >3.5m distant from acoustically reflecting surfaces and structures, other than the ground.

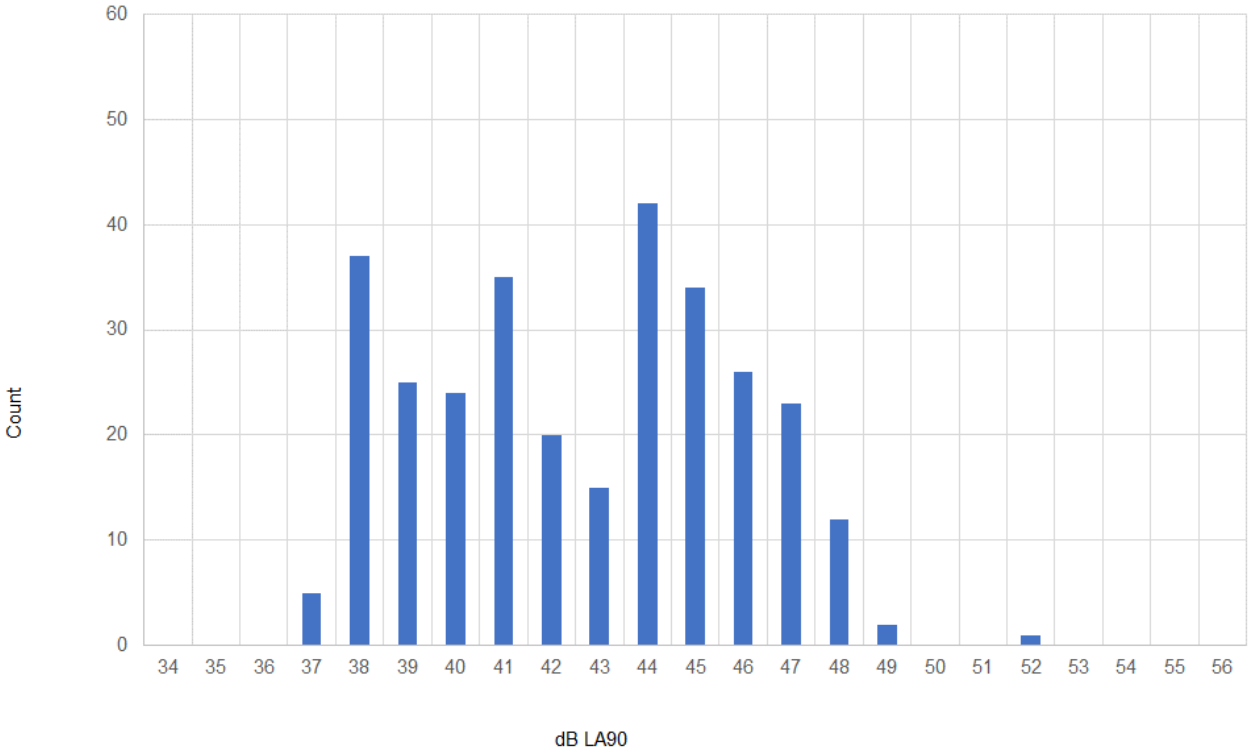
Location 1 – Garden of 141 Sheffield Road – Free-field – Saturday 16/10/2021 to Friday 22/10/2021
Rion NA-28 sound level meter (S/N 01070579), all values dB(A), 15-minute measurements



Same dataset as presented in the chart above, but with the adverse weather periods removed:

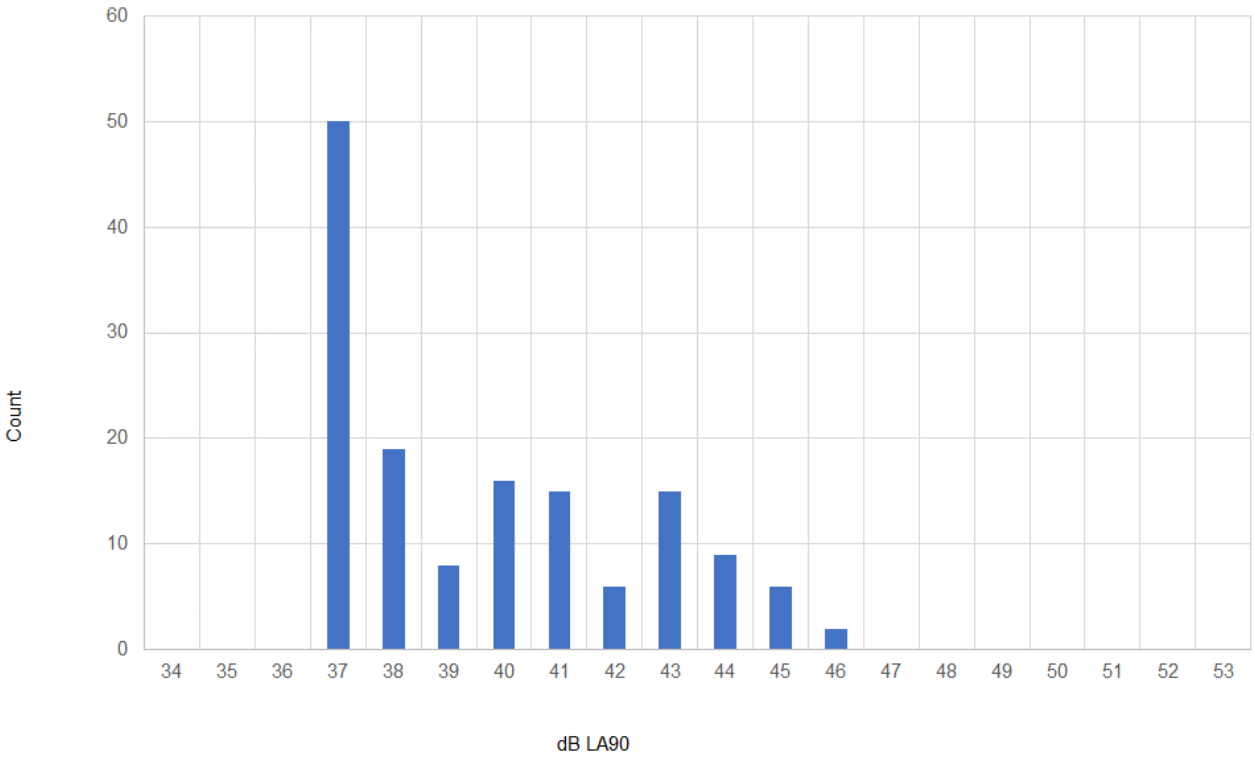


Location 1 – L_{A90} statistical count – Daytime



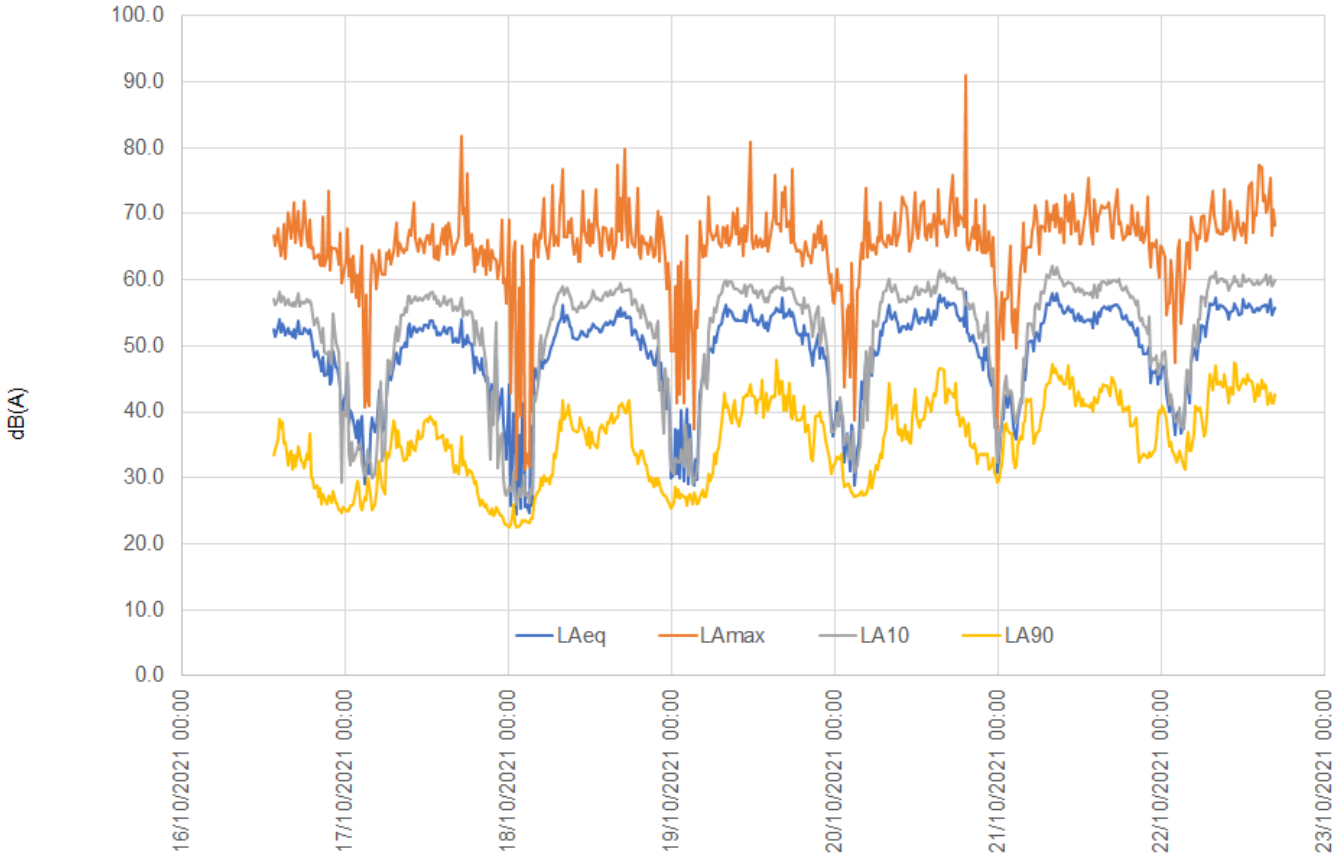
The typical background sound level is 44dB L_{A90} in the day

Location 1 – L_{A90} statistical count – Nighttime



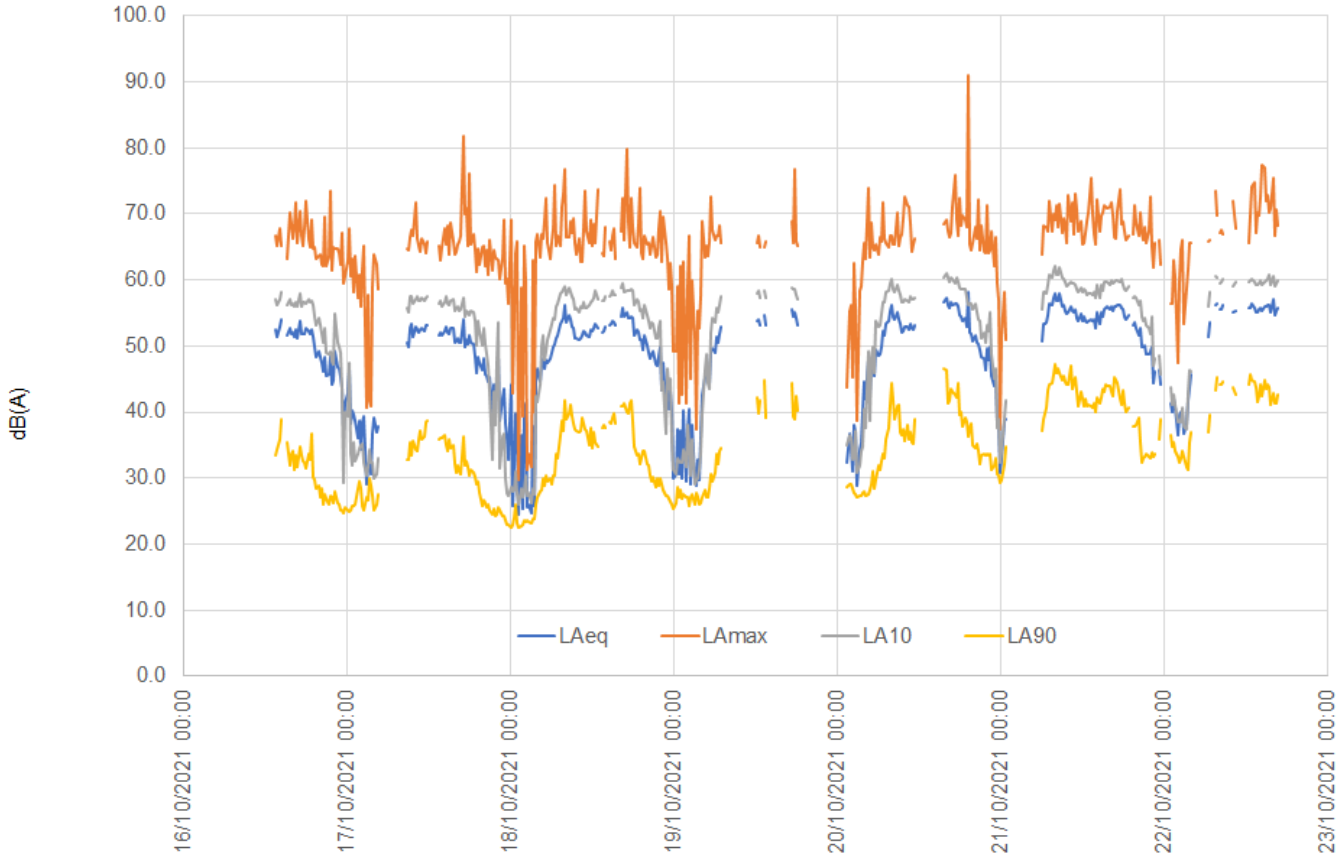
The typical background sound level is 37dB L_{A90} at night.

Location 2 – Adjacent to 9 Longley Ings – Free-field – Saturday 16/10/2021 to Friday 22/10/2021
Rion NA-28 sound level meter (S/N 30552175), all values dB(A), 15-minute measurements

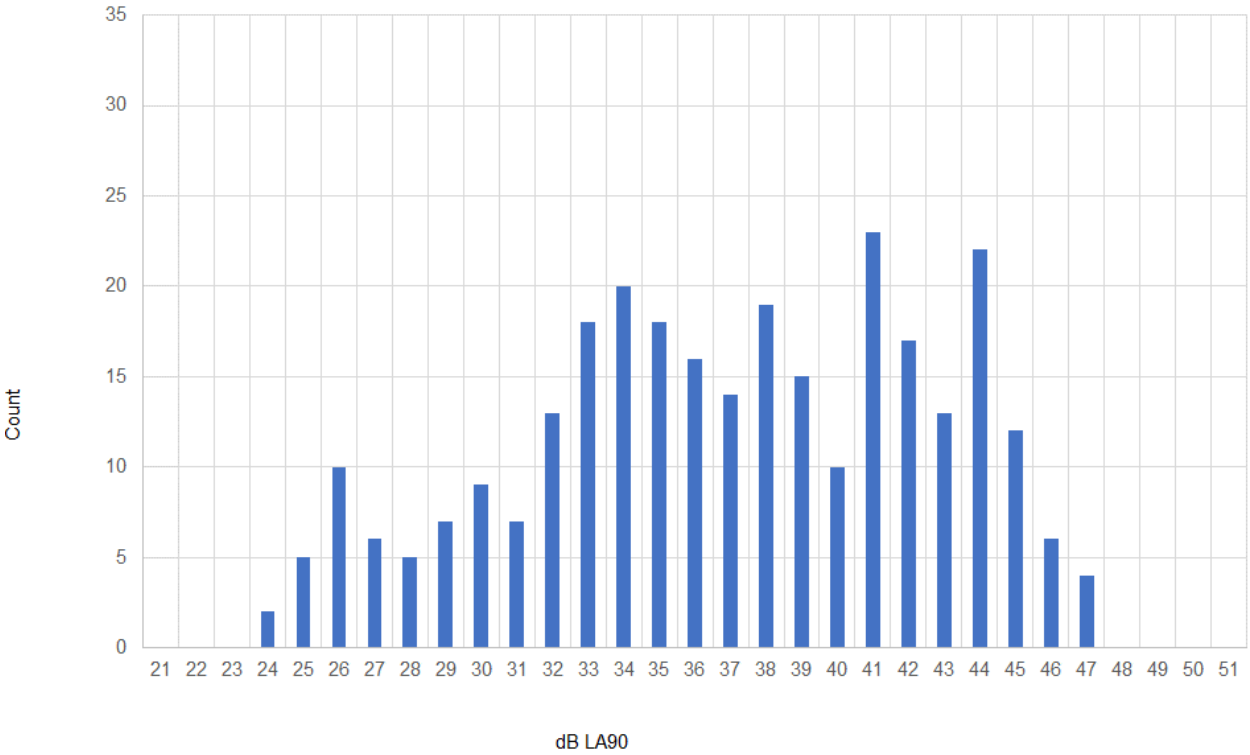


Email: admin@bluetreeacoustics.co.uk
Blue Tree Acoustics

Same dataset as presented in the chart above, but with the adverse weather periods removed:

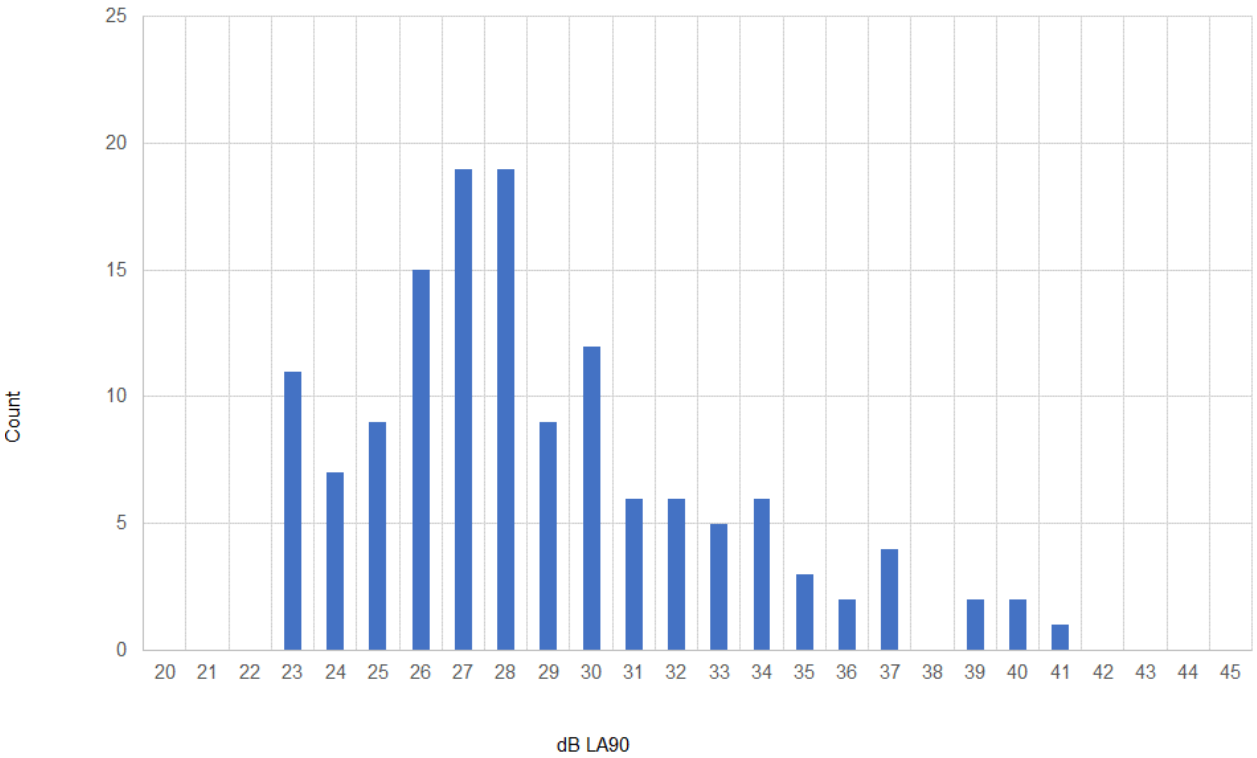


Location 2 – L_{A90} statistical count – Daytime



The typical background sound level is 34dB L_{A90} in the day.

Location 2 – L_{A90} statistical count – Nighttime



The typical background sound level is 27dB L_{A90} at night.

Email: admin@bluetreeacoustics.co.uk
Blue Tree Acoustics

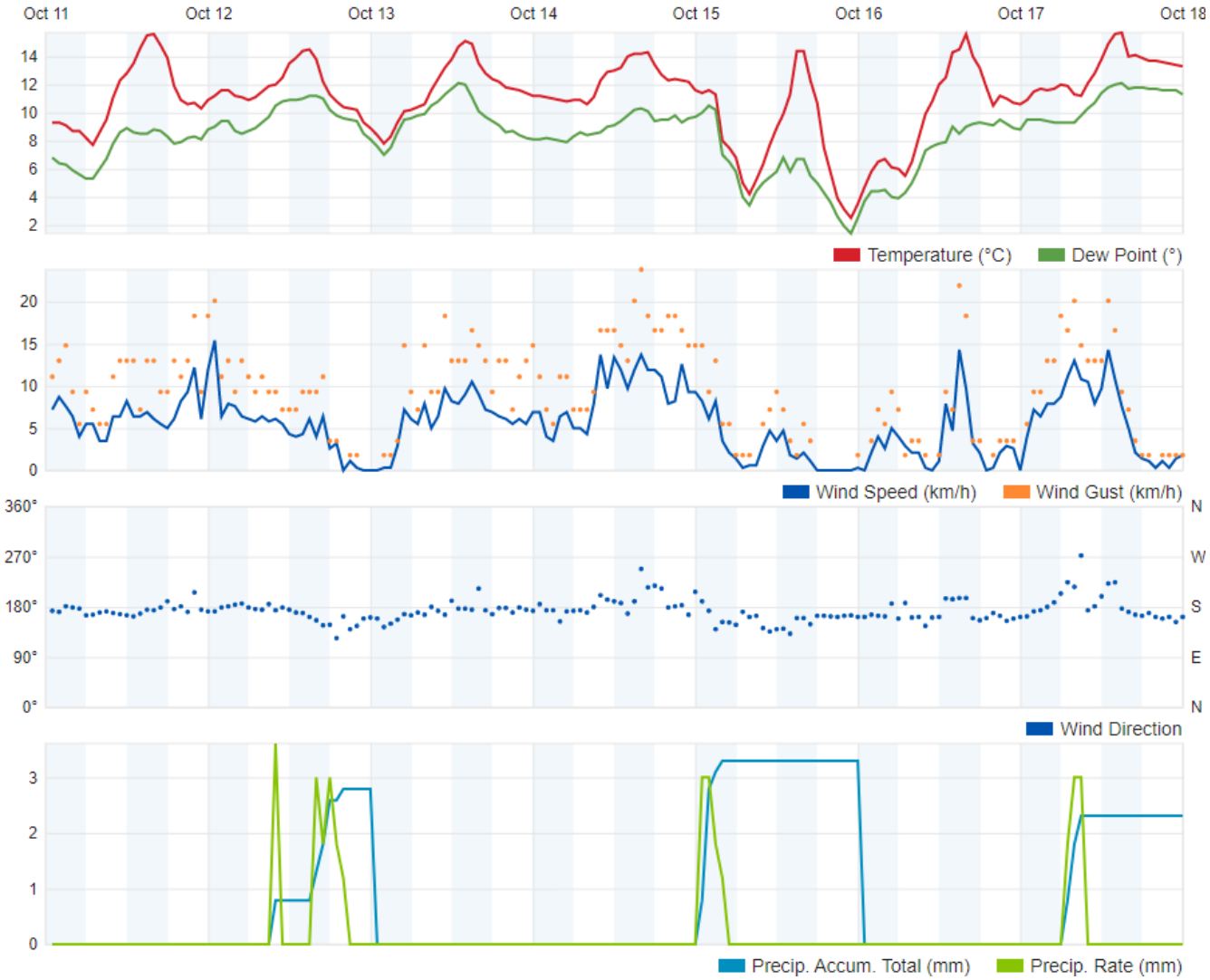
Short source measurements made manually during workshop activity – Thursday 04/11/2021
Rion NL-52 sound level meter (S/N 01021309)

Time	dB L_{Aeq}	dB L_{Amax}	dB L_{A10}	dB L_{A90}	Distance	Activity
15:09	101.5	106.5	105.9	59.5	1m	Compressed air gun wheel replacement off
15:10	101.4	106.9	105.7	65.7	1m	Compressed air gun wheel replacement off
15:10	98.4	107.4	104.8	59.4	1m	Compressed air gun wheel replacement on
15:13	92.4	98.5	96.7	80.2	1m	Air out of tyre
15:16	84.1	86.7	86.0	46.5	1m	Battery grinder
15:17	95.9	100.5	98.2	88.9	1m	Air grinder
15:22	100.3	106.8	104.0	58.1	1m	Hammering disc
15:35	69.4	83.5	68.9	39.1	1m	Door shut
15:37	83.2	86.7	85.1	42.2	1m	Engine
15:38	86.8	93.6	89.0	81.1	1m	Reversing bleeper
15:46	103.2	116.1	107.7	43.9	1m	Horn
15:47	89.3	97.0	94.0	76.2	1m	Old shutter door
15:52	74.6	87.4	80.3	51.7	1m	Modern shutter door

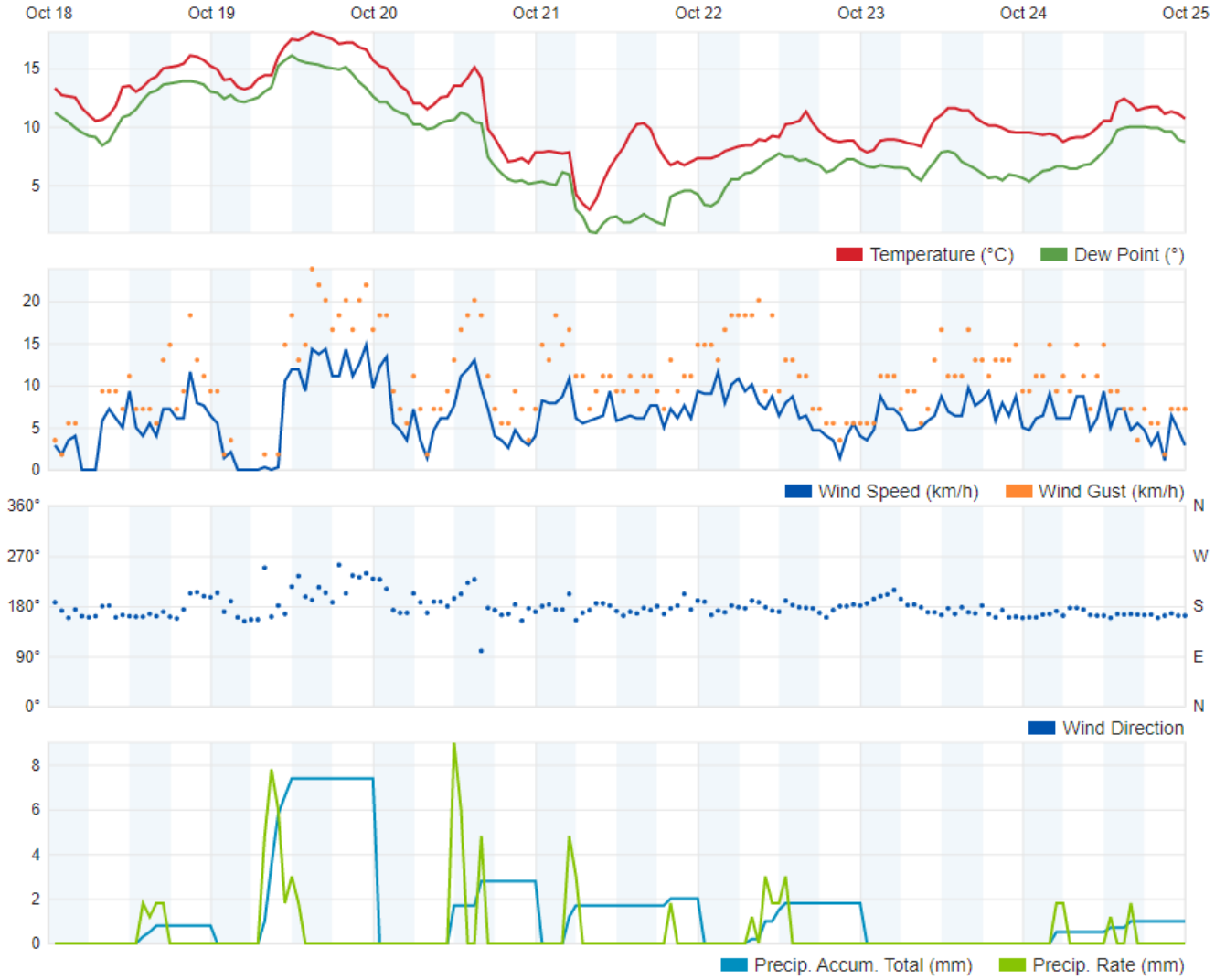
Email: admin@bluetreeacoustics.co.uk
Blue Tree Acoustics

APPENDIX 3 – WEATHER DATA

Monday 11/10/2021 – Sunday 17/10/2021



Monday 18/10/2021 – Sunday 24/10/2021



Email: admin@bluetreeacoustics.co.uk
Blue Tree Acoustics