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S - Noise Assessment Report

Merthyr Tydfil County Borough Council

GOATMILL ROAD DEVELOPMENT, MERTHYR TYDFIL

Baseline Noise Survey Report



70120737-002
DECEMBER 2024

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1. INTRODUCTION

1.1. THE PROJECT CONTEXT

1.1.1. The Goatmill Road Development site (referred to as the 'Site' hereafter) is proposed for industrial use. There is a potential for operational phase fixed plant and activities associated with the Proposed Development to generate noise at the nearest noise sensitive receptors (NSRs) surrounding the Site.

1.1.2. This report details the results of an environmental sound survey carried out at locations representative of the nearest NSRs. Drawing on the results of the environmental sound survey, and in accordance with current guidance, noise emission criteria has been set which will need to be achieved for all operational activities and building services plant associated with the Proposed Development.

1.1.3. This report is necessarily technical in nature so, to assist the reader, a glossary of acoustic terminology is presented in **Appendix A**.

1.2. SITE DESCRIPTION

1.2.1. The Site is located to the west of the A4060 which provides the link on the east side of Merthyr Tydfil connecting the A470 to the South and Cardiff, and the A465 to the East and Abergavenny. The A4102 and Goatmill Road bounds the Site to the west, with vehicular access gained via Goatmill Road to the north of the Site. Existing industrial premises bound the Site to the north.

1.2.2. The location of the site and illustrative masterplan layout is presented in Figure 1.

Figure 1: Site Location and Illustrative Masterplan



2. PLANNING POLICIES AND GUIDANCE

2.1. OVERVIEW

2.1.1. The following national and local planning policies and guidance documents are relevant to the assessment and control of noise at the Proposed Development:

- Planning Policy Wales Edition 11
- Technical Advice Note (Wales) 11: Noise 1997 (TAN11)
- Merthyr Tydfil Replacement Local Development Plan (LDP) 2016-2031
- British Standard 4142: Methods for Rating and Assessing Industrial and Commercial Sound

2.2. PLANNING POLICY WALES EDITION 11

2.2.1. Planning Policy Wales (PPW) Edition 11 – February 2021, describes the planning development policies of the Welsh Government. Noise is considered in several sections of the document including *Promoting Healthier Places, Traffic Management, Transportation Infrastructure and Protecting Special Characteristics and Qualities of Places*. The most specific detail related to noise is given in Section 6.7 of the policy "Air Quality and Soundscape"

2.3. TECHNICAL ADVICE NOTE (WALES) 11: NOISE 1997 (TAN11)

2.3.1. The current Welsh technical advice note on noise is TAN11. The introduction of TAN11 states:

"This note provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business."

2.3.2. TAN11 provides the following information:

- it indicates how noise issues should be handled in development plans and development control;
- outlines ways of mitigating the adverse impact of noise;
- provides specific guidance on noisy and noise-sensitive development;
- introduces the use of noise exposure categories; and
- gives guidance on the use of planning conditions relating to noise.

2.4. MERTHYR TYDFIL REPLACEMENT LOCAL DEVELOPMENT PLAN (LDP) 2016-2031 ADOPTED JANUARY 2020.

2.4.1. Policy EnW4: Environmental Protection states:

"Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from …

… Noise, vibration, dust, odour nuisance and light pollution;

6.6.31 While many elements of pollution control are outside the remit of the planning system it is important that new development does not lead to unacceptable levels of pollution and aims to reduce average population exposure to air and noise pollution. New development proposals will be required to reduce, or at the very least minimise the impact identified to the lowest possible acceptable level. If, as a result of consultation with bodies such as Natural Resources Wales and

Health and Safety Executive, the Council considers that a development proposal would lead to unacceptable pollution, then planning permission will not be granted."

2.4.2. Policy EcW5: Town and Local Centre Development states:

"6.7.50 PPW states that the agent of change principle requires that a business or person responsible for introducing a change is responsible for managing that change and any related impacts on, for example, the amenity or viability of an existing use. In practice, for example, this means a developer would have to ensure that solutions to address air quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable."

2.5. BS 4142 2014+A1:2019

2.5.1. BS4142 describes methods for assessing sound of an industrial and/or commercial nature, including sound from fixed installations (such as mechanical and electrical plant). It provides a method of determining the 'rating level' for sources of industrial or commercial sound for the purposes of investigating noise impact, assessing sound from new, modified, or additional sources of sound, and assessing sound affecting new residential premises.

2.5.2. BS4142 uses several terms to define the various parameters/indicators used in assessments, including:

- Specific sound - the commercial/industrial noise source under consideration;
- Residual sound - the sound level at the noise-sensitive receivers in the absence of the specific sound;
- Ambient sound - the sound level at the noise-sensitive receivers in the presence of the specific sound (i.e. ambient = residual + specific);
- Background sound level - the sound pressure level which is exceeded by the residual sound for 90% of the measurement period; and,
- Rating level - the specific sound, corrected for acoustically distinguishing characteristics.

2.5.3. BS4142 states it is normally possible to carry out a subjective assessment of characteristics, based on the following correction guidelines:

- Tonality: +2 dB for a 'just perceptible' tone, +4 dB for a 'clearly perceptible' tone, and rising to +6 dB for 'highly perceptible' tones;
- Impulsivity (rapidity of change and overall change in level): +3 dB for 'just perceptible' impulsivity, +6 dB for 'clearly perceptible' impulsivity, rising to +9 dB for 'highly perceptible' impulsivity; and,
- Intermittency: if the on/off-time of the specific sound is readily distinctive at the noise-sensitive receivers, +3 dB.

2.5.4. Typically, the greater the difference between the background and rating level, the greater the magnitude of impact, although BS4142 emphasises that this is highly context-specific.

2.5.5. BS4142 states that an initial estimate of the impact can be obtained by subtracting the background sound level from the rating level, and that:

"a) Typically, the greater the difference the greater the magnitude of the impact;
b) A difference of around +10 dB or more is likely to be indicative of significant adverse impact, depending on context;

c) *A difference of around +5 dB or more is likely to be indicative of adverse impact, depending on context;*

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

2.5.6. This initial estimate of impact can then be modified to take account of context, including reference to factors such as:

- The absolute level of the sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residuals purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:
  - Façade insulation on treatment;
  - Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
  - Acoustic screening.

2.6. CONSULTATION WITH ENVIRONMENTAL HEALTH OF MERTHYR TYDFIL COUNTY BOROUGH COUNCIL

2.6.1. In September 2024, contact was made with the Environmental Health Department of Merthyr Tydfil County Borough Council (MTCBC) and the proposed scope of the baseline noise survey and assessment methodology was agreed. The consultation confirmed that the operational phase of the Proposed Development is to be assessed according to BS 4142.

3. BASELINE SOUND SURVEY

3.1. OVERVIEW

3.1.1. To determine the current prevailing sound climate at the site and nearest existing residential receptors the following have been carried out:

- Unattended baseline measurement over an approximate 1-week period commencing at approximately 13:00 hours on the 16 September 2024 and concluding at approximately 14:00 hours on the 23 September 2024.
- Short term attended measurements between 1300 and 1600 hours on the 16 September 2024, between 12:00 and 13:00 hours on the 17 September 2024 and between 12:00 and 15:00 hours on the 24 September 2024.

3.1.2. WSP visited the site and found the environmental sound climate across the Site and at the nearest NSRs to be dominated by road traffic on the surrounding local road network, including Goat Mill Road, the A4102 and distant road traffic on the A4060. Operational activities associated with the existing commercial premises to the north-west of the Site on Goat Mill Road also contribute to the prevailing noise environment at the NSRs to the west of the Site.

3.2. MEASUREMENT LOCATIONS

3.2.1. The measurement locations adopted through the survey are shown in Figure 2 and can be described as follows.

- Measurement Location 1 (ML1): In the western part of the Site. This measurement location was selected to obtain representative data of the prevailing sound climate of the NSRs to the west of Goat Mill Road on Incline Top and Bradley Close. Continuous unattended sound measurements were carried out at this location.
- Measurement Location 2 (ML2): To the west of the Site. This measurement location was selected to obtain representative data of the prevailing road traffic noise levels on Goat Mill Road, to the north of the A4102. Short-term daytime attended measurements were carried out at this location.
- Measurement Location 3 (ML3): To the south-west of the Site. This measurement location was selected to obtain representative data of the prevailing road traffic noise levels on the A4102. Short-term daytime attended measurements were carried out at this location.
- Measurement Location 4 (ML4): To the south of the Site. This measurement location was selected to obtain representative data of the prevailing sound climate of the NSRs on Mount View. Short-term daytime attended measurements were carried out at this location.

3.2.2. All measurements were made at least 3.5m from reflecting surfaces, i.e. in free-field conditions, and were at a height of 1.5m above local ground.

Figure 2: Redline Boundary and approximate measurements locations



3.3. METEROLOGICAL CONDITIONS

3.3.1. A Davis Vantage Vue Weather Station was installed at ML1. The weather conditions were measured for the duration of the survey and are deemed representative of the weather conditions observed at the Site.

3.3.2. The weather conditions over the full measurement period were varied. Noise measurements recorded during dry conditions with wind speeds lower than or equal to 5 m/s were included for analysis and all other data was omitted. The temperature during the measurement period ranged from 6.1°C to 18.9°C.

3.4. EQUIPMENT

3.4.1. Table 1 provides a summary of Class 1 specification noise measuring equipment used to carry out the sound survey. The installation and collection of equipment was carried out by Jason Bradshaw, AMIOA.

Table 1: Survey Equipment Details

Measurement position	Equipment Description	Manufacturer & Type No.	Serial No.
ML1	Sound Level Meter	01dB-METRAVIB Black Solo 'Datalogging Integrating Sound Level Meter'	65811
	Pre-amplifier	01dB-Metravib PRE 21 S	16554
	Microphone	01dB Metravib MCE 212 Microphone	166394
	Calibrator	01dB-Stell Cal 21	34634224
ML2, ML3 & ML4	Sound Level Meter	Rion NL-32 Sound Level Meter	00451284
	Pre-amplifier	NH21 Preamplifier	15277
	Microphone	UC-53A Microphone	311836
	Calibrator	01dB-Stell Cal 21	34134165

3.4.2. Each of the measurement systems had been laboratory calibrated to traceable standards within the previous 24 months, with their dedicated handheld calibrators within the previous 12 months. Each system was calibrated on site using its handheld calibrator, at the beginning and end of measurements and no significant measurement drifts arose.

3.4.3. Each measurement system was installed with the microphone having a factory fit wind shield.

3.5. MEASUREMENT RESULTS

3.5.1. Table 2 presents a summary of the measured sound levels at MP1 to MP4. Full details of the obtained measurement results, including histograms showing the distribution of the sound pressure levels recorded during the surveys, are included in **Appendix B**.

Table 2: Baseline Sound Survey Results

Measurement Location	Measurement Period	Logarithmic Average $L_{Aeq,T}$	Range of $L_{Aeq,T}$	Range of $L_{A90,T}$	Typical Background Sound Level $L_{A90,T}$
ML1	Weekday Daytime	55	47-58	39-55	50
	Weekday Night-time	50	32-58	22-53	48
	Weekend Daytime	53	44-57	33-53	47
	Weekend Night-time	49	46-52	24-47	44
ML2	Daytime	64	62-65	-	-
ML3	Daytime	65	65-66	-	-
ML4	Daytime	54	54-55	-	-

4. BS 4142 DESIGN CRITERIA

4.1.1. Noise emission criteria for the operational phase fixed plant and activities associated with the Proposed Development could be incorporated into an appropriately worded planning condition thereby ensuring subsequent compliance and an appropriate means of control.

4.1.2. The baseline measurements at ML1 are considered to be representative of the nearest residential receptors on Goat Mill Road and Mount View. The representative background sound levels established at ML1 and presented in Table 2 have been used to set noise emission criteria for the Proposed Development. The noise emission criteria has been set equal to the background noise level. This is in line with the guidance BS 4142, which states that "*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*".

4.1.3. The noise emission criteria are set out in Table 3. The criteria have been set in terms of the Rating Level ($L_{Ar,Tr}$). This is the noise emission criteria after applying any acoustic character corrections.

Table 3 - Receptor Noise Limits for Proposed Fixed Plant, dB

Period	Cumulative Plant Noise Emission Limit (BS 4142 Rating Level)
Weekday Daytime (07:00 – 23:00)	50 dB $L_{Ar,1hour}$
Weekend Daytime (07:00 – 23:00)	48 dB $L_{Ar,1hour}$
Weekday Night-time (23:00 – 07:00)	47 dB $L_{Ar,15min}$
Weekend Night-time (23:00 – 07:00)	44 dB $L_{Ar,15min}$

4.1.4. The above criteria apply to the cumulative noise emission from all fixed plant at the receptor location. Based on BS 4142, the noise emission criteria are proposed to be achieved at 1 metre from the nearest noise sensitive residential window with all plant associated with the Proposed Development operating simultaneously and at design duty.

5. CONCLUSION

5.1.1. WSP has been commissioned by Merthyr Tydfil County Borough Council to undertake an environmental sound survey at locations representative of the nearest noise sensitive receptors (NSRs) surrounding the Goatmill Road Development Site.

5.1.2. There is a potential for operational phase fixed plant and activities associated with the Proposed Development to generate noise at the NSRs surrounding the Site. The report includes the determination of appropriate noise emission criteria for the control of noise associated with the operational phase fixed plant and activities associated with the Proposed Development. These limits have been set based on the results of the baseline noise survey, at a level sufficiently low that significant effects are not expected to arise. Compliance with the noise emission criteria could be ensured with the use of an appropriate planning condition.

5.1.3. Limitations to this report are presented in Appendix C.

Appendix A

ACOUSTIC TERMINOLOGY

GLOSSARY OF TECHNICAL TERMS

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurements, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc, according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

Typical sound levels found in the environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	**Threshold of pain**

Terminology Relating to Noise

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10-6 Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. LMax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Fast/Slow Time Weighting	Averaging times used in sound level meters.

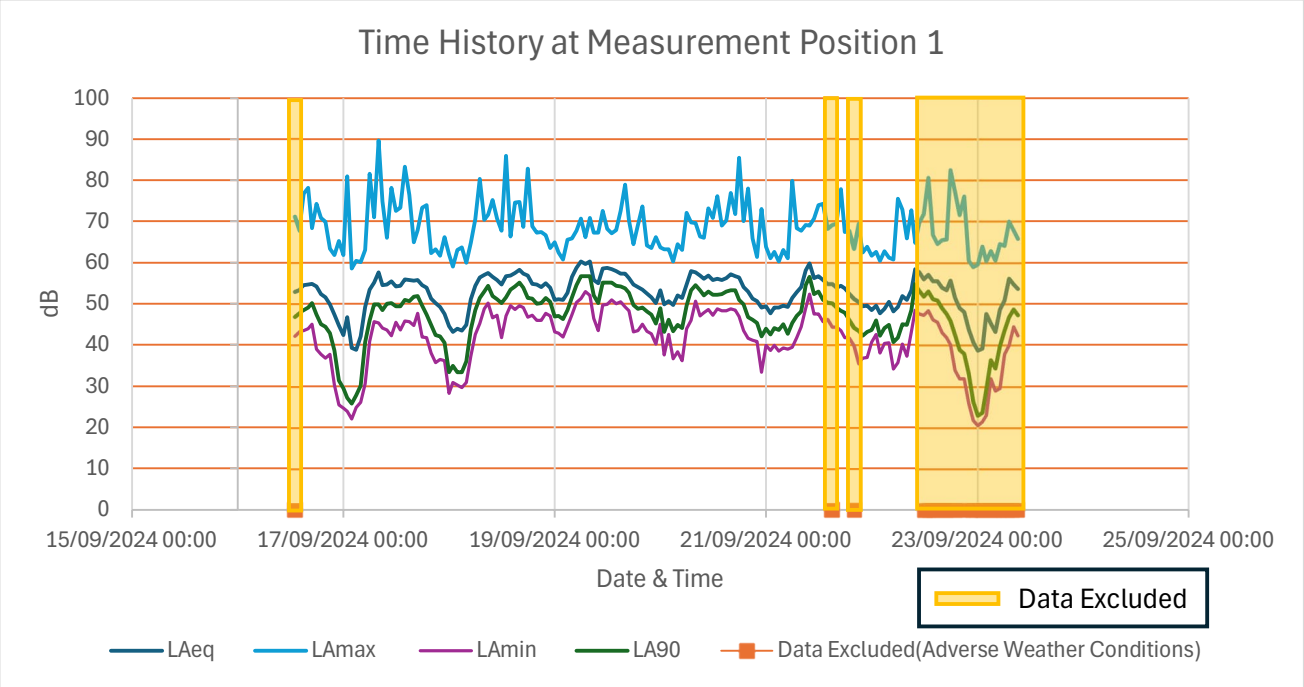
Appendix B

SUMMARY OF THE SOUND SURVEY RESULTS

Public

ATTENDED MEASUREMENTS AT ML1

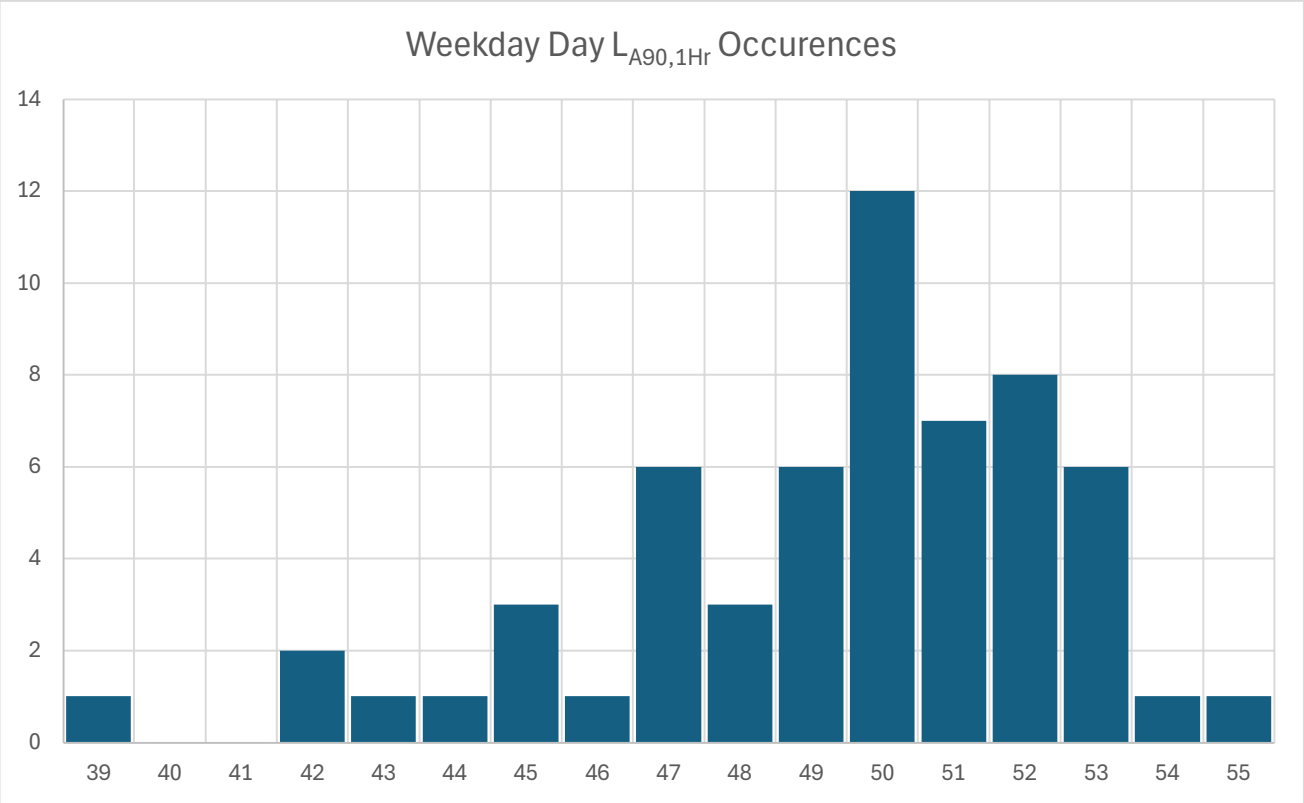
Figure B1: Time History of Noise Levels at ML1 Showing L_{Aeq}, L_{Amax}, L_{Amin} and L_{A90}



Background sound level data analysis

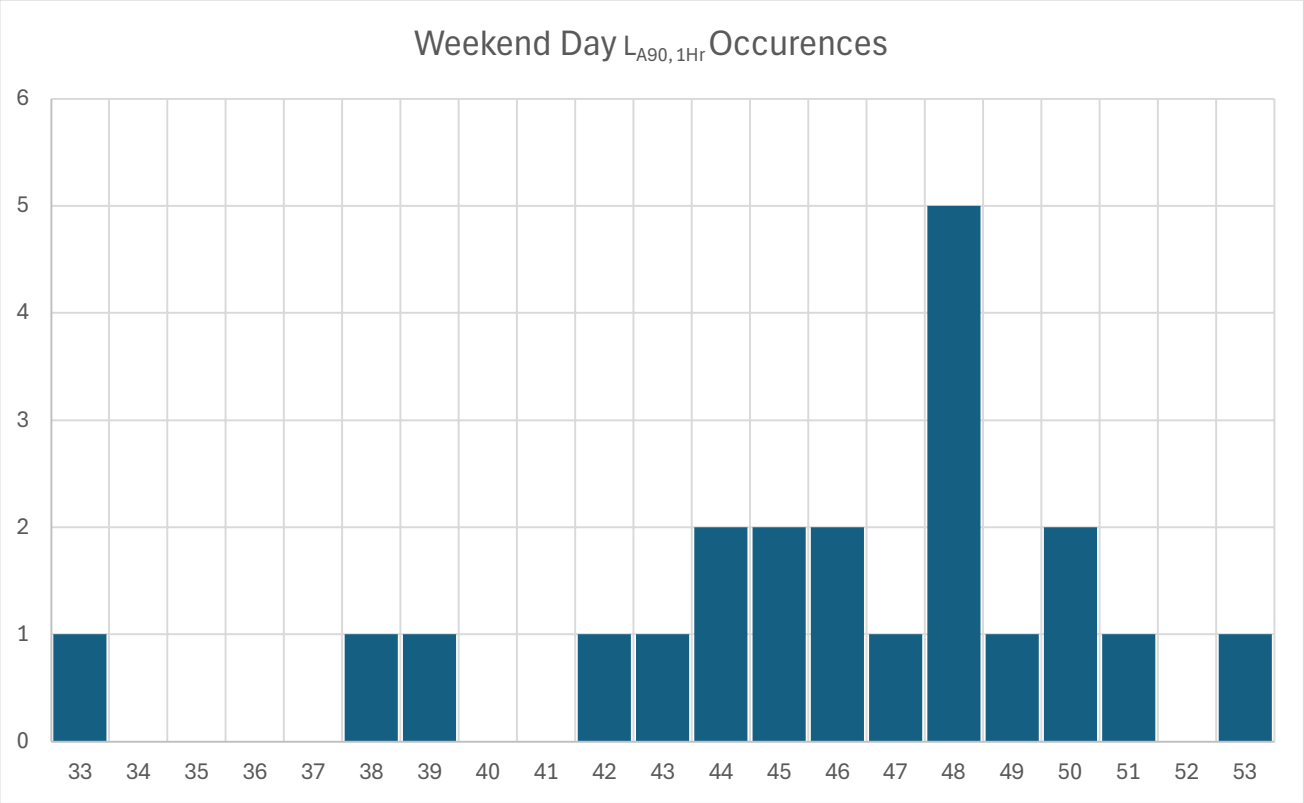
5.1.4. The measured noise levels have been analysed to determine the day and night-time background sound level. The methodology used follows the statistical approach presented in 4142:2014+A1:2019 *'Methods for Rating and Assessing Industrial and Commercial Sound'*. The measured levels in conjunction with the spread of noise levels, are used to determine the representative background sound level. Histogram charts showing the spread of the background noise levels over the measurement period are shown in **Error! Reference source not found.**

Figure B1: ML1 Weekday Daytime (07:00 – 23:00) $L_{A90,1Hr}$ Histogram



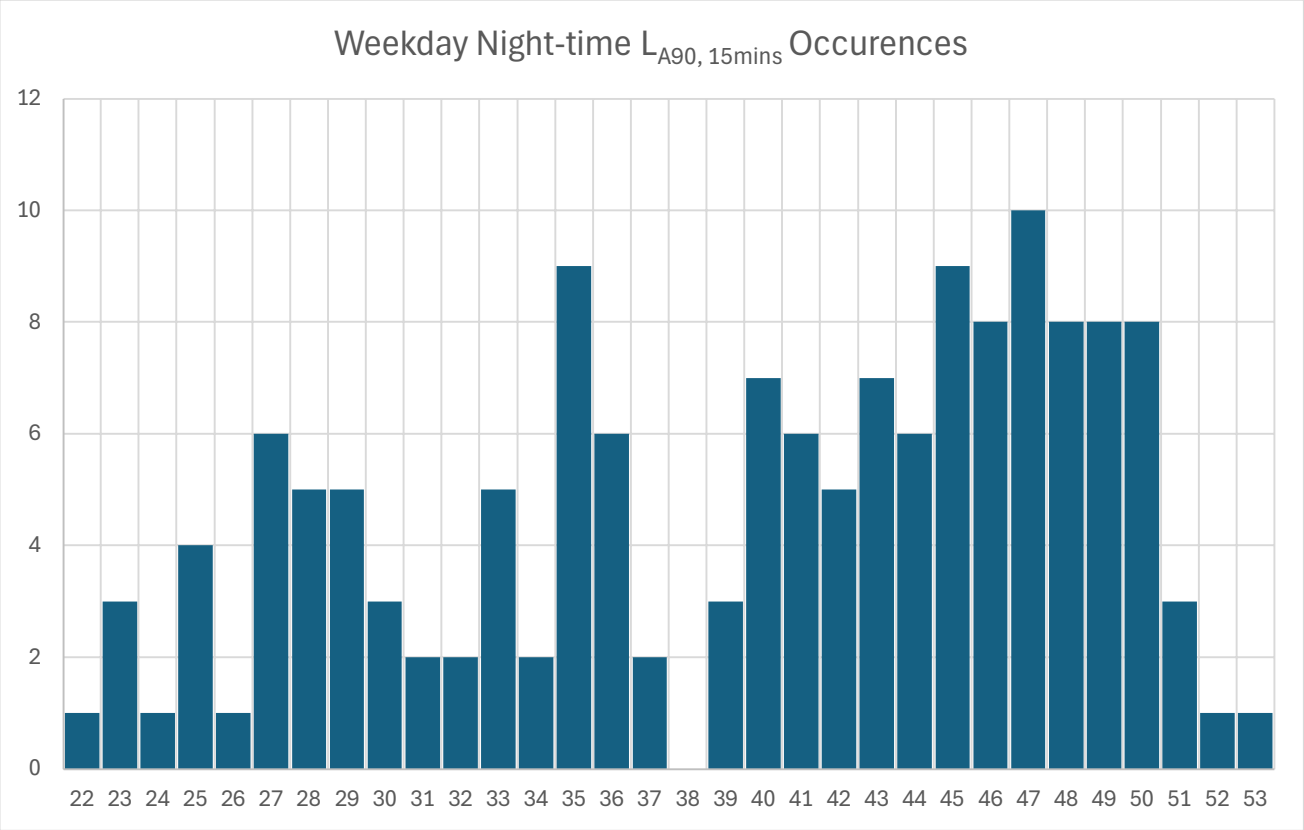
As seen in Figure B1, 50 dB $L_{A90,1Hr}$ is the most commonly occurring weekday daytime background sound level at ML1 for the duration of the survey period. Therefore, this is considered as the representative of the weekday daytime background sound level for this assessment.

Figure B2: ML1 Weekend Daytime (07:00 – 23:00) L_{A90},1Hr Histogram



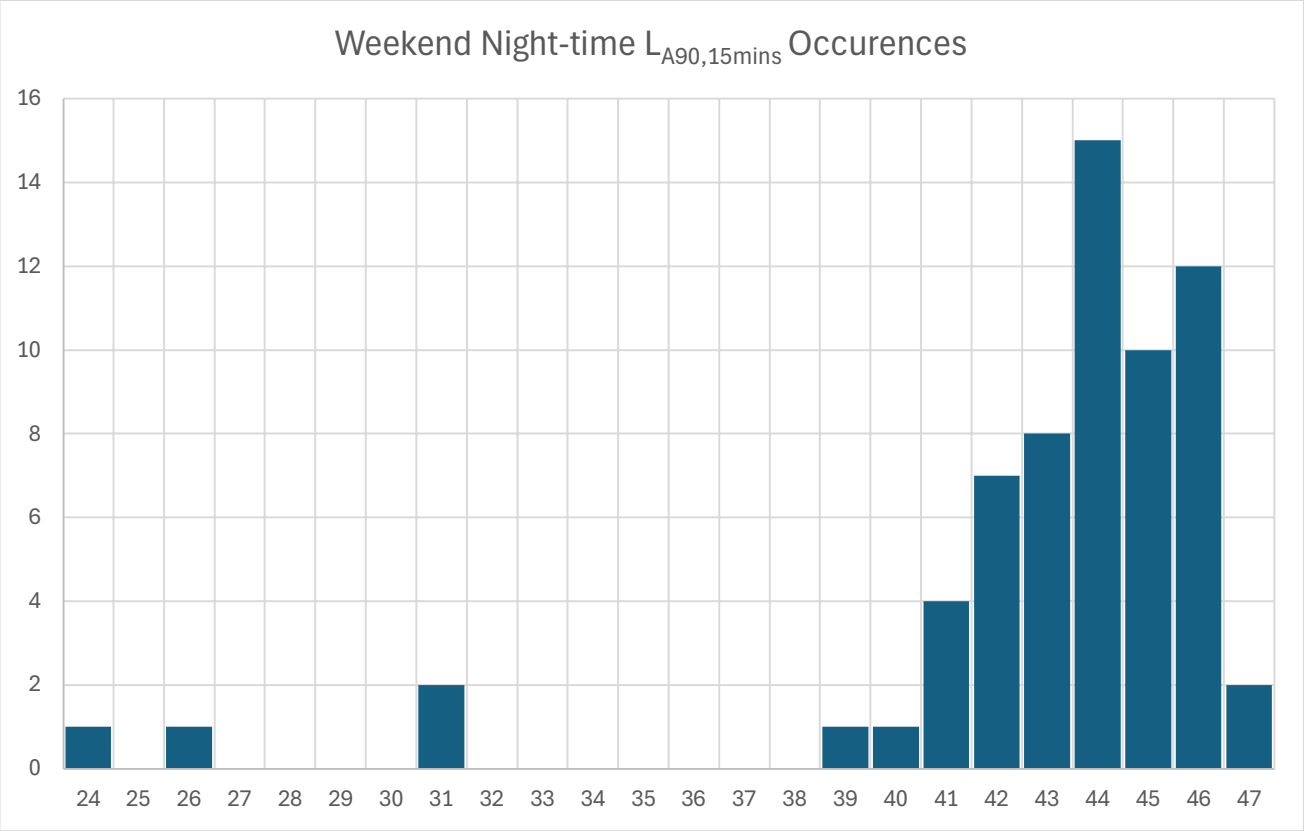
As seen in Figure B2, 48 dB L_{A90},1Hr is the most commonly occurring weekend daytime background sound level at ML1 for the duration of the survey period. Therefore, this is considered as the representative of the weekday daytime background sound level for this assessment.

Figure B3: MP1 Weekday Night-time (23:00 – 07:00) $L_{A90,15mins}$ Histogram



As seen in Figure B3**Error! Reference source not found.**, 47 dB $L_{A90,15mins}$ is the most commonly occurring weekday night-time background sound level at MP1 for the duration of the survey period. Therefore, this is considered as the representative of the weekday night-time background sound level for this assessment.

FigureB4: MP1 Weekend Night-time (23:00 – 07:00) $L_{A90,15mins}$ Histogram



As seen in Figure**Error! Reference source not found.**, 44 dB $L_{A90,15mins}$ is the most commonly occurring weekend night-time background sound level at MP1 for the duration of the survey period. Therefore, this is considered as the representative of the weekdend night-time background sound level for this assessment.

UNATTENDED MEASUREMENTS AT ML2, ML3 AND ML4

Table 4: Noise Measurement Summary for ML2

Date	Start Time	End Time	$L_{Aeq, T}$
16-09-2024	13:47	14:07	65
16-09-2024	14:12	14:32	62
16-09-2024	15:37	15:57	65
24-09-2024	12:37	12:57	63
24-09-2024	13:50	14:10	62
24-09-2024	14:12	14:32	63

Table 5: Noise Measurement Summary for ML3

Date	Start	End	$L_{Aeq, T}$
16-09-2024	13:15	13:35	65
16-09-2024	14:42	15:02	65
16-09-2024	15:08	15:28	66
17-09-2024	12:37	12:57	65
17-09-2024	13:30	13:50	65
17-09-2024	14:30	14:50	65

Table 6: Noise Measurement Summary for ML4

Date	Start	End	$L_{Aeq, T}$
17-09-2024	12:13	12:33	54
17-09-2024	13:00	13:20	54
17-09-2024	14:00	14:20	55
24-09-2024	12:10	12:30	54
24-09-2024	13:26	13:46	54
24-09-2024	14:38	14:58	55

Appendix C

LIMITATIONS

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorisation of WSP. WSP accepts no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/or WSP and agree to indemnify WSP for any and all loss or damage resulting therefrom. WSP accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned.

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