Noise Impact Assessment Thornton Park Manufacturing Facility, Alfreton

Environmental Permit Variation Application

Thorntons Limited

Prepared by:

SLR Consulting Limited

15 Middle Pavement, Nottingham, NG1 7DX

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Revision	Date	Prepared By	Checked By	Authorised By
01	9 December 2024	E. Taylor-Aspinall	M.Dawson	M.Dawson

Basis of Report

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Table of Contents

Tables in Text

Figures in Text

Appendices

1.0 Introduction

Thorntons Limited are seeking to increase production with the introduction of new confectionary products which will be manufactured at their Site located at Thornton Park, Somercotes, Alfreton, Derbyshire, DE55 4XJ.

Due to the potential for the increase in noise levels as a result of the proposed changes, a Noise Impact Assessment has been undertaken to support an application to vary the site's Permit.

It is understood that the production increase will include the installation of some low noise manufacturing plant within the existing buildings. It is SLR's understanding that breakout noise from these plant items would be negligible and would not require assessment. The assessment has therefore focus on the potential impacts of additional HGV movements.

This Report has been completed by Michelle Dawson who is a Corporate Member of the Institute of Acoustics (MIOA).

1.1 Report Structure

This Report presents:

- A description of the Site.
- A description of applicable guidance.
- An operational noise survey to determine the sound level at the boundary of the Site.
- A noise model to determine the potential noise levels arising from additional HGV movements.
- A comparison and a cumulative assessment of the measured boundary operational noise levels with the predicted noise from the additional HGV movements.
- A discussion on the change in operational noise level at the boundary arising from additional HGV movements.

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in **Appendix A**.

2.0 Site Description

2.1 Existing Site

The position of the Site in the context of the surrounding area can be seen in Figure 2-1: S.

Figure 2-1: Site Location

2.2 Proposals

It is understood that Thorntons seek to undertake the following additional production activities at the Site:

- The production of Nutella (chocolate spread). This will include:
  - The installation of a new production line dedicated to Nutella manufacture.
- Ferrero Collection Experience (FCE) production. The production of this confectionary range will include:
  - the installation of a new preparation area within the existing manufacturing building; and

As stated previously, the installation of some low noise plant will be within the existing buildings. Therefore noise breakout noise from these plant items would be negligible and have not been assessed.

From a noise perspective, an assessment of additional HGV movements has been undertaken. There are currently an average of 15 HGV movements a day at the Site. The

variations across the Site will add an additional 4 HGV movements per hour whilst HGV routes throughthe Site will remain the same. It is understood movements will occur during daytime hours only.

3.0 Scope and Guidance

3.1 Calculating Noise from HGV Movements

3.1.1 Calculation of Road Traffic Noise

The former Department of Transport and Welsh Office memorandum Calculation of Road Traffic Noise (CRTN) published in 1988, sets out the UK standard methods and procedures to predict and measure road traffic noise. These procedures were primarily intended to enable entitlement under the Noise Insulation Regulations, but they also provide guidance appropriate to the calculation of traffic noise for more general applications, for example the HGV route under assessment in this chapter.

In the UK, road traffic noise is predicted and measured in terms of a statistical measure, equivalent to the 10th percentile. Termed the L_{A10}, this measure of noise is equivalent to the noise level exceeded for 10% of the measurement period. Most legislation that refers to road traffic noise uses this noise index over an 18-hour period, from 06:00 hours to 00:00 hours.

However, in this assessment, the methodology presented in CRTN cannot be used as the standard states that the calculation algorithms presented in the guidance are not reliable when traffic flows are less than 50 movements per hour.

Therefore, the haul route methodology presented in BS5228-1:2009+A1:2014 will be used when predicting noise levels from HGVs associated with the Site.

3.1.2 BS5228-1:2009+A1:2014

BS5228-1:2009+A1:2014 sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities, such as the movement of HGVs on a haul route.

The haul route methodology is detailed in section F.2.5 of the Standard. It states in section F.2.5.1 that:

"The prediction of $L_{Aeq,\ T}$ from mobile plant using a regular route can be used when items of mobile plant pass at a known rate per hour".

The general expression for predicting the noise from the HGVs on a haul route is as follows:

$$L_{Aeq,\ T} = L_{WA} - 33 + 10\text{Log}_{10}Q - 10\text{Log}_{10}V - 10\text{Log}_{10}d$$

Where:

L_{WA} is the sound power level of the plant, in decibels (dB);

Q is the number of vehicles per hour;

V is the average vehicle speed, in kilometres per hour (km/h); and

d is the distance of receiving position from the centre of haul road, in metres (m).

The calculated noise level is then corrected to account for reflected sound, the angle of view, and the percentage on time.

The L_{WA} will be determined from measurement of HGV movements at at the Site. This is detailed further in Section 6.

3.2 Proposed Assessment Approach

The assessment will focus on the potential impacts of additional HGV movements with the following assessment completed:

- The change in noise level as a result of the additional HGVS.
- The absolute level with the additional HGV movements.

The approach to these assessments is detailed below.

3.3 Change in Noise Level

The additional HGV movements may increase the ambient noise level. To determine the impact of any change in the ambient noise level, the *IEMA Guidelines For Environmental Noise Impact Assessment Section 7: Assessment* will be used. Table 7-14 of the IEMA Guidelines details the impact from change in sound levels, and is replicated in Table 3-1.

Table 3-1: **Change in Noise Level Noise Impact**

Long-term Impact Classification	Short-term Impact Classification	Sound level change dB L_{pAeqT} (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
Negligible	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major	Major	≥ 10 dB

3.4 The Absolute Noise Level

The World Health Organisation *Guidelines for Community Noise* (WHO 1999), *Night Noise Guidelines for Europe* (WHO, 2009), and *Environmental Noise Guidelines for the European Region* document (WHO, 2018), recommend guideline noise levels regardless of the current noise environment. The documents suggest suitable noise levels for both indoor and outdoor living areas during daytime and night-time periods, and these levels are set regardless of the noise type or noise source, i.e. 'benchmark' levels. It advises on the minimum levels of noise before critical health effects, including annoyance, occur.

Of relevance to this Report, the WHO guidelines recommend the following noise limits:

- An indoor ambient daytime noise level in a habitable room of 35 dB $L_{Aeq,16hr}$.
- An external ambient daytime noise level in outdoor living areas of 50 – 55 dB $L_{Aeq,16hr}$.

The limits to be referred to in this assessment are summarised in Table 3-2.

Table 3-2: **Absolute Noise Limits**

Daytime External Ambient Limit	Daytime Internal Ambient Limit
55 dB(A)	35 dB(A)

The additional HGV movements may increase the ambient noise level to a level above an absolute noise level that is considered acceptable. In this assessment the following absolute limits will be referred to:

- Daytime: External limit of 55 dB(A).
- Daytime: Internal limit of 35 dB(A).

The impact scale to be used in this assessment is shown in Table 3-3[1].

Table 3-3: Absolute Noise Limits

Noise Impact	**$L_{Aeq,T}$ dB Noise Change**
None	No increase in the absolute noise level, or the existing absolute noise level increases but is equal to or less than the guideline value
Minor	The existing absolute noise level is above the guideline value and increases by between 0.1 and 2.9dB(A)
Moderate	The existing absolute noise level is above the guideline value and increases by between 3.0 and 4.9dB(A)
Major	The existing absolute noise level is above the guideline value and increases by 5.0+dB(A)

[1] Adapted from Table 7-12 of the IEMA guidelines

4.0 Existing Operational Noise Levels

4.1 Survey Date

To further inform this assessment, SLR completed a noise survey in at 4 locations around the site. The survey was undertaken between Thursday 17th October and Tuesday 22nd October 2024. During the survey, the Site was operational.

4.2 Weather Conditions

During the survey, weather conditions were reported as generally dry, with temperatures ranging from 17°C to 6°C. Rainfall was observed between 03:00 and 09:15 on Friday 18th October, and from 08:30 – 13:45 on Saturday 19th October. High wind speeds were recorded from 07:00 on Saturday 19th October to 06:45 on Sunday 20th October, and again between 10:15 and 14:45 on Sunday 20th October. Any extraneous data was therefore removed from the dataset.

Full details of the weather conditions during the survey are given in **Appendix B**.

4.3 Equipment

The noise survey equipment used during the survey is detailed in Table 4-1. All measurement instrumentation was calibrated before and after the measurements. No significant drift was observed. The calibration chain is traceable via the United Kingdom Accreditation Service to National Standards held at the National Physical Laboratory.

Table 4-1 Monitoring Equipment

Location	Description	Manufacturer	Type	Serial Number
1	Sound Level Meter	Cirrus	CR:171B	G400059
	Pre-Amplifier	Cirrus	MV:200F	12872F
	½" Pre-Polarised Microphone	Cirrus	MK:224	216587D
	Calibrator	Cirrus	CR:515	99960
	Outdoor kit	Cirrus	MK172	2546
2	Sound Level Meter	Cirrus	CR:171B	G300561
	Pre-Amplifier	Cirrus	MV:200F	11887F
	½" Pre-Polarised Microphone	Cirrus	MK:224	217658A
	Calibrator	2023-08-18	CR:515	87922
	Outdoor kit	Cirrus	MK172	2312
3	Sound Level Meter	Cirrus	CR:171B	G302667
	Pre-Amplifier	Cirrus	MV:200F	11288F
	½" Pre-Polarised Microphone	Cirrus	MK:224	217661A
	Calibrator	Cirrus	CR:515	94806
	Outdoor kit	Cirrus	MK172	o957
4	Sound Level Meter	RION	NL-52	331823

Location	Description	Manufacturer	Type	Serial Number
	Pre-Amplifier	RION	NH-25	21774
	½" Pre-Polarised Microphone	RION	UC-59	18250
	Calibrator	RION	NC-74	34336013
	Outdoor kit	N/A	N/A	N/A

4.4 Survey Locations

Sound levels were measured at four locations surrounding the existing site, situated to the north, east, west, and southeast, as illustrated in Figure 4-1.

Figure 4-1: Boundary Monitoring Locations

At each monitoring location, the microphone was placed 1.5 m above the local ground level in free-field conditions, i.e. at least 3.5 m from the nearest vertical reflecting surface, with the following noise level indices being recorded:

- $L_{Aeq,T}$ – The A-weighted equivalent continuous noise level over the measurement period.
- $L_{A90,T}$ – The A-weighted noise level exceeded for 90 % of the measurement period.
- $L_{A10,T}$ – The A-weighted noise level exceeded for 10 % of the measurement period.
- L_{AFmax} – The maximum A-weighted noise level during the measurement period.

The full survey results can be seen in **Appendix C** of this Report. Photographs of the meter set up can be seen in **Appendix D.**

4.5 Soundscape

At Location 1, the soundscape was dominated by noise from the Site, particularly the chiller to the north. Occasional banging was also audible. Distant road traffic noise from the A38 was audible but low. It should be noted that grass-cutting and leaf-blowing activities were recorded between 07:45 and 10:45 on Friday 18th October. This period has therefore been removed from the dataset.

Location 2 was also dominated by the various plant adjacent to the sound level meter. The external chiller was the dominant noise source. Distant road traffic noise from the A38 was also audible.

At Location 3, the soundscape was dominated by plant associated with the Site. In particular, a chiller to the south was the dominant noise source. HGV movements were also occasionally audible. Distant road traffic noise from the A38 and birdsong were also noted.

At Location 4, various plant from the Site was audible in the distance. HGV movements were generally the dominant noise source, accompanied by reverse bleepers. Other notable noise sources included the rustling of vegetation and birdsong. The A38 was audible in the absence of other noise sources.

4.6 Onsite Sound Level Results

A summary of the measured baseline noise levels used in the assessment are shown in Table 4-2. The full survey results can be seen in **Appendix C** of this Report.

At each location, the lowest 15-minute ambient noise level (L_{Aeq}) has been used to determine the noise environment during the '*quieter*' period, and the highest 15-minute ambient noise level (L_{Aeq}) has been used to determine the noise environment during the '*noisier*' period. The corresponding L_{A90}, L_{A10}, and L_{Amax} values have then been used.

Table 4-2: Summary of Measured Noise Levels dB

Location	Period		$L_{Aeq,T}$	L_{AFmax}	L_{A10}	L_{A90}
	Period	**Designation**				
1	Mon to Fri 07:00 – 23:00	Quietest	49.8	53.6	50.5	49.0
		Noisiest	61.8	75.9	65.6	49.8
	Mon to Fri 23:00 – 07:00	Quietest	48.7	54.5	49.4	47.9
		Noisiest	54.3	75.4	55.0	51.1
	Saturday 07:00 – 23:00	Quietest	50.4	56.7	51.6	49.2
		Noisiest	56.9	76.1	54.8	52.2
	Saturday 23:00 – 07:00	Quietest	48.7	50.7	49.2	48.0
		Noisiest	50.4	53.8	51.0	49.5
2	Mon to Fri 07:00 – 23:00	Quietest	51.4	55.9	52.3	50.2
		Noisiest	64.2	85.6	58.8	55.4
	Mon to Fri 23:00 – 07:00	Quietest	50.5	56.1	51.9	48.9
		Noisiest	59.6	63.6	60.8	58.1
	Saturday 07:00 – 23:00	Quietest	51.7	64.0	53.0	50.1
		Noisiest	58.3	70.2	60.1	56.1
	Saturday 23:00 – 07:00	Quietest	51.0	56.0	51.4	49.9
		Noisiest	53.8	59.9	55.5	51.7
3	Mon to Fri 07:00 – 23:00	Quietest	50.0	62.7	51.8	47.7
		Noisiest	60.6	82.6	54.3	51.4
	Mon to Fri 23:00 – 07:00	Quietest	47.8	54.6	49.7	44.9
		Noisiest	56.8	63.6	57.9	55.2
	Saturday 07:00 – 23:00	Quietest	49.7	56.0	51.4	47.6
		Noisiest	54.8	72.4	54.3	49.9
	Saturday 23:00 – 07:00	Quietest	48.4	59.1	50.1	46.4
		Noisiest	50.8	63.9	52.0	48.9
4	Mon to Fri 07:00 – 23:00	Quietest	42.2	52.2	43.6	40.7
		Noisiest	62.0	83.5	56.1	45.8
	Mon to Fri 23:00 – 07:00	Quietest	39.8	48.5	42.1	37.3
		Noisiest	59.9	71.3	62.6	53.1
	Saturday 07:00 – 23:00	Quietest	42.2	54.3	43.2	40.1
		Noisiest	54.1	74.0	50.7	45.2
	Saturday 23:00 – 07:00	Quietest	38.7	44.4	40.3	36.7
		Noisiest	46.0	64.1	47.1	44.7

5.0 Proposed Variation Noise Levels

The variation is to effect the following changes:

- Additional HGV movements. There are currently an average of 15 HGV movements a day at the Site. The variations across the Site will add an additional 4 HGV movements per hour whilst HGV routes through the Site will remain the same. It is understood movements will occur during daytime hours only.

The main sources of noise are detailed below.

5.1 Noise Sources

Details of the on-Site HGV movements are as follows:

- Height 1m.
- Moving point source.
- Speed 15mph.
- Additional Daytime 1-hour movements = 4[2].
- Sound Power 93dB(A)[3].

5.2 Noise Model Parameters

The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA, which implements the full range of UK noise-based calculation methods. The calculation algorithms set out in BS5228:2009+A1:2014have been used and the model assumes:

- A ground absorption factor of 0.5.
- Contour Data to include LIDAR terrain data.
- A daytime reciever height of 1.5m.
- A reflection factor of 3.

[2] Based upon 4 additional movements per hour

[3] Sound Power level of HGV at 15mph measured by SLR in Runcorn.

6.0 Ambient Noise Level Assessment

In order to determine the contribution from additional HGV movements, the calculated ambient noise level of additional HGV movements at the boundary monitoring locations (identified in Figure 4-1) is shown in Table 6-1.

Table 6-1: Ambient Noise Level of Additional HGVs – dB $L_{Aeq,1hr}$

Monitoring Location	Ambient Noise Level from 4 Movements in One Hour
Location 1	16
Location 2	37
Location 3	32
Location 4	37

6.1 Change in the Ambient Noise Level Assessment

In order to determine the potential increase in the ambient noise level at the boundary locations, it is necessary to logarithmically add the predicted level of the additional HGVs, to the lowest baseline ambient noise level measured at each location during the following two assessment periods:

- The lowest baseline ambient noise level measured between 7am and 11pm Monday to Friday; and
- The lowest baseline ambient noise level measured between 7am and 11pm on a Saturday.

The results of this calculation and the difference between the baseline noise level, the cumulative noise level, and the potential impact at each location, are shown in Table 6-2.

Table 6-2: Change in the Ambient Noise Level

Location	Period	Time	Base $L_{Aeq,T}$ Noise Level	Calculated $L_{Aeq,T}$ of Additional HGVs	Cumulative $L_{Aeq,T}$ Noise Level	Increase in the $L_{Aeq,T}$ Noise Level	Impact
1	Mon - Fri	07:00 – 23:00	50	16	50	0	None
	Saturday	07:00 – 23:00	50	16	50	0	None
2	Mon - Fri	07:00 – 23:00	51	37	51	0	None
	Saturday	07:00 – 23:00	52	37	52	0	None
3	Mon - Fri	07:00 – 23:00	50	32	50	0	None
	Saturday	07:00 – 23:00	50	32	50	0	None
4	Mon - Fri	07:00 – 23:00	42	37	43	1	Minor
	Saturday	07:00 – 23:00	42	37	43	1	Minor

It can be seen from Table 6-2 that:

- The highest change in noise level is just 1.0 dB(A). In accordance with the IEMA *Guidelines for Environmental Noise Impact Assessment* a change in noise level of this low magnitude would not typically be audible outside of laboratory conditions[4], and is therefore considered to be **negligible**.

- Monday to Friday the impact would be None at Locations 1 – 3. This impact is considered to be **negligible**.

- Monday to Friday the impact would be Minor at Location 4. This impact is considered to be **negligible.**
- On Saturdays the impact the impact would be None at Locations 1 – 3. This impact is considered to be **negligible**.
- On Saturdays the impact would be Minor at Location 4. This impact is considered to be **negligible.**

6.2 Absolute (Cumulative) Noise Level Assessment

In order to determine the worst-case cumulative absolute ambient noise level at each location (i.e. the existing noise plus the proposed noise), it is necessary to logarithmically add the calculated ambient sound level of the additional HGVs, to the highest baseline ambient noise level measured during the following two assessment periods:

- The highest baseline ambient noise level measured between 7am and 11pm Monday to Friday; and
- The highest baseline ambient noise level measured between 7am and 11pm on a Saturday.

The cumulative noise level is presented in Table 6.3.

[4] See section 2.7 of the IEMA Guidelines.

Table 6-3: Absolute Noise Level Assessment

Location	Period	Time	Base $L_{Aeq,T}$ Noise Level	Calculated $L_{Aeq,T}$ of Additional HGVs	Cumulative $L_{Aeq,T}$ Noise Level	Increase in the $L_{Aeq,T}$ Noise Level	Impact
1	Mon - Fri	07:00 – 23:00	62	16	62	0	None
	Saturday	07:00 – 23:00	57	16	57	0	None
2	Mon - Fri	07:00 – 23:00	64	37	64	0	None
	Saturday	07:00 – 23:00	58	37	58	0	None
3	Mon - Fri	07:00 – 23:00	61	32	61	0	None
	Saturday	07:00 – 23:00	55	32	55	0	None
4	Mon - Fri	07:00 – 23:00	62	37	62	0	None
	Saturday	07:00 – 23:00	54	37	54	0	None

As can be seen from Table 6-3, baseline noise levels at the monitoring locations already exceed the WHO 55dB daytime external ambient limit with the exception of Location 4 during Saturday daytime. This is due to noise from existing permitted Site operarations and the proposed additional HGV movements will not cause a breach.

The assessment has indicated that in isolation, noise from the additional HGV movements will be below the WHO limit at the surrounding sensitive receptors.

Furthermore, the additional movements will at worst cause a 0dB increase in ambient noise, which is considered to be **negligible**. The impact of the proposed HGVs is therefore not considered to be significant.

7.0 Conclusion

Thorntons Limited has appointed SLR to undertake an assessment of the noise impact of additional HGV movements at their Site located on Thornton Park, Somercotes, Alfreton, Derbyshire, DE55 4XJ.

Due to the potential for the additional HGV movements to increase noise levels in the area, a Noise Impact Assessment has been undertaken to support an application to vary the site's Permit.

This Report has been completed by Michelle Dawson a Corporate Member of the Institute of Acoustics (MIOA).

This Report has presented a change in noise level assessment of the existing HGV movements and a cumulative assessment including the additional HGV movements associated with the permit variation.

The Report has found:

- The increase in noise level at the existing quietest period at each location, will be no more than 1dB(A). This is considered to be **negligible**.
- During the existing noisiest period there will be no increase in the ambient noise level, and the additional HGVs will not cause an exceedance of the WHO external limit of 55 dB(A). This limit is already exceeded at nearly all locations.

Overall, it may be concluded that the proposed additional HGV movements per hour will have at most a Minor Impact at boundary locations, which will have no impact on the closest sensitive receptor locations during the daytime hours.

8.0 Closure

The assessment has required a suitable level of technical ability and has been undertaken by a Suitably Qualified Person (SQP). An individual with all the following credentials has been considered a SQP for this noise assessment:

- Has a minimum of three years' verifiable experience (within the last five years) of providing noise impact assessments. Such experience has clearly demonstrated a practical understanding of factors affecting acoustics in relation to the built environment, including acting in an advisory capacity to provide recommendations and design advice in planning, and;
- Holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

This assessment has been led and managed by a SQP as defined above.

The SQP confirms that the relevant measurements and calculations:

- Represent good industry practice in accordance with available guidance.
- Are appropriate given the development being assessed and scope of works proposed.
- Avoid invalid, biased and exaggerated claims.

The checker and author of this document confirm that they both comply with the definition of a SQP defined in this Section.

Regards,

SLR Consulting Limited

MDawson

M Dawson, BSc. (Hons) MIOA
Technical Director – Acoustics

E Taylor-Aspinall, MGeol. (Hons) AMIOA
Senior Acoustic Consultant

Appendix A Glossary

Noise Impact Assessment Thornton Park Manufacturing Facility, Alfreton

Environmental Permit Variation Application

Thorntons Limited

9 December 2024

A.1 Glossary of Terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A-1 Sound Levels Commonly Found in the Environment

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

Acoustic Terminology

dB (decibel) — The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2x10^{-5}$Pa).

dB(A) — A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

L_{Aeq} — L_{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.

L_{10} & L_{90} — If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

L_{Amax} — L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

Appendix B Weather Data

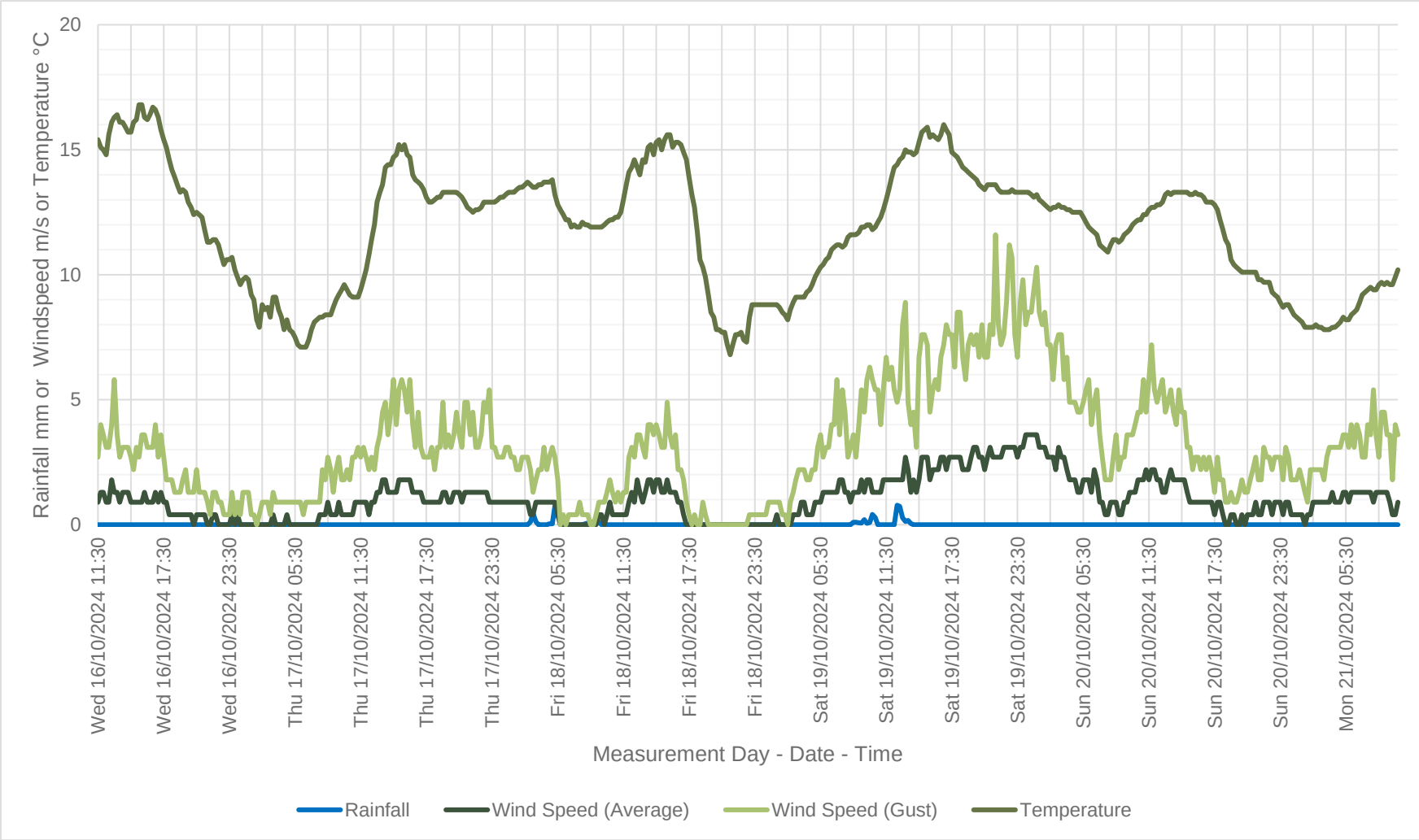
Noise Impact Assessment Thornton Park Manufacturing Facility, Alfreton

Environmental Permit Variation Application

Thorntons Limited

9 December 2024

Figure B-1: Weather Data



Appendix C Survey Summary Results

Noise Impact Assessment Thornton Park Manufacturing Facility, Alfreton

Environmental Permit Variation Application

Thorntons Limited

9 December 2024

Figure C-1: Time History Graph – Location 1, dB

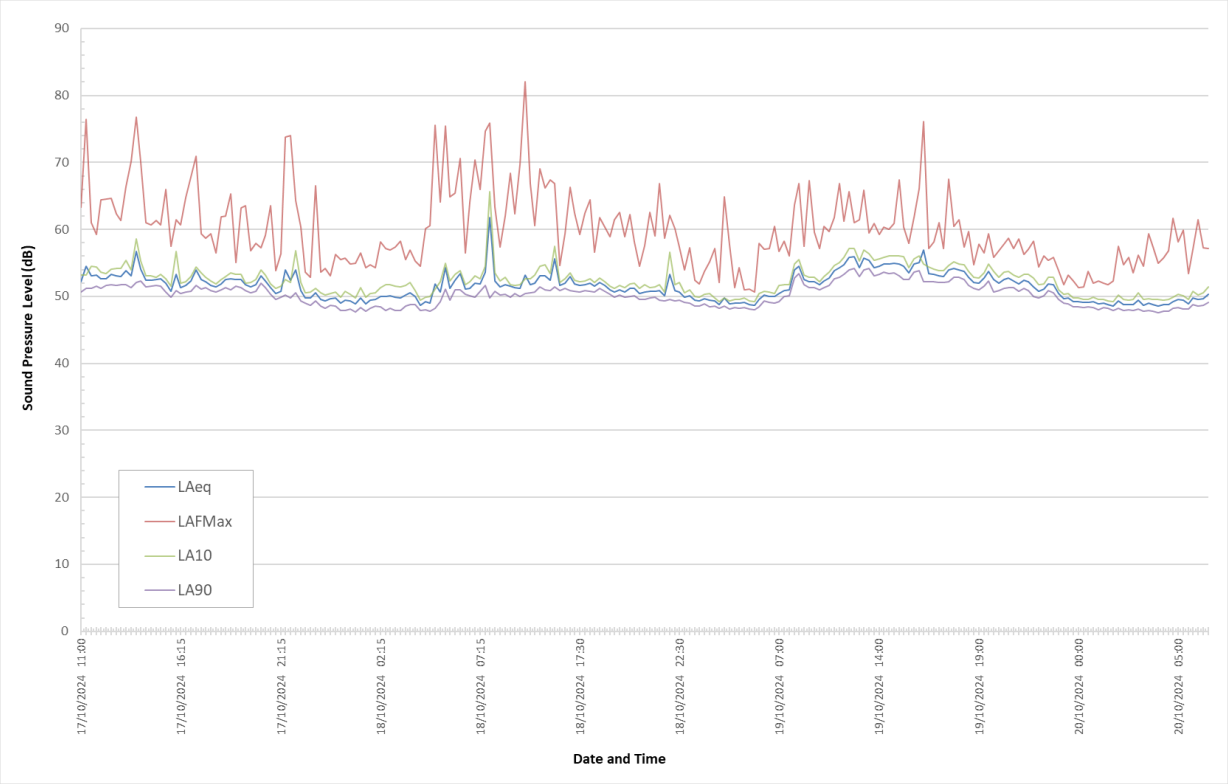


Figure C-2: Time History Graph – Location 2, dB

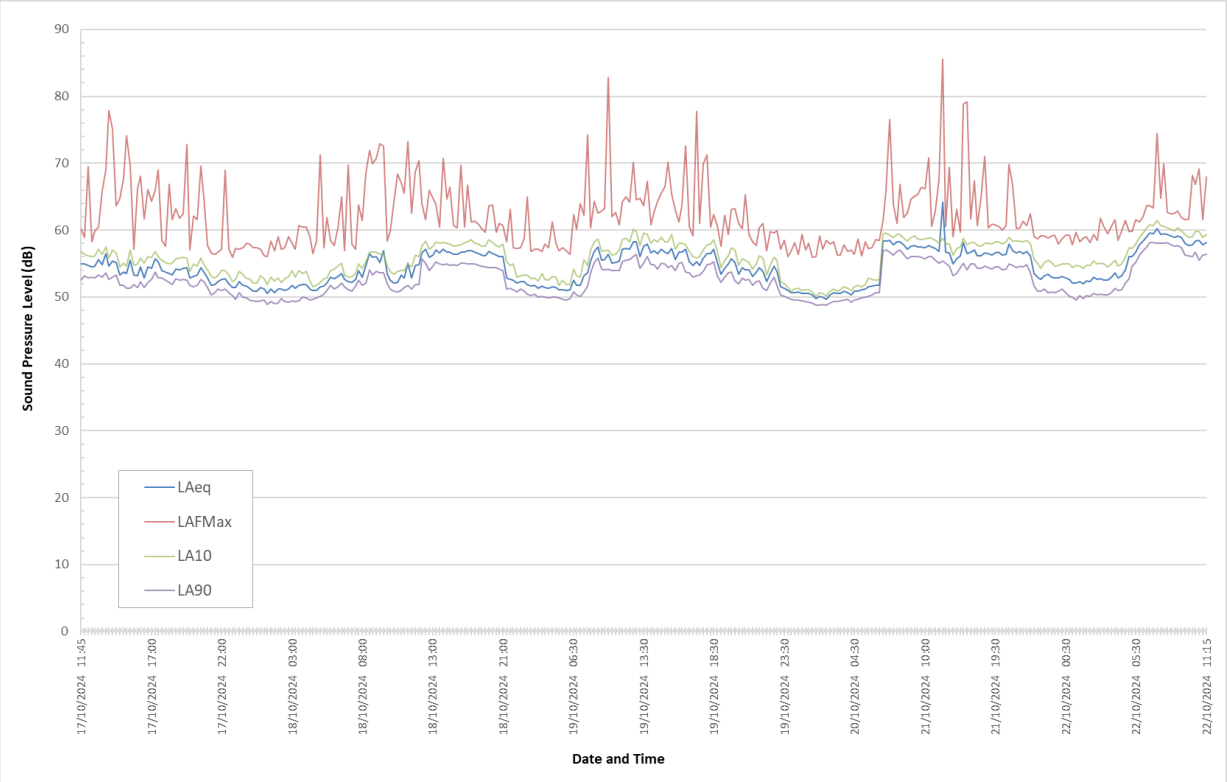


Figure C-3: Time History Graph – Location 3, dB

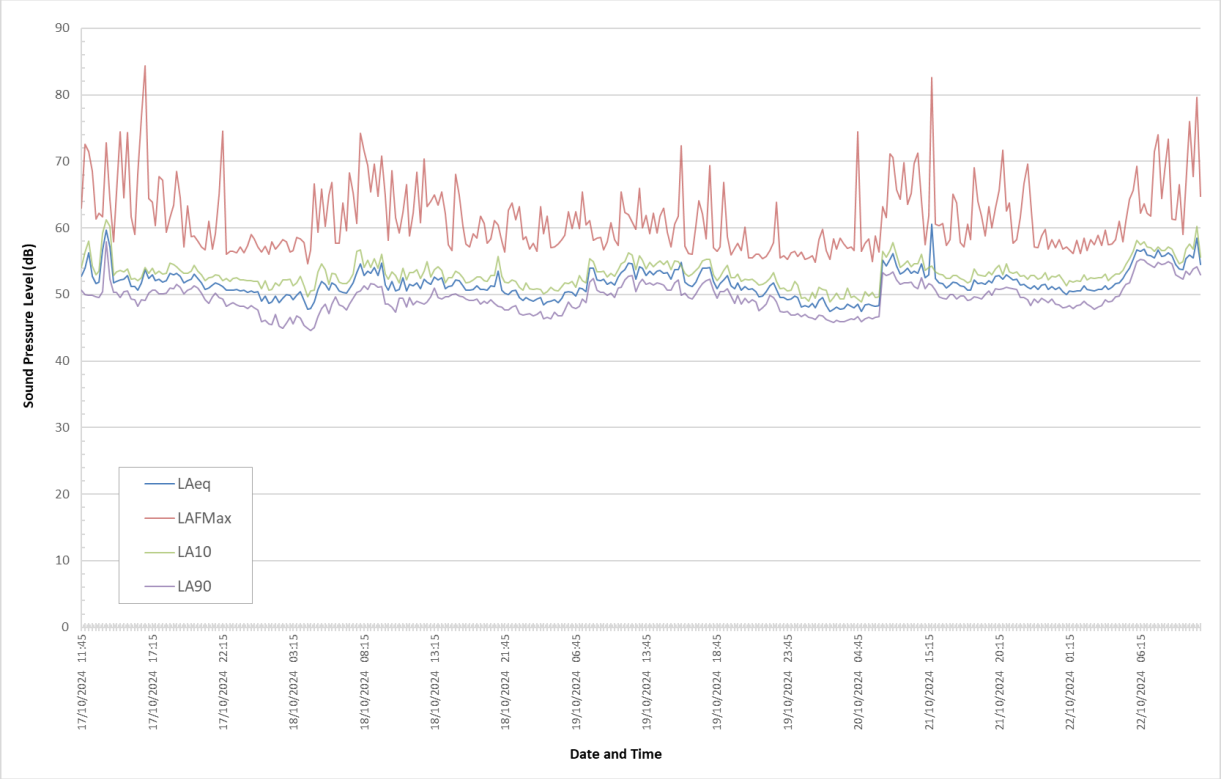
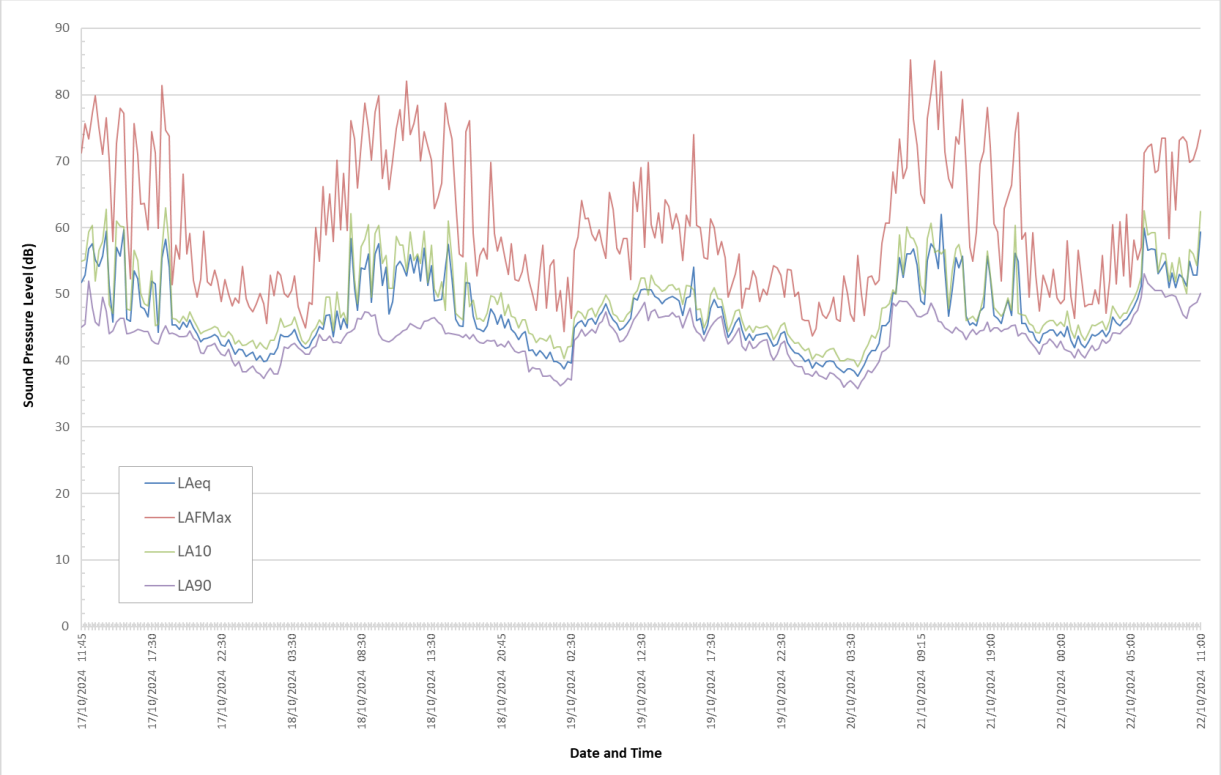


Figure C-4: Time History Graph – Location 4, dB



Appendix D Site Photographs

Noise Impact Assessment Thornton Park Manufacturing Facility, Alfreton

Environmental Permit Variation Application

Thorntons Limited

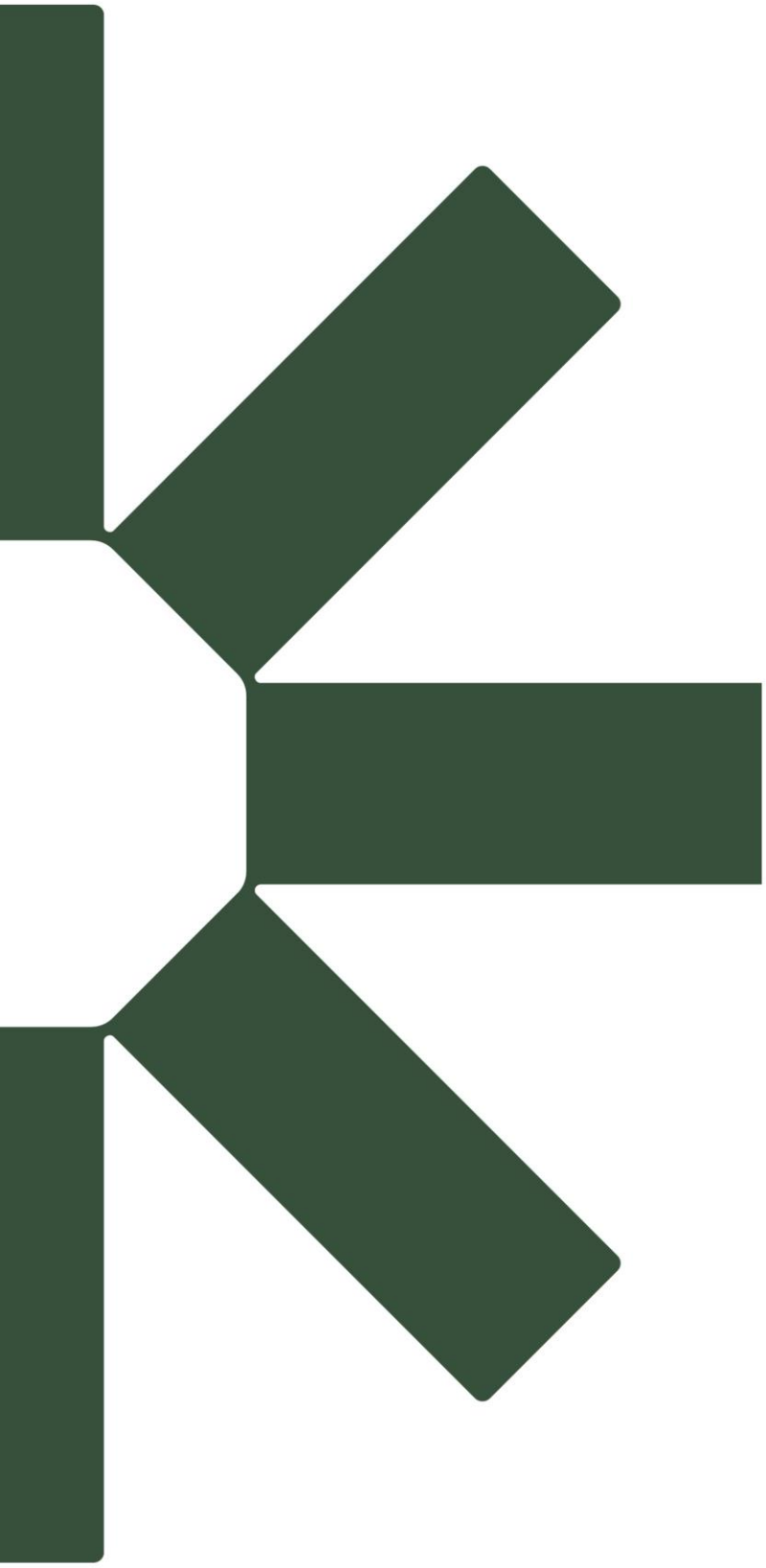
9 December 2024

Figure E-1: Location 1

Figure E-2: Location 2

Figure E-3: Location 3

Figure E-4: Location 4



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