Noise Impact Assessment

Ferrybridge 1 Line 3

For Enfinium

Report Quality Management			
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Assessment/Calculations Quality Management		
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Rev	**Date of Issue**	**Comment**
00	11/07/2025	First issue
01	05/08/2025	Survey co-ordinates

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1 Introduction

1.1 The Acoustics, Noise and Vibration Team at Savills has been appointed by Enfinium to undertake a noise impact assessment in relation to an Environment Agency (EA), 'Environmental Permit' (EP) variation application for bringing forward a third waste processing line (L3) at the existing Ferrybridge 1 'energy from waste' facility (EfW).

1.2 The assessment has been undertaken based upon information on the proposed development provided by the project team and acoustic data for the existing Ferrybridge L1 and L2 EfW based on previously submitted data . The assessment considers potential adverse noise impacts affecting the 'nearest noise sensitive receptors' (NSRs) to the proposed development site. The assessment has been undertaken following a baseline noise survey and desktop assessment.

1.3 The technical content of this assessment has been provided by Savills personnel, all of whom are corporate members, i.e. Member (MIOA) or Fellow (FIOA), or Associate members (AIOMA), of the Institute of Acoustics (IOA), the UK's professional body for those working in acoustics, noise and vibration. The assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the IOA.

1.4 The Team is also a member of the Association of Noise Consultants (ANC) which seeks to raise the standards of acoustic consultancy and improve recognition of the vital role which good acoustics, and the management and mitigation of noise and vibration play in achieving good design and effective planning in the built and natural environment. Membership of the ANC indicates that the Team is sufficiently competent to pass the high standards for entry to the association.

1.5 This report and assessment has been peer reviewed within the Savills team to ensure that it is technically robust and meets the requirements of our Integrated Management System.

1.6 Personnel and individual qualifications are provided within the Quality Management table at the start of this report and in Appendix A in accordance with the requirement of Section 12 of British Standard (BS) 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS 4142) [1].

2 Assessment Methodology

2.1 BS 4142 primarily provides a numerical method by which to determine the significance of sound of a commercial and/or industrial nature, i.e. the 'specific sound', at NSR locations.

2.2 The specific sound level may then be corrected for the character of the sound, if appropriate, and is then termed the 'Rating Level'.

2.3 The commentary to paragraph 9.2 of BS 4142 suggests the following subjective methods for the determination of the rating penalty for tonal, impulsive and/or intermittent specific sounds:

"Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a rating penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level should be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. … If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

2.4 The Rating Level is then compared to the background sound level, which should be representative of the period being assessed.

2.5 An initial estimate of the impact of the specific sound is obtained by subtracting the representative background sound level from the Rating Level.

2.6 Typically, the greater this difference, the greater is the magnitude of the impact:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

2.7 The lower the rating level is relative to the representative 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.

2.8 Whilst there is a relationship between the significance of impacts determined by the method contained within BS 4142 and the significance of effects described in the PPGN, there is not a direct link. It is not appropriate to ascribe numerical rating / background level differences to LOAEL and SOAEL because this fails to consider the context of the sound, which is a key requirement of the Standard.

2.9 The significance of the effect of the noise in question (i.e. whether above or below the SOAEL and LOAEL) should be determined on the basis of the significance of the initial estimate of impact from the BS 4142 assessment with reference to the examples of outcomes described within the PPGN and after having considered the context of the sound at the receptor/s affected.

3 Baseline Noise Description

3.1 Baseline survey details are provided in Appendix B. Table 3.1 below provides a summary of representative baseline sound levels, based on the 25th percentile levels of long term data, used in this assessment.

3.2 It should be noted that while baseline surveys were undertaken in 2024, following analysis of the data, existing F1 operations have not affected measured sound levels. This analysis is provided in Appendix B.

Table 3.1: Representative Baseline Sound Levels

NSRs	Daytime		Night-time	
	dB $L_{Aeq,T}$	dB $L_{A90,T}$	dB $L_{Aeq,T}$	dB $L_{A90,T}$
Residential dwellings on Frystone Lane (inc. Oakland Hill Park Home & Holmfield Farm)[1]	56	54	55	52
Residential dwellings on Polllard's Fields (inc. Castleford Lane)[2]	62	44	54	41
Residential dwellings on Hall Court (inc. Church Street)[3]	41	38	40	38
Notes: 1. Based on LT1 survey data, co-ordinates 53°43′13″N , 001°17′30″W. 2. Based on LT2 survey data, co-ordinates 53°42′50″N , 001°16′40″W. 3. Based on LT3 survey data, co-ordinates 53°43′32″N , 001°16′19″W.				

4 Calculations and Modelling

4.1 In order to calculate specific sound levels associated with operation of the proposed additional L3 as well as the existing L1 and L2 EfW, a 3D sound model has been built using SoundPLAN v9.1 noise modelling software.

4.2 Full details are provided in Appendix C, with a summary of model results provided in Table 4.1 below. Modelled specific sound level for the existing and proposed situation and the difference between the two, are provided as figures at the end of the report.

Table 4.1 Predicted Specific Sound Levels

NSR Location	Floor	Specific Sound level dB $L_{Aeq,Tr}$		
		Existing L1 & L2	L1, L2 & L3	Change
Oakland Hill Park Home Estate	GF	48	48	0
	FF	48	48	0
Holmfield Farm	GF	46	41	-5
	FF	46	41	-5
Polllard's Fields	GF	40	40	0
	FF	42	41	-1
Court Hall	GF	36	37	+1
	FF	37	37	0
Willow Green Academy	GF	38	38	0

5 Assessment

5.1 An initial estimate of impact undertaken in accordance with BS 4142, is shown in Tables 5.1 and 5.2 below for the daytime and night-time periods respectively. Predicted specific sound levels for the day are at ground floor level with night-time level taken at first floor level, all free-field.

5.2 The subjective method for determining rating penalties has been used to determine appropriate corrections for each receptor and assessment period. It is considered that the specific sound from the combined sources of plant will not be characterised as intermittent or impulsive, so no penalties have been applied for intermittency or impulsivity.

5.3 As it is considered that the only source of tonal noise from the proposed development is from the coolers and the contribution from this source to the overall specific sound is negligible (23 dBA), it is most unlikely that noise levels at the nearby NSRs would be perceived or characterised as tonal. As such, no penalties have been applied for tonality or any other features. It should also be noted that at NSRs where specific sound levels are highest residual sound levels are also high due to road traffic noise which would act to mask any potential character.

Table 5.1: BS 4142:2014+A1:2019 Assessment (daytime)

NSR	Background (dB $L_{A90,T}$)	Specific (dB $L_{Aeq,T}$)	Correction (dB)	Rating (dB $L_{Ar,Tr}$)	Difference (dB)
Oakland Hill Park Home	54	48	0	48	-6
Holmfield Farm	54	41	0	41	-13
Polllard's Fields	44	40	0	40	-4
Court Hall	38	37	0	37	-1
Willow Green Academy	44	38	0	38	-6

Table 5.2: BS 4142:2014+A1:2019 Assessment (night-time)

NSR	Background (dB $L_{A90,T}$)	Specific (dB $L_{Aeq,T}$)	Correction (dB)	Rating (dB $L_{Ar,Tr}$)	Difference (dB)
Oakland Hill Park Home	52	48	0	48	-4
Holmfield Farm	52	41	0	41	-11
Polllard's Fields	41	41	0	41	0
Court Hall	38	38	0	38	0

5.4 The results of the initial estimate of impact in Tables 5.1 and 5.2 are described in the following paragraphs.

5.5 During the daytime period, Rating Levels are at least 1 dB below the background sound level at all NSRs. This is at least 6 dB below the level at which an adverse impact may be likely depending on the context and 11 dB below the level at which an adverse impact may be likely depending on the context.

5.6 During the night-time period, the Rating Level is up to equal to the background sound level at the most affected NSRs, the group of properties at receptor location 'Court Hall' and Pollard's Fields'. This is 5 dB below the threshold level at which a moderate impact may result, depending on the context.

5.7 To accord with the guidance contained within BS 4142:2014+A1:2019 and provide a thorough assessment, consideration of the context of the scenario has been undertaken. Consideration of the context is provided in terms of the assessment of the absolute noise levels and the change in ambient sound due to the specific sound as addressed further on in this section.

Context

5.8 In this case, consideration of context does not increase the risk for adverse impacts to occur. During the daytime period, maximum Rating Levels are well below residual sound levels and would therefore not significantly affect ambient sound level, with an increase of 1 dB, which would likely not be discernible (baseline residual sound level of 41 dB plus Rating Level of 41 dB is 44 dB $L_{Aeq,T}$).

5.9 The character of the specific noise would be broadband in nature and not contain any characteristics that would be distinguishable or otherwise considered incongruous. It is considered likely that the specific noise would not be dissimilar to the residual acoustic sound, which is affected by distant road traffic movements and other industrial activity in the area.

5.10 The Site is part of a long established industrial zone and noise associated with similar plant/activity would have historically affected the acoustic environment.

5.11 On the basis of the above, the specific sound would likely not be particularly noticeable and if specifically discernible, not considered to be incongruous compared to the baseline situation.

5.12 Furthermore, with regard to the night-time period, Rating Levels are based on plant operation at 100% capacity, including the cooling fans, which is unlikely to be the case at night due to lower ambient temperatures. Cooling fans operating at a reduced capacity would have lower noise emissions, potentially significantly by several dB, such that resultant Rating Levels would not exceed the background sound levels.

5.13 It should also be noted that the addition of L3 does not significantly affect noise emissions from the Ferrybridge 1 facility overall. With reference to Tabel 4.1, noise levels for L1 to L3 are at most only 1 dB higher than for L3 only, which is a negligible increase and likely not one that would be noticeable.

5.14 Furthermore, for the NSR to the west ‘Holmfield Farm’, noise levels in future would be 5 dB lower with the addition of L3. This is as the L3 development includes a new L3 Boiler House building which acts to screen noise at this NSR from the coolers to the east. A 5 dB reduction would likely be noticeable and may be considered a material benefit at this NSR.

5.15 On the basis of the above, the impact of the sound is found to be no higher than initially predicted after consideration of the context of the sound, with adverse impacts unlikely and significant adverse impacts very unlikely.

6 Uncertainty

6.1 In all assessments, it is good practice to consider uncertainty which can arise from a number of different aspects. There are degrees of uncertainty associated with: instrumentation used for surveying; measurement technique and the variables influencing the measurement results such as transmission path and weather conditions; source terms used for modelling; calculation uncertainty; assessment uncertainty; and the subjective response of residents to noise sources.

6.2 Uncertainty due to instrumentation has been significantly reduced with the introduction of more modern instrumentation and is reduced further by undertaking field calibration checks on sound level meters before and after each measurement period and that all instrumentation is within accepted laboratory calibration intervals.

6.3 Every effort has been made to reduce the uncertainty of the baseline sound level measurements. The duration of the baseline survey is considered to significantly reduce the uncertainty associated with the baseline sound levels. Based on professional judgement including substantial experience of acquiring and analysing baseline data for numerous sites in various locations, and a desk-based review of the site and surrounding area, it is considered that the baseline data acquired during the survey is typical of the area.

6.4 Calculation uncertainty and assessment uncertainty have been reduced by peer review of all baseline data, model input data, model results and assessment calculations, and by using the appropriate level of precision at each stage of the assessment calculations.

6.5 A quantitative assessment has been undertaken based on information provided by the project team for the proposed development and professional judgement based on recognised and accepted empirical calculation methodologies. Where assumptions have been made, these have been informed through assessment and visiting many similar facilities and have favoured a worst-case scenario, allowing for a reasonable and robust assessment.

6.6 With regards to subjective response, the noise standards adopted for the assessment will have been based upon the subjective response of the majority of the population or will be based upon the most likely response of the majority of the population. This is considered to be the best that can be achieved in a population of varying subjective response which will vary dependent upon a wide range of factors.

6.7 All areas and potential consequences of uncertainty have been minimised at every stage of the assessment process. On the basis of the above, and in the context of subjective response, the effects of uncertainty on the assessment are considered minimal.

7 Summary & Conclusions

7.1 The Acoustics, Noise and Vibration Team at Savills has been appointed by Enfinium to undertake a noise impact assessment in relation to an Environment Agency (EA), 'Environmental Permit' (EP) variation application for bringing forward a third waste processing line (L3) at the existing Ferrybridge 1 'energy from waste' facility (EfW).

7.2 Operation of the combined L1 to L3 EfW facility would result in impacts of negligible magnitude at 'noise sensitive receptors' (NSRs). Significant adverse impacts would be very unlikely.

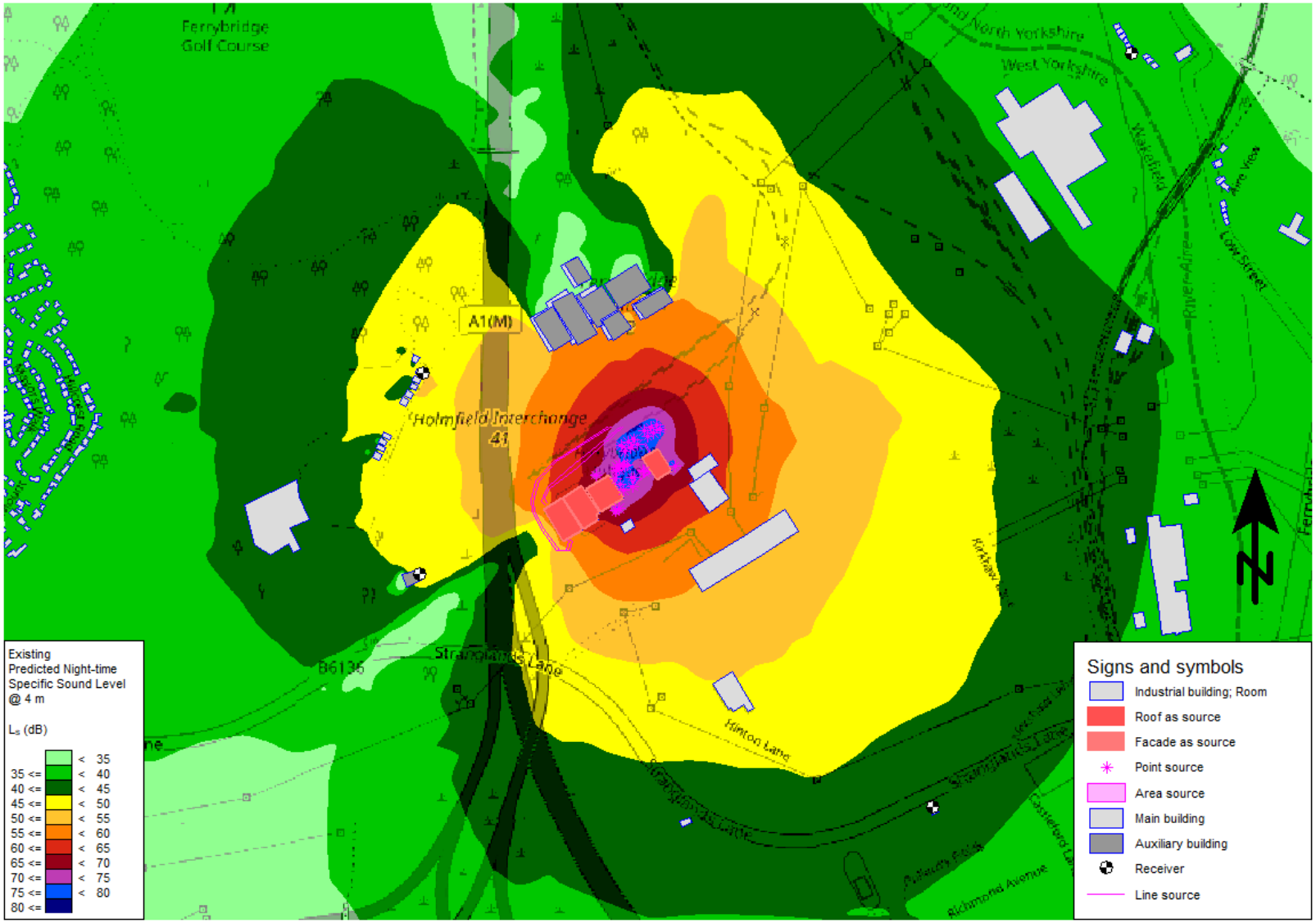
7.3 Operation of the combined L1 to L3 EfW facility compared to the existing L1 and L2 only EfW would result in at worst, noise levels increasing by 1 dB, a negligible increase which would likely not be noticeable, or increase the risk for adverse impacts to occur. Due to the construction of a new onsite building (L3 Boiler Hall) providing screen effects, noise level at one NSR, would be up to 5 dB lower as a result.

7.4 On the basis that significant adverse impacts associated with operation of the extended Ferrybridge EfW facility would be avoided and that operation of the new L3 would not result in potential significant impacts from the existing EfW to increase, operation of the proposed L3 would comply with the 'Noise Policy Statement for England' (NPSE) which sets out the long term overarching vision of Government noise policy.

References

1 British Standards Institution. British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound.

Figures



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Client: Enfinium

Project: Ferrybridge 1 L3

Job Ref: 702719

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Figure 1: Site & Survey Locations

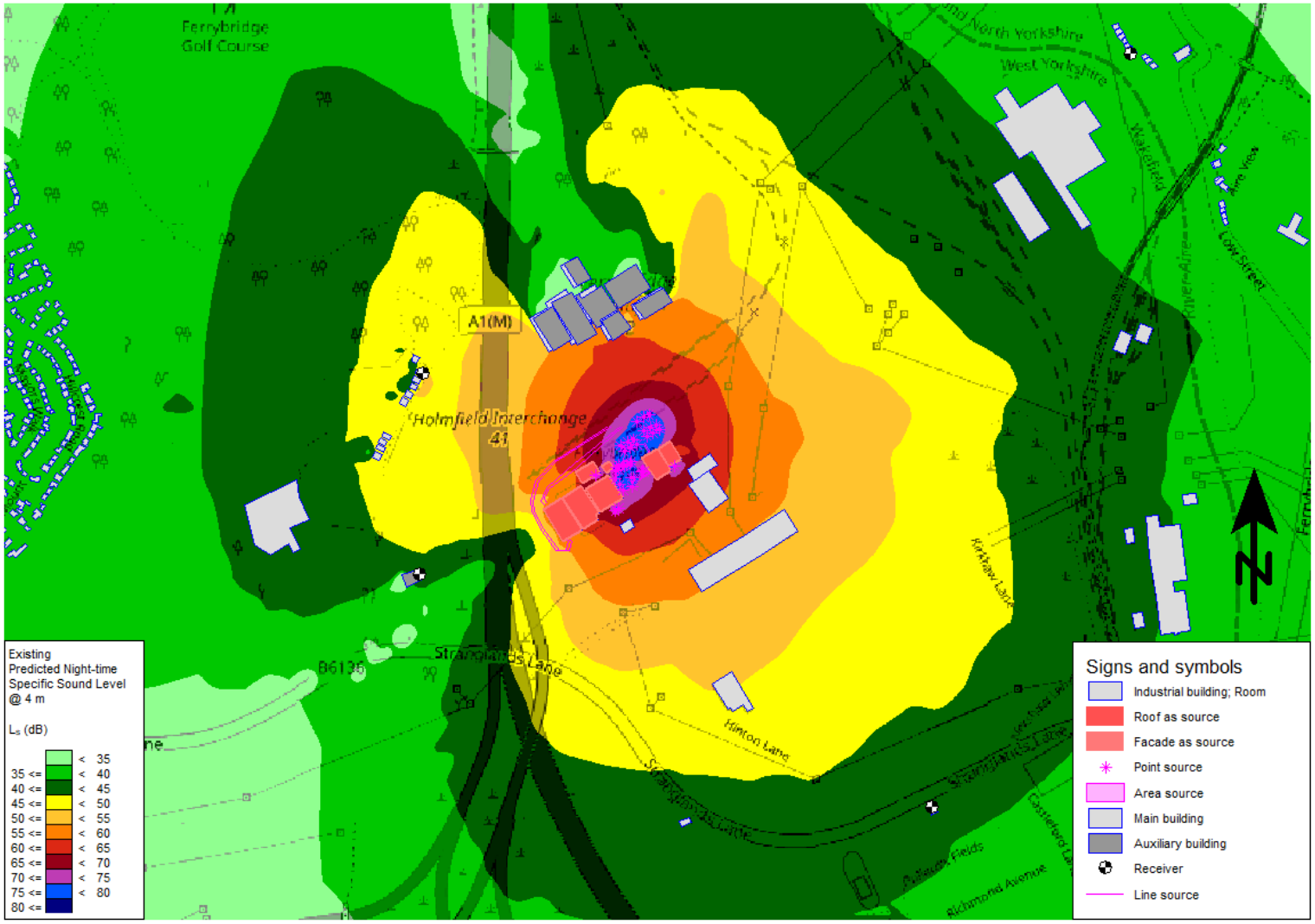

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Figure 2: LT1 Time History

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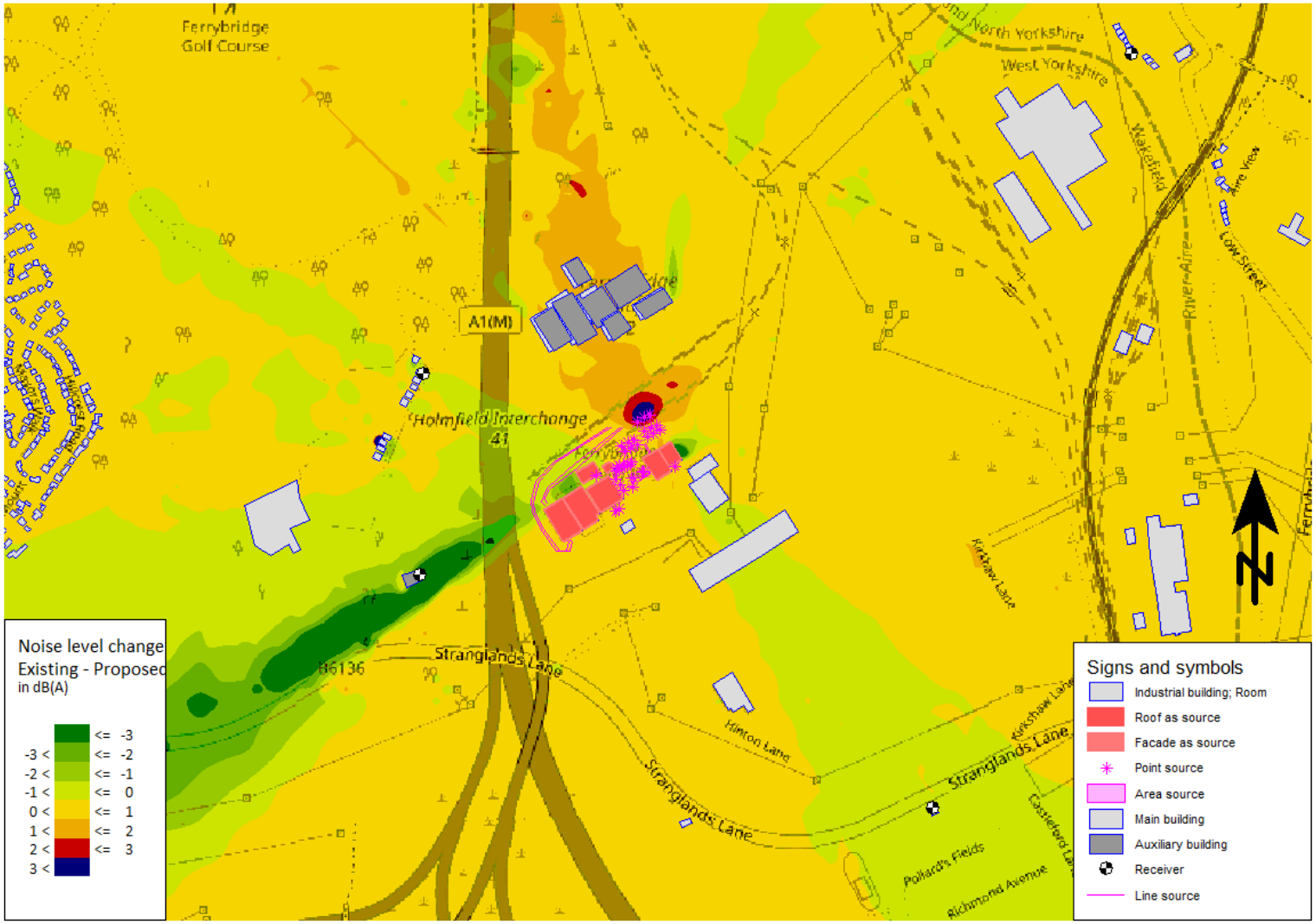

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Figure 3: Specific Sound Levels

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Appendices

Appendix A: BS 4142 Statements

Phil Evans: Director - Acoustics

BSc (Hons) Geology; MSc Acoustics, Vibration and Noise Control; Fellow of the Geological Society; Fellow of the Institute of Acoustics; Associate Member Acoustical Society of America

A.1 Phil is a Director and leads the Savills Acoustics Team. He is a specialist in environmental acoustics and is active on a number of committees including the Association of Noise Consultants' Vibration Working Group; British Standards Institution (BSi) Committee GME/21/6/4 - BS 6472: Guide to Evaluation of Human Exposure to Vibration in Buildings; BSi Committee B/564/01 on BS 5228: Noise and Vibration Control on Construction and Open Sites which has now also revised and issued BS 8233:2014 Guidance on sound insulation and noise reduction in buildings. He has been a corporate Member of the Institute of Acoustics (MIOA) for over 20 years.

A.2 Phil has over 25 years' experience in the project management of, and technical input to, environmental noise and vibration impact assessments for major developments. He is an expert in the industrial/commercial, transportation and construction sectors including the measurement, calculation, evaluation and mitigation of environmental noise and vibration. Phil has significant experience in the preparation and presentation of technical evidence and reports for public inquiries and planning applications. He is experienced in consultation and liaison with government departments, local authorities and other statutory bodies. He is an experienced expert witness. He has a Continuous Professional Development Record to support this competency and experience.

A.3 Phil has been involved in many BS 4142 noise assessments for both the previous and current 2014 version of BS 4142. He has given evidence at public inquiries where BS 4142 has been the primary assessment methodology. He is very familiar with the Standard and attended the joint ANC/BSi launch of the 2014 version of the Standard. On the basis of Phil's overall experience in acoustics combined with particular focus on BS 4142, he is deemed competent for BS 4142 assessments.

A.4 For this project, Phil as taken on the role of Project Director and has been responsible for overseeing and delivering the project.

Peter Barling: Associate - Acoustics

BSc (Hons) Physics; PGDip Environmental Assessment and Management; Member of the Institute of Acoustics

A.6 Peter is an Associate Consultant in Acoustics and environmental acoustics specialist with nine years' experience. He has a Degree in Physics and also has a Post Graduate Diploma in Environmental Assessment and Management. He has been a member of the Institute of Acoustics since 2013.

A.7 Peter has project managed and undertaken noise assessments for a variety of developments, including: large scale mixed-use developments, incorporating commercial, retail, leisure and residential elements; on-shore substations for off-shore windfarms; energy from waste facilities; manufacturing facilities; distribution centres; retail units; minerals extraction and exploration; solar farms; and petrol service filling stations. He has provided input into Environmental Impact Assessments (EIAs) and undertaken noise assessments to support planning applications and discharge planning conditions. He has a Continuous Professional Development (CPD) Record to support this competency and experience.

A.8 Peter has undertaken BS 4142 noise assessments for both the previous and current 2014 version of BS 4142. He is familiar with the Standard and has attended and participated in internal and external CPD training seminars regarding the revised 2014 version of the Standard. On the basis of Peter's overall experience in acoustics, combined with particular focus on BS 4142, he is deemed competent for BS 4142 assessments.

A.9 Peter was responsible for undertaking the baseline acoustic survey and review of the assessment and report.

Appendix B: Baseline Data

Appendix 7.1: Baseline Sound Monitoring Report

1.1.1 The Savills Acoustics Team has been commissioned by Enfinium to undertake baseline sound monitoring to inform the noise impact assessment for the proposed Ferrybridge 1 L3 project.

1.1.2 This report provides the results of baseline sound measurements undertaken to characterise the sound environment in the vicinity of the nearest Noise and Vibration Sensitive Receptors (NSRs) to the Proposed Development. These baseline levels have been used in the assessment of effects for the operational and construction noise and vibration assessments in Chapter 7 of the Environmental Statement Addendum.

1.1.3 This appendix provides a summary of the survey data for each survey location. Survey sheets indicating details and locations of noise monitoring equipment are provided in Annex A.

1.2 Survey locations

1.2.1 Survey locations were chosen to characterise baseline conditions in the vicinity of the nearest noise sensitive receptors to the Proposed Development and based on their proximity to the Site. The proposed monitoring were as follows:

- LT1: Frystone Lane, adjacent to Oakland Hill Park Home Estate, Ferrybridge. This location is approximately 250 m west of the proposed development boundary.
- LT2: Pollard's Fields, Ferrybridge. This location is approximately 660 m south-east of the proposed development boundary.
- LT3: Hall Court, Brotherton. This location is approximately 550m north-east of the proposed development boundary.

1.3 Baseline survey procedure

1.3.1 Long term unattended baseline sound level monitoring was undertaken between at three locations using a sound level meter. Measurements were undertaken between 30 August and 04 September 2024 at three locations in closest proximity to the Proposed Development.

1.3.2 All sound level monitoring was carried out using 'Class 1' Rion NL-52 sound level meters (SLM). Each SLM was checked for calibration prior to and immediately following the survey with no significant deviation found. At the long term monitoring locations, continuous data was logged of the fast time weighted, A-weighted, broadband sound pressure levels in 100 ms periods.

1.3.3 The long term surveys were established during the day and observations made of sources and other conditions in accordance with the requirements of British Standard BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (British Standards Institution (BSI), 2019). As a minimum, L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} parameters were recorded.

1.3.4 Long term surveys were undertaken following guidance contained in BS 7445 2:1991 'Description and measurement of environmental noise, Part 2: Guide to the acquisition of data pertinent to land use' (BSI, 1991).

1.3.5 Meteorological conditions were monitored during the long term surveys.

1.4 Baseline survey details and results

1.4.1 Survey record sheets for each location detailing the position of the noise monitors are presented in Annex A. Time histories of the measured sound levels and meteorological conditions during the survey period are presented in Annex A.

1.5 Determining representative baseline levels

1.5.1 To ascertain the typical sound levels at the measurement locations, time history plots have been produced and presented for each long term monitoring position. These are presented with the summary results tables in Annex B. The summaries of results in Annex B are based on analysis of the measured sound level processed into 15-minute samples.

1.5.2 Representative baseline sound levels have been determined, where possible, from long term monitoring survey locations. The data obtained have been analysed and compared against other datasets in order to obtain a representative baseline sound level.

1.5.3 Based on an analysis of the survey data and on site observations, operation of the existing F1 facility did not affect the measured baseline sound levels. Further analysis is provided as Annex B.

1.6 Operational noise assessment

1.6.1 BS 4142:2013+A1:2019 requires that the background sound levels adopted for the assessment are representative for the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night time period because it can be subject to a wide variation in background sound levels between the shoulder night periods. The accompanying note states that:

"*a representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or model value".*

1.6.2 In determining representative baseline noise levels for receptors identified within the PEIR and Environmental Statement, it will be necessary to analyse each location individually to ensure the most representative level is considered. BS 4142:2014+A1:2019 states that:

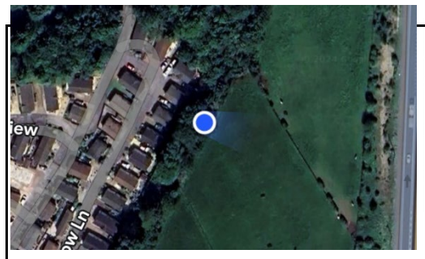
"In using the background sound level in the method for rating and assess industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods."

1.7 Construction noise assessment

1.7.1 To determine the most representative ambient sound levels, the equivalent continuous A-weighted sound pressure level, L_{Aeq}, was calculated based on standard construction hours and presented as a logarithmic average of the 15-minute period data over the relevant time period.

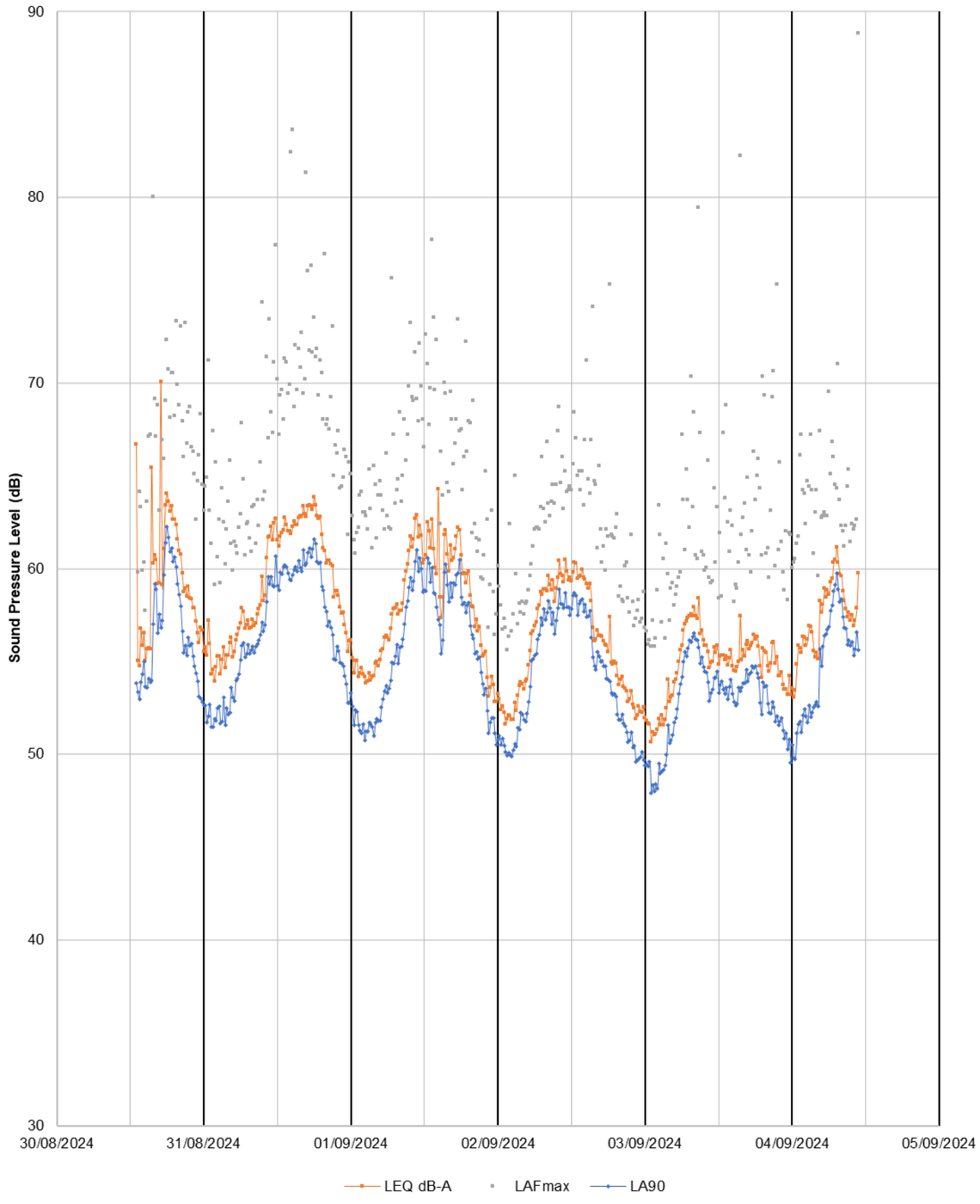
Annexe A: Baseline Data

Project Name and Number			Ferrybridge	
Location			LT1	
Purpose of Monitoring			Baseline	
Relevant Guidance / Standard			BS 4142:2019	
Sound Measurement System				
ID	Manufacturer / Model		Serial Number	
-	Rion NL-52		LT1	
Microphone Height	Façade / Freefield	Measurement Interval	Filename	
2	Freefield	125 ms	1	
		START	**END**	
Personnel		JT	JT	
Date / time		30/08/2024 13:00	00/01/1900 00:00	
Calibrator	Reference level	94.0	94.0	
	Meter reading	94.0	93.8	
Photographs of Measurement Location				

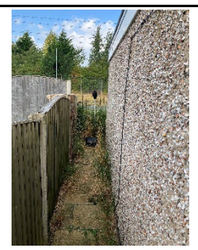


Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
LT1: Frystone Lane, adjacent to Oakland Hill Park Home Estate, Ferrybridge. This location is approximately 250 m west of the proposed development boundary
Description of sound environment (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Road traffic noise on A1(M)

Period	Background Sound Levels (dB $L_{A90,15min}$)					Residual Sound Levels (dB $L_{Aeq,15min}$)				
	Min	25th %[1]	50th %	75th %	Max	Min	25th %	50th %	75th %	Max
07:00 to 23:00	50	54	56	59	62	52	56	58	61	70
23:00 to 07:00	48	51	52	53	59	51	53	55	56	60

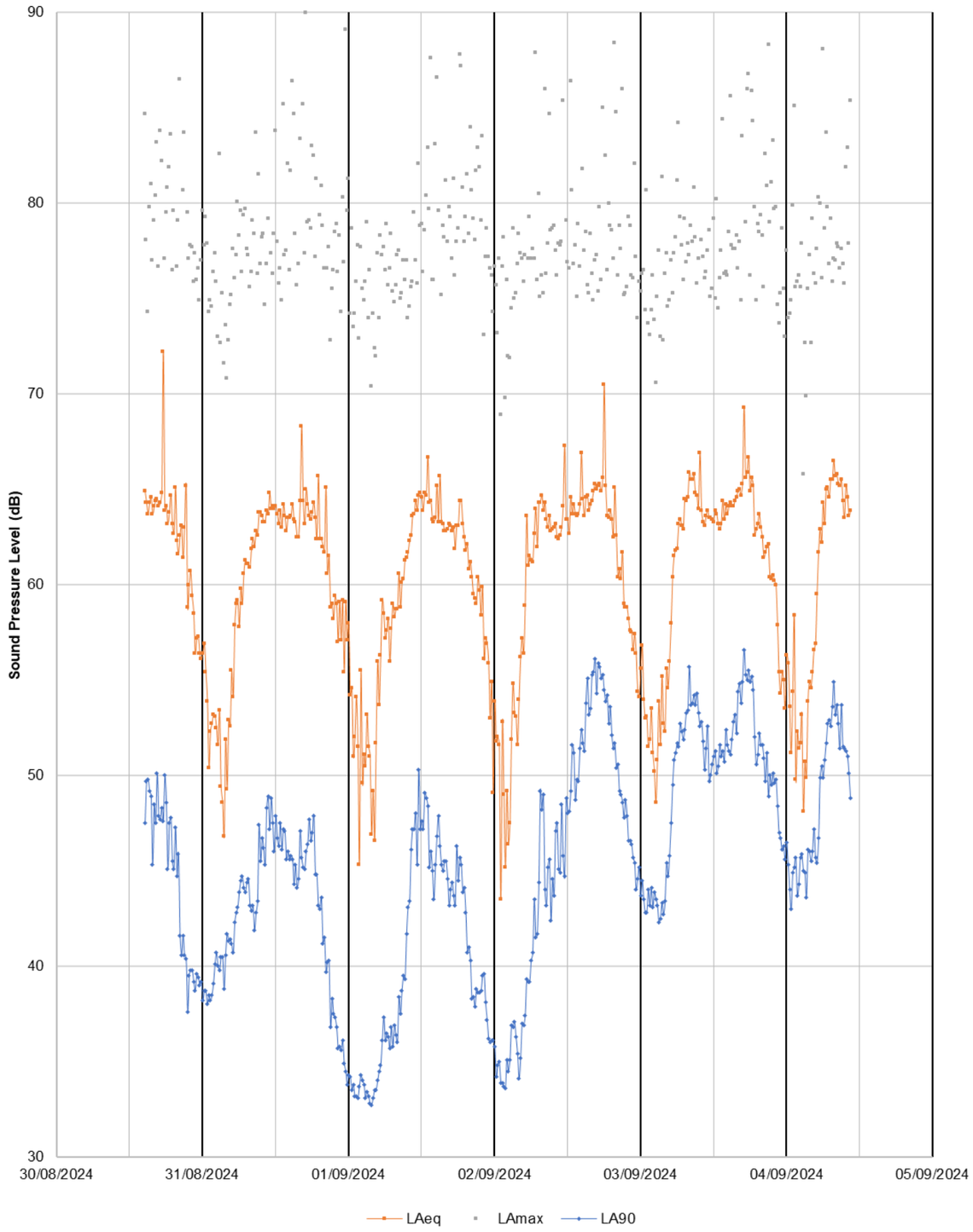


Relevant Guidance / Standard		BS 4142:2019	
Sound Measurement System			
ID	Manufacturer / Model	Serial Number	
-	Rion NL-52	LT2	
Microphone Height	Façade / Freefield	Measurement Interval	Filename
2	Freefield	125 ms	1
		START	**END**
Personnel		JT	JT
Date / time		30/08/2024 13:47	04/09/2024 10:32
Calibrator	Reference level	94.0	94.0
	Meter reading	94.0	93.8
Photographs of Measurement Location			

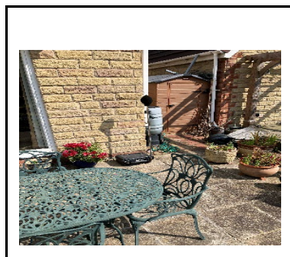


Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Pollard's Fields, Ferrybridge. This location is approximately 660 m south-east of the proposed development boundary.
Description of sound environment (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)
Local road traffic noise on B6136 and distant on A1(M)

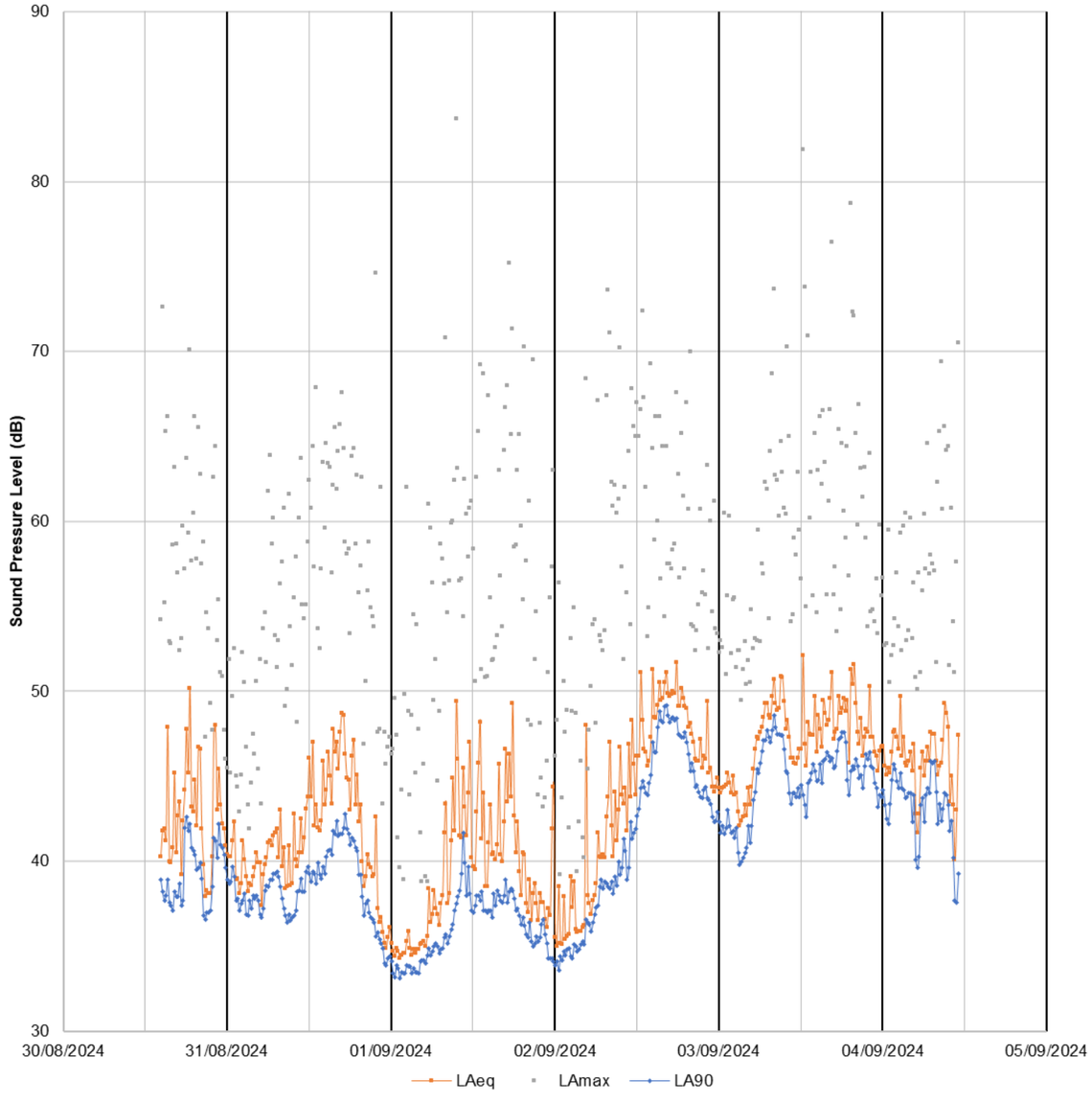
Period	Background Sound Levels (dB $L_{A90,15min}$)					Residual Sound Levels (dB $L_{Aeq,15min}$)				
	Min	25th %[1]	50th %	75th %	Max	Min	25th %	50th %	75th %	Max
07:00 to 23:00	36	44	48	51	57	55	62	64	64	72
23:00 to 07:00	33	36	41	45	53	44	52	54	57	65



Project Name and Number		Ferrybridge	
Location		LT3	
Purpose of Monitoring		Baseline	
Relevant Guidance / Standard		BS 4142:2019	
Sound Measurement System			
ID	Manufacturer / Model	Serial Number	
-	Rion NL-52	LT3	
Microphone Height	Façade / Freefield	Measurement Interval	Filename
2	Freefield	125 ms	1
		START	**END**
Personnel		JT	JT
Date / time		30/08/2024 13:47	04/09/2024 10:32
Calibrator	Reference level	94.0	94.0
	Meter reading	94.0	93.8
Photographs of Measurement Location			



Description of site (location of equipment, general surroundings, nature of ground between NSR and sound source(s) (hard/ soft ground, topography, intervening features, reflecting surfaces))
Hall Court, Brotherton. This location is approximately 550m north-east of the proposed development boundary.
Description of sound environment (principal environmental and natural sound sources, which sources are dominant, character of the sound environment cf. to the character of the new source)



Period	Background Sound Levels (dB $L_{A90,15min}$)					Residual Sound Levels (dB $L_{Aeq,15min}$)				
	Min	25th %[1]	50th %	75th %	Max	Min	25th %	50th %	75th %	Max
07:00 to 23:00	35	38	40	45	49	36	41	45	48	78
23:00 to 07:00	33	35	38	42	47	34	37	40	45	50

Annexe B: Baseline Analysis

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Report Quality Management			
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Report Ref:	703719_Memo01_R02	**Date of Issue:**	11/06/2025

Enfinium Ferrybridge 1 Line 3: Review of Baseline Sound Level Data

1.1 This memo has been drafted by the Acoustics, Noise and Vibration (ANV) Team at Savills to summarise 2024 baseline sound level surveys that have been undertaken by the Savills ANV Team at three noise sensitive receptor (NSR) locations in proximity to the existing Enfinium ERF facilities at Ferrybridge (F1 and F2).

1.2 The purpose of the 2024 surveys was to establish baseline sound levels to inform a noise impact assessment (NIA) for potential CCS facilities that may be developed for F1 and F2 in future.

1.3 Since the 2024 surveys were undertaken, Enfinium has decided to bring forward plans for the development of a third processing line (L3) at the existing F1 facility. Whist planning permission was granted for three lines in 2011, only two were bought forward.

1.4 As such, a new NIA is required to support the planning requirements to introduce a third line and an Environmental Permit Variation (EPV).

1.5 During initial consultation with the Environment Agency (EA) regarding the scope and method that should be employed for the EP variation application it has been stated that baseline sound level surveys used to inform the NIA submitted as part of the application should be unaffected by existing F1 operations.

1.6 Whilst the 2024 surveys were not undertaken with this explicit requirement in mind, due to the location of the NSRs, both the distance from F1 and distance to other existing noise sources (primarily motorways/roads) and that F1 noise emissions are of a magnitude that would result in low, or very low, noise immissions at NSRs only, it is considered that the data obtained in 2024 was unaffected by F1 operations. This is evidenced below.

Comparison of 2009 and 2024 data

1.7 In 2009 baseline sound level surveys were undertaken at NSR locations, by others, to inform the then planning application for F1. Surveys were undertaken at six locations, three of which were at locations representative of those undertaken in 2024.

1.8 Table 1 below provides a summary of the 2009 and 2024 background sound levels. Note that the 2009 levels are the average of the nine daytime and four night-time 5-minute surveys, and the 2024 levels are the overall average, as well as the 25th percentile values of the 5-day 15-minute sound level data.

Tabel 1: Summary of 2009 & 2024 Data

Location	Daytime dB $L_{A90,T}$			Night-time dB $L_{A90,T}$		
	2009	2024 (average)	2024 (25th Percentile)	2009	2024 (average)	2024 (25th Percentile)
Oakland Hill Park Home	56	56	54	51	52	51
Pollard's Fields	49	48	44	45	41	36
Hall Court, Brotherton	48	40	38	42	38	35

Oakland Hill Park Home

1.9 With reference to Tabel 1 above background sound levels in 2024 are very similar at Oakland Hill Park Home, the nearest NSR to F1, located to the west. This location is also in close proximity to the A1(M).

1.10 On the basis that background sound levels in 2009 and 2024 are very similar, it is considered that F1 has not affect the measured background sound level at Oakland Hill Park Home.

1.11 During the deployment and collection of the Oakland Hill Park Home survey the only noise sources that were noted to be affecting the acoustic environment by the Savills surveyor were road traffic movements on the A1(M), i.e. not existing F1 or F2 operations.

1.12 In addition, a review of the survey time history data does not indicate that F1 (or F2) operations were affecting the measured level, as shown below on Figure 1.

1.13 With reference to Figure 1 below, the background sound level follows a typical diurnal pattern, highest during the morning and evening periods and lowest at night, indicative that road traffic movements were the critical source affecting the acoustic environment.

1.14 It is also noted that that during the night-time period there is no 'flat lining' in the background sound level, which would be indicative of a constant noise source, such as F1, being the dominant source, which would be elevated above other noise sources.

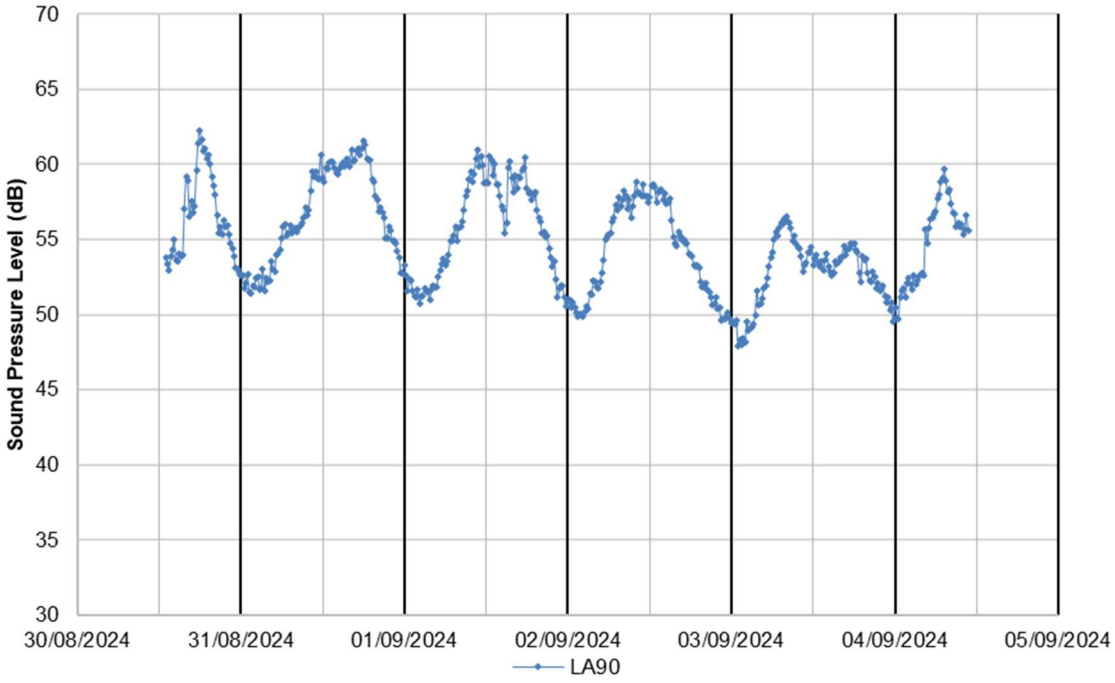

Figure 1: Oakland Hill Park Home Time History

1.15 It is also noted that the predicted F1 specific sound level at Oakland Hill Park Home, as detailed in the 2009 NIA, is 36 dB $L_{Aeq,Tr}$. This is a low level, 16 dB below the measured 2024 background sound level. On this basis, it is considered very unlikely that F1 operations would have affected the measured background sound level in 2024.

1.16 Consequently, it is concluded that background sound levels measured in 2024 at Oakland Hill Park Home were not affected by existing F1 operations.

Pollard's Fields

1.17 Baseline sound levels at Pollards Fields, the nearest NSRs to the south, are 1 and 4 dB lower in 2024 than in 2009. It is considered that the higher levels measured in 2009 were due to the operational power station cooling towers located close to the north, which have since been demolished.

1.18 Based on the above, from review of the data alone, it cannot be concluded that F1 does not affect the background sound level at Pollards Fields.

1.19 However, during the deployment and collection of the 2024 Pollard's Fields survey the only noise sources that were noted to be affecting the acoustic environment by the Savills surveyor were local road traffic movements on the B6136 and more distant on the A1(M), i.e. not existing F1 or F2 operations.

1.20 Furthermore, a review of the survey time history does not indicate that F1 (or F2) operations were affecting the measured level, as shown below on Figure 2.

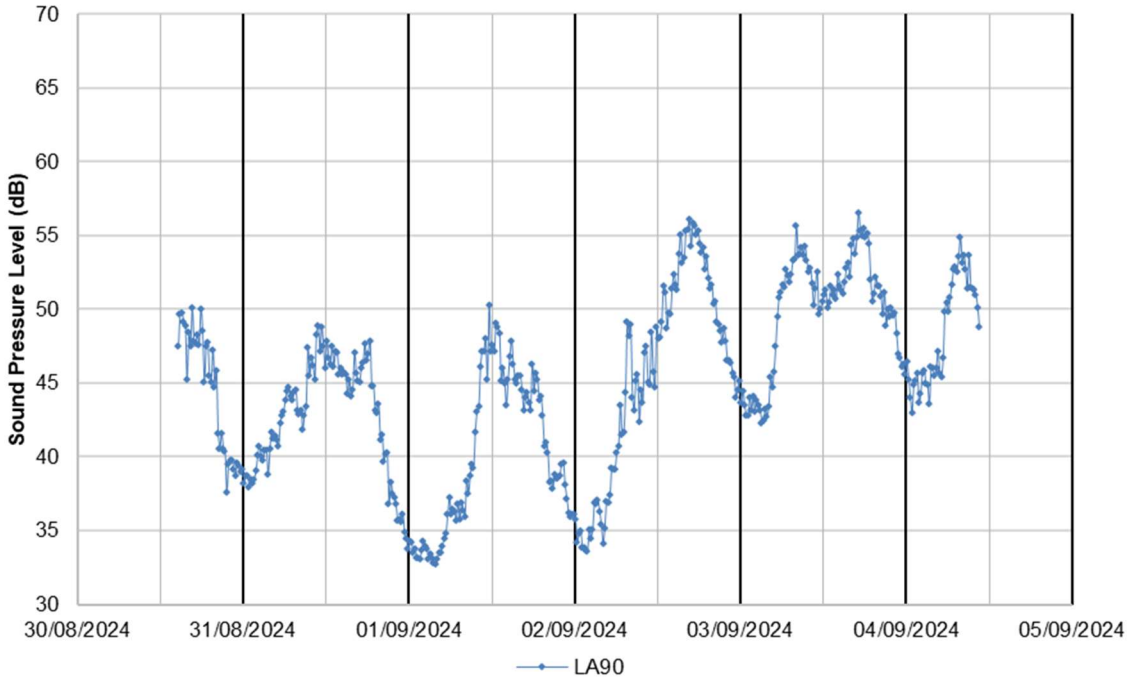

Figure 2: Pollard's Fields Time History

1.21 With reference to Figure 2 above, the background sound level follows a typical diurnal pattern, highest during the morning and evening periods and lowest at night, indicative that road traffic movements were the critical source affecting the acoustic environment.

1.22 It is also noted that that during the night-time period there is no 'flat lining' in the background sound level, which would be indicative of a constant noise source, such as F1, being the dominant source, which would be elevated above other noise sources.

1.23 It is also noted that the predicted F1 specific sound level at Pollards Fields, as detailed in the 2009 NIA, is 21 dB $L_{Aeq,Tr}$. This is a very low level, 20 dB below the measured 2024 background sound level. On this basis, it is considered very unlikely that F1 operations would have affected the measured background sound level in 2024.

1.24 Consequently, it is concluded that background sound levels measured in 2024 at Pollards Fields were not affected by existing F1 operations.

Hall Court, Brotherton

1.25 Baseline sound levels at Hall Court, Brotherton, the nearest NSRs to the east, are up to 8 dB lower in 2024 than in 2009, however it should be noted that the 2009 survey location was not in the exact same location, with the 2009 survey located closer to the road than the 2024 survey.

1.26 On the basis of the above, from review of the data alone, it cannot be concluded that F1 does not affect the background sound level at Hall Court.

1.27 However, during the deployment and collection of the Hall Court, Brotherton noise associated with existing F1 or F2 operations was not noted as being audible by the Savills surveyor.

1.28 Furthermore, a review of the time history does not indicate that F1 (or F2) operations were affecting the measured level, as shown below on Figure 3.

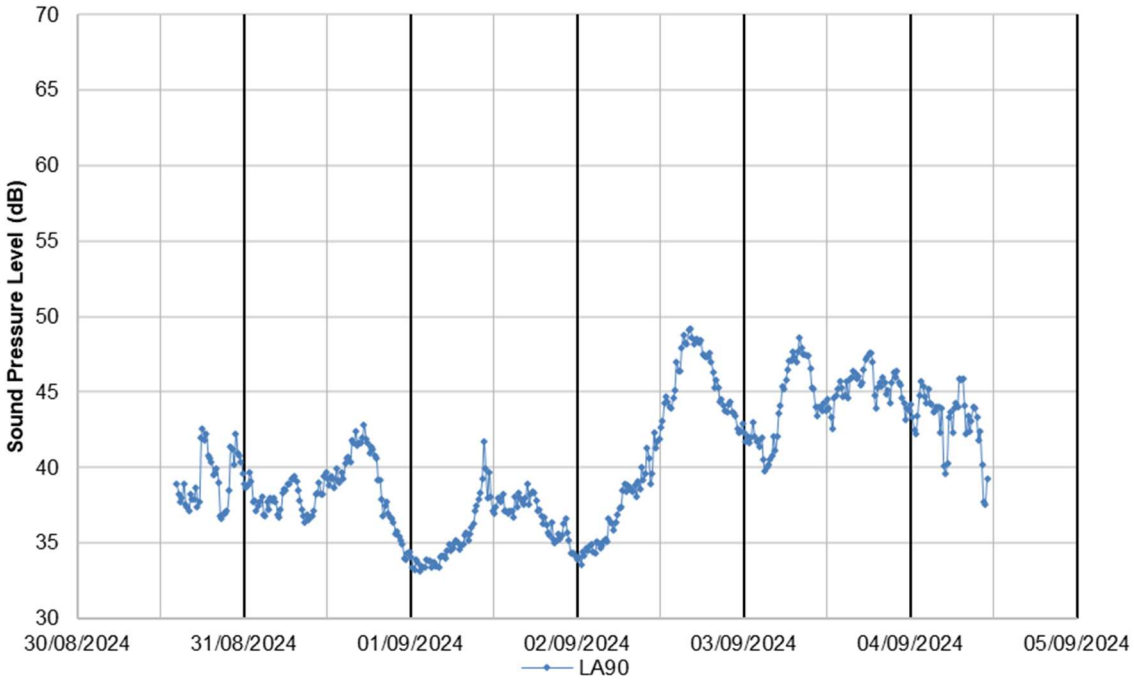

Figure 3: Hall Court, Brotherton Time History

1.29 With reference to Figure 3 above, during the night-time period there is no 'flat lining' in the background sound level, which would be indicative of a constant noise source, such as F1, being the dominant source, which would be elevated above other noise sources.

1.30 It is also noted that the predicted F1 specific sound level at Pollards Fields, as detailed in the 2009 NIA, is 24 dB $L_{Aeq,Tr}$. This is a very low level, 14 dB below the measured 2024 background sound level. On this basis, it is considered very unlikely that F1 operations would have affected the measured background sound level in 2024.

1.31 Consequently, it is concluded that background sound levels measured in 2024 at Hall Court, Brotherton were not affected by existing F1 operations.

Summary

1.32 Background sound levels have been measured in 2024 at three locations representative of the nearest NSRs to F1 to the west, south and east.

1.33 Based on a review of historical baseline data, time history of the 2024 data and observations, and predicted F1 specific sound levels it is concluded that existing F1 operations have not affected the background sound level data obtained in 2024.

Appendix C: Model Data

Appendix 7.3 Operational Noise Assessment Methodology and Results

1.1 Calculation and Modelling Inputs

1.1.1 This appendix describes the approach and presents the results of modelling the operational noise sources of the Ferrybridge 1 L3 project. The environmental effects of the noise levels predicted by the modelling are assessed in Chapter 7: Noise and Vibration.

1.2 Data sources

1.2.1 A quantitative assessment has been undertaken based on plant information of significant noise sources provided in the Condition 54 noise assessment.

1.2.2 In order to determine the specific sound levels resulting from the operation of the proposed development, a noise model has been built using SoundPLAN v9.1 noise modelling software. The model predicts noise levels under light down-wind conditions based on hemispherical propagation, atmospheric absorption, ground effects, screening and directivity based on the procedure detailed in ISO 9613-2:2024.

1.3 Description of sound sources

Plant	Operational Noise Level, dB(A)	No. Of Plant	Location	Approximate Height above Ground Level (m)
Boiler Hall	82.0 (SPL)	N/A	Internal noise level	49.0 (building)
Bunker	82.0 (SPL)	N/A	Internal noise level	41.9 (building)
Tipping Hall	82.0 (SPL)	N/A	Internal noise level	20.5 (building)
Turbine Building	88.0 (SPL)	N/A	Internal noise level	25.0 (building)
Air Cooled Condensers	102.0 (PWL)	2 sections of 6 units	External (Point Sources)	9.0
Stack	91.0 (PWL)	2	External (Point Sources)	100.0
Main Transformer	102.0 (PWL)	1	External (Point Source)	2.0
Coolers	96.0 (PWL)	2 Units	External (Point Sources)	2.0
Lime Blowers	92.0 (PWL)	4 (only 2 in operation at any one time)	External (Point Sources)	1.5
Air Compressors	97.0 (PWL)	3 (only 2 in operation at any one time)	External (Point Sources)	1.5
PAC	92.0 (PWL)	3 (only 2 in operation at any one time)	External (Point Sources)	1.5
Steam Line	96.0[1] (PWL)	2	External (Line Sources)	10.0
Ash Bunker Extraction	93.0 (PWL)	1	External (point source)	2.0
Gantry Crane	102.0 (PWL)	1	External (point source)	10.0
ID Fans	100.0 (PWL)	2	External (point sources)	4.0
ID Fan Lines	93.0 (PWL)	2	External (Line Sources)	25.0
Front Ender and Standard HGV's	98.0 (PWL)	16 movements per hour	External (Line Source)	1.5
Truck and Trailer HGV	105.0 (PWL)	9 movements per hour	External (Line Source)	1.5
Trains	N/A	3 per 24-hour period	External (Line Source)	0.6

[1] Estimated noise level

SRI for 0.7mm Steel

Frequency (Hz)	63	125	250	500	1000	2000	4000
Sound Reduction	10	15	16	22	23	22	30

1.4 Results

1.4.1 The predicted specific sound levels at the identified most affected NSRs (and other NSR in similar locations/areas) due to the operation of Ferrybridge 1 L3 are provided in Table 1 below.

1.4.2 Levels are presented for the existing Ferrybridge 1 L1 and L2 situation and for Ferrybridge 1 Lines 1 to 3, as well as the change.

1.4.3 Note that receptors representative of groups of properties are named for one property.

Table 1 Predicted specific sound levels at NSR Locations

NSR Location	Floor	Specific Sound level dB $L_{Aeq,Tr}$		
		Existing L1 & L2	L1, L2 & L3	Change
Oakland Hill Park Home Estate	GF	48	48	0
	FF	48	48	0
Holmfield Farm	GF	46	41	-5
	FF	46	41	-5
Polllard's Fields	GF	40	40	0
	FF	42	41	-1
Court Hall	GF	36	37	+1
	FF	37	37	0
Willow Green Academy	GF	38	38	0

1.5 Assessment

1.5.1 An initial estimate of impact undertaken in accordance with BS 4142, is shown in Tables 2 and 3 below for the daytime and night-time periods respectively. Predicted specific sound levels for the day are at ground floor level with night time level taken at first floor level, all free-field.

1.5.2 The subjective method for determining rating penalties has been used to determine appropriate corrections for each receptor and assessment period. It is considered that the specific sound from the combined sources of plant will not be characterised as intermittent or impulsive, so no penalties have been applied for intermittency or impulsivity.

1.5.3 As it is considered that the only source of tonal noise from the proposed development is from the coolers and the contribution from this source to the overall specific sound is negligible (23 dBA), it is most unlikely that noise levels at the nearby NSRs would be perceived or characterised as tonal. As such, no penalties have been applied for tonality or any other features. It should also be noted that at NSRs where specific sound levels are highest residual sound levels are also high due to road traffic noise which would act to mask any potential character.

Table 2 BS 4142 assessment of impact (Ferrybridge L1 to L3 daytime)

NVSR	Background (dB $L_{A90,T}$)	Specific (dB $L_{Aeq,T}$)	Correction (dB)	Rating (dB $L_{Ar,Tr}$)	Difference (dB)
Oakland Hill Park Home Estate	54	48	0	48	-6
Holmfield Farm	54	41	0	41	-13
Polllard's Fields	44	40	0	40	-4
Court Hall	38	37	0	37	-1
Willow Green Academy	44	38	0	38	-6

Table 3 BS 4142 assessment of impact (Ferrybridge L1 to L3 night-time)

NVSR	Background (dB $L_{A90,T}$)	Specific (dB $L_{Aeq,T}$)	Correction (dB)	Rating (dB $L_{Ar,Tr}$)	Difference (dB)
Oakland Hill Park Home Estate	52	48	0	48	-4
Holmfield Farm	52	41	0	41	-11
Polllard's Fields	41	41	0	41	0
Court Hall	38	38	0	38	0

1.5.4 The results of the initial estimate of impact in Tables 2 to 3 are described in the following paragraphs.

1.5.5 During the daytime period, Rating Levels are at least 1 dB below I the background sound level at all NSRs. This is at least 6 dB below the threshold level at which a moderate impact may result (+5 dB).

1.5.6 At the most affected NSR (Court Hall), the resultant daytime ambient sound level would be less than 55 dB $L_{Aeq,T}$ (baseline residual sound level of 41 dB plus Rating Level of 37 dB is 42 dB $L_{Aeq,T}$). As such, the resulting magnitude of impact would be negligible at this NSR. Similarly, at the other NSRs, the resultant daytime ambient sound level would also be less than 55 dB $L_{Aeq,T}$ or below background sound level; as such, the resulting magnitude of impact would range from no change to negligible at these NSRs.

1.5.7 The results of the initial estimate of impact during the daytime are therefore indicative of negligible impacts at all receptors, depending on the context.

1.5.8 During the night-time period, the Rating Level is up to equal to the background sound level at the most affected NSRs, the group of properties at receptor location 'Court Hall' and Pollard's Fields'. This is 5 dB below the threshold level at which a moderate impact may result.

1.5.9 At the most affected NSR (Pollard's Fields), the resultant night-time ambient sound level would be above 40 dB $L_{Aeq,T}$ (baseline residual sound level of 54 dB plus Rating Level of 41 dB is 54 dB $L_{Aeq,T}$); as such, the resulting magnitude of impact would be minor adverse at these NSRs.

1.5.10 The results of the initial estimate of impact during the night-time are therefore indicative of negligible to minor adverse impacts at all receptors, depending on the context.

1.5.11 To accord with the guidance contained within BS 4142:2014+A1:2019 and provide a thorough assessment, consideration of the context of the scenario has been undertaken. Consideration

of the context is provided in terms of the assessment of the absolute noise levels and the change in ambient sound due to the specific sound as addressed further on in this section.

Context

1.5.12 In this case, consideration of context does not increase the risk for adverse impacts to occur. During the daytime period, maximum Rating Levels are well below residual sound levels and would therefore not significantly affect ambient sound level, with an increase of 1 dB, which would likely not be discernible (baseline residual sound level of 41 dB plus Rating Level of 41 dB is 44 dB $L_{Aeq,T}$).

1.5.13 The character of the specific noise would be broadband in nature and not contain any characteristics that would be distinguishable or otherwise considered incongruous. It is considered likely that the specific noise would not be dissimilar to the residual acoustic sound, which is affected by distant road traffic movements and other industrial activity in the area.

1.5.14 The Site is part of a long established industrial zone and noise associated with similar plant/activity would have historically affected the acoustic environment.

1.5.15 On the basis of the above, the specific sound would likely not be particularly noticeable and if specifically discernible, not considered to be incongruous compared to the baseline situation.

1.5.16 Furthermore, with regard to the night-time period, Rating Levels are based on plant operation at 100% capacity, including the cooling fans, which is unlikely to be the case at night due to lower ambient temperatures. Cooling fans operating at a reduced capacity would have lower noise emissions, potentially significantly by several dB, such that resultant Rating Levels would not exceed the background sound levels.

1.5.17 It should also be noted that the addition of L3 does not significantly affect noise emissions from the Ferrybridge 1 facility overall. With reference to Tabel 1, noise levels for L1 to L3 are at most only 1 dB higher than for L3 only, with is negligible increase and likely not one that would be noticeably.

1.5.18 The addition of L3 noise sources contribute to the overall L1 to L3 received level only very marginally, with L3 sources generally 10 dB below L1 and L2 sources, hence the negligible increase following the addition of L3.

1.5.19 Furthermore for the NSR to the west ‘Holmfield Farm’, noise levels in future would be 5 dB lower with the addition of L3. This is as the L3 development includes a new L3 Boiler House building which acts to screen noise at this NSR from the coolers to the east. A 5 dB reduction would likely be noticeable and may be considered a material benefit at this NSR.

1.5.20 On the basis of the above, the impact of the sound is found to be no higher than initially predicted after consideration of the context of the sound, and the initial estimate of a negligible to minor impact is not changed.

1.5.21 Table 4 below provides a summary of the final consideration of the maximum magnitude of impact at each NSR for the daytime and night-time periods due to operation of Ferrybridge L3. Daytime impacts range from a magnitude of no change to negligible. Night-time impacts range from a magnitude of negligible to minor.

Table 4: BS 4142:2014+A1:2019 assessment of impact

NVSR	Daytime	Night-time
Oakland Hill Park Home Estate	No Change	Negligible
Holmfield Farm	No Change	No Change
Polllard’s Fields	Negligible	Negligible
Court Hall	Negligible	Negligible
Willow Green Academy	Negligible	-