

Light Valley Solar

Technical note: Noise and Vibration - Results Tables

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**Light Valley
Solar**

Infrastructure Planning

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1 Introduction

1.1 Purpose of the document

- 1.1.1 This technical note is the Applicant's response to Q1.10.6 of the Examining Authority's written questions and is to be read in conjunction with the Deadline 3 submission material.
- 1.1.2 The purpose of this note is to:
- 1) Present the tabulated results of the noise and vibration assessment, found in Appendices 11.2 [**APP-172**] and 11.3 [**APP-173**] of ES Chapter 11 Noise and Vibration [**APP-049**];
 - 2) Identify where there are exceedances of the Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL);
 - 3) Highlight the duration of exceedances where they occur; and
 - 4) Explain how these findings have informed the Environmental Statement (ES) assessment conclusions.

2 Assessment results

2.1 Overview

- 2.1.1 The assessment of construction noise was separated into daytime and night-time assessments (Horizontal Directional Drilling (HDD) works). The results for both assessments are found below in Table 2-1 and Table 2-2.
- 2.1.2 In the absence of environmental sound survey information at receptors, Category A of the BS 5228 standard is assumed to be the threshold for construction noise impact as a worst-case scenario. Additionally, effect levels have been defined in accordance with the terminology set out in the Noise Policy Statement for England (NPSE), namely LOAEL and the SOAEL.
- 2.1.3 These criteria are also aligned with BS5228-1, the London Good Practice Guide: Noise and Vibration Control for Demolition and Construction and the Technical Note Construction Noise: A Good Practice Guide to the Preparation, Submission and Management of Section 61 Consents. The definition of LOAEL and SOAEL for construction noise is presented in Table 11-10 of ES Chapter 11 Noise and Vibration [**APP-049**] and is replicated below in Table 2-1.
- 2.1.4 The assessment of likely significant effects is based on the BS5228 ABC method described in the ES Chapter 11 Noise and Vibration [**APP-049**]. Where construction noise is predicted to exceed the Category A threshold, there is the potential for a significant effect to occur. In such cases, mitigation measures have been identified with the aim of reducing noise levels below the relevant threshold.

Table 2-1 Thresholds of potential effects of construction noise in policy terms

Level of effect	Threshold value, 1 m in front of the relevant façade
LOAEL	Day: 65dBL _{Aeq,T} Evening: 55dBL _{Aeq,T} Night: 45dBL _{Aeq,T}
SOAEL	Day: 75dBL _{Aeq,T} Evening: 65dBL _{Aeq,T} Night: 55dBL _{Aeq,T}
Note: Day is 07:00 to 19:00, evening is 19:00 to 23:00 and night is 23:00 to 07:00	

2.1.5 Category A (daytime 65dBL_{Aeq,T}) corresponds to the LOAEL defined above and represents the threshold at which adverse effects may begin to occur. This threshold is therefore aligned with the onset of the Noise Policy Statement for England and noise exposure hierarchy within the Government Planning Practice Guidance on noise, with the objective to mitigate and minimise adverse impacts on health and quality of life. The SOAEL of 75dBL_{Aeq,T} (daytime) represents a higher threshold, above which significant adverse effects may occur and should be avoided where practicable. The SOAEL is set at a level consistent with the example noise insulation trigger levels presented in Table E.2 of BS 5228, the purpose of the noise insulation being to avoid significant effects to occupants of residential properties.

2.2 Construction noise results - daytime

- 2.2.1 In the daytime assessment (Table 2-1), no receptors reported an exceedance of either the LOAEL or SOAEL.
- 2.2.2 No exceedance of the Category A daytime noise adverse impact threshold (65dBL_{Aeq,T}) was predicted at any receptor. In line with BS5228, this is an indication of impacts not resulting in a significant effect.
- 2.2.3 As noted in the Noise and Vibration Chapter, it was concluded that noise effects from daytime construction activities would be not significant.

2.3 Construction noise results – night-time

- 2.3.1 Due to the potential for overnight HDD works in the construction schedule, an assessment for night-time construction noise was also carried out.
- 2.3.2 In the night-time assessment (Table 2-2), an exceedance of the Category A night-time noise impact threshold (45dBL_{Aeq,T}) was found at multiple receptors.
- 2.3.3 The duration of these impacts is anticipated to occur for up to 1-2 days for each HDD. This means that noise levels are not predicted to exceed the temporal threshold, for a significant effect, of more than 40 days within any six consecutive months, or for a period of ten or more days in any 15 consecutive days. As such

the temporal criterion for significance (as defined in Chapter 11 Noise and Vibration [**APP-049**]) is not expected to be exceeded.

- 2.3.4 An exceedance of the SOAEL is predicted at receptor CRC_R6 with levels of 56dB(A) reported. This predicted exceedance would occur when assuming that the HDD works would take place simultaneously at two different sites. This is a conservative assumption. It is then noted that if the HDD works are not simultaneous, no exceedances of SOAEL are predicted. As such, if simultaneous works are required at this receptor, additional noise modelling of the HDD works will be undertaken prior to construction, as set out in the oCEMP, to define specific mitigation measures to avoid such exceedance. For example, these could include implementing construction temporary barriers, or selection of quieter plant. Further examples are presented in the oCEMP [**REP2-091**].

2.4 Construction vibration results

- 2.4.1 The results of the construction vibration assessment are presented in Table 2-3. Results are given in terms of peak particle velocity (PPV) predicted at the first floor level of receptors (worst-case for disturbance to people). The types of vibrational sources assessed includes both transient (vibratory compaction startup/rundown, vibratory piling startup/rundown) and continuous (vibratory compaction steady operation, horizontal drilling).
- 2.4.2 For residential receptors the LOAEL is defined as a PPV of 0.3mm/s and the SOAEL is defined as a PPV of 1.0mm/s, as presented in Paragraph 11.5.26 of ES Chapter 11 Noise and Vibration [**APP-049**].
- 2.4.3 In total, an exceedance of the SOAEL is predicted at sixteen receptors with a highest expected PPV (when the plant operates at its closest to the receptor) of 2.0mm/s reported at S2_R1 caused by transient startup/rundown of vibratory piling, if a piling rig is used that is not designed to avoid these transient elevated vibration levels. There is the potential for complaints from receptors where exceedances are reported. However, these exceedances are likely to be tolerated provided prior warning is given to residents.
- 2.4.4 At this stage it is not possible to provide an accurate estimate for the duration of these exceedances as it is dependent on the construction schedule and equipment selection. Nevertheless, vibration levels are expected to be lower when construction works are further from sensitive receptors.
- 2.4.5 The oCEMP [**REP2-091**] includes provisions for giving notice to residents before commencing works; and operating compaction plant without the vibratory mechanism operating, where practicable. The oCEMP [**REP2-091**] also notes that to minimise potential vibration impacts, compaction could be achieved without using a vibratory system. Vibratory piling rigs are also available that avoid the transient elevated levels of vibration that can occur during start up and rundown.
- 2.4.6 Based on the above, adverse effects from construction vibration were assessed as not significant.

2.5 Operational noise results

- 2.5.1 The results of the operational noise assessment can be found in Table 2-4. Specific sound levels and background levels at each receptor for both day and night are presented along the rating sound level which includes the +4dB tonality character correction.
- 2.5.2 The LOAEL and SOAEL are defined with respect to the rating level at each receptor as +5dB and +10dB respectively above background.
- 2.5.3 At most receptors the rating level does not exceed the background level indicating low impact in accordance with BS4142.
- 2.5.4 At five receptors, rating levels exceed typical background by more than 5dB but less than 10dB (an exceedance of the LOAEL). These exceedances only occur during the night and are generally attributable to low background sound levels. In line with BS4142, this is likely to be an indication of adverse impact depending on the context.
- 2.5.5 The highest predicted night-time rating level of 39dBL_{Ar,Tr} is below the WHO Night Noise Guidelines for Europe (2009) LOAEL of 40dBL_{night,outside}. Assuming a 12–15dB(A) attenuation for a partially open window, the resulting internal noise levels at the receptor would be approximately 24–27dBL_{Ar,Tr}. These levels are below the WHO internal and external criteria presented in Table 11-14. Furthermore, the internal sound levels are also below the low frequency noise criterion described in NANR45.
- 2.5.6 In this context, the assessment concludes that the effects of operational noise on receptors is not significant.

Table 2-2 Construction noise predictions – daytime. Receptors with no LOAEL/SOAEL exceedances shown in grey

Assessed receptor	ABC category	Predicted construction noise levels dBL _{Aeq,12hr}	Exceedance over impact threshold dBL _{Aeq,12hr}	Exceedance of LOAEL (65dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (75dB)	Duration of SOAEL exceedance
CRC_R1	A (65 dB)	53	-12	-12	N/A	-22	N/A
CRC_R2	A (65 dB)	59	-6	-6	N/A	-16	N/A
CRC_R3	A (65 dB)	53	-12	-12	N/A	-22	N/A
CRC_R4	A (65 dB)	58	-7	-7	N/A	-17	N/A
CRC_R5	A (65 dB)	47	-18	-18	N/A	-28	N/A
CRC_R6	A (65 dB)	59	-6	-6	N/A	-16	N/A
CRC_R7	A (65 dB)	59	-6	-6	N/A	-16	N/A
CRC_R8	A (65 dB)	52	-13	-13	N/A	-23	N/A
CRC_R9	A (65 dB)	46	-19	-19	N/A	-29	N/A
CRC_R10	A (65 dB)	51	-14	-14	N/A	-24	N/A
CRC_R11	A (65 dB)	43	-22	-22	N/A	-32	N/A
CRC_R12	A (65 dB)	55	-10	-10	N/A	-20	N/A
CRC_R13	A (65 dB)	53	-12	-12	N/A	-22	N/A
CRC_R14	A (65 dB)	50	-15	-15	N/A	-25	N/A
CRC_R15	A (65 dB)	52	-13	-13	N/A	-23	N/A
CRC_R16	A (65 dB)	50	-15	-15	N/A	-25	N/A
CRC_R17	A (65 dB)	48	-17	-17	N/A	-27	N/A
CRC_R18	A (65 dB)	44	-22	-21	N/A	-31	N/A
CRC_R19	A (65 dB)	57	-8	-8	N/A	-18	N/A

Assessed receptor	ABC category	Predicted construction noise levels dBL _{Aeq,12hr}	Exceedance over impact threshold dBL _{Aeq,12hr}	Exceedance of LOAEL (65dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (75dB)	Duration of SOAEL exceedance
CRC_R20	A (65 dB)	51	-14	-14	N/A	-24	N/A
CRC_R21	A (65 dB)	57	-8	-8	N/A	-18	N/A
CRC_R22	A (65 dB)	53	-12	-12	N/A	-22	N/A
CRC_R23	A (65 dB)	51	-14	-14	N/A	-24	N/A
CRC_R24	A (65 dB)	48	-17	-17	N/A	-27	N/A
CRC_R25	A (65 dB)	54	-11	-11	N/A	-21	N/A
CRC_R26	A (65 dB)	51	-14	-14	N/A	-24	N/A
CRC_R27	A (65 dB)	48	-17	-17	N/A	-27	N/A
CRC_R28	A (65 dB)	47	-18	-18	N/A	-28	N/A
CRC_R29	A (65 dB)	45	-20	-20	N/A	-30	N/A
S1_R1	A (65 dB)	54	-11	-11	N/A	-21	N/A
S1_R2	A (65 dB)	45	-20	-20	N/A	-30	N/A
S1_R3	A (65 dB)	48	-17	-17	N/A	-27	N/A
S1_R4	A (65 dB)	60	-5	-5	N/A	-15	N/A
S1_R5	A (65 dB)	53	-12	-12	N/A	-22	N/A
S1_R6	A (65 dB)	46	-19	-19	N/A	-29	N/A
S1_R9	A (65 dB)	48	-17	-17	N/A	-27	N/A
S1_R10	A (65 dB)	60	-5	-5	N/A	-15	N/A
S1_R12	A (65 dB)	58	-7	-7	N/A	-17	N/A
S2_R1	A (65 dB)	60	-5	-5	N/A	-15	N/A
S2_R2	A (65 dB)	55	-10	-10	N/A	-20	N/A

Assessed receptor	ABC category	Predicted construction noise levels dBL _{Aeq,12hr}	Exceedance over impact threshold dBL _{Aeq,12hr}	Exceedance of LOAEL (65dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (75dB)	Duration of SOAEL exceedance
S2_R3	A (65 dB)	55	-10	-10	N/A	-20	N/A
S2_R4	A (65 dB)	58	-7	-7	N/A	-17	N/A
S2_R5	A (65 dB)	52	-13	-13	N/A	-23	N/A
S2_R6	A (65dB)	57	-8	-8	N/A	-18	N/A
S2_R7	A (65dB)	50	-15	-15	N/A	-25	N/A
S2_R8	A (65dB)	56	-9	-9	N/A	-19	N/A
S3_R1	A (65 dB)	51	-14	-14	N/A	-24	N/A
S4_R1	A (65 dB)	50	-15	-15	N/A	-25	N/A
S4_R2	A (65 dB)	55	-10	-10	N/A	-20	N/A
S4_R3	A (65 dB)	51	-14	-14	N/A	-24	N/A
S4_R4	A (65 dB)	54	-11	-11	N/A	-21	N/A
S4_R5	A (65 dB)	53	-12	-12	N/A	-22	N/A
S4_R6	A (65dB)	58	-7	-7	N/A	-17	N/A
S4_R7	A (65 dB)	49	-16	-16	N/A	-26	N/A
S4_R8	A (65 dB)	51	-14	-14	N/A	-24	N/A
S4_R11	A (65 dB)	58	-7	-7	N/A	-17	N/A
S6_R1	A (65 dB)	54	-11	-11	N/A	-21	N/A
S6_R2	A (65 dB)	58	-7	-7	N/A	-17	N/A
S6_R3	A (65 dB)	56	-9	-9	N/A	-19	N/A
S6_R4	A (65 dB)	55	-10	-10	N/A	-20	N/A
S6_R5	A (65 dB)	47	-18	-18	N/A	-28	N/A

Assessed receptor	ABC category	Predicted construction noise levels dBL _{Aeq,12hr}	Exceedance over impact threshold dBL _{Aeq,12hr}	Exceedance of LOAEL (65dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (75dB)	Duration of SOAEL exceedance
S7_R1	A (65 dB)	58	-7	-7	N/A	-17	N/A
S8_R1	A (65 dB)	55	-10	-10	N/A	-20	N/A
S8_R2	A (65 dB)	50	-15	-15	N/A	-25	N/A
S8_R3	A (65 dB)	45	-20	-20	N/A	-30	N/A

Table 2-3 Construction noise predictions – evening and night-time. Receptors with no LOAEL/SOAEL exceedances shown in grey. Receptors where SOAEL is exceeded shown in yellow

Assessed receptor	ABC category	Predicted construction noise levels* dBL _{Aeq,T}	Exceedance over impact threshold* dBL _{Aeq,T}	Exceedance of LOAEL (45dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (55dB)	Duration of SOAEL exceedance
CRC_R1	A (45 dB)	51	6	6	1-2 days	-4	N/A
CRC_R2	A (45 dB)	53	8	8	1-2 days	-2	N/A
CRC_R3	A (45 dB)	50	5	5	1-2 days	-5	N/A
CRC_R4	A (45 dB)	54	9	9	1-2 days	-1	N/A
CRC_R5	A (45 dB)	42	-3	-3	N/A	-13	N/A
CRC_R6	A (45 dB)	56	11	11	1-2 days	1	1-2 days
CRC_R7	A (45 dB)	52	7	7	1-2 days	-3	N/A
CRC_R8	A (45 dB)	48	3	3	1-2 days	-7	N/A
CRC_R9	A (45 dB)	42	-3	-3	N/A	-13	N/A
CRC_R10	A (45 dB)	46	1	1	1-2 days	-9	N/A
CRC_R11	A (45 dB)	38	-7	-7	N/A	-17	N/A
CRC_R12	A (45dB)	43	-2	-2	N/A	-12	N/A
CRC_R13	A (45dB)	51	6	6	1-2 days	-4	N/A
CRC_R14	A (45 dB)	47	2	2	1-2 days	-8	N/A
CRC_R15	A (45 dB)	51	6	6	1-2 days	-4	N/A
CRC_R16	A (45 dB)	48	3	3	1-2 days	-7	N/A
CRC_R17	A (45 dB)	44	-1	-1	N/A	-11	N/A
CRC_R18	A (45 dB)	40	-5	-5	N/A	-15	N/A
CRC_R19	A (45 dB)	50	5	5	1-2 days	-5	N/A
CRC_R20	A (45 dB)	49	4	4	1-2 days	-6	N/A

Assessed receptor	ABC category	Predicted construction noise levels* dBL _{Aeq,T}	Exceedance over impact threshold* dBL _{Aeq,T}	Exceedance of LOAEL (45dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (55dB)	Duration of SOAEL exceedance
CRC_R21	A (45 dB)	55	10	10	1-2 days	0	N/A
CRC_R22	A (45 dB)	51	6	6	1-2 days	-4	N/A
CRC_R23	A (45 dB)	48	3	3	1-2 days	-7	N/A
CRC_R24	A (45 dB)	46	1	1	1-2 days	-9	N/A
CRC_R25	A (45 dB)	46	1	1	1-2 days	-9	N/A
CRC_R26	A (45 dB)	45	0	0	N/A	-10	N/A
CRC_R27	A (45 dB)	46	1	1	1-2 days	-9	N/A
CRC_R28	A (45 dB)	45	0	0	N/A	-10	N/A
CRC_R29	A (45 dB)	45	0	0	N/A	-10	N/A
S1_R1	A (45 dB)	37	-8	-8	N/A	-18	N/A
S1_R2	A (45dB)	26	-19	-19	N/A	-29	N/A
S1_R3	A (45dB)	31	-14	-14	N/A	-24	N/A
S1_R4	A (45 dB)	40	-5	-5	N/A	-15	N/A
S1_R5	A (45 dB)	39	-6	-6	N/A	-16	N/A
S1_R6	A (45 dB)	42	-3	-3	N/A	-13	N/A
S1_R9	A (45 dB)	27	-18	-18	N/A	-28	N/A
S1_R10	A (45 dB)	30	-15	-15	N/A	-25	N/A
S1_R12	A (45 dB)	35	-10	-10	N/A	-20	N/A
S2_R1	A (45 dB)	51	6	6	1-2 days	-4	N/A
S2_R2	A (45 dB)	48	3	3	1-2 days	-7	N/A
S2_R3	A (45 dB)	52	7	7	1-2 days	-3	N/A
S2_R4	A (45 dB)	47	2	2	1-2 days	-8	N/A

Assessed receptor	ABC category	Predicted construction noise levels* dBL _{Aeq,T}	Exceedance over impact threshold* dBL _{Aeq,T}	Exceedance of LOAEL (45dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (55dB)	Duration of SOAEL exceedance
S2_R5	A (45 dB)	46	1	1	1-2 days	-9	N/A
S2_R6	A (45 dB)	47	2	2	1-2 days	-8	N/A
S2_R7	A (45 dB)	45	0	0	N/A	-10	N/A
S2_R8	A (45 dB)	53	8	8	1-2 days	-2	N/A
S3_R1	A (45 dB)	44	-1	-1	N/A	-11	N/A
S4_R1	A (45 dB)	48	3	3	1-2 days	-7	N/A
S4_R2	A (45 dB)	41	-4	-4	N/A	-14	N/A
S4_R3	A (45 dB)	40	-5	-5	N/A	-15	N/A
S4_R4	A (45 dB)	47	2	2	1-2 days	-8	N/A
S4_R5	A (45 dB)	46	1	1	1-2 days	-9	N/A
S4_R6	A (45 dB)	49	4	4	1-2 days	-6	N/A
S4_R7	A (45 dB)	45	0	0	N/A	-10	N/A
S4_R8	A (45 dB)	38	-7	-7	N/A	-17	N/A
S4_R11	A (45 dB)	39	-6	-6	N/A	-16	N/A
S6_R1	A (45 dB)	46	1	1	1-2 days	-9	N/A
S6_R2	A (45 dB)	46	1	1	1-2 days	-9	N/A
S6_R3	A (45 dB)	45	0	0	N/A	-10	N/A
S6_R4	A (45 dB)	42	-3	-3	N/A	-13	N/A
S6_R5	A (45 dB)	43	-2	-2	N/A	-12	N/A
S7_R1	A (45 dB)	53	8	8	1-2 days	-2	N/A
S8_R1	A (45 dB)	44	-1	-1	N/A	-11	N/A
S8_R2	A (45 dB)	38	-7	-7	N/A	-17	N/A

Assessed receptor	ABC category	Predicted construction noise levels* dBL _{Aeq,T}	Exceedance over impact threshold* dBL _{Aeq,T}	Exceedance of LOAEL (45dB)	Duration of LOAEL exceedance	Exceedance of SOAEL (55dB)	Duration of SOAEL exceedance
S8_R3	A (45 dB)	37	-8	-8	N/A	-18	N/A

Table 2-4 Construction vibration predictions (PPV, mm/s). Receptors with no LOAEL/SOAEL exceedances shown in grey. Receptors where SOAEL is exceeded shown in yellow

Assessed receptor	Vibratory compaction – startup/rundown	Vibratory compaction – steady	Vibratory piling startup/rundown	Horizontal drilling	Exceedance of LOAEL	Exceedance of SOAEL
CRC_R1	0.7	0.3	<0.1	0.2	0.4	-0.3
CRC_R2	0.6	0.3	<0.1	0.4	0.3	-0.4
CRC_R3	0.6	0.2	<0.1	0.4	0.3	-0.4
CRC_R4	0.8	0.3	<0.1	0.5	0.5	-0.2
CRC_R5	0.1	<0.1	<0.1	0.1	-0.2	-0.9
CRC_R6	0.9	0.4	<0.1	0.6	0.6	-0.1
CRC_R7	1.6	0.7	<0.1	0.5	1.3	0.6
CRC_R8	0.6	0.2	<0.1	0.2	0.3	-0.4
CRC_R9	0.3	0.1	<0.1	0.1	0	-0.7
CRC_R10	0.6	0.2	<0.1	0.2	0.3	-0.4
CRC_R11	0.1	<0.1	<0.1	0.1	-0.2	-0.9
CRC_R12	0.9	0.4	<0.1	0.1	0.6	-0.1
CRC_R13	0.6	0.3	<0.1	0.3	0.3	-0.4
CRC_R14	0.4	0.1	<0.1	0.2	0.1	-0.6
CRC_R15	0.3	0.1	<0.1	0.2	0	-0.7
CRC_R16	0.2	0.1	<0.1	0.2	-0.1	-0.8
CRC_R17	0.3	0.1	<0.1	0.1	0	-0.7
CRC_R18	0.5	0.2	<0.1	0.1	0.2	-0.5
CRC_R19	1.5	0.7	0.1	0.4	1.2	0.5
CRC_R20	0.2	0.1	0.2	0.2	-0.1	-0.8
CRC_R21	0.8	0.3	0.3	0.6	0.5	-0.2
CRC_R22	0.4	0.1	0.1	0.3	0.1	-0.6

Assessed receptor	Vibratory compaction – startup/rundown	Vibratory compaction – steady	Vibratory piling startup/rundown	Horizontal drilling	Exceedance of LOAEL	Exceedance of SOAEL
CRC_R23	0.2	0.1	0.1	0.2	-0.1	-0.8
CRC_R24	0.2	0.1	0.1	0.1	-0.1	-0.8
CRC_R25	0.8	0.3	0.1	0.1	0.5	-0.2
CRC_R26	0.4	0.2	<0.1	0.2	0.1	-0.6
CRC_R27	0.3	0.1	<0.1	0.2	0	-0.7
CRC_R28	0.1	<0.1	<0.1	0.1	-0.2	-0.9
CRC_R29	0.1	<0.1	<0.1	0.2	-0.1	-0.8
S1_R1	0.2	<0.1	1	<0.1	0.7	0
S1_R2	0.1	<0.1	0.3	<0.1	0	-0.7
S1_R3	0.1	<0.1	0.3	<0.1	0	-0.7
S1_R4	0.2	0.1	1.7	0.1	1.4	0.7
S1_R5	0.2	0.1	0.7	0.1	0.4	-0.3
S1_R6	0.1	<0.1	0.1	0.1	-0.2	-0.9
S1_R9	0.1	<0.1	0.3	<0.1	0	-0.7
S1_R10	0.2	0.1	1.8	<0.1	1.5	0.8
S1_R12	0.2	0.1	0.8	<0.1	0.5	-0.2
S2_R1	0.4	0.2	2	0.3	1.7	1
S2_R2	0.6	0.2	0.5	0.4	0.3	-0.4
S2_R3	0.6	0.2	0.3	0.4	0.3	-0.4
S2_R4	0.3	0.1	1.3	0.2	1	0.3
S2_R5	0.2	0.1	0.4	0.1	0.1	-0.6
S2_R6	0.2	0.1	1.2	0.1	0.9	0.2
S2_R7	0.5	0.2	0.2	0.2	0.2	-0.5
S2_R8	0.6	0.2	0.2	0.4	0.3	-0.4
S3_R1	0.1	<0.1	0.6	0.1	0.3	-0.4

Assessed receptor	Vibratory compaction – startup/rundown	Vibratory compaction – steady	Vibratory piling startup/rundown	Horizontal drilling	Exceedance of LOAEL	Exceedance of SOAEL
S4_R1	0.1	<0.1	0.3	0.2	0	-0.7
S4_R2	0.1	<0.1	0.8	<0.1	0.5	-0.2
S4_R3	0.2	0.1	0.2	0.1	-0.1	-0.8
S4_R4	0.1	<0.1	0.6	0.1	0.3	-0.4
S4_R5	0.1	<0.1	0.7	0.1	0.4	-0.3
S4_R6	0.1	<0.1	1.6	0.2	1.3	0.6
S4_R7	0.1	<0.1	0.2	0.1	-0.1	-0.8
S4_R8	0.3	0.1	1.2	<0.1	0.9	0.2
S4_R11	0.1	<0.1	1.8	<0.1	1.5	0.8
S6_R1	0.3	0.1	0.8	0.2	0.5	-0.2
S6_R2	0.1	<0.1	1.4	0.1	1.1	0.4
S6_R3	0.1	<0.1	1.2	0.2	0.9	0.2
S6_R4	0.1	<0.1	1.2	0.1	0.9	0.2
S6_R5	0.1	<0.1	0.3	0.1	0	-0.7
S7_R1	0.1	<0.1	1.2	1.2	0.9	0.2
S8_R1	0.4	0.1	0.6	0.1	0.3	-0.4
S8_R2	0.1	<0.1	0.4	0.1	0.1	-0.6
S8_R3	0.1	<0.1	0.2	<0.1	-0.1	-0.8

Table 2-5 Operational noise predictions. Receptors with no LOAEL/SOAEL exceedances shown in grey

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S1_R1	Mount Pleasant Farmhouse by Skipwith Road, Escrick	L1	33	22	29	23	33	27	0	5	-5	0	N/A	N/A	-10	-5	N/A	N/A
S1_R2	Residential receptors by Wheldrake Lane, Escrick (Gilbertson House, Gilbertson Farm Cottage, and The Granary)	L2 and L1	33	22	26	14	30	18	-3	-4	-8	-9	N/A	N/A	-13	-14	N/A	N/A
S1_R3	Residential receptors by Skipwith Road/Mill Hill, Escrick (Wheldrake Lodge, 1 East Lodge, and 2 East Lodge)	L3 and L1	38	27	27	17	31	21	-7	-6	-12	-11	N/A	N/A	-17	-16	N/A	N/A
S1_R4	Residential receptors by Skipwith Road, Escrick (1 Whinchat Cottages, 2 Whinchat Cottages, and Whinchat Cottages)	L4 and L1	38	27	27	17	31	21	-7	-6	-12	-11	N/A	N/A	-17	-16	N/A	N/A
S1_R5	Residential receptors by Skipwith Road, Escrick (Whinchat Hall, Whinchat Hall - The Pallion, and Whinchat Hall Stables)	L4 and L1	38	27	26	15	30	19	-8	-8	-13	-13	N/A	N/A	-18	-18	N/A	N/A

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S1_R6	Residential receptors by Skipwith Road, Skipwith (Bridge Farm Farmhouse and Four Oaks)	L1	33	22	19	8	23	12	-10	-10	-15	-15	N/A	N/A	-20	-20	N/A	N/A
S1_R7	Residential receptors by Roth Hill Lane, Thorganby (Mallard Lodge and Holly Grange)	L1	33	22	16	6	20	10	-13	-12	-18	-17	N/A	N/A	-23	-22	N/A	N/A
S1_R8	Residential receptors by Common Lane, Thorganby (Common Bottom Farm, Annex at Common Bottom Farm)	L2 and L1	33	22	18	6	22	10	-11	-12	-16	-17	N/A	N/A	-21	-22	N/A	N/A
S1_R9	Residential receptors by Wheldrake Lane, Escrick (Chequer Hall Cottage, Keepers Cottage, Gamekeepers Cottage, Tile Shed Cottage)	L2 and L1	33	22	24	15	28	19	-5	-3	-10	-8	N/A	N/A	-15	-13	N/A	N/A
S1_R10	Receptor located to the south of Wheldrake Lane (Tiledshed Farm)	L1	33	22	28	21	32	25	-1	3	-6	-2	N/A	N/A	-11	-7	N/A	N/A

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S1_R11	Receptor located to the north of Southmoor Road and to the west of Sandhole Lane (The Stables and Common Farm)	L1	33	22	21	9	25	13	-8	-9	-13	-14	N/A	N/A	-18	-19	N/A	N/A
S1_R12_b	Receptor located by Skipwith Road (Manor Farm)	L1	33	22	28	19	32	23	-1	1	-6	-4	N/A	N/A	-11	-9	N/A	N/A
S2_R1	Brexhaven by A63-Monk Fryston to Hambleton, Hambleton	L10 and L9	38	31	35	33	39	37	1	6	-4	1	N/A	Variable ¹	-9	-4	N/A	N/A
S2_R2	Breckswood on Breckswood Lane by A63-Monk Fryston to Hambleton, Hambleton	L10 and L9	38	31	35	32	39	36	1	5	-4	0	N/A	N/A	-9	-5	N/A	N/A
S2_R3	Residential receptor and commercial receptors on Green Lane by A63-Monk Fryston to Hambleton, Monk Fryston (Oakwood Cottage and B&B Fireplaces)	L10 and L9	38	31	34	32	38	36	0	5	-5	0	N/A	N/A	-10	-5	N/A	N/A

¹ Exceedance predicted to occur when plant items need to operate at the loads presented in Table 2-1 of Appendix 11.3 of the ES.

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S2_R4	Receptor located by Southern bridleway at midpoint of Fryston Common Lane	L9	38	31	36	35	40	39	2	8	-3	3	N/A	Variable ²	-8	-2	N/A	N/A
S2_R5	Receptor located by Northern bridleway at midpoint of Fryston Common Lane (Oak Tree Farm)	L9	38	31	31	29	35	33	-3	2	-8	-3	N/A	N/A	-13	-8	N/A	N/A
S2_R6	Receptor located at end of Fryston Common Lane where it meets Brecks Farm Lane (Siddle Farm)	L9	38	31	37	35	41	39	3	8	-2	3	N/A	Variable ³	-7	-2	N/A	N/A
S2_R7	Residential receptors by Common Lane, Hambleton (Dunroamin, and Hagg Bush Farm Cottage)	L12 and L9	38	31	29	26	33	30	-5	-1	-10	-6	N/A	N/A	-15	-11	N/A	N/A
S2_R8	Brecks Farm Cottage on Causeway Dike to Brecks Farm, by A63-Monk Fryston to Hambleton, Monk Fryston	L5 and L9	40	31	36	35	40	39	0	8	-5	3	N/A	Variable ⁴	-10	-2	N/A	N/A

² Exceedance predicted to occur when operational plant items need to operate at the loads presented in Table 2-1 of Appendix 11.3 of the ES.

³ Exceedance predicted to occur when operational plant items need to operate at the loads presented in Table 2-1 of Appendix 11.3 of the ES.

⁴ Exceedance predicted to occur when operational plant items need to operate at the loads presented in Table 2-1 of Appendix 11.3 of the ES.

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S3_R1	Residential receptors by Hillam Common Lane, Hillam (Silverfields, and mobile home at Meadow Farm)	L7 and L5	40	25	28	25	32	29	-8	4	-13	-1	N/A	N/A	-18	-6	N/A	N/A
S4_R1	Location not associated with any receptors — located on land bound by Hillam Common Lane and Pighill Nook Road	L5	40	25	28	25	32	29	-8	4	-13	-1	N/A	N/A	-18	-6	N/A	N/A
S4_R2	Representative of 6 residential receptors by Tinkler's Lane off of Haddlesey Road, Birkin (Birkin House, Barkhouse Farm, White Cottage, Park View)	L8 and L5	40	25	30	24	34	28	-6	3	-11	-2	N/A	N/A	-16	-7	N/A	N/A
S4_R3	Residential receptors by Roe Lane, Birkin (1 Hawthorn Cottages, 2 Hawthorn Cottages)	L8 and L5	40	25	28	24	32	28	-8	3	-13	-2	N/A	N/A	-18	-7	N/A	N/A

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S4_R4	Milefield by Pighill Nook Road, Hillam	L5	40	25	28	23	32	27	-8	2	-13	-3	N/A	N/A	-18	-8	N/A	N/A
S4_R5	Roe Lane Nursery, by Roe Lane, Hillam	L5	40	25	29	24	33	28	-7	3	-12	-2	N/A	N/A	-17	-7	N/A	N/A
S4_R6	Receptor located at end of Pighill Nook Road (Bowers House Farm)	L5	40	25	29	25	33	29	-7	4	-12	-1	N/A	N/A	-17	-6	N/A	N/A
S4_R7	Representative of receptors by Hillam Common Lane, Hillam (Shelton Firs, Botany Bay, Mayfield, Hillam Lodge, and Hillgate House)	L5	40	25	29	27	33	31	-7	6	-12	1	N/A	Variable ⁵	-17	-4	N/A	N/A
S4_R8	Receptor located by Wood Lane off of Haddlesey Road, Birkin (Woodhouse Farm)	L8 and L5	40	25	31	21	35	25	-5	0	-10	-5	N/A	N/A	-15	-10	N/A	N/A
S4_R9	Representative of the community of Gateforth (residential dwellings by Hillam Road,	L5	40	25	21	15	25	19	-15	-6	-20	-11	N/A	N/A	-25	-16	N/A	N/A

⁵ Exceedance predicted to occur when operational plant items need to operate at the loads presented in Table 2-1 of Appendix 11.3 of the ES.

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	Pale Lane, Landing Road, Gateforth New Road)																	
S4_R11	Woodlands property by Haddlesey Road/Tinkler's Lane, Birkin	L8 and L5	40	25	28	21	32	25	-8	0	-13	-5	N/A	N/A	-18	-10	N/A	N/A
S6_R1	Residential receptors by Turpin Lane, South Milford (The Granary at Milford Grange, and The Old Stables at Milford Grange)	L14 and L13	40	32	33	24	37	28	-3	-4	-8	-9	N/A	N/A	-13	-14	N/A	N/A
S6_R2	Milford Lodge Farm by Common Lane, South Milford	L13	38	30	33	27	37	31	-1	1	-6	-4	N/A	N/A	-11	-9	N/A	N/A
S6_R3	Milford Lodge Cottage by Common Lane, South Milford	L13	38	30	33	27	37	31	-1	1	-6	-4	N/A	N/A	-11	-9	N/A	N/A
S6_R4	Representative of residential receptors located at Northern end of Ingthorpe Lane/Westbourne Terrace, Monk Fryston	L15 and L13	41	33	31	22	35	26	-6	-7	-11	-12	N/A	N/A	-16	-17	N/A	N/A

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{Ar,Tr})		Level relative to background (dB)		Exceedance of LOAEL		Duration of LOAEL exceedance		Exceedance of SOAEL		Duration of SOAEL exceedance	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
S6_R5	Fryston Grange Farm by Fryston Common Lane, Monk Fryston	L9	38	31	30	21	34	25	-4	-6	-9	-11	N/A	N/A	-14	-16	N/A	N/A
S7_R1	Woodhaven by Common Lane, South Milford	L16 and L18	44	36	31	21	35	25	-9	-11	-14	-16	N/A	N/A	-19	-21	N/A	N/A
S8_R1	Hollybank Forge by Philip Lane, Hambleton	L23 and L18	35	25	29	21	33	25	-2	0	-7	-5	N/A	N/A	-12	-10	N/A	N/A
S8_R2	Melton Lays by Bishopdyke Road, Sherburn in Elmet	L18	35	25	28	18	32	22	-3	-3	-8	-8	N/A	N/A	-13	-13	N/A	N/A
S8_R3	Residential receptors by Bishopdyke Road, Sherburn in Elmet (Fairview Boarding Kennels, and Low Rest Park)	L18	35	25	25	16	29	20	-6	-5	-11	-10	N/A	N/A	-16	-15	N/A	N/A

References

- Ref 1 British Standards, “BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise (Part 1) and Vibration (Part 2),” 2014. British Standard Institution.
- Ref 2 ISO, “ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors,” 2024. International Organization for Standardization,
- Ref 3 Government of the United Kingdom of Great Britain and Northern Ireland, “Noise policy statement for England,” March 2010. [Online]. Available at: <https://www.gov.uk/government/publications/noise-policy-statement-for-england>
- Ref 4 Planning Policy Guidance – Noise. Ministry of Housing, Communities and Local Government, Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2018 to 2021). Published 6 March 2014. Available at: <https://www.gov.uk/guidance/noise--2>



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