

# Light Valley Solar

Environmental Statement Volume 3

## Appendix 11.3: Operational Noise Assumptions and Results

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# Infrastructure Planning

## Planning Act 2008

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# Light Valley Solar

## DCO Submission

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## Appendix 11.3: Operational Noise Assumptions and Results

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# 1 Introduction

## 1.1 Overview and purpose of the document

- 1.1.1 This appendix presents the assumptions made for the operational equipment for the Proposed Development, including maintenance and replacement activities, and details about the noise model. It includes information about sound power levels; number of sources; sound reduction indices of building elements; sources of information; and embedded mitigation measures.
- 1.1.2 For details of the assessment of operational noise, please refer to Chapter 11: Noise and Vibration (ES Volume 1) [EN0110012/APP/LVS/06.01.11].
- 1.1.3 Figure 11.2: Environmental Sound Survey and Assessment Locations (ES Volume 2) [EN0110012/APP/LVS/06.02.11.02], presents the location of the receptors for which operational noise levels have been predicted. Figure 11.3: Operational Noise Modelling Results - Predicted Daytime Sound Rating Level - 4m Above Ground (ES Volume 2) [EN0110012/APP/LVS/06.02.11.03], Figure 11.4: Operational Noise Modelling Results - Predicted Nighttime Sound Rating Level - 4m Above Ground (ES Volume 2) [EN0110012/APP/LVS/06.02.11.04] and Figure 11.5: Operational Noise Modelling Results - Predicted Daytime Sound Rating Level - 1.5m Above Ground (ES Volume 2) [EN0110012/APP/LVS/06.02.11.05] present grid maps associated with the operational noise of the Proposed Development.

## 2 Operational noise – stationary sources

### 2.1 Operational noise model assumptions

- 2.1.1 Table 2-1 presents information and assumptions about the operational noise sources included in the three-dimensional noise model. For these sources, sound power levels and spectral information are based on manufacturer equipment specifications from similar schemes.

**Table 2-1 Operational sound power levels for proposed sources (per unit)**

Proposed Development component	Source	Operating times	Number of sources	Sound power level (dBL <sub>Aw</sub> )	Sound power level spectral data (dBL <sub>w</sub> ) per octave band centre frequency, Hz							
					63	125	250	500	1k	2k	4k	8k
Substation	Transformer	24/7	Site 1: 1 Site 2: 5 Site 4: 3	92	92	98	97	90	84	66	64	58
BESS Compound	BESS Enclosure (60% fan speed)	24/7	Site 2: 539	73	73	76	71	69	68	65	61	58
	BESS converter unit (100% Power, with Noise Reduction Kit)	24/7	Site 2: 77	85	91	86	81	77	73	72	78	82
Solar Development Sites	Conversion units daytime (100% Power)	Daytime only	Total number: 105	91	97	92	87	83	79	78	84	88
	Conversion units daytime (100% Power, with Noise Reduction Kit)	Daytime only	Total number: 27	85	92	86	81	77	73	73	78	82
	Conversion units night-time (40% Power)	Night-time only	Total number: 105	80	81	76	65	69	67	67	74	79
	Conversion units night-time (40% Power, with Noise Reduction Kit)	Night-time only	Total number: 27	74	75	70	59	63	61	61	68	73

## 2.2 Operational noise assessment results

- 2.2.1 The results of the noise prediction model for representative noise sensitive receptors at all sites are presented in Table 2-2.
- 2.2.2 A +4 dB feature correction has been applied to the specific sound level to determine the rating level. The last column of Table 2-2 presents the level difference between the rating level and the representative background sound level. Where the difference is a negative number, it indicates that noise emissions from the Proposed Development are below the measured background level. Details of the assessment of likely significant effects are presented in the main chapter.
- 2.2.3 The cells in grey highlight indicated that there is an exceedance of the measured background sound level of more than 5 dB (LOAEL) and less than 10 dB (SOAEL).

**Table 2-2 Operational noise assessment**

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L <sub>A90</sub> )		Specific sound level (dB L <sub>Aeq</sub> )		Rating level (dB L <sub>Ar,Tr</sub> )		Level relative to background (dB)	
			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
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
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
S1_R4	Residential receptors by Skipwith Road, Escrick (1 Whinchat Cottages, 2 Whinchat Cottages, and 3 Whinchat Cottages)	L4 and L1	38	27	27	17	31	21	-7	-6
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
S1_R6	Residential receptors by Skipwith Road, Skipwith (Bridge Farm Farmhouse and Four Oaks)	L1	33	22	19	8	23	12	-10	-10
S1_R7	Residential receptors by Roth Hill Lane, Thorganby (Mallard Lodge and Holly Grange)	L1	33	22	16	6	20	10	-13	-12

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L <sub>A90</sub> )		Specific sound level (dB L <sub>Aeq</sub> )		Rating level (dB L <sub>Ar,Tr</sub> )		Level relative to background (dB)	
			Day	Night	Day	Night	Day	Night	Day	Night
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
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
S1_R10	Receptor located to the south of Wheldrake Lane (Tiledshed Farm)	L1	33	22	28	21	32	25	-1	3
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
S1_R12_b	Receptor located by Skipwith Road (Manor Farm)	L1	33	22	28	19	32	23	-1	1
S2_R1	Brexhaven by A63-Monk Fryston to Hambleton, Hambleton	L10 and L9	38	31	35	33	39	37	1	6
S2_R2	Breckswood on Breckswood Lane by A63-Monk Fryston to Hambleton, Hambleton	L10 and L9	38	31	35	32	39	36	1	5
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
S2_R4	Receptor located by Southern bridleway at midpoint of Fryston Common Lane	L9	38	31	36	35	40	39	2	8

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L <sub>A90</sub> )		Specific sound level (dB L <sub>Aeq</sub> )		Rating level (dB L <sub>Ar,Tr</sub> )		Level relative to background (dB)	
			Day	Night	Day	Night	Day	Night	Day	Night
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
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
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
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
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
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
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

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L <sub>A90</sub> )		Specific sound level (dB L <sub>Aeq</sub> )		Rating level (dB L <sub>Ar,Tr</sub> )		Level relative to background (dB)	
			Day	Night	Day	Night	Day	Night	Day	Night
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
S4_R4	Milefield by Pighill Nook Road, Hillam	L5	40	25	28	23	32	27	-8	2
S4_R5	Roe Lane Nursery, by Roe Lane, Hillam	L5	40	25	29	24	33	28	-7	3
S4_R6	Receptor located at end of Pighill Nook Road (Bowers House Farm)	L5	40	25	29	25	33	29	-7	4
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
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
S4_R9	Representative of the community of Gateforth (residential dwellings by Hillam Road, Pale Lane, Landing Road, Gateforth New Road)	L5	40	25	21	15	25	19	-15	-6
S4_R11	Woodlands property by Haddlesey Road/Tinkler's Lane, Birkin	L8 and L5	40	25	28	21	32	25	-8	0
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

Receptor number	Address	Representative baseline measurement location	Measured typical background sound level (dB L <sub>A90</sub> )		Specific sound level (dB L <sub>Aeq</sub> )		Rating level (dB L <sub>Ar,Tr</sub> )		Level relative to background (dB)	
			Day	Night	Day	Night	Day	Night	Day	Night
S6_R2	Milford Lodge Farm by Common Lane, South Milford	L13	38	30	33	27	37	31	-1	1
S6_R3	Milford Lodge Cottage by Common Lane, South Milford	L13	38	30	33	27	37	31	-1	1
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
S6_R5	Fryston Grange Farm by Fryston Common Lane, Monk Fryston	L9	38	31	30	21	34	25	-4	-6
S7_R1	Woodhaven by Common Lane, South Milford	L16 and L18	44	36	31	21	35	25	-9	-11
S8_R1	Hollybank Forge by Philip Lane, Hambleton	L23 and L18	35	25	29	21	33	25	-2	0
S8_R2	Melton Lays by Bishopdyke Road, Sherburn in Elmet	L18	35	25	28	18	32	22	-3	-3
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

### 3 Operational noise – maintenance and replacement

#### 3.1 Maintenance and replacement noise assumptions

3.1.1 Table 3-1 presents information and assumptions about maintenance and replacement works and associated noise information.

3.1.2 The noise modelling results are presented in Table 3-2.

**Table 3-1 Maintenance and replacement works noise assumptions**

Activity Name	Description	Equipment	No	%on time	dBL <sub>wA</sub>	Reference	Activity level dBL <sub>wA</sub>
Replacement of BESS Compound infrastructure	A1 - Removal of hardware and equipment	Core Drill (Electric)	1	60	113	BS5228 Table C 4-69	114
	A2 - Dismantling handling and moving equipment	Tracked Mobile Crane	1	60	95	BS5228 Table C 3-28	
	A3 – Installing handling and moving equipment	Tracked Mobile Crane	1	60	109	BS5228 Table C 1-20	
	A5 - Installation of batteries, racking, connections and grounding	Hand-Held Welder	1	60	101	BS5228 Table C 3-31	
	A6 - Removal of waste and old components	Tractor (Towing Equipment )	1	80	108	BS5228 Table C 4-74	
Replacement of Solar PV Panels	A1 - Removal of hardware and equipment	Core Drill (Electric)	1	60	113	BS5228 Table C 4-69	114
	A2 - Dismantling handling and moving equipment	Tracked Mobile Crane	1	60	95	BS5228 Table C 3-28	
	A3 - Installing handling and moving equipment	Tracked Mobile Crane	1	60	109	BS5228 Table C 1-20	
	A4 - Placement and securement of new solar panels	Hand-Held Welder	1	60	101	BS5228 Table C 3-31	

Activity Name	Description	Equipment	No	%on time	dBL <sub>wA</sub>	Reference	Activity level dBL <sub>wA</sub>
	A6 - Removal of waste and old components	Tractor (Towing Equipment )	1	80	108	BS5228 Table C 4-74	

## 3.2 Maintenance and replacement assessment results

3.2.1 The results of the noise prediction model for representative noise sensitive receptors at all sites are presented in Table 3-2. The cells in grey highlight indicated that there is an exceedance of the relevant ABC assessment criterion.

**Table 3-2 Maintenance noise prediction**

Assessed receptor	ABC Category (daytime criterion, dBL <sub>Aeq,12hr</sub> )	Predicted maintenance noise levels dBL <sub>Aeq,12hr</sub>	Exceedance over impact threshold
S1_R1	A (65)	57	-8
S1_R1_b	A (65)	48	-17
S1_R2	A (65)	47	-18
S1_R3	A (65)	49	-16
S1_R4	A (65)	63	-2
S1_R5	A (65)	55	-10
S1_R6	A (65)	43	-22
S1_R9	A (65)	50	-15
S1_R10	A (65)	63	-2
S1_R12	A (65)	48	-17
S1_R12_b	A (65)	61	-4
S1_R12_c	A (65)	50	-15
S2_R1	A (65)	62	-3
S2_R2	A (65)	55	-10
S2_R3	A (65)	52	-13
S2_R4	A (65)	60	-5
S2_R5	A (65)	51	-14
S2_R6	A (65)	59	-6
S2_R7	A (65)	46	-19
S2_R8	A (65)	51	-14
S3_R1	A (65)	53	-12
S4_R1	A (65)	44	-21
S4_R2	A (65)	57	-8
S4_R3	A (65)	49	-16
S4_R4	A (65)	55	-10
S4_R5	A (65)	54	-11
S4_R6	A (65)	60	-5
S4_R7	A (65)	45	-20
S4_R8	A (65)	53	-12
S4_R11	A (65)	62	-3
S6_R1	A (65)	55	-10
S6_R2	A (65)	61	-4

Assessed receptor	ABC Category (daytime criterion, dBL <sub>Aeq,12hr</sub> )	Predicted maintenance noise levels dBL <sub>Aeq,12hr</sub>	Exceedance over impact threshold
S6_R3	A (65)	58	-7
S6_R4	A (65)	58	-7
S6_R5	A (65)	45	-20
S7_R1	A (65)	60	-5
S8_R1	A (65)	52	-13
S8_R2	A (65)	53	-12
S8_R3	A (65)	46	-19



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