

Document Reference	Appendix No.	Title
4.01.8	8.1	Noise Figures





Document Reference	Appendix No.	Title
4.01.8	8.2	Basic Acoustic Terminology



## **APPENDIX 8-2**

### **BASIC ACOUSTIC TERMINOLOGY**

#### **NOISE**

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure level. It is because of this wide range that a noise level scale based on logarithms is used in noise measurement. This is the decibel or dB scale.

Audibility of sound covers a range of about 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ability to recognise a particular sound is dependent on the pitch or frequencies present in the source. Sound pressure measurements taken with a microphone cannot differentiate in the same way as the ear, consequently a correction is applied by the noise measuring instrument in order to correspond more closely to the frequency response of the ear which responds to sounds from 20 Hz to 20000 Hz. This is known as 'A weighting' and written as dB(A).

The use of this unit is internationally accepted and correlates well with subjective annoyance to noise.

The logarithmic basis of noise measurements means that when considering more than one noise source their addition must be undertaken in terms of logarithmic arithmetic. Thus, two noise sources each of 40 dB(A) acting together would not give rise to  $40 + 40 = 80$  dB(A) but rather  $40 + 40 = 43$  dB(A). This 3 dB(A) increase represents a doubling in sound energy but would be only just perceptible to a human ear.

The attached chart gives typical noise levels in terms of dB(A) for common situations.

Noise levels can vary with time according to source activity and indices have been developed in order to be able to assign a value to represent a period of noise level variations and to correspond with subjective response.

The definition in layman's terms is given below for terminology used in the measurement and results obtained during the survey work.

**A-weighting:** Normal hearing covers the frequency (pitch) range from about 20Hz to 20,000 Hz but sensitivity of the ear is greatest between about 500Hz and 5000Hz. The "A-weighting" is an electrical circuit built into noise meters to mimic this characteristic of the human ear.

**Ambient noise:** The totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

**Attenuation:** Noise reduction

**Background noise:** The general quiet periods of ambient noise when the noise source under investigation is not there.

**Decibel (dB):** The unit of measurement for sound based on a logarithmic scale. 0dB is the threshold of normal hearing; 140dB is the threshold of pain. A change of 1dB is only detectable under controlled laboratory conditions.

**dB(A) [decibel A weighted]:** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) serves to distinguish sounds of different frequency (or pitch) in a similar way to how the human ear responds. Measurements in dB(A) broadly agrees with an individual's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal everyday conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of sound.

**dB(C): [decibel C weighted]:** Frequency weighting which does not alter low frequency octave band levels by very much compared to 'A' weighting. Similar to linear reading (i.e. linear does not alter frequency spectra at all)

**Frequency (Hz):** The number of sound waves to pass a point in one second.

**L<sub>Aeq</sub>:** This is a noise index used to describe the "average" level of a noise that varies with time (T). It allows for the different sensitivities of the human ear to different frequencies (pitch), and averages fluctuating noise levels in a manner, which correlates well with human perceptions of loudness.

**L<sub>A10,T</sub>:** This noise index gives an indication of the upper limit or peak levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 10 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L<sub>A10</sub> reading was say 60dB, then this means that for 1 hour out of 10 the level went above 60dB.

**L<sub>A90,T</sub>:** This noise index gives an indication of the lower limit or levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L<sub>A90</sub> reading was say 50dB, then this means that for 9 hours out of 10 the level went above 50dB.

**L<sub>Amax</sub>:** This is the highest A weighted noise level recorded during a noise measurement period.

**L<sub>night,outside</sub>** : This is the A-weighted long-term average sound level measured outside as defined in ISO 1996-2: 1987, determined over all the night periods of a year.

**Residual noise:** The ambient noise remaining at a given position in a given situation when the noise source under investigation is not there.

**Specific noise:** The noise source under investigation for assessing the likelihood of complaints.

#### Examples of typical noise levels

Source/Activity	Indicative noise level [dB(A)]
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Busy road at 5km	35-45
Car at 65km/h at 100m	55
Busy general office	60
Conversation	60
Truck at 50km/h at 100m	65
City Traffic at 5m	75-85
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

Document Reference	Appendix No.	Title
4.01.8		
	8.3	Noise Survey Details



## APPENDIX 8-3

### NOISE SURVEY DETAILS

#### *Instrumentation*

<i>Manufacturer</i>	<i>Description</i>	<i>Type</i>	<i>Calibration Due date</i>	<i>Serial No.</i>
Cirrus	Real Time Sound Analyser	171B	April 2022	G056142
Norsonic	Integrating Sound Level Meter	116	December 2021	22697
Norsonic	Real Time Sound Analyser	140	February 2022	1405418
Norsonic	Real Time Sound Analyser	118	July 2022	31992
Cirrus	Electronic Calibrator	CR: 513A	April 2022	031523
Norsonic	Electronic Calibrator	Nor 1251	December 2021	24323

The noise meters used during the survey are precision grade type 1 meters to IEC 651 standard and accuracy.

Calibration Setting: 94dB

Meter Setting: Fast Response

#### Fieldwork Details:

Date of tests: Friday 26<sup>th</sup> to Monday 29<sup>th</sup> November 2021

Time Period: hours

Calibration: Before and after: 94dB

#### **Meteorological Conditions**

Weather conditions were recorded during the baseline survey are detailed in the following pages which provides the results of monitoring using a Davis Vantage Vue weather station:

The climatic conditions were suitable for monitoring environmental noise levels in accordance with advice given in BS 7445:2003 'Description and measurement of environmental noise' and BS4142:2014+A1:2019.

Noise climate generally formed by:

Local and distant road traffic noise and birdsong.

Date	Time	Temp Out	Wind Speed	Wind Dir	Rain
26/11/2021	07:30	9.6	2.8	WNW	0
26/11/2021	07:45	9.9	2.8	WNW	0
26/11/2021	08:00	9.8	2.5	WNW	0
26/11/2021	08:15	9.7	2.2	WNW	0
26/11/2021	08:30	9.7	2	WNW	0
26/11/2021	08:45	9.9	2.6	WNW	0
26/11/2021	09:00	10.2	1.5	WNW	0
26/11/2021	09:15	9.9	1.9	WNW	0
26/11/2021	09:30	10.2	1.5	WNW	0
26/11/2021	09:45	10	1.9	WNW	0
26/11/2021	10:00	10.1	1.8	WNW	0
26/11/2021	10:15	10.1	1.7	WNW	0
26/11/2021	10:30	10.3	1.5	WNW	0
26/11/2021	10:45	10	1.7	WNW	0
26/11/2021	11:00	10.2	1.8	WNW	0
26/11/2021	11:15	10.7	1.8	WNW	0
26/11/2021	11:30	9.5	2.3	WNW	0
26/11/2021	11:45	9.1	1.7	NW	0
26/11/2021	12:00	8.4	1.5	NW	0
26/11/2021	12:15	8	1.8	NW	0
26/11/2021	12:30	9.2	2.2	NW	0
26/11/2021	12:45	9.5	1.5	NW	0
26/11/2021	13:00	9.4	2	NW	0
26/11/2021	13:15	8.9	1.6	NW	0
26/11/2021	13:30	7.7	1.5	NW	0
26/11/2021	13:45	7.4	1.9	NW	0
26/11/2021	14:00	6.5	2.4	NW	0
26/11/2021	14:15	6.3	1.9	NW	0
26/11/2021	14:30	5.9	2.1	NW	0
26/11/2021	14:45	5.6	2.5	NW	0
26/11/2021	15:00	5.8	2.4	NW	0
26/11/2021	15:15	5.4	2	NW	0
26/11/2021	15:30	5.3	2.3	NW	0
26/11/2021	15:45	5.3	1.8	NW	0
26/11/2021	16:00	5.1	1.8	NW	0
26/11/2021	16:15	5.3	2.4	NW	0
26/11/2021	16:30	5.3	2.4	NW	0
26/11/2021	16:45	4.4	2.1	NW	0
26/11/2021	17:00	4.9	2.5	NW	0
26/11/2021	17:15	4.8	3.4	NW	0
26/11/2021	17:30	4.5	3.1	NW	0
26/11/2021	17:45	4.2	3.6	NW	0
26/11/2021	18:00	4	3.4	NW	0
26/11/2021	18:15	4.1	3.5	NW	0
26/11/2021	18:30	4.3	3.6	NW	0
26/11/2021	18:45	3.7	3.9	NW	0
26/11/2021	19:00	3.6	3.9	NW	0
26/11/2021	19:15	3.5	3.6	NW	0
26/11/2021	19:30	3.5	4.2	NW	0
26/11/2021	19:45	3.4	4.3	WNW	0
26/11/2021	20:00	3.5	4.3	WNW	0
26/11/2021	20:15	3.7	4.1	WNW	0
26/11/2021	20:30	3.9	4.1	WNW	0
26/11/2021	20:45	4.1	4.2	NW	0
26/11/2021	21:00	4.2	3.9	NW	0
26/11/2021	21:15	4	3.8	NW	0
26/11/2021	21:30	4.2	3.9	NW	0
26/11/2021	21:45	4.3	4	NW	0
26/11/2021	22:00	4.2	4.1	NW	0
26/11/2021	22:15	4.6	4.2	NW	0
26/11/2021	22:30	4.8	4.2	NW	0
26/11/2021	22:45	4.8	4.3	WNW	0
26/11/2021	23:00	4.7	4.4	WNW	0
26/11/2021	23:15	4.8	4.3	WNW	0
26/11/2021	23:30	4.8	4.6	WNW	0
26/11/2021	23:45	4.9	4.7	WNW	0
27/11/2021	00:00	4.9	5.5	WNW	0.5

Date	Time	Temp Out	Wind Speed	Wind Dir	Rain
27/11/2021	00:15	5.5	5.7	WNW	0.5
27/11/2021	00:30	6.1	6.1	WNW	0.7
27/11/2021	00:45	6.4	5.7	NW	0.82
27/11/2021	01:00	6.7	5.4	NW	0.92
27/11/2021	01:15	6.9	5.5	NNW	1.3
27/11/2021	01:30	6.1	5.4	NNW	0.25
27/11/2021	01:45	6.3	5.5	NNW	0.25
27/11/2021	02:00	6.2	5.8	NNW	0.44
27/11/2021	02:15	6.2	6.3	NNW	1.1
27/11/2021	02:30	6	6.4	NNW	0.45
27/11/2021	02:45	6.1	5.8	NNW	0.34
27/11/2021	03:00	6	5.4	NNW	0.24
27/11/2021	03:15	6	5.2	NNW	0.65
27/11/2021	03:30	5.9	5	NNW	0.87
27/11/2021	03:45	5.8	4.8	NNW	0.7
27/11/2021	04:00	6.1	4.7	NNW	0.75
27/11/2021	04:15	5.4	4.5	NNW	0.63
27/11/2021	04:30	5.8	4.2	N	0.5
27/11/2021	04:45	5.7	4.3	N	0.3
27/11/2021	05:00	5.7	4.5	N	0.2
27/11/2021	05:15	5.6	4.1	N	0.25
27/11/2021	05:30	5.6	3.9	N	0.45
27/11/2021	05:45	5.4	4.6	NNW	0.43
27/11/2021	06:00	5.5	5.1	NNW	0.5
27/11/2021	06:15	5.7	5.3	N	0.25
27/11/2021	06:30	5.4	5.1	N	0.2
27/11/2021	06:45	5.3	5	N	0.4
27/11/2021	07:00	5.4	4.8	N	0.45
27/11/2021	07:15	5.5	4.8	N	0.5
27/11/2021	07:30	5.5	5	N	0.62
27/11/2021	07:45	5.6	4.5	NNW	0.8
27/11/2021	08:00	5.7	4.4	NNW	0.87
27/11/2021	08:15	4.9	5.1	NNW	0.2
27/11/2021	08:30	5.5	5.2	NNW	0.4
27/11/2021	08:45	5.5	4.6	N	0.45
27/11/2021	09:00	5.8	4.5	N	0.56
27/11/2021	09:15	6.1	4.6	N	0.7
27/11/2021	09:30	6.3	4.3	N	0.5
27/11/2021	09:45	6.5	4.8	N	1.1
27/11/2021	10:00	6.8	4.5	N	0.6
27/11/2021	10:15	7.3	4.3	N	0.5
27/11/2021	10:30	6.7	4.6	N	0.8
27/11/2021	10:45	6.6	4.4	N	1.2
27/11/2021	11:00	6.5	4.8	N	0.87
27/11/2021	11:15	6.5	5.2	N	0.65
27/11/2021	11:30	6.3	4.6	N	0.67
27/11/2021	11:45	6.2	4.1	N	0.52
27/11/2021	12:00	6.4	3.8	N	0.4
27/11/2021	12:15	5.7	3.6	N	0.45
27/11/2021	12:30	6.4	3.8	N	0.35
27/11/2021	12:45	6.7	4.2	N	0.2
27/11/2021	13:00	6.8	4.2	N	0.2
27/11/2021	13:15	6.9	4.3	N	0.15
27/11/2021	13:30	6.7	4.5	N	0.1
27/11/2021	13:45	6.3	4.1	N	0.1
27/11/2021	14:00	6.3	3.8	N	0.4
27/11/2021	14:15	6.1	3.9	N	0.5
27/11/2021	14:30	5.7	4.1	N	0.6
27/11/2021	14:45	5.8	3.7	NNW	0.7
27/11/2021	15:00	5.9	3.9	NNW	0.5
27/11/2021	15:15	5.4	4.1	NNW	0.7
27/11/2021	15:30	5.6	3.6	NNW	0.3
27/11/2021	15:45	5	3.6	NNW	0.2
27/11/2021	16:00	5	3.7	NNW	0.2
27/11/2021	16:15	4.8	3.7	NNW	0.1
27/11/2021	16:30	4.9	3.5	N	0.1
27/11/2021	16:45	4.4	3.2	N	0
27/11/2021	17:00	4.4	3.2	N	0
27/11/2021	17:15	4.4	3.3	NNW	0
27/11/2021	17:30	4.1	3.6	NNW	0
27/11/2021	17:45	4.1	3.5	NNW	0
27/11/2021	18:00	3.9	2.7	NNW	0
27/11/2021	18:15	3.8	2.7	NNW	0
27/11/2021	18:30	3.8	2.6	NNW	0
27/11/2021	18:45	3.7	2.4	NNW	0
27/11/2021	19:00	3.6	2.2	NNW	0
27/11/2021	19:15	3.5	2.1	NNW	0
27/11/2021	19:30	3.3	2.8	NNW	0
27/11/2021	19:45	3.1	2.7	NNW	0
27/11/2021	20:00	3.1	2.5	NNW	0
27/11/2021	20:15	3	2.7	NNW	0
27/11/2021	20:30	2.9	3.7	NNW	0
27/11/2021	20:45	2.9	3.7	NNW	0
27/11/2021	21:00	2.8	3.9	NNW	0
27/11/2021	21:15	2.6	3.8	NNW	0
27/11/2021	21:30	2.6	3.2	N	0
27/11/2021	21:45	2.5	2.6	N	0
27/11/2021	22:00	2.4	2.3	N	0
27/11/2021	22:15	2.4	2.2	NNW	0
27/11/2021	22:30	2.4	2.1	NNW	0
27/11/2021	22:45	2.4	2.4	NNW	0
27/11/2021	23:00	2.3	2.2	NNW	0
27/11/2021	23:15	2.2	1.8	NNW	0
27/11/2021	23:30	2.2	1.9	NNW	0
27/11/2021	23:45	2.1	1.7	NW	0
28/11/2021	00:00	2	1.8	NW	0

Date	Time	Temp Out	Wind Speed	Wind Dir	Rain
28/11/2021	00:15	1.8	1.6	W	0
28/11/2021	00:30	1.9	1.6	NW	0
28/11/2021	00:45	1.9	1.5	WNW	0
28/11/2021	01:00	2.2	1.6	WNW	0
28/11/2021	01:15	2	1.5	NW	0
28/11/2021	01:30	2.2	1.5	NW	0
28/11/2021	01:45	2.7	1.4	N	0
28/11/2021	02:00	2.5	1.8	N	0
28/11/2021	02:15	2.9	1.5	NW	0
28/11/2021	02:30	2.8	1.6	NW	0
28/11/2021	02:45	3	1.5	NW	0
28/11/2021	03:00	2.7	1.5	NW	0
28/11/2021	03:15	2.6	1.6	NW	0
28/11/2021	03:30	2.2	1.4	NW	0
28/11/2021	03:45	2	1.6	NW	0
28/11/2021	04:00	1.9	1.7	NW	0
28/11/2021	04:15	1.1	1.9	WNW	0
28/11/2021	04:30	1.3	1.8	WNW	0
28/11/2021	04:45	1.5	2.1	W	0
28/11/2021	05:00	1.4	1.7	W	0
28/11/2021	05:15	1.4	1.8	W	0
28/11/2021	05:30	1.2	1.9	W	0
28/11/2021	05:45	1.5	1.9	NW	0
28/11/2021	06:00	1.3	1.9	NW	0
28/11/2021	06:15	1.5	2.2	NW	0
28/11/2021	06:30	1.9	2.1	NW	0
28/11/2021	06:45	1.7	2.4	NW	0
28/11/2021	07:00	1.8	2.1	NW	0
28/11/2021	07:15	1.7	2	NW	0
28/11/2021	07:30	2.1	2.1	NW	0
28/11/2021	07:45	2.6	2.1	NW	0
28/11/2021	08:00	2.5	2.6	NW	0
28/11/2021	08:15	2.7	2.2	NW	0
28/11/2021	08:30	3.2	2.3	NW	0
28/11/2021	08:45	3.1	2.4	WNW	0
28/11/2021	09:00	3.5	2.2	WNW	0
28/11/2021	09:15	4.1	2.3	WNW	0
28/11/2021	09:30	3.9	2.4	WNW	0
28/11/2021	09:45	4.9	2.1	NW	0
28/11/2021	10:00	5.3	2.1	NW	0
28/11/2021	10:15	5.3	2	WNW	0
28/11/2021	10:30	5.5	2.2	WNW	0
28/11/2021	10:45	5.4	2.3	WNW	0
28/11/2021	11:00	6	2.4	WNW	0
28/11/2021	11:15	6.4	2.3	WNW	0
28/11/2021	11:30	6.1	2.1	WNW	0
28/11/2021	11:45	6.2	1.8	WNW	0
28/11/2021	12:00	6.4	1.9	WNW	0
28/11/2021	12:15	6.8	2.1	WNW	0
28/11/2021	12:30	6.9	2.6	WNW	0
28/11/2021	12:45	7.2	2.7	WNW	0
28/11/2021	13:00	7.4	2.8	WNW	0
28/11/2021	13:15	7.3	3.2	WNW	0
28/11/2021	13:30	7.1	3.3	WNW	0
28/11/2021	13:45	6.9	3.3	W	0
28/11/2021	14:00	7.2	3.4	W	0
28/11/2021	14:15	7.2	2.9	WNW	0
28/11/2021	14:30	7.4	2.8	WNW	0
28/11/2021	14:45	7.3	2.7	WNW	0
28/11/2021	15:00	7.1	2.4	WNW	0
28/11/2021	15:15	6.7	2.3	WNW	0
28/11/2021	15:30	6.7	2.5	WNW	0
28/11/2021	15:45	6.6	2.3	WNW	0
28/11/2021	16:00	6.5	2.7	WNW	0
28/11/2021	16:15	6.5	2.6	WNW	0
28/11/2021	16:30	6.4	2.8	WNW	0
28/11/2021	16:45	6.3	2.8	W	0
28/11/2021	17:00	6.3	2.8	W	0
28/11/2021	17:15	6.1	2.7	WNW	0
28/11/2021	17:30	6.1	2.8	WNW	0
28/11/2021	17:45	5.9	3	NW	0
28/11/2021	18:00	5.7	2.6	NW	0
28/11/2021	18:15	6	2.5	NW	0
28/11/2021	18:30	6	2.8	NW	0
28/11/2021	18:45	5.5	2.6	WNW	0
28/11/2021	19:00	5.3	2.5	WNW	0
28/11/2021	19:15	5.2	2.3	NNW	0
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28/11/2021	19:45	4.8	2.7	NNW	0
28/11/2021	20:00	4.8	2.9	NNW	0
28/11/2021	20:15	4.8	3	N	0
28/11/2021	20:30	4.4	2	N	0
28/11/2021	20:45	4.2	1.9	NNE	0
28/11/2021	21:00	4.1	1.8	NNE	0
28/11/2021	21:15	3.8	1.6	NNW	0
28/11/2021	21:30	3.5	1.6	NNW	0
28/11/2021	21:45	3.2	1.7	N	0
28/11/2021	22:00	3.2	1.5	N	0
28/11/2021	22:15	2.8	1.4	NNE	0
28/11/2021	22:30	2.5	1.3	NNE	0
28/11/2021	22:45	2.1	0.9	N	0
28/11/2021	23:00	2.1	0.8	N	0
28/11/2021	23:15	1.6	0.5	N	0
28/11/2021	23:30	1.4	0.6	N	0
28/11/2021	23:45	1.2	0.6	NNE	0
29/11/2021	00:00	1.3	0.7	NNE	0

Date	Time	Temp Out	Wind Speed	Wind Dir	Rain
29/11/2021	00:15	1.5	1.1	N	0
29/11/2021	00:30	2.1	1.3	N	0
29/11/2021	00:45	2	1.3	W	0
29/11/2021	01:00	1.7	1.3	W	0
29/11/2021	01:15	1.8	1.3	WNW	0
29/11/2021	01:30	1.9	0.9	WNW	0
29/11/2021	01:45	1.5	0.9	WNW	0
29/11/2021	02:00	1.4	0.9	WNW	0
29/11/2021	02:15	1.1	0.9	WNW	0
29/11/2021	02:30	0.9	0.9	WNW	0
29/11/2021	02:45	1	0.9	WNW	0
29/11/2021	03:00	1.1	0.4	WNW	0
29/11/2021	03:15	1.2	0.4	WNW	0
29/11/2021	03:30	1.1	1.3	WNW	0
29/11/2021	03:45	1.1	1.3	NNW	0
29/11/2021	04:00	0.9	0.9	NNW	0
29/11/2021	04:15	0.9	0.9	N	0
29/11/2021	04:30	0.5	0.9	N	0
29/11/2021	04:45	0.7	0.9	N	0
29/11/2021	05:00	0.8	0.9	N	0
29/11/2021	05:15	0.9	0.9	N	0
29/11/2021	05:30	1	0.4	N	0
29/11/2021	05:45	1.1	0.4	N	0
29/11/2021	06:00	1.2	0	N	0
29/11/2021	06:15	1.4	0.4	NNE	0
29/11/2021	06:30	1.5	0.4	NNE	0
29/11/2021	06:45	1.6	0.9	NNE	0
29/11/2021	07:00	1.4	0.9	NNE	0
29/11/2021	07:15	1.5	1.3	NNE	0
29/11/2021	07:30	1.7	0.3	NNE	0
29/11/2021	07:45	1.2	0	VAR	0
29/11/2021	08:00	1.5	0	VAR	0
29/11/2021	08:15	1.6	0	VAR	0
29/11/2021	08:30	1.4	0	VAR	0
29/11/2021	08:45	1.3	0	VAR	0
29/11/2021	09:00	1.5	0	VAR	0
29/11/2021	09:15	1.5	0	VAR	0
29/11/2021	09:30	1.7	0	VAR	0
29/11/2021	09:45	1.9	0.5	SW	0
29/11/2021	10:00	3.1	0.7	SW	0
29/11/2021	10:15	3.8	0.7	SW	0
29/11/2021	10:30	4.2	0.8	SW	0
21/04/2020	10:45	5	1.1	SW	0
29/11/2021	11:00	5.6	1	SW	0
29/11/2021	11:15	5.9	0.9	SW	0
29/11/2021	11:30	6	1.2	SW	0

Document Reference	Appendix No.	Title
4.01.8		
	8.4	Baseline and Noise Survey Results



## **APPENDIX 8-4**

### **BASELINE & SITE NOISE SURVEY RESULTS**

## Noise Survey Results

Date: Friday 26th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 1

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position A - Brooklands**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
09:00	15:00	53.5	53.2	46.4	66.3	Distant road traffic & birdsong
09:15	15:00	49.1	51.4	45.8	60.1	
09:30	15:00	48.0	49.6	45.3	56.6	
09:45	15:00	50.0	52.5	46.4	60.4	
10:00	15:00	48.6	50.8	45.8	61.0	
10:15	15:00	47.3	49.4	44.6	52.9	
10:30	15:00	45.4	47.6	42.5	52.6	
10:45	15:00	44.4	46.3	41.6	57.9	
11:00	15:00	45.7	48.3	42.0	61.1	
11:15	15:00	47.4	49.7	44.1	57.2	
11:30	15:00	48.3	51.2	44.4	61.6	
11:45	15:00	62.9	56.5	46.8	88.6	
12:00	15:00	57.6	59.4	47.0	86.4	
12:15	15:00	56.6	53.0	46.3	89.4	
12:30	15:00	50.7	53.2	47.3	63.6	
12:45	15:00	61.4	57.0	46.2	87.8	
13:00	15:00	54.5	52.3	45.4	86.7	
13:15	15:00	51.3	54.5	46.8	59.2	
13:30	15:00	47.2	49.3	44.7	57.6	
13:45	15:00	59.0	56.5	48.0	87.8	
14:00	15:00	49.0	51.2	46.6	59.0	
14:15	15:00	54.1	53.9	48.4	85.1	
14:30	15:00	54.1	55.2	48.3	85.3	
14:45	15:00	52.3	53.6	48.4	82.3	
Average 0900-1500		54.8	53.4	46.1	53-89	

## Noise Survey Results

Date: Friday 26th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

**TABLE 2**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	50.2	52.4	47.6	58.4	
15:15	15:00	48.0	49.4	46.2	57.4	
15:30	15:00	48.7	50.5	46.6	60.9	
15:45	15:00	47.8	49.5	45.6	60.7	
16:00	15:00	58.8	61.8	47.1	79.2	
16:15	15:00	50.9	53.2	48.0	60.3	
16:30	15:00	56.0	60.1	45.3	75.1	
16:45	15:00	46.7	48.0	45.1	56.6	
17:00	15:00	46.6	48.2	44.6	54.5	
17:15	15:00	46.8	48.3	45.0	58.9	
17:30	15:00	54.3	54.2	46.3	84.8	
17:45	15:00	61.0	58.0	46.4	87.3	
18:00	15:00	46.0	47.5	44.1	54.1	
18:15	15:00	45.0	46.7	42.8	56.6	
18:30	15:00	44.7	47.2	41.9	52.1	
18:45	15:00	43.2	44.7	41.2	51.3	
19:00	15:00	43.5	45.3	41.2	48.6	
19:15	15:00	45.5	46.9	43.3	60.1	
19:30	15:00	45.2	46.9	42.5	58.2	
19:45	15:00	43.2	44.8	41.3	53.5	
20:00	15:00	43.5	45.2	41.4	49.3	
20:15	15:00	44.1	46.3	41.2	53.6	
20:30	15:00	41.9	44.1	39.5	48.1	
20:45	15:00	40.1	42.1	37.4	47.9	
21:00	15:00	39.9	42.0	37.0	50.1	
21:15	15:00	41.0	42.6	38.9	46.2	
21:30	15:00	41.8	43.6	39.4	53.9	
21:45	15:00	40.9	43.3	37.6	52.9	
22:00	15:00	44.6	46.7	41.3	52.2	
22:15	15:00	44.5	47.1	40.4	52.3	
22:30	15:00	40.2	42.0	37.7	47.6	
22:45	15:00	41.3	43.6	37.0	49.8	
Average 1500-2300		50.6	51.9	43.7	46-87	

## Noise Survey Results

Date: Friday 26th - Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm

**TABLE 3**

Data: **Baseline Sound Survey: Position A - Brooklands**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	39.0	41.0	36.5	46.9	
23:15	15:00	41.5	43.4	39.1	48.4	
23:30	15:00	43.0	45.0	39.6	52.2	
23:45	15:00	44.8	47.3	38.0	56.6	
00:00	15:00	58.9	55.0	41.2	87.0	Periods of rain
00:15	15:00	67.1	62.4	47.6	88.1	Periods of rain
00:30	15:00	68.6	64.6	49.3	88.7	Periods of rain
00:45	15:00	70.1	70.2	49.8	89.1	Periods of rain
01:00	15:00	72.1	75.9	52.2	89.4	Periods of rain
01:15	15:00	73.5	79.0	53.9	89.2	Periods of rain
01:30	15:00	75.1	80.7	55.9	90.7	Periods of rain
01:45	15:00	73.1	78.3	53.4	89.4	Periods of rain
02:00	15:00	73.6	79.0	53.7	89.7	Periods of rain
02:15	15:00	73.1	78.2	54.4	89.2	Periods of rain
02:30	15:00	71.7	75.0	54.0	88.9	Periods of rain
02:45	15:00	71.0	73.0	53.4	89.3	Periods of rain
03:00	15:00	71.4	74.5	52.2	89.8	Periods of rain
03:15	15:00	69.0	66.5	49.5	88.5	Periods of rain
03:30	15:00	70.7	71.9	50.5	89.3	Periods of rain
03:45	15:00	72.0	75.9	51.9	89.9	Periods of rain
04:00	15:00	69.4	67.6	50.0	89.7	Periods of rain
04:15	15:00	70.6	72.6	50.9	88.6	Periods of rain
04:30	15:00	69.5	67.7	50.8	90.3	Periods of rain
04:45	15:00	71.7	75.4	51.0	89.4	Periods of rain
05:00	15:00	70.6	72.0	51.3	89.3	Periods of rain
05:15	15:00	69.4	67.6	51.0	89.6	Periods of rain
05:30	15:00	70.9	73.4	50.5	89.5	Periods of rain
05:45	15:00	67.5	61.3	50.6	90.0	Periods of rain
06:00	15:00	72.6	77.6	51.7	88.5	Periods of rain
06:15	15:00	70.6	72.3	50.3	88.9	Periods of rain
06:30	15:00	68.6	65.7	49.6	88.2	Periods of rain
06:45	15:00	68.4	63.3	50.1	89.7	Periods of rain
Average 2300-0700		42.5	44.7	38.4	47-57	

## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

**TABLE 4**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	71.2	73.8	50.0	89.3	Periods of rain
07:15	15:00	70.0	71.1	51.0	89.3	Periods of rain
07:30	15:00	69.7	68.7	49.6	89.2	Periods of rain
07:45	15:00	68.2	65.0	49.6	89.3	Periods of rain
08:00	15:00	69.2	67.2	49.7	89.1	Periods of rain
08:15	15:00	70.8	72.5	49.7	89.6	Periods of rain
08:30	15:00	68.5	65.6	50.9	88.5	Periods of rain
08:45	15:00	70.4	71.0	52.1	89.4	Periods of rain
09:00	15:00	70.0	69.5	51.0	88.3	Periods of rain
09:15	15:00	69.0	67.4	51.5	88.3	Periods of rain
09:30	15:00	70.6	72.3	53.7	89.6	Periods of rain
09:45	15:00	69.0	67.1	52.1	89.2	Periods of rain
10:00	15:00	68.3	64.9	50.5	89.8	Periods of rain
10:15	15:00	67.3	63.1	50.7	88.6	Periods of rain
10:30	15:00	65.9	60.7	49.8	88.8	Periods of rain
10:45	15:00	65.9	60.5	50.5	89.1	Periods of rain
11:00	15:00	68.4	64.2	50.9	89.4	Periods of rain
11:15	15:00	64.2	57.2	48.6	88.9	Periods of rain
11:30	15:00	66.2	60.2	48.8	88.6	Periods of rain
11:45	15:00	65.4	59.6	47.9	88.0	Periods of rain
12:00	15:00	67.8	62.5	50.1	88.4	Periods of rain
12:15	15:00	67.6	63.8	48.5	88.6	Periods of rain
12:30	15:00	58.3	52.7	45.9	86.7	Periods of rain
12:45	15:00	65.5	59.0	47.3	88.7	Periods of rain
13:00	15:00	63.5	55.5	46.5	88.1	Periods of rain
13:15	15:00	58.9	55.0	45.4	86.9	Periods of rain
13:30	15:00	65.2	57.7	46.5	89.1	Periods of rain
13:45	15:00	53.9	52.5	44.3	85.0	Periods of rain
14:00	15:00	62.6	57.9	45.6	87.7	Periods of rain
14:15	15:00	58.8	54.3	45.1	87.2	Periods of rain
14:30	15:00	61.7	54.5	45.3	87.1	Periods of rain
14:45	15:00	61.0	53.8	44.8	88.6	Periods of rain
Average 1300-1500		61.7	55.5	45.4	85-90	

## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**

**TABLE 5**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	62.0	55.1	45.8	87.4	Periods of rain
15:15	15:00	56.9	49.7	44.1	87.6	Periods of rain
15:30	15:00	57.0	54.0	44.4	86.6	Periods of rain
15:45	15:00	55.9	51.3	44.8	84.9	Periods of rain
16:00	15:00	56.6	50.8	43.9	86.3	Periods of rain
16:15	15:00	56.8	50.7	43.8	87.8	Periods of rain
16:30	15:00	52.2	49.0	42.7	84.2	Periods of rain
16:45	15:00	54.0	47.2	41.4	85.6	
17:00	15:00	44.4	46.9	40.8	56.3	
17:15	15:00	48.8	45.7	41.7	65.2	
17:30	15:00	42.7	44.4	40.7	51.4	
17:45	15:00	43.0	44.7	40.4	53.3	
18:00	15:00	43.7	46.0	40.1	57.6	
18:15	15:00	43.4	45.5	40.4	53.7	
18:30	15:00	43.5	45.5	40.5	55.5	
18:45	15:00	47.7	46.0	39.8	63.1	
19:00	15:00	41.5	43.3	39.3	51.0	
19:15	15:00	40.0	41.8	37.2	50.3	
19:30	15:00	37.7	39.3	35.8	45.0	
19:45	15:00	37.7	39.8	34.7	48.2	
20:00	15:00	37.1	39.3	34.1	51.9	
20:15	15:00	37.5	39.5	34.9	45.6	
20:30	15:00	37.3	39.7	34.0	48.5	
20:45	15:00	36.9	38.9	33.4	55.2	
21:00	15:00	39.1	40.8	35.7	54.6	
21:15	15:00	39.8	41.8	36.4	53.1	
21:30	15:00	39.5	41.7	35.8	49.7	
21:45	15:00	37.0	38.9	34.1	55.5	
22:00	15:00	37.1	39.1	34.7	45.6	
22:15	15:00	38.1	39.5	36.0	51.3	
22:30	15:00	38.9	40.8	36.5	49.0	
22:45	15:00	39.4	41.4	36.7	49.4	
Average 1500-2300		42.0	42.9	38.0	45-65	



## Noise Survey Results

Date: Saturday 27th - Sunday 28th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

**TABLE 6**

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position A - Brooklands**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	39.0	40.9	36.2	49.5	
23:15	15:00	37.8	40.1	34.5	48.4	
23:30	15:00	38.2	40.9	34.2	50.0	
23:45	15:00	38.2	40.3	35.4	48.8	
00:00	15:00	40.0	42.2	35.9	51.8	
00:15	15:00	38.8	41.4	33.8	51.2	
00:30	15:00	38.7	40.8	32.2	53.2	
00:45	15:00	38.1	40.6	33.5	51.9	
01:00	15:00	38.5	40.4	32.2	54.1	
01:15	15:00	38.8	41.2	34.5	51.9	
01:30	15:00	40.0	42.7	35.1	51.0	
01:45	15:00	39.3	42.1	33.9	53.4	
02:00	15:00	41.1	44.2	33.4	51.4	
02:15	15:00	41.5	43.6	37.5	54.8	
02:30	15:00	39.8	41.8	36.7	50.5	
02:45	15:00	37.7	40.3	33.5	49.0	
03:00	15:00	33.4	36.3	27.6	49.1	
03:15	15:00	31.9	35.2	25.6	43.9	
03:30	15:00	28.2	31.1	23.5	43.7	
03:45	15:00	27.3	29.8	22.3	43.1	
04:00	15:00	26.7	29.4	23.1	37.7	
04:15	15:00	30.2	33.1	25.4	46.1	
04:30	15:00	30.9	34.0	25.1	44.8	
04:45	15:00	32.0	35.0	25.8	48.2	
05:00	15:00	34.0	37.0	28.1	49.1	
05:15	15:00	34.4	37.6	29.3	45.5	
05:30	15:00	34.8	37.1	30.9	51.1	
05:45	15:00	34.9	37.7	30.2	48.0	
06:00	15:00	36.9	39.6	31.6	48.6	
06:15	15:00	36.4	40.5	27.9	47.9	
06:30	15:00	37.0	39.4	32.5	51.4	
06:45	15:00	34.9	37.7	30.0	44.5	
Average 2300-0700		37.3	39.8	32.6	38-55	

## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

**TABLE 7**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	38.5	40.9	33.9	52.7	
07:15	15:00	40.5	41.0	34.4	67.0	
07:30	15:00	39.6	41.3	35.1	53.4	
07:45	15:00	39.4	42.0	35.0	53.4	
08:00	15:00	47.6	43.0	34.6	75.0	
08:15	15:00	41.3	43.9	36.6	58.0	
08:30	15:00	42.9	45.3	38.9	57.5	
08:45	15:00	42.9	45.8	37.7	54.7	
09:00	15:00	43.1	45.4	39.6	62.2	
09:15	15:00	44.1	45.0	39.7	68.5	
09:30	15:00	40.2	41.8	37.9	55.2	
09:45	15:00	39.9	41.3	36.6	68.4	
10:00	15:00	39.9	41.6	36.8	55.6	
10:15	15:00	41.3	43.0	38.8	60.0	
10:30	15:00	49.7	50.1	40.4	73.8	
10:45	15:00	42.0	43.5	39.8	52.6	
11:00	15:00	40.4	41.9	38.2	53.2	
11:15	15:00	41.9	44.9	38.2	55.9	
11:30	15:00	40.6	42.1	37.7	62.1	
11:45	15:00	39.9	41.6	37.5	51.2	
12:00	15:00	40.3	41.9	37.7	66.7	
12:15	15:00	39.8	40.3	36.6	63.4	
12:30	15:00	38.6	40.0	36.3	53.5	
12:45	15:00	42.8	42.1	37.7	66.5	
13:00	15:00	40.8	42.1	37.9	65.6	
13:15	15:00	41.7	43.5	38.8	66.6	
13:30	15:00	40.6	42.3	37.7	54.1	
13:45	15:00	41.1	42.5	39.1	57.2	
14:00	15:00	42.5	44.3	40.2	57.8	
14:15	15:00	40.0	41.5	38.1	53.5	
14:30	15:00	41.5	42.6	39.2	69.2	
14:45	15:00	42.3	43.7	39.9	62.4	
Average 0700-1500		42.3	43.4	38.0	51-75	

## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**  
 Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

**TABLE 8**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	43.6	43.8	39.7	73.0	
15:15	15:00	43.0	42.4	38.5	76.0	
15:30	15:00	42.2	43.7	40.0	61.5	
15:45	15:00	42.1	43.6	39.9	55.9	
16:00	15:00	43.1	44.1	39.4	58.5	
16:15	15:00	42.6	44.3	40.1	52.4	
16:30	15:00	42.8	44.4	40.6	55.6	
16:45	15:00	41.5	43.1	39.1	50.9	
17:00	15:00	41.9	43.4	39.8	47.2	
17:15	15:00	41.8	43.4	39.7	49.3	
17:30	15:00	42.1	43.7	39.9	50.1	
17:45	15:00	43.0	44.7	40.7	49.4	
18:00	15:00	43.1	44.9	40.4	56.2	
18:15	15:00	43.0	44.9	40.4	51.6	
18:30	15:00	43.3	45.1	41.1	51.3	
18:45	15:00	42.1	44.3	39.3	48.2	
19:00	15:00	41.3	43.1	38.9	53.6	
19:15	15:00	41.3	42.8	39.3	49.9	
19:30	15:00	41.8	43.2	38.4	60.8	
19:45	15:00	41.0	42.8	38.3	52.2	
20:00	15:00	41.3	43.2	38.5	49.4	
20:15	15:00	40.0	41.9	37.1	51.9	
20:30	15:00	39.4	41.6	35.9	48.0	
20:45	15:00	38.8	41.0	35.1	47.4	
21:00	15:00	37.4	39.5	34.4	46.6	
21:15	15:00	37.1	39.4	33.2	48.2	
21:30	15:00	36.0	38.3	32.7	49.0	
21:45	15:00	38.8	41.6	34.0	50.4	
22:00	15:00	37.3	40.0	32.2	51.5	
22:15	15:00	37.0	39.7	32.3	52.8	
22:30	15:00	36.0	38.6	32.4	45.5	
22:45	15:00	33.8	36.9	28.8	44.9	
Average 1500-2300		41.2	42.8	38.4	45-76	

## Noise Survey Results

Date: Sunday 28th - Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**

**TABLE 9**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	33.4	35.7	29.0	46.6	
23:15	15:00	35.4	37.8	31.9	46.1	
23:30	15:00	33.9	36.4	30.5	42.2	
23:45	15:00	32.1	35.5	26.5	42.6	
00:00	15:00	29.9	32.6	25.5	43.0	
00:15	15:00	33.4	35.9	29.6	50.8	
00:30	15:00	32.8	36.2	24.8	48.6	
00:45	15:00	35.4	38.7	27.5	50.5	
01:00	15:00	31.4	34.6	26.5	43.2	
01:15	15:00	33.0	35.8	26.9	49.0	
01:30	15:00	29.0	31.2	24.9	43.3	
01:45	15:00	28.4	31.7	24.6	38.2	
02:00	15:00	27.6	29.7	24.6	42.0	
02:15	15:00	28.8	31.0	25.3	44.7	
02:30	15:00	29.5	32.0	25.4	39.0	
02:45	15:00	26.7	28.9	24.1	37.9	
03:00	15:00	29.0	32.0	24.7	41.4	
03:15	15:00	27.4	30.2	23.4	40.9	
03:30	15:00	35.5	38.9	28.6	48.8	
03:45	15:00	29.8	33.2	22.9	45.2	
04:00	15:00	31.5	35.3	23.1	46.6	
04:15	15:00	34.4	37.8	26.8	45.4	
04:30	15:00	32.8	35.8	28.0	45.3	
04:45	15:00	37.9	41.7	27.8	53.3	
05:00	15:00	36.7	40.1	30.6	48.3	
05:15	15:00	42.2	45.3	37.2	53.7	
05:30	15:00	43.8	46.4	39.6	54.1	
05:45	15:00	43.2	45.5	39.6	51.1	
06:00	15:00	43.6	45.8	40.6	52.6	
06:15	15:00	45.9	48.0	43.0	54.4	
06:30	15:00	45.5	47.8	41.7	61.5	
06:45	15:00	46.3	48.4	43.3	53.5	
Average 2300-0700		38.9	41.4	35.1	38-62	

## Noise Survey Results

Date: Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position A - Brooklands**

**TABLE 10**

Instrumentation: Norsonic 116 Integrating Sound Level Meter (22697)  
 Calibration: 94dB

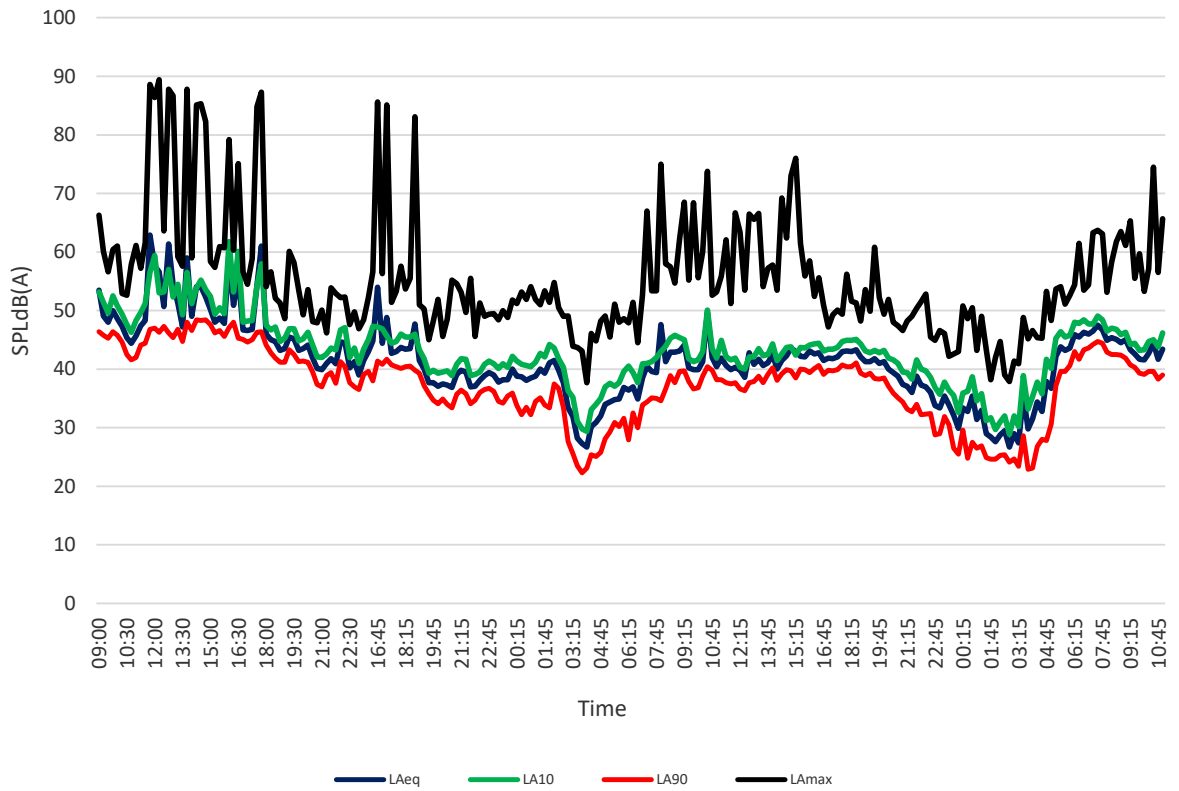
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	46.0	47.7	43.6	54.4	
07:15	15:00	46.5	47.7	44.2	63.3	
07:30	15:00	47.5	49.1	44.7	63.7	
07:45	15:00	46.7	48.4	44.4	63.1	
08:00	15:00	44.9	46.5	42.9	53.1	
08:15	15:00	45.4	47.0	42.5	58.3	
08:30	15:00	45.1	46.8	42.5	61.8	
08:45	15:00	44.5	45.9	42.4	63.5	
09:00	15:00	45.0	46.3	41.9	61.1	
09:15	15:00	43.3	44.2	40.7	65.3	
09:30	15:00	42.6	44.4	40.3	55.5	
09:45	15:00	41.7	43.2	39.3	59.7	
10:00	15:00	41.6	43.3	39.1	53.3	
10:15	15:00	42.7	44.7	39.6	57.1	
10:30	15:00	44.4	45.0	39.6	74.5	
10:45	15:00	41.7	43.8	38.3	56.5	
11:00	15:00	43.4	46.2	39.0	65.7	
Average 0700-1115		44.6	46.2	41.9	53-75	

<b>Overall Average</b>	<b>38.6</b>	<b>41</b>	<b>34.5</b>	<b>38-62</b>	<b>Excluding Rain</b>
<b>Overall Average</b>	<b>49.0</b>	<b>49.0</b>	<b>42.0</b>	<b>45-89</b>	<b>Excluding Rain</b>

Average 0430-0700	<b>40.8</b>	<b>43.3</b>	<b>37.1</b>	<b>45-62</b>	
Representative LA90			<b>28</b>		

<b>Overall Average</b>	<b>48.9</b>	<b>48.8</b>	<b>41.9</b>	<b>45-89</b>	<b>Including Rain</b>
<b>Overall Average</b>	<b>40.1</b>	<b>42.5</b>	<b>36.0</b>	<b>38-91</b>	<b>Including Rain</b>

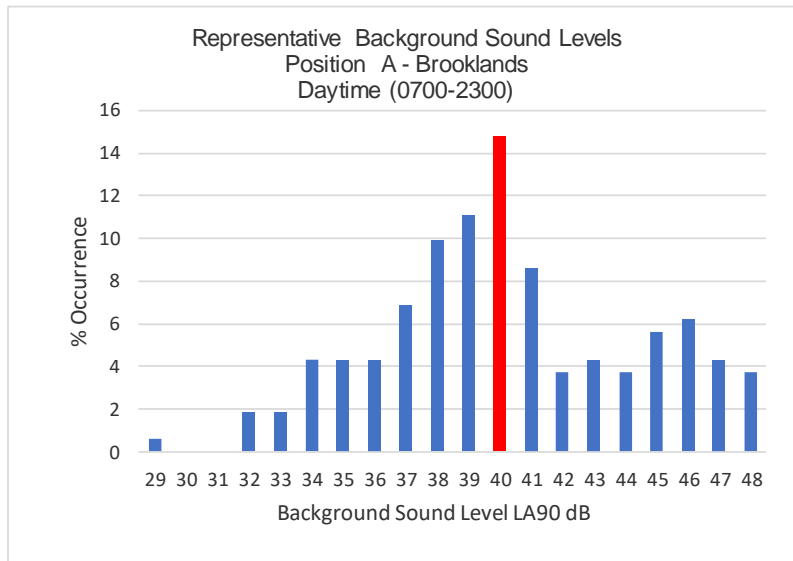
Background Sound Survey: Position A - Brooklands  
Friday 26th - Monday 29th November 2021



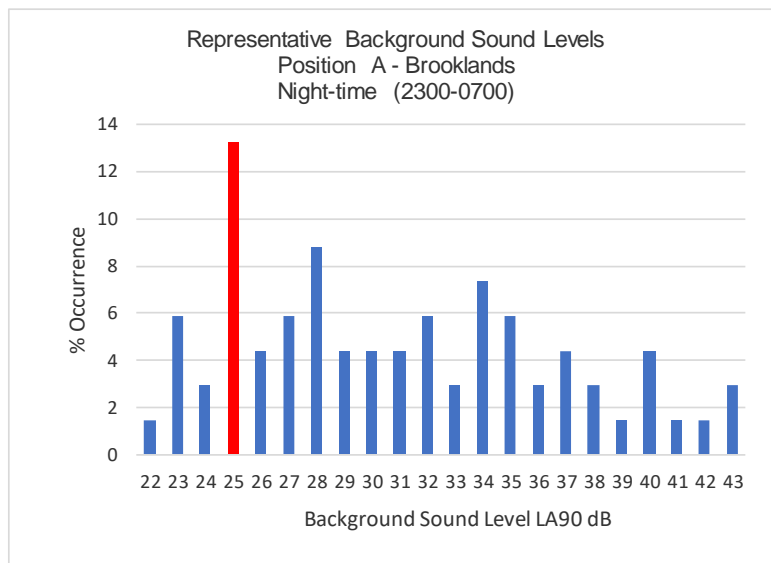


## LA90 Representative Levels

LA90	% Occurrence
29	0.6
30	0.0
31	0.0
32	1.9
33	1.9
34	4.3
35	4.3
36	4.3
37	6.8
38	9.9
39	11.1
<b>40</b>	<b>14.8</b>
41	8.6
42	3.7
43	4.3
44	3.7
45	5.6
46	6.2
47	4.3
48	3.7



LA90	% Occurrence
22	1.5
23	5.9
24	2.9
<b>25</b>	<b>13.2</b>
26	4.4
27	5.9
28	8.8
29	4.4
30	4.4
31	4.4
32	5.9
33	2.9
34	7.4
35	5.9
36	2.9
37	4.4
38	2.9
39	1.5
40	4.4
41	1.5
42	1.5
43	2.9



## Noise Survey Results

Date: Friday 26th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 11

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position B - North of Blackland Farm**

Instrumentation: Norsonic 118 Real Time Analyser (31992)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:45	15:00	60.9	63.0	56.0	70.5	Local Road Traffic Noise
08:00	15:00	61.7	63.5	53.3	78.7	Local Road Traffic Noise
08:15	15:00	60.7	63.5	53.9	68.8	
08:30	15:00	60.8	63.6	54.5	66.8	
08:45	15:00	60.1	63.1	52.9	65.4	
09:00	15:00	61.3	63.7	54.0	75.9	
09:15	15:00	59.6	63.1	51.9	67.1	
09:30	15:00	59.2	62.4	52.5	66.8	
09:45	15:00	59.2	62.1	52.9	66.0	
10:00	15:00	59.0	62.3	52.1	65.9	
10:15	15:00	59.3	62.9	51.4	66.1	
10:30	15:00	59.3	61.8	50.4	76.6	
10:45	15:00	58.9	62.3	49.7	66.1	
11:00	15:00	58.2	61.9	49.2	65.0	
11:15	15:00	59.2	62.2	52.7	65.9	
11:30	15:00	60.2	62.8	54.8	67.1	
11:45	15:00	61.2	63.4	55.0	76.0	
12:00	15:00	61.4	64.0	55.3	67.7	
12:15	15:00	60.5	63.2	55.5	66.1	
12:30	15:00	60.5	63.3	54.6	65.6	
12:45	15:00	61.0	63.6	55.3	71.4	
13:00	15:00	60.1	63.0	53.4	67.3	
13:15	15:00	61.6	65.0	53.0	68.1	
13:30	15:00	60.8	63.8	54.0	68.4	
13:45	15:00	62.4	64.7	58.2	68.7	
14:00	15:00	61.8	64.6	54.3	69.4	
14:15	15:00	62.0	64.7	56.3	69.0	
14:30	15:00	63.2	66.3	56.5	73.4	
14:45	15:00	62.3	65.0	56.9	68.1	
Average 0745-1500		60.7	63.5	54.2	65-79	

## Noise Survey Results

Date: Friday 26th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

TABLE 12

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	62.3	64.8	56.7	68.9	
15:15	15:00	62.4	65.0	56.9	69.7	
15:30	15:00	62.3	64.7	56.1	67.4	
15:45	15:00	62.4	65.1	56.0	67.8	
16:00	15:00	62.0	64.6	55.0	67.1	
16:15	15:00	62.6	64.8	57.6	77.7	
16:30	15:00	62.0	64.6	56.2	68.1	
16:45	15:00	61.7	64.3	56.5	66.3	
17:00	15:00	61.9	64.2	56.3	66.3	
17:15	15:00	62.0	64.3	56.9	65.8	
17:30	15:00	61.9	64.5	56.5	67.6	
17:45	15:00	61.9	64.4	56.3	69.1	
18:00	15:00	61.5	64.1	56.1	67.4	
18:15	15:00	60.2	63.1	52.6	66.1	
18:30	15:00	60.4	63.7	50.3	67.7	
18:45	15:00	59.3	63.4	49.4	66.6	
19:00	15:00	57.4	61.6	46.7	67.6	
19:15	15:00	58.6	62.9	49.1	65.8	
19:30	15:00	57.8	62.2	47.7	65.2	
19:45	15:00	57.0	61.3	44.6	64.8	
20:00	15:00	56.0	60.6	44.2	67.6	
20:15	15:00	57.1	61.5	47.0	65.1	
20:30	15:00	56.5	60.7	44.7	70.6	
20:45	15:00	55.9	60.6	40.9	67.3	
21:00	15:00	55.3	60.4	40.6	65.0	
21:15	15:00	55.8	60.8	41.4	66.0	
21:30	15:00	55.5	59.4	44.4	70.2	
21:45	15:00	54.7	59.7	41.5	64.3	
22:00	15:00	56.9	61.5	43.6	68.0	
22:15	15:00	55.6	60.0	42.2	67.1	
22:30	15:00	52.3	57.7	41.0	62.3	
22:45	15:00	53.3	58.0	41.5	65.5	
Average 1500-2300		59.8	62.9	53.1	62-78	



## Noise Survey Results

Date: Friday 26th - Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

**TABLE 13**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	53.0	58.3	39.7	63.9	
23:15	15:00	52.0	56.0	41.7	64.4	
23:30	15:00	50.4	53.6	38.8	64.0	
23:45	15:00	53.0	57.7	39.1	67.3	
00:00	15:00	56.0	60.6	44.2	66.5	Periods of rain
00:15	15:00	55.4	59.5	46.2	67.7	Periods of rain
00:30	15:00	62.1	65.7	53.2	74.0	Periods of rain
00:45	15:00	61.4	64.9	52.9	76.4	Periods of rain
01:00	15:00	66.0	69.6	56.4	77.5	Periods of rain
01:15	15:00	68.0	71.9	56.2	79.8	Periods of rain
01:30	15:00	70.0	72.6	56.4	90.9	Periods of rain
01:45	15:00	65.6	68.7	57.9	77.5	Periods of rain
02:00	15:00	69.4	72.8	56.9	82.9	Periods of rain
02:15	15:00	67.0	70.5	59.7	75.7	Periods of rain
02:30	15:00	65.3	67.9	58.1	77.7	Periods of rain
02:45	15:00	66.4	70.1	58.3	77.0	Periods of rain
03:00	15:00	64.5	68.2	56.9	76.7	Periods of rain
03:15	15:00	64.9	69.0	55.0	75.9	Periods of rain
03:30	15:00	66.2	69.7	58.4	76.7	Periods of rain
03:45	15:00	66.6	69.9	59.9	78.1	Periods of rain
04:00	15:00	64.5	68.3	55.6	74.4	Periods of rain
04:15	15:00	64.4	67.7	56.8	73.8	Periods of rain
04:30	15:00	66.3	69.5	58.3	77.1	Periods of rain
04:45	15:00	66.1	69.3	57.6	78.3	Periods of rain
05:00	15:00	63.5	66.8	55.5	76.8	Periods of rain
05:15	15:00	65.7	68.4	54.2	81.7	Periods of rain
05:30	15:00	65.4	68.2	57.7	78.7	Periods of rain
05:45	15:00	64.0	67.7	56.3	73.7	Periods of rain
06:00	15:00	66.7	69.9	57.1	79.5	Periods of rain
06:15	15:00	63.7	67.4	56.8	73.7	Periods of rain
06:30	15:00	63.0	66.3	56.0	71.6	Periods of rain
06:45	15:00	65.6	69.1	57.1	76.5	Periods of rain
Average 2300-0700		52.2	56.7	39.9	64-67	

## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

**TABLE 14**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	63.9	67.3	56.8	73.0	Periods of rain
07:15	15:00	64.5	68.4	56.2	74.9	Periods of rain
07:30	15:00	64.9	68.2	57.6	75.7	Periods of rain
07:45	15:00	66.1	69.2	56.2	78.7	Periods of rain
08:00	15:00	65.1	68.7	58.5	72.3	Periods of rain
08:15	15:00	62.6	66.3	56.2	70.2	Periods of rain
08:30	15:00	65.0	68.0	58.0	73.4	Periods of rain
08:45	15:00	67.5	70.7	61.1	77.7	Periods of rain
09:00	15:00	69.1	72.3	62.3	79.5	Periods of rain
09:15	15:00	69.4	72.6	62.5	81.6	Periods of rain
09:30	15:00	68.0	71.6	60.3	77.2	Periods of rain
09:45	15:00	65.2	69.2	57.4	74.3	Periods of rain
10:00	15:00	65.1	68.3	58.8	75.3	Periods of rain
10:15	15:00	65.1	68.1	58.7	72.9	Periods of rain
10:30	15:00	65.5	68.8	59.5	74.8	Periods of rain
10:45	15:00	67.1	70.3	60.9	76.0	Periods of rain
11:00	15:00	63.8	66.7	56.7	72.4	Periods of rain
11:15	15:00	63.0	66.3	55.8	70.4	Periods of rain
11:30	15:00	63.6	66.6	57.0	72.4	Periods of rain
11:45	15:00	65.0	68.4	57.7	72.6	Periods of rain
12:00	15:00	65.3	68.4	59.5	74.0	Periods of rain
12:15	15:00	63.6	66.6	56.4	72.2	Periods of rain
12:30	15:00	62.1	65.1	53.4	73.6	Periods of rain
12:45	15:00	63.1	64.9	55.0	81.9	Periods of rain
13:00	15:00	60.8	63.9	53.5	68.7	Periods of rain
13:15	15:00	59.8	63.3	50.2	68.3	Periods of rain
13:30	15:00	59.8	62.9	51.3	65.4	Periods of rain
13:45	15:00	61.8	64.4	53.0	76.9	Periods of rain
14:00	15:00	63.5	66.3	58.2	70.2	Periods of rain
14:15	15:00	62.9	66.0	57.0	71.6	Periods of rain
14:30	15:00	61.9	64.8	55.2	68.8	Periods of rain
14:45	15:00	62.3	64.6	56.4	71.1	Periods of rain
Average 1300-1500		61.7	64.6	55.1	65-77	





## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

TABLE 15

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmaz (dB)	Observations
15:00	15:00	60.8	63.7	53.8	66.7	Periods of rain
15:15	15:00	61.0	64.2	53.9	68.4	Periods of rain
15:30	15:00	60.1	63.5	51.5	67.7	Periods of rain
15:45	15:00	60.2	63.3	52.8	66.8	Periods of rain
16:00	15:00	60.5	63.8	51.1	72.2	Periods of rain
16:15	15:00	60.3	63.3	53.3	67.4	Periods of rain
16:30	15:00	59.3	62.7	51.0	71.5	Periods of rain
16:45	15:00	57.7	61.6	48.3	64.4	
17:00	15:00	58.1	61.8	48.1	66.7	
17:15	15:00	58.4	62.0	50.3	65.2	
17:30	15:00	57.6	61.6	46.7	67.2	
17:45	15:00	57.5	61.4	48.1	65.3	
18:00	15:00	57.4	61.3	47.6	65.7	
18:15	15:00	57.4	61.4	46.0	66.1	
18:30	15:00	57.6	61.5	48.2	64.8	
18:45	15:00	55.8	60.5	44.2	64.5	
19:00	15:00	56.1	60.2	45.0	67.0	
19:15	15:00	55.7	60.3	40.6	65.1	
19:30	15:00	55.9	60.3	43.0	67.1	
19:45	15:00	54.2	59.0	39.5	66.2	
20:00	15:00	53.8	58.7	36.7	64.9	
20:15	15:00	53.7	58.7	37.7	65.5	
20:30	15:00	52.6	57.4	35.3	66.5	
20:45	15:00	54.7	59.5	36.9	66.8	
21:00	15:00	53.3	58.1	37.5	64.1	
21:15	15:00	53.3	58.5	38.9	64.3	
21:30	15:00	52.8	57.5	38.1	64.9	
21:45	15:00	52.2	57.1	37.2	64.5	
22:00	15:00	52.2	56.7	38.5	65.0	
22:15	15:00	52.6	57.6	38.7	64.2	
22:30	15:00	53.0	58.0	39.6	64.7	
22:45	15:00	52.6	57.6	40.8	63.4	
Average 1500-2300		57.1	60.9	47.9	46-76	



## Noise Survey Results

Date: Saturday 27th - Sunday 28th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 16

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position B - North of Blackland Farm**

Instrumentation: Norsonic 118 Real Time Analyser (31992)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	54.4	57.8	40.4	72.5	
23:15	15:00	49.5	53.4	36.7	62.5	
23:30	15:00	50.5	54.7	36.8	66.2	
23:45	15:00	51.5	55.9	38.1	63.6	
00:00	15:00	52.0	56.2	41.1	66.1	
00:15	15:00	51.6	56.5	40.6	63.6	
00:30	15:00	47.5	49.8	37.5	62.6	
00:45	15:00	50.2	54.2	39.9	61.6	
01:00	15:00	47.2	50.0	37.3	61.5	
01:15	15:00	48.5	51.4	40.9	60.7	
01:30	15:00	46.5	47.7	38.8	62.5	
01:45	15:00	47.1	49.6	41.0	61.3	
02:00	15:00	47.6	50.5	40.8	62.5	
02:15	15:00	47.7	49.5	38.9	63.7	
02:30	15:00	46.7	46.7	36.8	66.4	
02:45	15:00	44.0	44.5	36.3	59.7	
03:00	15:00	45.6	46.1	34.0	63.8	
03:15	15:00	45.8	44.4	33.7	64.0	
03:30	15:00	43.0	41.3	32.5	59.8	
03:45	15:00	44.1	41.6	32.4	55.4	
04:00	15:00	44.0	41.7	32.1	62.9	
04:15	15:00	45.0	46.1	33.6	60.4	
04:30	15:00	46.4	46.8	33.5	62.7	
04:45	15:00	48.0	52.1	34.2	61.1	
05:00	15:00	48.1	50.4	34.3	63.1	
05:15	15:00	48.8	52.3	34.1	60.9	
05:30	15:00	52.7	56.4	34.4	71.2	
05:45	15:00	51.2	55.8	34.7	63.4	
06:00	15:00	50.7	54.8	36.2	64.7	
06:15	15:00	49.7	53.3	35.1	65.2	
06:30	15:00	51.2	55.3	35.4	66.5	
06:45	15:00	47.7	50.8	35.1	62.4	
Average 2300-0700		49.1	52.6	37.3	55-73	

## Noise Survey Results

Date: Sunday 28th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 17

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position B - North of Blackland Farm**

Instrumentation: Norsonic 118 Real Time Analyser (31992)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	51.0	55.0	36.4	66.2	
07:15	15:00	50.9	56.2	36.0	62.9	
07:30	15:00	51.4	55.2	35.2	70.2	
07:45	15:00	51.7	56.8	37.1	65.9	
08:00	15:00	51.9	57.2	36.8	62.7	
08:15	15:00	54.2	59.1	39.8	64.5	
08:30	15:00	55.8	60.3	43.0	68.5	
08:45	15:00	53.9	58.9	41.6	63.9	
09:00	15:00	54.3	59.2	41.9	65.3	
09:15	15:00	56.5	59.8	42.2	69.8	
09:30	15:00	55.5	59.9	41.8	70.3	
09:45	15:00	56.8	61.0	42.9	67.3	
10:00	15:00	56.2	60.3	41.2	69.0	
10:15	15:00	56.6	60.8	43.8	64.9	
10:30	15:00	58.5	62.0	47.2	69.2	
10:45	15:00	57.5	61.4	44.9	67.6	
11:00	15:00	57.0	60.6	46.0	65.1	
11:15	15:00	57.3	61.0	44.2	66.9	
11:30	15:00	57.4	61.4	43.4	67.3	
11:45	15:00	58.3	61.8	45.1	71.4	
12:00	15:00	58.1	62.2	44.1	67.8	
12:15	15:00	59.2	62.6	46.6	67.4	
12:30	15:00	58.5	62.4	43.5	67.5	
12:45	15:00	58.7	62.3	45.7	69.7	
13:00	15:00	58.3	61.9	44.2	67.9	
13:15	15:00	57.9	61.7	45.0	71.4	
13:30	15:00	58.2	61.9	44.7	69.5	
13:45	15:00	58.0	61.7	47.3	66.8	
14:00	15:00	58.6	62.0	46.8	72.4	
14:15	15:00	57.3	61.2	42.9	64.7	
14:30	15:00	59.3	61.9	45.5	77.0	
14:45	15:00	62.1	62.7	47.3	83.1	
Average 0700-1500		57.1	60.8	43.9	63-83	

## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

TABLE 18

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
15:00	15:00	58.2	61.8	47.2	70.4	
15:15	15:00	58.9	61.8	45.7	74.1	
15:30	15:00	59.9	61.7	47.5	79.2	
15:45	15:00	58.2	61.7	47.4	70.0	
16:00	15:00	57.3	61.2	45.6	64.2	
16:15	15:00	57.3	61.4	45.4	65.0	
16:30	15:00	57.5	61.1	46.9	65.1	
16:45	15:00	56.9	61.1	45.1	65.2	
17:00	15:00	56.4	60.8	43.1	63.8	
17:15	15:00	56.8	61.0	47.3	63.2	
17:30	15:00	57.0	61.2	44.9	64.7	
17:45	15:00	57.3	61.1	46.3	69.7	
18:00	15:00	55.6	59.7	45.2	64.5	
18:15	15:00	55.7	60.0	44.5	65.9	
18:30	15:00	56.4	60.8	45.9	63.8	
18:45	15:00	54.9	59.2	44.7	64.0	
19:00	15:00	56.8	60.2	43.0	76.2	
19:15	15:00	55.4	59.6	41.8	67.1	
19:30	15:00	55.8	60.1	42.0	64.7	
19:45	15:00	55.1	59.5	39.7	64.1	
20:00	15:00	56.5	60.8	43.6	65.8	
20:15	15:00	55.6	59.4	42.6	72.6	
20:30	15:00	54.5	59.3	39.5	66.2	
20:45	15:00	55.3	60.2	35.7	67.8	
21:00	15:00	52.2	57.1	36.4	64.2	
21:15	15:00	54.1	58.1	36.3	70.1	
21:30	15:00	52.7	58.0	38.4	63.9	
21:45	15:00	52.0	57.1	39.2	62.2	
22:00	15:00	51.9	56.9	36.0	63.2	
22:15	15:00	54.0	58.8	36.6	66.9	
22:30	15:00	51.6	56.5	34.9	64.0	
22:45	15:00	50.0	53.3	32.3	64.6	
Average 1500-2300		56.0	60.0	43.8	62-79	

## Noise Survey Results

Date: Sunday 28th - Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

TABLE 19

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	51.4	56.3	32.5	65.6	
23:15	15:00	49.6	53.5	32.4	63.3	
23:30	15:00	50.8	54.3	35.0	66.3	
23:45	15:00	53.1	54.6	30.5	75.8	
00:00	15:00	43.8	43.1	30.6	61.0	
00:15	15:00	46.7	49.2	32.5	62.7	
00:30	15:00	49.1	52.4	31.7	63.1	
00:45	15:00	51.1	54.5	31.9	70.6	
01:00	15:00	41.1	42.0	32.5	59.8	
01:15	15:00	41.9	38.8	32.0	62.9	
01:30	15:00	40.0	39.9	32.7	59.3	
01:45	15:00	45.3	39.9	30.3	66.6	
02:00	15:00	43.1	36.2	28.0	63.2	
02:15	15:00	40.3	37.5	29.5	58.8	
02:30	15:00	47.3	46.0	30.3	66.4	
02:45	15:00	39.1	32.9	29.4	60.5	
03:00	15:00	45.1	46.1	29.6	63.8	
03:15	15:00	46.6	45.7	29.9	63.4	
03:30	15:00	47.0	47.4	30.6	63.0	
03:45	15:00	45.7	46.7	31.7	63.0	
04:00	15:00	37.6	39.0	31.4	56.0	
04:15	15:00	50.0	52.1	34.2	67.9	
04:30	15:00	52.0	55.2	34.2	68.7	
04:45	15:00	52.3	55.3	33.5	69.2	
05:00	15:00	52.8	56.0	33.6	73.2	
05:15	15:00	55.4	59.0	40.8	69.0	
05:30	15:00	55.2	59.4	43.2	67.9	
05:45	15:00	56.3	60.2	43.0	67.9	
06:00	15:00	55.2	59.8	44.0	64.2	
06:15	15:00	56.7	60.7	45.7	66.7	
06:30	15:00	56.7	60.5	45.9	71.1	
06:45	15:00	59.0	62.4	49.4	68.8	
Average 2300-0700		51.8	55.3	39.4	56-76	

### Noise Survey Results

Date: Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position B - North of Blackland Farm**  
 Instrumentation: Norsonic 118 Real Time Analyser (31992)  
 Calibration: 94dB

**TABLE 20**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	58.6	62.1	49.9	66.0	
07:15	15:00	59.5	62.7	50.9	67.5	
07:30	15:00	60.3	63.2	52.9	68.6	
07:45	15:00	61.1	63.9	53.3	69.4	
08:00	15:00	61.1	63.7	54.7	70.2	
08:15	15:00	61.3	64.0	55.5	67.5	
08:30	15:00	61.4	64.2	54.4	71.1	
08:45	15:00	60.9	63.6	52.3	71.4	
09:00	15:00	60.2	63.1	52.4	70.0	
09:15	15:00	59.8	63.3	52.1	68.3	
09:30	15:00	59.5	62.8	51.9	68.5	
09:45	15:00	59.4	62.5	50.7	69.7	
10:00	15:00	58.7	62.1	50.1	69.1	
10:15	15:00	59.0	62.4	49.0	71.0	
10:30	15:00	59.4	62.8	48.4	71.8	
Average 0700-1045		60.1	63.1	52.3	66-72	

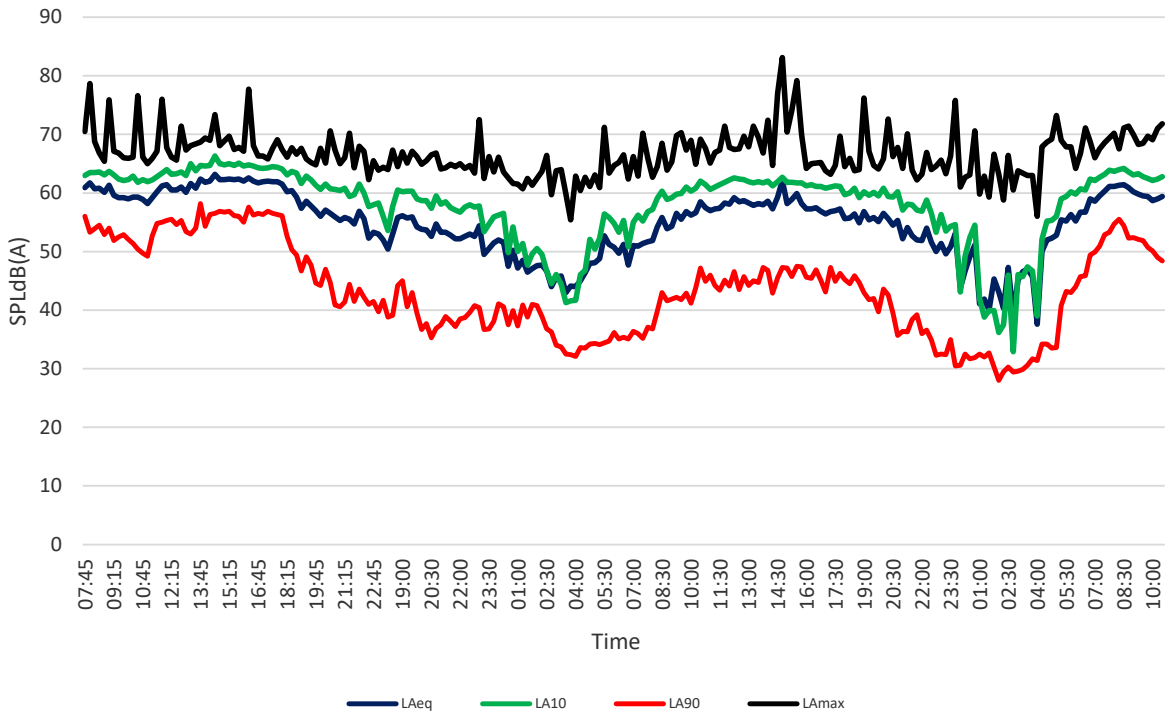
<b>Overall Average</b>	<b>50.8</b>	<b>54.3</b>	<b>38.6</b>	<b>55-76</b>	<b>Excluding Rain</b>
<b>Overall Average</b>	<b>58.5</b>	<b>61.8</b>	<b>50.6</b>	<b>46-83</b>	<b>Excluding Rain</b>

Average 0430-0700	<b>53.6</b>	<b>57.4</b>	<b>41.4</b>	<b>61-73</b>	
Representative LA90			<b>34</b>		

<b>Overall Average</b>	<b>58.5</b>	<b>61.8</b>	<b>50.5</b>	<b>46-83</b>	<b>Including Rain</b>
<b>Overall Average</b>	<b>51.2</b>	<b>55.2</b>	<b>39.0</b>	<b>35-82</b>	<b>Including Rain</b>

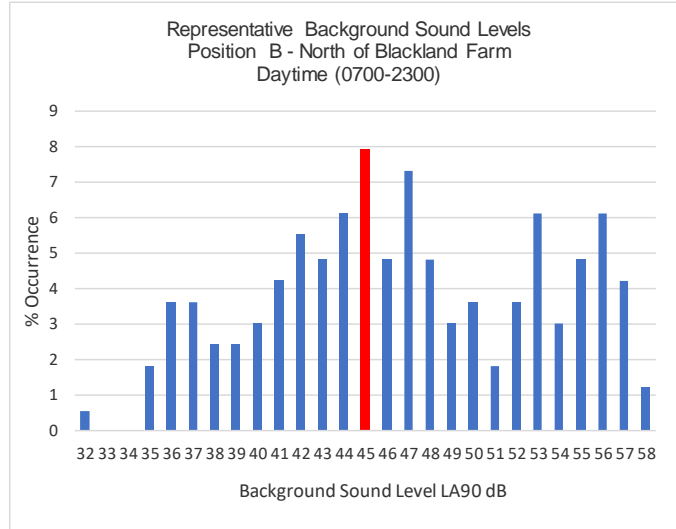


Background Sound Survey: Position B - North of Blackland Farm  
Friday 26th - Monday 29th November 2021

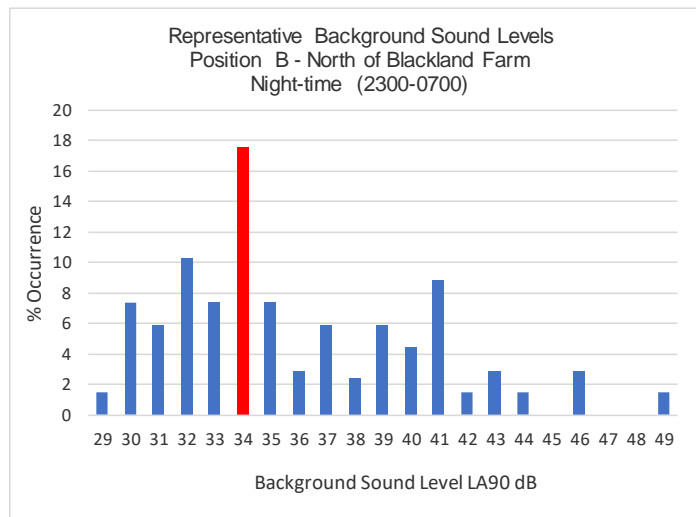


## LA90 Representative Levels

LA90	% Occurrence
32	0.6
33	0
34	0
35	1.8
36	3.6
37	3.6
38	2.4
39	2.4
40	3.0
41	4.2
42	5.5
43	4.8
44	6.1
<b>45</b>	<b>7.9</b>
46	4.8
47	7.3
48	4.8
49	3.0
50	3.6
51	1.8
52	3.6
53	6.1
54	3.0
55	4.8
56	6.1
57	4.2
58	1.2



LA90	% Occurrence
28	1.5
29	1.5
30	7.4
31	5.9
32	10.3
33	7.4
<b>34</b>	<b>17.6</b>
35	7.4
36	2.9
37	5.9
38	2.4
39	5.9
40	4.4
41	8.8
42	1.5
43	2.9
44	1.5
45	0.0
46	2.9
47	0.0
48	0.0
49	1.5



## Noise Survey Results

Date: Friday 26th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 21

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**

Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
08:15	15:00	50.1	51.0	44.4	60.2	Distant and local road traffic noise Birdsong
08:30	15:00	49.8	52.8	45.2	61.5	
08:45	15:00	47.9	50.4	44.5	56.3	
09:00	15:00	49.2	51.8	45.1	59.6	
09:15	15:00	47.7	50.2	43.9	59.7	
09:30	15:00	49.4	51.5	45.0	62.5	
09:45	15:00	49.2	51.7	45.4	58.1	
10:00	15:00	49.8	52.8	45.4	61.7	
10:15	15:00	46.3	48.3	43.5	57.3	
10:30	15:00	44.4	46.2	41.4	57.6	
10:45	15:00	42.5	44.4	40.3	57.6	
11:00	15:00	42.7	44.6	40.3	51.9	
11:15	15:00	47.8	50.6	43.2	60.3	
11:30	15:00	50.1	53.5	44.0	68.9	
11:45	15:00	53.9	57.5	47.2	66.3	
12:00	15:00	55.0	59.0	44.7	72.3	
12:15	15:00	49.9	53.0	44.7	66.2	
12:30	15:00	48.0	50.2	44.8	56.6	
12:45	15:00	49.2	52.2	43.6	66.9	
13:00	15:00	48.4	50.6	43.6	72.1	
13:15	15:00	49.0	51.8	44.1	67.8	
13:30	15:00	49.7	52.5	44.0	62.0	
13:45	15:00	55.3	58.4	47.6	73.3	
14:00	15:00	49.4	51.5	45.9	61.8	
14:15	15:00	48.2	50.1	45.8	55.8	
14:30	15:00	50.5	53.1	46.6	62.0	
14:45	15:00	48.6	50.9	45.8	57.0	
Average 0815-1500		49.9	52.8	44.7	52-73	

## Noise Survey Results

Date: Friday 26th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**  
 Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )  
 Calibration: 94dB

TABLE 22

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	48.9	51.1	46.3	59.5	
15:15	15:00	48.4	49.7	45.5	71.7	
15:30	15:00	47.2	47.7	44.6	70.4	
15:45	15:00	46.7	48.6	44.2	58.1	
16:00	15:00	45.9	46.7	43.0	69.0	
16:15	15:00	45.0	46.3	43.4	55.0	
16:30	15:00	44.9	45.6	42.2	65.0	
16:45	15:00	45.5	46.9	43.4	51.8	
17:00	15:00	46.2	47.4	44.0	66.0	
17:15	15:00	46.6	48.3	43.8	61.3	
17:30	15:00	49.8	51.3	45.7	66.8	
17:45	15:00	52.4	55.8	46.0	71.3	
18:00	15:00	46.3	48.6	43.3	56.4	
18:15	15:00	45.6	47.8	42.1	55.7	
18:30	15:00	42.9	44.6	40.3	52.1	
18:45	15:00	40.7	42.0	38.9	45.0	
19:00	15:00	41.8	43.6	39.7	51.3	
19:15	15:00	45.1	47.7	40.8	59.6	
19:30	15:00	42.7	44.5	40.7	50.9	
19:45	15:00	41.5	43.3	39.3	48.6	
20:00	15:00	43.2	45.5	40.0	56.7	
20:15	15:00	42.9	44.8	39.9	53.5	
20:30	15:00	41.9	42.5	38.2	66.1	
20:45	15:00	37.8	39.5	35.9	53.0	
21:00	15:00	38.9	40.6	36.9	45.3	
21:15	15:00	39.4	41.0	37.2	47.7	
21:30	15:00	41.9	43.8	39.5	49.8	
21:45	15:00	40.8	42.3	37.0	53.3	
22:00	15:00	42.8	45.4	38.1	54.7	
22:15	15:00	44.3	47.2	38.6	56.2	
22:30	15:00	38.6	40.8	35.7	47.9	
22:45	15:00	38.6	41.0	35.1	50.8	
Average 1500-2300		45.3	47.3	42.0	45-72	

## Noise Survey Results

Date: Friday 26th - Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm

**TABLE 23**

Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**

Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	38.2	39.8	36.1	50.2	
23:15	15:00	42.2	44.1	39.0	55.5	
23:30	15:00	43.4	45.4	39.9	58.0	
23:45	15:00	41.6	44.7	36.9	54.1	
00:00	15:00	50.8	53.6	43.8	72.1	Periods of rain
00:15	15:00	51.8	54.8	45.1	70.5	Periods of rain
00:30	15:00	57.9	61.4	51.7	78.0	Periods of rain
00:45	15:00	61.6	65.4	53.1	79.2	Periods of rain
01:00	15:00	60.6	63.4	54.6	84.1	Periods of rain
01:15	15:00	61.7	63.8	53.5	88.5	Periods of rain
01:30	15:00	62.8	65.8	53.3	88.1	Periods of rain
01:45	15:00	63.2	65.6	55.0	85.0	Periods of rain
02:00	15:00	61.5	64.7	55.2	80.0	Periods of rain
02:15	15:00	61.9	64.6	55.1	79.6	Periods of rain
02:30	15:00	62.3	65.4	54.5	84.3	Periods of rain
02:45	15:00	63.0	65.4	55.7	87.7	Periods of rain
03:00	15:00	61.6	65.5	54.8	74.7	Periods of rain
03:15	15:00	59.5	61.9	54.0	84.2	Periods of rain
03:30	15:00	61.5	64.2	55.3	80.7	Periods of rain
03:45	15:00	62.3	65.8	55.0	84.5	Periods of rain
04:00	15:00	60.2	63.3	52.0	80.5	Periods of rain
04:15	15:00	59.0	62.0	53.7	70.9	Periods of rain
04:30	15:00	60.5	63.8	53.9	75.5	Periods of rain
04:45	15:00	58.3	60.8	53.6	70.3	Periods of rain
05:00	15:00	59.8	63.6	52.1	74.6	Periods of rain
05:15	15:00	59.8	62.8	53.0	80.6	Periods of rain
05:30	15:00	63.3	65.6	55.4	88.5	Periods of rain
05:45	15:00	61.8	64.8	54.9	78.1	Periods of rain
06:00	15:00	63.7	66.6	55.4	85.9	Periods of rain
06:15	15:00	60.1	63.1	54.5	74.9	Periods of rain
06:30	15:00	58.1	60.8	52.2	72.3	Periods of rain
06:45	15:00	64.0	65.8	55.4	87.6	Periods of rain
Average 2300-0700		41.7	43.9	38.2	50-58	

## Noise Survey Results

Date: Saturday 27th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 24

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**

Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmaz (dB)	Observations
07:00	15:00	58.4	60.6	52.2	82.7	Periods of rain
07:15	15:00	60.2	63.2	53.2	80.4	Periods of rain
07:30	15:00	58.3	61.6	51.8	70.1	Periods of rain
07:45	15:00	59.8	62.7	53.4	81.2	Periods of rain
08:00	15:00	57.4	60.6	50.8	73.2	Periods of rain
08:15	15:00	56.1	59.0	51.3	72.3	Periods of rain
08:30	15:00	59.7	62.8	52.8	79.4	Periods of rain
08:45	15:00	61.8	65.1	54.7	83.3	Periods of rain
09:00	15:00	63.8	67.0	53.4	86.0	Periods of rain
09:15	15:00	62.0	64.5	54.8	86.7	Periods of rain
09:30	15:00	60.5	63.7	54.1	73.6	Periods of rain
09:45	15:00	61.6	64.9	54.3	74.6	Periods of rain
10:00	15:00	56.6	59.6	50.0	71.2	Periods of rain
10:15	15:00	57.0	59.9	50.7	76.5	Periods of rain
10:30	15:00	56.7	59.5	51.3	69.1	Periods of rain
10:45	15:00	58.7	62.3	50.7	72.0	Periods of rain
11:00	15:00	58.2	61.4	51.5	75.6	Periods of rain
11:15	15:00	57.9	61.0	51.6	74.1	Periods of rain
11:30	15:00	56.4	60.0	49.6	70.1	Periods of rain
11:45	15:00	59.4	62.6	49.1	76.7	Periods of rain
12:00	15:00	56.6	60.2	48.8	69.1	Periods of rain
12:15	15:00	54.7	58.0	49.4	68.2	Periods of rain
12:30	15:00	53.3	56.1	46.7	69.1	Periods of rain
12:45	15:00	49.4	51.6	45.2	64.5	Periods of rain
13:00	15:00	50.3	51.9	44.5	73.8	Periods of rain
13:15	15:00	49.6	52.0	45.0	64.6	Periods of rain
13:30	15:00	49.3	51.5	44.2	65.3	Periods of rain
13:45	15:00	53.5	56.4	47.9	67.7	Periods of rain
14:00	15:00	56.6	59.7	49.2	68.2	Periods of rain
14:15	15:00	53.2	55.8	48.4	71.0	Periods of rain
14:30	15:00	52.7	55.3	47.3	64.7	Periods of rain
14:45	15:00	52.4	55.4	46.5	70.2	Periods of rain
Log Average 1300-1500		52.8	55.5	46.9	65-87	
Average 1300-1500		52.2	54.8	46.6	65-87	

## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**  
 Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )  
 Calibration: 94dB

TABLE 25

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmaz (dB)	Observations
15:00	15:00	49.7	52.6	43.9	64.8	Periods of rain
15:15	15:00	51.2	54.6	44.5	68.9	Periods of rain
15:30	15:00	47.4	49.8	44.1	59.2	Periods of rain
15:45	15:00	50.0	52.8	44.7	62.6	Periods of rain
16:00	15:00	48.1	50.9	44.1	60.4	Periods of rain
16:15	15:00	49.0	52.2	43.2	64.1	Periods of rain
16:30	15:00	48.9	51.5	41.9	67.4	Periods of rain
16:45	15:00	43.0	45.2	39.2	58.9	
17:00	15:00	44.4	46.7	40.7	54.8	
17:15	15:00	44.4	46.4	41.8	53.1	
17:30	15:00	44.4	45.8	40.2	65.9	
17:45	15:00	43.4	45.8	39.7	60.9	
18:00	15:00	44.6	47.2	40.4	57.6	
18:15	15:00	45.6	47.9	40.2	59.8	
18:30	15:00	45.2	47.8	40.7	60.6	
18:45	15:00	44.6	46.9	40.1	62.0	
19:00	15:00	42.0	44.4	37.8	56.5	
19:15	15:00	40.3	43.2	35.5	50.8	
19:30	15:00	39.8	42.3	35.0	49.2	
19:45	15:00	39.4	42.4	34.1	53.4	
20:00	15:00	39.4	42.3	32.8	57.8	
20:15	15:00	38.3	41.7	32.4	50.8	
20:30	15:00	38.5	41.5	31.5	52.9	
20:45	15:00	38.2	41.2	31.9	54.7	
21:00	15:00	39.5	42.5	34.3	51.9	
21:15	15:00	39.6	42.7	35.0	50.9	
21:30	15:00	38.8	41.6	34.3	49.5	
21:45	15:00	38.4	41.0	33.6	52.4	
22:00	15:00	39.8	42.2	35.9	50.7	
22:15	15:00	41.0	43.8	37.2	53.4	
22:30	15:00	42.0	44.8	37.9	53.5	
22:45	15:00	41.5	44.0	37.4	52.1	
Log Average 1500-2300		44.9	47.7	40.0	49-69	
Average 1500-2300		43.1	45.8	38.3	49-69	

## Noise Survey Results

Date: Saturday 27th - Sunday 28th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 26

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**

Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmx (dB)	Observations
23:00	15:00	40.8	43.5	36.0	53.6	
23:15	15:00	37.4	40.2	33.1	49.0	
23:30	15:00	38.7	40.0	34.1	59.0	
23:45	15:00	38.7	41.6	34.3	49.1	
00:00	15:00	41.7	44.0	38.0	49.8	
00:15	15:00	43.8	45.4	38.6	68.3	
00:30	15:00	41.1	43.7	36.3	56.5	
00:45	15:00	42.0	44.5	37.9	52.8	
01:00	15:00	42.4	45.4	37.0	59.8	
01:15	15:00	44.0	46.3	40.0	57.4	
01:30	15:00	46.0	48.8	41.0	59.4	
01:45	15:00	45.1	47.2	40.9	58.4	
02:00	15:00	43.8	46.5	39.9	54.5	
02:15	15:00	39.5	41.8	35.8	53.0	
02:30	15:00	37.7	39.8	34.5	51.7	
02:45	15:00	36.3	39.1	31.7	48.8	
03:00	15:00	34.2	37.0	26.0	53.3	
03:15	15:00	31.1	34.2	24.3	45.4	
03:30	15:00	31.1	33.8	24.2	52.4	
03:45	15:00	25.6	27.3	23.6	34.0	
04:00	15:00	28.8	28.9	24.2	45.2	
04:15	15:00	31.6	33.8	28.2	42.5	
04:30	15:00	31.5	34.6	26.1	45.6	
04:45	15:00	32.0	34.7	25.5	50.8	
05:00	15:00	31.1	33.1	27.5	43.0	
05:15	15:00	32.8	34.9	29.5	44.5	
05:30	15:00	34.0	35.9	30.6	46.3	
05:45	15:00	35.4	38.1	31.2	45.2	
06:00	15:00	36.5	39.3	31.4	50.7	
06:15	15:00	34.1	36.9	30.2	43.1	
06:30	15:00	36.2	38.6	31.5	51.3	
06:45	15:00	33.3	35.5	29.5	49.7	
Average 2300-0700		39.5	42.0	35.1	34-68	



## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**  
 Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )  
 Calibration: 94dB

**TABLE 27**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	35.4	38.3	31.2	51.7	
07:15	15:00	34.7	37.0	30.9	47.7	
07:30	15:00	39.7	37.2	30.4	69.2	
07:45	15:00	34.9	37.1	31.3	50.5	
08:00	15:00	36.9	38.5	31.9	64.6	
08:15	15:00	38.1	40.2	34.3	56.7	
08:30	15:00	39.6	42.4	34.8	52.7	
08:45	15:00	37.9	40.4	33.7	54.7	
09:00	15:00	39.3	41.0	36.0	58.8	
09:15	15:00	38.6	40.0	36.5	51.9	
09:30	15:00	39.9	41.6	37.6	53.0	
09:45	15:00	40.0	41.6	37.0	59.5	
10:00	15:00	39.1	40.2	35.8	57.1	
10:15	15:00	38.1	40.0	35.7	56.1	
10:30	15:00	49.3	49.0	37.5	71.3	
10:45	15:00	38.9	40.5	36.8	53.8	
11:00	15:00	37.5	39.0	35.3	51.3	
11:15	15:00	41.7	44.6	35.0	60.6	
11:30	15:00	36.6	37.8	34.7	48.3	
11:45	15:00	37.5	39.3	34.9	53.6	
12:00	15:00	36.2	37.6	34.0	53.4	
12:15	15:00	36.0	37.1	34.0	51.3	
12:30	15:00	35.1	36.2	33.1	52.3	
12:45	15:00	37.4	39.0	34.0	55.3	
13:00	15:00	38.1	38.7	33.5	64.1	
13:15	15:00	35.5	37.3	33.1	48.9	
13:30	15:00	39.6	40.2	33.7	68.4	
13:45	15:00	39.1	40.9	36.2	55.1	
14:00	15:00	37.7	39.2	35.5	50.0	
14:15	15:00	35.6	37.0	33.5	47.3	
14:30	15:00	36.9	39.2	34.1	54.1	
14:45	15:00	38.4	40.4	35.8	50.8	
Average 0700-1500		39.4	40.6	34.8	47-71	

## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**  
 Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )  
 Calibration: 94dB

**TABLE 27**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	35.4	38.3	31.2	51.7	
07:15	15:00	34.7	37.0	30.9	47.7	
07:30	15:00	39.7	37.2	30.4	69.2	
07:45	15:00	34.9	37.1	31.3	50.5	
08:00	15:00	36.9	38.5	31.9	64.6	
08:15	15:00	38.1	40.2	34.3	56.7	
08:30	15:00	39.6	42.4	34.8	52.7	
08:45	15:00	37.9	40.4	33.7	54.7	
09:00	15:00	39.3	41.0	36.0	58.8	
09:15	15:00	38.6	40.0	36.5	51.9	
09:30	15:00	39.9	41.6	37.6	53.0	
09:45	15:00	40.0	41.6	37.0	59.5	
10:00	15:00	39.1	40.2	35.8	57.1	
10:15	15:00	38.1	40.0	35.7	56.1	
10:30	15:00	49.3	49.0	37.5	71.3	
10:45	15:00	38.9	40.5	36.8	53.8	
11:00	15:00	37.5	39.0	35.3	51.3	
11:15	15:00	41.7	44.6	35.0	60.6	
11:30	15:00	36.6	37.8	34.7	48.3	
11:45	15:00	37.5	39.3	34.9	53.6	
12:00	15:00	36.2	37.6	34.0	53.4	
12:15	15:00	36.0	37.1	34.0	51.3	
12:30	15:00	35.1	36.2	33.1	52.3	
12:45	15:00	37.4	39.0	34.0	55.3	
13:00	15:00	38.1	38.7	33.5	64.1	
13:15	15:00	35.5	37.3	33.1	48.9	
13:30	15:00	39.6	40.2	33.7	68.4	
13:45	15:00	39.1	40.9	36.2	55.1	
14:00	15:00	37.7	39.2	35.5	50.0	
14:15	15:00	35.6	37.0	33.5	47.3	
14:30	15:00	36.9	39.2	34.1	54.1	
14:45	15:00	38.4	40.4	35.8	50.8	
Average 0700-1500		39.4	40.6	34.8	47-71	

## Noise Survey Results

Date: Sunday 28th - Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**  
 Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )  
 Calibration: 94dB

**TABLE 29**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	40.9	44.9	26.3	58.9	
23:15	15:00	39.4	43.4	27.8	55.8	
23:30	15:00	40.5	44.2	32.2	57.1	
23:45	15:00	36.4	40.8	26.0	48.4	
00:00	15:00	30.9	34.1	23.9	49.0	
00:15	15:00	33.7	37.5	25.0	49.4	
00:30	15:00	37.0	40.6	24.6	53.5	
00:45	15:00	35.0	38.6	25.8	54.4	
01:00	15:00	30.6	34.2	25.1	45.0	
01:15	15:00	30.4	33.0	25.9	45.6	
01:30	15:00	28.9	31.4	25.9	39.4	
01:45	15:00	29.7	33.0	25.3	45.5	
02:00	15:00	29.6	31.7	24.9	46.4	
02:15	15:00	34.0	32.9	25.8	58.4	
02:30	15:00	31.4	34.4	25.0	46.1	
02:45	15:00	29.0	30.5	24.7	43.8	
03:00	15:00	28.6	30.2	26.0	42.3	
03:15	15:00	29.3	32.2	24.9	44.7	
03:30	15:00	34.4	38.0	25.3	49.3	
03:45	15:00	30.0	33.0	22.9	46.7	
04:00	15:00	29.7	33.4	23.9	43.3	
04:15	15:00	33.6	37.1	25.6	50.6	
04:30	15:00	33.6	37.5	25.6	46.4	
04:45	15:00	37.6	41.5	29.5	52.3	
05:00	15:00	37.0	40.9	29.7	50.3	
05:15	15:00	40.1	44.0	29.8	52.1	
05:30	15:00	41.5	45.1	32.2	53.2	
05:45	15:00	43.3	46.8	33.1	56.2	
06:00	15:00	43.7	46.7	36.8	59.3	
06:15	15:00	43.9	46.7	38.3	51.9	
06:30	15:00	44.6	47.3	39.0	53.7	
06:45	15:00	45.0	47.7	40.6	52.3	
Average 2300-0700		38.6	41.8	31.6	39-59	

## Noise Survey Results

Date: Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position C - Whitton Rosser Farm**  
 Instrumentation: Norsonic 140 Real Time Analyser ( 1405418 )  
 Calibration: 94dB

**TABLE 30**

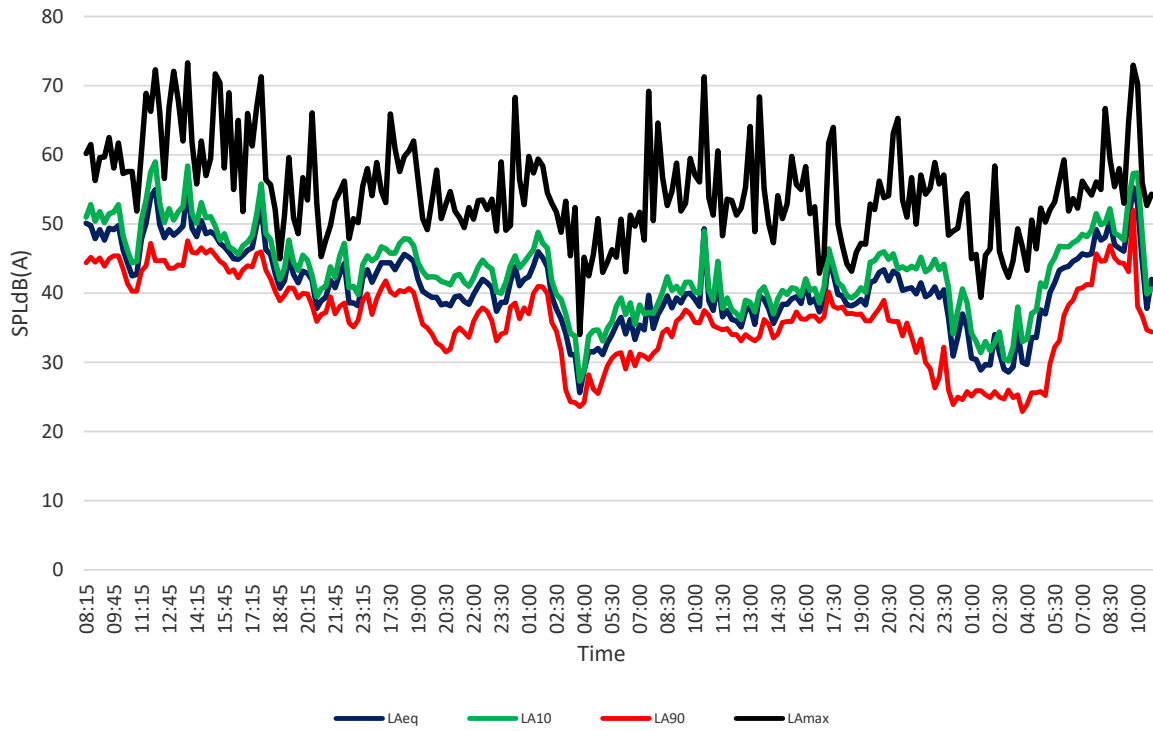
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	45.7	48.5	40.8	56.2	
07:15	15:00	45.5	48.2	41.3	55.1	
07:30	15:00	45.7	49.1	41.2	54.2	
07:45	15:00	49.2	51.5	45.7	56.1	
08:00	15:00	47.7	49.9	44.6	55.0	
08:15	15:00	48.1	50.2	44.7	66.7	
08:30	15:00	50.4	52.2	46.9	59.5	
08:45	15:00	47.0	48.7	45.1	55.4	
09:00	15:00	46.5	48.3	44.4	58.0	
09:15	15:00	46.1	47.7	44.3	53.0	
09:30	15:00	50.4	53.6	43.1	64.6	
09:45	15:00	55.3	57.3	52.0	73.0	
10:00	15:00	52.9	57.4	38.1	70.3	
10:15	15:00	44.6	48.5	36.7	56.0	
10:30	15:00	37.8	39.9	34.7	52.7	
10:45	15:00	42.0	40.6	34.4	54.3	
Average 0700-1100		48.9	51.6	44.6	53-73	

<b>Overall Average</b>	<b>39.3</b>	<b>42.1</b>	<b>34.1</b>	<b>34-68</b>	<b>Excluding Rain</b>
<b>Overall Average</b>	<b>45.6</b>	<b>48.2</b>	<b>41.2</b>	<b>43-74</b>	<b>Excluding Rain</b>

Average 0430-0700	<b>40.1</b>	<b>43.1</b>	<b>34</b>	<b>45-59</b>	
Representative LA90			<b>30</b>		

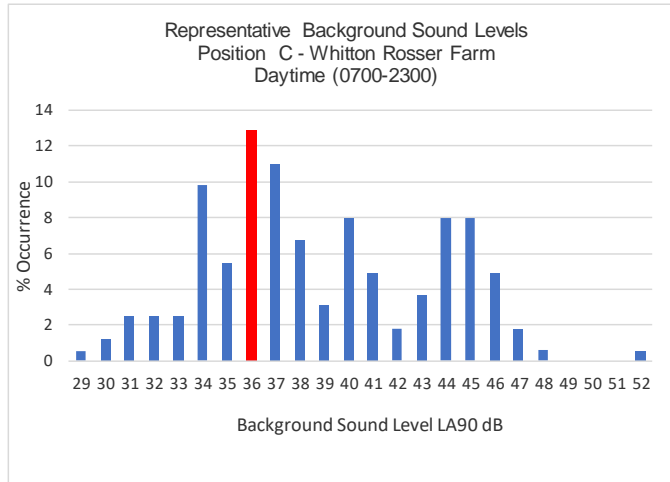
<b>Overall Average</b>	<b>45.5</b>	<b>48.1</b>	<b>41.1</b>	<b>43-74</b>	<b>Including Rain</b>
<b>Overall Average</b>	<b>40.1</b>	<b>42.7</b>	<b>35.7</b>	<b>34-89</b>	<b>Including Rain</b>

Background Sound Survey: Position C - Whitton Rosser Farm  
Friday 26th - Monday 29th November 2021

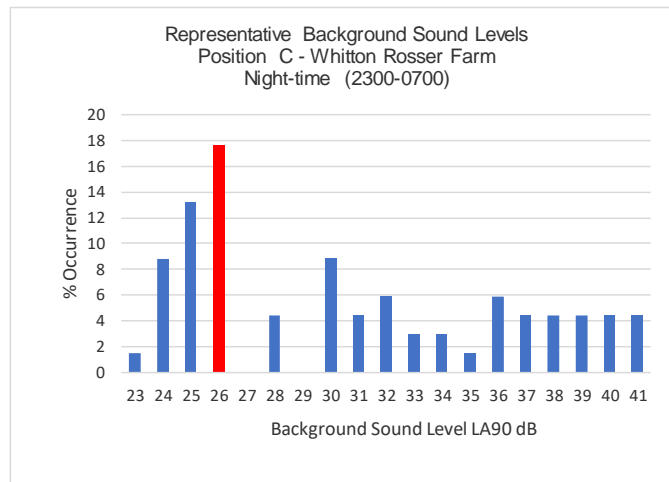


## LA90 Representative Levels

LA90	% Occurrence
29	0.6
30	1.2
31	2.5
32	2.5
33	2.5
34	9.8
35	5.5
<b>36</b>	<b>12.9</b>
37	11.0
38	6.7
39	3.1
40	8.0
41	4.9
42	1.8
43	3.7
44	8.0
45	8.0
46	4.9
47	1.8
48	0.6
49	0.0
50	0.0
51	0.0
52	0.6



LA90	% Occurrence
23	1.5
24	8.8
25	13.2
<b>26</b>	<b>17.6</b>
27	0.0
28	4.4
29	0.0
30	8.8
31	4.4
32	5.9
33	2.9
34	2.9
35	1.5
36	5.9
37	4.4
38	4.4
39	4.4
40	4.4
41	4.4



## Noise Survey Results

Date: Friday 26th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 31**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
09:30	15:00	52.6	53.8	45.7	60.4	Local road traffic noise & birdsong
09:45	15:00	49.2	51.6	45.1	61.6	
10:00	15:00	47.4	48.9	44.6	61.8	
10:15	15:00	46.1	47.7	43.3	58.3	
10:30	15:00	44.8	47.0	41.5	60.4	
10:45	15:00	43.3	45.2	40.7	52.8	
11:00	15:00	44.2	46.0	41.5	57.7	
11:15	15:00	47.9	50.6	42.8	61.4	
11:30	15:00	49.5	52.5	44.0	61.0	
11:45	15:00	51.7	54.4	45.3	65.3	
12:00	15:00	52.1	54.9	44.9	69.8	
12:15	15:00	47.4	49.2	44.5	61.1	
12:30	15:00	46.3	48.1	43.3	58.0	
12:45	15:00	48.0	49.7	44.1	66.6	
13:00	15:00	47.1	49.3	44.1	58.2	
13:15	15:00	47.6	50.0	44.3	56.9	
13:30	15:00	49.8	51.3	44.8	65.5	
13:45	15:00	52.0	54.8	47.0	65.2	
14:00	15:00	51.1	52.8	46.8	67.9	
14:15	15:00	47.8	49.8	44.9	57.1	
14:30	15:00	49.3	51.4	46.1	59.8	
14:45	15:00	48.5	50.1	45.9	60.9	
Average 0930-1500		49.0	51.2	44.6	53-70	

## Noise Survey Results

Date: Friday 26th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

TABLE 32

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	46.8	48.0	45.0	60.2	
15:15	15:00	48.0	49.5	45.0	59.9	
15:30	15:00	48.6	50.7	45.2	65.0	
15:45	15:00	47.0	48.8	44.1	62.3	
16:00	15:00	47.4	49.1	45.0	56.4	
16:15	15:00	49.2	52.2	44.5	64.6	
16:30	15:00	46.0	47.3	43.8	64.5	
16:45	15:00	46.3	47.6	43.8	59.1	
17:00	15:00	45.3	46.8	43.4	52.1	
17:15	15:00	46.1	47.5	43.8	54.9	
17:30	15:00	49.5	51.8	44.0	64.7	
17:45	15:00	48.3	49.7	44.6	68.6	
18:00	15:00	46.5	47.2	42.7	67.3	
18:15	15:00	45.8	47.7	42.8	60.7	
18:30	15:00	43.7	45.3	41.3	59.3	
18:45	15:00	43.5	45.3	40.5	55.7	
19:00	15:00	43.1	44.7	40.5	50.9	
19:15	15:00	44.7	46.5	41.5	59.6	
19:30	15:00	43.5	45.3	40.6	63.3	
19:45	15:00	42.9	45.3	39.1	54.9	
20:00	15:00	42.3	44.3	38.9	53.5	
20:15	15:00	42.9	45.5	39.0	54.6	
20:30	15:00	41.2	43.3	38.1	52.1	
20:45	15:00	39.0	41.1	36.0	48.9	
21:00	15:00	39.3	41.6	35.7	47.6	
21:15	15:00	41.1	42.7	35.8	61.8	
21:30	15:00	42.0	44.0	38.1	57.7	
21:45	15:00	39.0	41.2	35.6	50.5	
22:00	15:00	44.4	45.7	37.7	60.5	
22:15	15:00	43.3	45.6	39.8	61.7	
22:30	15:00	40.3	42.6	37.4	53.2	
22:45	15:00	39.7	42.4	35.8	59.0	
Average 1500-2300		45.2	47.1	41.9	48-69	



## Noise Survey Results

Date: Friday 26th - Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 33**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
23:00	15:00	39.8	42.1	36.3	47.7	
23:15	15:00	43.8	46.4	39.1	54.4	
23:30	15:00	41.5	44.0	37.8	49.6	
23:45	15:00	39.0	41.2	35.4	50.1	
00:00	15:00	49.6	52.9	41.5	64.0	Periods of rain
00:15	15:00	48.4	51.9	41.8	61.6	Periods of rain
00:30	15:00	57.1	60.5	49.2	74.2	Periods of rain
00:45	15:00	58.7	61.3	50.8	77.3	Periods of rain
01:00	15:00	58.5	62.1	50.4	72.6	Periods of rain
01:15	15:00	61.2	64.7	53.4	76.3	Periods of rain
01:30	15:00	62.4	65.3	53.0	80.3	Periods of rain
01:45	15:00	59.2	62.0	51.3	74.1	Periods of rain
02:00	15:00	58.6	61.1	53.0	72.3	Periods of rain
02:15	15:00	63.6	67.4	52.9	80.6	Periods of rain
02:30	15:00	60.2	62.9	51.8	77.4	Periods of rain
02:45	15:00	58.0	60.6	51.1	74.1	Periods of rain
03:00	15:00	58.2	60.9	50.7	73.2	Periods of rain
03:15	15:00	58.5	61.1	50.4	77.2	Periods of rain
03:30	15:00	58.7	61.8	52.1	74.8	Periods of rain
03:45	15:00	57.3	59.8	52.6	71.6	Periods of rain
04:00	15:00	57.3	60.0	49.7	73.6	Periods of rain
04:15	15:00	57.9	60.4	51.3	74.8	Periods of rain
04:30	15:00	59.0	60.8	49.2	80.9	Periods of rain
04:45	15:00	56.3	59.7	49.7	72.2	Periods of rain
05:00	15:00	56.9	58.1	48.9	75.7	Periods of rain
05:15	15:00	56.6	58.7	50.7	71.6	Periods of rain
05:30	15:00	60.6	63.0	49.1	81.2	Periods of rain
05:45	15:00	58.0	60.1	50.4	76.8	Periods of rain
06:00	15:00	58.1	61.1	51.5	73.1	Periods of rain
06:15	15:00	58.9	61.0	48.9	79.0	Periods of rain
06:30	15:00	55.7	58.4	50.4	68.0	Periods of rain
06:45	15:00	56.0	58.6	49.1	73.4	Periods of rain
Log Average 2300-0700		41.4	43.8	37.3	48-54	
Average 2300-0700		41.0	43.4	37.2	48-54	
Log Average 0930-2300		47.2	49.2	43.2	48-70	

## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 34**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	54.9	56.2	48.2	77.4	Periods of rain
07:15	15:00	55.0	56.7	48.4	72.0	Periods of rain
07:30	15:00	54.4	56.9	47.9	74.6	Periods of rain
07:45	15:00	55.8	58.9	49.0	70.8	Periods of rain
08:00	15:00	54.9	57.8	48.5	67.5	Periods of rain
08:15	15:00	52.8	54.7	48.1	70.3	Periods of rain
08:30	15:00	56.5	59.4	50.2	71.8	Periods of rain
08:45	15:00	56.9	60.0	50.5	71.5	Periods of rain
09:00	15:00	55.5	57.2	50.6	71.6	Periods of rain
09:15	15:00	60.4	60.8	51.3	85.1	Periods of rain
09:30	15:00	59.7	62.2	52.5	79.3	Periods of rain
09:45	15:00	57.5	60.0	51.5	73.8	Periods of rain
10:00	15:00	55.8	58.3	49.5	72.6	Periods of rain
10:15	15:00	56.4	59.8	50.8	67.9	Periods of rain
10:30	15:00	55.9	58.7	49.9	69.3	Periods of rain
10:45	15:00	53.2	55.2	48.6	67.2	Periods of rain
11:00	15:00	56.2	58.6	48.1	76.9	Periods of rain
11:15	15:00	55.2	56.9	49.1	74.0	Periods of rain
11:30	15:00	54.0	56.6	48.5	69.1	Periods of rain
11:45	15:00	56.6	58.4	48.7	76.4	Periods of rain
12:00	15:00	51.9	54.4	47.1	66.4	Periods of rain
12:15	15:00	51.4	53.0	45.4	70.4	Periods of rain
12:30	15:00	48.0	50.3	43.5	67.4	Periods of rain
12:45	15:00	44.9	46.0	42.9	59.5	Periods of rain
13:00	15:00	47.7	49.3	43.0	64.7	Periods of rain
13:15	15:00	46.5	48.5	41.5	62.4	Periods of rain
13:30	15:00	48.9	52.1	41.5	63.8	Periods of rain
13:45	15:00	50.6	51.7	43.5	72.3	Periods of rain
14:00	15:00	48.3	51.0	44.0	59.6	Periods of rain
14:15	15:00	47.3	48.2	43.7	62.2	Periods of rain
14:30	15:00	46.8	48.7	42.4	62.1	Periods of rain
14:45	15:00	47.5	49.8	43.0	65.2	Periods of rain
Average 1300-1500		48.1	50.1	42.9	60-72	

## Noise Survey Results

Date: Saturday 27th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

TABLE 35

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	47.5	50.5	42.4	59.5	Periods of rain
15:15	15:00	47.1	47.5	42.4	66.7	Periods of rain
15:30	15:00	47.3	49.3	43.1	62.3	Periods of rain
15:45	15:00	47.9	51.0	43.6	58.9	Periods of rain
16:00	15:00	45.8	47.5	42.2	62.4	Periods of rain
16:15	15:00	48.5	52.1	41.5	64.0	Periods of rain
16:30	15:00	43.4	44.4	40.3	57.3	Periods of rain
16:45	15:00	41.7	43.3	39.1	53.0	
17:00	15:00	43.2	45.4	39.9	53.0	
17:15	15:00	42.9	44.7	40.3	51.8	
17:30	15:00	41.9	43.7	39.5	50.4	
17:45	15:00	43.2	45.0	40.3	55.4	
18:00	15:00	44.2	46.7	40.4	59.0	
18:15	15:00	44.9	47.4	41.0	56.5	
18:30	15:00	42.9	44.5	39.4	57.7	
18:45	15:00	41.8	43.6	38.9	52.7	
19:00	15:00	41.5	42.8	37.8	60.8	
19:15	15:00	39.6	41.5	36.9	47.7	
19:30	15:00	39.0	41.2	36.0	52.4	
19:45	15:00	40.5	42.3	35.2	59.2	
20:00	15:00	37.5	39.7	33.7	46.3	
20:15	15:00	37.4	39.6	33.3	51.5	
20:30	15:00	36.7	38.9	32.0	50.2	
20:45	15:00	35.4	37.6	31.7	47.2	
21:00	15:00	39.3	41.9	33.0	58.3	
21:15	15:00	37.6	39.7	33.6	53.4	
21:30	15:00	37.1	39.2	33.6	47.7	
21:45	15:00	35.7	37.6	32.7	46.4	
22:00	15:00	36.9	39.1	33.2	48.6	
22:15	15:00	38.1	40.5	34.0	48.5	
22:30	15:00	37.8	40.1	34.2	48.2	
22:45	15:00	39.2	40.1	35.2	57.2	
Average 1500-2300		43.0	45.3	38.9	46-61	

## Noise Survey Results

Date: Saturday 27th - Sunday 28th November 2021

Location: Bonvilston & Saint Nicholas, Vale of Glamorgan

TABLE 36

Client: Sirius

Project: Oaklands Solar Farm

Data: **Baseline Sound Survey: Position D - Whitewell**

Instrumentation: Cirrus 171 Real Time Analyser (G056142)

Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmaz (dB)	Observations
23:00	15:00	37.8	40.1	34.1	46.1	
23:15	15:00	37.6	40.1	31.8	48.4	
23:30	15:00	38.1	40.1	33.0	55.5	
23:45	15:00	35.8	38.0	31.9	48.5	
00:00	15:00	39.2	41.8	35.1	48.3	
00:15	15:00	38.8	41.4	34.8	50.5	
00:30	15:00	38.6	40.3	34.9	52.3	
00:45	15:00	37.2	39.9	33.3	46.6	
01:00	15:00	40.3	43.5	35.3	51.2	
01:15	15:00	39.8	42.3	35.3	52.5	
01:30	15:00	40.0	42.5	34.7	52.8	
01:45	15:00	40.3	43.3	34.7	52.2	
02:00	15:00	35.3	38.0	32.5	46.3	
02:15	15:00	33.2	36.3	29.0	46.9	
02:30	15:00	34.0	37.3	28.6	49.4	
02:45	15:00	29.1	32.0	26.1	43.3	
03:00	15:00	30.6	33.4	27.3	43.0	
03:15	15:00	30.0	33.8	25.6	41.2	
03:30	15:00	28.7	31.5	25.6	44.4	
03:45	15:00	29.6	30.8	25.6	38.1	
04:00	15:00	29.8	32.8	26.8	44.6	
04:15	15:00	33.5	36.2	28.1	48.5	
04:30	15:00	32.8	36.2	27.1	49.3	
04:45	15:00	33.2	33.9	26.6	55.5	
05:00	15:00	29.9	32.9	27.8	41.7	
05:15	15:00	32.6	35.2	30.1	47.9	
05:30	15:00	34.8	37.6	31.2	46.8	
05:45	15:00	35.5	38.9	31.3	49.4	
06:00	15:00	36.9	39.9	32.0	55.6	
06:15	15:00	36.7	40.2	29.8	53.1	
06:30	15:00	36.2	38.5	32.4	53.9	
06:45	15:00	34.5	37.1	29.5	51.7	
Average 2300-0700		36.3	38.9	31.8	38-56	

## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 37**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	38.5	41.6	31.7	54.8	
07:15	15:00	45.1	43.6	32.7	67.6	
07:30	15:00	39.4	42.3	32.1	55.5	
07:45	15:00	38.4	41.5	31.1	52.9	
08:00	15:00	40.7	43.3	35.3	55.9	
08:15	15:00	44.0	45.0	36.1	63.1	
08:30	15:00	42.9	44.6	37.0	69.8	
08:45	15:00	42.4	44.7	38.1	54.0	
09:00	15:00	43.2	45.5	39.5	53.0	
09:15	15:00	41.5	43.8	36.9	55.8	
09:30	15:00	40.6	42.3	37.7	57.7	
09:45	15:00	38.6	40.3	36.0	52.3	
10:00	15:00	43.0	43.5	37.3	62.3	
10:15	15:00	40.8	42.0	37.4	61.1	
10:30	15:00	49.1	50.1	38.1	69.0	
10:45	15:00	41.5	43.0	38.6	59.1	
11:00	15:00	40.3	42.3	37.3	54.5	
11:15	15:00	43.2	45.5	36.2	65.8	
11:30	15:00	39.5	40.5	35.4	61.9	
11:45	15:00	40.4	43.0	35.0	56.3	
12:00	15:00	39.8	41.2	35.0	56.6	
12:15	15:00	44.1	45.1	33.8	66.5	
12:30	15:00	40.8	43.3	35.5	58.5	
12:45	15:00	39.6	41.5	36.5	55.5	
13:00	15:00	39.3	41.2	36.6	49.5	
13:15	15:00	40.2	42.7	36.2	60.0	
13:30	15:00	41.5	42.7	37.8	59.7	
13:45	15:00	40.7	42.4	38.3	54.2	
14:00	15:00	41.0	42.8	36.9	55.5	
14:15	15:00	39.1	41.3	35.6	52.1	
14:30	15:00	40.7	42.4	37.0	59.9	
14:45	15:00	42.2	42.6	37.6	58.5	
Average 0700-1500		42.0	43.5	36.5	50-70	

## Noise Survey Results

Date: Sunday 28th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

TABLE 38

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
15:00	15:00	41.7	42.6	38.3	62.1	
15:15	15:00	41.6	43.9	38.3	54.3	
15:30	15:00	42.2	44.1	39.4	55.6	
15:45	15:00	44.1	45.2	38.9	60.4	
16:00	15:00	43.3	45.6	39.5	55.6	
16:15	15:00	42.6	44.5	40.1	55.2	
16:30	15:00	42.7	44.3	40.2	53.5	
16:45	15:00	41.8	43.7	38.9	50.8	
17:00	15:00	42.0	43.9	39.6	49.5	
17:15	15:00	43.7	45.6	41.0	52.3	
17:30	15:00	42.1	44.0	39.0	51.5	
17:45	15:00	42.3	44.5	38.7	55.8	
18:00	15:00	43.0	45.2	39.0	54.1	
18:15	15:00	43.7	45.9	39.9	53.0	
18:30	15:00	42.9	45.3	39.4	53.0	
18:45	15:00	42.0	44.4	38.0	53.0	
19:00	15:00	41.1	43.4	37.5	52.1	
19:15	15:00	39.9	42.5	35.7	50.5	
19:30	15:00	40.1	42.1	37.3	51.8	
19:45	15:00	39.1	41.0	36.4	50.6	
20:00	15:00	39.3	41.4	36.0	49.2	
20:15	15:00	42.3	42.5	36.2	64.5	
20:30	15:00	39.8	41.7	36.5	55.8	
20:45	15:00	39.7	42.2	35.7	50.2	
21:00	15:00	38.3	40.4	35.0	48.7	
21:15	15:00	37.5	40.0	32.9	46.1	
21:30	15:00	36.0	37.9	32.9	46.9	
21:45	15:00	36.8	38.9	34.0	46.8	
22:00	15:00	36.3	38.9	31.9	48.8	
22:15	15:00	36.4	39.2	31.9	47.2	
22:30	15:00	36.4	38.8	30.8	51.7	
22:45	15:00	35.1	38.6	27.0	46.8	
Average 1500-2300		41.1	43.1	37.6	46-65	

## Noise Survey Results

Date: Sunday 28th - Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

TABLE 39

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmaz (dB)	Observations
23:00	15:00	34.4	37.3	27.8	51.9	
23:15	15:00	36.4	39.3	29.7	49.8	
23:30	15:00	33.7	37.0	27.6	48.2	
23:45	15:00	31.7	34.7	26.8	41.1	
00:00	15:00	30.1	32.1	25.8	49.2	
00:15	15:00	29.7	32.2	26.0	44.8	
00:30	15:00	35.0	39.2	25.9	48.0	
00:45	15:00	33.3	37.1	27.0	48.0	
01:00	15:00	29.7	33.2	26.3	41.6	
01:15	15:00	30.4	32.7	26.4	44.5	
01:30	15:00	28.3	30.2	26.5	41.2	
01:45	15:00	27.9	30.4	25.7	46.4	
02:00	15:00	28.2	30.7	25.5	39.0	
02:15	15:00	29.5	31.8	26.8	42.0	
02:30	15:00	31.7	34.1	27.4	44.8	
02:45	15:00	27.5	28.3	26.9	35.9	
03:00	15:00	30.8	31.0	27.0	46.5	
03:15	15:00	30.2	32.5	26.1	45.2	
03:30	15:00	28.5	30.8	26.1	42.4	
03:45	15:00	27.8	29.5	25.7	44.4	
04:00	15:00	30.6	33.3	26.4	45.3	
04:15	15:00	34.2	37.0	27.6	49.6	
04:30	15:00	33.4	35.9	26.9	49.8	
04:45	15:00	33.9	33.4	26.1	50.4	
05:00	15:00	30.5	32.5	27.1	49.8	
05:15	15:00	32.1	35.7	28.5	48.2	
05:30	15:00	34.2	37.3	29.4	45.5	
05:45	15:00	35.3	39.1	29.0	48.5	
06:00	15:00	37.2	39.3	30.5	51.3	
06:15	15:00	37.3	40.7	28.4	53.4	
06:30	15:00	36.6	39.0	31.0	54.5	
06:45	15:00	34.7	37.4	27.9	52.6	
Average 2300-0700		33.0	35.7	27.4	36-55	

## Noise Survey Results

Date: Monday 29th November 2021  
 Location: Bonvilston & Saint Nicholas, Vale of Glamorgan  
 Client: Sirius  
 Project: Oaklands Solar Farm  
 Data: **Baseline Sound Survey: Position D - Whitewell**  
 Instrumentation: Cirrus 171 Real Time Analyser (G056142)  
 Calibration: 94dB

**TABLE 40**

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmix (dB)	Observations
07:00	15:00	48.2	54.9	44.3	55.8	
07:15	15:00	46.6	47.2	44.1	58.9	
07:30	15:00	45.1	46.6	42.3	60.9	
07:45	15:00	43.7	45.7	41.2	57.0	
08:00	15:00	44.4	45.7	40.9	58.8	
08:15	15:00	47.6	50.3	42.6	62.7	
08:30	15:00	50.3	52.0	44.6	61.9	
08:45	15:00	52.5	54.0	44.9	66.1	
09:00	15:00	52.6	55.4	45.4	66.5	
09:15	15:00	46.8	48.9	44.2	60.5	
09:30	15:00	46.1	48.3	43.5	56.7	
09:45	15:00	48.6	49.4	43.8	67.1	
10:00	15:00	47.7	49.0	43.8	59.1	
10:15	15:00	48.3	49.5	43.8	57.6	
10:30	15:00	50.4	50.9	44.4	64.6	
10:45	15:00	51.5	55.3	47.4	66.0	
11:00	15:00	50.5	52.5	47.0	68.6	
11:15	15:00	47.6	50.0	44.6	57.7	
11:30	15:00	49.6	50.8	46.6	60.5	
Average 0700-1145		48.9	51.3	44.2	56-69	

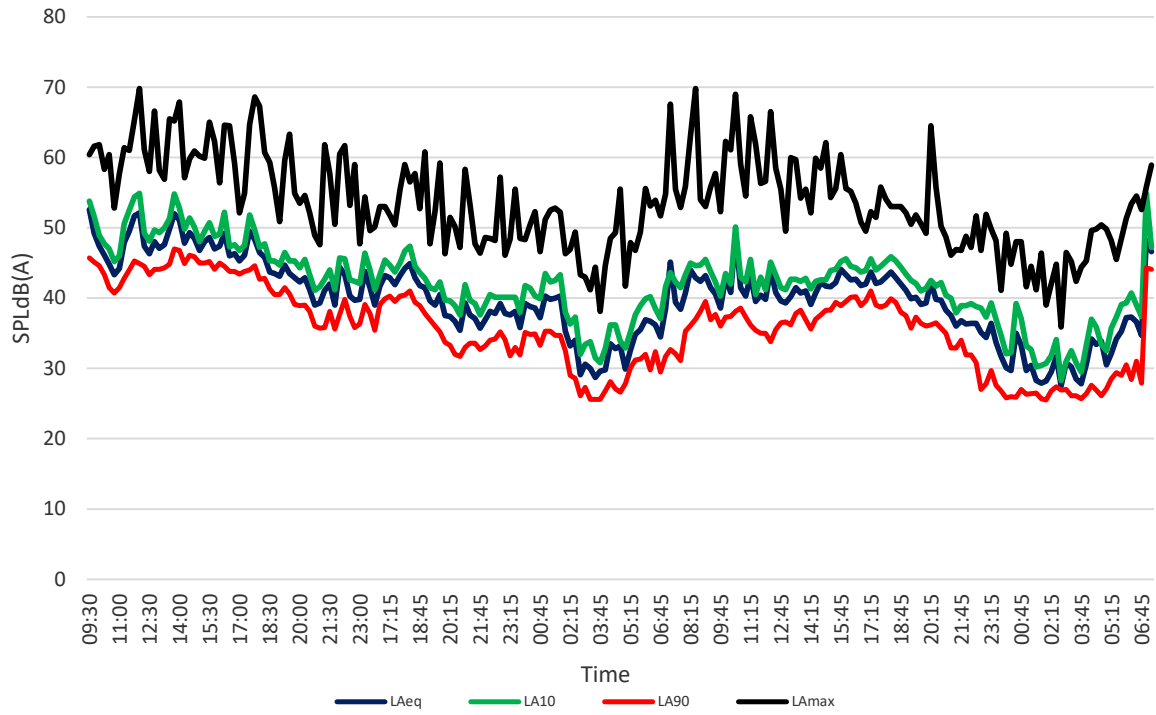
<b>Overall Average</b>	<b>35.7</b>	<b>38.4</b>	<b>31.1</b>	<b>38-56</b>	<b>Excluding Rain</b>
<b>Overall Average</b>	<b>45.5</b>	<b>47.6</b>	<b>41.3</b>	<b>46-70</b>	<b>Excluding Rain</b>

Average 0430-0700	<b>34.8</b>	<b>37.6</b>	<b>29.5</b>	<b>45-62</b>	
Representative LA90			<b>29</b>		

<b>Overall Average</b>	<b>45.3</b>	<b>47.4</b>	<b>41.2</b>	<b>46-70</b>	<b>Including Rain</b>
<b>Overall Average</b>	<b>38.2</b>	<b>40.8</b>	<b>34.0</b>	<b>38-85</b>	<b>Including Rain</b>

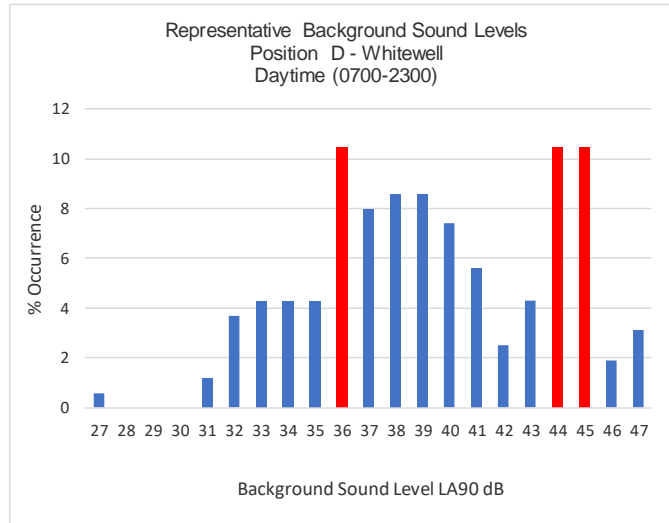


Background Sound Survey: Position D - Whitewell  
Friday 26th - Monday 29th November 2021

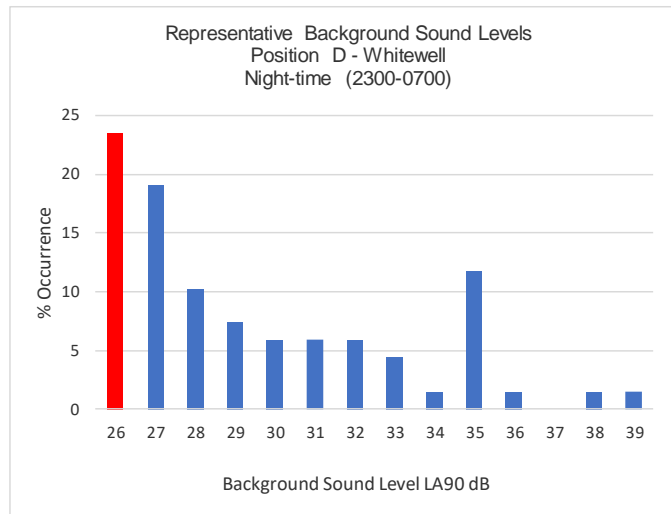


## LA90 Representative Levels

LA90	% Occurrence
27	0.6
28	0.0
29	0.0
30	0.0
31	1.2
32	3.7
33	4.3
34	4.3
35	4.3
<b>36</b>	<b>10.5</b>
37	8.0
38	8.6
39	8.6
40	7.4
<b>41</b>	<b>5.6</b>
42	2.5
43	4.3
<b>44</b>	<b>10.5</b>
<b>45</b>	<b>10.5</b>
46	1.9
47	3.1



LA90	% Occurrence
<b>26</b>	<b>23.5</b>
27	19.1
28	10.3
29	7.4
30	5.9
31	5.9
32	5.9
33	4.4
34	1.5
35	11.8
36	1.5
37	0
38	1.5
39	1.5



Document Reference	Appendix No.	Title
4.01.8		
	8.5	Plant Inventory Noise Levels

## APPENDIX 8-5

### PLANT INVENTORY NOISE LEVELS

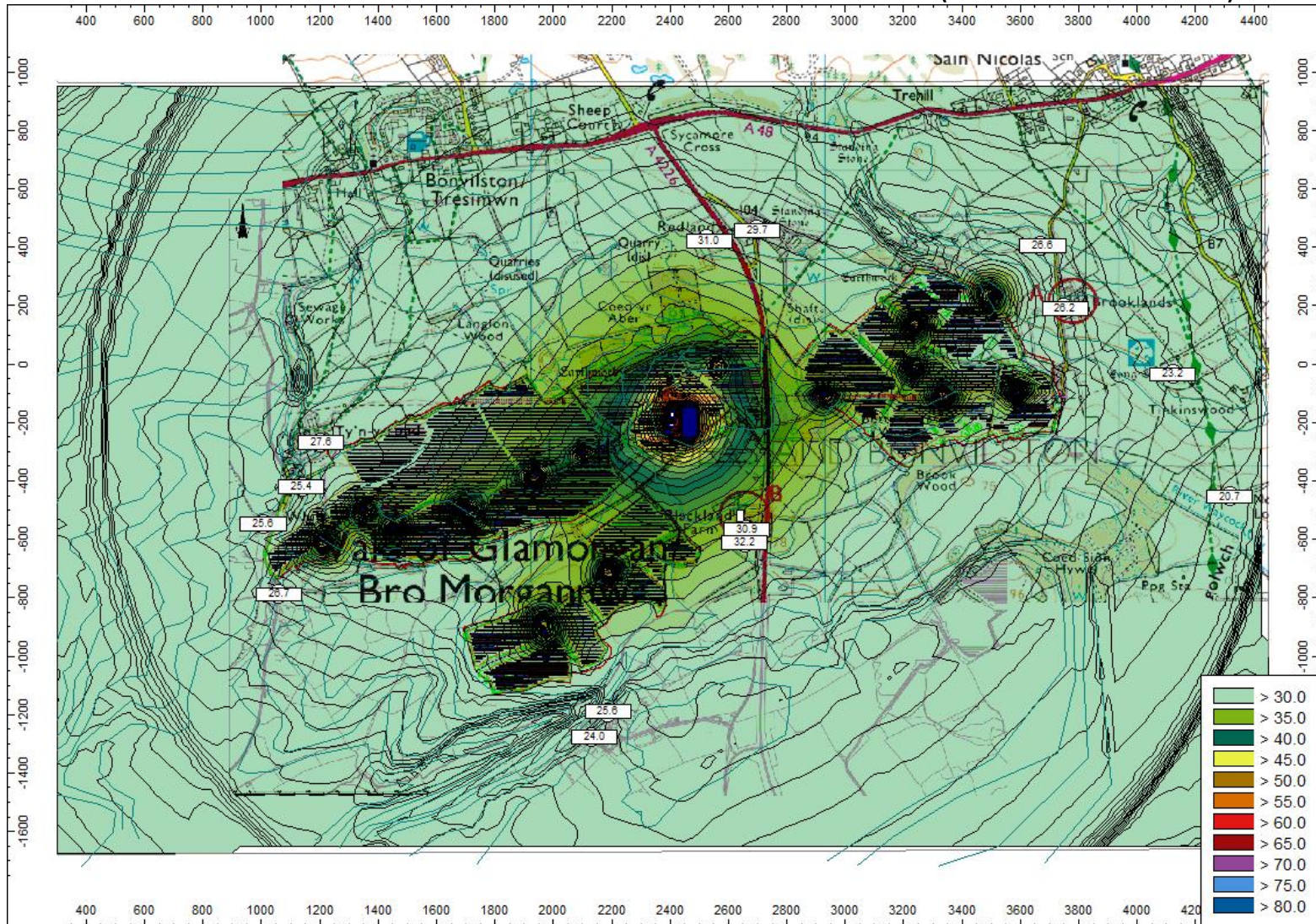
Plant	Measured Sound Pressure Levels LAeq dB	Assumed Sound Power Levels dBA
<b>Site Preparation</b>		
Tracked Excavator/Mini Digger	75 @ 10m	103
HGV	76 @ 10m	104
Compactor	78 @ 10m	106
Portable Water Bowser	76 @ 10m	104
<b>General Activities</b>		
Telehandler	76 @ 10m	104
Lorry	75 @ 10m	103
JCB	80 @ 10m	108
Compressor	71 @ 10m	99
Generator	74 @ 10m	102
Mini Digger	74 @ 10m	102
<b>Piling</b>		
Hydraulic Piling Rig	76 @ 10m	104
HGV	75 @ 10m	103
<b>Concreting Works</b>		
Truck Mixer	72 @ 10m	100
Concrete Pump	79 @ 10m	107
Poker Vibrator	74 @ 10m	102
Compressor	71 @ 10m	99
<b>Panel Installation</b>		
Mobile Crane	78 @ 10m	106
Power Tools	80 @ 10m	108
HGV	75 @ 10m	103

Document Reference	Appendix No.	Title
4.01.8		
	8.6	Noise Mapping Results

**APPENDIX 8-6**

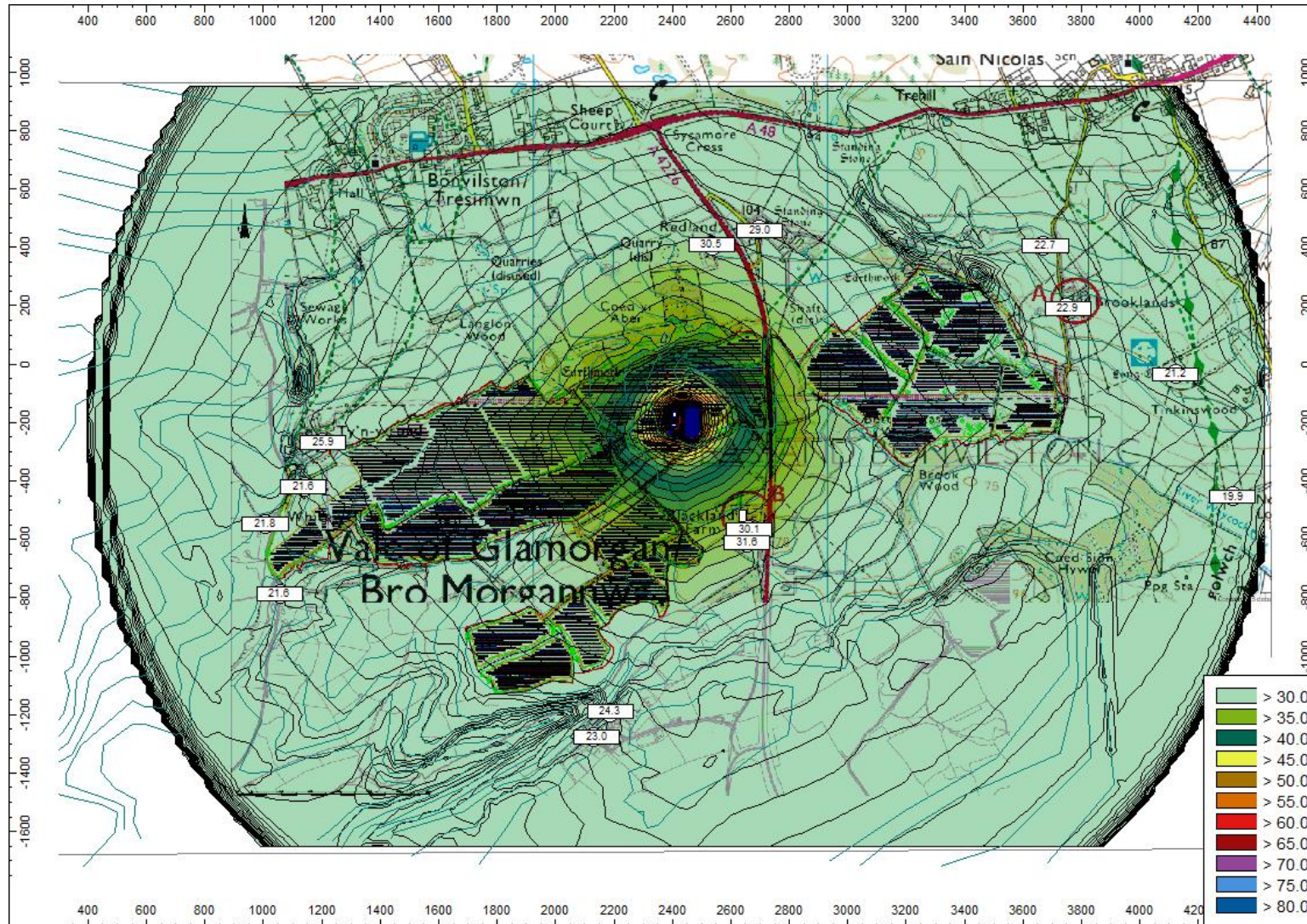
**NOISE MAPPING RESULTS**

**NOISE MAP 8-1: NOISE CONTOURS OF SOLAR FARM INCLUDING BATTERY STORAGE FACILITY (DAYTIME & SUNRISE HOURS)**





**NOISE MAP 8-2: NOISE CONTOURS OF BATTERY STORAGE FACILITY (NIGHT-TIME PERIOD)**





Document Reference	Appendix No.	Title
4.01.8		
	8.7	Vibration Technical Terms

## APPENDIX 8-7

### VIBRATION TECHNICAL TERMS

#### Ground Borne Vibrations

For any source of vibration on or near the surface of the ground, energy propagates away from the source via:

- a) Elastic body (or compression) waves – which radiate energy into the ground in all directions
- b) Surface (or shear) waves – which carry energy along the ground surface, caused when body waves are reflected back into the ground at the ground-surface interface

Thus, at any point away from that source, the ground motion is the sum of all the wave motions at that point. When wave motion has been generated, the waves will be attenuated as they travel away from the source. The two main mechanisms for attenuation are:

- a) Enlargement of the wavefront as the distance from the source increases, and
- b) Internal damping of the transmitting medium (the ground)

Ground borne vibration is therefore made up of a combination of different waves, travelling in different directions, at different speeds and at different frequencies. The frequency component of the vibration will affect the rate at which attenuation occurs since the internal damping of the ground is frequency dependent.

Since vibration enters buildings through the foundations, the hard structure of the building is normally affected to a greater degree than by air borne vibration. Often ground borne vibrations are more noticeable when standing or sitting near the middle of suspended wooden floors.

#### Ground Borne Vibration Measurement Units

Ground borne vibration is caused when the individual particles making up the strata are caused to oscillate by the passage of a pressure wave. The resulting vibration can be summarized in terms of 4 main parameters:

- a) **Velocity** – how fast the particles move when they are oscillating. Since the velocity of these particles continually change as the pressure wave passes the most useful value that is often reported is the maximum or peak particle velocity (PPV). PPVs are usually expressed in terms of  $\text{ms}^{-1}$  or  $\text{mms}^{-1}$ .
- b) **Acceleration** – is the rate at which the particle velocity changes during oscillation. It is usually measured in  $\text{ms}^{-2}$   $\text{mms}^{-2}$  or “g’s”. 1g is that acceleration imparted to an object by the earth’s gravitational pull and is approximately  $9.81 \text{ms}^{-2}$ .
- c) **Displacement** – is the distance moved by oscillating particles. This is usually very small and measured in mm or even  $\mu\text{m}$ .
- d) **Frequency** – is the number of oscillations per second which a particle undergoes due to the passage of a vibration wave. It is measured in cycles per second or Hertz (Hz).

The movement of particles induced to oscillate by vibration waves are usually measured in three mutually perpendicular directions to fully describe the vibration intensity, as particles will be oscillating in three dimensions. These are:

- a) **Longitudinal** – back and forth particle movement in the same direction that the vibration wave is travelling.
- b) **Vertical** – up and down movement perpendicular to the direction the vibration wave is travelling.
- c) **Transverse** – left and right particle movement perpendicular to the direction the vibration wave is travelling.

Document Reference	Appendix No.	Title
4.01.8		
	8.8	Vibration Monitoring Details

## **APPENDIX 8-8**

### **VIBRATION MONITORING DETAILS**

#### **Movement of HGVs Along Access Road**

##### **HGV Vibration Measurements**

Measurements of ground borne vibration were undertaken at site at positions close to the nearest residential property (i.e. rear garden boundary of nearest receptor). The methodology described below was employed during the vibration survey.

##### **Measurement Technique**

Vibration measurements were made, in the three mutually perpendicular axes, during the monitoring period. The Nomis seismograph was set to the 'continuous' and 'trigger' mode settings (trigger level of 0.3 mm/sec) and was placed at a distance of approximately 2 metres from the garden boundary (circa 10m from kerbside). Some additional measurements were taken at a distance of 2 metres from the kerbside of the access road for additional information. The seismograph has monitored the ground borne vibration in terms of Peak Particle Velocity (PPV).

##### **Results of Survey**

During the vibration survey, the seismograph transducer triggered during HGV movements when certain vehicles were travelling over the speed 'hump'. The maximum levels of vibration recorded ranged between 0.45mm/s to 0.83mm/s at the rear garden boundary position. Readings taken at closer distance (i.e. within 2 metres of the kerbside) showed the maximum vibration to be between 0.51mm/s and 1mm/s.

Results are provided on the following page:

**Table of Vibration Results:**

Position	Vibration Magnitude (mm/sec)			Peak Frequency (Hz)	Activity
	Horizontal x	Tranverse y	Vertical z		
Adjacent to nearest dwelling (in car park)	0.445	0.191	0.318	512	HGV into site
" " "	0.318	0.191	0.445	11.6	HGV into site
" " "	0.254	0.254	0.381	14.2	HGV out of site
" " "	0.318	0.191	0.381	15.5	HGV out
" " "	0.826	0.191	0.381	512	1 x HGV in, 2 x HGVs out
" " "	0.381	0.191	0.381	11.3/256	HGV in
" " "	0.318	0.254	0.318	2.8/12.4	HGV out
" " "	0.318	0.191	0.445	14.6	HGV in
" " "	0.254	0.254	0.318	15.5	HGV out
" " "	0.699	0.445	0.318	512	3 x HGVs in, 1 x HGV out
" " "	0.318	0.191	0.318	2.9/13.4	HGV in
" " "	0.445	0.191	0.254	512	HGV in
" " "	0.318	0.191	0.318	11.9/128	HGV out
" " "	0.254	0.191	0.508	14.6	HGV & skip wagon in
" " "	0.254	0.191	0.445	11.6	HGV out
" " "	0.318	0.191	0.572	-	Continuous mode (48 HGV movements over 1hour)
Within 5m of kerbside	0.508	0.254	1.016	10.6	2 x HGVs into site
" " "	0.318	0.127	0.318	13.1	HGV in
" " "	0.318	0.127	0.381	12.8	HGV out
" " "	0.381	0.191	0.572	10.8	HGV in

## Monitoring of HGVs and other vehicles at kerbside

The seismograph only triggered when some of the vehicles passed the monitoring positions.

The following tables detail the results of the ground vibration survey.

### Position 1:

#### Ground Vibration Measurements

Time:	Location:	Position:	Vibration level		
			X	Y	Z
08:26	Scawby Road (corner) (2m from kerbside)	Cars near & farside	0.191	0.127	0.318
08:26	Scawby Road (corner) (2m from kerbside)	HGV far side	0.191	0.127	0.254
08:38	Scawby Road (corner) (2m from kerbside)	Cars near & farside	0.191	1.27	0.254
08:39	Scawby Road (corner) (2m from kerbside)	Car far side Car	0.191	1.27	0.254
08:39	Scawby Road (corner) (2m from kerbside)	near side			
08:39	Scawby Road (corner) (2m from kerbside)	Tractor far side	0.254	0.127	0.254
08:43	Scawby Road (corner) (2m from kerbside)	Car near side			
08:43	Scawby Road (corner) (2m from kerbside)	HGV near side	0.318	0.127	0.254
08:44	Scawby Road (corner) (2m from kerbside)	Car near side			
08:44	Scawby Road (corner) (2m from kerbside)	Straw Trailer (empty)	0.191	0.127	0.254
08:45	Scawby Road (corner) (2m from kerbside)	near side			
08:45	Scawby Road (corner) (2m from kerbside)	Car near side	0.318	0.254	0.508
08:46	Scawby Road (corner) (2m from kerbside)	Car near side			
08:46	Scawby Road (corner) (2m from kerbside)	HGV near side	0.254	0.191	0.254
08:56	Scawby Road (corner) (2m from kerbside)	HGV Double Trailer	0.381	0.318	0.381
08:56	Scawby Road (corner) (2m from kerbside)	nearside			
08:57	Scawby Road (corner) (2m from kerbside)	HGV far side	0.254	0.127	0.318
08:57	Scawby Road (corner) (2m from kerbside)	Car near side			
08:57	Scawby Road (corner)	Car near side	0.381	0.254	0.445
Highest Levels		Cars	0.254	0.127	
Highest Levels		HGVs	0.445	0.254	
Highest Levels		Straw Trailer	0.381	0.318	
Highest Levels		HGV near side	0.381	0.318	
Highest Levels		HGV far side	0.445	0.191	

**Position 2**

**Access Road**

Time:	Location:	Position:	Vibration level		
			X (m/s <sup>2</sup> )	Y (m/s <sup>2</sup> )	Z (m/s <sup>2</sup> )
09:29	Access Road (2-3m)	Straw Trailer (loaded) far side	0.254	0.127	0.254
09:30	Access Road (2-3m)	HGV (Tanker) far side	0.318	0.318	0.254
09:31	Access Road (1m)	Straw Trailer (loaded) near side	0.318	0.318	0.318
09:31	Access Road (5m)	Straw Trailer (loaded) leaving junction	0.191	0.127	0.254
09:33	Access Road (1m)	Car near side	0.191	0.127	0.254
Highest levels                      Cars			0.191	0.127	0.254
Highest levels                      HGVs			0.318	0.318	0.254
Highest levels                      Straw Trailer			0.318	0.318	0.318

**Position 3:**

**Scawby Road (on pavement)**

Time:	Location:	Position:	Vibration level		
			X	Y (m/s <sup>2</sup> )	Z (m/s <sup>2</sup> ) (m/s <sup>2</sup> )
10:59	Pavement (1-2m from Scawby Road) Pavement	HGV Far Side	0.254	0.127	0.254
11:02	(1-2m from Scawby Road) Pavement	Car near side	0.191	0.127	0.254
11:03	(1-2m from Scawby Road) Pavement	HGV Far Side	0.254	0.127	0.254
11:05	(1-2m from Scawby Road) Pavement	Car near side	0.254	0.127	0.254
11:05	(1-2m from Scawby Road) Pavement	HGV (flatbed) loaded near side	0.445	0.318	0.381
11:06	(1-2m from Scawby Road) Pavement	Car near side	0.191	0.127	0.254
11:07	(1-2m from Scawby Road) Pavement	Car near side	0.191	0.127	0.254
11:07	(1-2m from Scawby Road) Pavement	HGV Near Side	0.445	0.381	0.445
11:07	(1-2m from Scawby Road) Pavement	Car near side	0.191	0.127	0.254
11:07	(1-2m from Scawby Road)	HGV Near Side	0.254	0.254	0.254
Highest levels                      Cars			0.254	1.270	0.254
Highest levels                      HGVs			0.445	0.381	0.445
Highest levels                      HGV near side			0.445	0.381	0.445
Highest levels                      HGV far side			0.254	0.127	0.254



### Research Data

The New Zealand Transport Agency published a research paper entitled 'Ground Vibration from Road Construction' in May 2012, which includes a table of measured PPV values for different types of plant. The results have been provided below as an extract from the paper for ease of reference.

### Vibration Levels from a Range of Construction Activities

