Appendix 11.3: Baseline Noise Monitoring

Baseline noise monitoring was undertaken in 2022 and 2024. Short-term attended measurements were undertaken in 2022 and long-term unattended measurements were undertaken in 2024.

2022 Baseline Noise Monitoring

Noise measurements were undertaken at 8 locations across the site in accordance with BS 7445-1: 20031 by James Sharpe AMIOA and Reid Malster AMIOA of Miller Goodall Ltd. The calibration of the sound level meters were checked before and after measurements with negligible deviation (<0.1 dB) noted. Details of the equipment used are shown in **Table A11.3.1**, below.

Measurement locations are indicated on **Figure 11.1** of **Chapter 11. Nosie and Vibration**. Measurements were taken during a daytime and night-time weekday period.

Table A11.3.1: Noise Monitoring Equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
MP1 – MP4 (Daytime) and MP1 & MP8 (Night-time)					
Class 1, Integrating Real Time 1/3 Octave Sound Analyser	NOR 140	Norsonic	1407510	15/12/2021	05552/1
Microphone	NOR 1225	Norsonic	384687	15/12/2021	
Class 1 Calibrator[2]	NOR 1251	Norsonic	34123	1/9/21	5409/1
MP5 – MP8 (Daytime)					
Class 1, Integrating Real Time 1/3 Octave Sound Analyser	NOR 140	Norsonic	1406017	3/11/21	05520/1
Microphone	NOR 1225	Norsonic	358159	3/11/21	
Field Calibrator	Type 4231	Brüel & Kjær	2478249	20/07/2020	04743/1

[1] BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

[2] IEC 60942 (2003) Electroacoustics – Sound calibrators

Three non-consecutive fifteen-minute sample measurements were undertaken at MP1-MP8 during the daytime survey

The night-time surveys concentrated on MP1 and MP8 which were identified as the noisiest two positions in the daytime survey. Two fifteen-minute samples were measured at MP1 and one fifteen-minute measurement at MP8. Additional measurements were attempted at MP8 but delays incurred on site at the time of the survey limited the night-time measurement periods.

Weather conditions during the survey were cool, dry and with wind speeds <5ms^{-1} and were considered suitable for the survey.

2024 Baseline Noise Monitoring

.1.1 Noise measurements were undertaken at locations MP9 and MP10 Measurement as indicated on **Figure 11.1** of **Chapter 11. Nosie and Vibration**, in accordance with BS 7445-1: 2003[3] by Dan Emery of Miller Goodall Ltd. The calibration of the sound level meter was checked before and after measurements with negligible deviation (<0.1 dB). Details of the equipment used are shown in

[3] BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

Table A11.3.2 below.

Table A11.3.2: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1[4],[5] Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-11111-E0	16/10/2023	05451/1
Pre-amplifier	Nti MA220	NTi Audio	6908	16/10/2023	05451/1
Microphone	NTi MC230A	NTi Audio	A14423	16/10/2023	05451/1
Outdoor microphone housing	NTi WP30	NTi Audio	N/A	13/09/2023	N/A
Class 1[6],[7] Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-15860-E0	27/02/2023	06143/1
Pre-amplifier	NTi MA220	NTi Audio	8102	27/02/2023	06143/1
Microphone	NTi MC230A	NTi Audio	A16445	27/02/2023	06143/1
Outdoor microphone housing	NTi WP30	NTi Audio	NA	NA	NA
Class 1 Calibrator[8]	CAL 200	Larson Davies	14154	10/10/2022	05964/1

Background and ambient noise monitoring was undertaken at the times specified in **Table A11.3.3**, below.

Weather conditions were determined both at the start and on completion of the survey. Whilst winds were greater than 5 ms^{-1} at the beginning of the survey period, historical weather data indicates that the wind dropped to below 5ms^{-1} by approximately 15:30 hours and remained below 5ms^{-1} for the remainder of Friday 26 January. Wind speeds

[4] IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

[5] IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

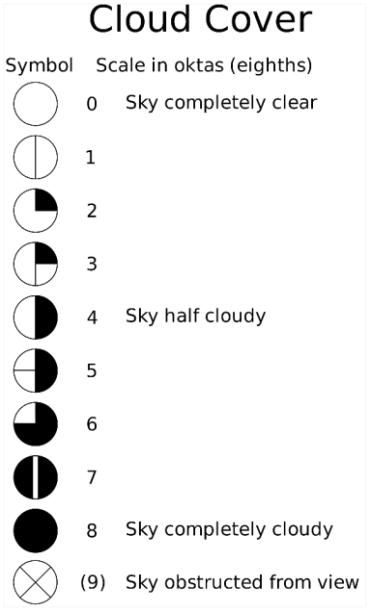
[6] IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

[7] IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

[8] IEC 60942 (2003) Electroacoustics – Sound calibrators

rose back to approximately 7 ms^{-1} during some periods of Saturday and Sunday, but had dropped to approximately 2ms^{-1} in the early hours of Monday 29 January.

Table A11.3.3: Dates, times and weather conditions during noise measurements at MP9

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
MP9 MP10	26/01/2024, 12:30 to 29/01/2024, 14:30	Temperature:	9 ºC	8 ºC
		Precipitation:	Dry	Dry
		Cloud cover (oktas – see opposite):	2	8
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	No	Slight
		Wind speed:	6 m/s	None
		Wind direction:	Variable, generally northerly	
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No

Measurements were undertaken over a 72 hour period between Friday and Monday to capture full 16 hour daytime and 72 hour night-time periods over both weekdays and weekend days. Measurements were made under free-field conditions at a height of 1.4 m

and 1.6 m above local ground level for measurement positions MP9 and MP10 respectively.

The measurement locations are detailed below and indicated on **Error! Reference source not found.**.

- MP9 approximately 10 m from Cefn Road.
- MP10 approximately 90 m from the southern boundary of land associated with Clwb Rygi Wrexham.

The noise sources within the vicinity of the measurement locations are summarised in **Table A11.3.4**, below:

Table A11.3.4: Description of noise sources affecting the site

Measurement Locations	Noise Sources
MP9	Road traffic noise from Cefn Road
MP10	Distant road traffic, birdsong occasional pedestrians on footpath to boundary of Clwb Rygi Wrecsam

Baseline Noise Monitoring Results

The results of the 2022 and 2024 baseline noise monitoring are presented in **Table A11.3.5**.

Table A11.3.5: Baseline monitoring results for 2022 and 2024 noise surveys

Location	Date	Day	Period	Type	Start Time hr:mm	Elapsed Time (hh:mm:ss)	$L_{Aeq,T}$ dB	L_{AFmax} *1. dB	$L_{A10,T}$ *2. dB	$L_{A90,T}$ *3. dB	Overall $L_{Aeq,T}$ dB
MP1	20/01/2022	Thursday	Daytime	Attended	10:20	00:15:00	52	63	56	44	53
					12:35	00:15:00	53	65	56	46	
					14:40	00:15:00	53	63	56	45	
MP1	02/02/2022	Wednesday	Night-time	Attended	05:30	00:15:00	51	62	55	39	51
					06:40	00:15:00	52	62	56	41	
MP2	20/01/2022	Thursday	Daytime	Attended	10:50	00:15:00	50	68	52	40	49
					13:00	00:15:00	48	64	52	37	
					15:10	00:15:00	48	62	51	42	
MP3	20/01/2022	Thursday	Daytime	Attended	11:25	00:15:00	43	56	44	39	45
					13:30	00:15:00	45	60	47	41	
					15:40	00:15:00	46	71	47	41	
MP4	20/01/2022	Thursday	Daytime	Attended	11:55	00:15:00	43	53	45	40	45
					14:00	00:15:00	46	60	48	42	
					16:05	00:15:00	45	53	47	44	
MP5	20/01/2022	Thursday	Daytime	Attended	10:40	00:15:00	45	63	47	42	43
					12:35	00:15:00	41	52	43	38	
					14:40	00:15:00	43	53	44	40	
MP6	20/01/2022	Thursday	Daytime	Attended	11:05	00:15:00	40	55	41	37	42
					13:00	00:15:00	40	57	40	36	
					15:05	00:15:00	44	61	43	38	
MP7	20/01/2022	Thursday	Daytime	Attended	11:40	00:15:00	42	59	43	39	43
					13:30	00:15:00	43	56	45	40	
					15:35	00:15:00	43	65	45	42	

Location	Date	Day	Period	Type	Start Time hr:mm	Elapsed Time (hh:mm:ss)	$L_{Aeq,T}$ dB	L_{AFmax} *1. dB	$L_{A10,T}$ *2. dB	$L_{A90,T}$ *3. dB	Overall $L_{Aeq,T}$ dB
MP8	20/01/2022	Thursday	Daytime	Attended	12:05	00:15:00	59	72	63	42	59
					13:55	00:15:00	60	74	64	44	
					16:00	00:15:00	60	70	64	46	
MP8	02/02/2022	Wednesday	Night-time	Attended	06:10	00:15:00	66	85	71	40	66
MP9	26/01/2024 / 29/01/24*3.	Friday / Monday*3.	Daytime	Unattended	14:30 / 07:00*4.	08:30:00 / 07:30:00*4.	62	n/a	66	46	62
MP9	26/01/2024 to 27/01/2024	Friday to Saturday	Night-time	Unattended	23:00	08:00:00	52	76	-	30	52
MP9	27/01/2024	Saturday	Daytime	Unattended	07:00	16:00:00	60	n/a	-	43	60
MP9	27/01/2024 to 28/01/2024	Saturday to Sunday	Night-time	Unattended	23:00	08:00:00	53	75	-	31	53

Location	Date	Day	Period	Type	Start Time hr:mm	Elapsed Time (hh:mm:ss)	$L_{Aeq,T}$ dB	L_{AFmax} *1. dB	$L_{A10,T}$ *2. dB	$L_{A90,T}$ *3. dB	Overall $L_{Aeq,T}$ dB
MP9	28/01/2024	Sunday	Daytime	Unattended	07:00	16:00:00	59	n/a	-	42	59
MP9	28/01/2024 to 29/01/2024	Sunday to Monday	Night-time	Unattended	23:00	08:00:00	55	75	-	28	55
MP10	26/01/2024 / 29/01/24*3.	Friday / Monday*3.	Daytime	Unattended	12:30 / 07:00*4.	10:30:00 / 05:30:00*4.	46	n/a	-	42	46
MP10	26/01/2024 to 27/01/2024	Friday to Saturday	Night-time	Unattended	23:00	08:00:00	37	50	-	33	37
MP10	27/01/2024	Saturday	Daytime	Unattended	07:00	16:00:00	45	n/a	-	38	45

Location	Date	Day	Period	Type	Start Time hr:mm	Elapsed Time (hh:mm:ss)	$L_{Aeq,T}$ dB	L_{AFmax} *1. dB	$L_{A10,T}$ *2. dB	$L_{A90,T}$ *3. dB	Overall $L_{Aeq,T}$ dB
MP10	27/01/2024 to 28/01/2024	Saturday to Sunday	Night-time	Unattended	23:00	08:00:00	41	57	-	35	41
MP10	28/01/2024	Sunday	Daytime	Unattended	07:00	16:00:00	42	n/a	-	40	42
MP10	28/01/2024 to 29/01/2024	Sunday to Monday	Night-time	Unattended	23:00	08:00:00	39	55	-	30	39

*1. The values presented for night-time L_{AFmax} associated with unattended measurements are the 10th highest $L_{AFmax,T}$ recorded during the 8hr night-time period, measured with a period T of 2 minutes.

*2. The value presented for unattended weekday measurement at MP9 is the 18 hour L_{10}, $L_{AF10,18hour}$, between 06:00 hrs and 00:00 hrs.

*3. For the 16 hour and 8 hour measurements at MP9 and MP10, the $L_{A,90}$ has been calculated using the histogram method with a time base, T, of 15 minutes. The value presented is the most commonly occurring $L_{A90,15min}$ value for the 16 hour or 8 hour period, respectively.

*4. Measurements recorded on Friday afternoon and Monday morning have been concatenated to represent a 24 hour weekday period.