

SSEN Transmission
Bingally 400/ 132 kV Substation
Environmental Appraisal
Volume 3
Appendix M

February 2025



APPENDIX M BACKGROUND SOUND LEVEL SURVEY

1.1 Measurement Survey Details

Instrumentation

1.1.1 The following table identifies the instrumentation used to conduct the measurements.

Table 1 Sound measurement equipment details

Measurement Location	Equipment Type	Model Number	Serial Number
All locations	Calibrator	Brüel & Kjær 4231	2061469
Challenger Lodge, Hilton Lodge	Sound level meter	Rion NL-52	01076308
Guisachan Cottage & Sawmill (Long Term)	Sound level meter	Rion NL-52	510142
Plodda Cottage (Long Term, Short Term)	Sound level meter	Rion NL-52	00386764
Guisachan Cottage (Short Term)	Sound level meter	Rion NL-52	00386766
Glass House, Birchwood House (Attended)	Sound level meter	Brüel & Kjær 2250	2507254

1.1.2 All the above equipment has in-date factory calibration certificates available on request. The sound level meters (SLMs) were field calibrated before conducting measurements and calibration was checked at the end of the measurements, where the maximum deviation in the calibrated signals was 0.3 dB at any location. All SLMs have been calibrated at a UKAS accredited laboratory within the previous two years.

1.1.3 All monitoring locations were 1.2 m to 1.5 m above ground level and free-field i.e. at least 3.5 m away from any reflecting surface except the ground.

1.1.4 The sound level meters were programmed to log L_{Aeq} , L_{Amax} , and L_{A90} values, and third-octave band spectral levels over the 15-minute measurement period – except for the attended measurements at Glass House and Birchwood House. The attended measurements logged the same values but over a 5-minute measurement period, which was then averaged over 15-minute periods for consistency with the presentation of the other data. Sound pressure levels were also logged every second.

1.2 Weather conditions

1.2.1 The meteorological conditions throughout the monitoring period were suitable for undertaking background sound level measurements: Any 15 minute periods with windspeeds exceeding 5 m/s and periods of rainfall were excluded from the results based on observation while in the region and public weather data sources.

Baseline Survey - Time Histories

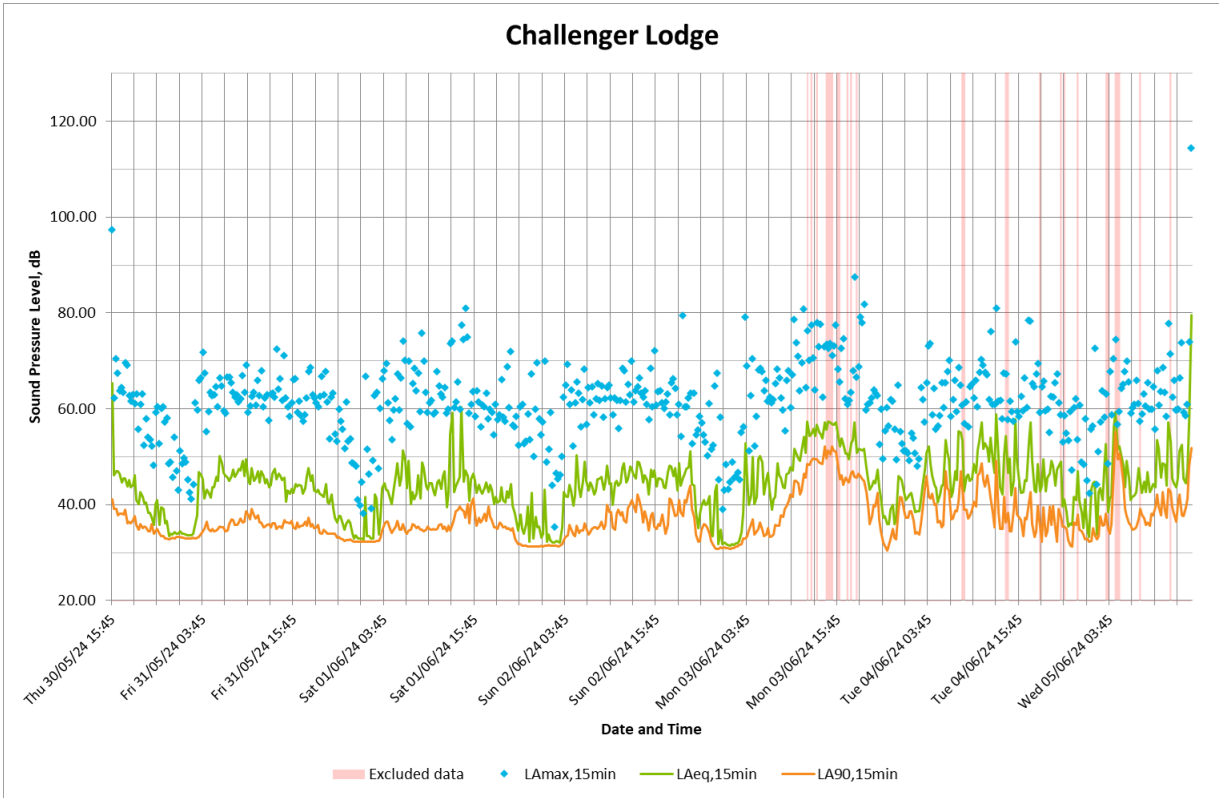


Figure 1 NSR3 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

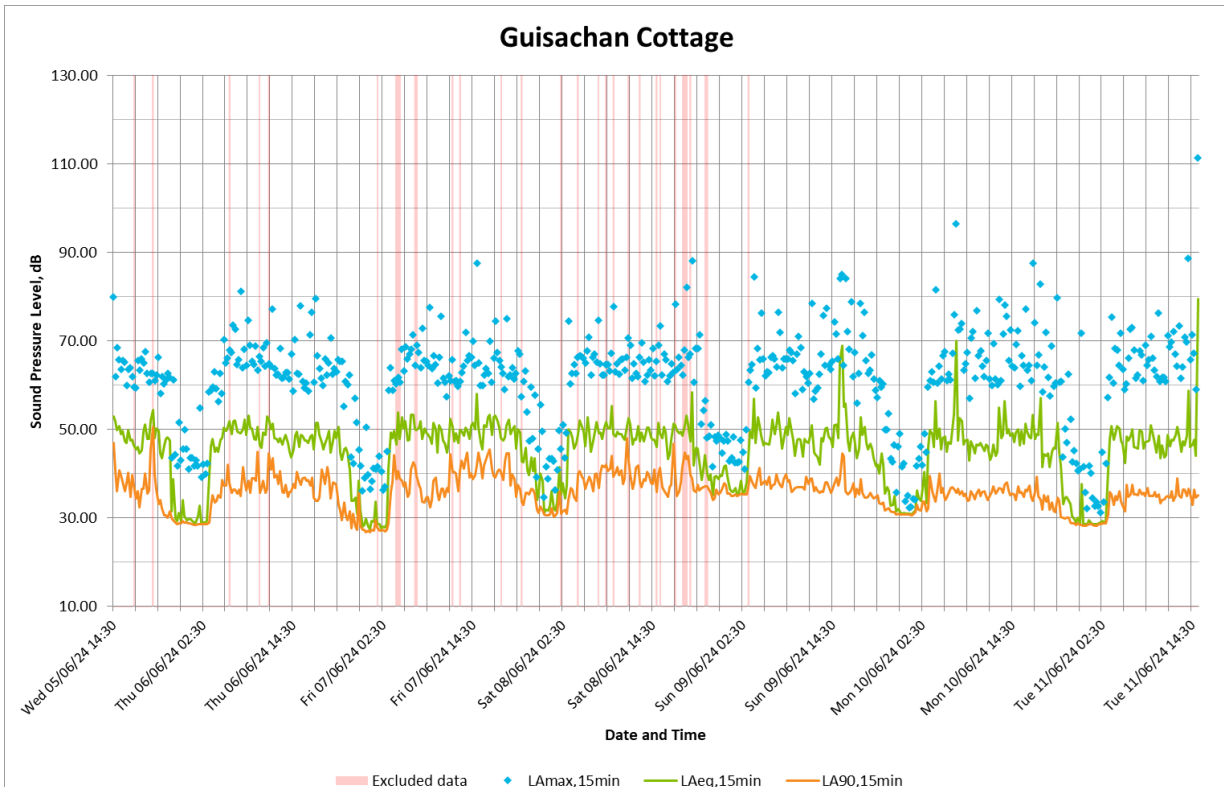


Figure 2 NSR6 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

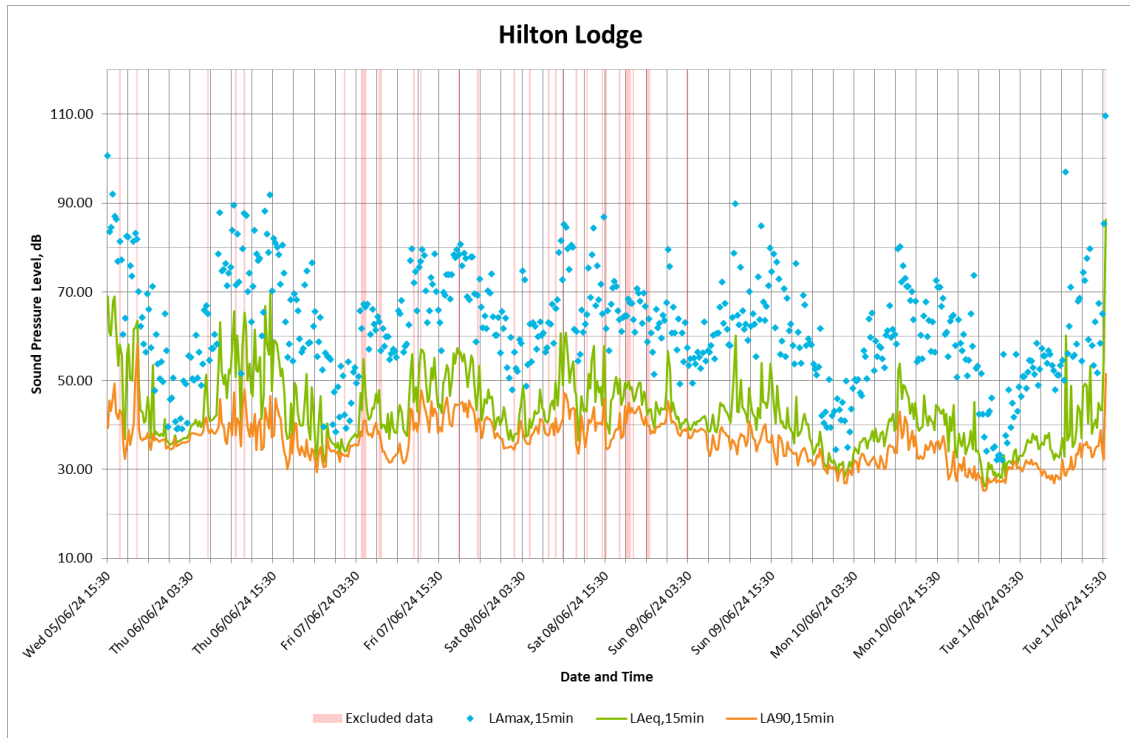


Figure 3 NSR5 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

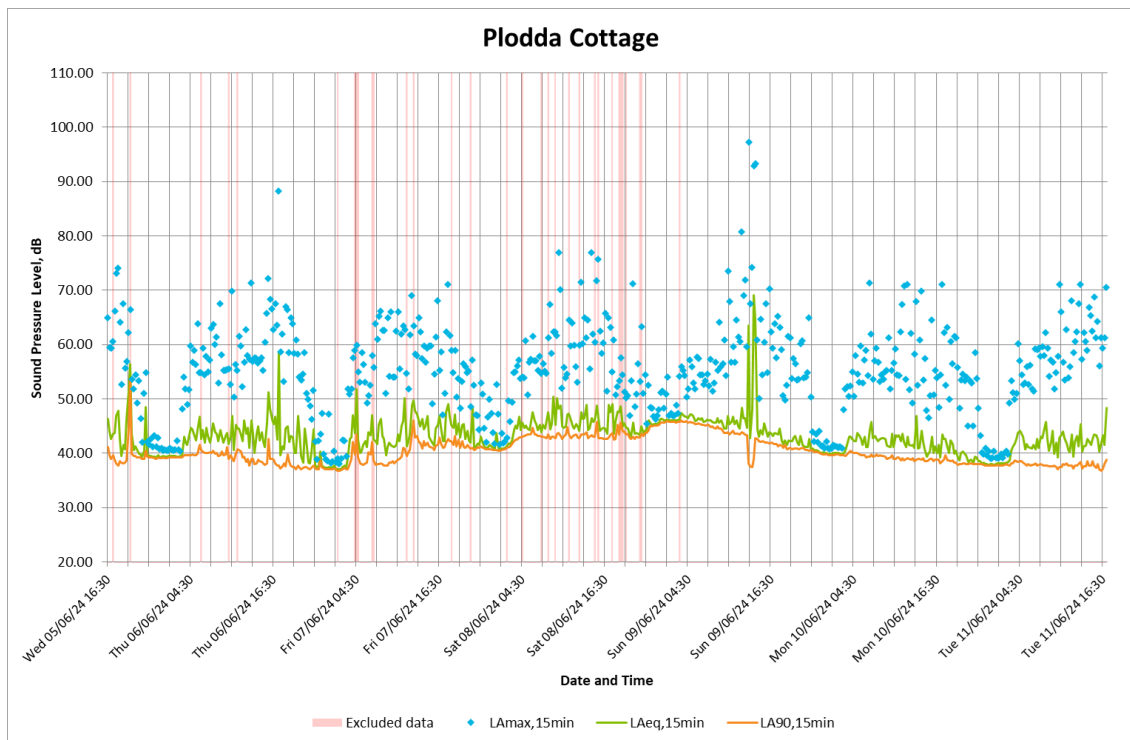


Figure 4 NSR7 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

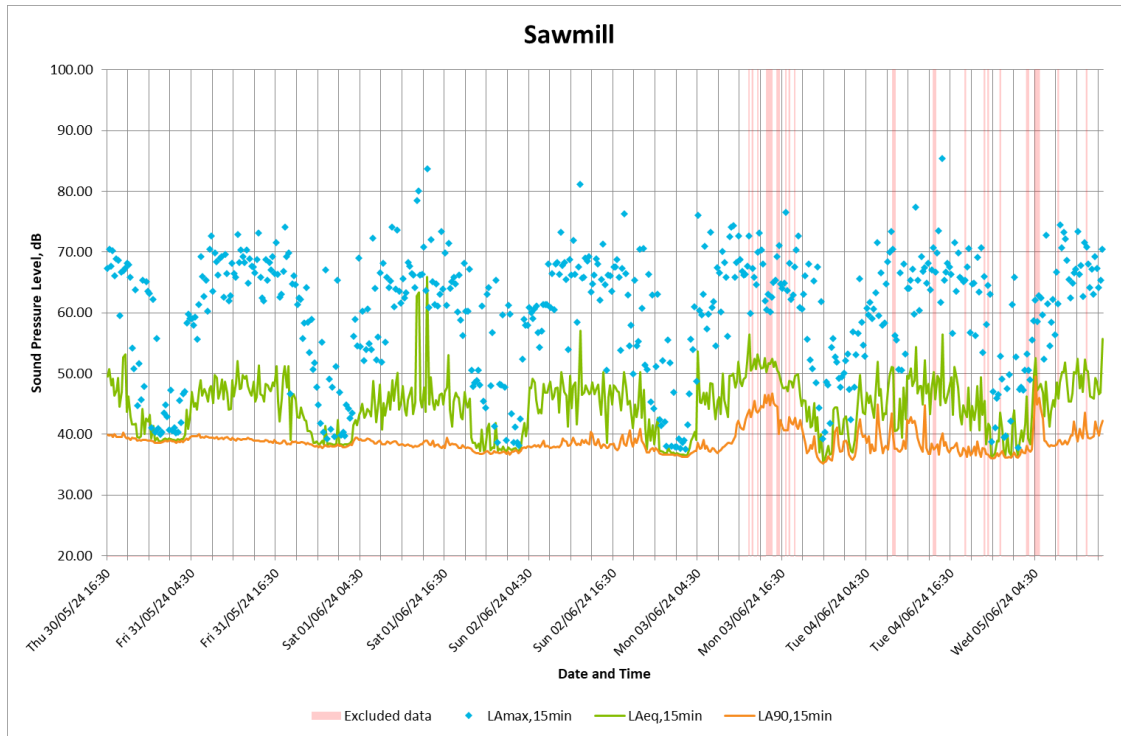


Figure 5 NSR4 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

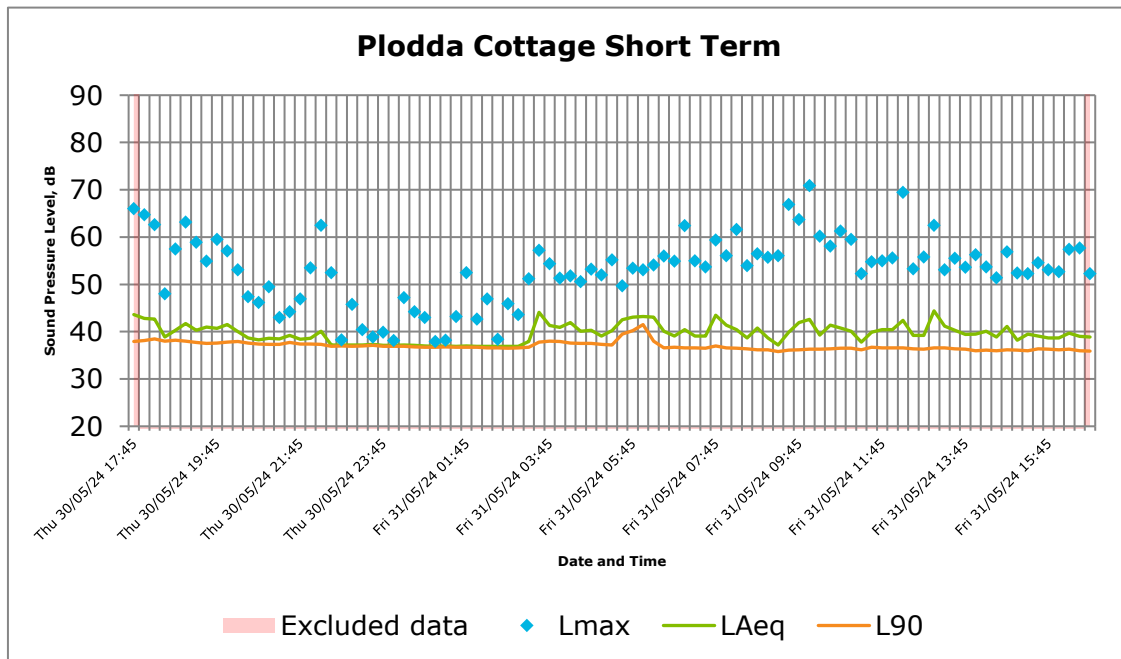


Figure 6 NSR7 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

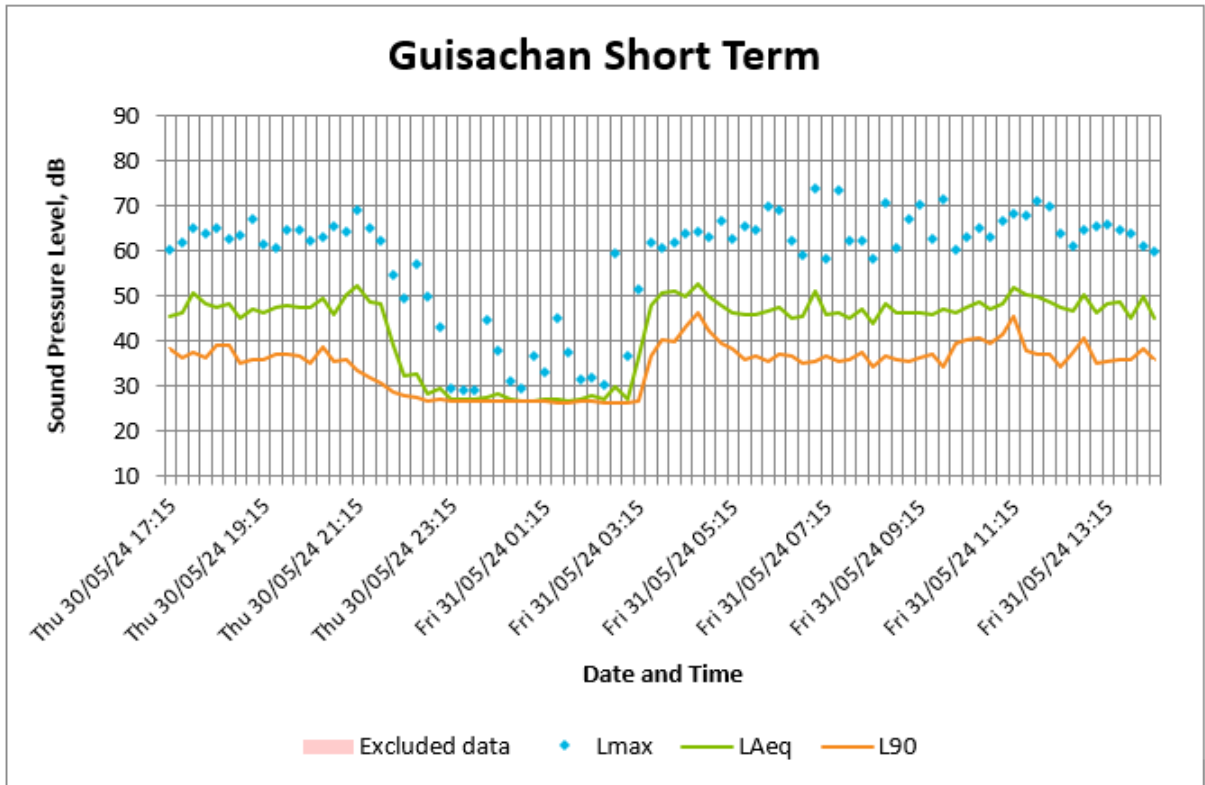


Figure 7 NSR6 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels including marking of excluded 15 minute periods due to weather and rain.

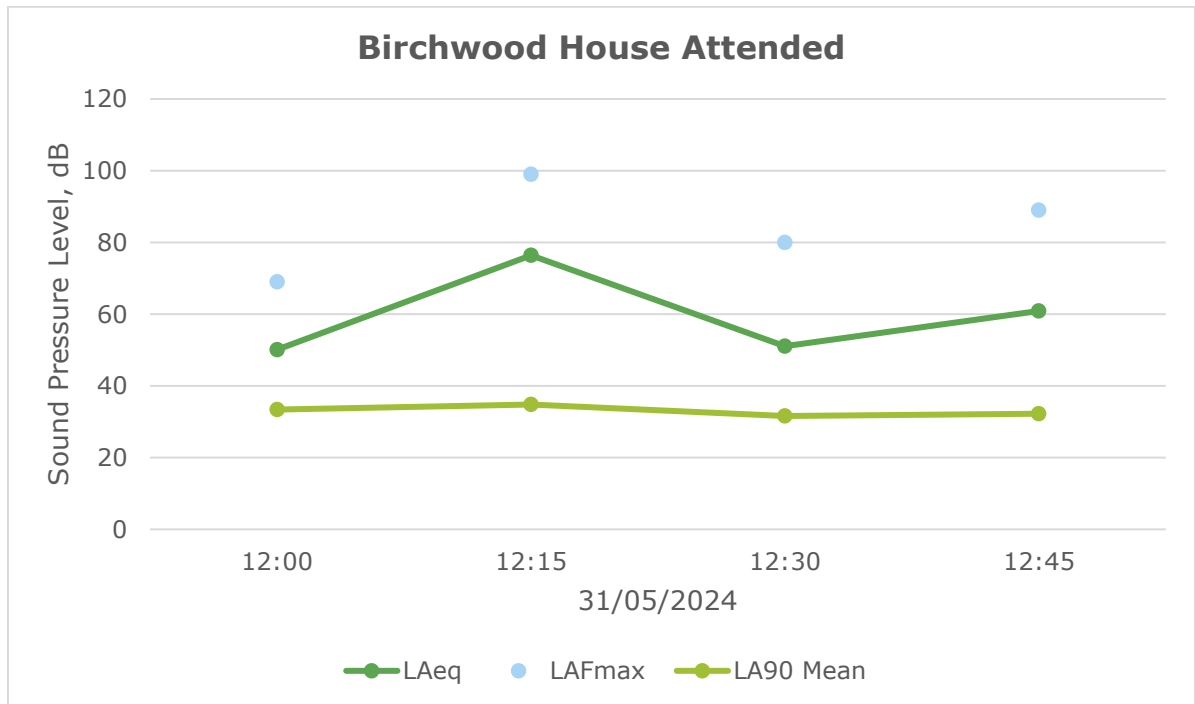


Figure 8 NSR2 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels over a 1 hour period in the day-time.

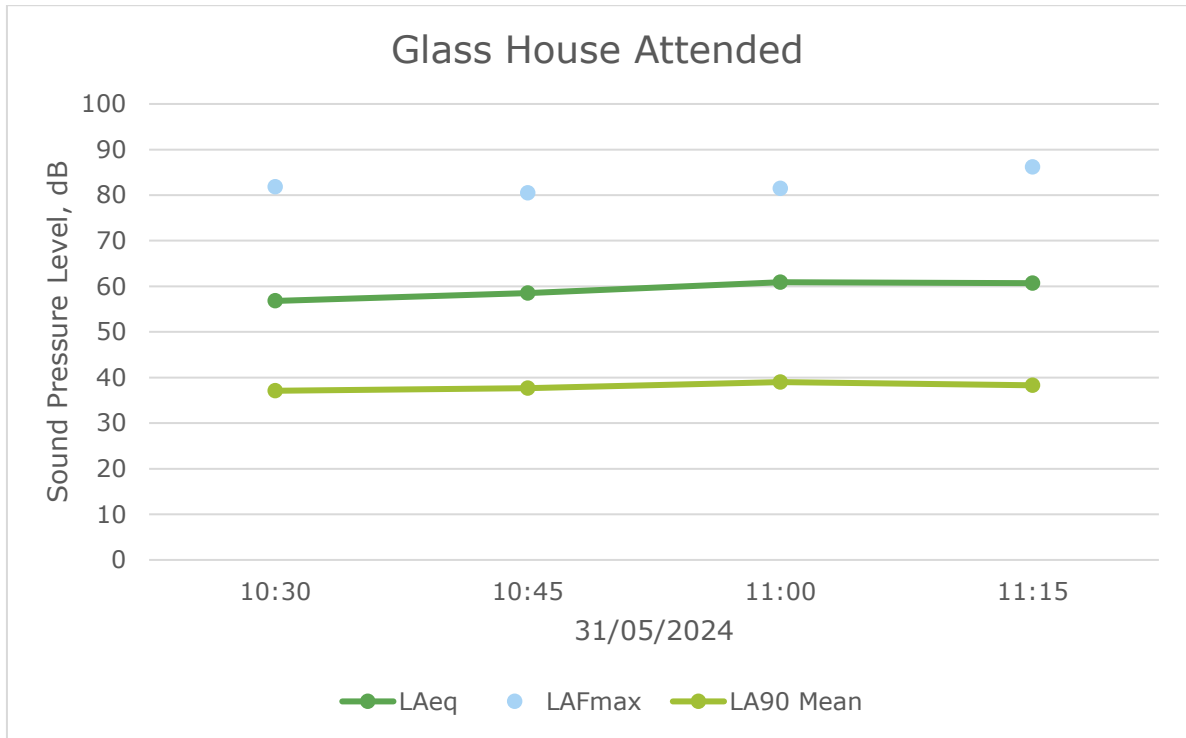


Figure 9 NSR1 - A time history plot of L_{Aeq} , L_{Amax} and L_{A90} logged 15 minute sound levels over a 1 hour period in the day-time

1.3 Baseline Survey - Levels by Day/Night Periods

1.3.1 The following is a summary of the logged levels grouped by day and night periods at each receptor.

Short Term

Table 1 Short Term Logged Levels

Guisachan Cottage (17:15 - 30/05/2024 : 14:15 - 31/05/2024)						
Period	Start	End	L_{Aeq}	L_{AFmax}	L_{A90} Mode	L_{A90} Mean
Day	07:00	19:00	48	74	36	37
Evening	19:00	23:00	48	69	36	34
Day-Evening	07:00	23:00	48	74	36	36
Night	23:00	07:00	45	70	27	32
Plodda Cottage (17:45 - 30/05/2024 : 16:45 - 31/05/2024)						
Period	Start	End	L_{Aeq}	L_{AFmax}	L_{A90} Mode	L_{A90} Mean
Day	07:00	19:00	41	71	36	37
Evening	19:00	23:00	40	63	38	38
Day-Evening	07:00	23:00	40	57	36	37
Night	23:00	07:00	40	71	37	37

Attended Term

Table 2 Attended Term Logged Levels

Attended Birchwood House (12:00 - 31/05/2024 : 13:00 – 31/05/2024)					
Period	Start	End	L_{Aeq}	L_{AFmax}	L_{A90}
Day	12:00	12:15	50	69	33
Day	12:15	12:30	76	99	35
Day	12:30	12:45	51	80	32
Day	12:45	13:00	61	89	32
Glass House (10:30 - 31/05/2024 : 11:30 – 31/05/2024)					
Period	Start	End	L_{Aeq}	L_{AFmax}	L_{A90}
Day	10:30	10:45	57	82	37
Day	10:45	11:00	59	80	38
Day	11:00	11:15	61	81	39
Day	11:15	11:30	61	86	38

Notes:

- 15minute periods represent an average of x3 5minute logged intervals
- Day periods include level logged between 07:00-23:00 only
- Night periods include level logged between 23:00-07:00 only

Long term

1.3.2 Averaged periods of monitoring locations are presented in **Volume 1, Chapter 13** of the Voluntary EA Report.

Table 3 Long Term Guisachan Cottage

Guisachan Cottage					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day	05/06/2024	07:00-19:00	49	80	40	38
Day	06/06/2024	07:00-19:00	49	81	38	38
Day	07/06/2024	07:00-19:00	50	88	39	39
Day	08/06/2024	07:00-19:00	50	70	40	39
Day	09/06/2024	07:00-19:00	55	85	36	37
Day	10/06/2024	07:00-19:00	55	96	35	36
Day	11/06/2024	07:00-19:00	64	111	35	35
Evening	05/06/2024	19:00-23:00	47	66	36	34
Evening	06/06/2024	19:00-23:00	46	71	38	33
Evening	07/06/2024	19:00-23:00	48	75	36	37
Evening	08/06/2024	19:00-23:00	49	88	36	37
Evening	09/06/2024	19:00-23:00	43	67	35	33
Evening	10/06/2024	19:00-23:00	44	80	30	31
Day-Evening	05/06/2024	07:00-23:00	48	80	36	36

Guisachan Cottage						
					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day-Evening	06/06/2024	07:00-23:00	48	81	38	37
Day-Evening	07/06/2024	07:00-23:00	50	88	39	39
Day-Evening	08/06/2024	07:00-23:00	50	88	40	39
Day-Evening	09/06/2024	07:00-23:00	54	85	36	36
Day-Evening	10/06/2024	07:00-23:00	54	96	35	35
Night	05/06/2024	23:00-07:00	45	74	29	32
Night	06/06/2024	23:00-07:00	47	71	27	32
Night	07/06/2024	23:00-07:00	46	74	31	34
Night	08/06/2024	23:00-07:00	47	85	35	37
Night	09/06/2024	23:00-07:00	47	82	31	34
Night	10/06/2024	23:00-07:00	45	75	28	31

Table 4 Long Term Hilton Lodge

Hilton Lodge						
					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day	05/06/2024	07:00-19:00	63	101	43	41
Day	06/06/2024	07:00-19:00	58	92	40	39
Day	07/06/2024	07:00-19:00	51	81	45	39
Day	08/06/2024	07:00-19:00	53	87	38	40
Day	09/06/2024	07:00-19:00	48	90	38	36
Day	10/06/2024	07:00-19:00		80	36	34
Day	11/06/2024	07:00-19:00	48	97	29	32
Evening	05/06/2024	19:00-23:00	54	83	37	38
Evening	06/06/2024	19:00-23:00	44	77	35	33
Evening	07/06/2024	19:00-23:00	51	79	41	42
Evening	08/06/2024	19:00-23:00	47	71	43	41
Evening	09/06/2024	19:00-23:00	40	76	32	33
Evening	10/06/2024	19:00-23:00	37	74	28	28
Day-Evening	05/06/2024	07:00-23:00	60	101	37	39
Day-Evening	06/06/2024	07:00-23:00	57	92	40	38
Day-Evening	07/06/2024	07:00-23:00	51	81	43	40
Day-Evening	08/06/2024	07:00-23:00	52	87	38	40
Day-Evening	09/06/2024	07:00-23:00	47	90	35	35
Day-Evening	10/06/2024	07:00-23:00	43	80	36	33

Hilton Lodge						
					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Night	05/06/2024	23:00-07:00	41	67	38	37
Night	06/06/2024	23:00-07:00	41	67	34	36
Night	07/06/2024	23:00-07:00	43	75	38	38
Night	08/06/2024	23:00-07:00	46	80	39	39
Night	09/06/2024	23:00-07:00	34	65	30	31
Night	10/06/2024	23:00-07:00	34	58	30	30

Table 5 Long Term Plodda Cottage

Plodda Cottage						
					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day	05/06/2024	07:00-19:00	45	74	38	39
Day	06/06/2024	07:00-19:00	46	88	38	39
Day	07/06/2024	07:00-19:00	45	71	41	40
Day	08/06/2024	07:00-19:00	46	77	43	43
Day	09/06/2024	07:00-19:00	55	97	42	43
Day	10/06/2024	07:00-19:00	42	71	39	39
Day	11/06/2024	07:00-19:00	43	71	38	38
Evening	05/06/2024	19:00-23:00	44	62	39	40
Evening	06/06/2024	19:00-23:00	42	65	37	37
Evening	07/06/2024	19:00-23:00	44	57	41	41
Evening	08/06/2024	19:00-23:00	44	71	43	43
Evening	09/06/2024	19:00-23:00	42	65	41	41
Evening	10/06/2024	19:00-23:00	39	62	38	38
Day-Evening	05/06/2024	07:00-23:00	44	74	39	39
Day-Evening	06/06/2024	07:00-23:00	46	88	38	39
Day-Evening	07/06/2024	07:00-23:00	45	71	41	41
Day-Evening	08/06/2024	07:00-23:00	46	77	43	43
Day-Evening	09/06/2024	07:00-23:00	54	97	41	42
Day-Evening	10/06/2024	07:00-23:00	42	71	39	39
Night	05/06/2024	23:00-07:00	42	64	39	39
Night	06/06/2024	23:00-07:00	40	59	37	38
Night	07/06/2024	23:00-07:00	44	62	41	42
Night	08/06/2024	23:00-07:00	46	58	46	46
Night	09/06/2024	23:00-07:00	41	71	40	40
Night	10/06/2024	23:00-07:00	40	60	38	38

Table 6 Long Term Sawmill

Sawmill					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day	30/05/2024	07:00-19:00	49	70	40	40
Day	31/05/2024	07:00-19:00	48	74	39	39
Day	01/06/2024	07:00-19:00	53	84	38	38
Day	02/06/2024	07:00-19:00	48	81	39	39
Day	03/06/2024	07:00-19:00	49	74	31	41
Day	04/06/2024	07:00-19:00	49	85	36	39
Day	05/06/2024	07:00-19:00	49	75	37	40
Evening	30/05/2024	19:00-23:00	45	68	39	39
Evening	31/05/2024	19:00-23:00	42	66	38	38
Evening	01/06/2024	19:00-23:00	42	68	37	37
Evening	02/06/2024	19:00-23:00	44	71	38	38
Evening	03/06/2024	19:00-23:00	43	68	38	38
Evening	04/06/2024	19:00-23:00	44	71	32	37
Day-Evening	30/05/2024	07:00-23:00	47	70	39	39
Day-Evening	31/05/2024	07:00-23:00	47	74	39	39
Day-Evening	01/06/2024	07:00-23:00	52	84	38	38
Day-Evening	02/06/2024	07:00-23:00	47	81	38	38
Day-Evening	03/06/2024	07:00-23:00	48	74	33	40
Day-Evening	04/06/2024	07:00-23:00	48	85	35	38
Night	30/05/2024	23:00-07:00	43	69	39	39
Night	31/05/2024	23:00-07:00	42	72	38	38
Night	01/06/2024	23:00-07:00	43	65	37	37
Night	02/06/2024	23:00-07:00	44	76	37	37
Night	03/06/2024	23:00-07:00	45	72	38	38
Night	04/06/2024	23:00-07:00	43	73	31	38

Table 7 Long Term Challenger Lodge

Challenger Lodge					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day	30/05/2024	07:00-19:00	55	97	38	38
Day	31/05/2024	07:00-19:00	46	73	36	36
Day	01/06/2024	07:00-19:00	49	81	35	36
Day	02/06/2024	07:00-19:00	46	72	35	38

Challenger Lodge						
					L_{A90}	L_{A90}
Period	Date	Time	L_{Aeq}	L_{AFmax}	Mode	Mean
Day	03/06/2024	07:00-19:00	53	88	46	44
Day	04/06/2024	07:00-19:00	51	81	37	40
Day	05/06/2024	07:00-19:00	65	114	38	39
Evening	30/05/2024	19:00-23:00	40	63	35	35
Evening	31/05/2024	19:00-23:00	40	68	34	34
Evening	01/06/2024	19:00-23:00	40	72	32	34
Evening	02/06/2024	19:00-23:00	45	80	39	37
Evening	03/06/2024	19:00-23:00	46	82	40	37
Evening	04/06/2024	19:00-23:00	46	67	35	35
Day-Evening	30/05/2024	07:00-23:00	51	97	36	36
Day-Evening	31/05/2024	07:00-23:00	45	73	36	36
Day-Evening	01/06/2024	07:00-23:00	48	81	35	36
Day-Evening	02/06/2024	07:00-23:00	46	80	35	37
Day-Evening	03/06/2024	07:00-23:00	51	88	45	42
Day-Evening	04/06/2024	07:00-23:00	50	81	39	39
Night	30/05/2024	23:00-07:00	43	72	33	34
Night	31/05/2024	23:00-07:00	43	74	32	34
Night	01/06/2024	23:00-07:00	42	70	31	33
Night	02/06/2024	23:00-07:00	44	79	31	33
Night	03/06/2024	23:00-07:00	46	74	39	39
Night	04/06/2024	23:00-07:00	46	73	36	36