

Construction noise and vibration Monthly Report – March 2024

London Borough of Hillingdon

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Non-Technical Summary

This Noise and Vibration Monitoring Report fulfils HS2 Limited's commitment detailed in the Environmental Minimum Requirements (EMRs), Annex 1, Code of Construction Practice, to present the results of noise monitoring carried out within the London Borough of Hillingdon during the month of March 2024.

Within this period noise and vibration monitoring was undertaken at the following worksites:

- Colne Valley Viaduct site (ref.: CVV), where compound operation, maintenance and operation of the haul road and jetty, ground investigation works, pier construction, site preparation, water pumping, installation of satellite welfare and generator farms, South Abutment works, maintenance and operation of Grand Union Canal, fencing, environmental maintenance, stockpiling, river crossing works, launching girder, construction of scaffold bridge, deck finishes and landscaping works were underway.
- West Ruislip Portal worksite (ref.: WRP) where construction of attenuation tanks, construction of cross passage, piling, Golf Course maintenance works, construction of storage area, removal of temporary conveyor structure, delivery and storage operations, conveyor operations and train movements were underway.
- Breakspear Road worksite (ref.: BR), where mobilisation of drainage diversions, piling and working platform construction, piling, excavations, installation of monitoring equipment, preparation for noise barrier testing and conveyor operation were underway.
- South Ruislip Ventilation Shaft worksite (ref.: SRVS), where steel fixing, block works, concrete pours, road sweeping, wall works, excavations, concrete break out, platform construction, pile caps work, dewatering operations and general site management were underway.
- Harvil Road worksite (ref.: HR), where tunnel boring machine material treatment, mound construction, earthworks maintenance, conveyor and siltbuster operations were underway.
- Northern Sustainable Placement Area worksite (ref.: NSPA) where siltbuster operations and general site maintenance were underway.

Further works, where monitoring did not take place, were also undertaken at the following locations:

- Copthall North, where excavations, material movement, construction of Copthall Tunnel, drainage, highway construction works, attenuation pond works, structure removal and works for working platform for piling rig works

were underway.

The HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (<https://www.gov.uk/government/publications/hs2-information-papers-environment>), were exceeded twenty-four (24) times during the reporting period.

There were no exceedances of trigger levels as defined in Section 61 consents during the reporting period.

Six (6) complaints were received during the monitoring period. A description of the complaints, the results of investigations and any actions taken are detailed in Table 8 of this report.

Abbreviations and Descriptions

The abbreviations, descriptions and project terminology used within this report can be found in Table 1.

Table 1: Table of Abbreviations

Acronym/Term	Definition
$L_{Aeq,T}$	See equivalent continuous sound pressure level
Ambient sound	A description of the all-encompassing sound at a given location and time which will include sound from many sources near and far. Ambient sound can be quantified in terms of the equivalent continuous sound pressure level, $L_{pAeq,T}$
Decibel(s), or dB	Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure (measured in Pascal (Pa)). Because of this wide range, a level scale called the decibel (dB) scale, based on a logarithmic ratio, is used in sound measurement. Audibility of sound covers a range of approximately 0-140dB.
Decibel(s) A-weighted, or dB(A)	The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure sound is weighted to represent the performance of the ear. This is known as the 'A weighting' and is written as 'dB(A)'.
Equivalent continuous sound pressure level, or $L_{Aeq,T}$	An index used internationally for the assessment of environmental sound impacts. It is defined as the notional unchanging level that would, over a given period of time (T), deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating sound levels can be described in terms of an equivalent single figure value, typically expressed as a decibel level.
Exclusion of data	Measurement of noise levels can be affected by weather conditions such as prolonged periods of rain, winds speeds higher than 5m/s and snow/ice ground cover. Noise levels measured during these periods are considered not representative of normal noise conditions at the site and, for the purposes of this report, are excluded from the assessment of exceedances and calculation of typical noise levels and are also greyed out in charts. Identifiable incongruous noise and vibration events not attributable to HS2 construction noise are also excluded.
Façade	A facade noise level is the noise level 1m in front of a large reflecting surface. The effect of reflection, is to produce a slightly higher (typically +3 dB) sound level than it would be if the reflecting surface was not there.
Free-field	A free-field noise level is the noise level measured at a location where no reflective surfaces, other than the ground, lies within 3.5 metres of the microphone position.
LOAEL	Lowest Observed Adverse Effect Level - the level above which adverse effects on health and quality of life can be detected.
Peak particle velocity, or PPV	Instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position. The PPV is a simple indicator of perceptibility and risk of damage to structures due to vibration. It is usually measured in mm/s.
SOAEL	Significant Observed Adverse Effect Level - the level above which significant adverse effects on health and quality of life occur.
Sound pressure level	The parameter by which sound levels are measured in air. It is measured in decibels. The threshold of hearing has been set at 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB at a distance of 1 metre and a change of 3dB in a time varying sound signal is commonly regarded as being just detectable. A change of 10dB is subjectively twice, or half, as loud.
Vibration dose value, or VDV	An index used to evaluate human exposure to vibration in buildings. While the PPV provides information regarding the magnitude of single vibration events, the VDV provides a measure of the total vibration experienced over a specified period of time (typically 16h daytime and 8h night-time). It takes into account the magnitude, the number and the duration of vibration events and can be used to quantify exposure to continuous, impulsive, occasional and intermittent vibration. The vibration dose value is measured in $m/s^{1.75}$.

1 Introduction

1.1.1 HS2 is required to undertake noise (and vibration) monitoring as necessary to comply with the requirements of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements, including specifically Annex 1: Code of Construction Practice, in addition to any monitoring requirements arising from conditions imposed through consents under Section 61 of the Control of Pollution Act, 1974 or through Undertakings & Assurances given to third parties. Such monitoring may be undertaken for the following purposes:

- monitoring the impact of construction works;
- to investigate complaints, incidents and exceedance of trigger levels; or
- monitoring the effectiveness of noise and vibration control measures.

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the London Borough of Hillingdon (LBH) for the period 1st to 31st March 2024.

1.1.3 Active construction sites in the local authority area where monitoring was undertaken during this period include:

- Colne Valley Viaduct worksite, ref.: CVV (see Plan 1 in Appendix A), where work activities included:
 - Compound operations, including de-sanding works.
 - Maintenance and operation of the haul road and jetty.
 - Ground investigation works.
 - Pier construction, including fibre-reinforced concrete works, post tensioning and tower crane mobilisation and demobilisation.
 - Site preparation works, including bulk earthworks, drainage and tree removal.
 - Water pumping management works.
 - Installation of satellite welfare and generator farms.
 - South Abutment works, including earthworks, stabilisation, fibre-reinforced concrete works, drainage works, abutment construction, yard

supporting activities, piling platform construction, and load transfer platform construction.

- Grand Union Canal works, including operation and maintenance.
- Fencing works.
- Environmental maintenance works.
- Stockpiling.
- Construction of River Colne crossing, including emergency obstruction dismantling works.
- Launching girder and deck works, including launching gantry erection, steel structure erection and dismantling, post tensioning works, stressing, grouting and crane assembly and dismantling works.
- Deck finishes works, including preparation and operation of storage yards, installation of access provision, traffic management, installation of parapets, stairs, noise barriers, troughs, pipes, steel works, support plant, construction of kerbs and concrete stitch, filling of voids and top openings, and waterproofing.
- Landscaping works, including removal of cofferdams, earthworks, ground profiling and cut, ground drainage, soil placement and de-vegetation.
- Construction of Grand Union Canal scaffold bridge.
- West Ruislip Portal worksite, ref.: WRP (see Plan 2 in Appendix A), where work activities included:
 - Construction of permanent attenuation tanks.
 - Construction of cross passage.
 - Piling.
 - Golf Course maintenance works, including vegetation clearance and wildlife habitat maintenance.
 - Construction of storage area.
 - Removal of temporary conveyor structure.
 - Segment delivery and storage operations.
 - Main conveyor operation.
 - Segment train movements.

- Breakspear Road worksite, ref.: BR (see Plan 2 in Appendix A), where work activities included:
 - Mobilisation of drainage diversion.
 - Piling platform construction.
 - Preparation works for working platform for piling rig.
 - Piling.
 - Excavations.
 - Installation of monitoring equipment.
 - Preparation for noise barrier testing.
 - Conveyor operations.
- South Ruislip Ventilation Shaft worksite, ref.: SRVS (see Plan 4 in Appendix A), where work activities included:
 - Steel fixing.
 - Block works.
 - Concrete pours.
 - Road sweeping.
 - Wall works, including services relocation, hoarding removal, sheet piling and digging.
 - Excavations.
 - Concrete break out.
 - Platform construction.
 - Pile caps works.
 - Dewatering operations.
 - General site management, including site security.
- Harvil Road worksite, ref.: HR (see Plan 2 in Appendix A), where work activities included:
 - Tunnel boring machine material treatment.
 - Construction of mounds, including material placement and compaction.
 - Earthworks maintenance.
 - Conveyor operation.

- Siltbuster operations, including maintenance and drainage works.
- Northern Sustainable Placement Area worksite, ref.: NSPA (see Plan 3 in Appendix A), where work activities included:
 - Siltbuster operation.
 - General site maintenance.

1.1.4 Further works, where monitoring did not take place, were also undertaken at the following location:

- Cophall North, where excavations, material movement, construction of Cophall Tunnel, drainage, highway construction works, attenuation pond works, structure removal and preparation works for working platform for piling rig were underway.

1.1.5 The applicable standards, guidance, and monitoring methodology are outlined in the construction noise and vibration monitoring methodology report which can be found at the following location <https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2>. Noise and vibration monitoring reports for previous months can also be found at this location.

1.2 Measurement Locations

1.2.1 Nineteen (19) noise and two (2) vibration monitoring installations were active in March in the LBH area. Table 2 summarises the position of noise and vibration monitoring installations within the LBH area in March 2024.

1.2.2 Maps showing the position of noise monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
CVV	DLC-NMP	Dew's Farm Cottages, Dews Lane, Harefield, Uxbridge
	HFM-NMP	Harefield Marina, Moorhall Road, London Borough of Hillingdon
	PLD-NMP	Peerless Drive, Harefield, Uxbridge
	WRC-NMP	Savay Lane, Denham, Uxbridge

Worksite Reference	Measurement Reference	Address
WRP	WRP-N001	Ruislip Golf Course, Ickenham Rd, Ruislip
	N048	Ruislip Golf Course, Ickenham Rd, Ruislip
	N056	83 The Greenway, Ickenham, Ruislip
	N057	123 The Greenway, Ickenham, Ruislip
	GW-V001	95 The Greenway, Ickenham, Uxbridge
BR	N065	Breakspear Road South, Harefield, Uxbridge
	N066	Hoylake Crescent, Ickenham, Uxbridge
	TKL-N001	Tile Kiln Lane, Harefield, Uxbridge
SRVS	N061	Cineworld South Ruislip car park, Ruislip
	TCA-N001	Trenchard Avenue, Ruislip
	SRVS-V001a	Braintree Road, Ruislip
HR	N067	Harvil Road worksite south boundary
	SSPA-HR	Harvil Road
	BSR-N001	Breakspear Road
	DGT-N001	Dogs Trust West London
NSPA	NSPA-N001	Newyears Green Lane
	NSPA-N002	Newyears Green Lane

2 Summary of Results

2.1 Summary of Measured Noise and Vibration Levels

2.1.1 Table 3 presents a summary of the measured noise levels at each monitoring location over the reporting period. The $L_{Aeq,T}$ is presented for each of the relevant time periods averaged over the calendar month, along with the highest single period $L_{Aeq,T}$ that was found to occur within the month.

Table 3: Summary of Measured dB LAeq Data over the Monitoring Period

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekday Average LAeq,T (Highest Day LAeq,T)					Saturday Average LAeq,T (Highest Day LAeq,T)					Sunday / Public Holiday Average LAeq,T (Highest Day LAeq,T)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
CVV	DLC-NMP	Dew's Farm Cottages, Dews Lane, Harefield	Façade	56.2 (59.1)	62.5 (66.1)	55.4 (59.4)	50.2 (56.8)	50.6 (77.5)	53.9 (55.7)	58.6 (67.2)	52.5 (55.6)	51.5 (64.2)	47.5 (56.2)	49.1 (55.5)	48.9 (59.8)
	HFM-NMP	Harefield Marina, Moorhall Road, London	Free-field	55.0 (60.7)	60.8 (65.0)	59.7 (67.7)	58.9 (68.5)	56.3 (69.8)	54.1 (59.0)	59.2 (66.9)	58.0 (70.0)	54.3 (70.2)	47.9 (55.5)	52.1 (69.2)	47.5 (55.6)
	PLD-NMP	Peerless Drive, Harefield, Uxbridge	Façade	55.1 (58.2)	58.3 (61.5)	51.0 (54.6)	47.9 (58.5)	49.3 (62.1)	52.9 (55.6)	54.1 (61.5)	50.8 (52.2)	50.1 (53.9)	48.1 (55.8)	50.6 (56.2)	46.8 (56.8)
	WRC-NMP	Savay Lane, Denham, Uxbridge	Façade	55.2 (56.8)	54.1 (56.0)	52.8 (54.5)	50.0 (56.2)	51.5 (66.1)	54.4 (55.3)	53.7 (54.9)	53.9 (57.3)	51.9 (55.6)	50.9 (61.9)	51.9 (55.8)	49.6 (58.8)
WRP	WRP-N001	West Ruislip Golf Club, Ickenham Rd, Ruislip	Free-field	50.6 (53.2)	50.9 (53.6)	50.2 (56.9)	47.3 (58.6)	47.6 (54.4)	51.1 (52.6)	50.0 (51.8)	49.4 (50.6)	48.8 (51.8)	47.5 (53.3)	48.8 (53.0)	45.7 (54.5)
	N048	West Ruislip Golf Club, Ickenham Rd, Ruislip	Free-field	59.9 (63.7)	60.3 (68.4)	54.6 (60.6)	54.1 (59.4)	52.1 (59.3)	54.7 (56.5)	54.9 (56.5)	55.2 (58.8)	53.9 (58.0)	52.6 (65.3)	53.8 (59.5)	51.0 (57.1)
	N056	83 The Greenway, Ickenham, Ruislip	Façade	61.7 (63.3)	60.5 (61.3)	61.1 (64.3)	59.6 (61.7)	56.7 (63.0)	59.2 (60.1)	60.0 (60.6)	59.1 (60.2)	60.2 (61.5)	57.1 (75.0)	58.4 (63.7)	56.9 (60.9)
	N057	123 The Greenway, Ickenham, Ruislip	Façade	57.6 (60.1)	56.6 (58.7)	56.8 (60.0)	55.7 (64.2)	52.2 (57.8)	55.1 (55.5)	56.8 (57.5)	55.6 (56.0)	56.6 (64.9)	50.2 (55.9)	54.4 (59.7)	55.2 (72.4)

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
BR	N065	Breakspear Road South, Harefield	Free-field	68.7 (70.4)	67.8 (70.9)	68.1 (70.2)	65.5 (68.9)	61.1 (68.5)	65.5 (66.6)	66.8 (67.1)	67.1 (67.3)	66.6 (70.5)	59.4 (64.6)	66.2 (68.8)	61.7 (68.3)
	N066	Hoylake Crescent, Ickenham, Uxbridge	Free-field	58.6 (61.8)	56.9 (58.4)	56.3 (59.5)	54.3 (56.6)	54.0 (64.2)	58.2 (59.8)	56.6 (58.3)	54.9 (55.5)	55.2 (56.9)	52.6 (63.7)	54.4 (60.3)	53.9 (61.0)
	TKL-N001	Tile Kiln Lane, Harefield, Uxbridge	Free-field	51.5 (53.9)	52.4 (54.7)	51.3 (56.1)	49.3 (54.0)	48.0 (53.8)	49.6 (51.6)	49.9 (50.4)	50.1 (50.4)	50.1 (52.3)	48.9 (53.2)	48.7 (52.7)	47.8 (58.0)
SRVS	N061	Cineworld South Ruislip car park, Ruislip	Free-field	60.3 (63.9)	63.5 (65.3)	62.3 (67.1)	61.8 (70.2)	57.0 (70.7)	59.6 (60.5)	62.8 (65.1)	61.4 (61.5)	62.7 (67.1)	55.8 (63.8)	60.3 (64.3)	55.8 (60.6)
	TCA-N001	Trenchard Avenue, Ruislip	Free-field	58.9 (60.5)	60.1 (62.8)	59.3 (64.1)	57.4 (61.2)	54.7 (59.6)	57.8 (58.2)	58.9 (62.4)	57.1 (57.9)	58.1 (64.5)	51.6 (57.8)	56.3 (62.3)	53.8 (59.8)
HR	N067	Harvil Road worksite south boundary	Free-field	58.0 (60.6)	59.4 (61.8)	58.5 (62.2)	55.9 (63.7)	54.4 (66.1)	59.0 (61.6)	60.6 (63.2)	61.7 (63.7)	57.6 (62.4)	53.4 (60.2)	58.3 (66.5)	54.4 (62.9)
	SSPA-HR	Harvil Road	Free-field	61.2 (62.7)	61.5 (63.3)	60.7 (63.9)	56.9 (59.6)	54.7 (63.3)	58.5 (59.6)	59.5 (60.3)	58.8 (59.8)	58.2 (60.6)	52.2 (56.7)	57.3 (60.3)	54.7 (62.9)
	BSR-N001	Breakspear Road	Free-field	69.0 (70.3)	68.3 (69.3)	68.3 (69.9)	65.5 (69.0)	61.7 (69.5)	65.3 (66.4)	67.3 (67.8)	67.8 (68.0)	67.1 (69.8)	60.5 (64.9)	66.5 (69.8)	61.5 (68.8)
	DGT-N001	Dogs Trust West London	Façade	53.6 (55.6)	54.3 (57.3)	51.7 (58.7)	48.4 (54.7)	47.6 (56.3)	51.0 (51.8)	52.7 (53.6)	51.0 (52.6)	50.2 (54.0)	46.2 (49.8)	48.2 (53.0)	45.5 (56.1)

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
NSPA	NSPA-N001	Newyears Green Lane	Free-field	60.1 (66.7)	60.2 (69.8)	59.0 (71.8)	54.4 (69.2)	52.0 (80.8)	54.8 (56.3)	58.4 (59.3)	58.8 (59.7)	54.7 (62.3)	48.5 (56.8)	56.0 (69.4)	53.6 (68.8)
	NSPA-N002	Newyears Green Lane	Free-field	50.0 (55.2)	51.9 (60.8)	48.8 (60.3)	46.4 (54.3)	45.3 (53.0)	47.3 (48.1)	49.6 (50.9)	50.3 (52.8)	47.7 (54.5)	45.3 (51.3)	47.7 (52.6)	46.2 (53.8)

2.1.2 Table 4 presents a summary of the measured vibration levels at each monitoring location over the reporting period. The highest PPV measured during the monitoring along any axis is presented in the table.

Table 4: Summary of Measured PPV Data over the Monitoring Period

Worksite Reference	Measurement Reference	Monitor Address	Highest PPV measured in any axis, mm/s
WRP	GW-V001	95 The Greenway, Ickenham, Uxbridge	0.78 (Y-axis)
SRVS	SRVS-V001a	Braintree Road, Ruislip	6.09 (Z-axis)

2.1.3 Appendix C presents graphs of the noise and vibration monitoring data over the month for each of the measurement locations. Noise data presented consists of the hourly L_{Aeq} values and, where relevant, the $L_{Aeq,T}$ values (where the time period T has been taken to be the averaging period as specified in Table 1 of HS2 Information Paper E23). Vibration data presented consist of hourly PPV values. The full data set for the monitoring equipment can be found at the following location: <https://data.gov.uk/dataset/24542ae7-dd44-444f-b259-871c4cc43b5e/environmental-monitoring-data>.

2.2 Exceedances of the LOAEL and SOAEL

2.2.1 The lowest observed adverse effect level (LOAEL) is defined in the Planning Practice Guidance – Noise (PPG) as the level above which "noise starts to cause small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life".

2.2.2 The significant observed adverse effect level (SOAEL) is defined in the 'Planning Practice Guidance – Noise' as the level above which "noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area."

2.2.3 HS2 Phase One Information Paper E23: Control of Construction Noise and Vibration sets out the LOAELs and SOAELs for construction noise.

2.2.4 Where reported construction noise levels exceed the LOAEL and SOAEL, relevant periods will be identified. Summary statistics to evaluate ongoing qualification for noise insulation and temporary rehousing are also presented where relevant.

2.2.5 Table 5 presents a summary of recorded exceedances of the LOAEL and SOAEL at each measurement location over the reporting period, including the number of exceedances during each time period.

Table 5: Summary of Exceedances of LOAEL and SOAEL

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
CVW	DLC-NMP	Dew's Farm Cottages, Dews Lane, Harefield, Uxbridge	Weekday	0800-1800	2	No exceedance
			Saturday	0800-1300	1	
				1400-2200	2	
	HFM-NMP	Harefield Marina, Moorhall Road, London	Weekday	0700-0800	2	No exceedance
			Weekday	0800-1800	4	No exceedance
Weekday			1800-1900	11	1	
Weekday			1900-2200	47	13	
Saturday			0700-0800	1	No exceedance	
Saturday			0800-1300	2	No exceedance	
Saturday			1300-1400	2	1	
Saturday			1400-2200	11	6	
Sunday	0700-2200	8	4			
Night	2200-0700	124	91			
PLD-NMP	Peerless Drive, Harefield, Uxbridge	All days	All periods	No exceedance	No exceedance	
WRC-NMP	Savay Lane, Denham, Uxbridge	All days	All periods	No exceedance	No exceedance	
WRP	WRP-N001	West Ruislip Golf Club, Ickenham Rd, Ruislip	All days	All periods	No exceedance	No exceedance
	N048	West Ruislip Golf Club, Ickenham Rd, Ruislip	Weekday	0800-1800	1	No exceedance
	N056	83 The Greenway, Ickenham, Ruislip	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
	N057	123 The Greenway, Ickenham, Ruislip	All days	All periods	No exceedance	No exceedance
BR	N065	Breakspear Road South, Harefield, Uxbridge	All days	All periods	Not applicable**	No exceedance
	N066	Hoyle Crescent, Ickenham, Uxbridge	All days	All periods	No exceedance	No exceedance
	TKL-N001	Tile Kiln Lane, Harefield, Uxbridge	All days	All periods	No exceedance	No exceedance
SRVS	N061	Hoyle Crescent, Ickenham, Uxbridge	All days	All periods	Not applicable*	Not applicable*
	TCA-N001	Trenchard Avenue, Ruislip	All days	All periods	No exceedance	No exceedance
HR	N067	Harvil Road worksite south boundary	All days	All periods	No exceedance	No exceedance
	SSPA-HR	Harvil Road	All days	All periods	Not applicable**	No exceedance
	BSR-N001	Breakspear Road	All days	All periods	Not applicable**	No exceedance
	DGT-N001	Dogs Trust West London	All days	All periods	No exceedance	No exceedance
NSPA	NSPA-N001	Newyears Green Lane	Weekday	0800-1800	2	No exceedance
	NSPA-N002	Newyears Green Lane	All days	All periods	No exceedance	No exceedance

* The defined LOAEL and SOAEL criteria are not applicable to non-residential receptor.

** The LOAEL has not been assessed due to high baseline levels.

2.2.6 Exceedances of the LOAEL were recorded at four (4) monitoring locations during weekday, Saturday and Sunday daytime, evening and night-time periods.

2.2.7 For the purpose of reporting the number of days where the SOAEL is exceeded, multiple exceedances of the SOAEL in a 24-hour period would be counted as a single exceedance during that day. Over the reporting period, the overall number of SOAEL exceedances at each measurement location is shown in Table 6 and may be lower than the total sum of individual exceedances reported in Table 5 for each location.

Table 6: Summary of Total Exceedances of SOAEL

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
CVV	HFM-NMP	Harefield Marina, Moorhall Road, London	24

2.2.8 Twenty-four (24) SOAEL exceedances were recorded due to HS2 construction works during March 2024. The exceedance occurred at HFM-NMP during weekday, Saturday and Sunday daytime and night-time periods.

2.3 Exceedances of Trigger Level

2.3.1 Table 7 provides a summary of exceedances of the Section 61 trigger noise levels determined to be due to HS2 related construction noise measured during the reporting period, along with the findings of any investigation.

Table 7: Summary of Exceedances of Trigger Levels

Complaint Reference Number (if applicable)	Worksite Reference	Date and Time Period	Identified Source	Results of Investigation (including noise monitoring results)	Actions Taken
-	-	-	-	-	-

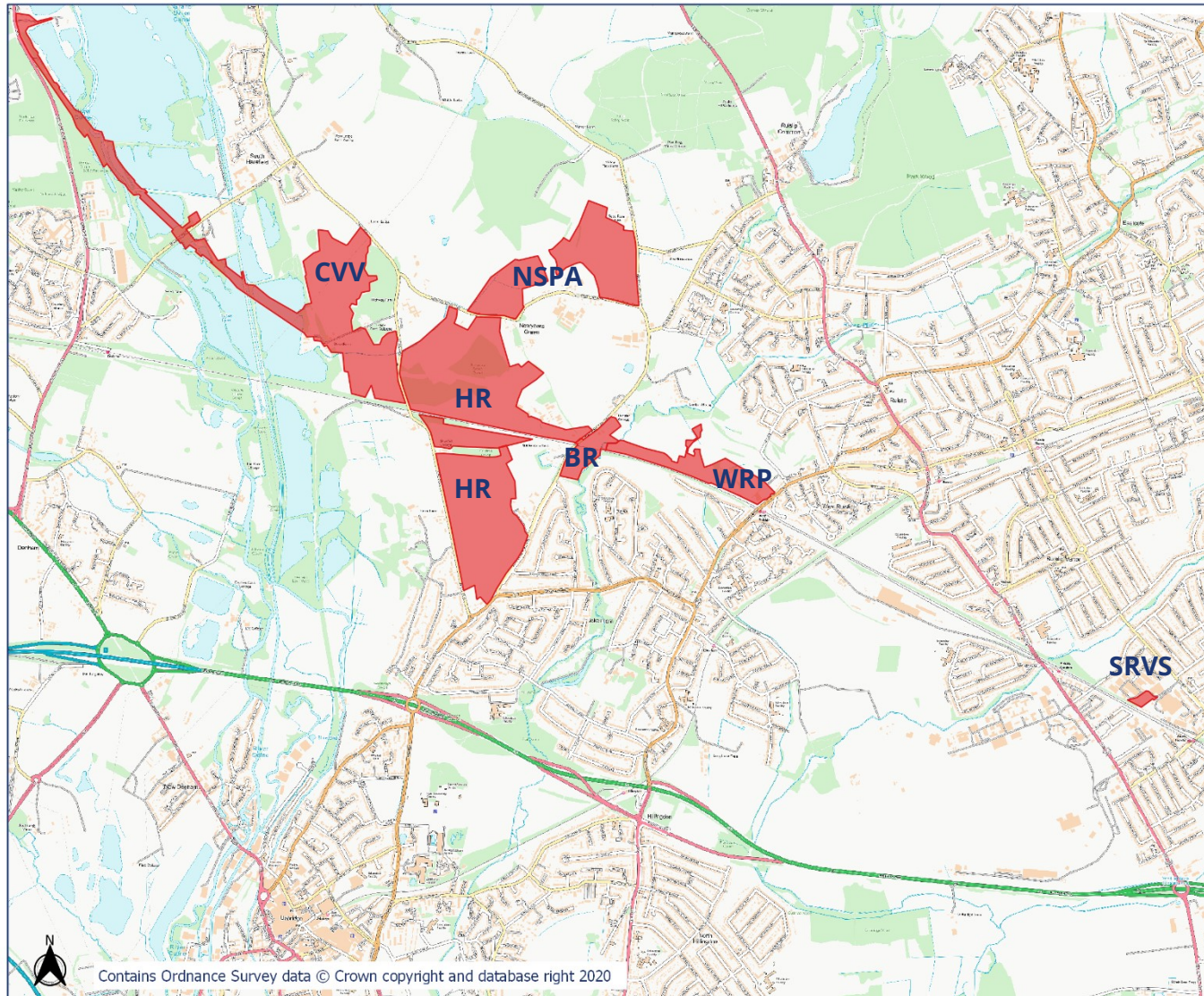
2.4 Complaints

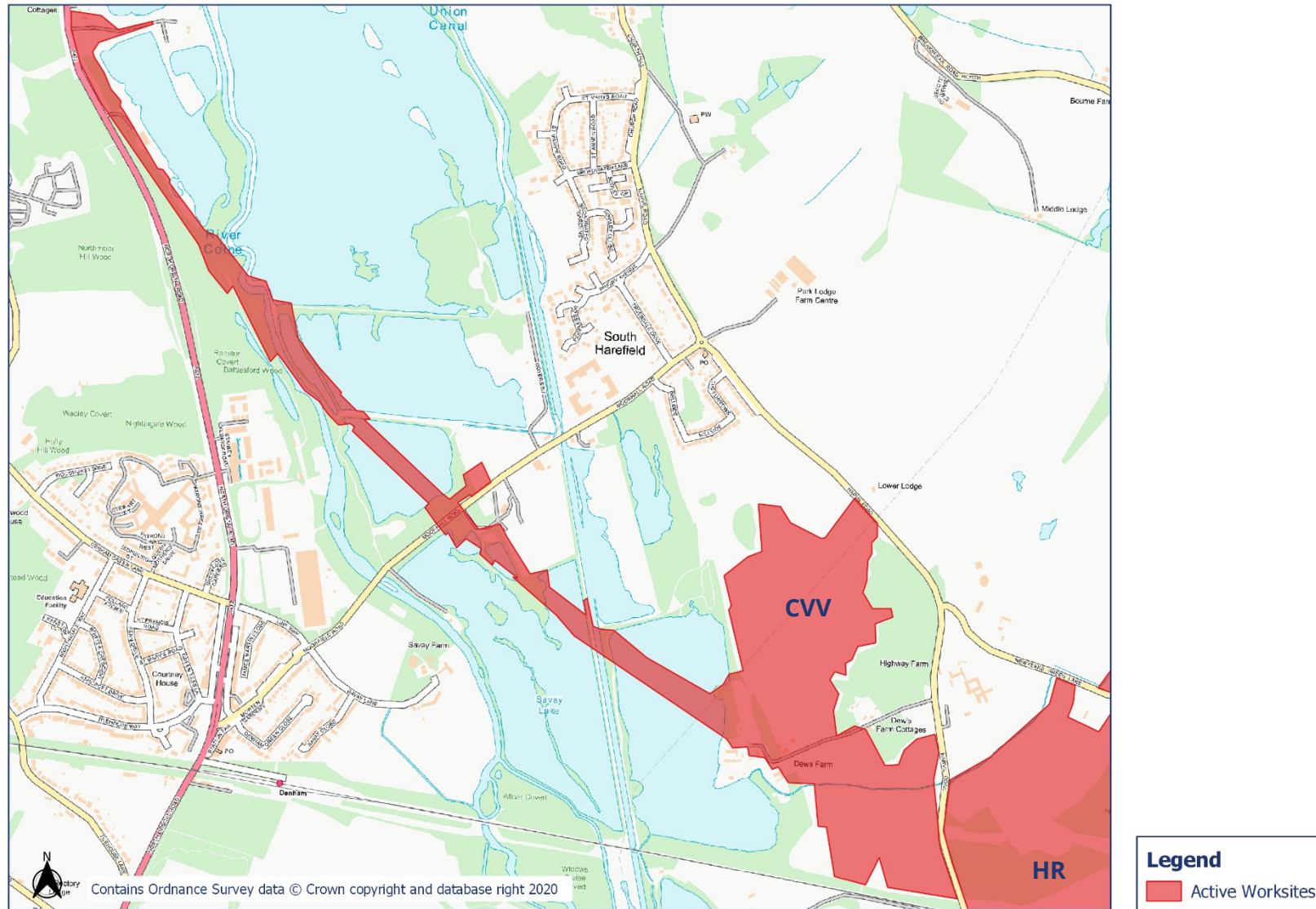
2.4.1 Table 8 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

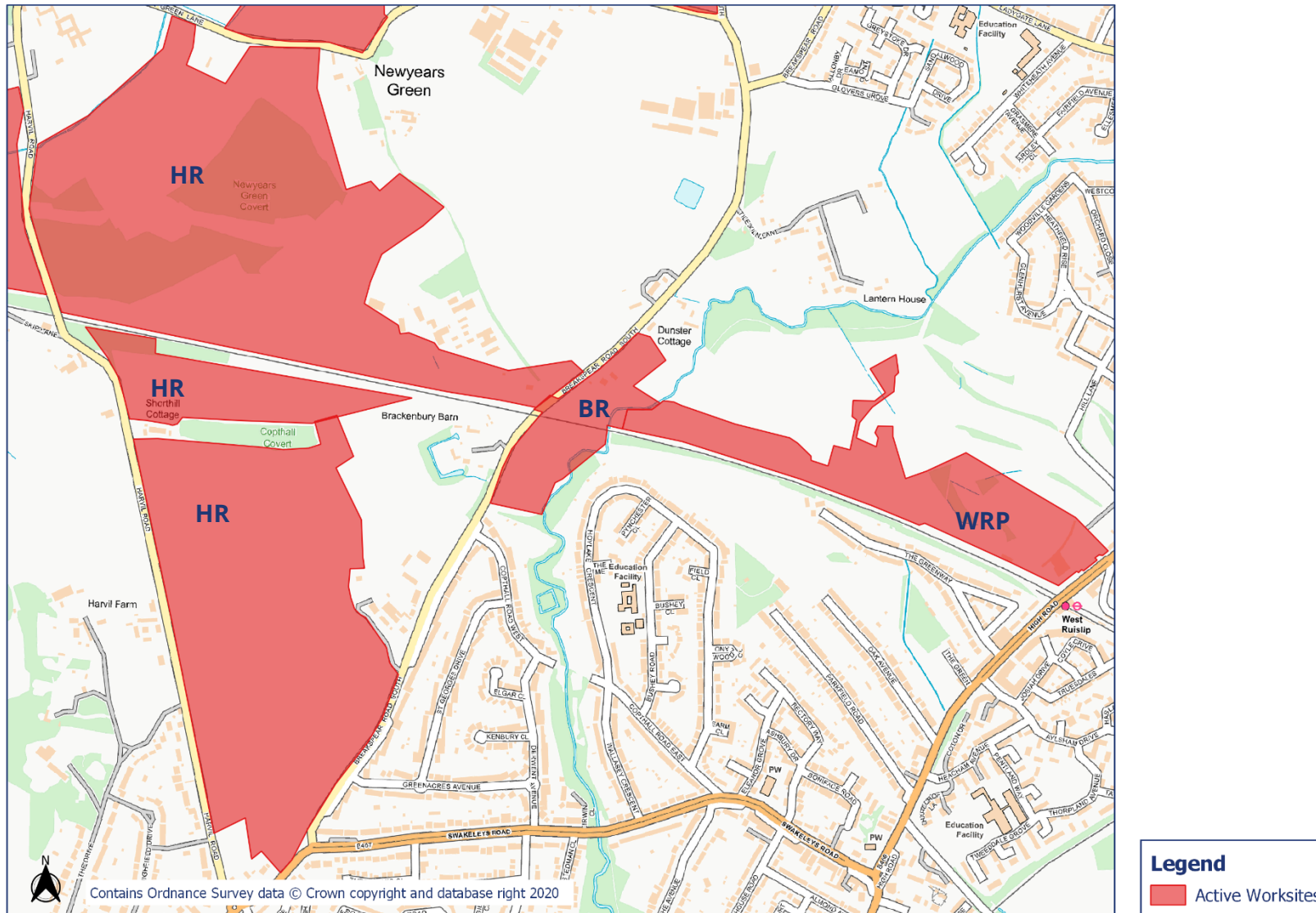
Table 8: Summary of Complaints

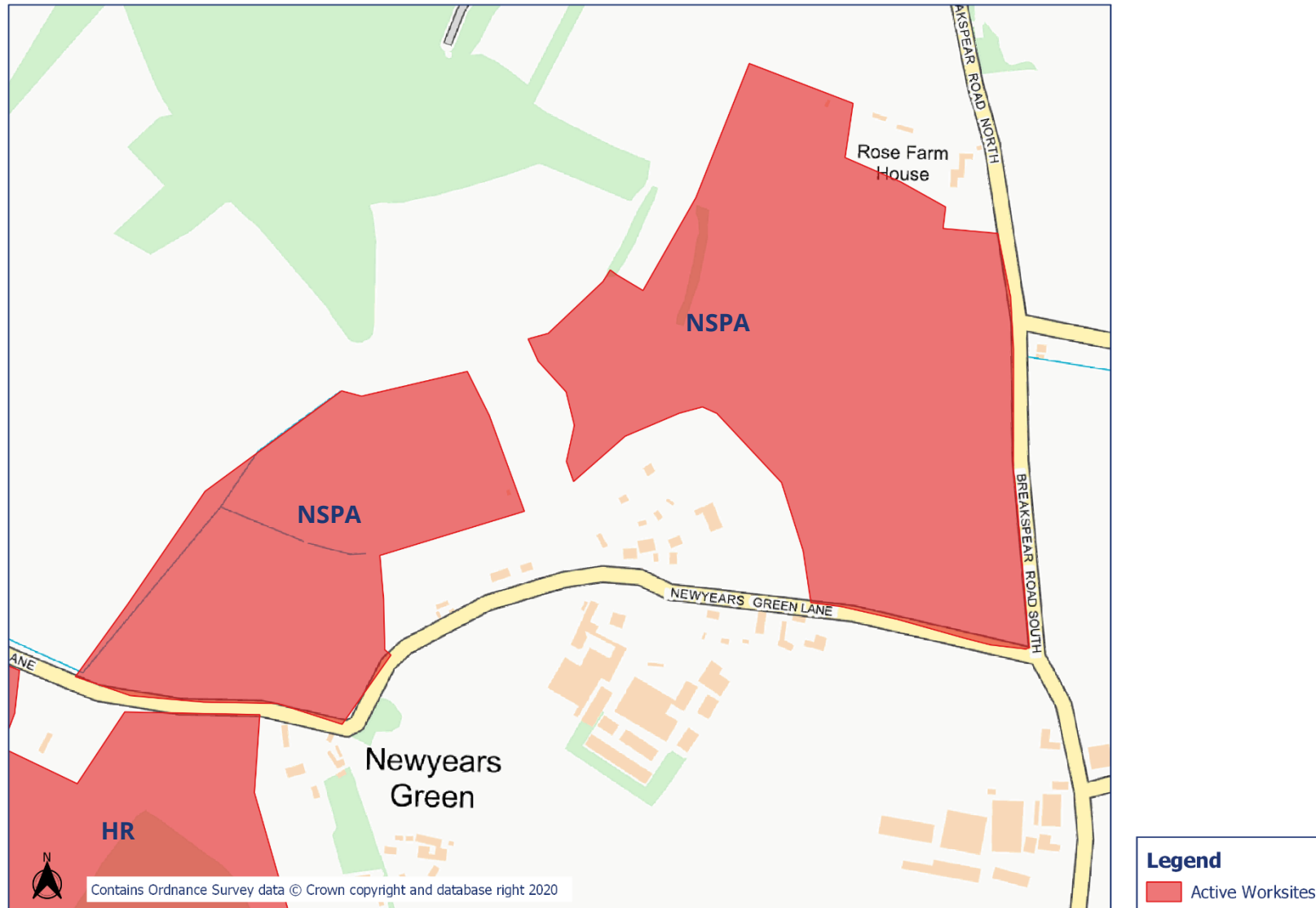
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-24-106808-E-C	HR	Complaint due to diesel train parked at the bottom of property with engine running.	The idling train noise was due to time required for the engine to build up pressure for the brake system.	A response was provided to the residents.
HS2-24-107514-E-C	SRVS	Ongoing noise disturbance reported by resident.	The works were to be completed on the day of complaint.	A response was provided to the residents.
HS2-24-107612-E-C	CVV	Complaint about generator noise coming from site.	Noise due to 24/7 working site.	The resident has been offered respite during nosier works.
HS2-24-107624-E-C	WRP	Complaint due to ongoing noise from nearby site.	Currently under investigation.	Currently under investigation.
HS2-24-107722-E-C	SRVS/WRP	Machinery noise at night.	Complaint associated with Network Rail tamping works and not due to HS2 works.	The complaint was anonymous, and no response could be provided. No actions taken
HS2-24-107731-E-C	SRVS/WRP	Complaint regarding noisy works undertaken outside of property.	Noise associated with tunnelling works for Cross Passage construction. Some phases of the works were anticipated to be noisy for short periods.	No contact details for resident were provided, therefore, the contractor was unable to provide a response.

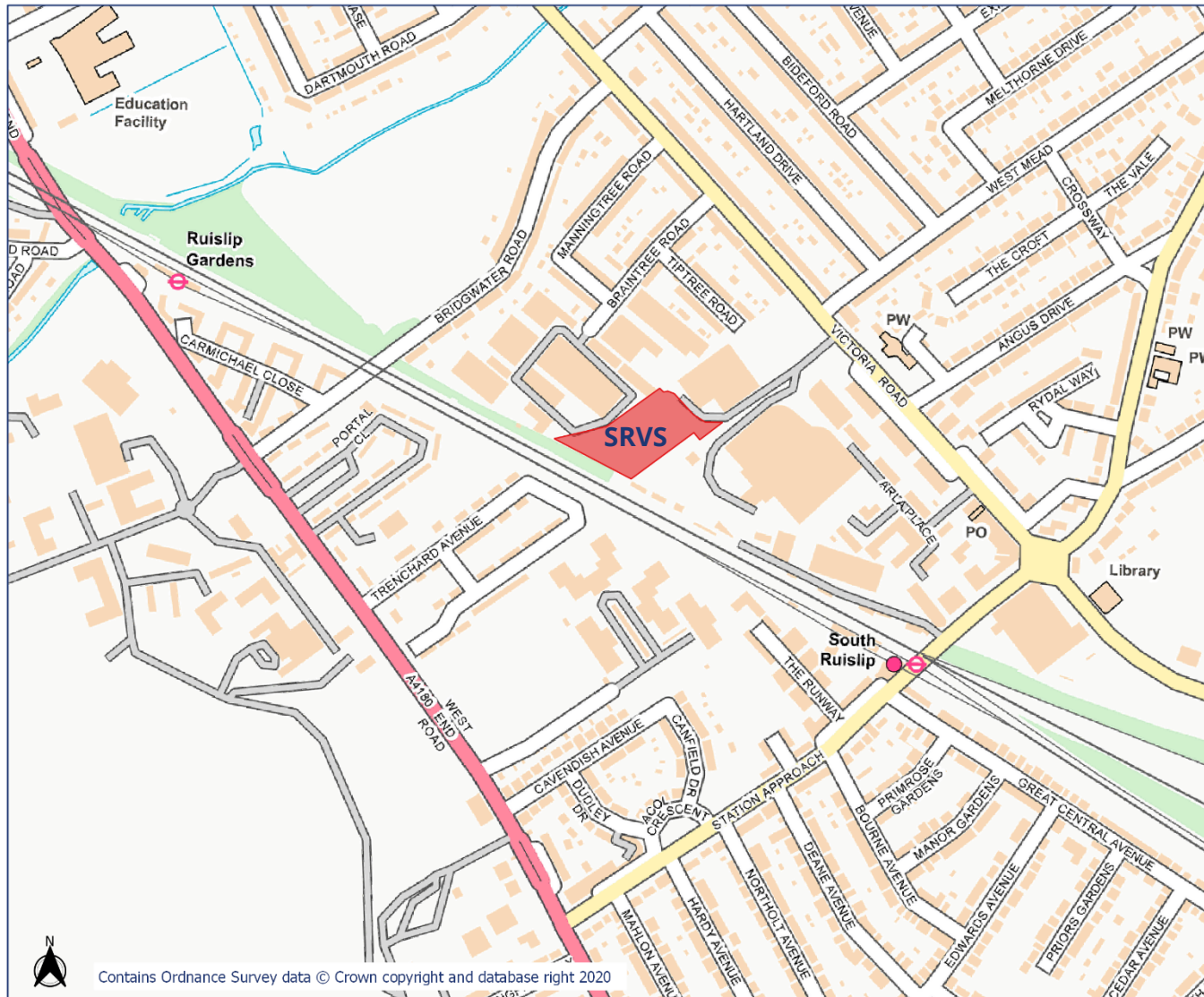
Appendix A Site Locations



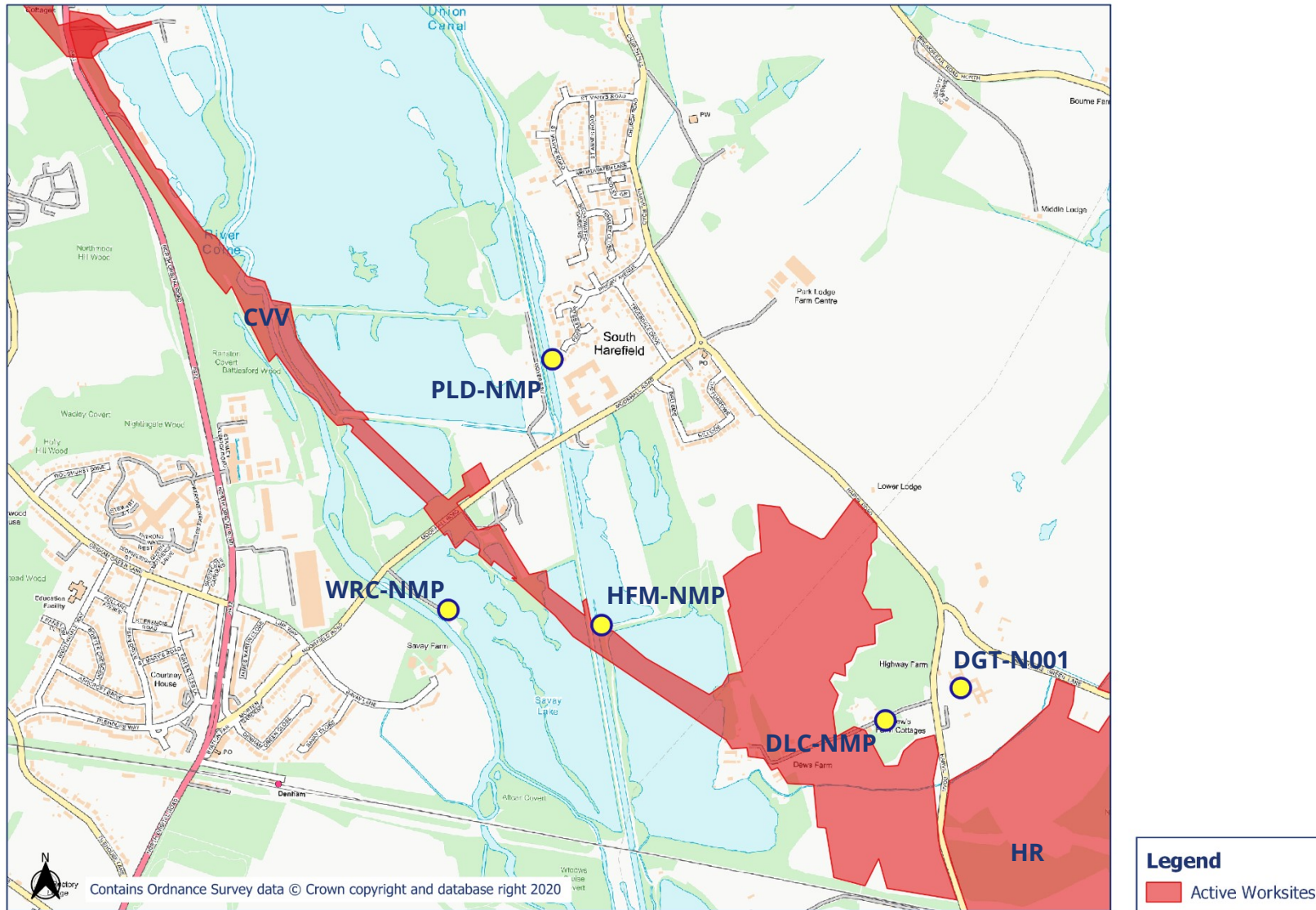


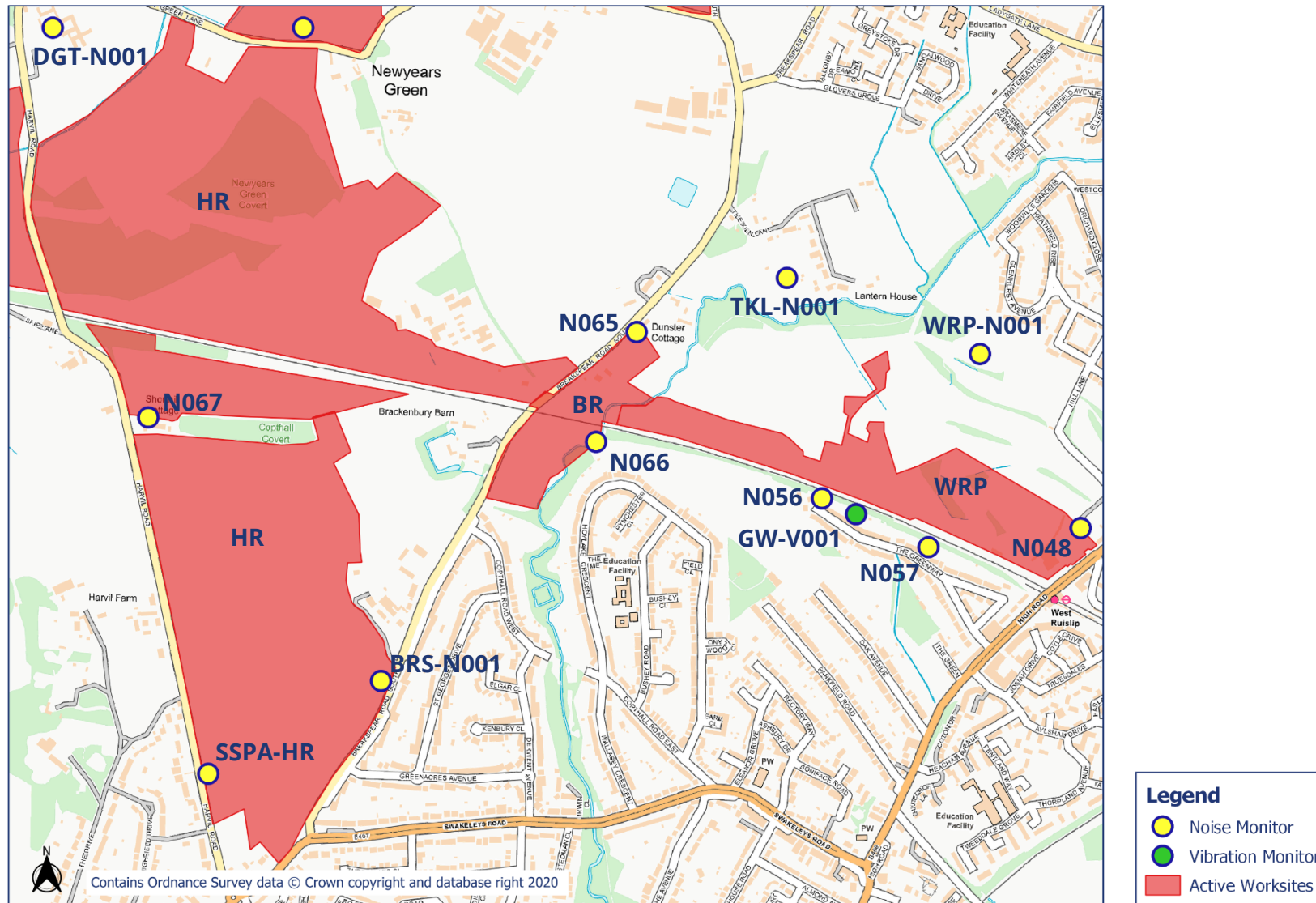


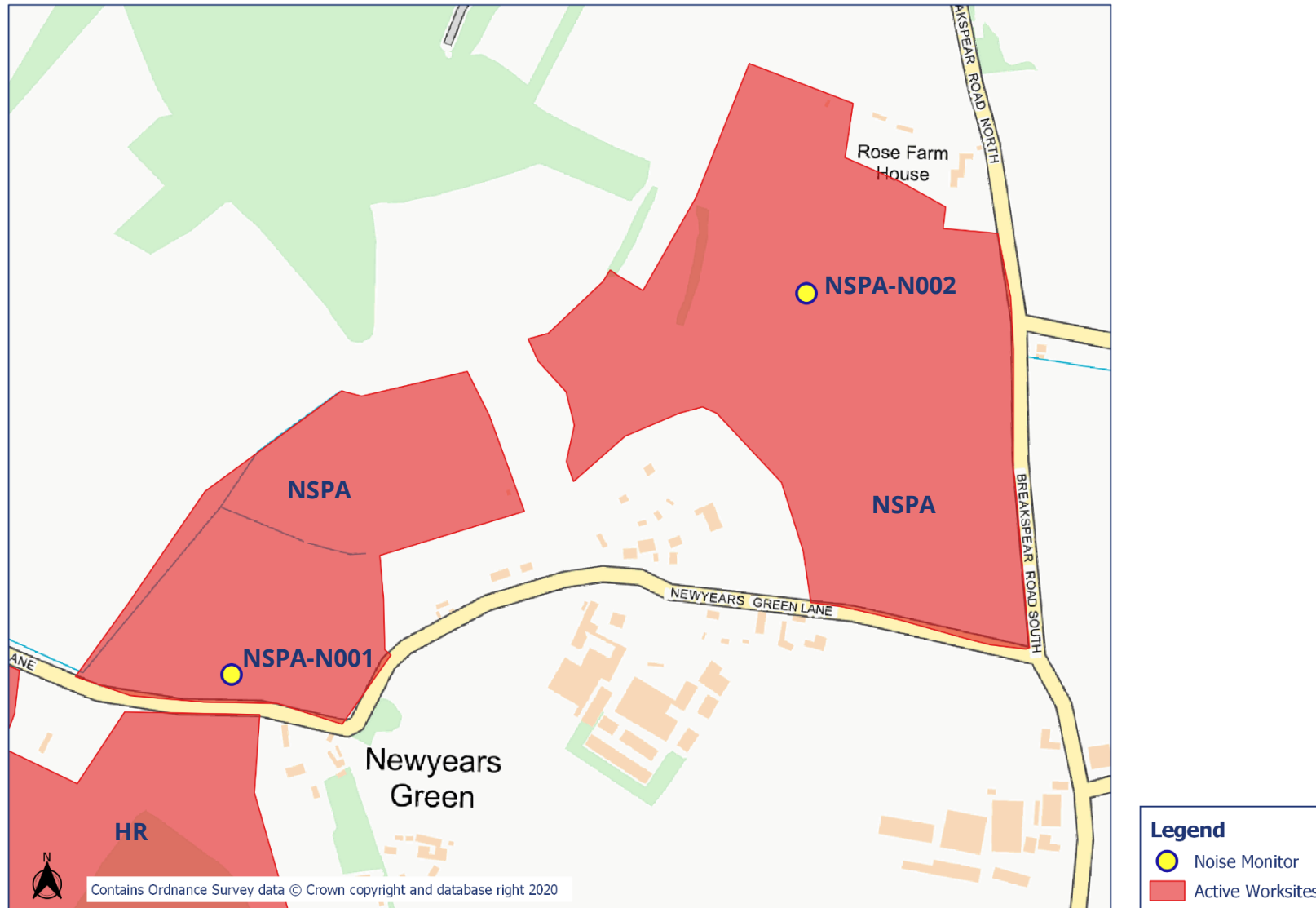


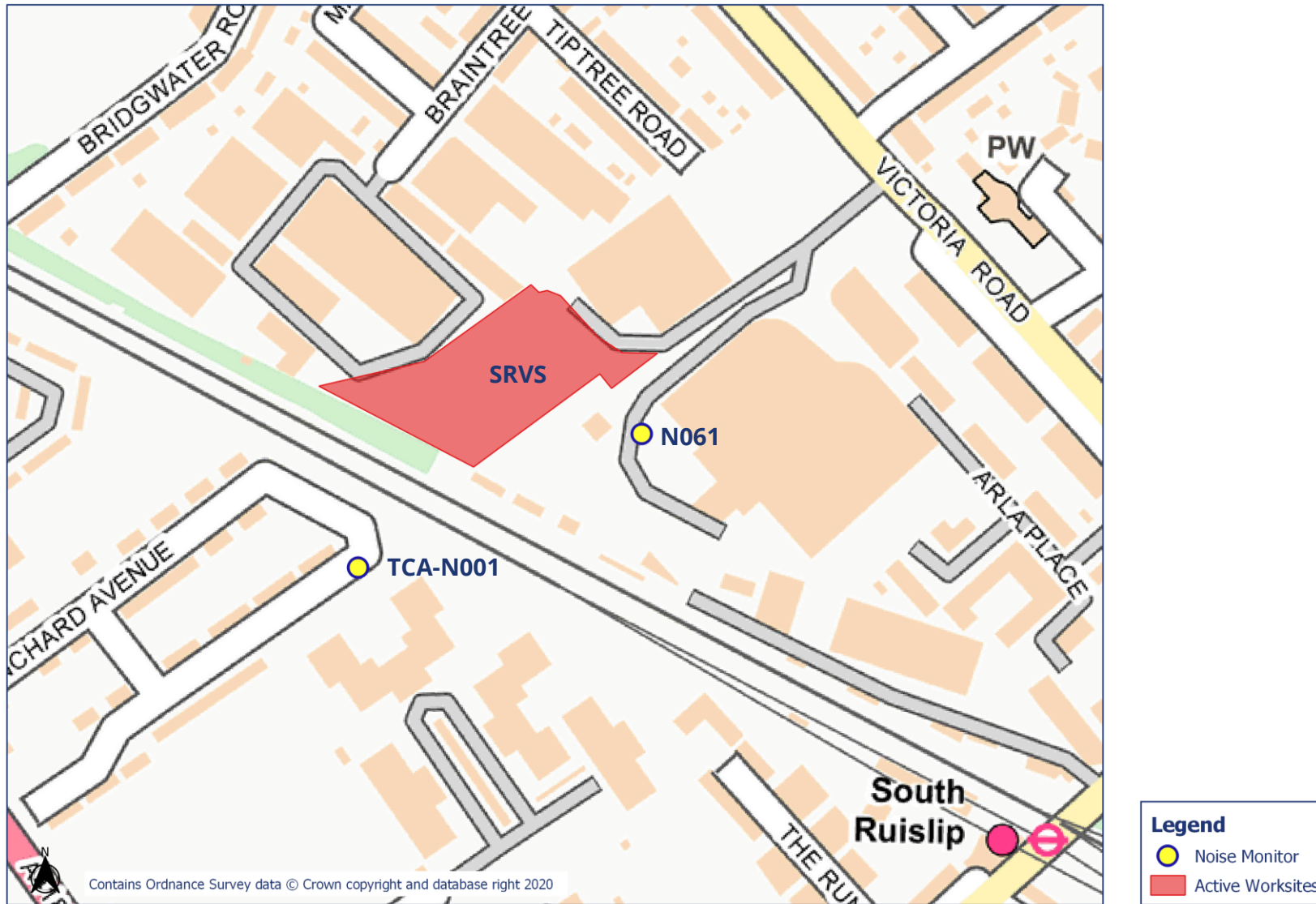


Appendix B Monitoring Locations







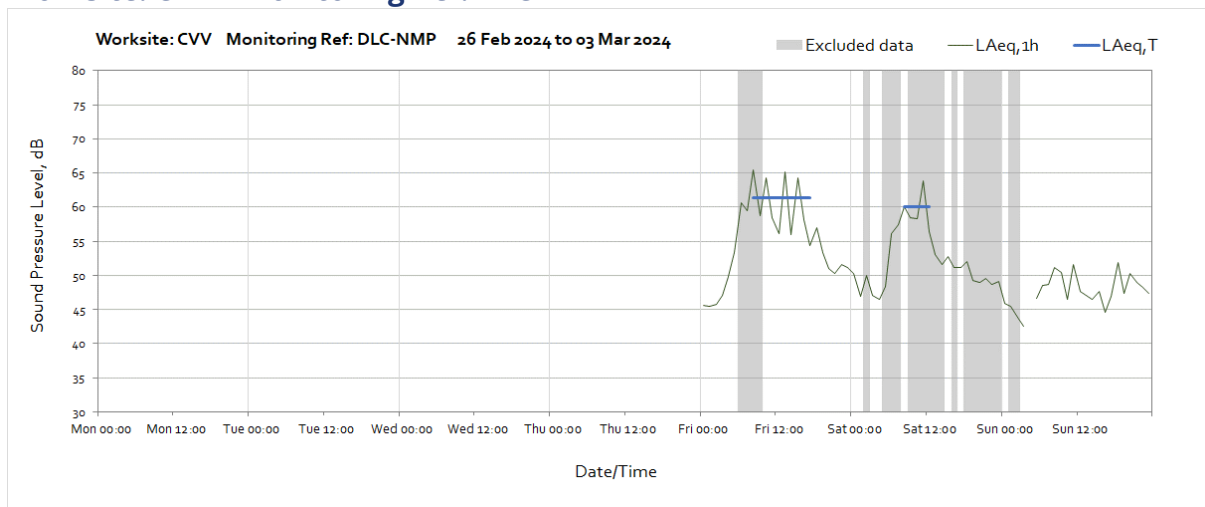


Appendix C Data

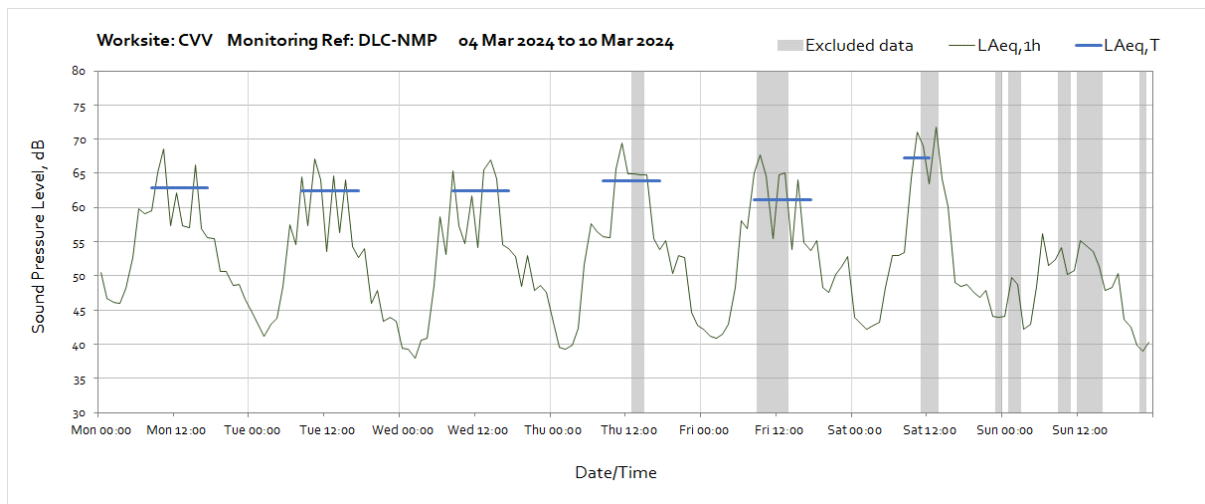
Noise

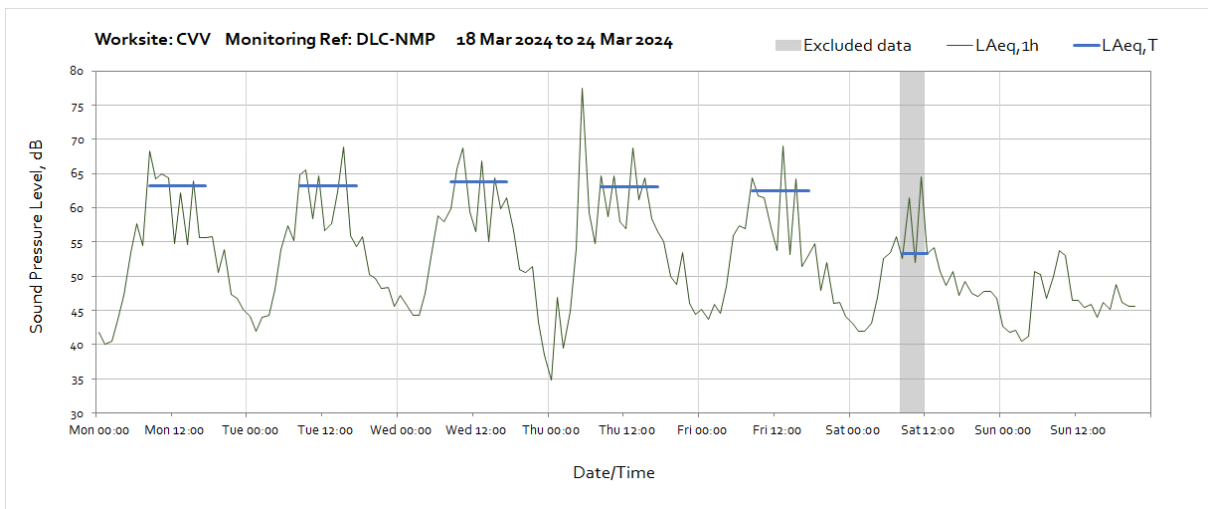
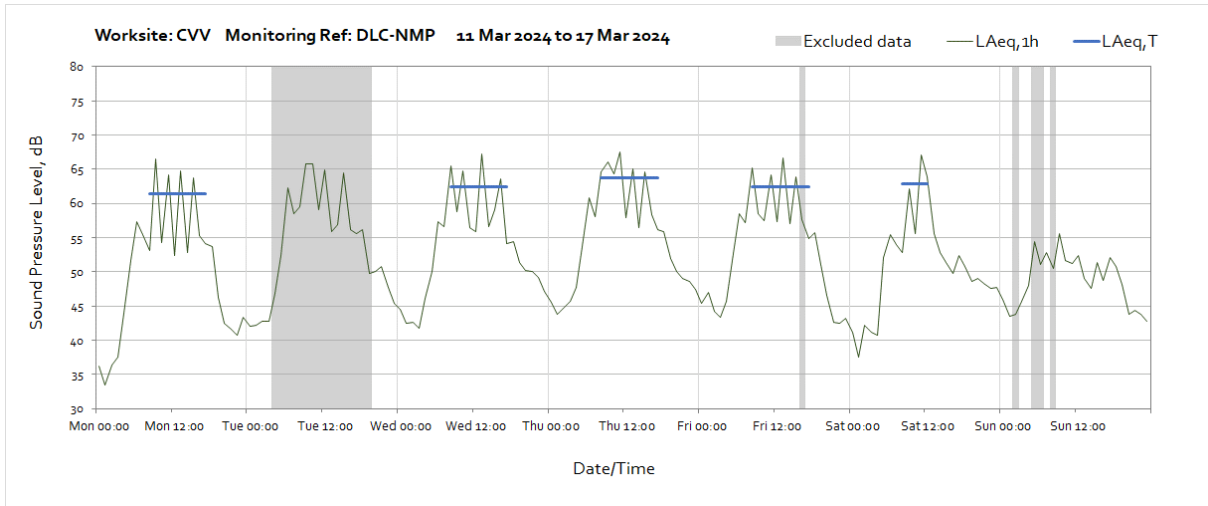
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods where noise levels are adversely affected by weather or only measured for part of the period, which are not representative of HS2 construction works, have been greyed out and excluded from the calculation of the $L_{Aeq,T}$ values in Table 3 of the main report.

Worksite: CVV - Monitoring Ref: DLC-NMP

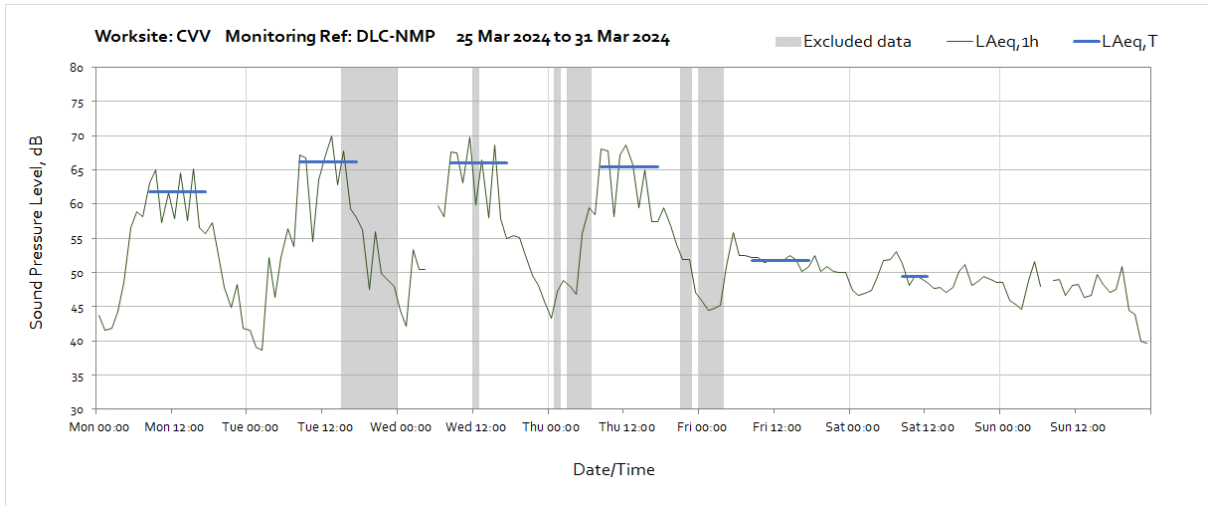


Note: Missing data between 04:00 and 05:00 on Sunday 3rd March was due to a communication error between the monitoring station and server.



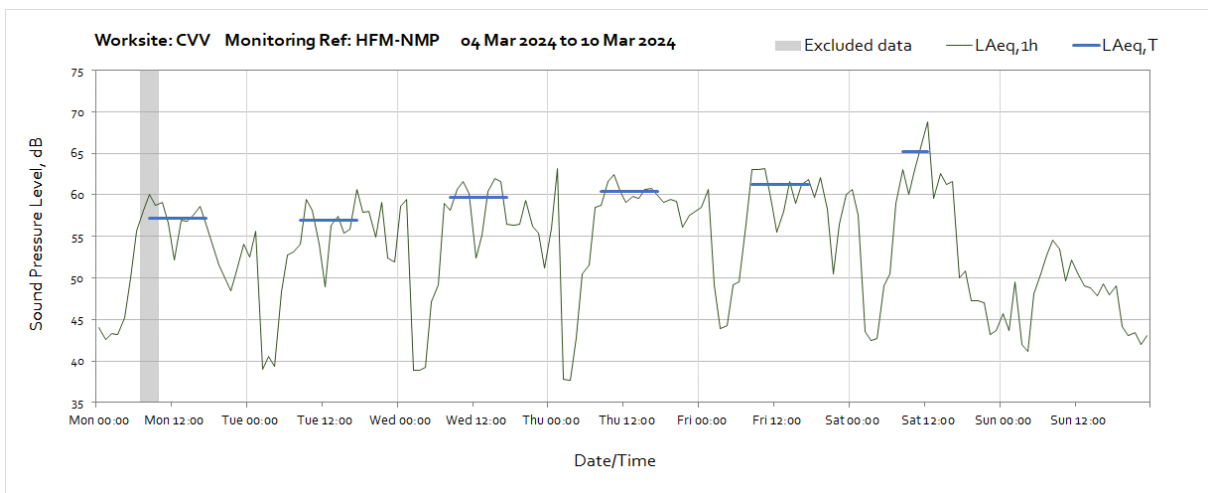
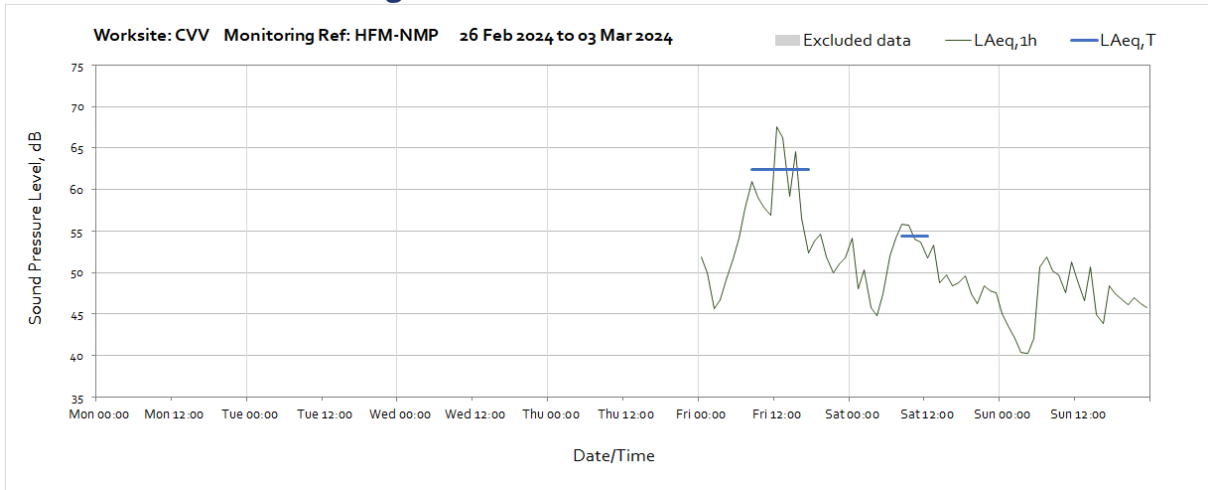


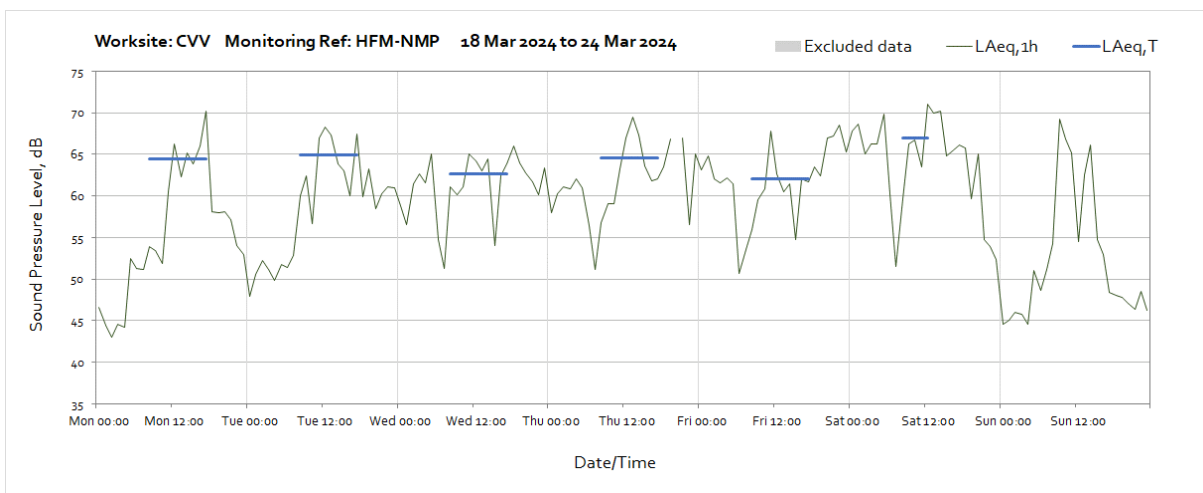
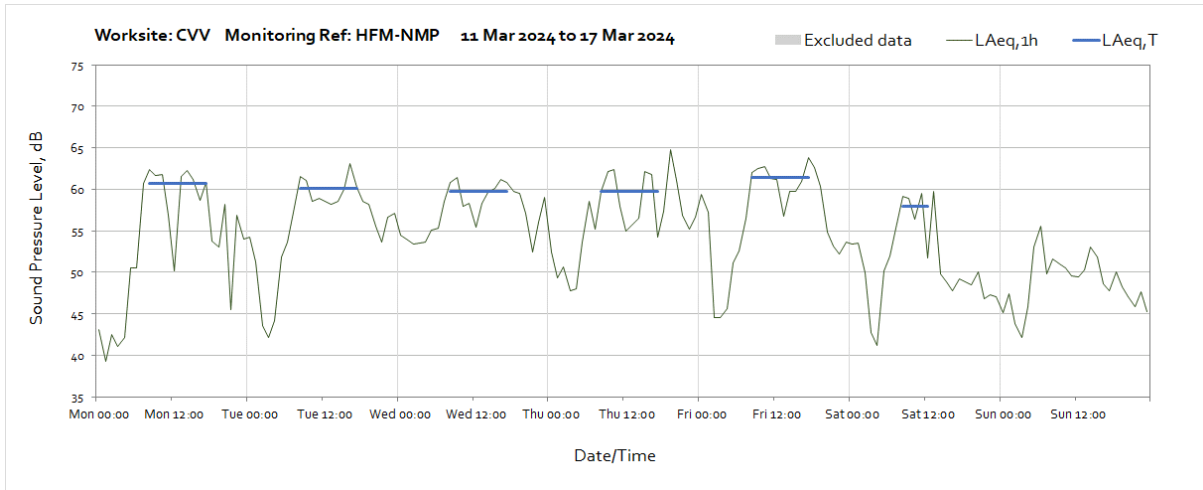
Note: Missing data between 22:00 and 23:00 on Sunday 24th March was due to a communication error between the monitoring station and server.



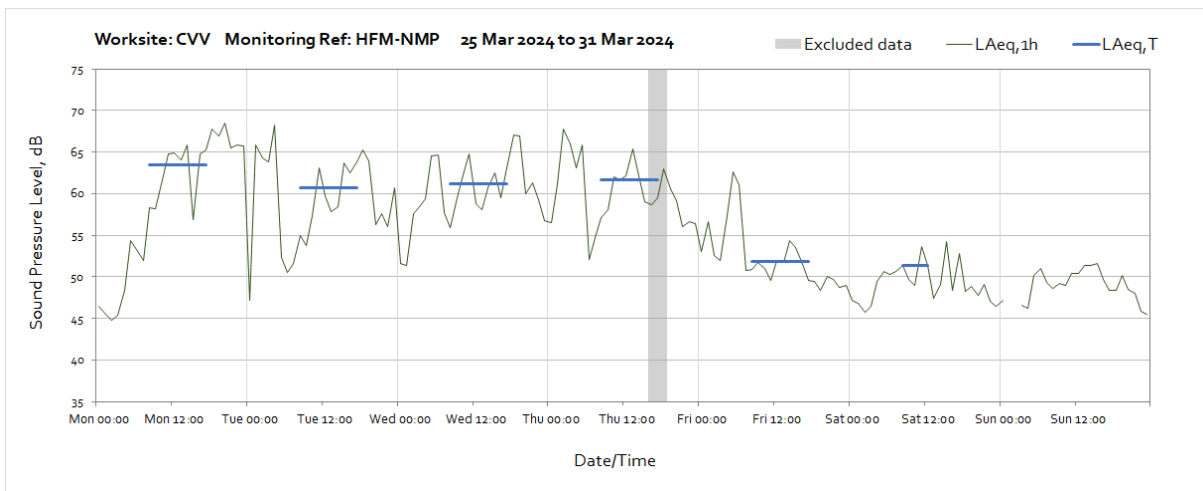
Note: Missing data between 05:00 and 06:00 on Wednesday 27th March was due to a communication error between the monitoring station and server. Missing data between 07:00 and 08:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: CVV – Monitoring Ref: HFM-NMP



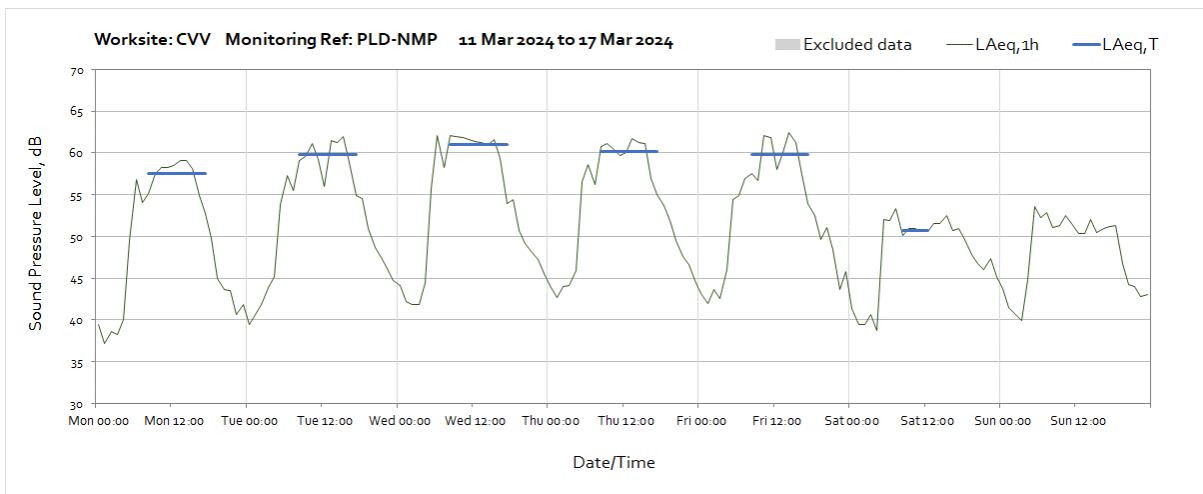
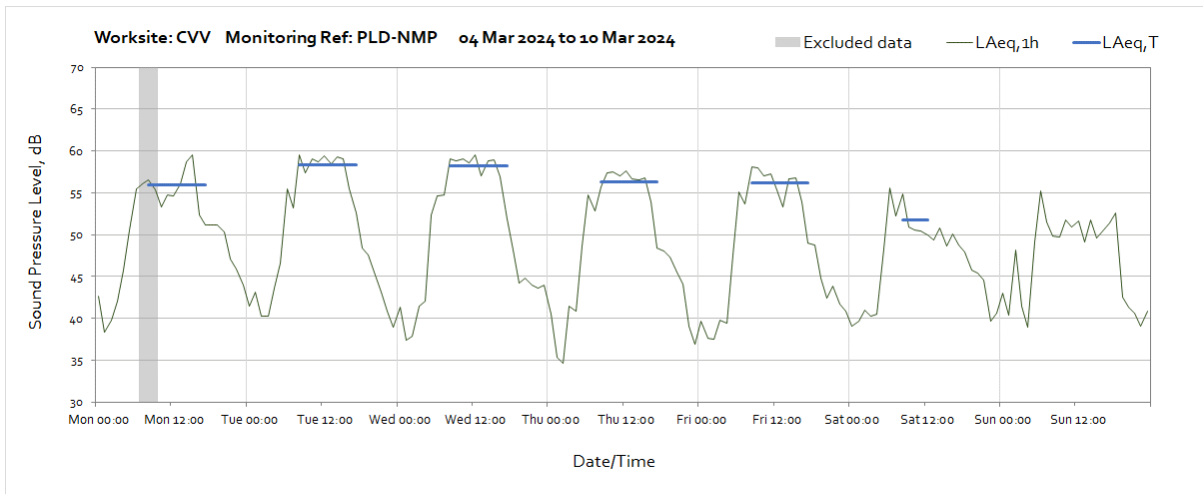
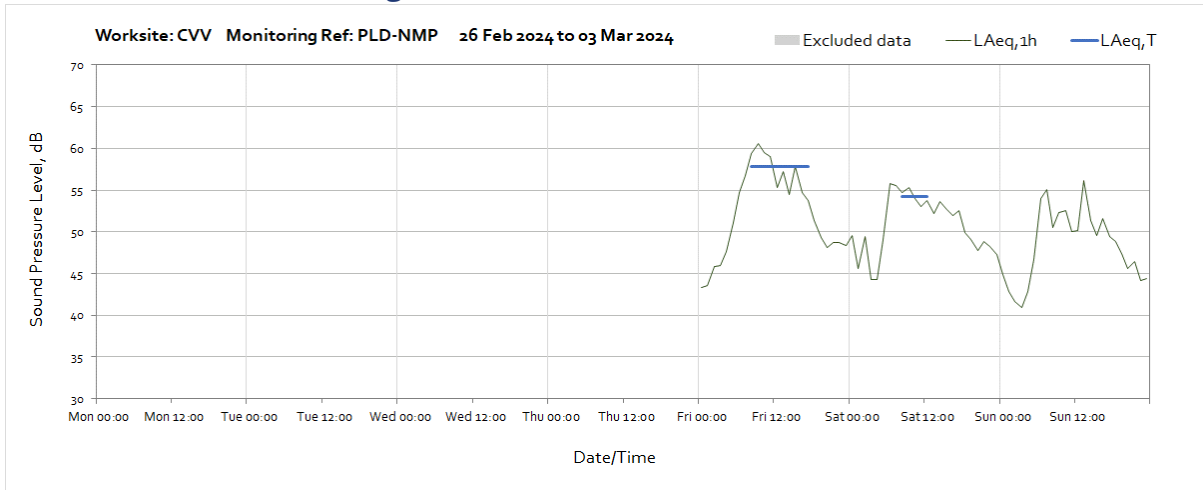


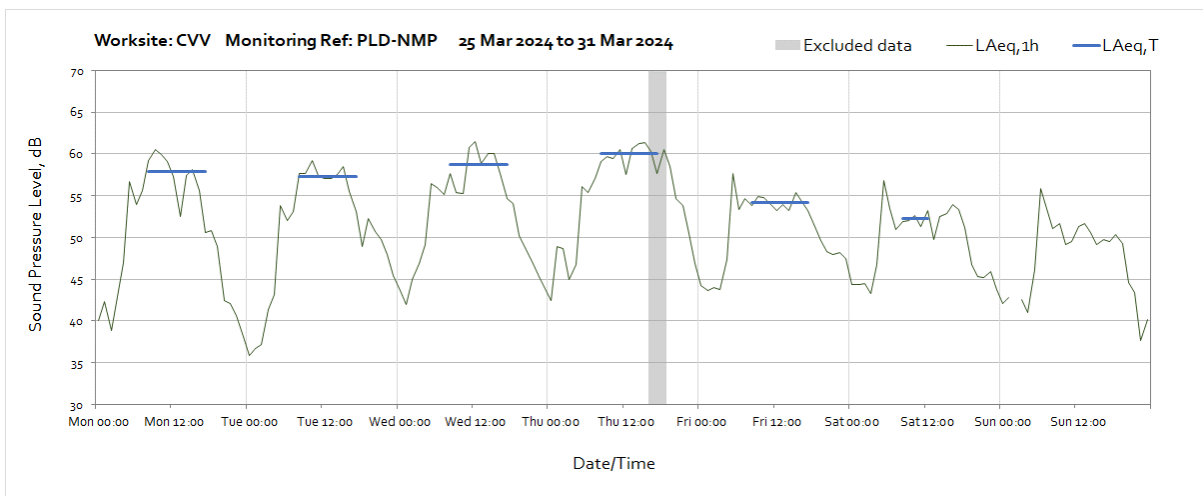
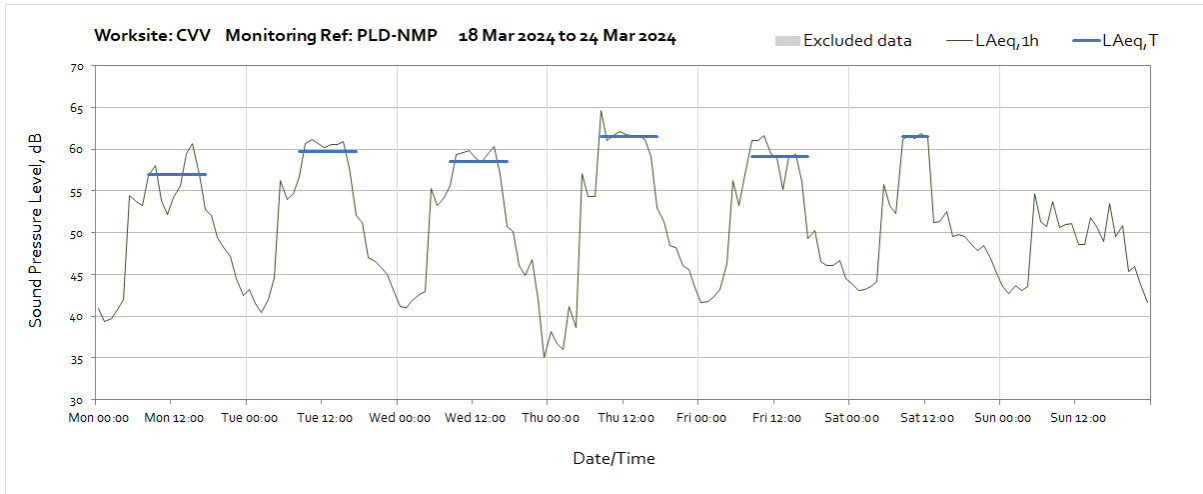
Note: Missing data between 20:00 and 21:00 on Thursday 21st March was due to a communication error between the monitoring station and server.



Note: Missing data between 01:00 and 03:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

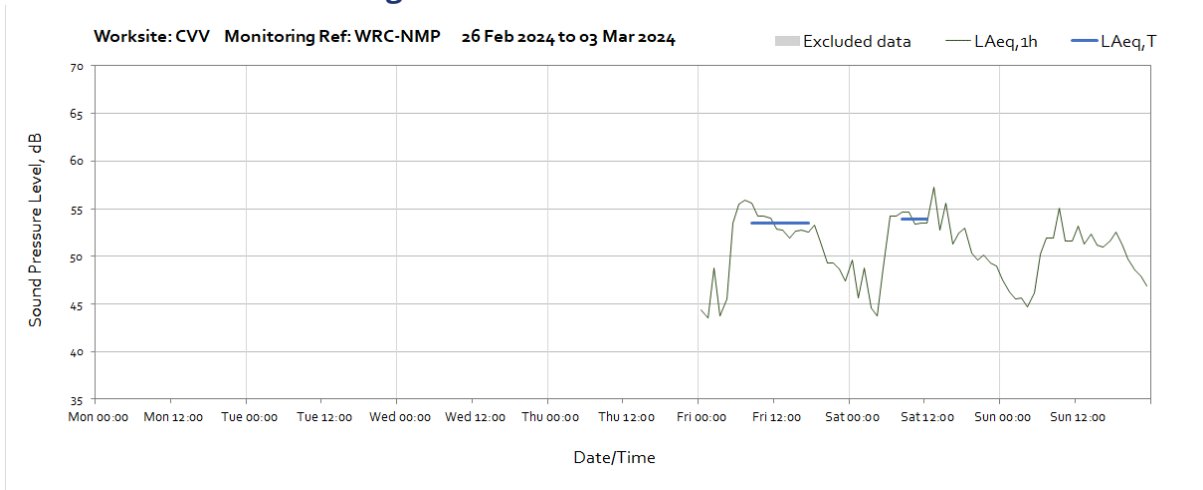
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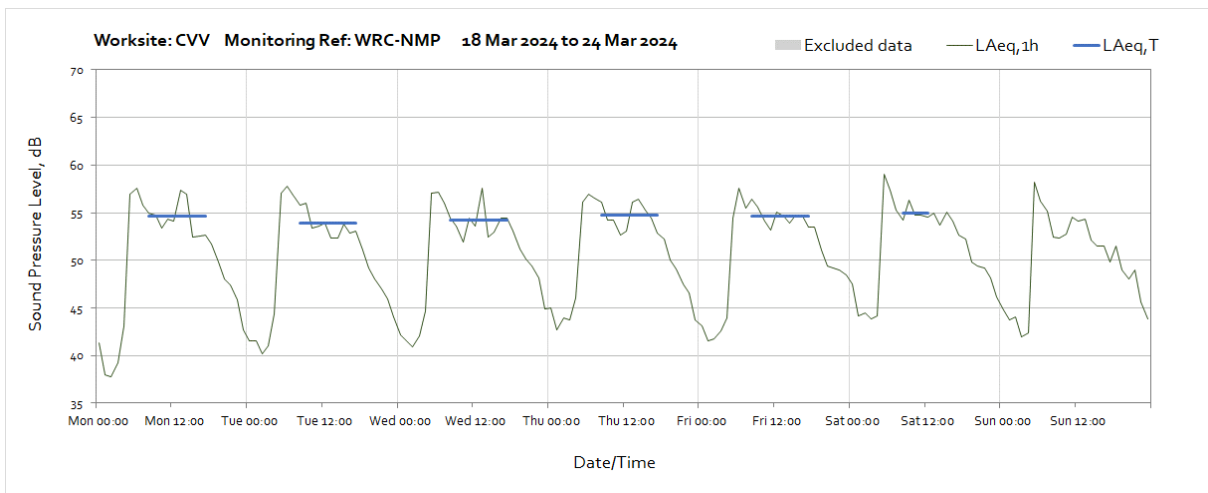
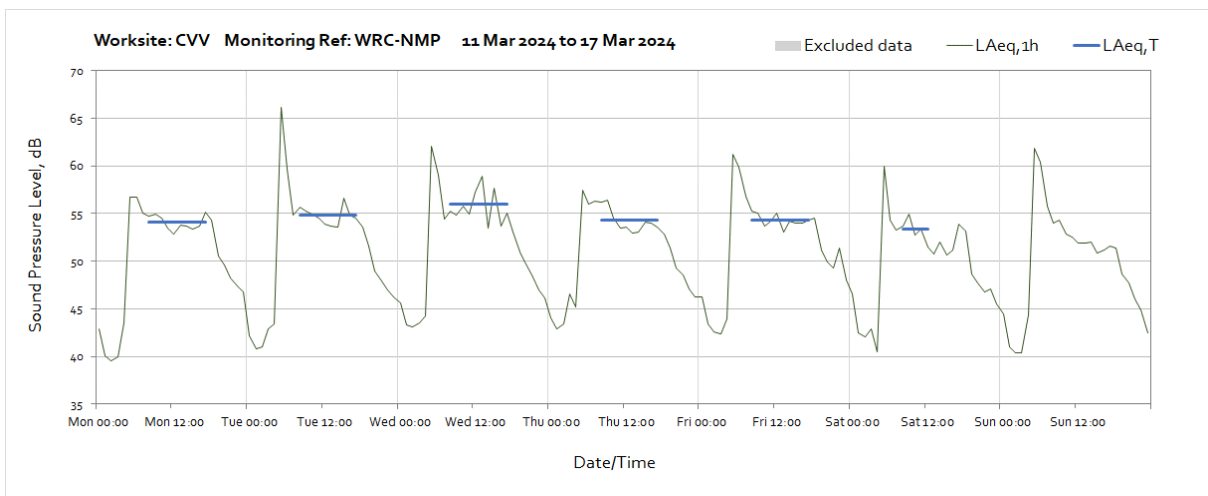
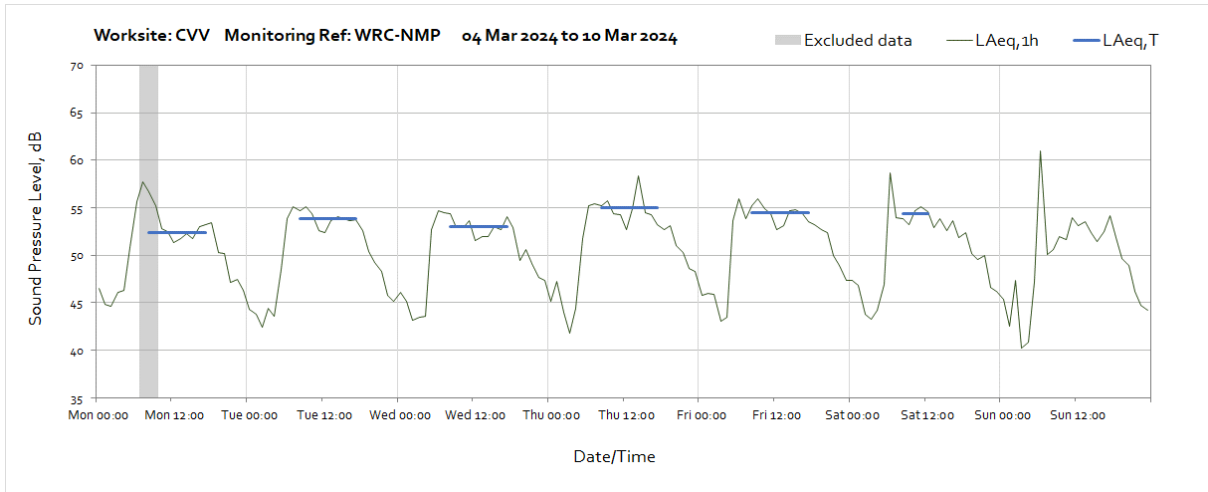


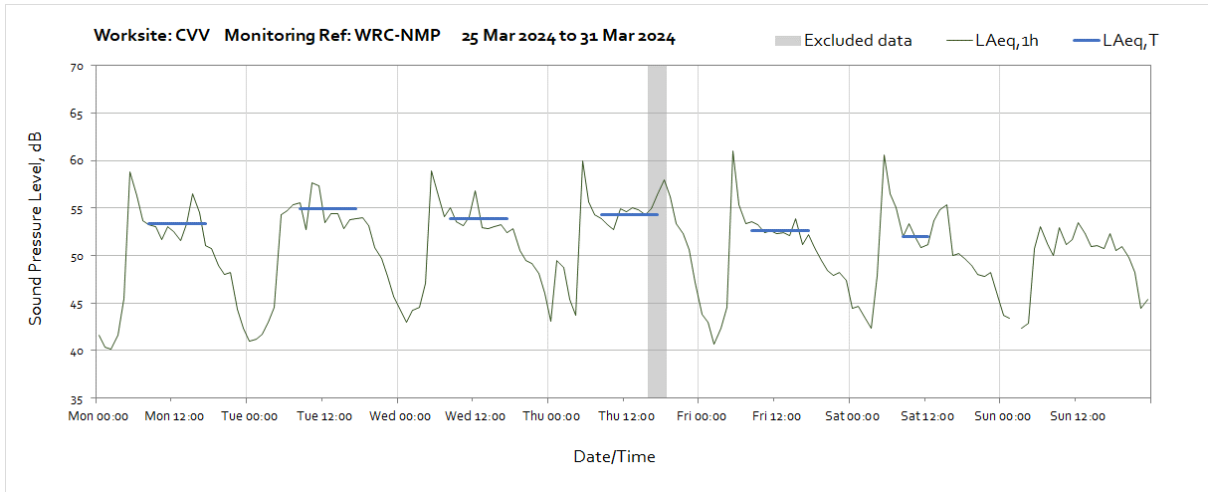


Note: Missing data between 02:00 and 03:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: CVV – Monitoring Ref: WRC-NMP

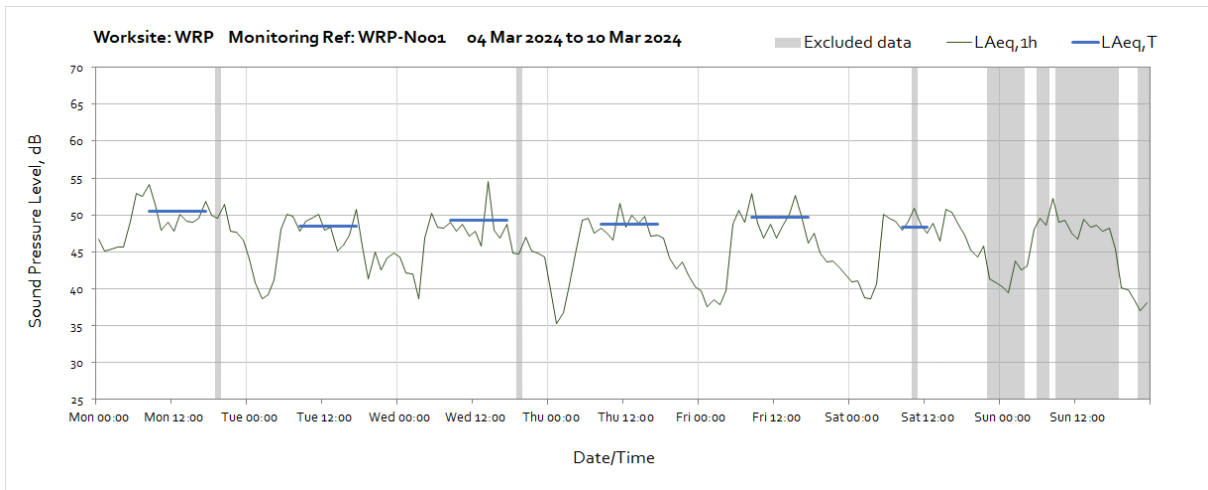
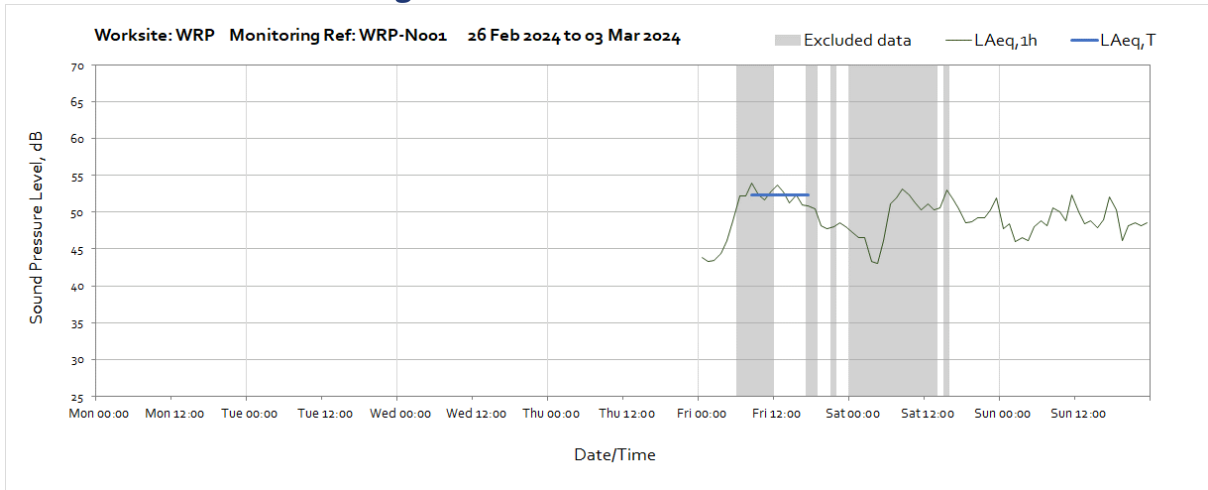


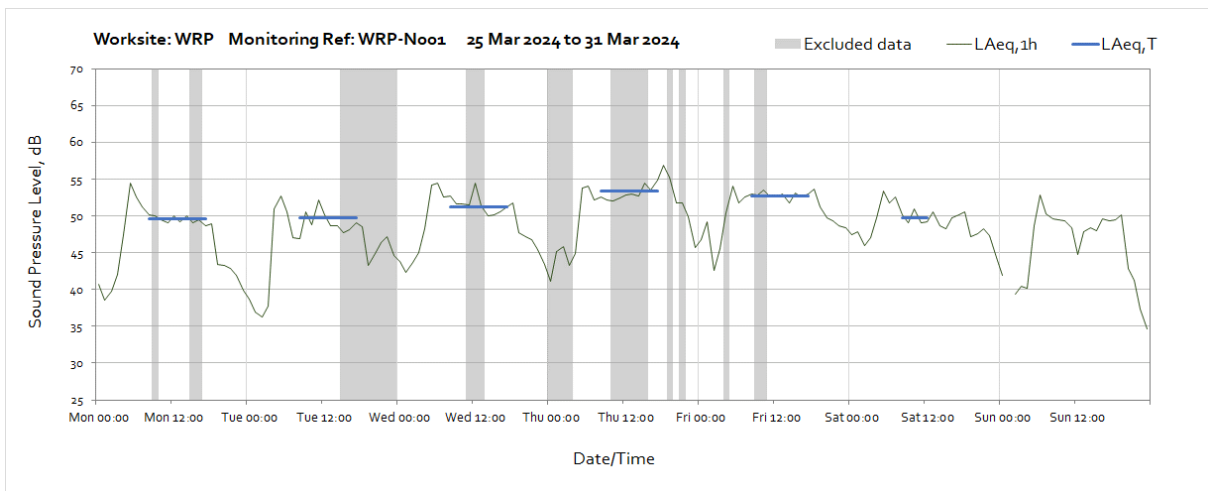
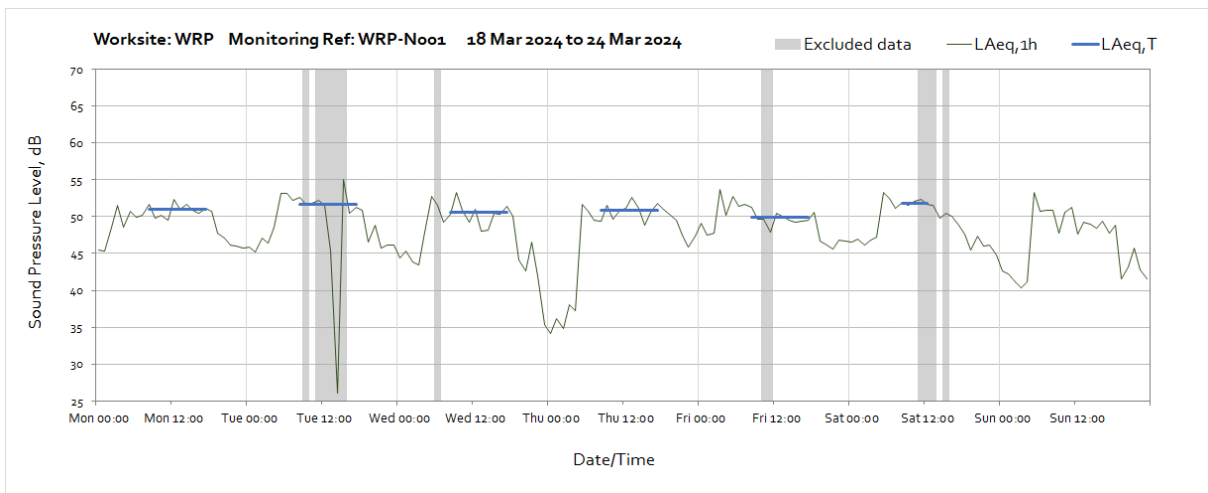
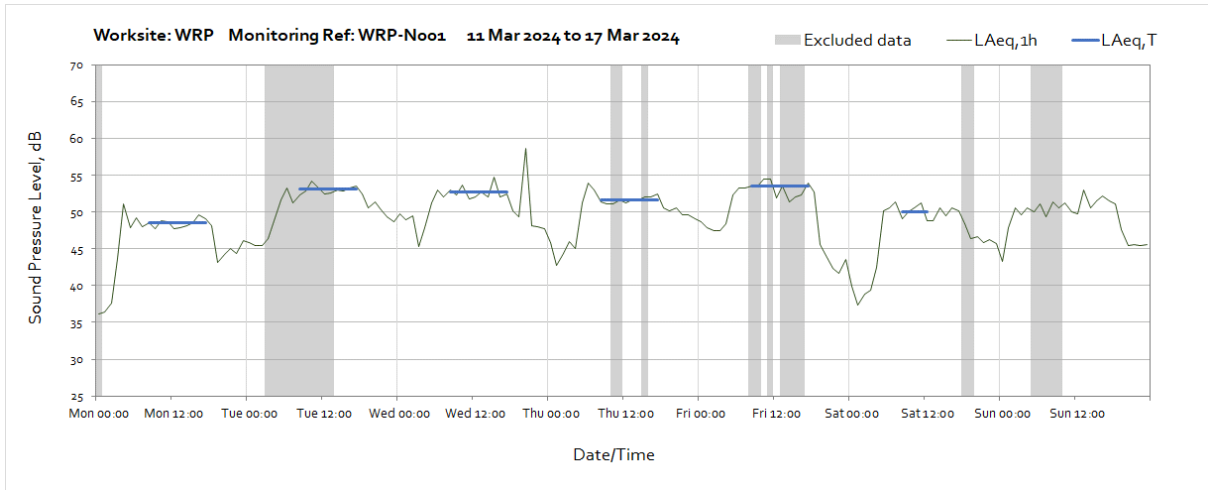




Note: Missing data between 02:00 and 03:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

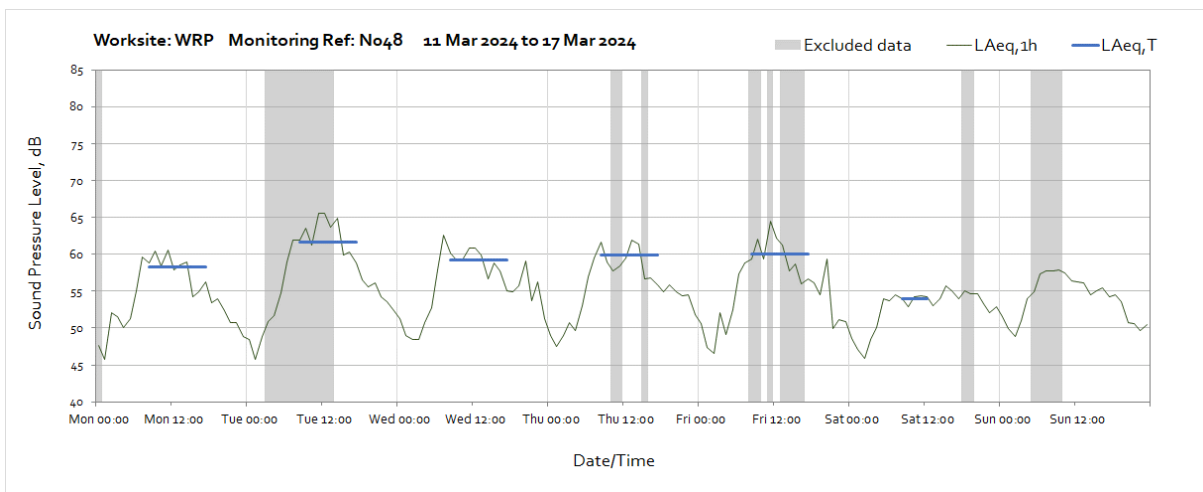
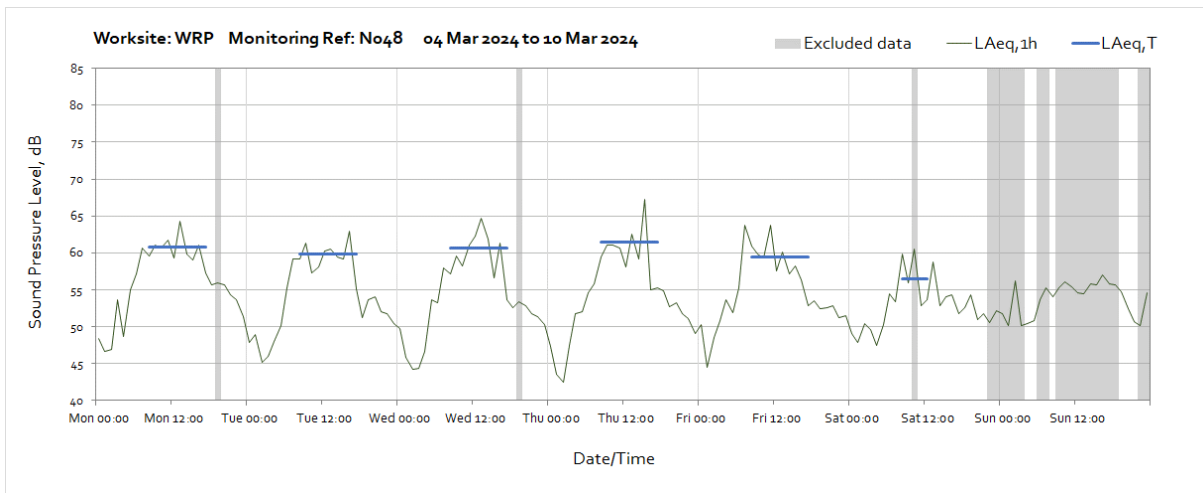
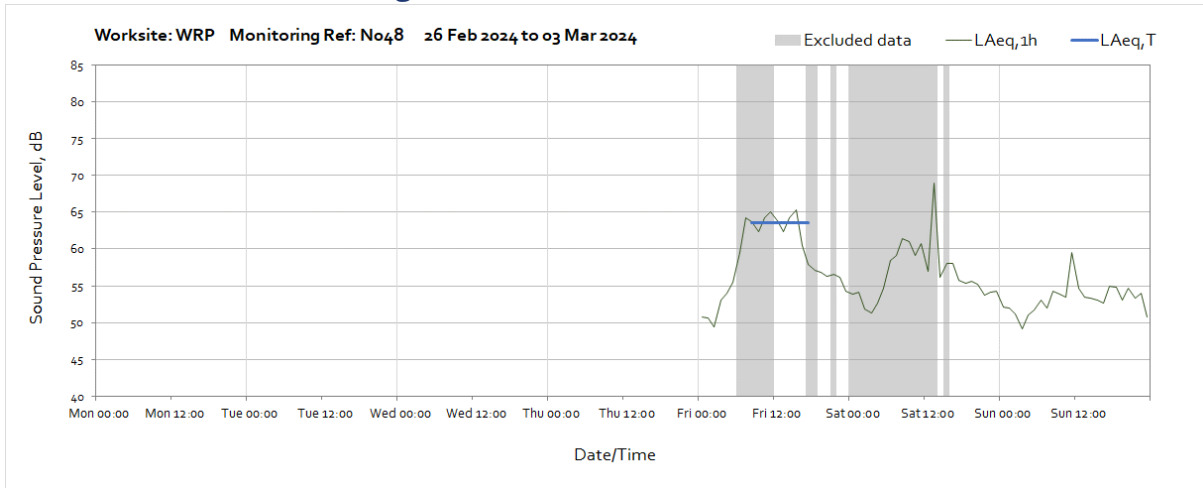
Worksite: WRP – Monitoring Ref: WRP-N001



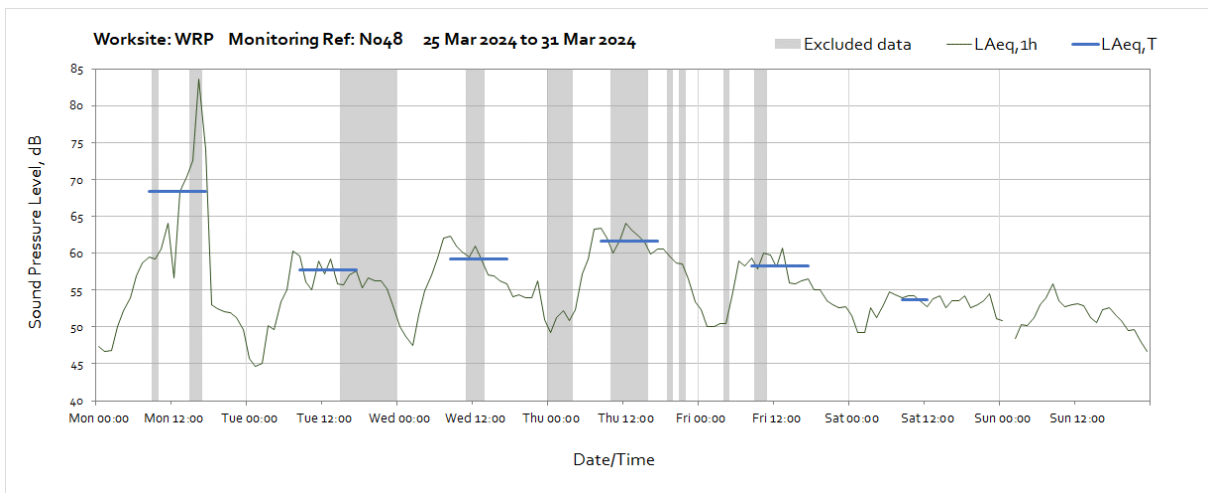
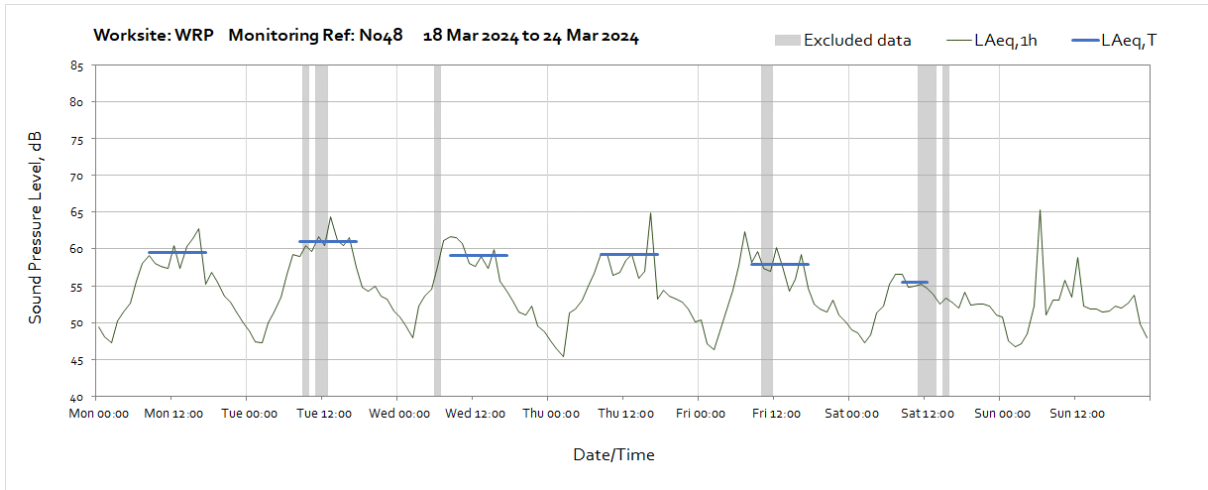


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: WRP – Monitoring Ref: N048

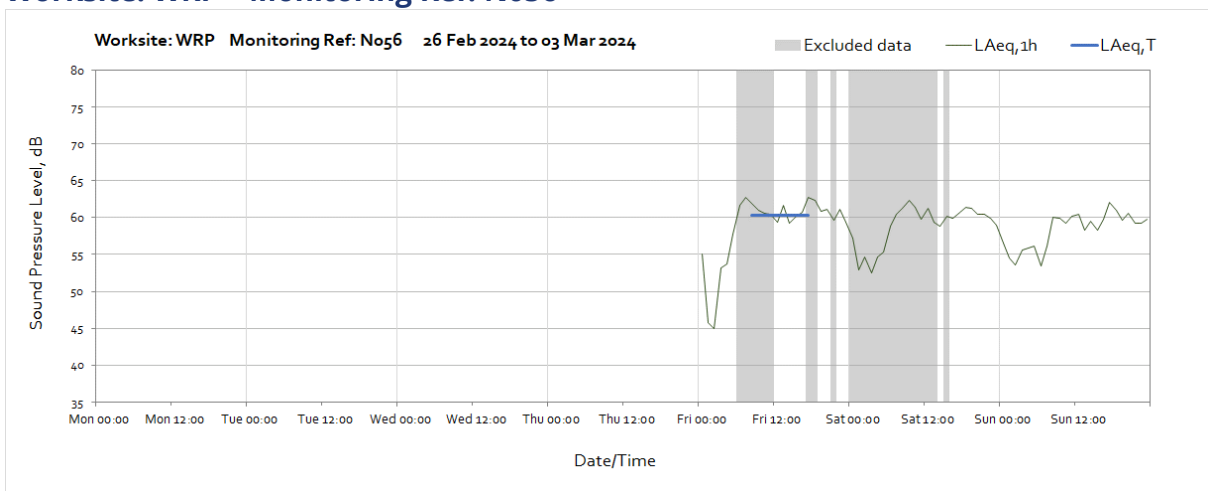


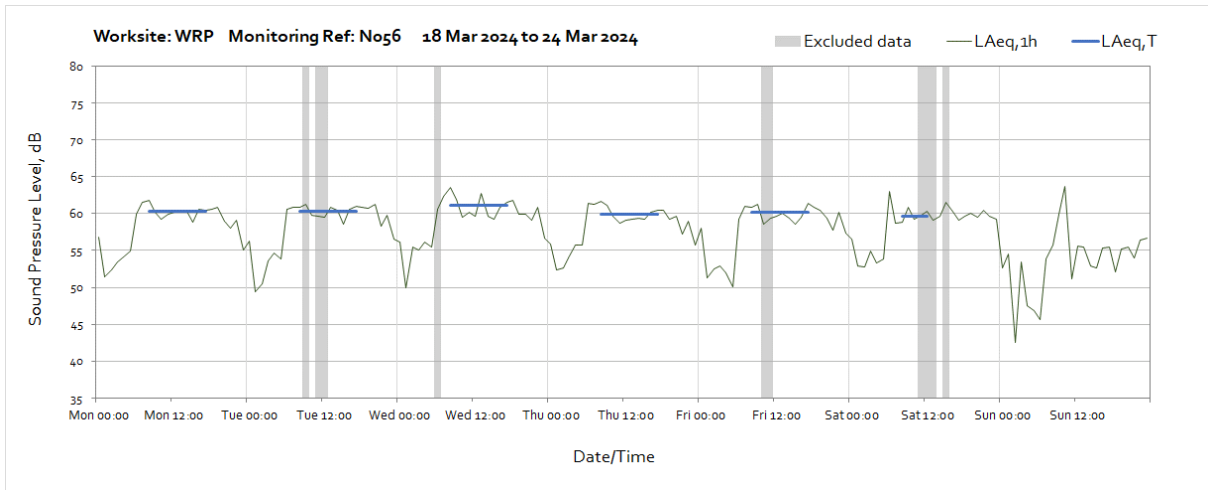
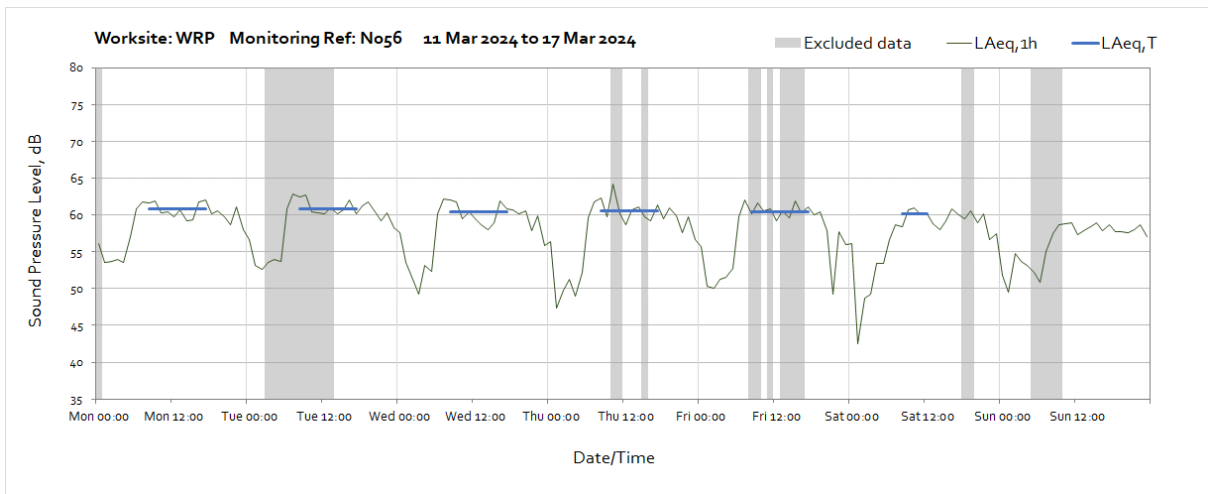
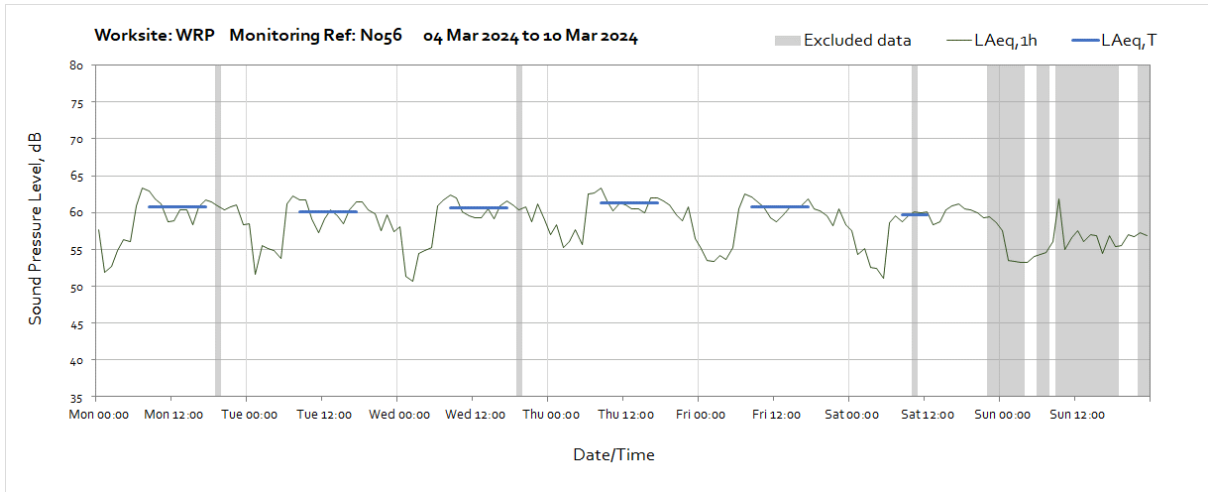
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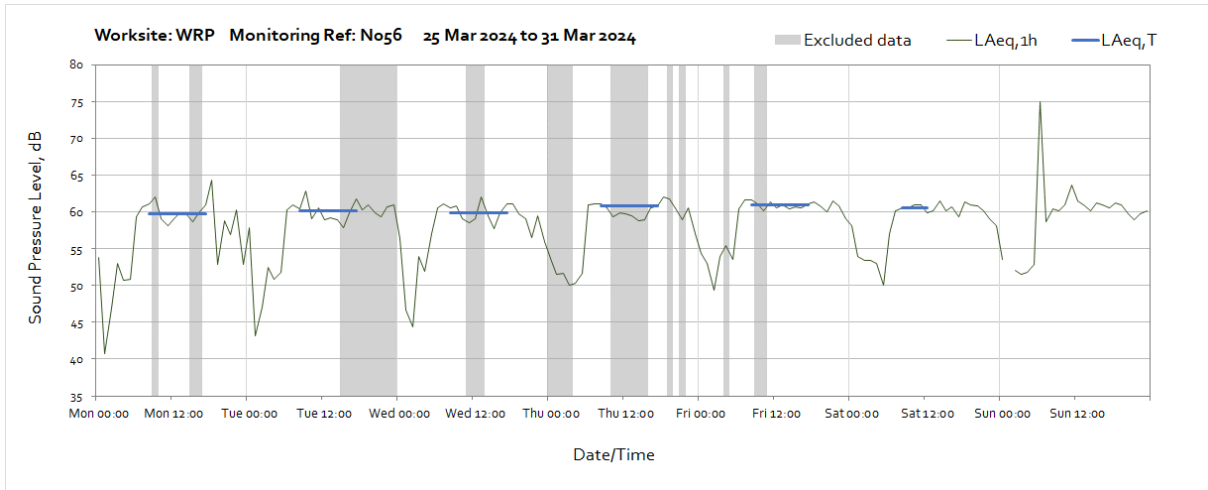


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

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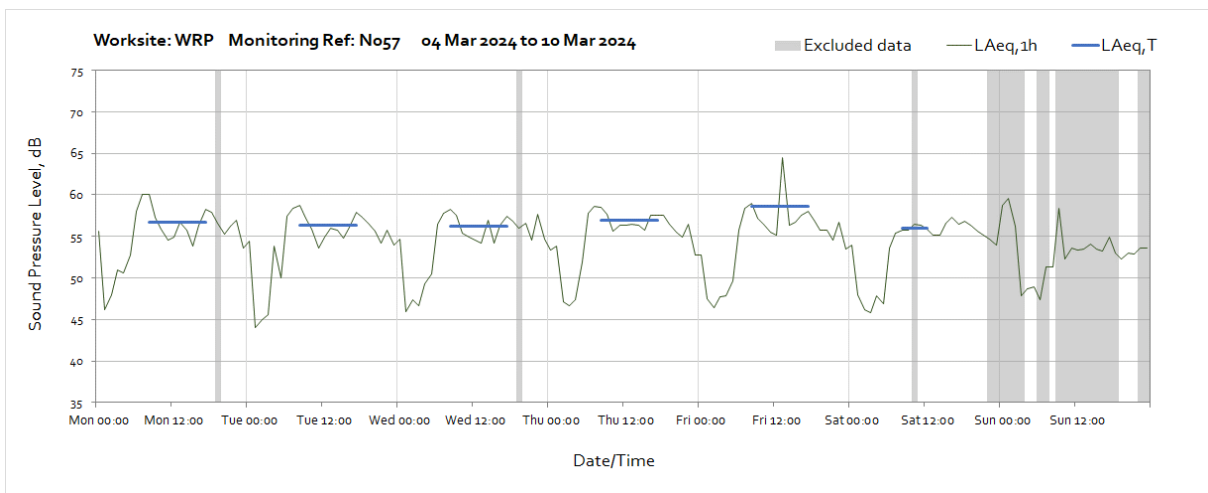
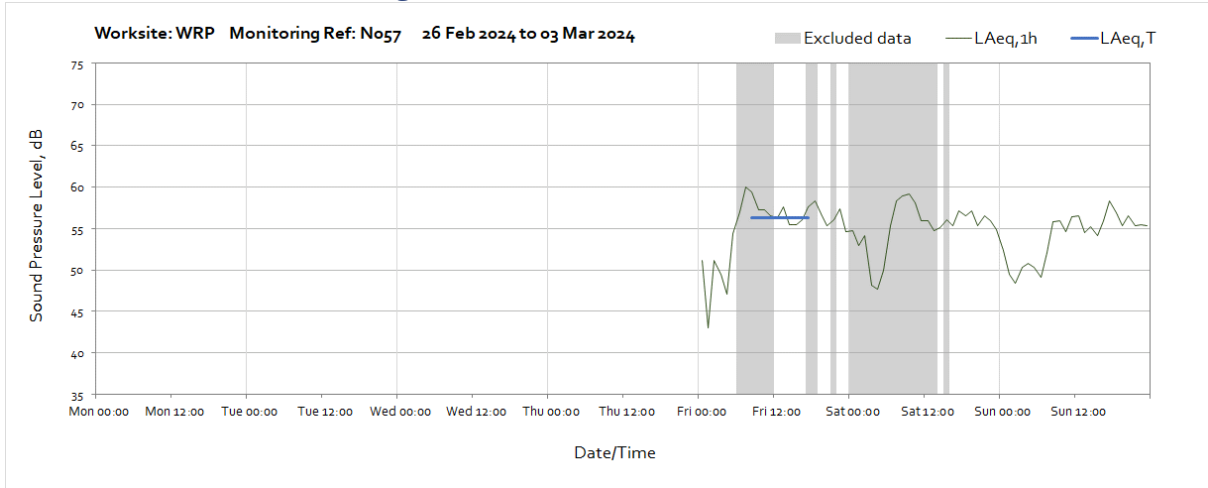


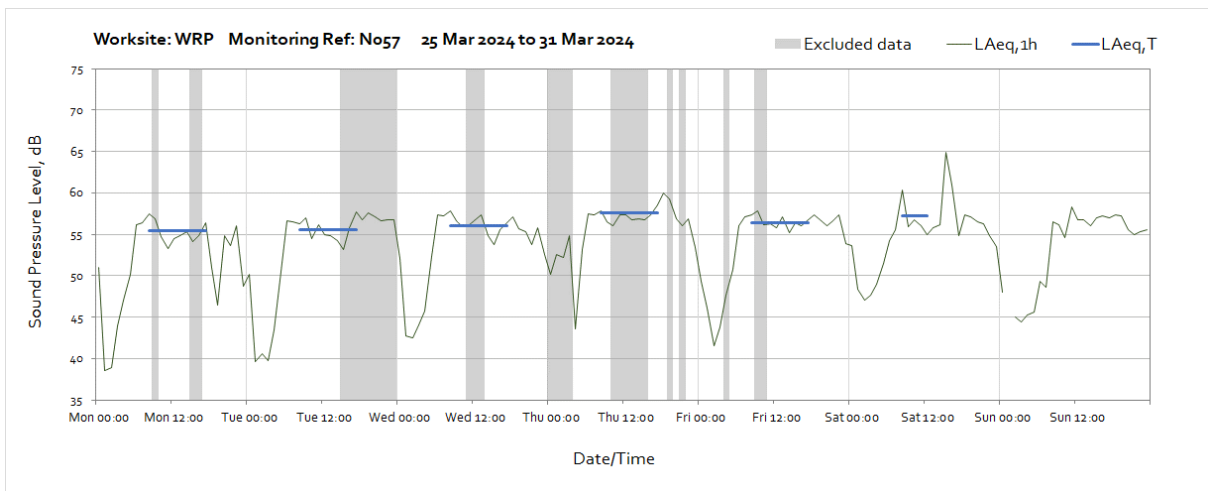
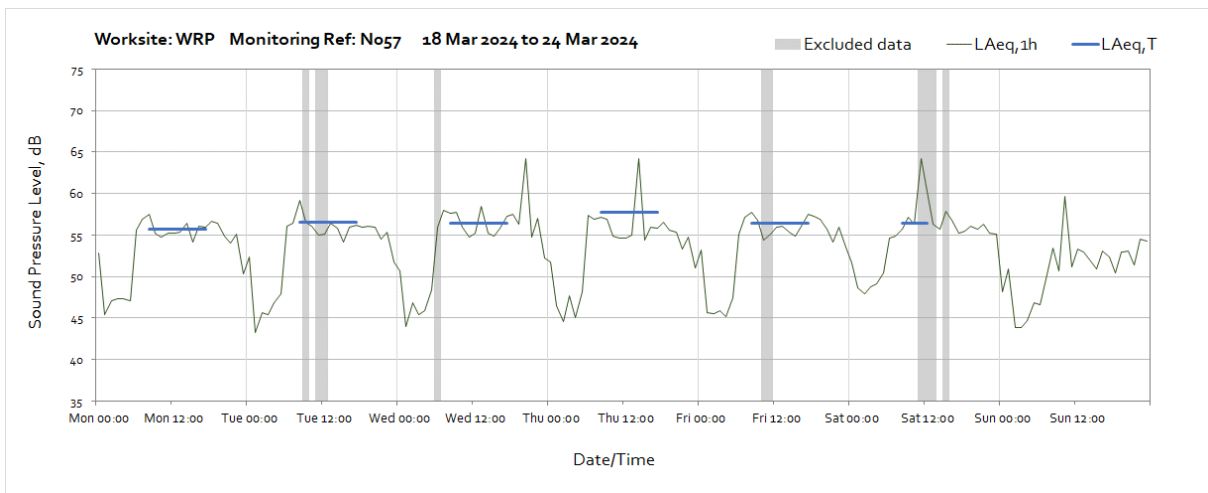
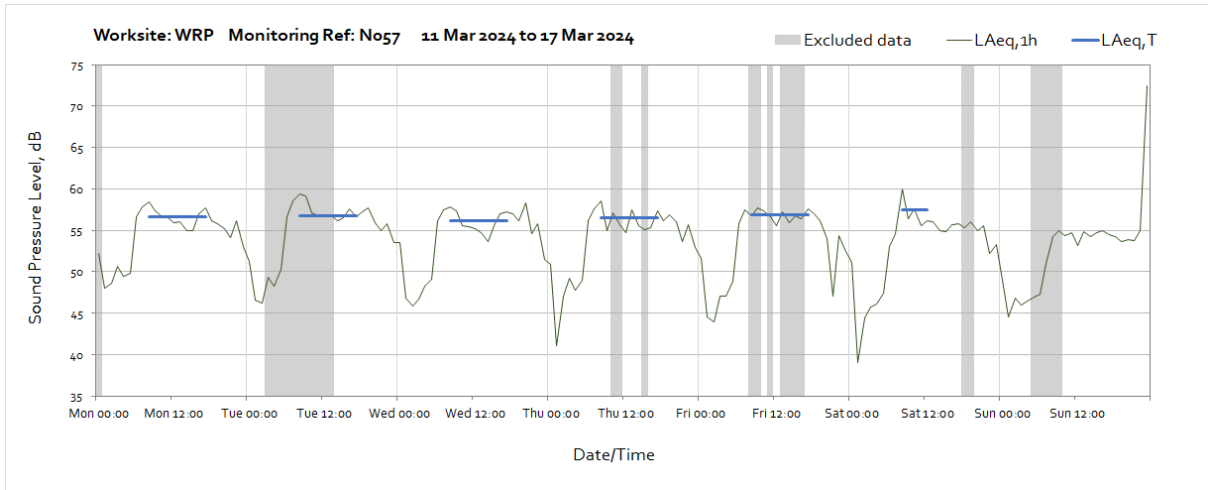




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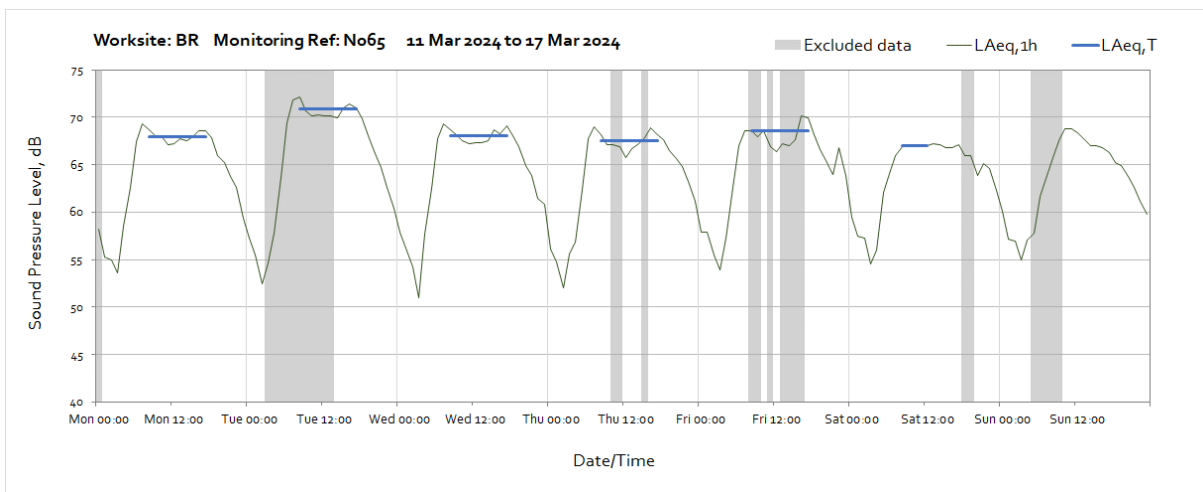
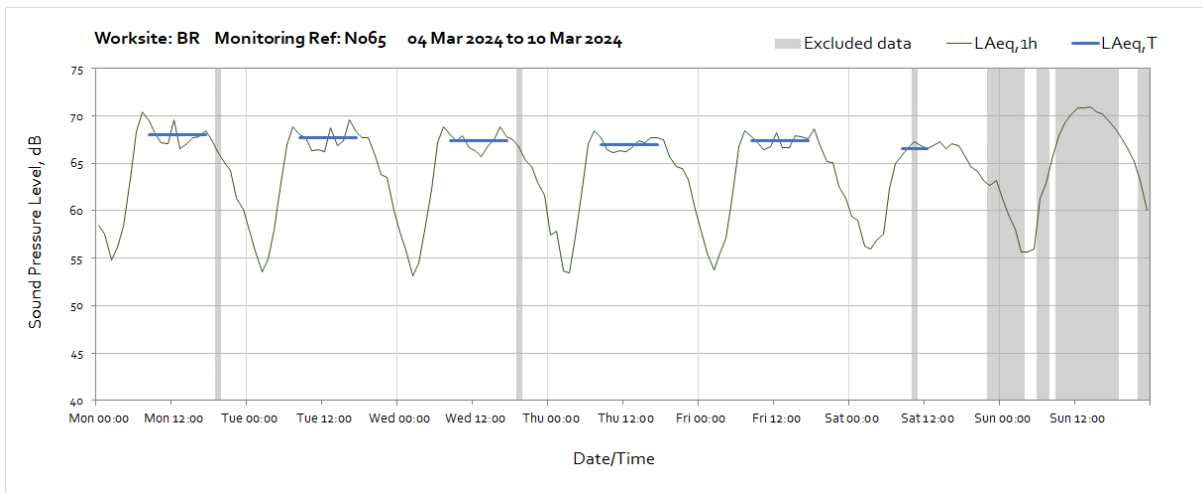
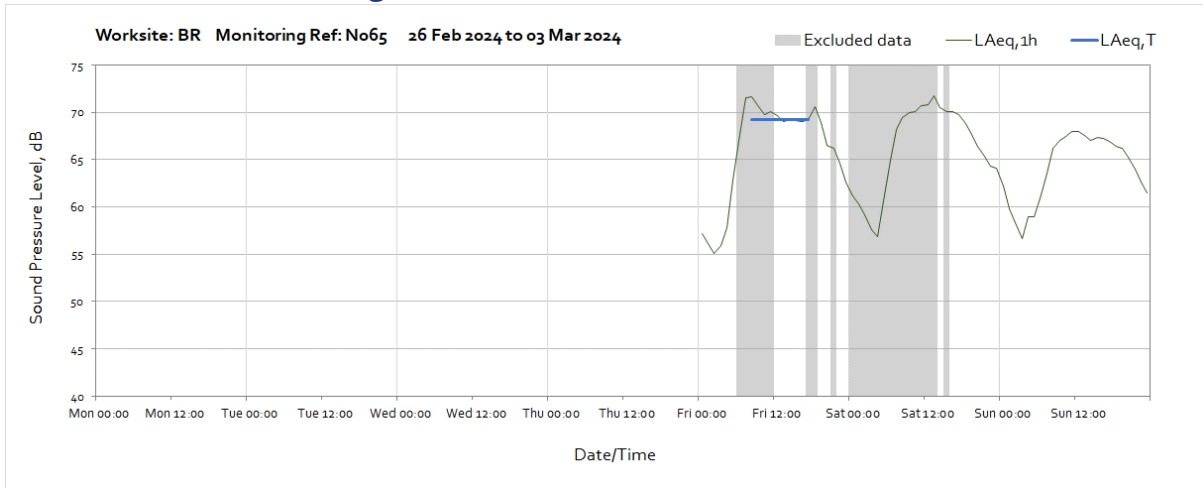
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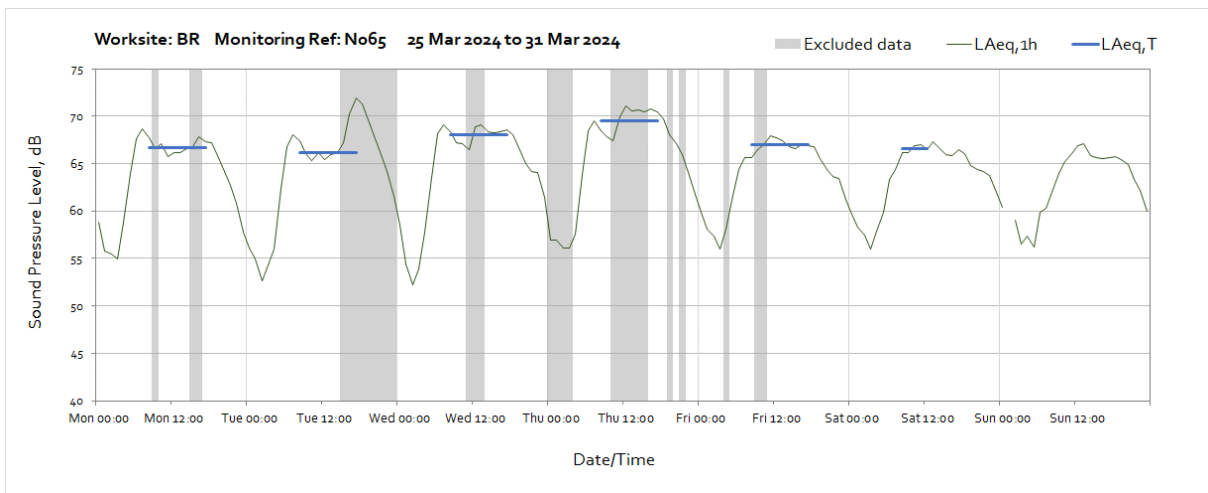
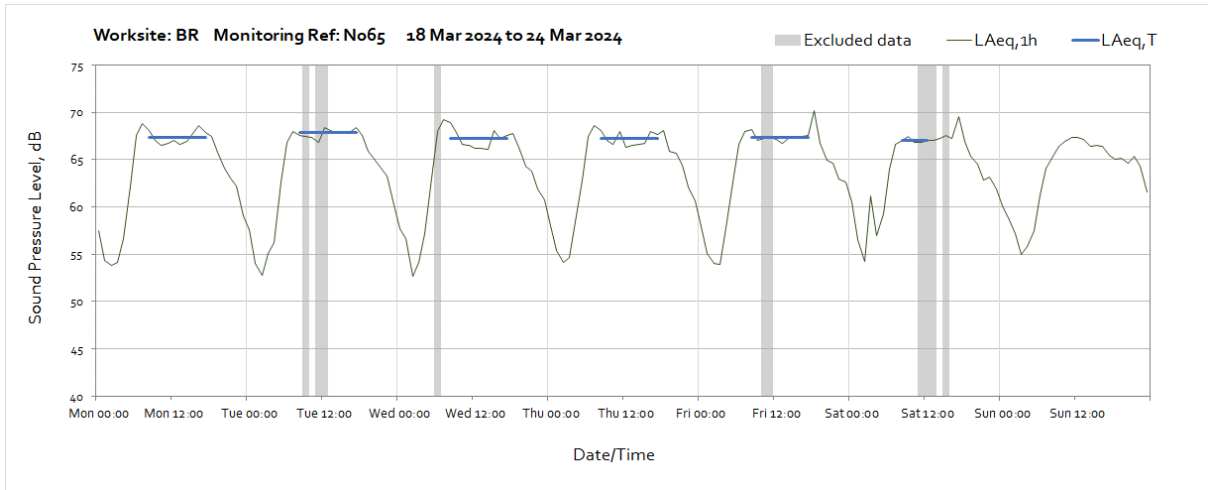


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: BR – Monitoring Ref: N065

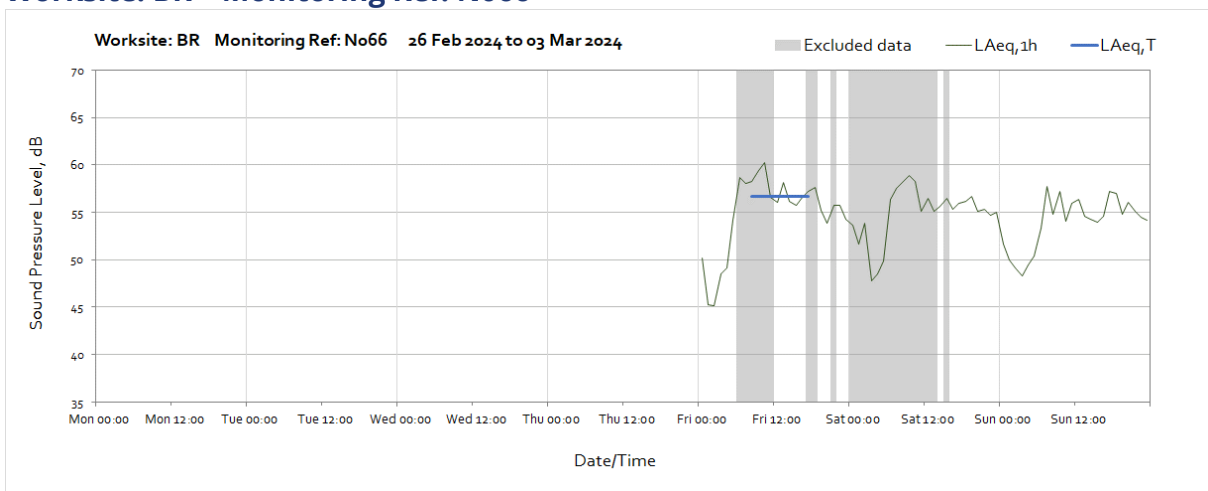


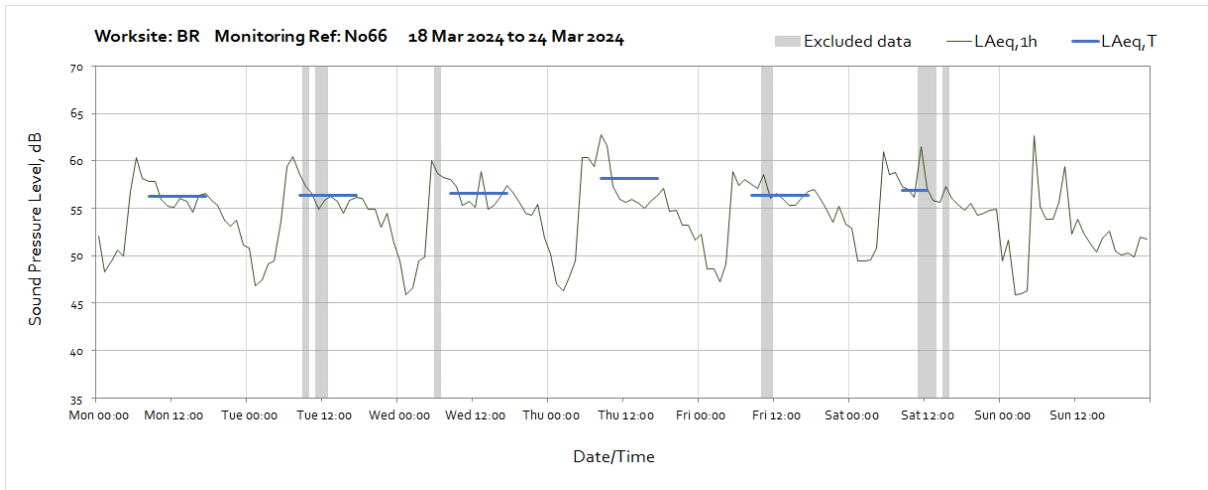
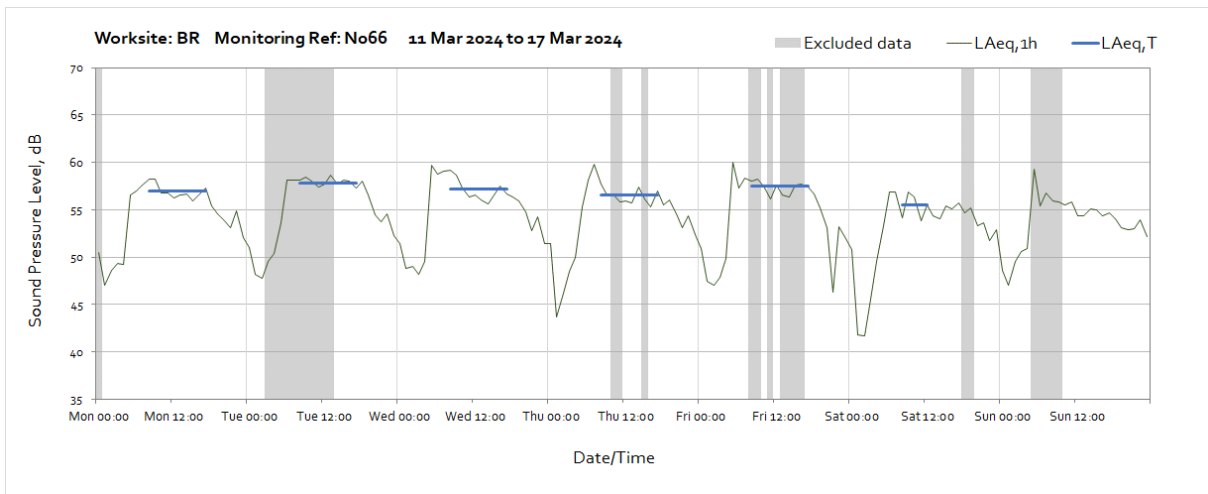
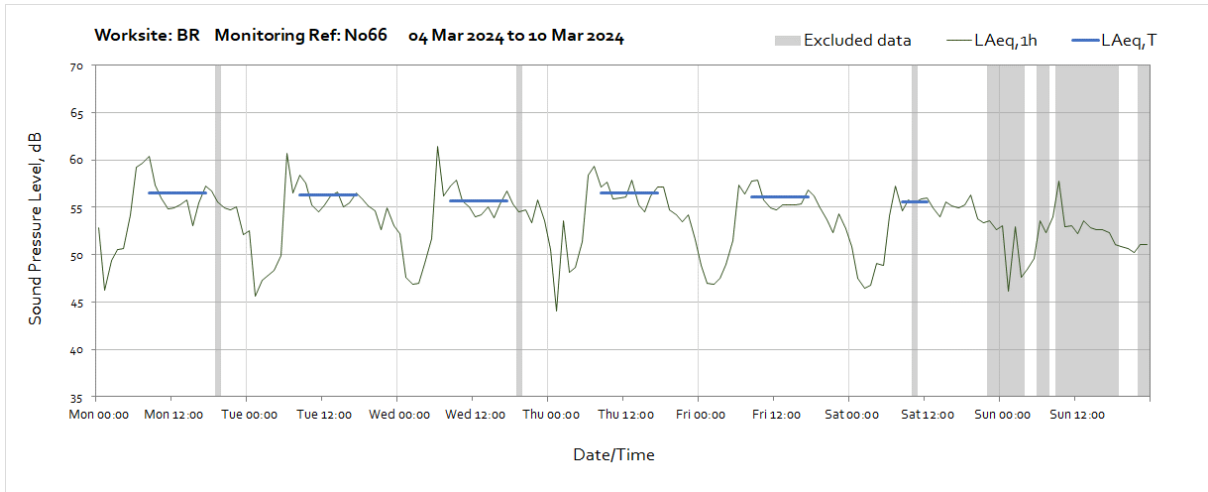
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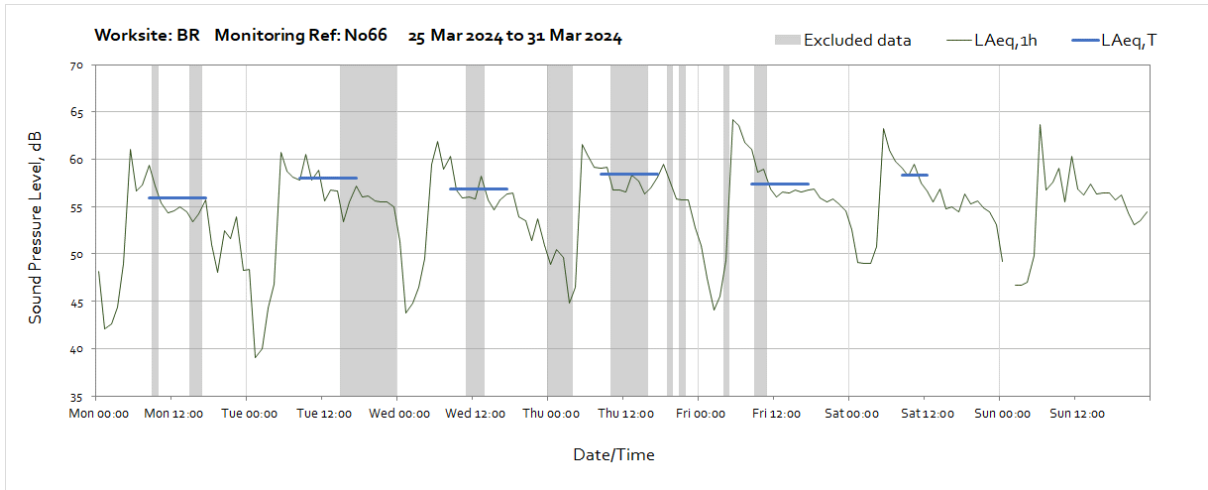


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: BR – Monitoring Ref: N066

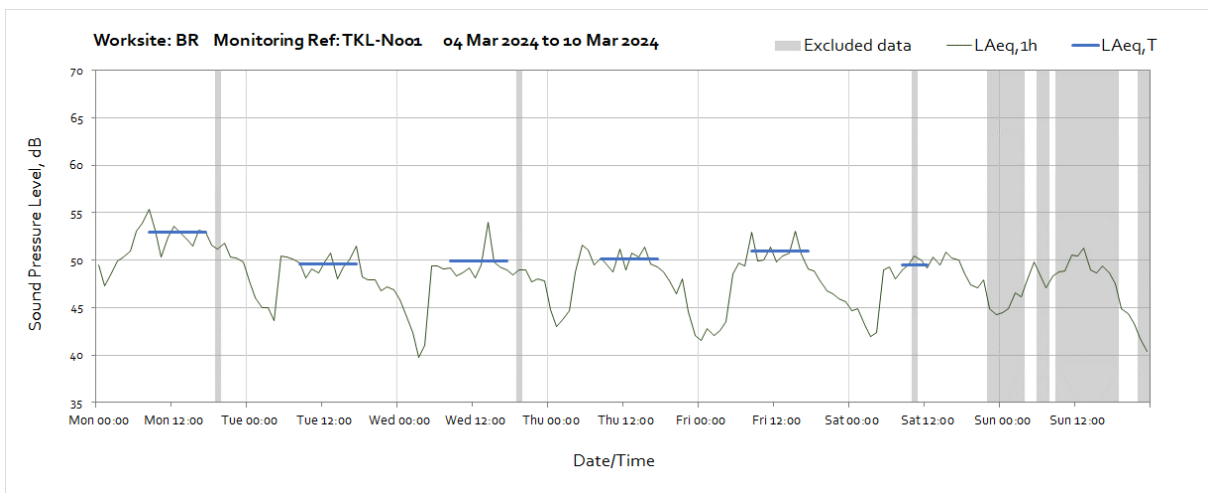
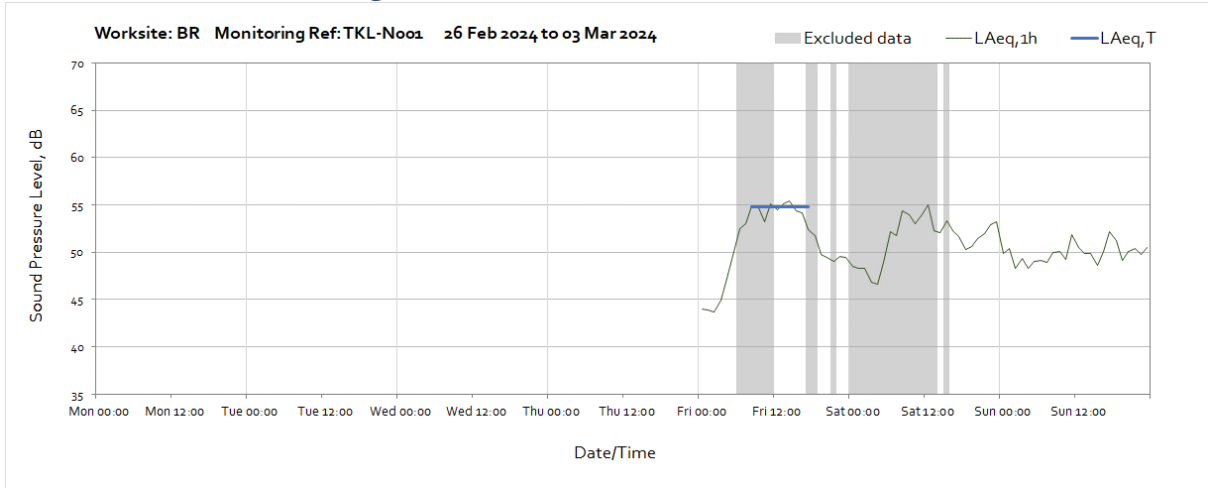


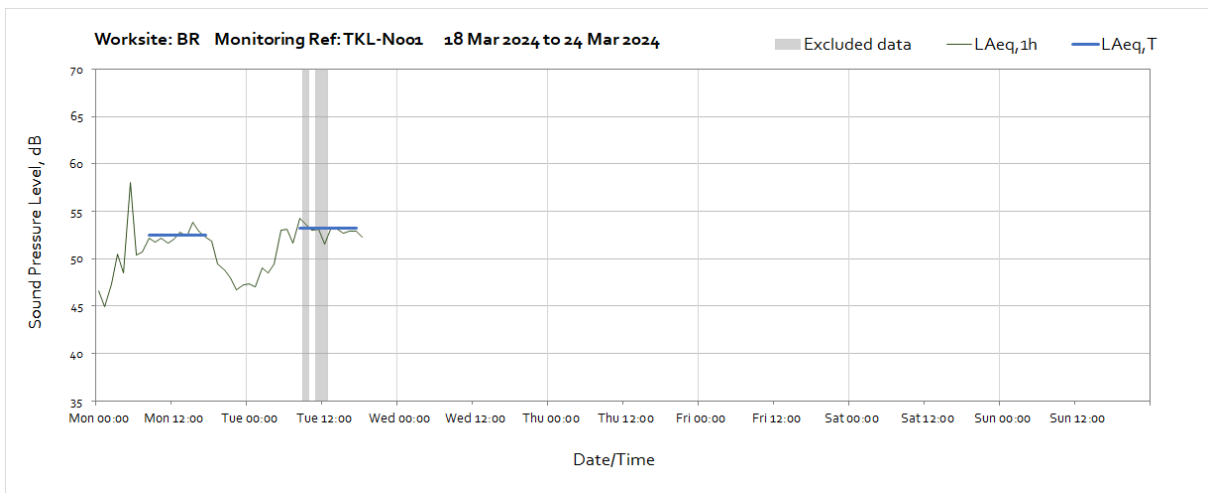
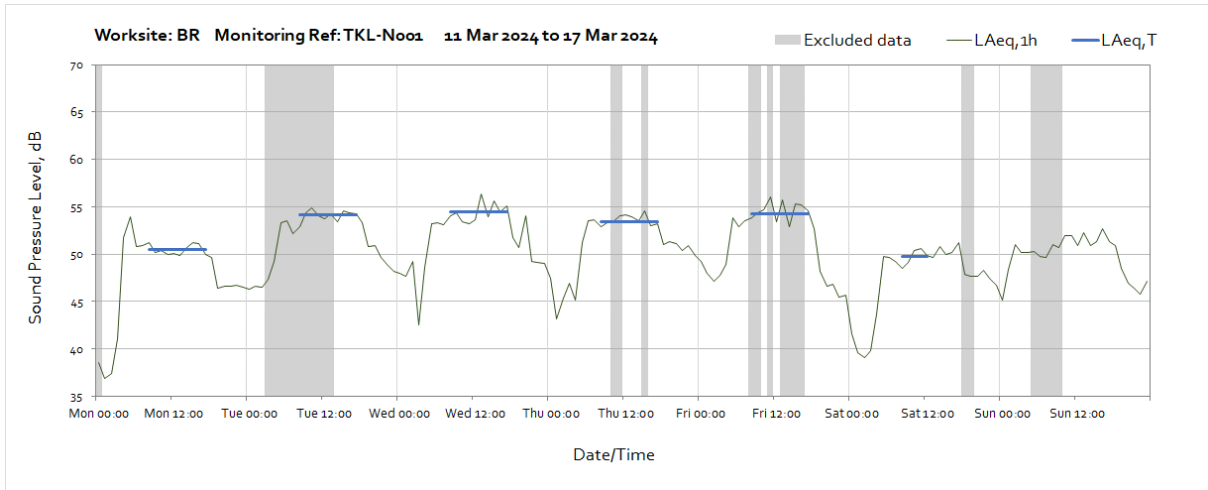




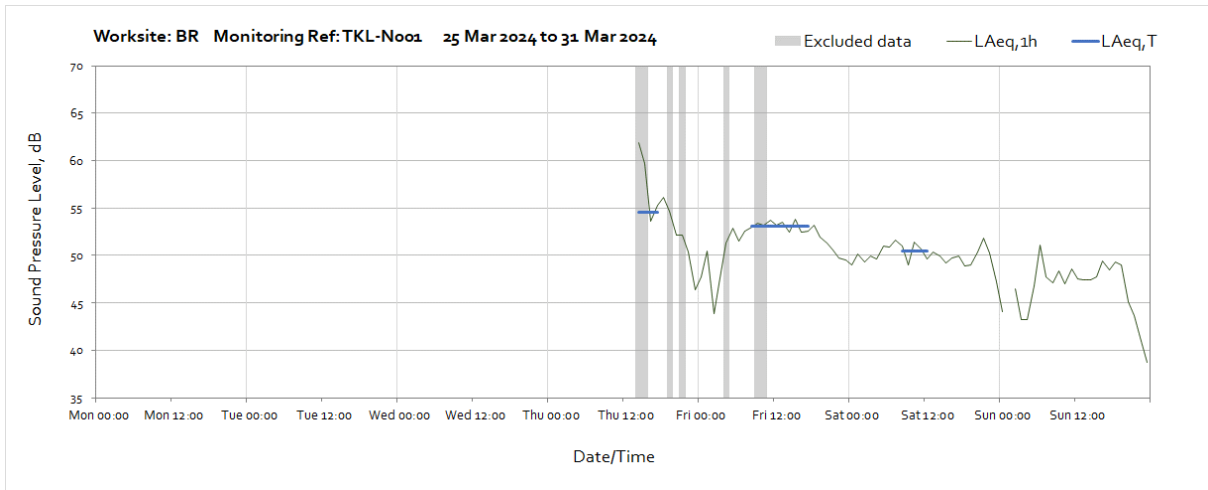
Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: BR – Monitoring Ref: TKL-N001





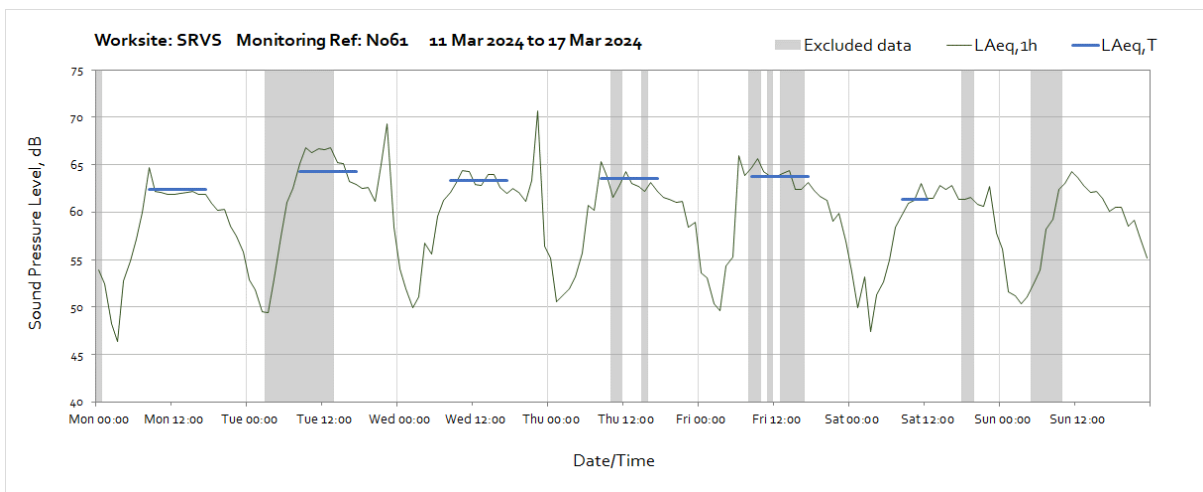
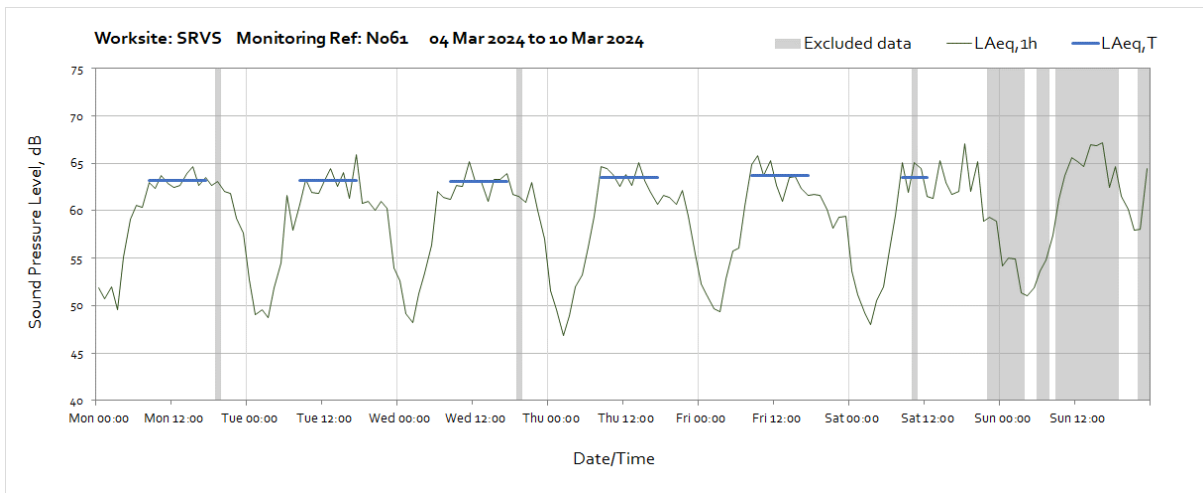
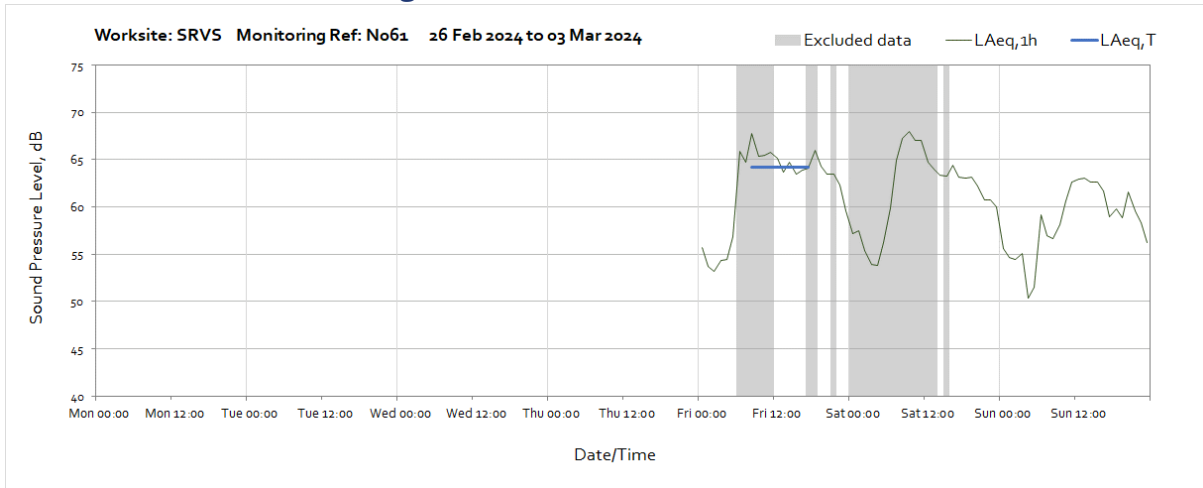
Note: Missing data between 19:00 on Tuesday 19th March and 14:00 on Thursday 28th March was due to faulty battery and power cables which were replaced.



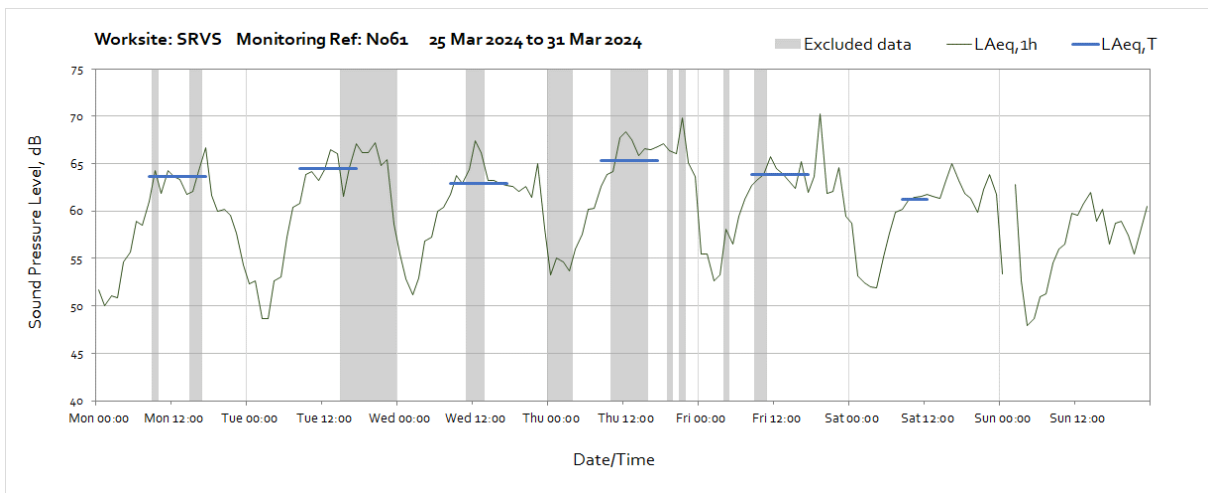
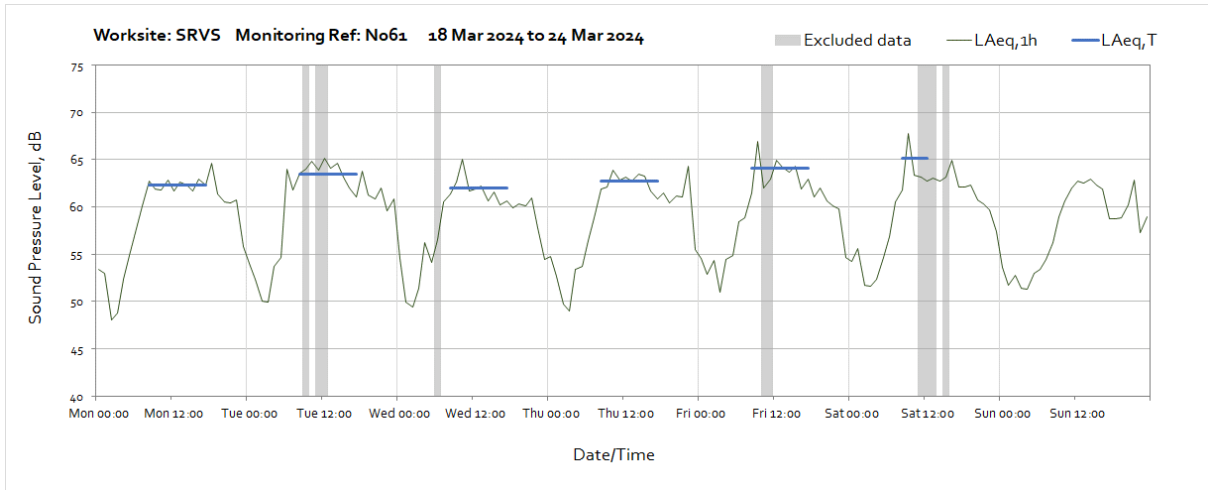
Note: Missing data between 19:00 on Tuesday 19th March and 14:00 on Thursday 28th March was due to faulty battery and power cables which were replaced. Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

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Worksite: SRVS – Monitoring Ref: N061

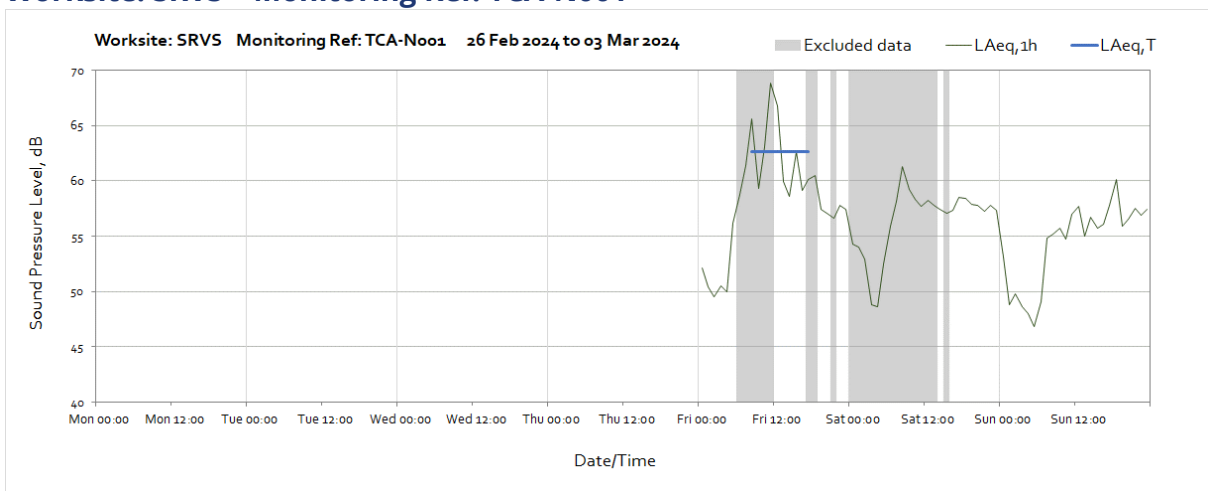


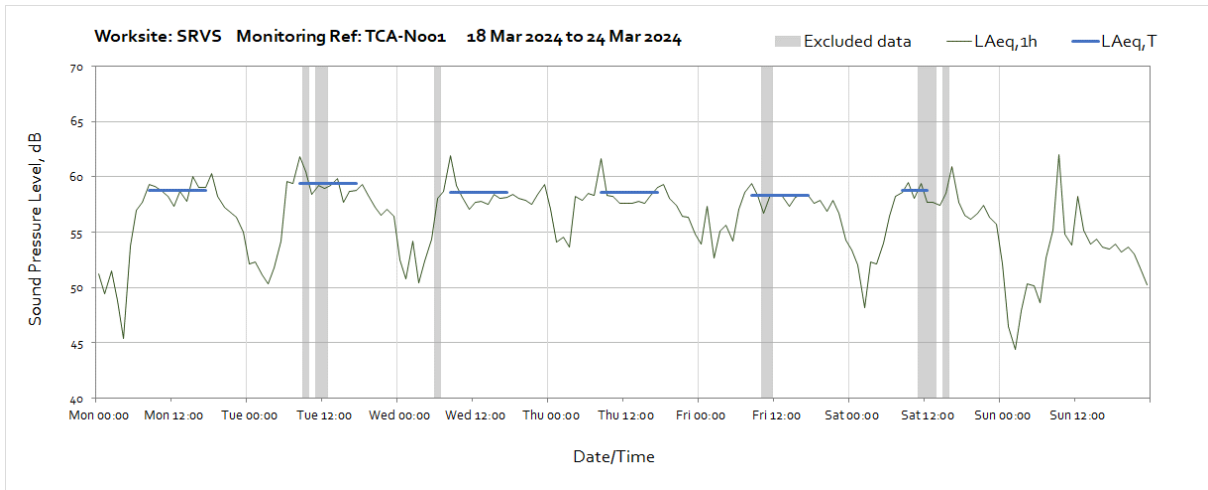
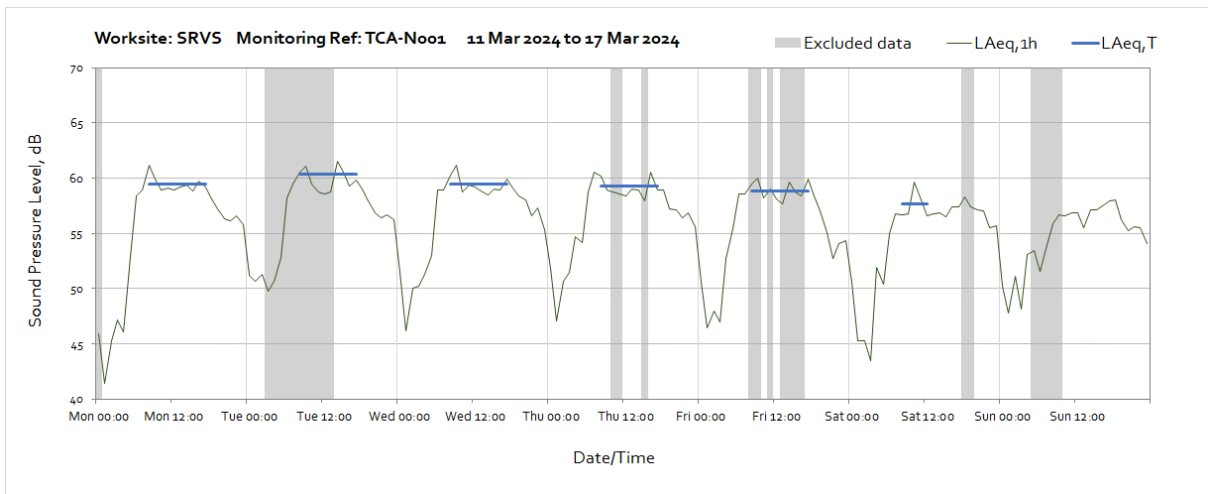
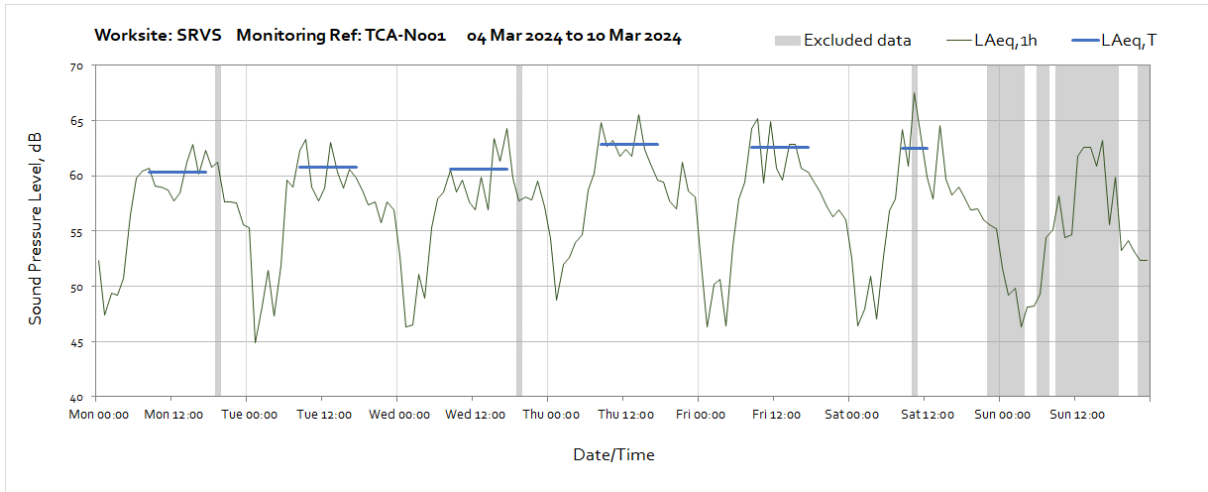
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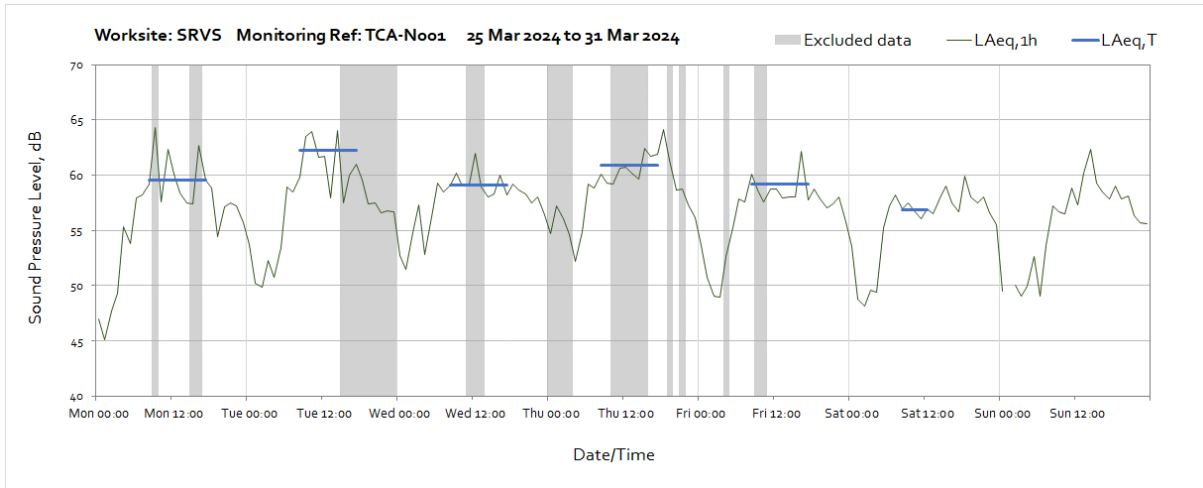


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: SRVS – Monitoring Ref: TCA-N001

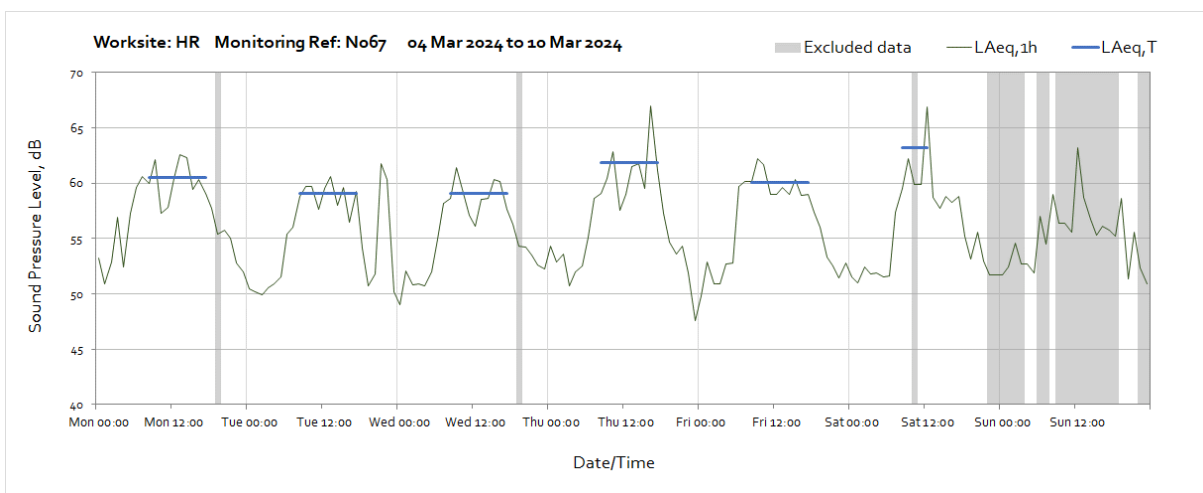
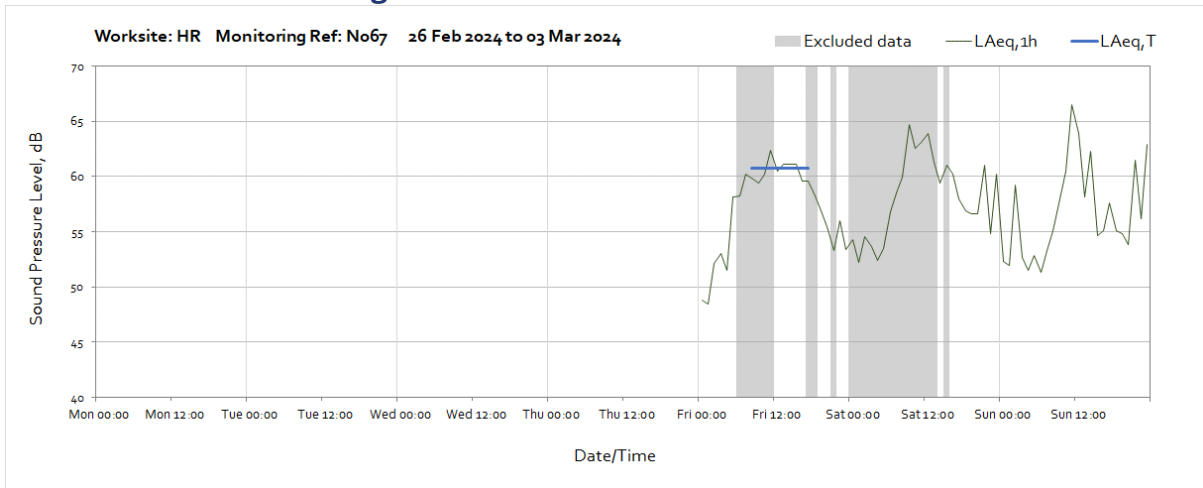


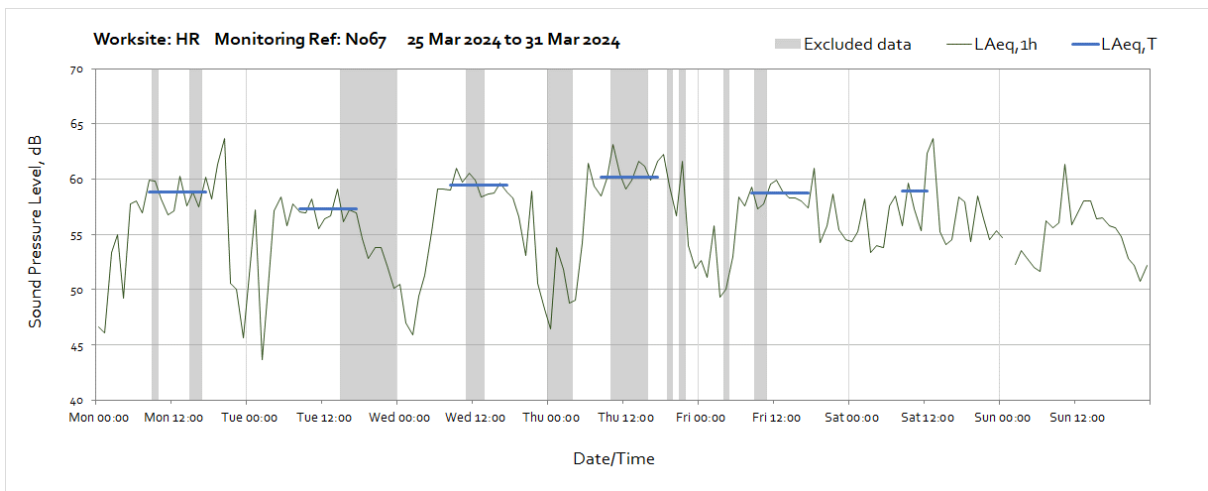
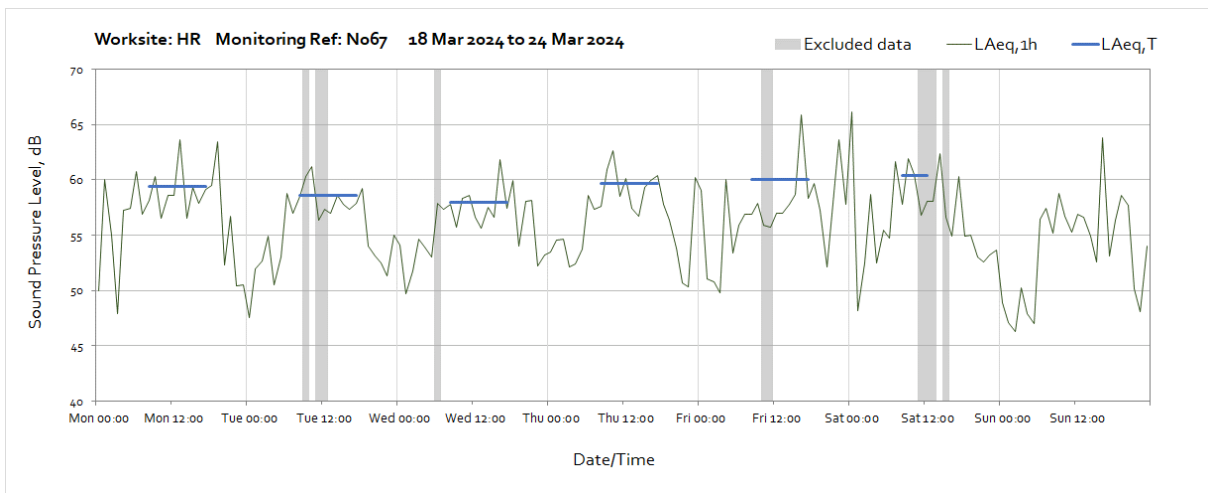
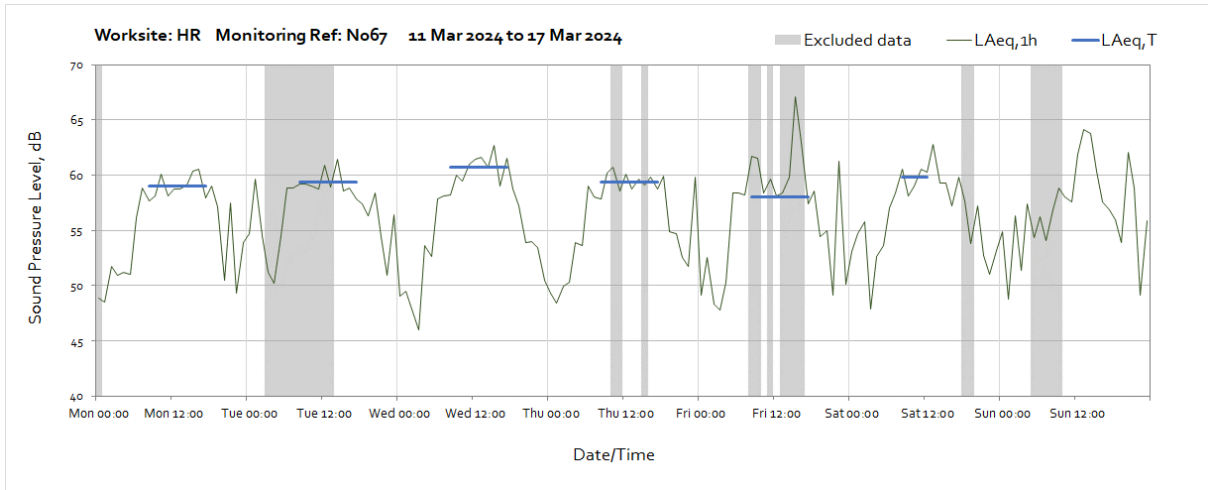




Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

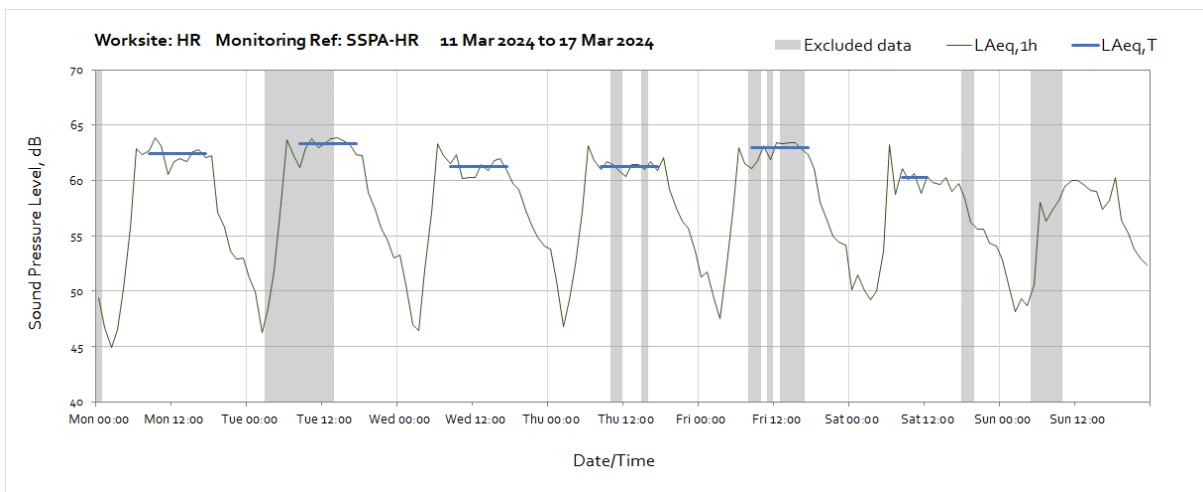
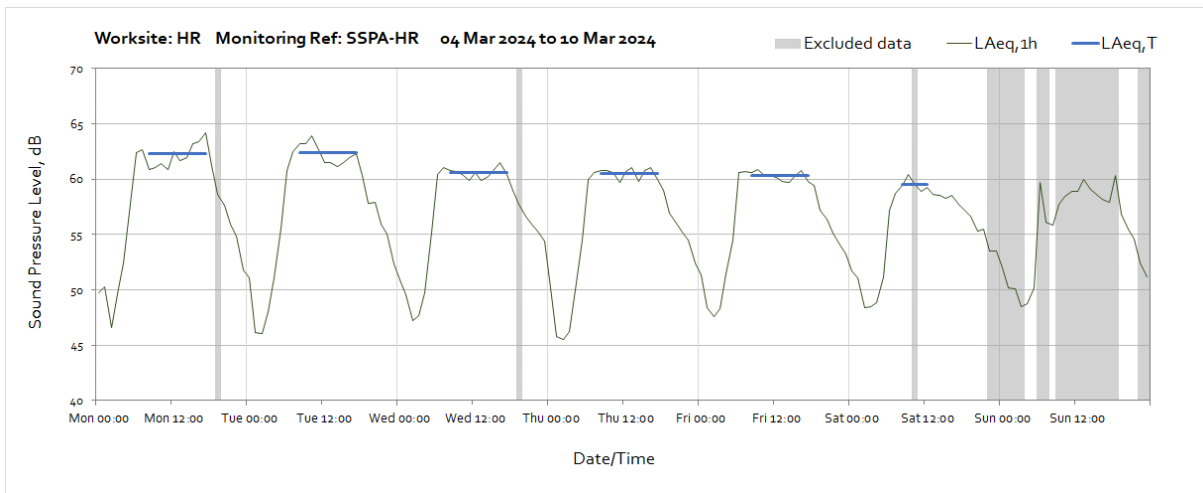
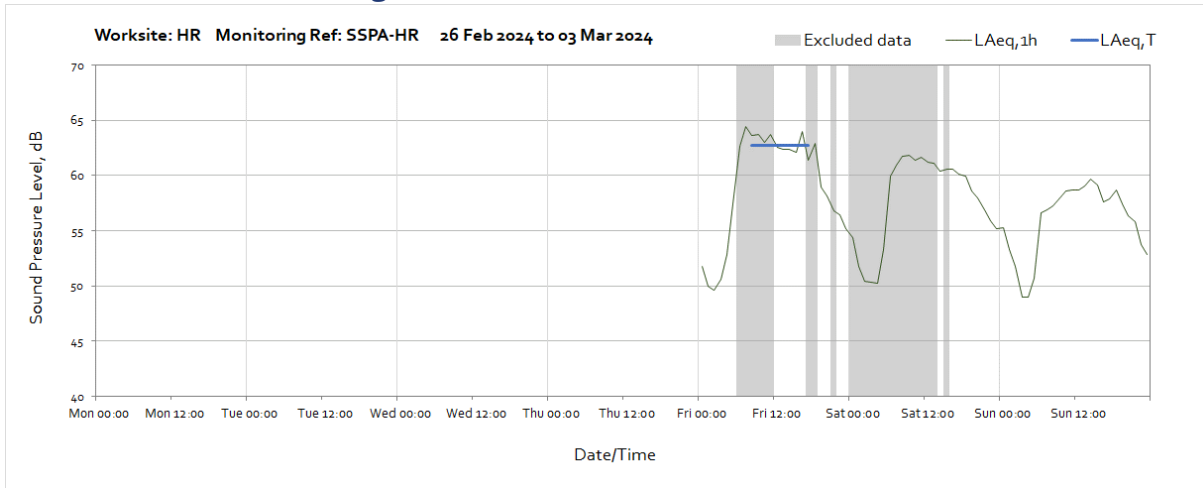
Worksite: HR - Monitoring Ref: N067



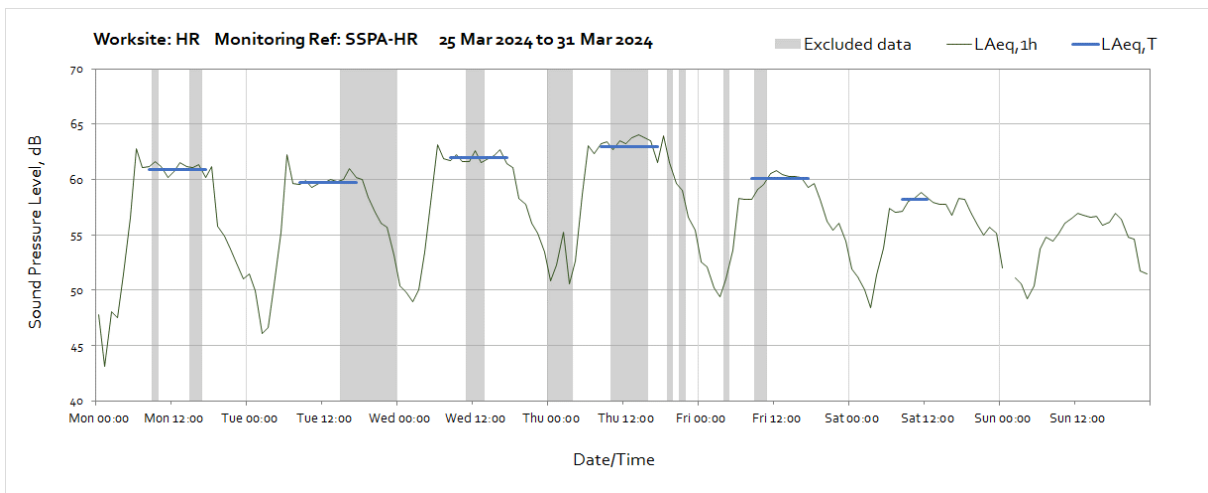
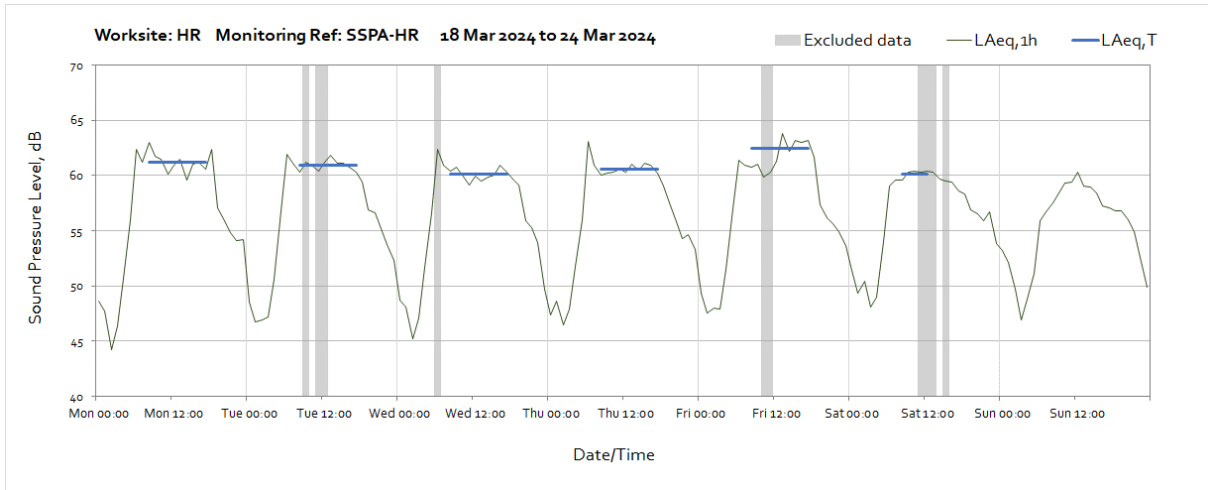


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: HR – Monitoring Ref: SSPA-HR

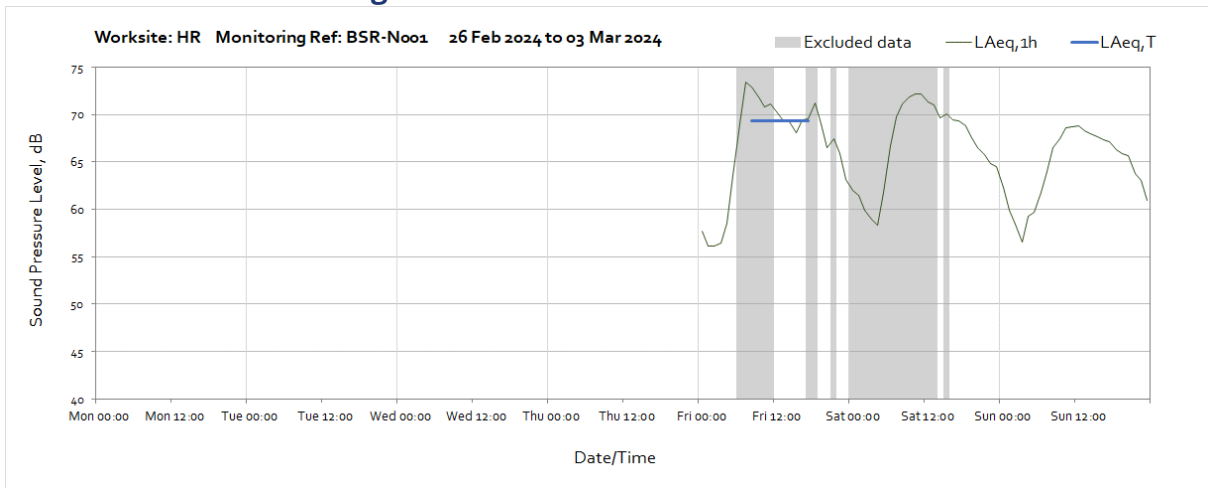


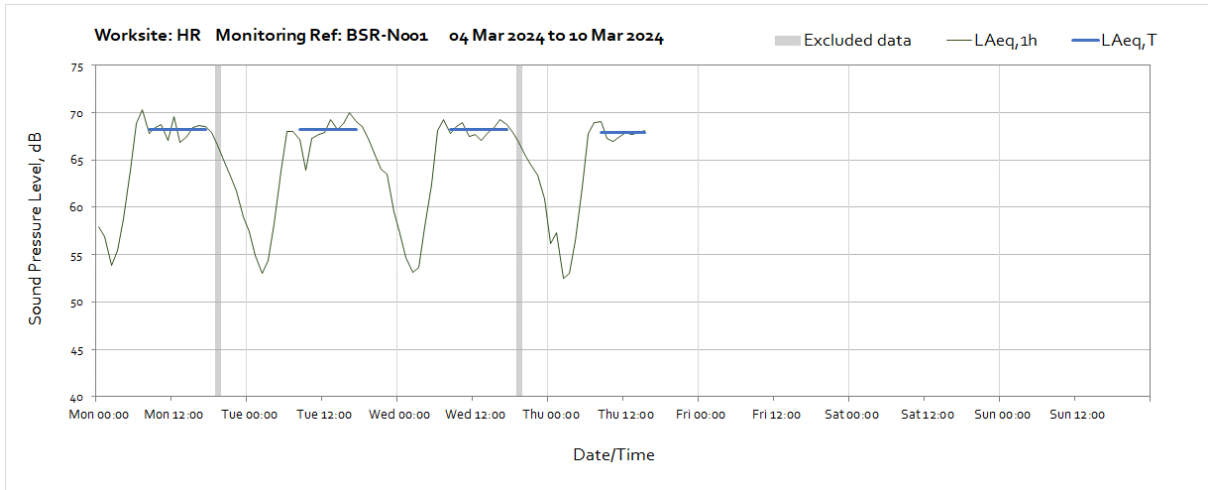
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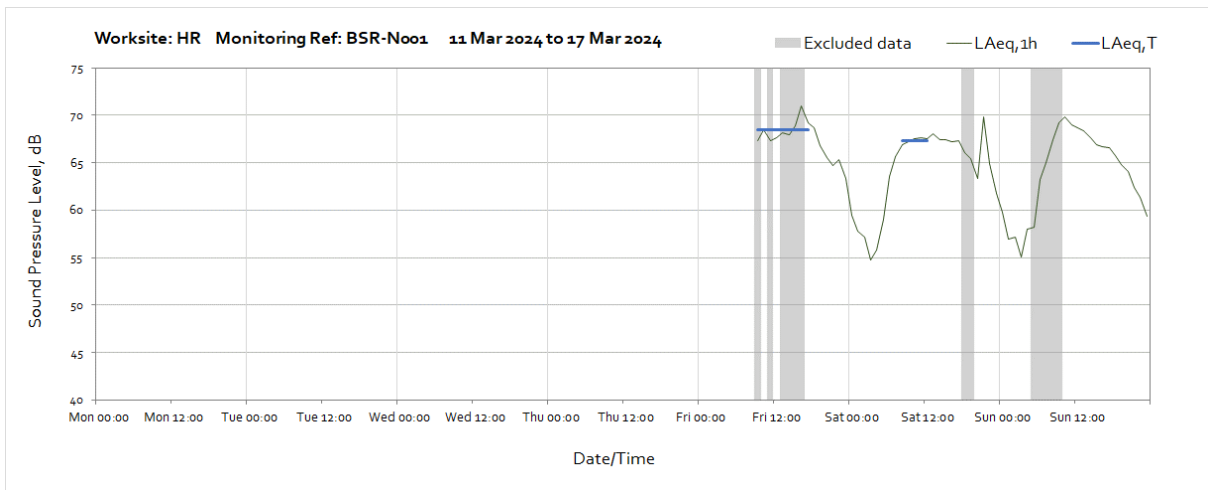
Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: HR - Monitoring Ref: BSR-N001

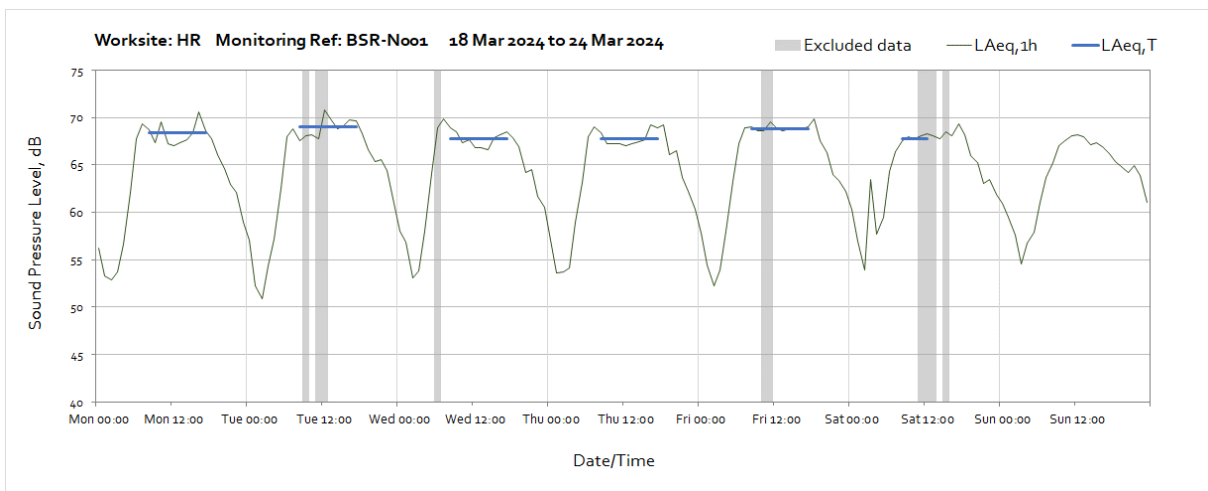


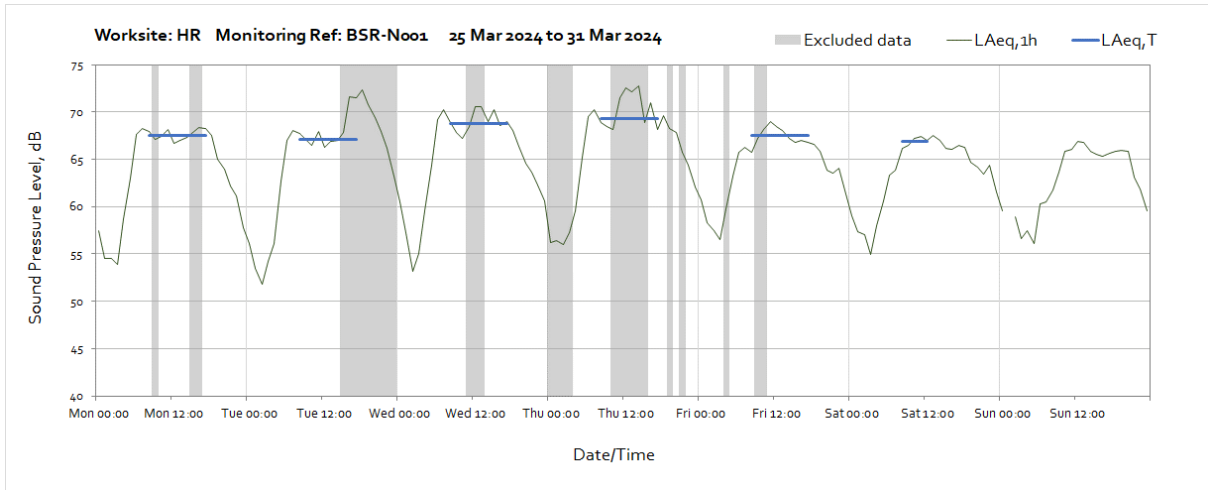


Note: Missing data between 16:00 on Thursday 7th March and 09:00 on Friday 15th March was due to depleted battery at the monitoring station.



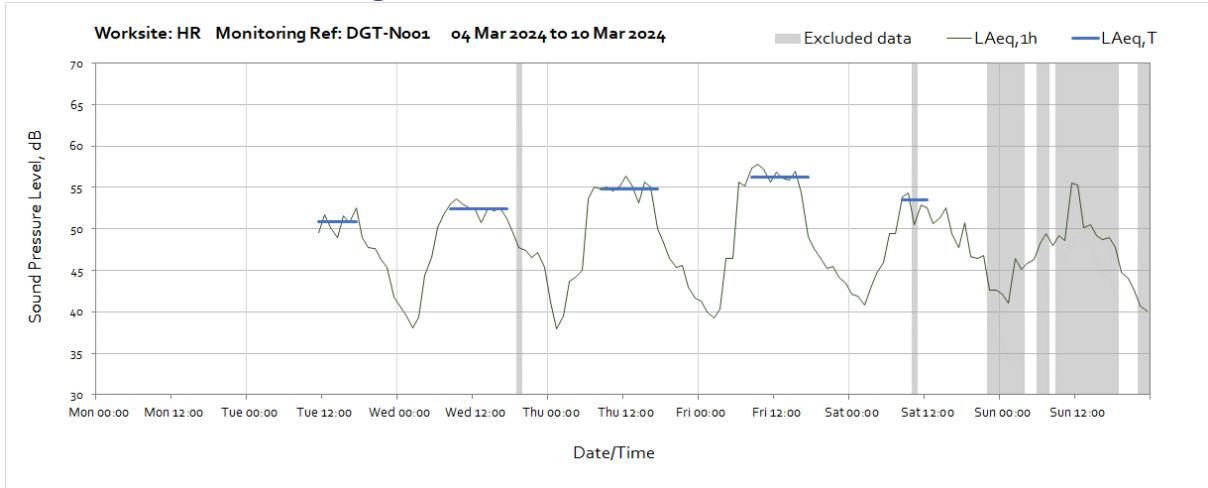
Note: Missing data between 16:00 on Thursday 7th March and 09:00 on Friday 15th March was due to depleted battery at the monitoring station.



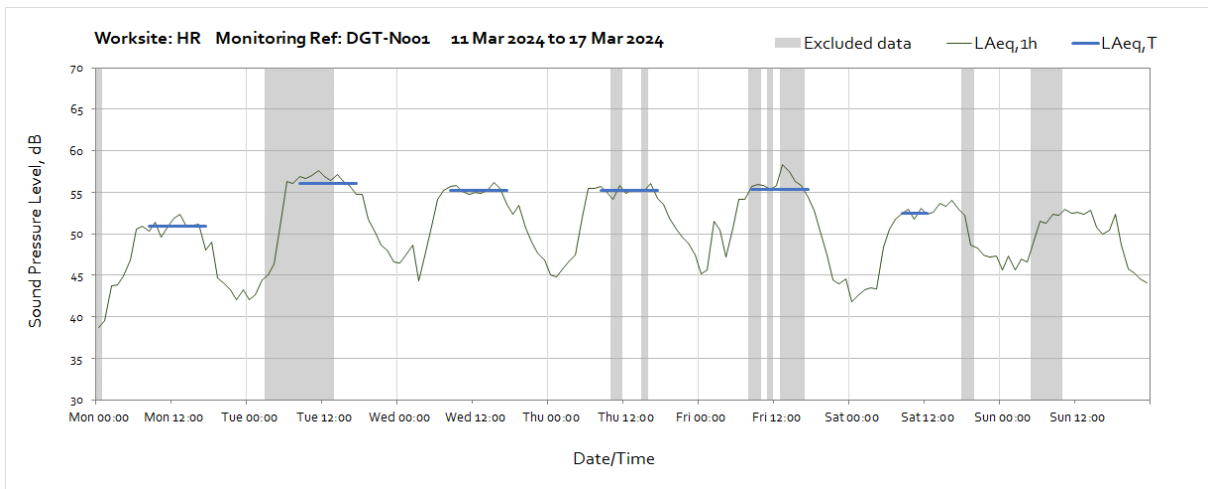


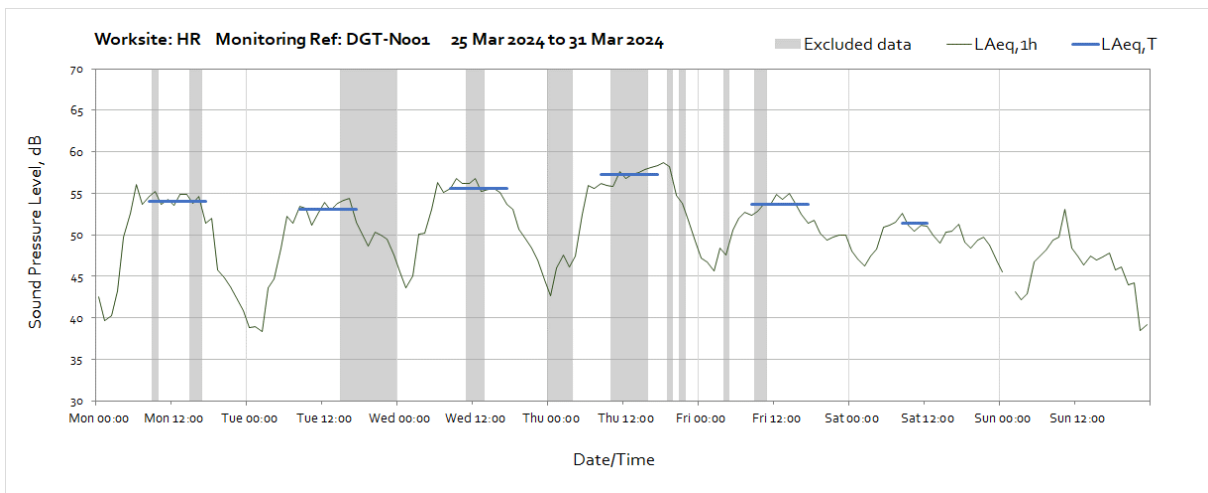
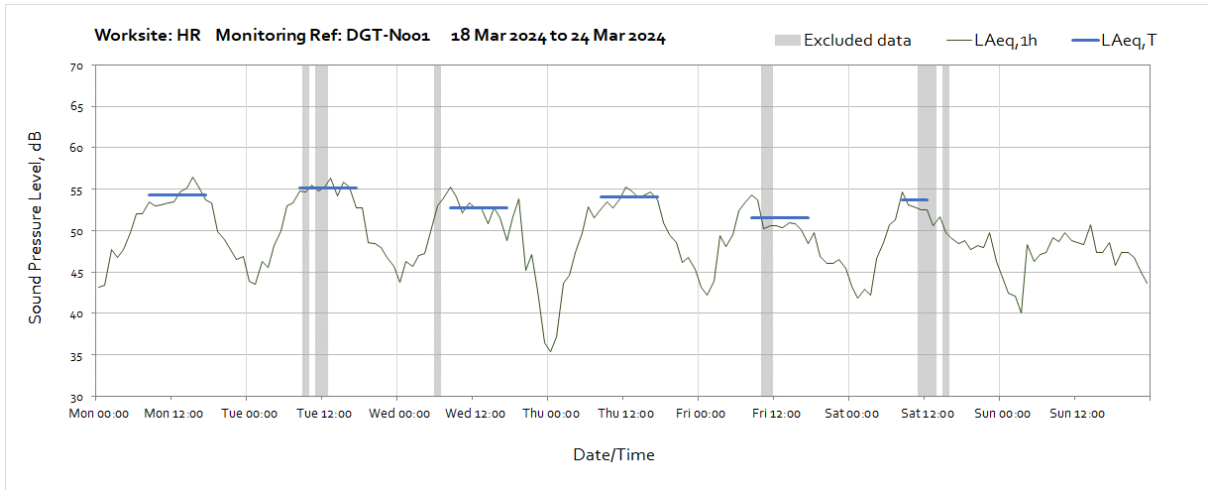
Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: HR - Monitoring Ref: DGT-N001



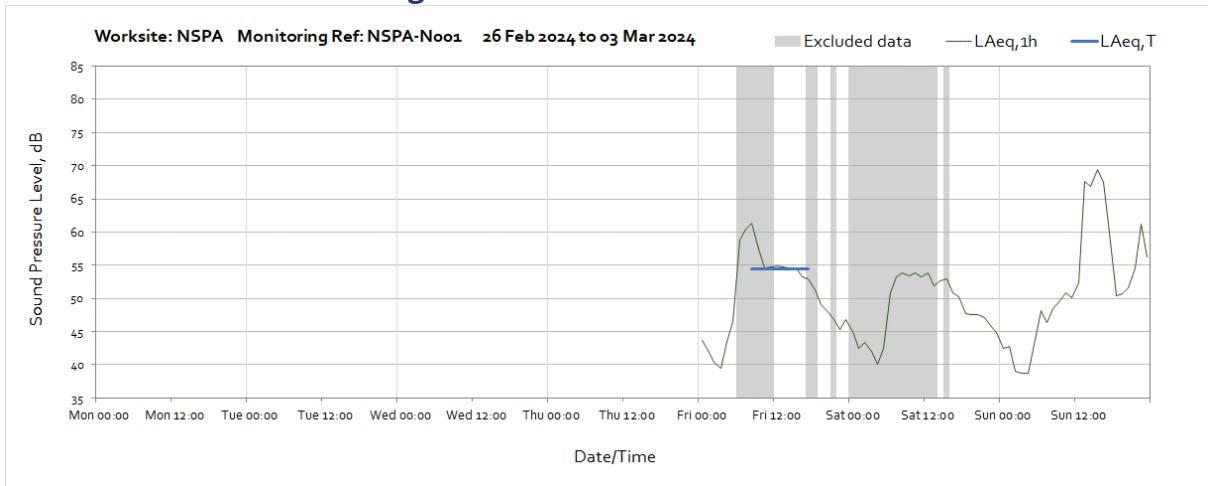
Note: Missing data between the beginning of the month and 11:00 on Tuesday 5th March was due to depleted battery at the monitoring station.

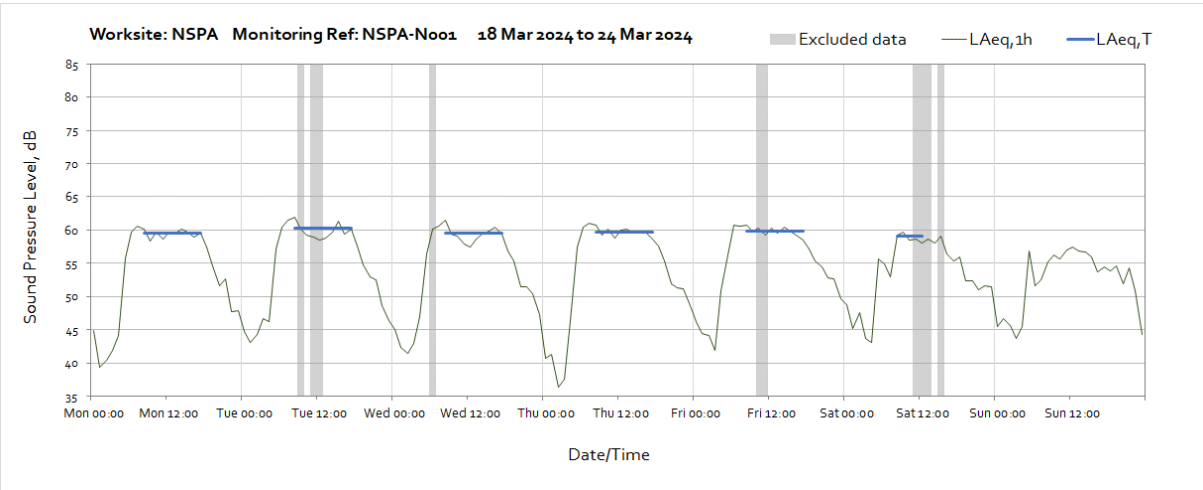
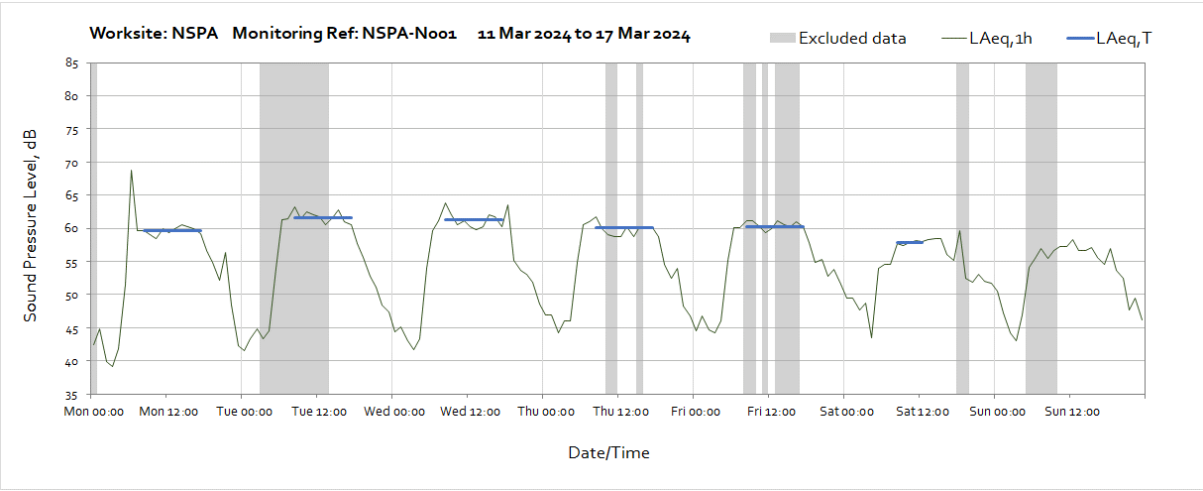
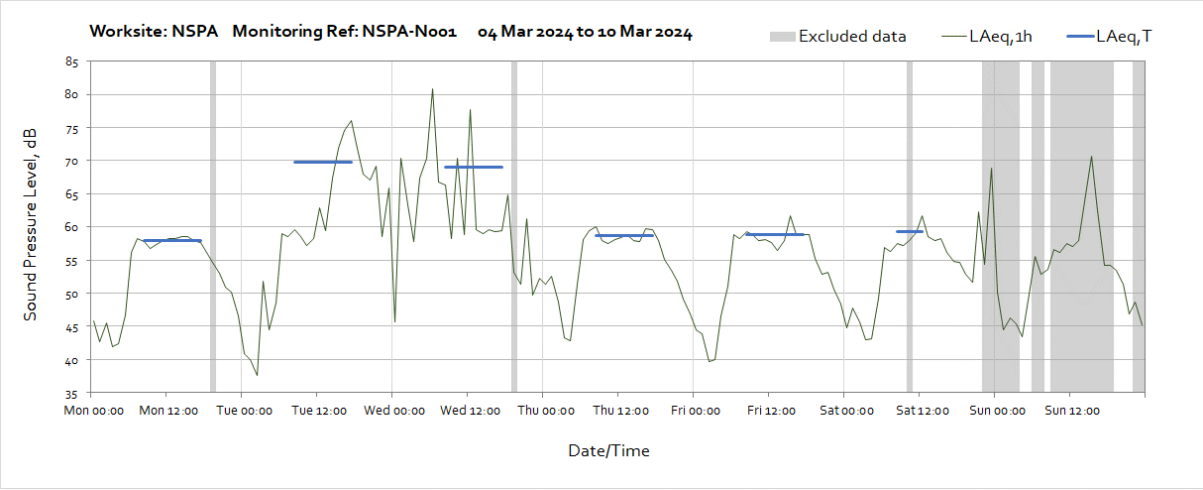


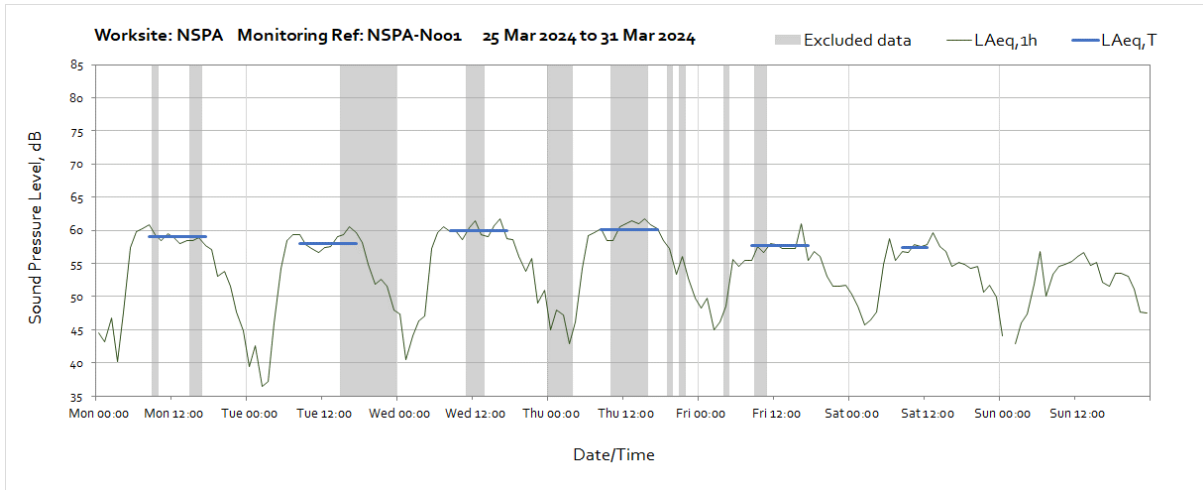


Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: NSPA – Monitoring Ref: NSPA-N001

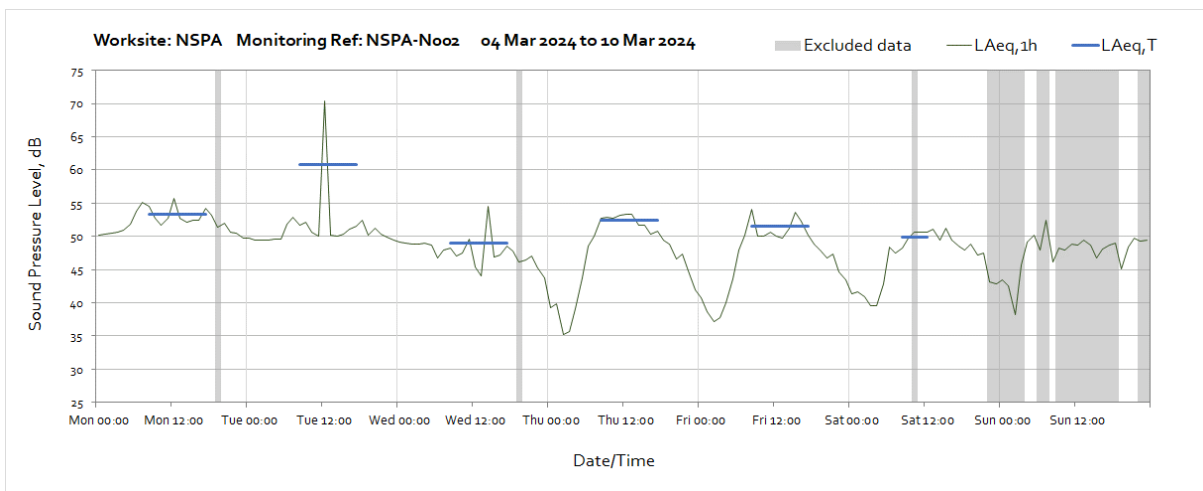
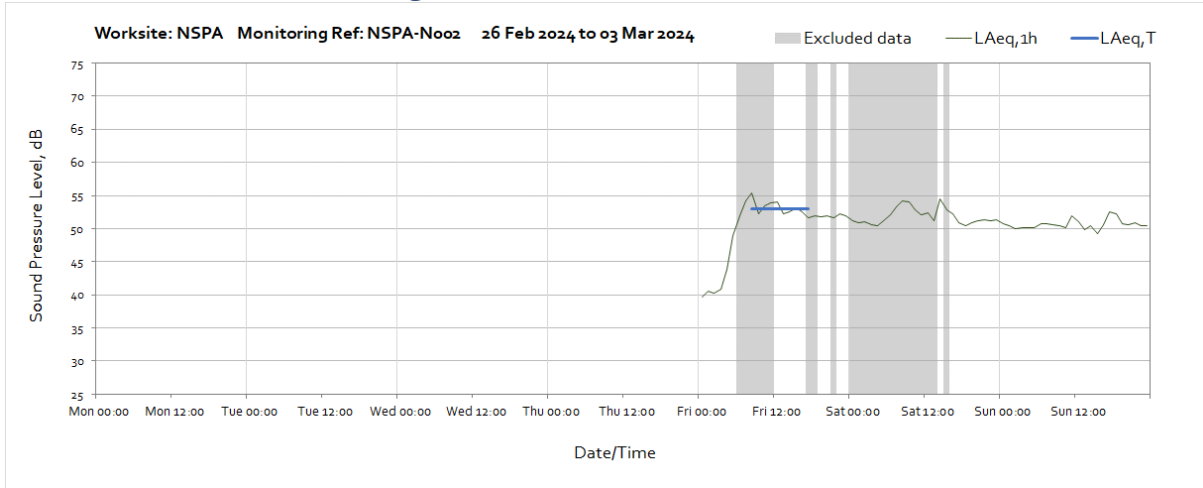


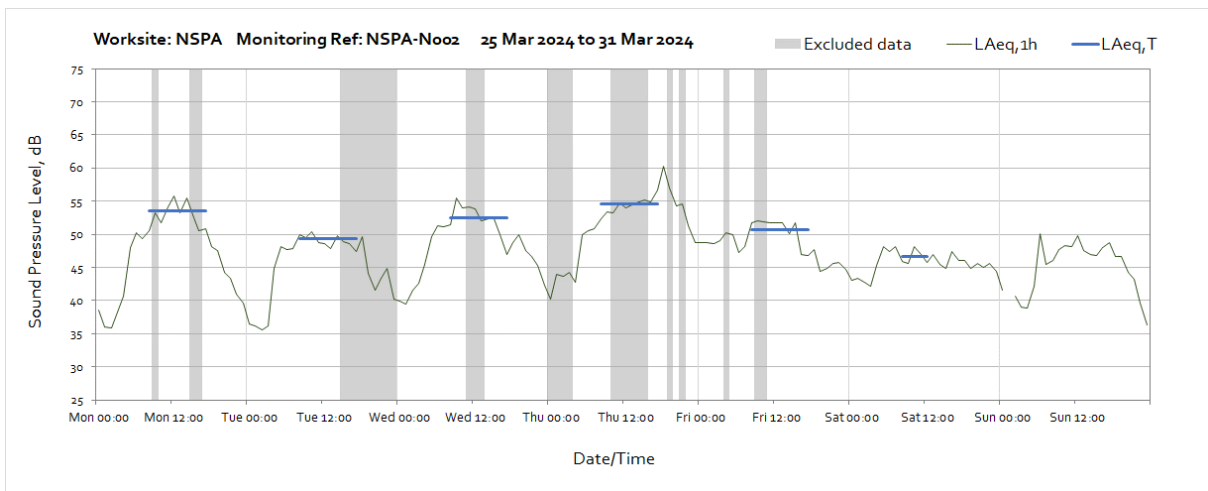
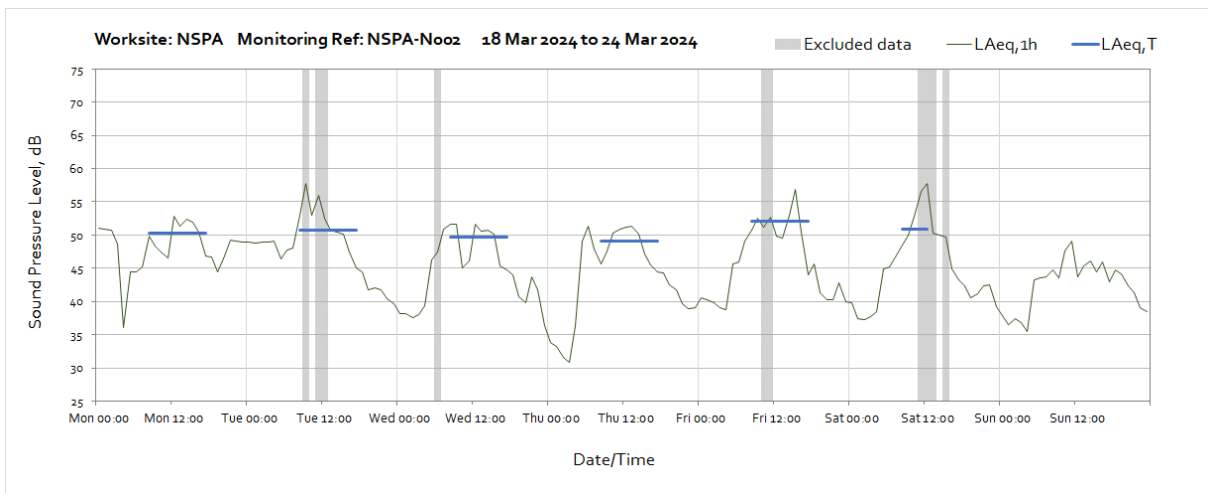
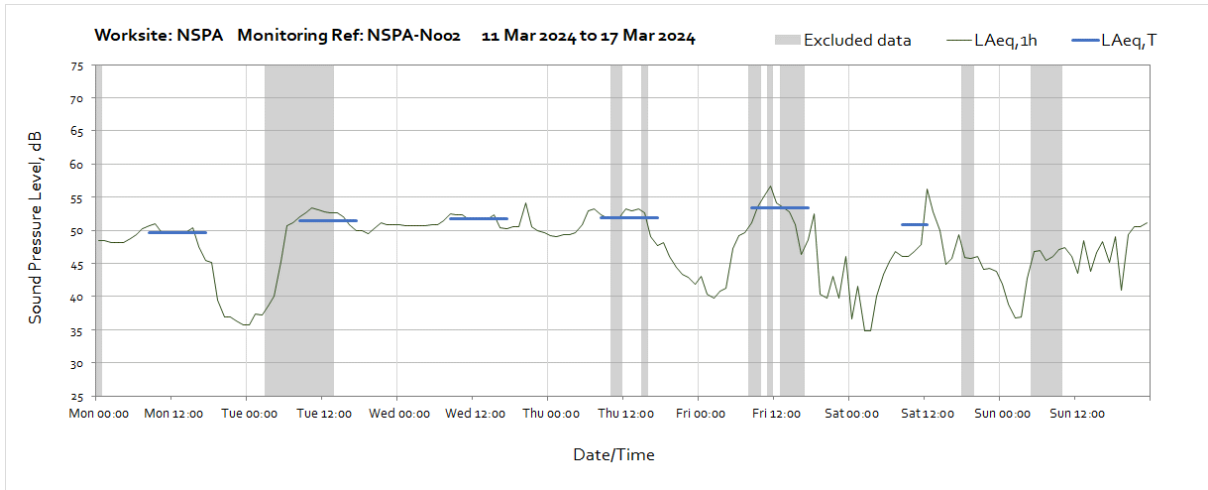




Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Worksite: NSPA – Monitoring Ref: NSPA-N002



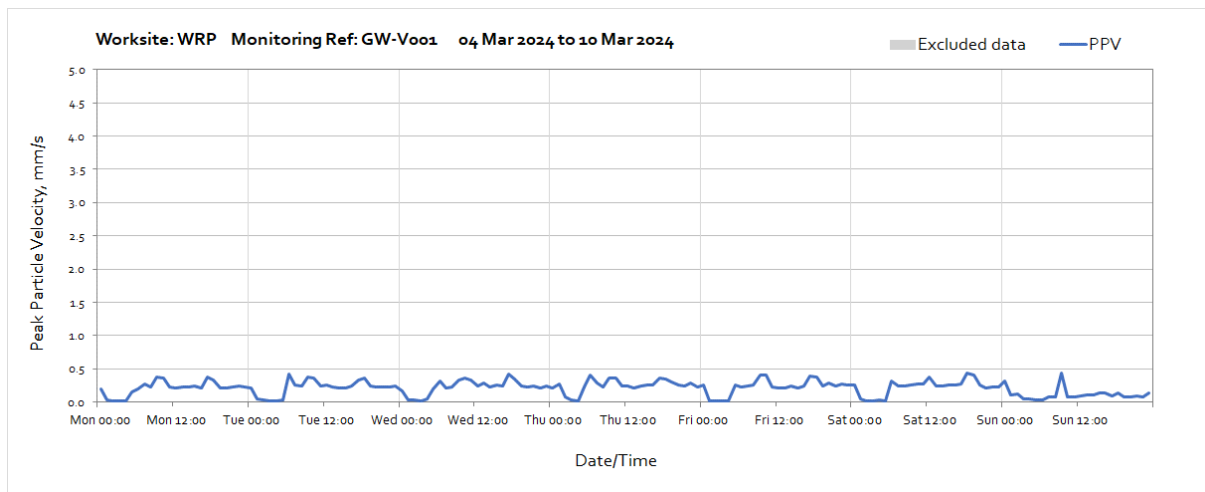
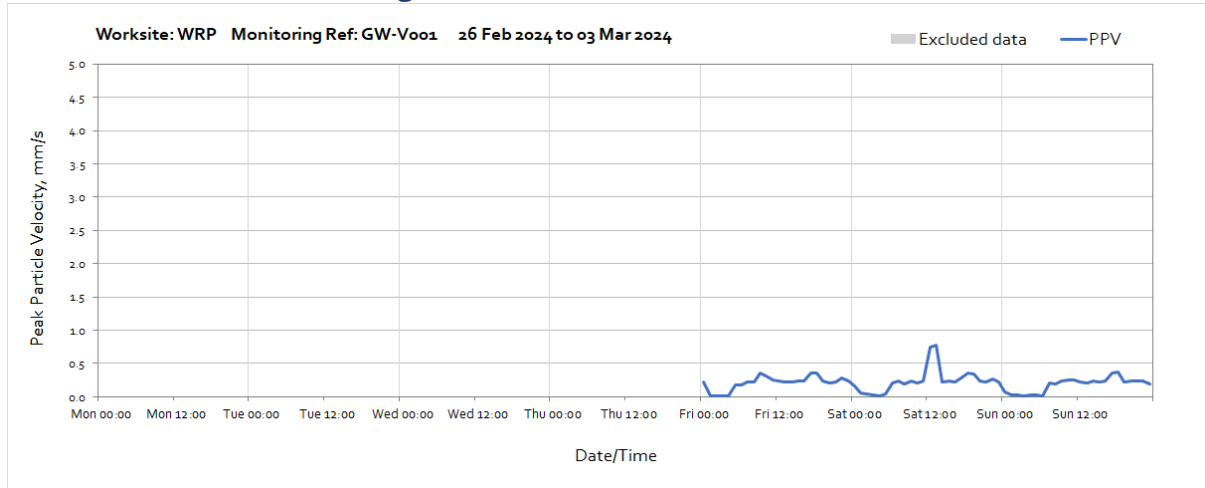


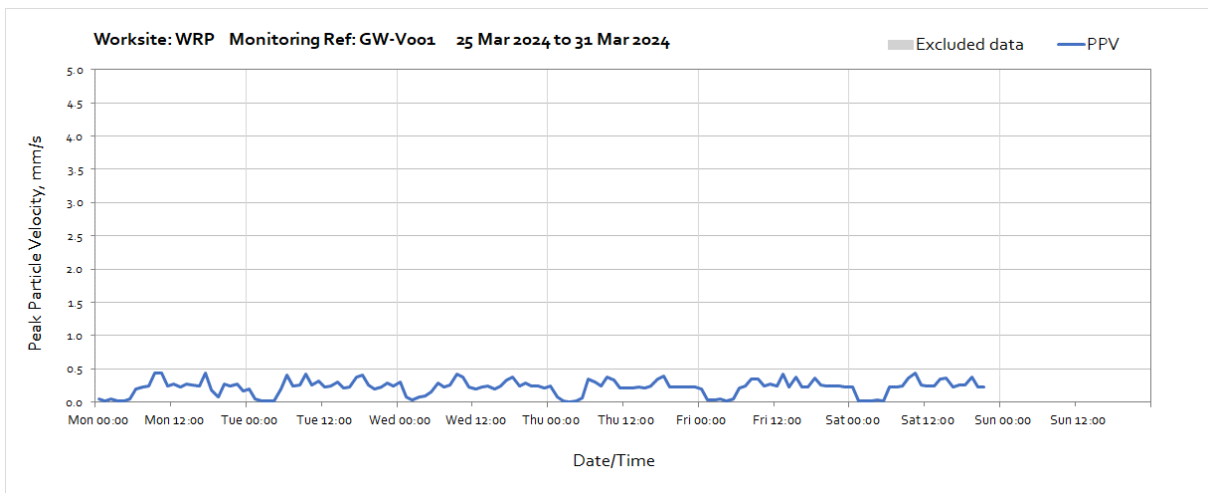
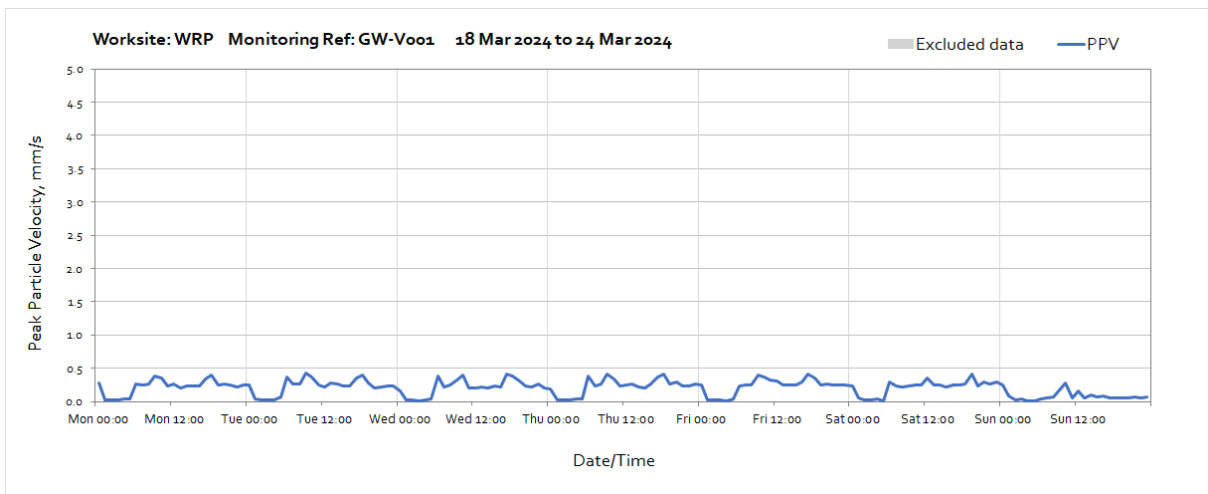
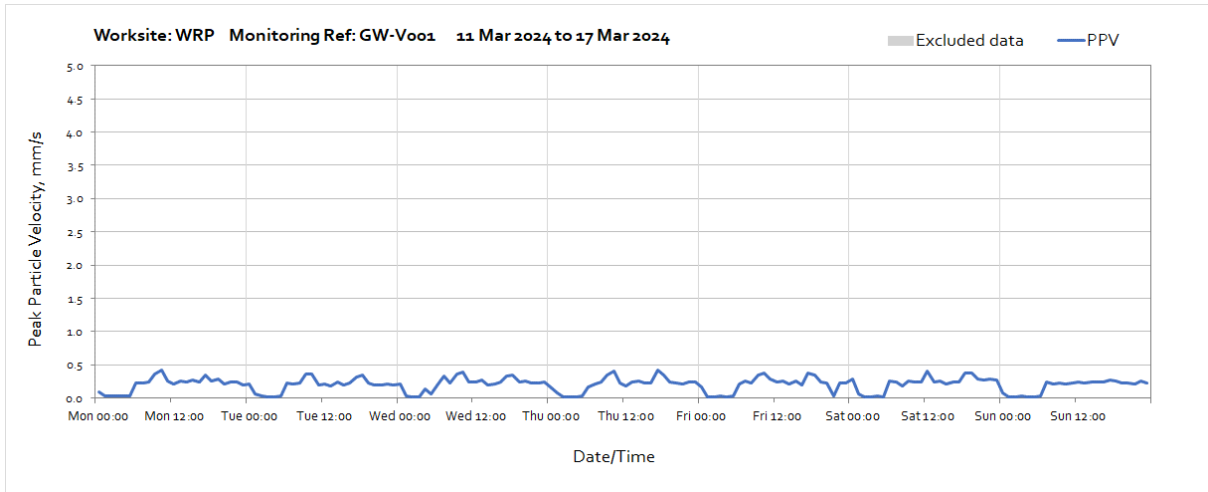
Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.

Vibration

The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axis x, y, and z. Periods where PPV values have been affected by local interference with the vibration monitor or only measured for part of the period, which are not representative of HS2 construction works, have been greyed out and excluded when calculating values in Table 4 of the main report.

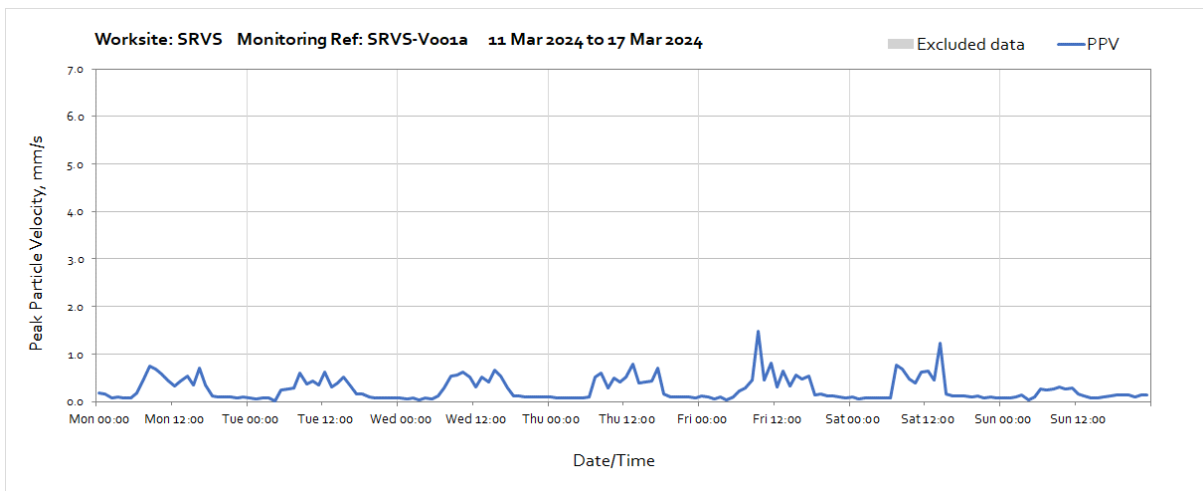
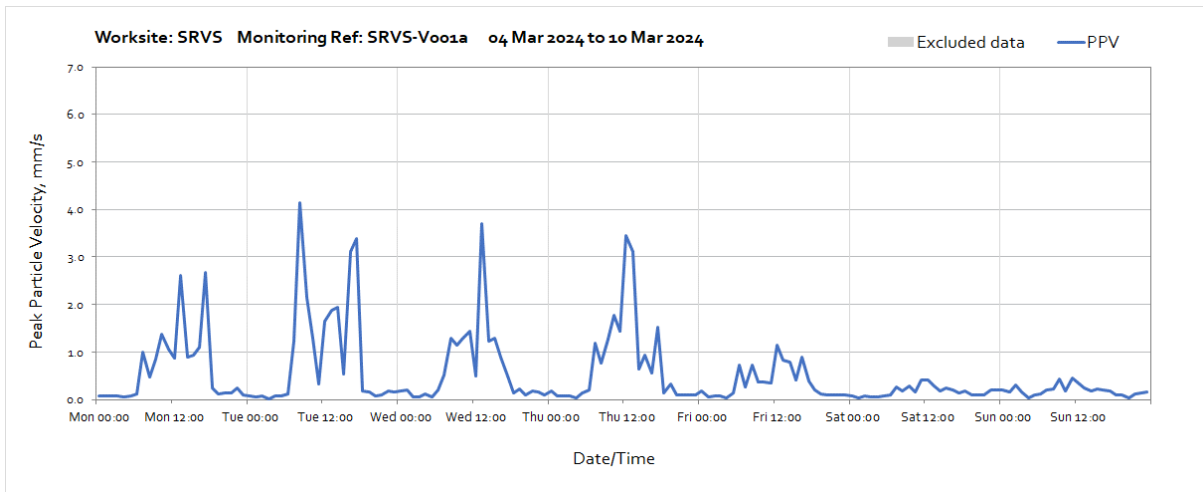
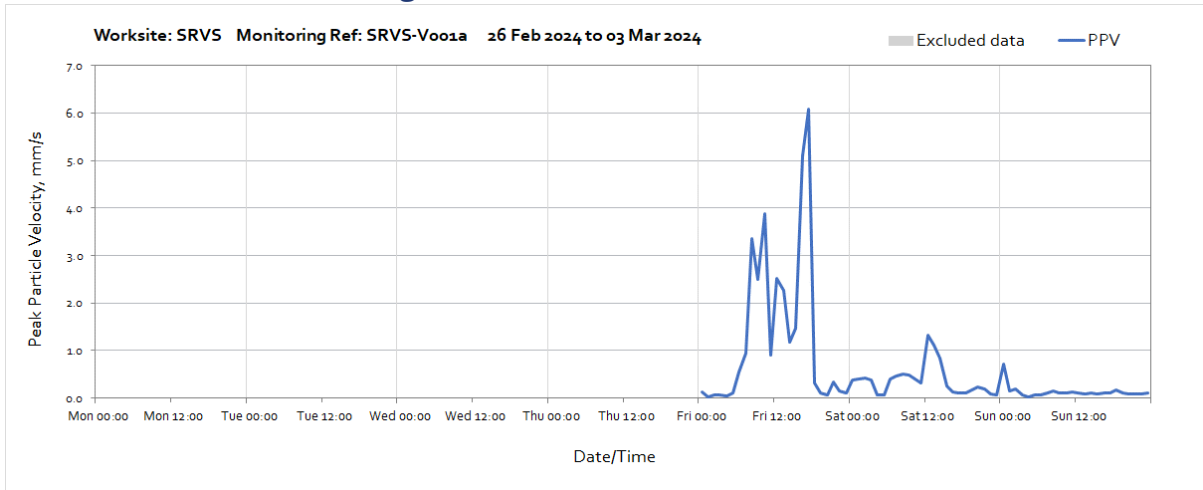
Worksite: WRP – Monitoring Ref: GW-V001



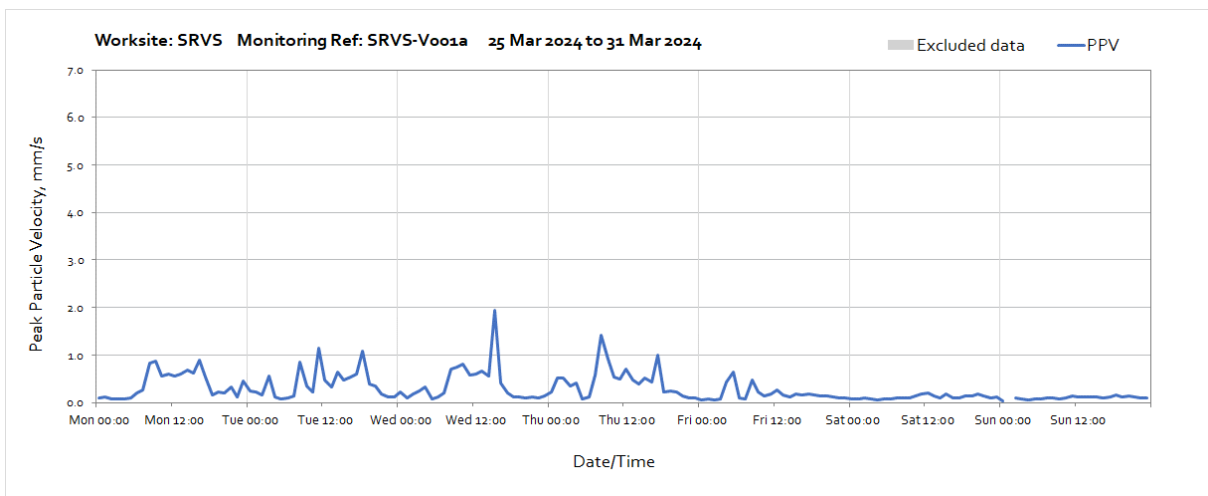
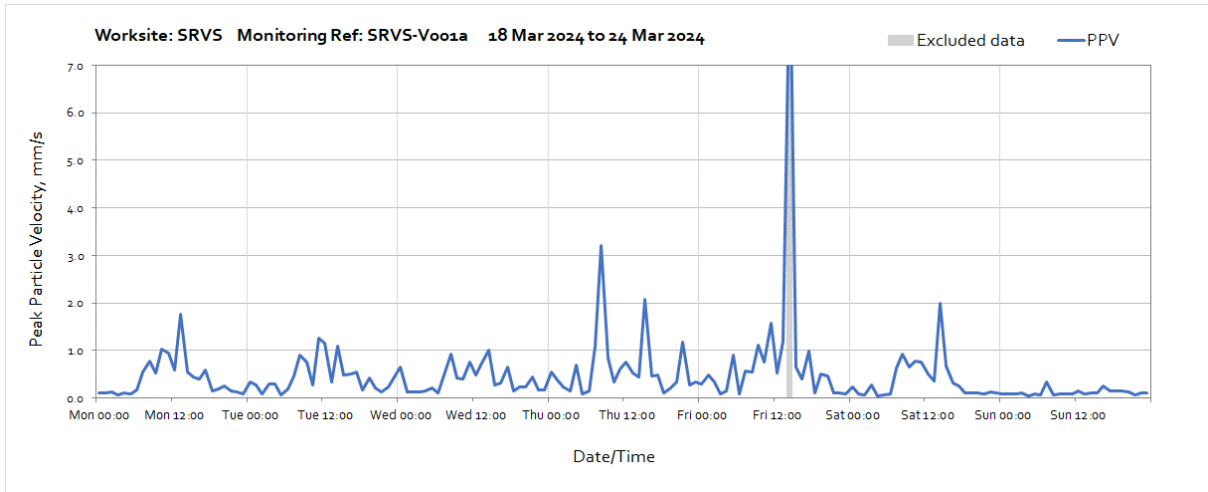


Note: Missing data between 22:00 on Saturday 30th March and the end of the month was due to depleted battery at the monitoring station.

Worksite: SRVS – Monitoring Ref: SRVS-V001a



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Note: Missing data between 01:00 and 02:00 on Sunday 31st March was due to a monitor time adjustment at the start of British Summer Time.