

Construction noise and vibration Monthly Report – November 2023

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 November 2023.

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, bulk earthworks fill, backfilling, tree removal, water pumping, installation of satellite welfare and generator farms, South Abutment works, stabilisation, drainage, piling platform construction, maintenance and operation of Grand Union Canal, fencing, environmental maintenance, stockpiling, river crossing works, launching girder, construction of scaffold bridge, deck and landscaping works were underway.
- West Ruislip Portal worksite (ref.: WRP) where construction of attenuation tanks, concrete system preparation works, wildlife habitat maintenance, Golf Course maintenance works, construction of storage area, mobilisation of piling equipment, delivery and storage operations, conveyor operations and train movements were underway.
- Breakspear Road worksite (ref.: BR), where geotechnical surveys, removal of concrete foundation, earthworks, drainage, piling platform preparation, construction of embankment retaining walls, mobilisation of piling equipment, lifting operations, crane removal, bridge surveys, scanning activities and conveyor operation were underway.
- South Ruislip Ventilation Shaft worksite (ref.: SRVS), where installation of secondary lining, steel fixing, tunnel boring machine intervention, road sweeping, excavations, breakdown works, adit maintenance, dewatering operations and general site management were underway.
- Harvil Road worksite (ref.: HR), where highway construction works, earthworks backfill, working platform preparations, borehole installation, tunnel boring machine material treatment, mound construction, conveyor and siltbuster operations, installation of bridge parapet and utility works were underway.
- Northern Sustainable Placement Area worksite (ref.: NSPA) where earthworks mound construction, vegetation clearance and general site maintenance were underway.

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

- Copthall North, where excavation works, material movement, construction of Copthall Tunnel, drainage, attenuation pond works, installation of utility infrastructure and highway construction 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 not exceeded during the reporting period.

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

Two (2) complaints were received during the monitoring period. A description of the complaints, the results of investigations and any actions taken are detailed in Table 7 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 30th November 2023.

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 fill, 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 works, including launching gantry, steel structure erection, post tensioning works, stressing, grouting and crane assembly and dismantling works.
- Deck works, including preparation and operation of storage yards, installation of access provision, traffic management, installation of parapets, noise barriers, troughs, pipes, steel works, installation of stairs, support plant, construction of kerbs and concrete stitch, filling of voids, waterproofing, diaphragm walls, concrete works, drainage and steel works.
- Landscaping works, including removal of cofferdams, earthworks, ground profiling and cut, ground drainage, soil placement, tree removal 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 tank.
 - Concrete system preparation works.
 - Wildlife habitat maintenance.
 - Golf Course maintenance works including vegetation clearance, tree pruning and reinstatement of archaeological areas.
 - Construction of storage area.
 - Mobilisation of piling equipment.
 - 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:
 - Geotechnical surveys.
 - Partial removal of concrete foundation.
 - Earthworks including tunnel boring machine material storage and drainage works.
 - Piling platform preparation.
 - Construction of embankment retaining walls including excavation and concreting works.
 - Mobilisation of piling equipment.
 - Lifting operations.
 - Crane removal.
 - Bridge surveys.
 - Scanning activities.
 - Conveyor operation.
- South Ruislip Ventilation Shaft worksite, ref.: SRVS (see Plan 4 in Appendix A), where work activities included:
 - Installation of secondary lining including striking.
 - Steel fixing.
 - Tunnel boring machine intervention.
 - Road sweeping.
 - Excavations.
 - Breakdown works.
 - Adit maintenance.
 - Dewatering operations.
 - General site management, including site security.
- Harvil Road worksite, ref.: HR (see Plan 2 in Appendix A), where work activities included:
 - Highway construction works.
 - Earthworks backfill.

- Working platform preparation.
- Borehole installation.
- Tunnel boring machine material treatment.
- Mound construction including placement and compaction of materials.
- Conveyor operation.
- Siltbuster operations including maintenance and drainage works.
- Installation of bridge parapet.
- Utility works.
- Northern Sustainable Placement Area worksite, ref.: NSPA (see Plan 3 in Appendix A), where work activities included:
 - Earthworks mound construction including grass seeding, landscaping, vegetation clearance and siltbuster operation.
 - General site maintenance.

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

- Copthall North, where excavation works, material movement, construction of Copthall Tunnel, drainage, attenuation pond works, installation of utility infrastructure and highway construction works 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 Eighteen (18) noise and two (2) vibration monitoring installations were active in November in the LBH area. Table 2 summarises the position of noise and vibration monitoring installations within the LBH area in November 2023.

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
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	55.4 (57.5)	63.7 (70.4)	54.8 (57.7)	48.9 (57.1)	49.2 (60.4)	54.1 (55.3)	60.7 (63.9)	53.6 (56.8)	52.5 (68.3)	46.0 (52.3)	52.1 (55.9)	50.1 (58.6)
	HFM-NMP	Harefield Marina, Moorhall Road, London	Free-field	52.7 (55.5)	58.2 (71.6)	50.3 (52.9)	48.4 (52.7)	45.6 (53.4)	50.4 (52.7)	50.2 (51.7)	49.4 (51.4)	54.9 (69.3)	44.5 (55.2)	52.1 (63.2)	46.6 (52.6)
	PLD-NMP	Peerless Drive, Harefield, Uxbridge	Façade	52.2 (54.5)	54.7 (63.7)	50.0 (54.5)	48.4 (52.5)	45.6 (52.9)	50.9 (52.7)	54.2 (59.3)	51.6 (55.2)	52.7 (65.4)	44.7 (50.4)	51.8 (60.0)	46.1 (51.6)
WRP	WRP-N001	West Ruislip Golf Club, Ickenham Rd, Ruislip	Free-field	48.5 (51.4)	49.6 (53.9)	48.0 (53.4)	46.1 (54.8)	43.1 (51.8)	47.7 (49.8)	49.8 (50.5)	50.5 (53.6)	50.5 (62.6)	43.5 (50.2)	52.5 (63.6)	45.9 (54.0)
	N048	West Ruislip Golf Club, Ickenham Rd, Ruislip	Free-field	59.7 (62.3)	60.0 (63.4)	54.5 (56.9)	52.8 (56.7)	50.8 (60.2)	55.8 (57.3)	57.3 (58.4)	55.7 (60.4)	55.8 (66.7)	50.0 (53.6)	55.9 (63.2)	51.7 (59.6)
	N056	83 The Greenway, Ickenham, Ruislip	Façade	61.3 (62.8)	60.4 (60.9)	61.3 (62.2)	59.5 (62.2)	56.0 (61.8)	58.7 (59.2)	59.7 (60.0)	60.3 (62.2)	60.0 (63.4)	51.7 (57.6)	60.1 (66.8)	55.1 (60.6)
	N057	123 The Greenway, Ickenham, Ruislip	Façade	57.7 (59.0)	57.0 (61.2)	57.5 (58.9)	55.8 (62.8)	52.7 (58.1)	55.6 (56.3)	56.6 (57.2)	56.8 (58.5)	57.4 (67.6)	48.4 (55.6)	57.8 (69.3)	52.3 (57.6)
BR	N065	Breakspear Road South, Harefield	Free-field	68.2 (70.5)	67.4 (69.2)	67.6 (70.0)	65.5 (70.0)	60.9 (68.7)	66.0 (67.5)	68.0 (69.2)	68.5 (70.5)	67.0 (70.4)	60.3 (65.4)	66.3 (69.0)	60.9 (66.8)
	N066	Hoylake Crescent, Ickenham, Uxbridge	Free-field	56.9 (58.2)	57.0 (59.4)	56.8 (58.8)	54.6 (56.3)	52.1 (56.8)	54.5 (55.0)	55.8 (56.1)	55.8 (56.5)	58.0 (72.7)	51.6 (66.5)	57.1 (67.4)	51.5 (56.2)

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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
	TKL-N001	Tile Kiln Lane, Harefield, Uxbridge	Free-field	50.3 (52.6)	51.3 (54.0)	49.7 (54.8)	47.6 (52.5)	44.3 (51.4)	49.6 (50.1)	50.6 (50.9)	50.6 (51.9)	51.0 (58.6)	44.8 (55.2)	51.8 (60.1)	45.4 (50.6)
SRVS	N061	Cineworld South Ruislip car park, Ruislip	Free-field	60.0 (64.7)	63.3 (64.9)	63.4 (66.6)	62.3 (68.0)	56.9 (68.0)	61.3 (63.3)	63.5 (64.7)	63.1 (63.7)	63.6 (70.1)	56.2 (65.2)	62.7 (67.2)	57.0 (61.4)
	TCA-N001	Trenchard Avenue, Ruislip	Free-field	59.4 (60.4)	60.2 (62.3)	60.0 (65.6)	58.4 (63.7)	54.7 (61.0)	58.9 (59.5)	58.6 (59.5)	57.8 (58.5)	59.0 (66.0)	51.8 (58.7)	58.5 (65.3)	55.2 (60.2)
HR	N067	Harvil Road worksite south boundary	Free-field	56.8 (63.6)	61.0 (65.5)	56.2 (63.8)	56.2 (64.2)	53.3 (68.3)	54.9 (56.5)	57.5 (58.6)	56.8 (61.6)	61.8 (71.6)	55.8 (67.3)	59.7 (68.5)	54.2 (66.7)
	SSPA-HR	Harvil Road	Free-field	61.7 (63.2)	61.4 (62.7)	59.6 (60.9)	57.2 (59.8)	54.5 (62.9)	59.2 (59.8)	60.8 (61.5)	60.8 (61.8)	59.8 (67.8)	54.1 (64.3)	60.1 (69.7)	54.3 (62.0)
	BSR-N001	Breakspear Road	Free-field	69.9 (73.2)	69.0 (70.6)	69.0 (71.1)	66.4 (71.2)	62.3 (70.8)	67.3 (69.6)	69.5 (70.6)	70.1 (71.8)	67.8 (72.3)	61.2 (66.0)	67.7 (71.6)	62.7 (68.6)
	DGT-N001	Dogs Trust West London	Façade	53.1 (55.8)	53.7 (56.5)	50.0 (52.8)	48.3 (52.7)	47.4 (54.3)	51.5 (52.3)	53.5 (55.6)	52.7 (53.1)	50.7 (56.6)	46.2 (50.6)	52.0 (56.0)	47.3 (53.6)
NSPA	NSPA-N001	Newyears Green Lane	Free-field	60.1 (61.8)	59.8 (61.7)	57.9 (59.4)	53.6 (56.4)	50.3 (59.5)	56.1 (58.0)	58.6 (58.9)	58.8 (59.5)	55.9 (59.0)	47.8 (51.4)	54.7 (59.0)	49.5 (59.0)
	NSPA-N002	Newyears Green Lane	Free-field	50.6 (53.8)	52.8 (55.1)	48.7 (56.2)	45.8 (54.2)	44.2 (53.7)	49.5 (53.1)	51.5 (53.6)	50.3 (52.8)	48.0 (55.2)	41.9 (49.8)	48.4 (53.9)	42.0 (48.9)

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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	0.60 (Y-axis)
SRVS	SRVS-V001a	Braintree Road, Ruislip	1.12 (Y-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
CVV	DLC-NMP	Dew's Farm Cottages, Dews Lane, Harefield, Uxbridge	Weekdays Weekdays Nights	0800-1800 1900-2200 2200-0700	5 1 27	No exceedance
	HFM-NMP	Harefield Marina, Moorhall Road, London	Weekdays Saturdays	0800-1800 1400-2200	1 2	No exceedance
	PLD-NMP	Peerless Drive, Harefield, Uxbridge	All days	All periods	No exceedance	No exceedance
WRP	WRP-N001	West Ruislip Golf Club, Ickenham Rd, Ruislip	Saturdays Sundays	1400-2200 0700-2200	1 3	No exceedance
	N048	West Ruislip Golf Club, Ickenham Rd, Ruislip	All days	All periods	No exceedance	No exceedance
	N056	83 The Greenway, Ickenham, Ruislip	Weekdays Saturdays	0700-0800 1900-2200 1300-1400 1400-2200	1 38 1 21	No exceedance
	N057	123 The Greenway, Ickenham, Ruislip	Weekdays Saturdays Sundays	1900-2200 1400-2200 0700-2200	1 1 7	No exceedance
BR	N065	Breakspear Road South, Harefield, Uxbridge	All days	All periods	Not applicable**	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
	N066	Hoylake Crescent, Ickenham, Uxbridge	Weekdays Saturdays Sundays	1900-2200 1400-2200 0700-2200	9 6 1	No exceedance
	TKL-N1	Tile Kiln Lane, Harefield, Uxbridge	Saturdays Sundays	1400-2200 0700-2200	3 4	No exceedance
SRVS	N061	Hoylake Crescent, Ickenham, Uxbridge	All days	All periods	Not applicable*	Not applicable*
	TCA-N001	Trenchard Avenue, Ruislip	Weekdays Sundays	1800-1900 1900-2200 0700-2200	1 2 3	No exceedance
HR	N067	Harvil Road worksite south boundary	Weekdays	0700-0800 0800-1800 1800-1900	1 2 1	No exceedance
	SSPA-HR	Harvil Road	All days	All periods	No exceedance	No exceedance
	BSR-N001	Breakspear Road	Weekdays Saturdays Nights	0700-0800 0800-1800 1800-1900 1900-2200 0800-1300 1300-1400 1400-2200 2200-0700	10 20 17 16 4 3 16 2	No exceedance
	DGT-N001	Dogs Trust West London	All days	All periods	No exceedance	No exceedance
NSPA	NSPA-N001	Newyears Green Lane	Saturdays Saturdays	1300-1400 1400-2200	4 8	No exceedance
	NSPA-N002	Newyears Green Lane	Saturdays	1400-2200	1	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 twelve (12) monitoring locations. The LOAEL exceedances were recorded during weekdays, Saturdays, Sundays and nights.

2.2.7 No SOAEL exceedances were recorded due to HS2 construction works during November 2023.

2.3 Exceedances of Trigger Level

2.3.1 Table 6 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 6: 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 7 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

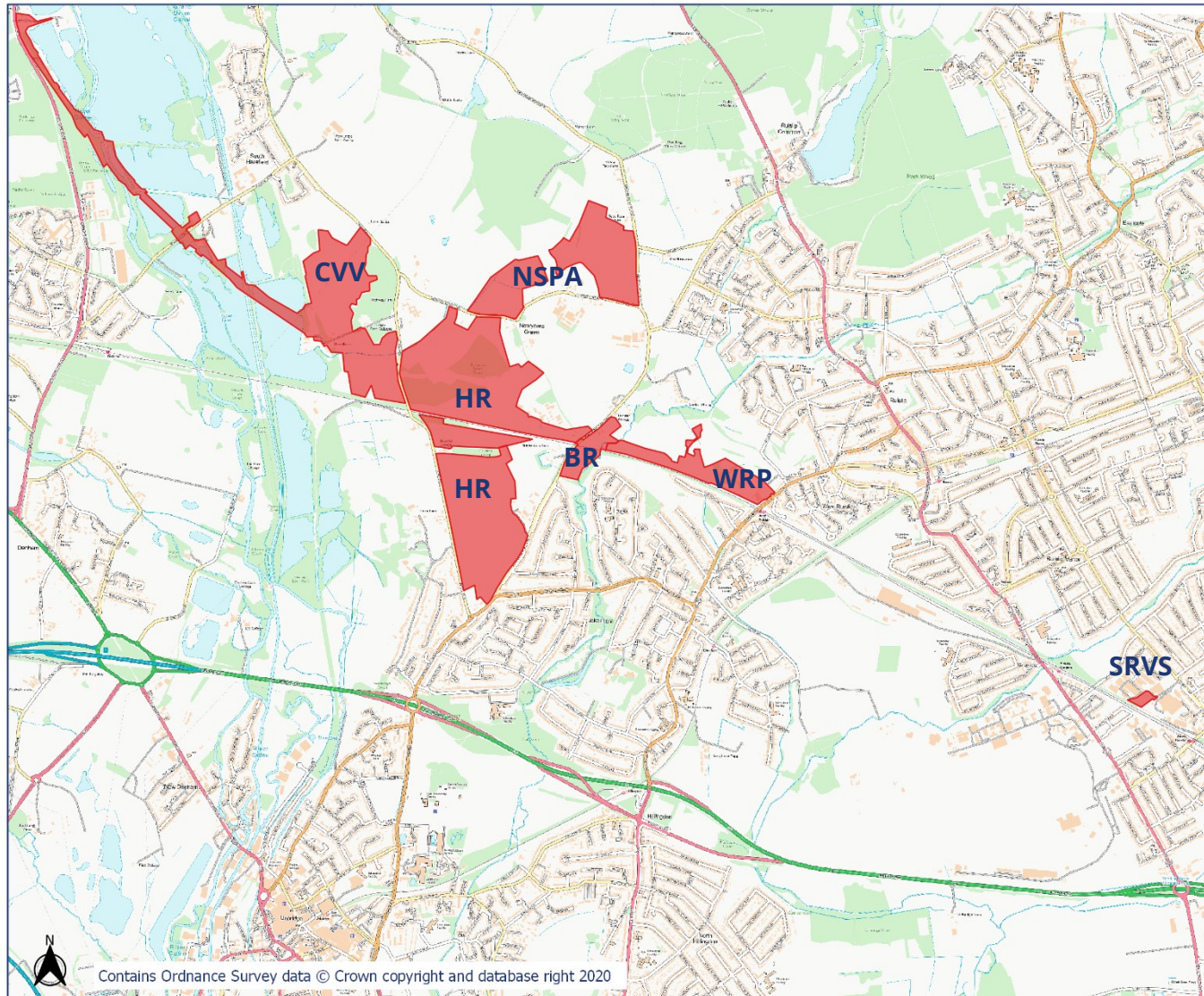
Table 7: Summary of Complaints

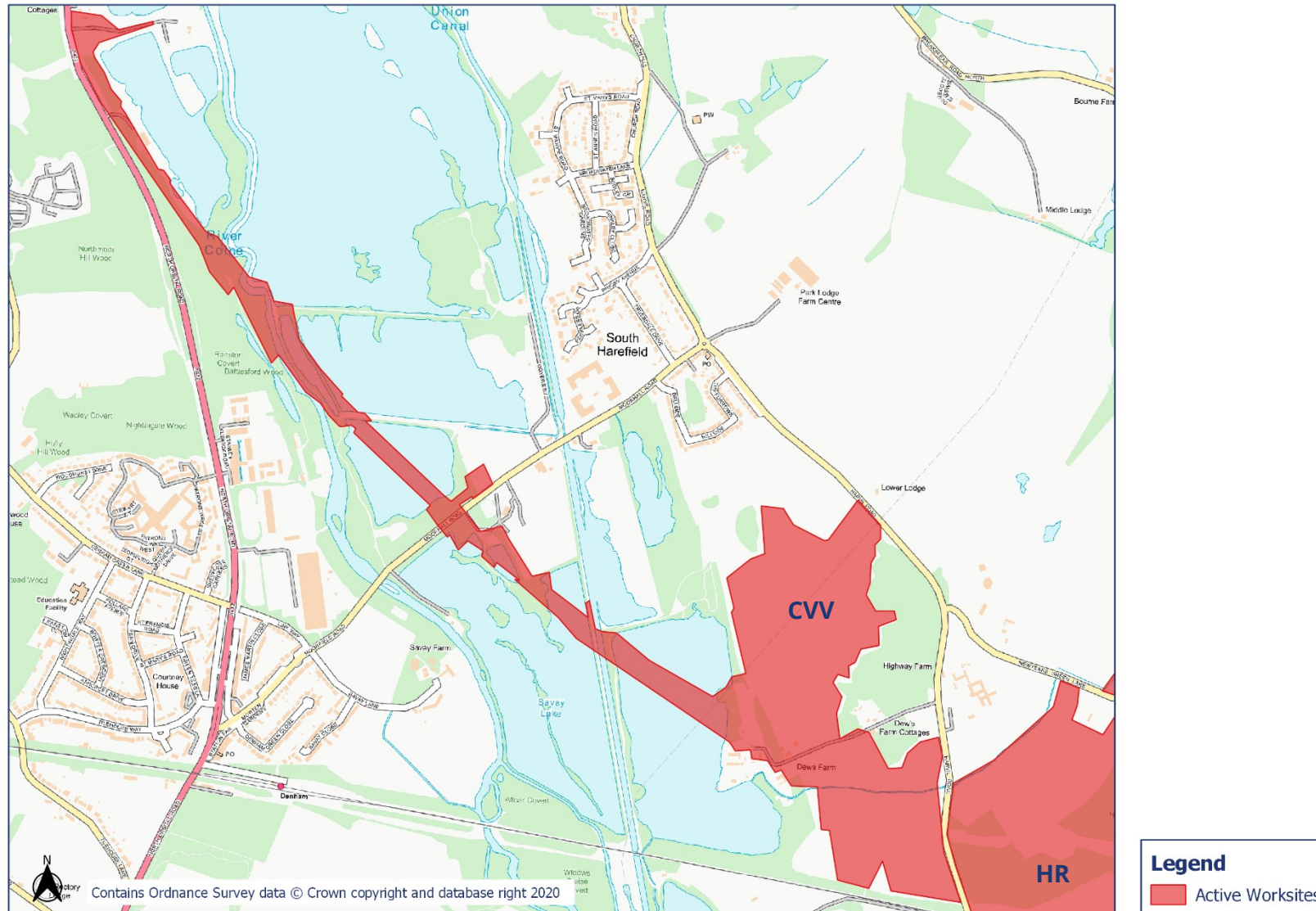
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-23-102855-E-C	WRP	Complaint about loud banging noise disturbing sleep.	Noise was due to a team carrying out remedial work using an impact gun and a grinder, neither of which should have been used at that time of night.	The team was re-briefed about the approved working methods. A response was provided to the complainant.
HS2-23-103566-E-C	N/A	Complaint regarding buzzing noise at night.	Investigation was carried out regarding the complaint on the following day, but the noise source could not be identified. The noise levels measured at fixed monitors were checked and were found to not exceed limits.	A response was sent to the complainant.

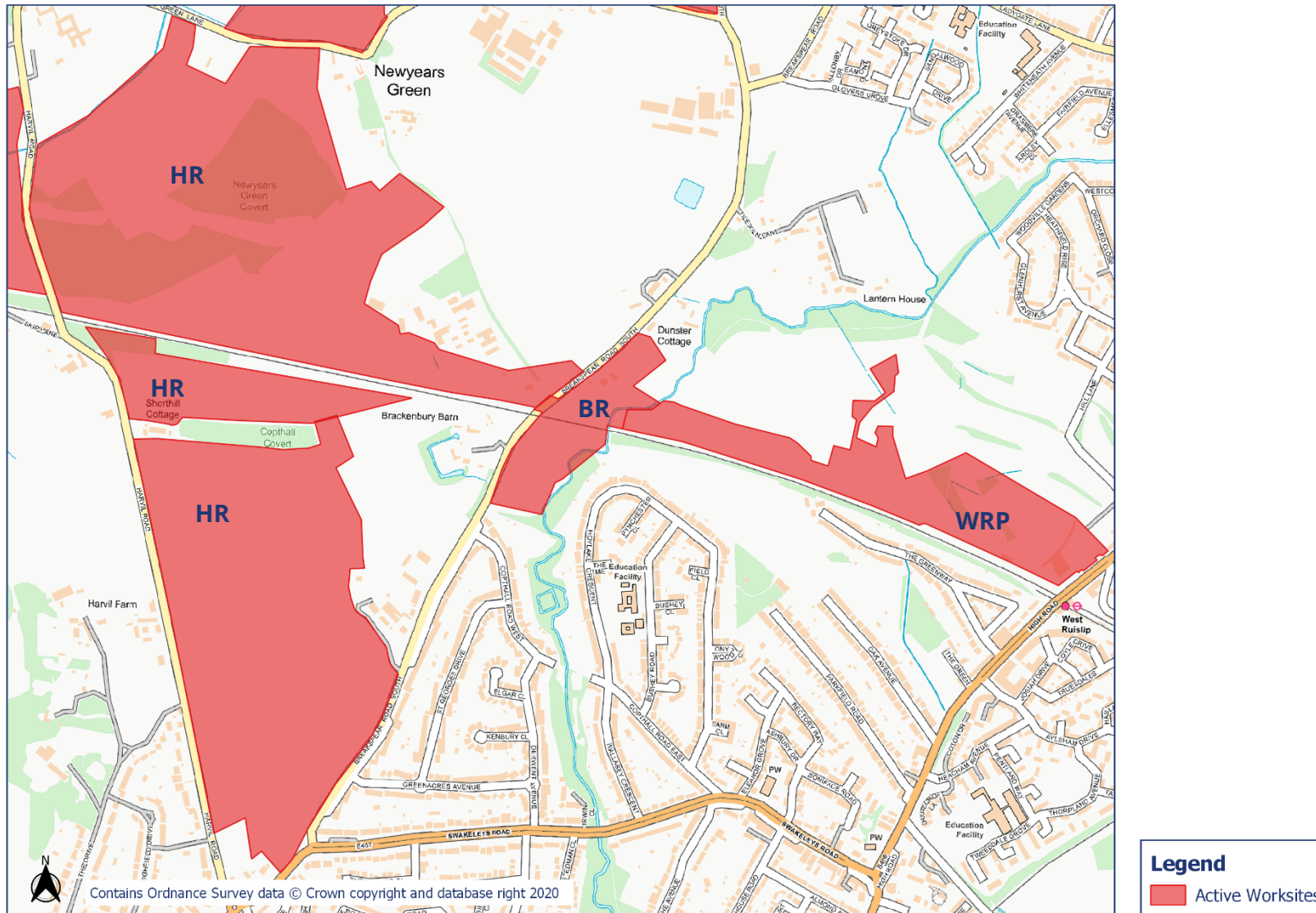
Appendix A Site Locations

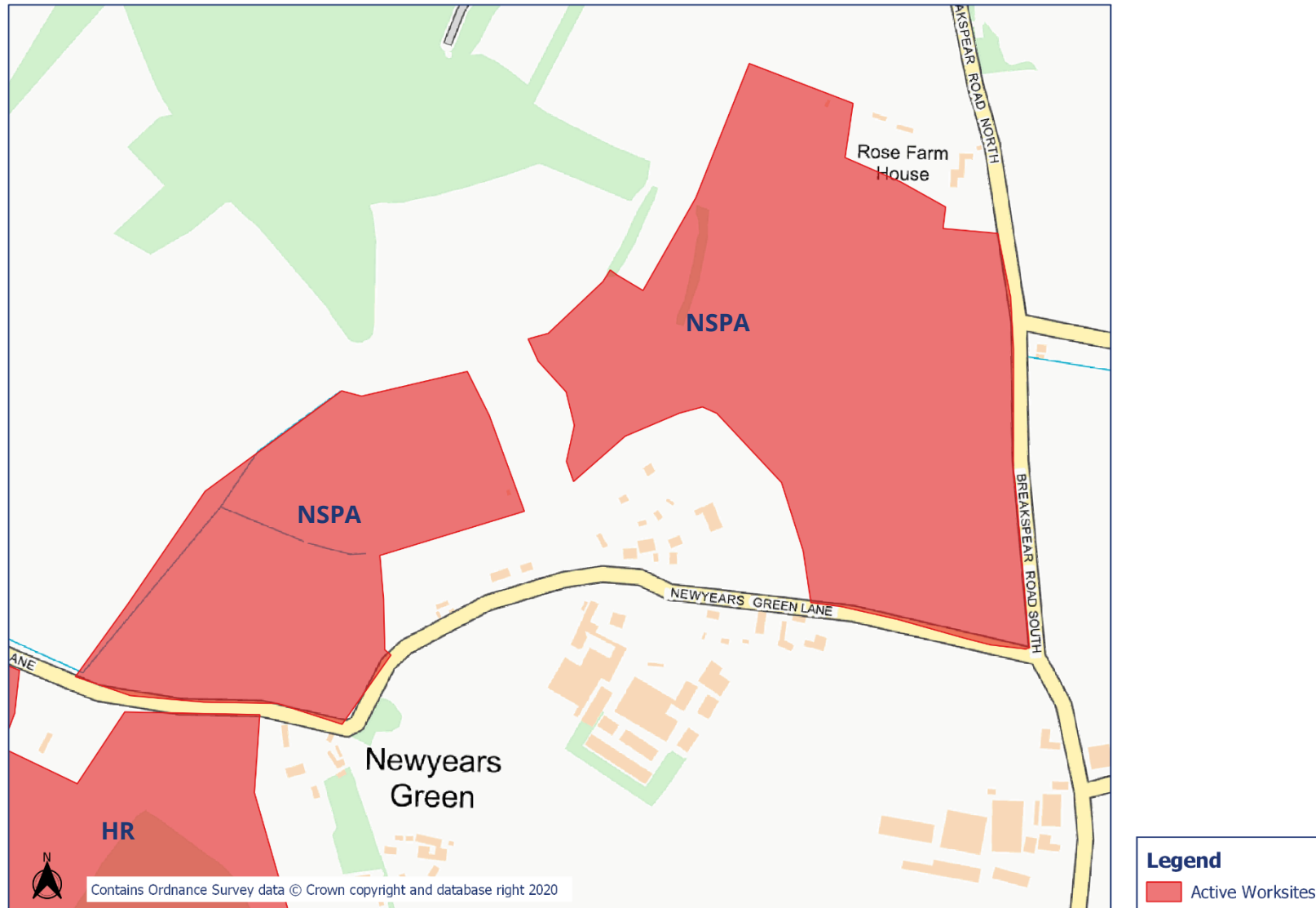
HS2

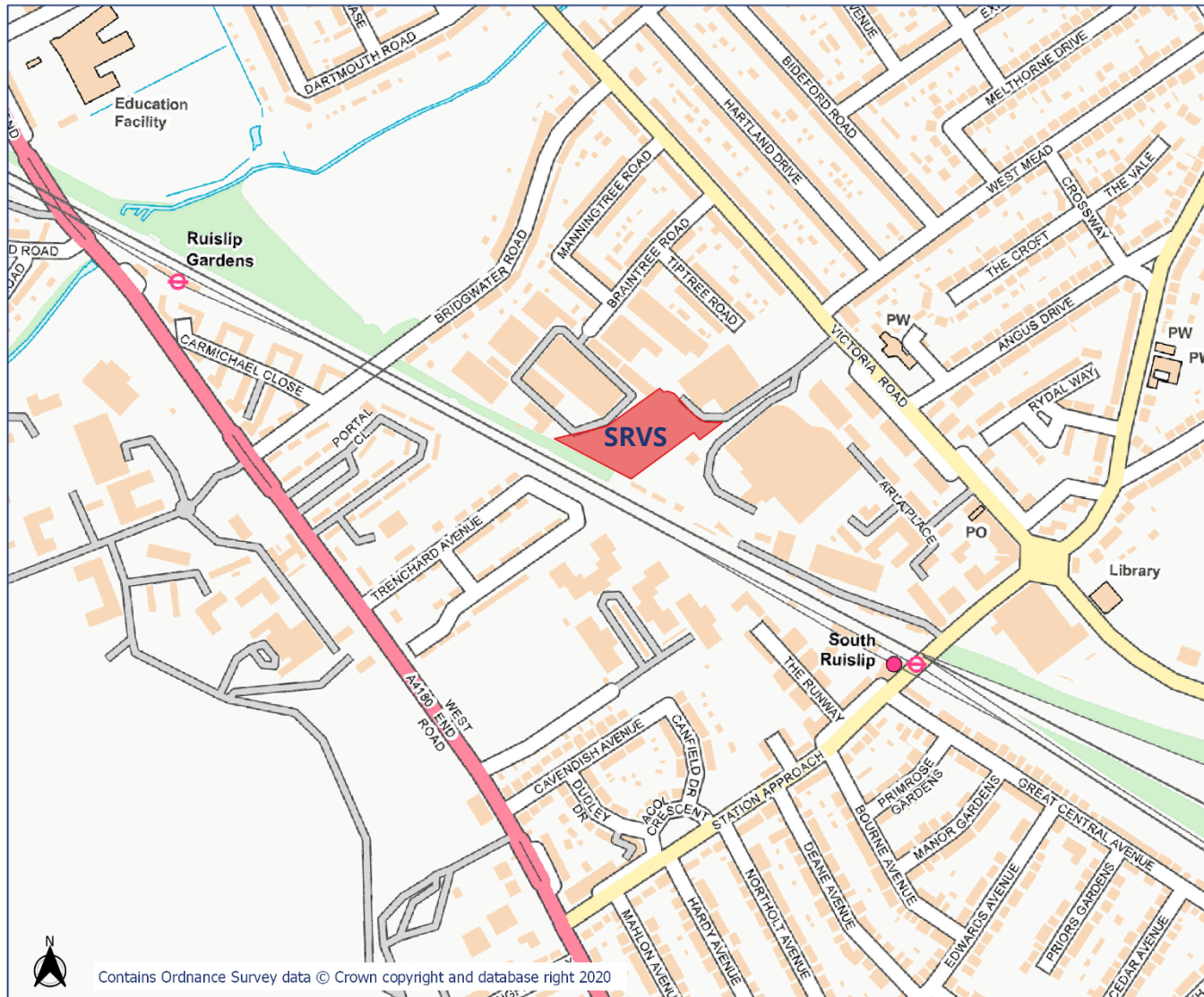
Worksite Identification Plan - Overview



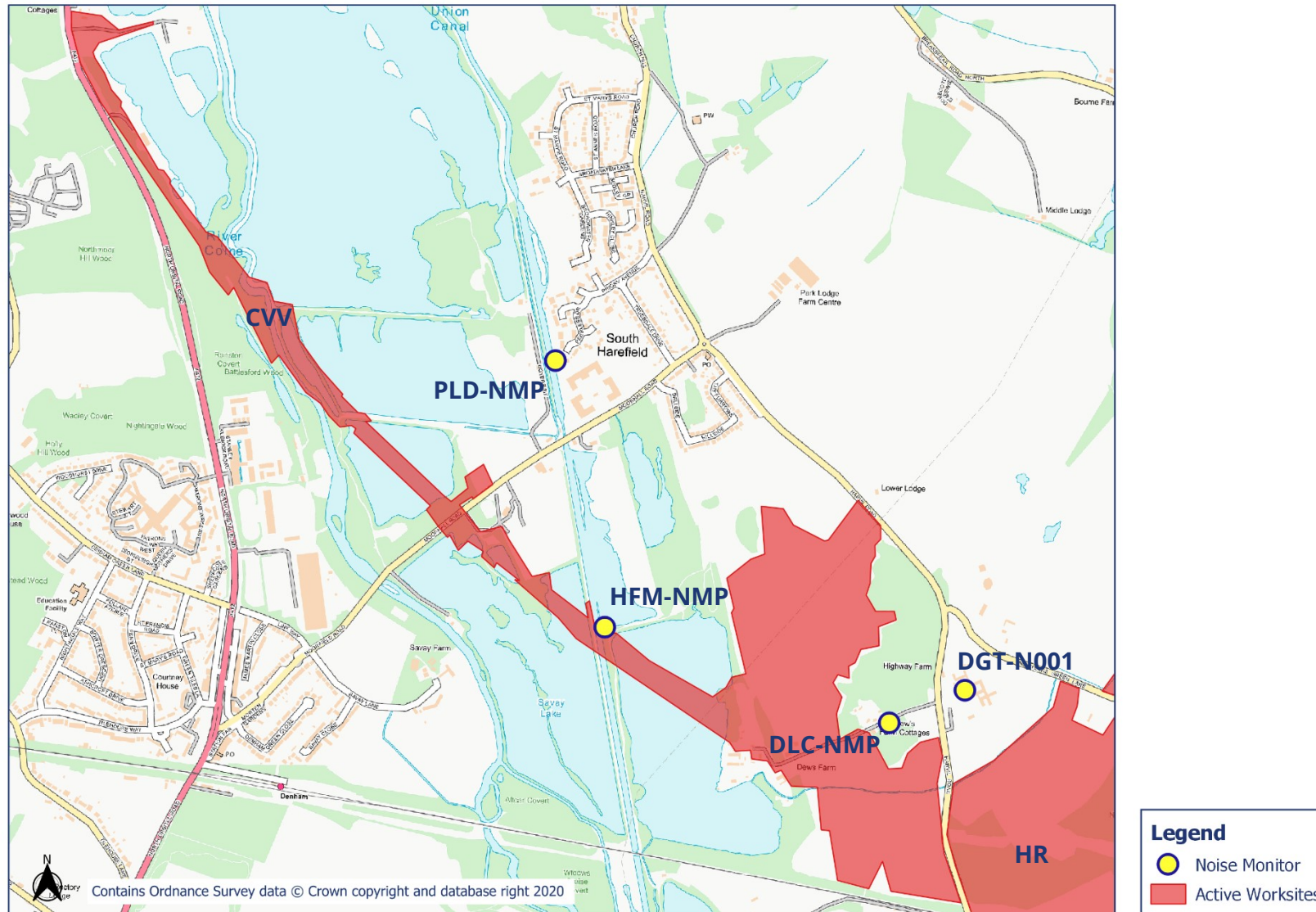


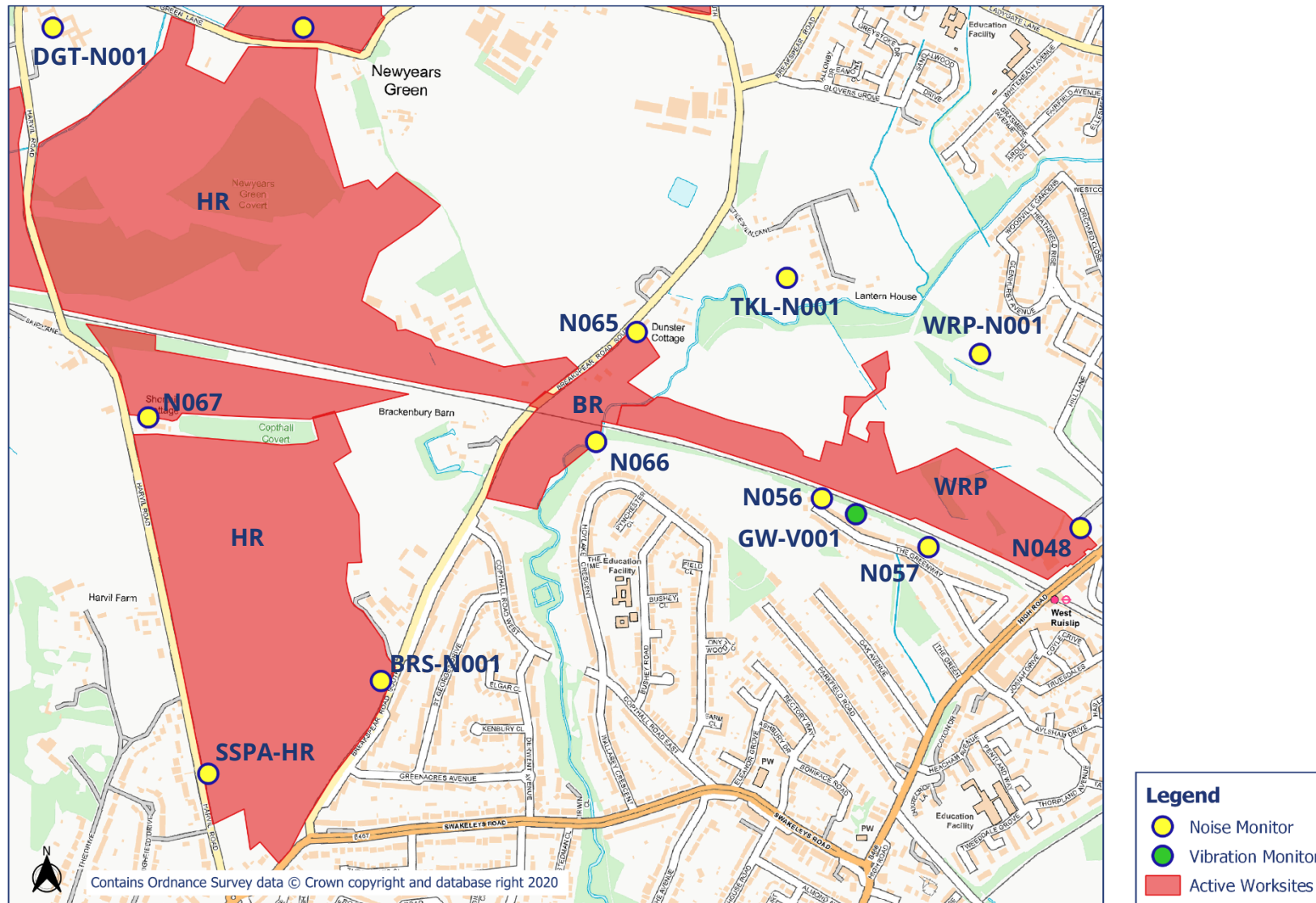


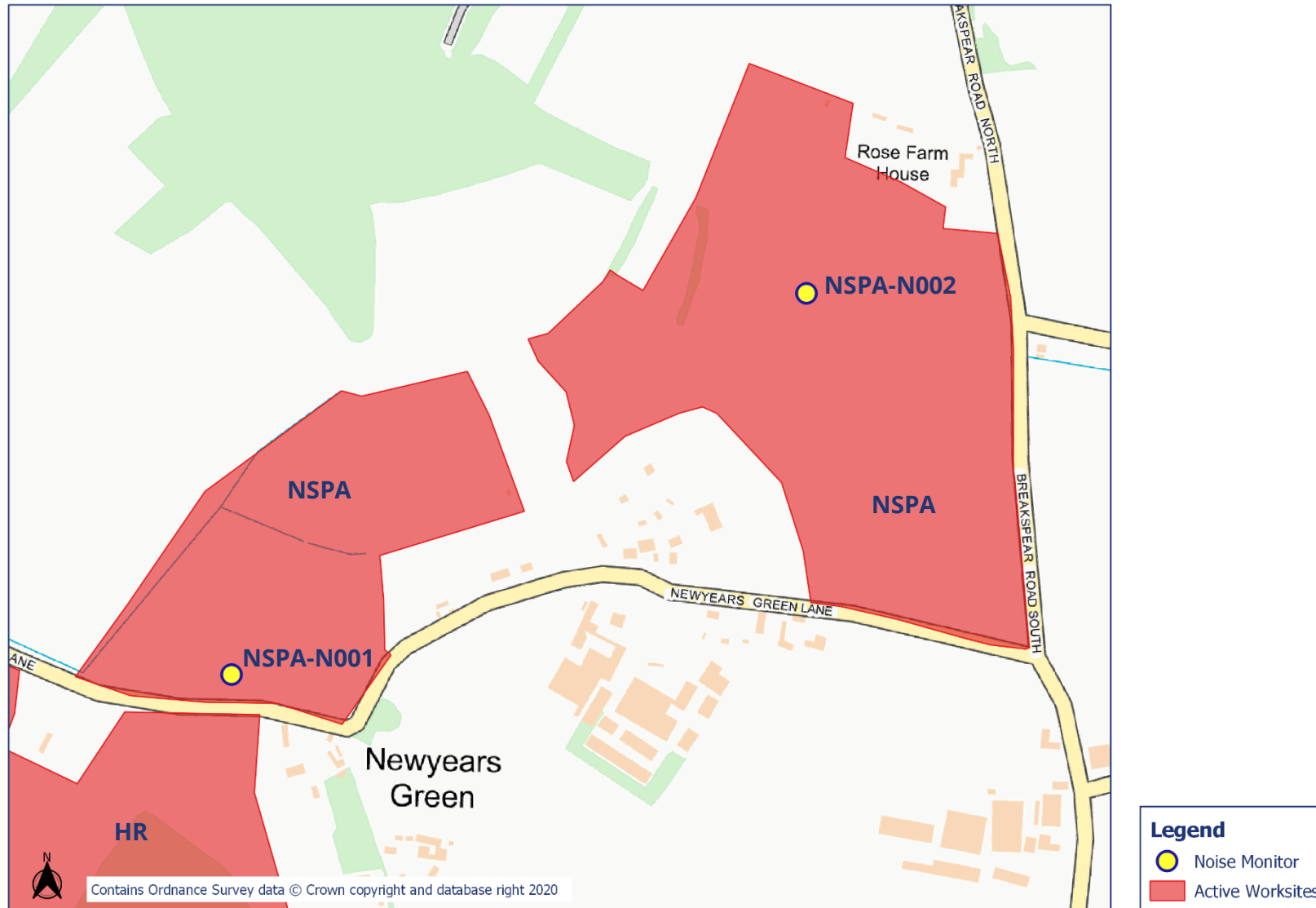


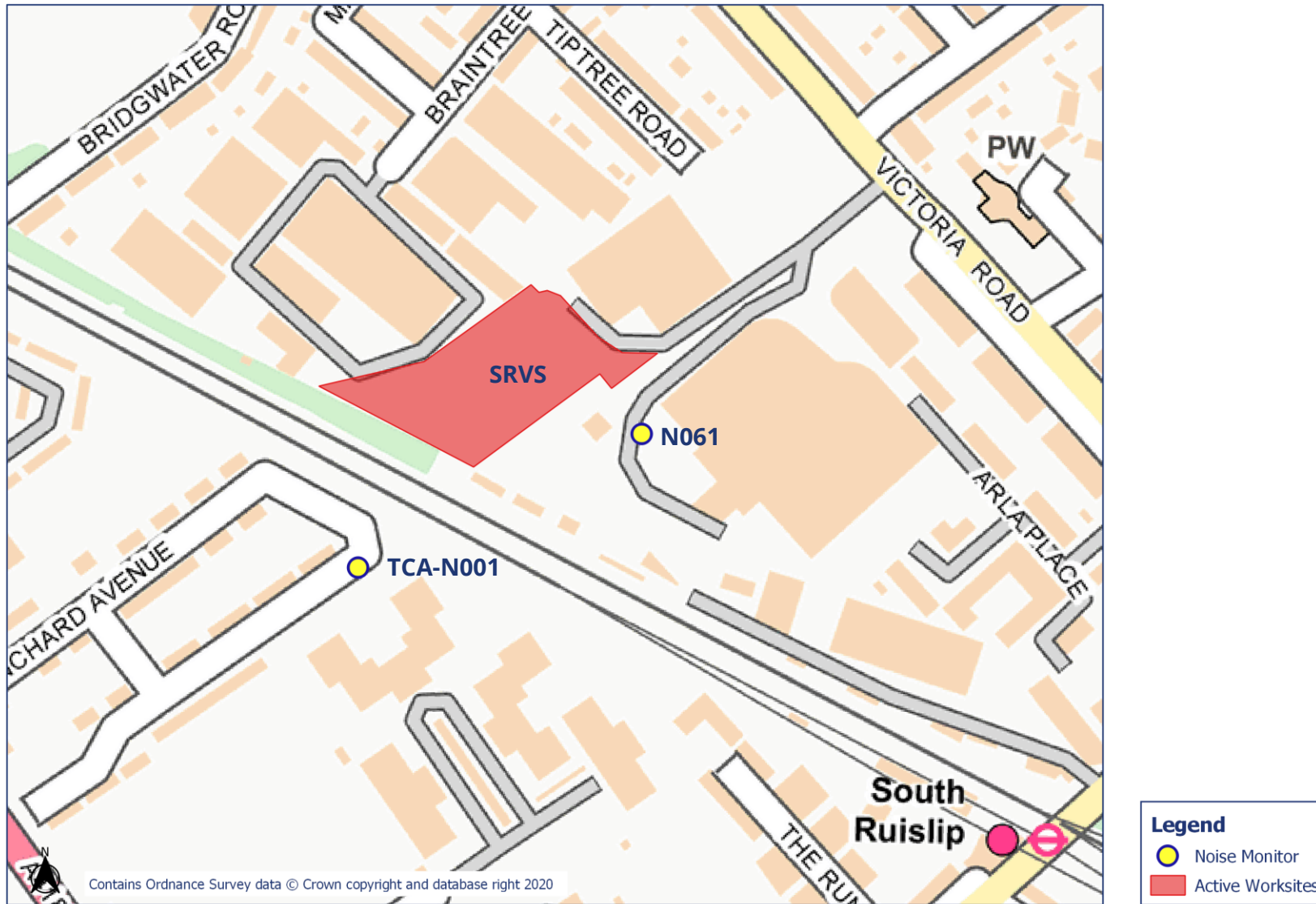


Appendix B Monitoring Locations







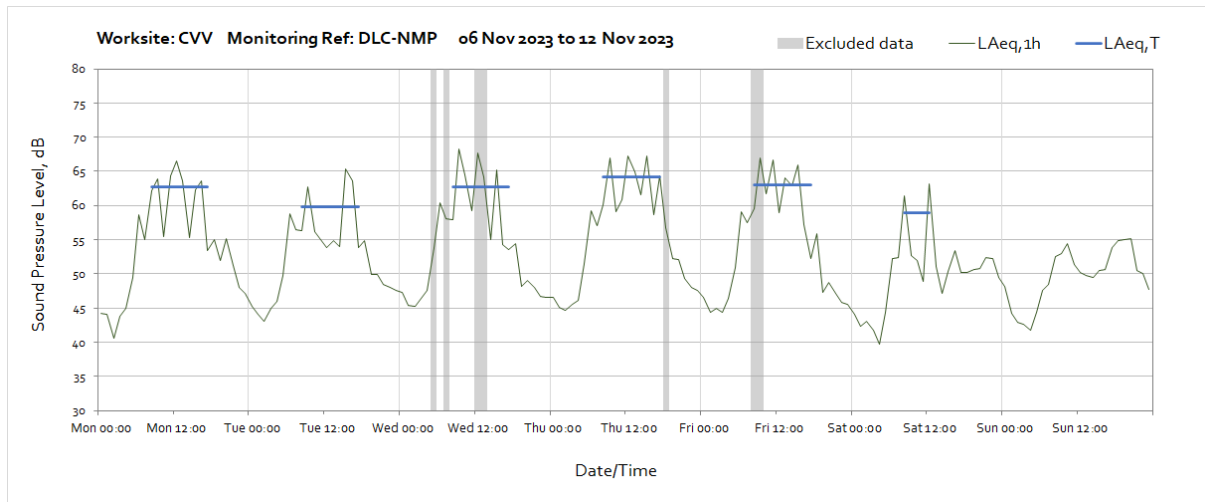
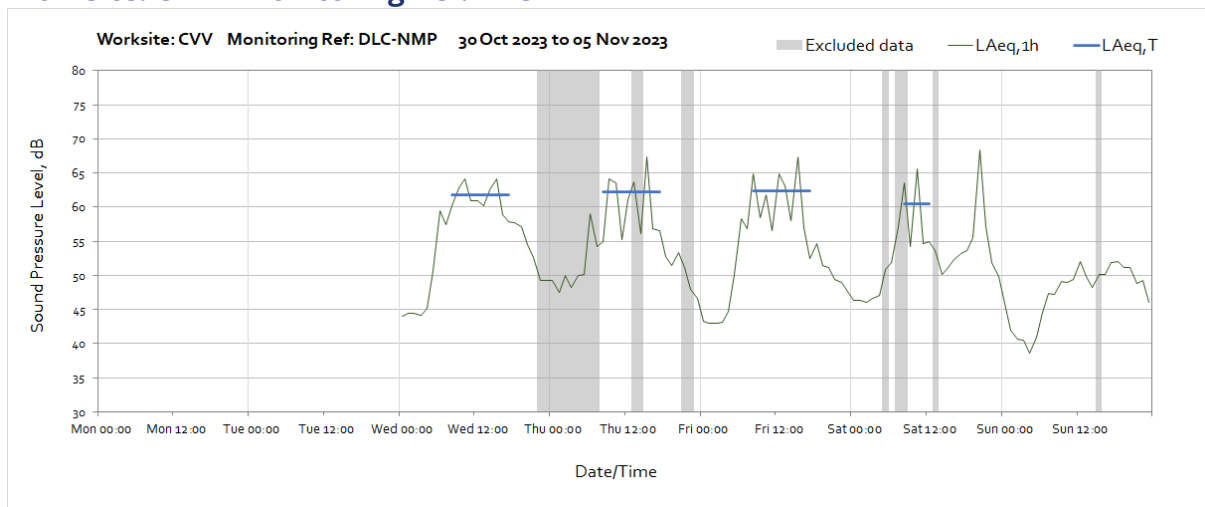


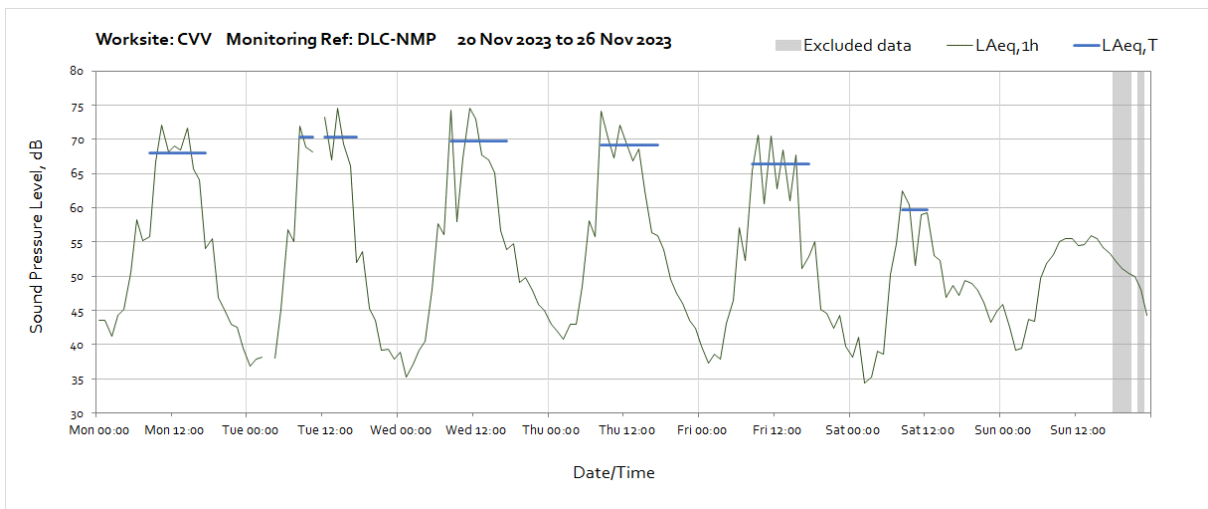
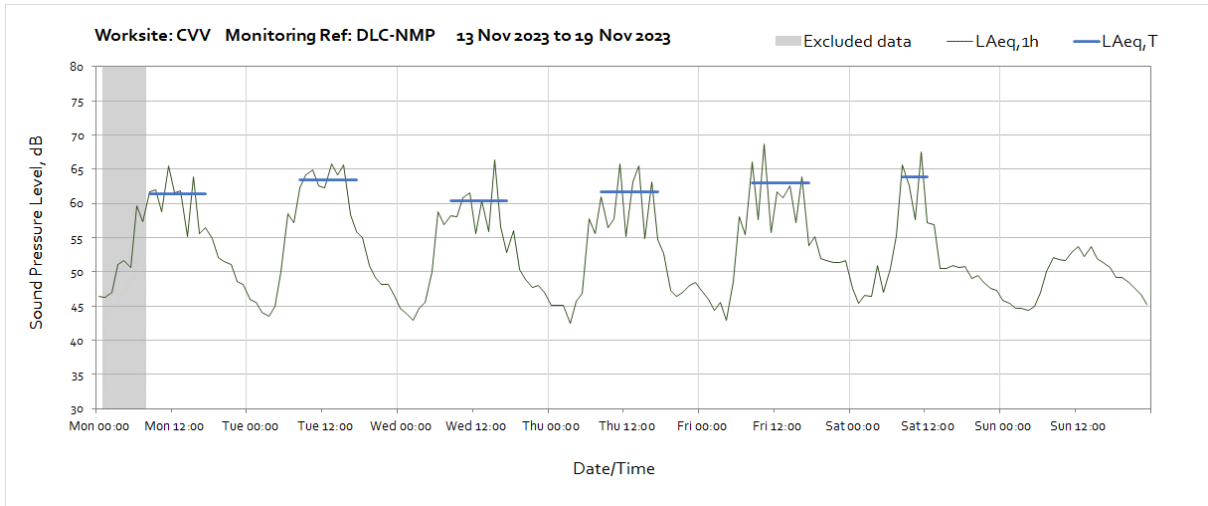
Appendix C Data

Noise

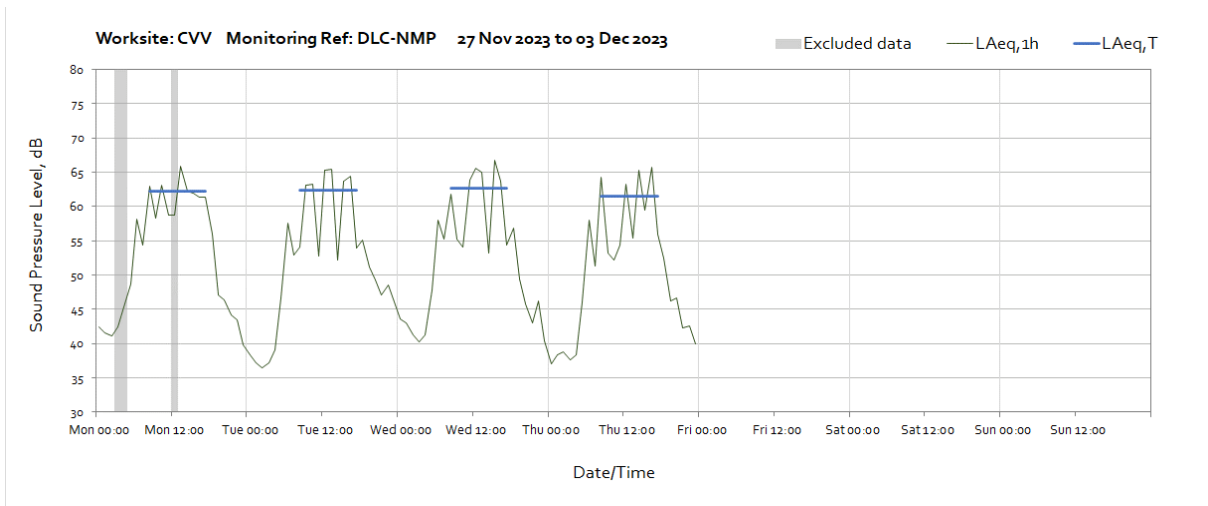
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods where noise levels are adversely affected by weather or only measured 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

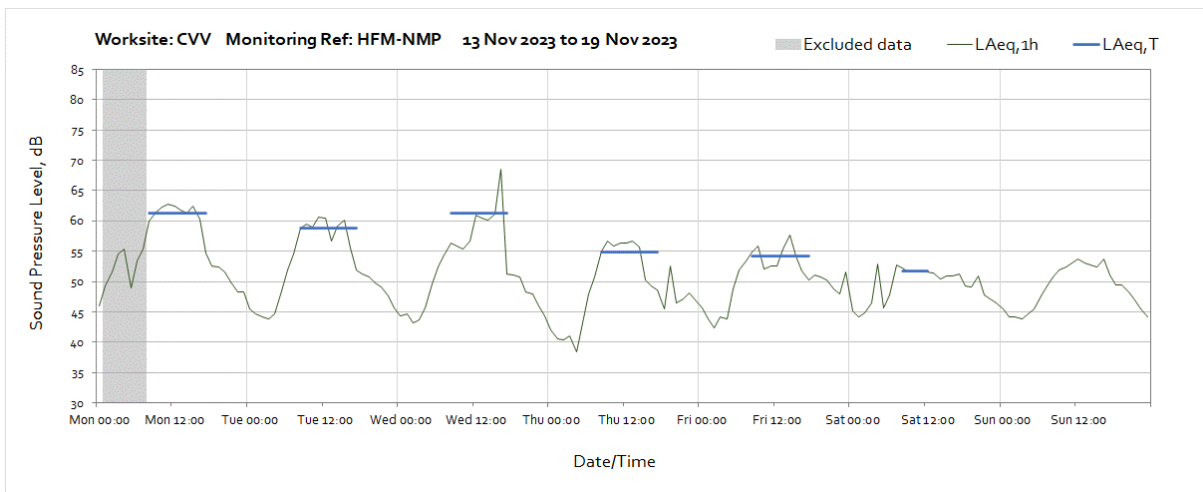
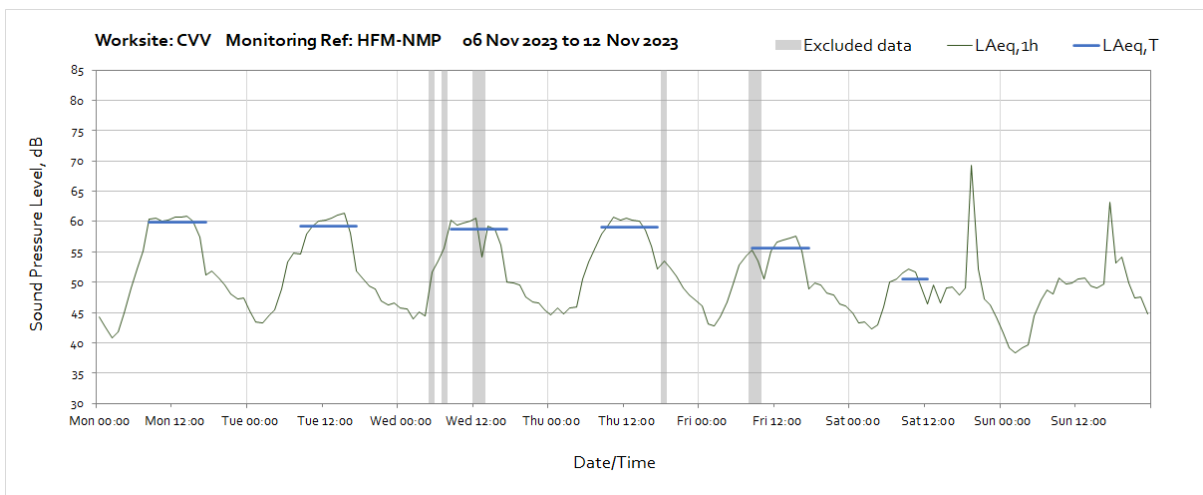
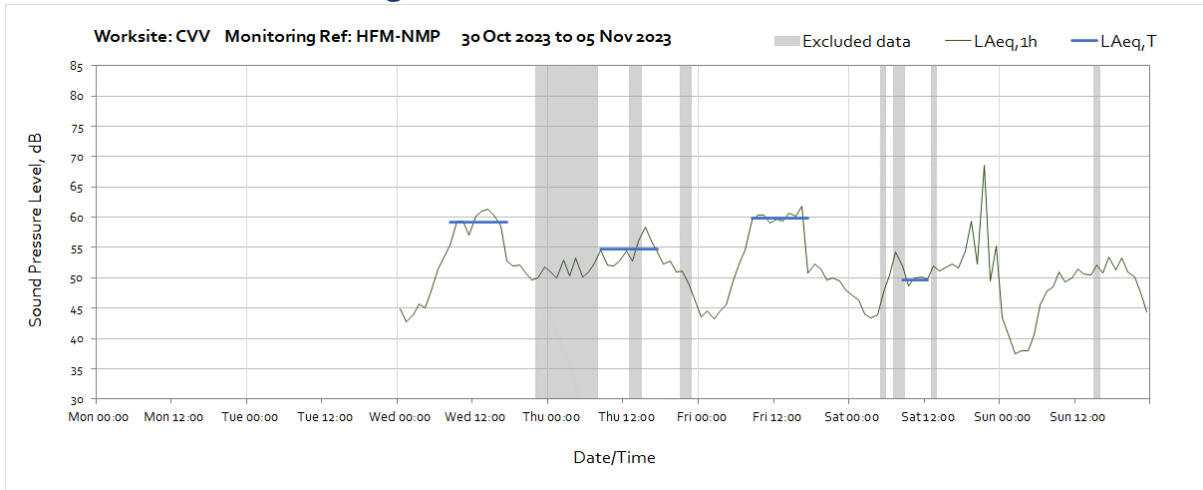




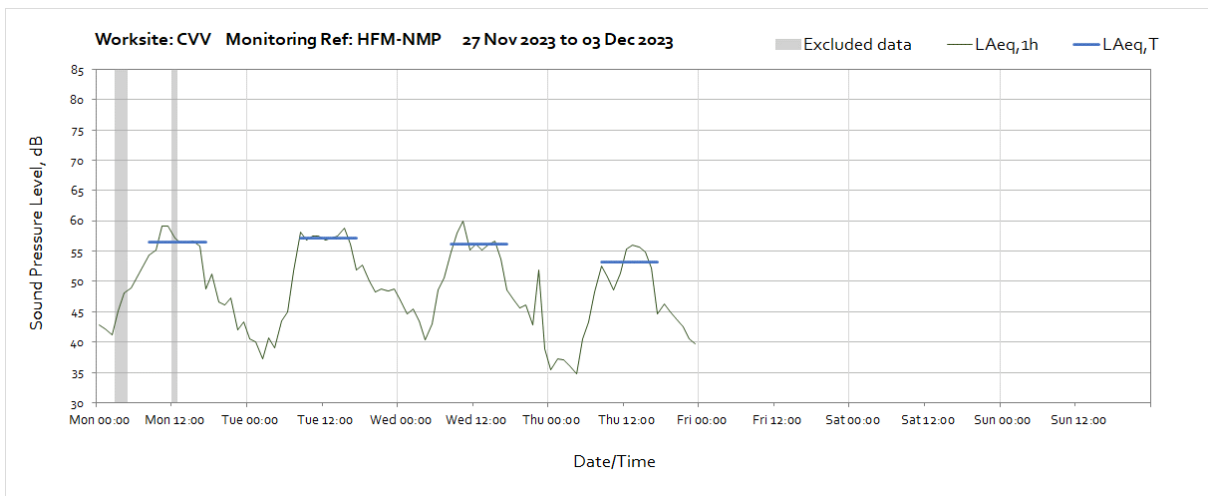
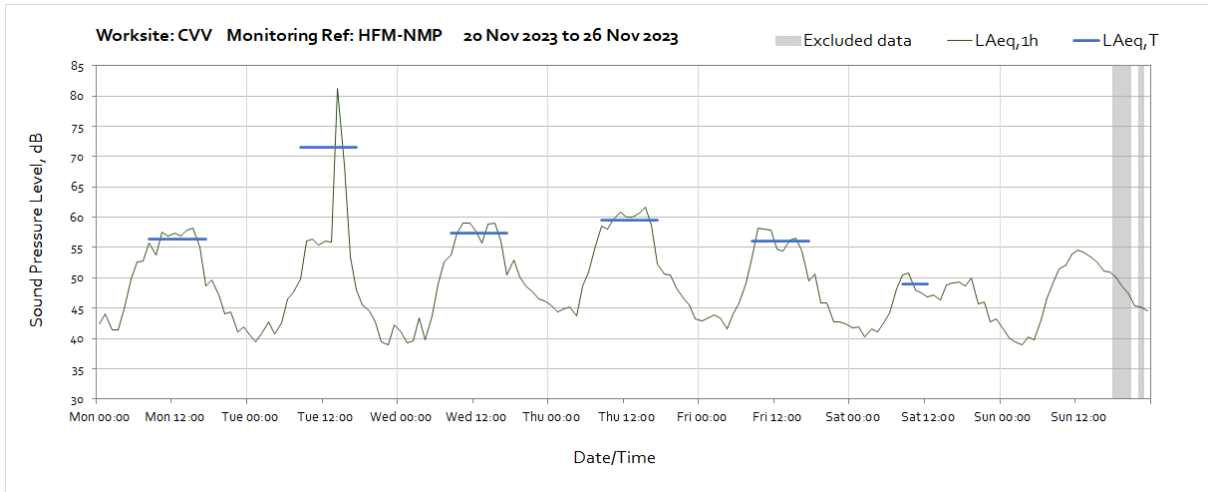
Note: Missing data between 03:00 and 04:00 on Tuesday 21st November were due to monitor's setting updates. Missing data between 11:00 and 12:00 on Tuesday 21st November were due to monitor's field calibration.



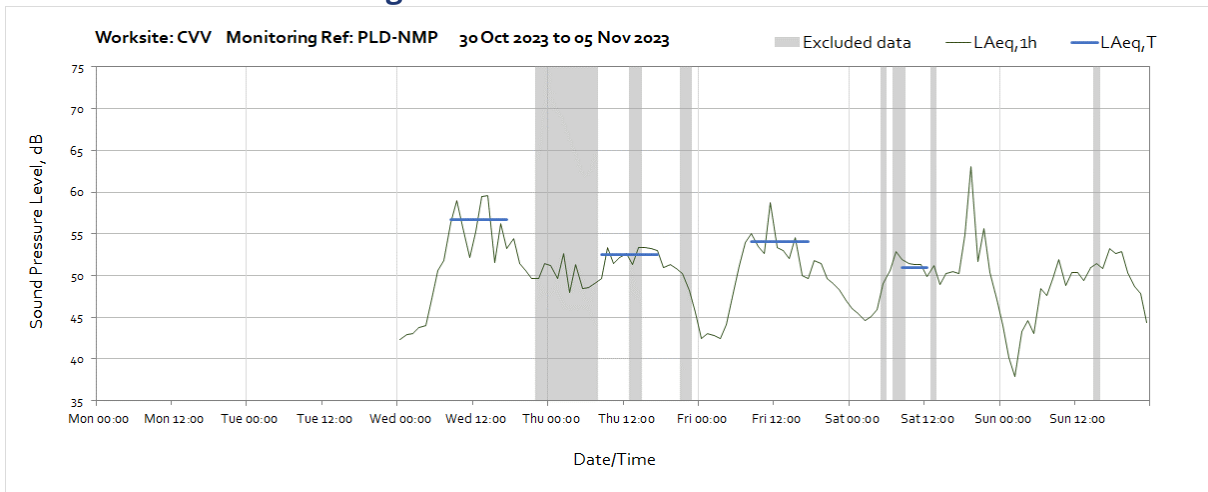
Worksite: CVV – Monitoring Ref: HFM-NMP

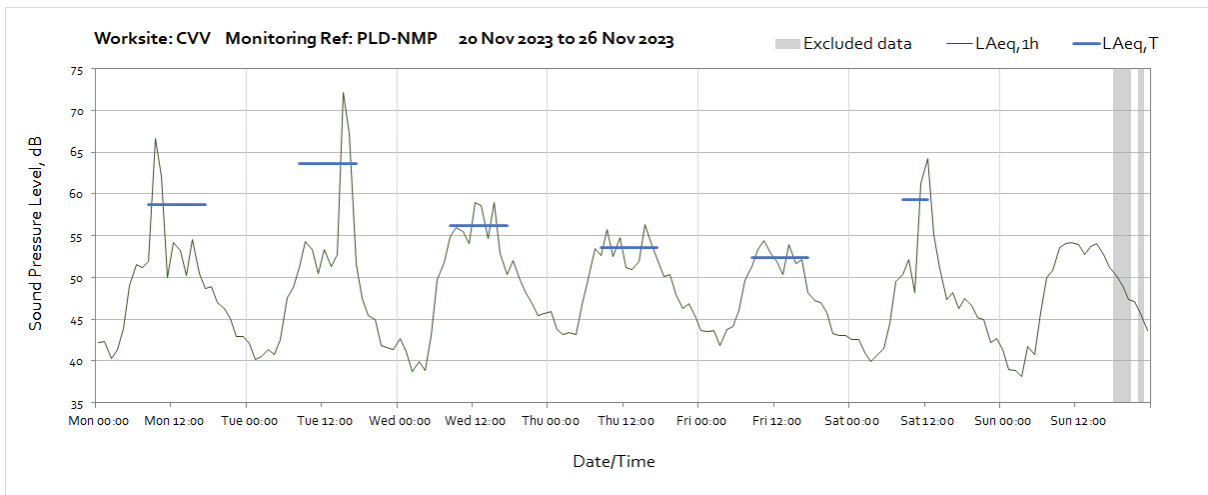
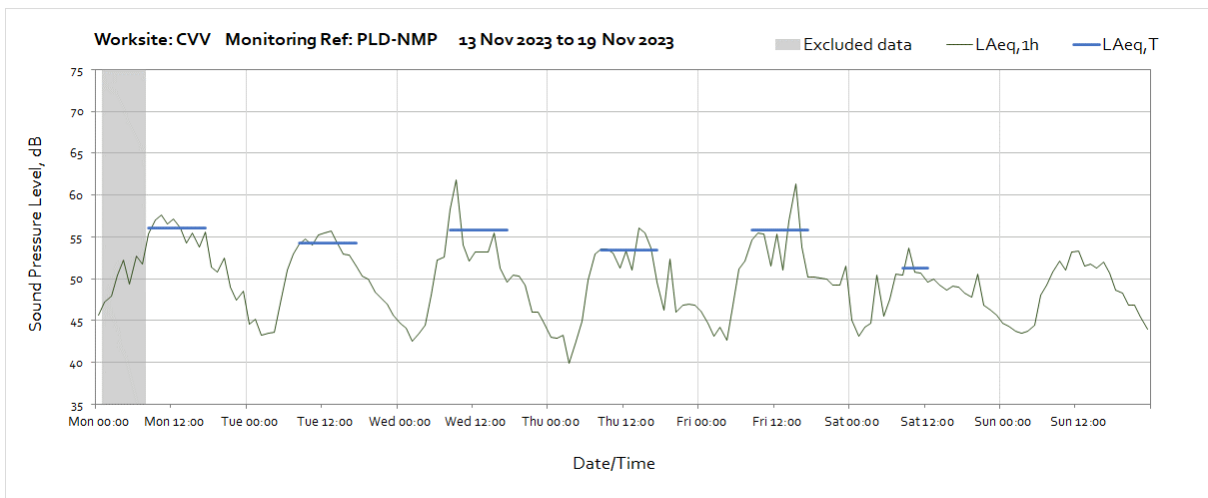
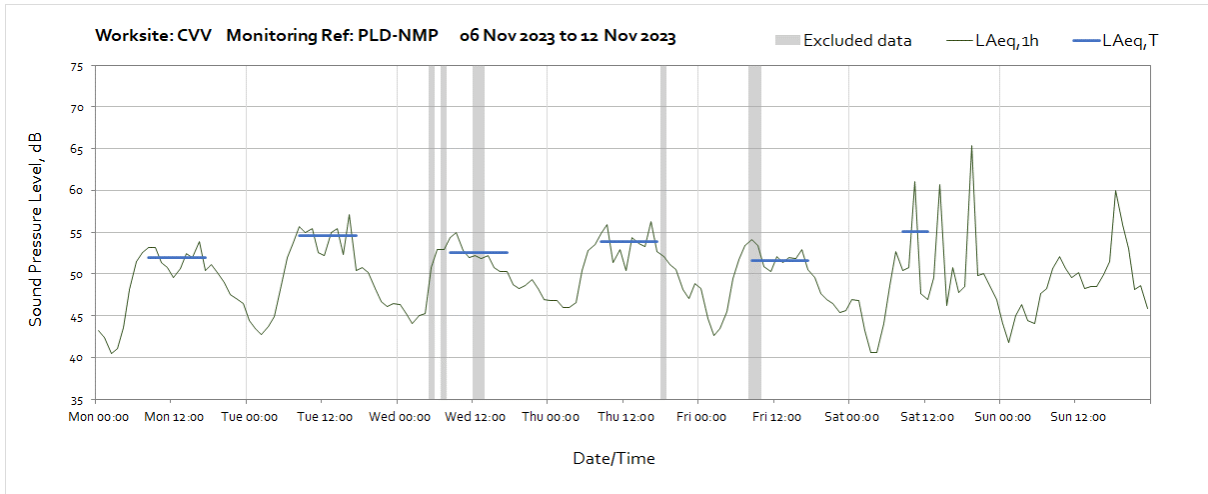


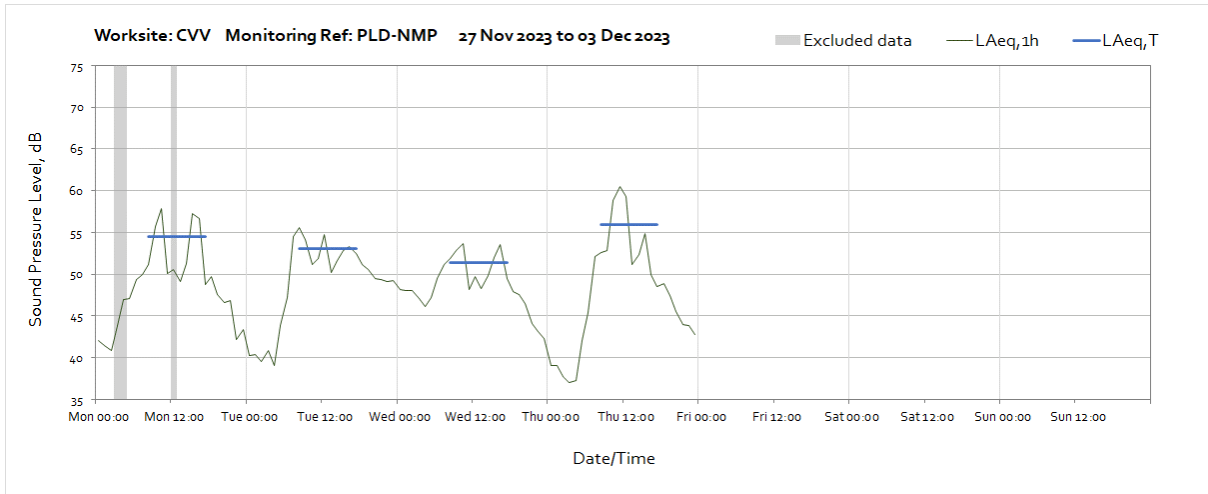
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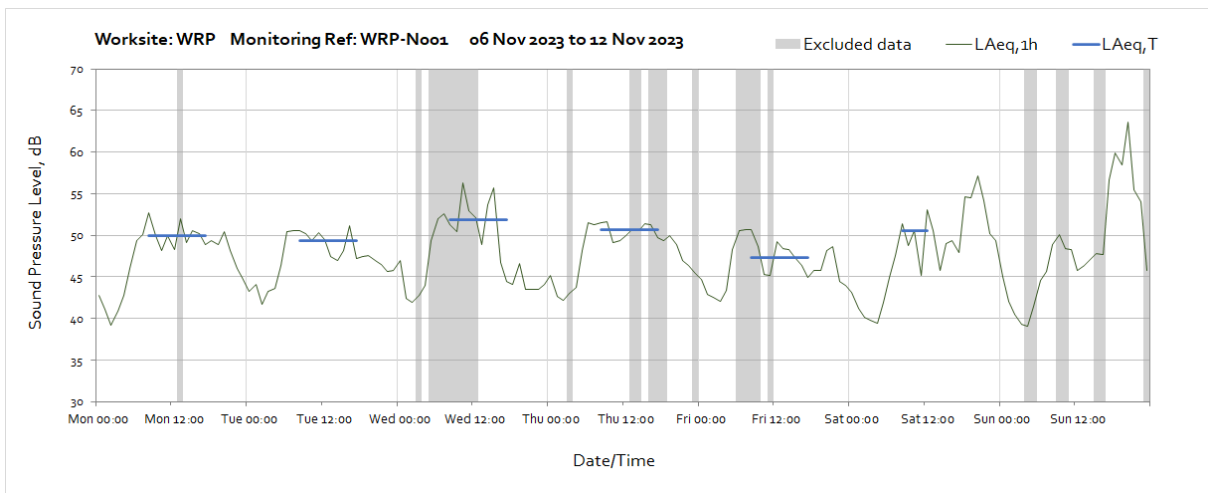
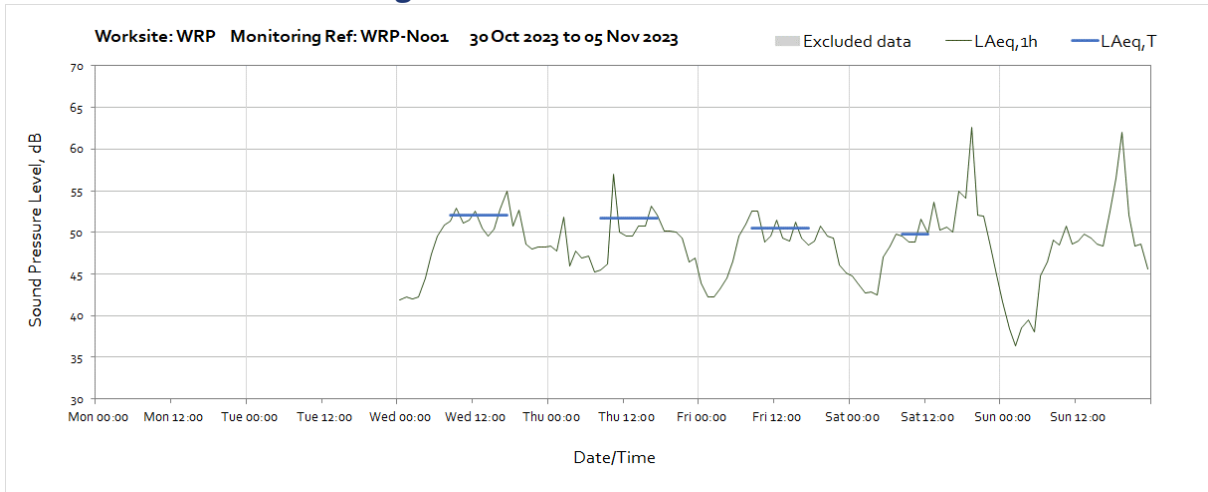
Worksite: CVV - Monitoring Ref: PLD-NMP

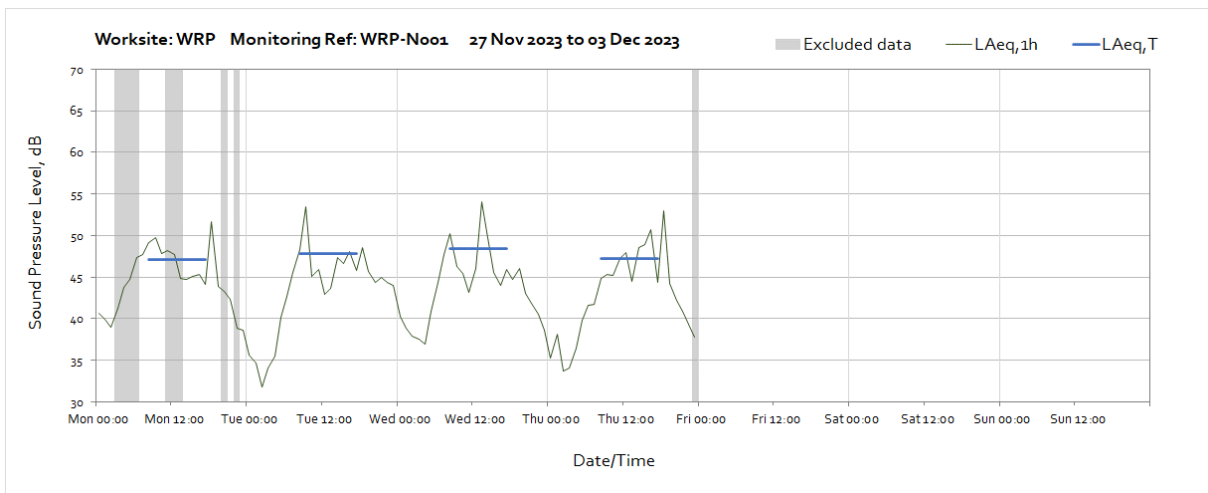
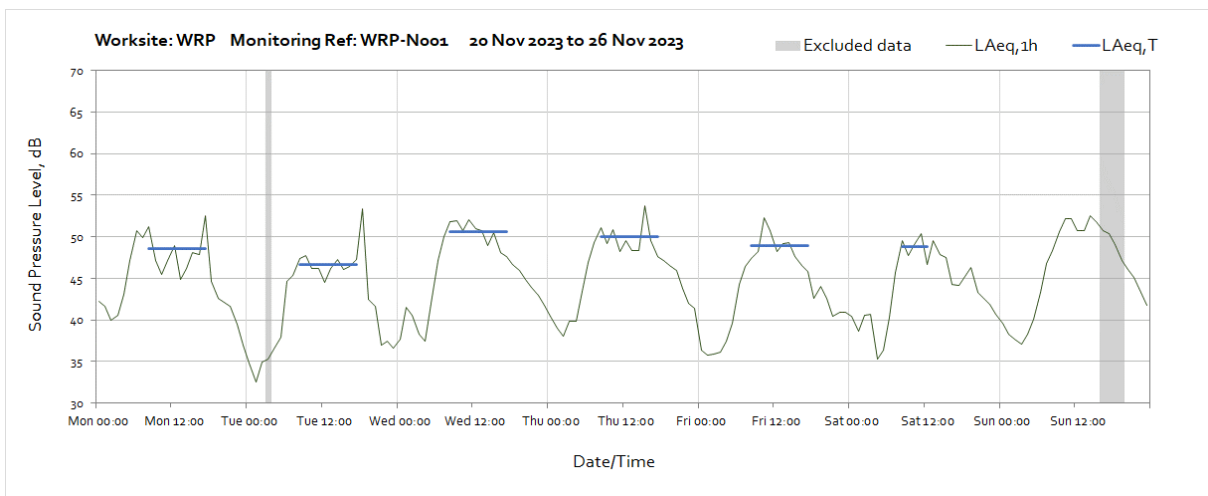
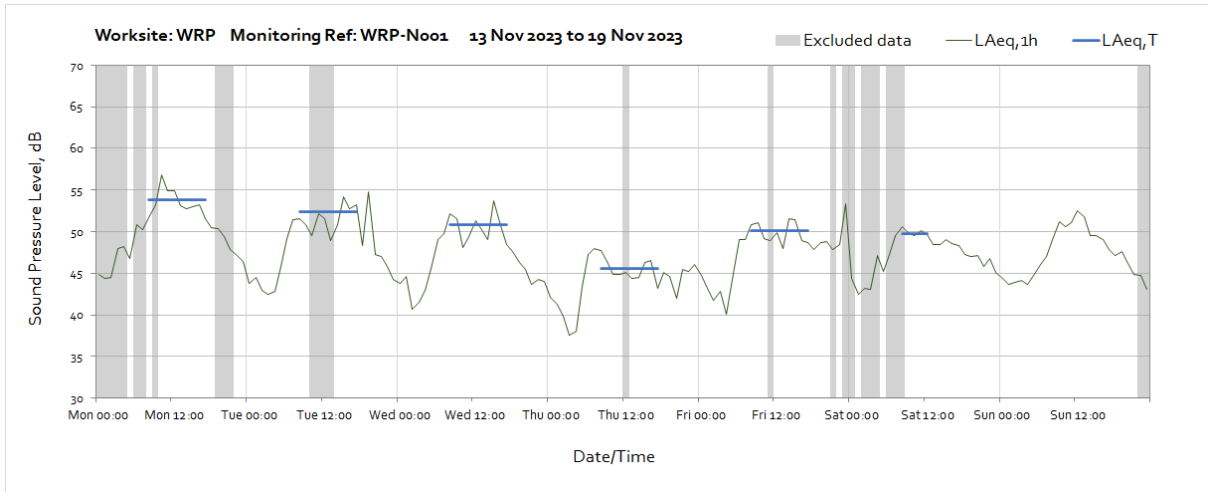




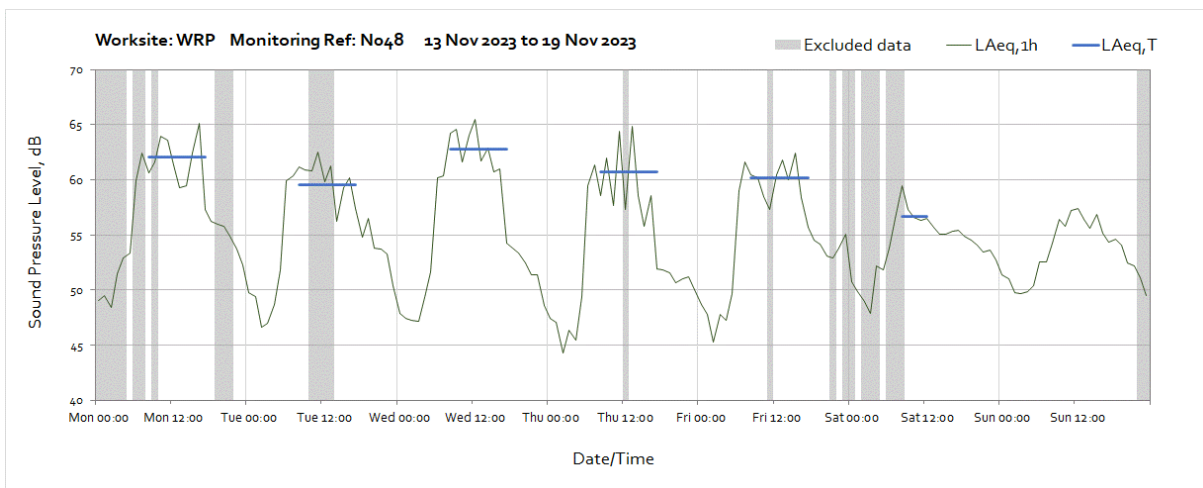
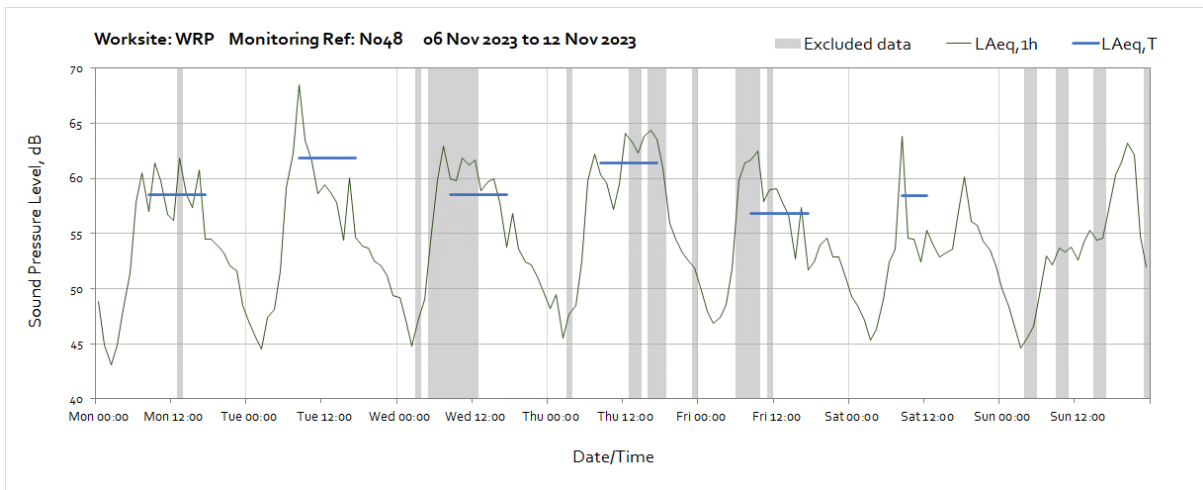
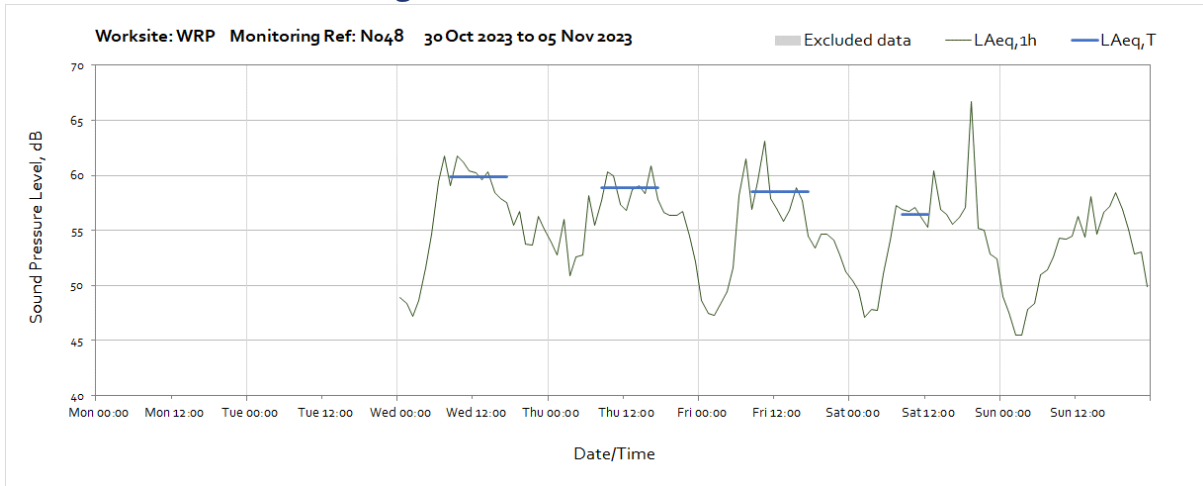


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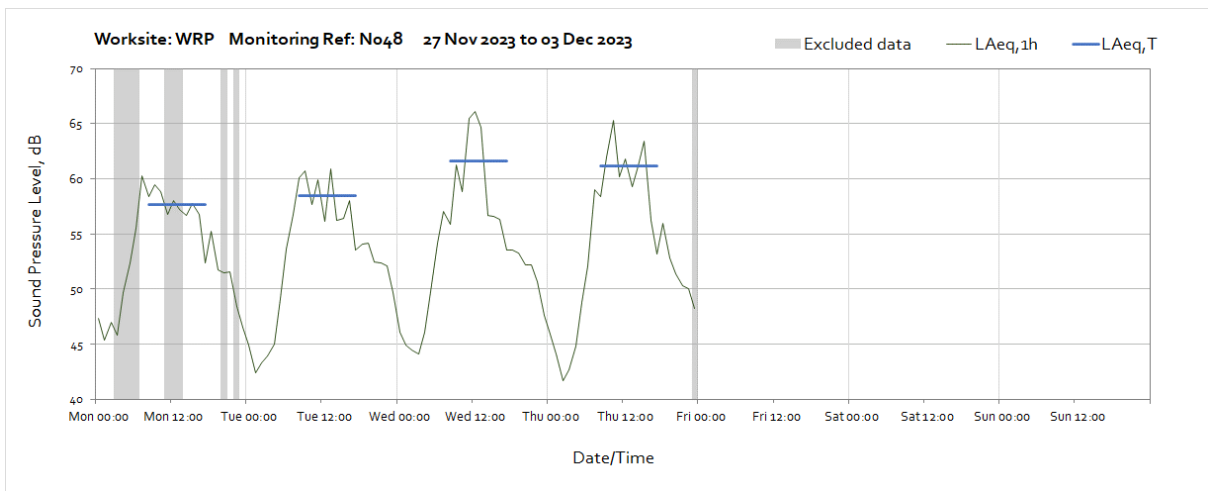
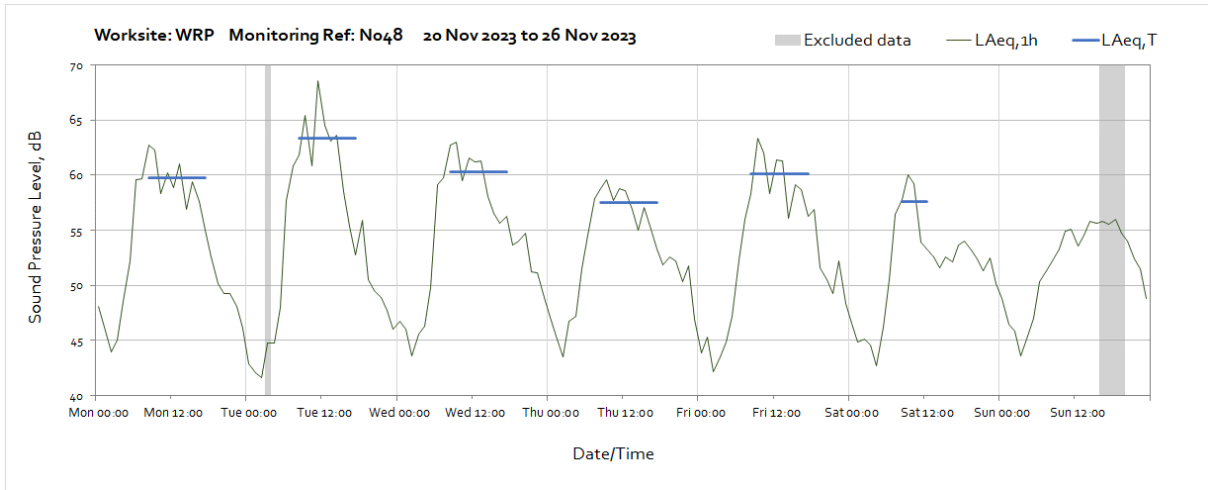




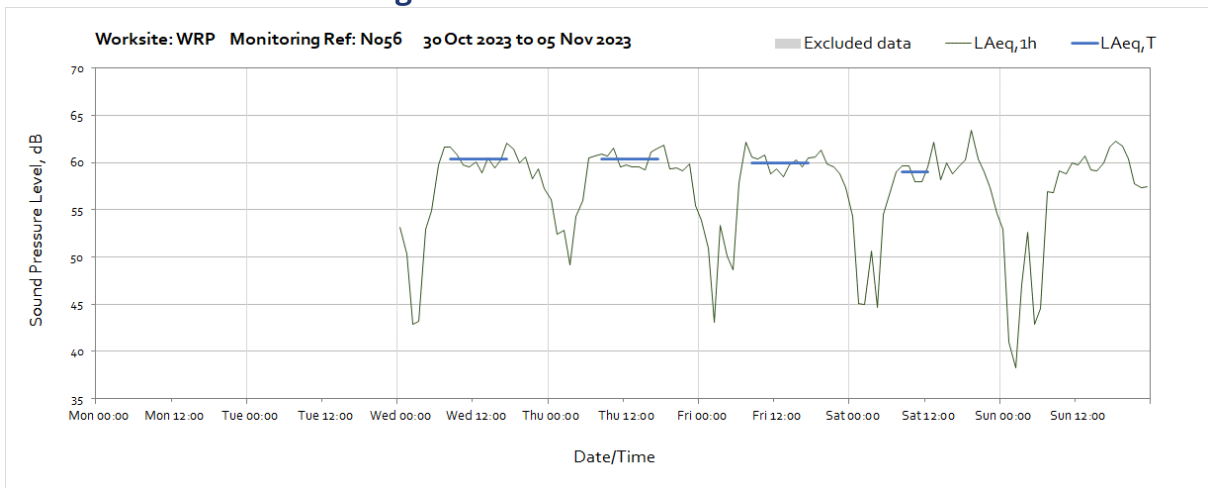
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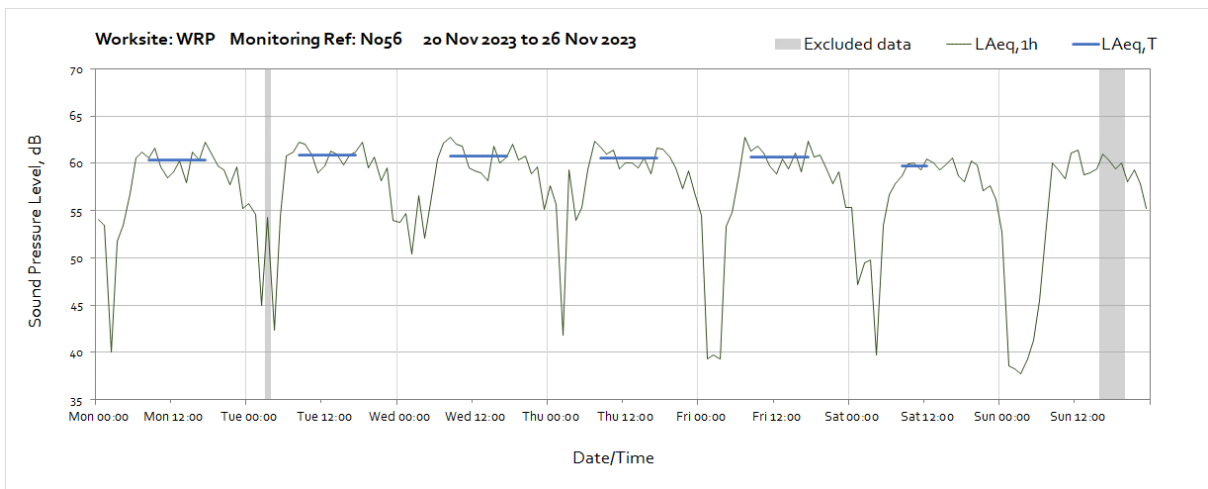
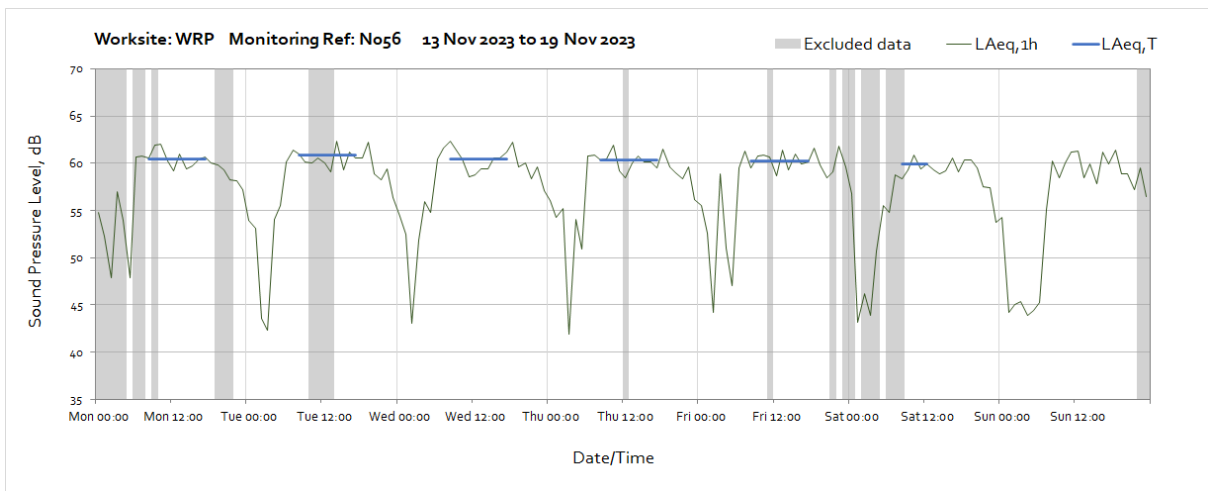
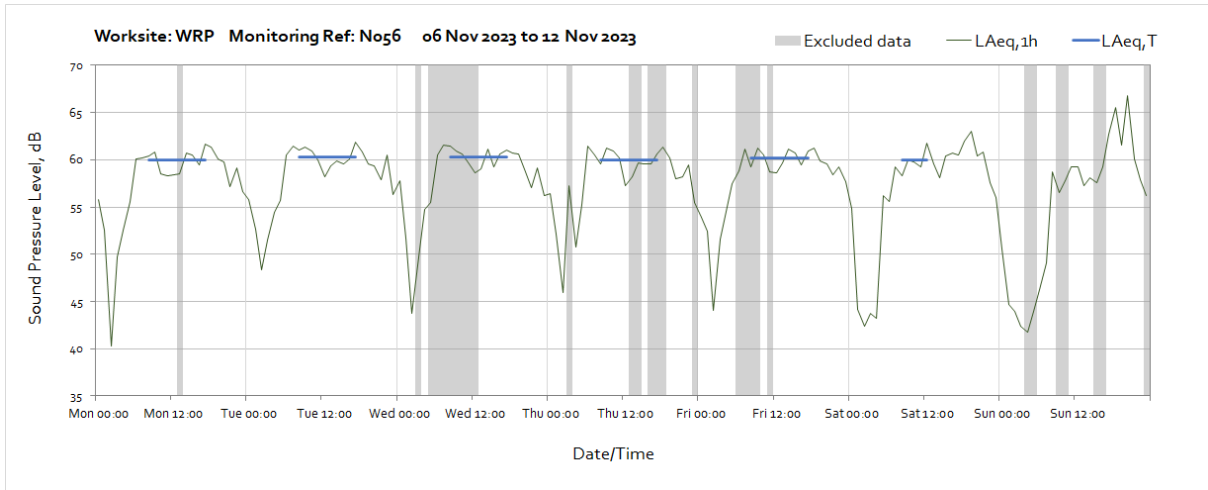


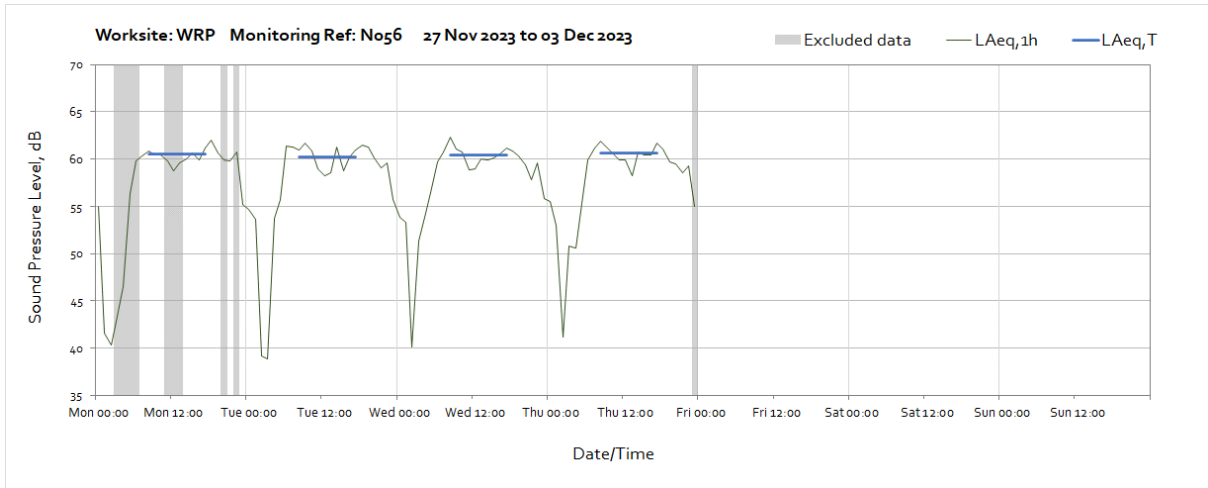
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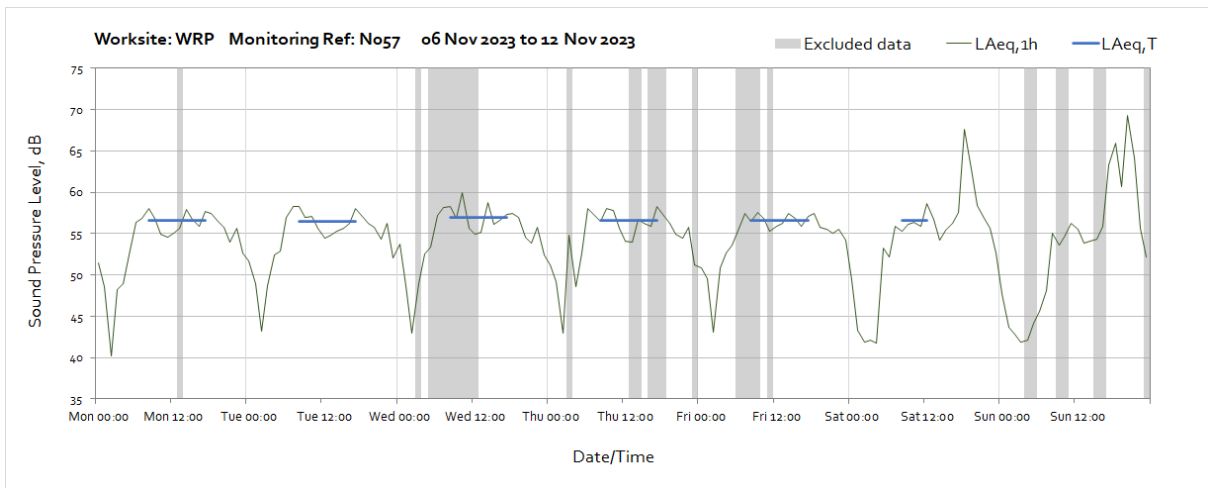
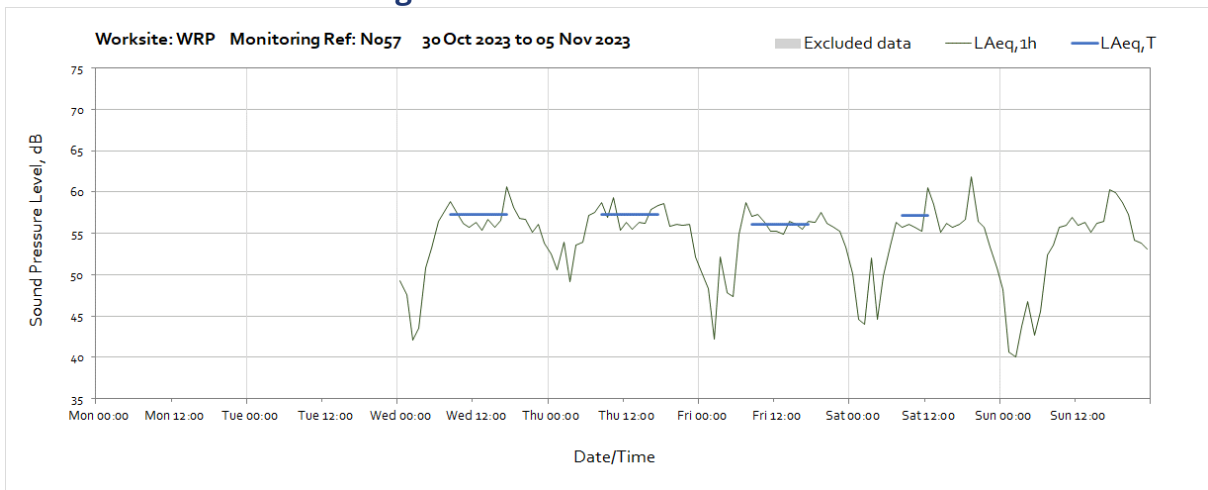
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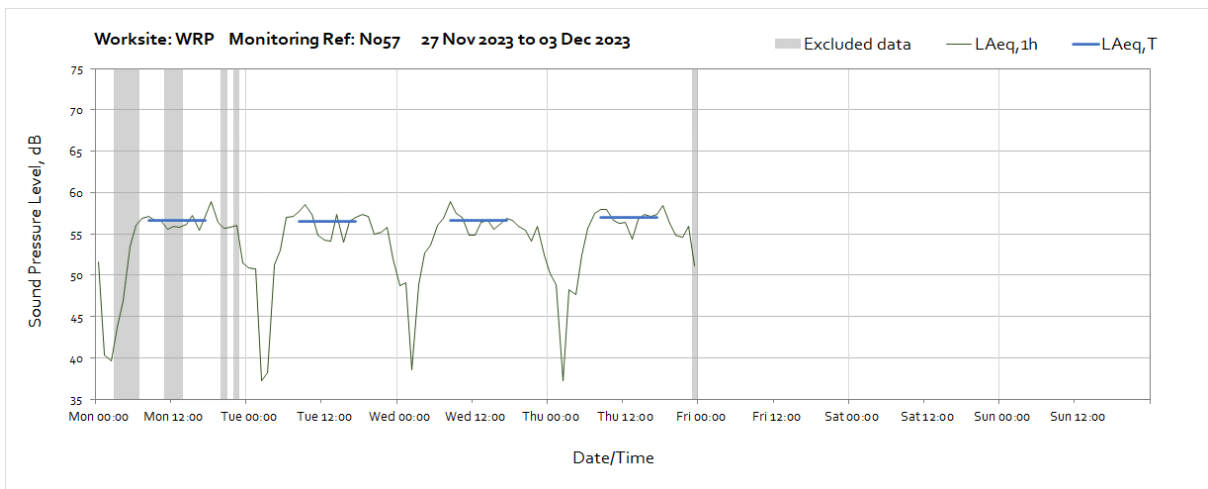
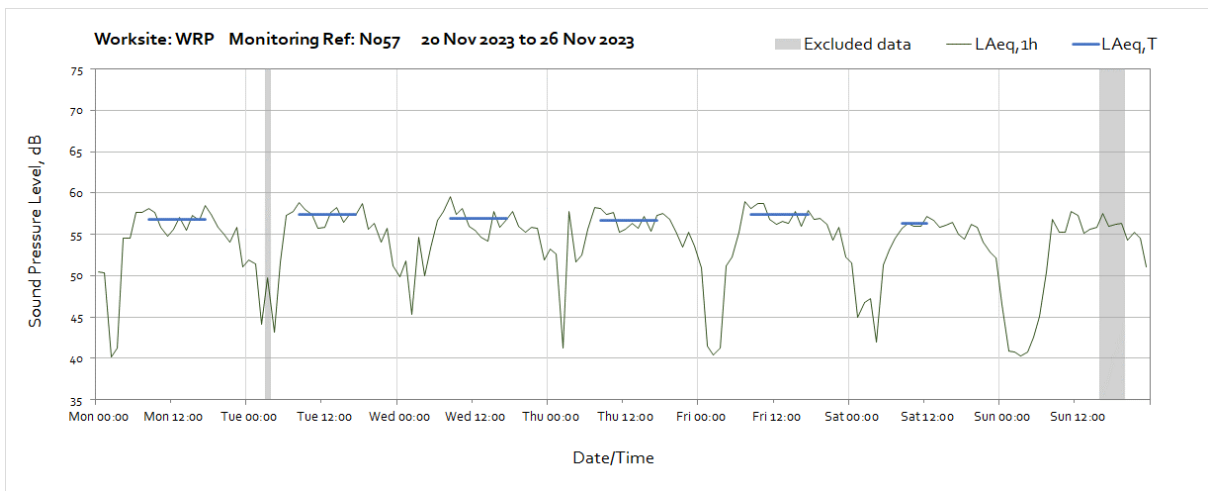
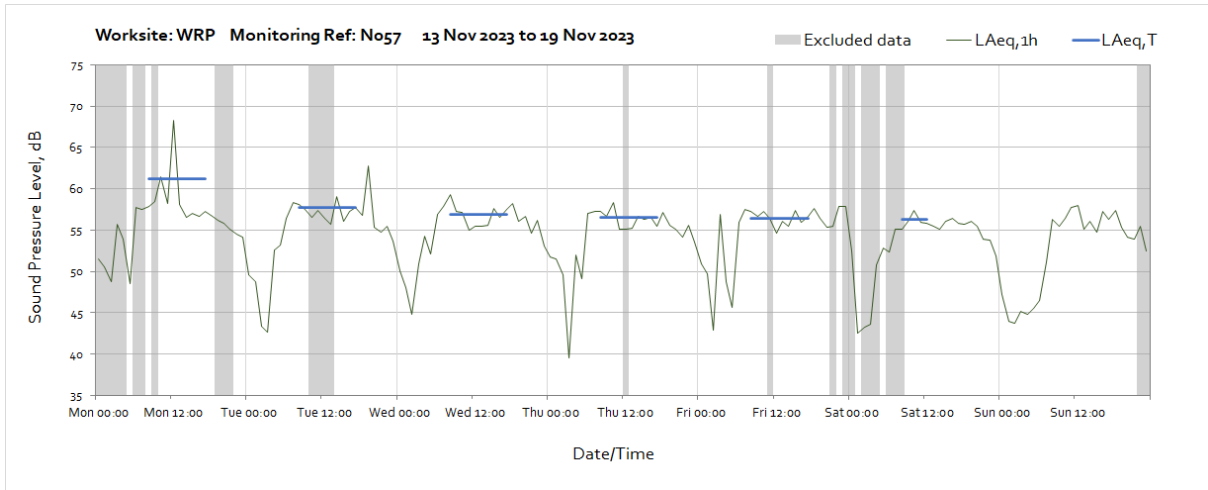




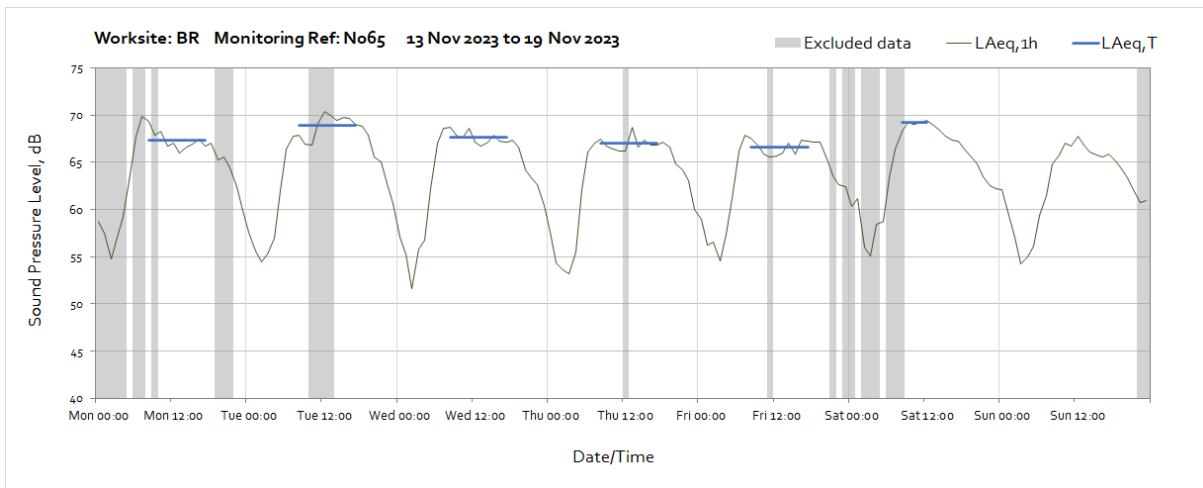
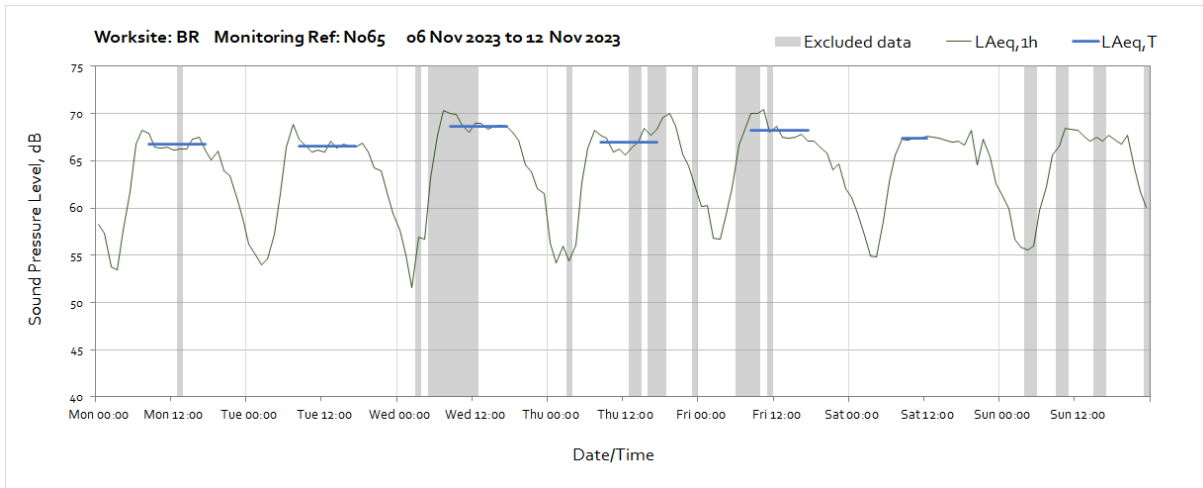
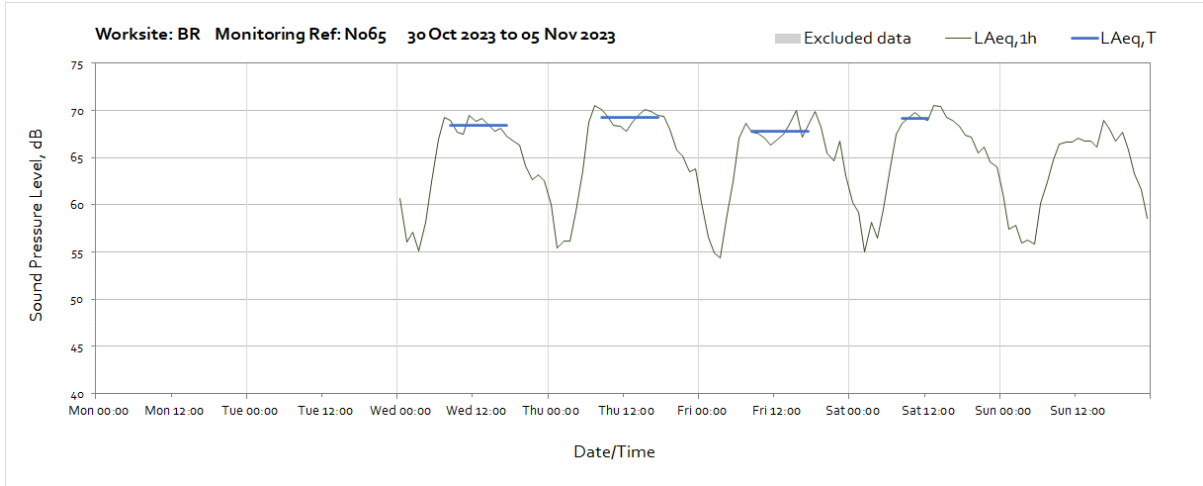


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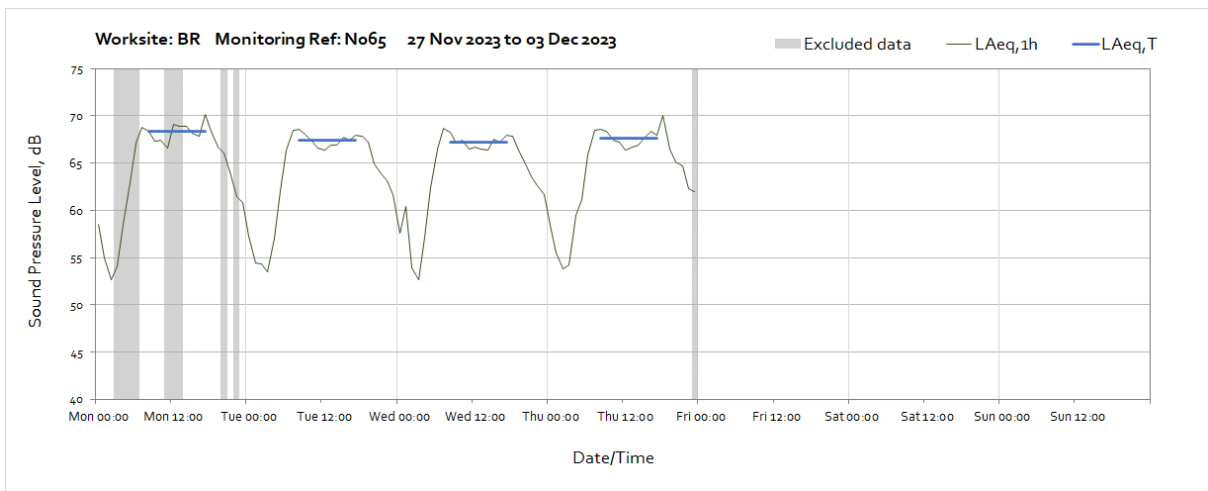
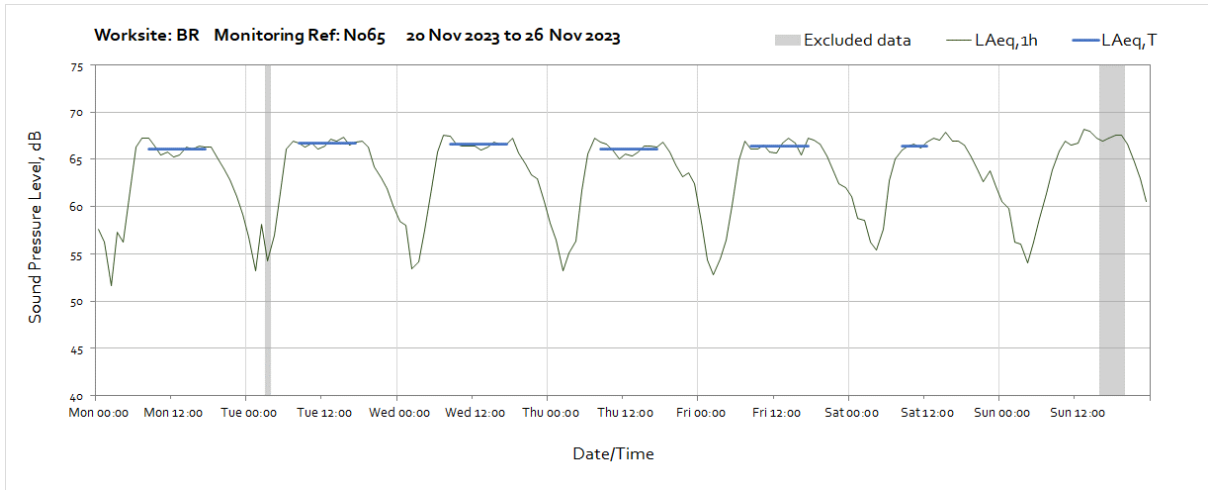




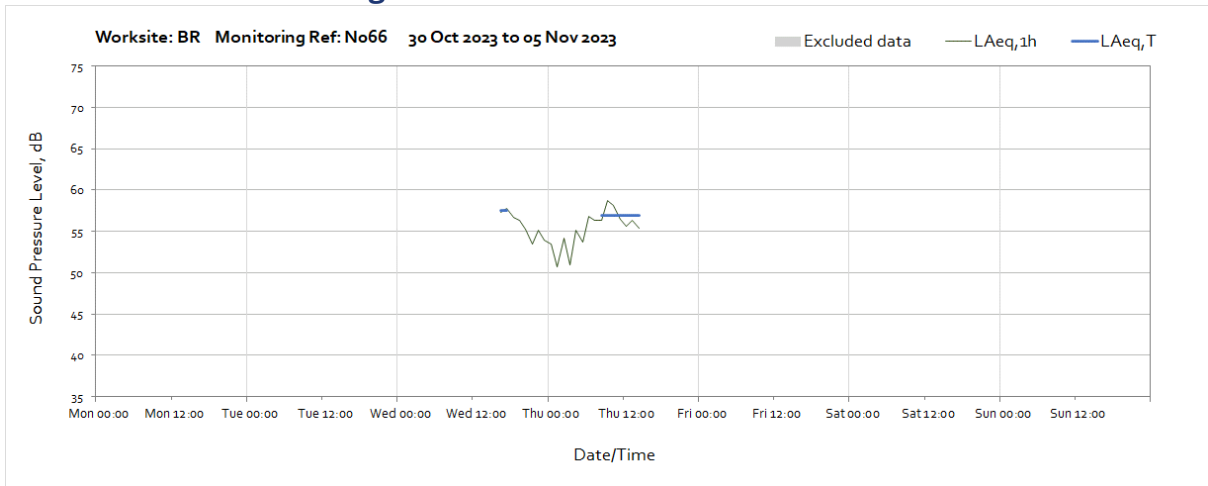
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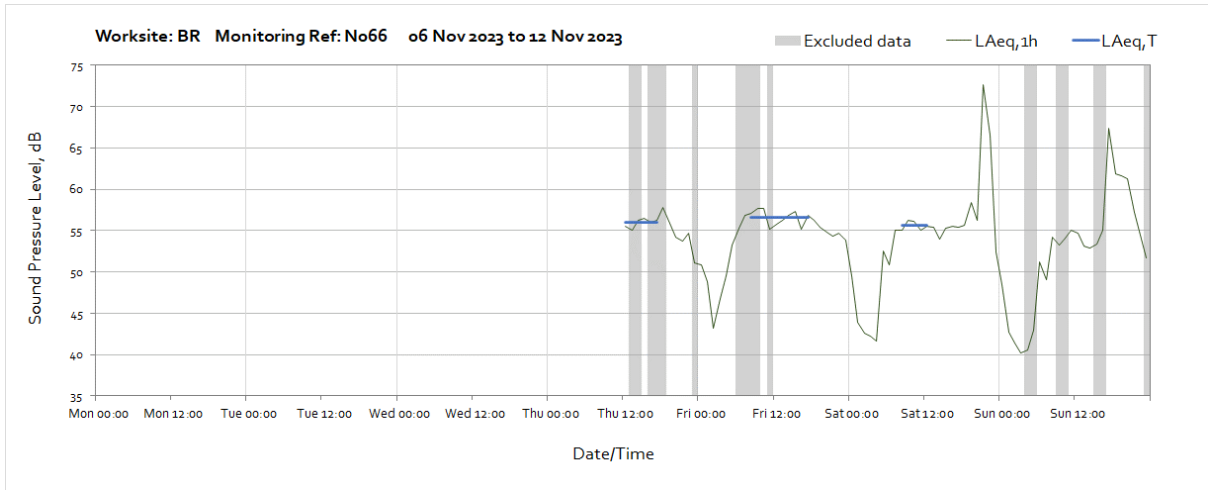


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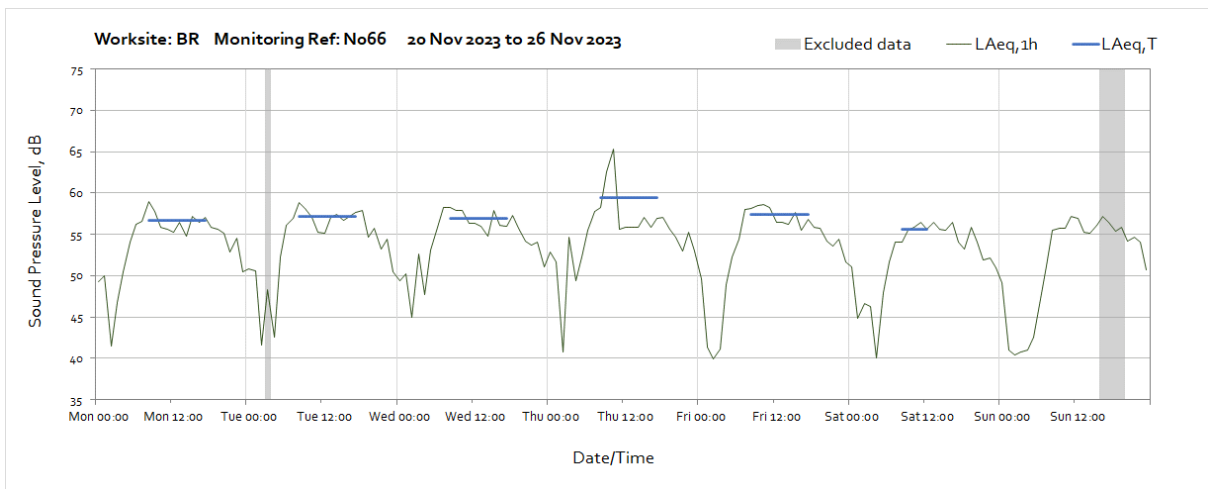
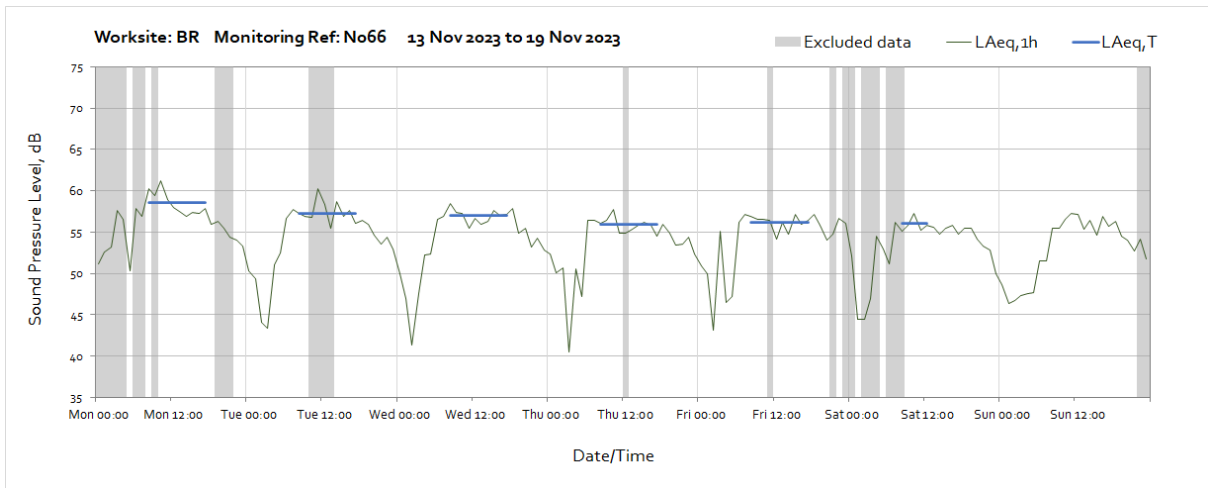


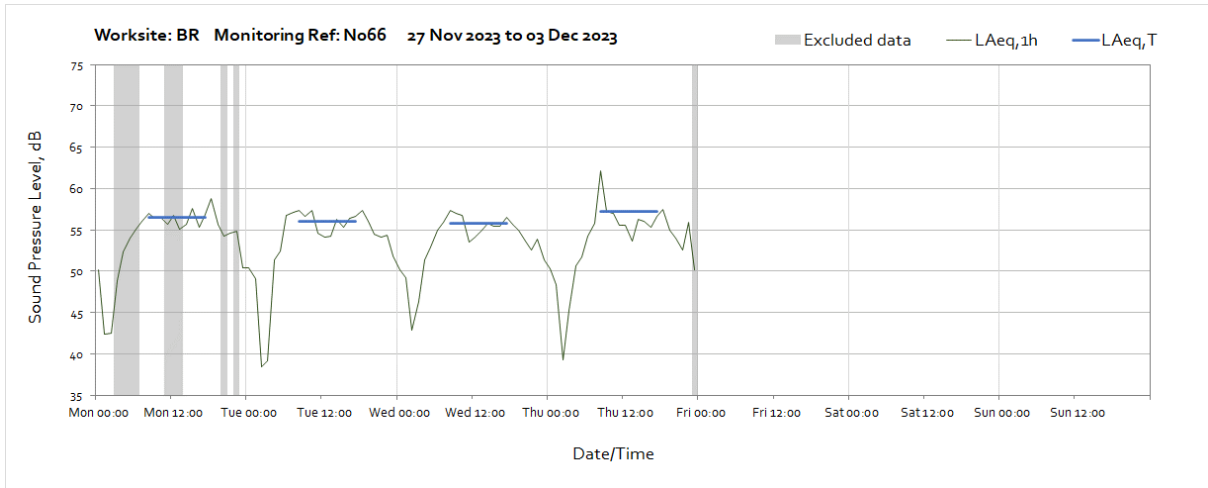
Note: Missing data between 00:00 and 16:00 on Wednesday 1st November was due to depleted battery. Missing data between 15:00 on Thursday 2nd November and 12:00 on Thursday 9th November was due to power supply issues which is now solved.

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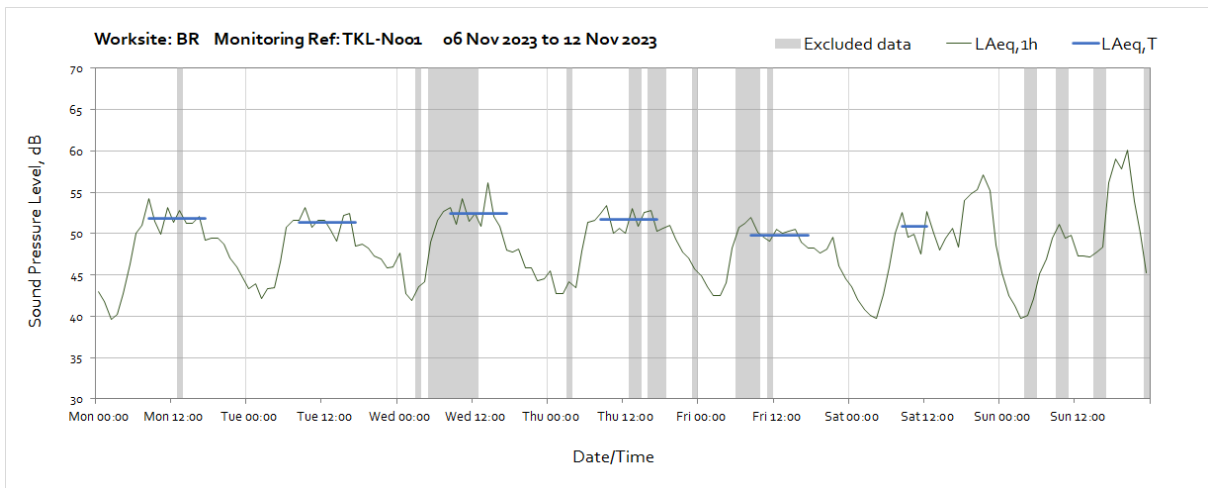
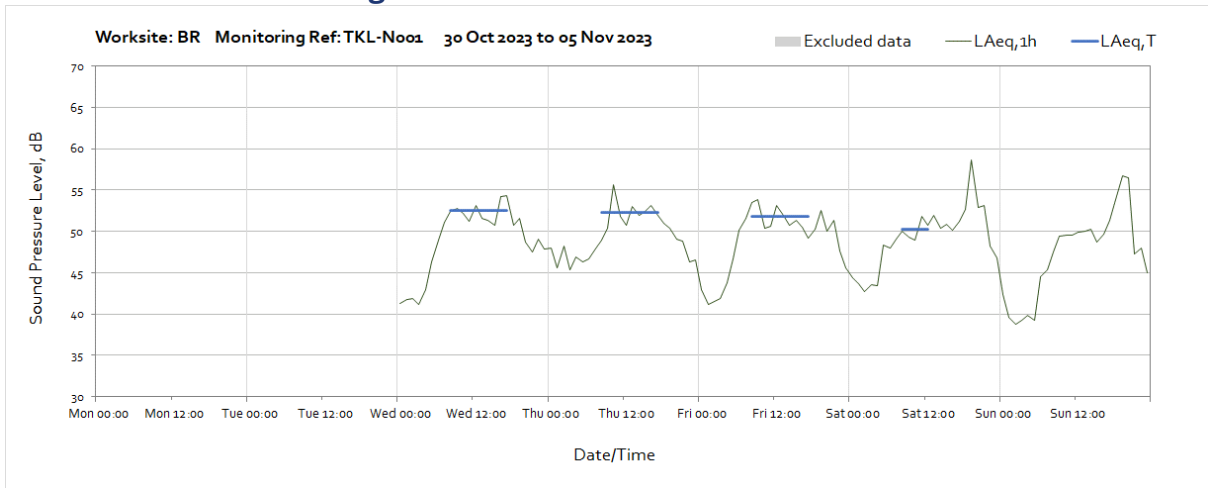


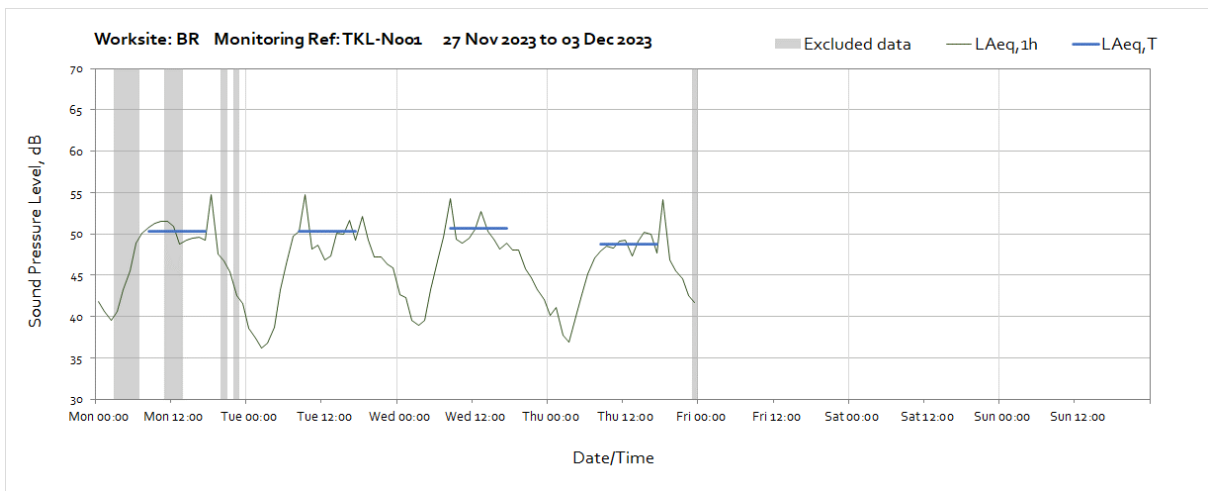
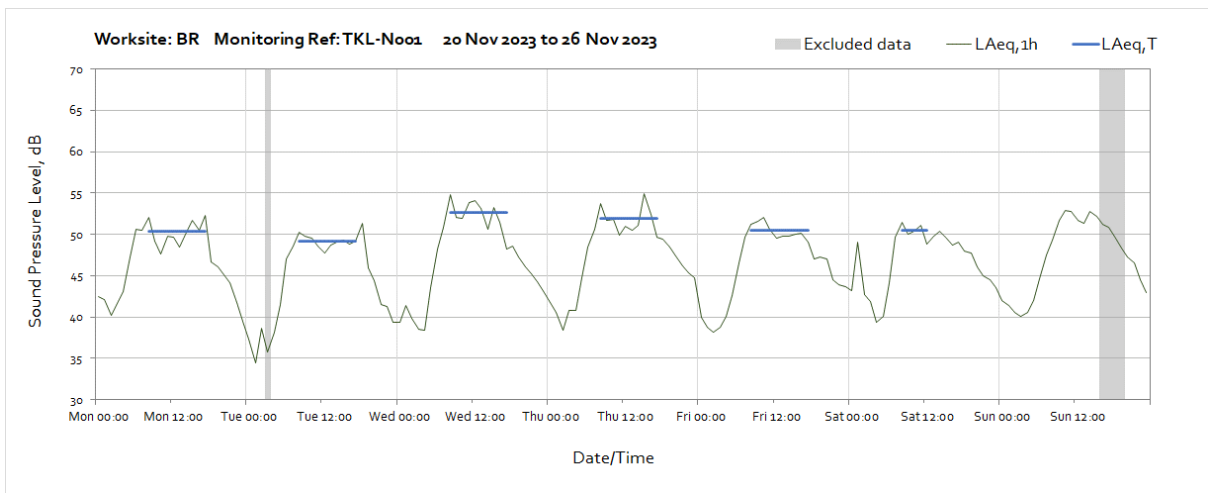
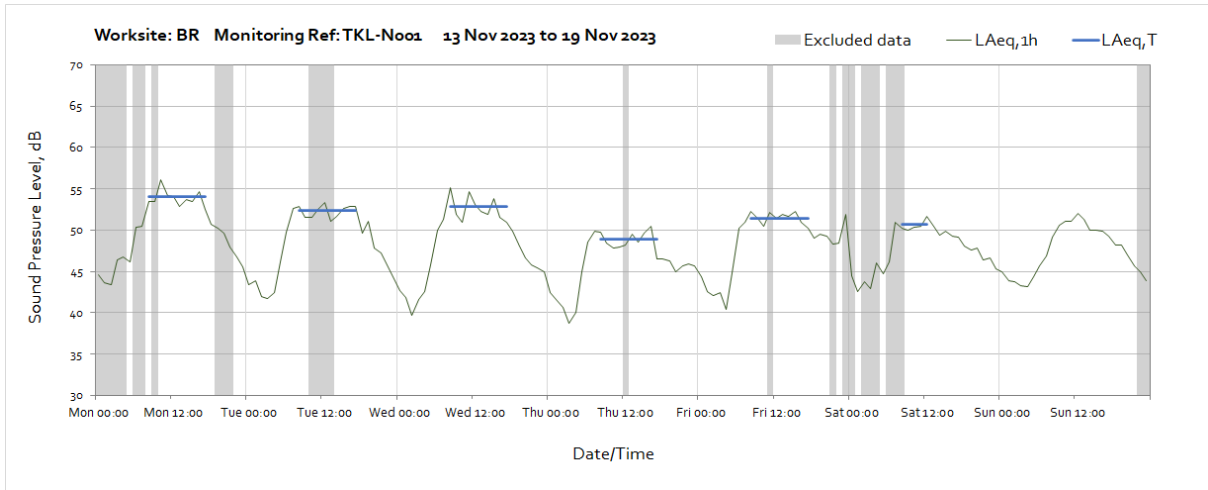
Note: Missing data between 15:00 on Thursday 2nd November and 12:00 on Thursday 9th November was due to power supply issues which is now solved.



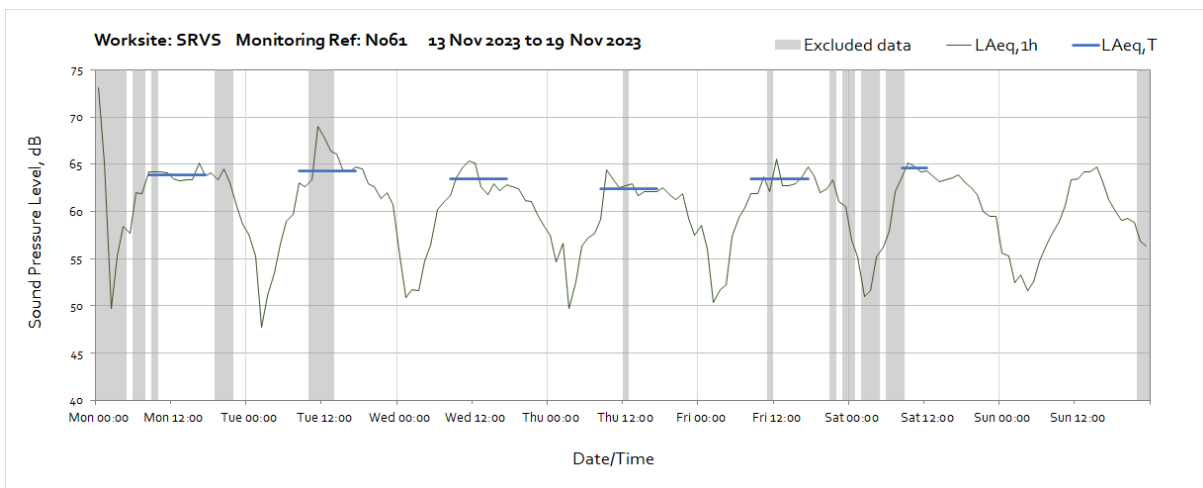
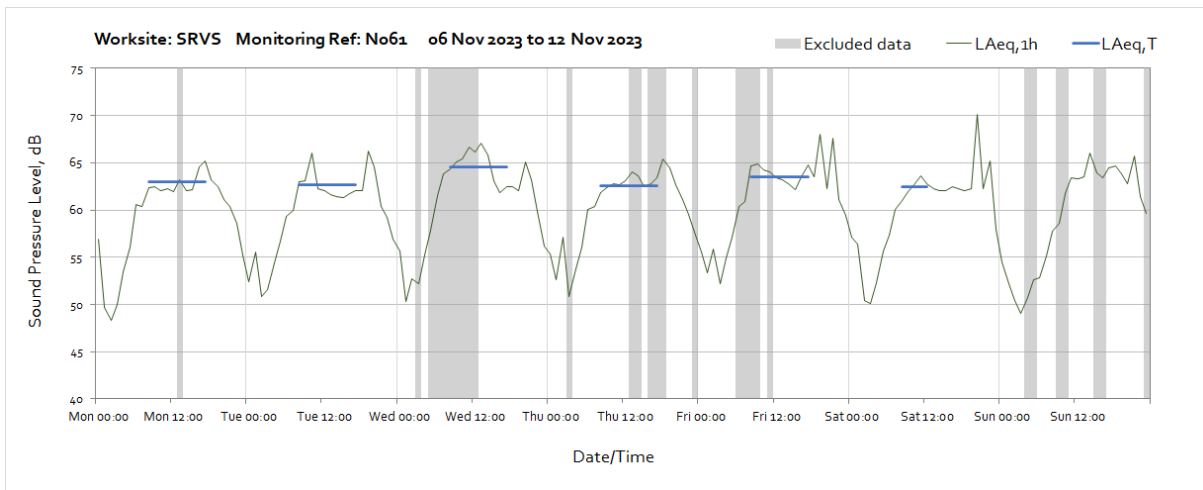
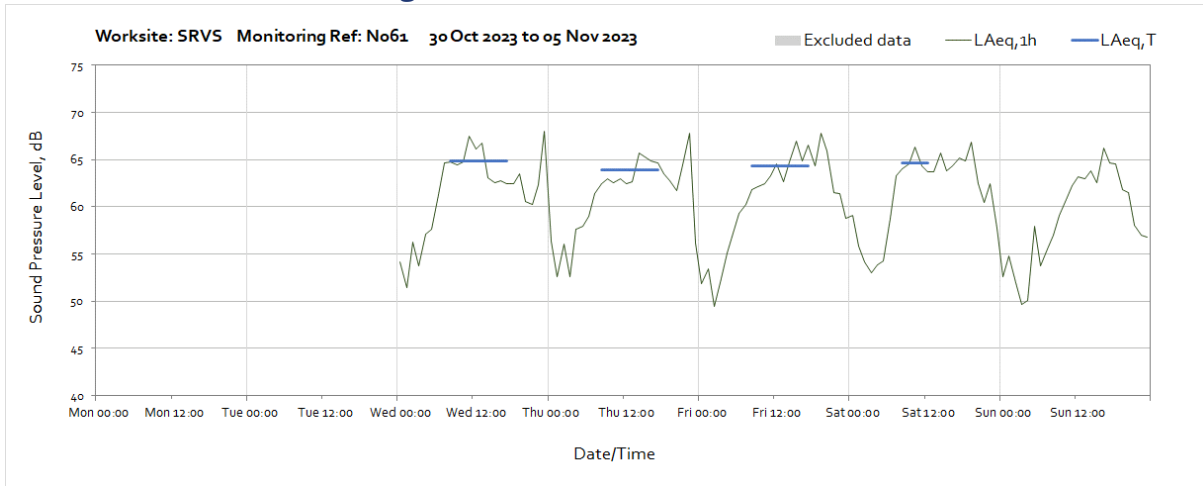


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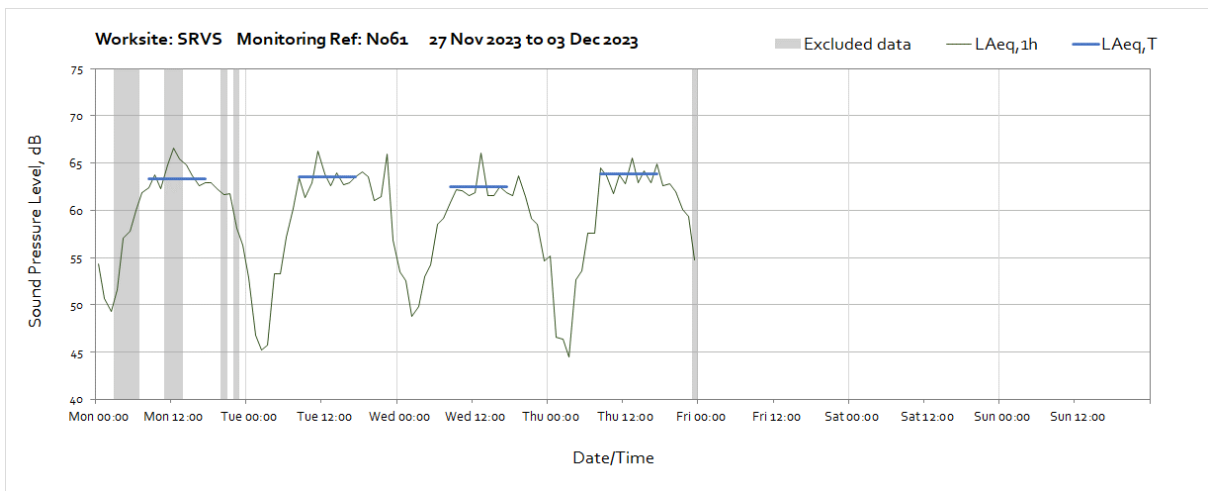
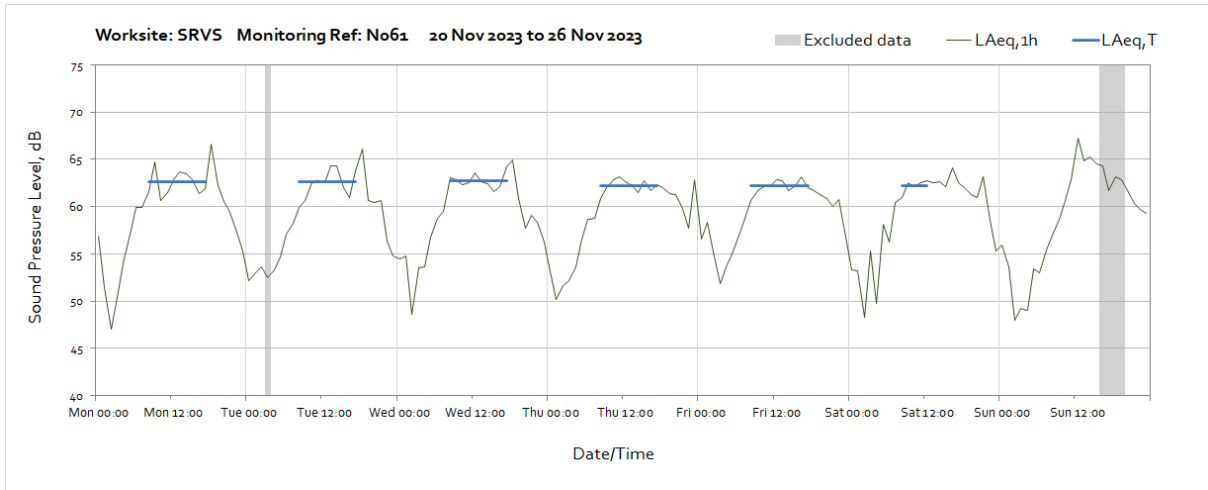




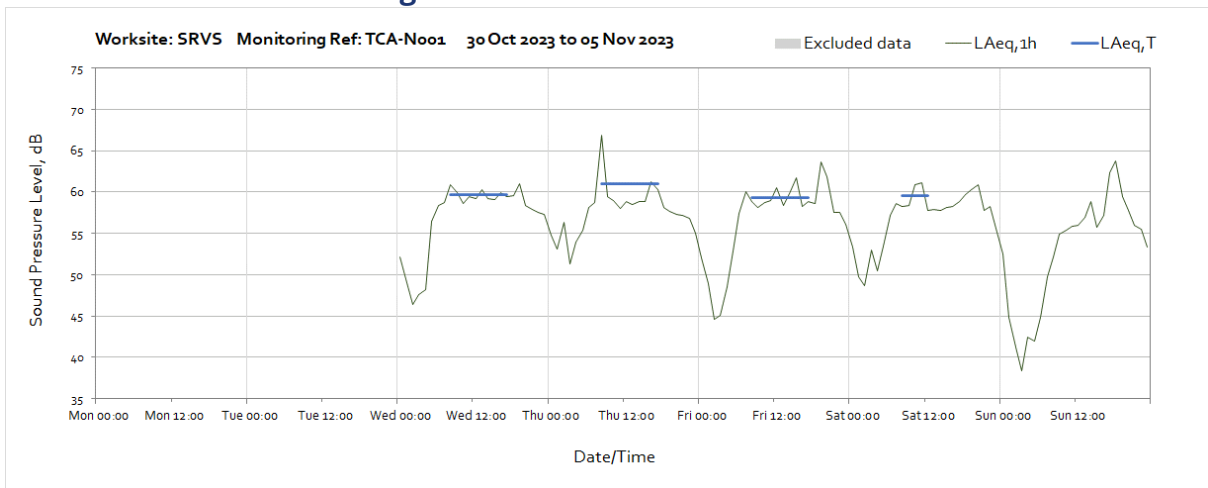
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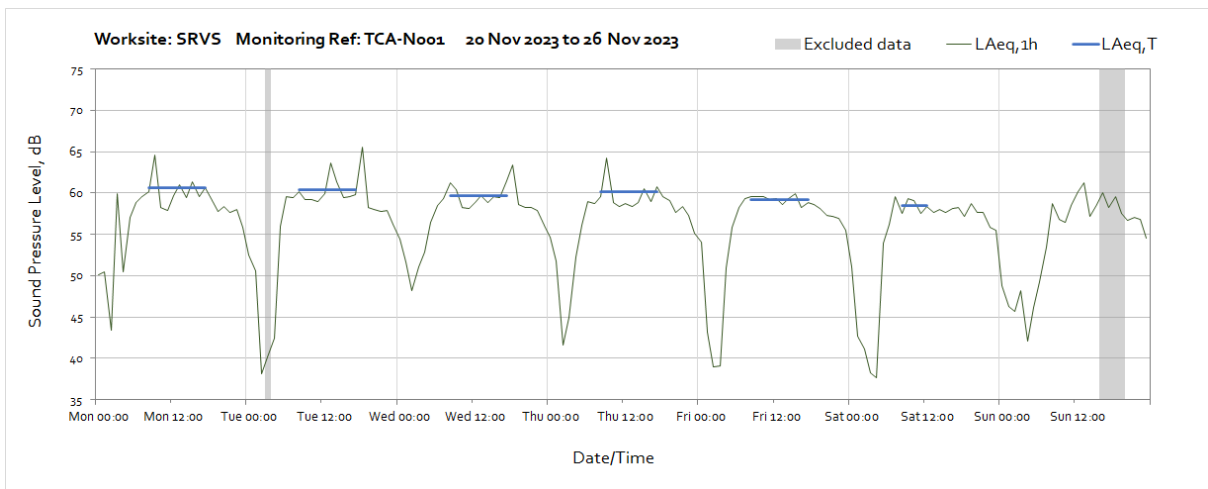
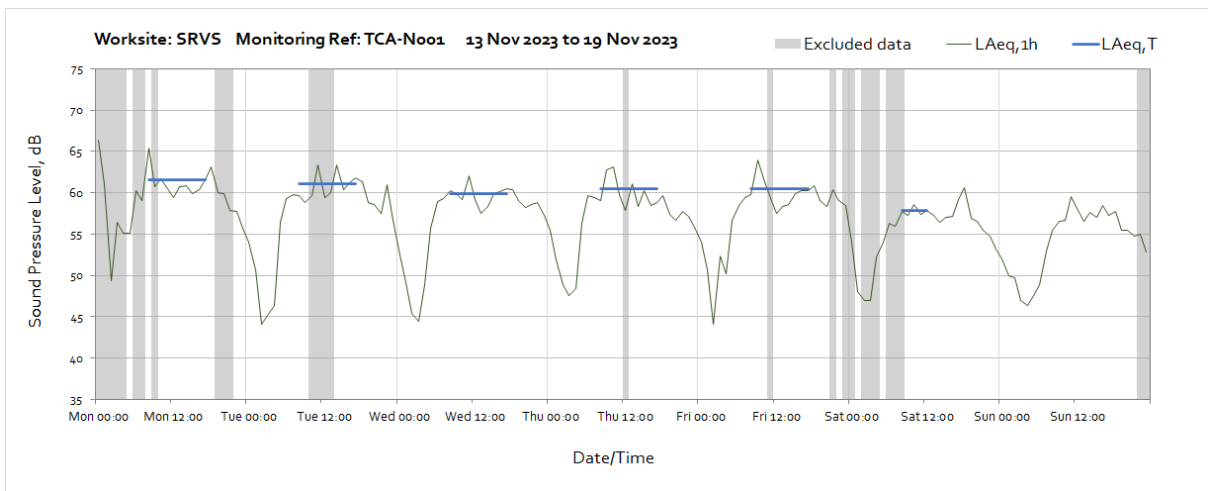
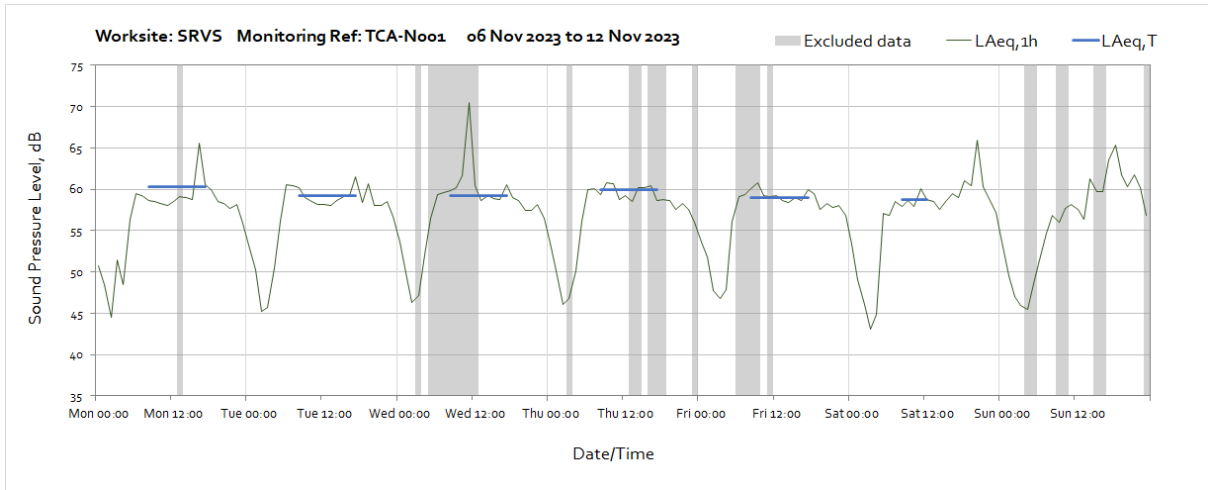


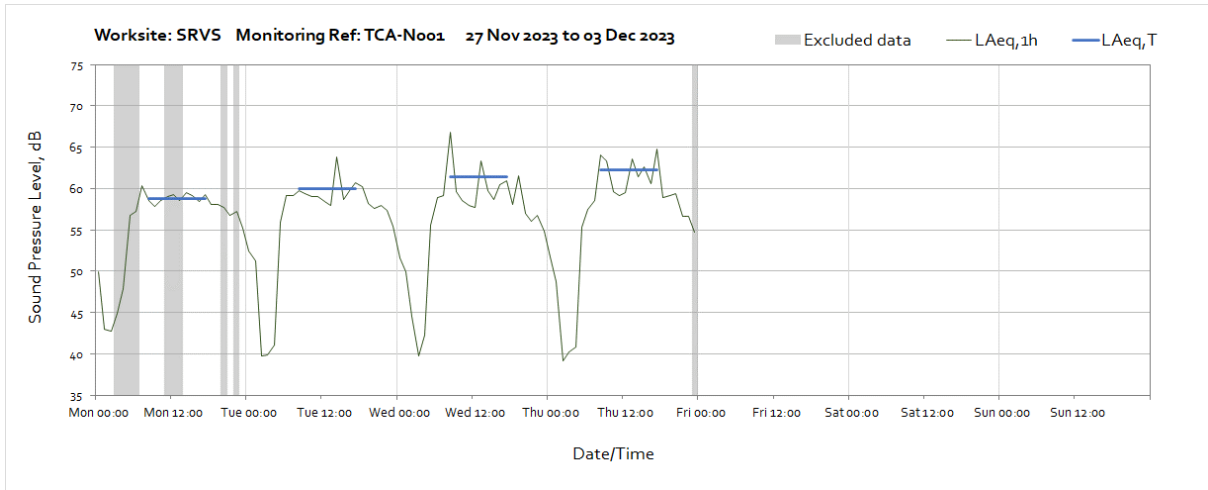
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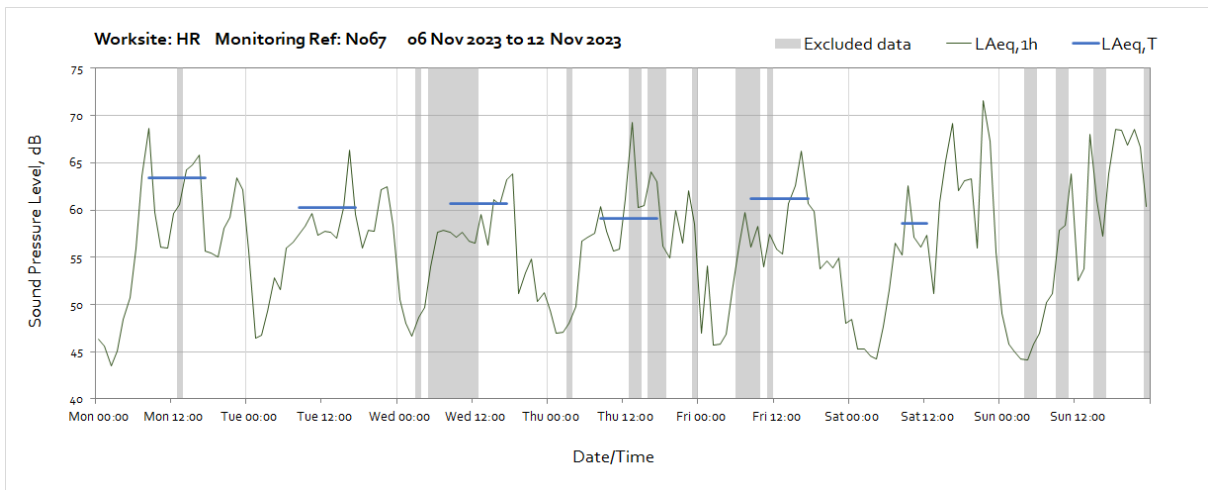
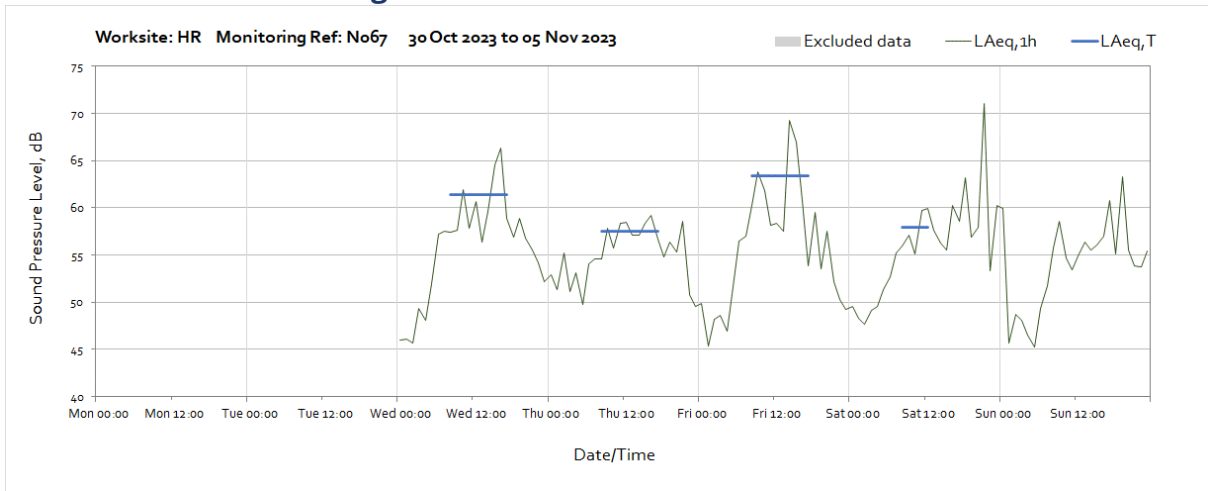
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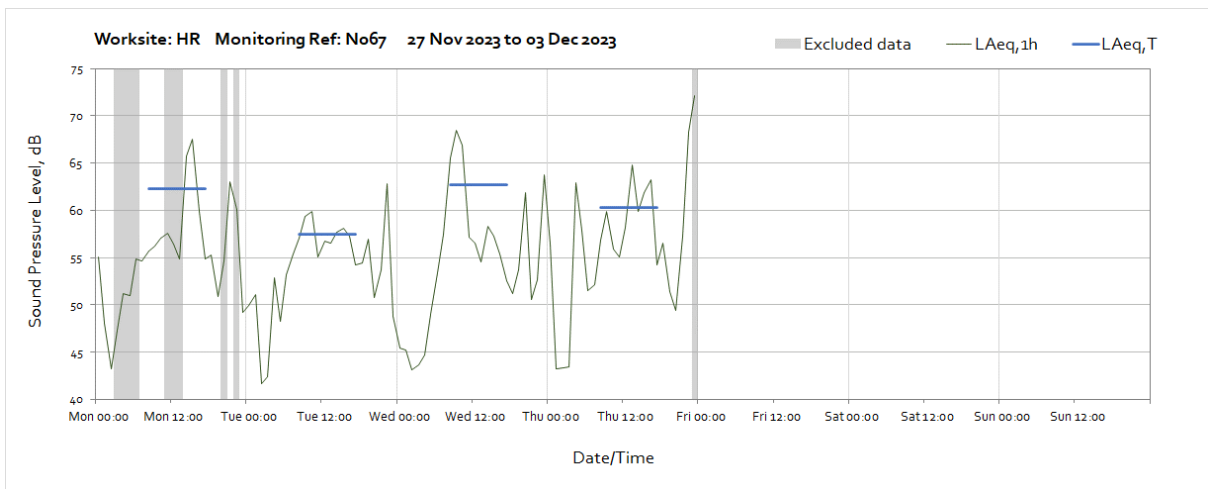
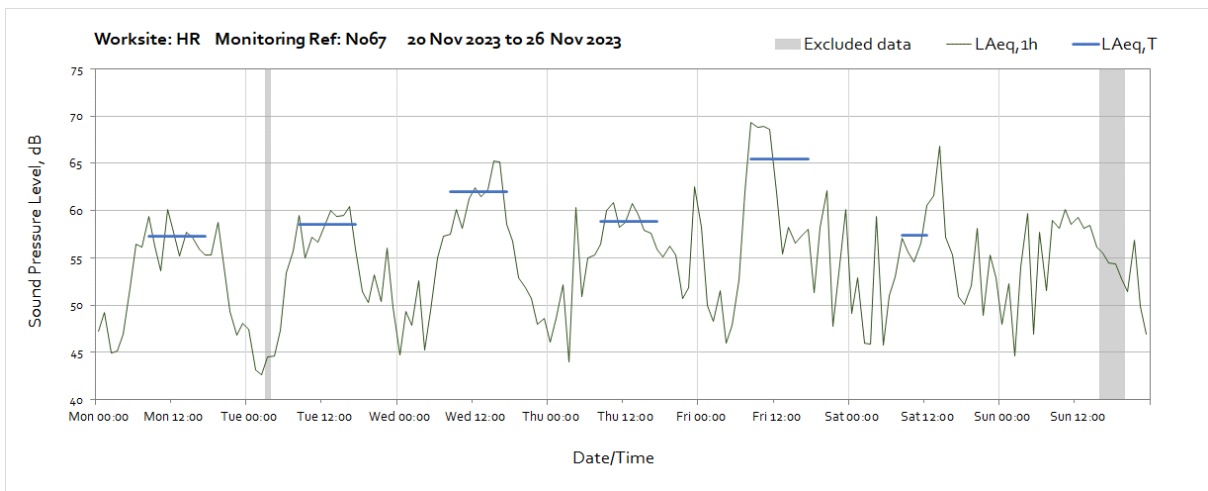
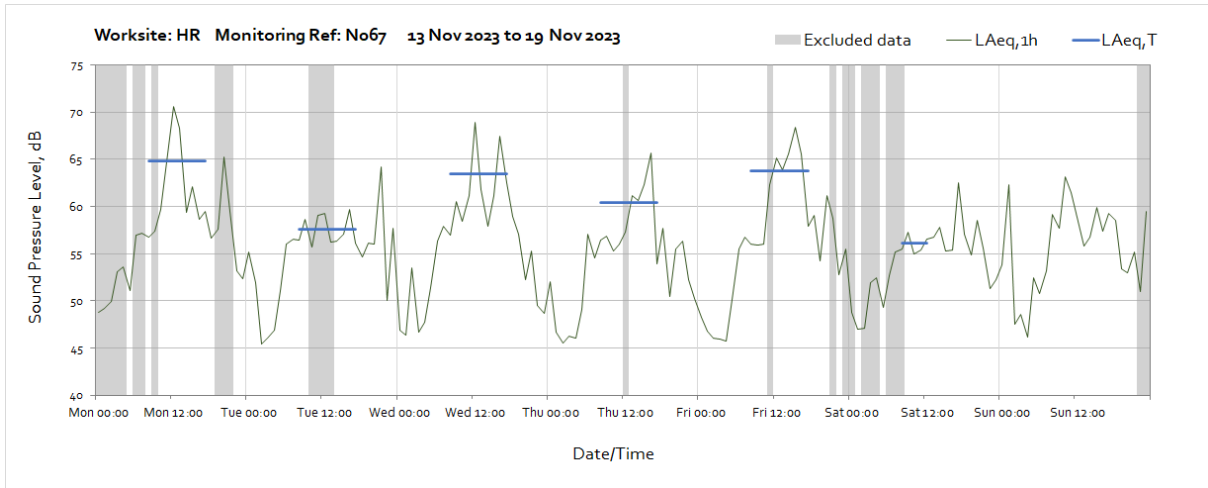




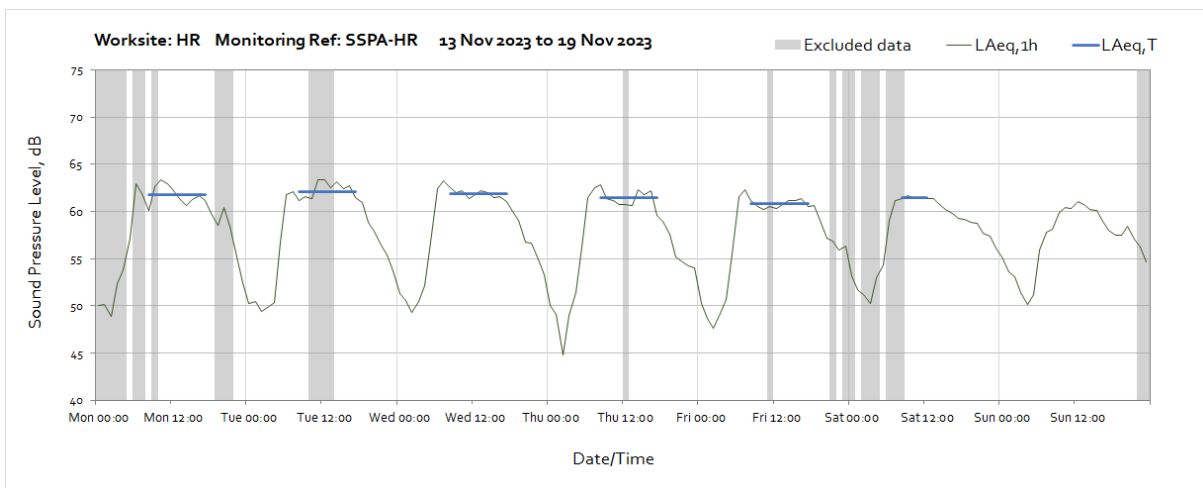
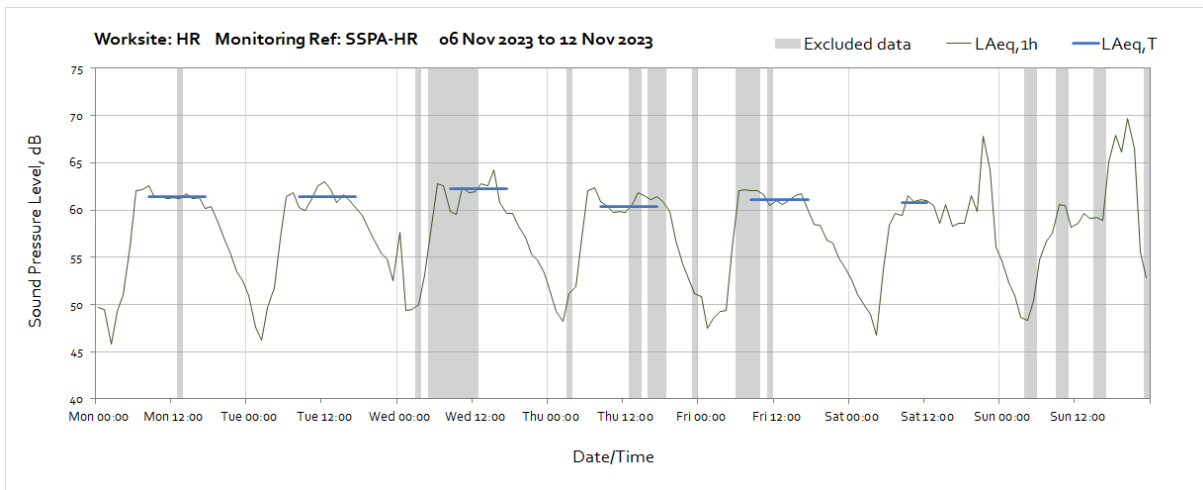
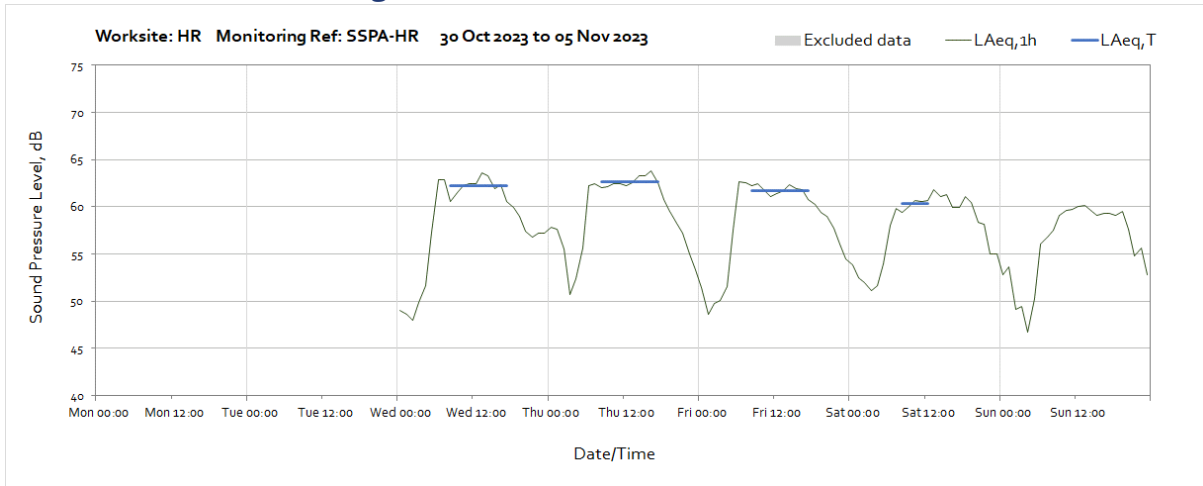


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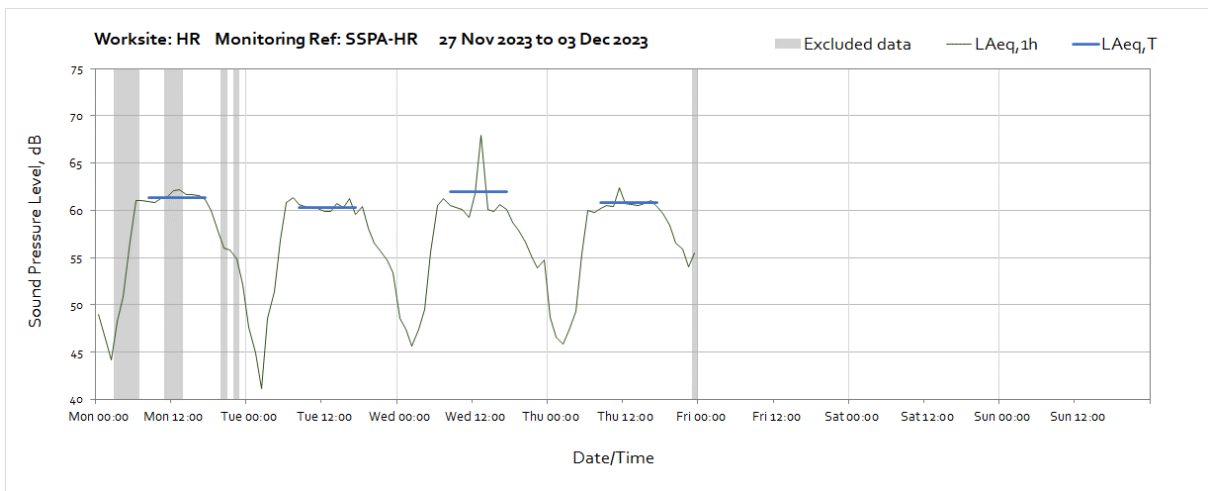
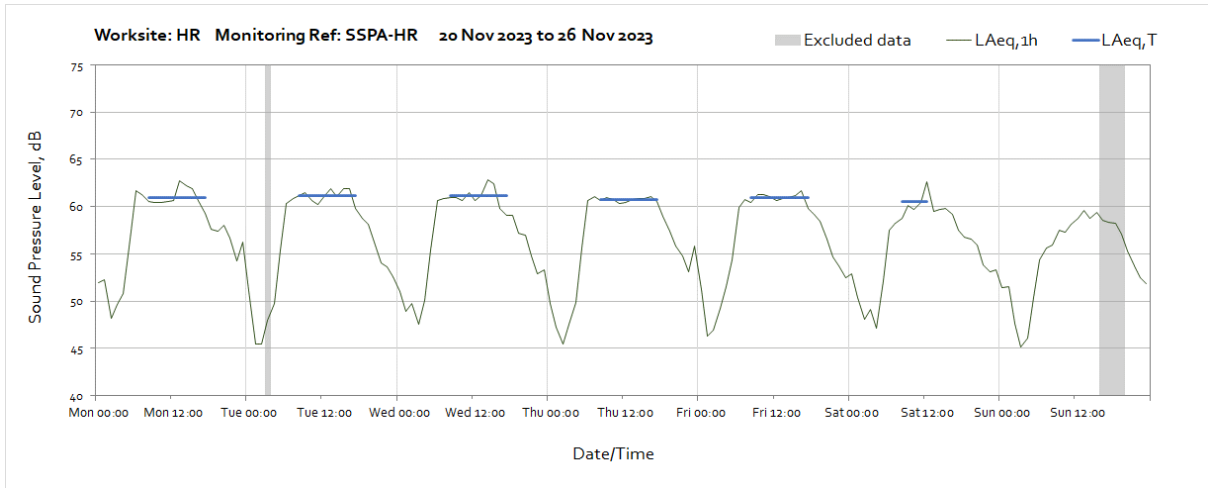




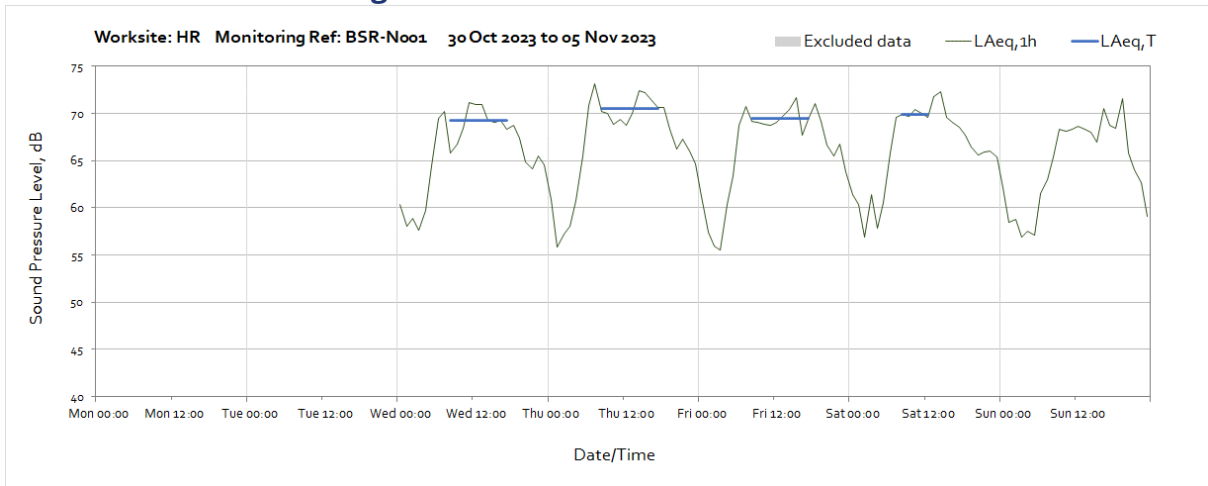
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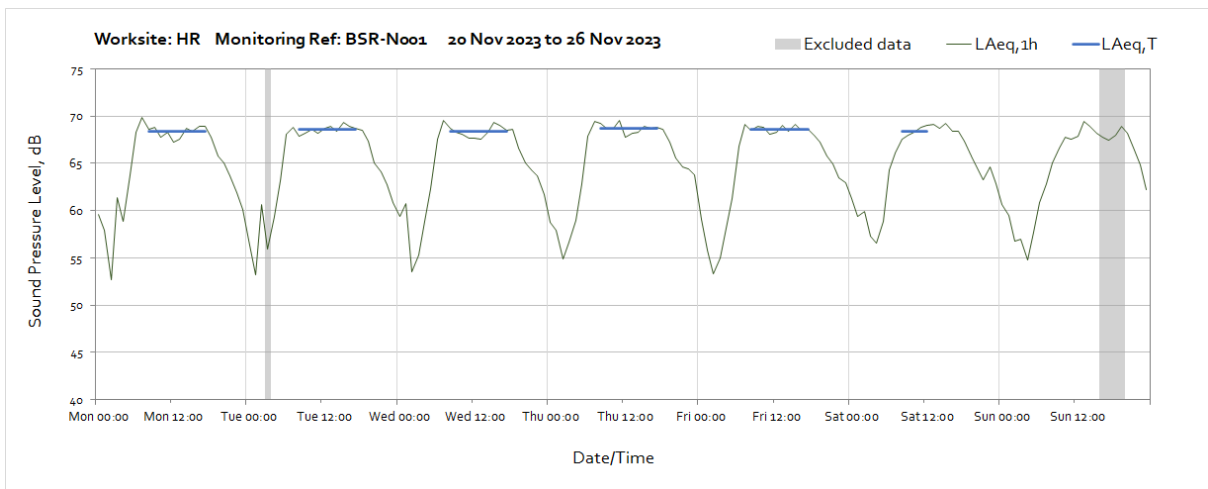
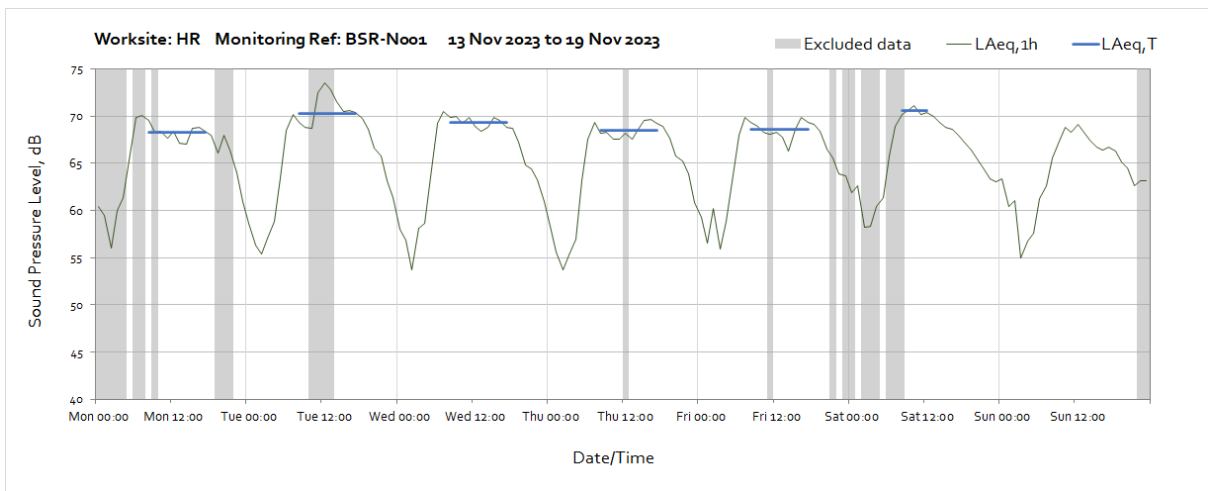
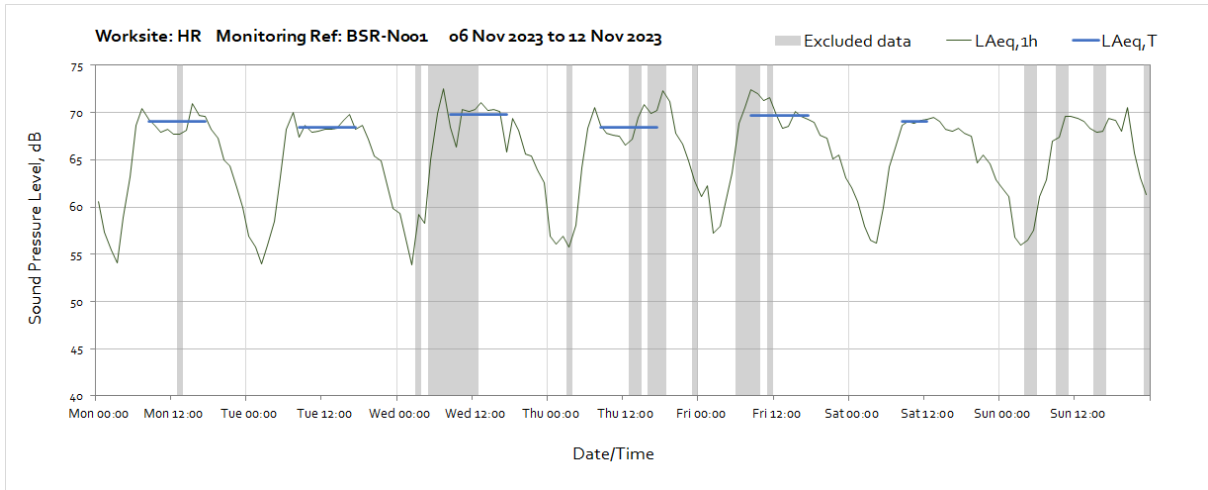


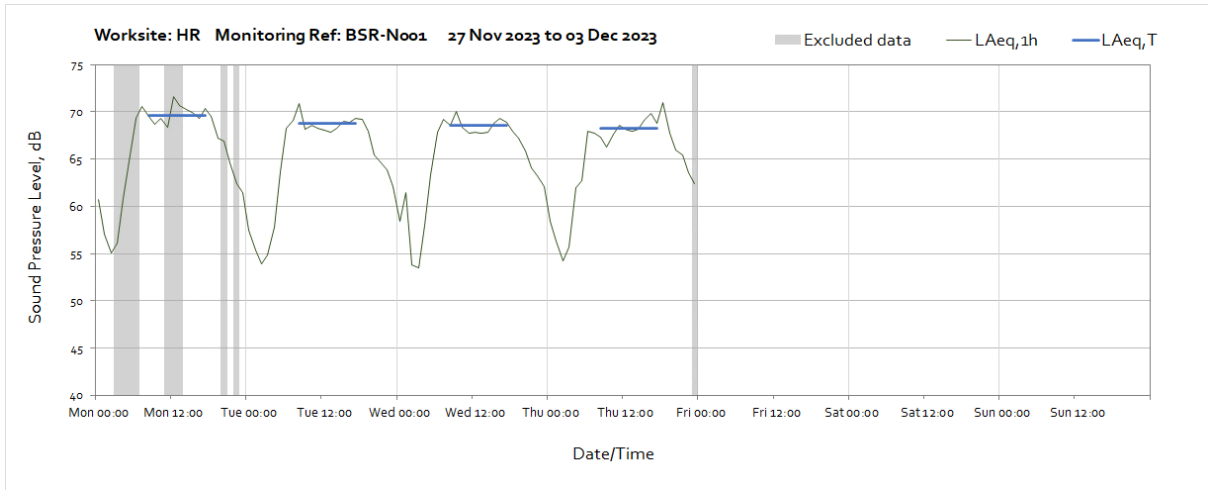
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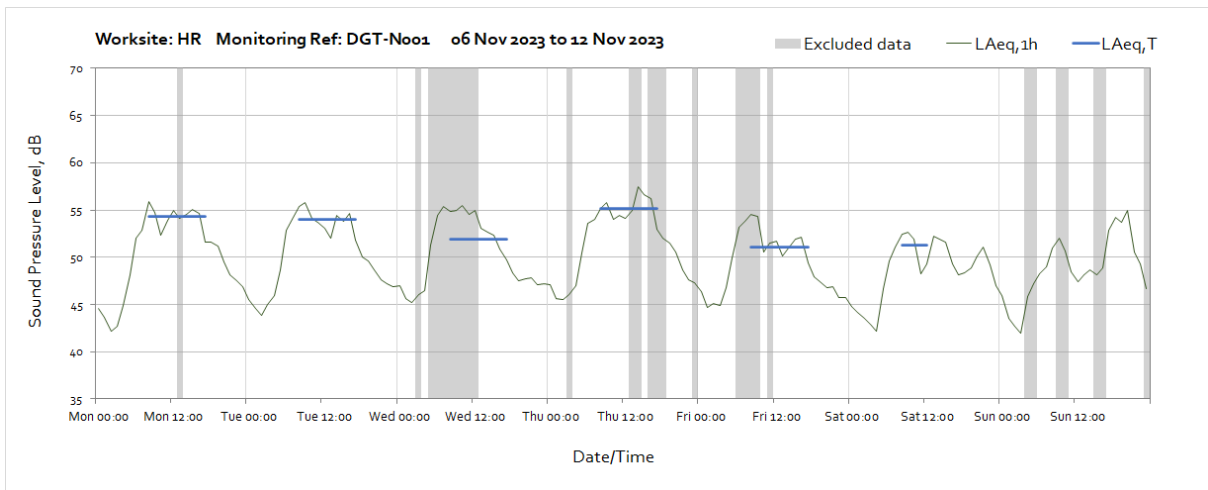
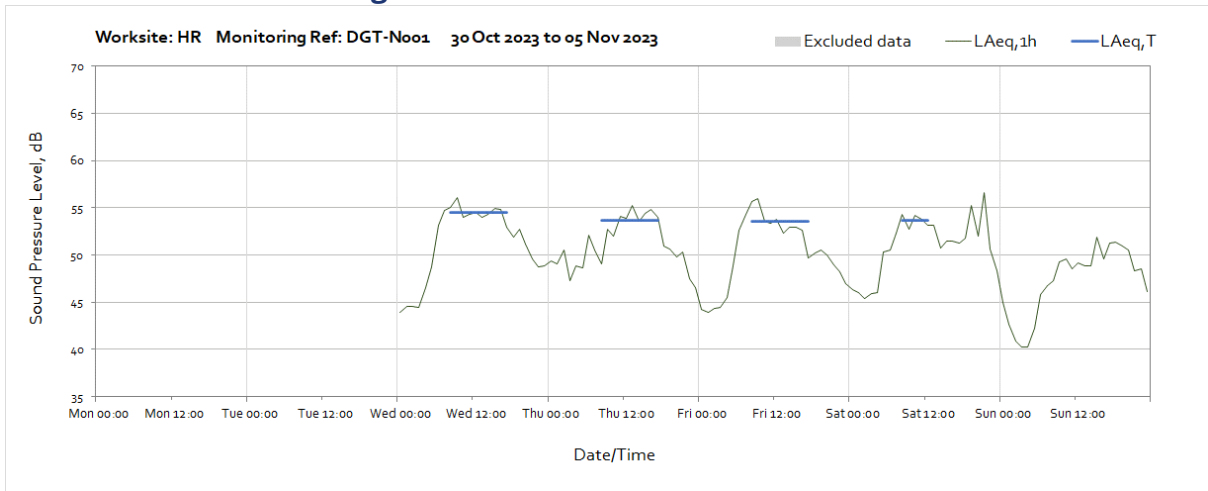
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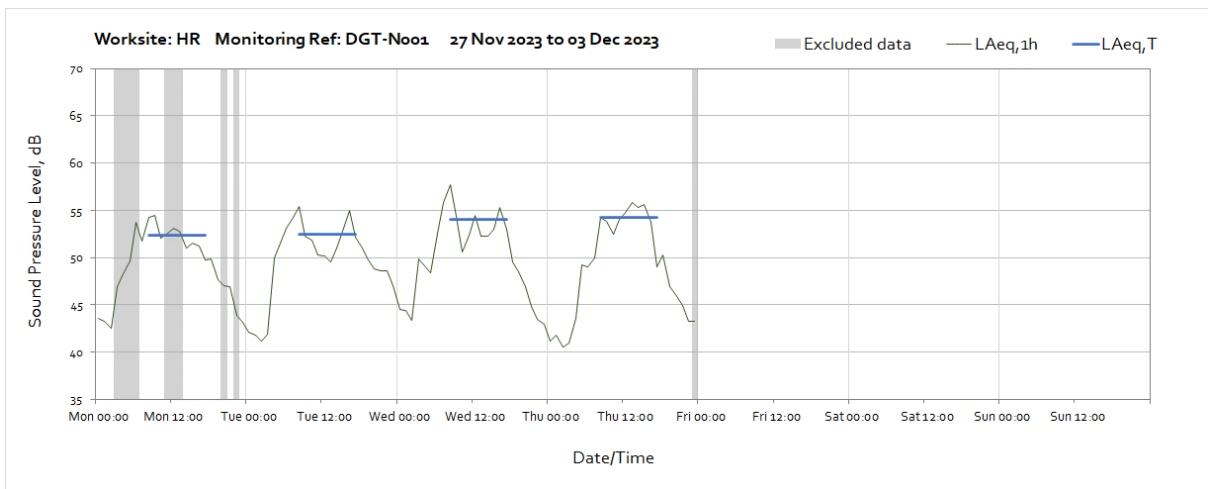
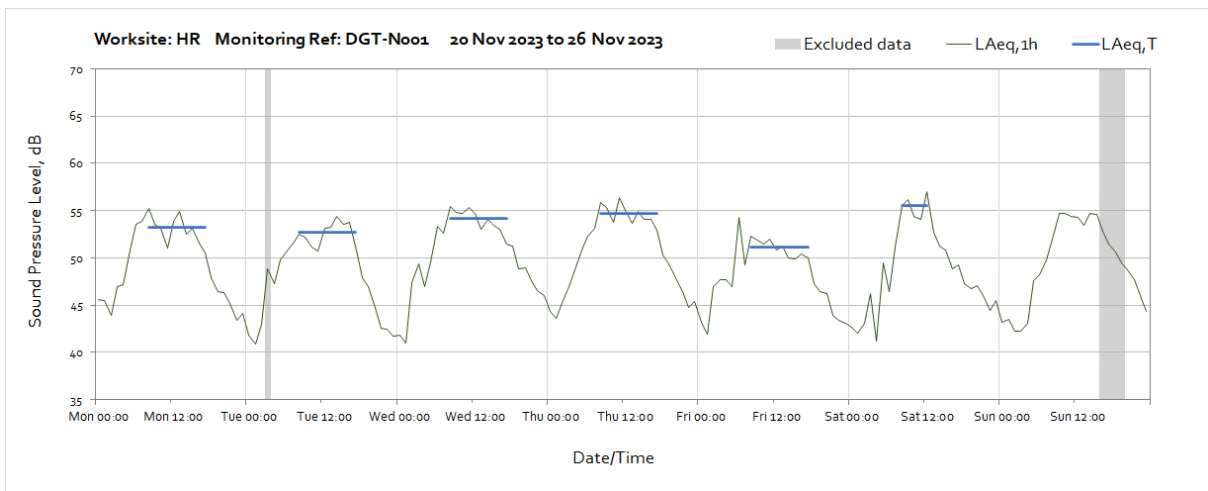
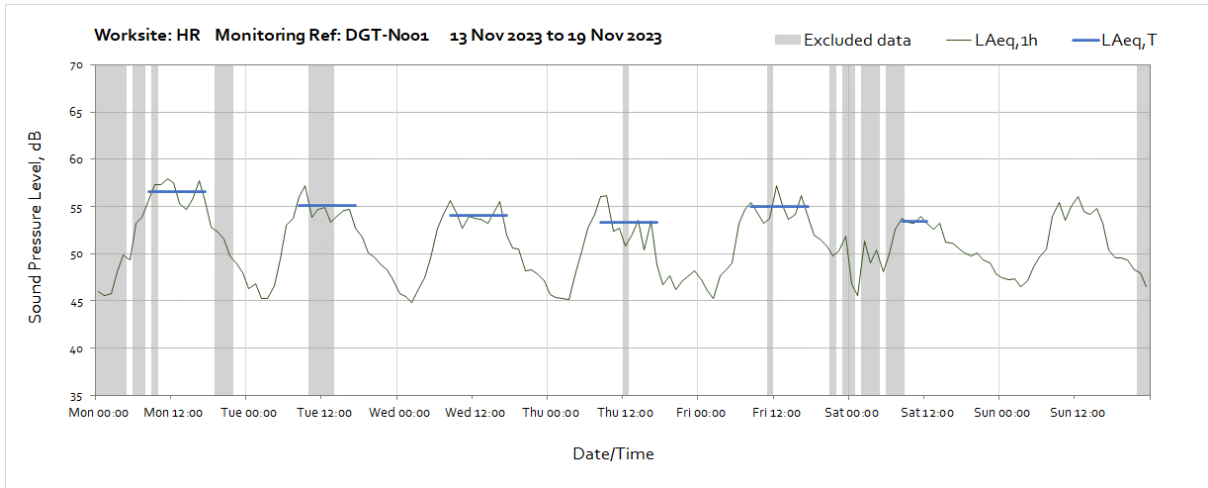




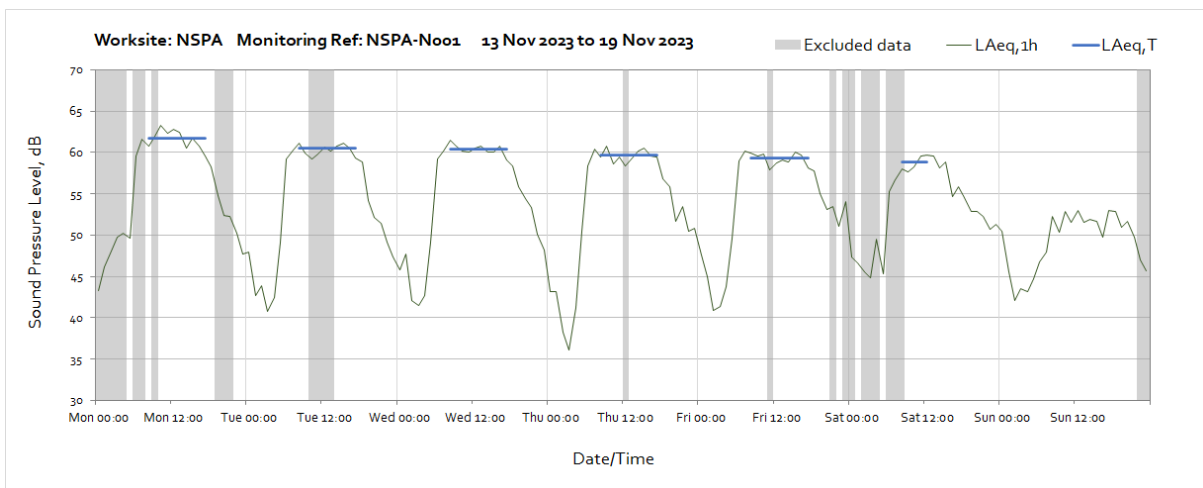
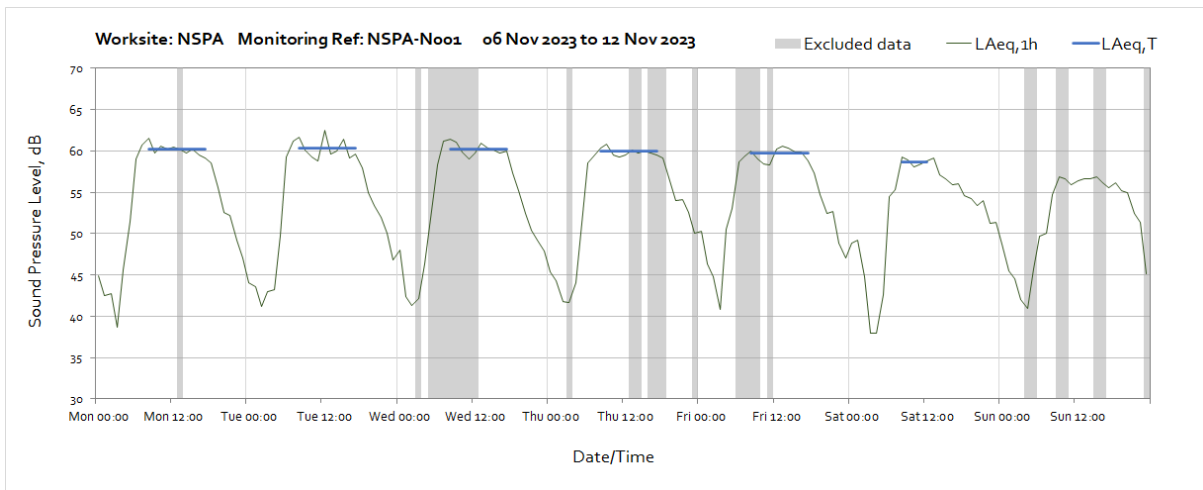
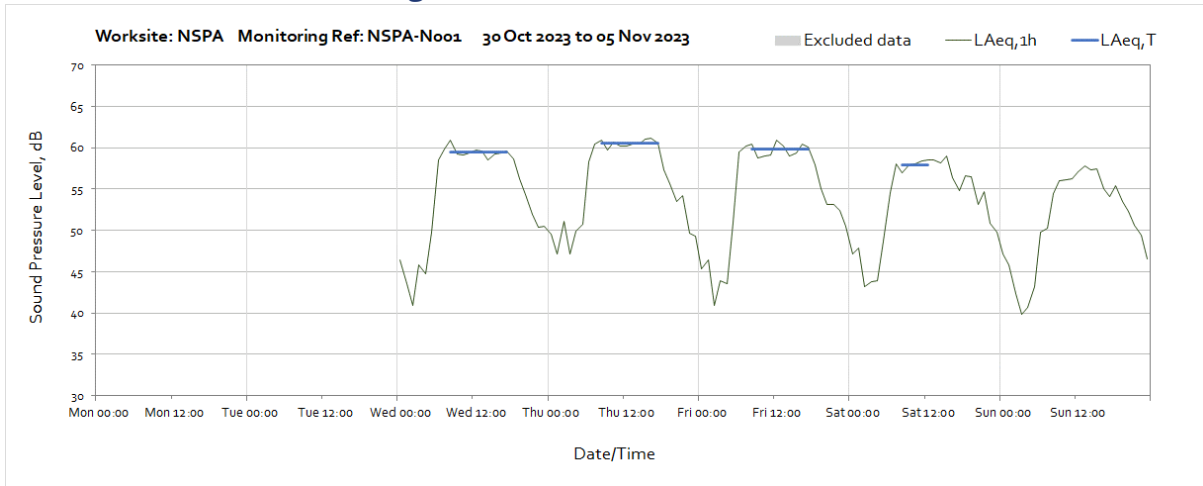


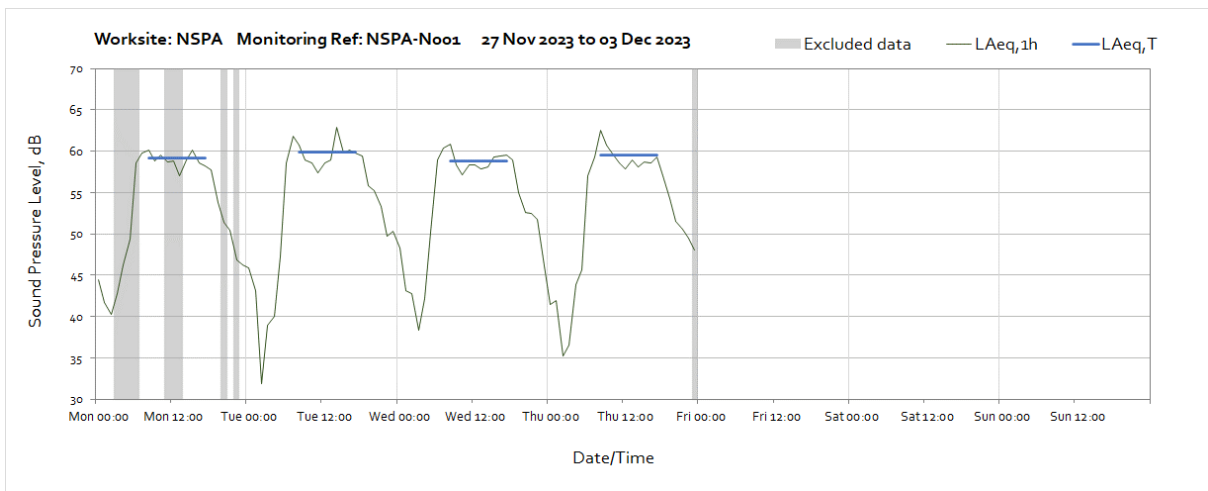
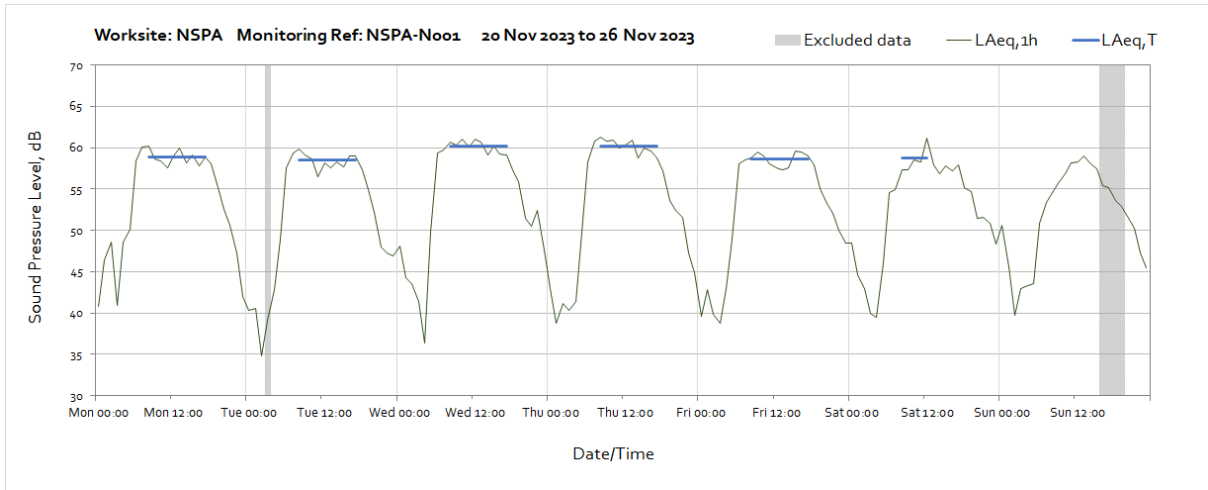
Worksite: HR – Monitoring Ref: DGT-N001



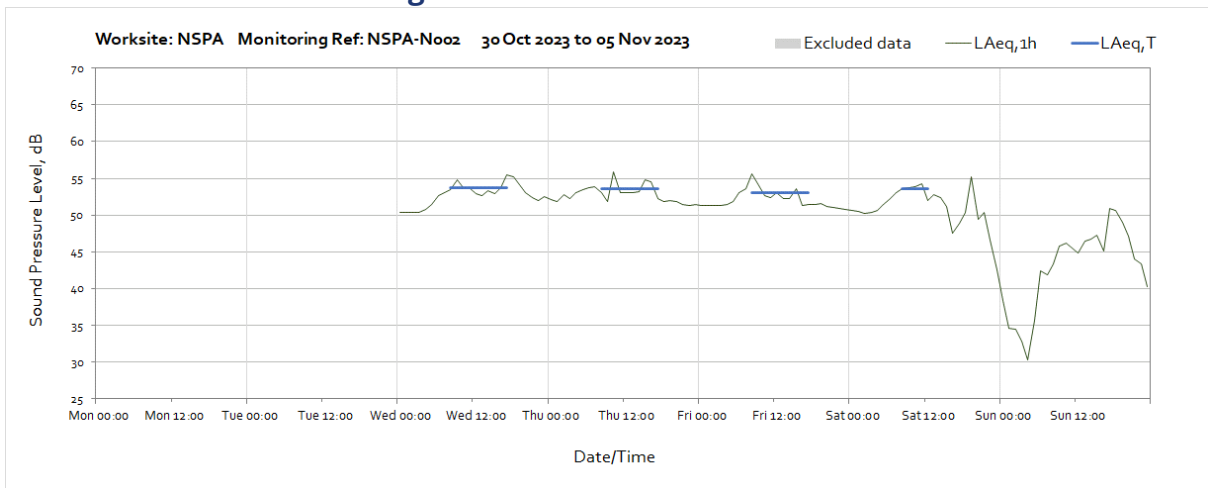


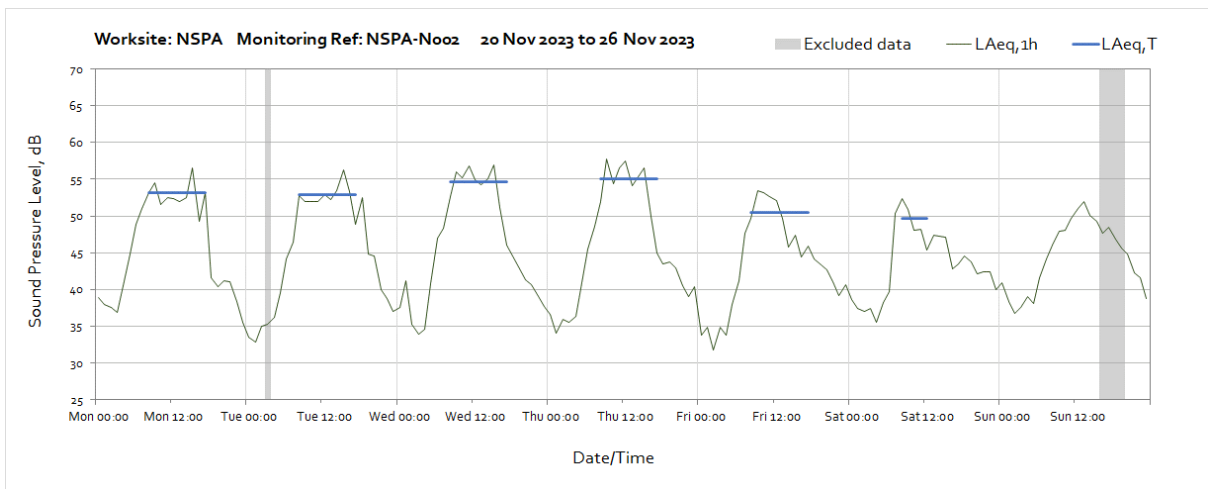
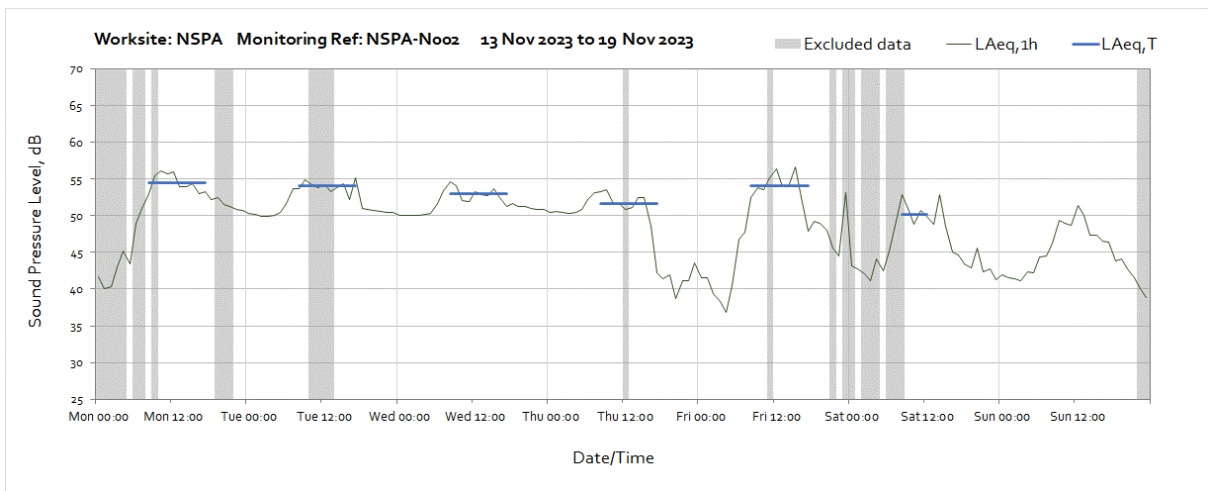
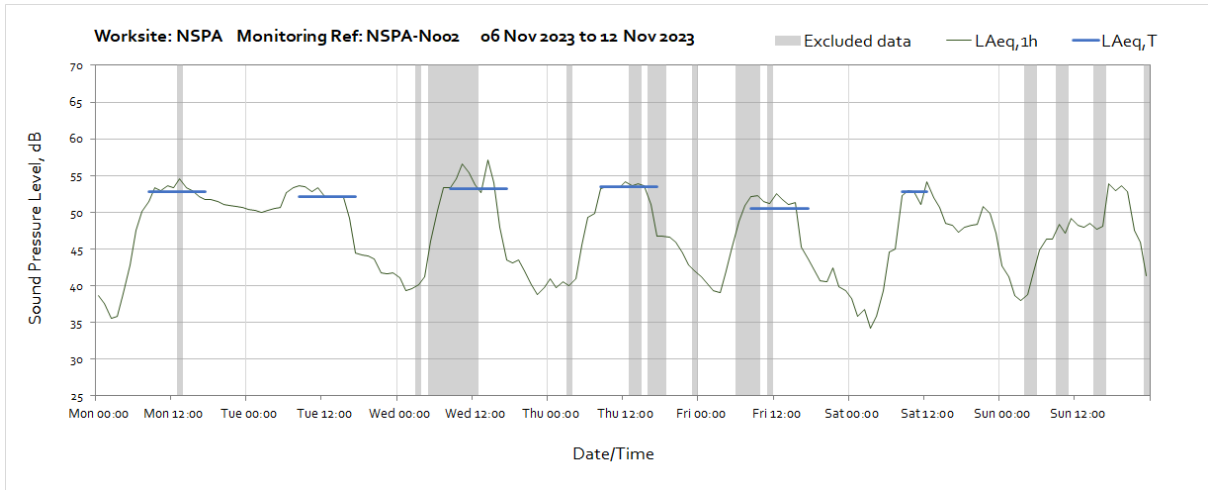
Worksite: NSPA – Monitoring Ref: NSPA-N001

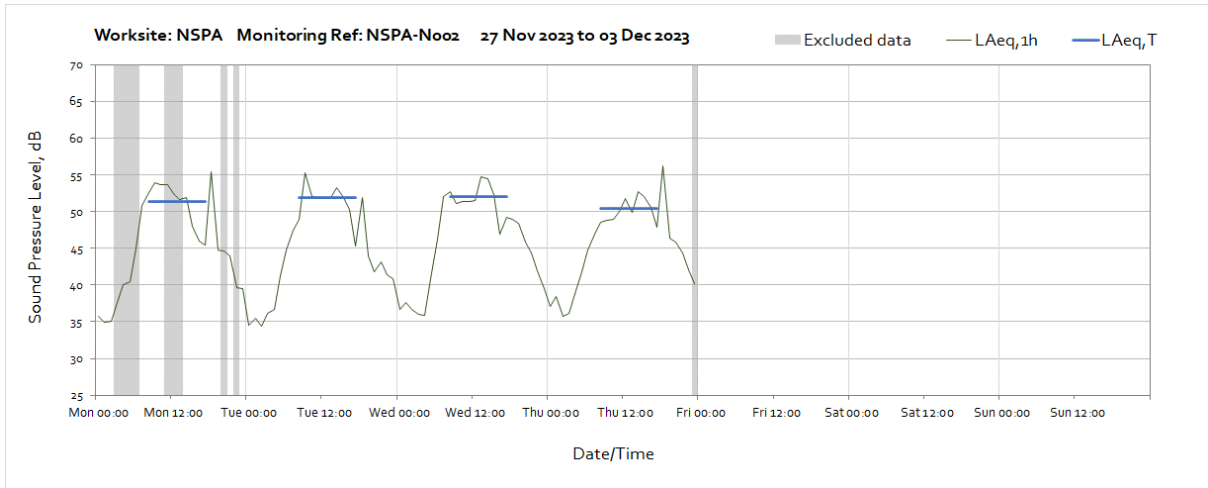




Worksite: NSPA – Monitoring Ref: NSPA-N002



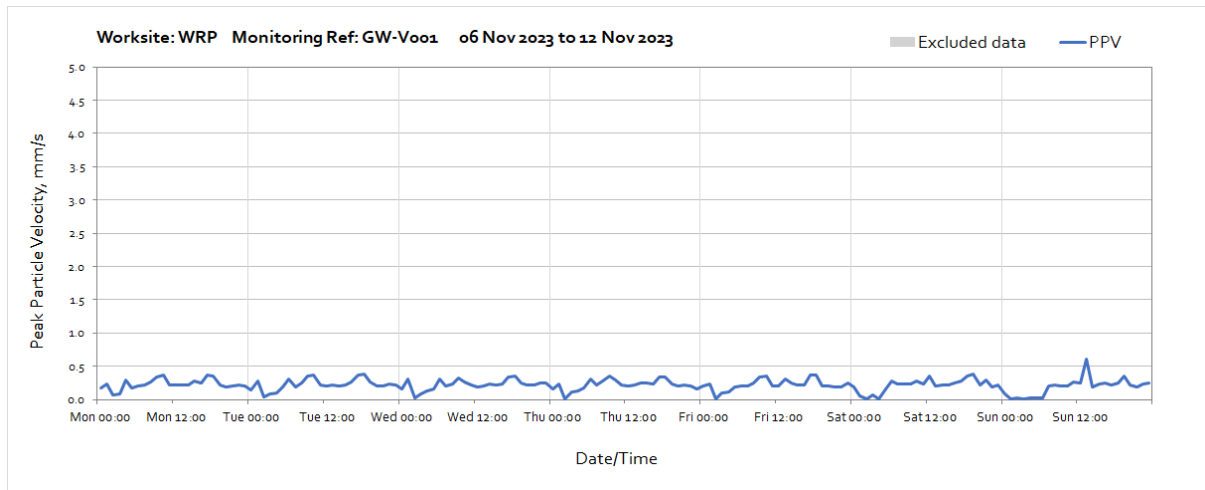
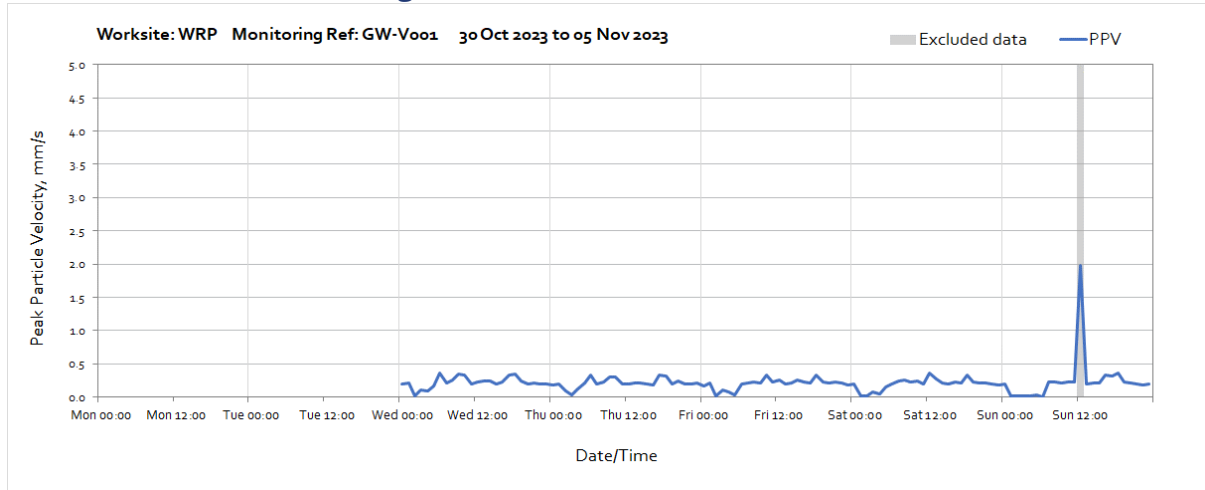


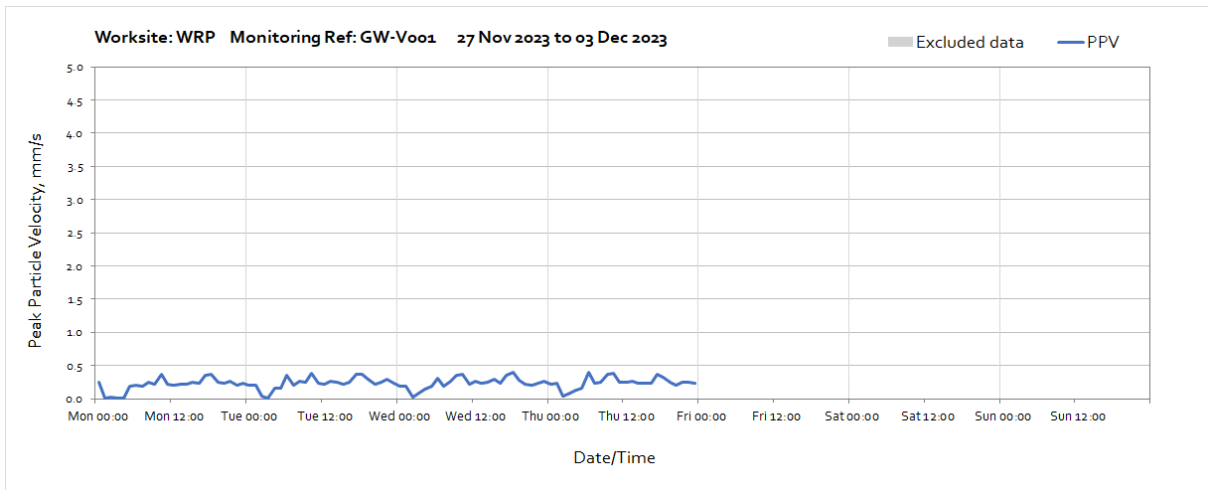
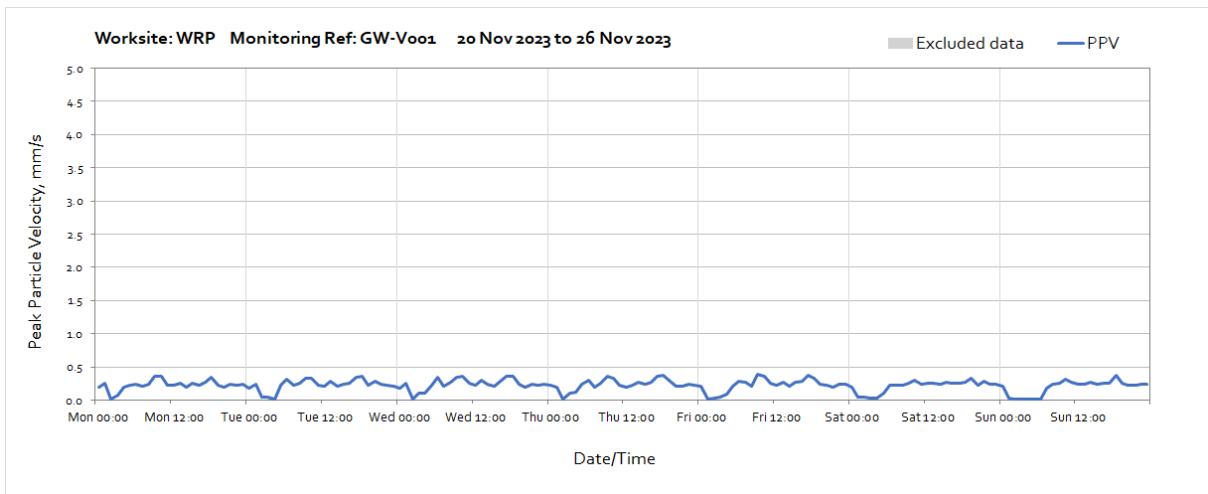
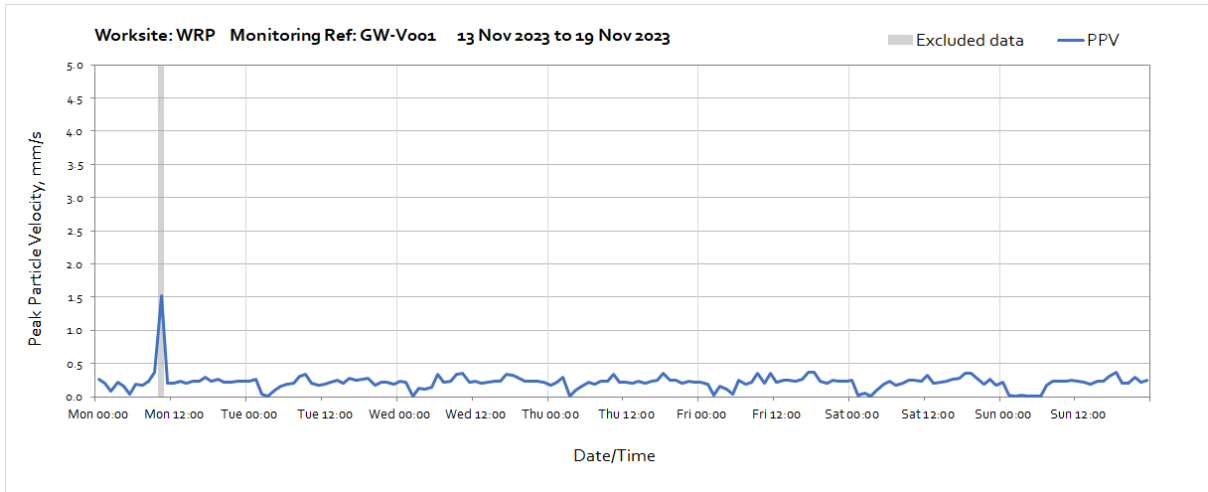


Vibration

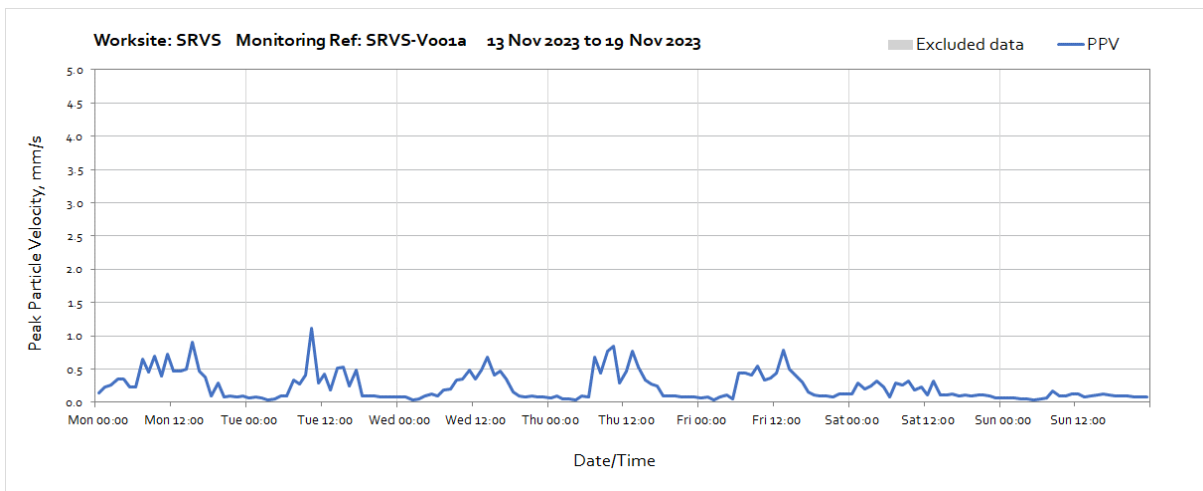
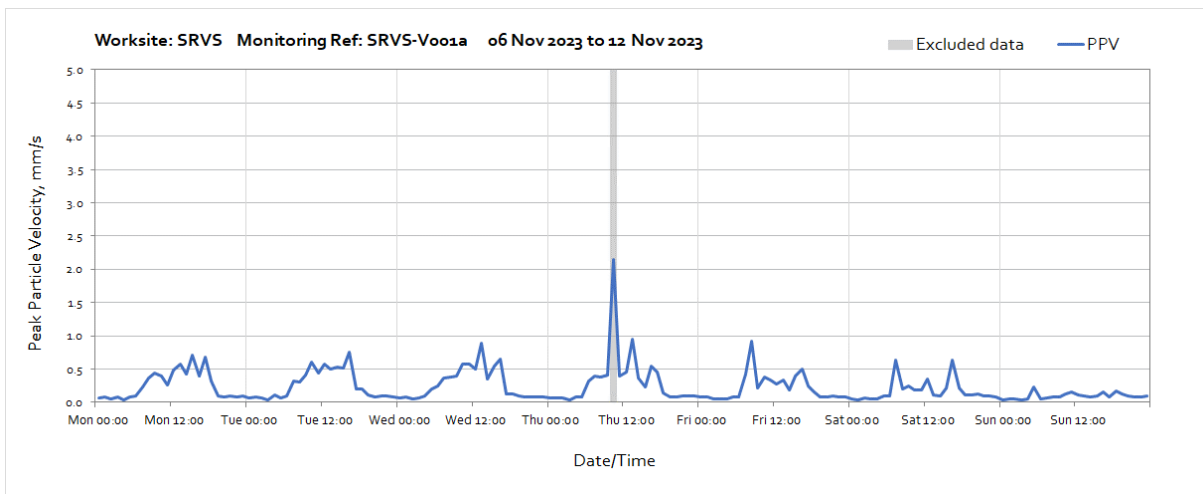
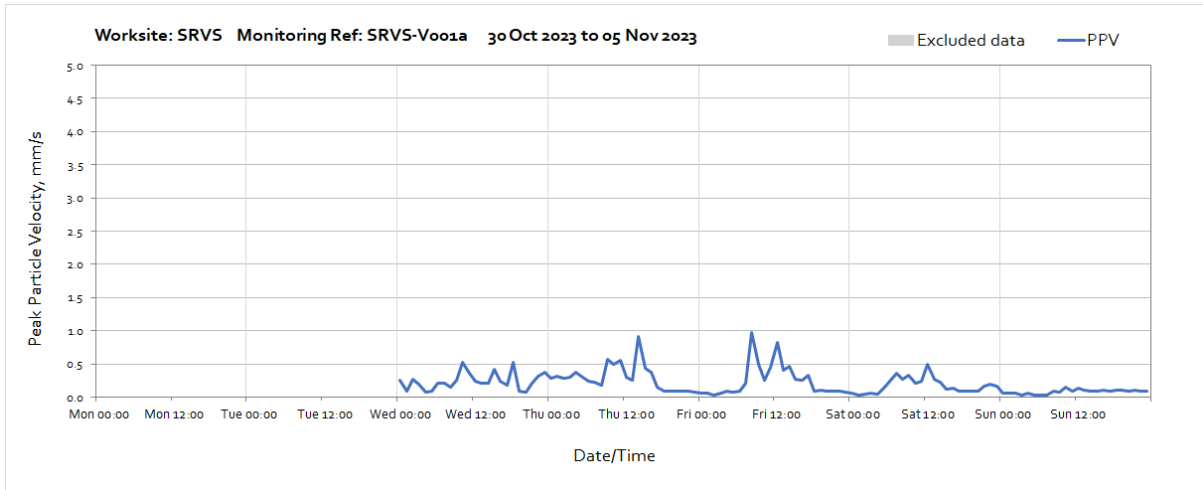
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axis x, y, and z. Periods where PPV values have been affected by local interference with the vibration monitor or only measured for part 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





Worksite: SRVS – Monitoring Ref: SRVS-V001a



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