

Construction noise and vibration Monthly Report – October 2022

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 October 2022.

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

- Colne Valley Viaduct Dews Lane site (ref.: CVV-DL), where compound operation, piling works, invasive vegetation removal works, ground investigation works, pier construction, water pumping works, maintenance of the haul road, installation of satellite welfare and generator farms, earthworks, drainage works, concrete drilling, pontoon installation, condition surveys, compensation pond construction, material storage, fencing works, environmental maintenance works, cofferdam excavation dewatering, base slab construction, river crossing construction, car park construction, launching girder and deck works and utility works were underway;
- Colne Valley Viaduct Moorhall Road site (ref.: CVV-MR), where piling, ground investigation works, pier construction, installation of ducts, water management, maintenance of haul road, installation of satellite welfare and generator farms, concrete drilling, compensation pond construction, material storage, cofferdam excavation, base slab construction, fibre and reinforced concrete crossing, launching girder and deck works, fencing works, utility diversion works and environmental maintenance were underway;
- West Ruislip Portal worksite (ref.: WRP) where installation of conveyor belt, tunnel boring machine works, installation and commissioning of grouting plant, soil treatment area works, installation of conveyor base, topsoil stripping, redevelopment of Golf Course and reinforcement of concrete floor slab were underway;
- Breakspear Road worksite (ref.: BR), where bored piling, earthworks and backfilling and construction of bridges were underway;
- South Ruislip Ventilation Shaft worksite (ref.: SRVS), where jet grouting works, road sweeping operations, excavation works, removal of waste materials, platform breaking and concrete works were underway;
- Harvil Road worksite (ref.: HR), where construction of treatment silos and tunnel bore machine material testing area, road works, assembly of conveyor belt, construction of haul road and attenuation pond, earthworks, topsoil stripping,

vegetation clearance, installation of hoarding and bridge construction were underway.

Further works, where monitoring did not take place, were also undertaken at The Greenway (West Ruislip) where sewer utility 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.

Ten (10) complaints were received during the monitoring period. A description of the complaint, the results of investigation 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 31st October 2022.

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

- Colne Valley Viaduct Dews Lane site, ref.: CVV-DL (see Plan 1 in Appendix A), where work activities included:
 - Piling works, including jetty piling, stockpiling, sheet piling, operation of support plant for the cofferdam construction, pile trimming, de-sanding of pile bore, installation of reinforcement cages, concrete works and breaking out works.
 - Compound operations, including de-sanding works.
 - Invasive vegetation removal works.
 - Ground investigation works.
 - Pier construction, including yard supporting activities, leg post tensioning and tower crane mobilisation and demobilisation.
 - Water pumping works.
 - Maintenance of the haul road.

- Installation of satellite welfare and generator farms.
- Stabilisation, earthworks and drainage works.
- Concrete drilling.
- Pontoon installation and condition surveys.
- Construction of compensation pond.
- Material storage.
- Fencing works.
- Utility diversion works.
- Environmental maintenance works.
- Cofferdam excavations.
- Base slab construction.
- Dewatering works.
- Construction of river crossing including emergency obstruction dismantling works.
- Car park construction.
- Deck and launching girder works.
- Colne Valley Viaduct Moorhall Road site, ref.: CVV-MR (see Plan 1 in Appendix A), where work activities included:
 - Piling works, including jetty piling, sheet piling, pile trimming, pile bore, pile cap construction, installation of reinforcement cages, concrete pouring and bored pile breaking out works.
 - Ground investigation works.
 - Pier construction, including yard supporting activities, leg post tensioning and tower crane mobilisation.
 - Water pumping works.
 - Maintenance of haul road.
 - Installation of satellite welfare and generator farms.
 - Concrete drilling.
 - Construction of compensation pond.
 - Material storage.

- Fencing works.
- Utility diversion works.
- Environmental maintenance.
- Construction of river crossing including emergency obstruction dismantling works.
- Excavation works.
- Base slab construction.
- Launch girder and deck works.
- West Ruislip Portal Worksite, ref.: WRP (see Plan 3 in Appendix A), where work activities included:
 - Installation of conveyor belt.
 - Tunnel boring machine works including assembly and construction of the water treatment for the tunnel boring machine.
 - Grouting plant installation and commissioning.
 - Soil treatment area works including haul road construction.
 - Topsoil stripping.
 - Installation of conveyor base.
 - Redevelopment of Golf Course including hoarding installation, ecological works and vegetation clearance.
 - Reinforcement of concrete floor slab for gantry crane installation.
- Breakspear Road Worksite, ref.: BR (see Plan 2 in Appendix A), formerly West Ruislip Retained Embankment, where work activities included:
 - Bored piling.
 - Earthworks including backfill works.
 - Construction of bridges.
- South Ruislip Ventilation Shaft worksite, ref.: SRVS (see Plan 4 in Appendix A), where work activities included:
 - Jet grouting works.
 - Road sweeping operations.
 - Shaft excavation works.
 - Removal of waste materials.

- Platform breaking and concrete works for support pads.
- Harvil Road worksite, ref.: HR (see Plan 2 in Appendix A), where work activities included:
 - Construction of treatment silos and tunnel bore machine material testing area.
 - Road works.
 - Assembly of conveyor belt.
 - Construction of haul road and attenuation pond.
 - Earthworks.
 - Topsoil stripping.
 - Vegetation clearance.
 - Installation of hoarding.
 - Bridge construction.

1.1.4 Further works, where monitoring did not take place, were also undertaken at The Greenway (West Ruislip) where sewer utility 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 Fifteen (15) noise and two (2) vibration monitoring installations were active in October in the LBH area. Table 2 summarises the position of noise and vibration monitoring installations within the LBH area in October 2022.

1.2.2 The noise monitor ref.: SSPA-BSR located within Harvil Road worksite, ref.: HR, was moved 75 meters North along Breakspear Road and renamed ref.: BSR-N001 on 12th October 2022.

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

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
Colne Valley Viaduct Dews Lane (CVV-DL)	CVV-DL-NMP2	Highway Farm House, Harvil Rd, Harefield, Uxbridge
	CVV-DL-NMP3	Dew's Farm Cottages, Dews Lane, Harefield, Uxbridge
Colne Valley Viaduct Moorhall Road (CVV-MR)	CVV-MR-NMP1	Weir Cottage, Denham Garden Village, Denham, Buckinghamshire
	CVV-MR-NMP2	Harefield Marina, Moorhall Road, London Borough of Hillingdon, London, Greater London
	CVV-MR-NMP3	Peerless Drive, Harefield, Uxbridge
West Ruislip Portal (WRP)	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
Breakspear Road (BR)	N065	Breakspear Road South, Harefield, Uxbridge
	N066	Hoylake Crescent, Ickenham, Uxbridge
	TKL-N001	Tile Kiln Lane, Harefield, Uxbridge
South Ruislip Ventilation Shaft (SRVS)	N061	Cineworld South Ruislip car park, Ruislip
	SRVS-V001	Braintree Industrial Estate - Building D4
Harvil Road (HR)	N067	Harvil Road worksite south boundary
	SSPA-HR	Harvil Road
	SSPA-BSR	Breakspear Road
	BSR-N001	Breakspear Road

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-DL	CVV-DL-NMP2	Highway Farm House, Harvil Rd, Harefield, Uxbridge	Free-field	58.2 (59.5)	58.5 (61.6)	57.6 (58.9)	57.0 (58.2)	56.4 (59.0)	61.8 (78.0)	58.8 (59.6)	58.3 (59.3)	57.2 (59.0)	56.3 (58.6)	57.7 (64.8)	56.5 (58.4)
	CVV-DL-NMP3	Dew's Farm Cottages, Dews Lane, Harefield, Uxbridge,	Free-field	57.5 (62.0)	61.8 (66.0)	54.2 (57.1)	52.4 (56.8)	49.5 (57.5)	53.4 (55.5)	55.9 (57.0)	51.9 (54.6)	49.7 (55.0)	47.1 (57.5)	51.8 (64.3)	49.9 (58.2)
CVV-MR	CVV-MR-NMP1	Weir Cottage, Denham Garden Village, Denham, Buckinghamshire	Free-field	51.9 (54.3)	52.8 (56.7)	50.4 (52.7)	48.7 (54.6)	46.3 (51.9)	49.8 (50.1)	51.3 (52.0)	49.8 (51.1)	49.3 (51.5)	46.6 (60.8)	50.6 (61.7)	47.4 (55.0)
	CVV-MR-NMP2	Harefield Marina, Moorhall Road, London, Greater London	Free-field	53.5 (57.4)	57.2 (65.0)	50.7 (56.6)	49.7 (58.0)	46.5 (52.7)	51.1 (51.8)	56.7 (61.6)	52.0 (59.9)	52.4 (66.0)	46.8 (58.8)	51.2 (61.1)	47.3 (52.6)
	CVV-MR-NMP3	Peerless Drive, Harefield, Uxbridge	Free-field	52.1 (54.9)	57.6 (66.3)	50.0 (55.9)	48.9 (59.5)	45.1 (52.4)	50.2 (50.5)	51.5 (53.1)	52.2 (62.0)	49.3 (54.7)	46.1 (59.7)	51.3 (63.4)	46.7 (55.2)
WRP	N048	West Ruislip Golf Club, Ickenham Rd, Ruislip	Free-field	58.1 (65.8)	58.4 (62.7)	54.3 (59.0)	53.6 (60.6)	50.3 (60.6)	59.4 (62.7)	58.8 (64.7)	56.1 (66.2)	54.0 (61.2)	49.1 (54.6)	53.1 (56.5)	50.3 (58.0)
	N056	83 The Greenway, Ickenham, Ruislip	Façade	61.5 (62.8)	60.7 (61.7)	61.9 (63.9)	60.2 (66.1)	56.1 (62.6)	57.2 (59.6)	59.1 (60.3)	57.3 (60.7)	57.0 (62.8)	50.8 (60.4)	60.0 (63.0)	55.6 (61.2)

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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
	N057	123 The Greenway, Ickenham, Ruislip	Façade	57.3 (59.0)	56.4 (58.1)	57.7 (59.7)	56.4 (65.3)	52.0 (63.8)	53.5 (56.9)	56.0 (60.4)	53.6 (55.7)	53.6 (60.4)	47.3 (55.9)	56.1 (61.5)	51.8 (58.4)
BR	N065	Breakspear Road South, Harefield, Uxbridge	Free-field	65.5 (68.1)	65.1 (67.2)	65.5 (68.4)	62.8 (67.7)	58.1 (66.1)	62.7 (65.8)	63.8 (65.3)	64.3 (65.9)	62.7 (66.1)	56.5 (62.3)	63.6 (65.9)	59.3 (65.4)
	N066	Hoylake Crescent, Ickenham, Uxbridge	Free-field	56.2 (58.3)	56.8 (71.4)	56.5 (58.2)	54.5 (56.7)	50.3 (56.4)	52.3 (54.5)	54.1 (55.6)	52.6 (54.5)	52.2 (56.1)	46.6 (54.6)	55.9 (70.3)	49.7 (56.9)
	TKL-N001	Tile Kiln Lane, Harefield, Uxbridge	Free-field	50.2 (52.6)	50.5 (53.3)	49.3 (52.6)	49.2 (59.8)	46.0 (55.2)	49.1 (50.1)	51.5 (52.6)	50.8 (55.2)	49.0 (52.2)	46.2 (49.9)	49.7 (56.9)	46.6 (50.5)
SRVS	N061	Cineworld South Ruislip car park, Ruislip	Free-field	59.6 (61.4)	62.7 (67.4)	63.5 (70.2)	62.9 (70.8)	58.4 (77.5)	60.2 (61.0)	62.9 (63.0)	62.8 (63.4)	62.5 (66.8)	57.0 (63.7)	61.6 (70.8)	56.0 (67.9)
HR	N067	Harvil Road worksite south boundary	Free-field	56.0 (60.7)	60.0 (62.7)	58.2 (66.3)	57.2 (64.1)	49.3 (57.5)	53.4 (54.7)	59.0 (60.6)	54.8 (55.8)	58.3 (64.7)	50.0 (60.7)	58.5 (65.5)	50.1 (56.8)
	SSPA-HR	Harvil Road	Free-field	69.9 (72.3)	70.1 (73.8)	68.8 (78.5)	66.4 (77.3)	63.2 (71.1)	67.5 (69.2)	68.9 (71.3)	68.9 (70.9)	67.3 (70.8)	60.5 (65.3)	66.9 (71.2)	63.1 (71.7)
	SSPA-BSR	Breakspear Road	Free-field	65.3 (66.7)	65.5 (65.8)	64.8 (65.2)	62.4 (65.7)	56.1 (65.3)	58.8 (64.4)	64.4 (67.9)	63.4 (66.0)	61.8 (66.9)	56.2 (60.7)	63.2 (64.8)	58.4 (64.8)
	BSR-N001	Breakspear Road	Free-field	67.8	67.2	67.3	63.9	59.3	63.5	66.3	61.8	61.7	54.3	64.5	62.1

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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
				(69.4)	(69.0)	(73.6)	(67.4)	(67.6)	(66.1)	(67.7)	(67.3)	(68.2)	(63.4)	(67.3)	(67.6)

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	0.94 (Y-axis)
SRVS	SRVS-V001	Braintree Industrial Estate - Building D4	1.51 (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-DL	CVW-DL-NMP2	Highway Farm House, Harvil Rd, Harefield, Uxbridge	All days	All period	No exceedance	No exceedance
	CVW-DL-NMP3	Dew's Farm Cottages, Dews Lane, Harefield, Uxbridge	Weekdays	0800-1800	1	No exceedance
CVW-MR	CVW-MR-NMP1	Weir Cottage, Denham Garden Village, Denham, Buckinghamshire	Nights	2200-0700	3	No exceedance
			Sundays	0800-2200	2	No exceedance
	CVW-MR-NMP2	Harefield Marina, Moorhall Road, London, Greater London	Weekdays	0800-1800	1	No exceedance
			Saturdays	1300-1400	1	No exceedance
Saturdays			1400-2200	3	No exceedance	
CVW-MR-NMP3	Peerless Drive, Harefield, Uxbridge	Sundays	0800-2200	1	No exceedance	
		Nights	2200-0700	2	No exceedance	
WRP	N048	West Ruislip Golf Club, Ickenham Rd, Ruislip	Nights	2200-0700	2	No exceedance
	N056	83 The Greenway, Ickenham, Ruislip	All days	All period	No exceedance	No exceedance
	N057	123 The Greenway, Ickenham, Ruislip	All days	All period	No exceedance	No exceedance
BR	N065	Breakspear Road South, Harefield, Uxbridge	Weekdays	0800-1800	2	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	0800-1800	1	No exceedance
	TKL-N1	Tile Kiln Lane, Harefield, Uxbridge	All days	All period	No exceedance	No exceedance
SRVS	N061	Hoylake Crescent, Ickenham, Uxbridge	All days	All period	Not applicable**	Not applicable**
HR	N067	Harvil Road worksite south boundary	All days	All period	No exceedance	No exceedance
	SSPA-HR	Harvil Road	Weekdays Saturdays	0800-1800 0800-1300	22 5	No exceedance No exceedance
	SSPA-BSR	Breakspear Road	Weekdays Saturdays	0800-1800 0800-1300	1 1	No exceedance No exceedance
	BSR-N001	Breakspear Road	Weekdays Saturdays	0800-1800 0800-1300	13 2	No exceedance No exceedance

*A distance correction has been applied when calculating exceedances of the LOAEL and SOAEL.

2.2.6 Exceedances of the LOAEL were recorded at ten (10) monitoring locations. The LOAEL exceedances were recorded during weekdays, Saturdays, Sundays and night-time working hours. No exceedances of the SOAEL were recorded during the monitoring period.

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

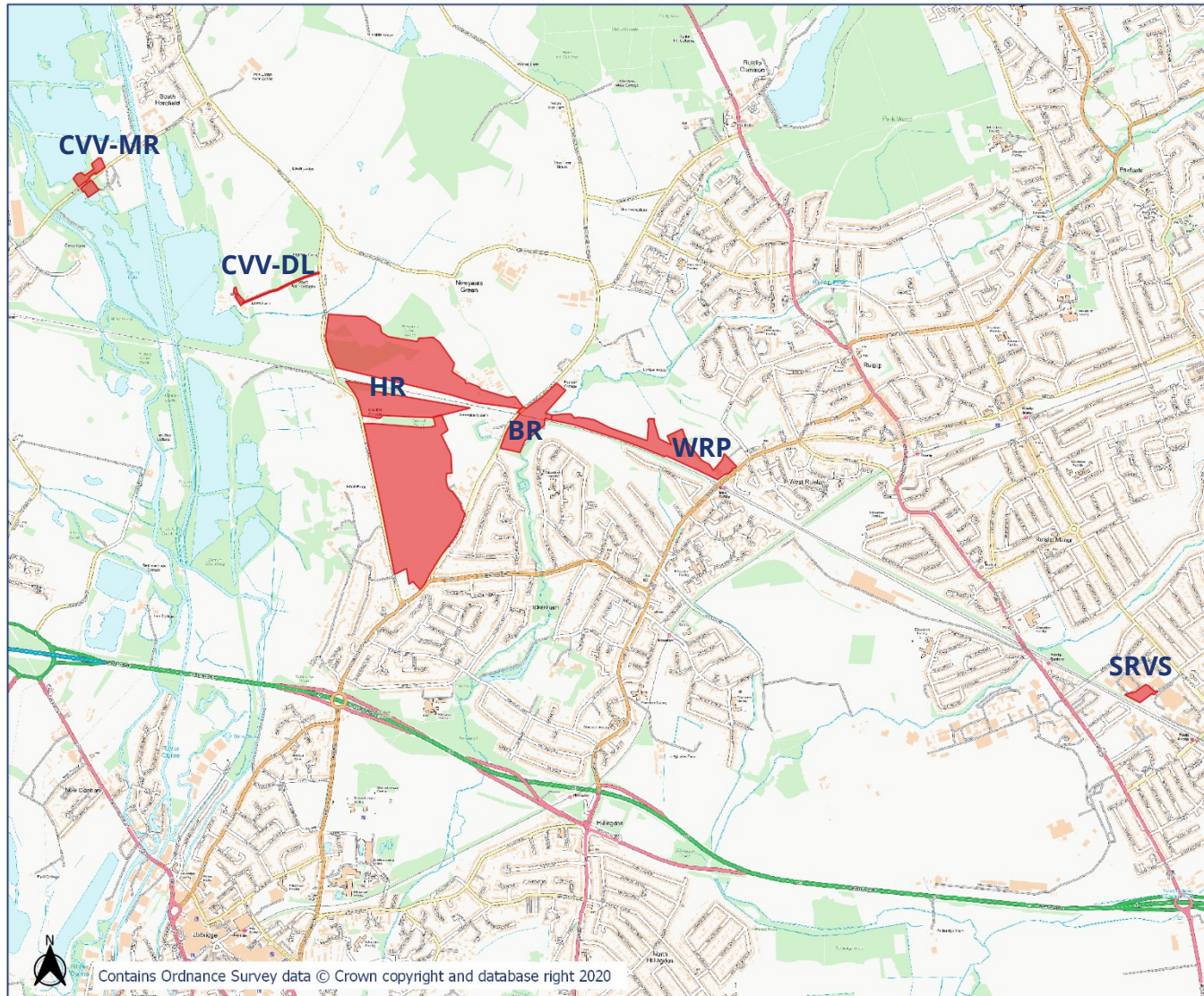
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-22-44016-C HS2-22-83945-E-C HS2-22-83936-E-C HS2-22-83950-E-C HS2-22-83935-E-C HS2-22-83962-E-C	WRP	Complaints due to noise disturbance during nights from drilling, scratching noise and drones flying around. Has been an ongoing occurrence on multiple occasions.	The investigation showed that noise was likely produced by motors from the top and bottom of the conveyor belt.	An apology was provided to the stakeholder for the noise. Further mitigation has been applied by lowering the speed. Screening will also be erected around the motors to attenuate the noise source.
HS2-22-44031-C	HR	Complaint due to noise disturbance from works with vibrations shaking the house. The stakeholder is concerned about the structural damage and requires noise monitoring.	Investigation showed that noise, vibration stemmed from vibro-roller used for the last part of the creation of the attenuation pond on the site next to Breakspear Road South.	Works now completed. Noise monitoring installed. Apology for disturbance provided.
HS2-22-44042-C	CVV-MR	Complaint regarding noise disturbance overnight described as ship horn going off, frequently through the night, past the 10pm shut down times.	Data from fixed noise monitors surrounding sites confirm no recent exceedances.	In-depth noise monitoring surveys to be undertaken on site.
HS2-22-44068-C	WRP	Complaint due to noise pollution at	Noise stemmed from motors on the temporary conveyor removing spoil.	Following review, motors to be run at lower speed with noise attenuation.

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
		unacceptable times of the night.		Stacker structure also covered. Apology for disturbance provided.
HS2-22-44078-C	WRP	Complaint about noise disturbance from generator located near property.	Investigation showed that works undertaken at the location were not related to HS2.	Matter passed to the external contractor for investigation.

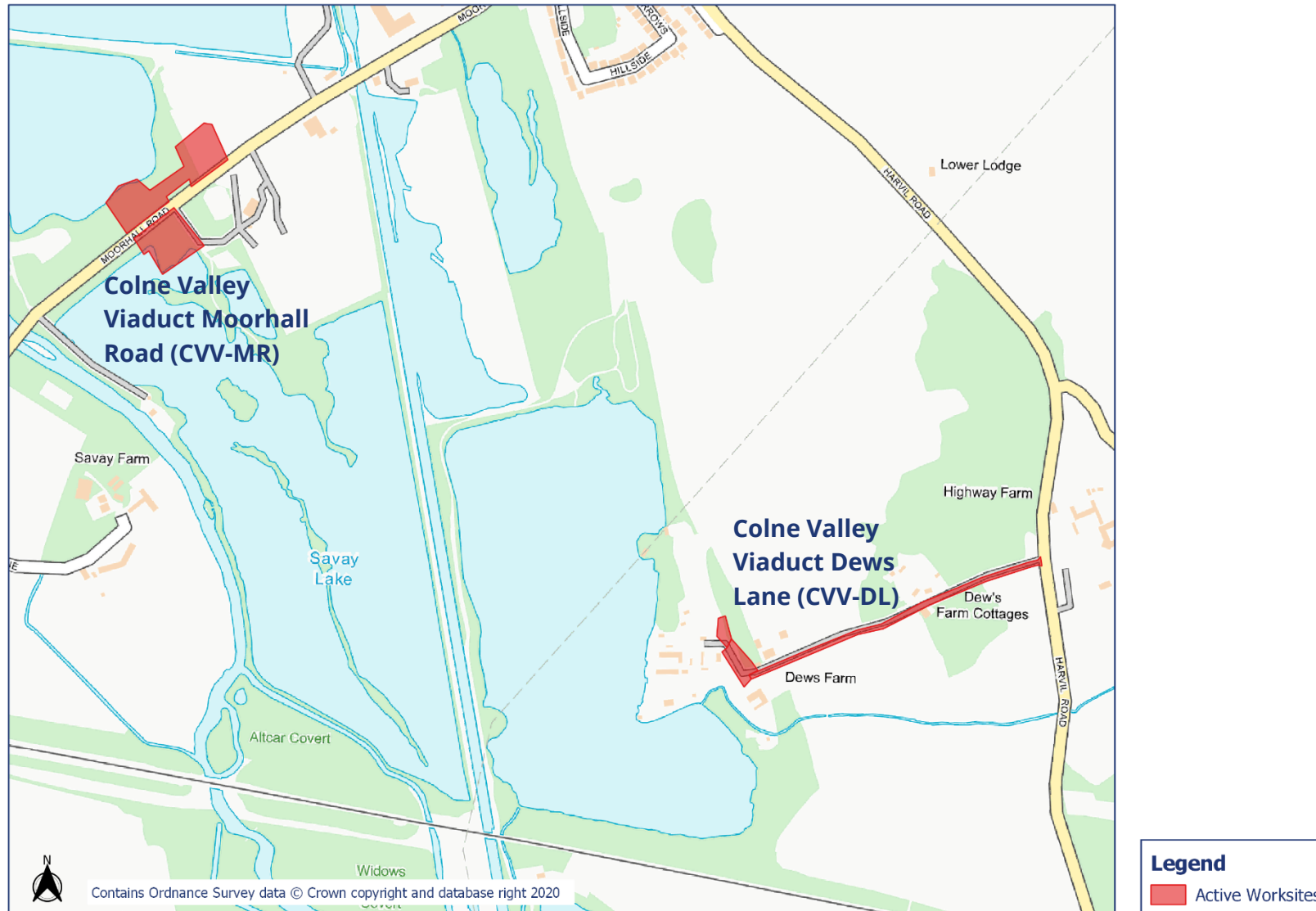
Appendix A Site Locations

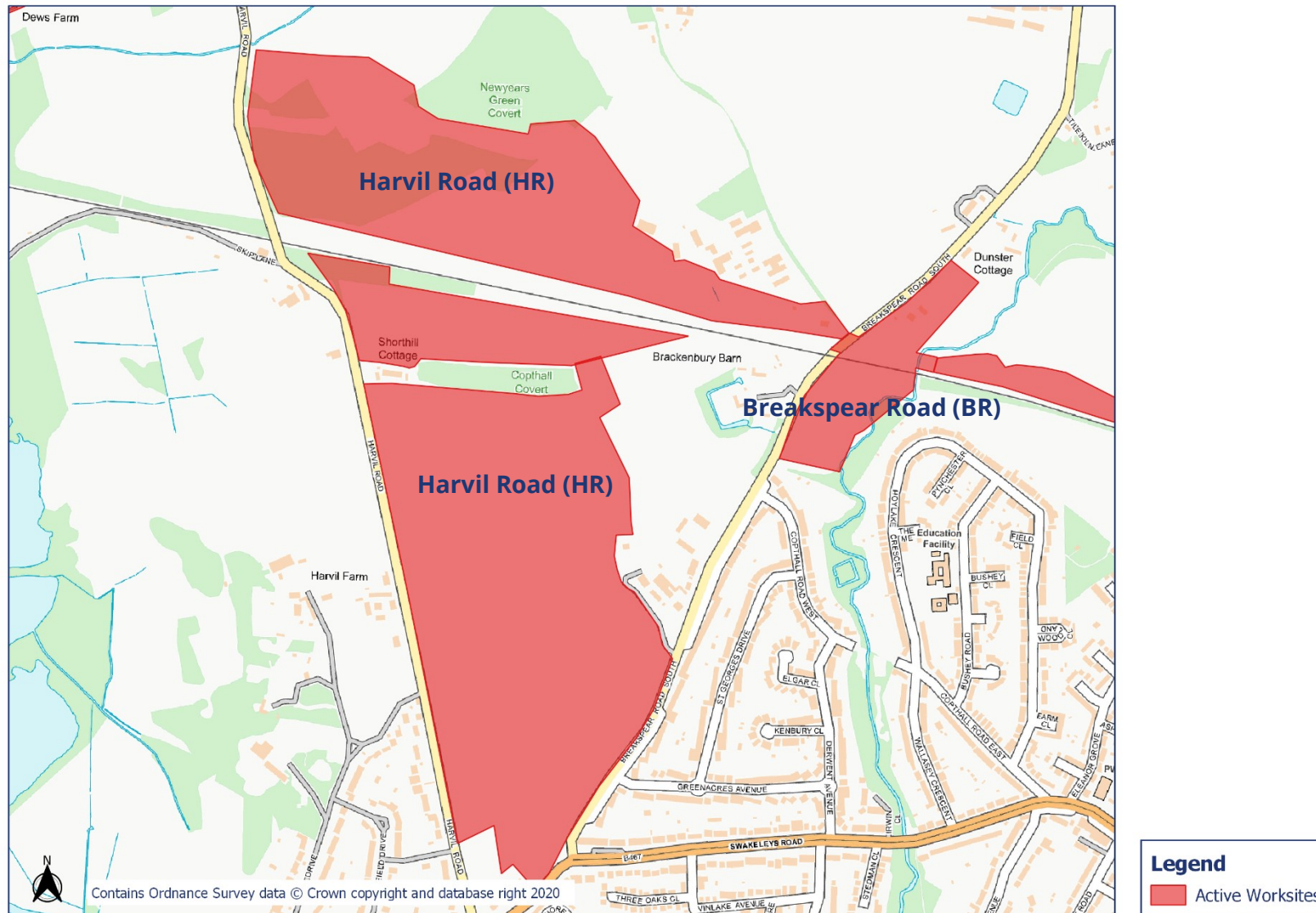
HS2

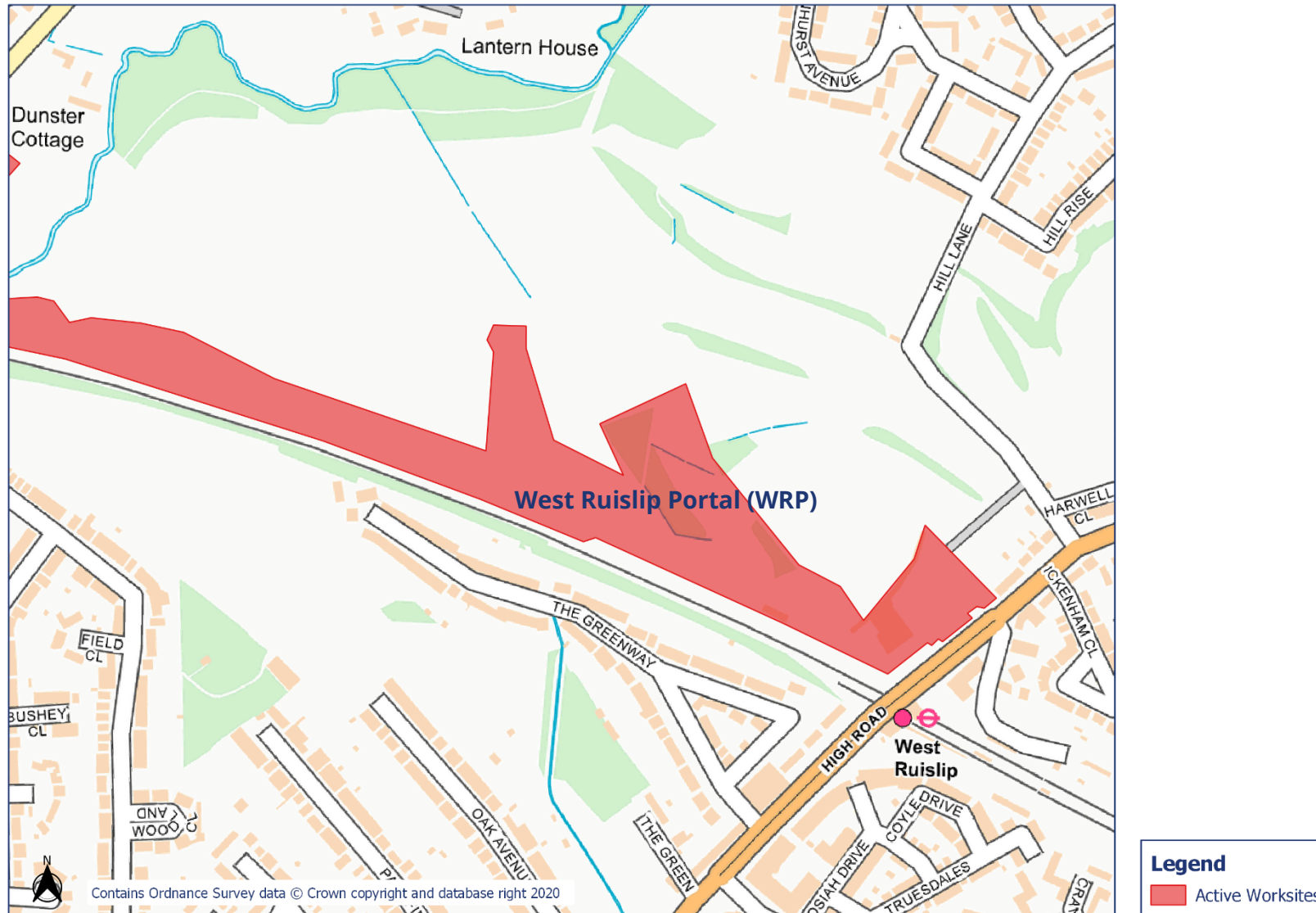
Worksite Identification Plan - Overview

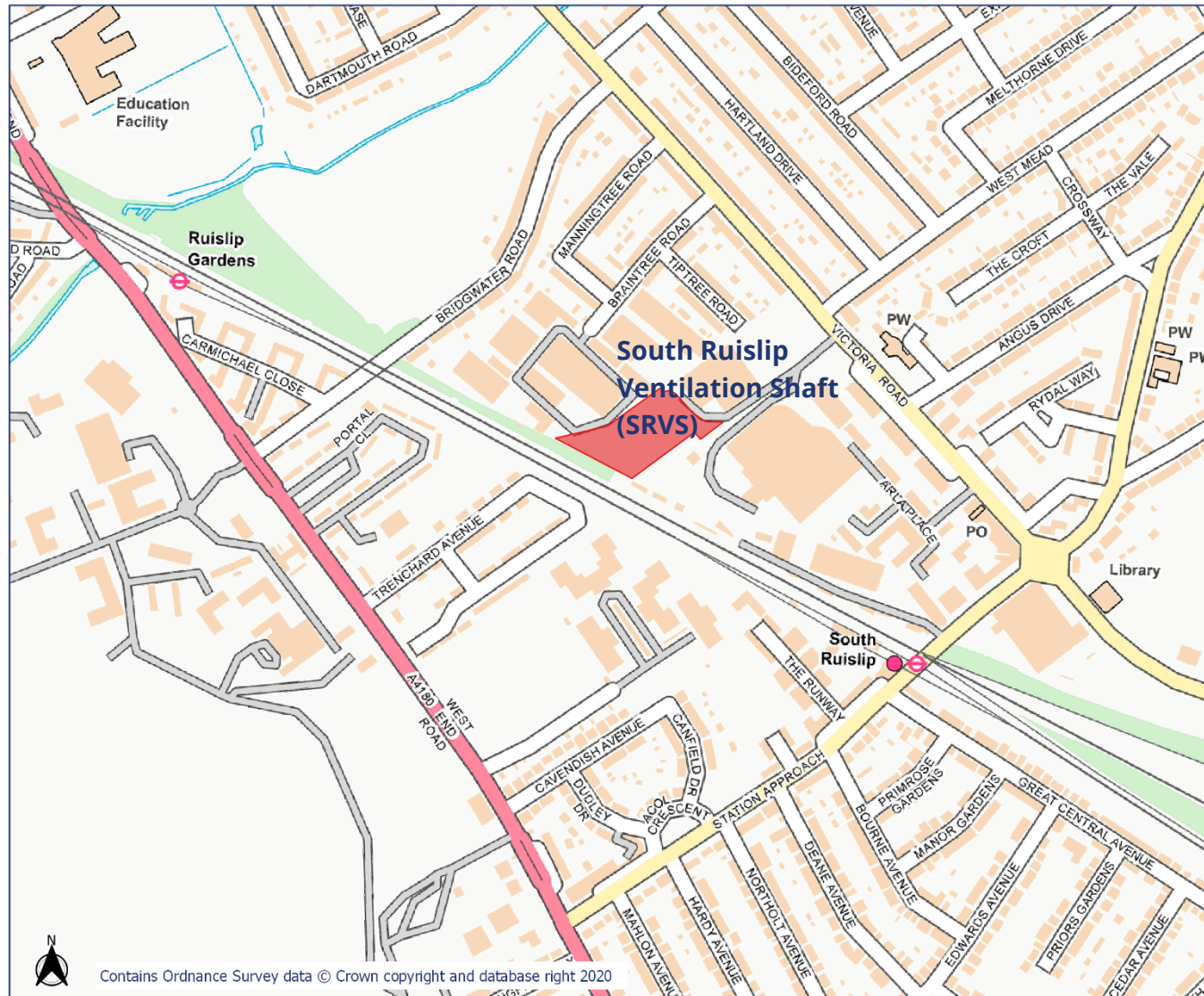


OFFICIAL

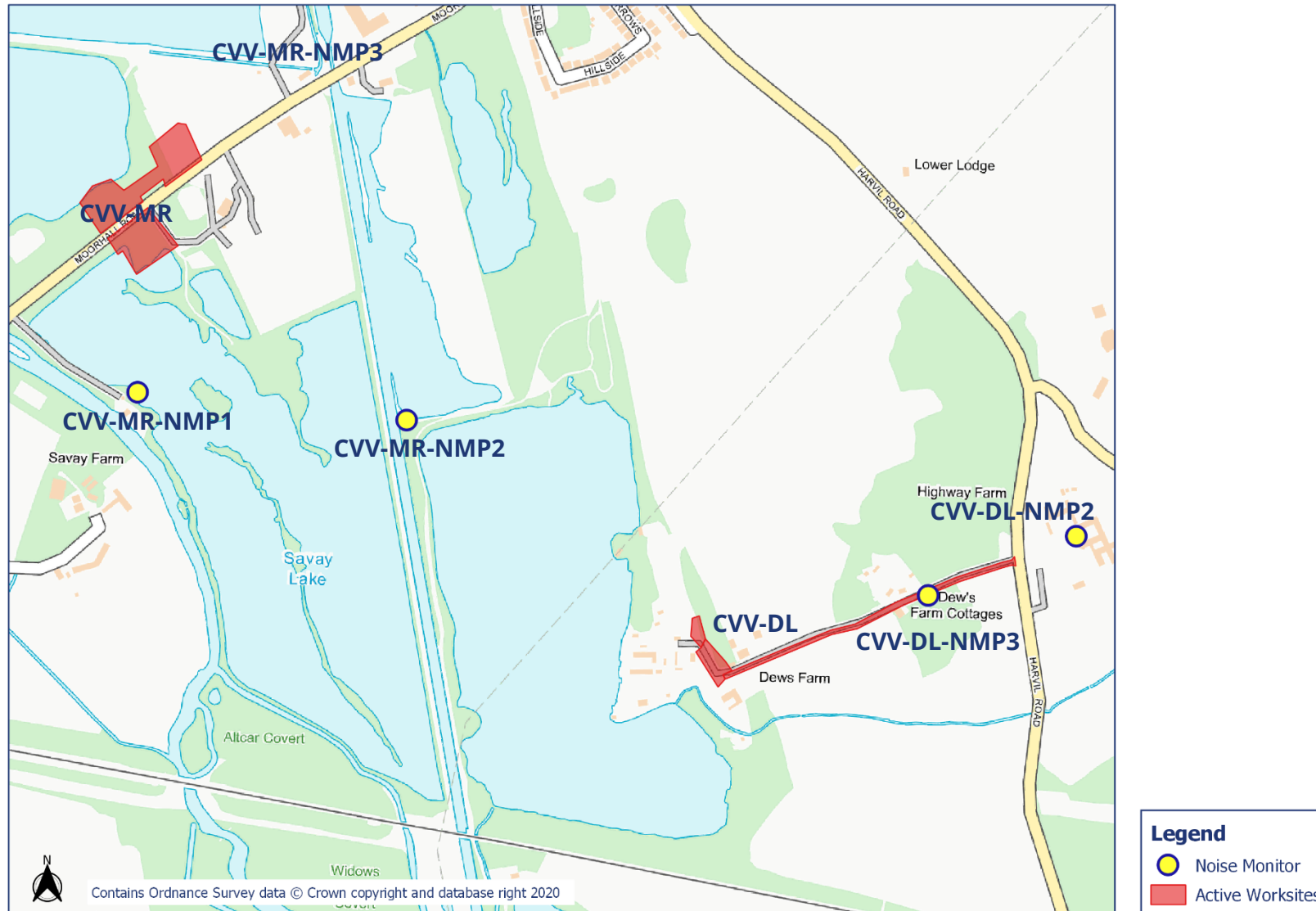


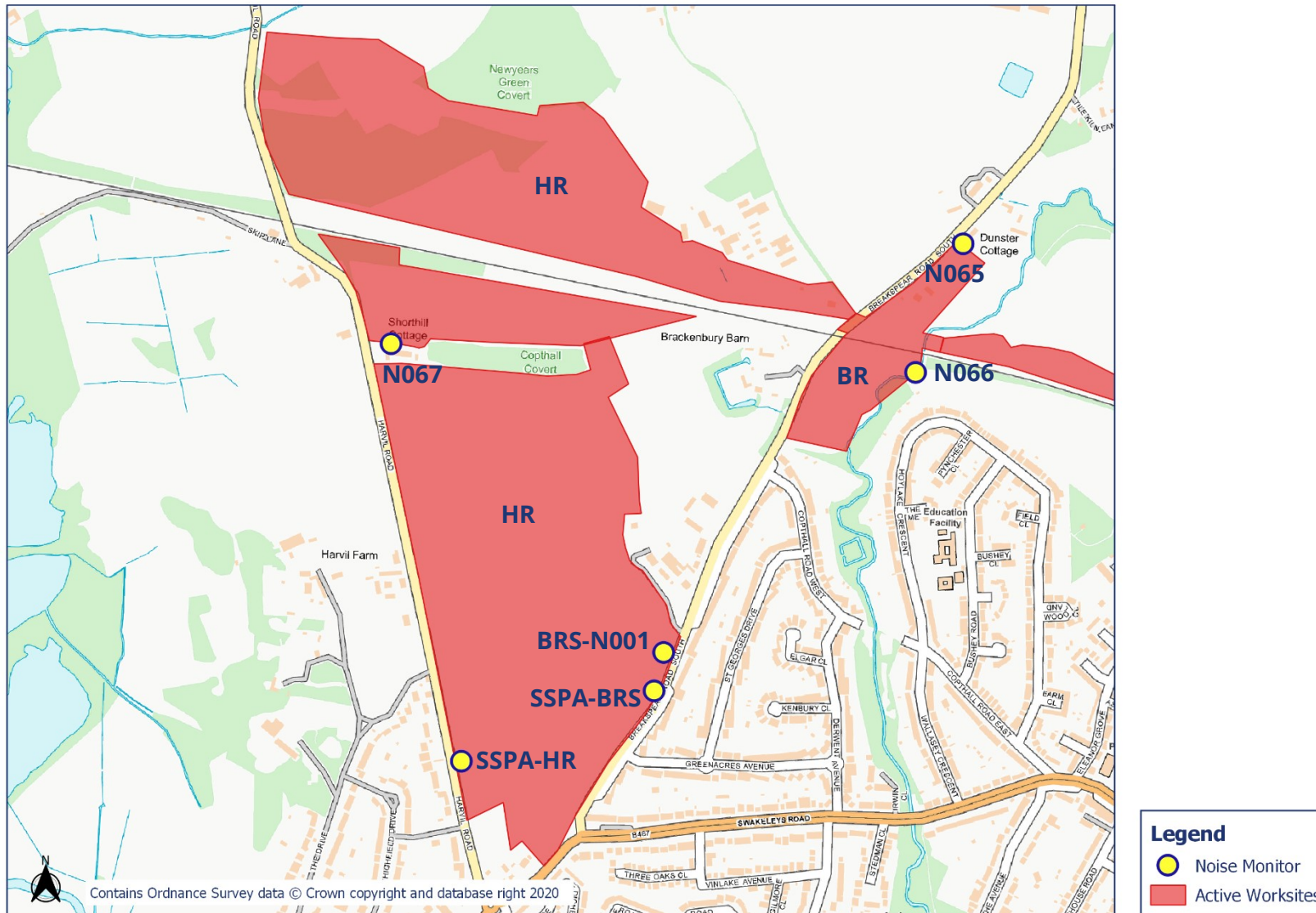


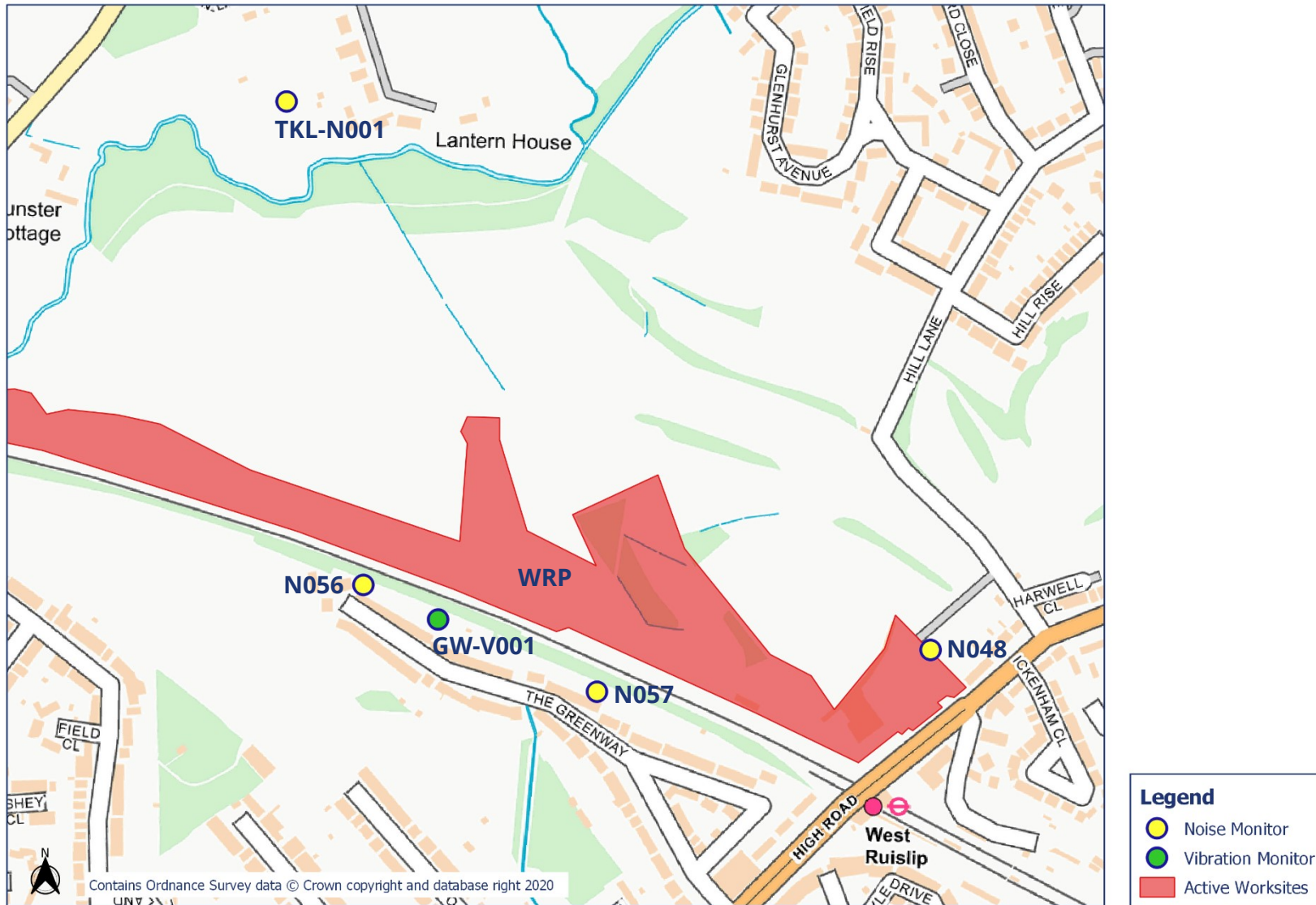


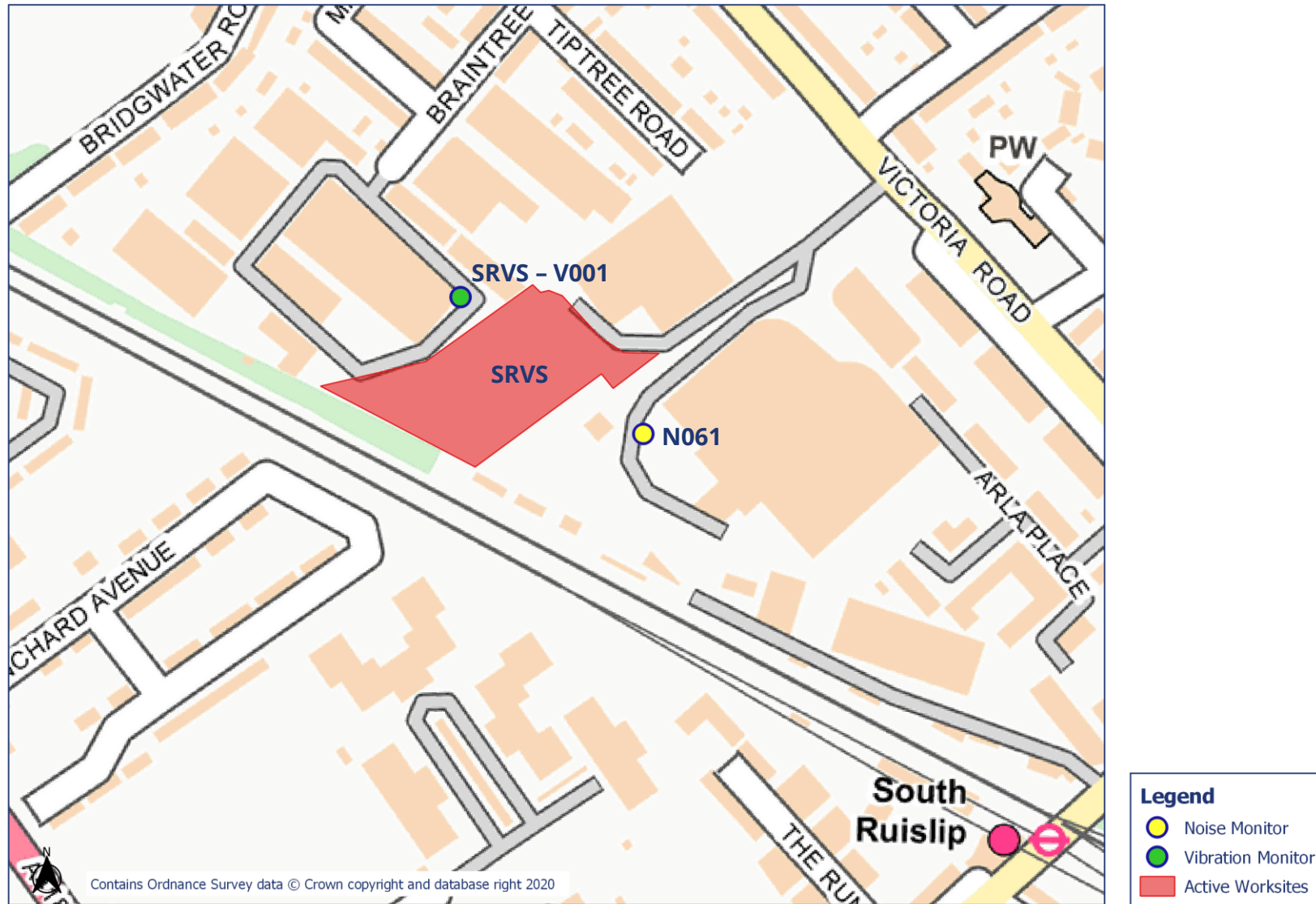


Appendix B Monitoring Locations









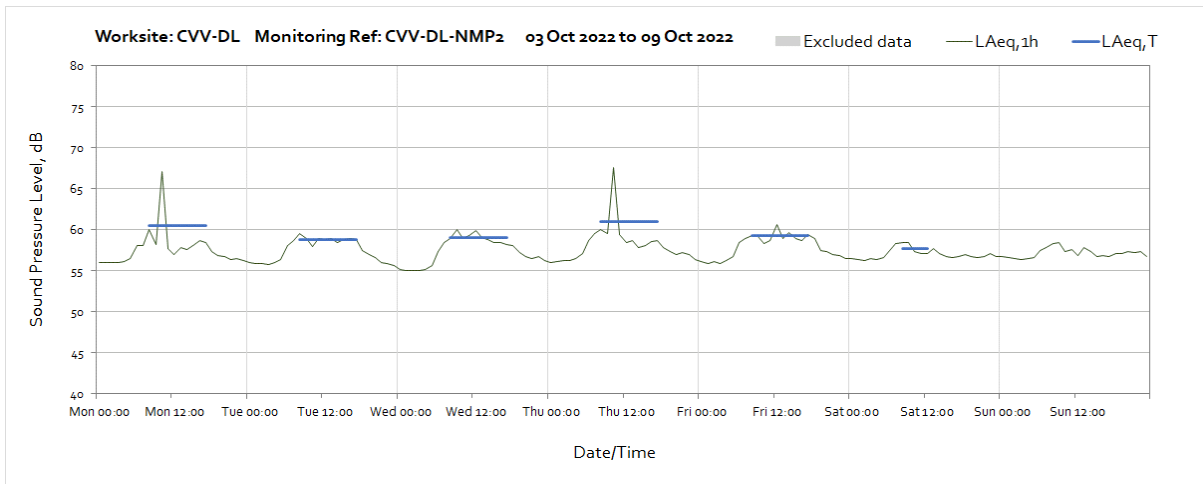
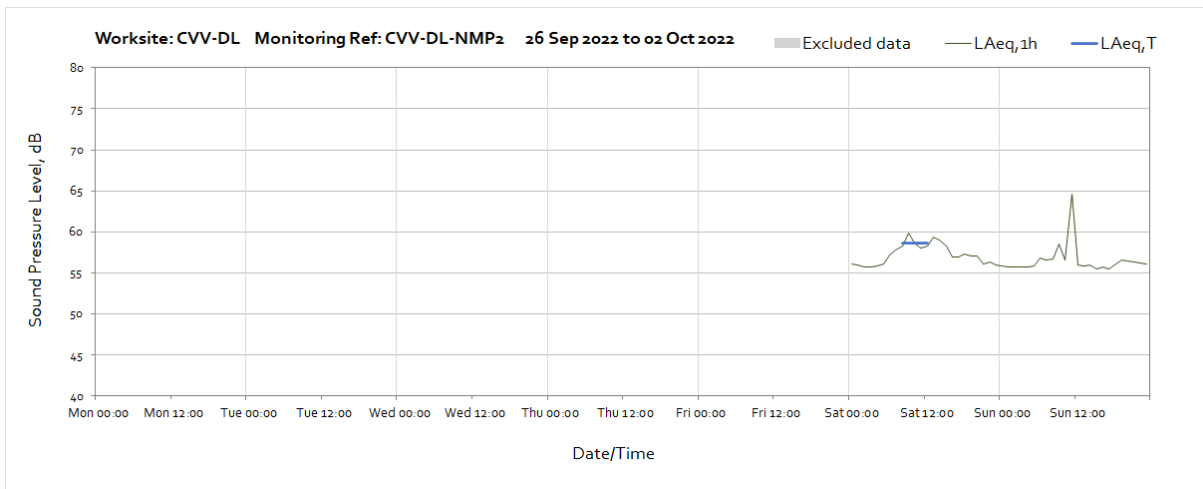
Appendix C Data

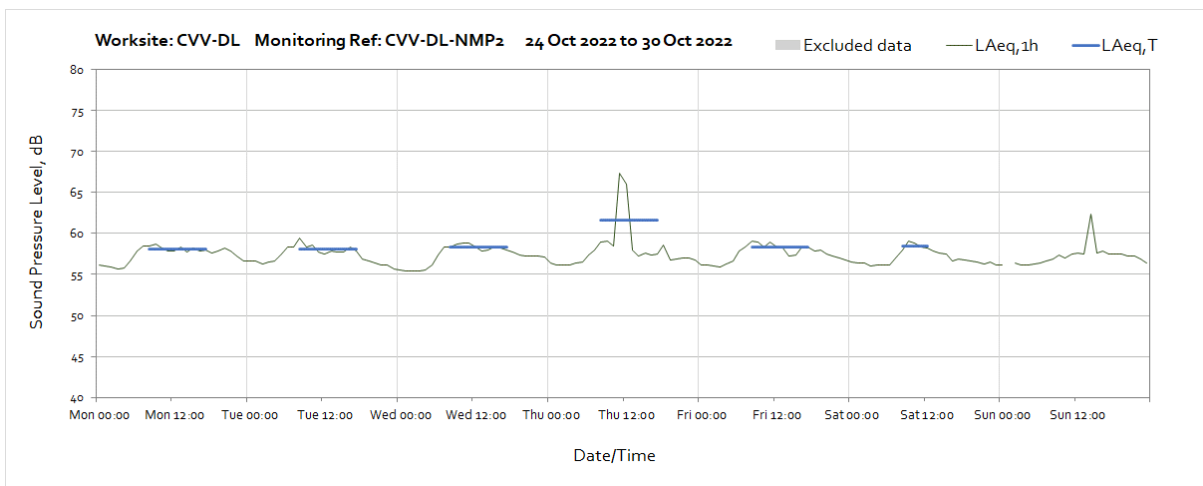
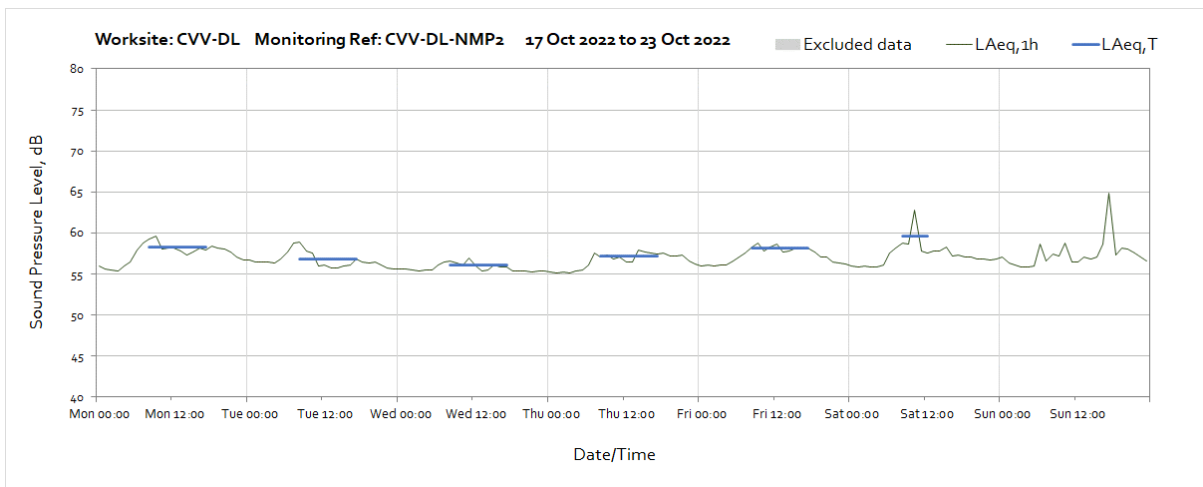
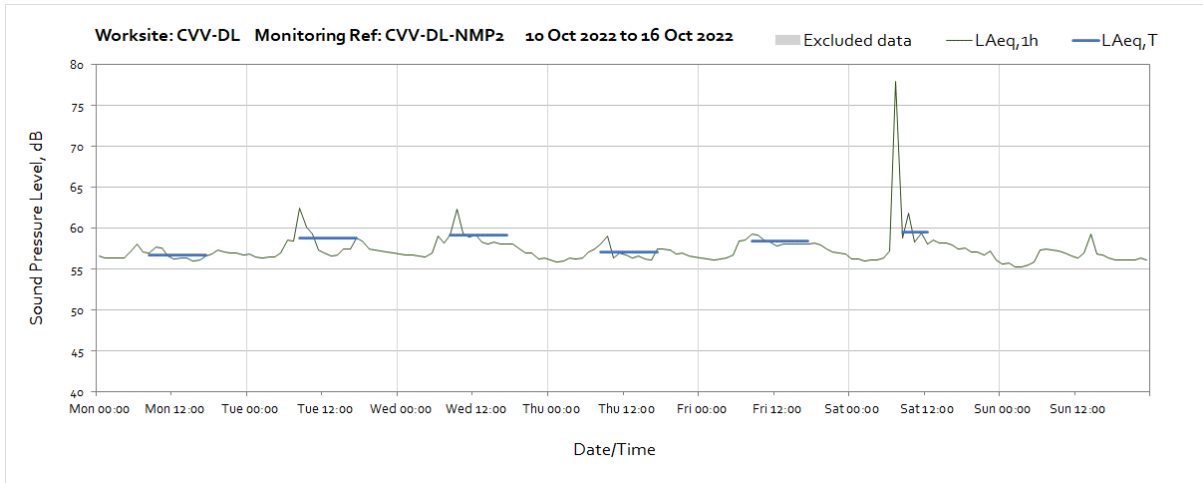
Noise

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 with adversely weather affected noise levels are greyed out and have been excluded from the calculation of the $L_{Aeq,T}$ values in Table 3 of the main report.

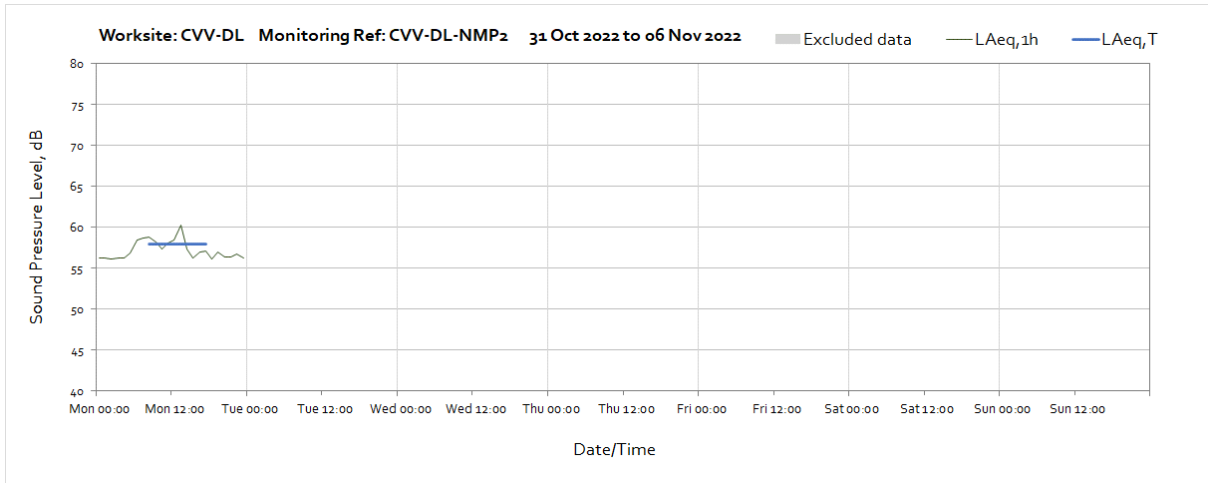
Worksite: Colne Valley Viaduct Dews Lane (CVV-DL)

Monitoring Ref: CVV-DL-NMP2



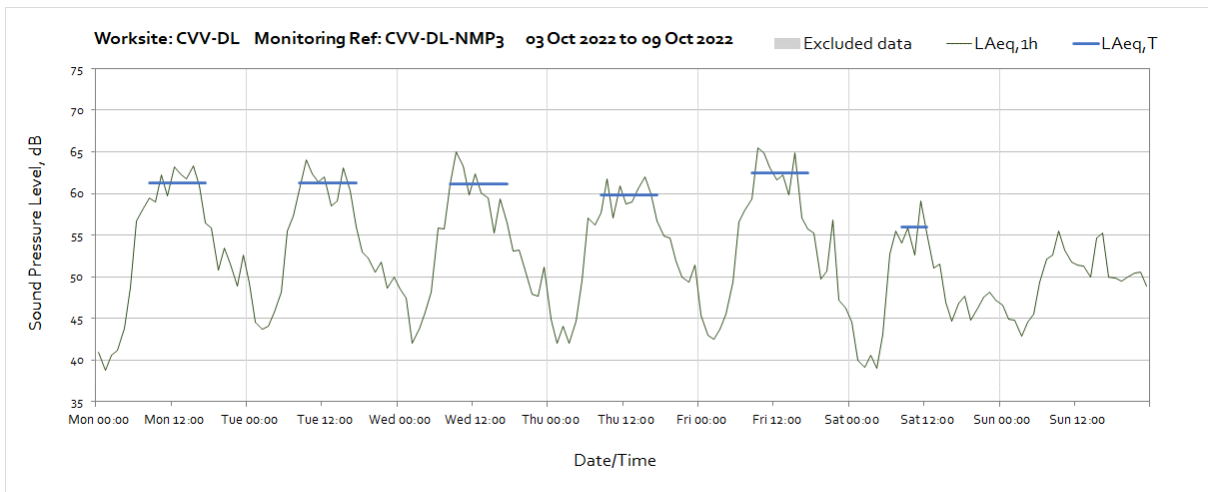
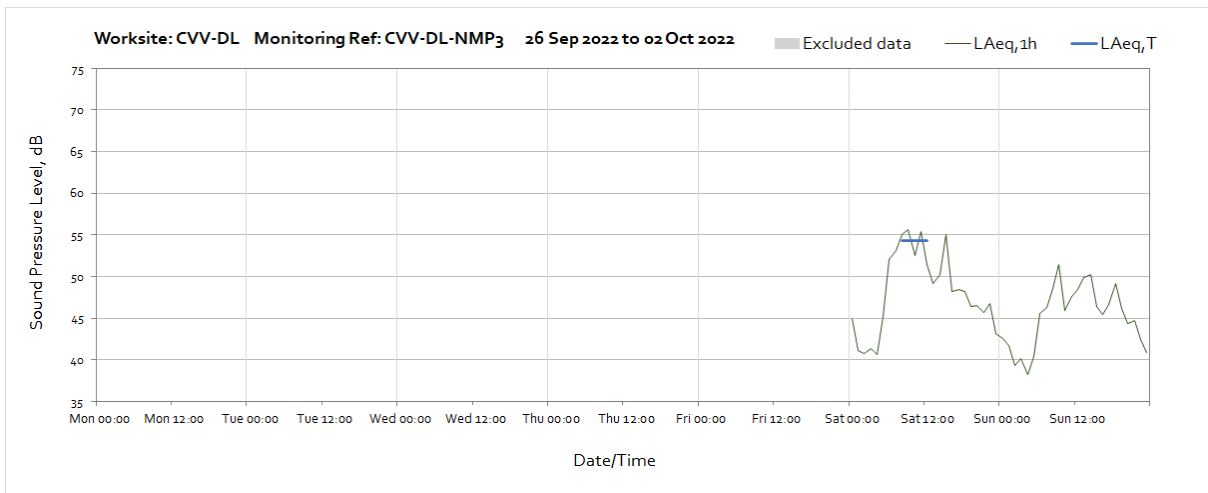


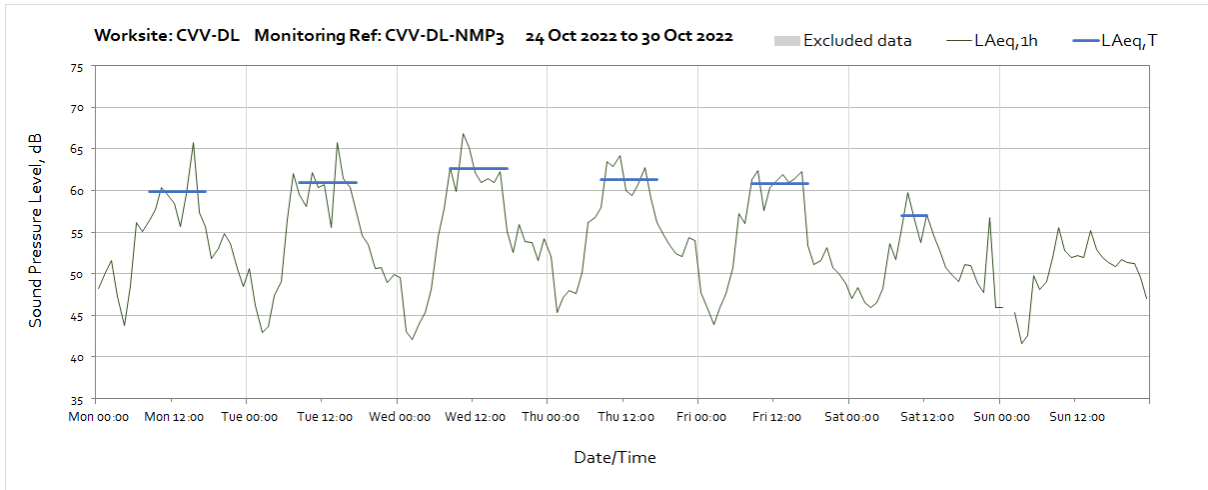
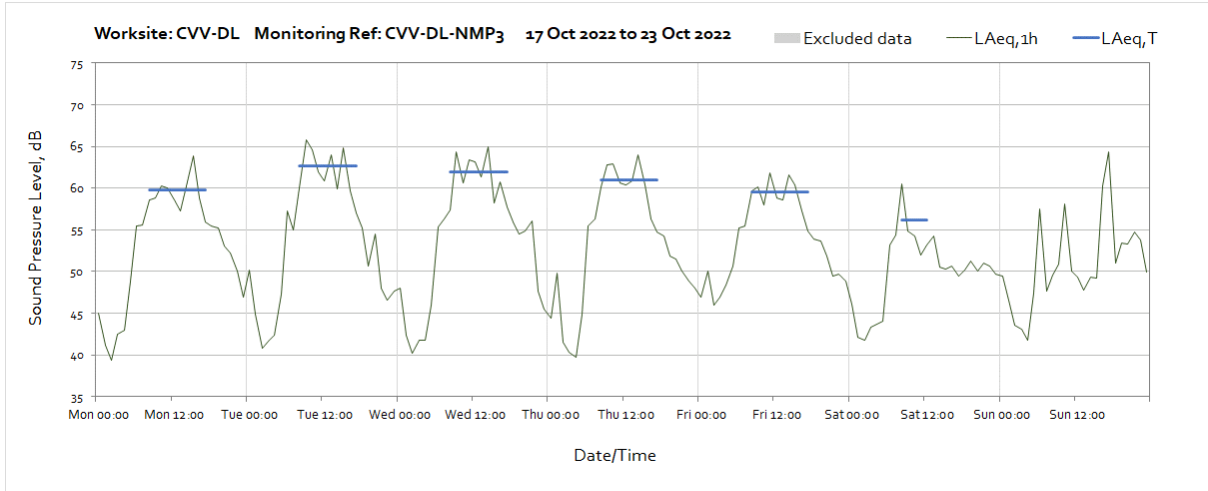
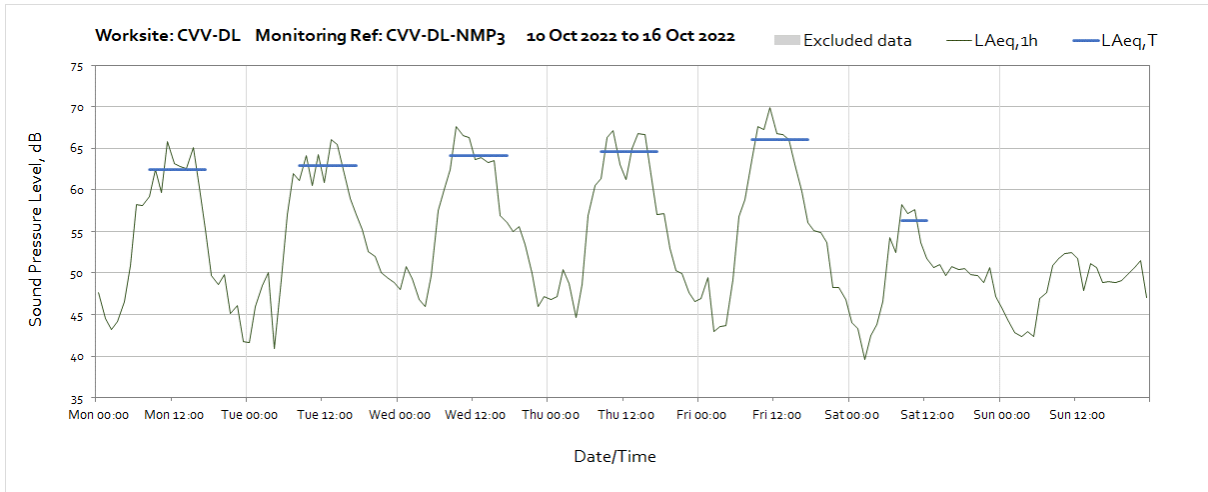
Note: Missing data at 01:00 on Sunday 30th October was due to a software issue associated with the end of British Summer Time.



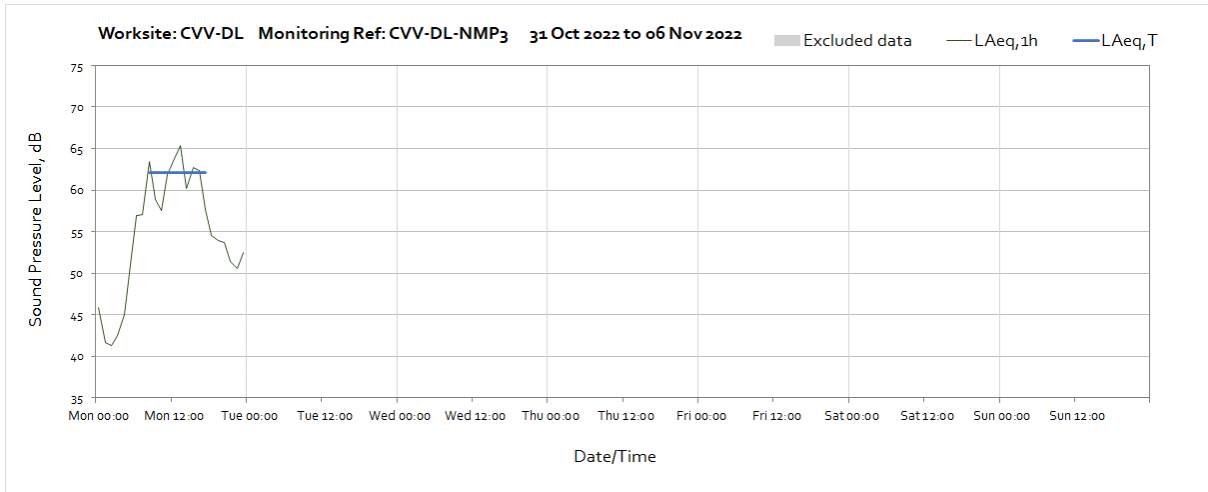
Worksite: Colne Valley Viaduct Dews Lane (CVV-DL)

Monitoring Ref: CVV-DL-NMP3

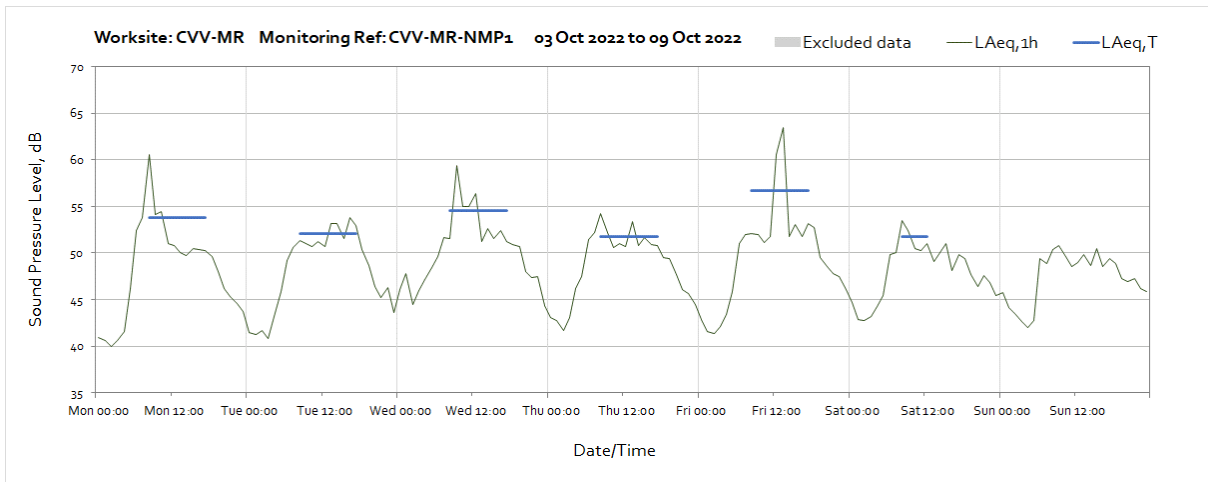
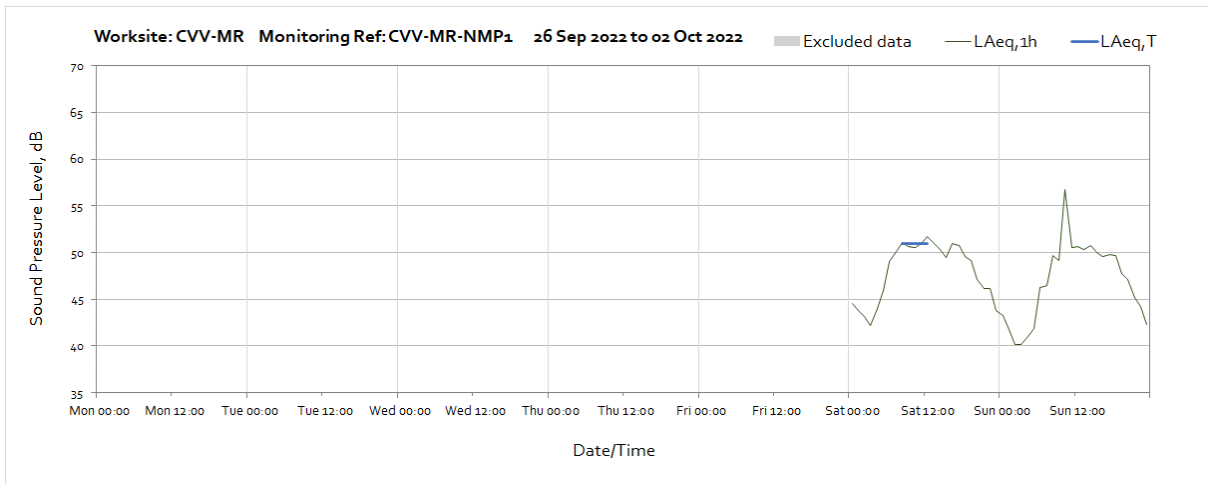


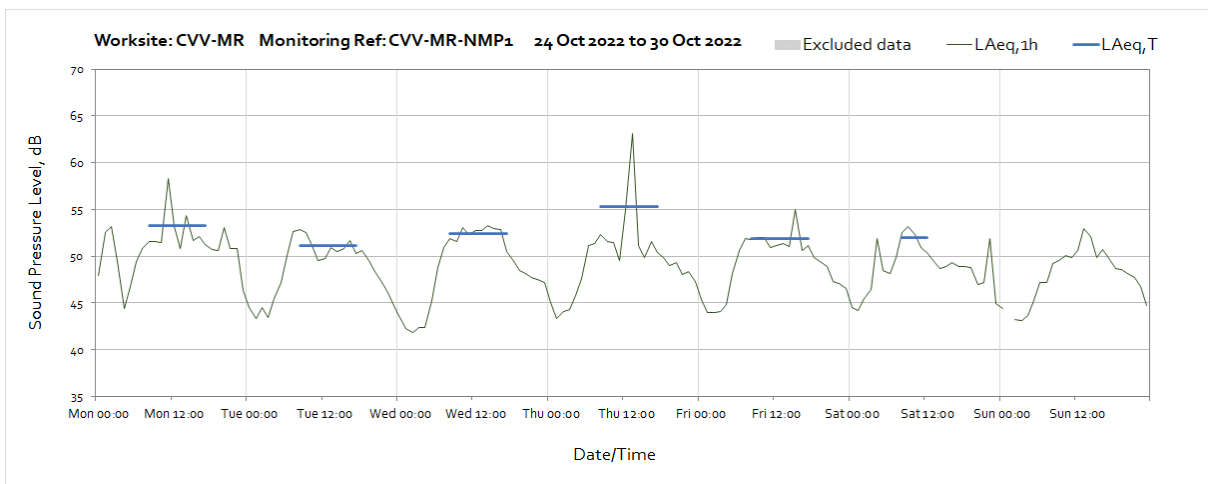
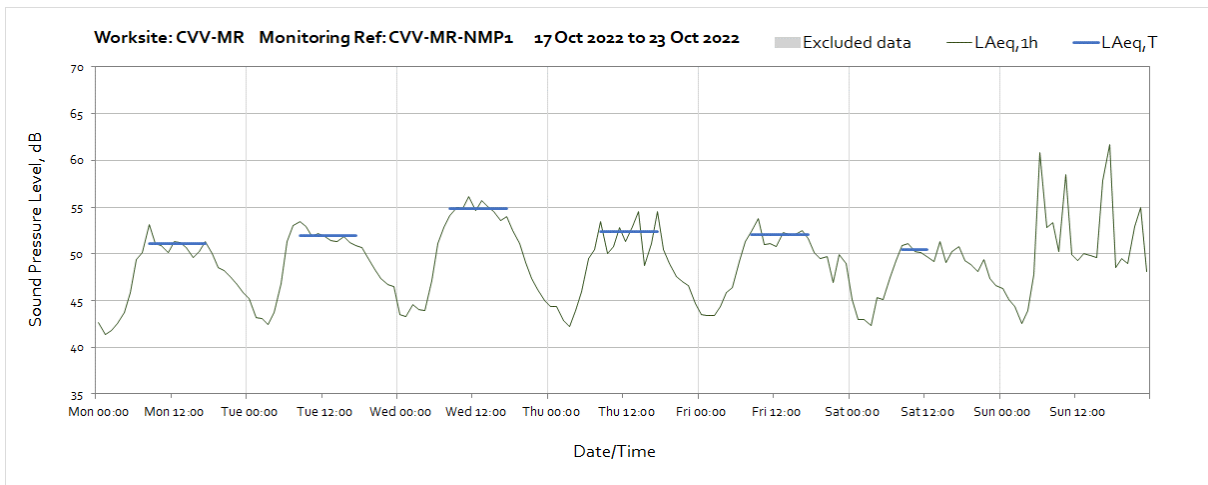
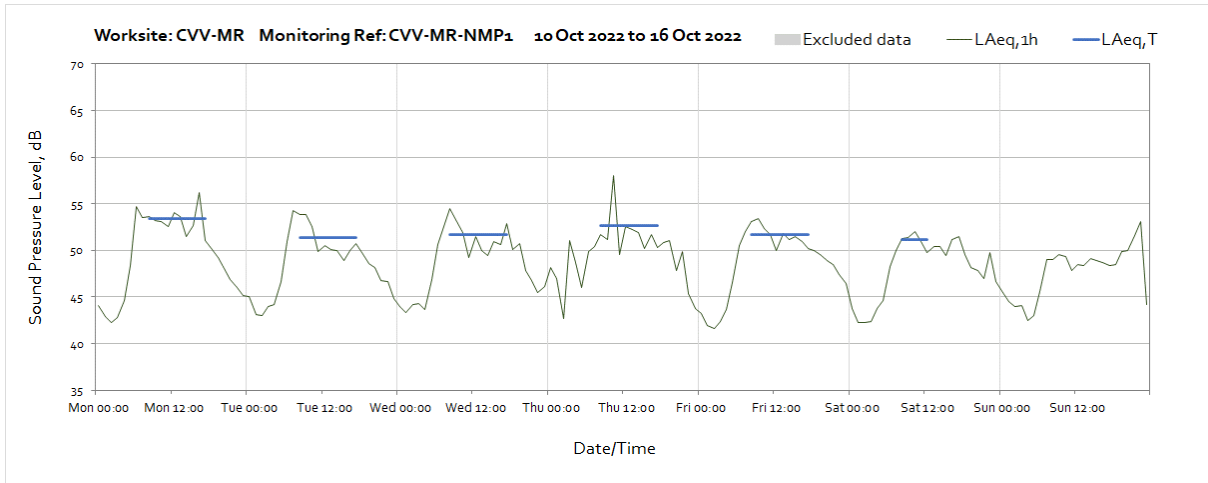


Note: Missing data at 01:00 on Sunday 30th October was due to a software issue associated with the end of British Summer Time.

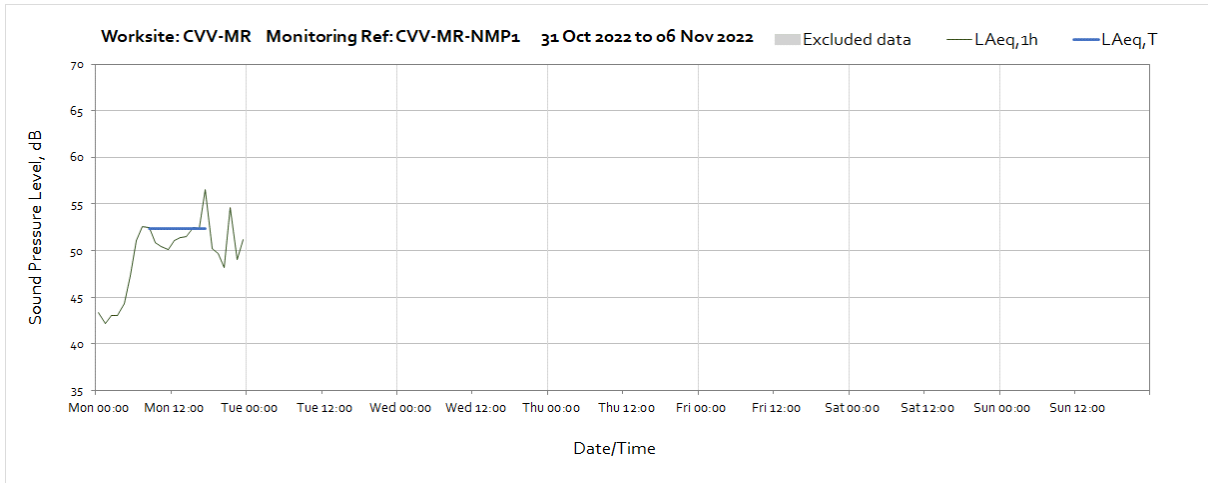


Worksite: Colne Valley Viaduct Moorhall Road (CVV-MR)
Monitoring Ref: CVV-MR-NMP1



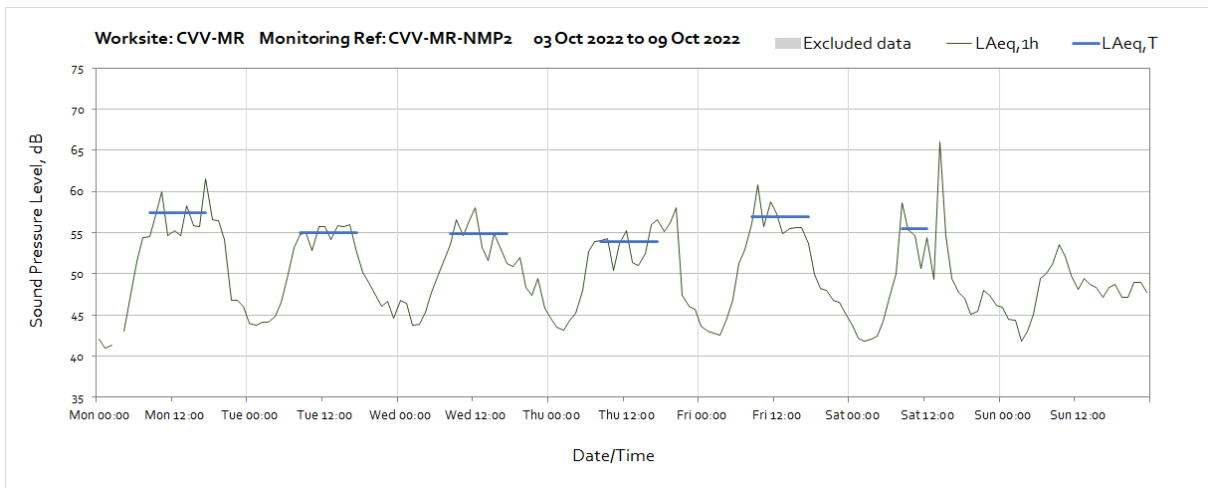
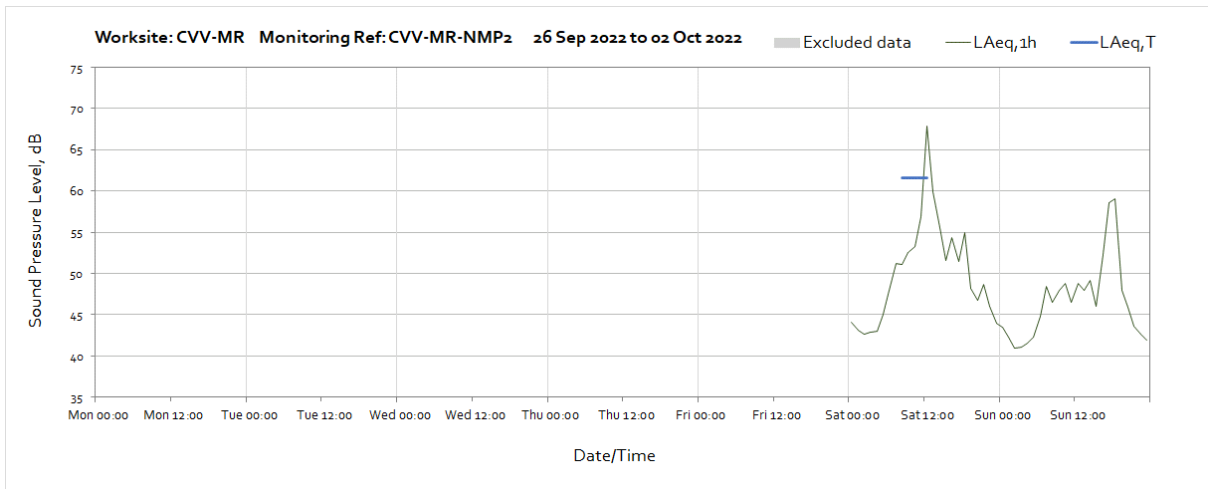


Note: Missing data at 01:00 on Sunday 30th October was due to a software issue associated with the end of British Summer Time.

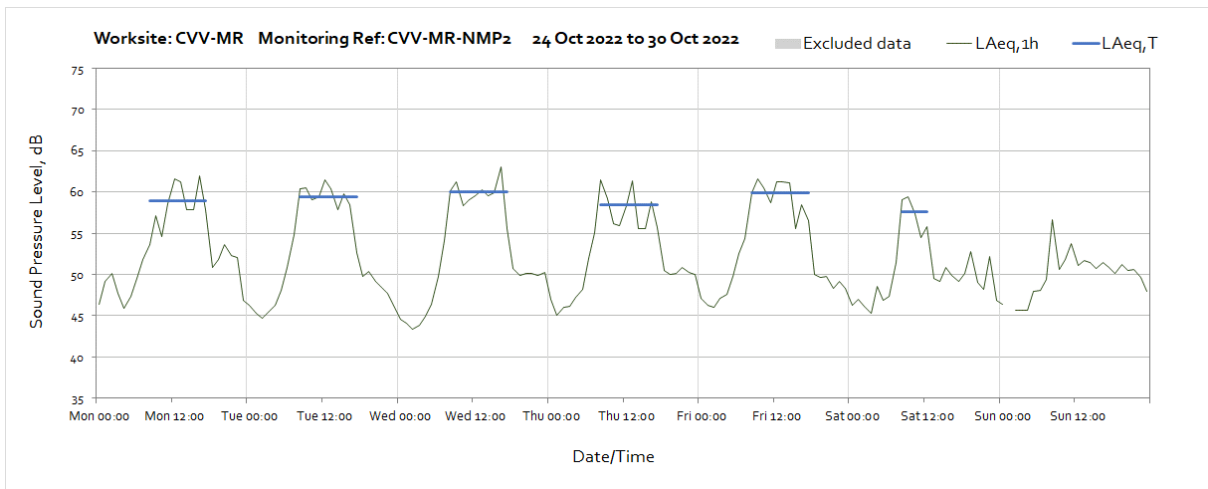
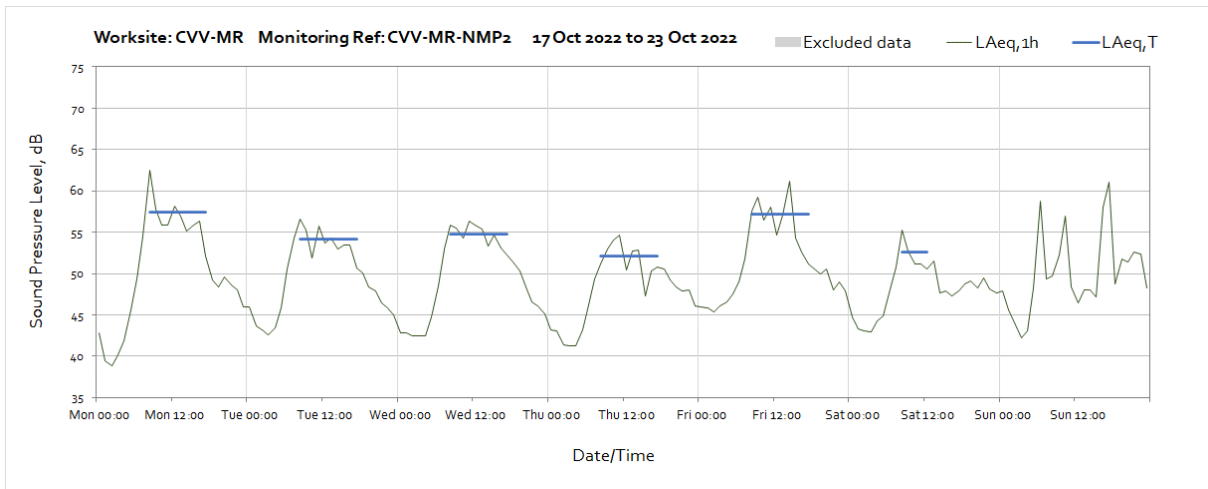
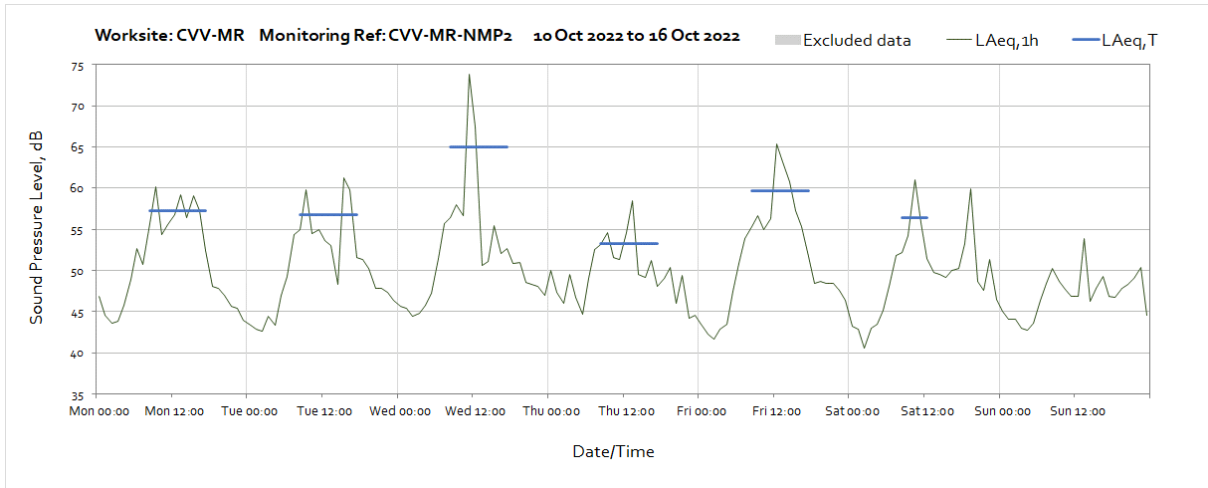


Worksite: Colne Valley Viaduct Moorhall Road (CVV-MR)

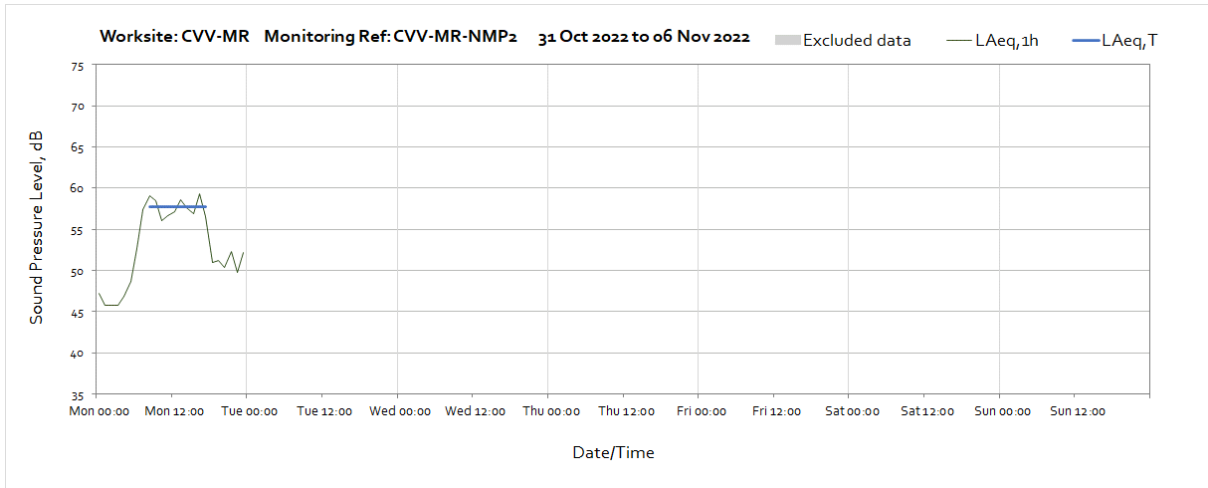
Monitoring Ref: CVV-MR-NMP2



Note: Missing data at 03:00 on Monday 3rd October was due to monitor setting updates.

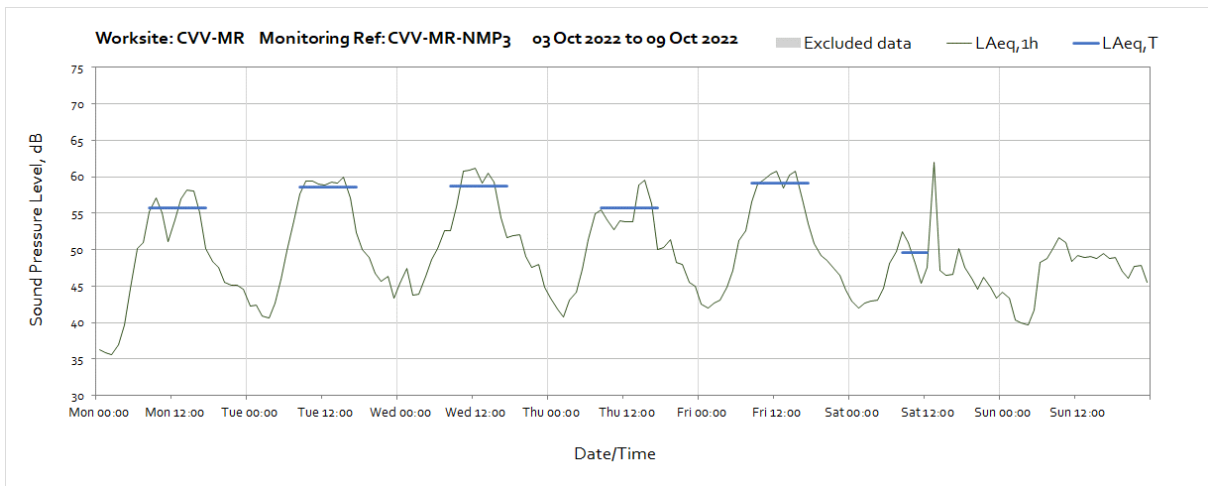
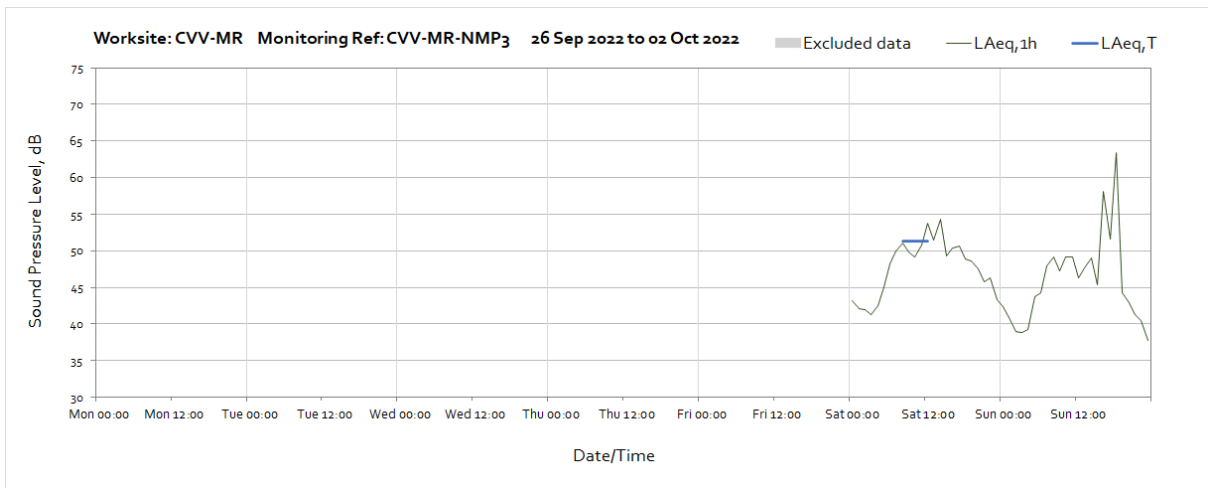


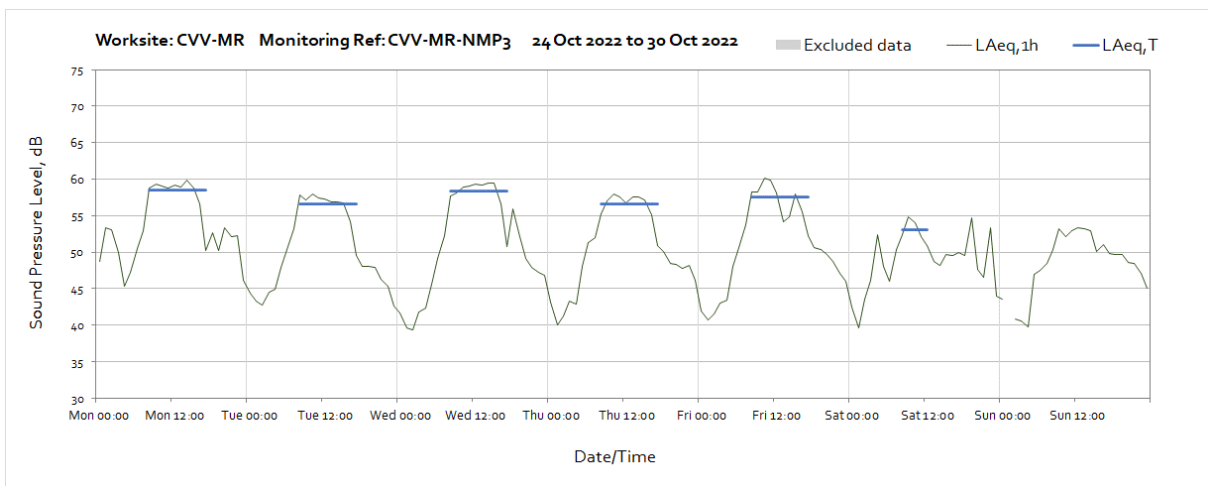
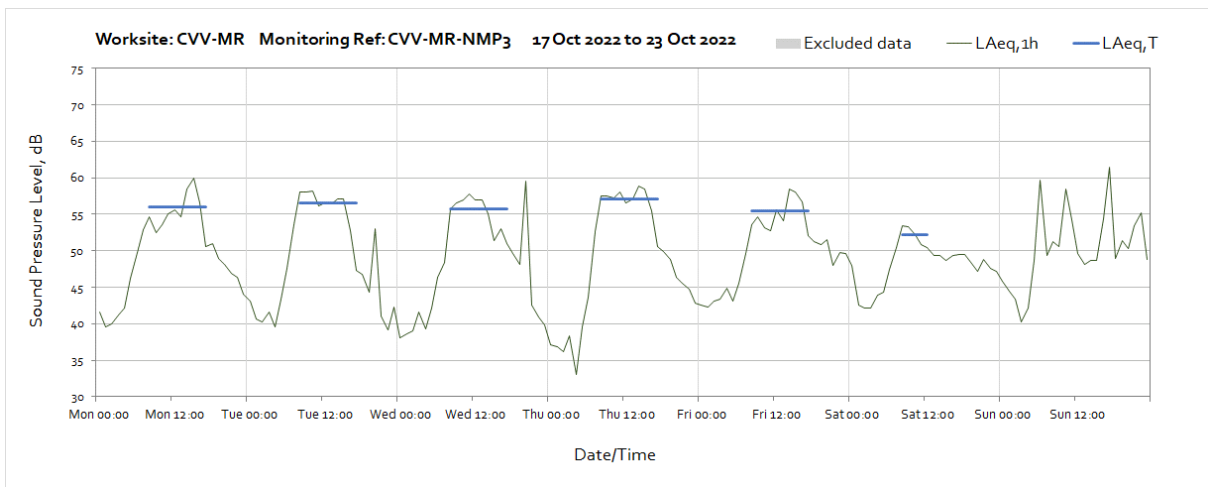
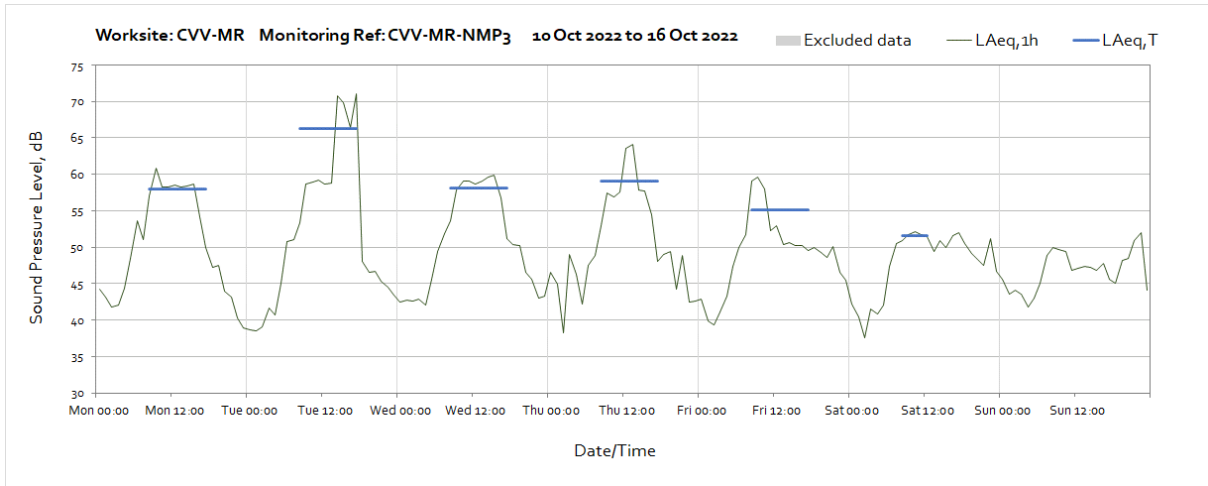
Note: Missing data at 01:00 on Sunday 30th October was due to a software issue associated with the end of British Summer Time.



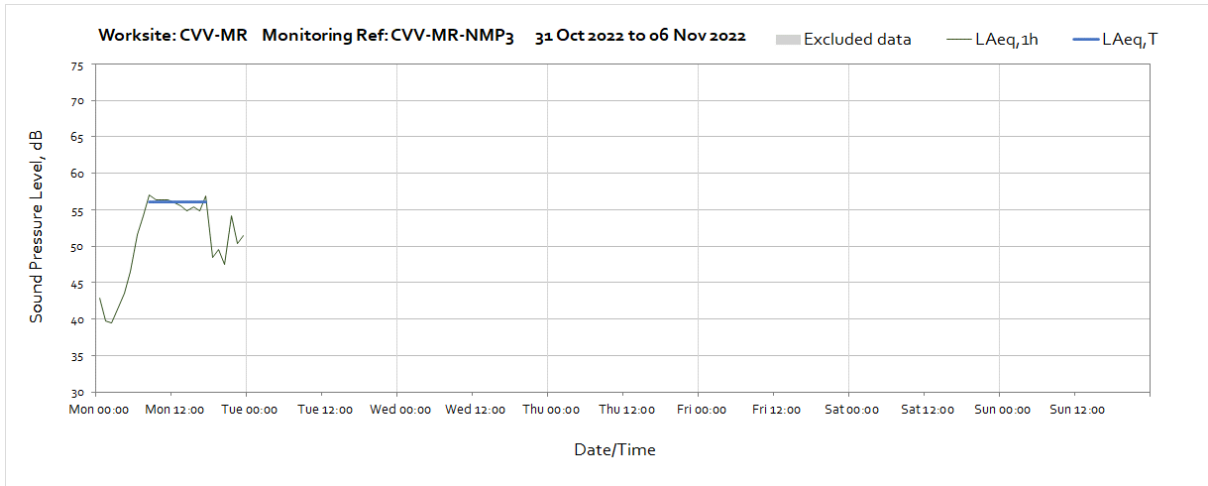
Worksite: Colne Valley Viaduct Moorhall Road (CVV-MR)

Monitoring Ref: CVV-MR-NMP3

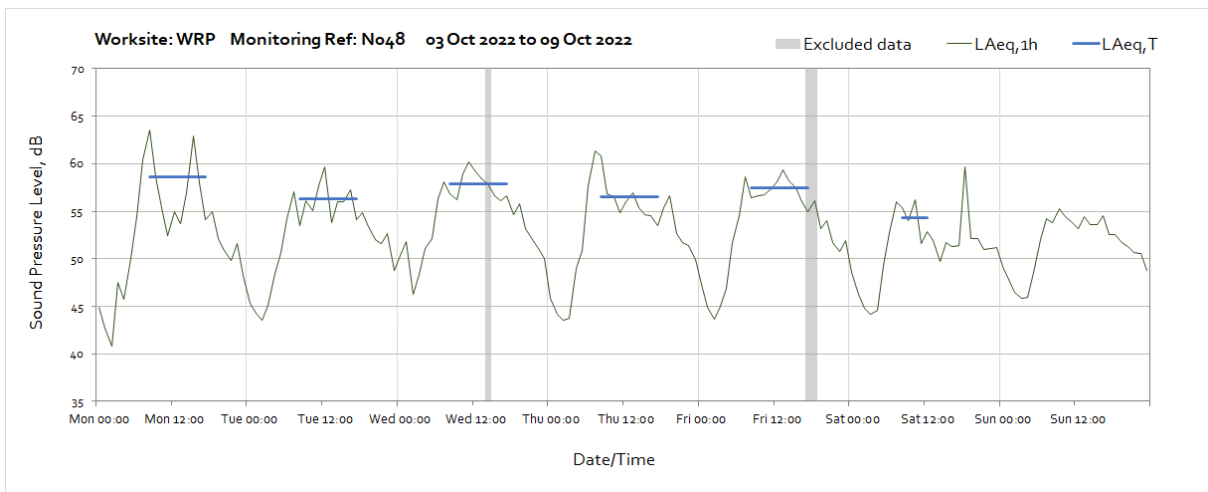
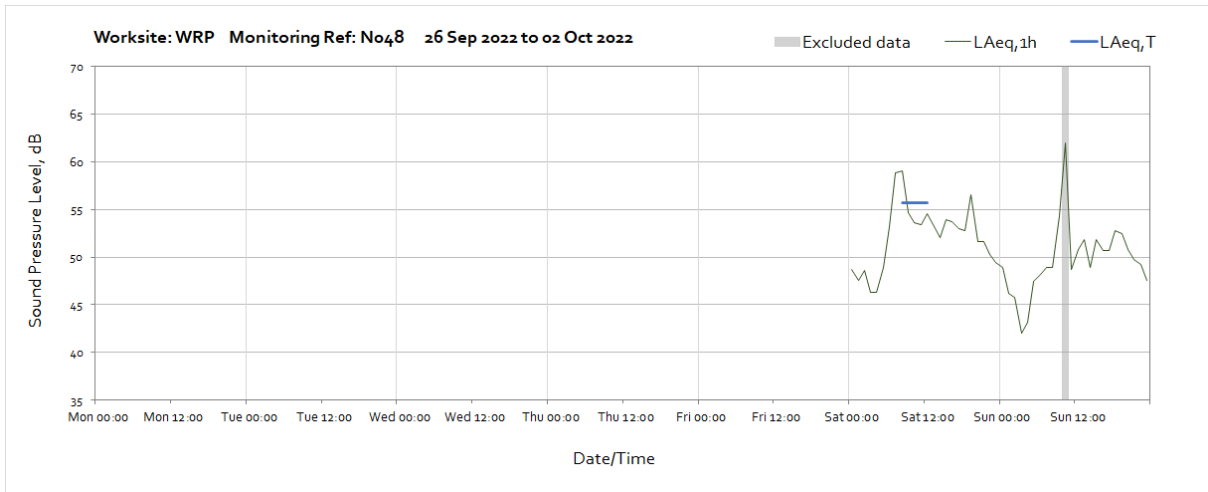


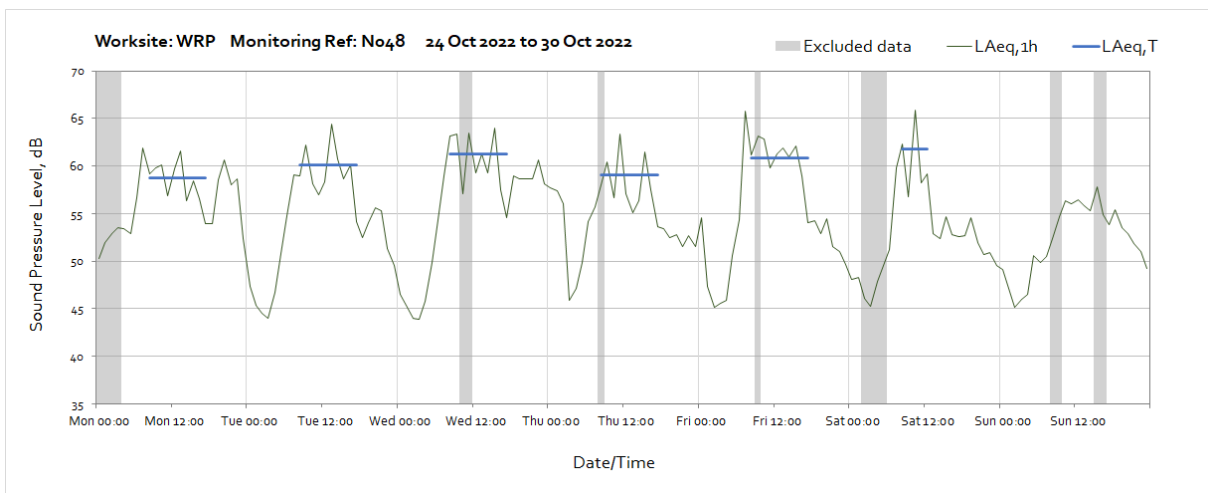
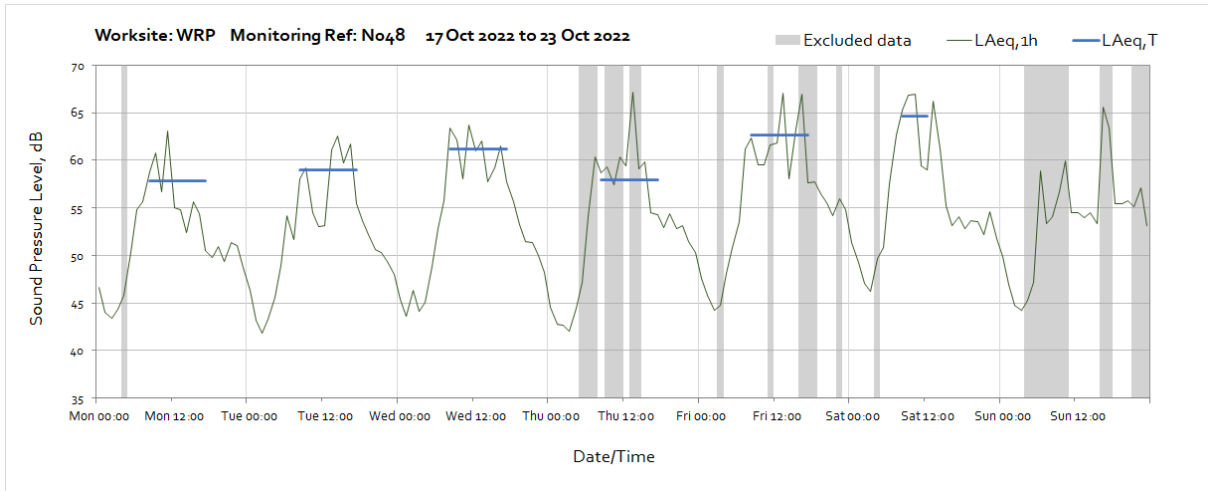
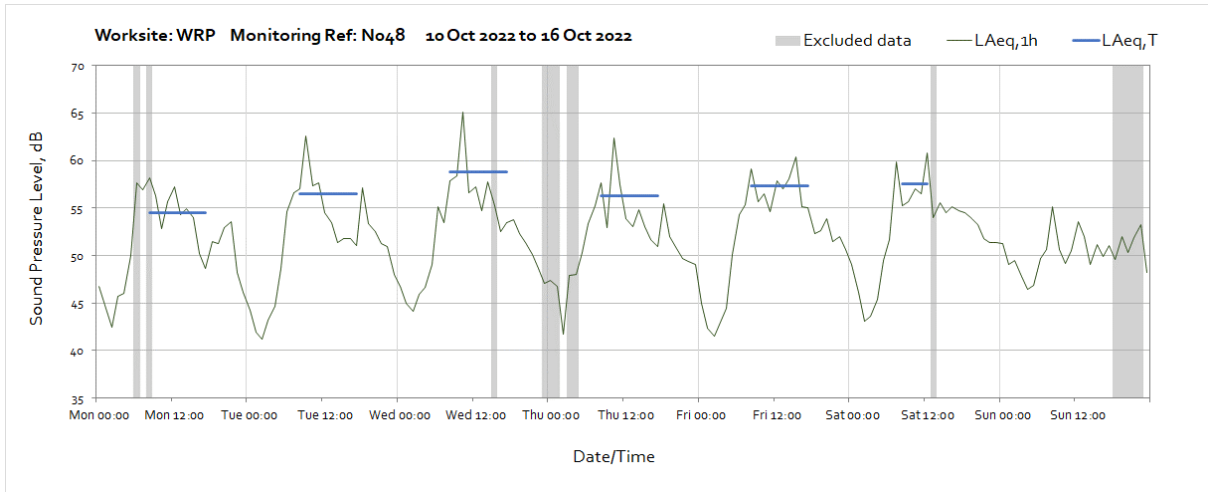


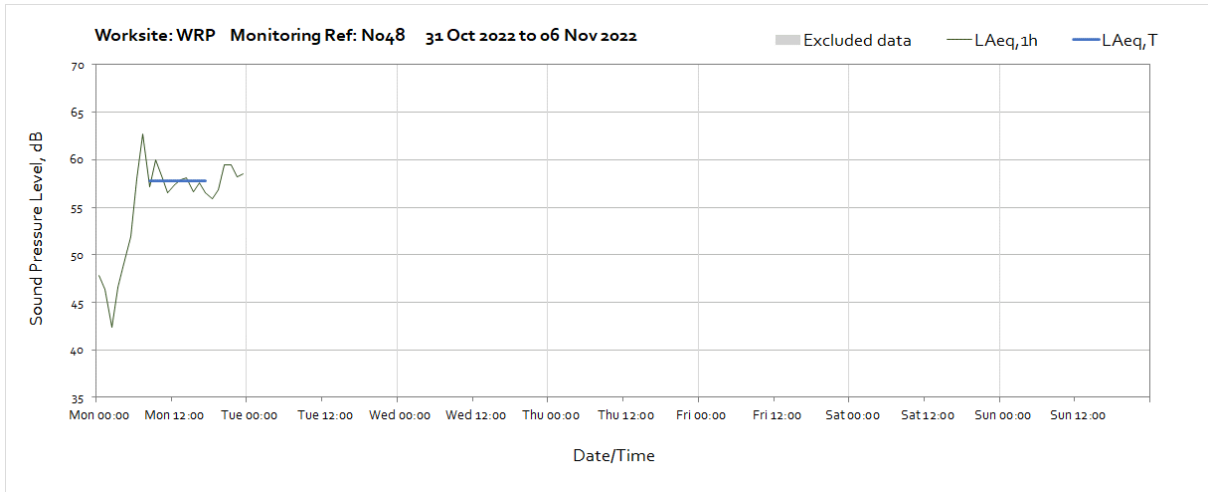
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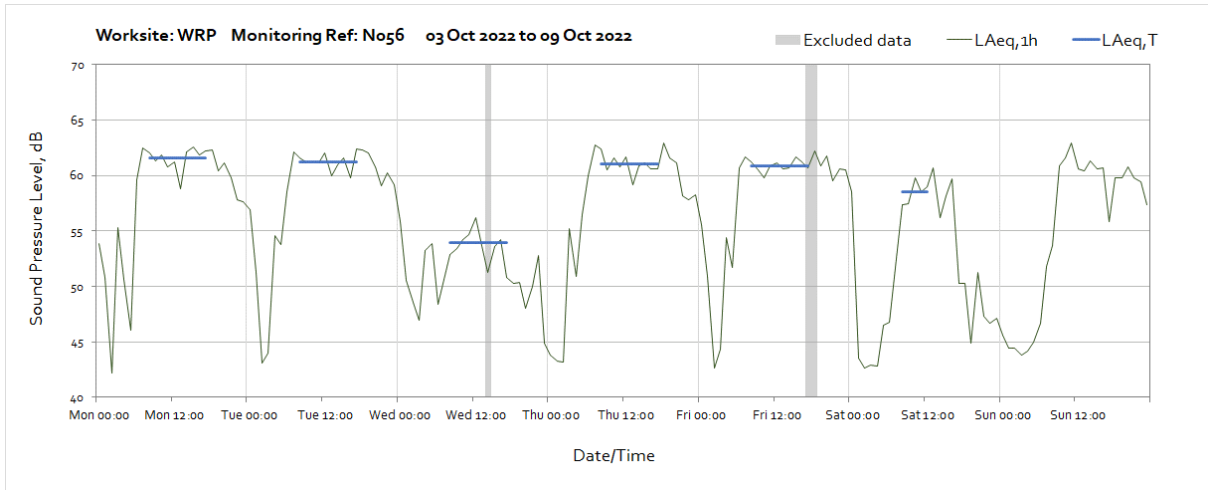
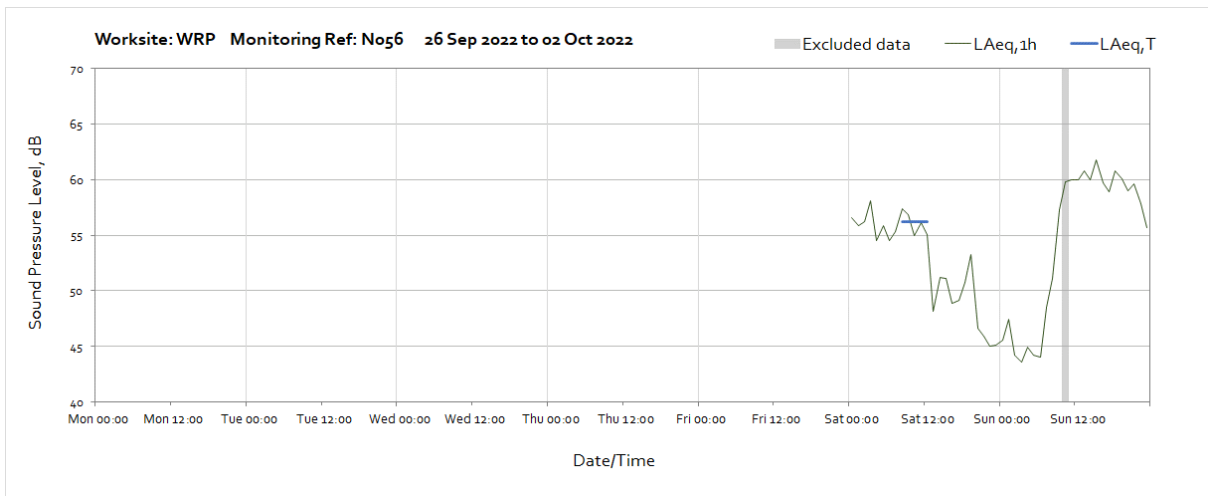
Worksite: West Ruislip Portal (WRP) – Monitoring Ref: N048

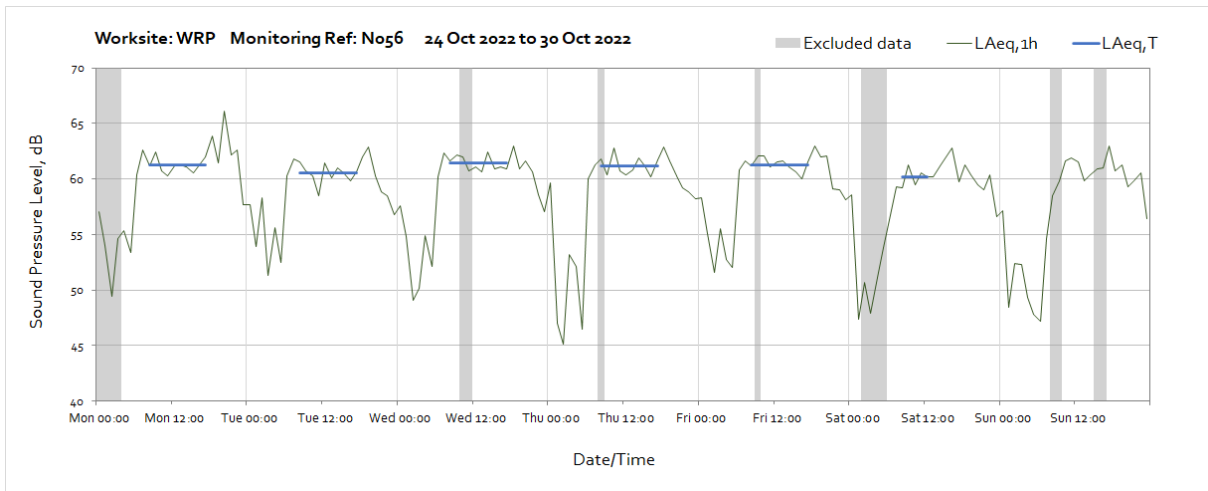
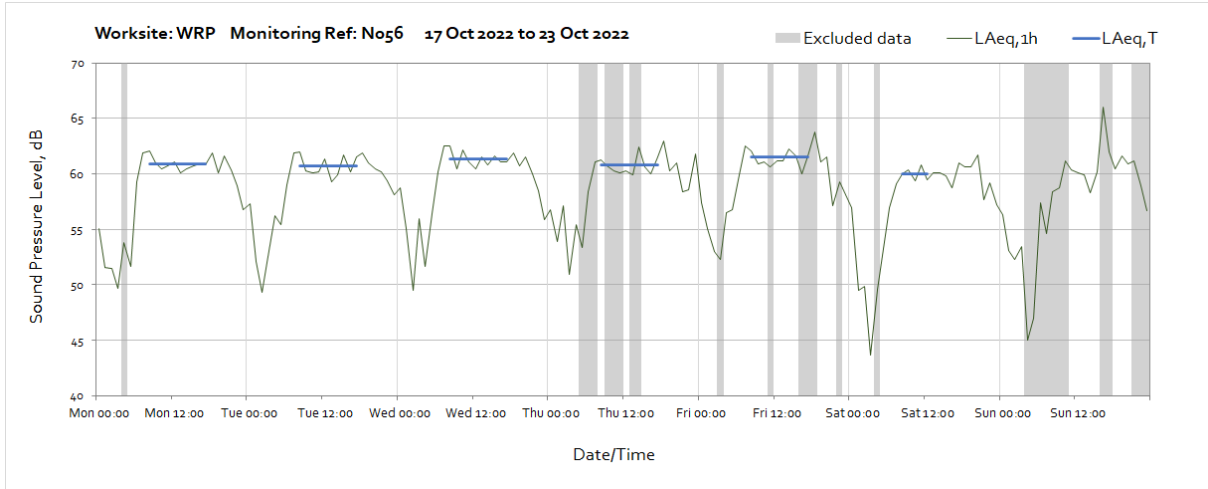
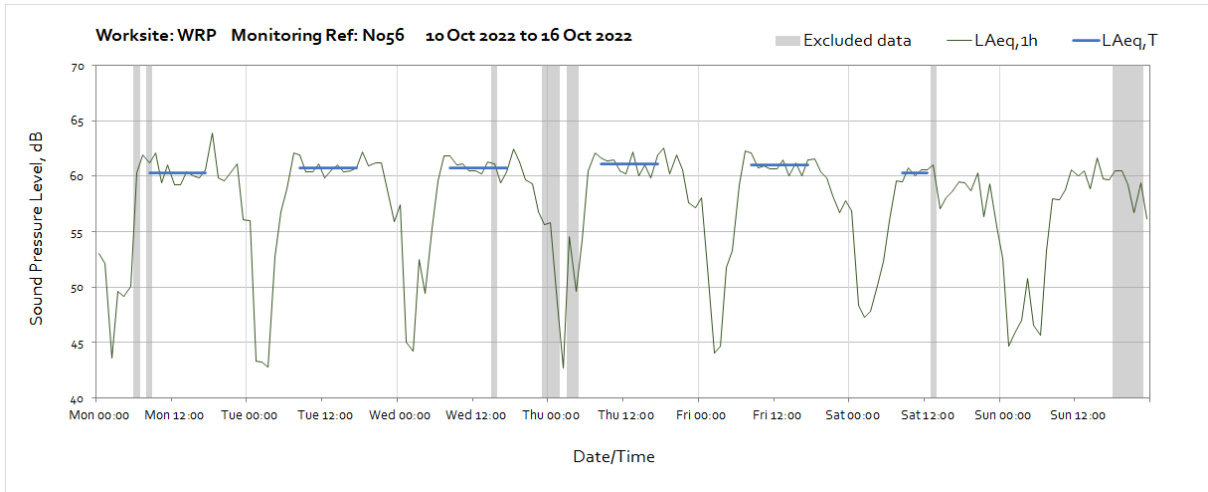


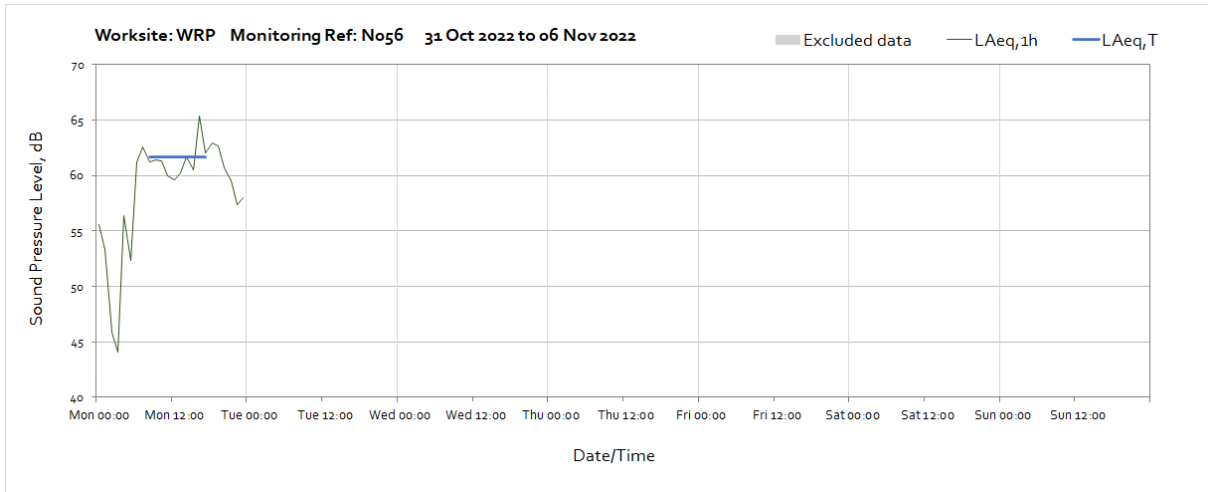




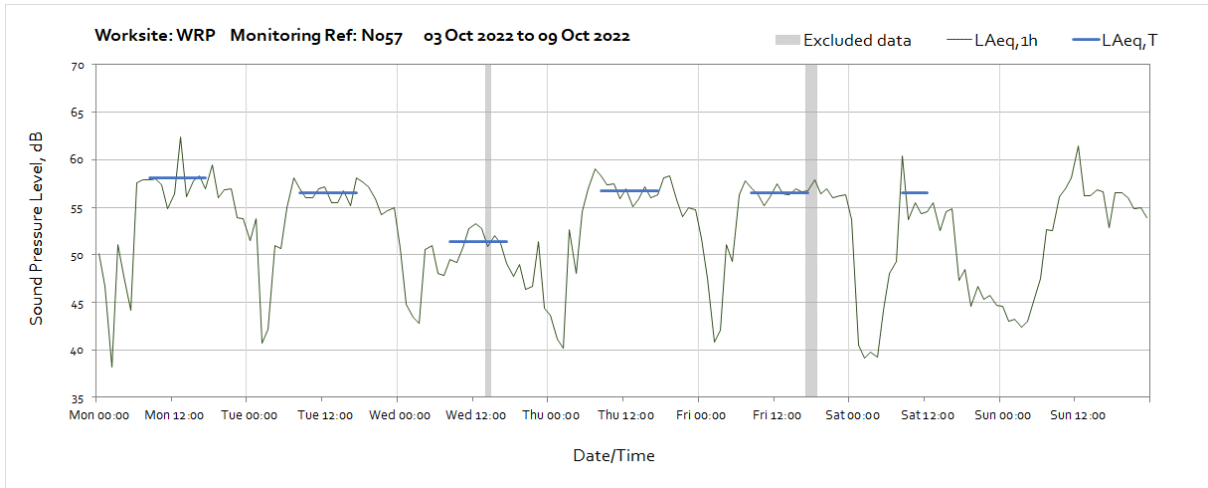
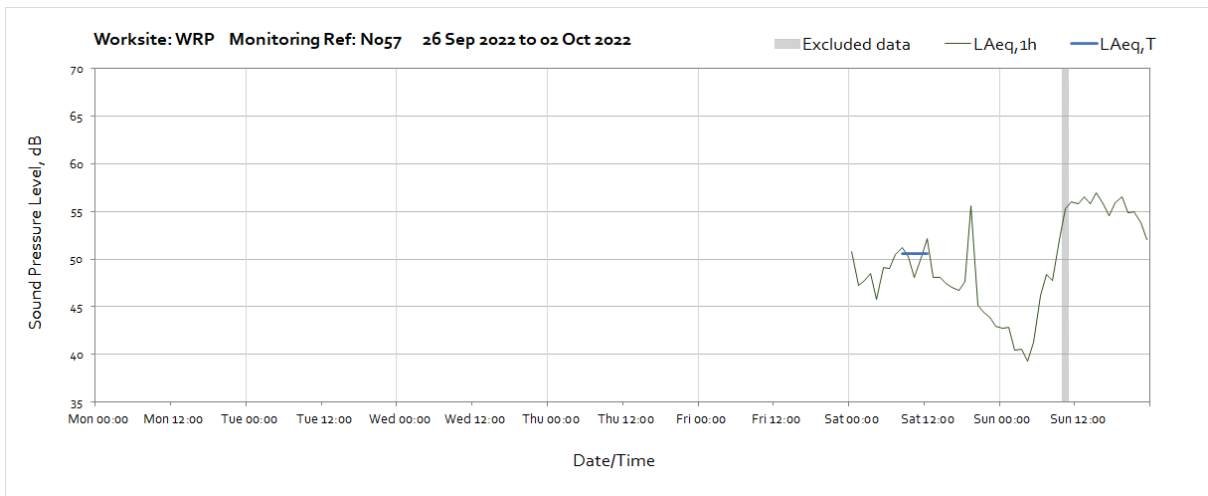
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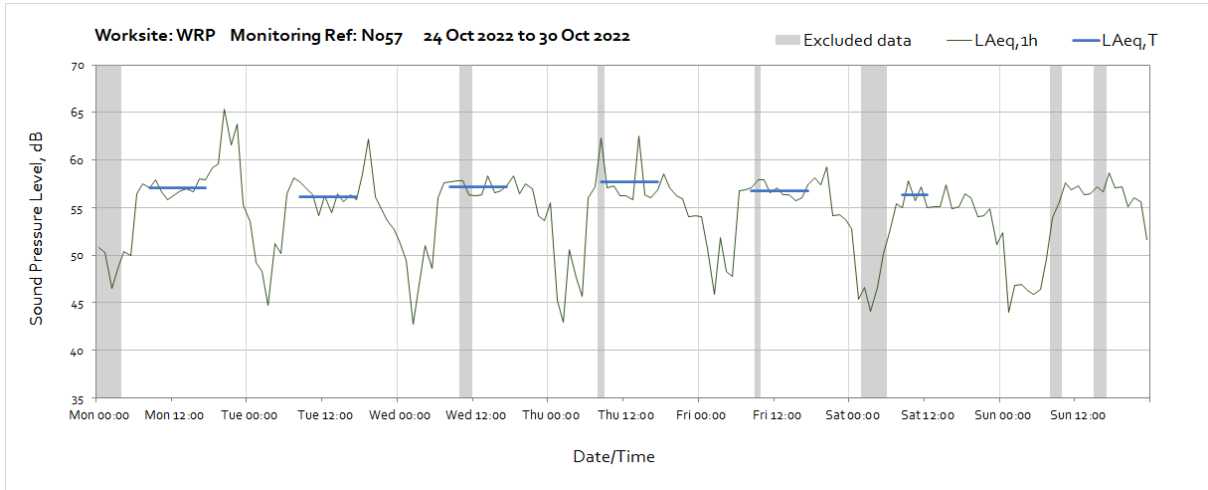
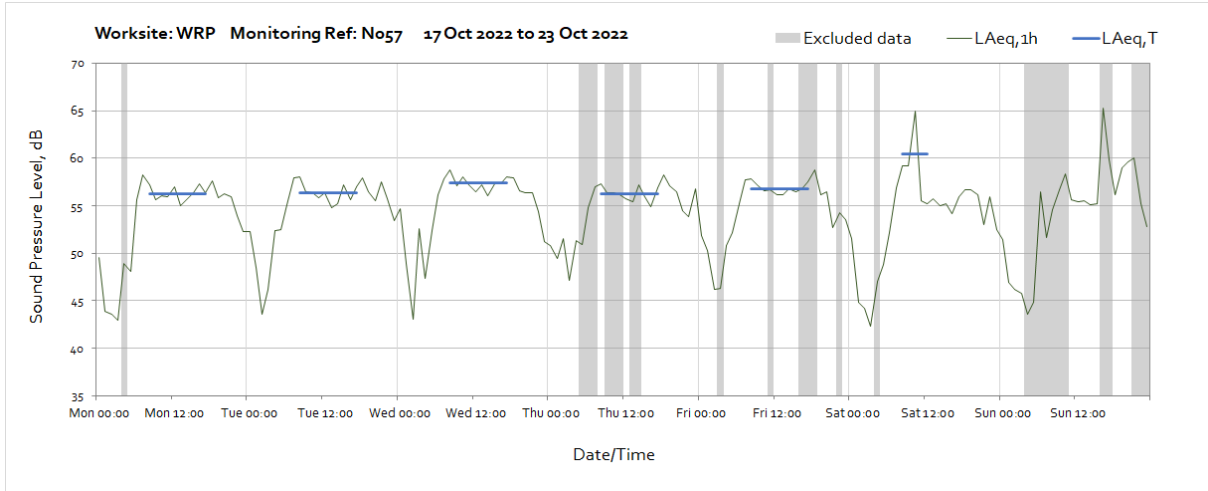
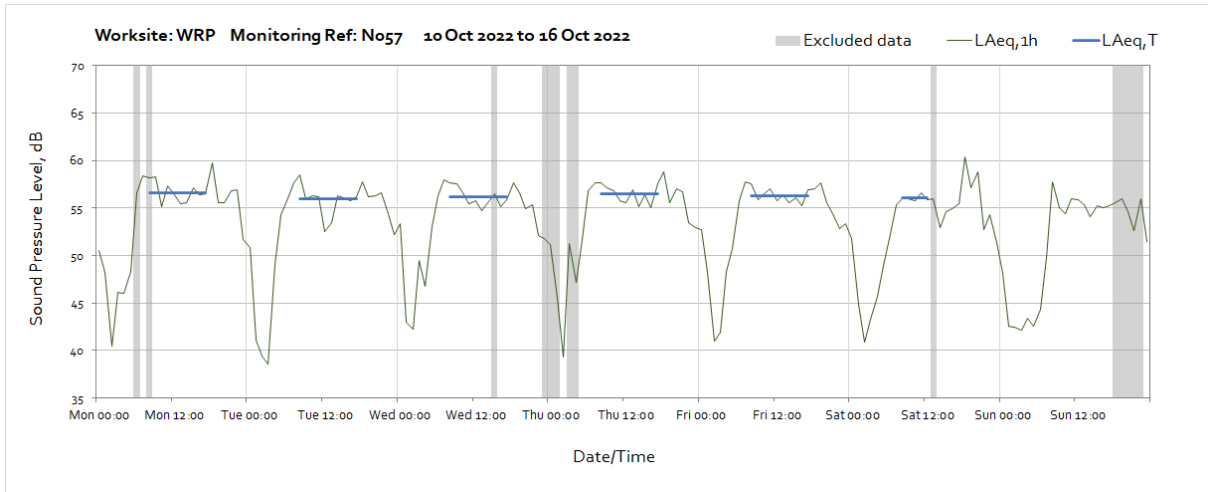


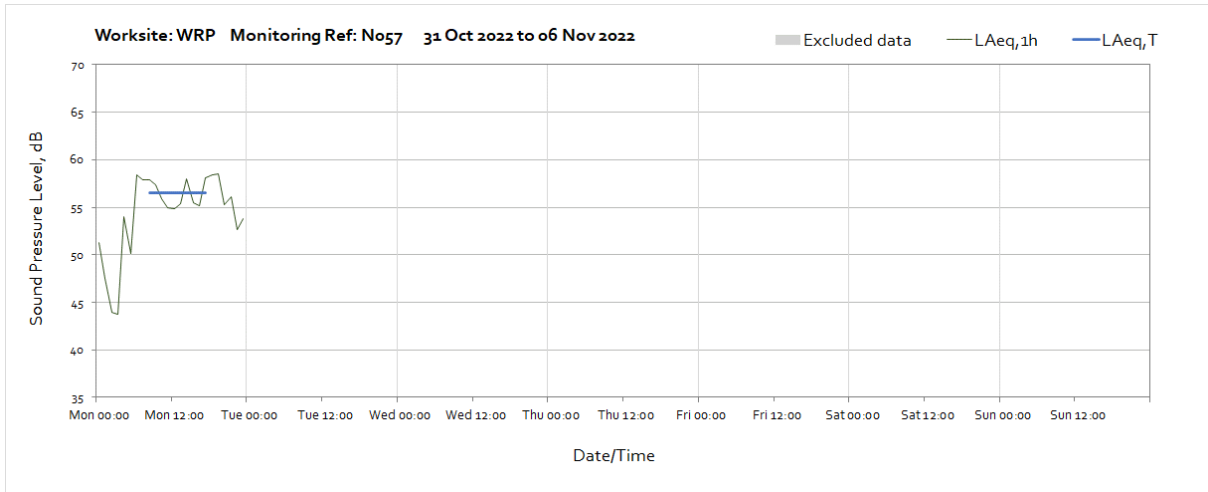




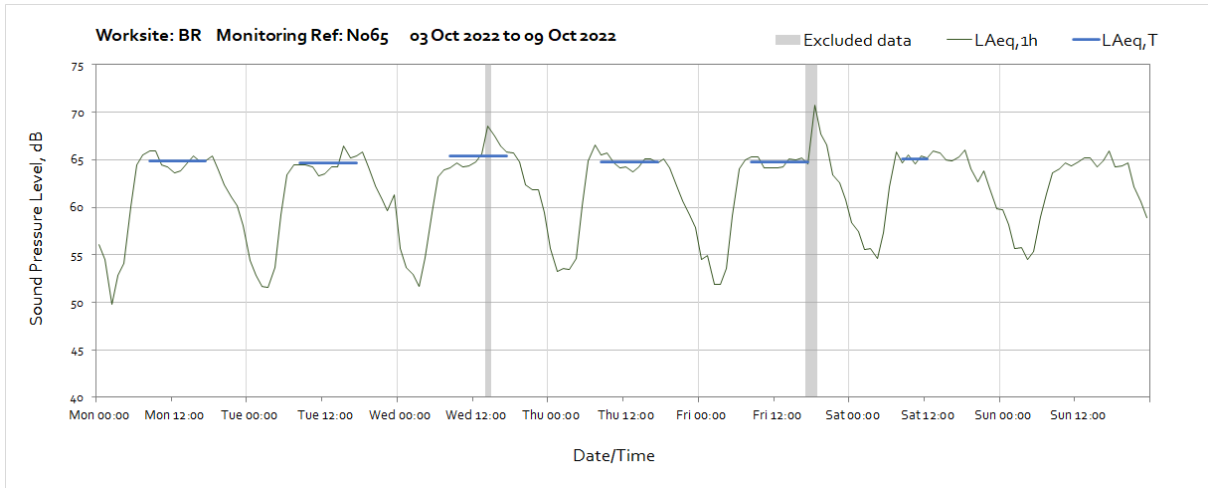
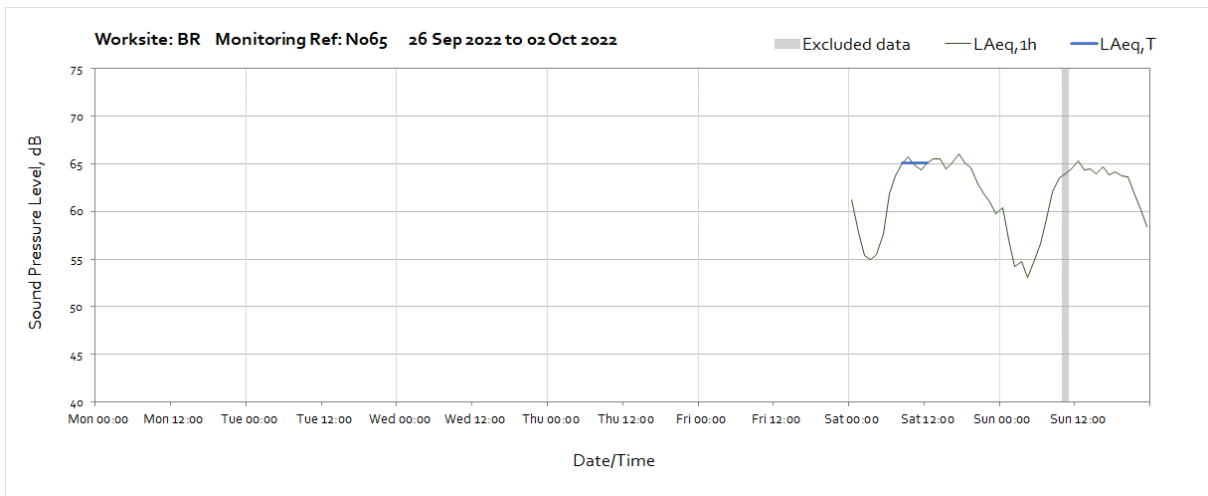
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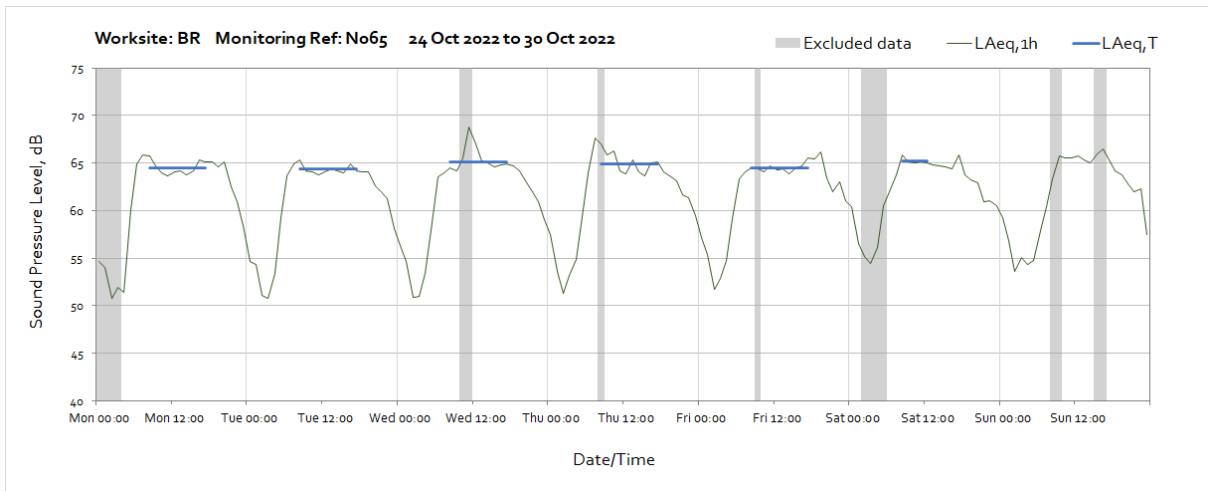
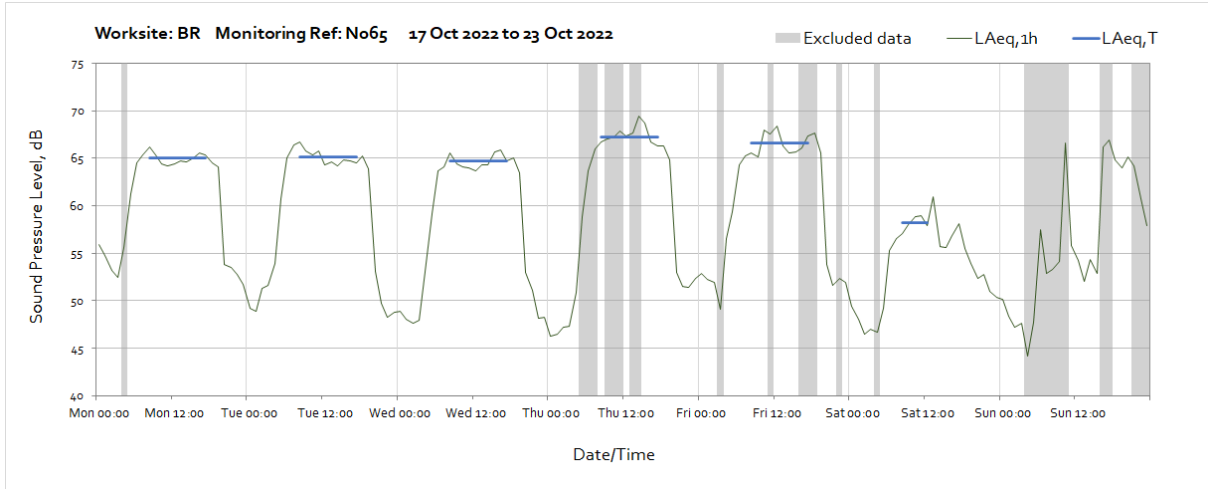
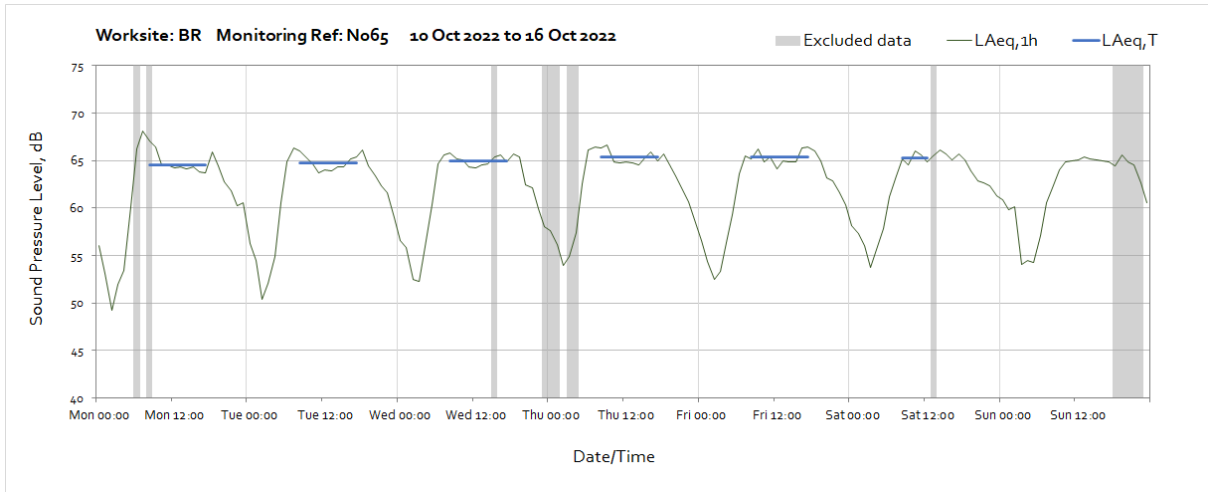


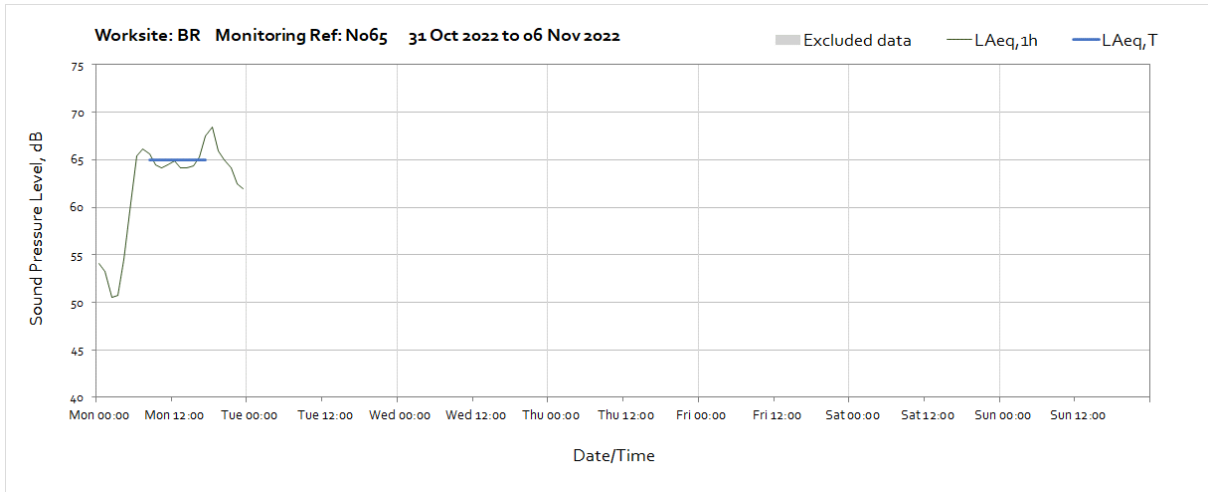




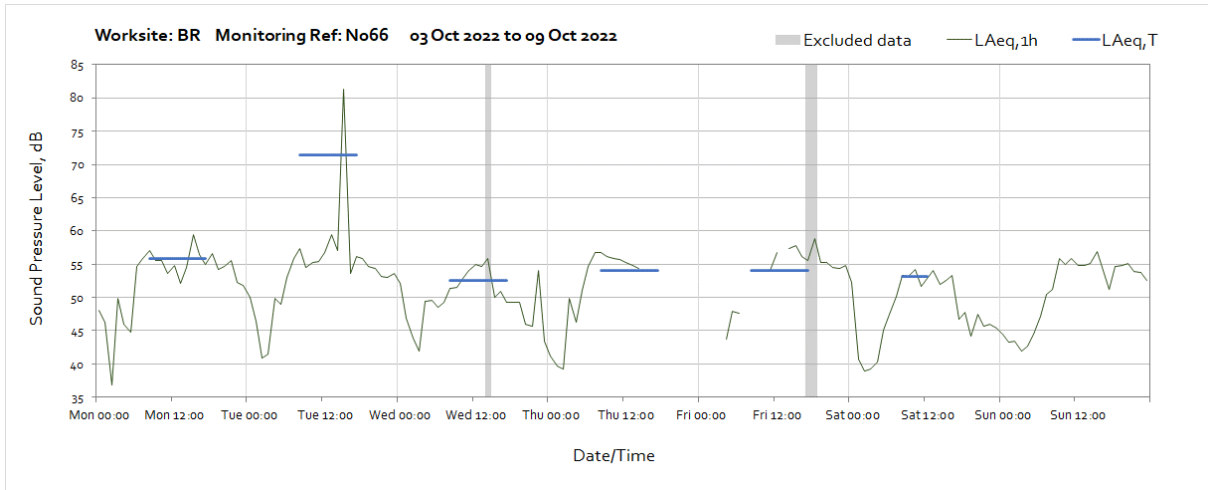
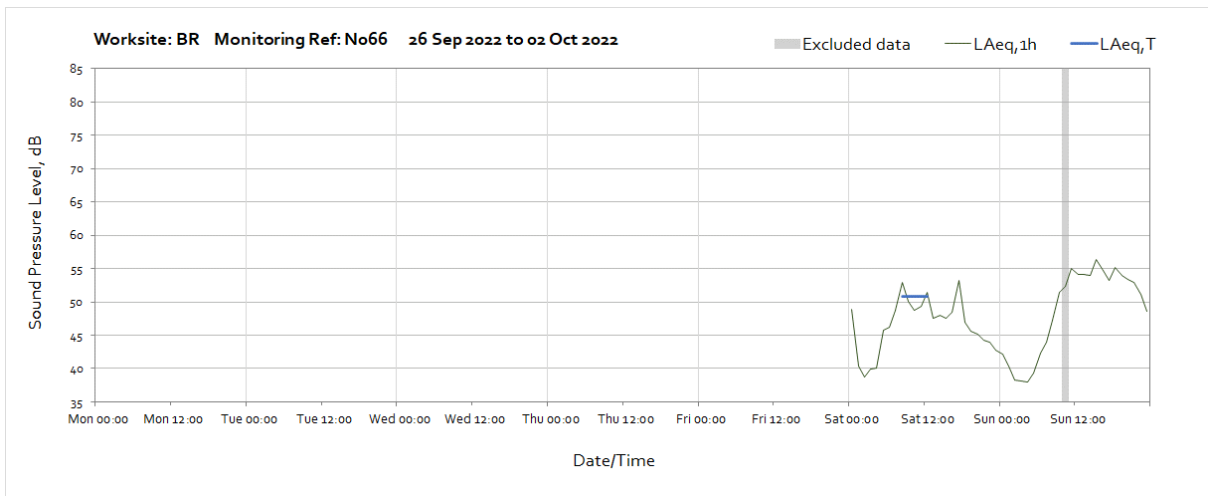
Worksite: Breakspear Road (BR) – Monitoring Ref: N065



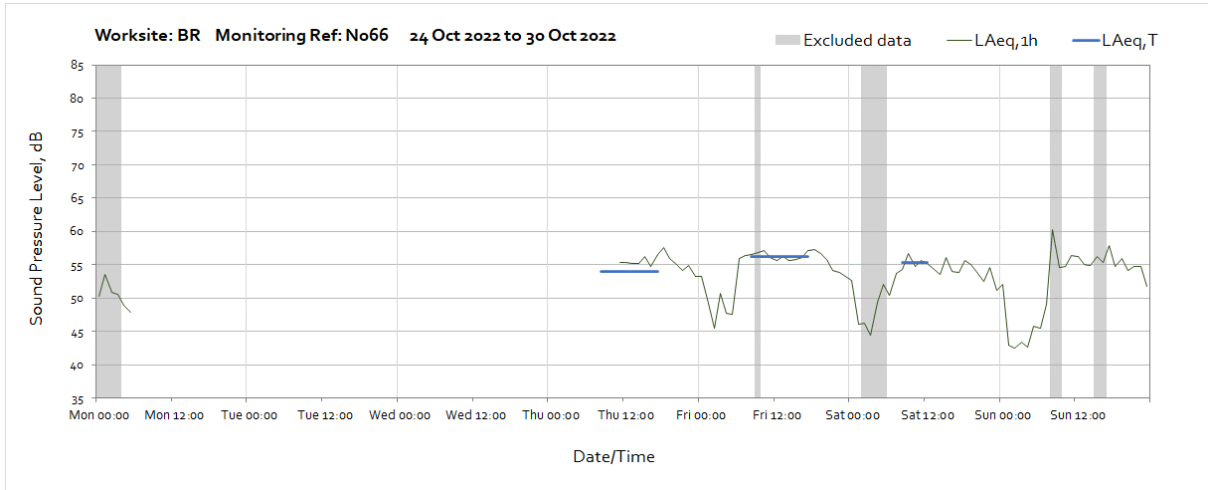
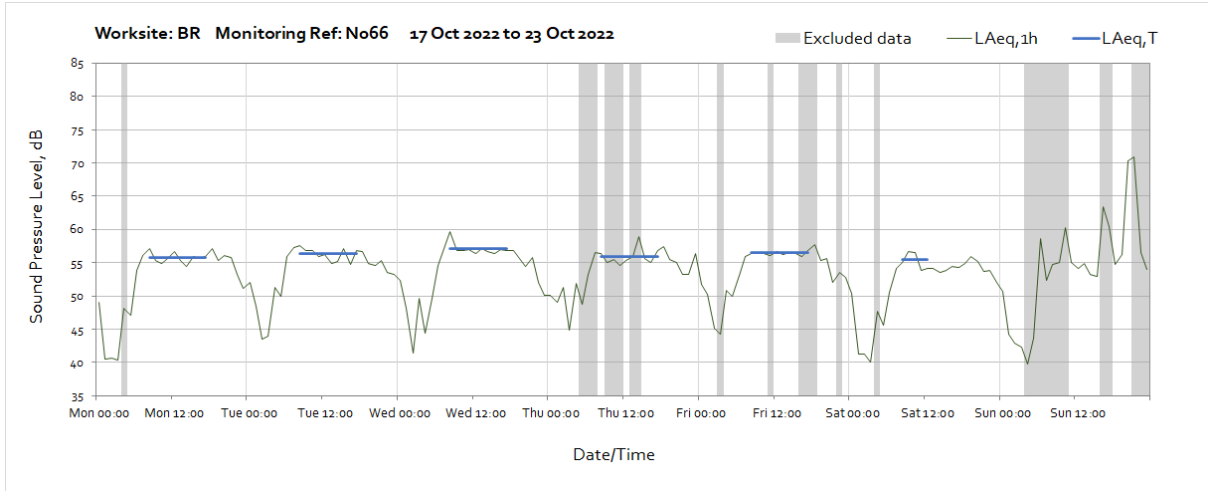
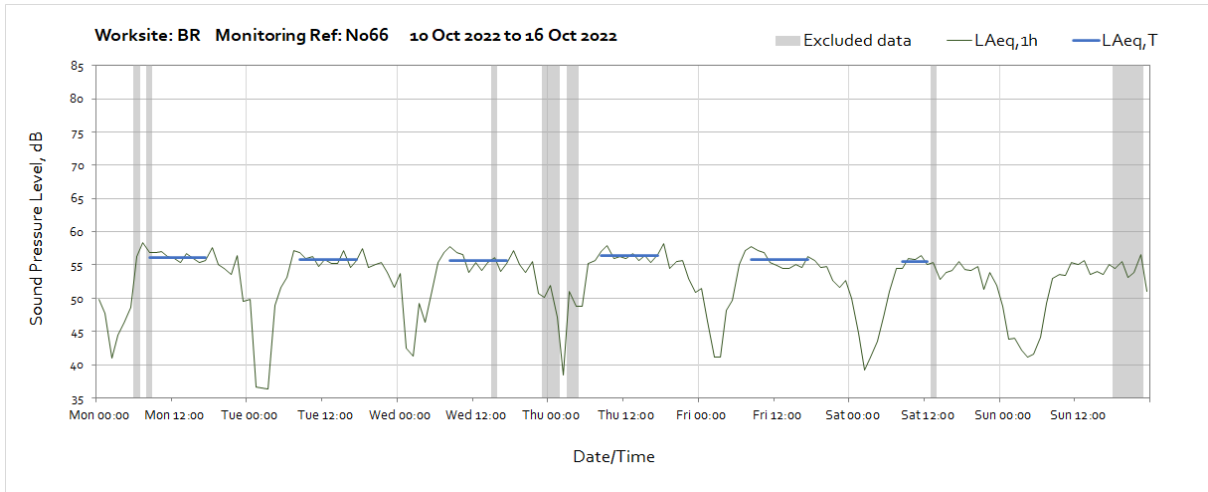




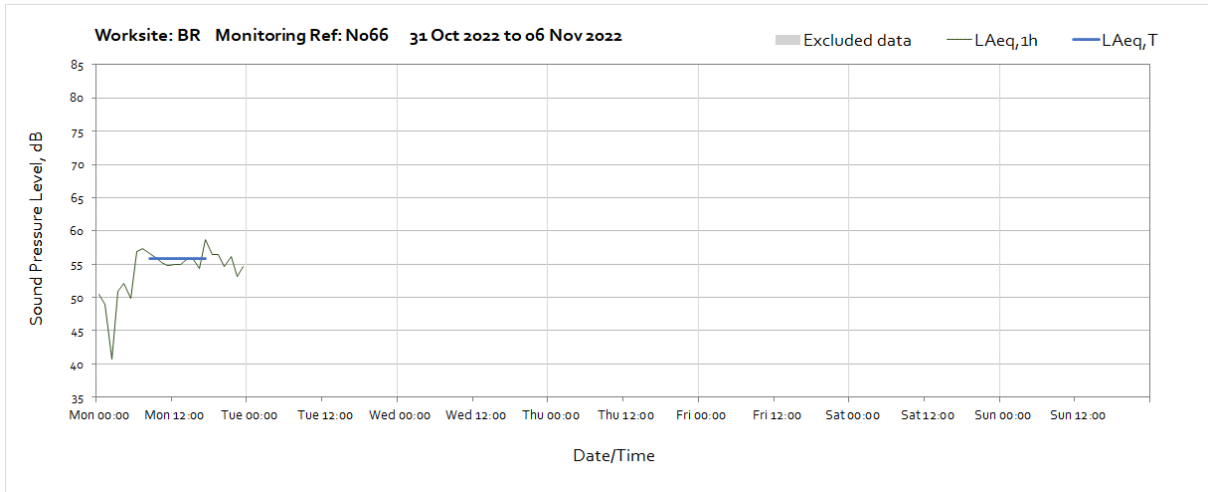
Worksite: Breakspear Road (BR) – Monitoring Ref: N066



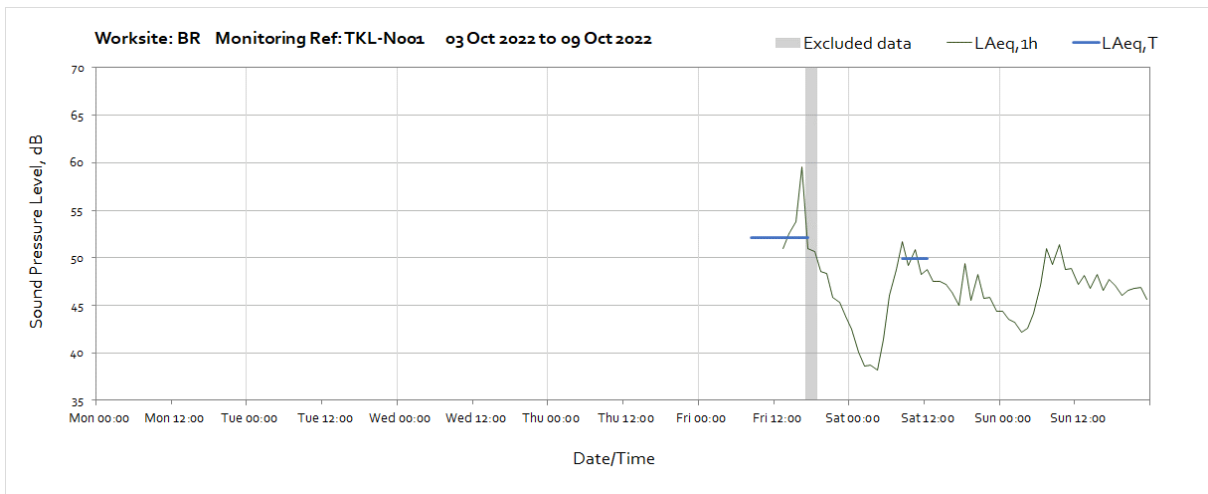
Note: Missing data throughout the week was due to loss of battery power at the monitoring station.



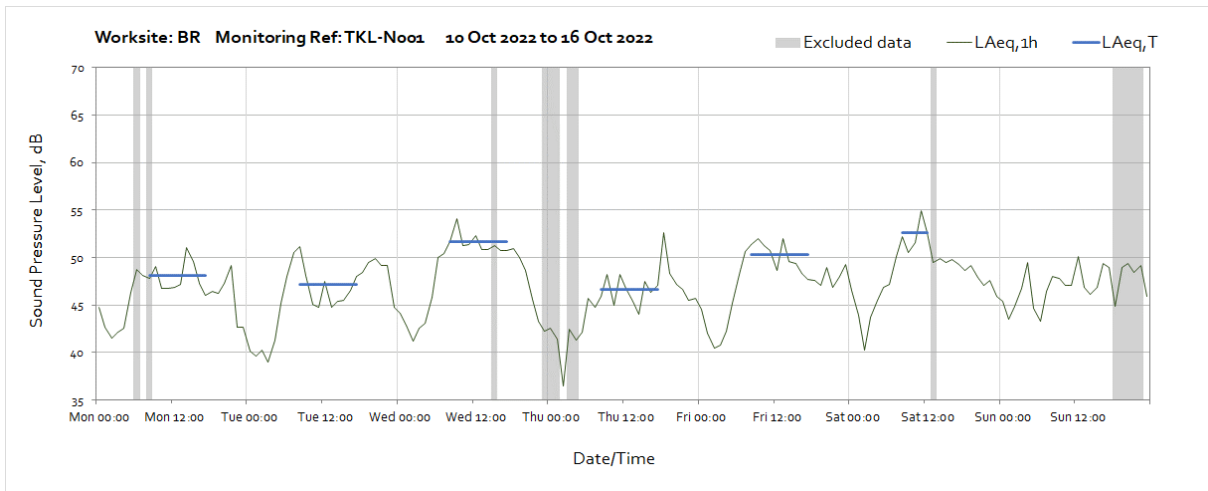
Note: Missing data between 06:00 on Monday 24th October and 10:00 on Thursday 27th October was due to loss of battery power at the monitoring station.

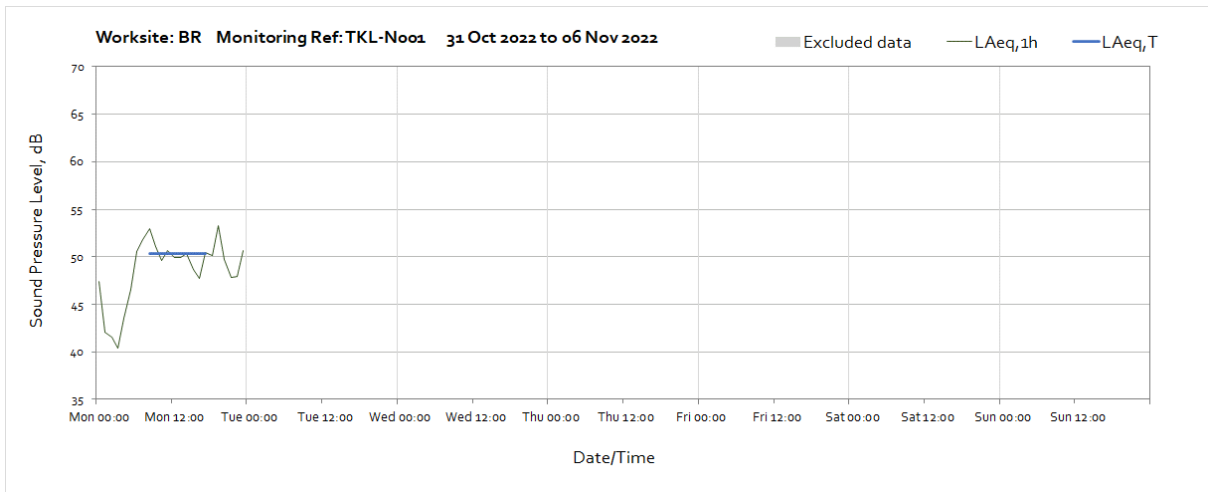
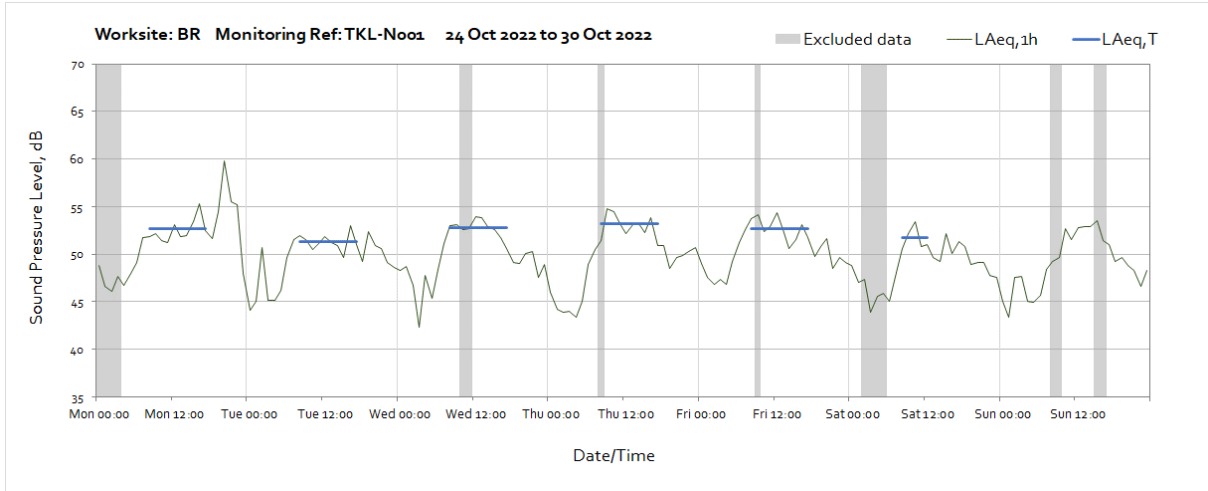
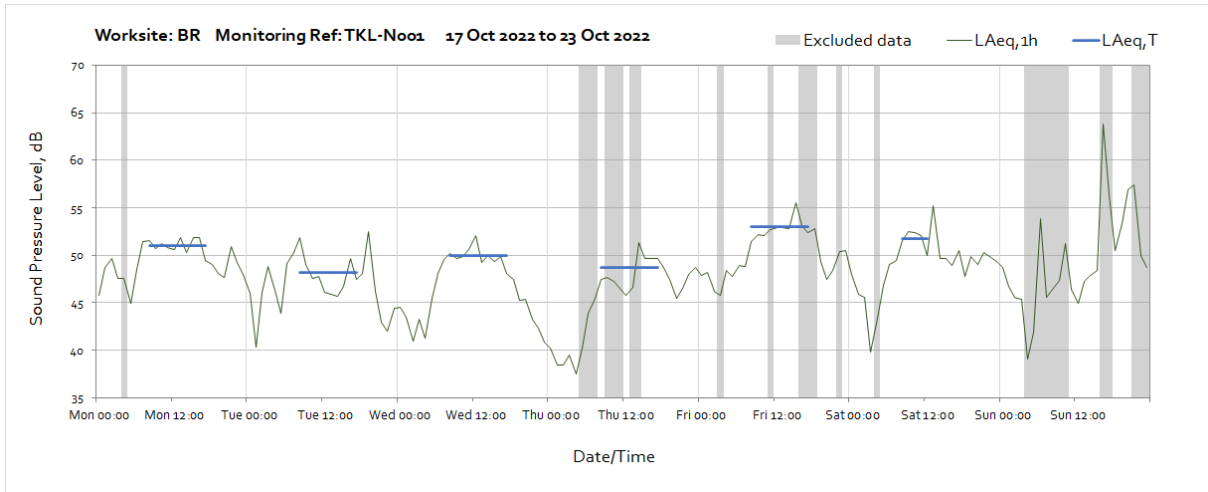


Worksite: Breakspare Road (BR) – Monitoring Ref: TKL-N001

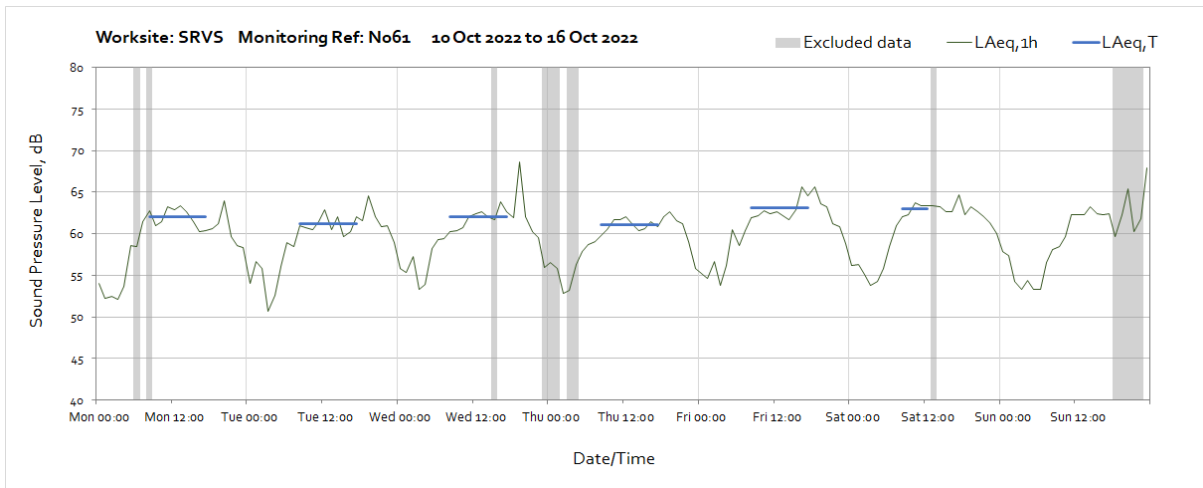
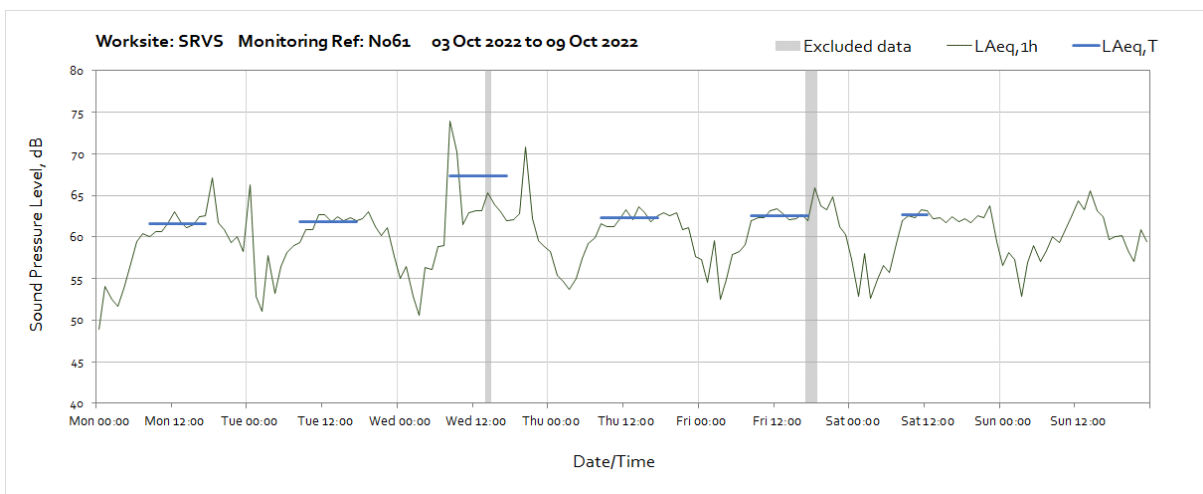
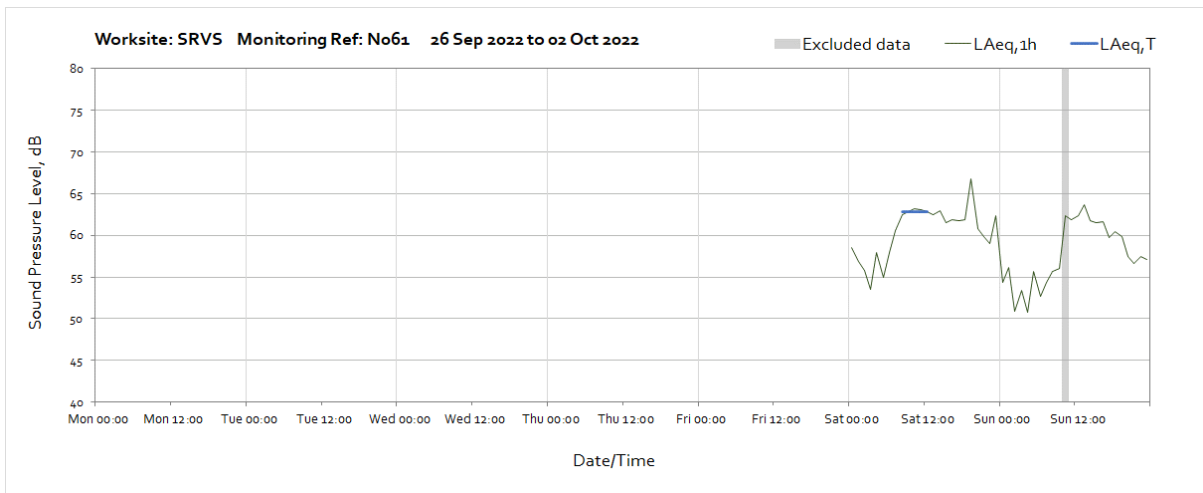


Note: Noise monitor reinstalled at 13:00 on Friday 7th October after being offline during repairs due to being vandalised.

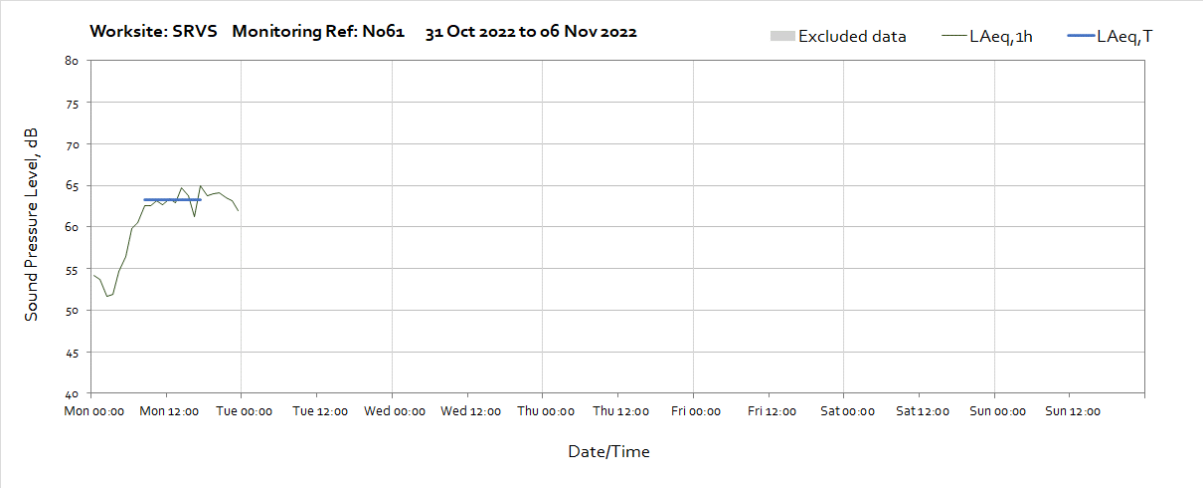
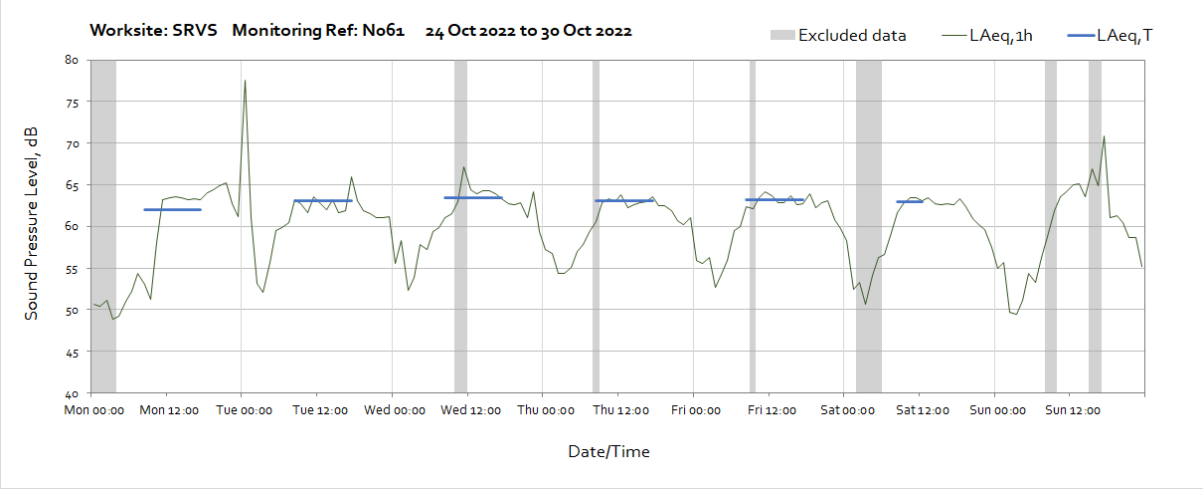
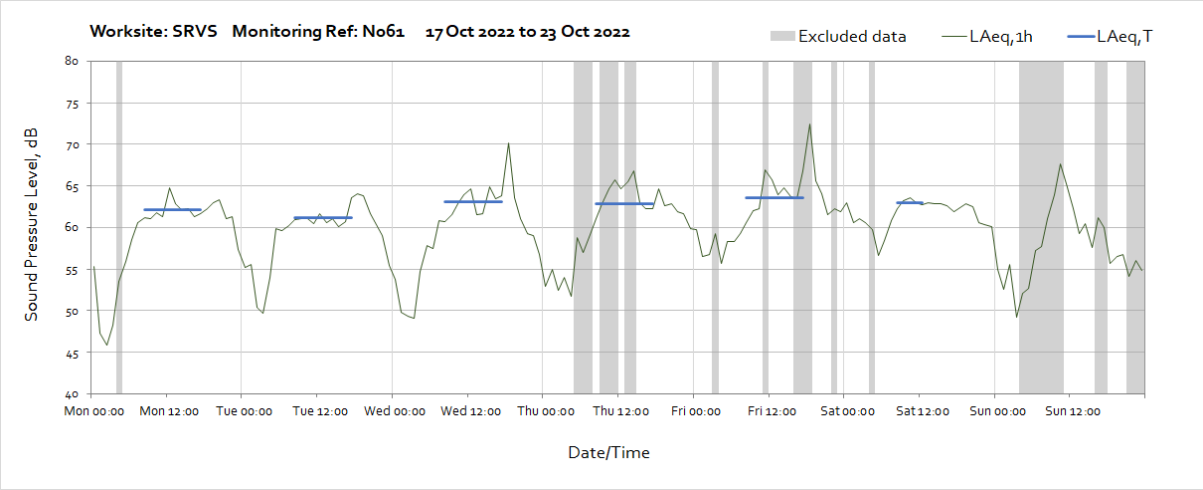




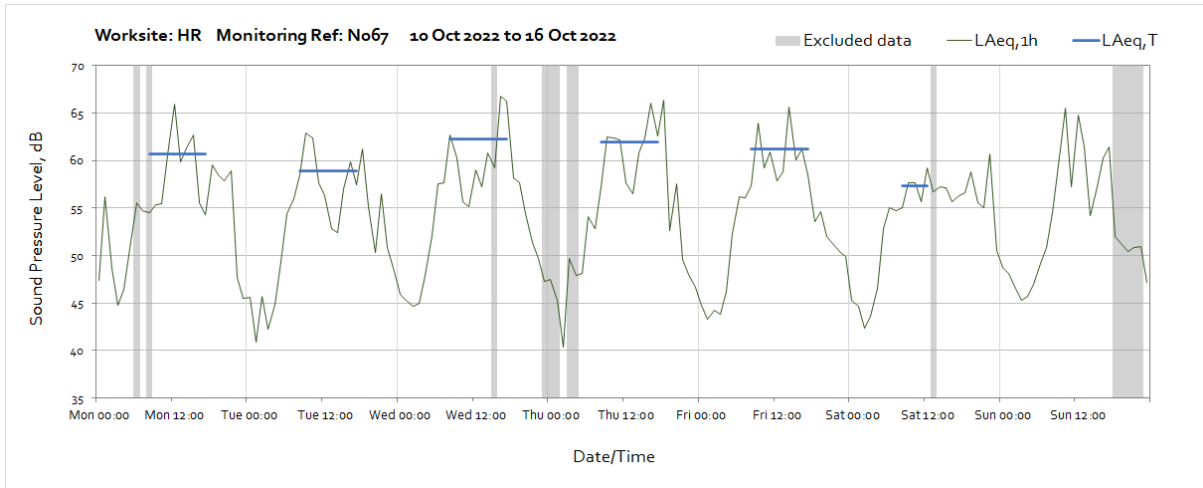
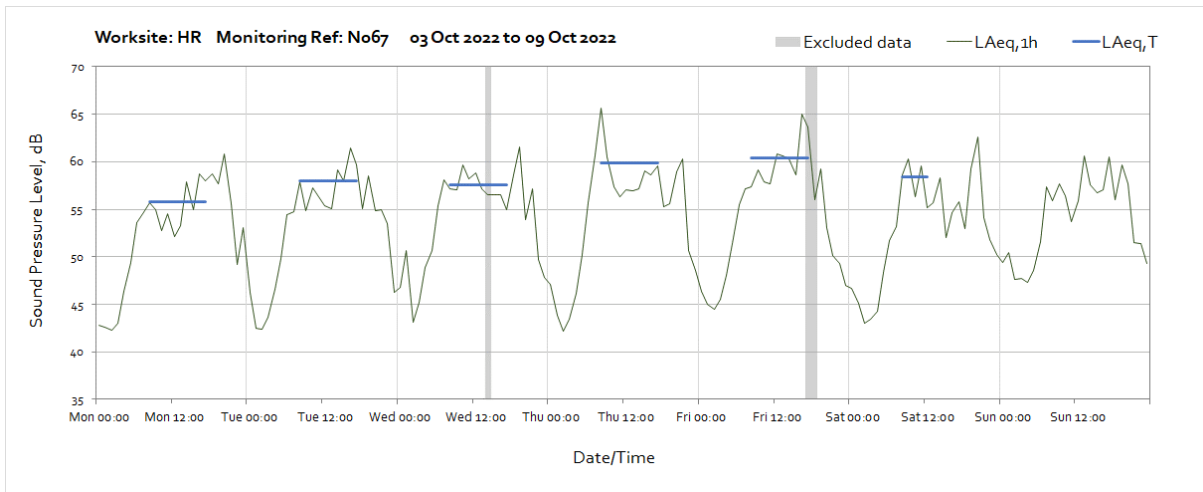
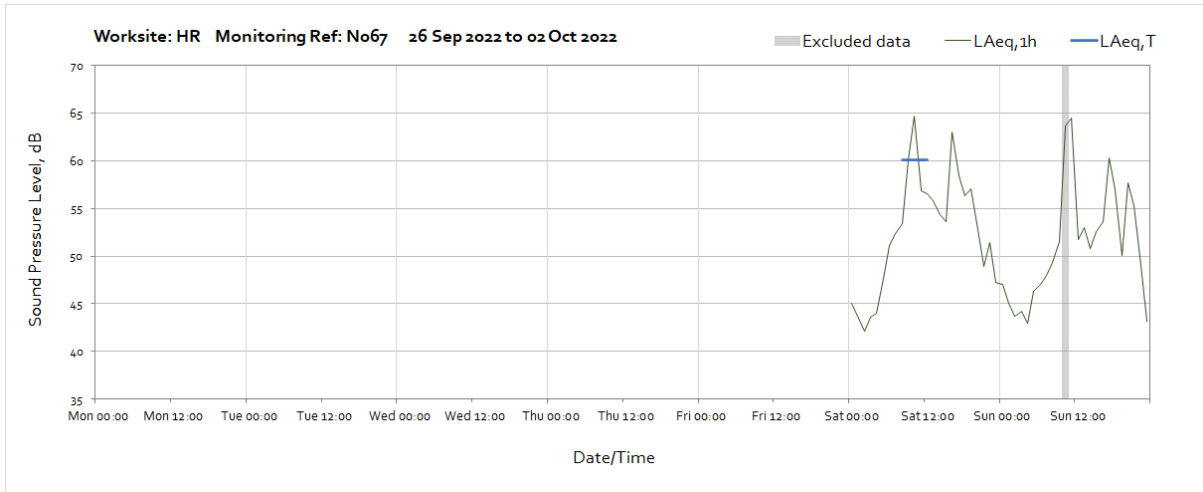
Worksite: South Ruislip Ventilation Shaft (SRVS) – Monitoring Ref: N061

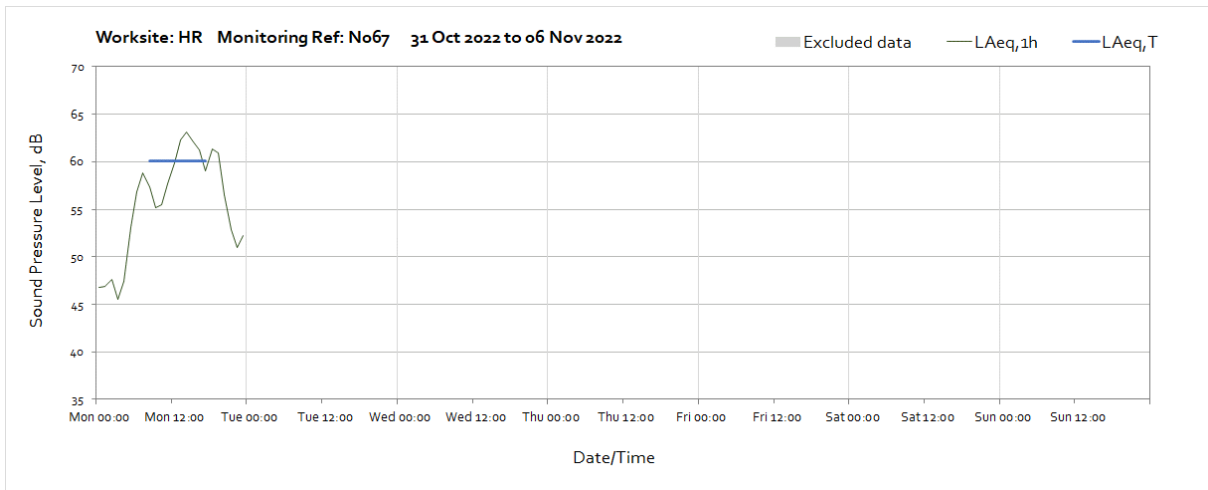
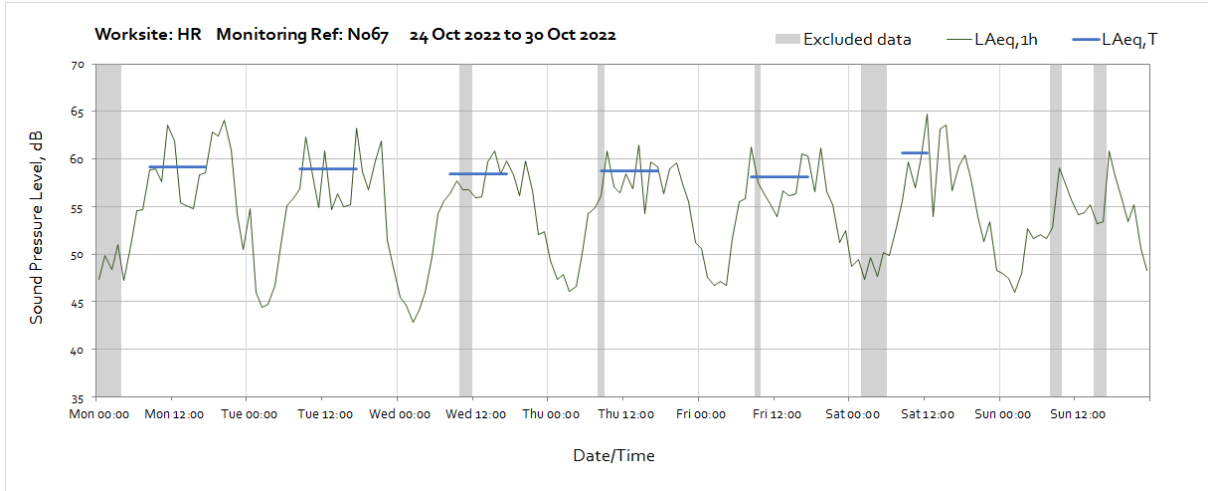
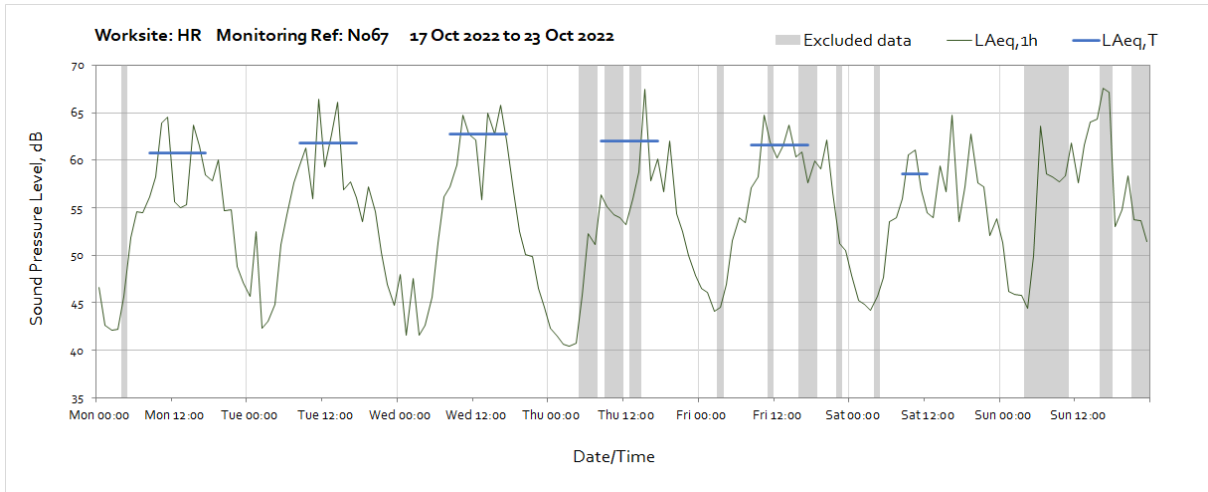


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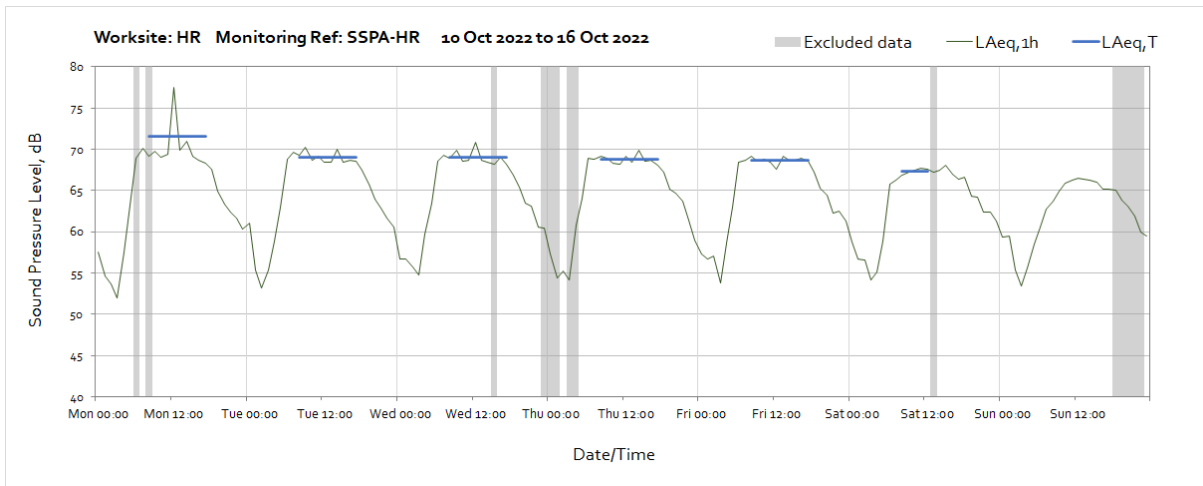
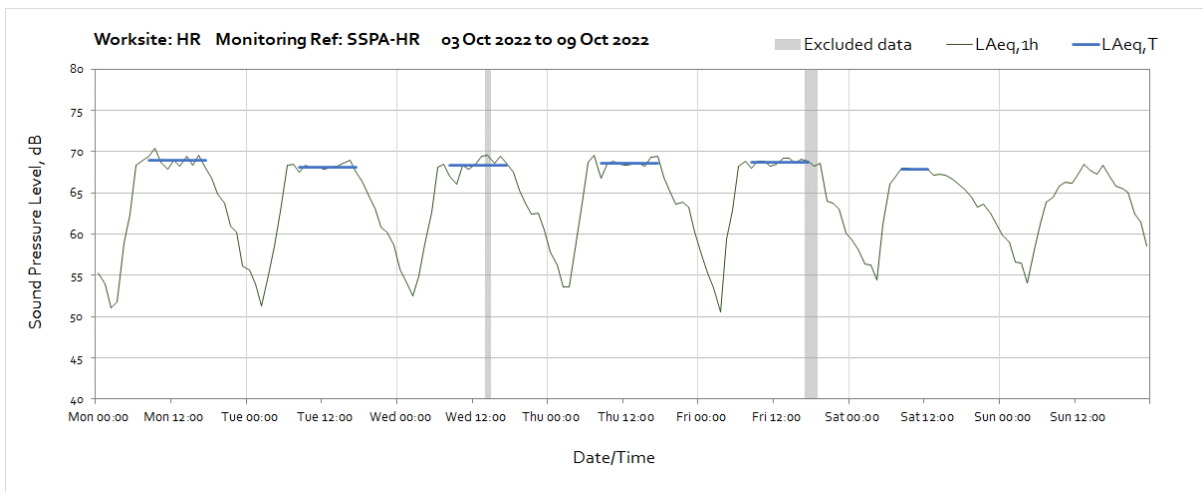
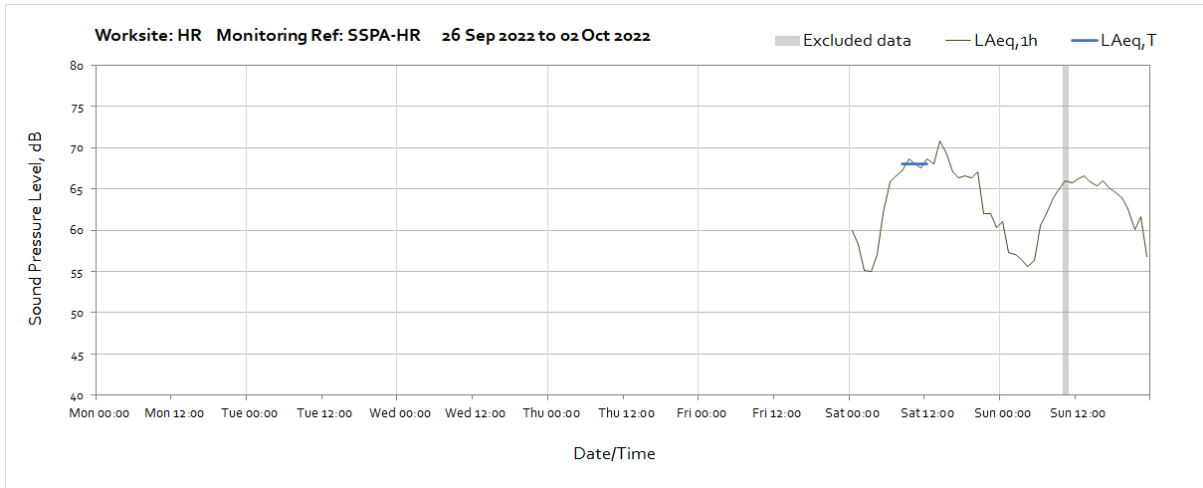


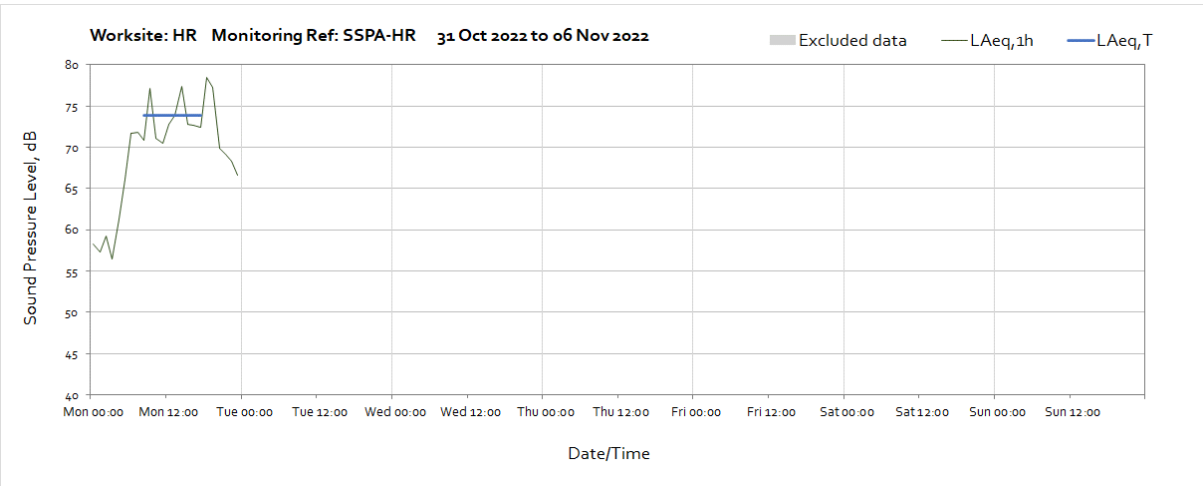
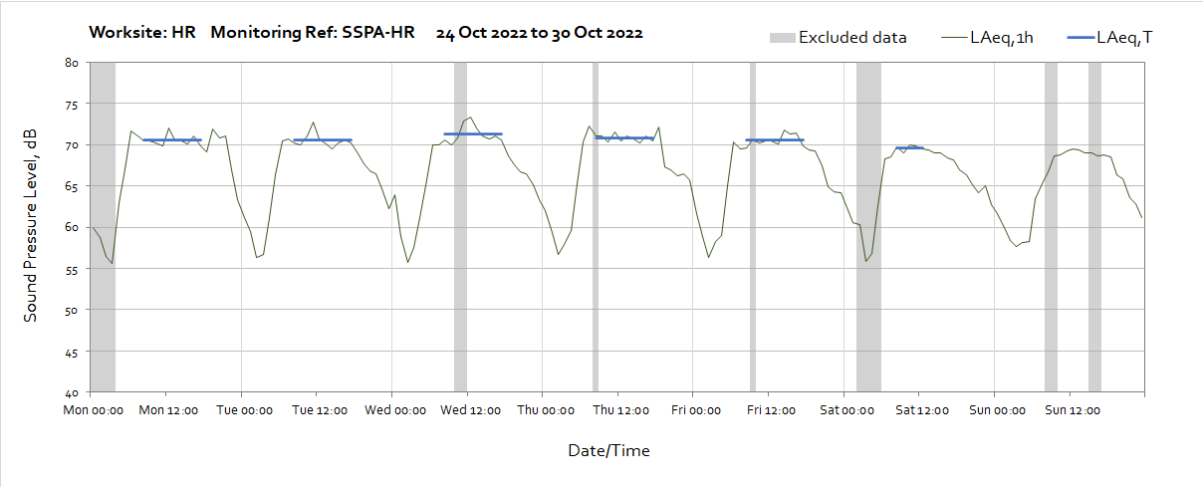
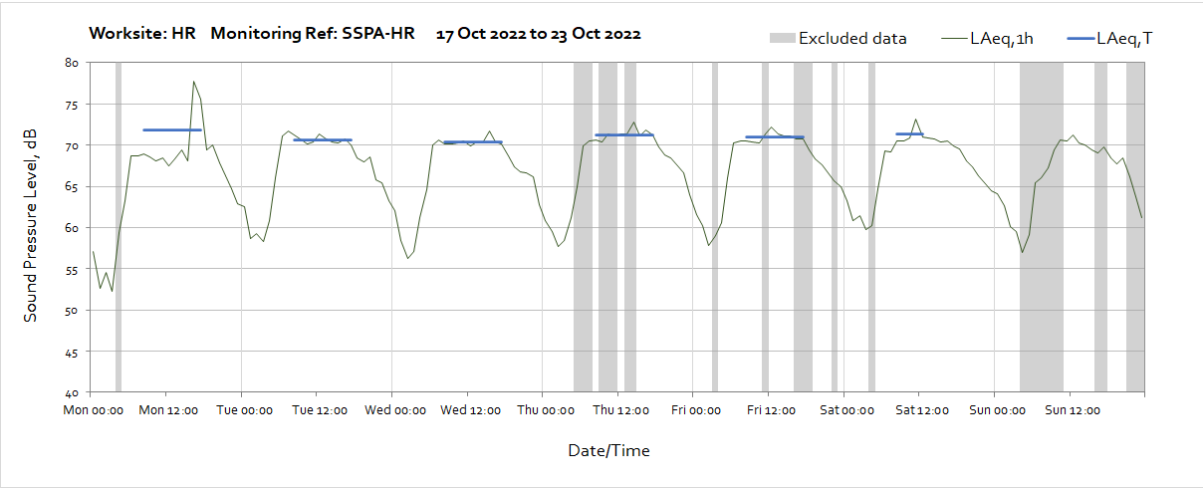
Worksite: Harvil Road (HR) – Monitoring Ref: N067



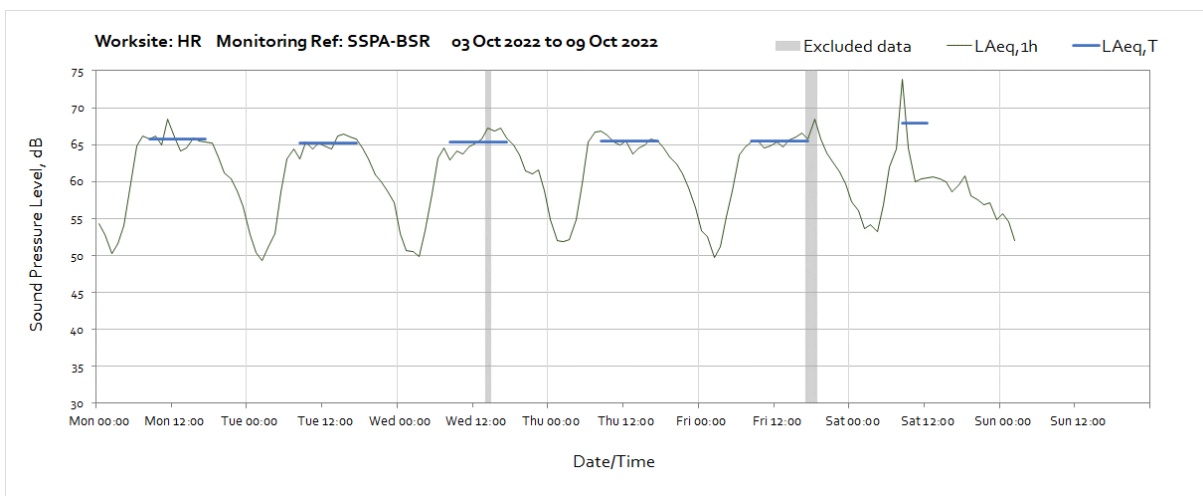
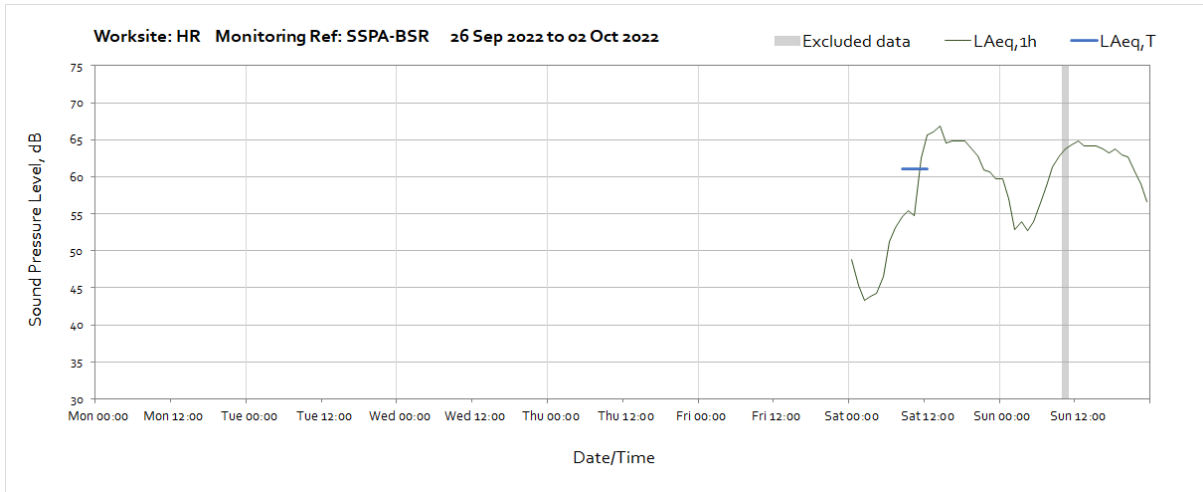


Worksite: Harvil Road (HR) – Monitoring Ref: SSPA-HR



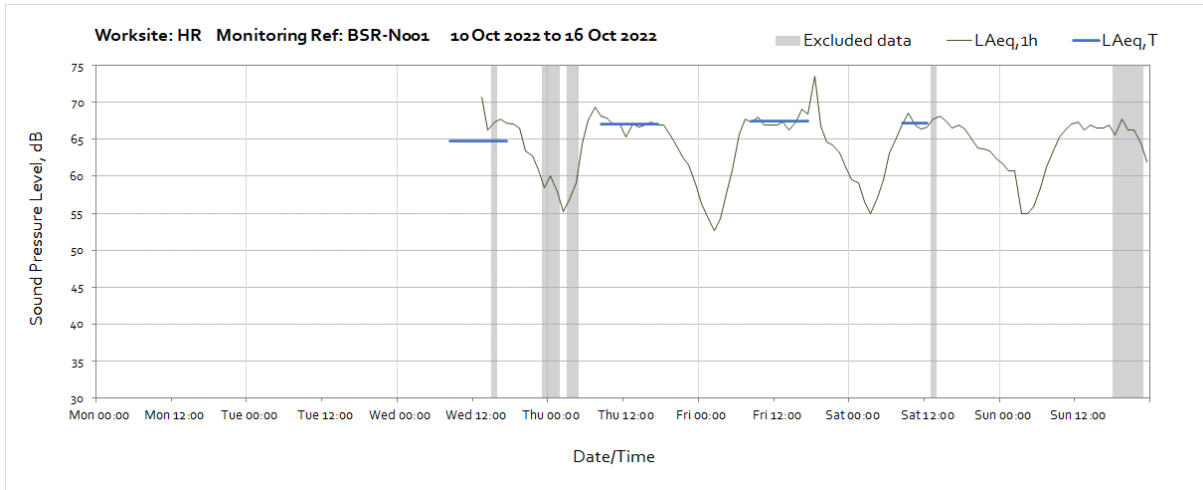


Worksite: Harvil Road (HR) – Monitoring Ref: SSPA-BSR

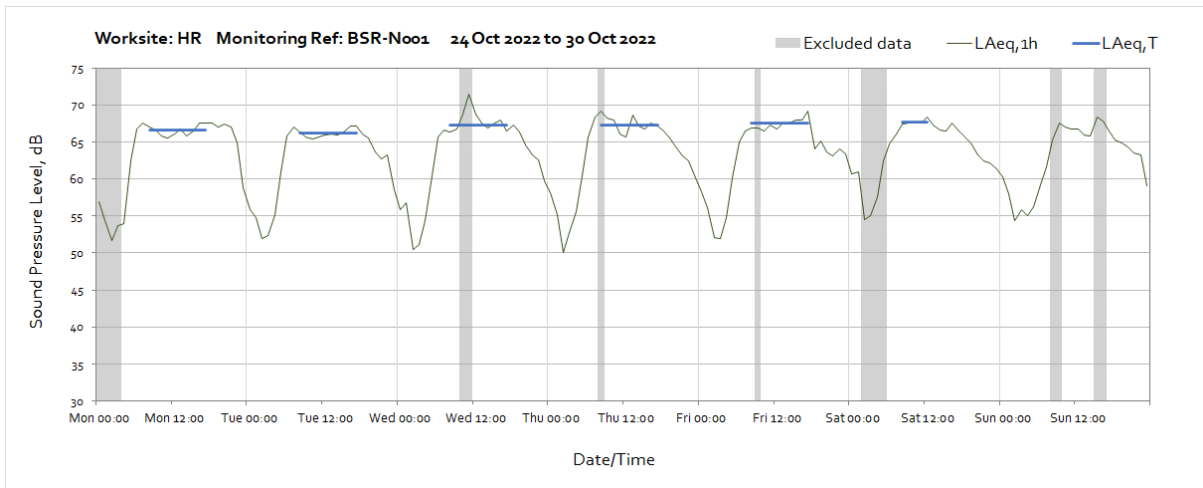
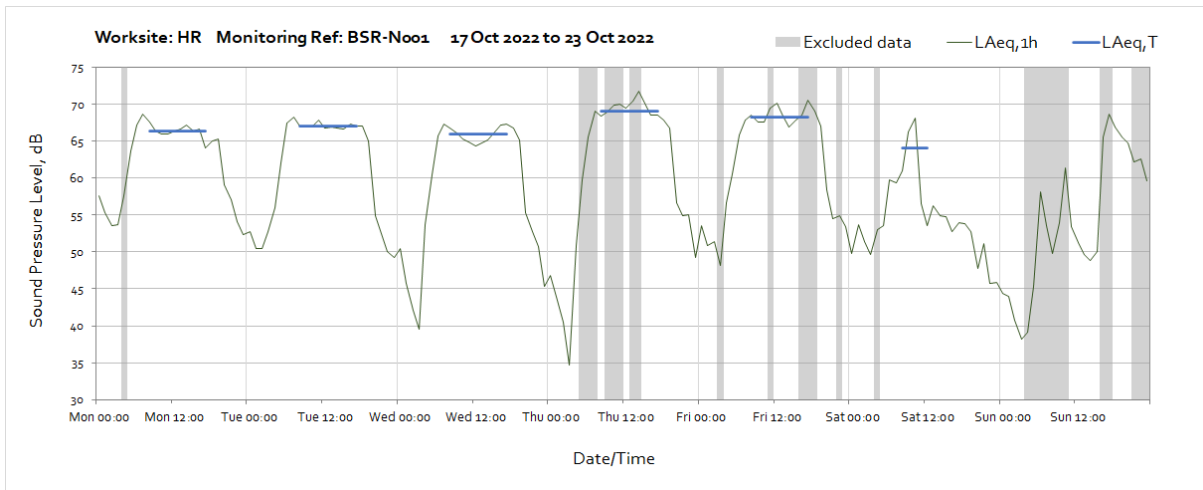


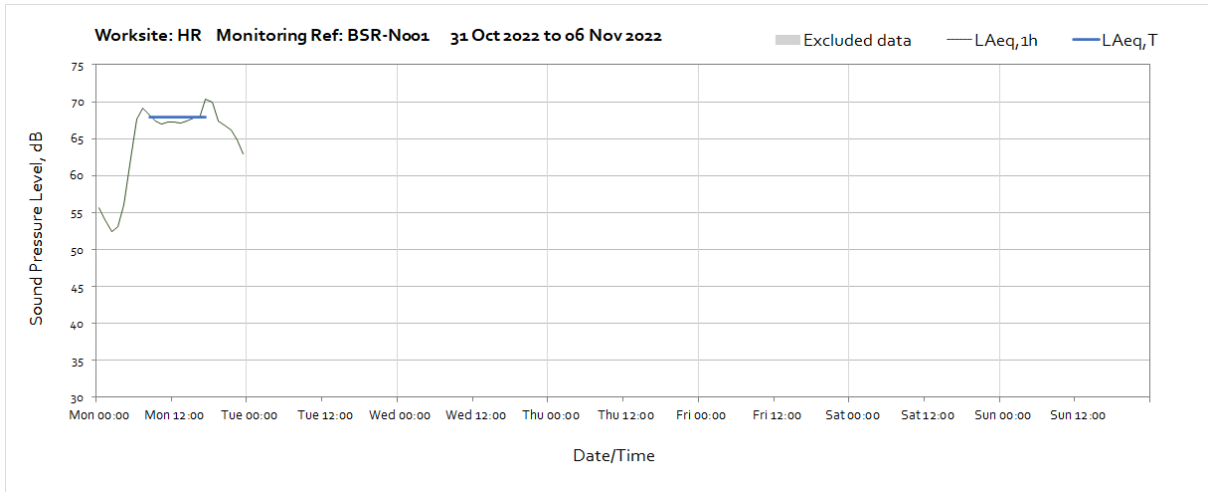
Note: Missing data between 03:00 on Sunday 9th October and 12:00 on Wednesday 12th October was due to loss of battery power at the monitoring station. The noise monitor was relocated 75m to the north, installed at 13:00 on Wednesday 12th October and renamed ref.: BSR-N001.

Worksite: Harvil Road (HR) – Monitoring Ref: BSR-N001



Note: The noise monitor ref.: SSPA-BSR was relocated 75m to the north, installed at 13:00 on Wednesday 12th October and renamed ref.: BSR-N001.

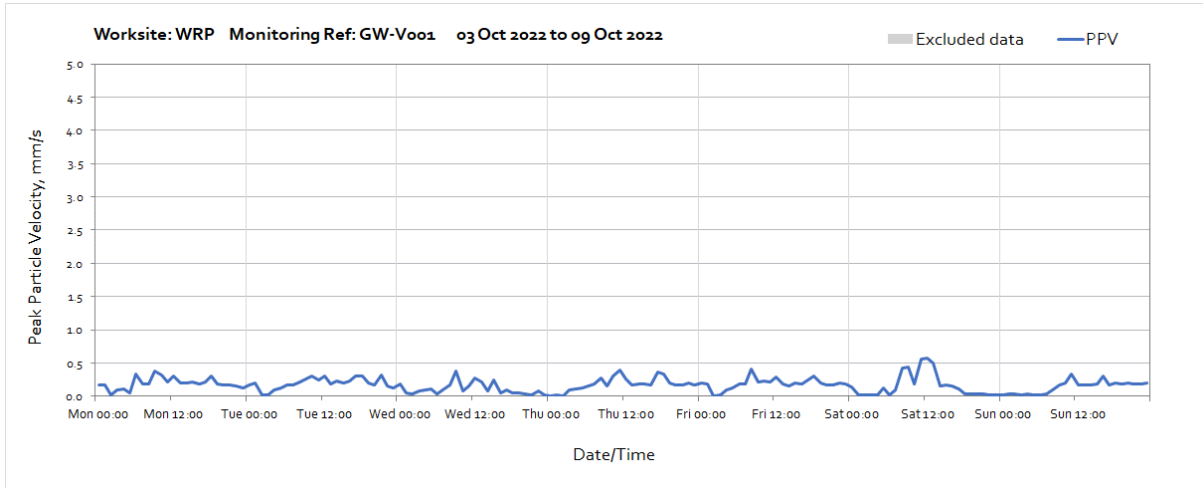
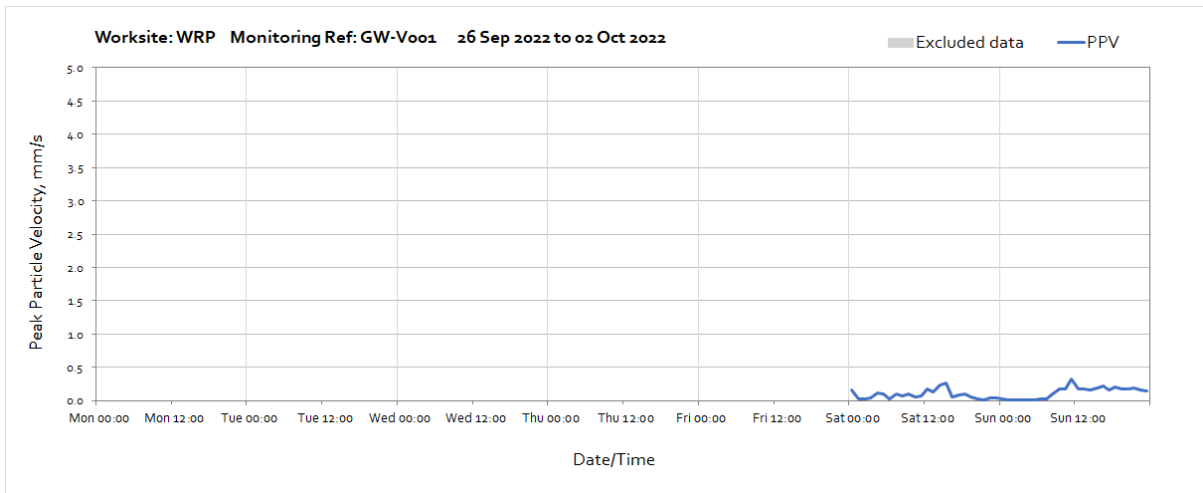


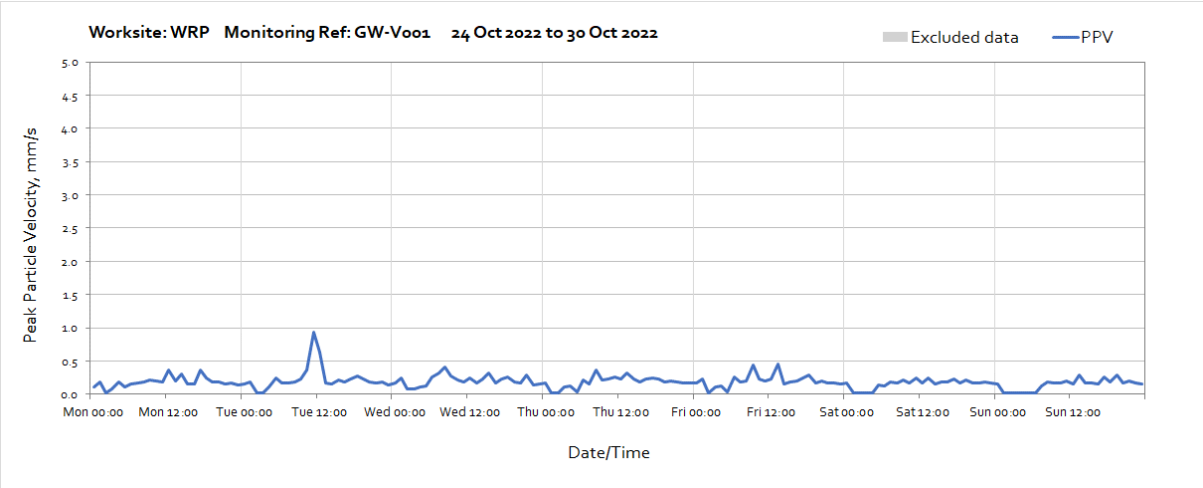
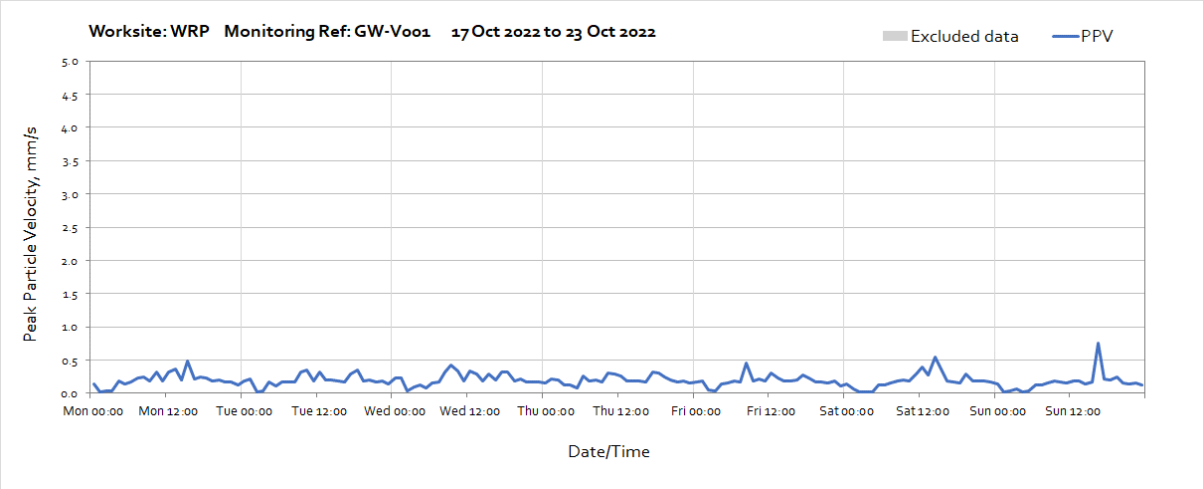
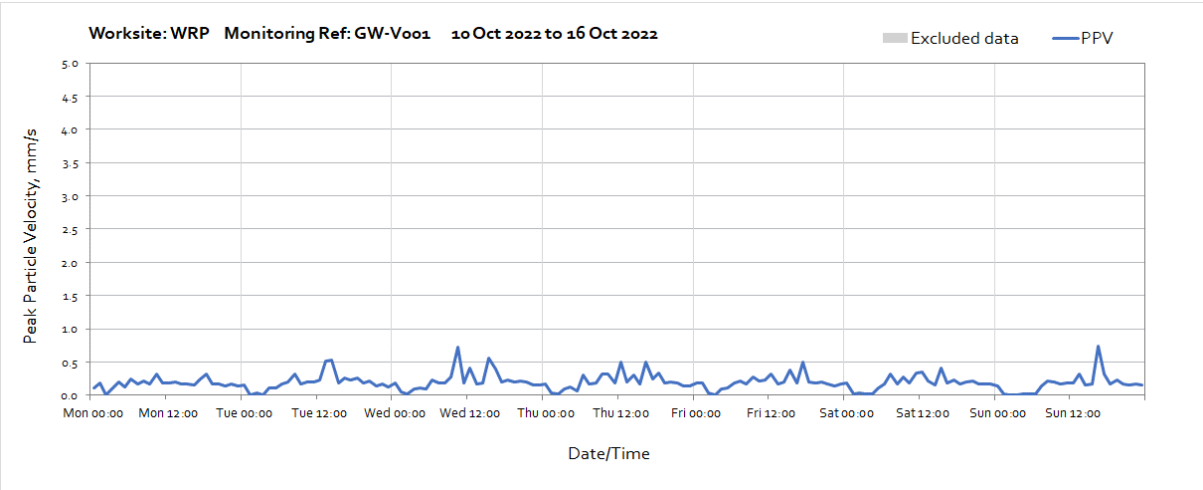


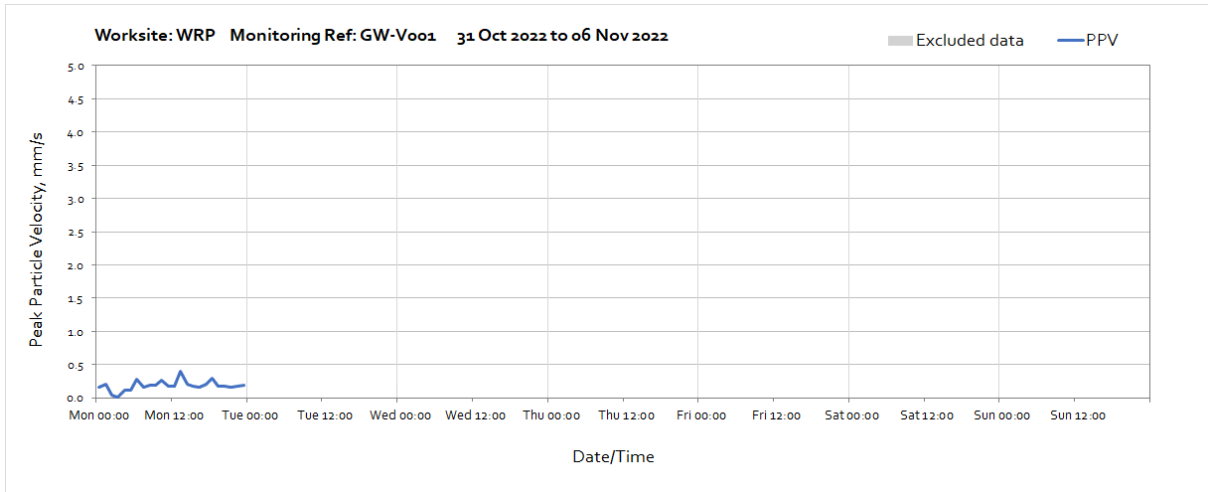
Vibration

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. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative of HS2 construction works, these values have been greyed out in the following charts and have been excluded to calculate values in Table 4 of the main report.

Worksite: West Ruislip Retained Embankment (WRP) – Monitoring Ref: GW-V001







Worksite: South Ruislip Ventilation Shaft (SRVS) - Monitoring Ref: SRVS-V001

