

## Construction Noise and Vibration Monthly Report – September 2024

Buckinghamshire

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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 Buckinghamshire (BS) during the month of September 2024.

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

- A422 Turweston North worksite (ref.: A422 TN) where overbridge and viaduct construction, excavation, material movements, crushing and screening were underway.
- School End (ref.: SE) and Hermitage Chetwode (ref.: HC) worksites where concreting, panel and paratop installation, reinforcement works, highway realignment, bulk excavation, preparation for de-vegetation, de-vegetation, drainage layer installation, lifting, site access and mass haul road maintenance and welding were underway.
- Twyford worksite (ref.: TW) where utility diversion, water management, digging, material placement and haul and site access road maintenance were underway.
- West Street Overbridge worksite (ref.: WSO), where beam installation and preparation, temporary support installation, pilecaps blinding, bridge bearings lifting and installation and drainage works were underway.
- Calvert worksite (ref.: CAL) where formwork reinforced concrete, production of concrete, material movements and earthworks were underway.
- Woodlands worksite (ref.: WDL) where reinforcement bar fixing and material movements were underway.
- Quainton worksite (ref.: QAR) where backfilling, de-vegetation and fence installation were underway.
- Oat Close worksite (ref.: OC) where overbridge works, earthworks, excavation and stockpiling underway.
- Waddesdon worksite (ref.: WAD) where culvert construction, utility diversion, earthworks, road tie-in, topsoil stripping and excavation were underway.
- Meadoway worksite (ref.: MW) where road realignment was underway.
- Blackgrove worksite (ref.: BG) where overbridge construction and earthworks were underway.
- Risborough Road worksite (ref.: RR) where road construction and utility diversion were underway.

- Nash Lee Lane worksite (ref.: NLL) where pre-grouting, piling, de-vegetation, de-watering, pile cap construction, earthworks, road construction, excavation, backfilling and compaction, repairs to bank area and placement of cocomattings were underway.
- Wendover Green Tunnel worksite (ref.: WGT) where earthworks, de-vegetation, excavation, bank construction, tarmacking, utility diversions, demolition, installation of slurry walls, v-ditch lining and excavation, site access road relocation, repair works, vegetation clearance and batching plant maintenance underway.
- Grove Farm worksite (ref.: GF) where earthworks and de-vegetation were underway.
- Small Dean Viaduct Compound worksite (ref.: SDVC) where scabbing, deck construction, material deliveries, abutment works, piling, installation of stone and working platform, welding, pre-fabrication, steel fixing and concrete pours were underway.
- Rocky Lane Embankment worksite (ref.: RLE) where de-watering and earthworks were underway.
- Wendover Dean Viaduct worksite (ref.: WDV) where installation of deck soffit trial panel and abutment monitoring were underway.
- Leather Lane worksite (ref.: LL) where intrusive surveying and earthworks were underway.
- South Heath worksite (ref.: SH) where earthworks, utility works, general site activities, culvert works, overbridge construction, ground investigation works, site access and haul road construction and operation were underway.
- North Portal worksite (ref.: NP) where plant operations, platform construction, piling platform reinstatement, porous portal structure works, tunnel bore machine dismantling, building construction and batching plant installation and operation were underway.
- Chesham Road worksite (ref.: CHSM), where general site activities, tunnel connections, headhouse concrete works and internal and external building works were underway.
- Little Missenden Vent Shaft worksite (ref.: LM) where site operation, tunnel connections, steel works, zinc cladding and building construction were underway.
- Amersham Vent Shaft worksite (ref.: AM), where site operation, external and internal works, tunnel connection, superstructure concrete works, pre-casting of boundary wall, internal building works, steel, cladding and mechanical plant works were underway.

- Chalfont St Giles Vent Shaft worksite (ref.: CSG) where site operation, road maintenance, tunnel connection works and internal and external building works were underway.
- Chalfont St Peter Vent Shaft worksite (ref.: CSP), where site operation, road maintenance, tunnel connections, steel, cladding and internal and external building works were underway.
- Colne Valley Viaduct worksite, which is partly located in the London Borough of Hillingdon (LBH), (ref.: CVV), where jetty and haul road maintenance, operation and removal, compound operations, auto transformed feeder station works, ground investigation, pier construction, pumping water management, satellite compound welfare works, abutment works, generator farm operation, gas crossing emergency dismantling works, environmental maintenance, River Colne crossing, viaduct girder, viaduct deck, landscaping works and footbridge installation were underway.

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

- Grovill Embankment (Westbury) where excavation and replace was underway.
- Charndon Lodge Pumping Station where crash deck removal, coring and benching were underway.
- Infrastructure Maintenance Depot (IMD) where watercourse diversion and earthworks were underway.
- Shepherds Furze Culvert where backfilling was underway.
- MCJ where pile capping was underway.
- Bat Mitigation Structure where formwork reinforced concrete works and technical backfill were underway.
- Sheephouse Wood North Culvert where waterproofing were underway.
- SLC13 where formwork reinforced concrete works were underway.
- GUN28 overbridge where deck and diaphragm works and technical backfill were underway.
- QUA36 overbridge where pile cap works were underway.
- Edgcott Road overbridge where backfilling, drainage and snagging were underway.
- Doddershall Culverts where culvert unit installation and formwork reinforced concrete works were underway.
- Station Road overbridge where piling was underway.

- Hills Farm where stockpiling was underway.
- Culvert No.12 where pipes and headwall installation were underway.
- Addison Road where earthworks and drainage were underway.
- Aylesbury Golf Course where cutting and culvert works, and utility diversion were underway.
- Thame Valley Viaduct Causeway where piling, drainage works, installation of reinforced concrete, pile cropping, and installation of formwork and beams were underway.
- Fleet Marston where earthworks, culvert and overbridge works were underway.
- Along A41 where concrete batching plant operation, earthworks, vehicle restraint system installation, highway construction, kerbing, pavement construction, signage installation and drainage works were underway.
- Bowood Lane where backfilling, installation of shutters, excavation, drainage works and digging were underway.
- Nash Lee Road Diversion where earthworks were underway.

The HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (<https://www.gov.uk/government/publications/hs2-information-papers-environment>), were exceeded twenty-one (21) times during the reporting period.

No exceedances of trigger levels as defined in Section 61 consents occurred during the reporting period.

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

# Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

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

# 1 Introduction

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

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

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the Buckinghamshire (BS) Local Authority area for the period 1<sup>st</sup> to 30<sup>th</sup> September 2024.

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

- A422 Turweston North worksite, ref.: A422 TN (see Plan 1 in Appendix A), where works activities included:
  - Overbridge construction.
  - Viaduct construction.
  - Crushing and screening.
  - Excavation.
  - Material movements.
- School End worksite, ref.: SE (see Plan 2 in Appendix A) and Hermitage Chetwode Worksite ref.: HC (see plan 2 in Appendix A), where works activities included:
  - Concreting.
  - Panel and paratop installation.
  - Reinforcement works.



- Highway realignment.
- Bulk excavation.
- Preparation for de-vegetation and de-vegetation.
- Drainage layer installation.
- Lifting.
- Site access and mass haul road maintenance.
- Welding.
- Twyford worksite, ref.: TW (see Plan 2 in Appendix A), where works activities included:
  - Utility diversion works, including bulk digging.
  - Water management.
  - Digging.
  - Material placement.
  - Haul and site access road maintenance.
- West Street Overbridge worksite, ref.: WSO (see Plan 2 in Appendix A), where works activities included:
  - Beam installation preparation works.
  - Temporary support installation.
  - Pilecaps blinding works.
  - Bridge bearings lifting and installation.
  - Drainage works.
- Calvert worksite, ref.: CAL (see Plan 3 in Appendix A) where works activities included:
  - Formwork reinforced concrete works.
  - Production of concrete.
  - Material movements.
  - Earthworks, including excavation and filling.
- Woodlands worksite, ref.: WDL (see Plan 4 in Appendix A) where works activities included:

- Reinforcement bar fixing.
- Material movements.
- Quainton worksite, ref.: QAR (see Plan 4 in Appendix A) where works activities included:
  - Backfilling.
  - De-vegetation.
  - Fence installation.
- Oat Close worksite, ref.: OC (see Plan 5 in Appendix A), where works activities included:
  - Overbridge works, including piling, formwork reinforced concrete works and beam installation.
  - Earthworks.
  - Excavation.
  - Stockpiling.
- Waddesdon worksite, ref.: WAD (see Plan in Appendix A), where works activities included:
  - Culvert construction.
  - Utility diversion.
  - Earthworks.
  - Road tie-in works, including curbing.
  - Topsoil stripping and excavation.
- Meadoway worksite, ref.: MW (see Plan in Appendix A), where works activities included:
  - Road realignment.
- Blackgrove worksite, ref.: BG (see Plan in Appendix A), where works activities included:
  - Overbridge construction.
  - Earthworks.
- Risborough Road worksite, ref.: RR (see Plan in Appendix A), where works activities included:

- Road construction.
- Utility diversion.
- Nash Lee Lane worksite, ref.: NLL (see Plan 6 in Appendix A), where works activities included:
  - Pre-grouting.
  - Piling.
  - De-vegetation.
  - De-watering.
  - Pile cap construction.
  - Earthworks.
  - Road construction works, including road diversion.
  - Excavation.
  - Backfilling and compaction.
  - Repairs to bank area.
  - Placement of cocomattng.
- Wendover Green Tunnel worksite, ref.: WGT (see Plan 6 in Appendix A), where works activities included:
  - Earthworks, including digging and material movements.
  - De-vegetation.
  - Excavation.
  - Bank construction.
  - Tarmacking.
  - Utility diversion works, including excavation.
  - Demolition.
  - Installation of slurry wall works, including pre-grouting and platform extension.
  - V-ditch lining and excavation.
  - Site access road relocation.
  - Repair works.

- Vegetation clearance.
- Batching plant maintenance.
- Grove Farm worksite, ref.: GF (see Plan 7 in Appendix A), where works activities included:
  - Earthworks, including material movements.
  - De-vegetation.
- Small Dean Viaduct Compound worksite, ref.: SDVC (see Plan 7 in Appendix A), where works activities included:
  - Scabbing.
  - Deck construction, including installation of neoprene, scaffolding and edge protection.
  - Material deliveries.
  - Abutment works, including concrete pours.
  - Piling.
  - Installation of working platform.
  - Welding of deck.
  - Installation of stone platform.
  - Pre-fabrication of steel reinforcement bars.
  - Steel fixing.
  - Concrete pours.
- Rocky Lane Embankment worksite, ref.: RLE (see Plan 7 in Appendix A), where works activities included:
  - De-watering.
  - Earthworks, including material movements.
- Wendover Dean Viaduct worksite, ref.: WDV (see Plan 7 in Appendix A), where works activities included:
  - Installation of deck soffit trial panel.
  - Abutment monitoring.
- Leather Lane worksite, ref.: LL (see Plan 8 in Appendix A), where works activities included:

- Intrusive surveying.
- Earthworks.
- South Heath worksite, ref.: SH (see Plan 8 in Appendix A), where works activities included:
  - Earthworks.
  - Utility works, including drainage.
  - General site activities.
  - Culvert works.
  - Overbridge construction.
  - Ground investigation works.
  - Site access and haul road construction and operation.
- North Portal worksite, ref.: NP (see Plan 8 in Appendix A), where works activities included:
  - Operation of site plant.
  - Platform construction.
  - Piling platform reinstatement.
  - Porous portal structure works, including reinforced concrete frame and concrete works.
  - Tunnel bore machine dismantling.
  - Building construction.
  - Batching plant installation and operation.
- Chesham Road worksite, ref.: CHSM (see Plan 8 in Appendix A), where works activities included:
  - General site activities.
  - Headhouse construction works, including concrete and external works.
  - Internal and external building works, including steel and cladding works.
- Little Missenden Vent Shaft worksite ref.: LM (see Plan 9 in Appendix A), where works activities included:
  - General site activities including operation of plant.
  - Tunnel connection works.

- Headhouse superstructure concrete works.
- Building construction internal and external works.
- Amersham Vent Shaft worksite, ref.: AM (see Plan 10 in Appendix A), where works activities included:
  - General site activities including operation of plant.
  - External and internal works.
  - Tunnel connection works.
  - Superstructure concrete works.
  - Pre-casting of boundary wall.
  - Internal building works.
  - Steel and cladding works.
  - Mechanical plant works.
- Chalfont St Giles Vent Shaft worksite, ref.: CSG (see Plan 11 in Appendix A), where works activities included:
  - General site activities including operation of plant.
  - Road maintenance.
  - Tunnel connection works.
  - Internal and external building works.
- Chalfont St Peter Vent Shaft worksite, ref.: CSP (see Plan 12 in Appendix A), where works activities included:
  - Operation of plant.
  - Road maintenance.
  - Tunnel connection works.
  - Steel and cladding works.
  - Internal and external building works.
- Colne Valley Viaduct – Load Test Pile 1 worksite, which is partly located in the London Borough of Hillingdon (LBH), ref.: CVV (see Plan 13 in Appendix A), where works activities included:
  - Jetty and haul road operation, maintenance and removal, including excavation, backfill, landscaping, cutting piles and steel works.

- Compound operations.
- Auto transformed feeder station works including site preparation, bulk earthworks filling, drainage works and vegetation clearance.
- Ground investigation works.
- Pier construction, including tower crane mobilisation and demobilisation, formwork, reinforced concrete works and post-tensioning.
- Pumping water management.
- Satellite compound welfare and generator farm operation.
- Abutment works, including earthworks, piling, pile trimming and installation, early formwork reinforced concrete works and drainage.
- Environmental maintenance.
- River Colne crossing including emergency removal of obstruction to reinforced concrete crossing.
- Girder and deck erection and installation, including span segmental erection, internal post-tensioning, steel structure erection and dismantling, stressing and grouting, crane assembly and dismantling.
- Deck finishes including preparation and operation of storage yards, installation of below deck access provision, traffic management on deck surface, installation of parapets, installation of noise barriers, troughs, pipes, steel works and other minor materials to the storage yards and deck, installation of stairs, operation of support plant, construction of kerbs, construction of concrete stitch, filling of voids and top openings, waterproofing, diaphragm walls construction, abutment works, concrete works (within deck), drainage and steel works.
- Landscaping works including removal of cofferdams, earthworks, profiling and cutting, manhole chamber construction, drainage, soil placement and vegetation clearance.
- Footbridge installation.

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

- Grovill Embankment (Westbury) where excavation and replace was underway.
- Charndon Lodge Pumping Station where crash deck removal, coring and benching were underway.
- Infrastructure Maintenance Depot (IMD) where watercourse diversion and earthworks were underway.

- Shepherds Furze Culvert where backfilling was underway.
- MCJ where pile capping was underway.
- Bat Mitigation Structure where formwork reinforced concrete works and technical backfill were underway.
- Sheephouse Wood North Culvert where waterproofing were underway.
- SLC13 where formwork reinforced concrete works were underway.
- GUN28 overbridge where deck and diaphragm works and technical backfill were underway.
- QUA36 overbridge where pile cap works were underway.
- Edgcott Road overbridge where backfilling, drainage and snagging were underway.
- Doddershall Culverts where culvert unit installation and formwork reinforced concrete works were underway.
- Station Road overbridge where piling was underway.
- Hills Farm where stockpiling was underway.
- Culvert No.12 where pipes and headwall installation were underway.
- Addison Road where earthworks and drainage were underway.
- Aylesbury Golf Course where cutting and culvert works, and utility diversion were underway.
- Thame Valley Viaduct Causeway where piling, drainage works, installation of reinforced concrete, pile cropping, and installation of formwork and beams were underway.
- Fleet Marston where earthworks, culvert and overbridge works were underway.
- Along A41 where concrete batching plant operation, earthworks, vehicle restraint system installation, highway construction, kerbing, pavement construction, signage installation and drainage works were underway.
- Bowood Lane where backfilling, installation of shutters, excavation, drainage and digging were underway.
- Nash Lee Road Diversion where earthworks 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->

OFFICIAL



[of-hs2](#). Noise and vibration monitoring reports for previous months can also be found at this location.

## 1.2 Measurement Locations

- 1.2.1 Forty (40) noise and six (6) vibration monitoring installations were active in September in the BS area. Table 2 summarises the location of noise and vibration monitoring installations within the BS area in September 2024.
- 1.2.2 Noise monitor WAD-NMP2, within the vicinity of Waddesdon worksite, ref.: WAD, was installed at the start of September 2024.
- 1.2.3 Noise monitor BG-NMP1, within the vicinity of Blackgrove worksite, ref.: BG, was decommissioned on 3<sup>rd</sup> September 2024.
- 1.2.4 Maps showing the positions of noise and vibration monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
A422 TN	TN-NMP1	Turweston, Brackley
SE	SE-NMP1	School End, Chetwode
	SE-Vib1	School End, Chetwode
HC	HC-NMP1	Hermitage, Chetwode
TW	TW-NMP1	Twyford, Buckinghamshire
WSO	WSO-NMP1	West Street, Twyford
	PF-Vib1	Twyford, Buckinghamshire
CAL	SHC-NMP1	School Hill Compound, Calvert
	BRA-Vib1	13 Brackley Lane, Calvert Village
	FCC-NMP1	Calvert South
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton
	WDL-Vib1	Station Road, Quainton
QAR	QAR-NMP2	Station Rd, Quainton
	LSF-NMP1	Upper South Farm
OC	MF-NMP1	Moat Farm, Marsh Lane
MW	MW-NMP1	Hartwell, Buckinghamshire
WAD	WAD-NMP1	Waddesdon, Buckinghamshire
	WAD-NMP2	Waddesdon, Buckinghamshire

Worksite Reference	Measurement Reference	Address
BG	BG-NMP1	Waddesdon, Buckinghamshire
RR	RR-NMP1	Stoke Mandeville, Aylesbury
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee
	NLL-NMP2	Nash Lee Lane, Nash Lee
WGT	ER-NMP1	Ellesborough Rd, Wendover
	ER-Vib1	Ellesborough Rd, Wendover
	BL-NMP1	Bacombe Lane, Wendover
	WT-NMP1	A413, Wendover
	WGT-NMP1	Wendover, Aylesbury
GF	GF-NMP1	Grove Farm, Wendover
	GF-Vib1	Grove Farm, Wendover
SDVC	SDVC-NMP1	Rocky Lane, Wendover
RLE	NCAS6-NMP1	Chesham Lane, The Lee, Wendover
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover
WDV	WDV-NMP1	Upper Wendover Dean Farm, A413, Wendover
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath
SH	HGF-NMP1	Hunts Green Farm, Kings Lane, South Heath
	PKF-NMP1	Park Farm, South Heath
NP	BFH-NMP1	Bury Farm, Great Missenden
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath
	BLH-NMP1	Bayleys Hatch, South Heat, Great Missenden
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath
AM	AM-NMP1	Amersham Vent Shaft Worksite, Whielden Lane, Amersham
LM	LM-NMP1	Little Missenden, A413, Amersham
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham
CSG	CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
CSP	CFC-NMP1	Cricket Field Cottages, Chesham Lane, Chalfont St. Peter
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter
CVV*	CVV-NMP1	Northern boundary, Load Test Pile 1 Worksite, Denham Water Ski Club

\* This worksite is within the London Borough of Hillingdon, for more details on the works taking place please refer to the London Borough of Hillingdon Noise and Vibration Report available at: <https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2>

## 2 Summary of Results

### 2.1 Summary of Measured Noise 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
A422 TN	TN-NMP1	Turweston, Brackley	Free-field	50.8 (58.0)	55.3 (65.8)	51.6 (59.6)	45.3 (51.6)	44.5 (53.3)	50.1 (57.9)	54.4 (64.1)	55.1 (63.7)	50.1 (66.4)	44.2 (51.1)	46.2 (51.7)	45.1 (53.1)
SE	SE-NMP1	School End, Chetwode	Free-field	54.7 (62.9)	58.4 (61.4)	48.1 (58.1)	41.7 (54.4)	40.0 (53.2)	48.5 (49.9)	50.3 (53.5)	50.4 (53.1)	44.8 (53.4)	39.5 (54.0)	45.1 (54.9)	42.4 (52.9)
HC	HC-NMP1	Hermitage, Chetwode	Free-field	55.8 (59.2)	59.2 (61.6)	50.0 (54.4)	44.5 (55.2)	43.9 (56.0)	49.9 (52.4)	52.4 (55.0)	51.8 (54.4)	46.8 (55.0)	44.3 (54.4)	46.5 (57.9)	47.4 (57.9)
TW	TW-NMP1	Twyford	Free-field	49.0 (54.5)	56.8 (75.4)	48.5 (56.6)	46.0 (56.0)	44.6 (54.1)	44.9 (46.0)	47.2 (50.3)	47.3 (48.7)	45.7 (49.9)	45.7 (58.9)	46.0 (52.0)	46.9 (56.3)
WSO	WSO-NMP1	West Street, Twyford	Free-field	51.8 (69.4)	62.3 (70.4)	55.1 (79.5)	50.4 (78.1)	46.8 (74.0)	46.1 (56.3)	50.7 (54.3)	50.1 (58.8)	47.6 (58.6)	47.8 (71.6)	52.5 (69.8)	50.9 (76.8)
CAL	SHC-NMP1	School Hill Compound, Calvert	Free-field	56.3 (59.2)	59.1 (62.0)	53.2 (58.1)	50.7 (55.6)	50.6 (57.2)	54.7 (57.2)	57.8 (58.8)	54.4 (55.6)	52.7 (58.4)	50.8 (59.5)	50.9 (56.8)	51.7 (57.8)
	FCC-NMP1	Calvert South	Free-field	48.9 (53.6)	52.3 (57.2)	44.2 (53.0)	42.5 (57.3)	41.8 (53.3)	44.1 (46.2)	50.3 (57.0)	46.2 (49.1)	44.0 (49.2)	43.0 (58.2)	44.4 (51.5)	44.4 (54.6)
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Free-field	65.8 (73.4)	69.8 (71.9)	50.3 (62.1)	43.6 (52.3)	45.7 (59.4)	58.1 (62.7)	63.7 (65.2)	61.4 (68.6)	55.7 (63.9)	44.4 (62.9)	52.9 (70.7)	47.6 (57.9)

OFFICIAL

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
QAR	QAR-NMP2	Station Rd, Quainton	Free-field	53.3 (56.8)	52.6 (58.0)	52.7 (72.0)	49.1 (60.4)	46.2 (56.0)	54.5 (56.8)	55.2 (58.3)	55.1 (58.2)	54.3 (57.6)	48.4 (61.6)	51.2 (58.7)	49.7 (62.8)
	LSF-NMP1	Upper South Farm	Free-field	49.5 (54.1)	52.3 (58.6)	46.0 (52.9)	41.7 (49.9)	37.1 (49.3)	49.0 (51.9)	50.4 (57.9)	46.8 (48.0)	46.1 (53.3)	42.6 (63.0)	48.8 (60.9)	43.9 (65.2)
OC	MF-NMP1	Moat Farm, Marsh Lane	Free-field	48.3 (55.2)	52.7 (56.1)	45.2 (53.8)	43.8 (55.2)	40.8 (54.0)	42.4 (46.9)	49.1 (55.0)	50.9 (57.9)	46.6 (54.9)	39.0 (47.2)	47.4 (66.5)	43.1 (56.3)
WAD	WAD-NMP1	Waddesdon, Buckinghamshire	Free-field	55.4 (66.2)	58.4 (69.0)	55.9 (65.2)	51.3 (60.3)	49.5 (64.3)	51.6 (61.4)	57.8 (59.3)	57.9 (61.1)	55.9 (64.1)	52.0 (68.5)	53.0 (61.3)	53.6 (61.7)
	WAD-NMP2	Waddesdon, Buckinghamshire	Free-field	51.5 (57.5)	52.5 (56.9)	45.9 (55.5)	42.6 (52.9)	39.4 (52.9)	46.2 (51.0)	48.1 (49.8)	45.3 (47.1)	44.9 (56.3)	42.9 (64.2)	44.8 (56.8)	42.3 (53.7)
MW	MW-NMP1	Hartwell, Buckinghamshire	Free-field	61.0 (64.7)	61.5 (67.8)	60.7 (64.7)	57.5 (60.6)	53.9 (61.8)	58.7 (59.8)	62.0 (64.9)	62.0 (66.7)	59.9 (69.3)	52.9 (56.6)	58.4 (67.9)	54.3 (62.0)
BG	BG-NMP1	Waddesdon, Buckinghamshire	Free-field	53.5 (55.7)	56.5 (57.6)	49.3 (49.3)	44.4 (46.2)	43.3 (48.5)	-* -*	-* -*	-* -*	-* -*	35.8 (41.2)	45.4 (48.1)	43.2 (49.4)
RR	RR-NMP1	Stoke Mandeville, Aylesbury	Free-field	50.3 (56.6)	56.2 (65.2)	48.5 (55.0)	45.9 (54.2)	42.9 (54.3)	47.0 (50.2)	54.1 (58.6)	52.2 (61.3)	55.3 (66.1)	42.9 (52.0)	49.1 (58.7)	45.7 (56.3)
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Free-field	54.2 (60.8)	59.9 (63.5)	51.7 (56.0)	49.5 (54.4)	46.6 (55.3)	50.1 (53.2)	55.0 (61.0)	51.1 (53.4)	49.9 (54.6)	46.9 (54.4)	51.3 (58.7)	48.9 (58.3)

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
	NLL-NMP2	Nash Lee Lane, Nash Lee	Free-field	54.4 (60.3)	56.4 (68.5)	52.3 (56.8)	50.1 (54.8)	47.9 (55.1)	50.9 (54.4)	53.4 (54.7)	51.4 (53.2)	50.8 (56.3)	47.0 (49.6)	51.1 (56.0)	49.5 (56.6)
WGT	ER-NMP1	Ellesborough Rd, Wendover	Free-field	55.9 (59.2)	55.7 (58.8)	54.8 (59.1)	51.6 (56.2)	49.0 (57.3)	51.8 (54.0)	53.8 (55.2)	52.1 (55.3)	51.2 (54.9)	46.8 (52.9)	51.1 (54.5)	49.4 (57.1)
	BL-NMP1	Bacombe Lane, Wendover	Free-field	50.9 (57.4)	57.4 (63.7)	49.6 (54.5)	47.6 (50.9)	45.9 (51.4)	47.9 (49.3)	54.0 (55.4)	52.0 (57.0)	49.4 (55.4)	46.0 (50.5)	48.9 (54.4)	47.6 (55.6)
	WT-NMP1	A413, Wendover	Free-field	67.3 (68.6)	66.6 (67.7)	66.5 (68.3)	63.2 (66.7)	60.0 (67.6)	63.4 (64.1)	65.0 (65.2)	65.3 (65.8)	64.5 (68.7)	58.3 (63.7)	64.3 (67.0)	60.8 (67.6)
	WGT-NMP1	Wendover, Aylesbury	Free-field	52.1 (58.4)	51.4 (56.9)	51.0 (57.1)	48.9 (57.9)	46.1 (56.4)	50.1 (55.5)	49.4 (53.5)	49.4 (53.9)	49.0 (54.2)	43.2 (51.1)	48.3 (54.7)	47.6 (57.2)
GF	GF-NMP1	Grove Farm, Wendover	Free-field	53.8 (61.3)	54.4 (58.0)	52.6 (58.8)	49.8 (57.0)	46.5 (55.7)	51.9 (53.7)	52.9 (53.8)	49.2 (51.9)	50.7 (59.1)	45.8 (54.6)	50.7 (57.3)	49.2 (59.0)
SDVC	SDVC-NMP1	Rocky Lane, Wendover	Free-field	63.4 (66.3)	63.9 (68.4)	62.1 (64.8)	59.6 (63.9)	56.9 (64.0)	59.9 (60.7)	62.0 (63.4)	61.5 (62.3)	60.5 (62.6)	55.4 (59.9)	60.2 (63.4)	57.8 (64.4)
RLE	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	53.0 (65.0)	54.7 (58.9)	48.0 (55.4)	44.9 (53.0)	43.0 (52.3)	49.2 (52.2)	51.7 (54.8)	50.2 (53.6)	49.6 (62.1)	42.6 (48.6)	46.6 (53.6)	45.5 (55.0)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	56.1 (60.5)	57.7 (61.9)	54.7 (58.1)	52.0 (59.9)	49.1 (56.1)	53.1 (55.8)	58.3 (61.0)	57.2 (61.0)	54.6 (60.1)	48.3 (53.0)	55.2 (67.4)	52.7 (66.4)

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
WDV	WDV-NMP1	Upper Wendover Dean Farm, A413, Wendover	Free-field	50.7 (61.4)	53.7 (57.8)	48.5 (58.8)	46.1 (56.7)	45.2 (58.0)	47.5 (49.9)	50.9 (53.6)	49.5 (51.3)	47.7 (54.5)	47.2 (59.5)	49.4 (56.6)	49.4 (61.4)
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	51.1 (60.0)	54.5 (66.3)	50.1 (66.2)	48.5 (64.9)	47.1 (62.0)	47.4 (49.8)	49.8 (52.5)	47.0 (49.1)	45.4 (50.3)	47.5 (60.5)	53.6 (73.0)	51.6 (67.9)
SH	HGF-NMP1	Hunts Green Farm, Kings Lane, South Heath	Free-field	47.3 (63.6)	48.4 (50.9)	45.6 (51.2)	42.4 (52.9)	38.4 (50.5)	44.9 (45.9)	48.0 (49.4)	45.7 (47.4)	45.4 (52.2)	39.7 (50.1)	47.4 (65.4)	41.3 (52.8)
	PKF-NMP1	Park Farm, South Heath	Free-field	56.1 (65.2)	55.8 (63.8)	48.8 (58.2)	44.8 (61.9)	42.6 (52.6)	49.0 (51.3)	49.2 (50.4)	49.0 (50.7)	46.4 (51.4)	42.7 (52.8)	47.7 (54.6)	45.3 (52.9)
NP	BFH-NMP1	Bury Farm, Great Missenden	Free-field	45.1 (57.1)	47.9 (56.1)	44.2 (56.0)	40.3 (50.8)	38.7 (52.0)	42.7 (45.6)	46.6 (49.5)	46.2 (49.0)	43.8 (50.7)	40.2 (52.0)	45.2 (53.1)	40.5 (51.5)
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Free-field	50.8 (62.1)	50.8 (56.8)	49.3 (62.0)	46.1 (57.5)	42.6 (57.3)	46.8 (51.5)	48.6 (53.1)	47.2 (49.1)	46.2 (52.4)	41.5 (51.5)	48.7 (57.0)	44.3 (52.2)
	BLH-NMP1	Bayleys Hatch, South Heath, Great Missenden	Free-field	47.9 (56.8)	49.2 (55.0)	46.5 (59.9)	42.6 (51.9)	40.5 (53.0)	45.3 (47.2)	49.2 (50.3)	50.5 (61.2)	49.4 (57.8)	41.3 (53.6)	46.6 (57.1)	42.5 (52.5)
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Free-field	58.1 (63.5)	57.3 (60.9)	56.6 (63.0)	52.9 (60.4)	48.3 (57.5)	53.0 (54.1)	55.1 (56.8)	54.9 (56.7)	53.4 (56.8)	46.6 (56.5)	55.3 (68.4)	48.8 (55.3)
AM	AM-NMP1	Whielden Lane, Amersham	Free-field	61.6 (62.8)	62.2 (63.4)	59.9 (62.5)	57.2 (60.1)	53.1 (60.0)	58.0 (59.1)	61.9 (63.6)	60.9 (63.8)	58.4 (63.1)	52.7 (57.1)	58.2 (60.6)	54.1 (61.8)

OFFICIAL

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
LM	LM-NMP1	Little Missenden, A413, Amersham	Free-field	52.4 (56.9)	52.0 (55.5)	52.1 (57.0)	48.5 (54.3)	44.5 (54.1)	47.9 (49.9)	51.5 (52.8)	50.7 (53.3)	50.8 (53.7)	44.9 (50.6)	50.9 (56.3)	46.8 (53.6)
	PWC-NMP1	Patricia Holmes, LM Worksite, Amersham	Free-field	60.1 (62.5)	59.1 (61.3)	59.8 (64.6)	55.9 (60.1)	51.8 (59.7)	56.0 (56.7)	57.9 (58.6)	58.1 (59.3)	57.2 (59.3)	50.9 (54.8)	57.0 (63.0)	52.0 (58.4)
CSG	CSG-NMP1	CSG Worksite, Bottom House Farm Lane	Free-field	45.5 (49.2)	51.9 (61.2)	46.4 (56.2)	41.9 (52.2)	41.6 (54.5)	44.4 (46.7)	49.3 (53.2)	47.1 (49.1)	46.5 (53.0)	42.7 (55.3)	47.4 (58.0)	43.8 (58.0)
CSP	CFC-NMP1	Cricket Field Cottages, Chesham Lane, Chalfont St. Peter	Free-field	55.3 (63.9)	57.8 (68.8)	52.5 (58.7)	49.9 (56.9)	45.5 (56.0)	50.9 (53.6)	57.1 (59.5)	53.7 (56.3)	54.1 (68.0)	46.2 (54.0)	52.9 (65.0)	47.6 (55.6)
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	45.6 (50.9)	48.4 (51.7)	46.2 (54.7)	44.2 (52.5)	39.9 (48.5)	43.5 (46.0)	49.1 (51.0)	47.9 (49.3)	47.7 (53.1)	42.2 (49.3)	46.6 (52.8)	42.7 (54.4)
CVV	CVV-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	61.9 (63.7)	60.3 (62.7)	59.9 (63.7)	56.5 (61.6)	54.5 (62.4)	57.0 (57.8)	59.0 (59.5)	59.5 (60.0)	58.0 (59.5)	53.5 (59.5)	57.9 (60.9)	55.0 (61.5)

\*Missing data due to BG-NMP1 monitor retrieval on 3<sup>rd</sup> September.



2.1.2 Table 4 presents a summary of the measured vibration levels at the 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
SE	SE-Vib1	School End, Chetwode	3.59 (Y-axis)
WDL	WDL-Vib1	Station Road, Quainton	2.51 (X-axis)
CAL	BRA-Vib1	13 Brackley Lane, Calvert Village	4.20 (Y-axis)
WSO	PF-Vib1	Twyford, Buckinghamshire	1.13 (Y-axis)
WGT	ER-Vib1	46, Ellesborough Rd, Wendover	1.57 (Y-axis)
GF	GF-Vib1	Grove Farm, Wendover	3.35 (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 LOELs and SOELs for construction noise.

2.2.4 Where reported construction noise levels exceed the LOEL and SOEL at nearby receptors, 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 LOEL and SOEL over the reporting period, including the number of exceedances during each time period.

Table 5: Summary of Exceedances of LOEL and SOEL

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOEL	Number of exceedances of SOEL
A422 TN	TN-NMP1	Turweston, Brackley	Weekday Saturday	0800-1800 0800-1300	1 1	No exceedance No exceedance
SE	SE-NMP1	School End, Chetwode	All days	All periods	No exceedance	No exceedance
HC	HC-NMP1	Hermitage, Chetwode	All days	All periods	No exceedance	No exceedance
TW	TW-NMP1	Twyford	Weekday	0800-1800	3	1
WSO	WSO-NMP1	West Street, Twyford	Weekday	0800-1800	10	No exceedance
CAL	SHC-NMP1	School Hill Compound, Calvert	All days	All periods	Not Applicable*	Not Applicable*
	FCC-NMP1	Calvert South	Night	2200-0700	20	No exceedance
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Weekday	0700-0800	20	7
				0800-1800	21	No exceedance
				1800-1900	1	No exceedance
			Saturday	0700-0800	2	No exceedance
				0800-1300	3	No exceedance
				1300-1400	3	1
				1400-2200	12	1
QAR	QAR-NMP2	Station Rd, Quainton	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
	LSF-NMP1	Upper South Farm	All days	All periods	No exceedance	No exceedance
OC	MF-NMP1	Moat Farm, Marsh Lane	All days	All periods	No exceedance	No exceedance
WAD	WAD-NMP1	Waddesdon, Buckinghamshire	Weekday Night	0800-1800 2200-0700	3 65	No exceedance 65
	WAD-NMP2	Waddesdon, Buckinghamshire	All days	All periods	No exceedance	No exceedance
MW	MW-NMP1	Hartwell, Buckinghamshire	Weekday Saturday	0800-1800 0800-1300	1 1	No exceedance No exceedance
BG	BG-NMP1	Waddesdon, Buckinghamshire	All days	All periods	No exceedance	No exceedance
RR	RR-NMP1	Stoke Mandeville, Aylesbury	Weekday	0800-1800	4	No exceedance
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Weekday	0800-1800	1	No exceedance
	NLL-NMP2	Nash Lee Lane, Nash Lee	Weekday Saturday	0800-1800 0800-1300	1 1	No exceedance No exceedance
WGT	ER-NMP1	Ellesborough Rd, Wendover	All days	All periods	No exceedance	No exceedance
	BL-NMP1	Bacombe Lane, Wendover	Weekday Saturday	0800-1800 1400-2200	1 1	No exceedance No exceedance
	WT-NMP1	A413, Wendover	Weekday	0700-0800 0800-1800	20 21	1 No exceedance
			Saturday	0700-0800 0800-1300 1300-1400 1400-2200	3 4 4 8	No exceedance No exceedance No exceedance 1
			Sunday	0700-2200	20	No exceedance
WGT-NMP1	Wendove, Aylesbury	Weekday Saturday Sunday	0700-0800 1400-2200 0700-2200	1 4 12	No exceedance No exceedance No exceedance	
GF	GF-NMP1	Grove Farm, Wendover	All days	All periods	No exceedance	No exceedance
SDVC	SDVC-NMP1	Rocky Lane, Wendover	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
RLE	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	All days	All periods	No exceedance	No exceedance
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	All days	All periods	No exceedance	No exceedance
WDV	WDV-NMP1	A413, Wendover	All days	All periods	No exceedance	No exceedance
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath	Weekday	0800-1800	1	No exceedance
SH	HGF-NMP1	Hunts Green Farm, Kings Lane, South Heath	Weekday	0700-0800	1	No exceedance
	PKF-NMP1	Park Farm, South Heath	Weekday	0700-0800 0800-1800	4 2	No exceedance No exceedance
NP	BFH-NMP1	Bury Farm, Great Missenden	All days	All periods	No exceedance	No exceedance
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Weekday	0700-0800	1	No exceedance
	BLH-NMP1	Bayleys Hatch, South Heath, Great Missenden	Weekday Saturday	1800-1900 1300-1400 1400-2200	1 1 4	No exceedance No exceedance No exceedance
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	All days	All periods	No exceedance	No exceedance
AM	AM-NMP1**	Whielden Lane, Amersham	All days	All periods	Not applicable**	No exceedance
LM	LM-NMP1**	Little Missenden Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham	All days	All periods	Not applicable***	Not applicable***

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
CSG	CSG-NMP1**	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
CSP	CFC-NMP1	Cricket Field Cottages, Chesham Lane	All days	All periods	No exceedance	No exceedance
	CSP-NMP2**	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
CVV	CVV-NMP1**	Denham Water Ski Club, North Orbital Road	All days	All periods	Not applicable*	No exceedance

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

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

\*\*\* The LOAEL and SOAEL have not been assessed due to distance between monitoring station and nearest receptor.

2.2.6 Exceedances of the LOAEL were recorded at eighteen (18) monitoring locations during the month of September 2024. LOAEL exceedances were recorded during weekday, Saturday and Sunday daytime, evening and nighttime working periods.

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

Table 6: Summary of Total Exceedances of SOAEL

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
TW	TW-NMP1	Twyford	1
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	9
WAD	WAD-NMP1	Waddesdon, Buckinghamshire	9
WGT	WT-NMP1	A413, Wendover	2

2.2.8 Twenty-one (21) SOAEL exceedances were recorded due to HS2 construction works during September 2024. The exceedances occurred at TW-NMP1, WDL-NMP1 and WAD-NMP1 during weekday and Saturday daytime and evening, Saturday afternoon and nighttime working periods.

## 2.3 Exceedances of Trigger Level

2.3.1 Table 7 provides a summary of exceedances of the S61 trigger noise levels determined to be due to HS2 related construction noise measured during the reporting period, along with the findings of any investigation.

Table 7: Summary of Exceedances of Trigger Levels

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

## 2.4 Complaints

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

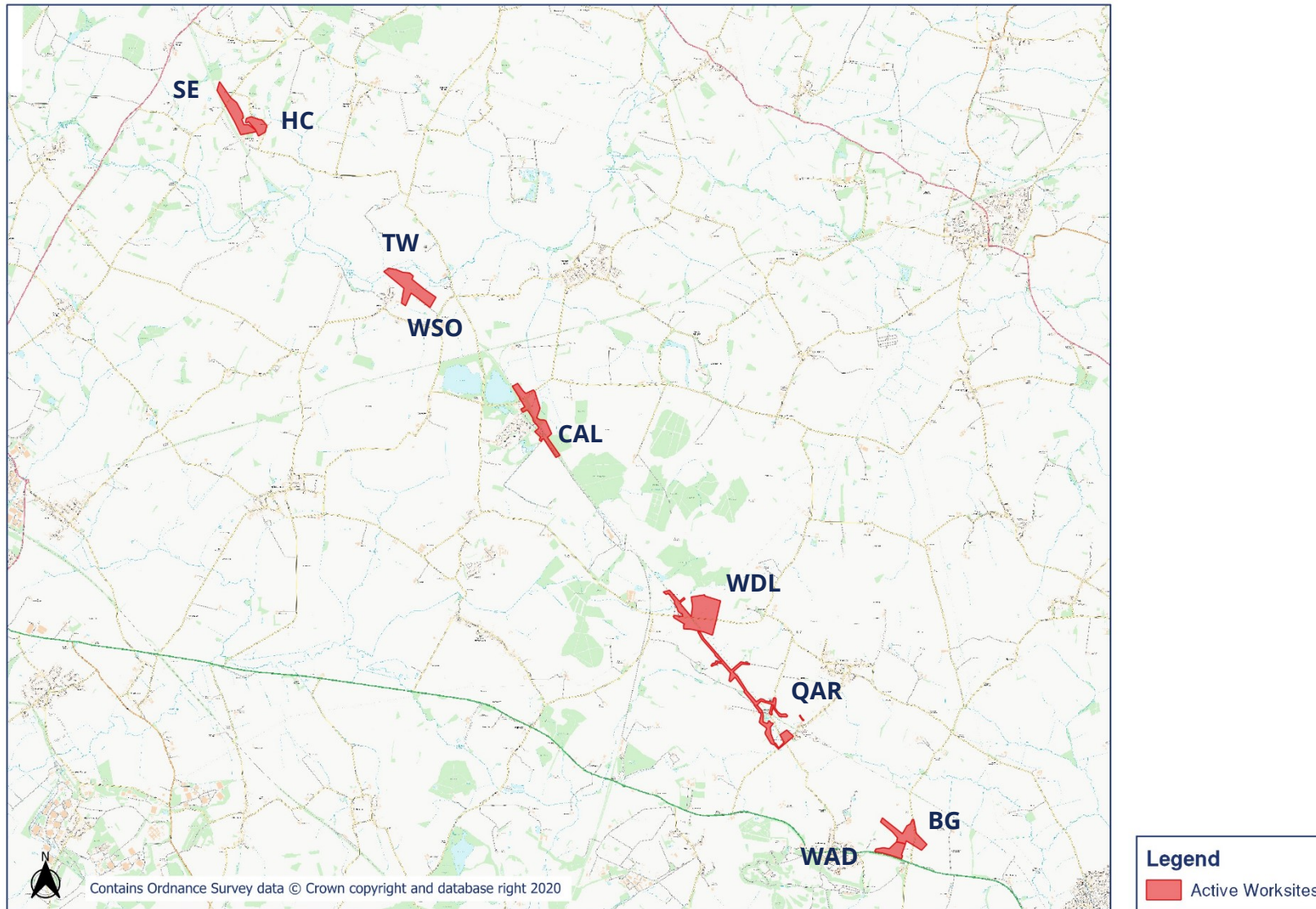
Table 8: Summary of Complaints

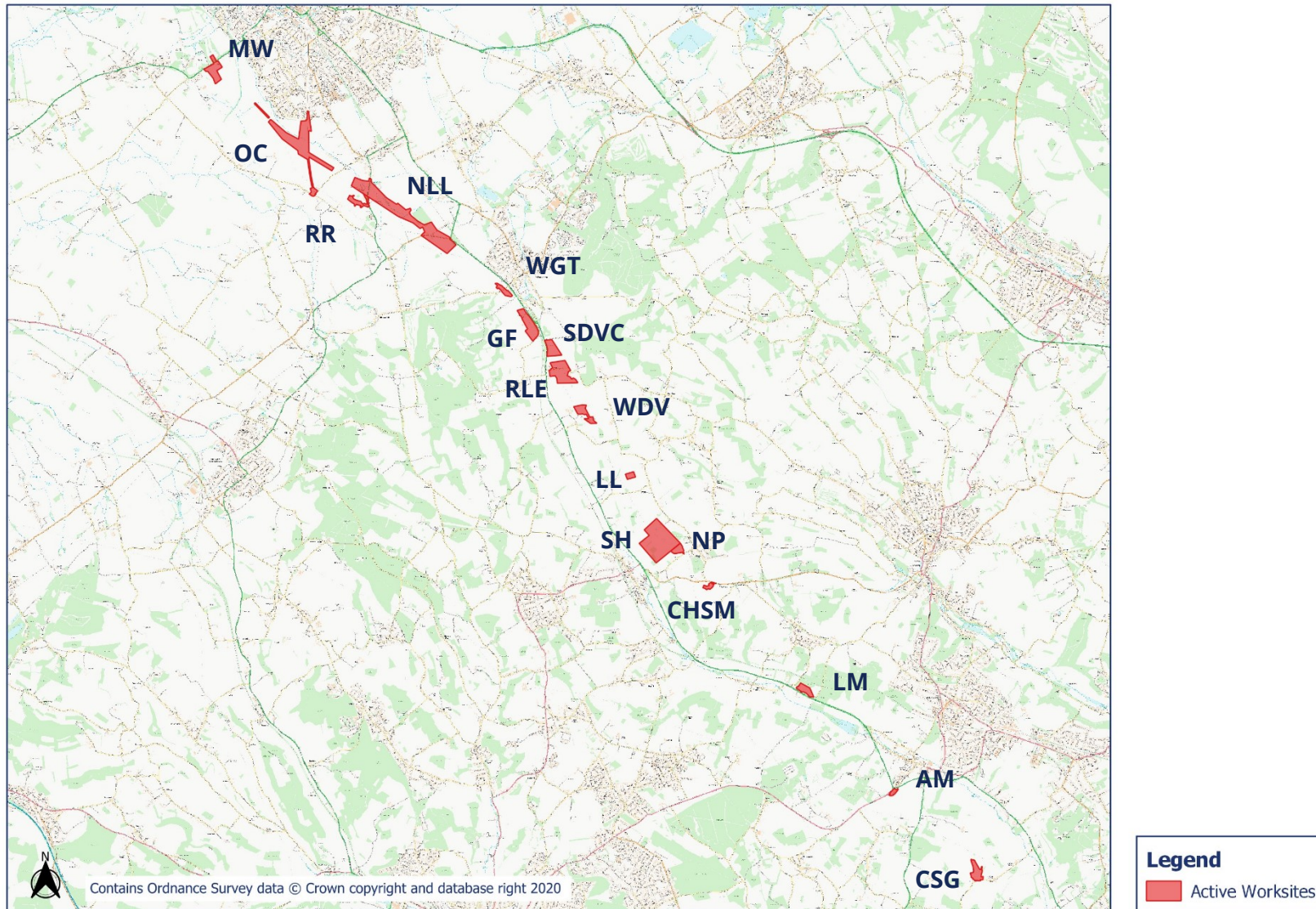
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-24-45683-C	MW	Disturbance due to general noise from construction nearby.	Not related to HS2 works.	Resident has been updated with the results of the investigation.
HS2-24-113288-E - C	WDV	Complaint regarding general site noise and 'buzzing' vehicle noise.	Noise due to construction of a permeability wall.	The machinery in use fitted with reversing 'buzzer' noise will be kept to a minimum. Resident has been updated with the results of the investigation.
HS2-24-45704-C	QAR	Disturbance from intermittent	No HS2 works were undertaken in the area at the time of complaint.	Resident has been updated with the results of the investigation.

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
		noise, similar to jet engine noise.		
HS2-24-45721-C	MW	Complaint due to construction noise and vibration at the weekend.	Noise due to utility works. Residents were informed of the works. Noise barriers are in place to reduce impacts. No exceedances of noise were found upon investigation.	Resident has been updated with the results of the investigation.
HS2-24-114243-E-C	NLL	Disturbance due to noise from cranes and machinery.	Noise due to concrete pours. Works were undertaken within approved consents. No exceedances of noise were found upon investigation.	Resident has been updated with the results of the investigation
HS2-24-114365-E-C	OC	Complaint due to machinery noise in the evening.	Not related to HS2 works.	Resident has been updated with the results of the investigation.

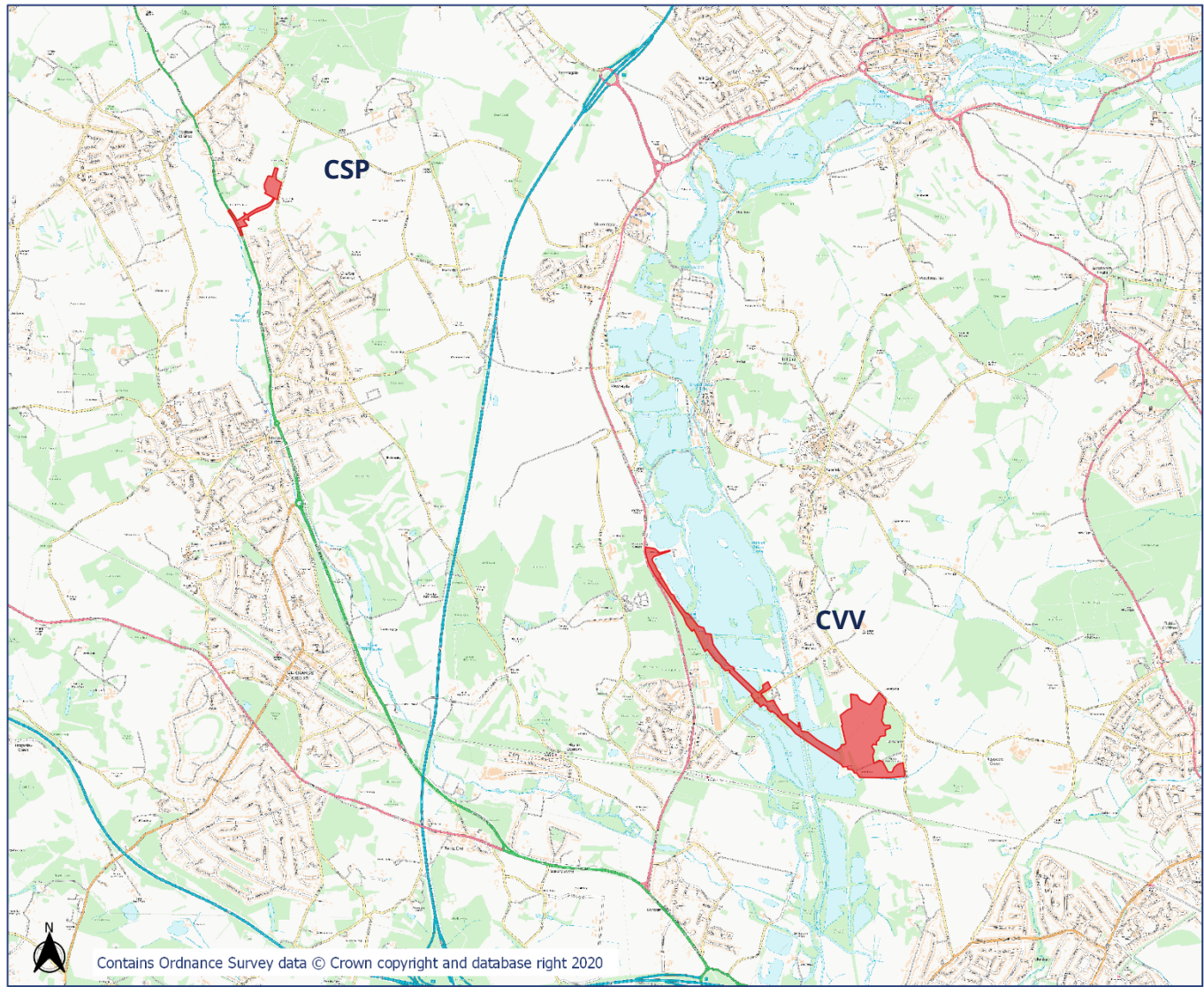
# Appendix A Site Locations



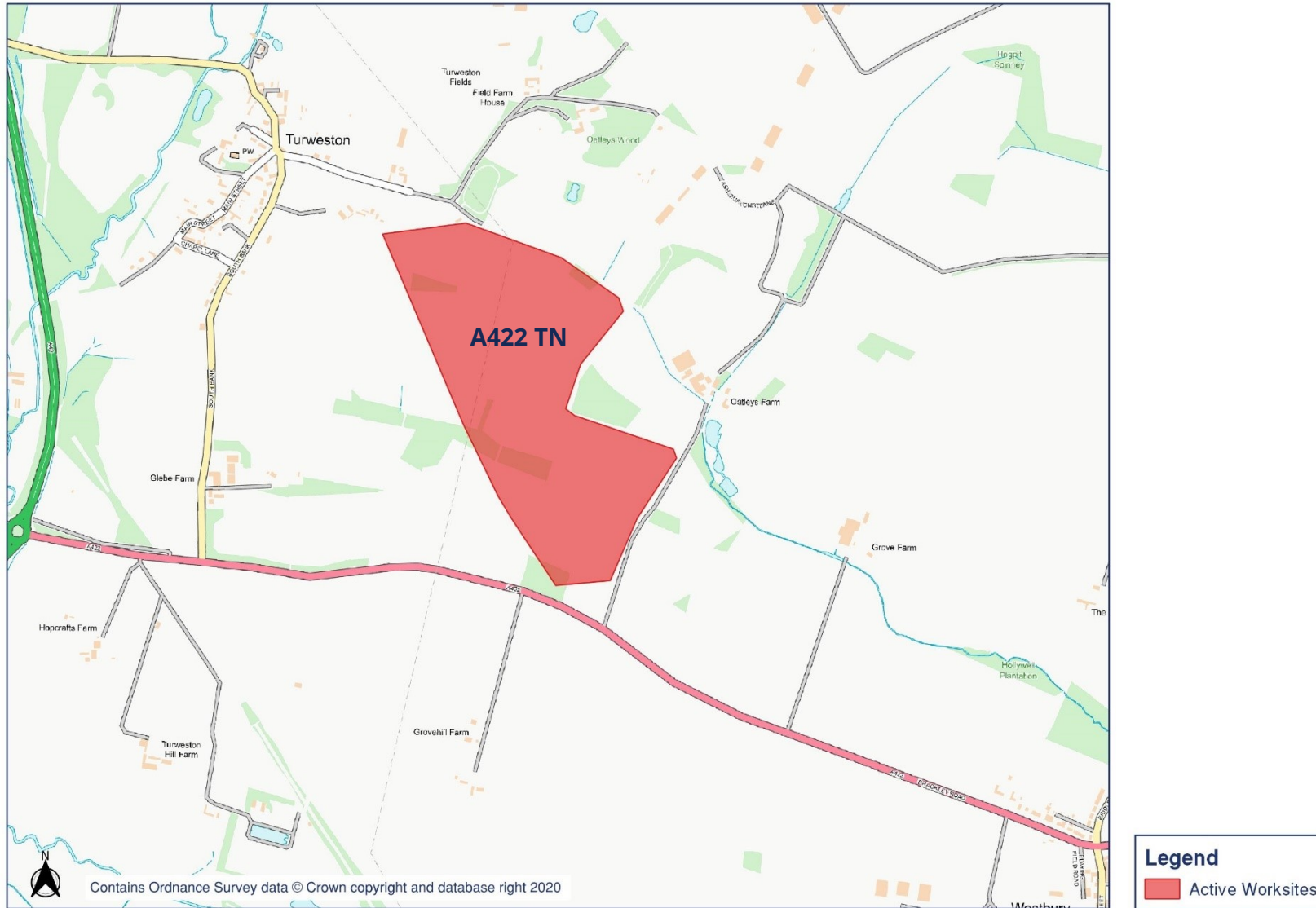


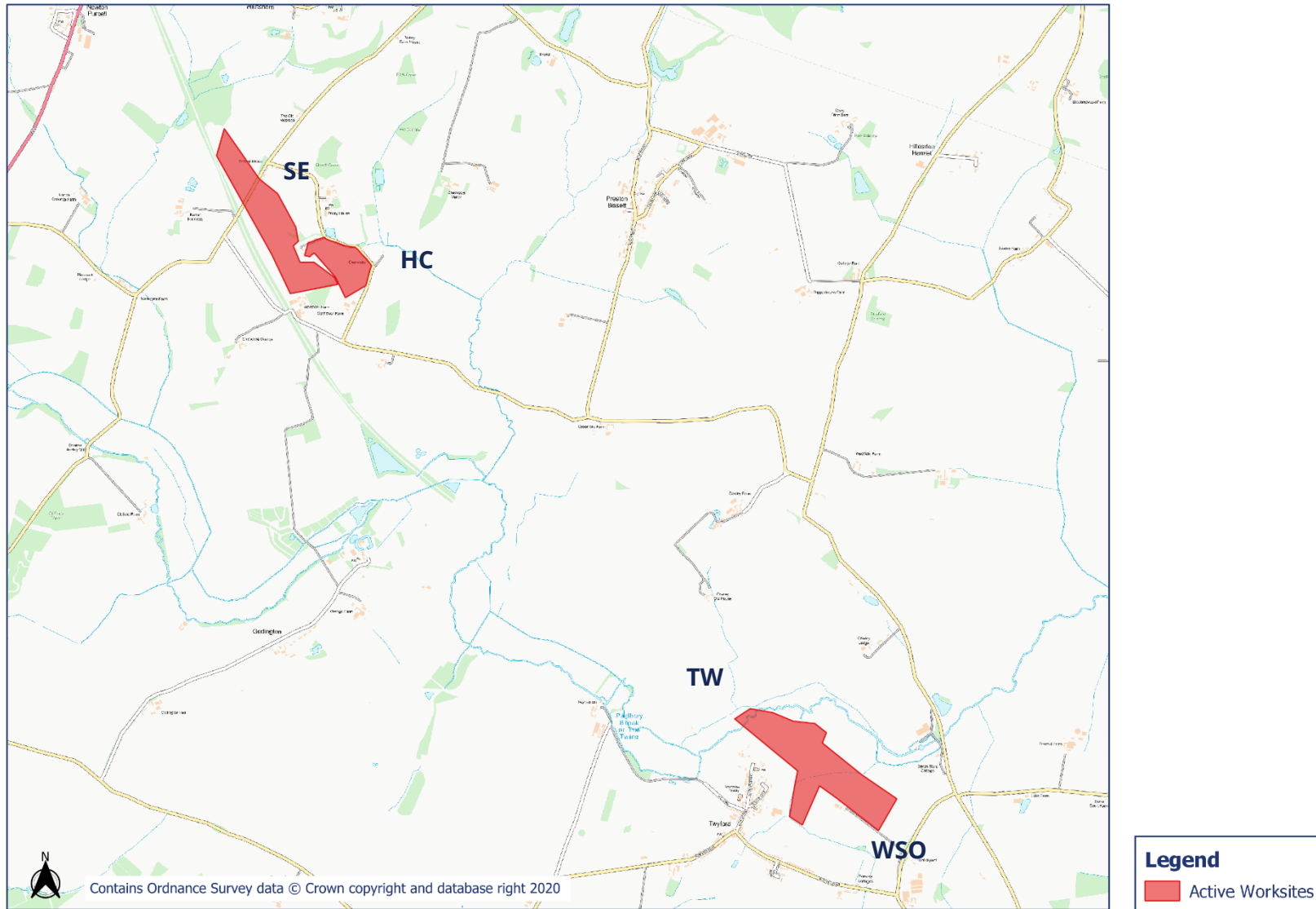


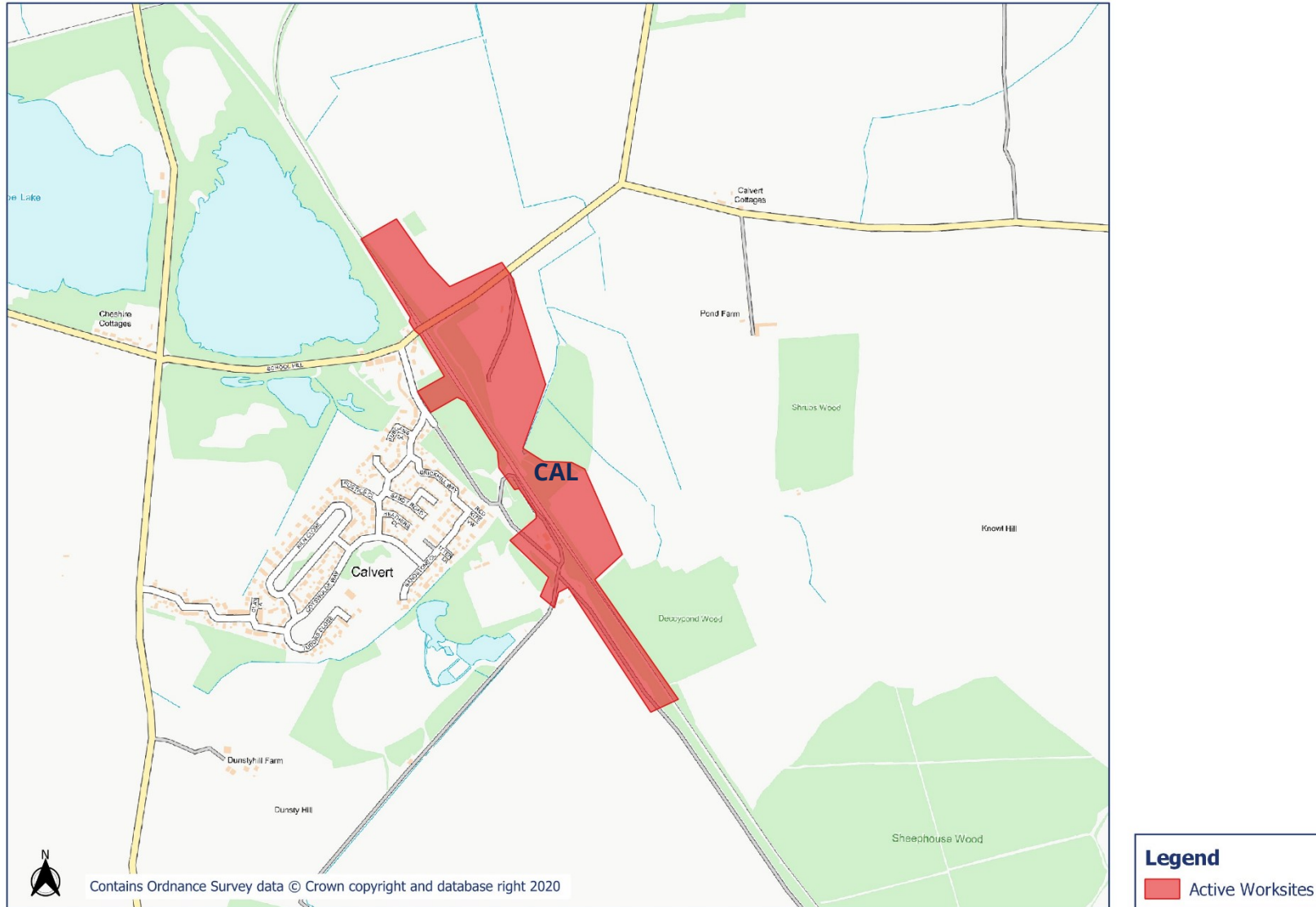
# HS2 Worksite Identification Plan - Overview 3

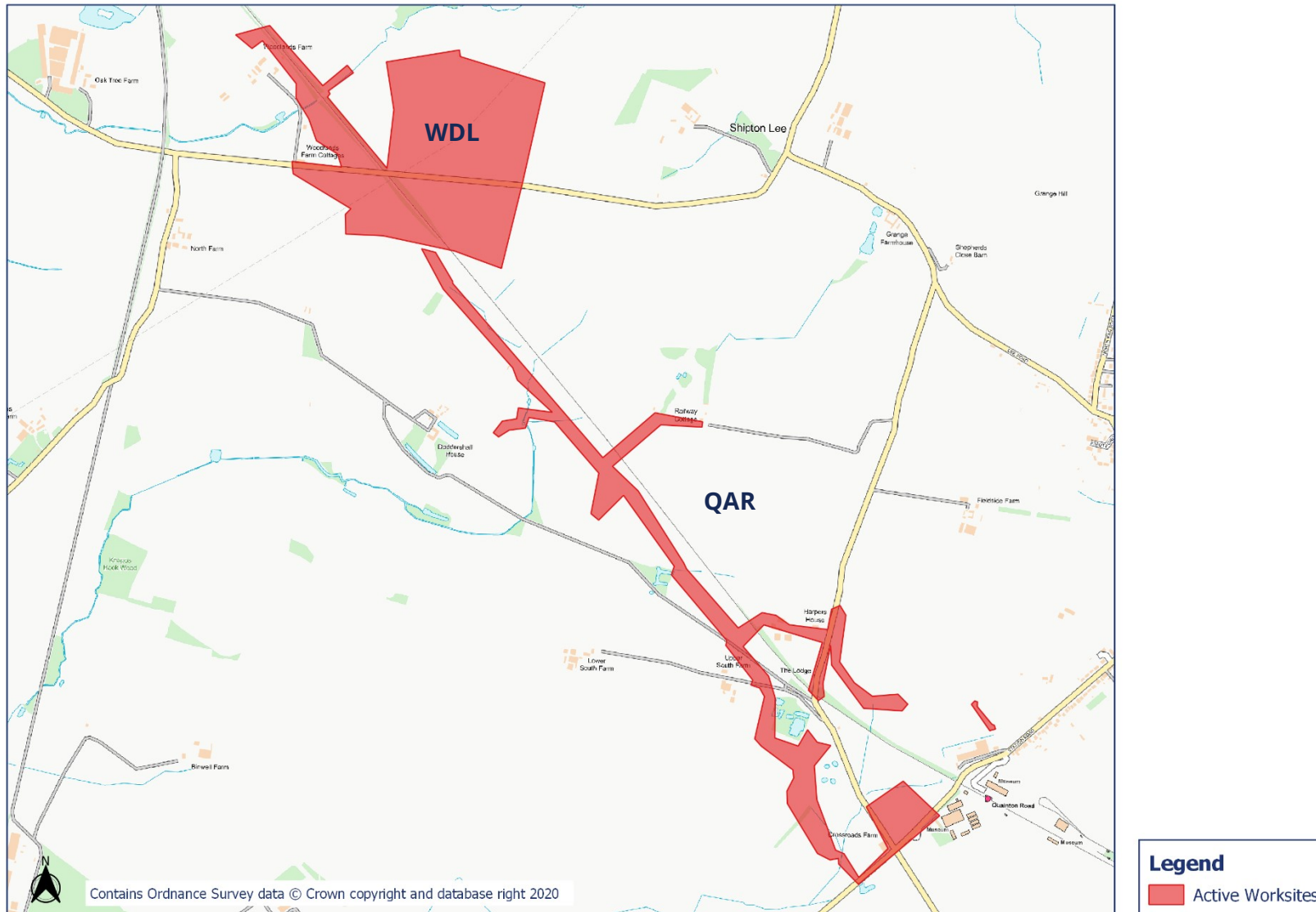


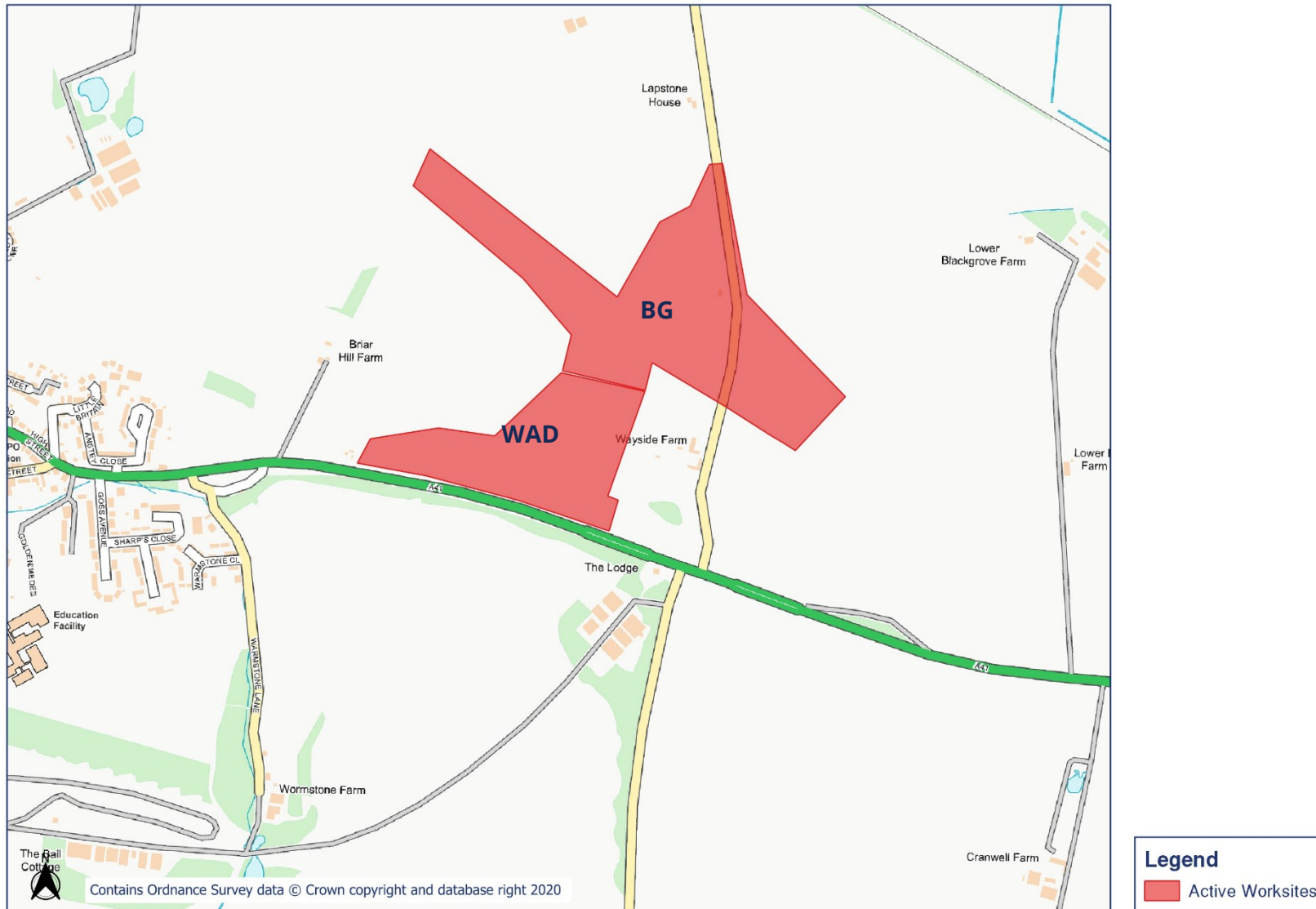
OFFICIAL



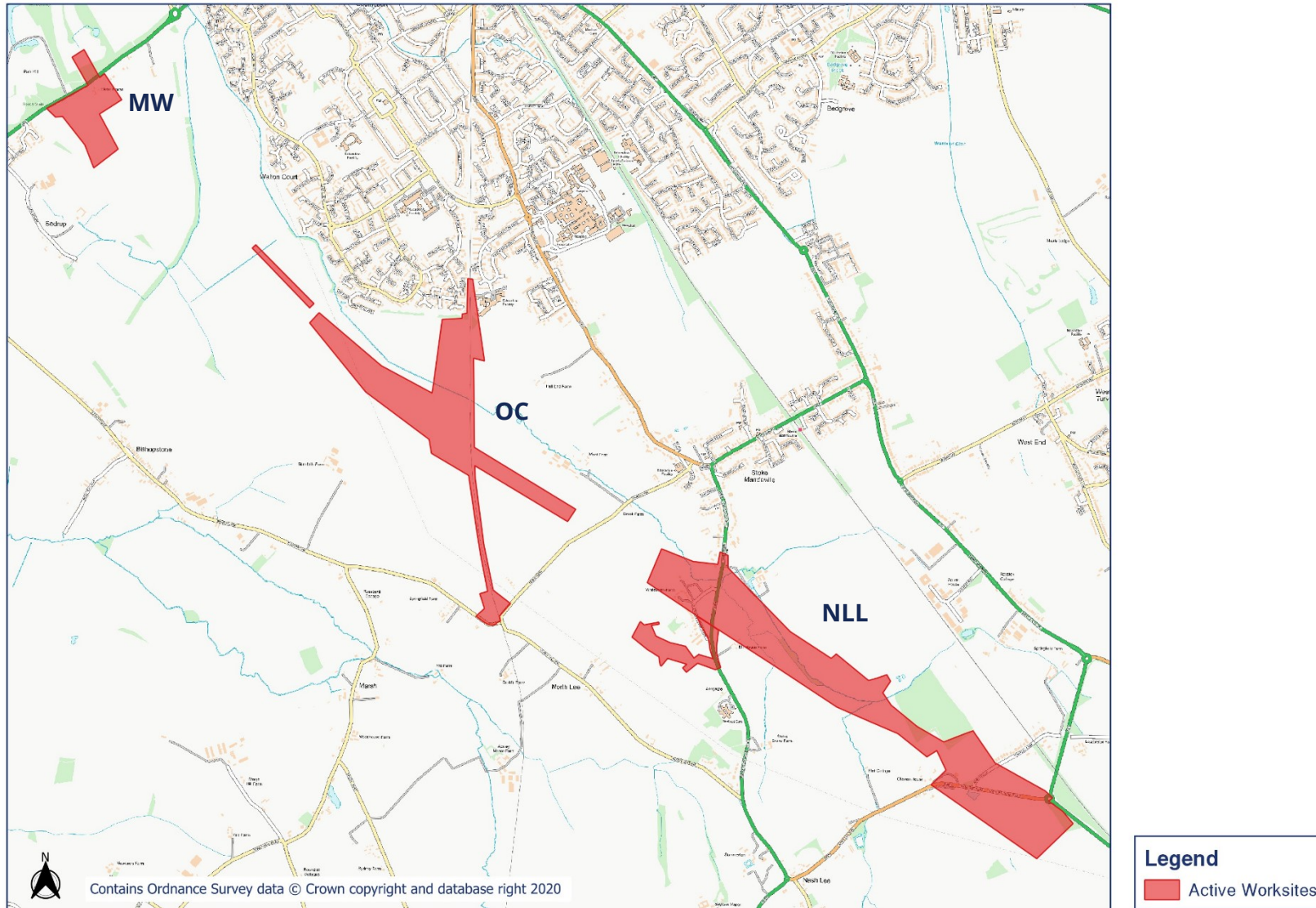


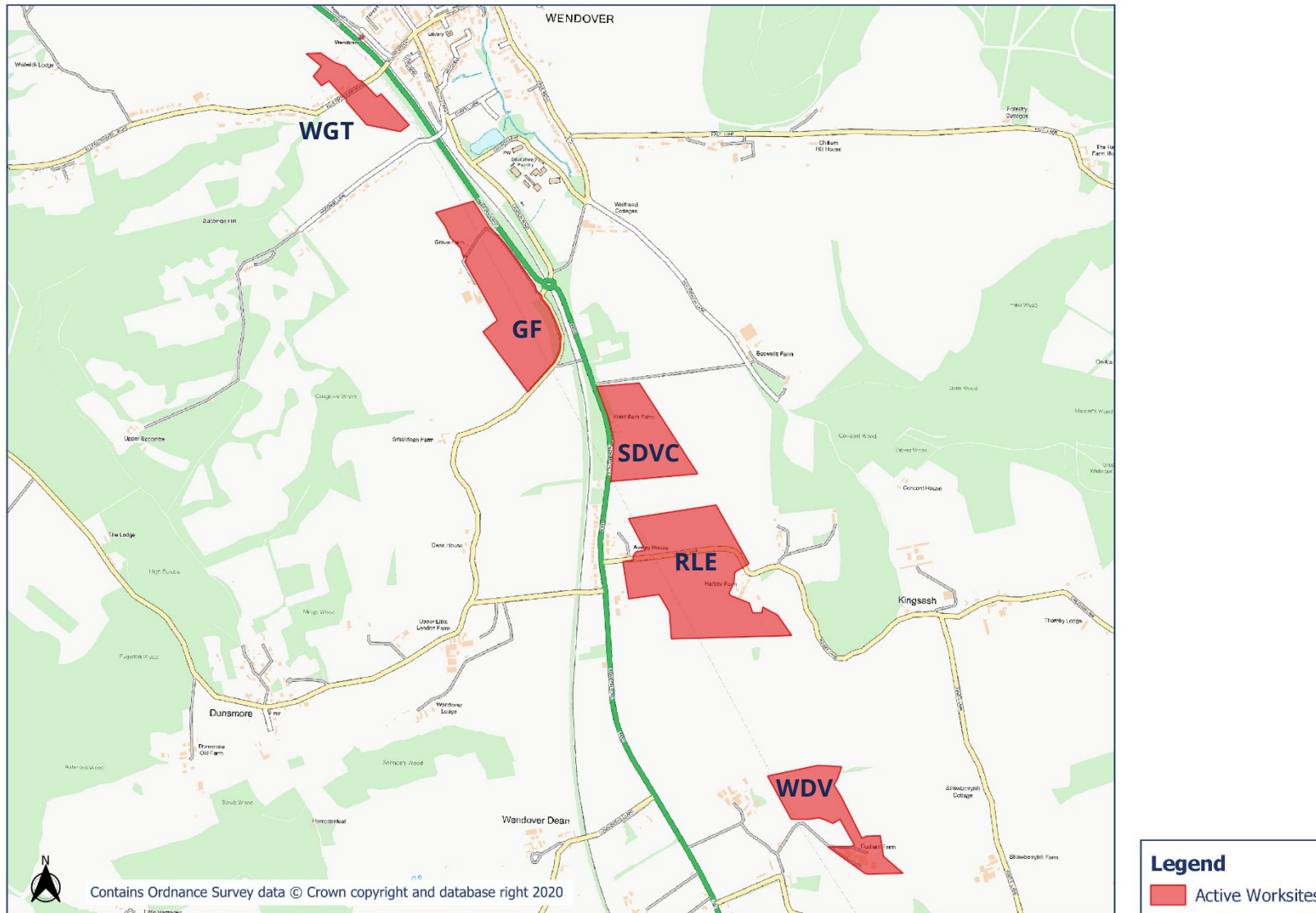


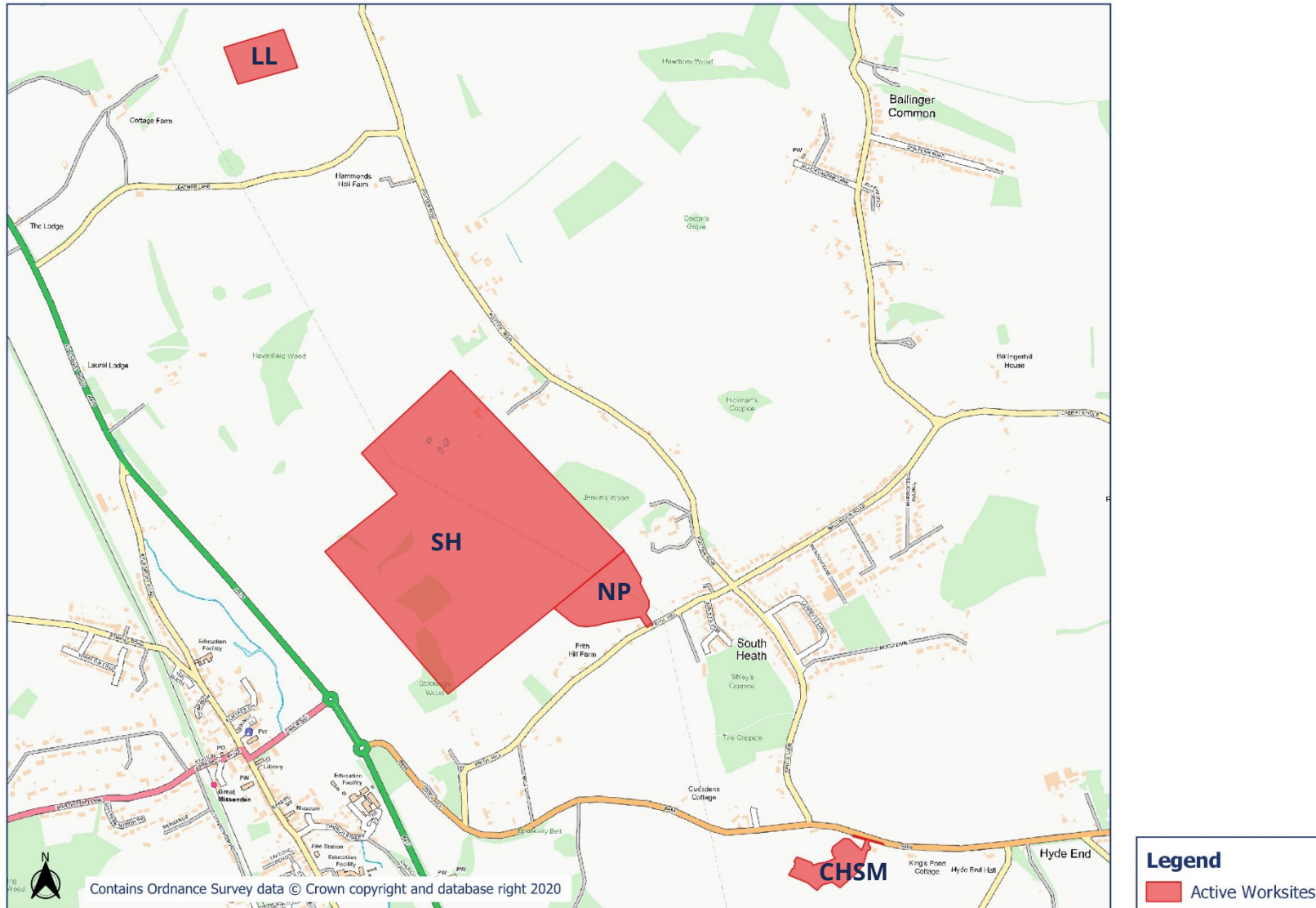




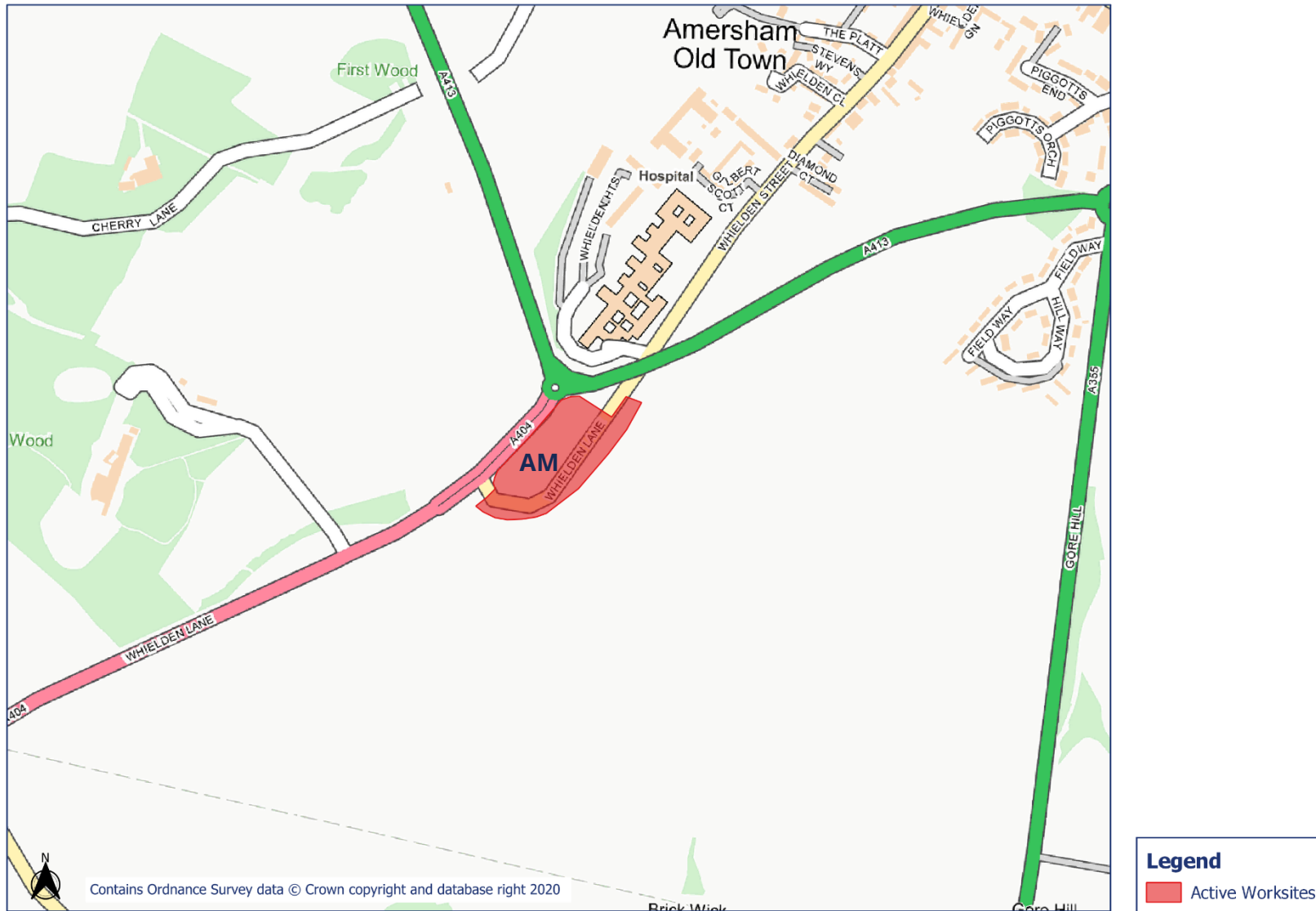




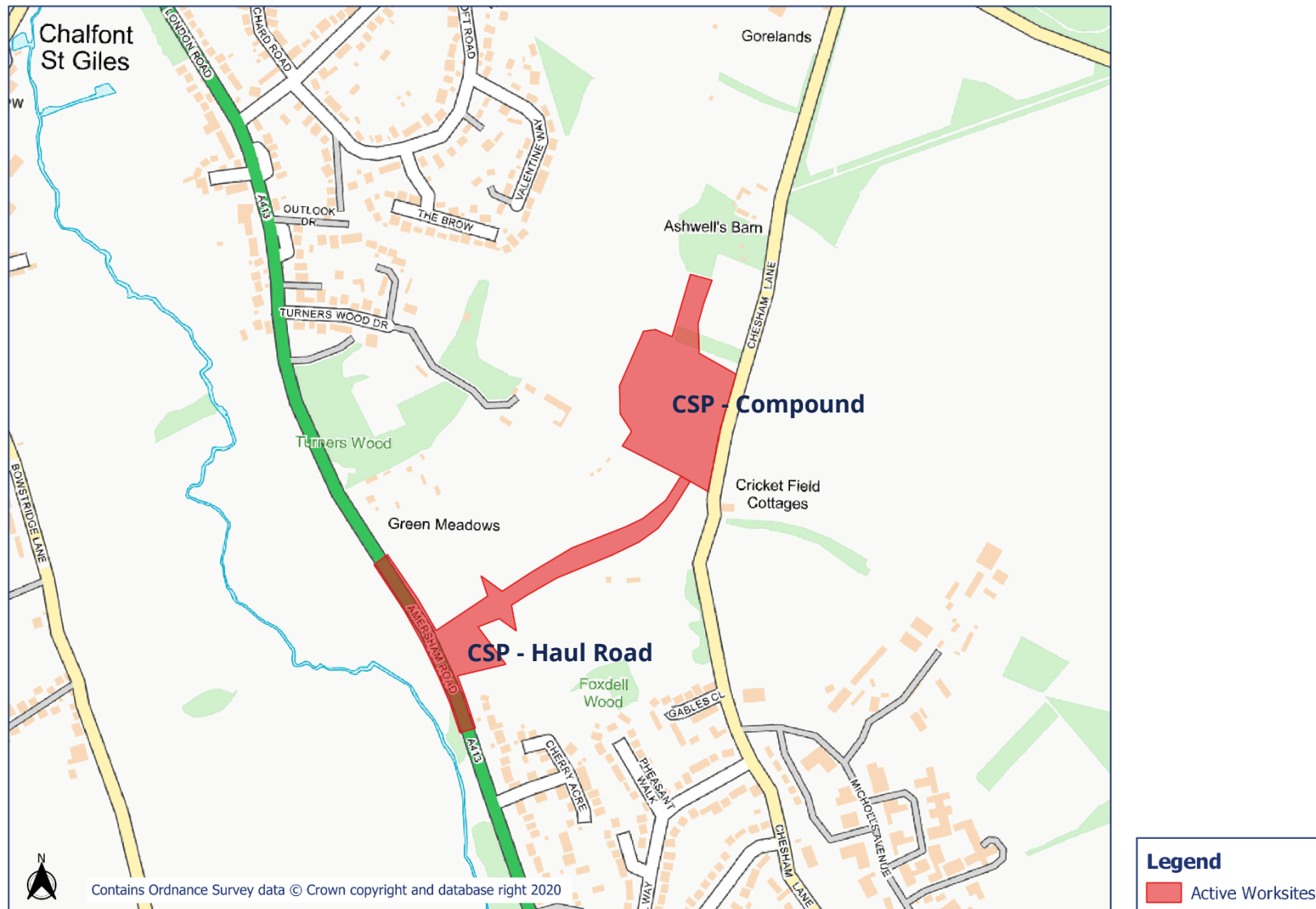


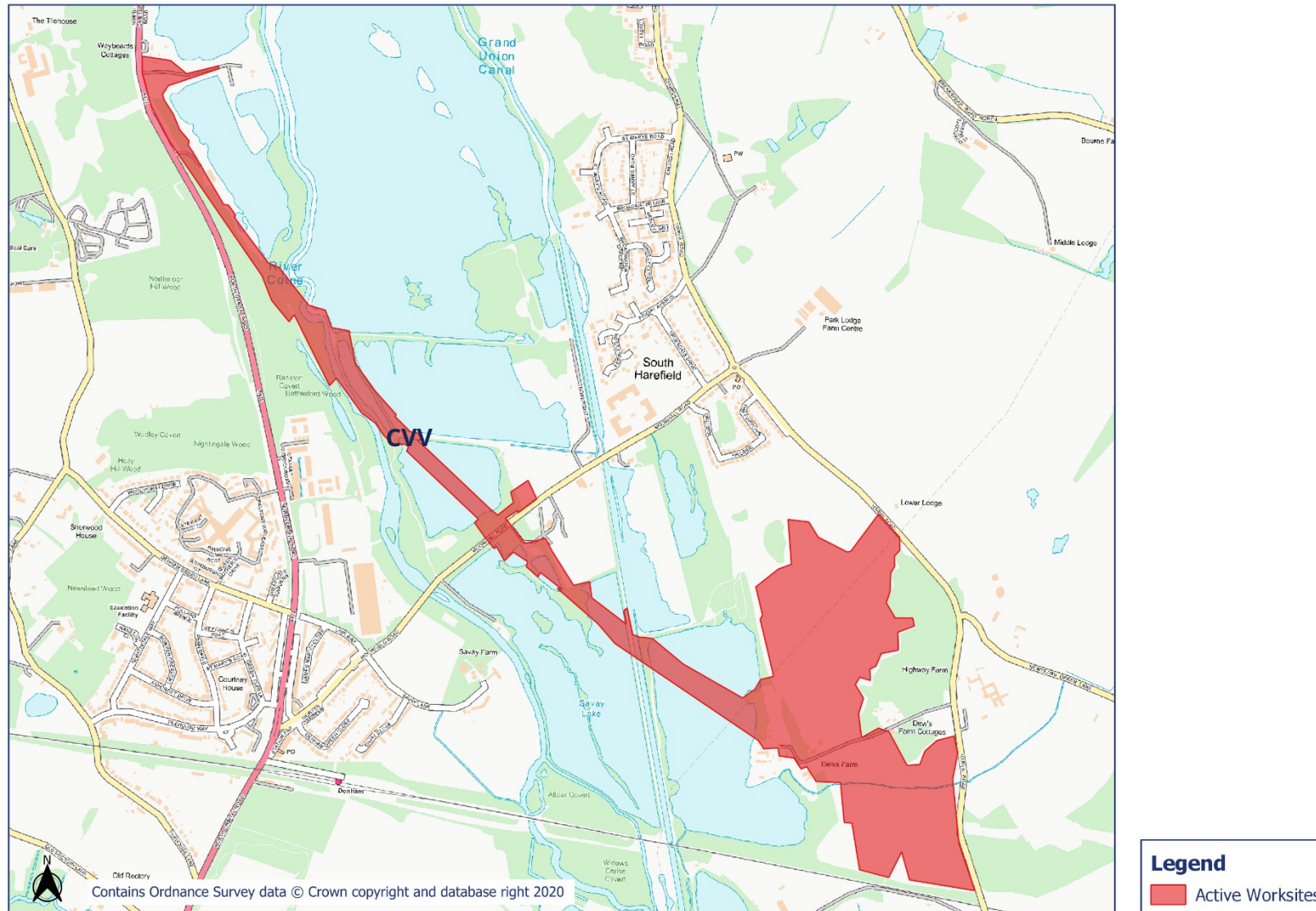






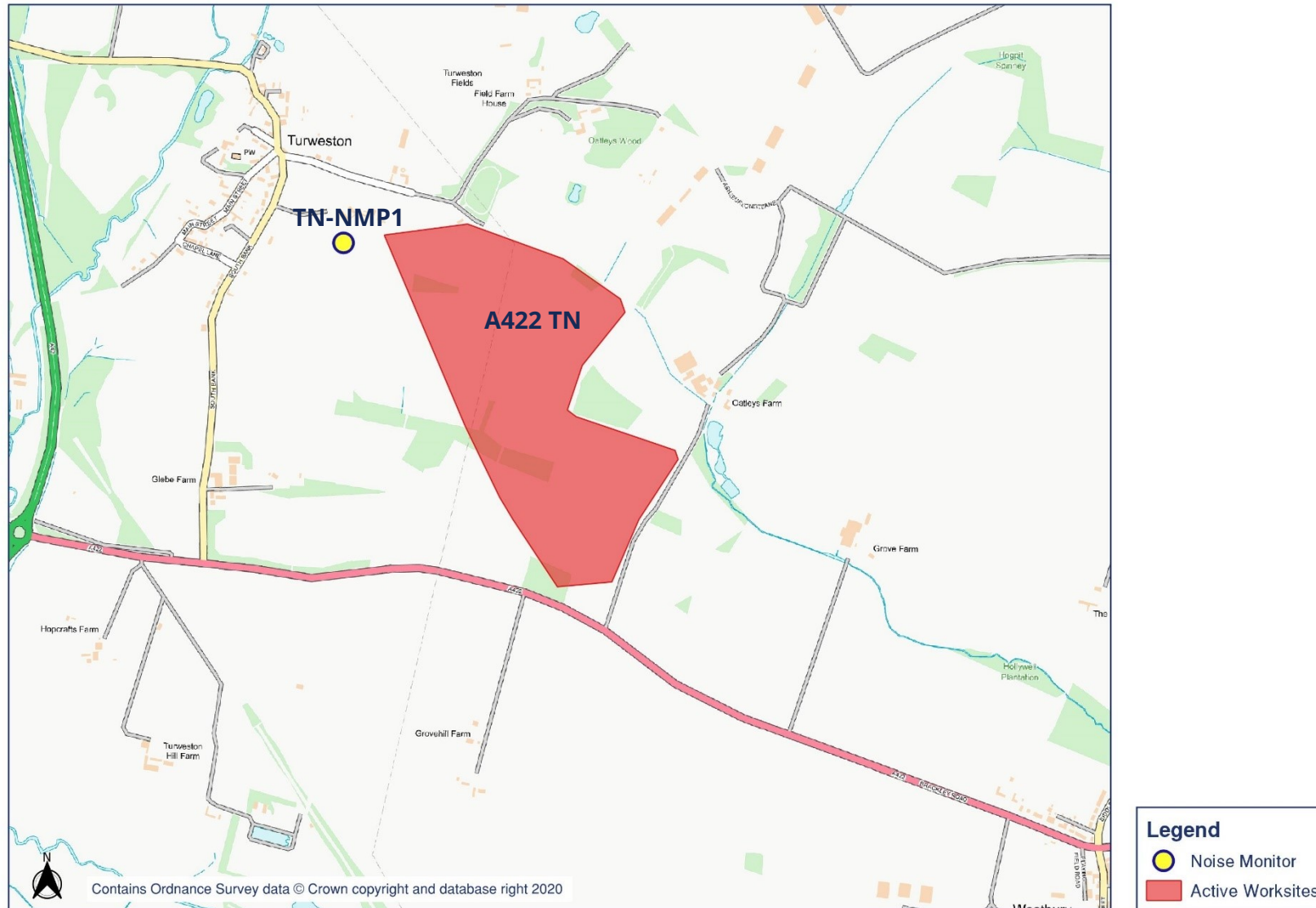


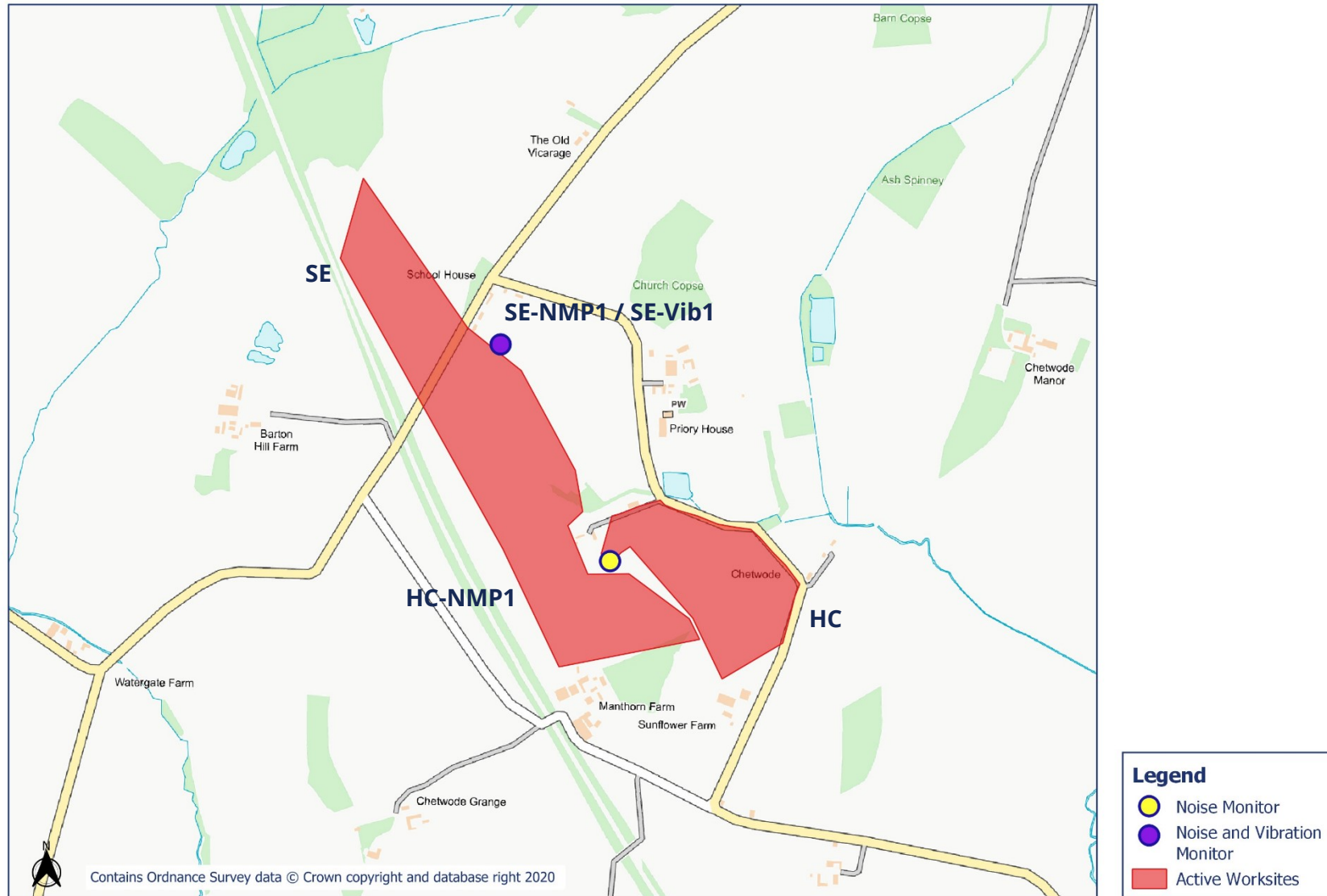


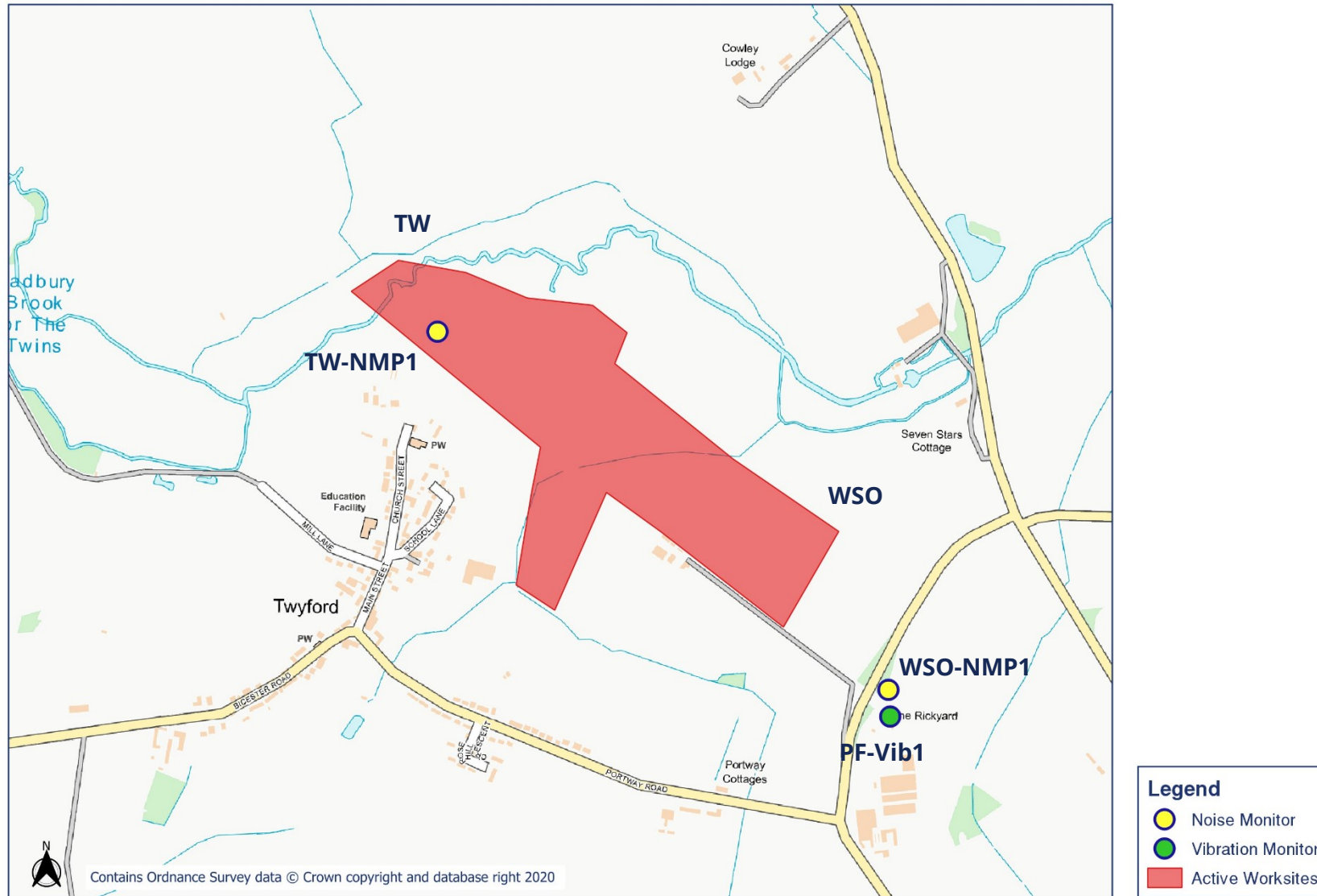


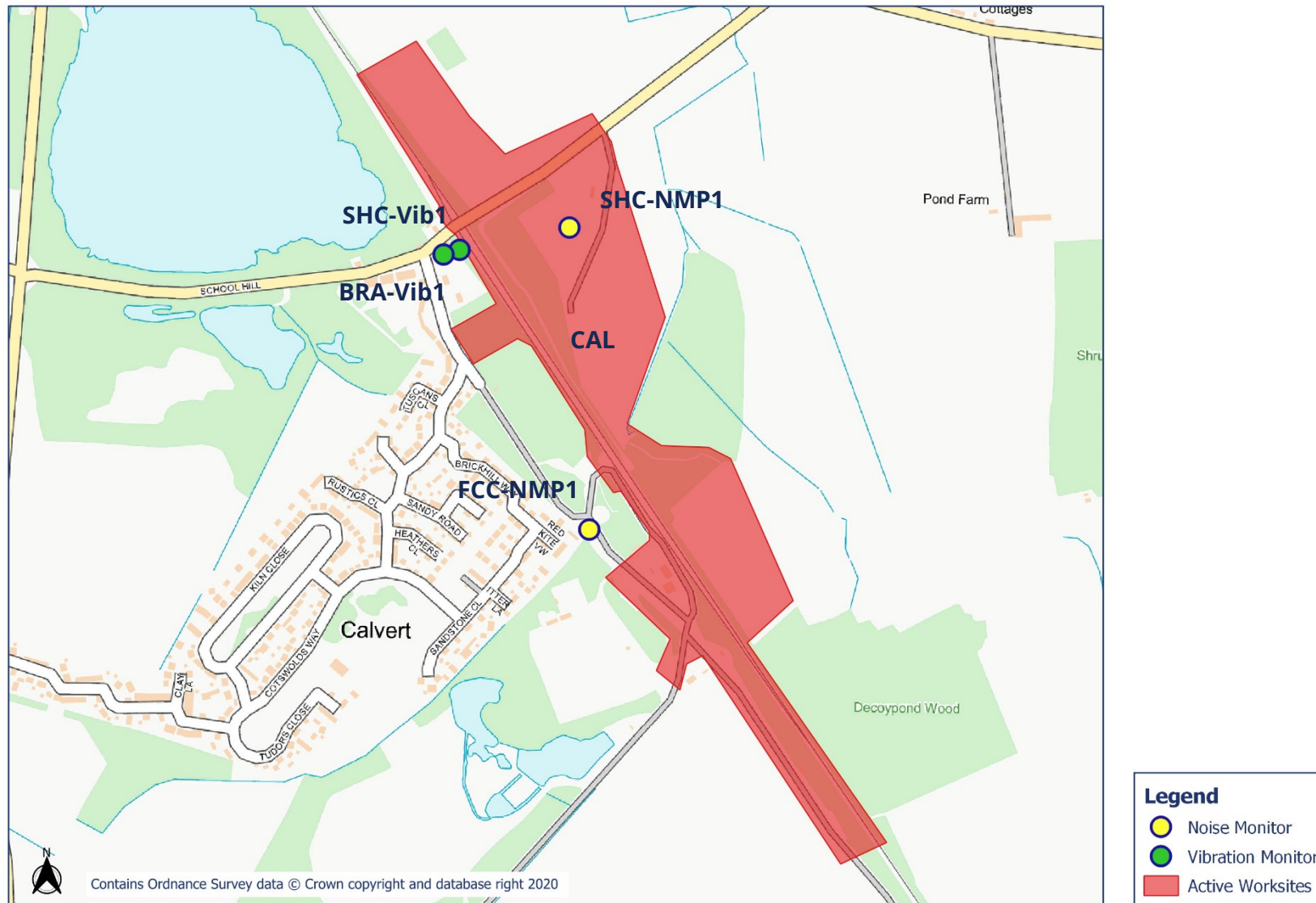


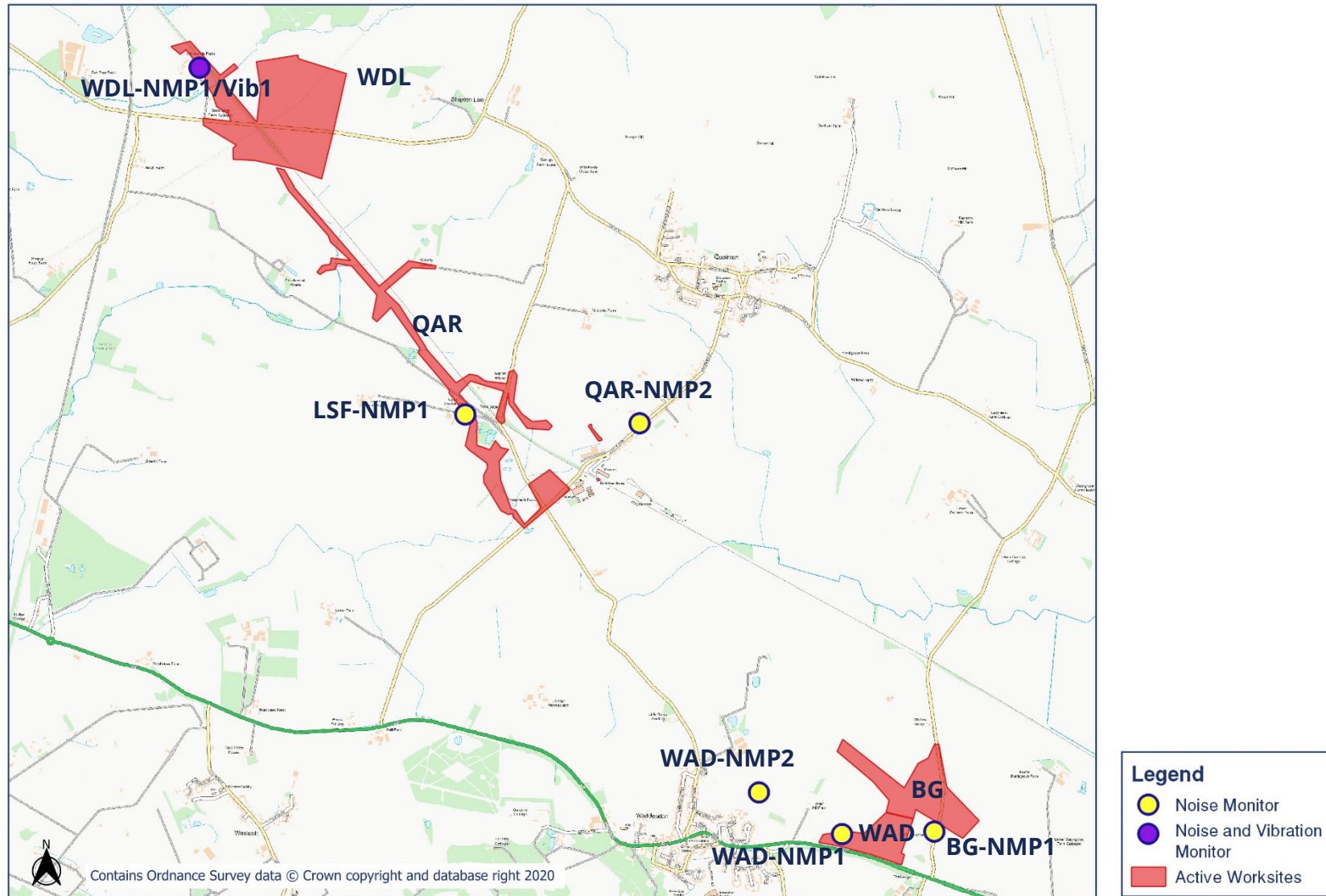
# Appendix B Monitoring Locations

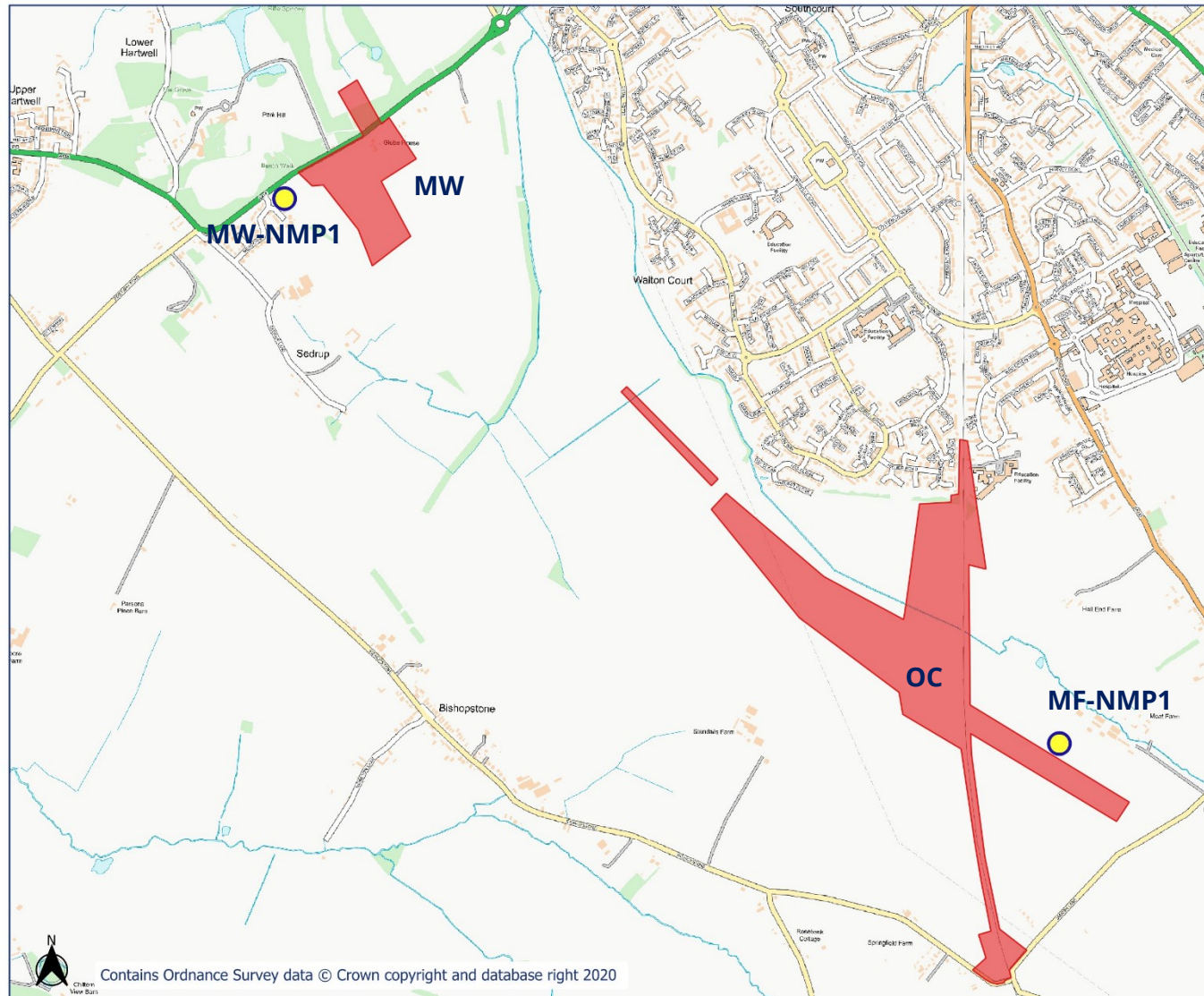


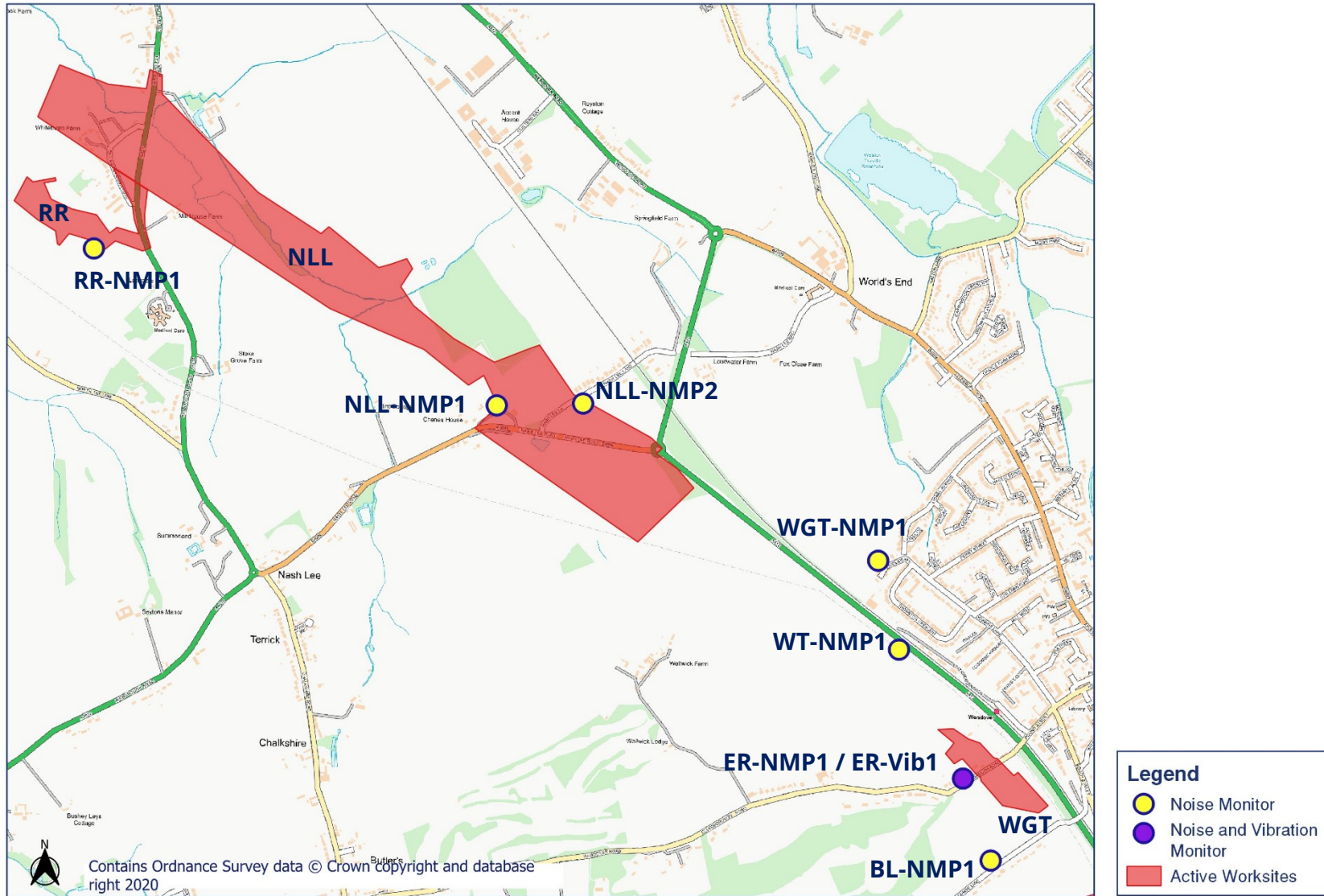




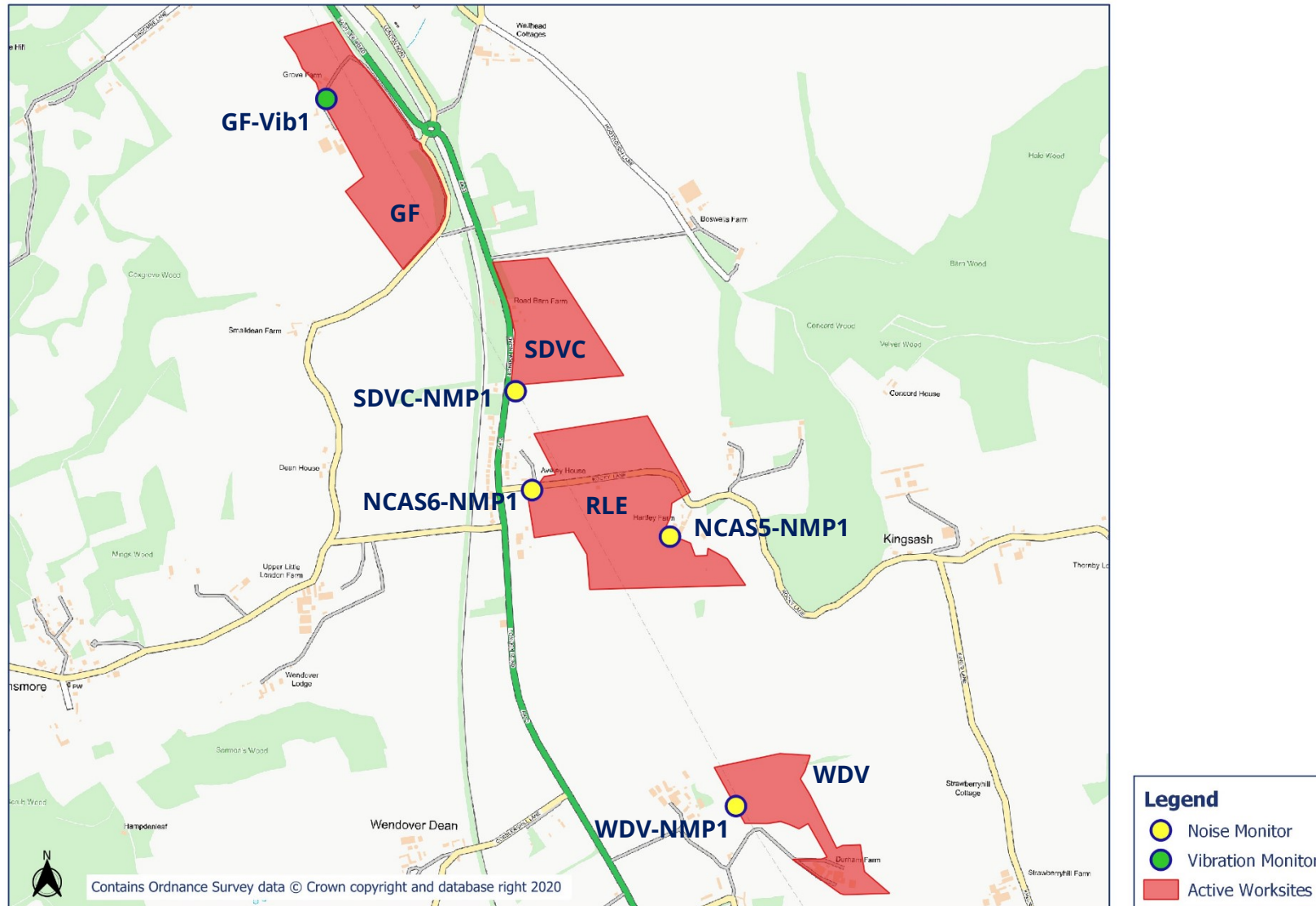


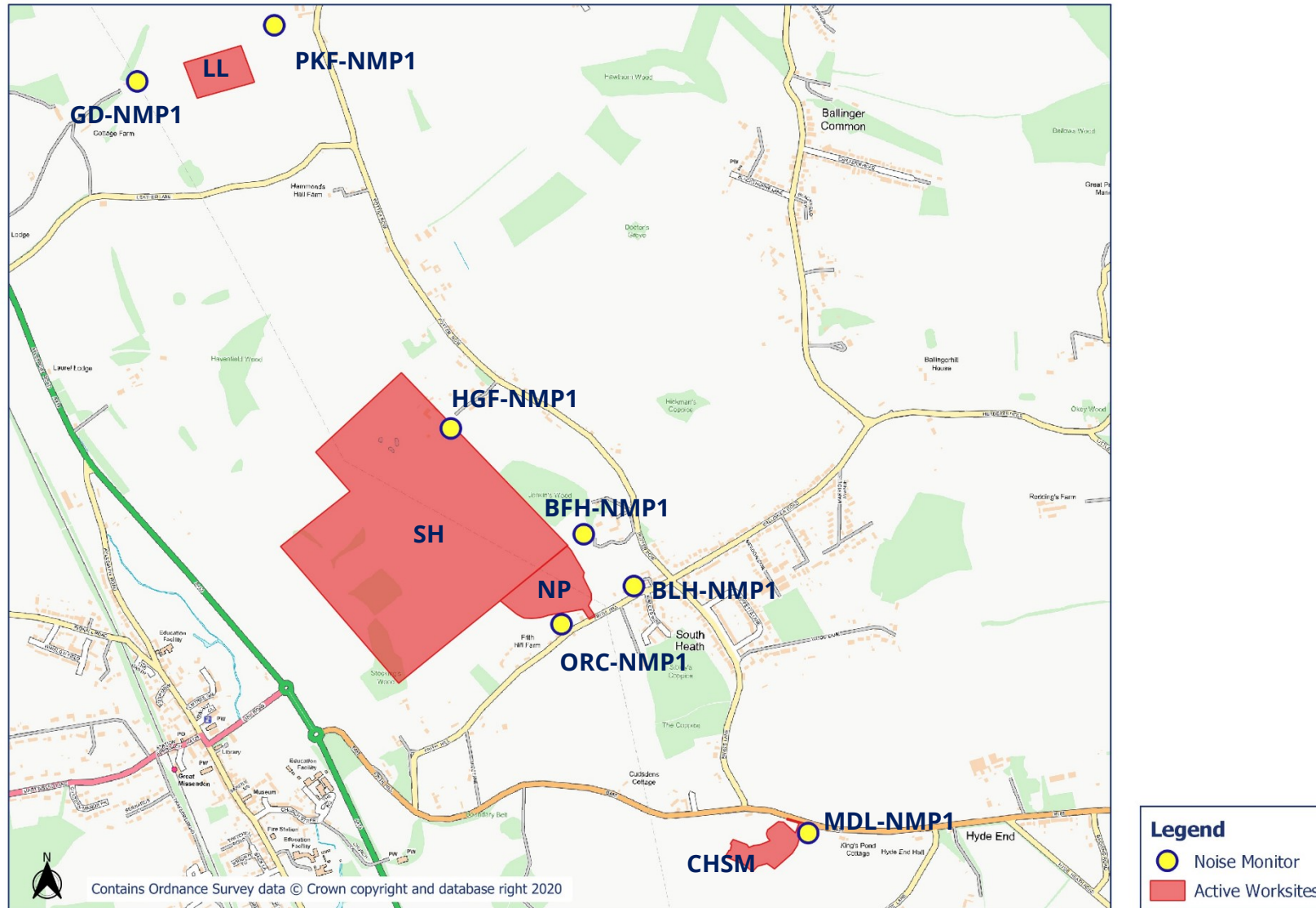




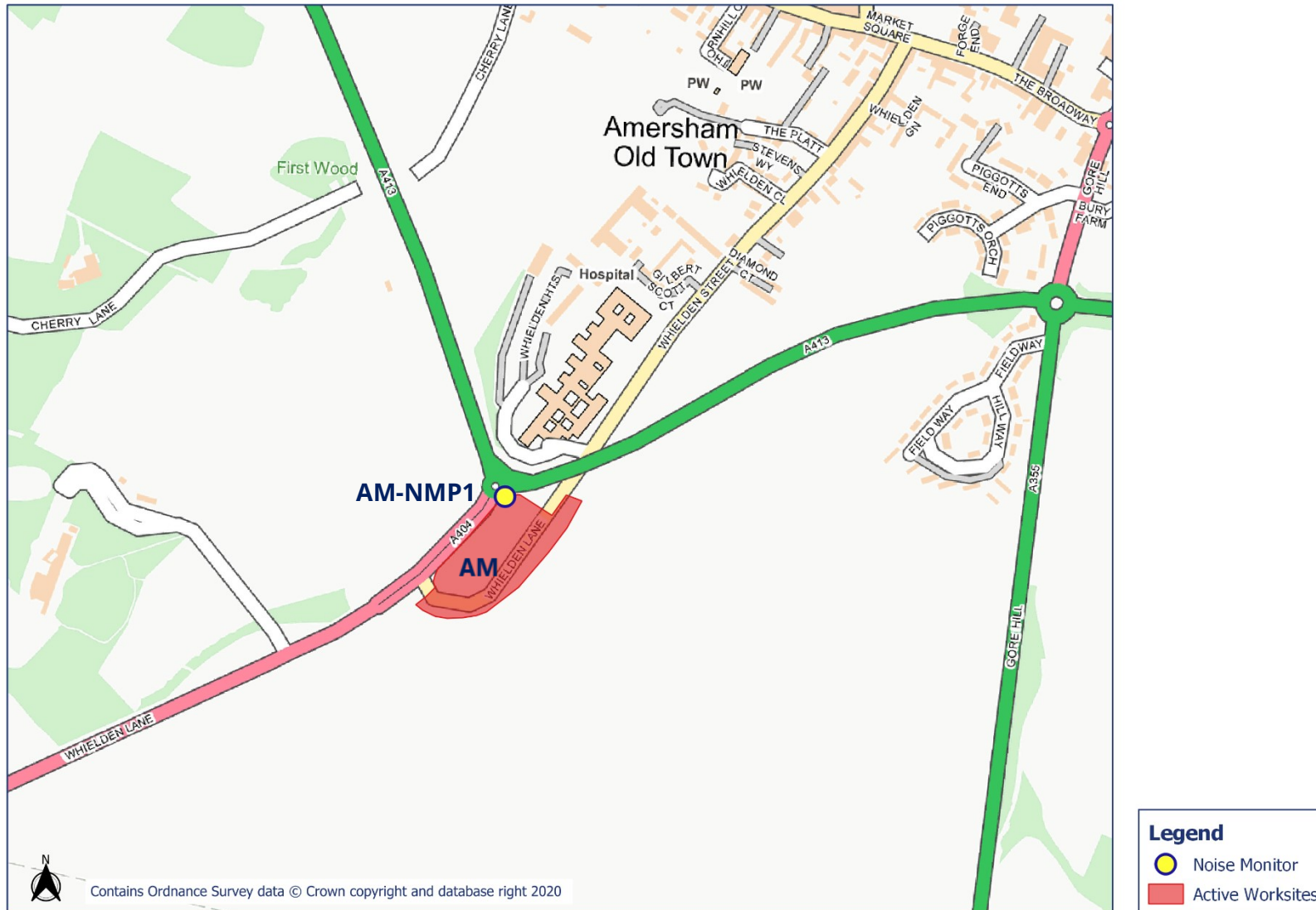






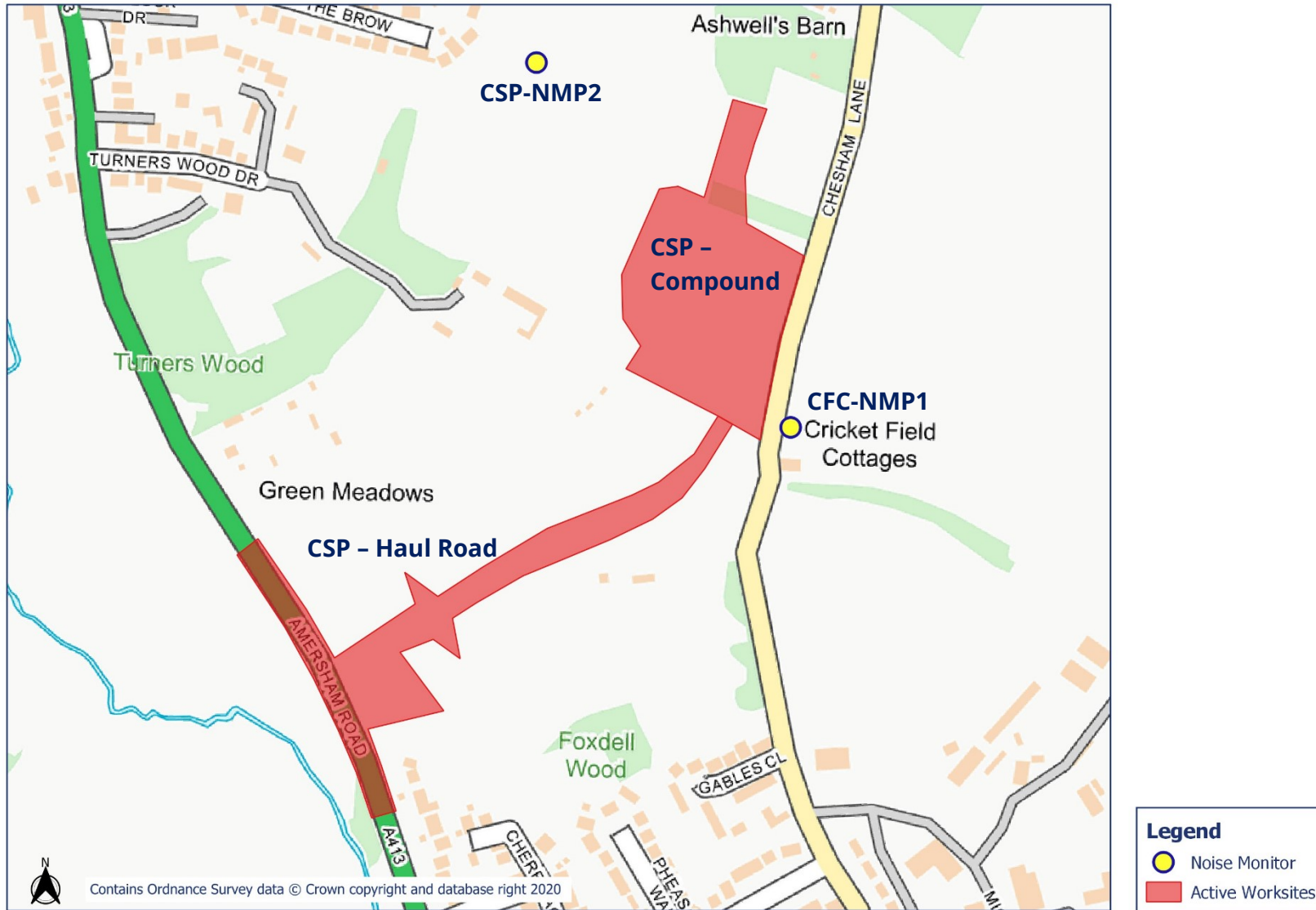


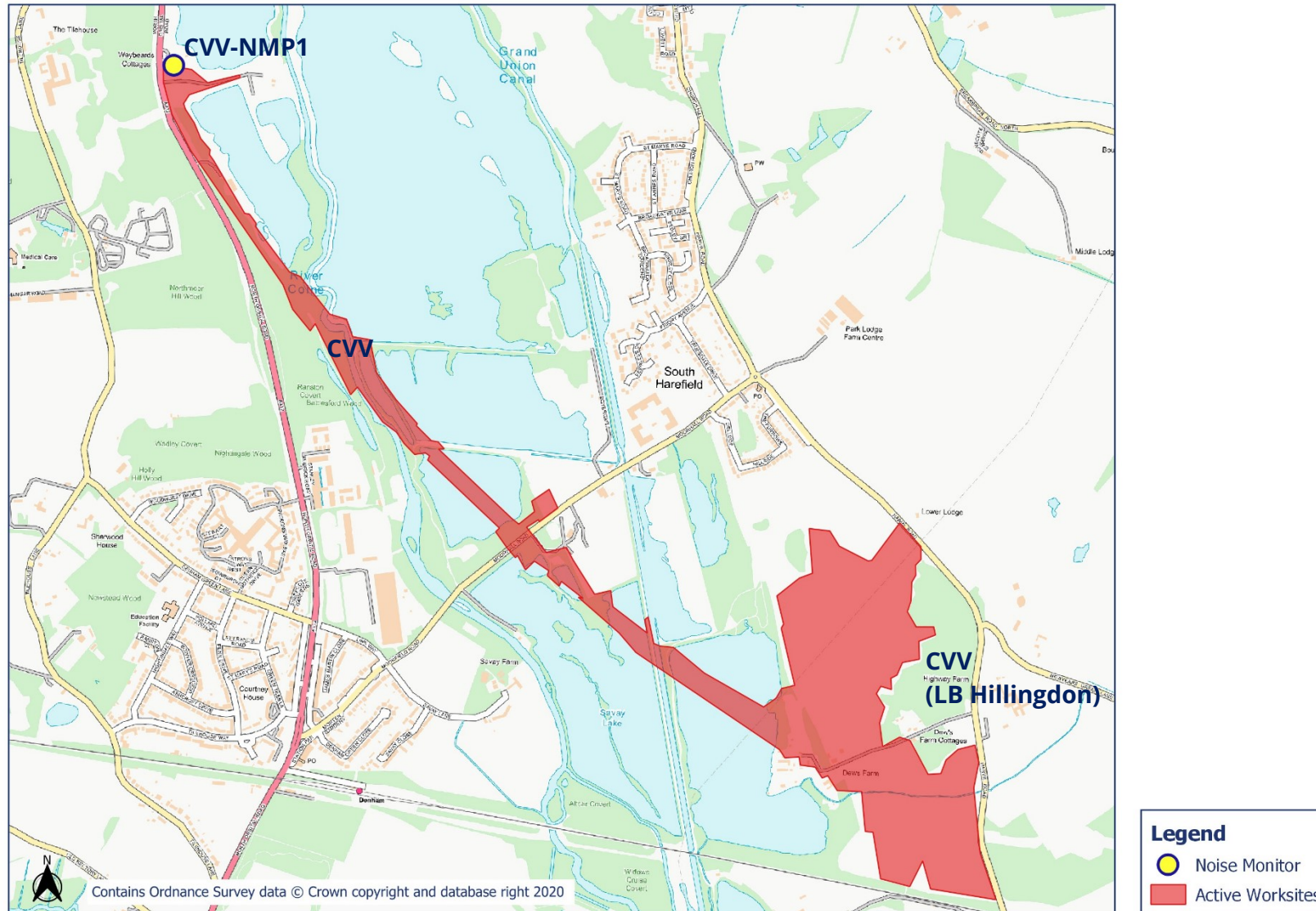






# HS2 Noise and Vibration Monitoring Plan - 13



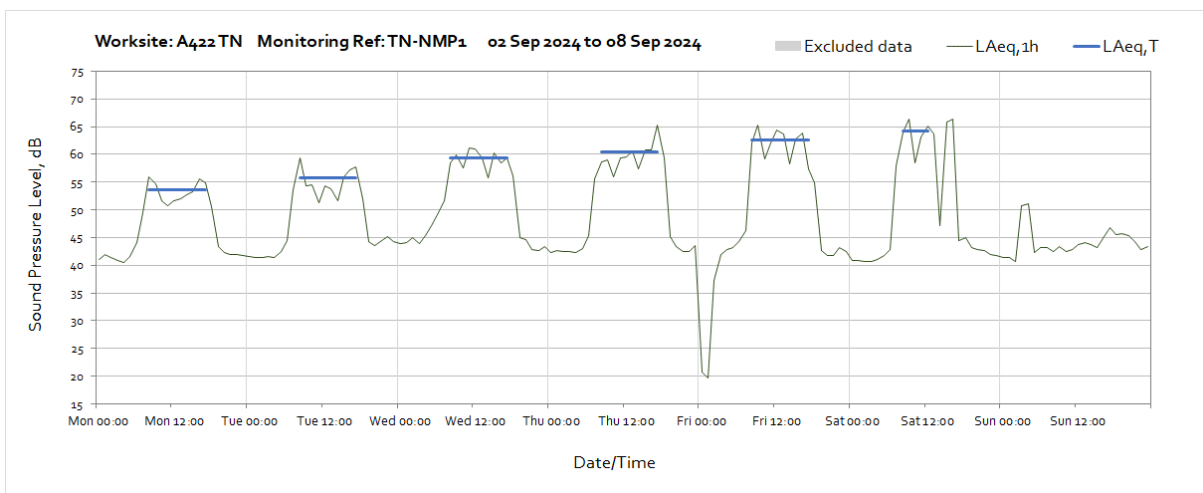
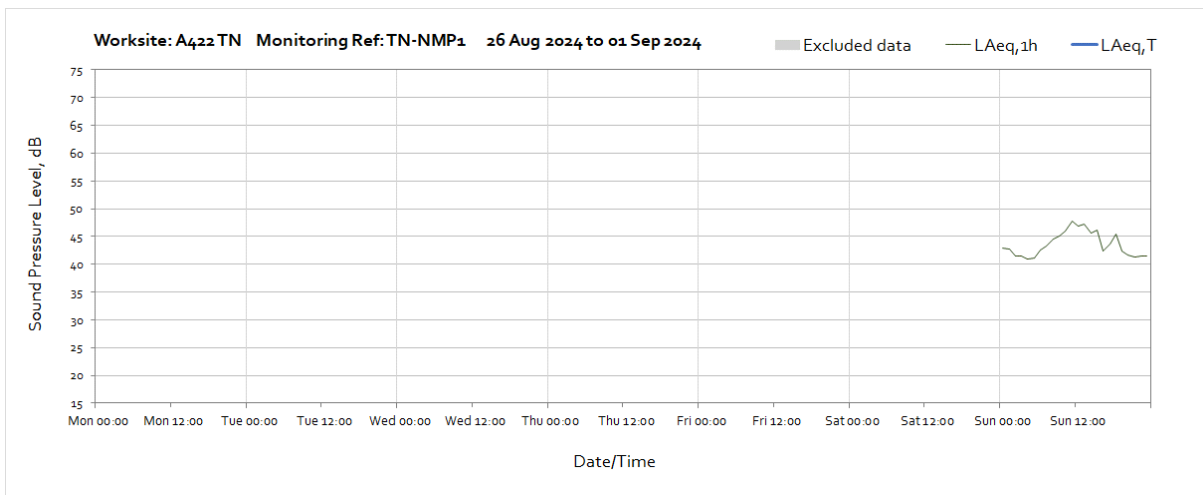


# Appendix C Data

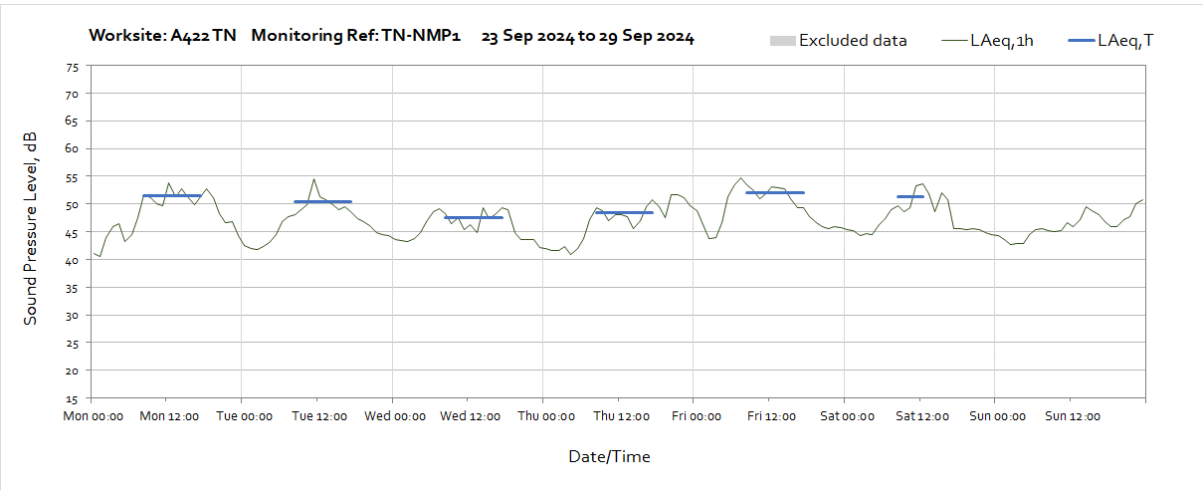
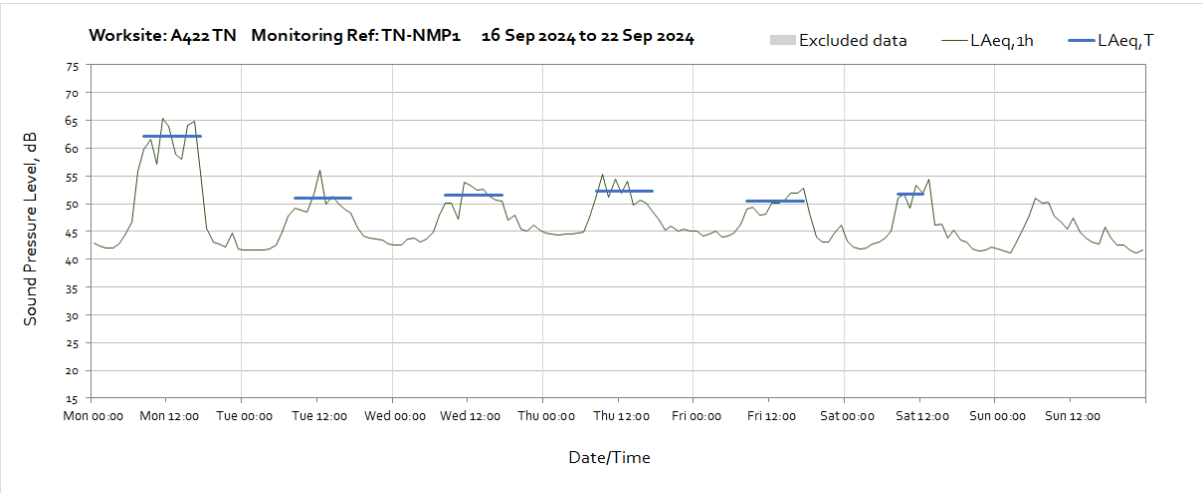
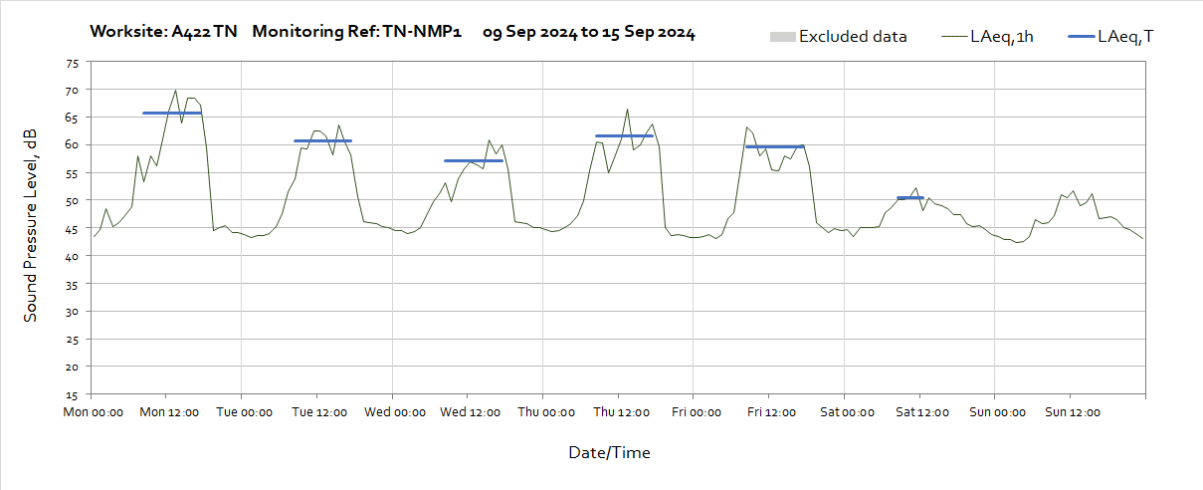
## Noise

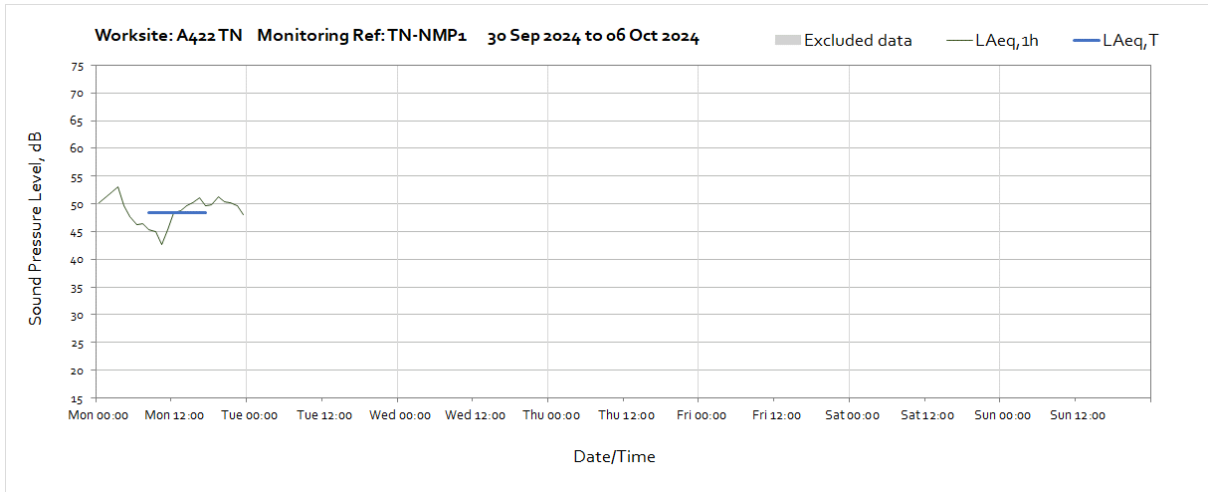
The following graphs show the hourly measured ambient noise level  $L_{Aeq,1h}$  and, where relevant, the averaged noise level  $L_{Aeq,T}$  values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods where noise levels are adversely affected by weather or only measured 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: A422 TN – Monitoring Ref: TN-NMP1

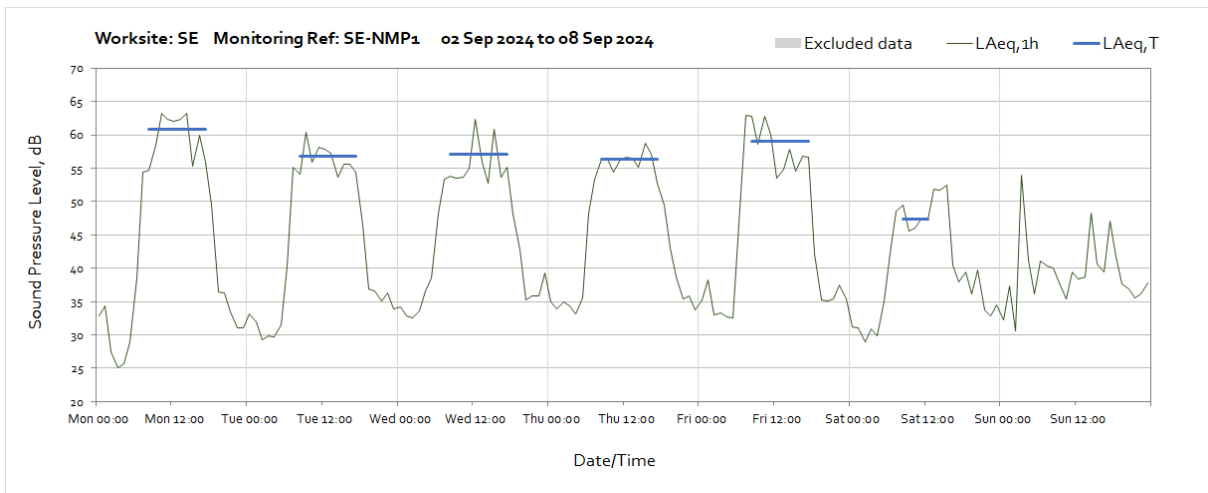
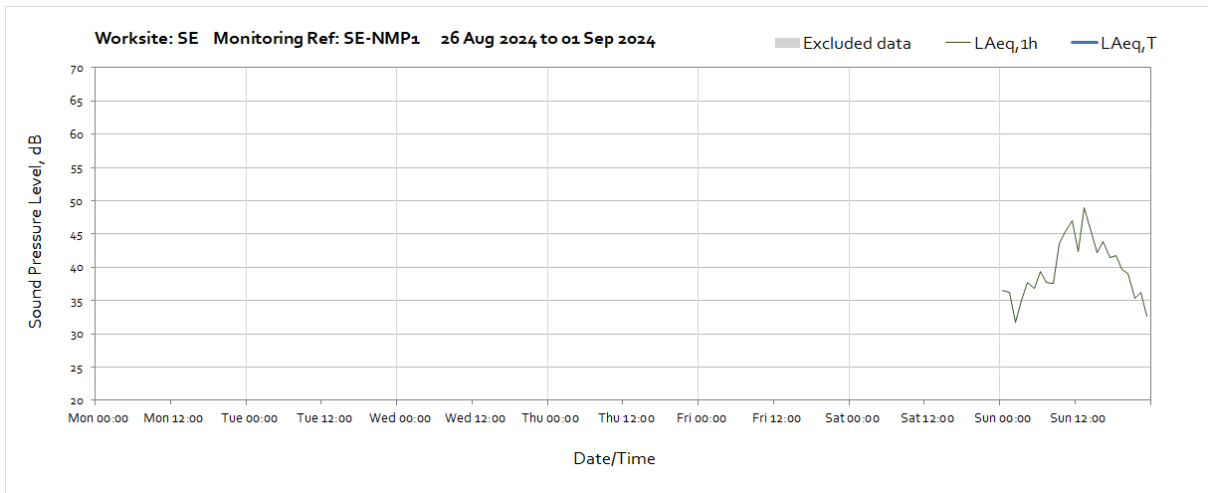


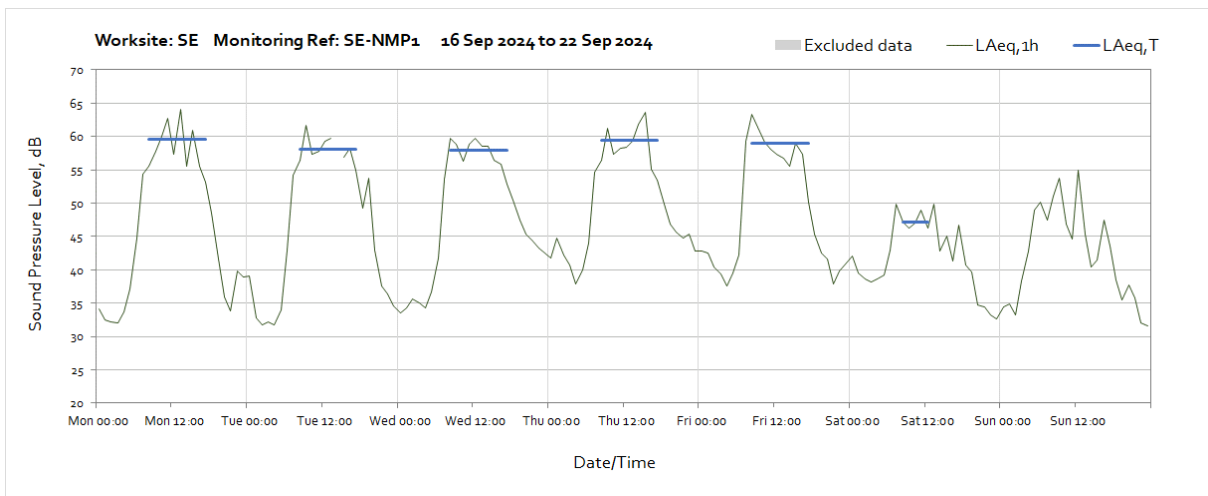
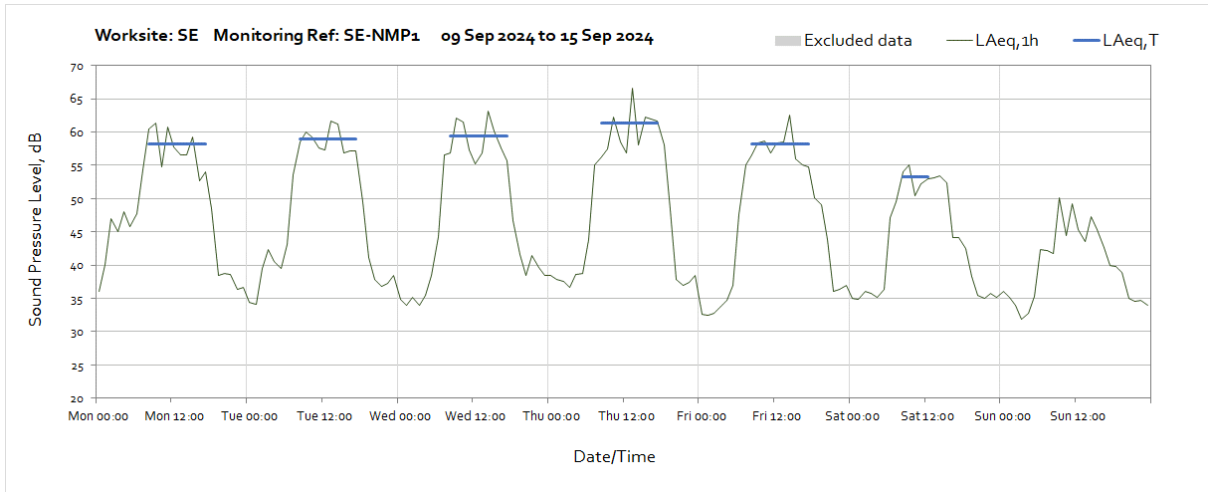




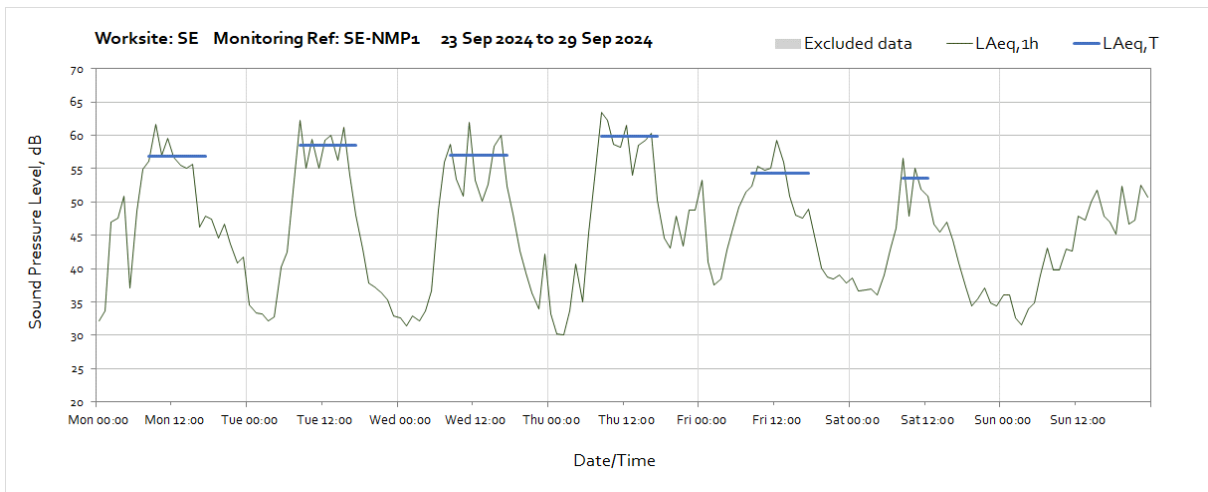


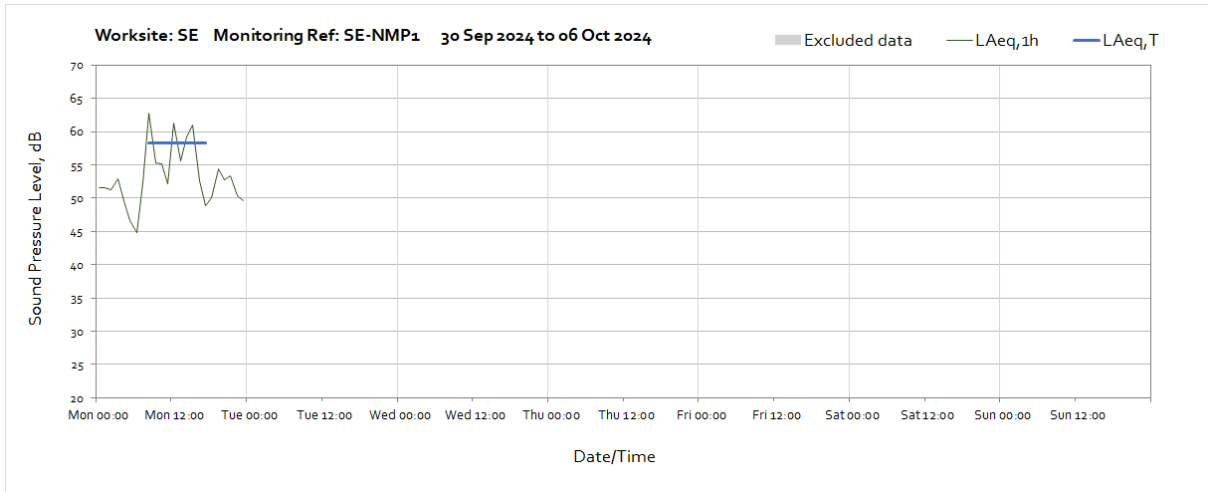
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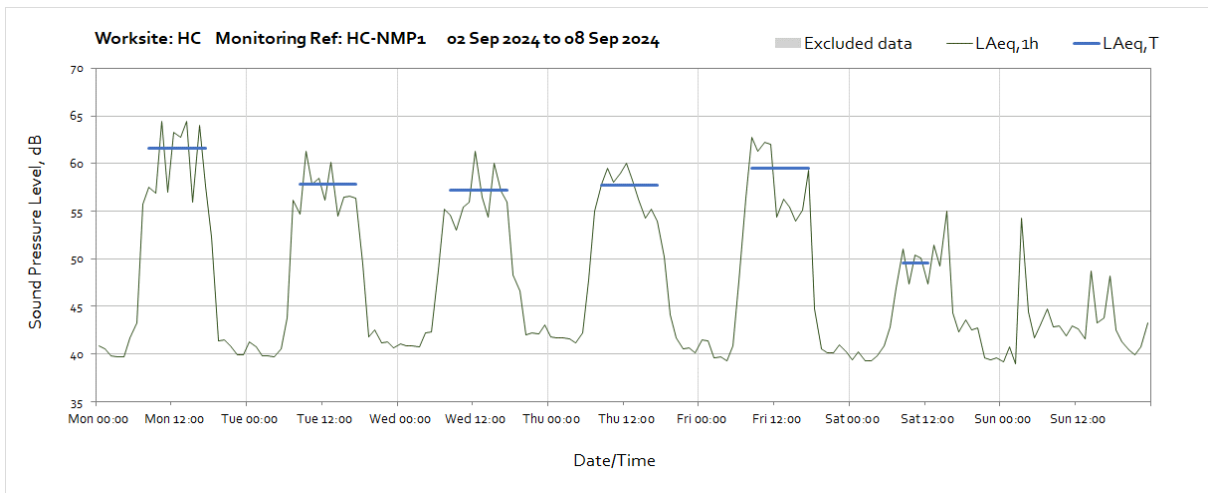
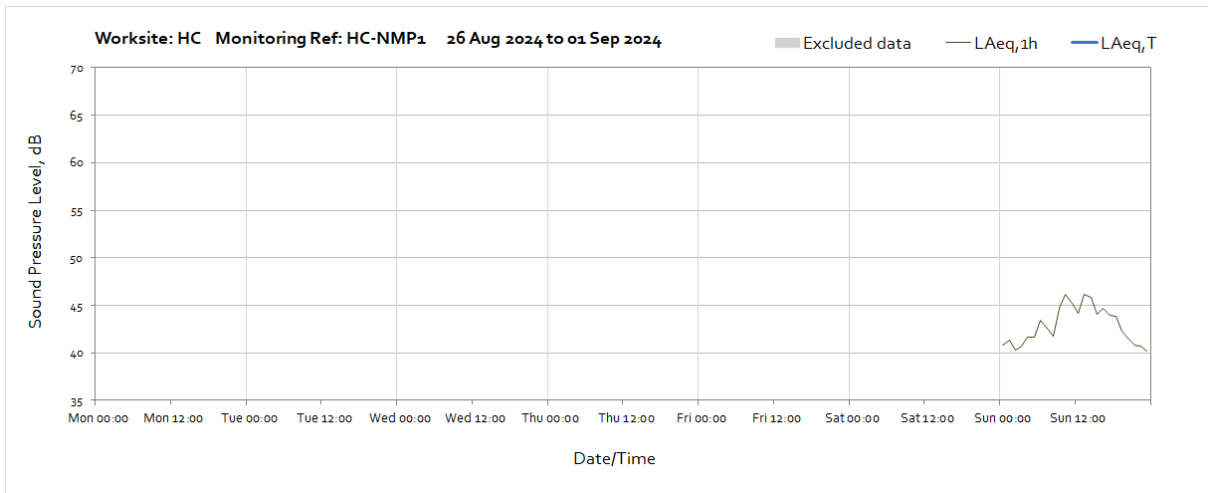


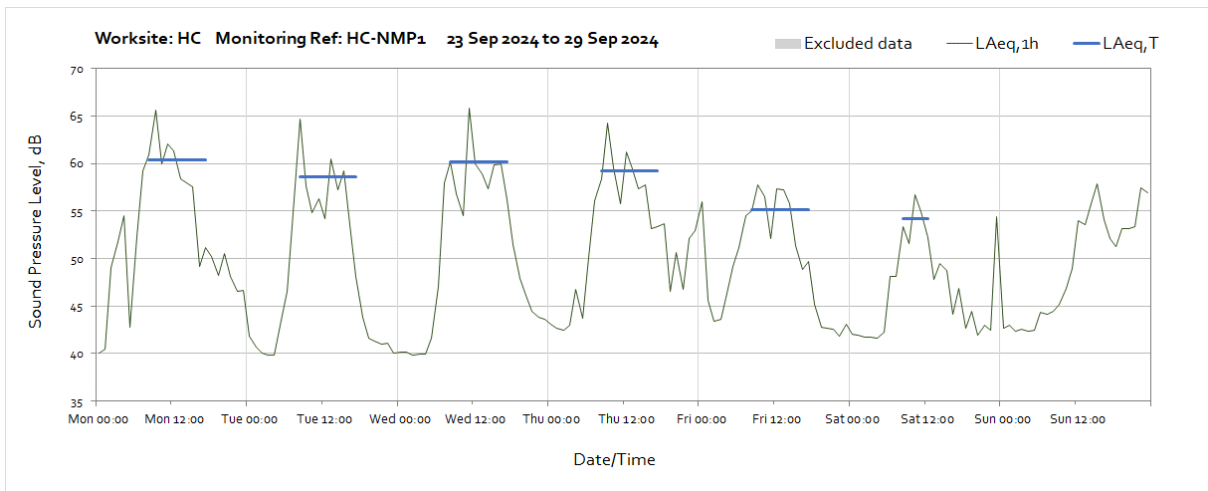
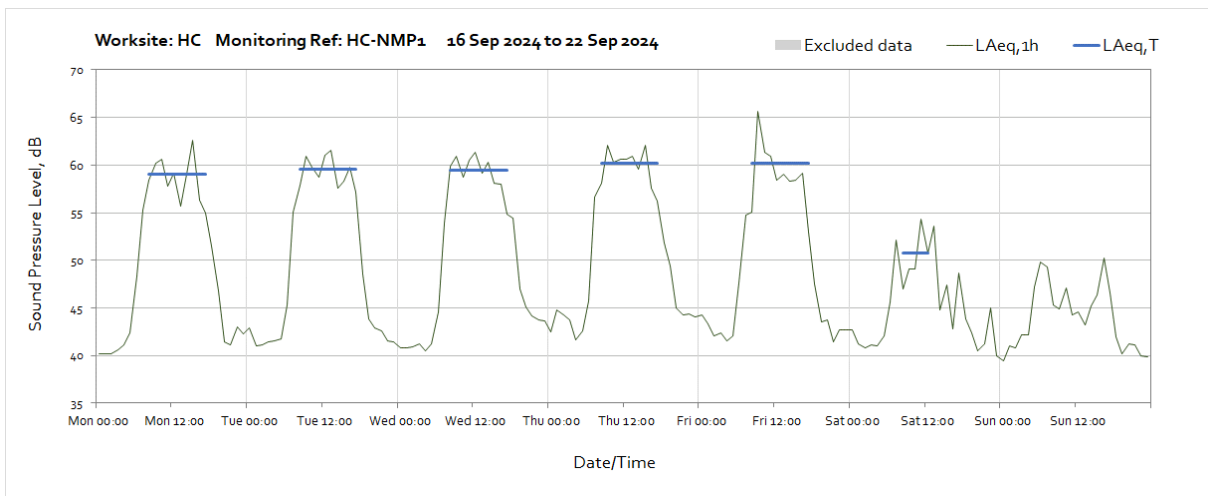
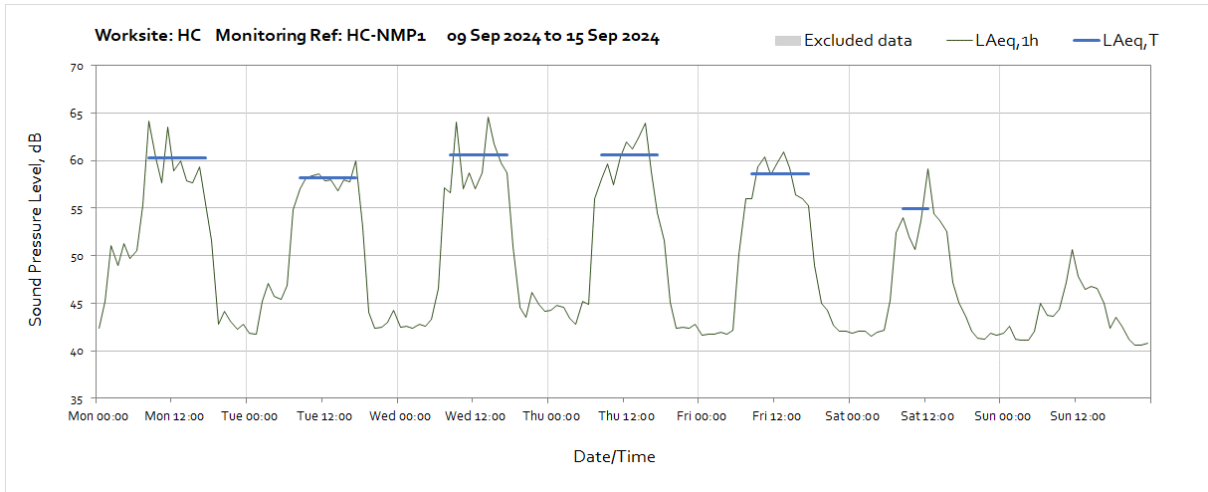
Note: Missing data between 14:00 and 15:00 on Tuesday 17<sup>th</sup> September was due to monitor maintenance.

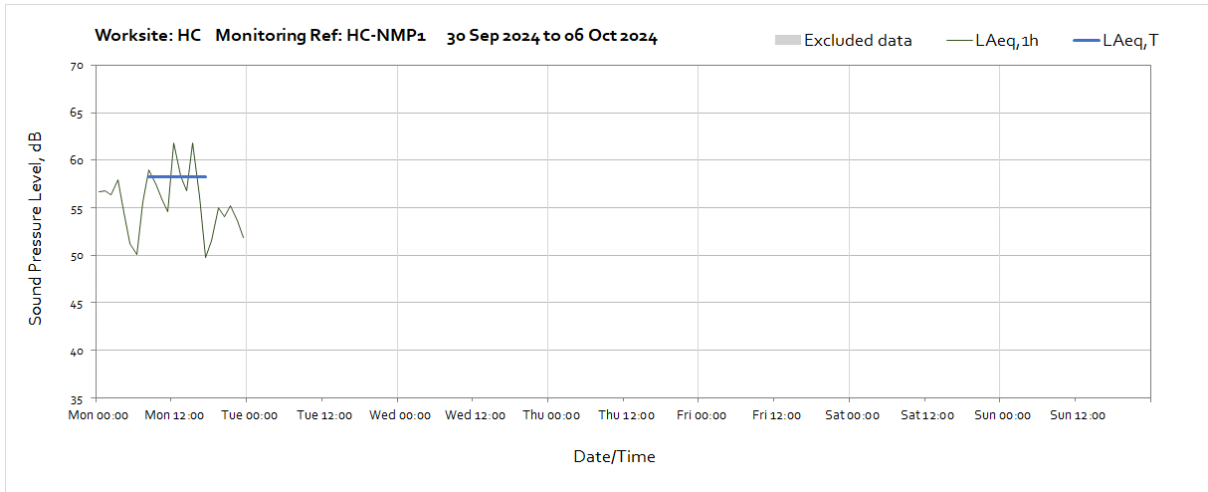




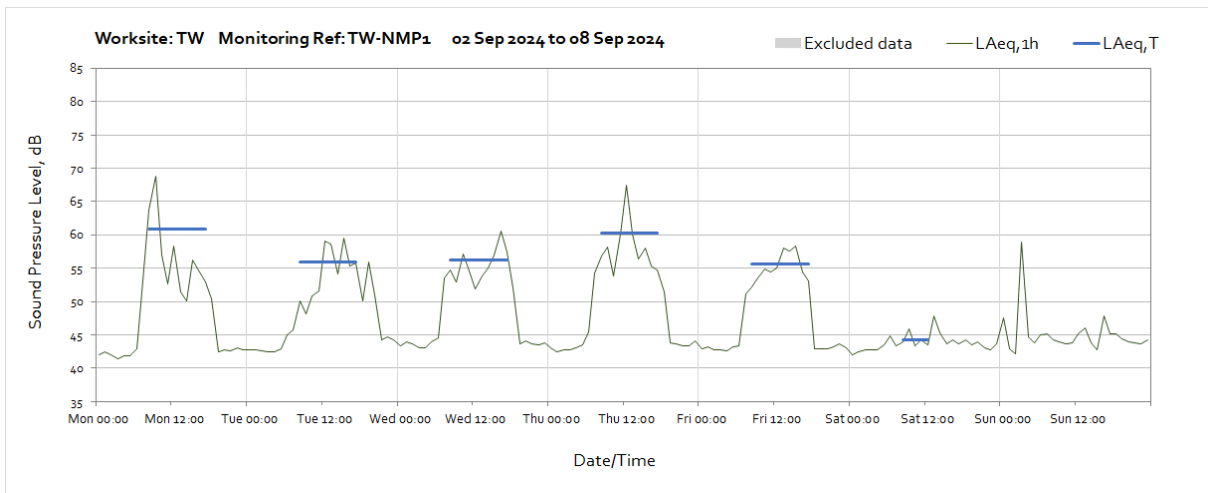
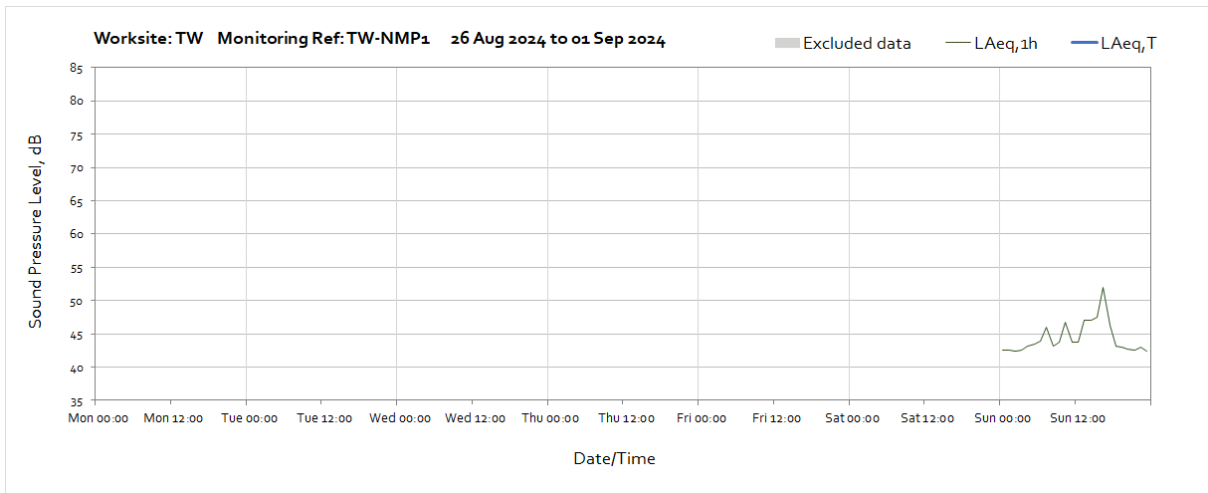
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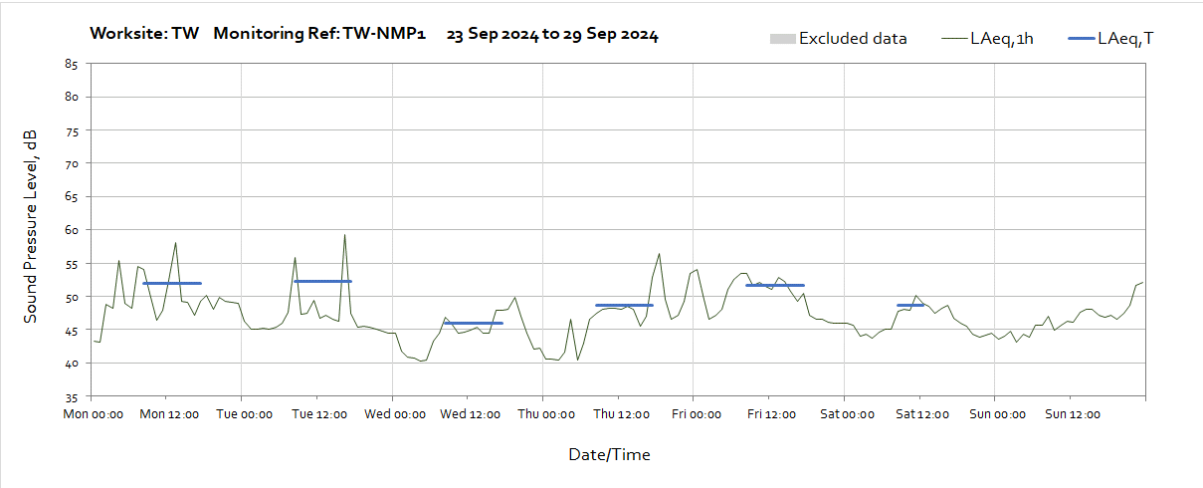
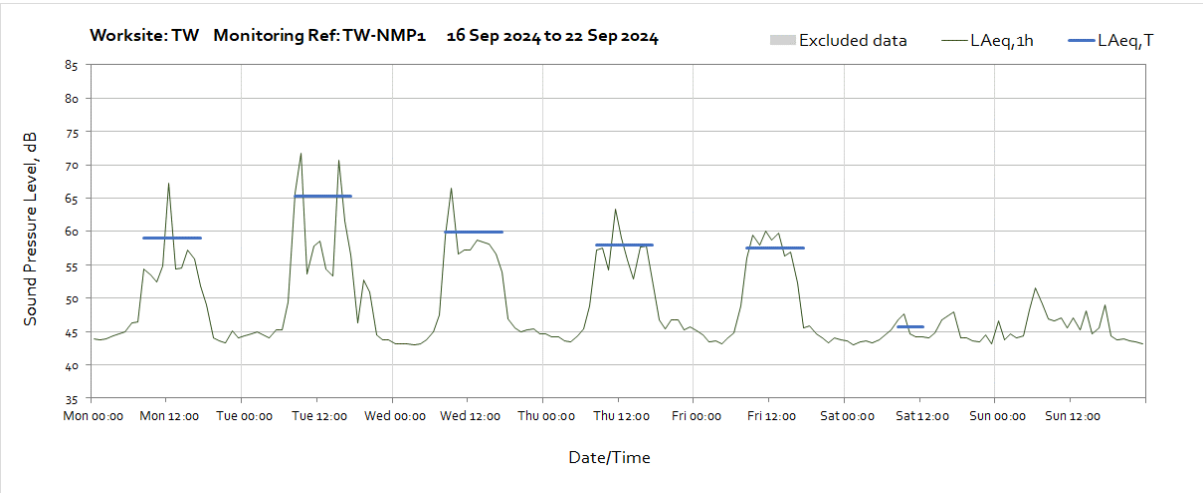
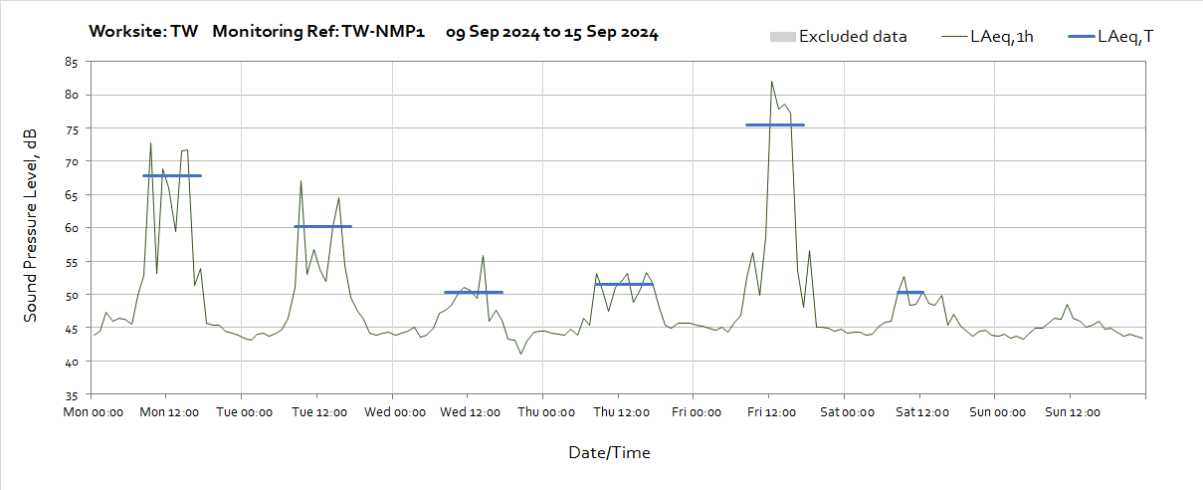


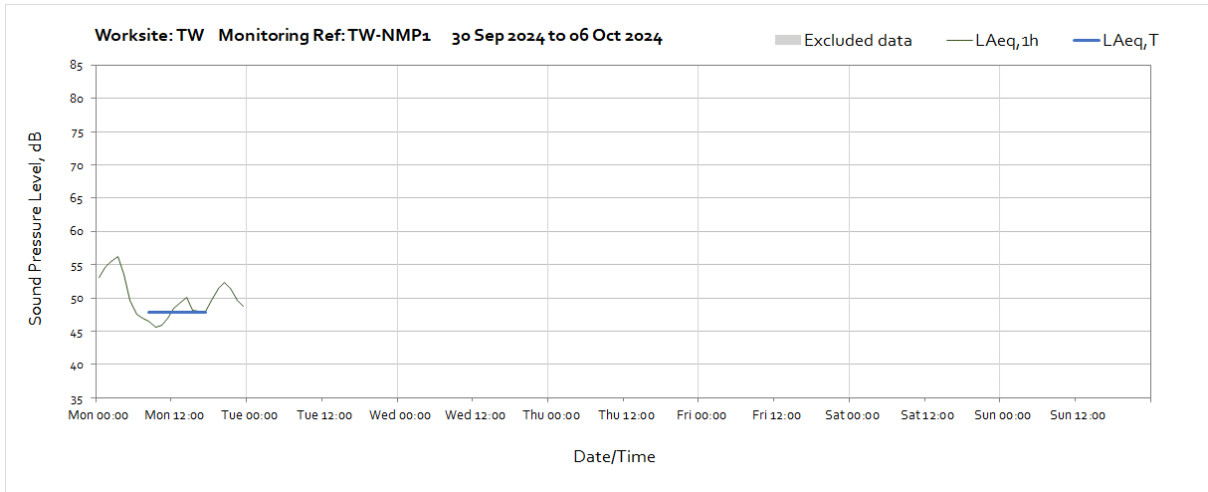




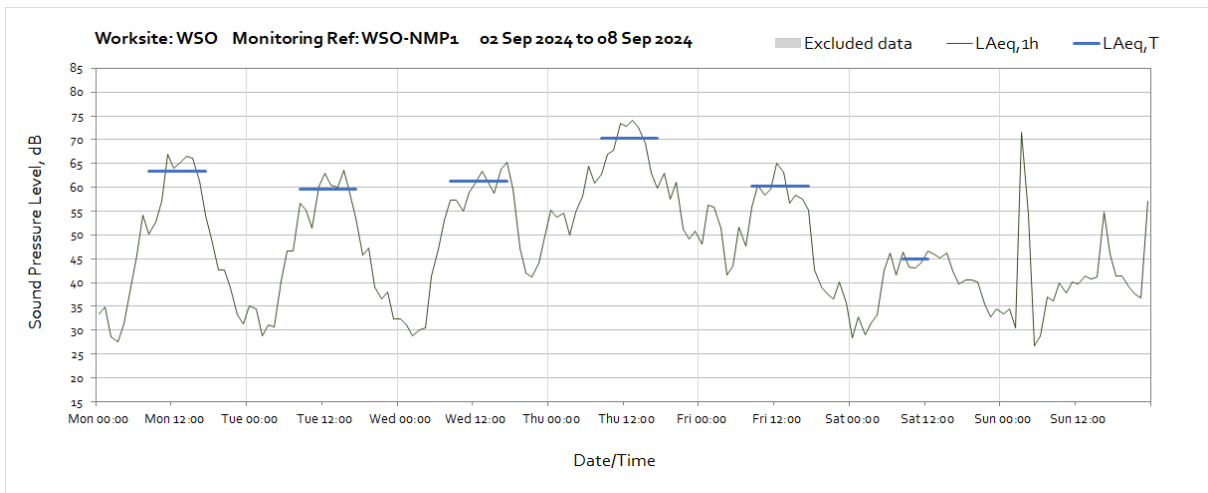
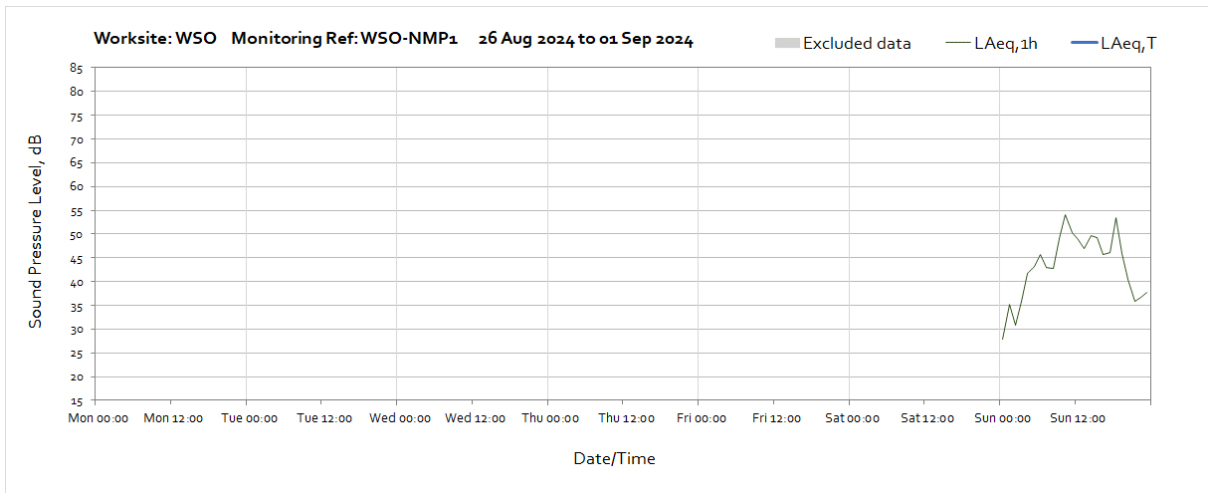
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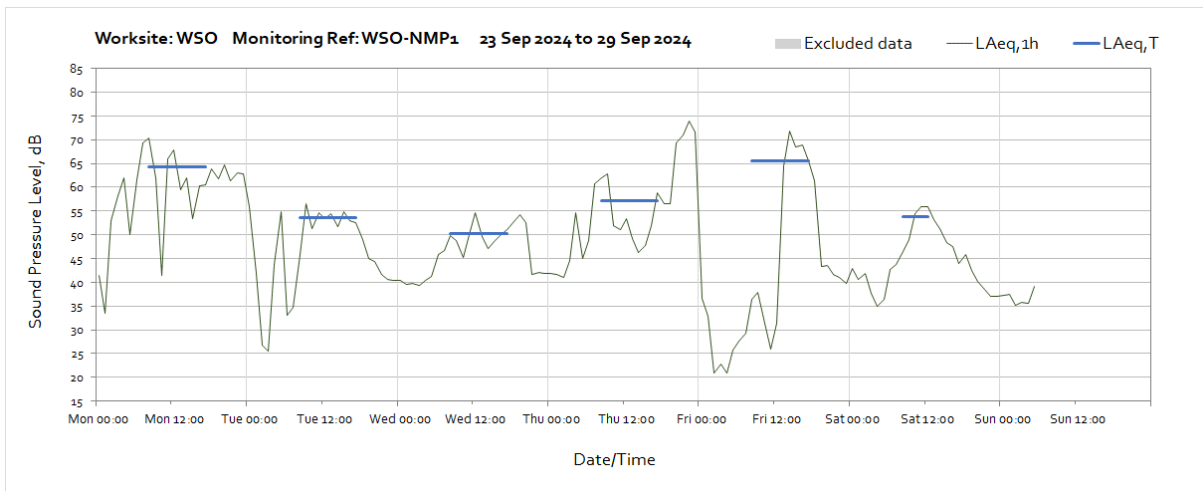
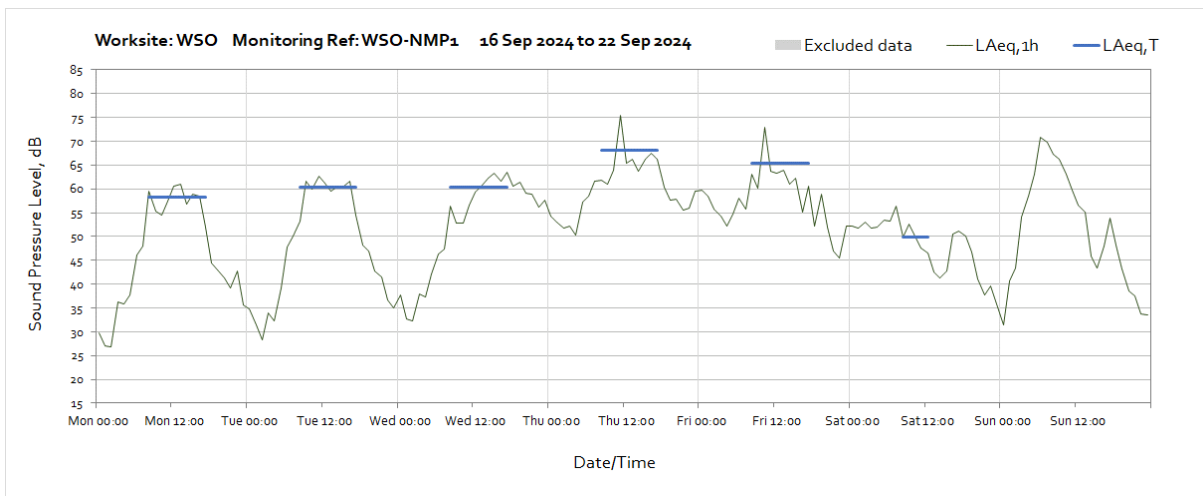
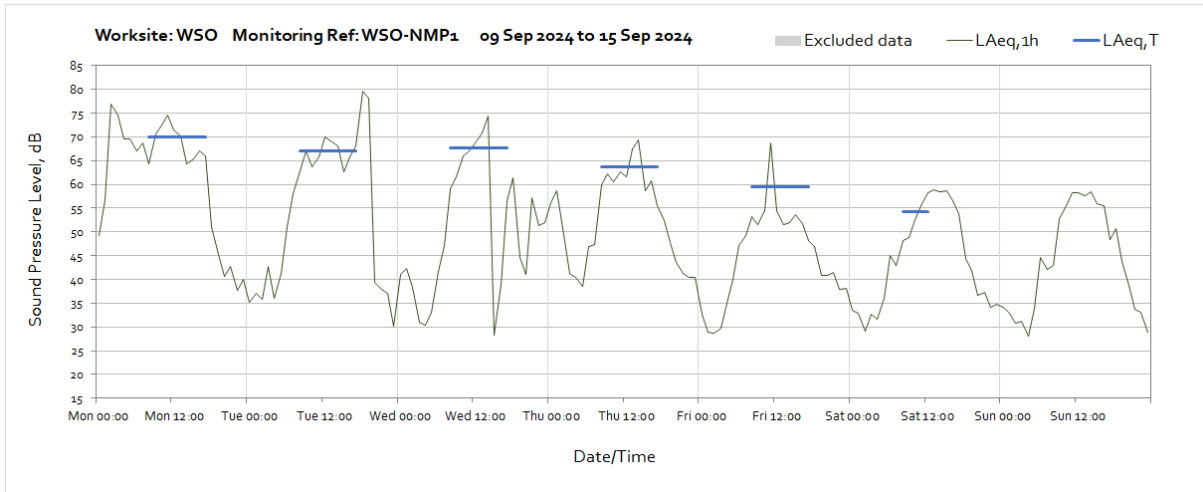




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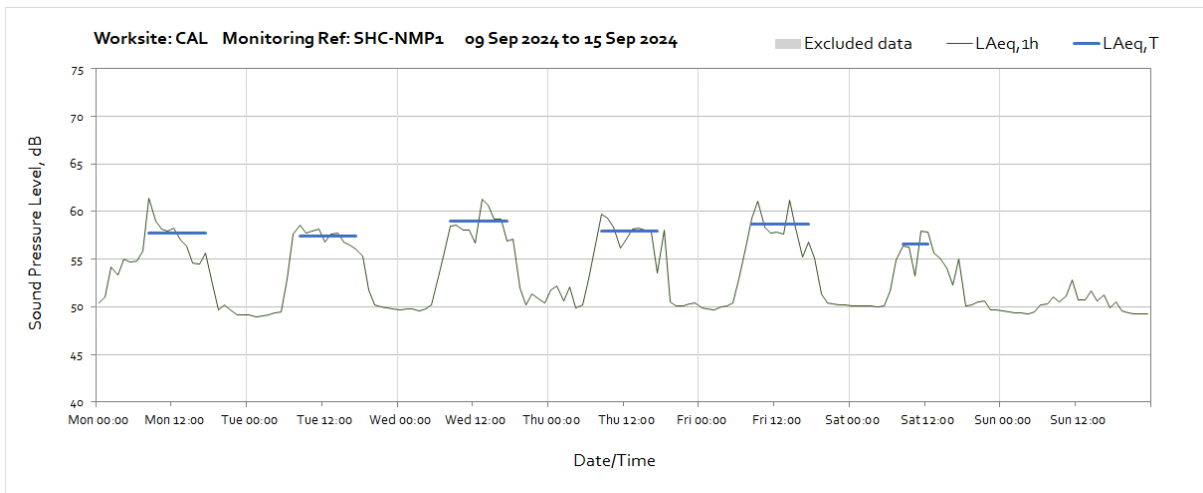
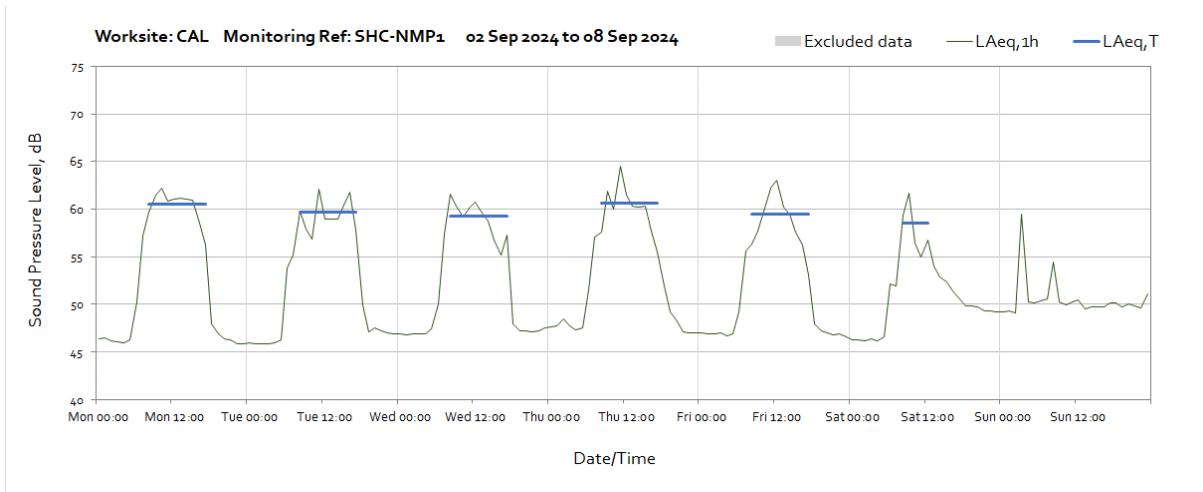
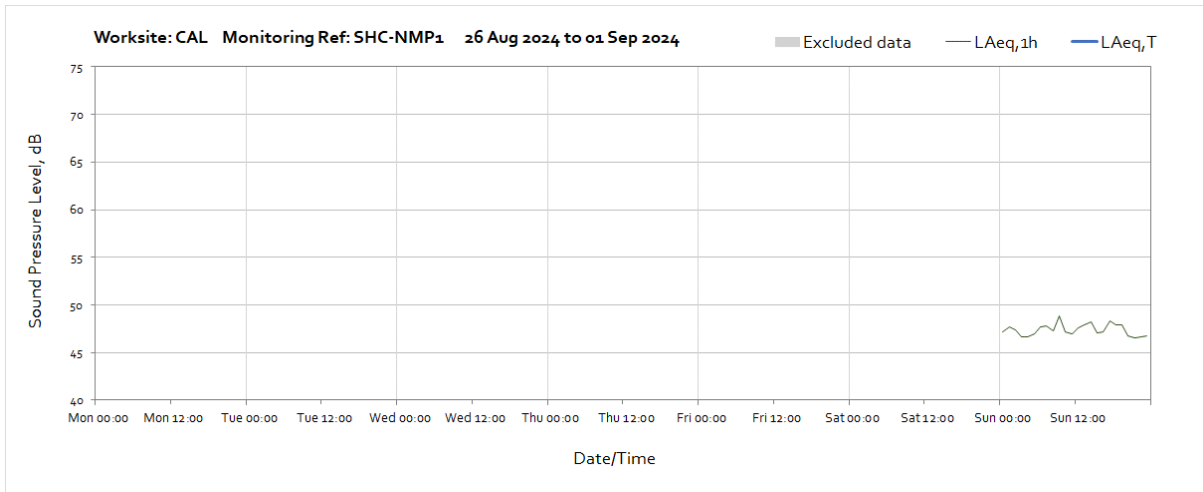


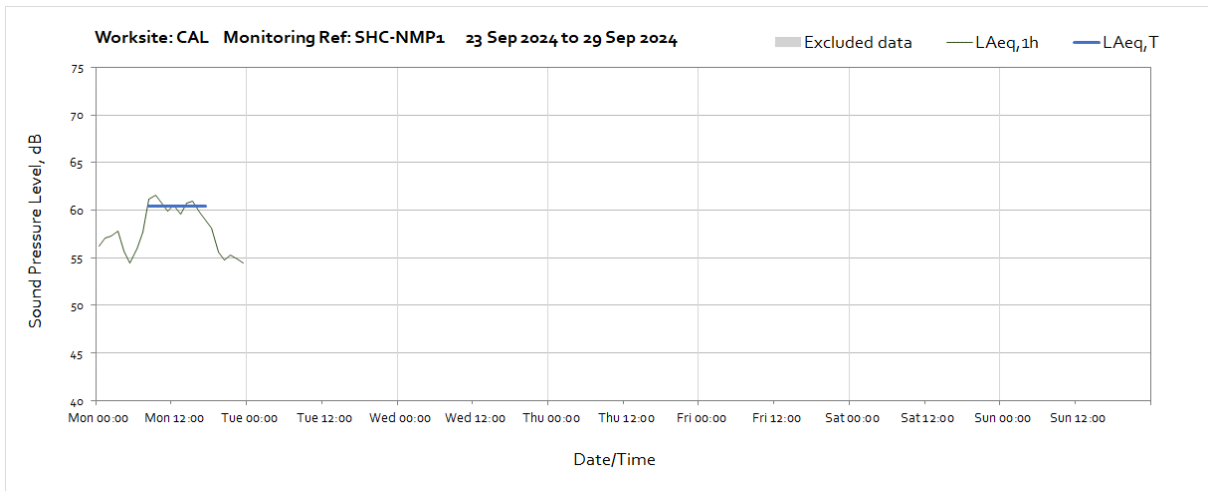
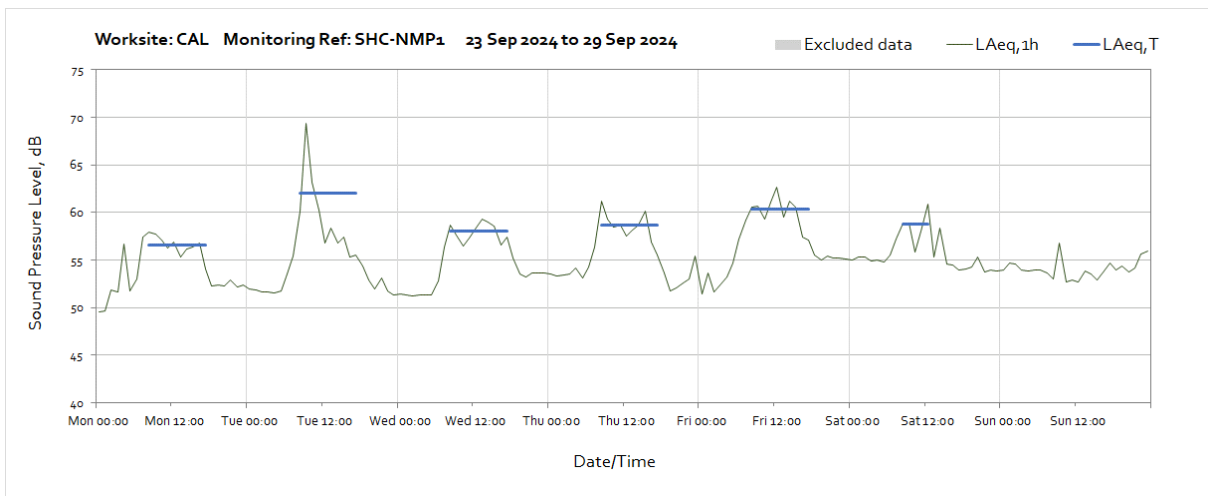
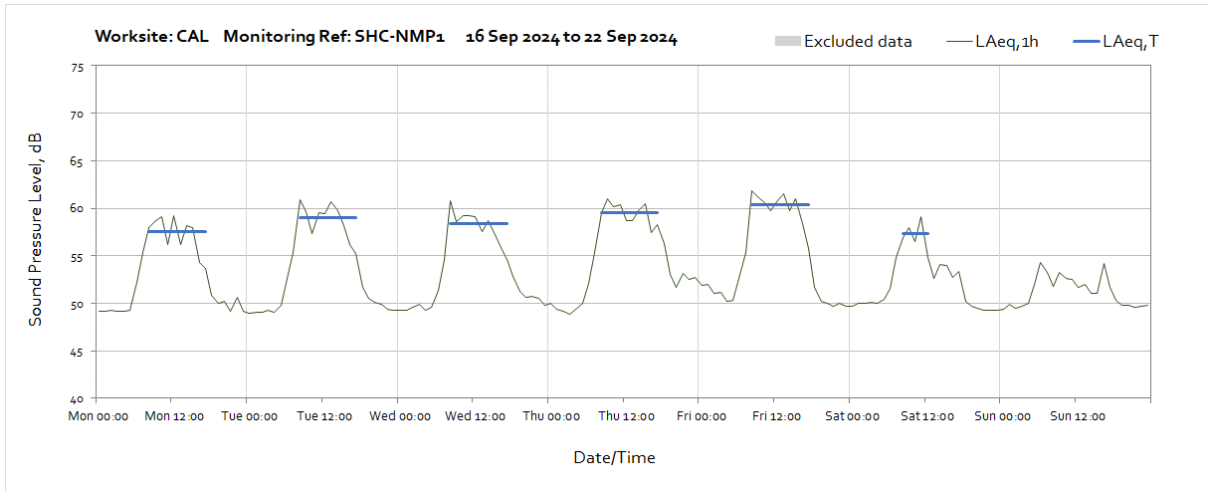




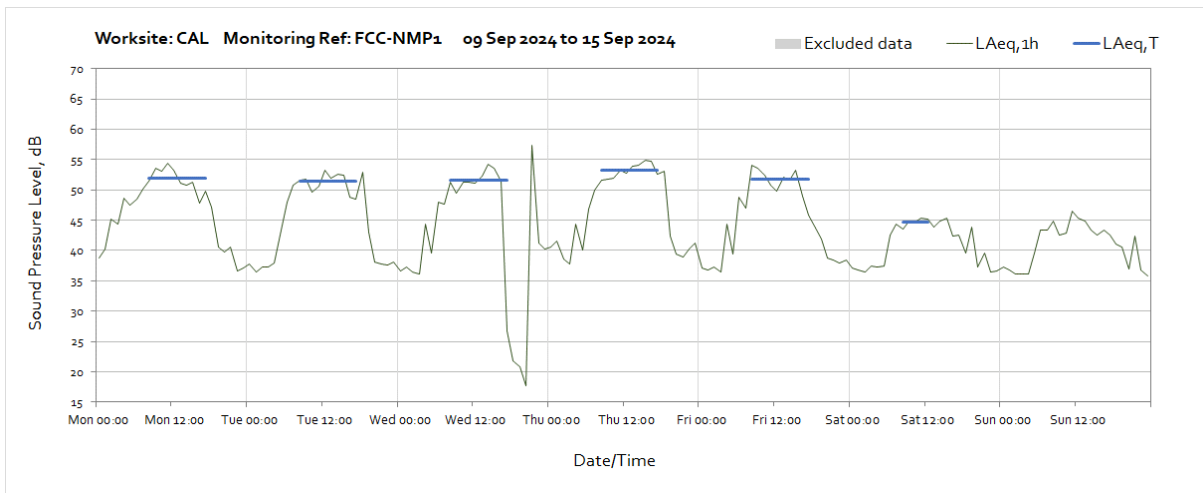
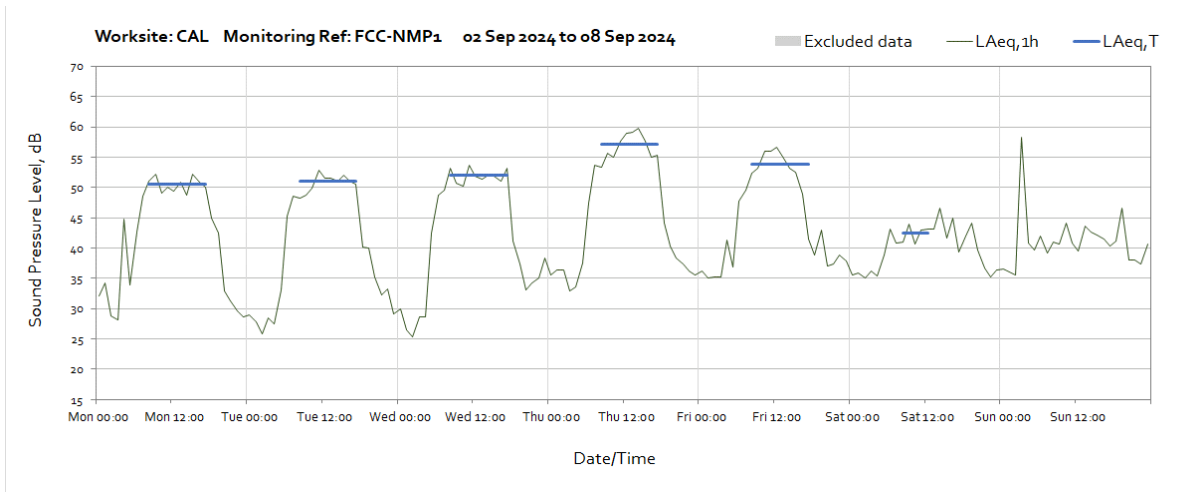
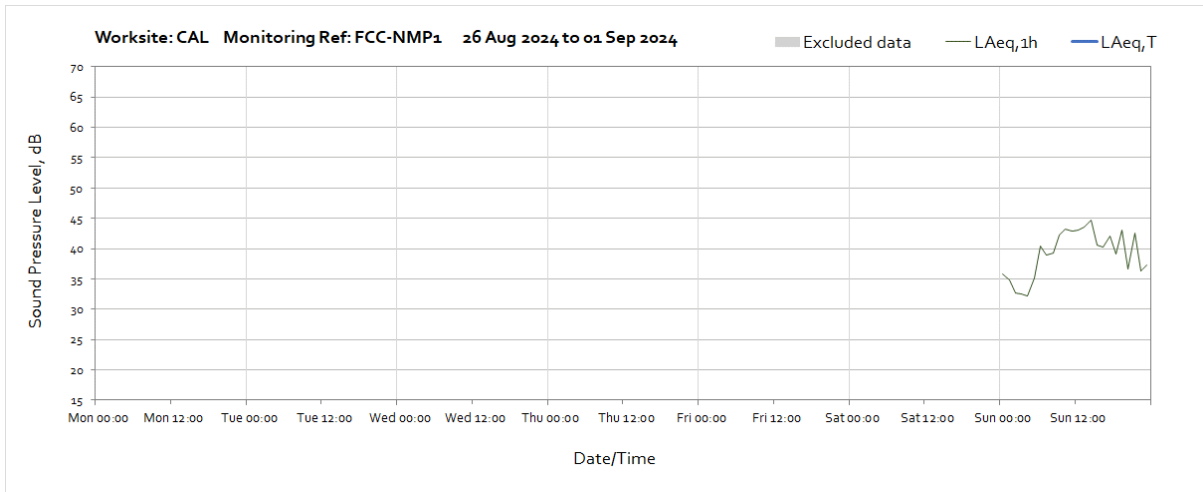
Note: Monitor was offline from 06:00 on Sunday 29<sup>th</sup> September due to flooding to the monitoring location, the monitoring equipment is due to be replaced.

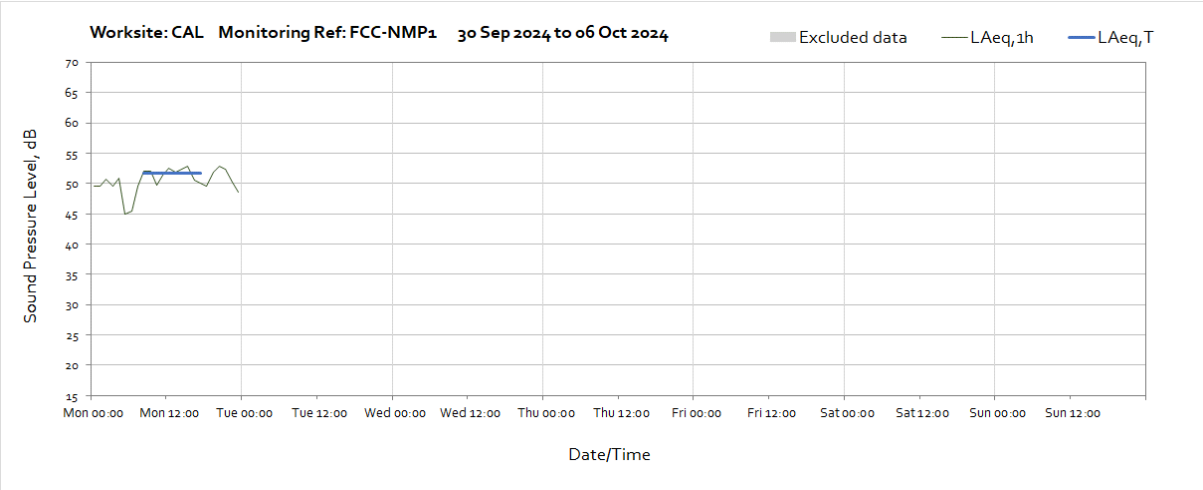
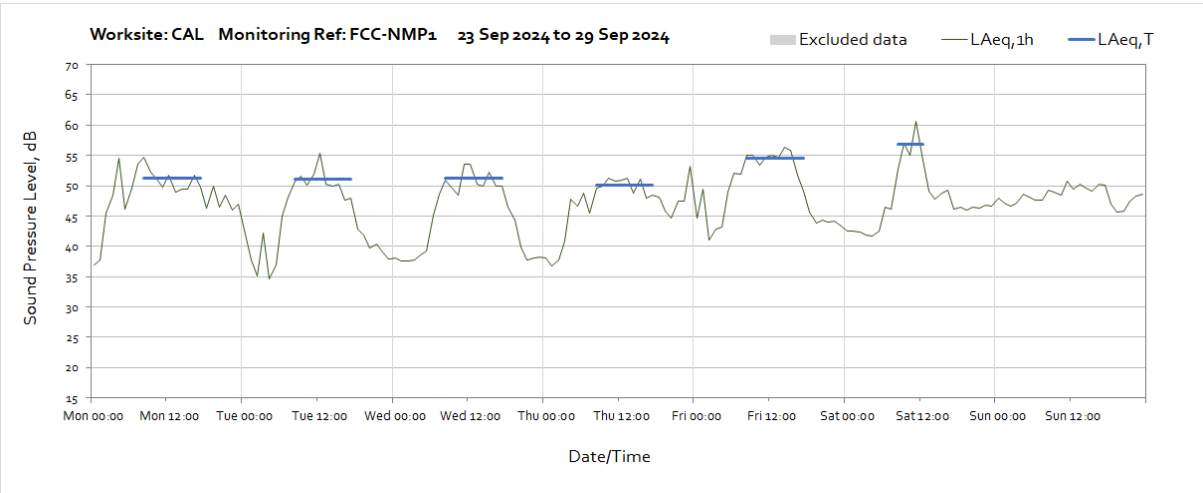
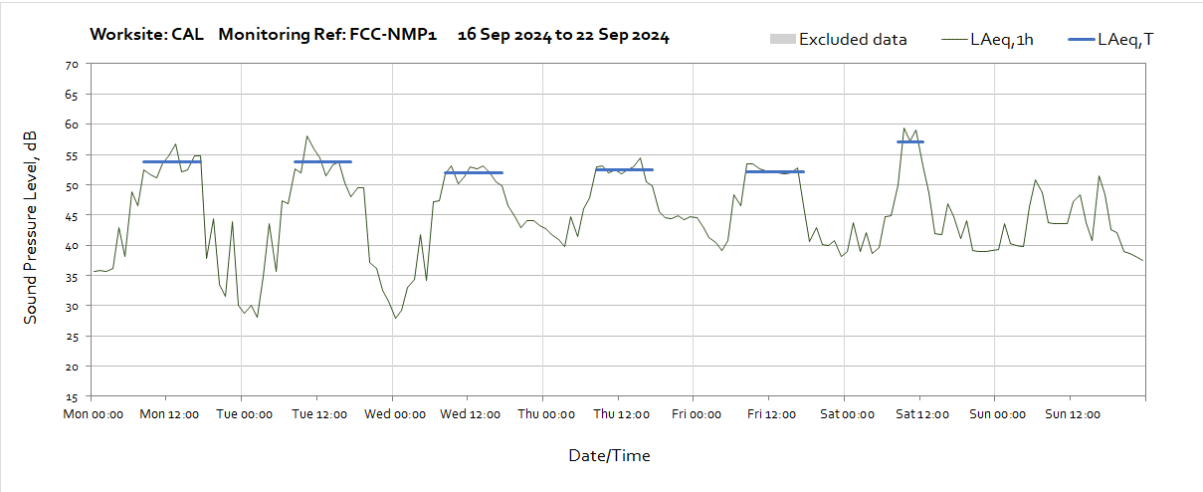
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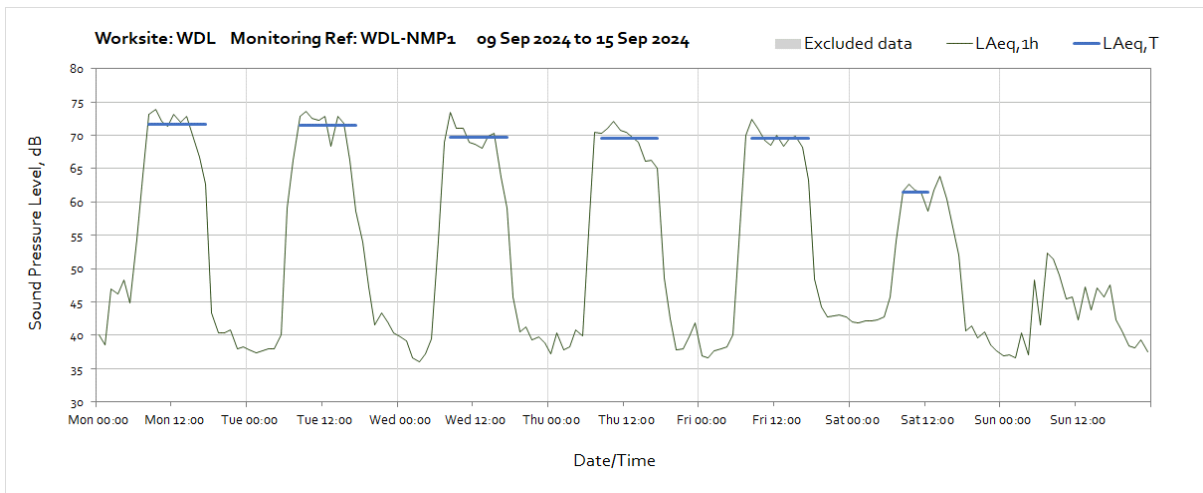
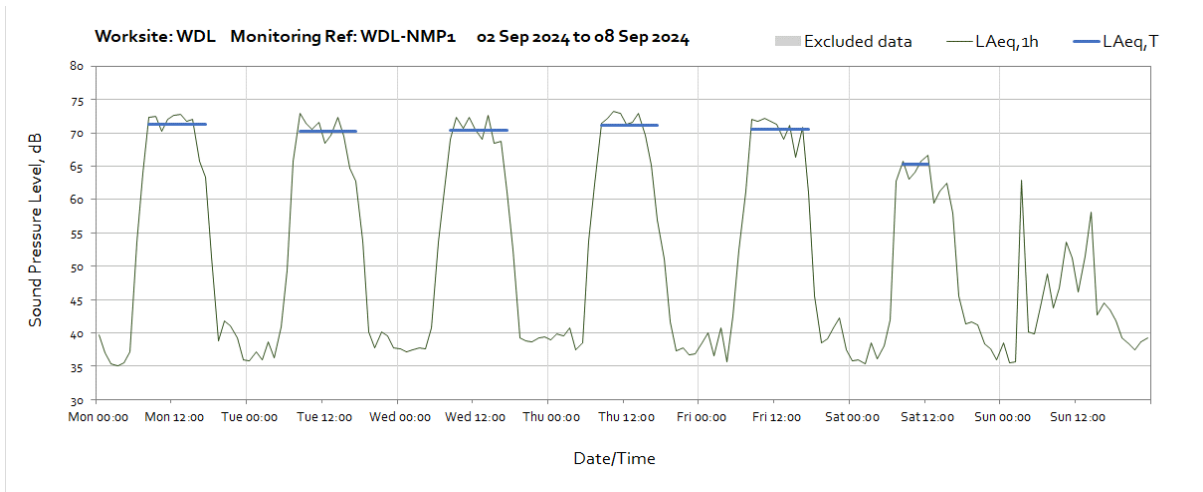
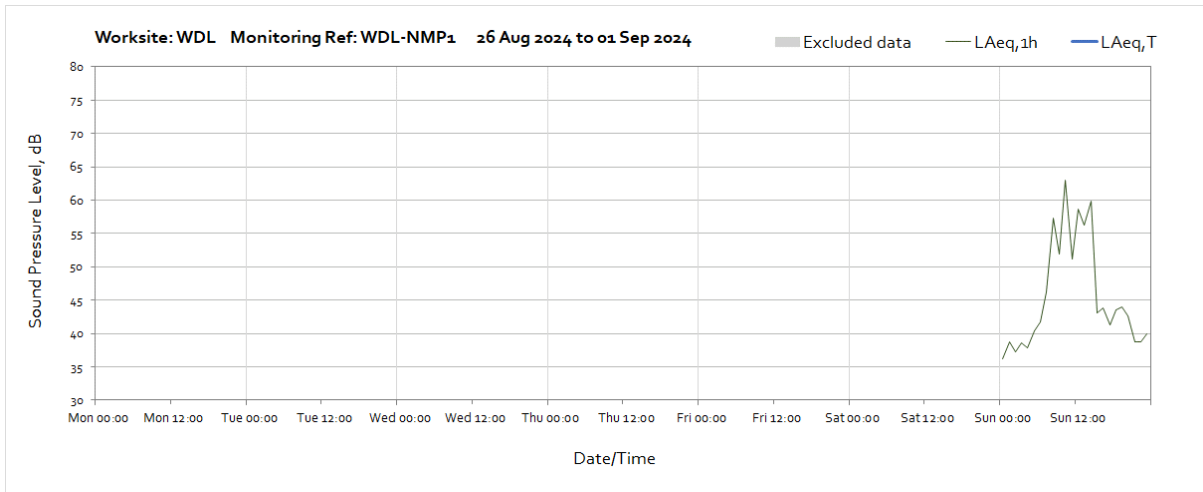


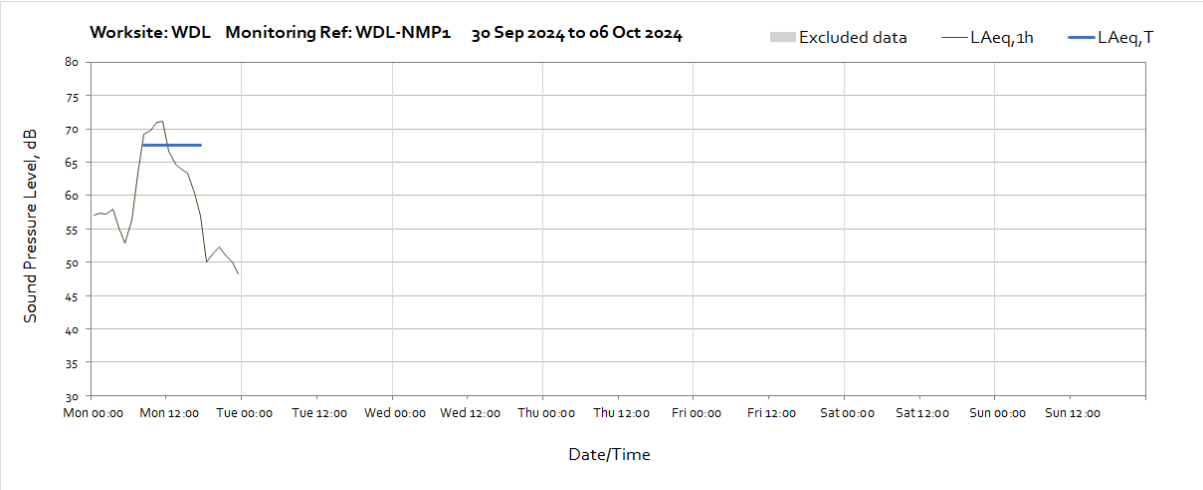
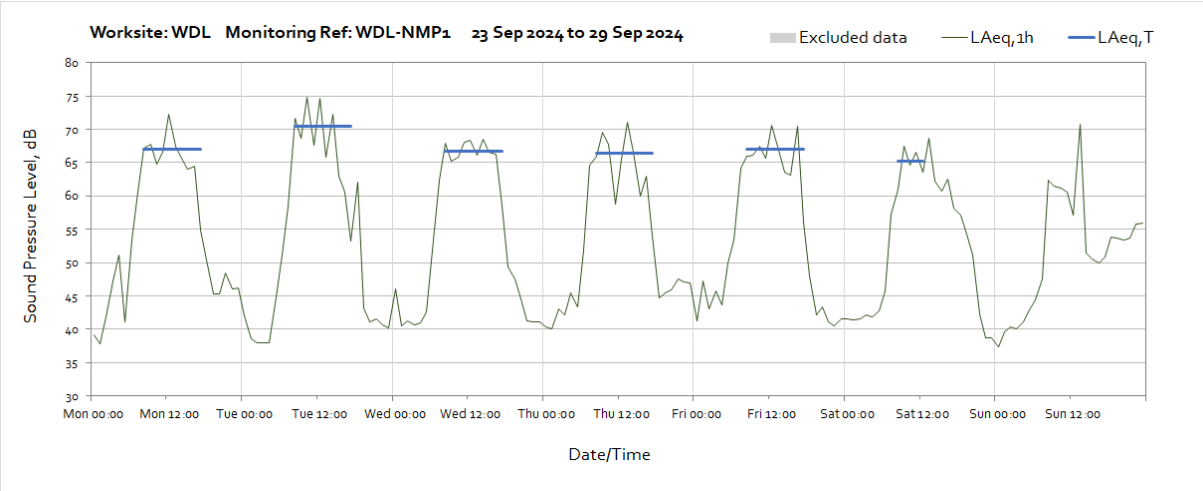
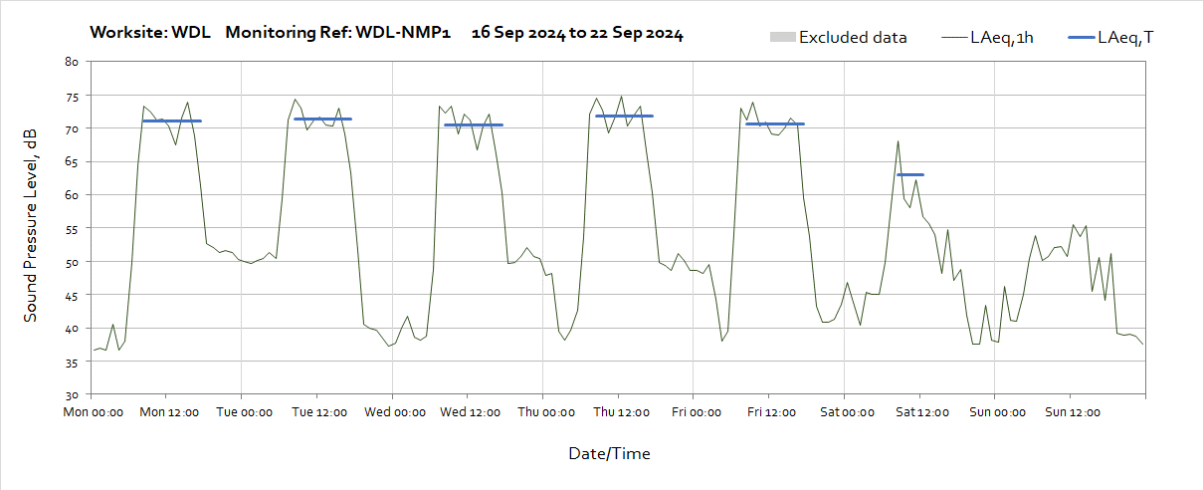
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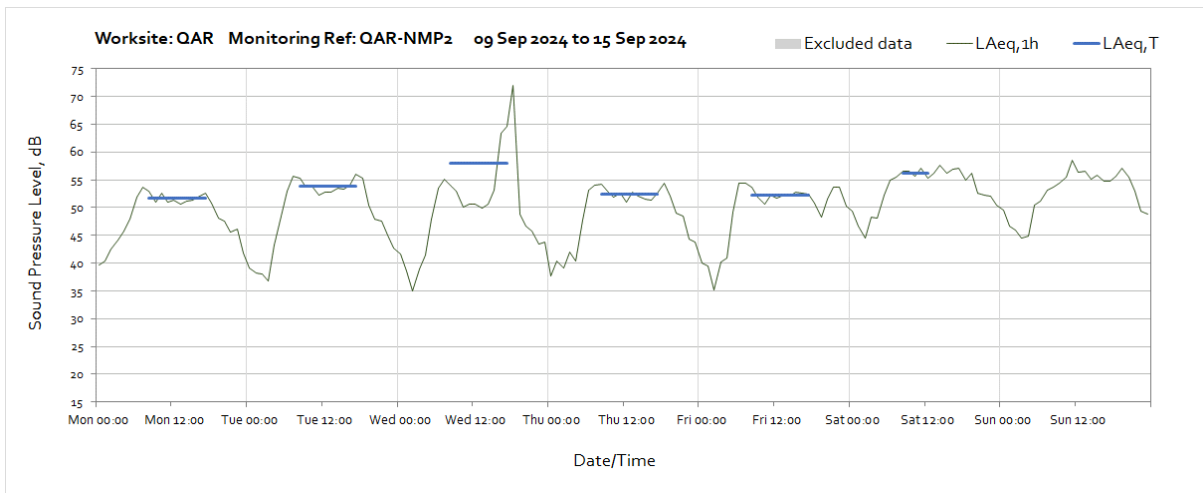
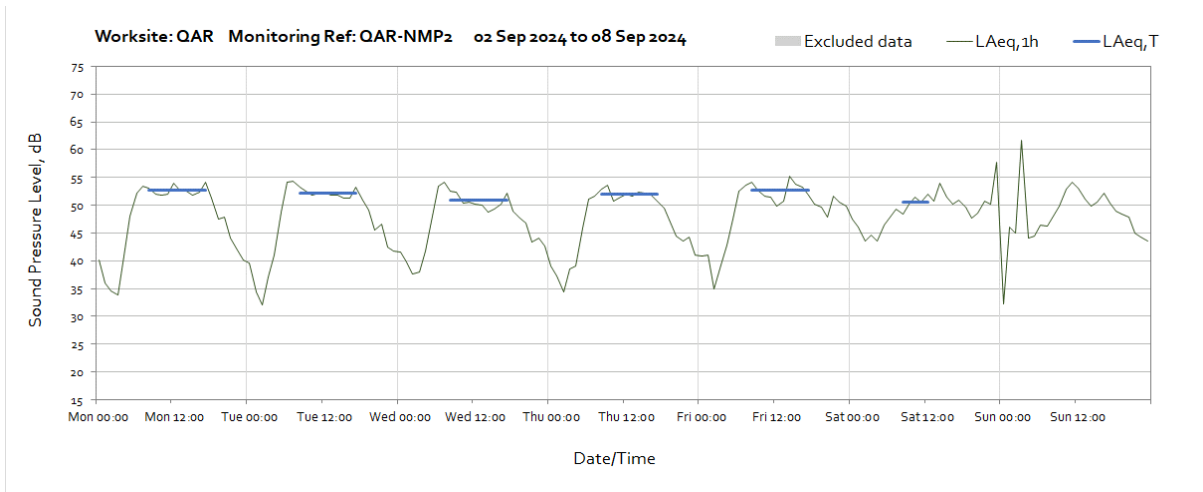
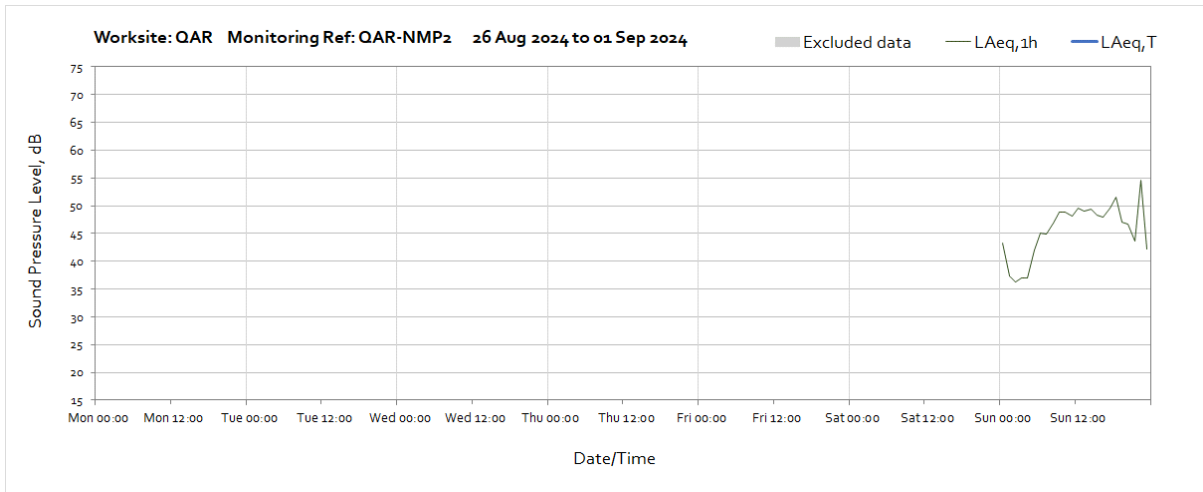


# Worksite: WDL – Monitoring Ref: WDL-NMP1

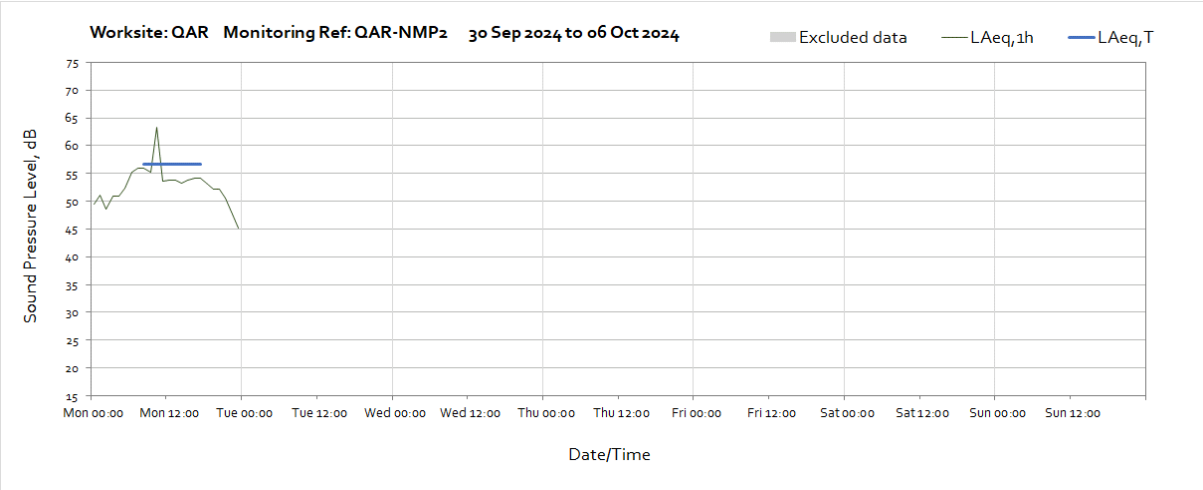
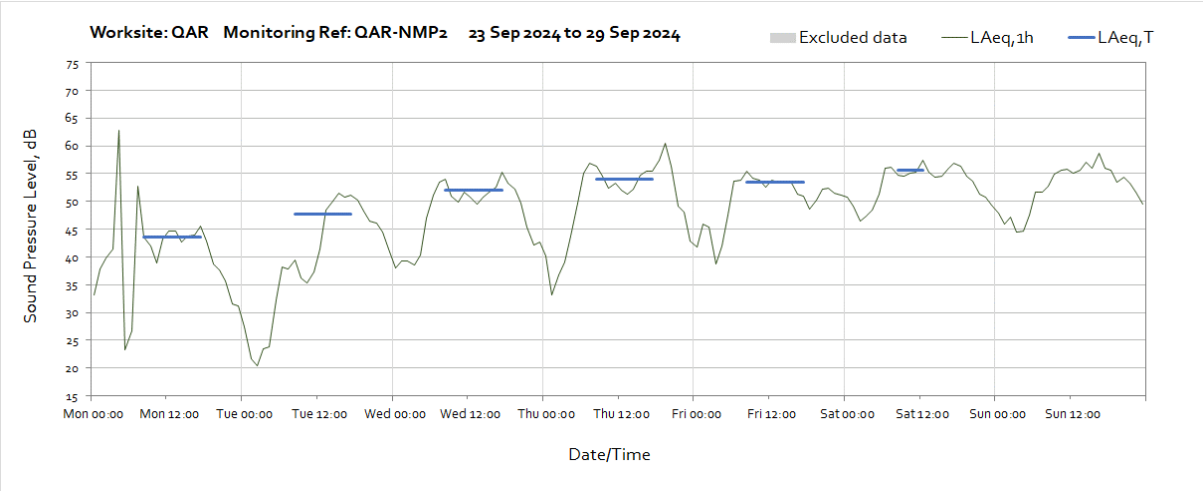
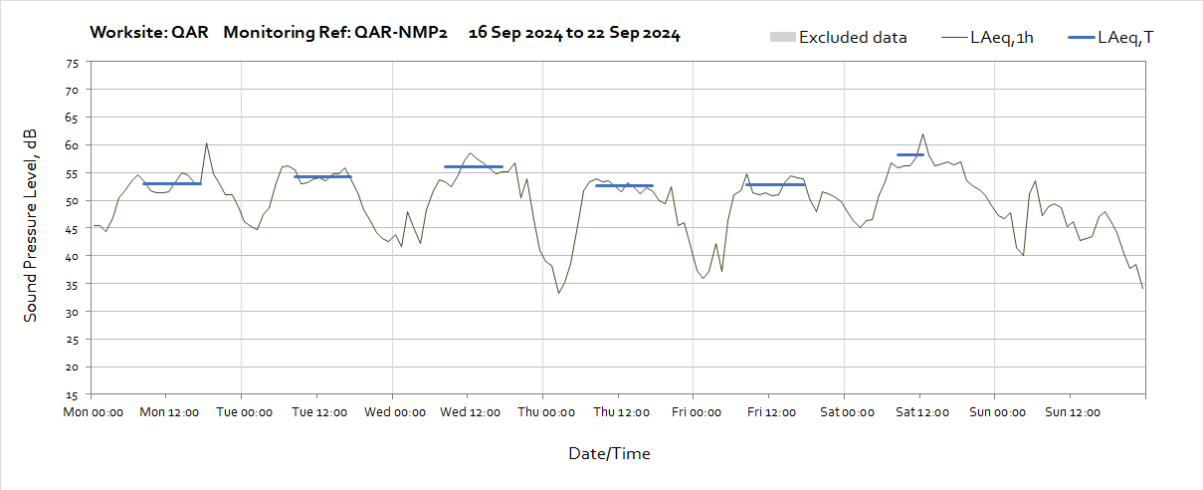




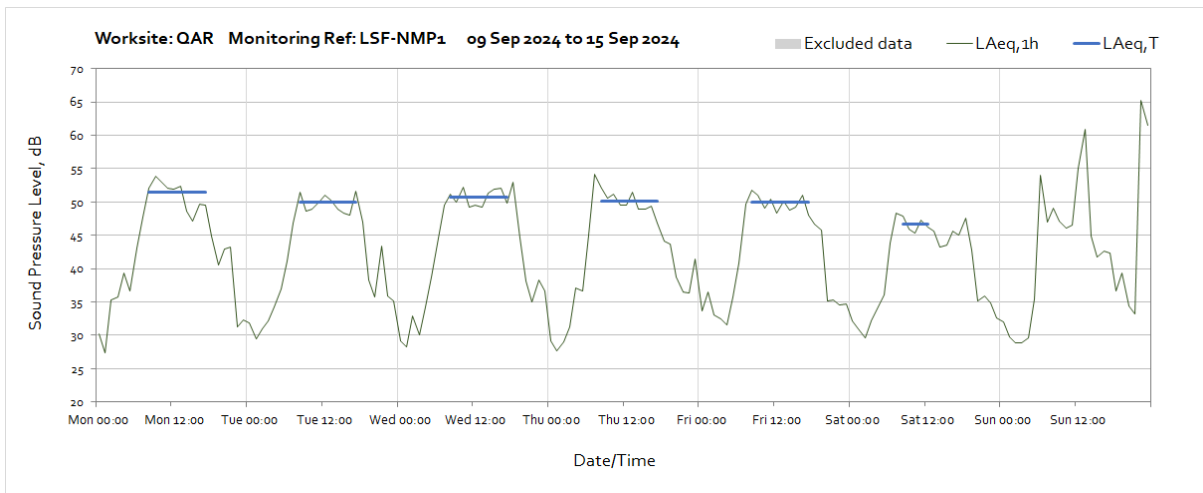
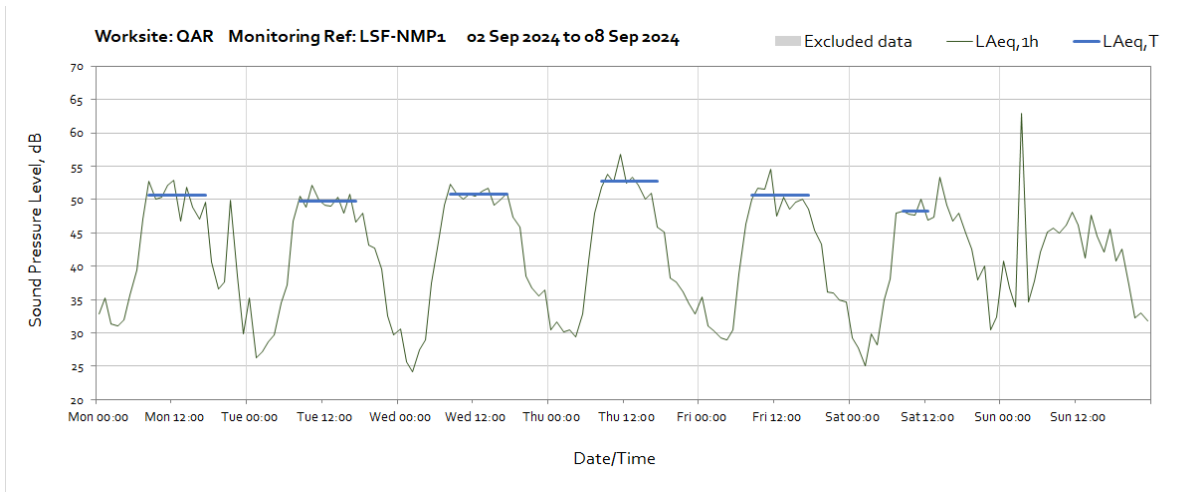
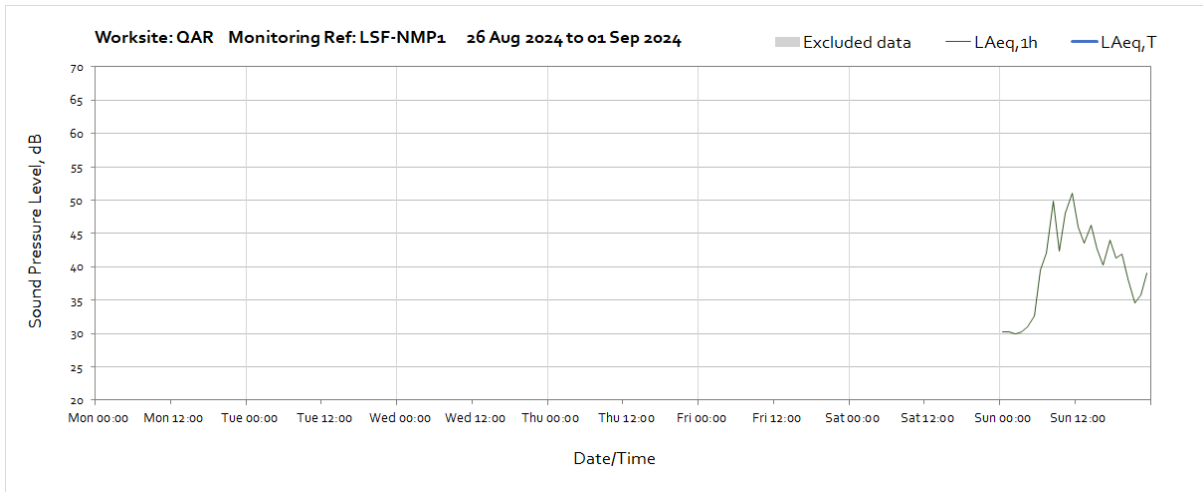
## Worksite: QAR – Monitoring Ref: QAR-NMP2



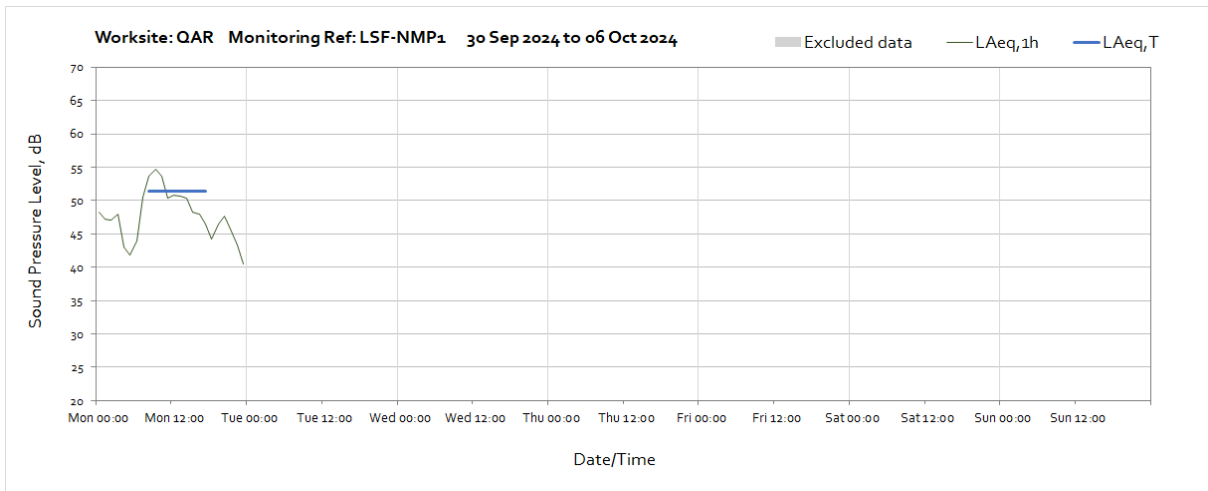
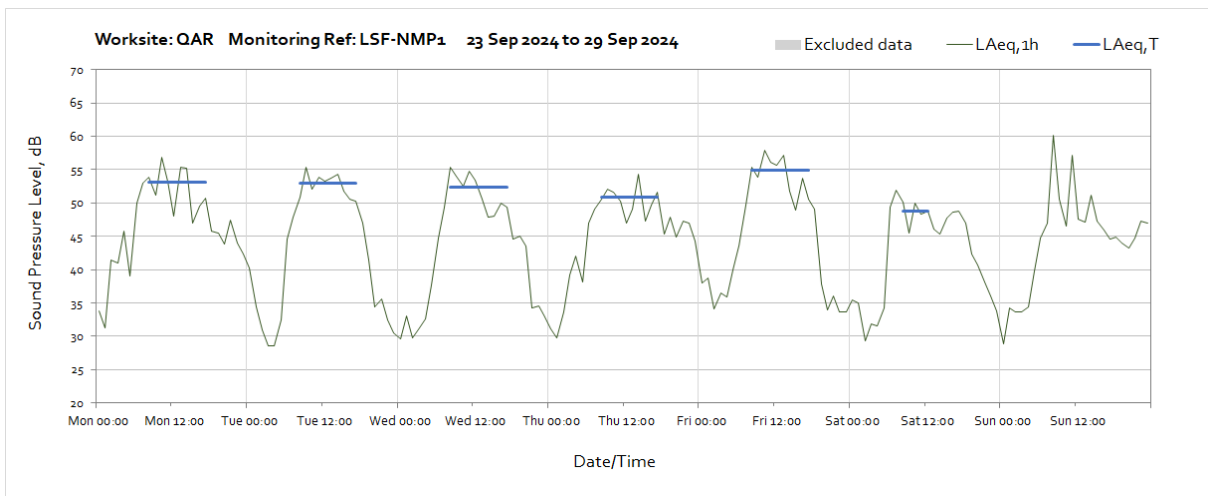
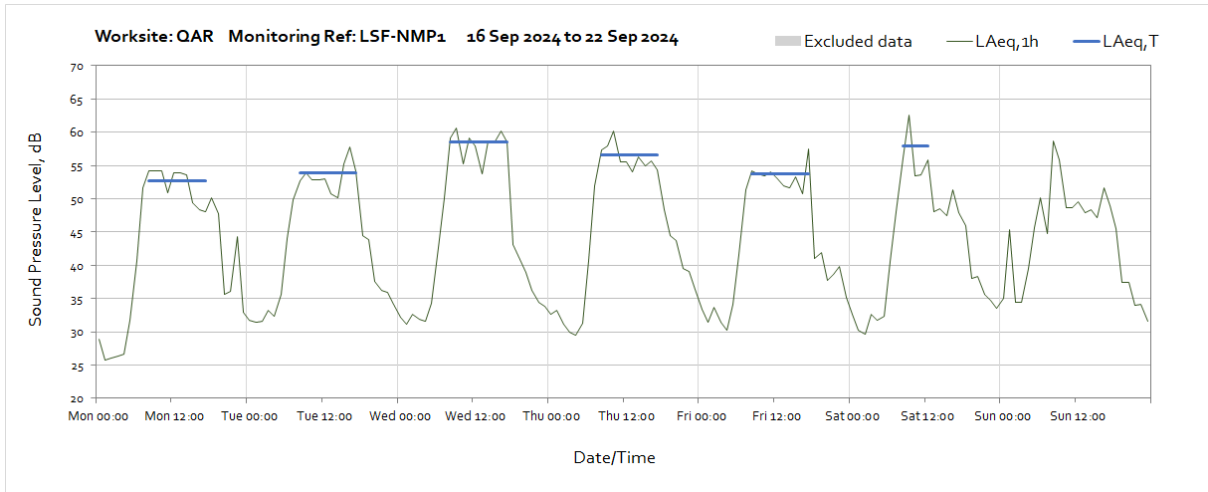




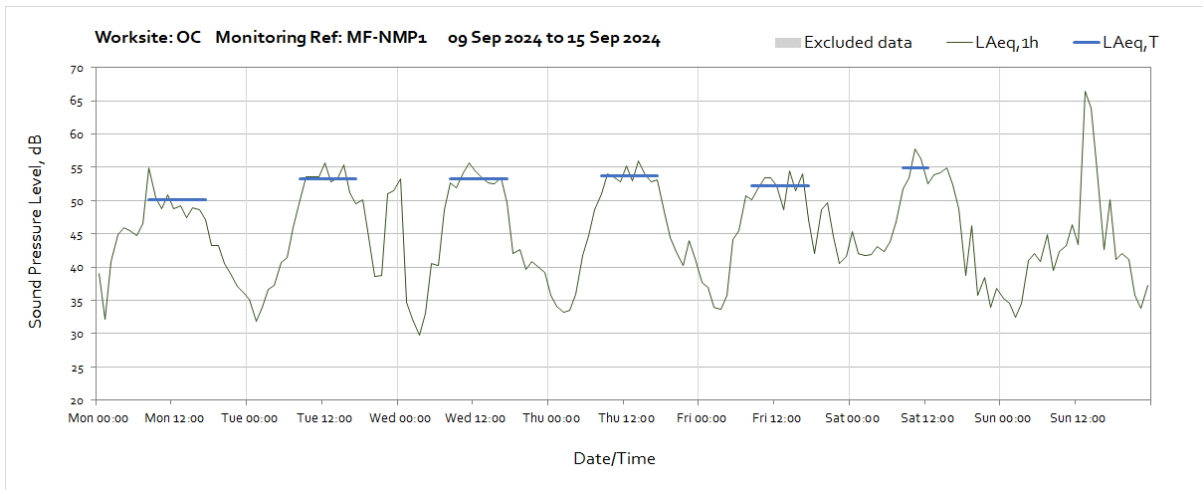
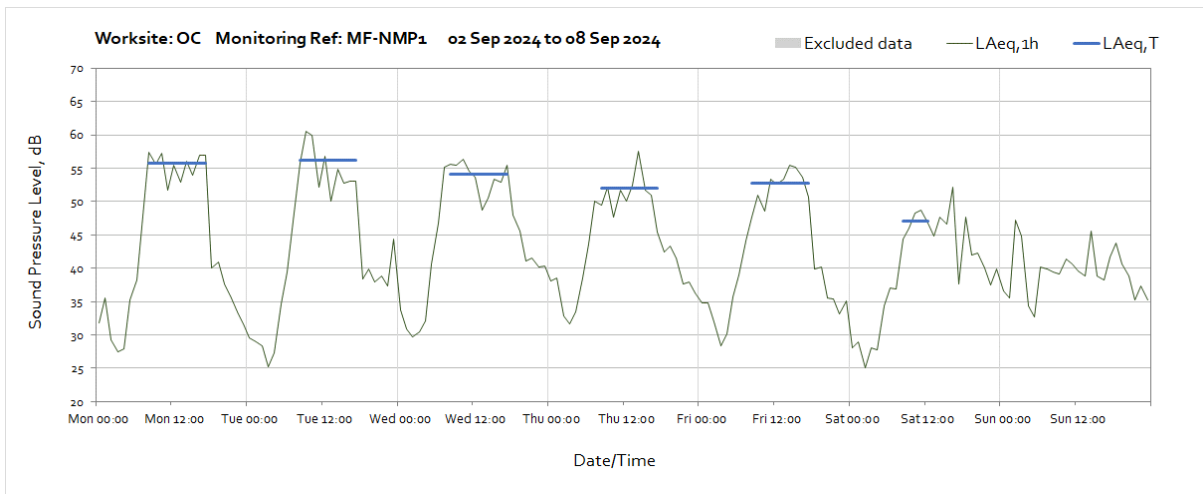
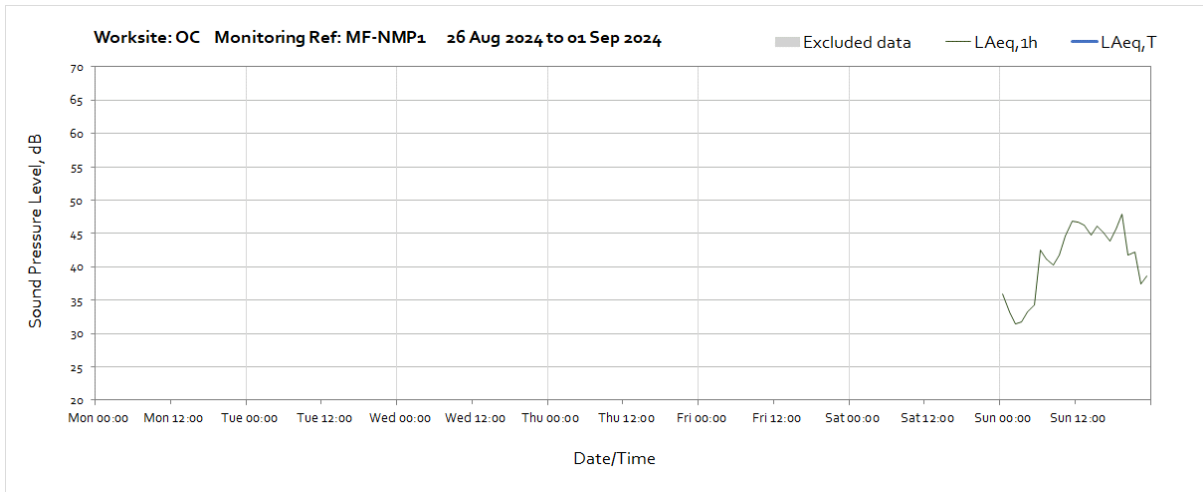
## Worksite: QAR – Monitoring Ref: LSF-NMP1

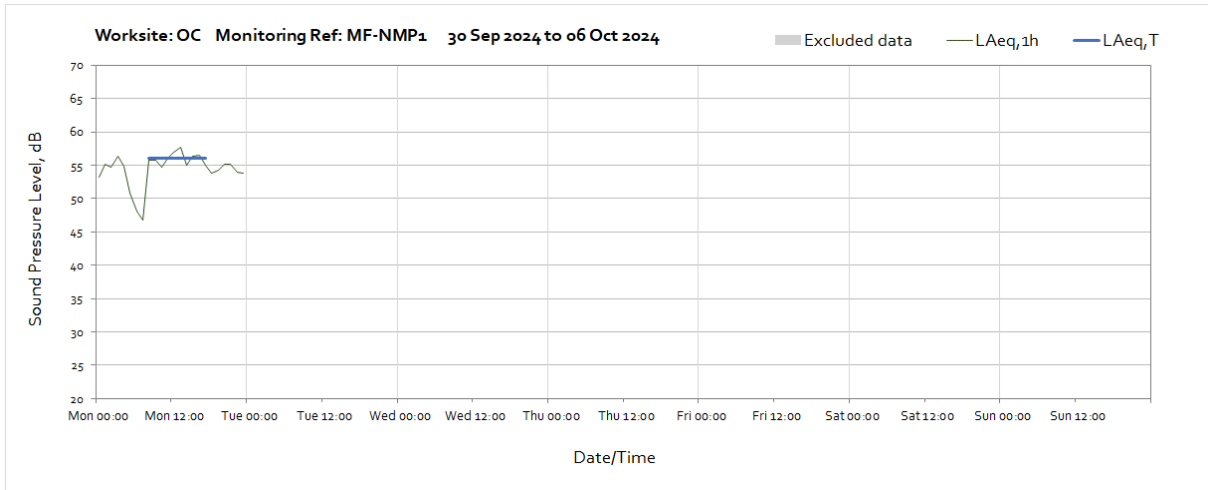
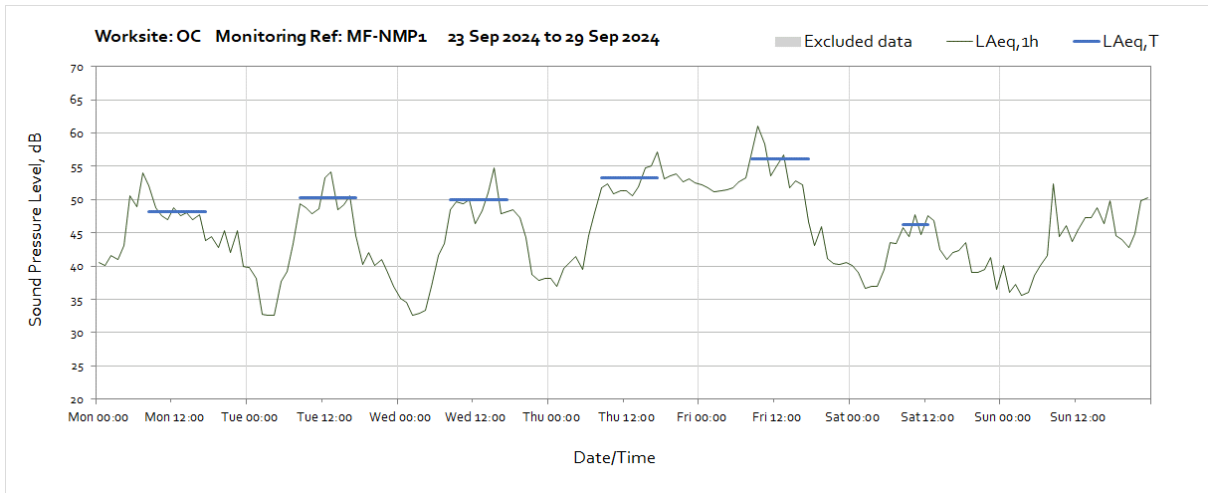
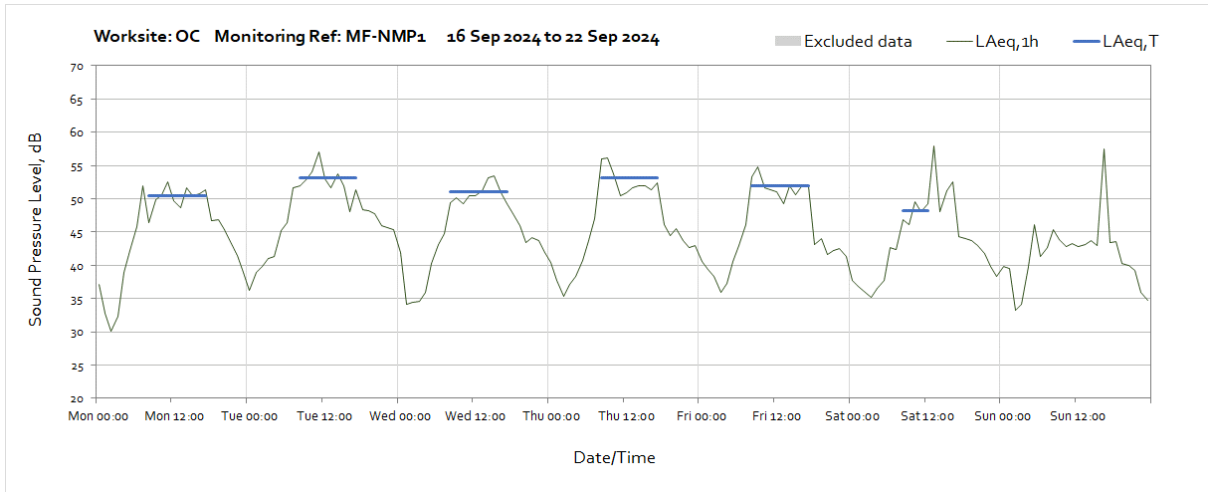


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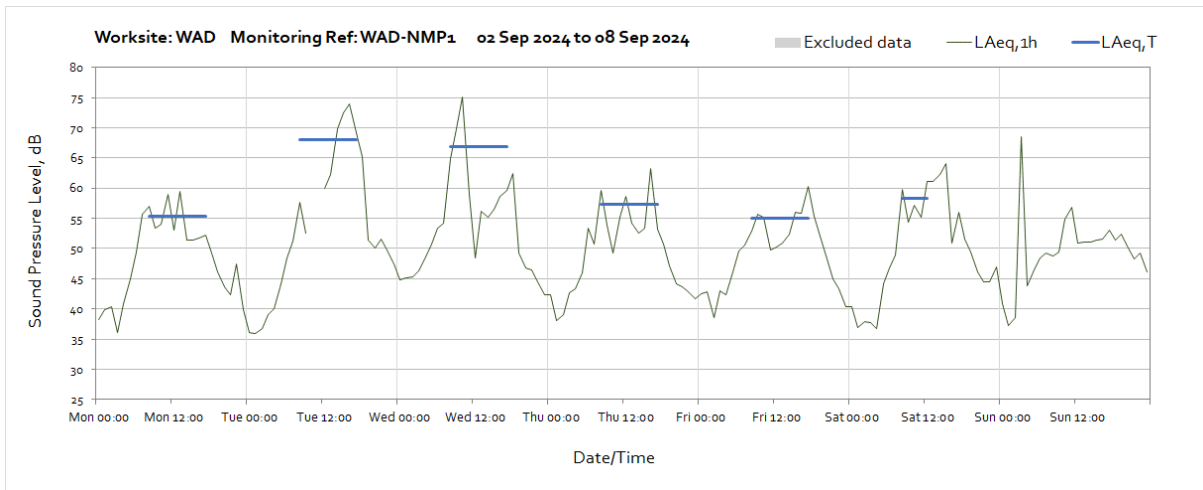
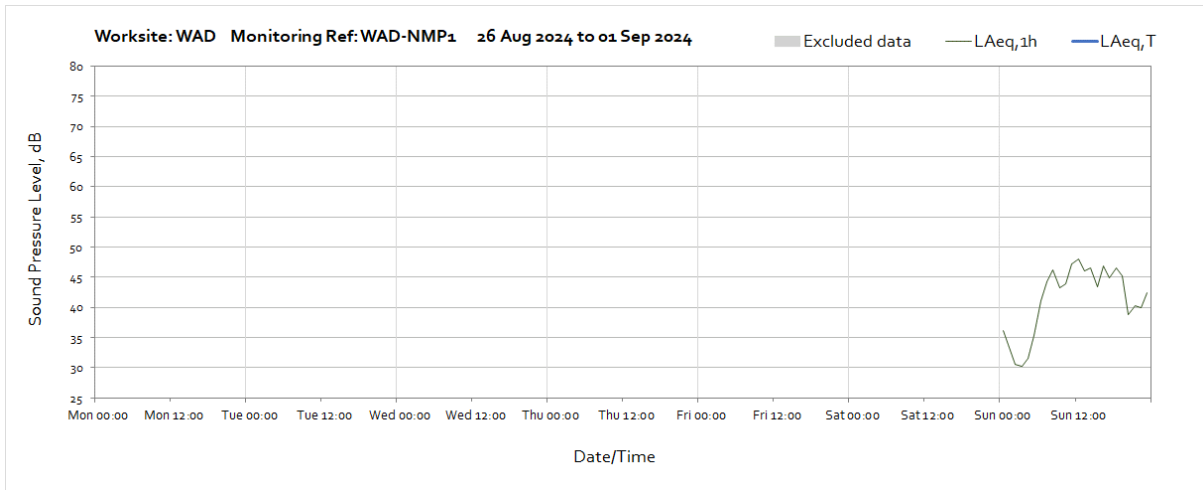


## Worksite: OC – Monitoring Ref: MF-NMP1

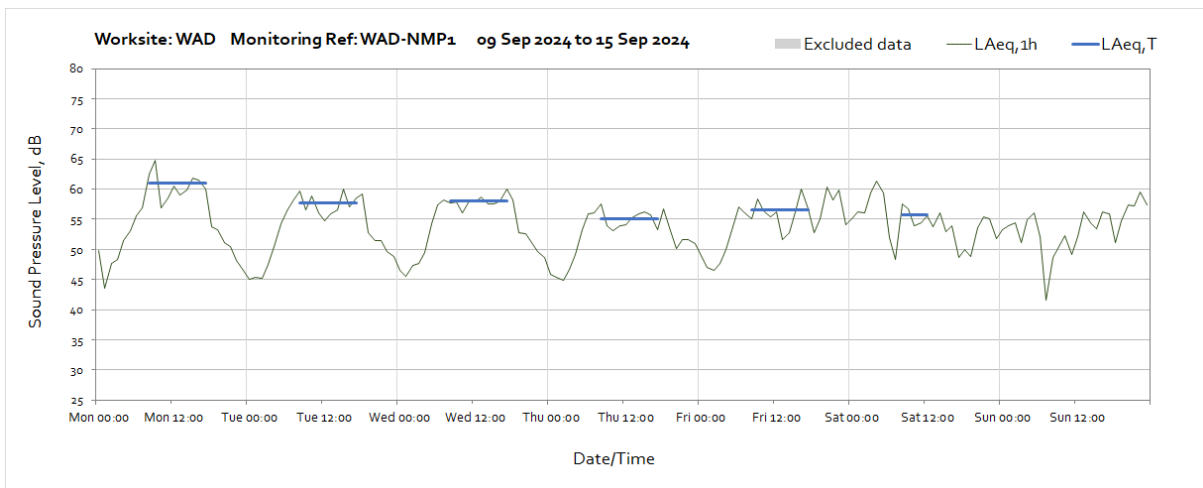


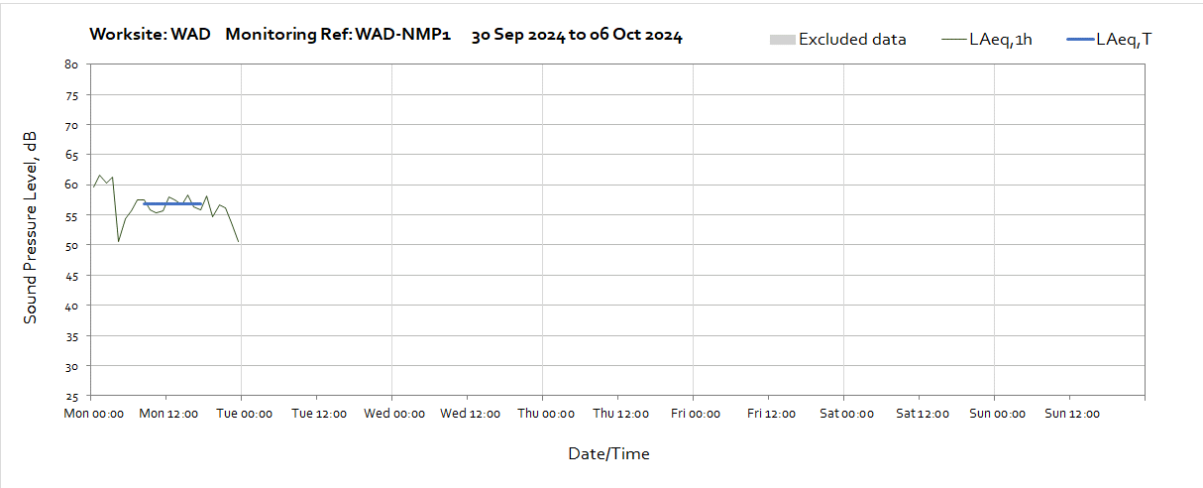
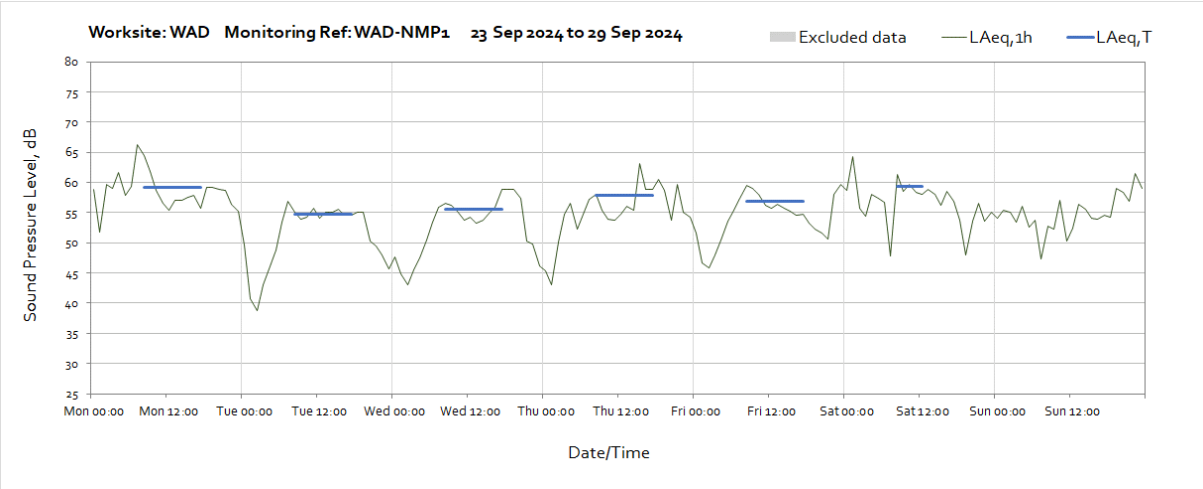
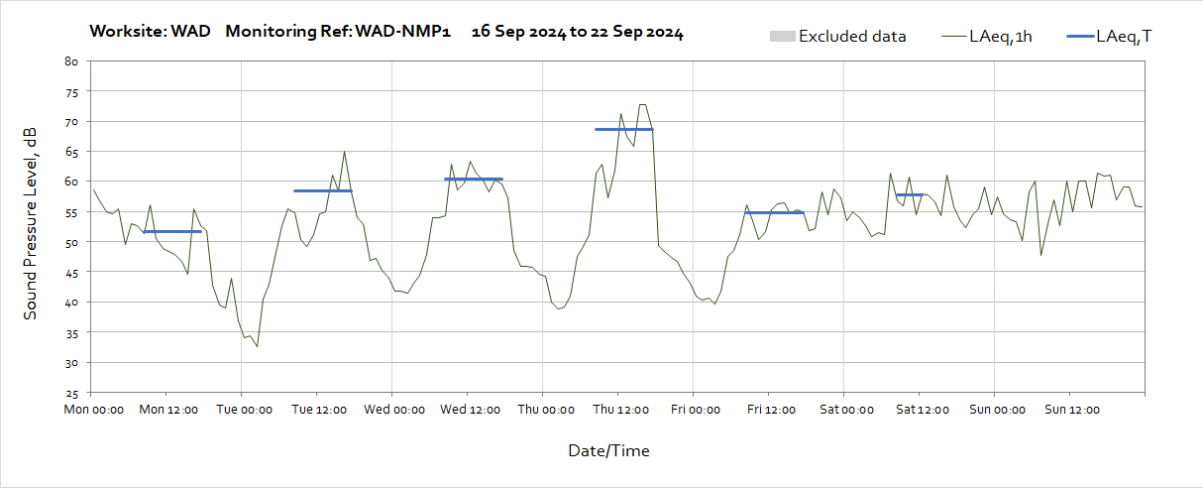


## Worksite: WAD – Monitoring Ref: WAD-NMP1

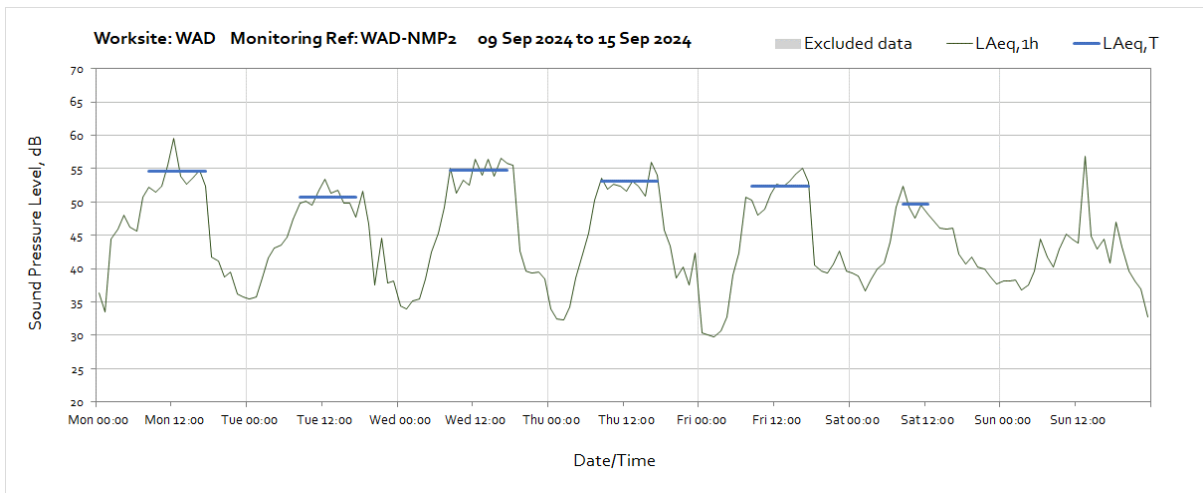
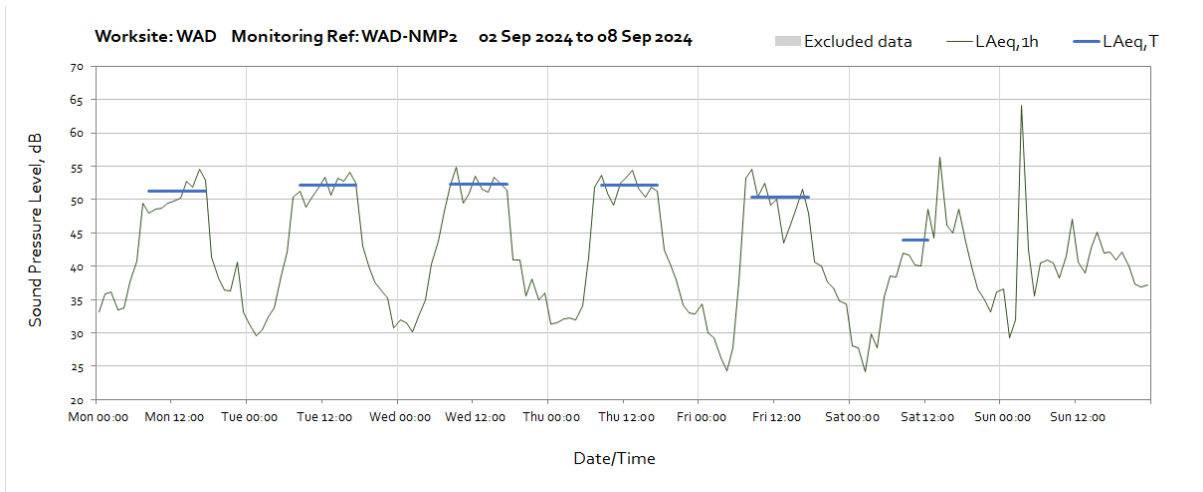
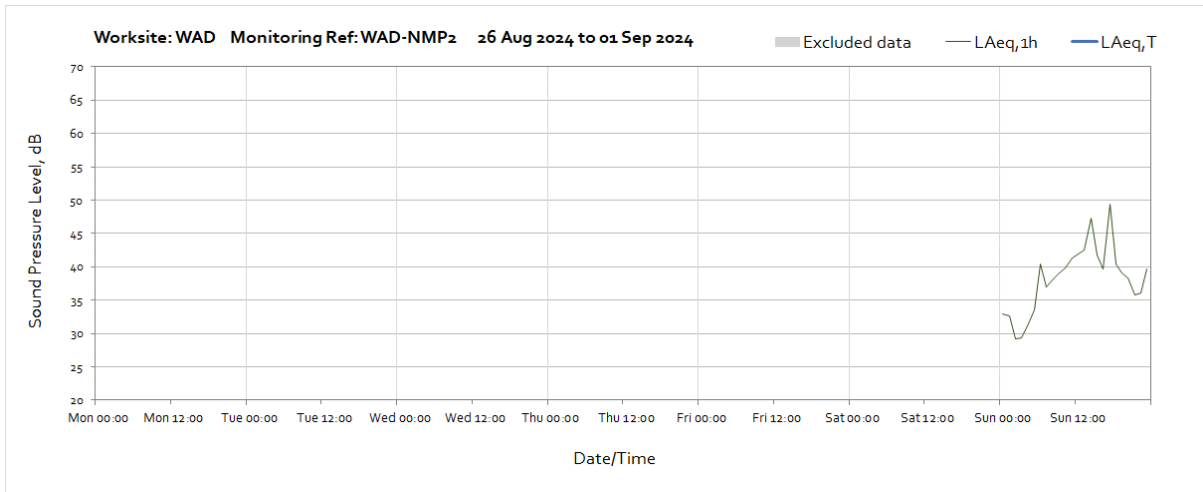


Note: Missing data between 10:00 and 12:00 on Tuesday 3rd September was due to monitor maintenance.

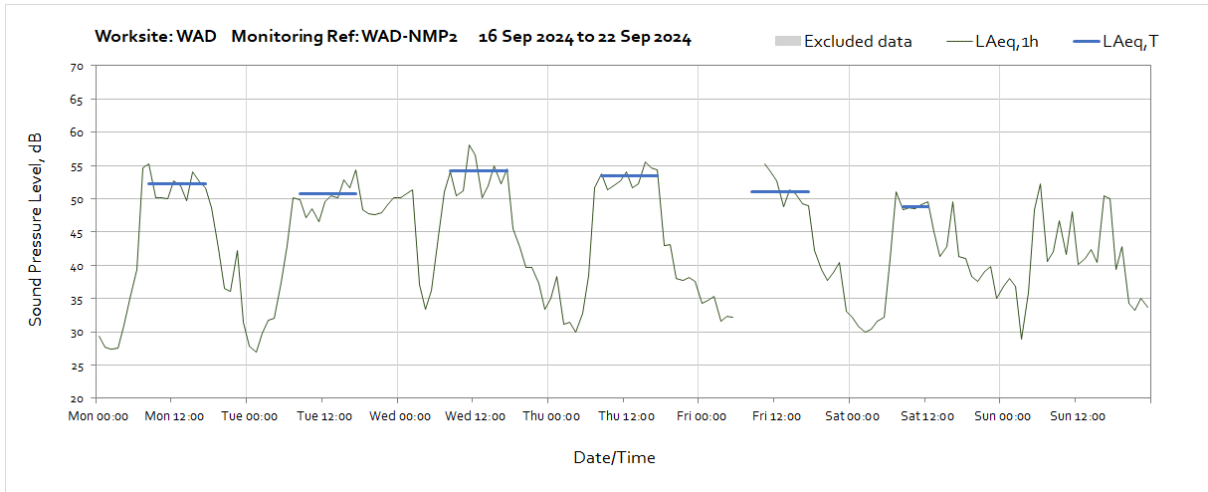




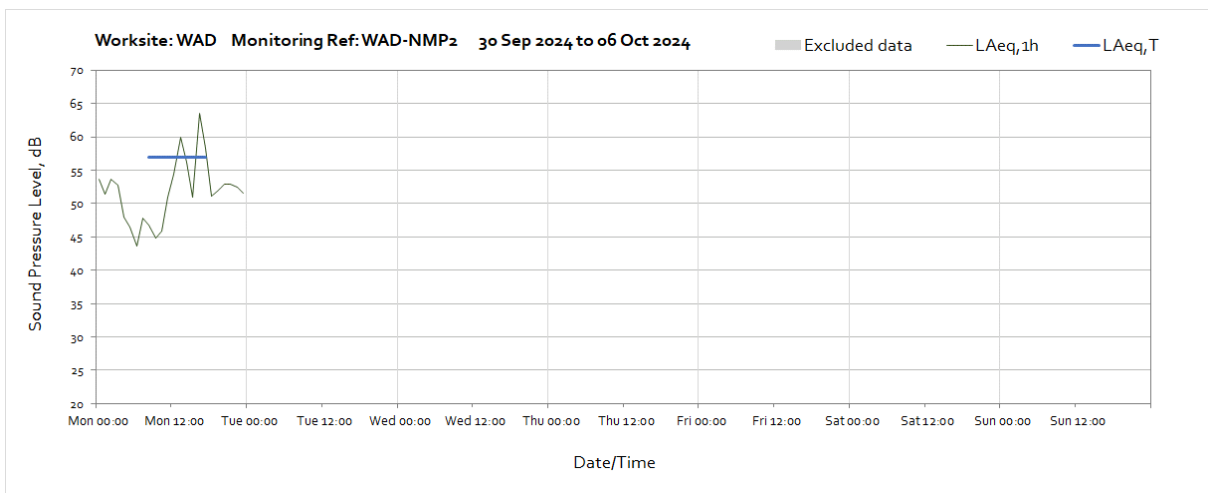
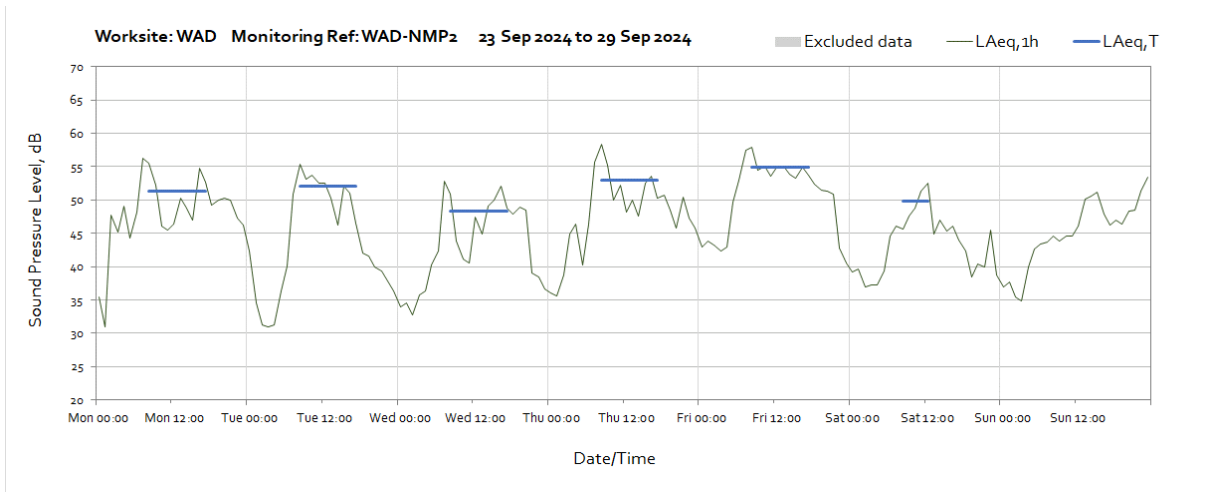
## Worksite: WAD – Monitoring Ref: WAD-NMP2



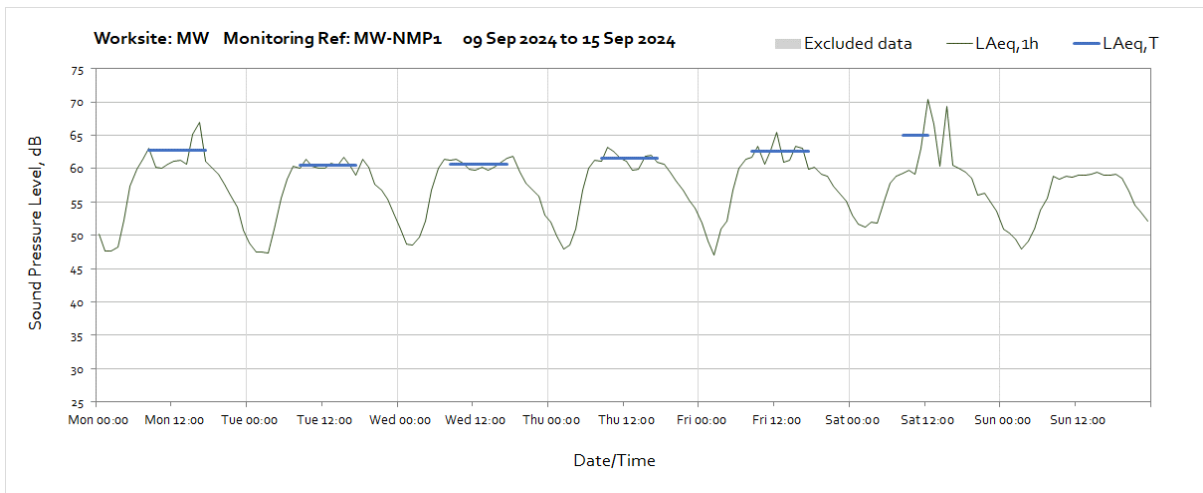
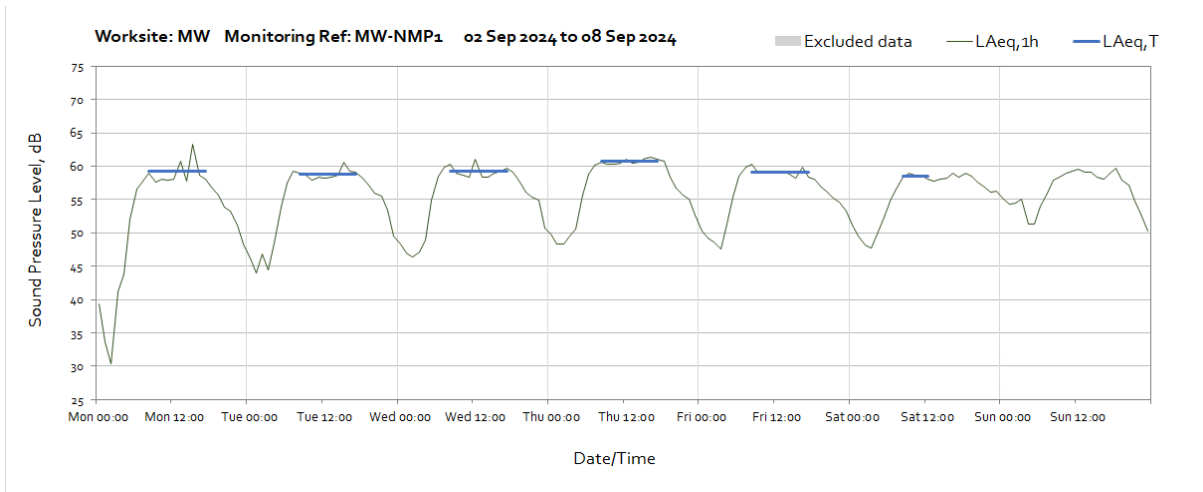
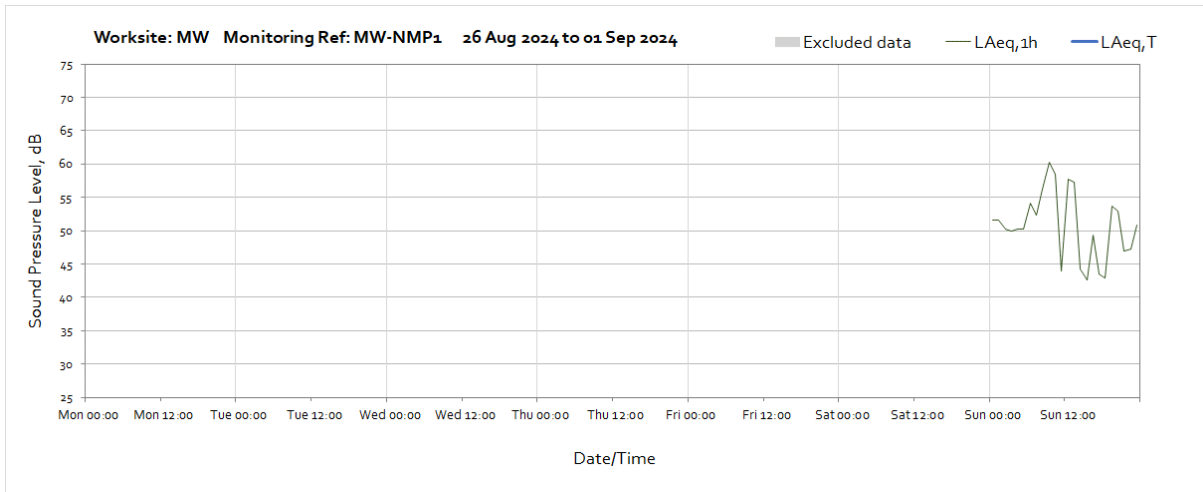




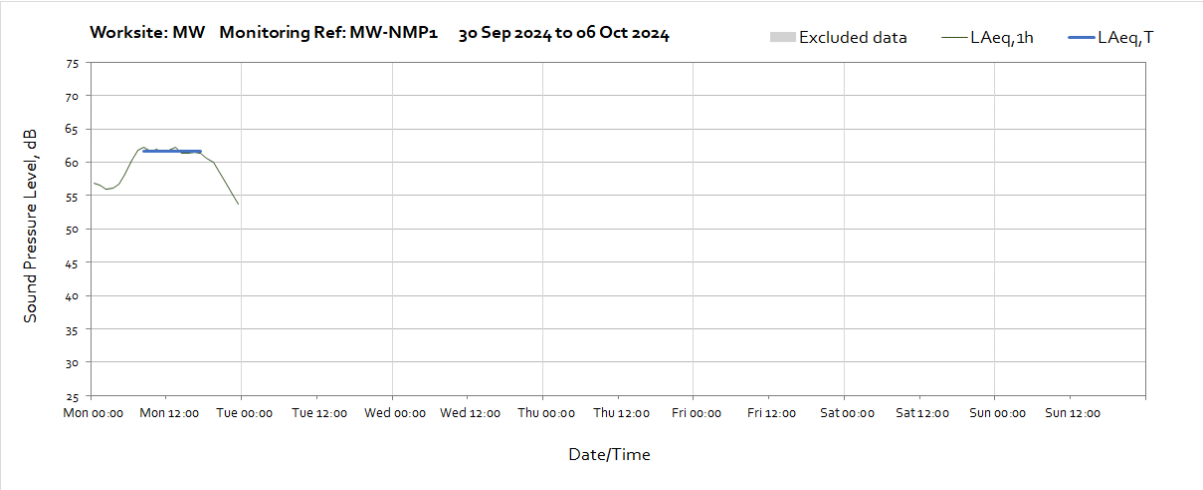
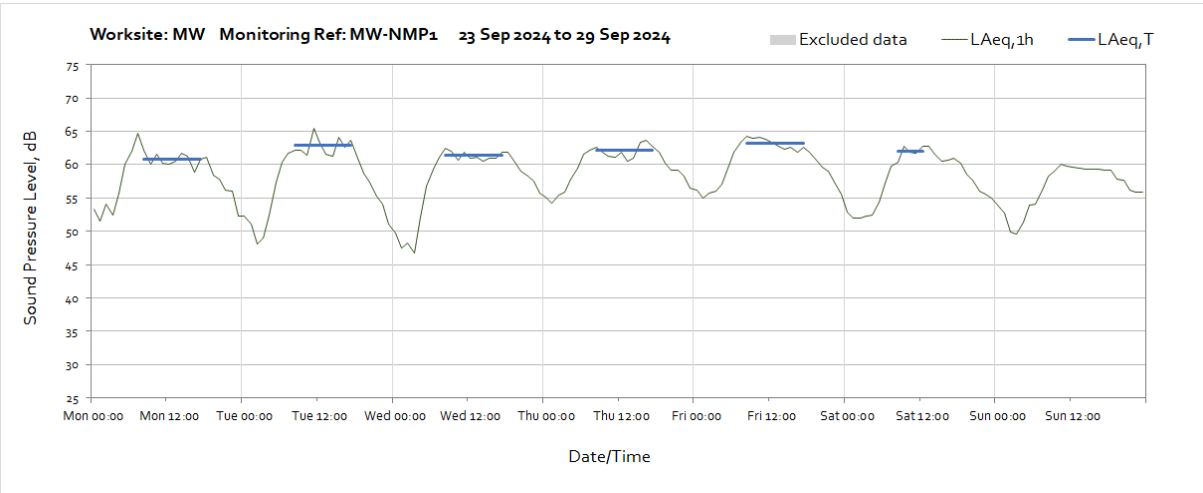
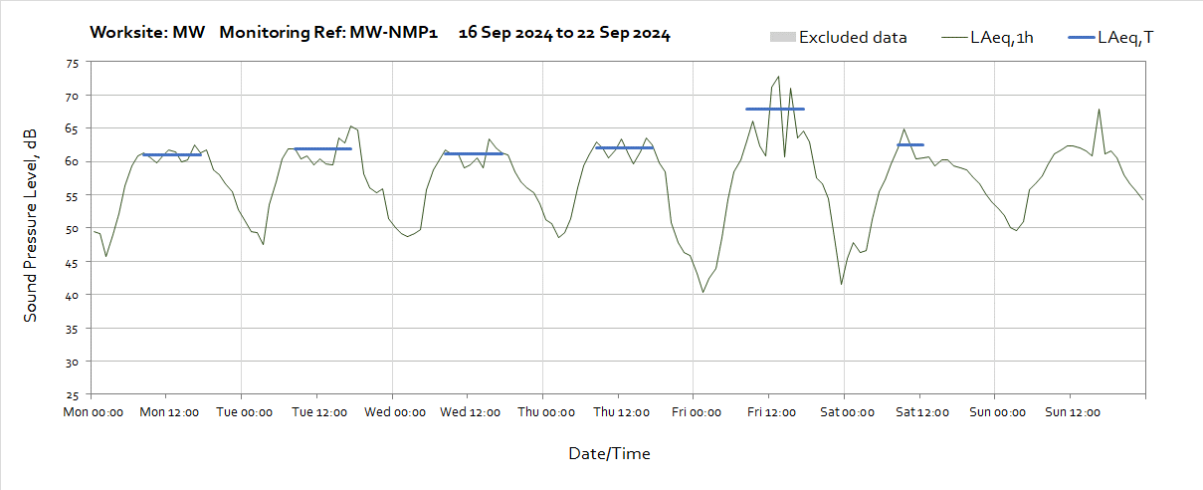
Note: Missing data between 06:00 and 10:00 on Friday 20th September is currently under investigation.



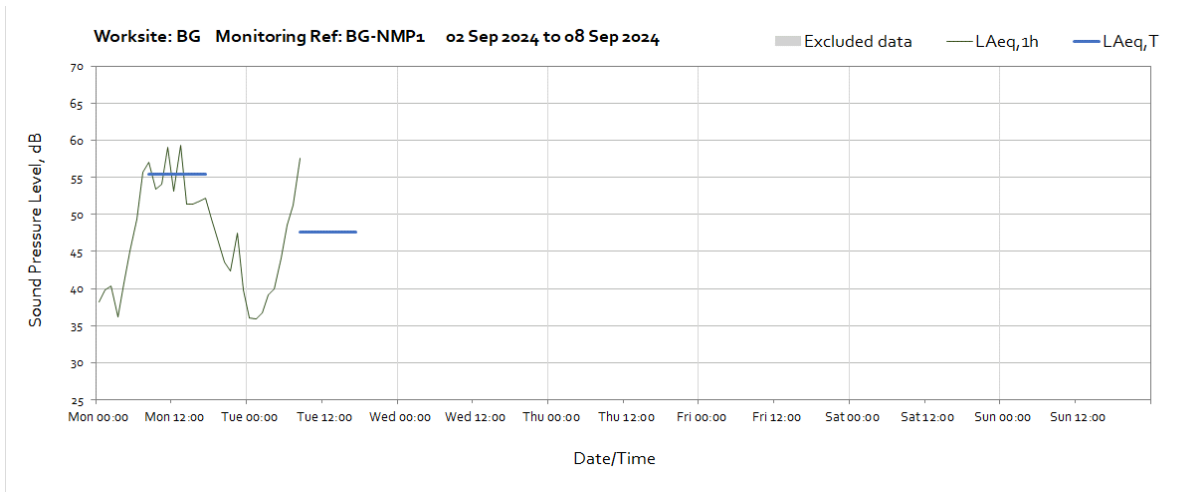
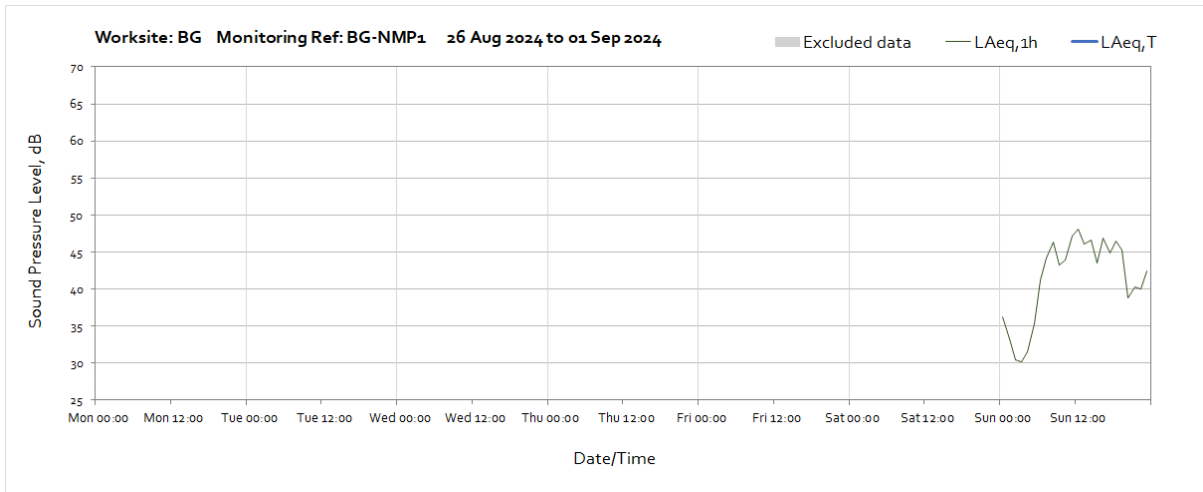
## Worksite: MW – Monitoring Ref: MW-NMP1



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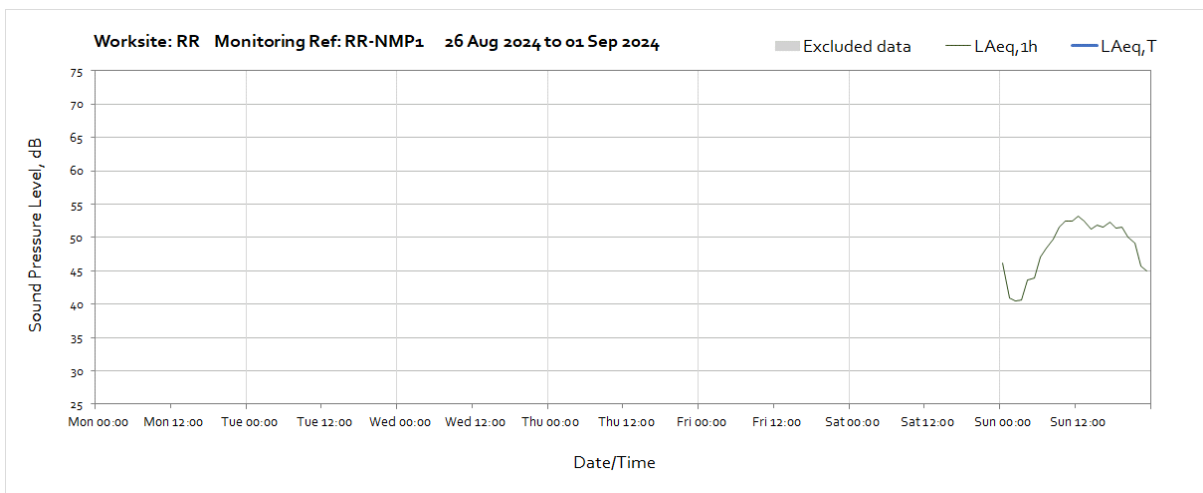


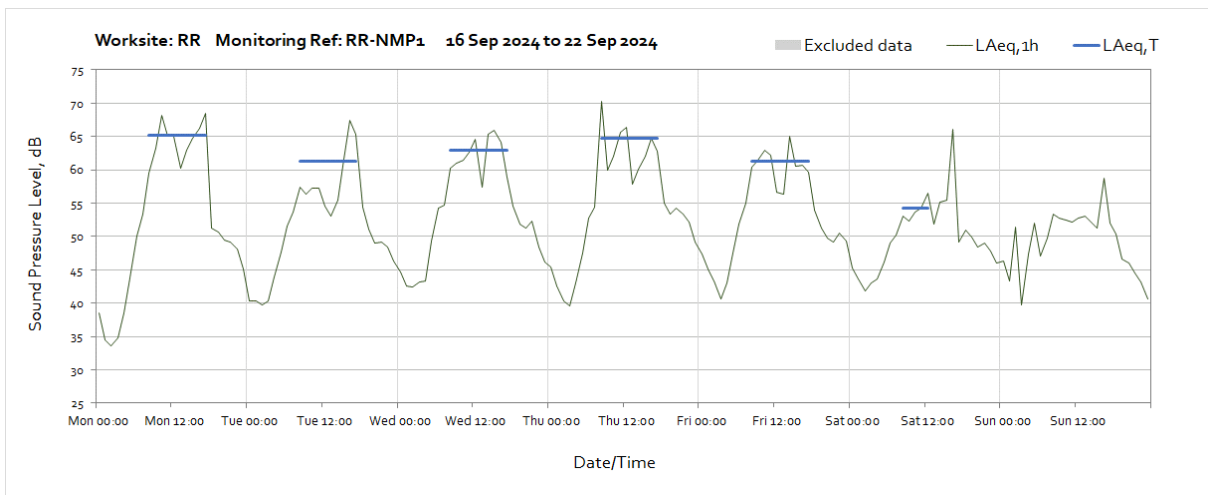
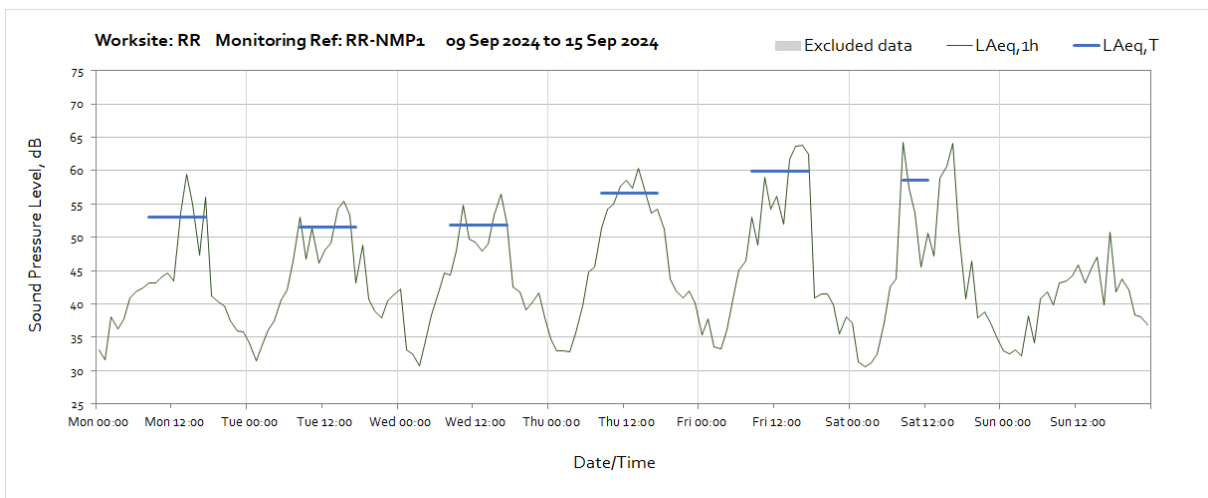
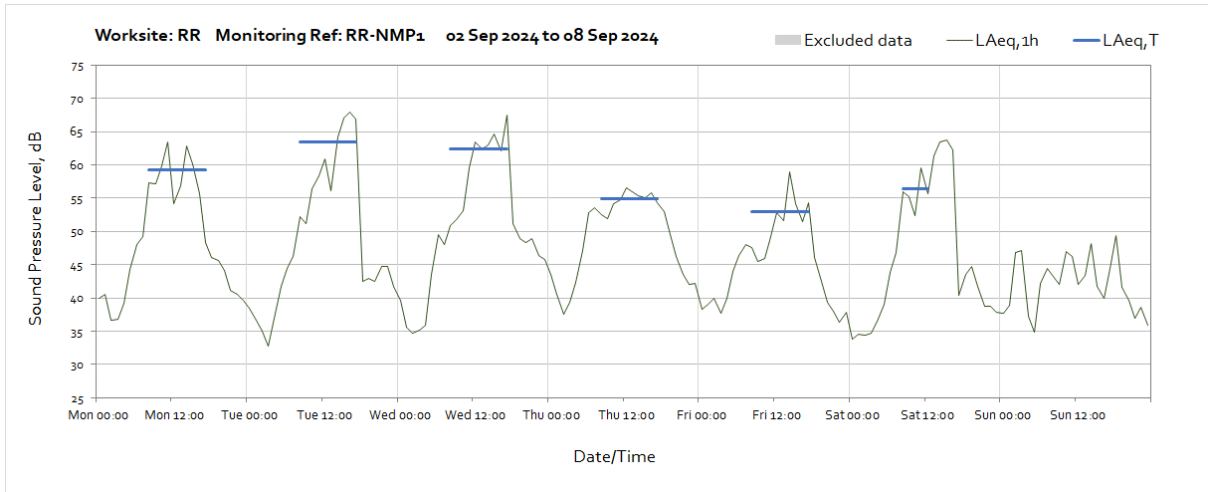
## Worksite: BG – Monitoring Ref: BG-NMP1

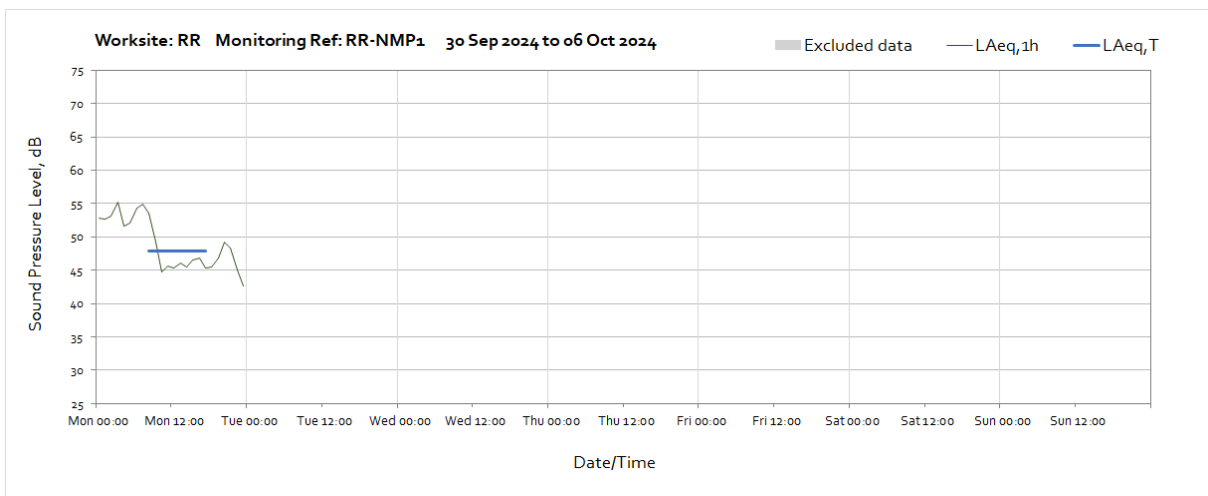
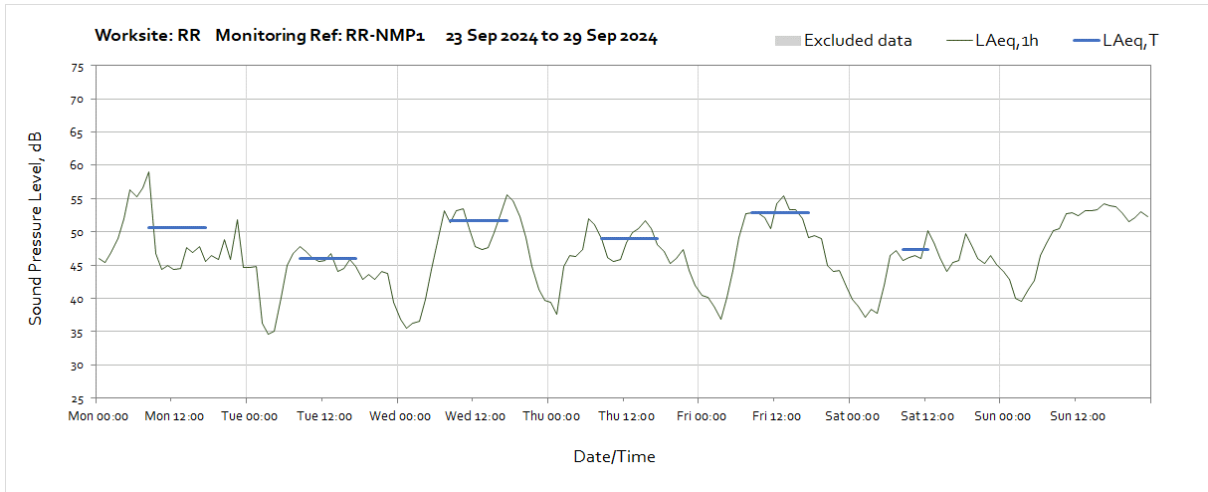


Note: Monitor was retrieved at 09:00 on Tuesday 3<sup>rd</sup> September.

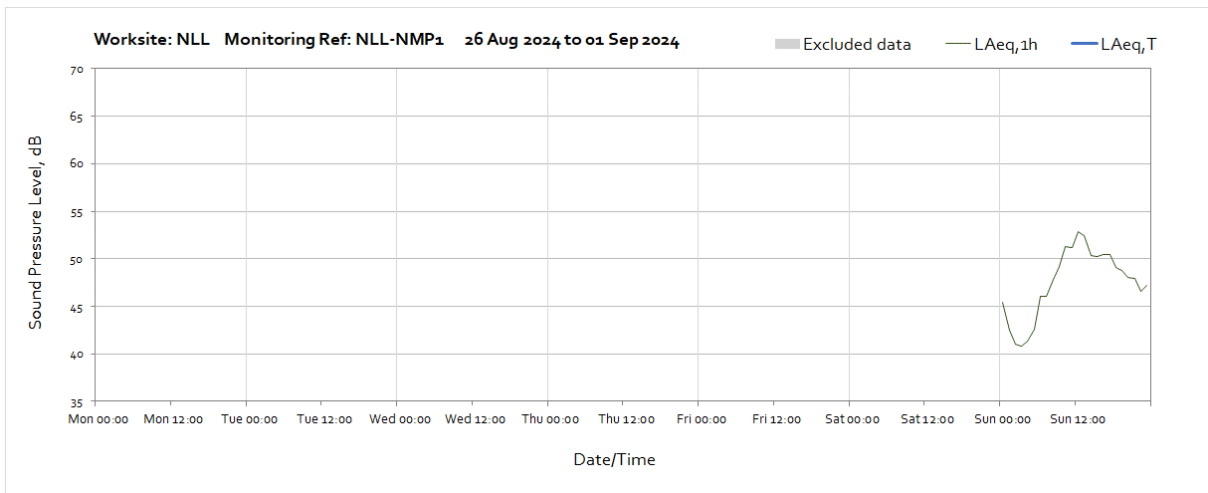
## Worksite: RR – Monitoring Ref: RR-NMP1

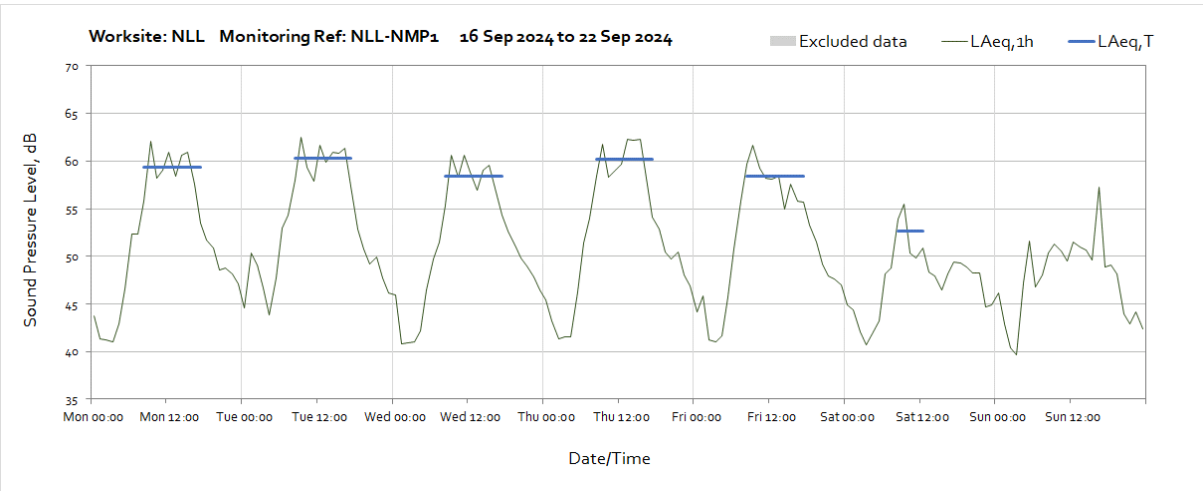
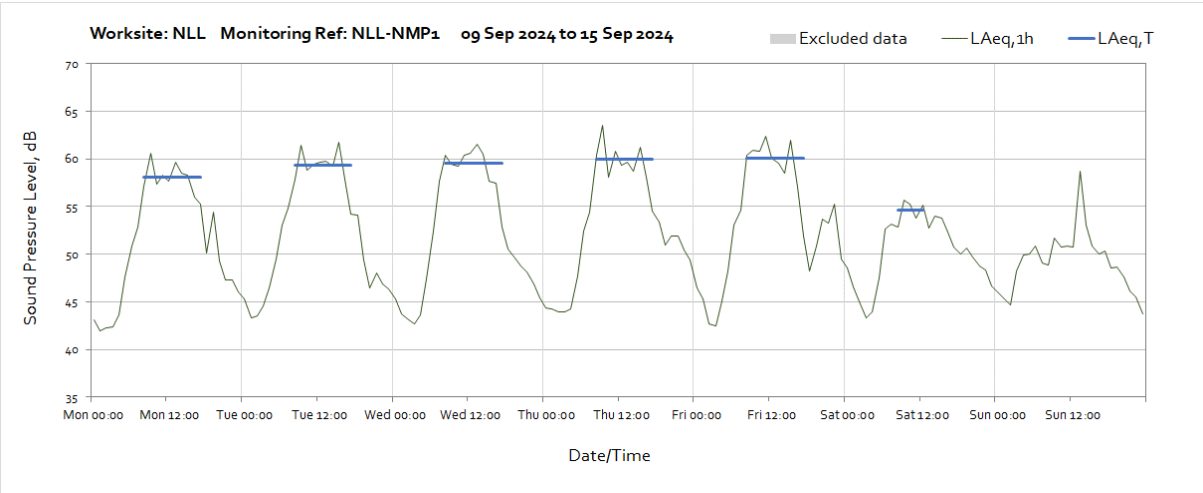
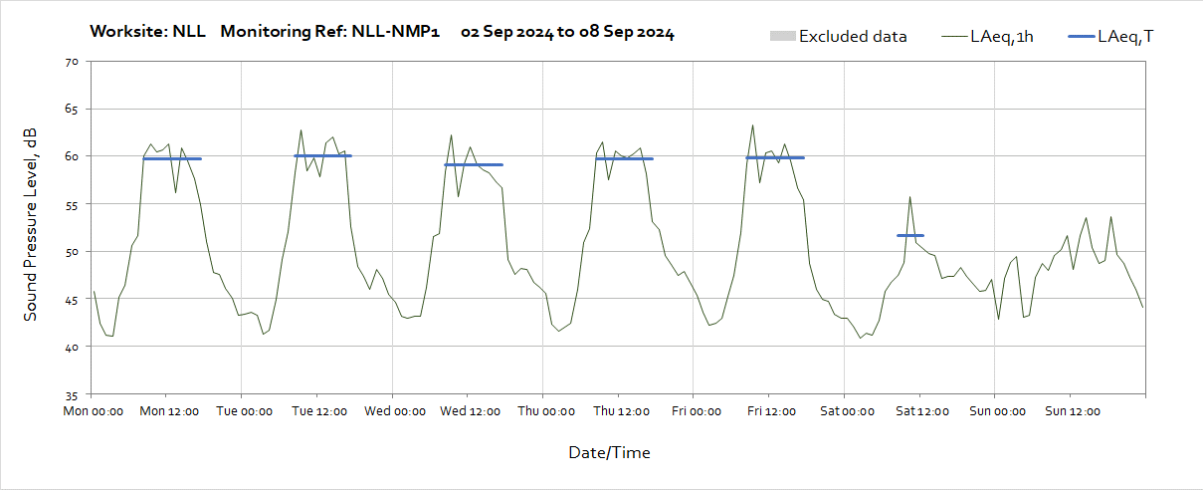


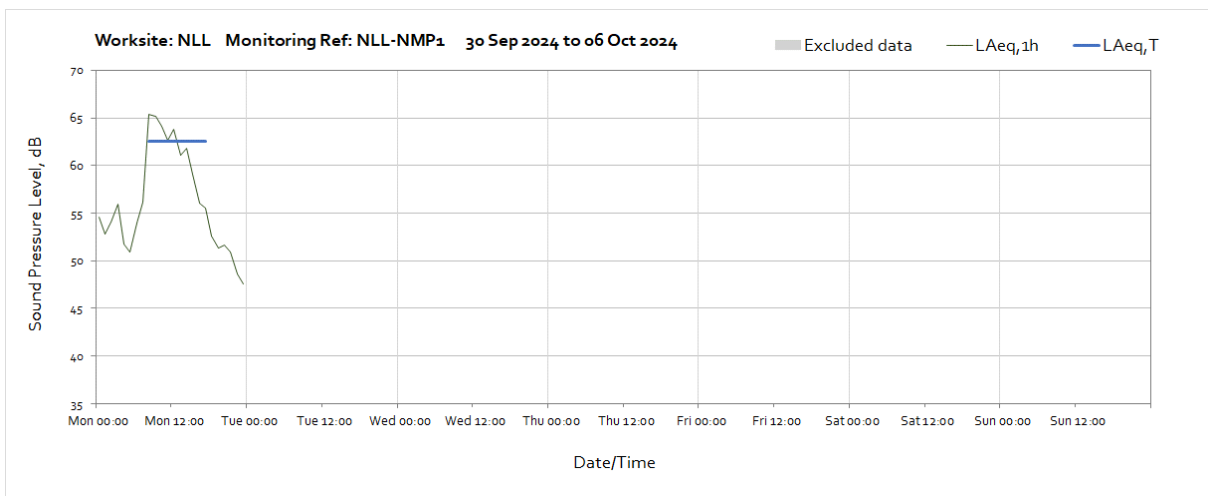
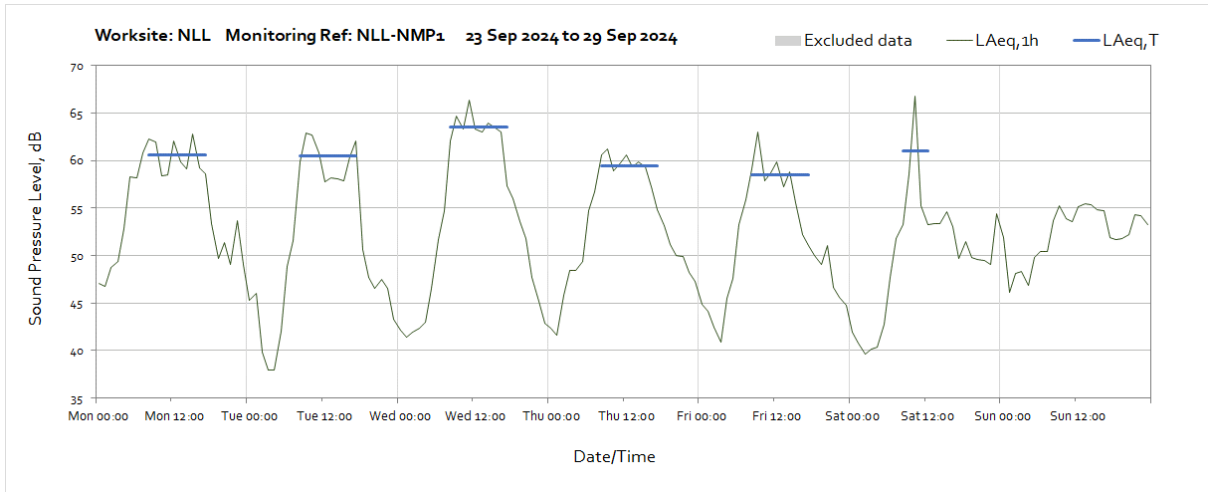




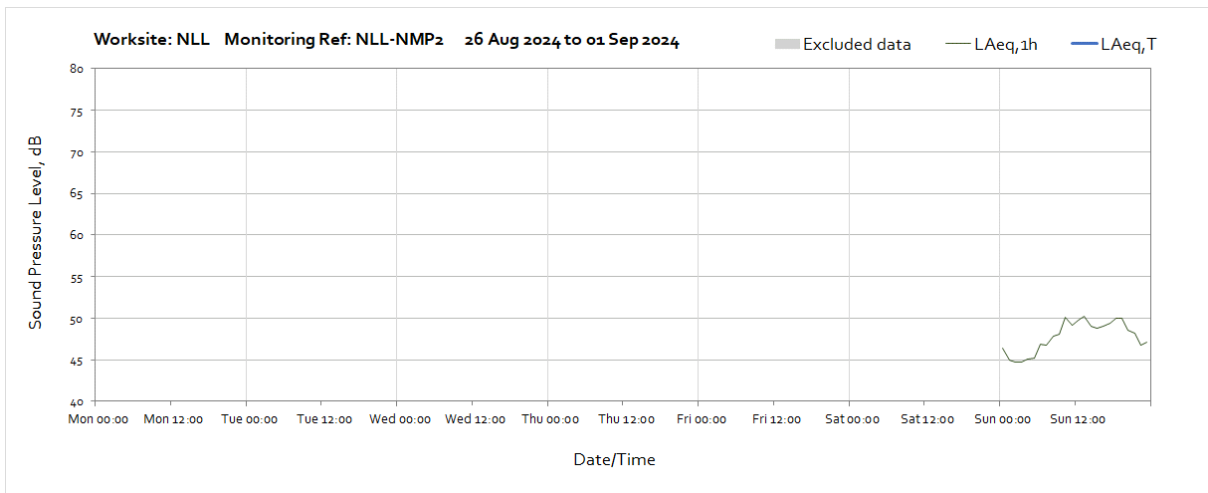
**Worksite: NLL - Monitoring Ref: NLL-NMP1**



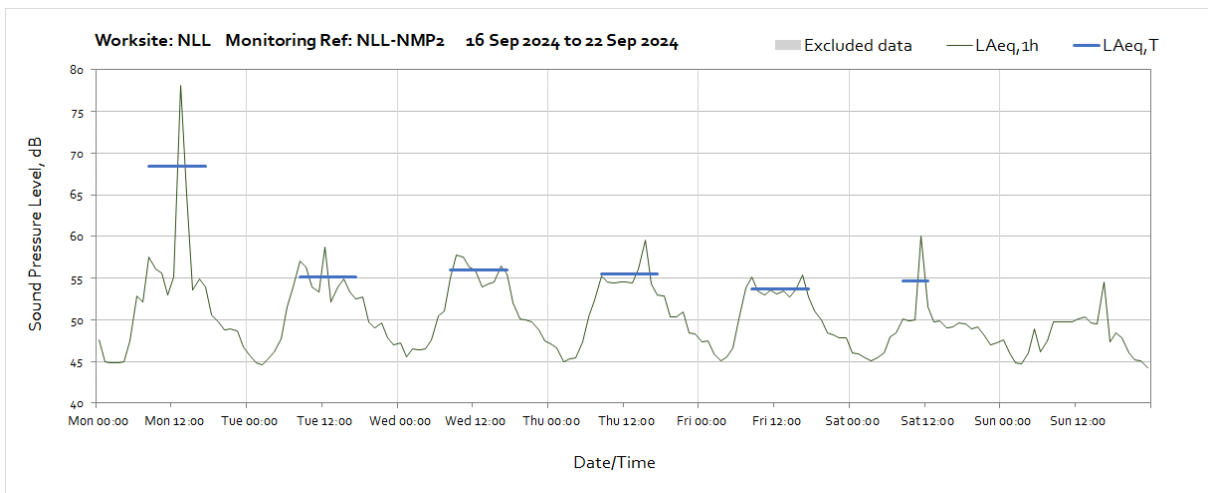
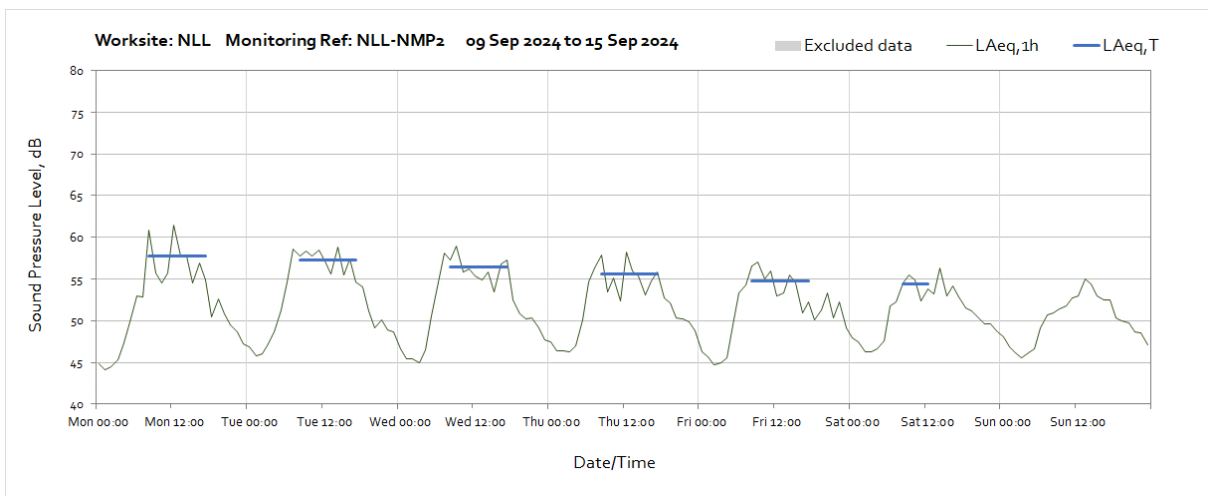
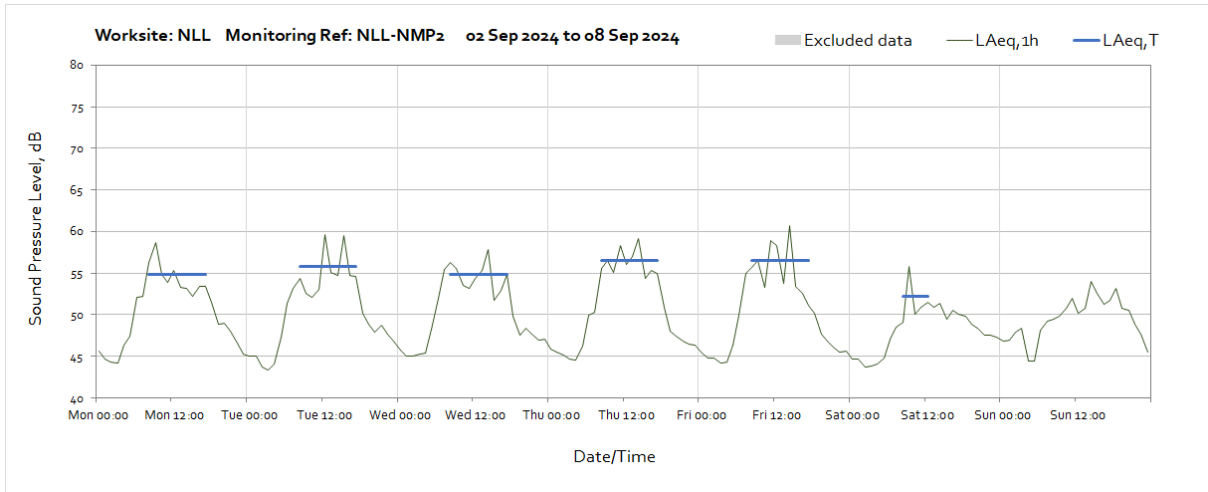


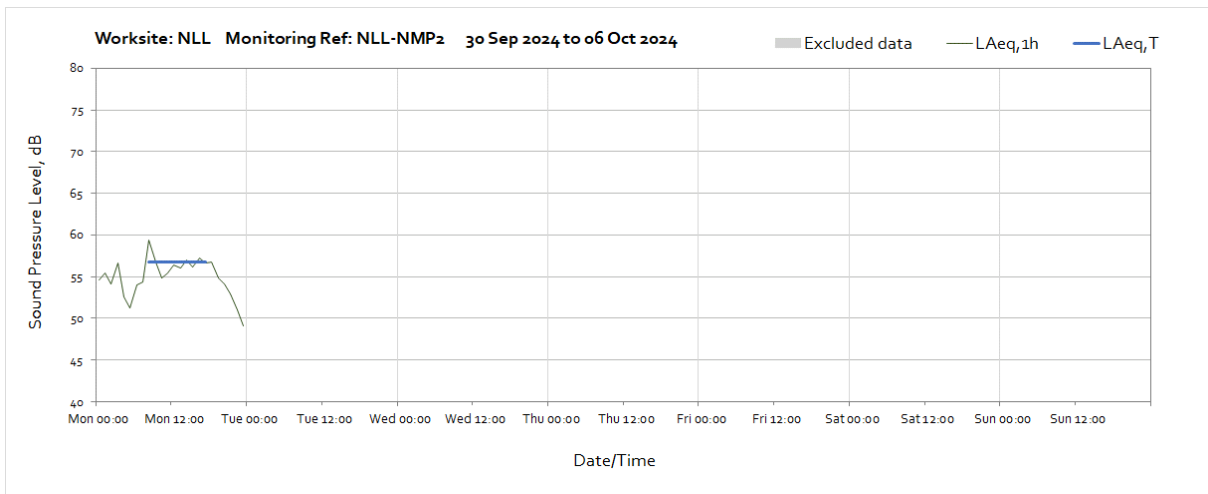
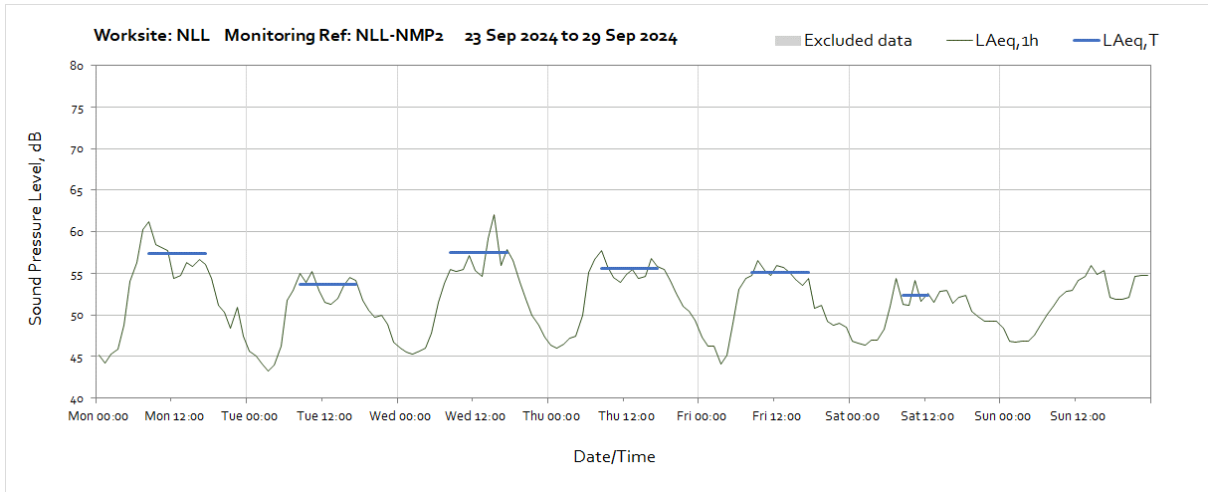


**Worksite: NLL - Monitoring Ref: NLL-NMP2**

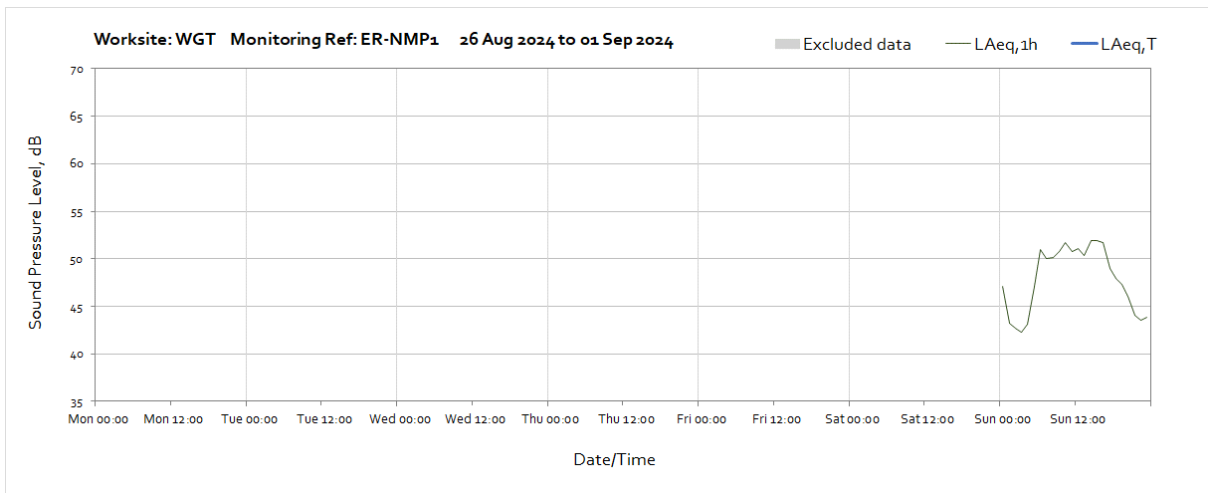


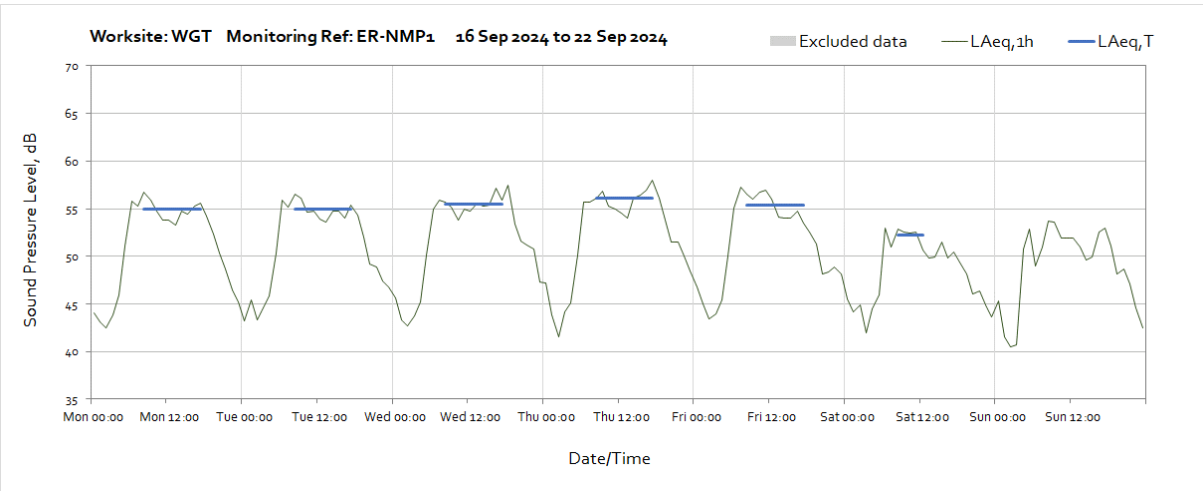
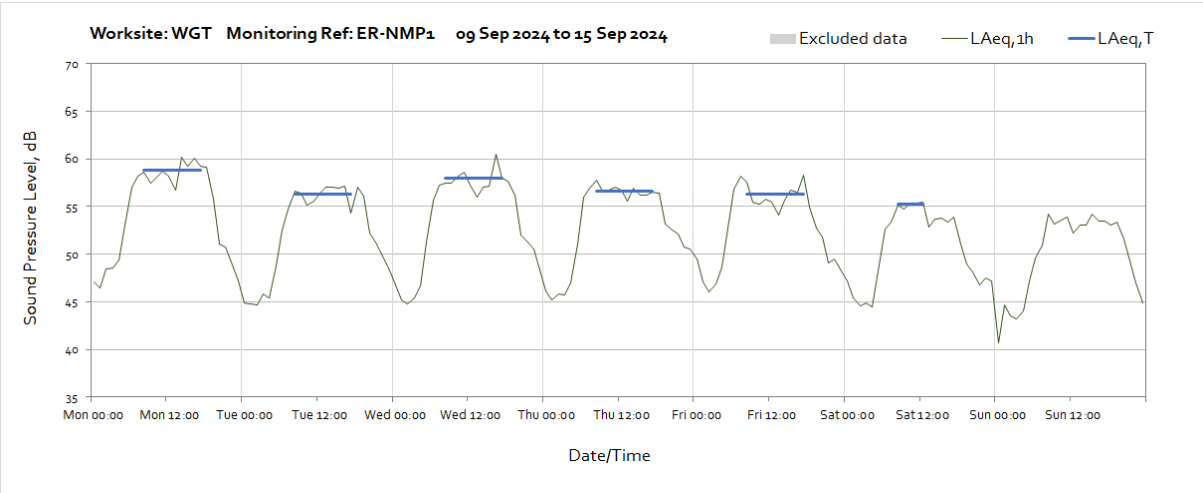
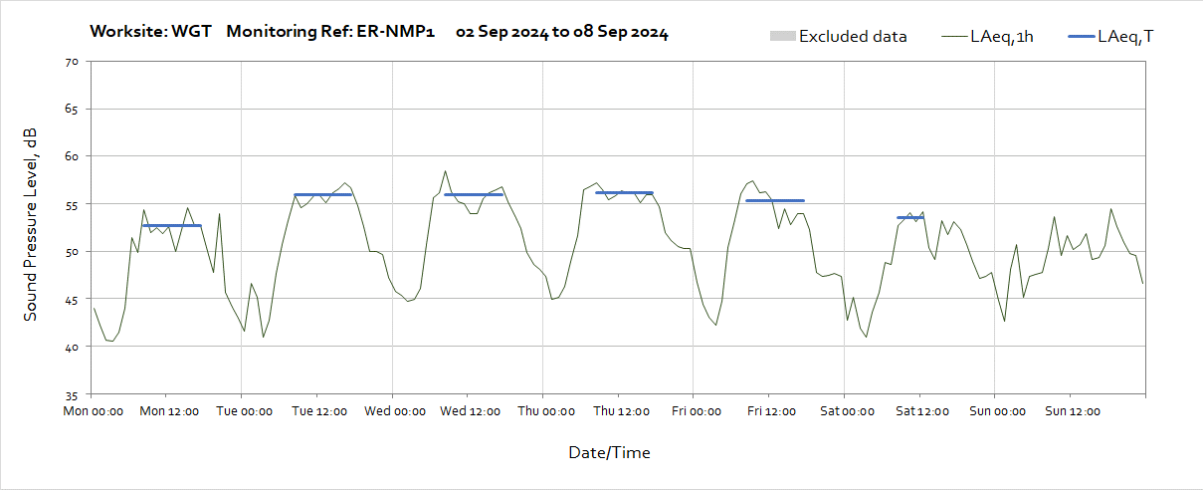


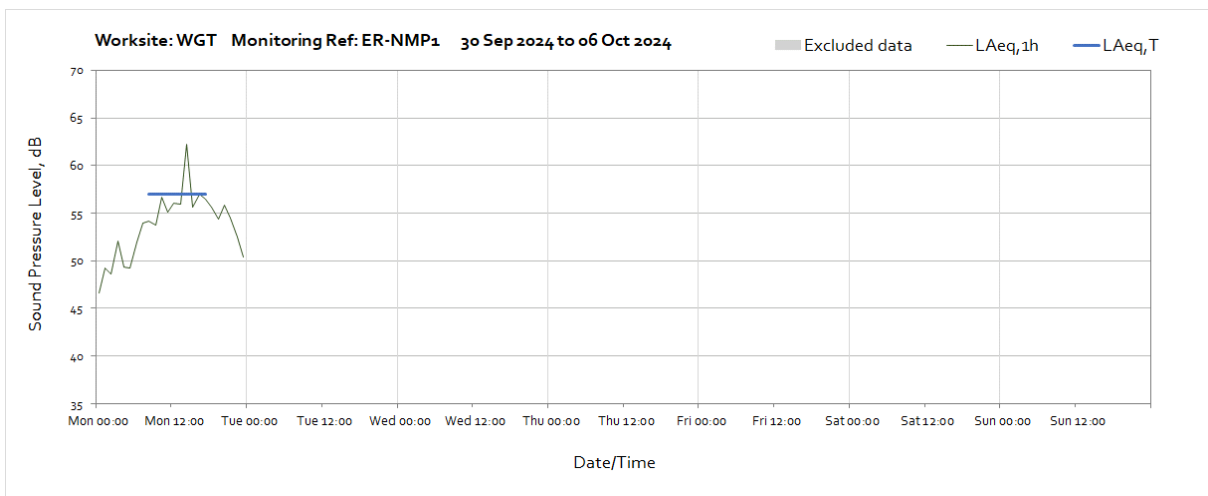
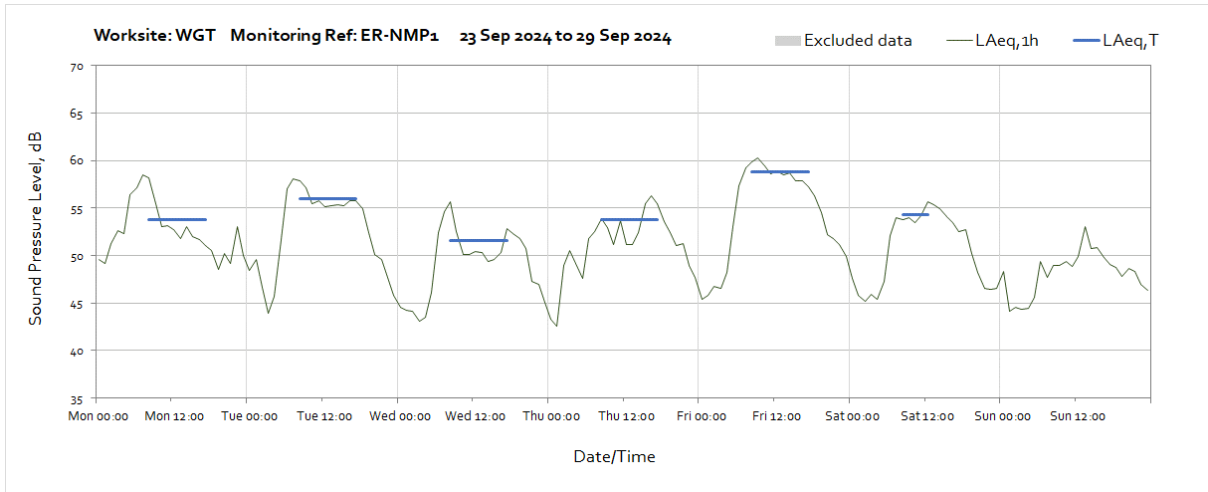




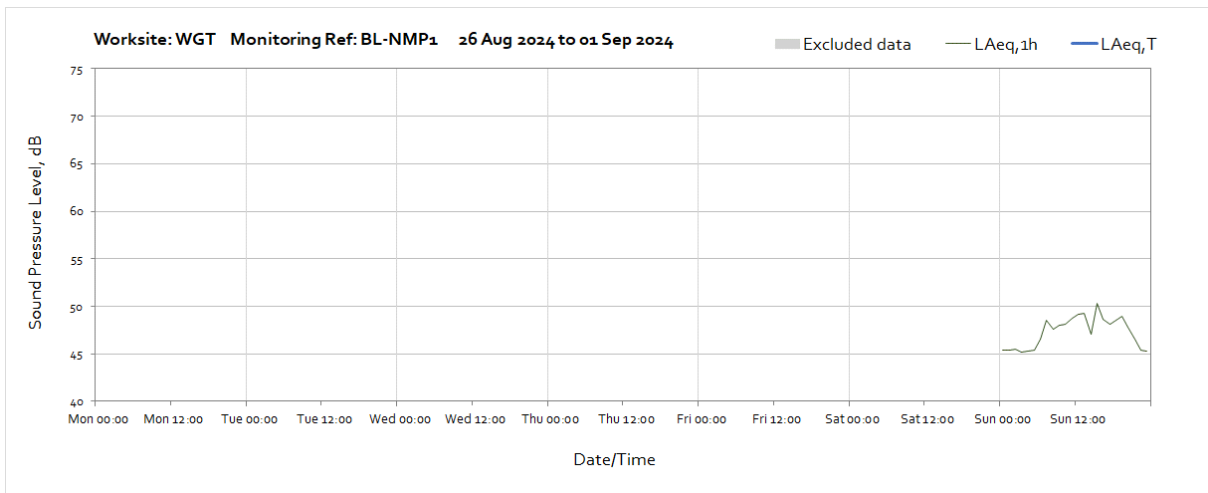
**Worksite: WGT – Monitoring Ref: ER-NMP1**

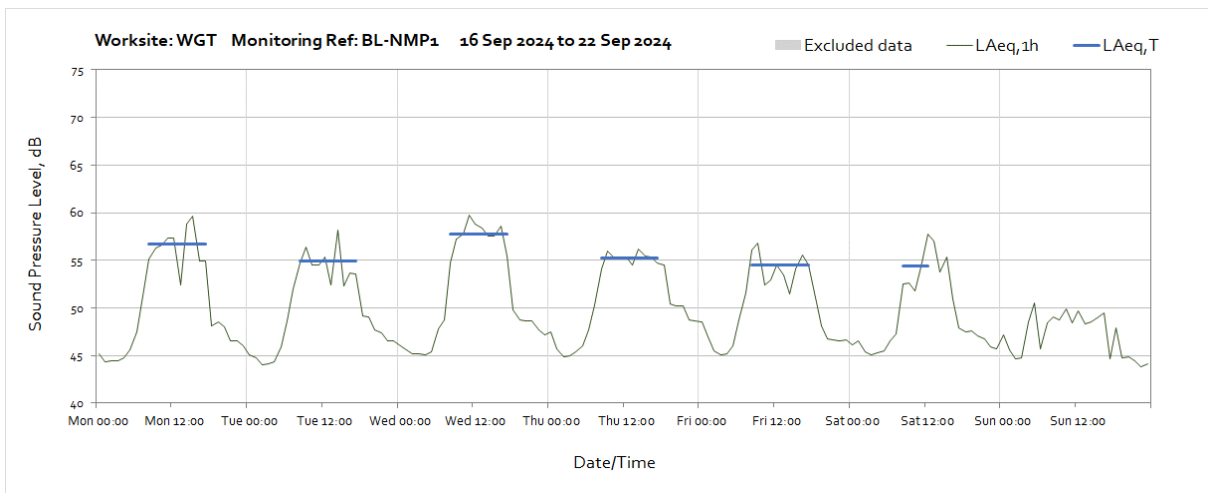
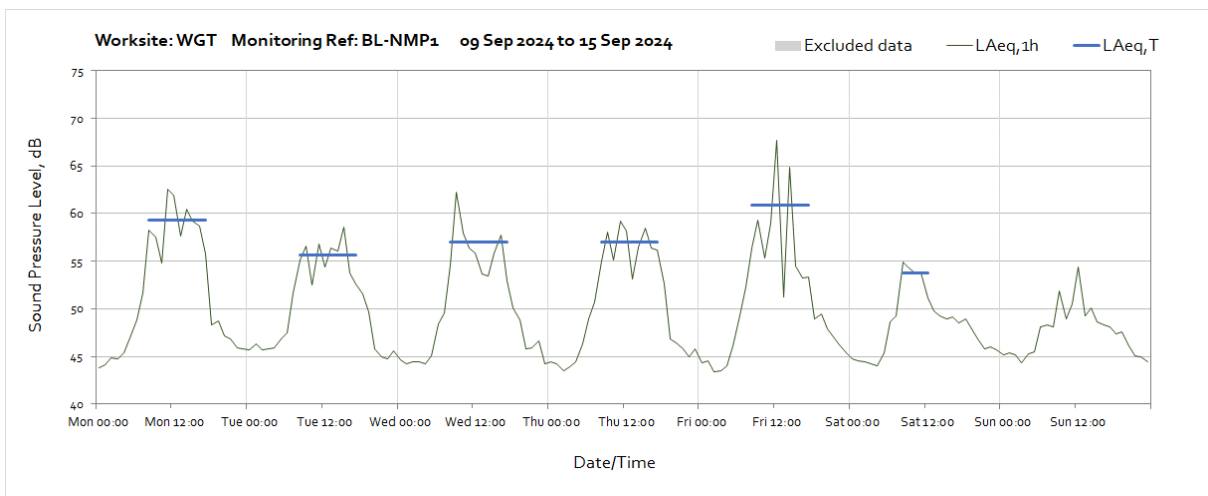
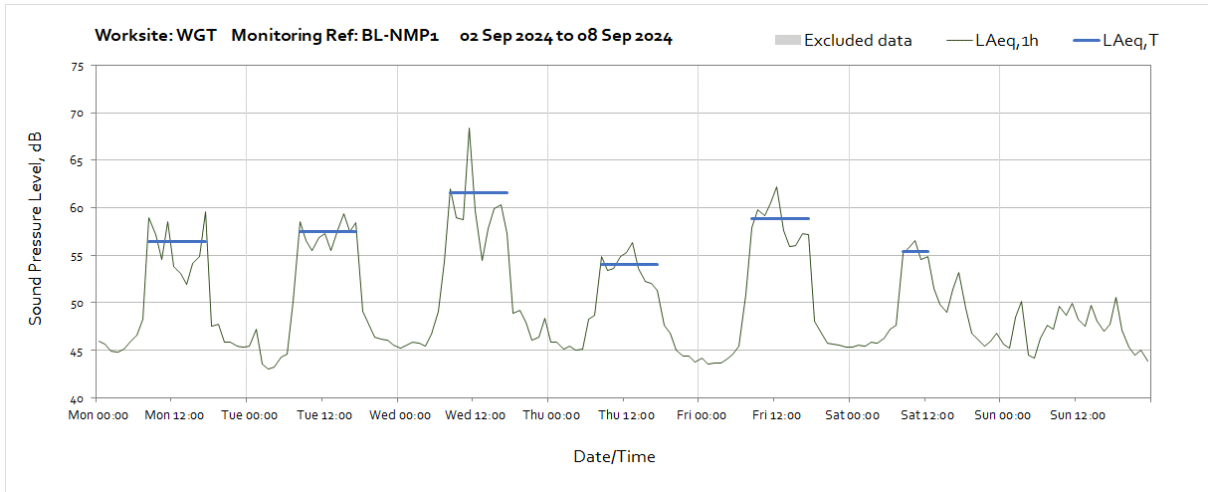


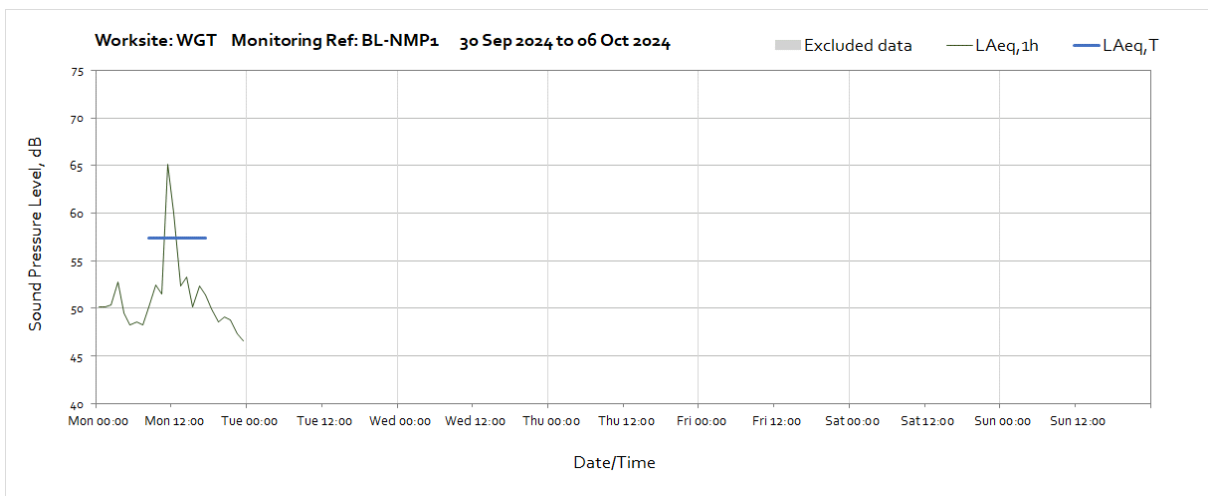
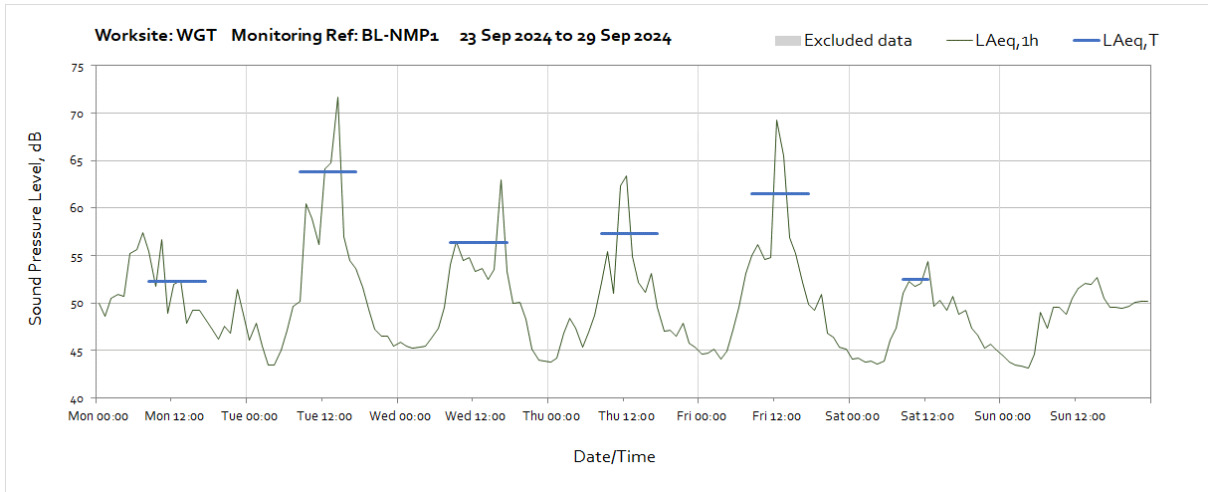




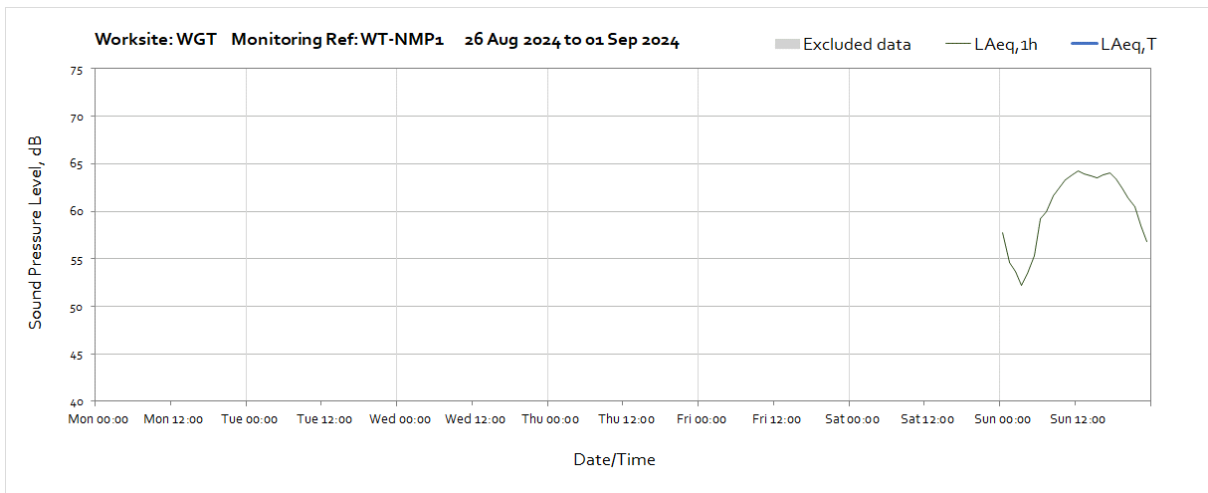
**Worksite: WGT - Monitoring Ref: BL-NMP1**

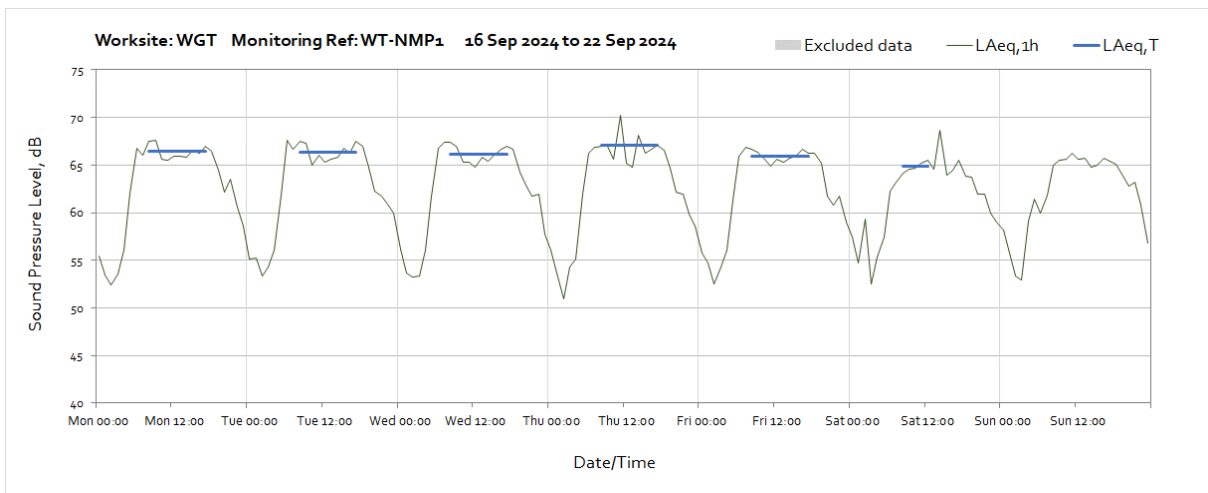
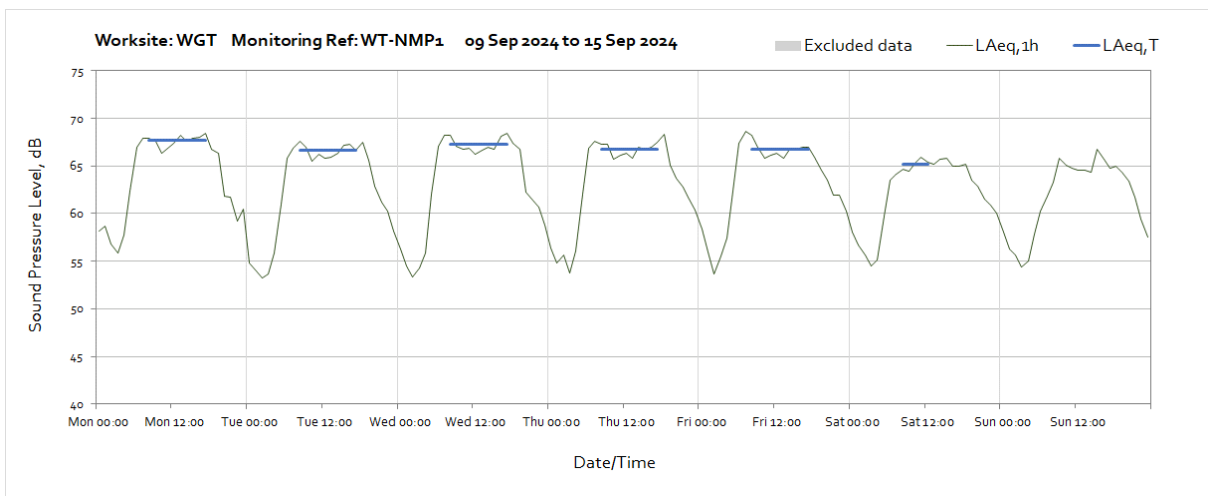
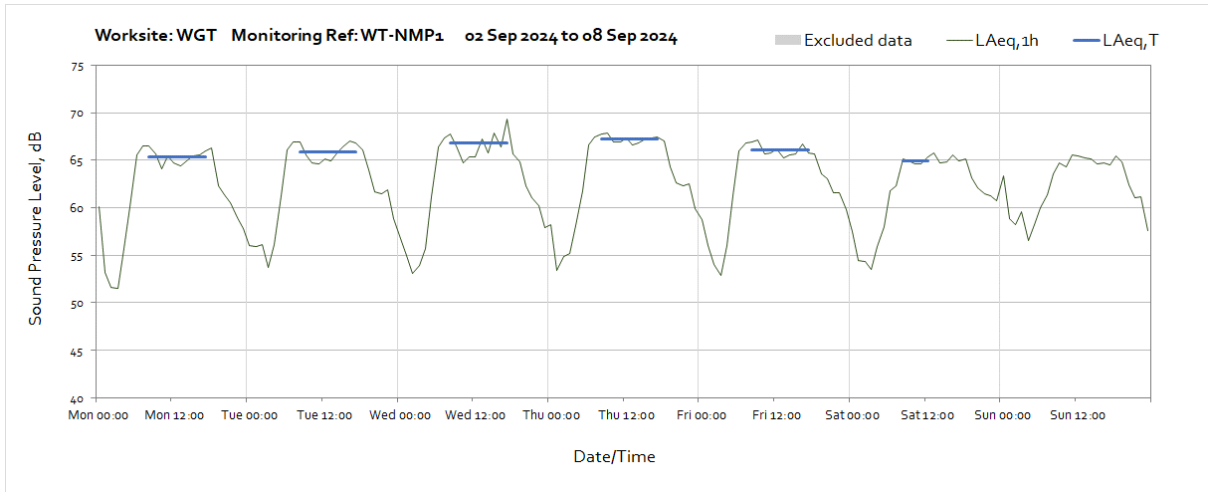


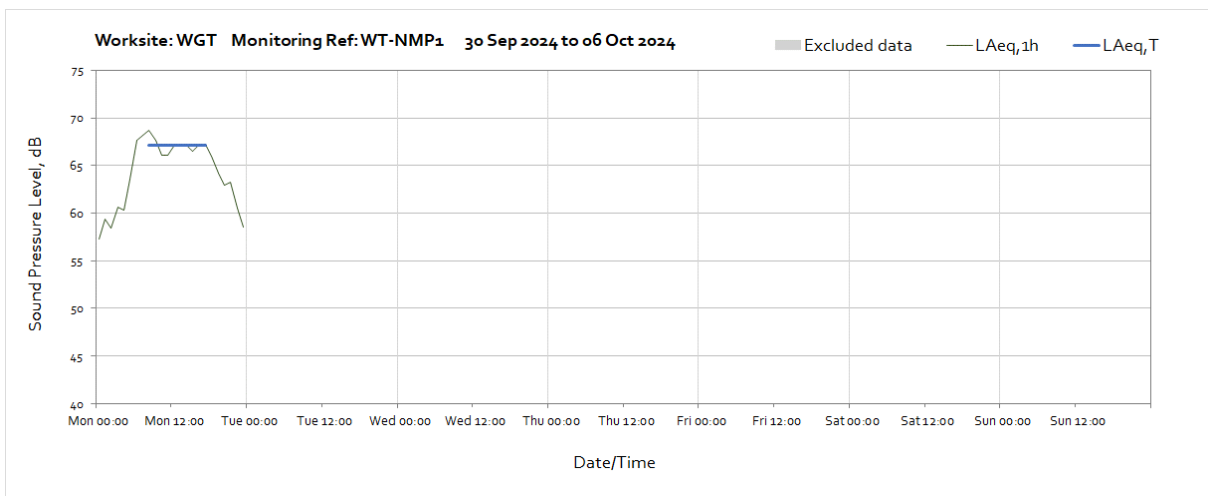
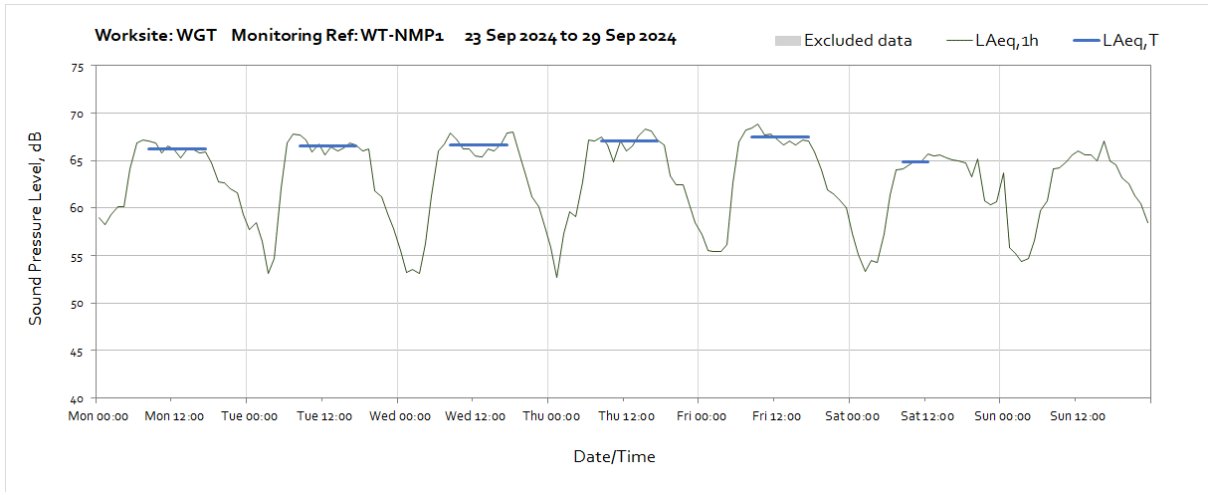




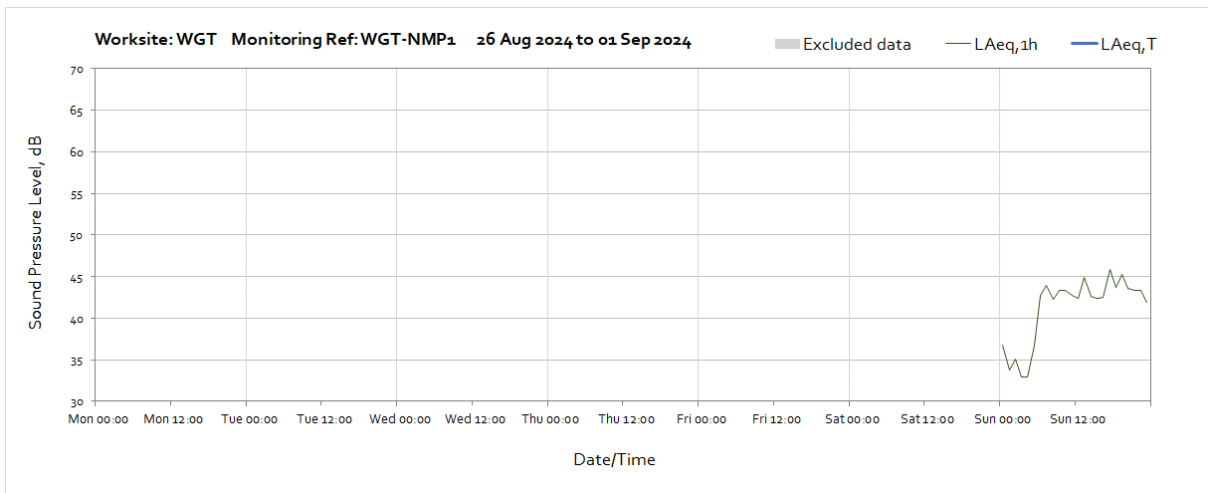
**Worksite: WGT - Monitoring Ref: WT-NMP1**



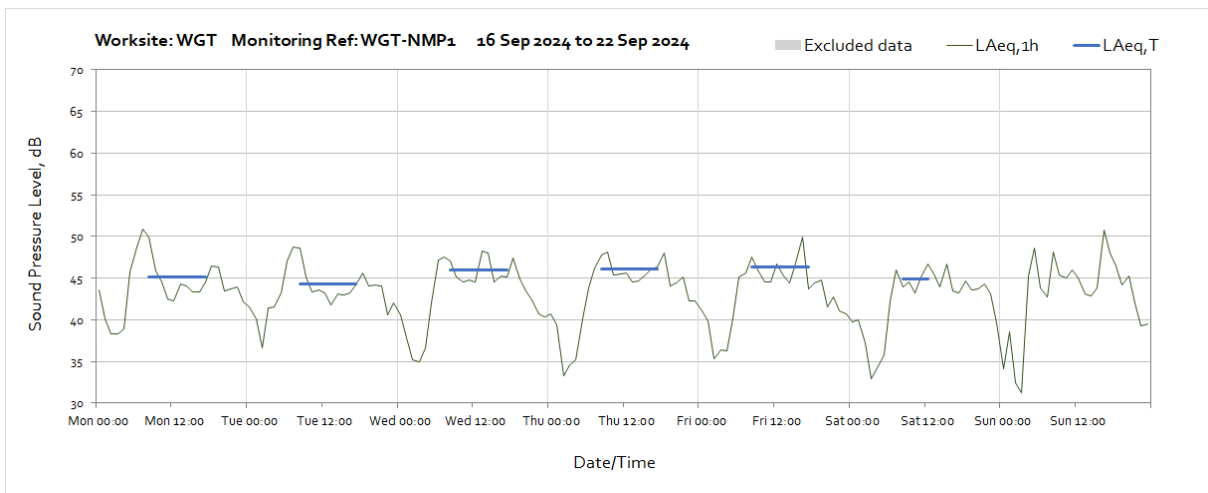
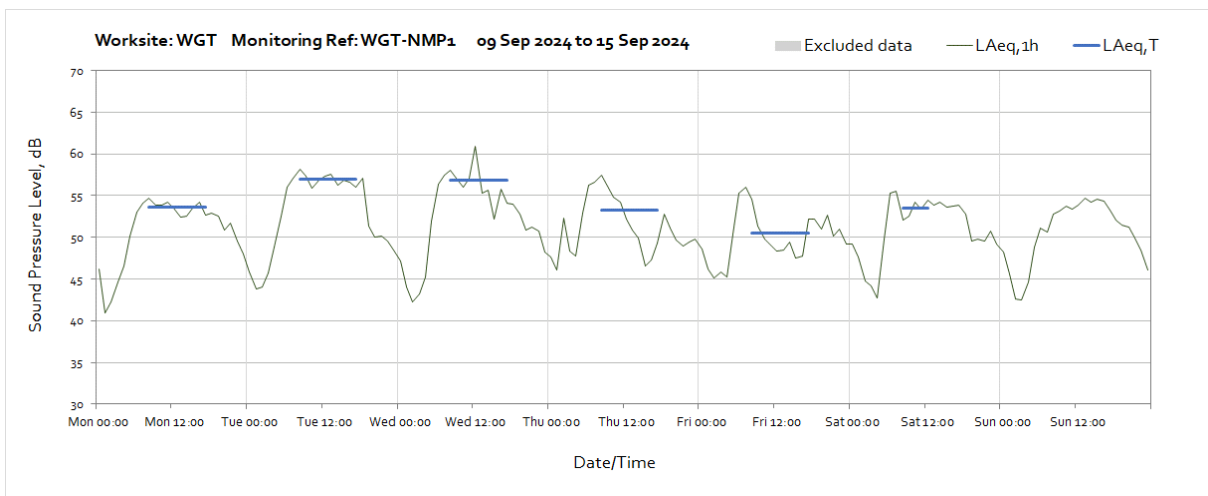
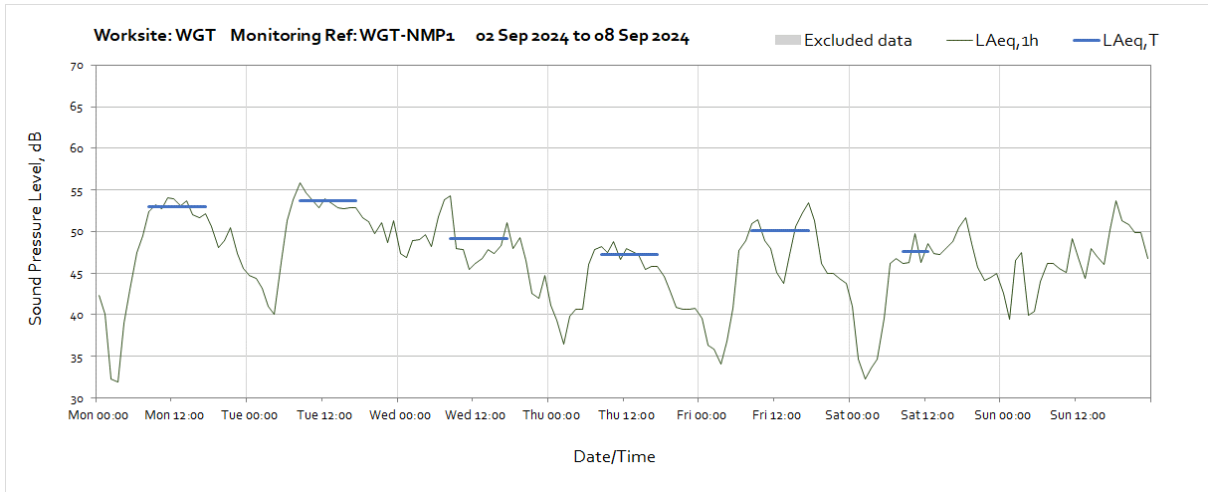


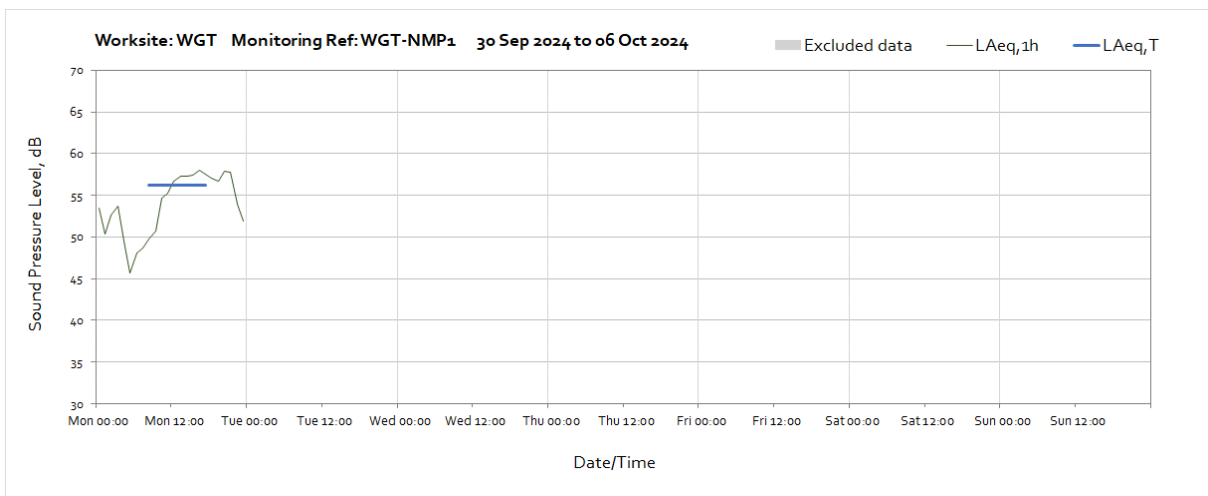
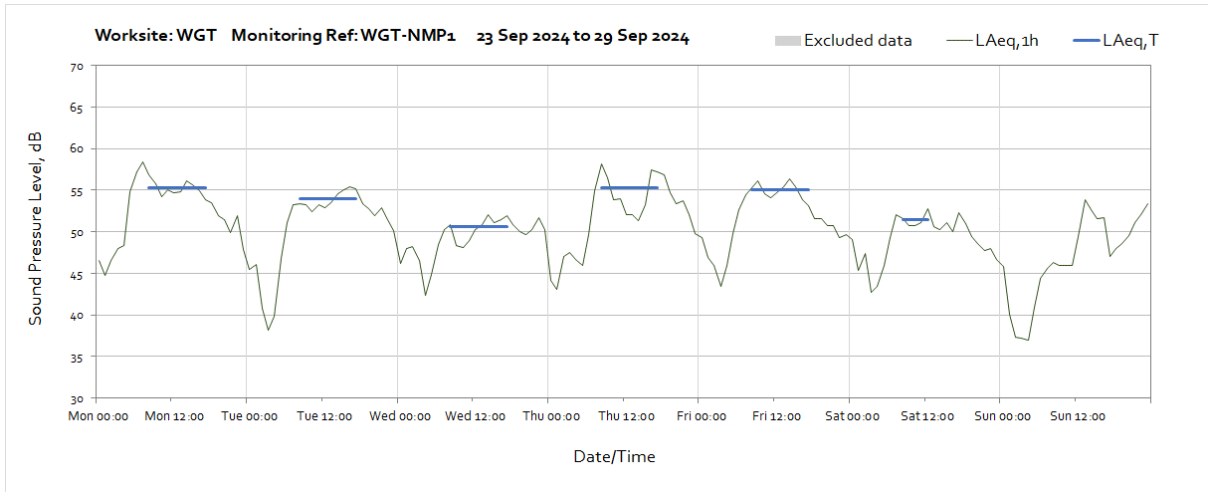


**Worksite: WGT – Monitoring Ref: WGT-NMP1**

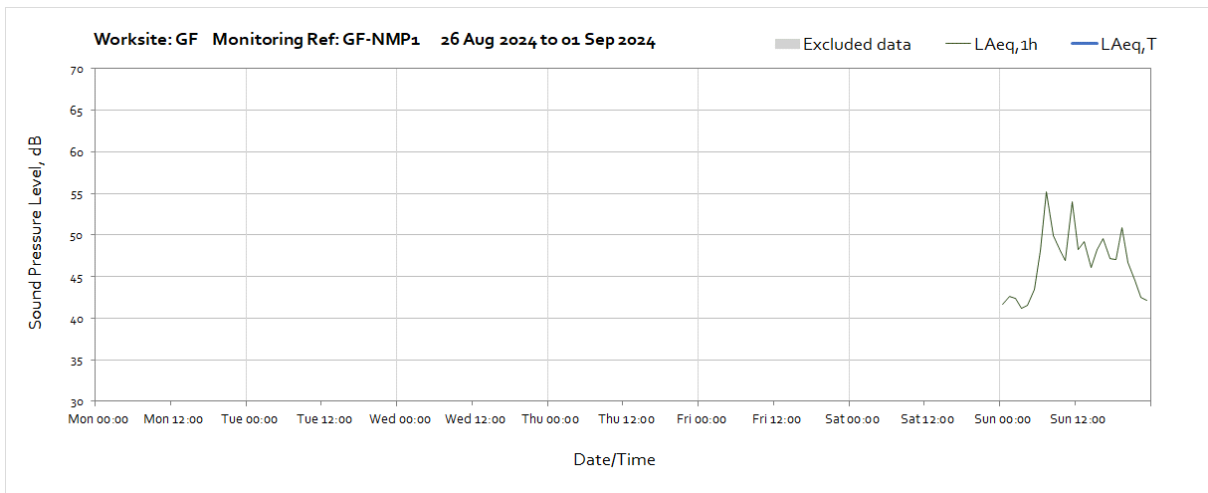


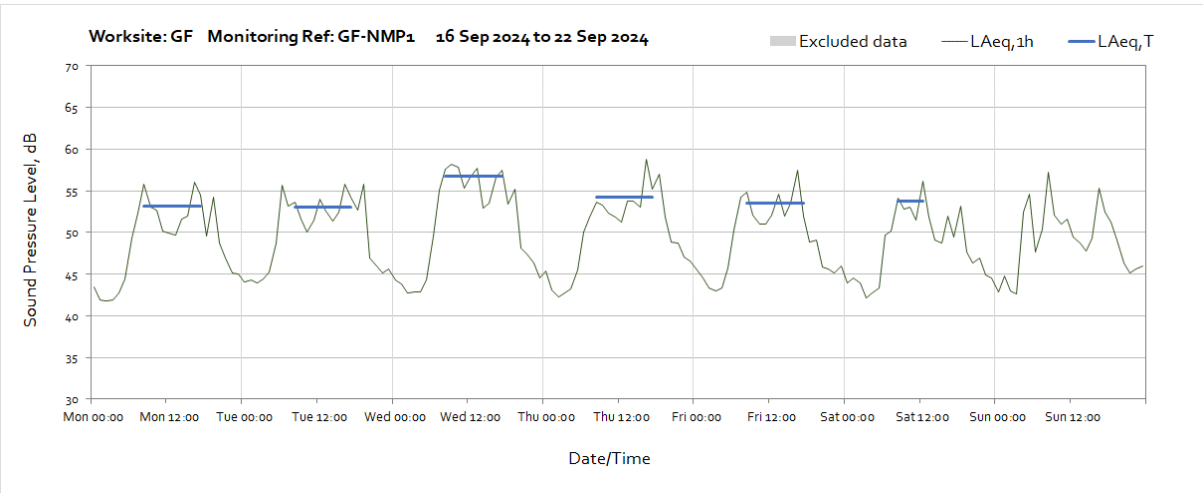
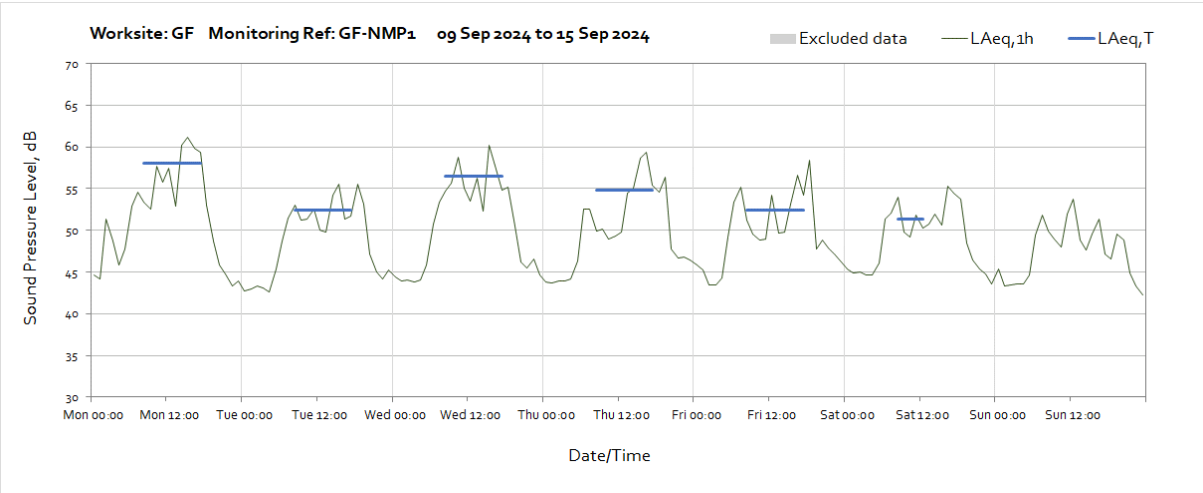
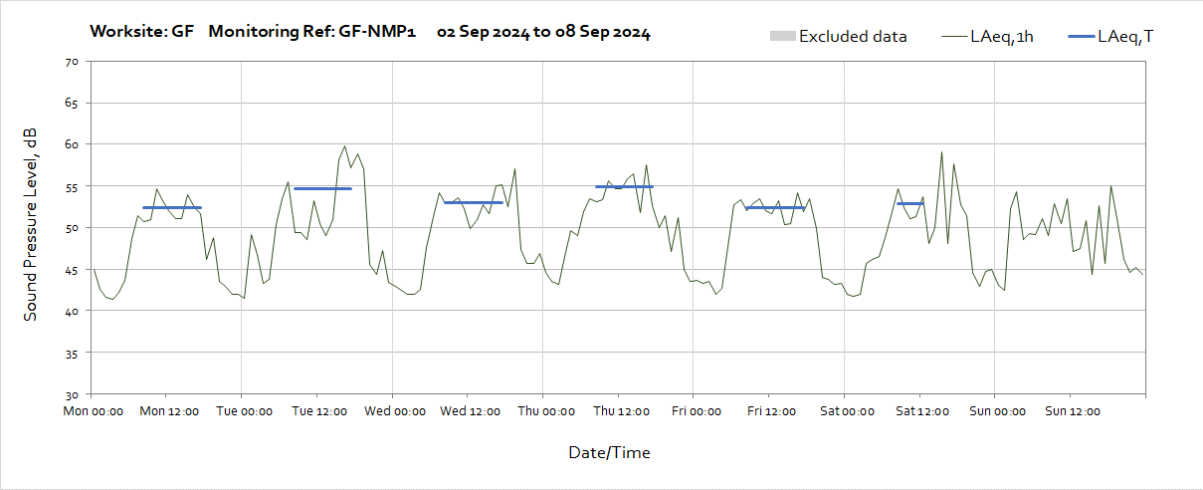


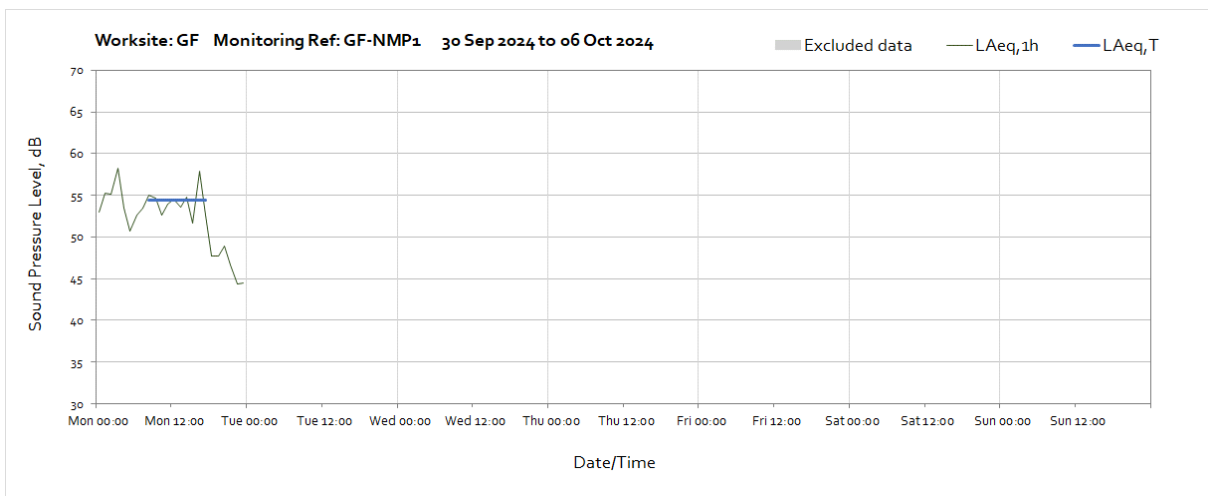
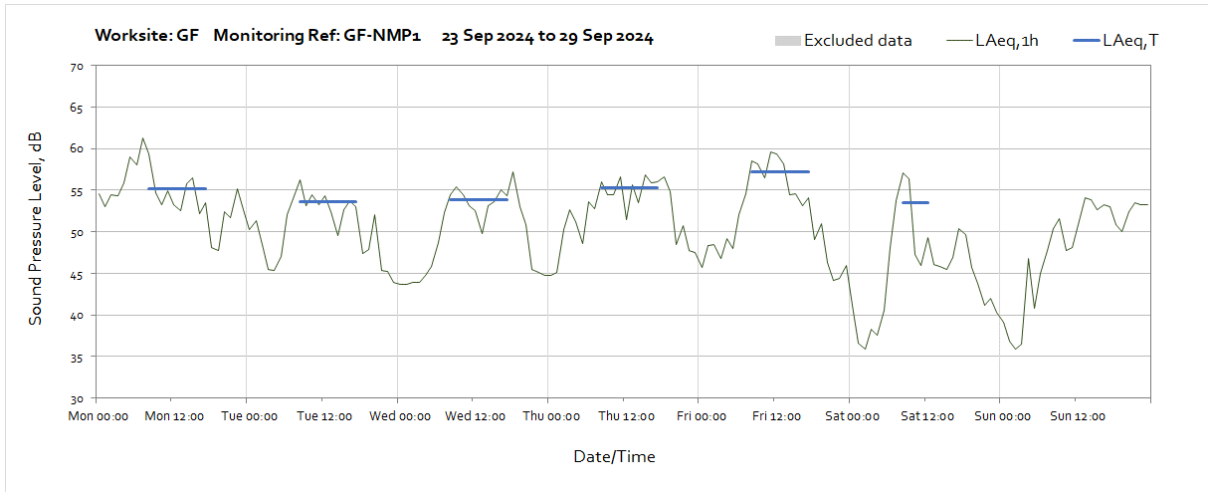




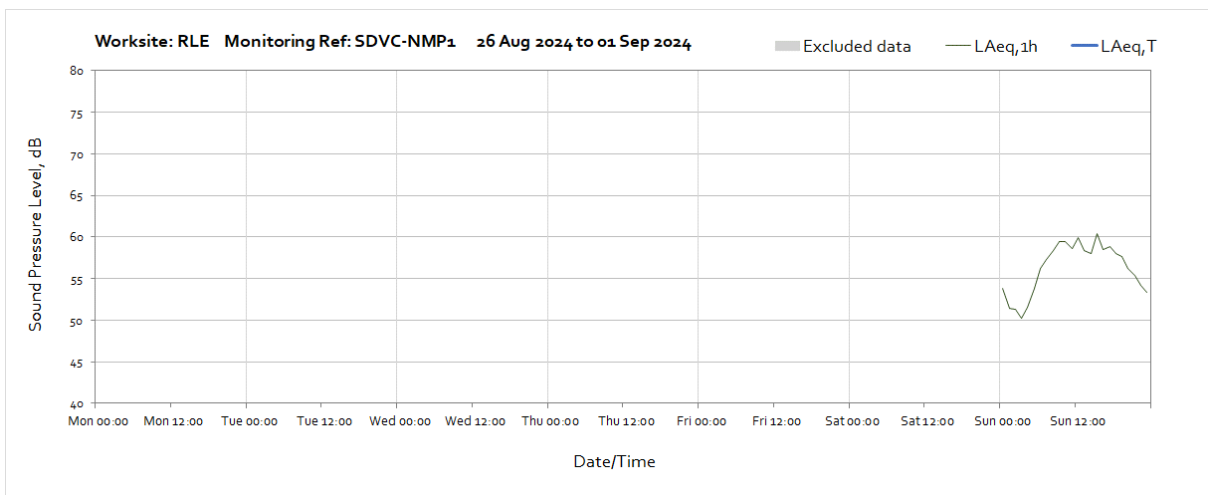
**Worksite: GF – Monitoring Ref: GF-NMP1**

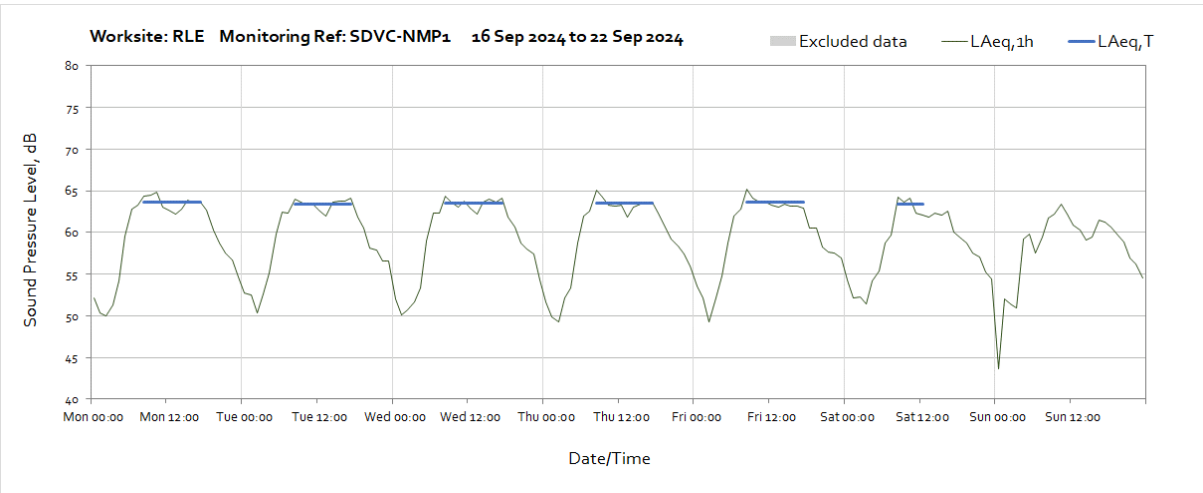
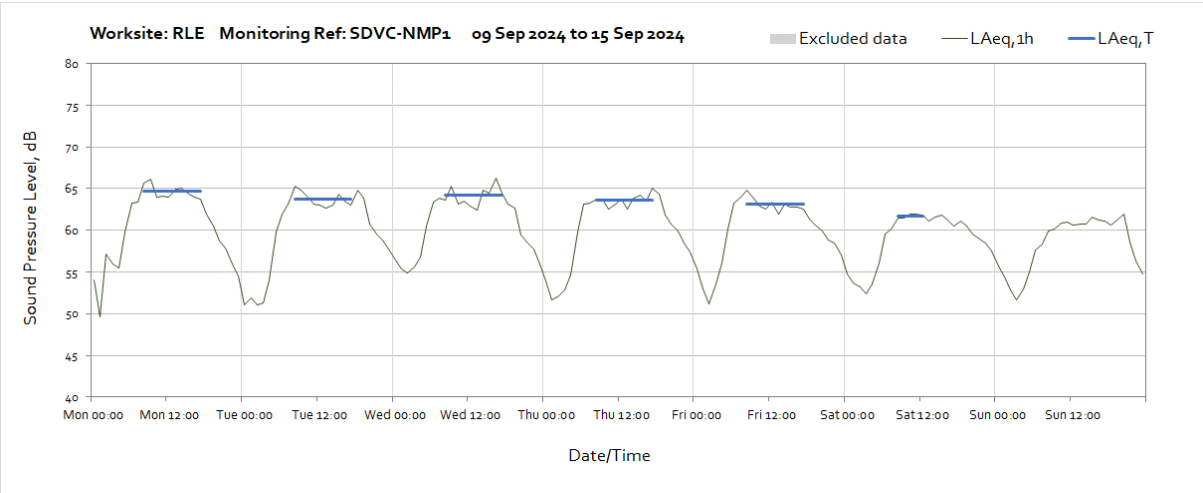
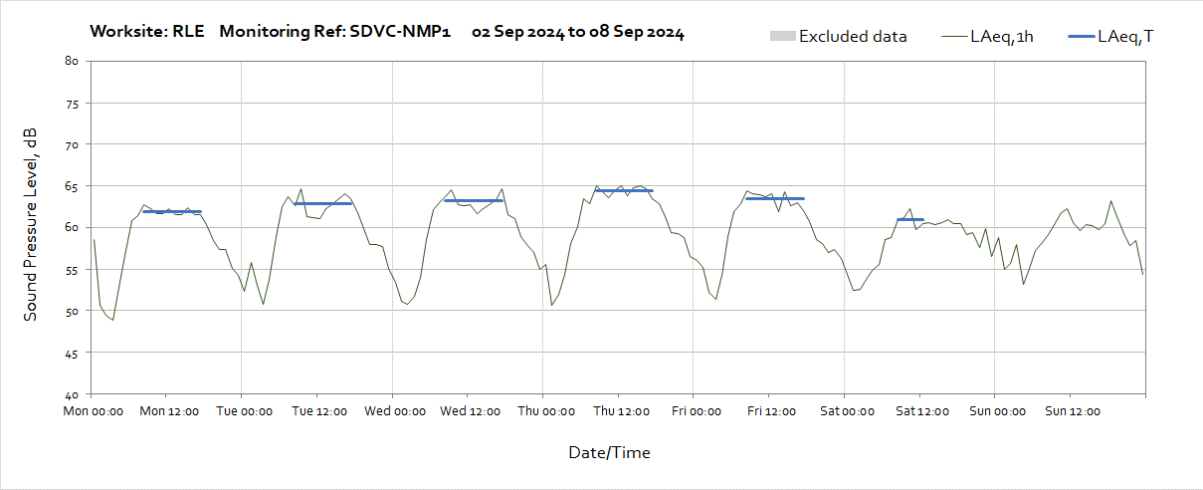


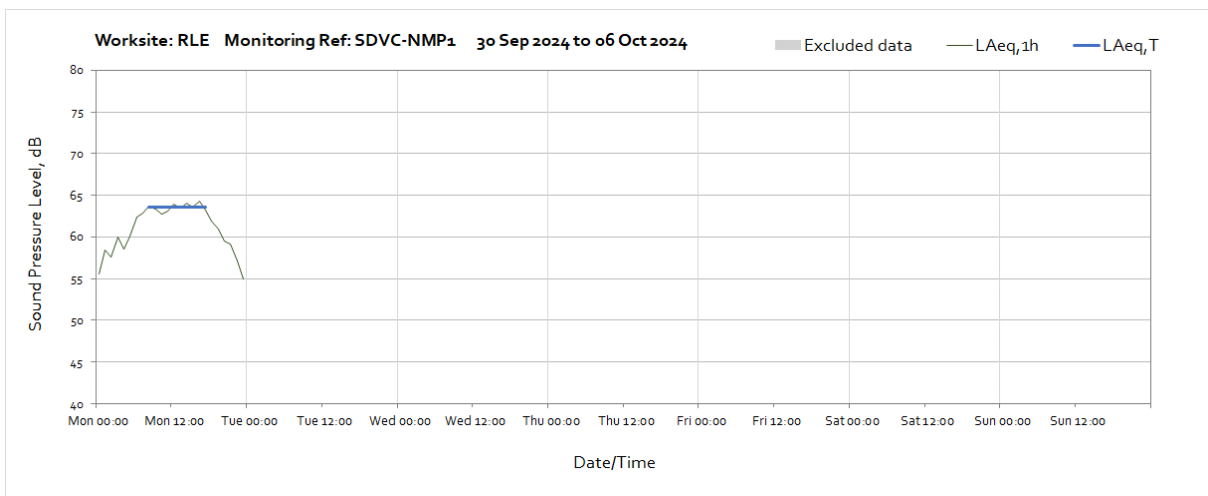
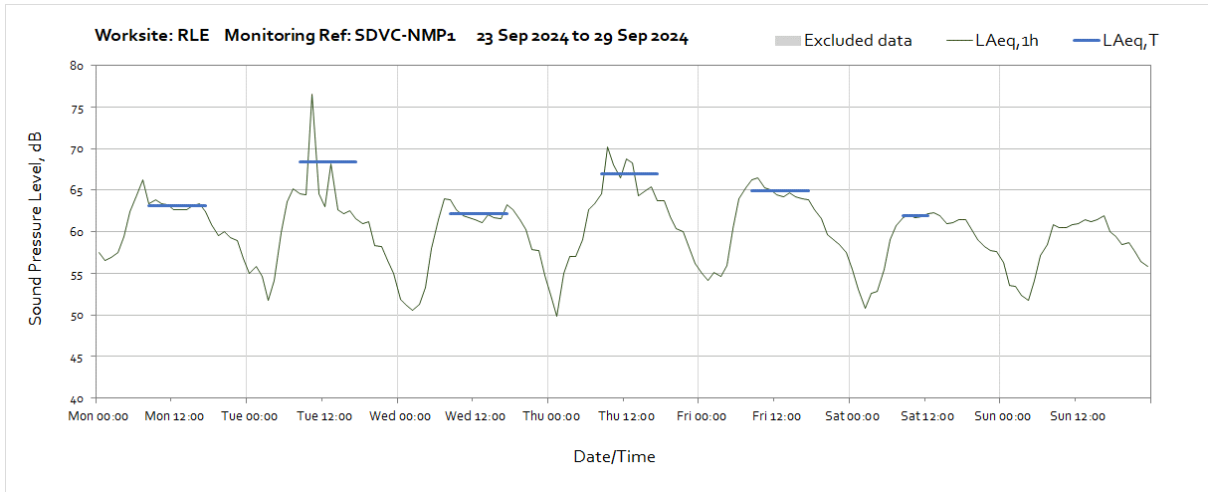




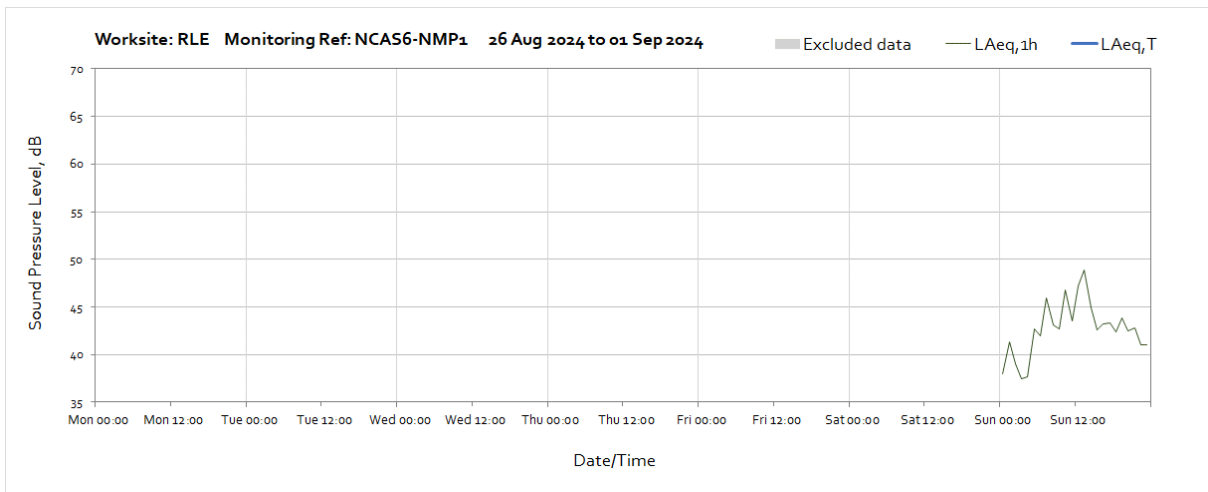
**Worksite: RLE – Monitoring Ref: SDVC-NMP1**

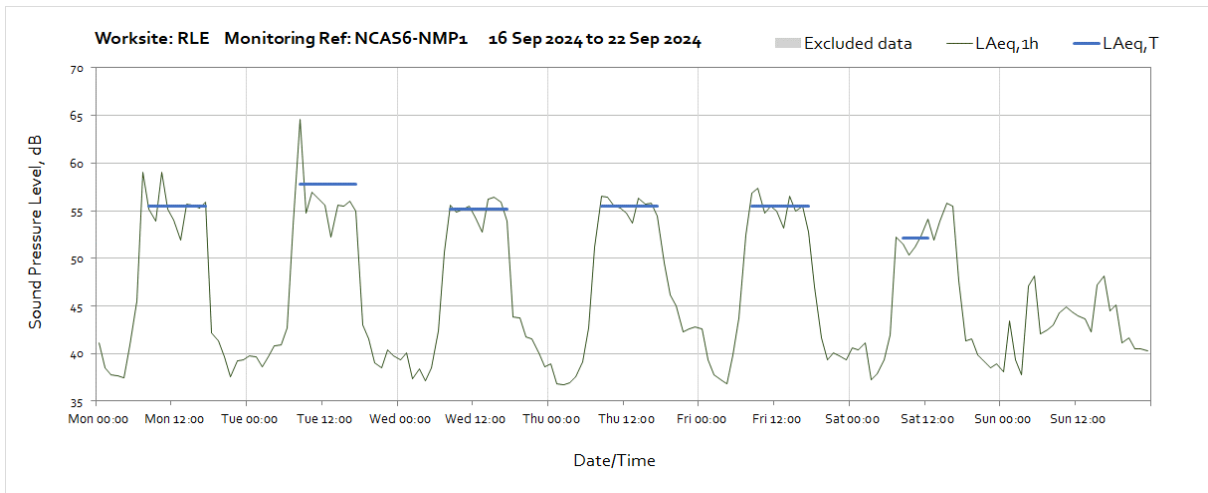
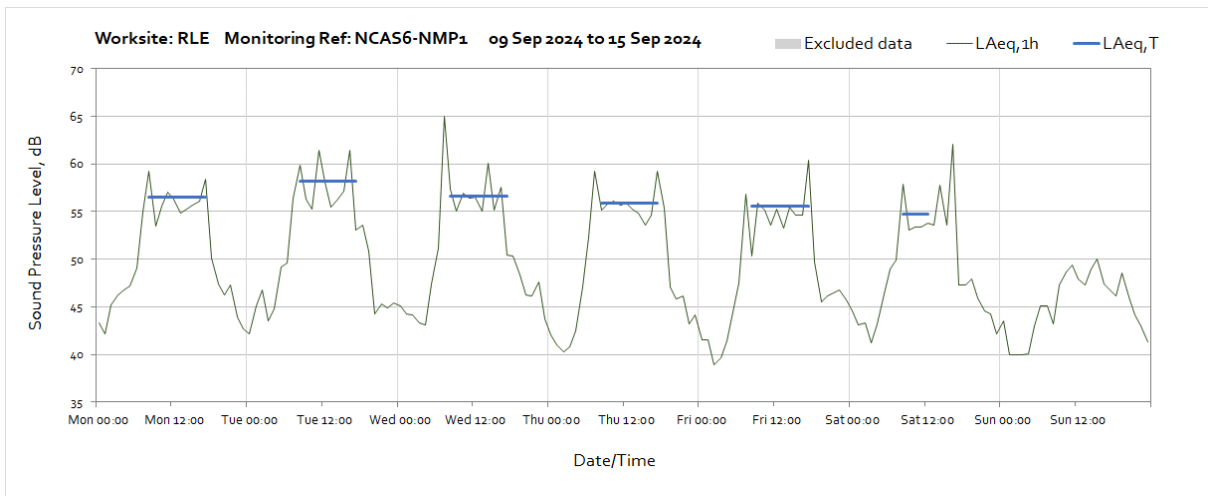
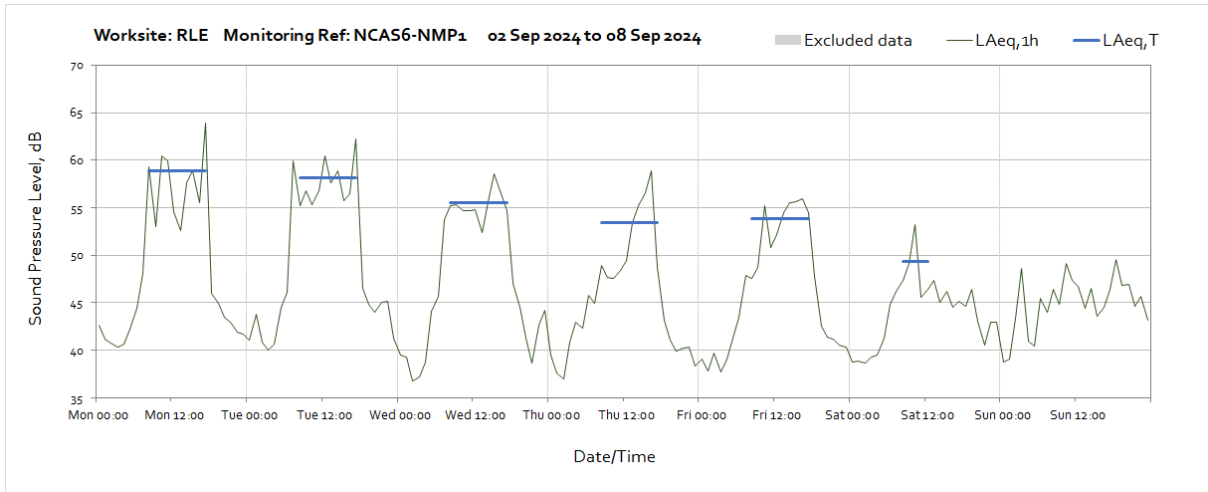


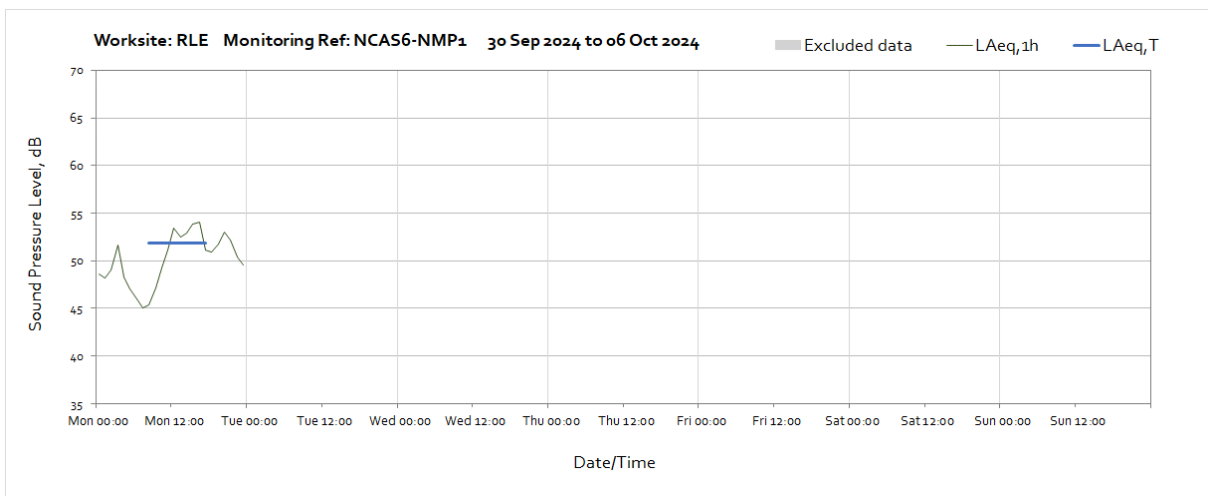
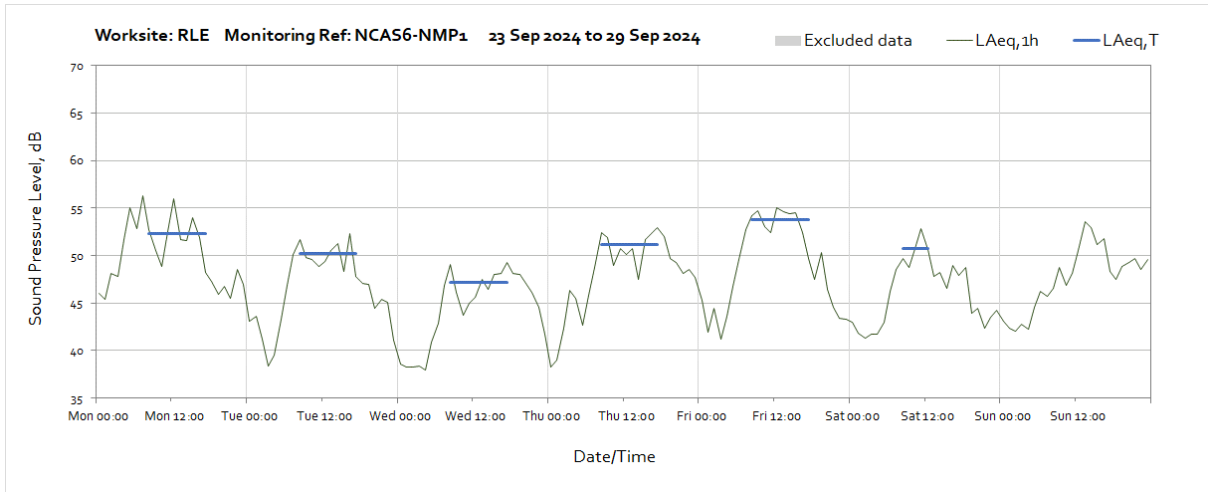




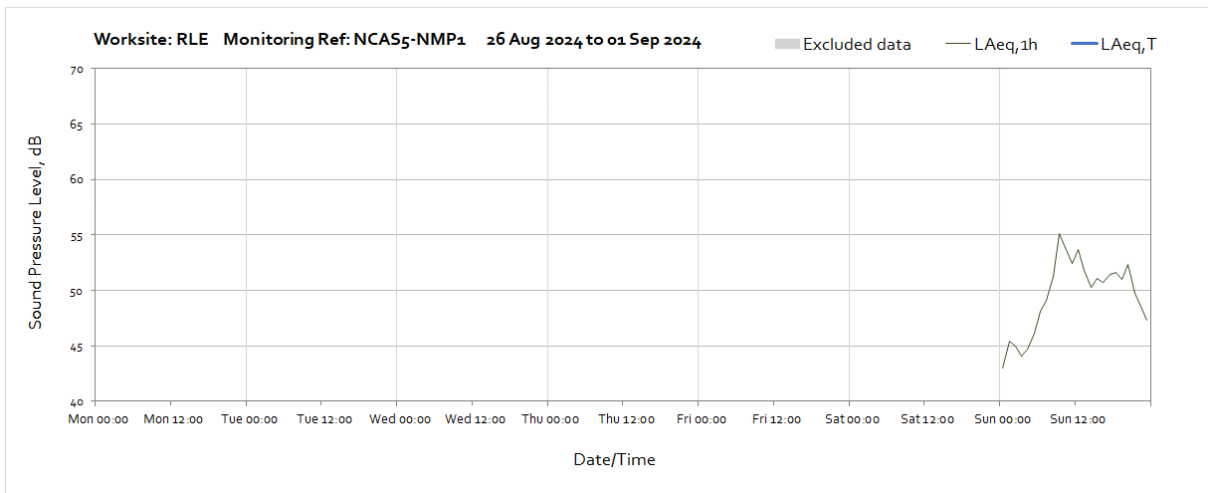
**Worksite: RLE - Monitoring Ref: NCAS6-NMP1**



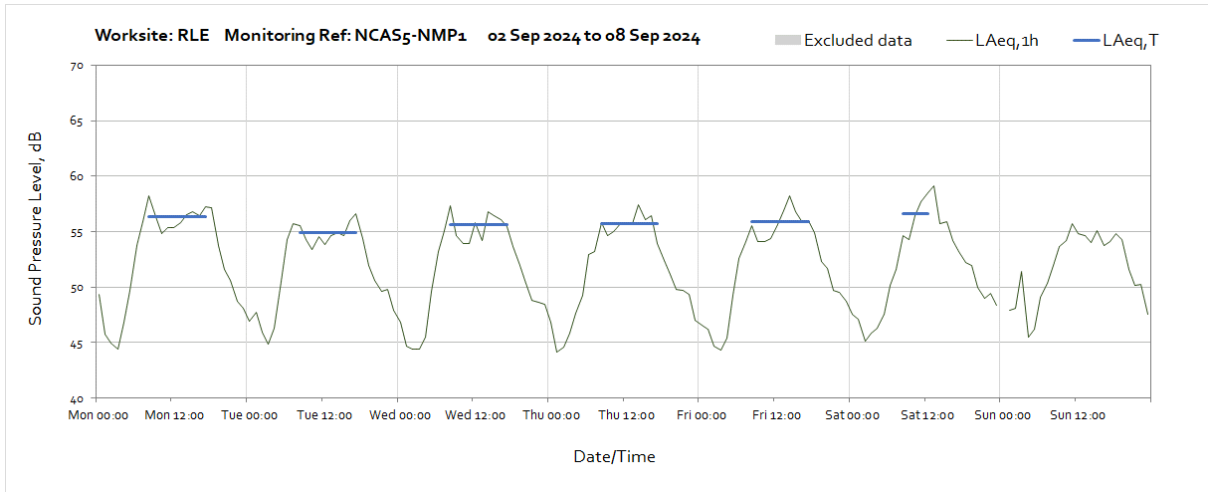




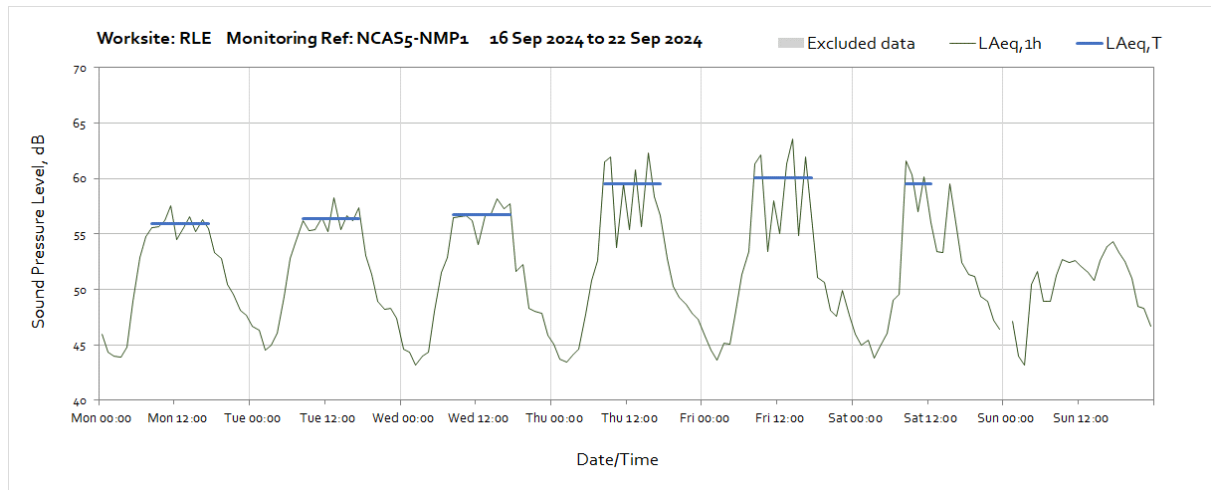
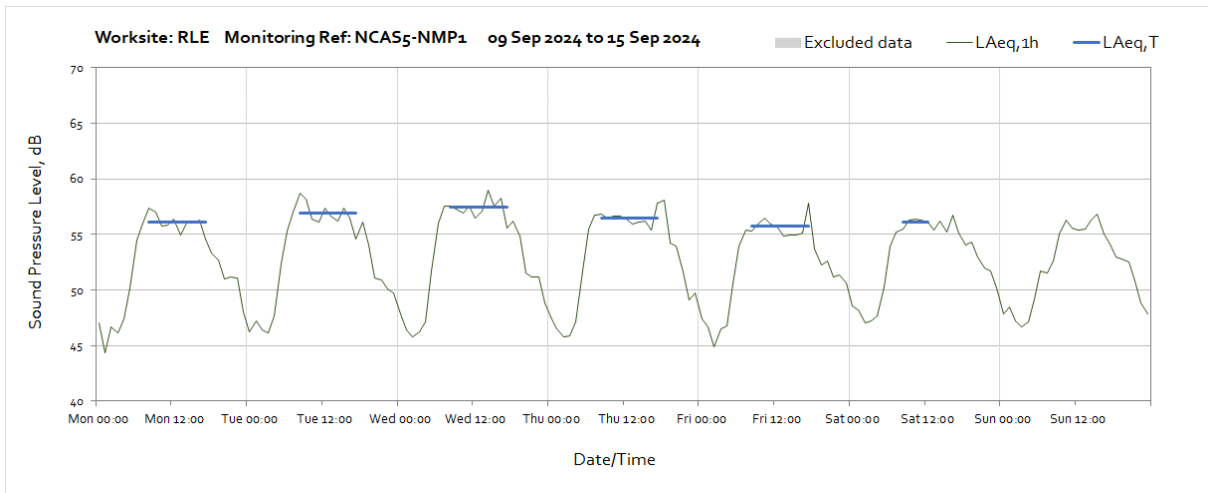
**Worksite: RLE - Monitoring Ref: NCAS5-NMP1**





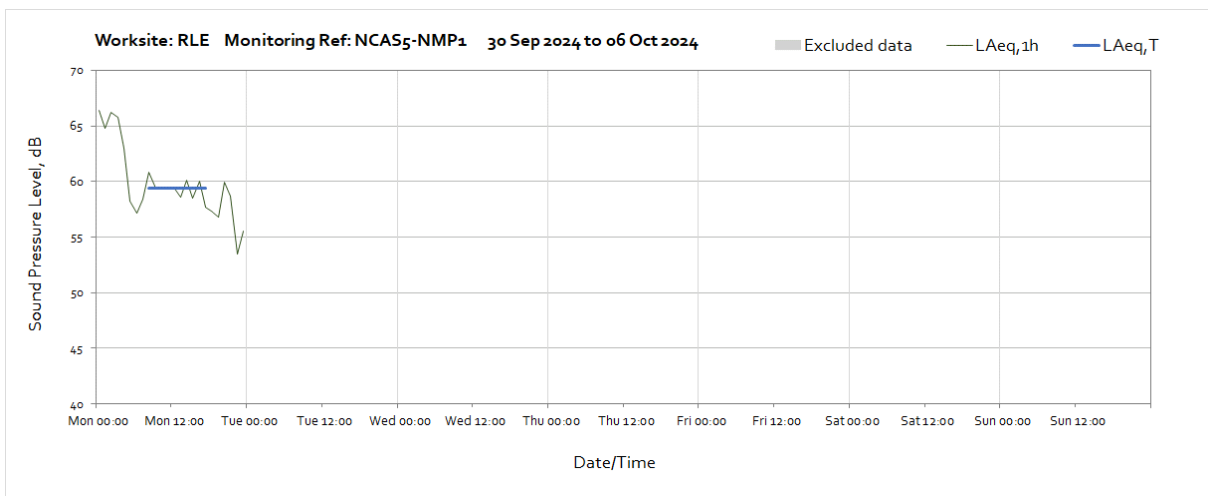
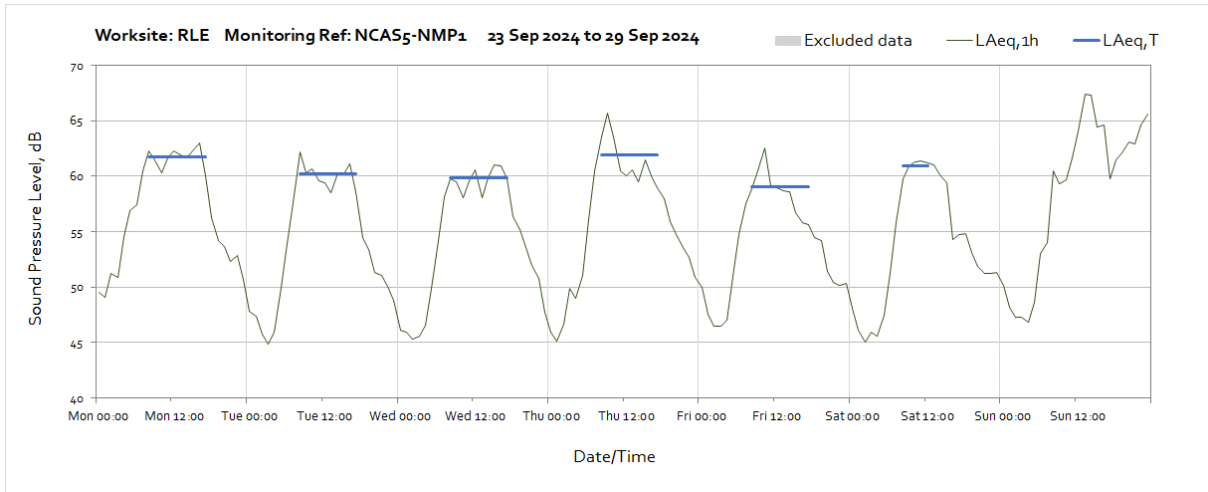


Note: Missing data between 00:00 and 01:00 on Sunday 8<sup>th</sup> September was due to a database update that caused a delay in updating the data to the server.

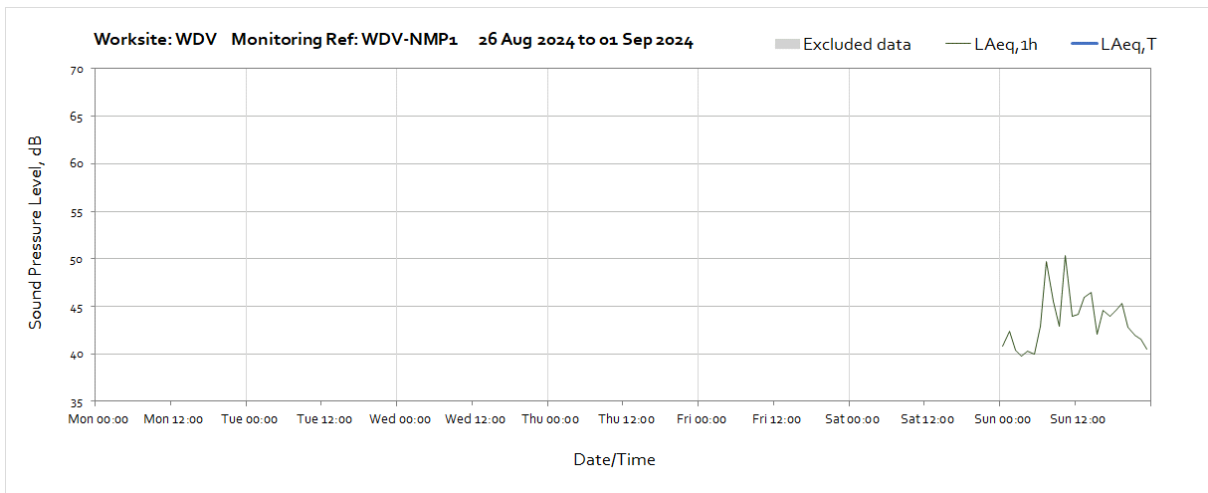


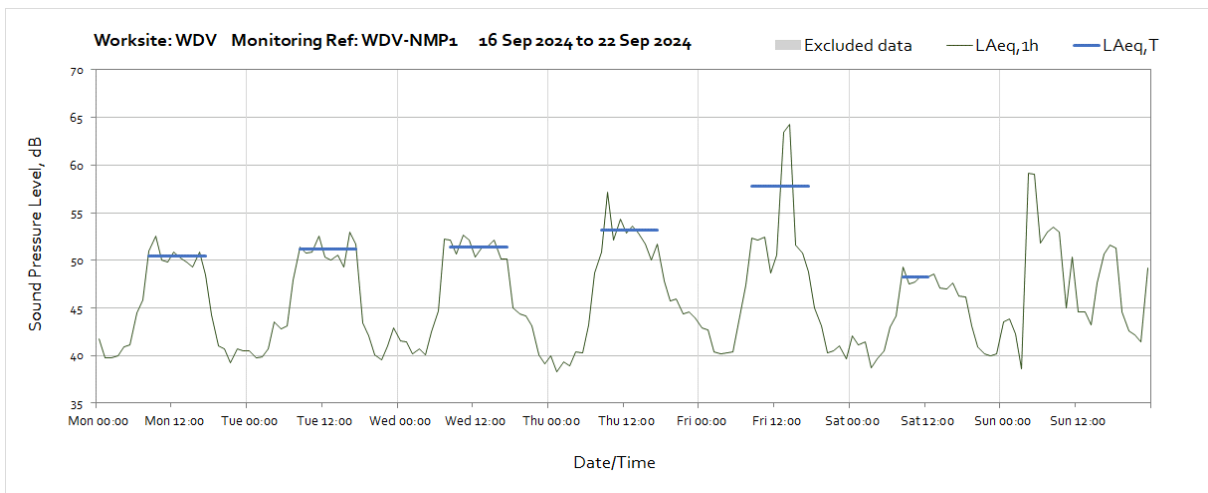
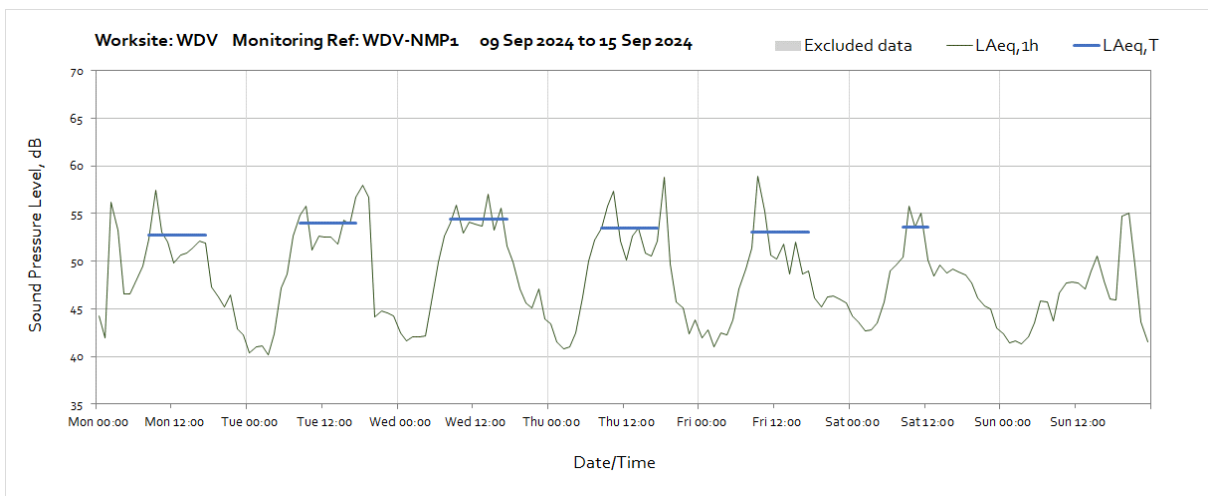
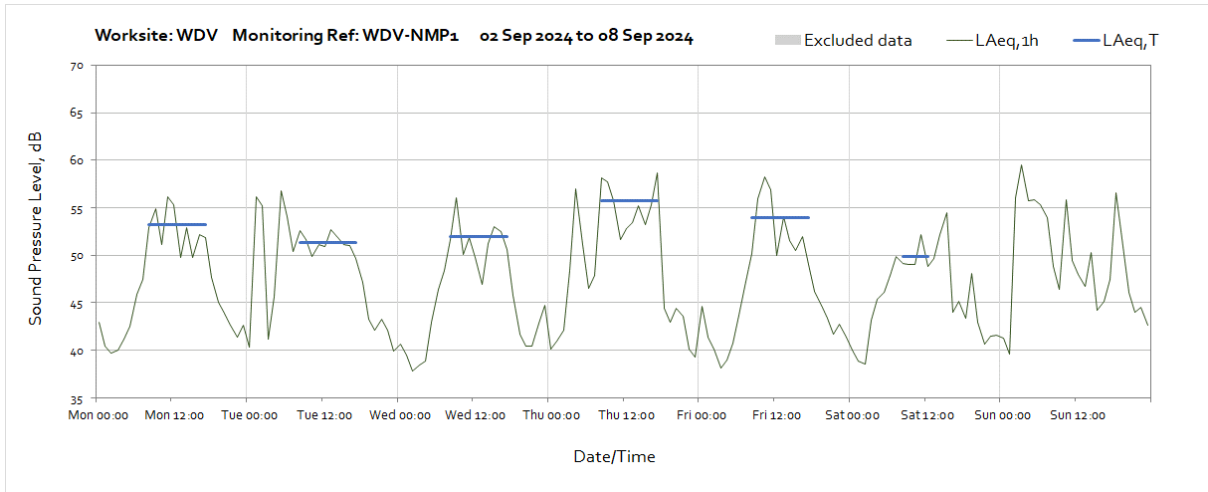
Note: Missing data between 00:00 and 01:00 on Sunday 22<sup>nd</sup> September was due to a database update that caused a delay in updating the data to the server.

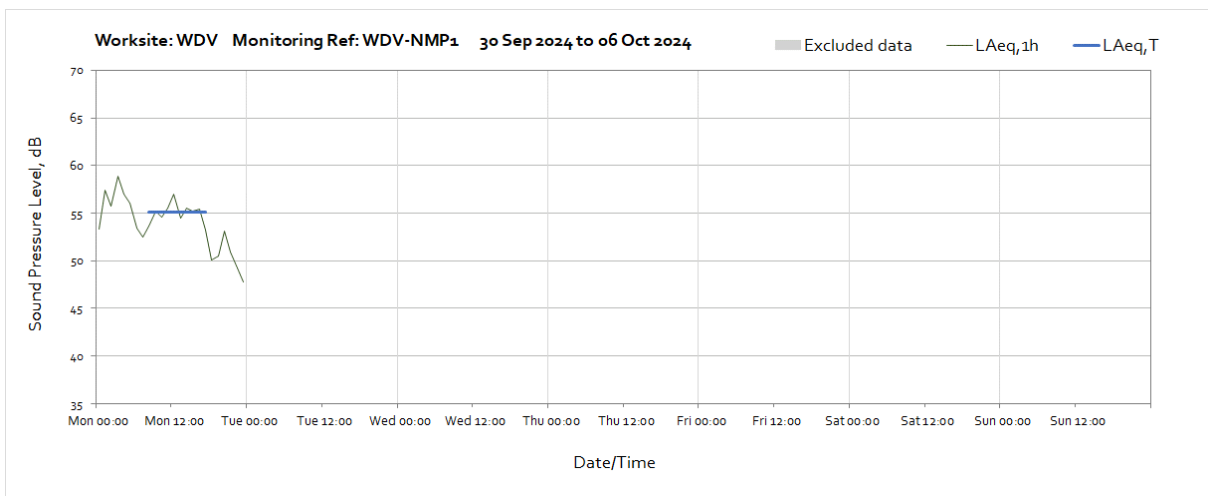
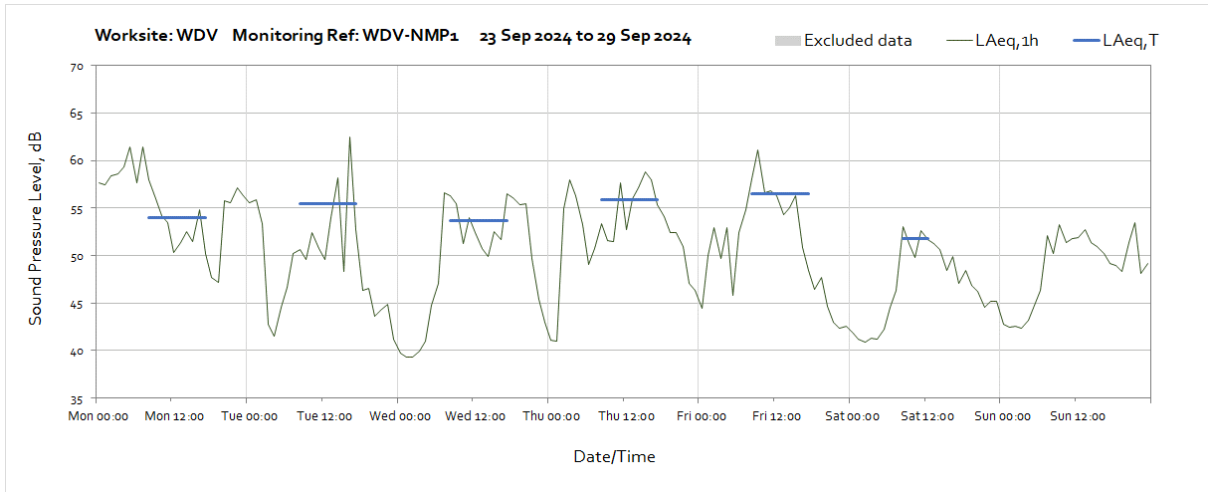
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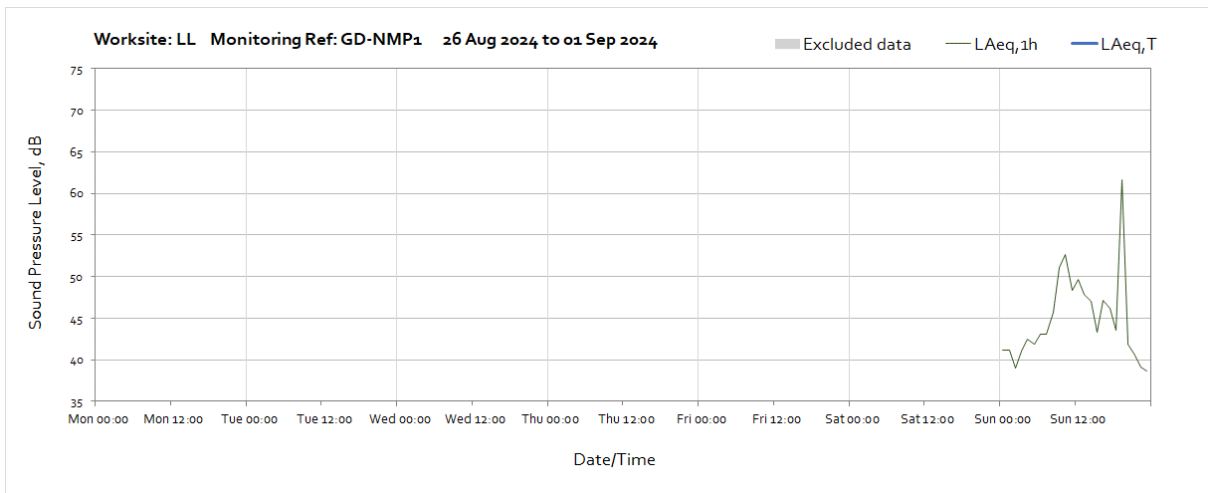
**Worksite: WDV – Monitoring Ref: WDV-NMP1**

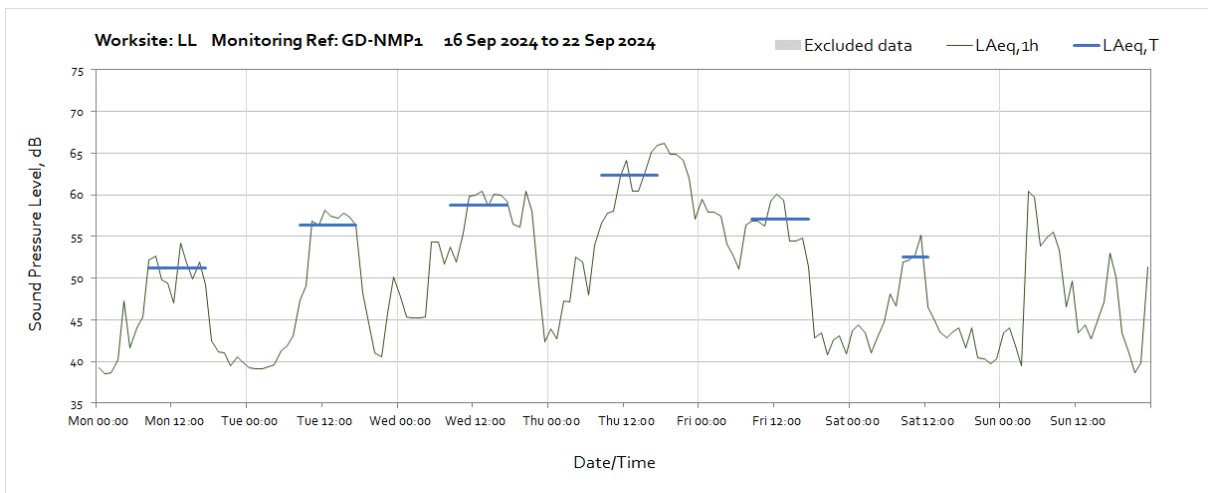
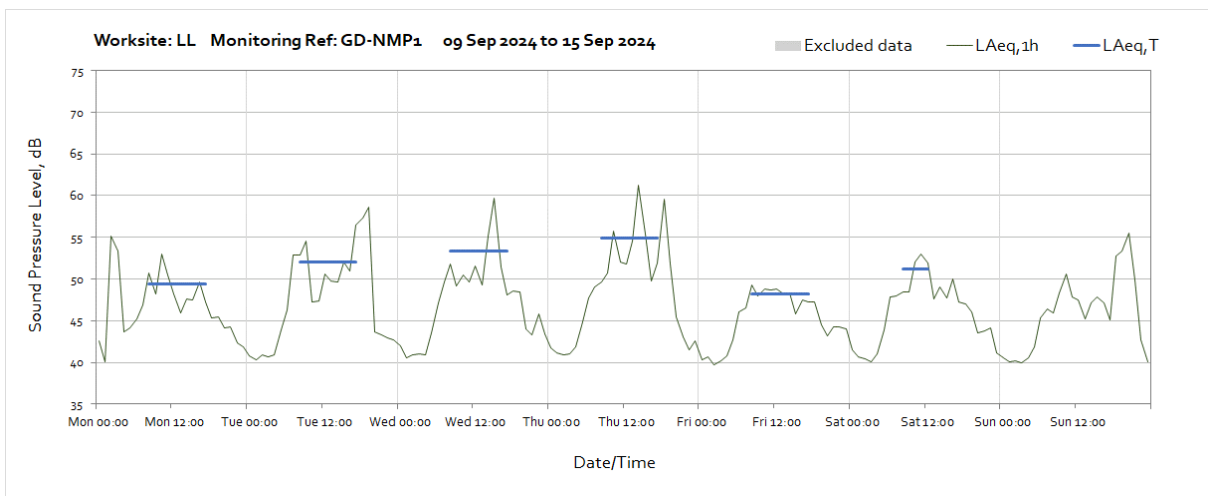
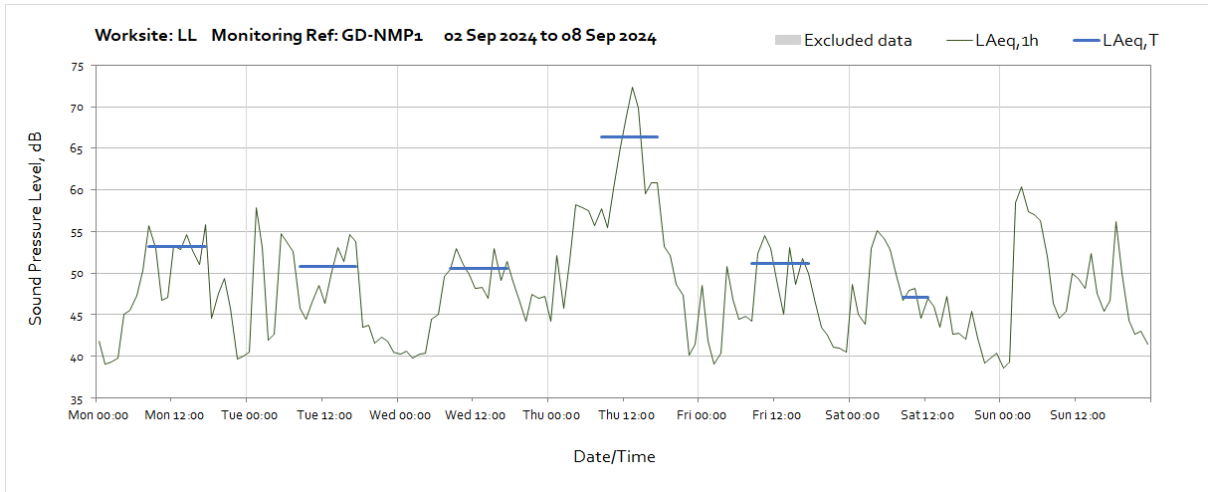


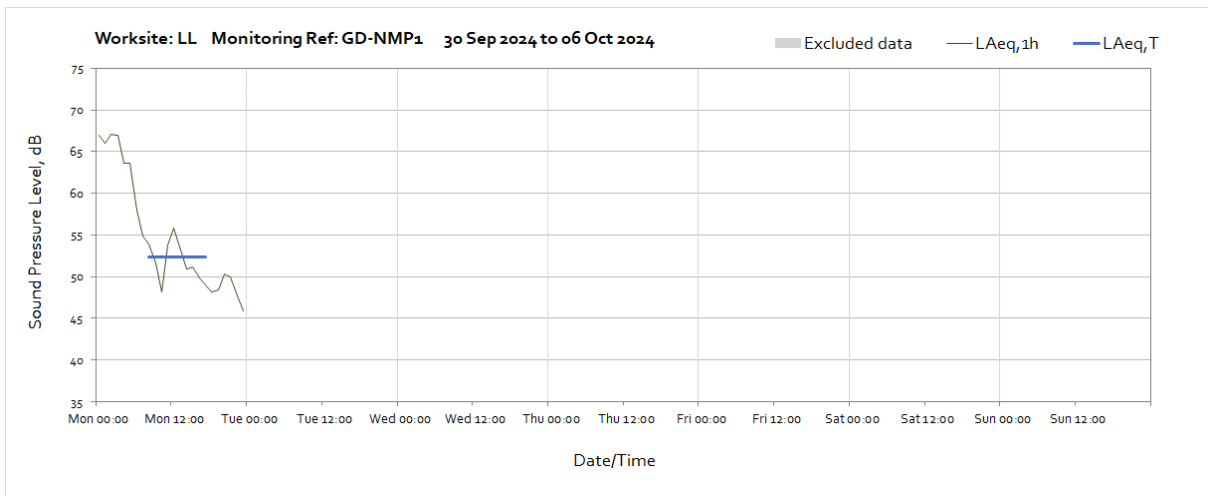
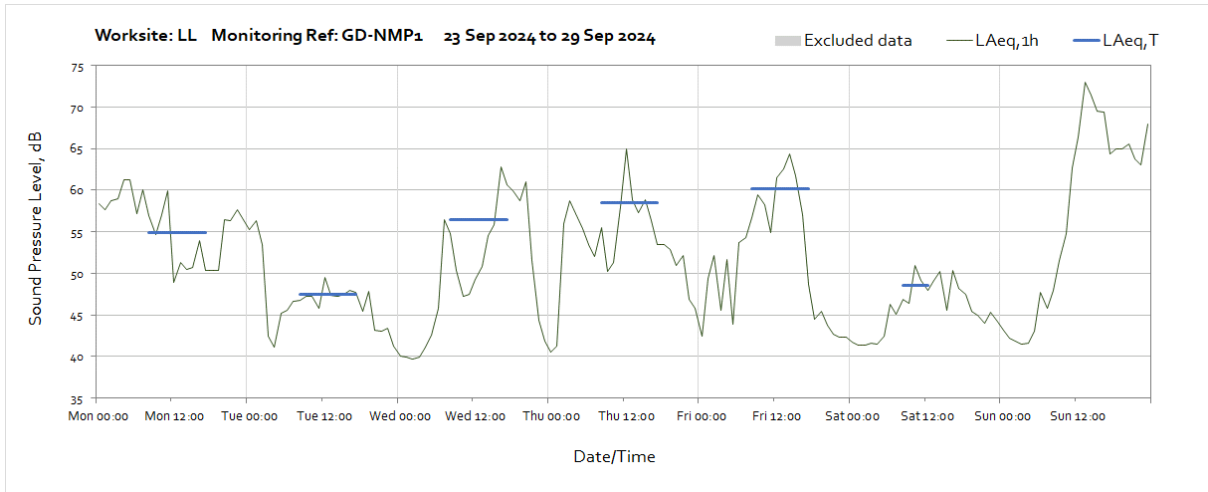




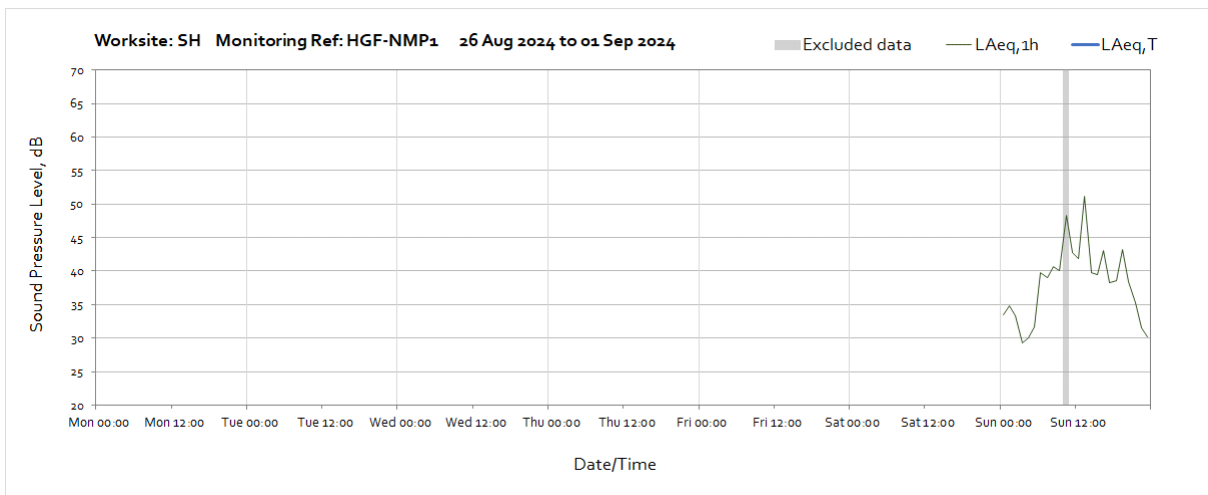
**Worksite: LL - Monitoring Ref: GD-NMP1**

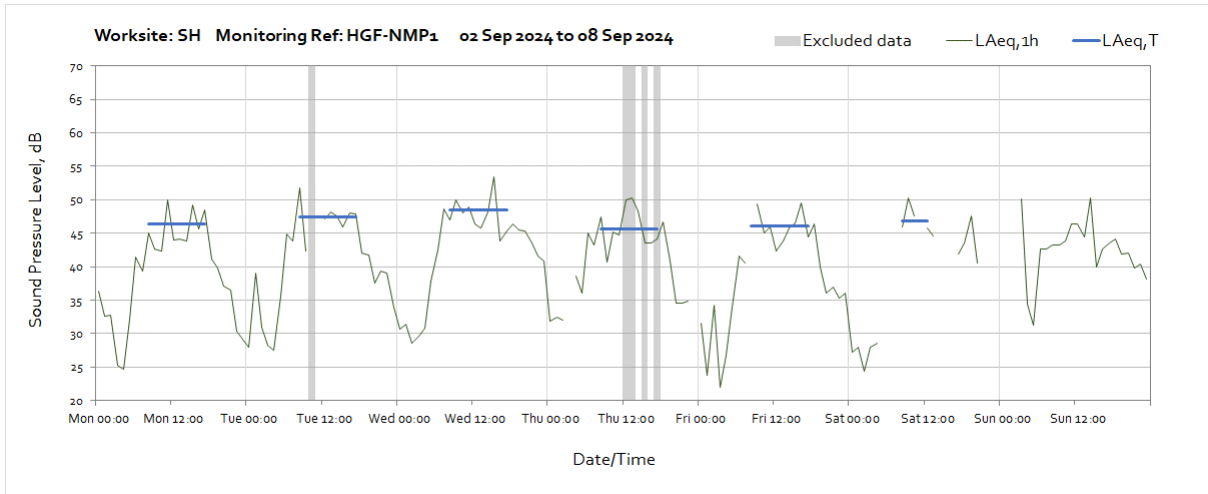




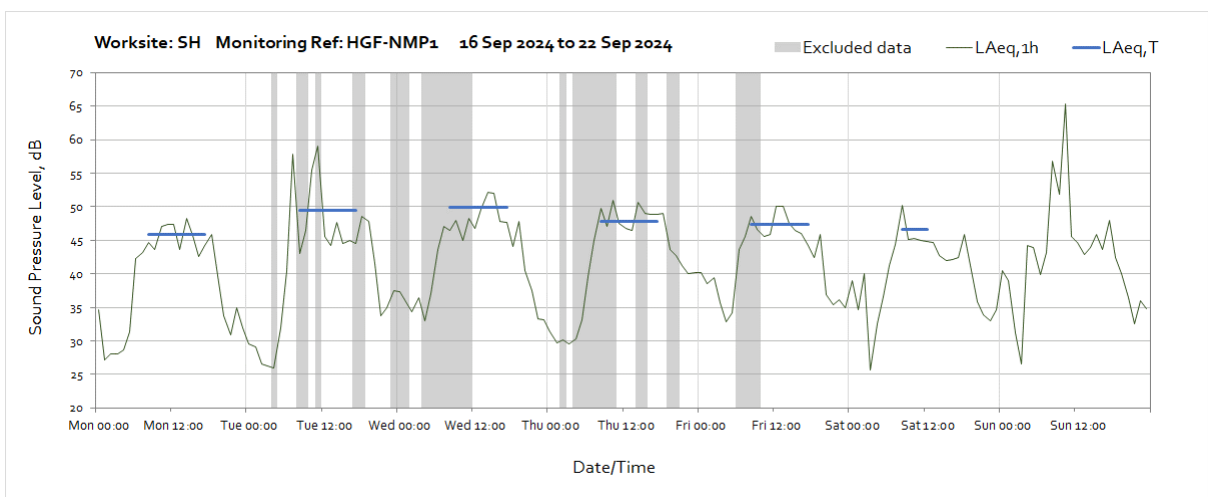
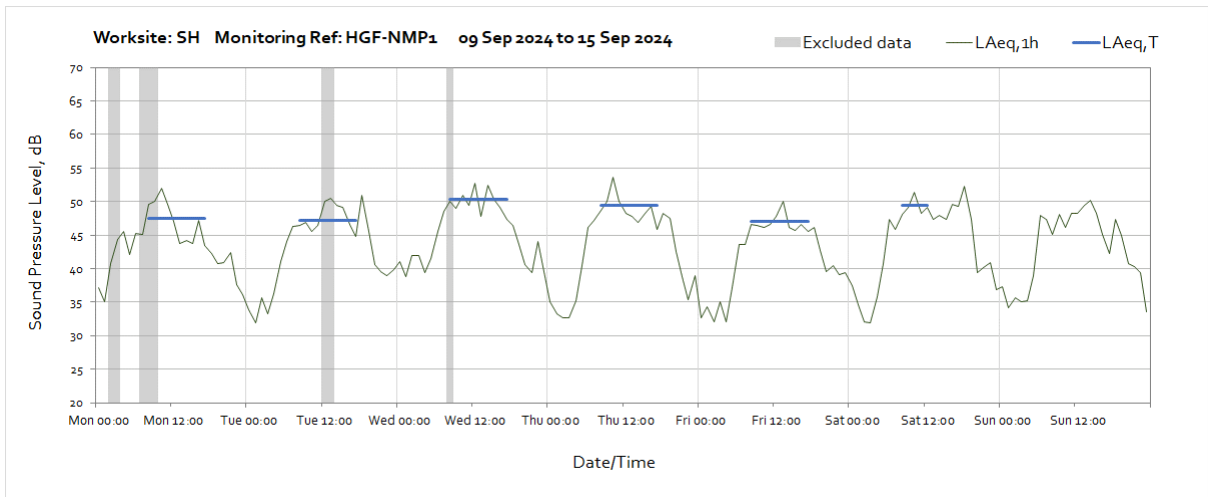


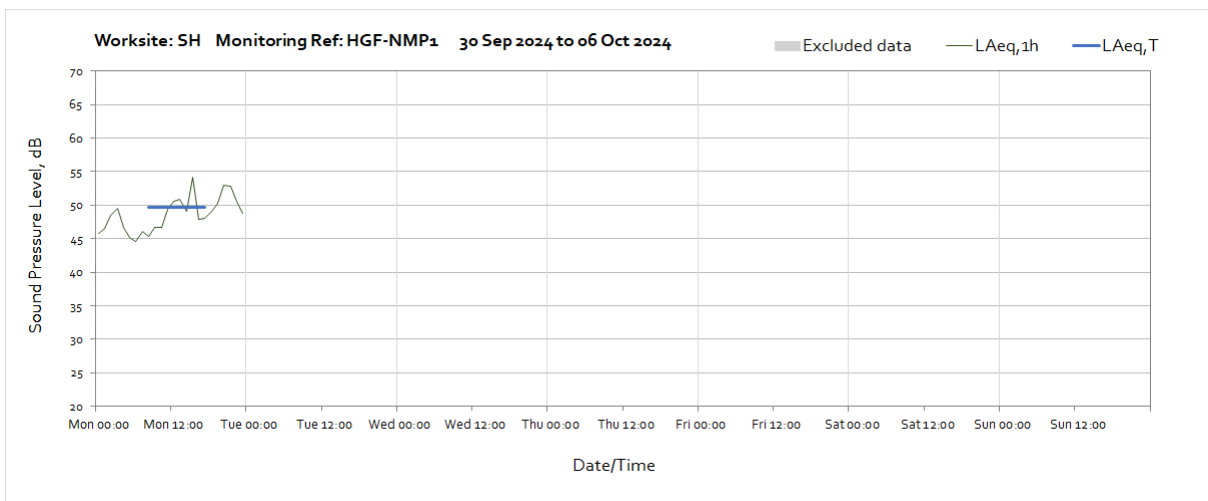
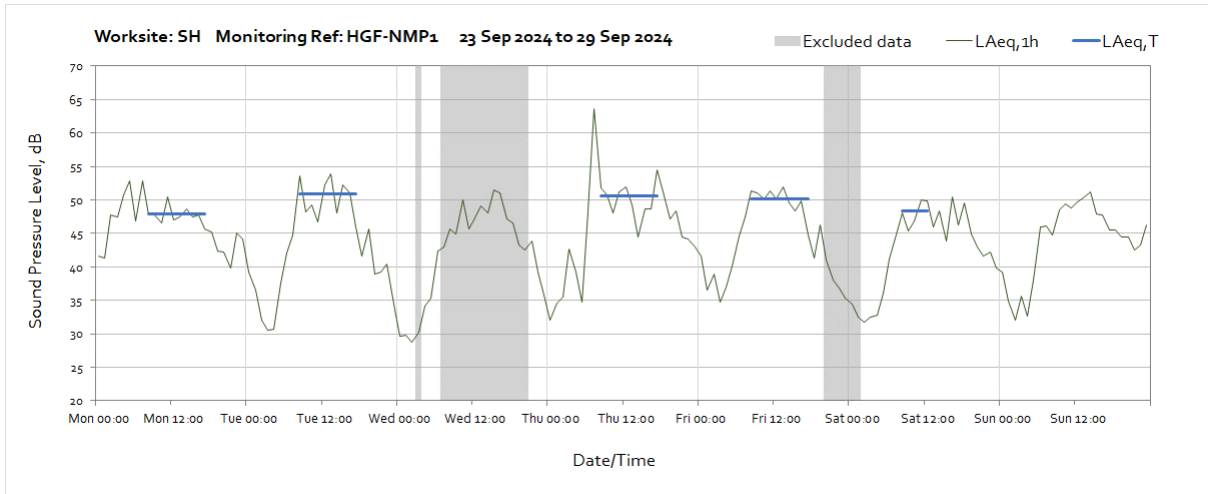
**Worksite: SH - Monitoring Ref: HGF-NMP1**



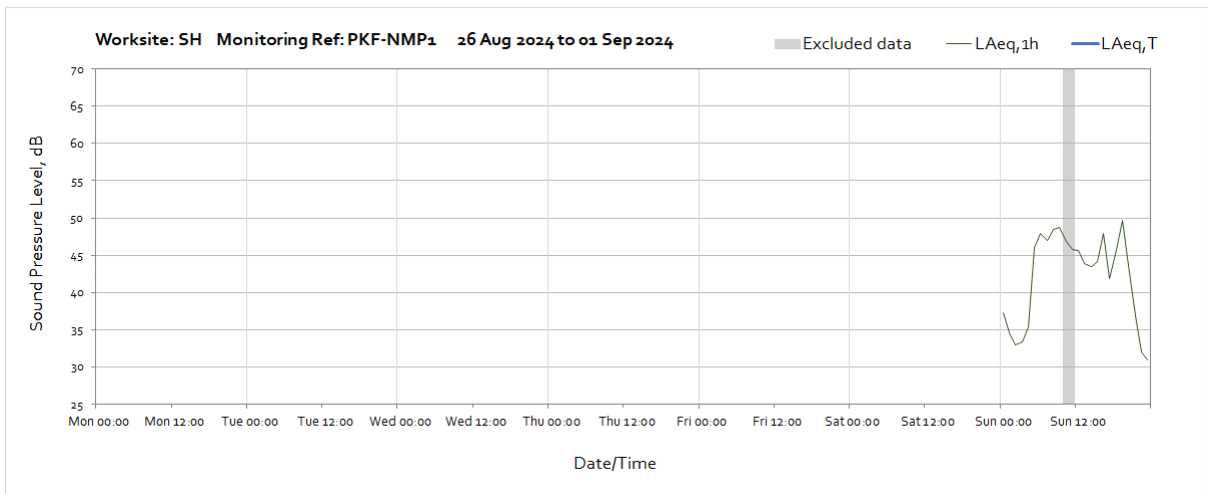


Note: Missing data between 11:00 and 12:00 on Tuesday 3<sup>rd</sup> September was due to monitor field calibration. Missing data throughout the week was due to a communications error between the server and the monitoring station.

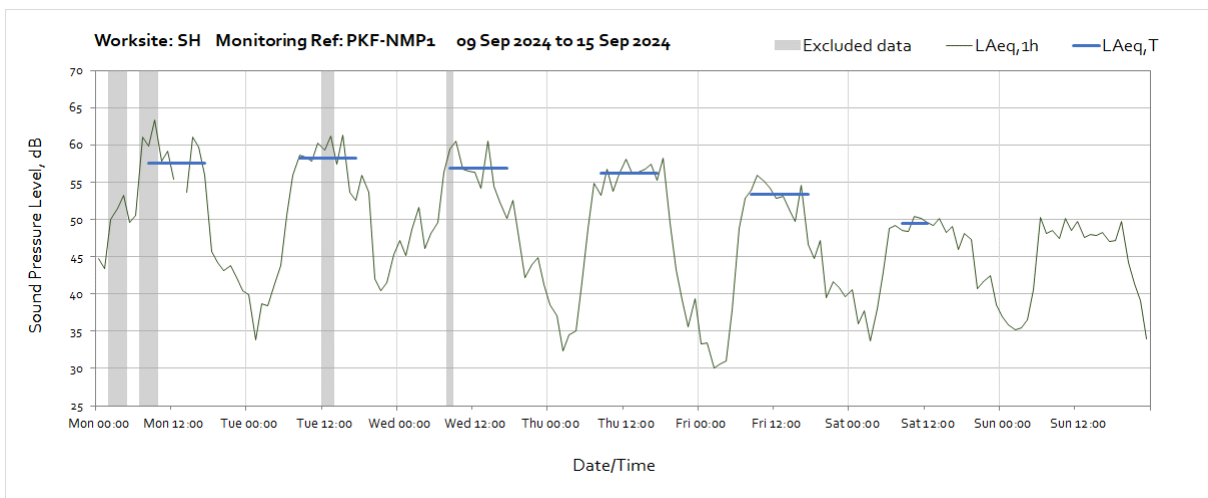
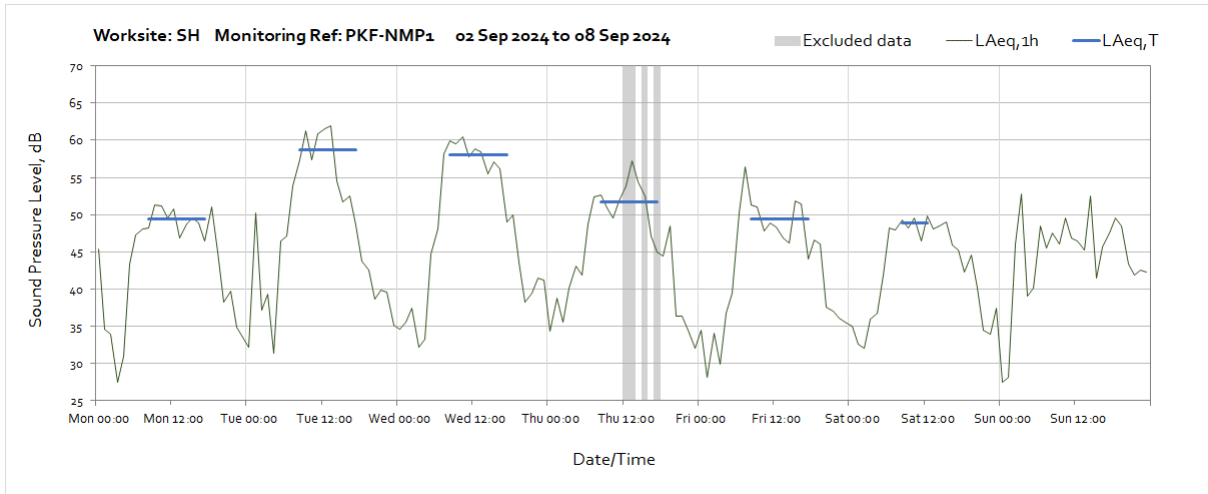




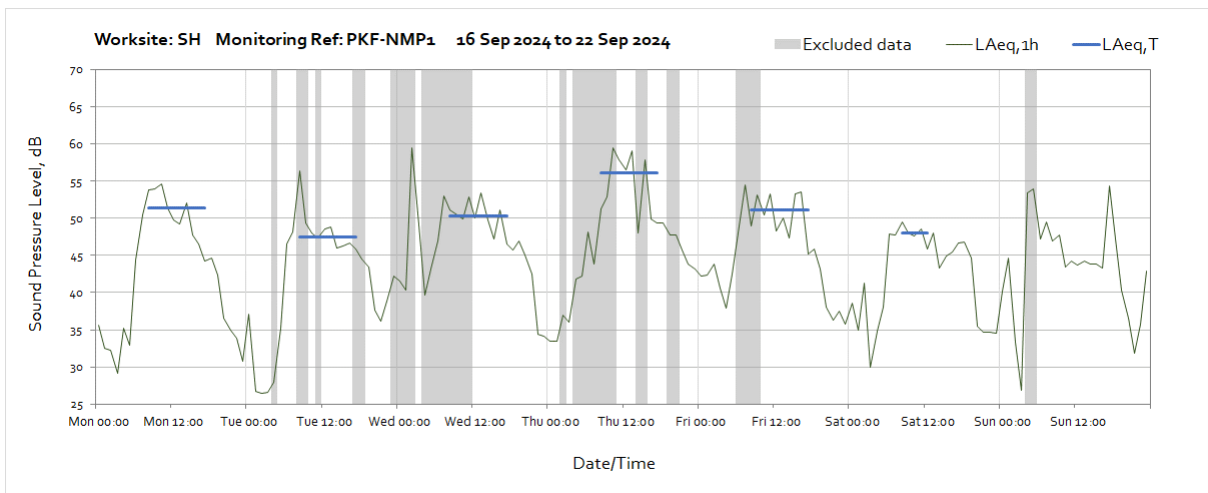
**Worksite: SH – Monitoring Ref: PKF-NMP1**

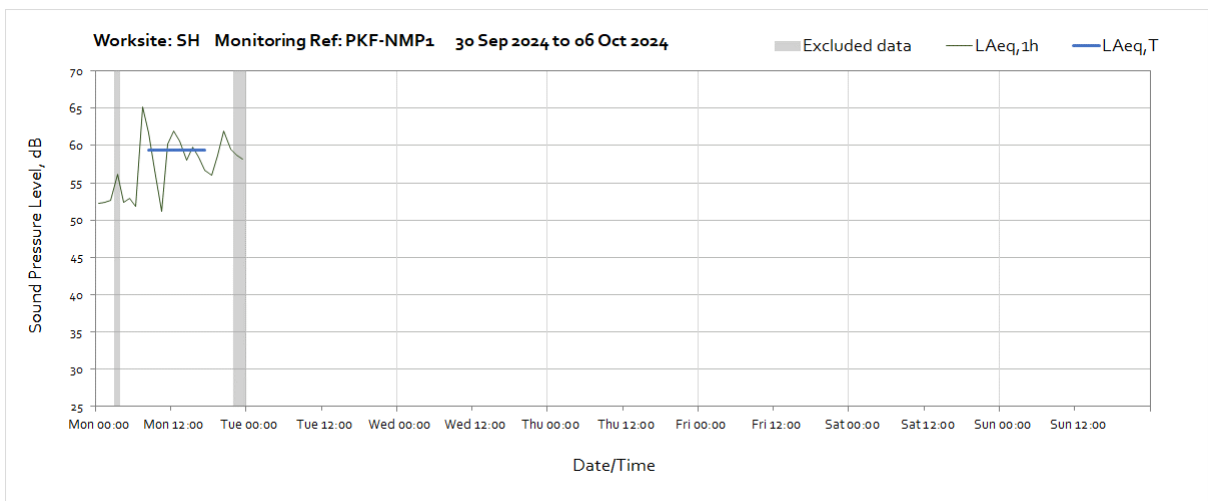
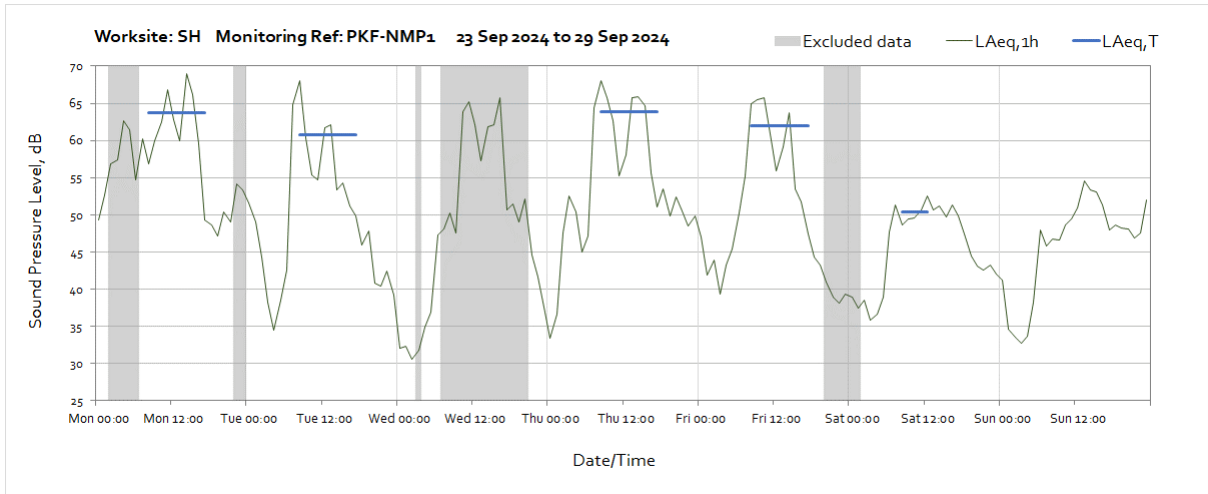




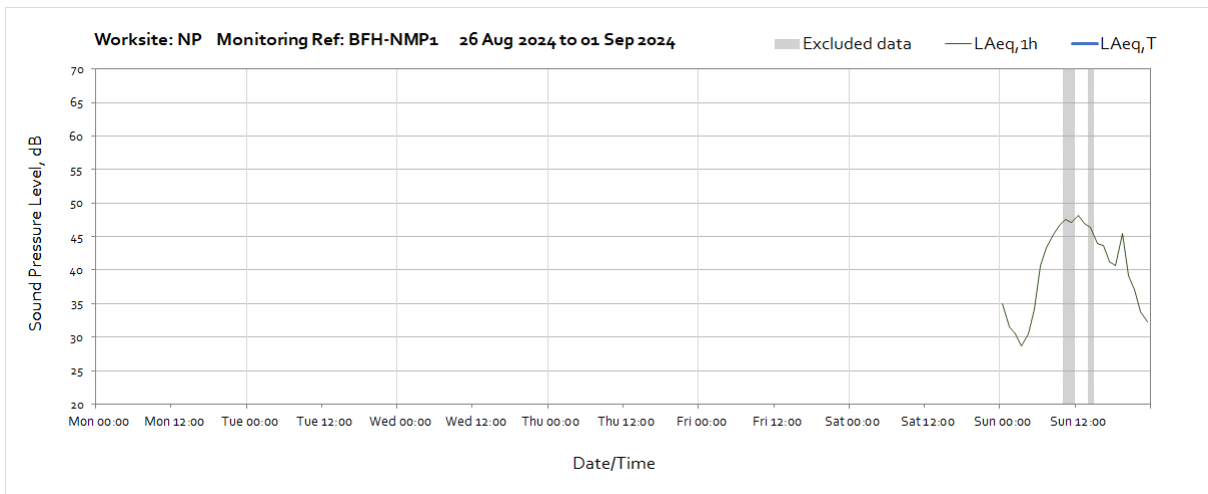


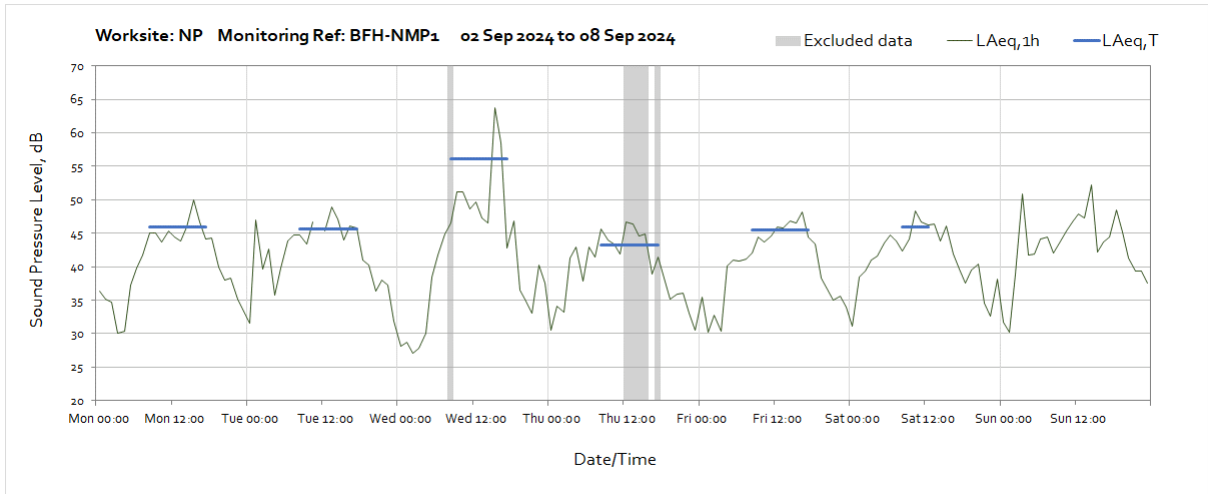
Note: Missing data between 13:00 and 14:00 on Monday 9<sup>th</sup> September was due to a communications error between the server and the monitoring station.



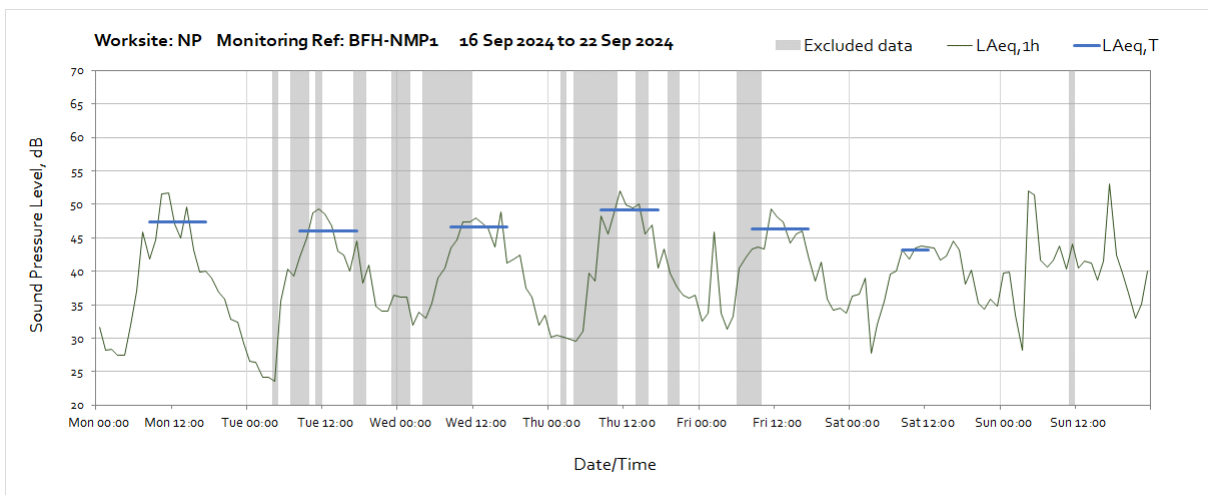
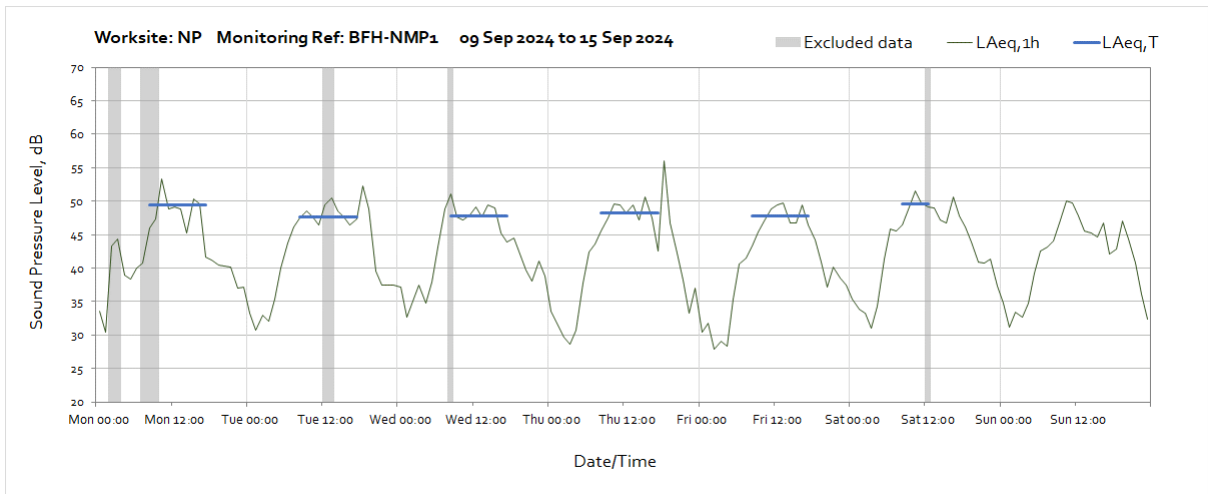


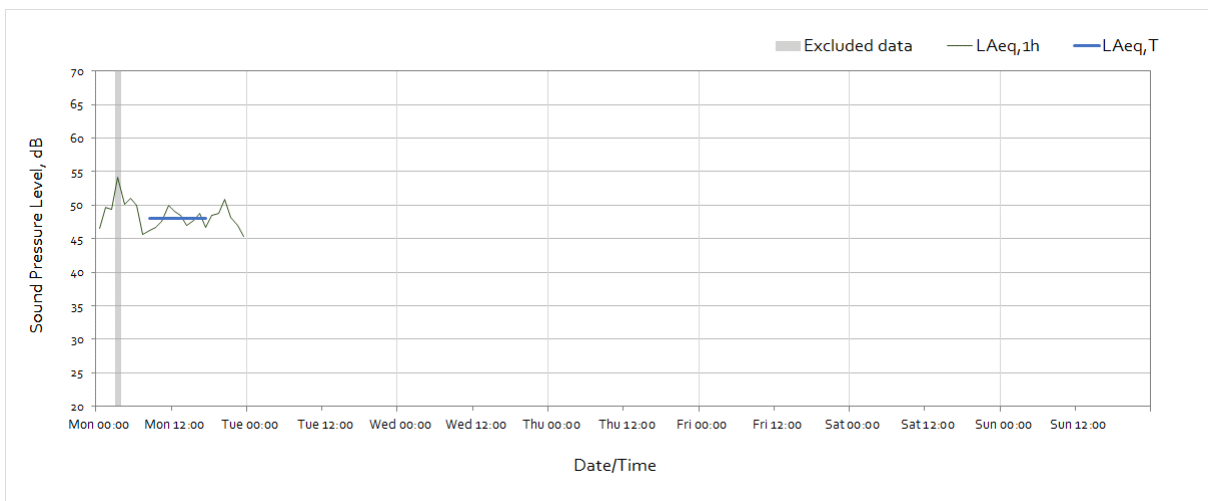
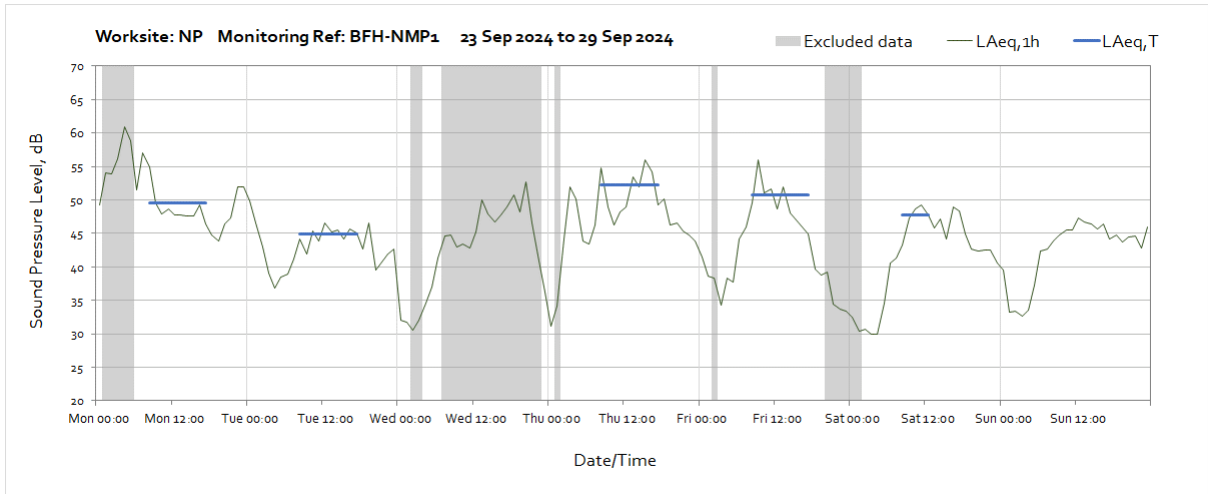
**Worksite: NP – Monitoring Ref: BFH-NMP1**



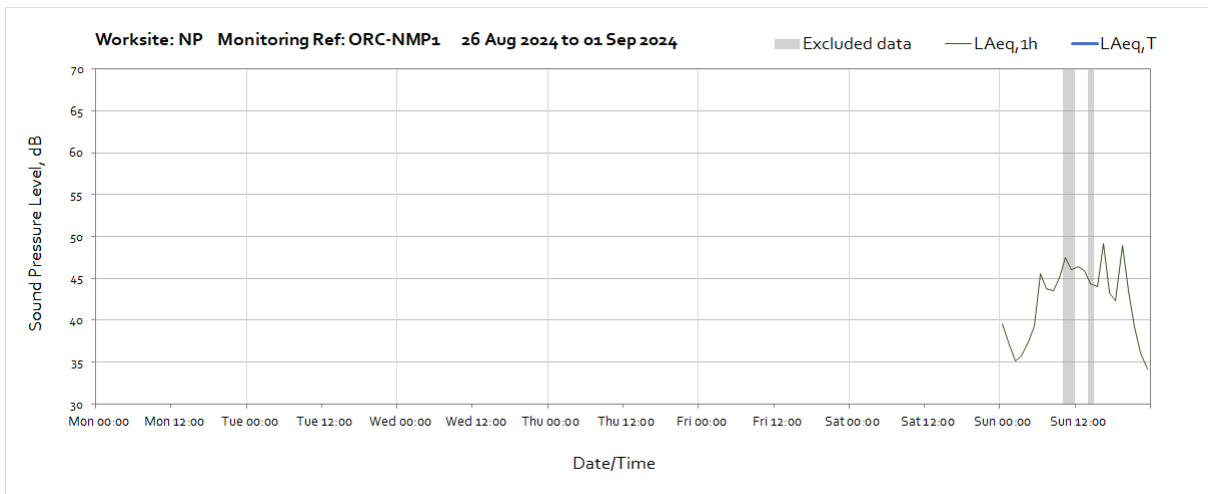


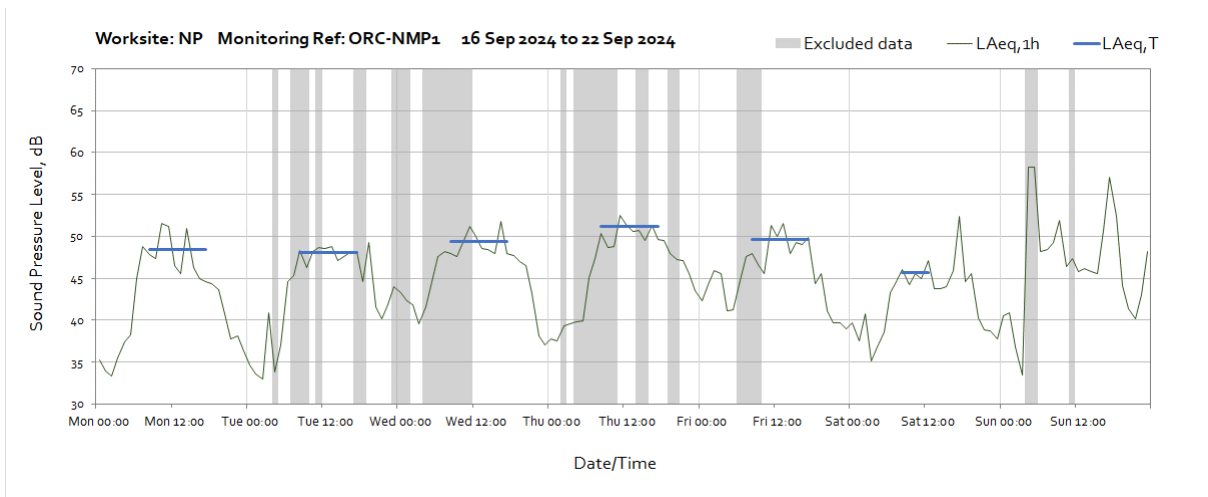
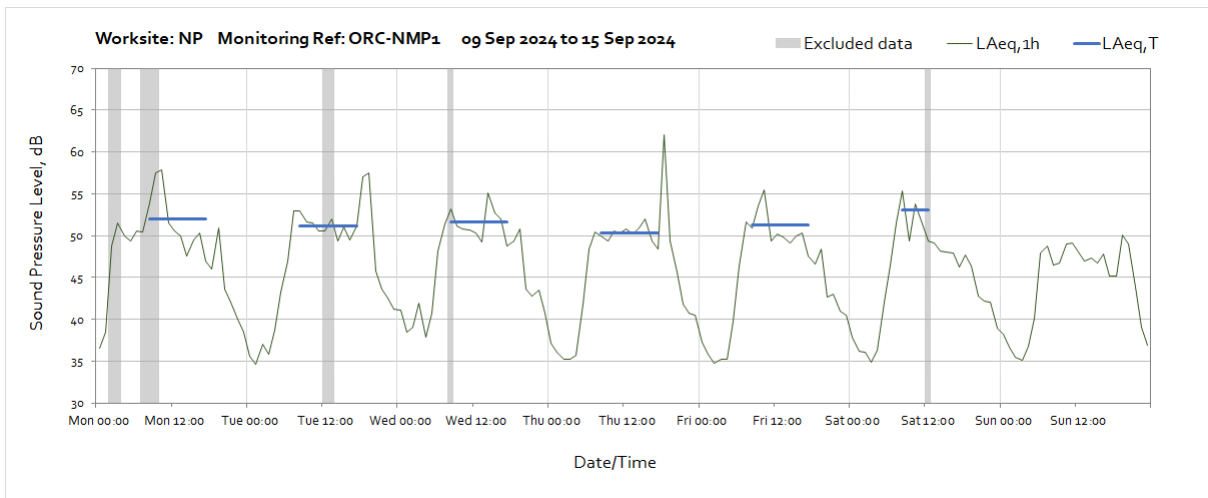
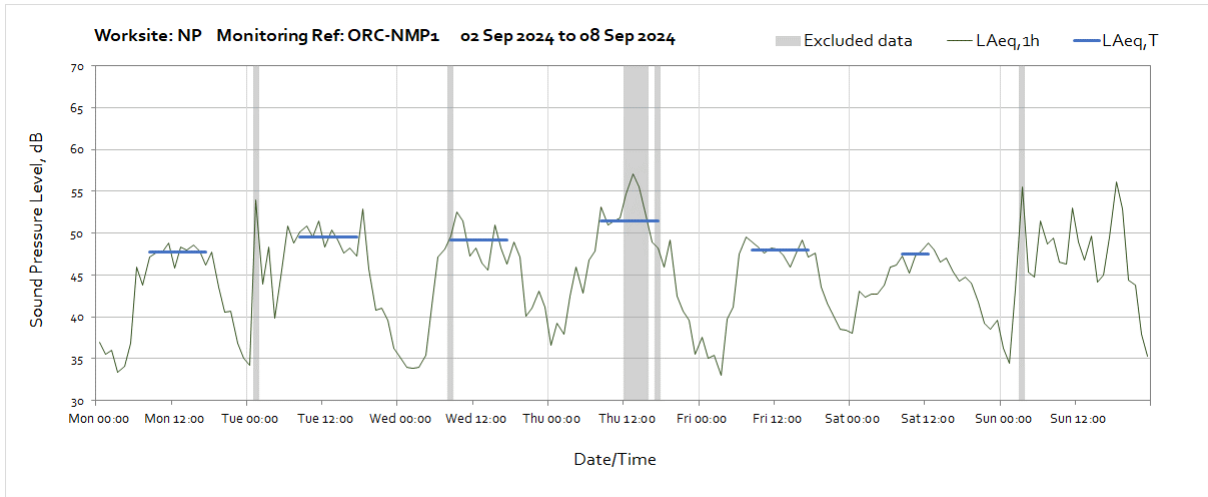
Note: Missing data between 11:00 and 12:00 on Tuesday 3<sup>rd</sup> September was due to monitor field calibration.

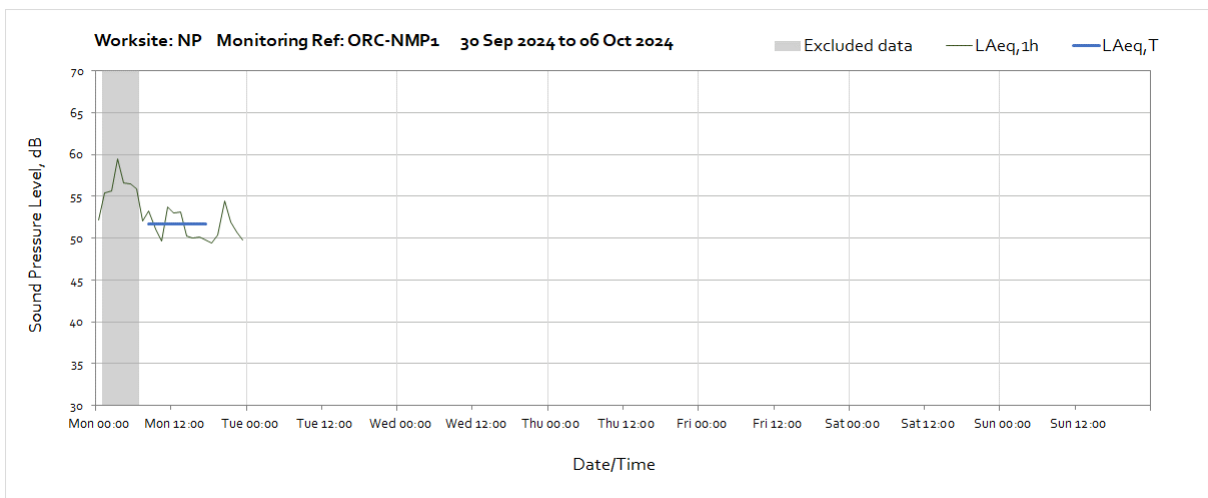
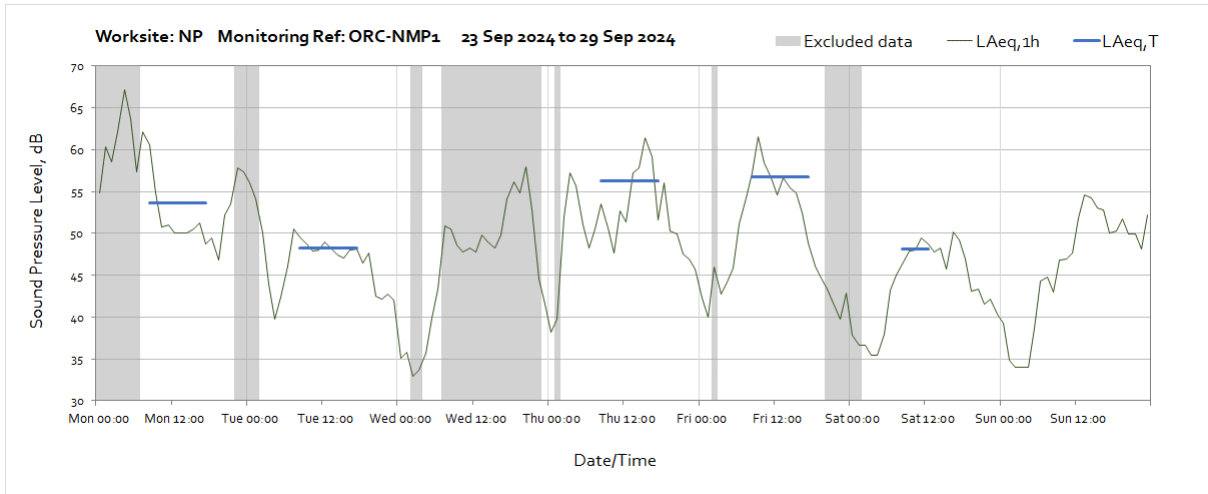




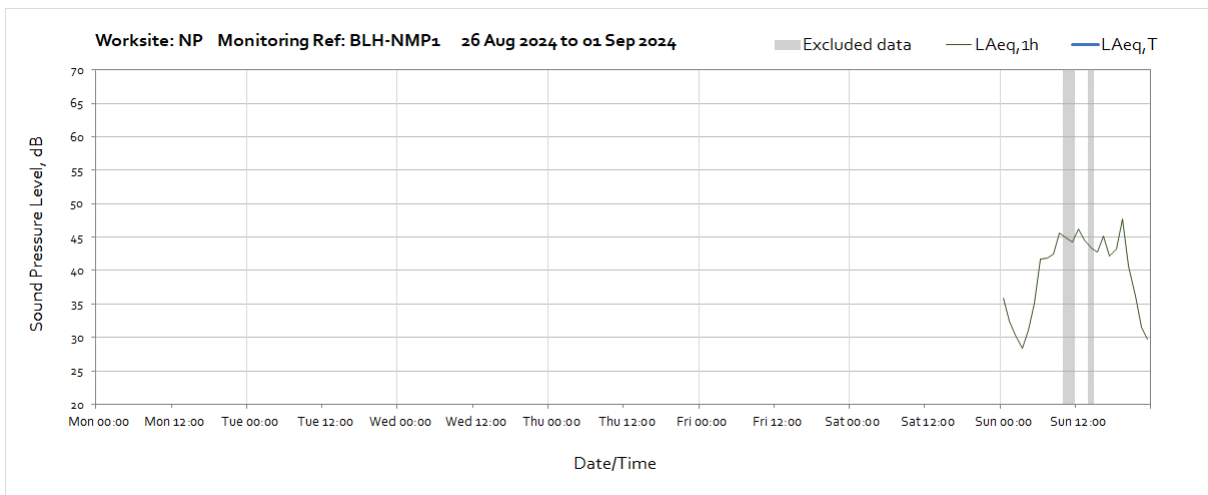
**Worksite: NP – Monitoring Ref: ORC-NMP1**

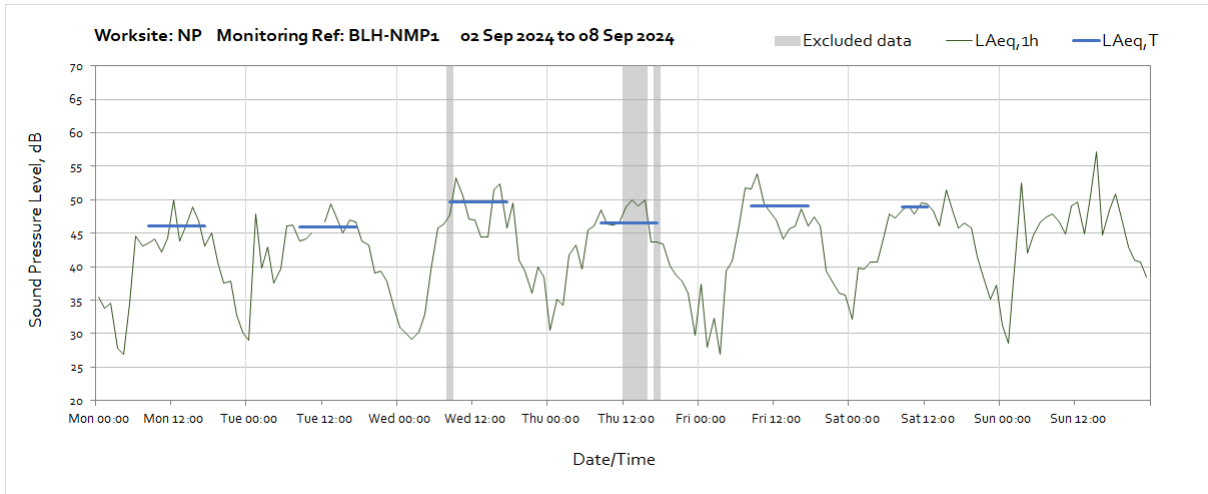




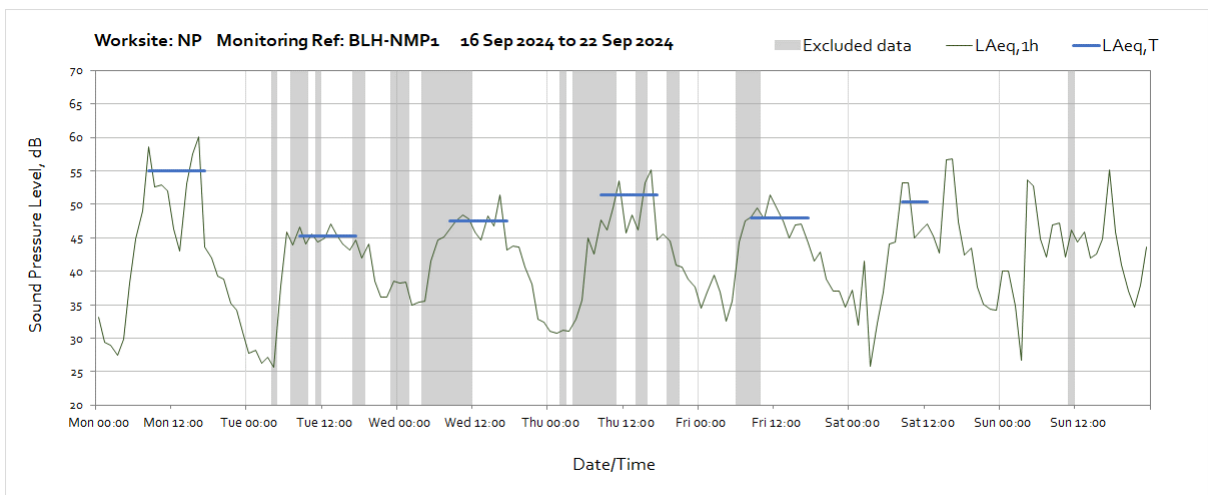
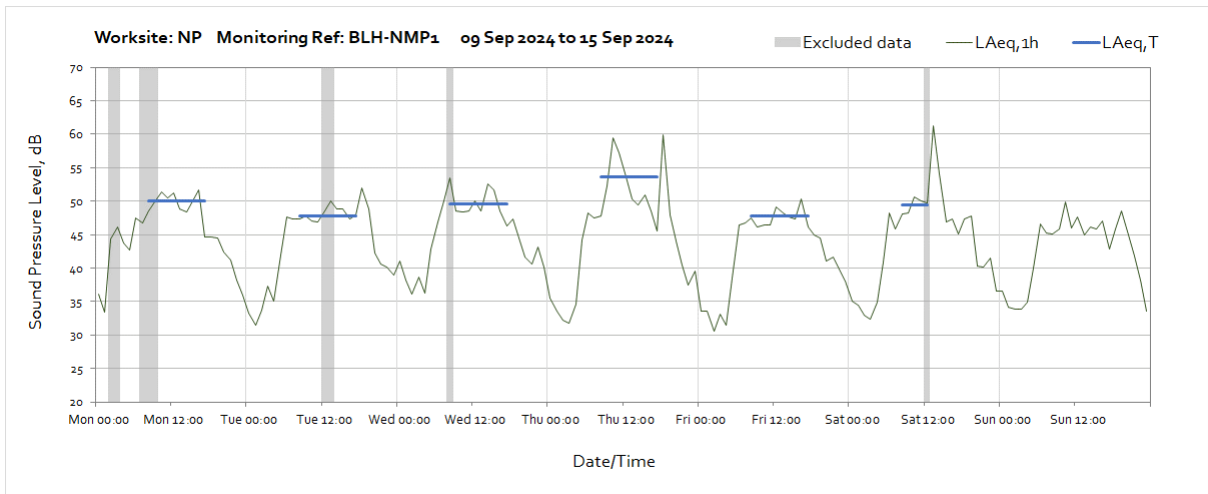


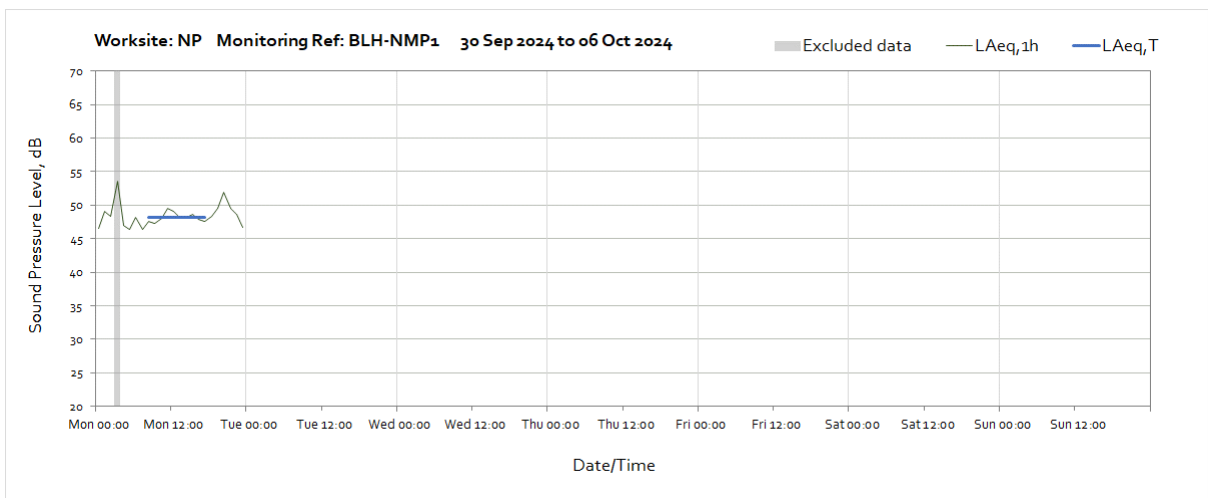
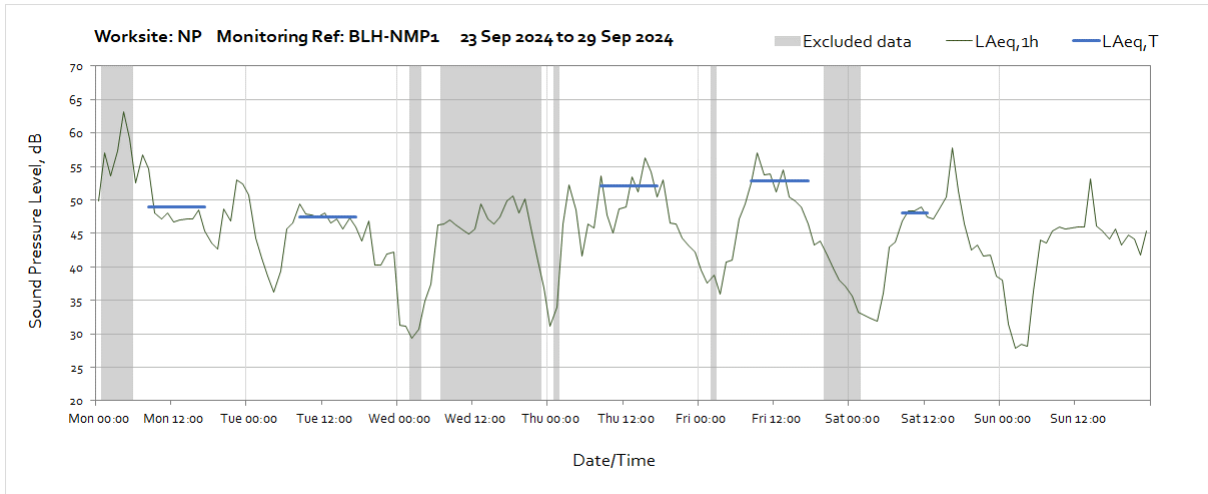
**Worksite: NP - Monitoring Ref: BLH-NMP1**



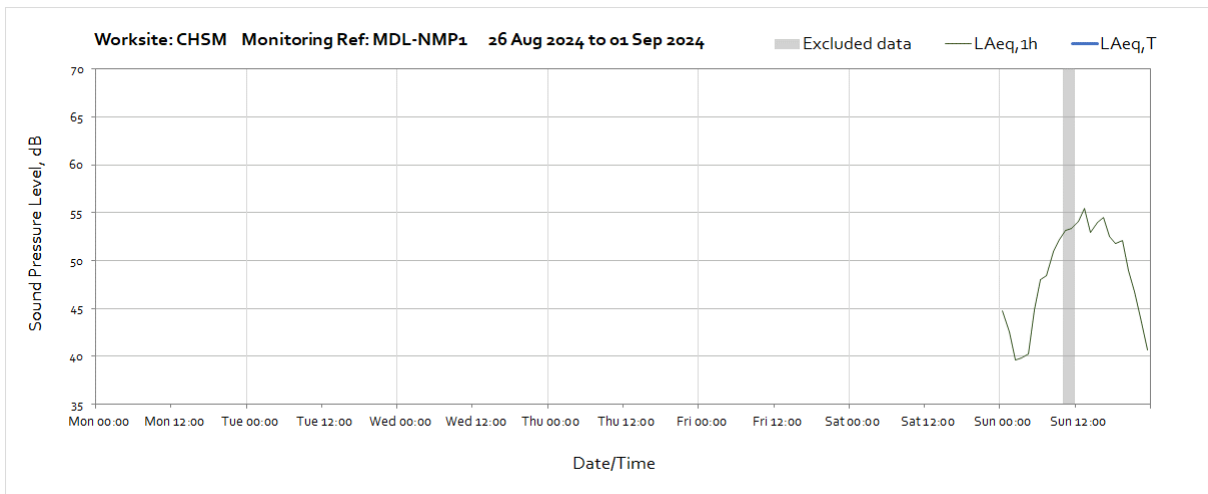


Note: Missing data between 11:00 and 12:00 on Tuesday 3<sup>rd</sup> September was due to monitor field calibration.

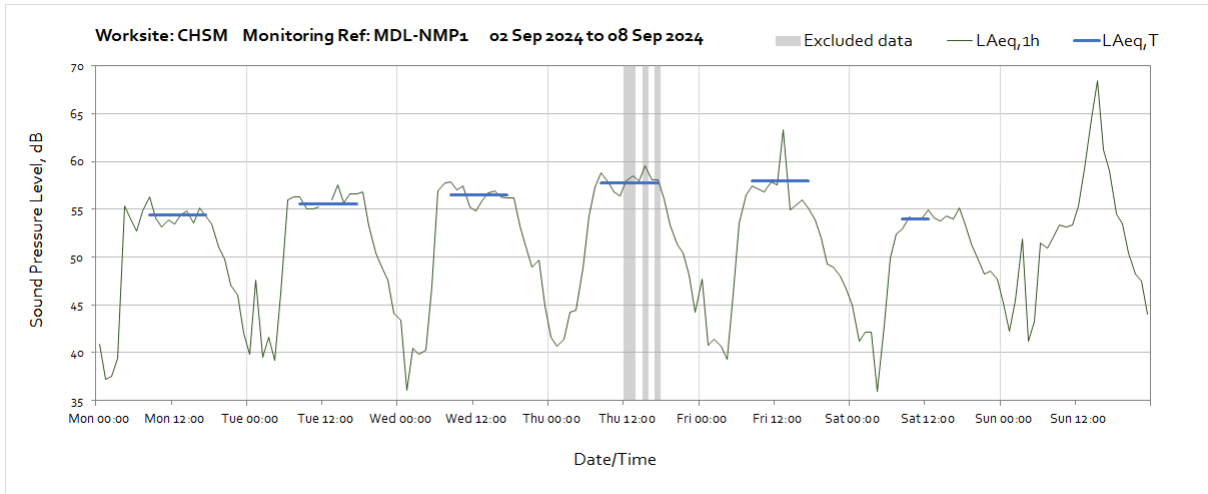




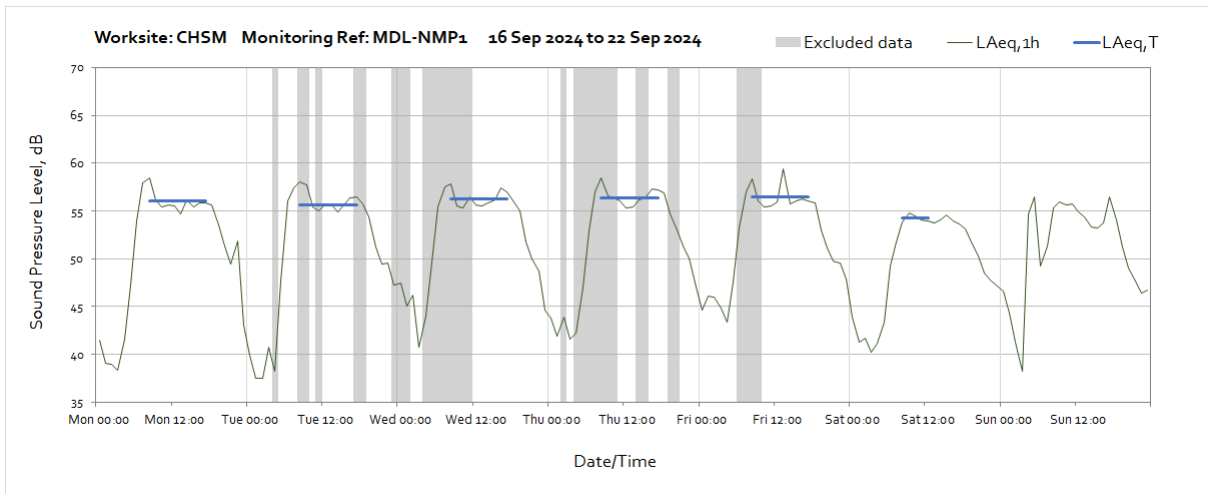
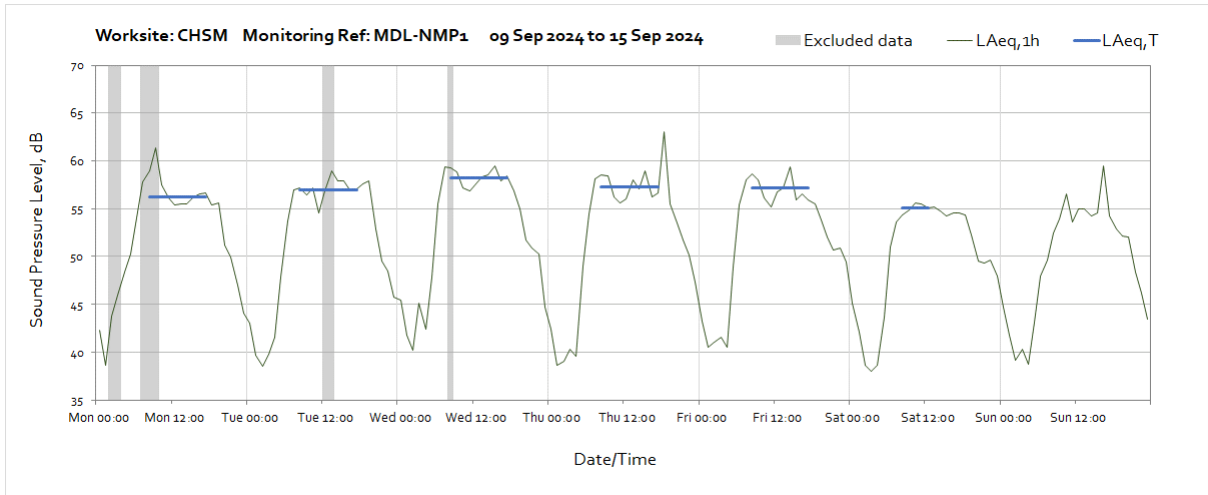
**Worksite: CHSM - Monitoring Ref: MDL-NMP1**

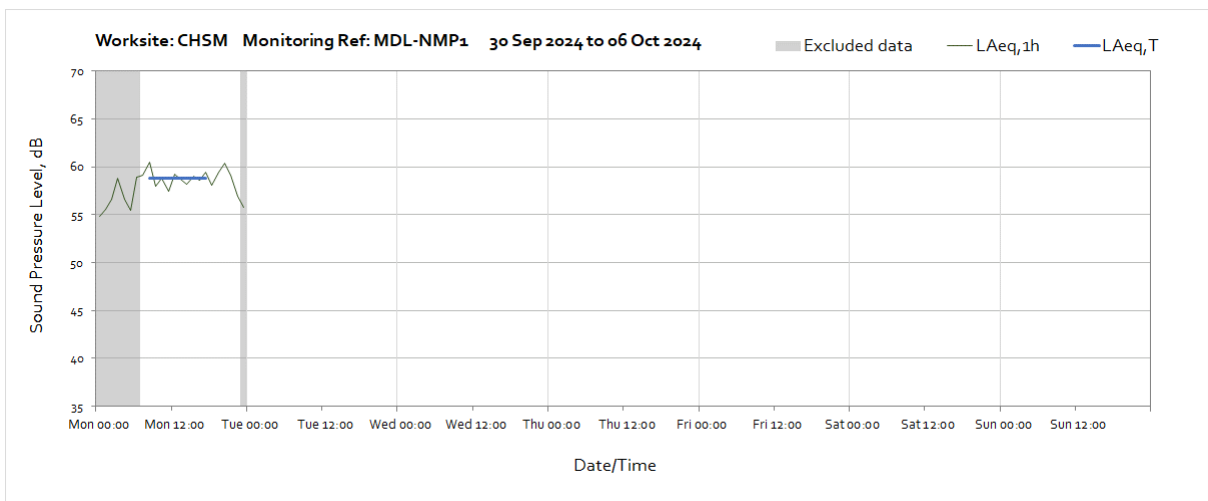
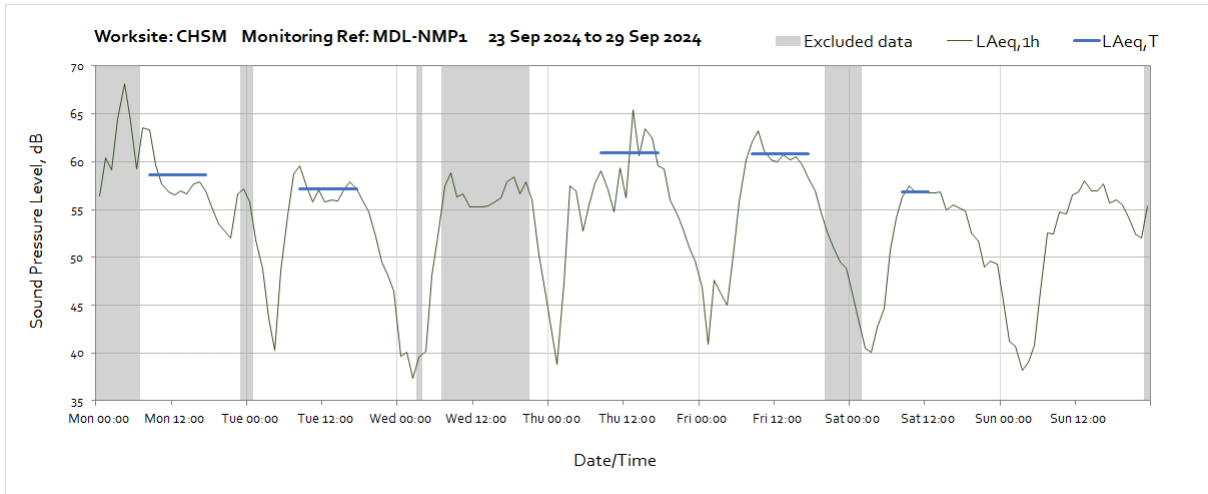




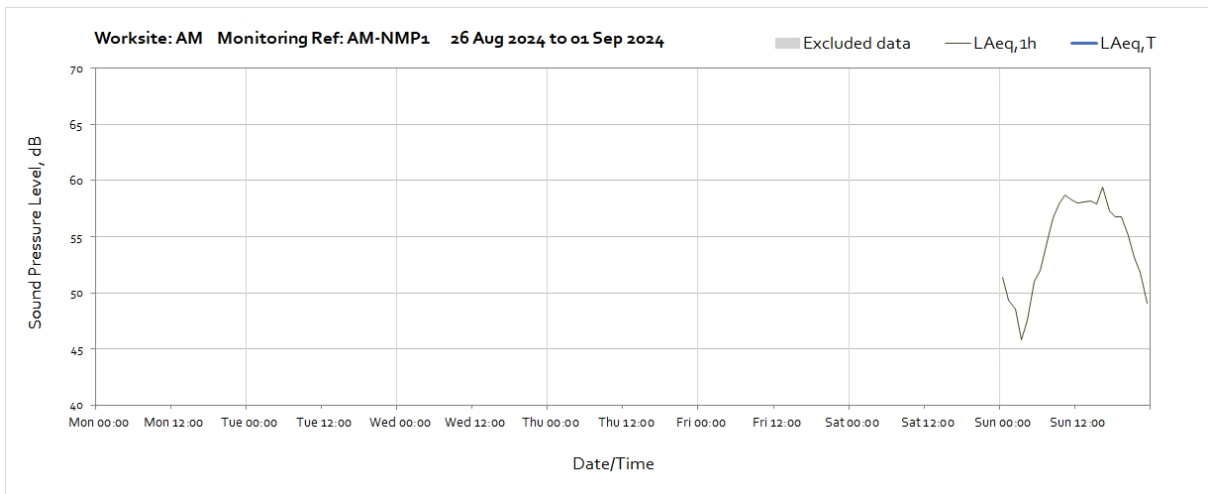


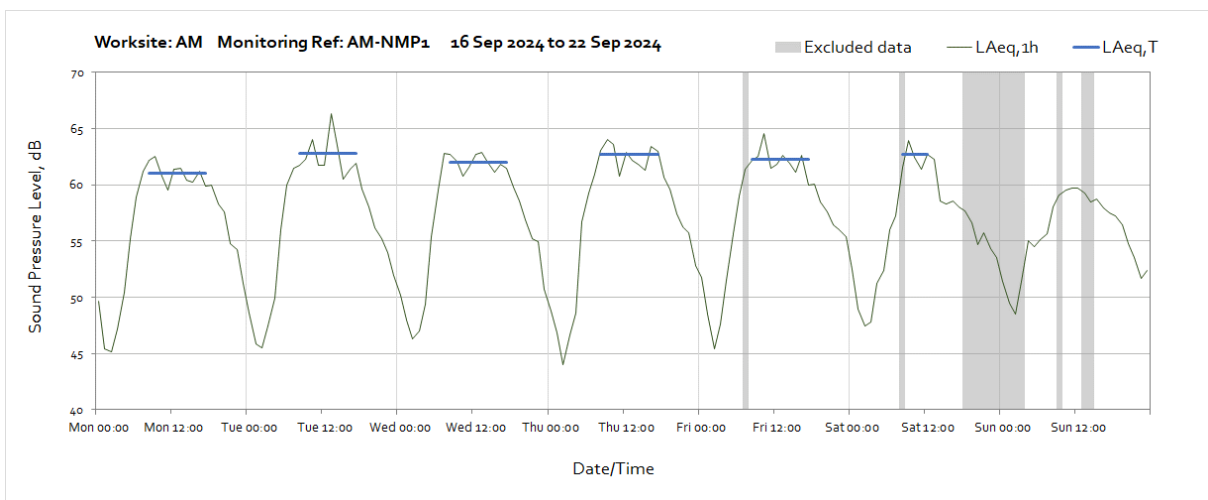
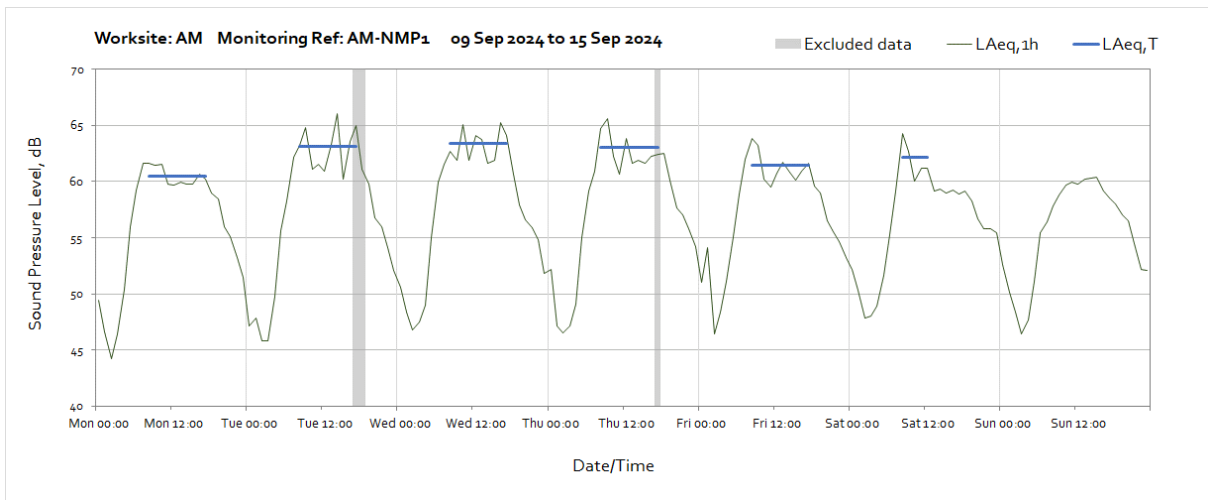
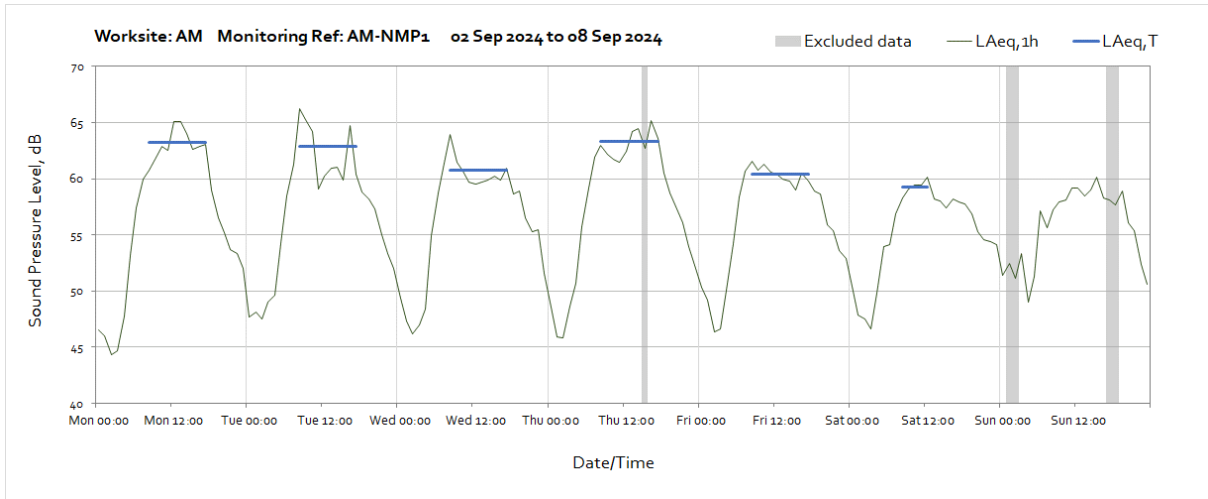
Note: Missing data between 12:00 and 13:00 on Tuesday 3<sup>rd</sup> September was due to monitor field calibration.

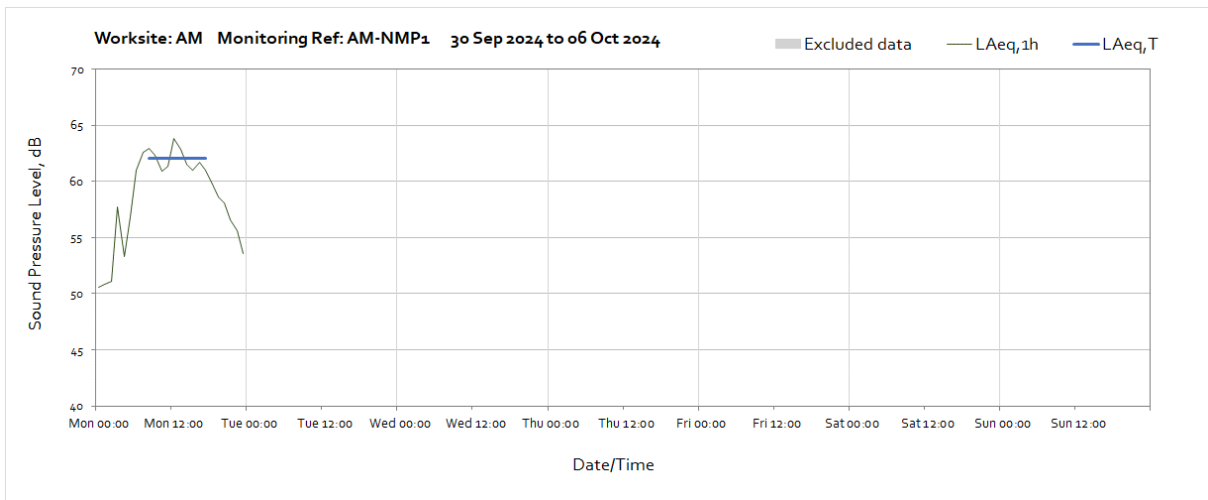
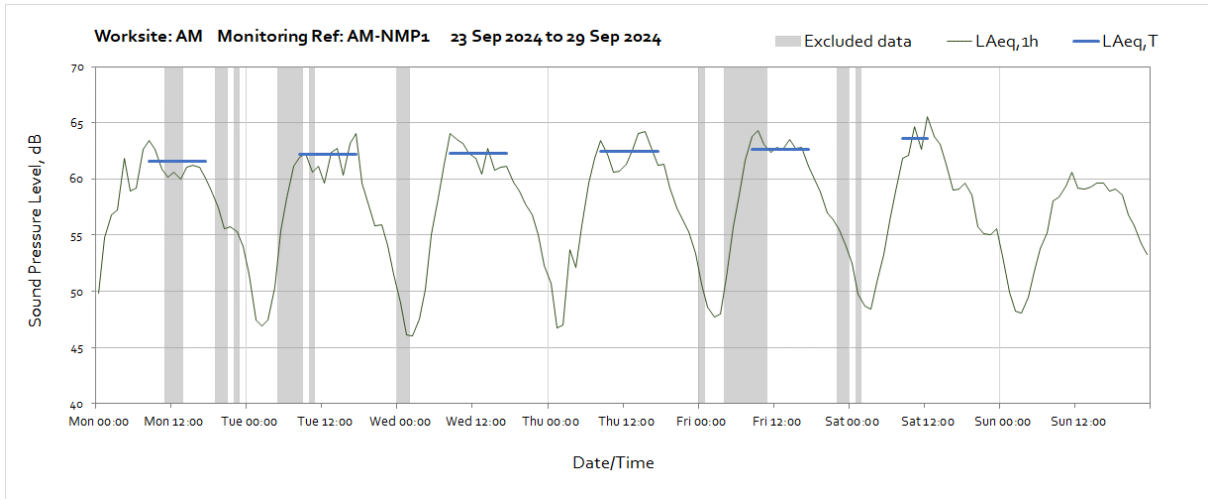




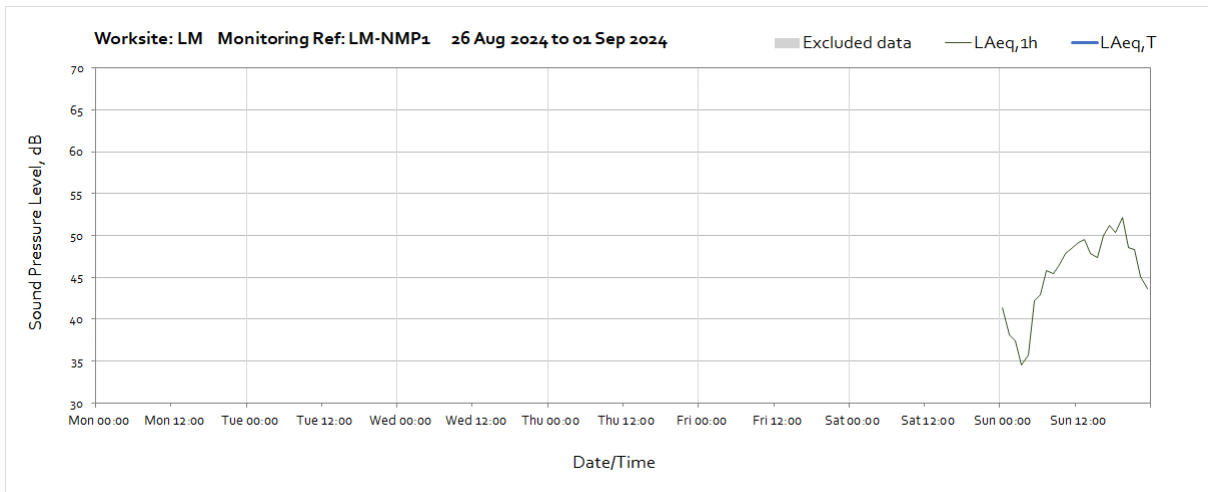
**Worksite: AM - Monitoring Ref: AM-NMP1**

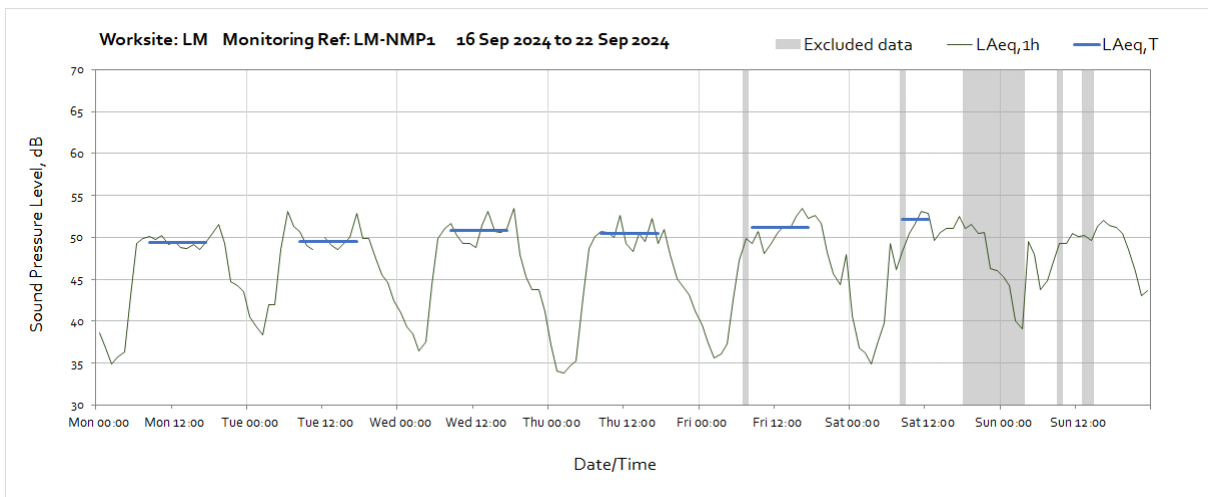
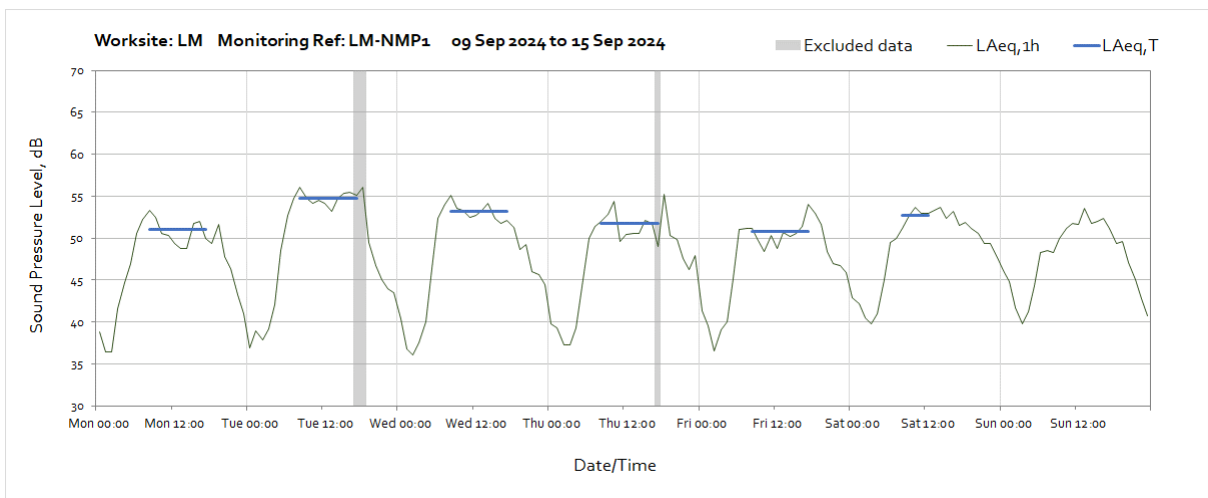
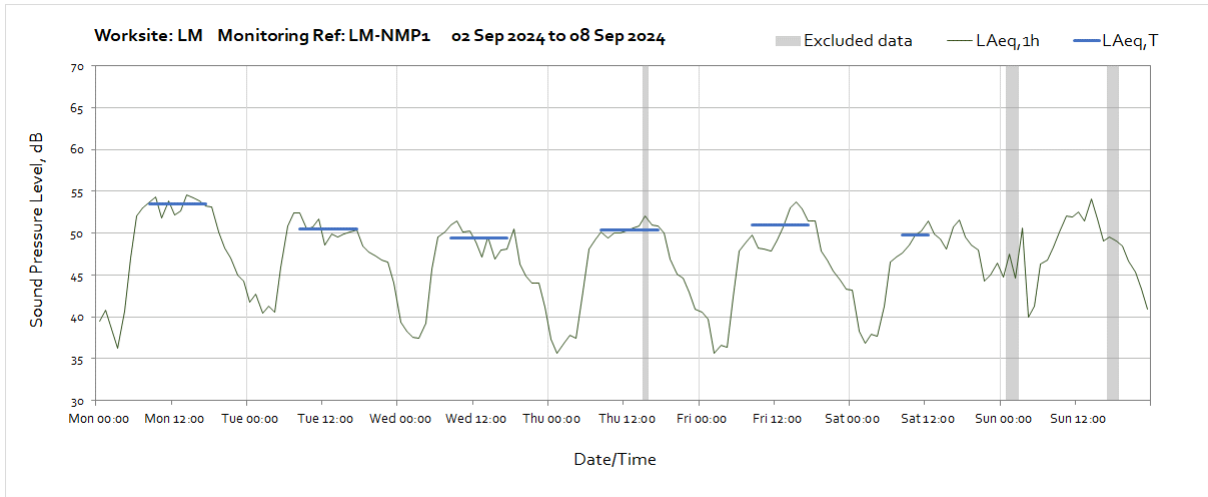




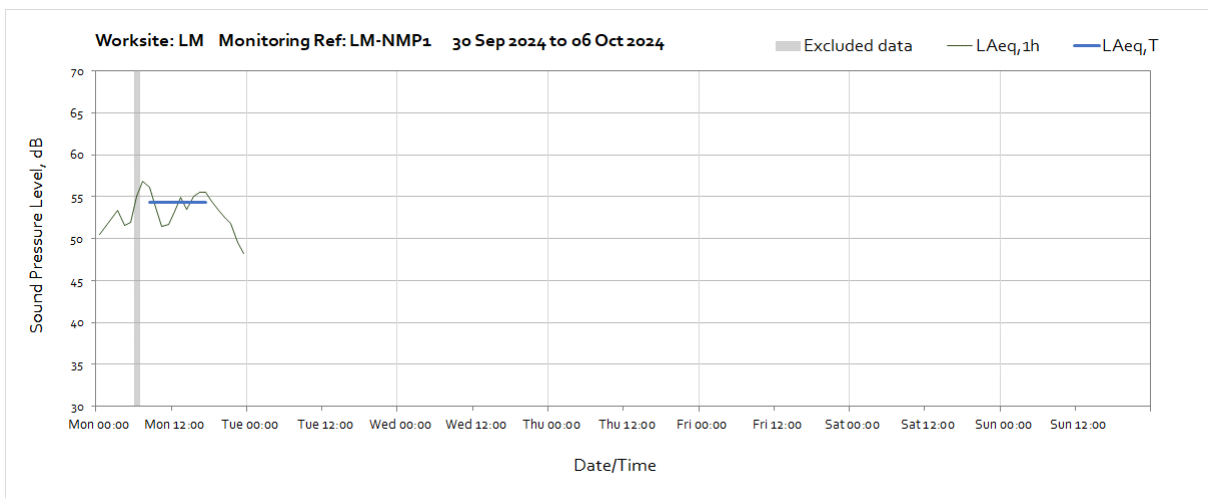
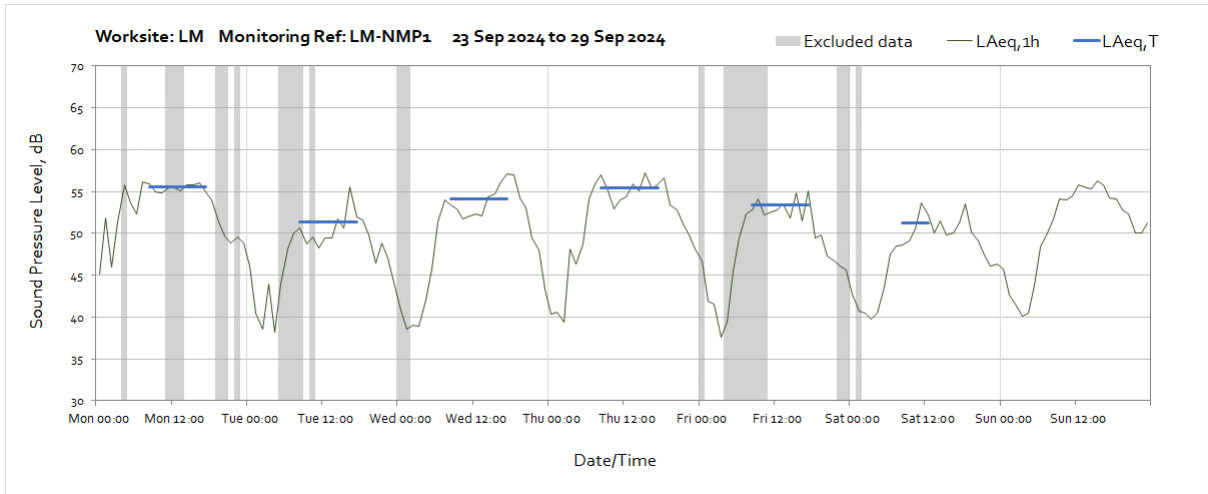


**Worksite: LM – Monitoring Ref: LM-NMP1**

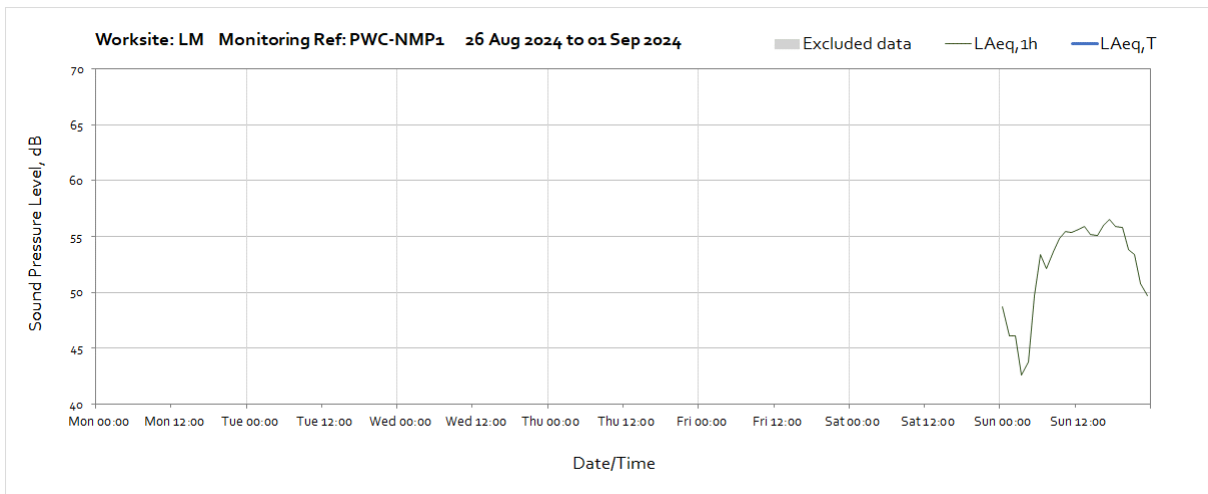


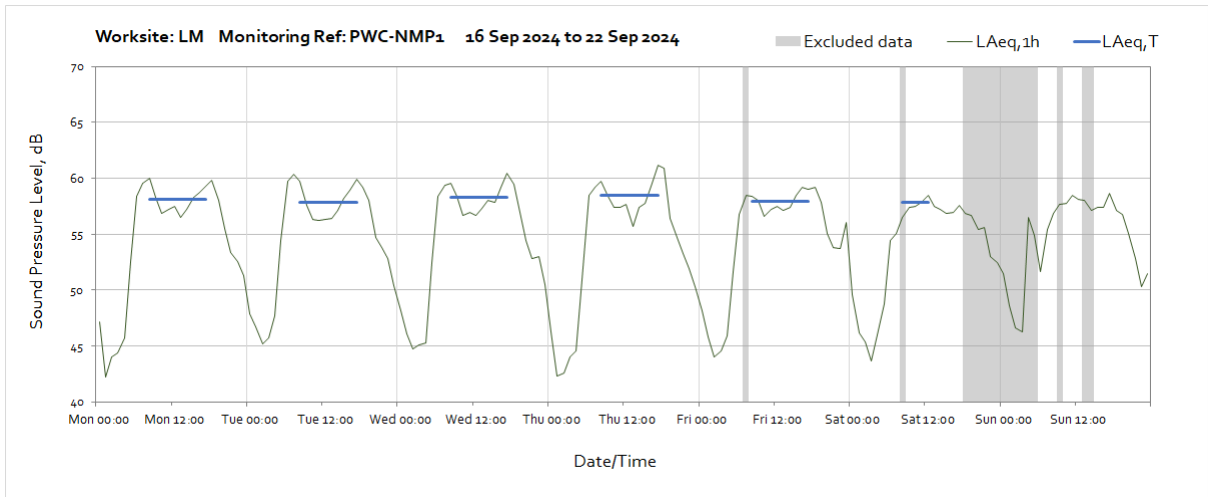
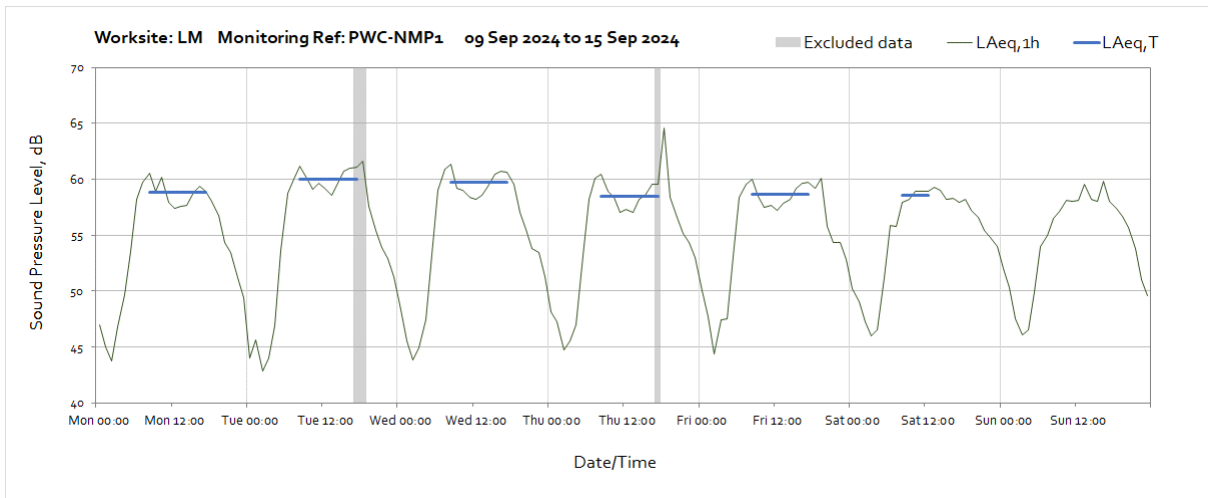
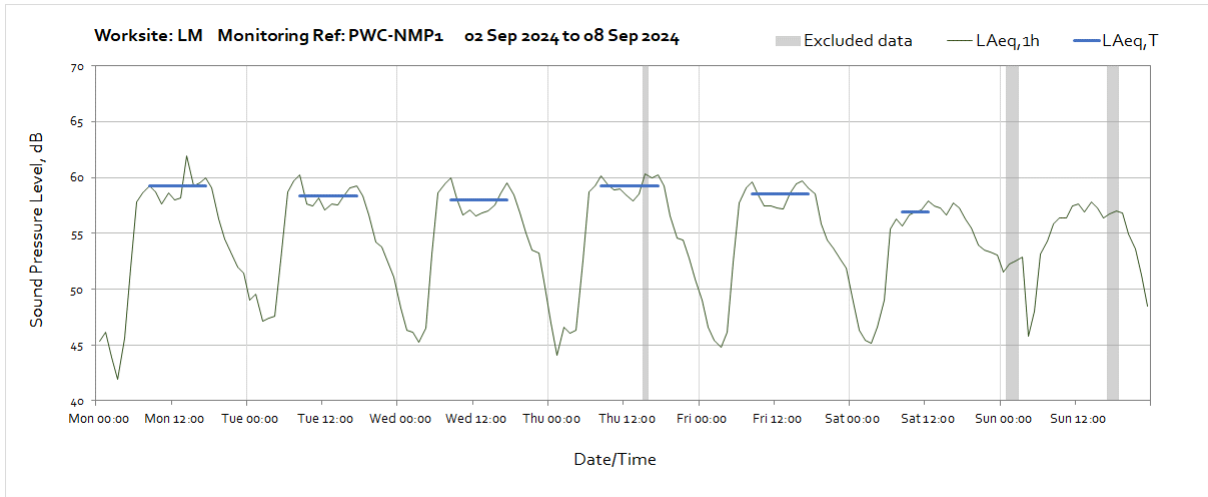


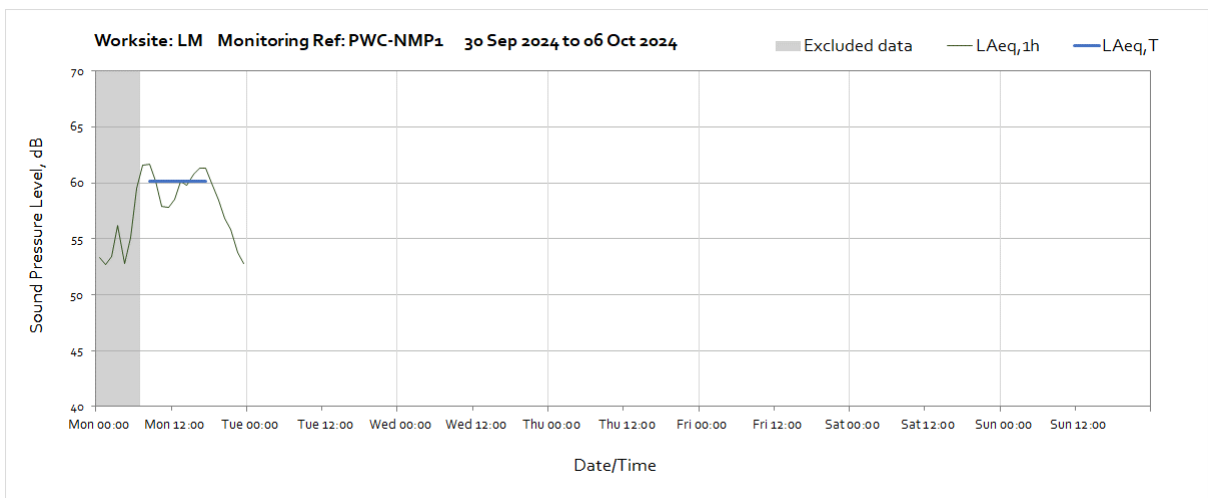
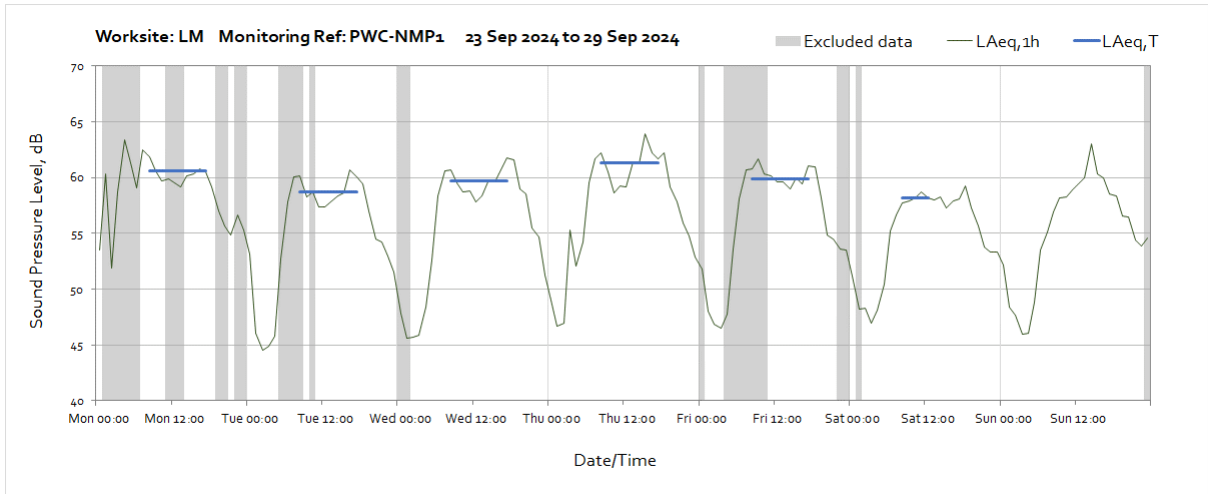
Note: Missing data between 11:00 and 12:00 on Tuesday 17<sup>th</sup> September was due to monitor field calibration.



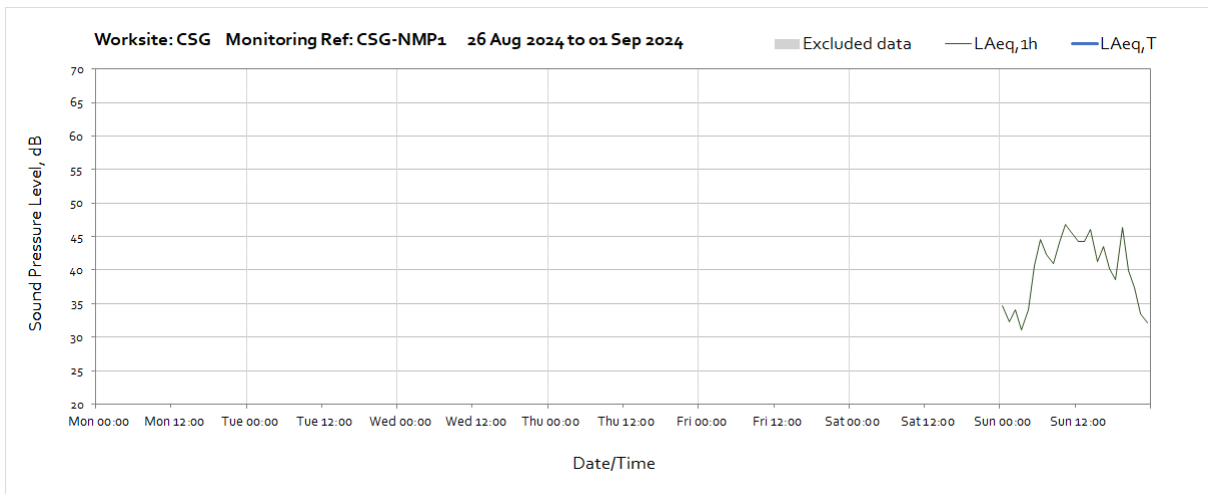
**Worksite: LM – Monitoring Ref: PWC-NMP1**



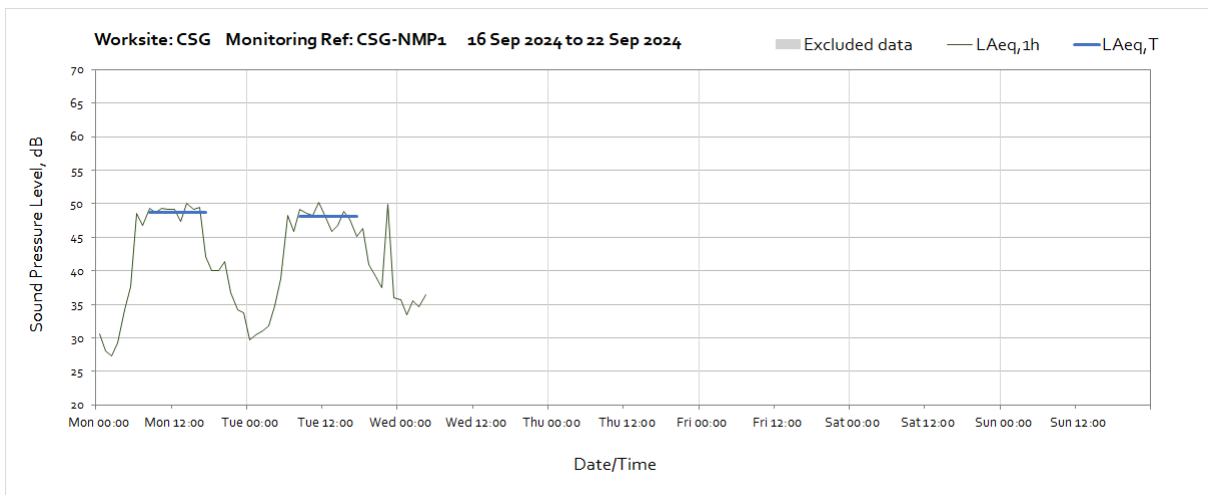
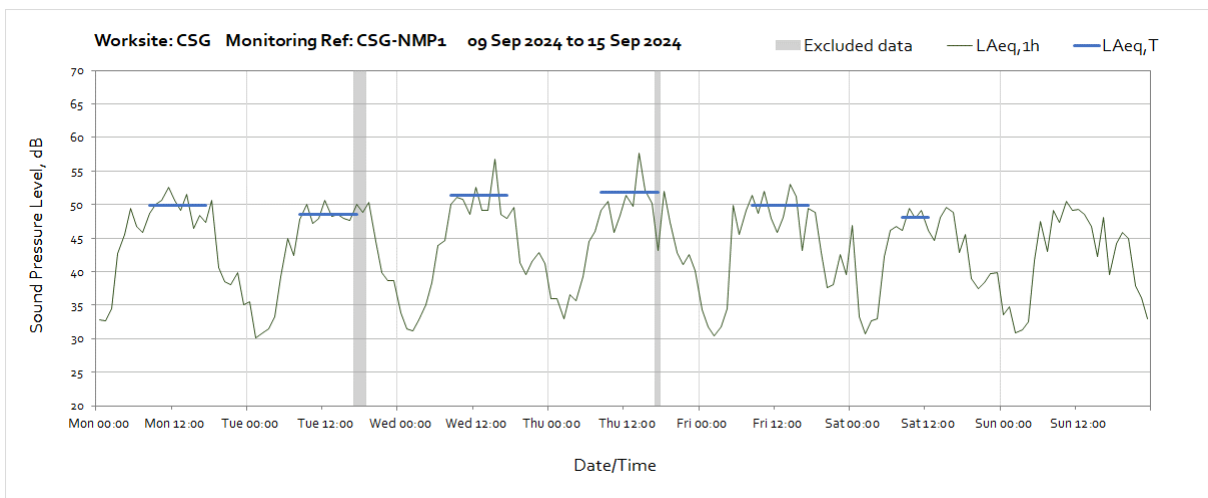
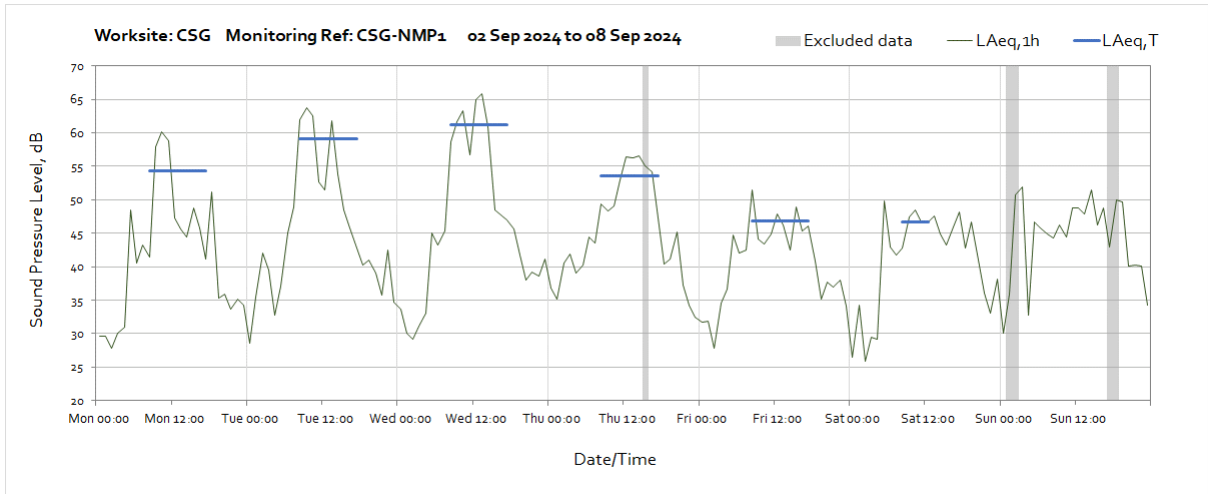




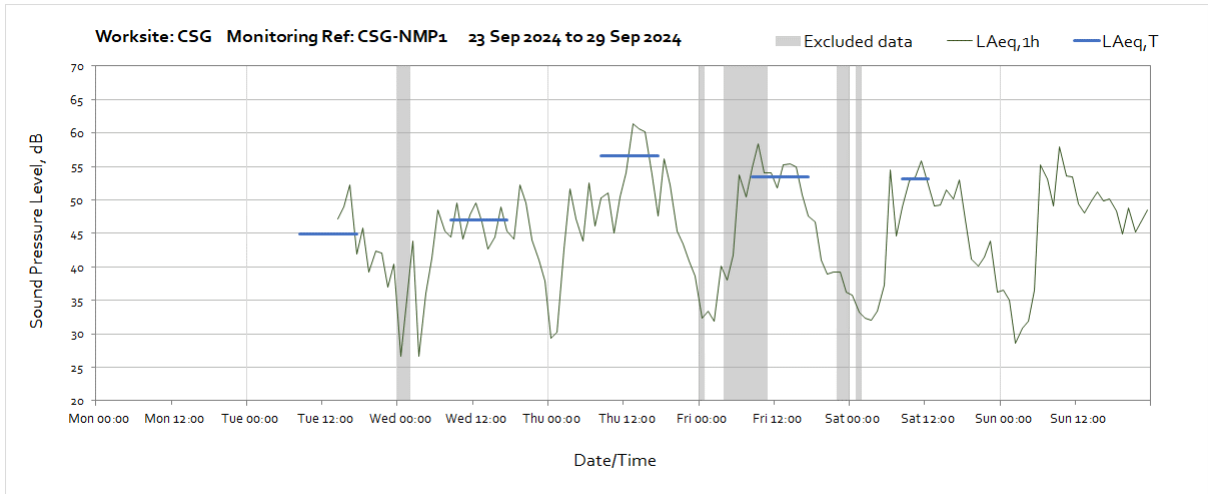
**Worksite: CSG – Monitoring Ref: CSG-NMP1**



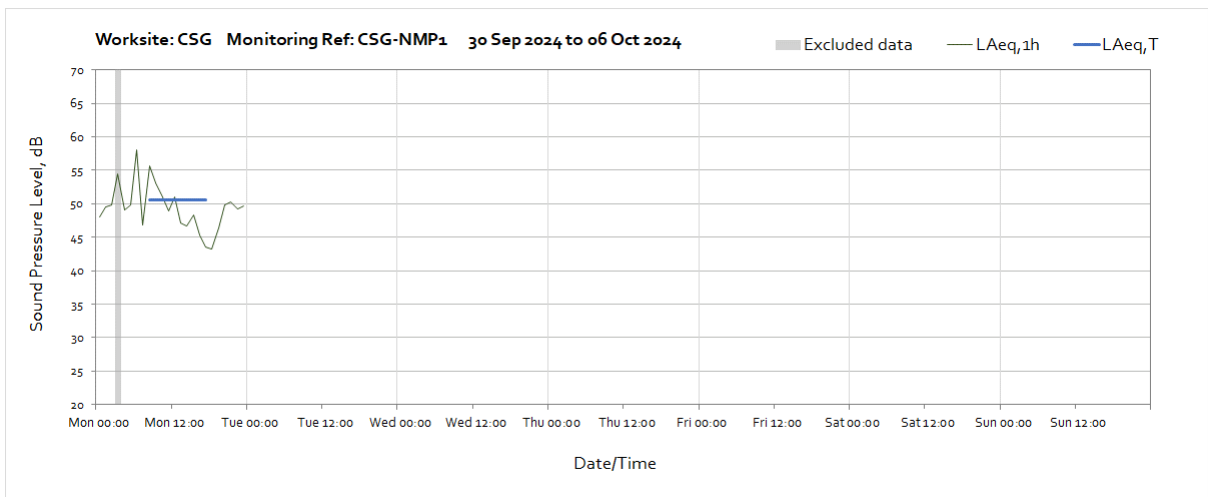




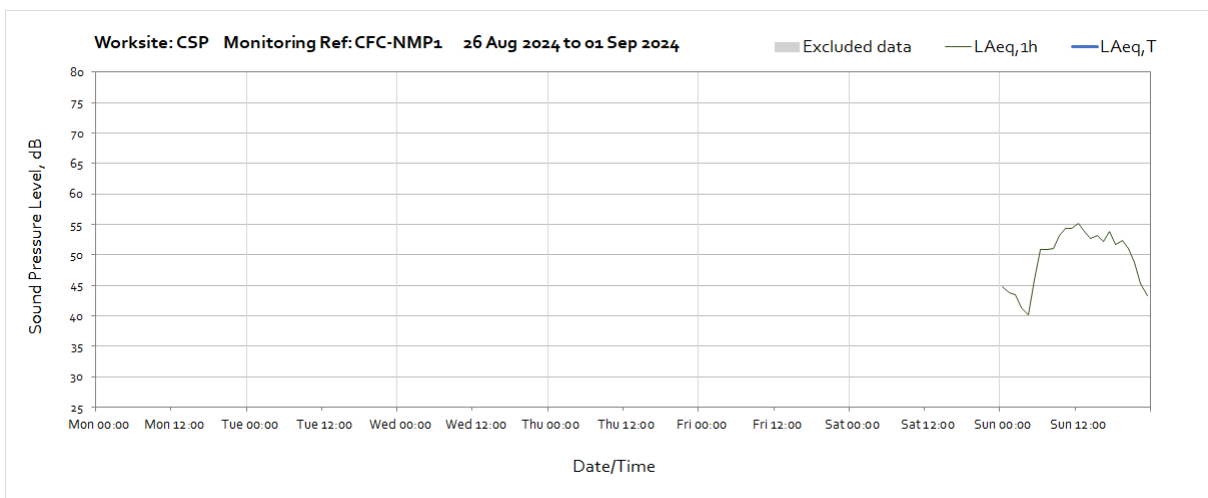
Note: Missing data between 05:00 on Wednesday 18<sup>th</sup> September and 14:00 on Tuesday 24<sup>th</sup> September was due to an issue with the monitoring stations power which has now been resolved.

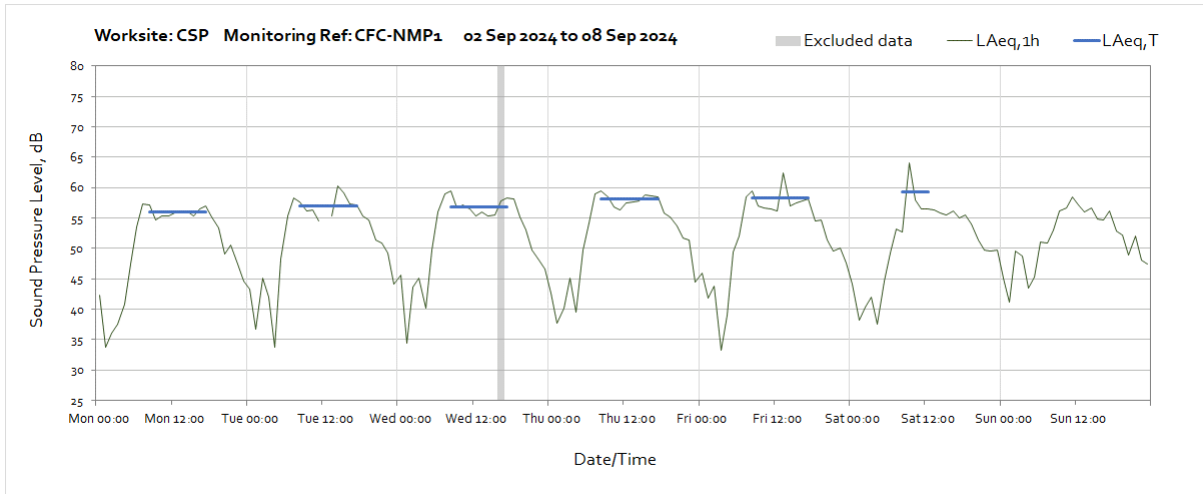


Note: Missing data between 05:00 on Wednesday 18<sup>th</sup> September and 14:00 on Tuesday 24<sup>th</sup> September was due to an issue with the monitoring stations power which has now been resolved.

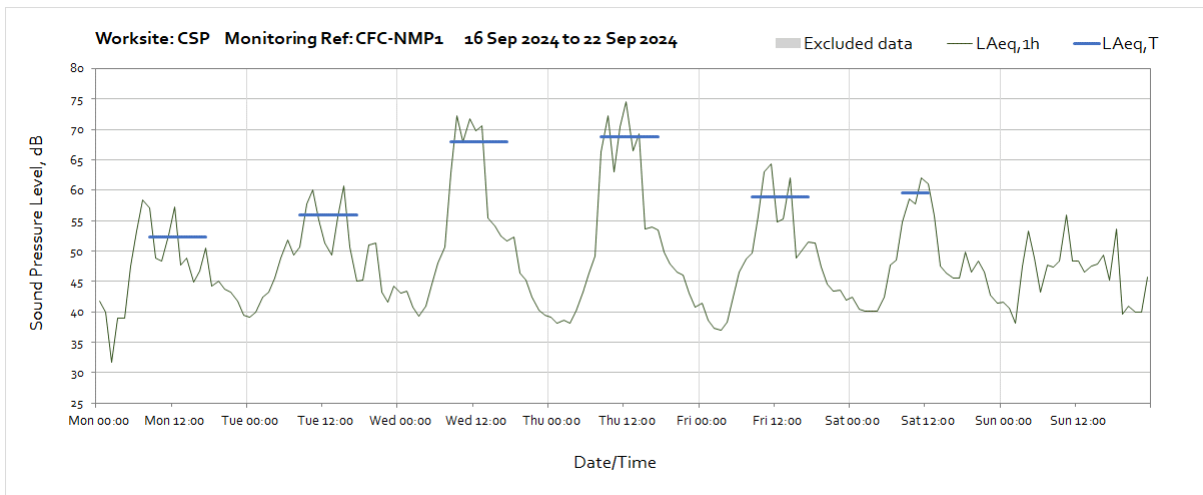
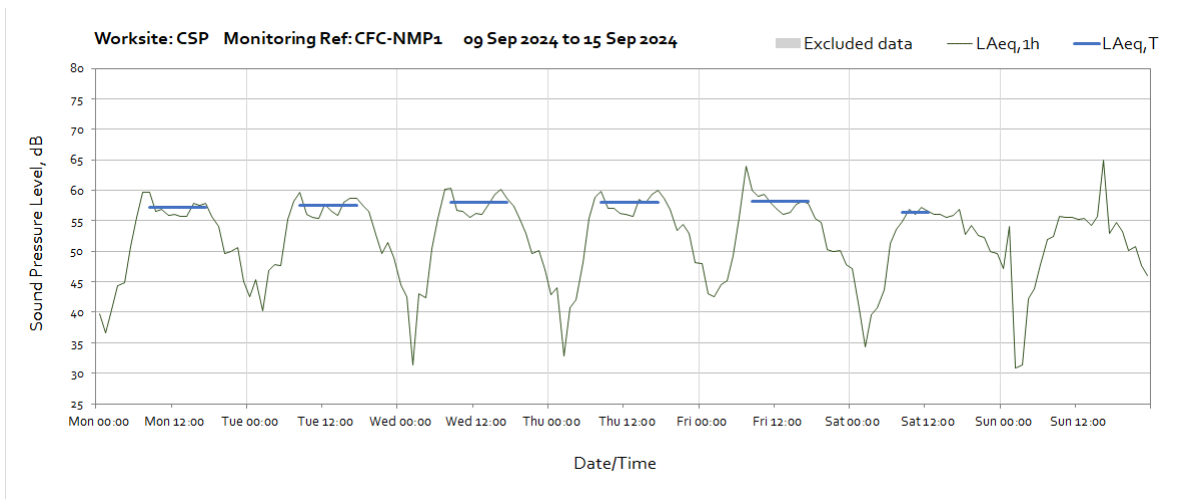


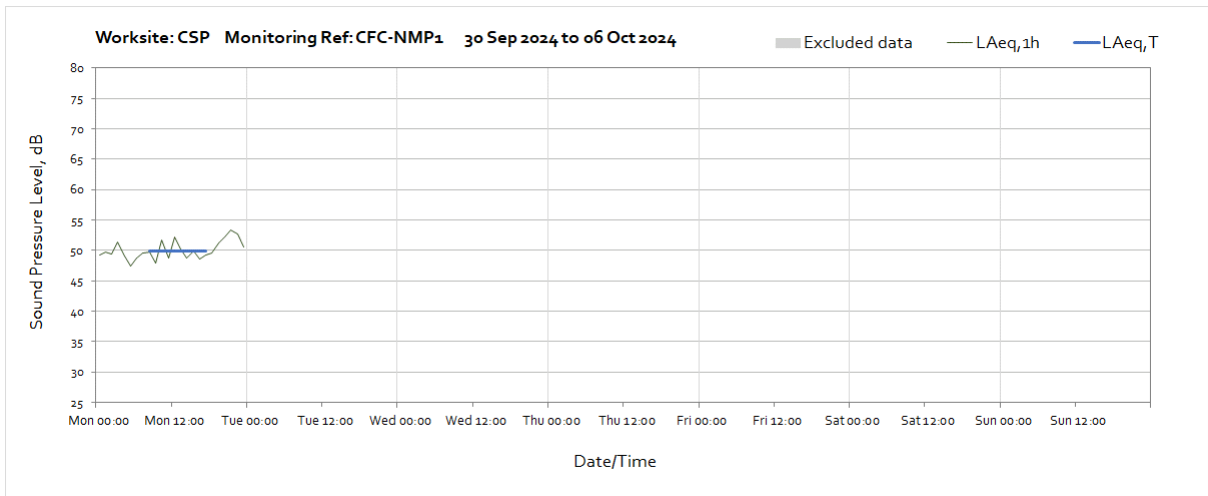
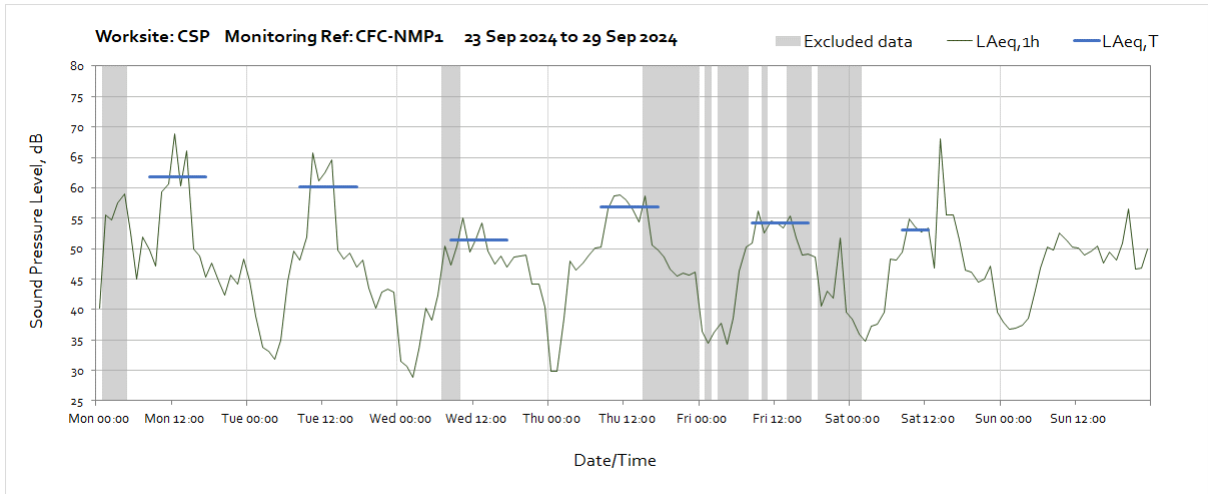
### Worksite: CSP – Monitoring Ref: CFC-NMP1



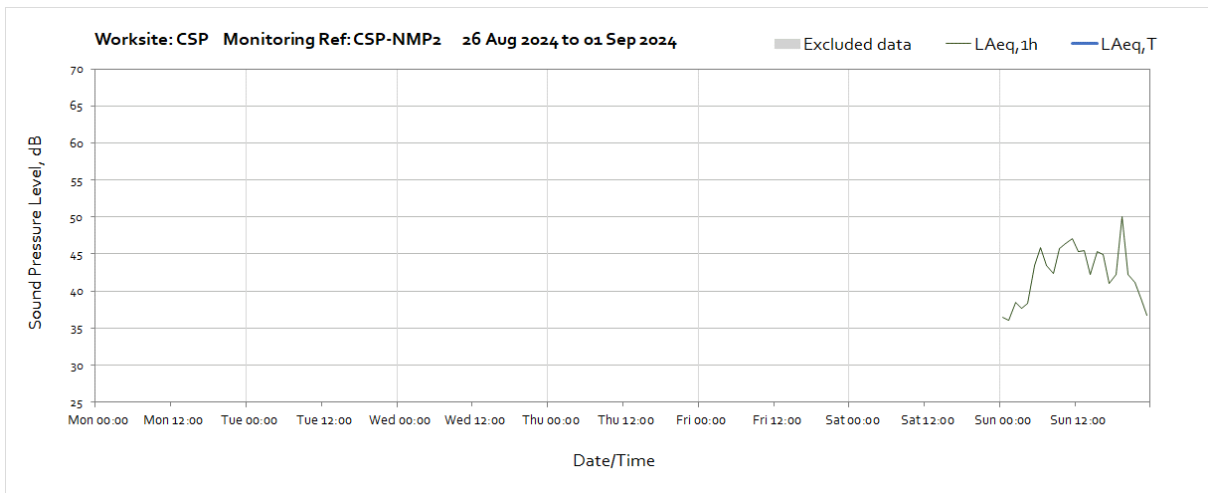


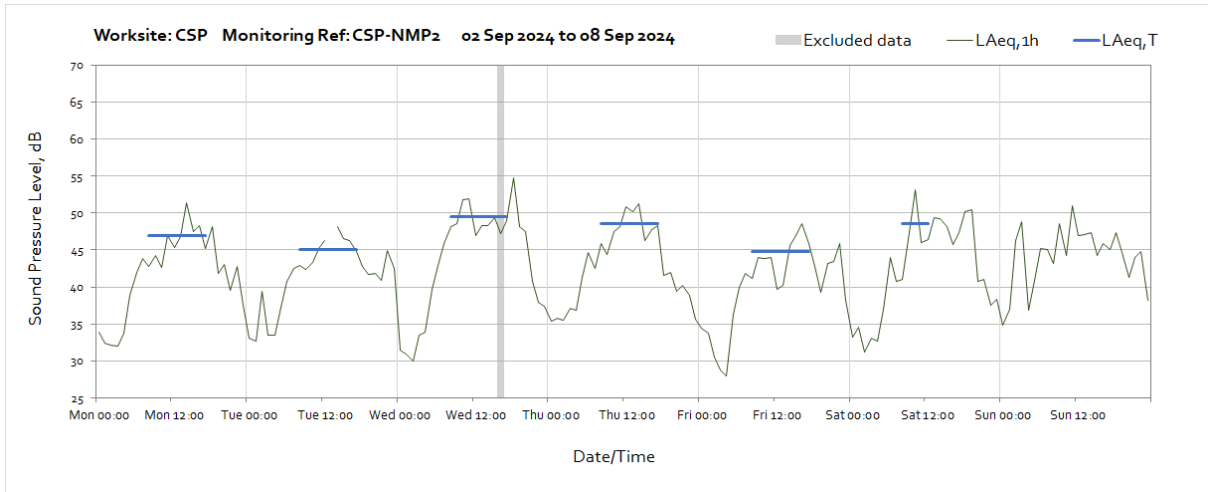
Note: Missing data between 12:00 and 13:00 on Tuesday 3<sup>rd</sup> September was due to monitor field calibration.



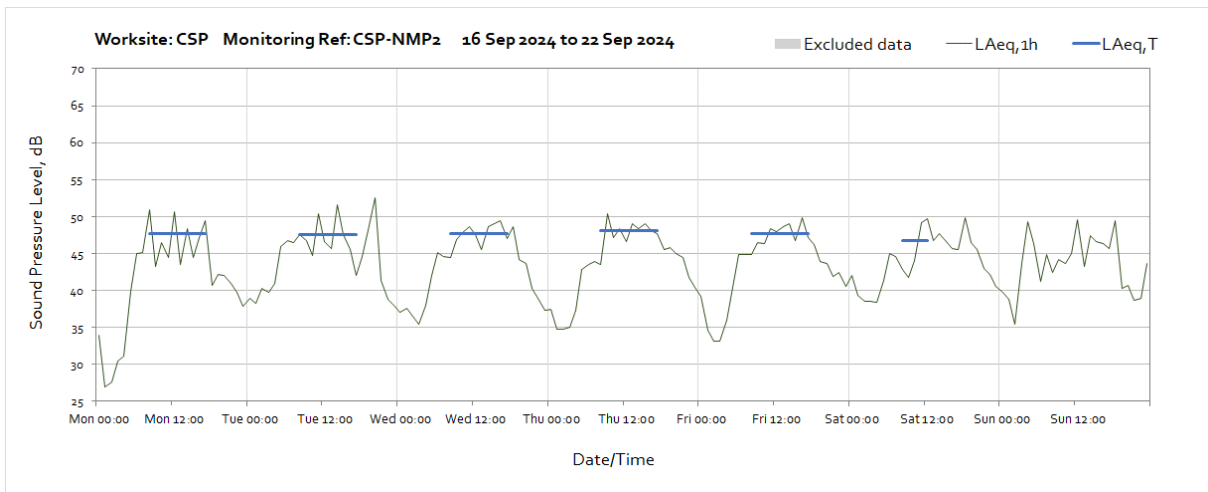
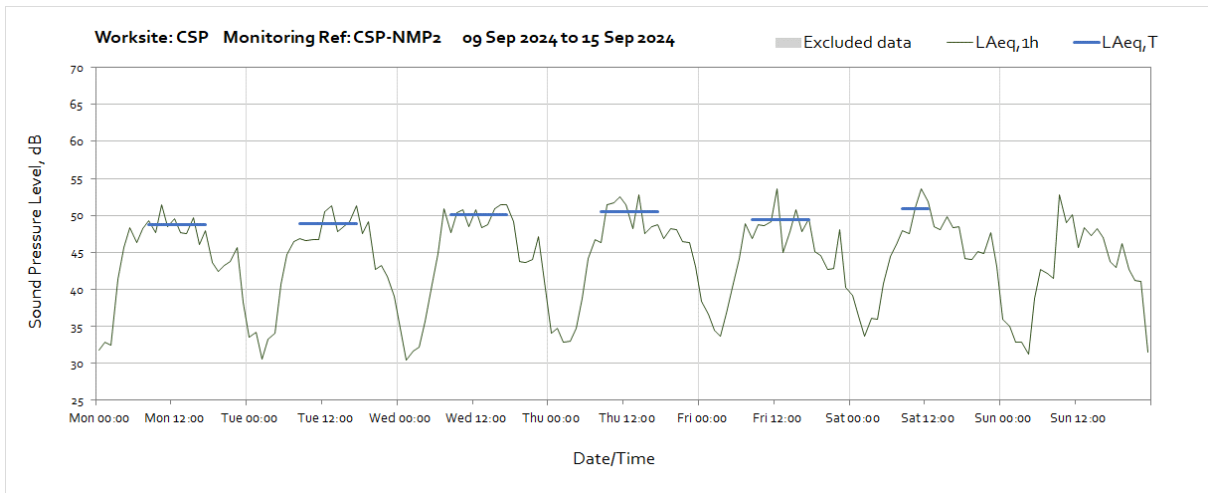


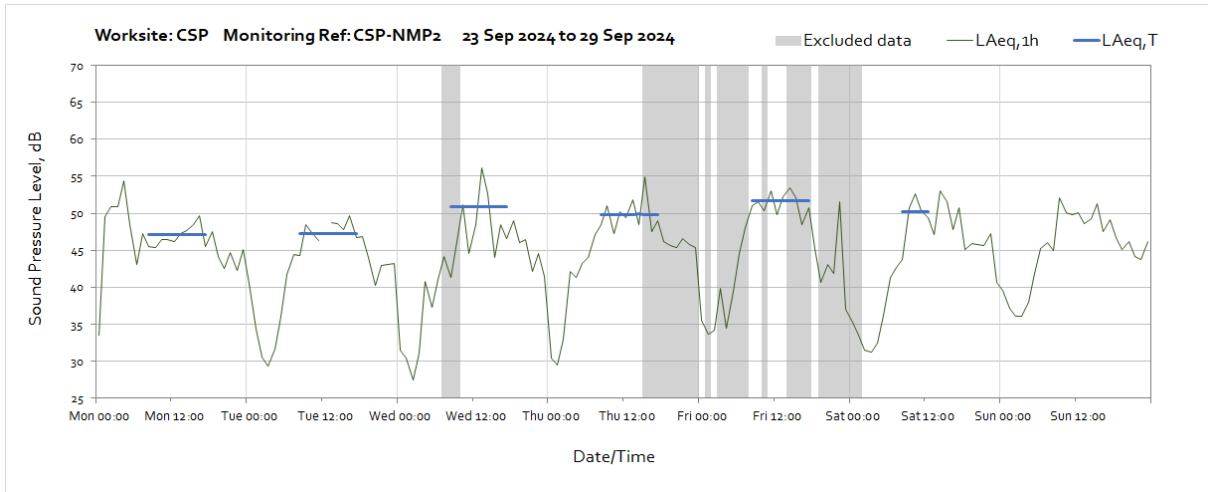
**Worksite: CSP - Monitoring Ref: CSP-NMP2**



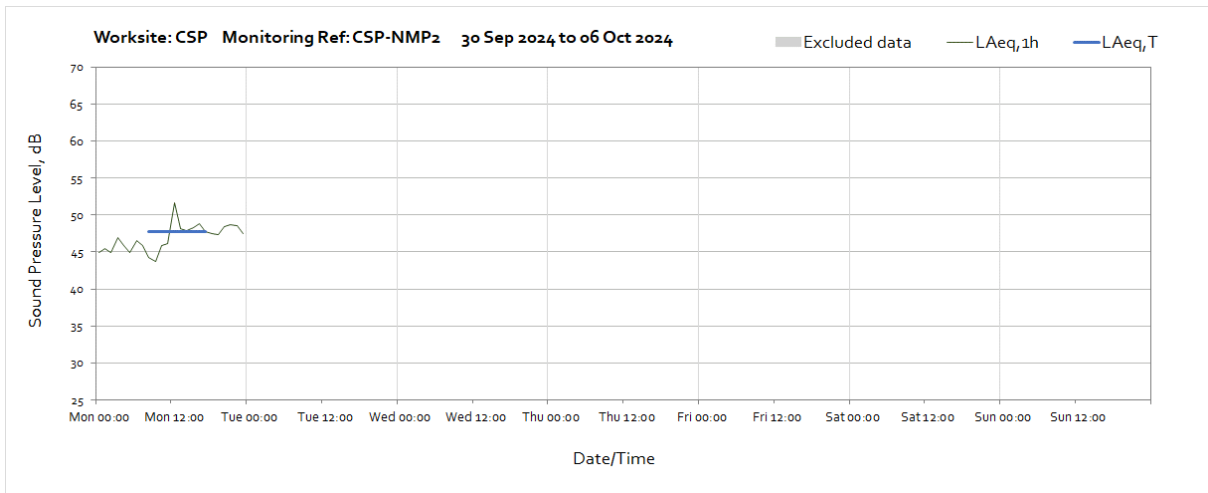


Note: Missing data between 13:00 and 14:00 on Tuesday 3<sup>rd</sup> September was due to monitor field calibration.

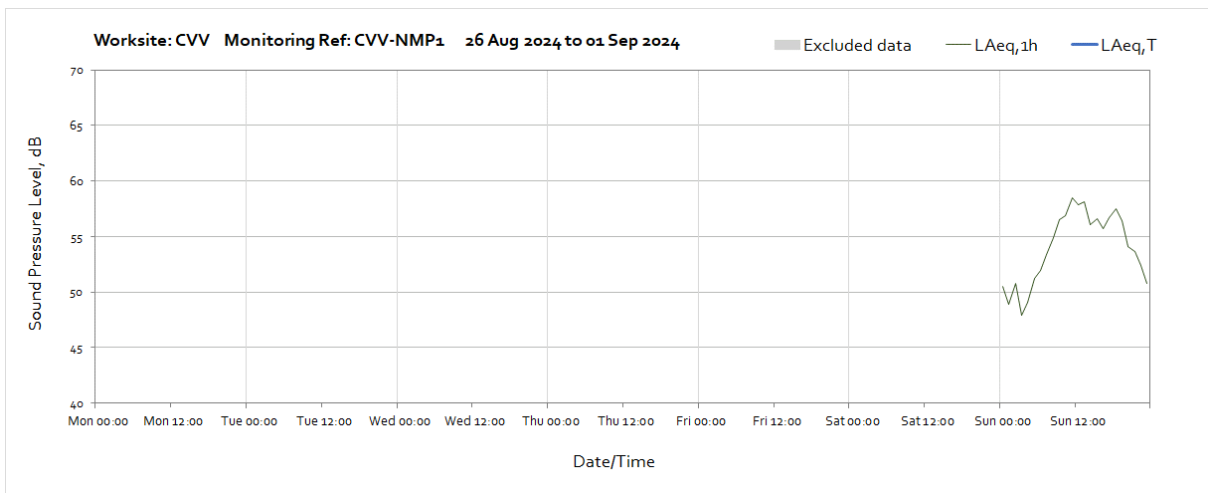


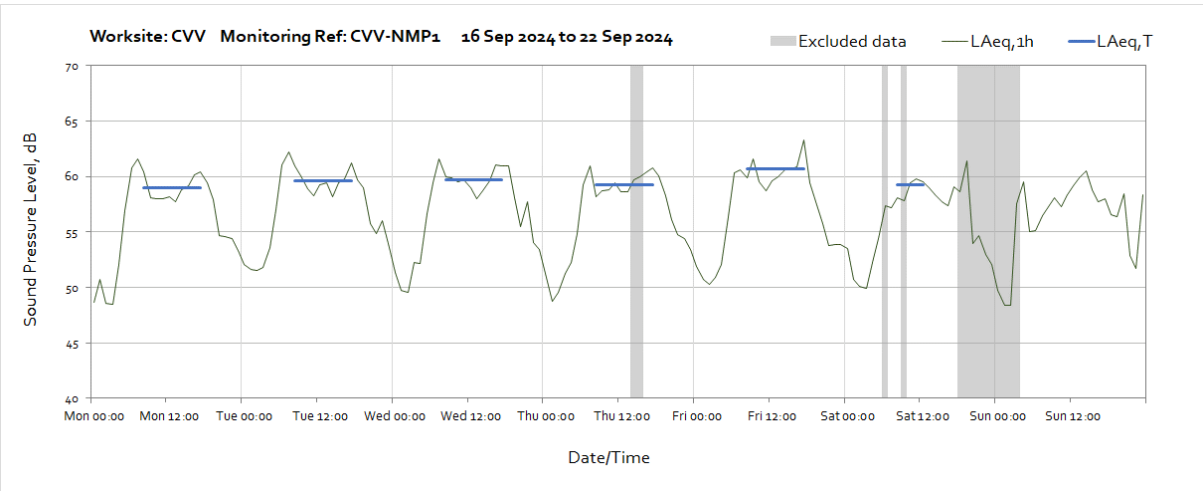
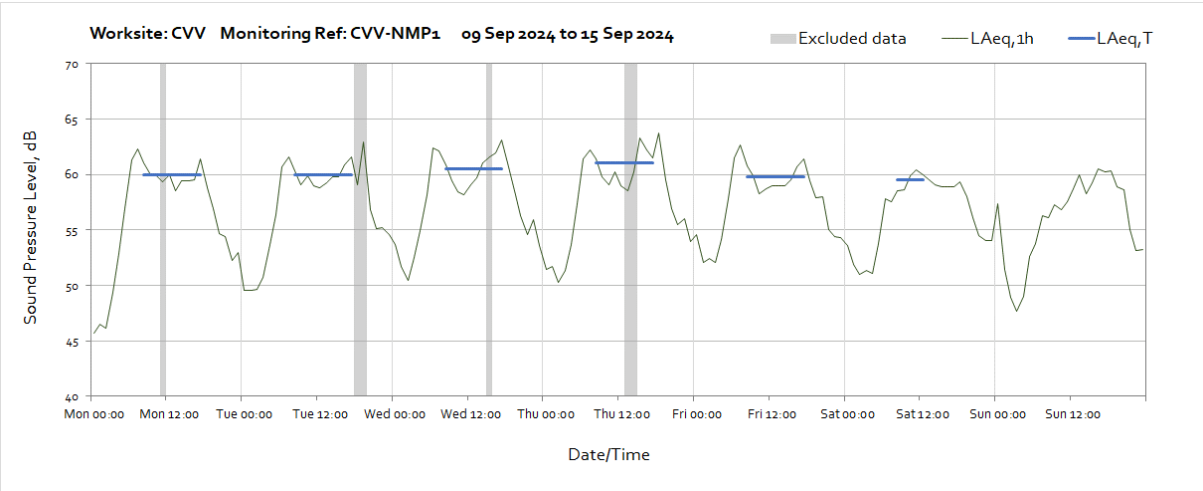
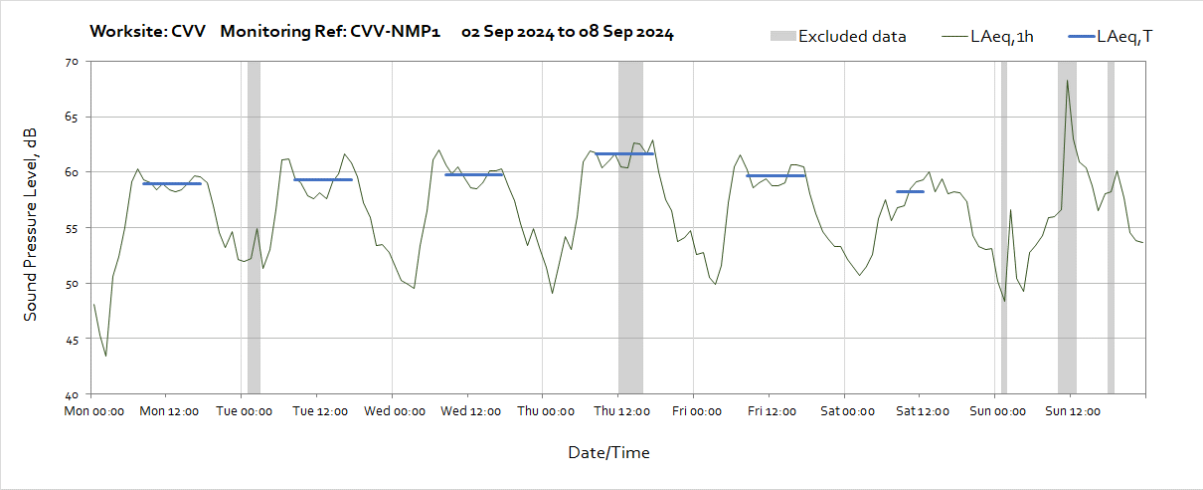


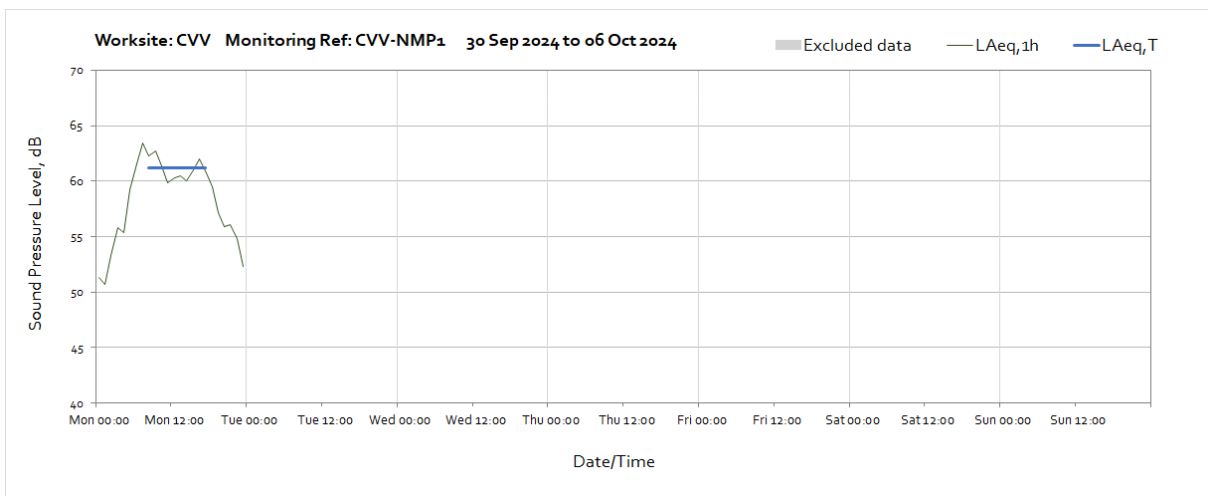
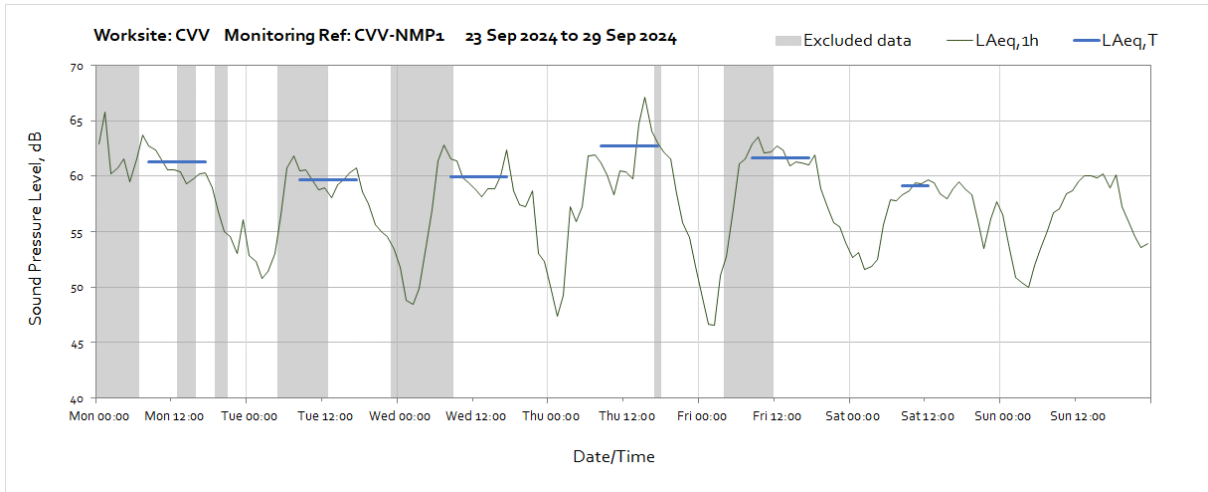
Note: Missing data between 12:00 and 13:00 on Tuesday 24<sup>th</sup> September was due to a communications error between the server and monitoring station.



**Worksite: CVV- Monitoring Ref: CVV-NMP1**





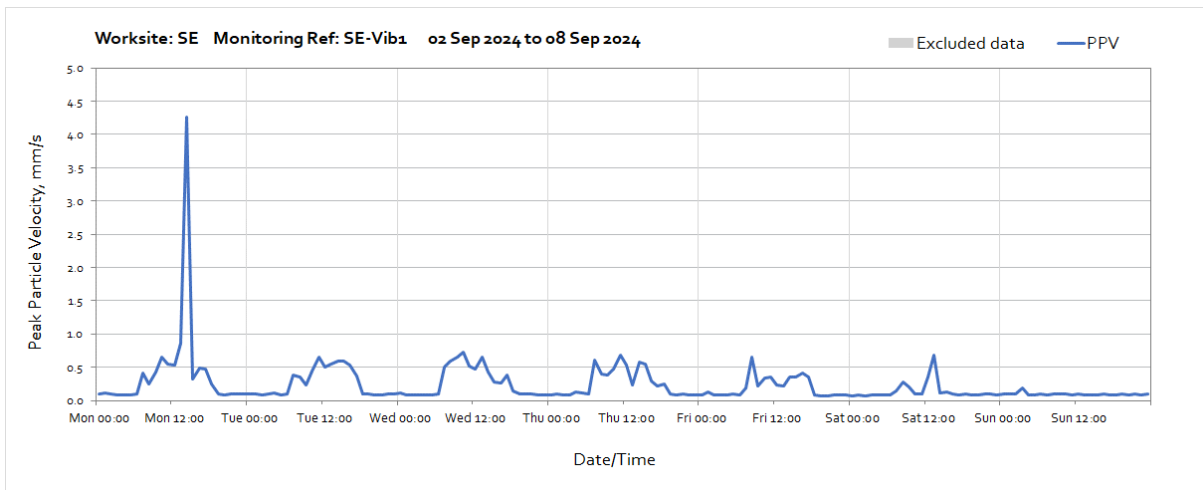
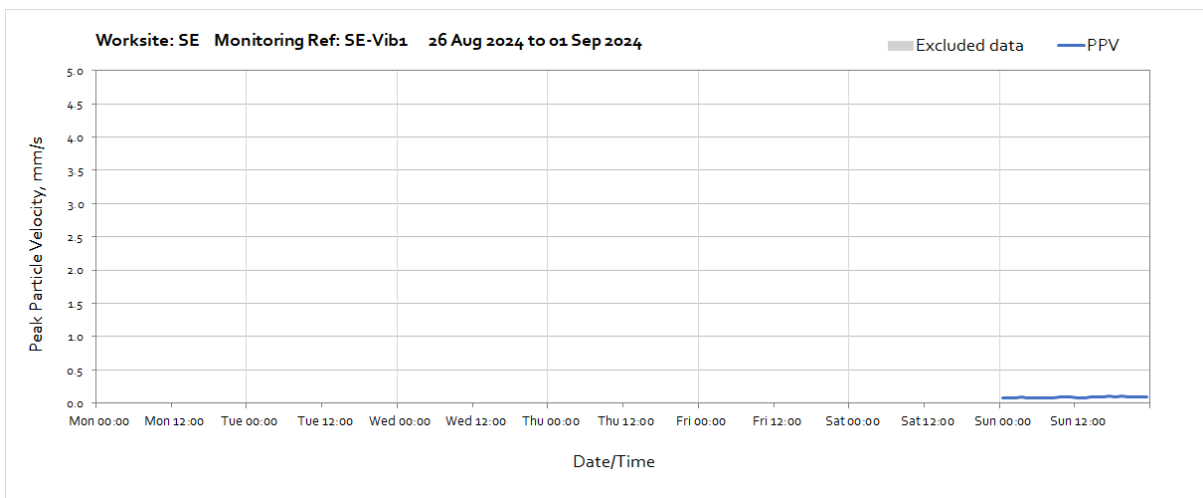


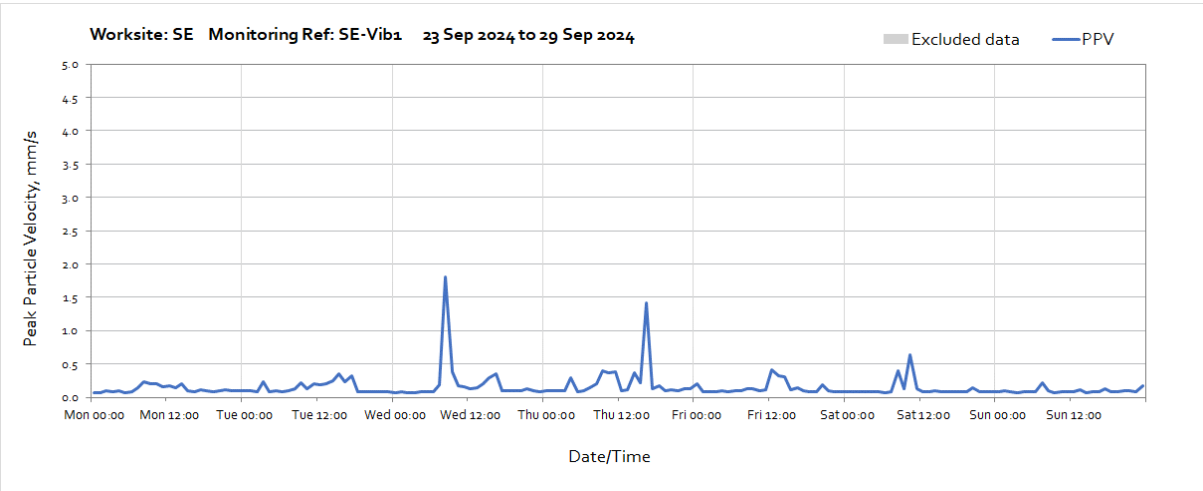
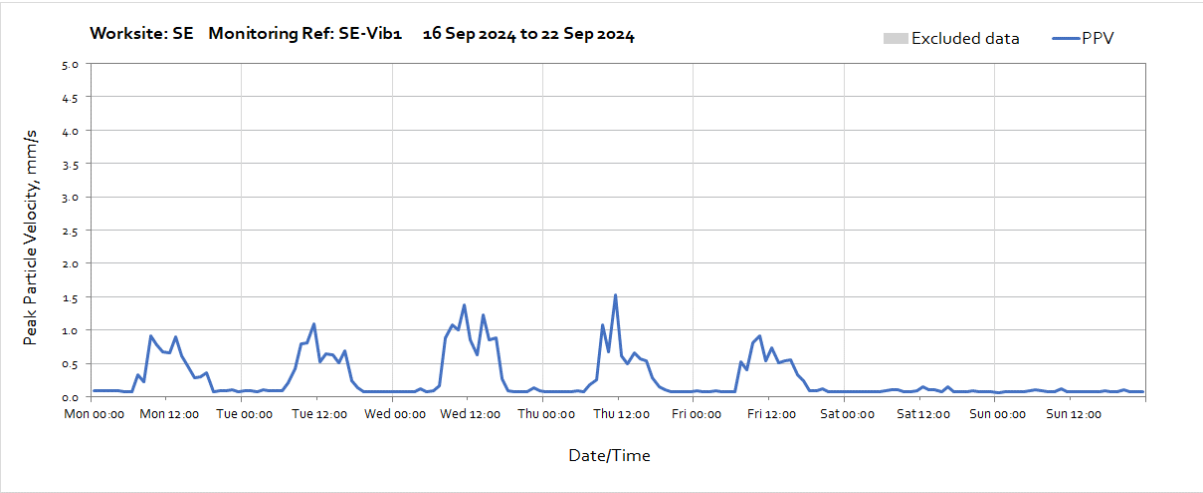
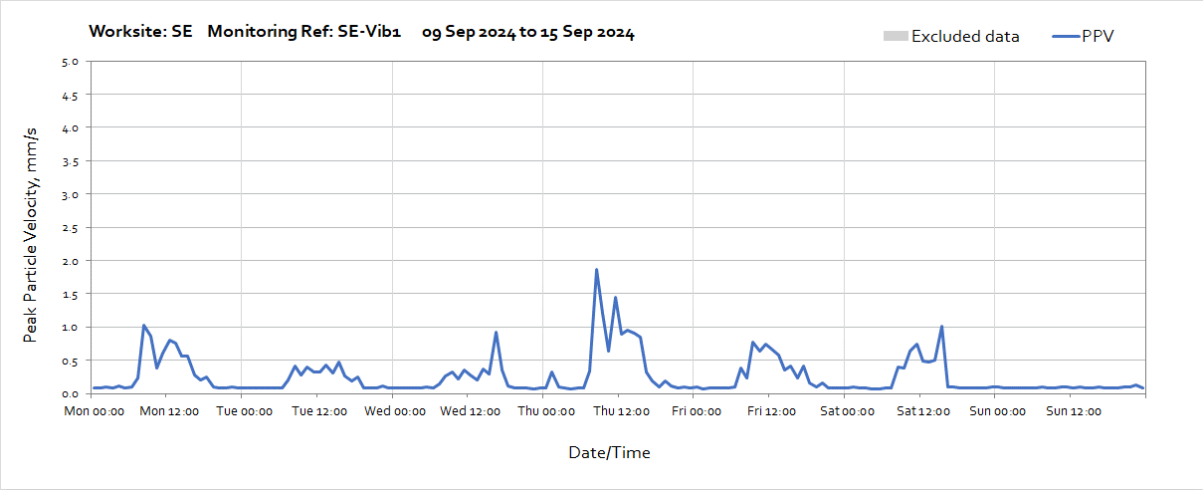


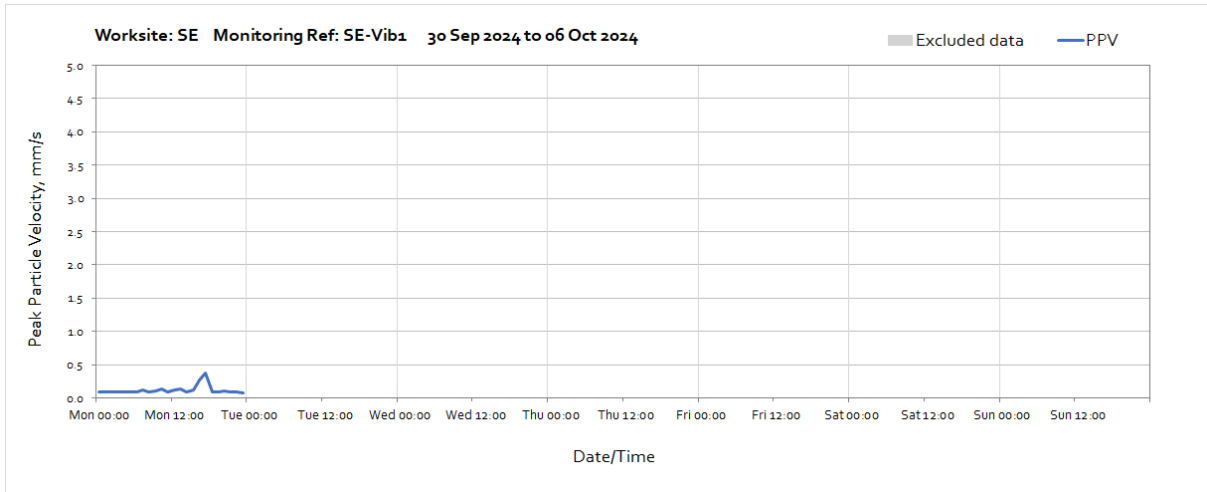
## Vibration

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 axes 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.

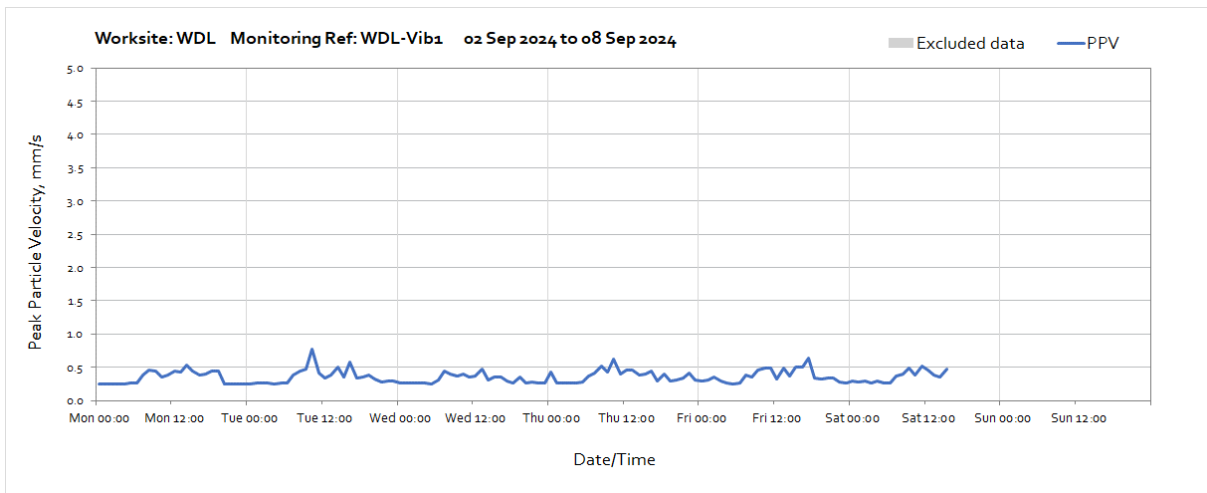
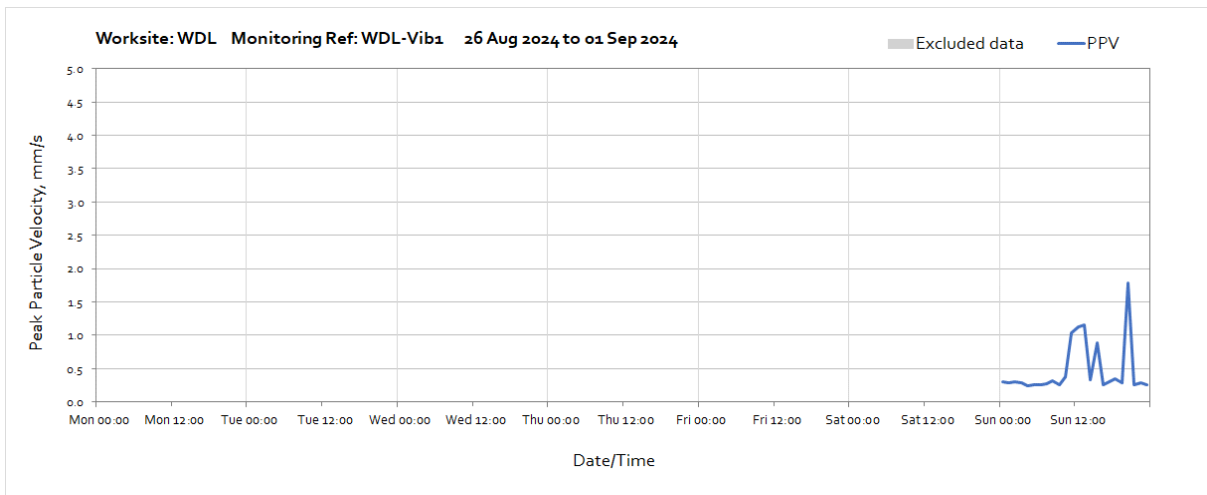
### Worksite: SE – Monitoring Ref: SE-Vib1





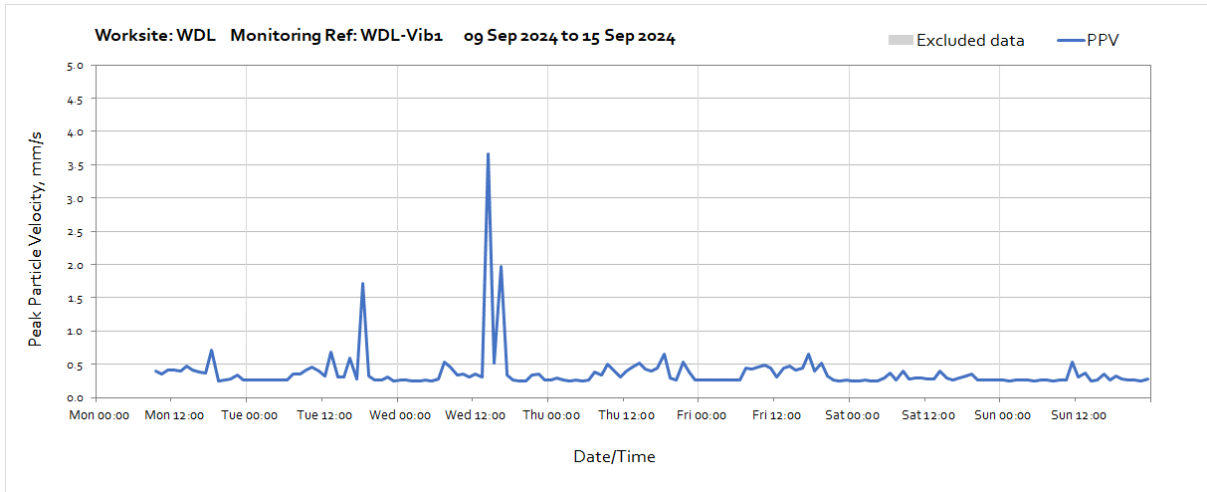


### Worksite: WDL – Monitoring Ref: WDL-Vib1

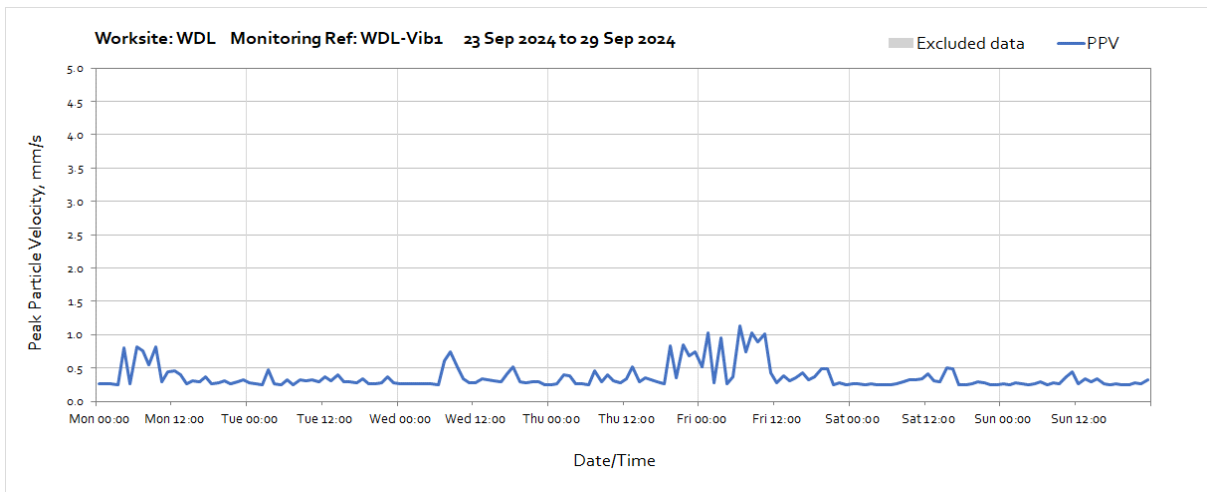
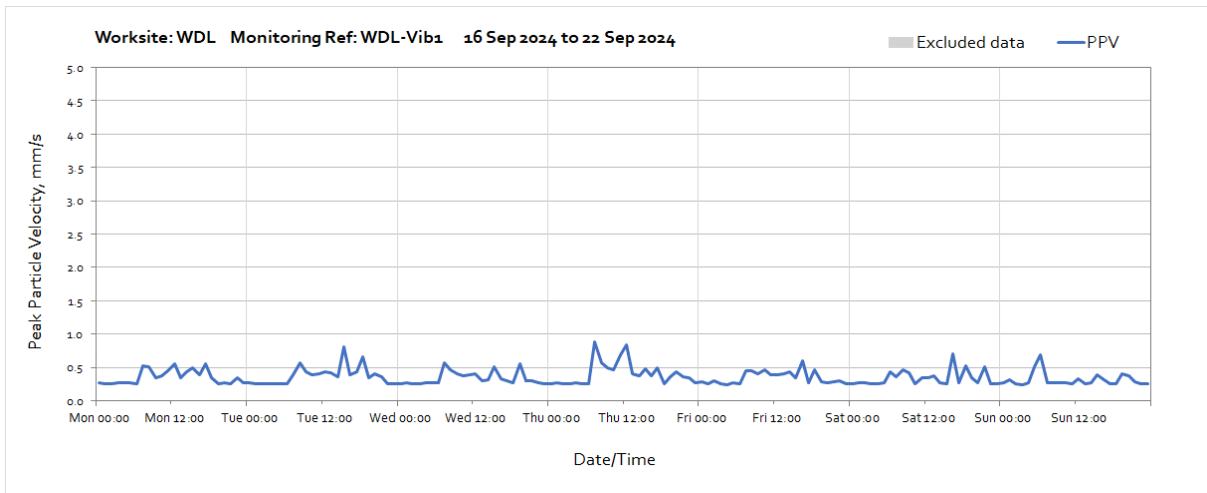


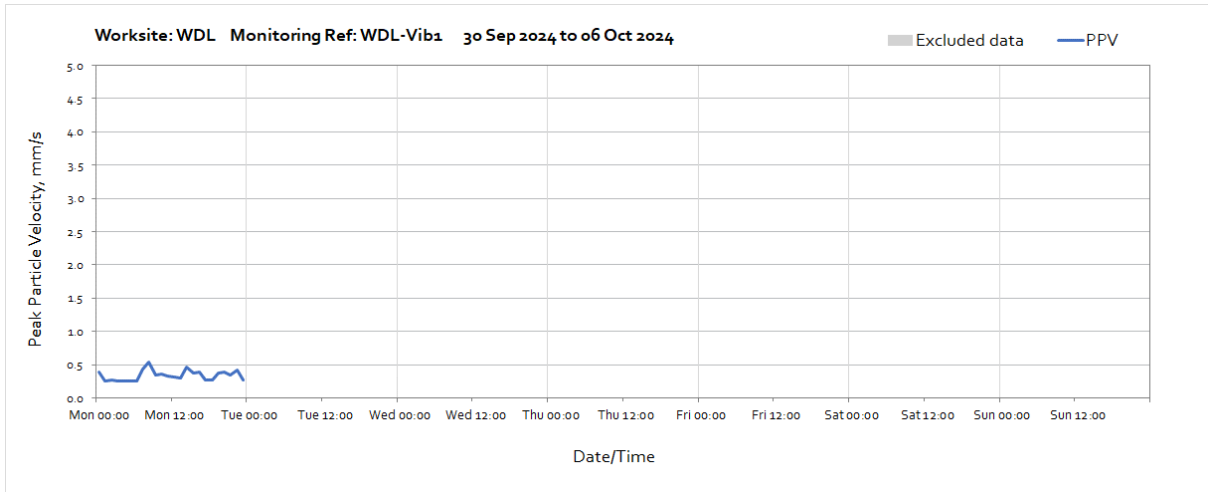
Note: Missing data between 16:00 on Saturday 7<sup>th</sup> September until 09:00 on Monday 9<sup>th</sup> September was due to a depleted monitor battery.

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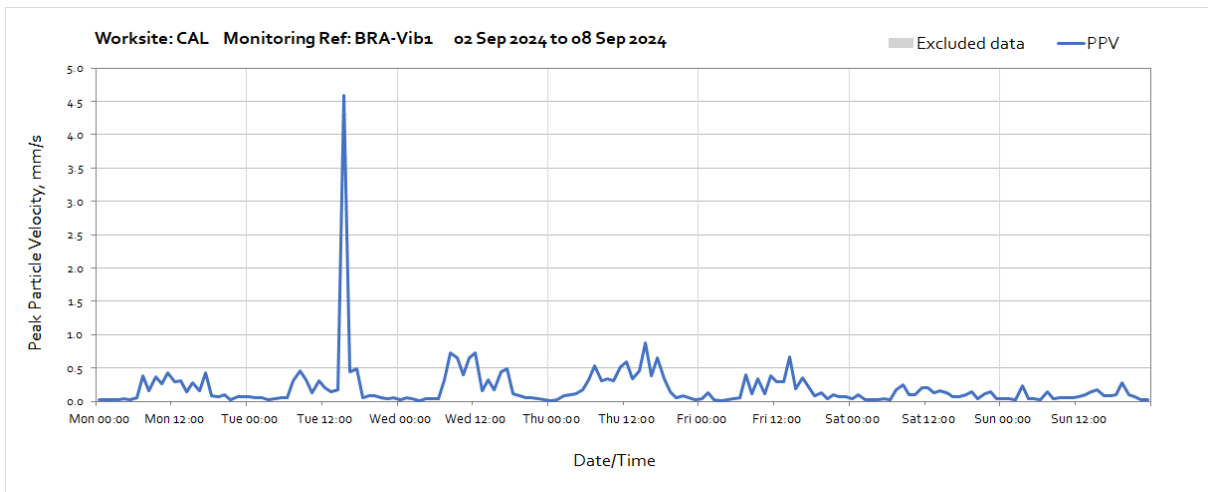
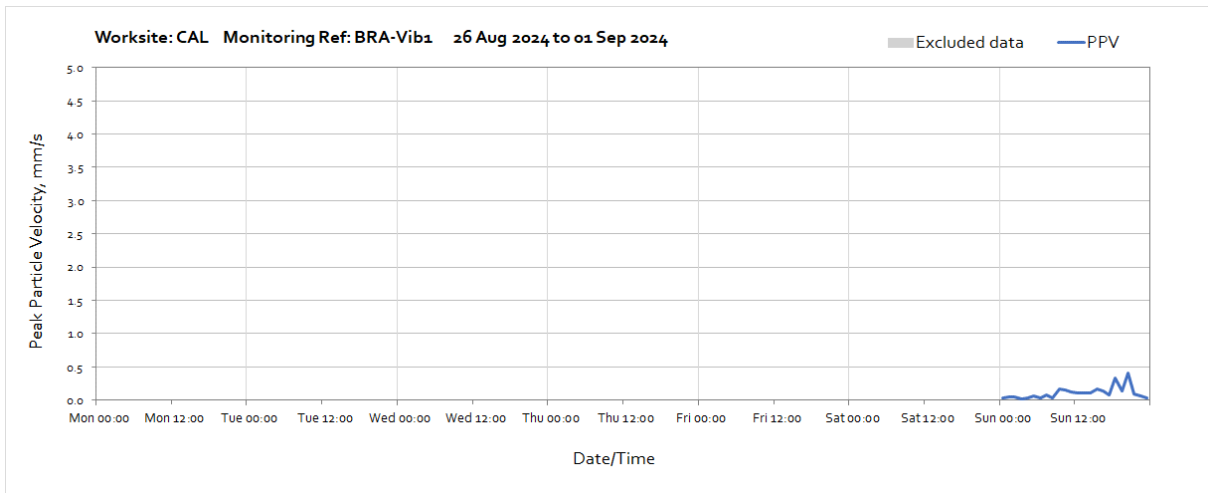


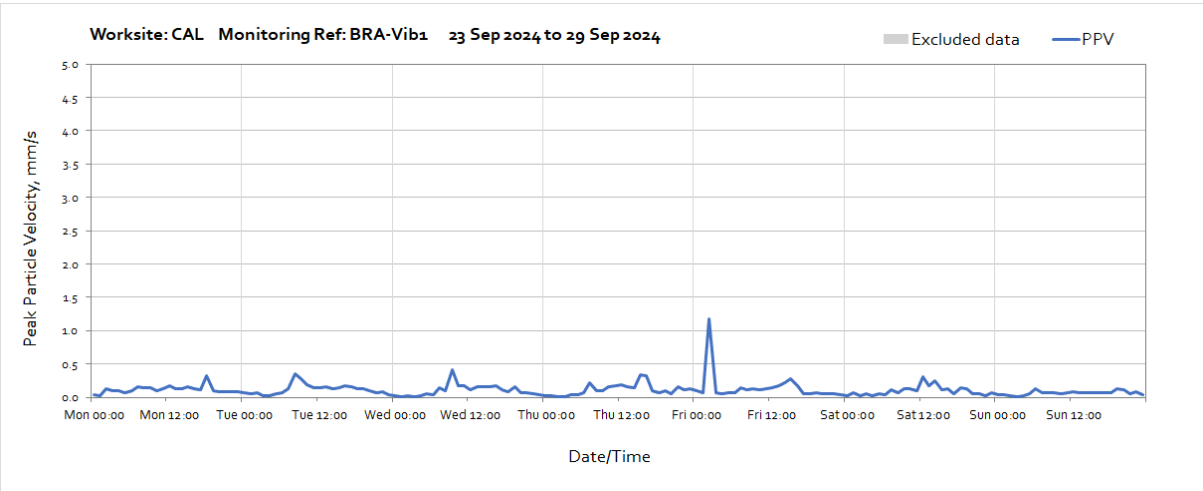
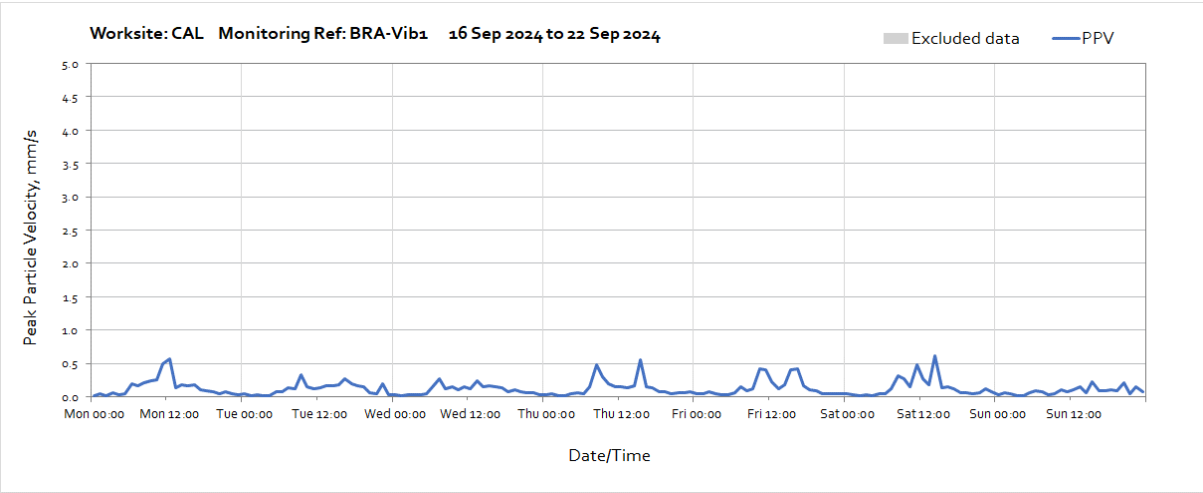
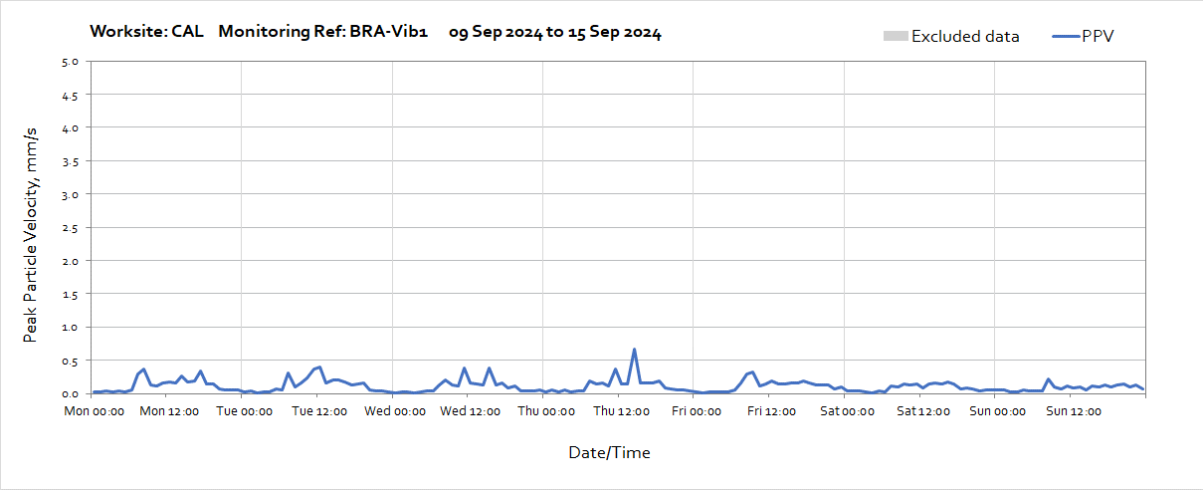
Note: Missing data between 16:00 on Saturday 7<sup>th</sup> September until 09:00 on Monday 9<sup>th</sup> September was due to a depleted monitor battery.

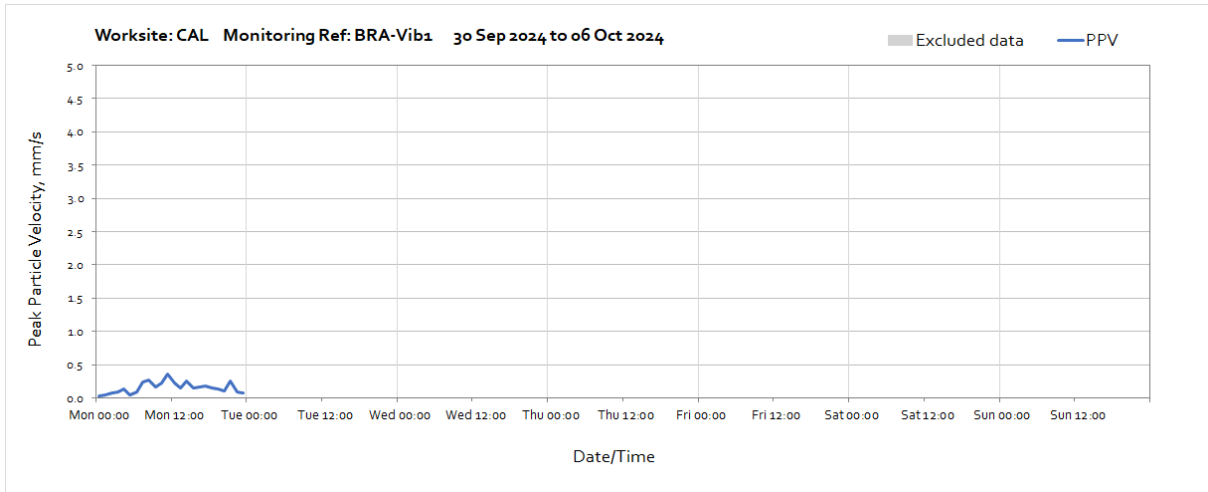




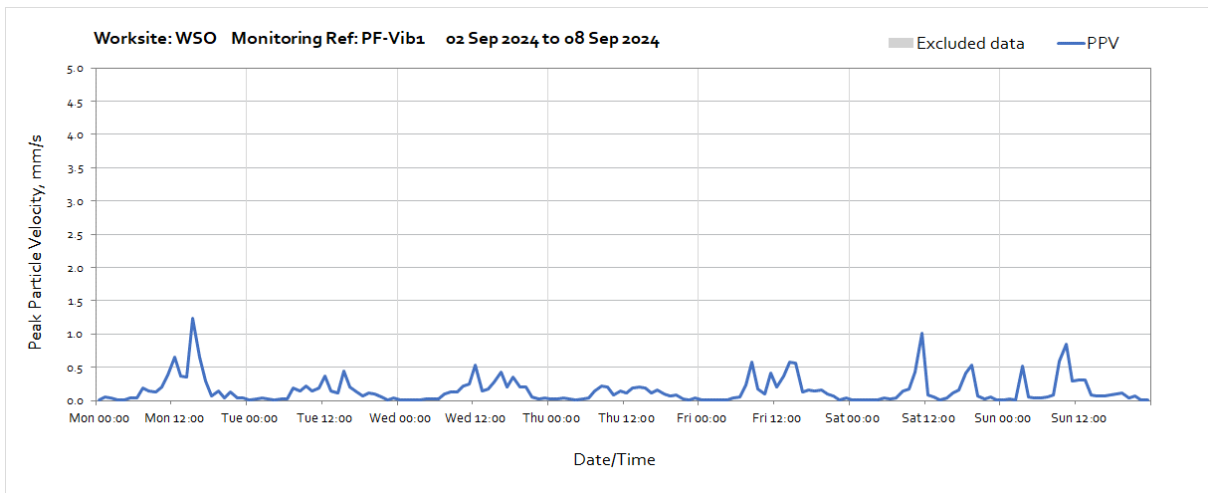
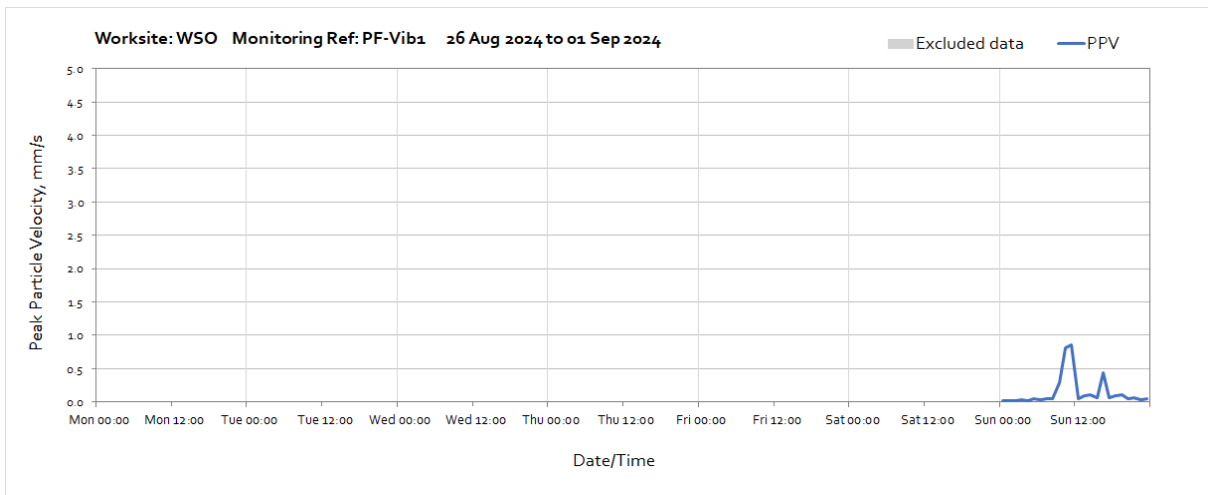
**Worksite: CAL – Monitoring Ref: BRA-Vib1**

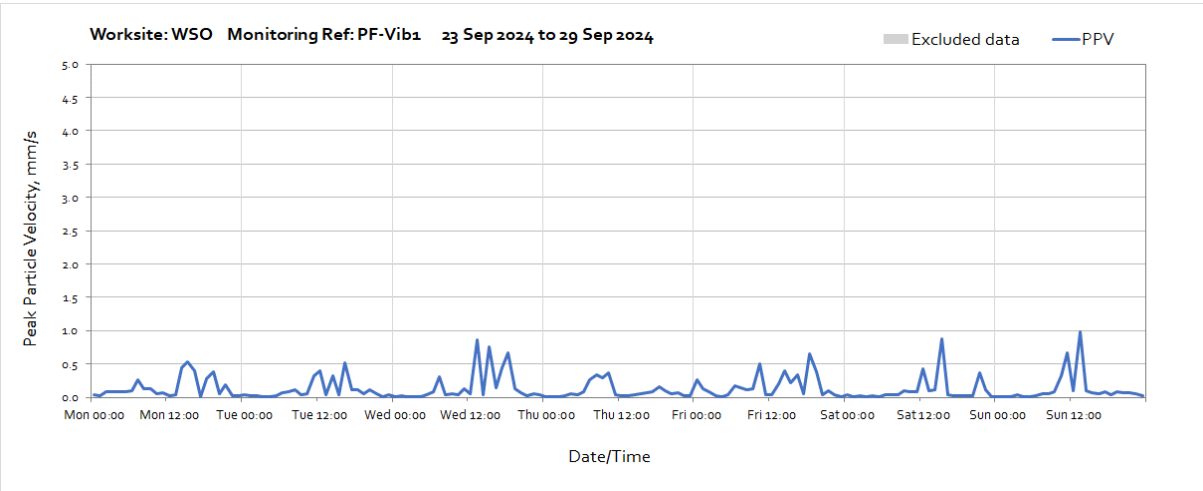
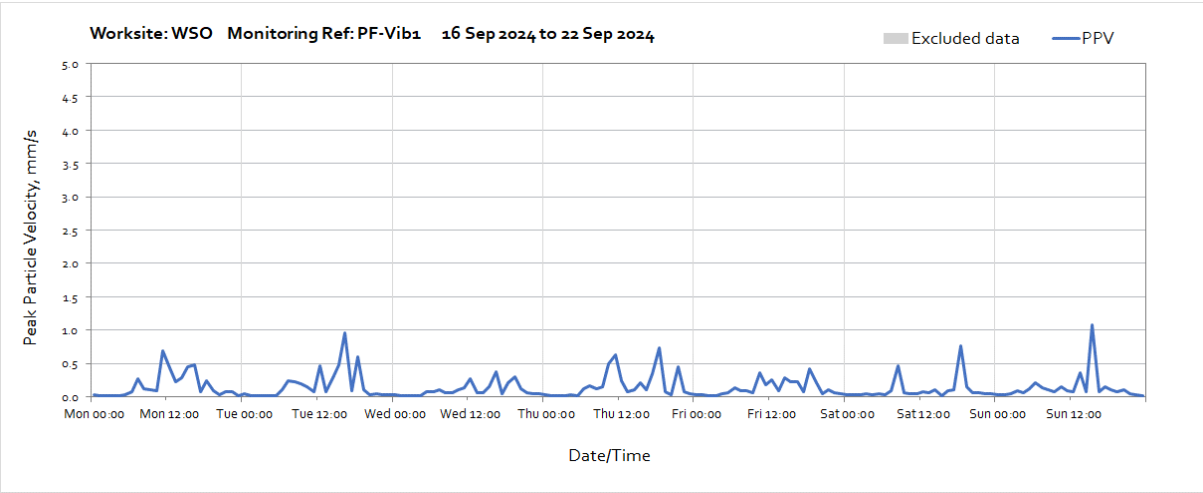
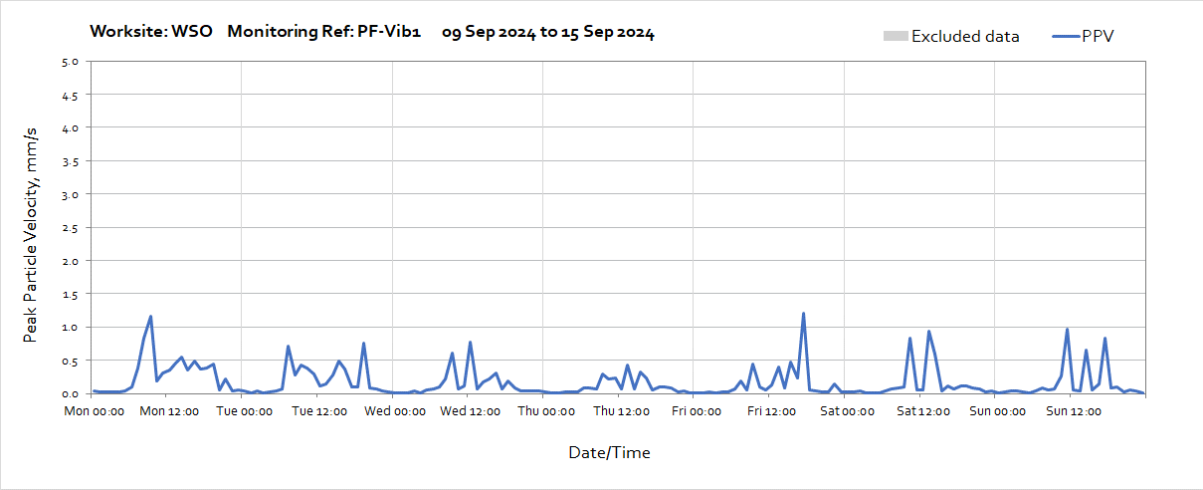




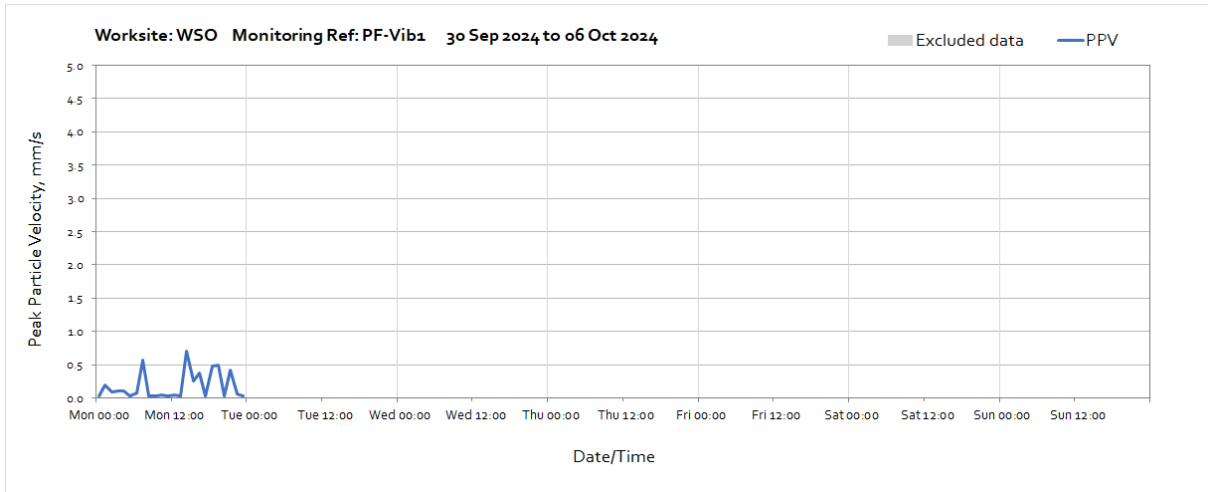


### Worksite: WSO – Monitoring Ref: PF-Vib1

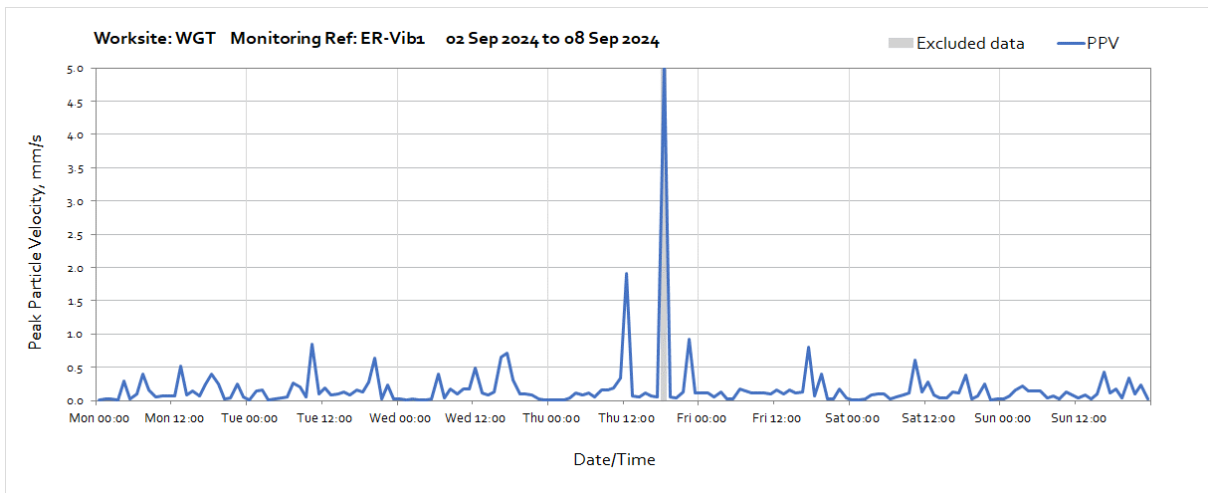
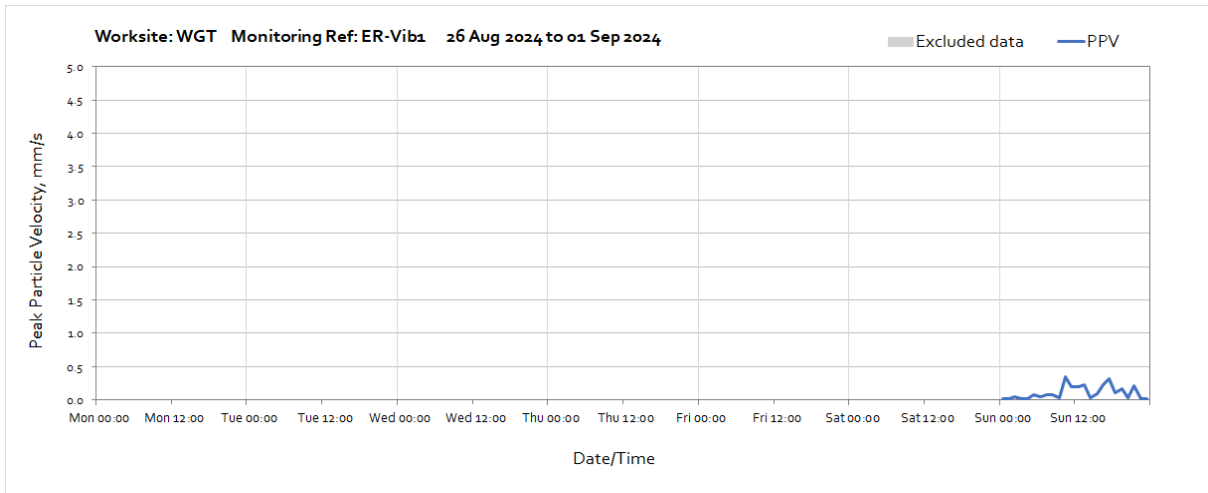


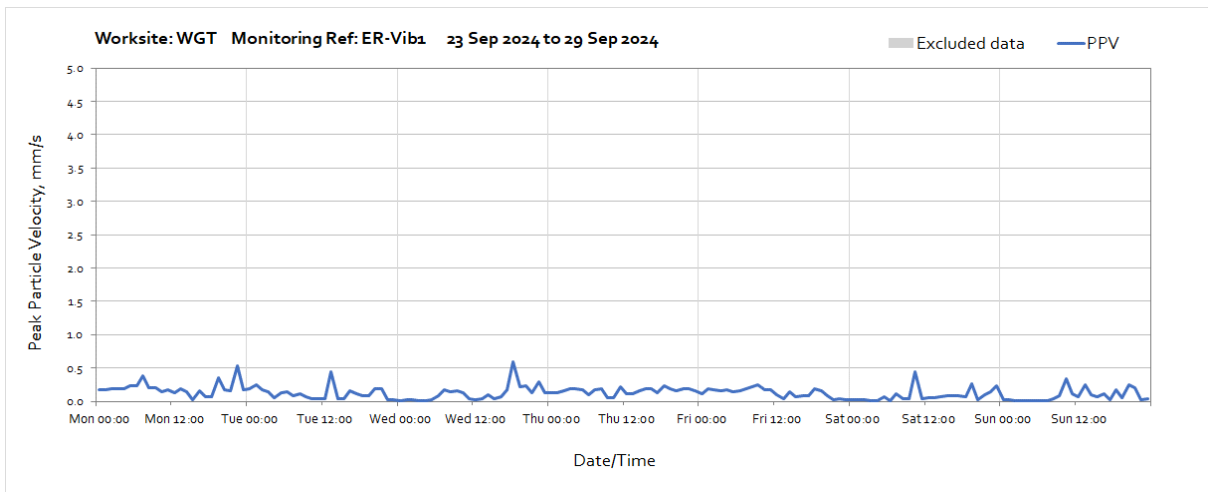
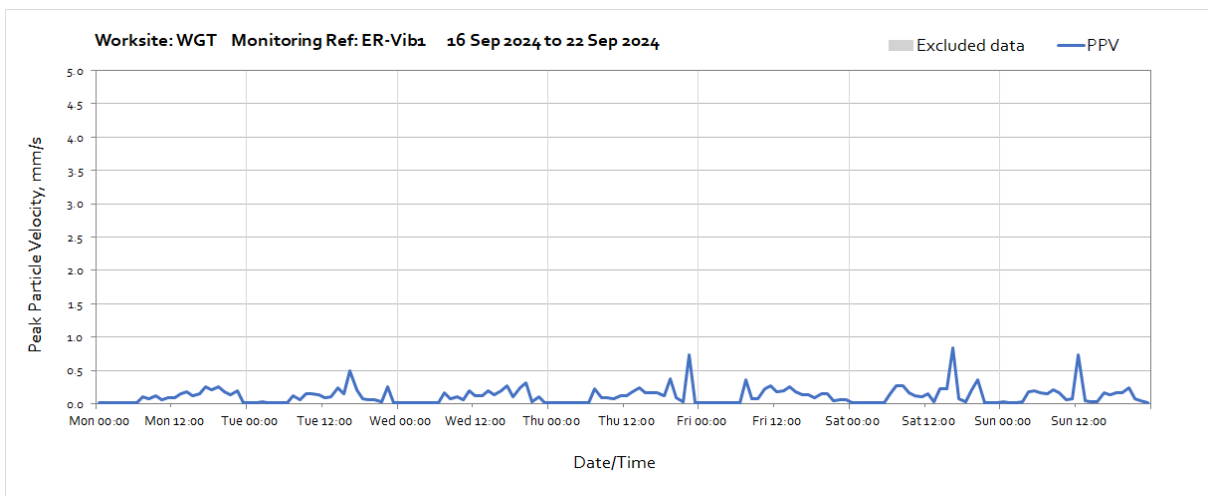
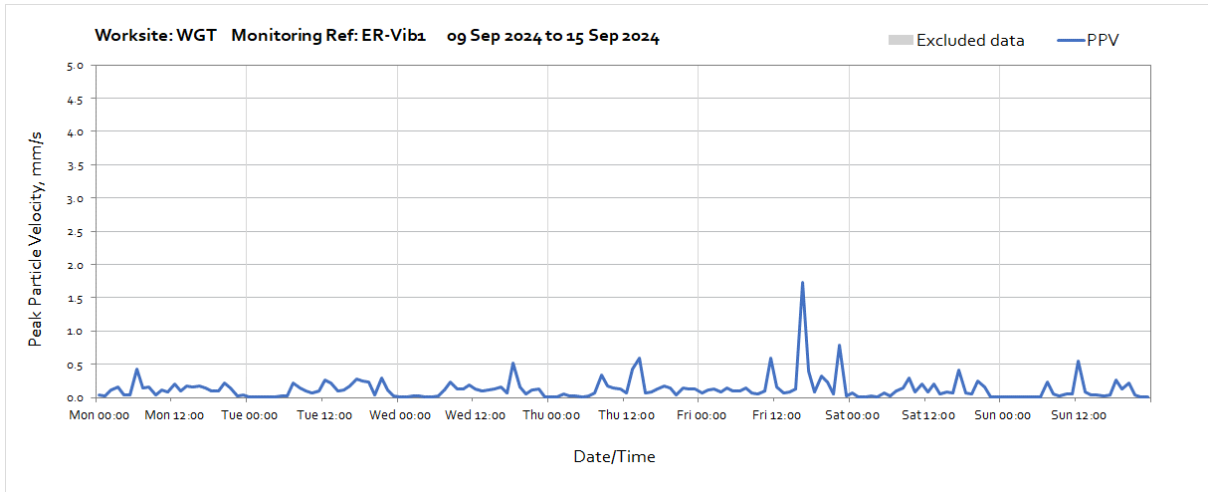


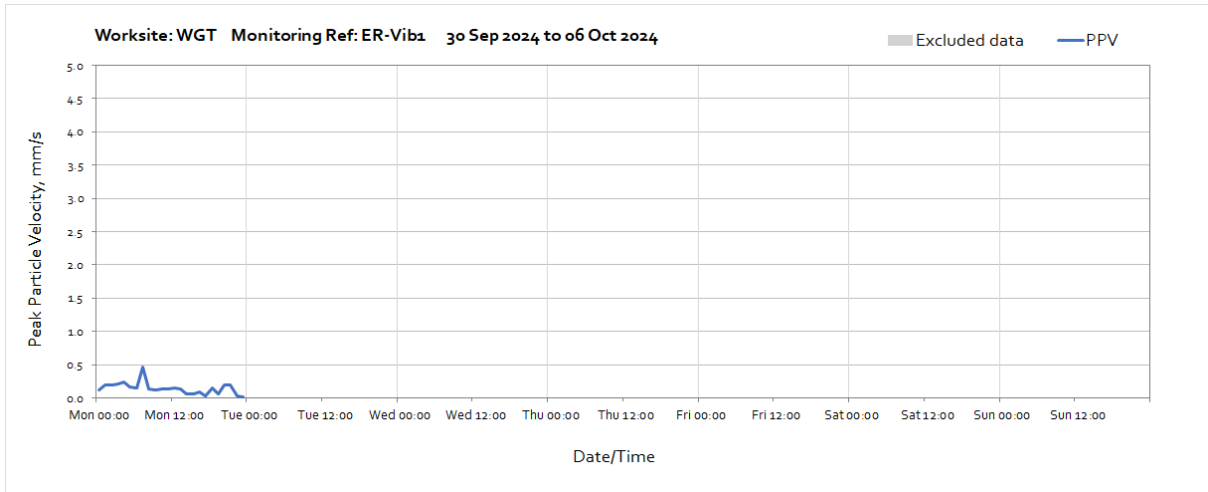




### Worksite: WGT – Monitoring Ref: ER-Vib1







**Worksite: GF – Monitoring Ref: GF-Vib1**

