

## **Construction Noise and Vibration Monthly Report – April 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 April 2024.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of the A422 Turweston North worksite (ref.: A422 TN) where drainage, material loading, trial pit construction, stockpile removal, borehole drilling, cutting stabilisation, overbridge construction, viaduct construction and cutting excavation were underway.
- Noise monitoring was undertaken in the vicinity of the School End (ref.: SE) and Hermitage Chetwode (ref.: HC) worksites where overbridge works, site access and haul road operation and maintenance, steel structure lifting and assembly, stockpile maintenance, drainage, vehicle movements, operation and maintenance of site access and mass haul roads, material deliveries bulk excavation and utility works were underway.
- Noise monitoring was undertaken in the vicinity of the Twyford worksite (ref.: TW) where material deliveries, excavation and replace, embankment works, preparation for bridge closure, pond backfilling, topsoiling, vegetation trimming and fencing installation were underway.
- Noise monitoring was undertaken in the vicinity of the West Street Overbridge worksite (ref.: WSO), where concrete pours, shutter installation, waterproofing, technical backfill and formwork reinforced concrete works were underway.
- Noise monitoring was undertaken in the vicinity of the Calvert worksite (ref.: CAL) where operation of concrete batching plant, piling, waterproofing, technical backfill, material movements, earthworks and maintenance were underway.
- Noise monitoring was undertaken in the vicinity of the Woodlands worksite (ref.: WDL) where installation of wingwalls, diversion works and material movements were underway.
- Noise monitoring was undertaken in the vicinity of the Quanton worksite (ref.: QAR) where car park extension and earthworks were underway.
- Noise monitoring was undertaken in the vicinity of the Meadoway and Glebe House worksite (ref.: MW&GH) where earthworks, overbridge and diversion works were underway.
- Noise monitoring was undertaken in the vicinity of Oat Close worksite (ref.: OC) where overbridge works, earthworks, excavation and stockpiling were underway.

- Noise monitoring was undertaken in the vicinity of Waddesdon worksite (ref.: WAD) where road works, topsoil stripping and excavation were underway.
- Noise monitoring was undertaken in the vicinity of Nash Lee Lane worksite (ref.: NLL) where headwall blinding, orchard installation, waterproofing, mammal shelf construction, headwall and wingwall construction and diversion works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Green Tunnel worksite (ref.: WGT) where road construction, digging, bridleway construction, installation of gullies, filter drain and fencing, cutting, topsoiling, temporary diversion works, removal of utilities bridge, construction of utility protection slab, substation replacement, scaffold erection, tarmacking, utility works, stockpile and site maintenance were underway.
- Noise monitoring was undertaken in the vicinity of Grove Farm worksite (ref.: GF) where material deliveries were underway.
- Noise monitoring was undertaken in the vicinity of Small Dean Viaduct Compound worksite (ref.: SDVC) where demobilisation, excavation, pile cap concrete pours, pier construction, installation and lifting of hammerhead and rebar, launch platform construction, lifting of beams and welding were underway.
- Noise monitoring was undertaken in the vicinity of Rocky Lane Embankment worksite (ref.: RLE) where earthworks, platform and access ramp installation and drainage works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Dean Viaduct worksite (ref.: WDV) where pier construction, abutment works, and launch platform construction were underway.
- Noise monitoring was undertaken in the vicinity of Leather Lane worksite (ref.: LL) where earthworks and operation of site access road were underway.
- Noise monitoring was undertaken in the vicinity of South Heath Cutting worksite (ref.: SHCW) where operation of site access road and earthworks were underway.
- Noise monitoring was undertaken in the vicinity of North Portal worksite (ref.: NP) where plant operations, piling platform reinstatement, porous portal structure works, tunnel bore machine dismantling, compound works and batching plant installation were underway.
- Noise monitoring was undertaken in the vicinity of Chesham Road worksite (ref.: CHSM), where general site activities, headhouse construction and internal and external building works were underway.

- Noise monitoring was underway in the vicinity of Little Missenden Vent Shaft worksite (ref.: LM) where site operation, tunnel connections, superstructure concrete and building construction were underway.
- Noise monitoring was underway in the vicinity of Amersham Vent Shaft worksite (ref.: AM), where site operation, external works, tunnel connection and superstructure concrete works were underway.
- Noise monitoring was underway in the vicinity of Chalfont St Giles Vent Shaft worksite (ref.: CSG) where site operation, road maintenance, tunnel connection works and internal and external building works were underway.
- Noise monitoring was underway in the vicinity of 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.
- Noise monitoring was underway in the vicinity of the 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, girder, deck, landscaping works and footbridge installation were underway.

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

- Infrastructure Maintenance Depot (IMD) where technical backfill and earthworks were underway.
- MCJ where bulk excavation were underway.
- Bat mitigation structure where concrete pours, formwork reinforced concrete works, excavation and earthworks were underway.
- FCC Access Road Retaining Wall where retaining wall base construction and installation of rock blocks were underway.
- Greatmoor Culvert where formwork reinforced concrete works, concrete pours, earthworks and technical backfill were underway.
- GUN28 overbridge where formwork reinforced concrete works, deck and diaphragm construction and technical backfilling were underway.
- QUA36 overbridge where pile cutting and formwork reinforced concrete pile cap works were underway.

- Finemere Culvert where sheet piling, earthworks and excavation were underway.
- Hills Farm where stockpiling was underway.
- Edgcott Road overbridge where formwork reinforced concrete works were underway.
- Calvert Cutting Retaining Wall where piling and pile breakdown were underway.
- Aylesbury Golf Course where cutting and culvert works, and utility diversion were underway.
- Thame Valley Viaduct Causeway where piling, installation of reinforced concrete, pile cropping, installation 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 steel fixing and deck works were underway.
- Nash Lee Road Diversion where piling platform extension and construction 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 sixteen (16) times during the reporting period.

Three (3) exceedances of trigger levels as defined in Section 61 consents occurred during the reporting period.

Three (3) 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 April 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> April 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:
  - Drainage.
  - Material loading.
  - Trial pit construction.
  - Stockpile removal.
  - Borehole drilling.
  - Cutting stabilisation.
  - Overbridge construction.
  - Viaduct construction.
  - Cutting excavation.



- 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:
  - Overbridge works, including reinforced concrete works, steel fixing and shuttering.
  - Steel structure lifting and assembly.
  - Stockpile maintenance.
  - Drainage works, including pond maintenance.
  - Vehicle movements.
  - Operation and maintenance of site access and mass haul road.
  - Material deliveries.
  - Bulk excavation.
  - Utility works, including diversion works, excavation, backfill and traffic management.
- Twyford worksite, ref.: TW (see Plan 2 in Appendix A), where works activities included:
  - Material deliveries.
  - Site access road and haul road maintenance and operation.
  - Excavation and replace.
  - Embankment works.
  - Preparation for Twyford Causeway bridge closure.
  - Pond backfilling.
  - Topsoiling, including backfilling.
  - Vegetation trimming.
  - Fencing installation.
- West Street Overbridge worksite, ref.: WSO (see Plan 2 in Appendix A), where works activities included:
  - Concrete pours.
  - Shutter installation.
  - Waterproofing.
  - Technical backfill.

- Formwork reinforced concrete works for approach retaining and ballast wall.
- Calvert worksite, ref.: CAL (see Plan 3 in Appendix A) where works activities included:
  - Operation of concrete batching plant.
  - Piling.
  - Waterproofing.
  - Technical backfill.
  - Material movements.
  - Earthworks and maintenance.
- Woodlands worksite, ref.: WDL (see Plan 4 in Appendix A) where works activities included:
  - Installation of wingwalls.
  - Diversion works.
  - Material movements.
- Quanton worksite, ref.: QAR (see Plan 4 in Appendix A) where works activities included:
  - Car park extension.
  - Earthworks.
- Meadoway and Glebe House worksite, ref.: MW&GH (see Plan 5 in Appendix A), where works activities included:
  - Earthworks.
  - Overbridge works, including construction of abutments, piers and formwork reinforced concrete works.
  - Diversion works.
- 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:
  - Road works, including curbing.
  - Topsoil stripping.
  - Excavation.
- Nash Lee Lane worksite, ref.: NLL (see Plan 6 in Appendix A), where works activities included:
  - Headwall blinding.
  - Orchard installation.
  - Waterproofing.
  - Mammal shelf construction.
  - Headwall and wingwall construction.
  - Diversion works.
- Wendover Green Tunnel worksite, ref.: WGT (see Plan 6 in Appendix A), where works activities included:
  - Road construction.
  - Digging.
  - Bridleway construction.
  - Installation of gullies.
  - Cutting.
  - Topsoiling.
  - Installation of filter drain.
  - Temporary diversion works.
  - Removal of utilities bridge.
  - Construction of utilities protection slab, including concrete pours.
  - Substation replacement.
  - Fencing installation.
  - Scaffold erection.

- Borehole protection construction.
- Tarmacking of site access road.
- Utility works, including water pipe and water valve installation.
- Stockpile maintenance.
- Site maintenance, including signage relocation, construction of bowser discharge area, batching plant maintenance, v-ditch excavation and tarmacking.
- Grove Farm worksite, ref.: GF (see Plan 7 in Appendix A), where works activities included:
  - Material deliveries.
- Small Dean Viaduct Compound worksite, ref.: SDVC (see Plan 7 in Appendix A), where works activities included:
  - Demobilisation, including bentonite platform.
  - Excavation.
  - Pile cap concrete pours.
  - Pier construction including installation and lifting of stem and cage.
  - Installation and lifting of hammerhead and rebar.
  - Launch platform construction.
  - Lifting of beams.
  - Welding.
- Rocky Lane Embankment worksite, ref.: RLE (see Plan 7 in Appendix A), where works activities included:
  - Earthworks, including excavation and replace.
  - Platform and access ramp installation.
  - Drainage works, including pond maintenance and surface water management.
- Wendover Dean Viaduct worksite, ref.: WDV (see Plan 7 in Appendix A), where works activities included:
  - Pier construction, including hammerhead installation, concrete pours, bearing installation and grouting of bearings.
  - Abutment works, including pile cropping and excavation.

- Launch platform construction, including welding and installation of precast planks and handrails.
- Leather Lane worksite, ref.: LL (see Plan 8 in Appendix A), where works activities included:
  - Earthworks, including material movements.
  - Operation of site access road.
- South Heath Cutting worksite, ref.: SHCW (see Plan 8 in Appendix A), where works activities included:
  - Operation of site access road.
  - Earthworks, including material movements.
- North Portal worksite, ref.: NP (see Plan 8 in Appendix A), where works activities included:
  - Operation of site support plant.
  - Piling platform works including scraping, installation of hardstanding, earthworks and dismantling works.
  - Porous portal structure works including reinforced concrete frame and concrete works.
  - Tunnel bore machine dismantling.
  - Compound works.
  - Batching plant installation.
- 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.
  - 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 works.
  - Tunnel connection works.
  - Superstructure concrete 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:

- Infrastructure Maintenance Depot (IMD) where technical backfill and earthworks were underway.
- MCJ where bulk excavation were underway.
- Bat mitigation structure where concrete pours, formwork reinforced concrete works, excavation and earthworks were underway.
- FCC Access Road Retaining Wall where retaining wall base construction and installation of rock blocks were underway.
- Greatmoor Culvert where formwork reinforced concrete works, concrete pours, earthworks and technical backfill were underway.
- GUN28 overbridge where formwork reinforced concrete works, deck and diaphragm construction and technical backfilling were underway.
- QUA36 overbridge where pile cutting and formwork reinforced concrete pile cap works were underway.

- Finemere Culvert where sheet piling, earthworks and excavation were underway.
- Hills Farm where stockpiling was underway.
- Edgcott Road overbridge where formwork reinforced concrete works were underway.
- Calvert Cutting Retaining Wall where piling and pile breakdown were underway.
- Aylesbury Golf Course where cutting and culvert works, and utility diversion were underway.
- Thame Valley Viaduct Causeway where piling, 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 steel fixing and deck works were underway.
- Nash Lee Road Diversion where piling platform extension and construction were underway.

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

## 1.2 Measurement Locations

- 1.2.1 Thirty-seven (37) noise and six (6) vibration monitoring installations were active in April in the BS area. Table 2 summarises the positions of noise and vibration monitoring installations within the BS area in April 2024.
- 1.2.2 Noise monitor WAD-NMP1, within the vicinity of Waddesdon worksite, ref.: WAD, was installed on Monday 22<sup>nd</sup> April.
- 1.2.3 Noise monitor TW-NMP1, within the vicinity of Twyford worksite, ref.: TW, was retrieved for repair at 13:00 on Wednesday 17th April.
- 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
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
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury
OC	MF-NMP1	Moat Farm, Marsh Lane
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury
WAD	WAD-NMP1	Waddesdon, Buckinghamshire
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
GF	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
	WDV-Vib1	Upper Wendover Dean Farm, A413, Wendover
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath
SHCW	PR-NMP1	Potters Row, 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

Worksite Reference	Measurement Reference	Address
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
	CSP-NMP3	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
	DFS-NMP1	Denham Film Studio, Uxbridge

\* 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	51.8 (57.6)	53.6 (61.2)	48.7 (54.5)	45.3 (50.6)	44.8 (51.9)	48.1 (51.4)	50.1 (53.7)	52.3 (57.4)	48.0 (54.6)	46.1 (52.4)	48.6 (54.1)	45.4 (51.5)
SE	SE-NMP1	School End, Chetwode	Free-field	52.7 (59.7)	59.7 (62.3)	45.8 (55.7)	42.7 (52.0)	41.5 (57.9)	55.8 (61.9)	60.1 (64.2)	58.6 (64.0)	53.0 (62.9)	45.5 (55.9)	47.2 (58.3)	41.3 (51.2)
HC	HC-NMP1	Hermitage, Chetwode	Free-field	53.1 (61.7)	60.6 (64.2)	49.2 (54.8)	47.7 (57.3)	48.1 (67.0)	51.7 (55.5)	56.2 (61.6)	55.3 (59.5)	52.1 (59.8)	48.9 (58.9)	49.8 (59.5)	47.5 (55.9)
TW	TW-NMP1	Twyford	Free-field	44.7 (47.0)	50.2 (57.9)	44.1 (53.3)	40.3 (49.3)	43.5 (51.4)	45.4 (45.4)	49.1 (49.1)	53.7 (53.7)	49.1 (52.5)	52.6 (60.1)	51.4 (55.0)	39.9 (46.7)
WSO	WSO-NMP1	West Street, Twyford	Free-field	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*	_* _*
CAL	SHC-NMP1	School Hill Compound, Calvert	Free-field	54.9 (70.9)	61.2 (69.1)	50.4 (66.6)	48.2 (68.5)	47.6 (65.7)	59.6 (62.5)	68.4 (74.1)	64.3 (69.4)	61.0 (69.0)	52.6 (69.4)	65.7 (73.1)	56.0 (65.3)
	FCC-NMP1	Calvert South	Free-field	49.3 (52.7)	49.3 (56.2)	44.4 (50.6)	40.1 (48.5)	44.1 (53.8)	50.6 (53.4)	52.1 (52.9)	51.5 (55.4)	48.6 (55.9)	44.5 (53.0)	50.6 (55.7)	44.3 (51.8)
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Free-field	61.5 (70.9)	65.6 (73.1)	45.2 (52.6)	43.8 (52.9)	44.8 (61.2)	67.9 (70.5)	71.6 (72.7)	70.8 (74.6)	65.2 (73.9)	47.1 (56.3)	68.3 (74.6)	45.1 (57.7)

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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	53.8 (62.4)	56.0 (67.7)	51.8 (69.3)	49.8 (68.7)	47.1 (64.5)	58.2 (63.6)	57.6 (64.8)	55.5 (66.4)	54.5 (67.1)	48.9 (62.2)	59.7 (72.5)	56.2 (67.3)
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	Free-field	55.4 (58.9)	56.3 (67.9)	55.1 (57.8)	53.1 (57.8)	50.5 (58.0)	53.7 (55.5)	55.4 (56.9)	56.7 (58.0)	54.8 (57.4)	51.2 (60.9)	54.9 (59.1)	49.7 (55.8)
OC	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	Free-field	45.8 (53.0)	50.1 (58.8)	45.8 (52.7)	43.4 (52.6)	43.5 (59.4)	46.4 (51.8)	48.2 (51.2)	47.9 (55.1)	46.5 (54.9)	44.0 (56.2)	47.0 (57.0)	43.2 (50.1)
	MF-NMP1	Moat Farm, Marsh Lane	Free-field	47.9 (53.8)	52.7 (60.9)	46.6 (57.6)	43.6 (52.0)	40.8 (47.3)	43.9 (45.8)	46.8 (47.3)	44.7 (45.7)	45.4 (50.0)	40.9 (49.5)	45.6 (52.8)	41.6 (48.1)
WAD	WAD-NMP1	Waddesdon, Buckinghamshire	Free-field	51.4 (56.3)	52.5 (56.5)	48.9 (55.4)	47.9 (53.2)	46.1 (54.4)	51.1 (51.1)	52.5 (52.5)	52.0 (52.0)	49.2 (52.7)	50.6 (52.9)	50.5 (51.9)	49.0 (55.1)
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Free-field	55.4 (59.8)	59.1 (64.4)	53.6 (56.7)	50.8 (54.8)	49.4 (57.6)	51.2 (54.5)	52.8 (56.1)	53.4 (56.5)	52.1 (56.5)	48.7 (54.3)	52.8 (57.7)	49.1 (56.2)
	NLL-NMP2	Nash Lee Lane, Nash Lee	Free-field	53.9 (57.4)	58.4 (60.8)	52.2 (55.5)	49.6 (54.3)	47.6 (57.0)	52.3 (57.4)	52.3 (55.5)	52.4 (55.9)	51.0 (55.5)	47.9 (55.4)	52.0 (59.6)	47.1 (54.5)
WGT	ER-NMP1	Ellesborough Rd, Wendover	Free-field	55.7 (59.2)	56.3 (68.6)	55.3 (63.3)	51.8 (58.0)	49.8 (59.2)	52.4 (54.6)	53.4 (55.9)	54.6 (57.0)	53.8 (59.0)	49.9 (56.5)	54.2 (60.2)	48.5 (55.6)
	BL-NMP1	Bacombe Lane, Wendover	Free-field	50.1 (52.6)	57.5 (63.2)	50.0 (52.9)	48.2 (51.1)	47.7 (52.6)	49.9 (51.1)	51.1 (51.4)	49.5 (50.3)	49.1 (51.4)	48.4 (52.4)	50.3 (56.9)	47.9 (50.6)

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
	WT-NMP1	A413, Wendover	Free-field	66.9 (68.9)	66.4 (67.7)	66.7 (69.3)	63.2 (69.7)	60.3 (69.7)	63.7 (65.9)	64.9 (66.5)	65.2 (66.3)	64.1 (69.7)	58.1 (62.9)	63.6 (66.6)	59.4 (67.5)
GF	GF-NMP1	Grove Farm, Wendover	Free-field	52.7 (55.6)	53.7 (59.0)	50.8 (56.8)	48.1 (56.4)	47.3 (56.3)	51.4 (54.6)	51.1 (53.2)	48.8 (50.8)	49.6 (54.6)	48.2 (53.0)	50.4 (58.2)	45.1 (50.8)
SDVC	SDVC-NMP1	Rocky Lane, Wendover	Free-field	63.5 (66.5)	63.5 (64.9)	63.5 (70.6)	60.1 (67.8)	57.8 (68.1)	61.0 (63.3)	62.6 (63.4)	62.4 (63.1)	61.7 (63.6)	54.2 (59.4)	61.2 (67.4)	55.6 (64.3)
RLE	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	55.3 (61.2)	57.3 (61.4)	49.4 (54.3)	46.5 (53.1)	45.2 (56.5)	46.0 (50.9)	49.5 (51.9)	48.4 (55.0)	48.3 (55.6)	47.5 (57.3)	49.4 (56.4)	44.4 (52.1)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	58.1 (60.8)	58.3 (60.7)	56.7 (59.3)	54.0 (58.0)	51.5 (64.7)	54.5 (56.4)	56.6 (59.8)	57.3 (60.1)	55.3 (60.0)	50.8 (56.7)	55.7 (59.9)	51.4 (58.3)
WDV	WDV-NMP1	Upper Wendover Dean Farm, A413, Wendover	Free-field	53.0 (56.4)	54.9 (57.9)	51.2 (56.4)	47.9 (55.0)	48.0 (57.2)	50.7 (53.3)	50.4 (51.9)	49.4 (53.3)	49.9 (55.4)	48.4 (56.6)	50.3 (56.6)	45.3 (58.1)
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	50.9 (60.1)	58.8 (70.5)	52.7 (69.7)	50.1 (66.6)	46.9 (65.6)	51.4 (56.3)	55.9 (61.6)	53.0 (64.2)	56.0 (65.0)	45.3 (70.6)	47.8 (69.4)	39.7 (52.1)
SHCW	PR-NMP1	Potters Row, South Heath	Free-field	50.0 (57.4)	51.4 (58.4)	50.4 (60.7)	48.2 (58.4)	47.0 (57.6)	46.7 (51.3)	49.4 (53.8)	49.4 (56.7)	50.4 (56.1)	47.9 (57.3)	50.5 (58.2)	46.5 (56.2)

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
NP	BFH-NMP1	Bury Farm, Great Missenden	Free-field	49.5 (53.5)	50.5 (55.6)	48.4 (50.5)	46.1 (53.2)	44.6 (53.8)	47.7 (48.8)	48.9 (51.0)	48.1 (49.6)	48.0 (51.6)	46.7 (52.4)	48.2 (53.0)	44.7 (51.6)
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Free-field	52.6 (56.0)	54.0 (60.4)	52.2 (61.2)	50.9 (59.9)	47.7 (65.0)	49.9 (53.6)	53.0 (53.6)	53.4 (56.2)	50.9 (55.3)	49.3 (56.1)	52.6 (63.6)	48.9 (57.5)
	BLH-NMP1	Bayleys Hatch, South Heath, Great Missenden	Free-field	50.1 (51.9)	51.0 (59.4)	49.3 (58.0)	45.3 (52.0)	43.3 (52.7)	48.5 (49.8)	53.5 (56.4)	58.5 (61.5)	51.7 (67.6)	47.2 (53.5)	48.2 (54.0)	43.8 (51.1)
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Free-field	56.8 (58.9)	58.0 (60.7)	55.7 (57.4)	52.4 (56.4)	48.8 (56.9)	53.6 (54.9)	56.6 (57.1)	55.9 (56.6)	55.4 (58.1)	49.8 (56.3)	54.7 (58.6)	48.6 (55.3)
AM	AM-NMP1	Whielden Lane, Amersham	Free-field	61.8 (63.5)	61.8 (64.6)	60.5 (62.0)	57.5 (60.5)	53.8 (60.4)	58.8 (60.1)	61.5 (63.0)	61.3 (61.6)	58.9 (61.0)	51.2 (55.8)	58.7 (63.7)	52.4 (60.9)
LM	LM-NMP1	Little Missenden, A413, Amersham	Free-field	54.2 (59.0)	54.4 (57.7)	53.7 (58.0)	50.4 (55.6)	47.4 (58.0)	49.7 (52.2)	52.8 (55.8)	50.7 (51.7)	51.6 (56.4)	46.7 (51.2)	51.2 (54.9)	46.4 (54.7)
	PWC-NMP1	Patricia Holmes, LM Worksite, Amersham	Free-field	61.3 (63.2)	60.8 (62.7)	60.1 (61.6)	56.6 (60.5)	56.2 (81.2)	58.1 (59.6)	59.6 (60.9)	59.3 (59.6)	58.4 (62.5)	53.9 (58.0)	57.3 (60.7)	53.2 (61.1)

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
CSG	CSG-NMP1	CSG Worksite, Bottom House Farm Lane	Free-field	48.8 (53.9)	50.6 (54.6)	46.5 (52.6)	45.0 (56.1)	43.6 (55.4)	46.8 (50.9)	50.7 (52.4)	47.5 (47.7)	45.8 (52.3)	44.7 (51.0)	47.4 (62.1)	43.0 (54.2)
CSP	CFC-NMP1	Cricket Field Cottages, Chesham Lane, Chalfont St. Peter	Free-field	59.9 (63.8)	58.7 (61.0)	57.5 (59.9)	53.5 (58.8)	50.2 (62.9)	56.5 (57.9)	58.4 (58.8)	58.2 (59.9)	55.3 (58.0)	49.3 (56.2)	55.3 (62.9)	50.3 (61.8)
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	47.6 (51.0)	49.8 (53.6)	48.0 (51.2)	45.7 (51.8)	42.2 (49.1)	45.4 (48.0)	48.6 (50.5)	48.8 (51.5)	47.1 (51.6)	42.6 (46.9)	47.8 (53.8)	43.4 (49.7)
	CSP-NMP3	Chalfont St Peter Vent Shaft Worksite	Free-field	58.3 (61.2)	57.7 (59.9)	57.4 (60.0)	54.3 (58.0)	51.9 (65.4)	54.0 (54.2)	56.6 (57.3)	56.0 (56.8)	55.5 (57.8)	51.3 (63.3)	55.6 (58.5)	51.9 (62.6)
CVV	CVV-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	62.9 (66.0)	61.7 (67.1)	61.1 (63.5)	57.3 (61.0)	56.3 (63.9)	59.1 (60.0)	60.7 (60.8)	60.7 (61.1)	59.4 (61.1)	54.4 (57.7)	58.9 (62.7)	55.8 (62.7)
	DFS-NMP1	Denham Film Studio, Uxbridge	Free-field	55.4 (60.6)	53.8 (57.8)	52.2 (60.5)	53.0 (58.5)	50.7 (64.1)	56.0 (57.4)	54.1 (54.9)	50.3 (55.0)	52.1 (56.7)	49.9 (57.7)	53.0 (57.8)	51.1 (59.3)

\* Monitor WSO-NMP1 was offline for the month of April due to water ingress to the monitoring station.



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	4.37 (Y-axis)
WDL	WDL-Vib1	Station Road, Quainton	1.19 (X-axis)
CAL	BRA-Vib1	13 Brackley Lane, Calvert Village	1.14 (Y-axis)
WGT	ER-Vib 1	46, Ellesborough Rd, Wendover	2.05 (Y-axis)
WDV	WDV-Vib1	Upper Wendover Dean Farm, A413, Wendover	4.68 (Z-axis)
GF	GF-Vib1	Grove Farm, Wendover	1.92 (X-axis)

2.1.3 Appendix C presents graphs of the noise and vibration monitoring data over the month for each of the measurement locations. Noise data presented consists of the hourly  $L_{Aeq}$  values and, where relevant, the  $L_{Aeq,T}$  values (where the time period T has been taken to be the averaging period as specified in Table 1 of HS2 Information Paper E23). Vibration data presented consist of hourly PPV values. The full data set for the monitoring equipment can be found at the following location:

<https://data.gov.uk/dataset/24542ae7-dd44-444f-b259-871c4cc43b5e/environmental-monitoring-data>.

## 2.2 Exceedances of the LOAEL and SOAEL

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

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

difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.

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

2.2.4 Where reported construction noise levels exceed the LOAEL and SOAEL 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 LOAEL and SOAEL over the reporting period, including the number of exceedances during each time period.

Table 5: Summary of Exceedances of LOAEL and SOAEL

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
A422 TN	TN-NMP1	Turweston, Brackley	All days	All periods	No exceedance	No exceedance
SE	SE-NMP1	School End, Chetwode	Saturday	0800-1300	1	No exceedance
HC	HC-NMP1	Hermitage, Chetwode	Weekday	0800-1800	7	No exceedance
TW	TW-NMP1	Twyford	All days	All periods	No exceedance	No exceedance
WSO	WSO-NMP1	West Street, Twyford	All days	All periods	Not Applicable**	Not Applicable**
CAL	SHC-NMP1	School Hill Compound, Calvert	All days	All periods	Not Applicable	Not Applicable
	FCC-NMP1	Calvert South	All days	All periods	No exceedance	No exceedance
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Weekday	0700-0800	10	8
				0800-1800	15	2
			Saturday	0700-0800	4	3
				0800-1300	4	1
			1300-1400	4	4	
			Sunday	0700-2200	29	27
QAR	QAR-NMP2	Station Rd, Quainton	Weekday	0800-1800	3	No exceedance
			Saturday	0800-1300	1	No exceedance
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	Weekday	0800-1800	1	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
OC	MF-NMP1*	Moat Farm, Marsh Lane	All days	All periods	No exceedance	No exceedance
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	All days	All periods	No exceedance	No exceedance
WAD	WAD-NMP1	Waddesdon, Buckinghamshire	All days	All periods	No exceedance	No exceedance
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Weekdays	0800-1800	1	No exceedance
	NLL-NMP2	Nash Lee Lane, Nash Lee	All days	All periods	No exceedance	No exceedance
WGT	ER-NMP1	Ellesborough Rd, Wendover	Weekdays	0800-1800	1	No exceedance
	BL-NMP1	Bacombe Lane, Wendover	Weekdays	0800-1800	1	No exceedance
	WT-NMP1	A413, Wendover	Weekday Saturday	0800-1800 0800-1300	20 3	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
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	5	No exceedance
SHCW	PR-NMP1	Potters Row, South Heath	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
NP	BFH-NMP1	Bury Farm, Great Missenden	Weekday	1900-2200	1	No exceedance
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Weekday	1800-1900	1	No exceedance
			Saturday	1900-2200 1400-2200	4 2	No exceedance No exceedance
BLH-NMP1	Bayleys Hatch, South Heath, Great Missinden	Saturday	1300-1400	2	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	No exceedance	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
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
	CSP-NMP3*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
CVV	CVV-NMP1*	Northern boundary, Load Test Pile 1 Worksite	Night	2200-0700	4	No exceedance
	DFS-NMP1*	Denham Film Studio, Uxbridge	All days	All periods	No exceedance	No exceedance

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

\*\* Monitor WSO-NMP1 was offline for the month of April due to water ingress to monitoring station.

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2.2.6 Exceedances of the LOAEL were recorded at fourteen (14) monitoring locations during the month of April 2024. LOAEL exceedances were recorded during weekday and Saturday 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
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	16

2.2.8 Sixteen (16) SOAEL exceedances were recorded due to HS2 construction works during April 2024. The exceedance occurred at WDL-NMP1 during weekday, Saturday and Sunday daytime 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
-	CAL	20/04/2024 13:00 – 17:00	Machine engine noises, vehicles reversing, people conversing, birds, road sweeper, vehicle movements	74.2 dB $L_{Aeq,T}$	Environmental health officer was notified of the trigger exceedance. Incident has since been resolved

Complaint Reference Number (if applicable)	Worksite Reference	Date and Time Period	Identified Source	Results of Investigation (including noise monitoring results)	Actions Taken
			and suspended loads dropping.		
-	WDL	22/04/2024 08:00 – 17:00	Vehicle movements, machine noise, vehicle reversing, birds and wind.	71.8 dB L <sub>Aeq,T</sub>	Environmental health officer was notified of the trigger exceedance. Incident has since been resolved
-	CAL	23/03/2024 08:00 – 17:00	Vehicle reversing alarm, vehicle movements, birds and wind.	67.8 dB L <sub>Aeq,T</sub>	Environmental health officer was notified of the trigger exceedance. Incident has since been resolved

## 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.

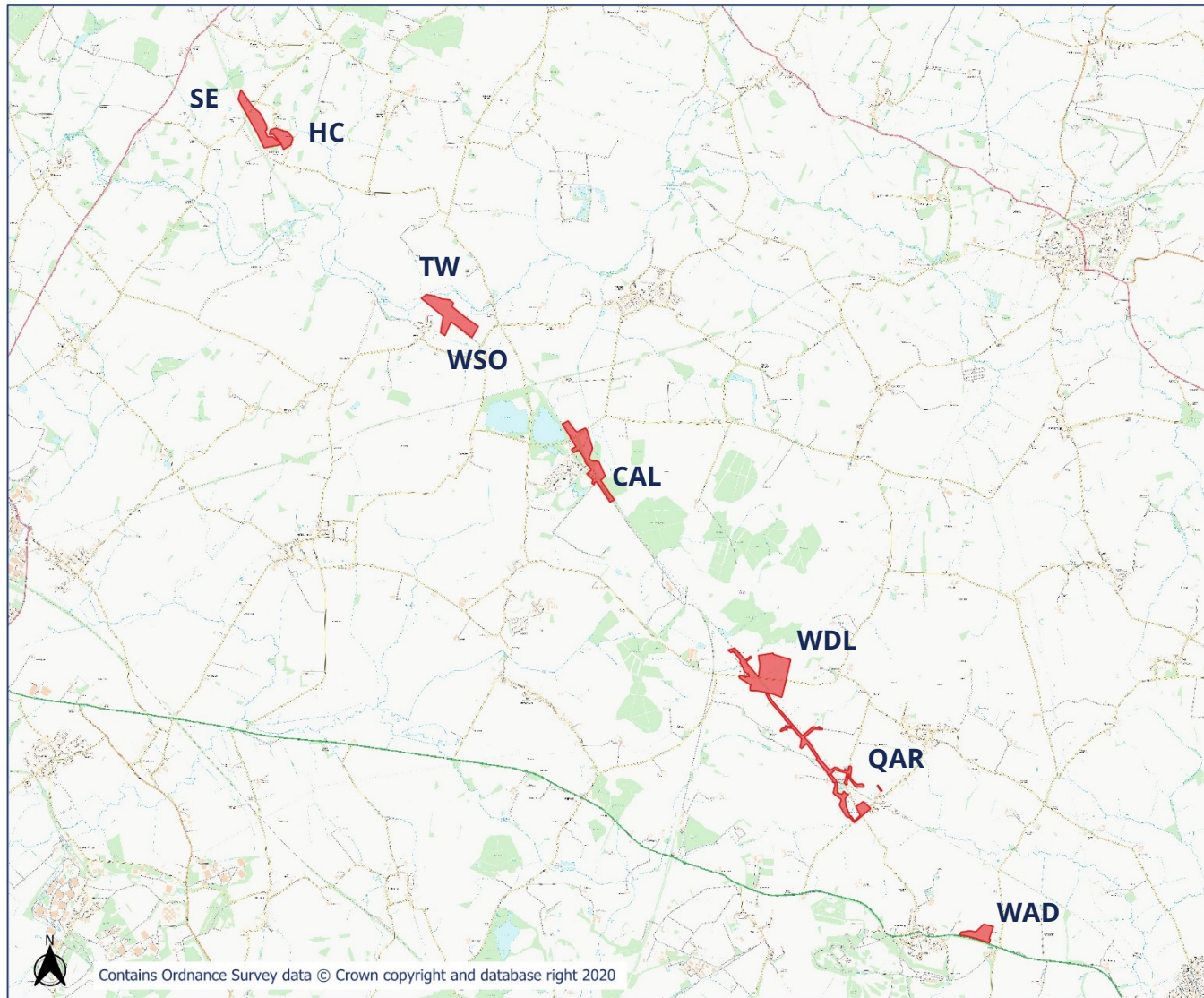
Table 8: Summary of Complaints

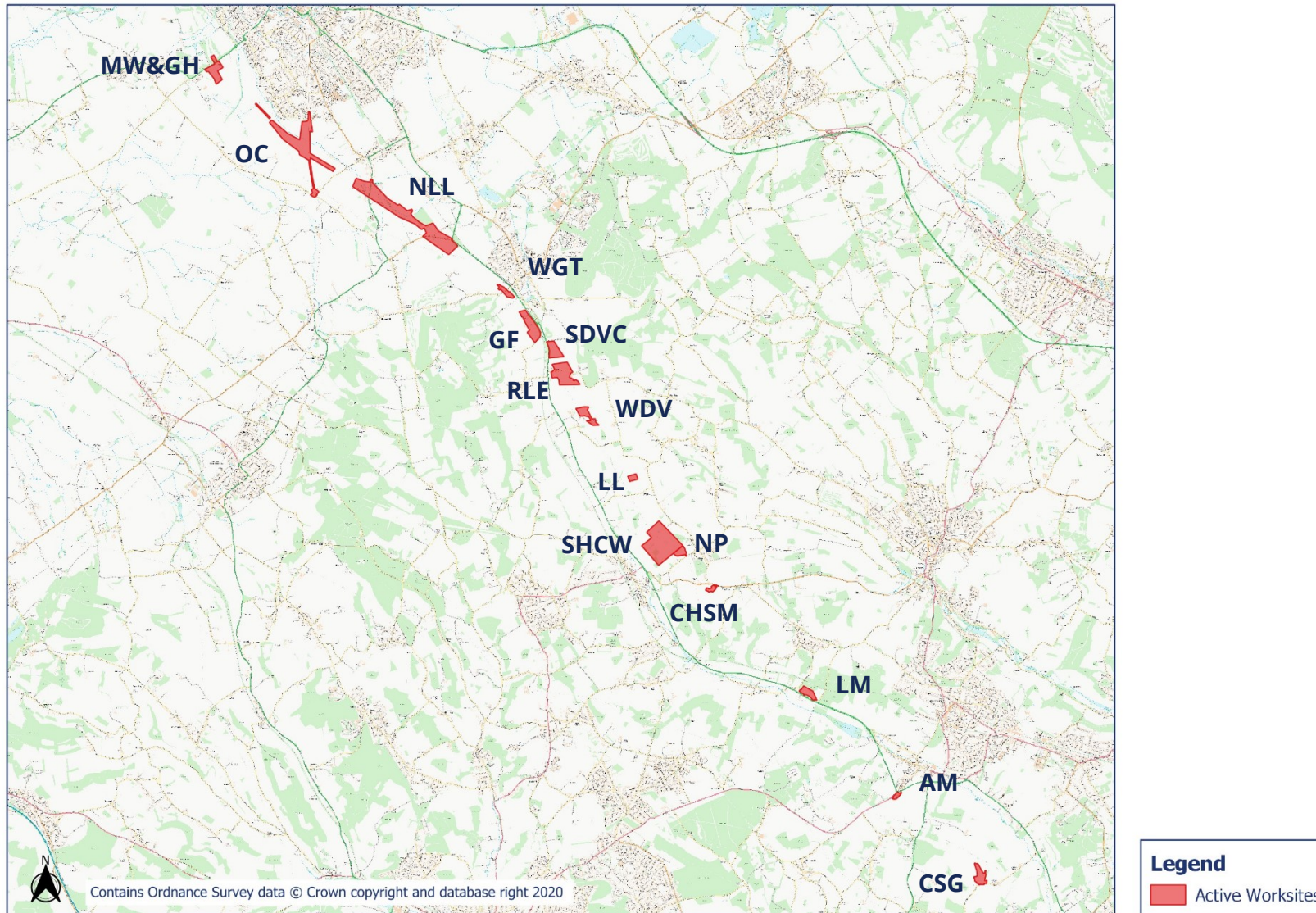
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-24-107830-E-C	RLE	Disturbance due to generator noise.	Disturbance was caused by generator powering festoon lights on site.	Contractor has arranged for an electrician to rewire the lights into the compound, making the generator redundant. Resident has been provided with the results of the investigation.
HS2-24-107805-E-C	RLE	Complaint due to loud hammering noises heard from site.	Noise disturbance was within consented working hours. Monitoring data demonstrates compliance with Section 61 requirements.	Stakeholder was provided with the results of the investigation.

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-24-108153-E-C	NLL	Disturbance due to noise from site.	A generator was found to be on a setting which allowed it to switch on intermittently during the night to recharge the battery. The setting has since been adjusted.	Resident has been provided with the results of the investigation.

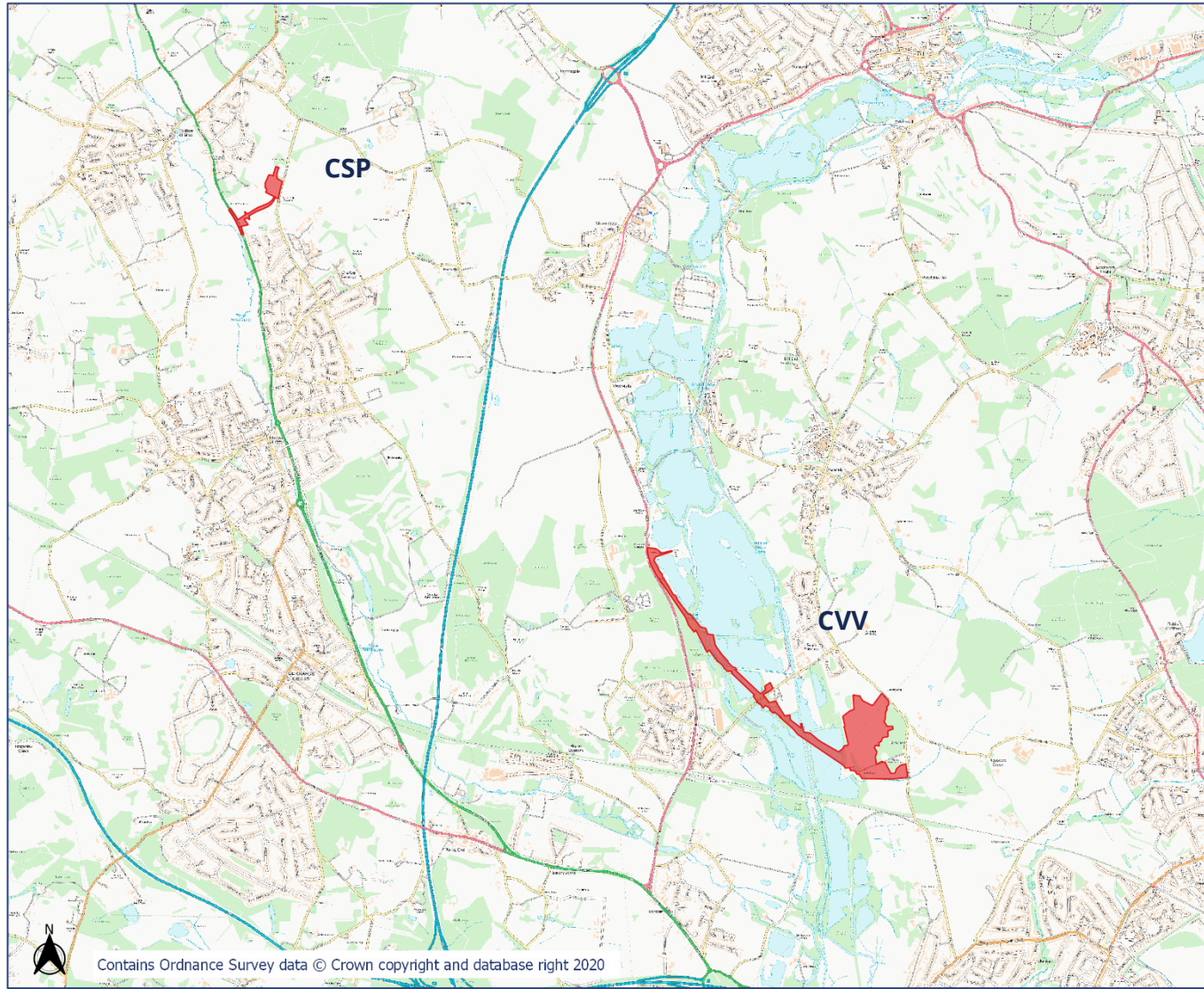
# Appendix A Site Locations



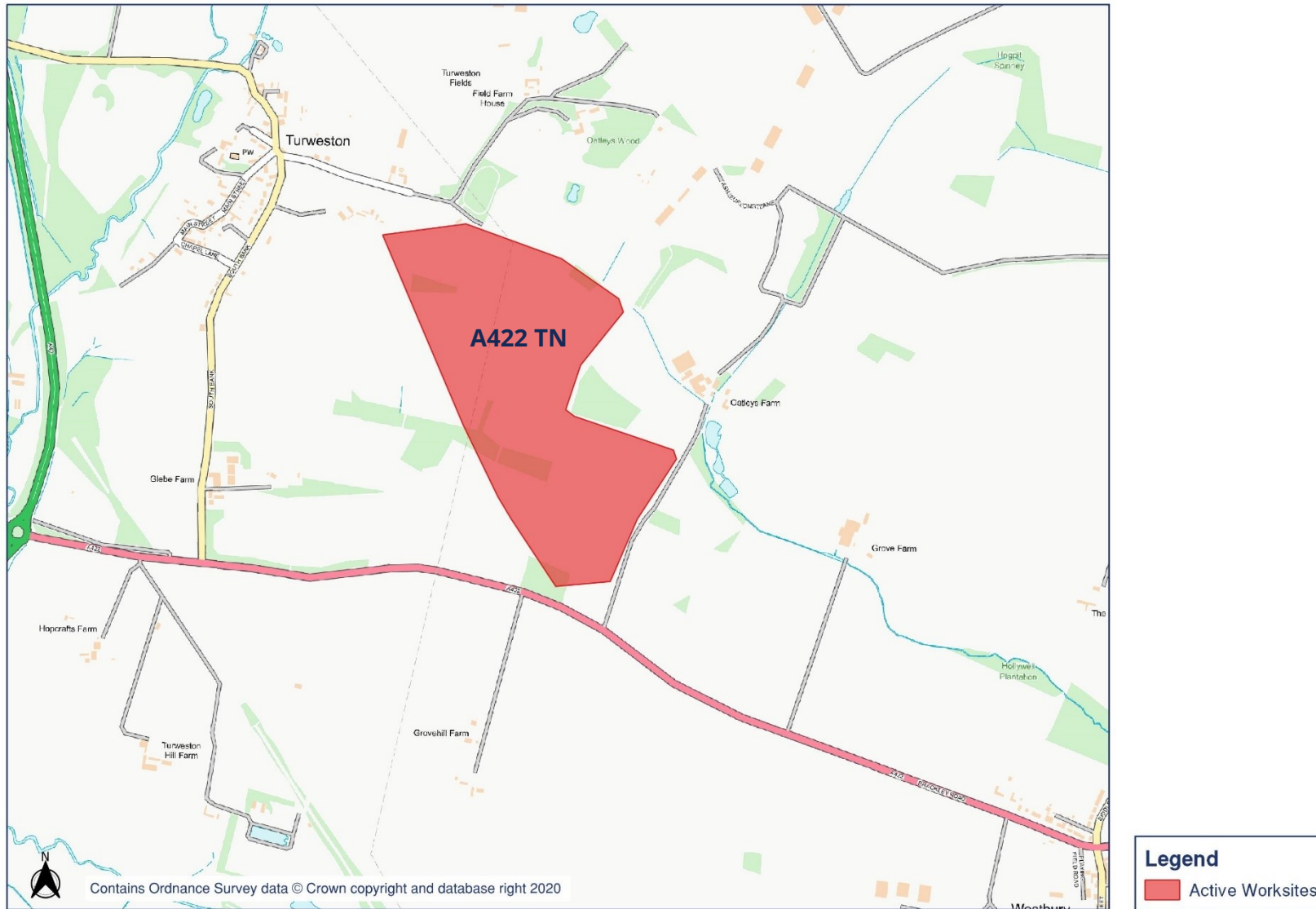


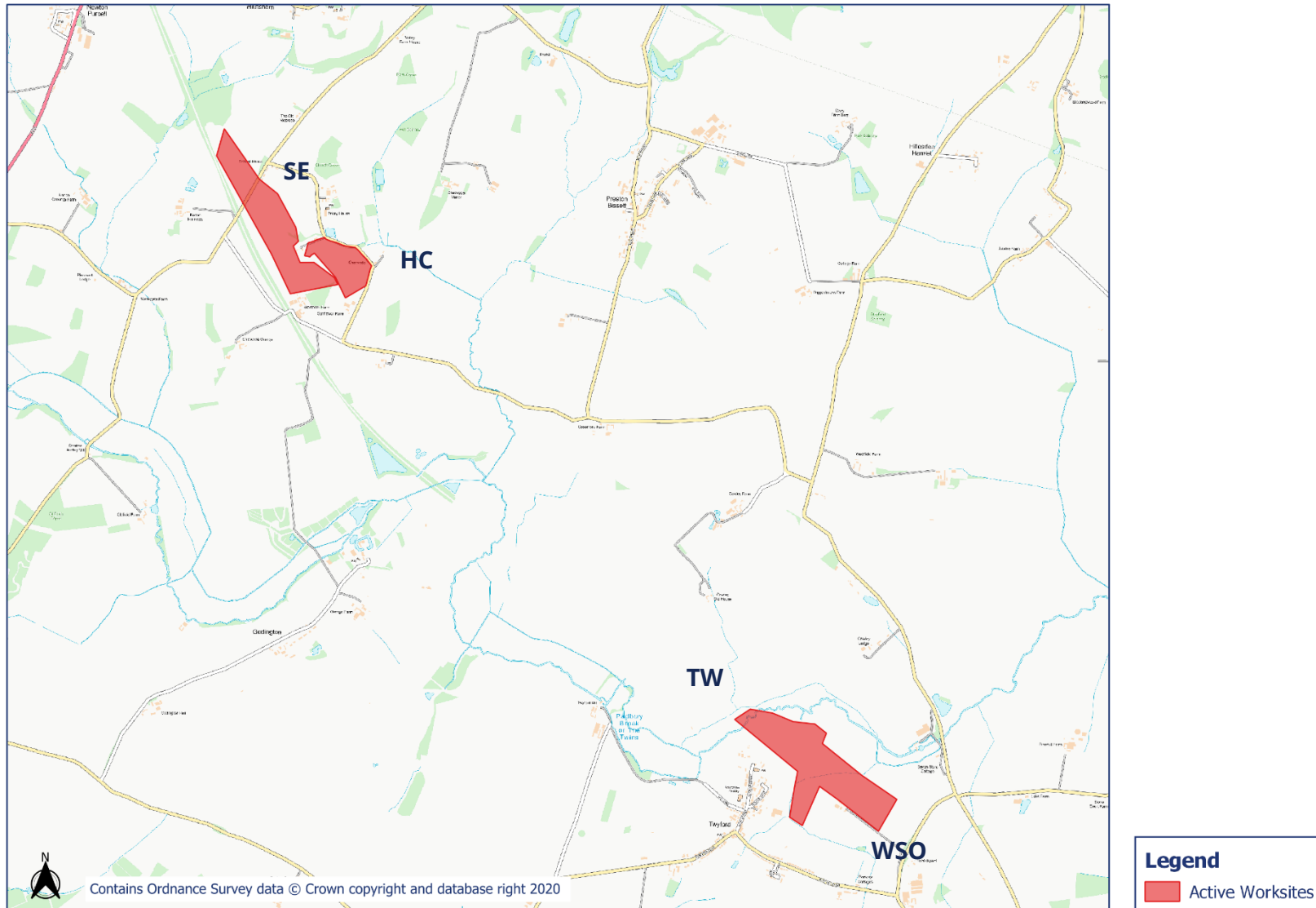


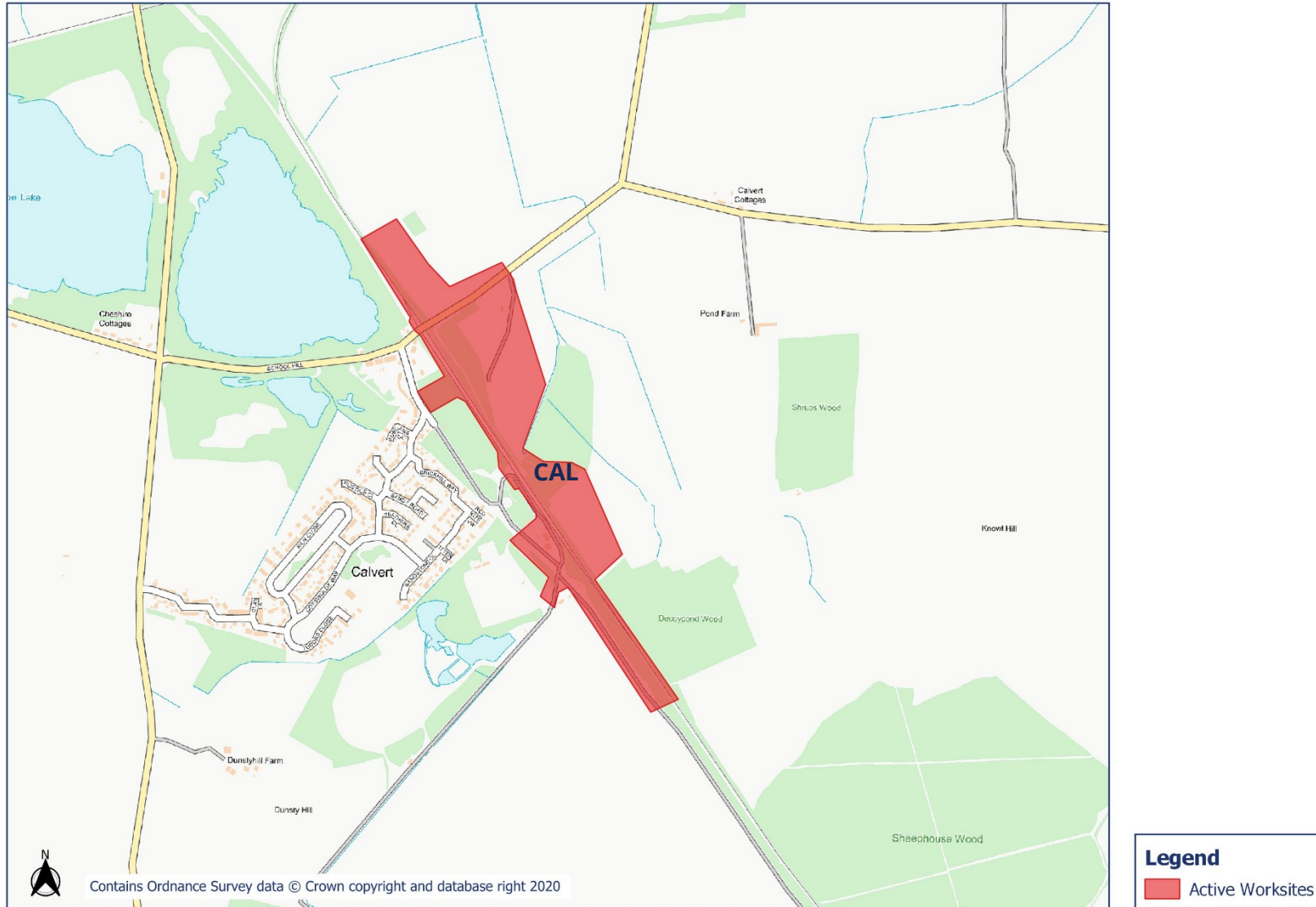
# HS2 Worksite Identification Plan - Overview 3

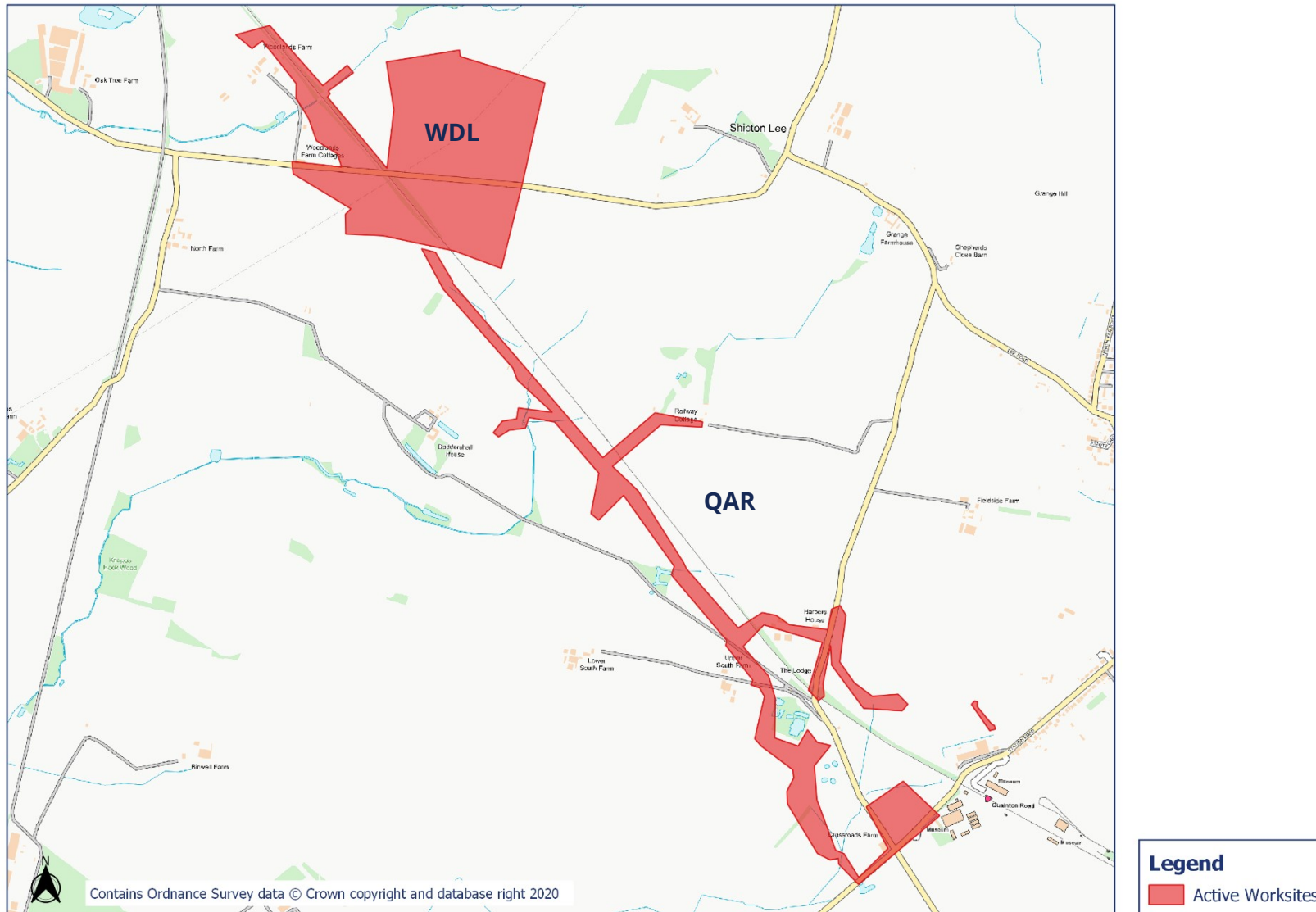


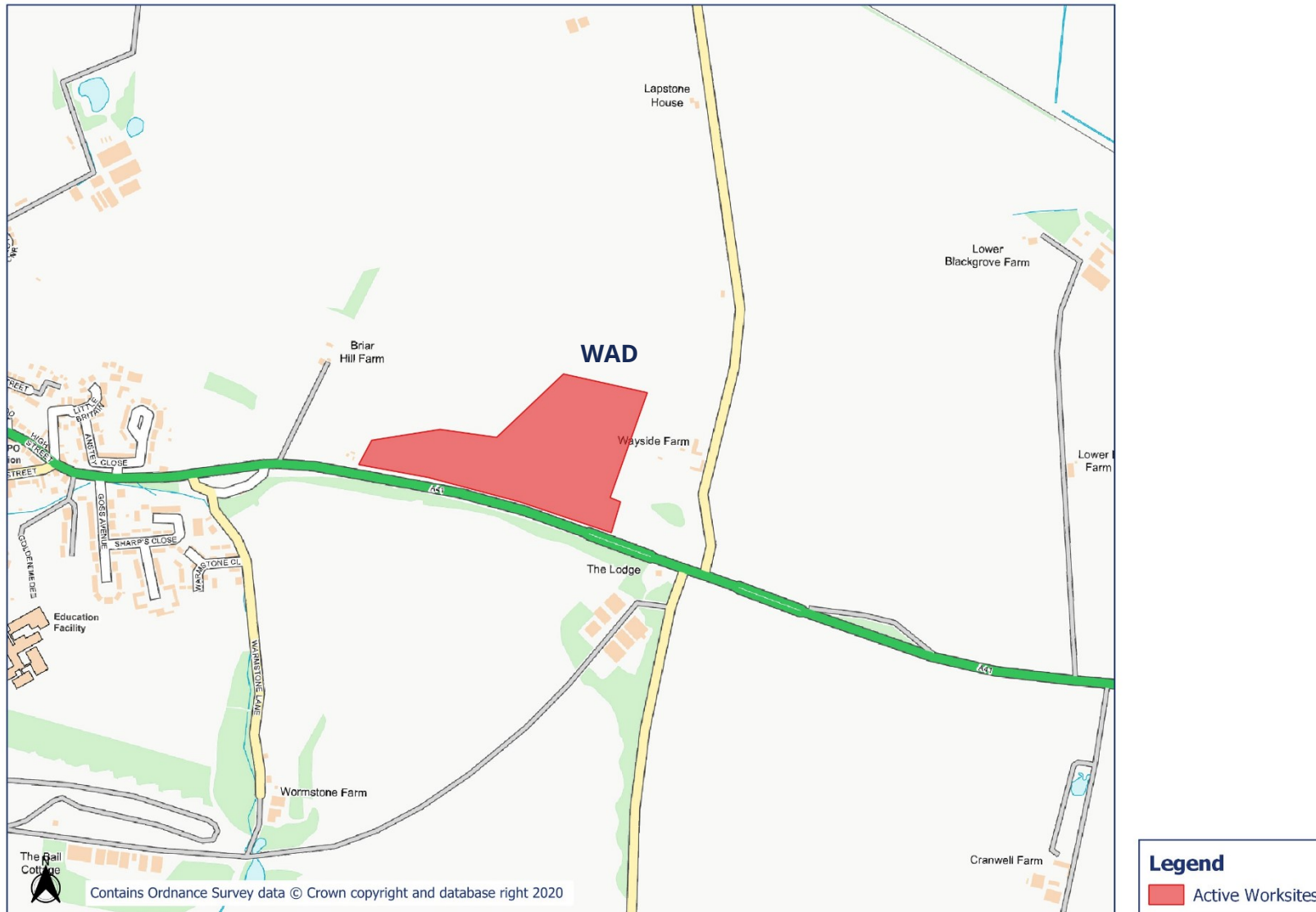
OFFICIAL



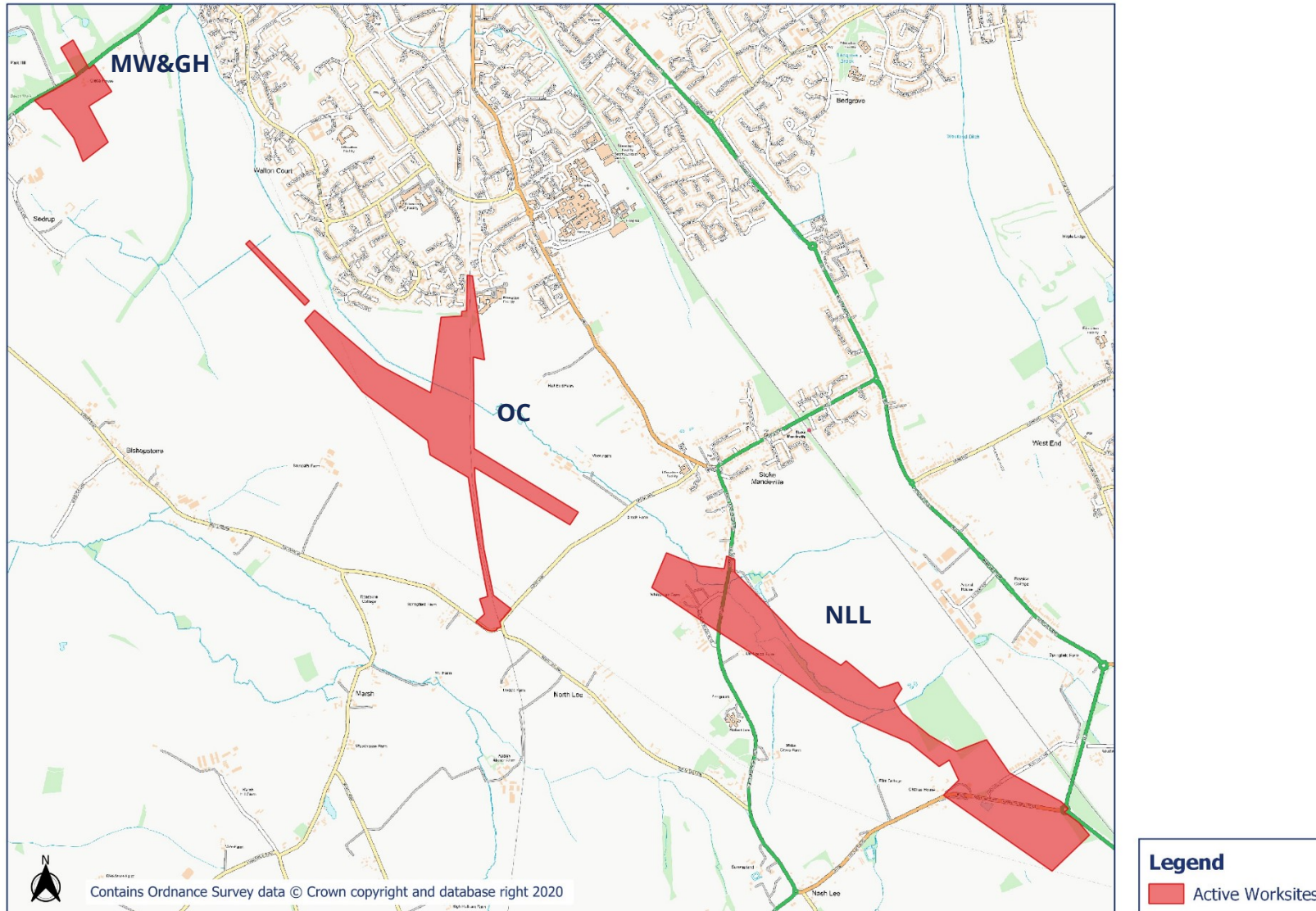


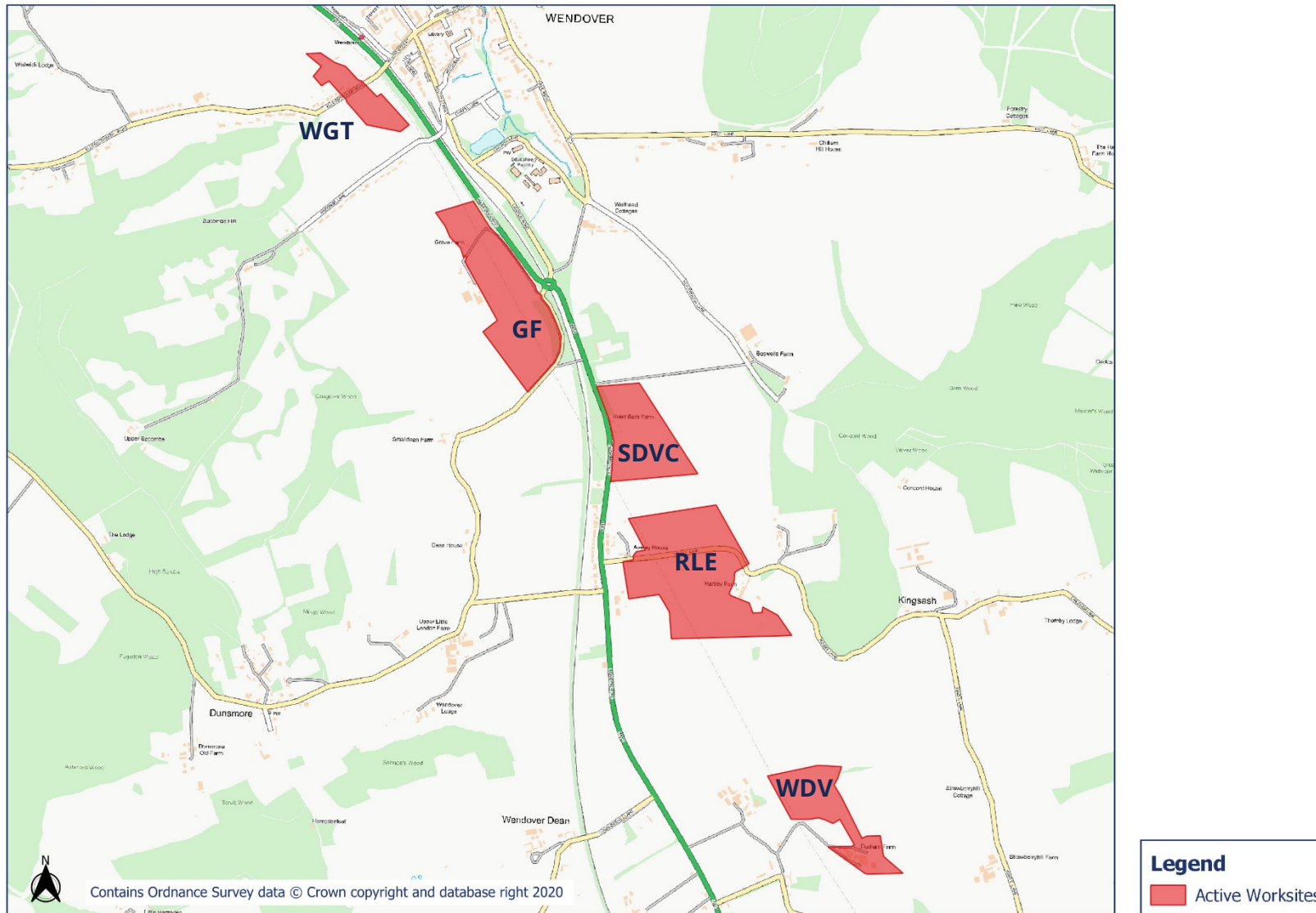


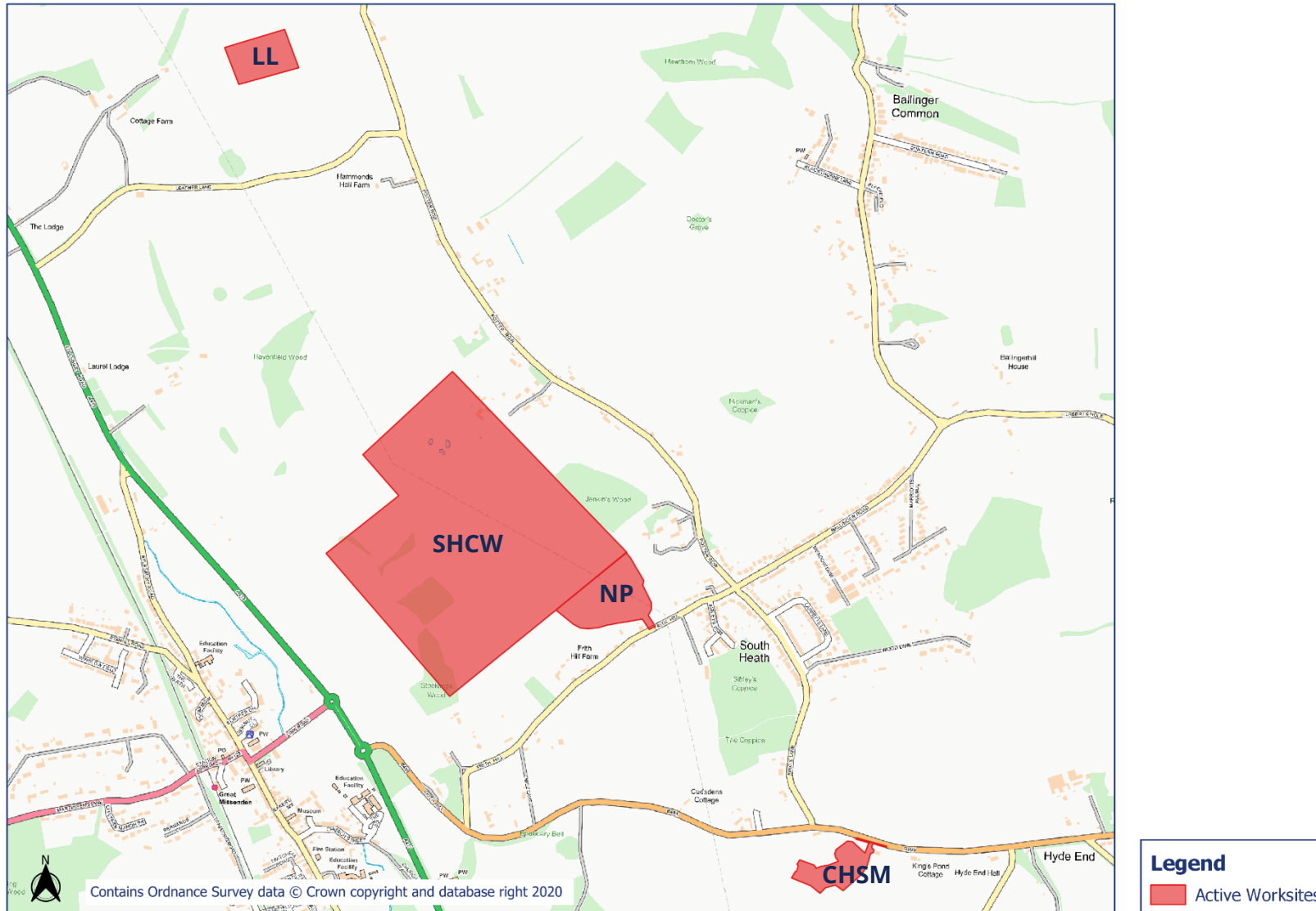






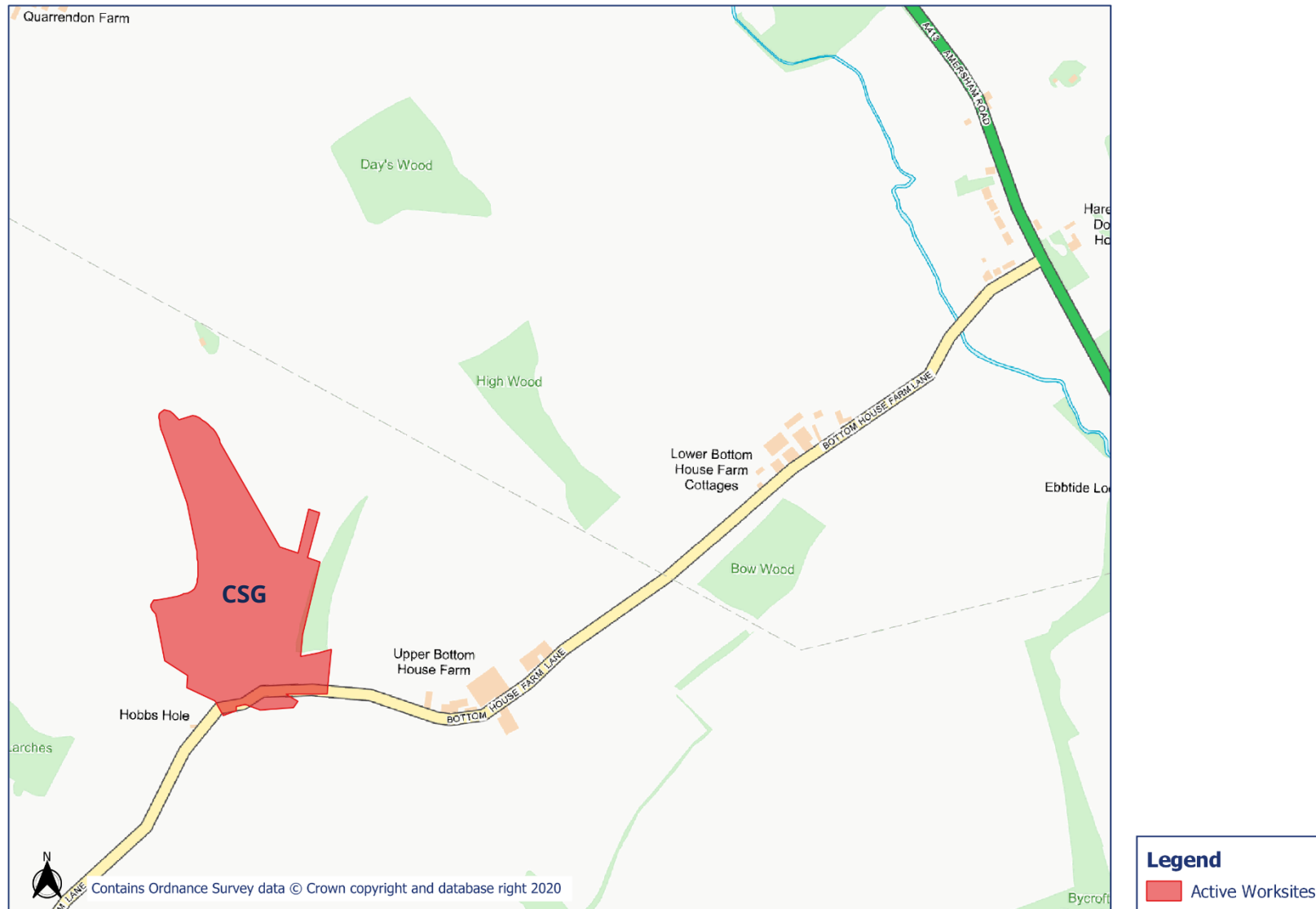


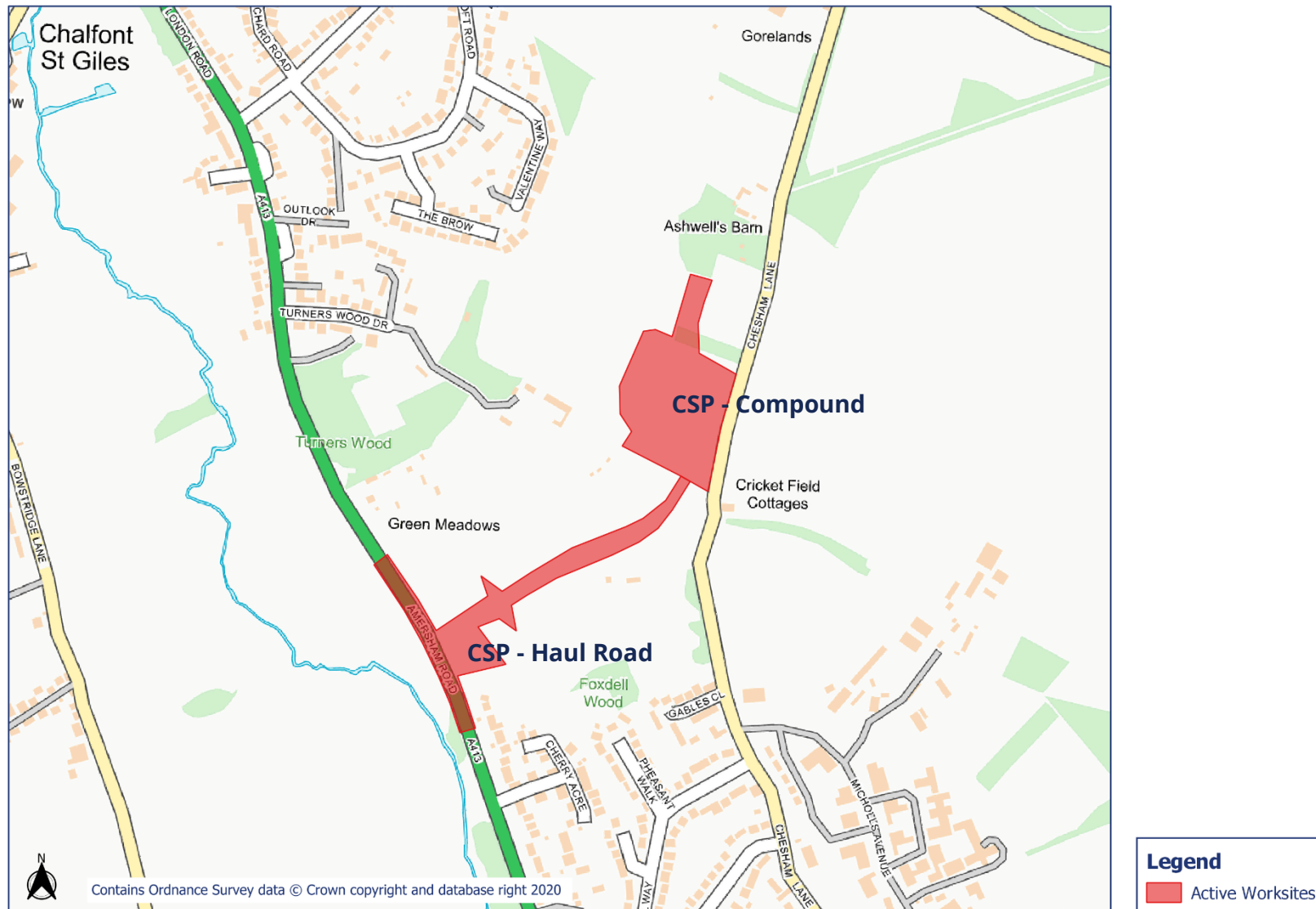


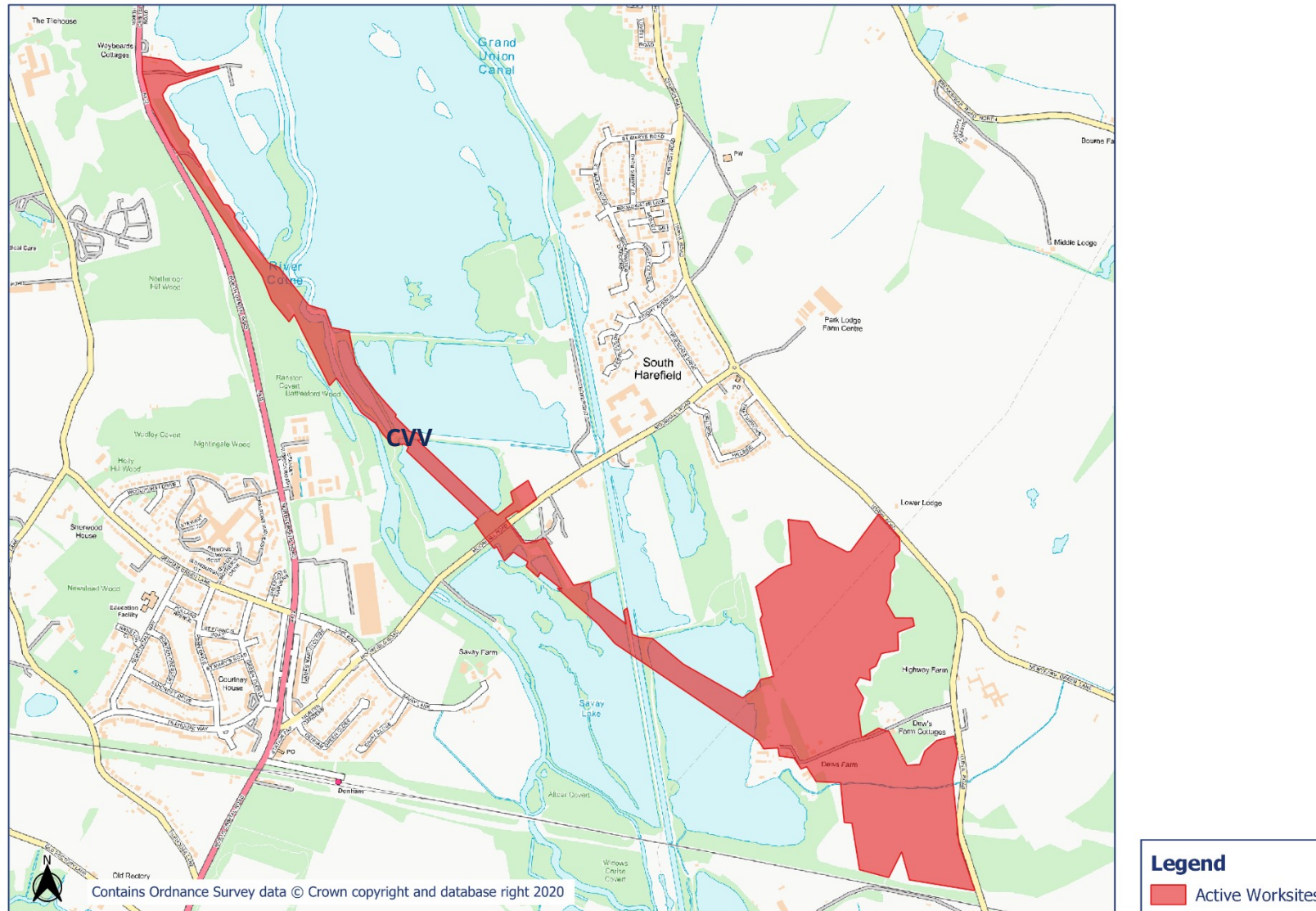






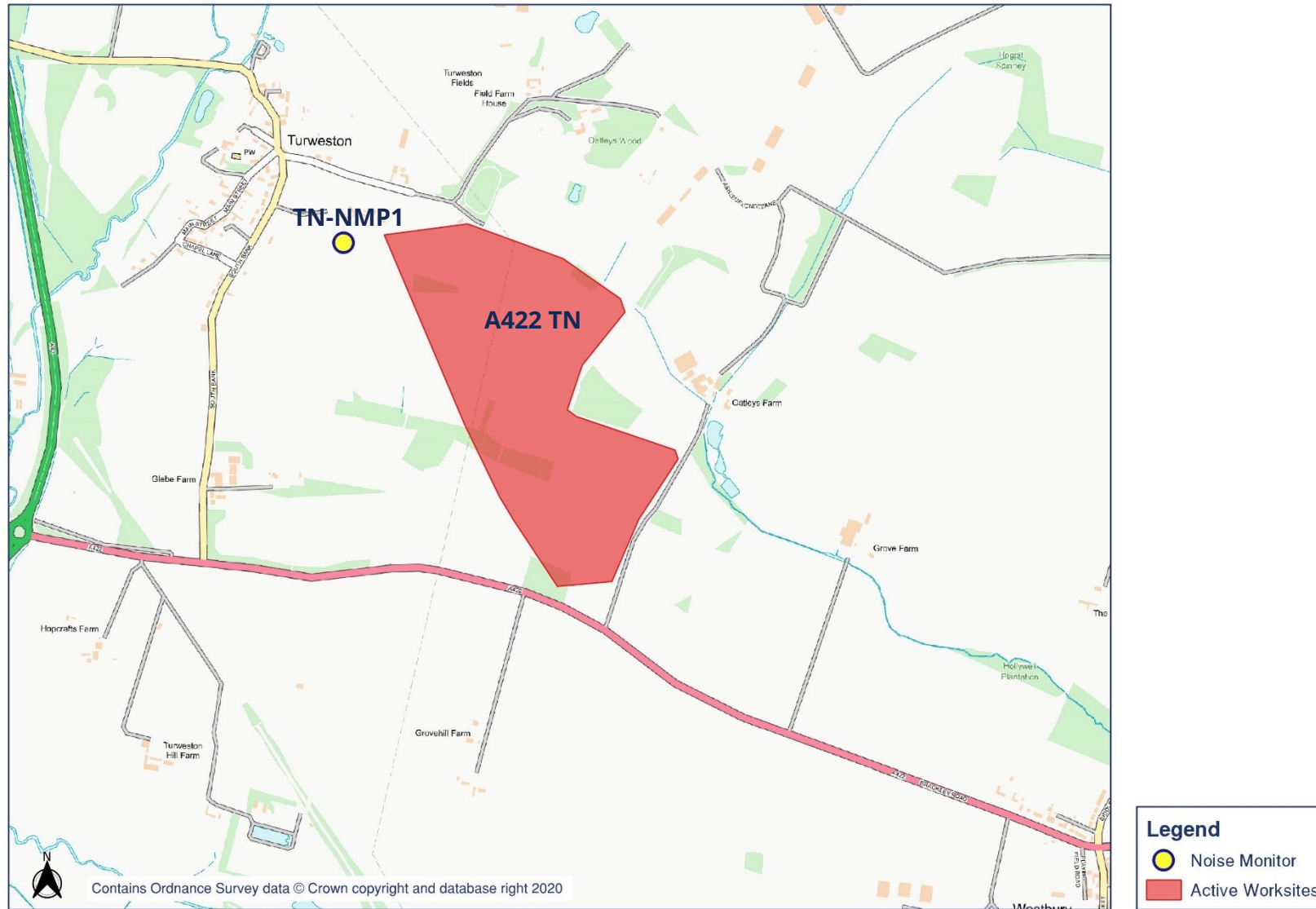


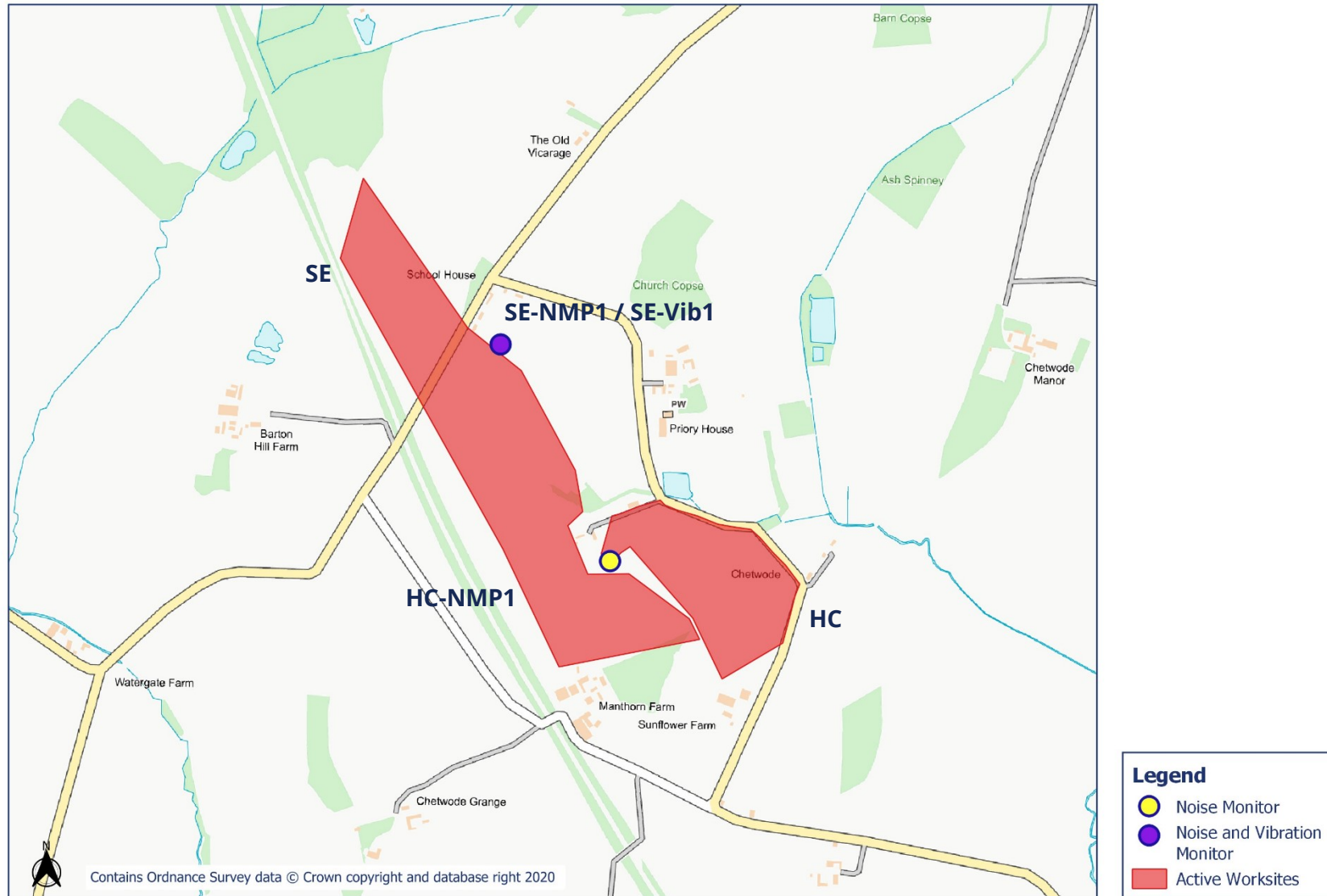


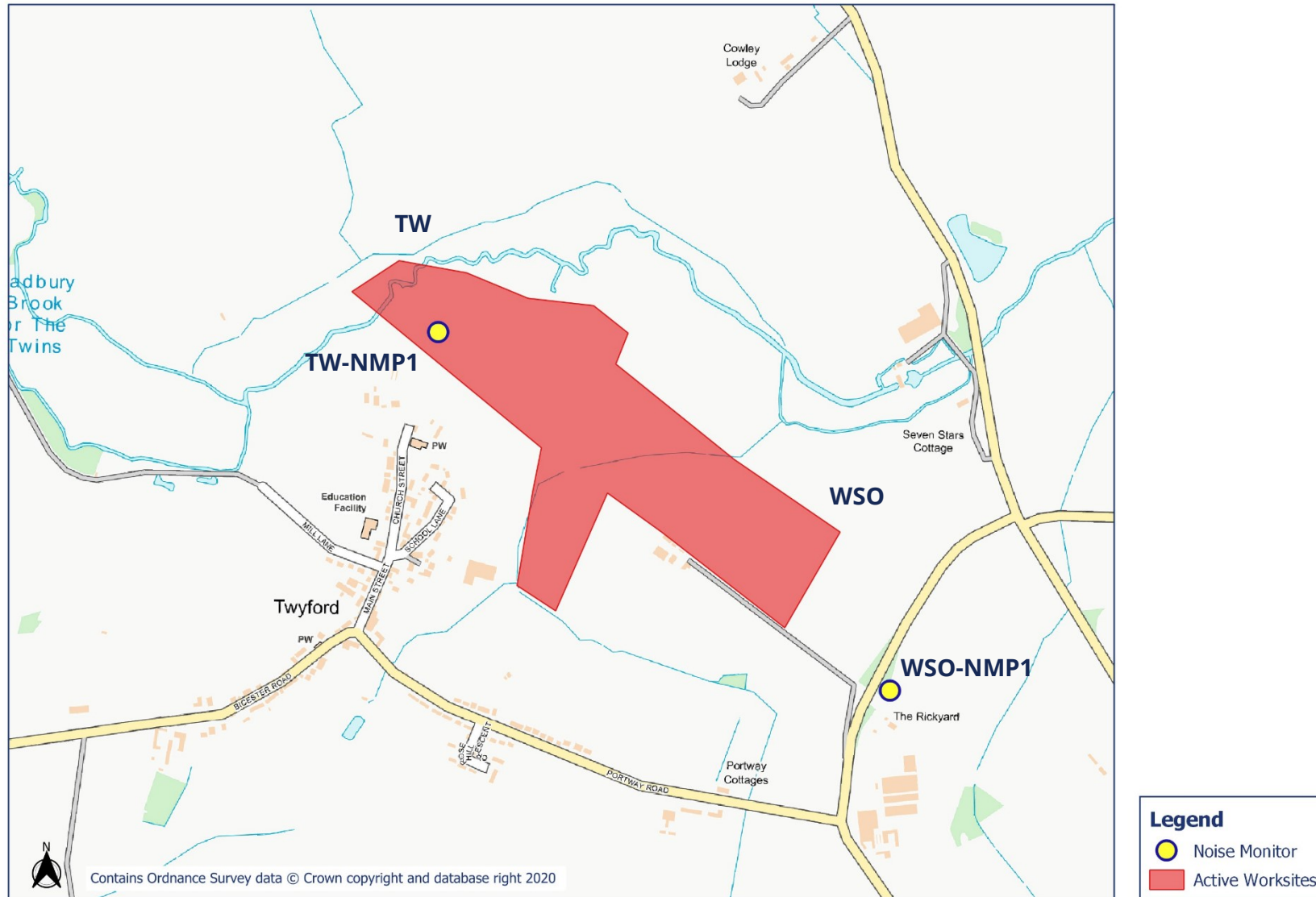


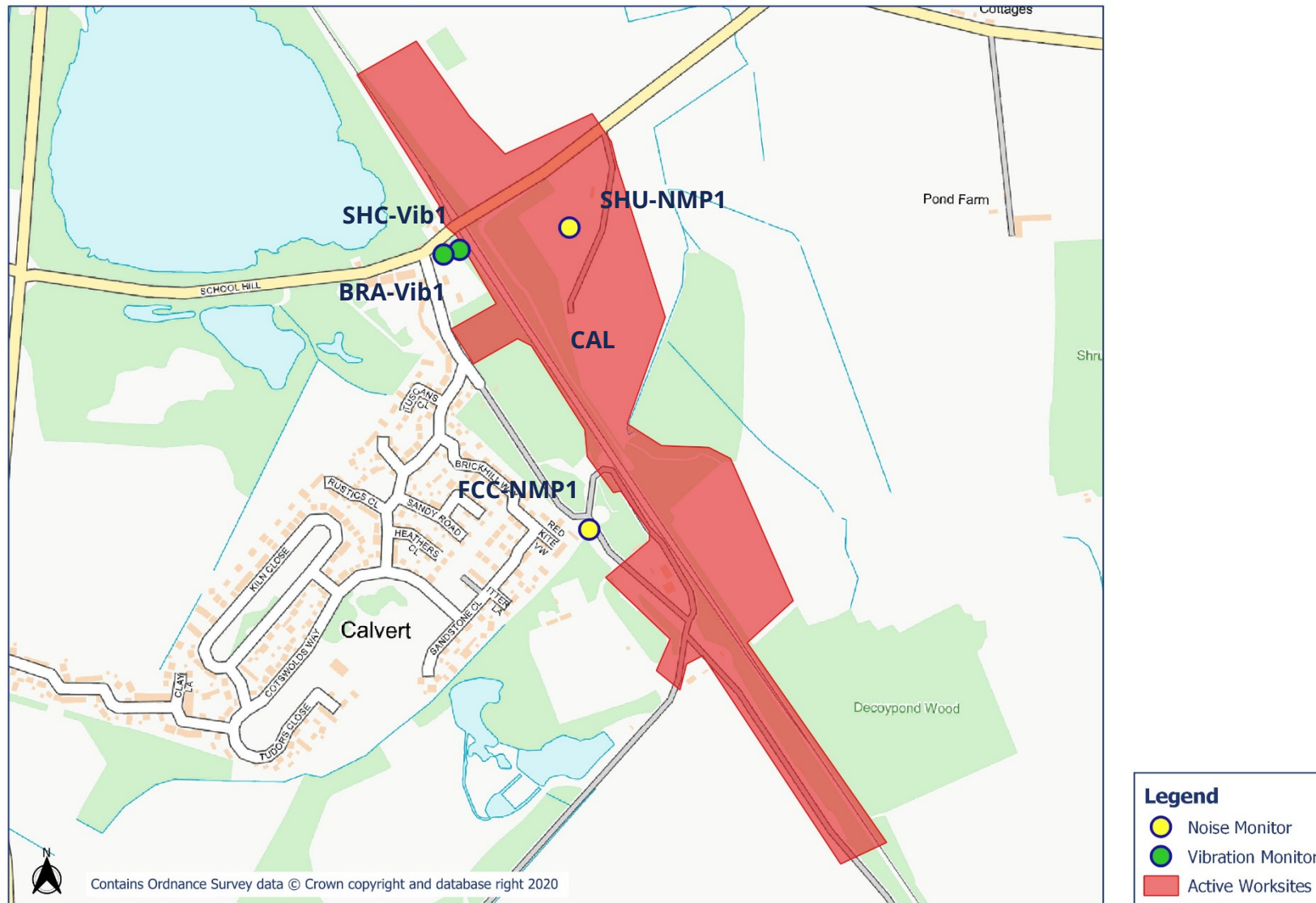


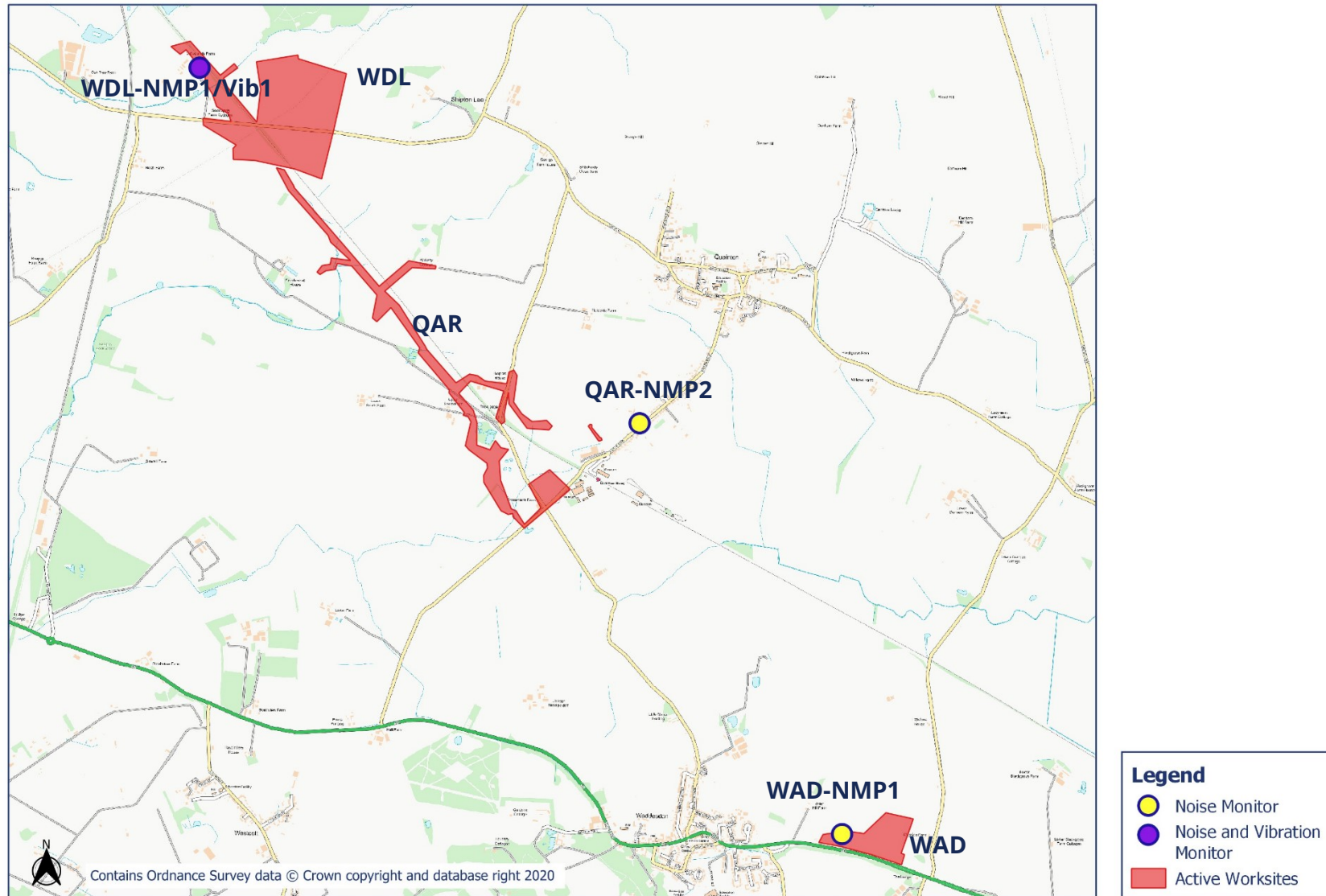
# Appendix B Monitoring Locations

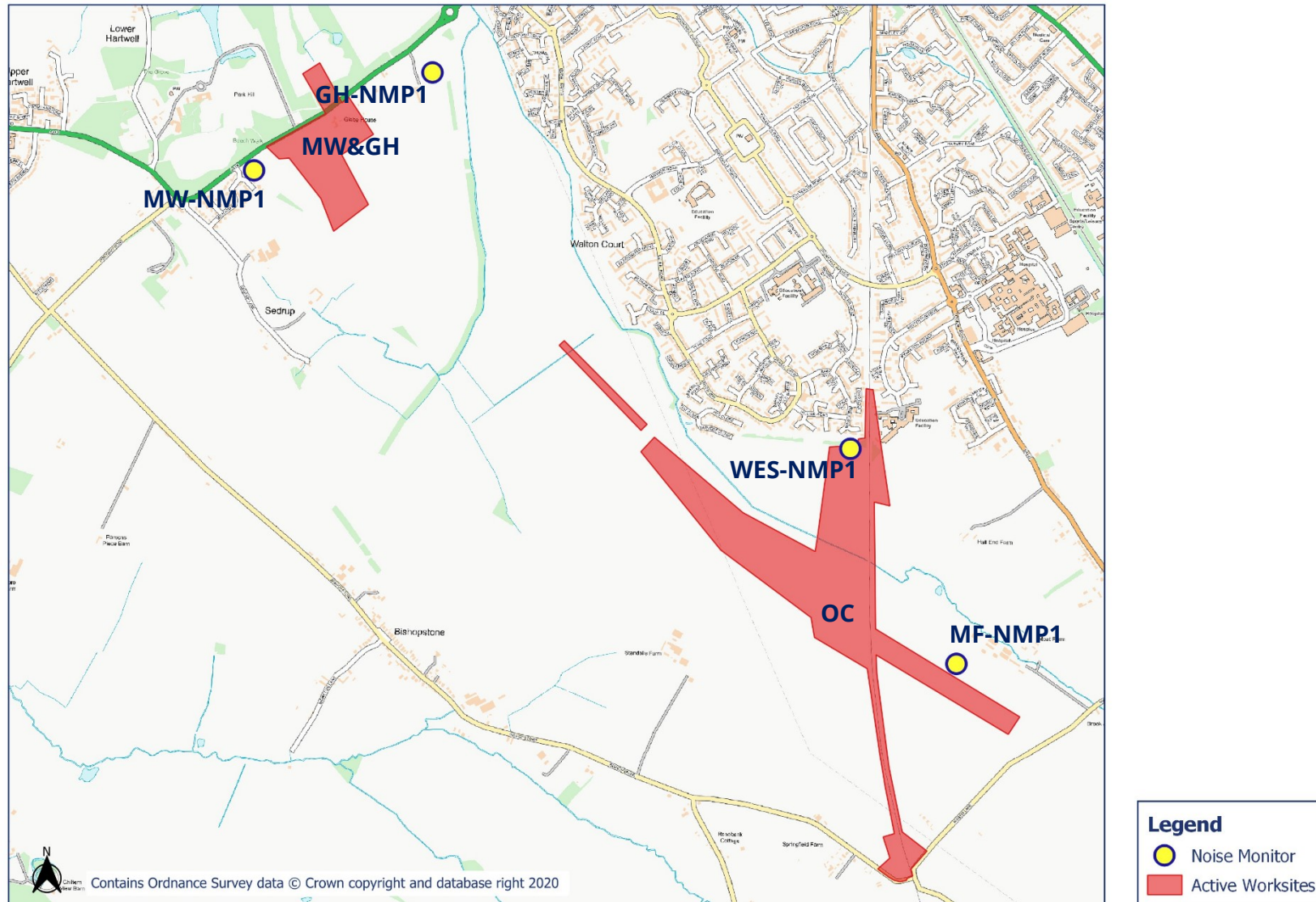


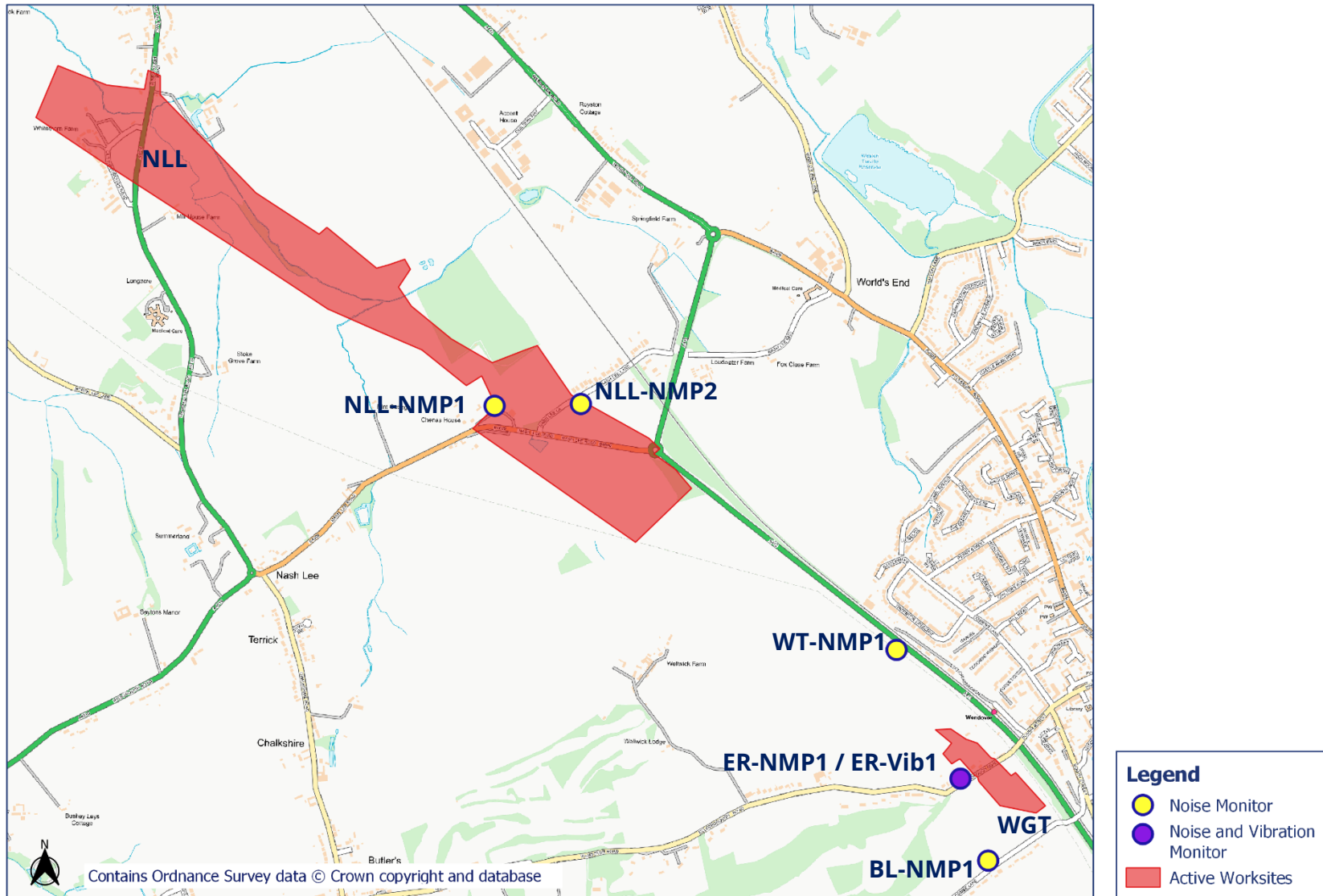




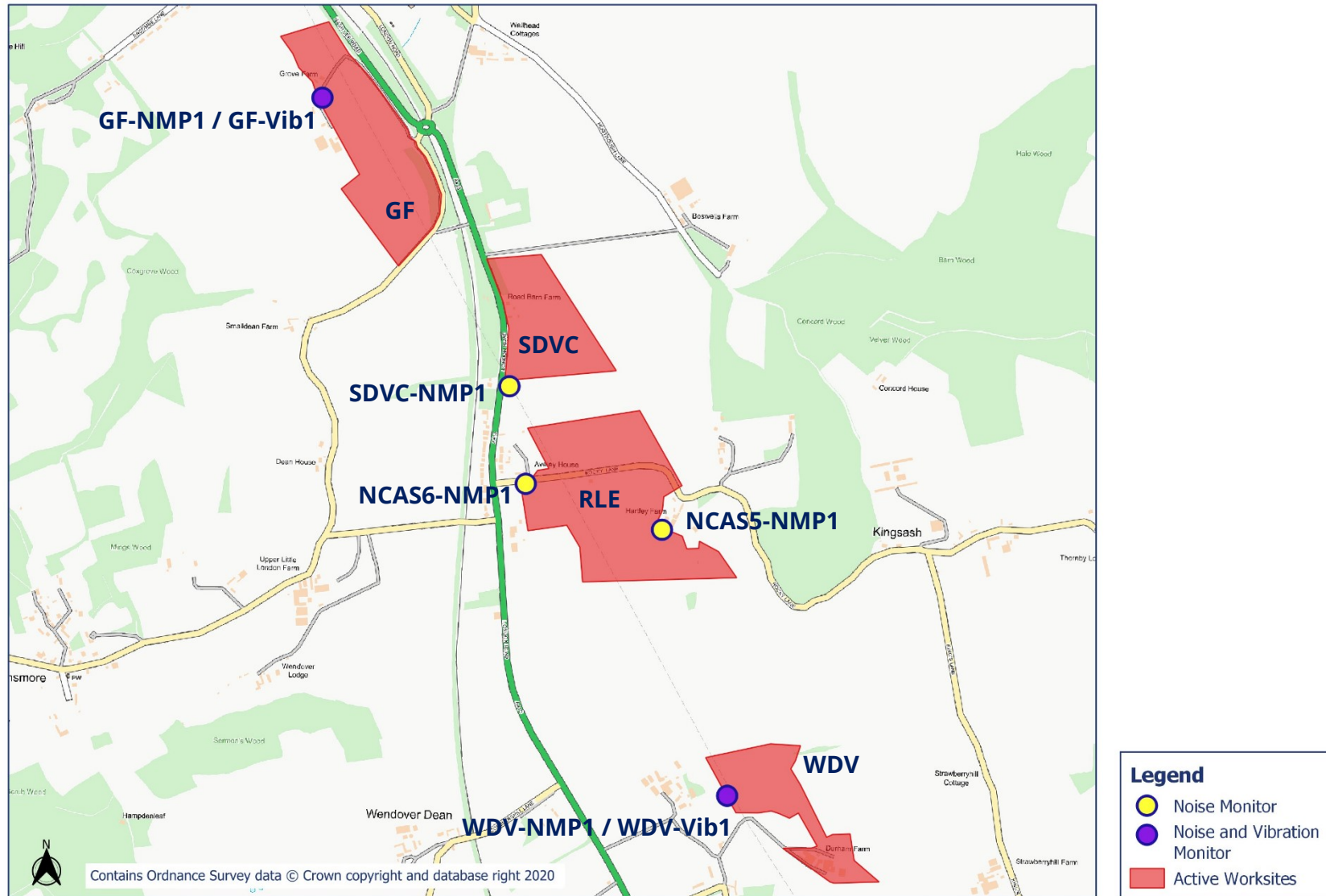


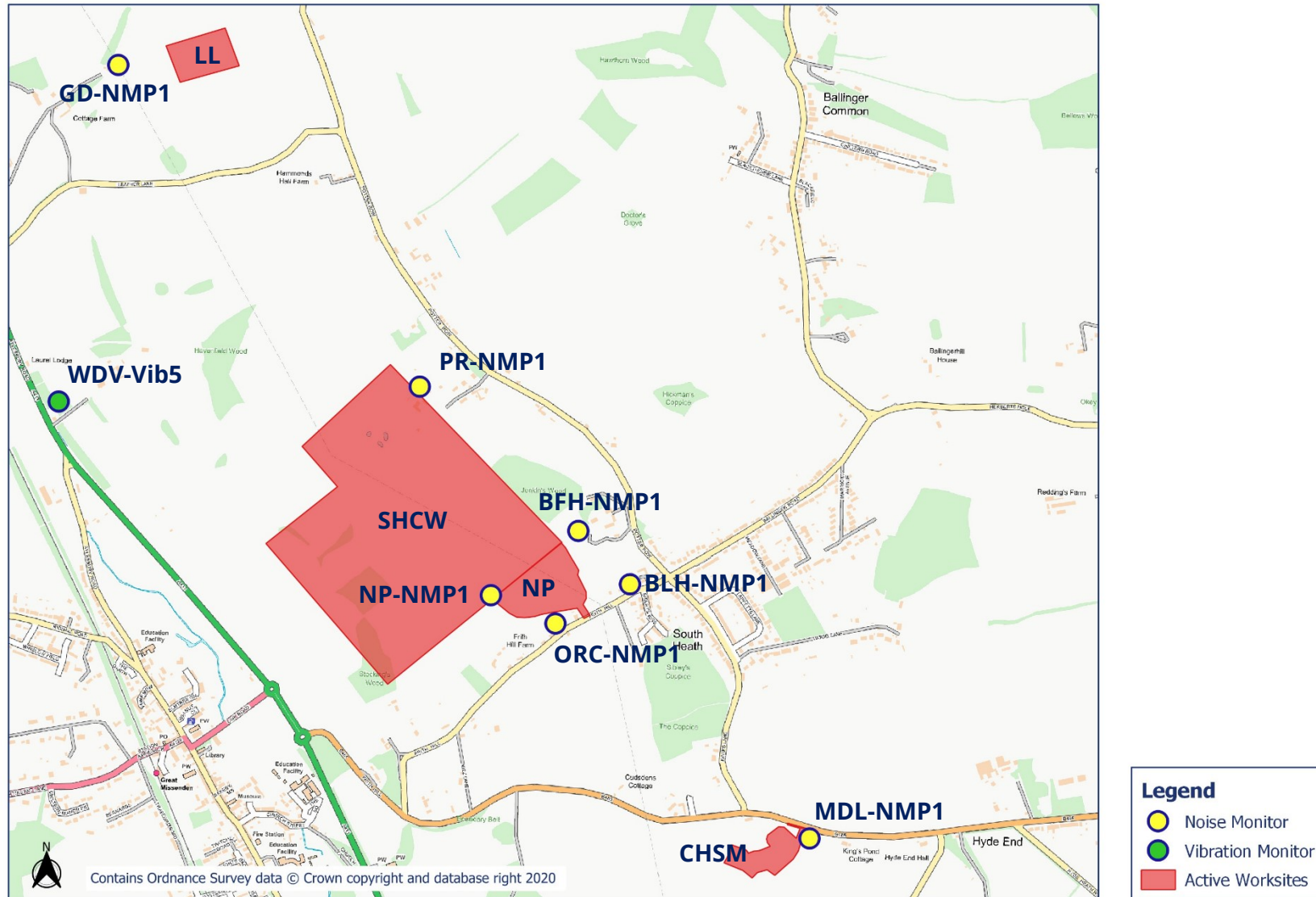




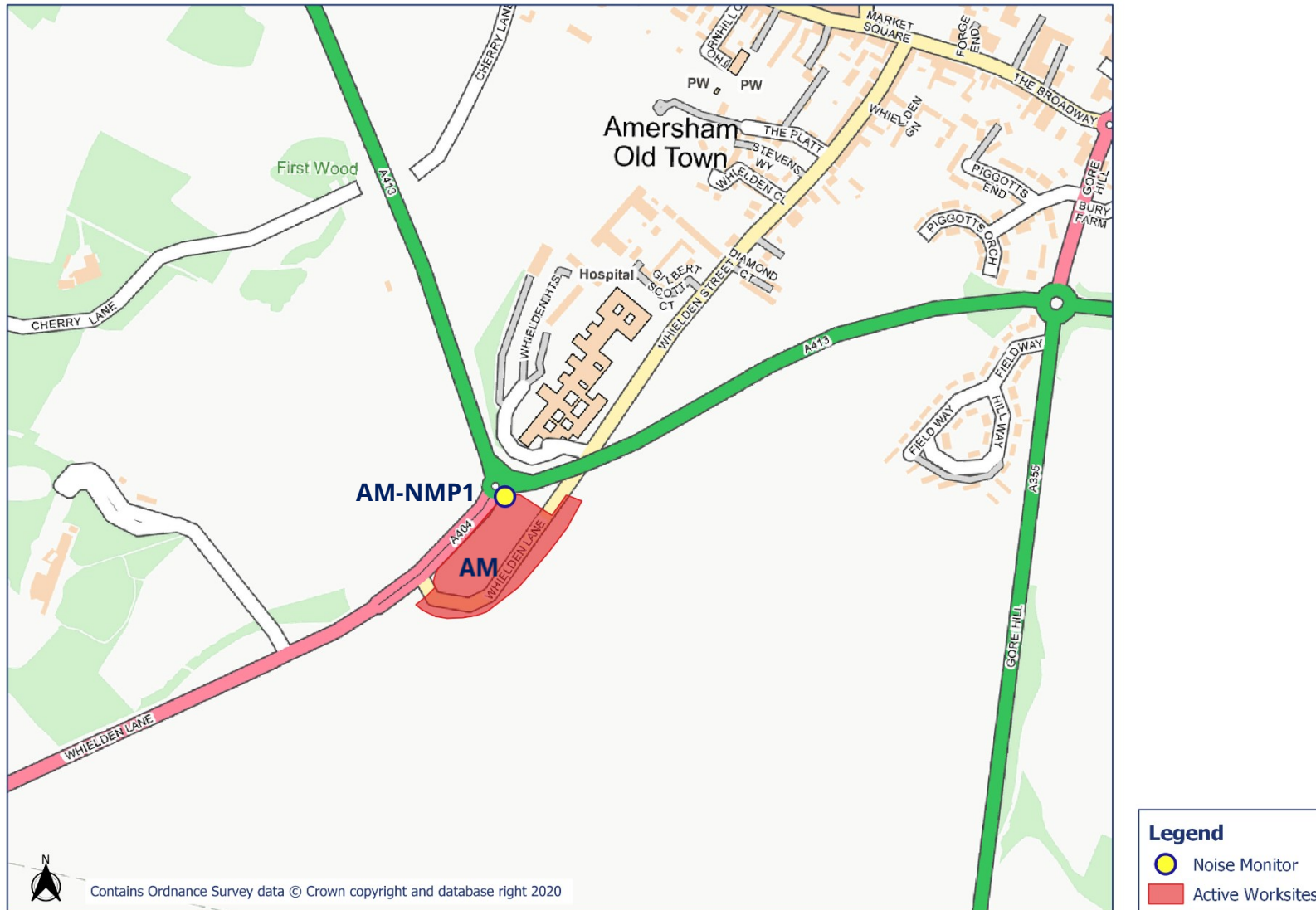






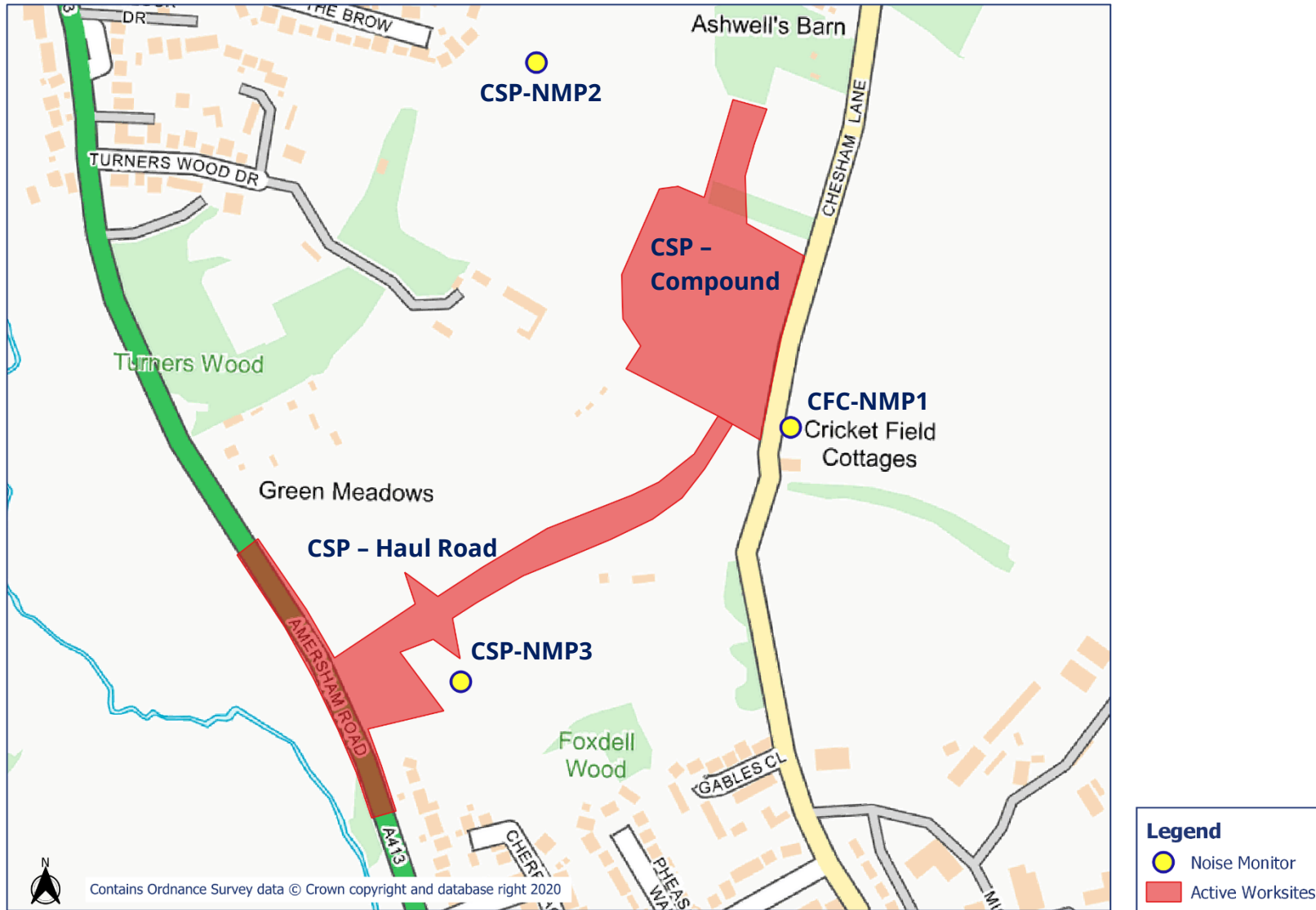


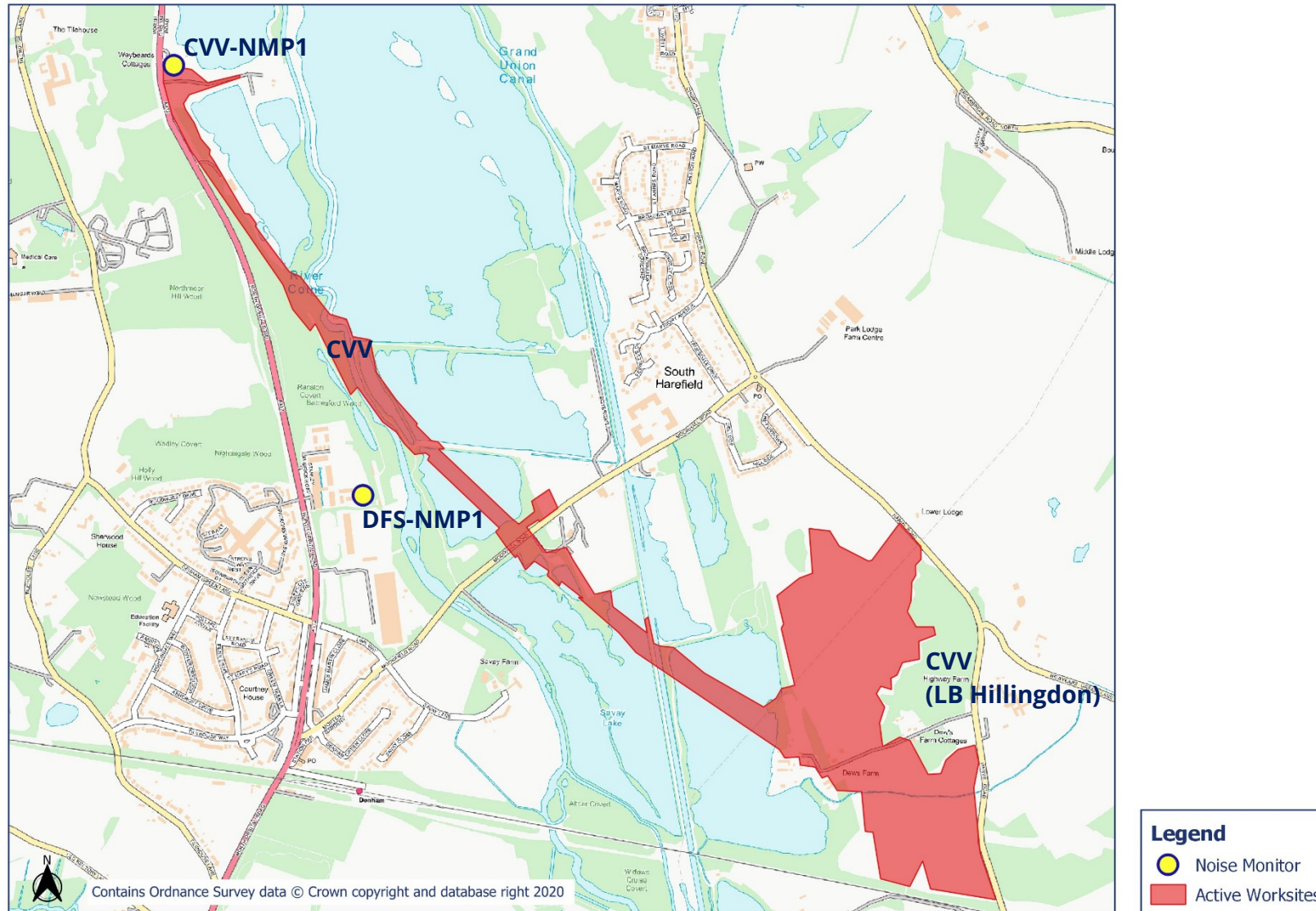






# HS2 Noise and Vibration Monitoring Plan - 13



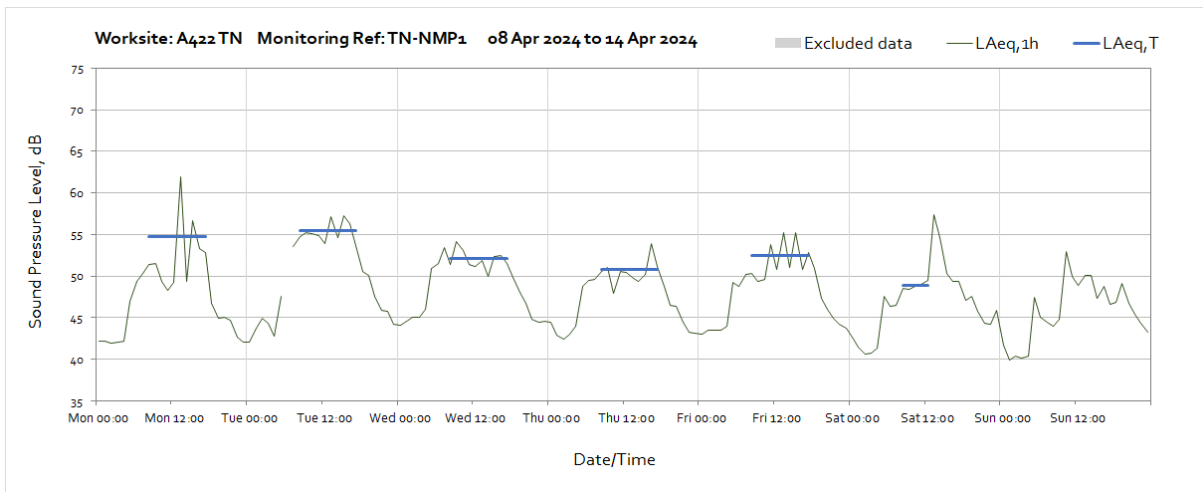
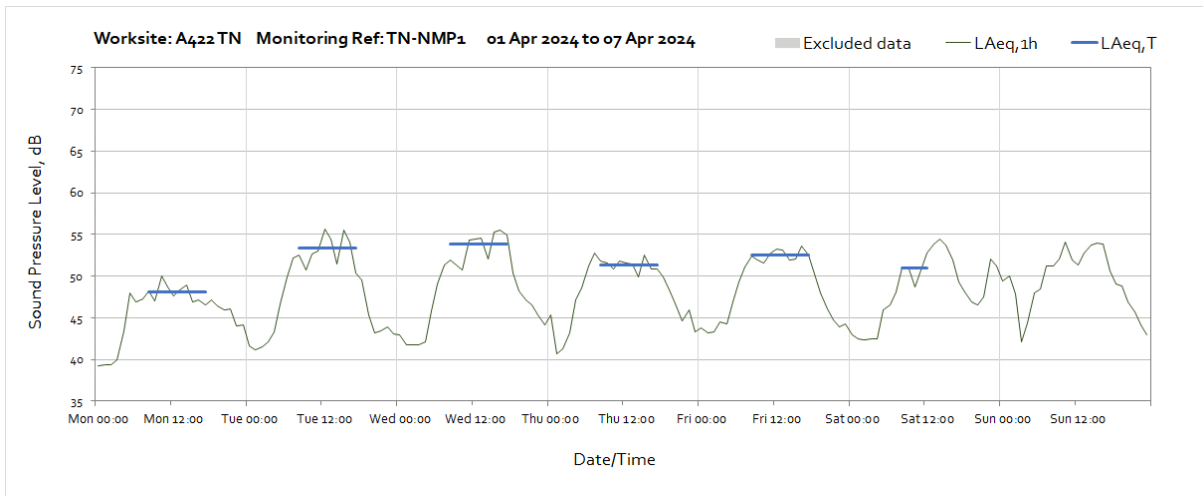


# Appendix C Data

## Noise

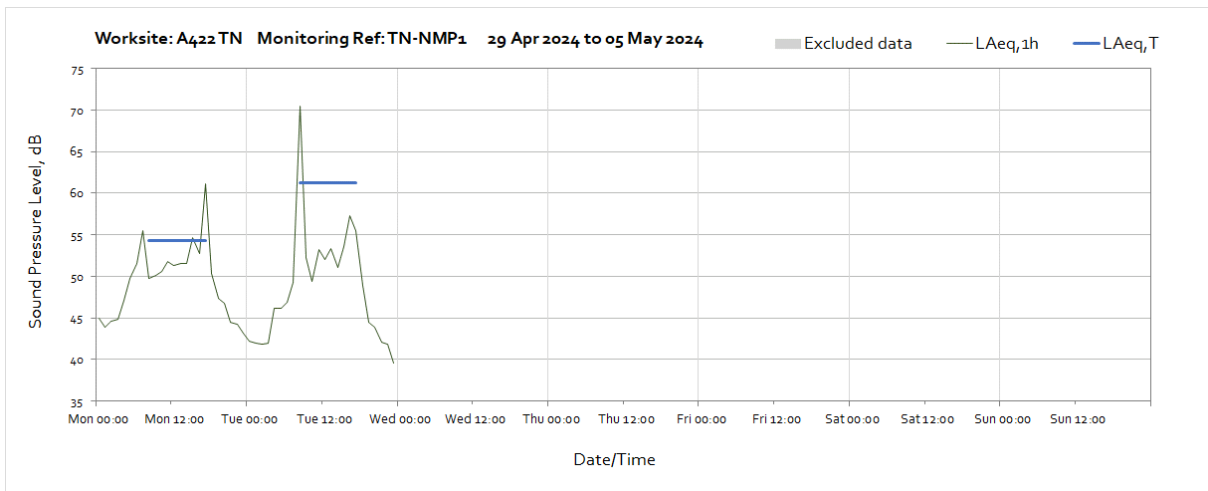
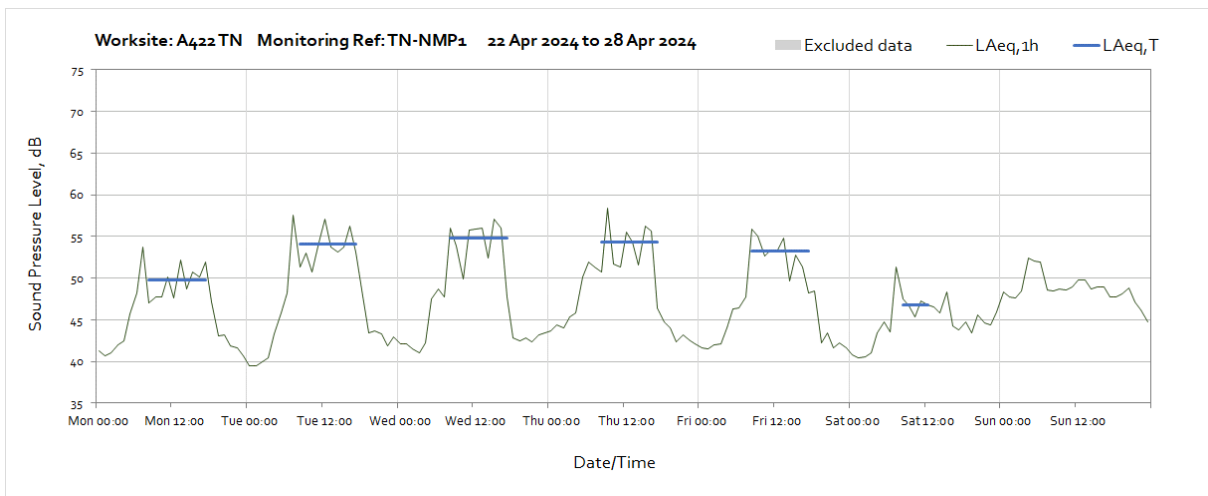
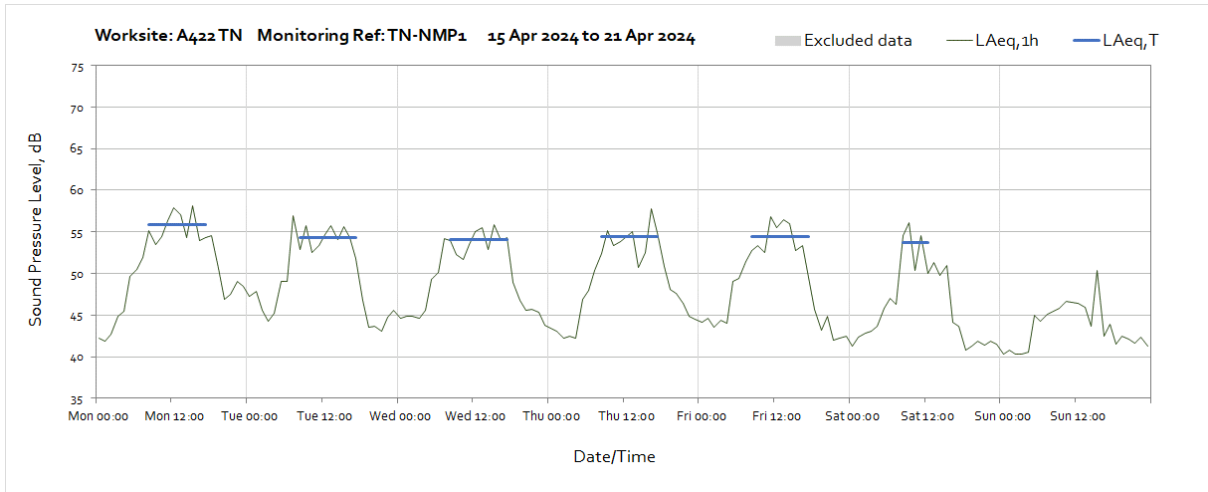
The following graphs show the hourly measured ambient noise level  $L_{Aeq,1h}$  and, where relevant, the averaged noise level  $L_{Aeq,T}$  values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods where noise levels are adversely affected by weather or only measured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

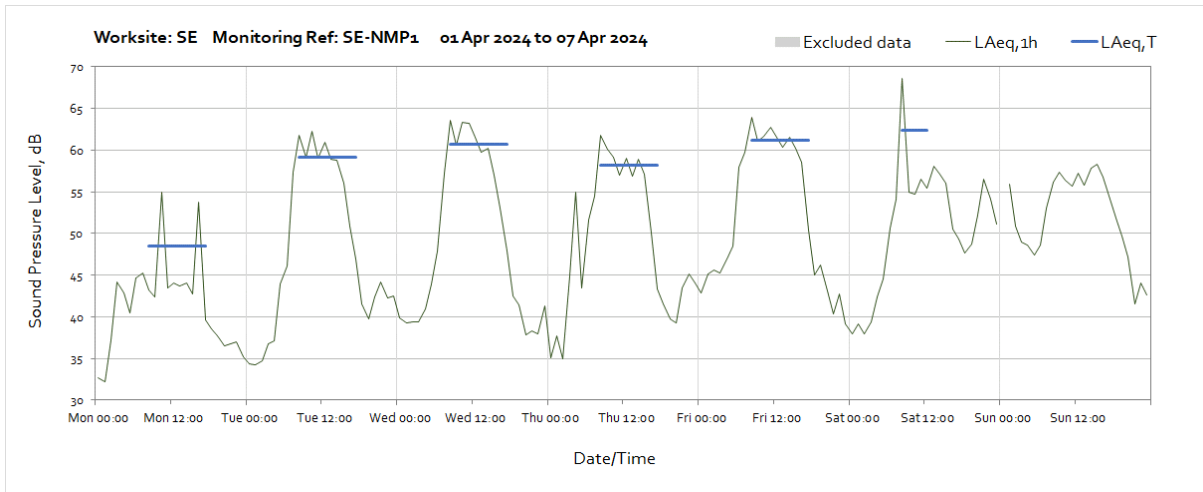


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to maintenance activities undertaken on server platform.

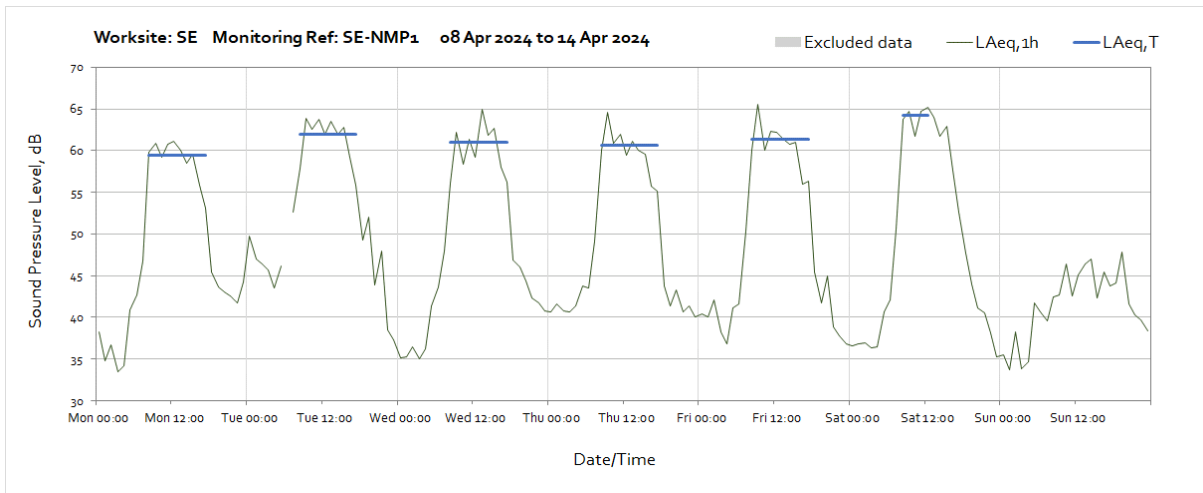




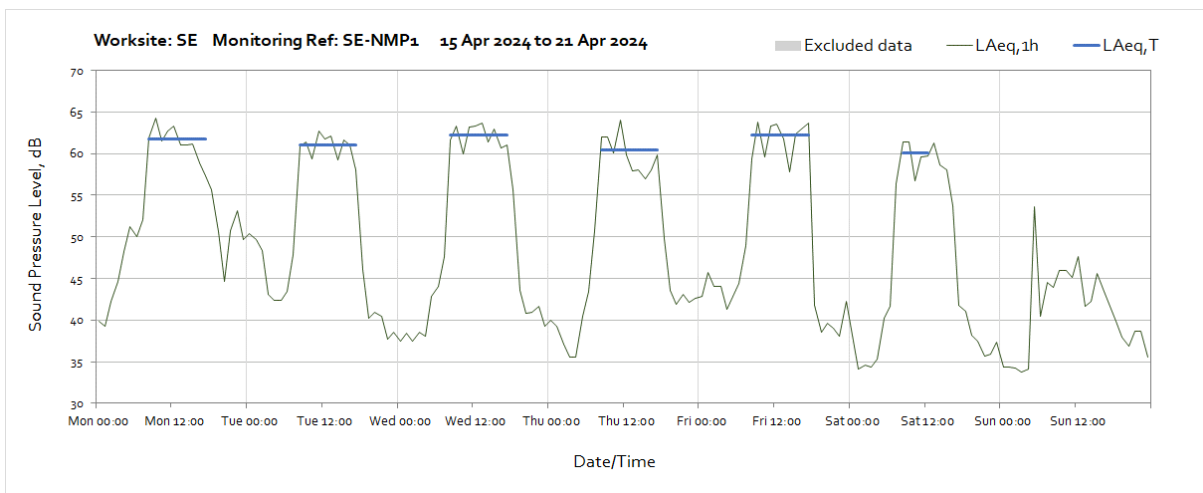
## Worksite: SE – Monitoring Ref: SE-NMP1



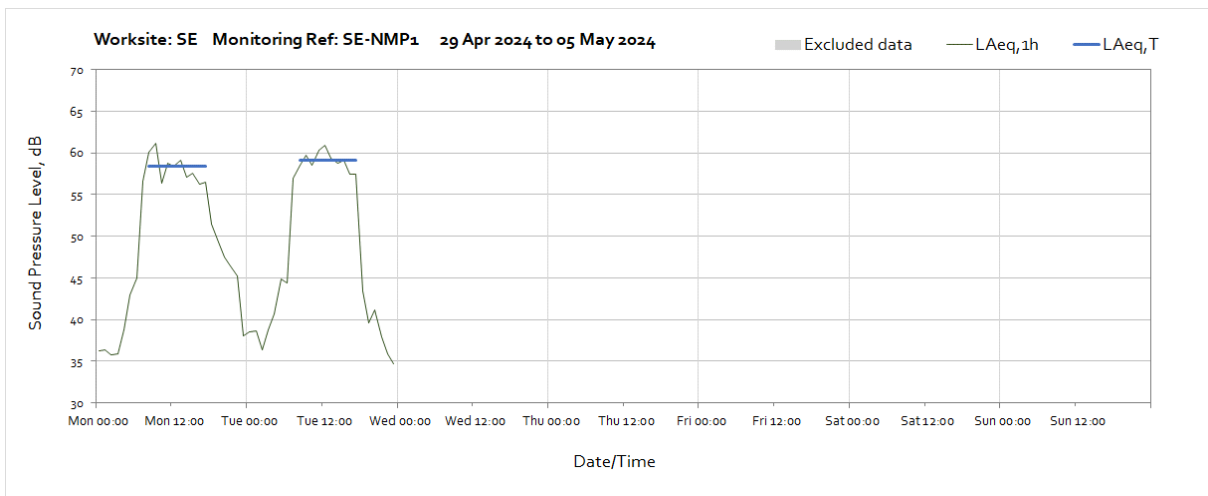
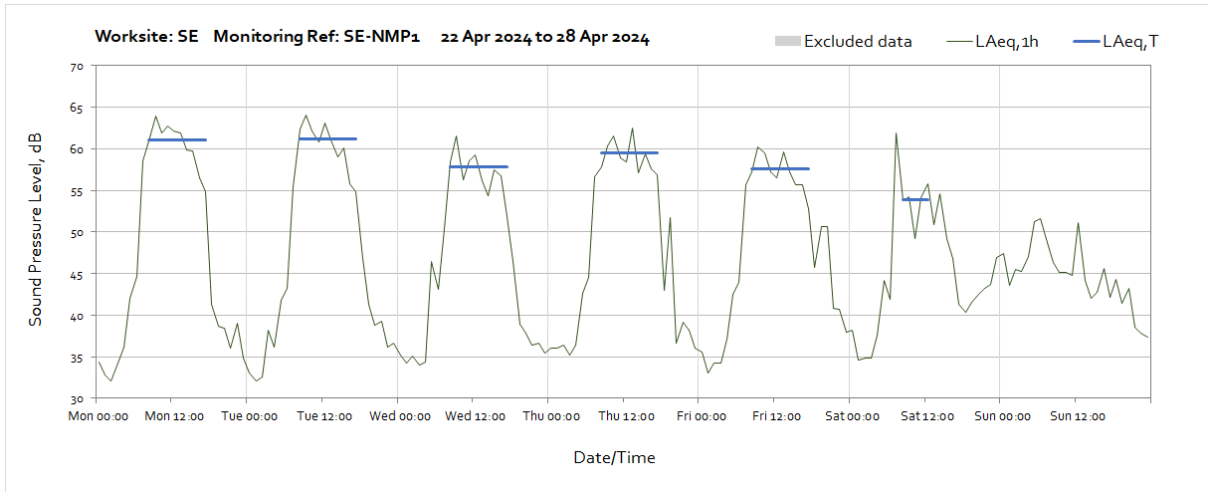
Note: Missing data between 00:00 and 01:00 on Sunday 7<sup>th</sup> April is due to maintenance activities undertaken on server platform.



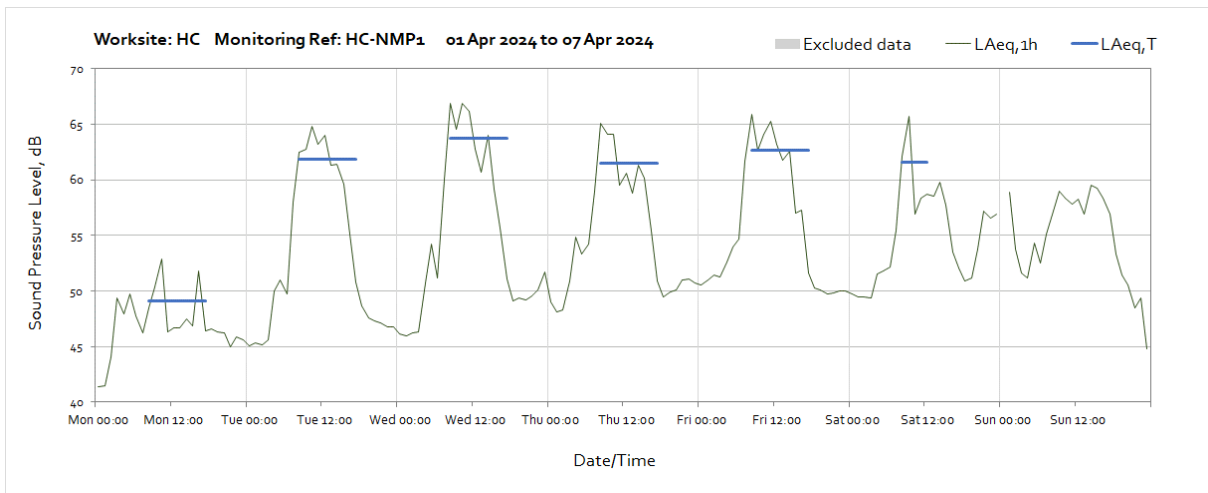
Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April is due to maintenance activities undertaken on server platform.



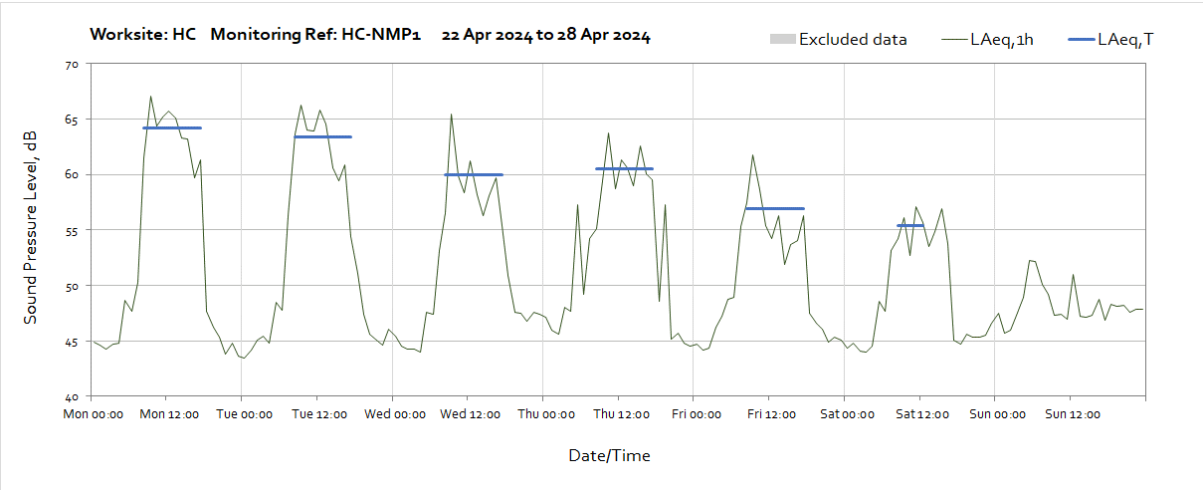
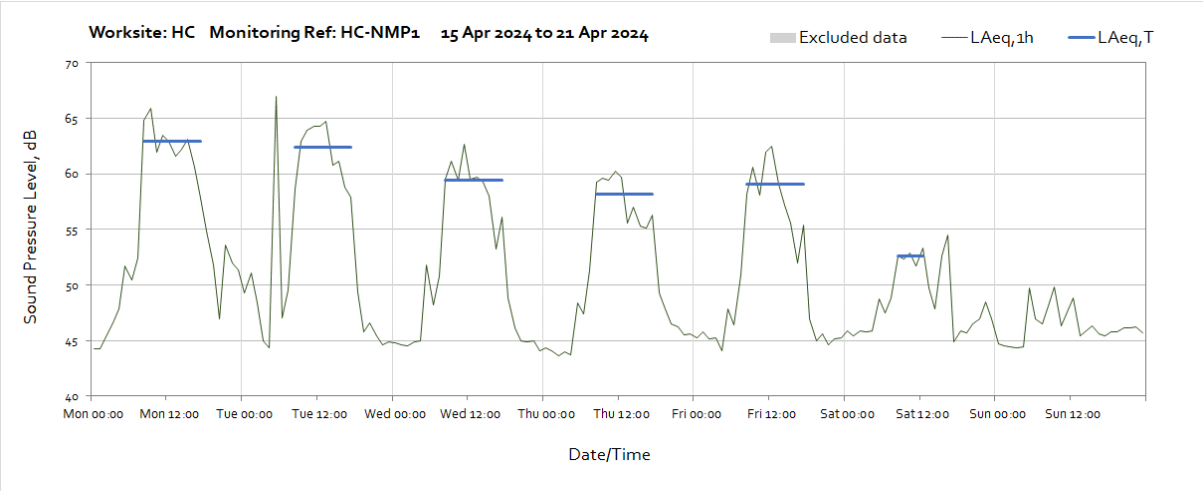
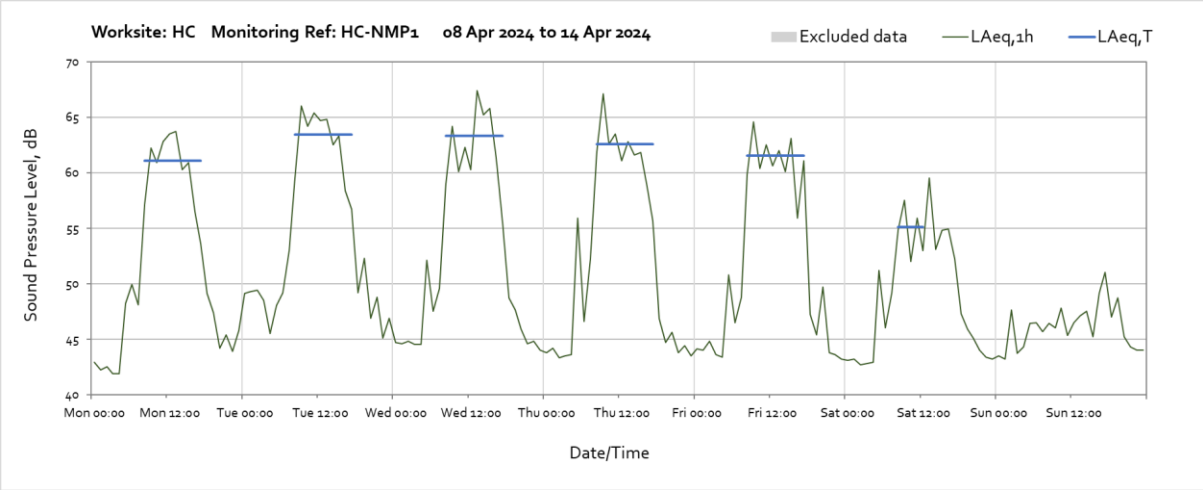
OFFICIAL

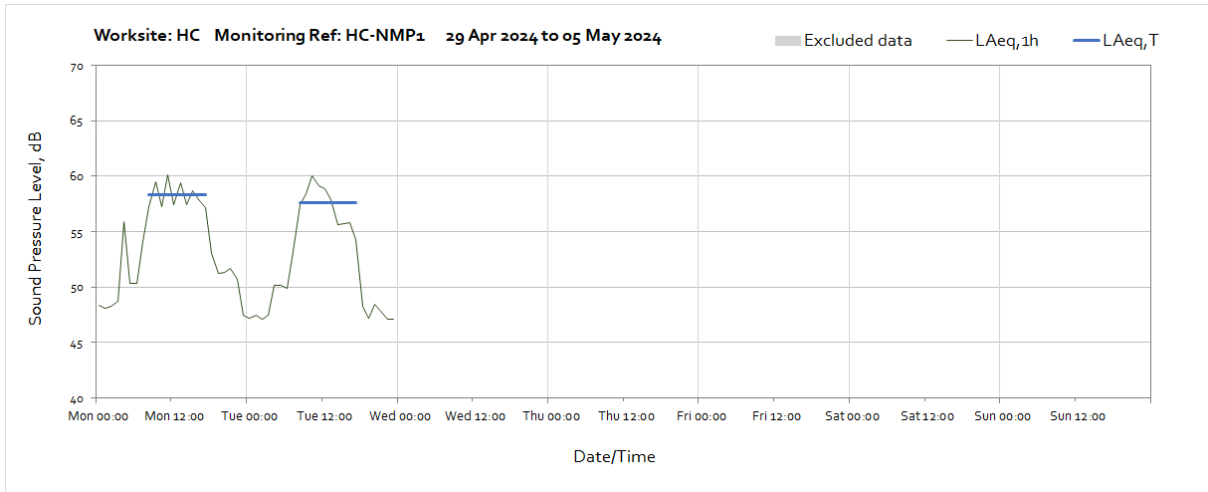


**Worksite: HC - Monitoring Ref: HC-NMP1**

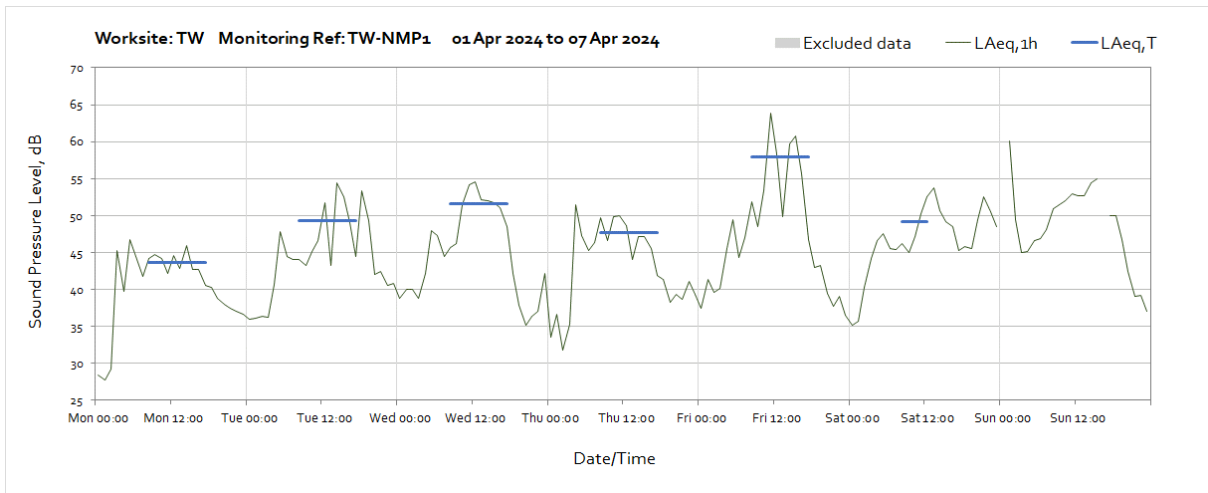


Note: Missing data between 00:00 and 01:00 on Sunday 7<sup>th</sup> April is due to maintenance activities undertaken on server platform.

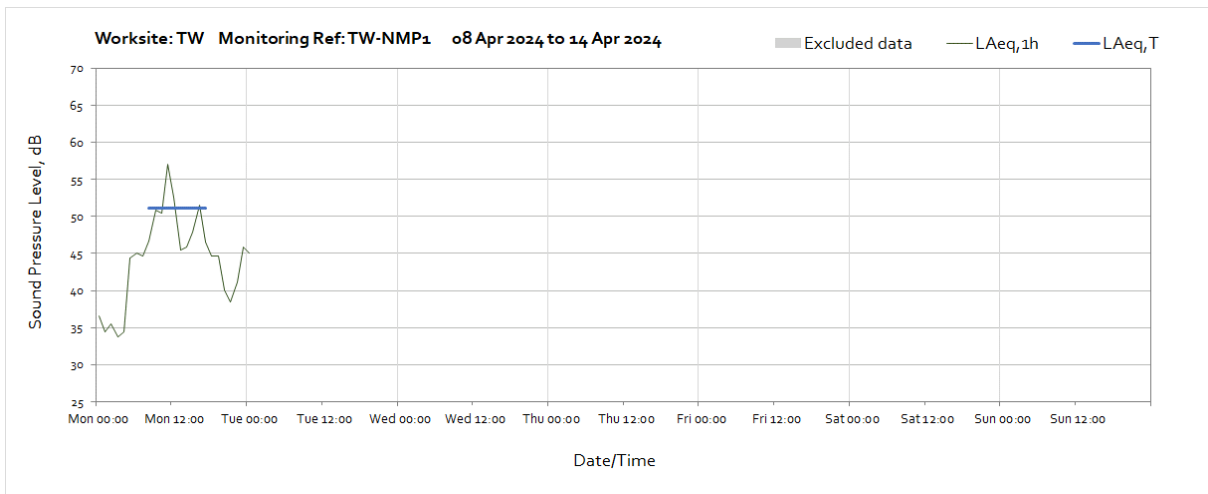




**Worksite: TW – Monitoring Ref: TW-NMP1**



Note: Missing data between 00:00 and 01:00 and 16:00 and 17:00 on Sunday 7<sup>th</sup> April is due to maintenance activities undertaken on server platform.



Note: Missing data between 01:00 on Tuesday 9<sup>th</sup> April until 13:00 on Wednesday 17<sup>th</sup> April at 13:00 was

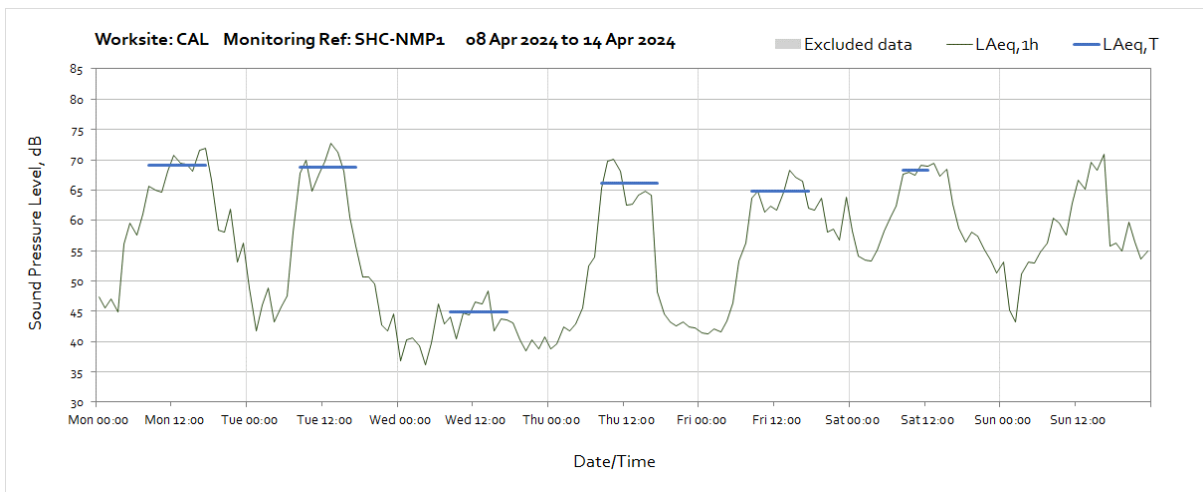
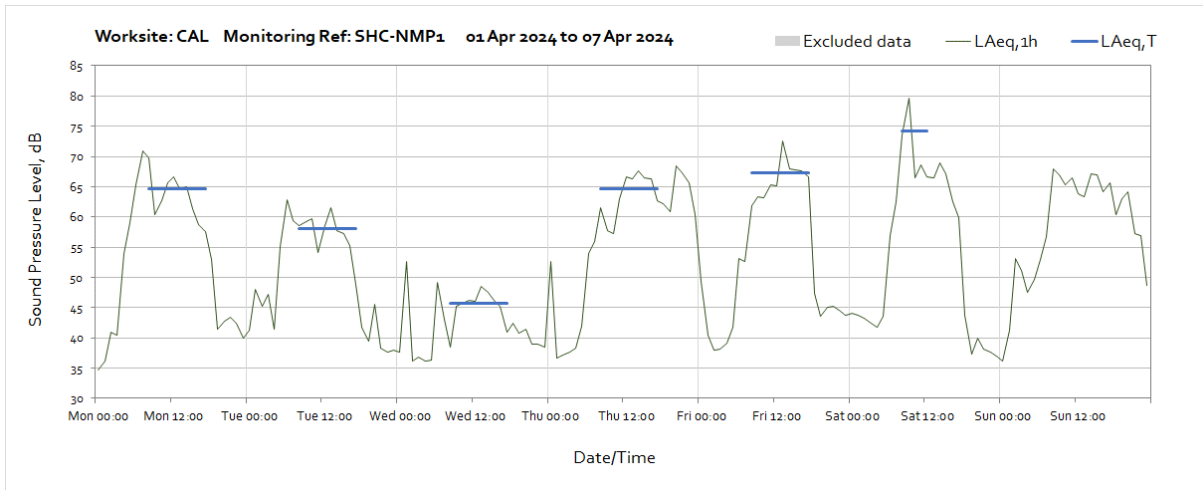
OFFICIAL

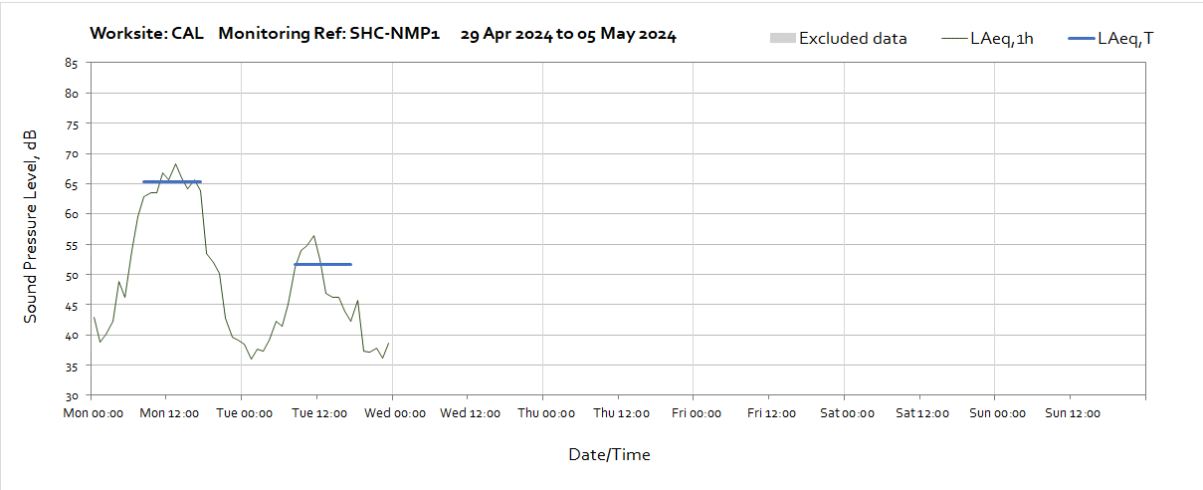
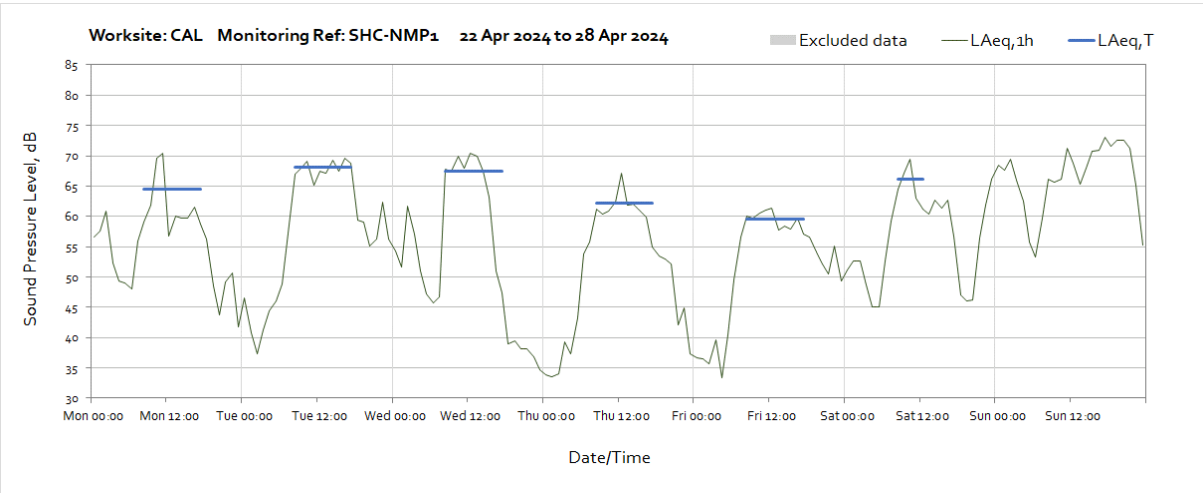
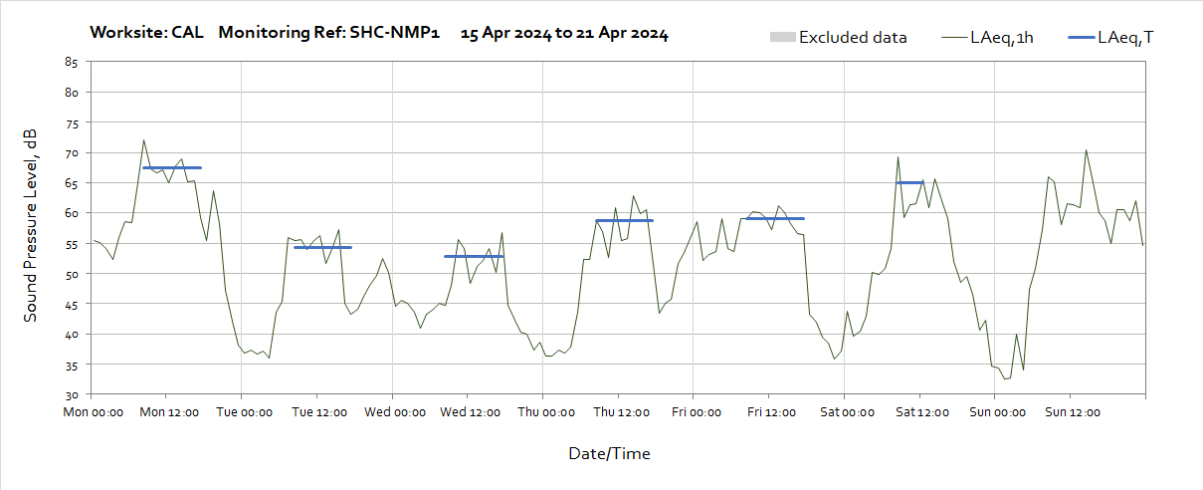
due to a data storage error at the monitoring station. Monitor was retrieved for repair at 13:00 on Wednesday 17<sup>th</sup> April.

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

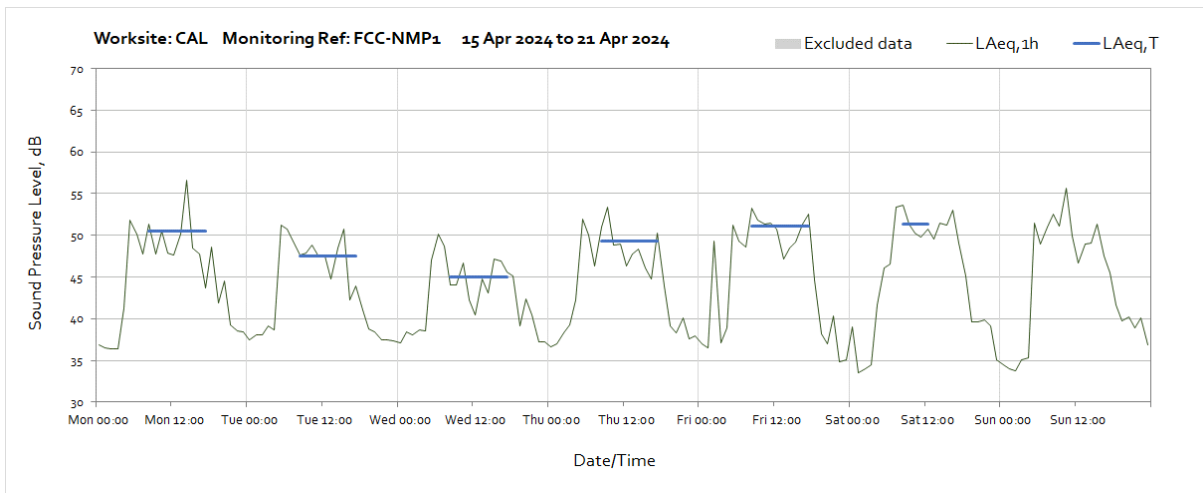
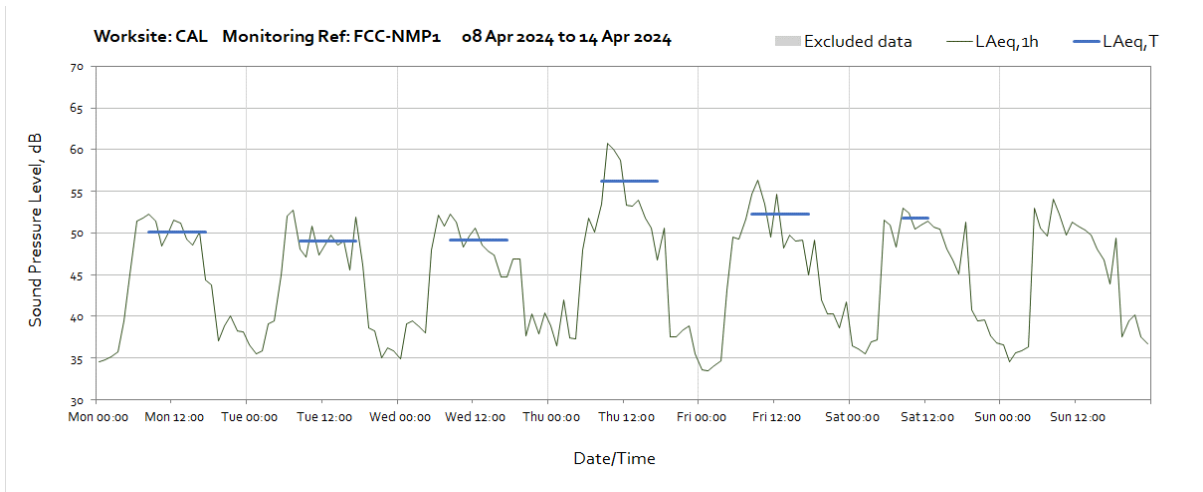
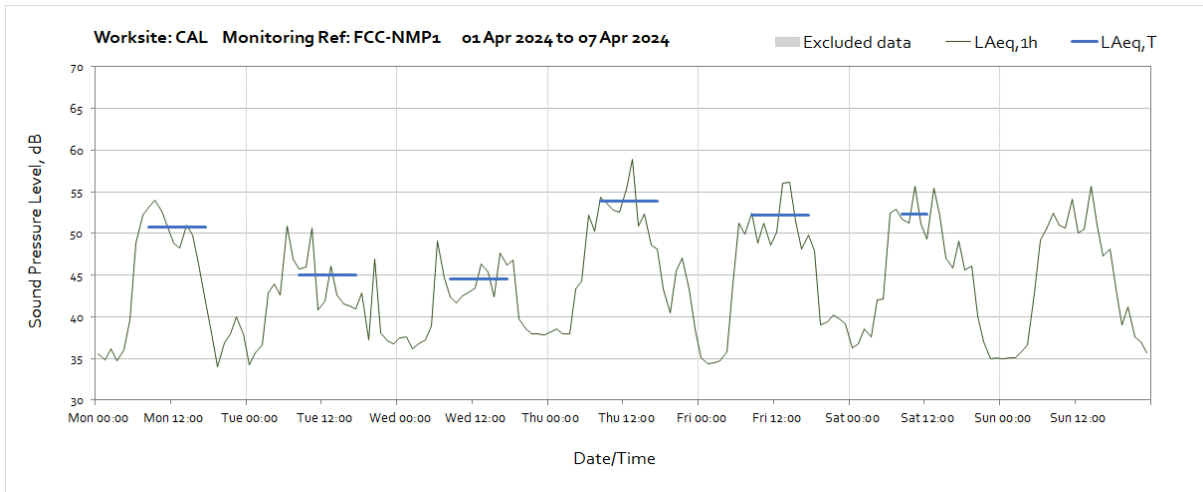
Note: Monitor was offline for the month of April due to water ingress to monitoring station.

### Worksite: CAL – Monitoring Ref: SHC-NMP1

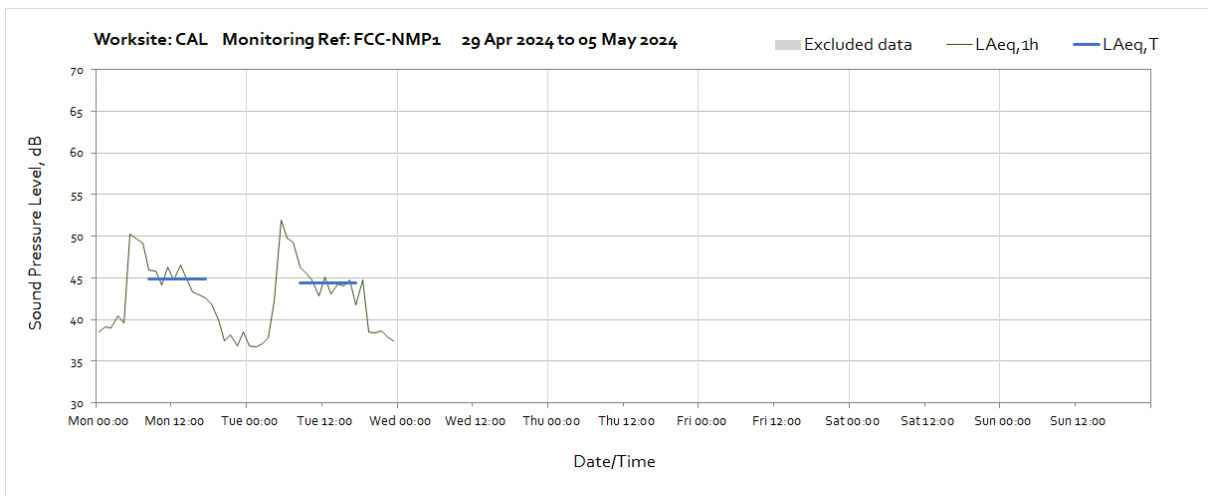
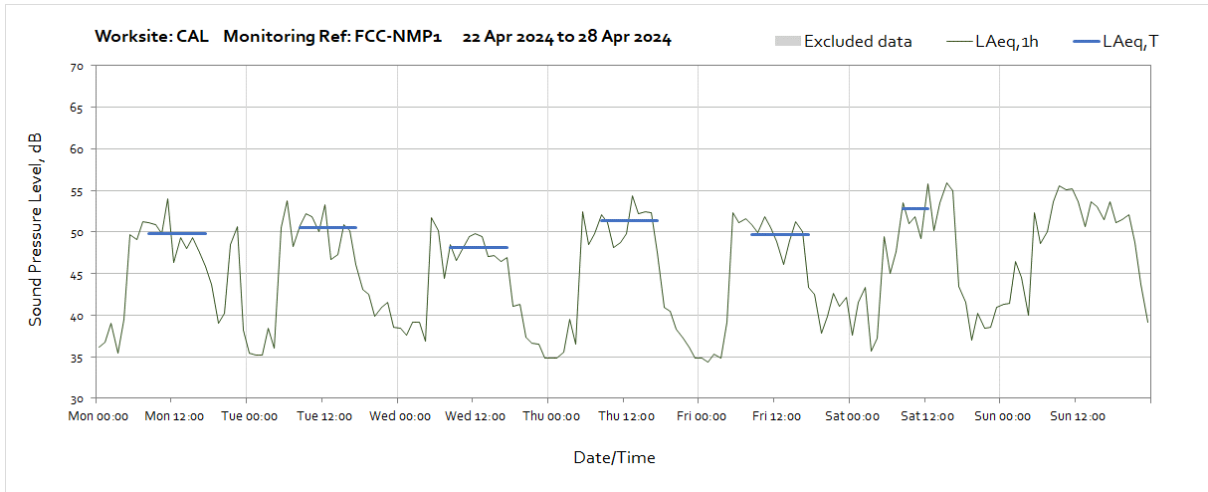




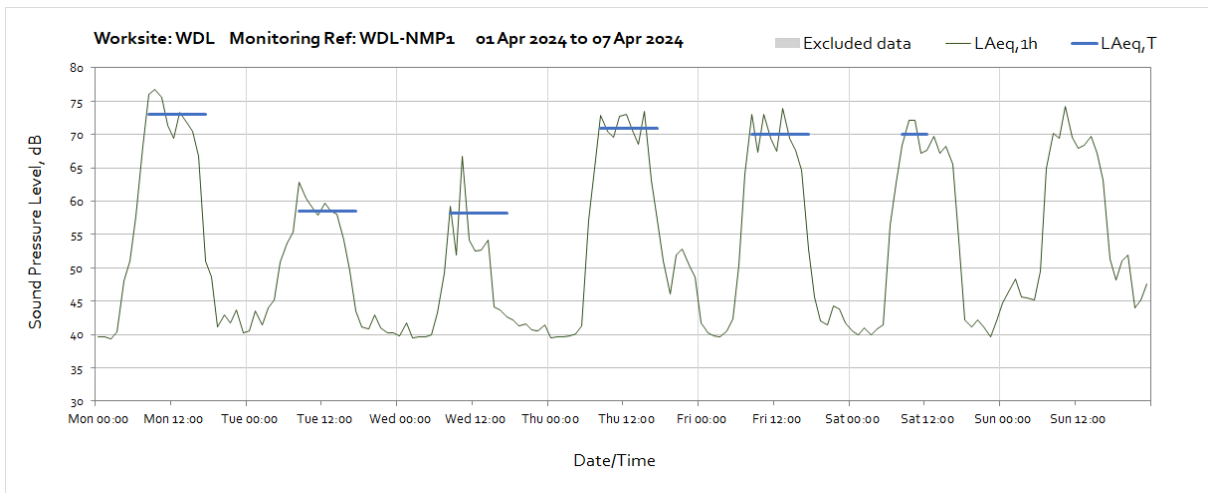
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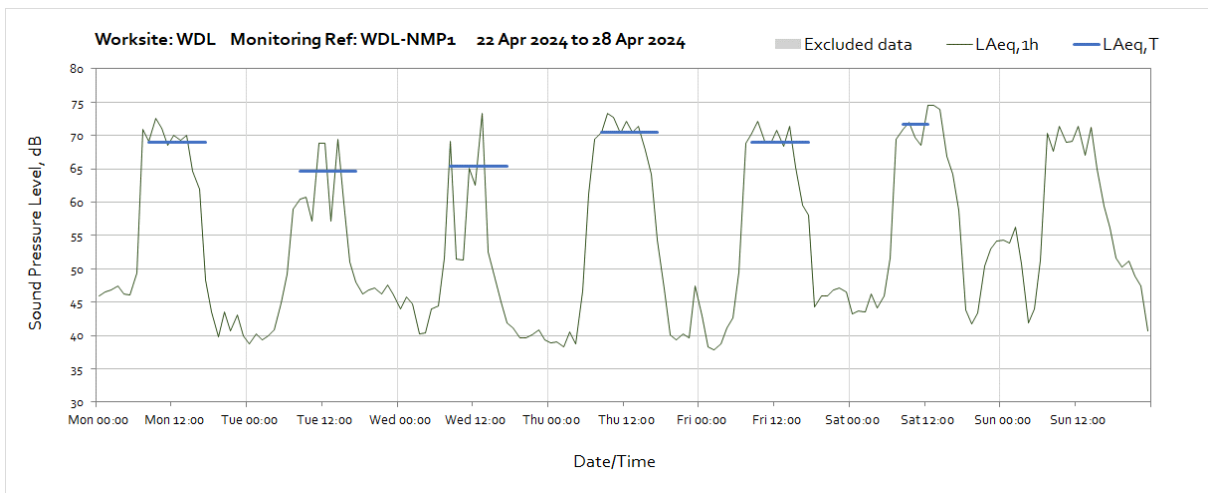
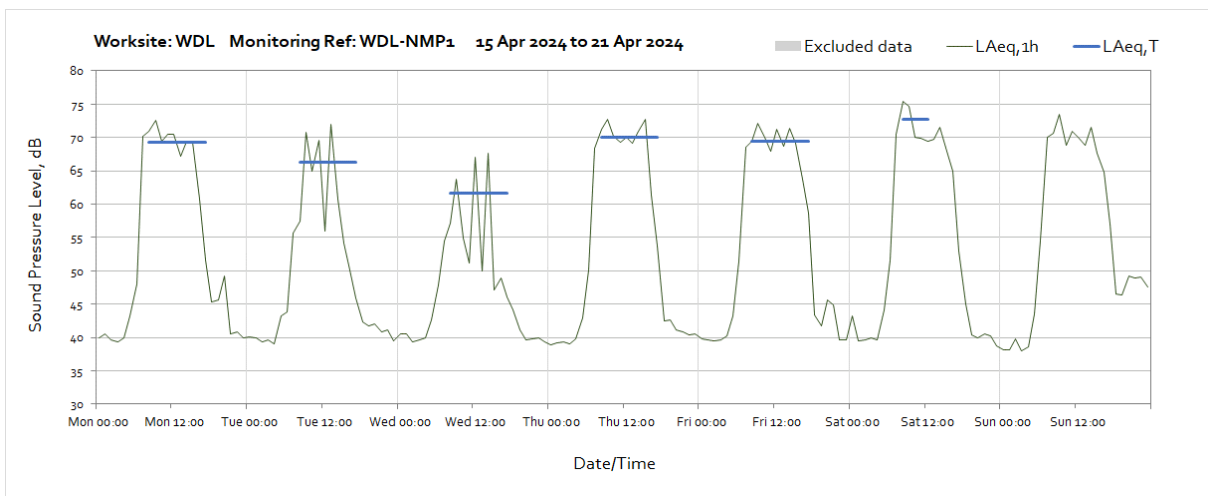
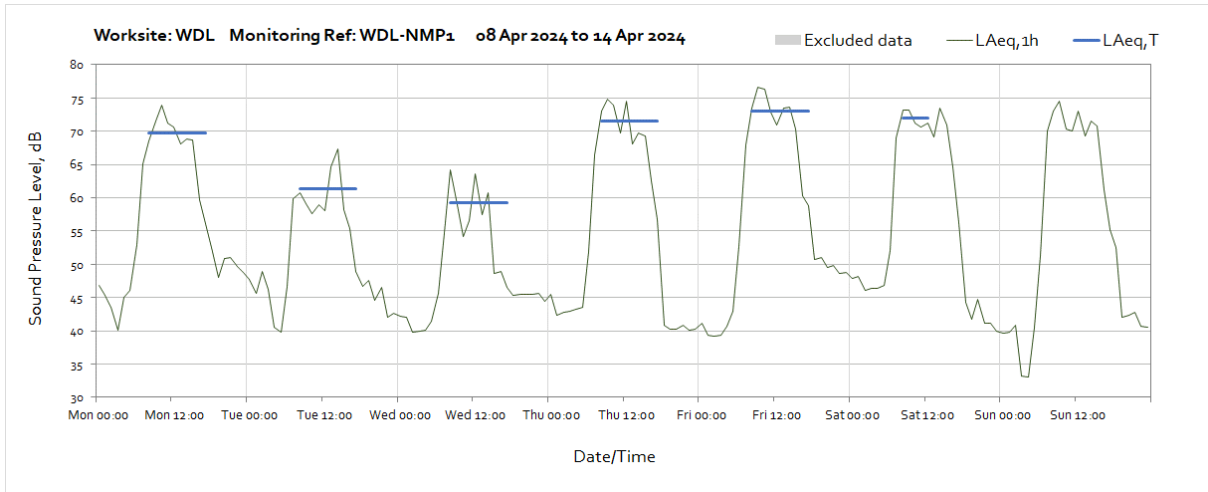


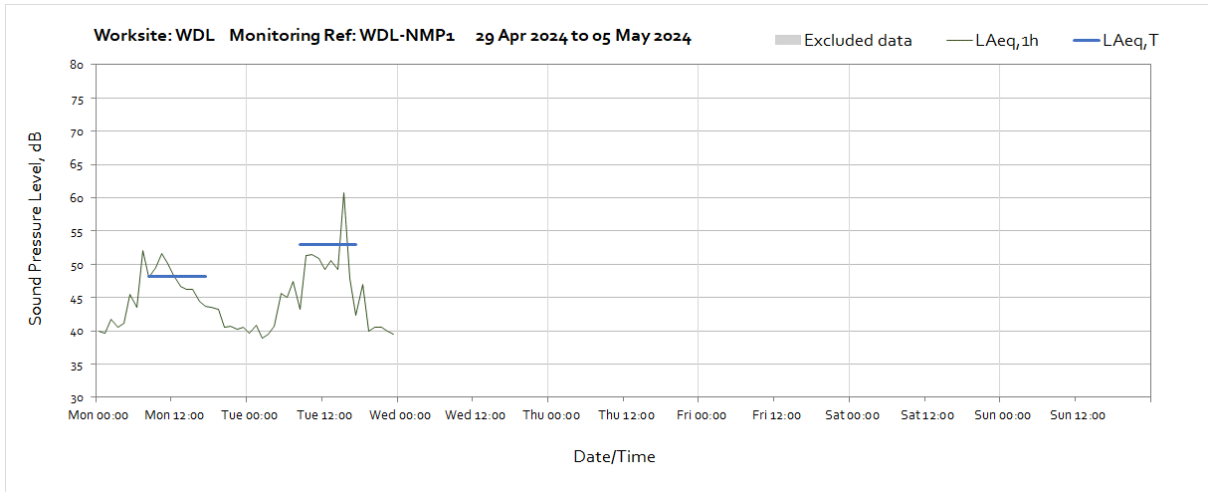




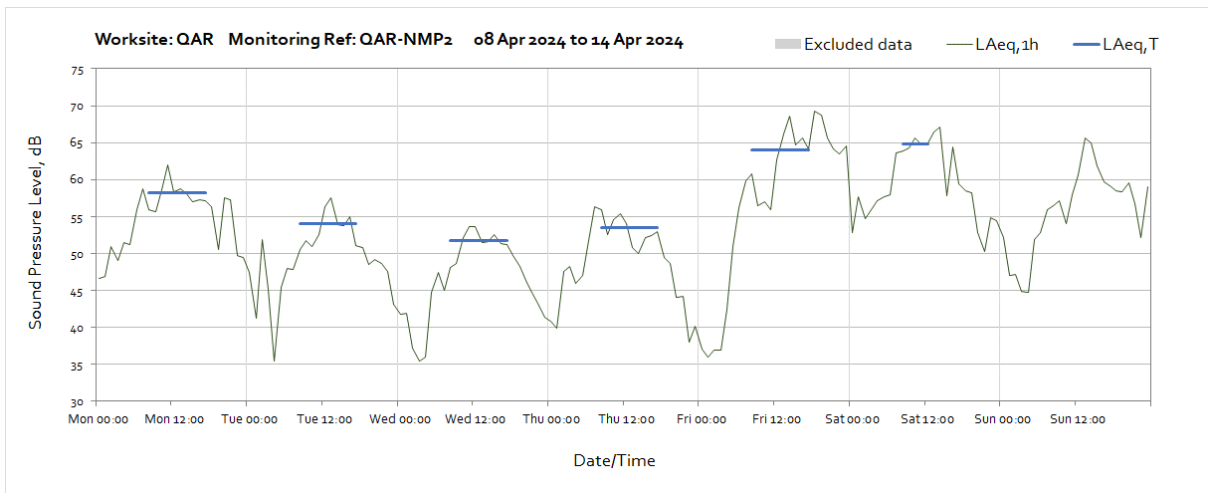
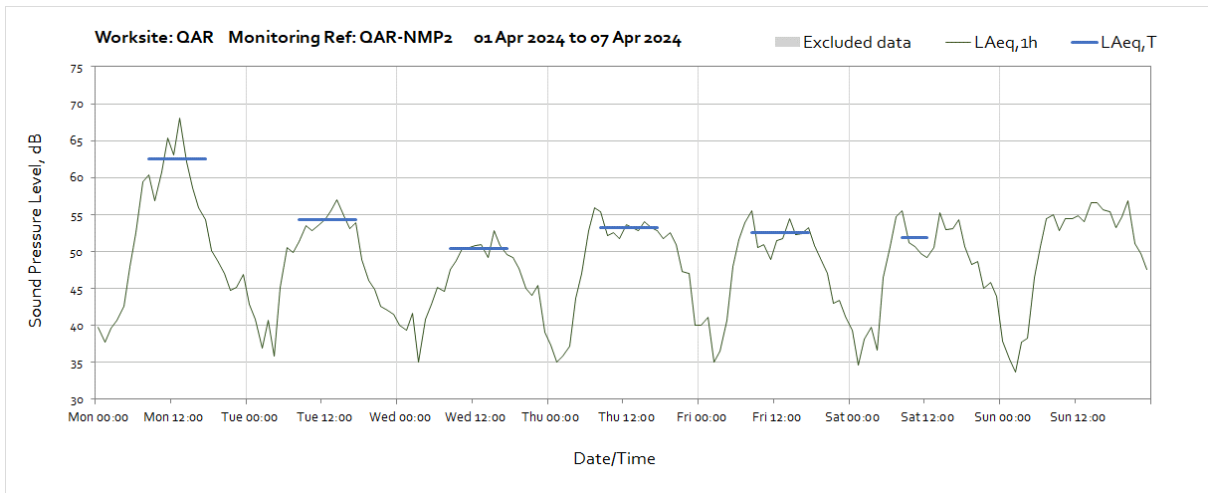
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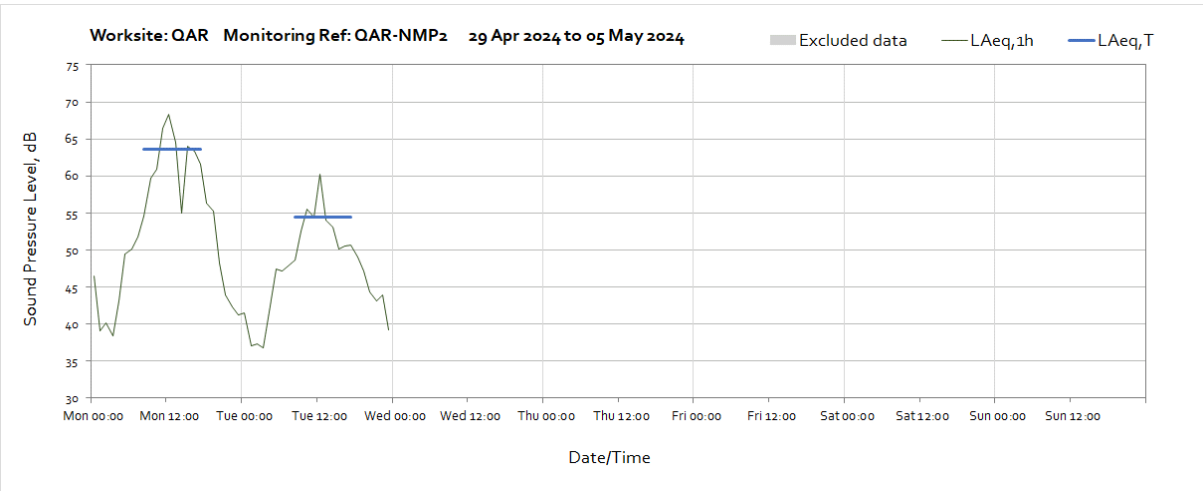
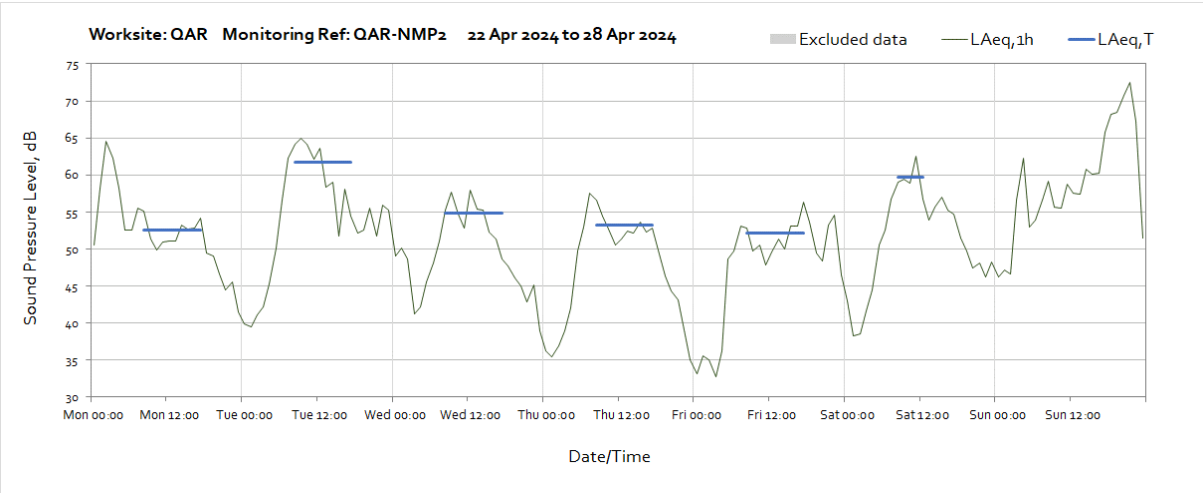
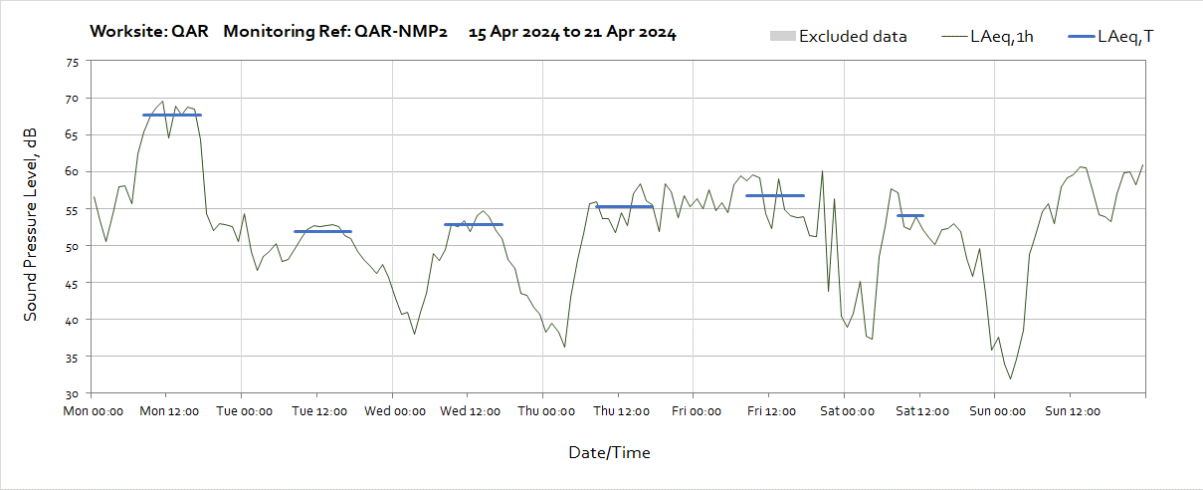




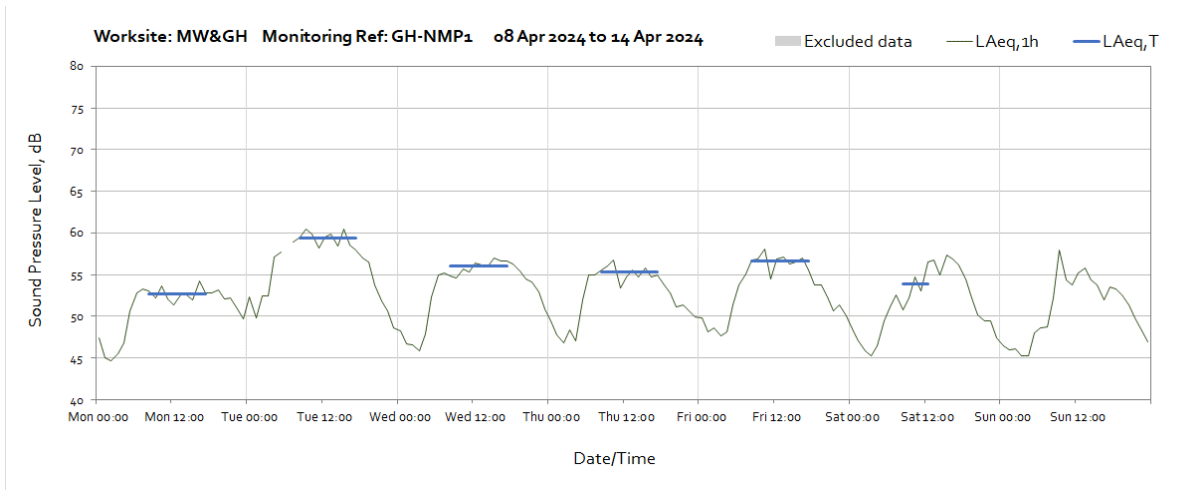
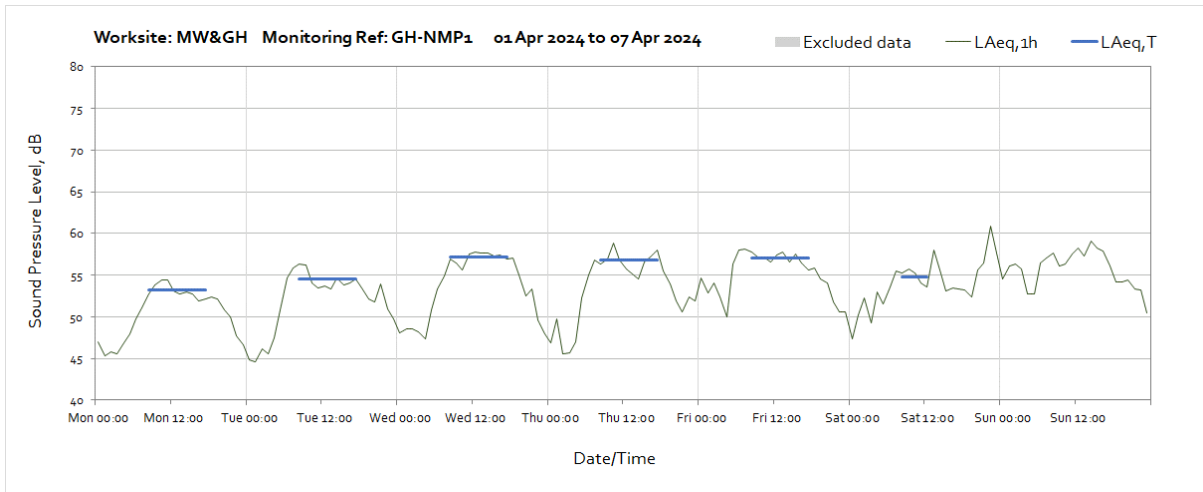


**Worksite: QAR – Monitoring Ref: QAR-NMP2**

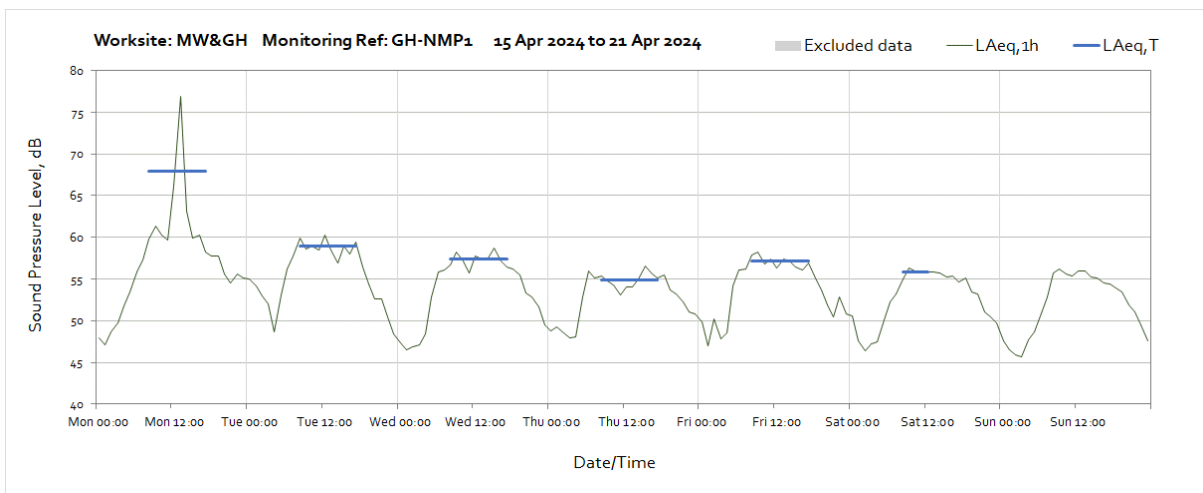


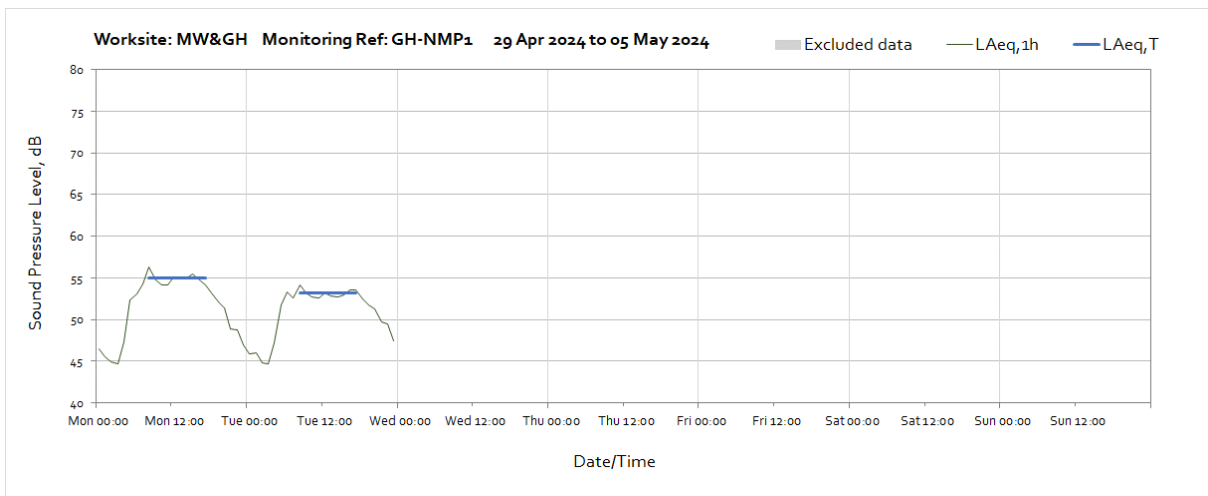
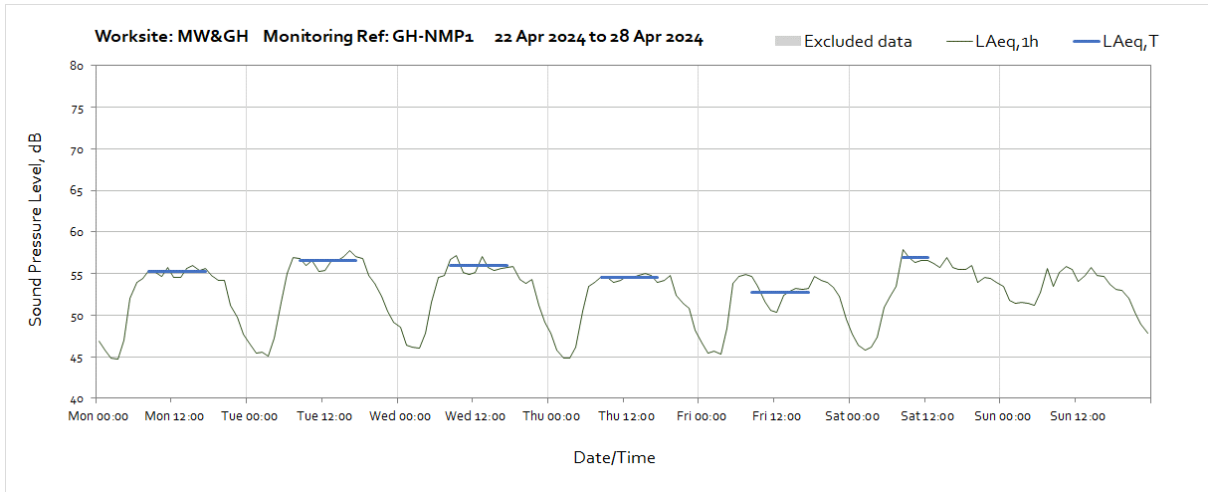


## Worksite: MW&GH – Monitoring Ref: GH-NMP1

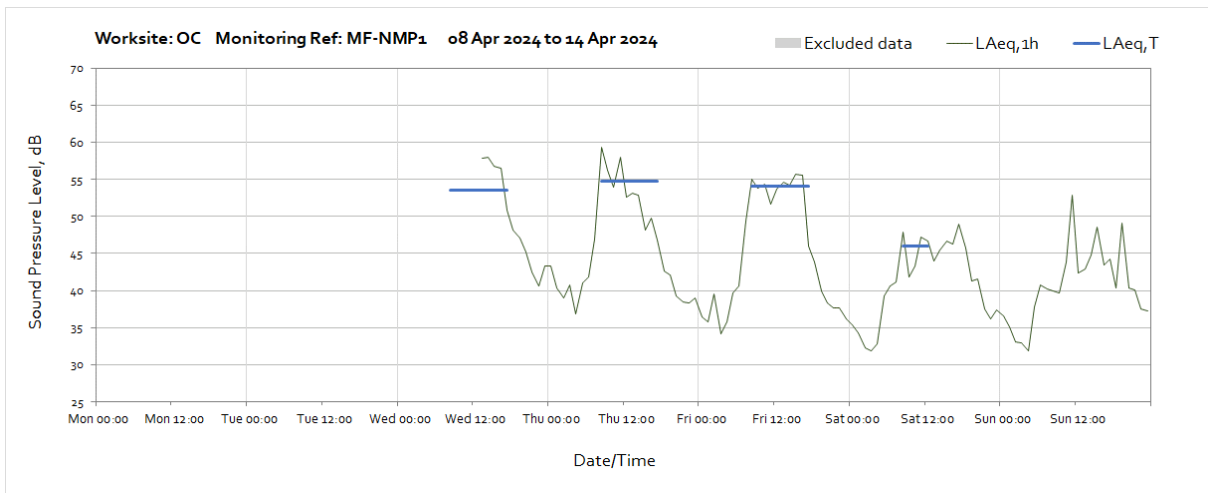


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

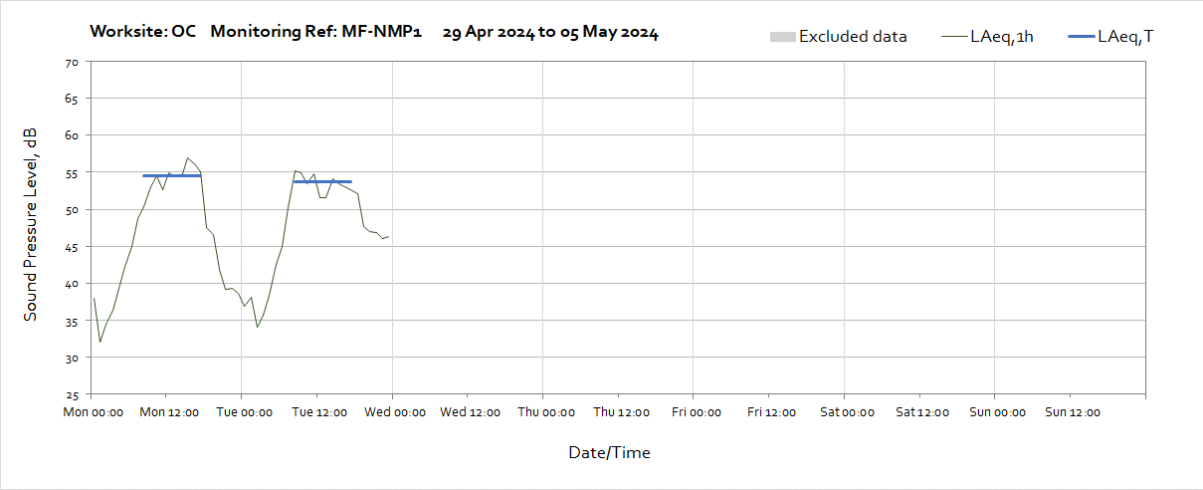
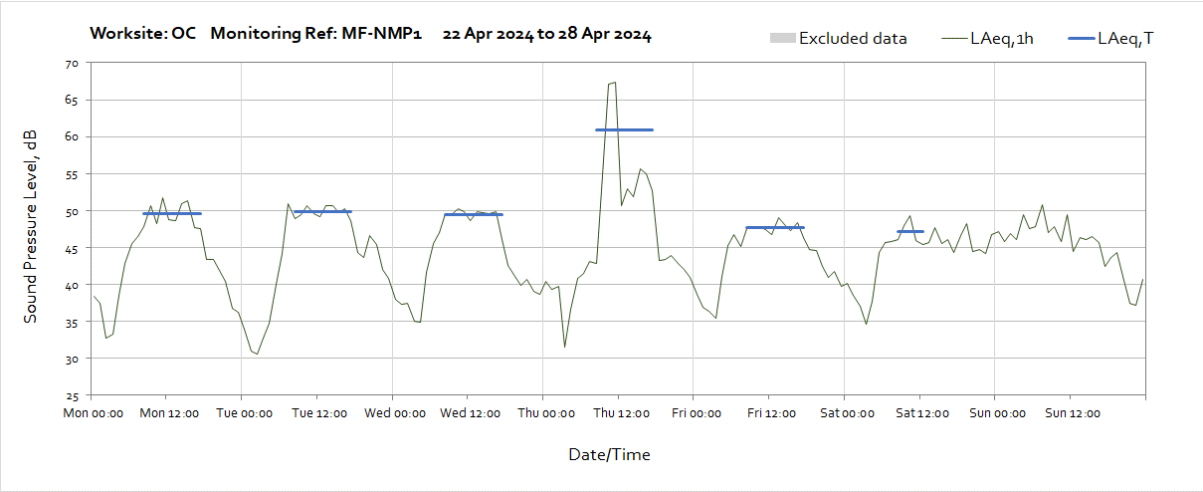
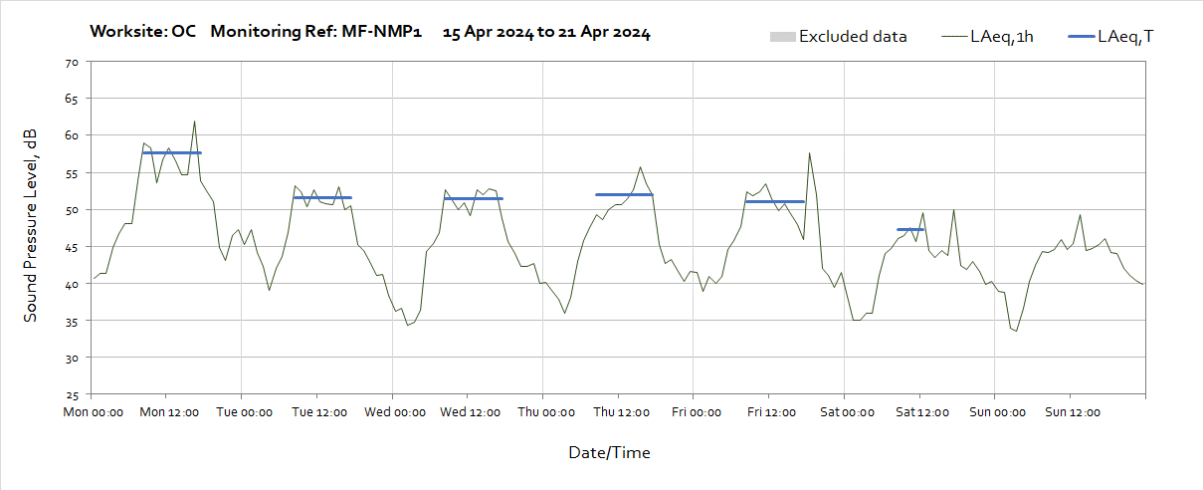




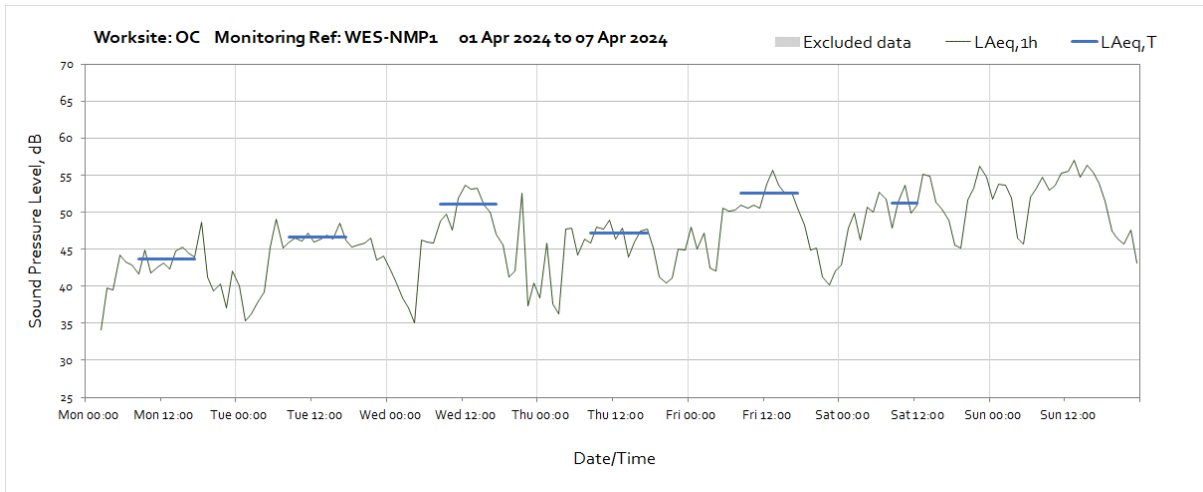
**Worksite: OC - Monitoring Ref: MF-NMP1**



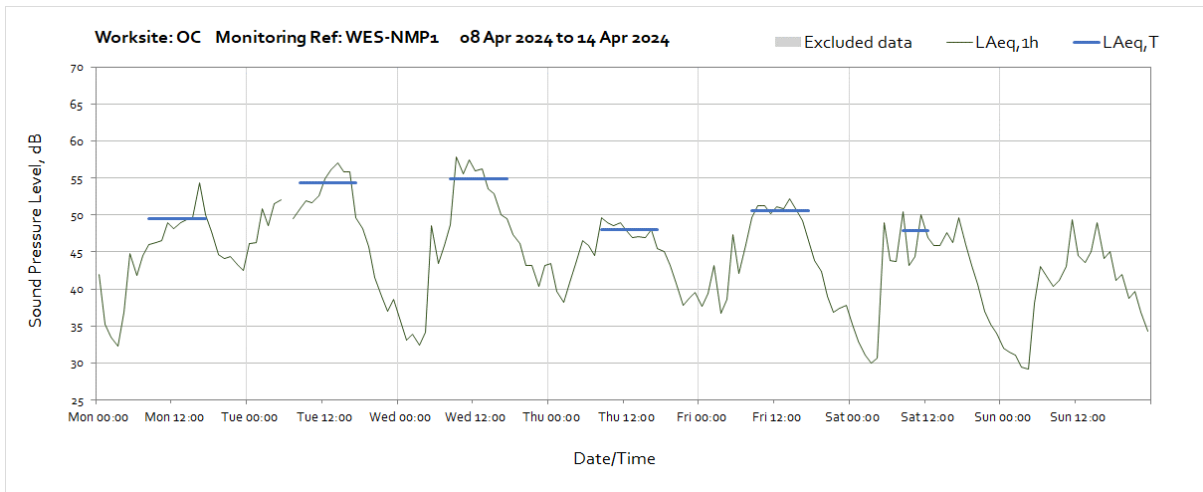
Note: Missing data from the start of the month until 13:00 on Wednesday 10<sup>th</sup> April was due to a loss of power to the monitoring station caused by poor weather conditions preventing sufficient light to reach the solar panel.



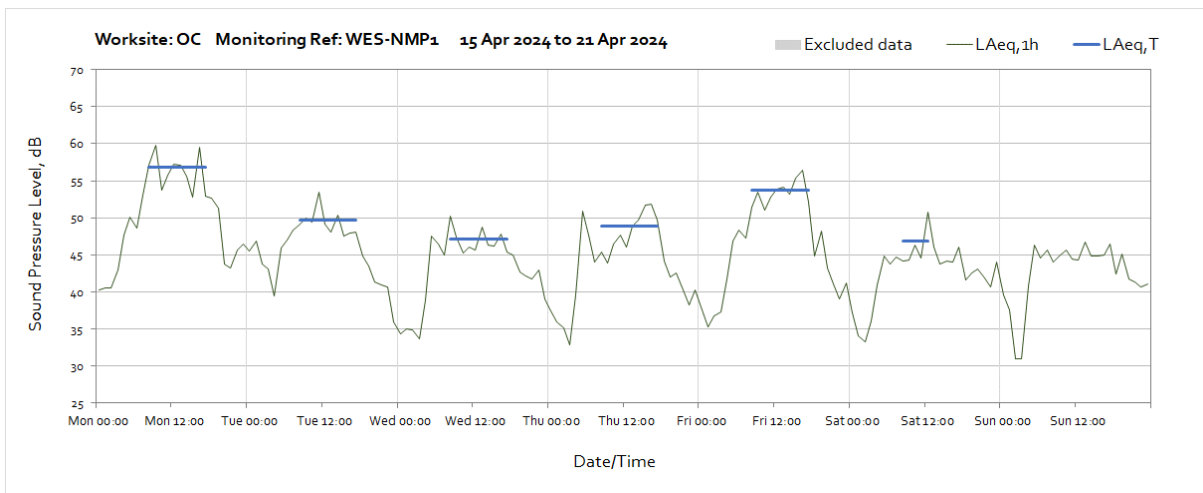
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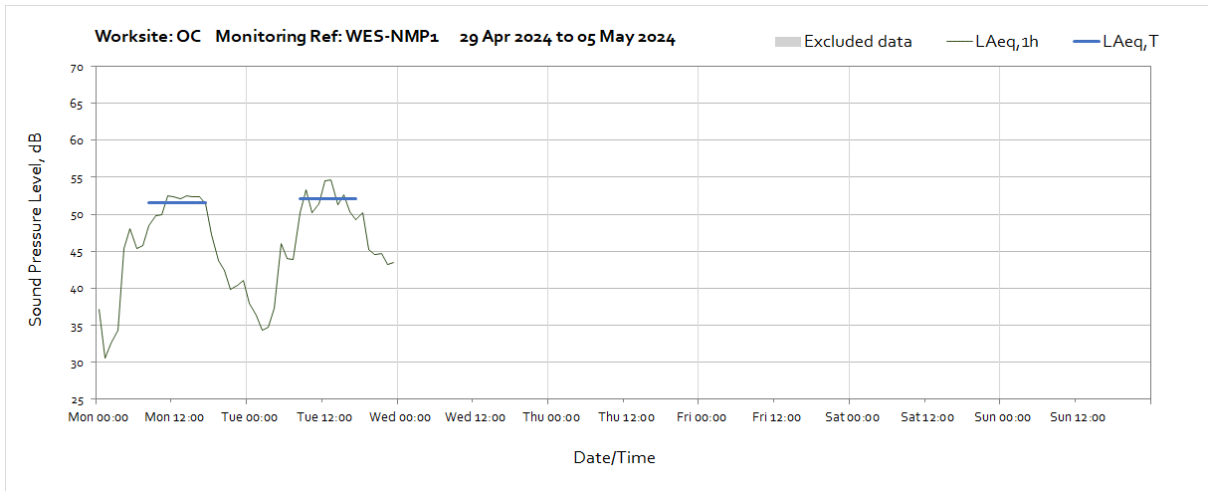
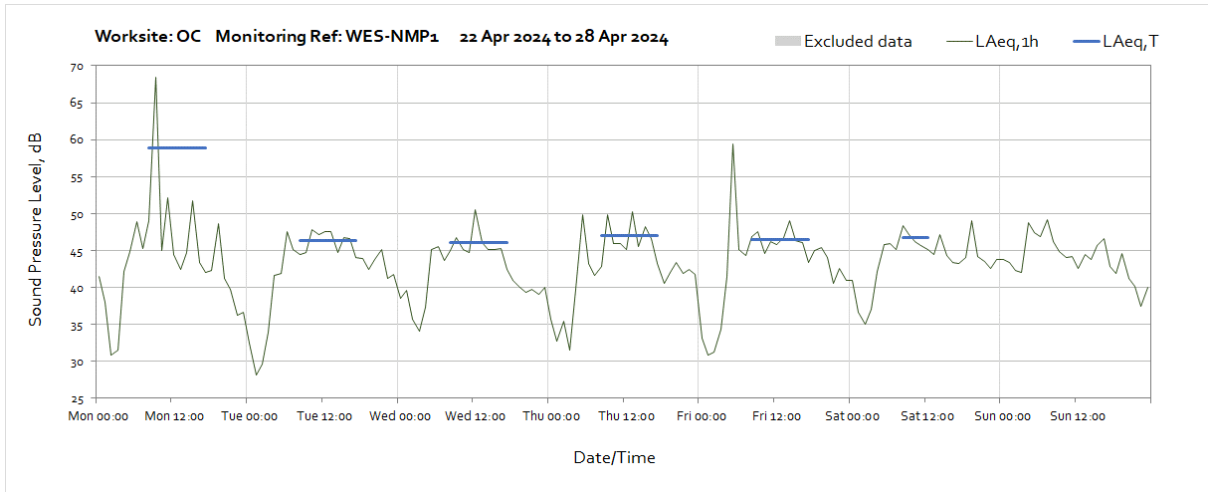
Note: Missing data between 01:00 and 02:00 on Monday 1<sup>st</sup> April was due to an error with connection to the data storage.



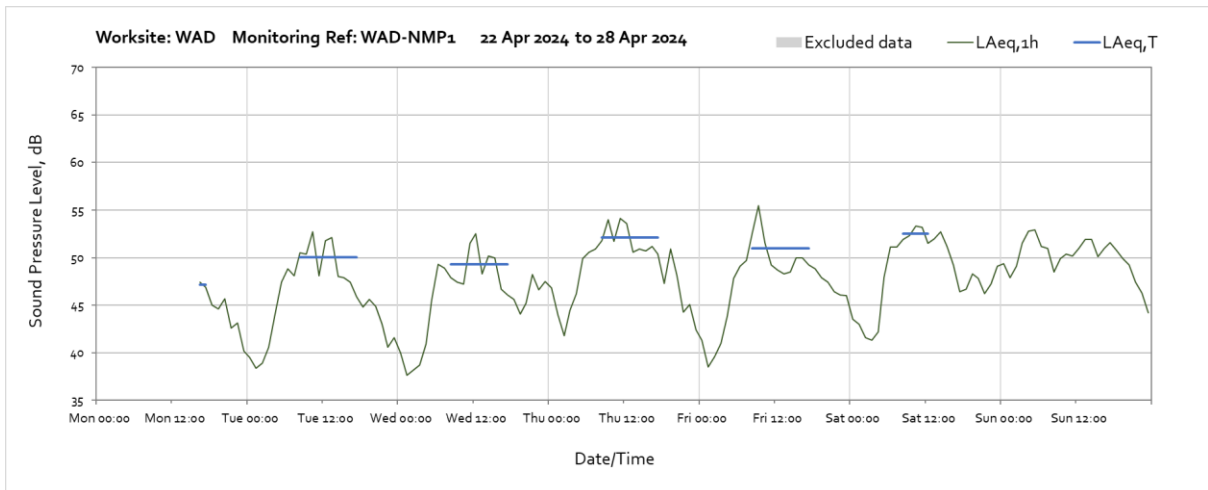
Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.



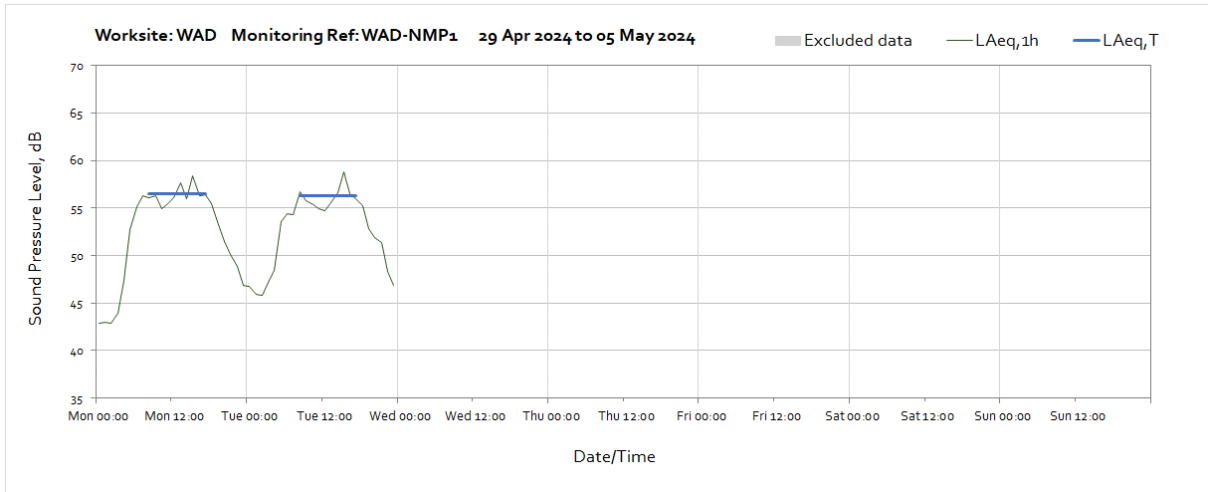




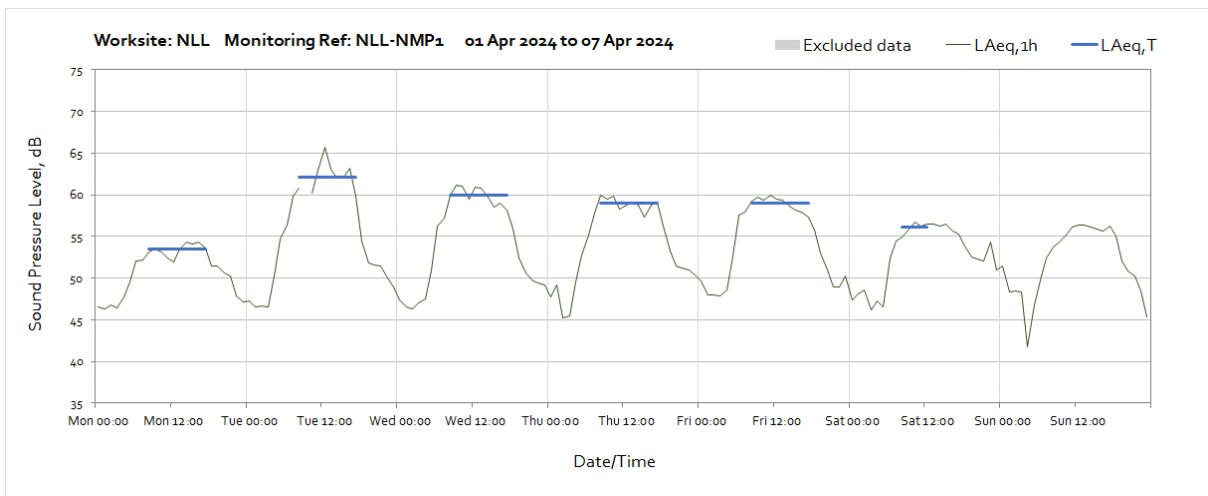
**Worksite: WAD – Monitoring Ref: WAD-NMP1**



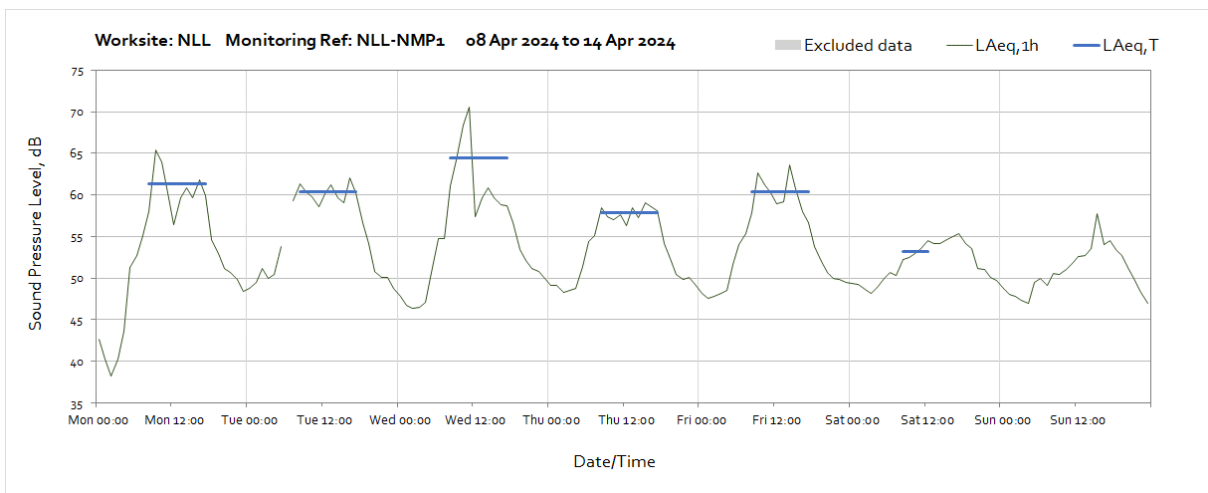
Note: Monitor was installed at 16:00 on Monday 22<sup>nd</sup> April.



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

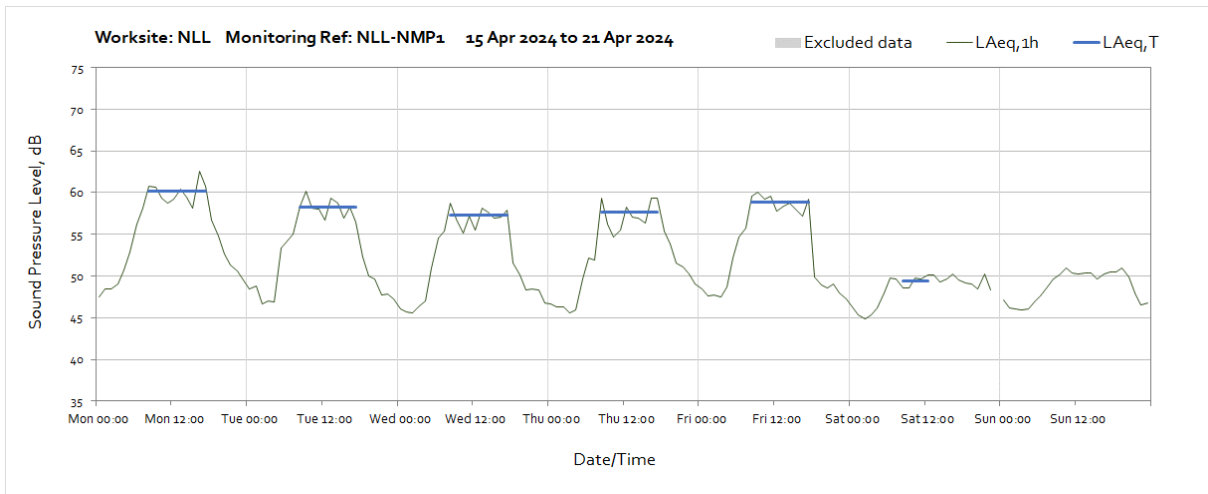


Note: Missing data between 09:00 and 10:00 on Tuesday 2<sup>nd</sup> April was due to an error with connection to the data storage.

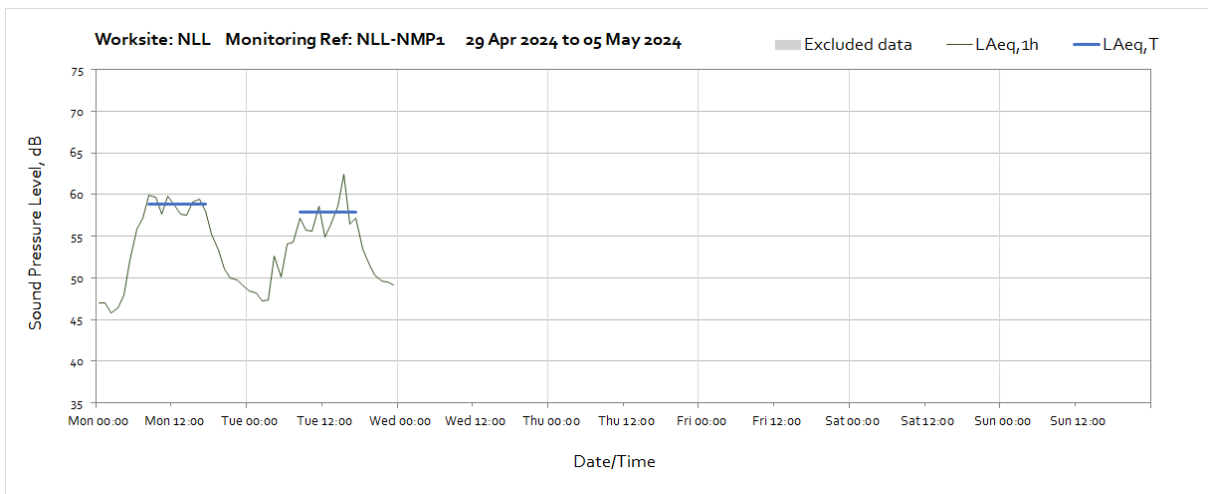
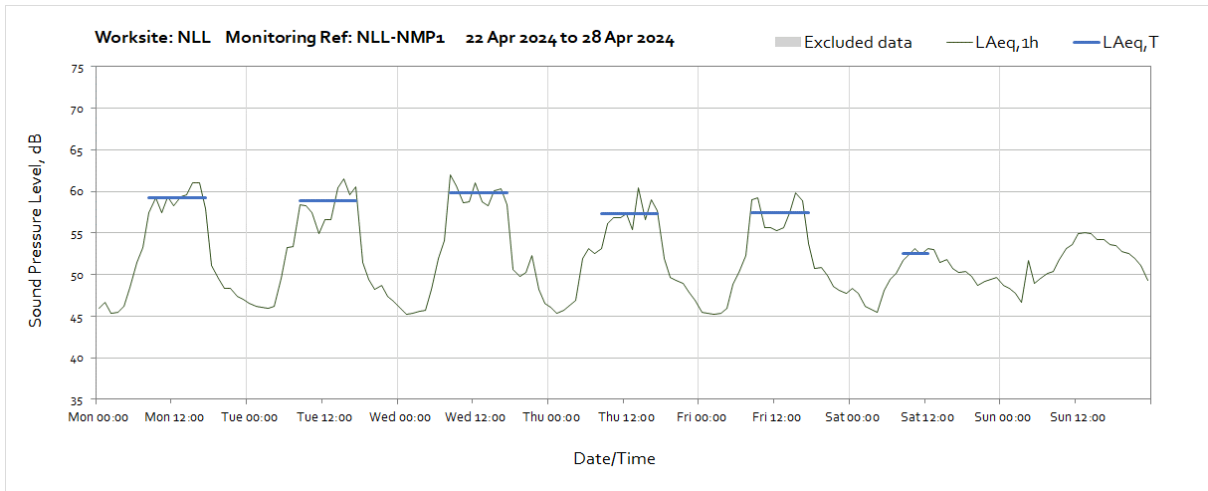


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

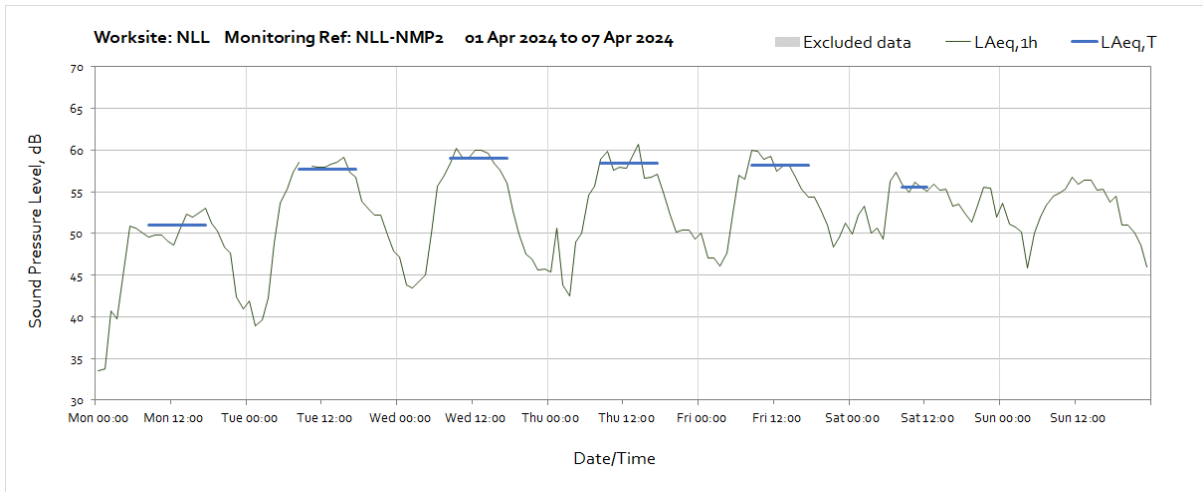
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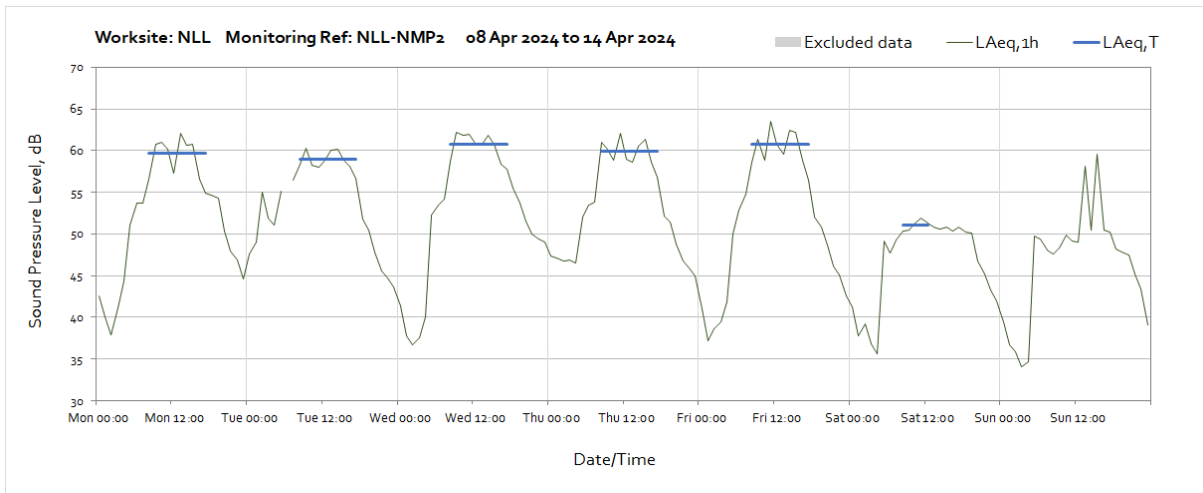
Note: Missing data between 23:00 and 00:00 on Saturday 20<sup>th</sup> April was due to an error with connection to the data storage.



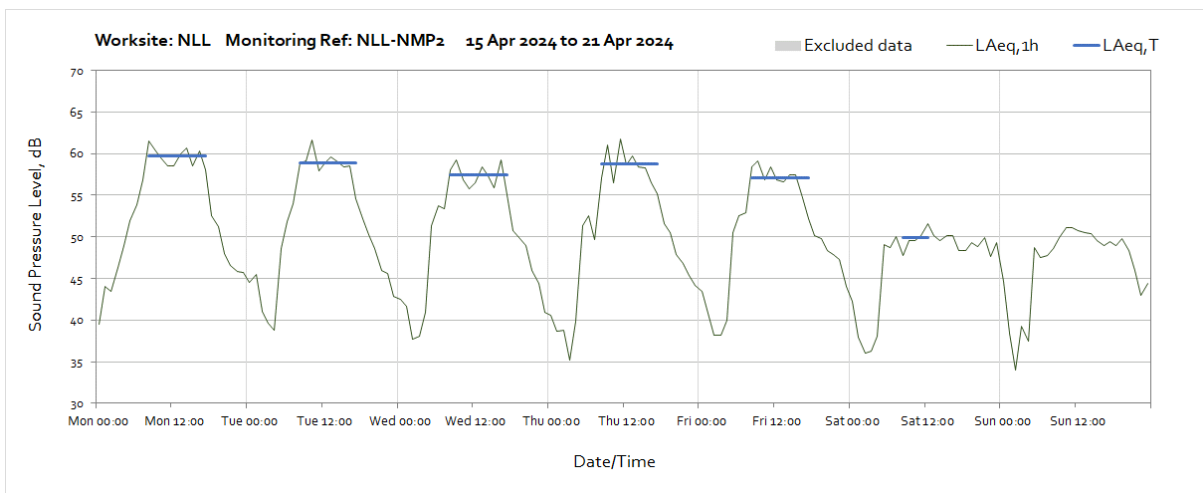
## Worksite: NLL – Monitoring Ref: NLL-NMP2



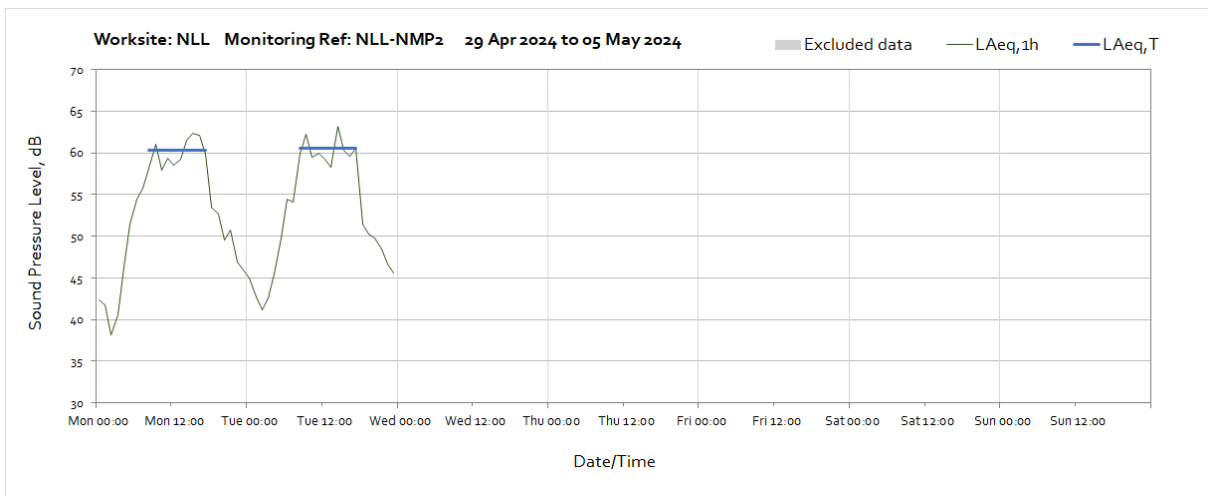
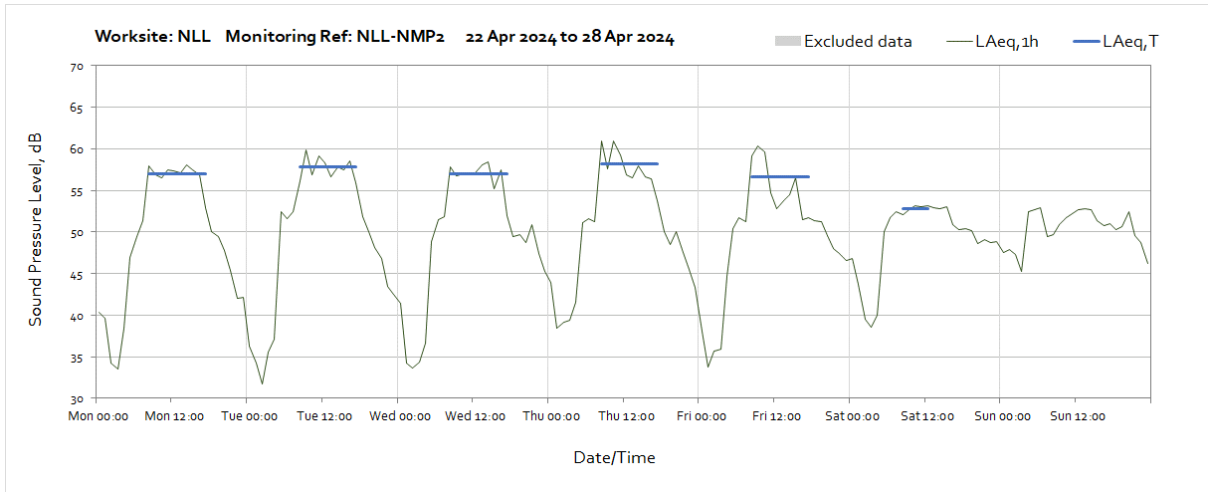
Note: Missing data between 09:00 and 10:00 on Tuesday 2<sup>nd</sup> April was due to an error with connection to the data storage.



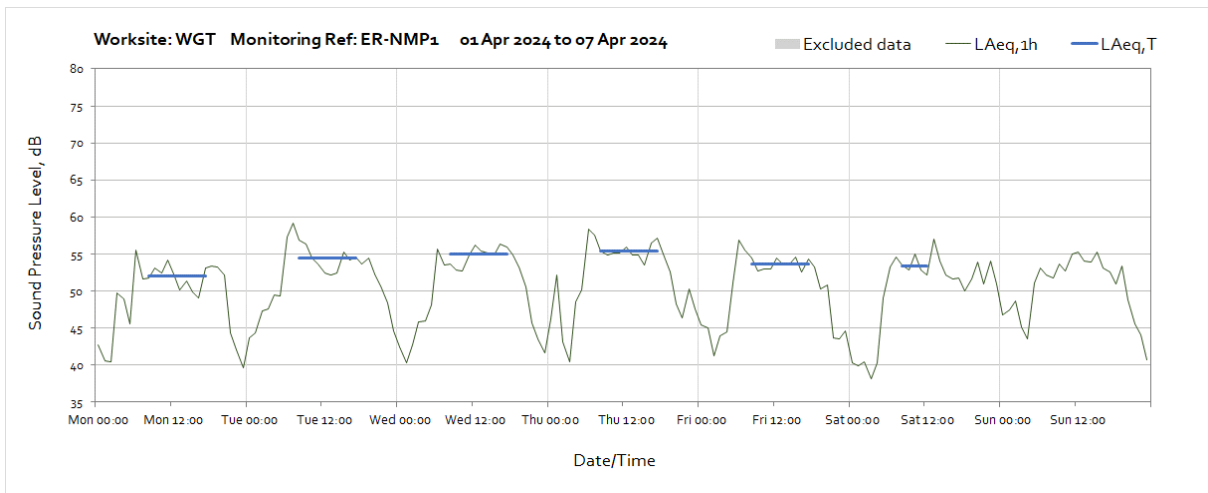
Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

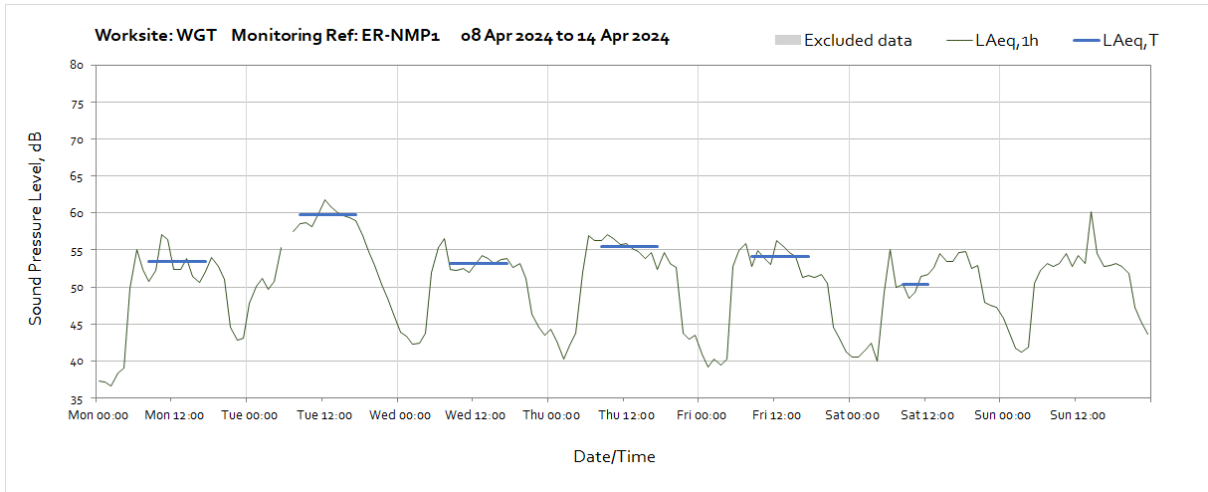


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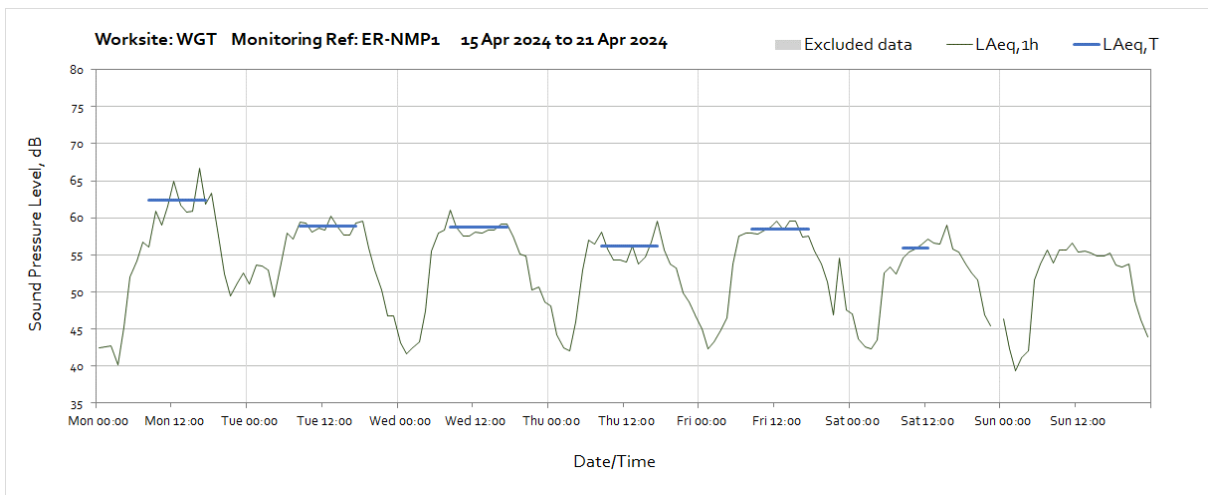


**Worksite: WGT - Monitoring Ref: ER-NMP1**

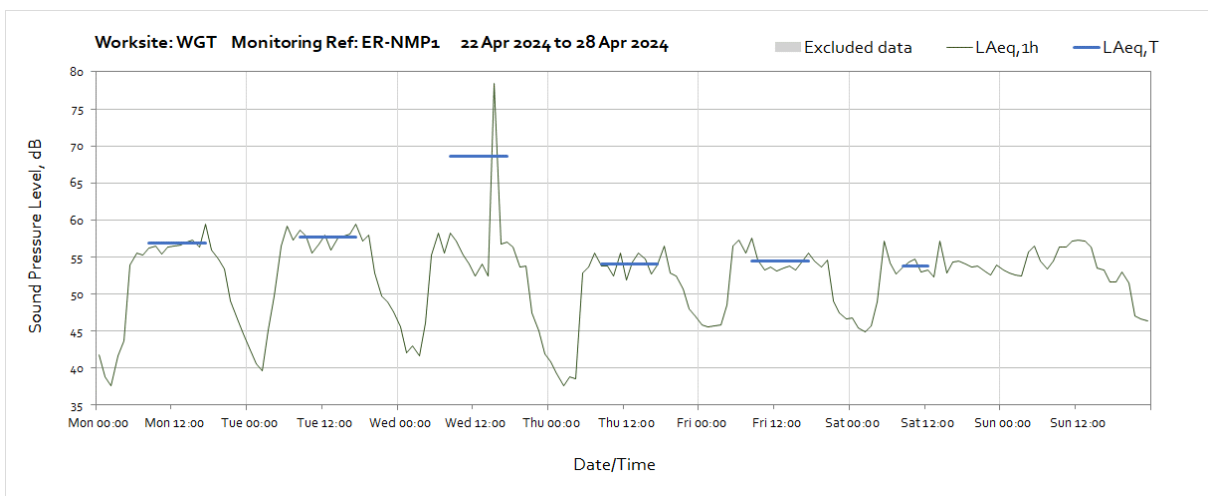


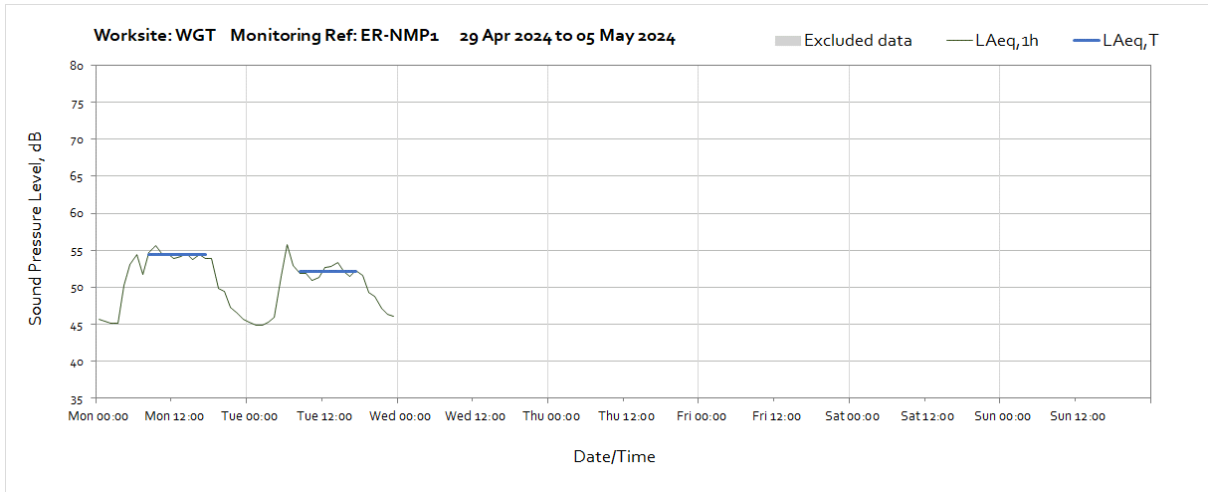


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

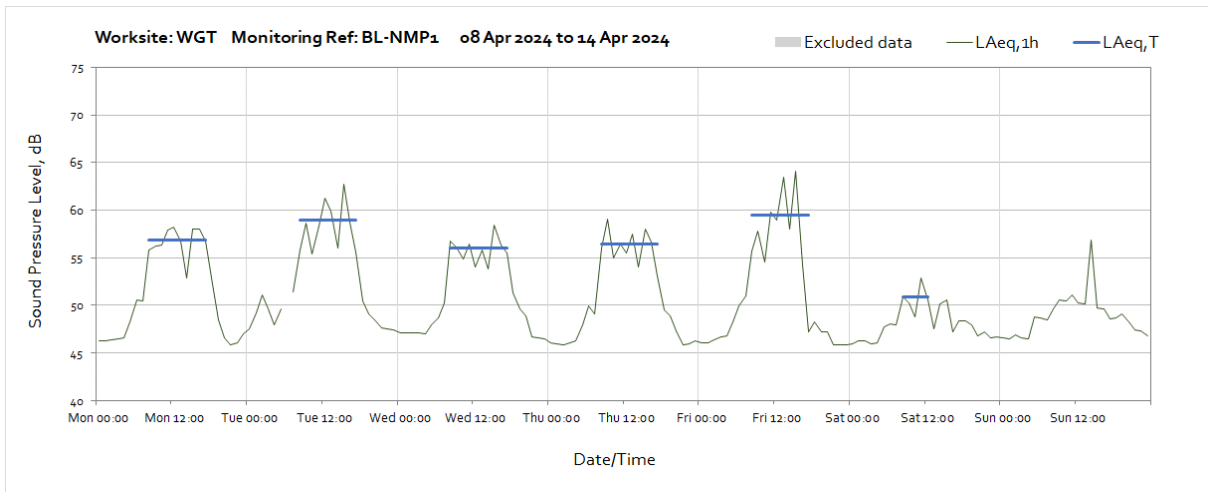
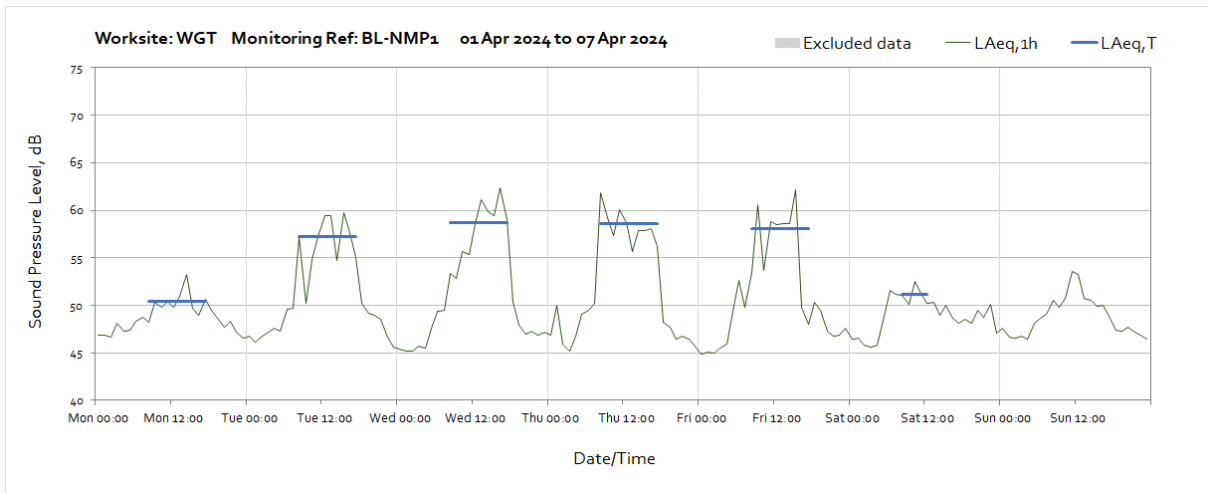


Note: Missing data between 23:00 on Saturday 20<sup>th</sup> and 00:00 on Sunday 21<sup>st</sup> April was due to an error with connection to the data storage.

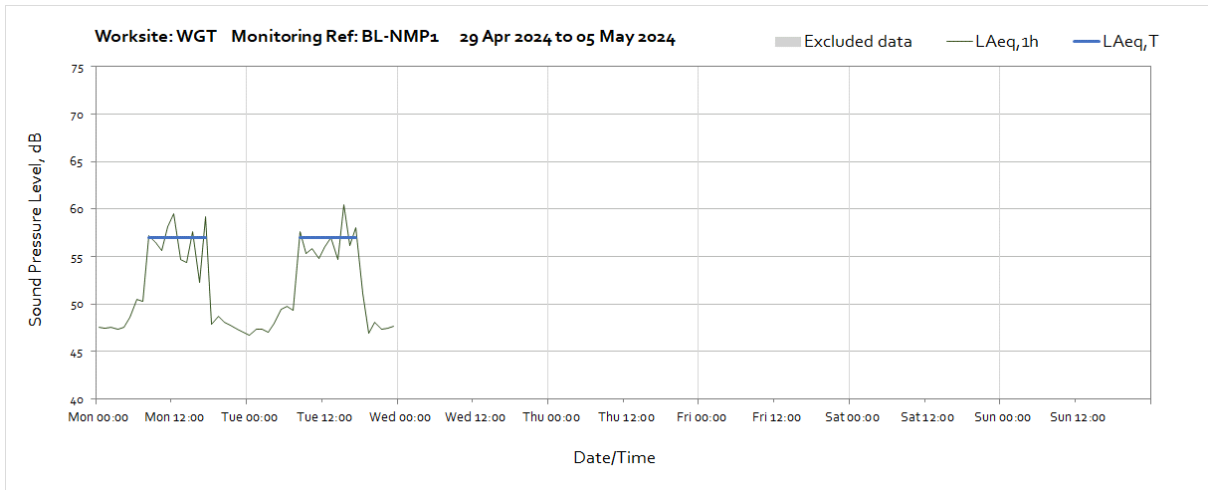
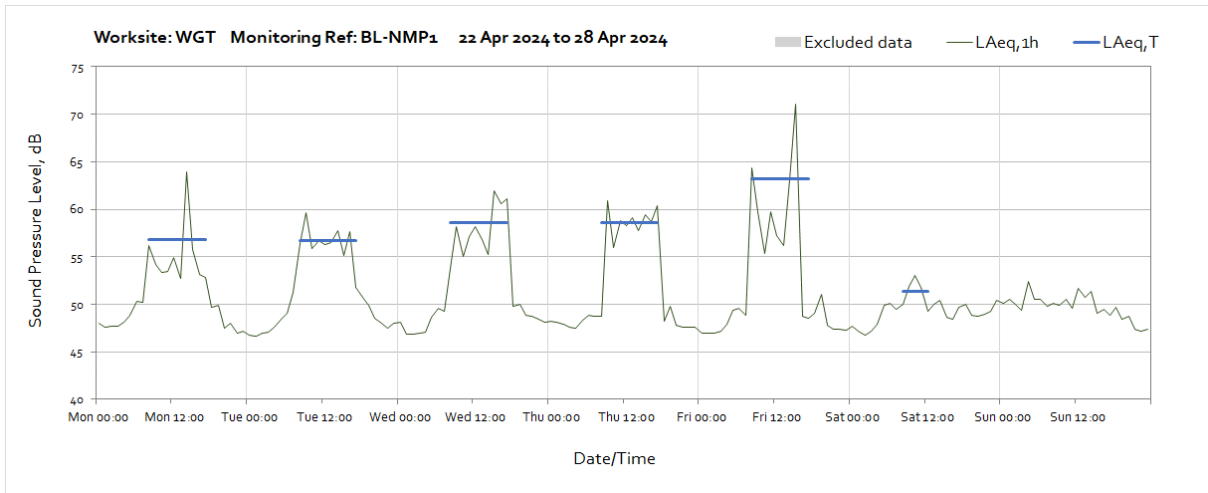
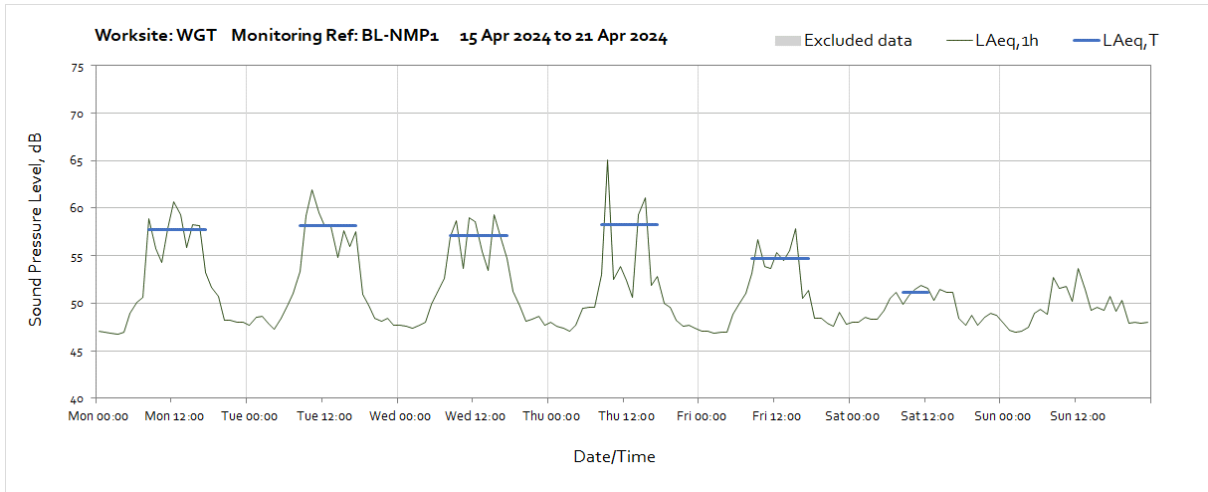




**Worksite: WGT - Monitoring Ref: BL-NMP1**

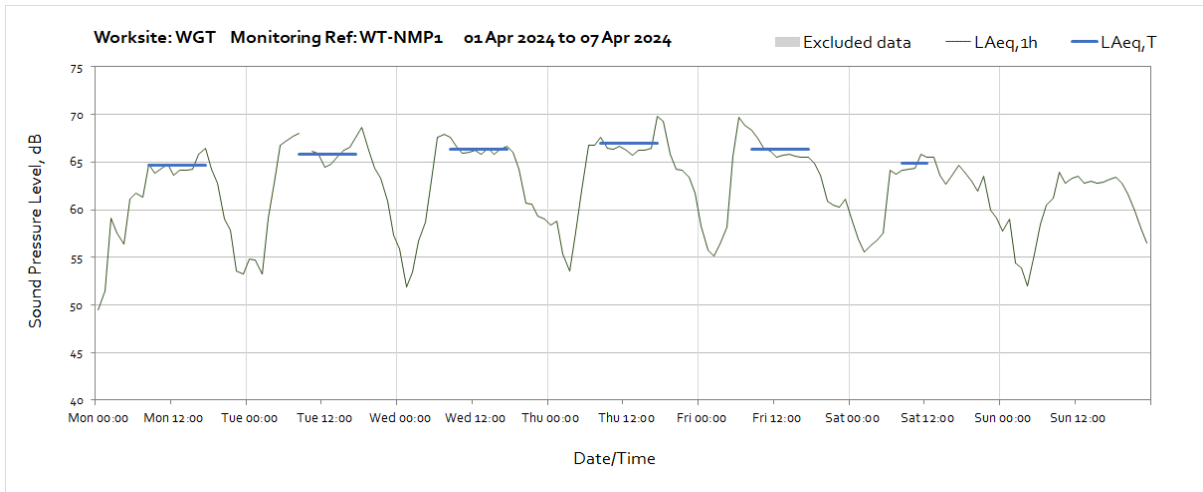


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

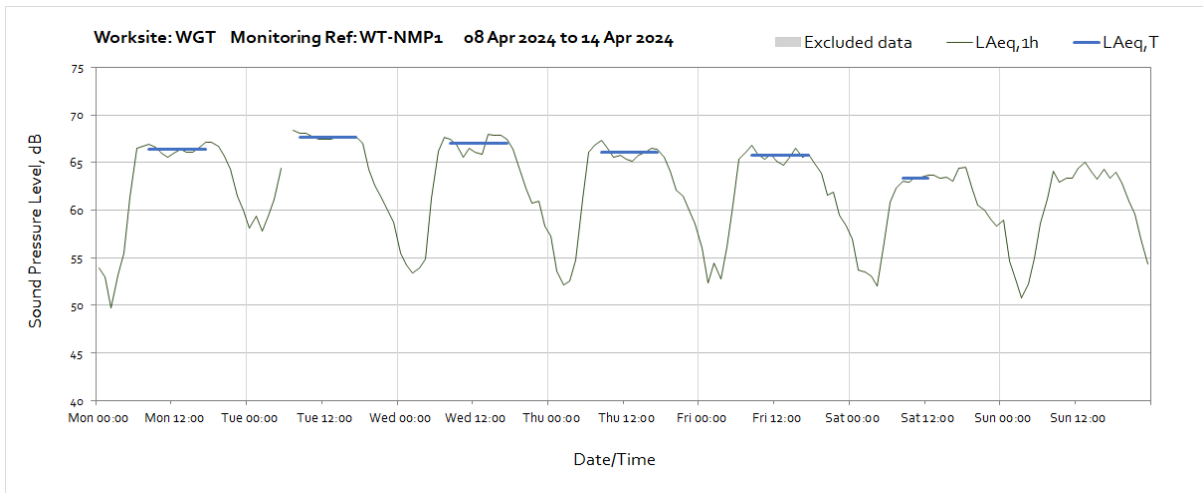




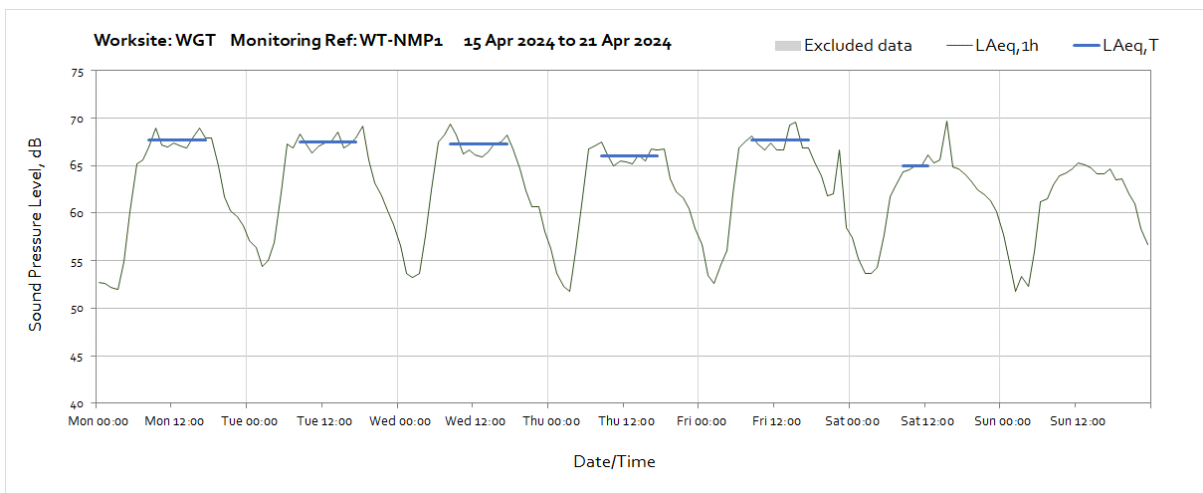
## Worksite: WGT – Monitoring Ref: WT-NMP1



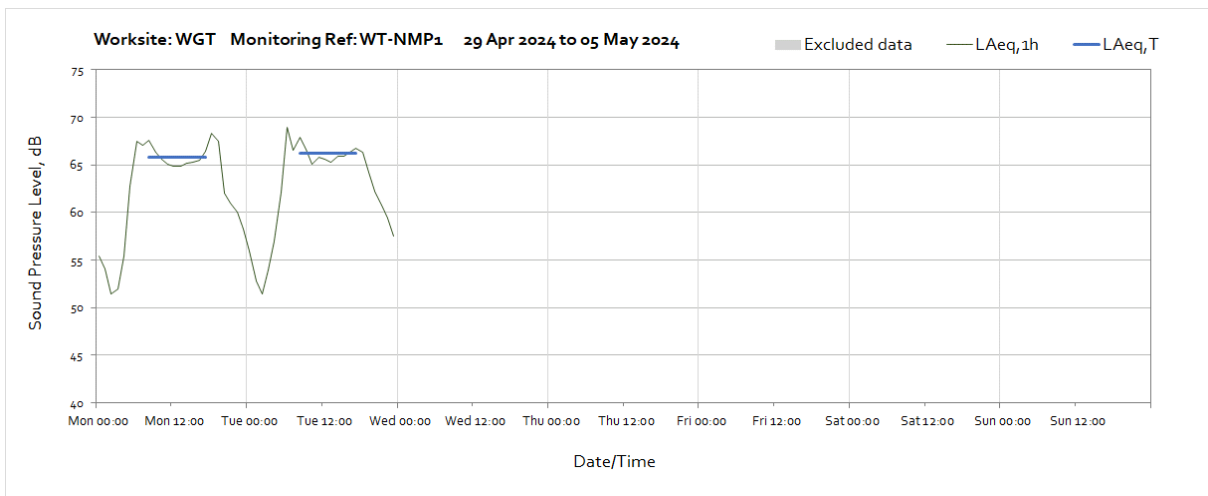
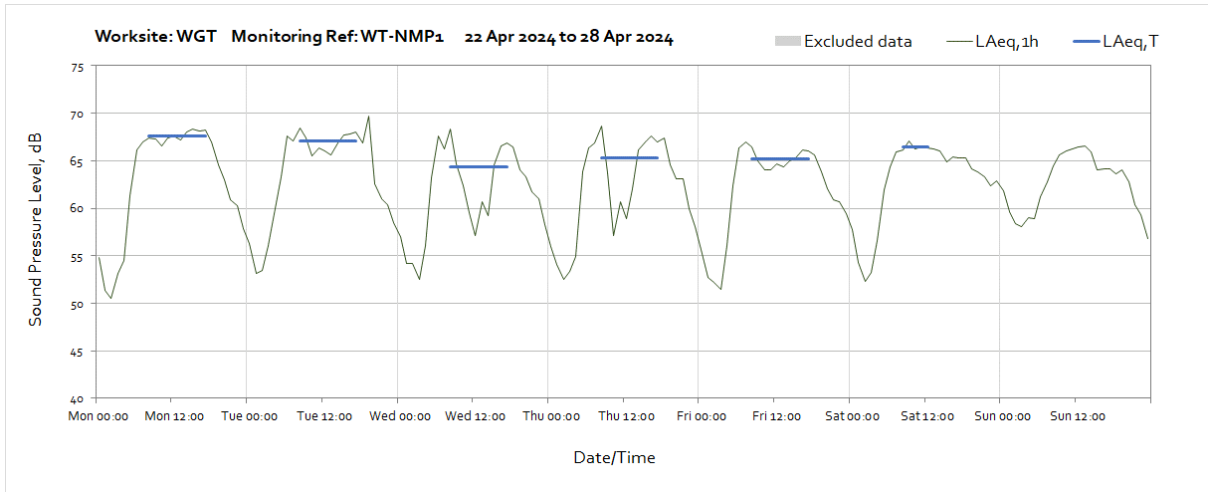
Note: Missing data between 09:00 and 10:00 on Tuesday 2<sup>nd</sup> April was due to an error with connection to the data storage.



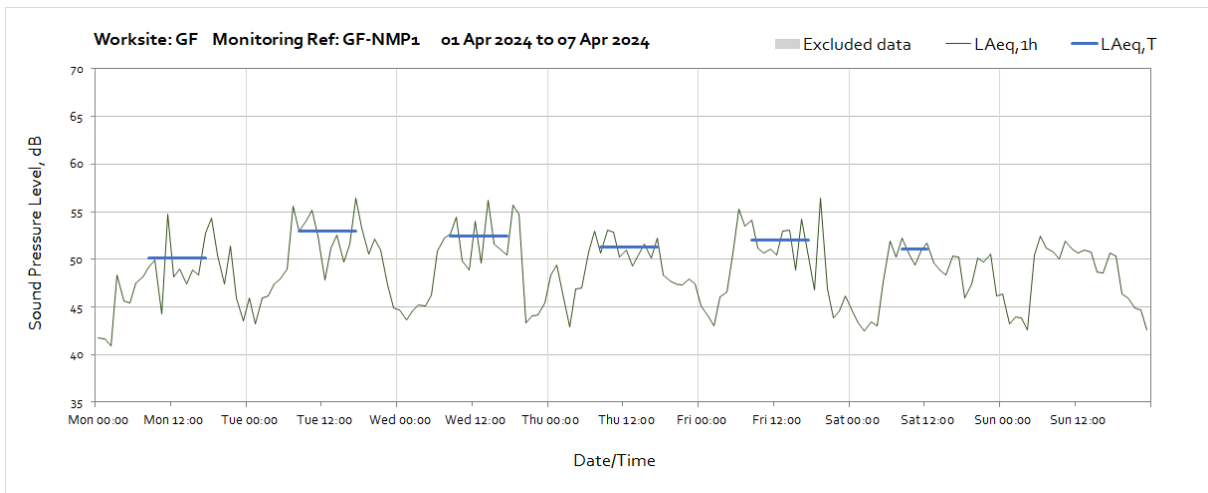
Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

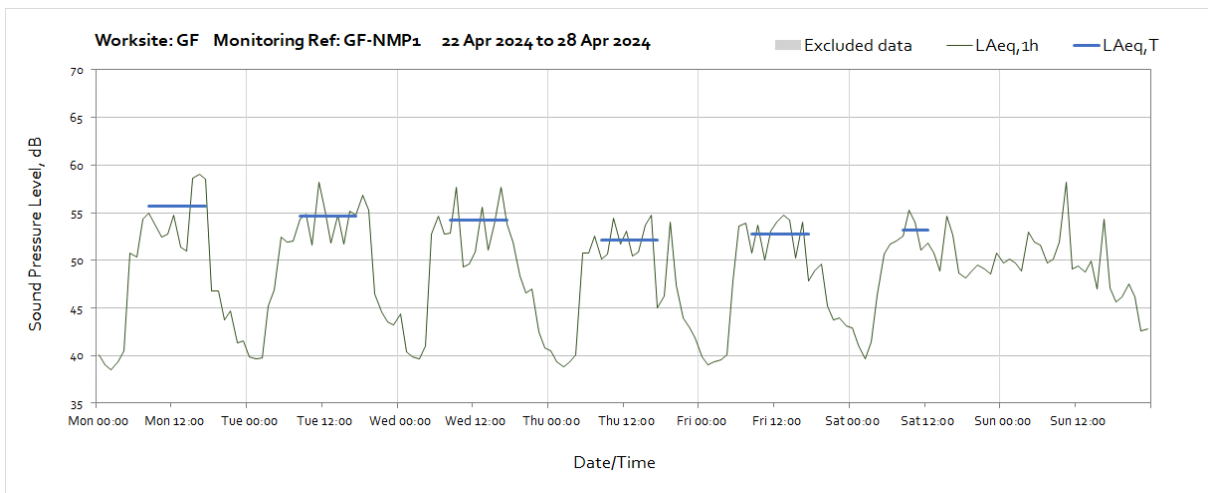
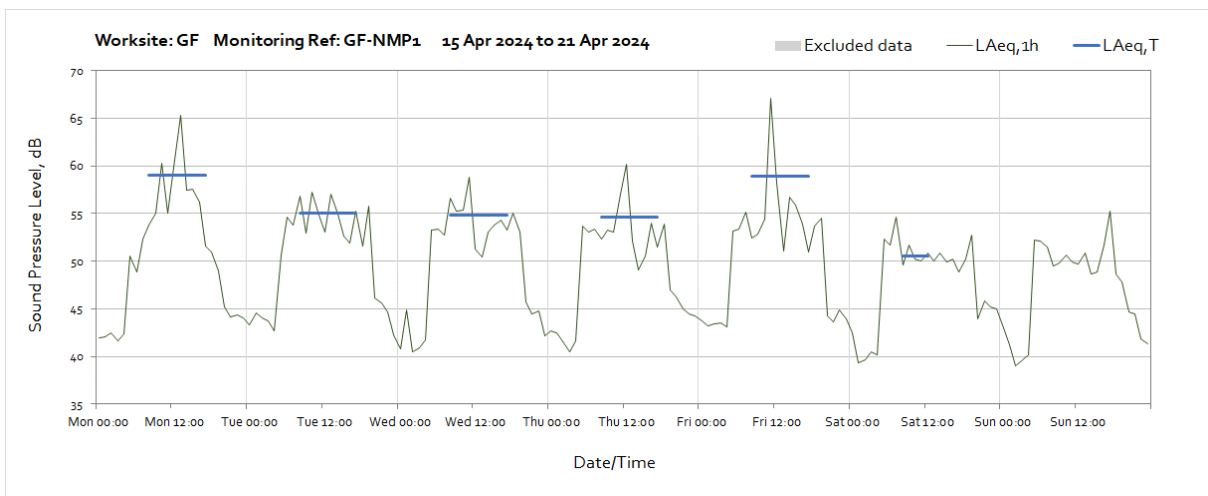
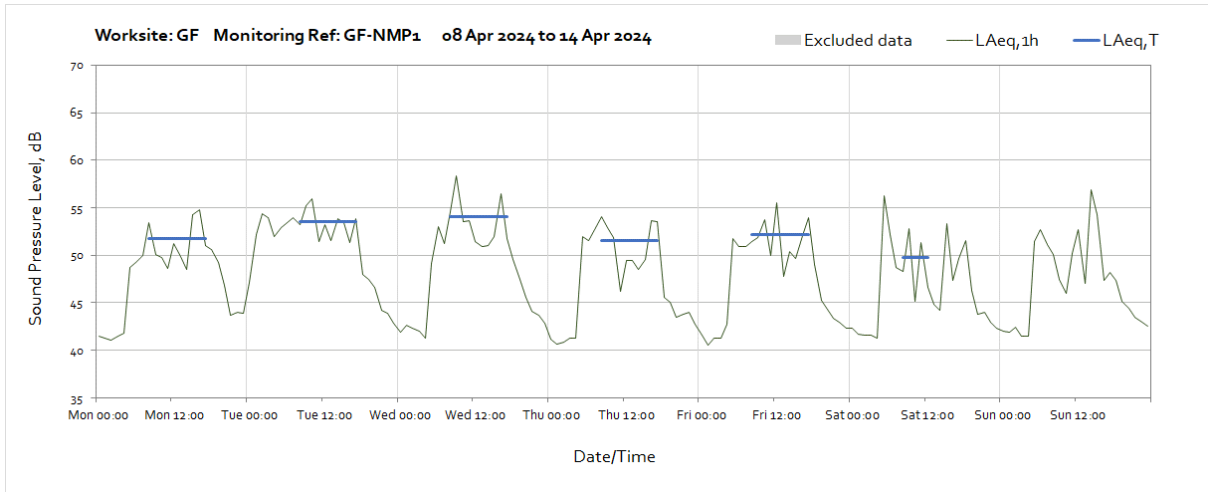


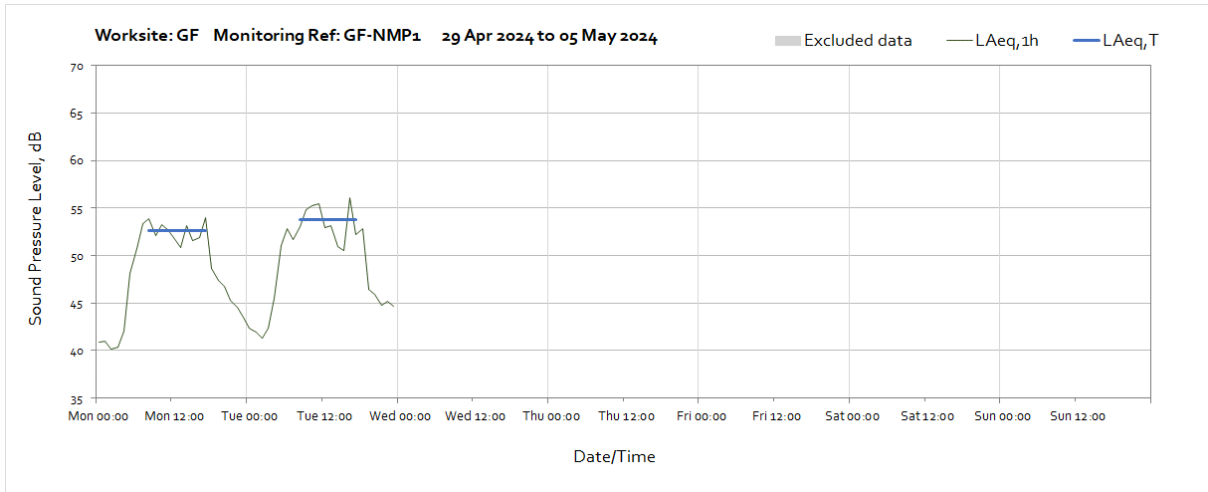
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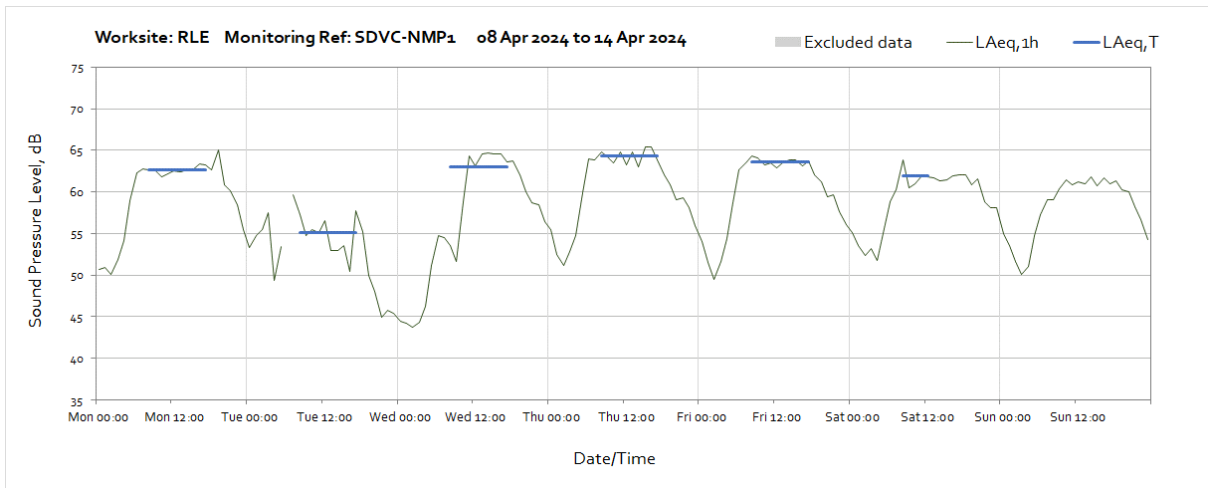
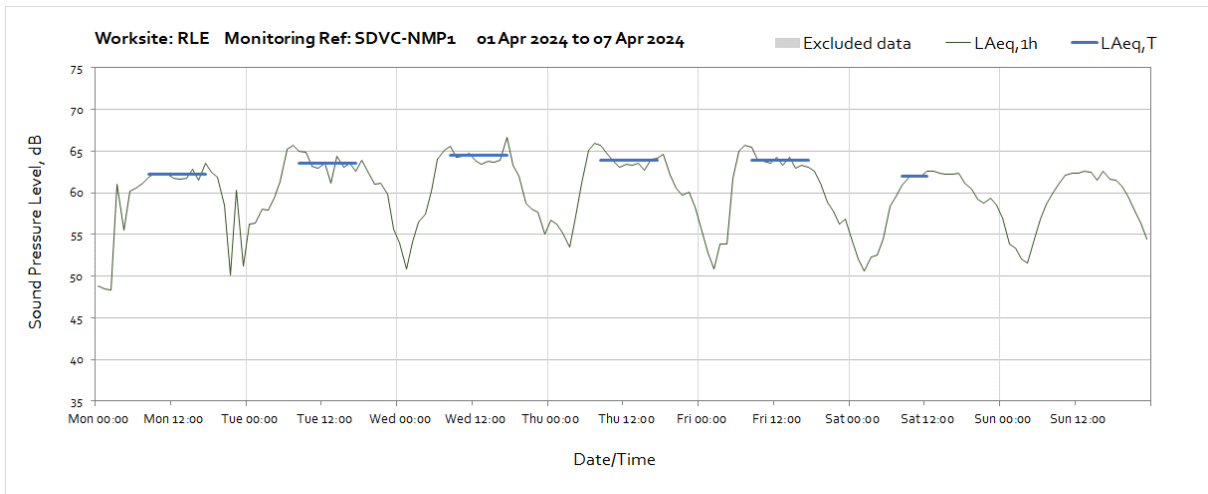
**Worksite: GF – Monitoring Ref: GF-NMP1**





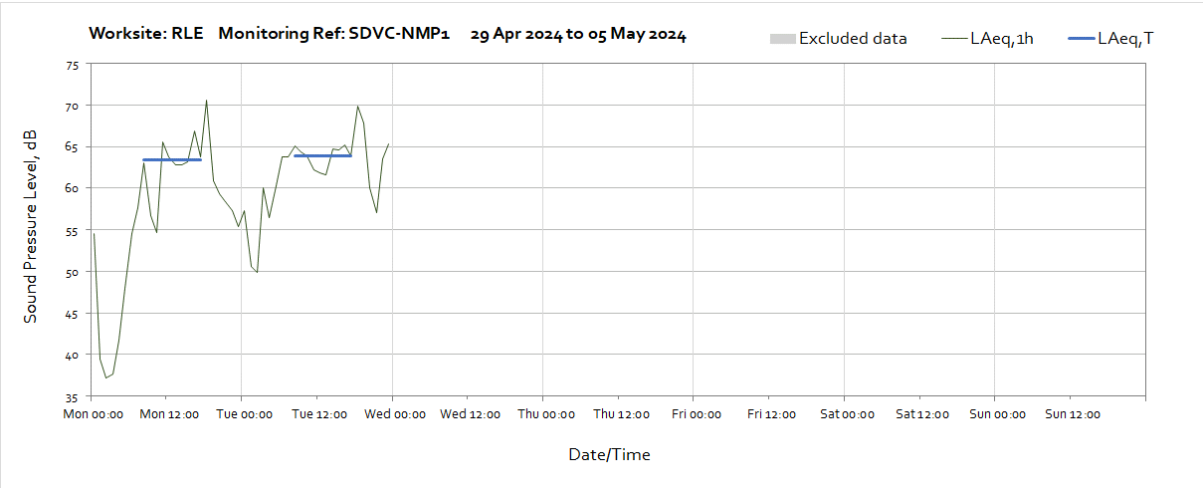
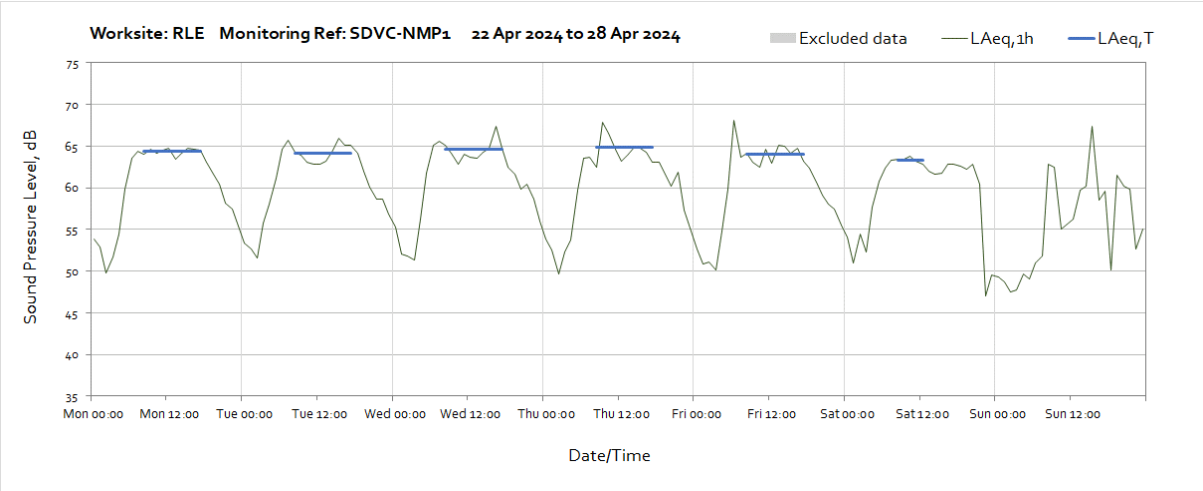
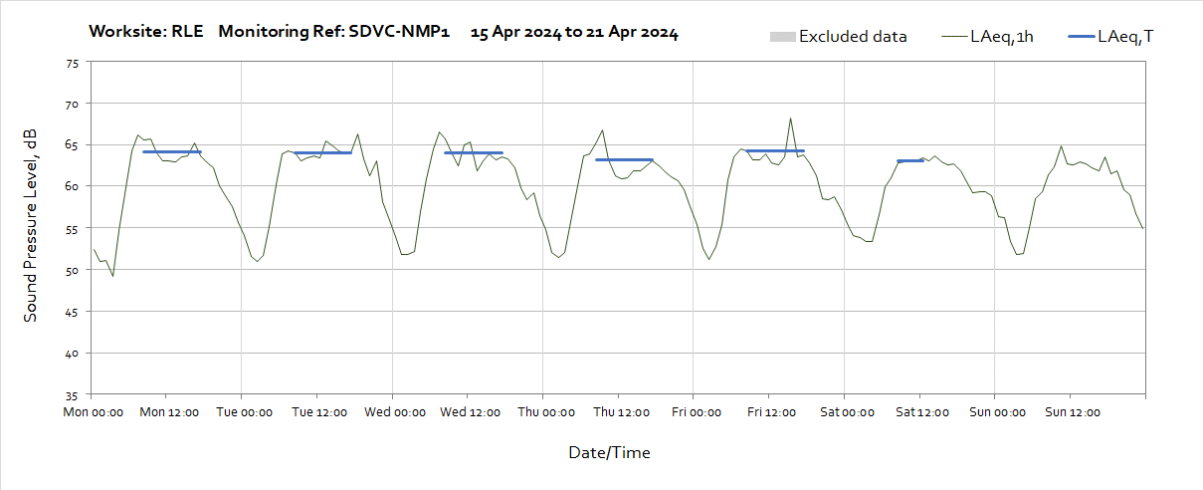


**Worksite: RLE – Monitoring Ref: SDVC-NMP1**

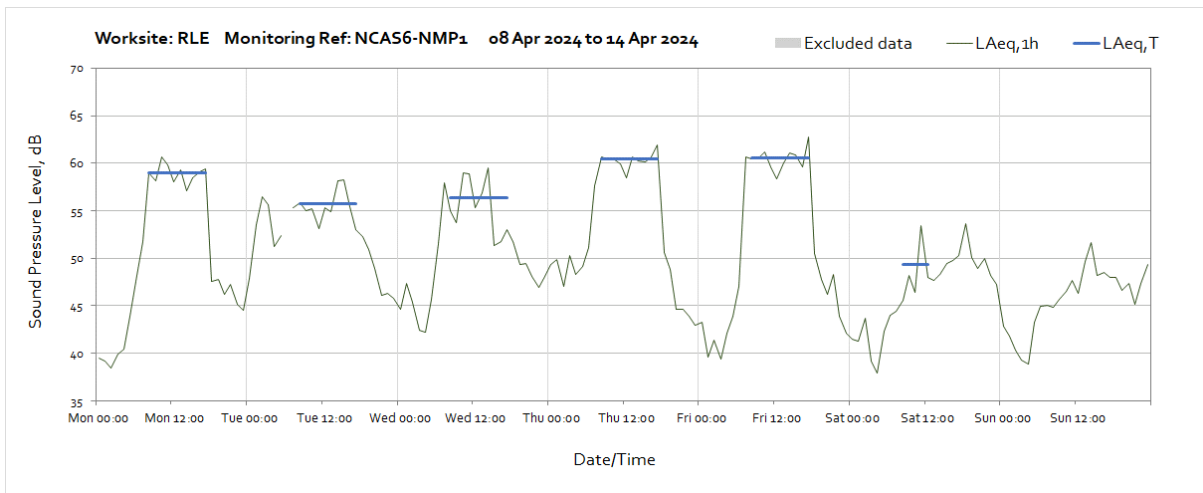
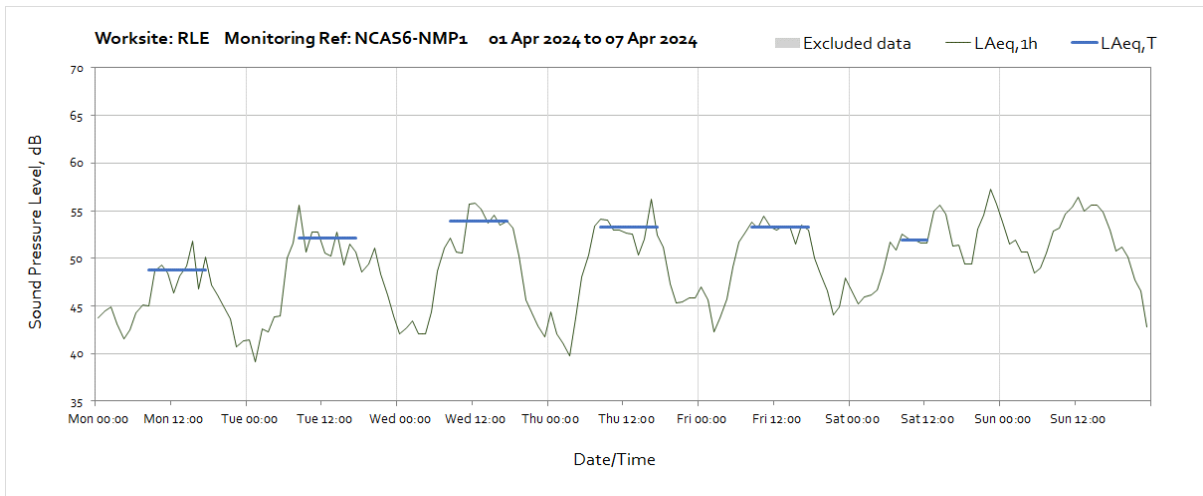


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

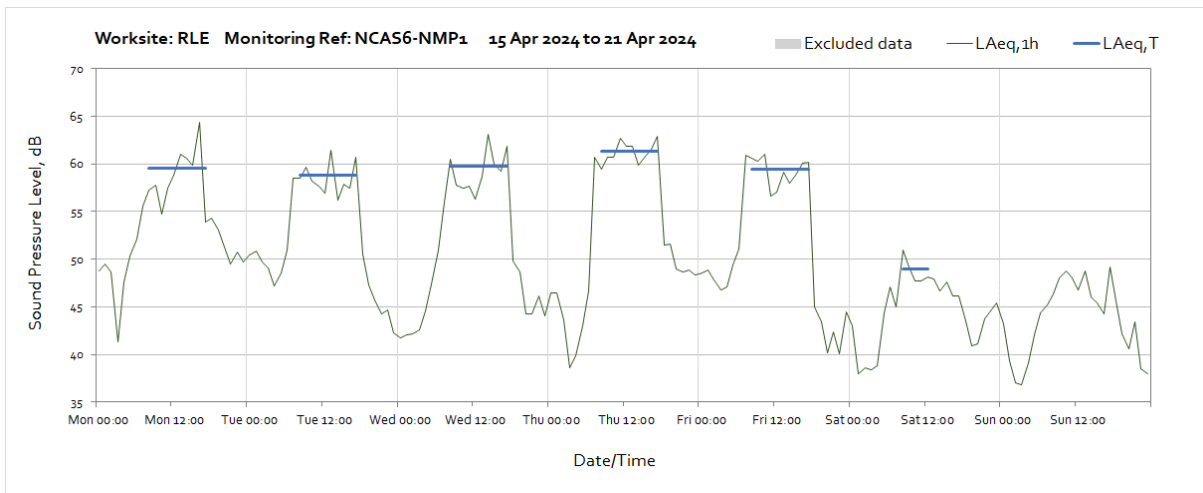
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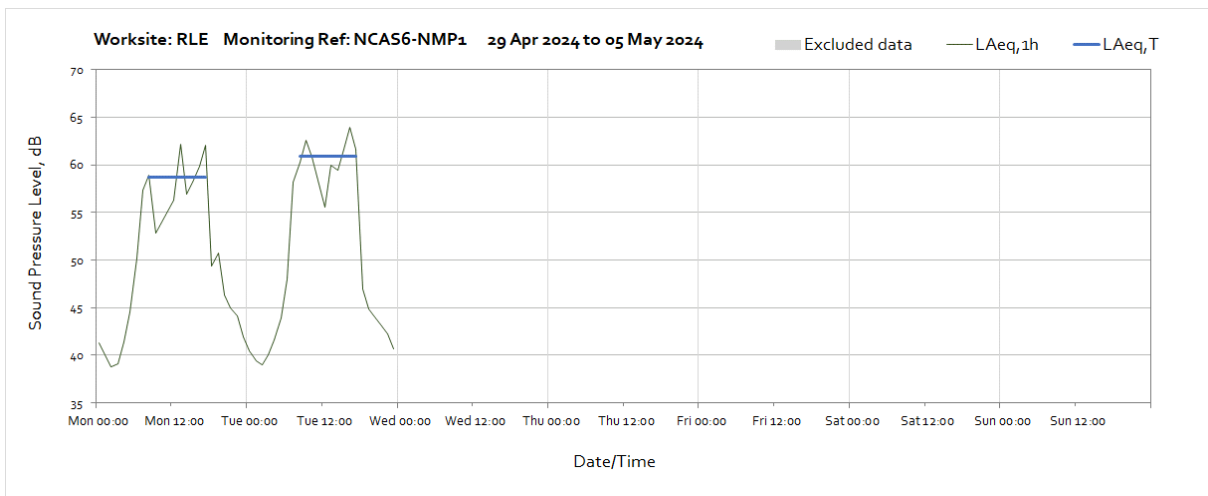
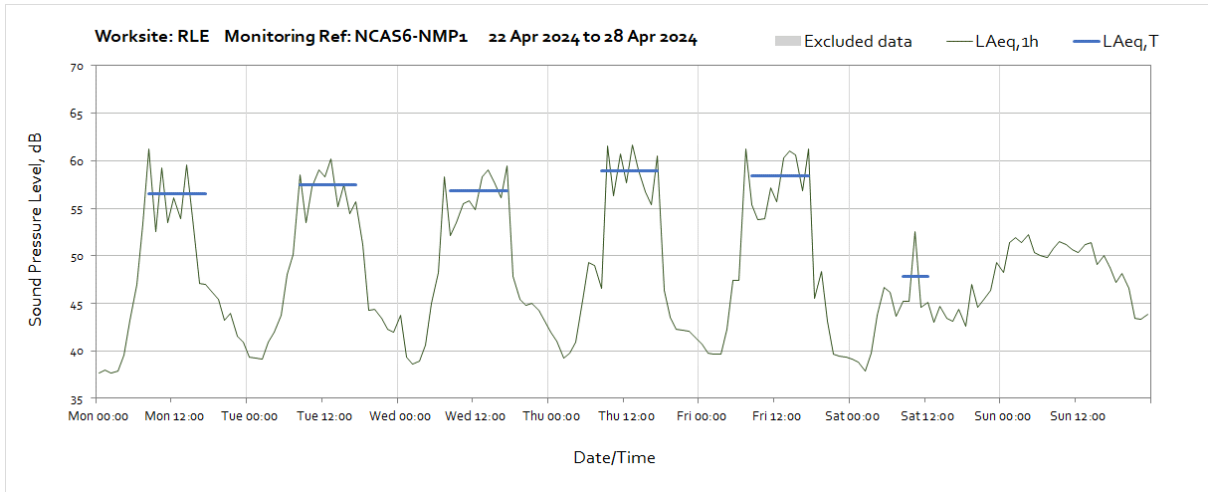


## Worksite: RLE – Monitoring Ref: NCAS6-NMP1

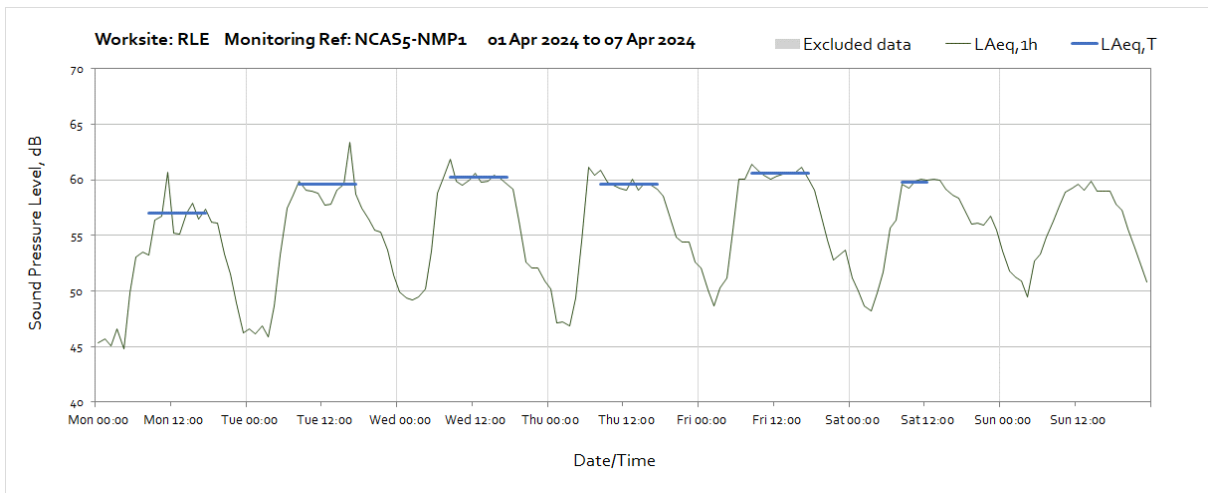


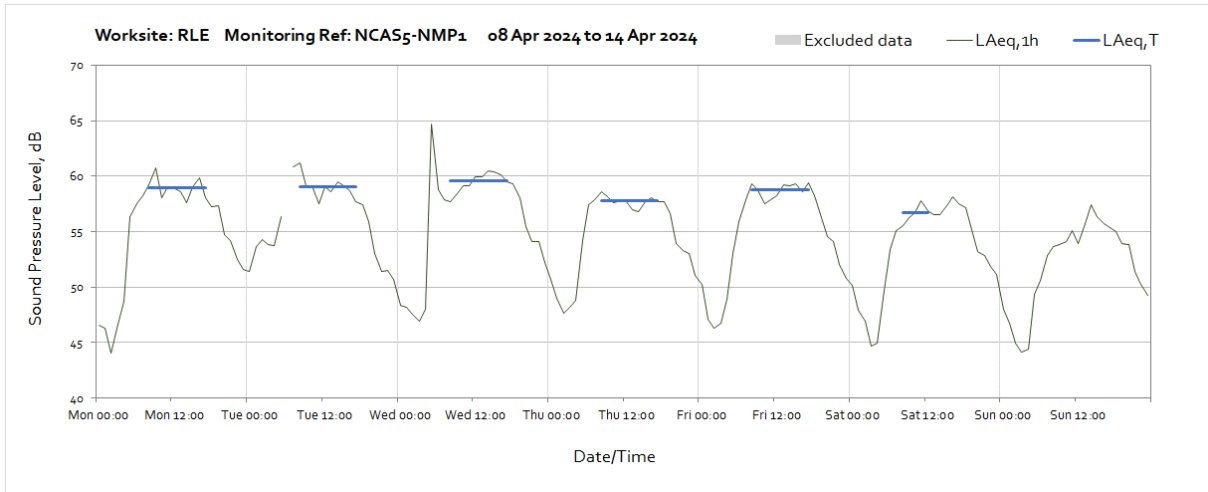
Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.



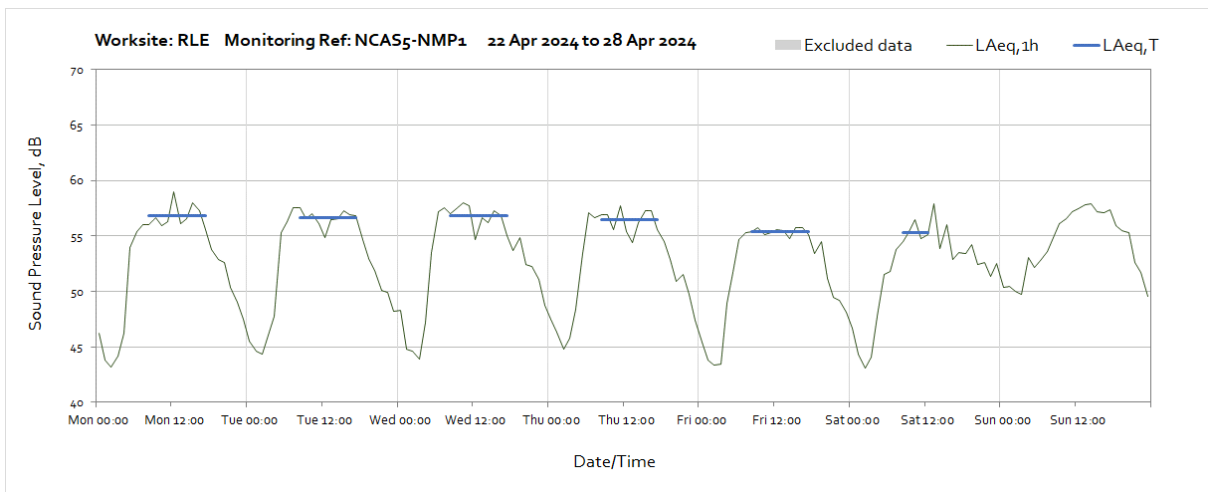
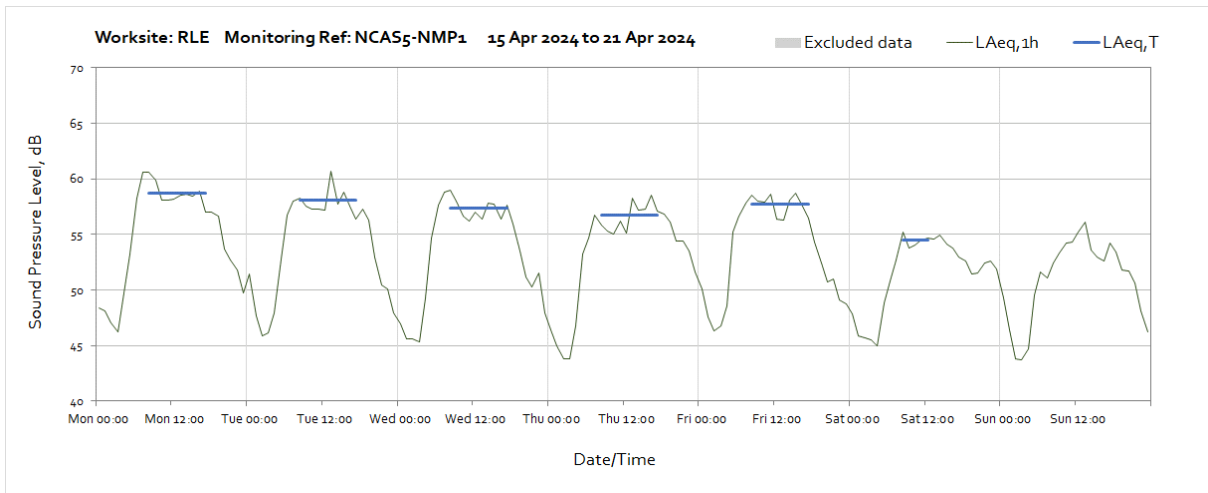


**Worksite: RLE - Monitoring Ref: NCAS5-NMP1**

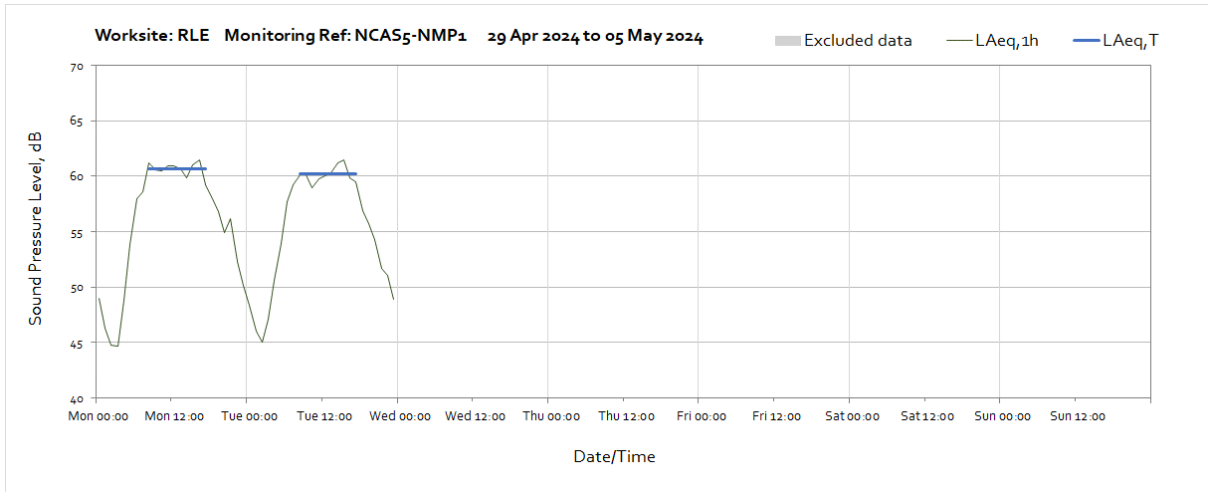




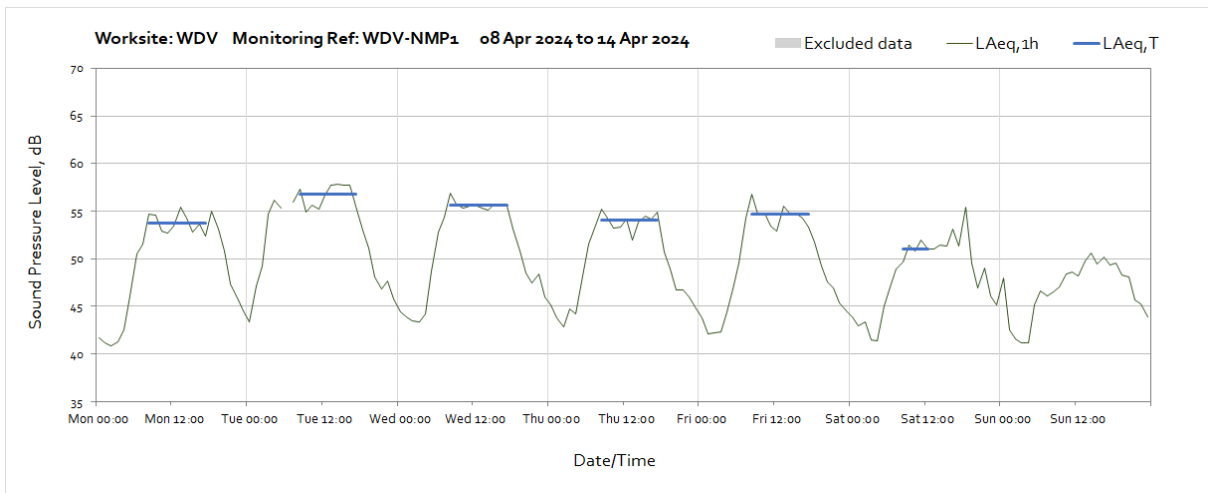
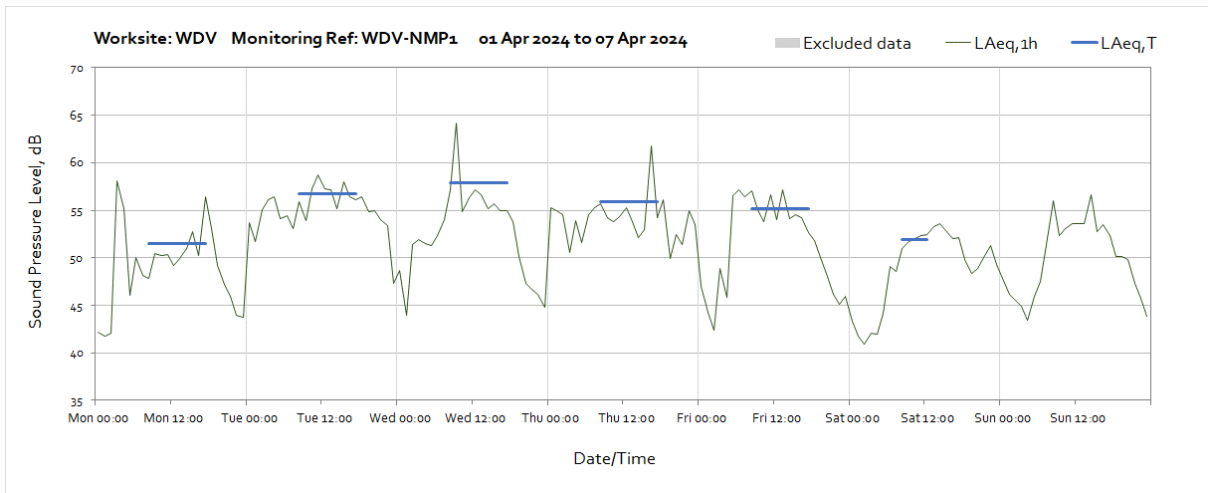
Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.





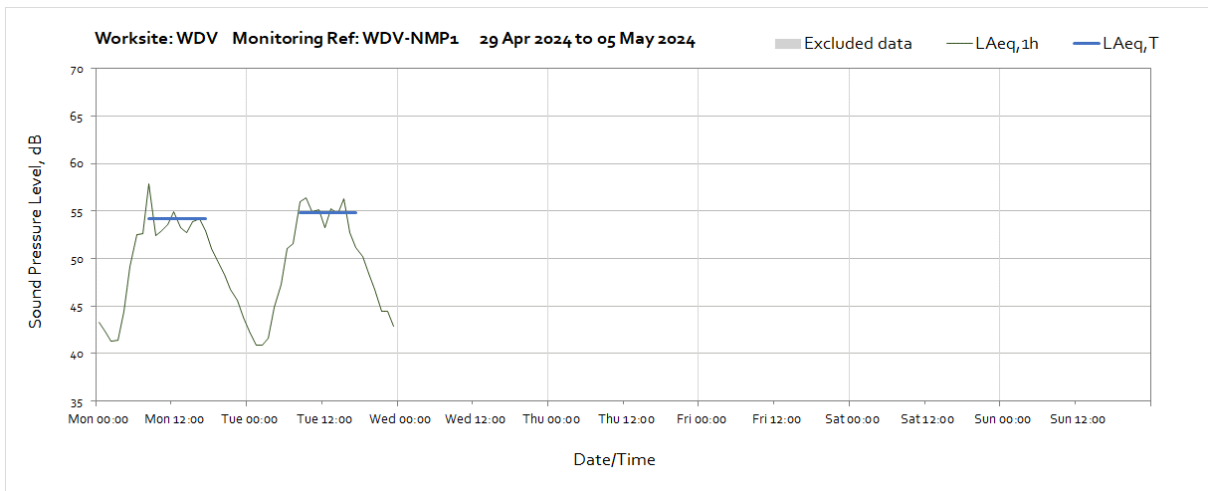
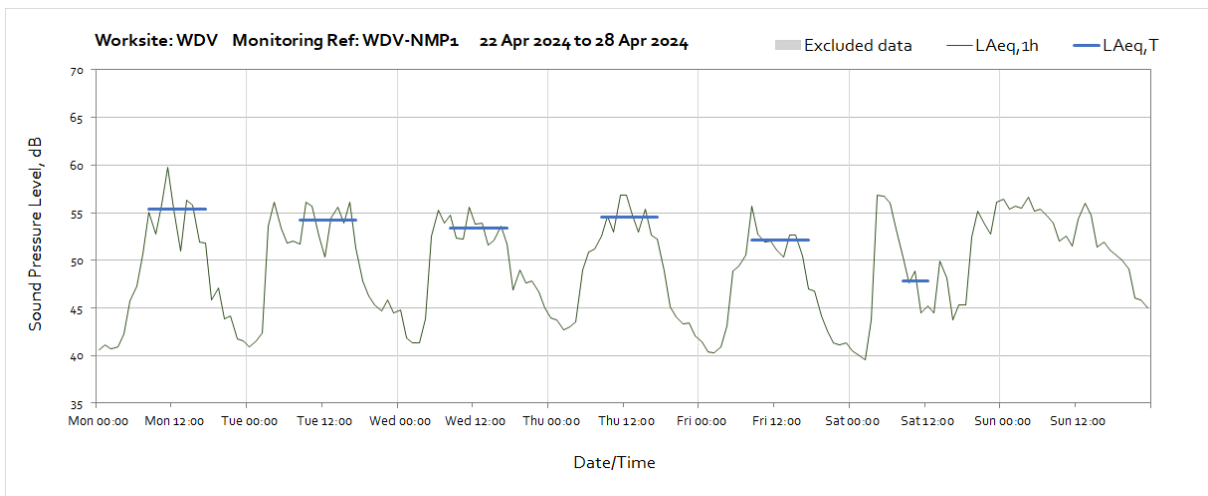
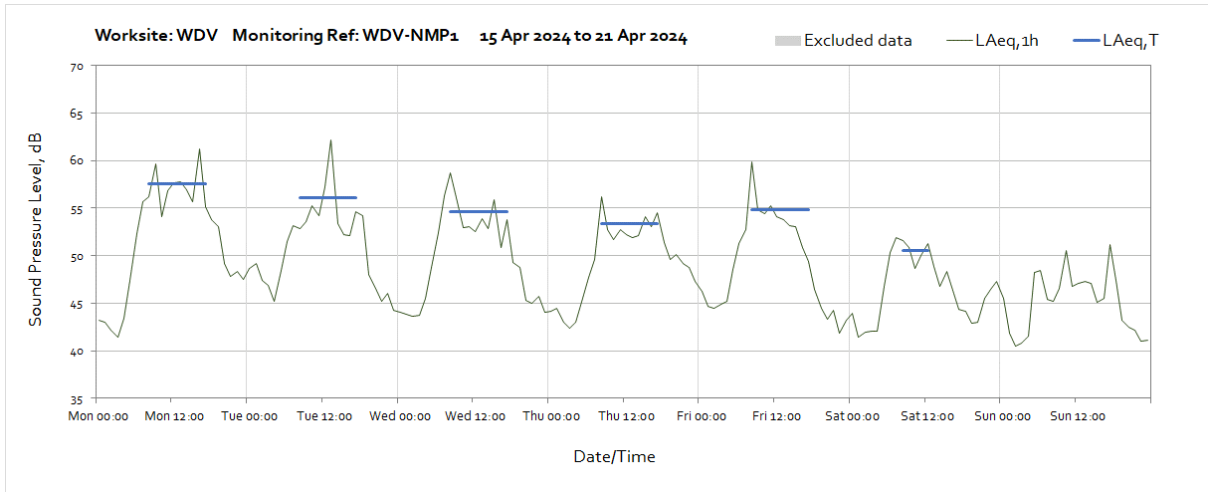


**Worksite: WDV – Monitoring Ref: WDV-NMP1**

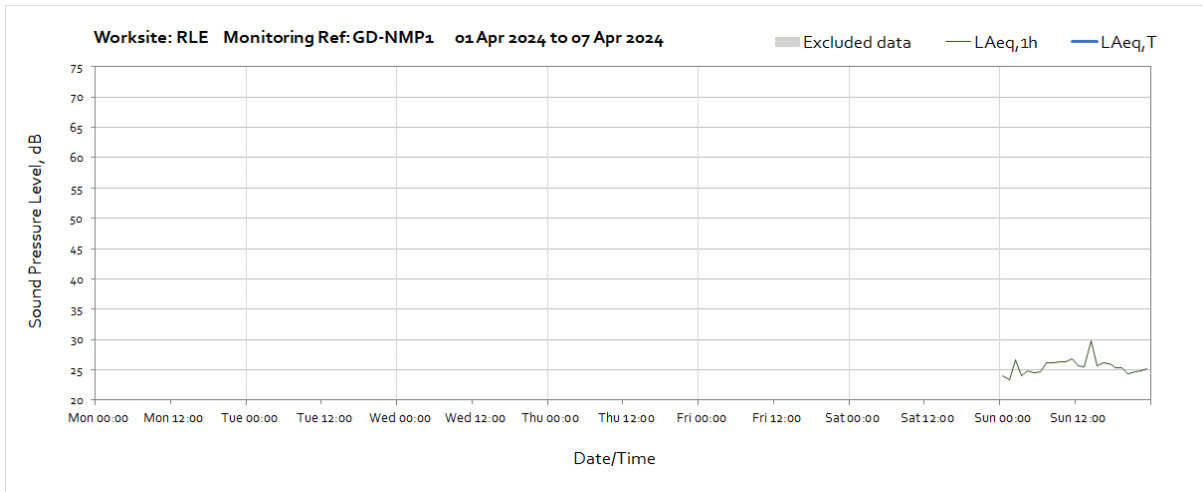


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

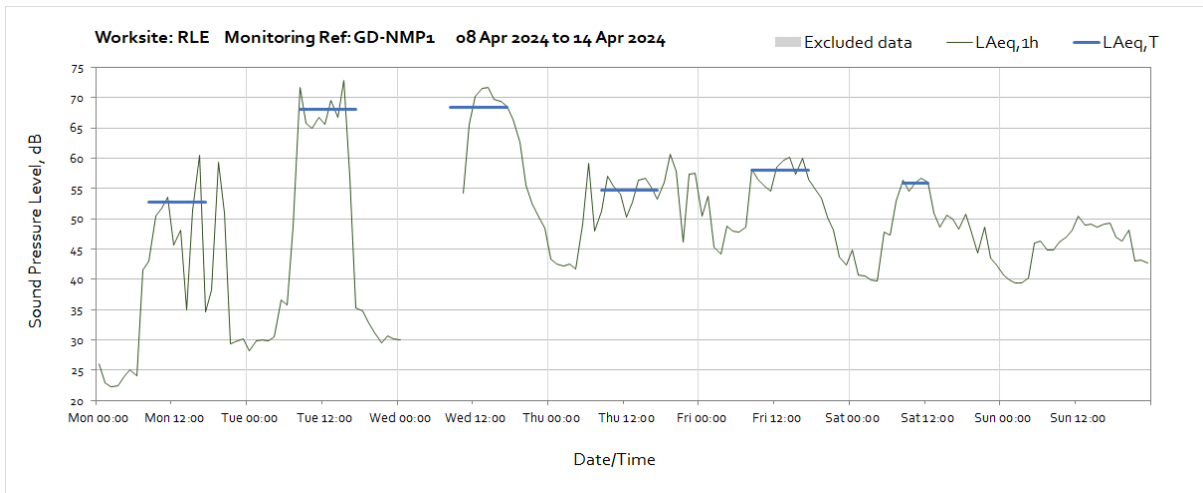
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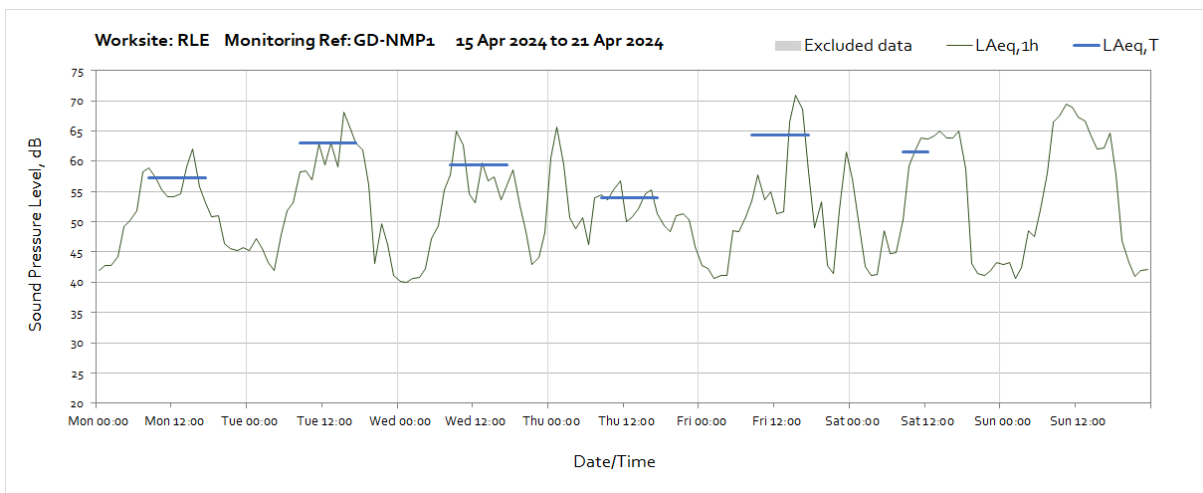
## Worksite: LL – Monitoring Ref: GD-NMP1



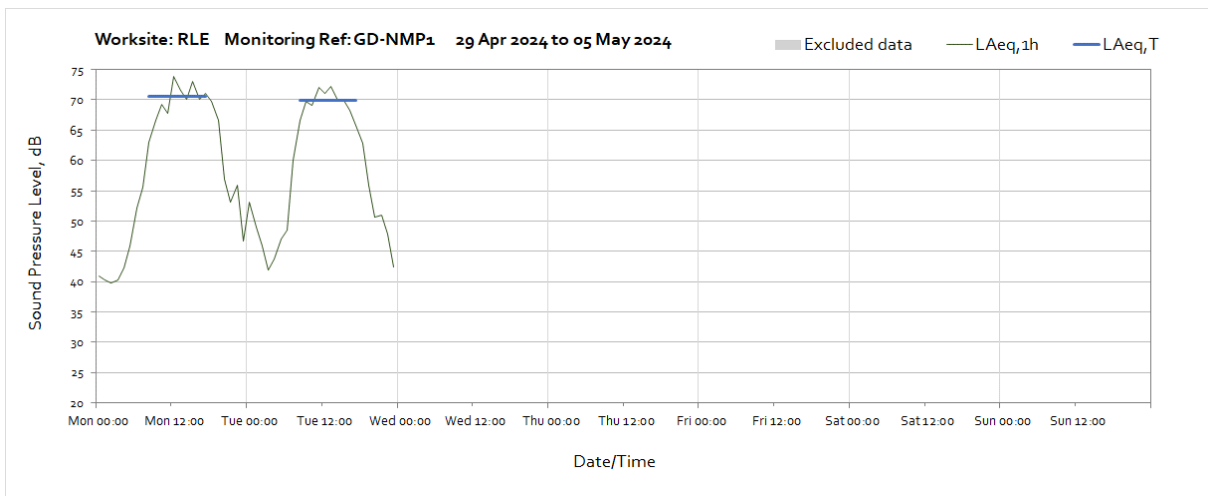
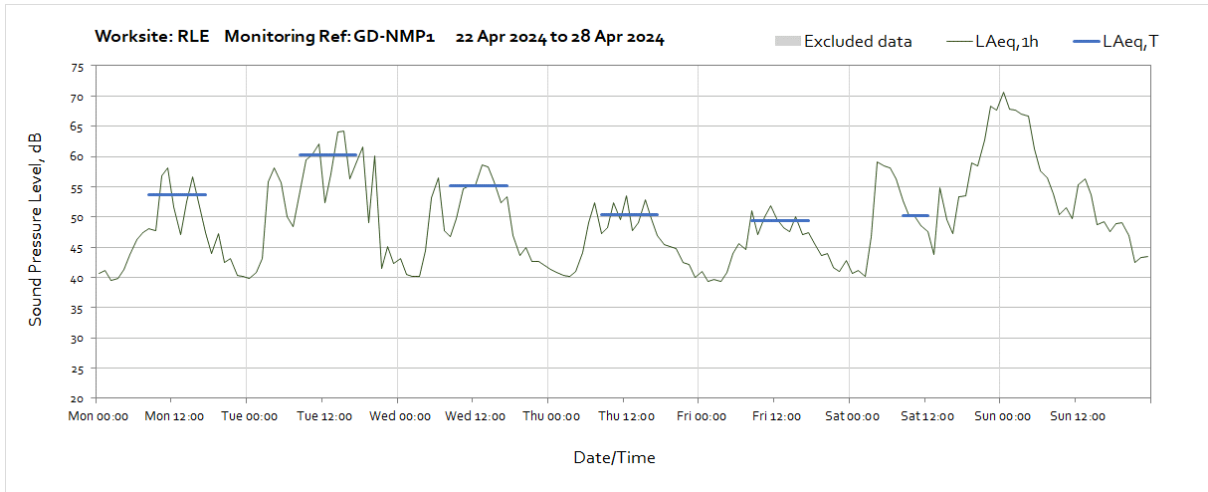
Note: Missing data from the start of the month until 00:00 on Sunday 7<sup>th</sup> April was due to a monitor fault, monitor was sent to supplier for investigation and replaced.



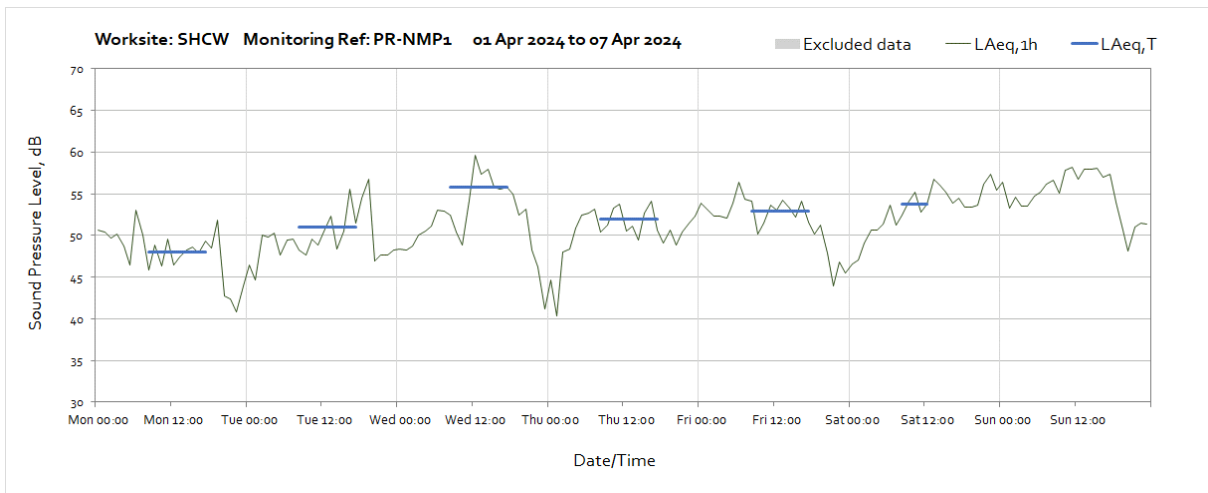
Note: Missing data between 01:00 and 10:00 on Wednesday 10<sup>th</sup> April was due to a loss of power to the monitoring station caused by poor weather conditions preventing sufficient light to reach the solar panel.

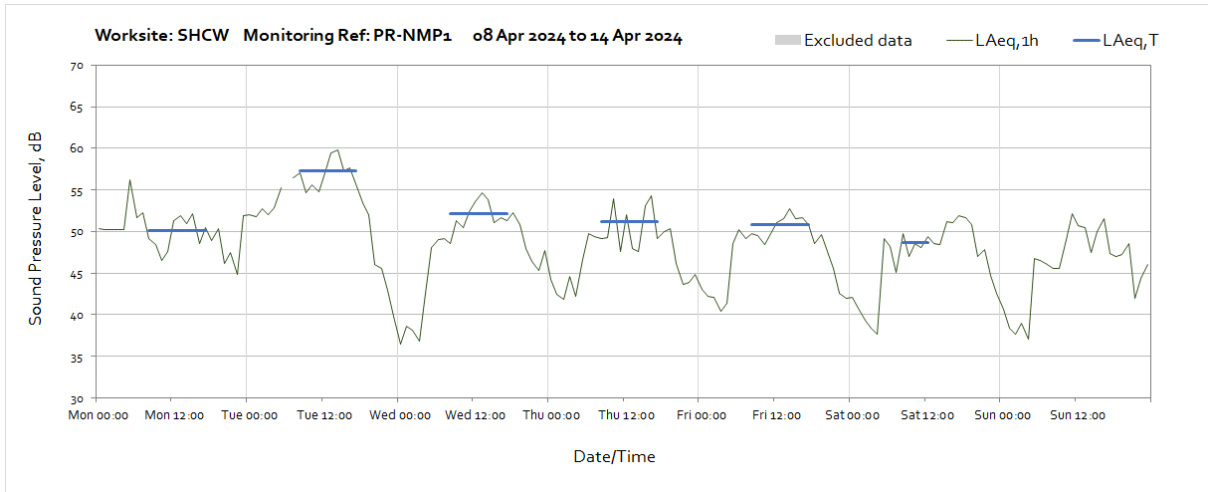


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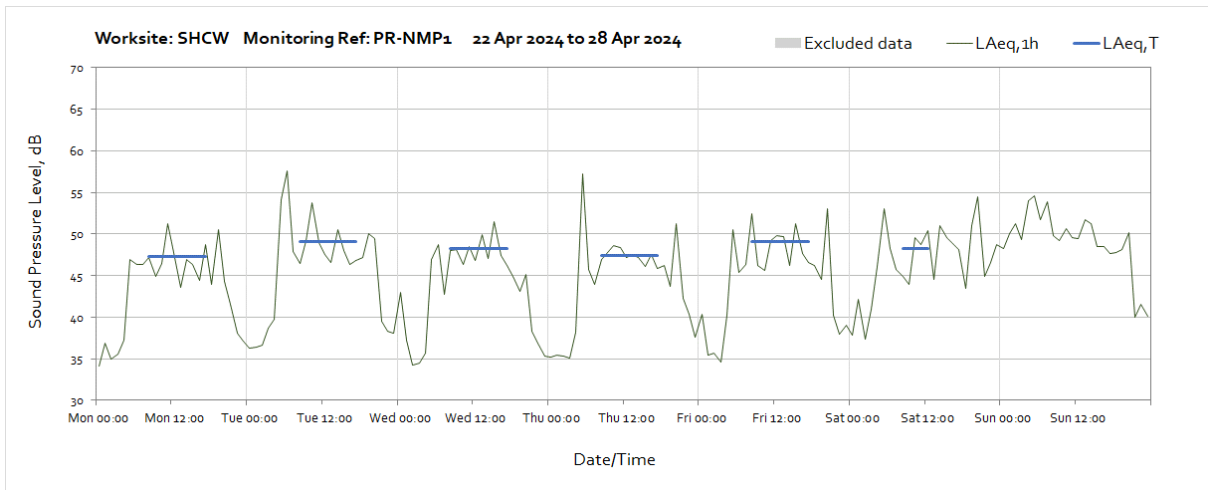
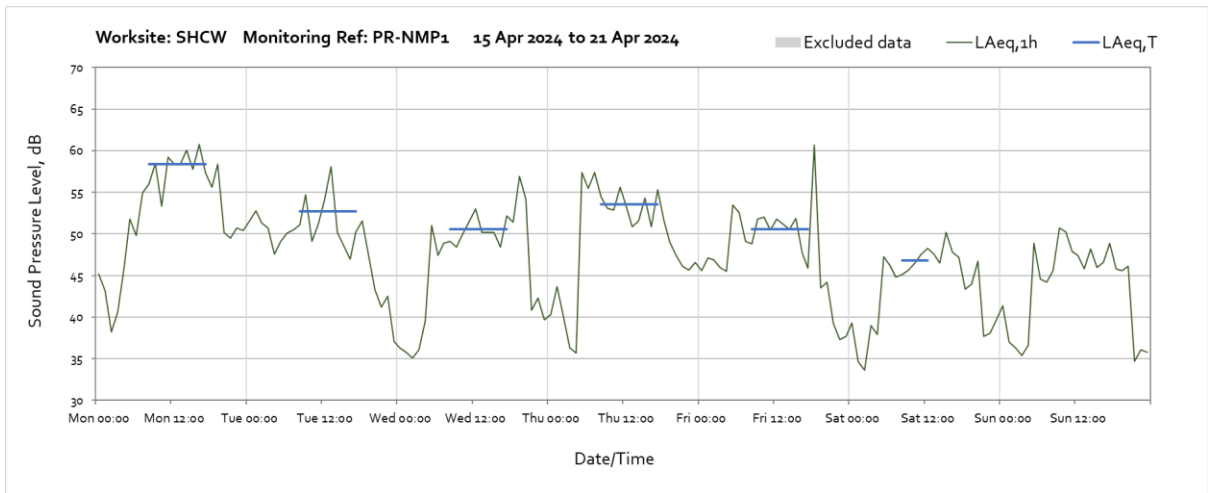


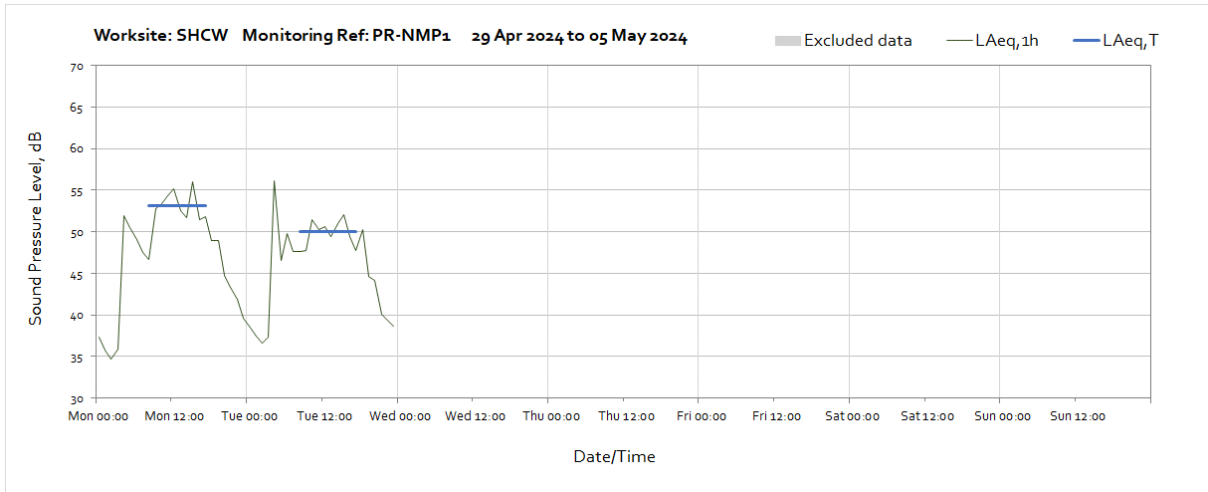
**Worksite: SHCW – Monitoring Ref: PR-NMP1**



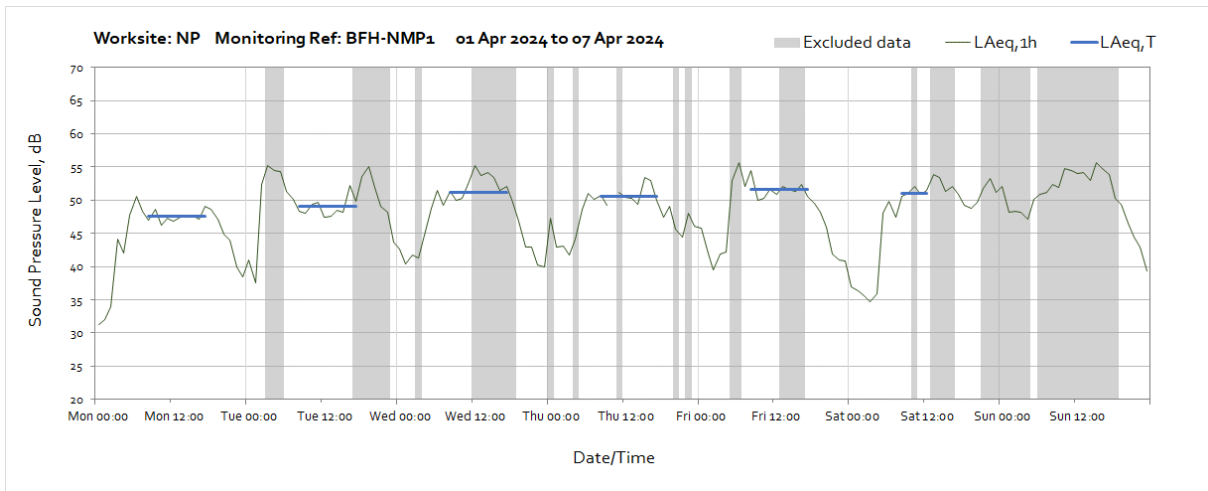


Note: Missing data between 06:00 and 07:00 on Tuesday 9<sup>th</sup> April was due to an error with connection to the data storage.

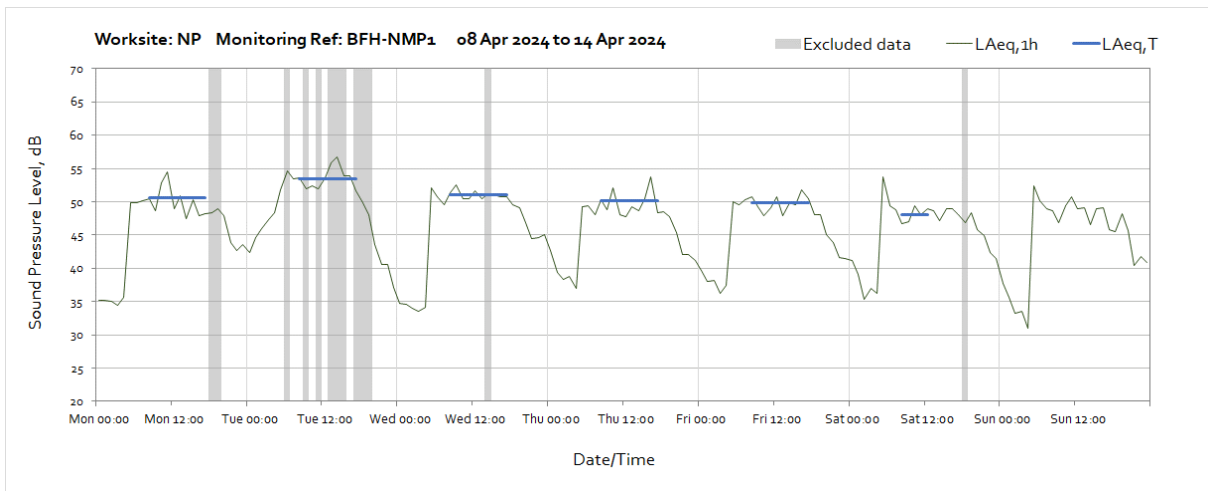


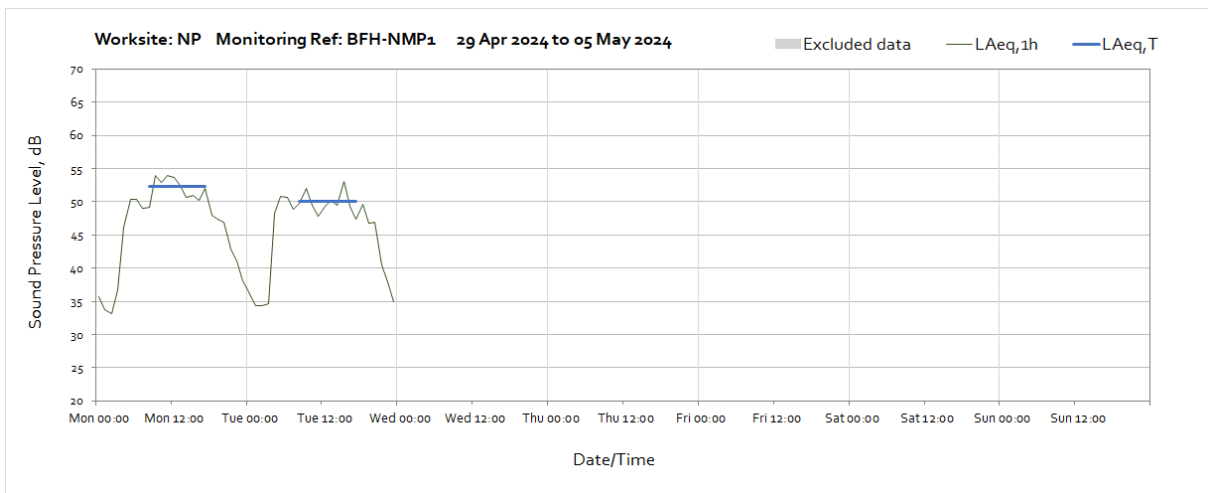
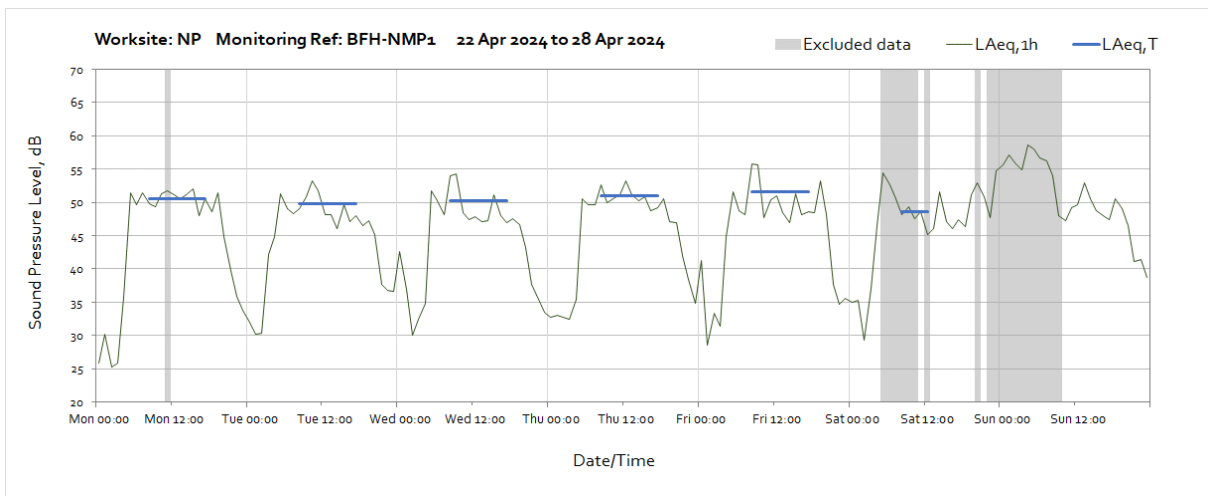
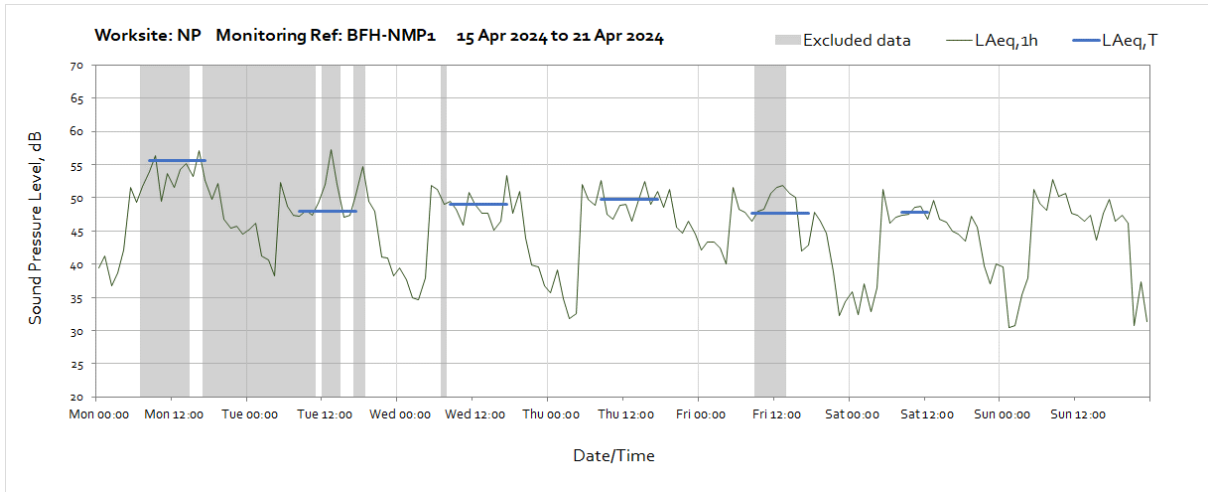


**Worksite: NP - Monitoring Ref: BFH-NMP1**

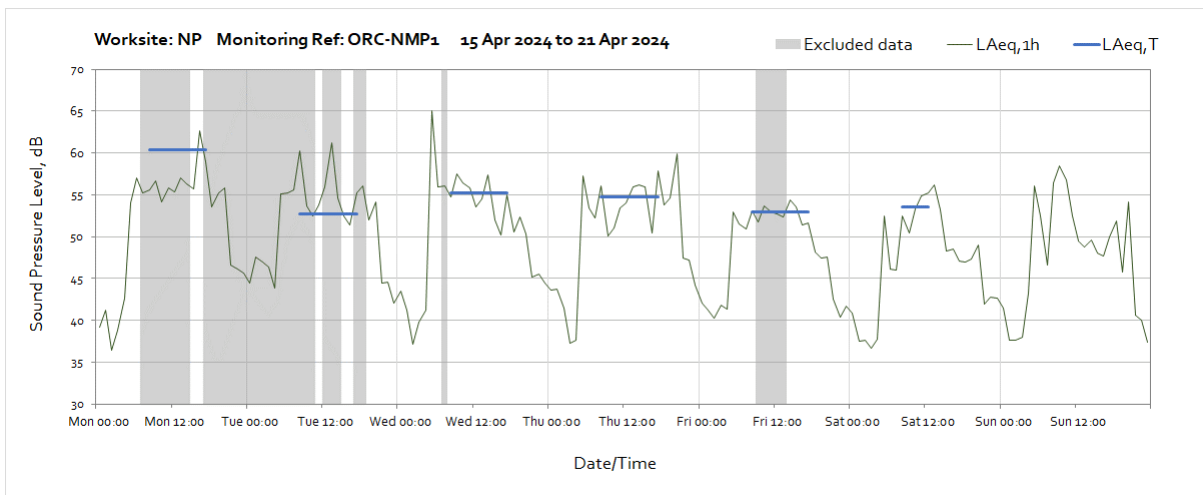
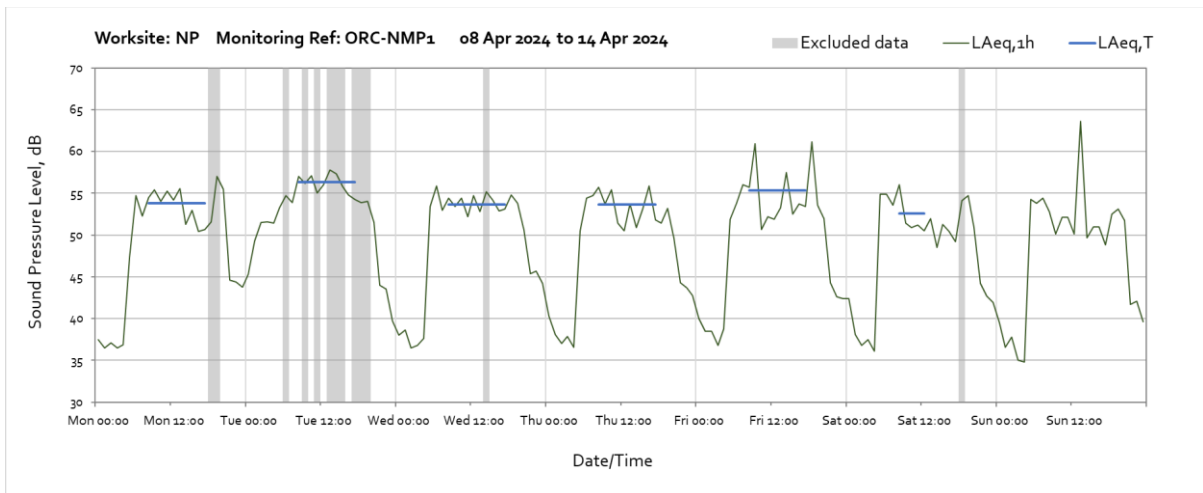
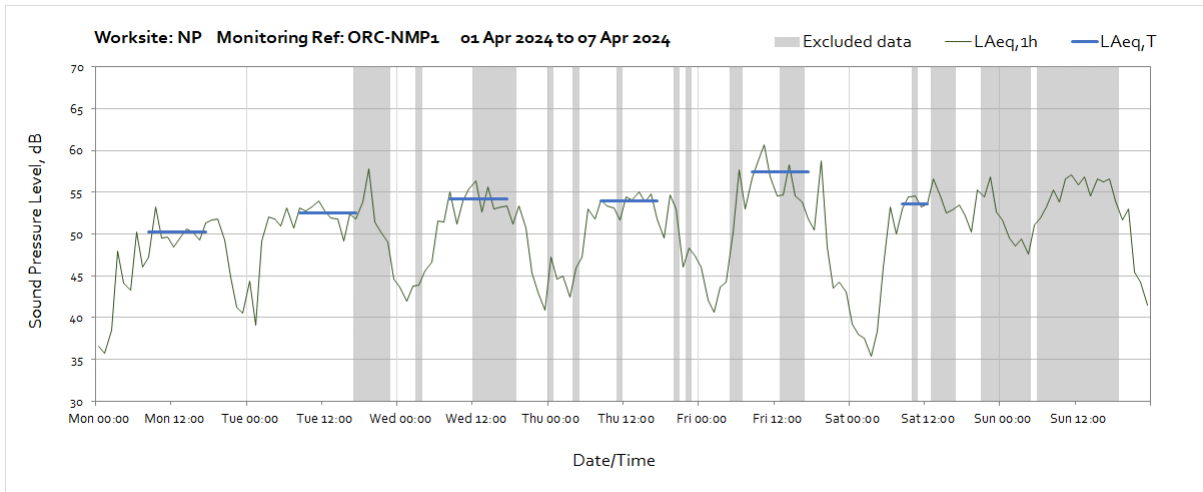


Note: Missing data between 10:00 and 11:00 on Thursday 4<sup>th</sup> April was due to monitor field calibration.

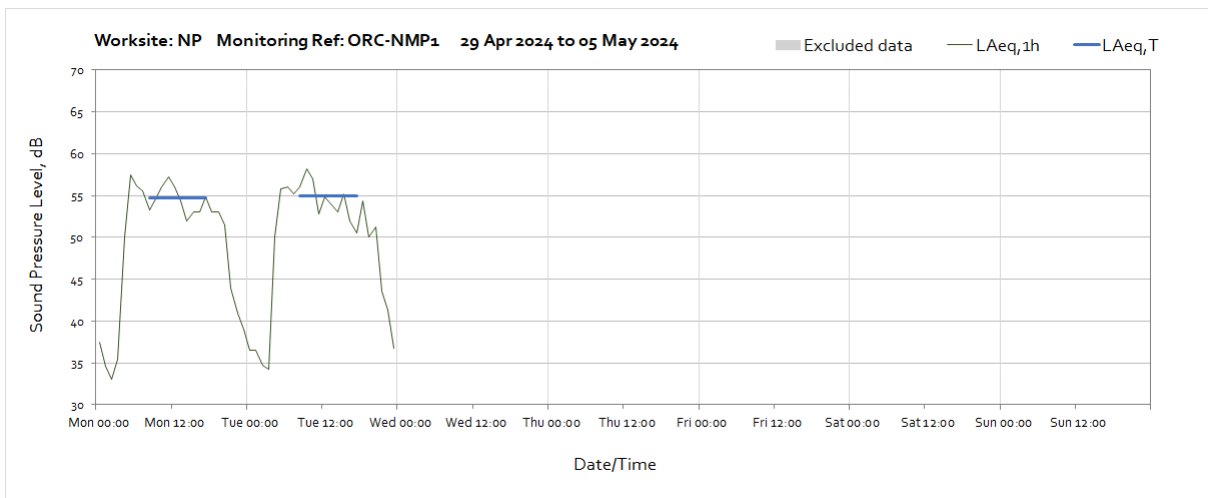
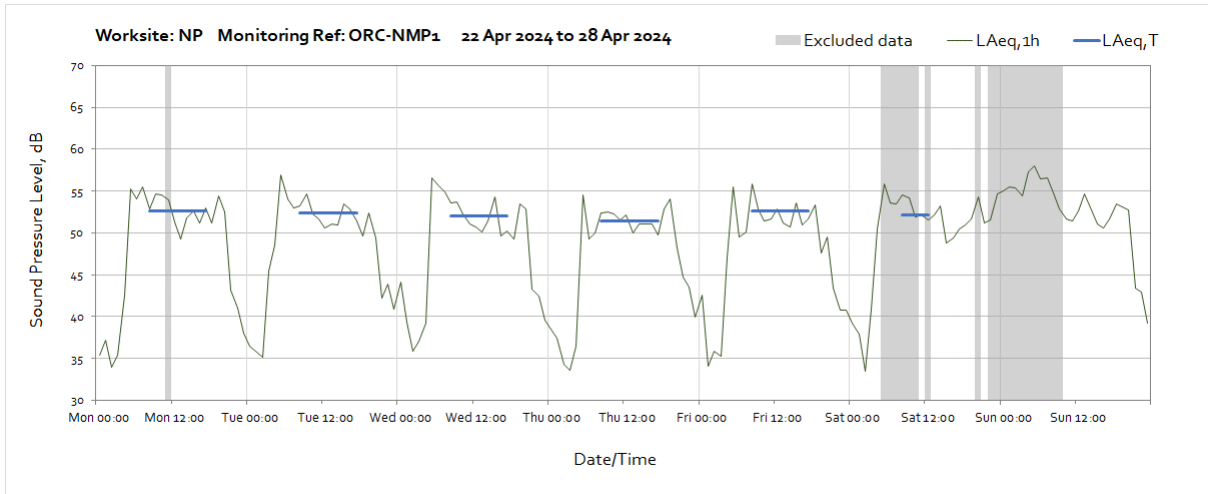




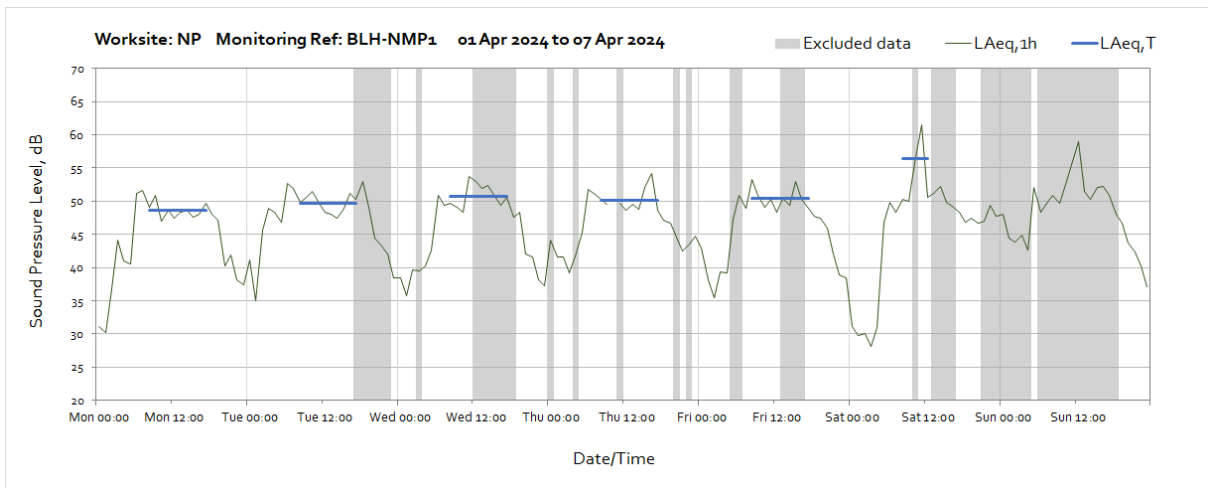
## Worksite: NP – Monitoring Ref: ORC-NMP1



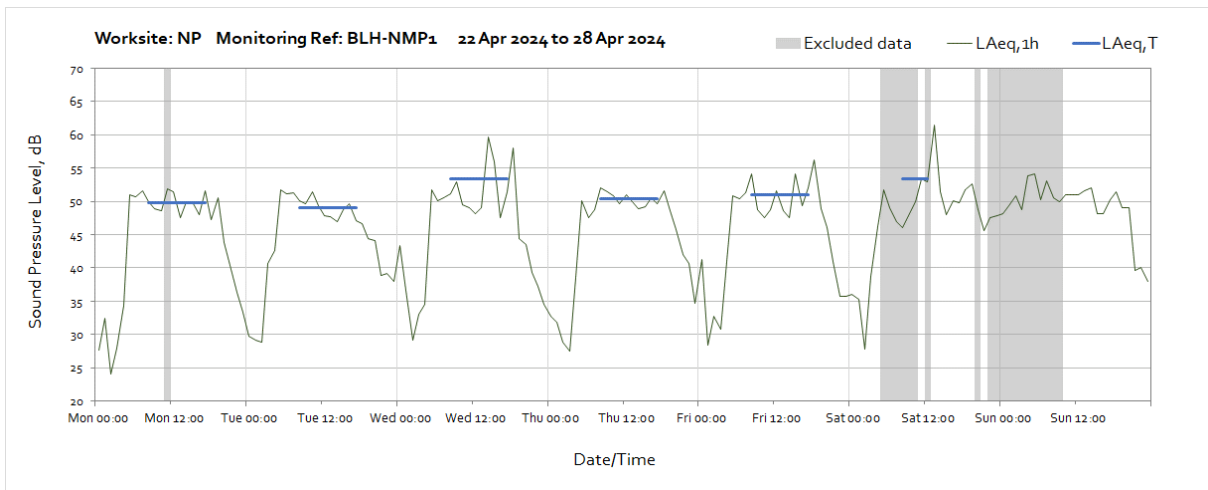
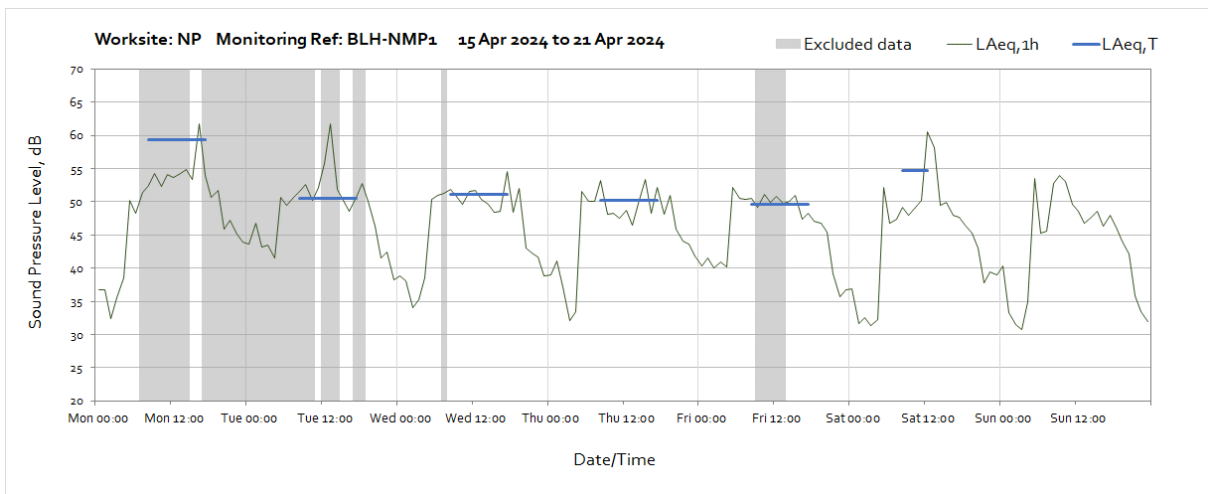
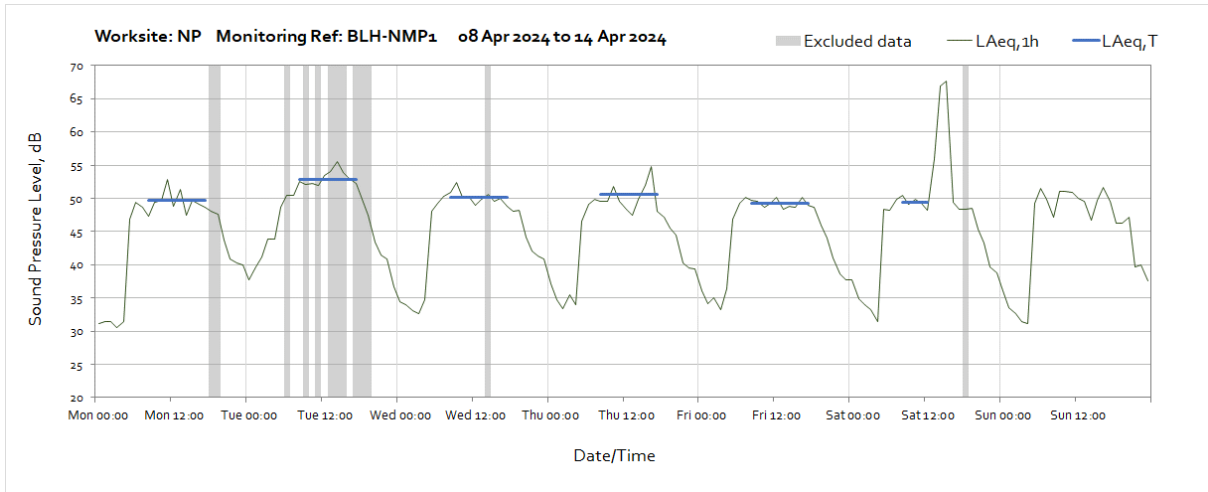


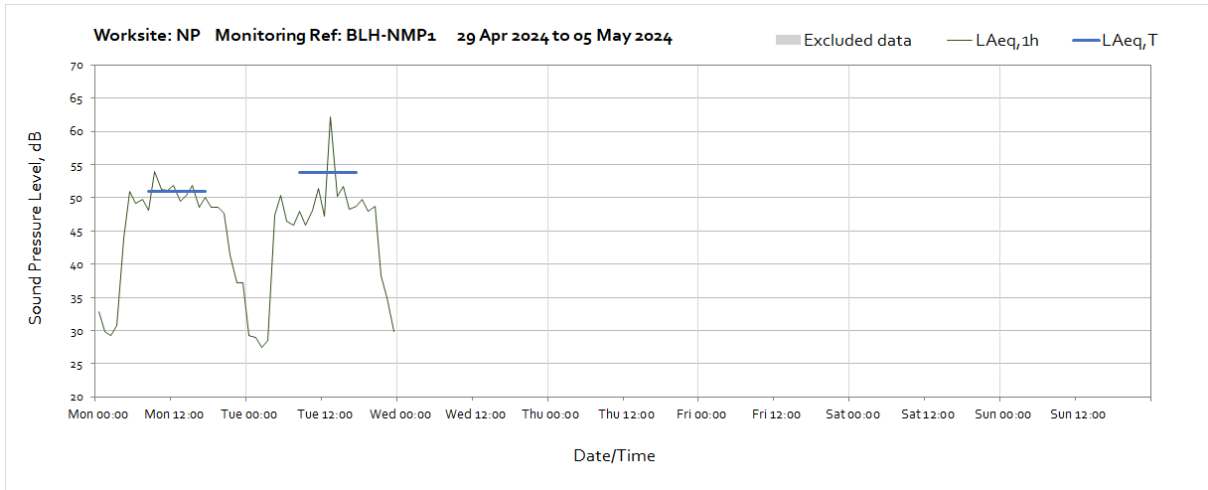


**Worksite: NP - Monitoring Ref: BLH-NMP1**

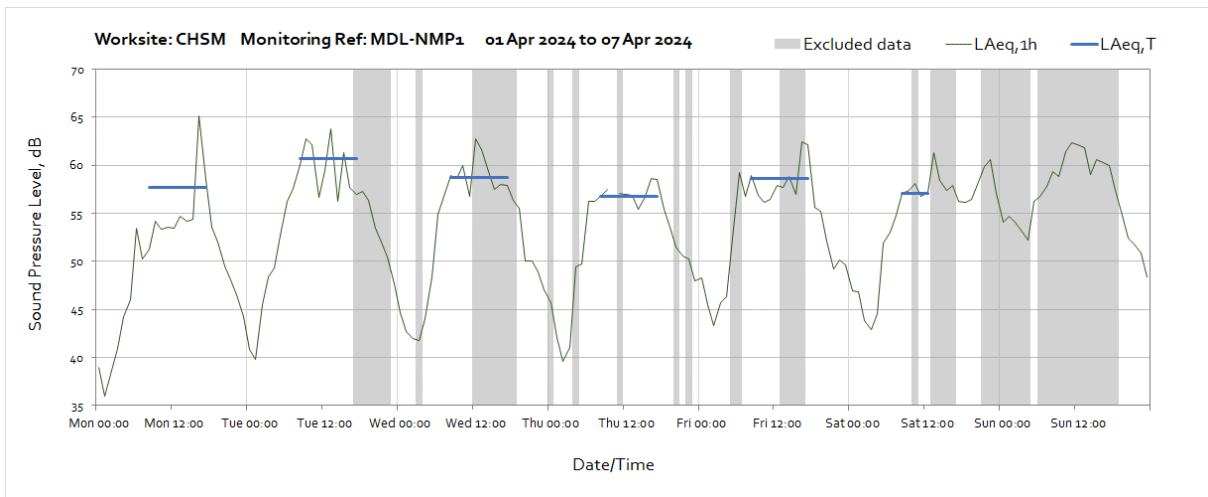


Note: Missing data between 10:00 and 11:00 on Thursday 4<sup>th</sup> April was due to monitor field calibration.

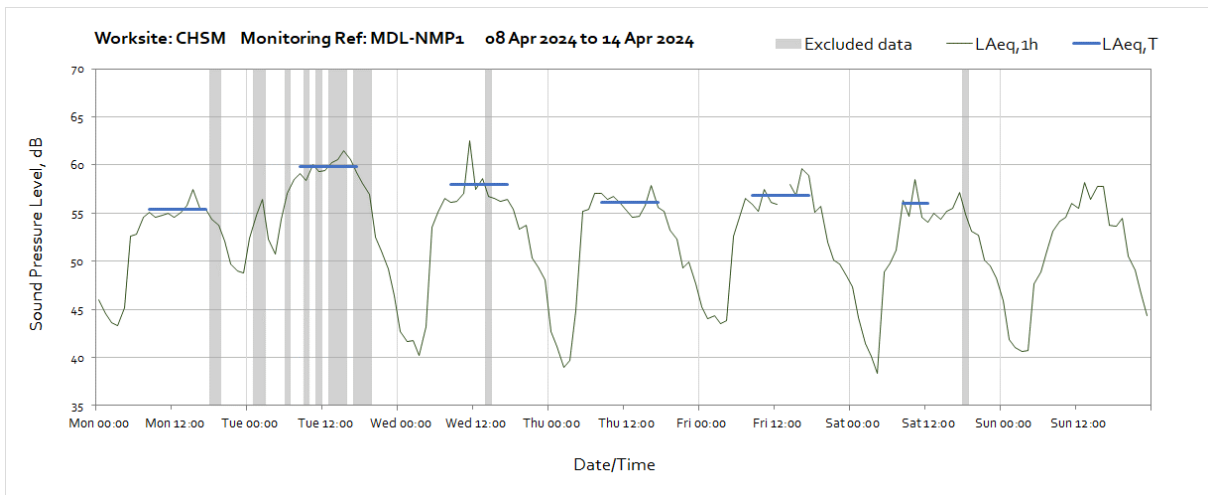




**Worksite: CHSM – Monitoring Ref: MDL-NMP1**

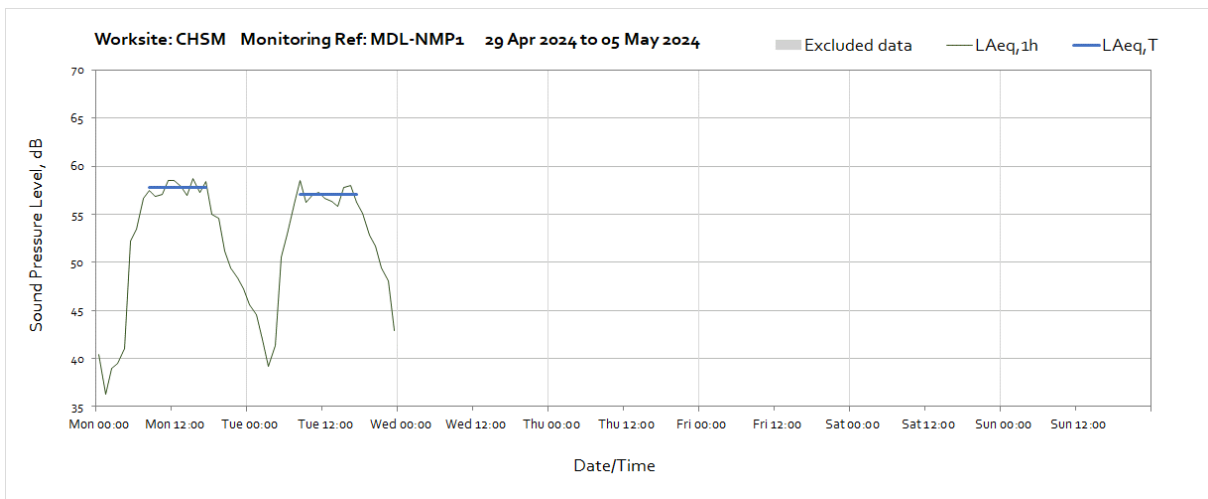
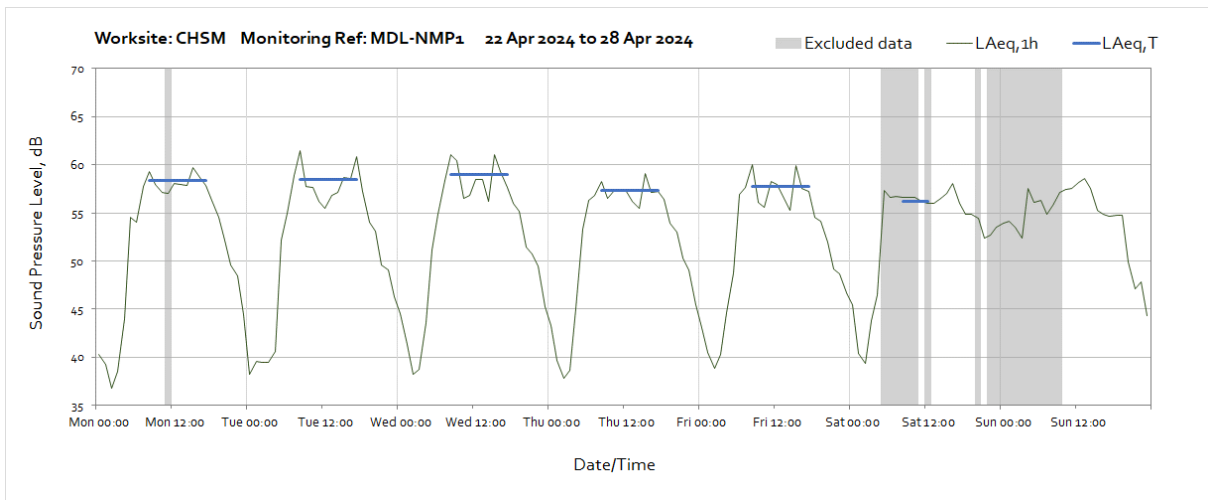
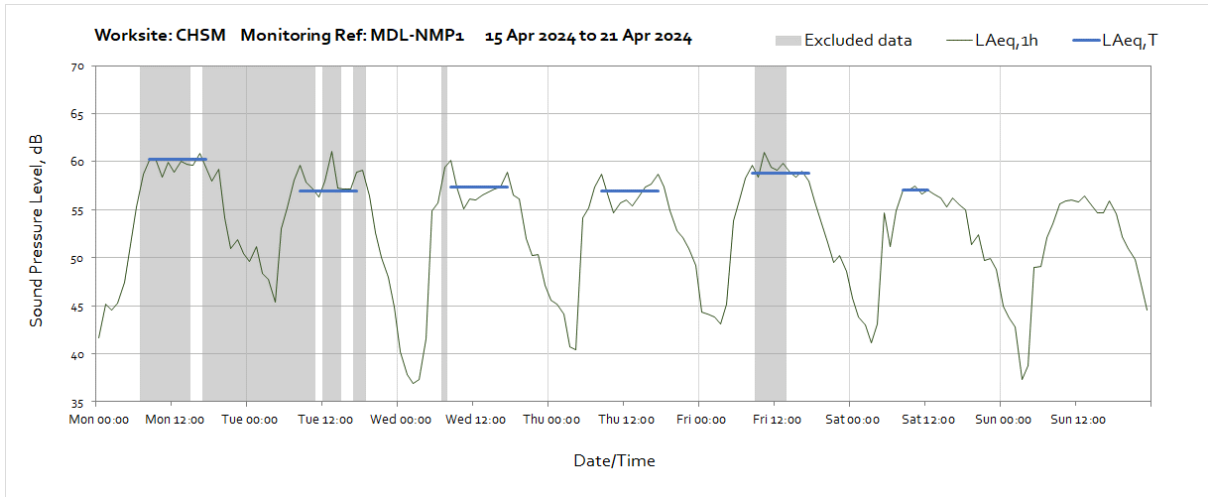


Note: Missing data between 10:00 and 11:00 on Thursday 4<sup>th</sup> April was due to monitor field calibration.

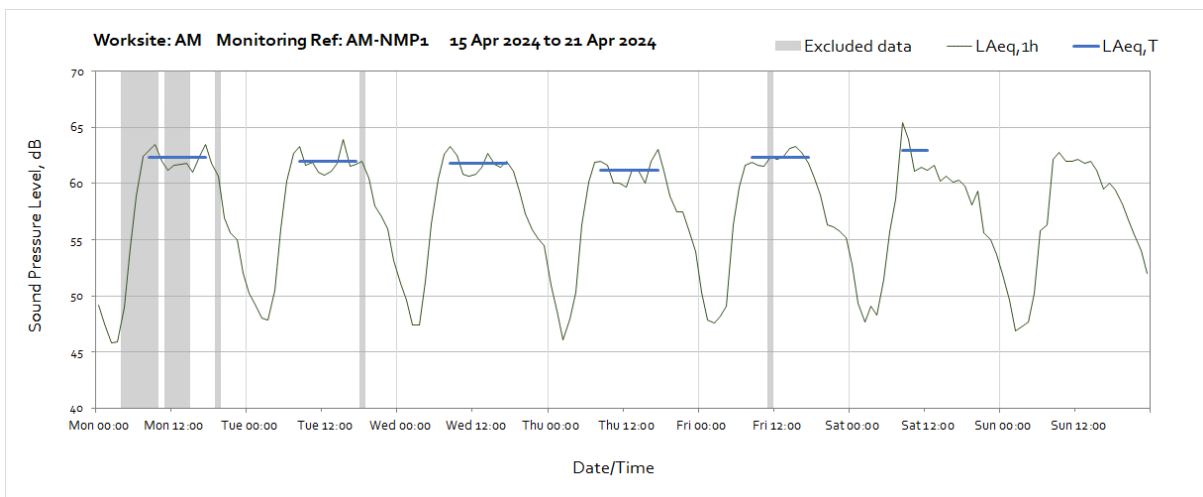
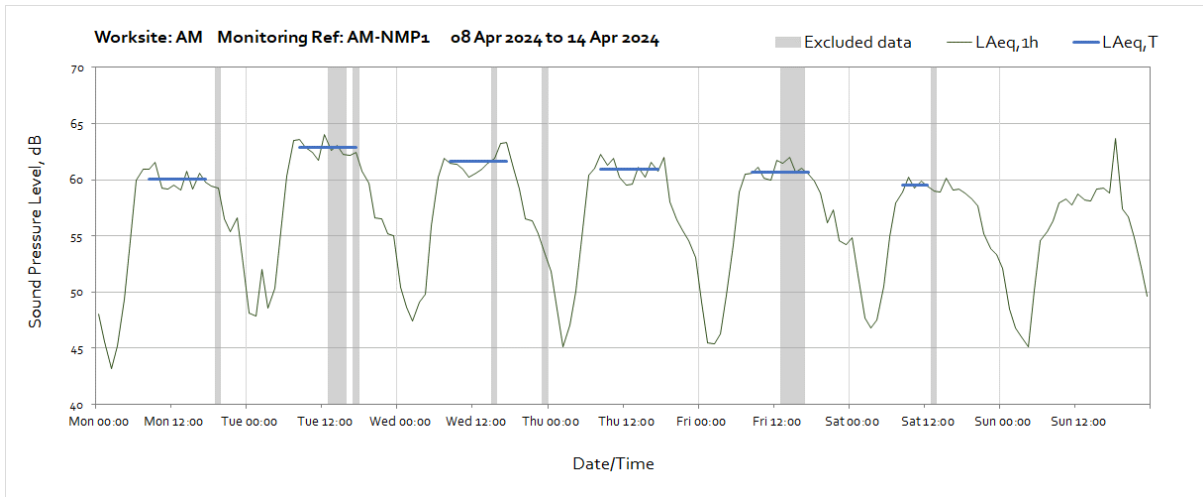
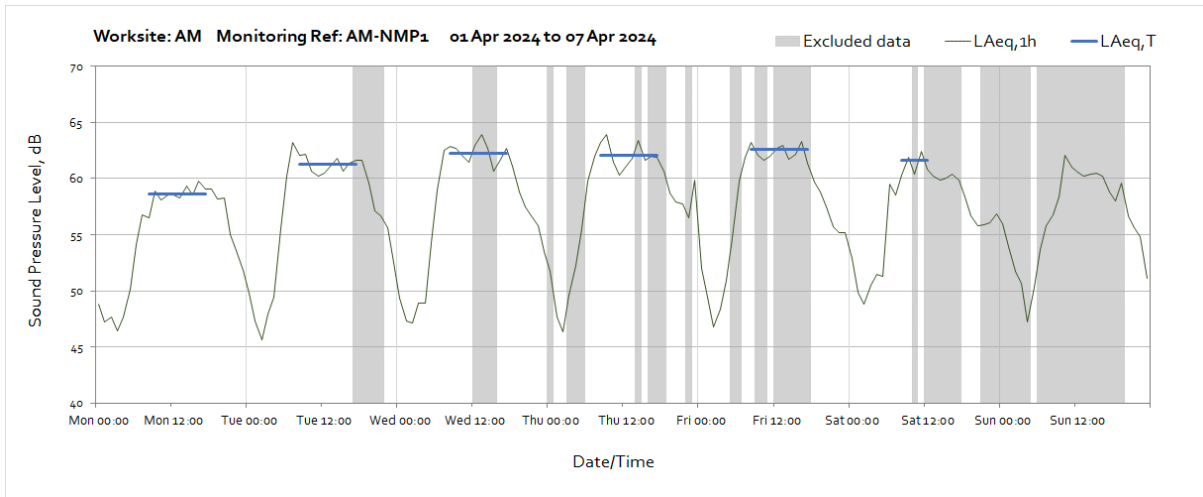


Note: Missing data between 13:00 and 14:00 on Friday 12<sup>th</sup> April was due to a communication error between the monitoring station and server.

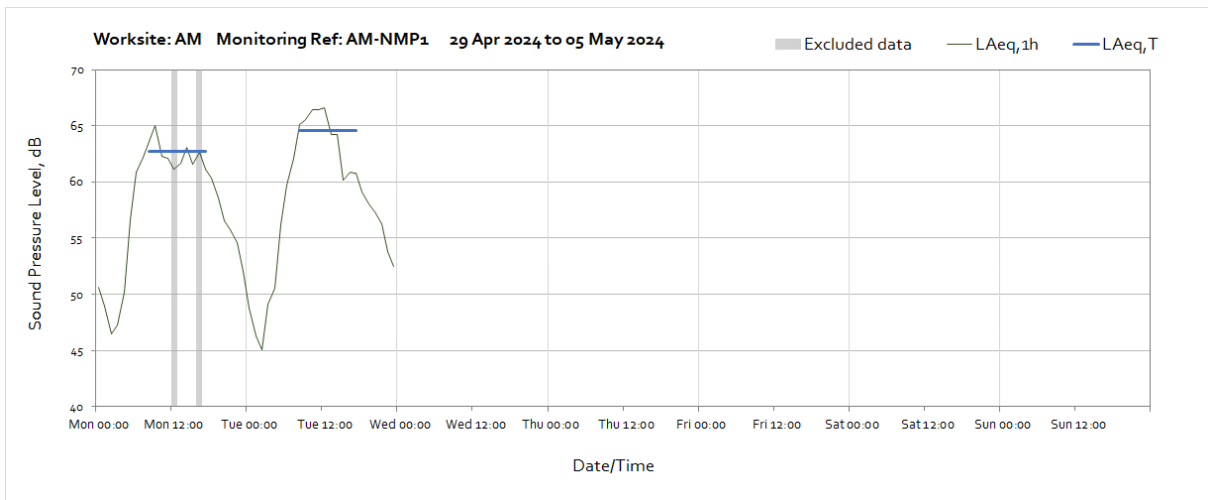
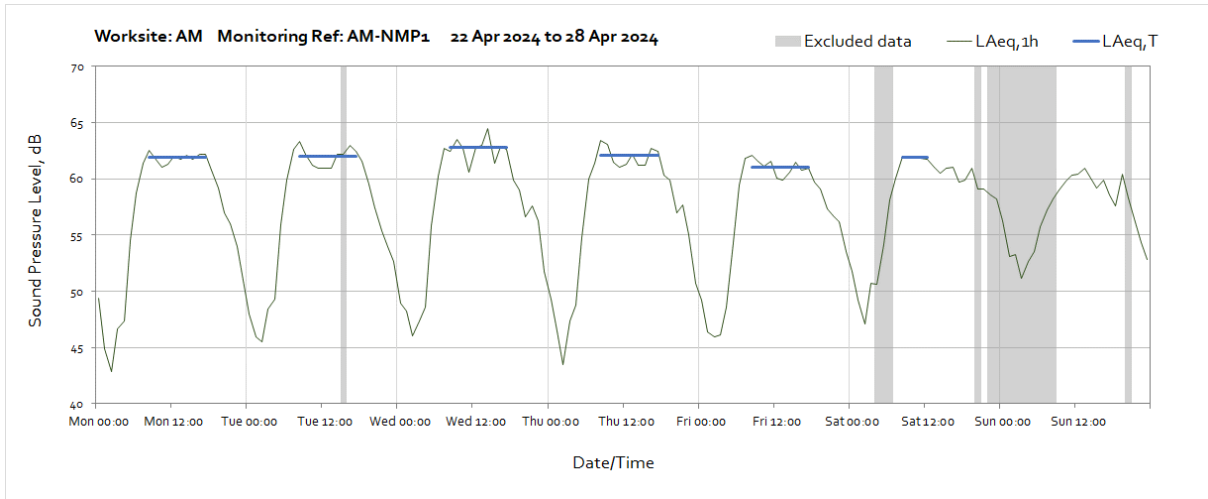
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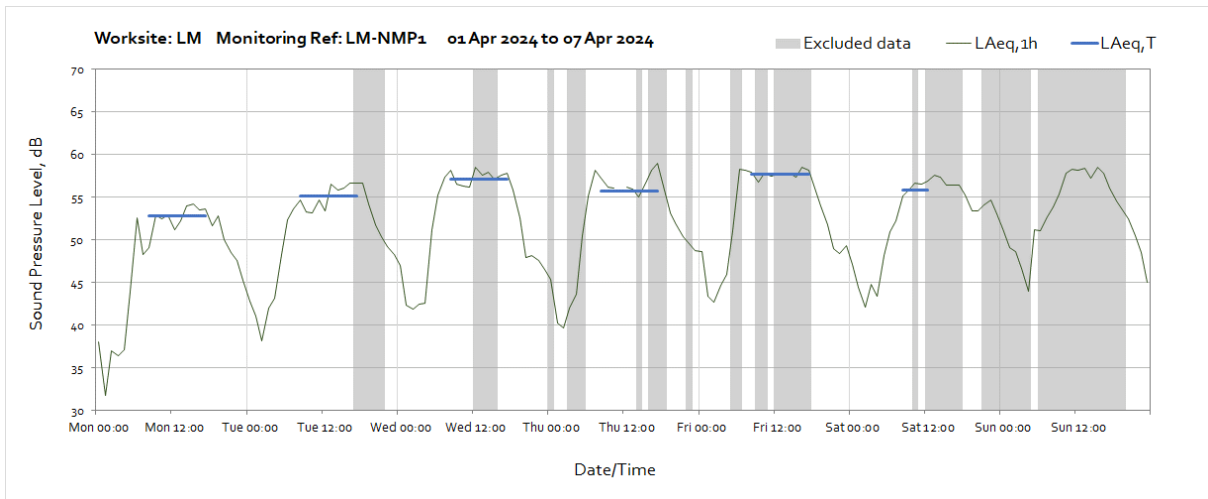
## Worksite: AM - Monitoring Ref: AM-NMP1



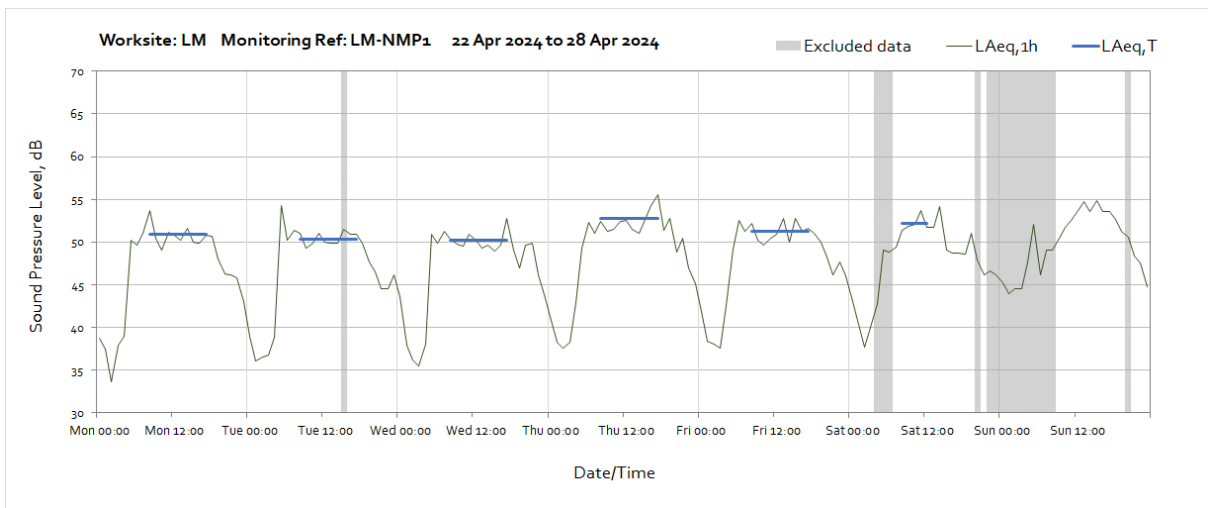
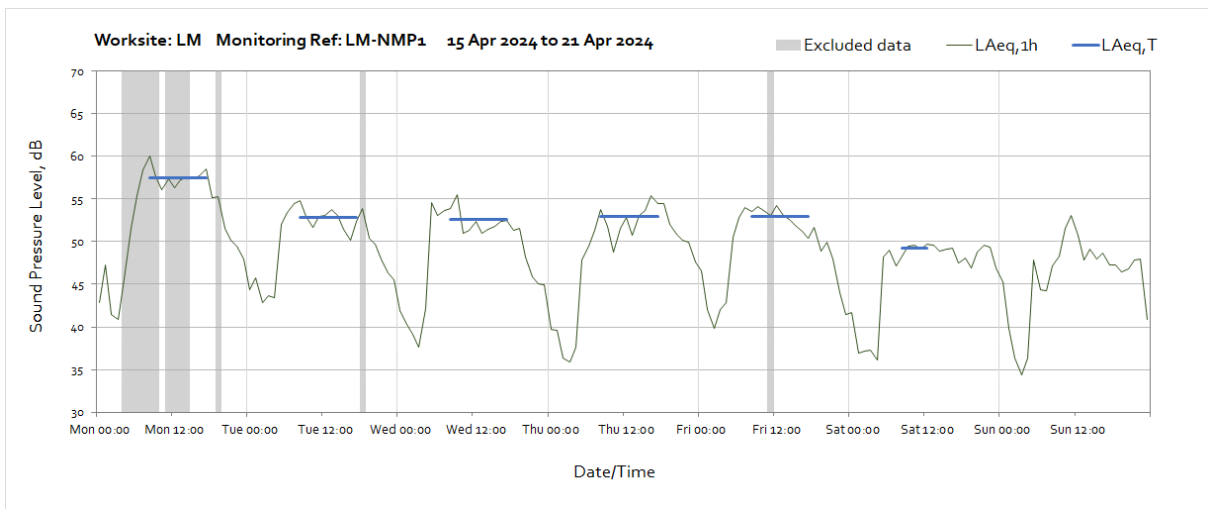
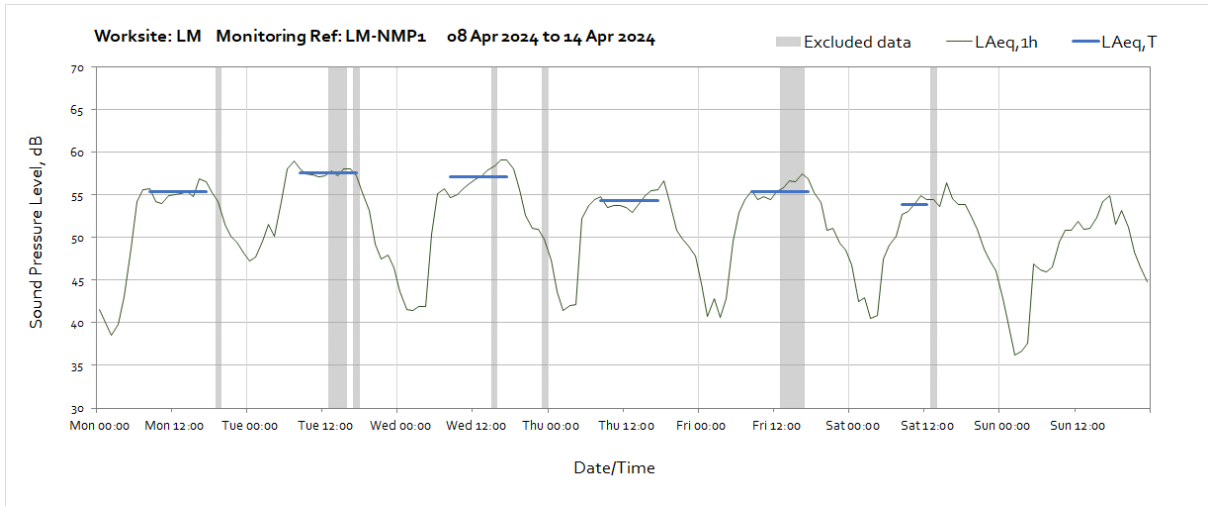
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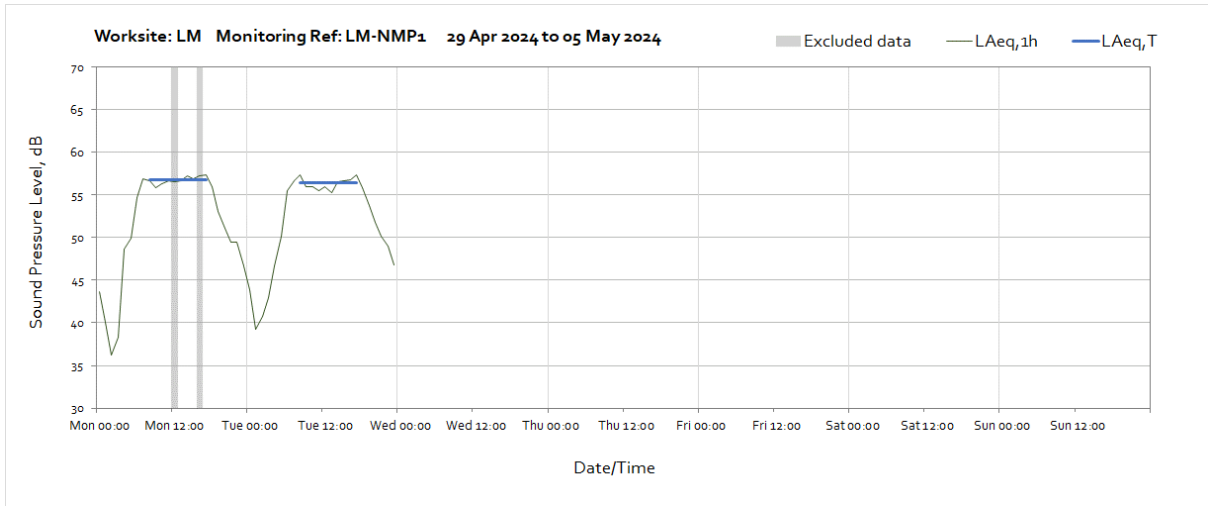


### Worksite: LM - Monitoring Ref: LM-NMP1

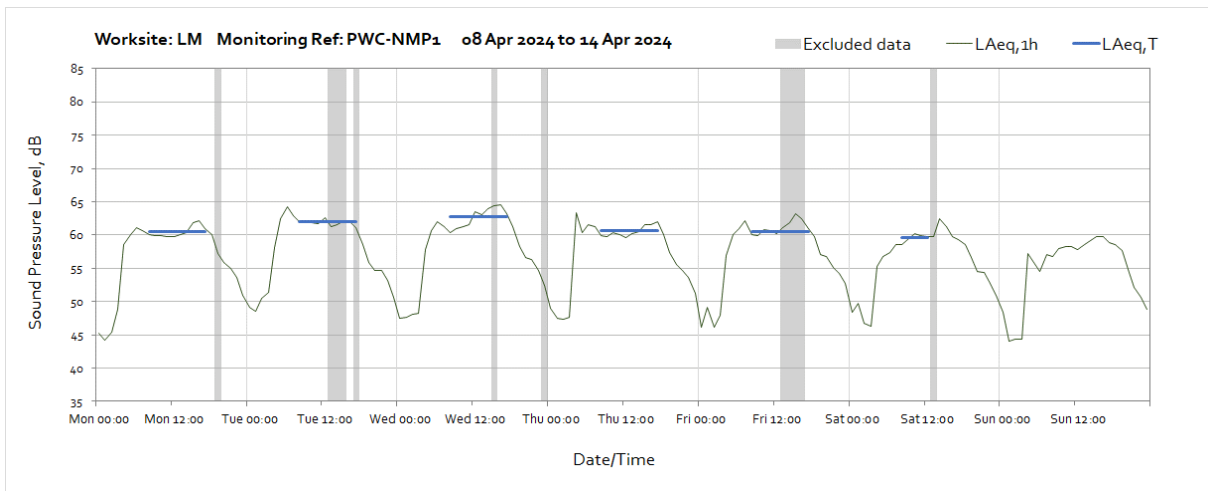
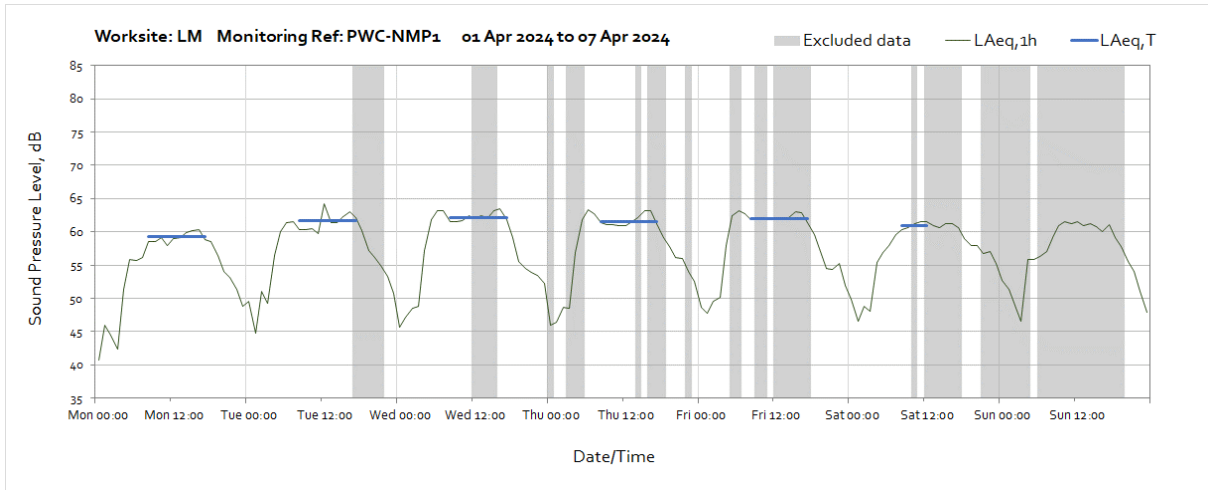


Note: Missing data between 11:00 and 12:00 on Thursday 4<sup>th</sup> April was due to monitor field calibration.

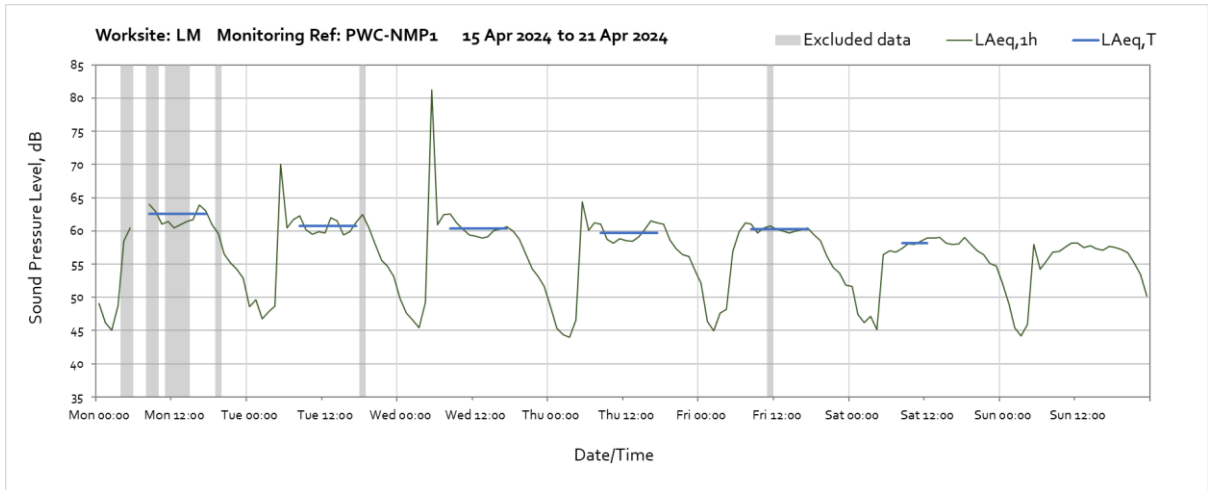




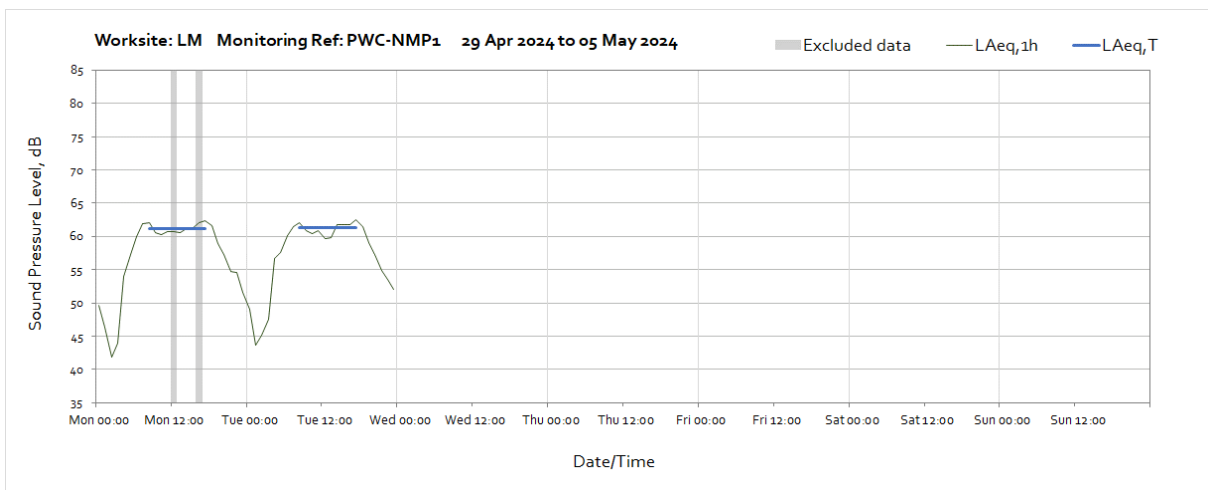
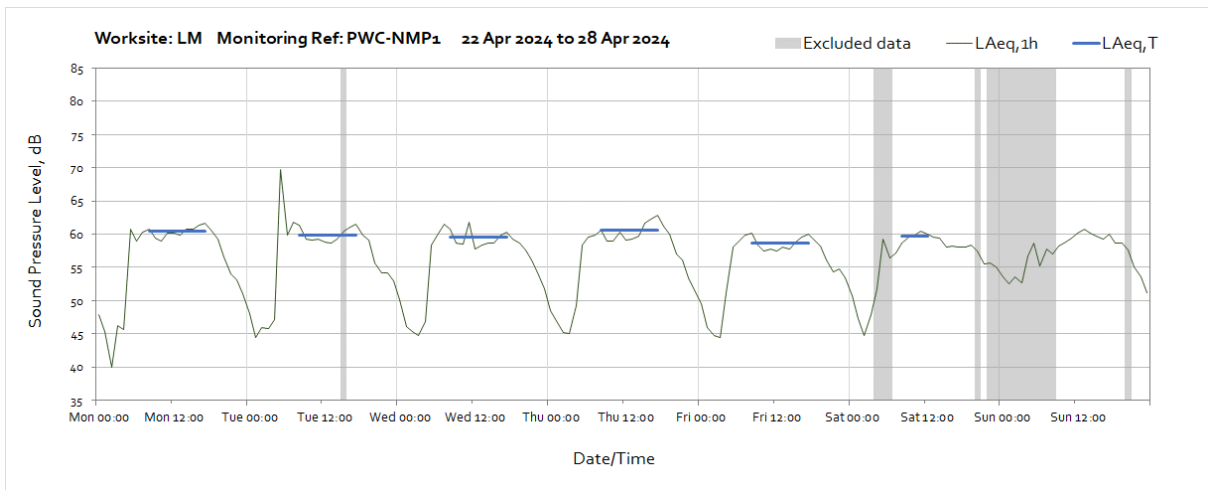
### Worksite: LM – Monitoring Ref: PWC-NMP1



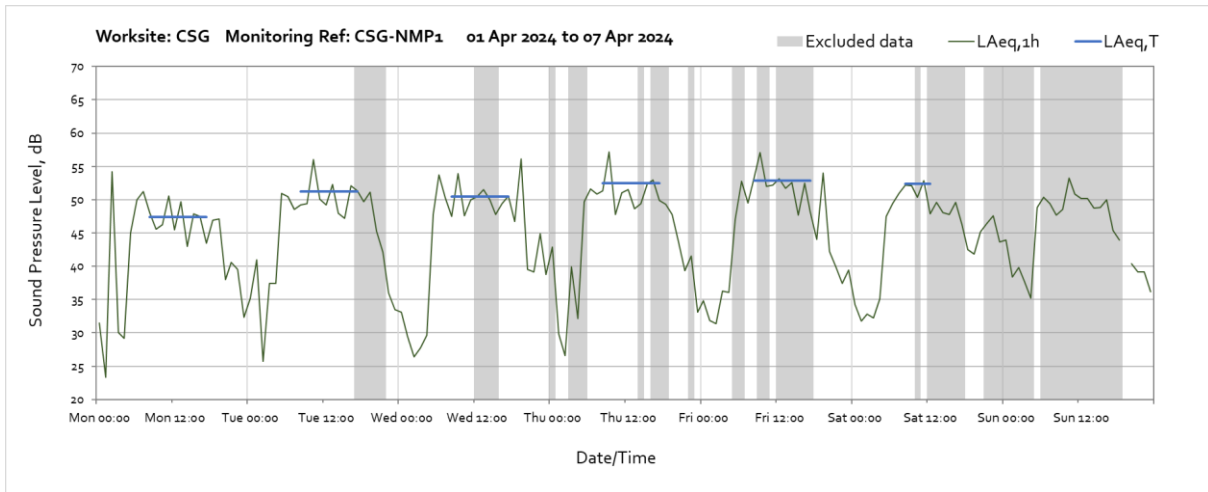




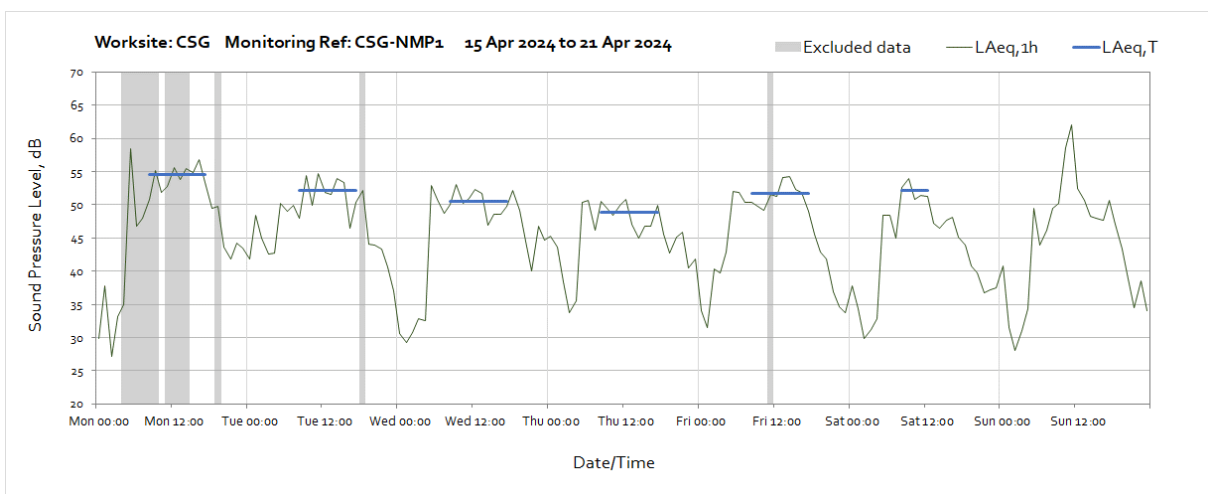
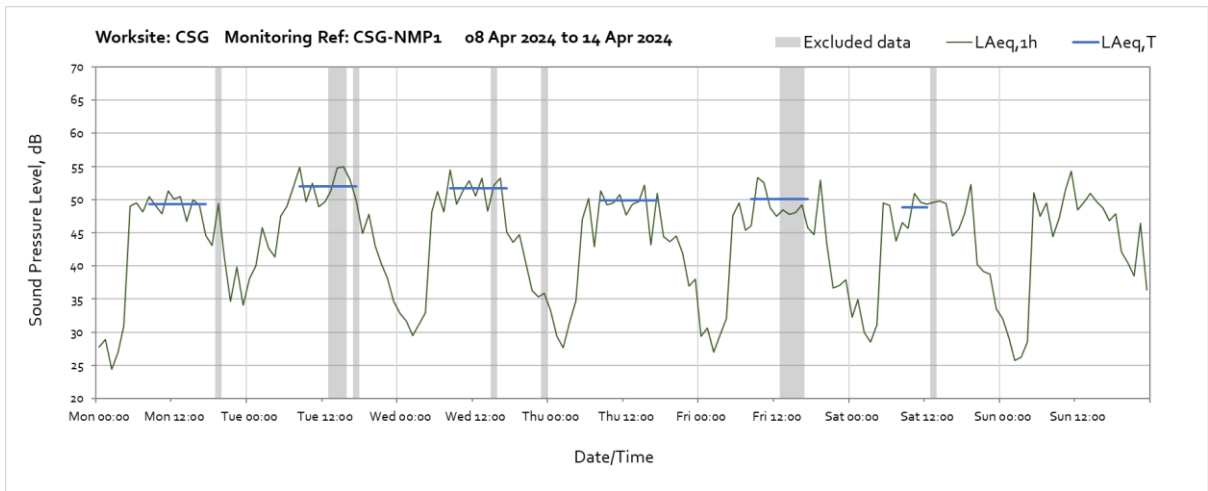
Note: Missing data between 06:00 and 08:00 on Monday 15<sup>th</sup> April was due to a communication error between the monitoring station and server.

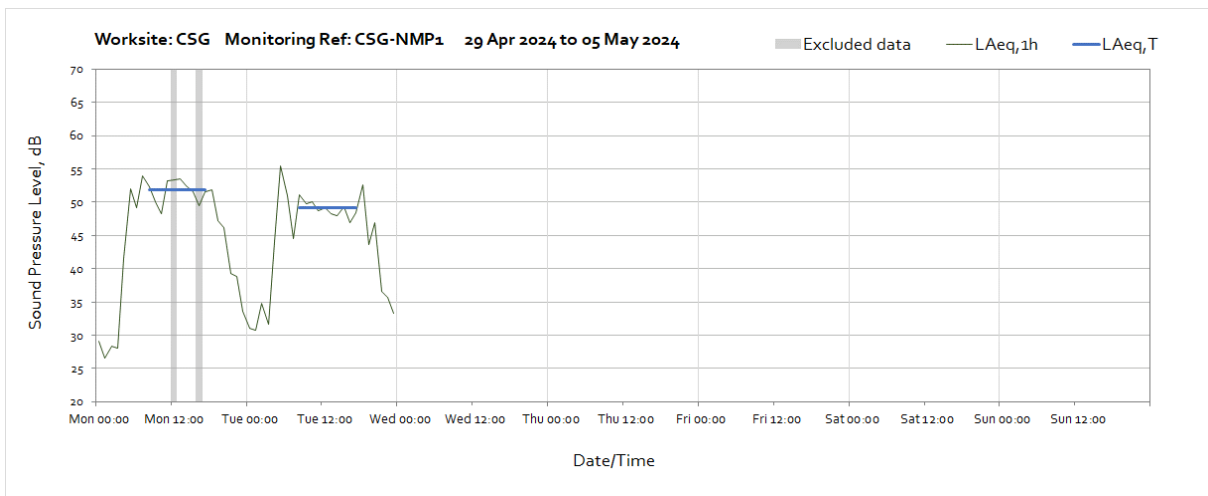
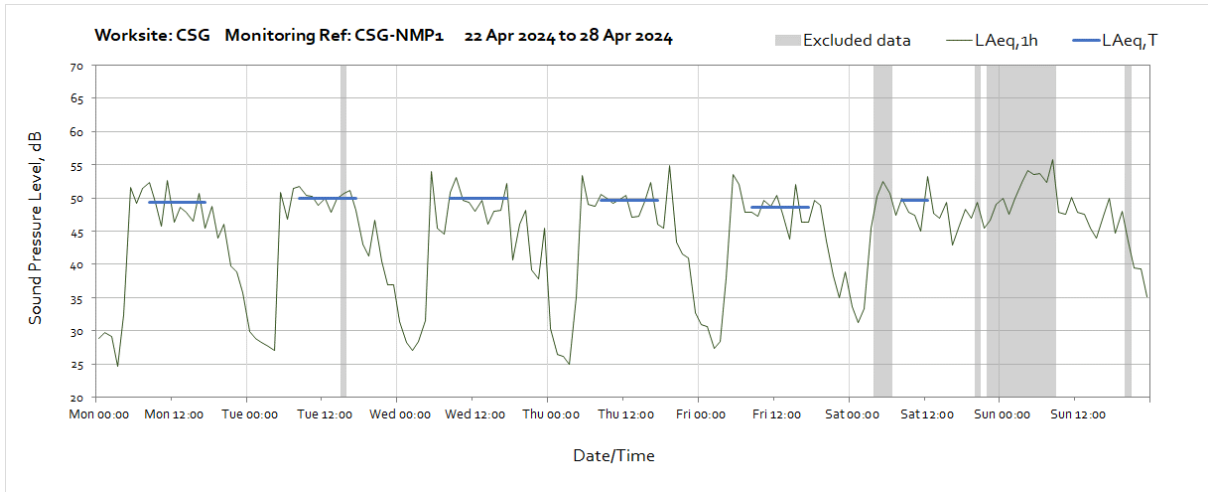


## Worksite: CSG – Monitoring Ref: CSG-NMP1

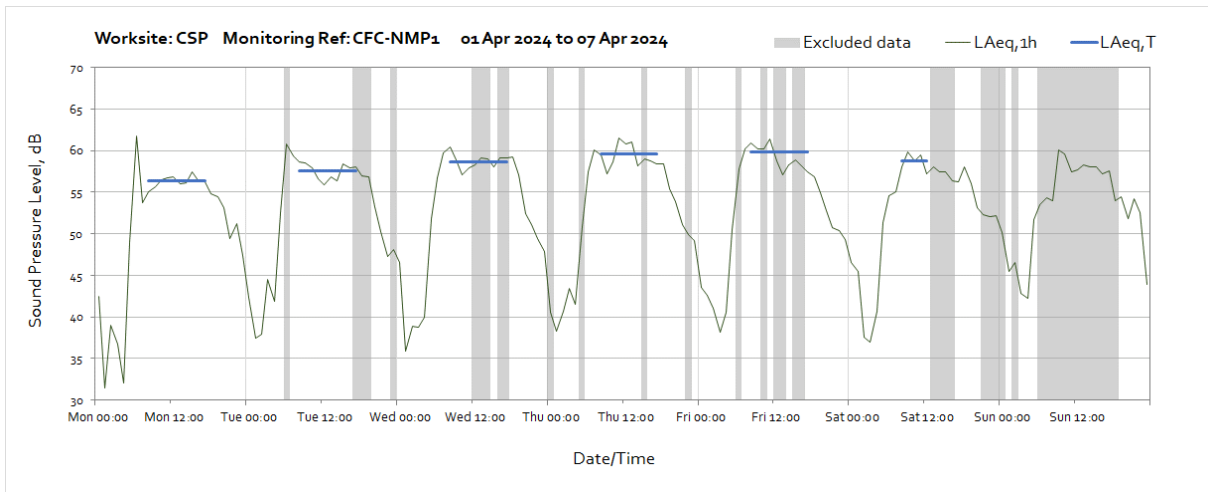


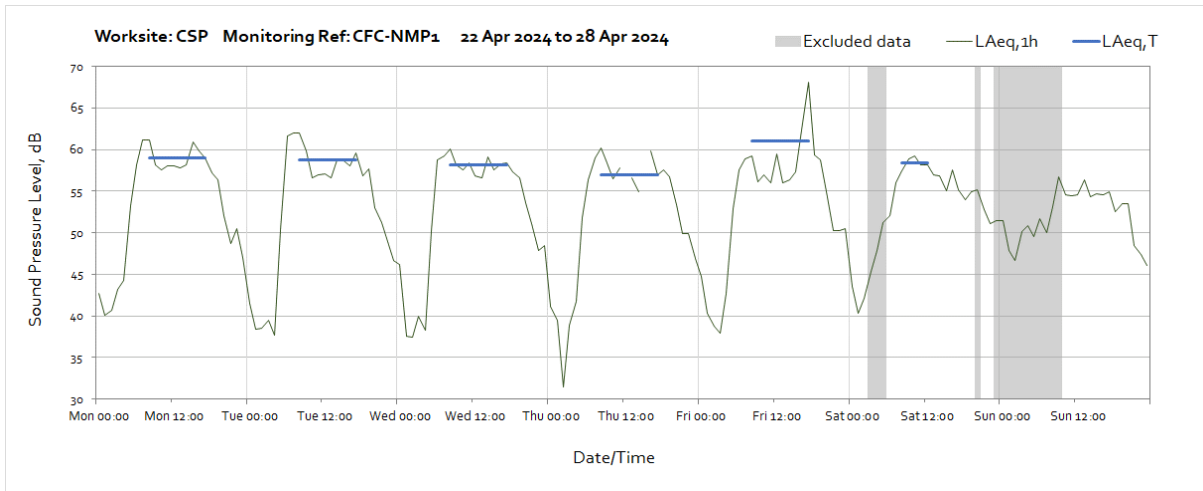
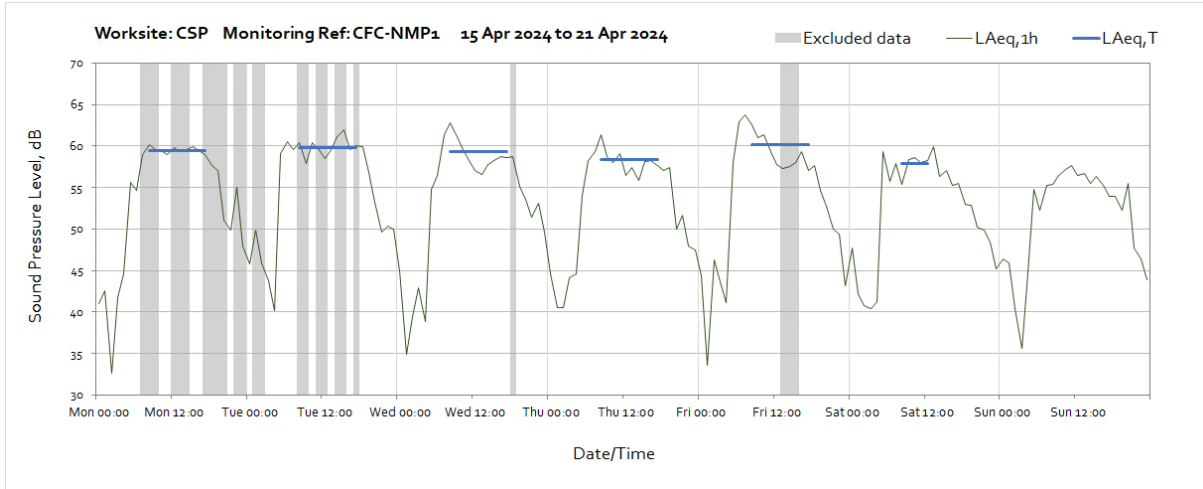
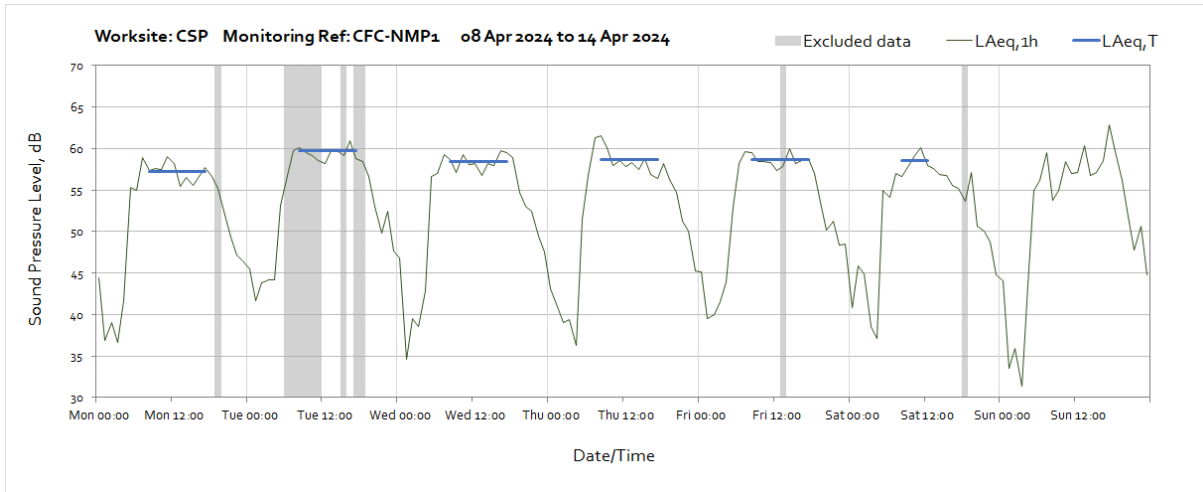
Note: Missing data between 19:00 and 20:00 on Sunday 7<sup>th</sup> April was due to a communication error between the monitoring station and server.



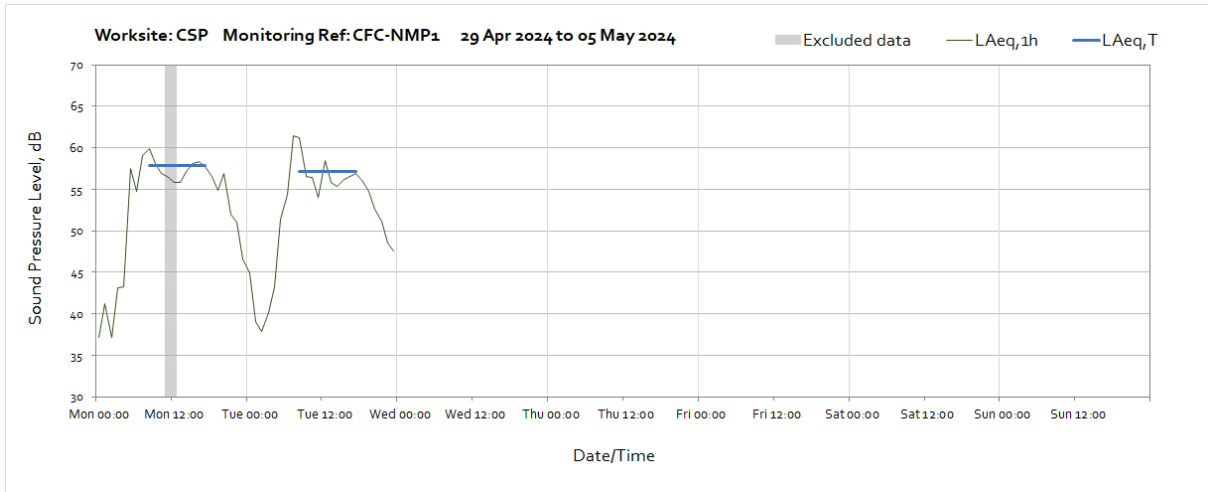


**Worksite: CSP – Monitoring Ref: CFC-NMP1**

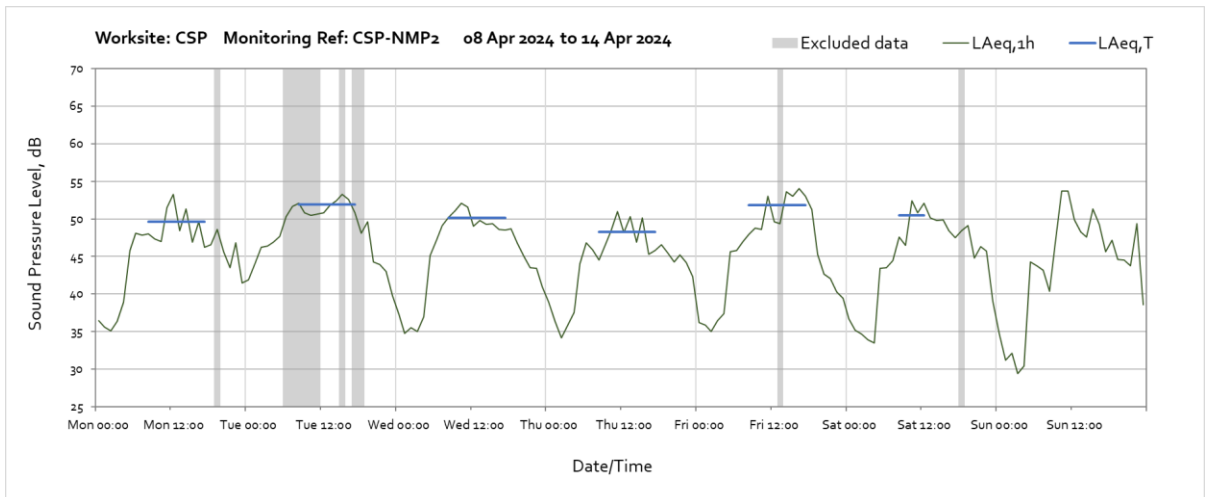
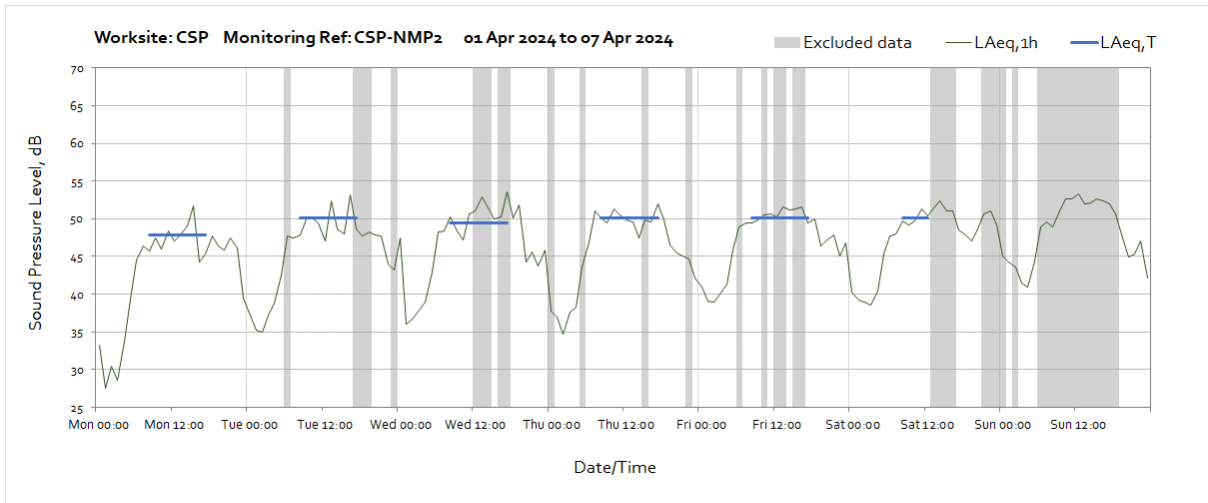


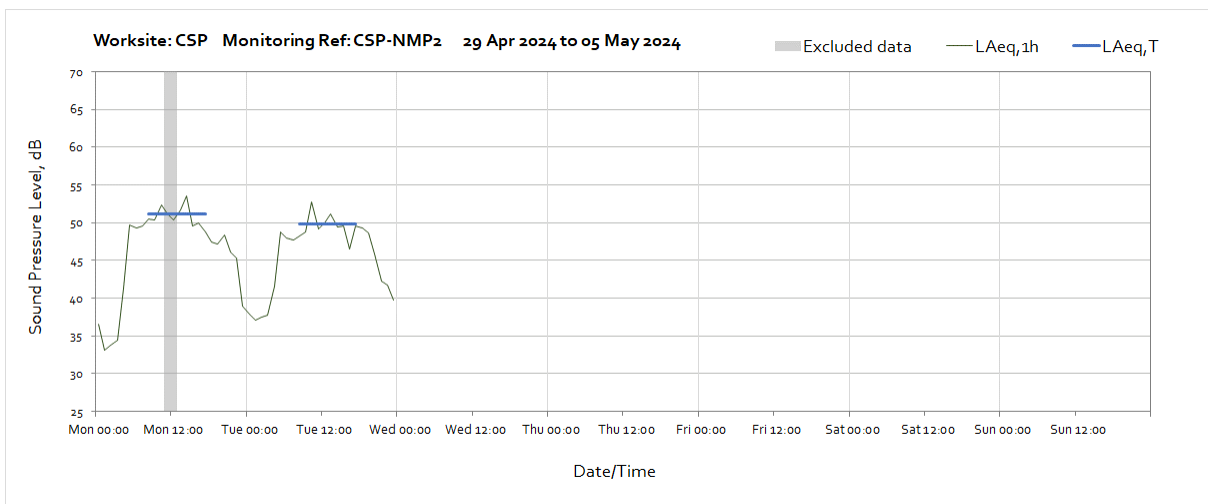
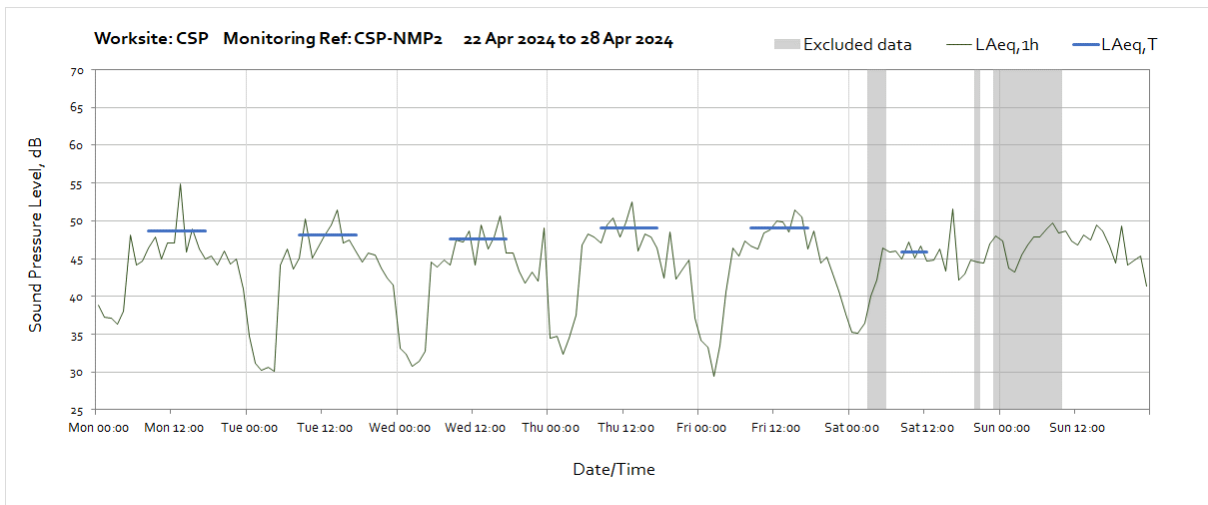
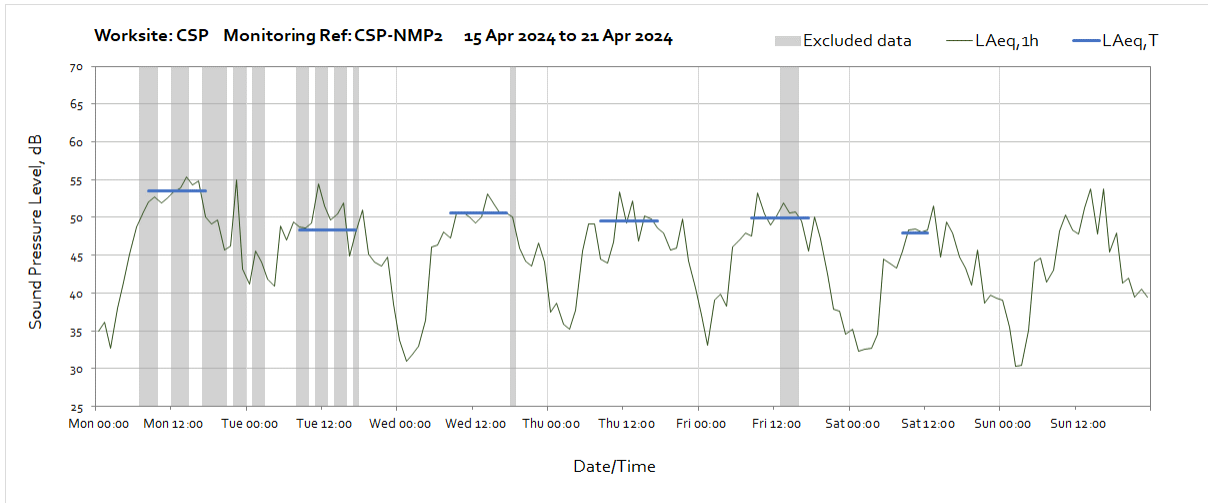


Note: Missing data between 12:00 and 13:00 on Thursday 25<sup>th</sup> April was due to monitor field calibration. Missing data between 15:00 and 16:00 on Thursday 25<sup>th</sup> April was due to a communication error between the monitoring station and server.

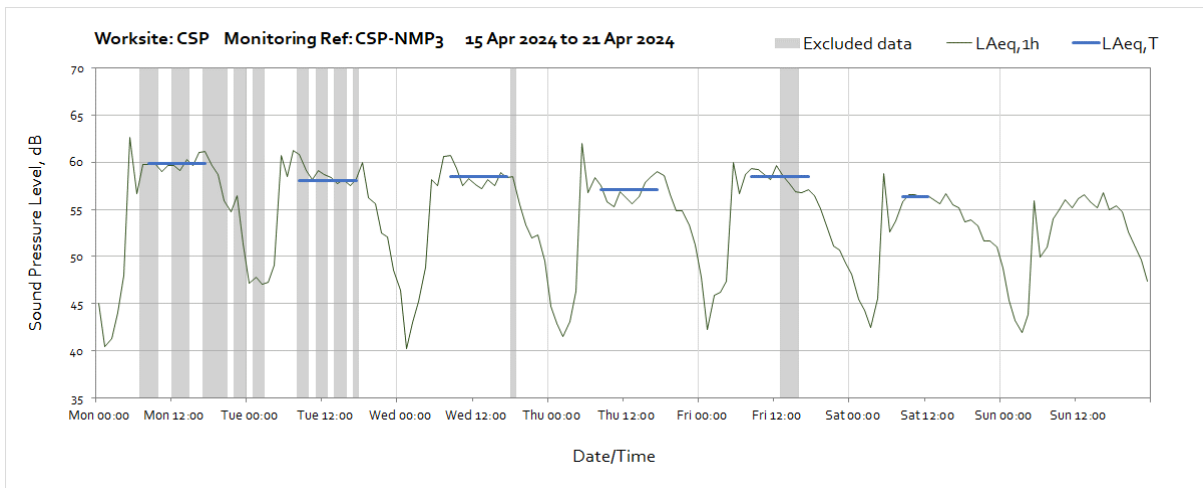
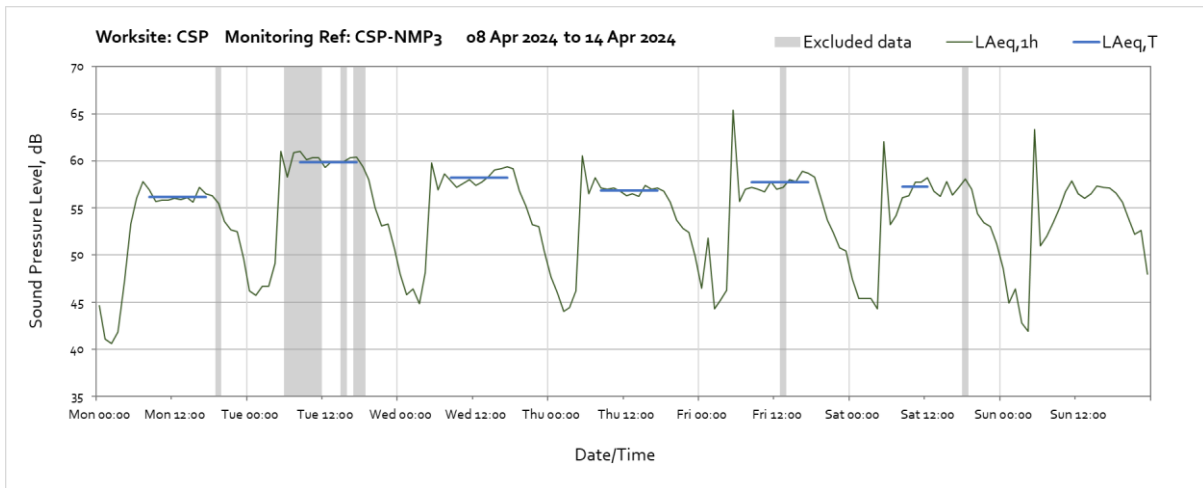
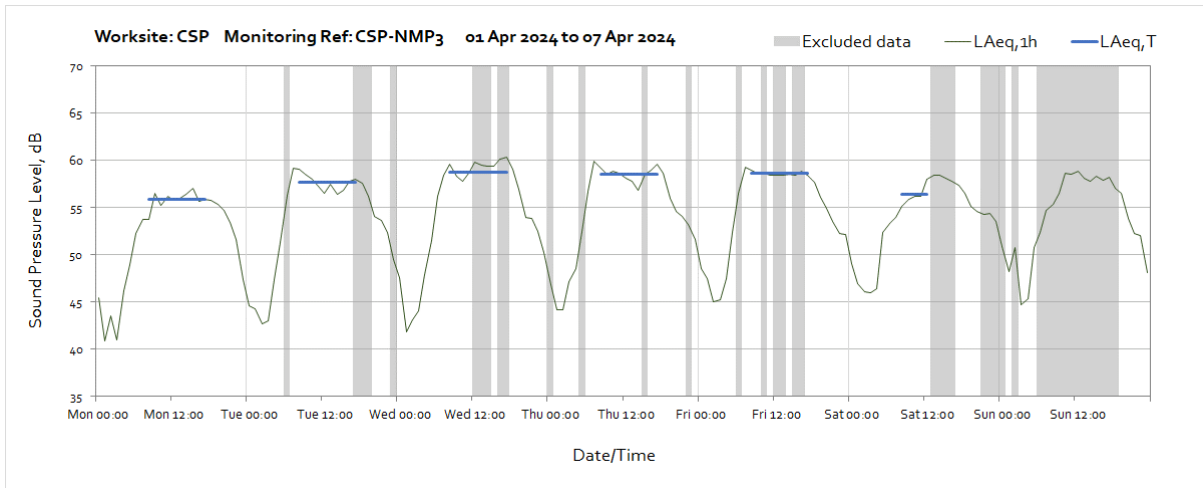


**Worksite: CSP - Monitoring Ref: CSP-NMP2**

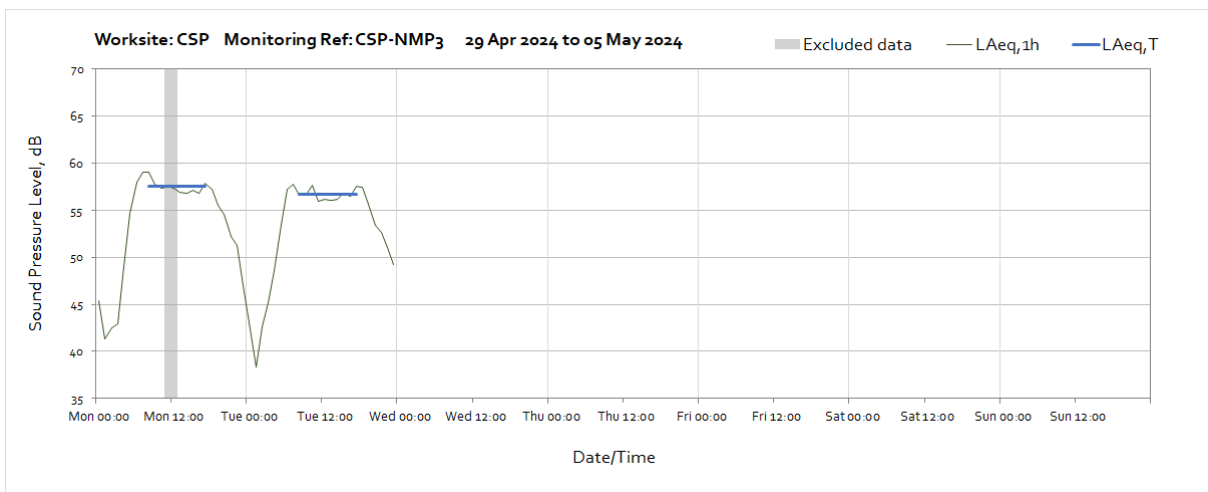
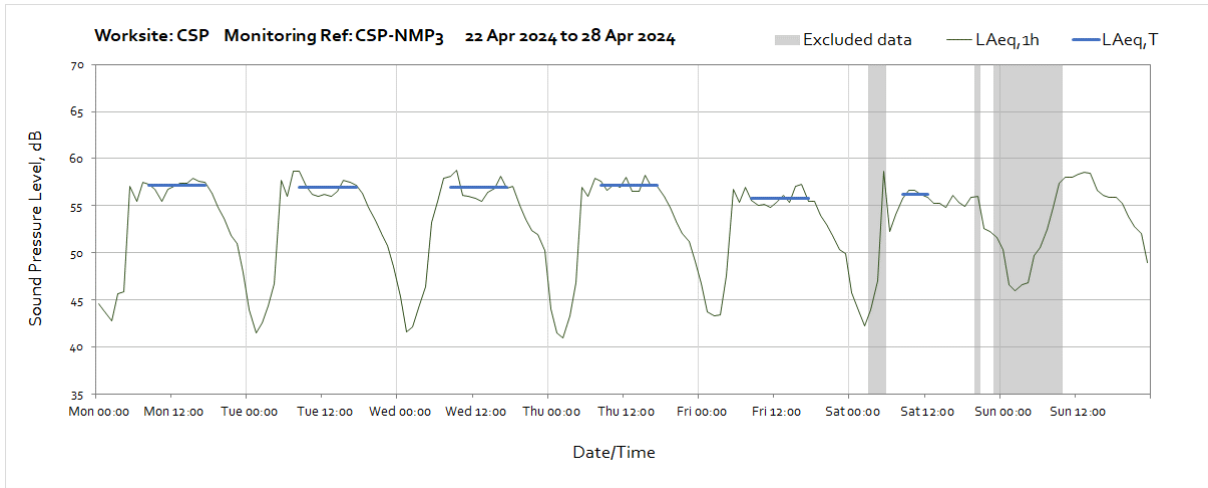




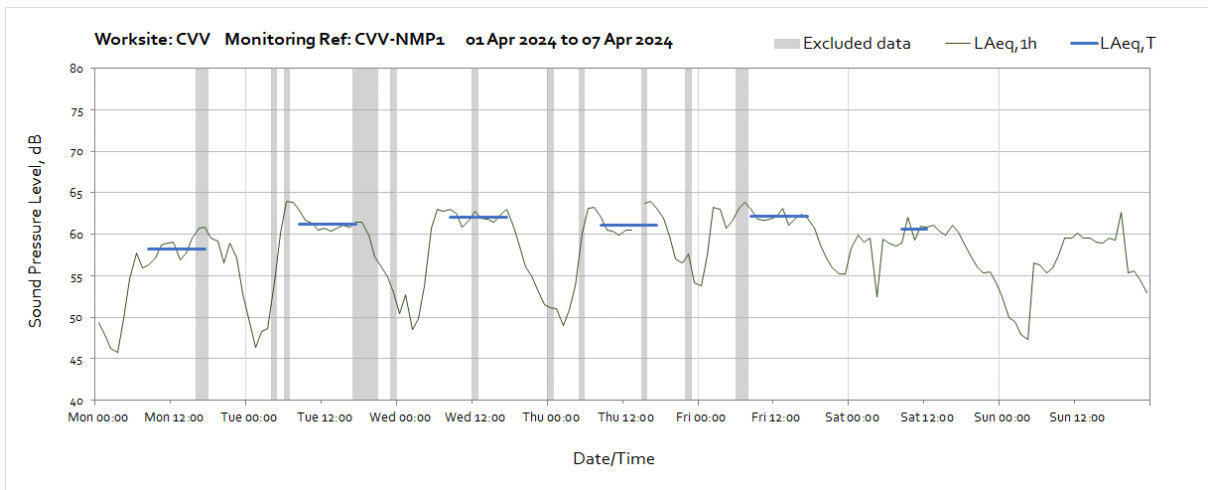
## Worksite: CSP – Monitoring Ref: CSP-NMP3



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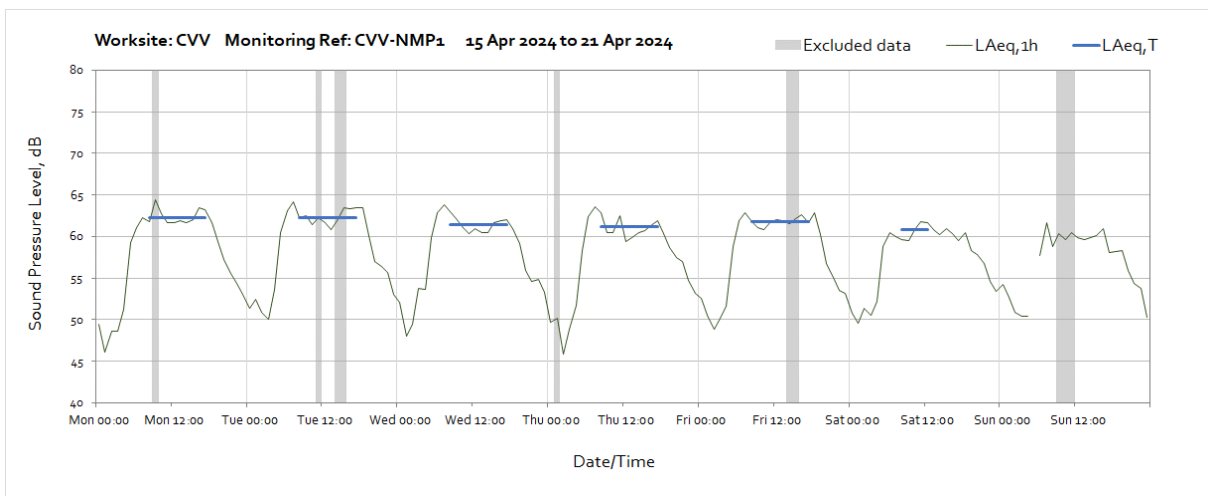
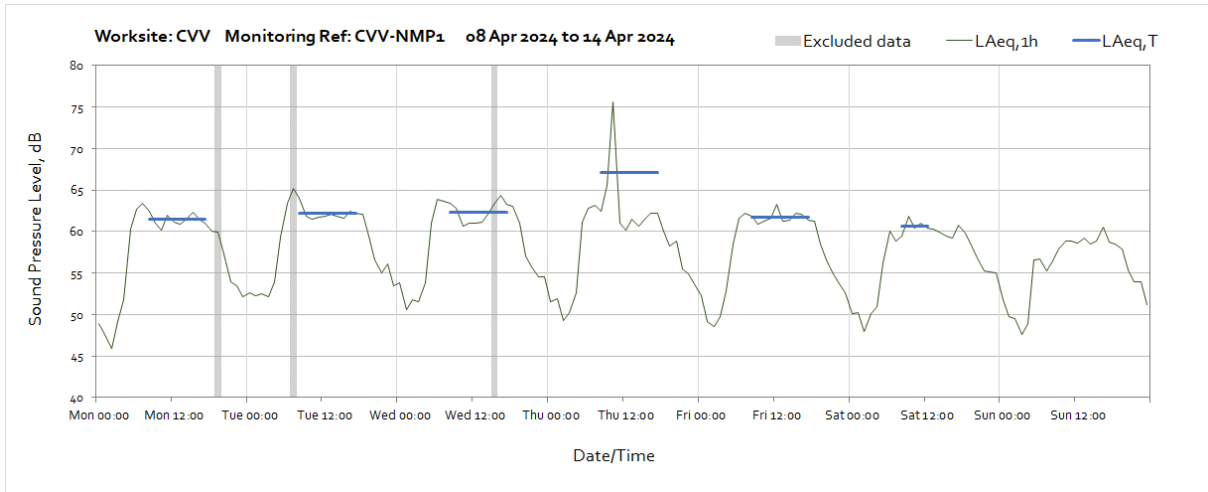


**Worksite: CVV- Monitoring Ref: CVV-NMP1**

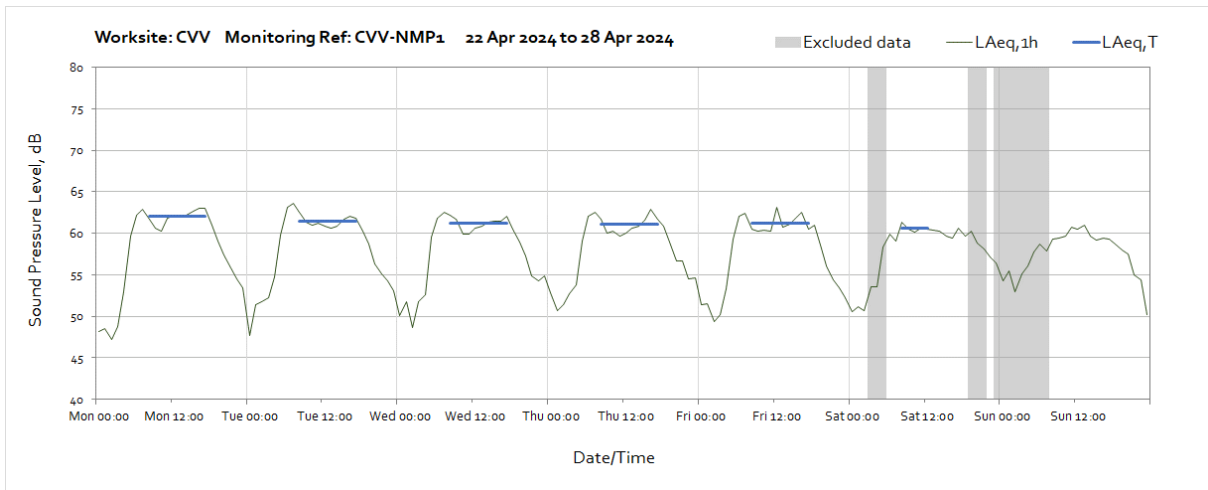


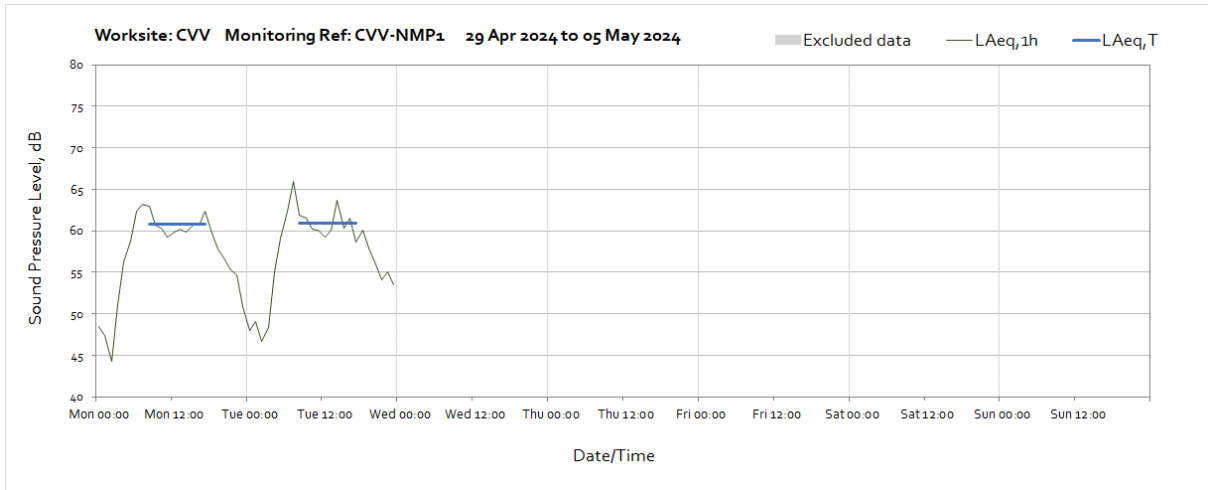
Note: Missing data between 14:00 and 15:00 on Thursday 4<sup>th</sup> April was due to monitor field calibration.



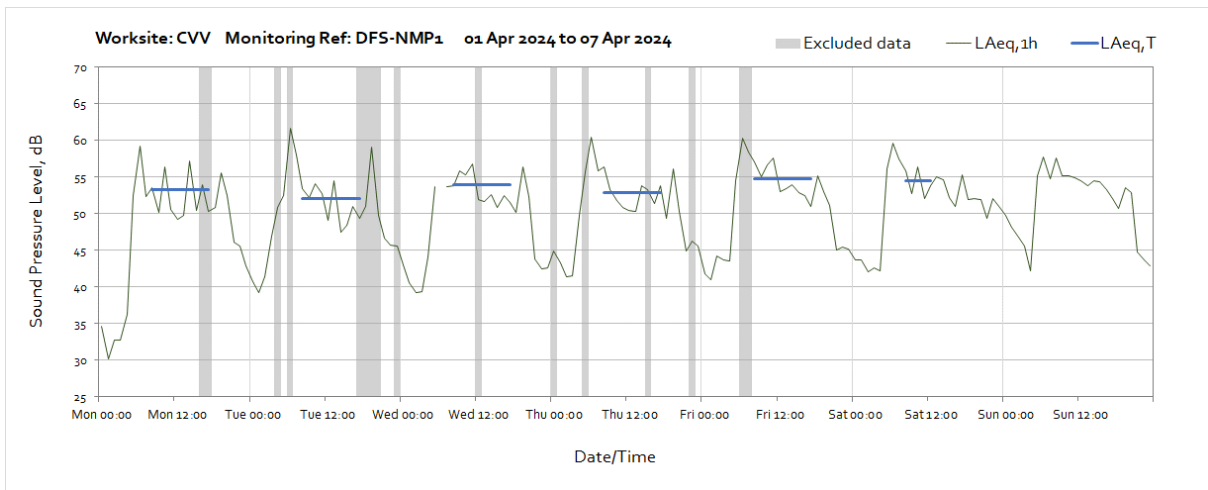


Note: Missing data between 05:00 and 06:00 on Sunday 21<sup>st</sup> April was due to a communication error between the monitoring station and server.

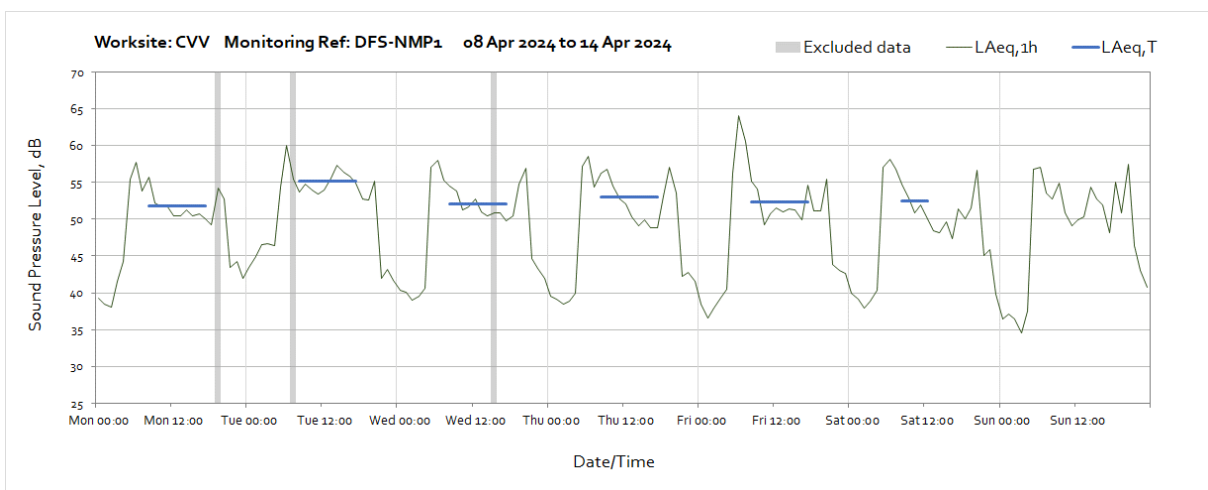


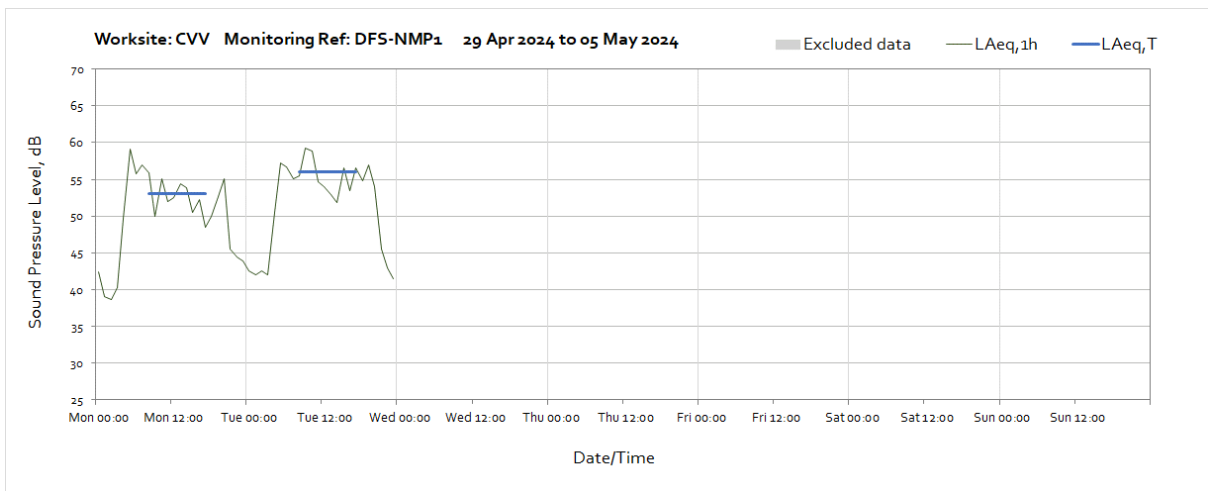
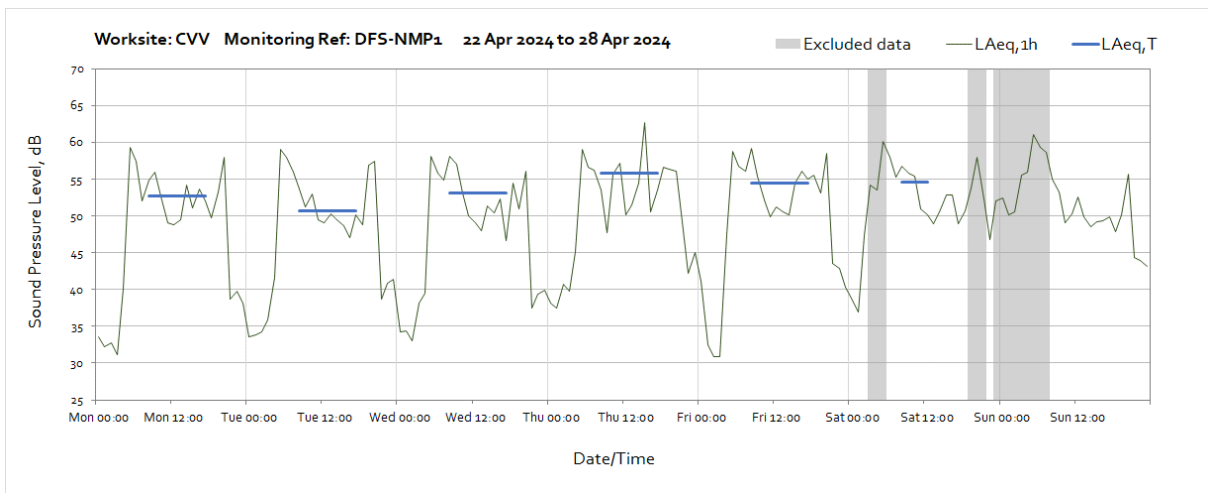
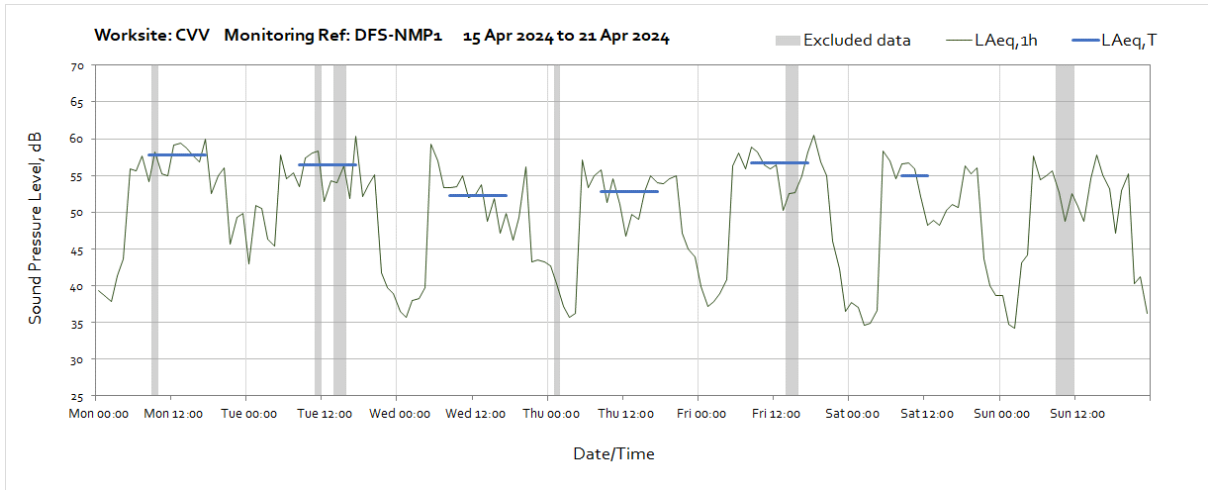


**Worksite: CVV – Monitoring Ref: DFS-NMP1**



Note: Missing data between 06:00 and 07:00 on Wednesday 3<sup>rd</sup> April was due to a communication error between the monitoring station and server.

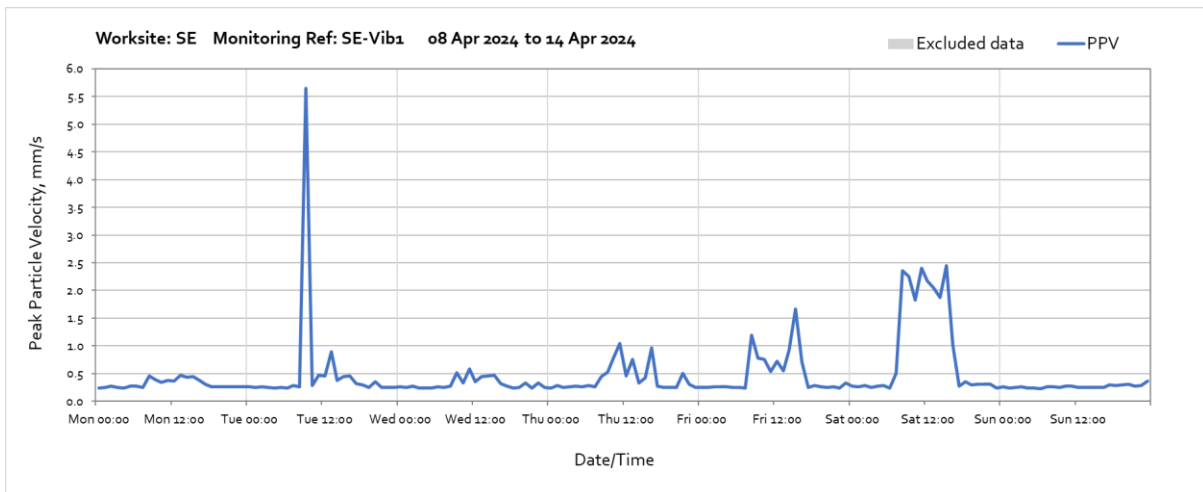
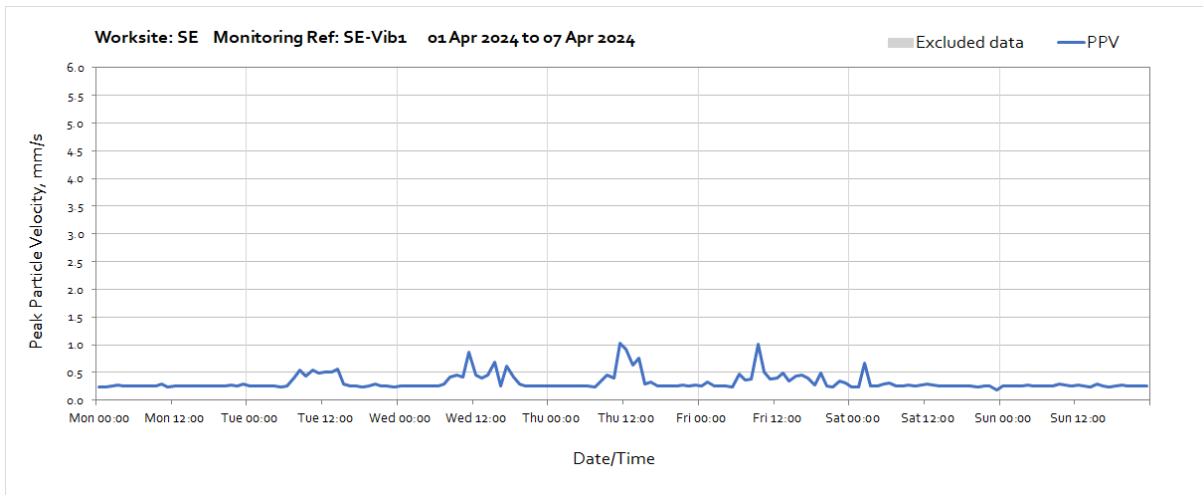


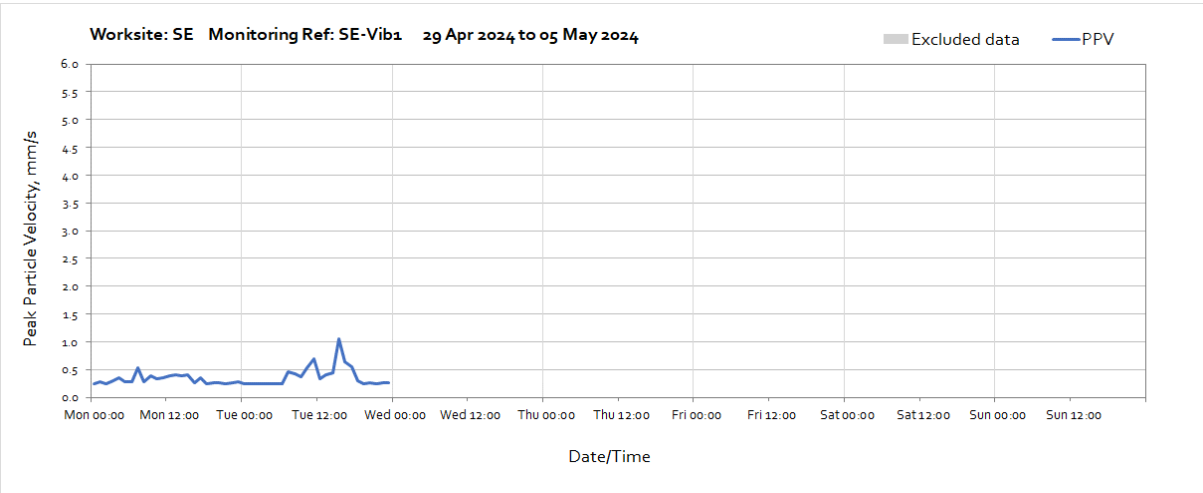
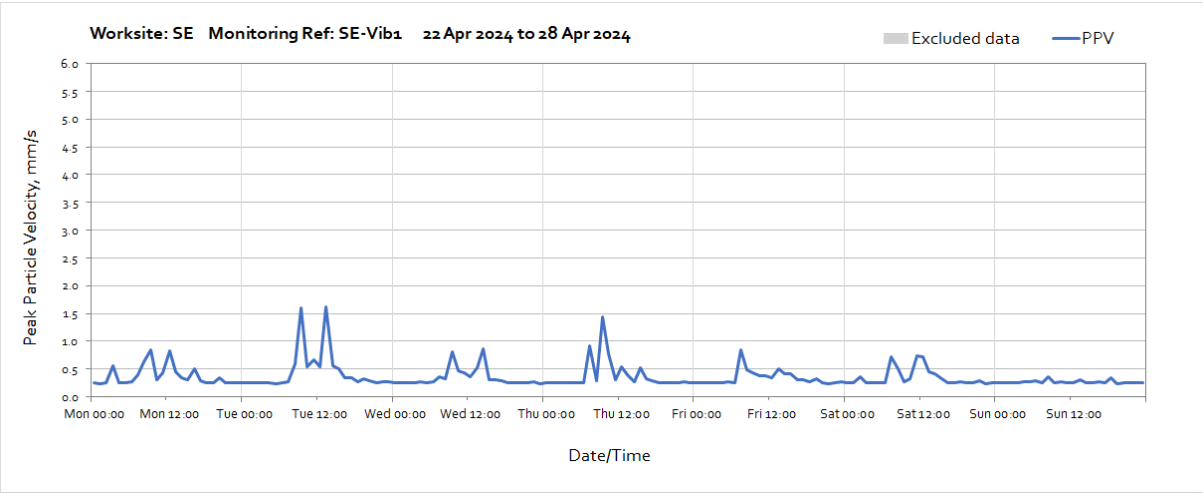
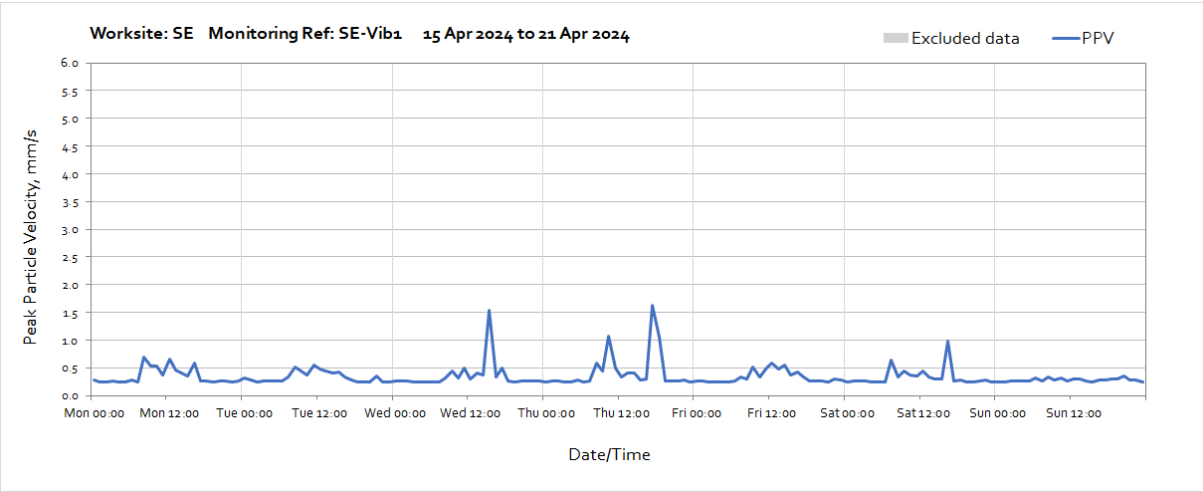


# Vibration

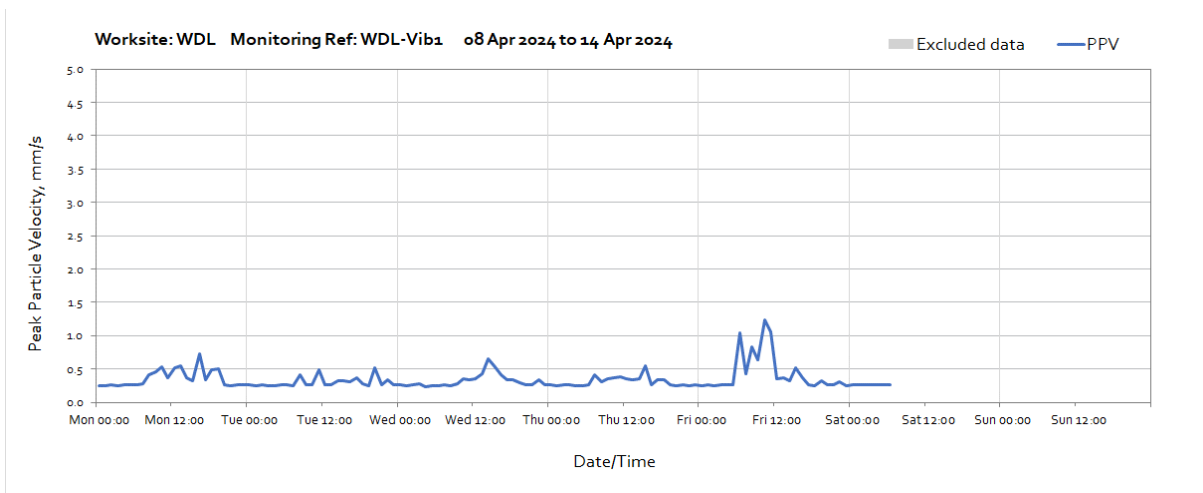
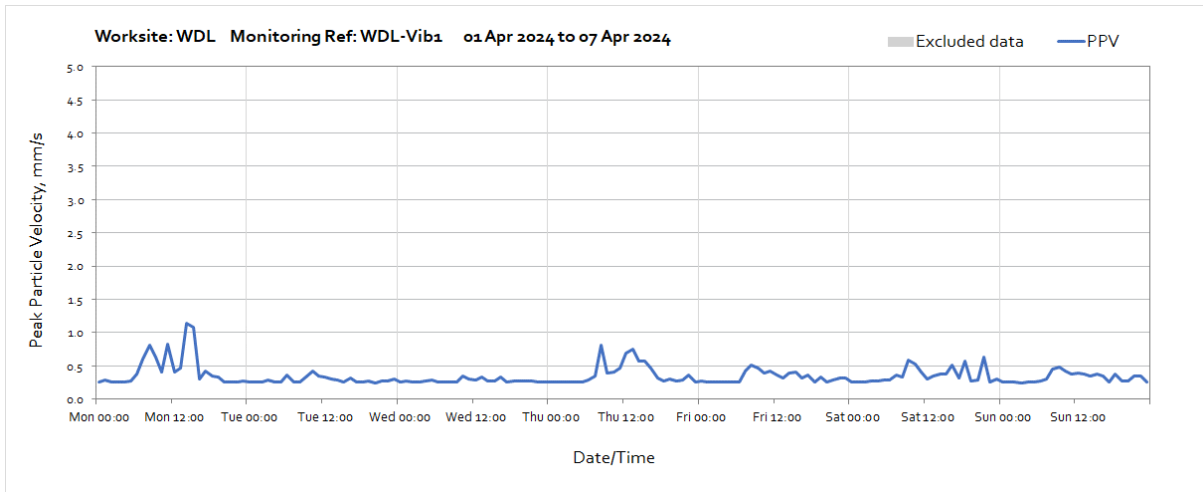
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axes x, y and z. Periods where PPV values have been affected by local interference with the vibration monitor or only measured for part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

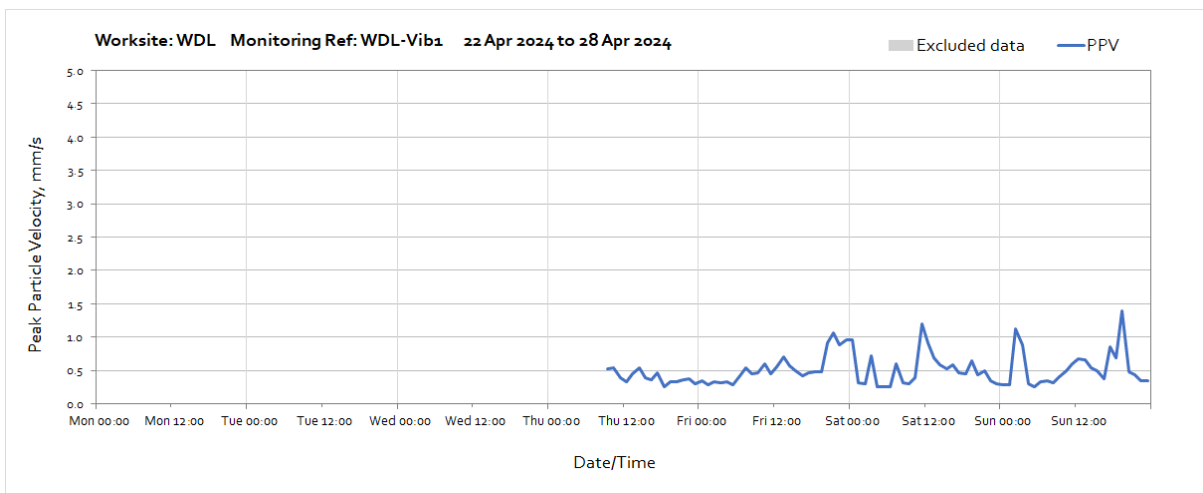




## Worksite: WDL – Monitoring Ref: WDL-Vib1

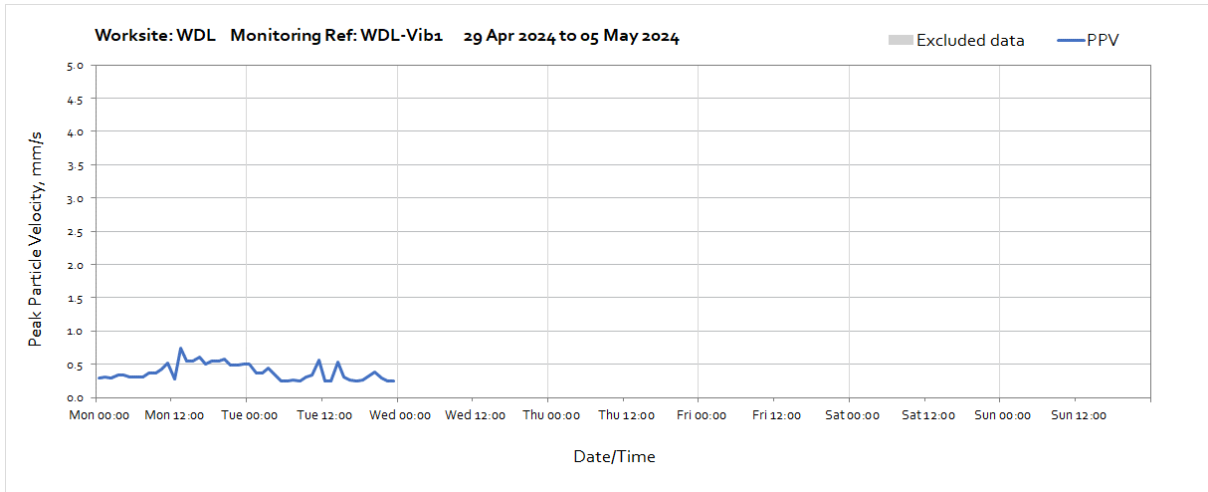


Note: Missing data between 07:00 on Saturday 13<sup>th</sup> April until 09:00 on Thursday 25<sup>th</sup> April was due to a depleted monitor battery which has since been replaced.

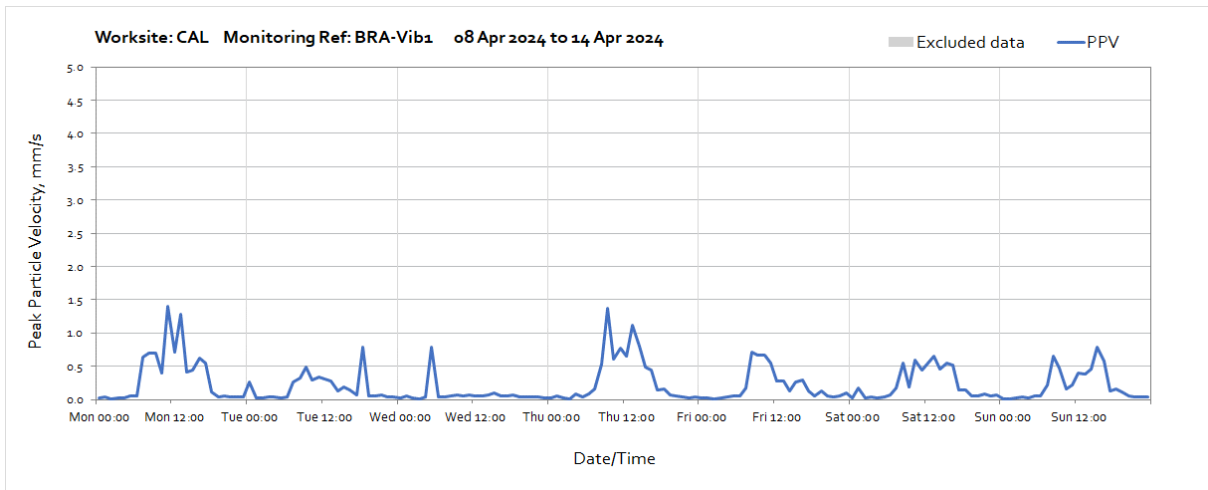
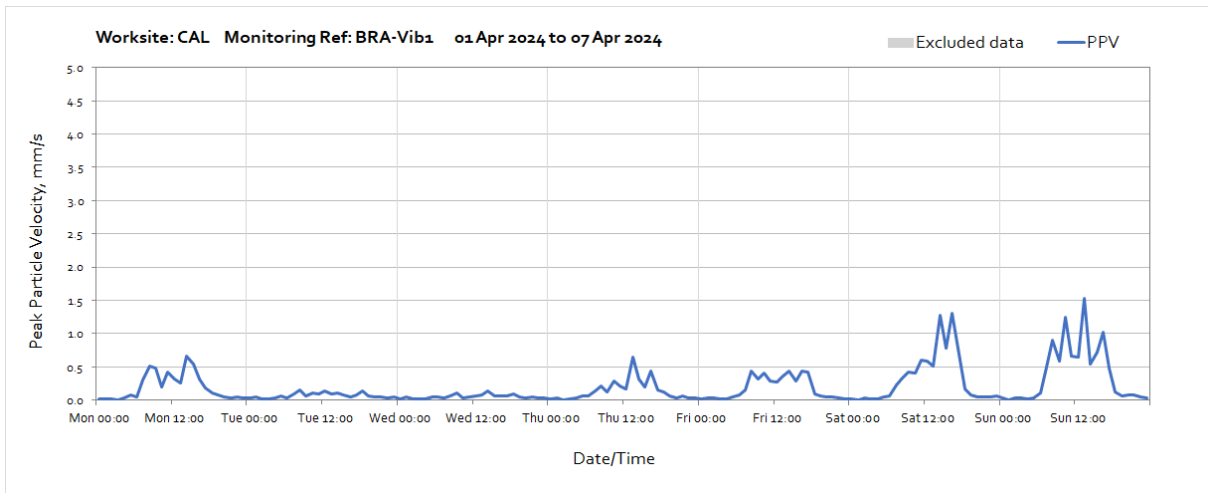


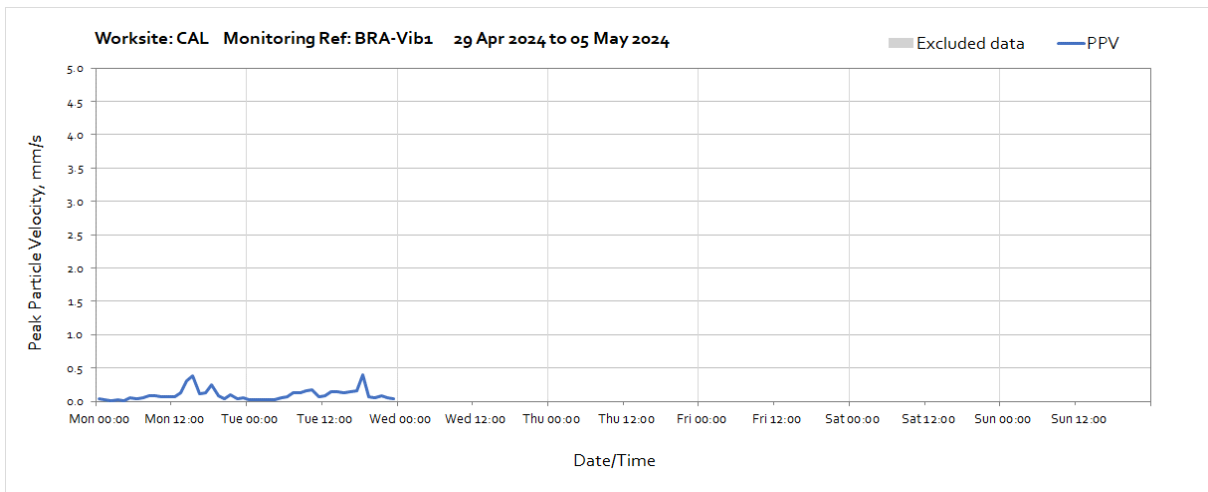
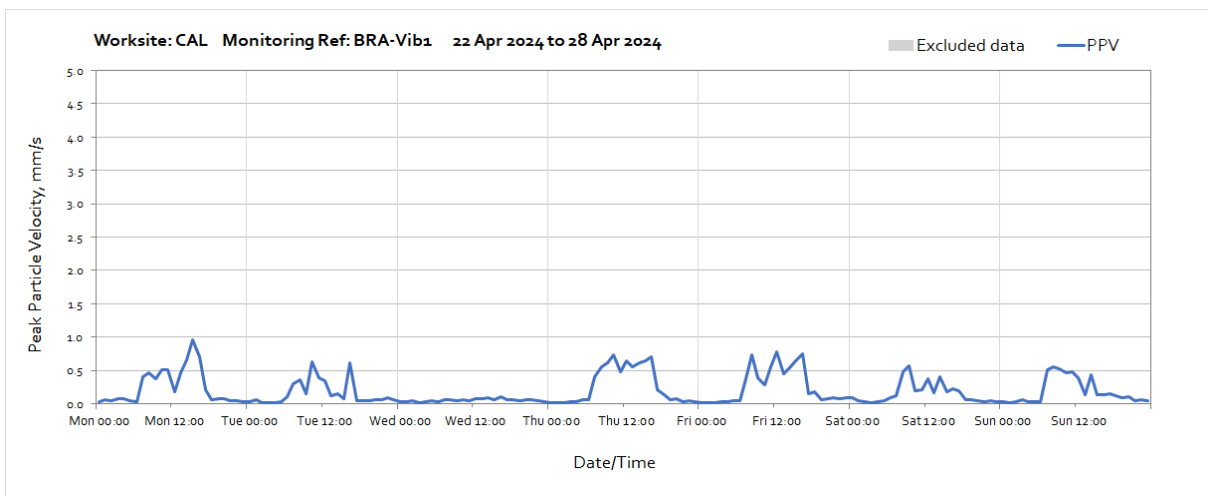
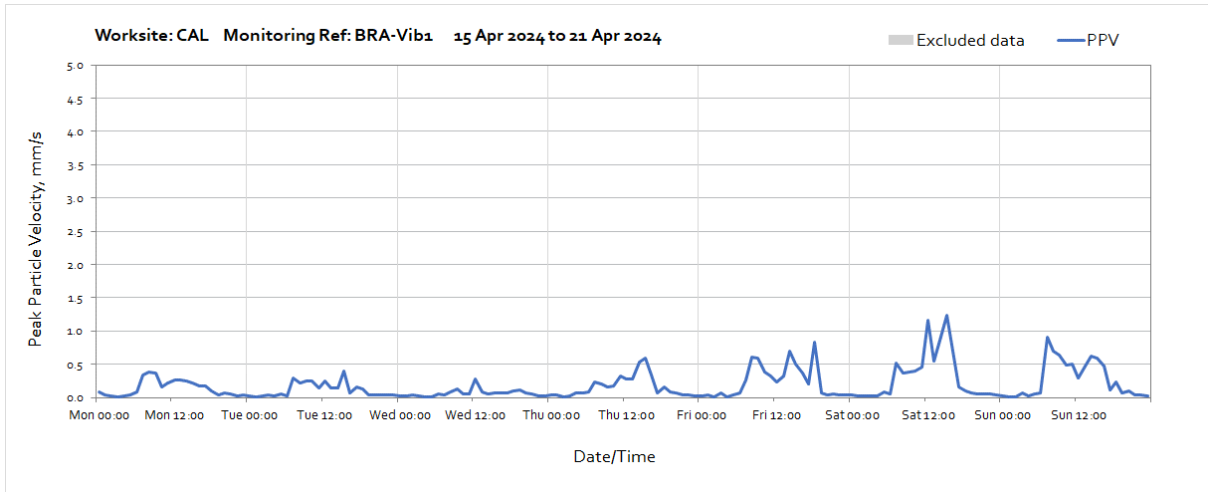
Note: Missing data between 07:00 on Saturday 13<sup>th</sup> April until 09:00 on Thursday 25<sup>th</sup> April was due to a depleted monitor battery which has since been replaced.

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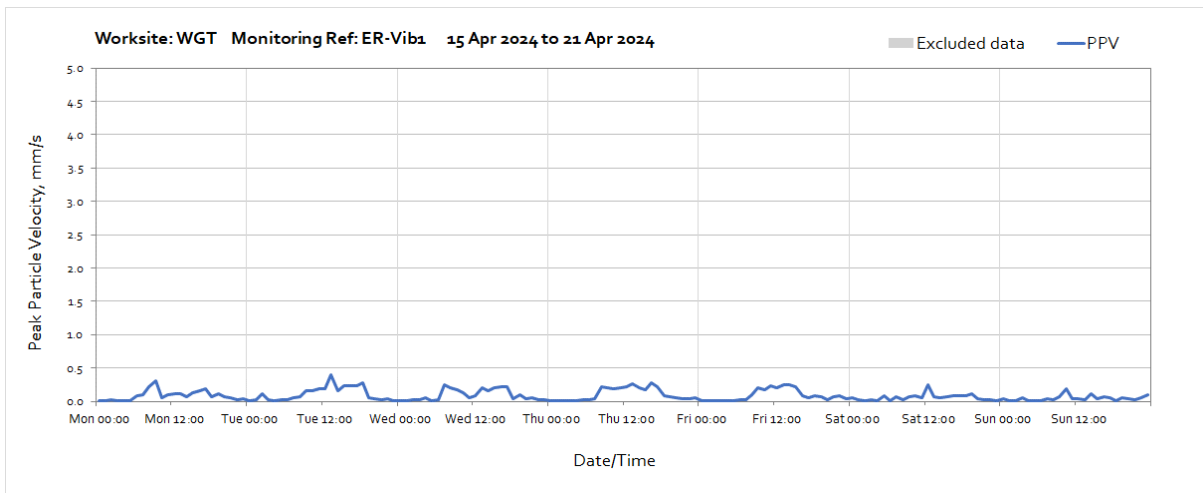
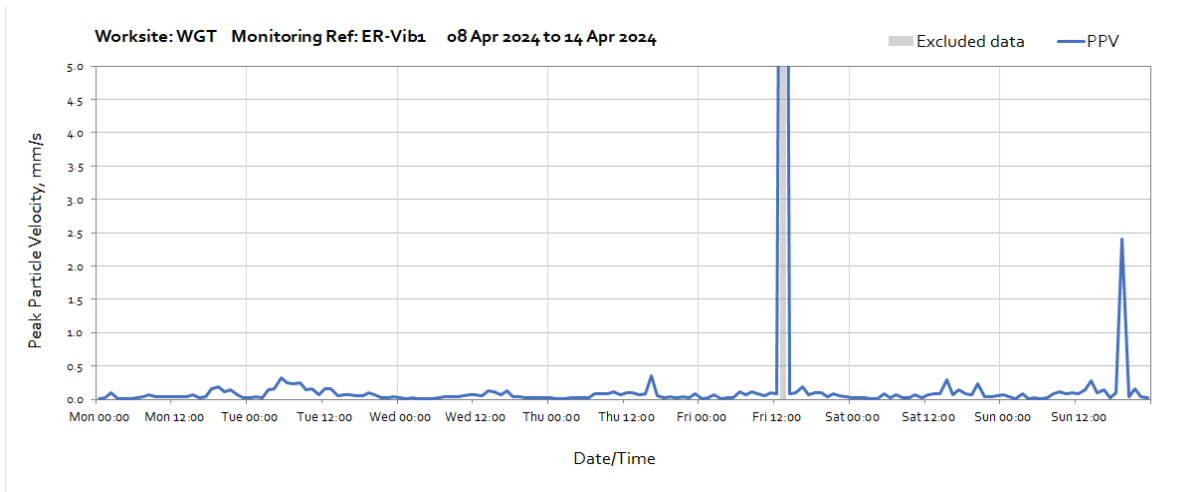
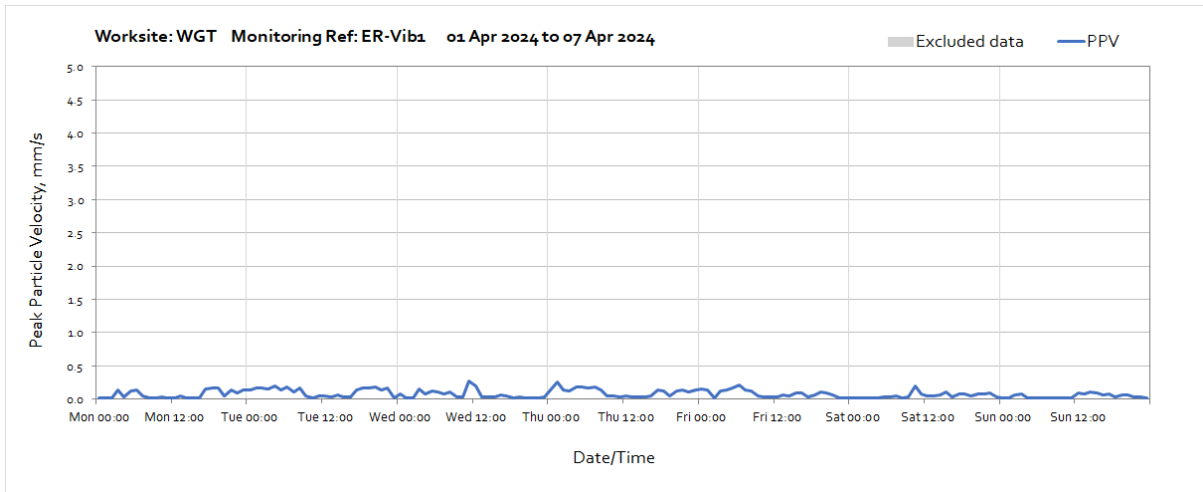
**Worksite: CAL - Monitoring Ref: BRA-Vib1**



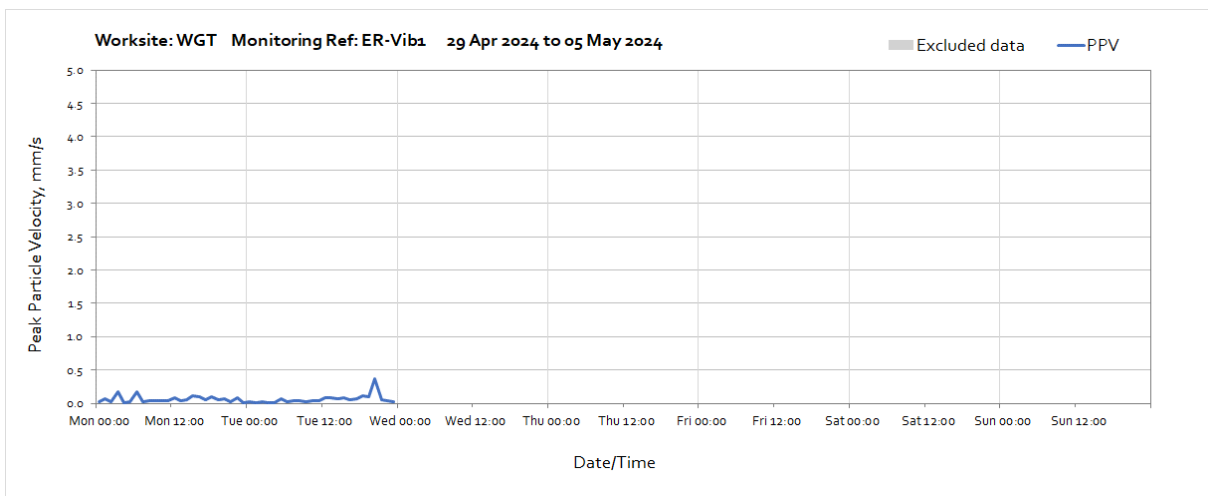
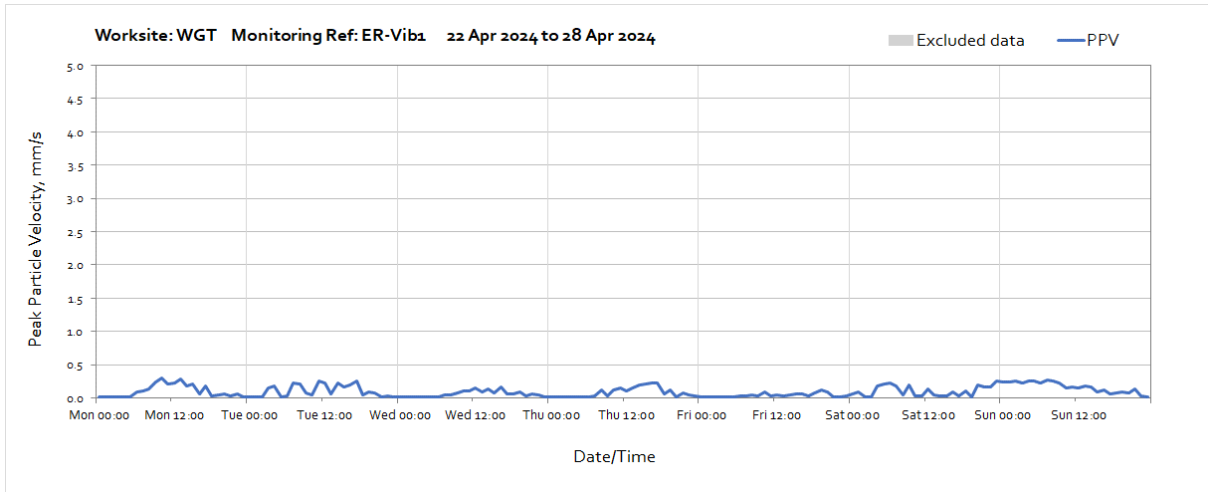




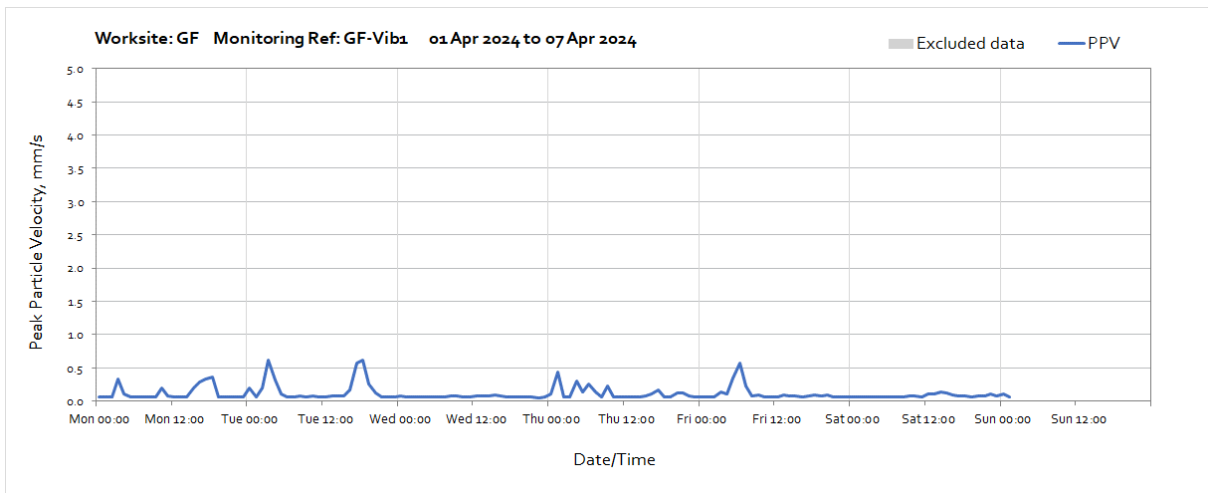
## Worksite: WGT – Monitoring Ref: ER-Vib1



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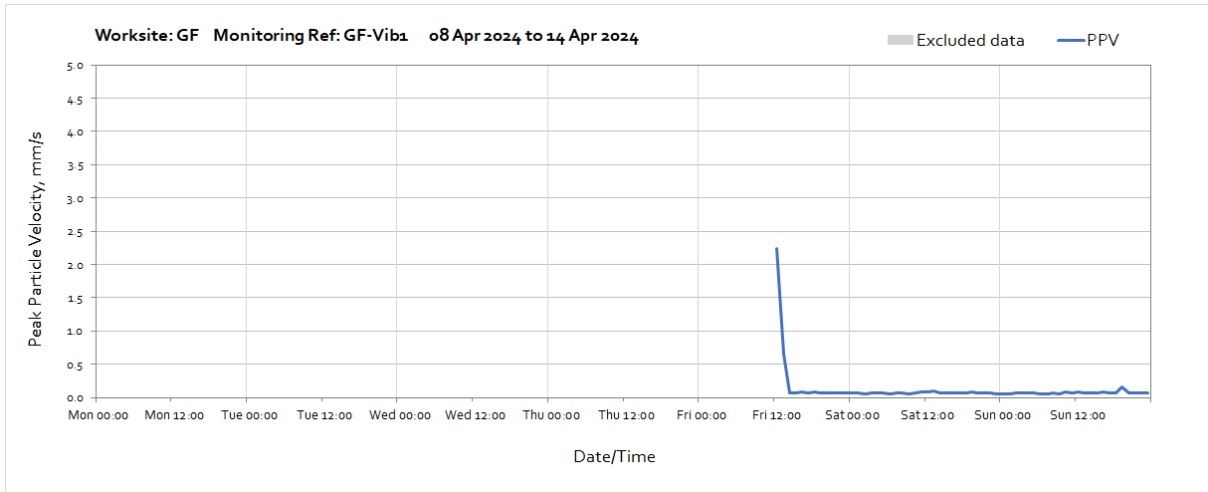


**Worksite: GF – Monitoring Ref: GF-Vib1**

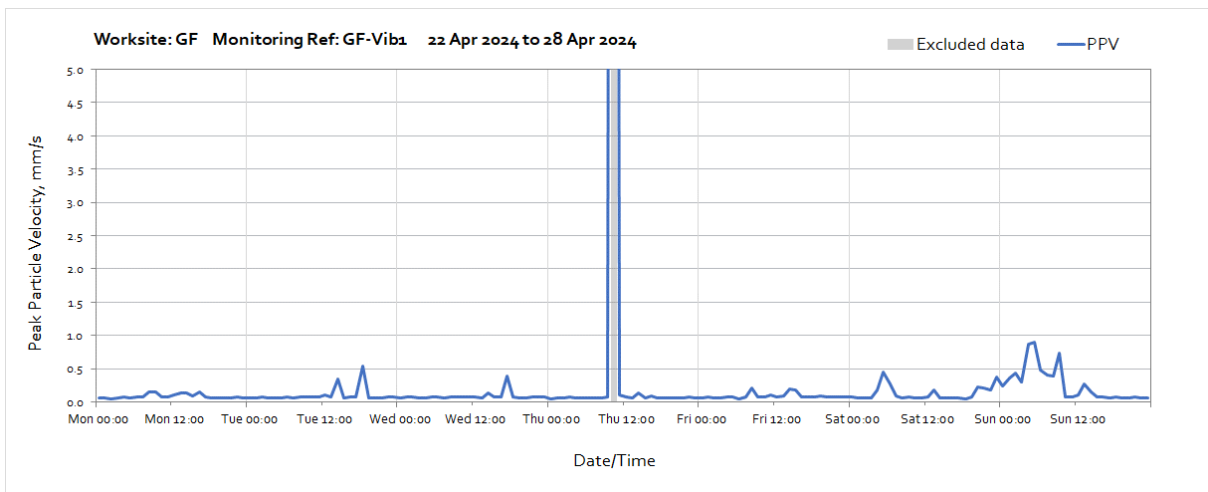
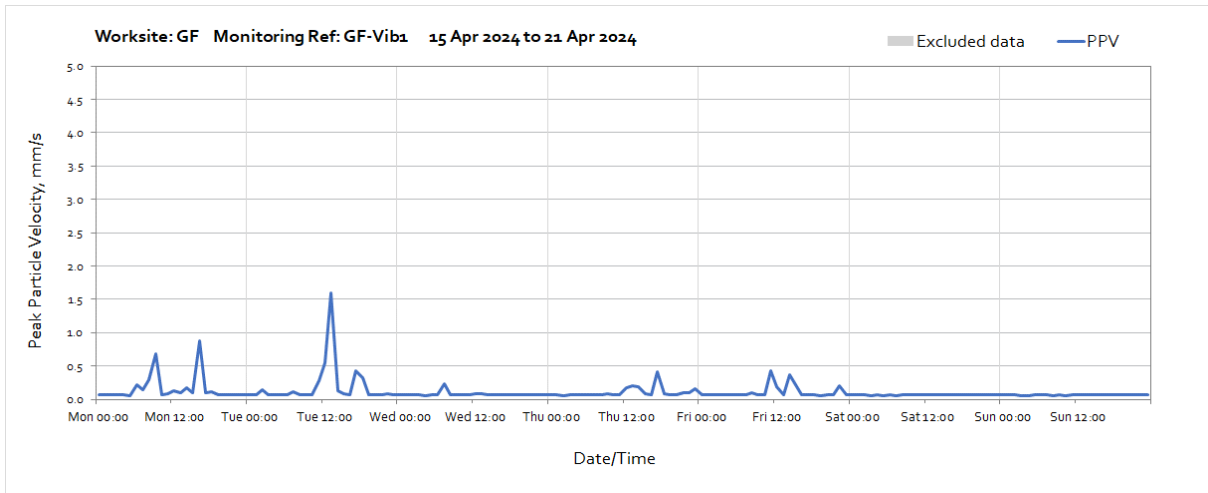


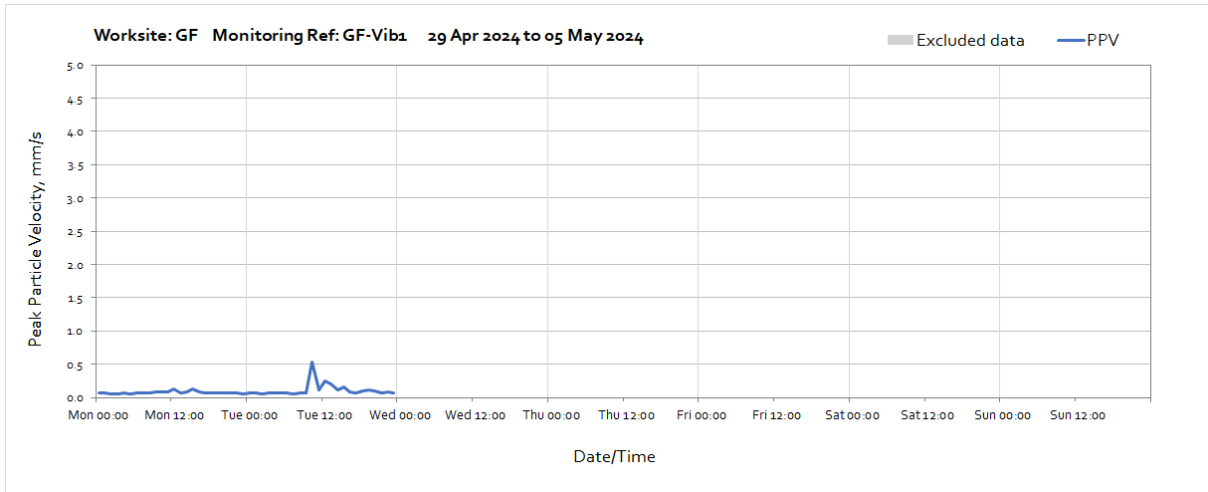
Note: Missing data between 02:00 on Sunday 7<sup>th</sup> April and 12:00 on Friday 12<sup>th</sup> April was due to a loss of power to the monitoring station caused by poor weather conditions preventing sufficient light to reach the solar panel.

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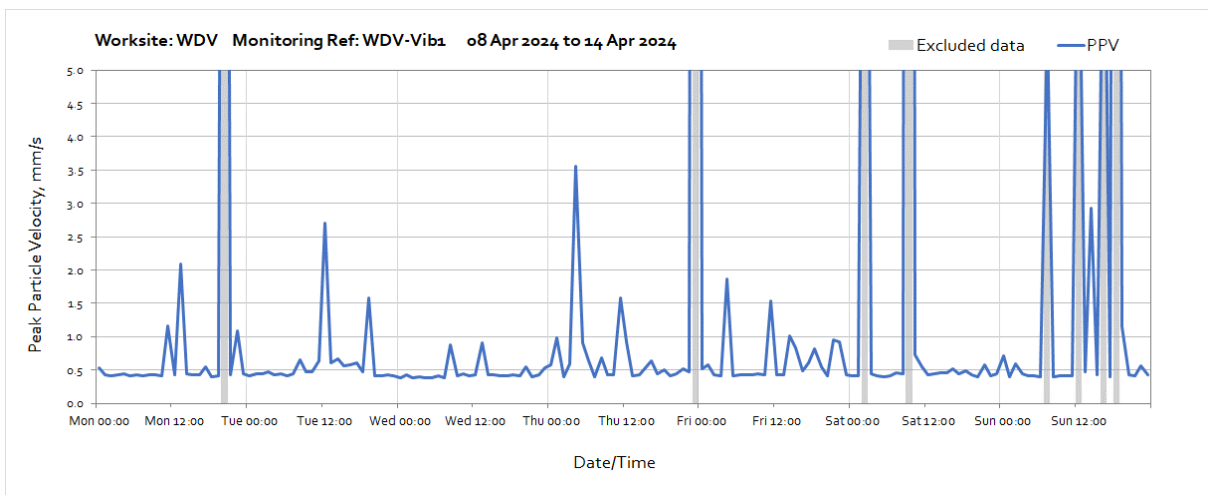
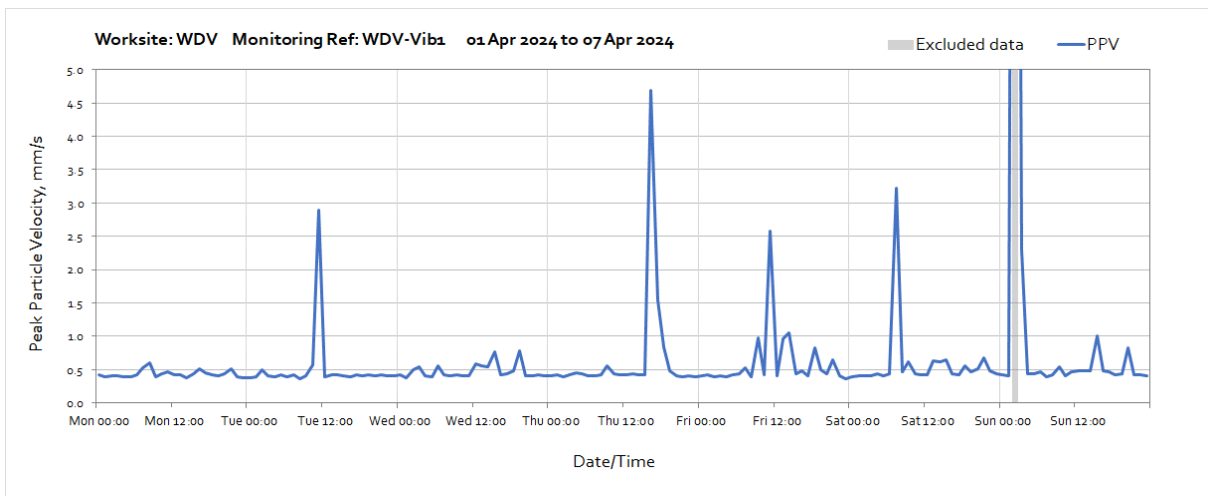


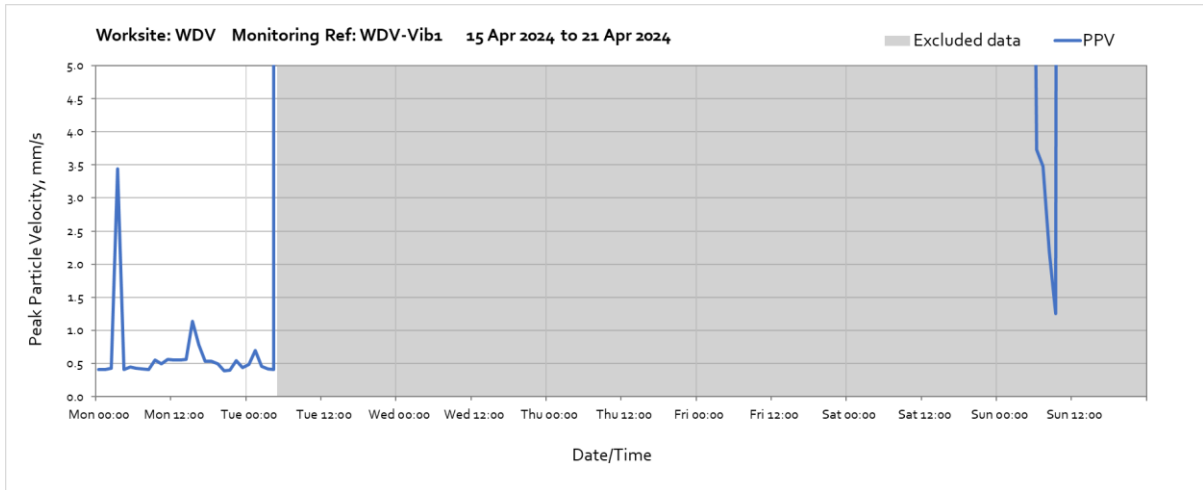
Note: Missing data between 02:00 on Sunday 7<sup>th</sup> April and 12:00 on Friday 12<sup>th</sup> April was due to a loss of power to the monitoring station caused by poor weather conditions preventing sufficient light to reach the solar panel.



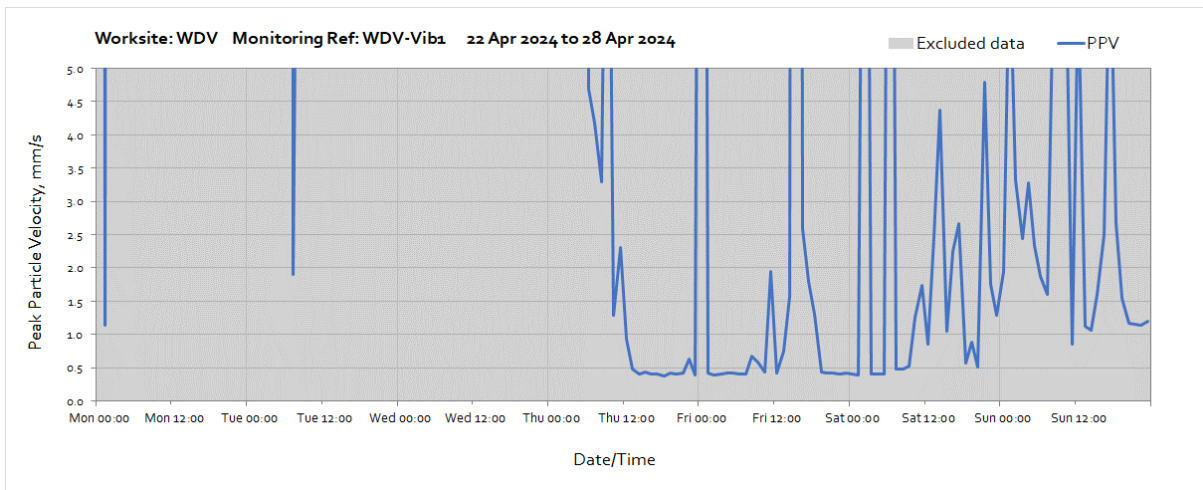


**Worksite: WDV - Monitoring Ref: WDV-Vib1**

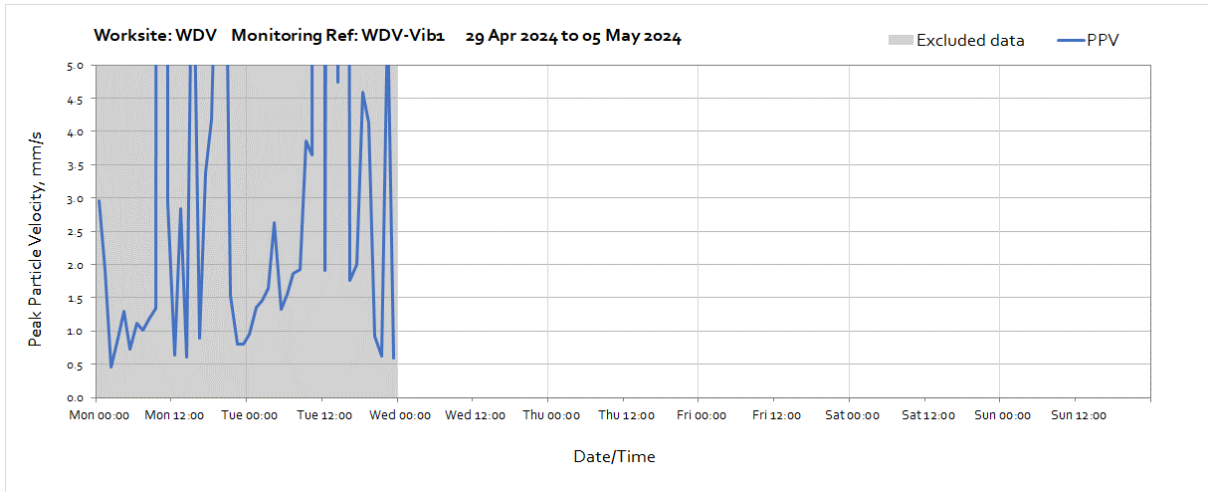




Note: Excluded data between 05:00 on Tuesday 16<sup>th</sup> and the end of the month was due to a monitor storage fault.



Note: Excluded data between 05:00 on Tuesday 16<sup>th</sup> and the end of the month was due to a monitor storage fault.



Note: Excluded data between 05:00 on Tuesday 16<sup>th</sup> and the end of the month was due to a monitor storage fault.