

## Construction Noise and Vibration Monthly Report – August 2023

### 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 August 2023.

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 material crushing and screening, stockpile haulage, drainage and diversion works were underway.
- Noise monitoring was undertaken in the vicinity of the School End (ref.: SE) and Hermitage Chetwode (ref.: HC) worksites where compound development, haul road maintenance, bulk excavation, topsoil stripping, drainage works, overbridge construction, stockpiling and vehicle movements were underway.
- Noise monitoring was undertaken in the vicinity of the Twyford worksite (ref.: TW) where access and haul road maintenance, bulk excavation, excavation, culvert works, vehicle movements and stockpiling were underway.
- Noise monitoring was undertaken in the vicinity of the West Street Overbridge worksite (ref.: WSO), where formwork reinforced concrete, embankment earthworks, road diversion works and trenching were underway.
- Noise monitoring was undertaken in the vicinity of the Addison Road worksite (ref.: AR) where embankment earthworks and overbridge construction were underway.
- Noise monitoring was undertaken in the vicinity of the Calvert worksite (ref.: CAL) where operation of concrete batching plant, material movements, earthworks and installation of pre-cast units were underway.
- Noise monitoring was undertaken in the vicinity of the Woodlands worksite (ref.: WDL) where concrete deck works, concrete protection slab, waterproofing, grouting, backfilling, material movements and sheet piling were underway.
- Noise monitoring was undertaken in the vicinity of the Quanton worksite (ref.: QAR) where no works were underway.
- Noise monitoring was undertaken in the vicinity of the Meadoway and Glebe House worksite (ref: MW&GH) where backfilling and overbridge works were underway.
- Noise monitoring was undertaken in the vicinity of Oat Close worksite (ref: OC) where topsoil stripping, stockpiling, excavation, ballast removal, overbridge and culvert works were underway.

- Noise monitoring was undertaken in the vicinity of Nash Lee Lane worksite (ref.: NLL) where de-vegetation, site access road construction, excavation, signage installation, earthworks, stockpiling, bridge construction and fence installation works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Green Tunnel worksite (ref.: WGT) where construction of plant crossing, construction of platform, installation of vehicle crush barriers, stockpiling, utility works, bridge installation, site maintenance, backfilling, earthworks, construction of guide wall, de-vegetation and fence installation were underway.
- Noise monitoring was undertaken in the vicinity of Grove Farm worksite (ref.: GF) where construction of plant crossing and installation of vehicle crush barrier works were underway.
- Noise monitoring was undertaken in the vicinity of Small Dean Viaduct Compound worksite (ref.: SDVC) where excavation, embankment works, platform maintenance, utility diversion works, construction of working platform and ramp, road diversion, ground investigation and stockpile movement works were underway.
- Noise monitoring was undertaken in the vicinity of Rocky Lane Embankment worksite (ref.: RLE) where access road maintenance, fuel slab installation, platform construction, backfilling, drainage and concrete works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Dean Viaduct worksite (ref.: WDV) where scaffolding works, launch support installation, sheet piling, temporary jack installation, installation and sealing of precast planks, earthworks, stockpile movements and pier construction were underway.
- Noise monitoring was undertaken in the vicinity of Leather Lane worksite (ref.: LL) where hydroseeding and stockpile movements were underway.
- Noise monitoring was undertaken in the vicinity of South Heath Cutting worksite (ref.: SHCW) where vegetation clearance was underway.
- Noise monitoring was undertaken in the vicinity of North Portal worksite (ref.: NP) where plant operations, building platform, piling platform, track platform, headwall capping-beam, porous portal structure and drainage works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chesham Road worksite (ref.: CHSM), where site operation, concrete and internal structure works were undertaken.
- Noise monitoring was undertaken in the vicinity of Little Missenden Vent Shaft worksite (ref.: LM) where site operation, internal structures construction, basement construction and superstructure concrete works were undertaken.



- Noise monitoring was undertaken in the vicinity of Amersham Vent Shaft worksite (ref.: AM), where site operation, internal structure construction, tunnel connection, basement construction, superstructure concrete and drainage works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chalfont St Giles Vent Shaft worksite (ref.: CSG) where site operation, road maintenance, tunnel connection, basement construction, ground level and building works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chalfont St Peter Vent Shaft worksite (ref.: CSP), where site operation, basement construction, road maintenance, tunnel connection and ground level works were underway.
- Noise monitoring was undertaken 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 and operation, compound operations, auto transformed feeder station works, ground investigation, pier construction, pumping water management, satellite compound welfare, generator farm operation, concrete drilling, pile trimming, gas crossing emergency dismantling works, Grand Union canal operation and maintenance, fencing, environmental maintenance, cofferdam excavation, River Colne crossing, girder, deck and landscaping works were underway.

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

- Godington where construction of the site access road, haul road maintenance and vehicle movements were underway.
- Grovill Embankment – Westbury where excavations were underway.
- North of School End where vegetation clearance, stockpiling, compound maintenance and vehicle movements were underway.
- Turweston along the A422 where compound development, temporary bridge and road diversion works were underway.
- East West Rail (EWR) interfaces where technical backfilling was underway.
- Charndon Lodge where technical backfilling and drainage works were underway.
- Infrastructure Maintenance Depot (IMD) where earthworks were underway.
- Shepherds Furze Culvert where waterproofing, technical backfill and stockpiling were underway.
- MCJ where earthworks including excavation, filling, overbridge and underbridge bulk excavation and landscaping were underway.
- Greatmoor Culvert where waterproofing and technical backfill was underway.

- Calvert, along the bat mitigation structure where earthworks including excavation and filling was underway.
- GUN28 overbridge where formwork reinforced concrete was underway.
- Doddershall Culvert where concrete protection slab and technical backfill were underway.
- Hills Farm where stockpiling was underway.
- Edgcott Road Overbridge where pile excavation and cropping were underway.
- FCC Cell 6 where stockpiling was underway.
- Thame Valley Viaduct Causeway where piling, drainage, installation of reinforced cement concrete, pile cropping, formwork installation and lifting beams were underway.
- Along A41 where concrete batching works, earthworks, highways, drainage, kerbing, pavement, vehicle restraint systems operation and signage installation were underway.
- Fleet Marston where earthworks, culvert and overbridge works were underway.
- Bowood Lane where tunnelling works, including excavation, stockpile movements, utility works, concrete pours and tunnel stripping, stone laying, scabble and safety chain installation and construction of wingwalls were underway.
- Nash Lee Road Diversion where material movements including fencing installation was underway.
- Aylesbury Golf Course where utility diversion works were underway.

There were thirty (30) exceedance of 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>), during the reporting period.

There were two (2) exceedances of trigger levels as defined in Section 61 consents during the reporting period.

Twenty-three (23) 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 August 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 31<sup>st</sup> August 2023.

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:
  - Material crushing and screening.
  - Stockpile haulage.
  - Drainage works.
  - Diversion works.
- 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:
  - Compound development.
  - Haul road maintenance.
  - Bulk excavation works.
  - Topsoil stripping.

- Overbridge construction.
- Removal of badger fencing.
- Stockpiling.
- Vehicle movements.
- Drainage works, including pond maintenance.
- Twyford worksite, ref.: TW (see Plan 2 in Appendix A), where works activities included:
  - Access and haul road maintenance.
  - Bulk excavation.
  - Excavation.
  - Culvert works.
  - Vehicle movements.
  - Stockpiling.
- West Street Overbridge worksite, ref.: WSO (see Plan 2 in Appendix A), where works activities included:
  - Formwork reinforced concrete works.
  - Embankment earthworks.
  - Road diversion works.
  - Trenching for installation of pipework.
- Addison Road worksite, ref.: AR (see Plan 3 in Appendix A), where works activities included:
  - Overbridge construction.
  - Embankment earthworks.
- Calvert worksite, ref.: CAL (see Plan 3 in Appendix A) where works activities included:
  - Operation of concrete batching plant.
  - Material movements.
  - Earthworks, including excavation and filling.
  - Installation of pre-cast units.

- Woodlands worksite, ref.: WDL (see Plan 4 in Appendix A) where works activities included:
  - Concrete deck works, including installation of scaffolding and reinforcement bar fixing.
  - Concrete protection slab.
  - Waterproofing.
  - Grouting.
  - Backfilling.
  - Material movements.
  - Sheet piling.
- Quainton worksite, ref.: QAR (see Plan 4 in Appendix A) where no works activities were underway.
- Meadoway and Glebe House worksite, ref.: MW&GH (see Plan 5 in Appendix A), where works activities included:
  - Backfilling.
  - Overbridge works, including excavation.
- Oat Close worksite, ref.: OC (see Plan 5 in Appendix A), where works activities included:
  - Topsoil stripping.
  - Stockpiling.
  - Excavation.
  - Ballast removal.
  - Overbridge works, including construction of abutments.
  - Culvert works.
- Nash Lee Lane worksite, ref.: NLL (see Plan 6 in Appendix A), where works activities included:
  - De-vegetation.
  - Site access road construction.
  - Excavation.
  - Signage installation.

- Earthworks.
- Stockpiling, including movements and maintenance.
- Bridge construction.
- Fence installation.
- Wendover Green Tunnel worksite, ref.: WGT (see Plan 6 in Appendix A), where works activities included:
  - Construction of plant crossing, including stoning, scraping, trimming and concrete works.
  - Construction of platform.
  - Installation of vehicle crush barriers.
  - Stockpiling, including movements, maintenance and hydroseeding.
  - Utility works, including installation of filter drain and fuel interceptor, and diversion works.
  - Bridge installation.
  - Site maintenance.
  - Backfilling.
  - Earthworks.
  - Construction of guide wall.
  - De-vegetation.
  - Fence installation.
- Grove Farm worksite, ref.: GF (see Plan 7 in Appendix A), where works activities included:
  - Construction of plant crossing, including excavation, stoning, scraping, trimming and concrete works.
  - Installation of vehicle crush barriers.
- Small Dean Viaduct Compound worksite, ref.: SDVC (see Plan 7 in Appendix A), where works activities included:
  - Excavation.
  - Embankment works.
  - Platform maintenance.

- Utility diversion.
- Construction of working platform and ramp.
- Road diversion.
- Ground investigation.
- Earthworks.
- Stockpile movements.
- Rocky Lane Embankment worksite, ref.: RLE (see Plan 7 in Appendix A), where works activities included:
  - Access road maintenance, including stoning.
  - Fuel slab installation.
  - Platform construction.
  - Backfilling,
  - Drainage works.
  - Concrete works.
- Wendover Dean Viaduct worksite, ref.: WDV (see Plan 7 in Appendix A), where works activities included:
  - Scaffolding works.
  - Launch support installation.
  - Sheet piling.
  - Temporary jack installation.
  - Installation and sealing of precast planks.
  - Earthworks.
  - Stockpile movements.
  - Pier construction, including hammer head reinforcement fixing.
- Leather Lane worksite, ref.: LL (see Plan 8 in Appendix A), where works activities included:
  - Stockpile movements, including earthworks.
  - Hydroseeding.



- South Heath Cutting worksite, ref.: SHCW (see Plan 8 in Appendix A), where works activities included:
  - Vegetation clearance.
- North Portal worksite, ref.: NP (see Plan 8 in Appendix A), where works activities included:
  - General site operation of plant.
  - Building platform works including scraping, installation of hardstanding, surfacing, services and drainage.
  - Piling platform works including scraping, installation of hardstanding, earthworks and dismantling works.
  - Track platform works including scraping and installation of hardstanding, surfacing, services and drainage.
  - Headwall capping-beam works including excavation, reinforced concrete works and temporary propping.
  - Drainage works including excavation, drainage installation and backfilling.
  - Porous portal structure works including reinforced concrete works and concrete pours.
- Chesham Road worksite, ref.: CHSM (see Plan 8 in Appendix A), where works activities included:
  - General site activities.
  - Internal structure works including reinforced concrete works.
  - Concrete 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.
  - Internal structures construction works, including installation of wall and slabs.
  - Basement construction including installation of basement internals and demolition works.
  - Superstructure concrete works.
- Amersham Vent Shaft worksite, ref.: AM (see Plan 10 in Appendix A), where works activities included:

- General site activities including operation of plant.
- Internal structure construction including concrete walls and floors.
- Tunnel connection works.
- Basement construction including installation of basement internals and demolition works.
- Superstructure concrete works.
- Drainage 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.
  - Basement construction.
  - Ground level works, including concrete works.
  - Building works.
- Chalfont St Peter Vent Shaft worksite, ref.: CSP (see Plan 12 in Appendix A), where works activities included:
  - General site activities including operation of plant.
  - Road maintenance.
  - Tunnel connection works.
  - Basement construction, including excavation to formation of basement internal and headhouse concrete works.
  - Ground level works including headhouse concrete and external 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 and maintenance.
  - Compound operations.
  - Auto transformed feeder station works, including site preparation, installation of ducts, earthworks, bulk earthworks filling and drainage works.
  - Ground investigation works.

- Pier construction, including tower crane mobilisation and demobilisation, fibre-reinforced concrete works and post-tensioning.
- Pumping water management.
- Satellite compound welfare and generator farm operation.
- Concrete drilling.
- Pile trimming.
- Gas crossing emergency dismantling works.
- Grand Union canal works, including pontoon operation and maintenance.
- Fencing works.
- Environmental maintenance.
- Cofferdam excavation, including excavation, dewatering and installation of waling beams and concrete plugs.
- River Colne crossing including emergency removal of obstruction to reinforced concrete crossing.
- Girder and deck erection and installation, including span segmental erection, grouting, internal post-tensioning and steel structure erection, 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, noise barriers, troughs, pipes, steel works and other minor materials to the storage yards and deck, installation of access to top of deck, foundation works, support plant operation, construction of robust kerbs, construction of concrete stitch, filling of voids and top openings, waterproofing, diaphragm walls construction, concrete works (within deck), drainage and steel works.
- Landscaping works including removal of cofferdams, earthworks, profiling and cutting, manhole chamber construction and soil placement.

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

- Godington where construction of the site access road, haul road maintenance and vehicle movements were underway.
- Grovill Embankment – Westbury where excavations were underway.
- North of School End where vegetation clearance, stockpiling, compound maintenance and vehicle movements were underway.

- Turweston along the A422 where compound development, temporary bridge and road diversion works were underway.
- East West Rail (EWR) interfaces where technical backfilling was underway.
- Charndon Lodge where technical backfilling and drainage works were underway.
- Infrastructure Maintenance Depot (IMD) where earthworks were underway.
- Shepherds Furze Culvert where waterproofing, technical backfill and stockpiling were underway.
- MCJ where earthworks including excavation, filling, overbridge and underbridge bulk excavation and landscaping were underway.
- Greatmoor Culvert where waterproofing and technical backfill was underway.
- Calvert, along the bat mitigation structure where earthworks including excavation and filling was underway.
- GUN28 overbridge where formwork reinforced concrete was underway.
- Doddershall Culvert where concrete protection slab and technical backfill were underway.
- Hills Farm where stockpiling was underway.
- Edgcott Road Overbridge where pile excavation and cropping were underway.
- FCC Cell 6 where stockpiling was underway.
- Thame Valley Viaduct Causeway where piling, drainage, installation of reinforced cement concrete, pile cropping, formwork installation and lifting beams were underway.
- Along A41 where concrete batching works, earthworks, highways, drainage, kerbing, pavement, vehicle restrain systems operation and signage installation were underway.
- Fleet Marston where earthworks, culvert and overbridge works were underway.
- Bowood Lane where tunnelling works, including excavation, stockpile movements, utility works, concrete pours and tunnel stripping, stone laying, scabble and safety chain installation and construction of wingwalls were underway.
- Nash Lee Road Diversion where material movements including fencing installation was underway.
- Aylesbury Golf Course where utility diversion works were underway.

1.1.5 The applicable standards, guidance, and monitoring methodology are outlined in the construction noise and vibration monitoring methodology report which can be

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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 Forty-three (43) noise and twelve (12) vibration monitoring installations were active in August in the BS area. Table 2 summarises the positions of noise and vibration monitoring installations within the BS area in August 2023.
- 1.2.2 Noise monitor MW-NMP1, within the vicinity of Meadow Way and Glebe House worksite, ref.: MW&GH, was removed due to multiple stolen monitors. Attended noise monitoring will be conducted in this area once disruptive works commence.
- 1.2.3 Noise monitors WYC-NMP1, within the vicinity of Colne Valley Viaduct - Load Test Pile 1 worksite, ref.: CVV, was removed on 17<sup>th</sup> August due to monitor vandalism.
- 1.2.4 Noise and vibration monitor BP-NMP1/Vib1, within the vicinity of Oat Close worksite, ref.: OC, was installed on 16<sup>th</sup> August.
- 1.2.5 Noise monitor ML-NMP1, within the vicinity of Oat Close worksite, ref.: OC, was installed on 16<sup>th</sup> August.
- 1.2.6 Vibration monitor WF-Vib1, within the vicinity of Oat Close worksite, ref.: OC, was installed on 16<sup>th</sup> August.
- 1.2.7 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
AR	AR-NMP1	Addison Road, Rosehill Farm
CAL	SHC-NMP1	School Hill Compound, Calvert

Worksite Reference	Measurement Reference	Address
	SHC-Vib1	School Hill Compound, Calvert
	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
	WF-Vib1	41 Westfield, Hawkslade
	BP-NMP1	Booker Park School, Aylesbury
	BP-Vib1	Booker Park School, Aylesbury
	ML-NMP1	Marsh Lane, Aylesbury
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee
	NLL-NMP2	Nash Lee Lane, Nash Lee
WGT	ER-NMP1	Ellesborough Rd, Wendover
	ER-Vib1	Ellesborough Rd, Wendover
	BL-NMP1	Bacombe Lane, Wendover
	WT-NMP1	A413, Wendover
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
	WVD-Vib2	Upper Wendover Dean Farm, A413, Wendover
	SHF-Vib1	Strawberry Hill Farmhouse, Wendover Dean
	SH-Vib1	Strawberry Hill Cottage, Wendover Dean
	SC-Vib1	Sainfoin Cottage, Wendover Dean
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath
	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
	WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham, Denham Garden Village
	DFS-NMP1	Denham Film Studio, Uxbridge
	SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire

\* 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 L<sub>Aeq</sub> Data over the Monitoring Period

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Saturday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Sunday / Public Holiday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )	
				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	48.5 (50.7)	50.2 (54.7)	46.8 (57.8)	45.3 (50.3)	45.3 (50.9)	45.6 (46.4)	47.9 (49.3)	47.9 (51.7)	47.2 (52.1)	45.0 (47.8)	48.1 (52.2)	45.8 (51.0)
SE	SE-NMP1	School End, Chetwode	Free-field	52.1 (56.9)	59.5 (64.6)	44.2 (48.4)	43.6 (49.3)	43.1 (48.5)	51.2 (56.1)	53.4 (61.0)	51.6 (59.6)	51.4 (61.0)	43.8 (45.8)	46.8 (50.1)	44.1 (46.2)
HC	HC-NMP1	Hermitage, Chetwode	Free-field	52.5 (63.1)	57.5 (63.4)	46.1 (50.6)	44.7 (52.0)	43.2 (49.8)	48.0 (52.3)	51.8 (58.0)	49.9 (57.9)	47.7 (54.3)	43.7 (47.6)	47.8 (52.1)	43.3 (47.9)
TW	TW-NMP1	Twyford	Free-field	43.8 (52.5)	53.9 (66.7)	43.7 (53.2)	42.9 (52.7)	40.4 (50.5)	42.7 (44.4)	46.3 (48.0)	45.2 (51.0)	46.0 (51.4)	39.4 (43.7)	46.3 (54.9)	40.5 (50.8)
WSO	WSO-NMP1	West Street, Twyford	Free-field	46.1 (59.9)	50.1 (63.9)	44.4 (52.0)	42.8 (53.7)	39.5 (58.2)	45.4 (50.9)	47.9 (50.4)	46.3 (49.9)	50.7 (74.2)	41.4 (61.8)	47.7 (62.1)	37.7 (48.0)
AR	AR-NMP1	Addison Road, Rosehill Farm	Free-field	44.7 (51.6)	62.3 (76.4)	45.6 (66.5)	39.3 (45.0)	36.1 (49.8)	43.7 (45.2)	49.0 (52.1)	47.7 (51.4)	43.8 (50.5)	34.9 (43.4)	44.4 (52.5)	37.0 (47.2)

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Saturday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Sunday / Public Holiday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
CAL	SHC-NMP1	School Hill Compound, Calvert	Free-field	_*	_*	_*	_*	_*	_*	_*	_*	_*	_*	_*	_*
	FCC-NMP1	Calvert South	Free-field	50.8 (54.0)	51.8 (59.0)	48.3 (56.0)	44.3 (51.1)	41.5 (52.0)	44.9 (48.8)	46.4 (47.8)	44.6 (48.3)	43.7 (48.8)	37.7 (45.0)	46.1 (56.8)	42.0 (55.3)
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Free-field	64.9 (71.3)	67.0 (74.0)	57.8 (68.2)	43.1 (50.7)	42.4 (54.6)	46.2 (49.6)	56.4 (59.4)	48.2 (53.8)	45.7 (50.7)	41.4 (46.1)	48.9 (65.0)	42.2 (48.7)
QAR	QAR-NMP2	Station Rd, Quainton	Free-field	48.0 (68.7)	51.9 (63.0)	47.3 (64.5)	44.2 (58.6)	41.6 (61.8)	48.2 (53.7)	54.2 (62.4)	56.0 (64.4)	54.8 (63.1)	40.0 (48.4)	50.8 (65.1)	40.9 (48.0)
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	Free-field	53.7 (57.8)	53.5 (61.9)	53.2 (55.0)	51.9 (58.6)	49.1 (58.4)	51.2 (51.6)	53.0 (53.7)	53.4 (53.9)	53.5 (58.8)	48.7 (52.4)	52.8 (55.5)	49.2 (52.9)
OC	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	Free-field	48.0 (52.2)	52.1 (57.4)	48.1 (54.1)	45.1 (60.3)	42.1 (58.8)	44.9 (49.7)	51.6 (56.0)	50.5 (55.2)	48.2 (60.3)	42.1 (51.0)	45.0 (51.0)	45.4 (56.1)
	MF-NMP1	Moat Farm, Marsh Kane	Free-field	46.4 (48.0)	51.1 (54.9)	45.6 (51.8)	40.6 (43.4)	37.7 (48.5)	45.2 (45.2)	49.3 (49.3)	45.5 (45.5)	44.6 (46.0)	39.6 (42.9)	46.4 (49.8)	38.7 (44.0)
	BP-NMP1	Booker Park School, Aylesbury	Free-field	50.2 (57.9)	55.3 (60.6)	51.2 (63.3)	49.3 (63.7)	45.9 (62.7)	46.0 (47.5)	48.2 (49.7)	53.7 (57.1)	53.7 (64.3)	48.0 (60.2)	46.5 (55.5)	56.7 (63.8)
	ML-NMP1	Marsh Lane, Aylesbury	Free-field	57.5 (68.0)	60.8 (68.0)	57.5 (68.1)	58.9 (70.1)	58.9 (74.8)	54.9 (61.0)	60.3 (62.7)	55.4 (57.2)	62.1 (73.2)	59.9 (73.1)	55.7 (67.4)	59.8 (67.6)

OFFICIAL

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Saturday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Sunday / Public Holiday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Free-field	51.9 (56.1)	56.5 (68.6)	53.7 (64.7)	49.8 (55.5)	47.8 (53.9)	50.7 (51.7)	52.9 (55.0)	53.1 (54.5)	51.5 (54.4)	47.5 (50.1)	50.7 (52.7)	48.7 (54.6)
	NLL-NMP2	Nash Lee Lane, Nash Lee	Free-field	50.3 (54.3)	57.9 (63.4)	51.9 (55.9)	48.6 (55.3)	45.8 (54.4)	49.9 (53.3)	53.5 (56.9)	52.1 (53.3)	50.4 (55.5)	44.4 (48.8)	49.2 (55.1)	45.7 (53.2)
WGT	ER-NMP1	Ellesborough Rd, Wendover	Free-field	52.5 (55.0)	56.7 (62.7)	53.0 (56.6)	51.0 (59.4)	46.5 (54.1)	51.0 (51.8)	51.6 (52.8)	52.9 (54.5)	51.6 (55.0)	45.1 (51.1)	52.6 (58.2)	46.6 (53.8)
	BL-NMP1	Bacombe Lane, Wendover	Free-field	46.8 (50.7)	48.2 (53.7)	47.5 (52.0)	45.7 (61.6)	43.1 (59.2)	46.5 (50.1)	48.1 (51.3)	48.7 (50.0)	47.9 (55.6)	41.9 (47.5)	46.7 (50.7)	42.2 (50.5)
	WT-NMP1	A413, Wendover	Free-field	65.5 (68.2)	65.4 (69.6)	65.2 (70.5)	62.4 (72.3)	58.7 (68.7)	62.3 (64.0)	63.6 (66.0)	64.3 (66.0)	63.2 (67.9)	56.2 (60.7)	64.6 (78.1)	58.3 (67.1)
GF	GF-NMP1	Grove Farm, Wendover	Free-field	53.4 (62.3)	53.4 (56.4)	51.2 (58.6)	47.8 (63.2)	44.3 (57.3)	49.3 (56.0)	52.2 (54.5)	48.5 (51.4)	49.2 (55.5)	42.8 (48.3)	49.9 (60.3)	44.2 (51.0)
SDVC	SDVC-NMP1	Rocky Lane, Wendover	Free-field	62.0 (63.9)	62.4 (63.9)	60.7 (62.0)	58.8 (63.7)	55.9 (63.7)	59.8 (61.8)	62.1 (64.4)	62.4 (63.8)	60.7 (63.4)	54.6 (58.9)	60.0 (63.5)	56.0 (63.1)
RLE	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	47.6 (51.8)	51.4 (54.6)	49.9 (55.6)	45.1 (59.9)	42.4 (48.3)	45.8 (47.3)	49.7 (54.3)	50.1 (52.4)	48.5 (54.0)	42.7 (48.1)	47.7 (60.0)	42.7 (49.2)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	54.7 (58.1)	55.1 (57.3)	54.4 (56.7)	51.7 (56.3)	48.0 (55.8)	53.4 (54.4)	56.0 (58.8)	56.0 (57.0)	53.6 (55.8)	47.3 (51.1)	53.0 (57.3)	48.0 (55.6)

OFFICIAL

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
WDV	WDV-NMP1	Upper Wendover Dean Farm, A413, Wendover	Free-field	49.0 (54.7)	53.3 (57.3)	48.5 (52.4)	45.8 (55.1)	43.6 (57.4)	48.6 (56.9)	51.0 (57.5)	50.8 (55.0)	49.2 (55.7)	42.4 (49.1)	47.6 (58.5)	44.2 (57.4)
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee	Free-field	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**
SHCW	PR-NMP1	Potters Row, South Heath	Free-field	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**	_ _**
NP	BFH-NMP1	Bury Farm, Great Missenden	Free-field	43.9 (48.4)	50.6 (56.3)	47.3 (53.2)	41.8 (48.9)	37.2 (46.5)	42.3 (42.9)	50.8 (53.2)	50.0 (54.1)	45.3 (50.2)	37.1 (42.1)	45.4 (49.6)	38.6 (48.5)
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Free-field	50.2 (55.8)	54.5 (58.7)	50.9 (56.9)	47.9 (55.4)	43.1 (53.4)	47.3 (49.1)	55.6 (58.8)	54.9 (60.5)	50.3 (54.4)	43.3 (49.2)	50.4 (57.5)	44.4 (55.6)
	BLH-NMP1	Bayleys Hatch, South Heath, Great Missenden	Free-field	46.2 (48.1)	50.4 (54.8)	49.6 (54.7)	45.6 (58.1)	38.8 (48.0)	43.9 (47.2)	52.7 (60.9)	50.6 (54.8)	47.7 (56.9)	38.5 (46.4)	50.5 (63.6)	40.1 (50.0)

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Saturday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Sunday / Public Holiday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Free-field	55.5	55.8	54.6	51.7	47.2	52.6	54.3	56.9	54.6	46.4	55.5	46.6
				(62.2)	(62.7)	(58.8)	(55.8)	(57.9)	(53.4)	(55.1)	(60.3)	(60.4)	(53.3)	(67.2)	(53.6)
AM	AM-NMP1	Whielden Lane, Amersham	Free-field	60.6	61.0	59.1	56.9	52.4	57.5	60.7	63.4	59.7	51.6	57.9	51.9
				(61.7)	(63.4)	(60.2)	(61.2)	(59.1)	(60.6)	(64.6)	(65.3)	(65.4)	(56.0)	(61.2)	(57.9)
LM	LM-NMP1	Little Missenden, A413, Amersham	Free-field	57.2	57.4	57.2	54.3	49.7	52.1	55.2	56.0	54.8	47.5	54.4	49.1
	PWC-NMP1	Patricia Holmes, LM Worksite, Amersham	Free-field	58.4	58.2	58.5	55.3	50.7	54.2	55.8	57.5	55.8	48.5	55.1	49.9
CSG	CSG-NMP1	CSG Worksite, Bottom House Farm Lane	Free-field	45.6	48.8	44.5	41.6	39.3	43.8	47.9	50.0	48.3	40.7	46.7	40.5
				(57.0)	(60.9)	(49.0)	(53.3)	(53.4)	(49.3)	(49.0)	(52.4)	(60.1)	(49.4)	(52.6)	(51.3)
CSP	CFC-NMP1	Cricket Field Cottages, Chesham Lane, Chalfont St. Peter	Free-field	58.3	58.1	56.9	53.4	48.7	54.2	56.6	56.5	55.1	46.6	55.4	49.1
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	45.5	51.2	45.3	43.8	39.9	42.6	48.9	50.4	45.6	41.3	47.7	39.3
	CSP-NMP3	Chalfont St Peter Vent Shaft Worksite	Free-field	54.9	55.4	55.1	52.8	48.5	52.5	55.8	56.4	54.2	47.6	54.6	48.1
				(59.8)	(65.3)	(62.9)	(58.6)	(56.9)	(55.4)	(57.6)	(56.7)	(58.4)	(52.6)	(63.4)	(58.5)
				(47.9)	(68.5)	(49.0)	(48.9)	(49.2)	(44.1)	(51.1)	(51.3)	(49.5)	(52.7)	(51.8)	(46.3)
				(57.0)	(57.0)	(56.5)	(56.9)	(55.4)	(53.2)	(56.2)	(56.5)	(57.3)	(52.7)	(56.9)	(54.9)

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Saturday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Sunday / Public Holiday Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
CVV	CVV-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	62.1 (63.9)	61.3 (62.7)	60.6 (62.8)	57.6 (61.1)	55.2 (63.2)	58.0 (59.0)	60.8 (61.8)	61.7 (63.6)	59.6 (63.9)	52.2 (55.2)	59.1 (63.5)	54.2 (61.9)
	WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	Free-field	58.4 (59.2)	59.3 (67.0)	56.0 (57.1)	52.9 (54.9)	50.6 (58.0)	54.4 (54.7)	57.1 (57.9)	58.2 (58.7)	57.2 (59.4)	49.7 (56.0)	55.4 (58.9)	51.2 (56.9)
	DFS-NMP1	Denham Film Studio, Uxbridge	Free-field	46.5 (55.6)	48.4 (53.8)	49.5 (54.2)	45.1 (52.3)	41.8 (52.1)	46.5 (54.1)	48.9 (51.2)	48.3 (51.1)	48.9 (56.3)	41.6 (50.9)	50.3 (68.8)	39.7 (44.6)
	SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire	Free-field	46.2 (49.5)	47.1 (62.5)	44.1 (52.9)	42.5 (45.6)	40.8 (49.6)	45.0 (48.2)	46.6 (48.5)	46.8 (48.4)	45.0 (48.5)	40.4 (50.0)	44.0 (47.7)	40.2 (46.7)

\* Missing data at monitor SHC-NMP1 due to issue with SIM card.

\*\*Missing data at monitors HG-NMP1, GD-NMP1 and PR-NMP1 was due to monitors at laboratory for calibration.

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	4.57 (X-axis)
OC	BP-Vib1	Booker Park School, Aylesbury	4.52 (Y-axis)
	WF-Vib1	41 Westfield, Hawkslade	5.60 (X-axis)
WGT	ER-Vib 1	46, Ellesborough Rd, Wendover	2.51 (X-axis)
WDV	WDV-Vib1	Upper Wendover Dean Farm, A413, Wendover	0.92 (Y-axis)
	WDV-Vib2	Upper Wendover Dean Farm, A413, Wendover	0.89 (Z-axis)
	SHF-Vib1	Strawberry Hill Farmhouse, Wendover Dean	6.05 (Z-axis)
	SH-Vib1	Strawberry Hill Cottage, Wendover Dean	6.53 (Z-axis)
	SC-Vib1	Sainfoin Cottage, Wendover Dean	1.62 (X-axis)
GF	GF-Vib1	Grove Farm, Wendover	2.15 (X-axis)
WDL	WDL-Vib1	Station Road, Quainton	1.72 (X-axis)
SHC	SHC-Vib1	School Hill Compound, Calvert	2.43 (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	Weekdays Saturdays	0800-1800 1300-1400 1400-2200	2 1 3	No exceedance
HC	HC-NMP1	Hermitage, Chetwode	Weekdays Saturdays	0800-1800 1300-1400 1400-2200	2 1 3	No exceedance
TW	TW-NMP1	Twyford	Weekdays	0800-1800	1	No exceedance
WSO	WSO-NMP1	West Street, Twyford	Weekdays Saturdays Sundays	0800-1800 0800-1300 0700-2200	1 1 7	No exceedance No exceedance No exceedance
AR	AR-NMP1	Addison Road, Rosehill Farm	Weekdays	0800-1800	14	1



Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
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	Weekdays	0700-0800 0800-1800	17 22	8 1
QAR	QAR-NMP2	Station Rd, Quainton	All days	All periods	No exceedance	No exceedance
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	All days	All periods	No exceedance	No exceedance
OC	MF-NMP1	Moat Farm, Marsh Lane	All days	All periods	No exceedance	No exceedance
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	Weekdays Saturday Nights	1900-2200 1400-2200 2200-0700	7 2 99	No exceedance No exceedance 19
	BP-NMP1	Booker Park School, Aylesbury	Weekdays Saturdays Sundays Nights	1800-1900 1900-2200 1400-2200 0700-2200 2200-0700	3 5 3 1 61	No exceedance 1 1 No exceedance 23
	ML-NMP1	Marsh Lane, Aylesbury	Weekdays Saturdays Sundays Nights	0700-0800 1800-1900 1900-2200 1400-2200 0700-2200 2200-0700	1 2 20 8 4 97	1 1 2 3 0 51
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Weekdays	0800-1800	1	No exceedance
	NLL-NMP2	Nash Lee Lane, Nash Lee	Weekdays	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
WGT	ER-NMP1	Ellesborough Rd, Wendover	All days	All periods	No exceedance	No exceedance
	BL-NMP1	Bacombe Lane, Wendover	All days	All periods	No exceedance	No exceedance
	WT-NMP1	A413, Wendover	Weekdays Saturdays	0800-1800 0800-1300	17 1	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	Saturdays	1400-2200	1	No exceedance
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Saturdays	1400-2200	1	No exceedance
WDV	WDV-NMP1	A413, Wendover	All days	All periods	No exceedance	No exceedance
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath	Not Applicable**	Not Applicable**	Not Applicable**	Not Applicable**
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Not Applicable**	Not Applicable**	Not Applicable**	Not Applicable**
SHCW	PR-NMP1	Potters Row, South Heath	Not Applicable**	Not Applicable**	Not Applicable**	Not Applicable**
NP	BFH-NMP1	Bury Farm, Great Missenden	All days	All periods	No exceedance	No exceedance
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Weekdays Saturdays	1900-2200 1300-1400	3 1	No exceedance No exceedance
	BLH-NMP1	Bayleys Hatch, South Heath, Great Missenden	Weekdays Saturdays	1900-2200 1400-2200	3 1	No exceedance No exceedance
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Weekdays Saturdays	0700-0800 1300-1400 1400-2200	1 1 6	No exceedance 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
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	Not Applicable	Not Applicable	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	All days	All periods	No exceedance	No exceedance
	WYC-NMP1***	Wyatt's Covert, Tilehouse Lane, Denham	All days	All periods	No exceedance	No exceedance
	DFS-NMP1***	Denham Film Studio, Uxbridge	All days	All periods	No exceedance	No exceedance
	SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire	All days	All periods	No exceedance	No exceedance

\* No data was captured for the month of August due to SIM card issue

\*\* Noise monitors were sent off to laboratory for calibration and therefore no data was captured for the month of August.

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

2.2.6 Exceedances of the LOAEL were recorded at seventeen (17) monitoring locations during the month of August 2023. LOAEL exceedances were recorded during weekdays, evenings, Saturdays, Sundays and night-time periods.

2.2.7 For the purpose of reporting the number of days where the SOAEL is exceeded, multiple exceedances of the SOAEL in a 24-hour period would be counted as a single exceedance during that day. Over the reporting period, the overall number of SOAEL exceedances at each measurement location is shown in Table 6 and August 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
AR	AR-NMP1	Addison Road, Rosehill Farm	1
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	9
OC	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	4
	BP-NMP1	Booker Park School, Aylesbury	7
	ML-NMP1	Marsh Lane, Aylesbury	9

2.2.8 Thirty (30) SOAEL exceedance were recorded due to HS2 construction works during August 2023. The exceedances occurred at AR-NMP1, WDL-NMP1, WES-NMP1, BP-NMP1 and ML-NMP1 during weekday, evening, Saturday, Sunday and night-time working hours.

## 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
-	WDL	02/08/2023 2200-0700	Vehicle movements on site access road.	3dB exceedance was measured at noise monitor. Exceedance due to monitor position directly adjacent to site access road, receptor is further from road.	Local authority was notified, no further action taken.
-	AR	22/08/2023 0800-1800	Embankment earthworks.	3 dB exceedance value was measured at noise monitor. Exceedance due to earthworks immediately adjacent to the monitor.	Local authority was notified, no further action taken.

## 2.4 Complaints

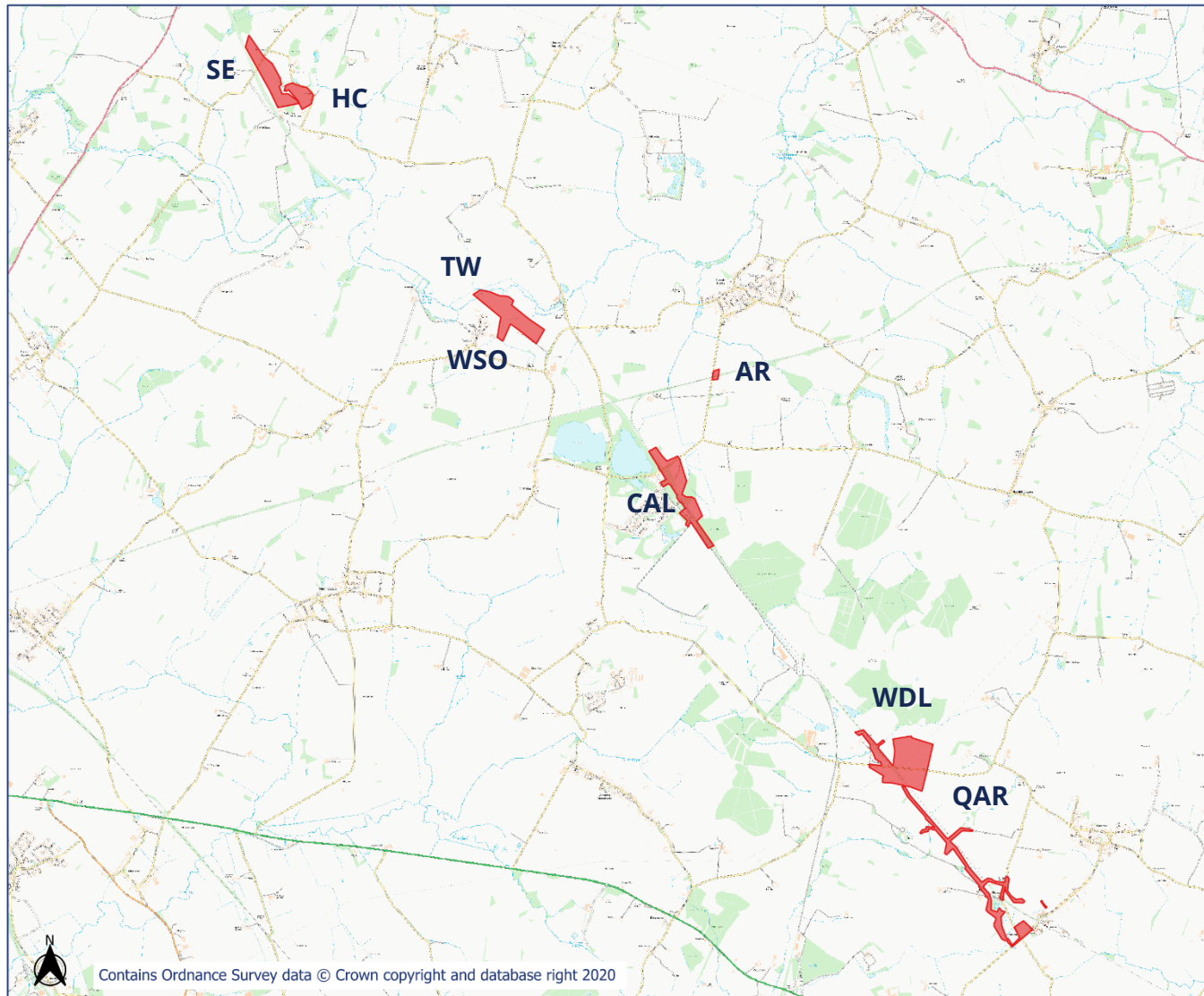
2.4.1 Table 8 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

Table 8: Summary of Complaints

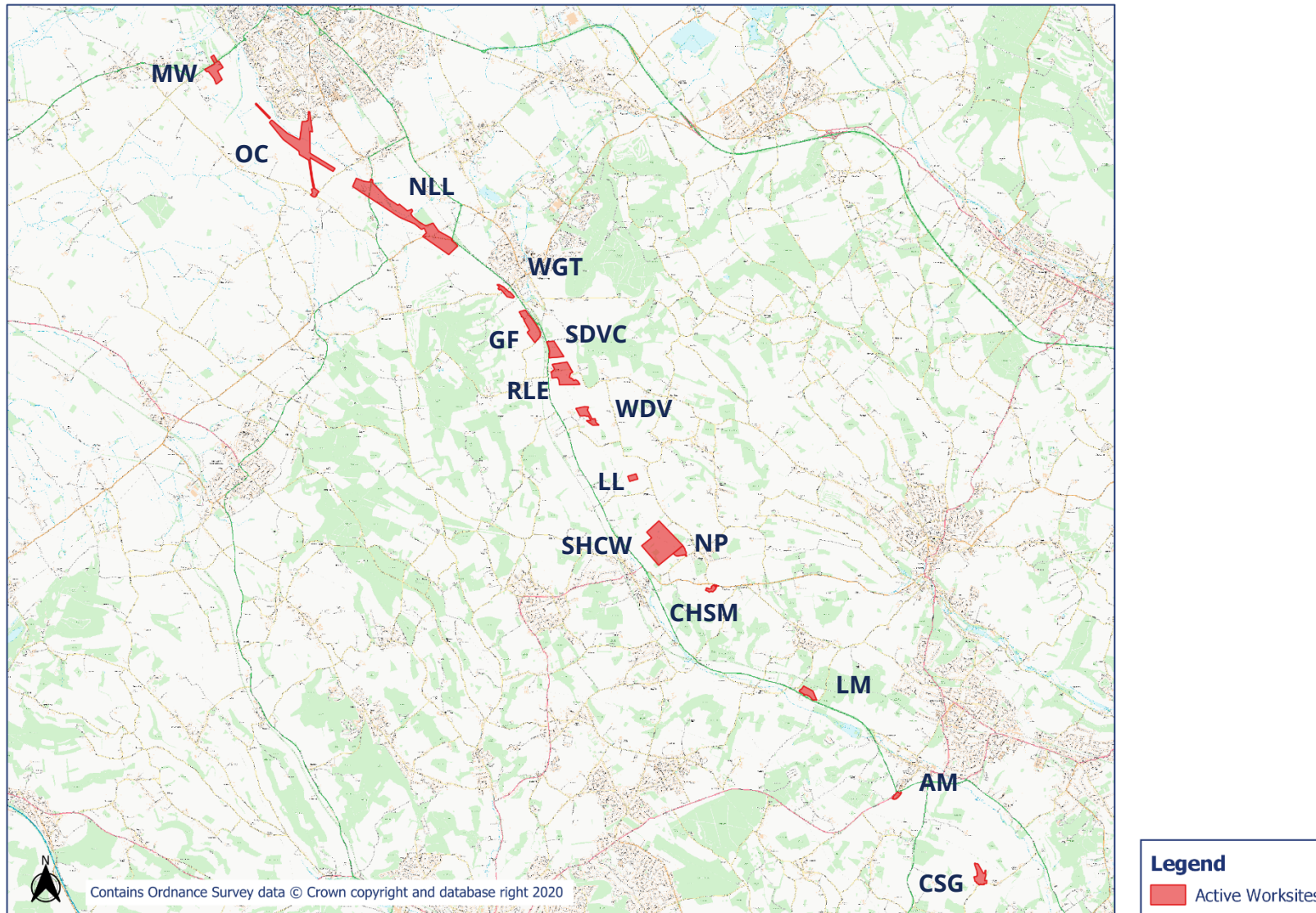
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-23-44874-C	NLL	Disturbance due to machinery noise at night.	Noise due to water pump operating during periods of heavy rain.	Site team were reminded to ensure equipment is turned off at the end of the day. Stakeholder has been informed of the results of the investigation.
HS2-23-44877-C HS2-23-44880-C	NP	Complaint due to noise from lorries reversing.	Disturbance was caused by machinery reversing alarms.	The machinery which caused the disturbance has been identified and a lower frequency alarm has been installed. Stakeholder has been informed of the results of the investigation.

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-23-97347-E-C	NLL	Complaint due to faulty generator noise in early hours of the morning.	Investigation showed all generators were working correctly. Generators are in use between 0600 and 1800 as per consent.	Stakeholder has been informed of the results of the investigation.
HS2-23-99303-E-C	NLL	Disturbance due to noise from nearby site at night-time.	Noise may have been caused by site teams operating in restricted hours at night.	Site teams have been reminded to not use certain areas of the site at night including cabin. Stakeholder was provided with an explanation.
HS2-23-99515-E-C	NLL	Complaint due to noise from generator at nearby site.	Generator is operating 24/7 for staff cabin use and cannot be turned off due to health and safety.	Stakeholder has been informed of the results of the investigation.
HS2-23-99588-E-C HS2-23-99589-E-C HS2-23-99590-E-C HS2-23-99591-E-C HS2-23-99592-E-C HS2-23-99594-E-C HS2-23-99595-E-C HS2-23-99601-E-C HS2-23-99602-E-C HS2-23-99597-E-C HS2-23-99604-E-C HS2-23-44905-C HS2-23-99664-E-C HS2-23-99909-E-C HS2-23-99932-E-C HS2-23-99770-E-C	OC	Disturbance due to noise at nearby site during night-time.	Noise due to realignment railway works that are necessary for new railway to be constructed. Appropriate consents are in place for extended working hours and noise monitoring in place at nearby fixed locations to ensure the noise levels are within consented limits.	The results of the investigation and a copy of the works notice has been provided to the residents.
HS2-23-99726-E-C	OC	Noise due to night-time works at nearby site.	Ongoing night-time works at nearby site.	Engagement team have been in contact with resident to arrange temporary relocation for the family. This is an on-going engagement.

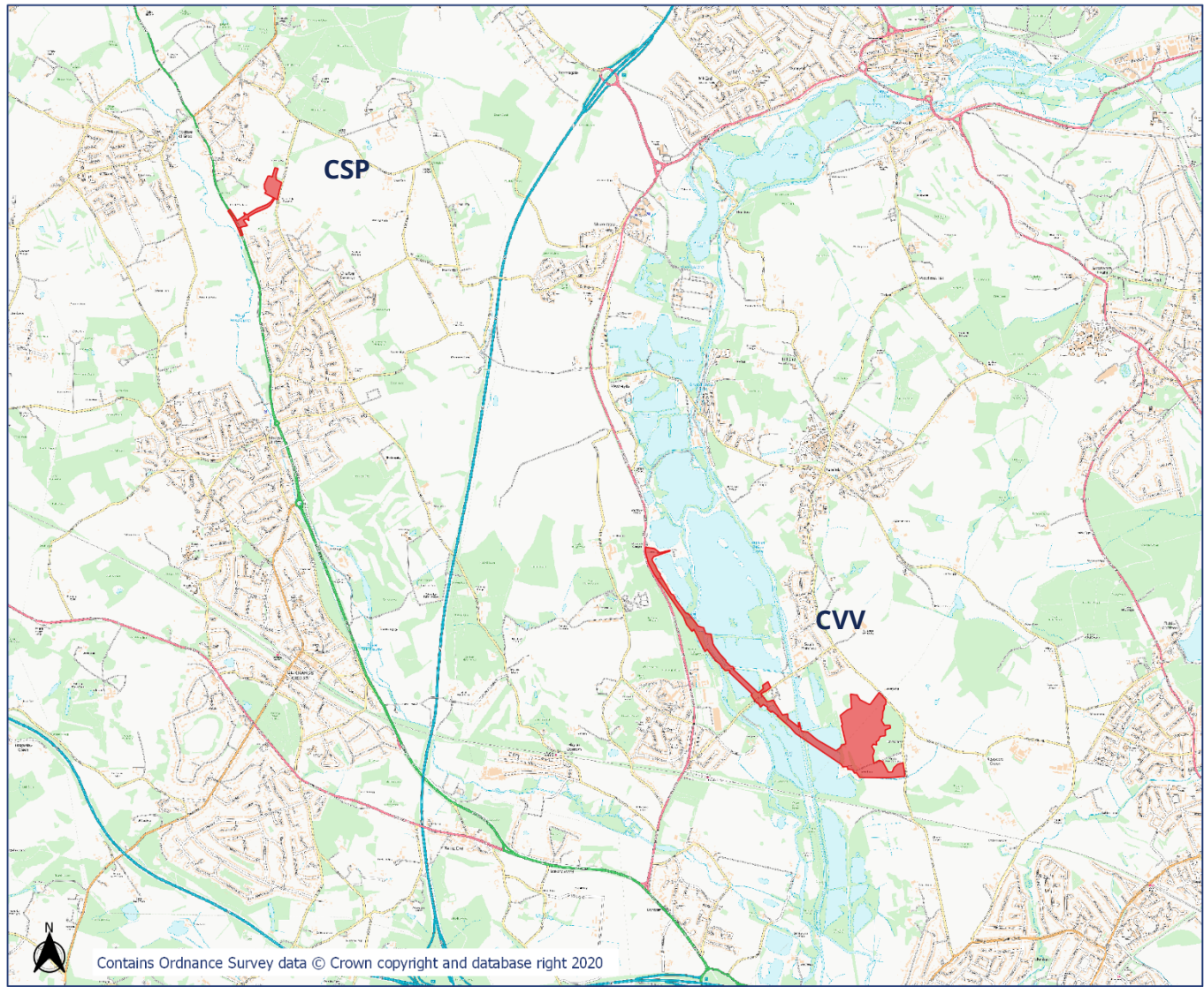
# Appendix A Site Locations





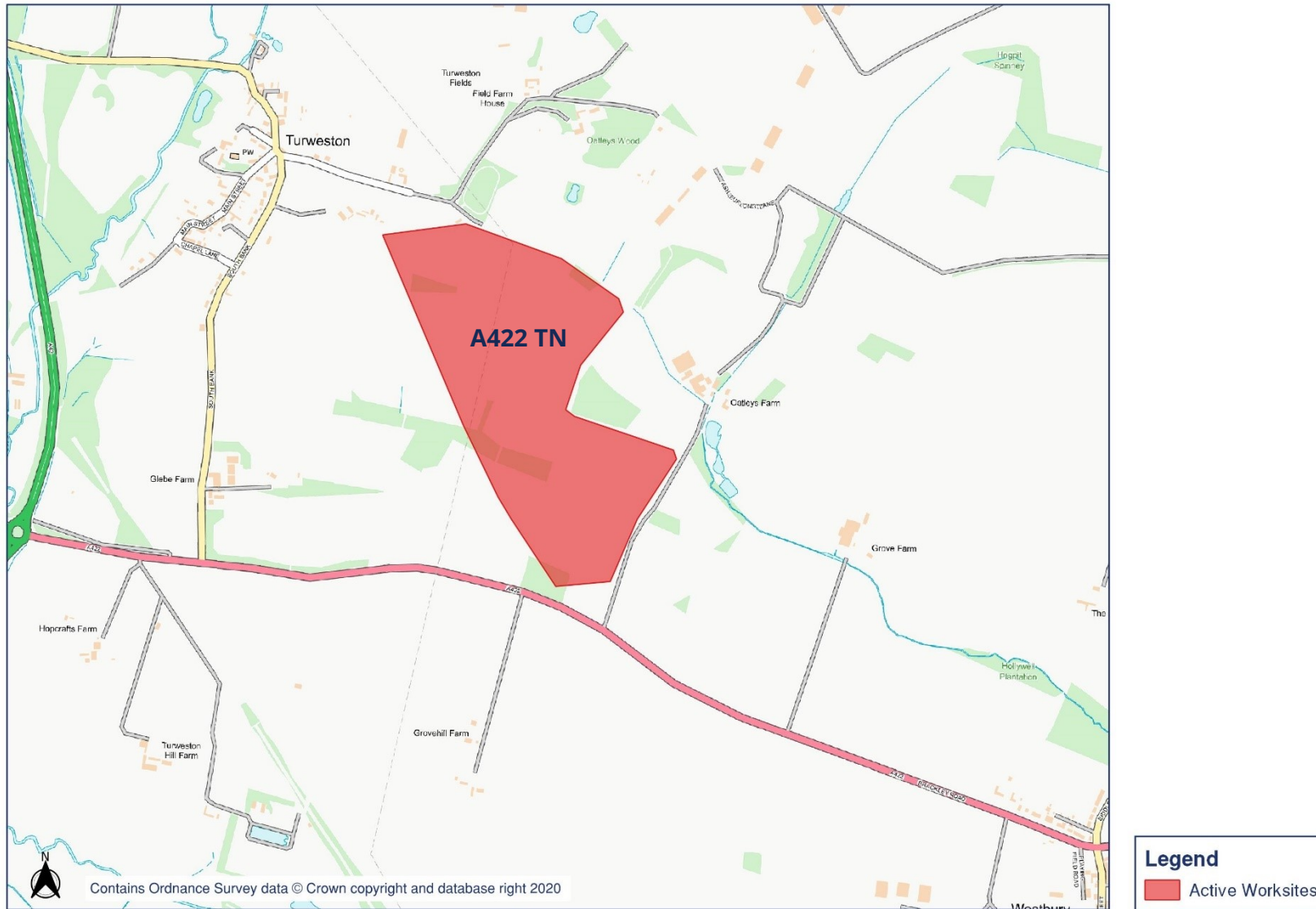


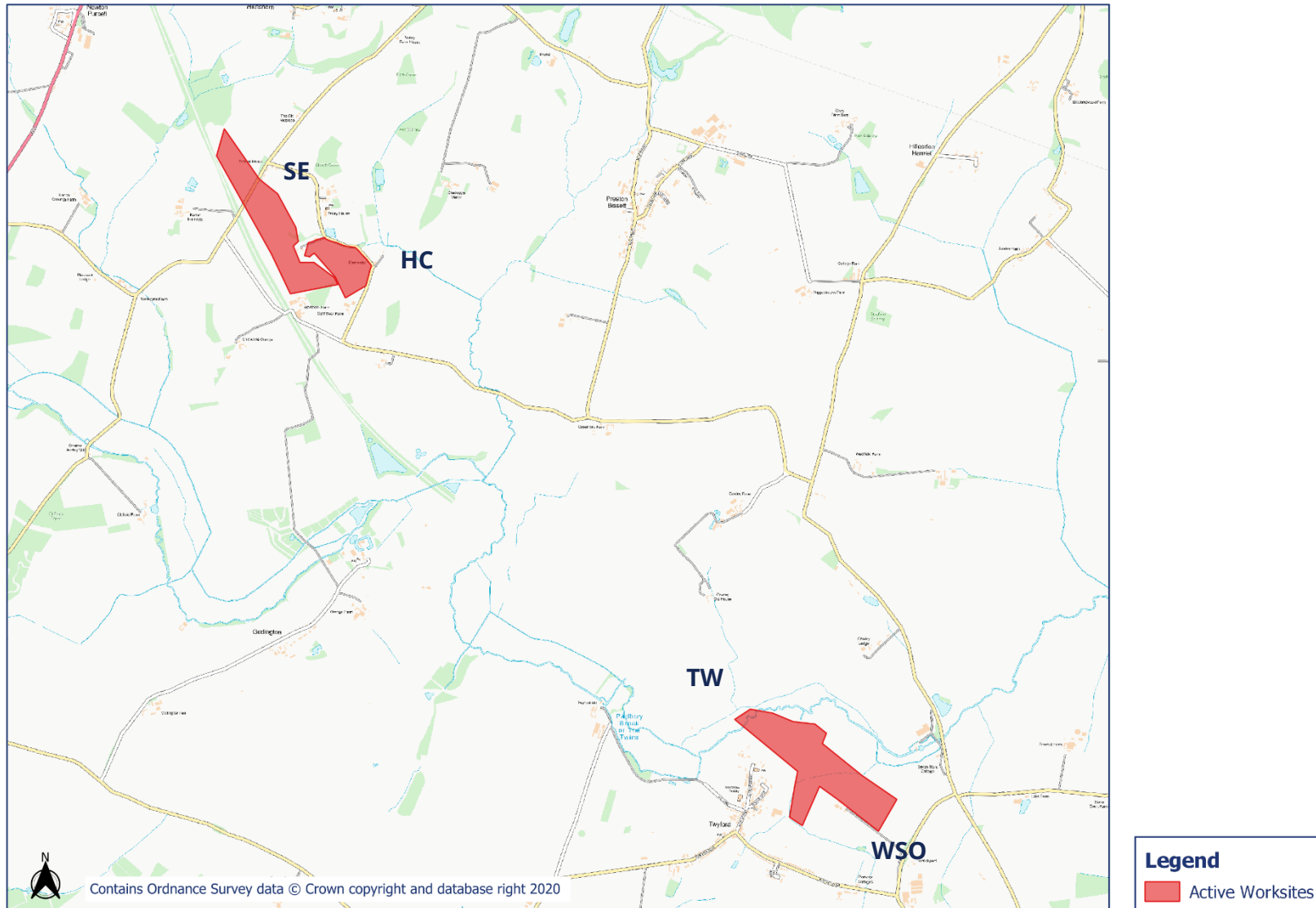
# HS2 Worksite Identification Plan - Overview 3

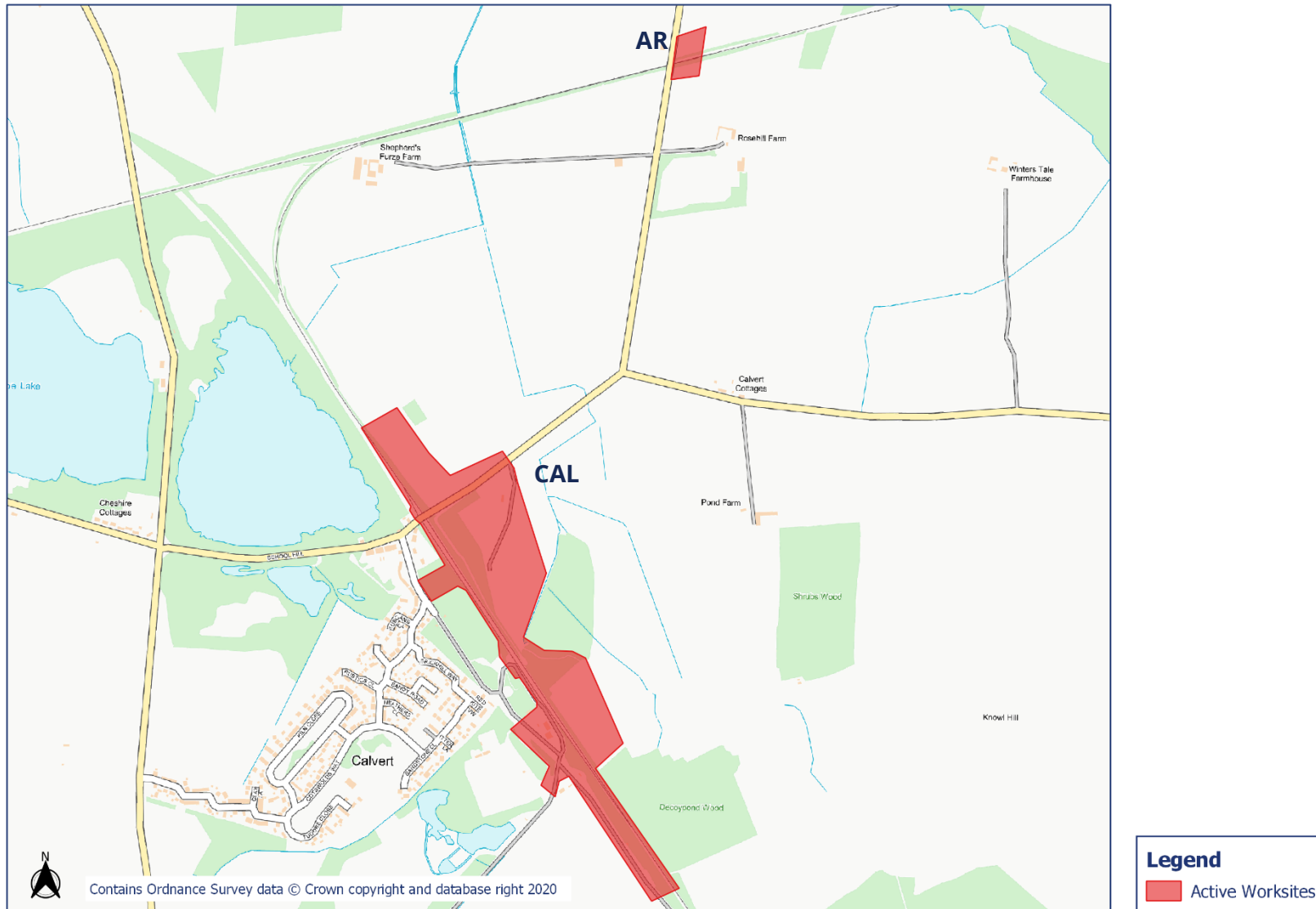


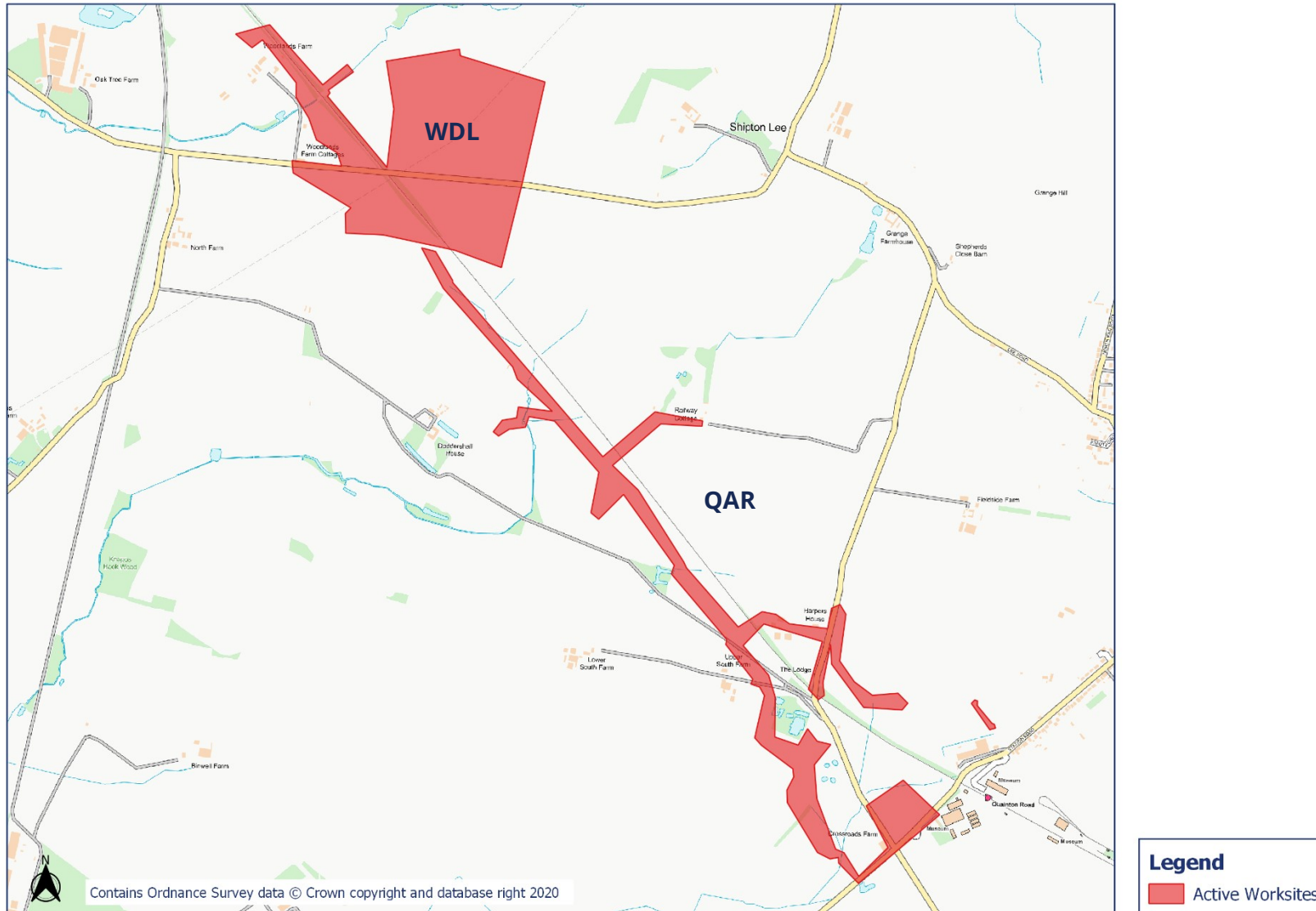
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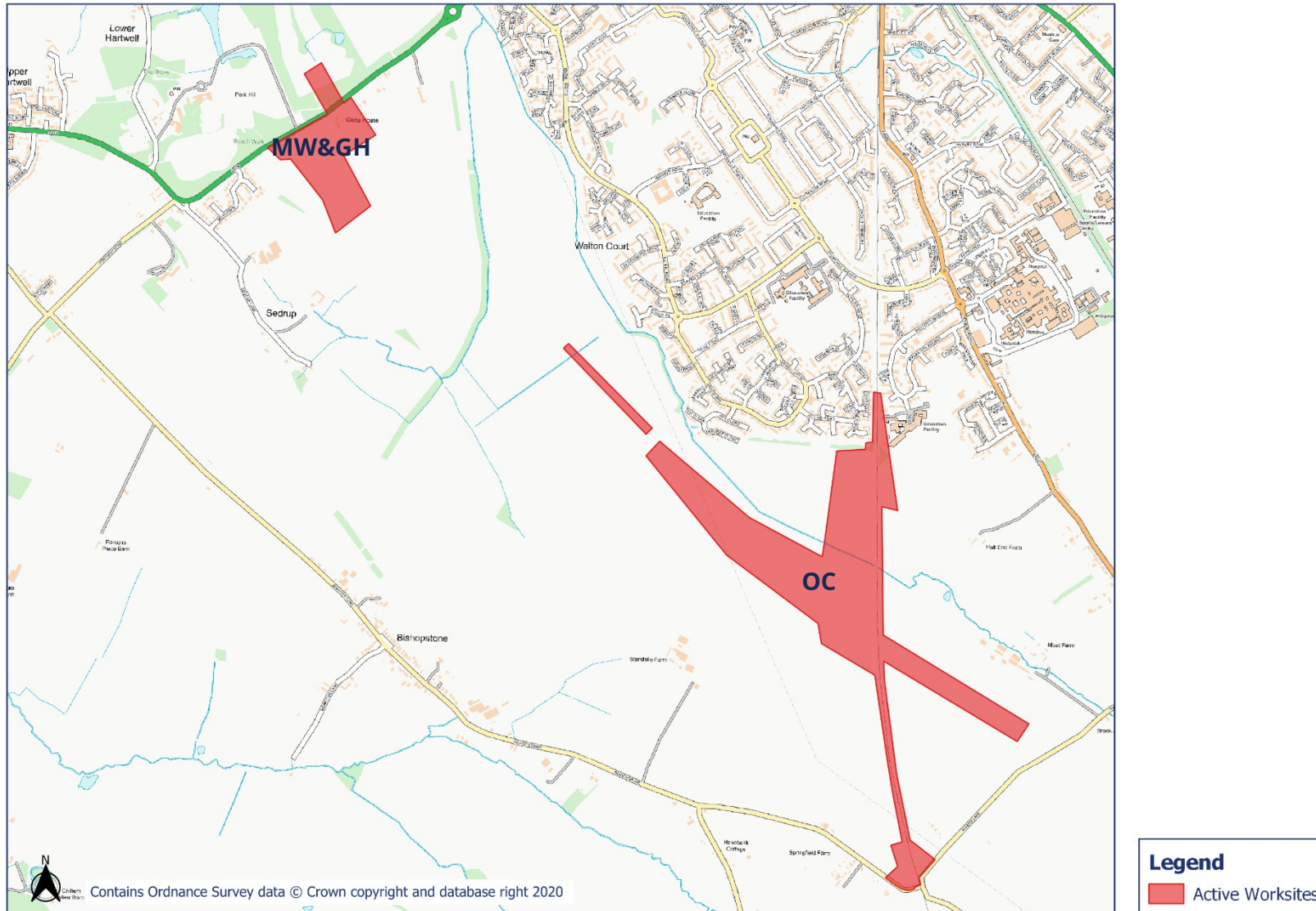


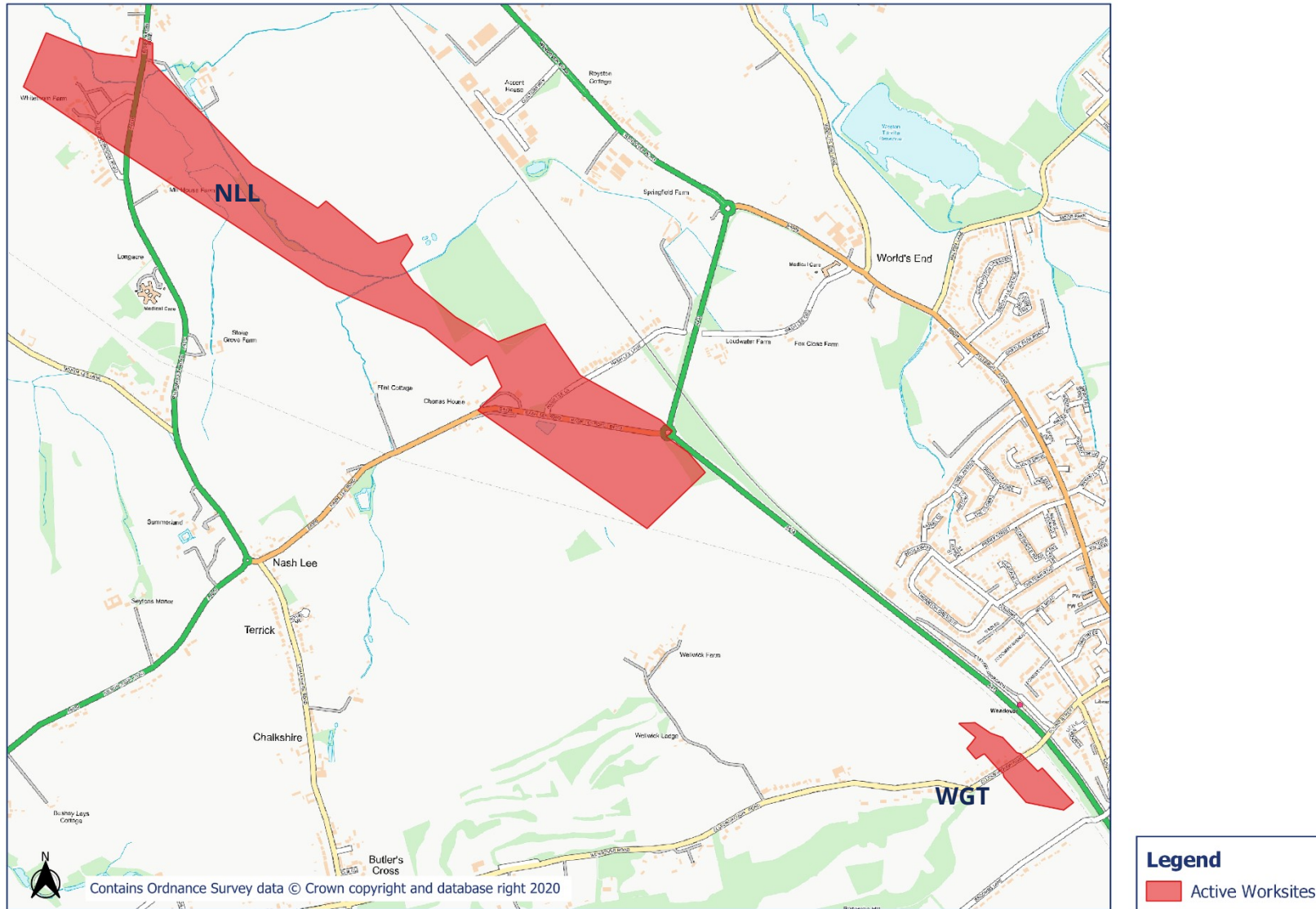




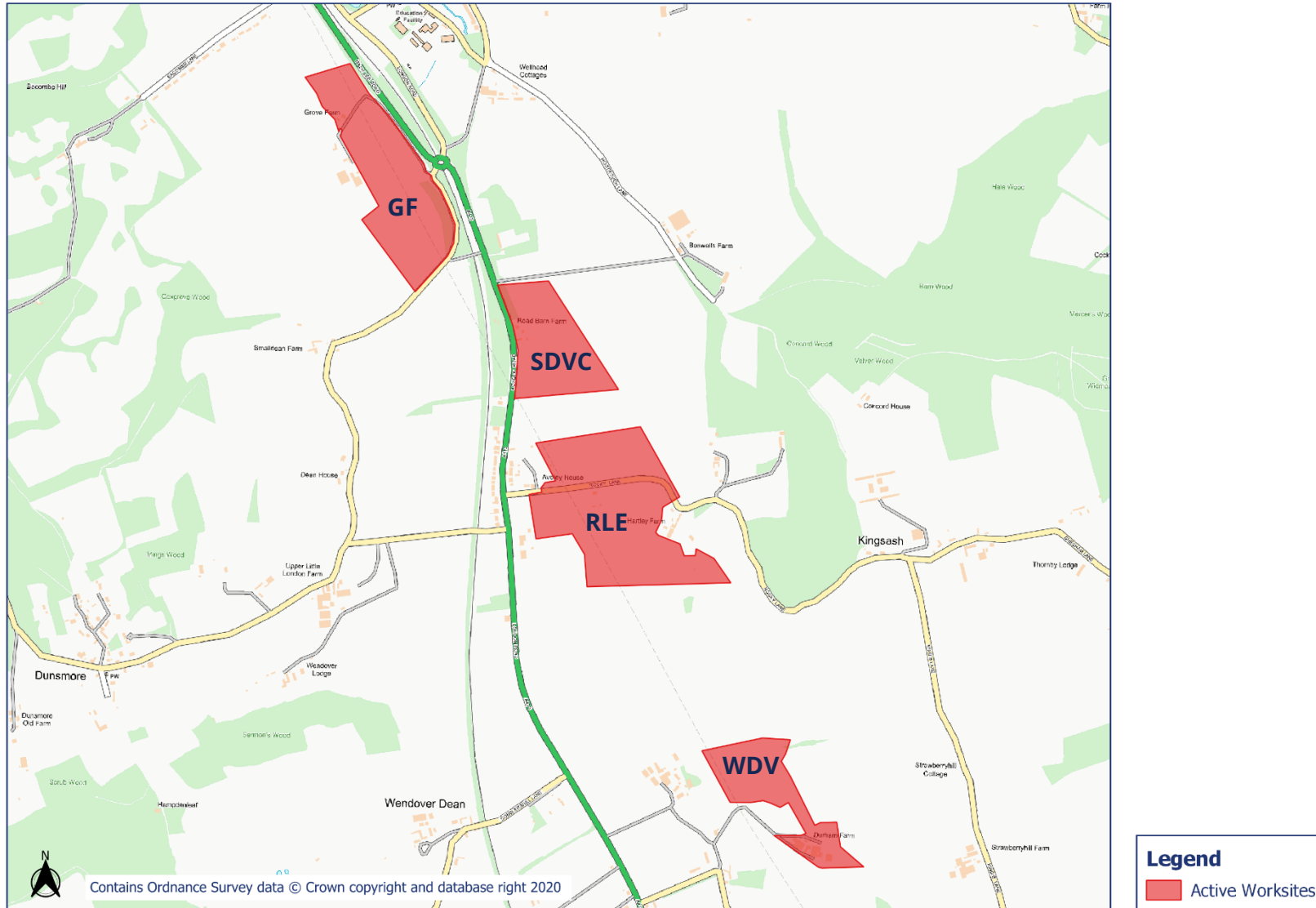


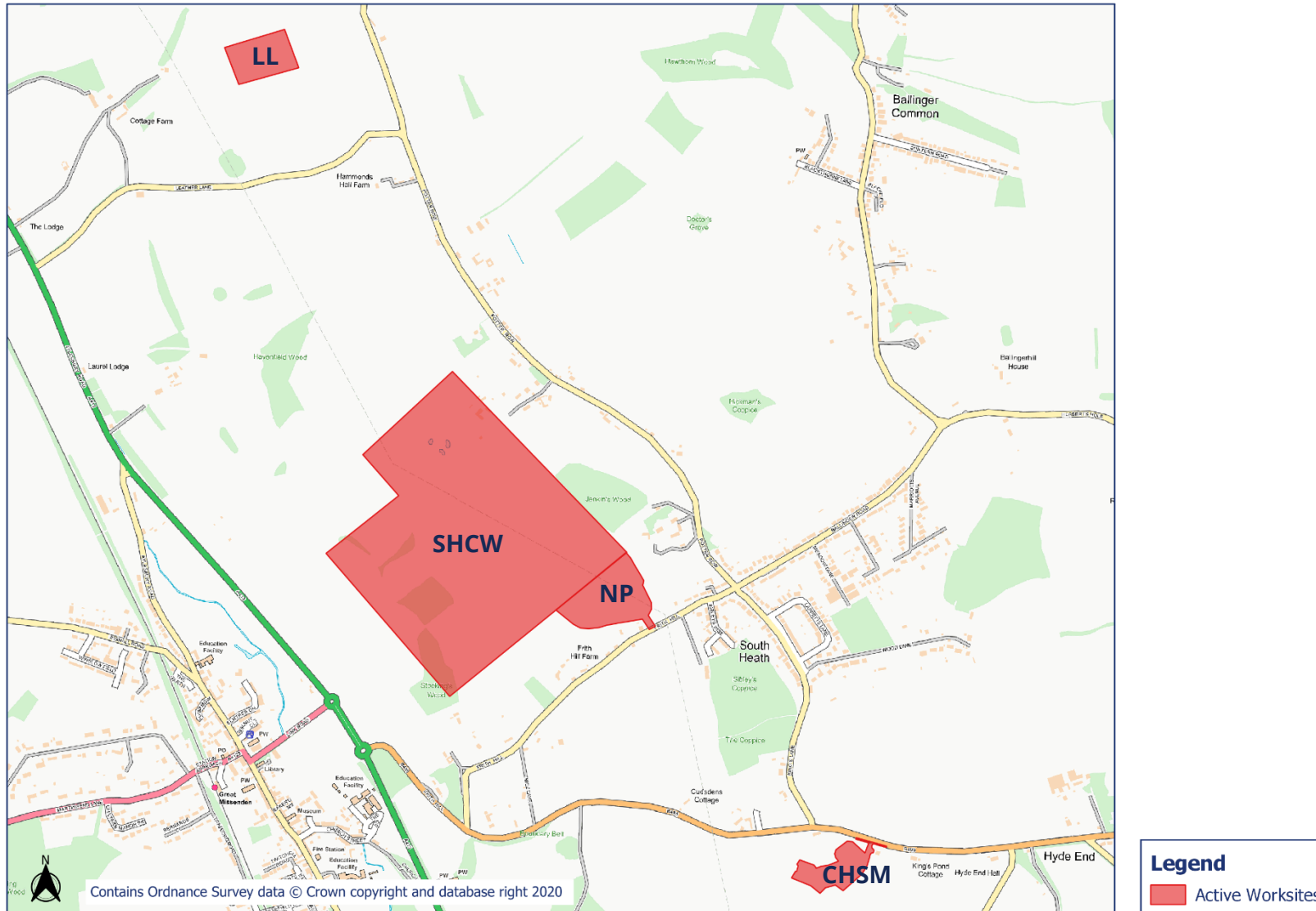




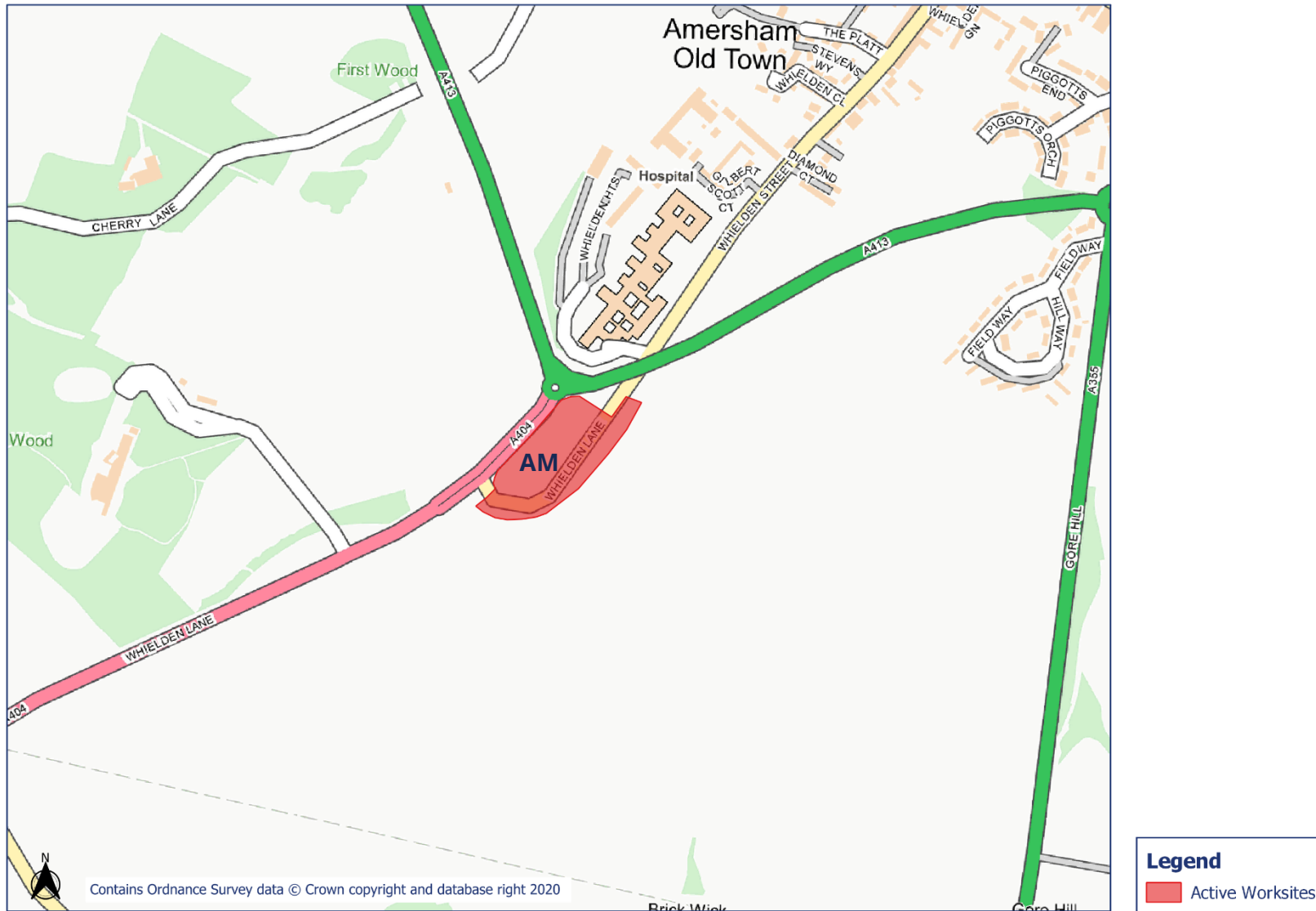








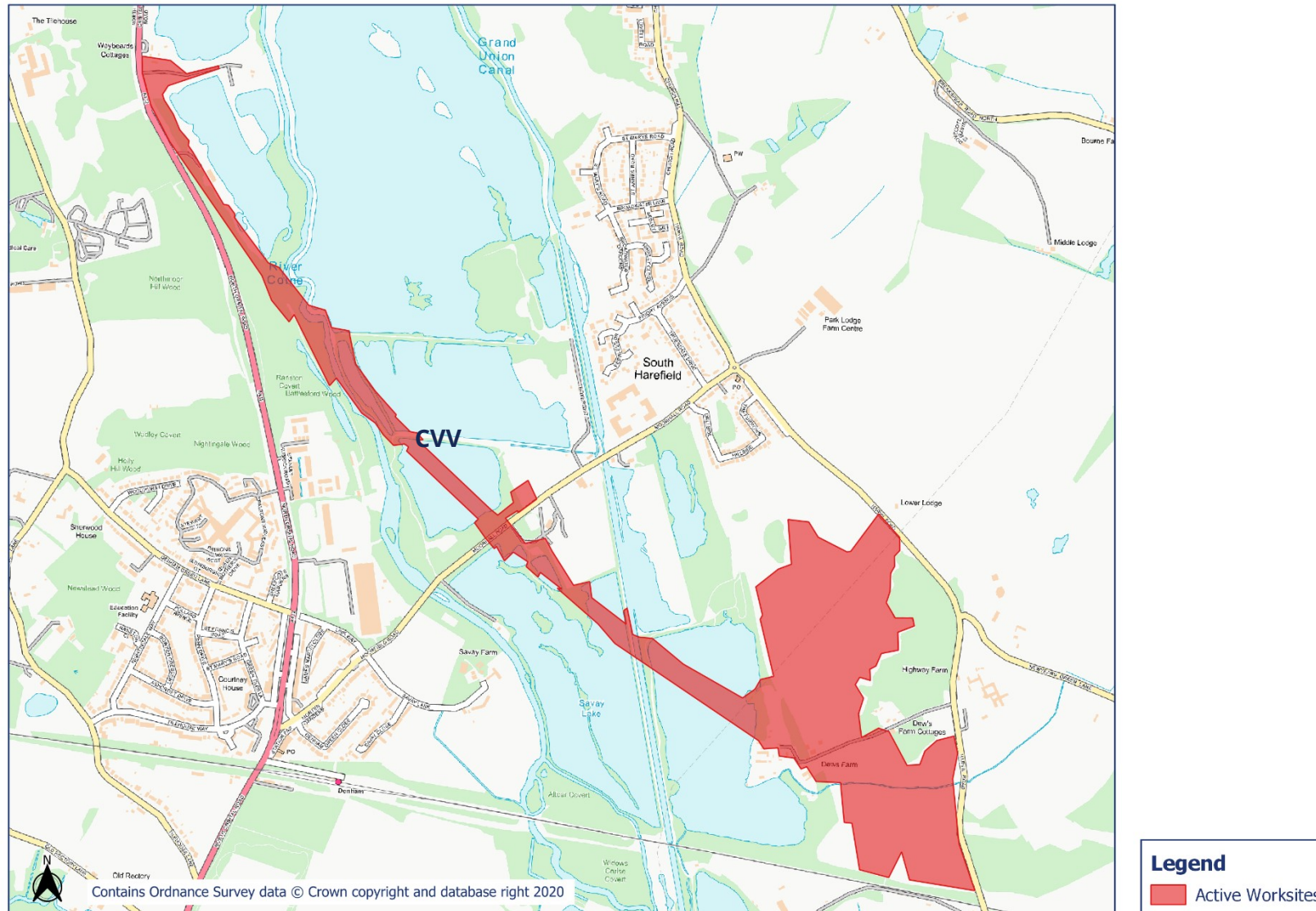






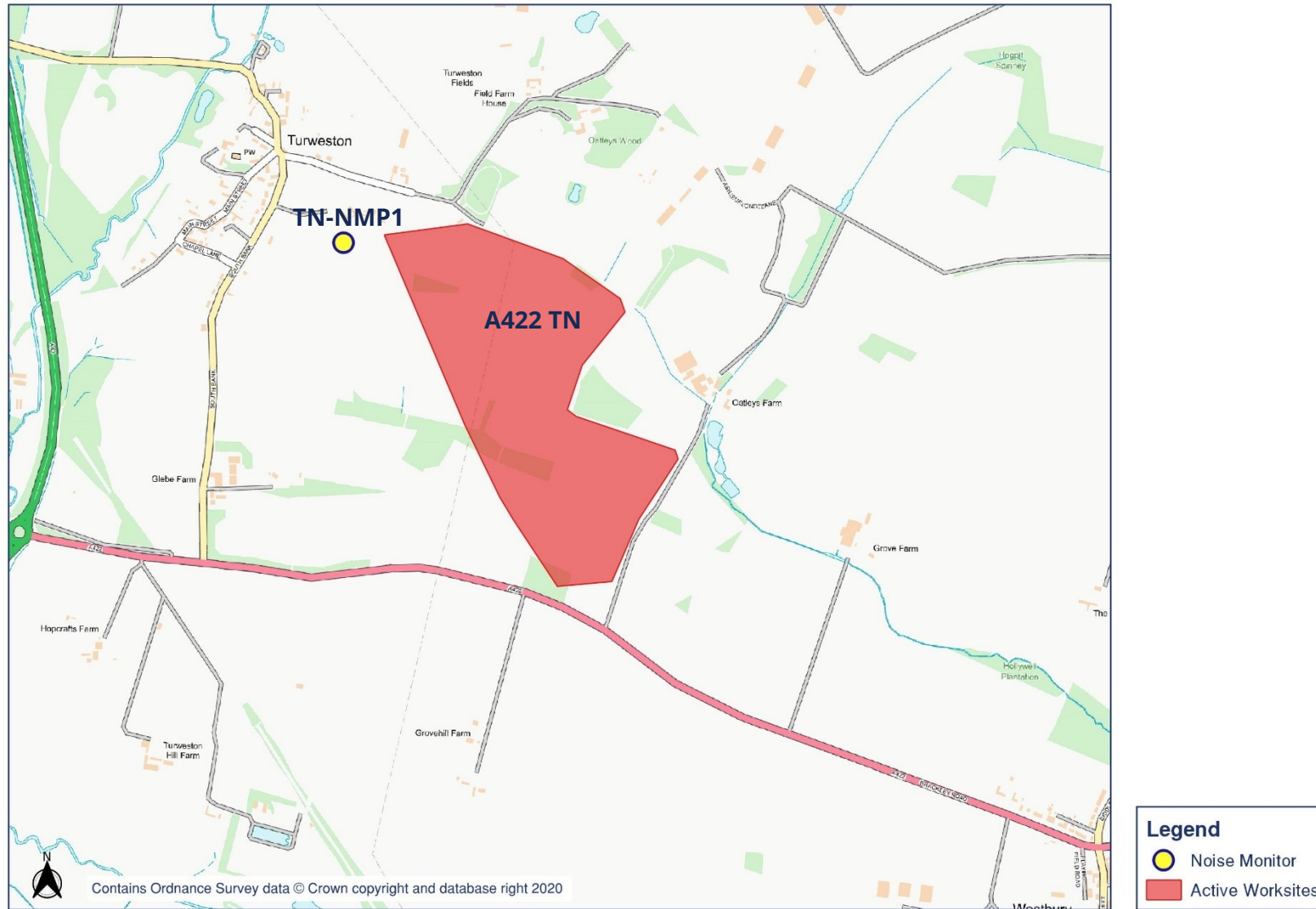


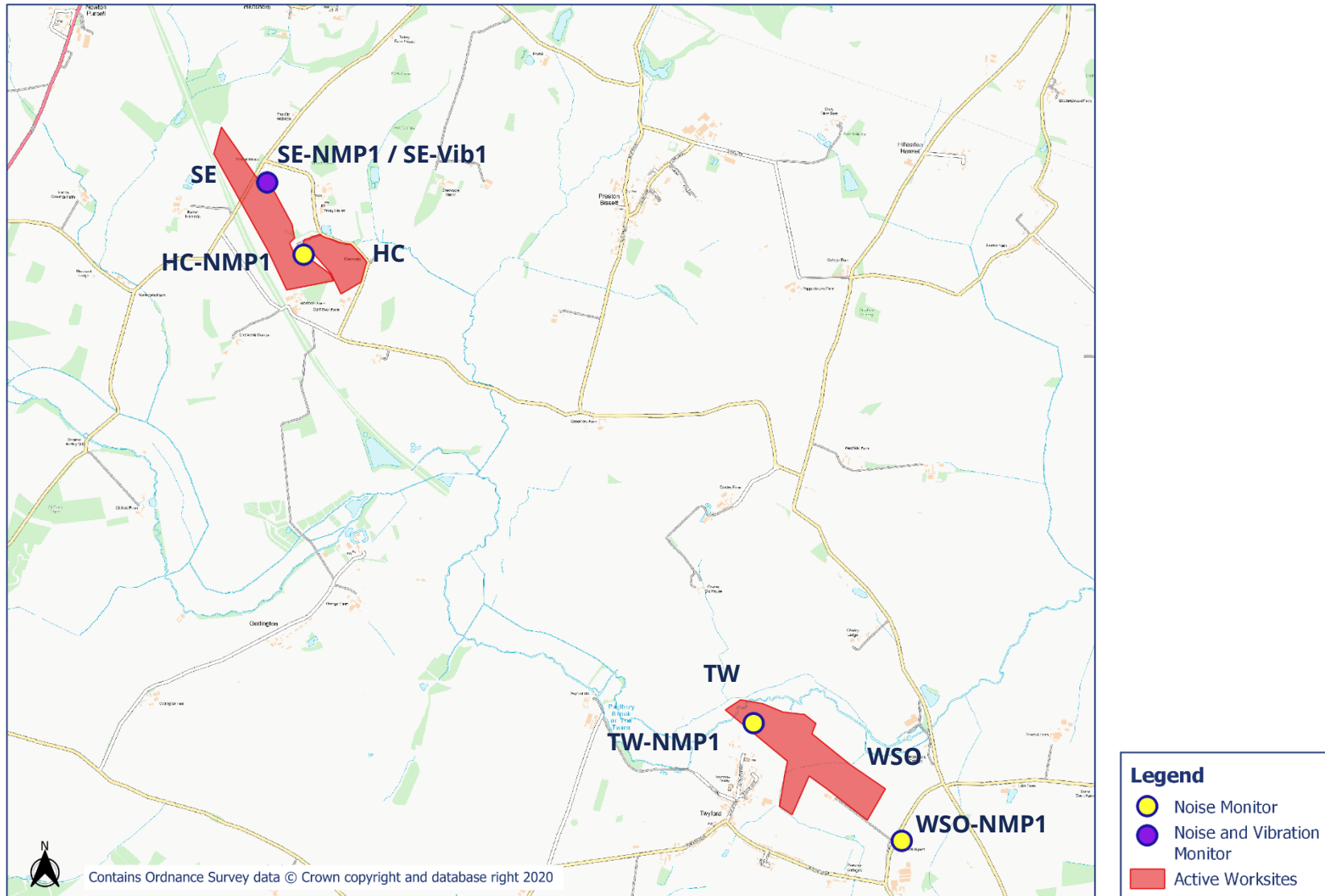




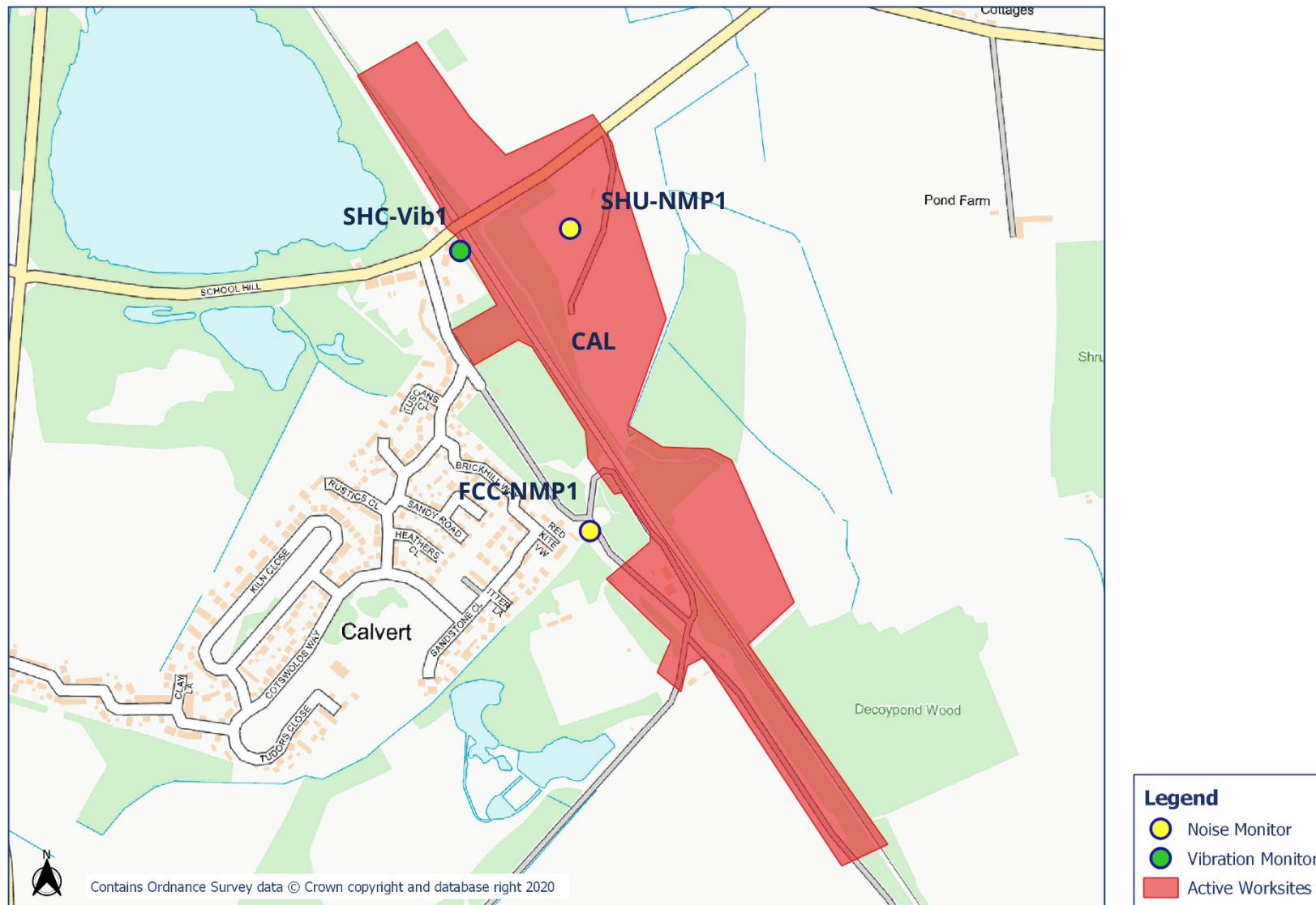
# Appendix B Monitoring Locations

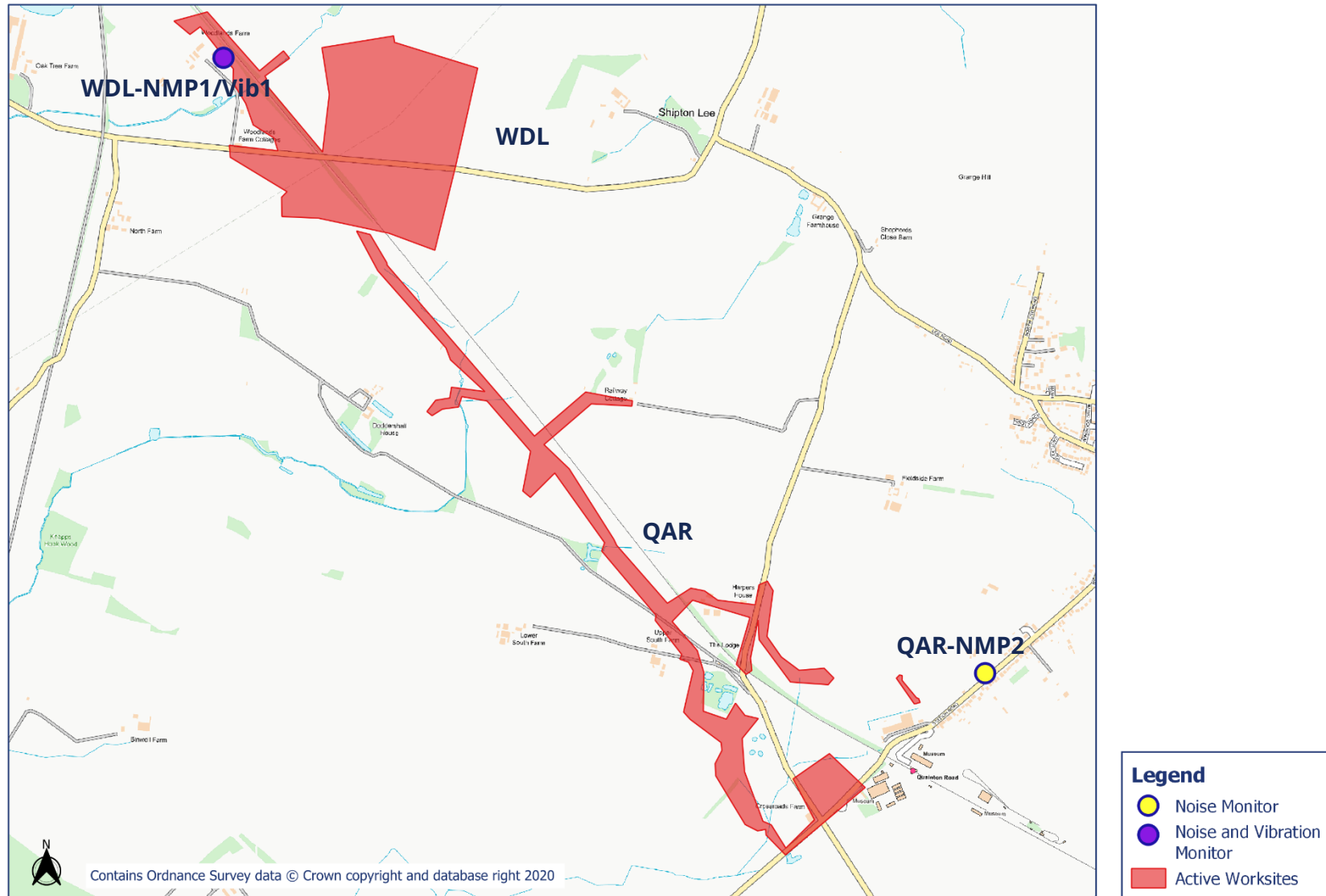




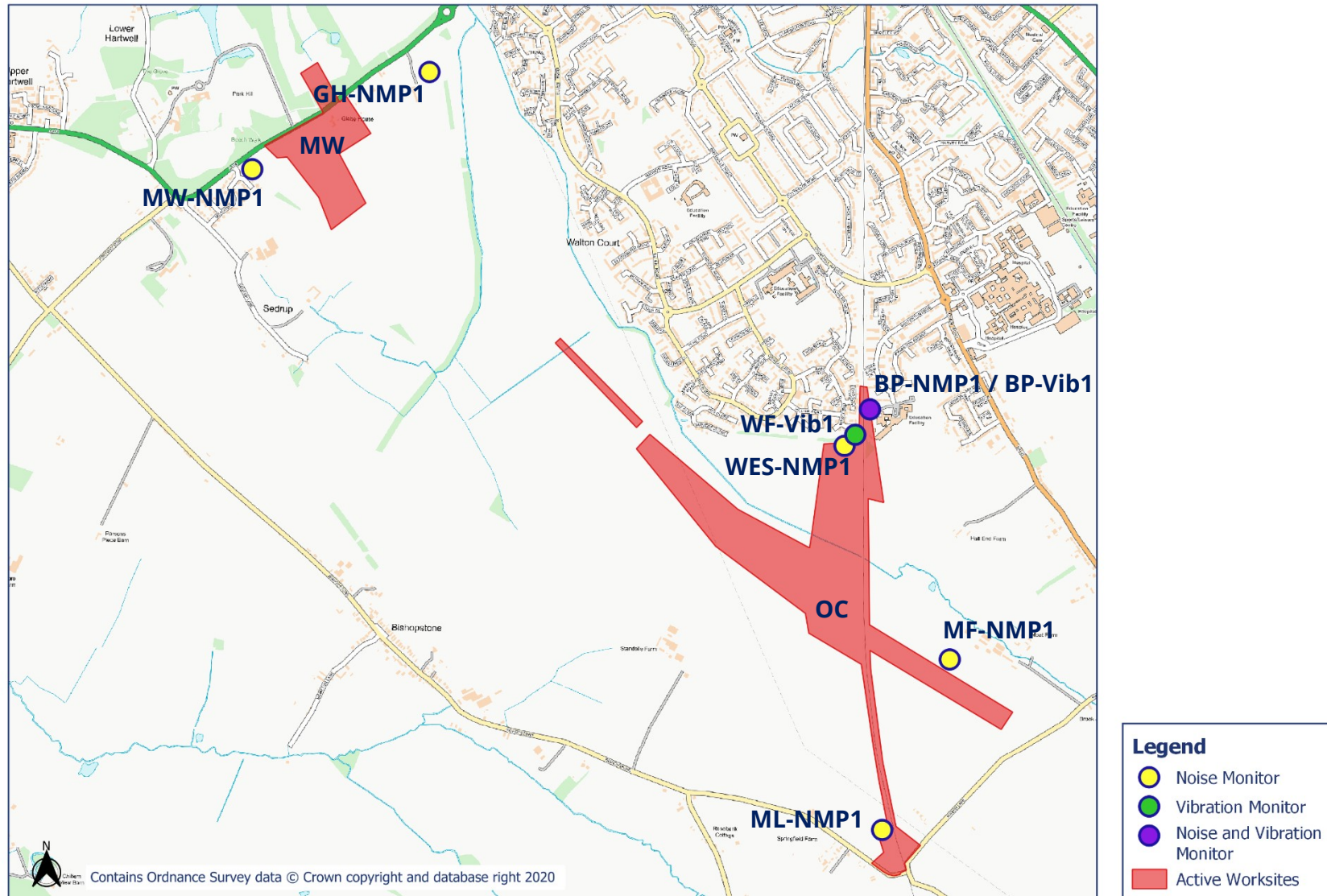


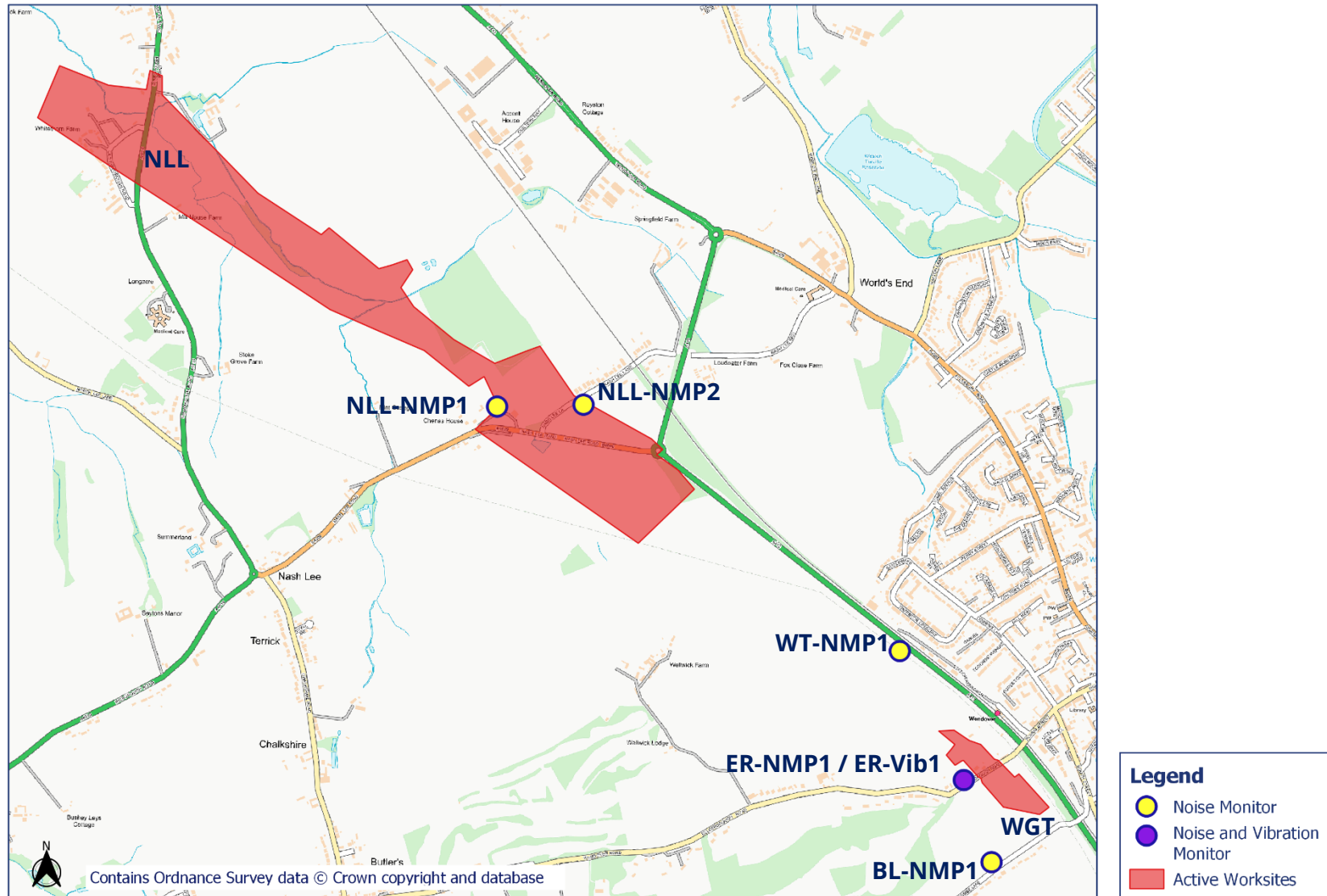


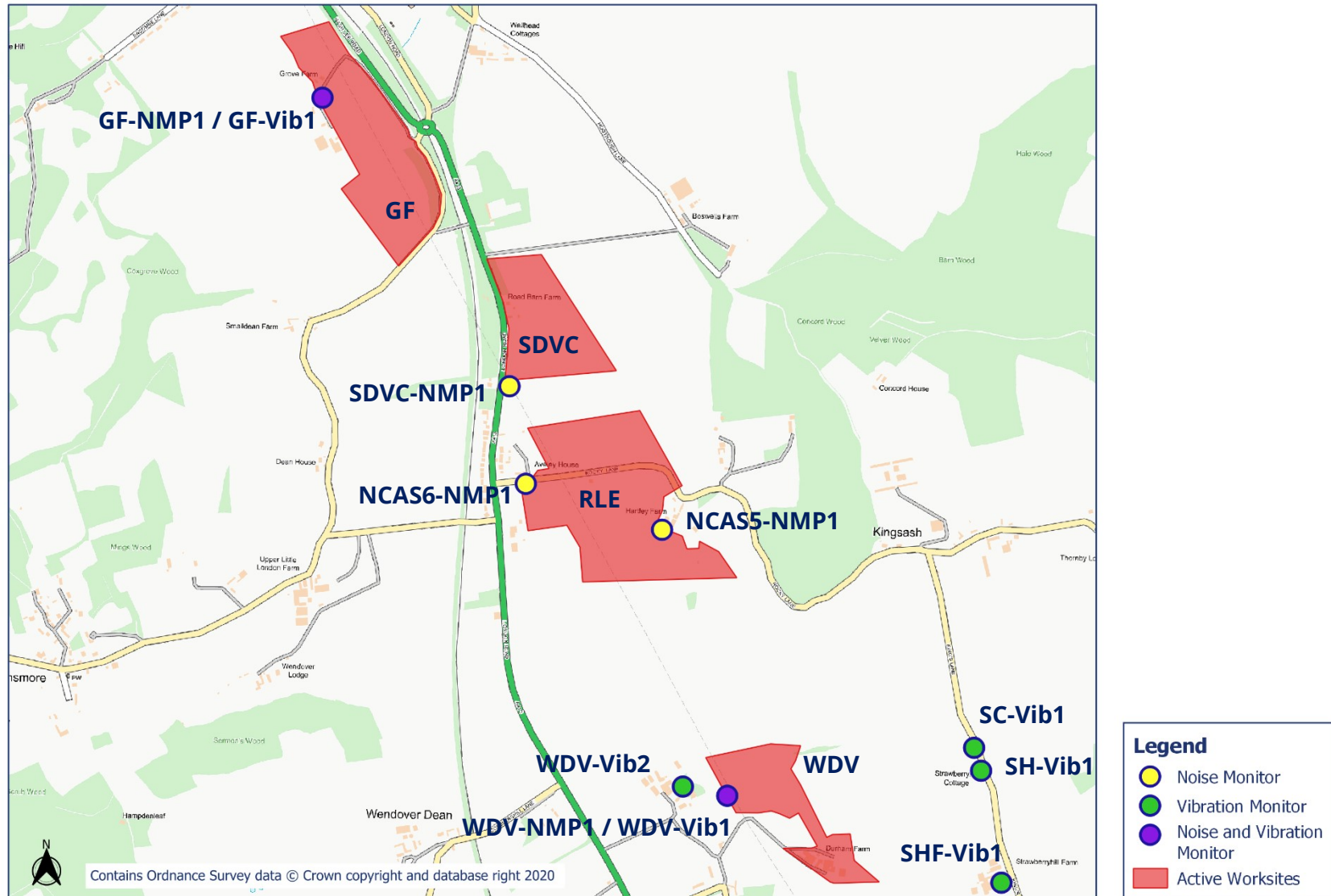




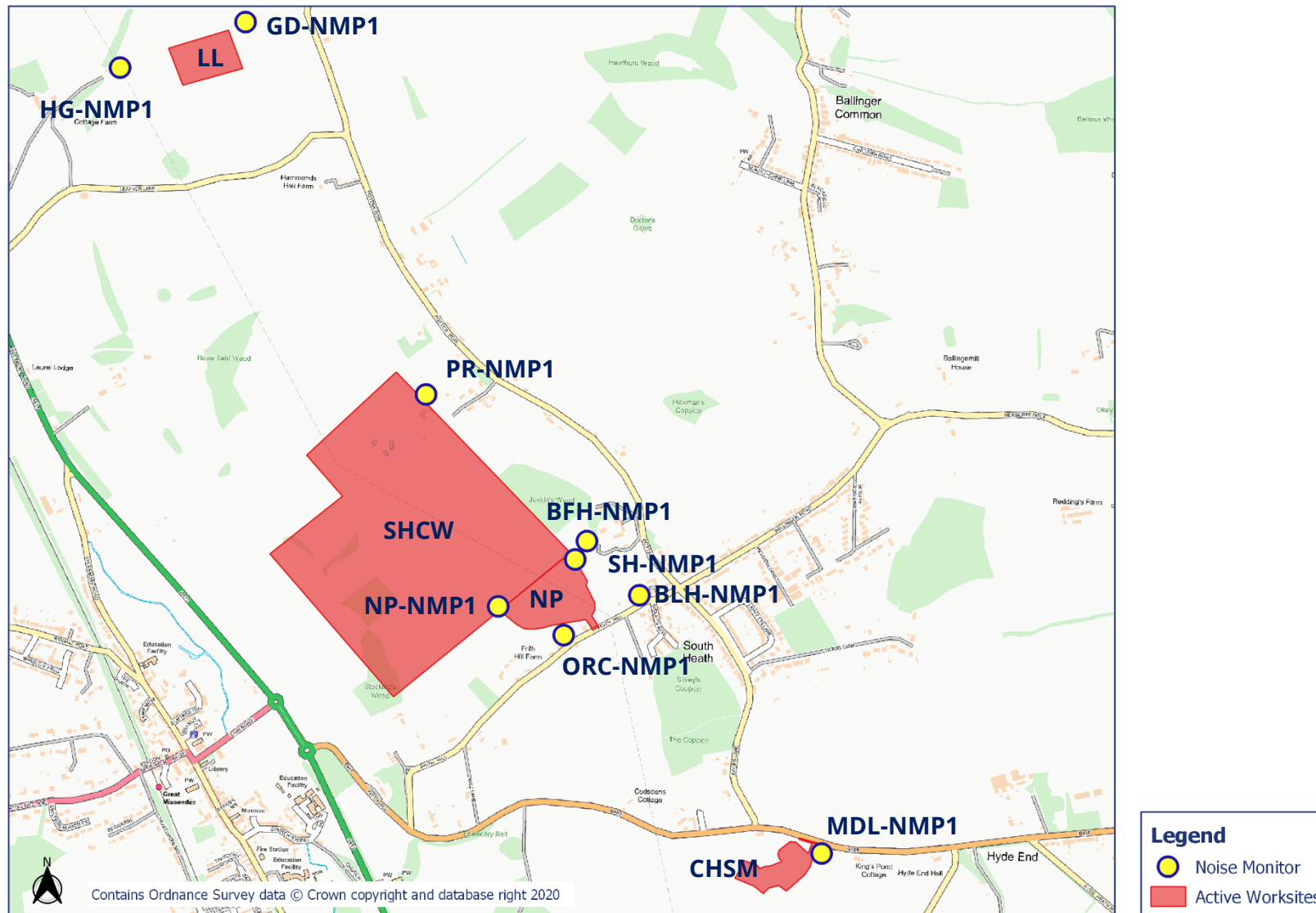




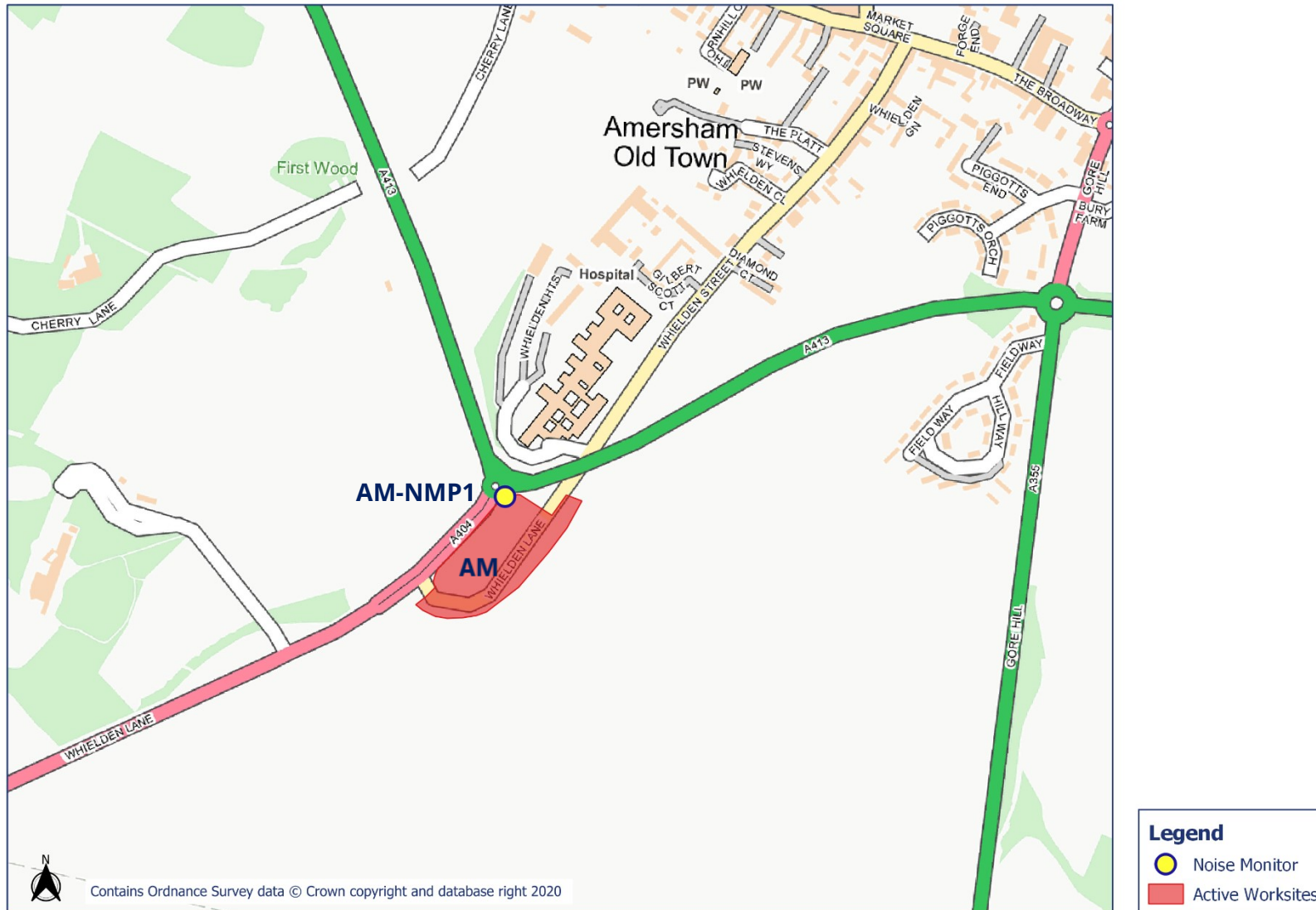






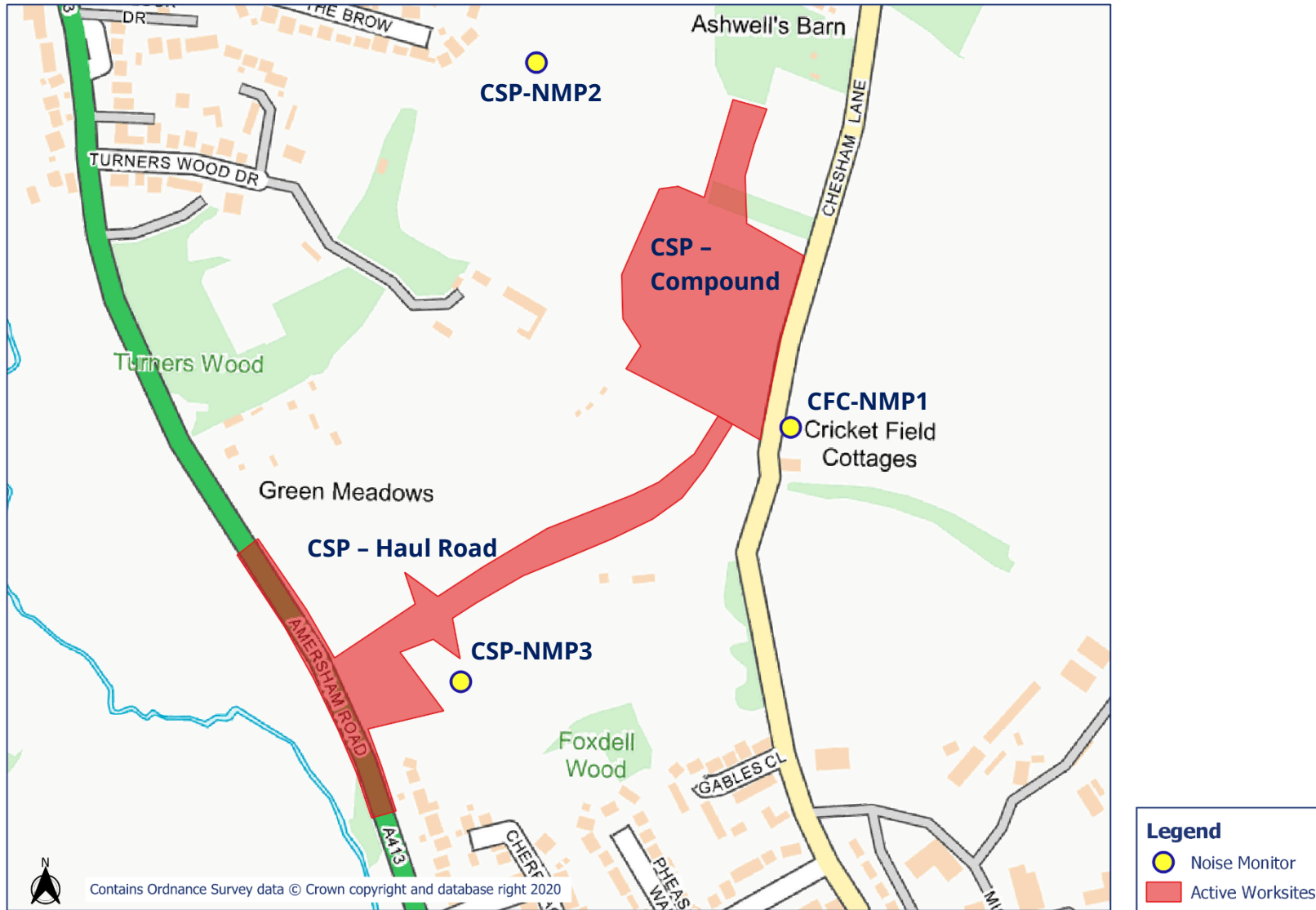




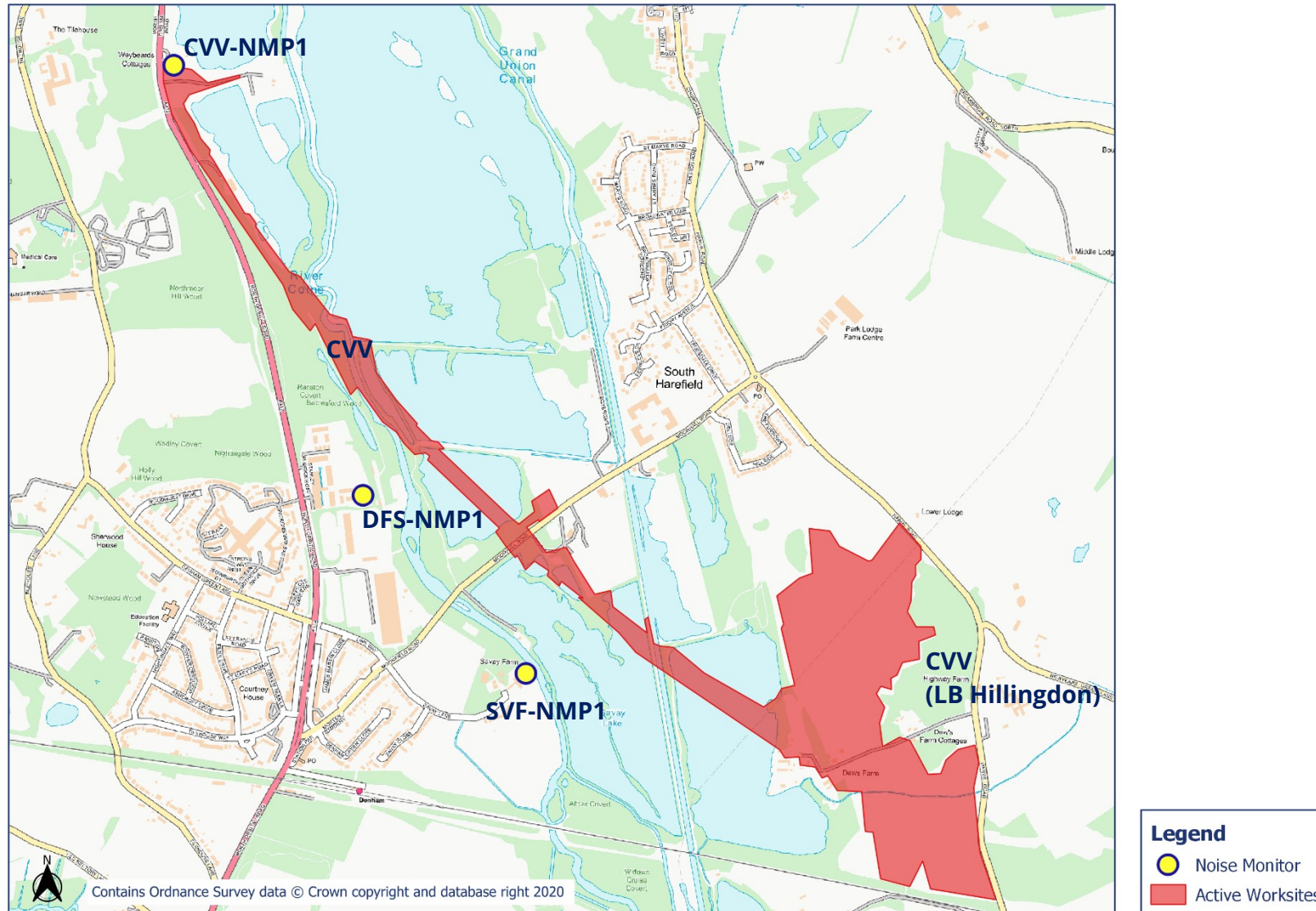




# HS2 Noise and Vibration Monitoring Plan - 13





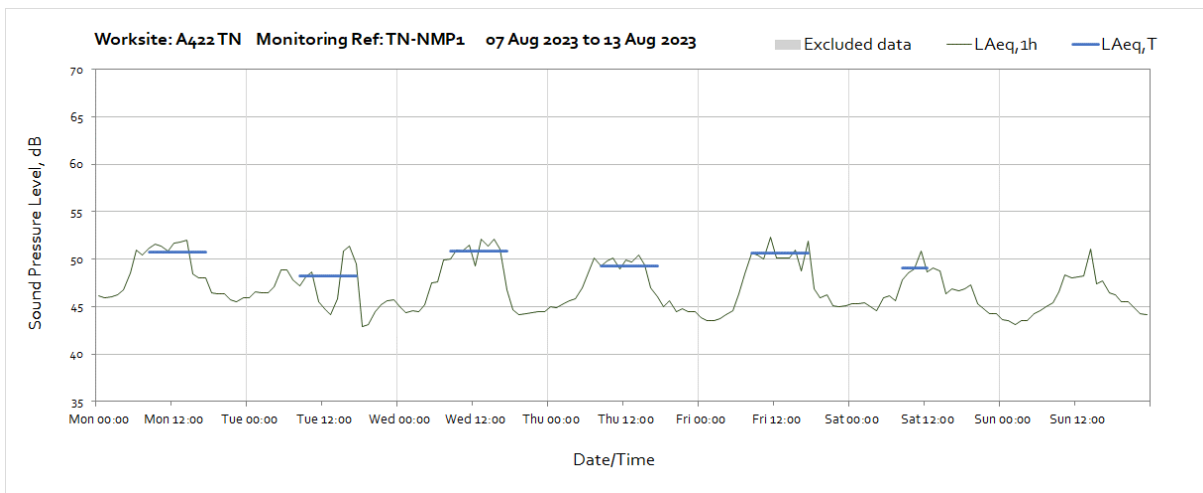
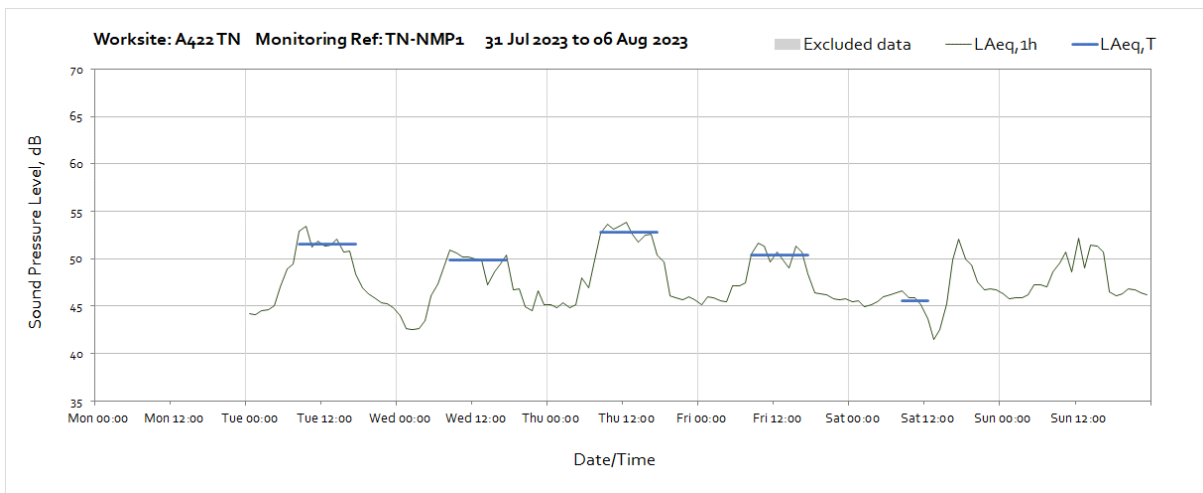


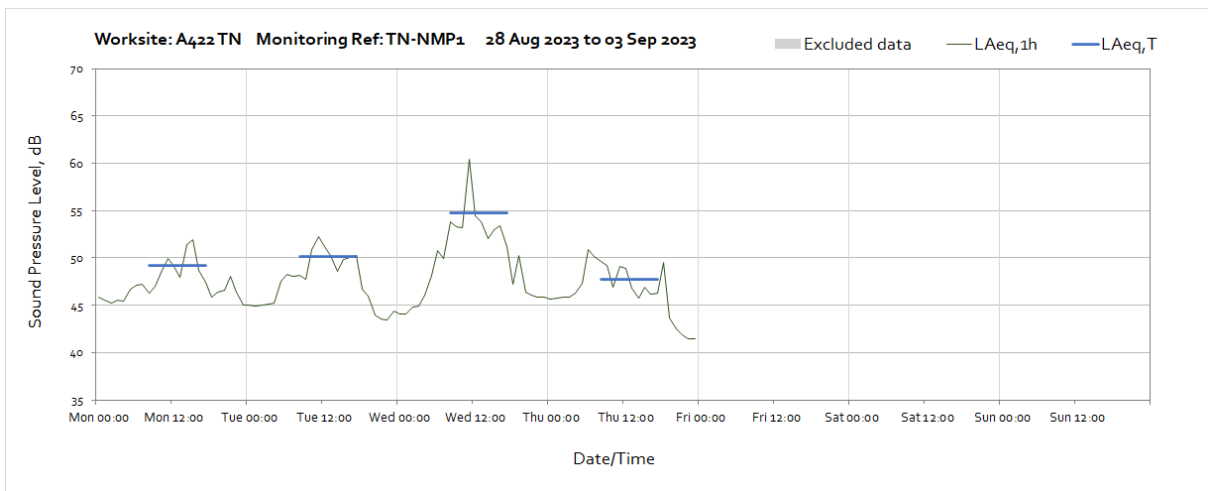
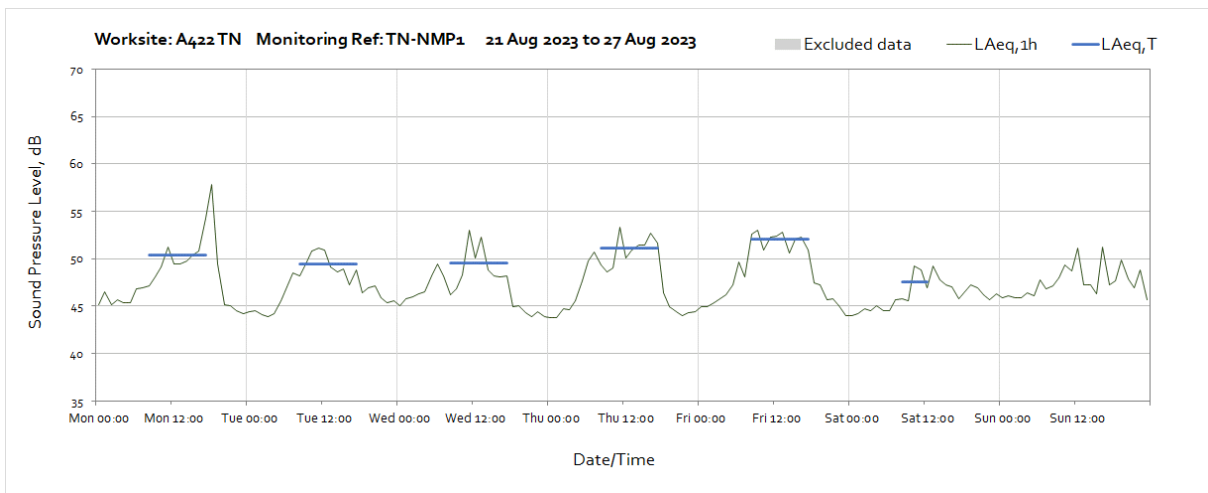
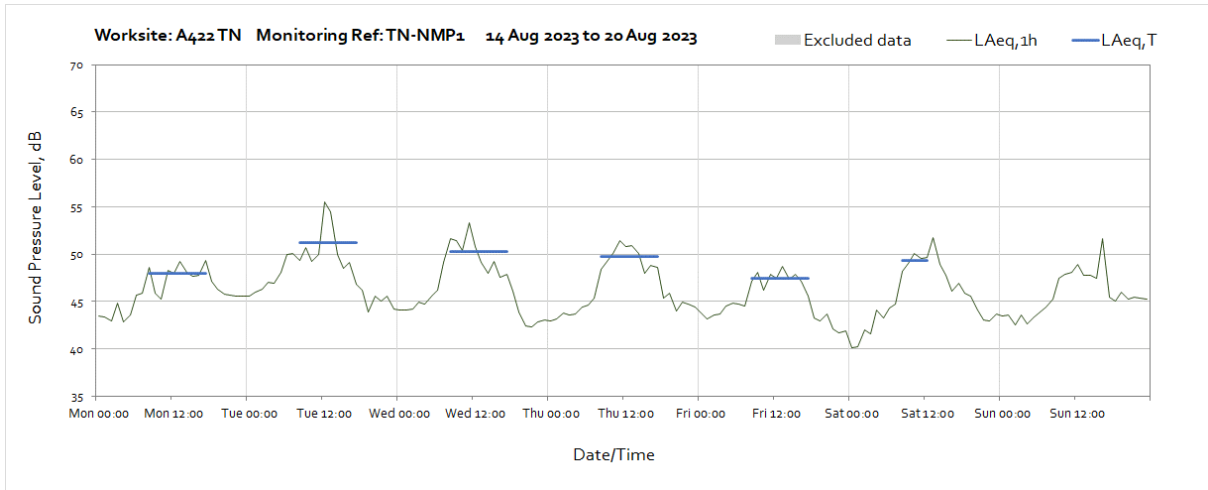
# Appendix C Data

## 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.

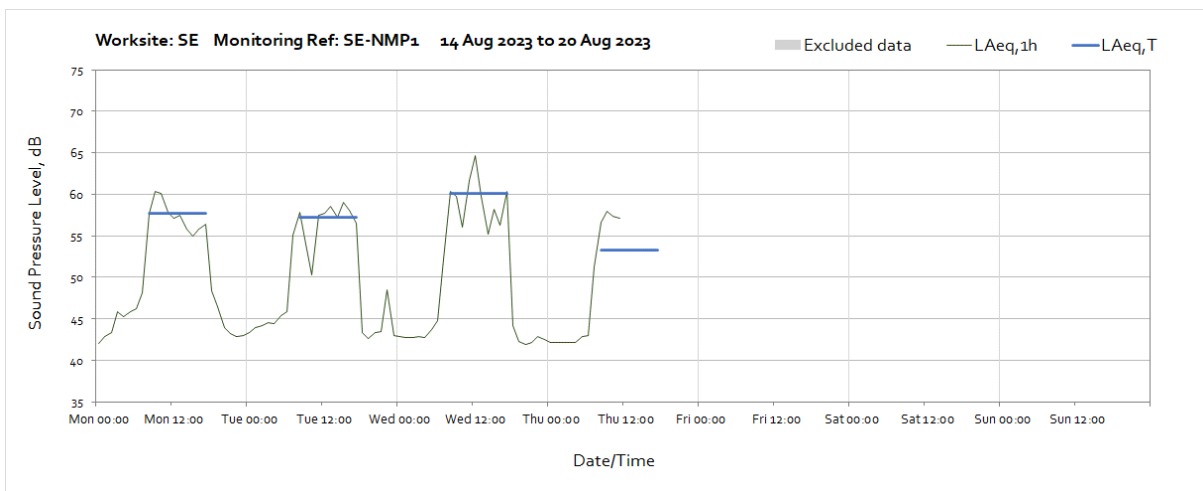
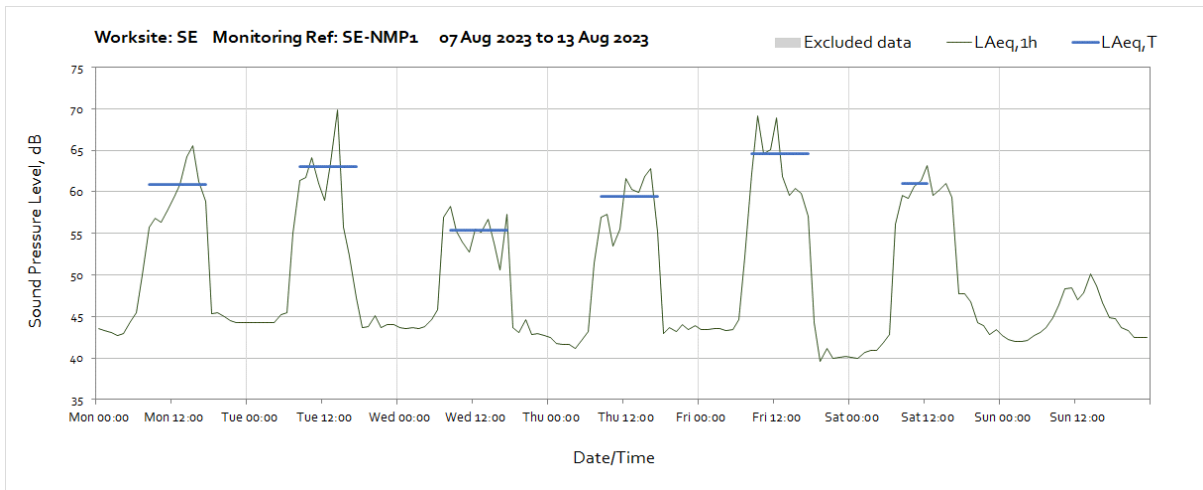
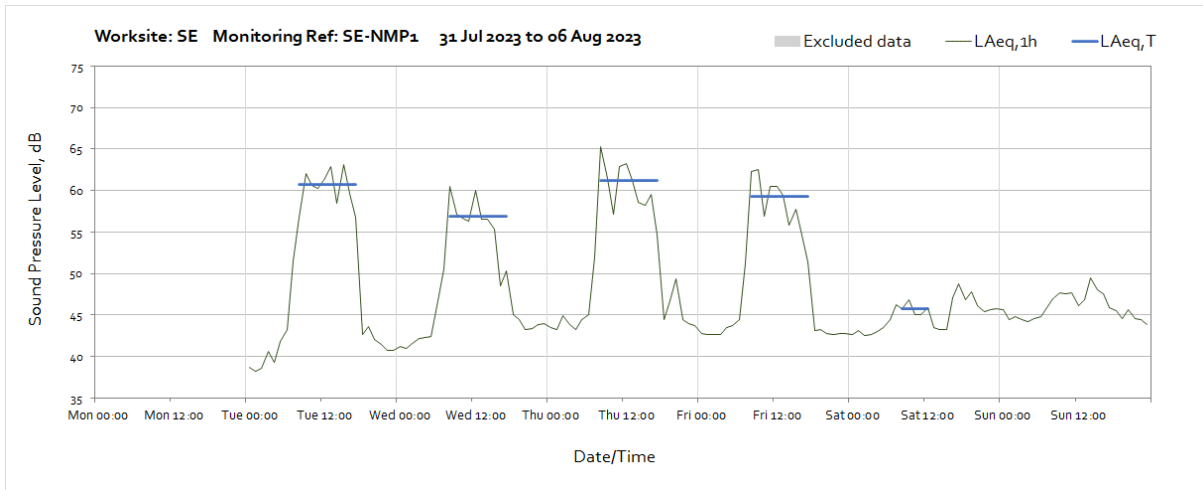
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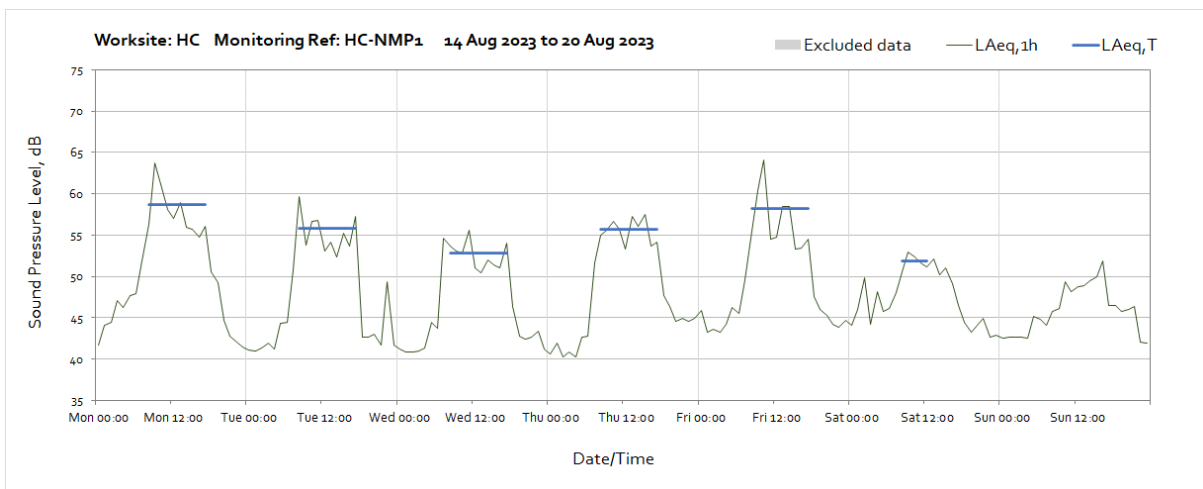
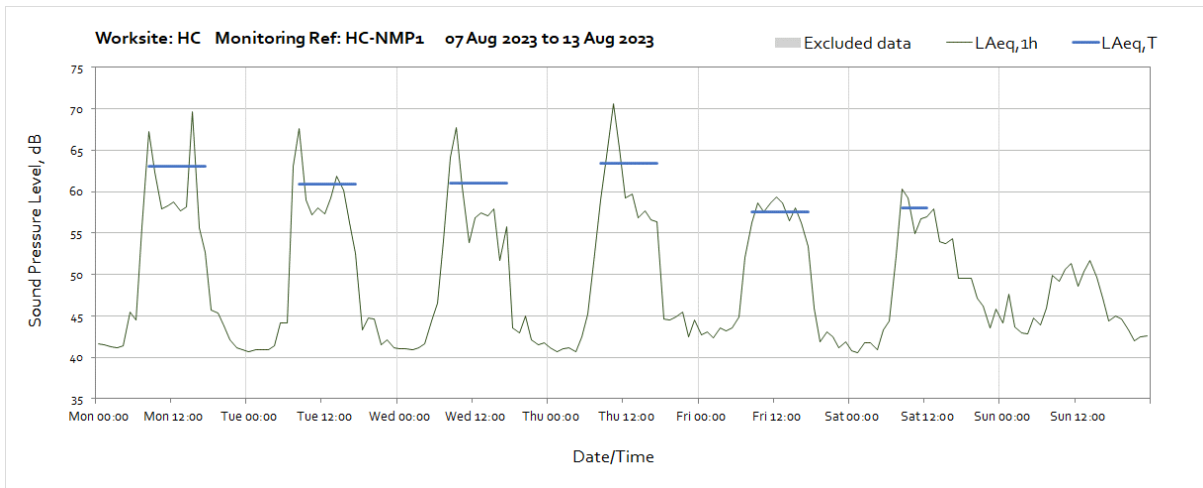
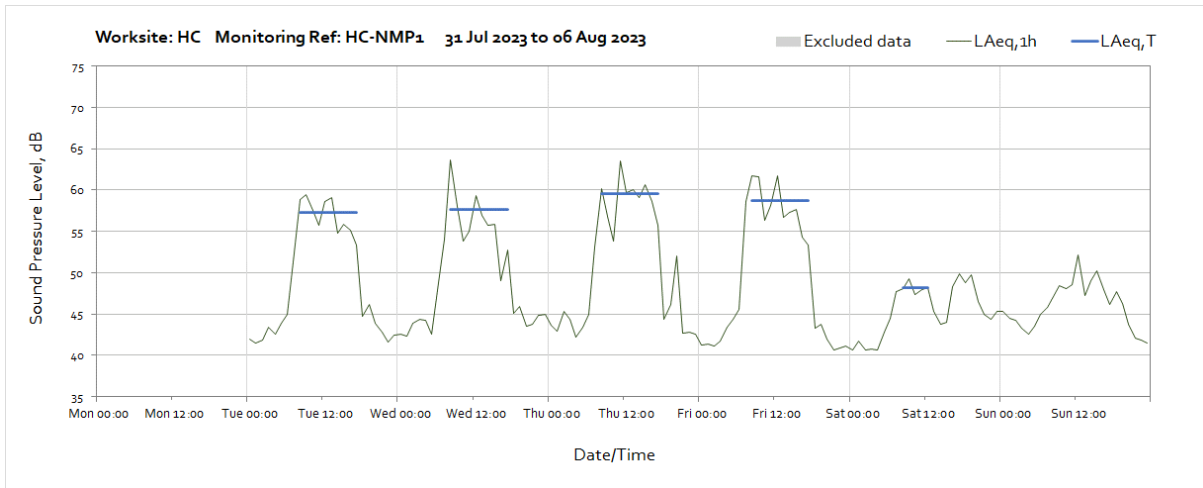
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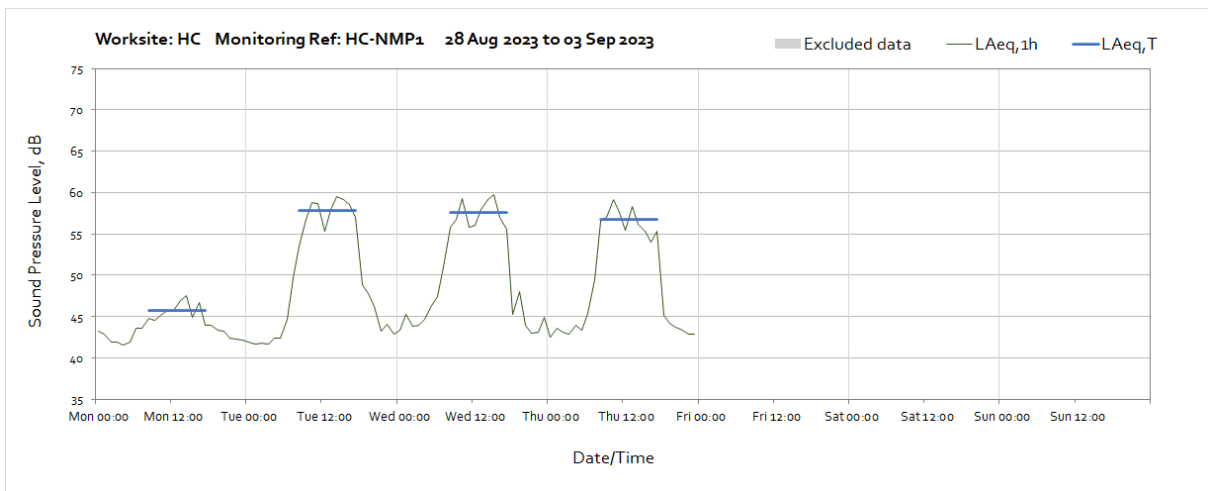
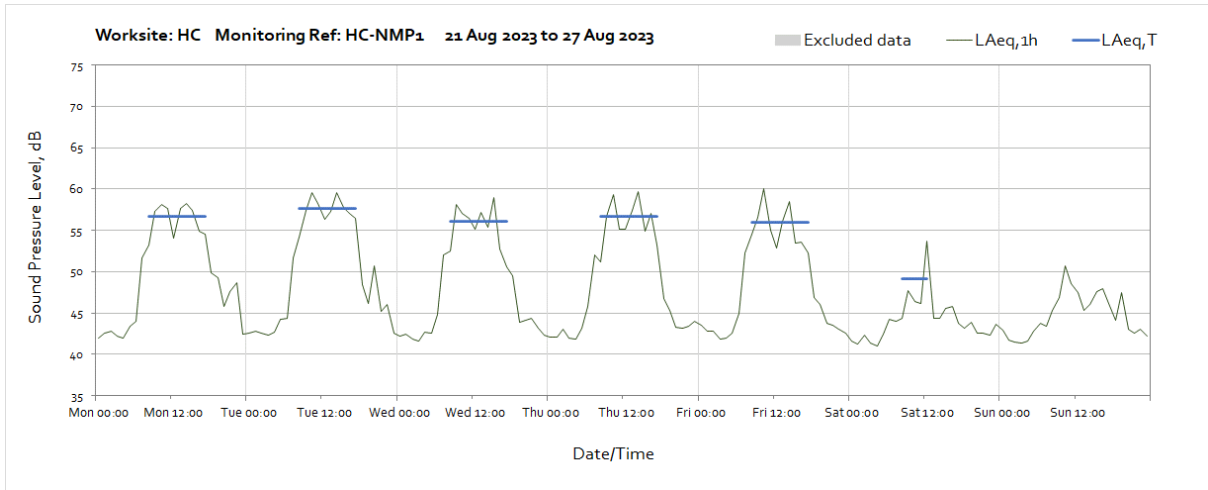


Note: Missing data from 12:00 on Thursday 17<sup>th</sup> August until month end was due to damage to the communication cable & a loose power connection

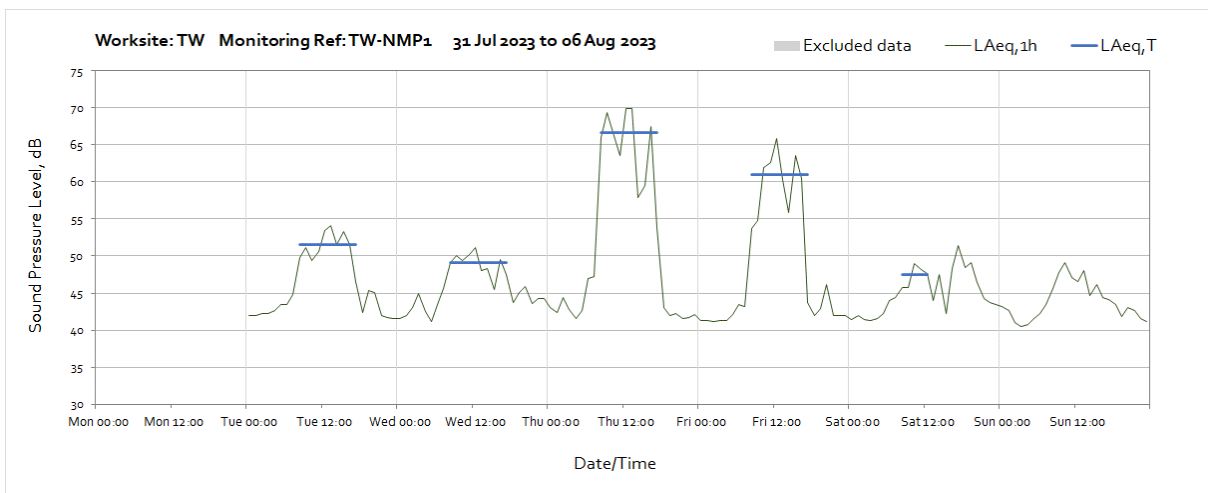
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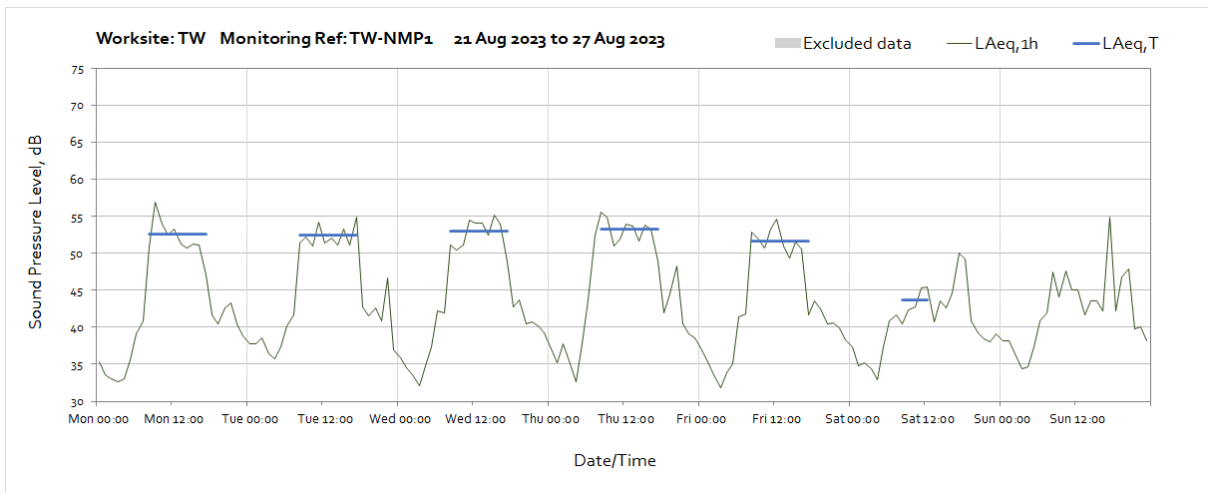
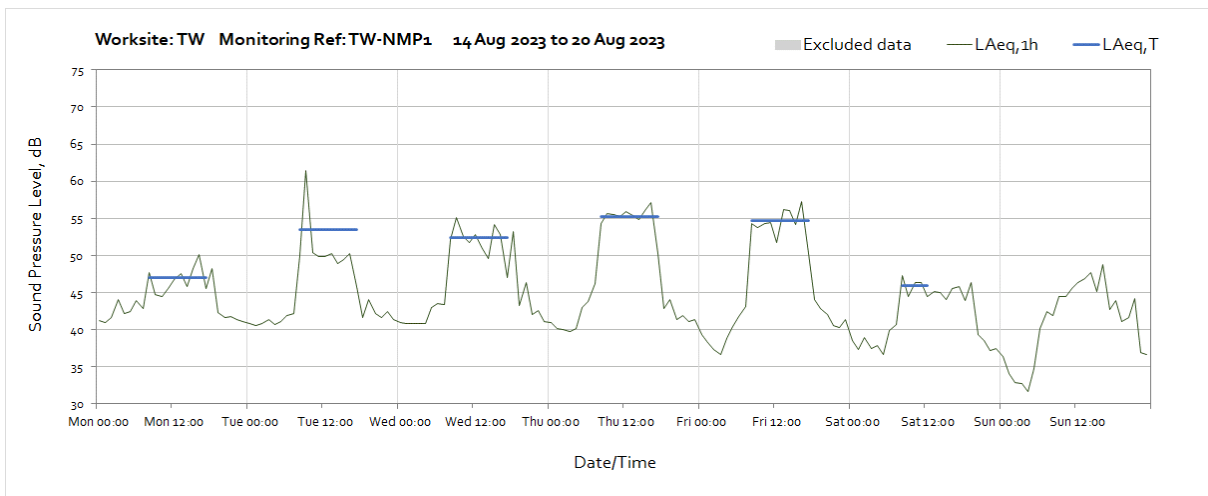
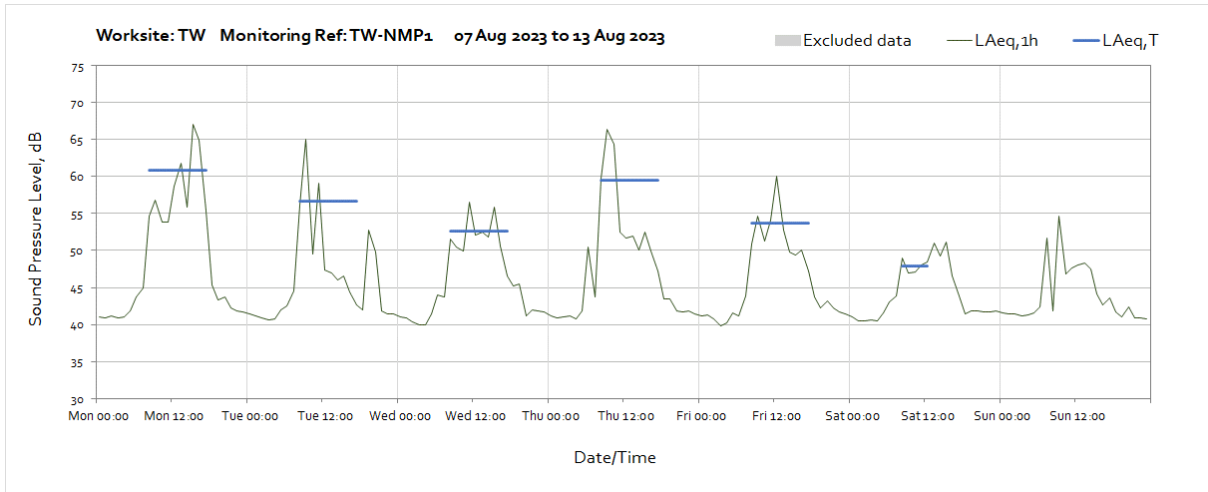
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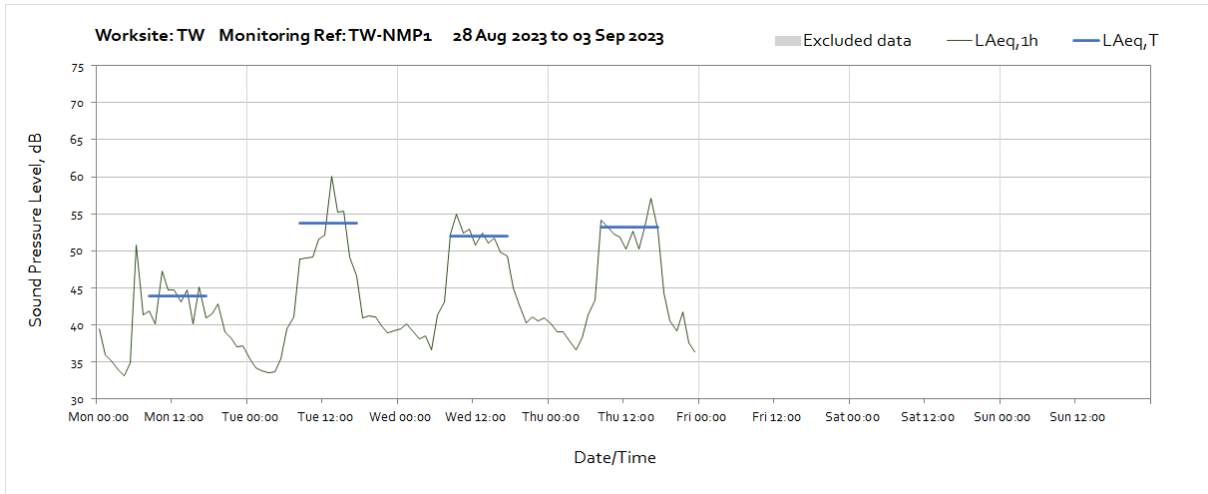




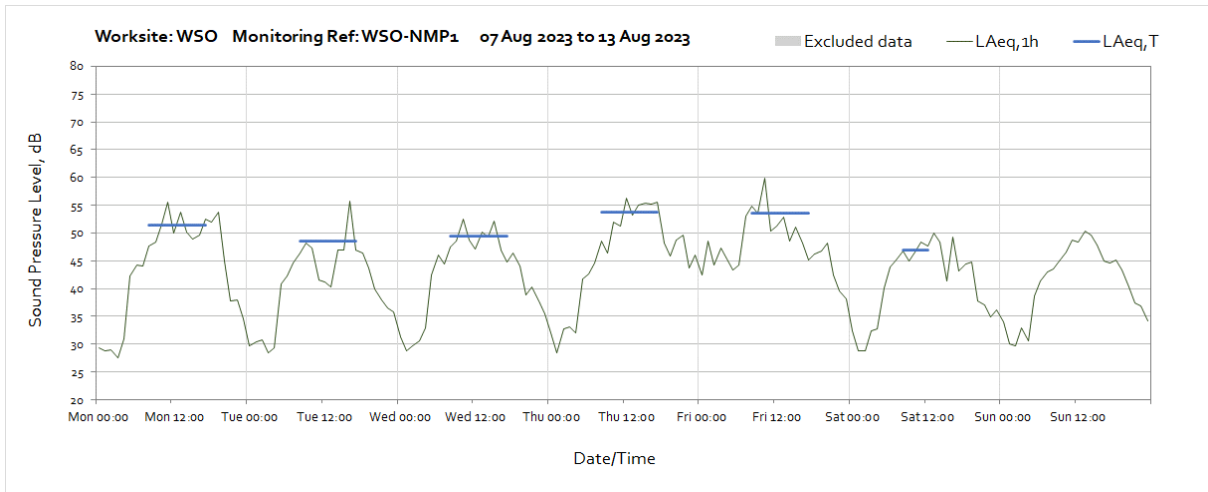
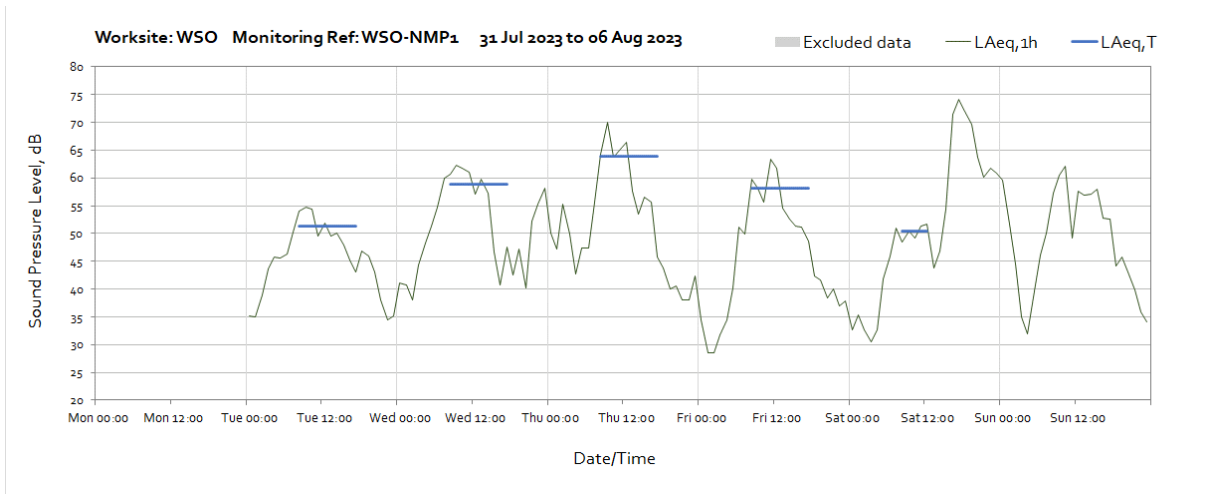
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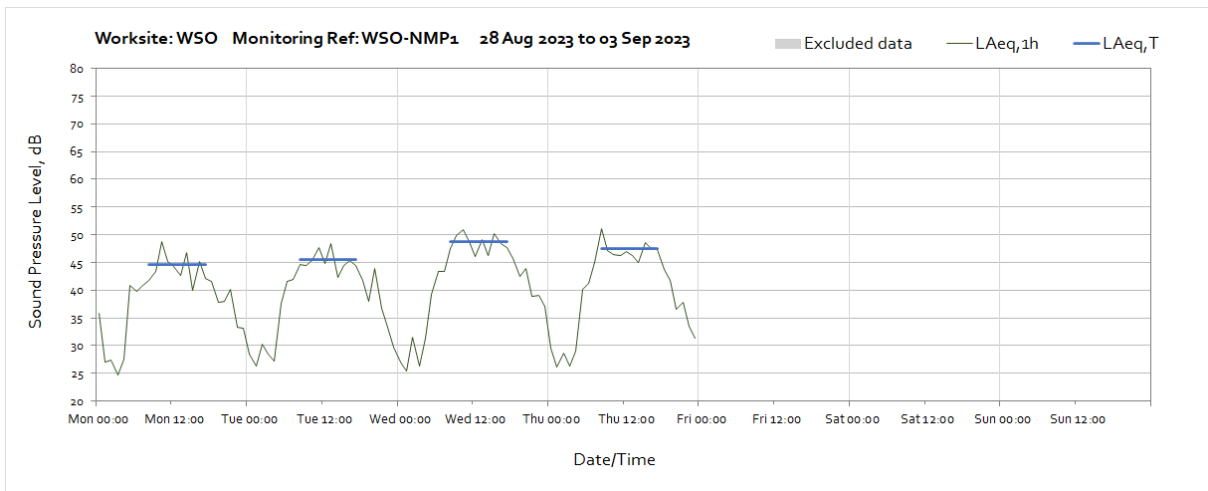
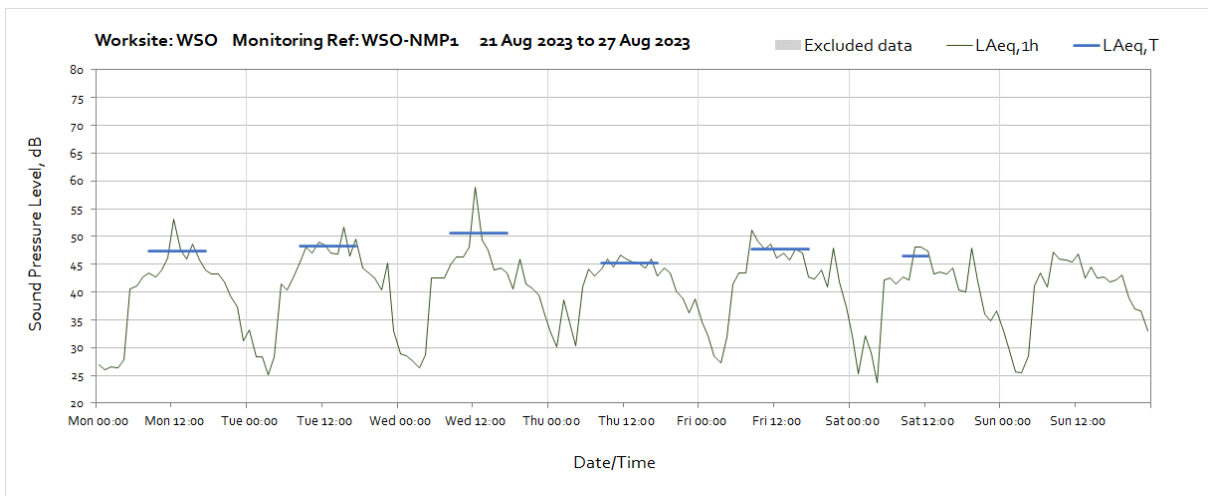
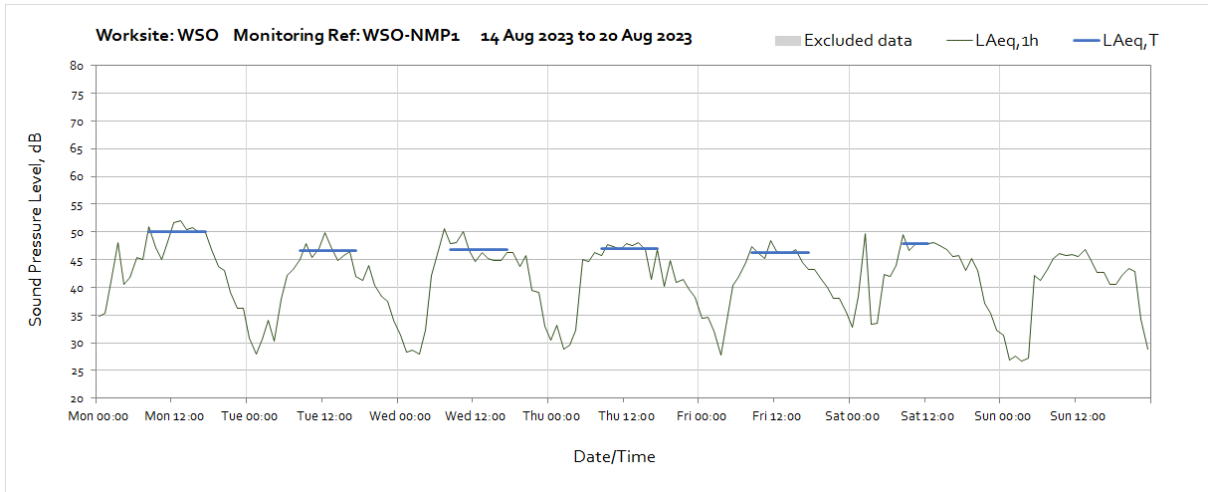




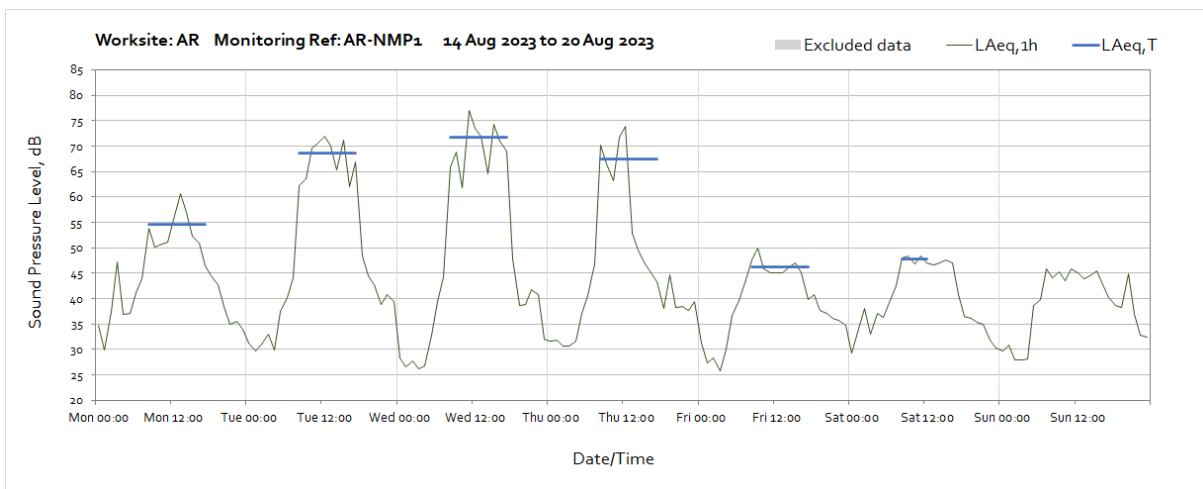
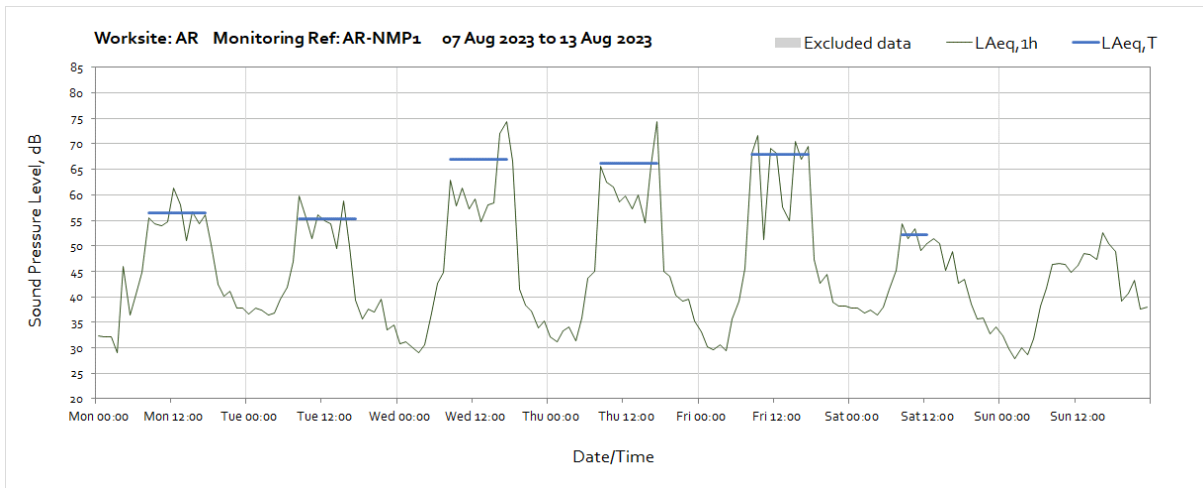
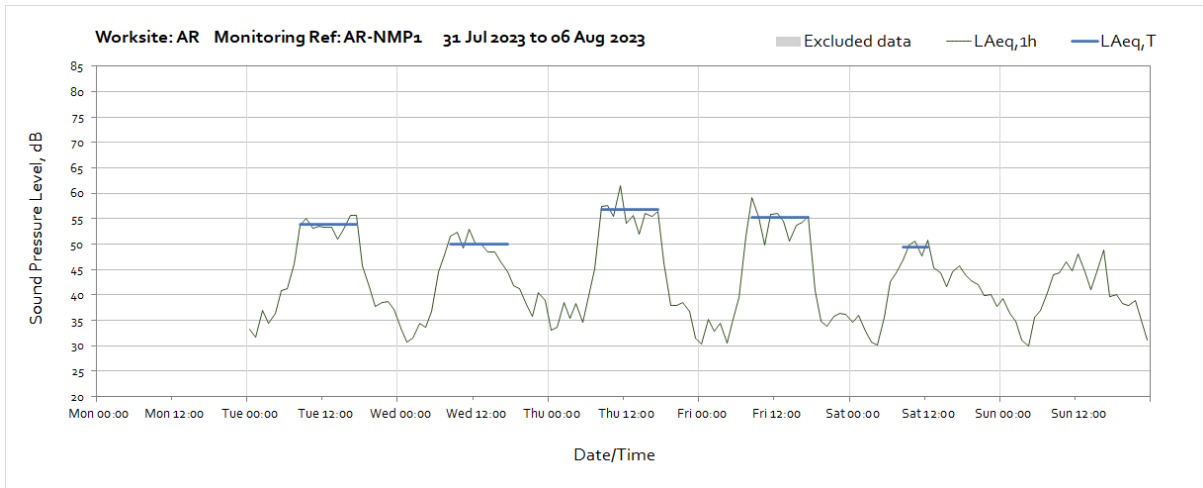


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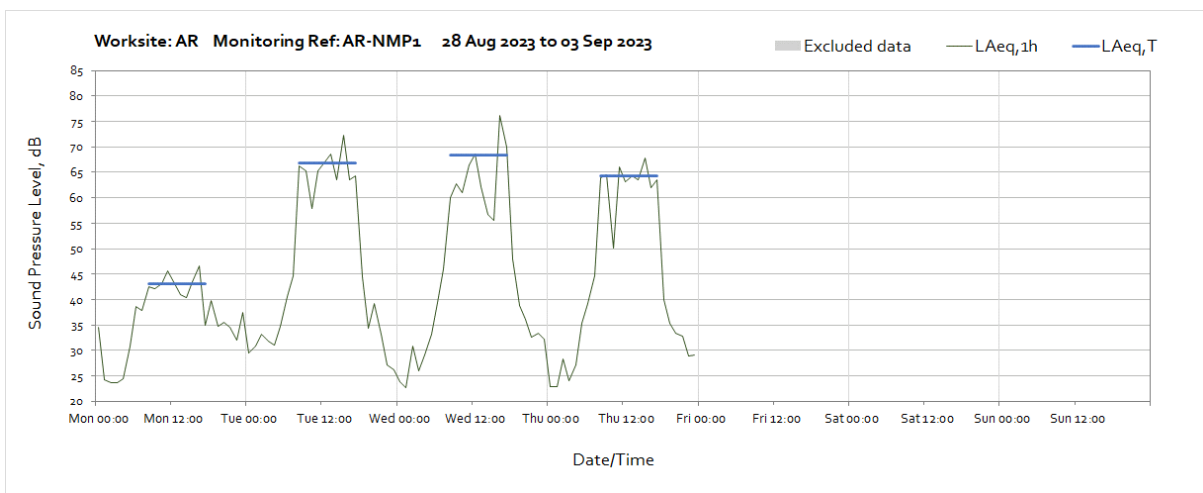
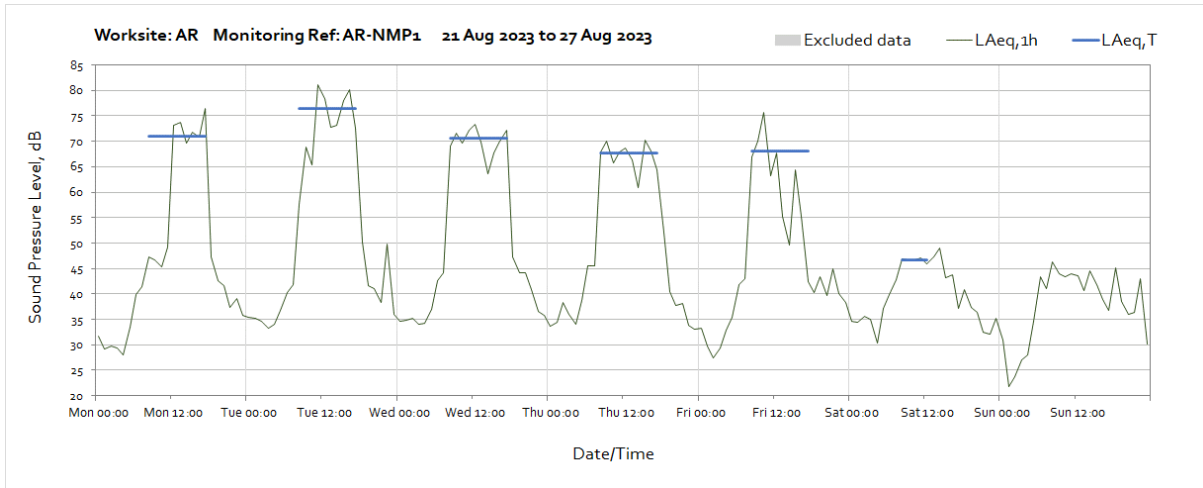




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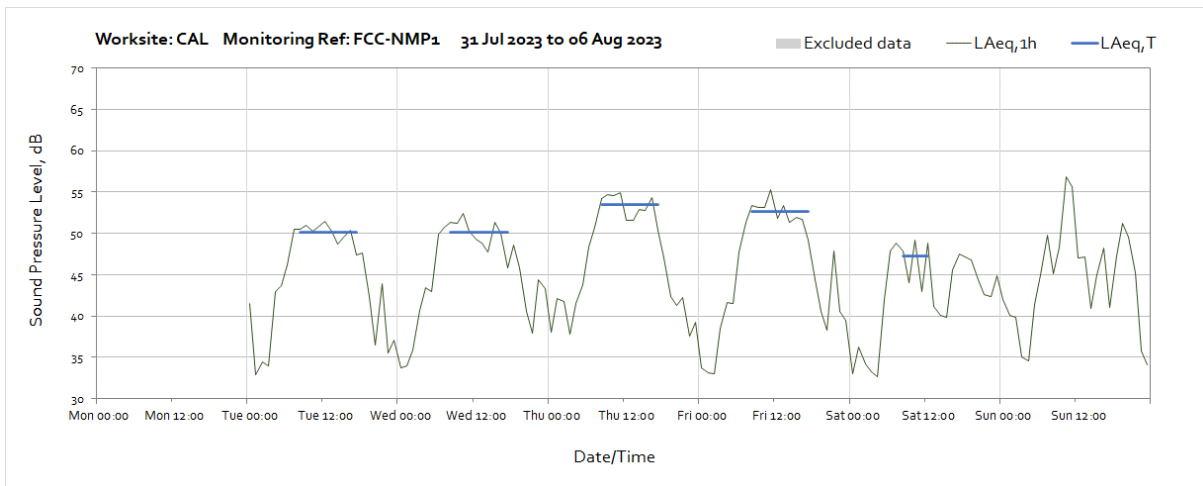


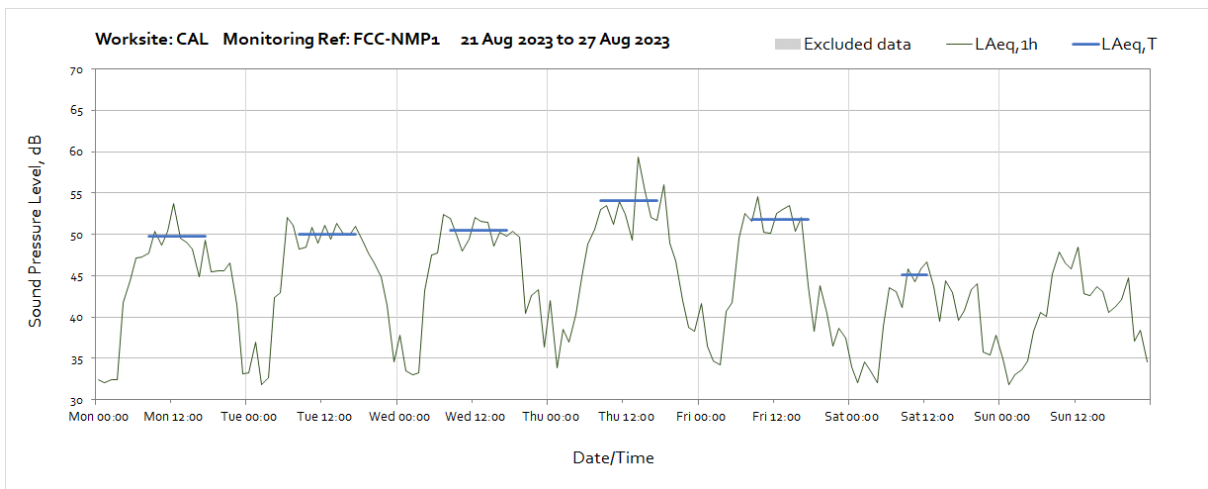
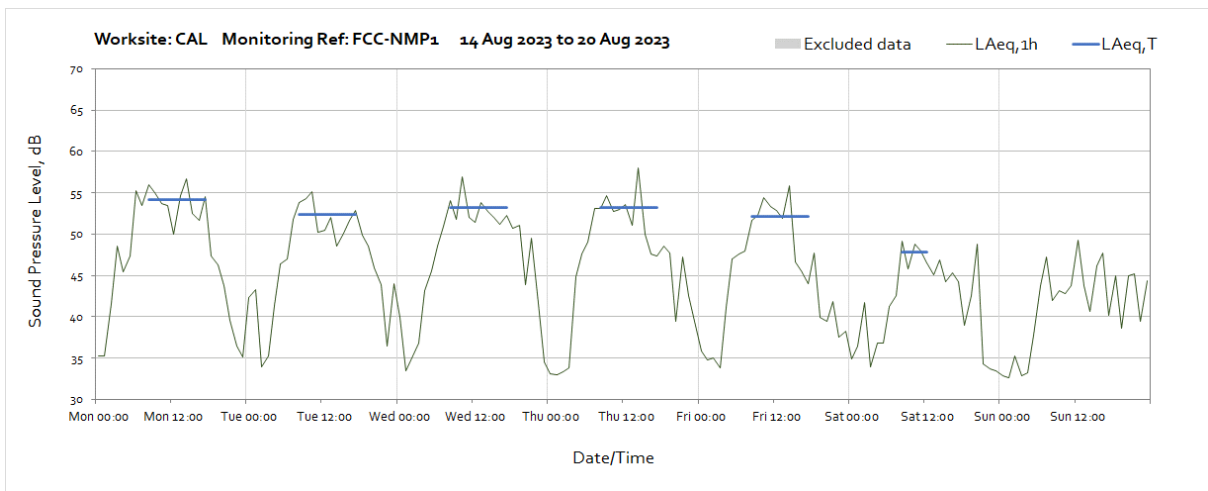
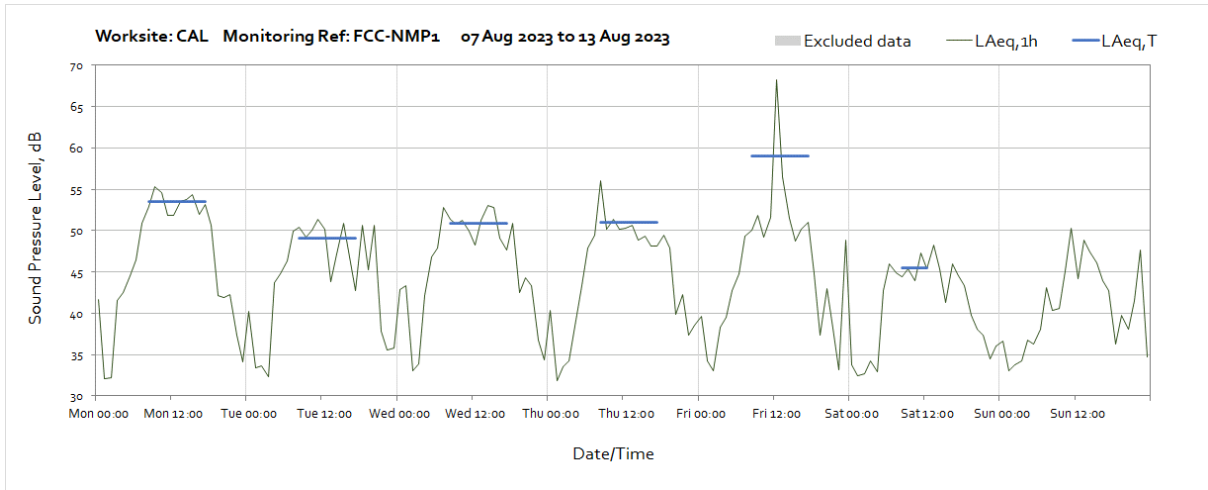


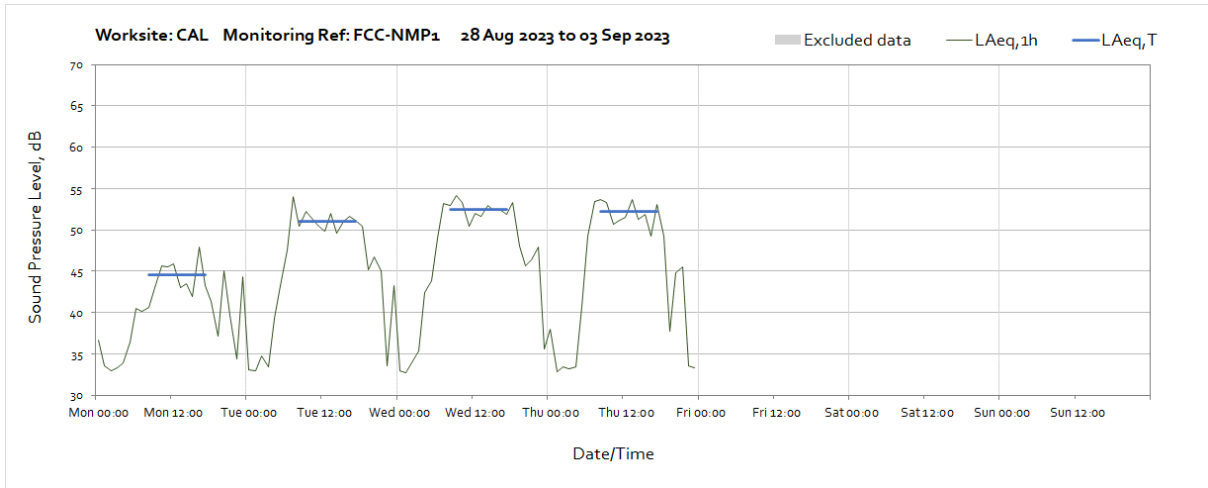
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No data was obtained during the month of August due to an issue with the SIM card.

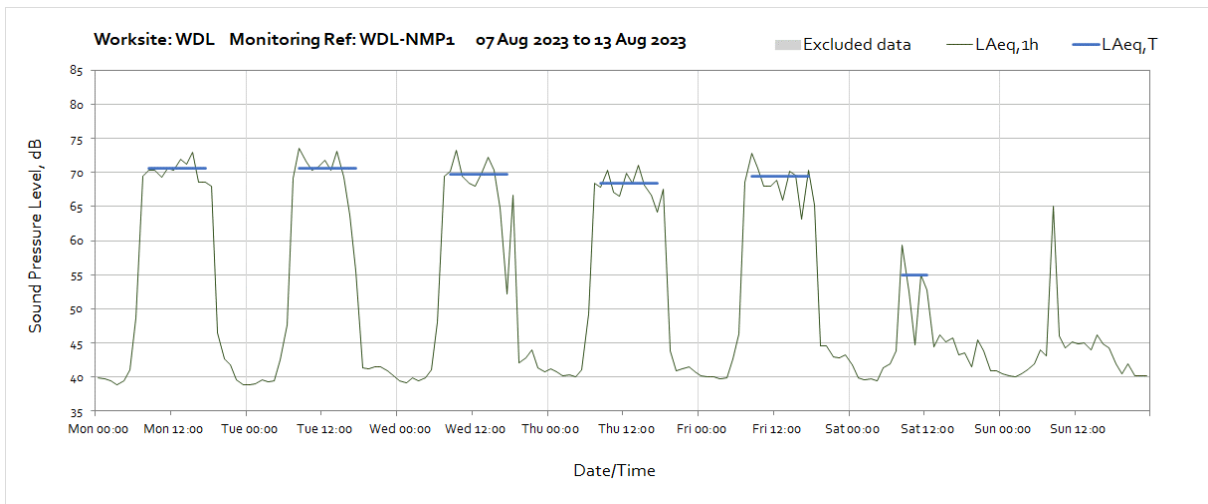
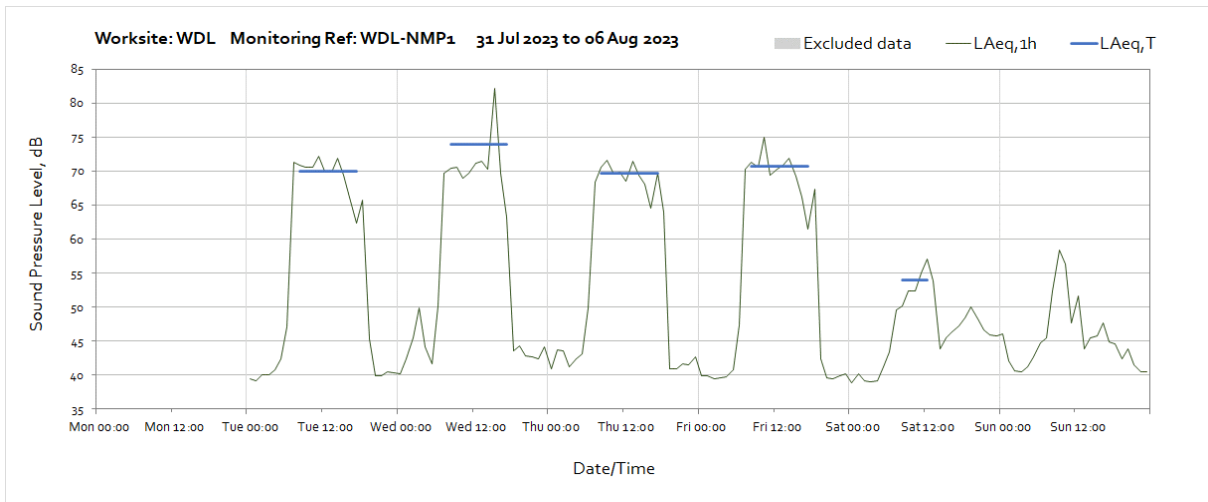
**Worksite: CAL – Monitoring Re: FCC-NMP1**

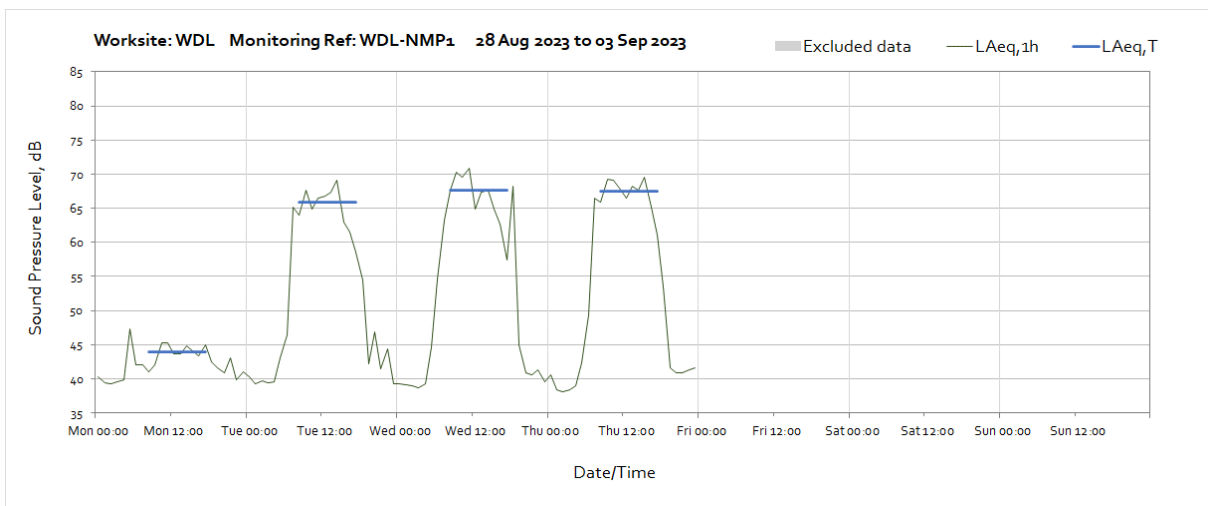
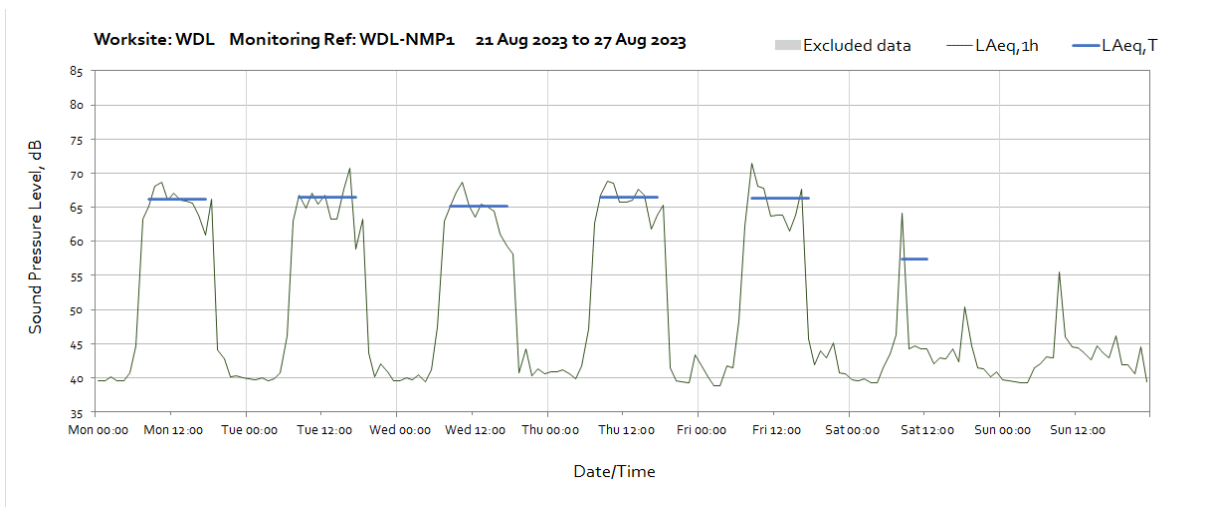
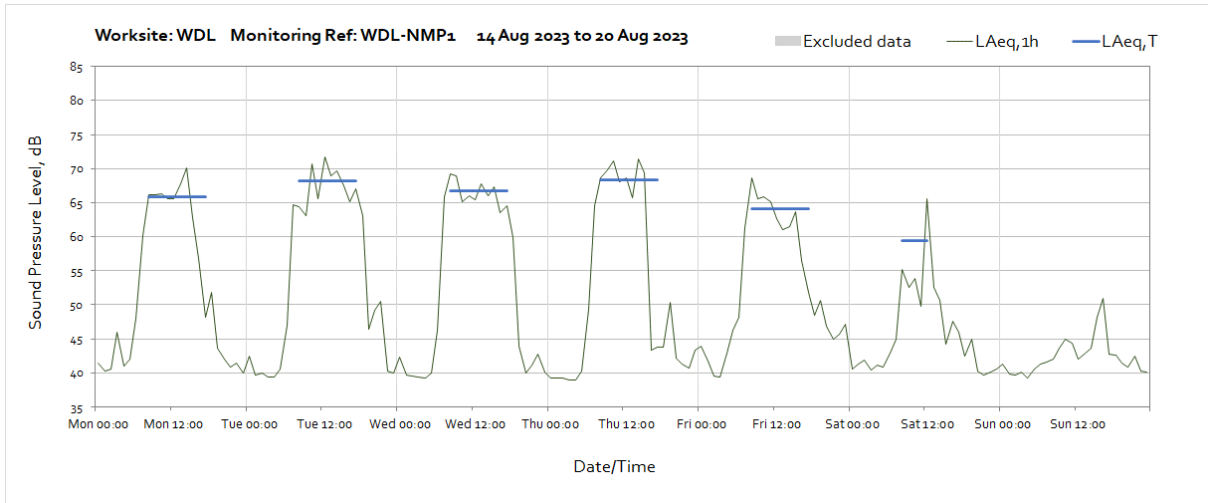




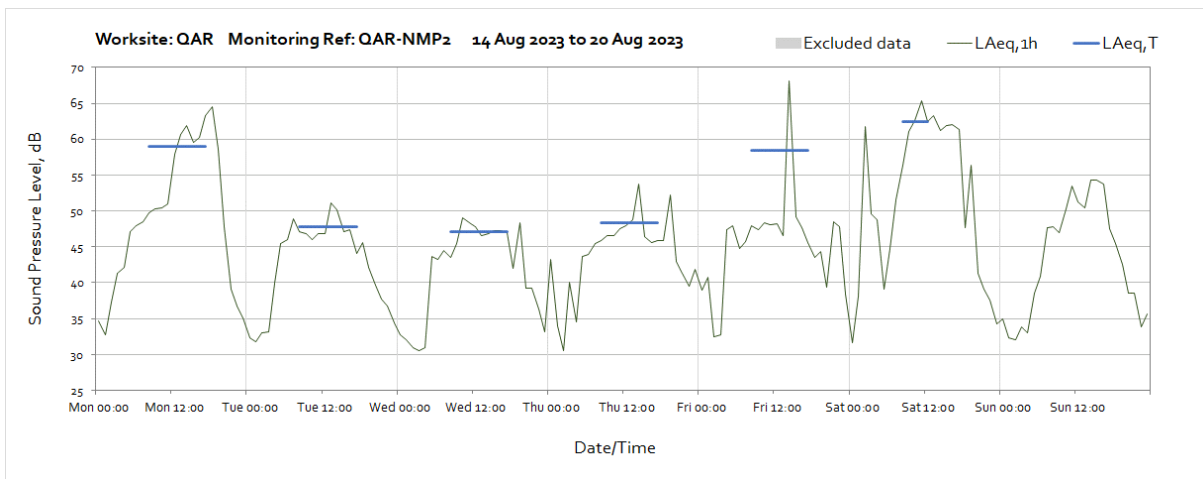
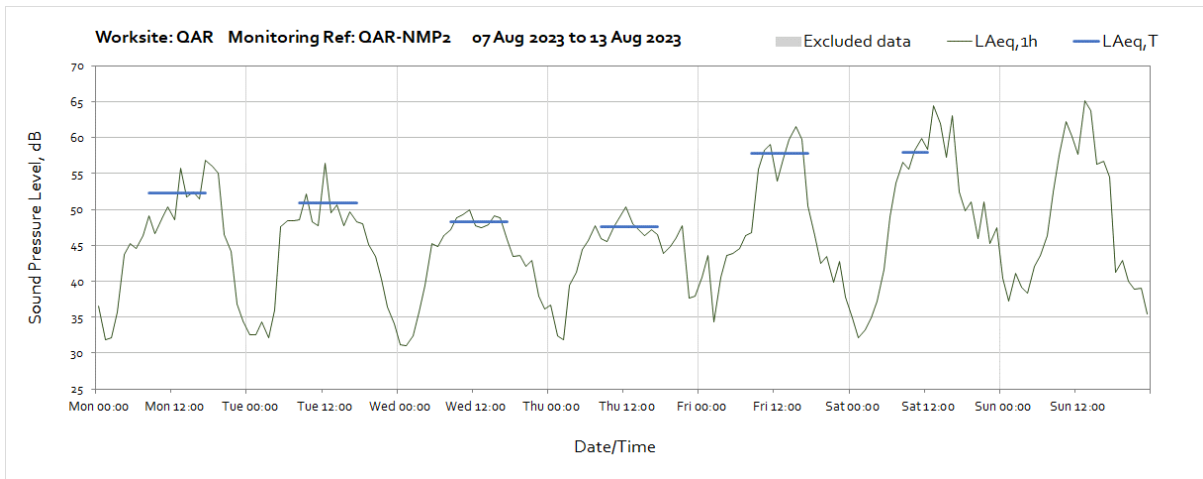
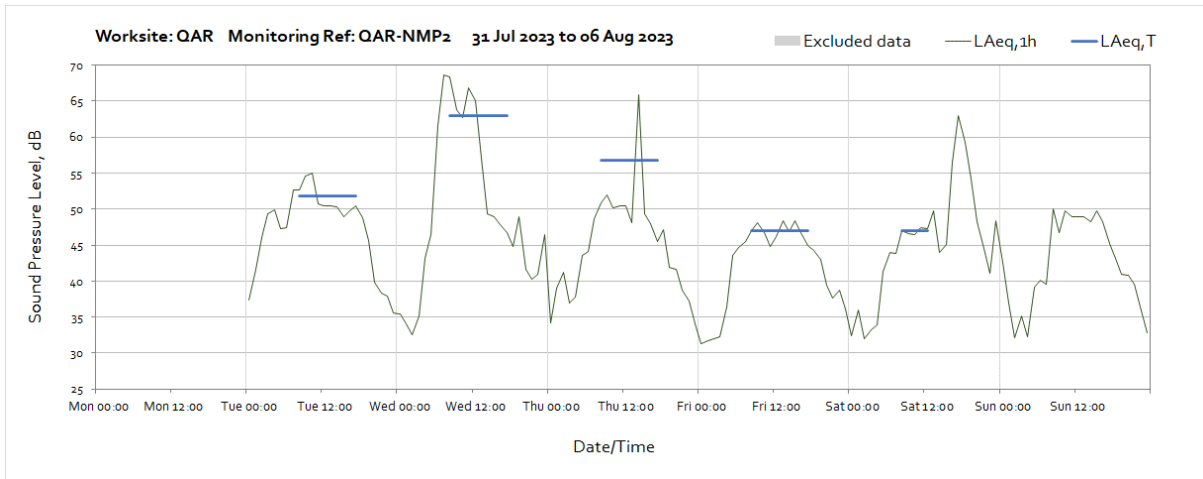


**Worksite: WDL - Monitoring Ref: WDL-NMP1**

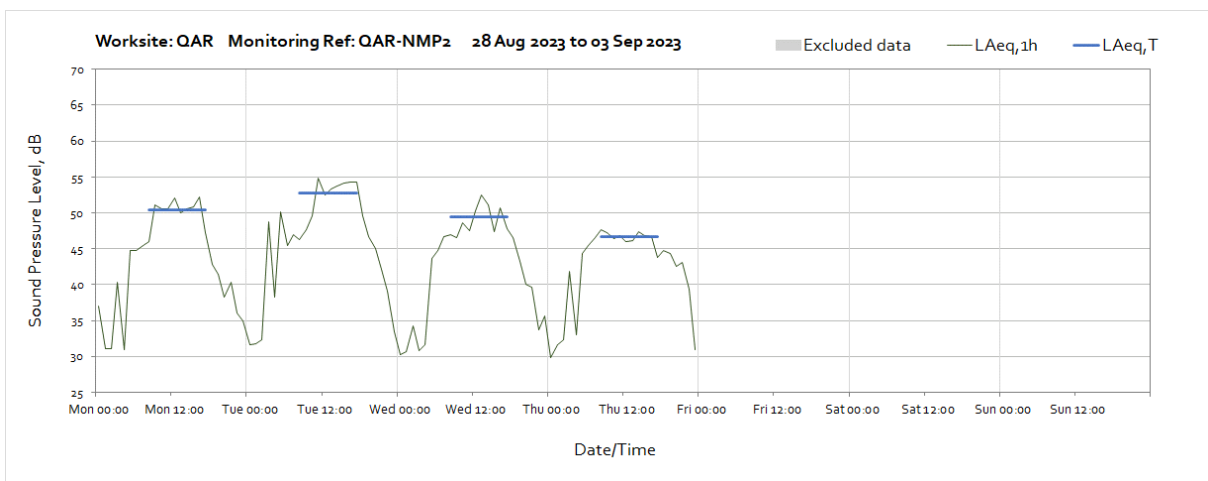
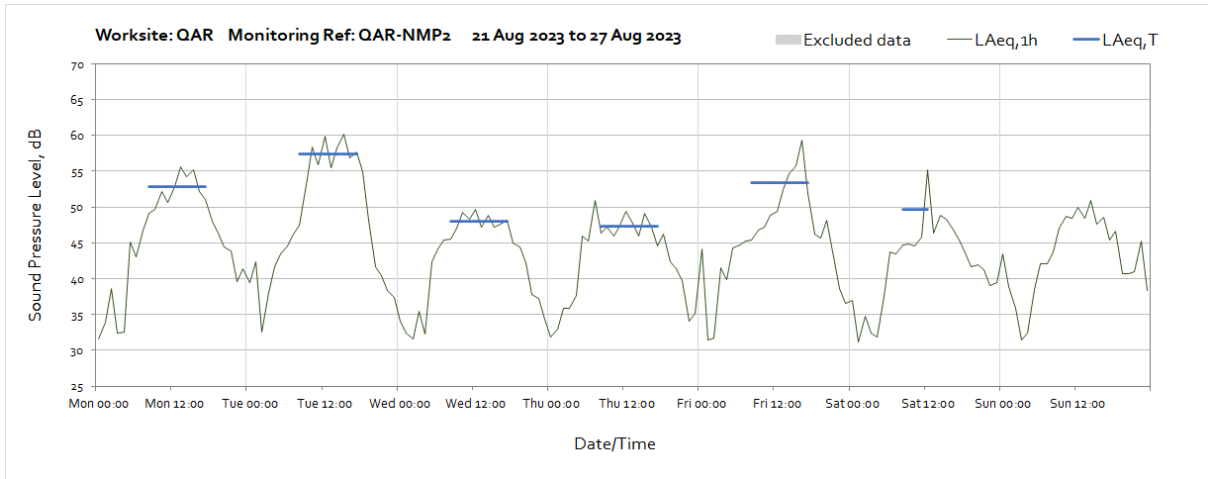




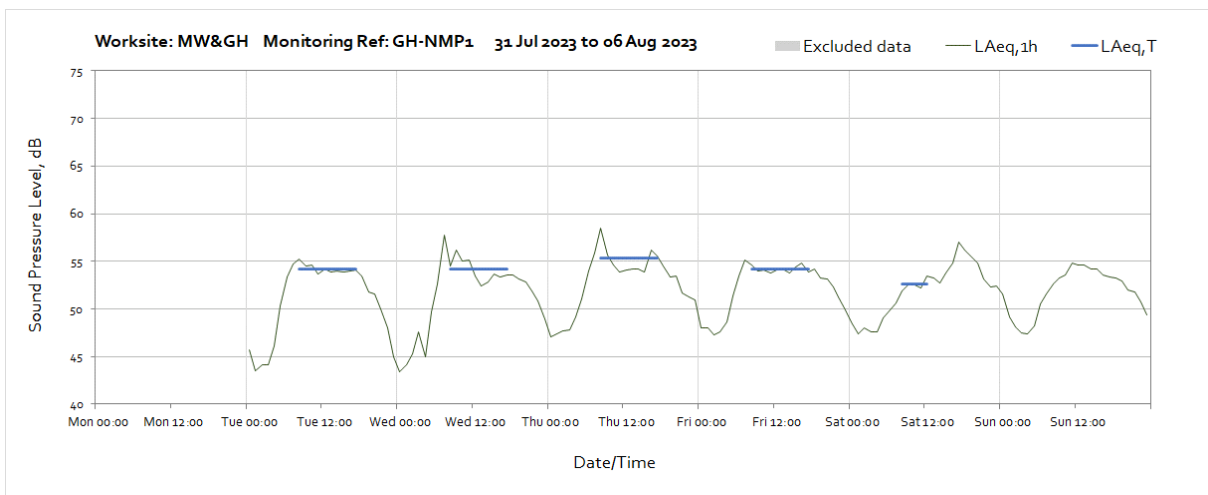
## Worksite: QAR – Monitoring Ref: QAR-NMP2

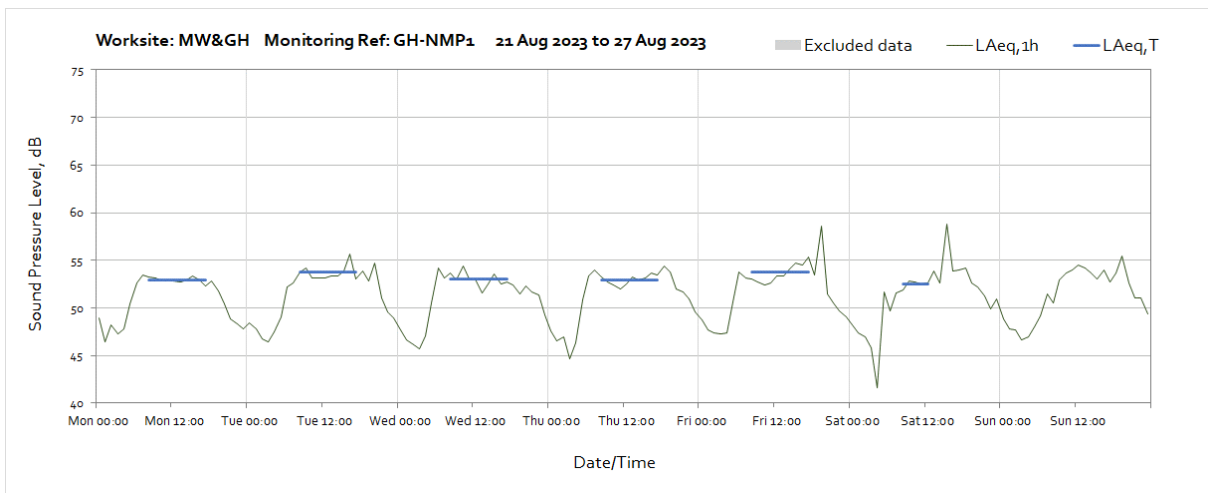
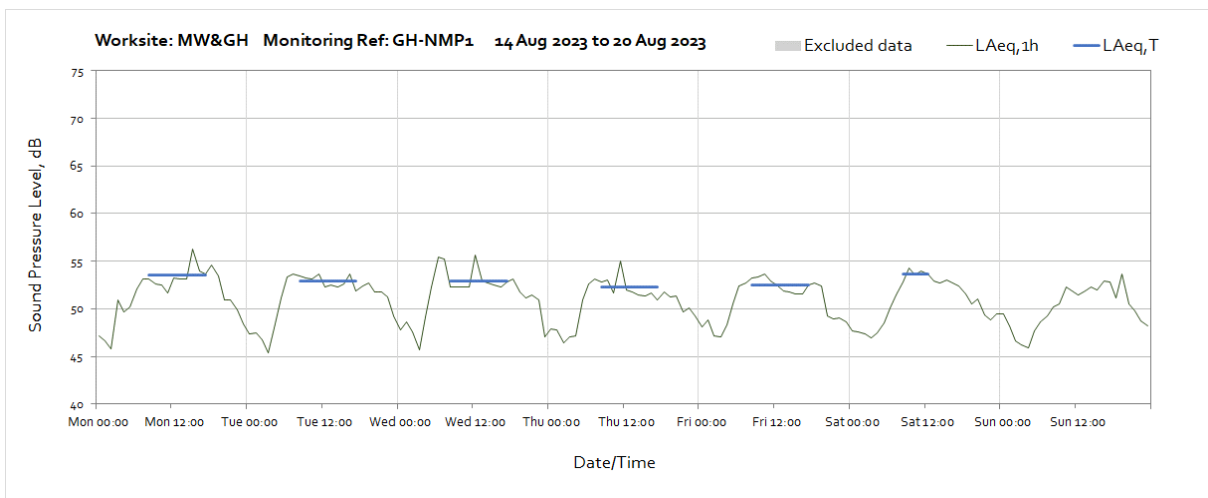
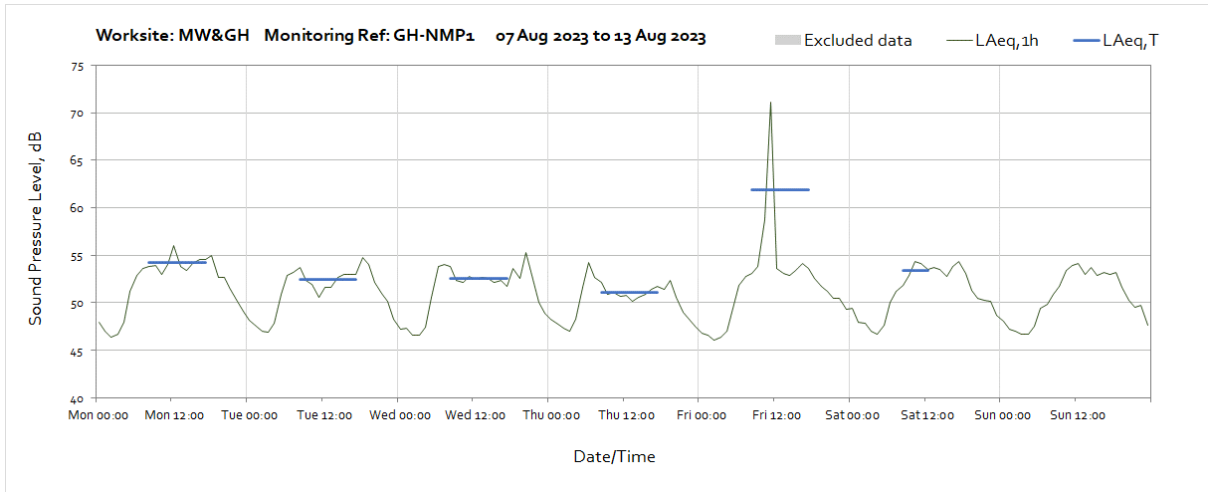


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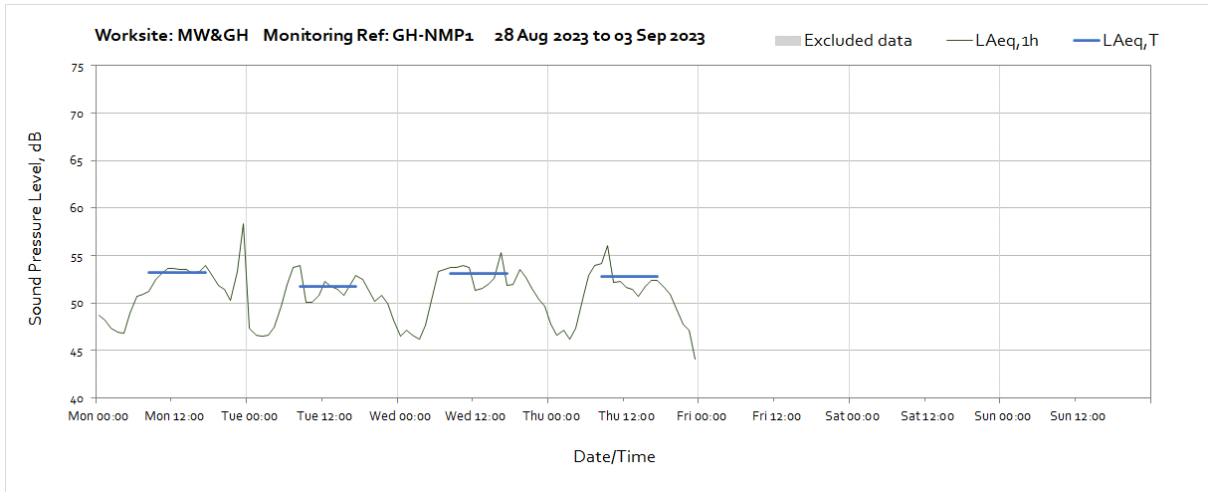


**Worksite: MW&GH – Monitoring Ref: GH-NMP1**

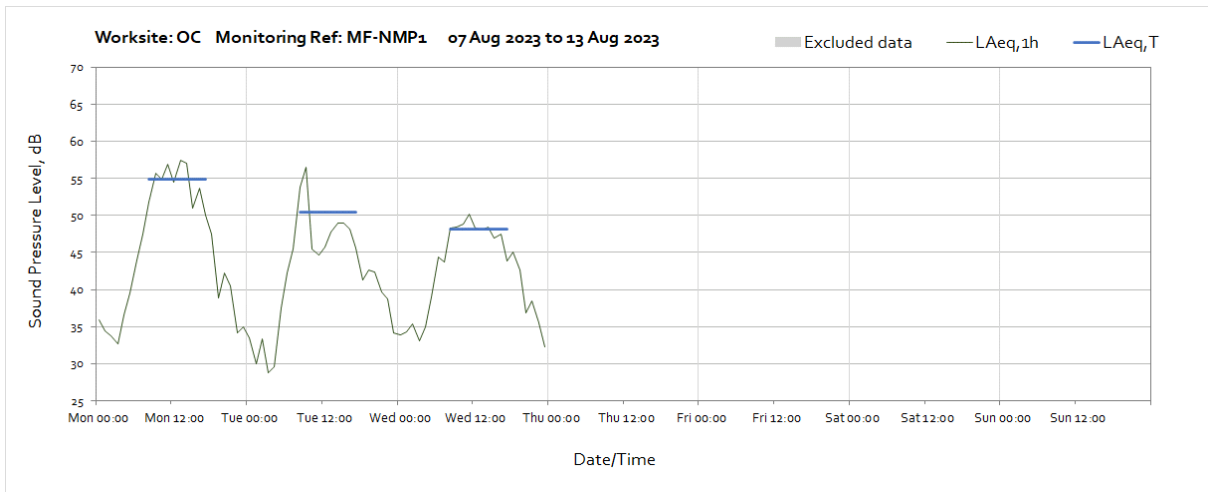
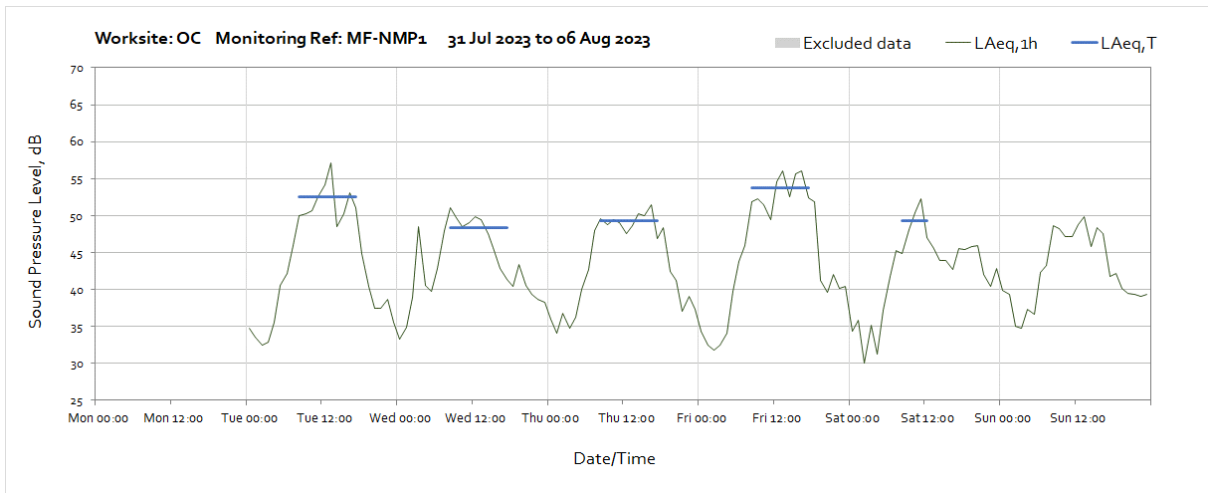






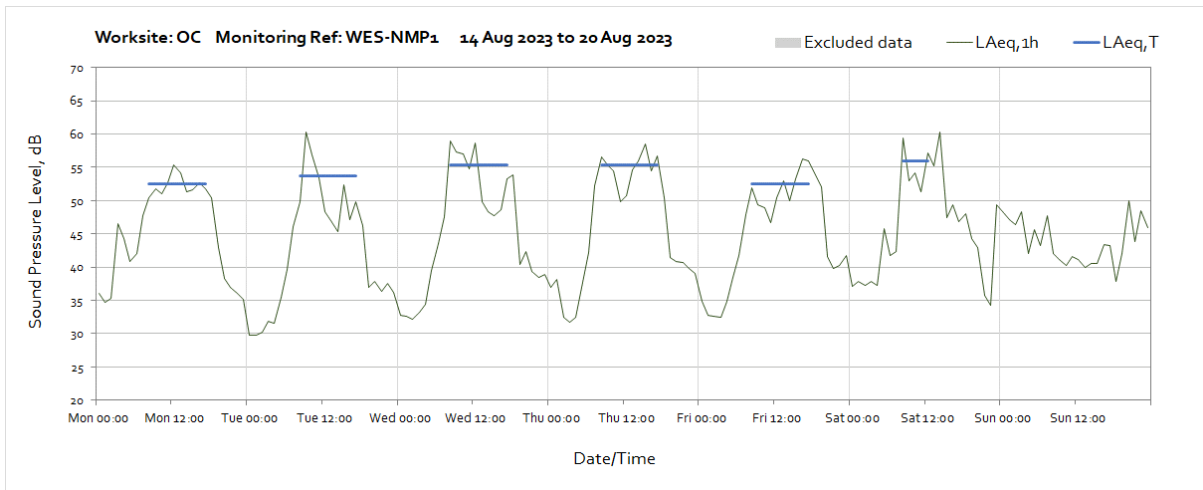
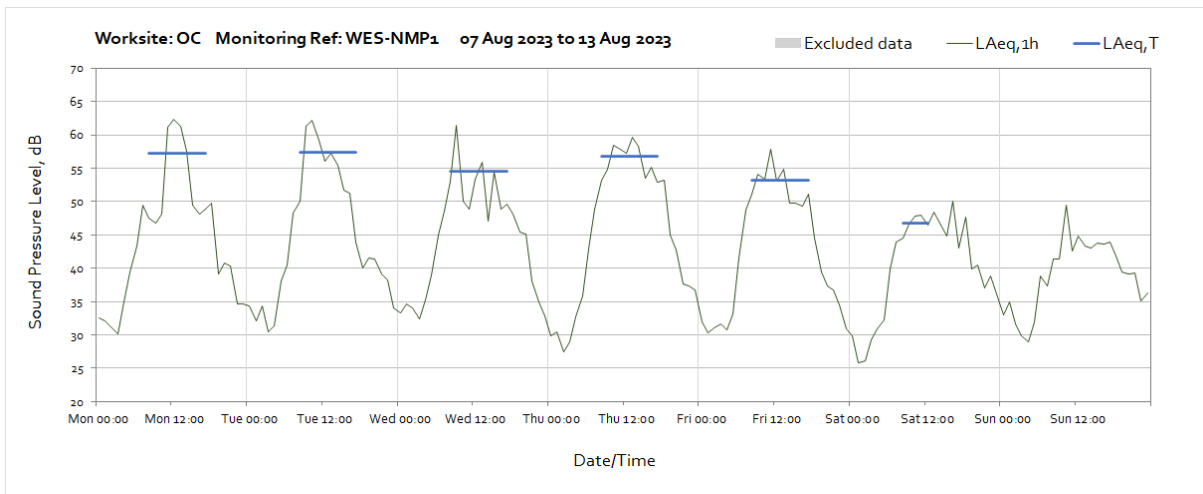
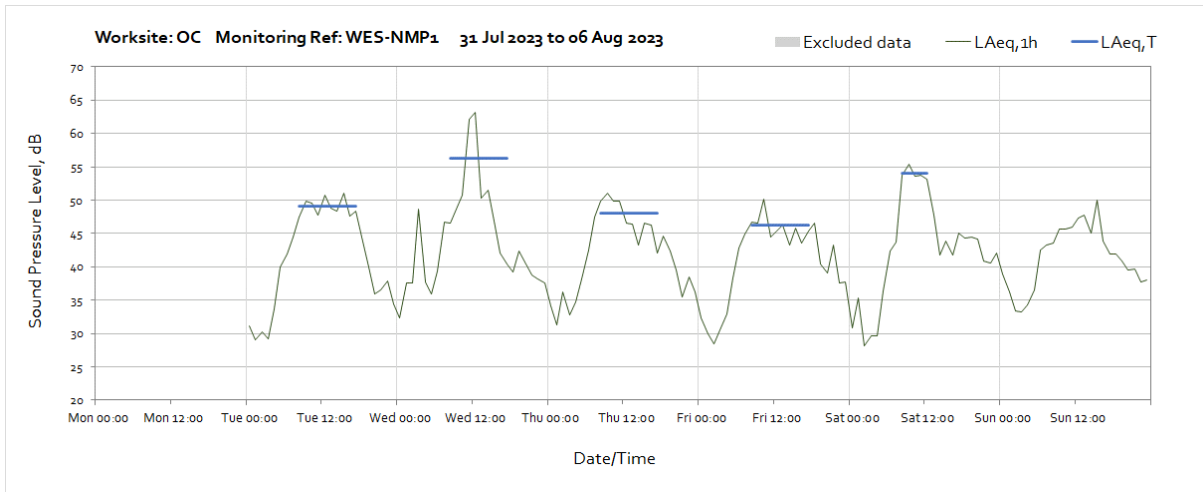


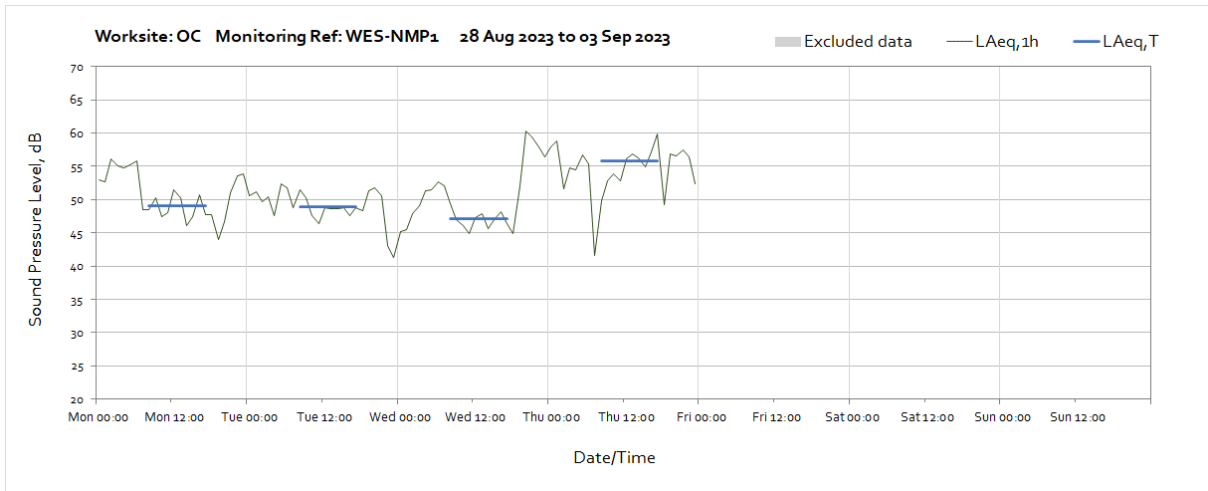
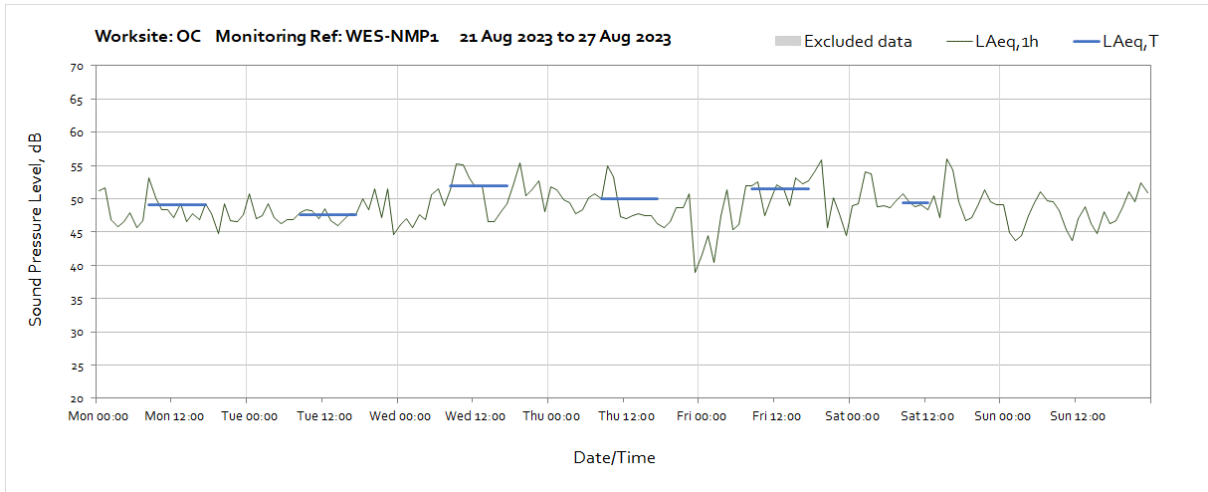
**Worksite: OC - Monitoring Ref: MF-NMP1**



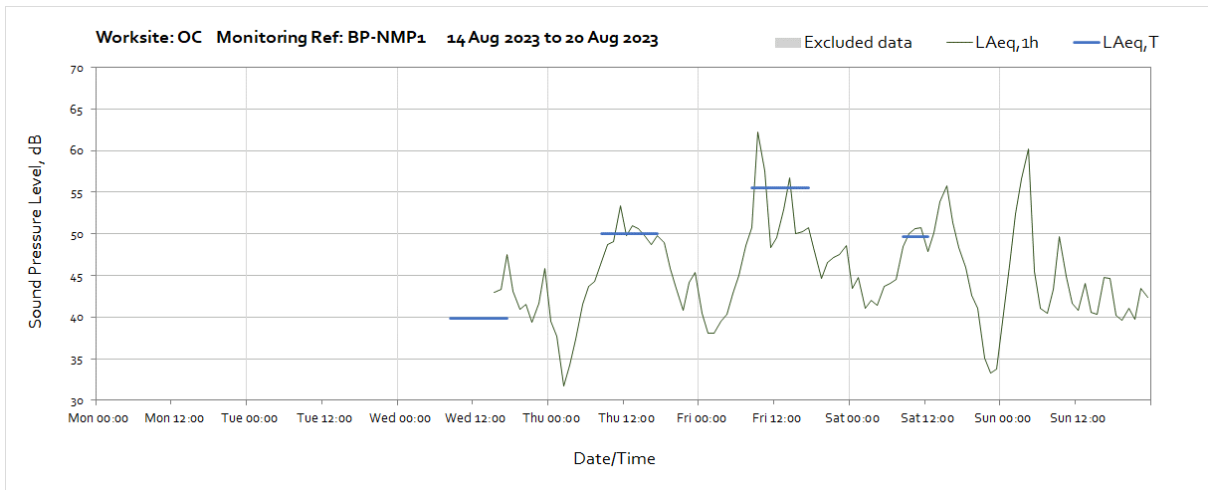
Note: Missing data from 00:00 on Thursday 10<sup>th</sup> August until month end was due to loss of battery power due to a fault with the solar charge controller. A new solar controller is being deployed shortly.

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

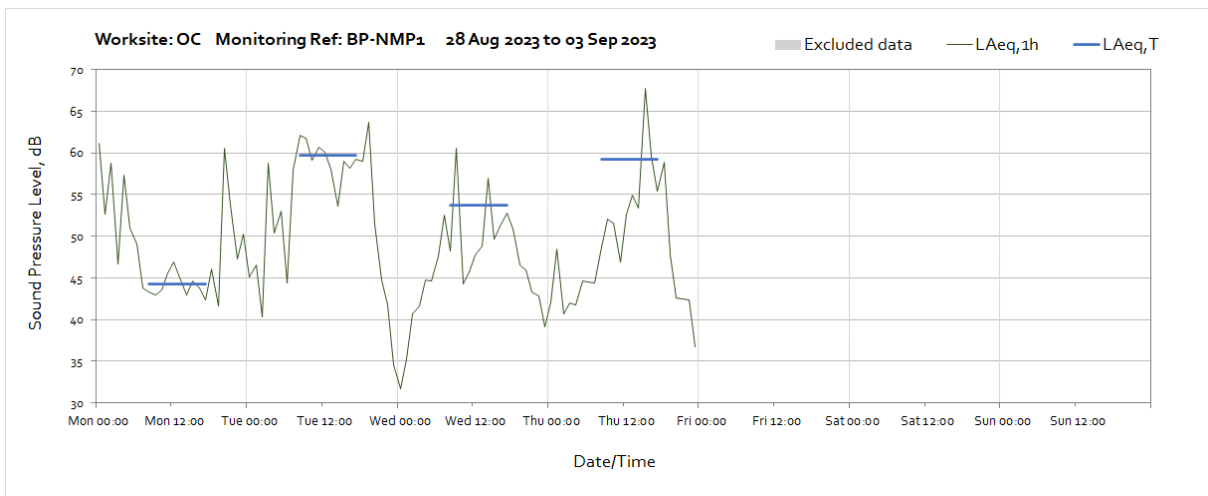
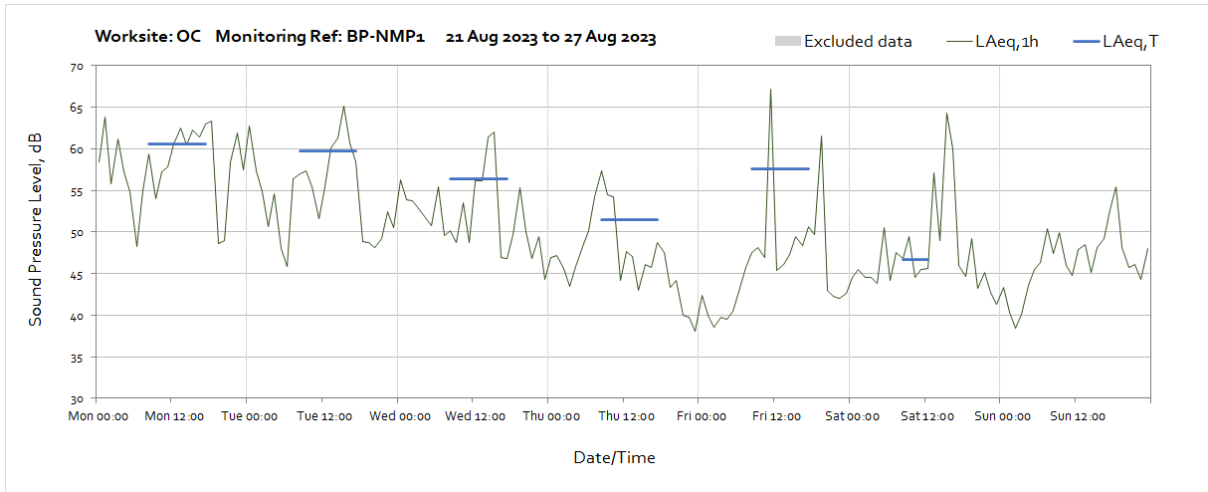




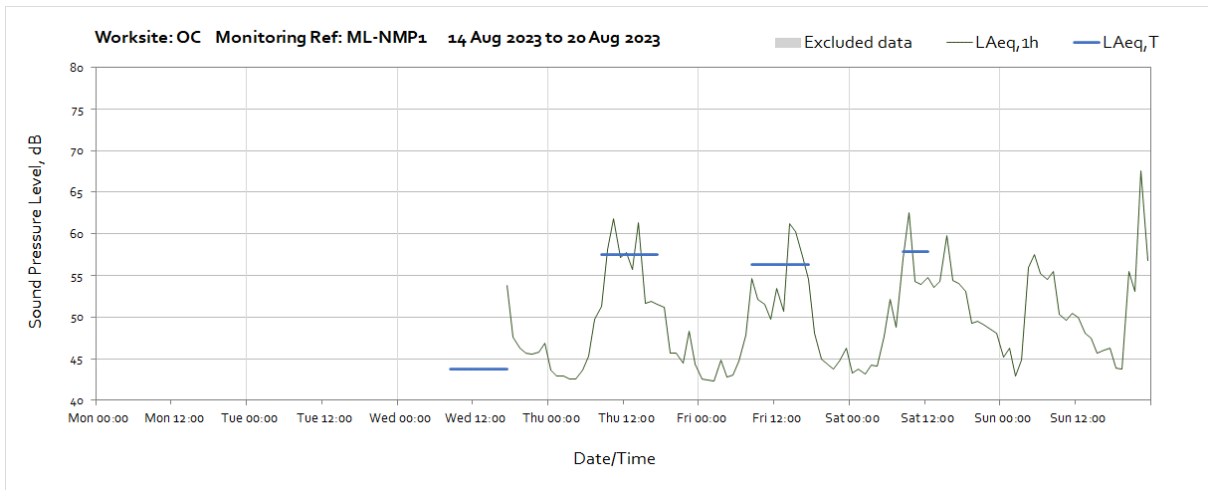
**Worksite: OC - Monitoring Ref: BP-NMP1**



Note: Monitor was installed at 15:00 on Wednesday 16<sup>th</sup> August.

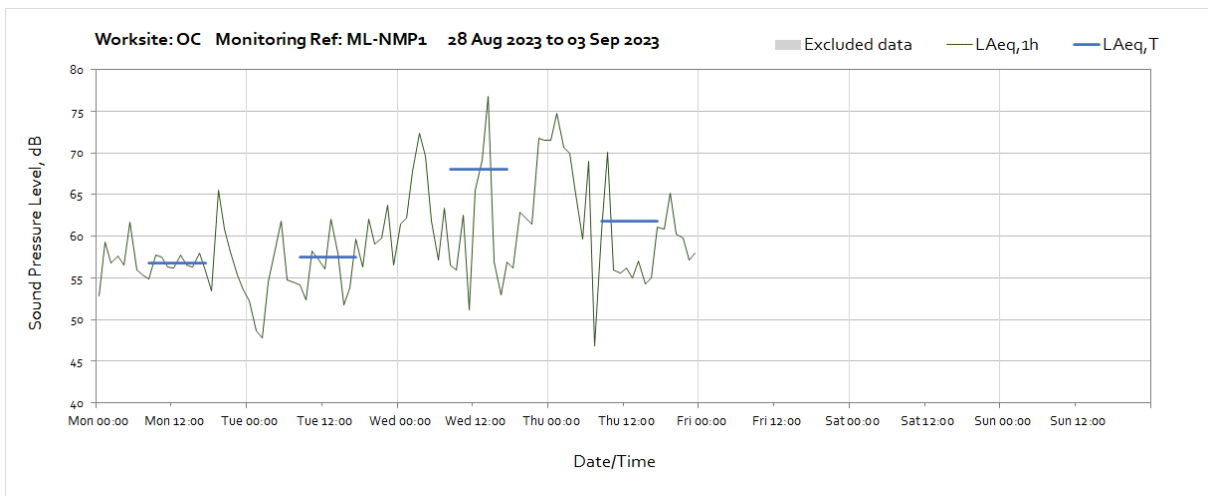
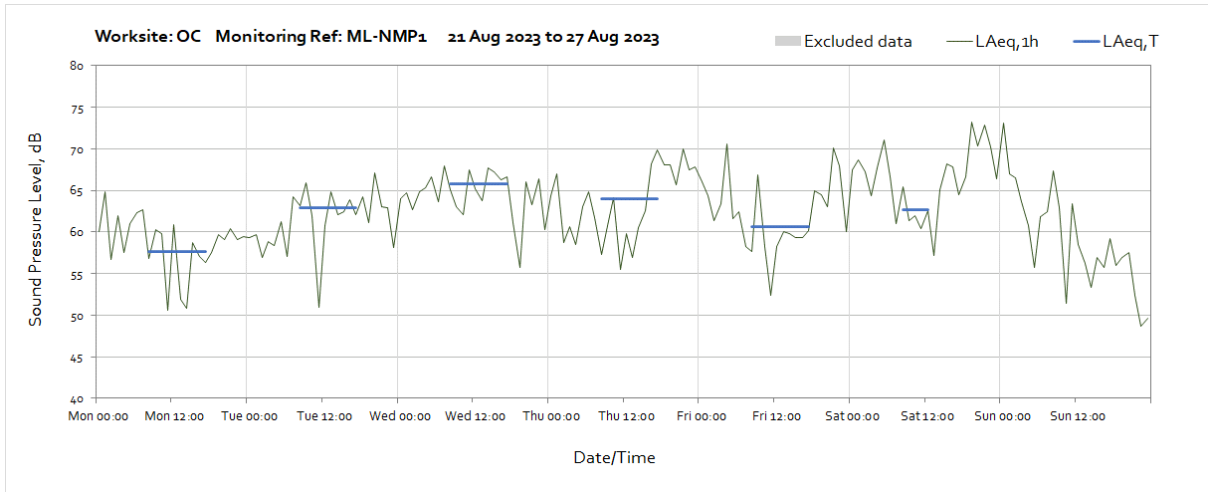


**Worksite: OC - Monitoring Ref: ML-NMP1**

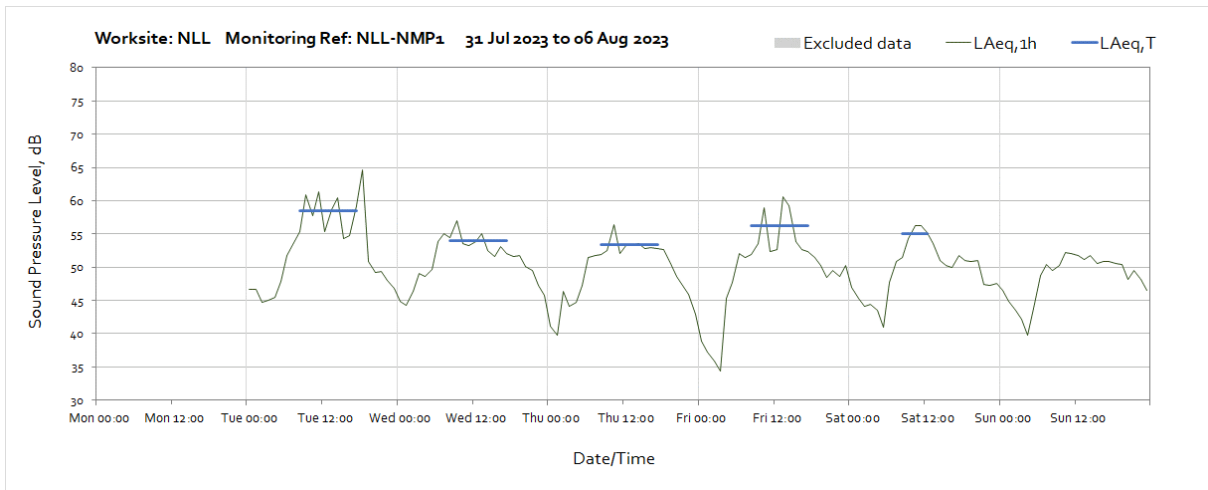


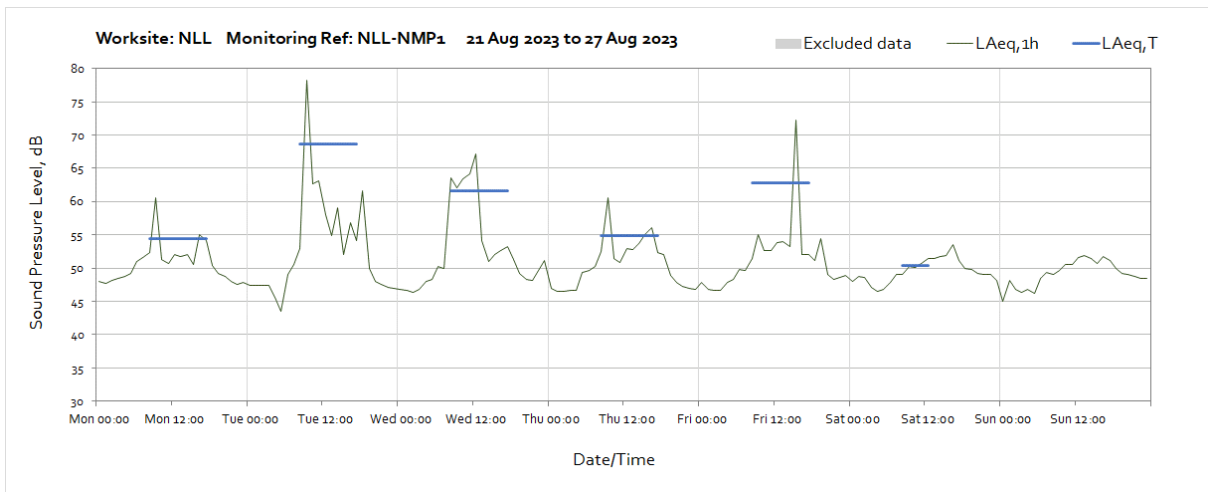
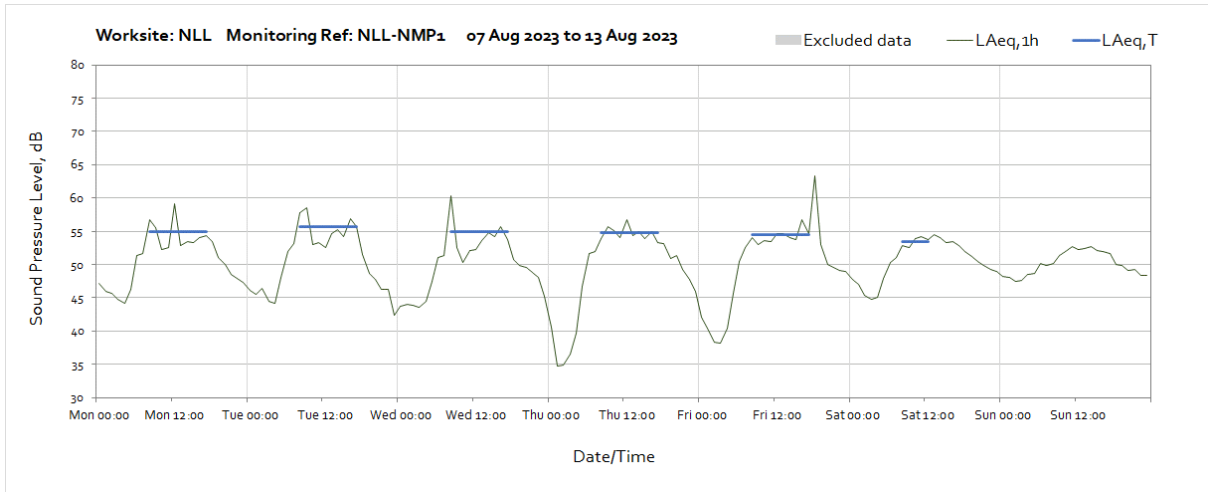
Note: Monitor was installed at 17:00 on Wednesday 16<sup>th</sup> August.

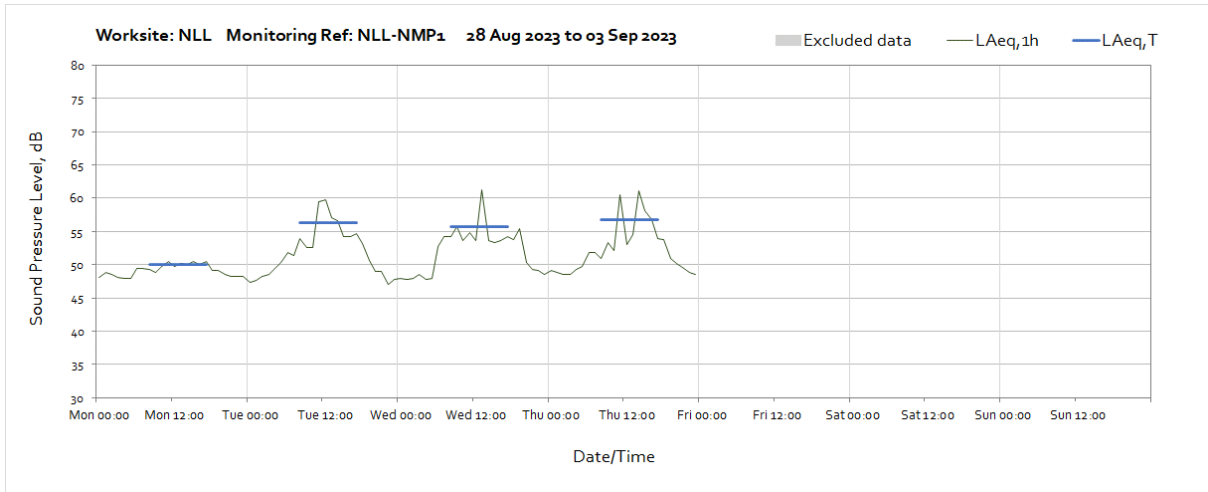
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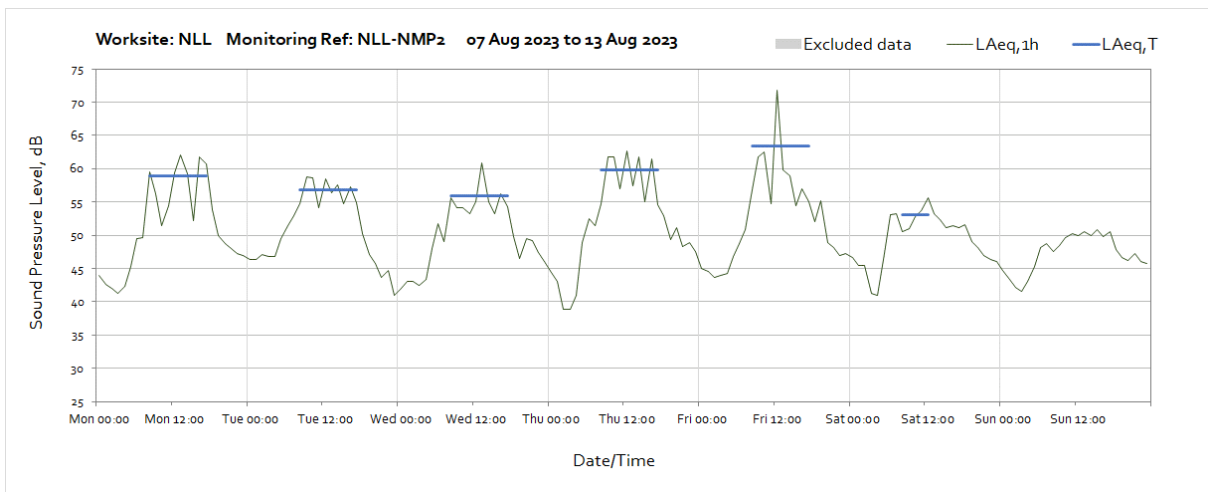
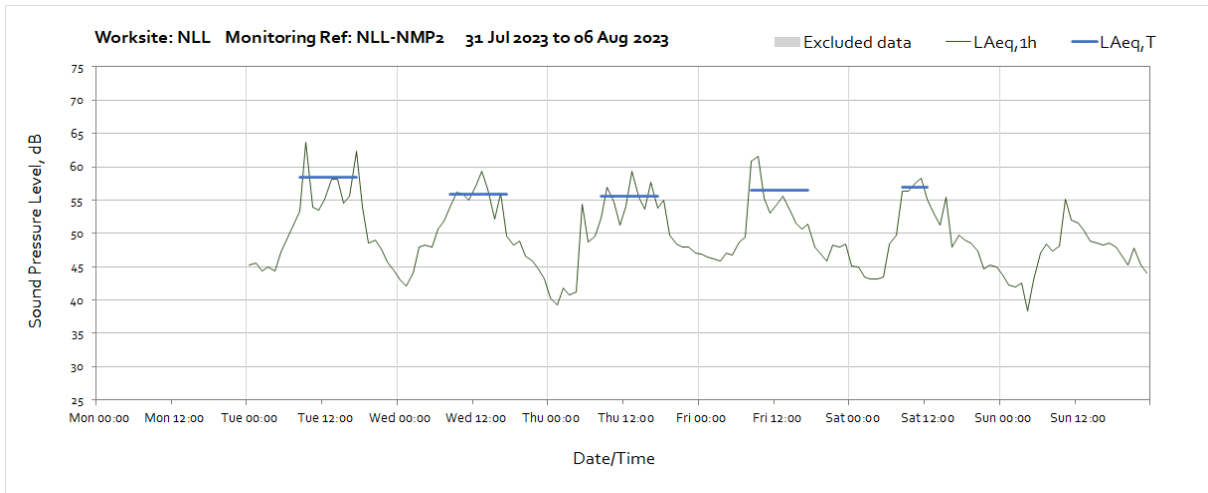
**Worksite: NLL - Monitoring Ref: NLL-NMP1**



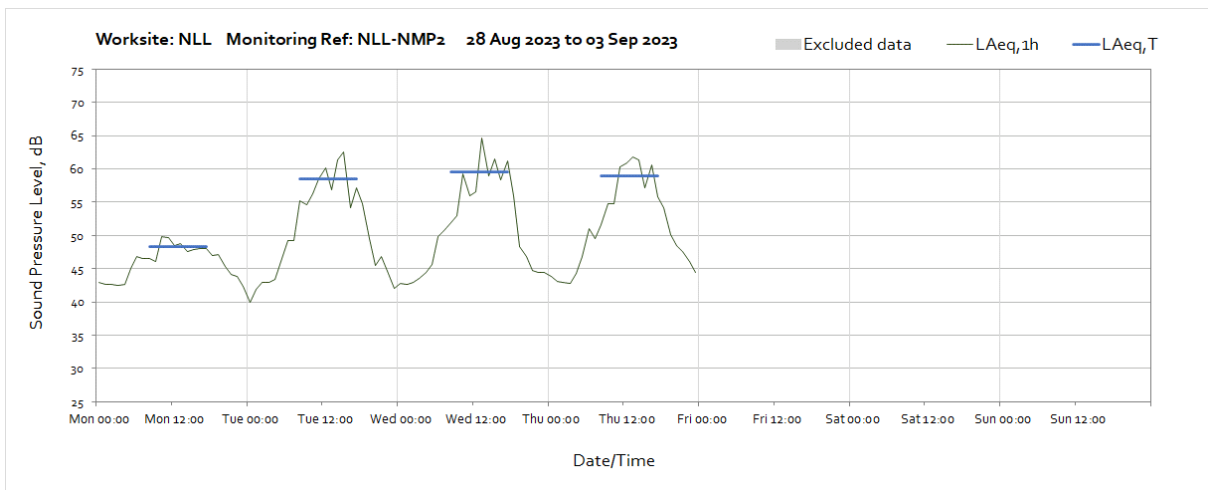
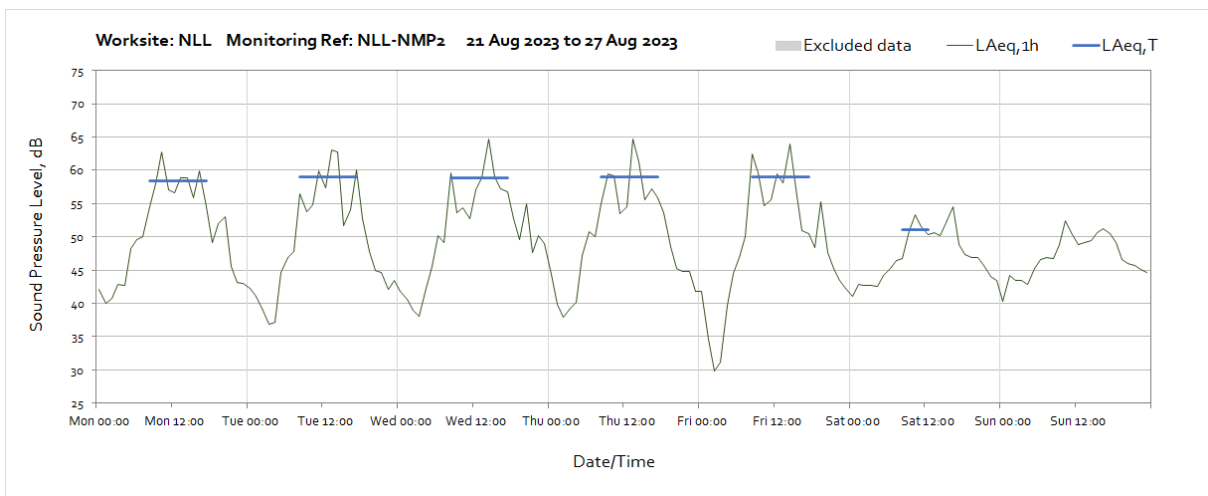
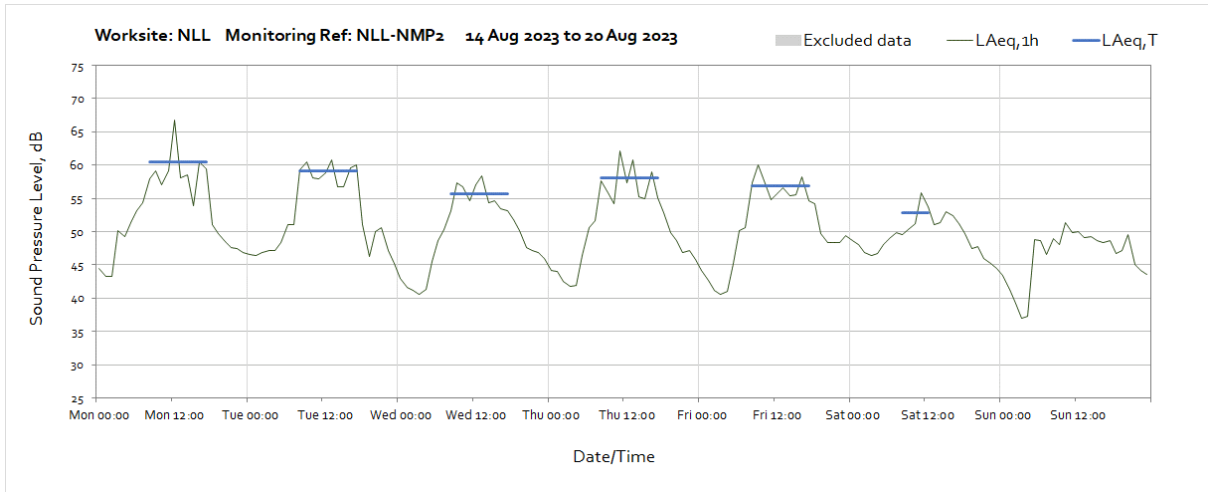




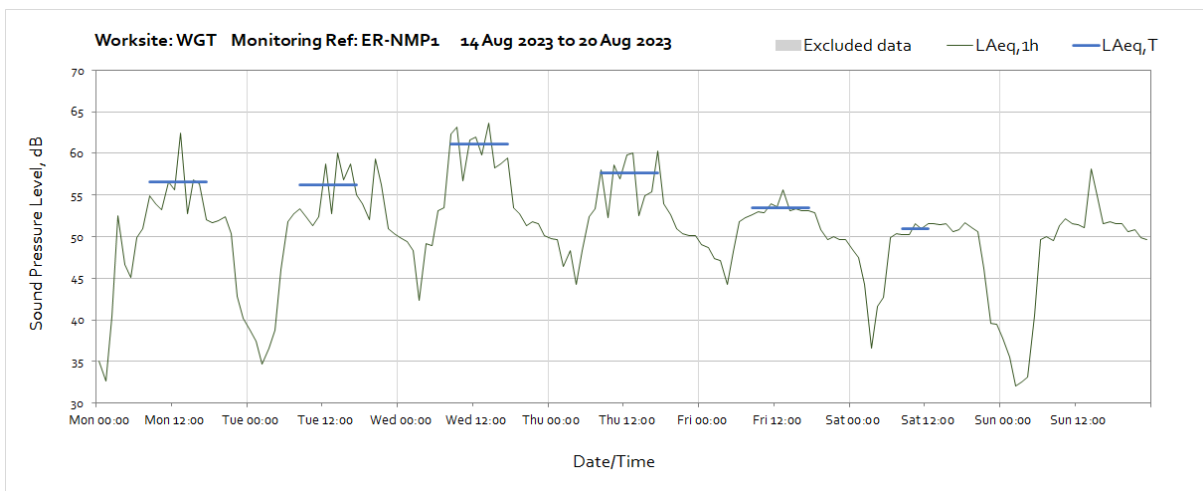
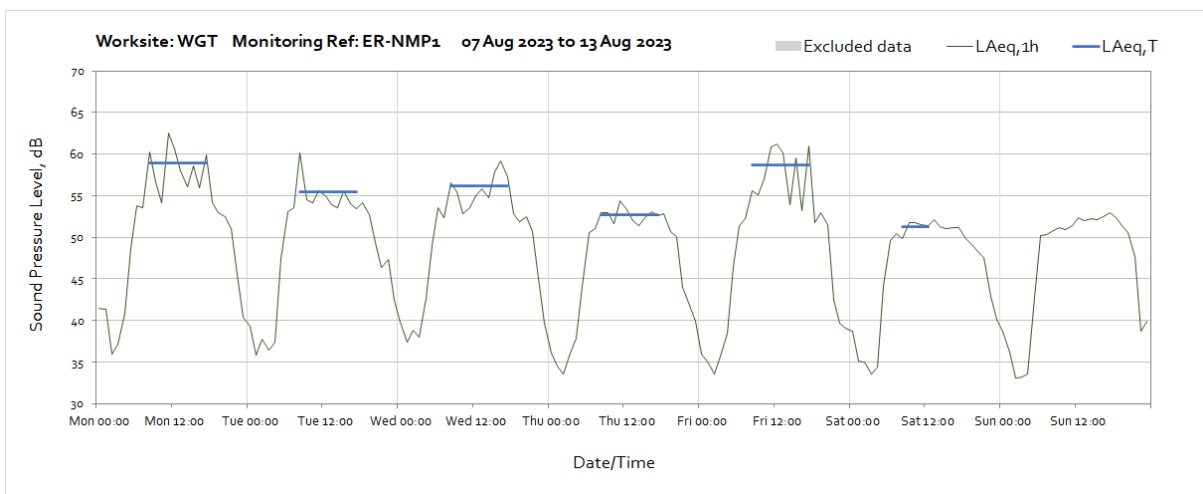
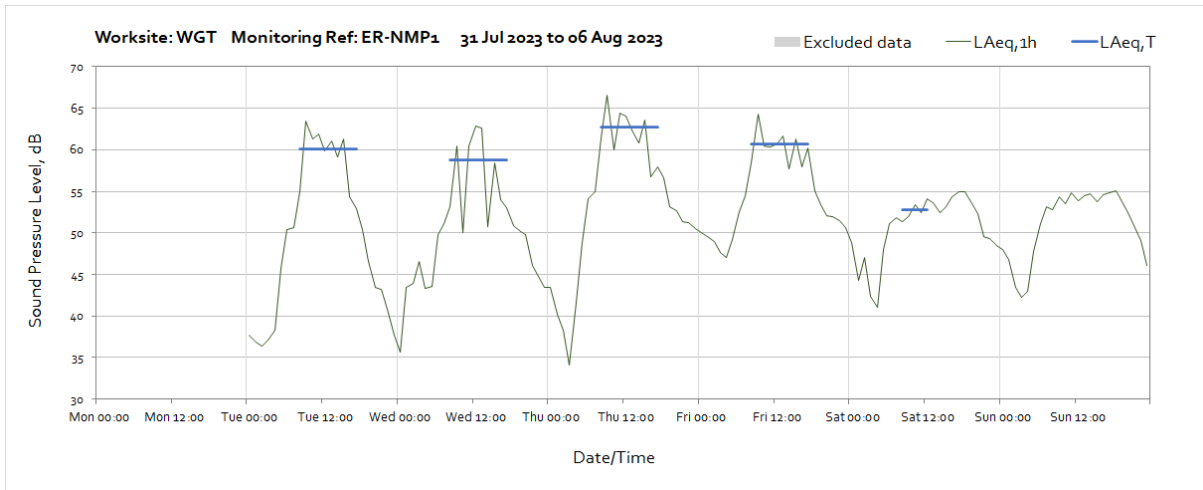
### Worksite: NLL - Monitoring Ref: NLL-NMP2

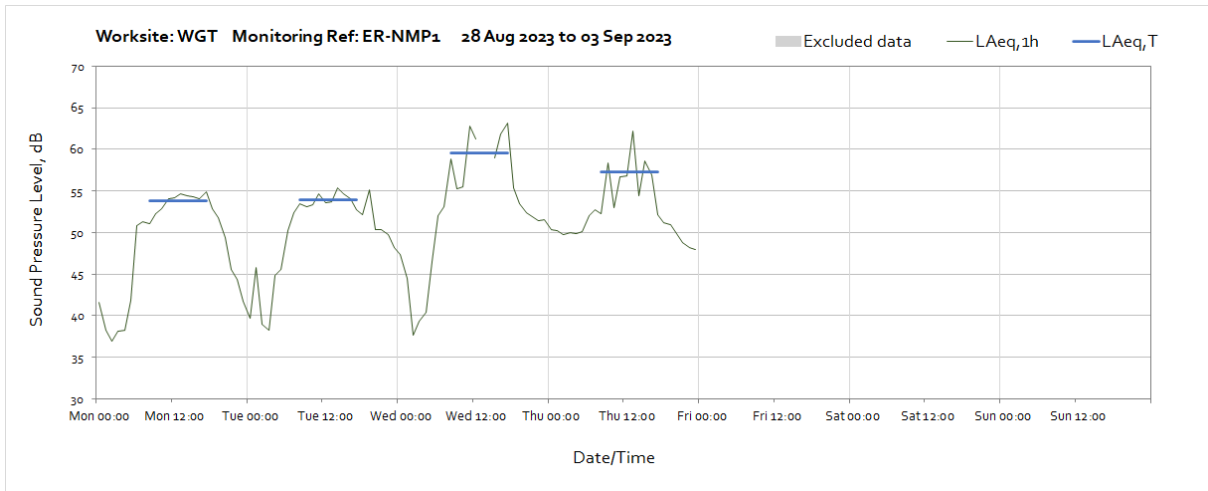
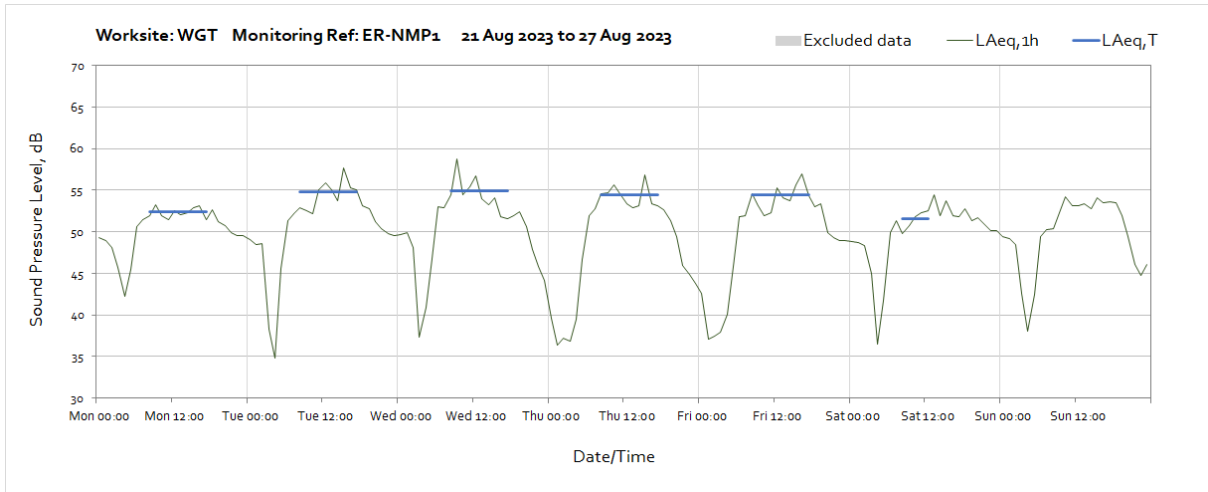






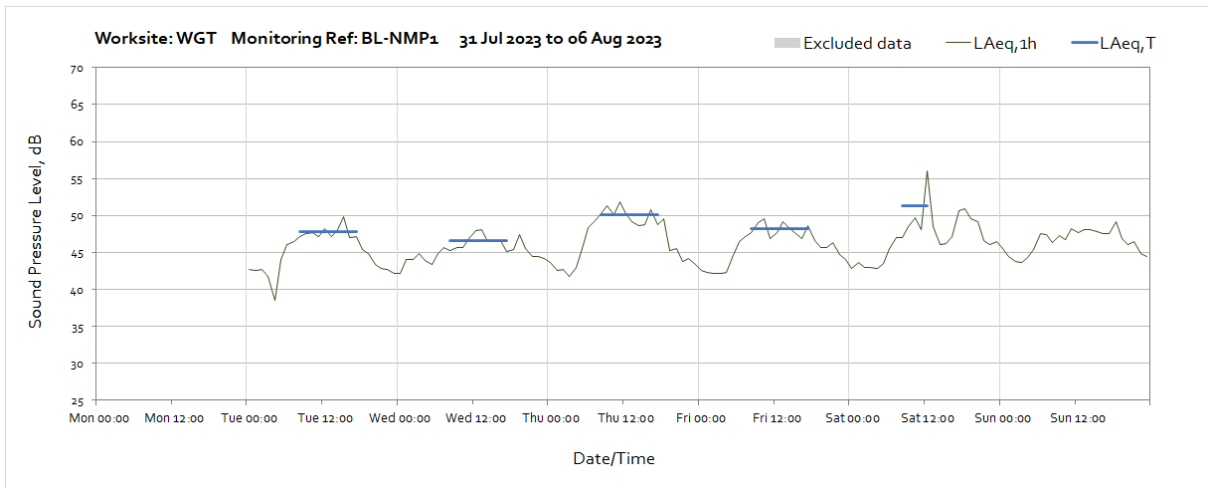
## Worksite: WGT – Monitoring Ref: ER-NMP1

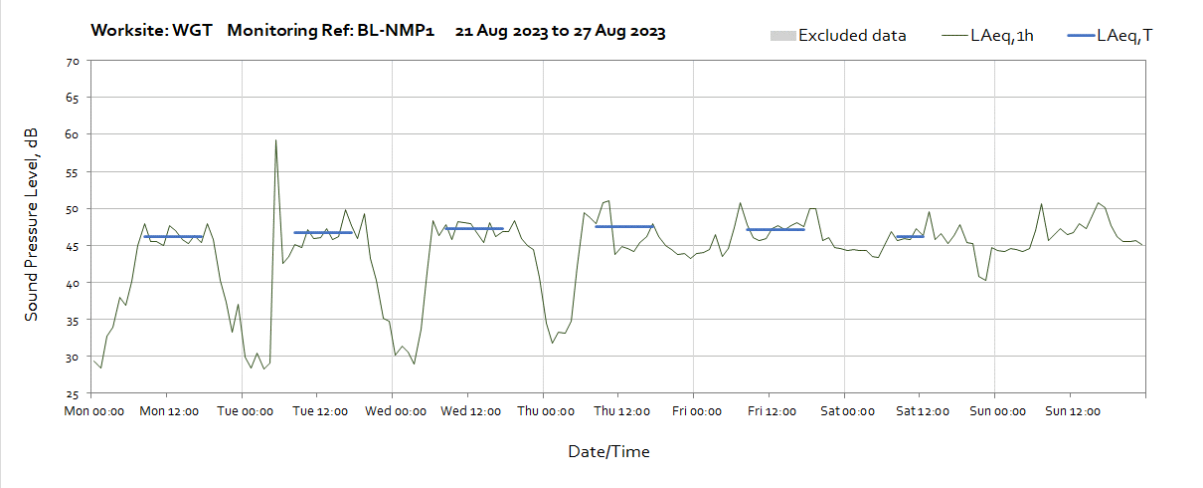
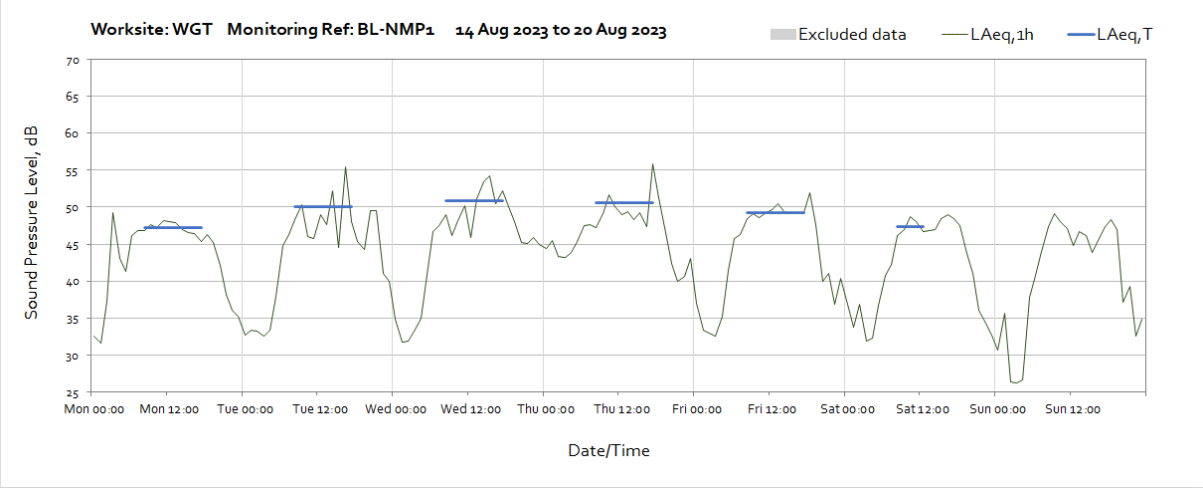
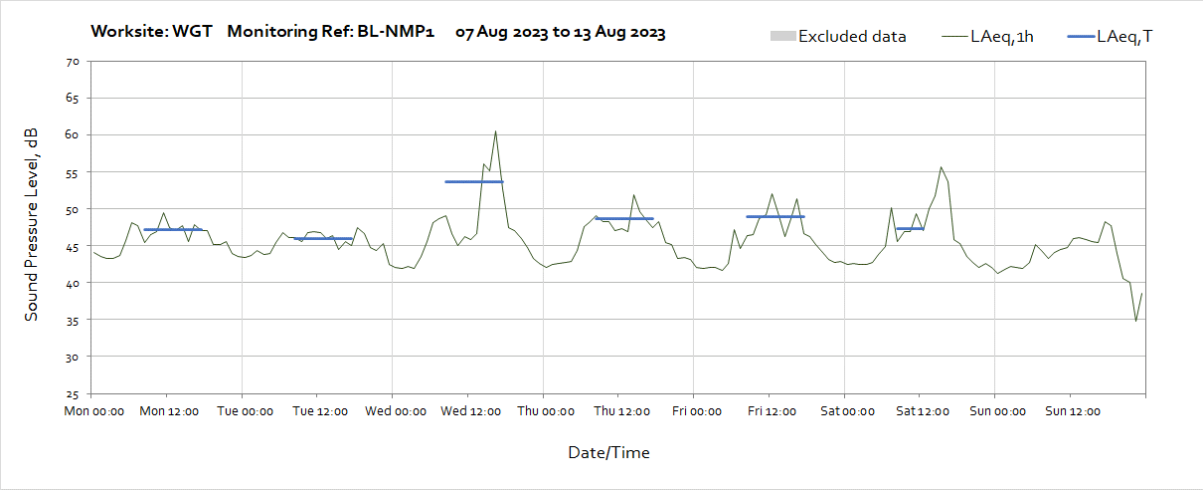


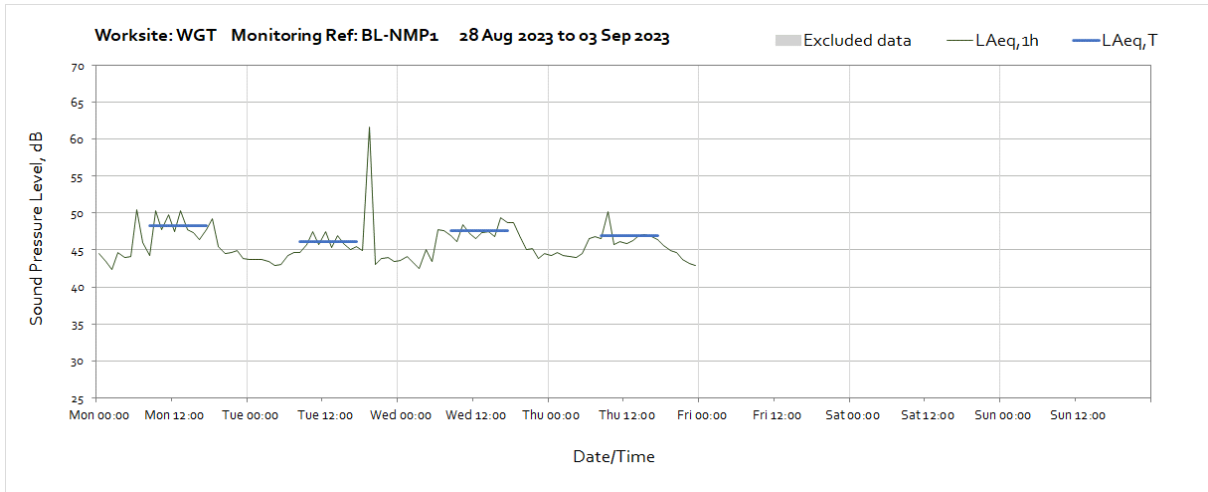


Note: Missing data between 13:00 and 14:00 on Wednesday 30<sup>th</sup> August was due to monitor maintenance.

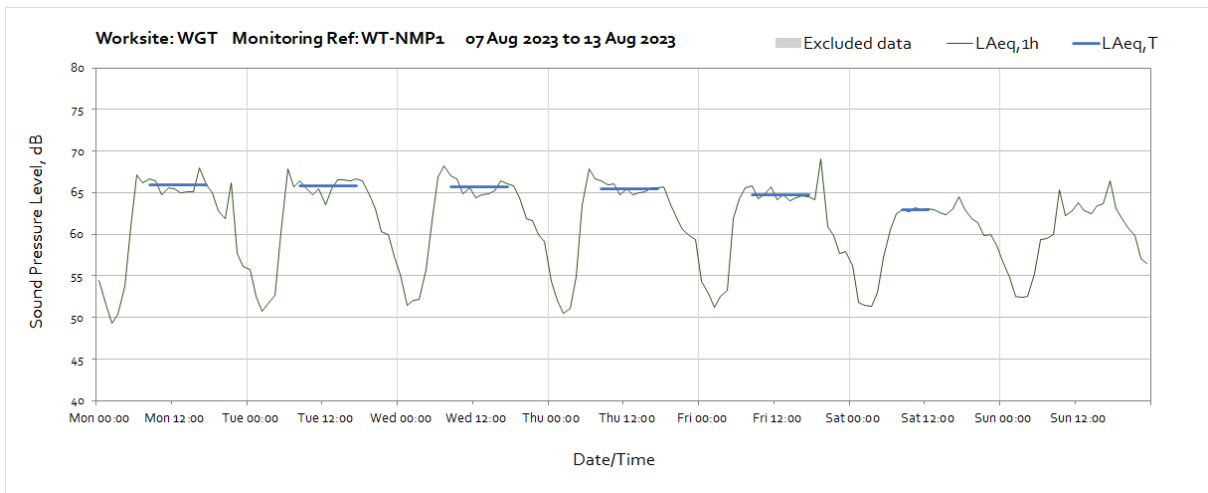
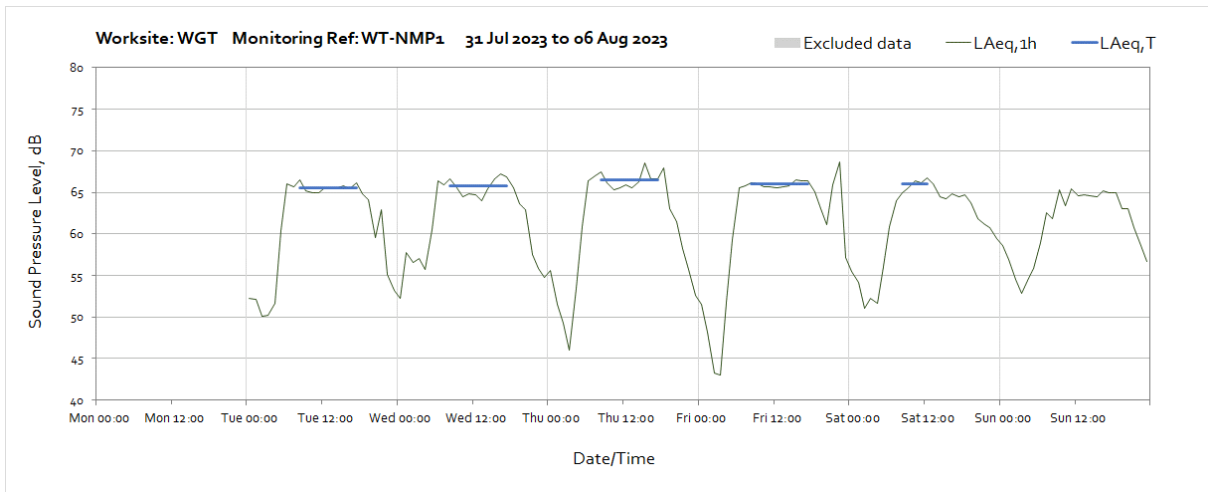
### Worksite: WGT - Monitoring Ref: BL-NMP1

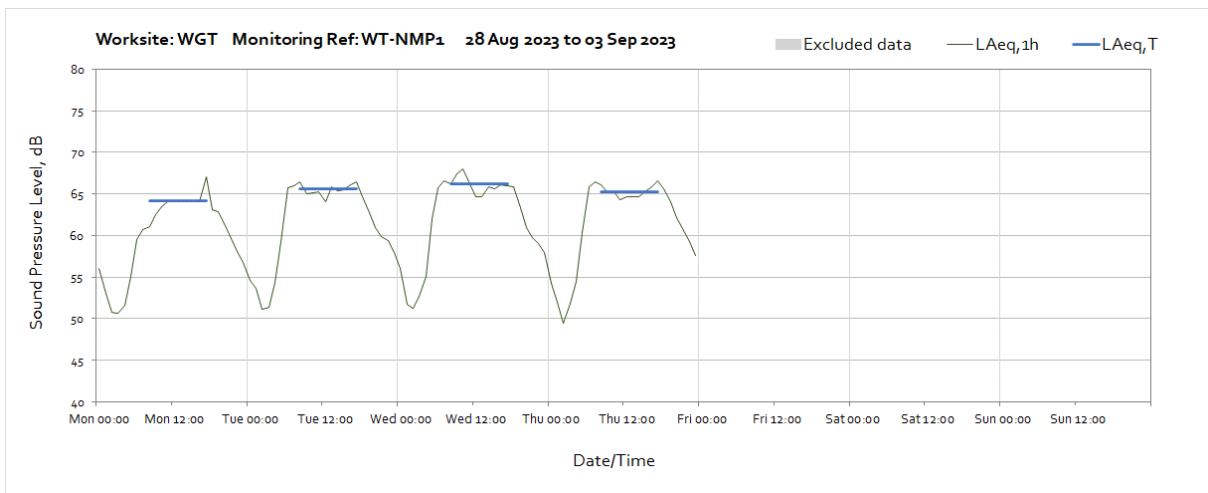
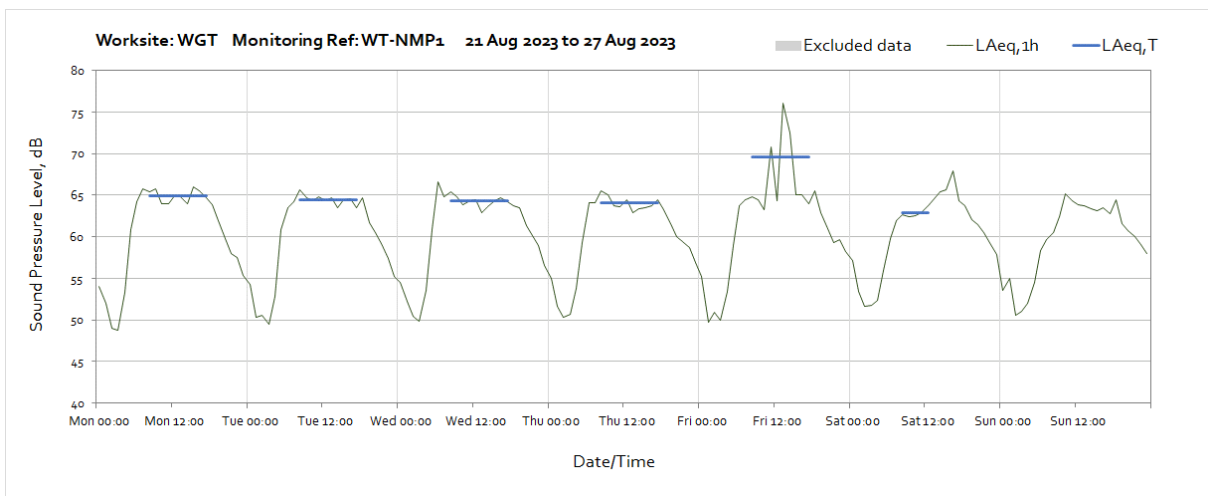
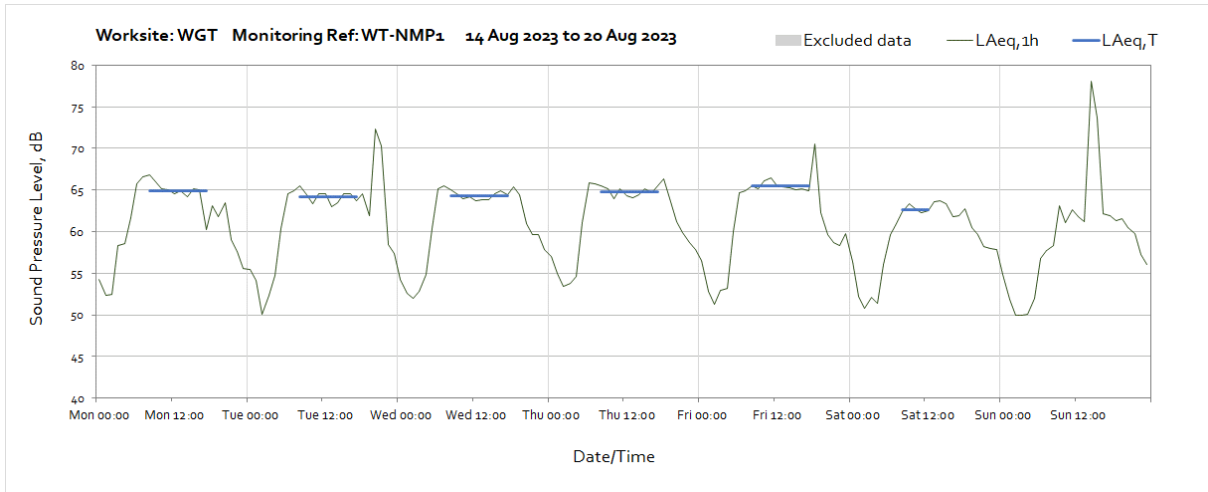




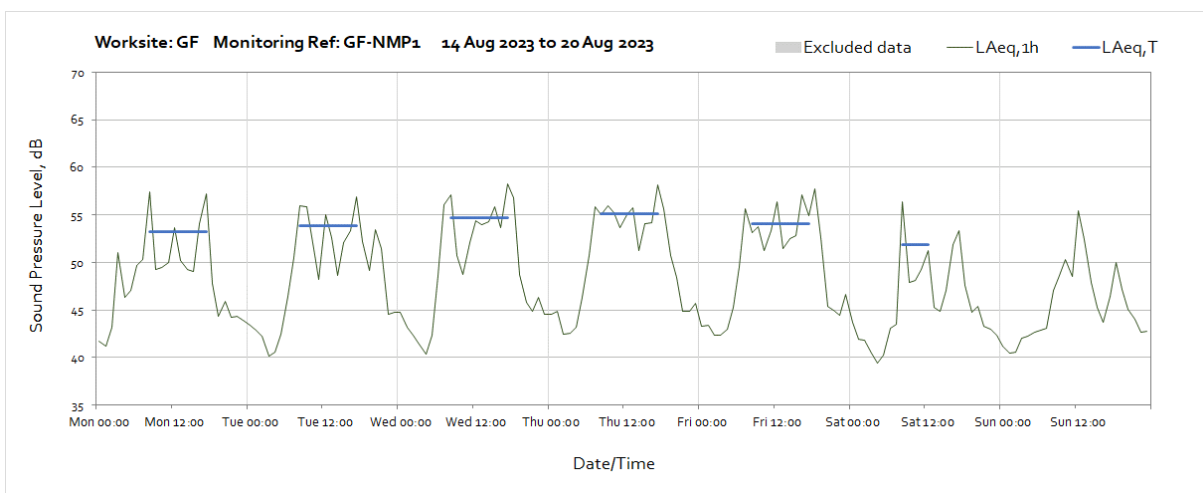
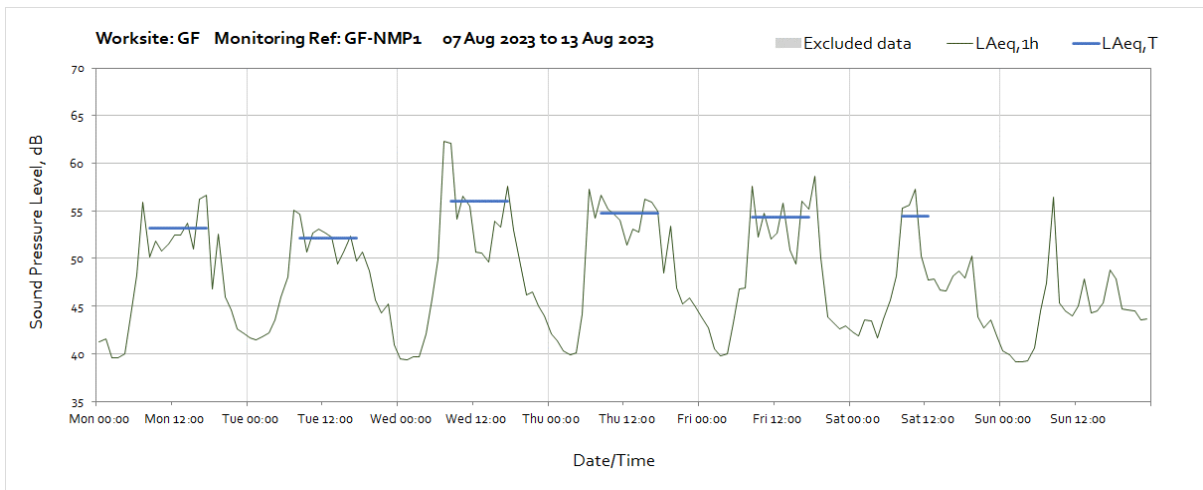
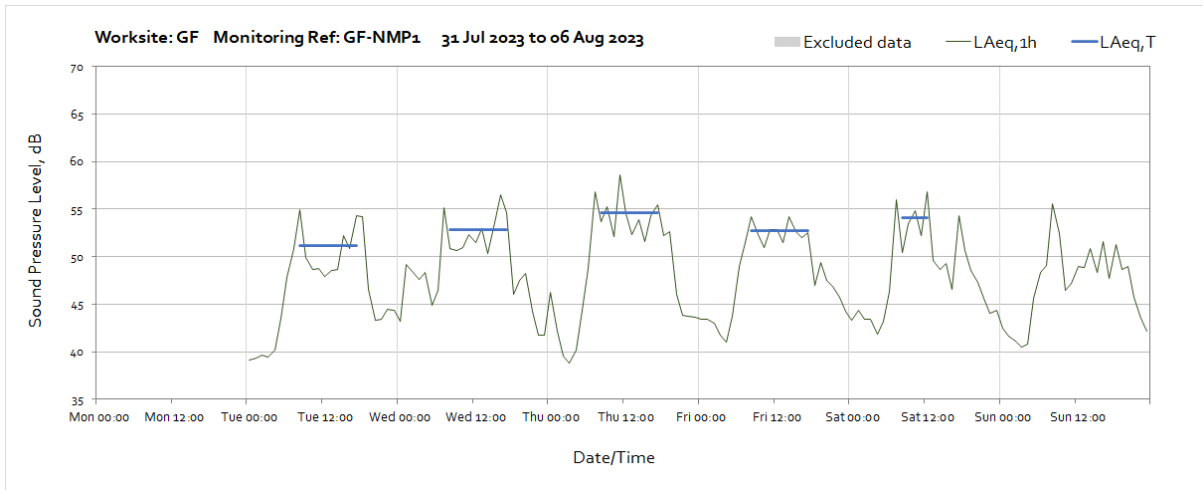


**Worksite: WGT - Monitoring Ref: WT-NMP1**



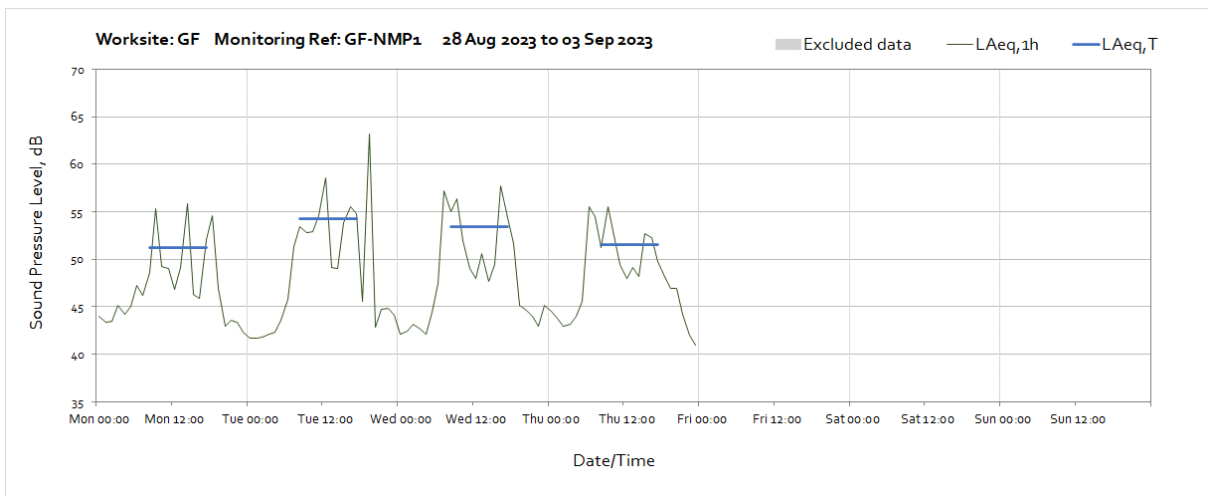
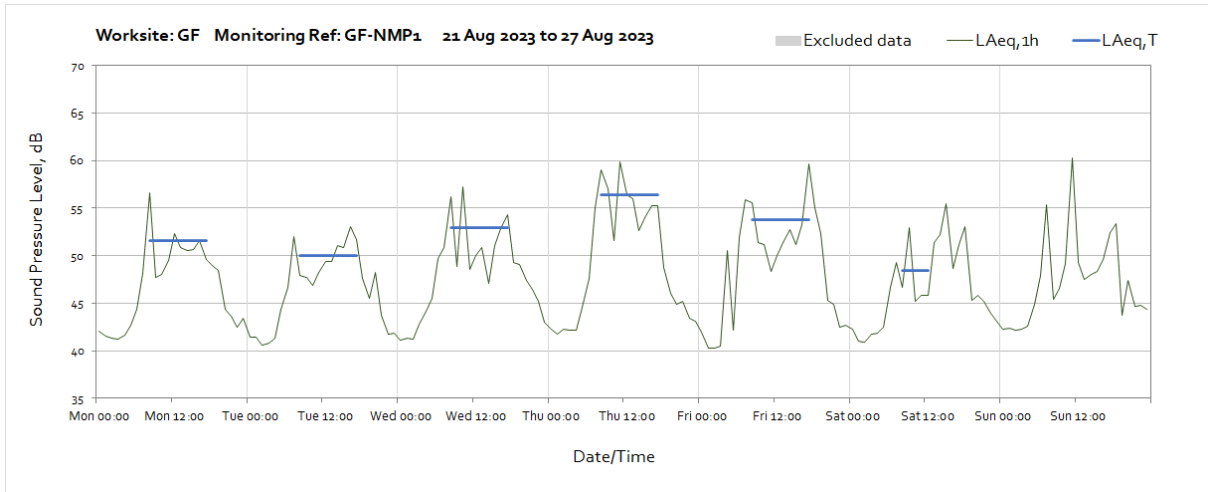


## Worksite: GF – Monitoring Ref: GF-NMP1

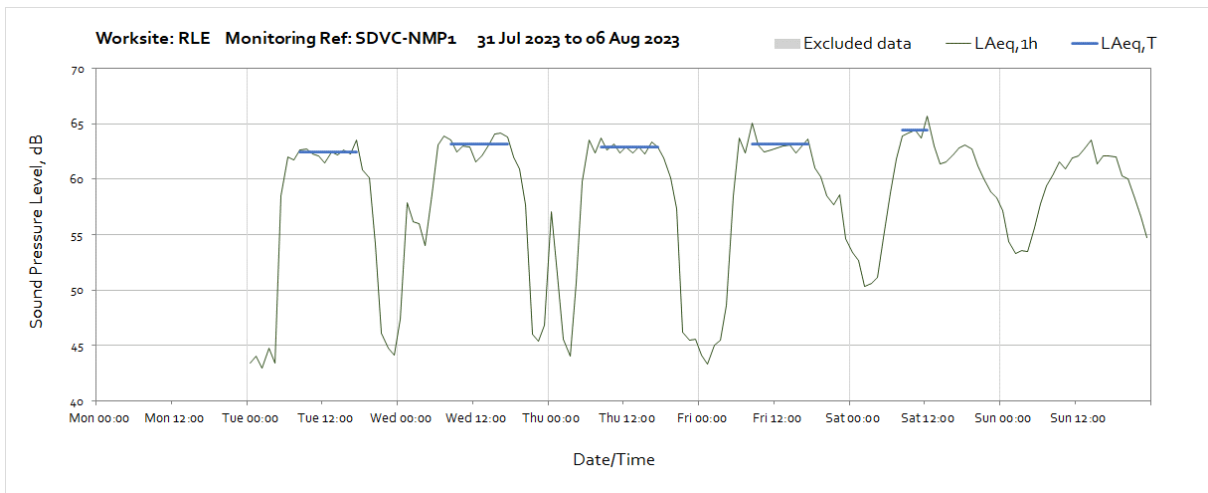


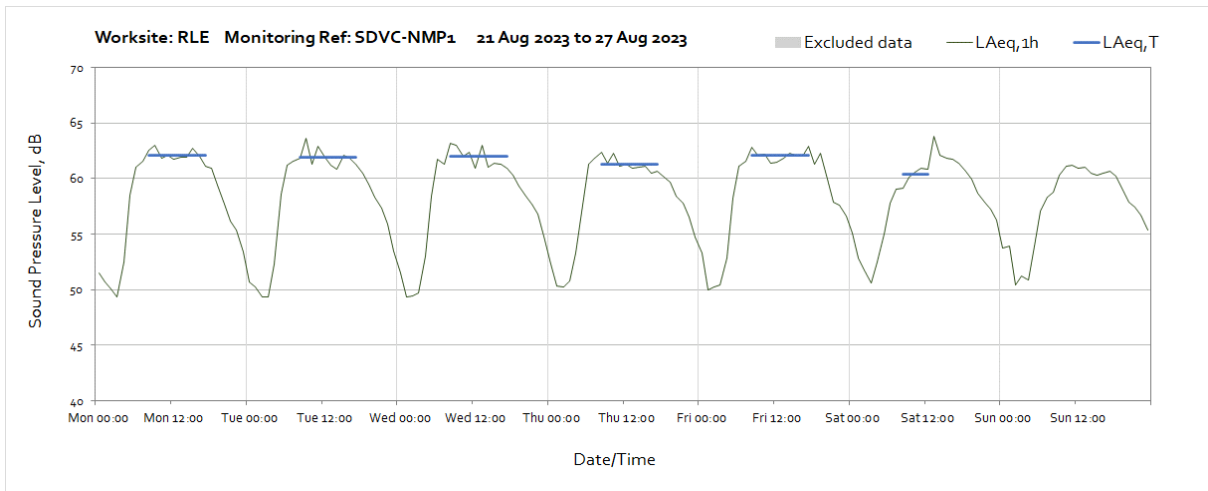
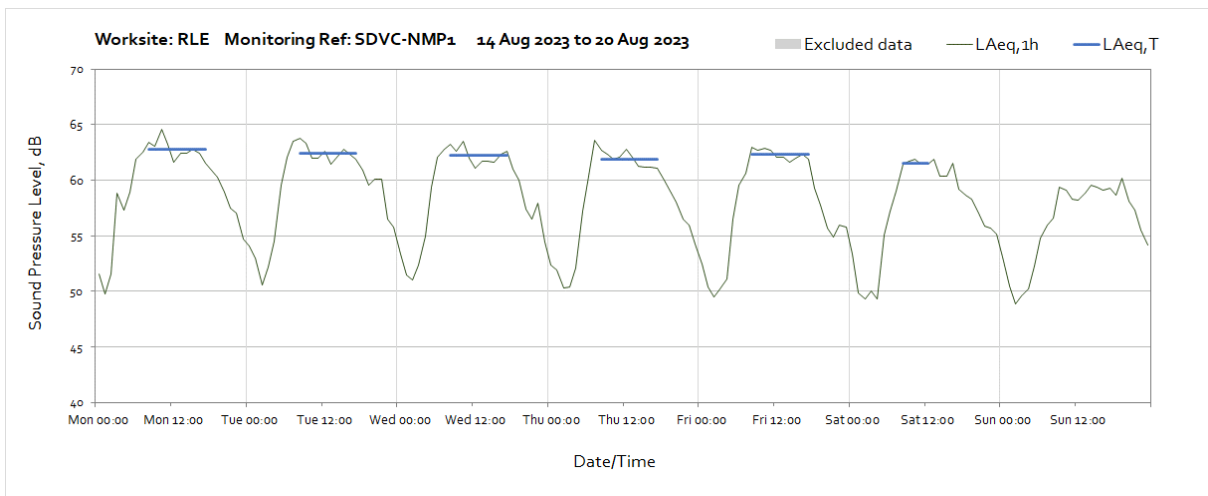
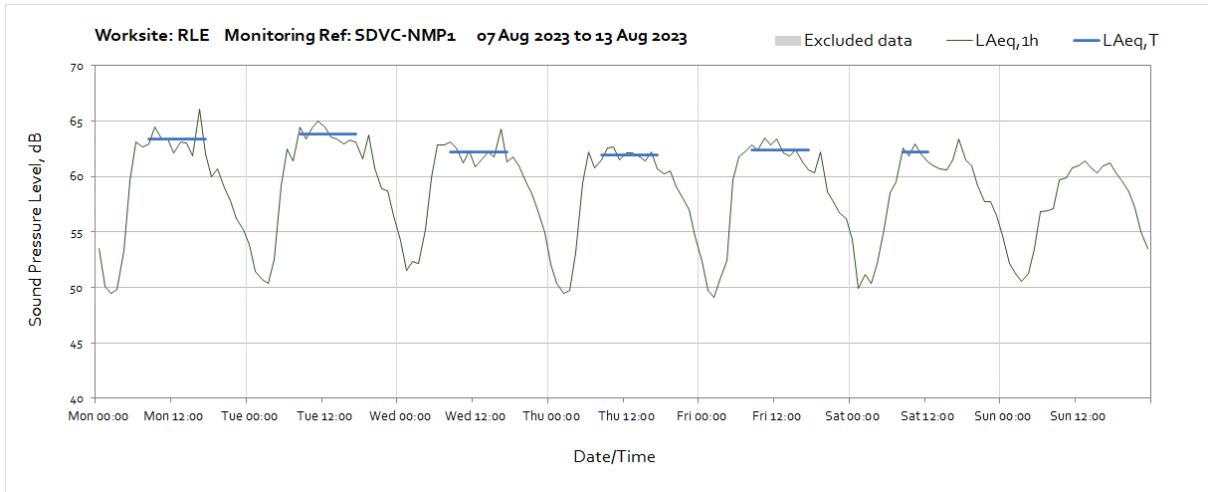
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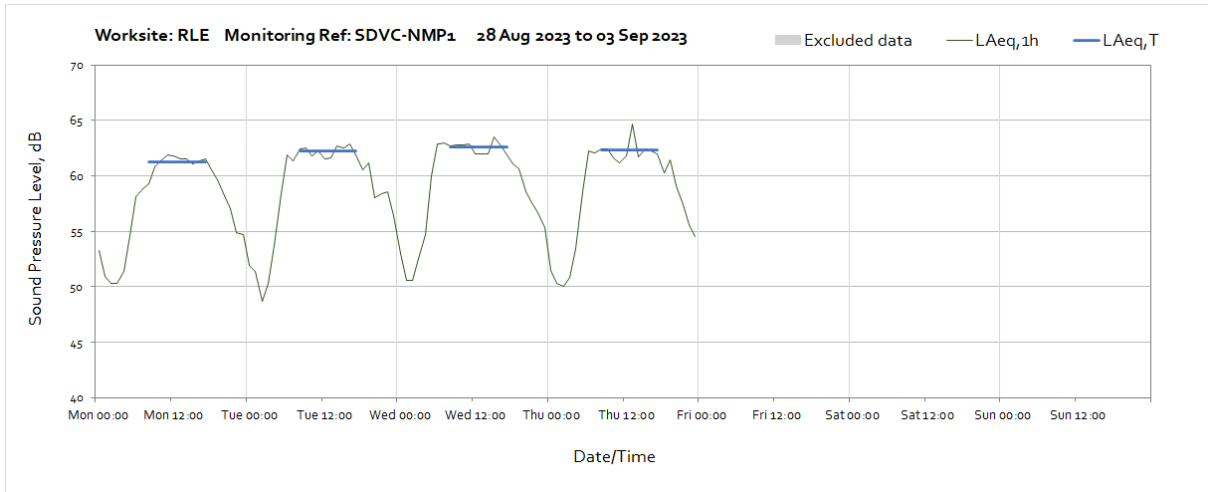




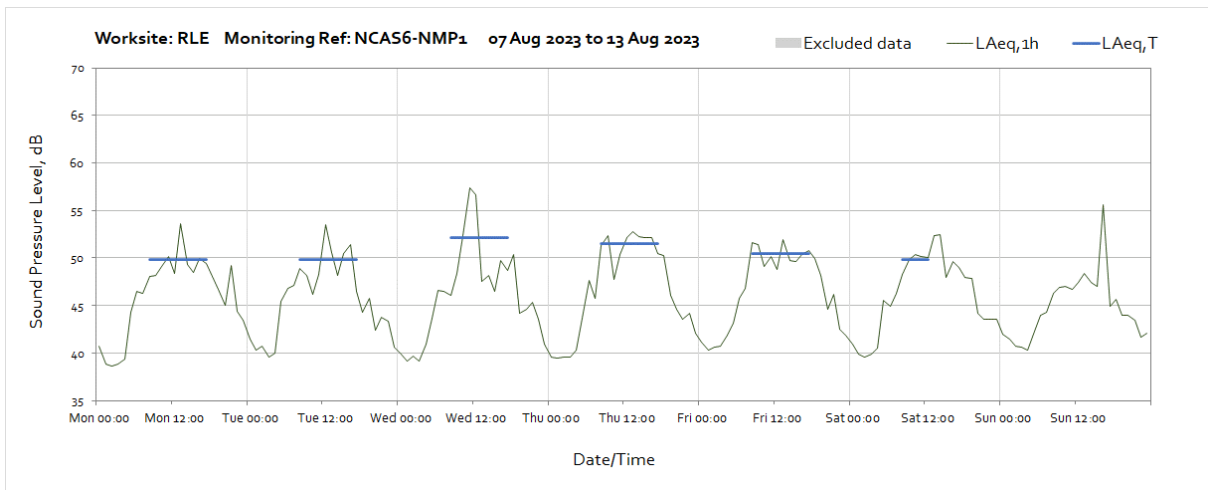
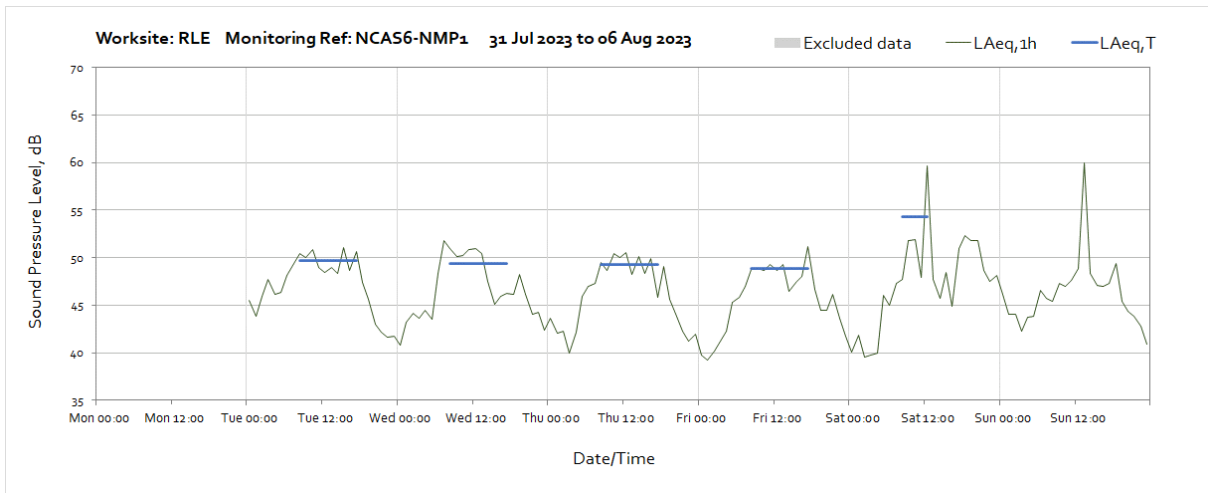
**Worksite: RLE - Monitoring Ref: SDVC-NMP1**

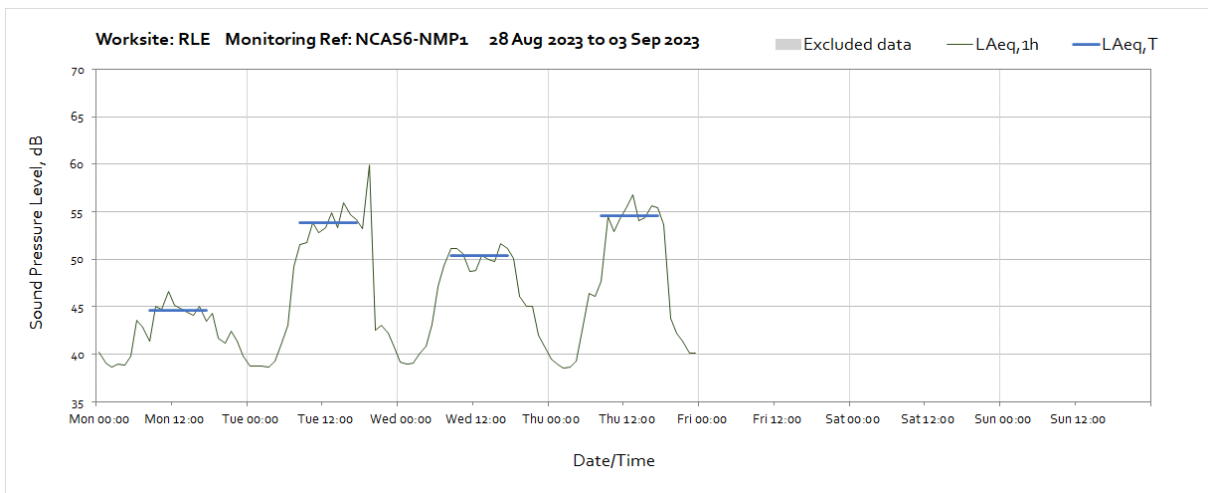
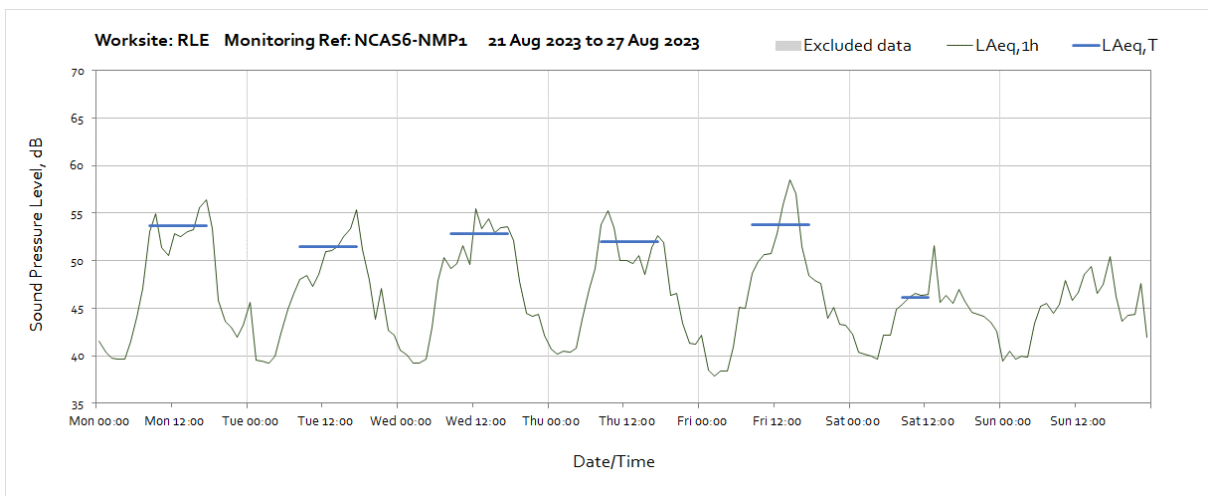
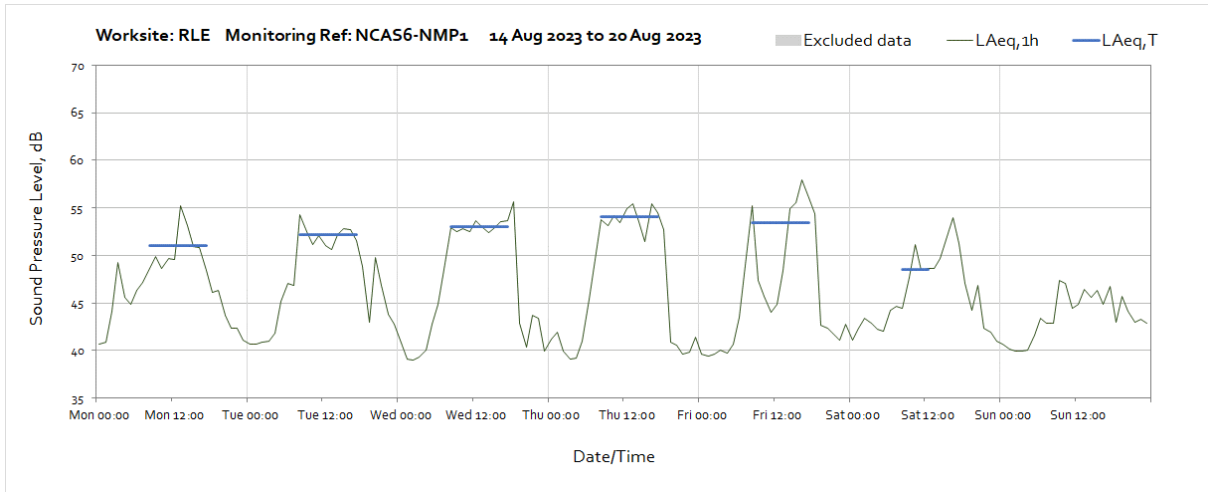




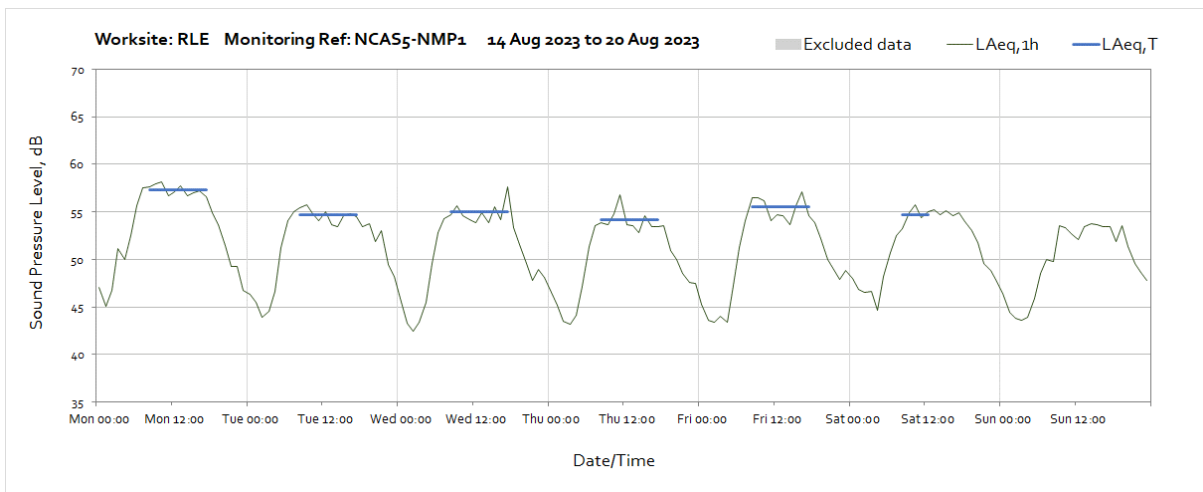
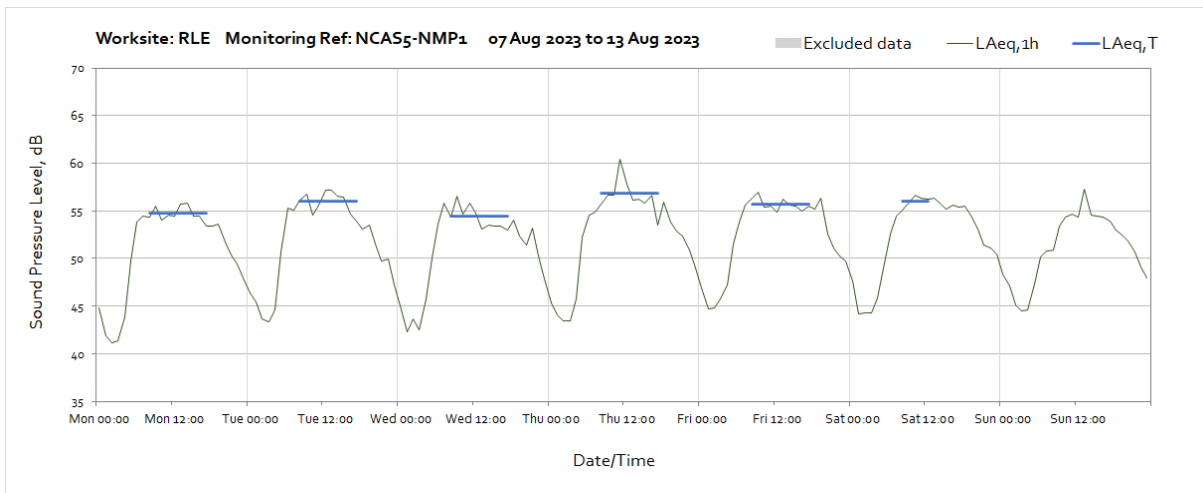
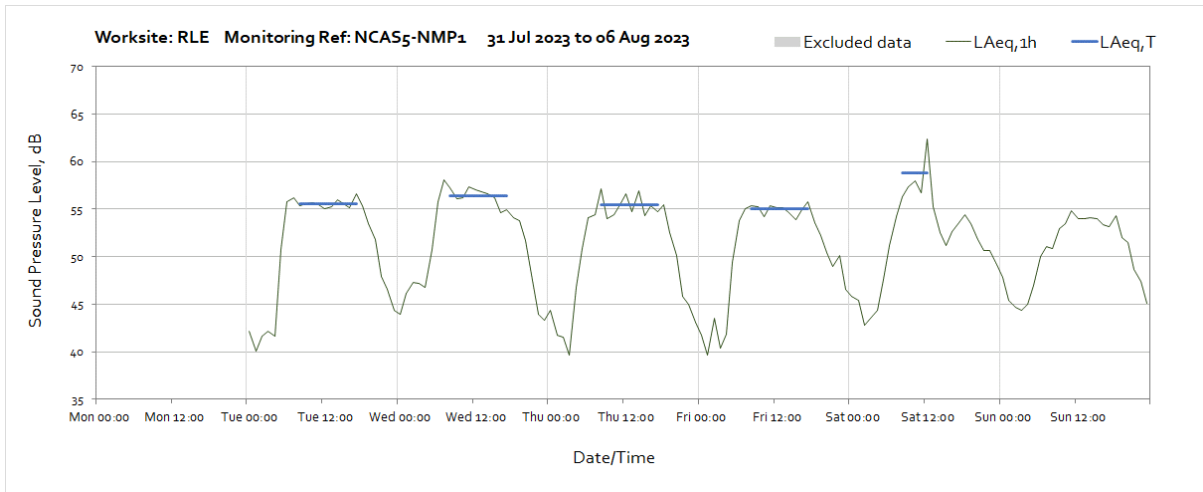


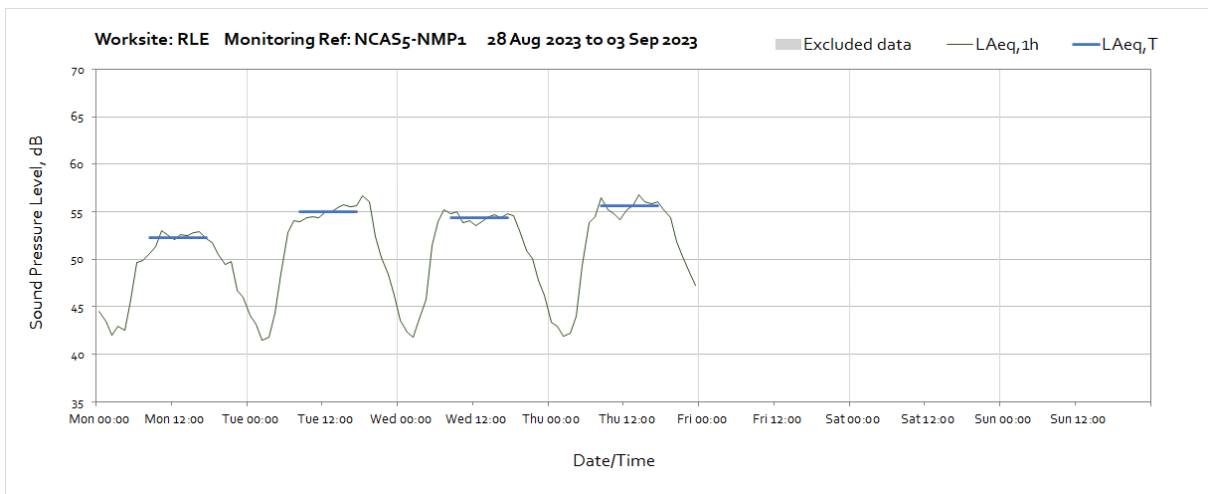
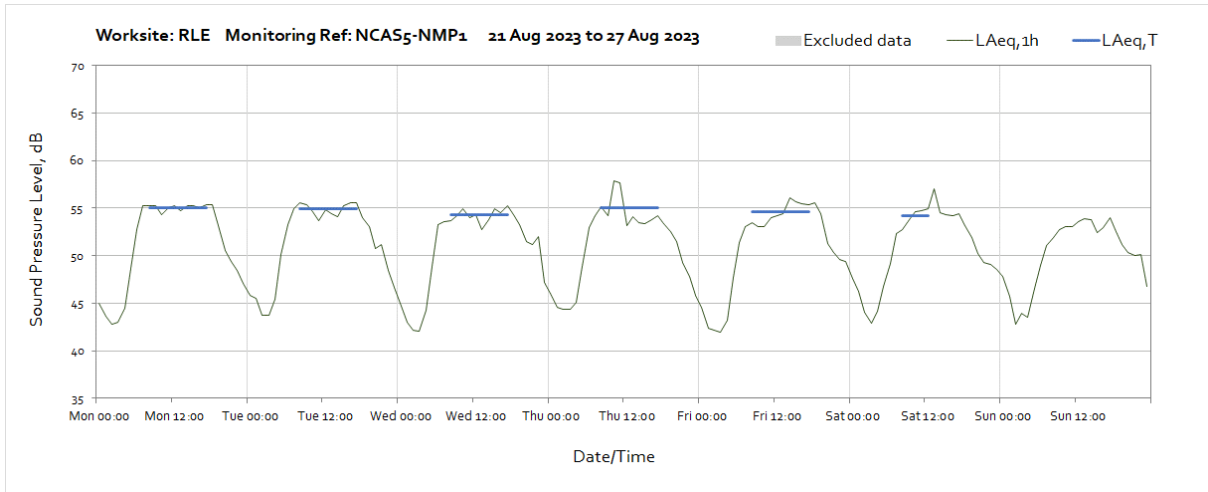
### Worksite: RLE – Monitoring Ref: NCAS6-NMP1



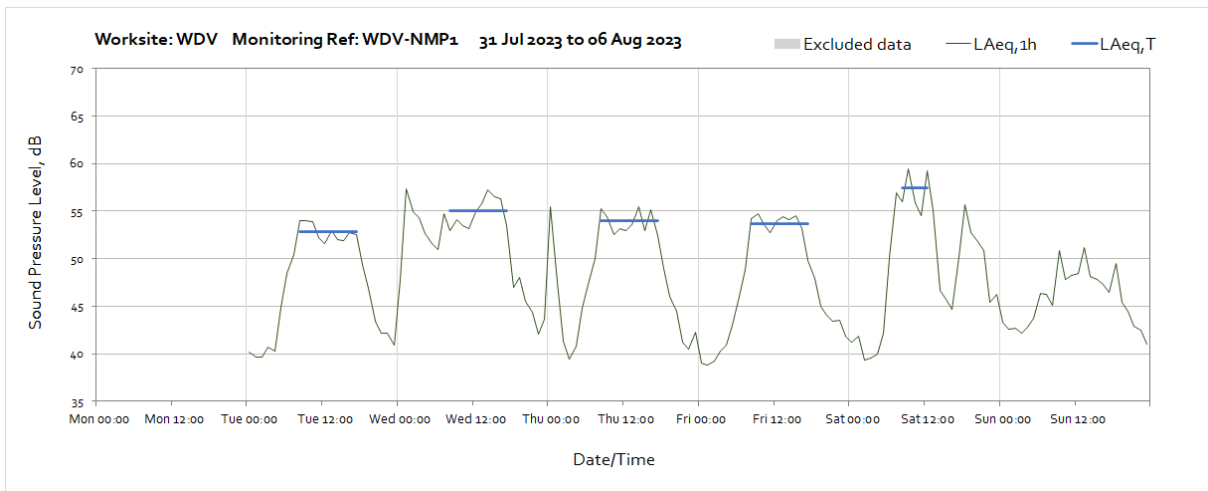


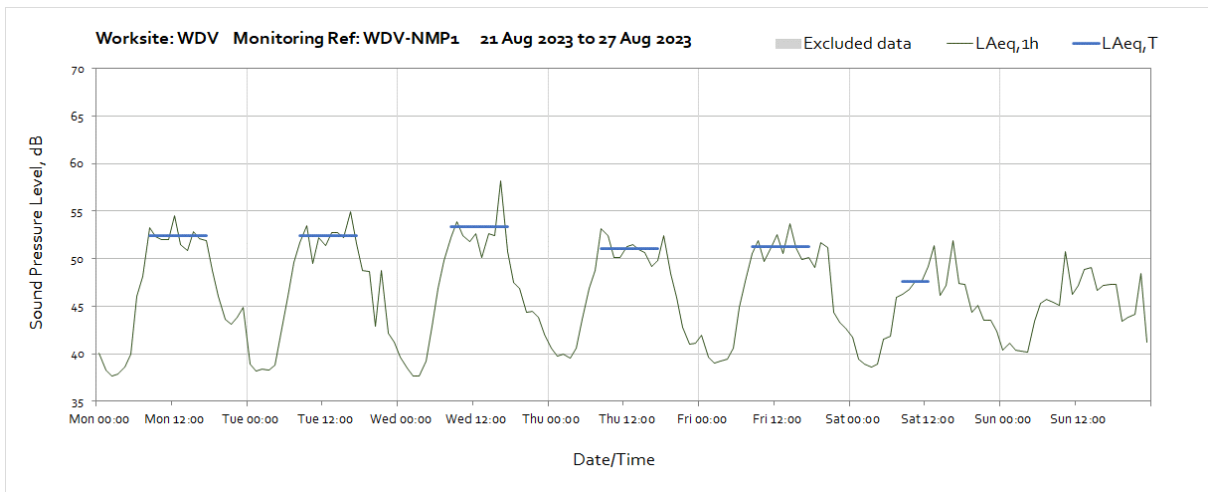
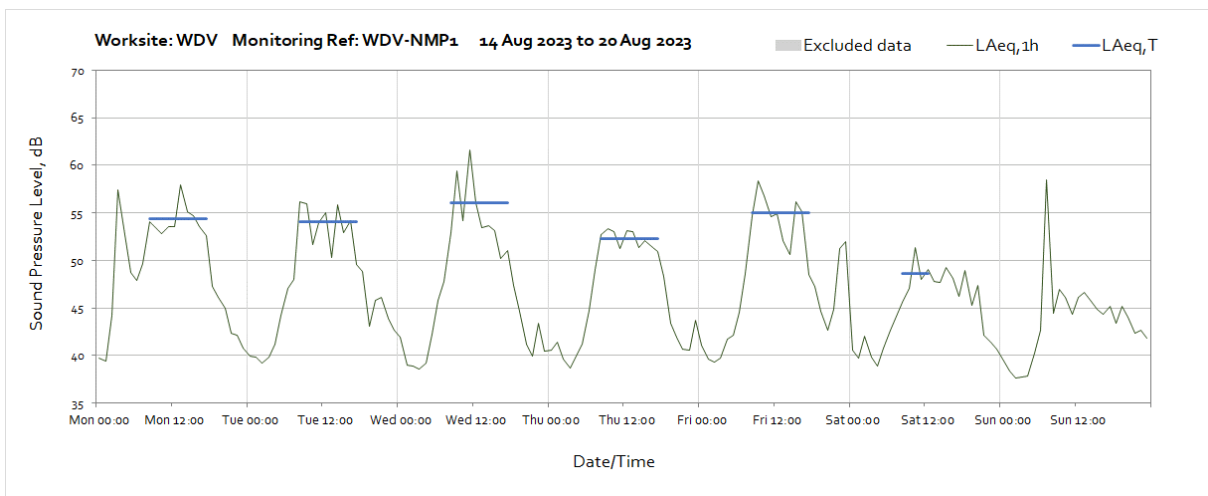
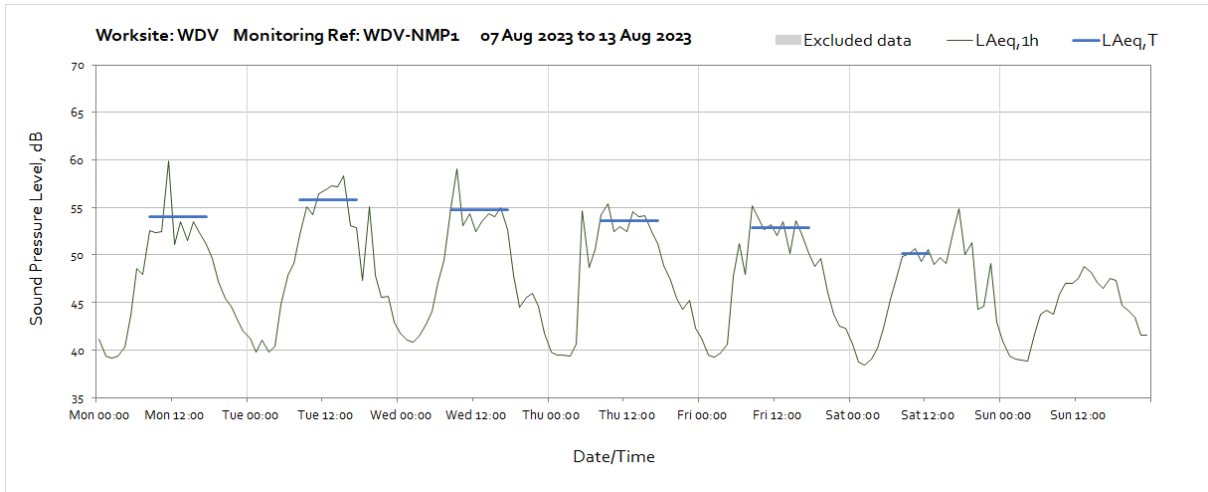
# Worksite: RLE – Monitoring Ref: NCAS5-NMP1

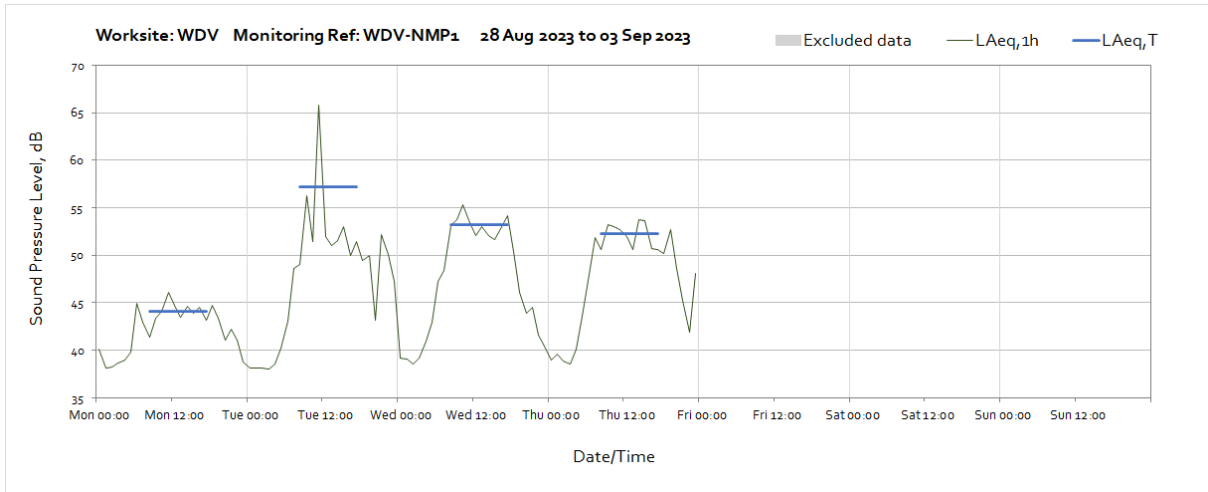




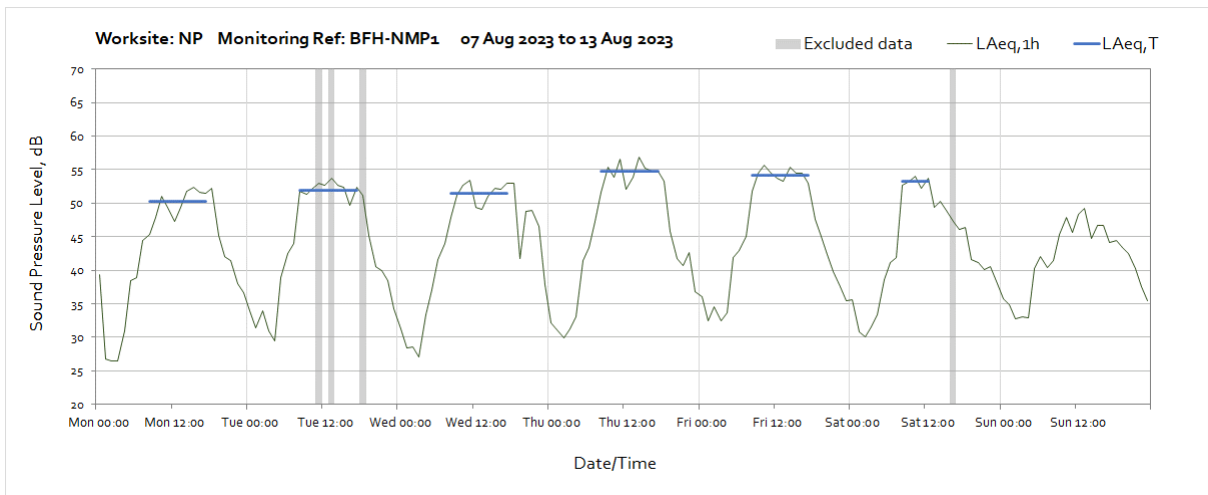
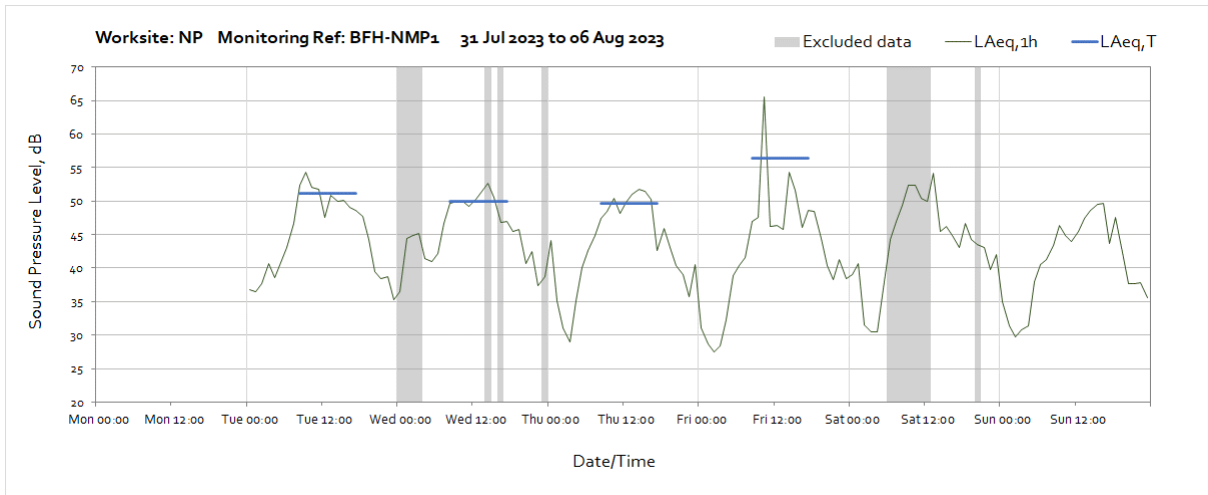
**Worksite: WDV - Monitoring Ref: WDV-NMP1**



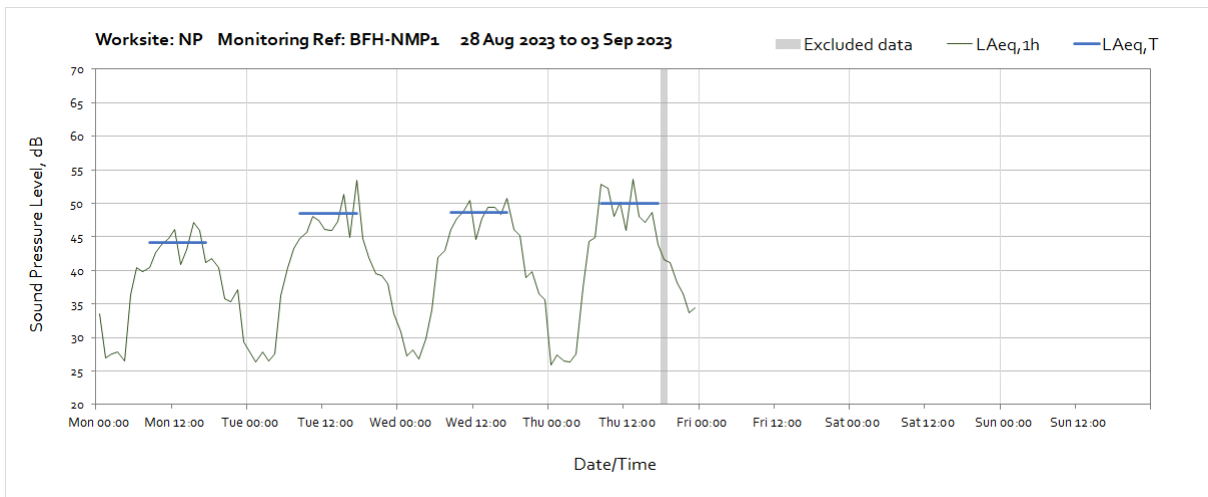
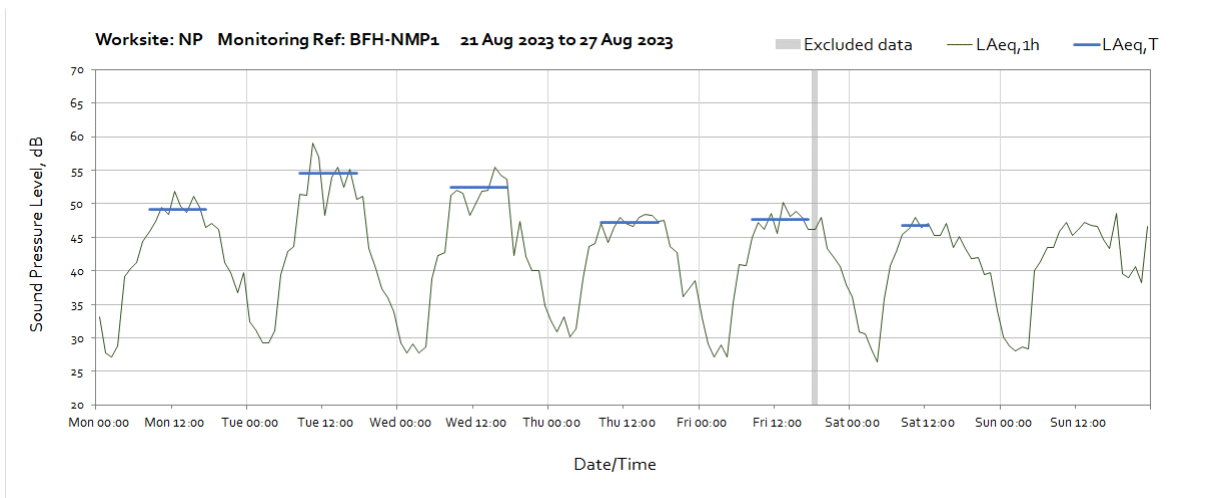
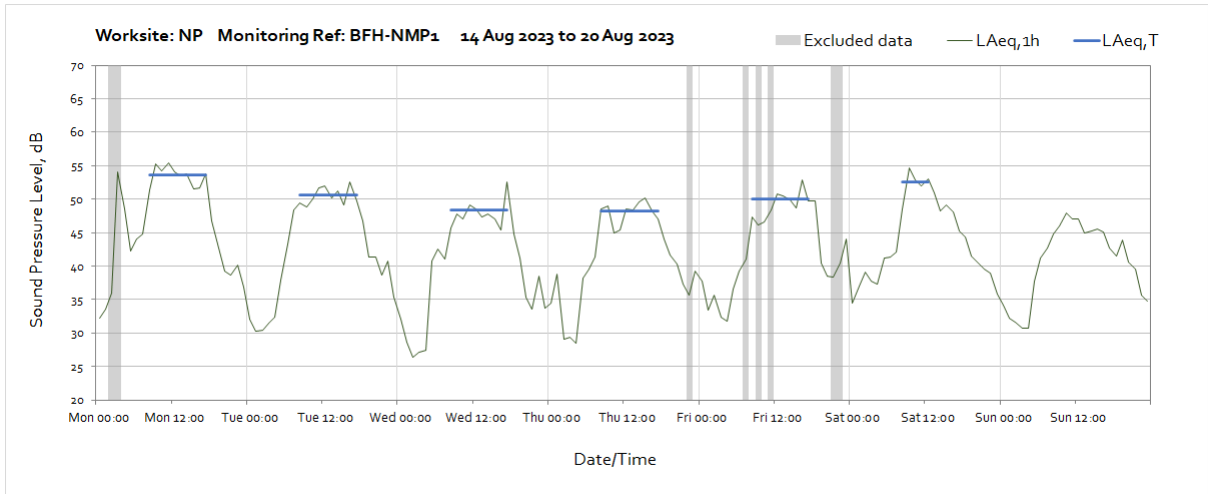




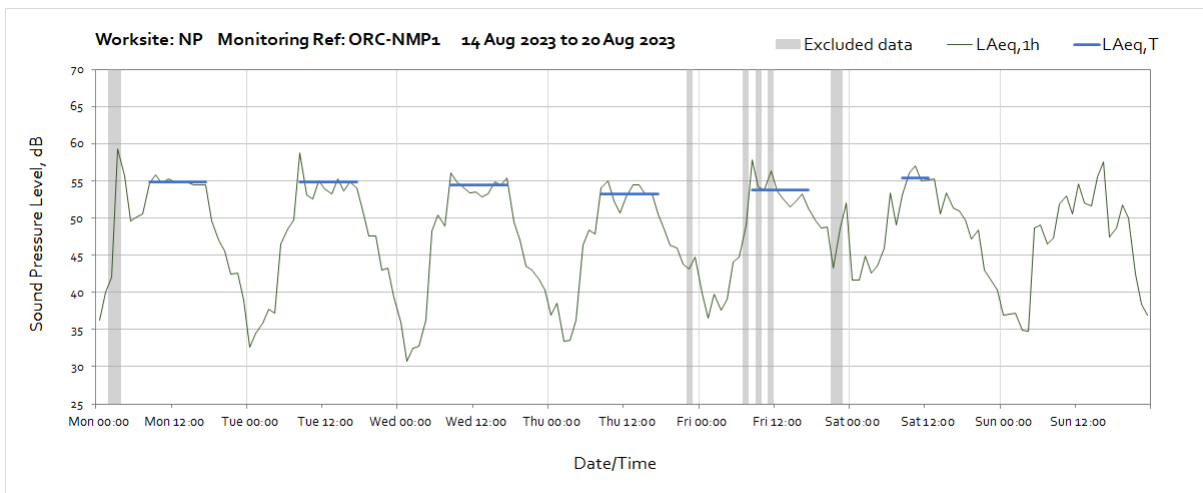
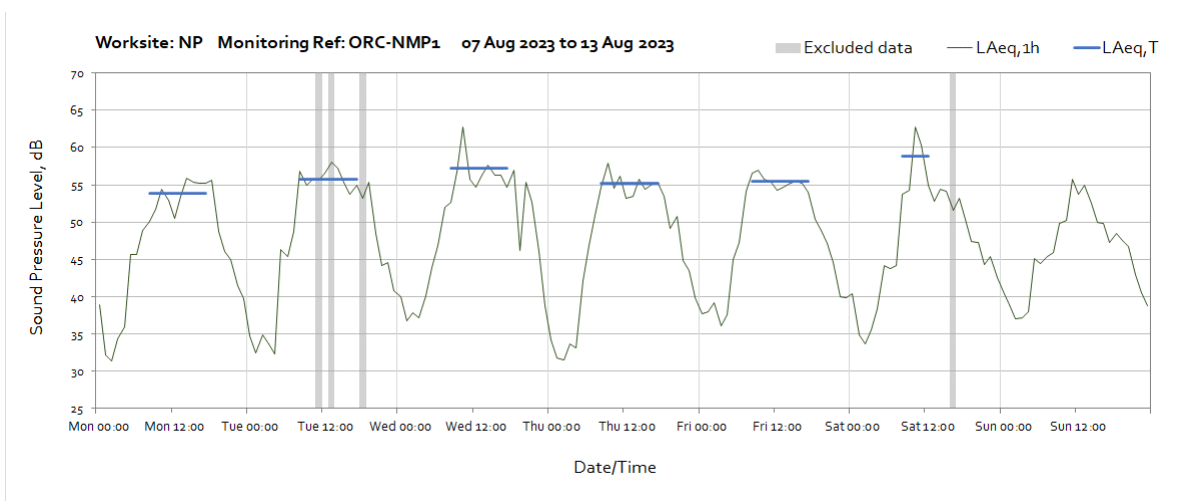
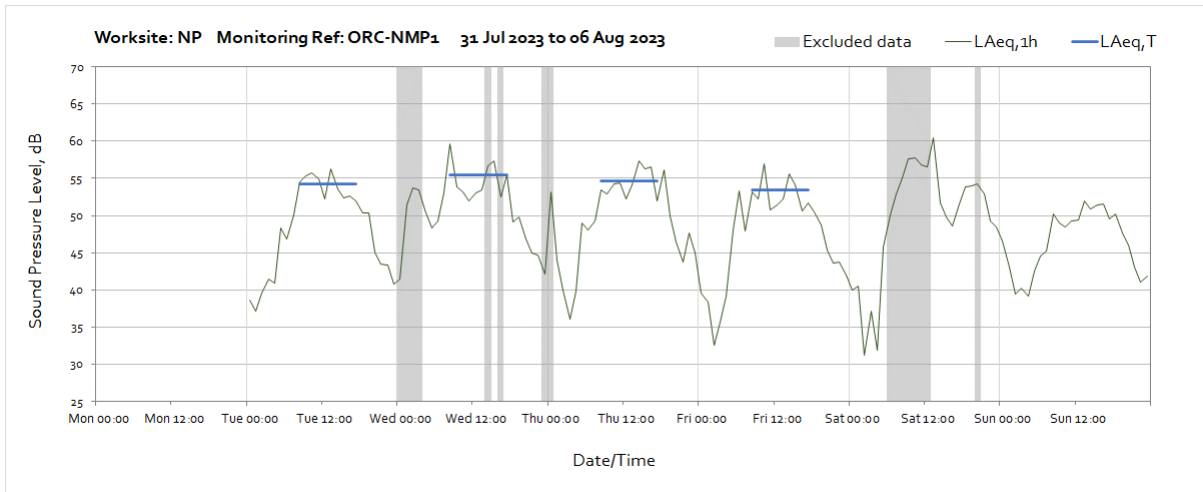
**Worksite: NP - Monitoring Ref: BFH-NMP1**

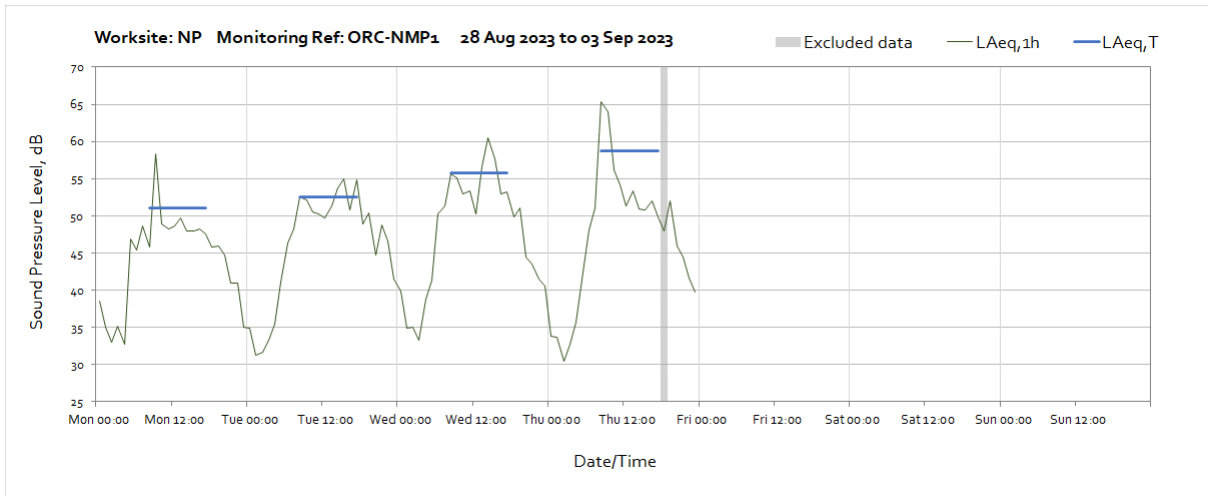
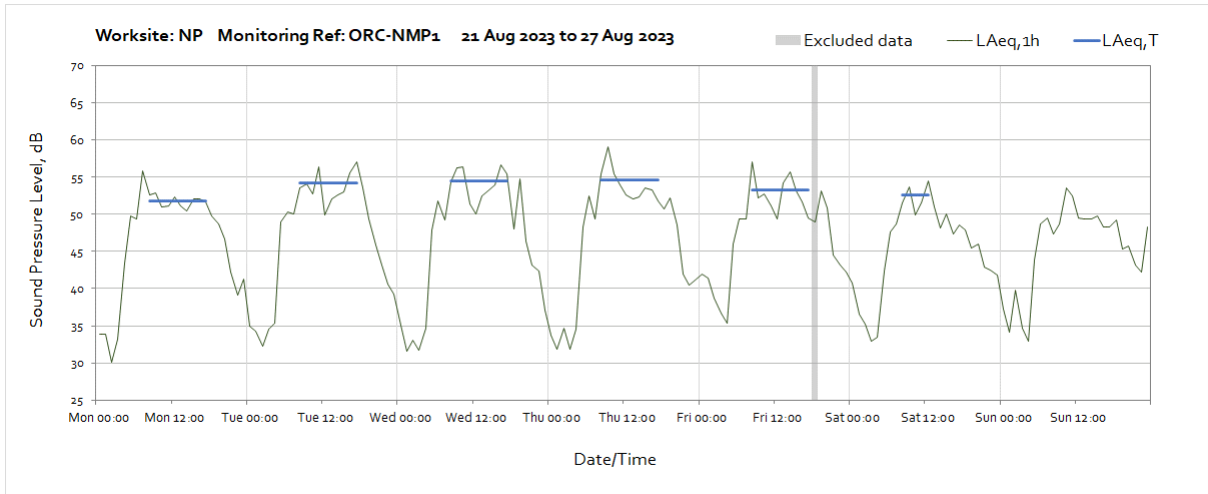




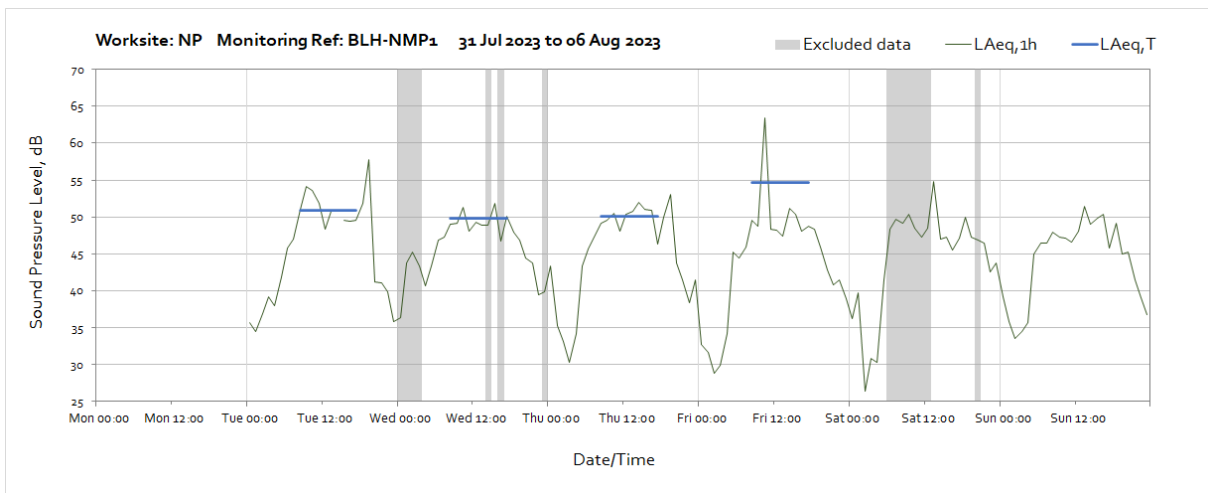


## Worksite: NP – Monitoring Ref: ORC-NMP1

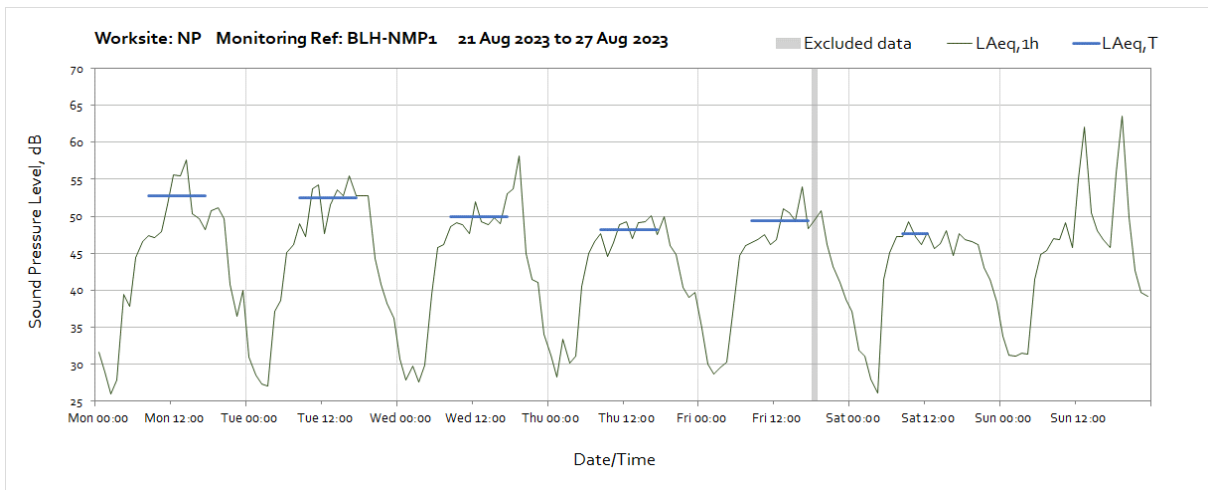
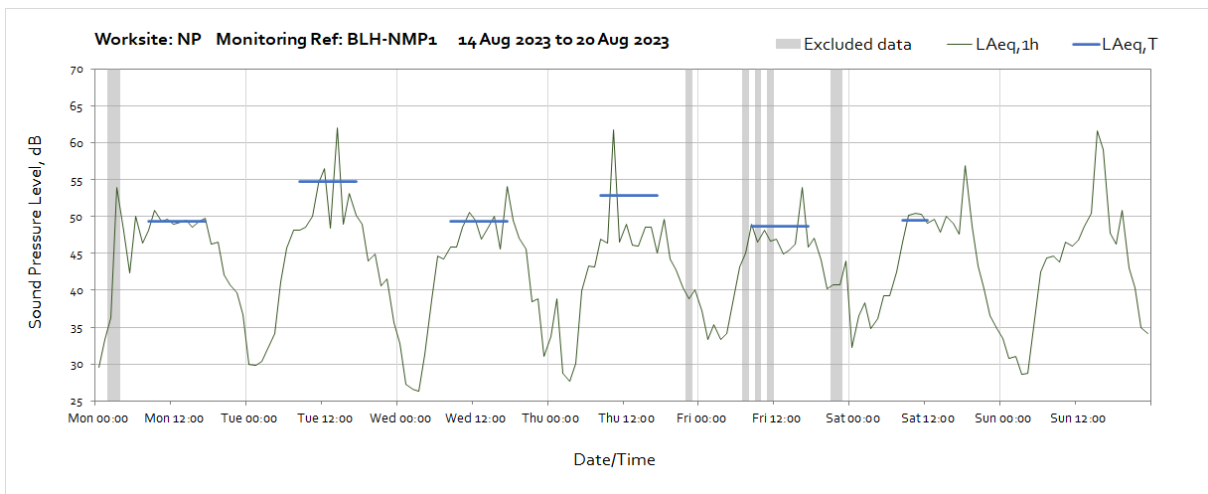
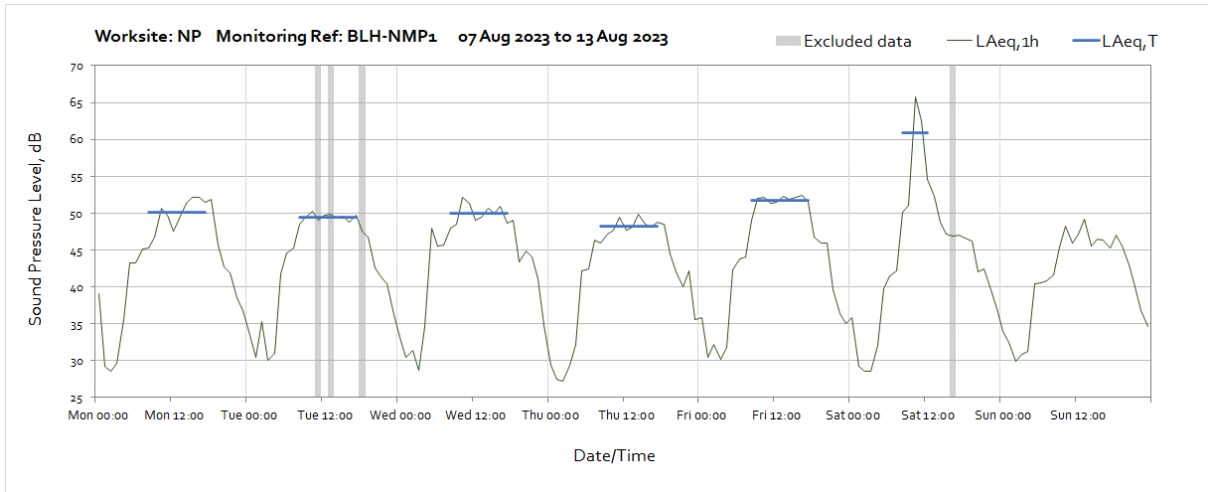


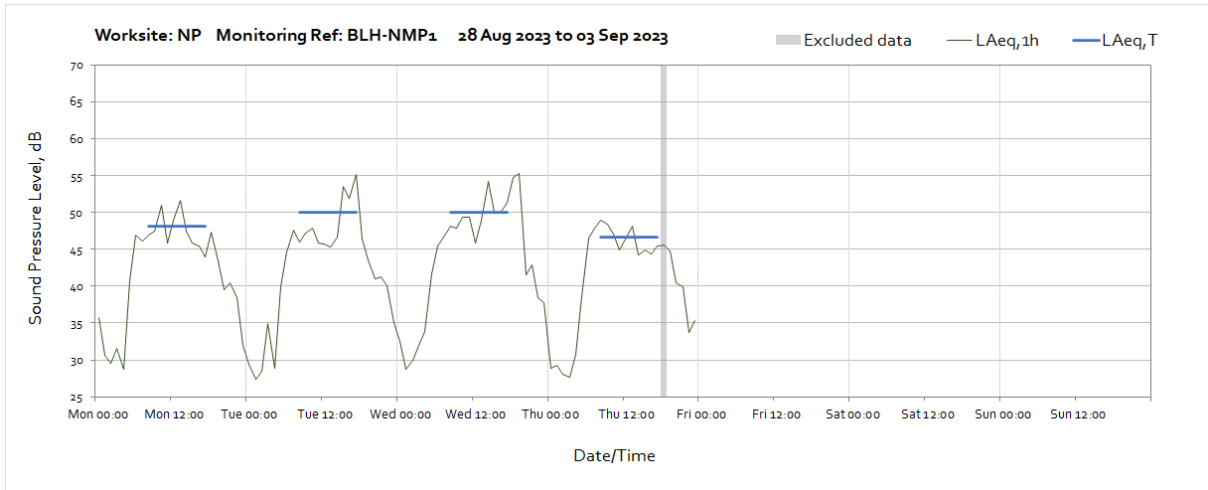


**Worksite: NP - Monitoring Ref: BLH-NMP1**

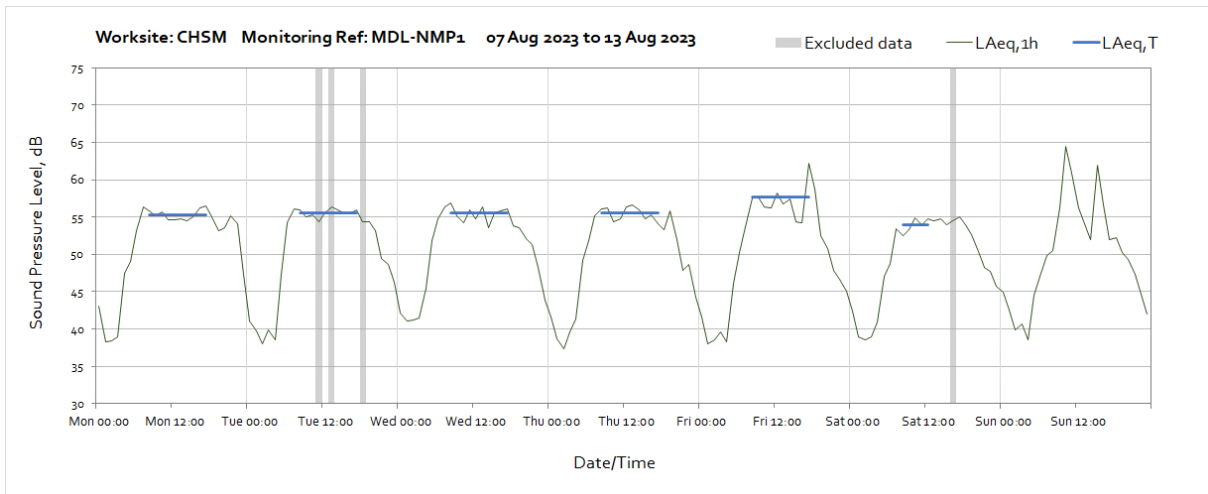
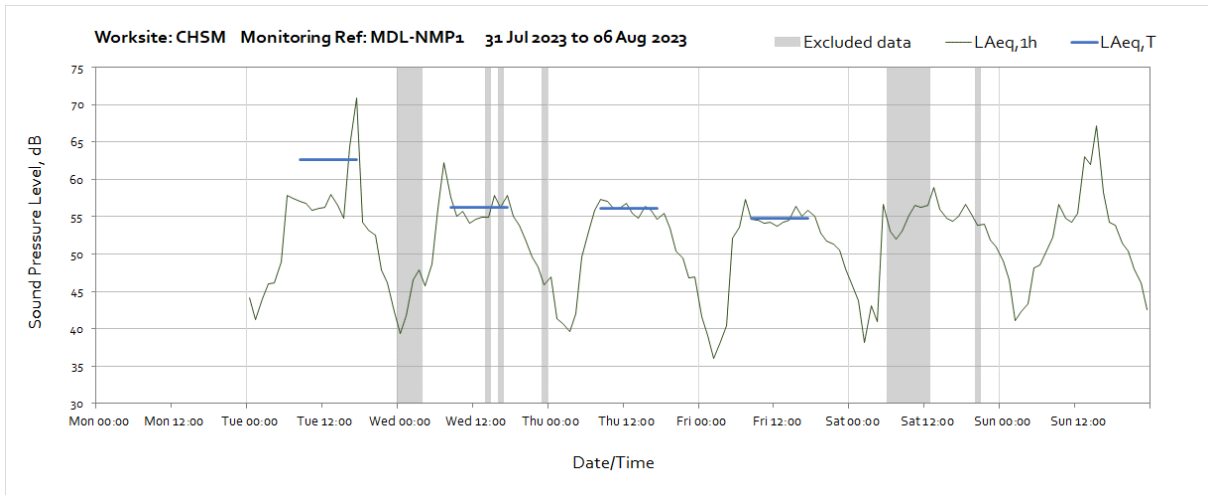


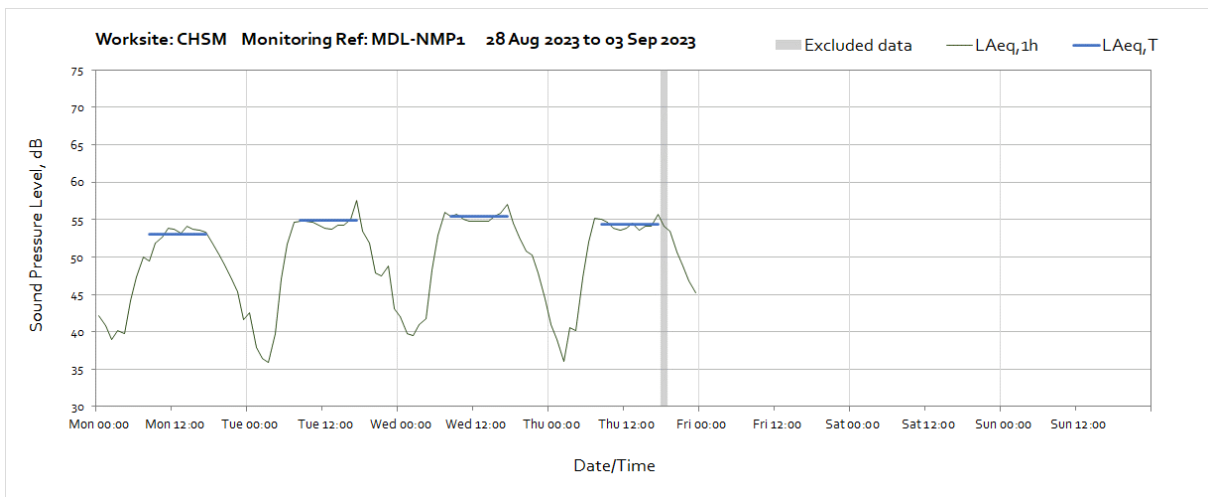
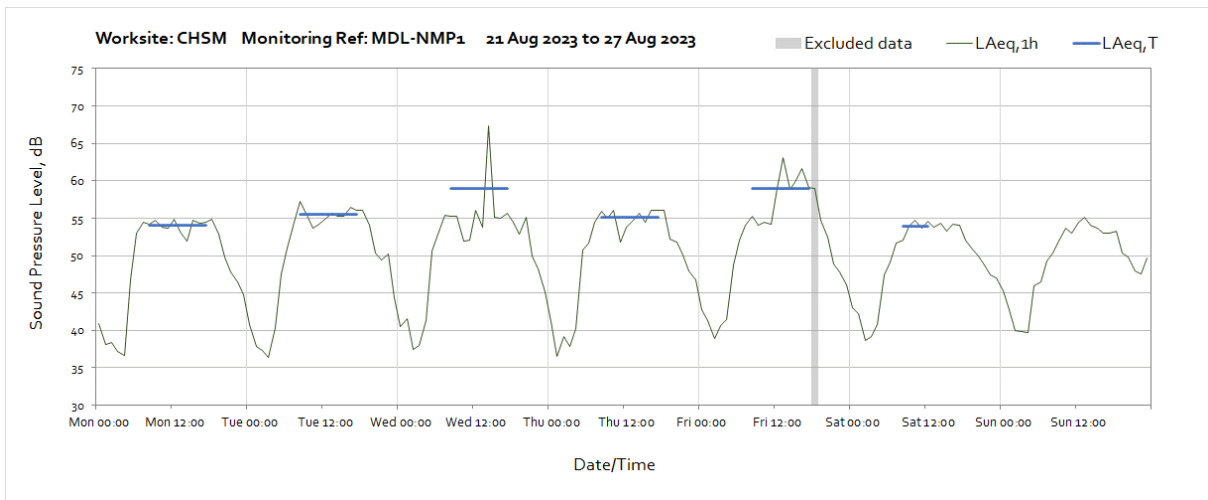
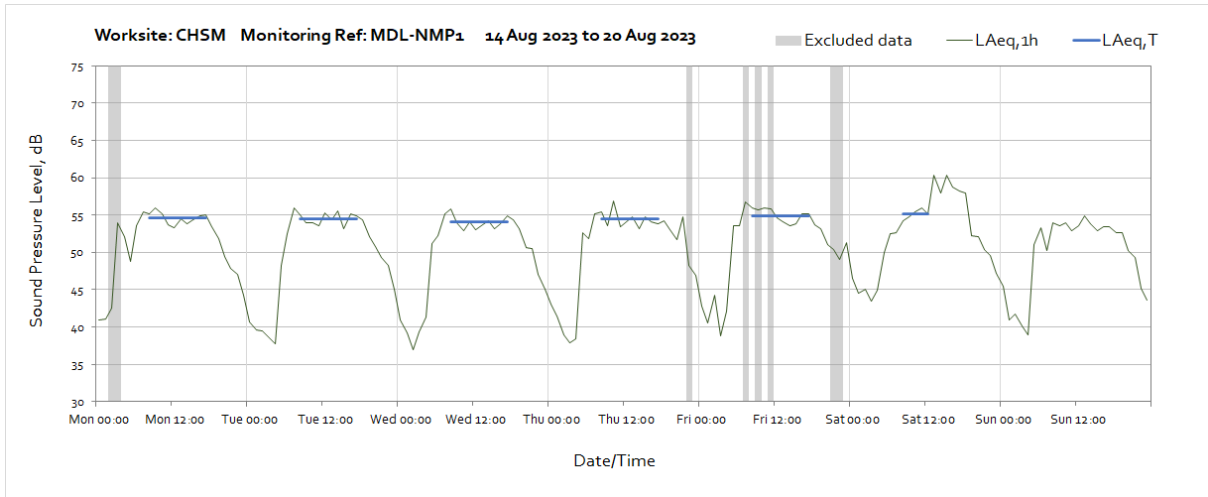
Note: Missing data between 14:00 and 15:00 on Tuesday 1<sup>st</sup> August was due to monitor maintenance.



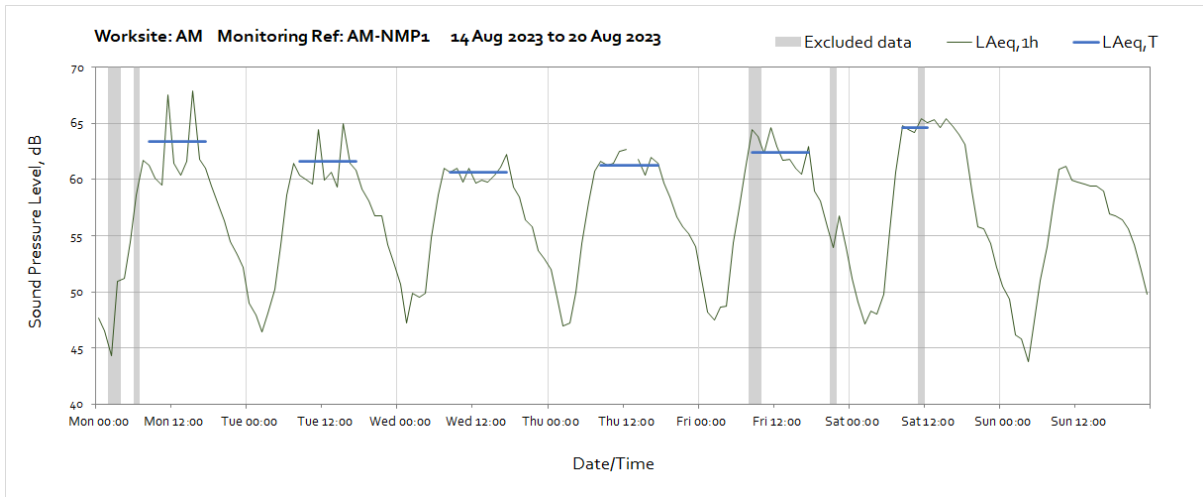
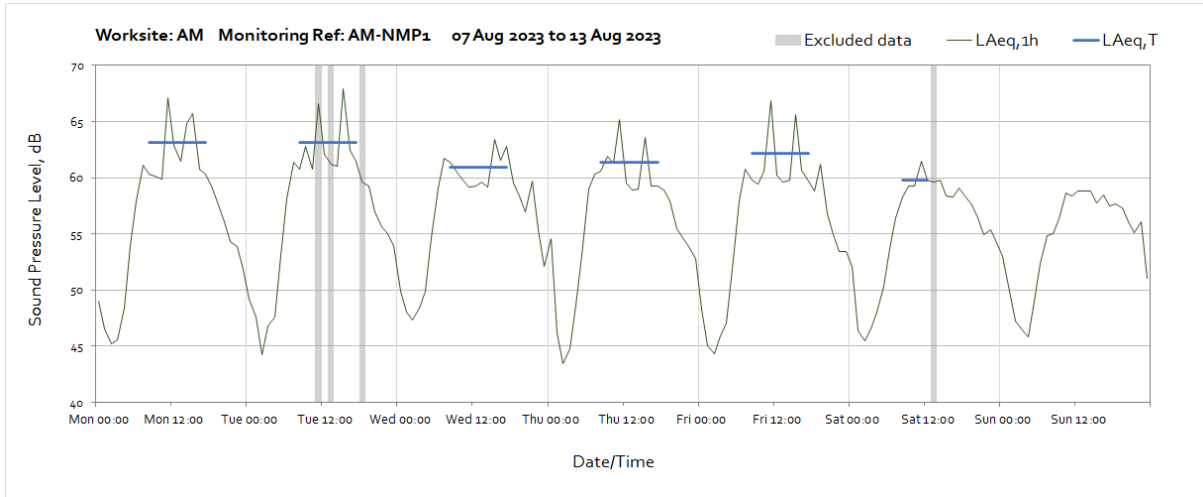
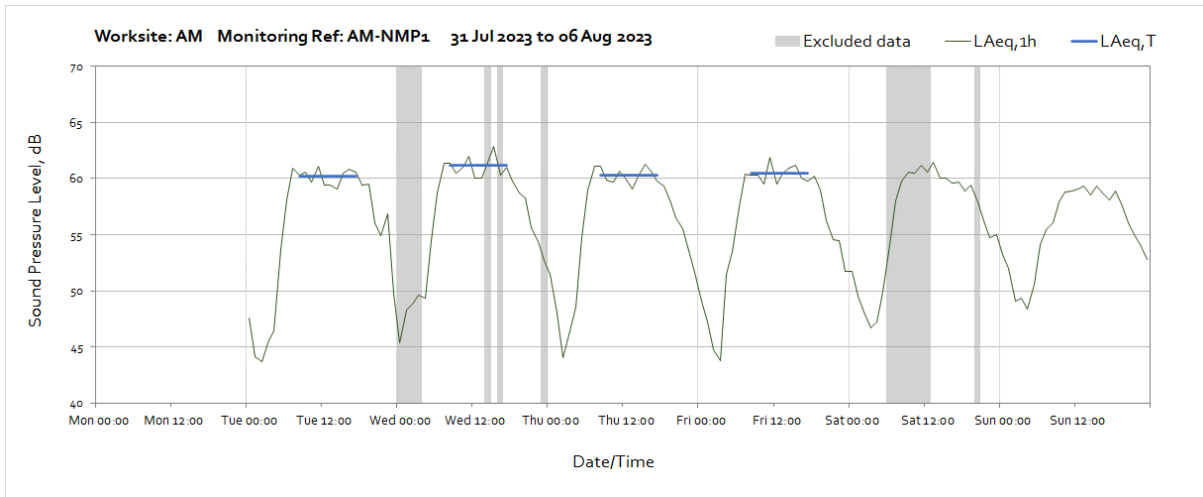


**Worksite: CHSM - Monitoring Ref: MDL-NMP1**



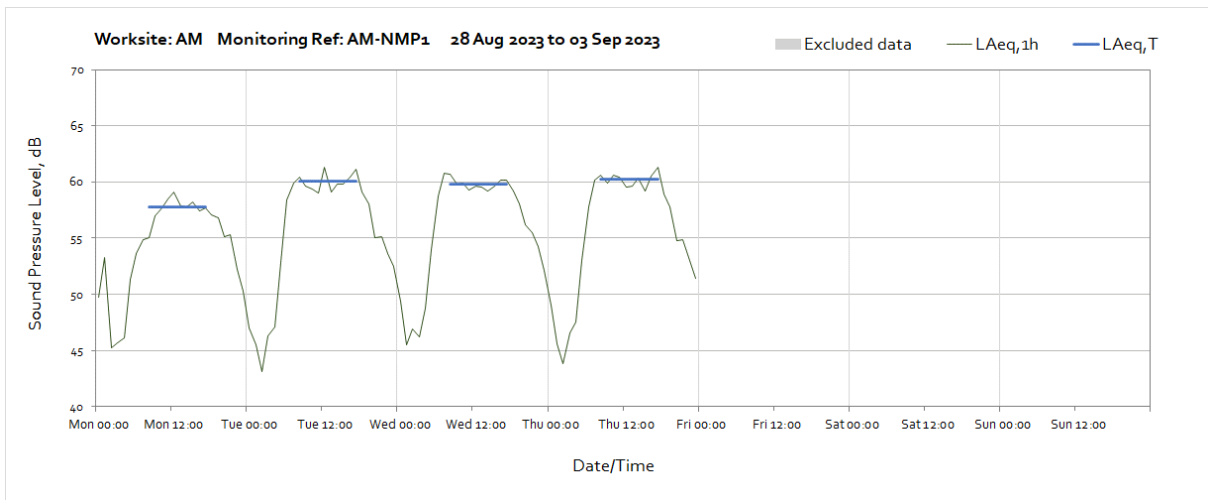
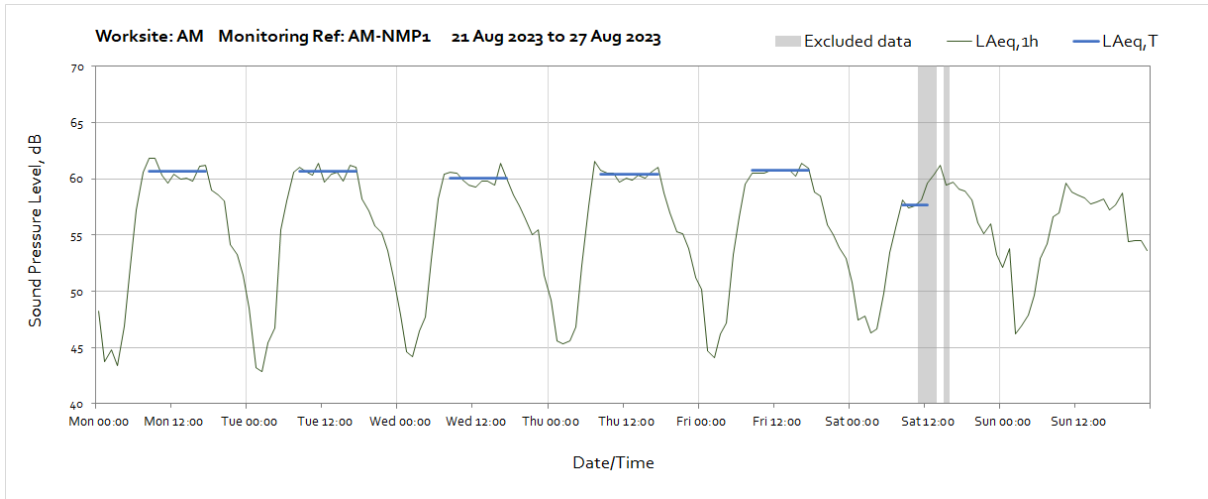


## Worksite: AM - Monitoring Ref: AM-NMP1

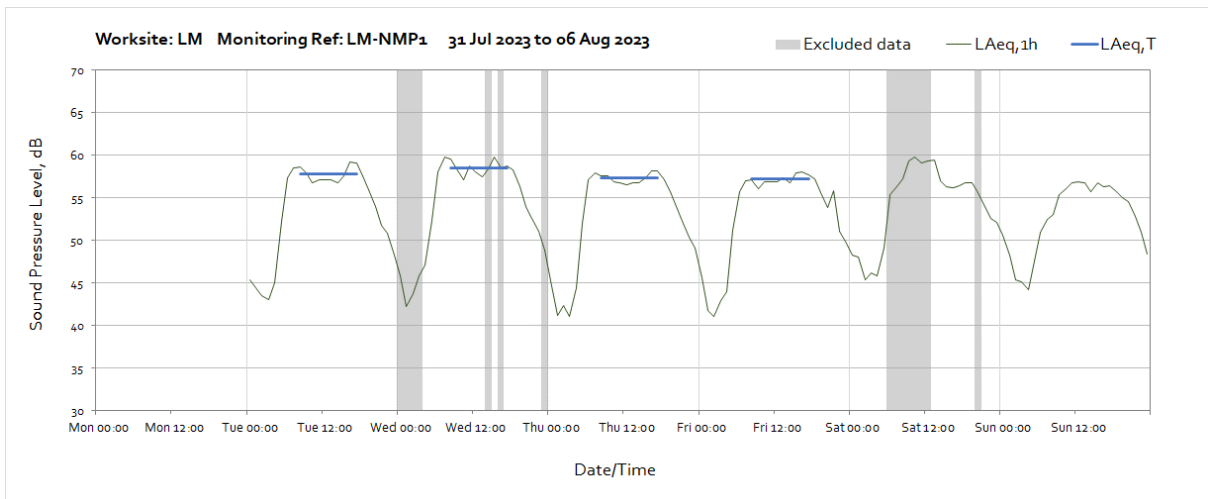


Note: Missing data between 13:00 and 14:00 on Thursday 17<sup>th</sup> August was due to monitor maintenance.

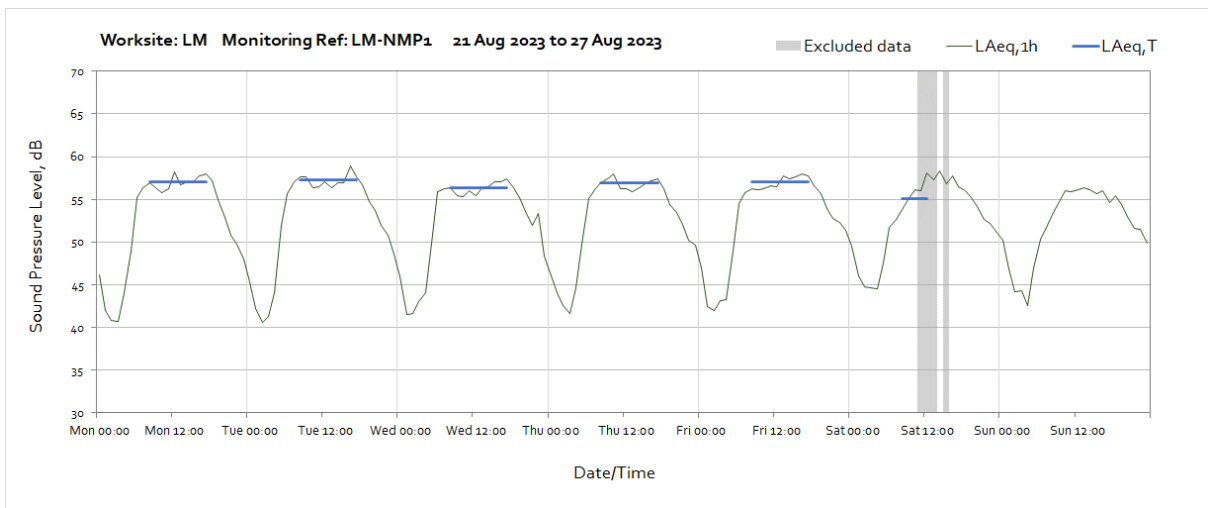
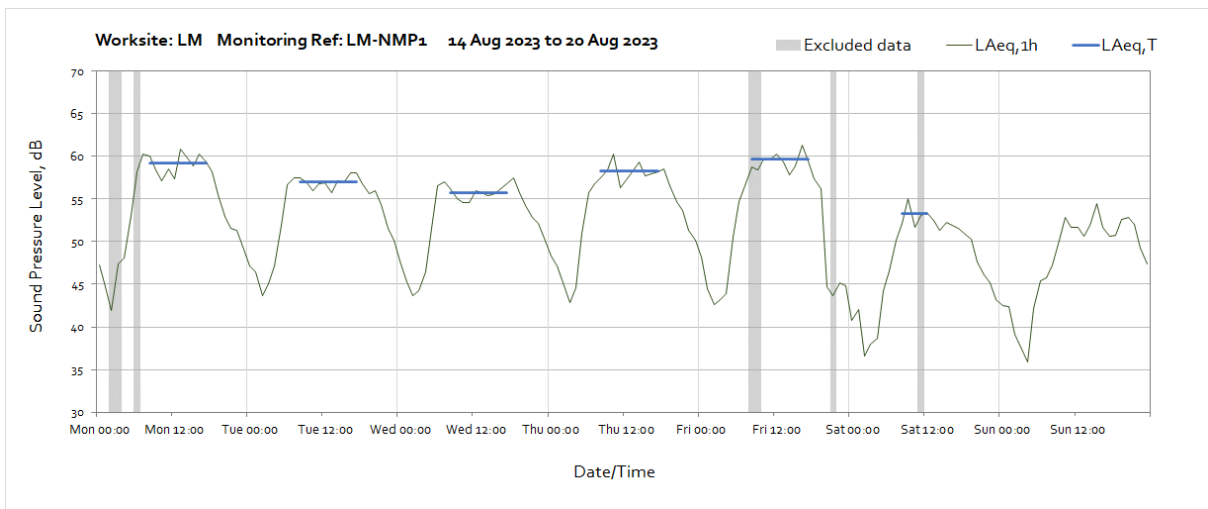
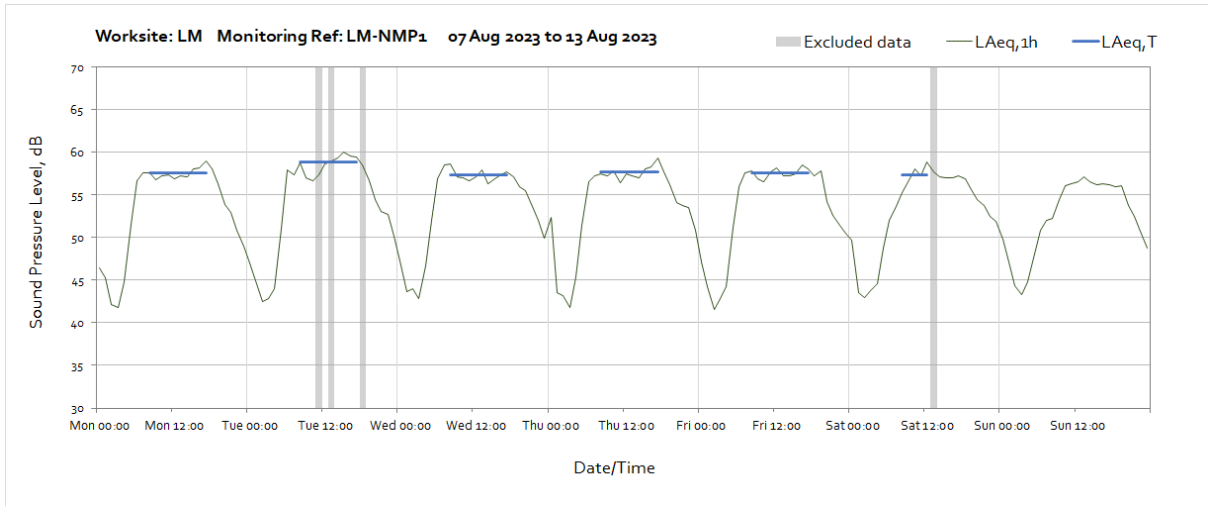
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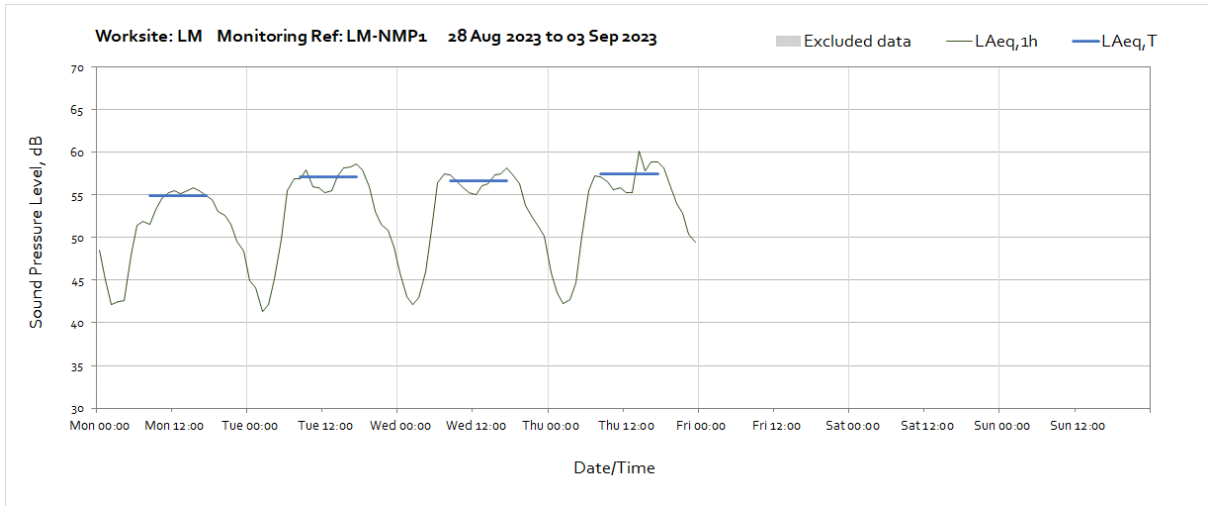


**Worksite: LM – Monitoring Ref: LM-NMP1**

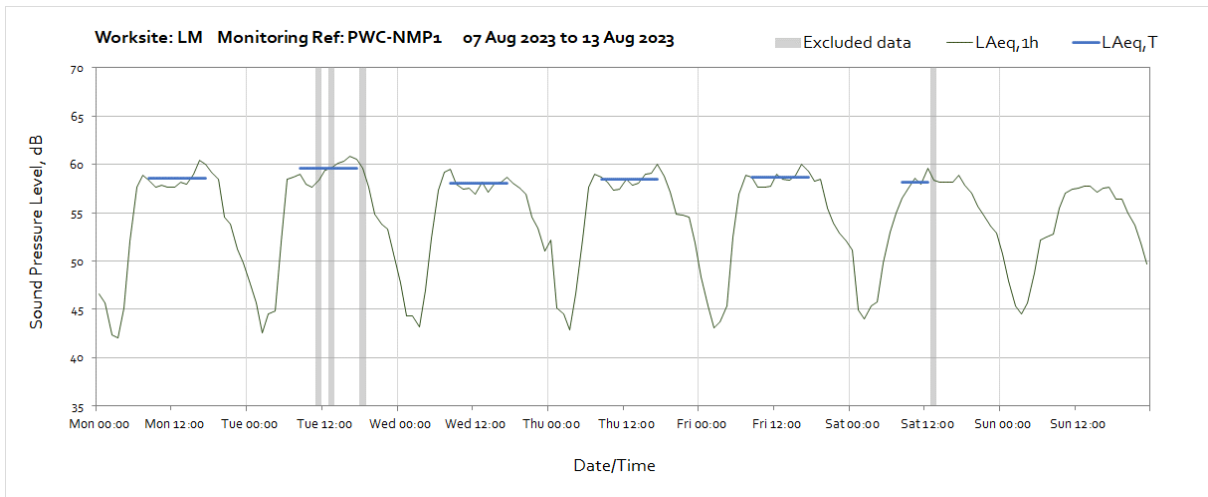
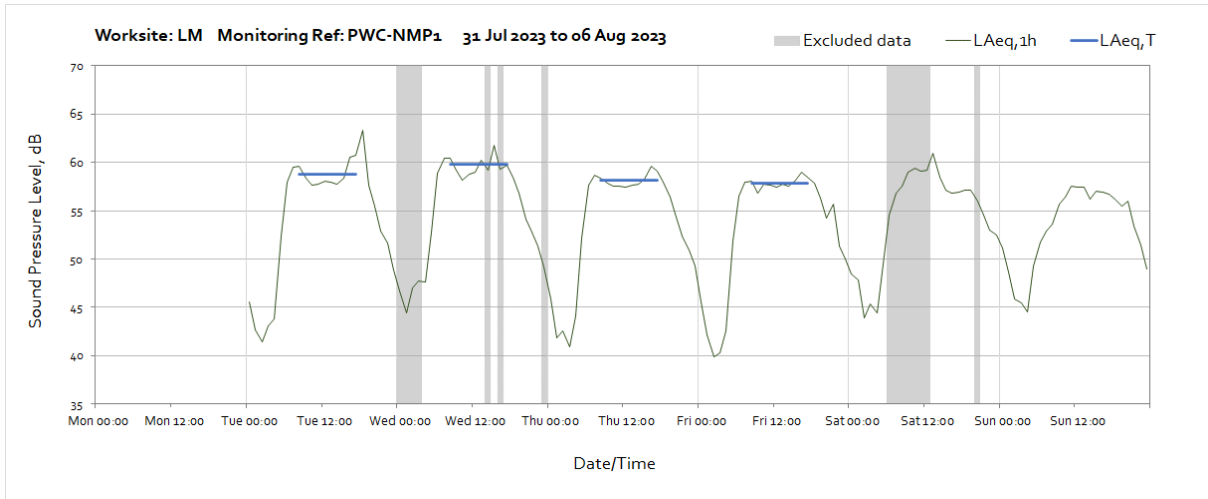


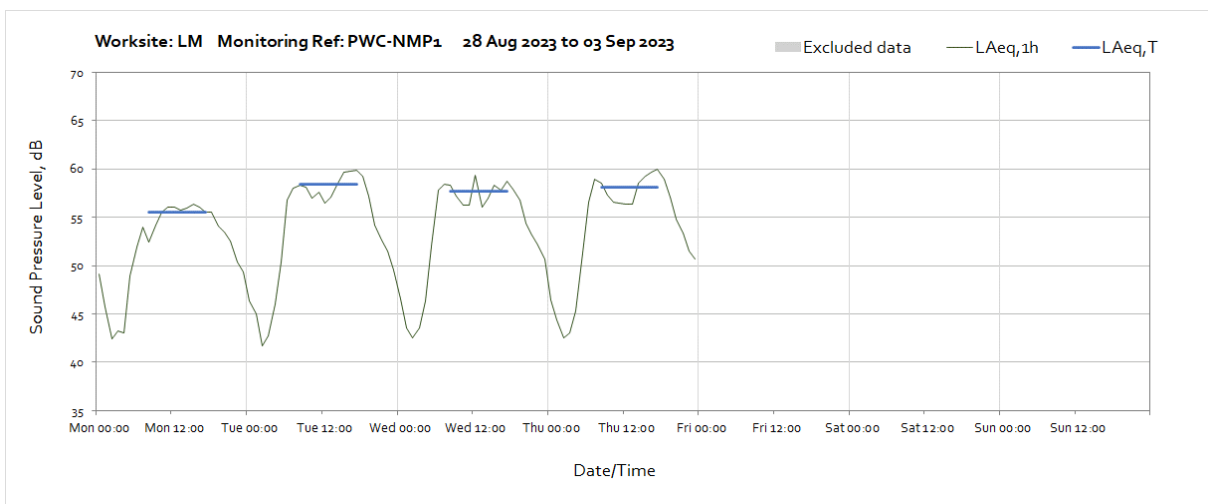
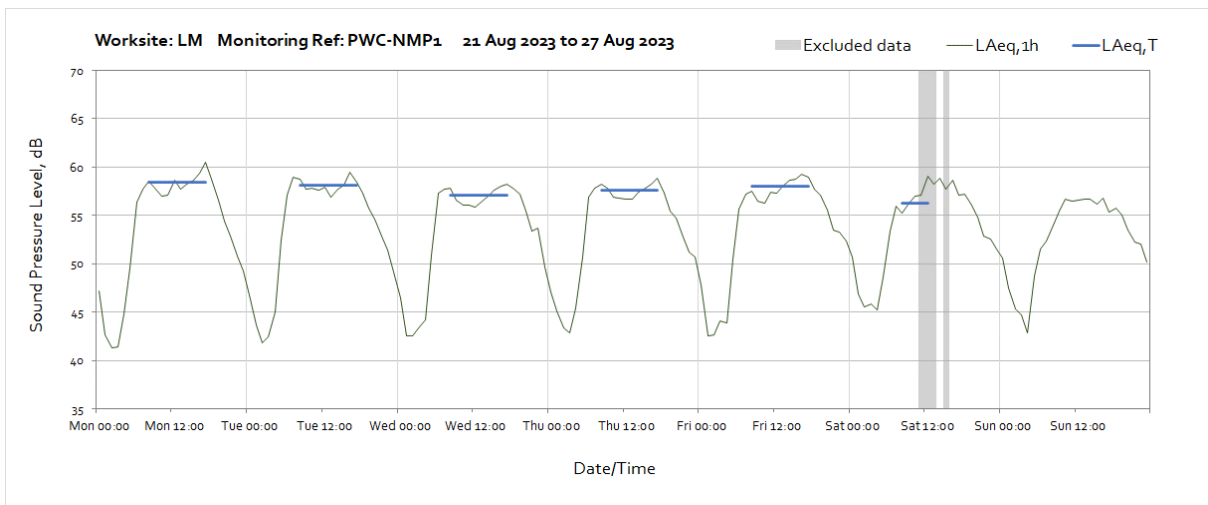
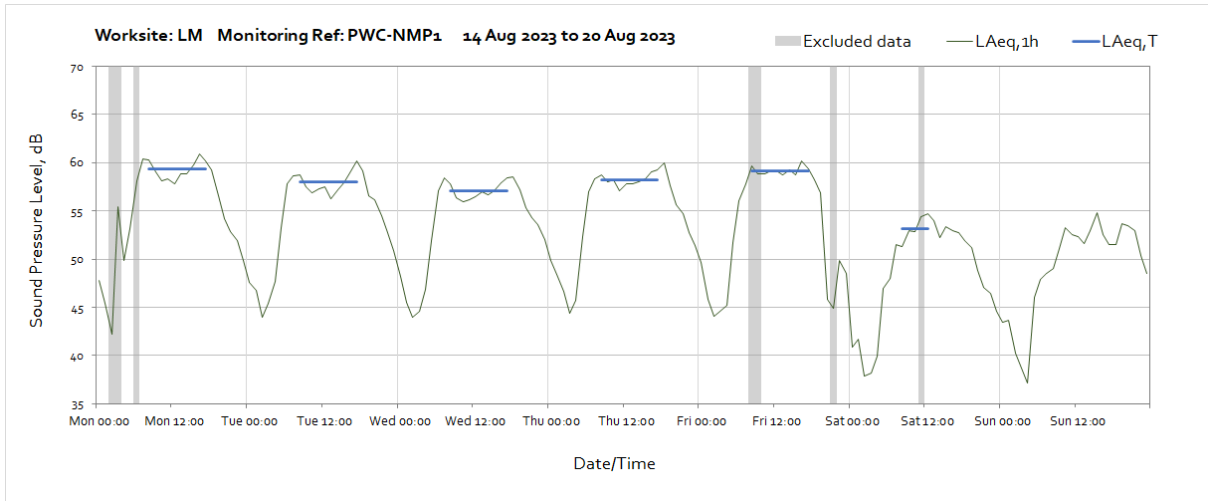




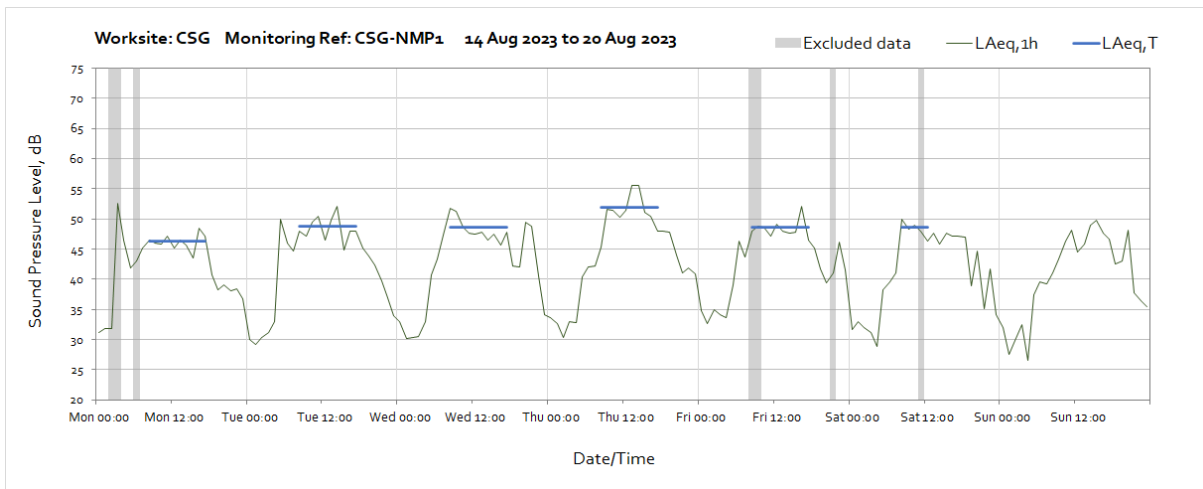
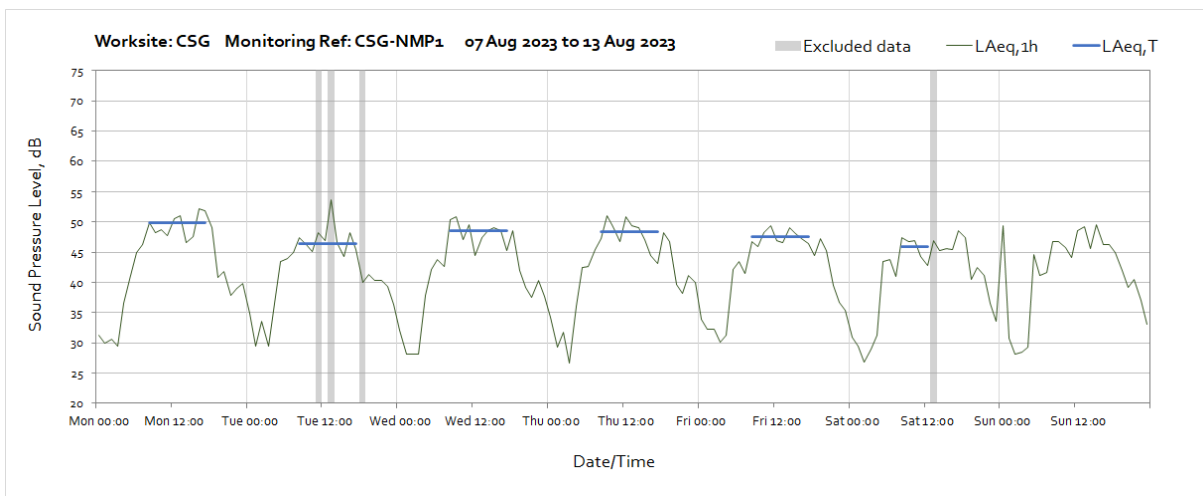
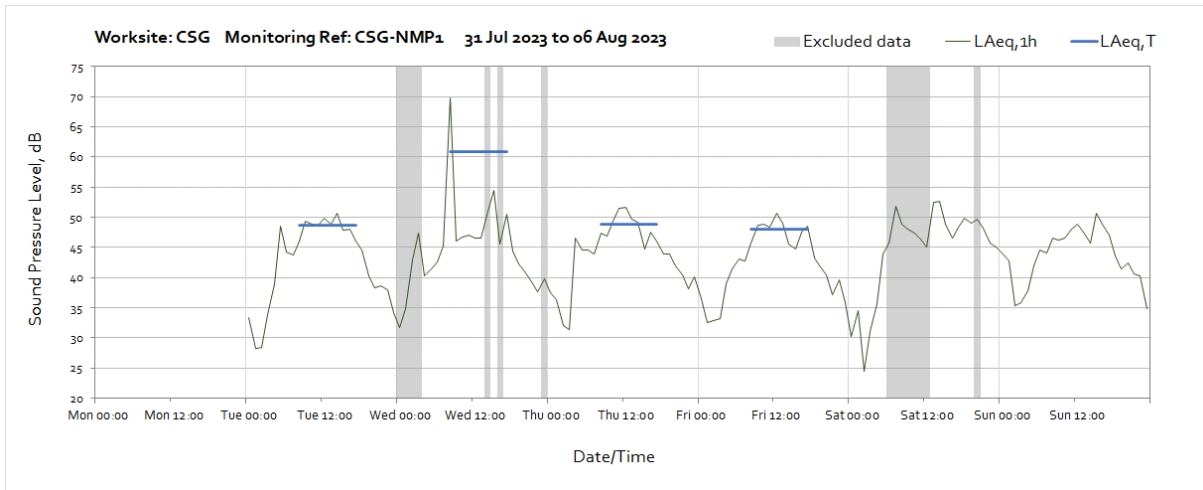


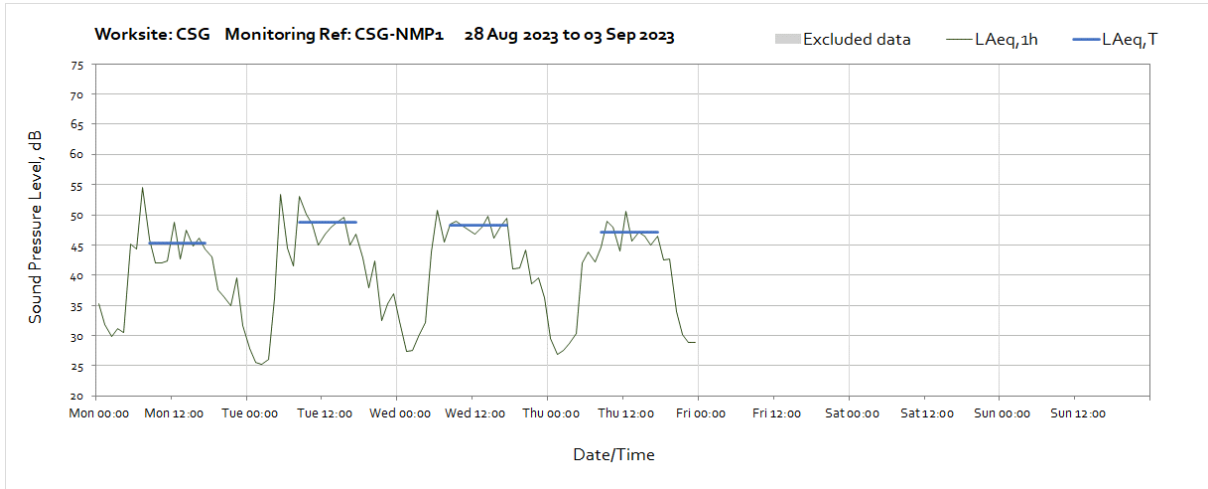
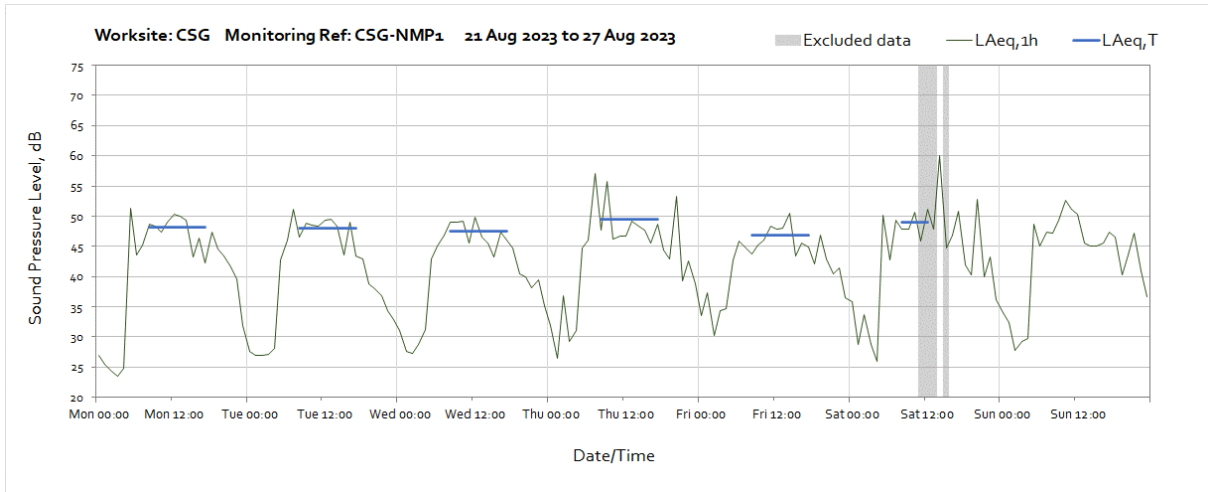
### Worksite: LM – Monitoring Ref: PWC-NMP1



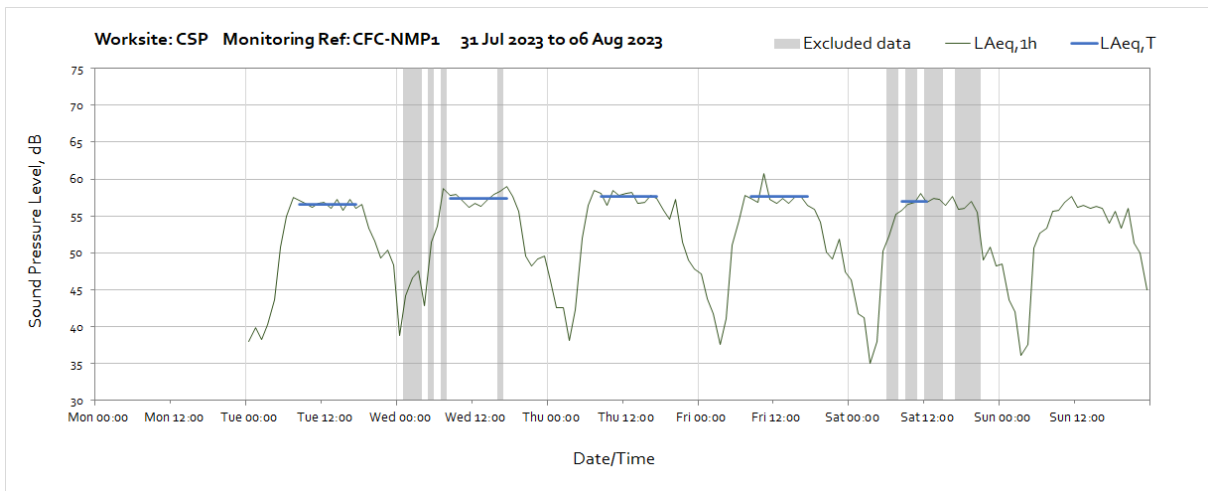


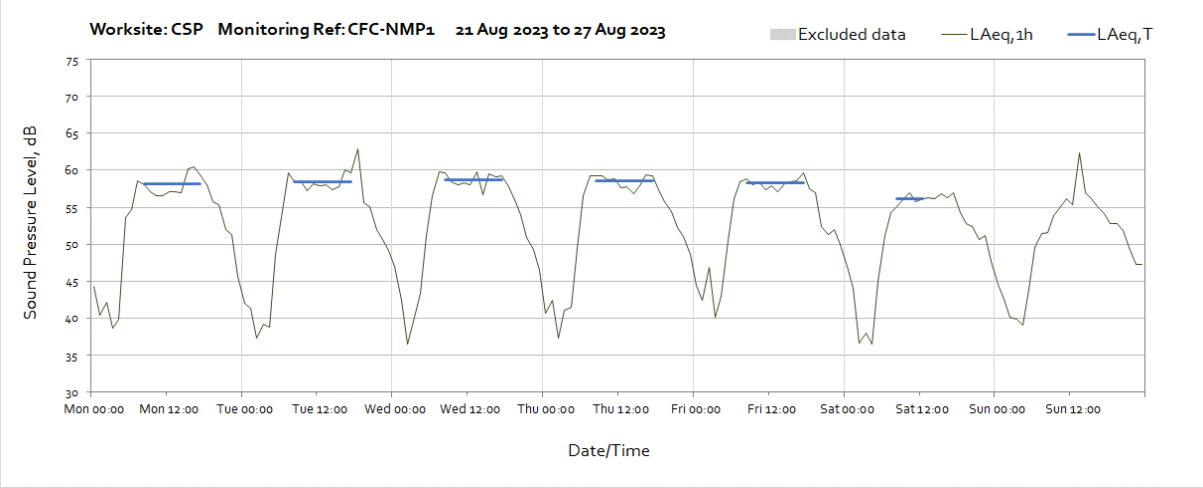
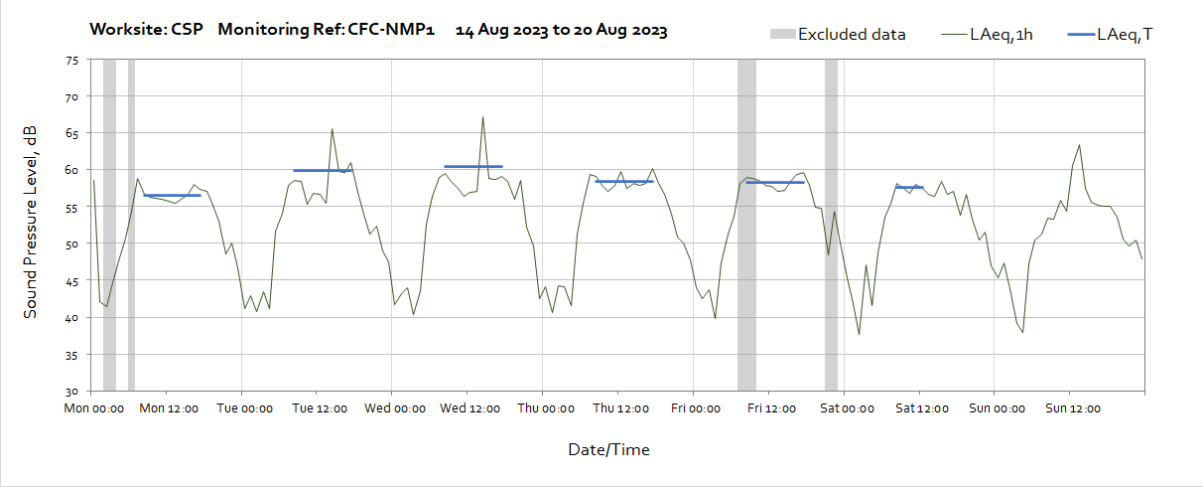
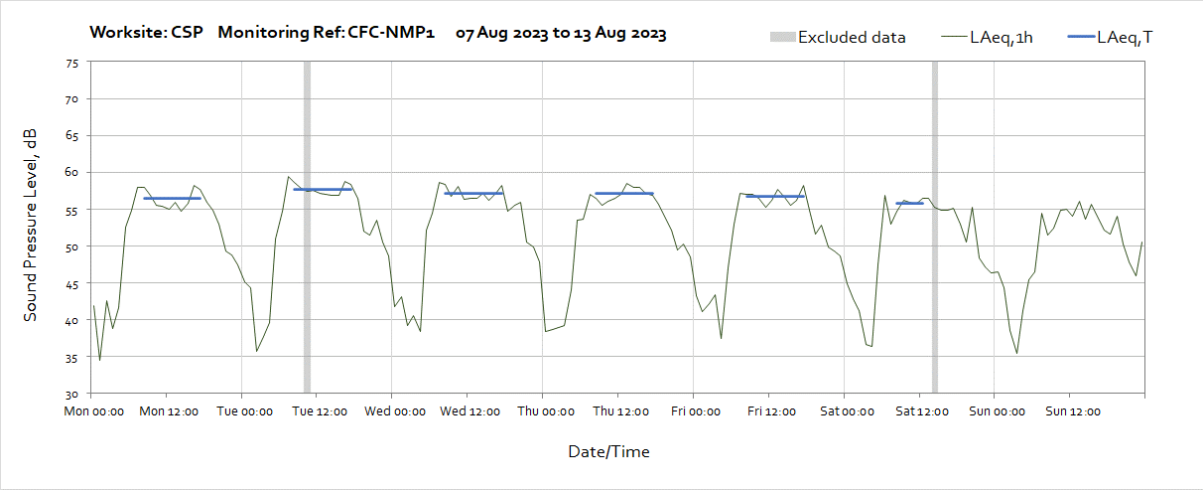
## Worksite: CSG – Monitoring Ref: CSG-NMP1

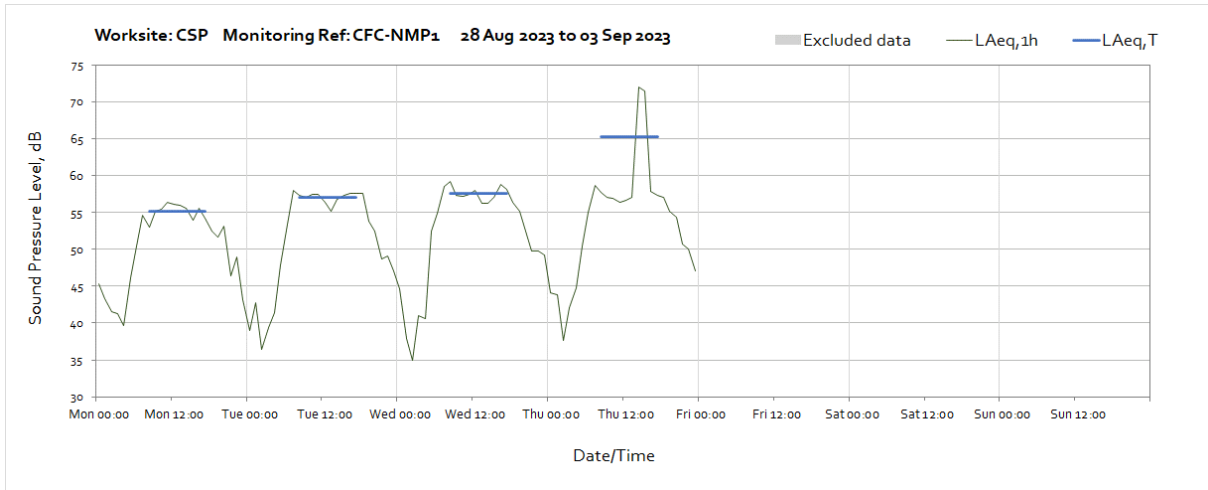




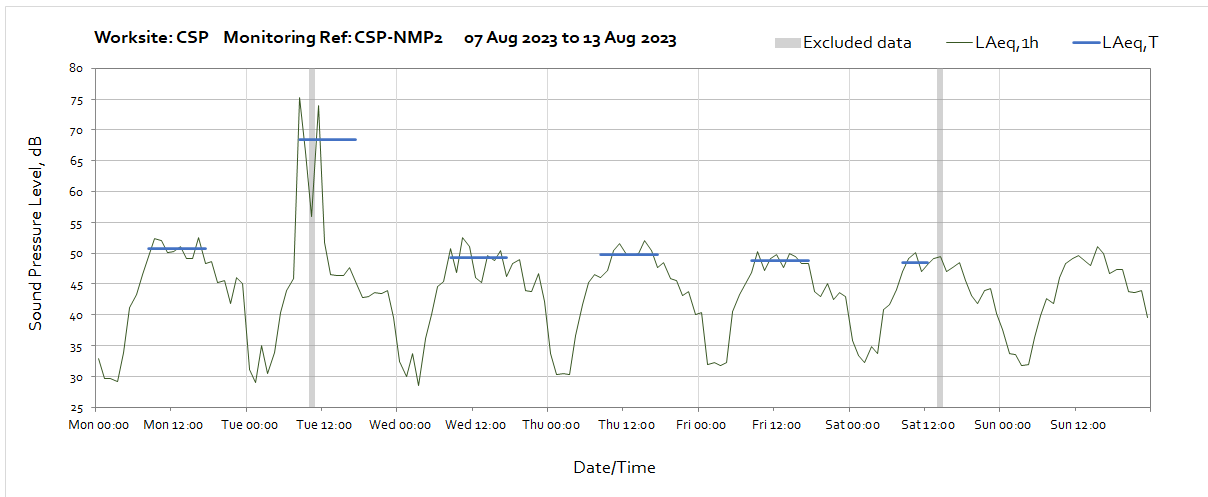
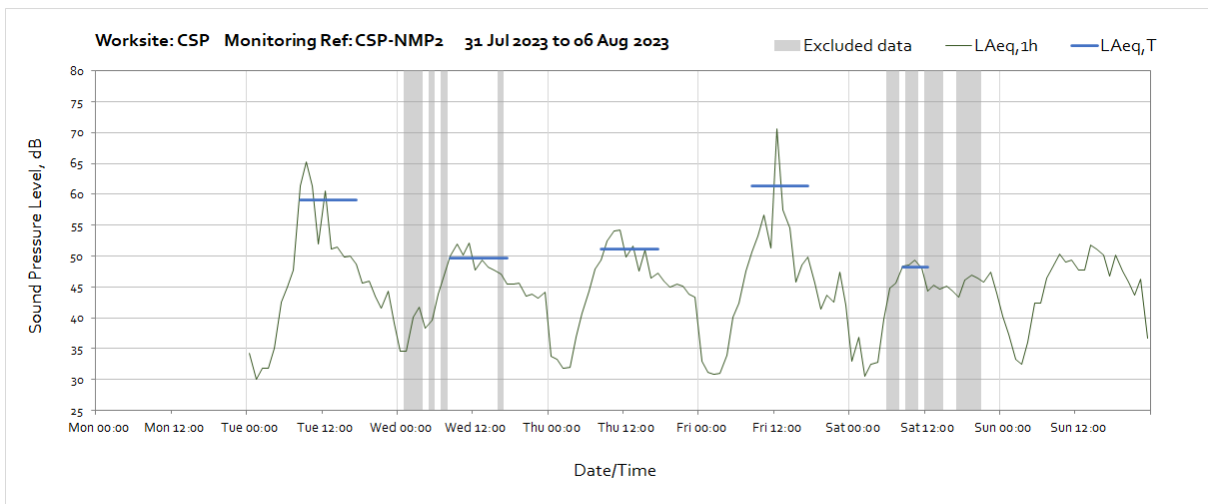
**Worksite: CSP - Monitoring Ref: CFC-NMP1**

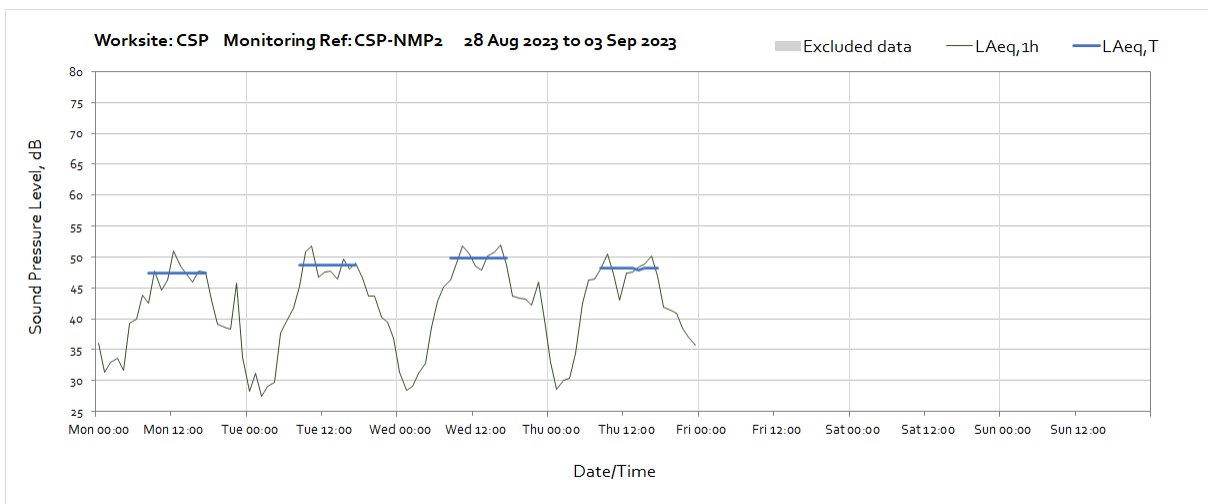
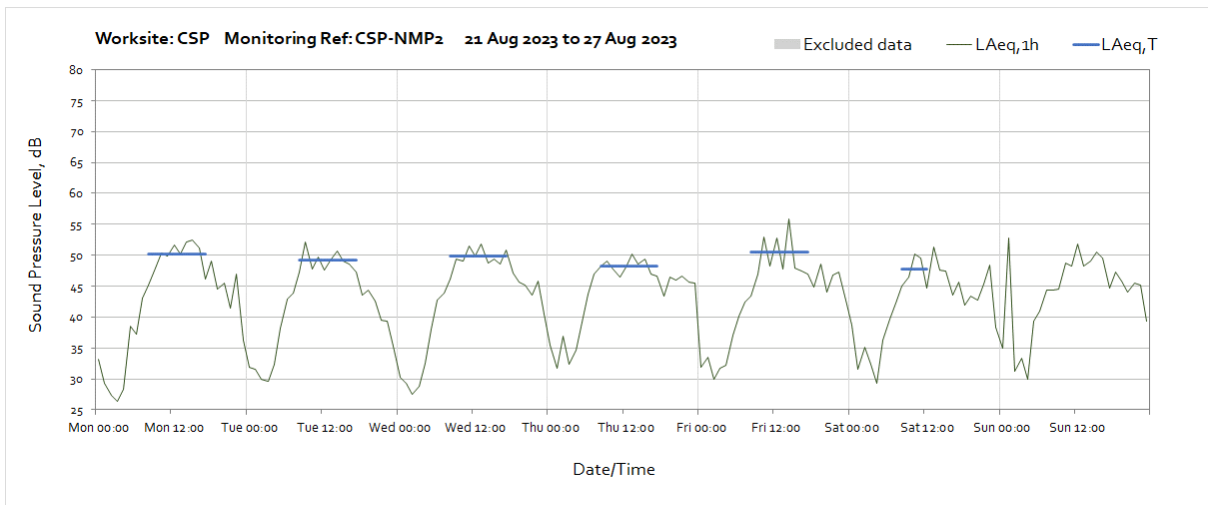
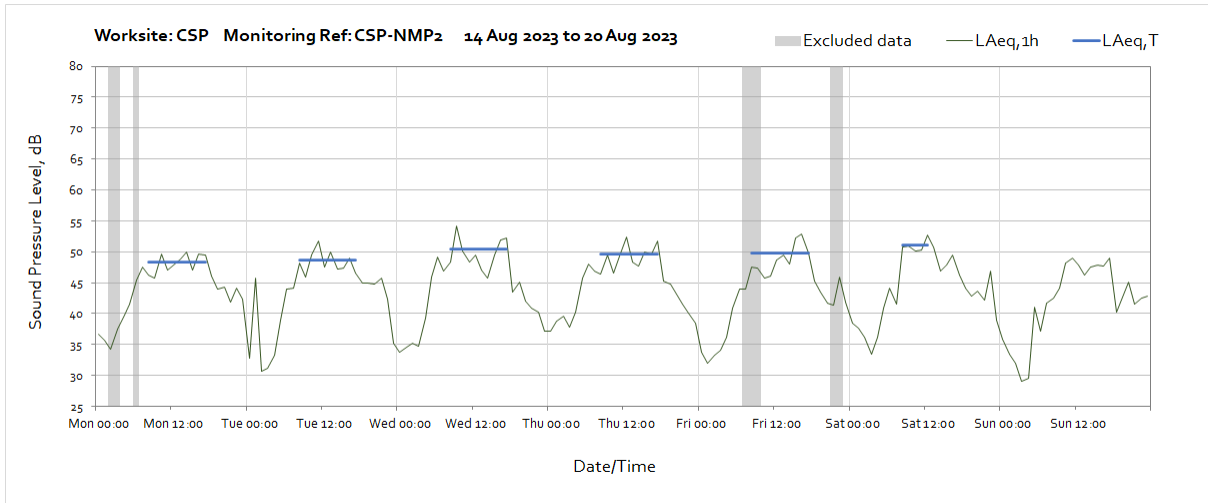






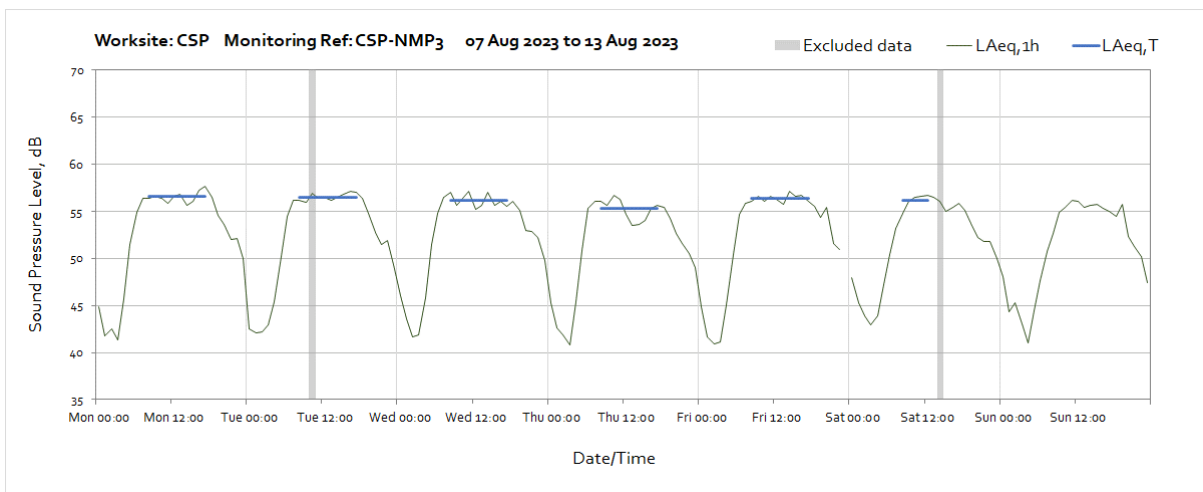
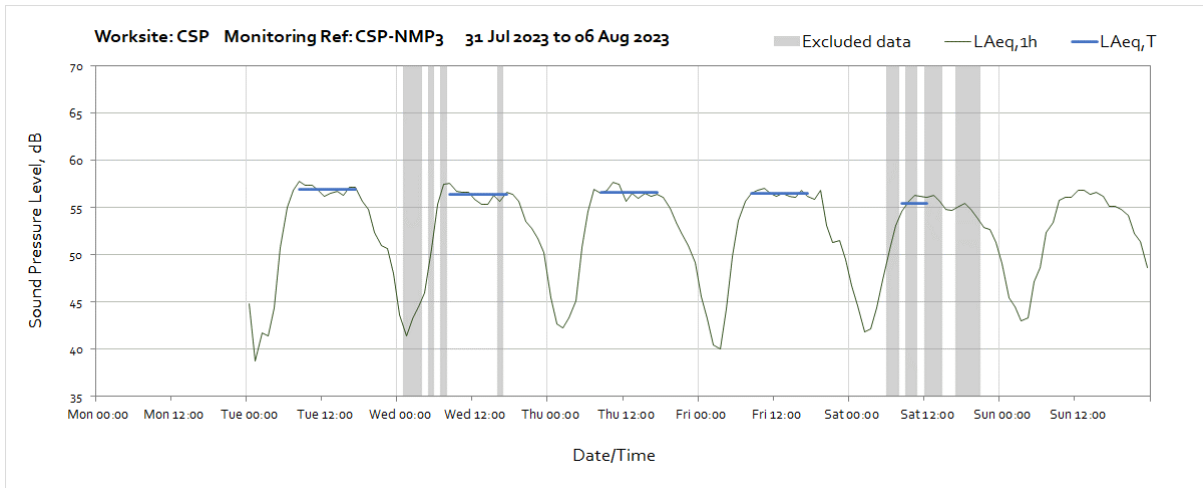
**Worksite: CSP - Monitoring Ref: CSP-NMP2**



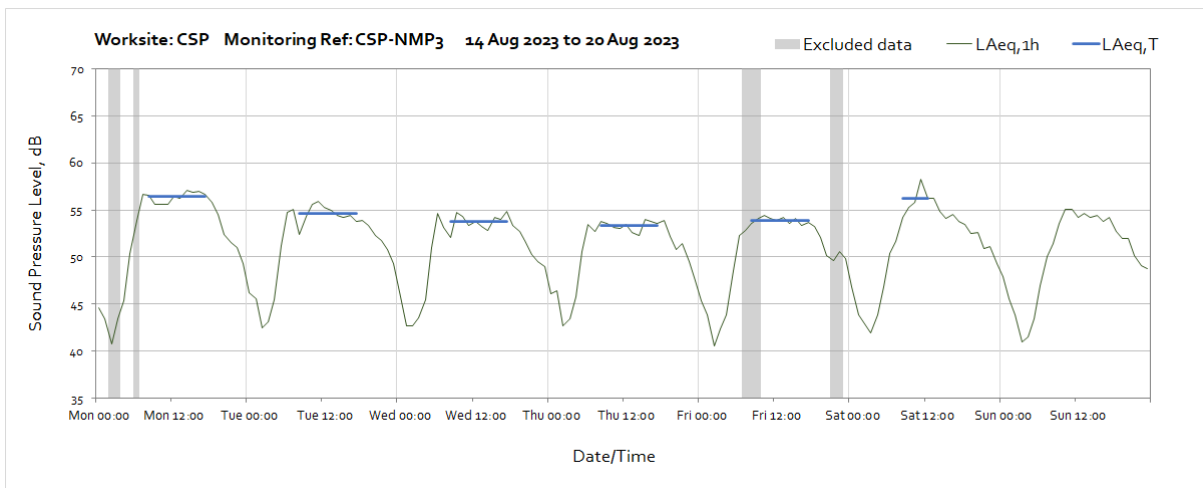


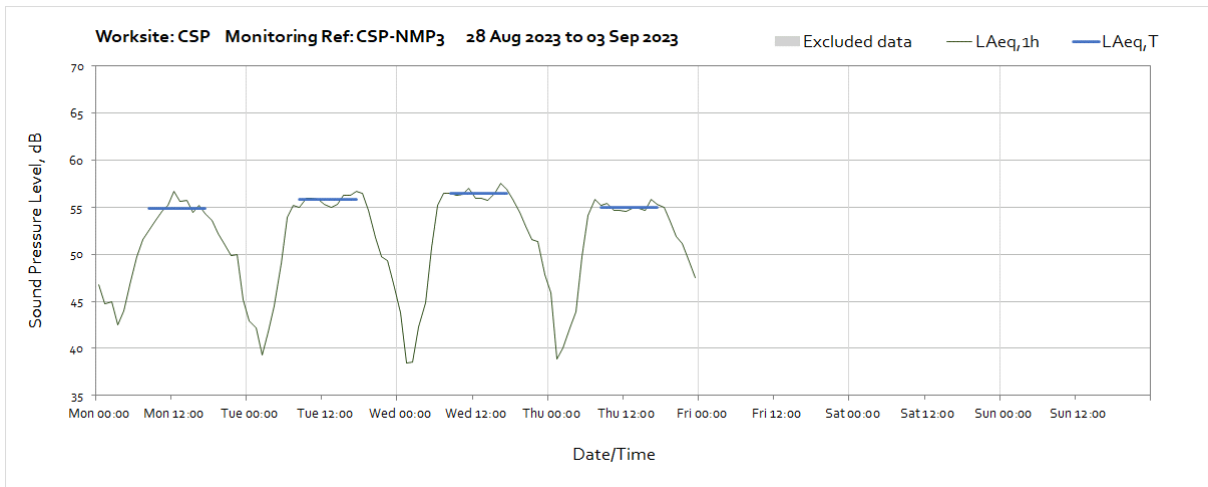
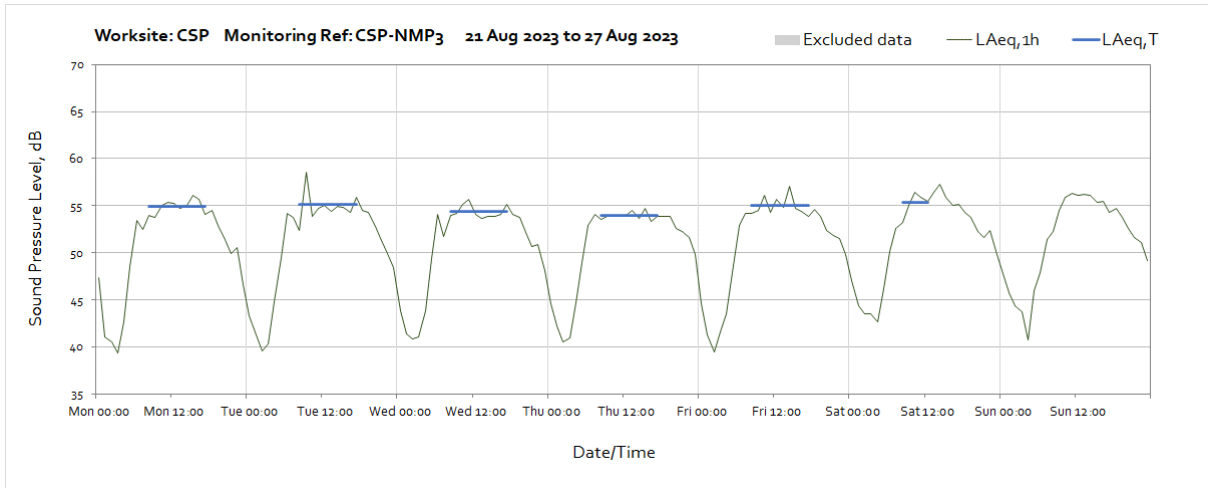


## Worksite: CSP – Monitoring Ref: CSP-NMP3

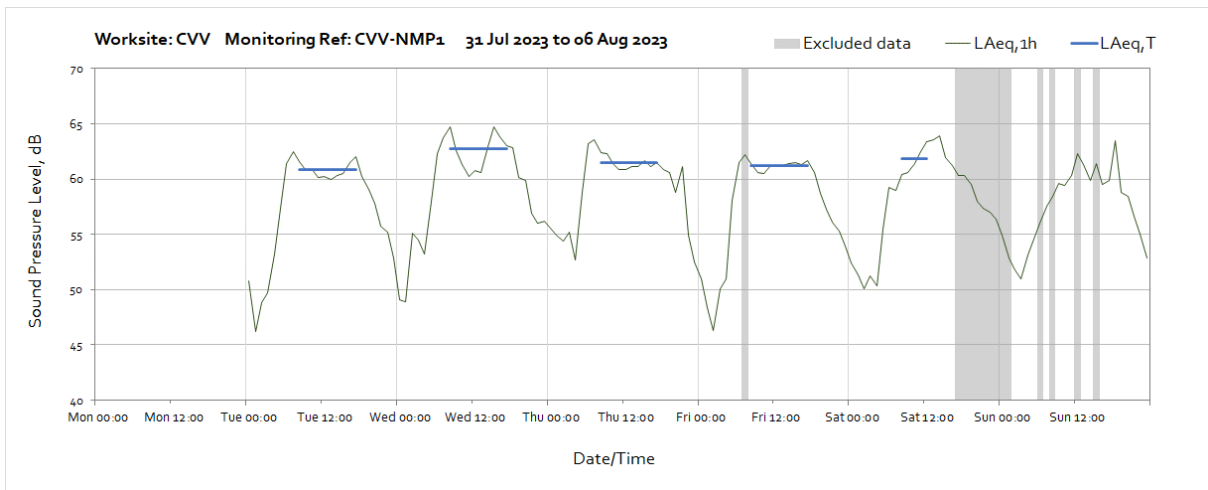


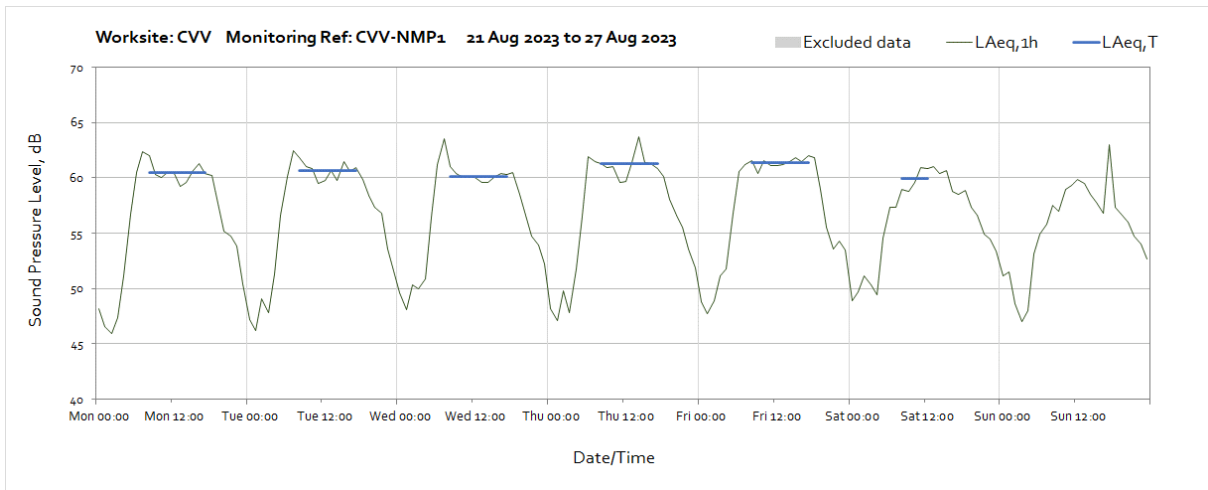
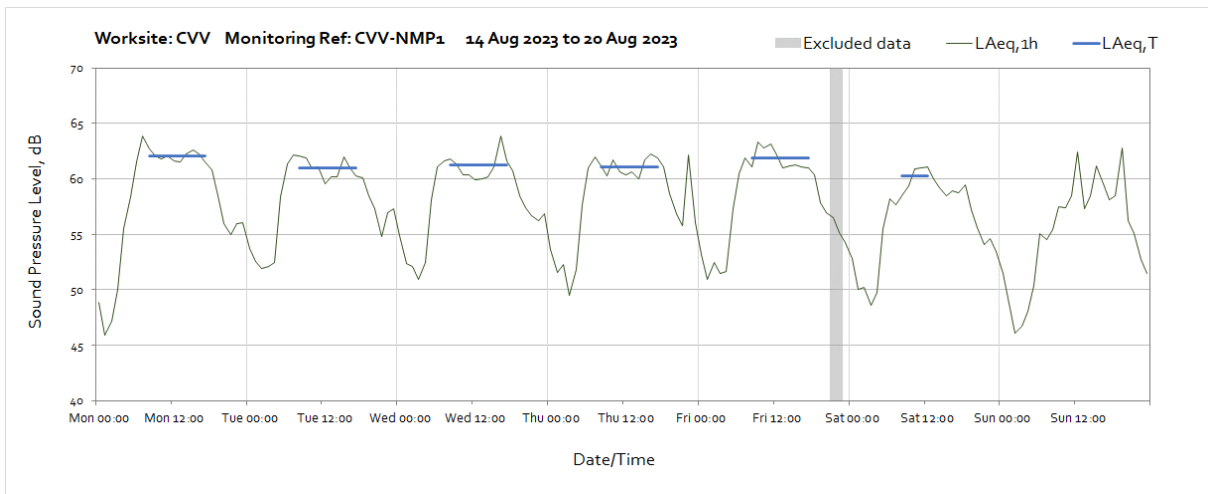
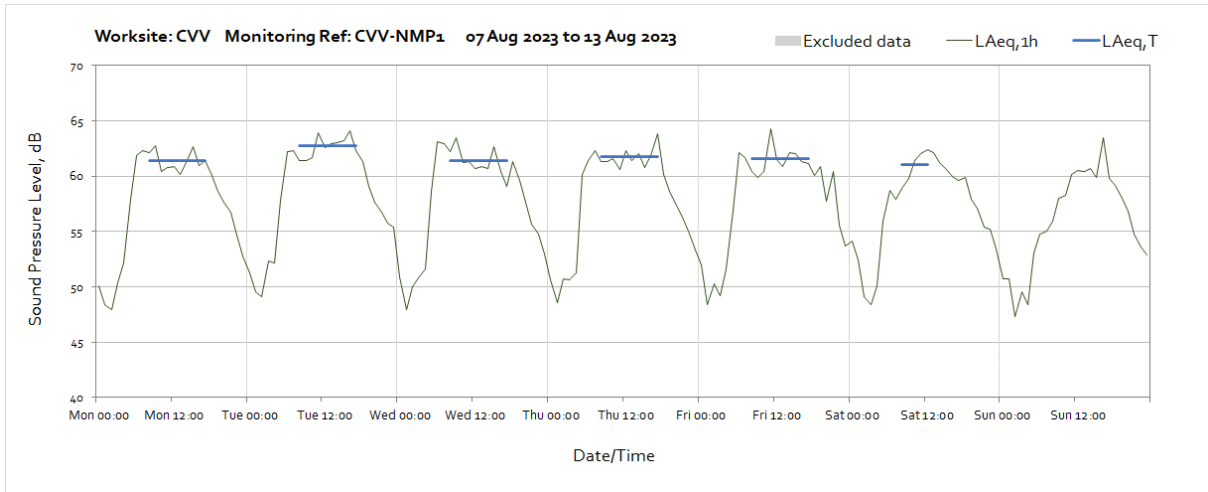
Note: Missing data between 23:00 and 00:00 on Friday 11<sup>th</sup> August was due to monitor settings update.

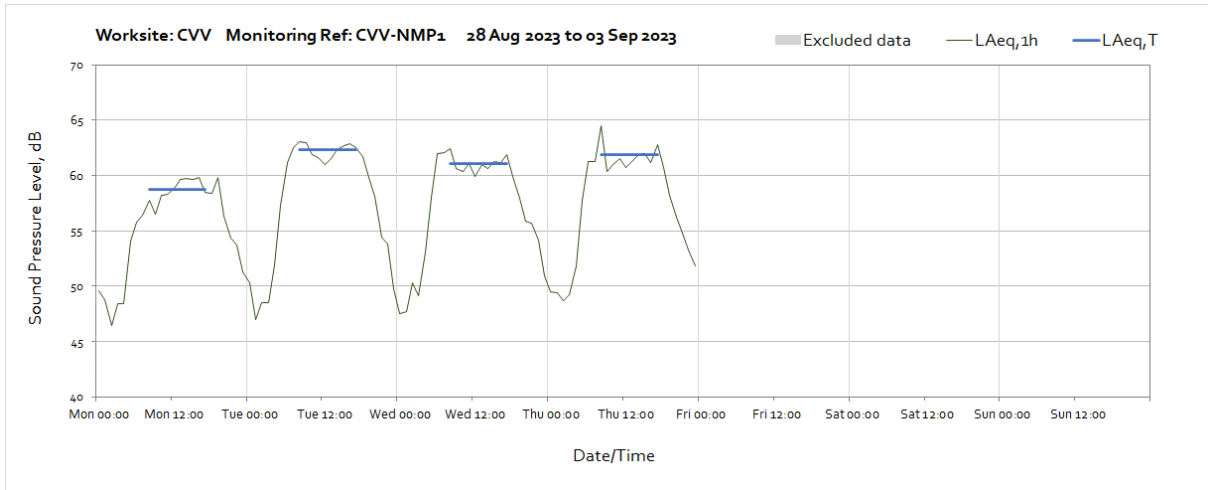




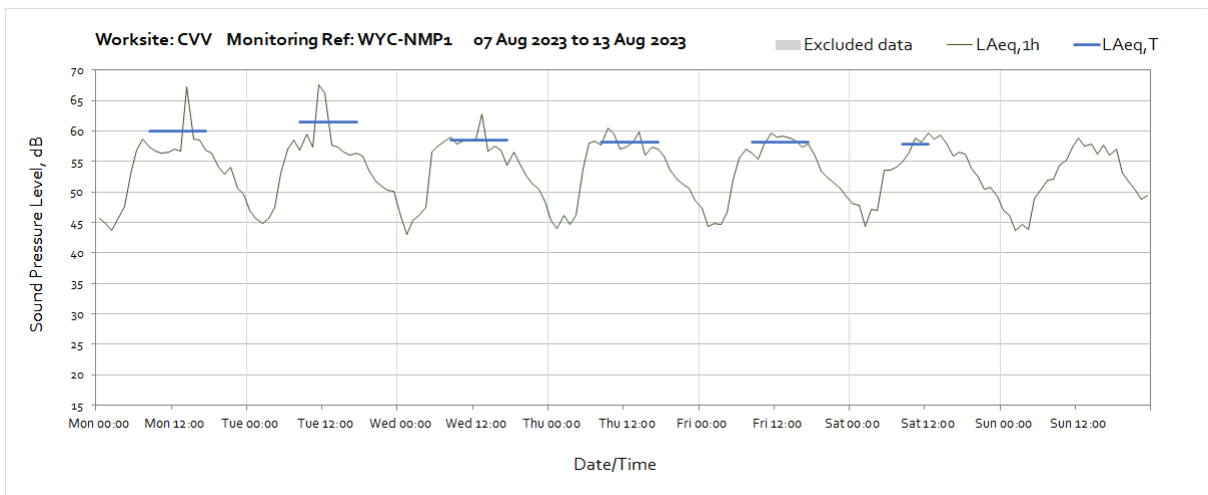
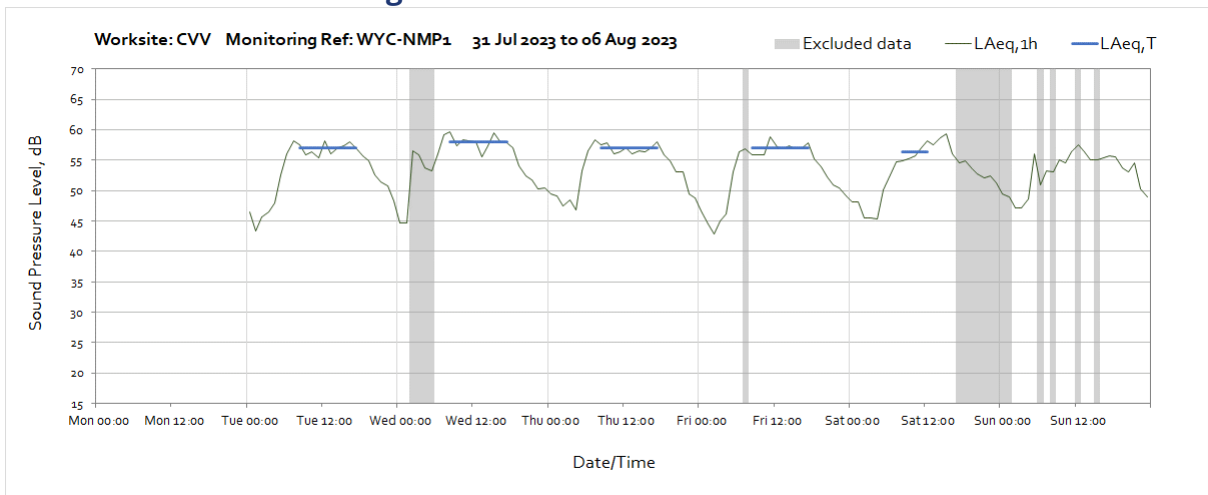
**Worksite: CVV- Monitoring Ref: CVV-NMP1**

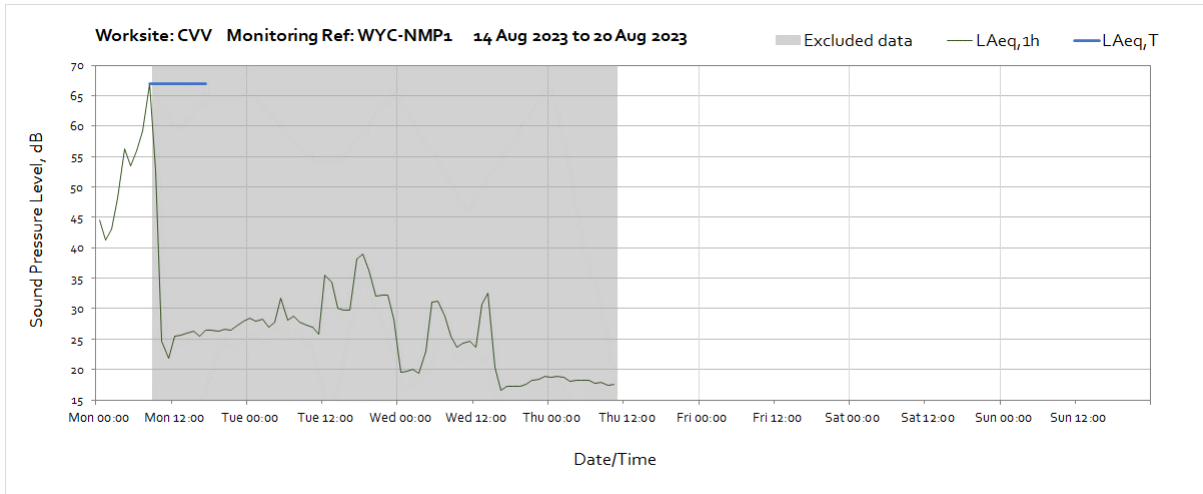






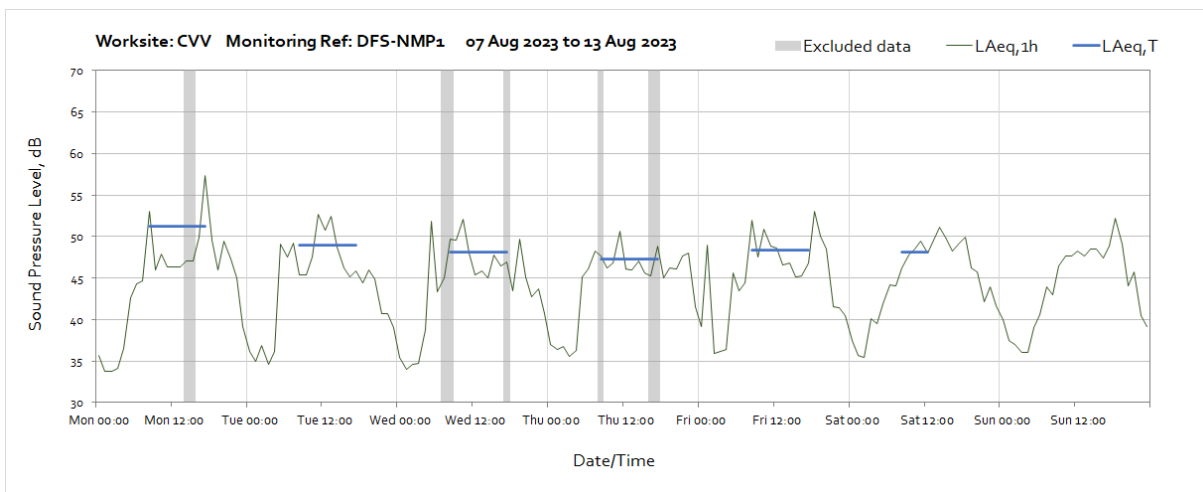
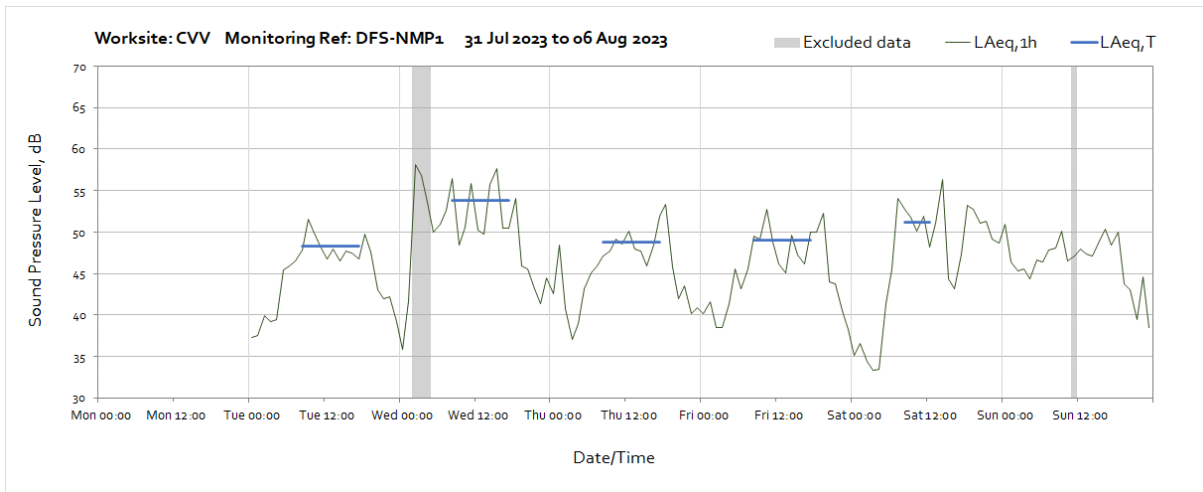
**Worksite: CVV – Monitoring Ref: WYC-NMP1**

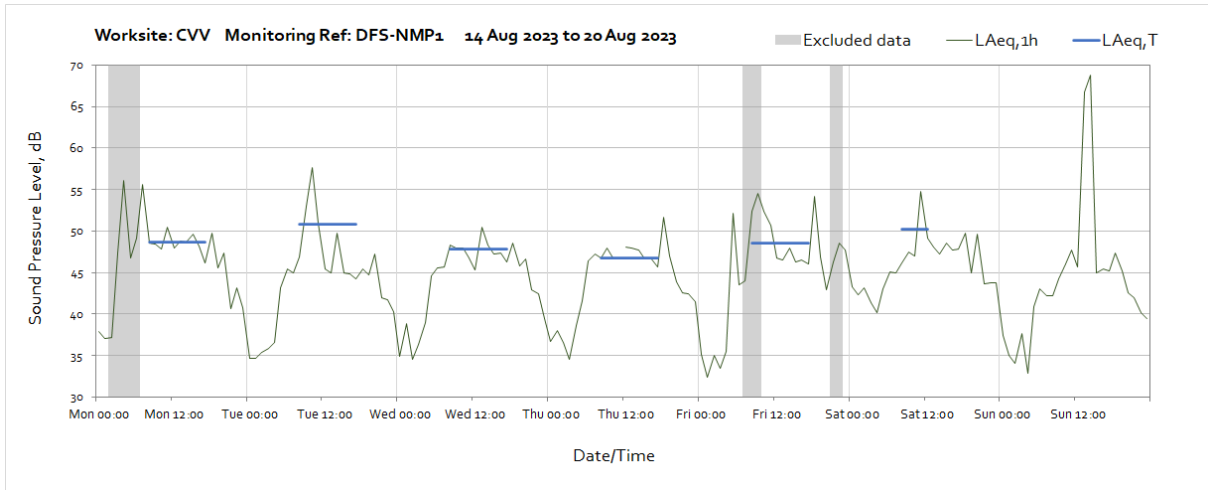




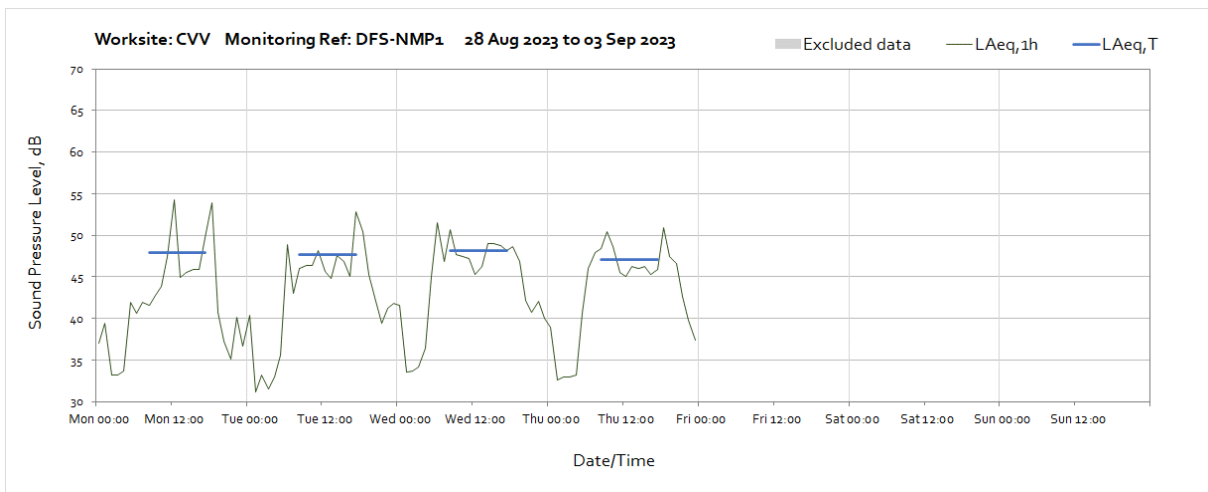
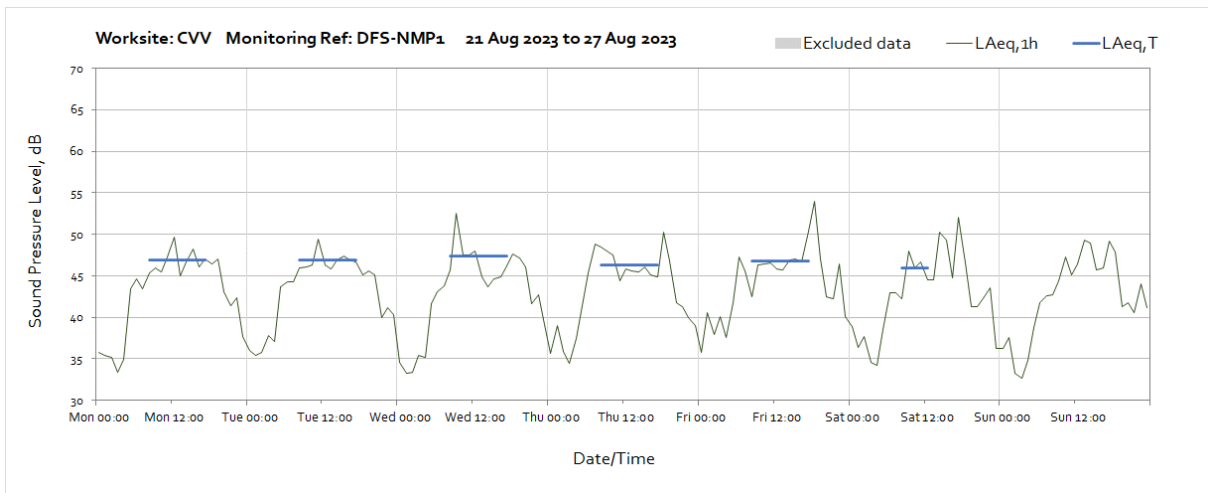
Note: Missing data from 11:00 on Thursday 17<sup>th</sup> August was due to monitor vandalism, monitor has now be decommissioned.

### Worksite: CVV - Monitoring Ref: DFS-NMP1

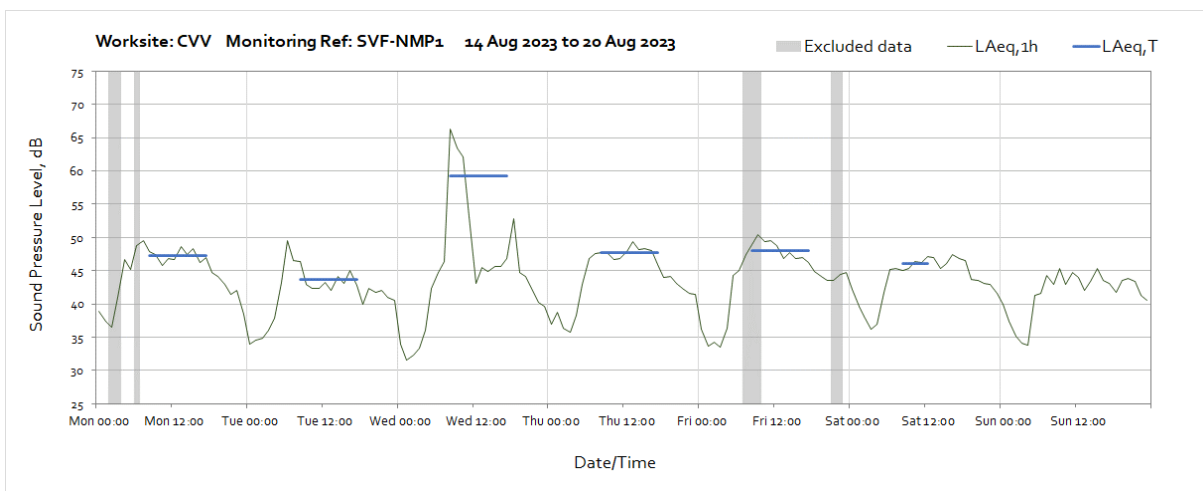
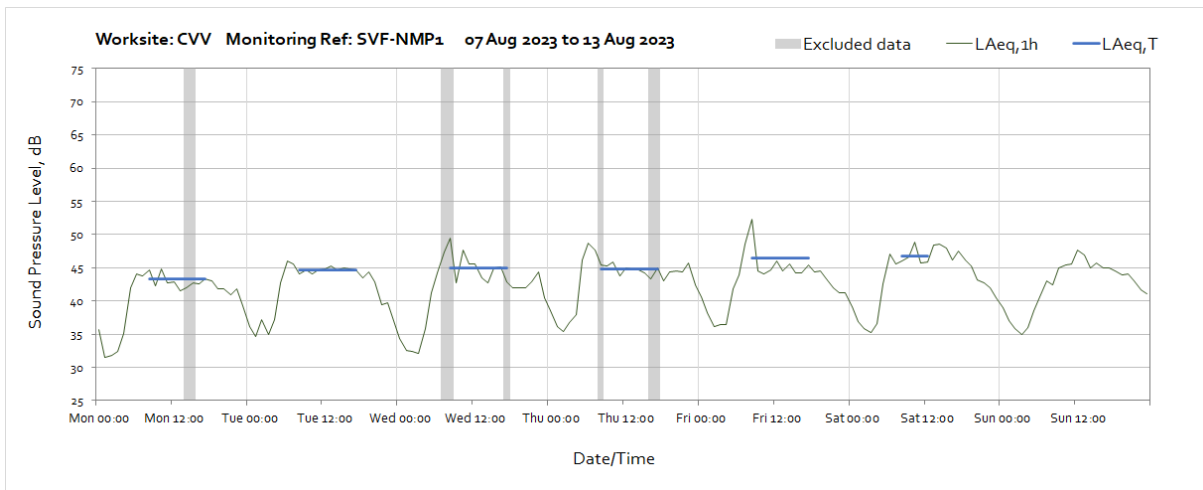
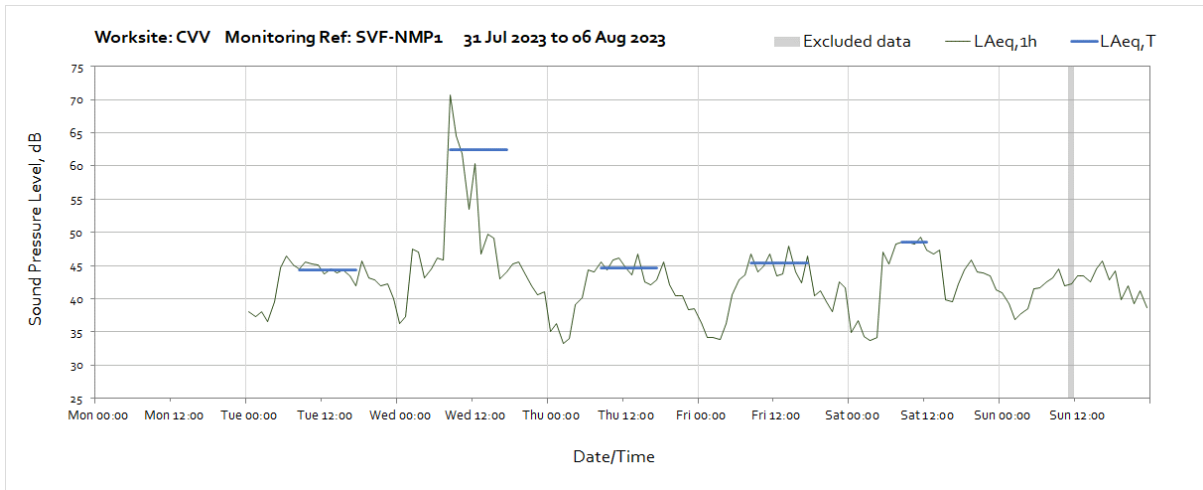


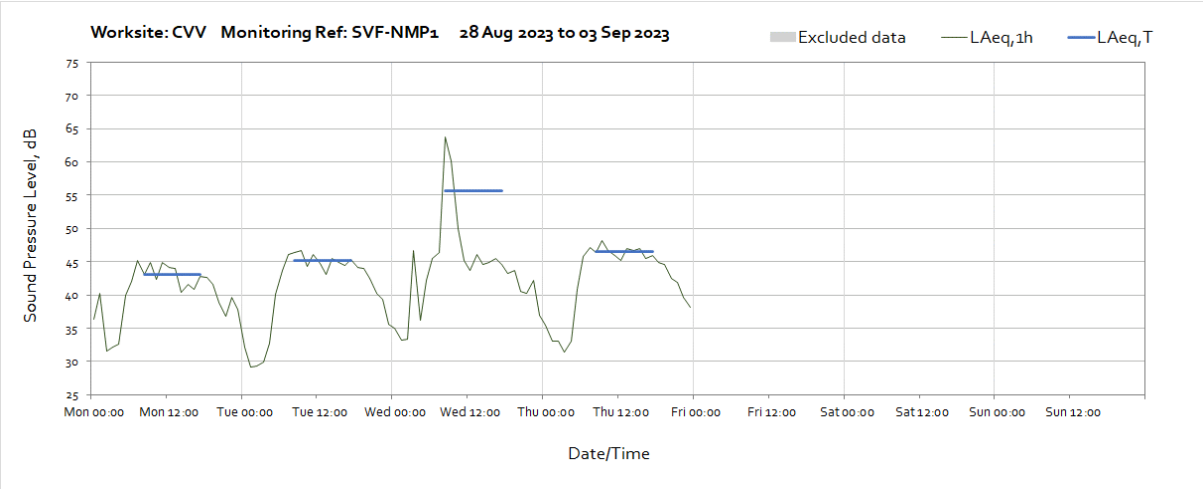
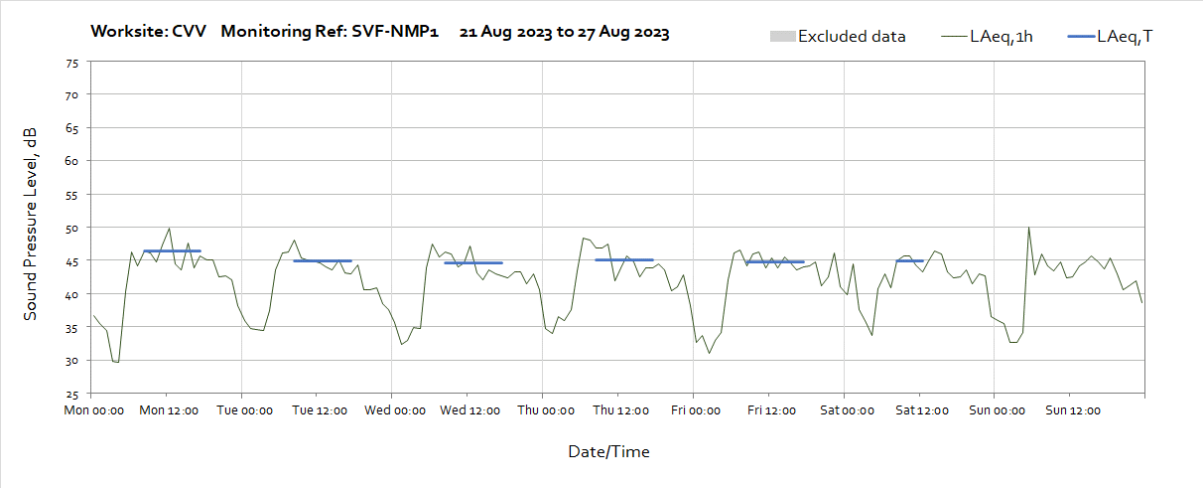


Note: Missing data between 11:00 and 12:00 on Thursday 17<sup>th</sup> August was due to monitor maintenance.



## Worksite: CVV – Monitoring Ref: SVF-NMP1



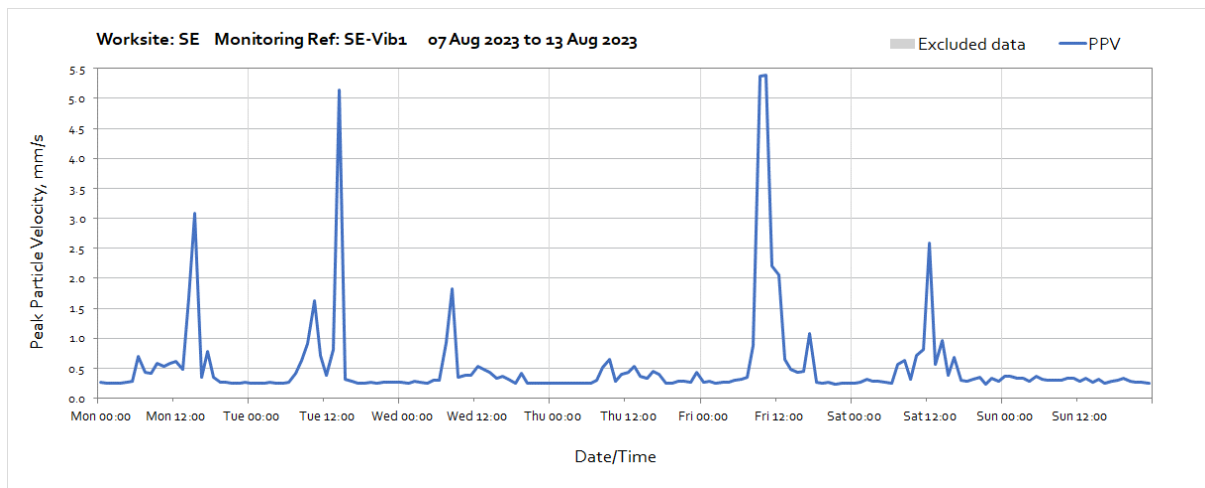
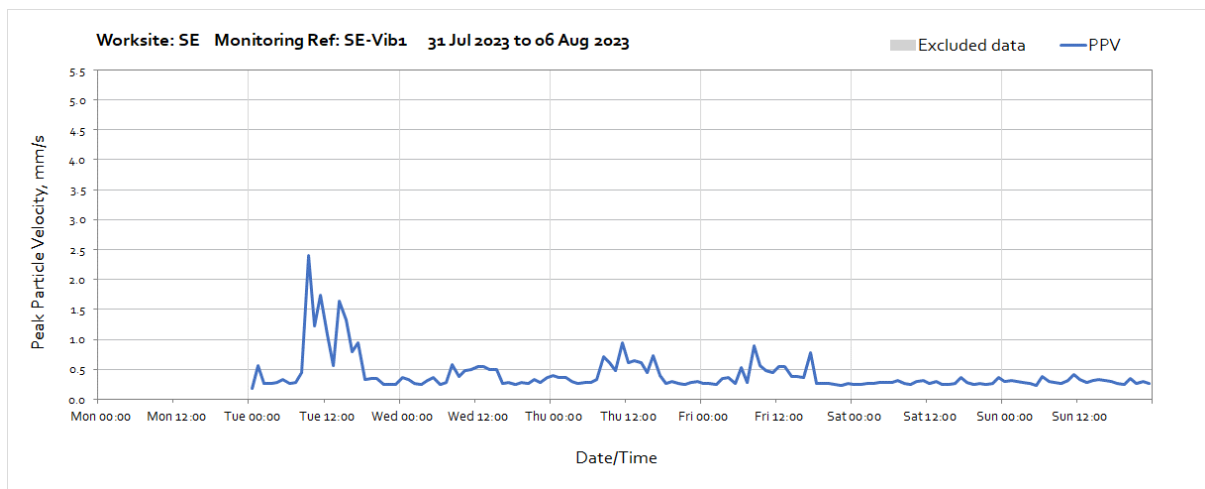




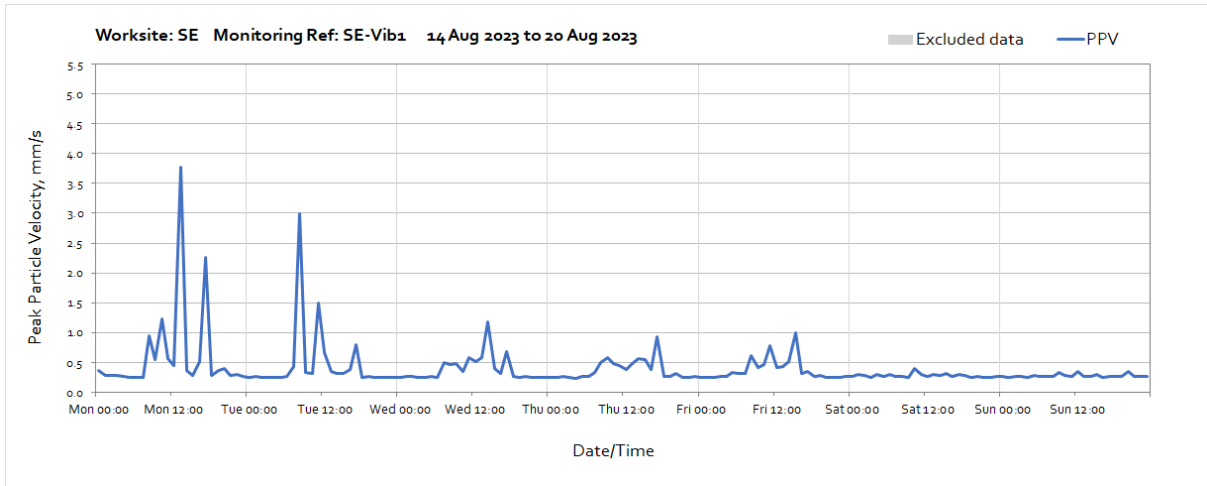
## Vibration

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

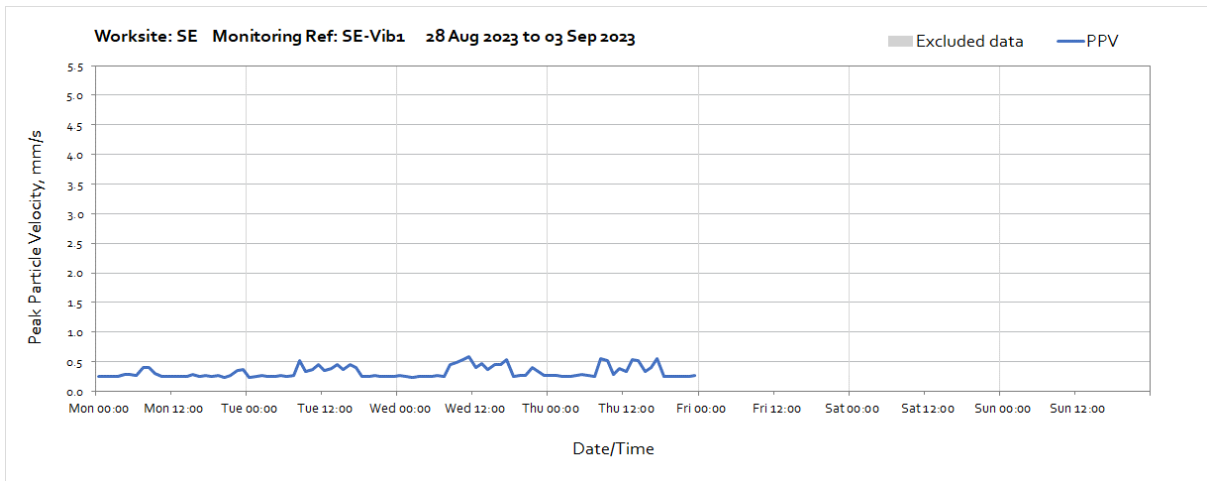
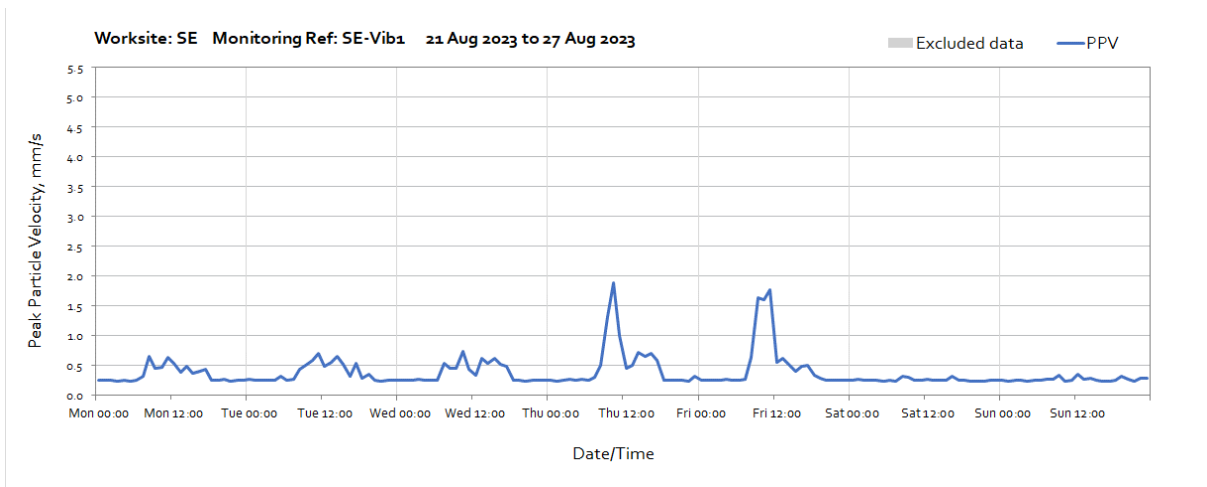
### Worksite: SE – Monitoring Ref: SE-Vib 1



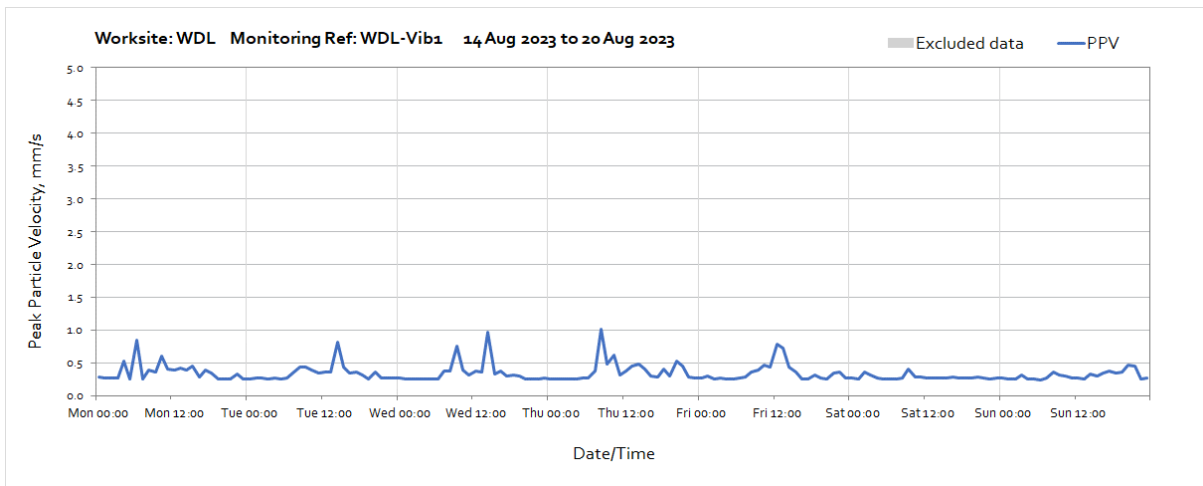
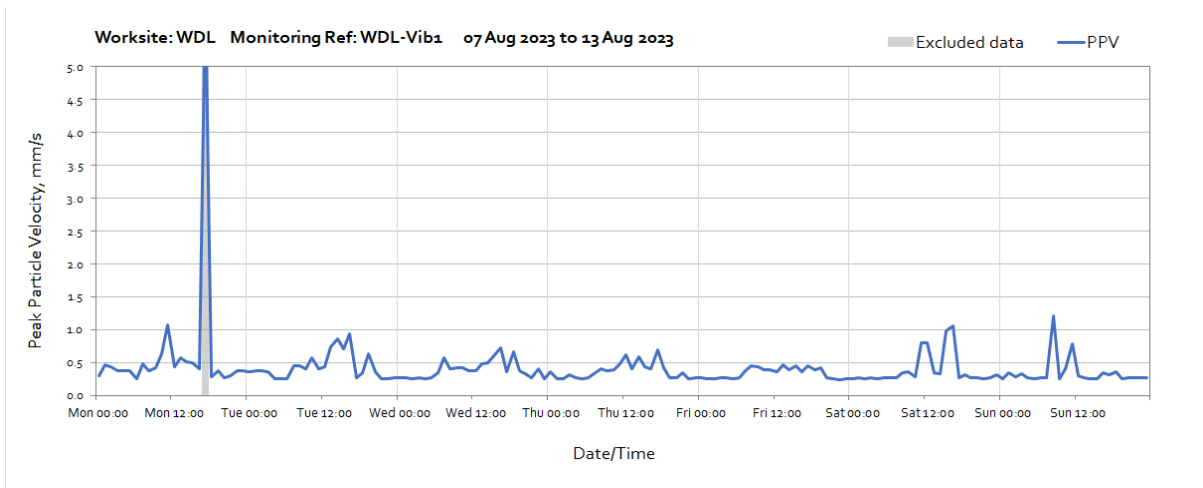
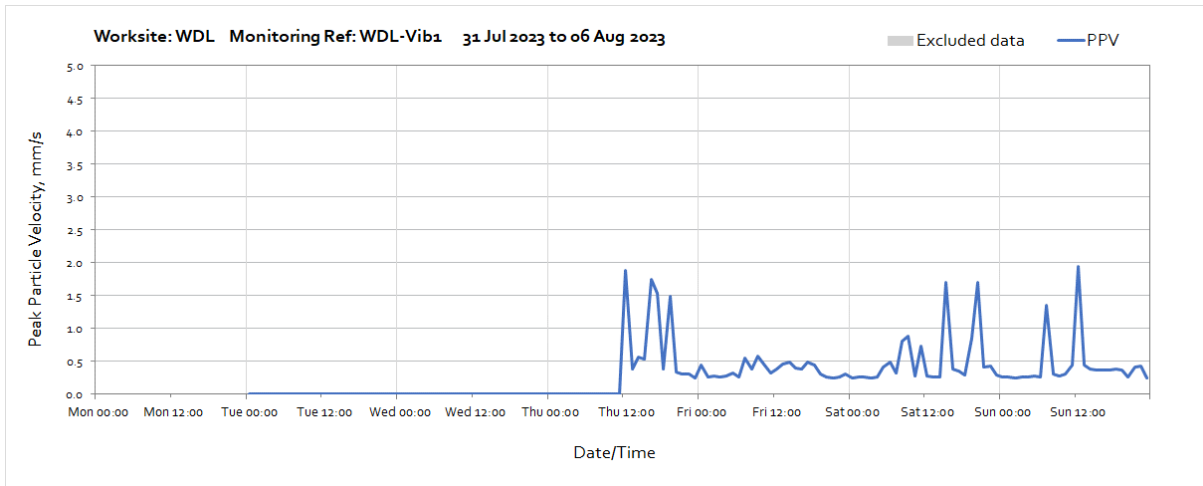
Note: High vibration levels throughout the week were due to excavation works.

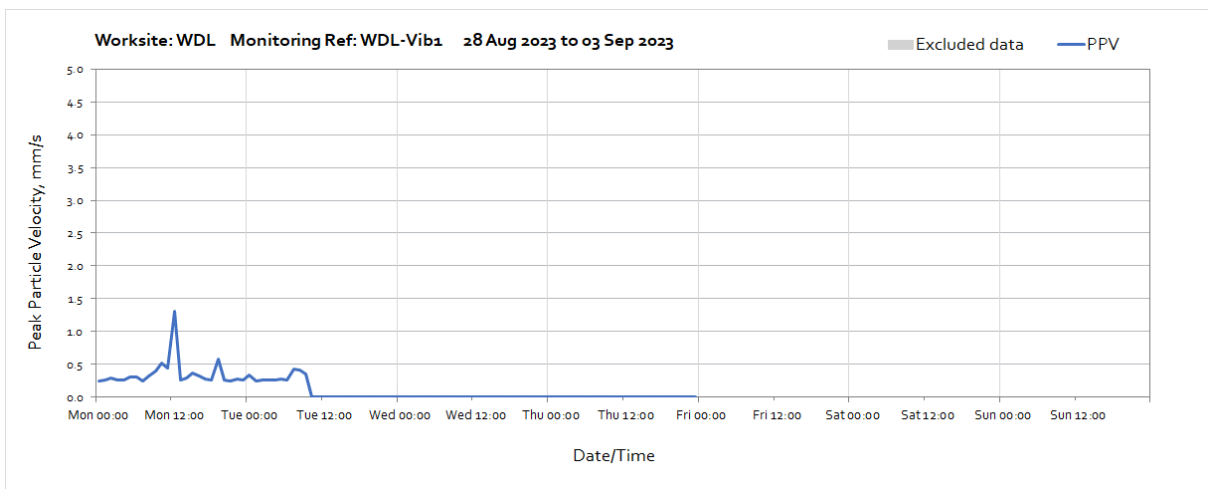
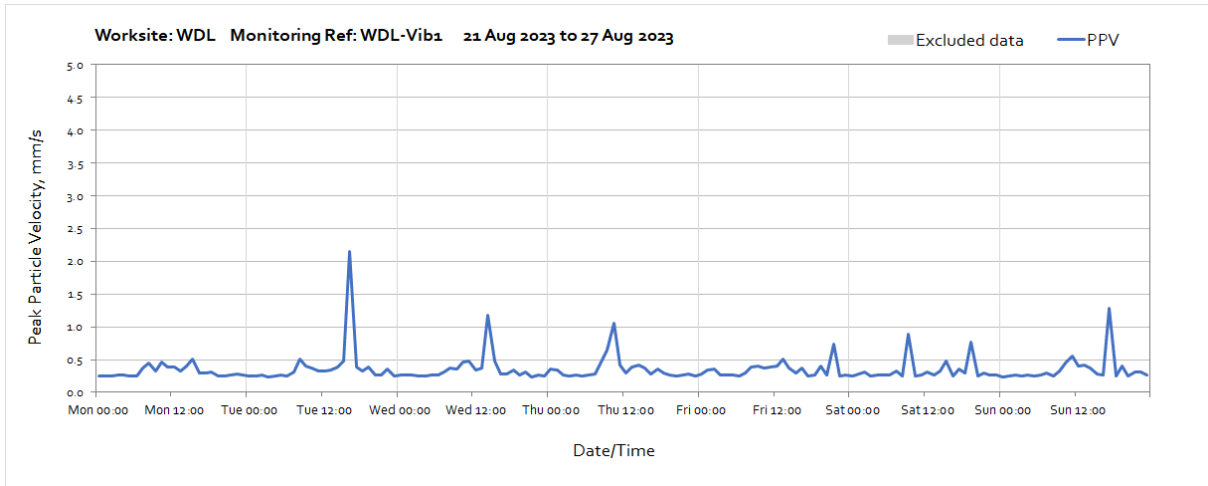


Note: High vibration levels throughout the week were due to excavation works.

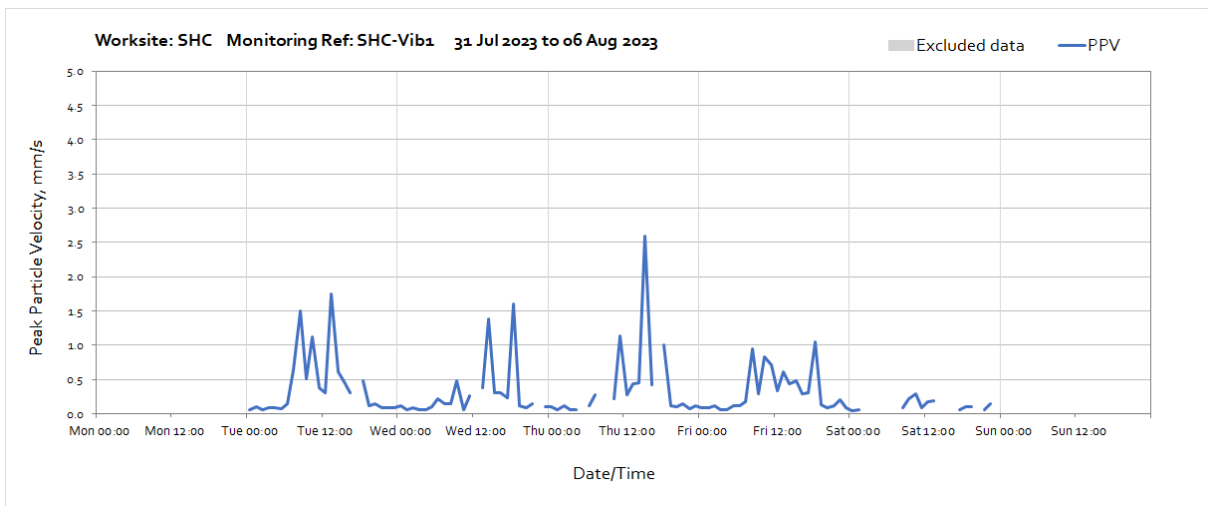


## Worksite: WDL – Monitoring Ref: WDL-Vib1

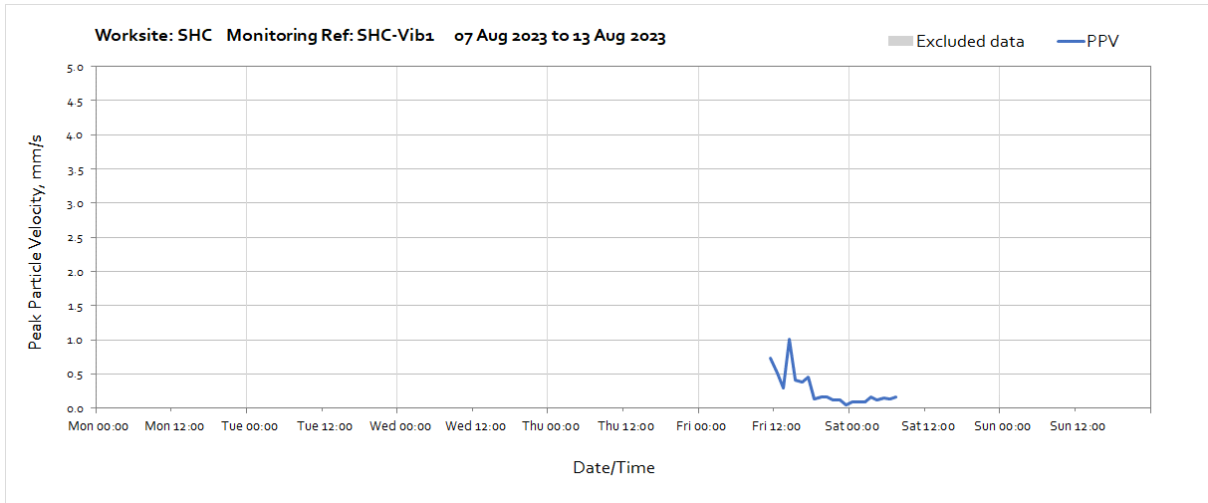




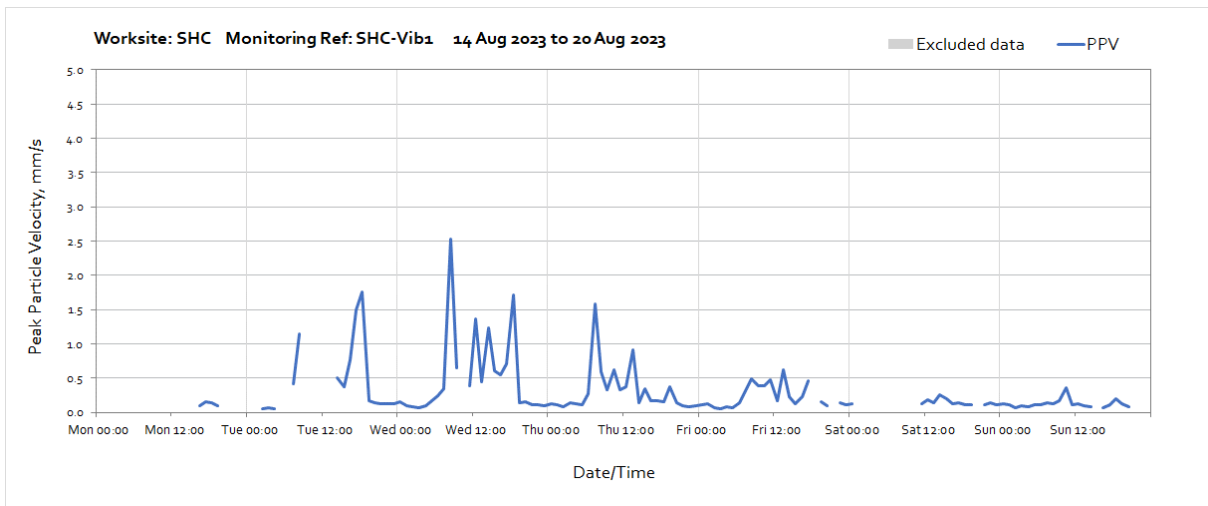
### Worksite: SHC – Monitoring Ref: SHC-Vib1



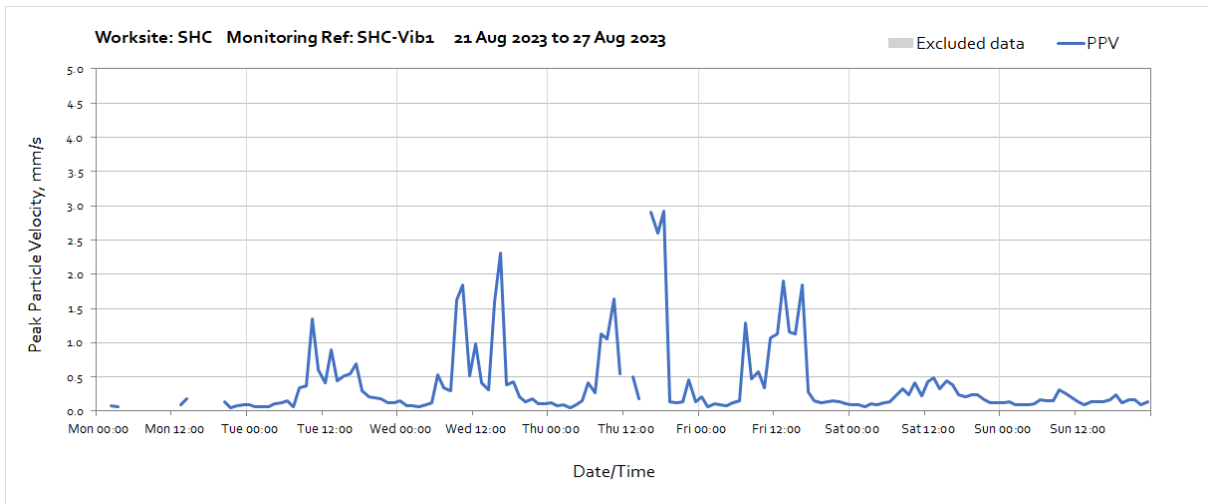
Note: Missing data throughout the week was due to poor signal.



Note: Missing data throughout the week was due to loss of power.

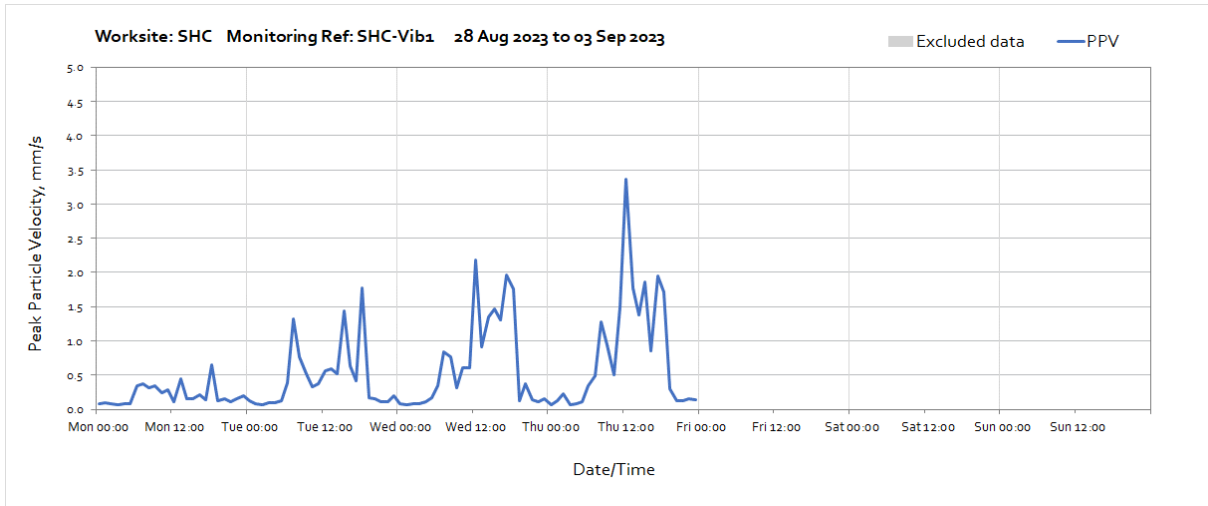


Note: Missing data throughout the week was due to poor signal.

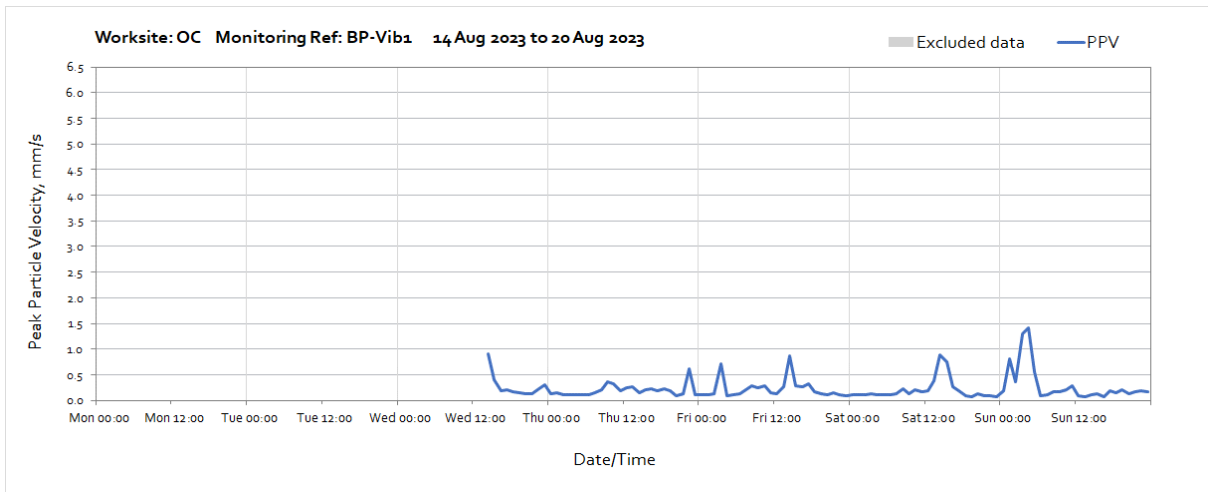


Note: Missing data throughout the week was due to poor signal.

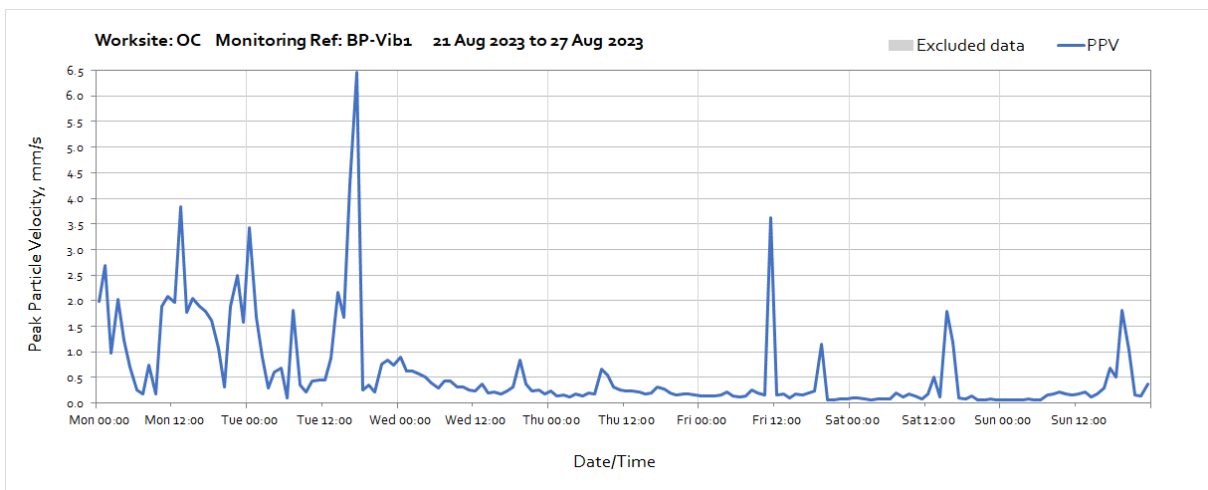
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**Worksite: OC – Monitoring Ref: BP-Vib1**

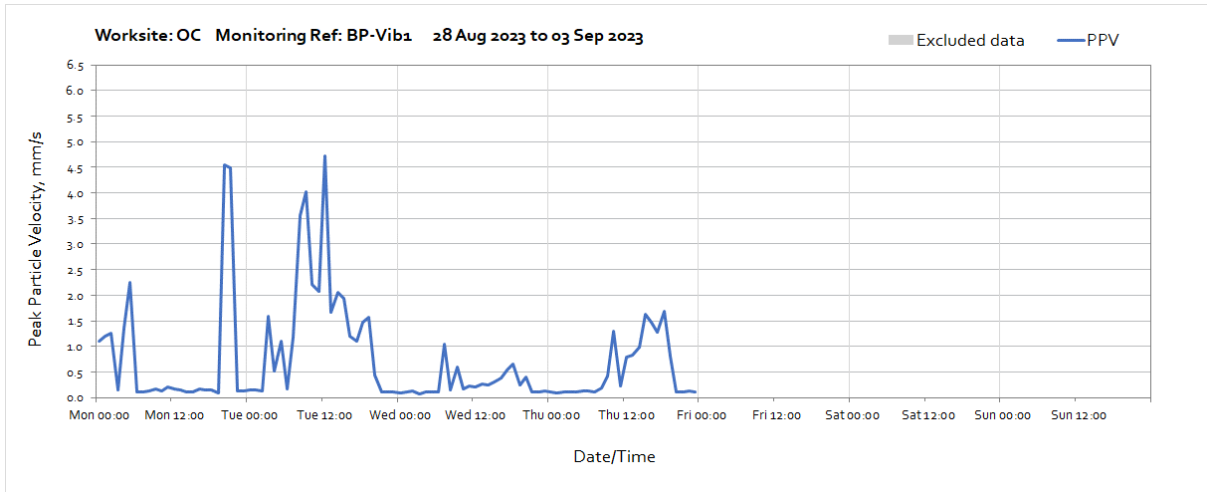


Note: Monitor was installed at 14:00 on Wednesday 16<sup>th</sup> August.



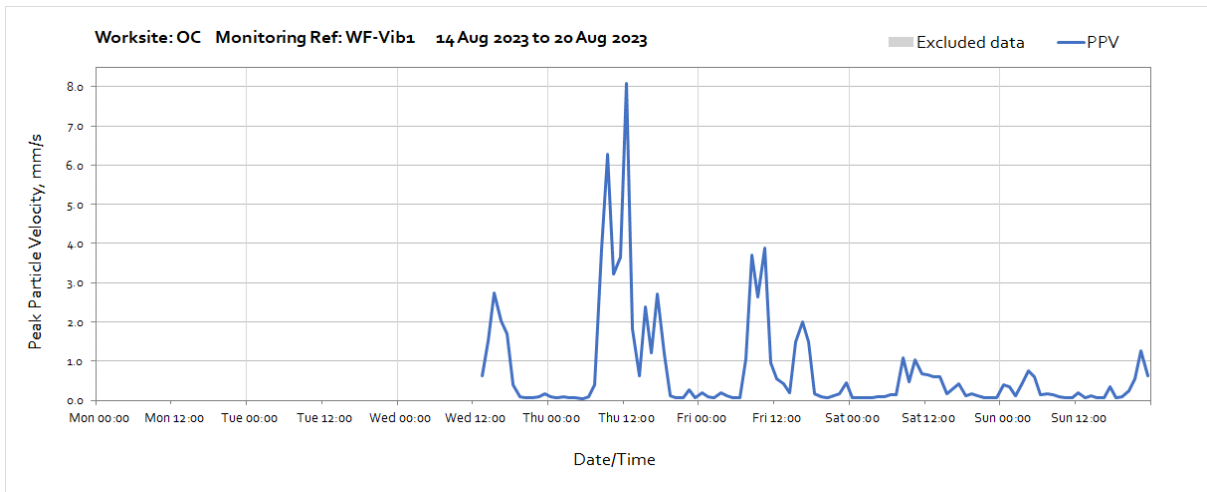
Note: High vibration levels throughout the week were due to embankment works including excavation.

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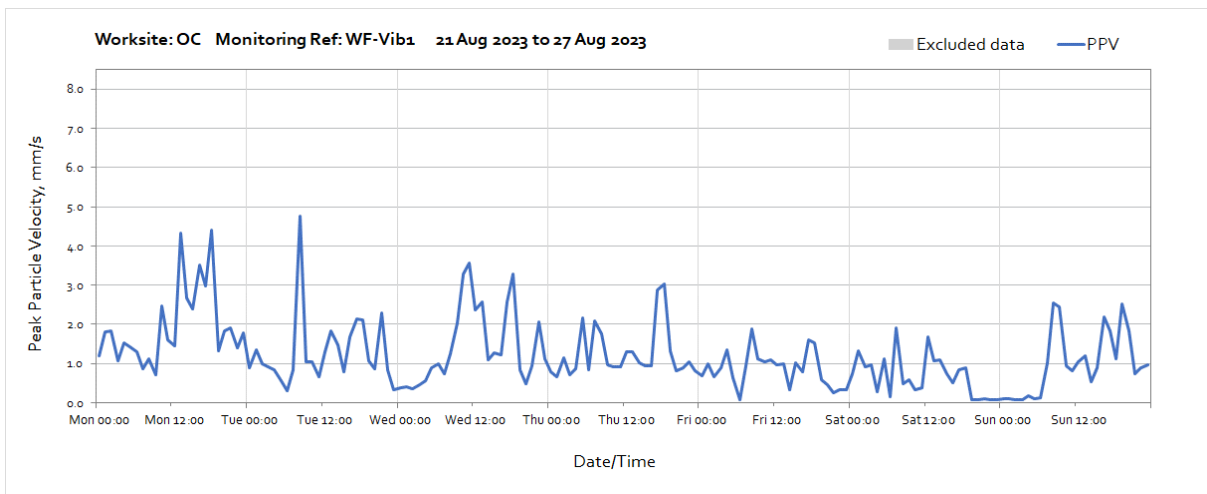


Note: High vibration levels throughout the week were due to embankment works including excavation.

### Worksite: OC – Monitoring Ref: WF-Vib1

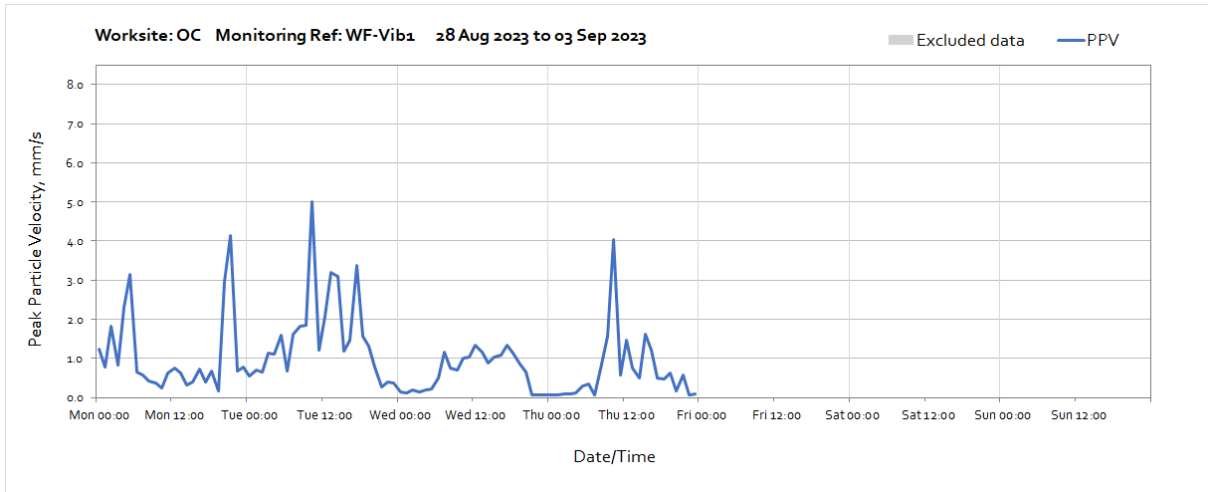


Note: Monitor was installed at 13:00 on Wednesday 16<sup>th</sup> August. High vibration levels throughout the week were due to embankment works including excavation.



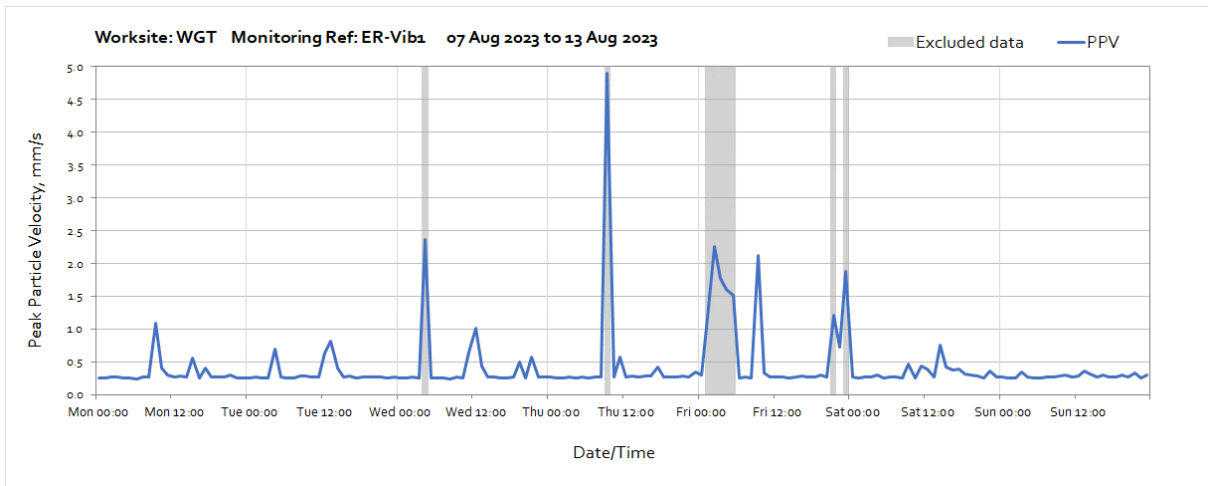
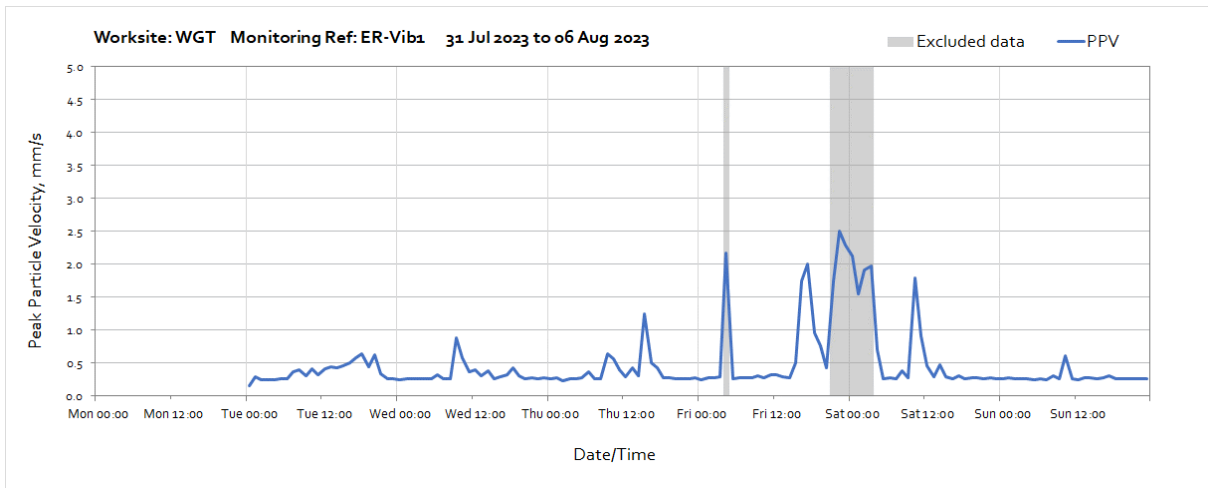
Note: High vibration levels throughout the week were due to embankment works including excavation.

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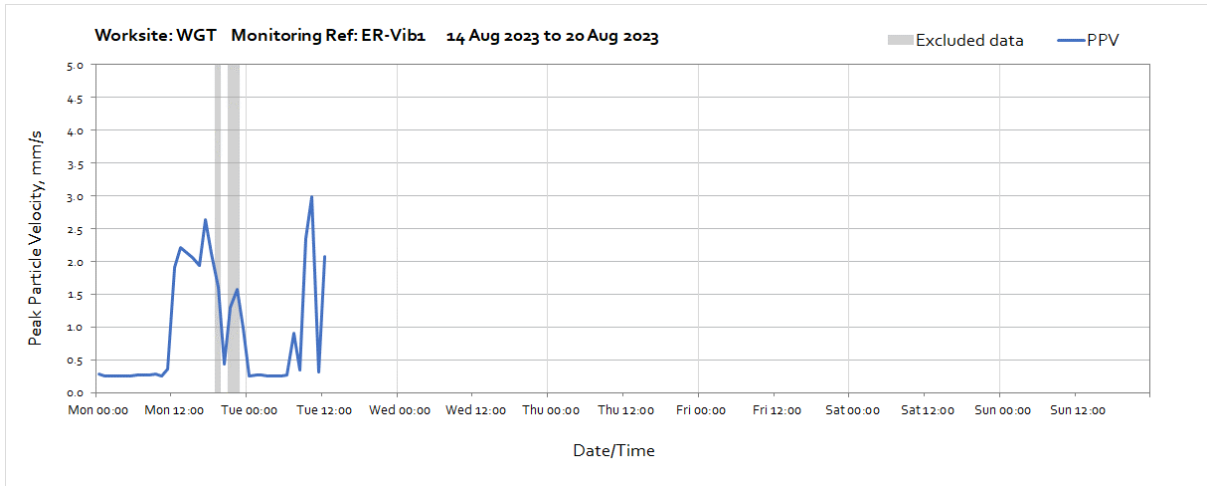


Note: High vibration levels throughout the week were due to embankment works including excavation.

### Worksite: WGT – Monitoring Ref: ER-Vib 1

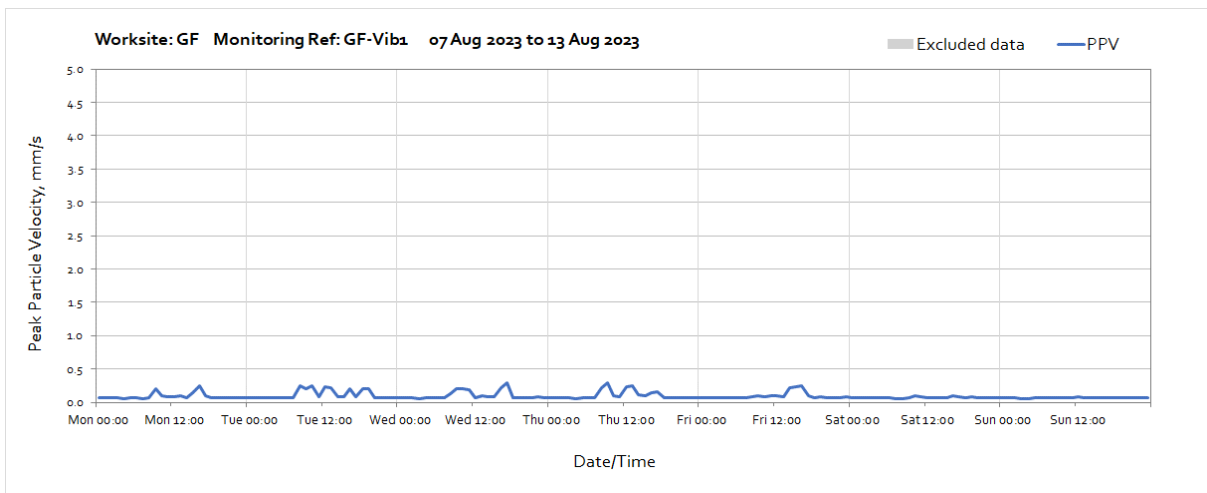
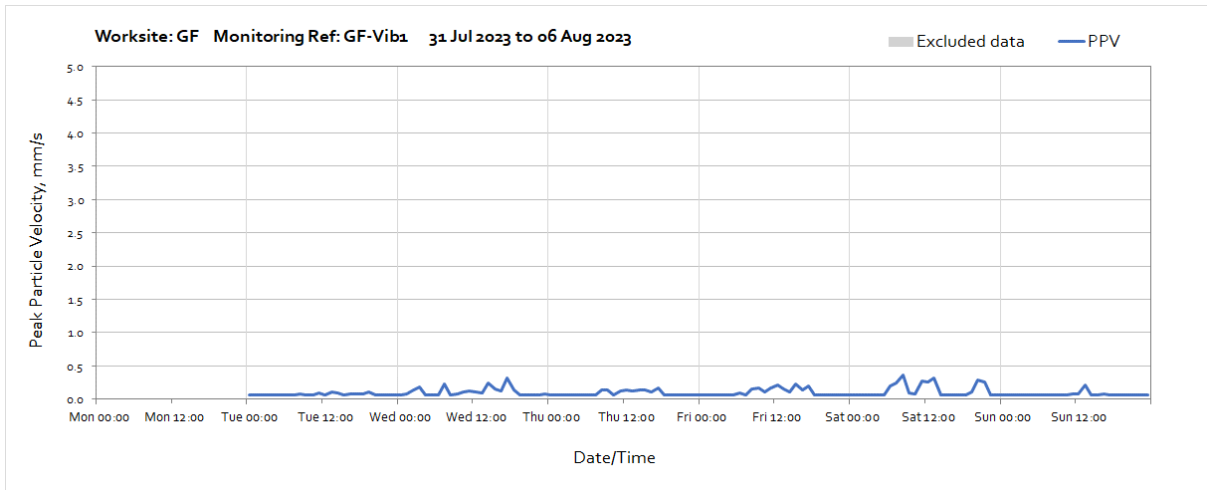


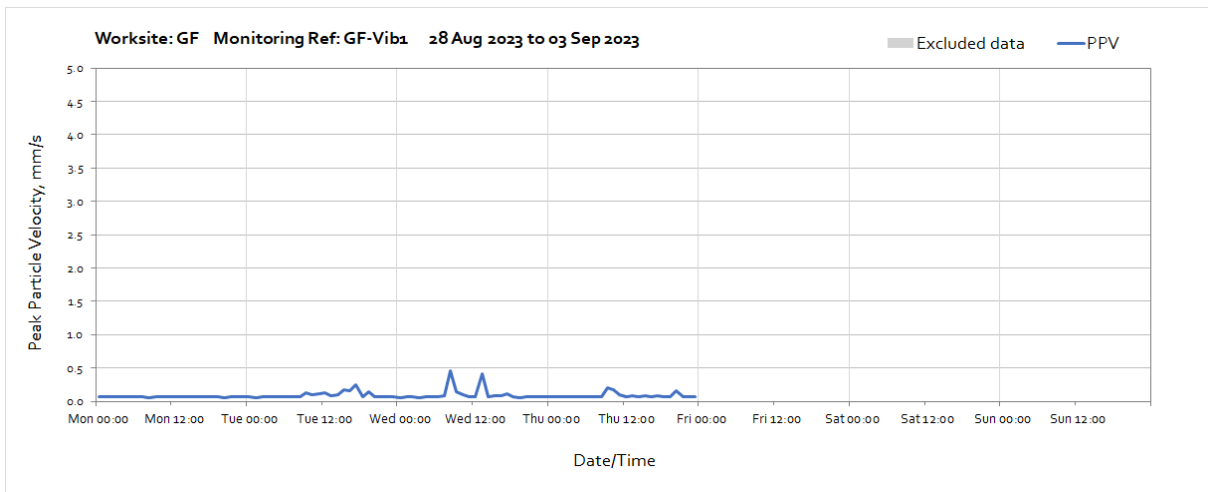
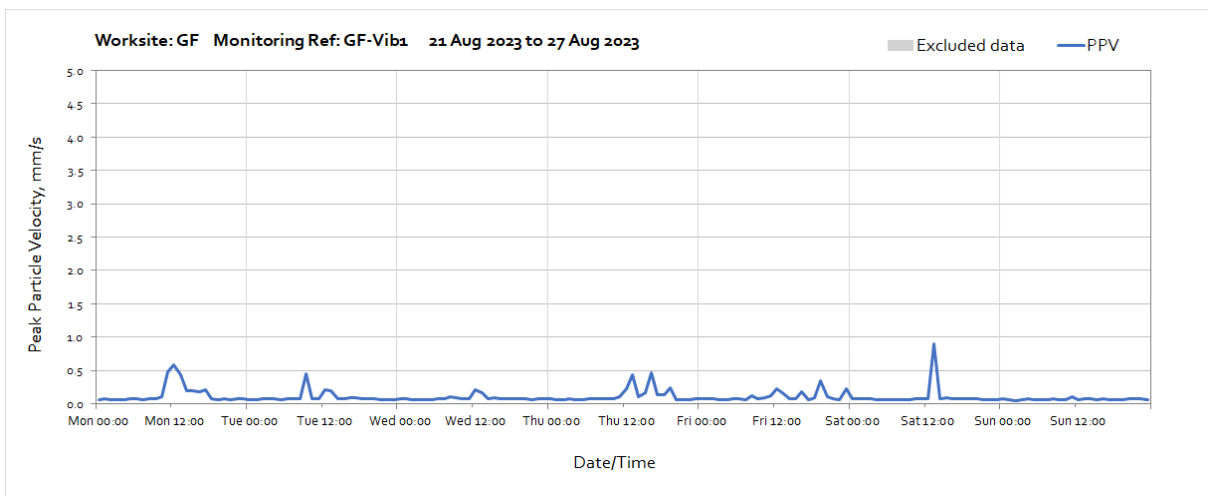
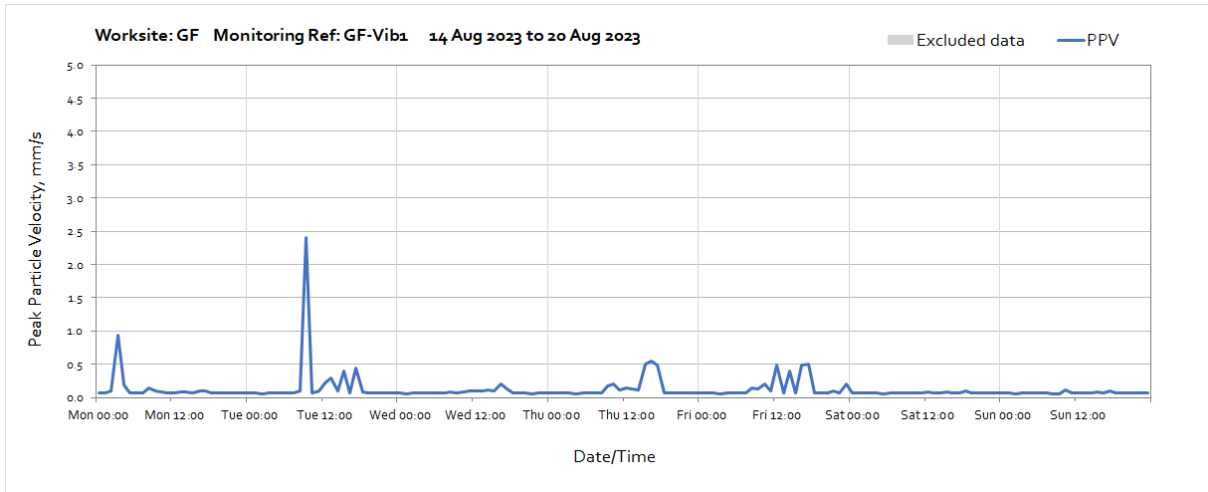




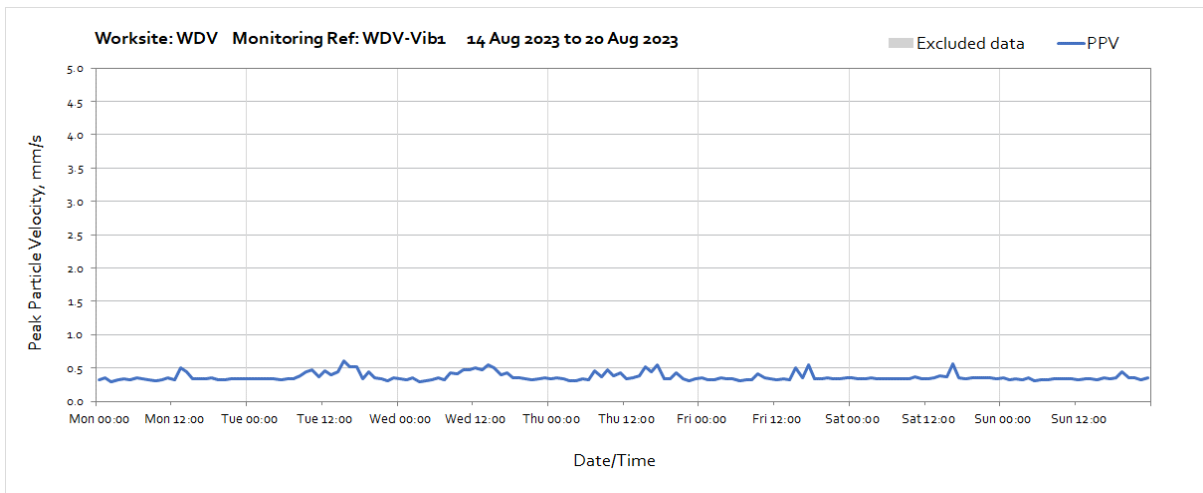
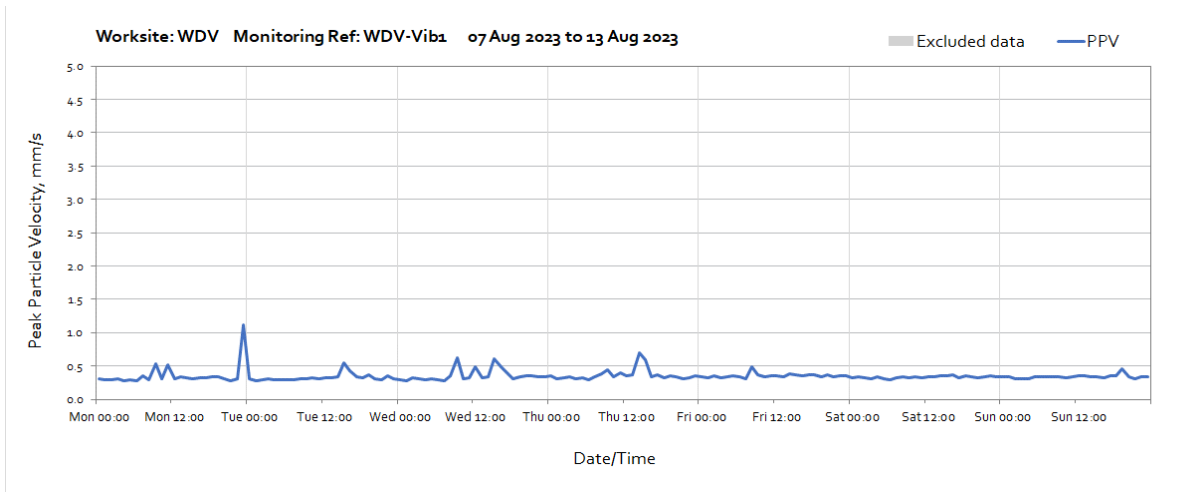
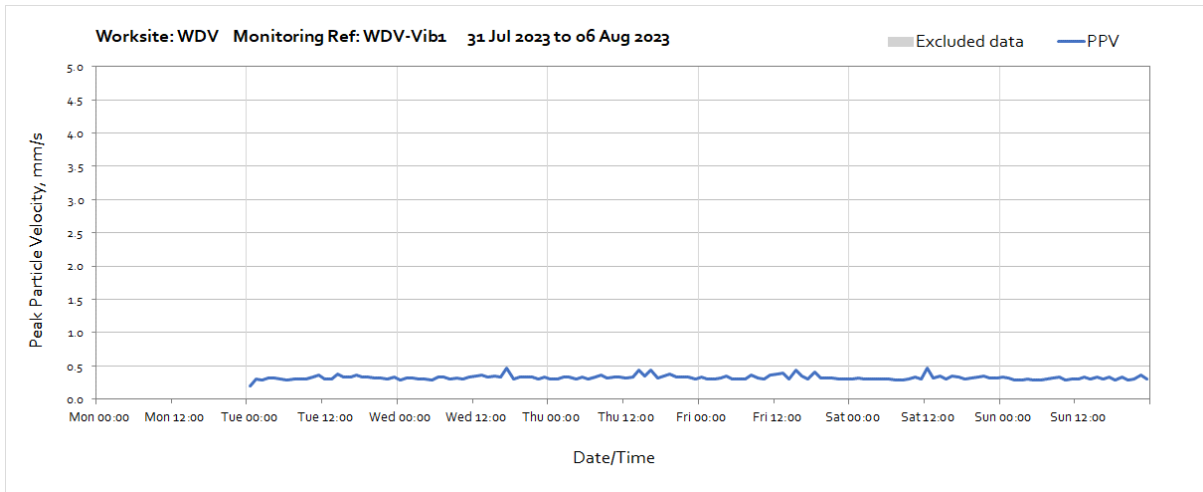
Note: Missing data from 13:00 on Tuesday 15<sup>th</sup> August until month end was due to depleted monitor battery.

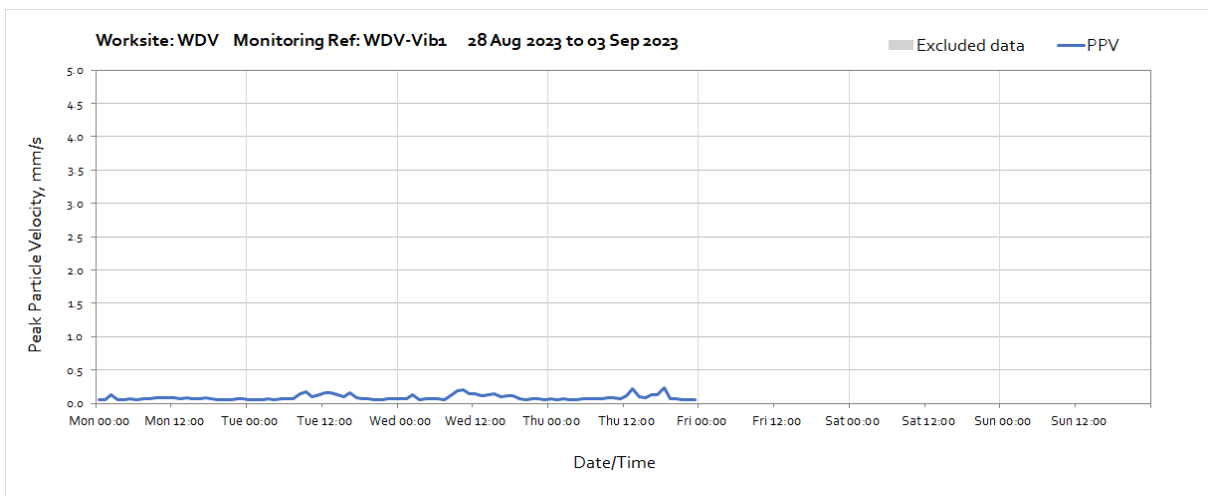
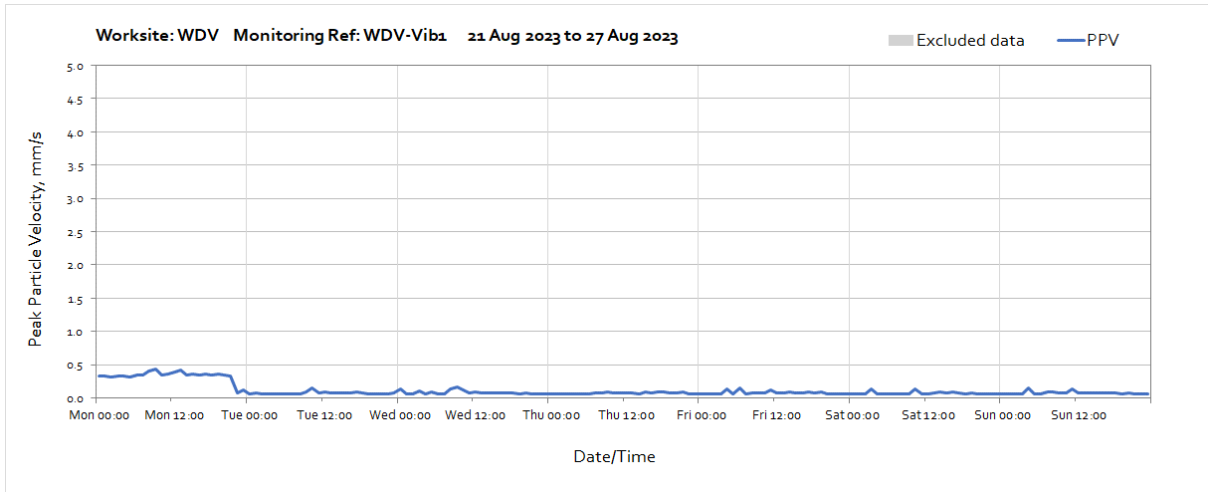
**Worksite: GF – Monitoring Ref: GF-Vib1**



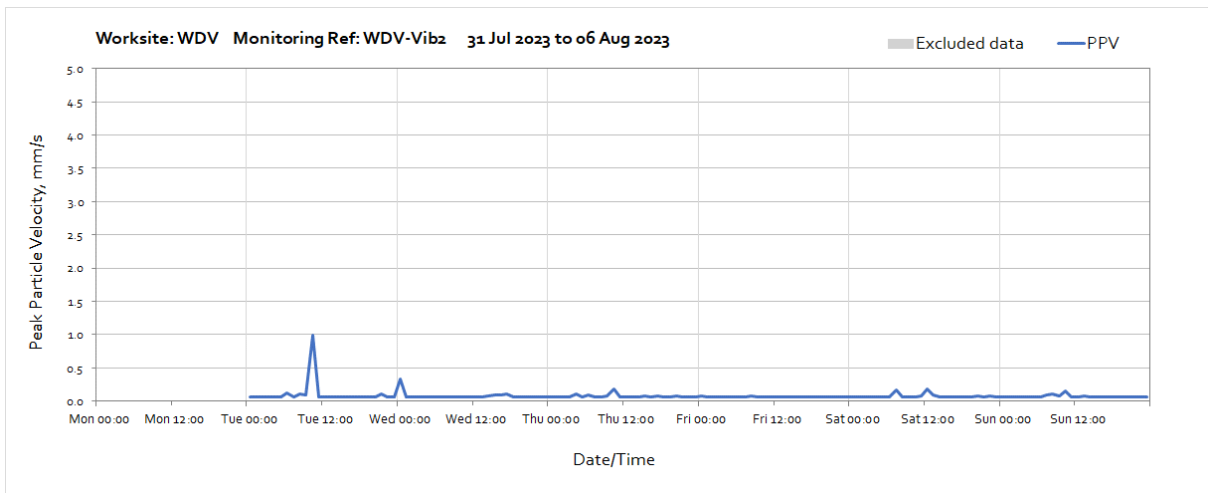


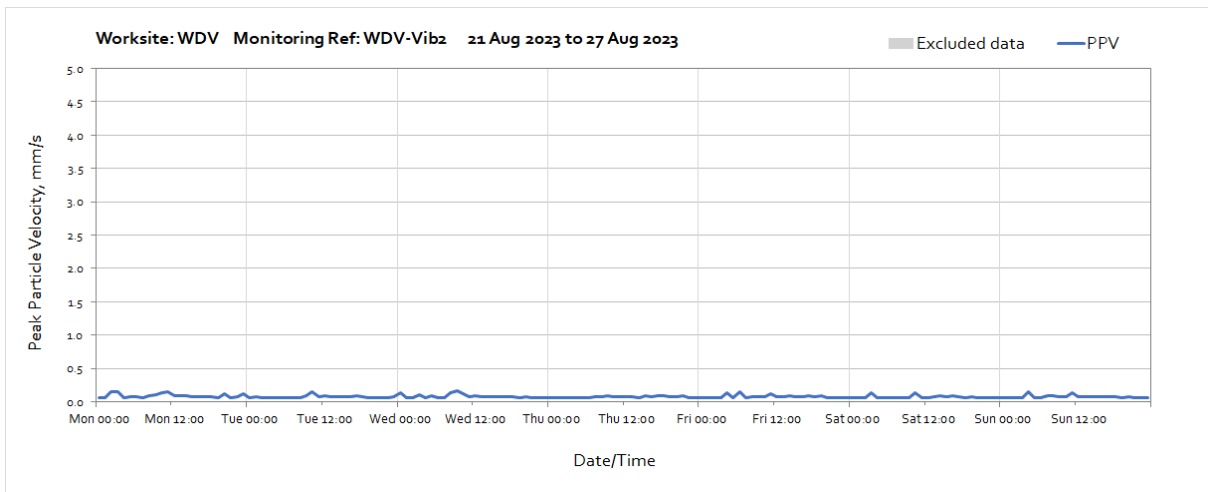
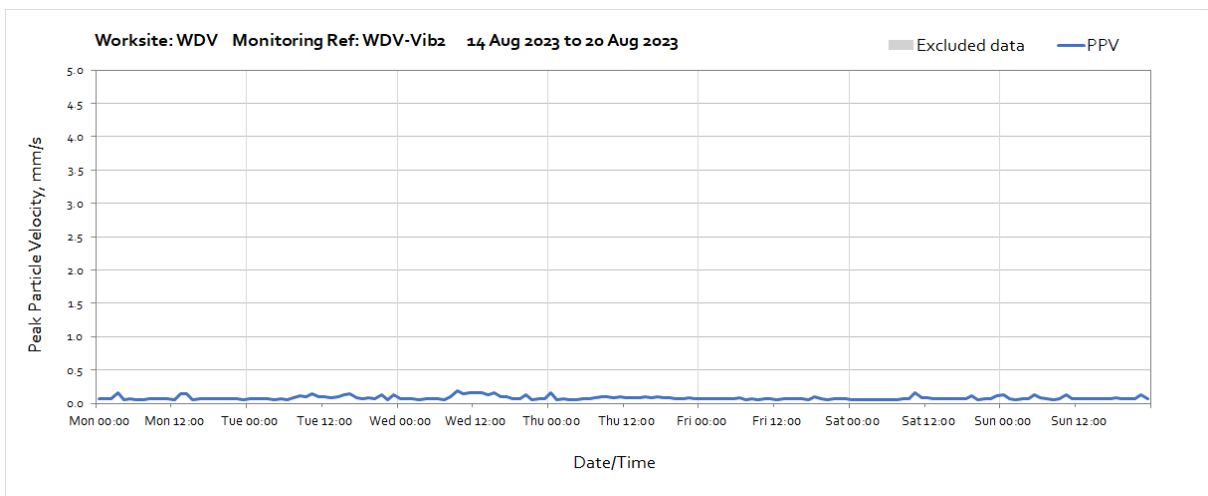
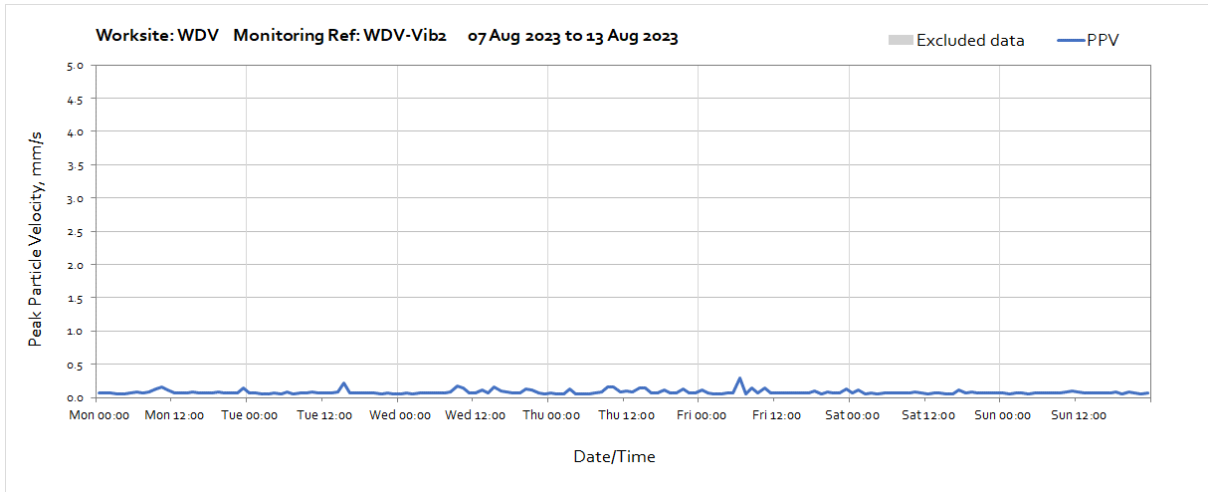
## Worksite: WDV – Monitoring Ref: WDV-Vib 1

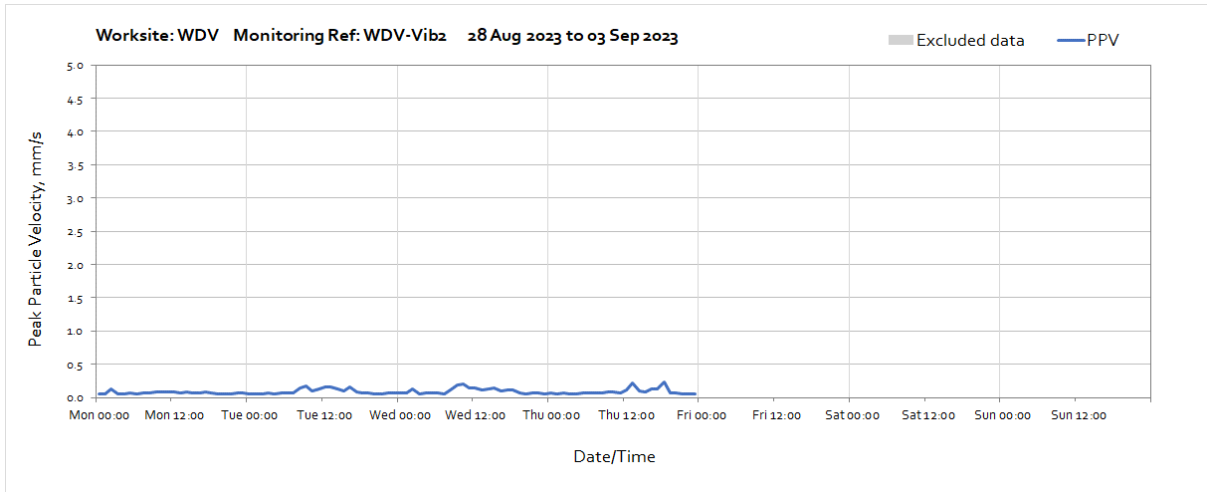




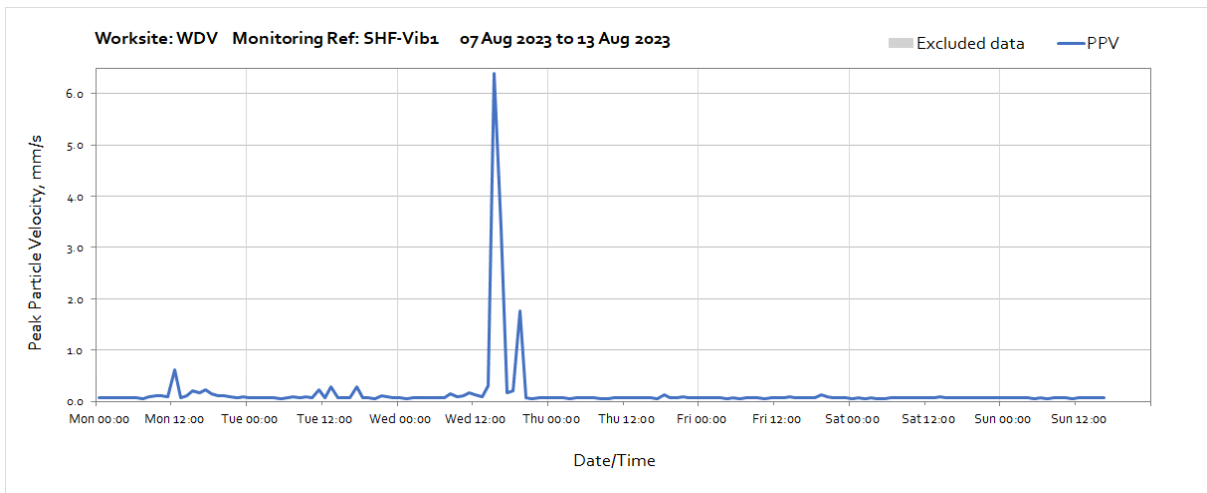
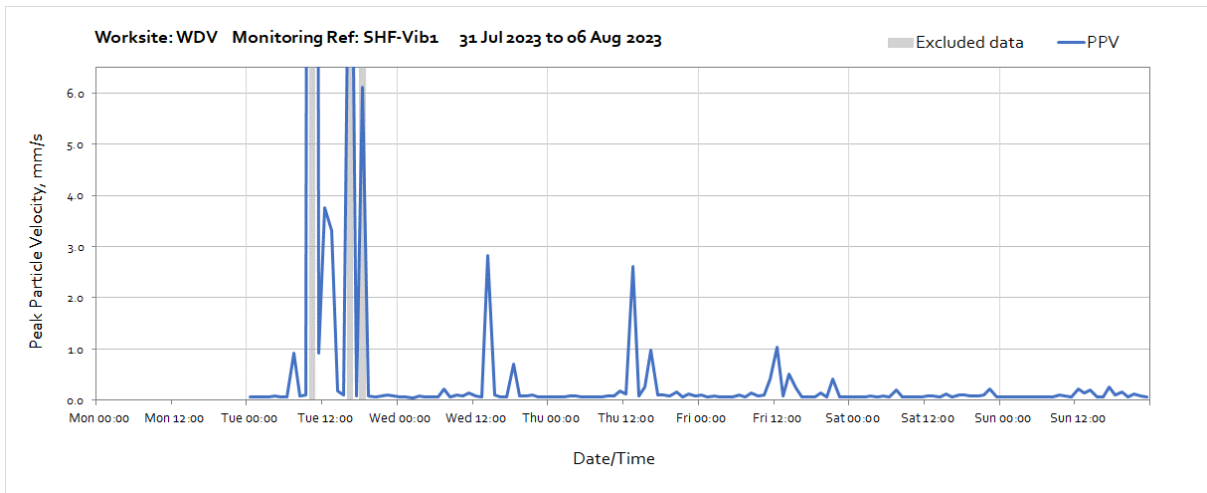
**Worksite: WDV - Monitoring Ref: WDV-Vib 2**







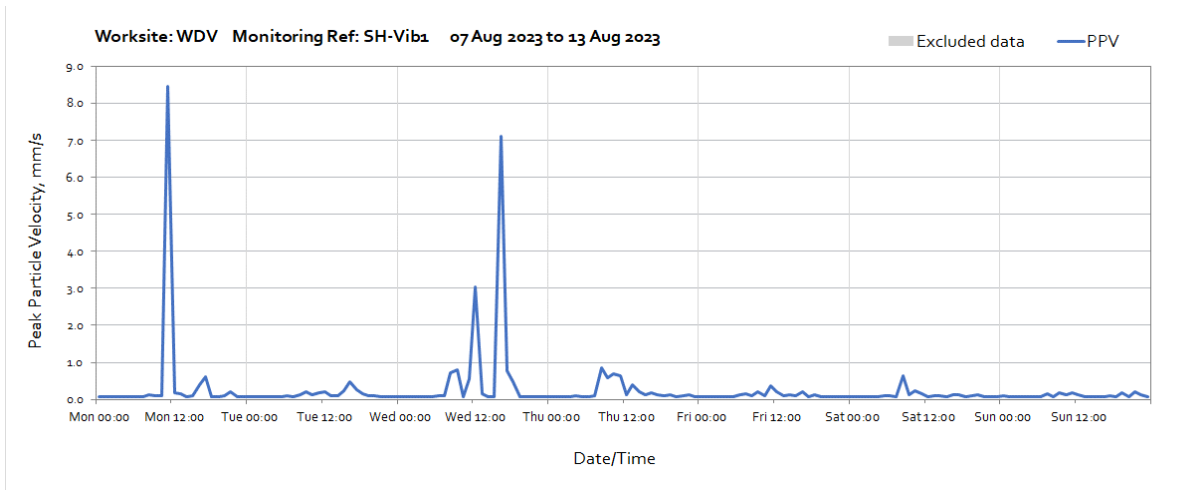
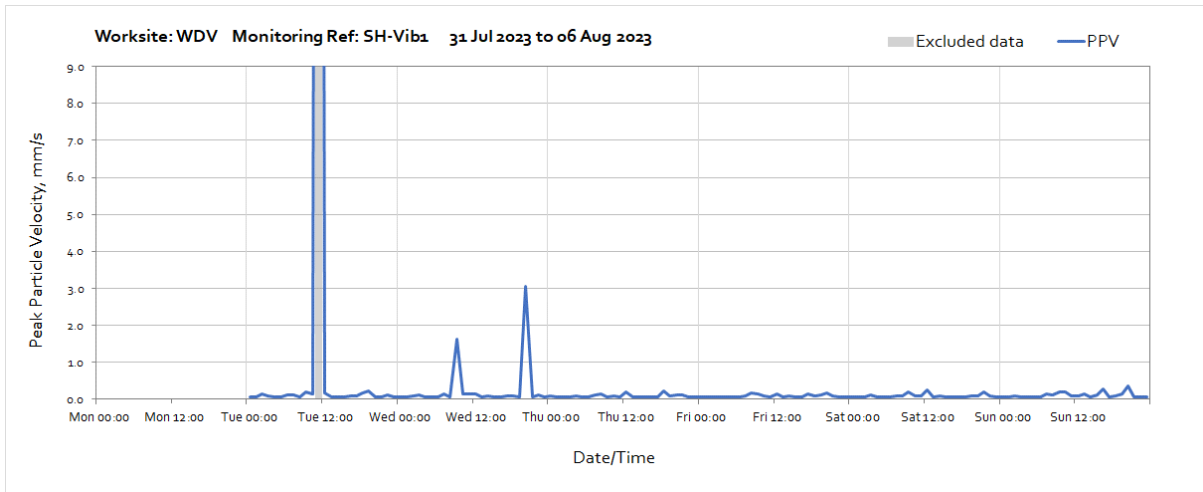
### Worksite: WDV – Monitoring Ref: SHF-Vib1



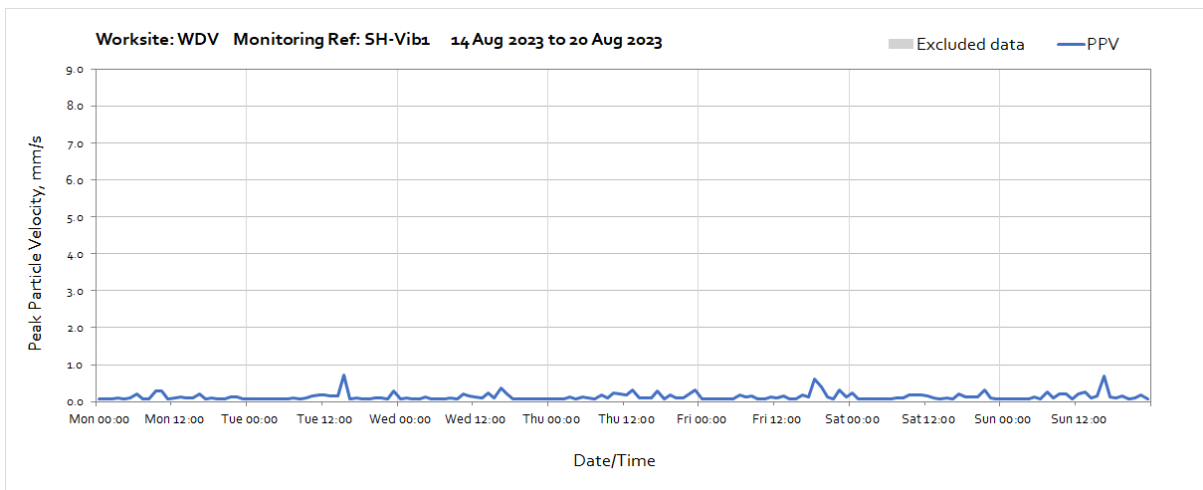
Note: High vibration level at 15:00 on Wednesday 9<sup>th</sup> August was due to piling works. Missing data from 17:00 on Sunday 13<sup>th</sup> August until month end was due to a monitor fault.

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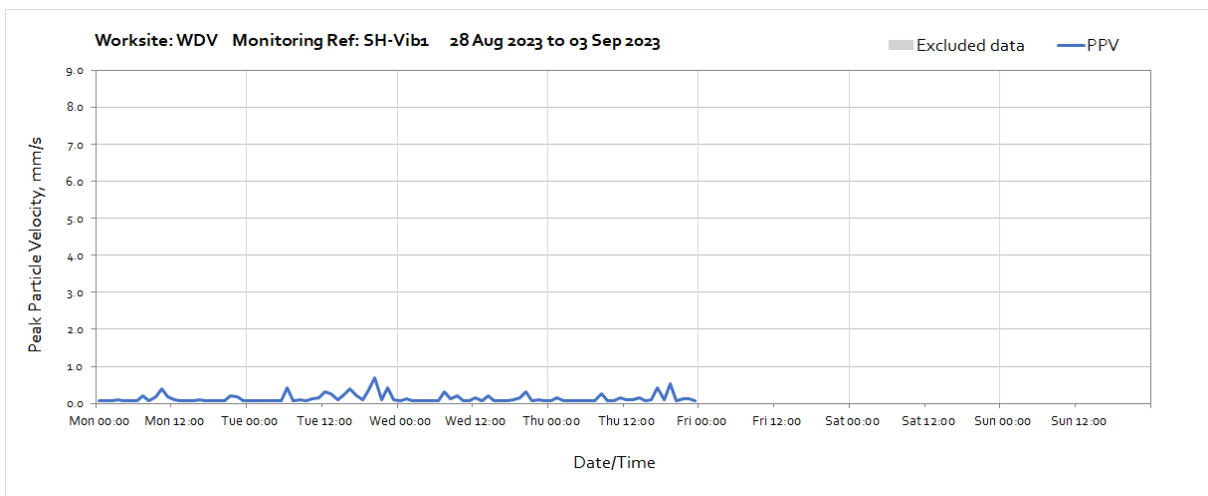
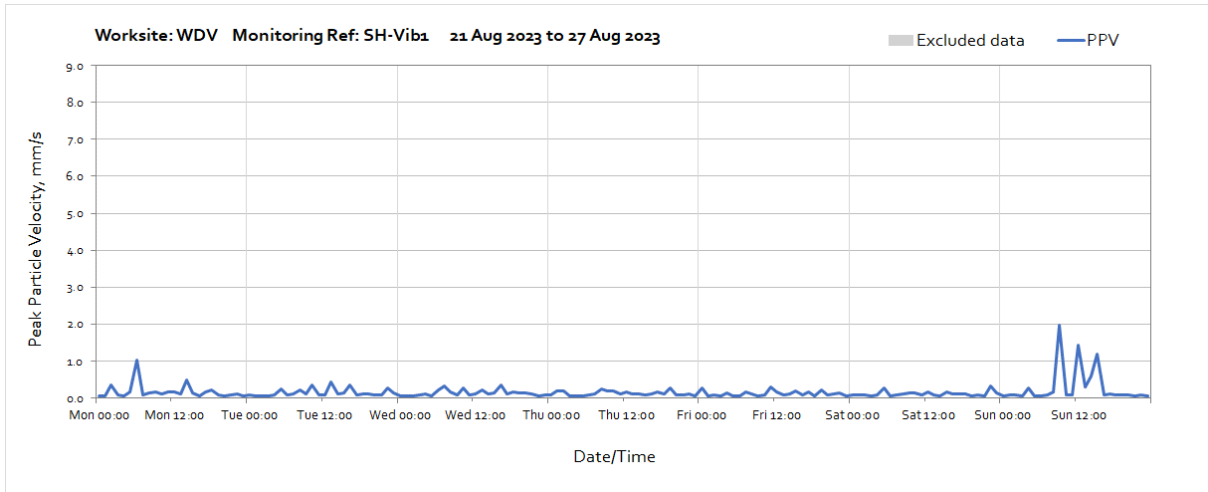
## Worksite: WDV – Monitoring Ref: SH-Vib1



Note: High vibration levels throughout the week were due to piling works.



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

