

Construction Noise and Vibration Monthly Report – January 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 January 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 drainage and dewatering maintenance works, aggregate deliveries, ditch installation, water pipe installation and processing limestone works were underway.
- Noise monitoring was undertaken in the vicinity of the School End (ref.: SE), Rosehill Farm (ref.: RF), and Hermitage Chetwode (ref.: HC) worksites where compound development works, haul road maintenance, bulk excavations, topsoil stripping, drainage works, fencing works, pilings works, stockpiling and vehicle movements were underway.
- Noise monitoring was undertaken in the vicinity of the Twyford worksite (ref.: TW) where access and site road maintenance works, vehicle movements, culvert construction, drainage works, topsoil stripping and stockpiling were underway.
- Noise monitoring was undertaken in the vicinity of the West Street Overbridge worksite (ref.: WSO), where utility works, deliveries, concrete works and culvert works were underway.
- Noise monitoring was undertaken in the vicinity of the Addison Road worksite (ref.: AR) where assembly of steel deck and embankment earthworks were underway.
- Noise monitoring was undertaken in the vicinity of the School Hill Compound worksite (ref.: SHC) where operation of concrete batching plant was underway.
- Noise monitoring was undertaken in the vicinity of the FCC Sidings worksite reference (ref: FCC) where concrete batching works were underway.
- Noise monitoring was undertaken in the vicinity of the Woodlands worksite (ref.: WDL) where excavation and stone backfilling and installation of temporary flume pipe works were underway.
- Noise monitoring was undertaken in the vicinity of the Quainton worksite (ref.: QAR) where backfilling and utility works were underway.
- Noise monitoring was undertaken in the vicinity of the Meadoway and Glebe House worksite (ref: MW&GH) where earthworks, piling works, stockpiling and site haul road construction were underway.

- Noise monitoring was undertaken in the vicinity of Oat Close worksite (ref: OC) where stockpiling, piling works, silt buster set up, utility diversion works, haul road construction and earthworks were underway.
- Noise monitoring was undertaken in the vicinity of Nash Lee Lane worksite (ref.: NLL) where installation of fuel storage area, stockpiling, site access road, fencing, platform extension works, installation of water pipe connection, lockers and heating elements works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Green Tunnel worksite (ref.: WGT) where surface water management works, construction of crane platforms, drainage works, excavation works, soil stripping, bridge installation, site access road extension, concrete works, backfilling and investigation and monitoring works were underway.
- Noise monitoring was undertaken in the vicinity of Grove Farm worksite (ref: GF) where installation of strip foundation and protection slabs and trial hole construction works were underway.
- Noise monitoring was undertaken in the vicinity of Rocky Lane Embankment worksite (ref: RLE) where compound installation works, material movements, maintenance of the surface water management system and utility works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Dean Viaduct worksite (ref: WDV) where compound construction works, piling works and concrete works were underway.
- Noise monitoring was undertaken in the vicinity of Leather Lane worksite (ref: LL) where maintenance of surface water management system and archaeological works were underway.
- Noise monitoring was undertaken in the vicinity of South Heath Cutting worksite (ref: SHCW) where surface water management system works were underway.
- Noise monitoring was undertaken in the vicinity of North Portal worksite (ref: NP) where site access and haul road works, piling works, site and plant operations, building platform works, track works, excavation works, drainage works and reinforced concrete works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chesham Road worksite (ref.: CHSM), where site operation and reinforced concrete works were undertaken.
- Noise monitoring was undertaken in the vicinity of Little Missenden Vent Shaft worksite (ref.: LM) where site operation, collar construction, secondary lining and small basement construction were undertaken.

- Noise monitoring was undertaken in the vicinity of Amersham Vent Shaft worksite (ref.: AM), where site operation, construction of internal structure and small basement construction works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chalfont St Giles Vent Shaft worksite (ref.: CSG) where site operation, road maintenance works, reinforced concrete works, connection to tunnels and basement construction works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chalfont St Peter Vent Shaft worksite (ref.: CSP), where site operation, road maintenance, secondary lining works, reinforced concrete works, connection to tunnels and basement construction works were underway.
- Noise monitoring was undertaken in the vicinity of the Colne Valley Viaduct - Load Test Pile 1 worksite, which is partly located in the London Borough of Hillingdon (LBH), (ref.: CVV, formerly CVV-LTP #1), where piling works, construction of a cofferdam, compound operation, maintenance of haul roads, ground investigation works, pier construction, pumping water management, satellite welfare operation, generator farm operation, north abutment works, concrete drilling, gas crossing emergency dismantling works, material storage, fencing, utility diversion works, environmental maintenance, base slab construction, River Colne crossing, girder and deck 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, topsoil stripping and vegetation clearance were underway.
- Grovill Embankment – Westbury where excavations were underway.
- North of School End where excavations, vegetation clearance, fencing, vehicle movements, stockpiling and drainage works were underway.
- Turweston along the A422 where compound development works and temporary bridge and road diversion works were underway.
- East West Rail (EWR) interfaces where backfilling was underway.
- Charndon Lodge where concrete works, including rebar fixing, formworks lifting, concrete pours and reinforced concrete works were underway.
- Infrastructure Maintenance Depot (IMD) where concrete works, including rebar fixing, formworks lifting and concrete pours were underway.
- Hills Farm where stockpiling and maintenance works were underway.
- Edgcott Road Overbridge where piling works were underway.

- Doddershall Culvert where concrete and waterproofing works were underway.
- Along the bat mitigation structure in Calvert area where sheet piling was underway.
- Aylesbury Golf Course where construction of site haul road, stockpiling, earthworks, compound setup and pond construction were underway.
- Thame Valley Viaduct Causeway where temporary bridge construction, piling, aggregate laying, cofferdam construction and compound setup were underway.
- Fleet Marston where earthworks, stockpiling, drainage works, habitat site maintenance works and pond construction were underway.
- Along A41 where concrete batching works, aggregate placement, geogrid installation, embankment works, stockpiling and earthworks were underway.
- Waddesdon Embankment and North Cutting where earthworks, stockpiling, compound setup, drainage works and construction of site haul road were undertaken.
- Bowood Lane where excavation works and concrete works including blinding, shutting and steel fixing were underway.
- Nash Lee Road Diversion where asphaltting and construction of temporary bridge works were underway.

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

Two (2) complaints were received within the Buckinghamshire area during the monitoring period. A description of complaints, the results of investigations and any action taken are detailed in Table 7 of this report.

Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

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

1 Introduction

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

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

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the Buckinghamshire (BS) Local Authority area for the period 1st to 31st January 2023.

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

- A422 Turweston North worksite, reference A422 TN (see Plan 1 in Appendix A), where works activities included:
 - Drainage and dewatering maintenance works.
 - Aggregate deliveries.
 - Processing limestone works.
 - Water pipe installation.
 - Ditch installation.
- School End worksite, reference SE (see Plan 2 in Appendix A), Rosehill Farm worksite reference RF (see Plan 2 in Appendix A), and Hermitage Chetwode Worksite reference HC (see plan 2 in Appendix A), where works activities included:
 - Compound development works.

- Haul road maintenance.
- Bulk excavations.
- Topsoil stripping.
- Drainage works including pond maintenance works.
- Fencing works including removal of badger fencing.
- Stockpiling.
- Vehicle movements.
- Piling works including construction of piling platform.
- Twyford worksite, reference TW (see Plan 2 in Appendix A), where works activities included:
 - Access and site haul road maintenance.
 - Vehicle movements.
 - Drainage works.
 - Culvert construction.
 - Topsoil stripping.
 - Stockpiling.
- West Street Overbridge worksite, reference WSO (see Plan 3 in Appendix A), where works activities included:
 - Utility works including trenching, duct laying, utility connection works and installation of access chambers.
 - Concrete works including rebar fixing, formwork installation and concrete pours.
 - Material deliveries.
 - Culvert works including backfilling.
- Addison Road worksite, reference AR (see Plan 3 in Appendix A), where works activities included:
 - Assembly of steel deck.
 - Embankment earthworks.
- School Hill Compound worksite, reference SHC (see Plan 3 in Appendix A), where works activities included:

- Operation of concrete batching plant.
- FCC Sidings worksite, reference FCC (see Plan 3 in Appendix A) where works activities included:
 - Concrete batching.
- Woodlands worksite, reference WDL (see Plan 4 in Appendix A) where works activities included:
 - Excavation and stone backfilling.
 - Installation of temporary flume pipe.
- Quainton worksite, reference QAR (see Plan 4 in Appendix A) where works activities included:
 - Backfilling.
 - Utility works including cable pulling.
- Meadoway and Glebe House worksite, reference MW&GH (see Plan 5 in Appendix A), where works activities included:
 - Earthworks.
 - Piling including construction of piling platform.
 - Stockpiling.
 - Site haul road construction.
- Oat Close worksite, reference OC (see Plan 5 in Appendix A), where works activities included:
 - Stockpiling.
 - Piling works.
 - Silt buster set up.
 - Utility diversion works.
 - Earthworks.
 - Haul road construction.
- Nash Lee Lane worksite, reference NLL (see Plan 6 in Appendix A), where works activities included:
 - Installation of fuel storage area including extension of platform.
 - Stockpiling.

- Widening of site access road.
- Fencing works.
- Installation of water pipe connections, lockers and heating elements.
- Wendover Green Tunnel worksite, reference WGT (see Plan 6 in Appendix A), where works activities included:
 - Surface water management works.
 - Construction of crane platforms.
 - Drainage works.
 - Excavation works.
 - Soil stripping.
 - Bridge installation.
 - Site access road extension.
 - Concrete works including v-ditch construction and concrete pours.
 - Backfilling.
 - Investigation and monitoring works.
- Grove Farm worksite, reference GF (see Plan 7 in Appendix A), where works activities included:
 - Installation of strip foundation.
 - Installation of protection slabs.
 - Trial hole construction.
- Rocky Lane Embankment worksite, reference RLE (see Plan 7 in Appendix A), where works activities included:
 - Compound installation works.
 - Maintenance of the surface water management system.
 - Utilities works.
 - Material movements.
- Wendover Dean Viaduct worksite, reference WDV (see Plan 7 in Appendix A), where works activities included:
 - Compound construction works.

- Piling works including pile cropping.
- Concrete works including shuttering, steel fixing, concrete pours and pre-grouting.
- Leather Lane worksite, reference LL (see Plan 8 in Appendix A), where works activities included:
 - Maintenance of the surface water management system.
 - Archaeological works.
- South Heath Cutting worksite, reference SHCW (see Plan 8 in Appendix A), where works activities included:
 - Surface water management system works, including pond installation.
- North Portal worksite, reference NP (see Plan 8 in Appendix A), where works activities included:
 - Site access road works including scrape formation works, installation of hardstanding and kerbing, drainage and service works, installation of signage and asphaltting.
 - Haul road dismantling works.
 - General site operation of plant and equipment.
 - Piling platform works including reinstatement and maintenance works, dismantling works, drainage and services, scrape formation works and installation of hardstanding.
 - Building and tracks 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.
 - Reinforced concrete works including concrete pours.
- Chesham Road worksite, reference CHSM (see Plan 8 in Appendix A), where works activities included:
 - General site activities including power utility connections works.
 - Reinforced concrete works for internal structures and superstructures .
- Little Missenden Vent Shaft worksite reference LM (see Plan 9 in Appendix A), where works activities included:

- General site activities including operation of plant and equipment.
- Collar construction.
- Secondary lining works.
- Small basement construction.
- Amersham Vent Shaft worksite, reference AM (see Plan 10 in Appendix A), where works activities included:
 - General site activities including operation of plant and equipment.
 - Internal structure including concrete and floor works.
 - Small basement construction.
- Chalfont St Giles Vent Shaft worksite, reference CSG (see Plan 11 in Appendix A), where works activities included:
 - General site activities including operation of plant and equipment.
 - Road maintenance.
 - Reinforced concrete works for internal structure walls and floor.
 - Connection to tunnels including demolition and reinforced concrete works.
 - Basement construction including excavation.
- Chalfont St Peter Vent Shaft worksite, reference CSP (see Plan 12 in Appendix A), where works activities included:
 - General site activities including operation of plant and equipment.
 - Road maintenance.
 - Secondary lining works.
 - Reinforced concrete works for internal structure walls and floor.
 - Connection to tunnels including demolition and reinforced concrete works.
 - Basement construction.
- Colne Valley Viaduct - Load Test Pile 1 worksite, which is partly located in the London Borough of Hillingdon (LBH), reference CVV (see Plan 13 in Appendix A), formerly CVV-LTP #1, where works activities included:
 - Piling works including jetty piling, piling platform relocation, bored piling, de-sanding pile bore, pile trimming, installation of reinforcement cage and concreting pile, grout curtain construction around viaduct pile groups, maintenance plant and clean up around piles.

- Compound operations.
- Maintenance of haul roads.
- Ground investigation works.
- Pier construction including tower crane mobilisation and demobilisation.
- Pumping water management.
- Satellite welfare operation.
- Generator farm operation.
- North abutment works including yard supporting activities.
- Concrete drilling.
- Gas crossing emergency dismantling works.
- Material storage.
- Fencing works.
- Utility diversion.
- Environmental maintenance.
- Construction of a cofferdam including excavations.
- Base slab construction.
- River Colne crossing including emergency removal of obstruction to reinforced concrete crossing.
- Girder and deck erection and installation including span segmental erection, grouting, steel structure erection and dismantling.
- Deck finishes including delivery of parapets, noise barriers, troughs, pipes, steel works and other minor materials to the storage yards and deck, filling of voids and secondary concrete (within deck) and supply and installation of carrier drainpipe and access ramps required within the deck.

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

- Godington where construction of the site access road, topsoil stripping and vegetation clearance were underway.
- Grovill Embankment – Westbury where excavations were underway.
- North of School End where excavations, vegetation clearance, fencing, vehicle movements, stockpiling and drainage works were underway.

- Turweston along the A422 where compound development works and temporary bridge and road diversion works were underway.
- East West Rail (EWR) interfaces where backfilling was underway.
- Charndon Lodge where concrete works, including rebar fixing, formworks lifting, concrete pours and reinforced concrete works were underway.
- Infrastructure Maintenance Depot (IMD) where concrete works, including rebar fixing, formworks lifting and concrete pours were underway.
- Hills Farm where stockpiling and maintenance works were underway.
- Edgcott Road Overbridge where piling works were underway.
- Doddershall Culvert where concrete and waterproofing works were underway.
- Along the bat mitigation structure in Calvert area where sheet piling was underway.
- Aylesbury Golf Course where construction of site haul road, stockpiling, earthworks, compound setup and pond construction were underway.
- Thame Valley Viaduct Causeway where temporary bridge construction, piling, aggregate laying, cofferdam construction and compound setup were underway.
- Fleet Marston where earthworks, stockpiling, drainage works, habitat site maintenance works and pond construction were underway.
- Along A41 where concrete batching works, aggregate placement, geogrid installation, embankment works, stockpiling and earthworks were underway.
- Waddesdon Embankment and North Cutting where earthworks, stockpiling, compound setup, drainage works and construction of site haul road were undertaken.
- Bowood Lane where excavation works and concrete works including, blinding, shutting and steel fixing were underway.
- Nash Lee Road Diversion where asphaltting and construction of temporary bridge works were underway.

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

1.2 Measurement Locations

- 1.2.1 Forty-seven (47) noise and eight (8) vibration monitoring installations were active in January in the BS area. Table 2 summarises the positions of noise and vibration monitoring installations within the BS area in January 2023.
- 1.2.2 The noise monitor ref.: MF-NMP1, located in the vicinity of Oat Close worksite (ref.: OC), is currently being repaired and therefore no noise data were recorded at this monitoring location during the reporting period.
- 1.2.3 Noise monitor ref.: SH-NMP1, within the vicinity of South Heath Cutting worksite (ref.: SHC) was removed for the duration of January 2023 due to a solar panel fault.
- 1.2.4 Noise and vibration monitor ref.: GF-NMP1, Vib1 within the vicinity of Grove Farm worksite was installed on 16th January 2023.
- 1.2.5 Noise and vibration monitor ref.: NCAS7-NMP1, Vib1, within the vicinity of Rocky Lee Embankment worksite (ref.: RLE) was installed on 9th January 2023.
- 1.2.6 Vibration monitor ref.: WVD-Vib2, within the vicinity of Wendover Dean Viaduct worksite (ref.: WDV) was installed on 9th January 2023.
- 1.2.7 Vibration monitor ref.: NCAS6-Vib1, within the vicinity of Rocky Lee Embankment worksite (ref.: RLE) was installed on 9th January 2023.
- 1.2.8 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
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode
	RF-Vib1	Old Stable Cottage, Rosehill Farm, Chetwode
HC	HC-NMP1	Hermitage, Chetwode
TW	TW-NMP1	Twyford, Buckinghamshire
WSO	WSO-NMP1	West Street, Twyford
AR	AR-NMP1	Addison Road, Rosehill Farm
SHC	SHC-NMP1	School Hill Compound, Calvert

Worksite Reference	Measurement Reference	Address
FCC	FCC-NMP1	Calvert South
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton
QAR	QAR-NMP2	Station Rd, Quainton
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury
	MW-NMP1	Aylesbury, Buckinghamshire
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee
	NLL-NMP2	Nash Lee Lane, Nash Lee
WGT	ER-NMP1	Ellesborough Rd, Wendover
	ER-Vib1	Ellesborough Rd, Wendover
	BL-NMP1	Bacombe Lane, Wendover
	WT-NMP1	A413, Wendover
GF	GF-NMP1	Grove Farm, Wendover
	GF-Vib1	Grove Farm, Wendover
RLE	SDVC-NMP1	Rocky Lane, Wendover
	NCAS7-NMP1	Rocky Lane, The Lee, Wendover
	NCAS7-Vib1	Rocky Lane, The Lee, Wendover
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover
	NCAS6-Vib1	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
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
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

Worksite Reference	Measurement Reference	Address
CSG	CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
	CSG-NMP2	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
	PIC-NMP1	Bottom House Farm Lane, Chalfont St Giles
CSP	CSP-NMP1	Chalfont St Peter Vent Shaft Worksite, 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_{Aeq} Data over the Monitoring Period

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
A422 TN	TN-NMP1	Turweston, Brackley	Free-field	49.4 (52.0)	51.7 (65.7)	48.7 (52.0)	46.3 (49.9)	44.4 (53.4)	43.2 (45.9)	48.2 (49.7)	48.6 (49.6)	48.4 (51.2)	43.4 (50.3)	51.9 (69.5)	44.6 (50.6)
SE	SE-NMP1	School End, Chetwode	Free-field	49.1 (55.7)	56.4 (67.5)	46.3 (53.0)	45.5 (53.1)	45.9 (59.0)	45.0 (48.8)	45.2 (46.8)	45.3 (47.9)	44.5 (48.4)	43.4 (46.5)	55.3 (69.2)	44.2 (46.5)
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	Free-field	47.1 (55.8)	48.6 (52.1)	45.5 (48.2)	44.8 (48.2)	45.0 (52.9)	45.6 (48.2)	46.8 (49.3)	45.1 (47.5)	44.6 (47.0)	43.5 (44.4)	48.2 (54.1)	43.7 (44.7)
HC	HC-NMP1*	Hermitage, Chetwode	Free-field	- -	52.7 (52.7)	48.7 (48.7)	49.3 (50.0)	48.7 (49.3)	- -	- -	- -	- -	- -	- -	- -
TW	TW-NMP1	Twyford	Free-field	45.9 (53.9)	51.6 (62.1)	43.5 (48.5)	42.5 (48.1)	43.0 (58.3)	42.9 (46.2)	44.2 (45.2)	45.2 (47.0)	42.9 (50.3)	38.3 (46.1)	49.4 (60.6)	40.9 (44.4)
WSO	WSO-NMP1	West Street, Twyford	Free-field	48.9 (52.6)	51.1 (55.6)	43.2 (47.5)	40.8 (47.6)	40.4 (54.5)	47.8 (49.5)	52.0 (53.9)	52.3 (54.8)	46.8 (54.0)	37.5 (46.0)	48.4 (56.8)	38.2 (46.4)
AR	AR-NMP1**	Addison Road, Rosehill Farm	Free-field	5.3 (58.1)	10.7 (57.7)	8.0 (57.1)	7.8 (59.9)	6.3 (56.1)	10.5 (52.4)	11.1 (55.4)	11.3 (56.5)	10.4 (57.4)	- -	10.9 (58.4)	- -
SHC	SHC-NMP1	School Hill Compound, Calvert	Free-field	52.9 (61.5)	56.8 (68.8)	50.2 (53.5)	47.6 (54.6)	45.5 (57.5)	45.9 (50.7)	48.6 (52.9)	48.8 (52.3)	45.6 (51.1)	41.4 (50.6)	53.6 (66.6)	42.8 (50.8)

* Monitor HC-NMP1 experienced solar panel enclosure faults throughout the month of January. ** Monitor AR-NMP1 was reinstalled on 26th January.

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Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average LAeq,T (Highest Day LAeq,T)					Saturday Average LAeq,T (Highest Day LAeq,T)					Sunday / Public Holiday Average LAeq,T (Highest Day LAeq,T)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
FCC	FCC-NMP1	Calvert South	Free-field	54.6 (60.9)	57.7 (63.0)	45.5 (55.8)	43.2 (54.1)	41.9 (54.3)	47.1 (51.0)	46.2 (49.0)	43.9 (47.8)	45.7 (60.3)	41.3 (56.7)	54.3 (63.8)	42.9 (53.1)
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Free-field	56.9 (67.7)	65.8 (71.7)	49.5 (56.0)	48.0 (55.1)	48.5 (68.7)	47.4 (50.7)	56.3 (66.5)	50.9 (54.5)	50.4 (65.0)	45.8 (51.0)	62.8 (75.7)	46.5 (53.5)
QAR	QAR-NMP2	Station Rd, Quainton	Free-field	56.1 (74.2)	58.7 (75.2)	53.4 (73.1)	53.1 (74.0)	53.8 (78.7)	56.4 (72.6)	58.2 (71.1)	58.1 (69.3)	51.6 (65.5)	46.6 (56.7)	52.7 (68.8)	44.7 (57.2)
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	Free-field	55.7 (59.4)	56.7 (58.7)	56.3 (58.7)	54.7 (58.6)	51.9 (65.1)	51.4 (54.1)	54.7 (56.3)	54.4 (55.9)	54.0 (62.9)	48.9 (57.5)	55.9 (59.1)	49.2 (57.0)
	MW-NMP1	Aylesbury, Buckinghamshire	Free-field	63.2 (64.8)	63.6 (66.1)	62.2 (64.0)	60.2 (63.1)	56.8 (70.2)	57.2 (58.3)	63.4 (69.5)	64.3 (68.9)	61.7 (70.6)	56.2 (63.6)	63.5 (76.4)	56.6 (62.9)
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury	Free-field	49.4 (63.0)	50.5 (58.5)	48.7 (56.3)	48.0 (56.5)	48.0 (68.1)	49.5 (54.4)	50.6 (56.9)	49.7 (54.3)	47.1 (54.8)	42.3 (49.3)	46.1 (52.4)	44.8 (53.7)
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	Free-field	46.7 (57.5)	51.1 (60.9)	45.4 (52.8)	45.0 (56.0)	45.0 (77.3)	45.1 (47.3)	45.4 (48.8)	45.0 (48.0)	43.0 (49.8)	38.0 (45.5)	46.4 (55.7)	39.4 (46.7)
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Free-field	57.1 (60.8)	57.6 (61.4)	56.4 (59.6)	54.0 (57.6)	51.8 (57.6)	51.9 (53.6)	56.1 (58.1)	57.0 (59.2)	55.1 (58.5)	51.0 (58.0)	57.3 (65.5)	52.0 (57.6)
	NLL-NMP2	Nash Lee Lane, Nash Lee	Free-field	58.3 (62.4)	58.3 (62.6)	57.2 (61.2)	54.3 (58.6)	51.0 (60.9)	53.1 (54.2)	57.6 (60.4)	58.5 (61.5)	56.2 (61.0)	49.5 (57.8)	56.5 (61.2)	51.9 (59.5)

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
WGT	ER-NMP1	Ellesborough Rd, Wendover	Free-field	57.9 (60.4)	60.5 (67.3)	56.4 (57.5)	53.1 (56.5)	49.3 (57.5)	50.3 (51.3)	55.6 (56.3)	57.0 (58.6)	55.0 (58.2)	49.2 (58.1)	58.8 (68.8)	49.6 (58.0)
	BL-NMP1	Bacombe Lane, Wendover	Free-field	47.4 (50.1)	49.2 (56.9)	47.7 (50.3)	45.7 (51.5)	43.3 (52.1)	44.0 (47.8)	46.5 (48.5)	49.1 (49.5)	46.7 (53.5)	41.7 (49.1)	48.3 (51.9)	43.6 (49.8)
	WT-NMP1	A413, Wendover	Free-field	66.5 (68.7)	67.2 (68.5)	66.4 (68.7)	63.1 (67.7)	59.7 (67.8)	60.3 (62.0)	64.7 (66.0)	65.9 (67.8)	64.5 (67.0)	59.7 (67.9)	66.4 (69.3)	60.7 (68.6)
GF	GF-NMP1***	Grove Farm, Wendover	Free-field	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	52.5 (60.0)	- -
RLE	SDVC-NMP1	Rocky Lane, Wendover	Free-field	64.7 (66.4)	65.6 (71.7)	64.1 (66.2)	62.2 (65.9)	58.8 (66.1)	59.9 (61.1)	63.6 (64.7)	64.3 (66.5)	62.9 (66.5)	58.2 (65.5)	64.3 (67.1)	58.9 (66.1)
	NCAS7-NMP1	Chesham Lane, The Lee, Wendover	Free-field	49.0 (54.2)	53.0 (60.1)	48.7 (55.3)	47.4 (57.1)	44.8 (59.4)	48.2 (51.5)	48.4 (51.6)	48.2 (50.5)	45.8 (49.9)	42.0 (48.7)	51.2 (58.4)	42.0 (47.7)
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	47.1 (52.0)	49.2 (51.3)	47.8 (51.4)	46.4 (52.1)	42.7 (50.0)	44.9 (45.5)	47.5 (48.2)	48.2 (49.9)	48.5 (53.4)	45.9 (49.9)	48.9 (52.7)	46.6 (52.4)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	57.7 (60.9)	58.3 (62.1)	56.7 (60.6)	54.7 (58.5)	51.7 (62.1)	53.1 (54.9)	56.8 (58.6)	57.6 (60.6)	55.8 (59.5)	50.3 (58.4)	56.7 (61.8)	50.7 (58.4)
WDV	WDV-NMP1	Upper Wendover Dean Farm, A413, Wendover	Free-field	53.4 (58.1)	56.1 (58.4)	51.7 (57.2)	49.8 (56.8)	47.3 (58.8)	48.4 (50.5)	51.8 (53.6)	53.0 (56.8)	52.1 (58.0)	48.8 (58.0)	54.7 (61.2)	47.5 (57.0)
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee	Free-field	49.1 (59.7)	51.3 (59.3)	48.3 (59.8)	46.7 (58.1)	46.8 (65.0)	46.5 (52.0)	47.9 (54.5)	48.0 (50.8)	47.2 (53.1)	42.5 (50.3)	49.0 (55.3)	44.5 (52.3)

*** Monitor GF-NMP1 was installed on 16th January. Missing data after installation until month end was due to monitor switching off due to fault.

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Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Saturday Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Sunday / Public Holiday Average L _{Aeq,T} (Highest Day L _{Aeq,T})	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	52.5 (76.5)	55.6 (71.7)	52.0 (68.8)	49.5 (68.1)	49.9 (77.4)	51.0 (59.5)	53.1 (68.0)	54.6 (69.8)	50.7 (63.0)	47.5 (60.1)	49.8 (61.4)	42.9 (58.3)
SHCW	PR-NMP1	Potters Row, South Heath	Free-field	51.4 (66.2)	55.0 (62.5)	50.3 (62.9)	49.3 (63.8)	49.6 (69.3)	50.3 (59.8)	50.9 (59.8)	51.2 (58.2)	47.6 (56.1)	43.2 (48.7)	52.0 (63.2)	42.1 (51.9)
NP	BFH-NMP1	Bury Farm, Great Missenden	Free-field	46.7 (57.2)	53.3 (59.1)	46.1 (53.6)	44.1 (52.8)	41.1 (59.1)	46.2 (52.9)	47.8 (52.9)	47.8 (53.9)	45.0 (52.5)	43.1 (54.4)	46.6 (55.4)	39.3 (48.9)
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Free-field	52.2 (55.8)	55.9 (58.5)	51.3 (56.4)	48.8 (55.9)	45.6 (57.5)	51.2 (56.0)	53.1 (55.1)	53.7 (59.5)	50.3 (55.8)	46.5 (58.3)	50.8 (59.2)	45.1 (55.1)
	BLH-NMP1	Bayleys Hatch, South Heath, Great Missenden	Free-field	54.6 (58.1)	54.2 (56.4)	48.1 (53.1)	45.7 (50.0)	42.9 (54.5)	54.2 (54.9)	52.6 (53.8)	52.7 (54.0)	48.5 (54.1)	43.3 (54.2)	50.5 (55.2)	41.3 (49.0)
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Free-field	56.9 (61.5)	57.5 (60.2)	55.4 (58.0)	52.5 (59.0)	48.4 (59.9)	52.9 (54.2)	55.7 (56.9)	55.8 (57.2)	54.4 (57.9)	48.0 (60.0)	53.6 (59.4)	46.9 (55.7)
AM	AM-NMP1	Whielden Lane, Amersham	Free-field	62.7 (65.8)	65.4 (69.5)	61.0 (63.1)	58.4 (60.8)	54.4 (62.6)	58.0 (59.0)	61.2 (61.6)	61.1 (61.6)	59.7 (62.0)	53.9 (61.0)	59.1 (63.0)	53.8 (62.4)
LM	LM-NMP1	Little Missenden, A413, Amersham	Free-field	62.1 (63.4)	61.4 (63.0)	61.4 (63.0)	58.0 (60.8)	53.7 (61.5)	58.2 (59.8)	60.4 (62.4)	60.7 (62.0)	59.1 (62.1)	52.1 (55.8)	59.0 (61.7)	52.8 (59.6)
	PWC-NMP1	Patricia Holmes, LM Worksite, Amersham	Free-field	61.6 (64.3)	61.3 (63.7)	60.8 (62.8)	57.4 (61.0)	53.1 (61.0)	58.7 (61.0)	60.7 (63.1)	61.0 (63.4)	58.9 (62.6)	52.1 (59.6)	59.0 (63.5)	51.5 (59.6)
CSG	CSG-NMP1	CSG Worksite, Bottom House Farm Lane	Free-field	47.1 (61.5)	50.1 (60.3)	44.3 (49.2)	41.0 (49.1)	40.3 (59.6)	44.5 (48.3)	48.0 (49.4)	47.0 (49.8)	44.2 (50.7)	40.0 (51.4)	46.4 (56.1)	40.4 (51.4)

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Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Saturday Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Sunday / Public Holiday Average L _{Aeq,T} (Highest Day L _{Aeq,T})	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
CSG	CSG-NMP2	CSG Worksite, Bottom House Farm Lane	Free-field	50.3 (53.5)	56.7 (63.3)	50.6 (54.0)	43.1 (51.1)	44.5 (54.5)	49.0 (52.3)	49.9 (52.4)	48.4 (51.2)	46.7 (52.5)	44.6 (50.7)	47.4 (53.8)	45.6 (52.0)
	PIC-NMP1	Bottom House Farm Lane, Chalfont St Giles, Buckinghamshire	Free-field	55.7 (57.4)	55.9 (61.2)	54.1 (55.5)	51.6 (55.4)	48.5 (62.6)	53.4 (54.3)	55.8 (57.0)	55.6 (56.7)	53.5 (59.0)	46.2 (51.9)	53.5 (58.8)	47.9 (55.9)
CSP	CSP-NMP1	Chalfont St Peter Vent Shaft Worksite	Free-field	57.9 (62.2)	58.7 (61.0)	56.7 (58.7)	52.7 (61.5)	48.6 (60.3)	54.4 (55.4)	57.5 (58.9)	58.5 (60.0)	55.1 (60.4)	47.6 (56.9)	54.7 (62.9)	47.0 (55.0)
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	47.7 (52.3)	50.4 (52.3)	46.9 (51.4)	44.4 (50.5)	41.4 (50.4)	47.4 (50.5)	50.1 (51.5)	50.2 (52.9)	46.5 (51.0)	41.2 (54.4)	48.0 (57.4)	40.0 (47.2)
	CSP-NMP3	Chalfont St Peter Vent Shaft Worksite	Free-field	58.6 (60.9)	58.7 (60.2)	58.1 (60.3)	55.5 (58.9)	51.0 (58.5)	54.9 (55.6)	58.4 (59.8)	58.4 (60.4)	57.1 (60.3)	50.6 (58.8)	56.7 (59.8)	50.1 (57.9)
CVV	CVV-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	64.7 (67.4)	63.8 (65.5)	63.5 (67.2)	59.9 (65.5)	57.3 (65.0)	60.3 (61.8)	62.6 (63.4)	63.5 (63.9)	61.3 (63.6)	54.6 (58.4)	60.9 (65.6)	56.9 (64.5)
	WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	Free-field	59.5 (61.8)	59.1 (60.7)	58.0 (60.1)	54.4 (58.5)	52.4 (59.6)	56.5 (57.5)	58.2 (59.5)	59.1 (61.6)	56.6 (61.2)	50.2 (57.6)	56.5 (63.0)	51.2 (58.8)
	DFS-NMP1	Denham Film Studio, Uxbridge	Free-field	50.9 (56.9)	50.4 (54.6)	50.8 (54.5)	46.5 (55.0)	44.6 (56.5)	53.4 (59.2)	50.5 (52.9)	49.8 (51.6)	50.5 (60.6)	44.6 (57.7)	51.1 (62.1)	45.1 (56.4)
	SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire	Free-field	51.7 (54.3)	50.5 (54.8)	47.8 (50.6)	46.1 (51.2)	44.4 (52.9)	51.7 (52.4)	51.5 (52.1)	48.9 (50.1)	47.8 (51.7)	47.7 (73.9)	49.0 (52.9)	44.1 (51.0)

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	5.25 (X-axis)*
RF	RF-Vib 1	Old Stable Cottage, Rosehill Farm, Chetwode	1.87 (Y-axis)
WGT	ER-Vib 1	46, Ellesborough Rd, Wendover	2.82 (X-axis)
WDV	WDV-Vib1	Upper Wendover Dean Farm, A413, Wendover	2.99 (Y-axis)
	WDV-Vib2	Upper Wendover Dean Farm, A413, Wendover	0.24 (Z-axis)
GF	GF-Vib1	Grove Farm, Wendover	3.24 (Z-axis)
RLE	NCAS7-Vib1	Chesham Lane, The Lee, Wendover	0.37 (X-axis)
	NCAS6-Vib1	Chesham Lane, The Lee, Wendover	0.29 (X-axis)

*High vibration levels at SE-Vib1 are due to proximity of plant movements to the vibration monitor. The nearest receptor is 50 meters further away and therefore the vibration levels at the receptor are lower.

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	Weekdays	0800-1800	2	No exceedance
SE	SE-NMP1	School End, Chetwode	Weekdays	0800-1800	3	No exceedance
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	All days	All periods	No exceedance	No exceedance
HC	HC-NMP1	Hermitage, Chetwode	All days	All periods	No exceedance	No exceedance
TW	TW-NMP1	Twyford	All days	All periods	No exceedance	No exceedance
WSO	WSO-NMP1	West Street, Twyford	All days	All periods	No exceedance	No exceedance
AR	AR-NMP1	Addison Road, Rosehill Farm	All days	All periods	No exceedance	No exceedance
SHC	SHC-NMP1	School Hill Compound, Calvert	Weekdays	0800-1800	2	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
FCC	FCC-NMP1	Calvert South	Weekdays	0800-1800	1	No exceedance
WDL	WDL-NMP1	Woodlands Farmhouse, Station Rd, Quainton	Weekdays Saturdays	0800-1800 0800-1300	20 1	No exceedance No exceedance
QAR	QAR-NMP2	Station Rd, Quainton	Weekdays Saturdays	0800-1800 0800-1300	6 1	No exceedance
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	All days	All periods	No exceedance	No exceedance
	MW-NMP1	Aylesbury, Buckinghamshire	Weekdays	0800-1800	2	No exceedance
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury	All days	All periods	No exceedance	No exceedance
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	All days	All periods	No exceedance	No exceedance
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Weekdays Saturdays	0700-0800 1400-2200	2 7	No exceedance No exceedance
	NLL-NMP2	Nash Lee Lane, Nash Lee	Weekdays Saturdays	0700-0800 1800-1900 0700-0800 1300-1400 1400-2200	15 7 2 2 11	No exceedance No exceedance No exceedance No exceedance No exceedance
WGT	ER-NMP1	Ellesborough Rd, Wendover	Weekdays Saturdays	0800-1800 1400-2200	4 12	No exceedance No exceedance
	BL-NMP1	Bacombe Lane, Wendover	All days	All periods	No exceedance	No exceedance
	WT-NMP1	A413, Wendover	Weekdays Saturdays	0700-0800 0800-1800 1800-1900 0700-0800 0800-1300 1300-1400 1400-2200	21 21 21 4 4 4 12	No exceedance No exceedance No exceedance No exceedance No exceedance No exceedance No exceedance
GF	GF-NMP1	Grove Farm, Wendover	All days	All periods	No exceedance	No exceedance
RLE	SDVC-NMP1	Rocky Lane, Wendover	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
	NCAS7-NMP1	Chesham Lane, The Lee, Wendover	All days	All periods	No exceedance	No exceedance
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	All days	All periods	No exceedance	No exceedance
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Saturdays	1400-2200	10	No exceedance
WDV	WDV-NMP1	A413, Wendover	Saturdays	1400-2200	1	No exceedance
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath	All days	All periods	No exceedance	No exceedance
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Weekdays	0700-0800 0800-1800 1800-1900	1 2 5	No exceedance No exceedance No exceedance
			Saturdays	0800-1300 1300-1400 1400-2200	1 1 3	No exceedance No exceedance No exceedance
SHCW	PR-NMP1	Potters Row, South Heath	All days	All periods	No exceedance	No exceedance
NP	BFH-NMP1	Bury Farm, Great Missenden	All days	All periods	No exceedance	No exceedance
	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	All days	All periods	No exceedance	No exceedance
	BLH-NMP1	Bayleys Hatch, South Heat, Great Missinden	Saturdays	1400-2200	1	No exceedance
CHSM	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Saturdays	1400-2200	6	No exceedance
AM	AM-NMP1*	Whielden Lane, Amersham	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
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	Weekdays Saturdays	0800-1800 1800-1900 0800-1300 1300-1400 1400-2200	1 13 1 3 11	No exceedance No exceedance No exceedance No exceedance No exceedance
CSG	CSG-NMP1*	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
	CSG-NMP2*	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
	PIC-NMP1	Bottom House Farm Lane, Chalfont St Giles	Saturdays	1400-2200	2	No exceedance
CSP	CSP-NMP1*	Chalfont St Peter Vent Shaft Worksite	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

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

** The ambient noise level is close to the LOAEL and measured LOAEL exceedances are considered to be mostly due to ambient noise levels exceeding the LOAEL and not due to HS2 construction noise.

2.2.6 Exceedances of the LOAEL were recorded at eighteen (18) monitoring locations during the month of January 2023. LOAEL exceedances were recorded during weekday and Saturday time periods.

2.2.7 No SOAEL exceedances were recorded due to HS2 construction works during December 2022.

2.3 Exceedances of Trigger Level

2.3.1 Table 6 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 6: Summary of Exceedances of Trigger Levels

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

2.4 Complaints

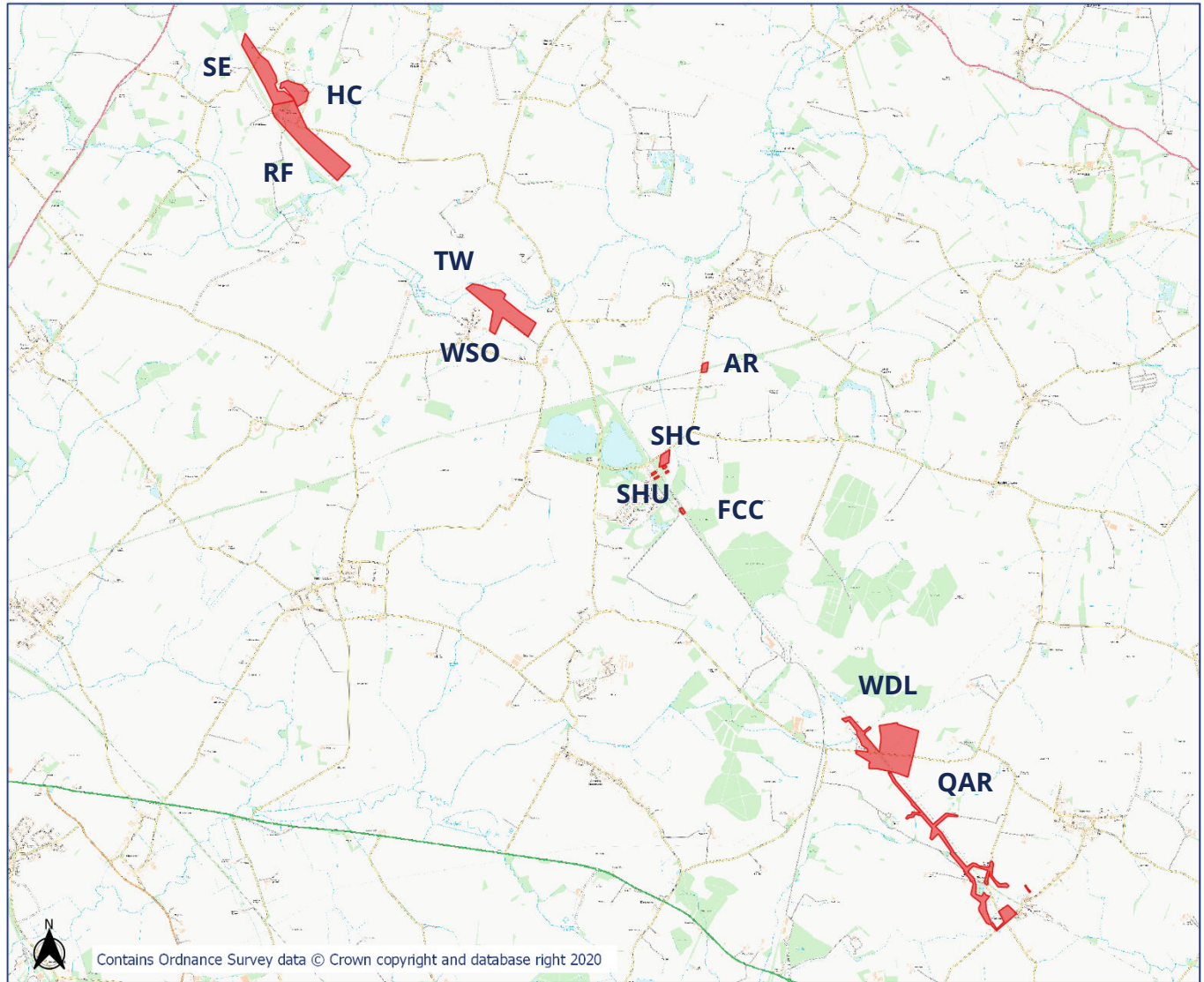
2.4.1 Table 7 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

Table 7: Summary of Complaints

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-23-88624-E-C	MW	Noise from site at night which stakeholder advises is a mile away.	Investigation shows that there were no HS2 works ongoing at this time. Further investigation shows noise was likely from non-HS2 related Thames Water emergency works.	The stakeholder has been contacted and information has been provided.
HS2-23-88270-E-C	SHU	Complaint was made by stakeholder due to vibrations from machinery felt inside their property.	Investigation showed installation of ground markers were underway at the time of the complaint.	A vibration monitor will be put in place in the area by end of February. The stakeholder has been contacted and informed of the outcome.

Appendix A Site Locations

HS2 Worksite Identification Plan - Overview 1



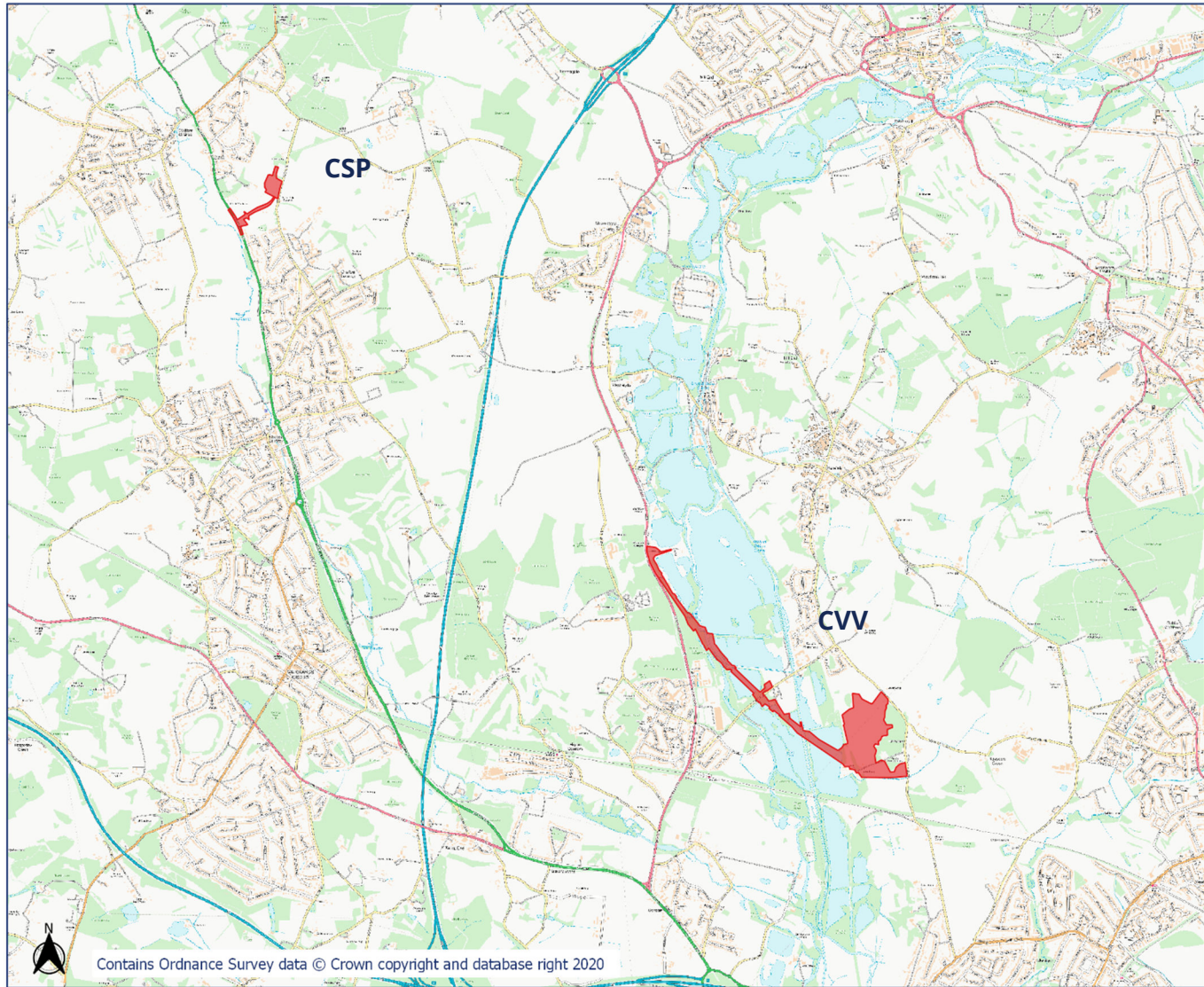
OFFICIAL

HS2 Worksite Identification Plan - Overview 2

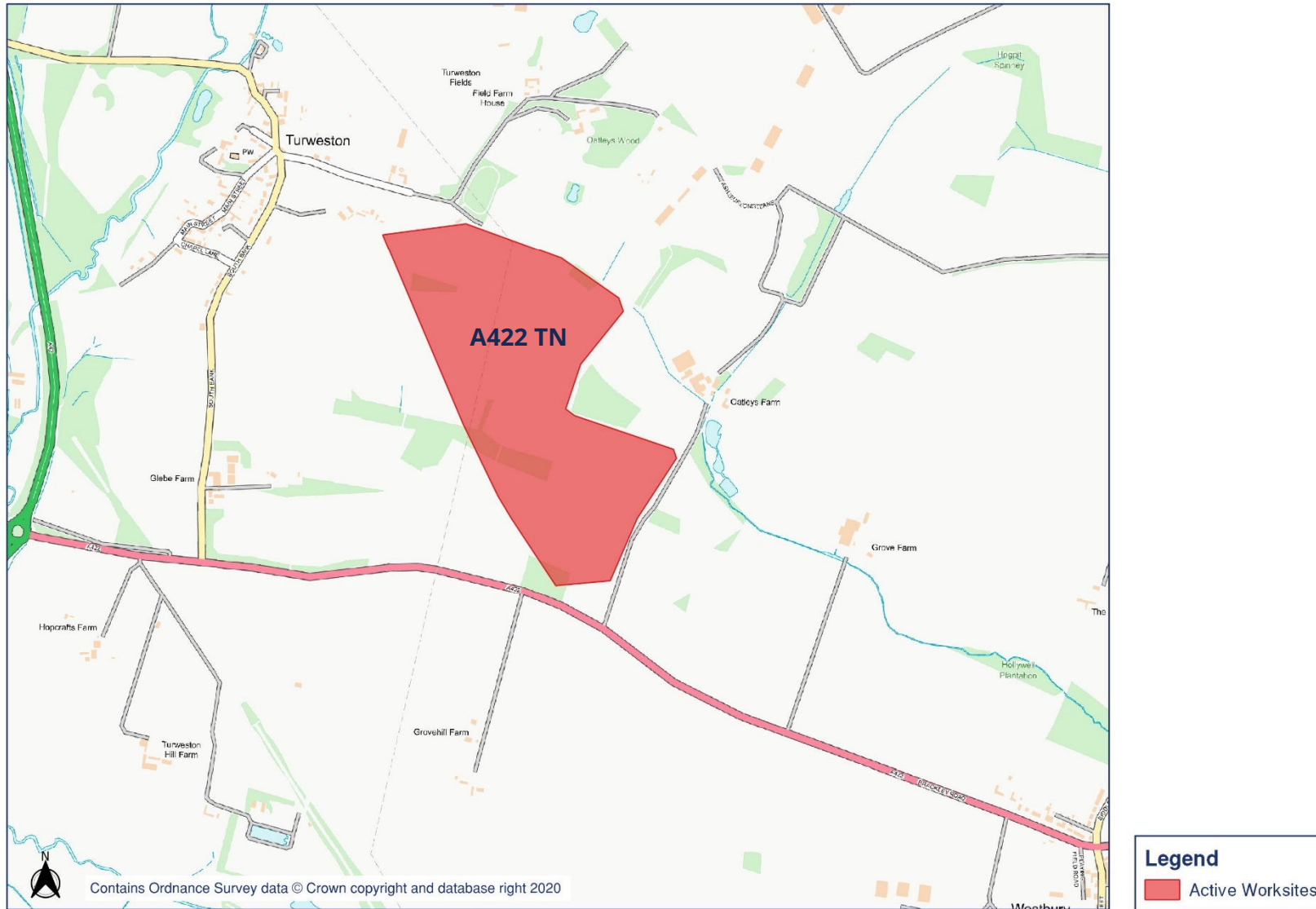


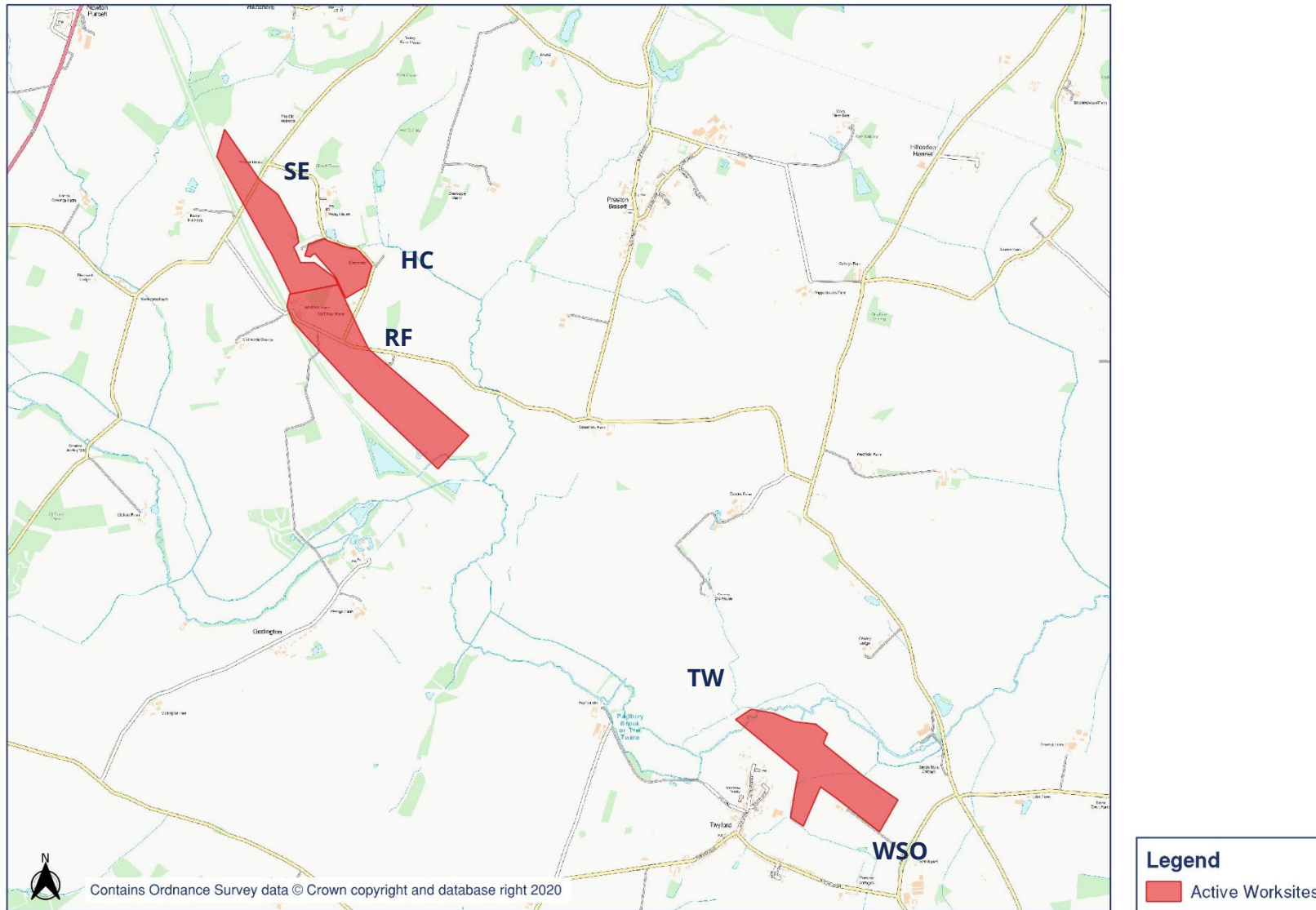
OFFICIAL

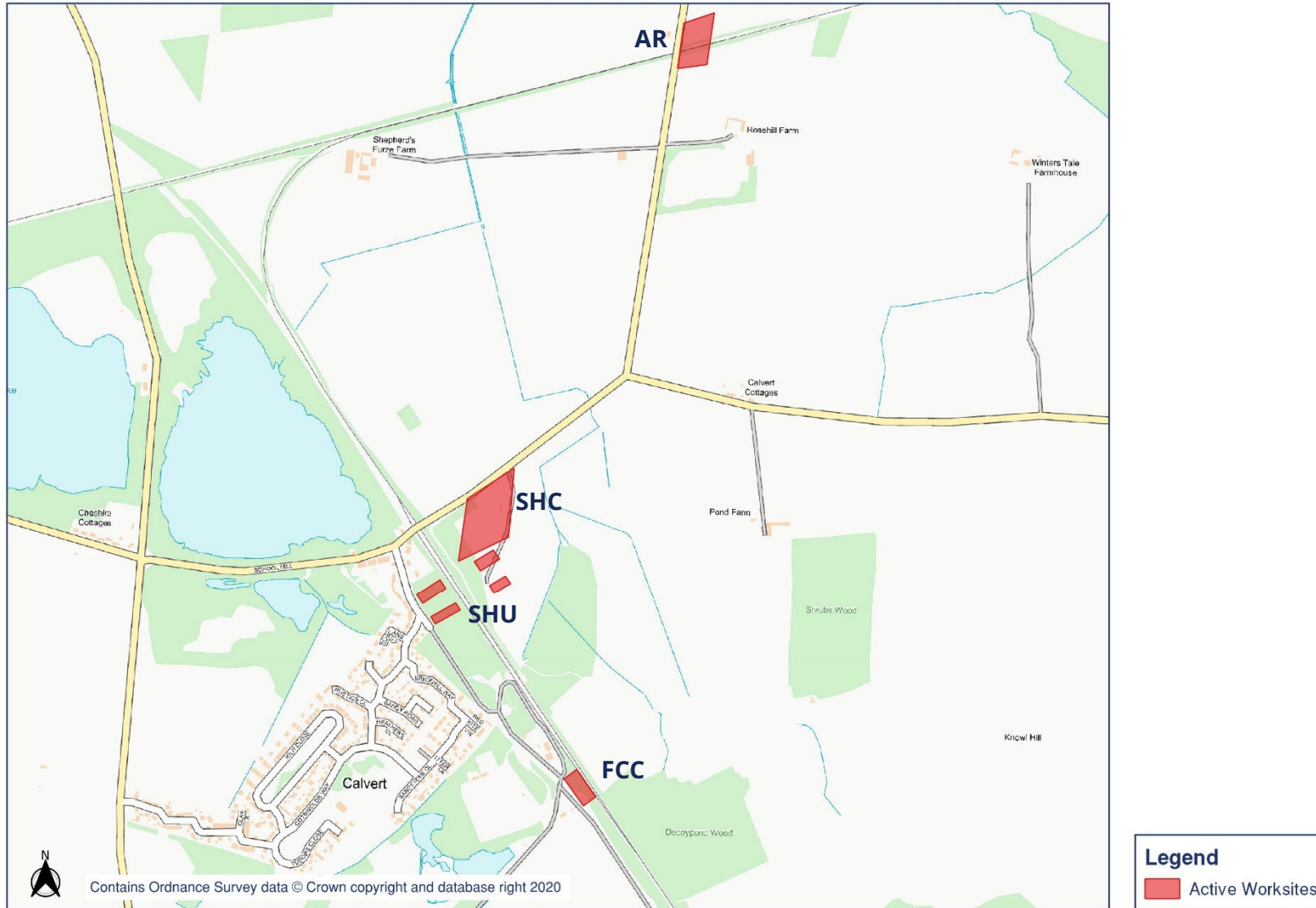
HS2 Worksite Identification Plan - Overview 3

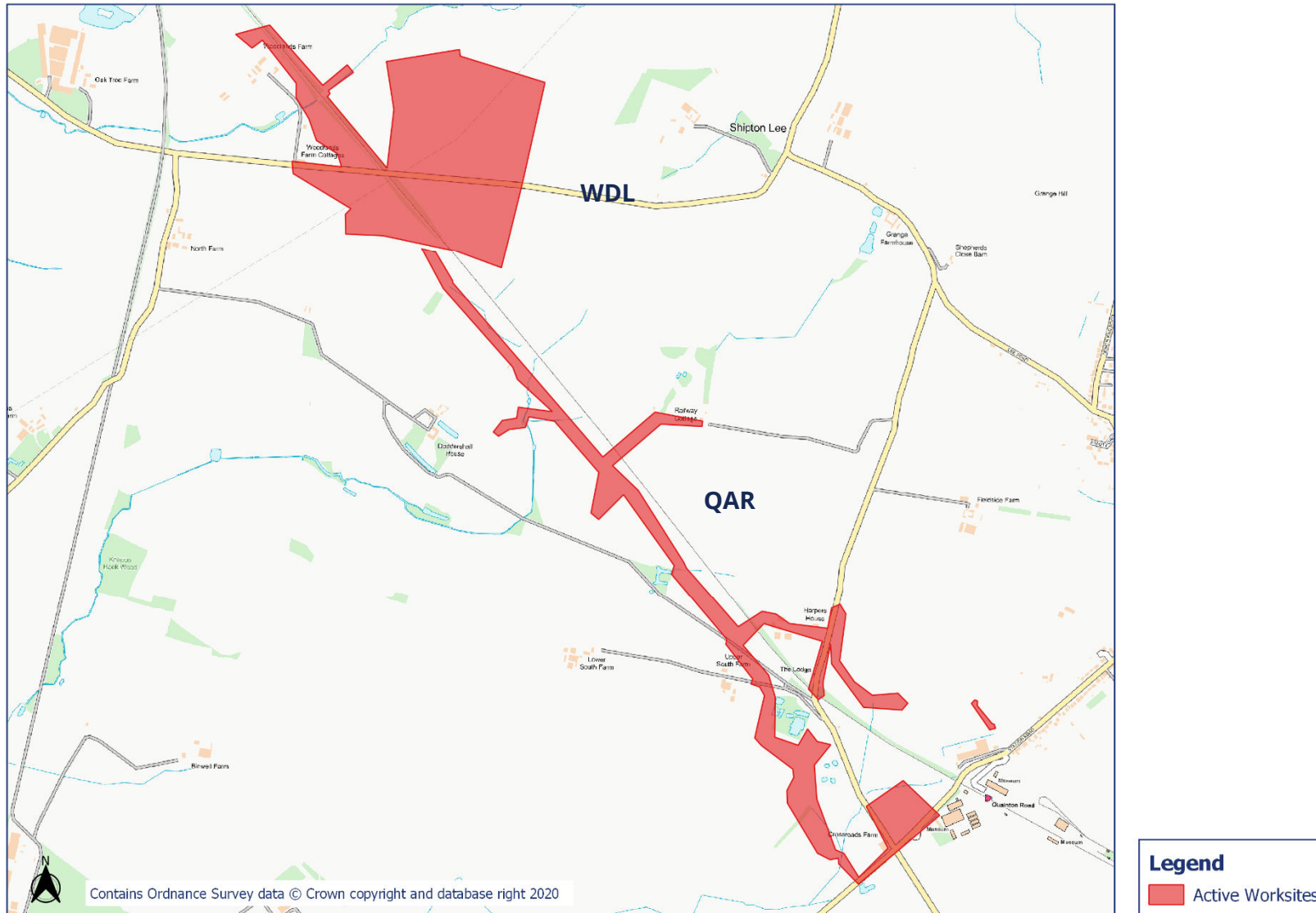


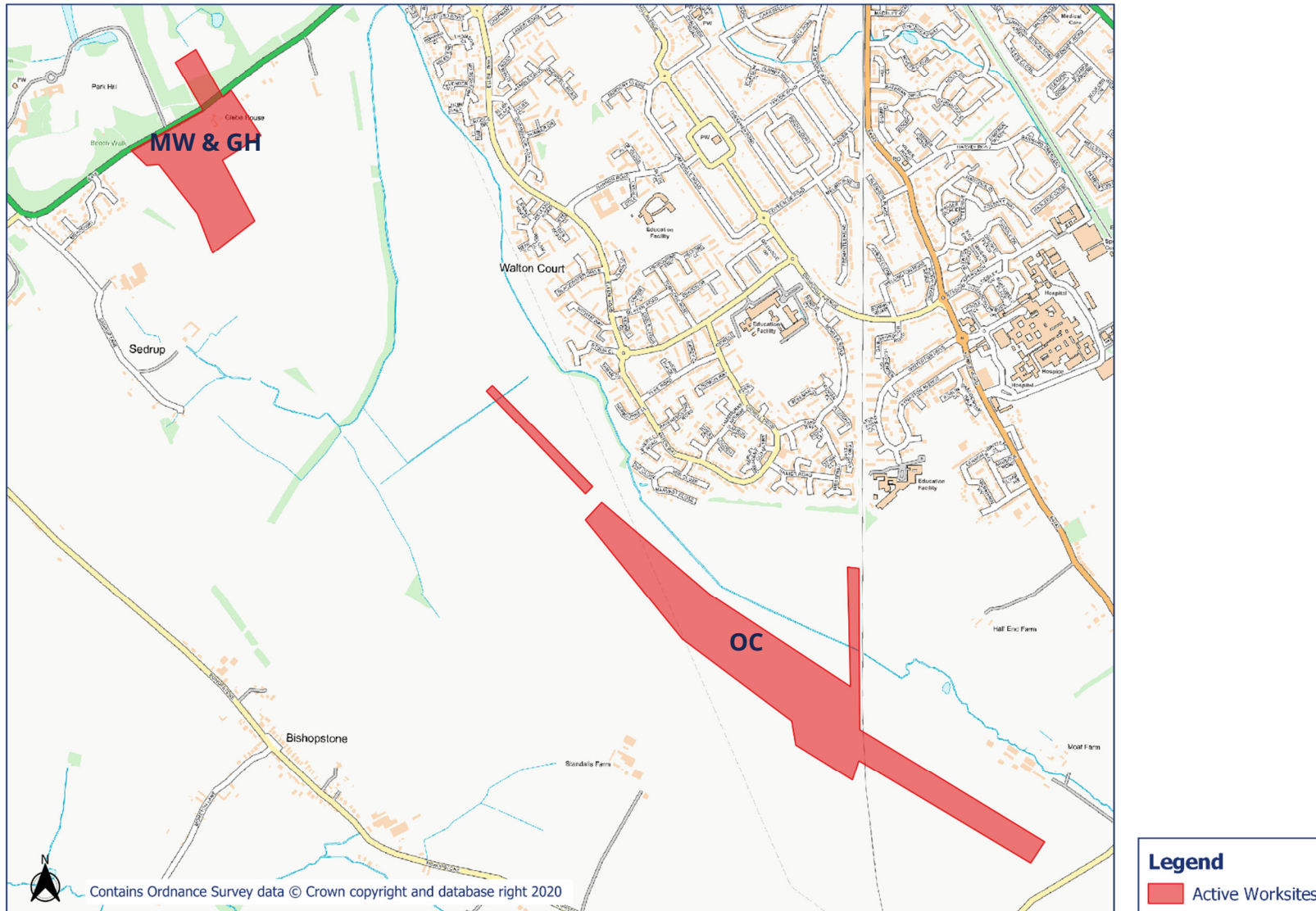
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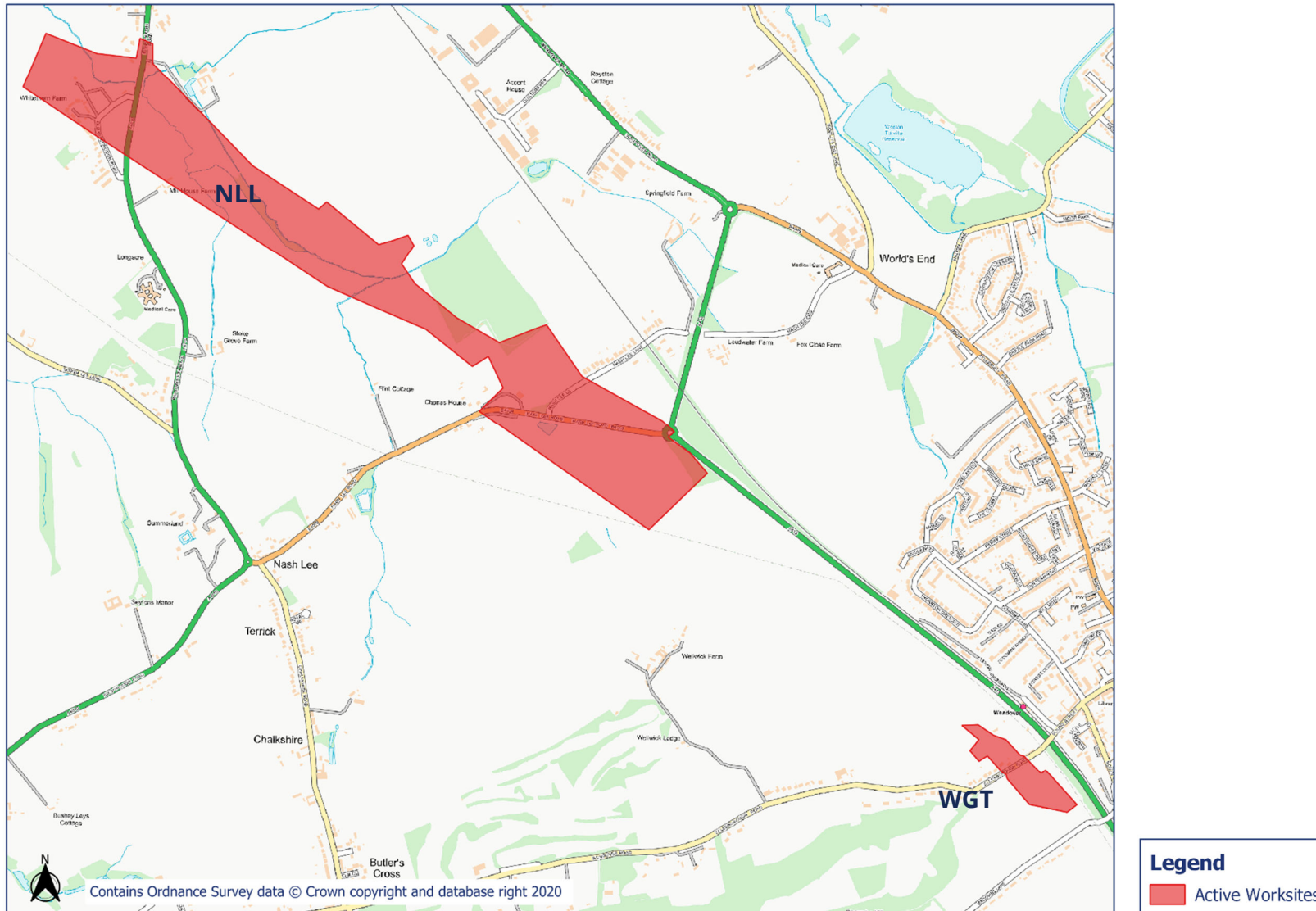


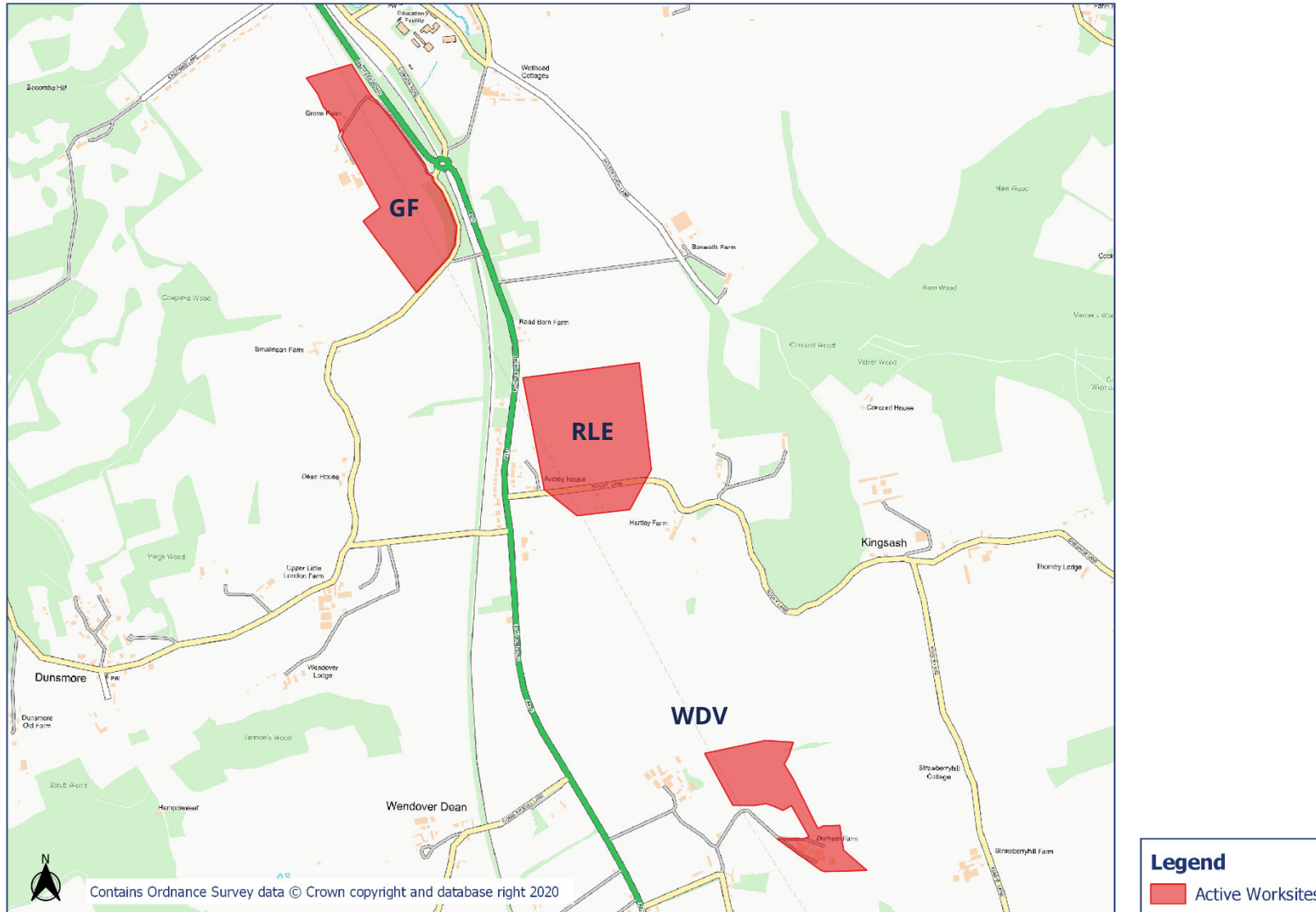


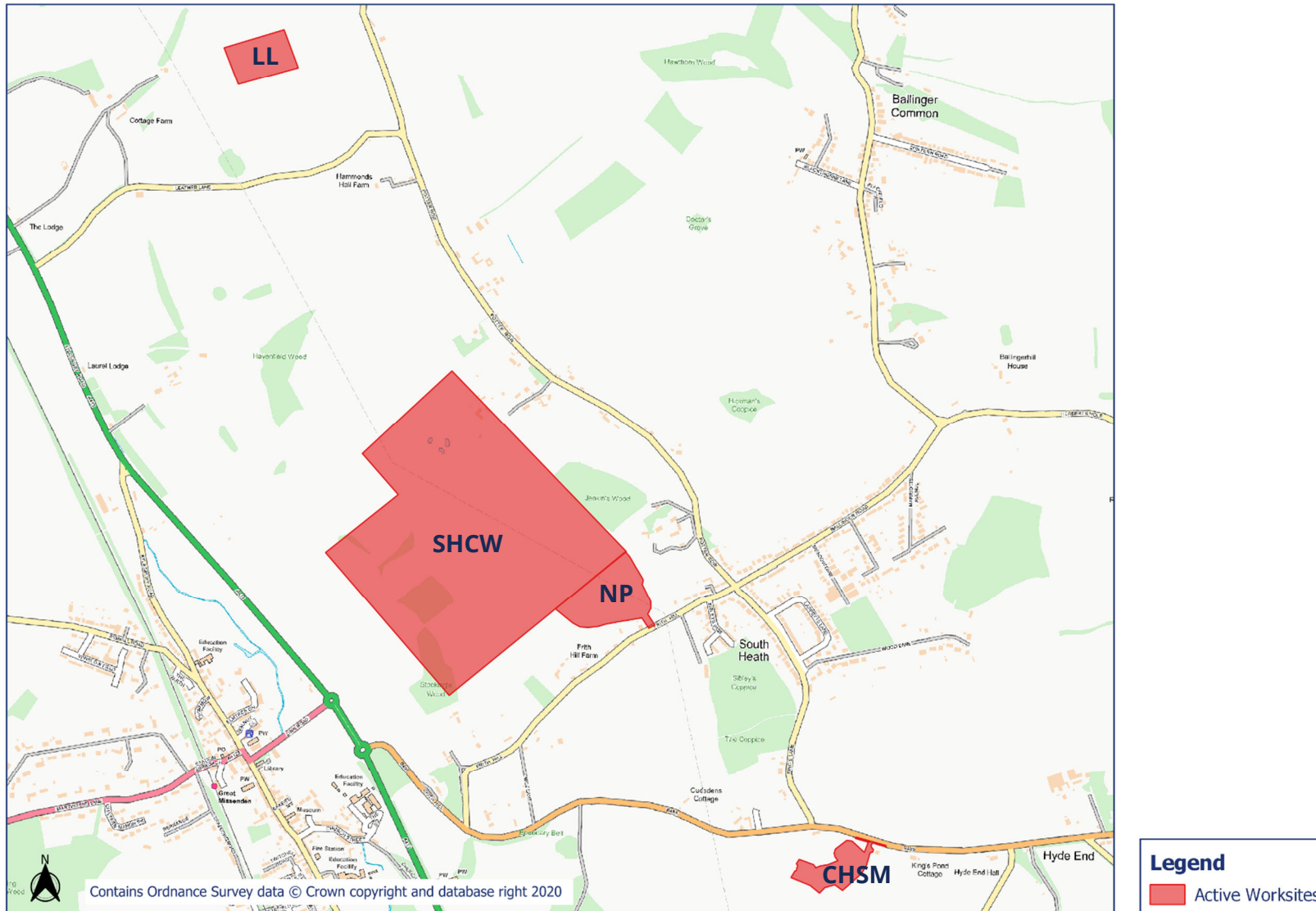




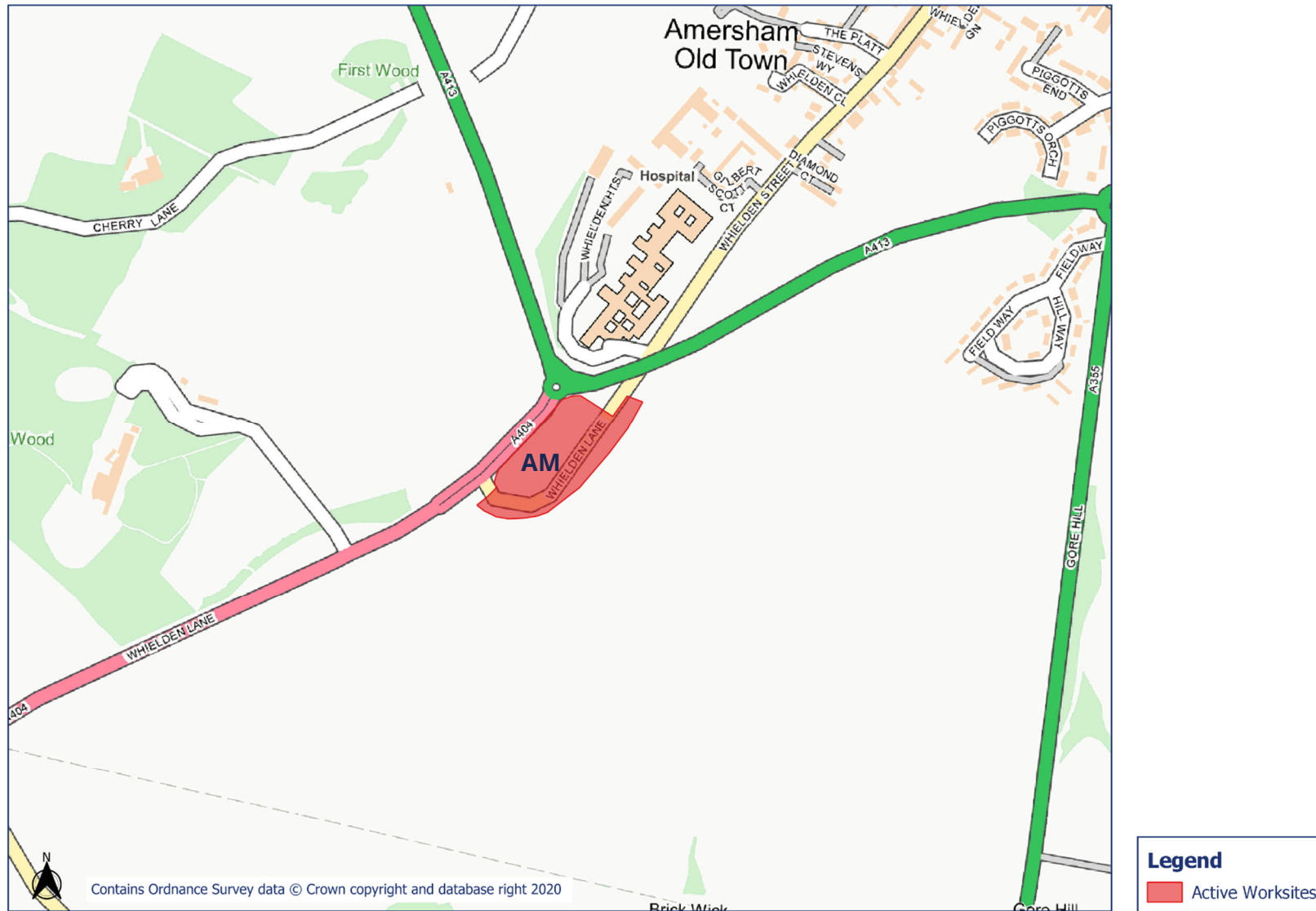


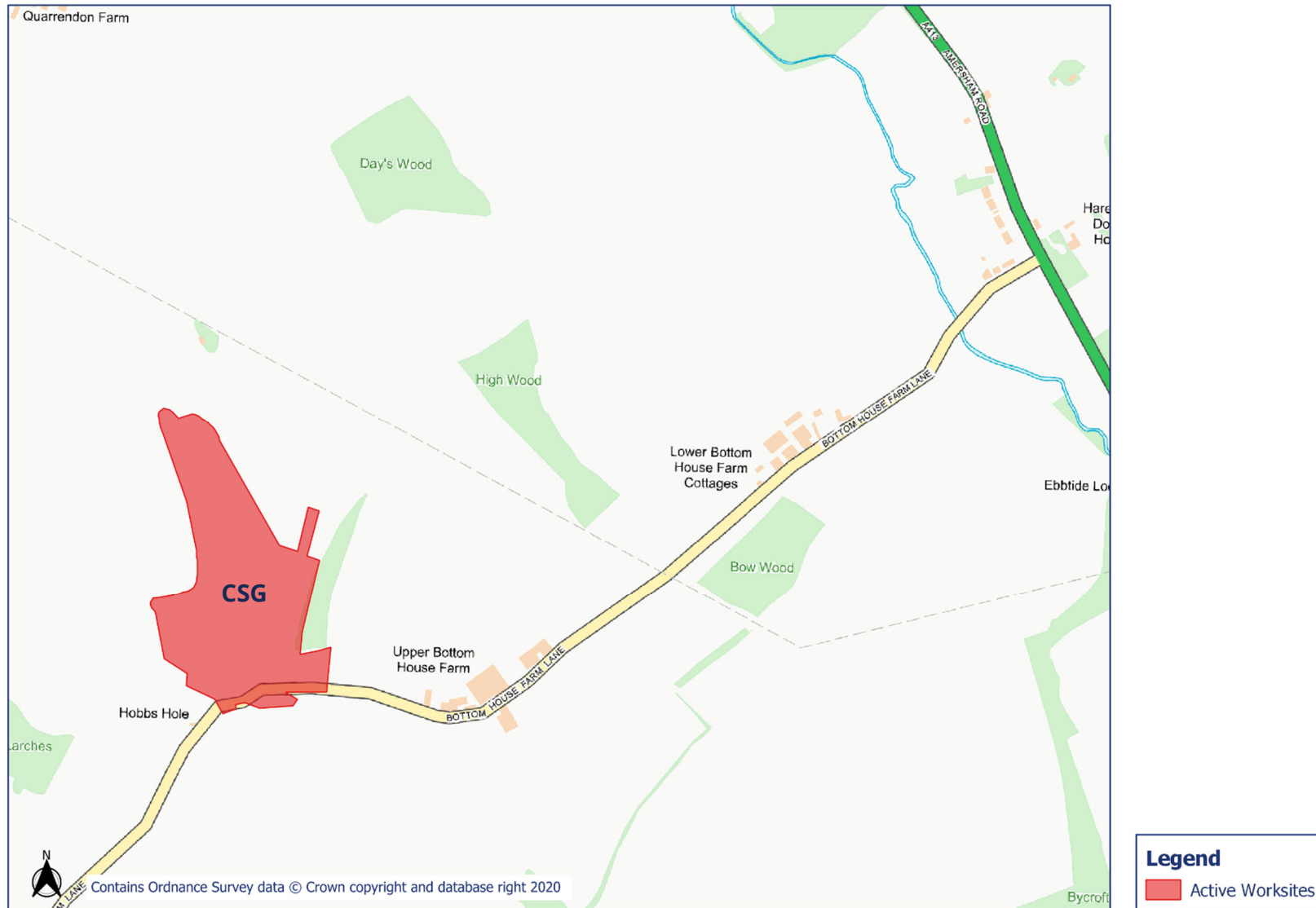




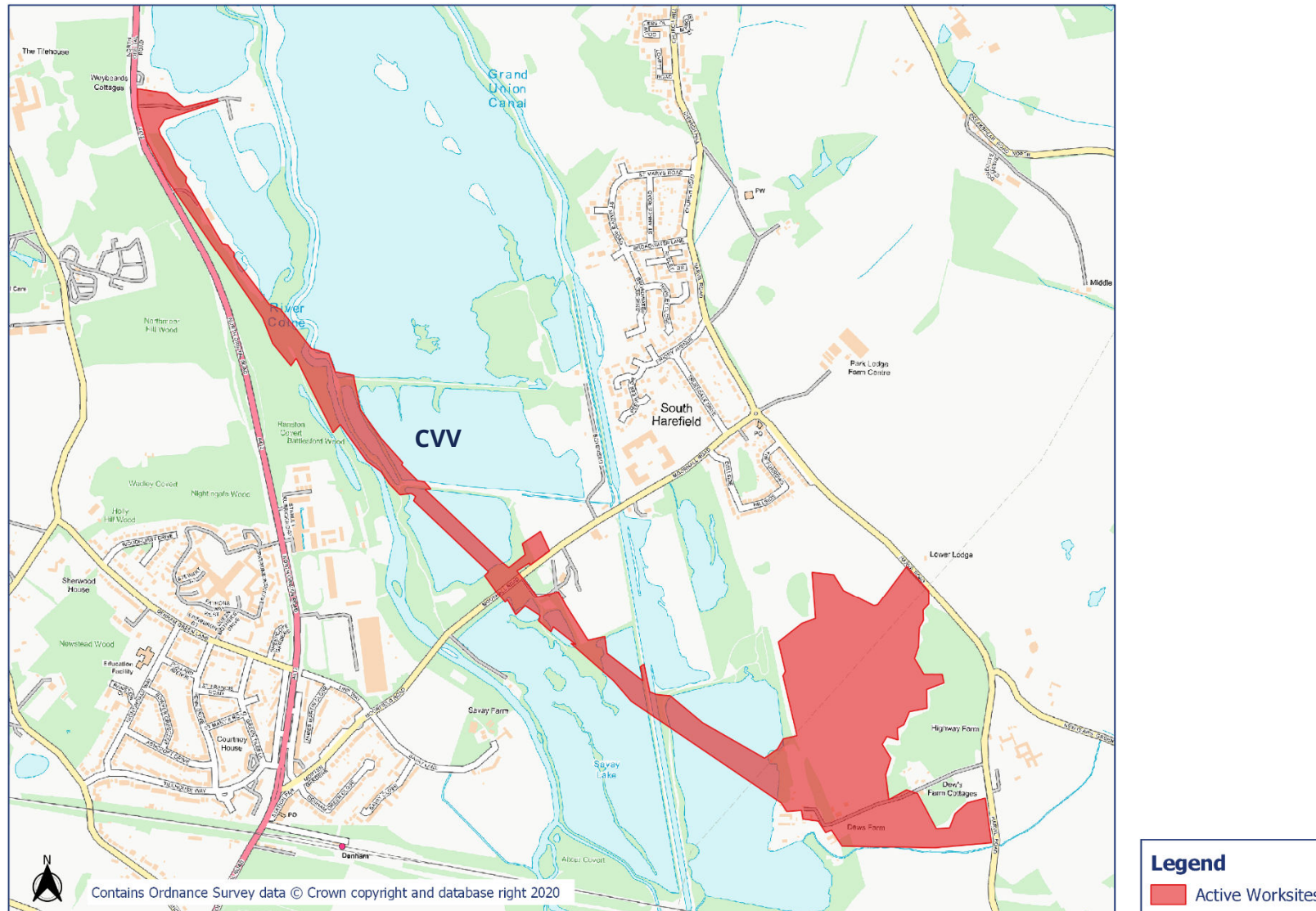




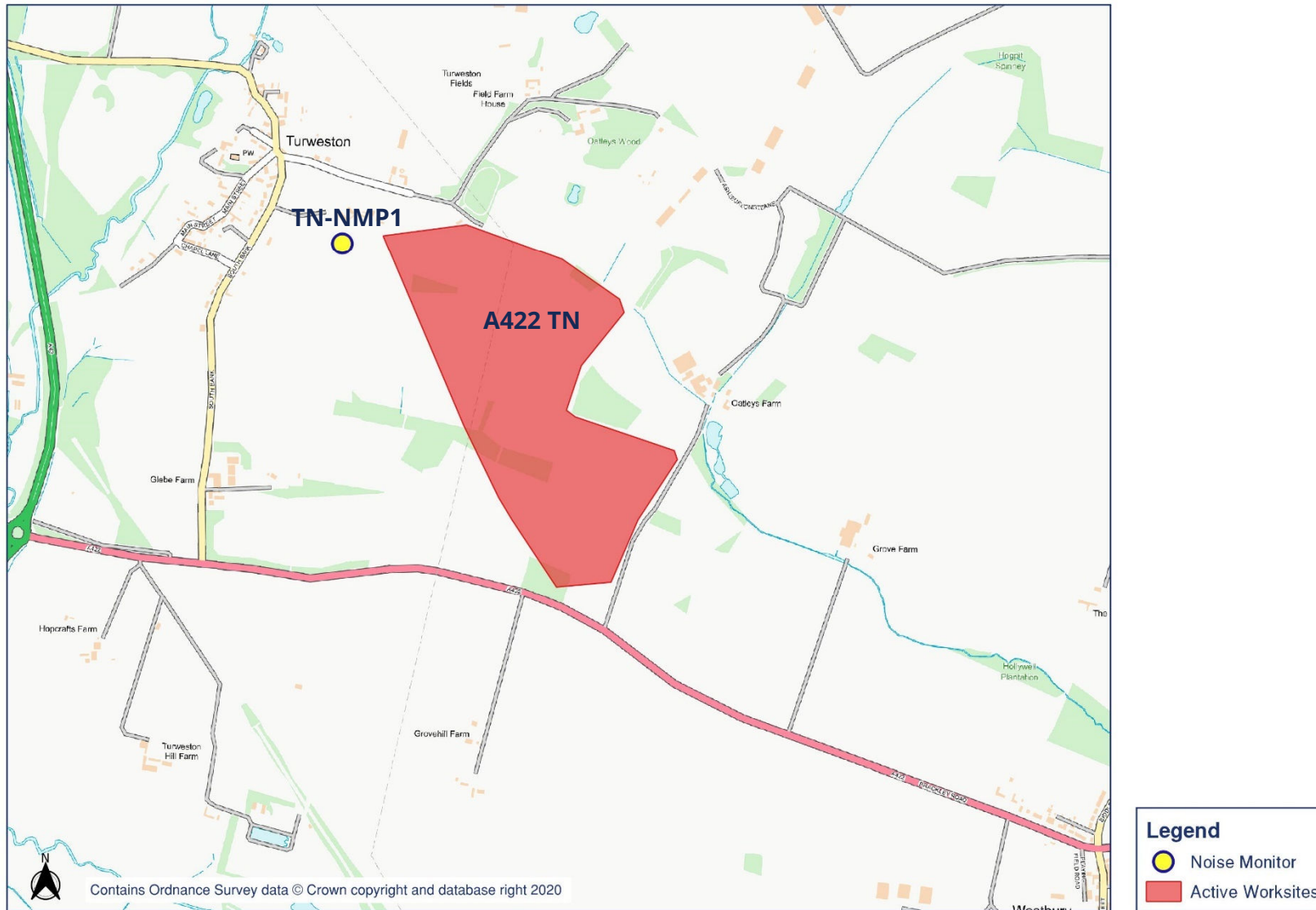






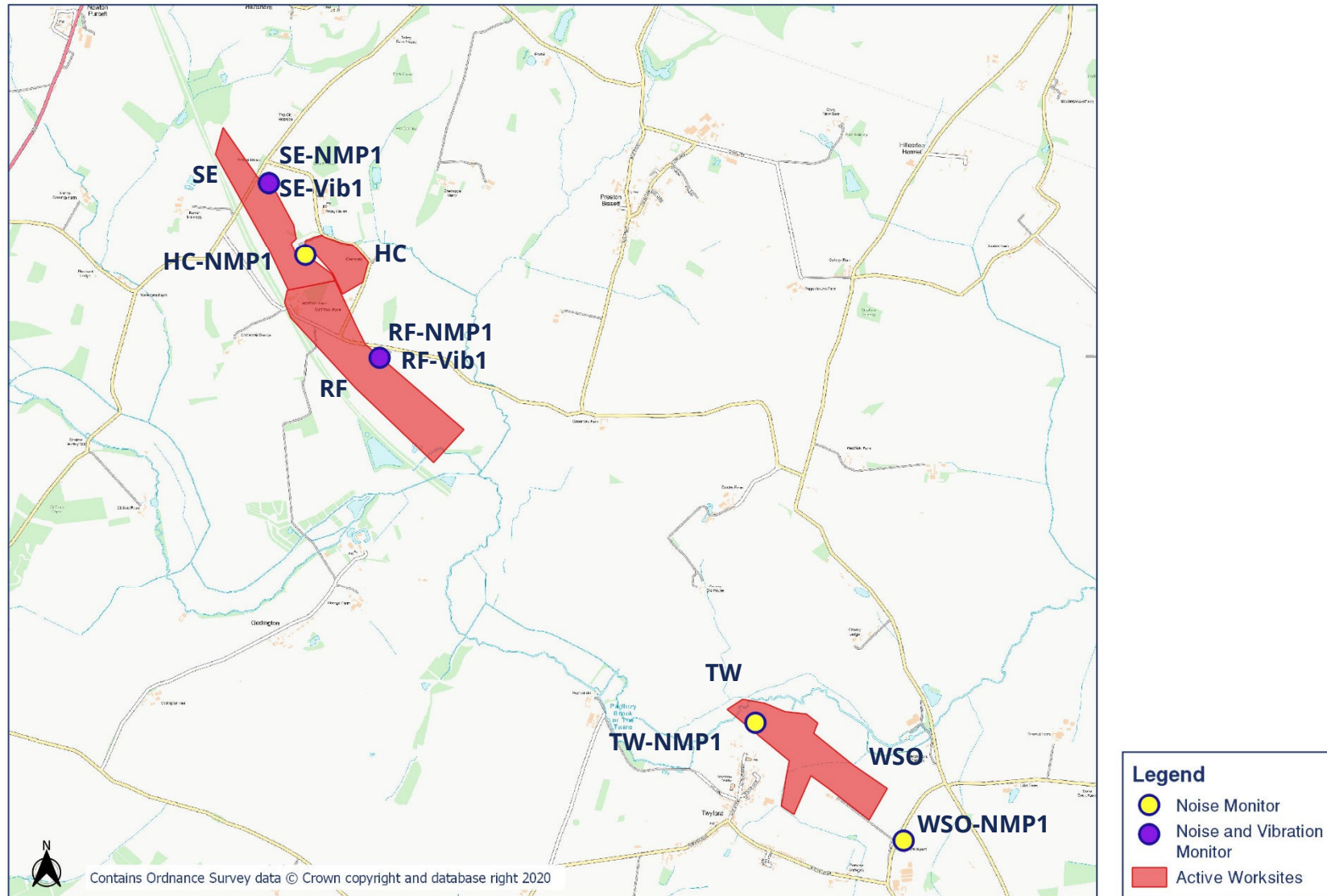


Appendix B Monitoring Locations

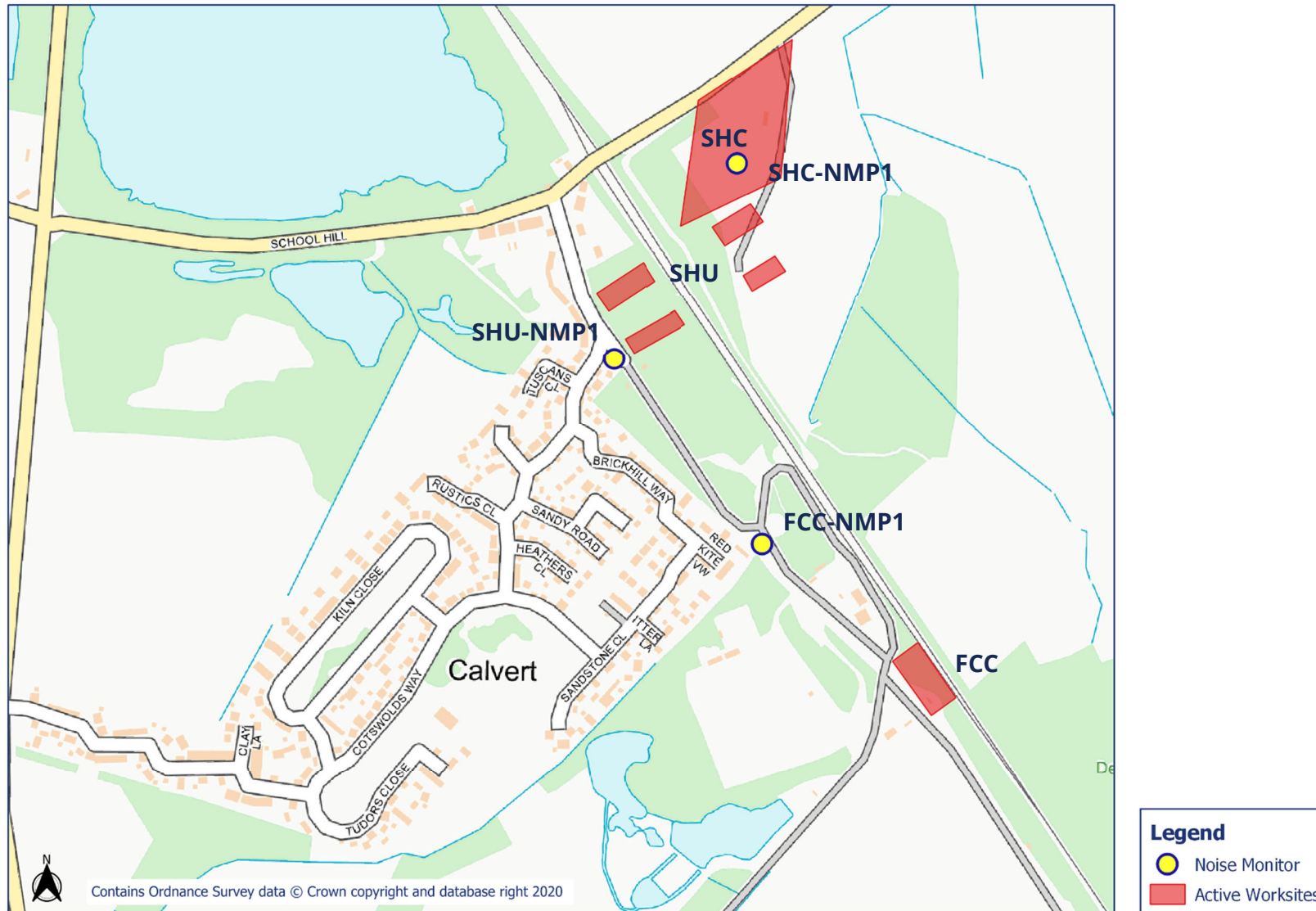


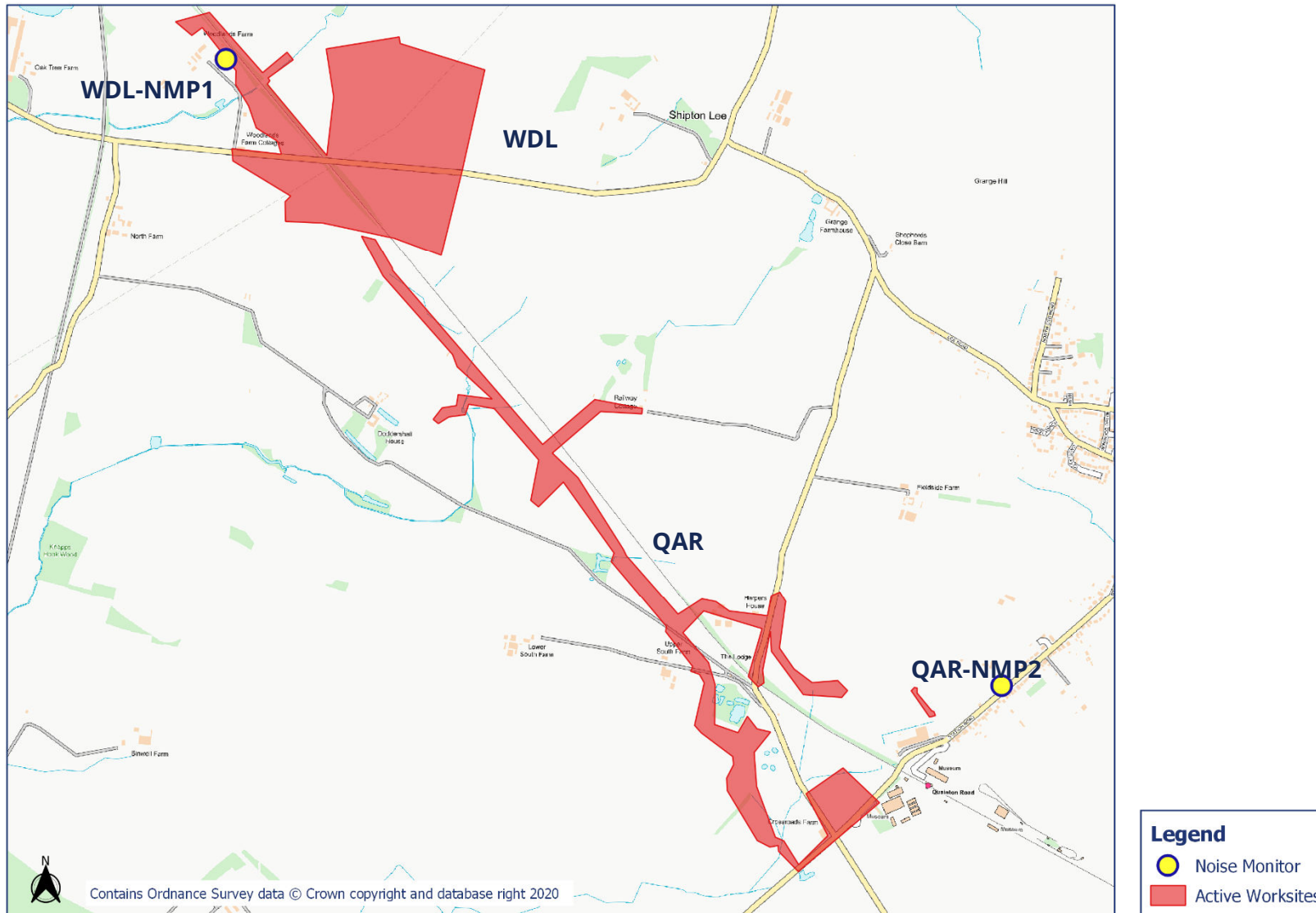
HS2

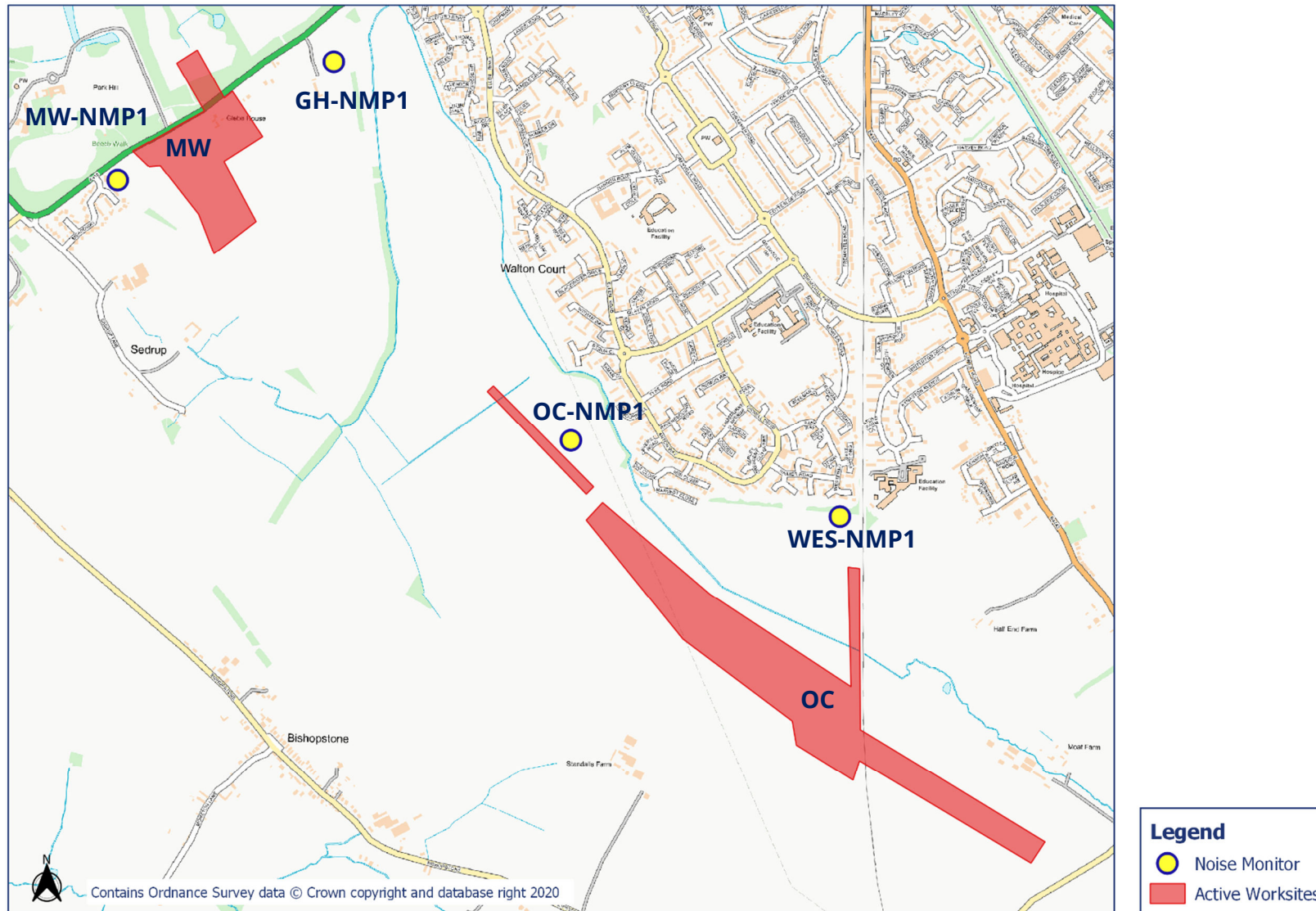
Noise and Vibration Monitoring Plan - 2

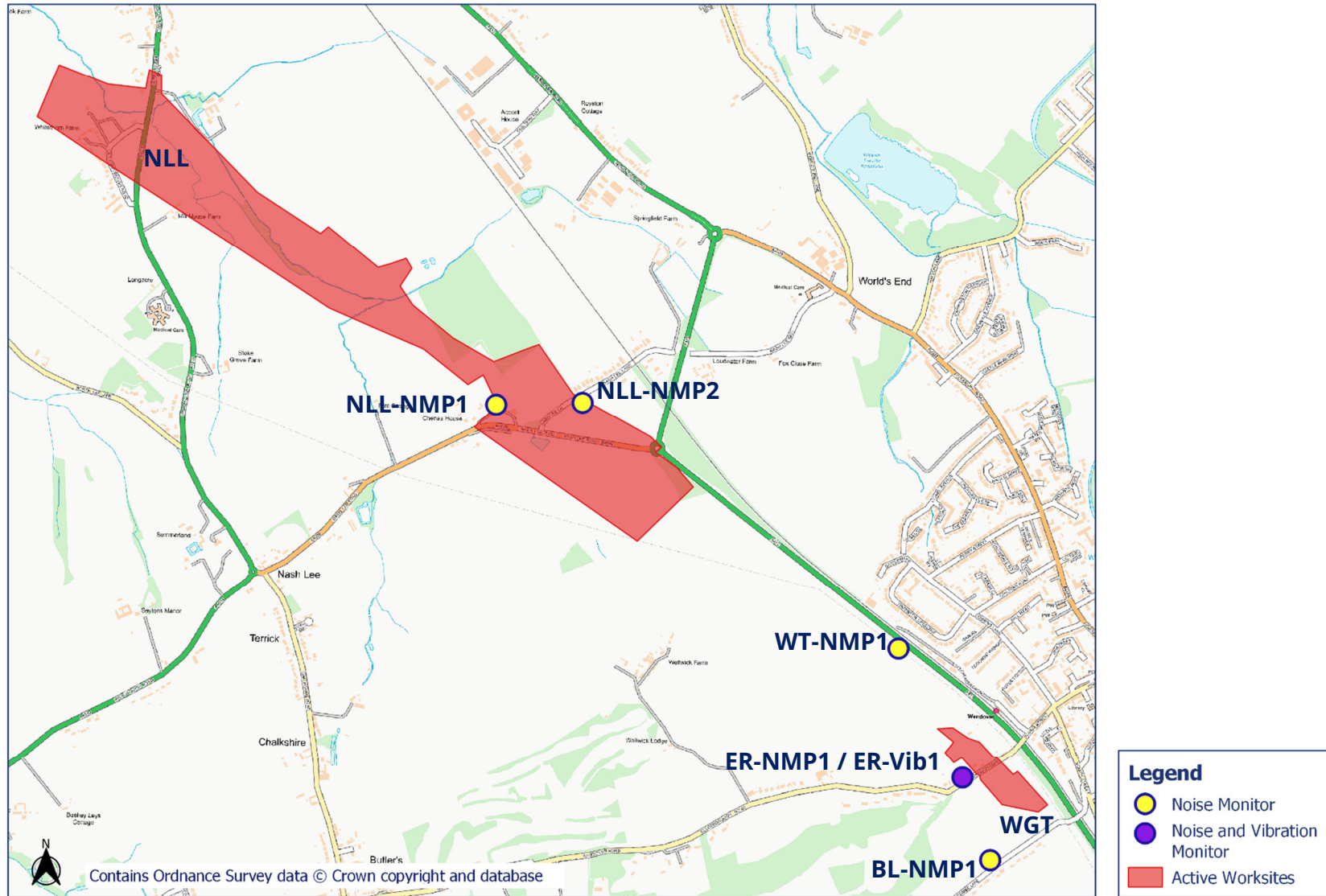


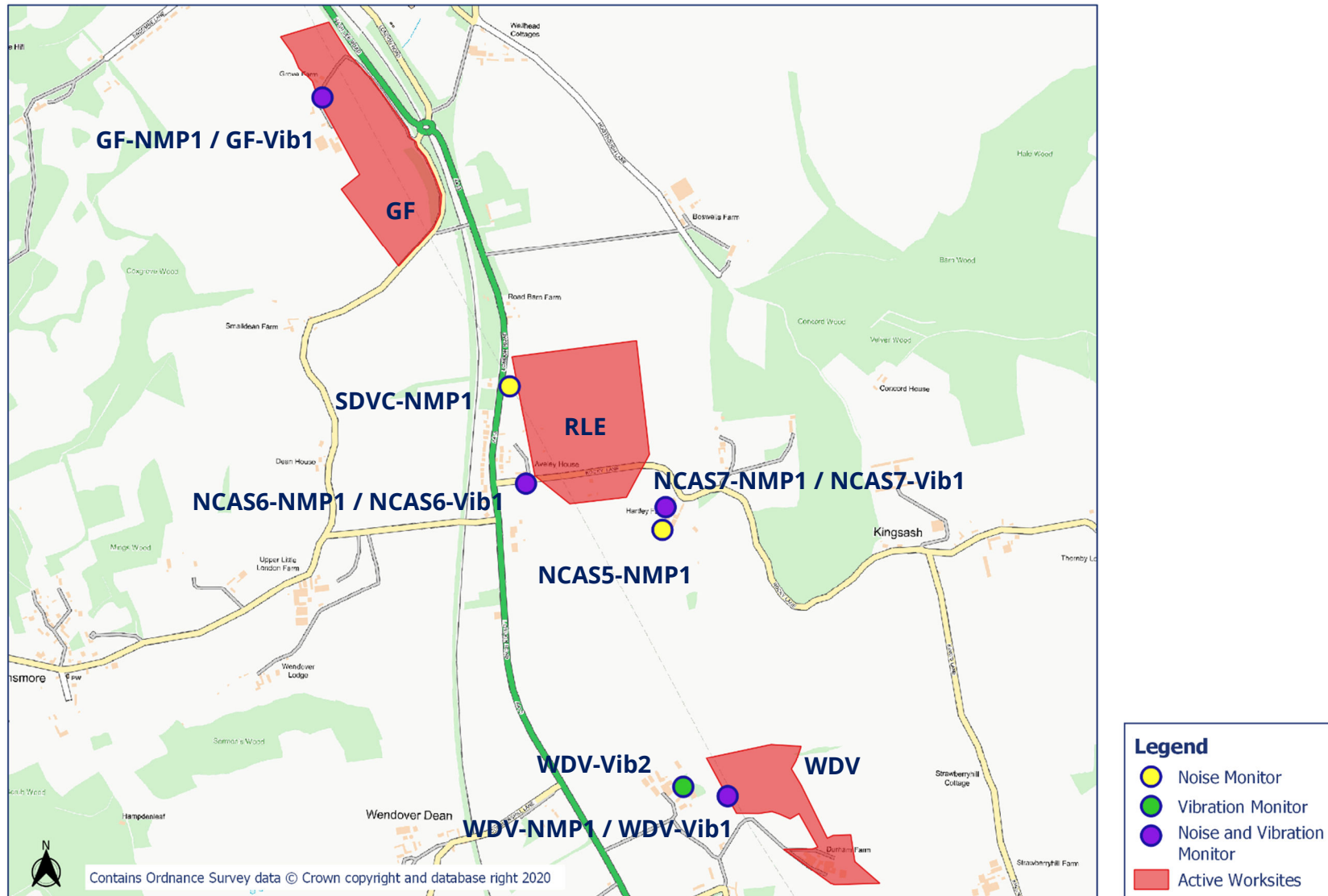


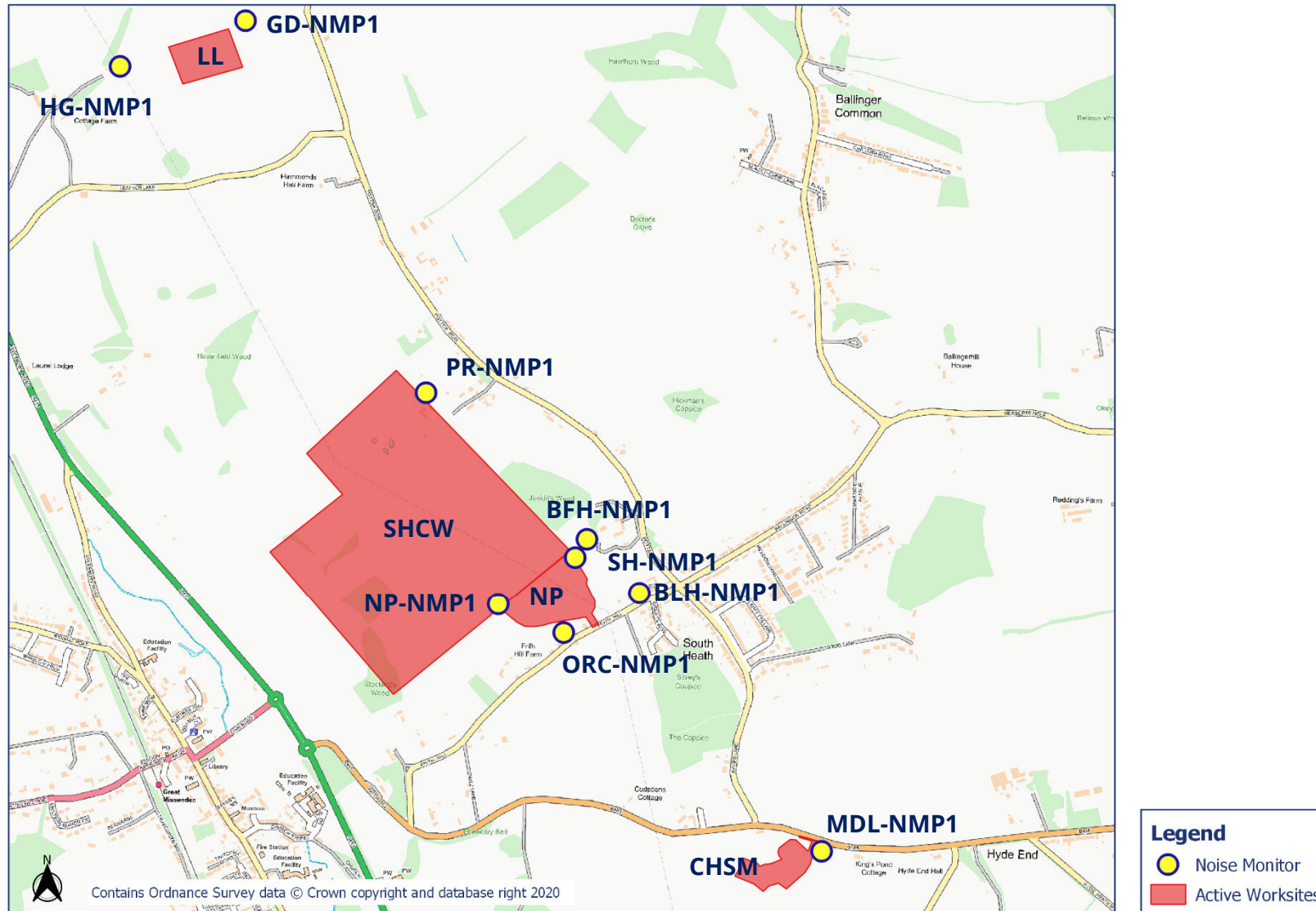






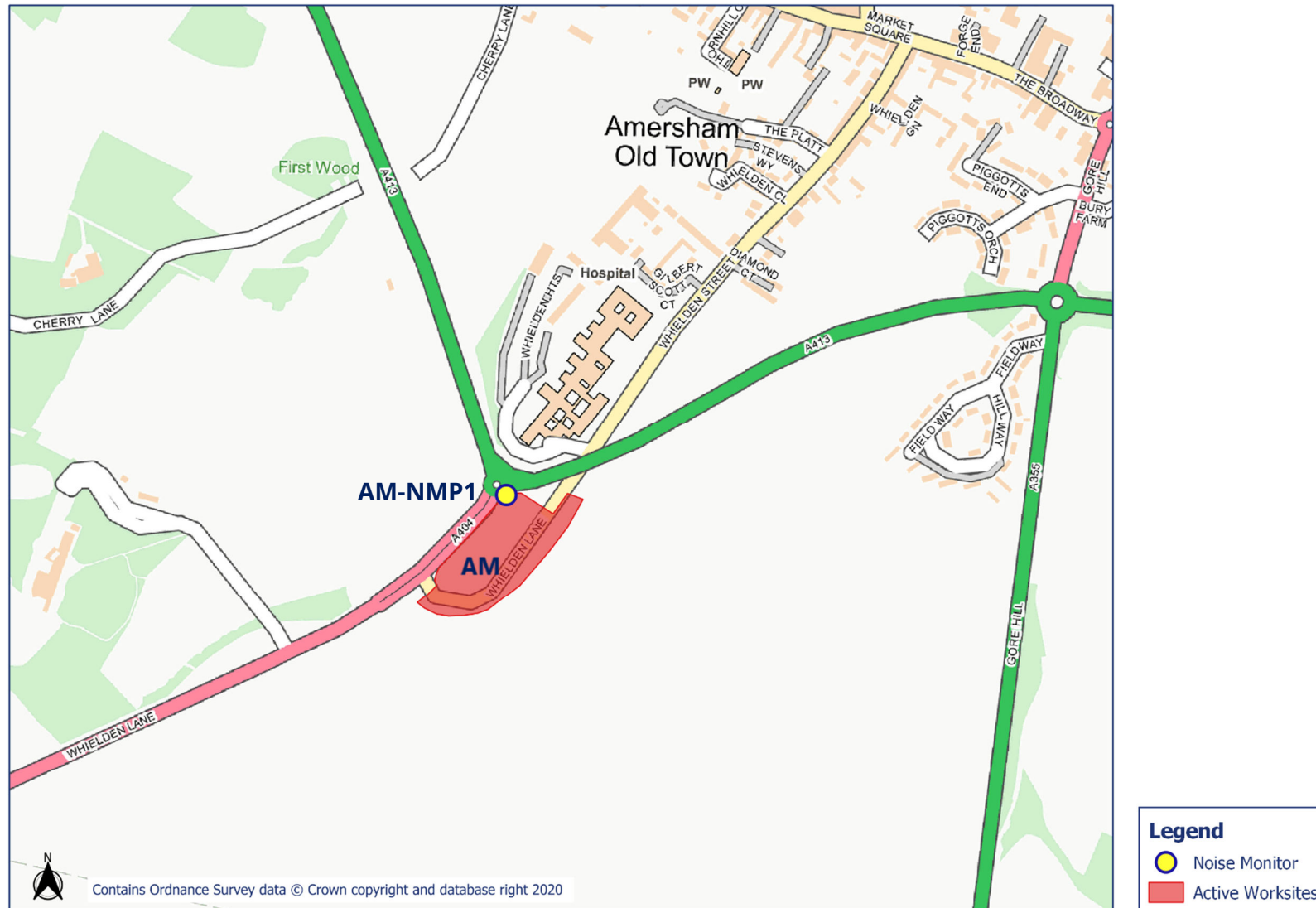


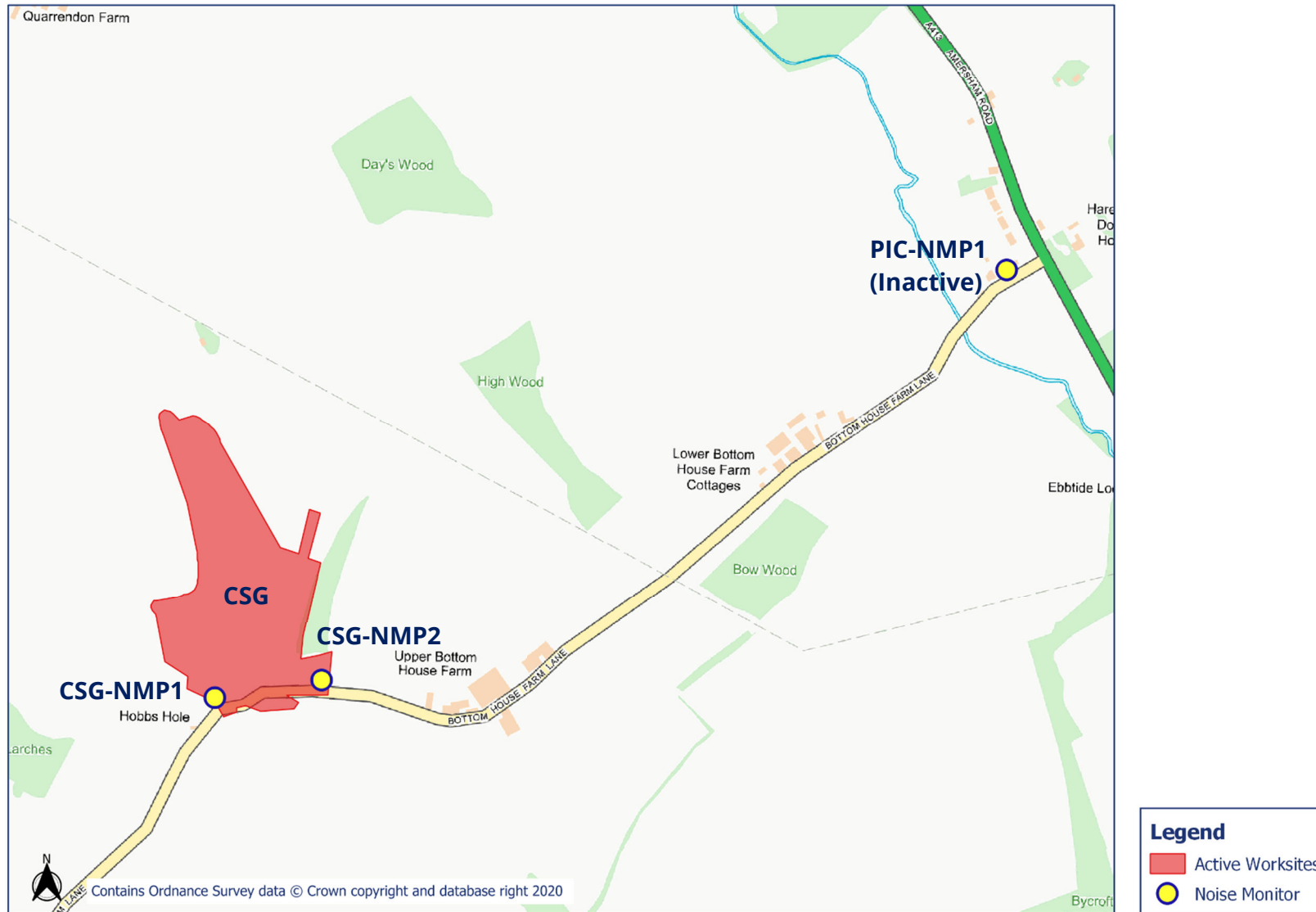




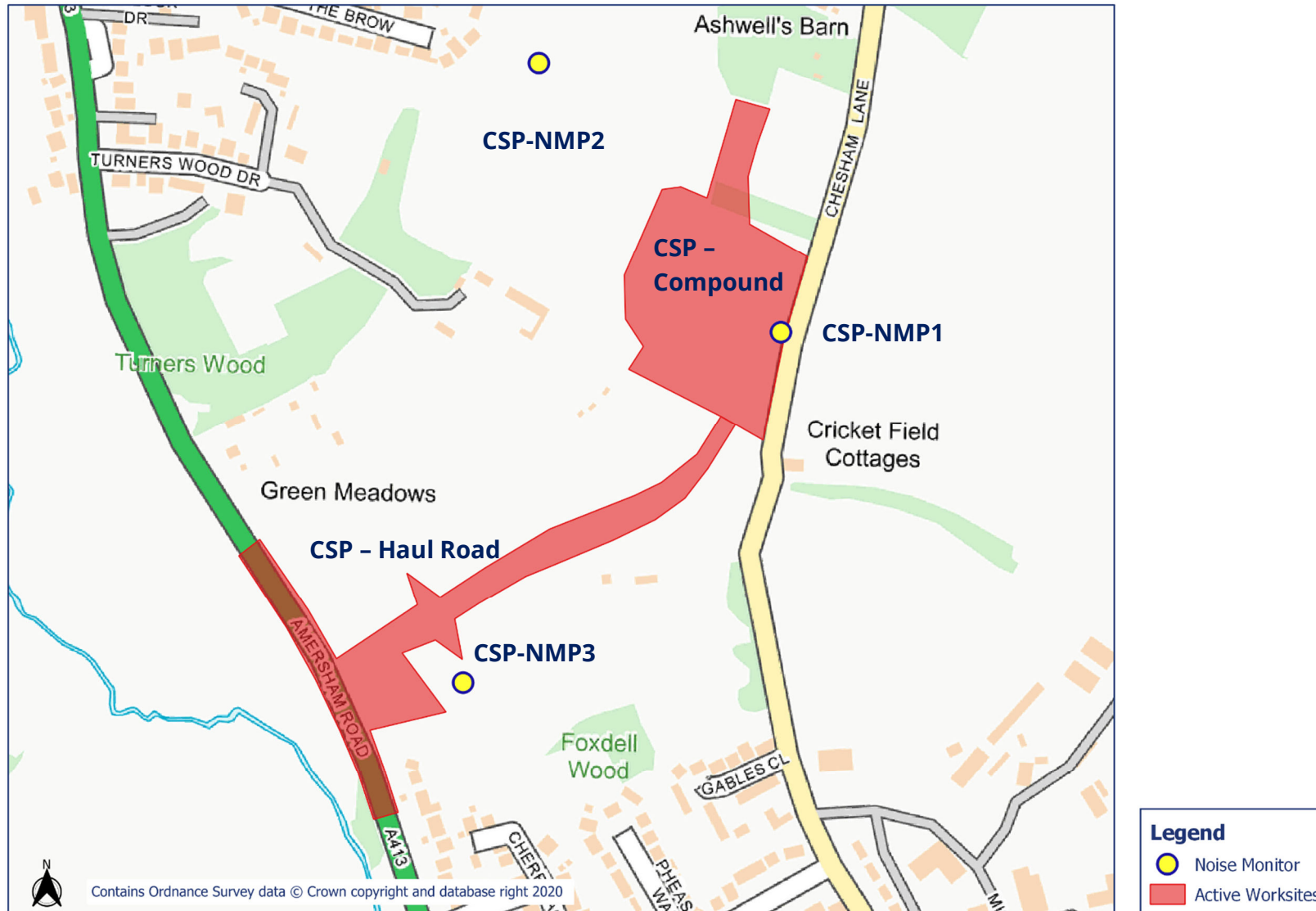


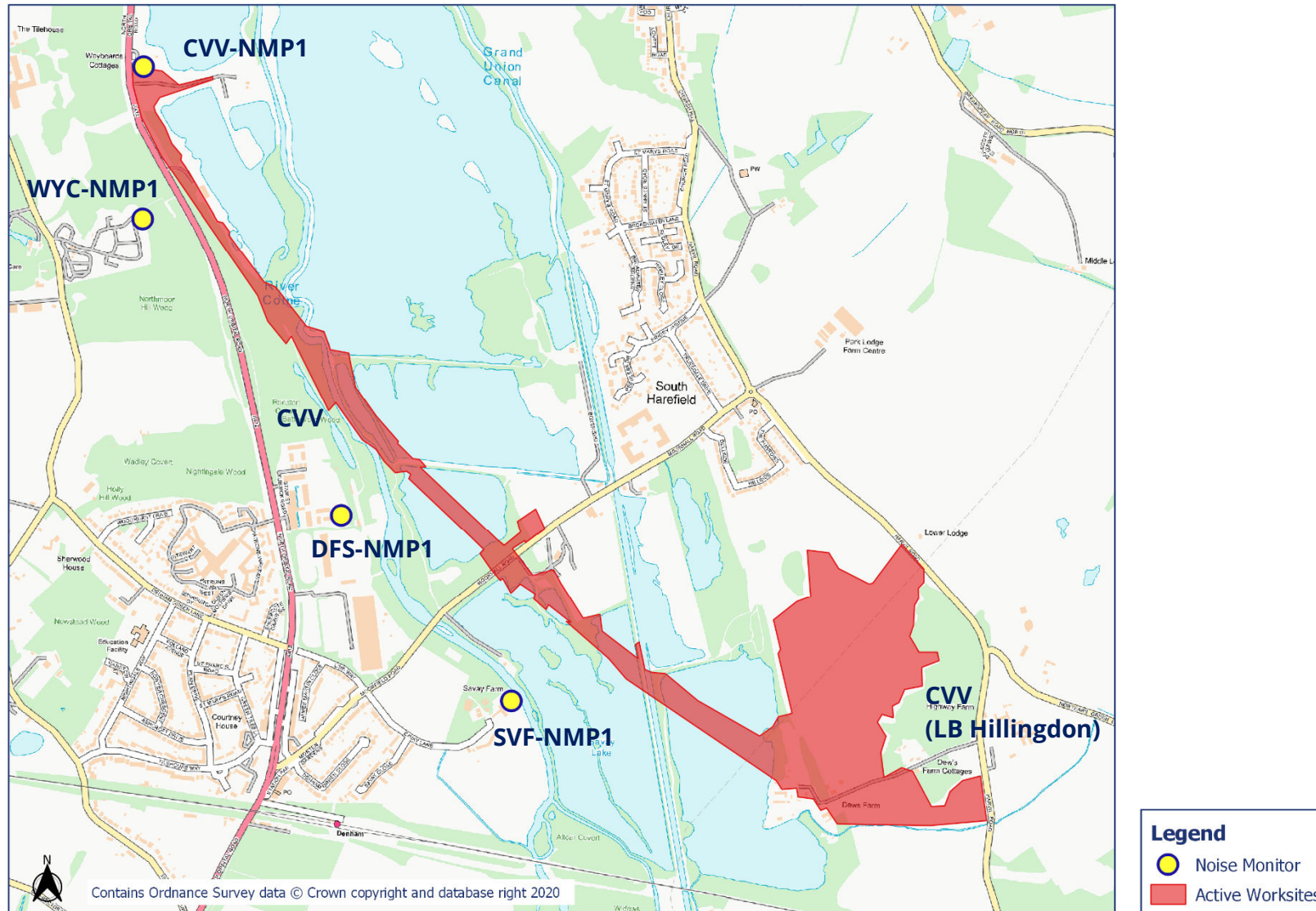
HS2 Noise and Vibration Monitoring Plan - 11





HS2 Noise and Vibration Monitoring Plan - 13



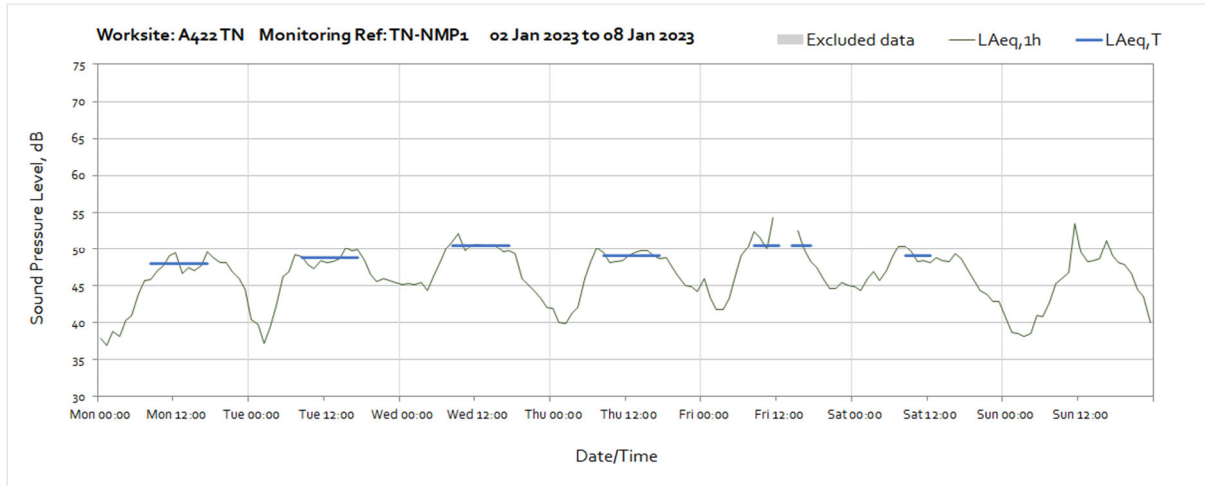
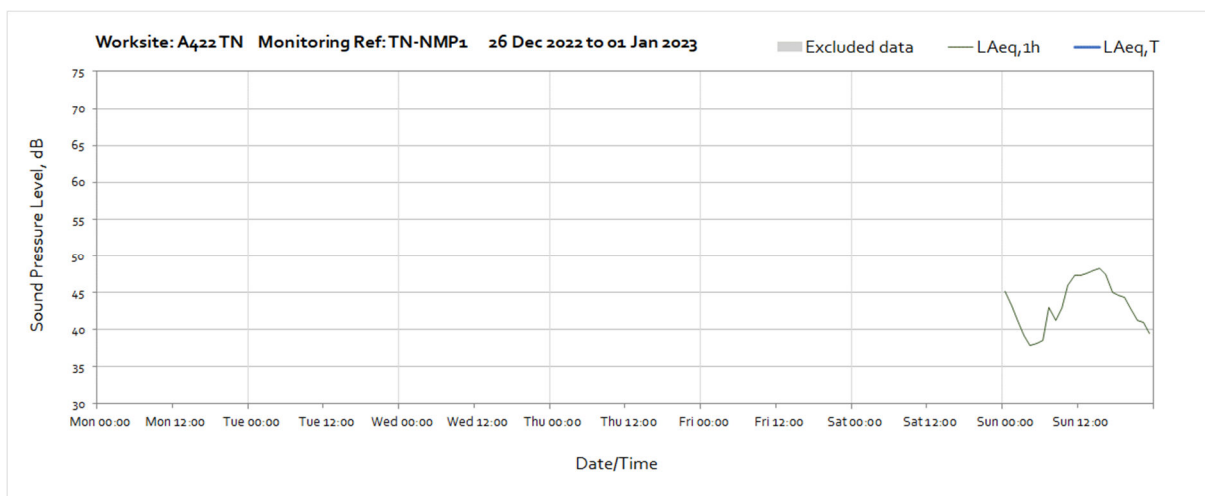


Appendix C Data

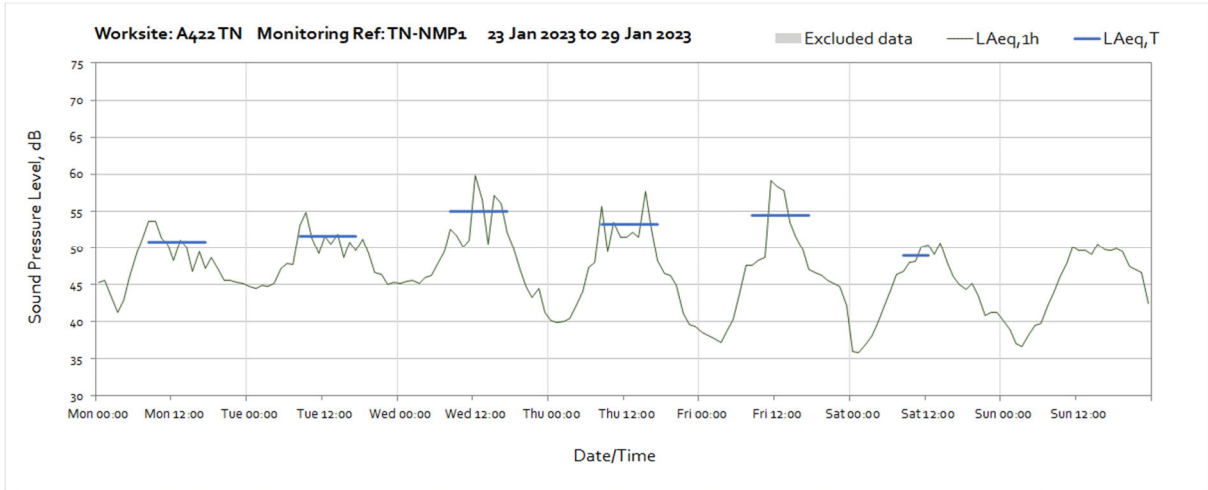
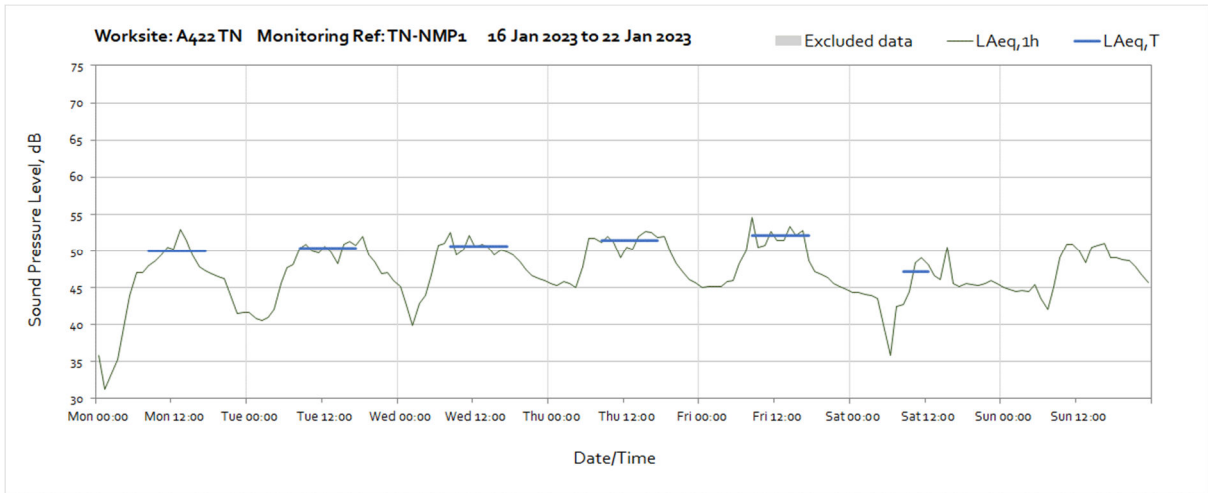
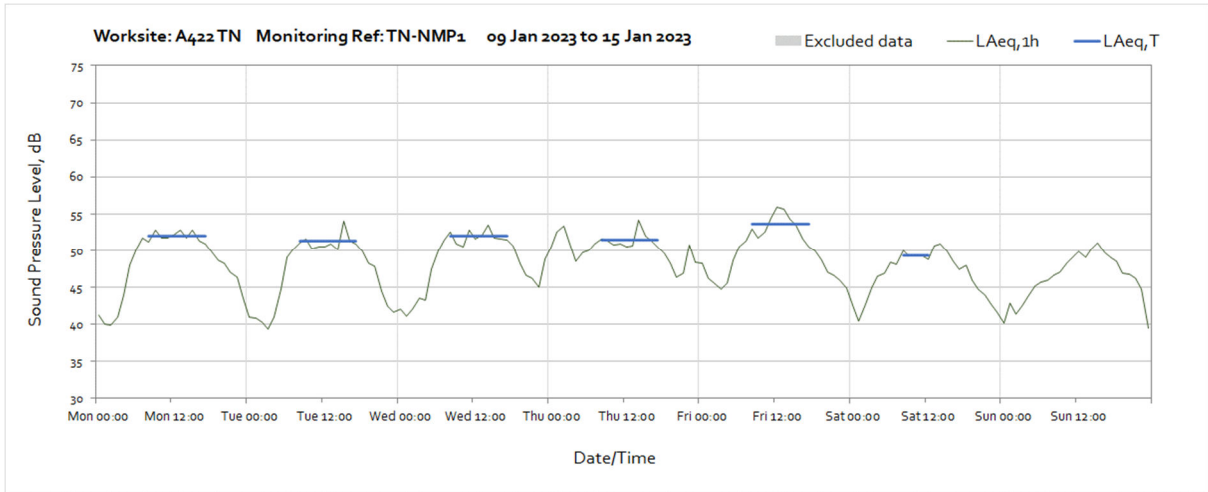
Noise

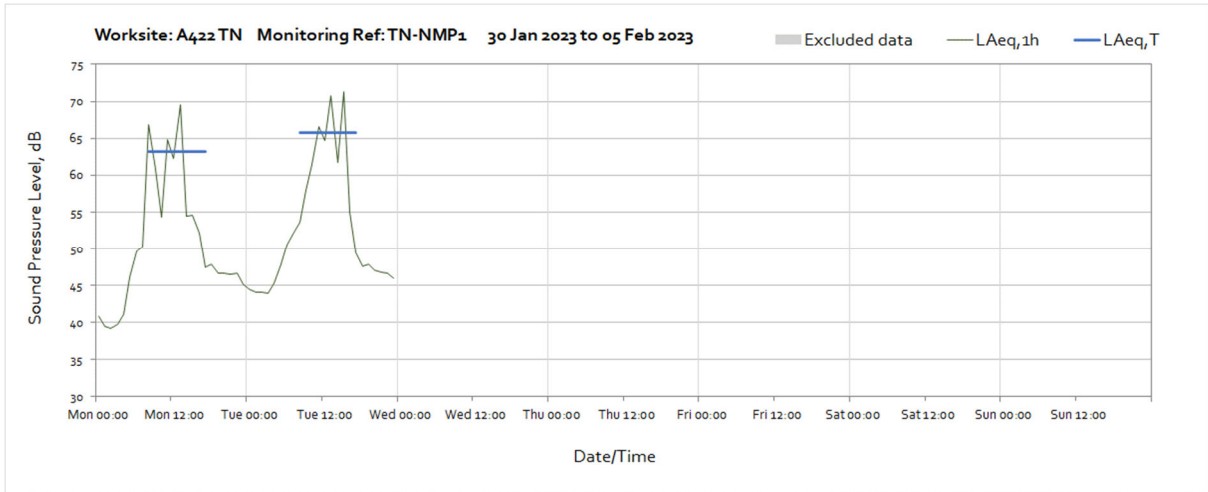
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods with adversely weather affected noise levels are greyed out and have been excluded from the calculation of the $L_{Aeq,T}$ values in Table 3 of the main report.

Worksite: A422 TN – Monitoring Ref: TN-NMP1

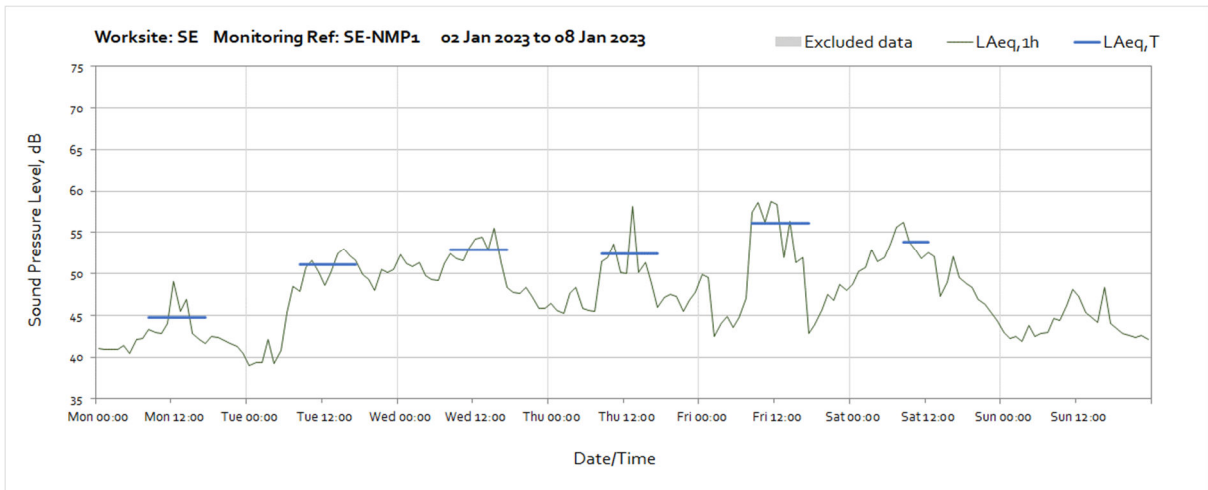
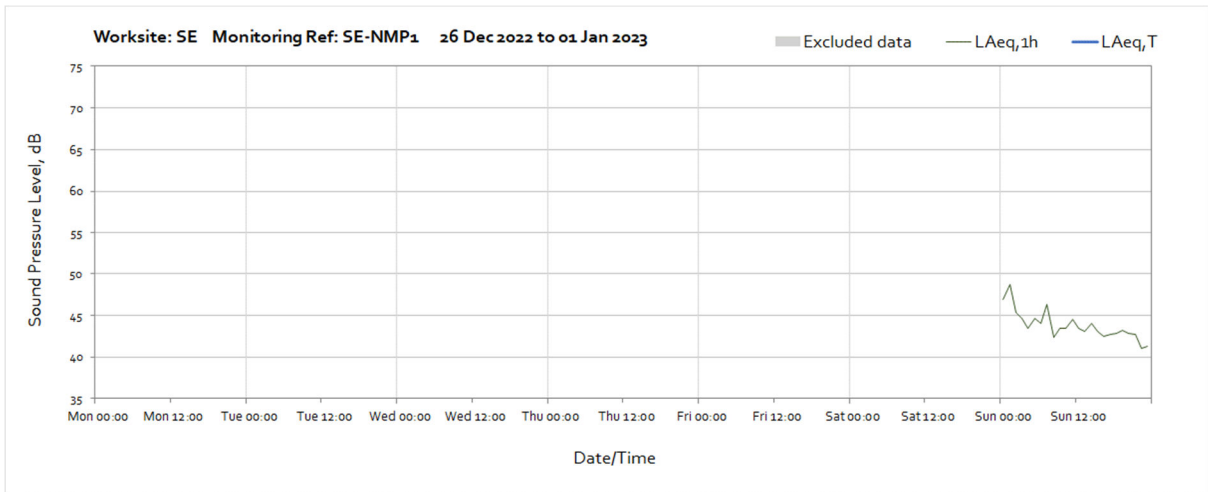


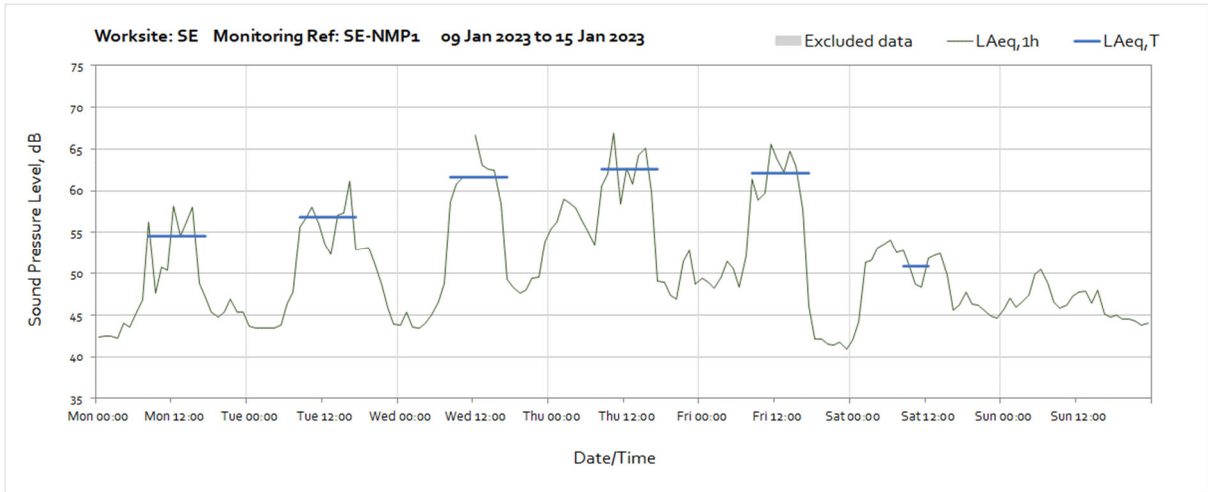
Note: Missing data between 12:00 and 15:00 on 6th January was due to monitor maintenance.



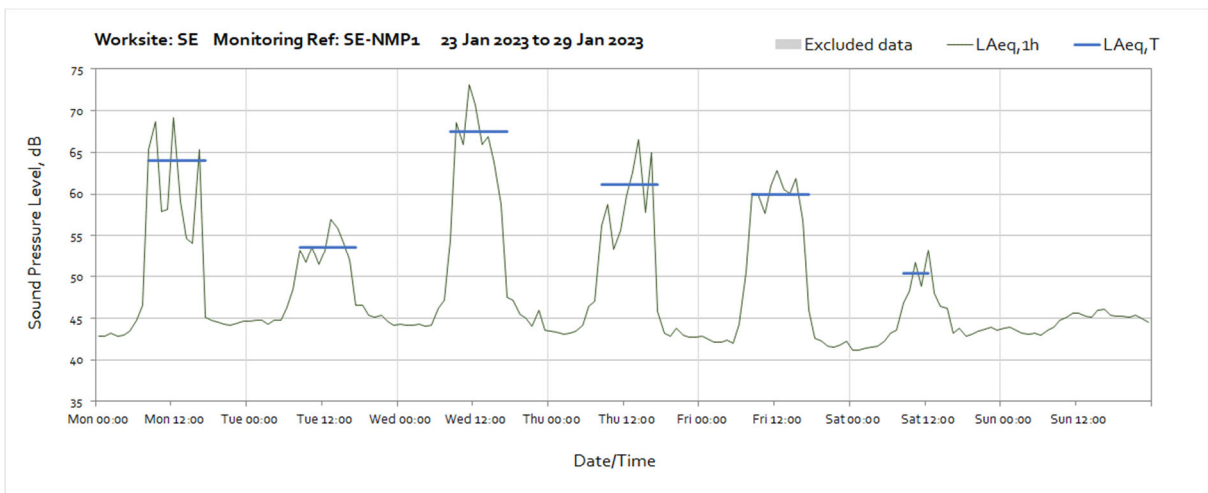
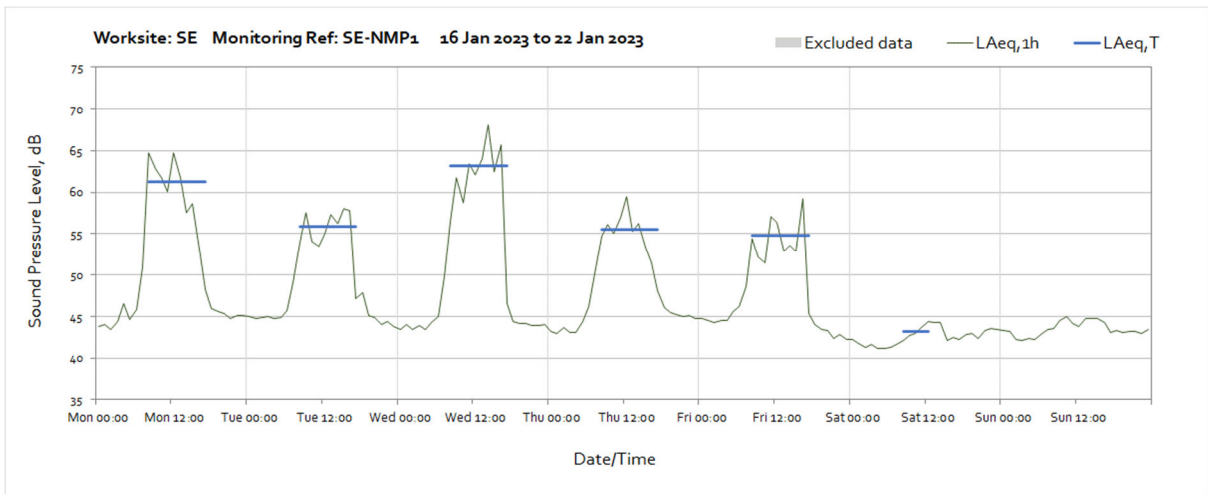


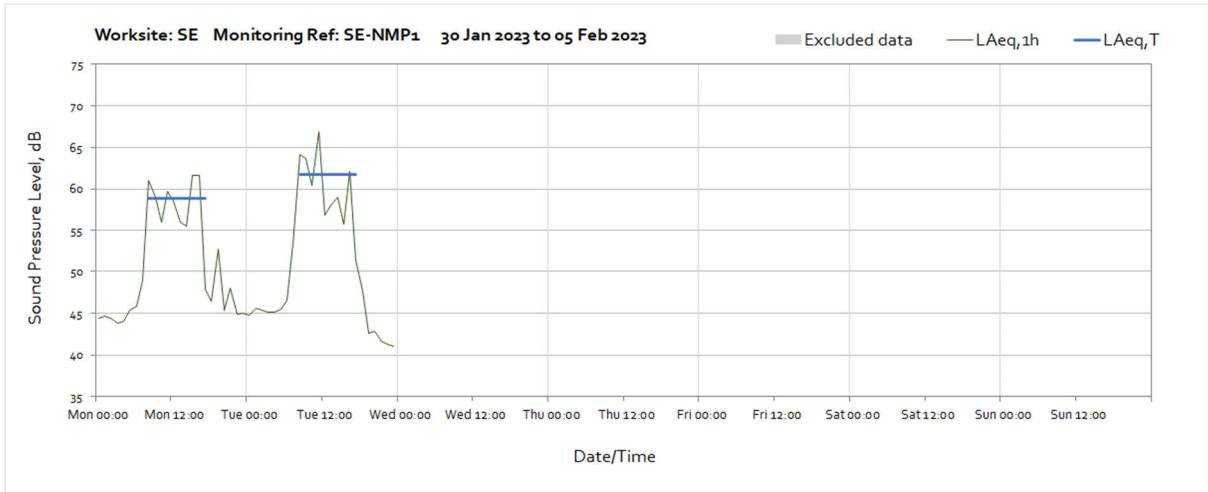
Worksite: SE – Monitoring Ref: SE-NMP1



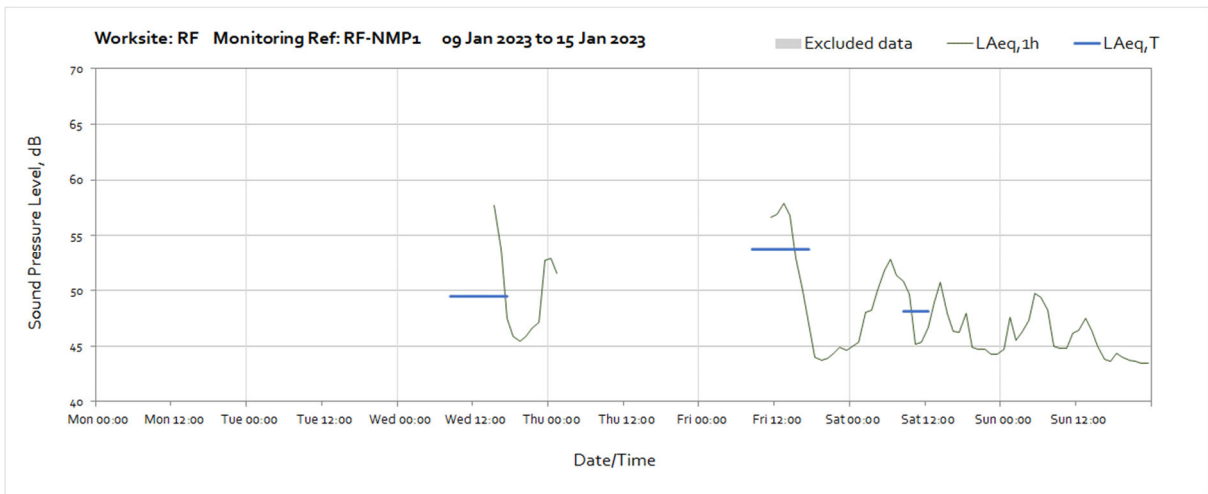


Note: Missing data between 11:00 and 12:00 on 11th January was due to monitor maintenance.

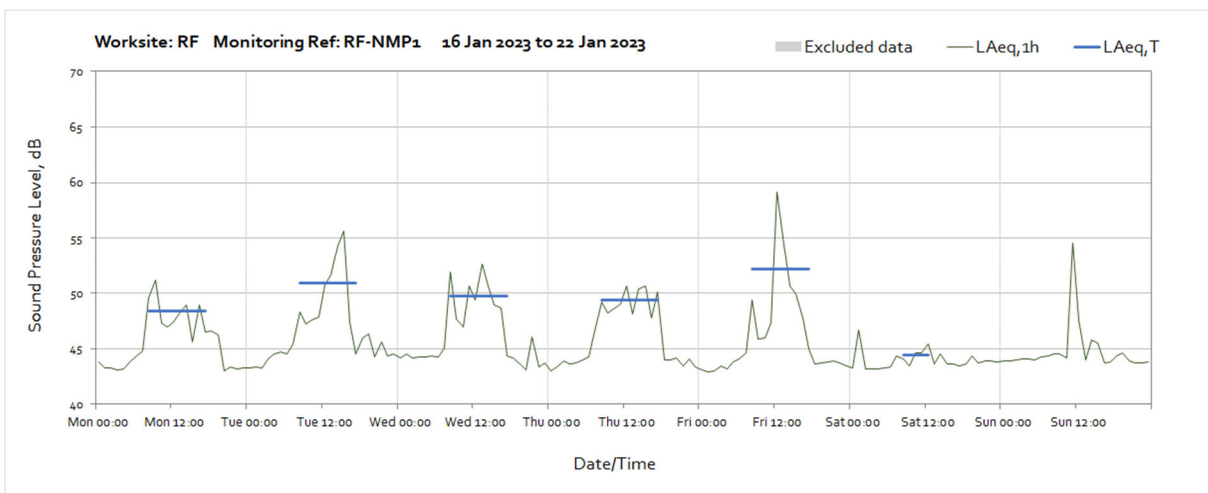


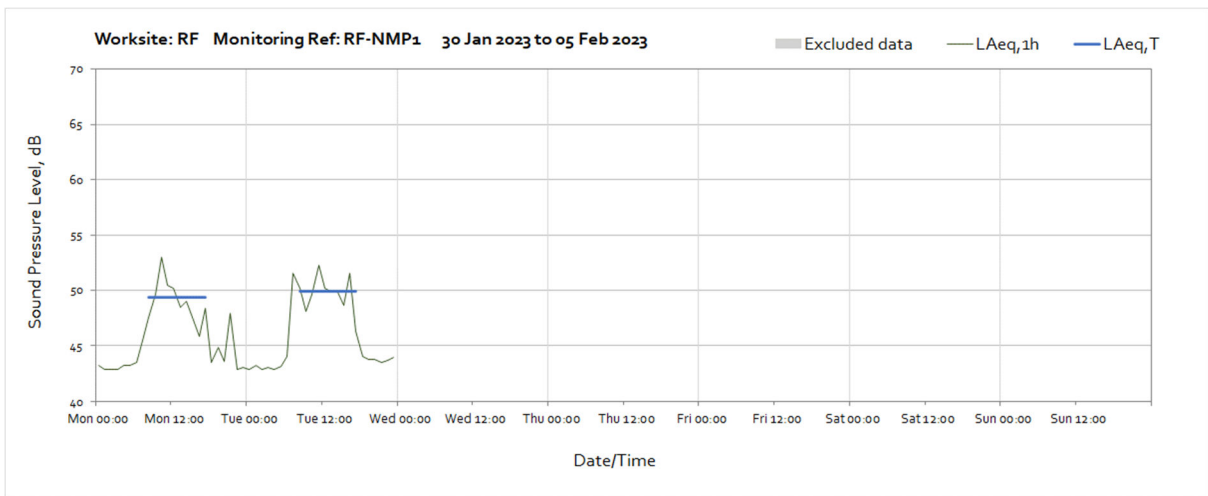
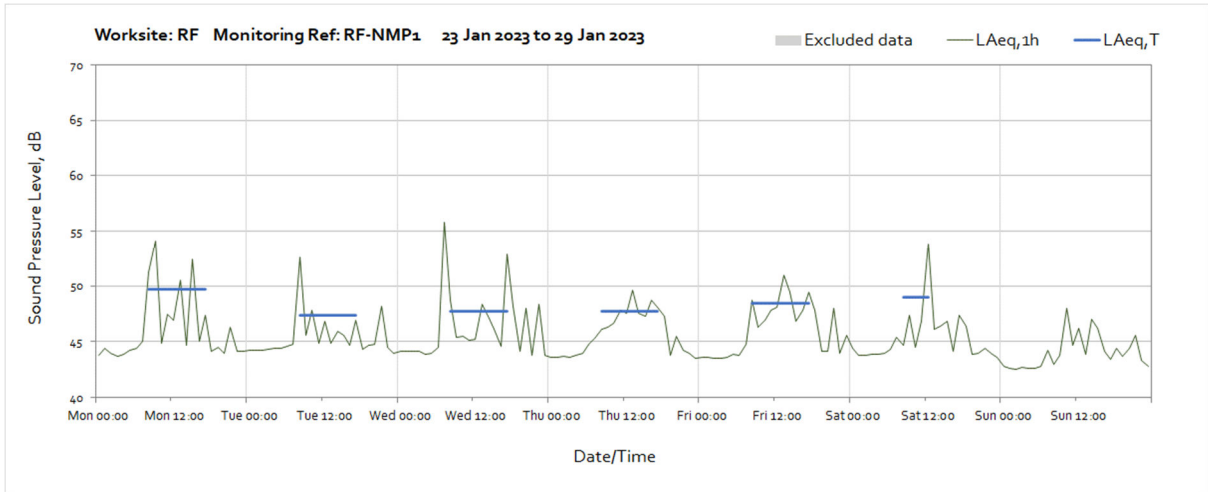


Worksite: RF – Monitoring Ref: RF-NMP1

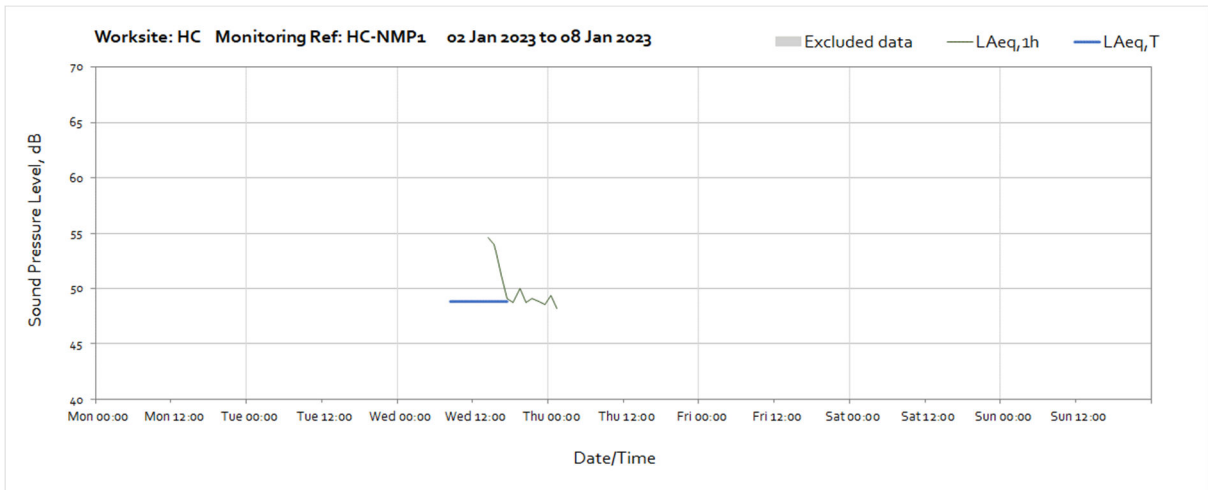


Note: Missing data from the start of the month until 15:00 on 11th January and between 02:00 on 12th January until 11:00 on 13th January was due to loss of power to monitor.





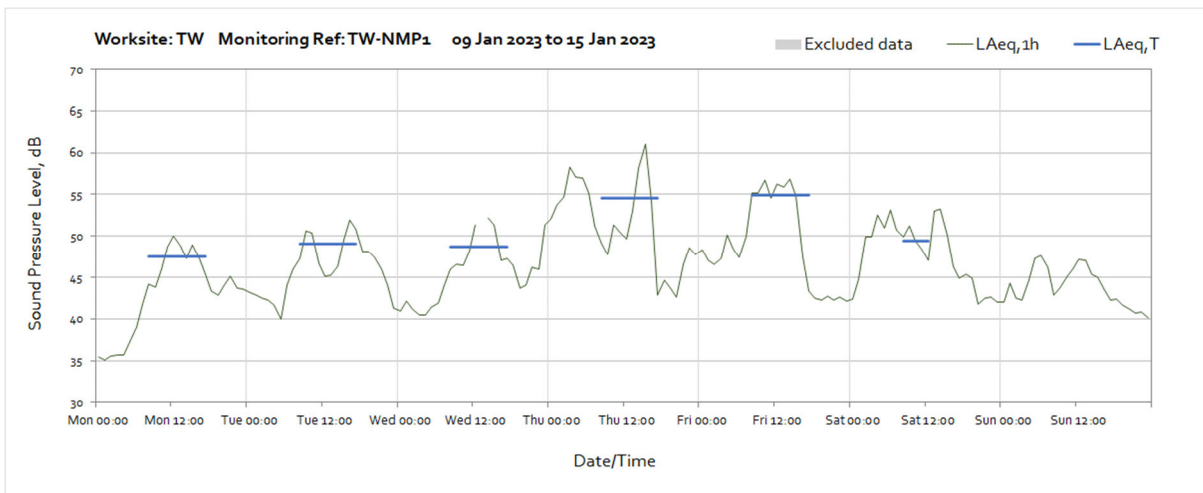
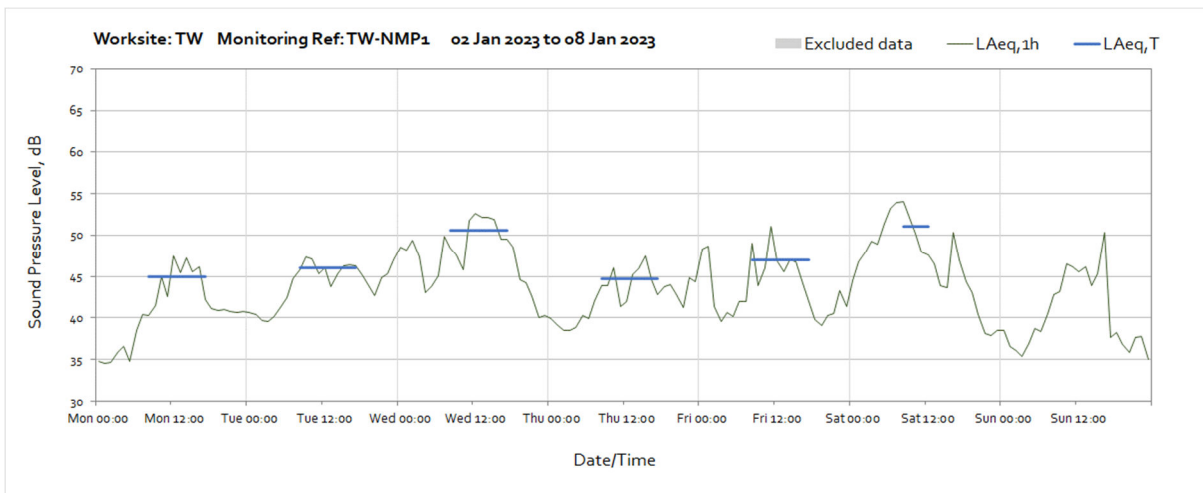
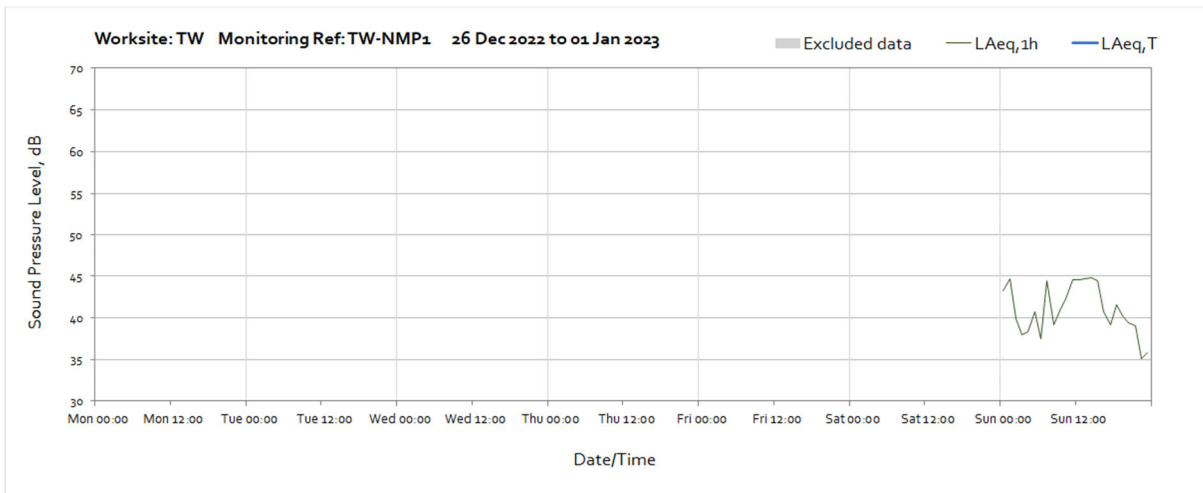
Worksite: HC - Monitoring Ref: HC-NMP1



Note: Missing data from the start of the month until 14:00 on 4th January and from 02:00 on 5th January until month end was due to solar panel enclosure fault.

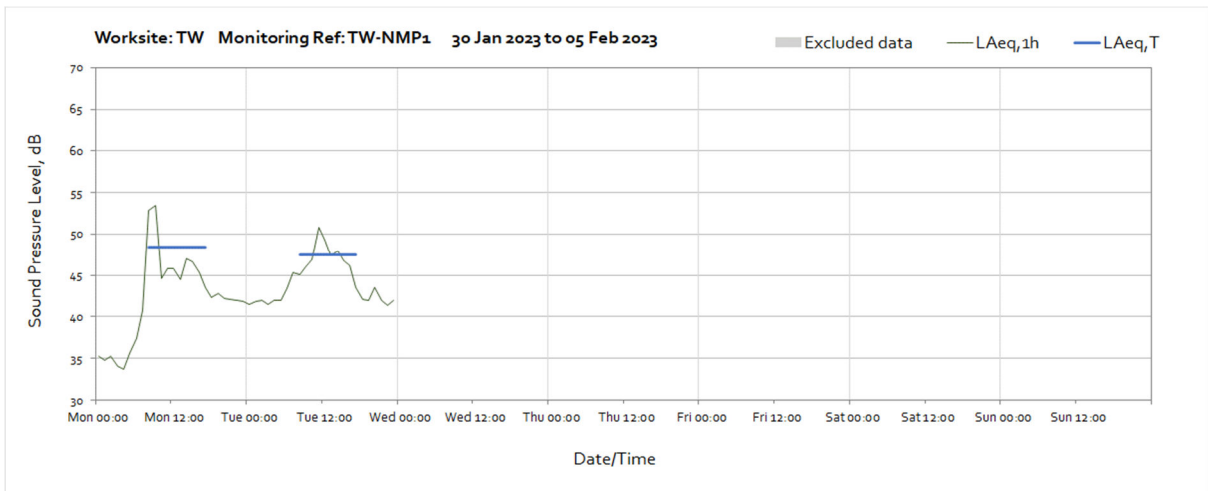
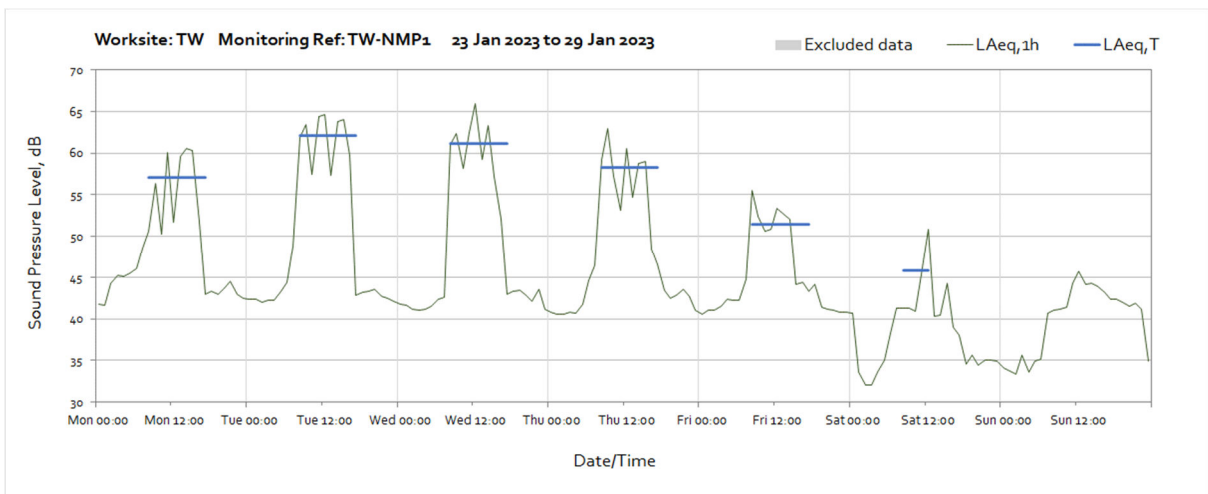
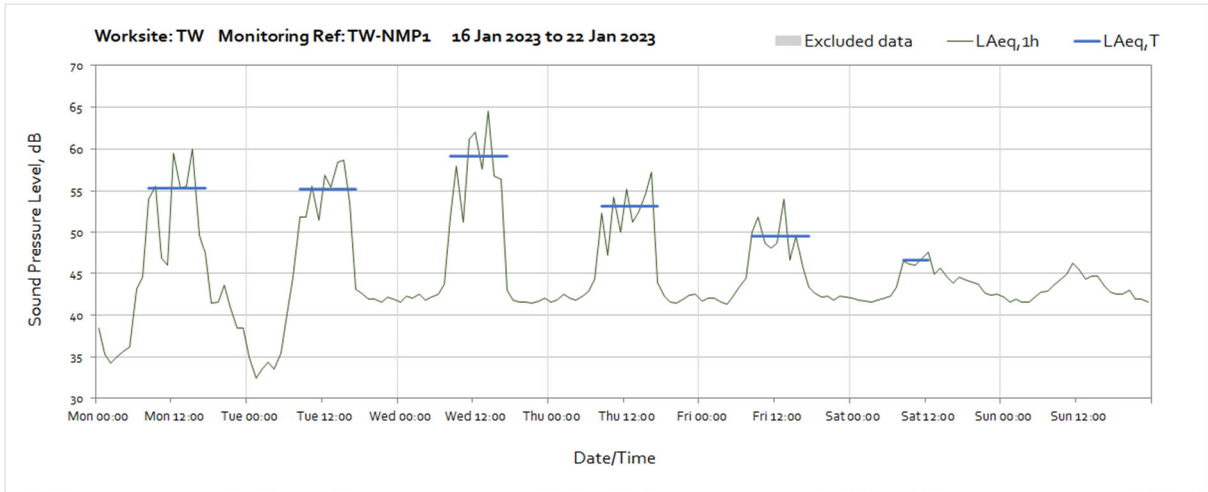
OFFICIAL

Worksite: TW – Monitoring Ref: TW-NMP1

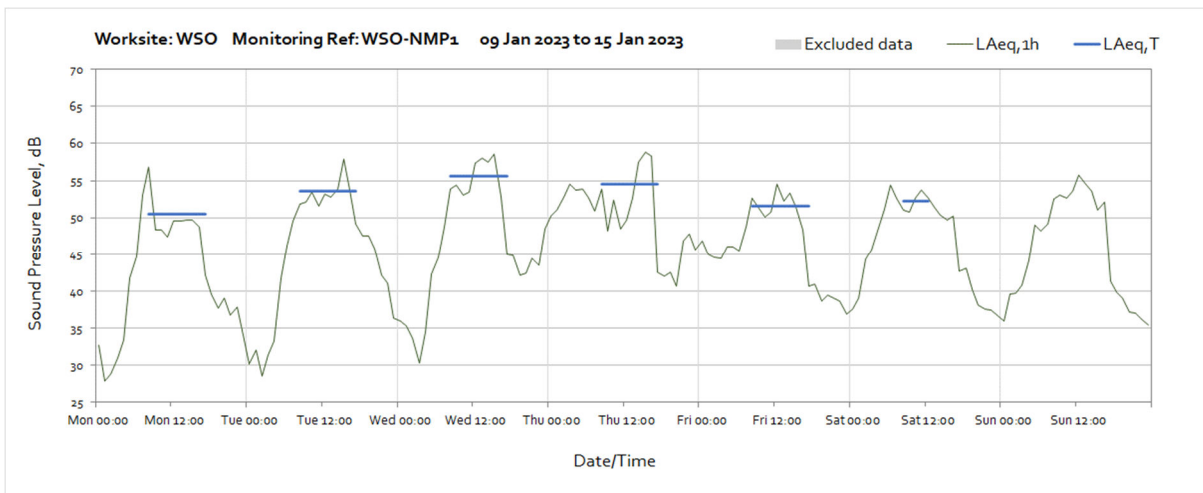
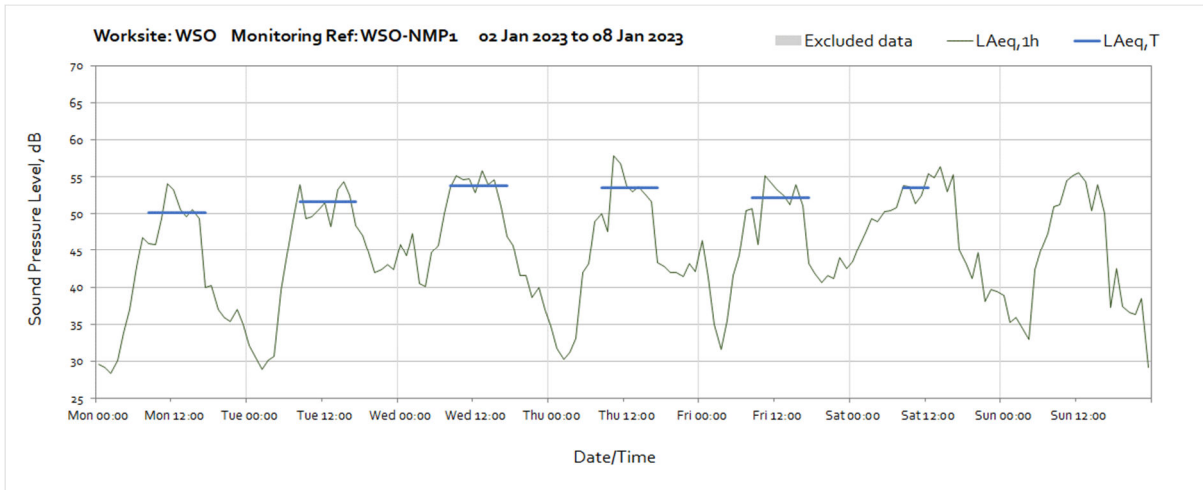
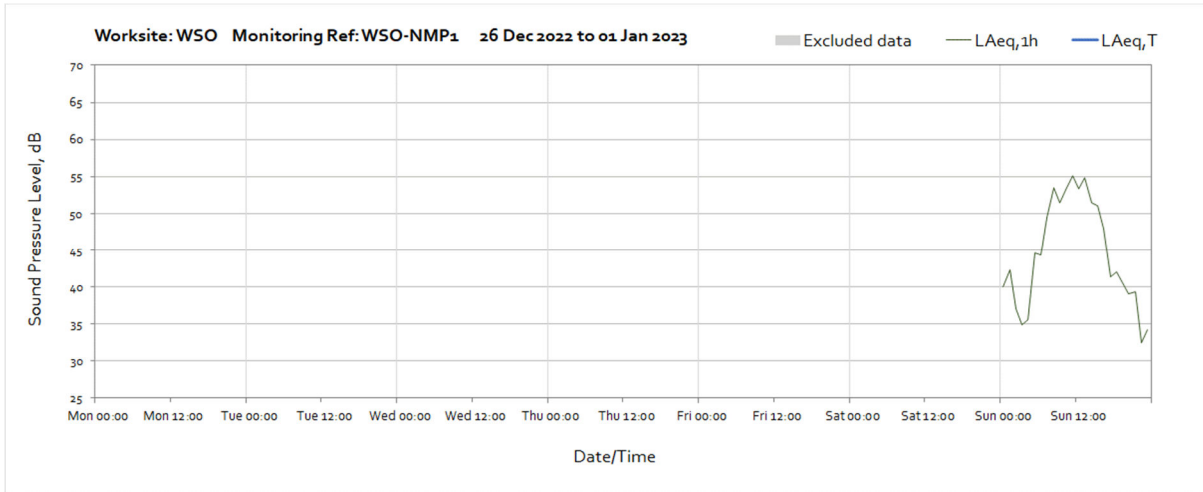


Note: Missing data between 13:00 and 14:00 on 11th January was due to monitor maintenance.

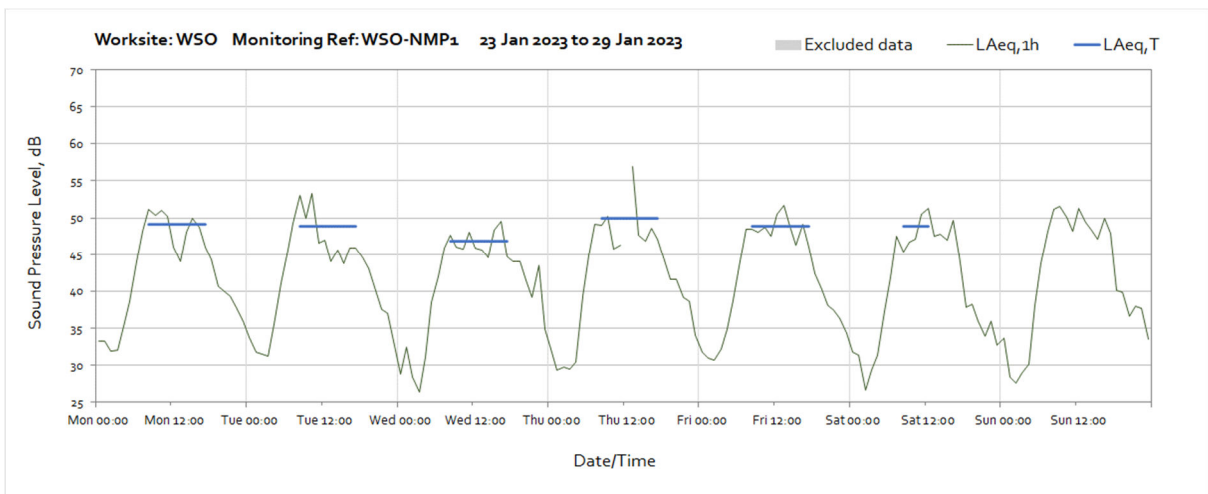
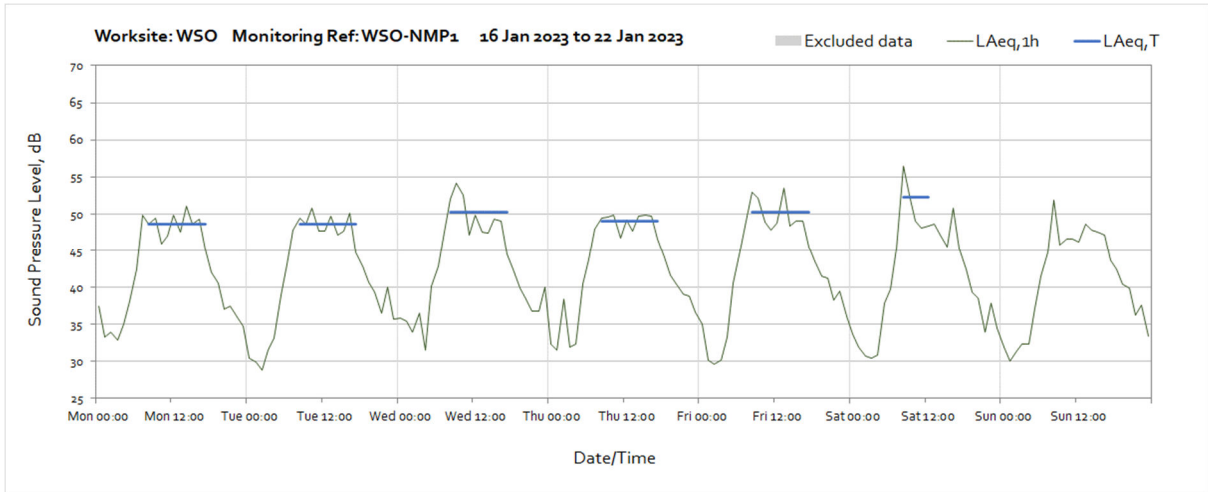
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Worksite: WSO – Monitoring Ref: WSO-NMP1



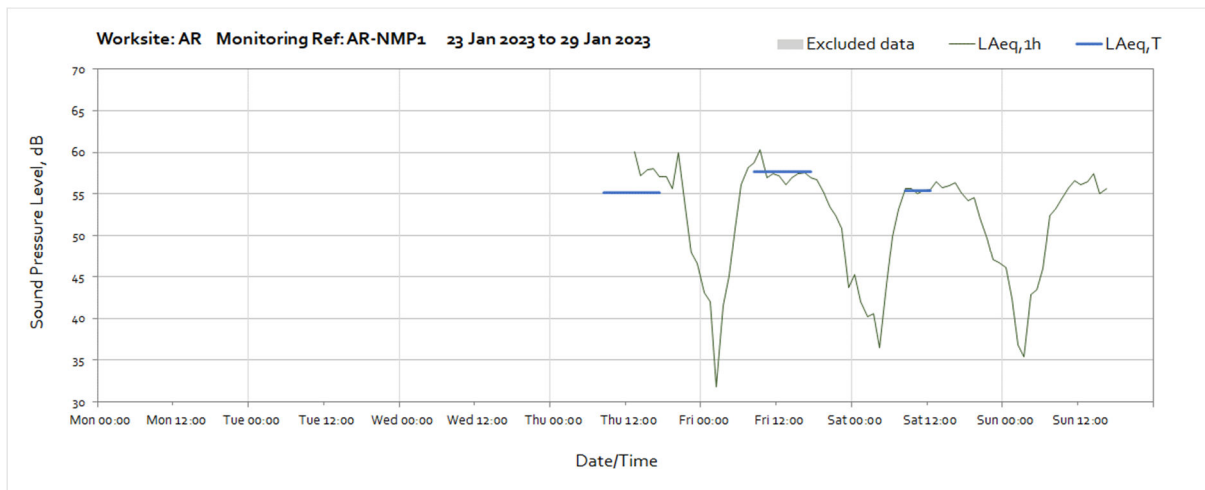
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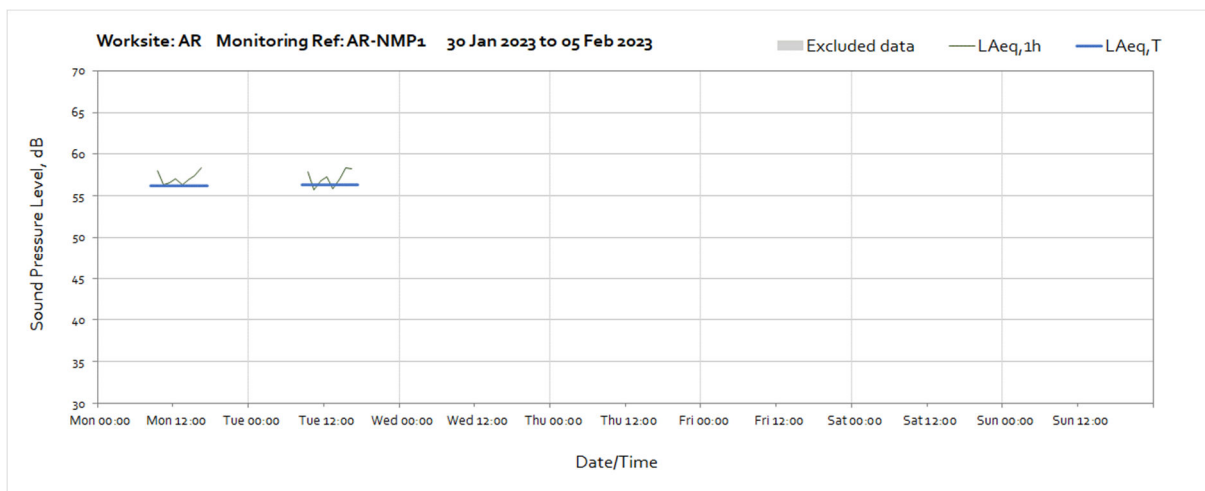
Note: Missing data between 12:00 and 13:00 on 26th January was due to monitor maintenance.



Worksite: AR – Monitoring Ref: AR-NMP1

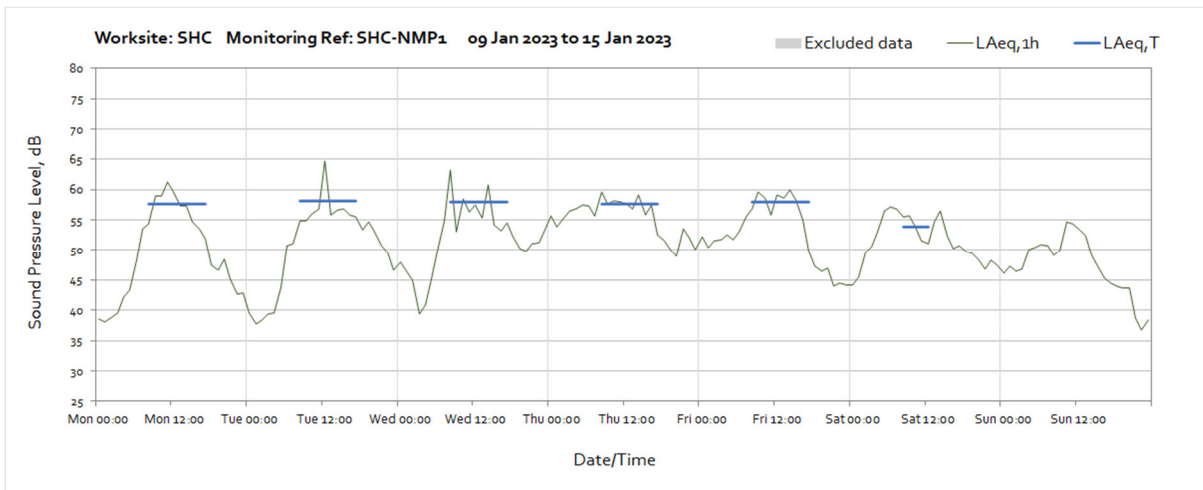
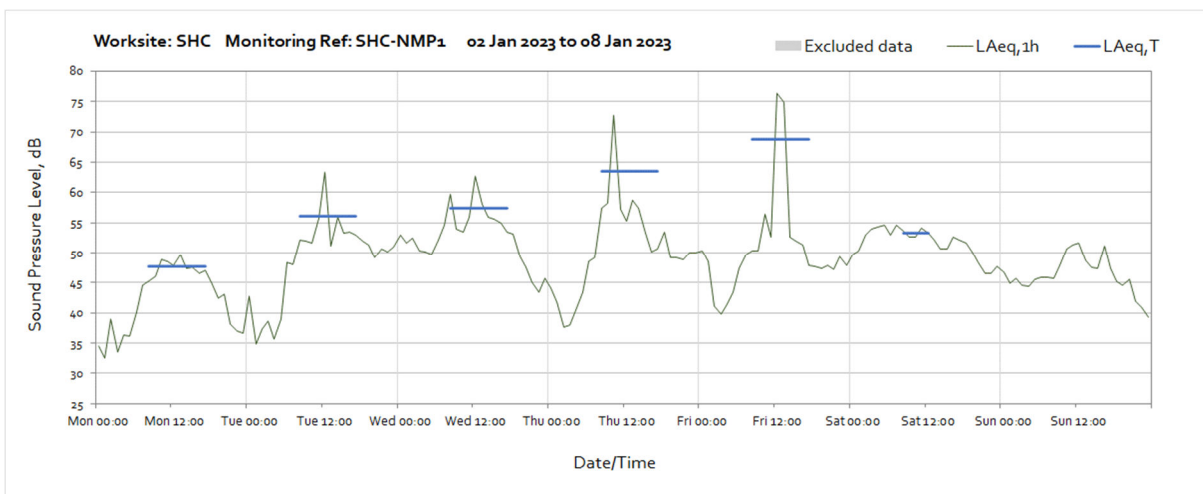
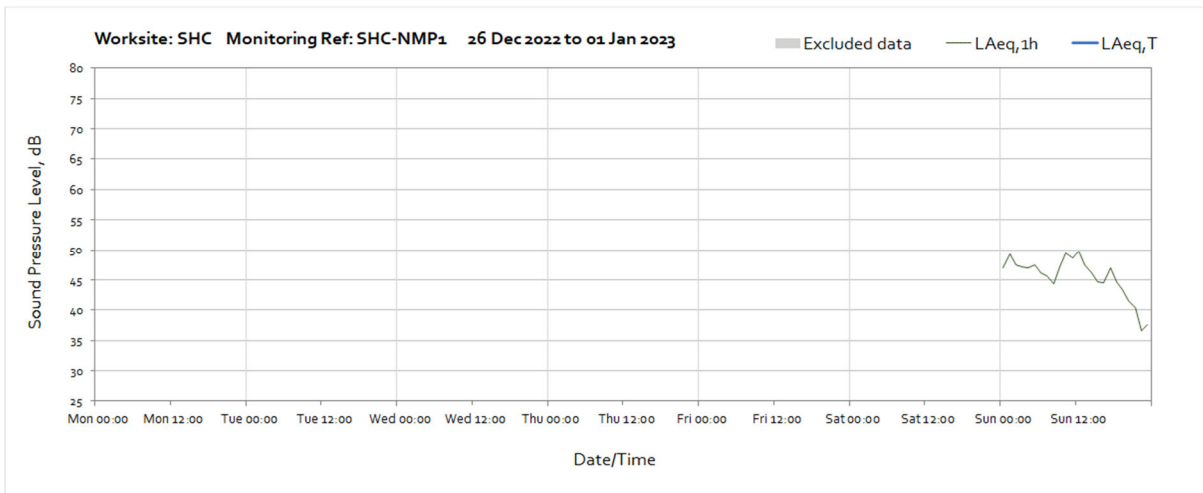


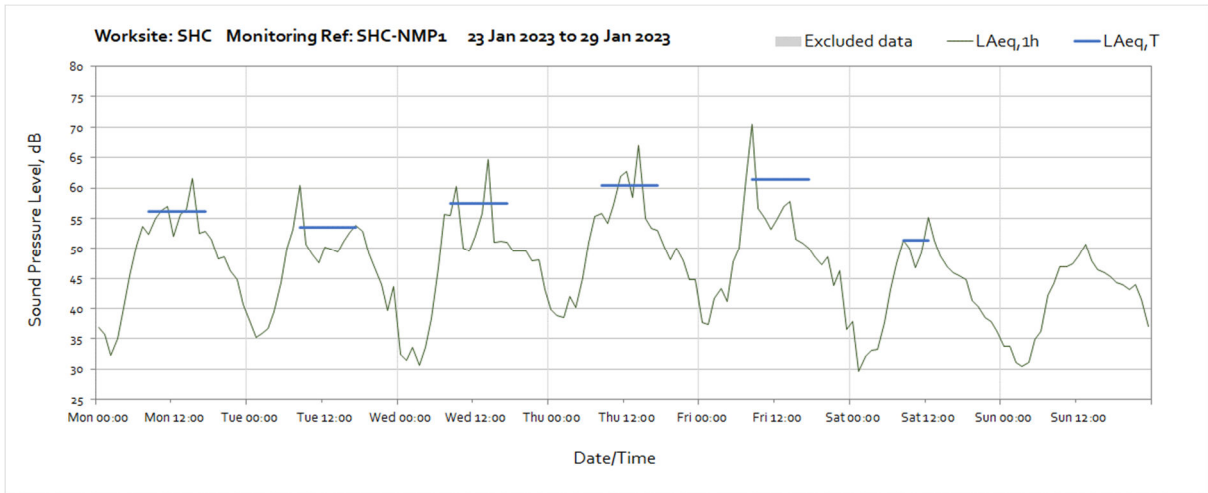
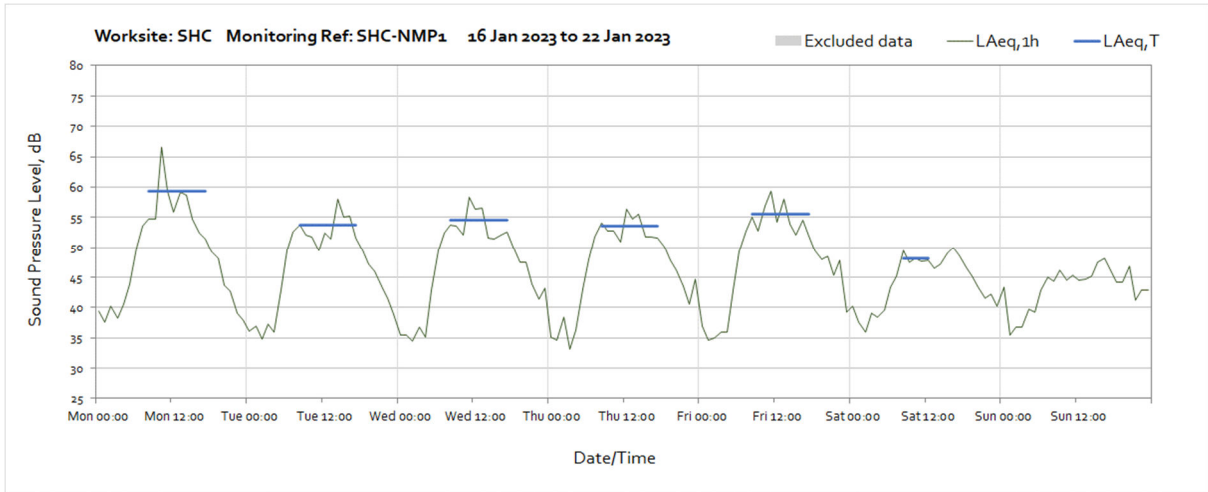
Note: Monitor was reinstalled at 13:00 on 26th January. Missing data between 17:00 on 29th January until 09:00 on 20th January was due to depleted monitor power.



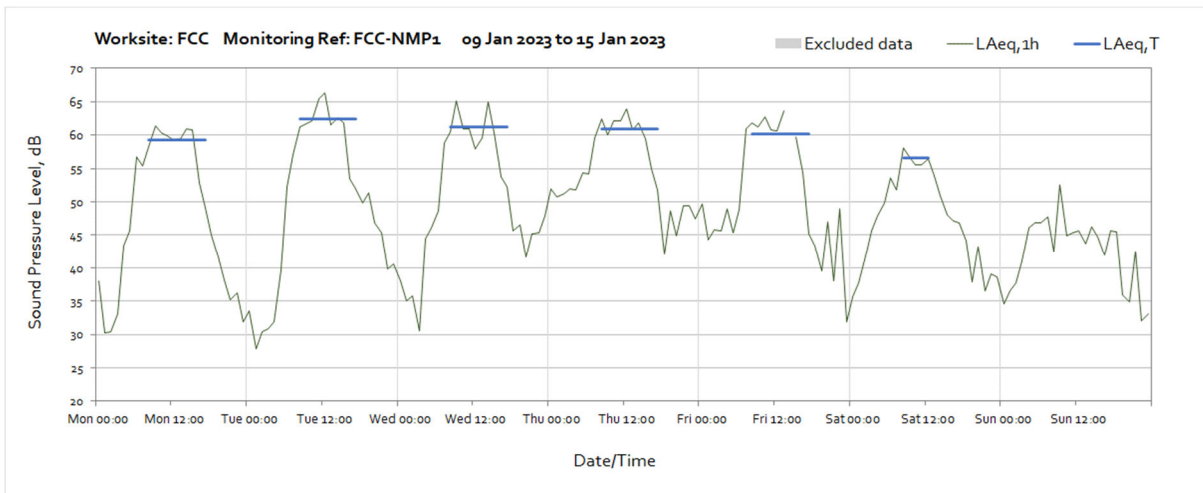
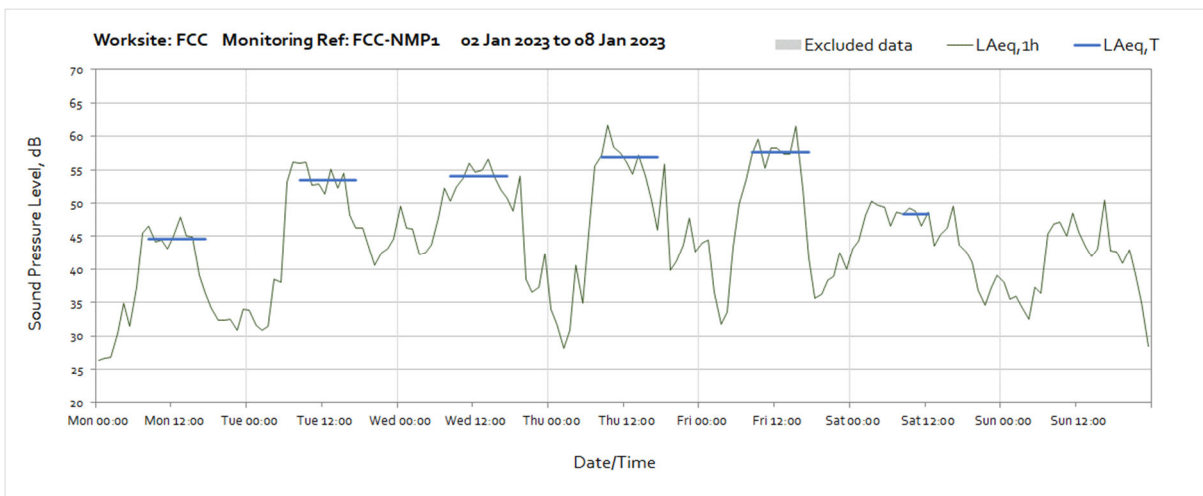
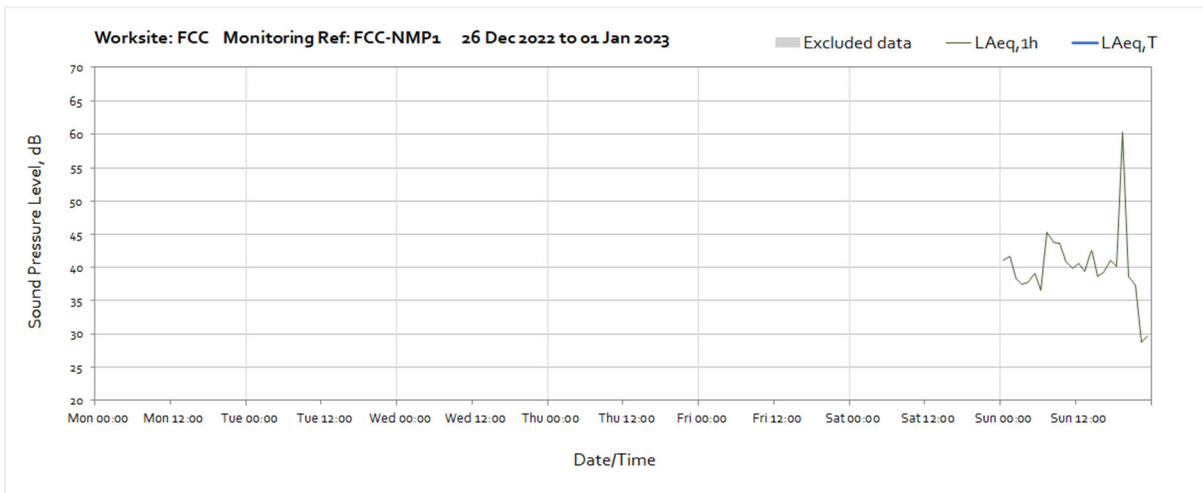
Note: Missing data between 17:00 on 30th January and 09:00 on 31st January and from 17:00 on 31st January until month end was due to depleted monitor power.

Worksite: SHC – Monitoring Ref: SHC-NMP1

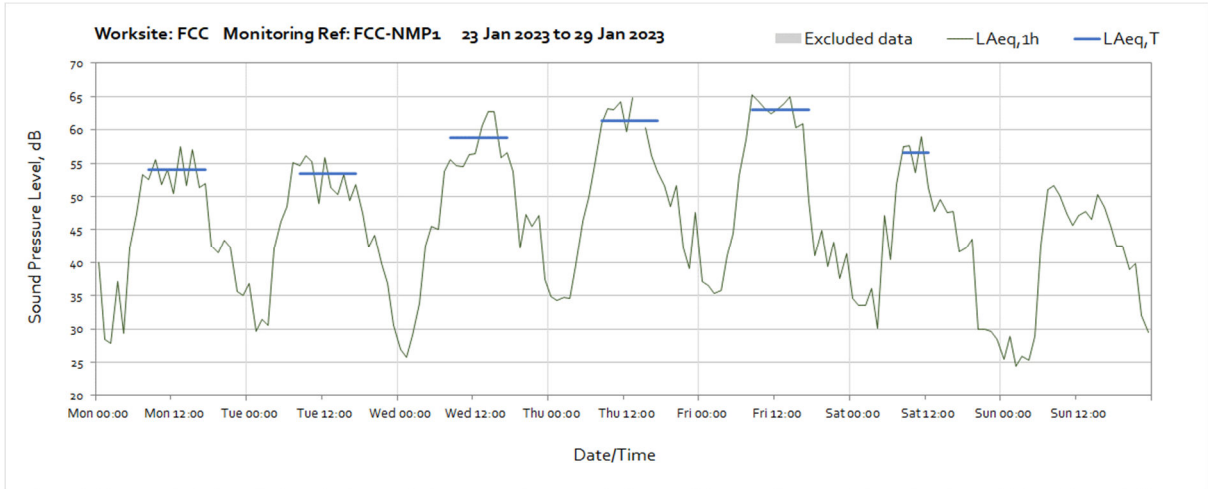
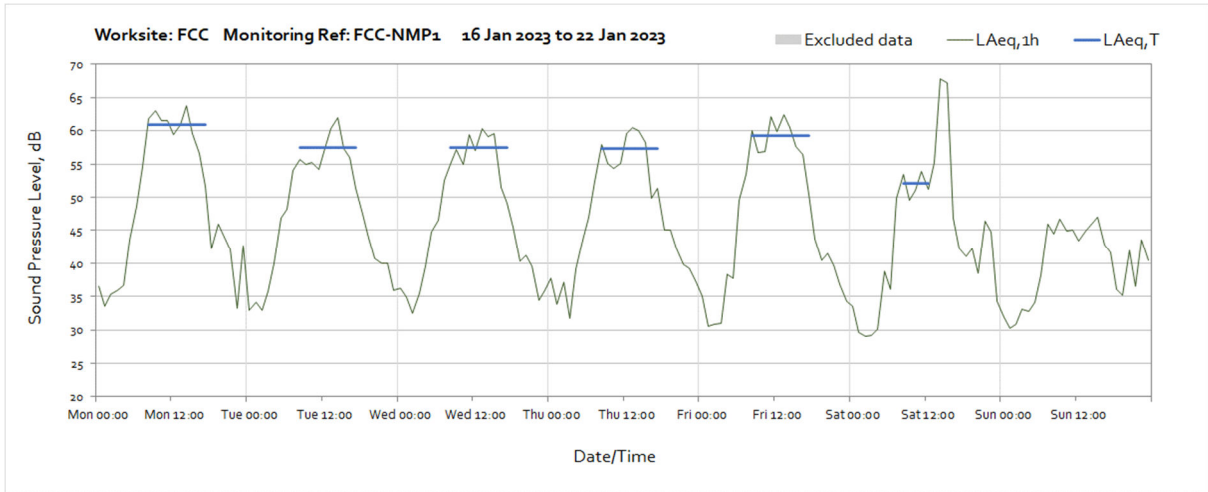




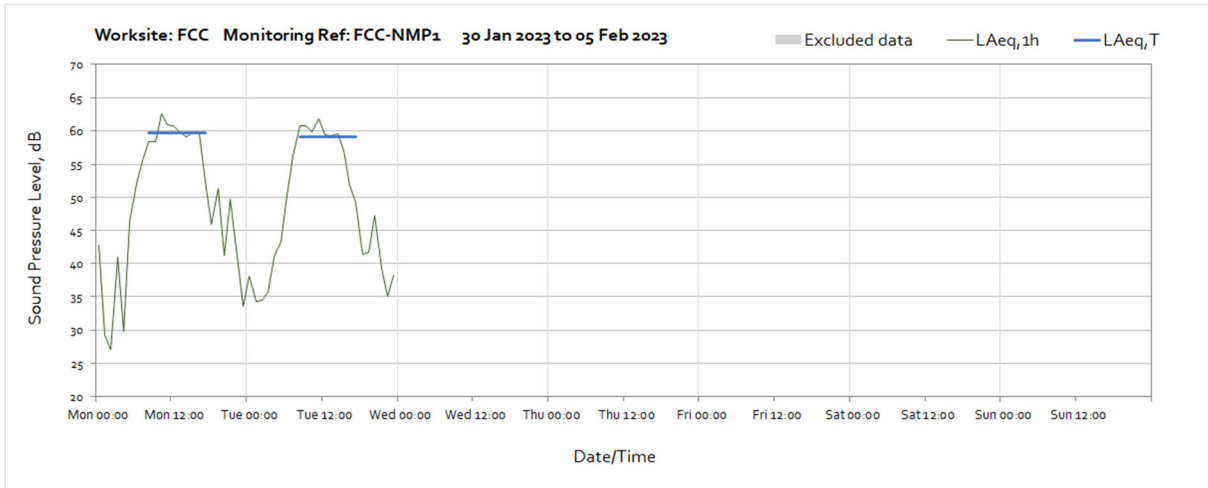
Worksite: FCC – Monitoring Ref: FCC-NMP1



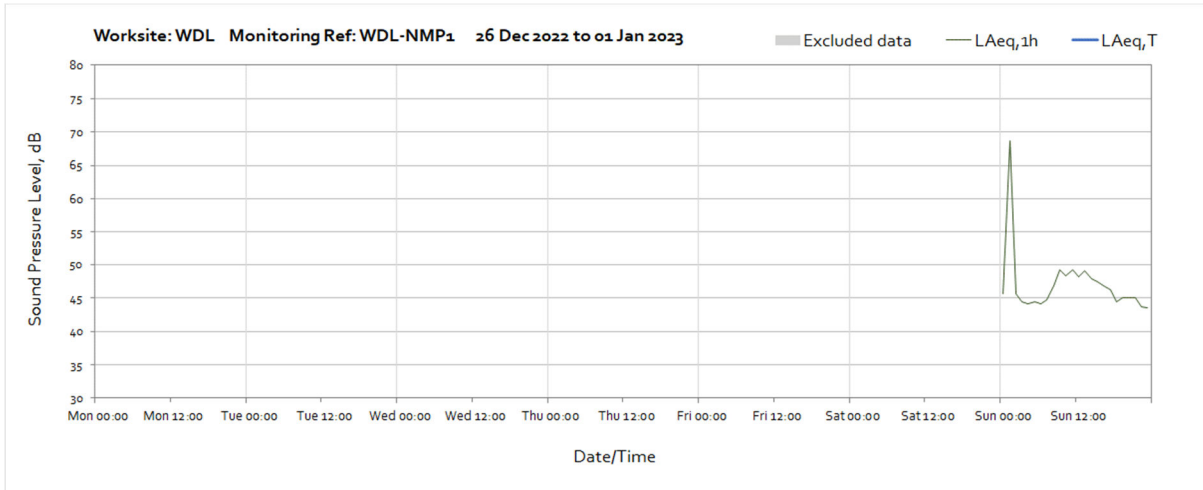
Note: Missing data between 14:00 and 15:00 on 13th January was due to monitor maintenance.



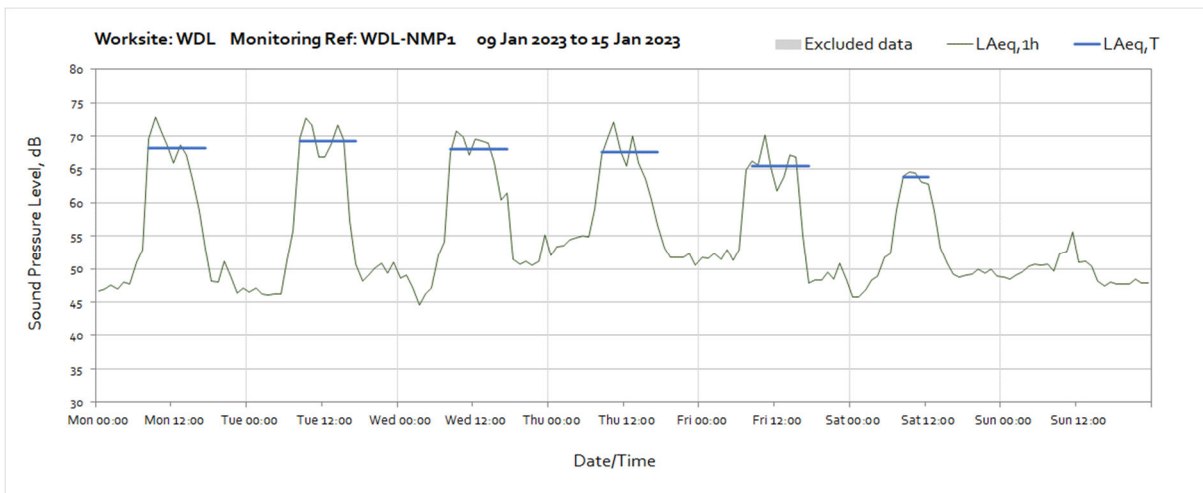
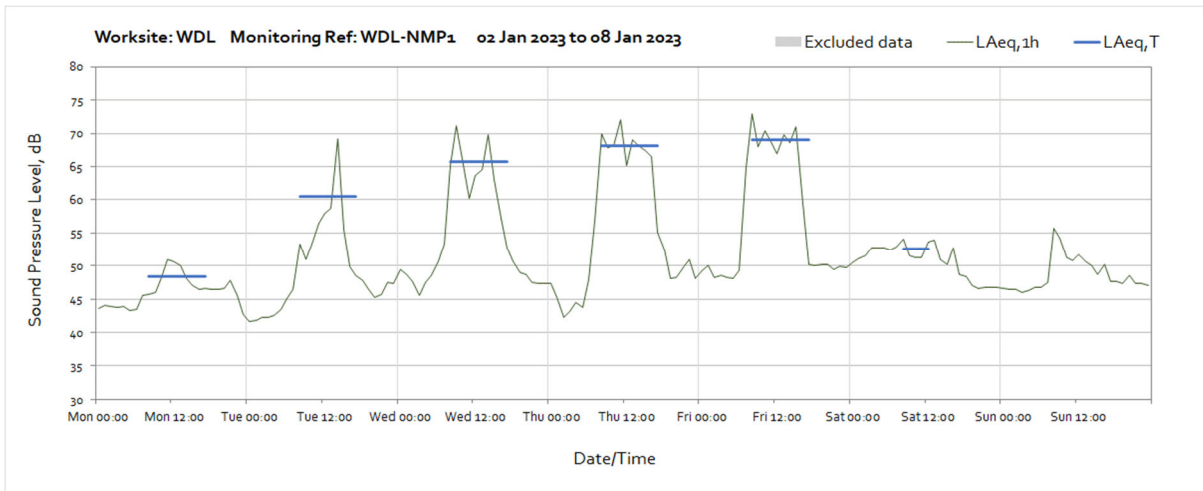
Note: Missing data between 14:00 and 15:00 on 26th January was due to monitor maintenance.

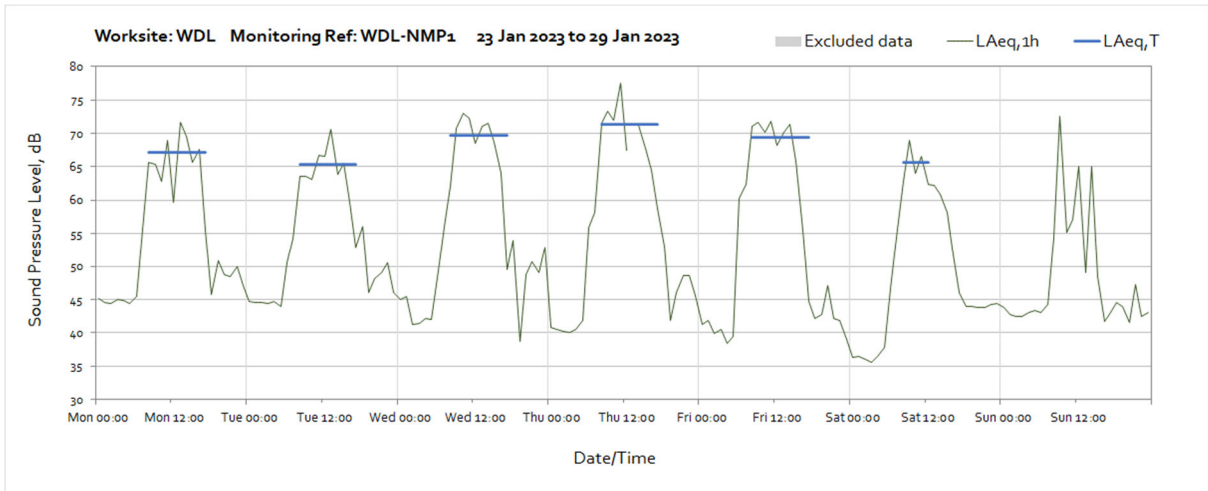
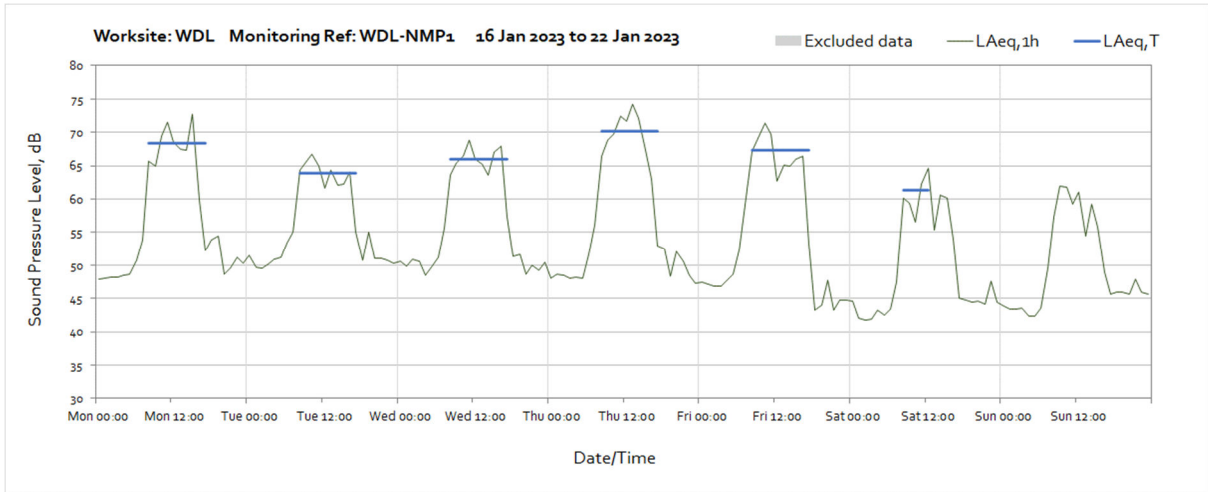


Worksite: WDL – Monitoring Ref: WDL-NMP1

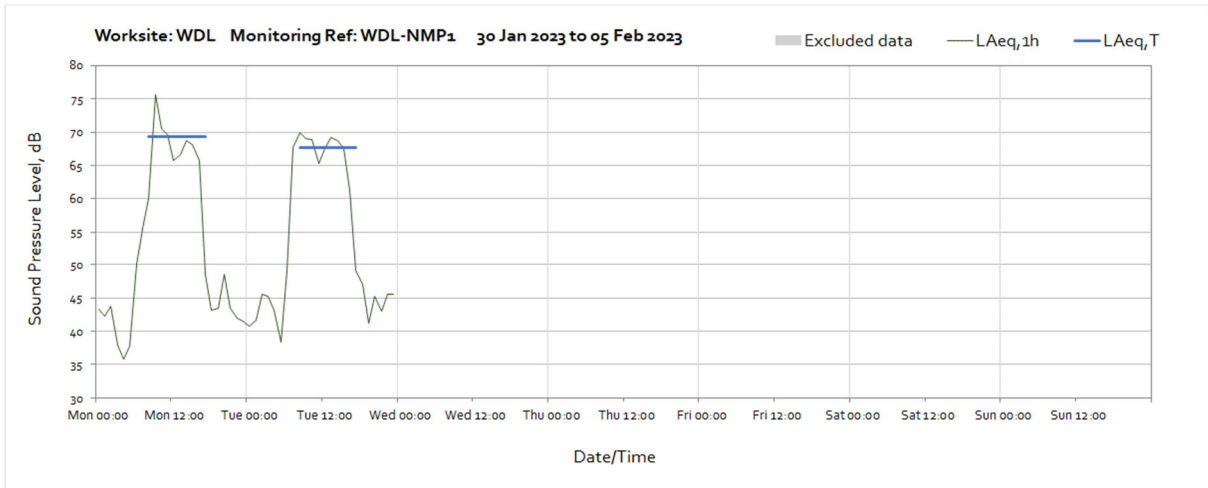


Note: High noise levels measured at 01:00 on Sunday 1st January were due to New Year Night celebration.

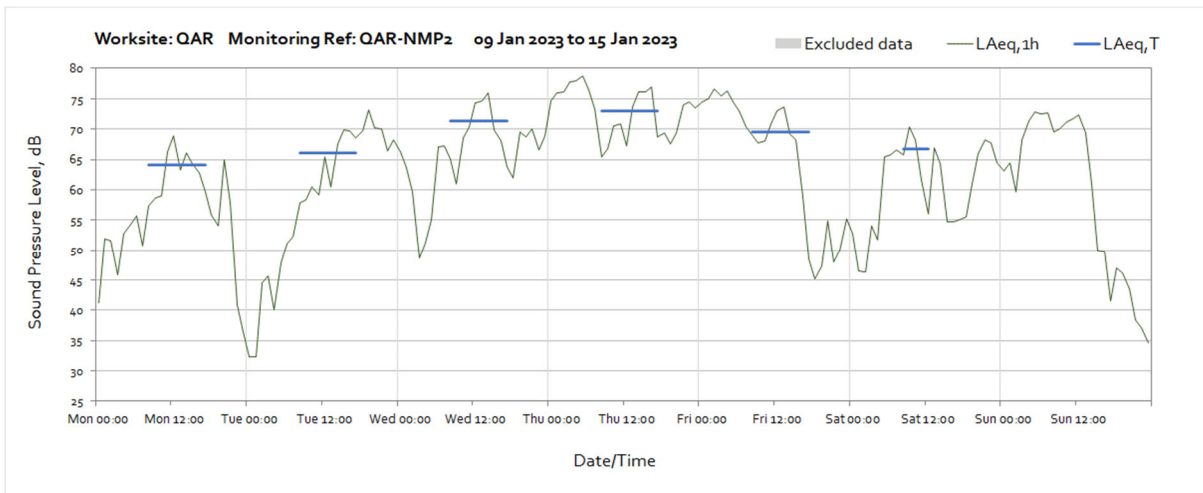
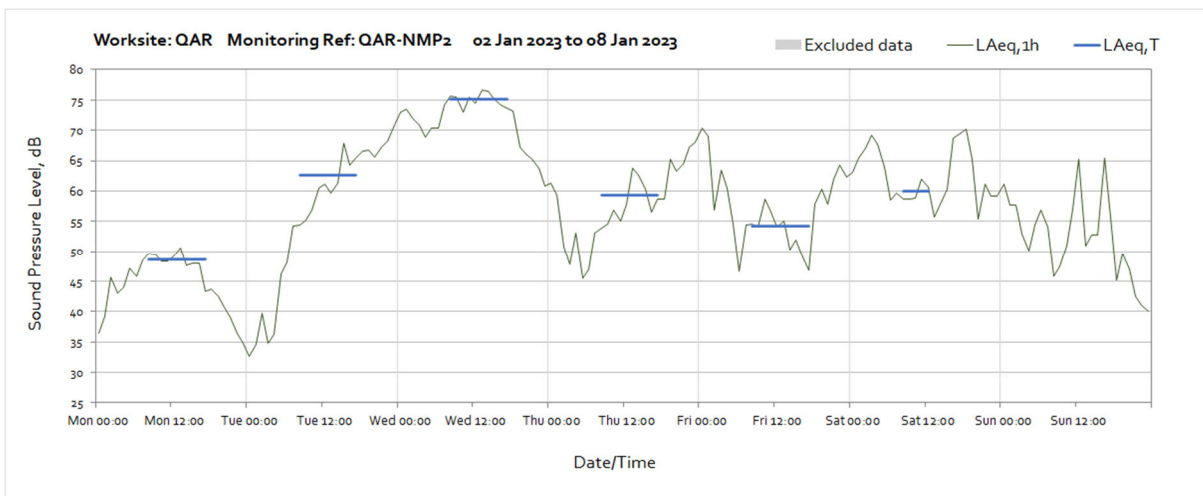
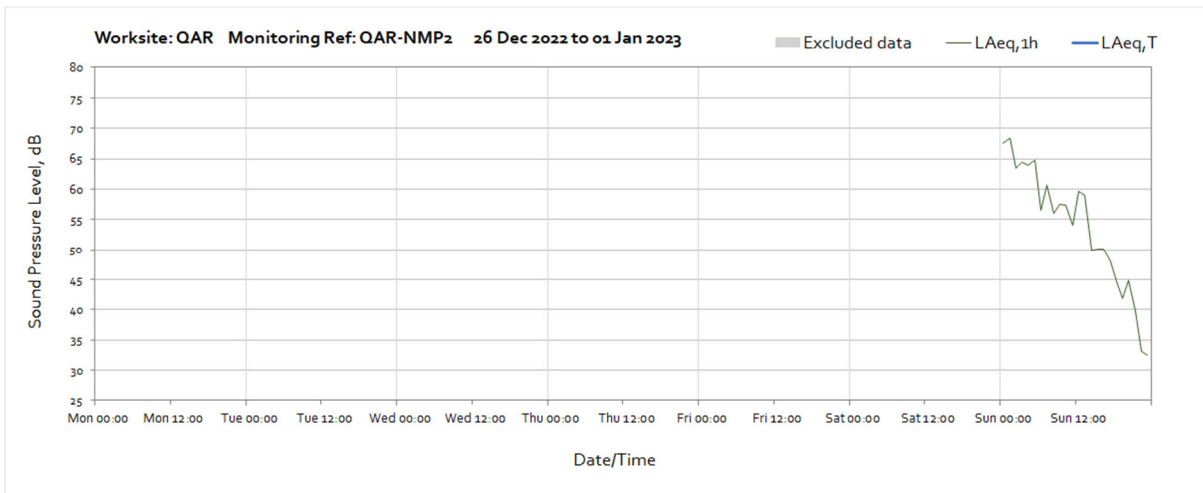




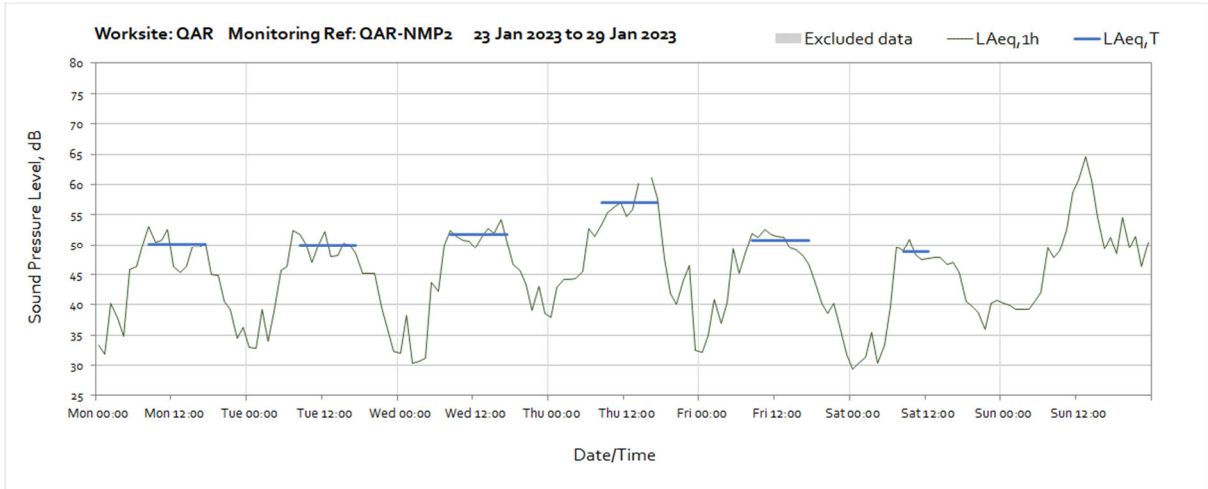
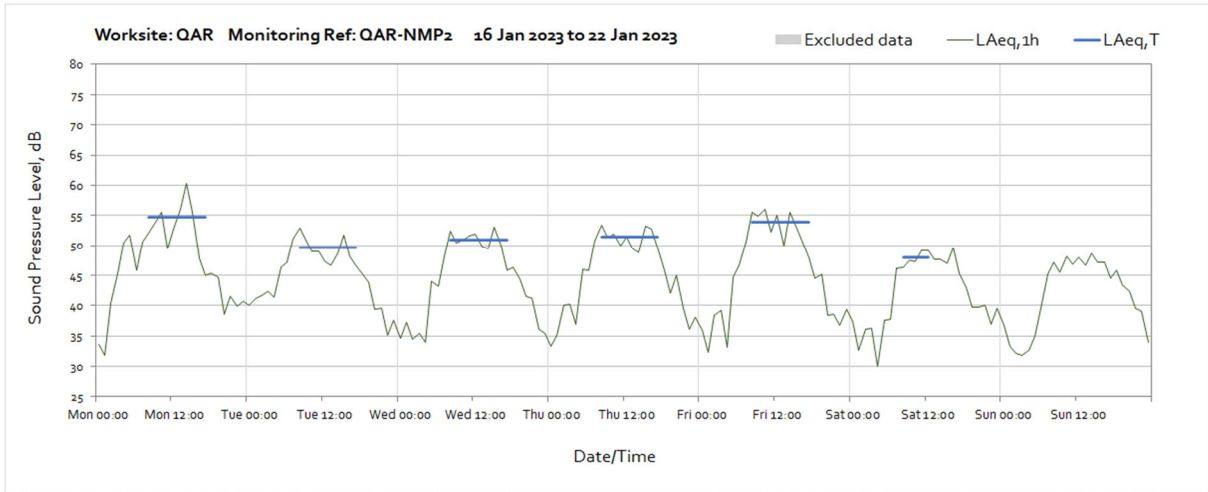
Note: Missing data between 13:00 and 14:00 on 26th January was due to monitor maintenance.



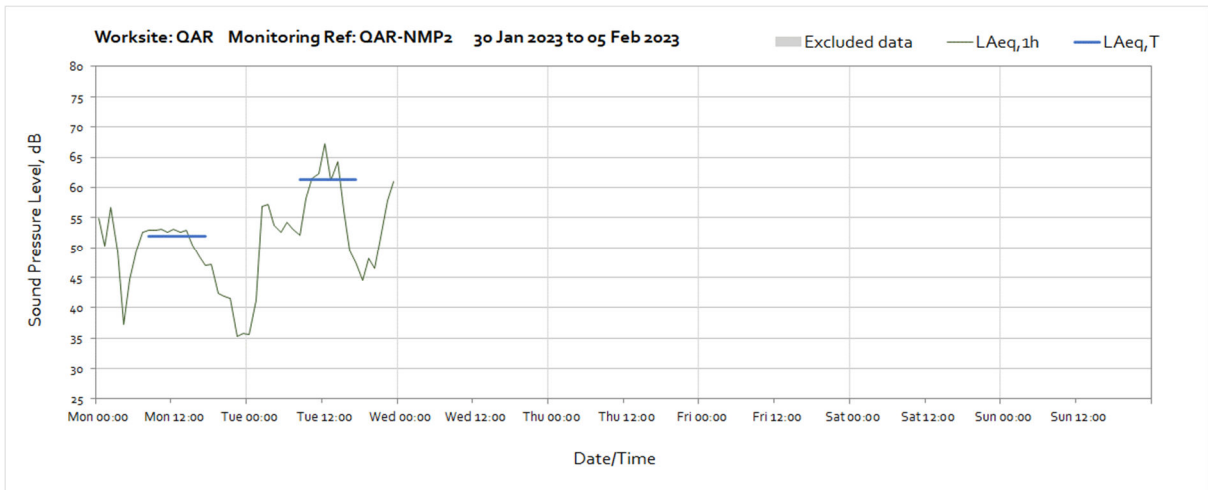
Worksite: QAR – Monitoring Ref: QAR-NMP2



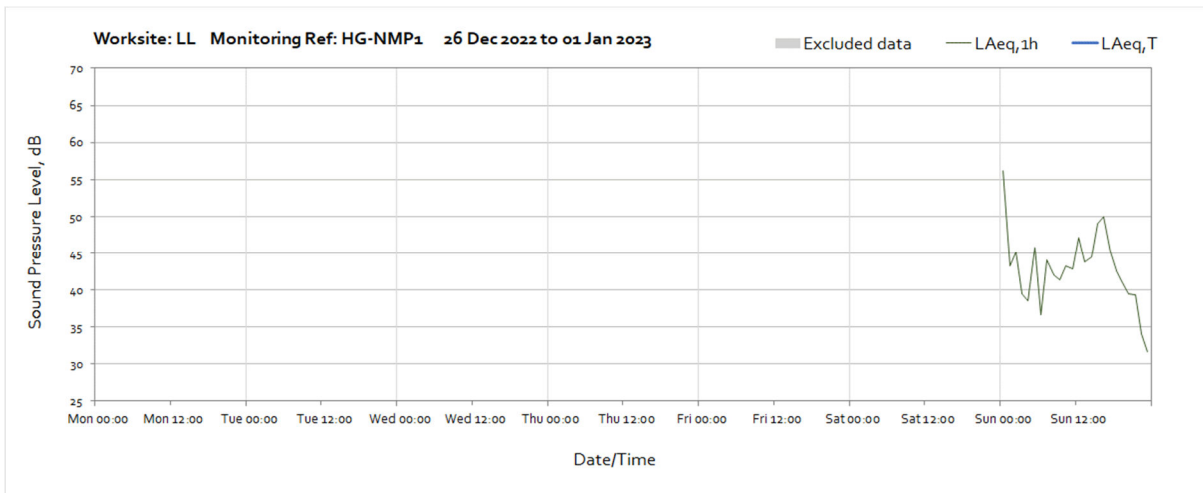
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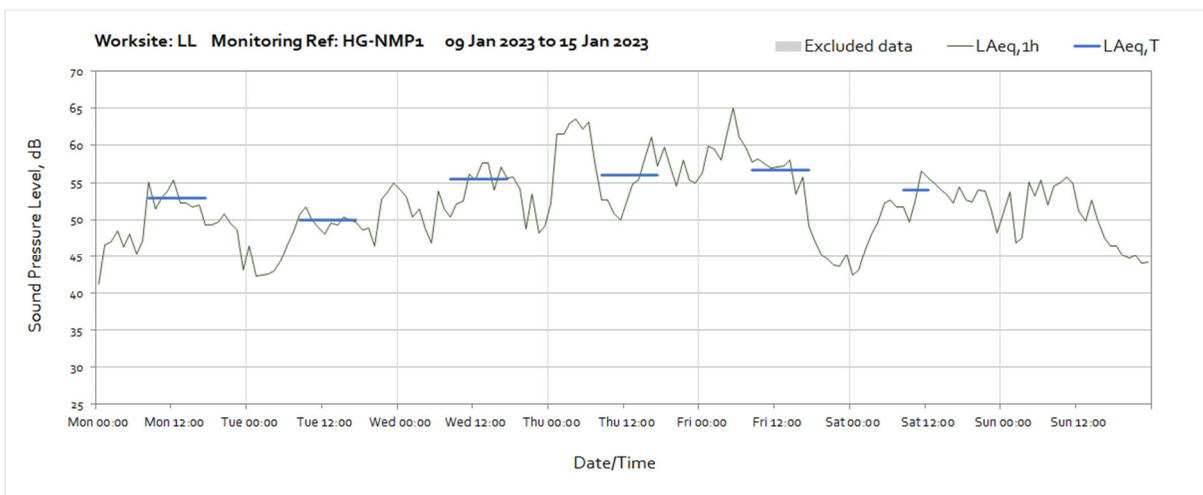
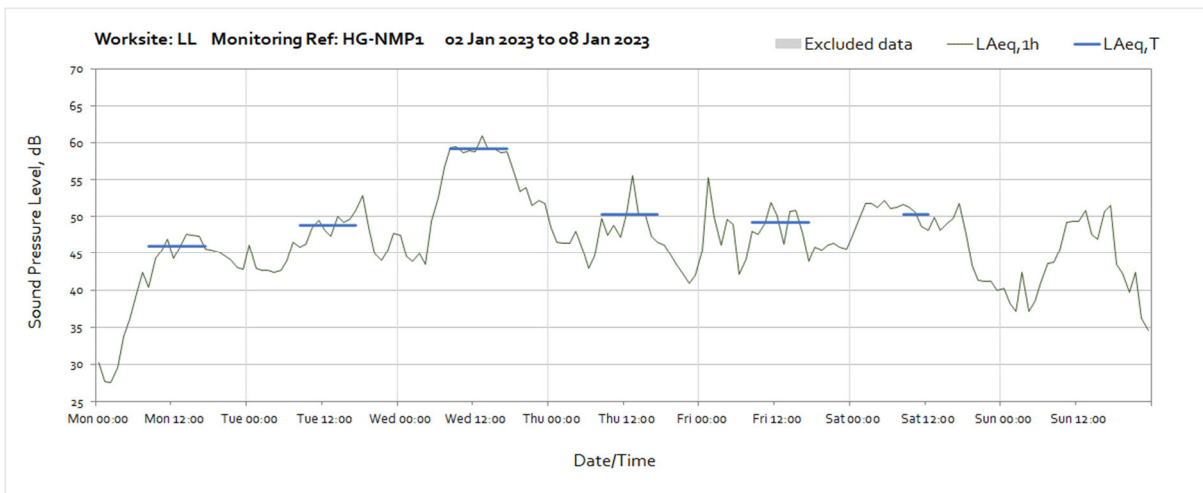
Note: Missing data between 15:00 and 16:00 on 26th January was due to monitor maintenance.

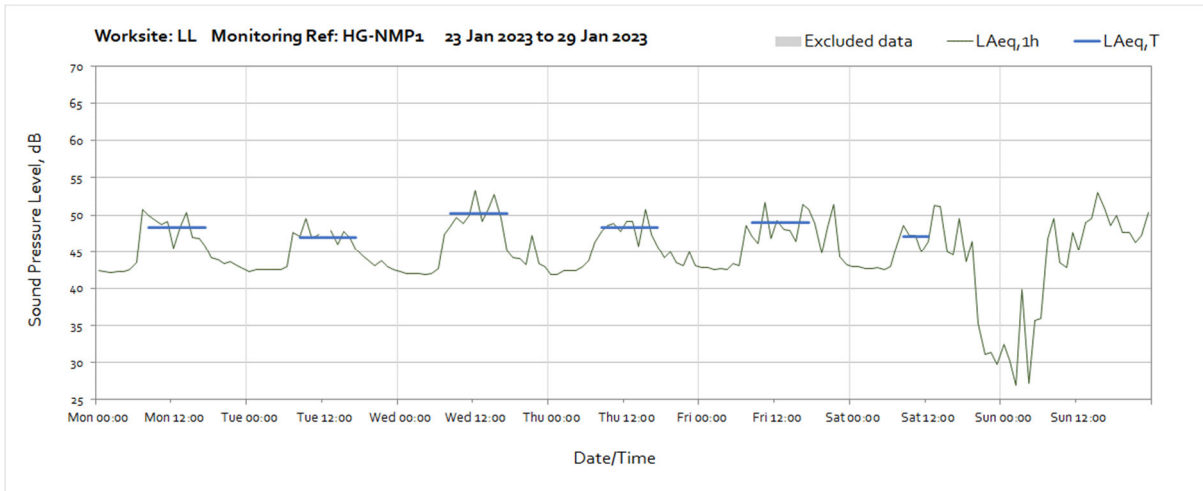
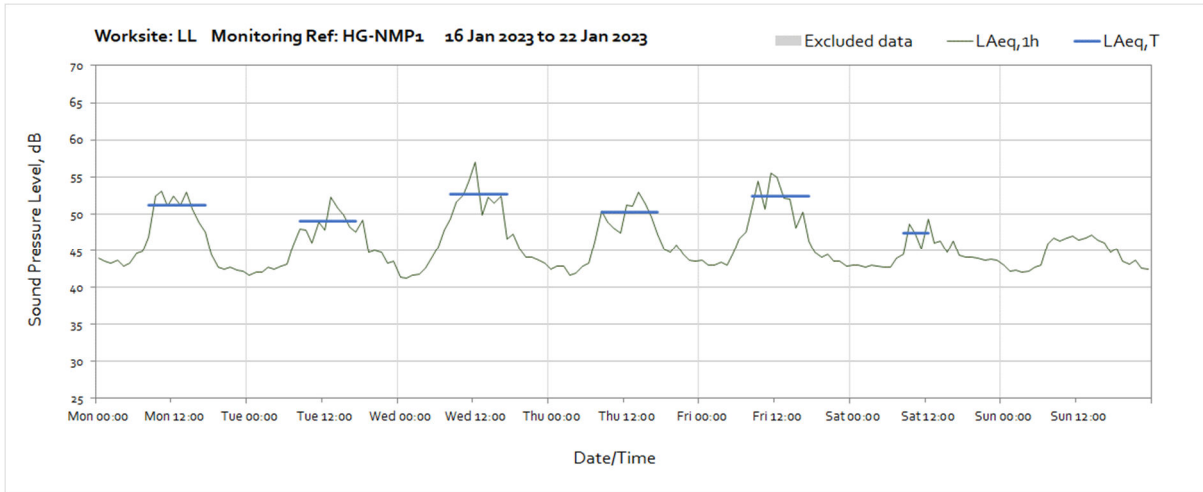


Worksite: LL – Monitoring Ref: HG-NMP1

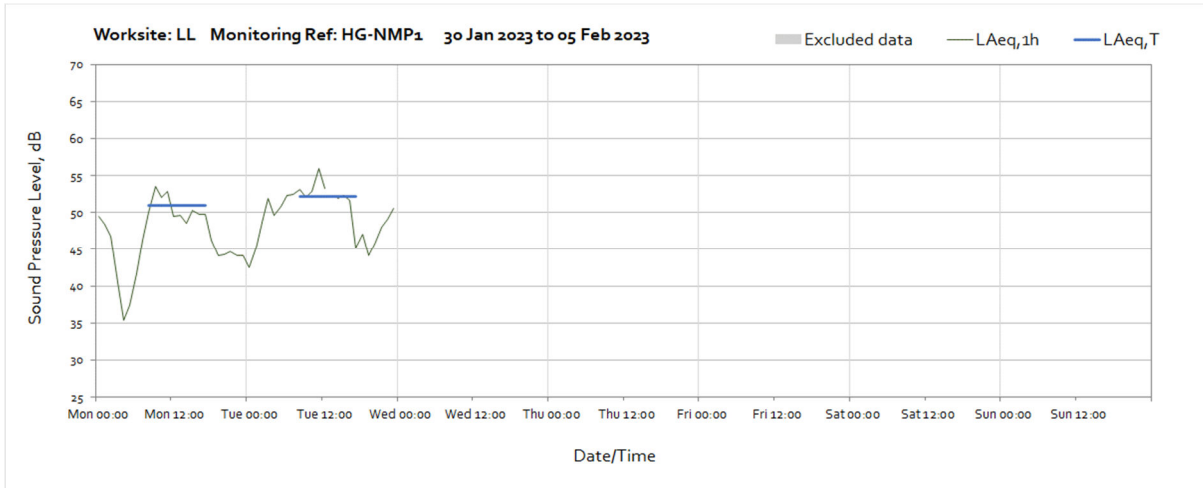


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



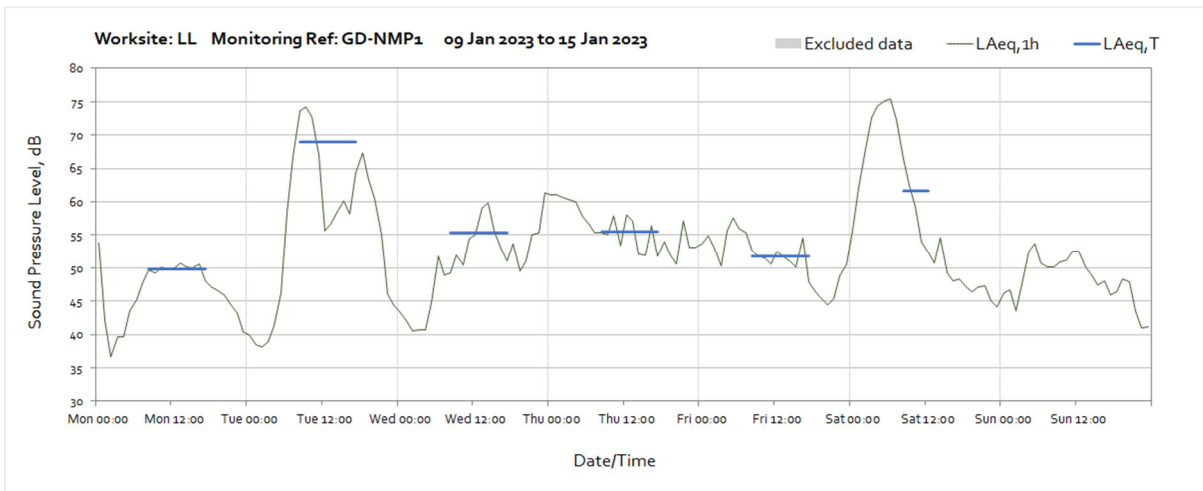
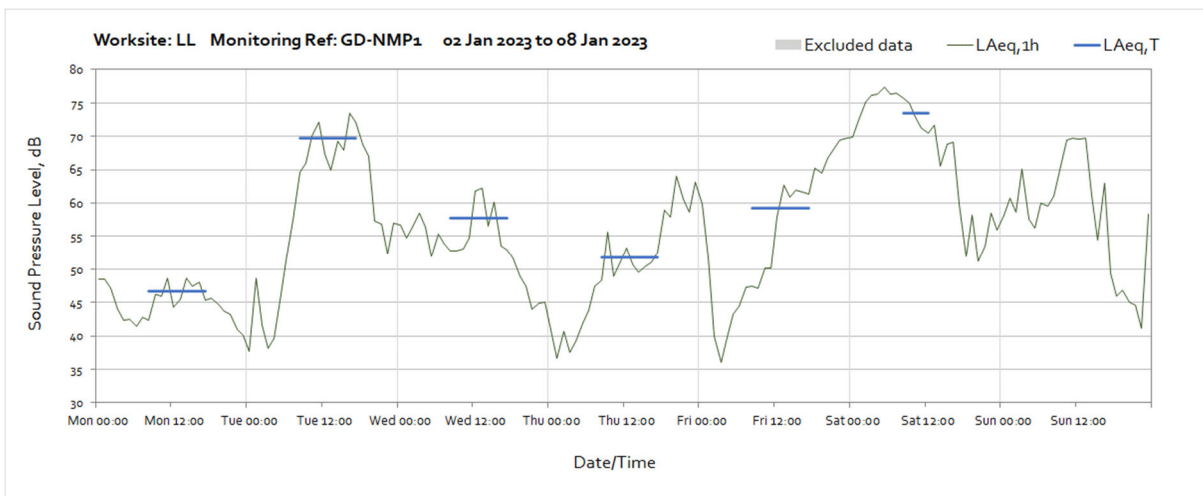
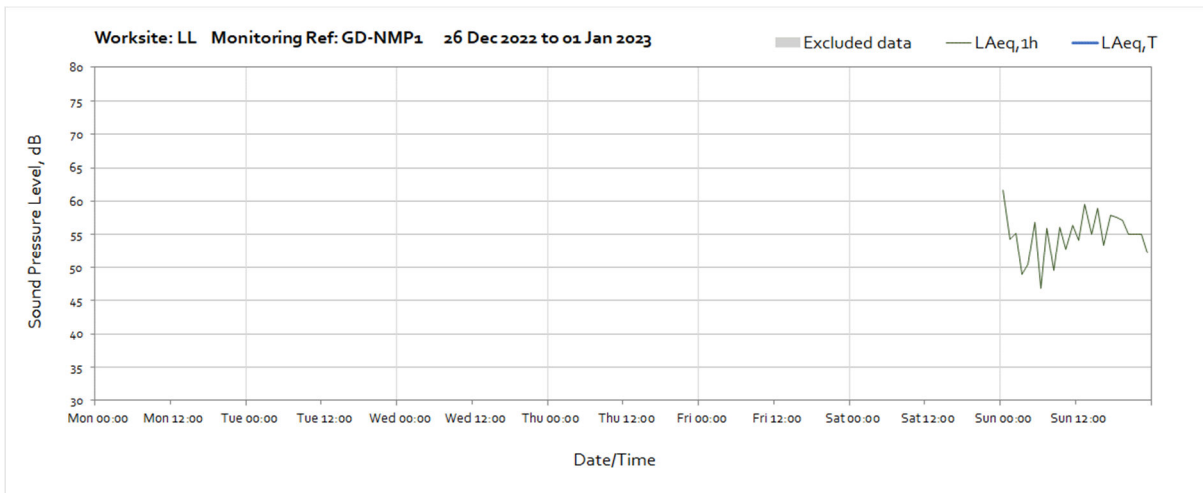


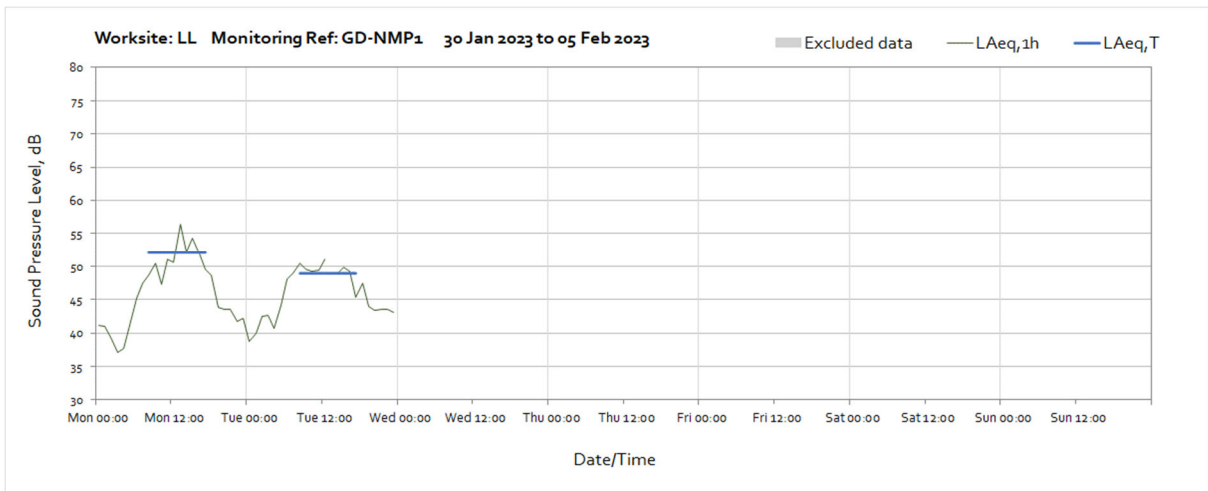
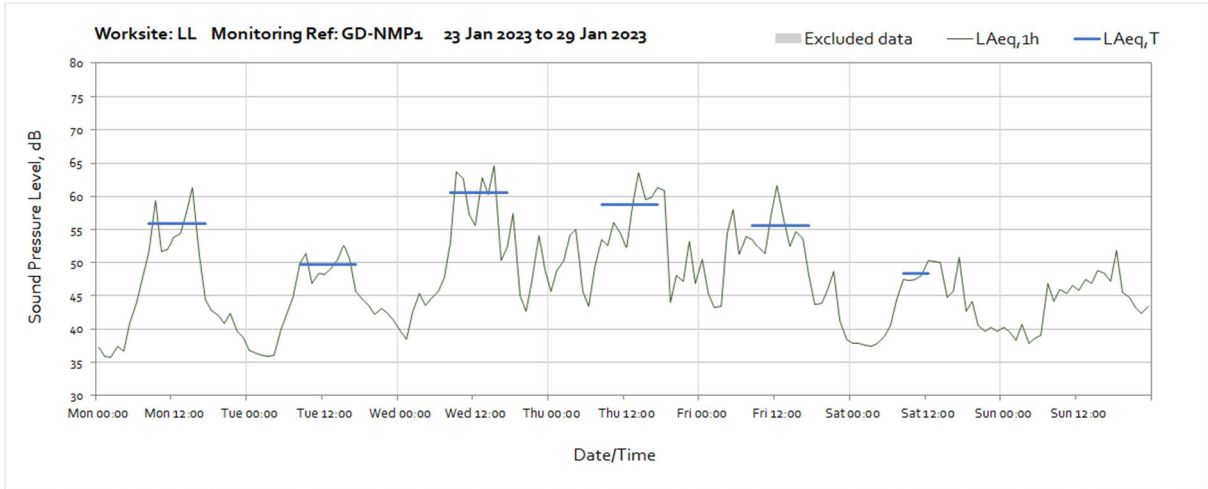
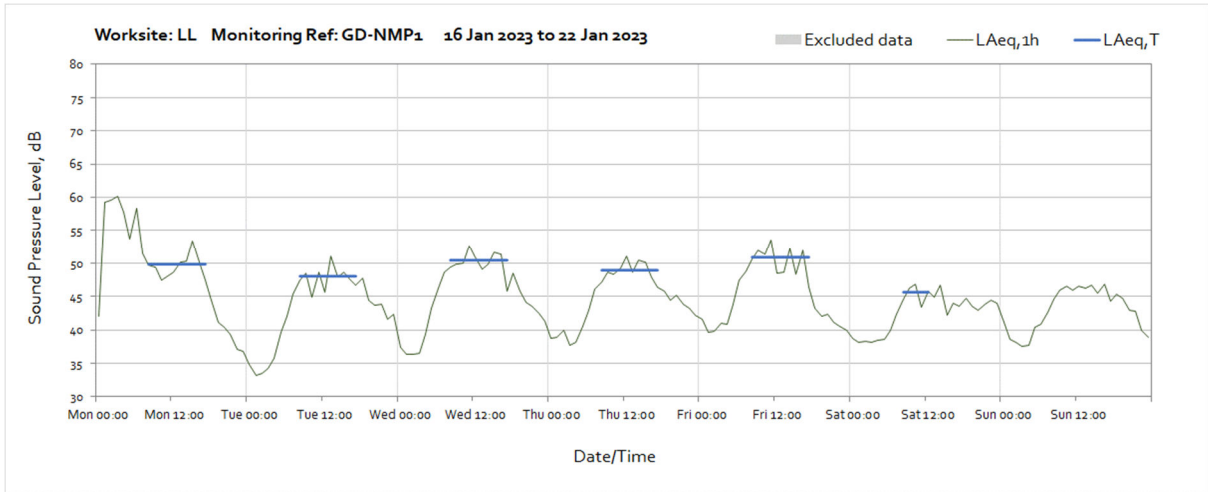
Note: Missing data between 12:00 and 13:00 on 24th January was due to monitor maintenance.



Note: Missing data between 13:00 and 14:00 on 31st January was due to monitor maintenance.

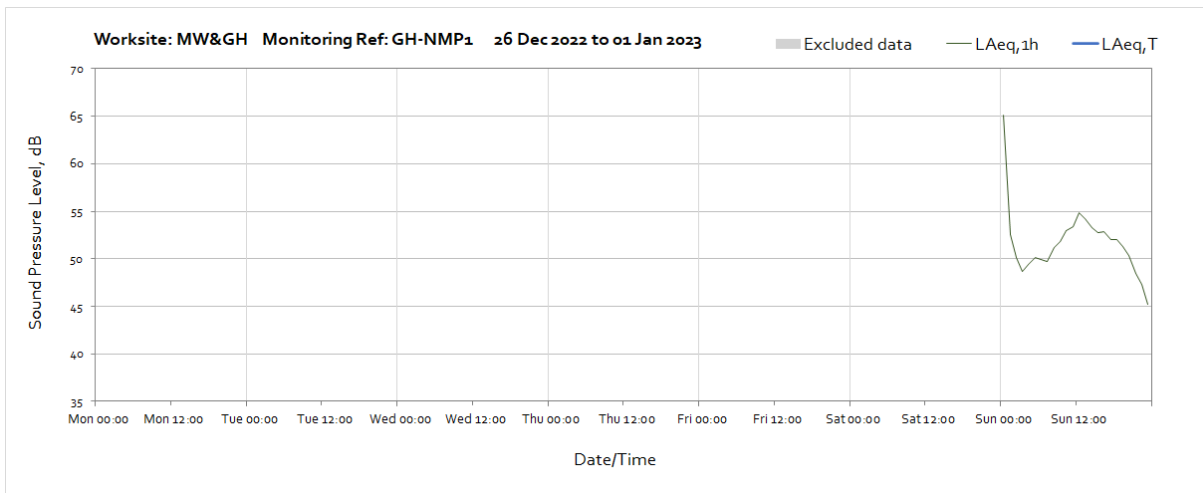
Worksite: LL - Monitoring Ref: GD-NMP1



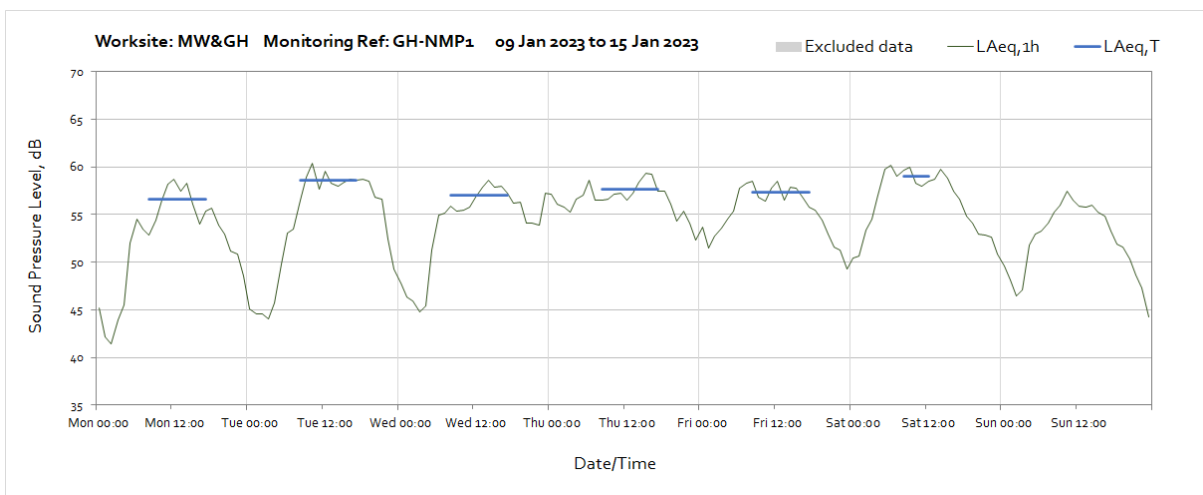
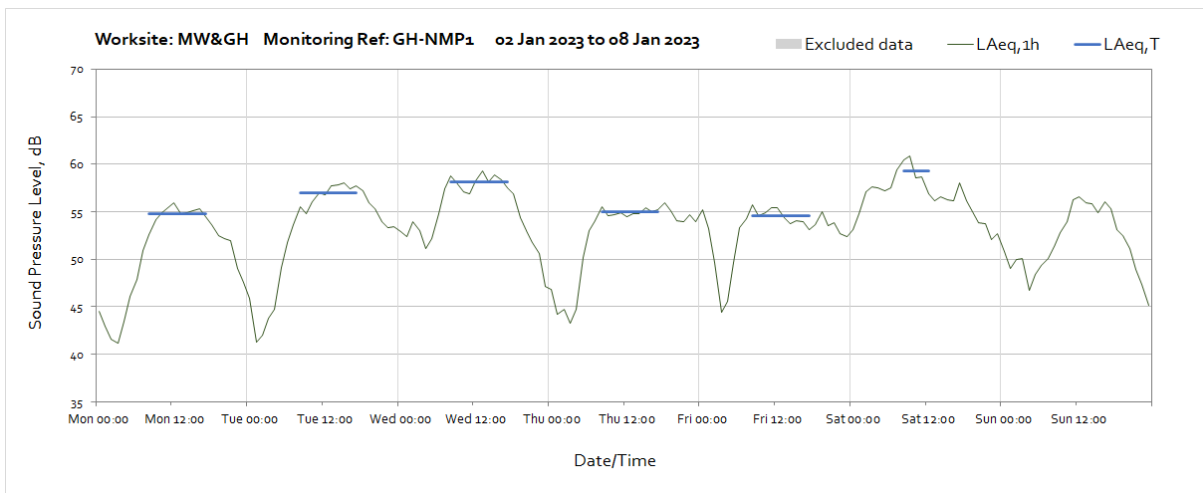


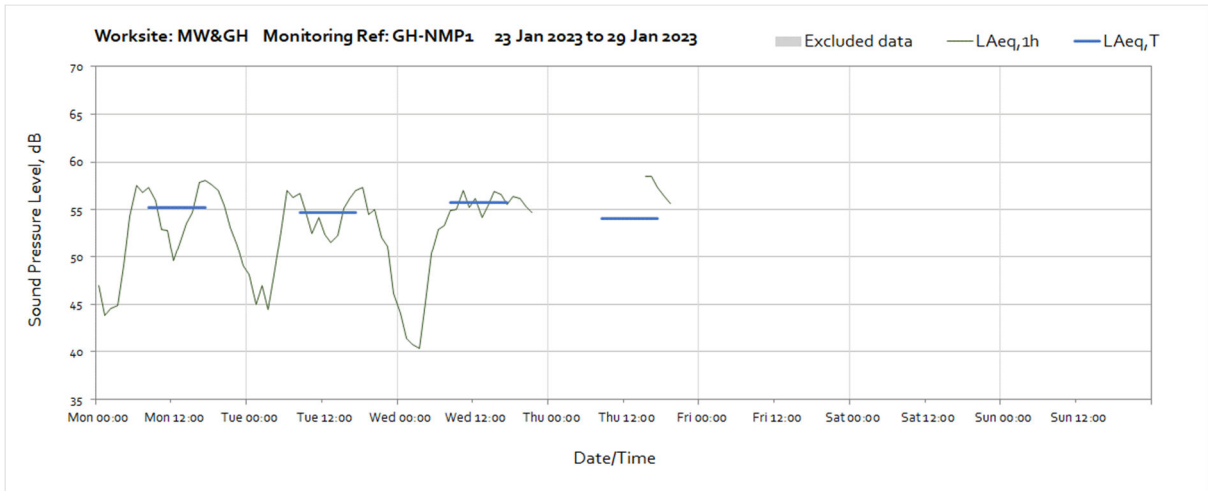
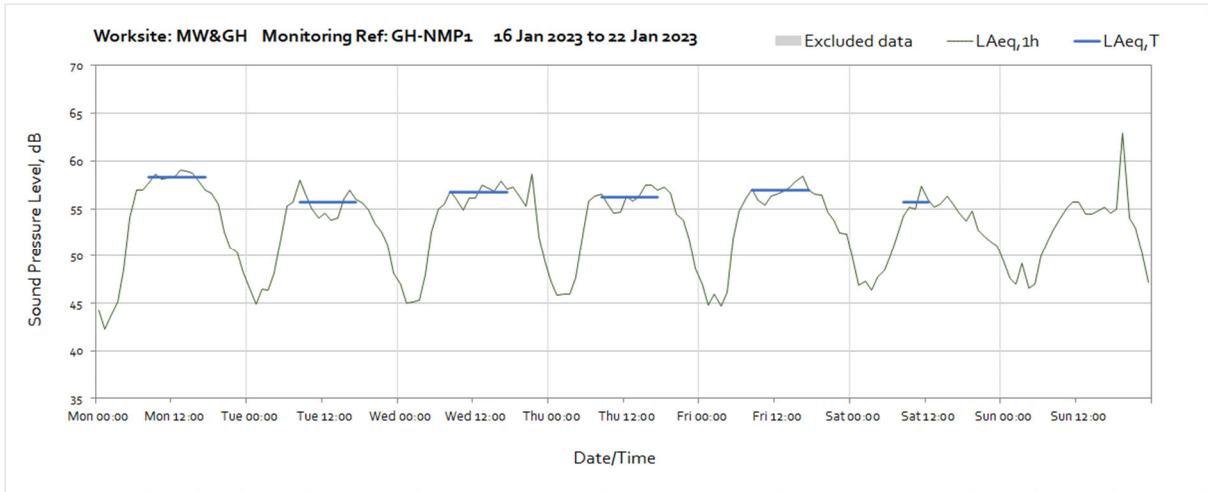
Note: Missing data between 13:00 and 14:00 on 31st January was due to monitor maintenance.

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

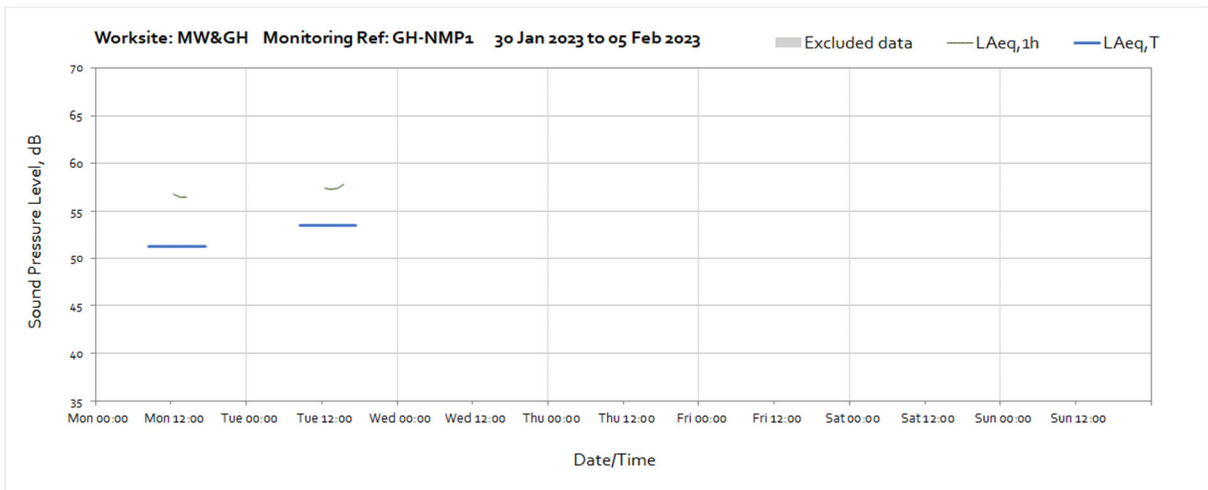


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



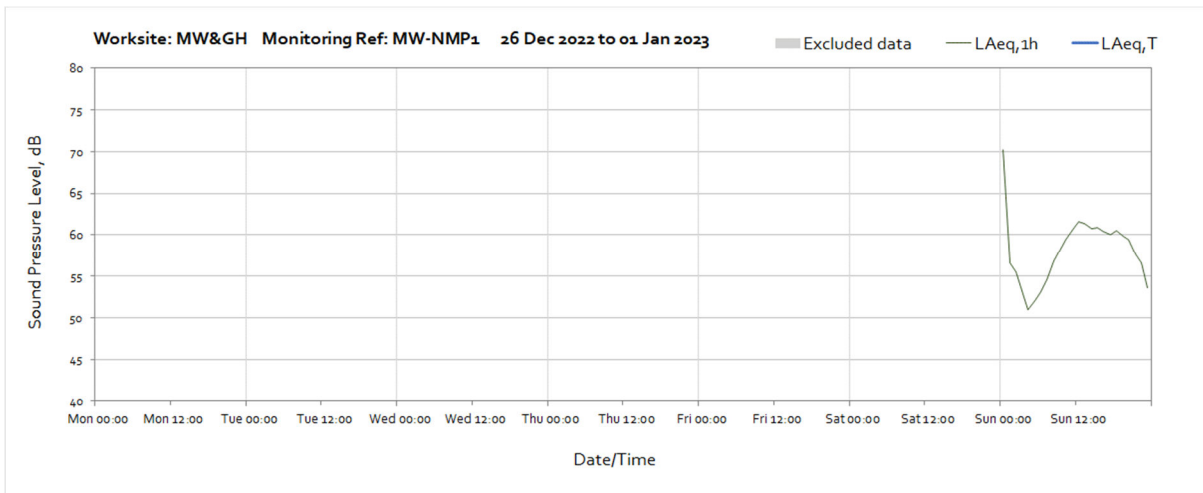


Note: Missing data between 22:00 on 25th January until 15:00 on 26th January and between 20:00 on 26th January until 12:00 on 31st January was due to depleted monitor battery.

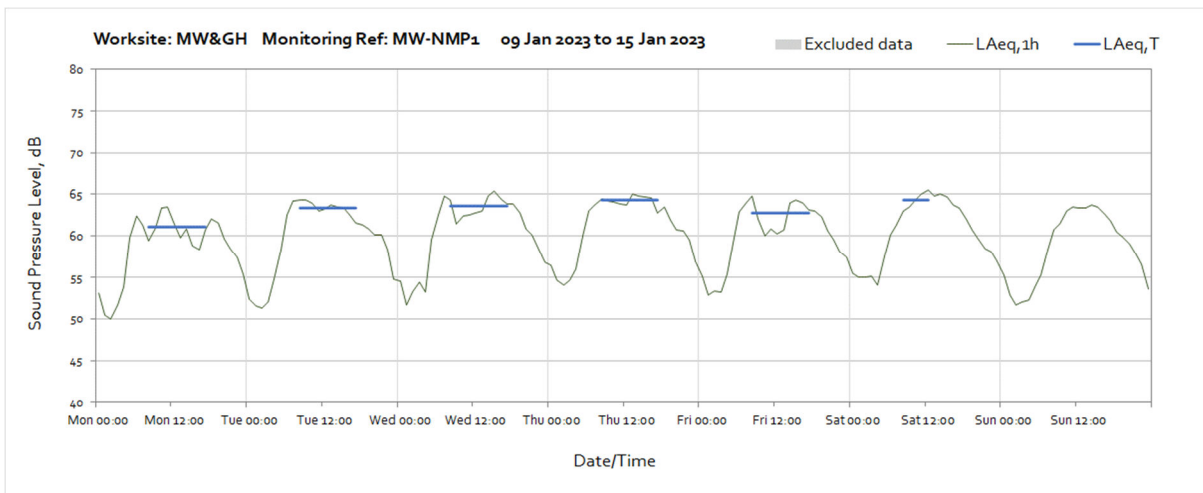
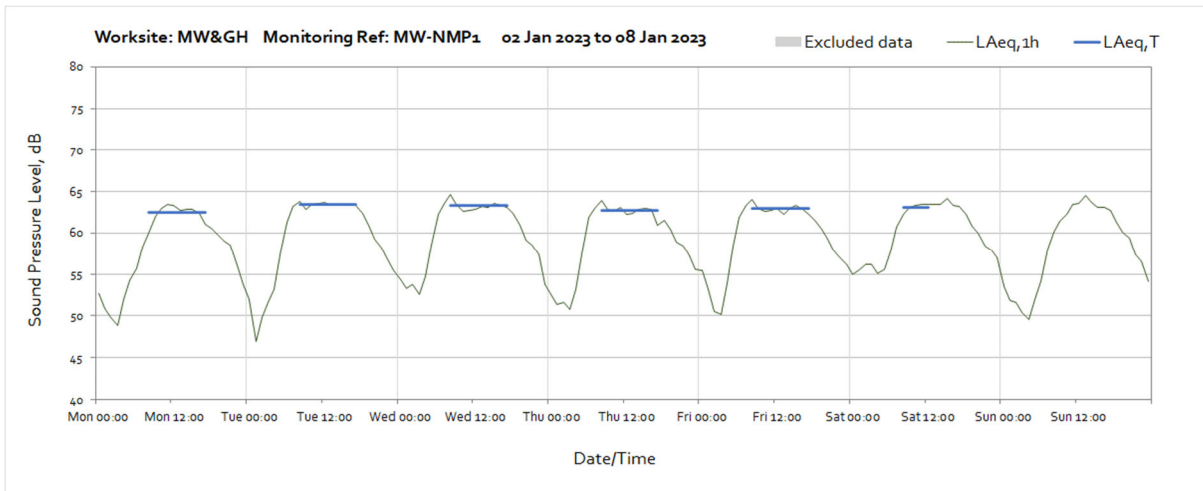


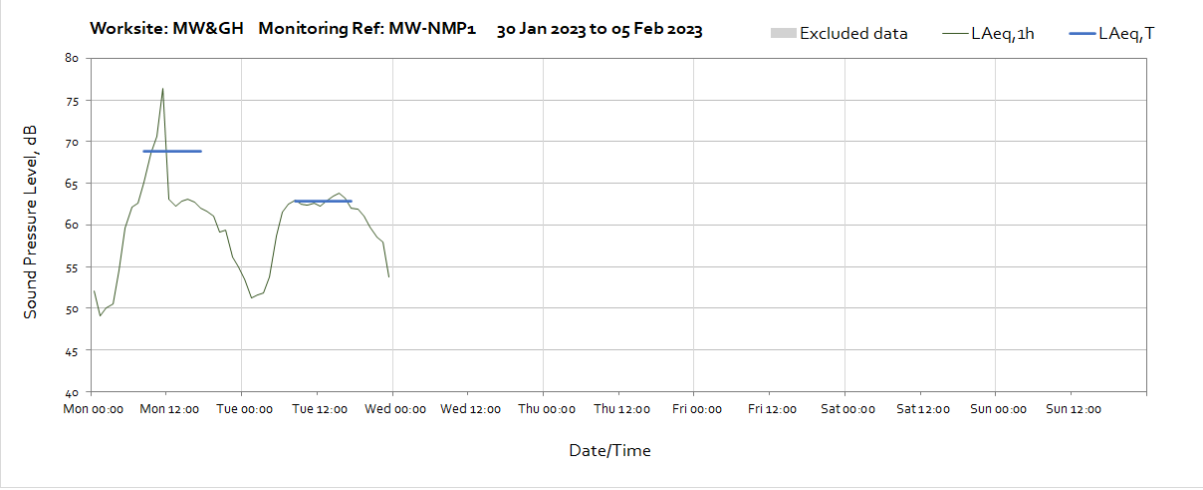
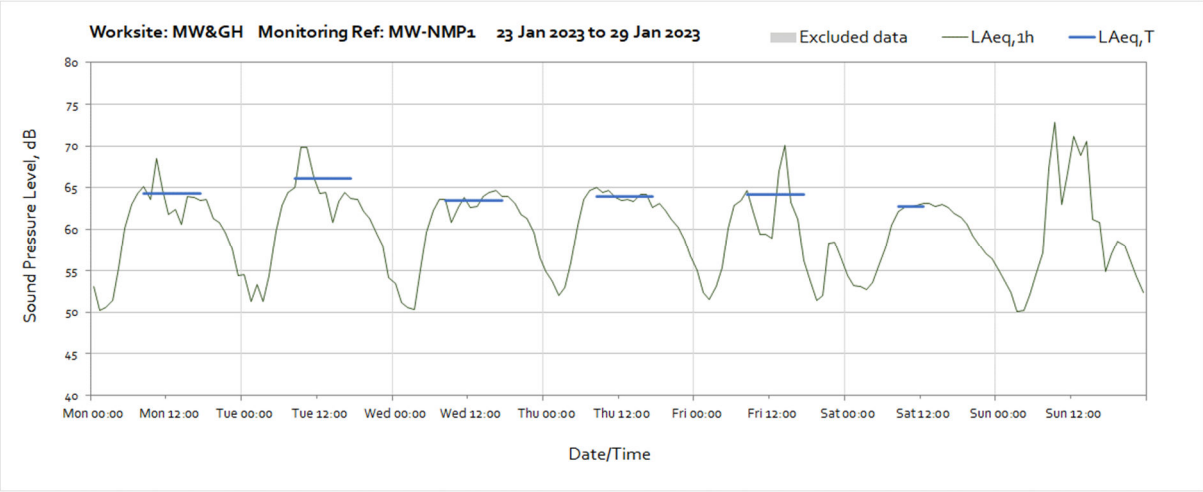
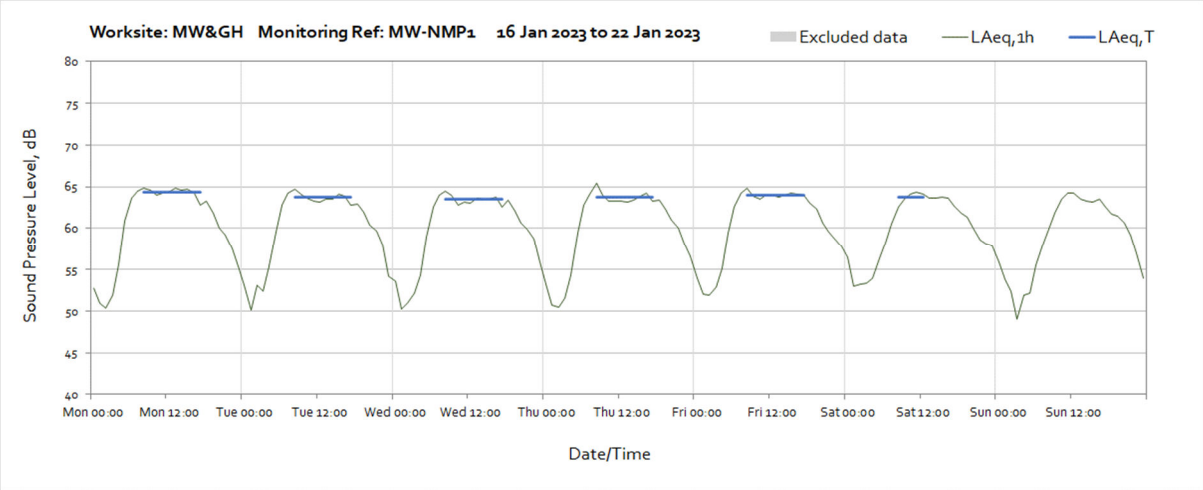
Note: Missing data between 20:00 on 26th January until 12:00 on 31st January and from 16:00 until month end was due to depleted monitor battery.

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

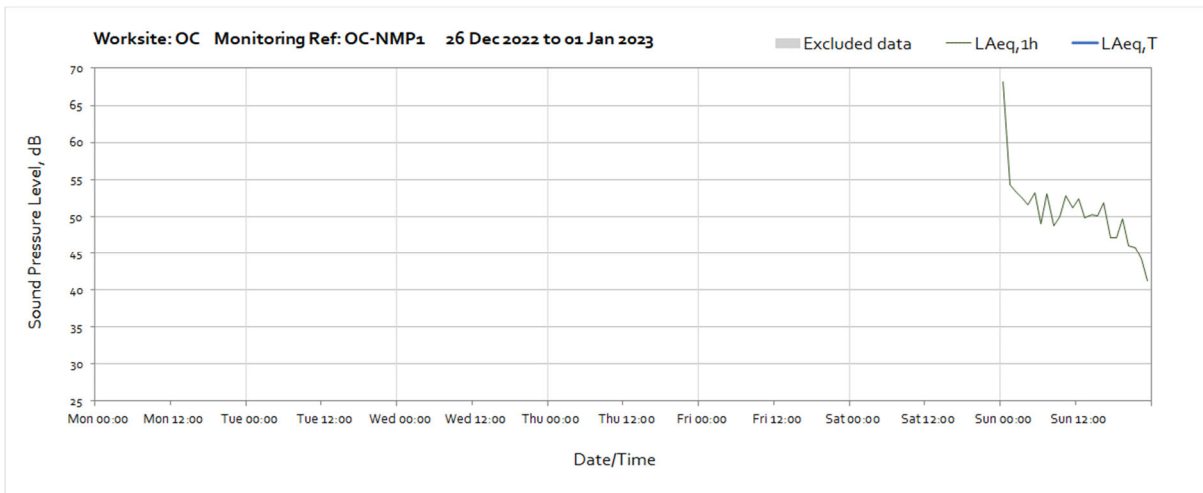


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.

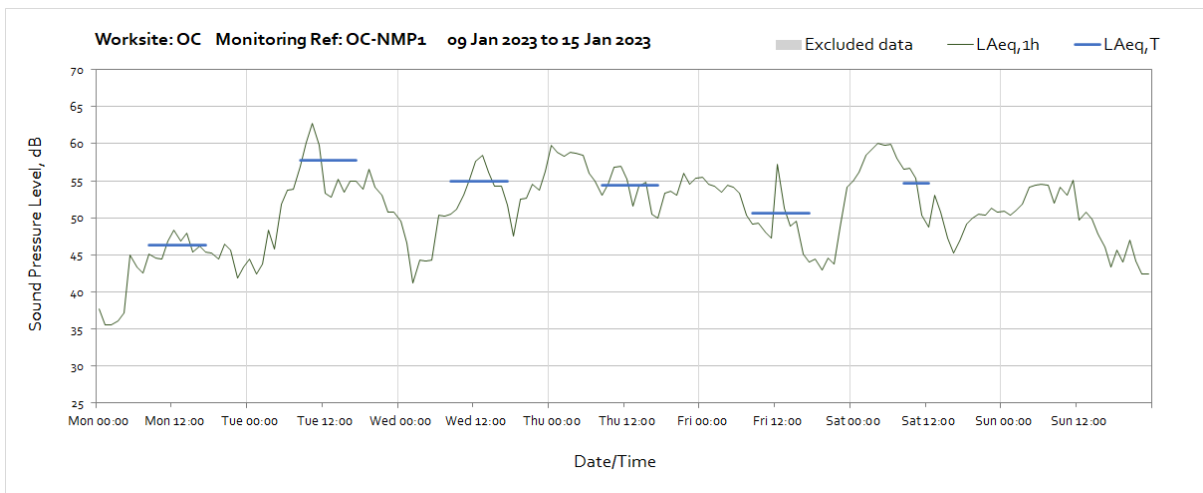
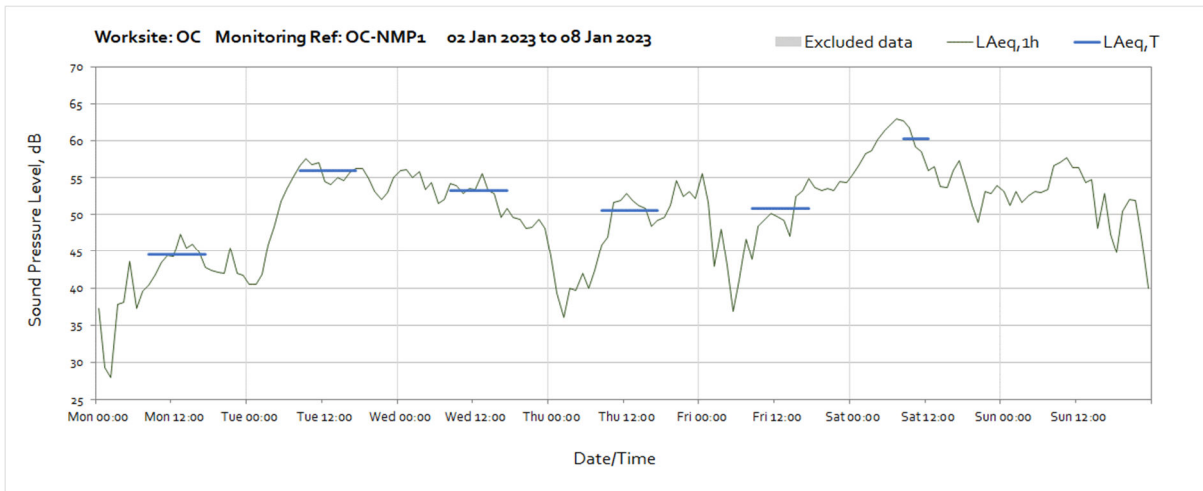


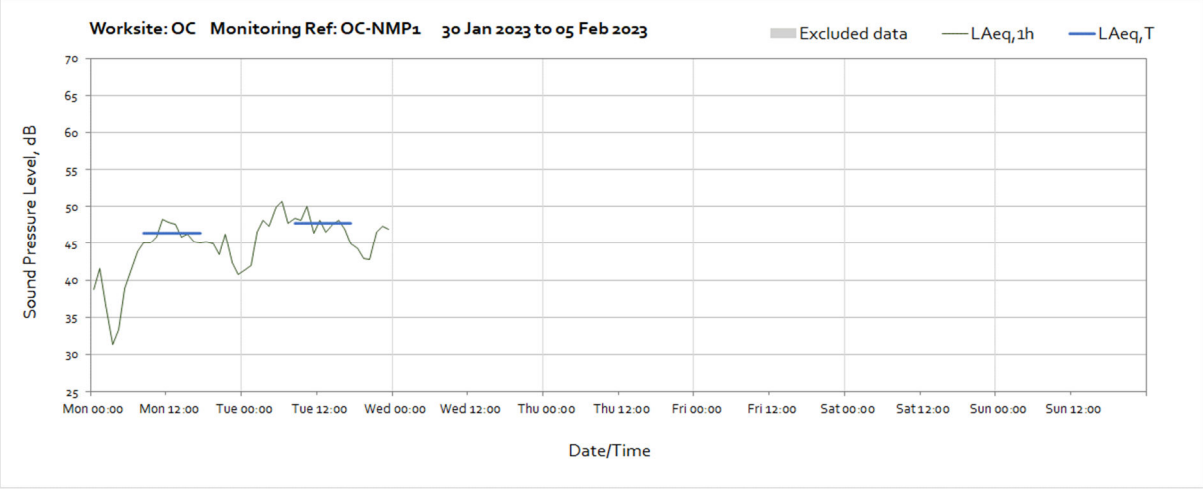
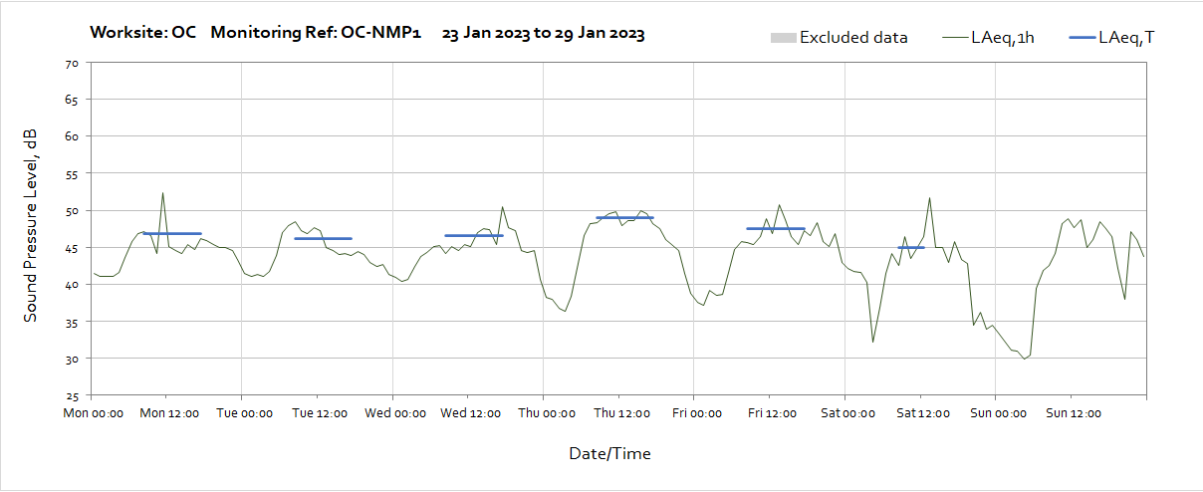
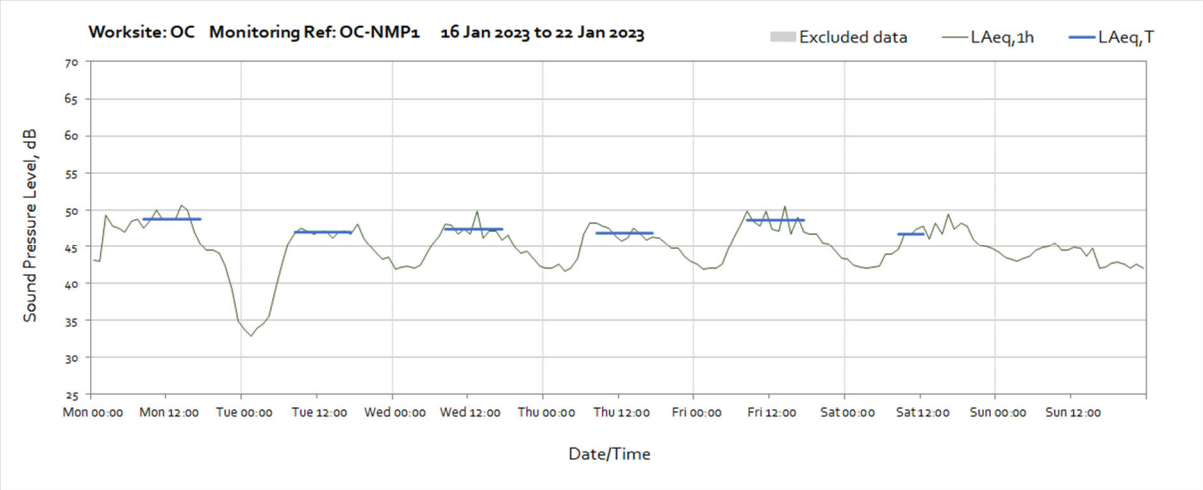


Worksite: OC – Monitoring Ref: OC-NMP1

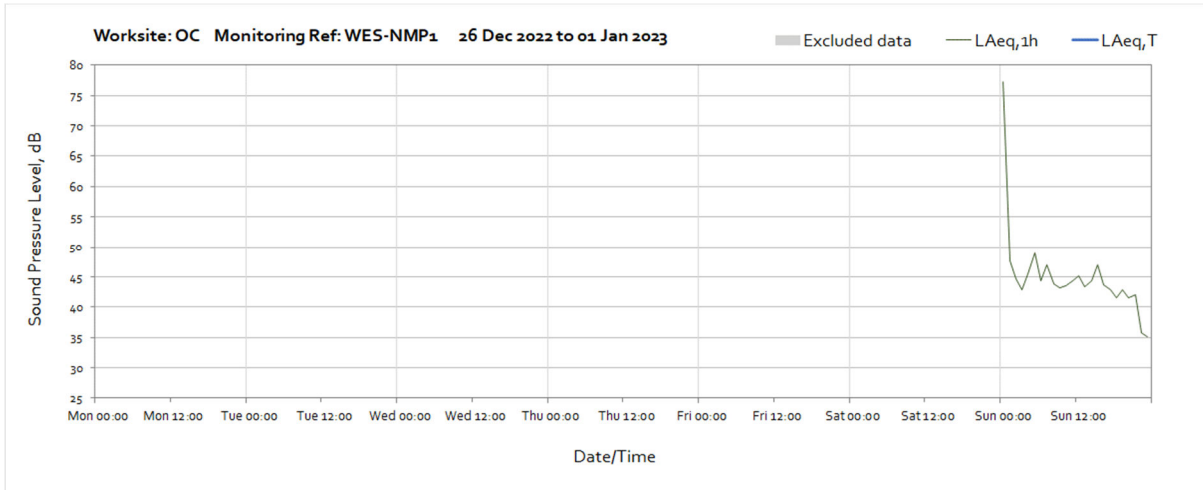


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.

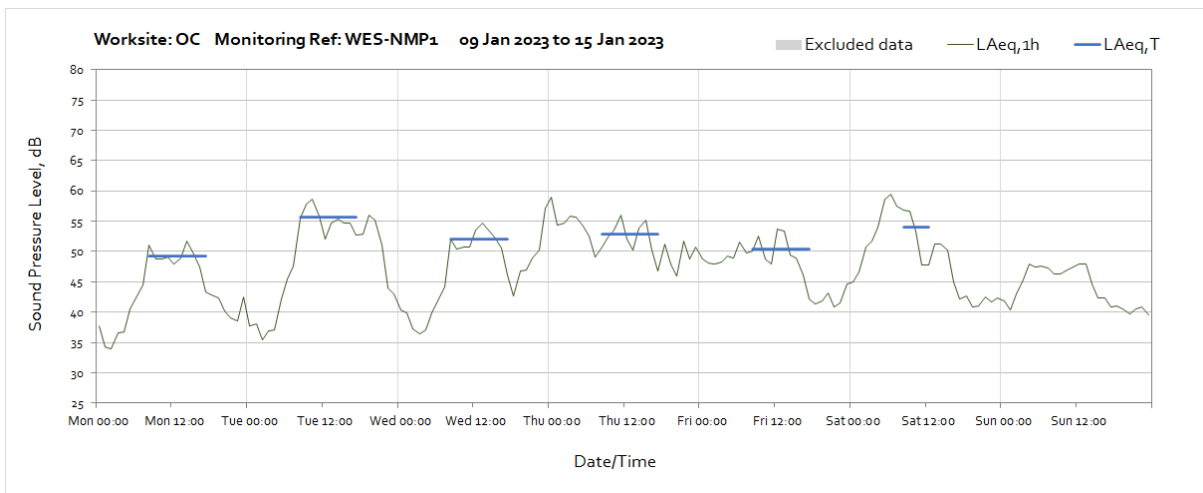
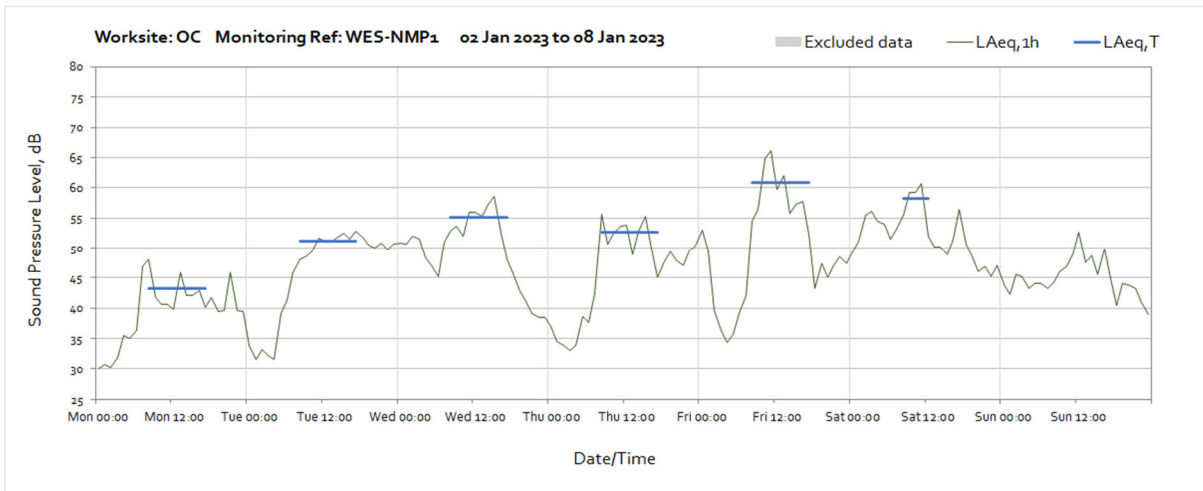


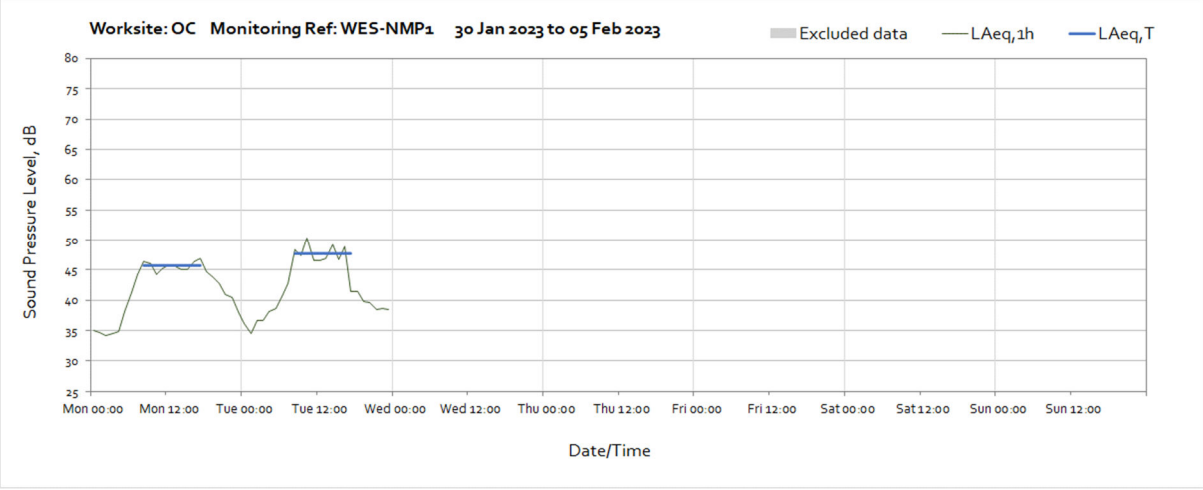
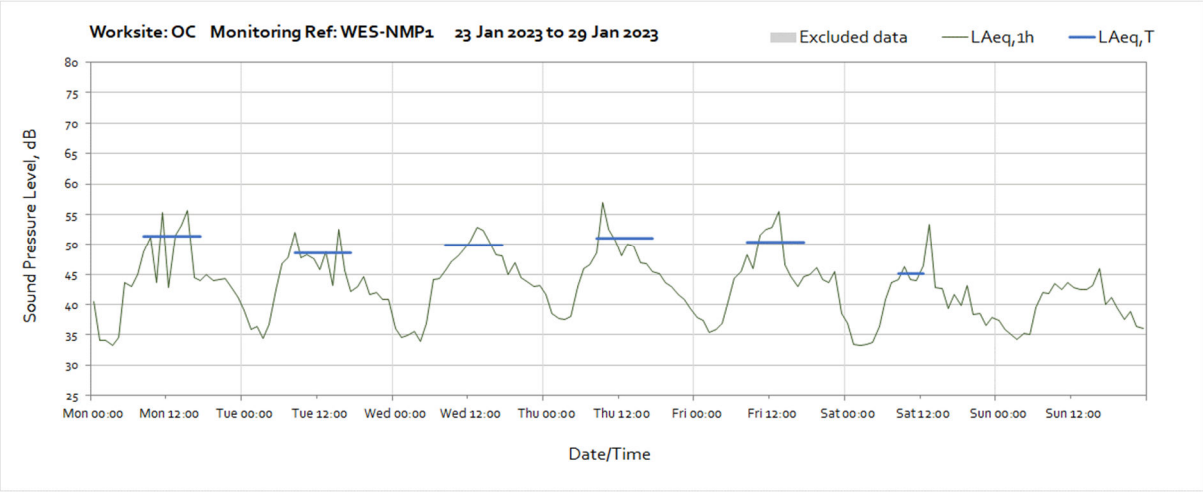
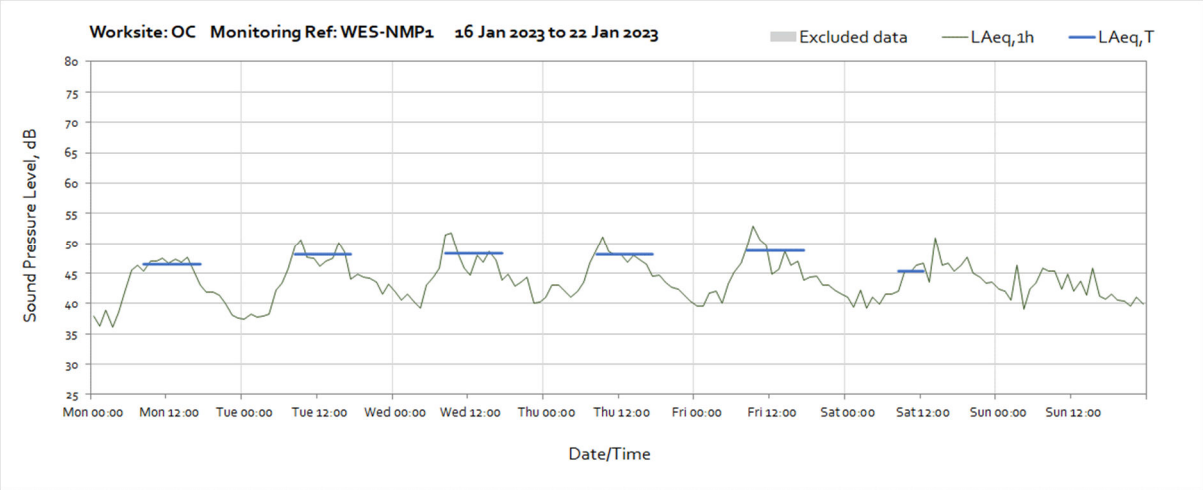


Worksite: OC – Monitoring Ref: WES-NMP1

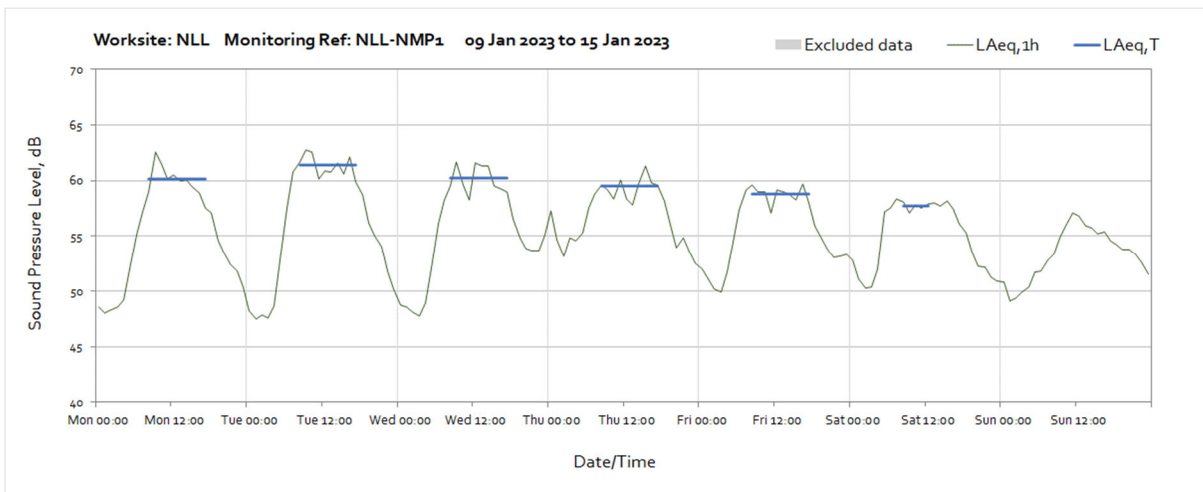
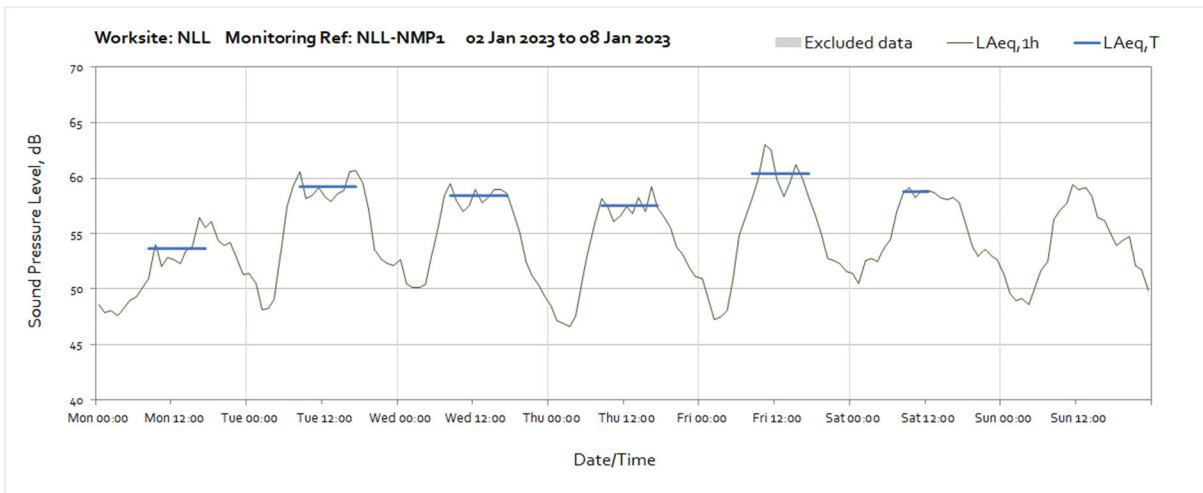
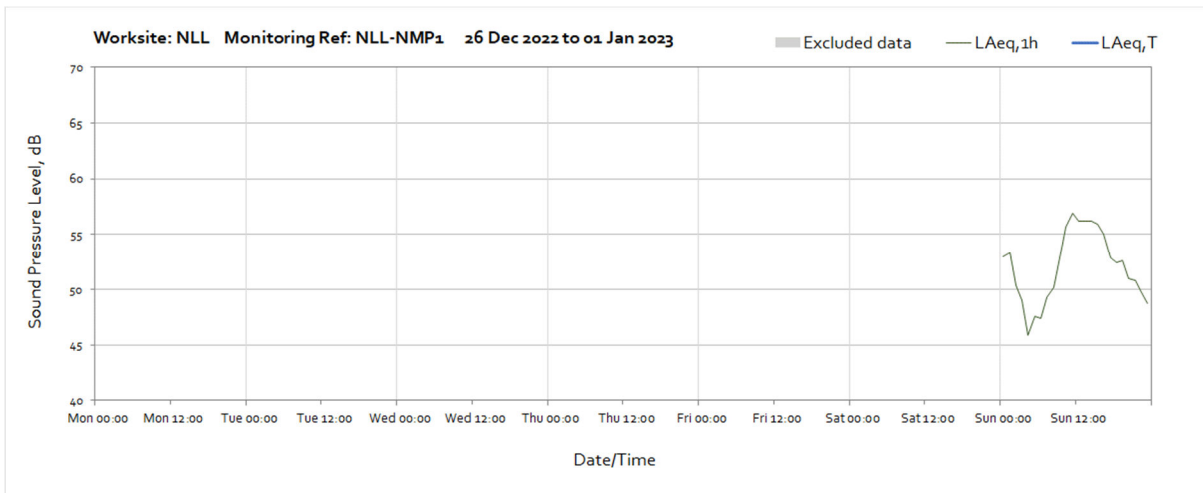


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.

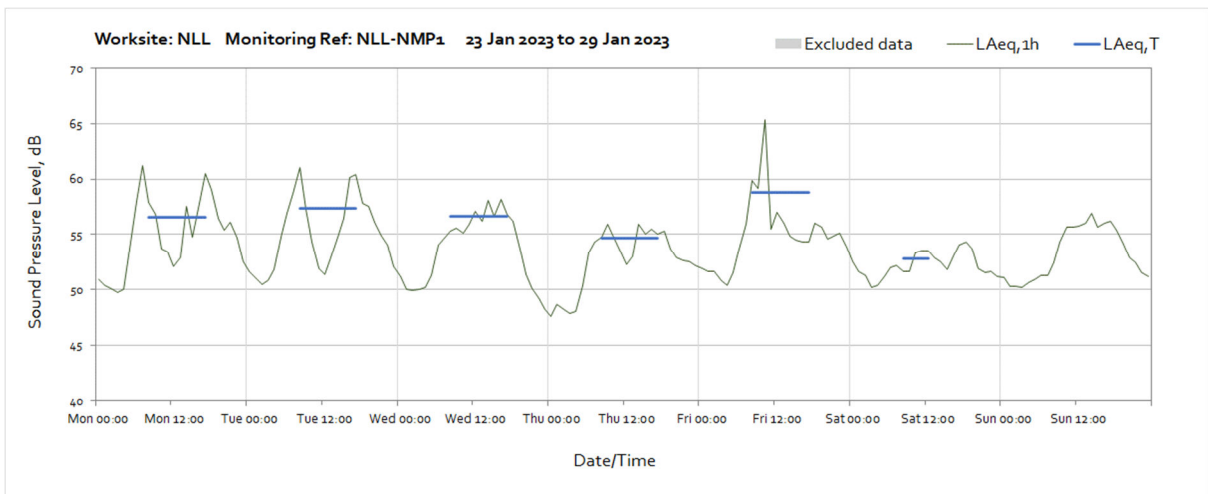
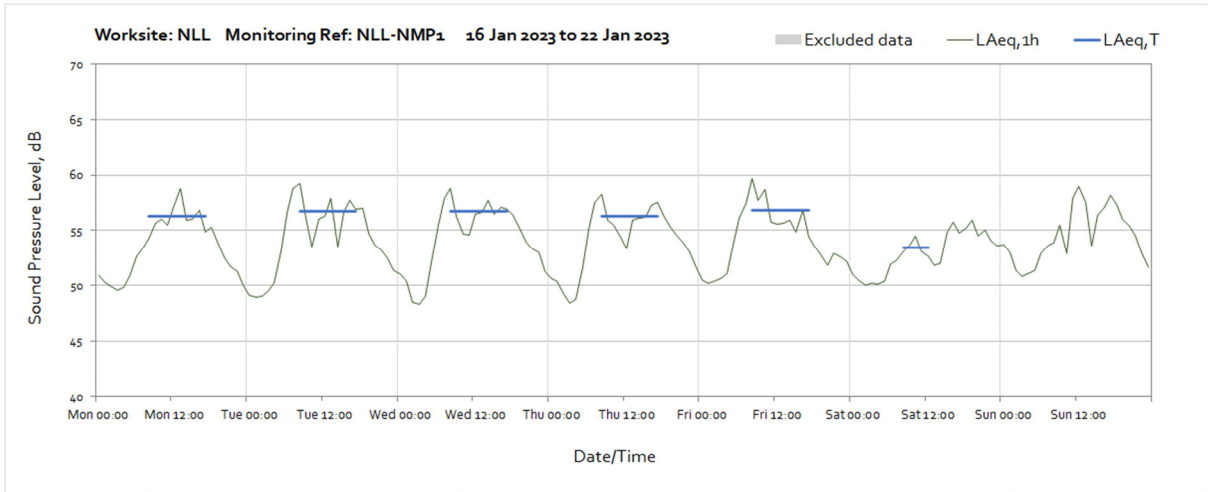




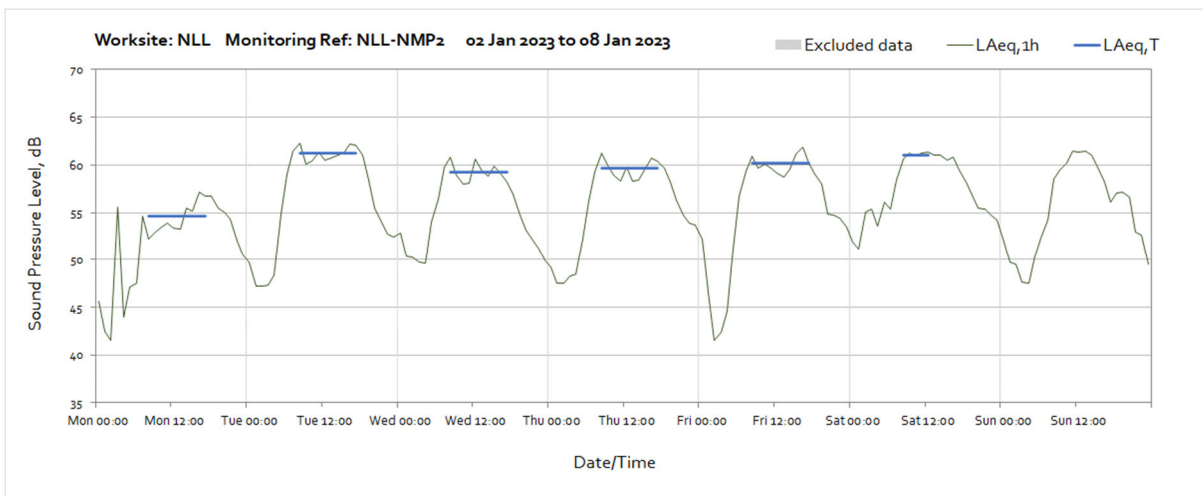
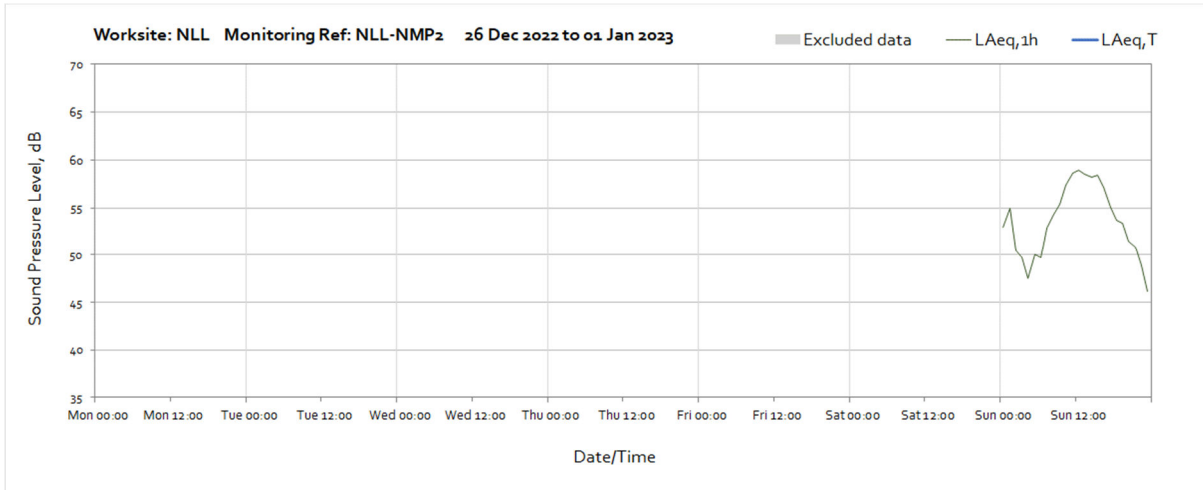
Worksite: NLL – Monitoring Ref: NLL-NMP1

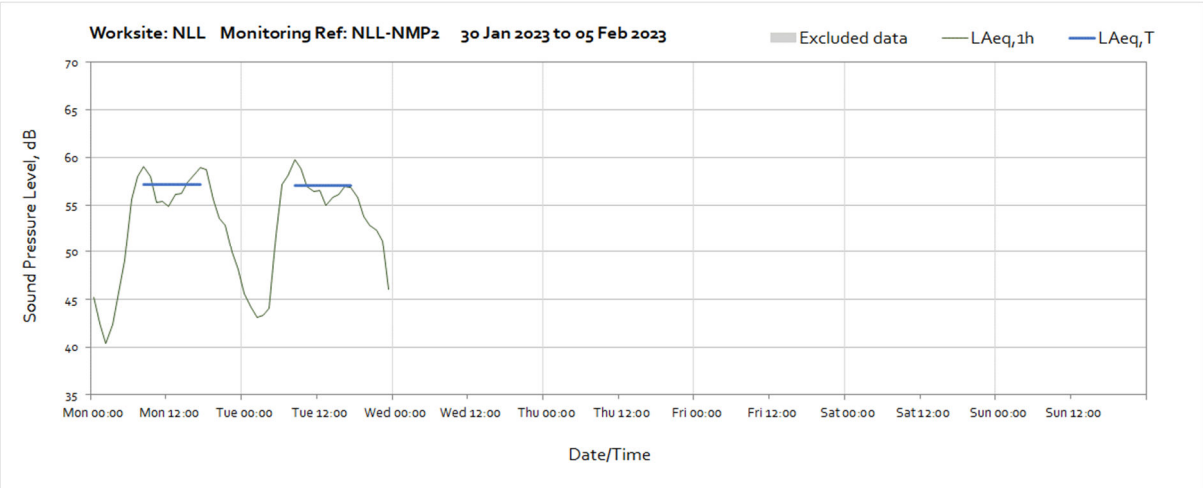
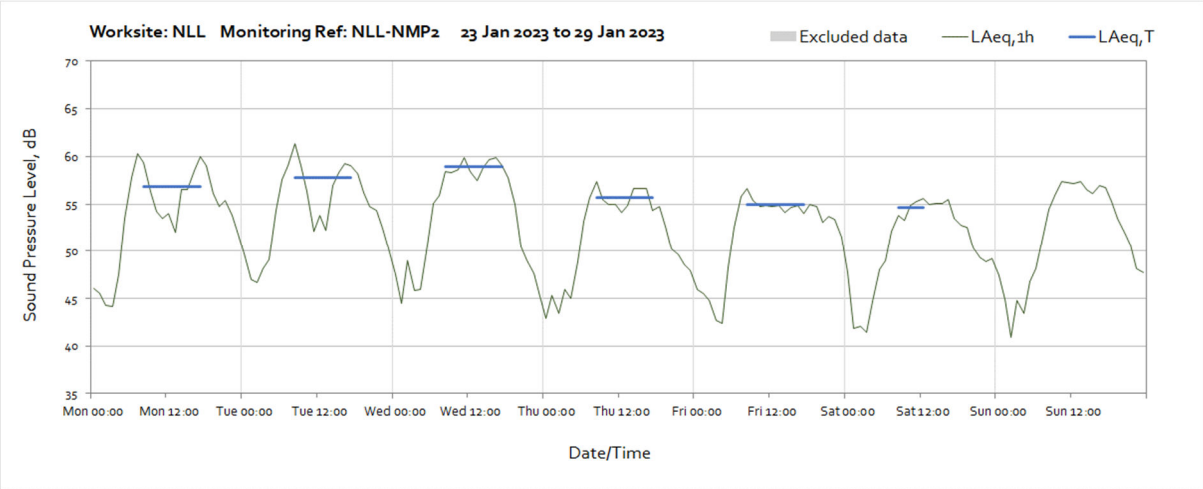
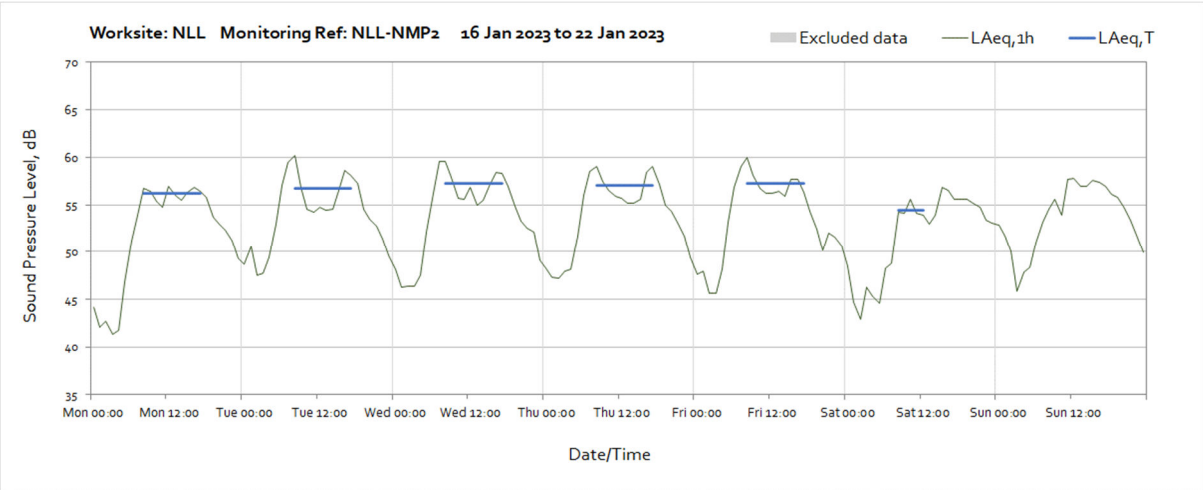


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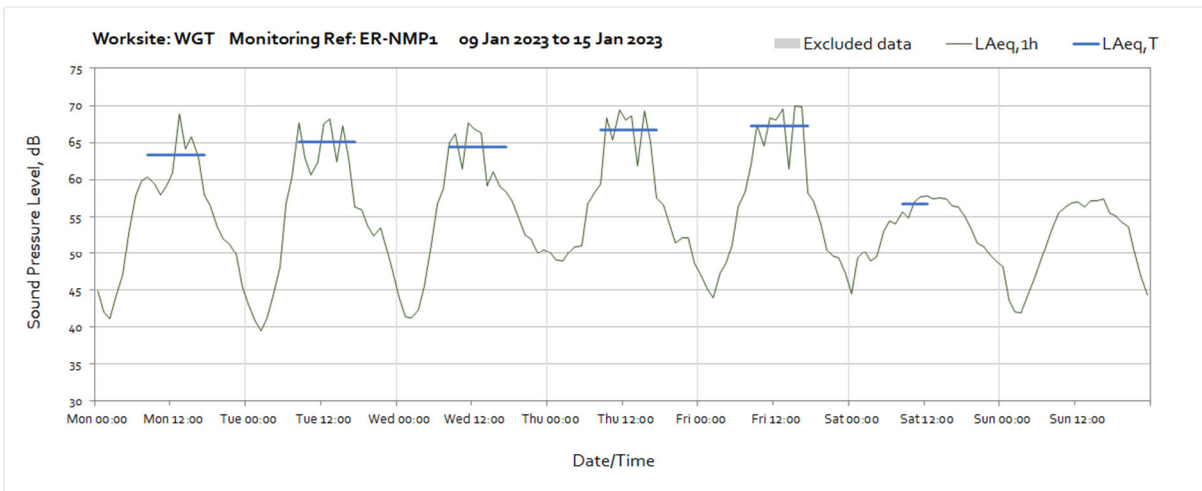
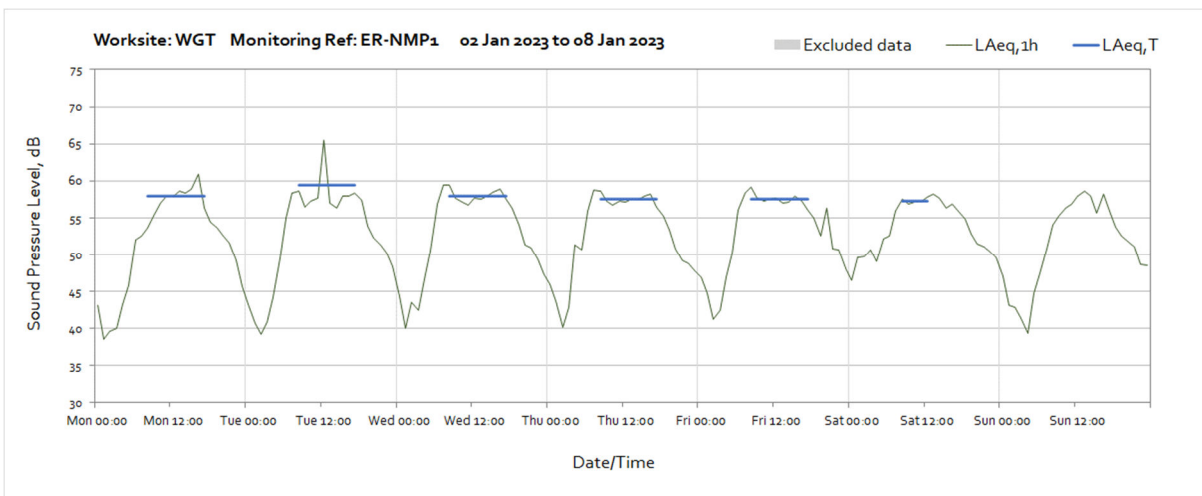
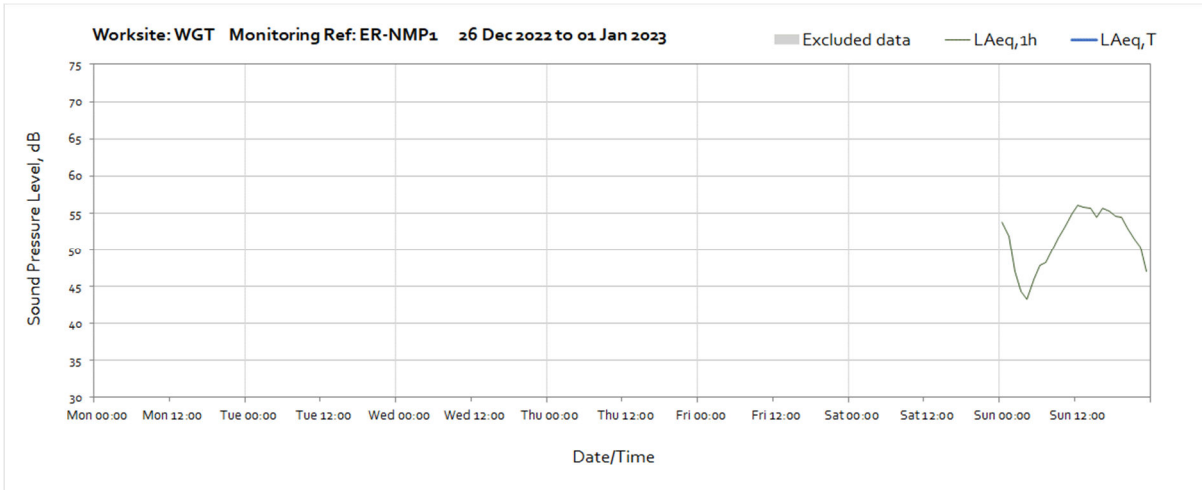


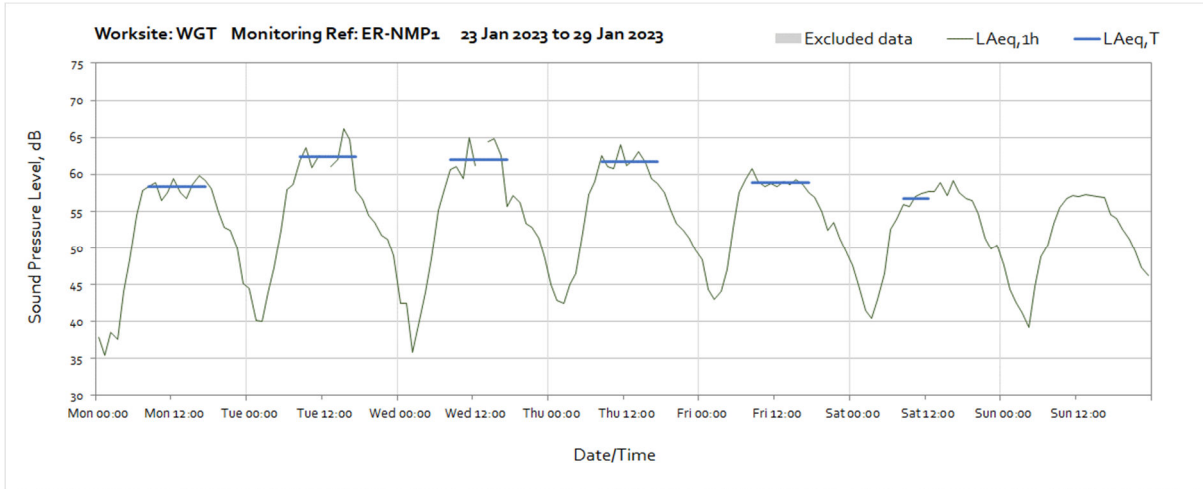
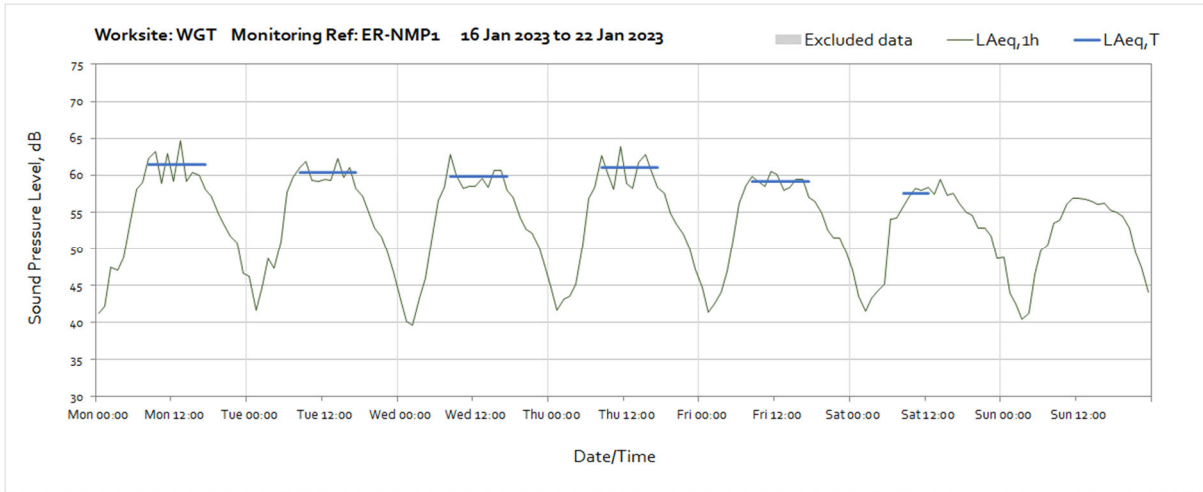
Worksite: NLL – Monitoring Ref: NLL-NMP2



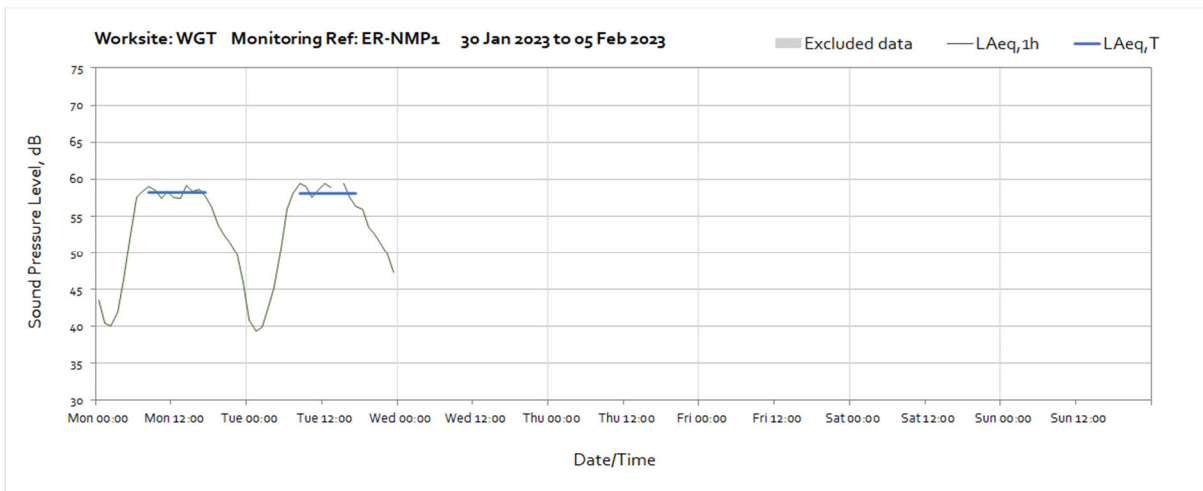


Worksite: WGT - Monitoring Ref: ER-NMP1



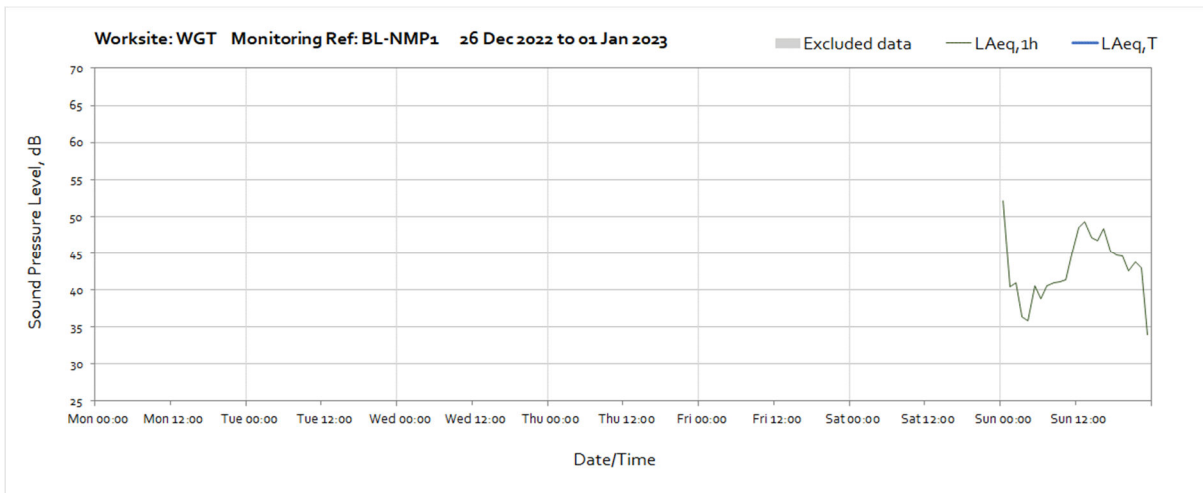


Note: Missing data between 12:00 and 13:00 on 24th January and between 13:00 and 14:00 on 25th January was due to monitor maintenance.

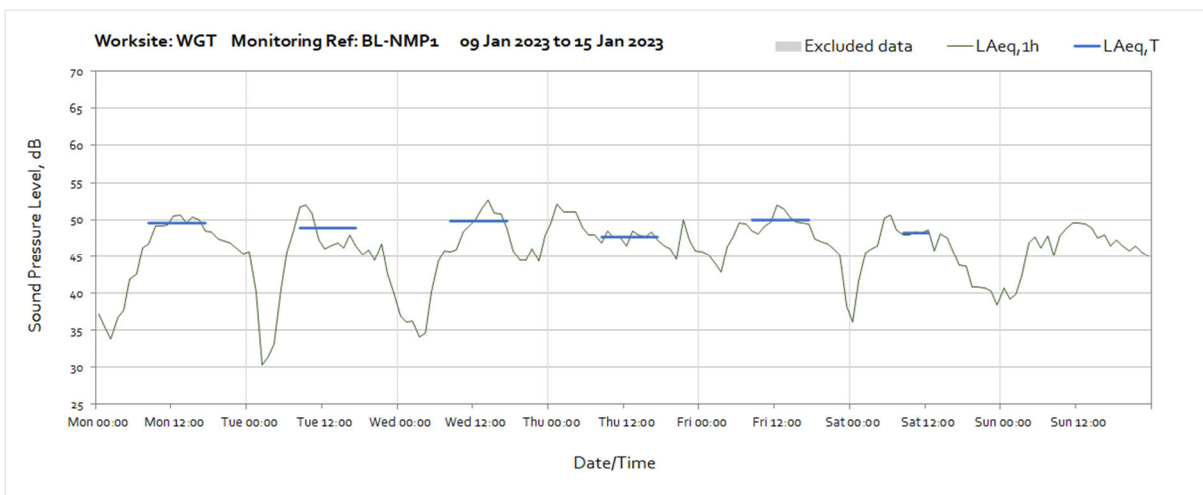
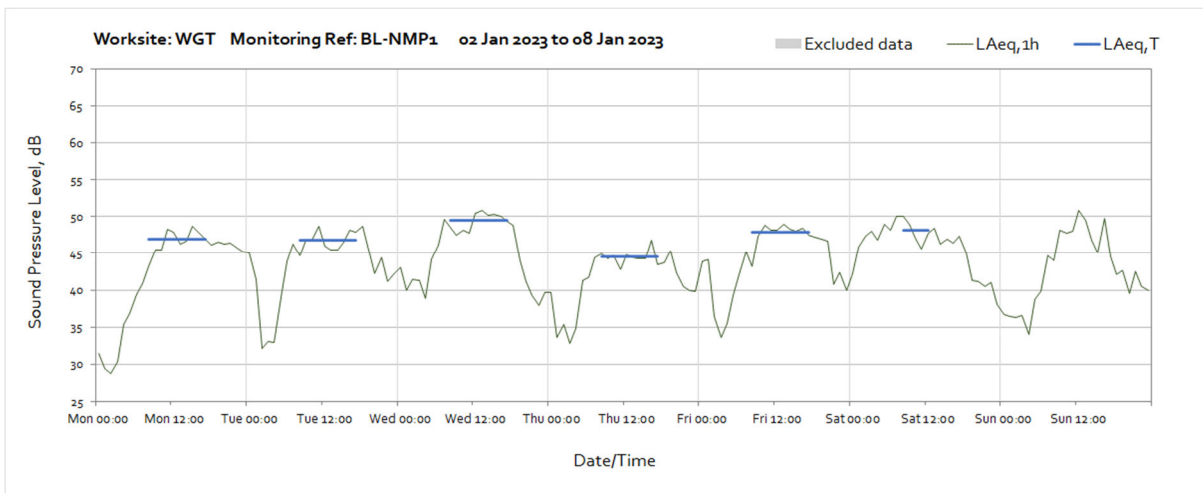


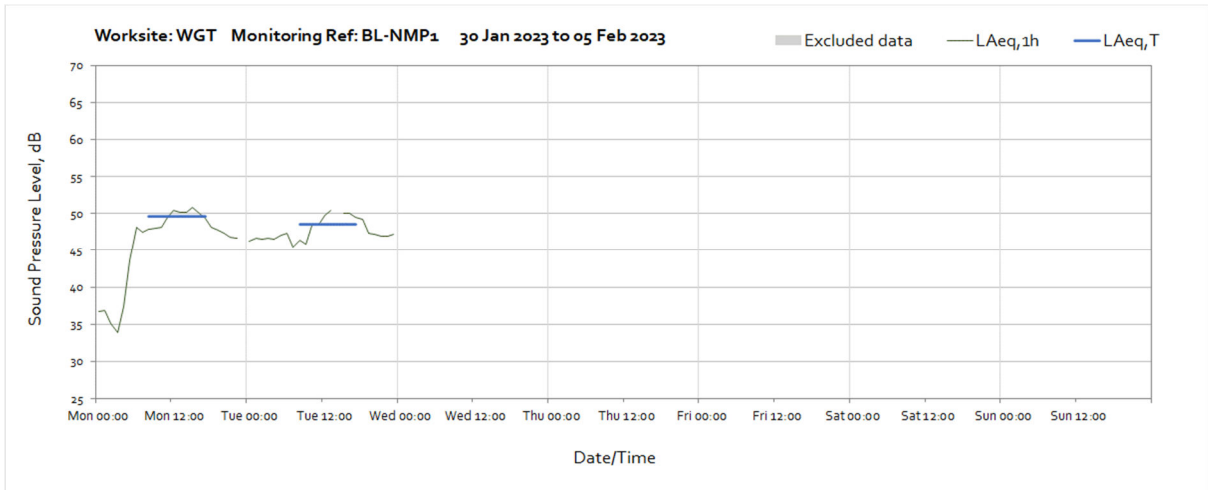
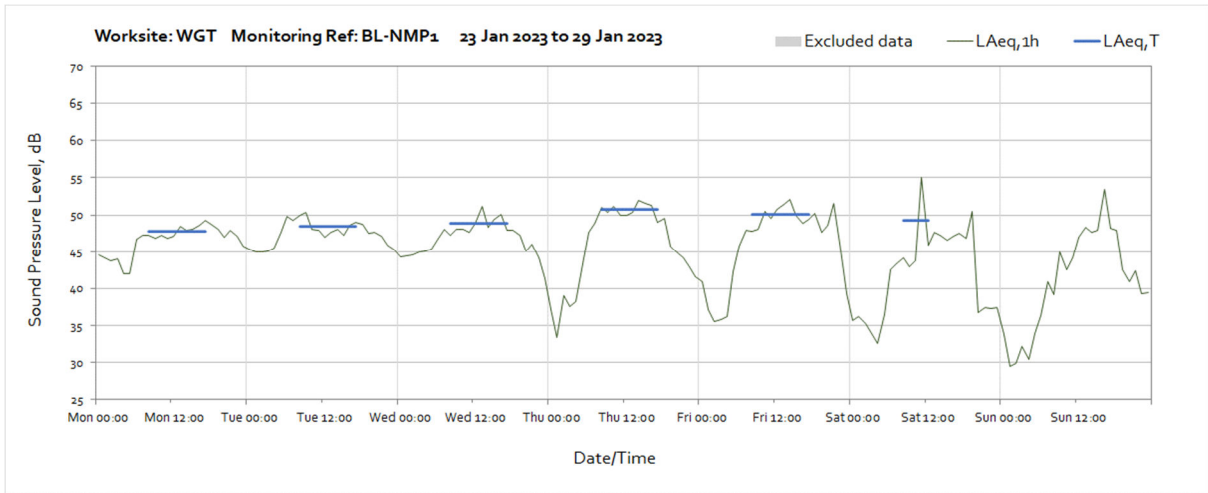
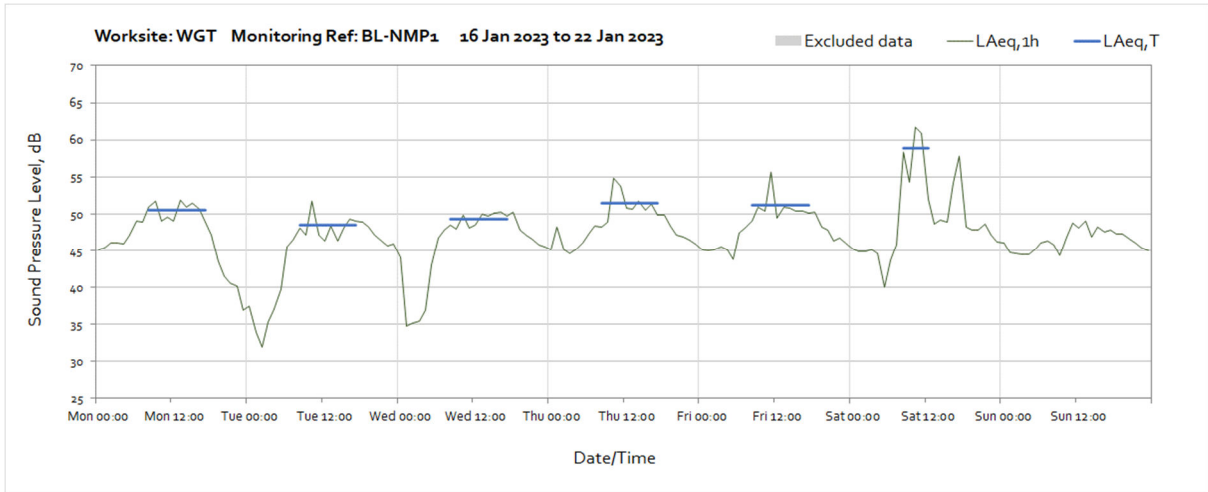
Note: Missing data between 14:00 and 15:00 on 31st January was due to monitor maintenance.

Worksite: WGT – Monitoring Ref: BL-NMP1



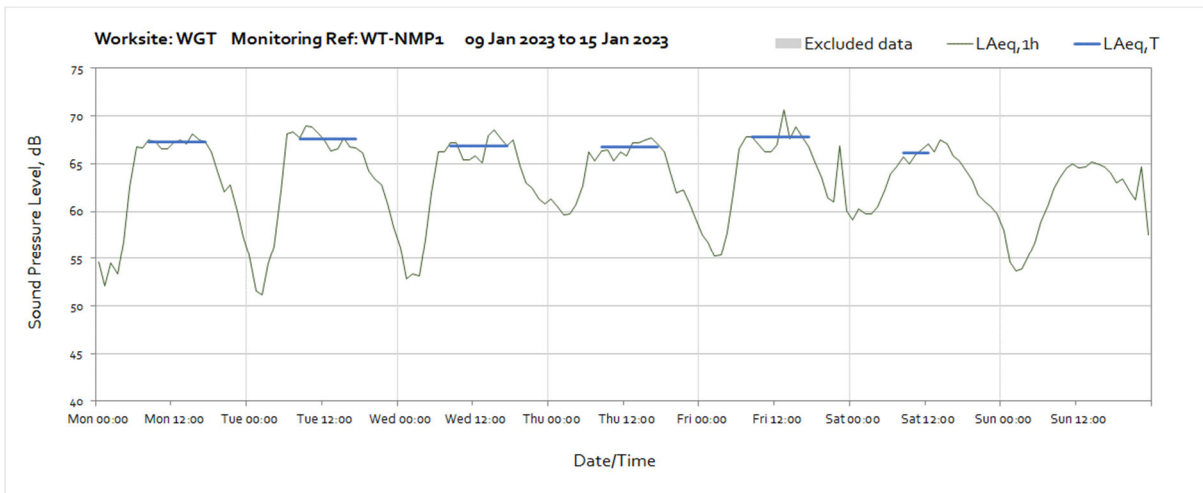
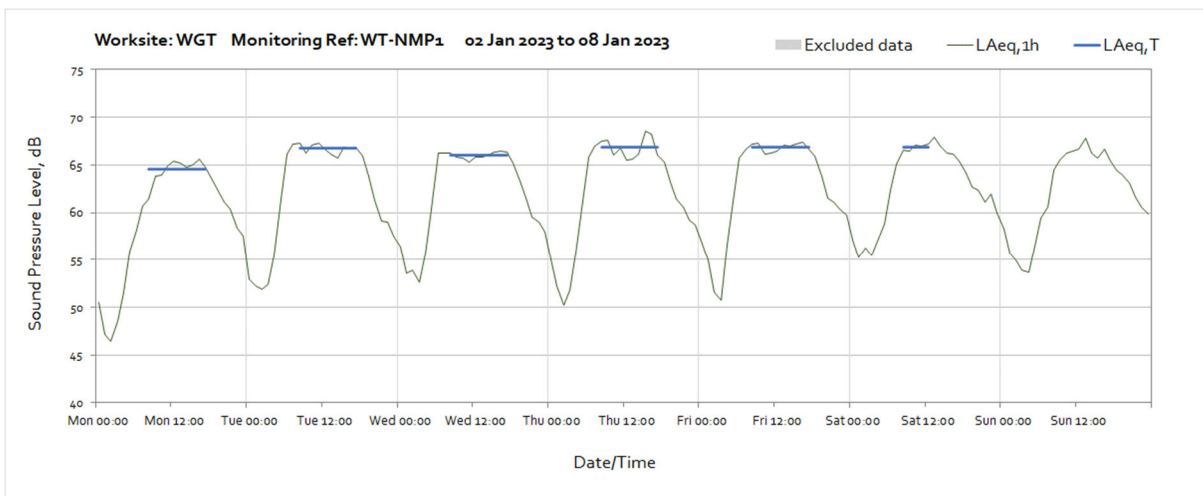
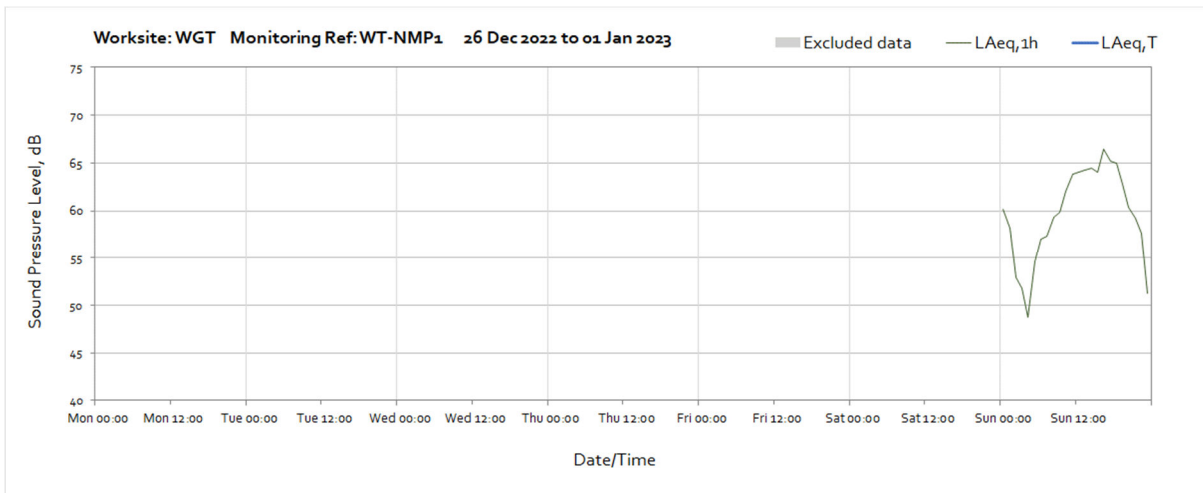
Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.

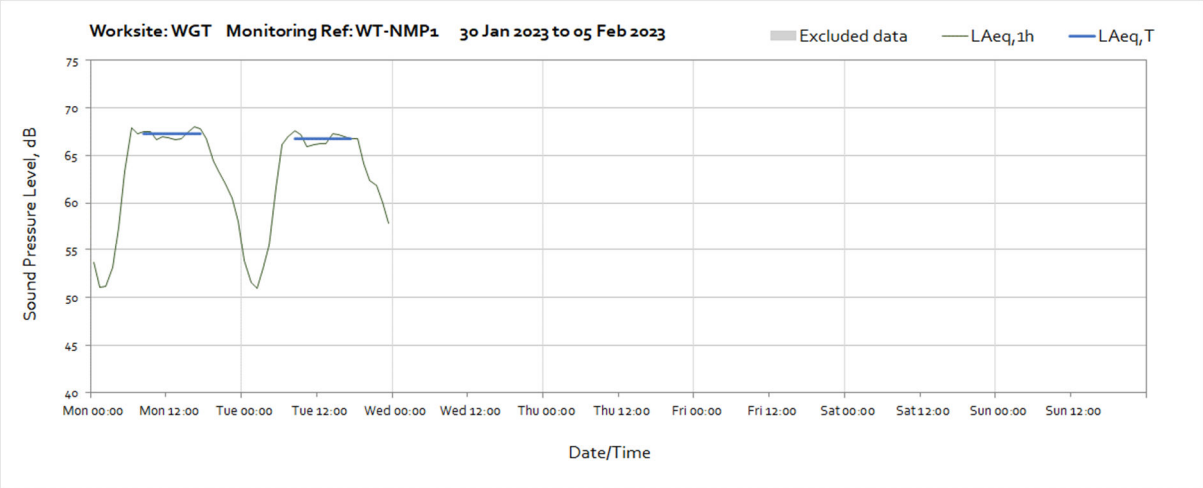
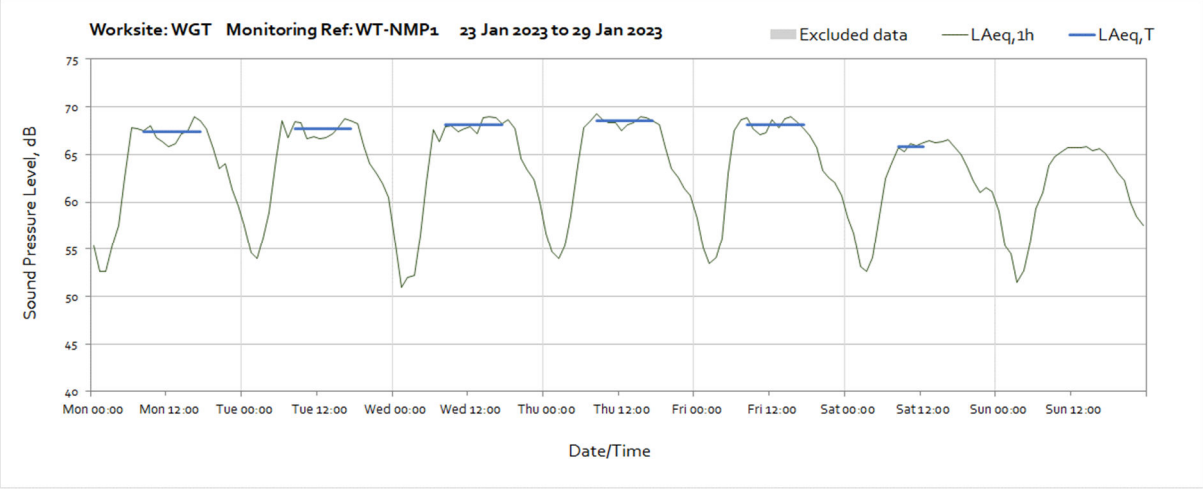
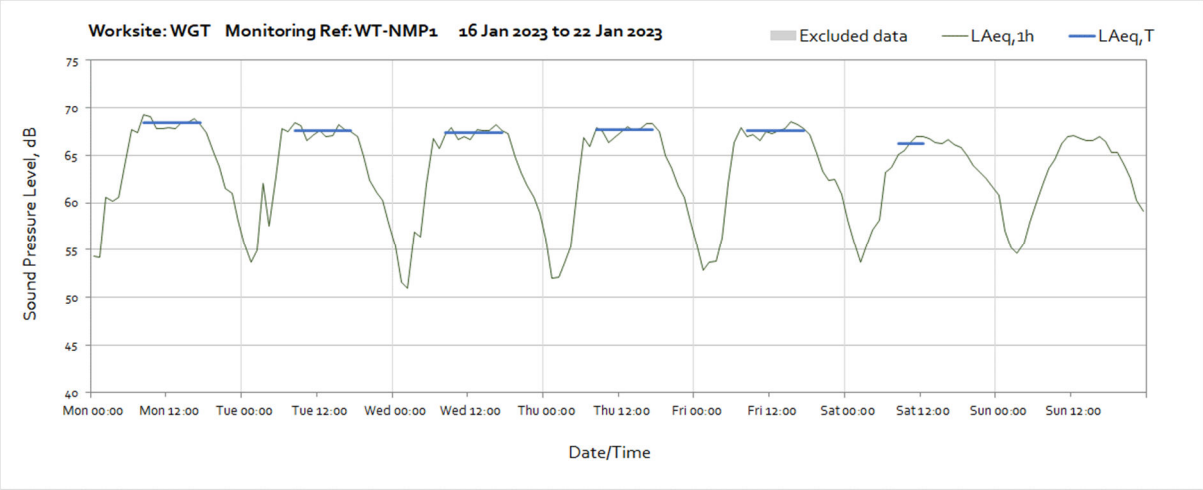




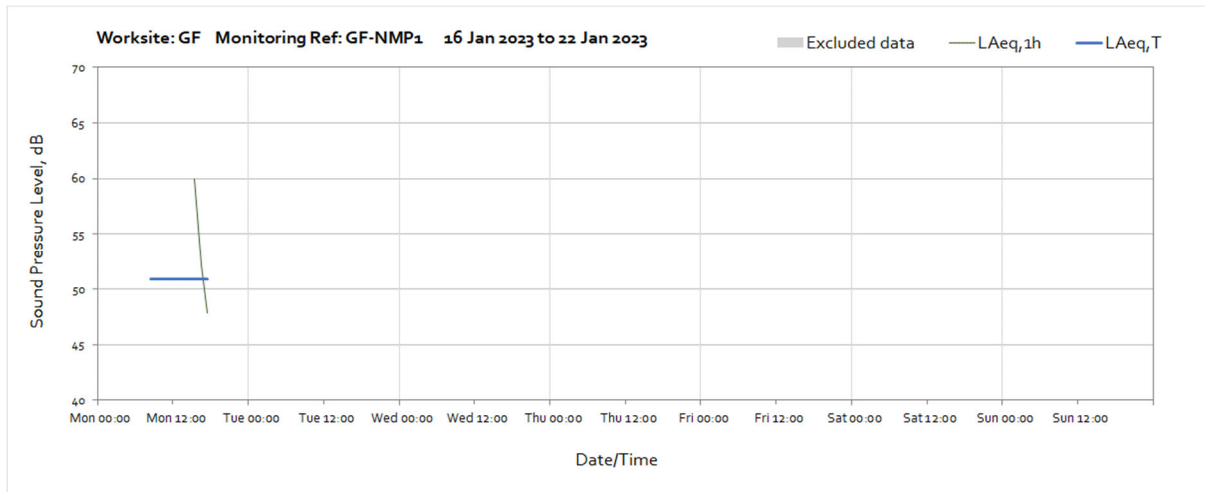
Note: Missing data between 23:00 and 00:00 on 30th January was due to an automatic system check. Missing data between 14:00 and 15:00 on 31st January was due to monitor maintenance.

Worksite: WGT - Monitoring Ref: WT-NMP1



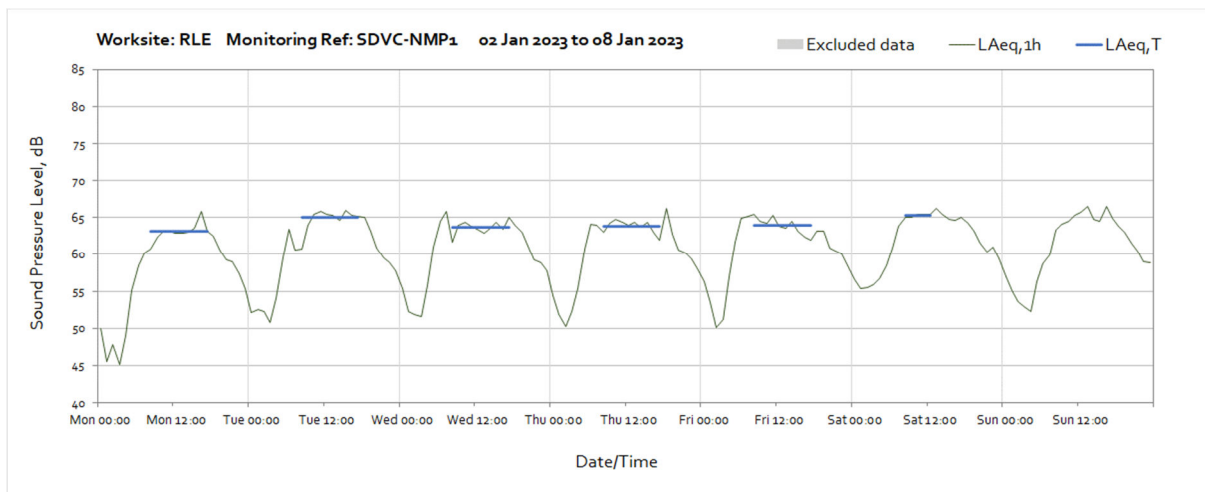
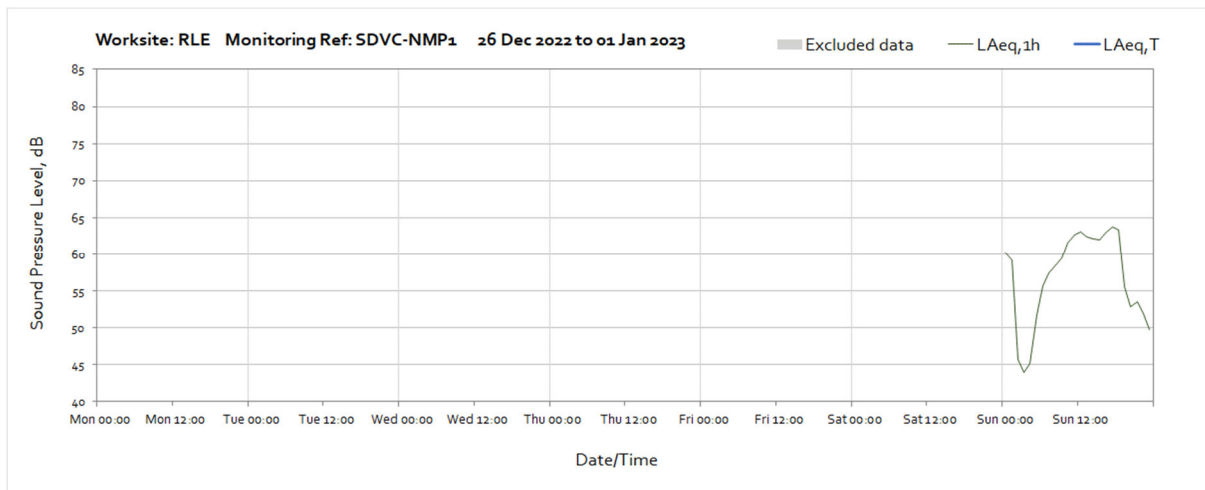


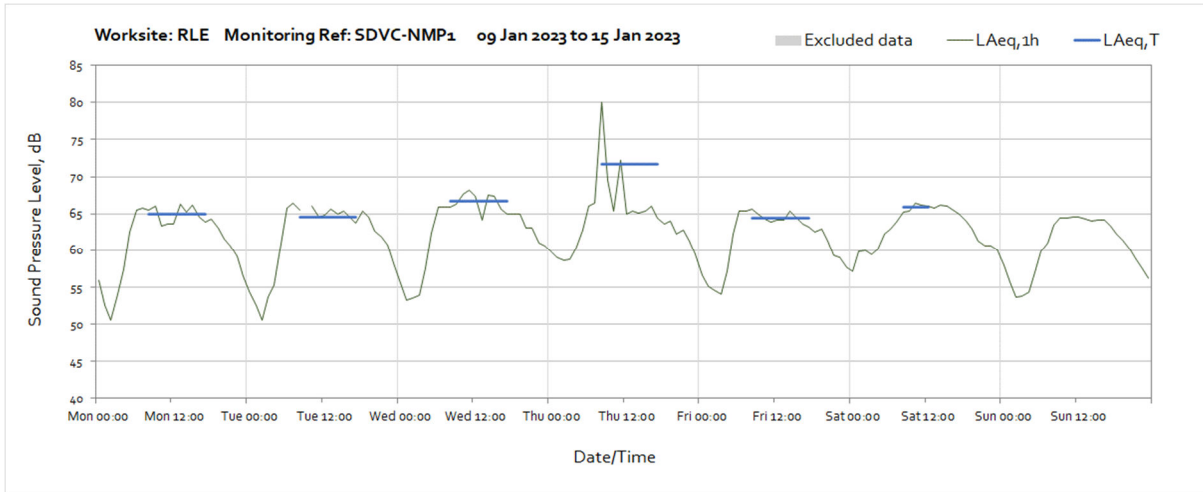
Worksite: GF – Monitoring Ref: GF-NMP1



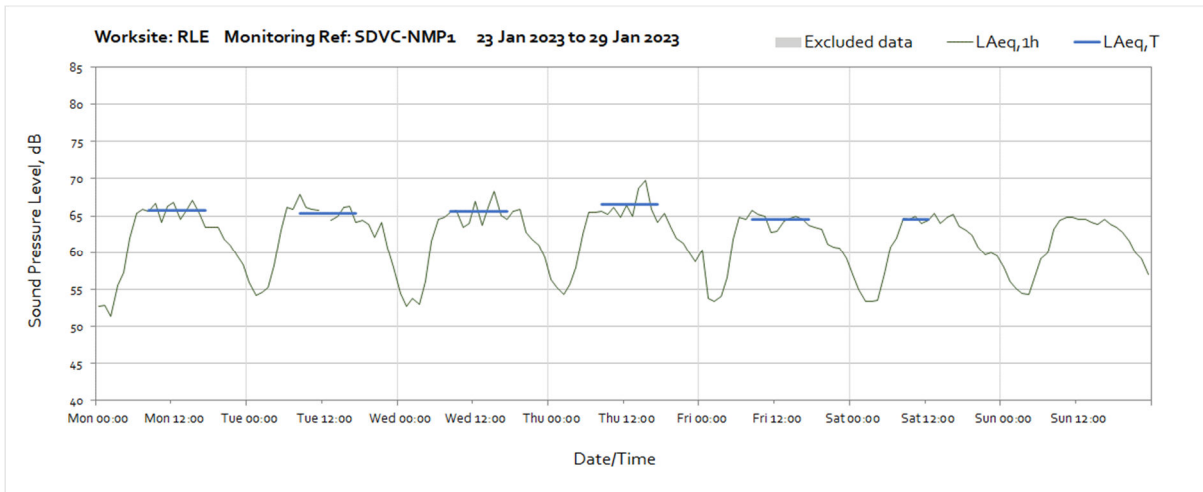
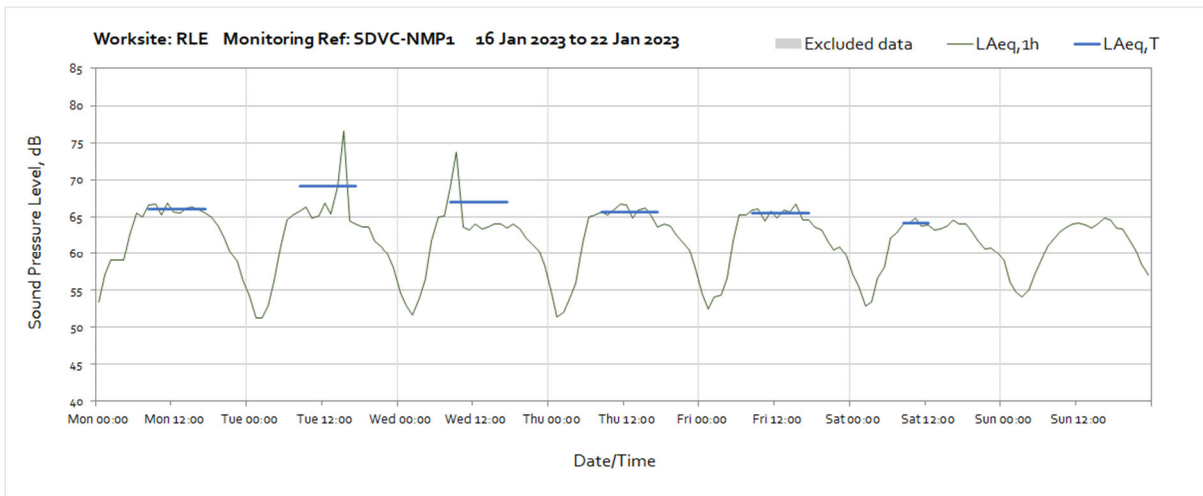
Note: Monitor was installed at 15:00 on 16th January. Missing data from 18:00 until month end was due to monitor switching off due to fault.

Worksite: RLE – Monitoring Ref: SDVC-NMP1

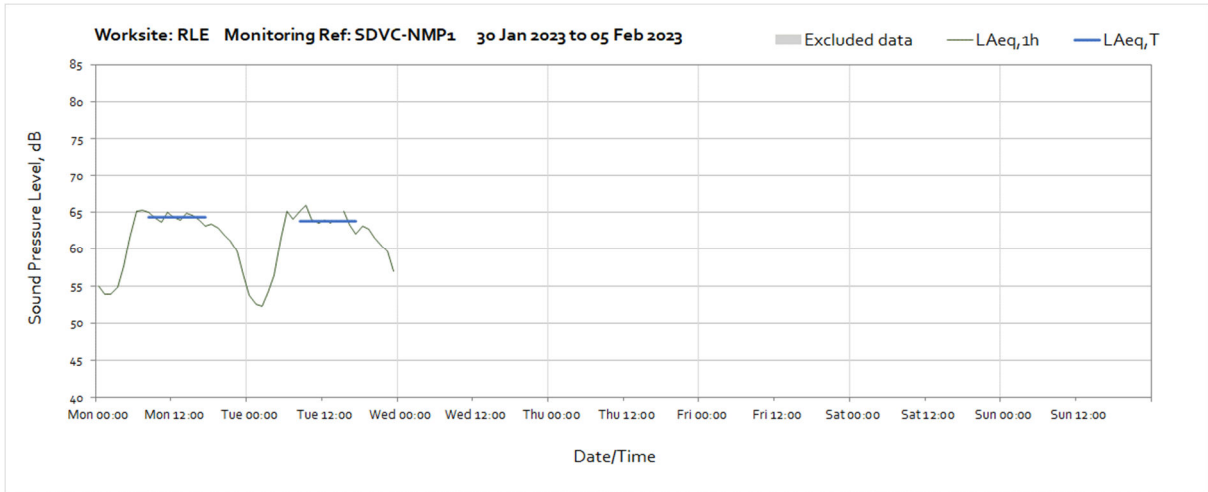




Note: Missing data 09:00 and 10:00 on 10th January was due to monitor maintenance.

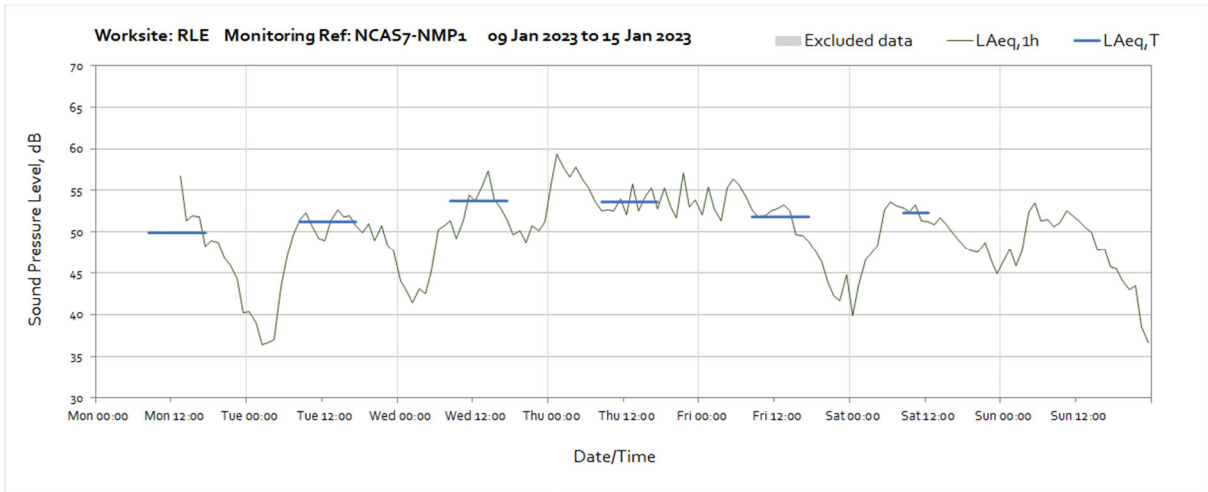


Note: Missing data between 12:00 and 13:00 on 24th January was due to monitor maintenance.

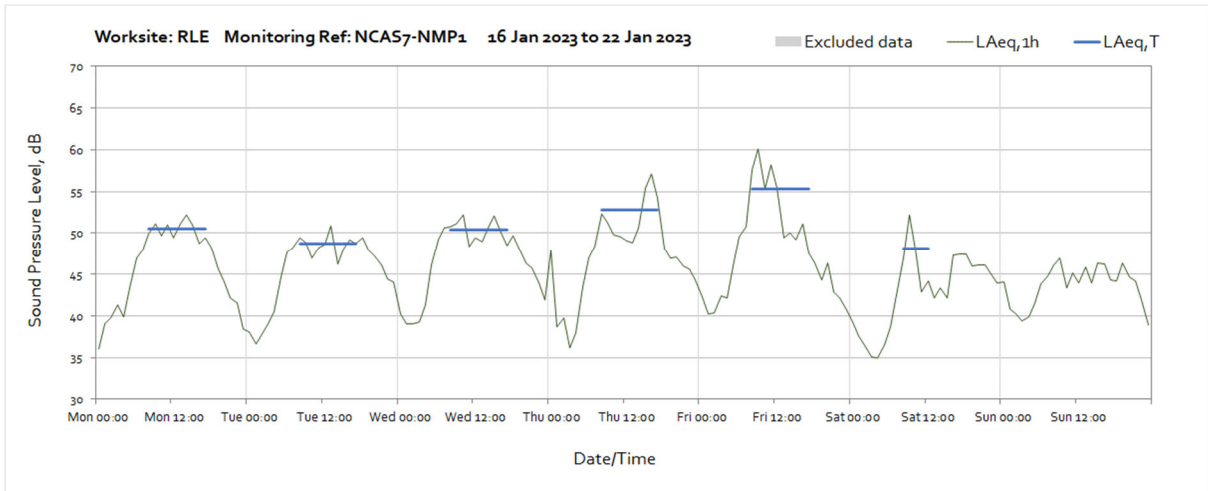


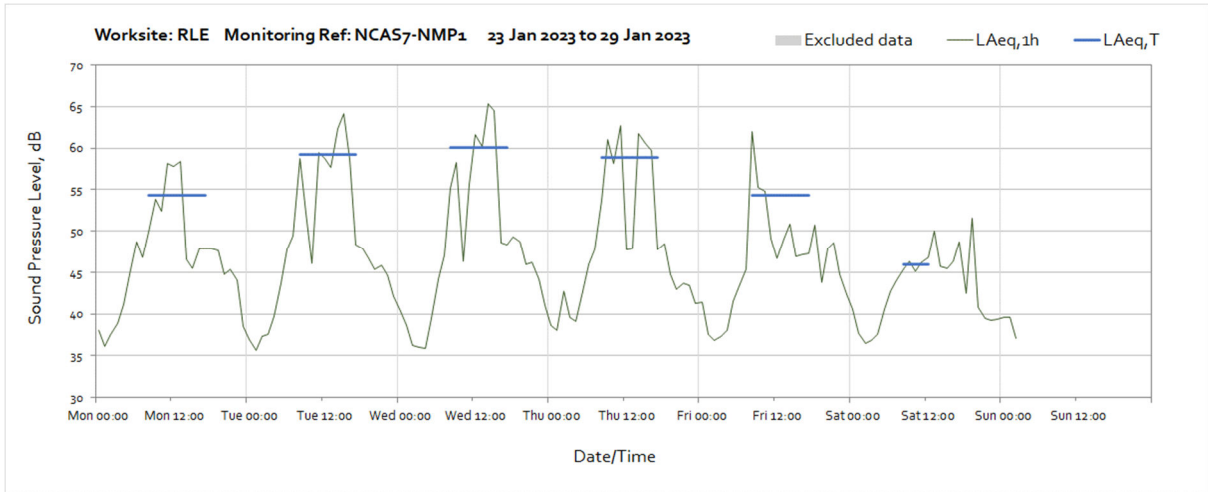
Note: Missing data between 14:00 and 15:00 on 31st January was due to monitor maintenance.

Worksite: RLE - Monitoring Ref: NCAS7-NMP1



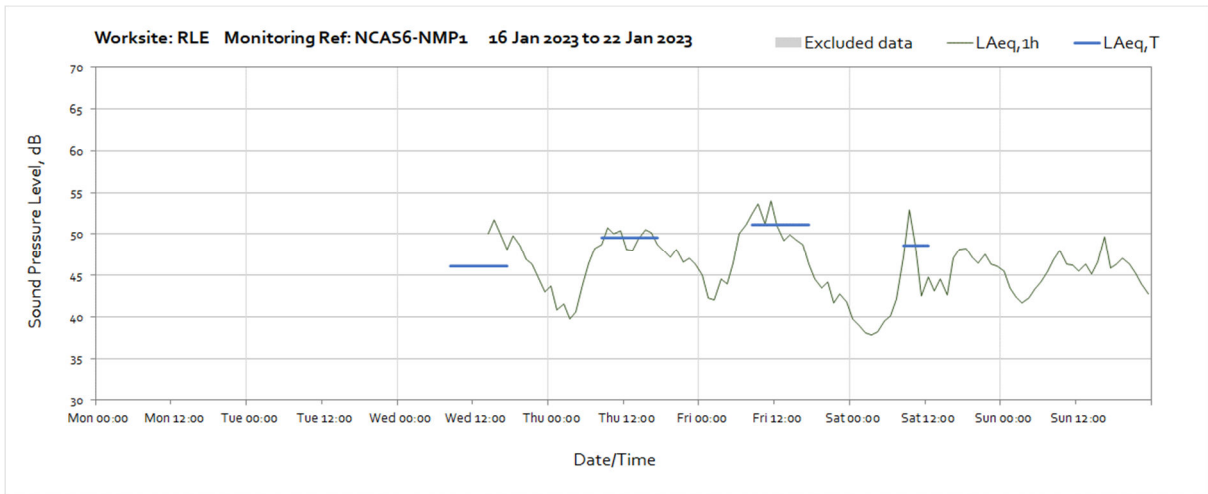
Note: Monitor as installed on 9th January.



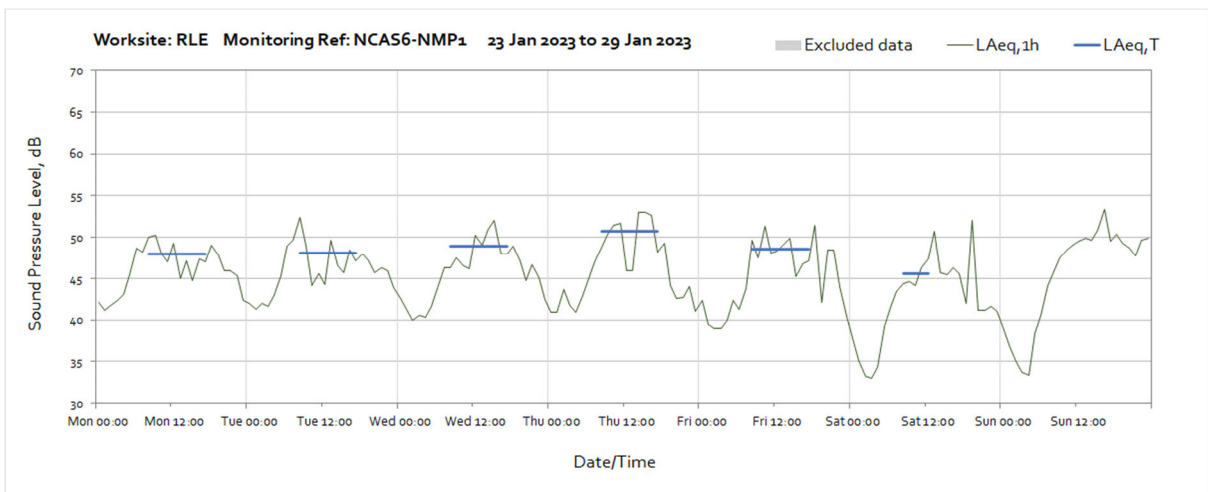


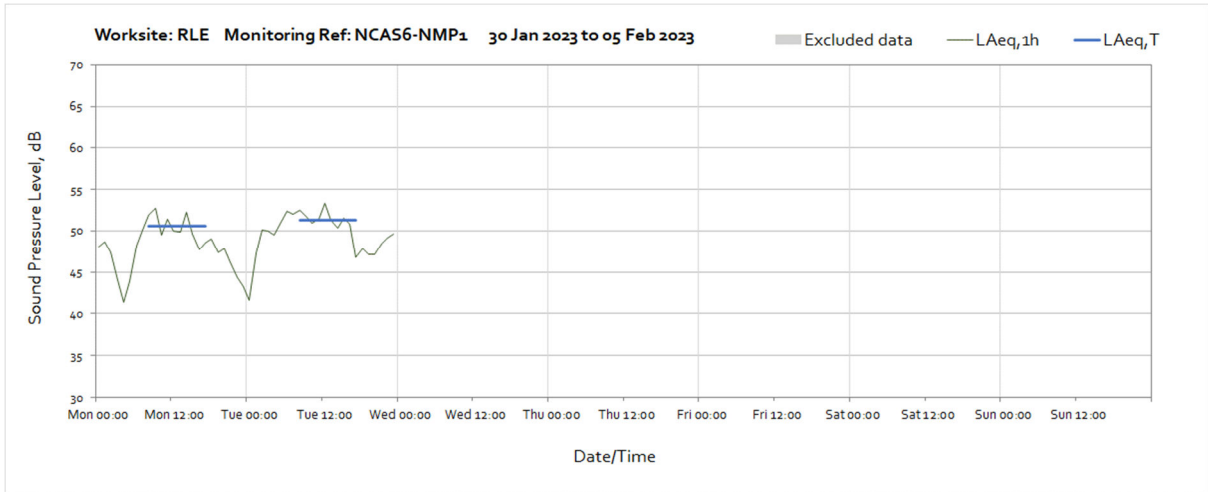
Note: Missing data from 03:00 on 29th January was due to loss of power to the monitor.

Worksite: RLE - Monitoring Ref: NCAS6-NMP1

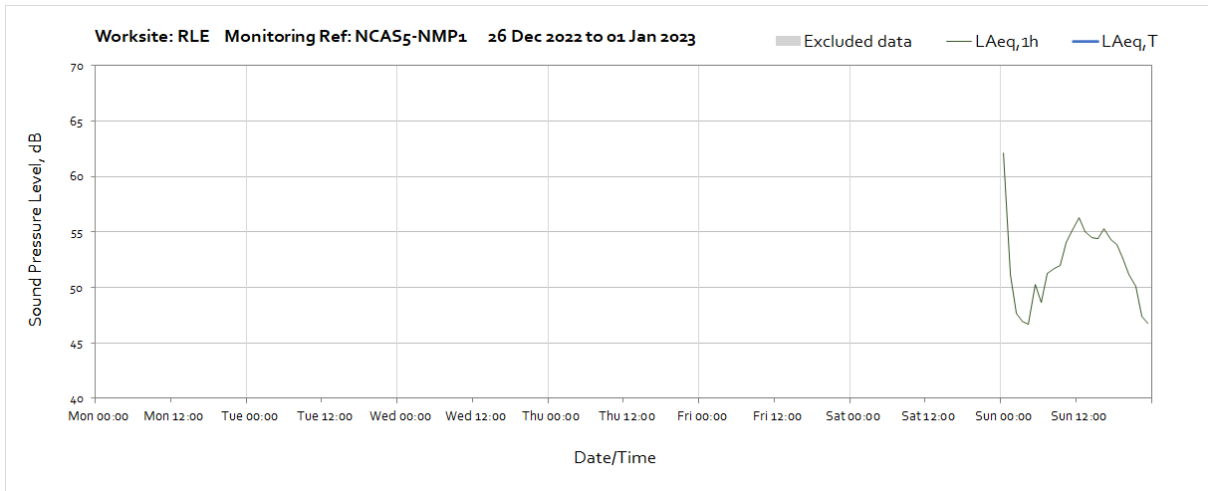


Note: Monitor was reinstalled at 14:00 on 18th January.

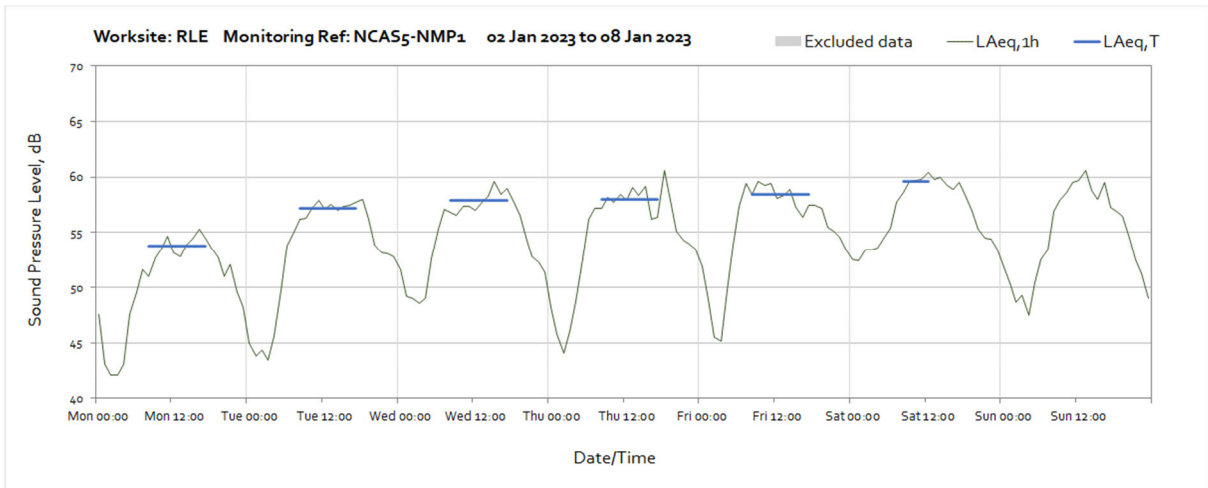


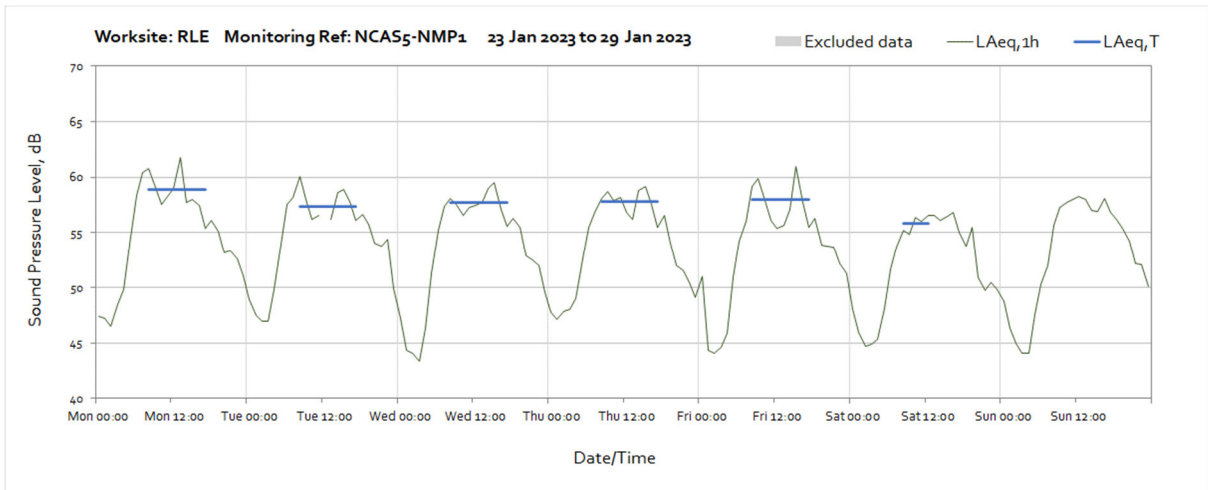
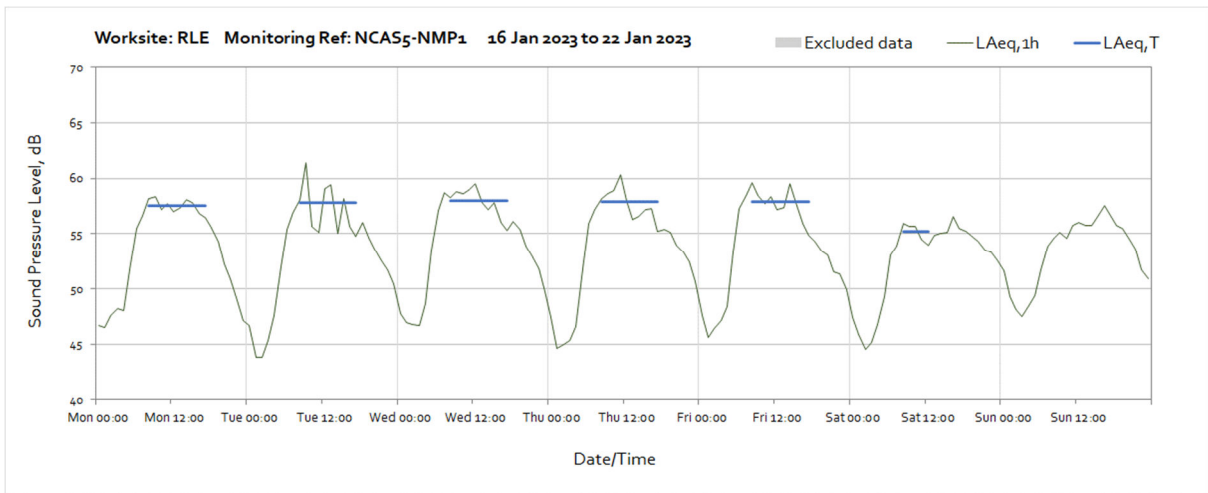
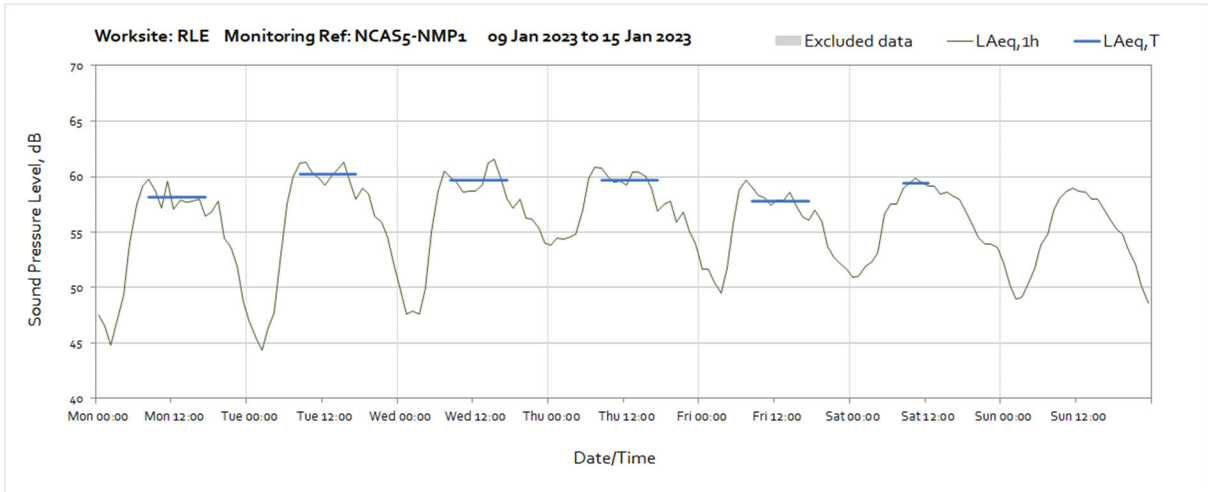


Worksite: RLE – Monitoring Ref: NCAS5-NMP1

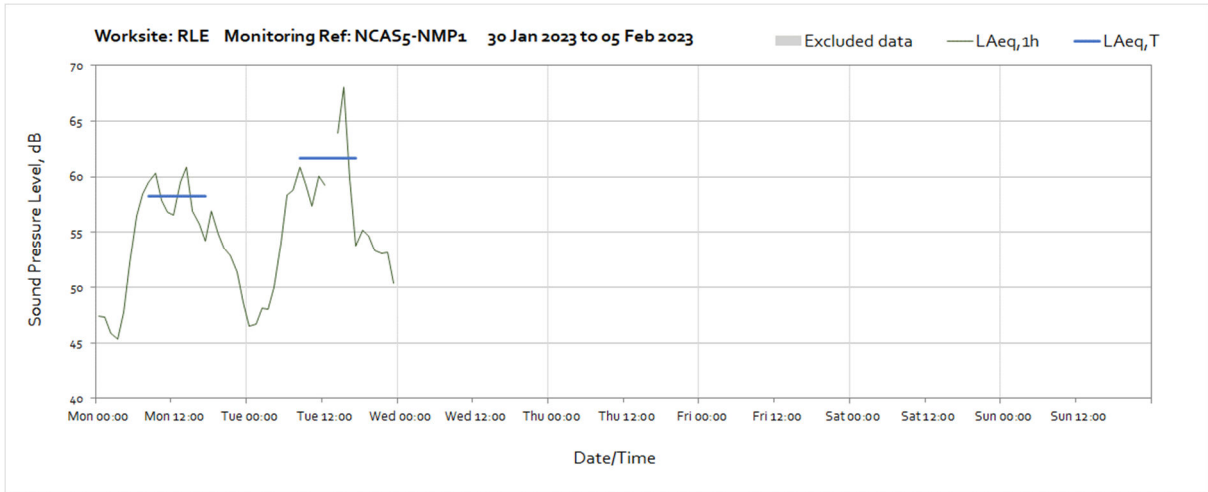


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



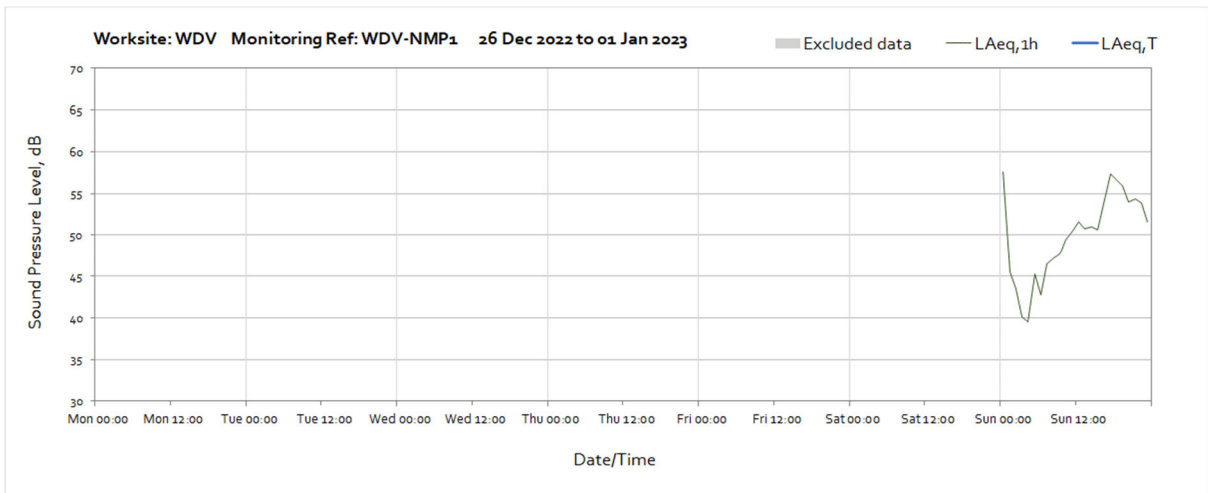


Note: Missing data between 12:00 and 13:00 on 24th January was due to monitor maintenance.

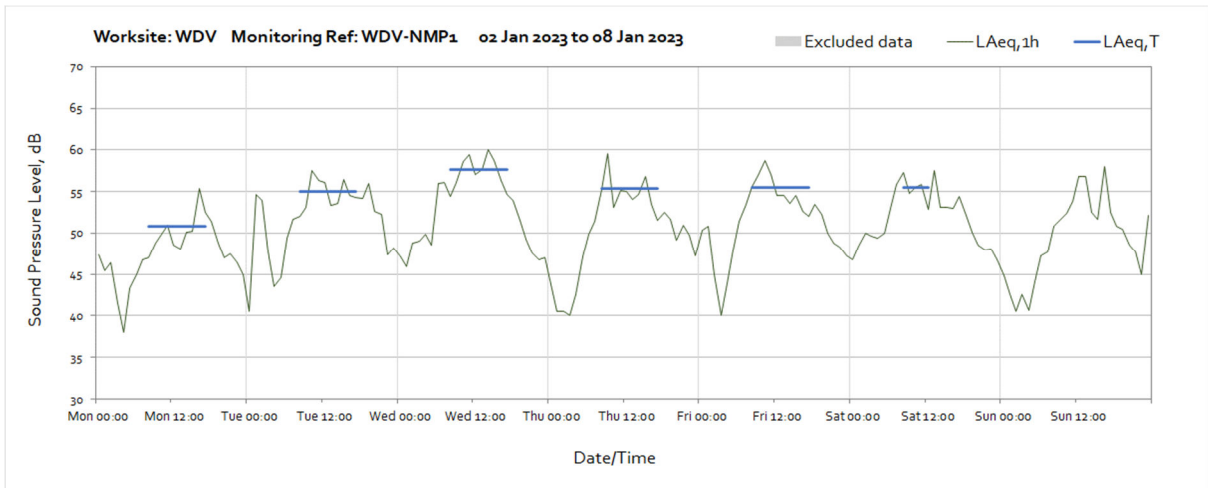


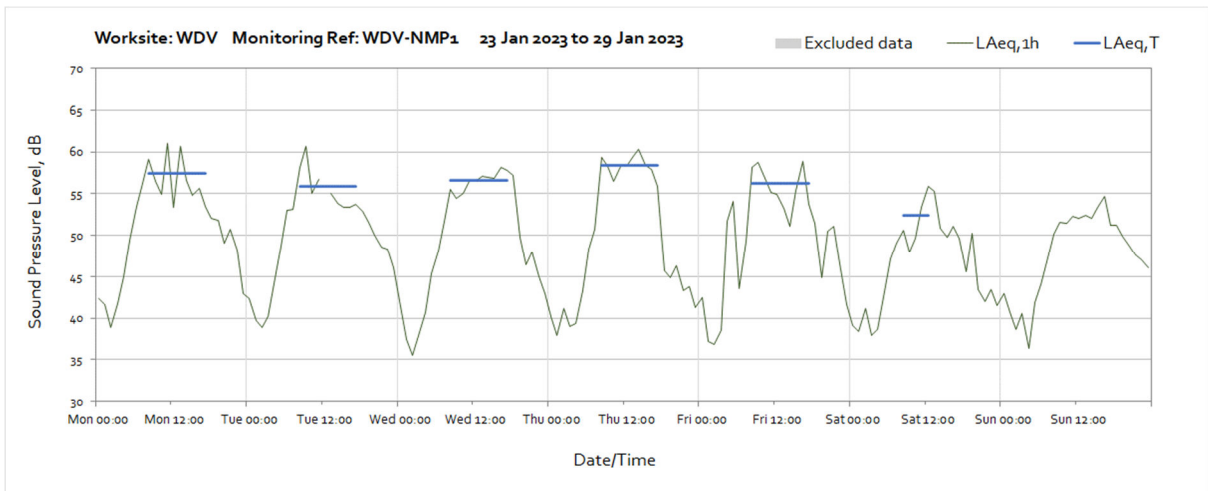
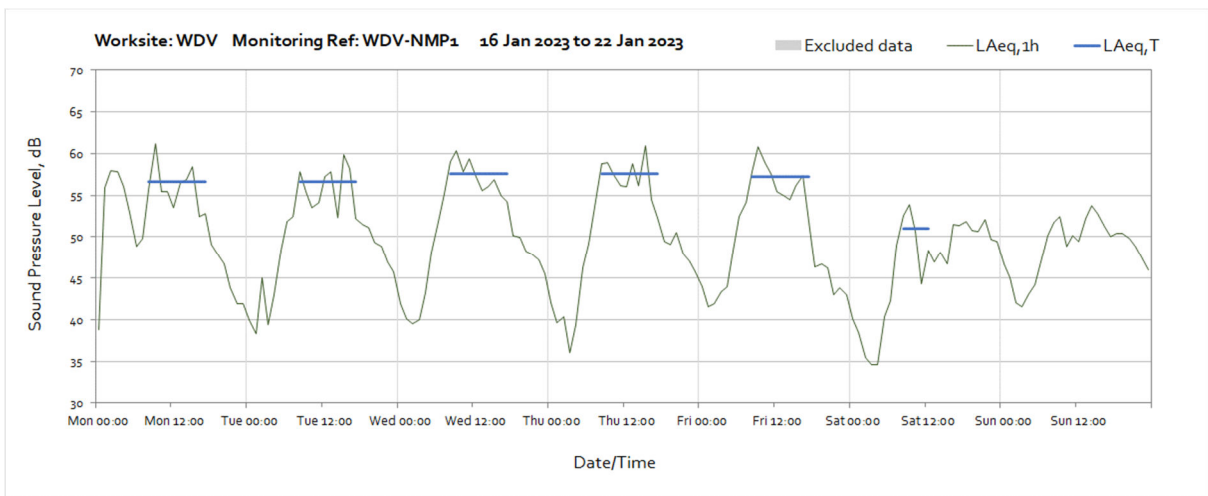
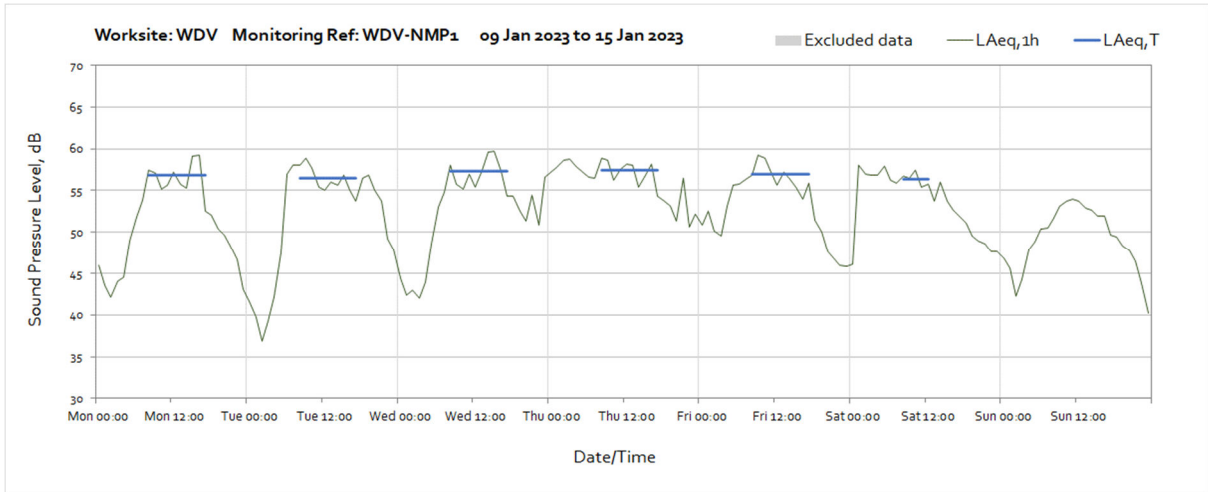
Note: Missing data between 13:00 and 14:00 on 31st January was due to monitor maintenance.

Worksite: WDV – Monitoring Ref: WDV-NMP1

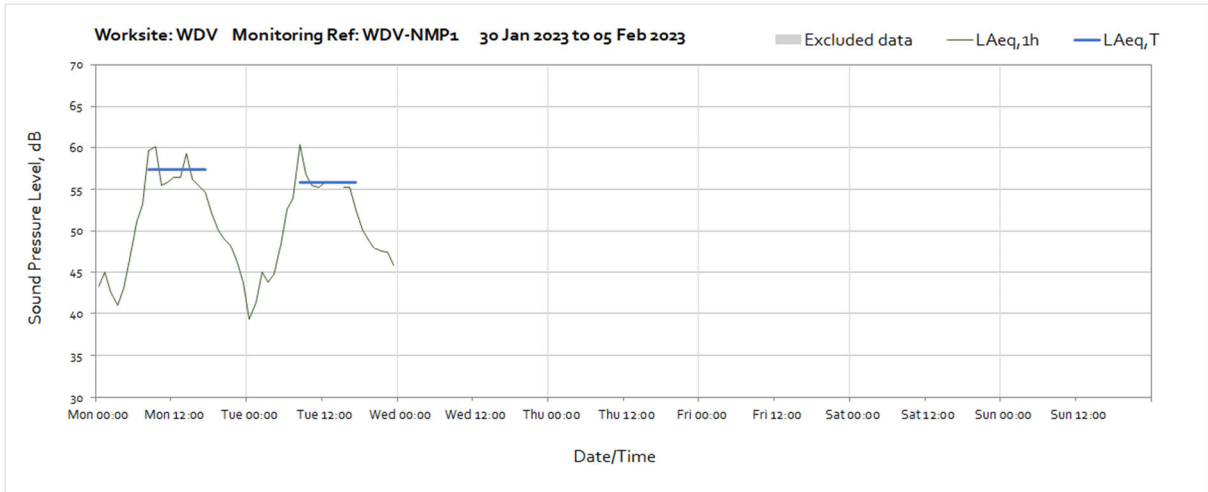


Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



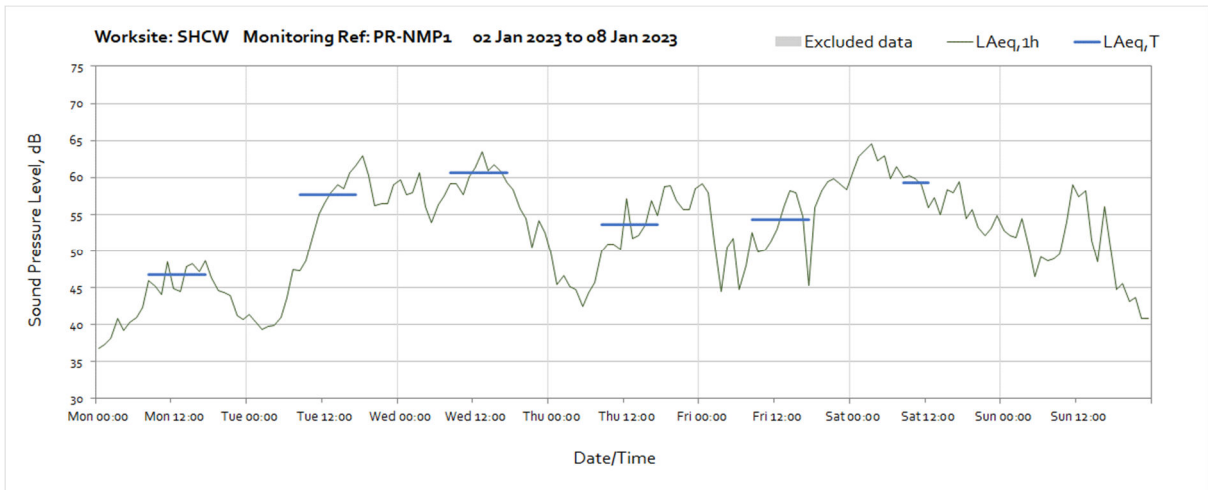
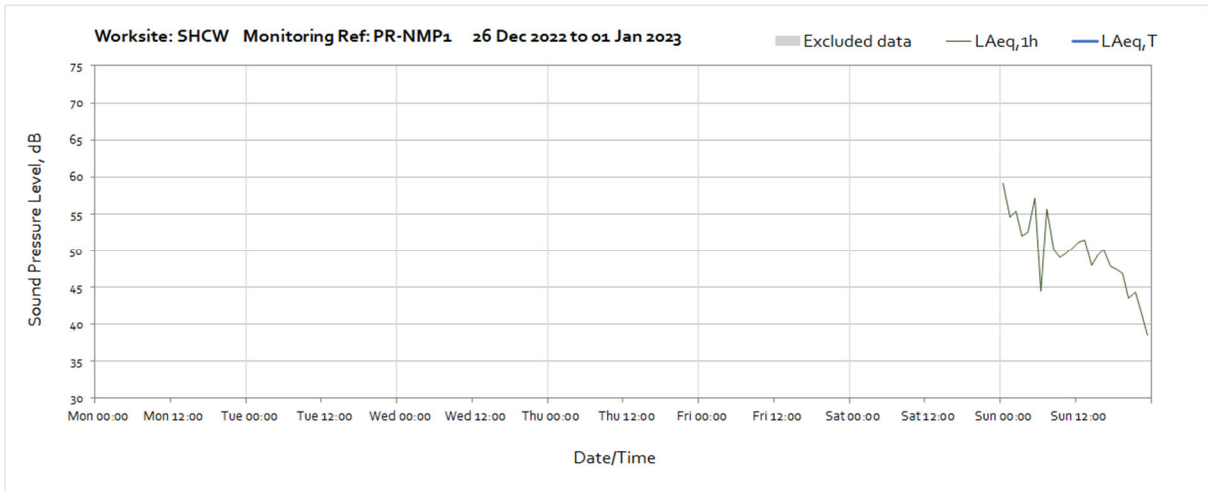


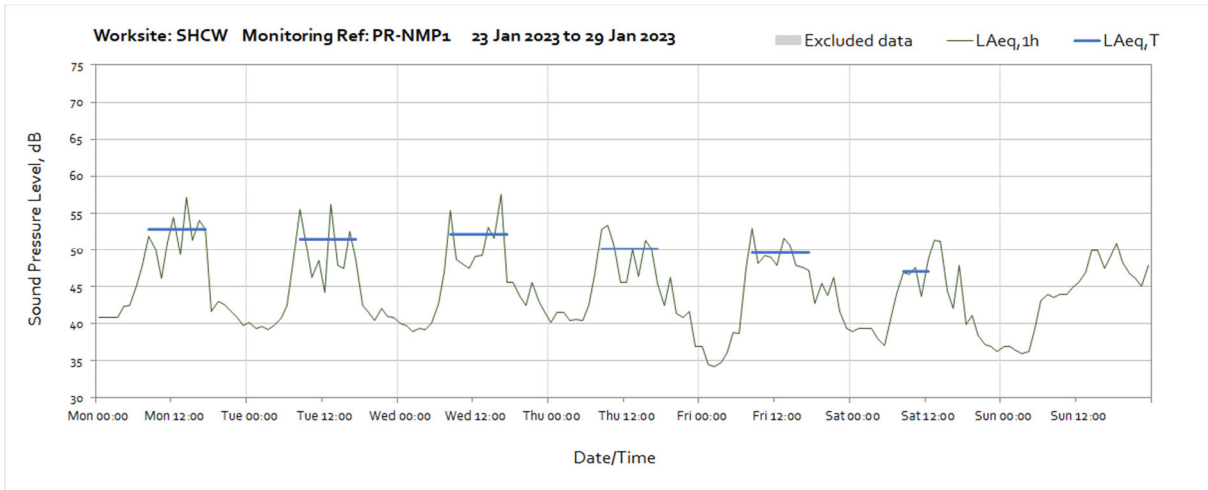
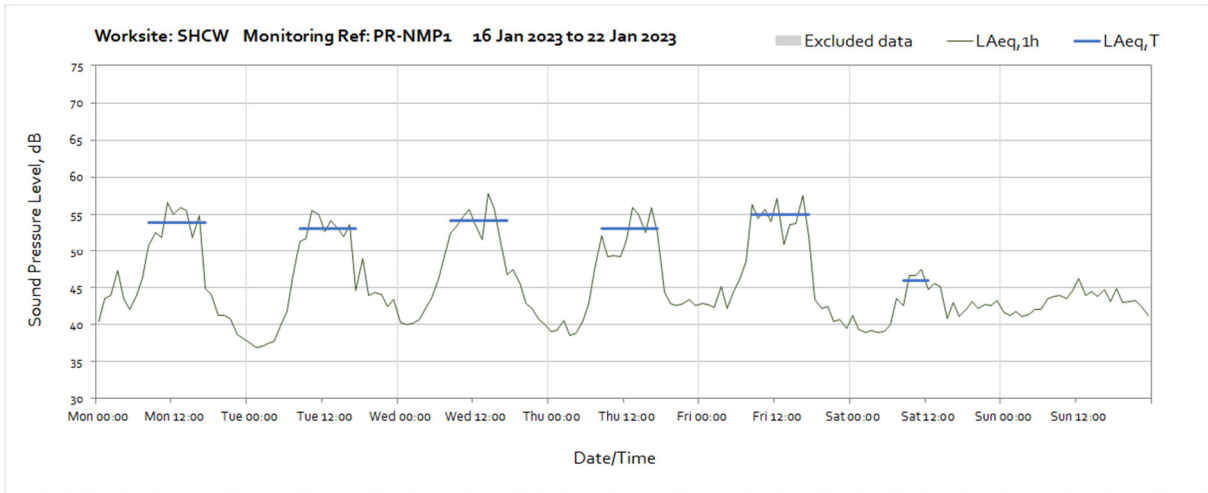
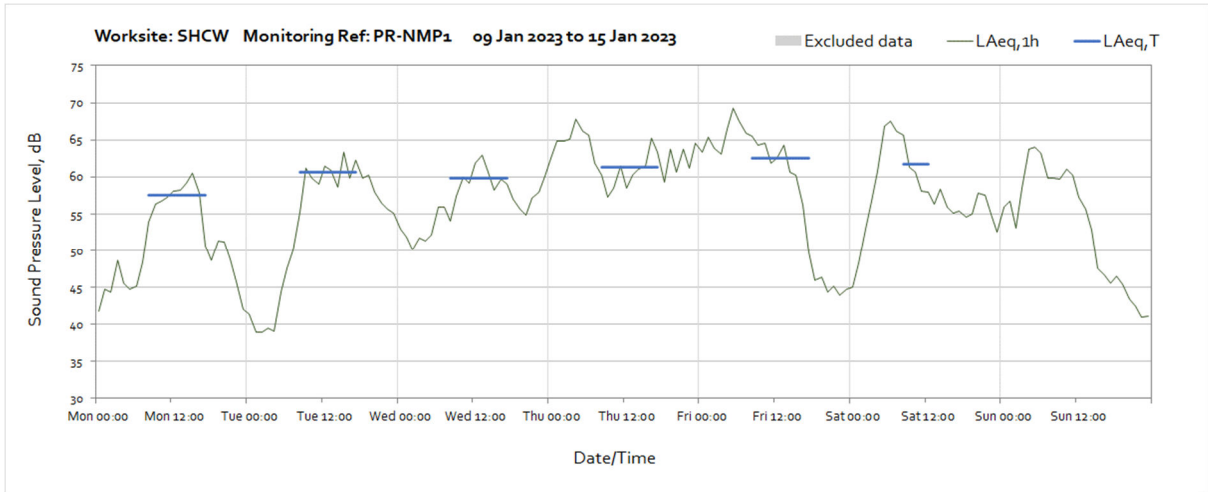
Note: Missing data between 12:00 and 13:00 on 24th January was due to monitor maintenance.

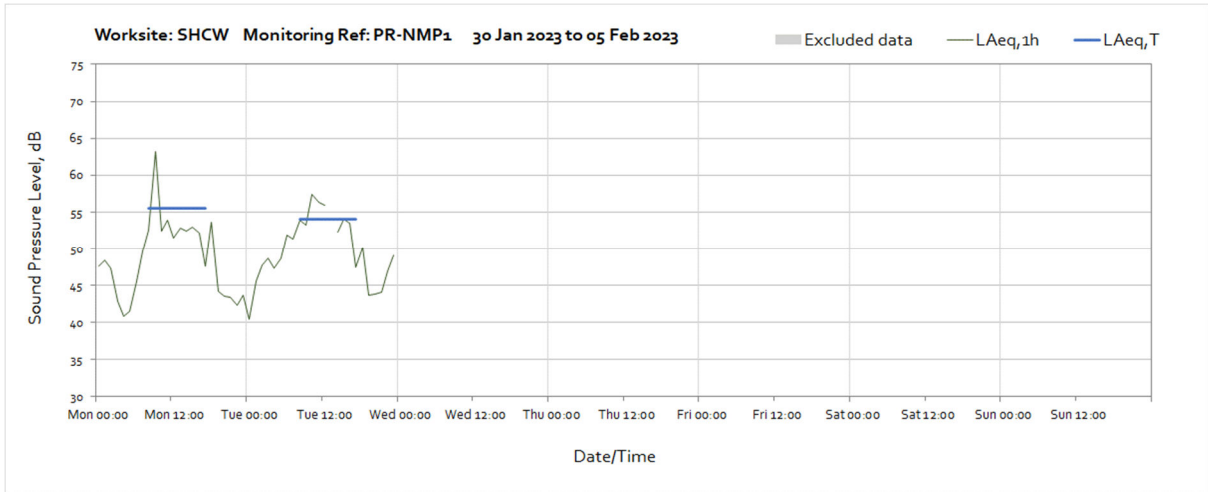


Note: Missing data between 14:00 and 15:00 on 31st January was due to monitor maintenance.

Worksite: SHCW – Monitoring Ref: PR-NMP1

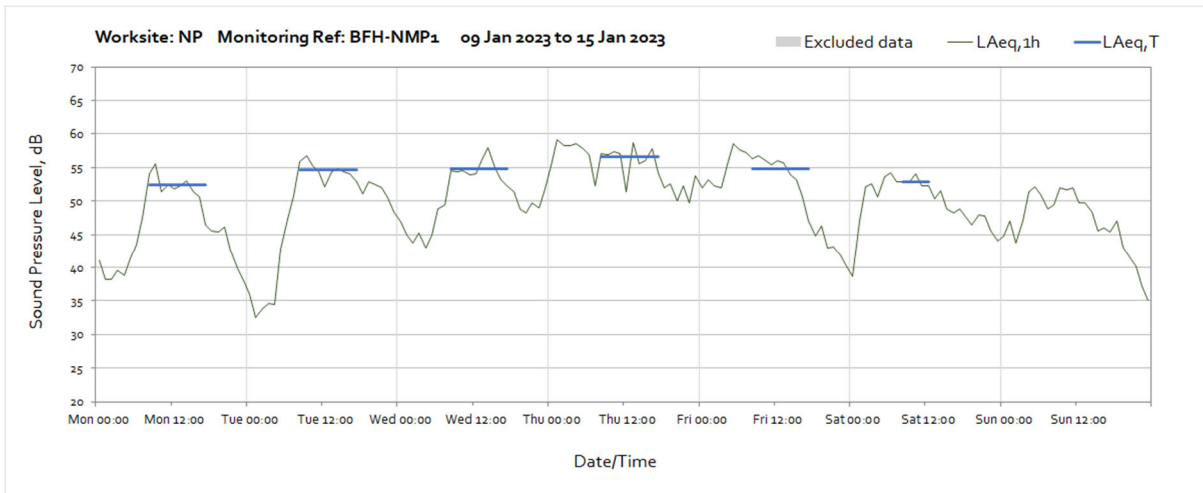
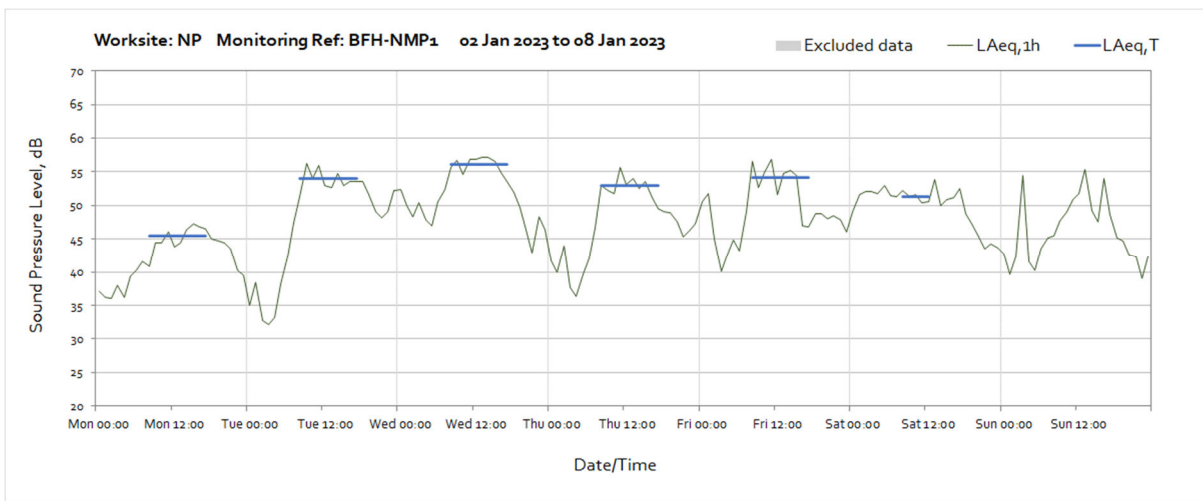
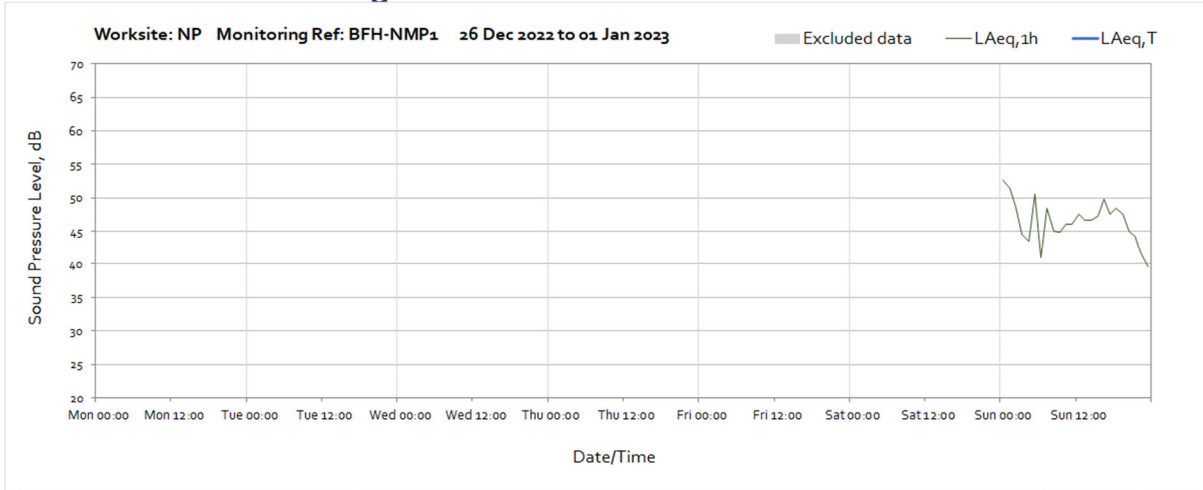


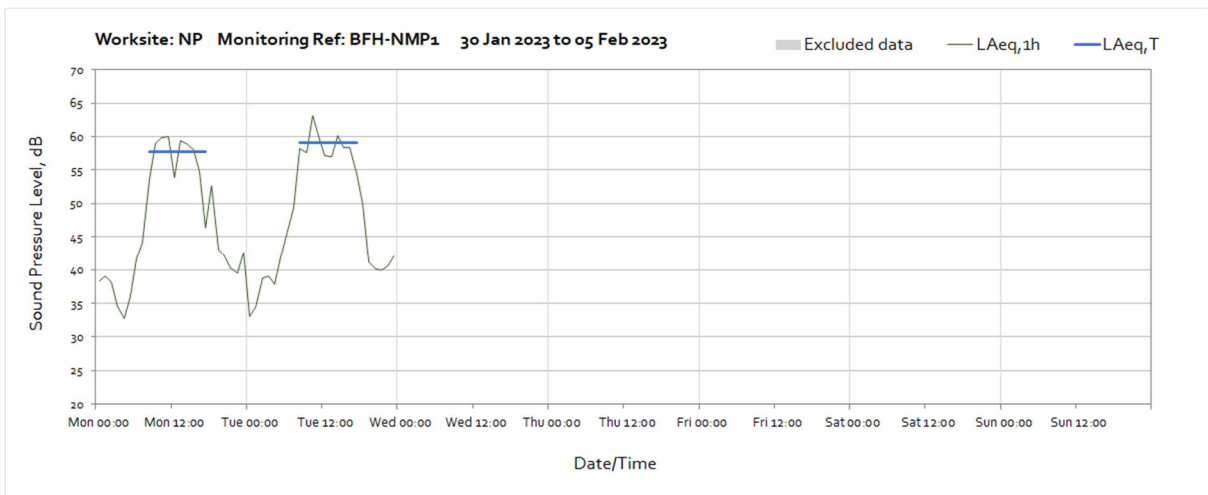
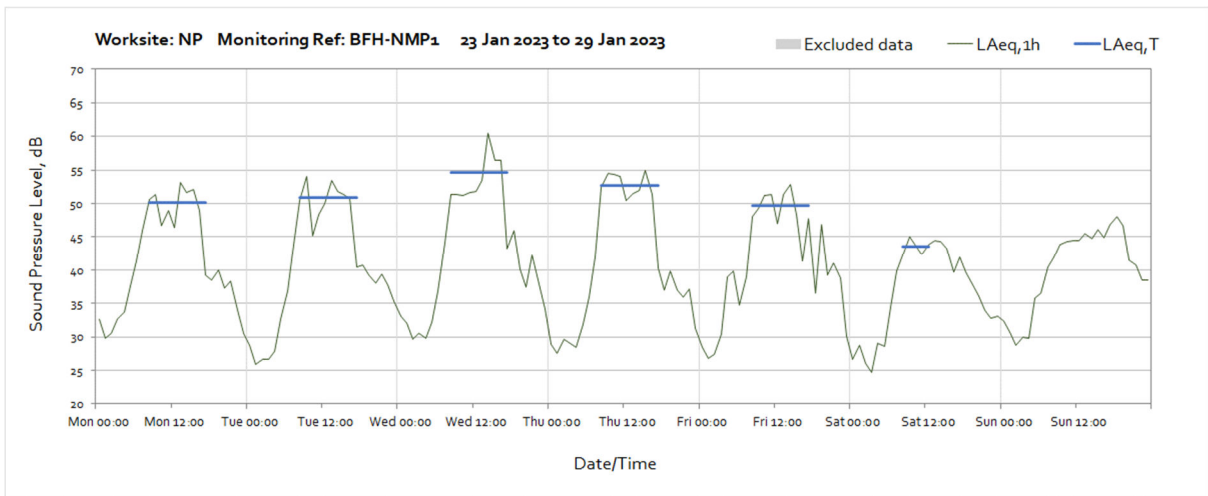
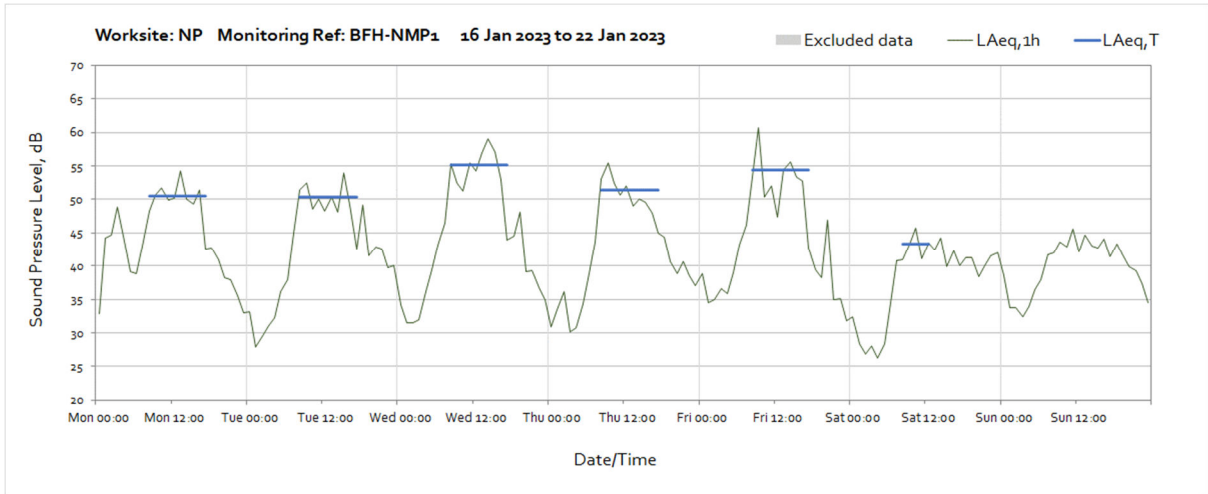




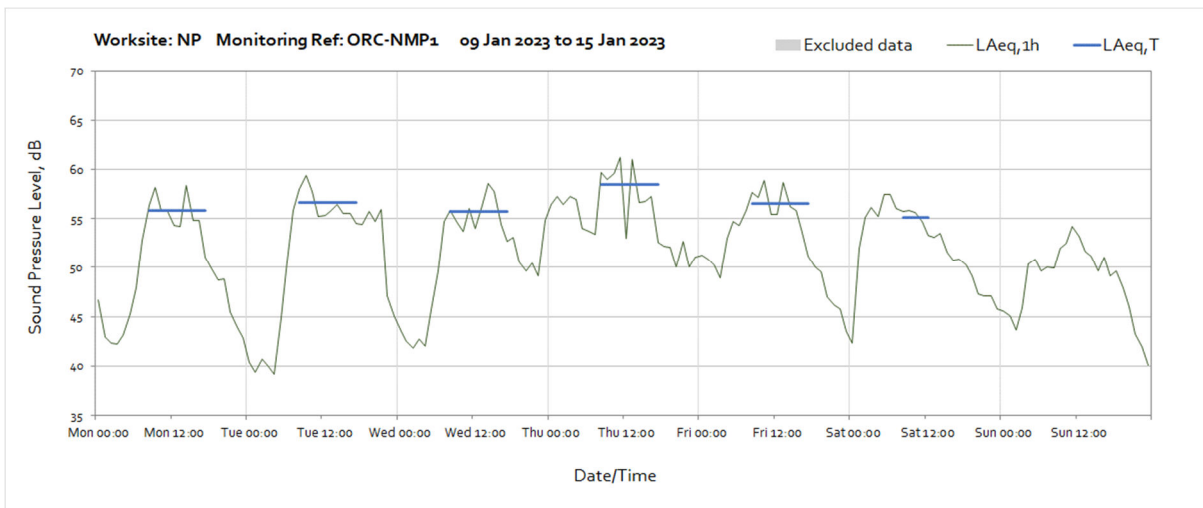
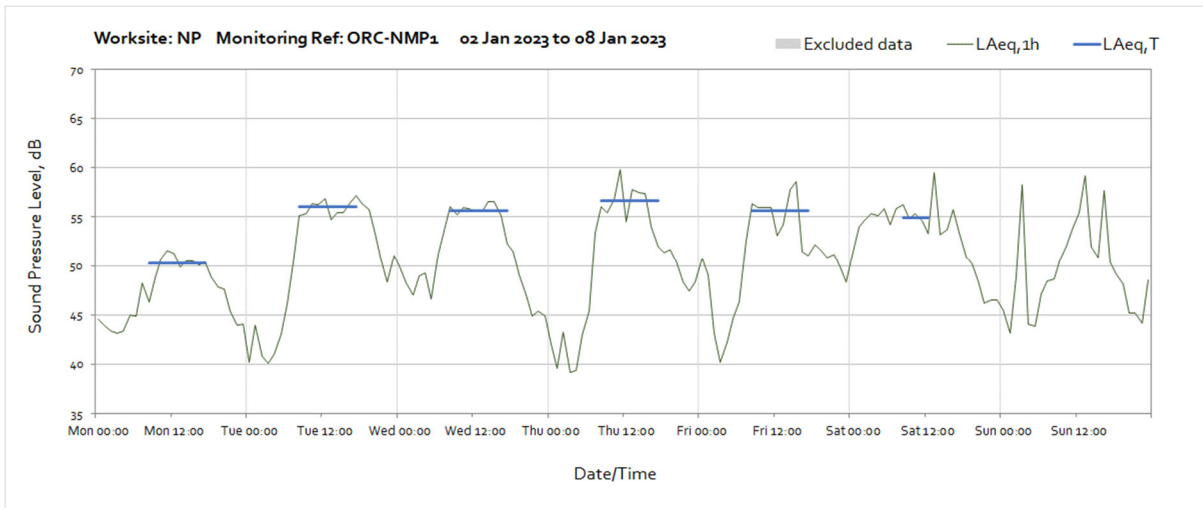
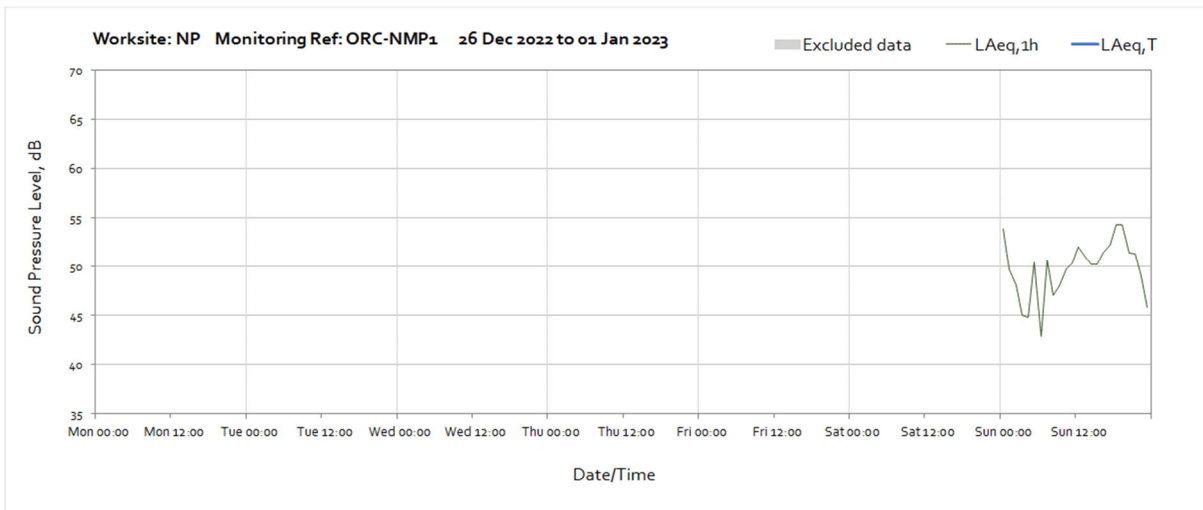
Note: Missing data between 13:00 and 14:00 on 31st January was due to monitor maintenance.

Worksite: NP – Monitoring Ref: BFH-NMP1

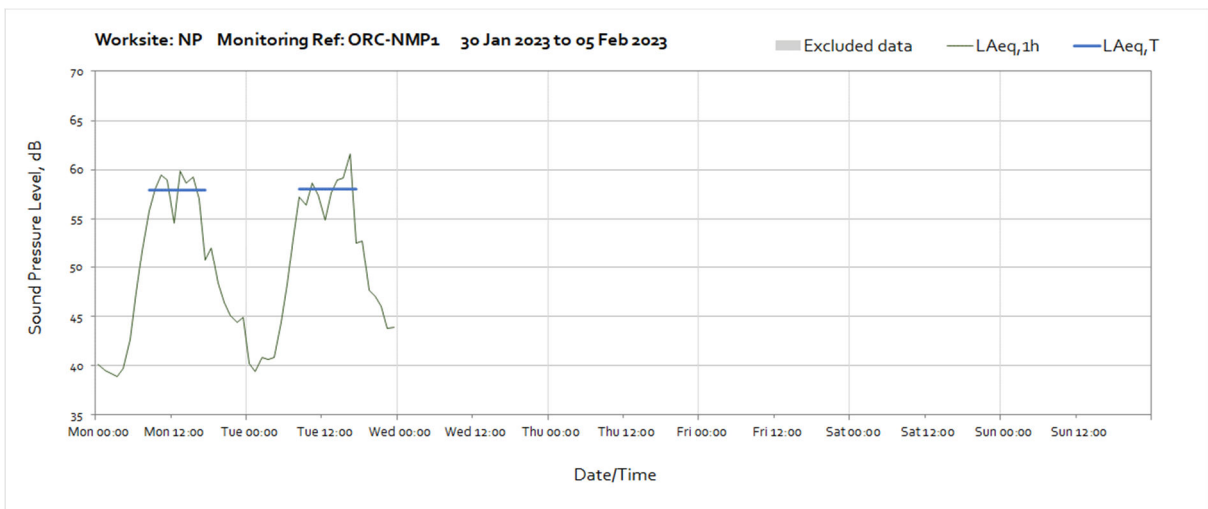
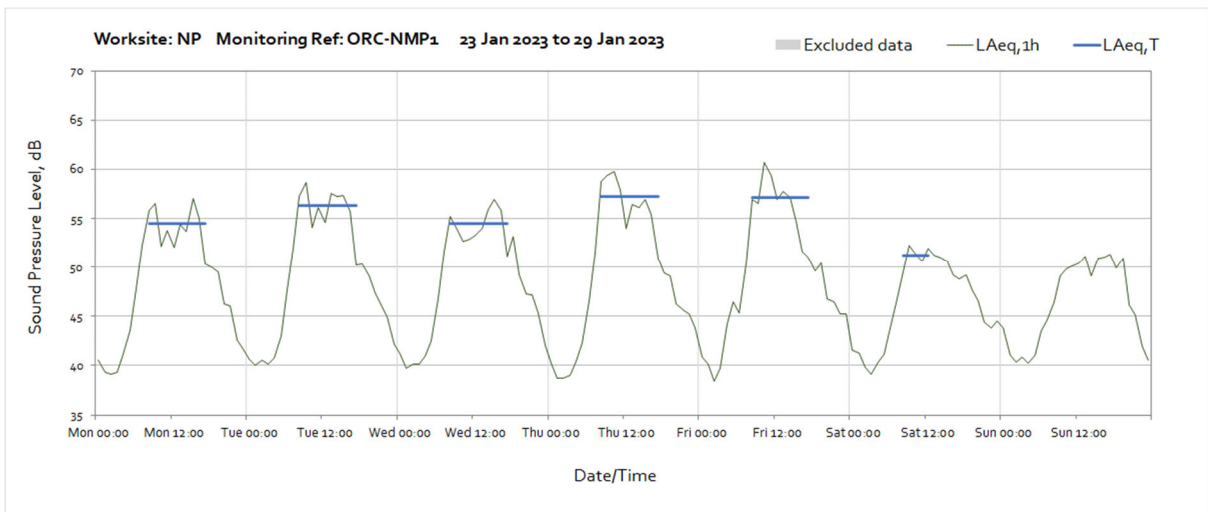
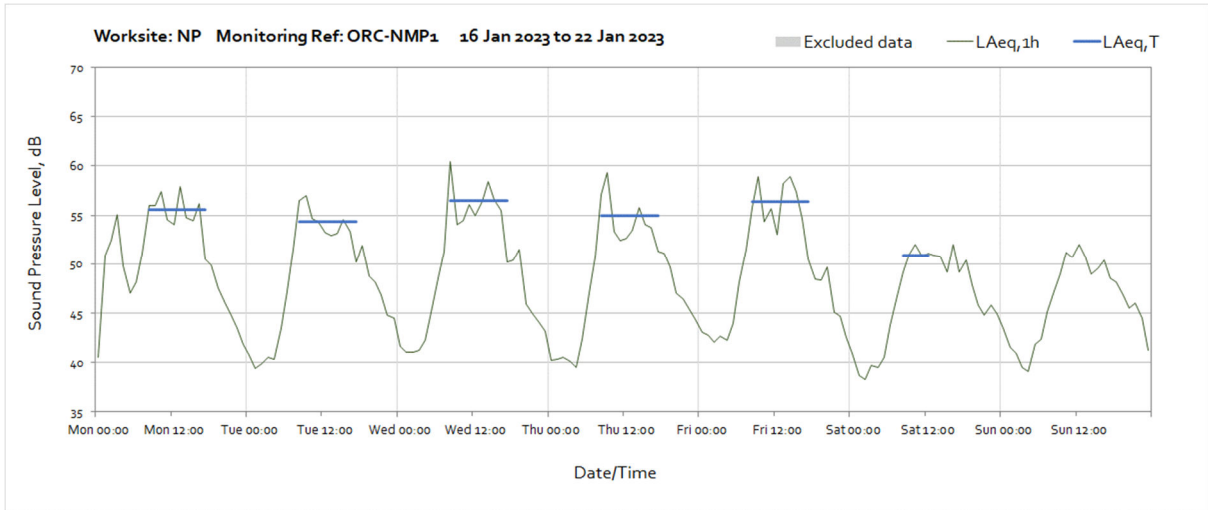




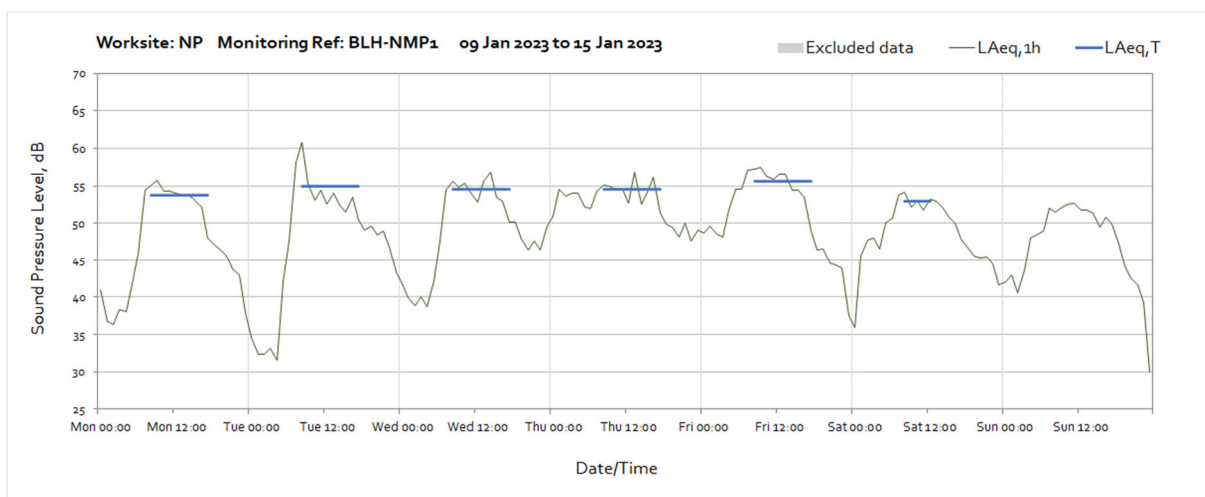
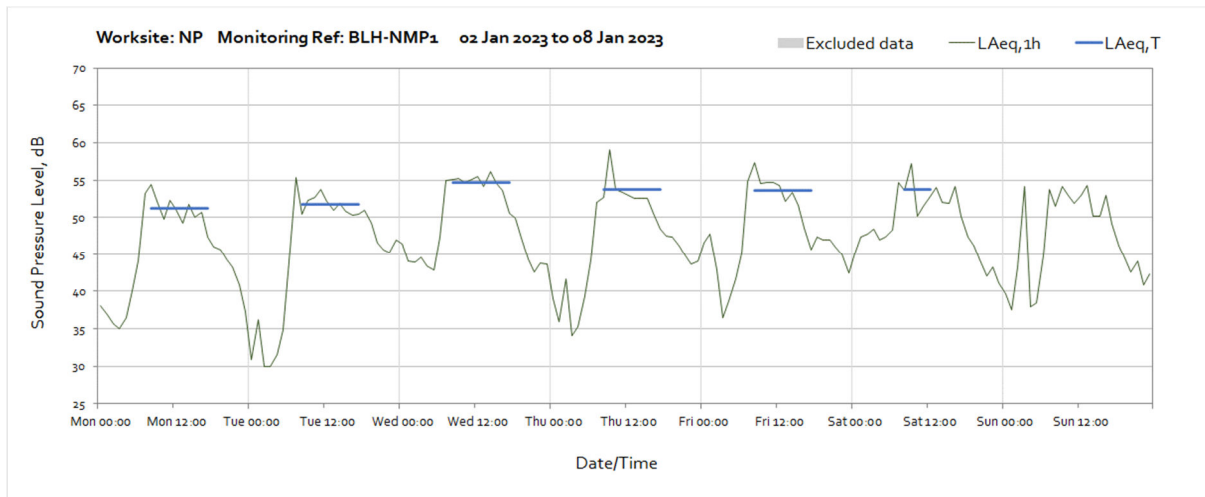
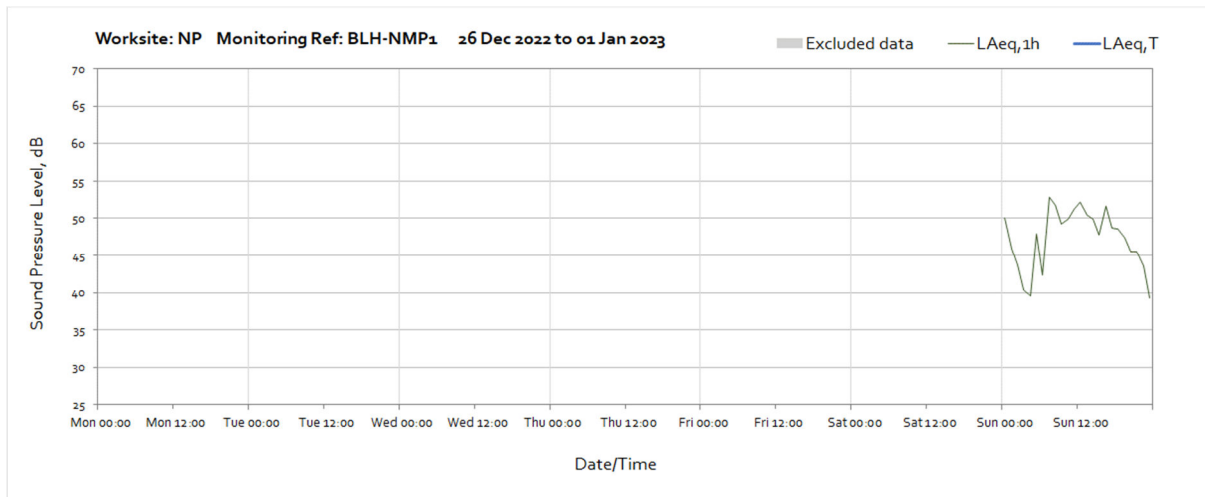
Worksite: NP – Monitoring Ref: ORC-NMP1



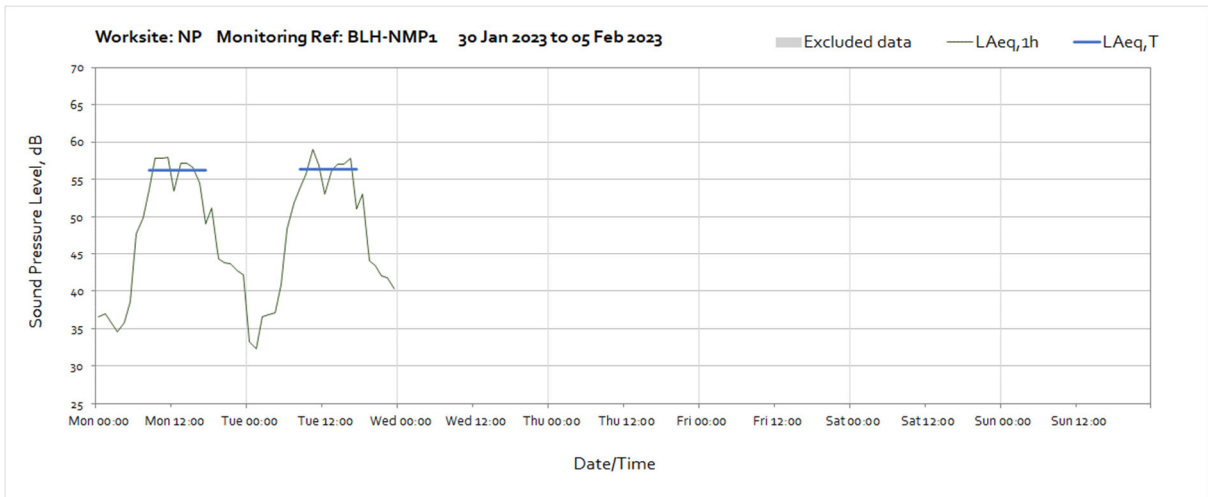
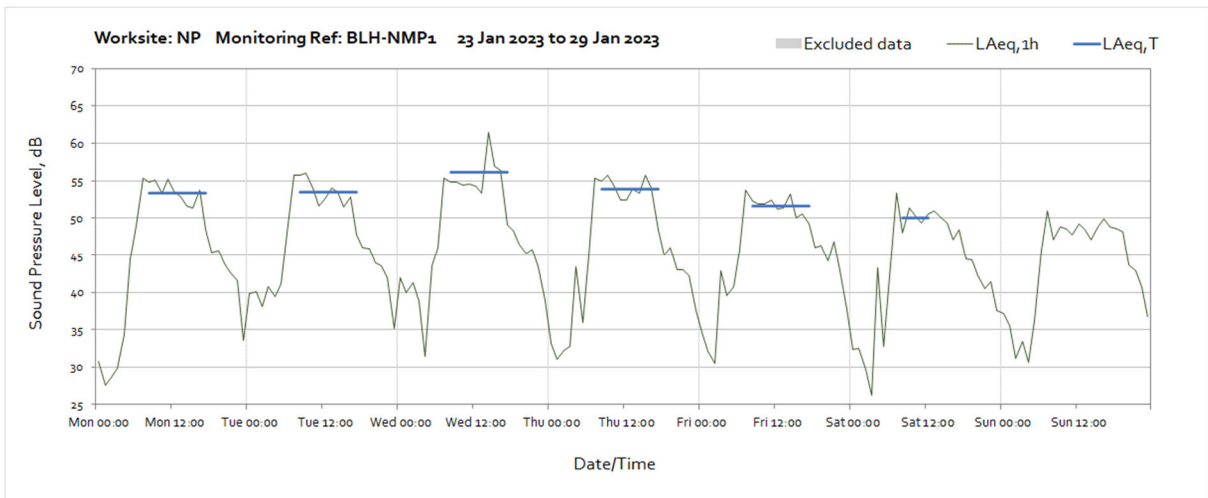
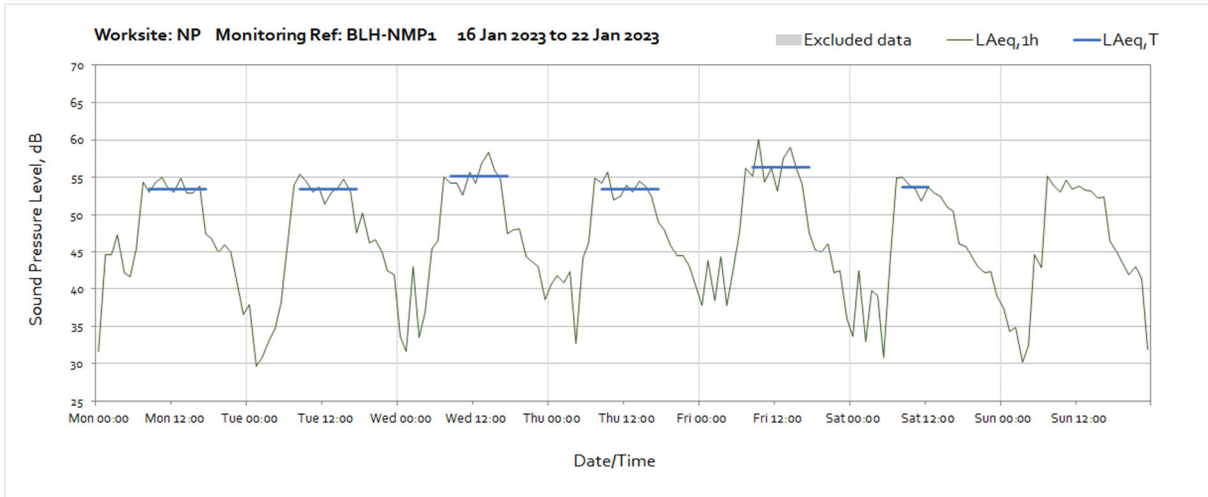
OFFICIAL



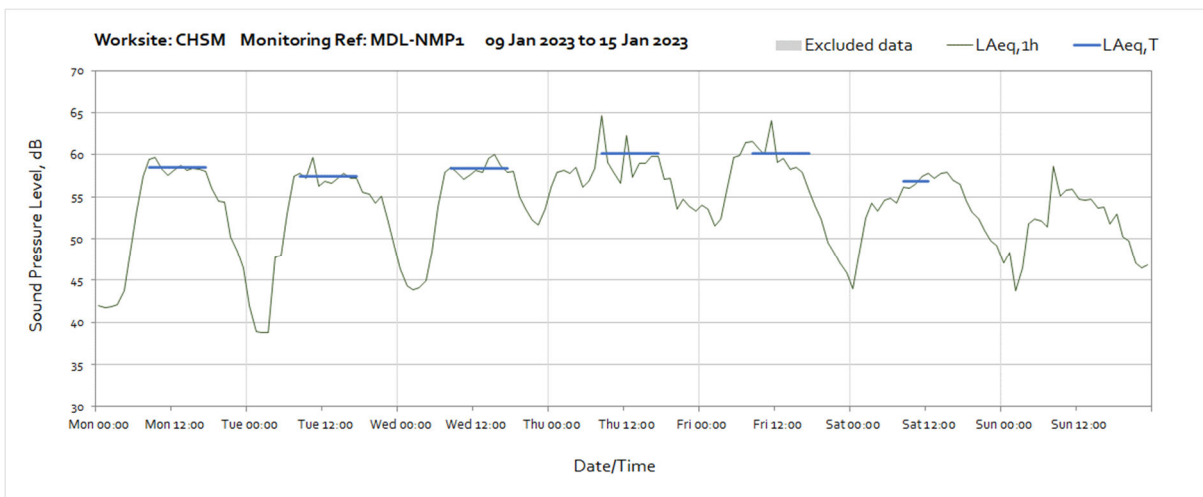
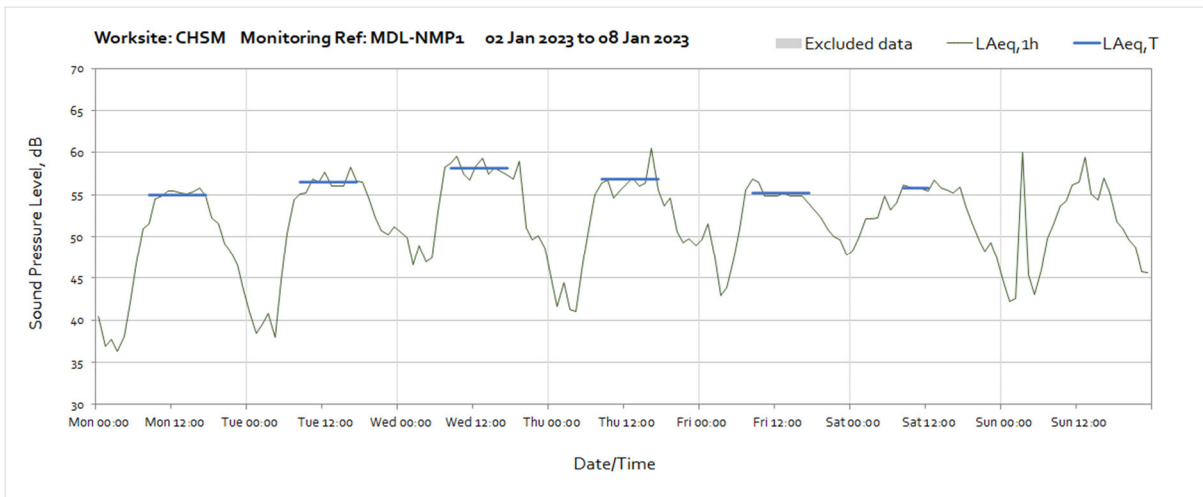
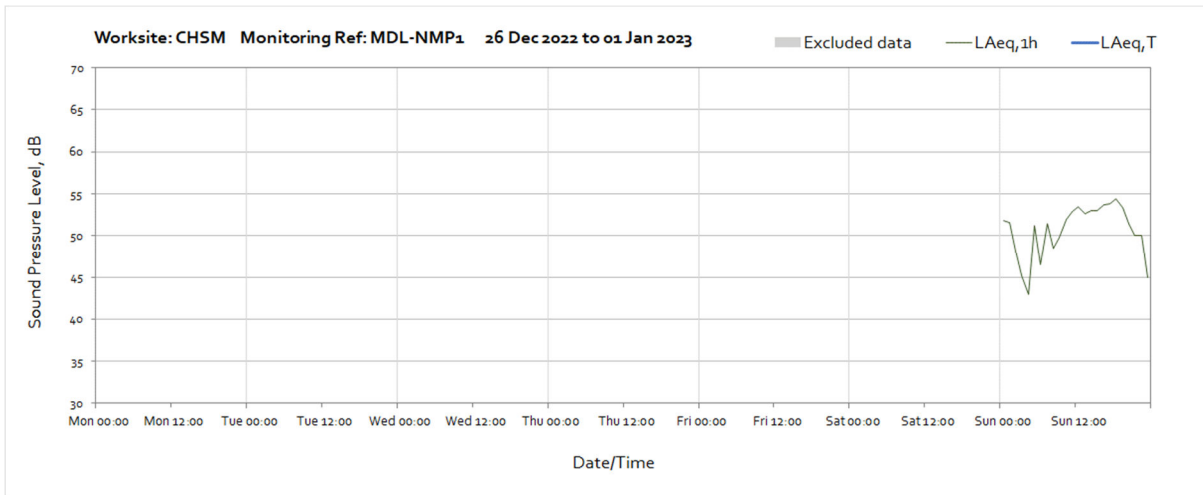
Worksite: NP – Monitoring Ref: BLH-NMP1

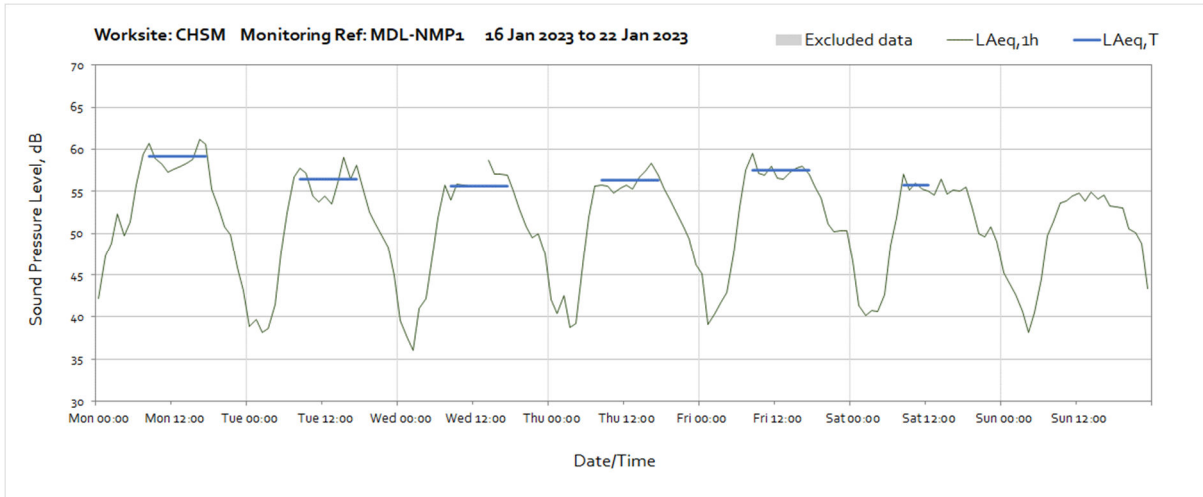


OFFICIAL

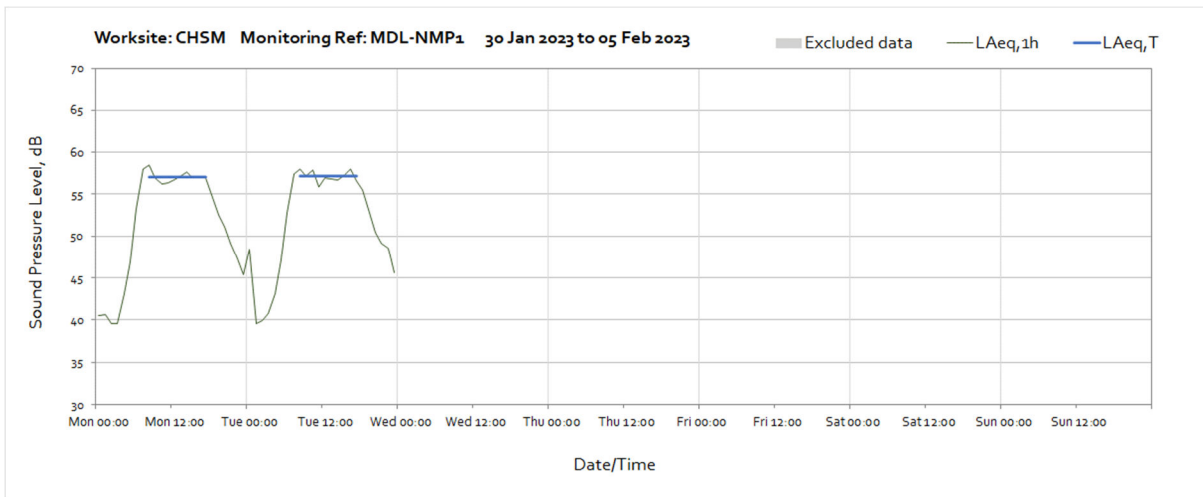
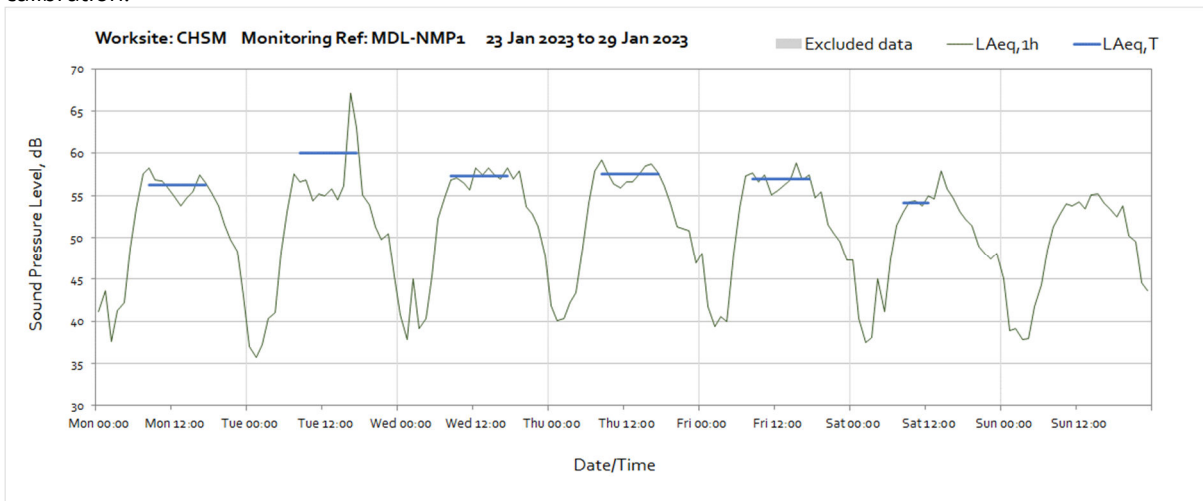


Worksite: CHSM – Monitoring Ref: MDL-NMP1

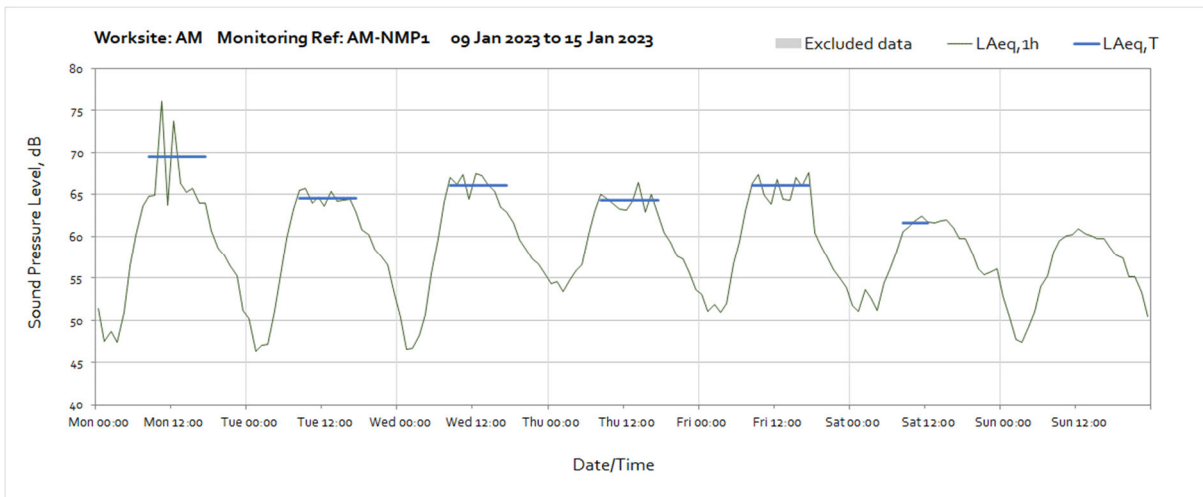
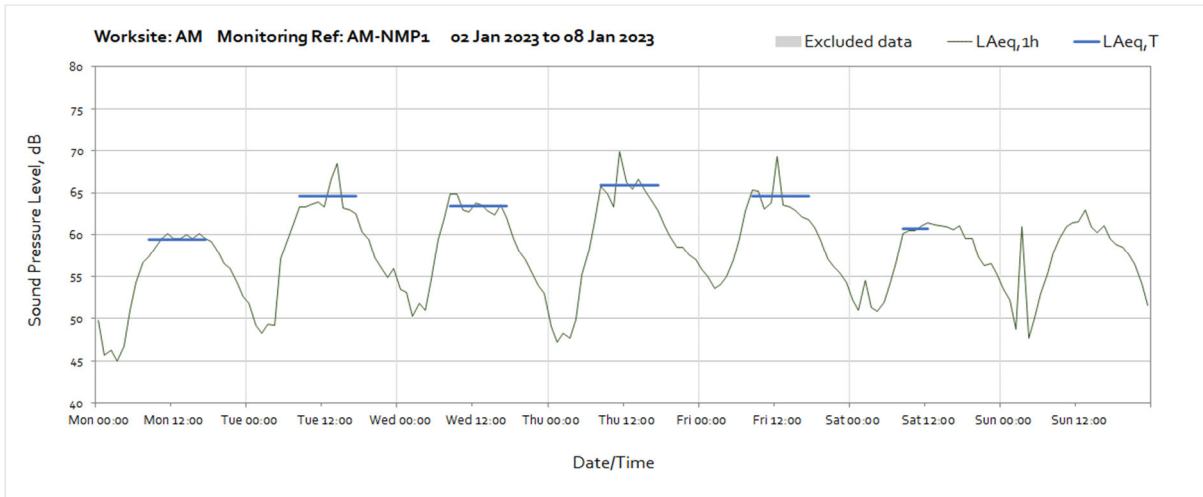
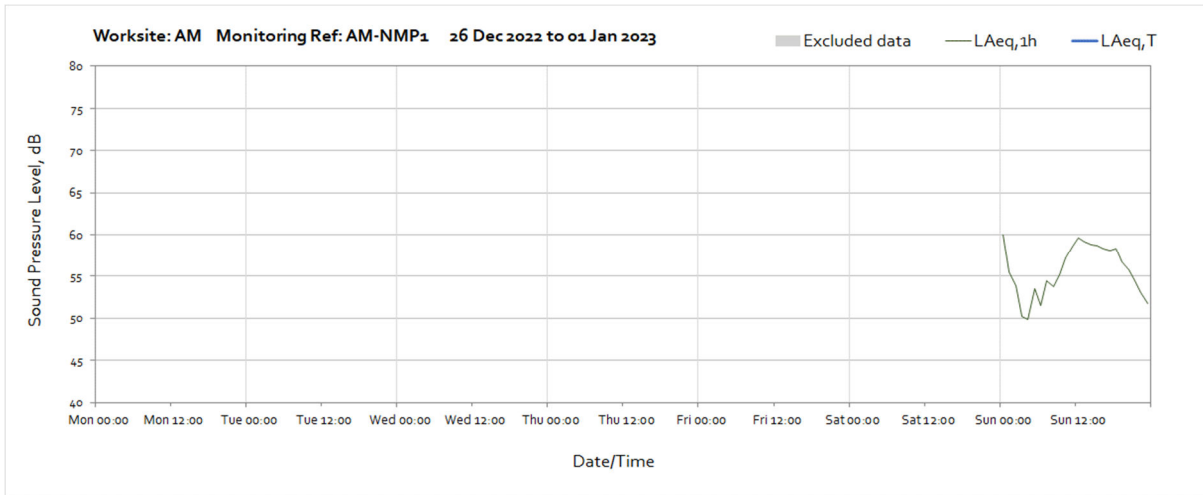




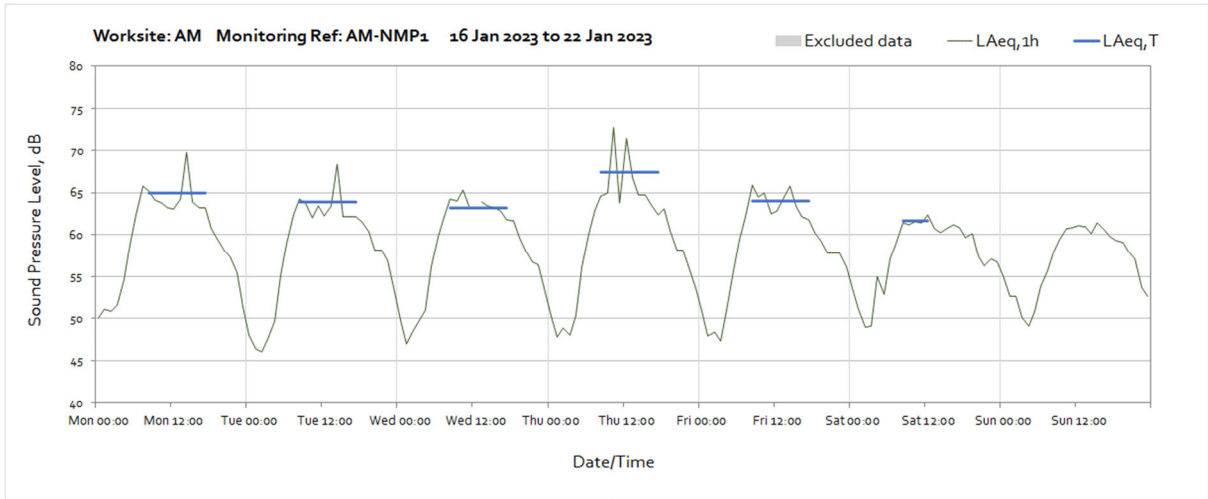
Note: Missing data between 12:00 and 14:00 on 18th January was due to monitor maintenance and field calibration.



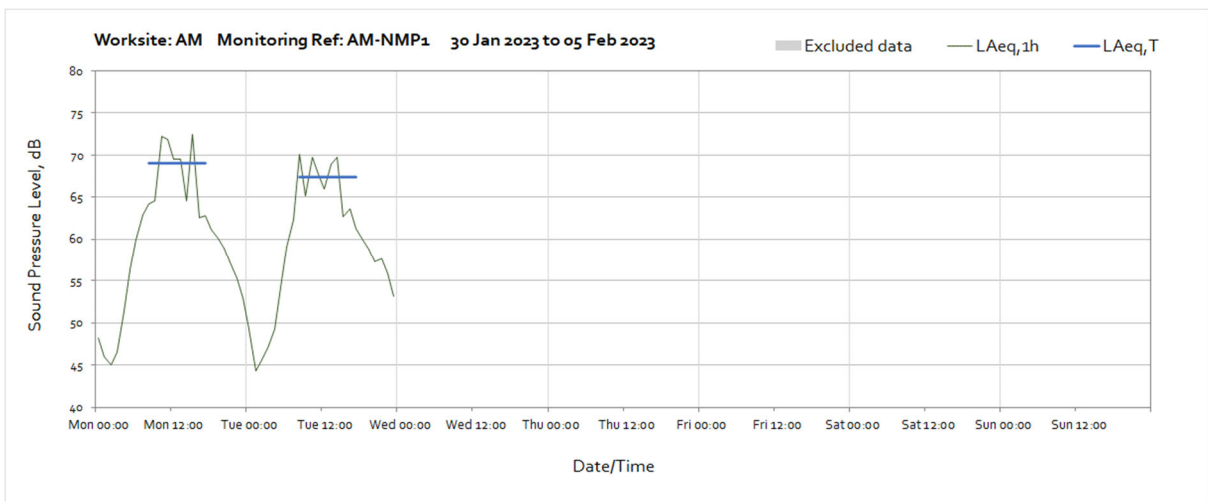
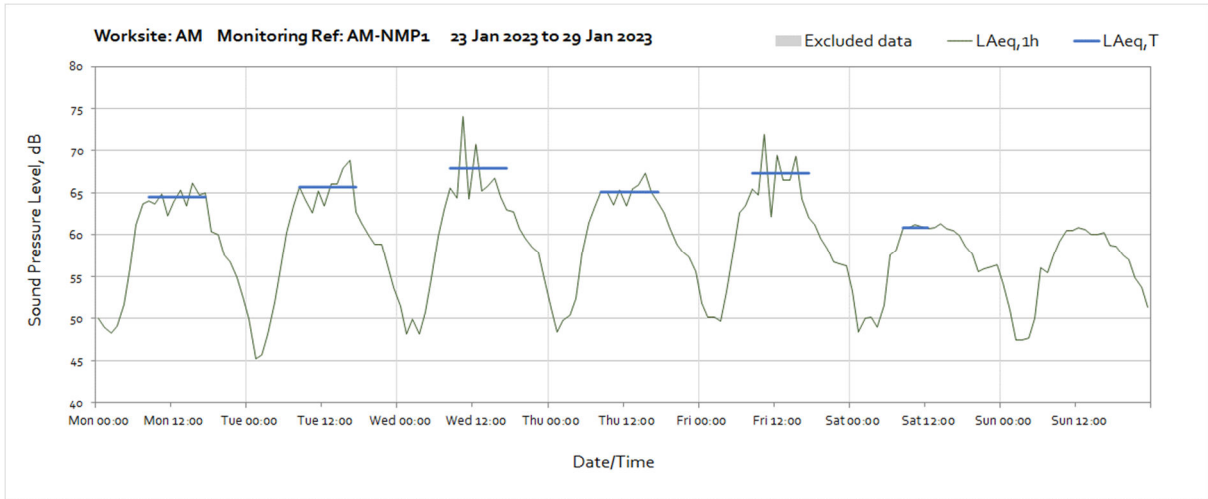
Worksite: AM - Monitoring Ref: AM-NMP1



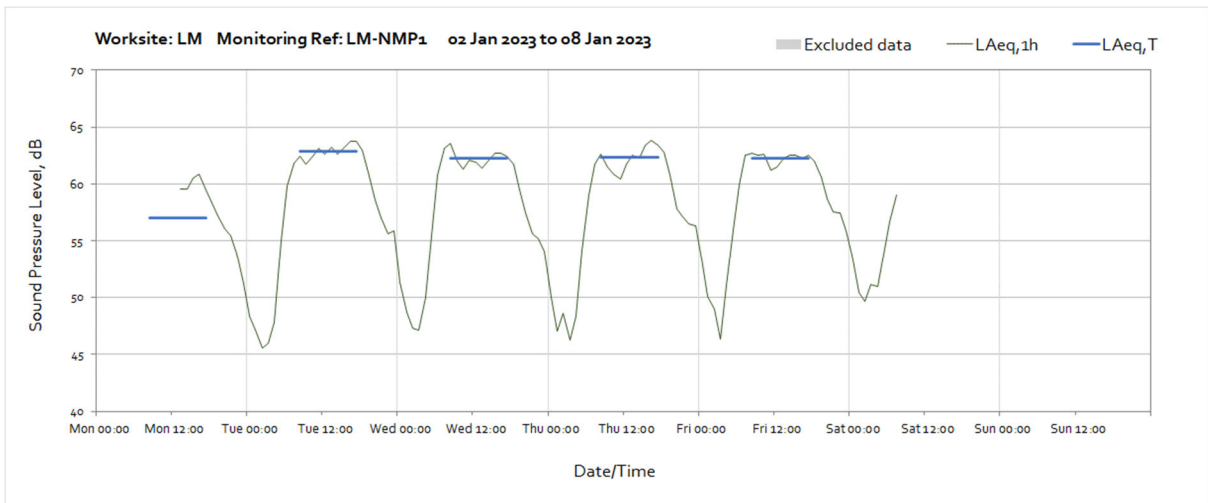
OFFICIAL



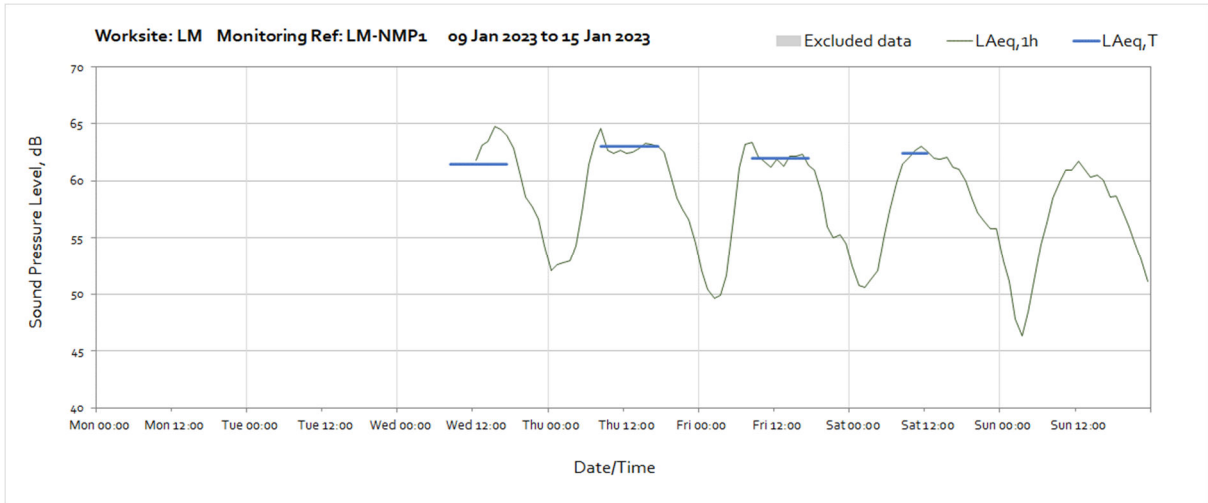
Note: Missing data between 12:00 and 13:00 on 18th January was due to monitor field calibration.



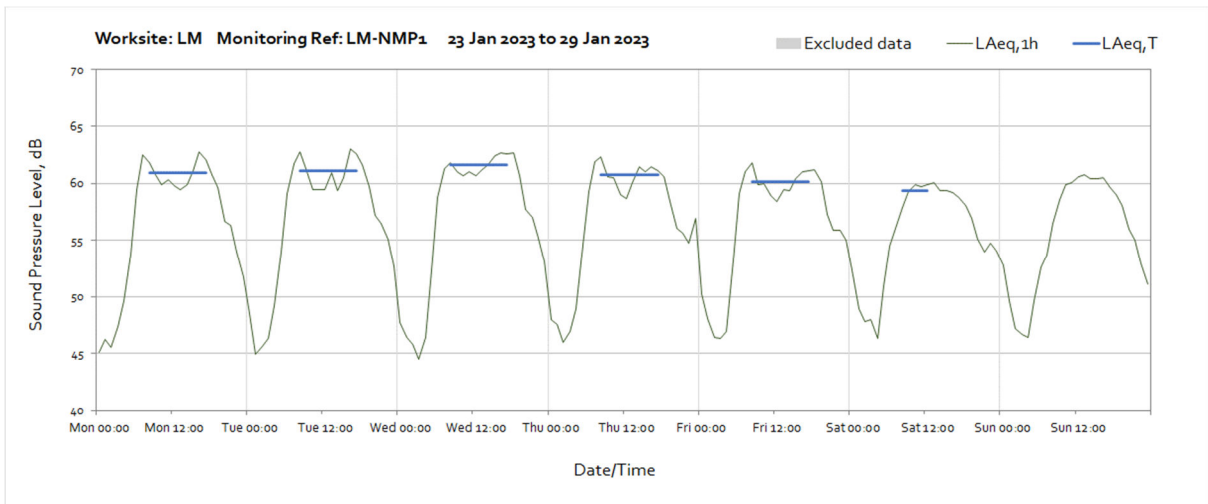
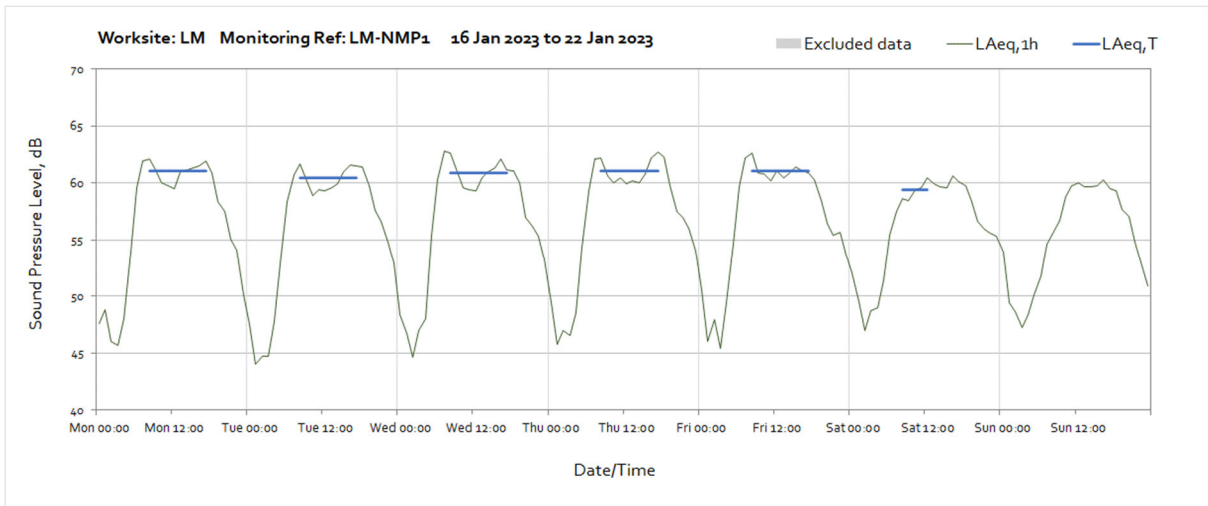
Worksite: LM – Monitoring Ref: LM-NMP1

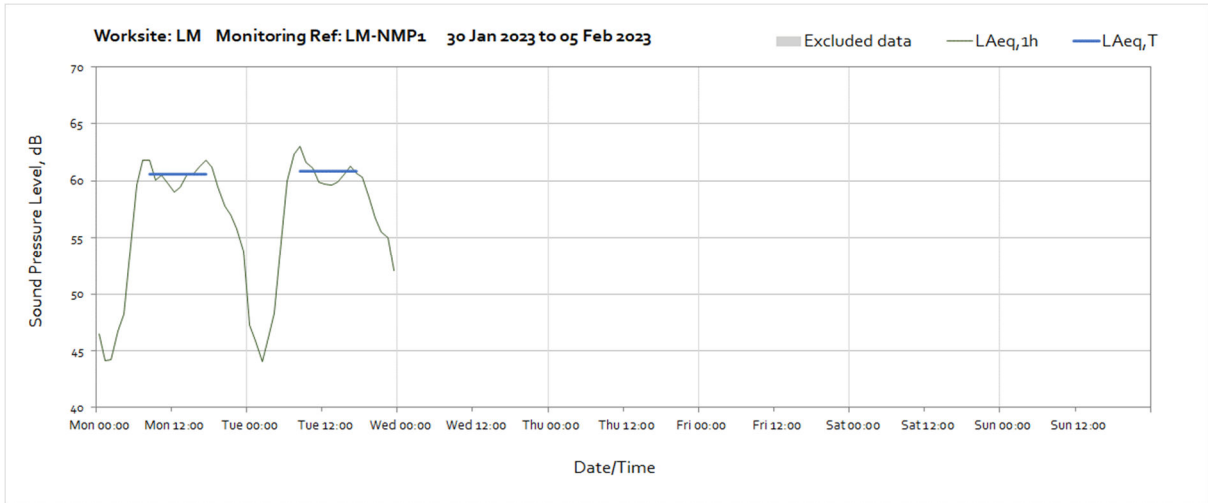


Note: Missing data between 00:00 on 1st January until 13:00 on 2nd January was due to monitor power issue. Missing data between 08:00 on 7th January until 12:00 on 11th January was due to monitor power issue.

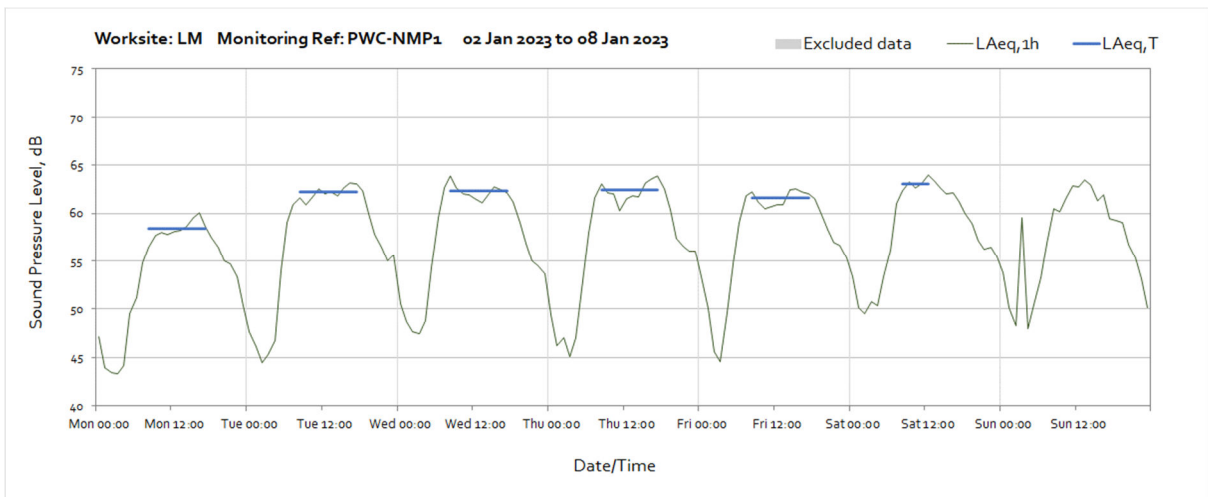
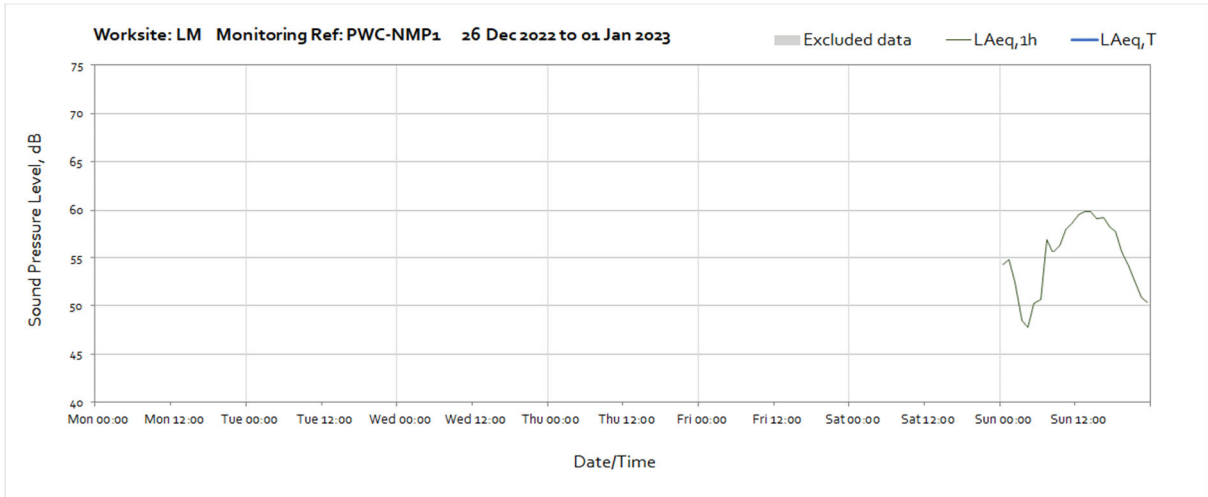


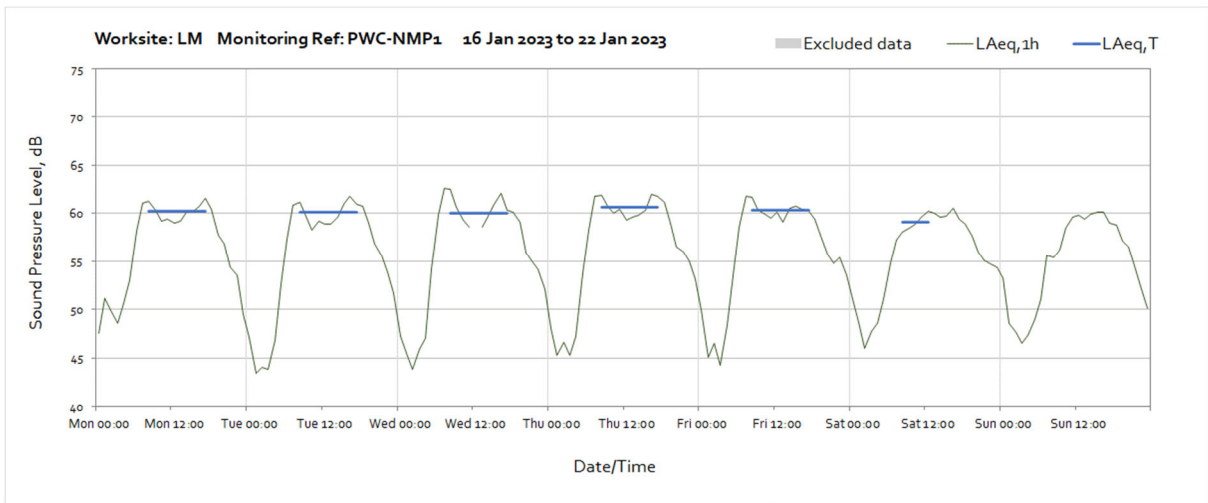
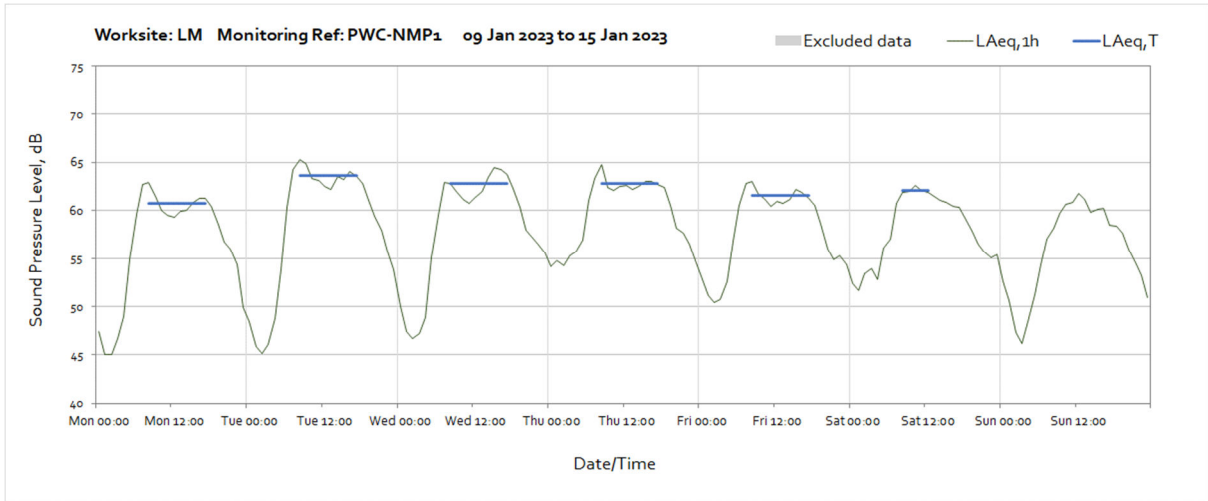
Note: Missing data between 08:00 on 7th January until 12:00 on 11th January was due to monitor power issue.



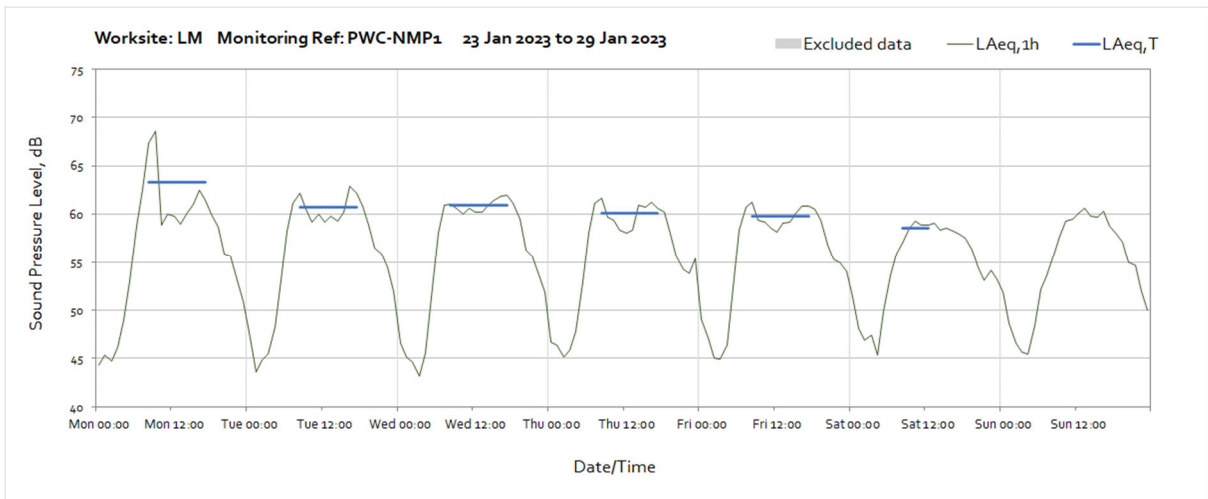


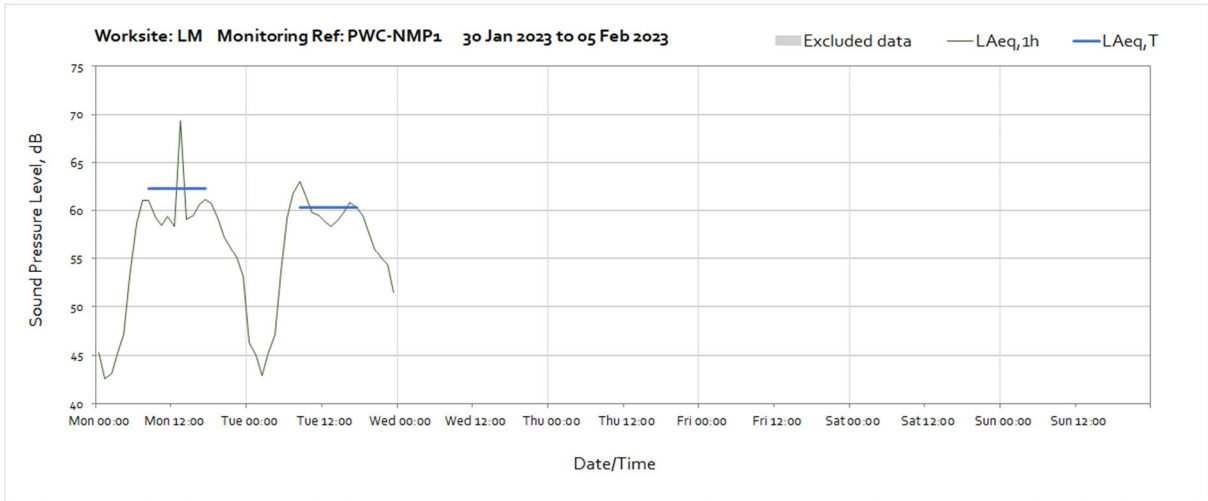
Worksite: LM – Monitoring Ref: PWC-NMP1



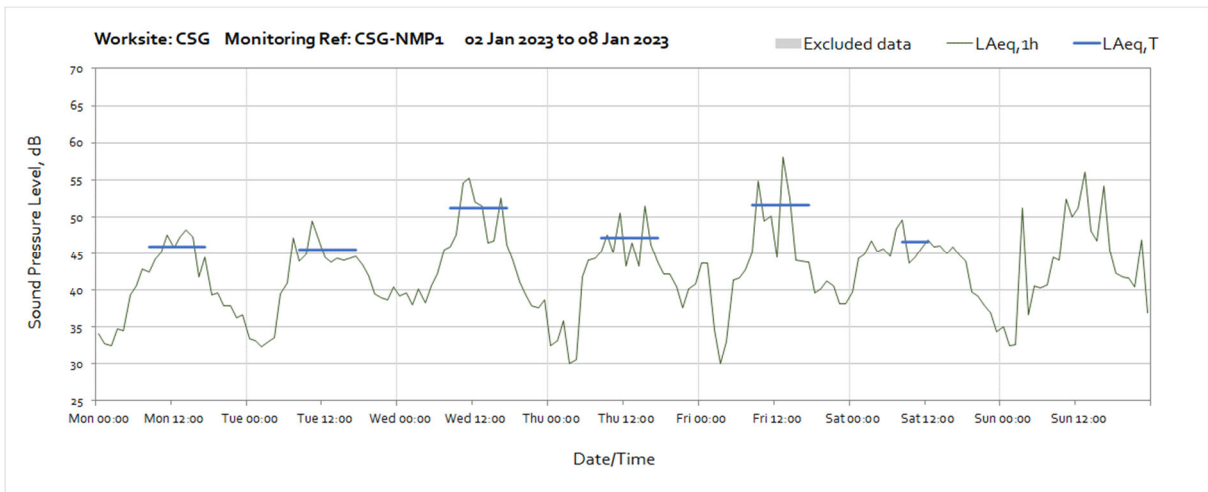
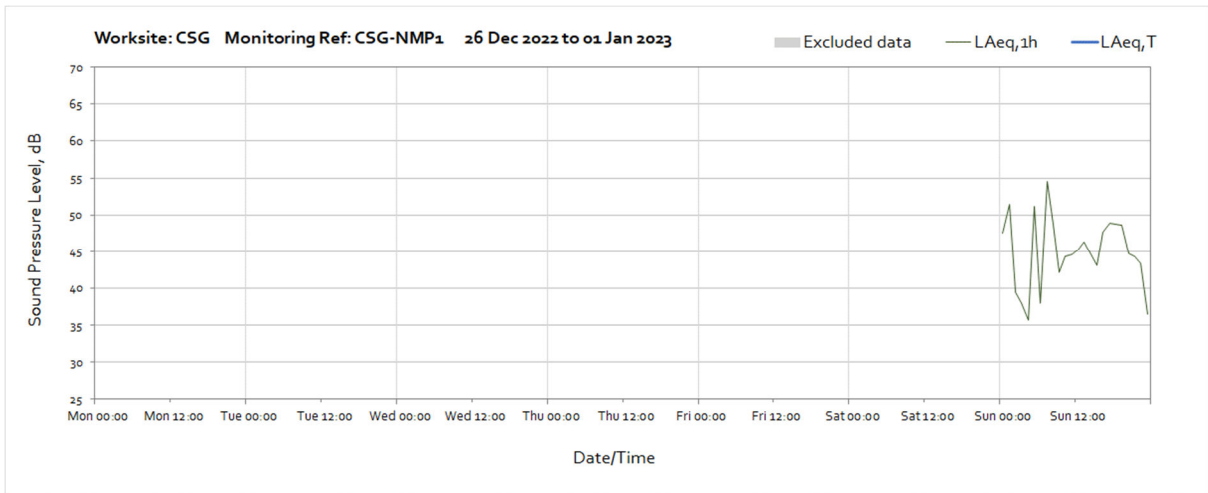


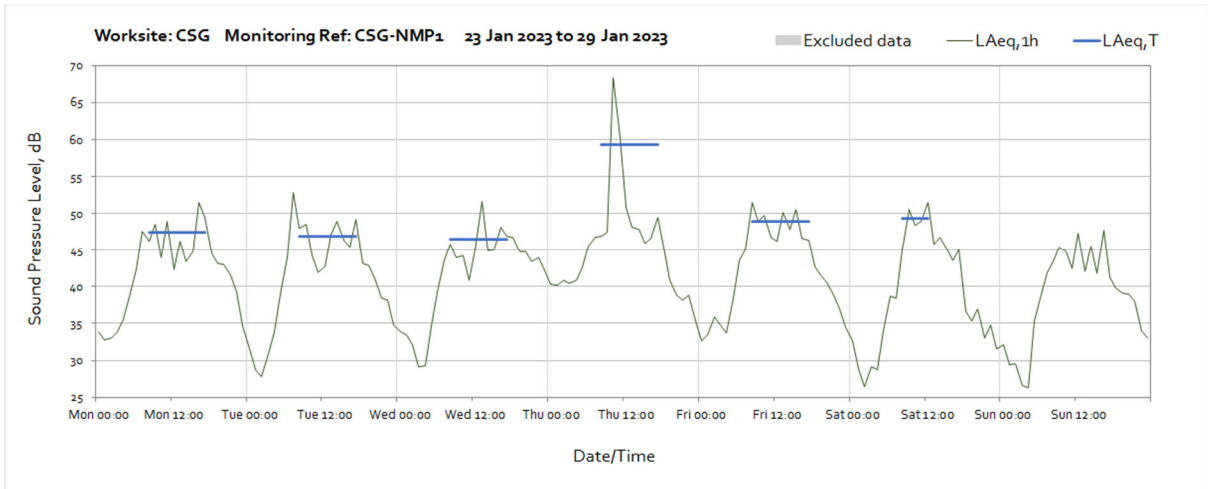
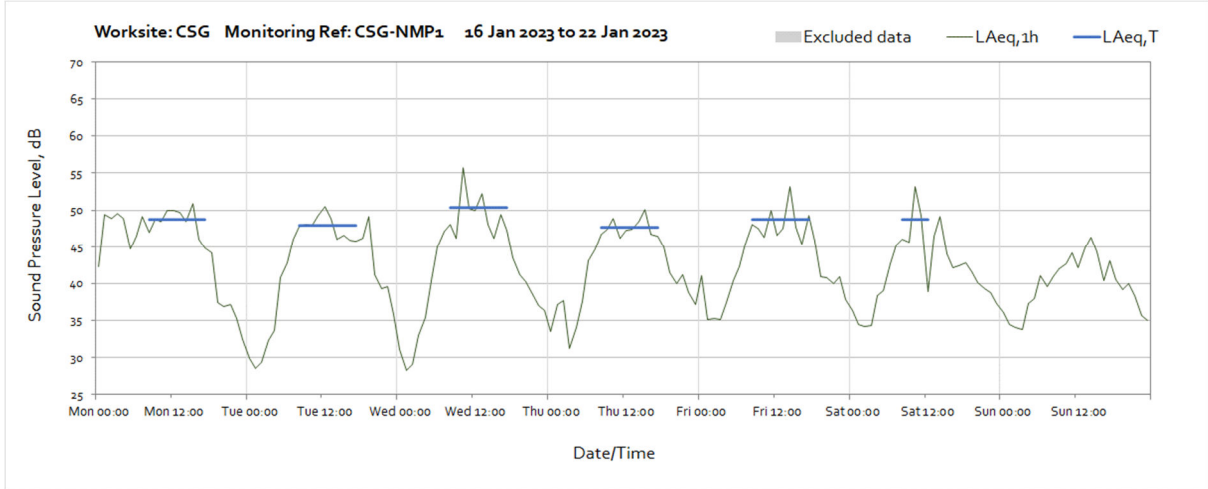
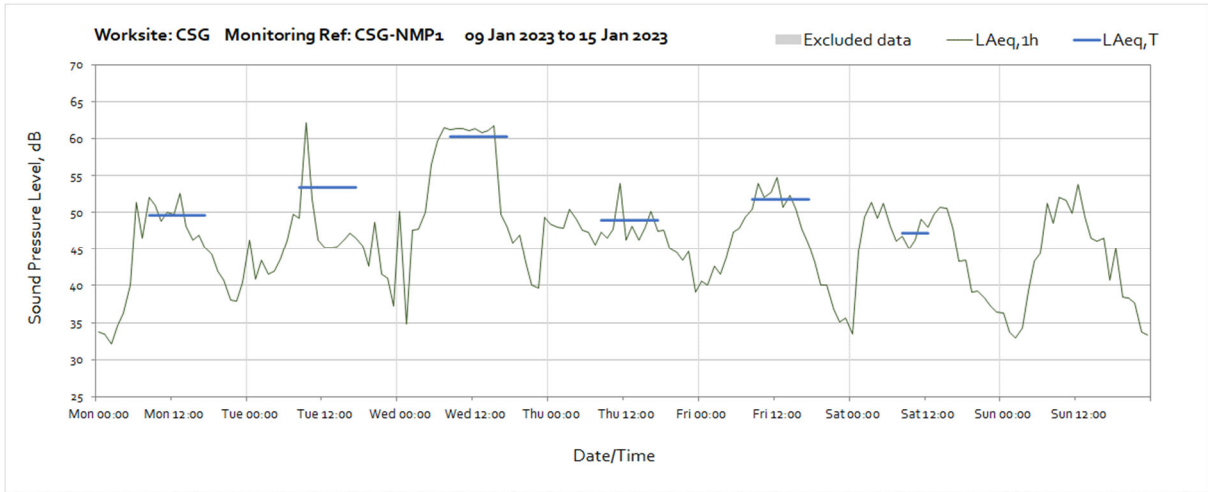
Note: Missing data between 12:00 and 13:00 on 18th January was due to monitor field calibration.

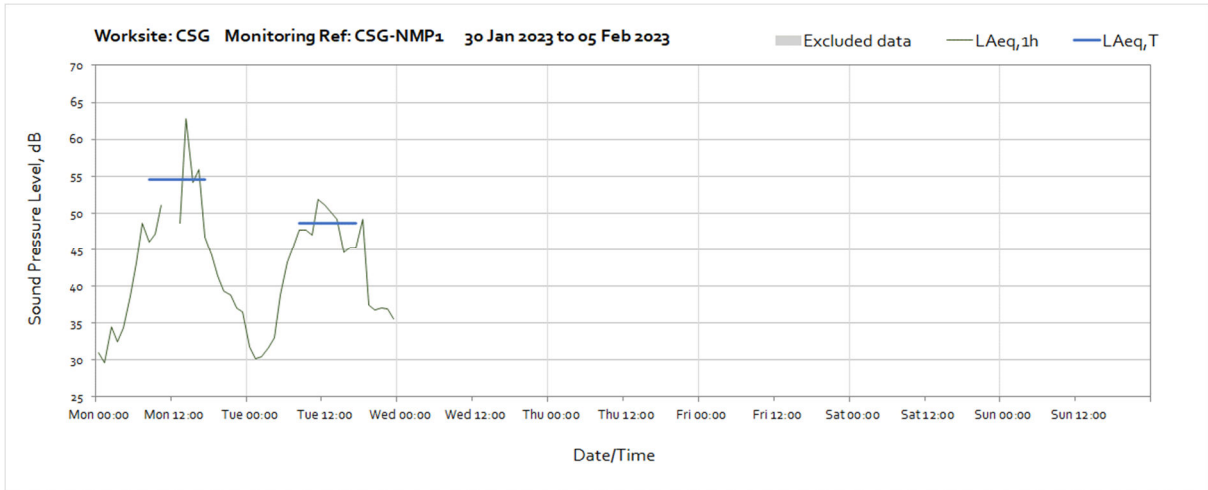




Worksite: CSG - Monitoring Ref: CSG-NMP1

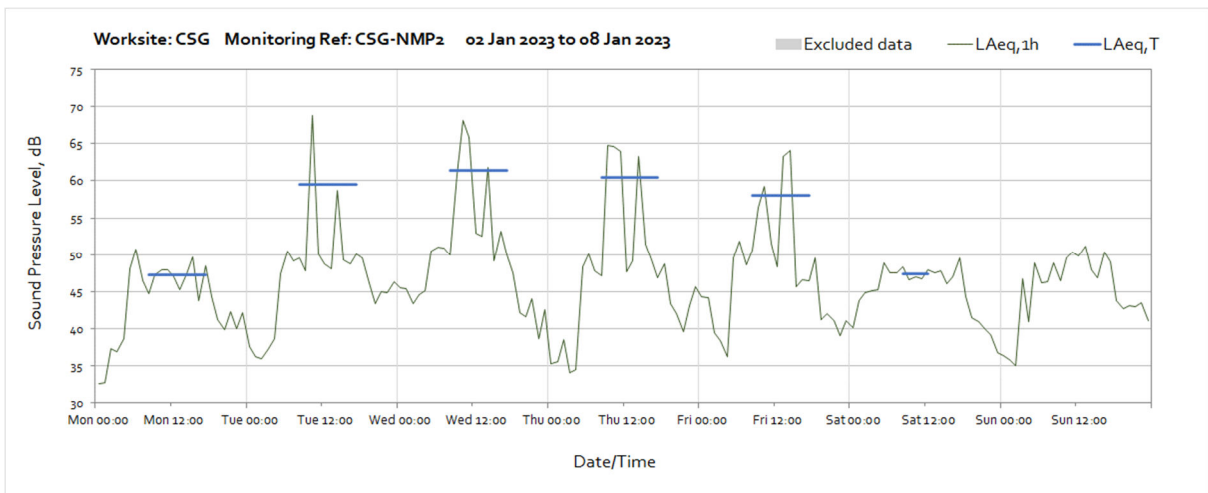
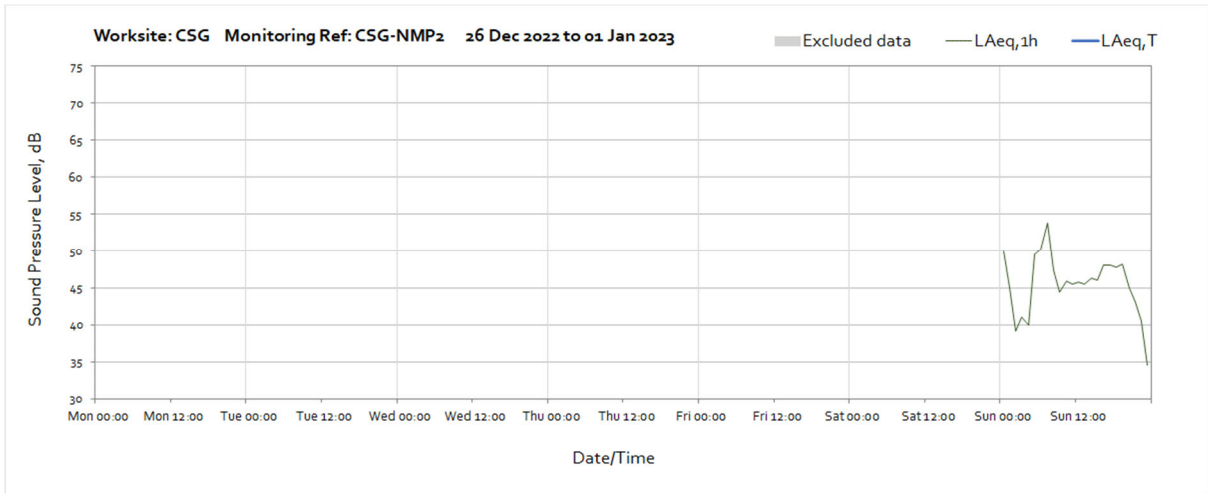


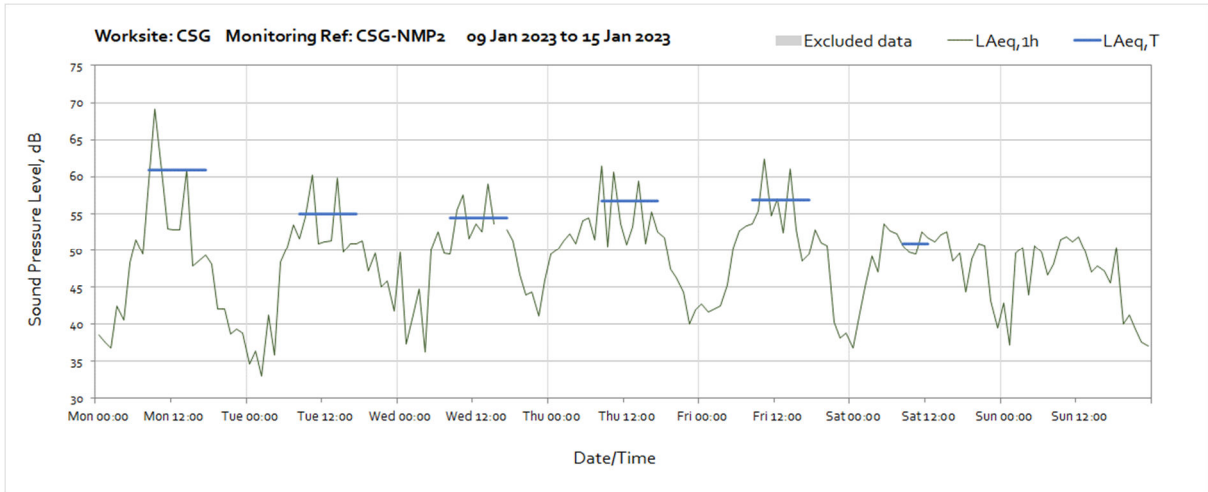




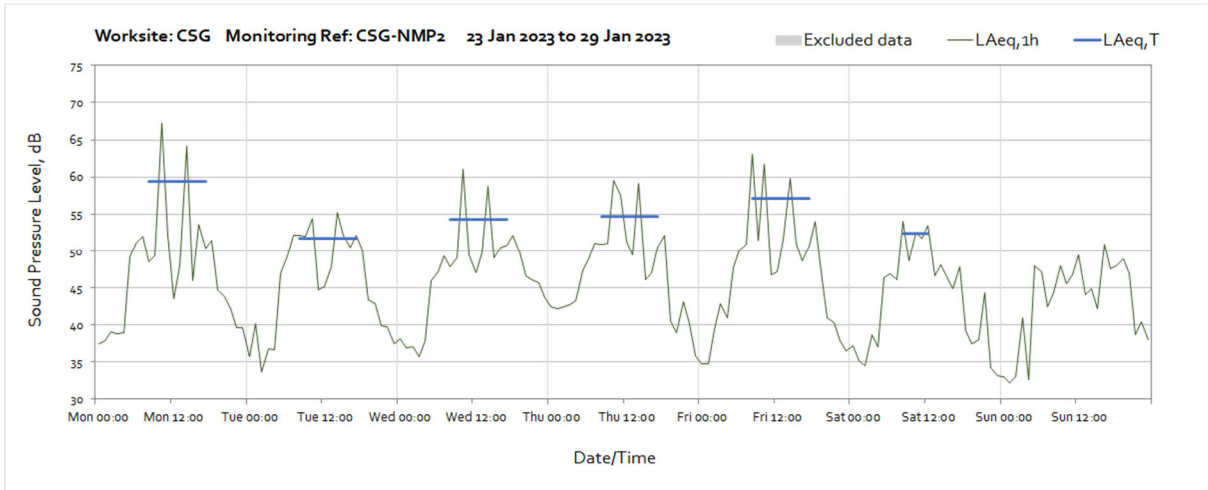
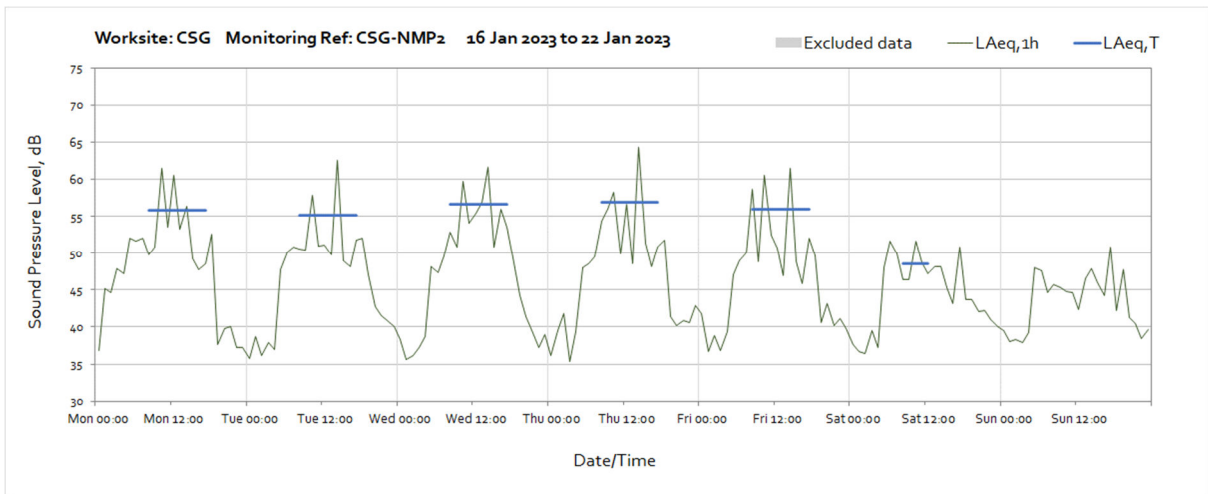
Note: Missing data between 11:00 and 13:00 on 30th January was due to monitor maintenance.

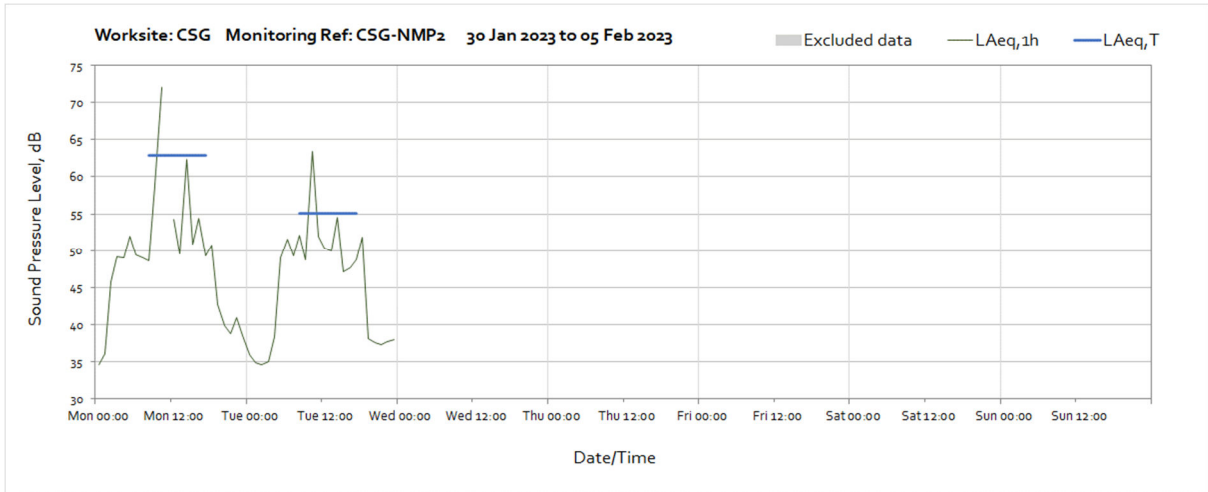
Worksite: CSG – Monitoring Ref: CSG-NMP2





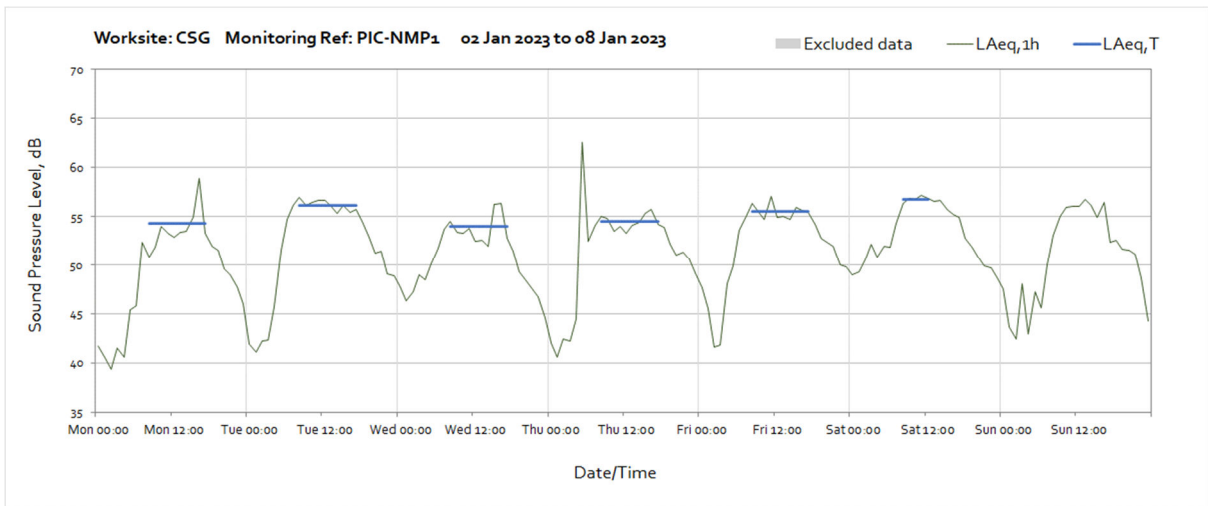
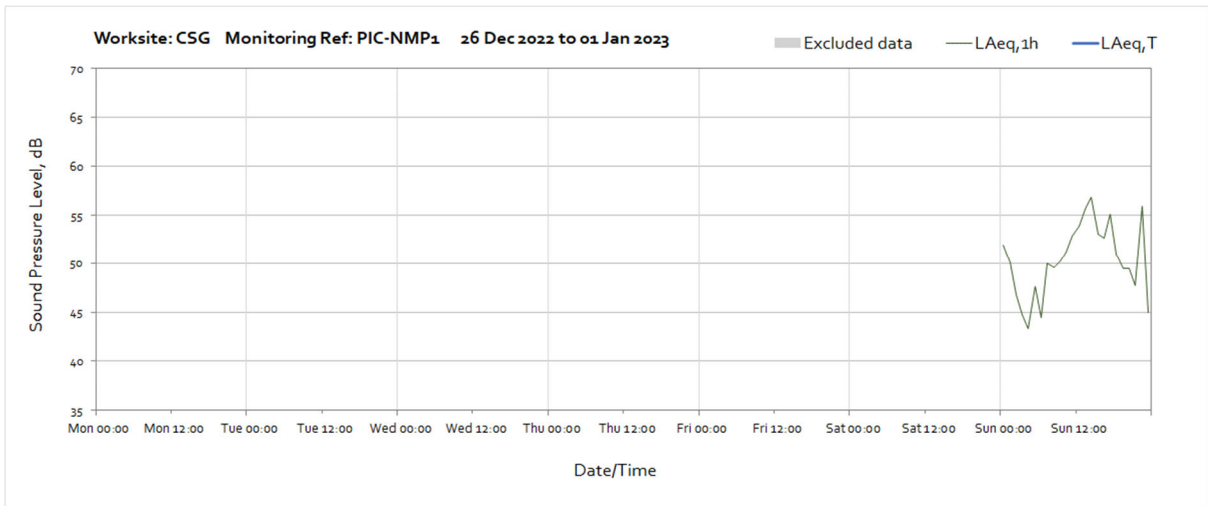
Note: Missing data between 16:00 and 17:00 on 11th January was due to monitor maintenance.





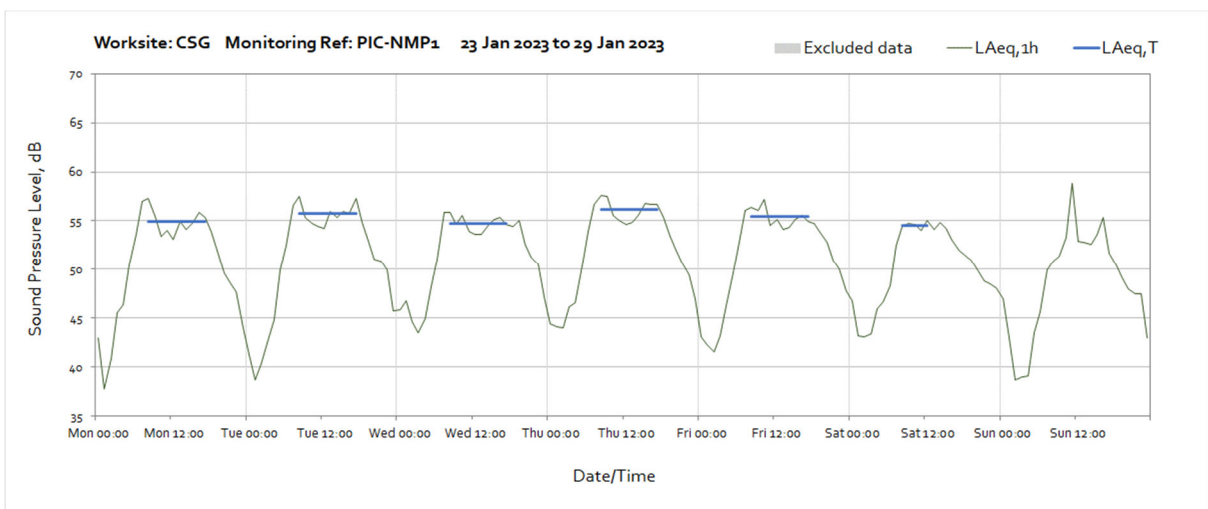
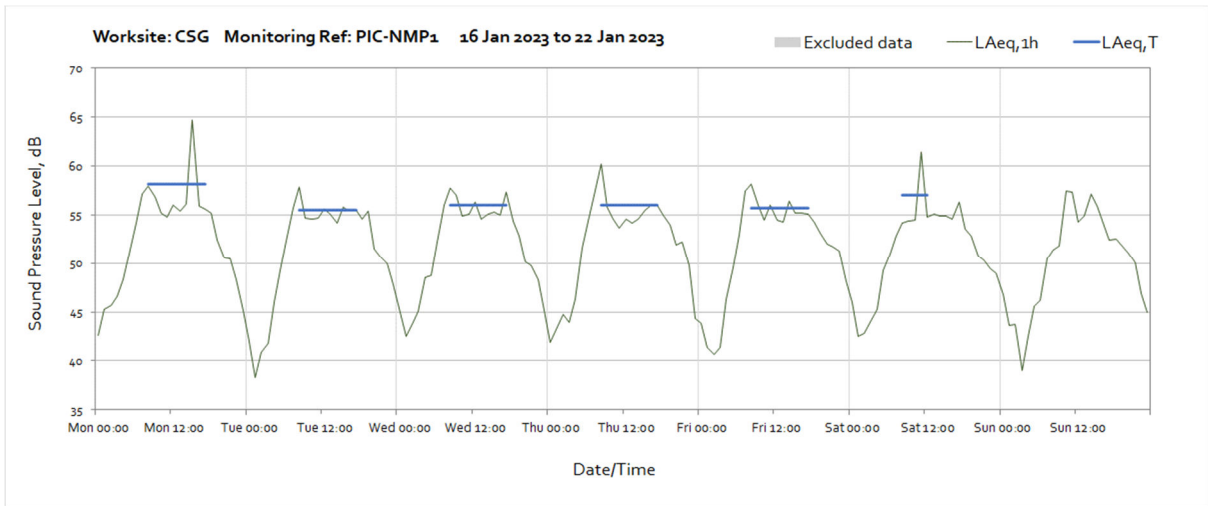
Note: Missing data between 11:00 and 12:00 on 30th January was due to monitor maintenance.

Worksite: CSG – Monitoring Ref: PIC-NMP1



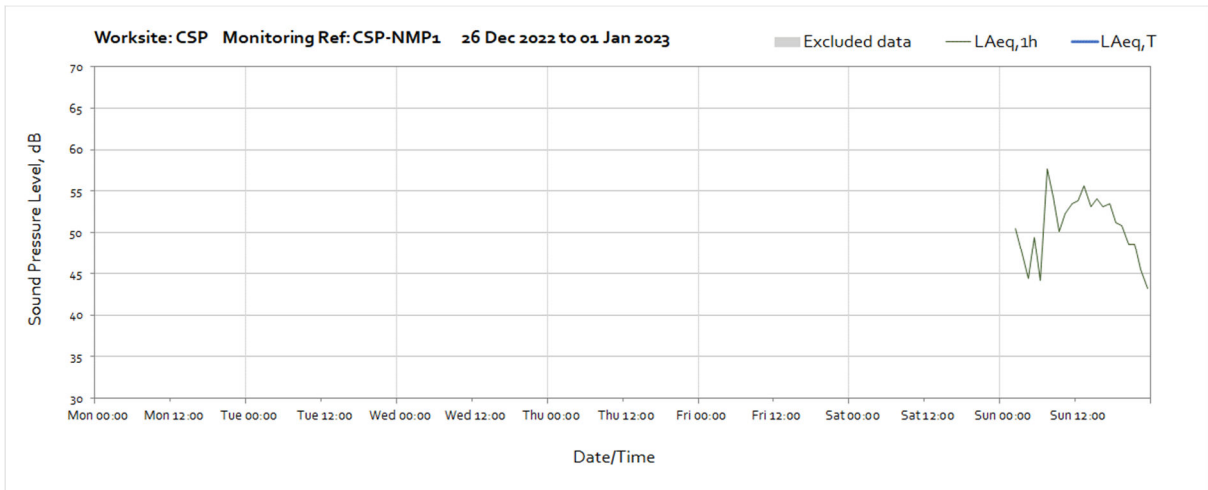


Note: Missing data between 11:00 on 9th January and 14:00 on 11th January was due to monitor loss of power.

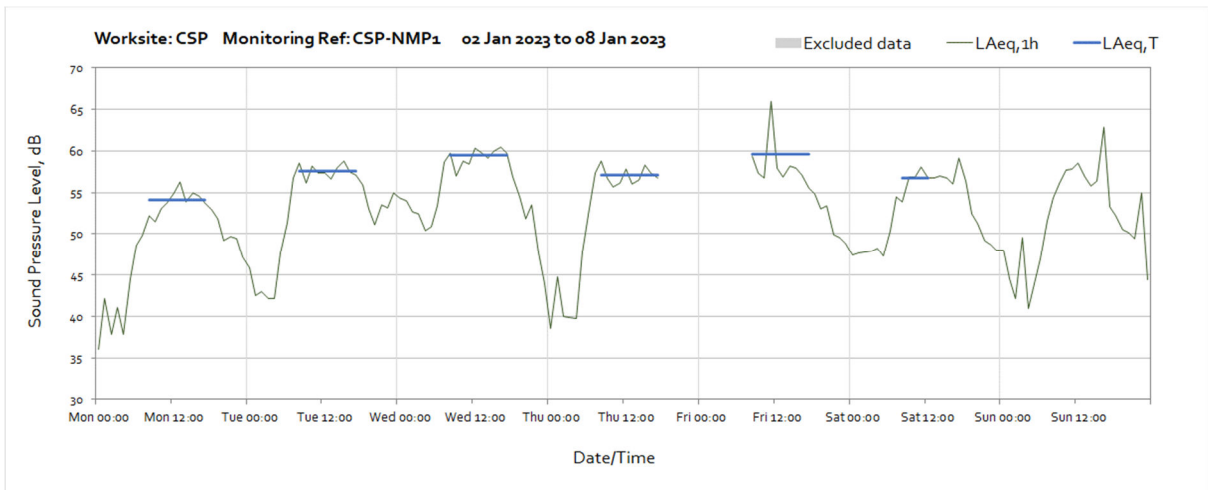




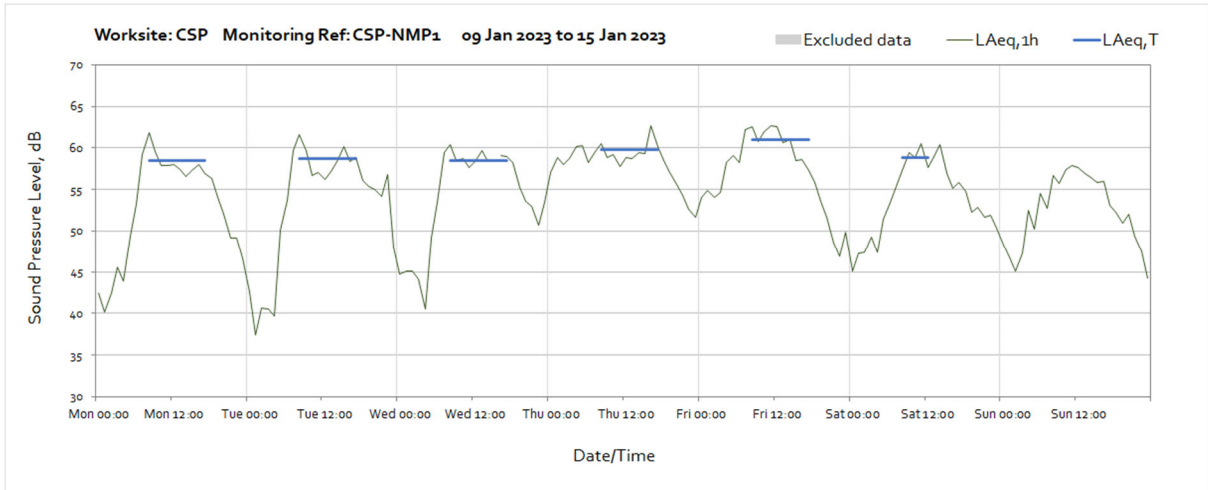
Worksite: CSP – Monitoring Ref: CSP-NMP1



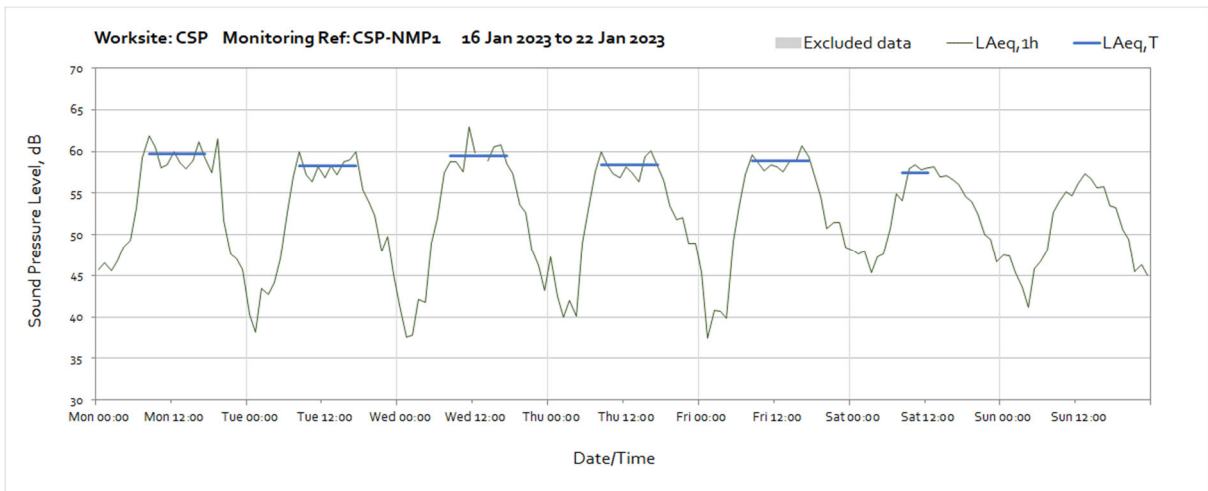
Note: Missing data between 01:00 and 02:00 on 1st January was due to data exporting issue.



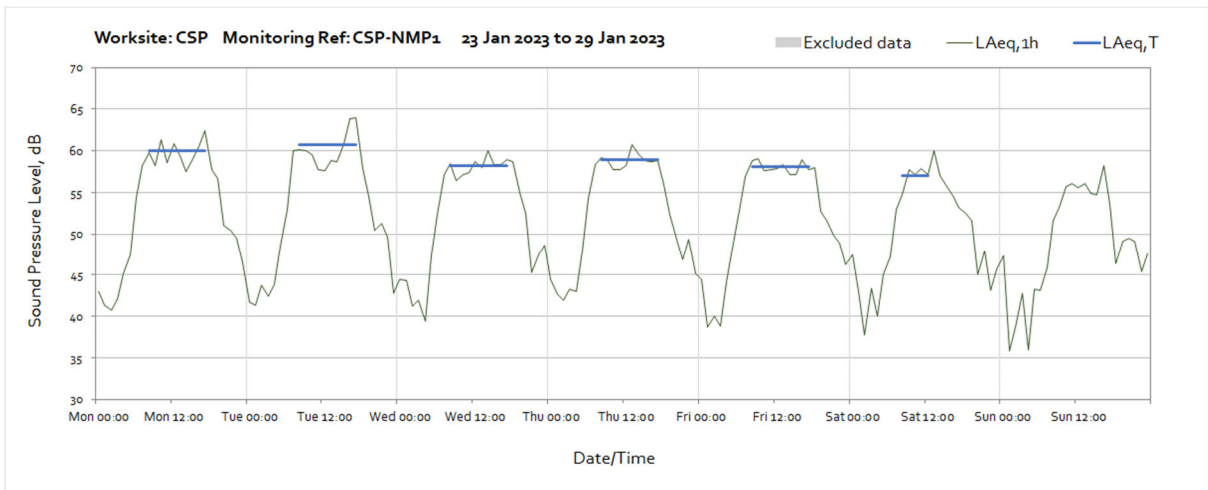
Note: Missing data between 18:00 on 5th January until 08:00 on 6th January was due to a monitor power issue.

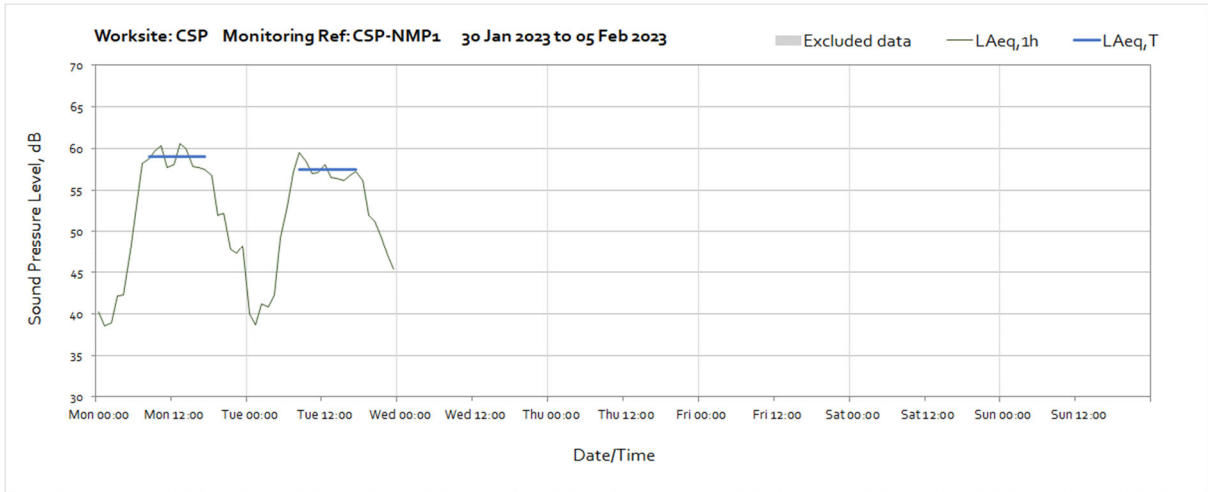


Note: Missing data between 15:00 and 16:00 on 11th January was due to monitor maintenance.

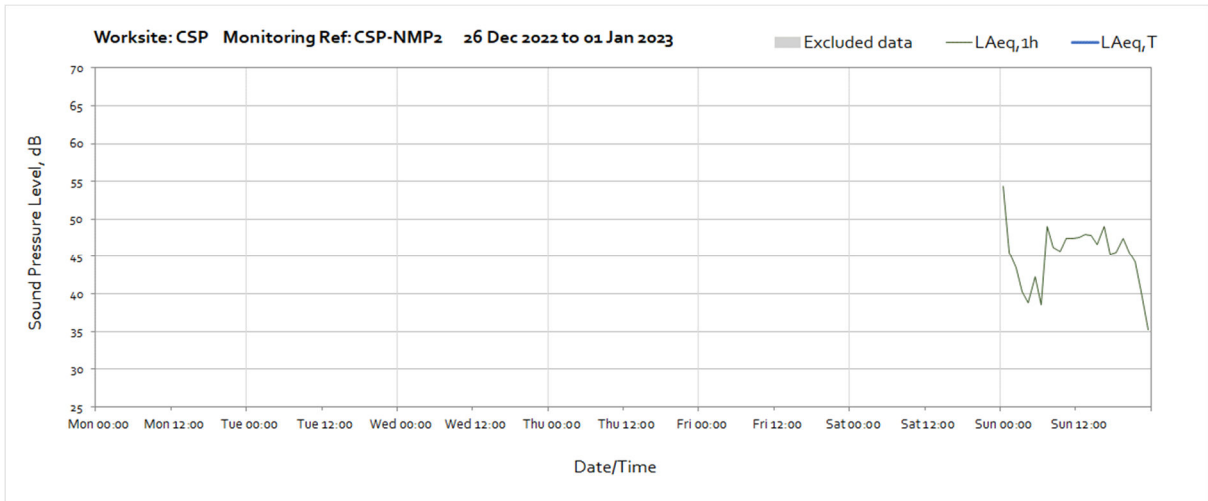


Note: Missing data between 13:00 and 14:00 was due to monitor field calibration.

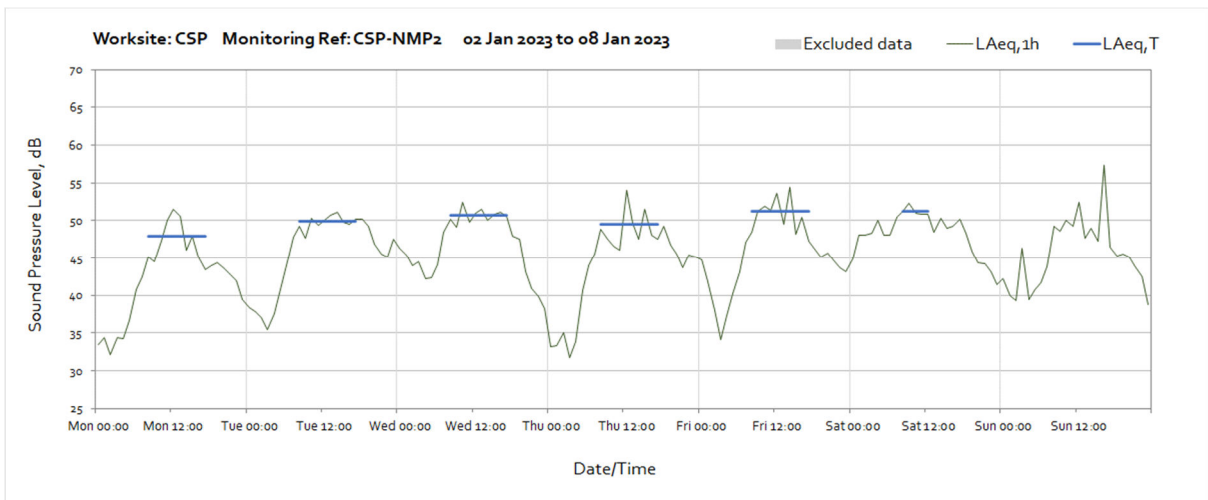


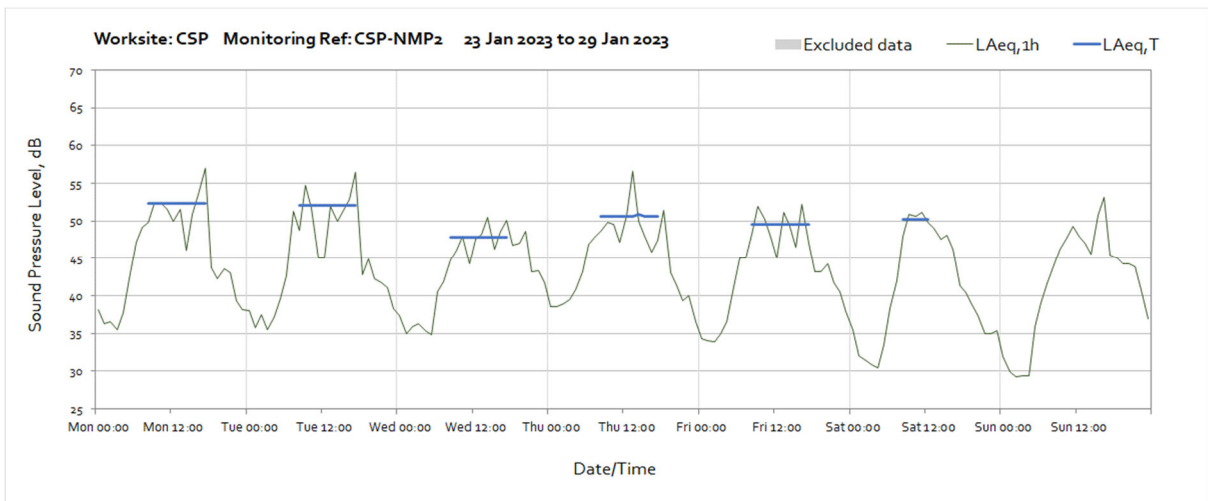
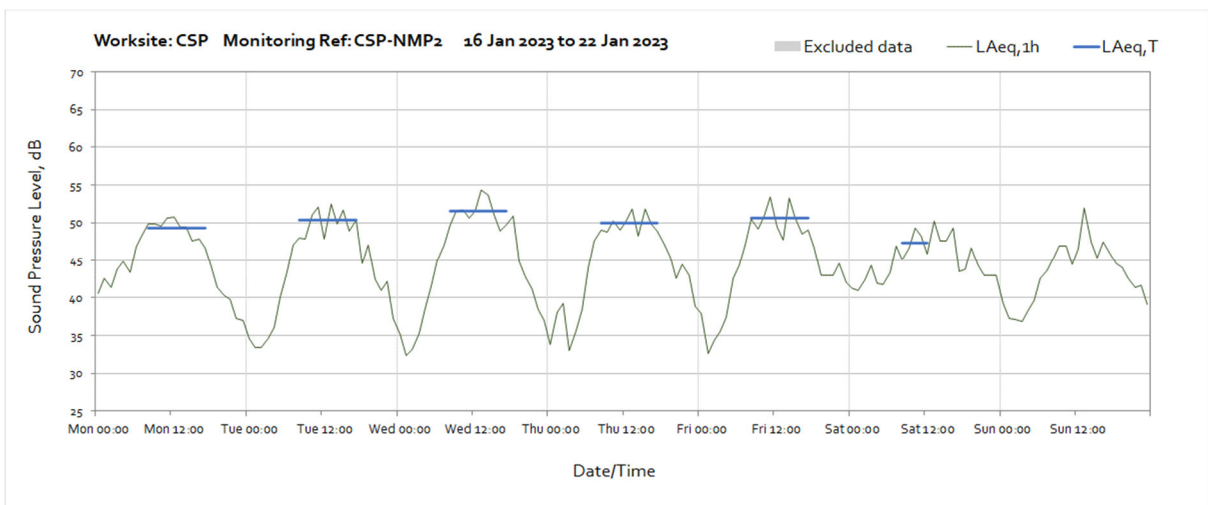
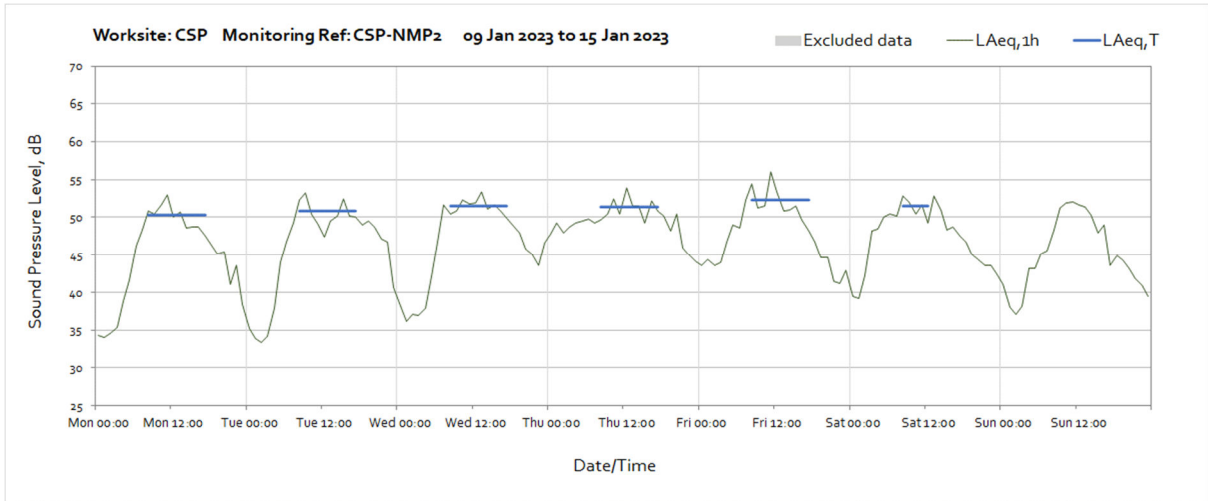


Worksite: CSP - Monitoring Ref: CSP-NMP2



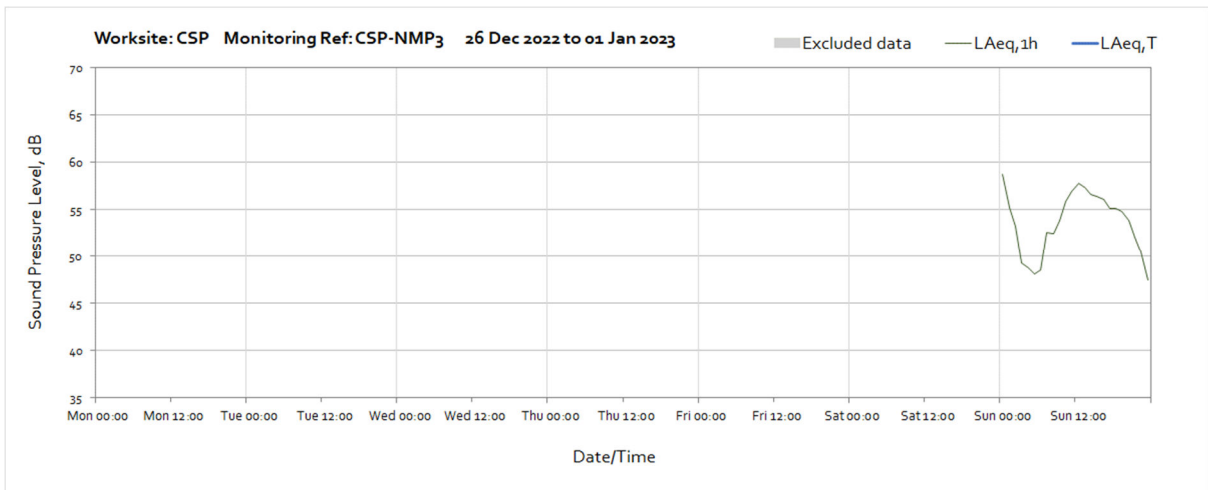
Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



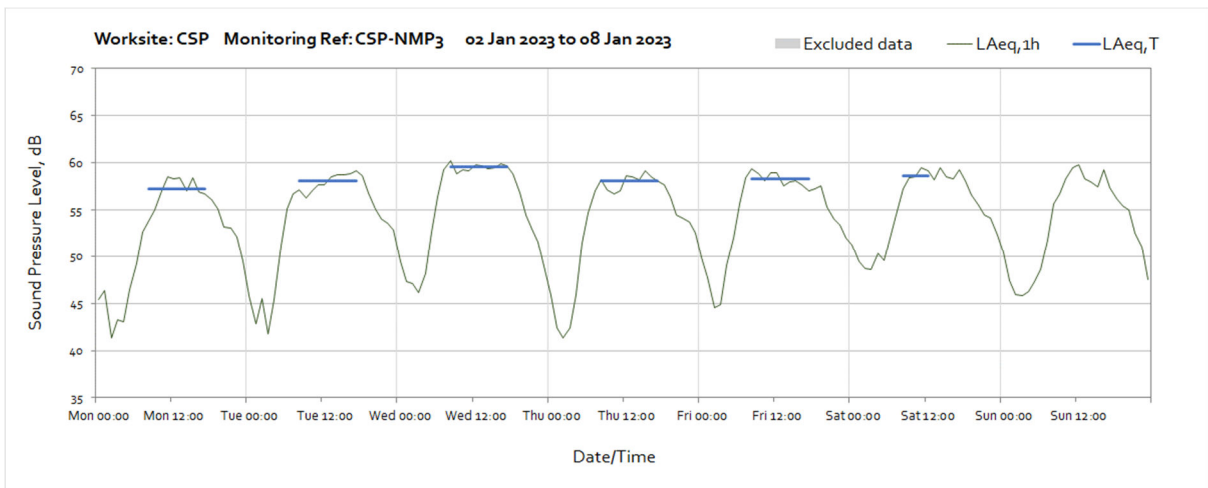


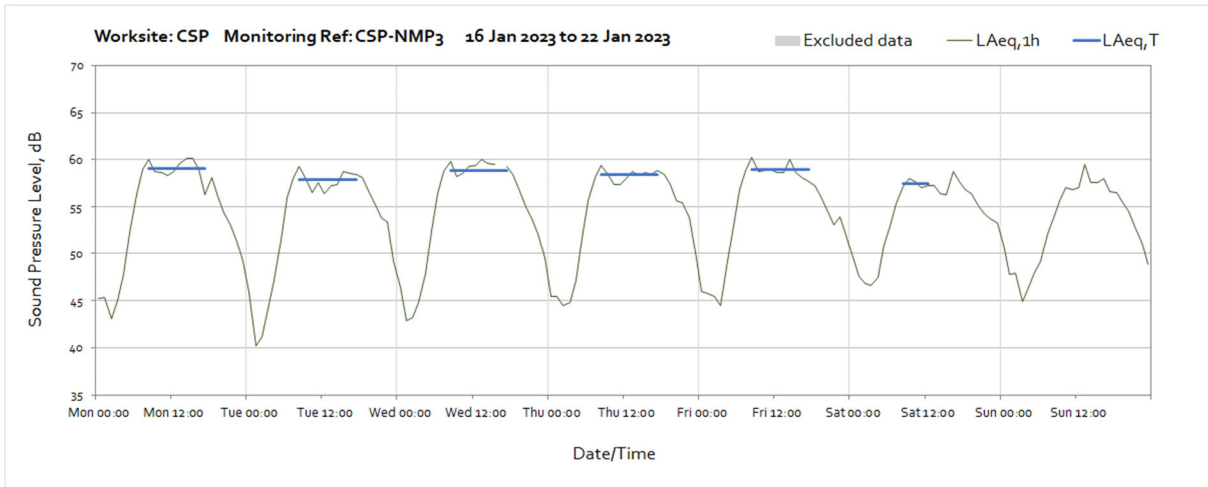
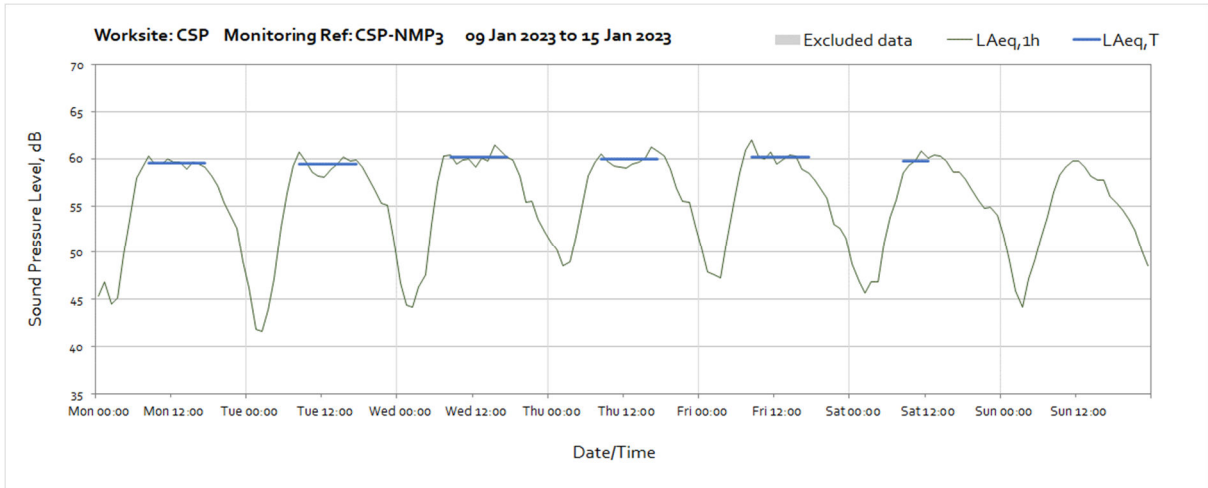


Worksite: CSP – Monitoring Ref: CSP-NMP3

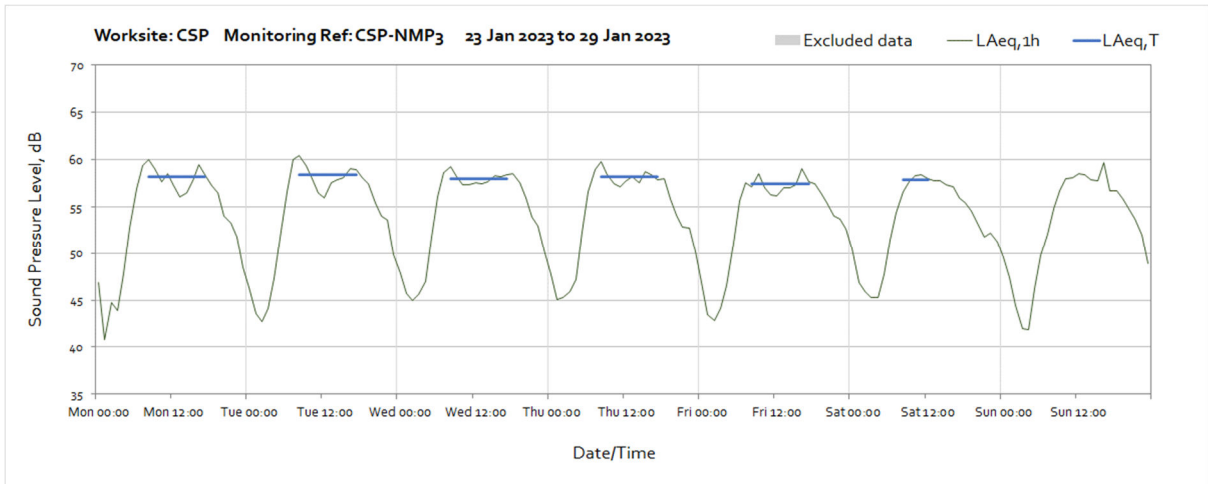


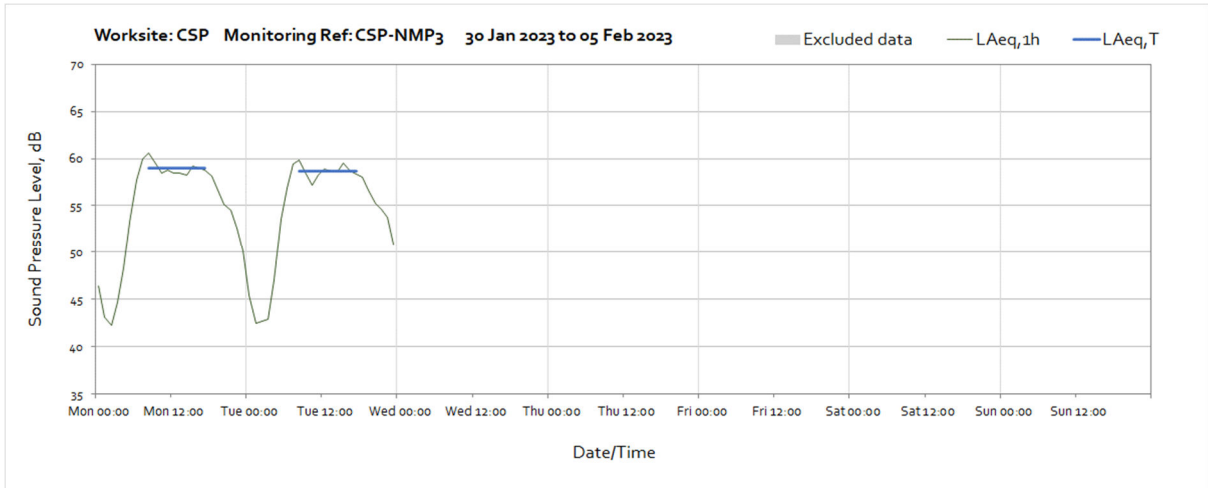
Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



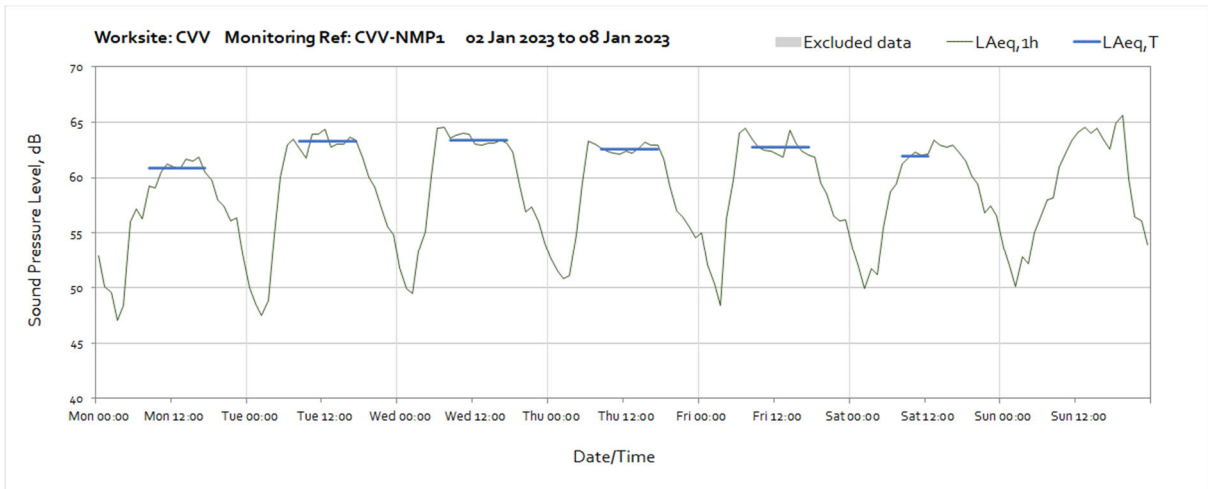
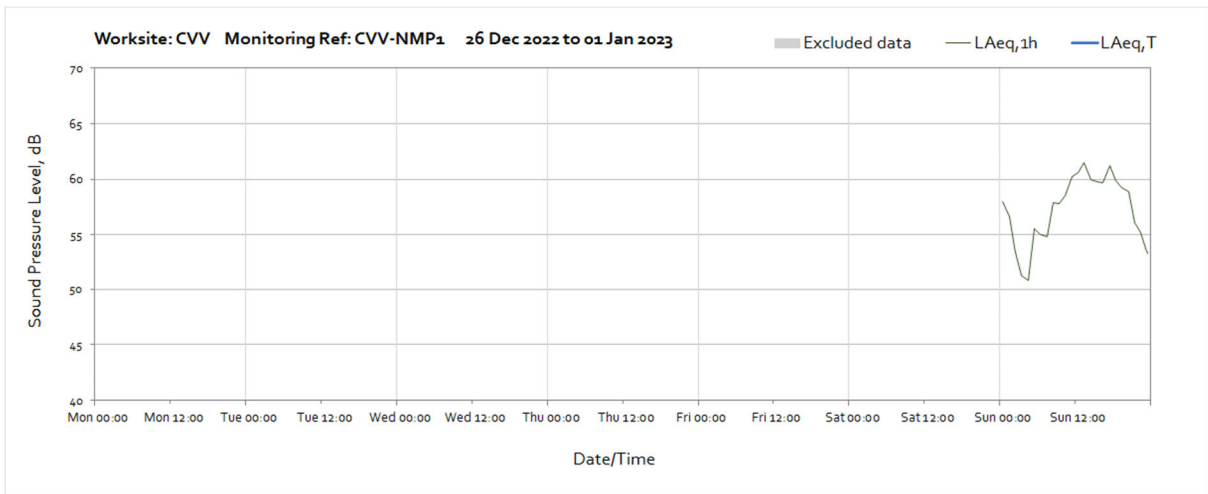


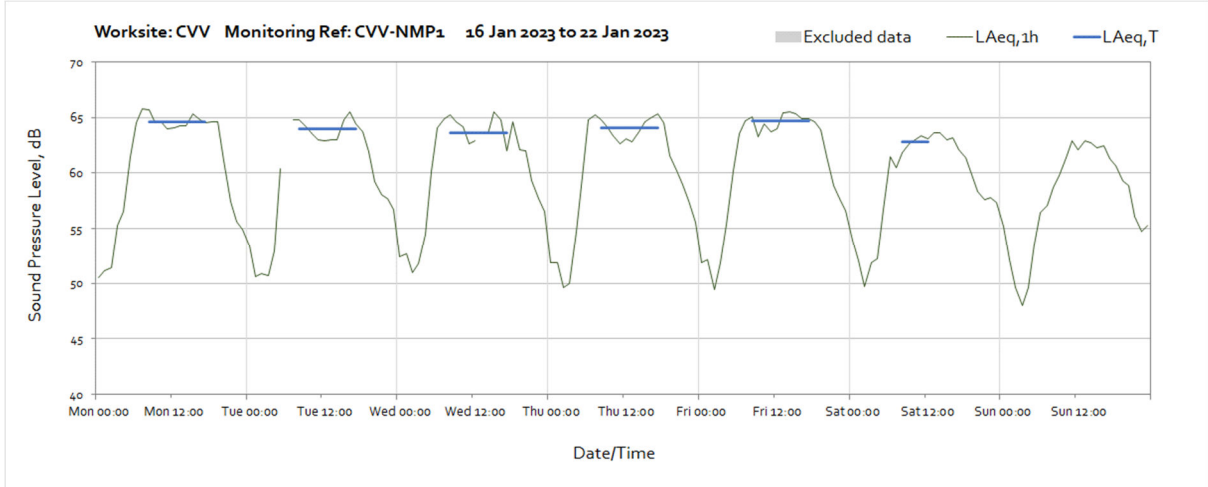
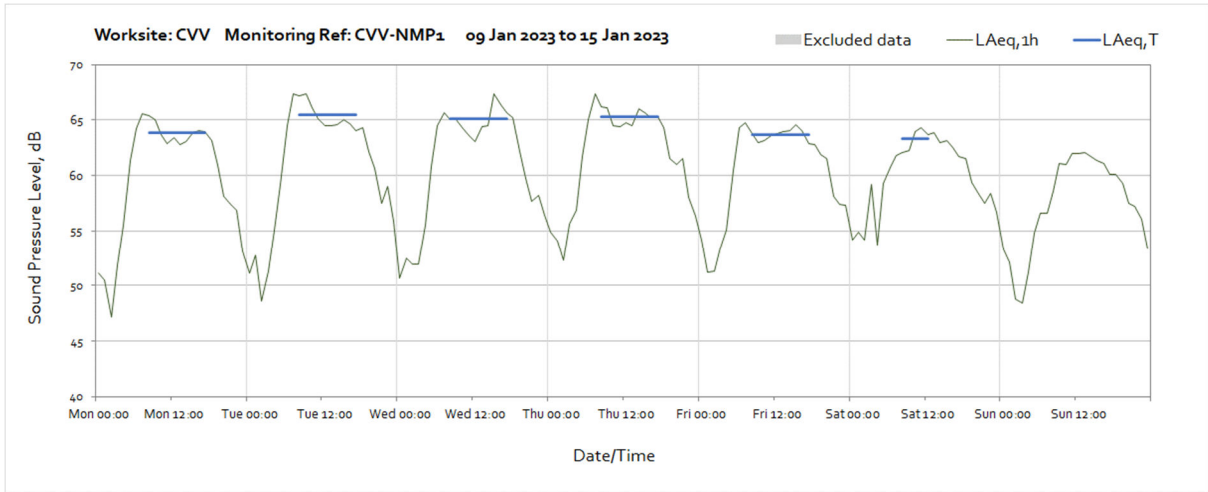
Note: Missing data between 16:00 and 17:00 on 18th January was due to monitor field calibration.



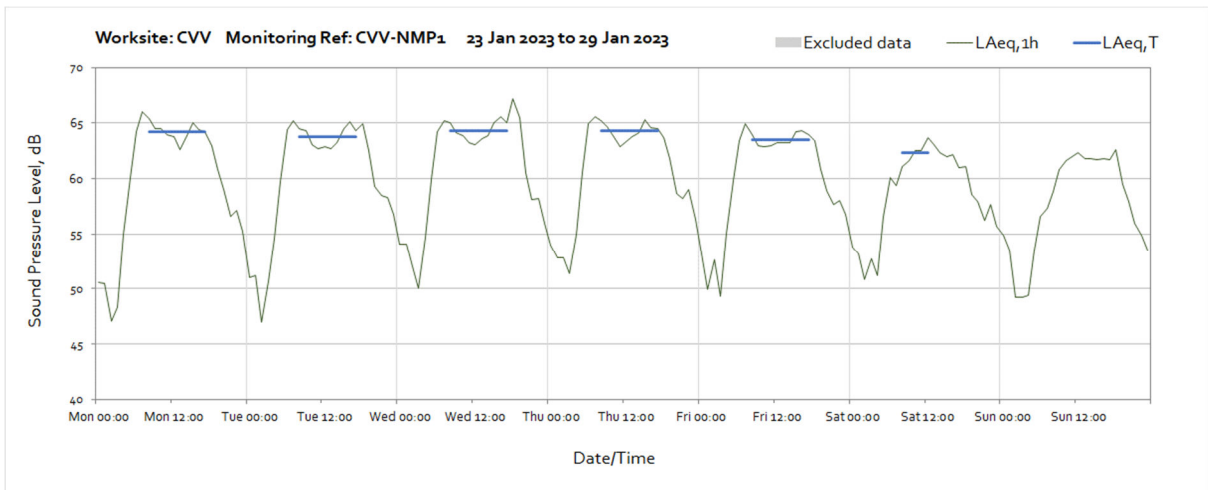


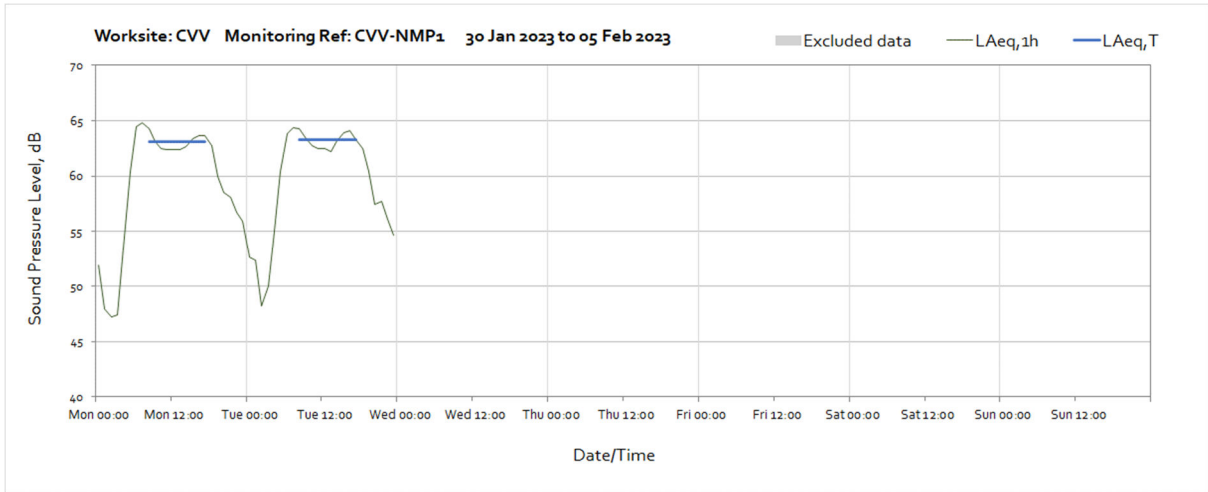
Worksite: CVV- Monitoring Ref: CVV-NMP1



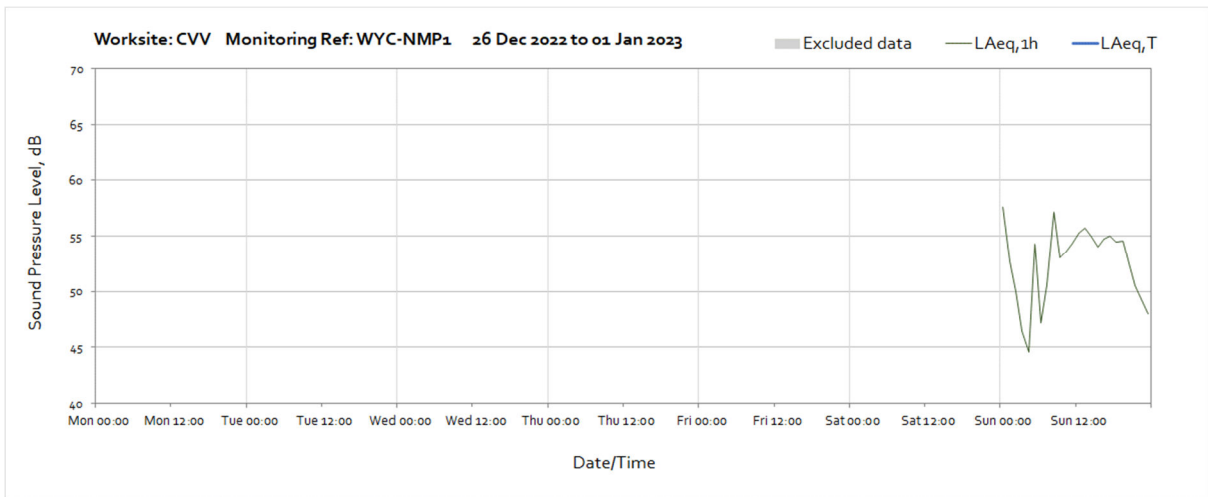


Note: Missing data between 06:00 and 07:00 on 17th January was due to monitor maintenance. Missing data between 13:00 and 14:00 on 18th January was due to monitor field calibration.

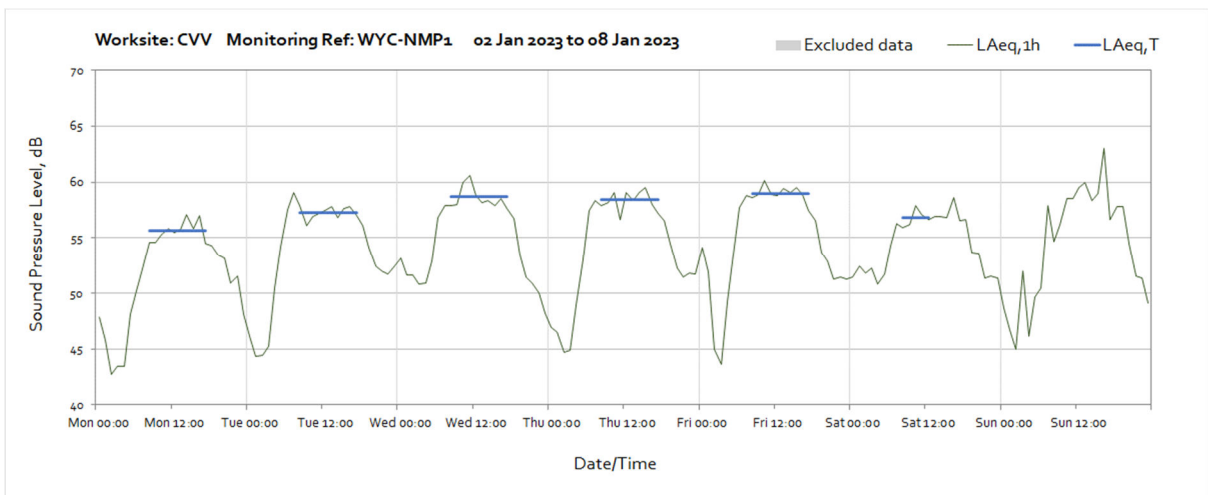


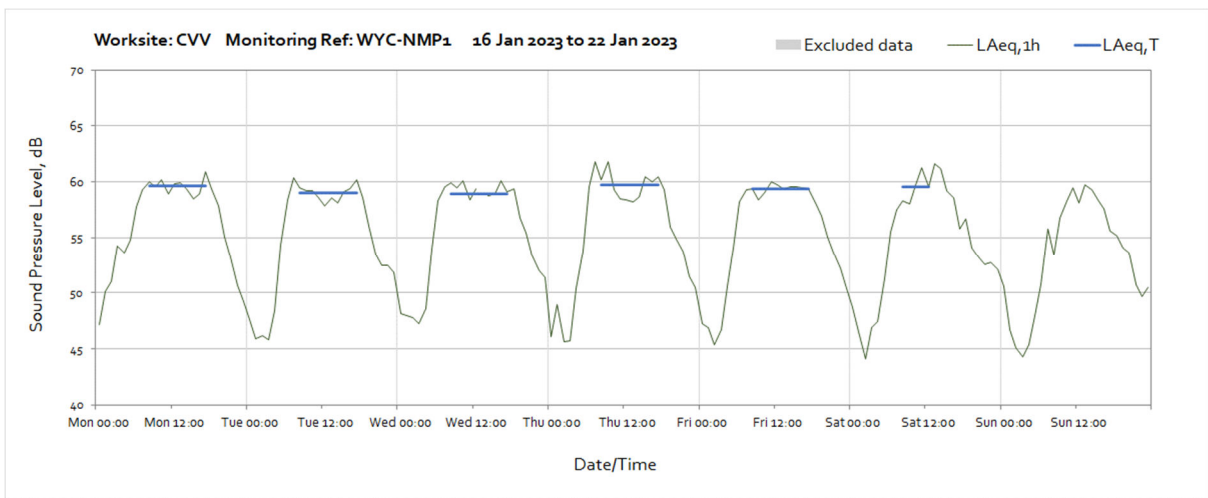
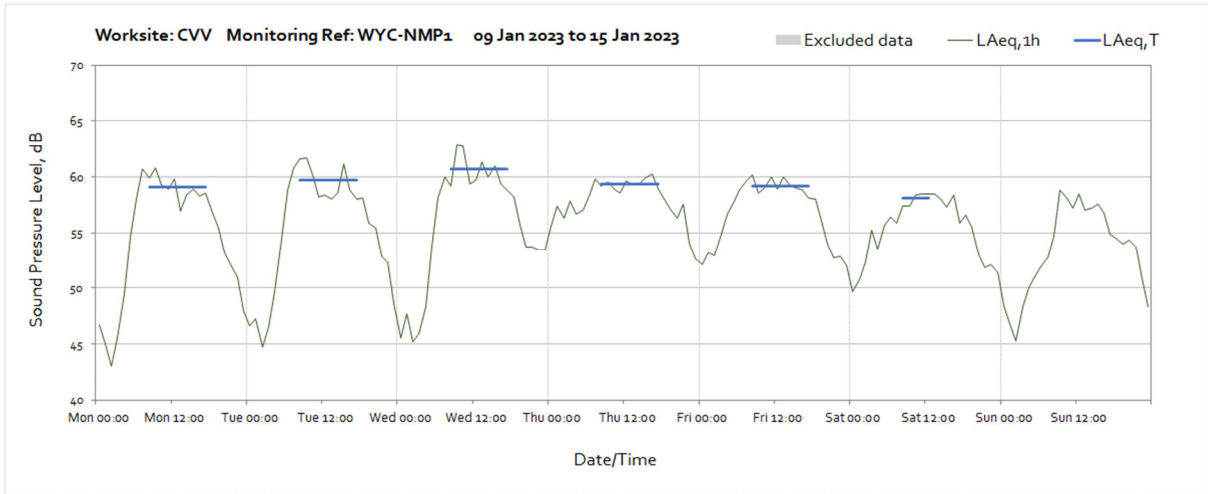


Worksite: CVV – Monitoring Ref: WYC-NMP1

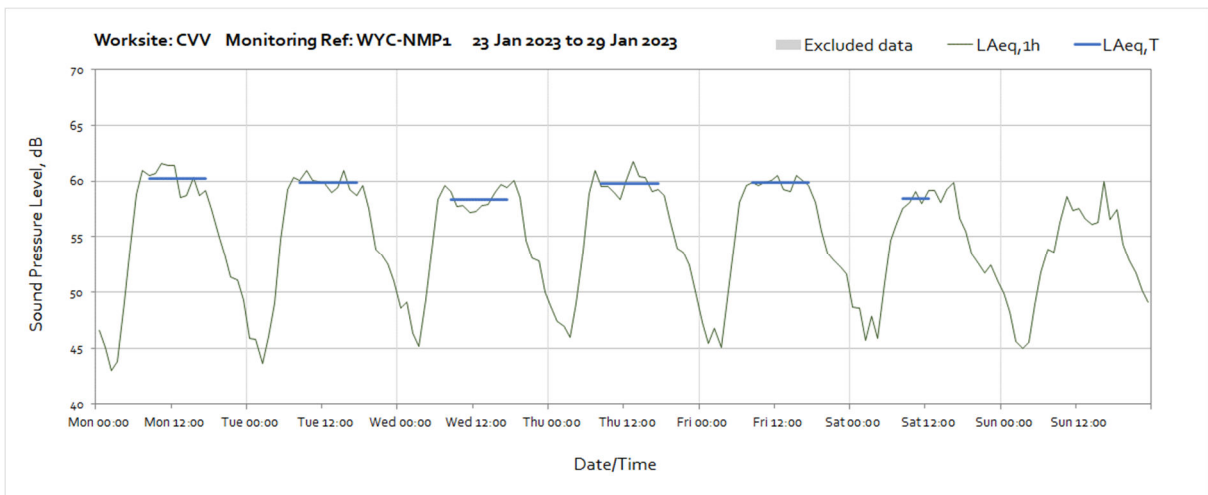


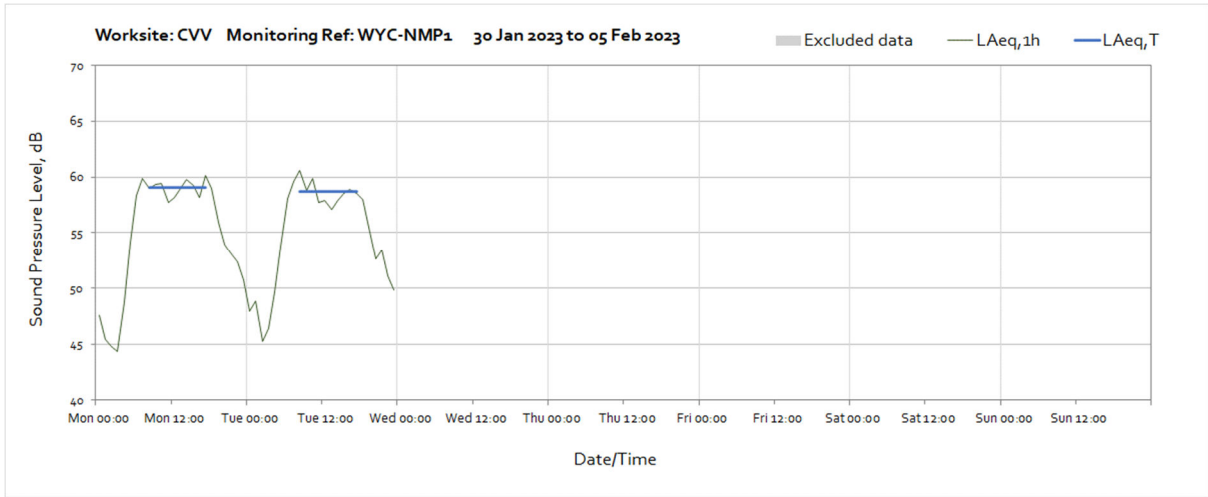
Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



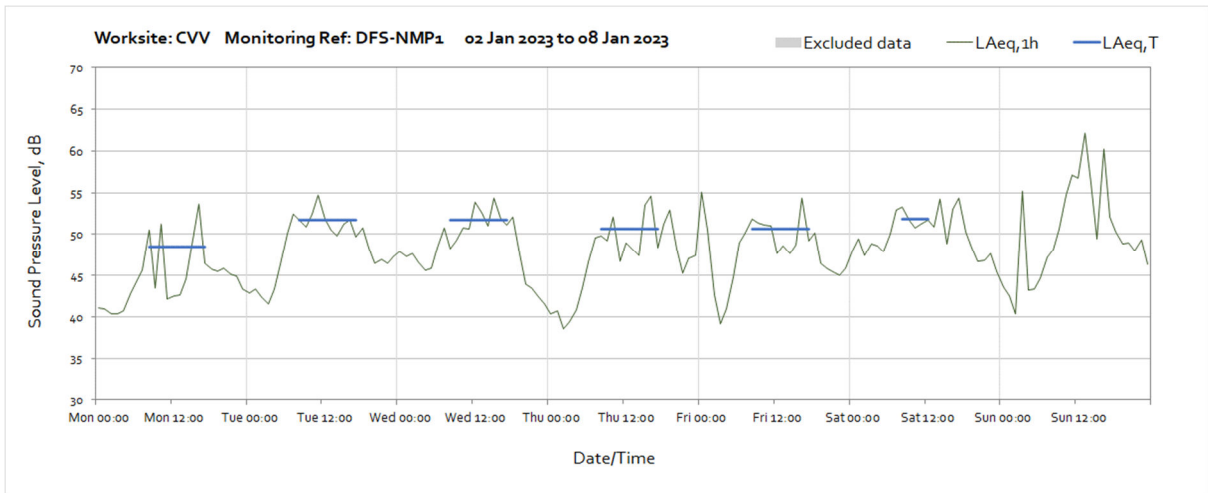
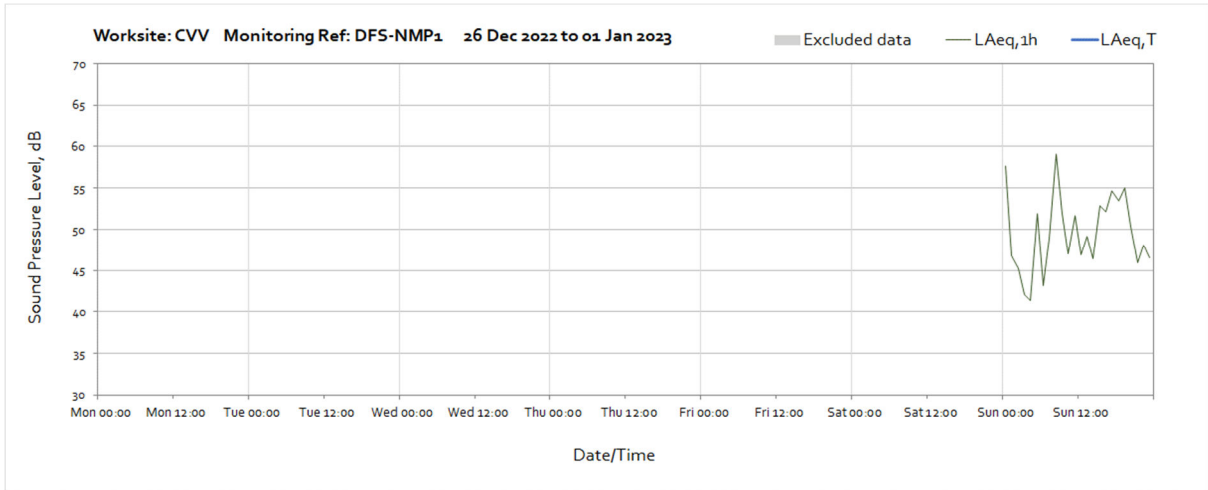


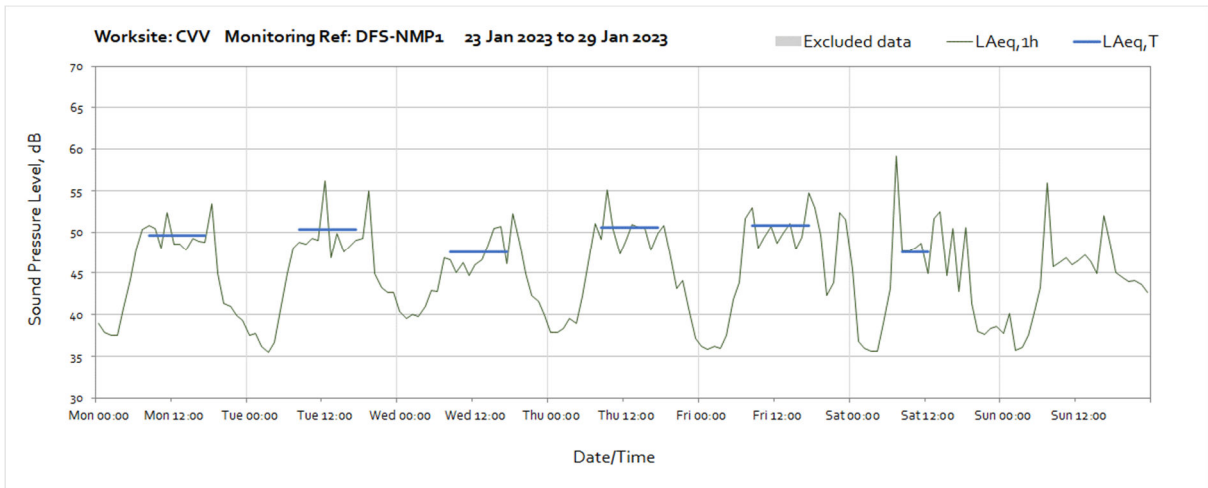
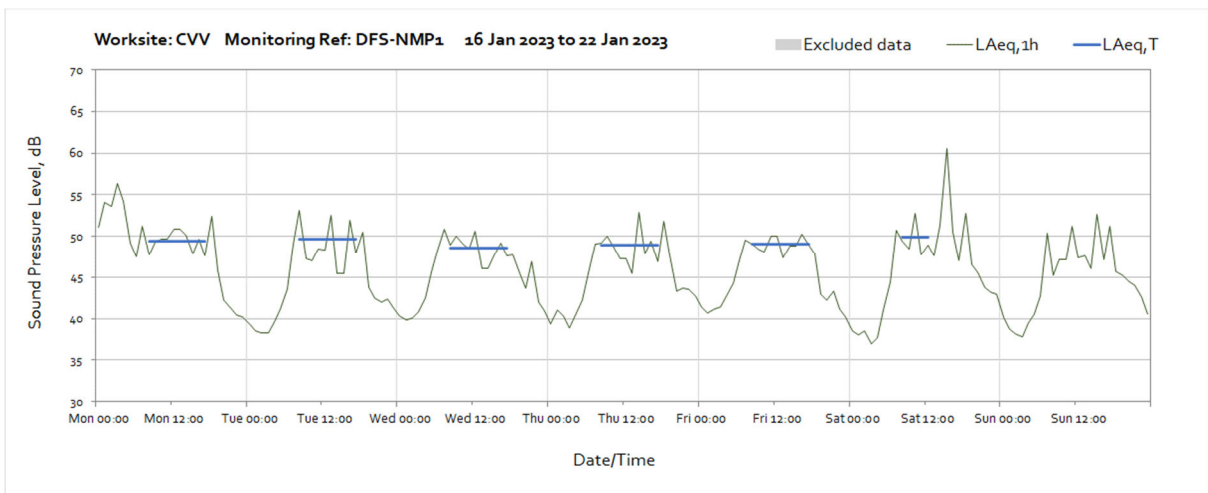
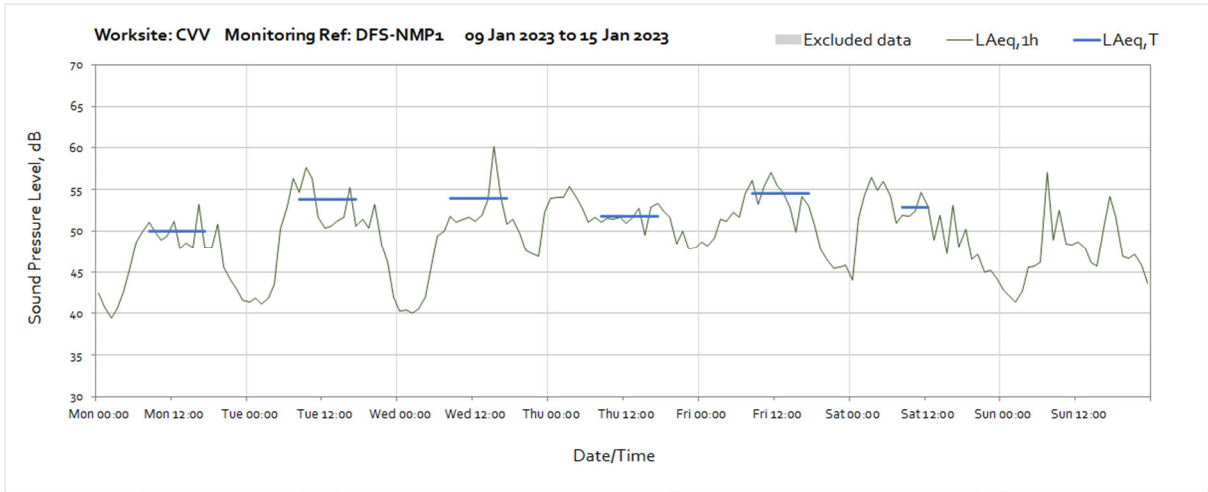
Note: Missing data between 13:00 and 14:00 on 18th January was due to monitor field calibration.

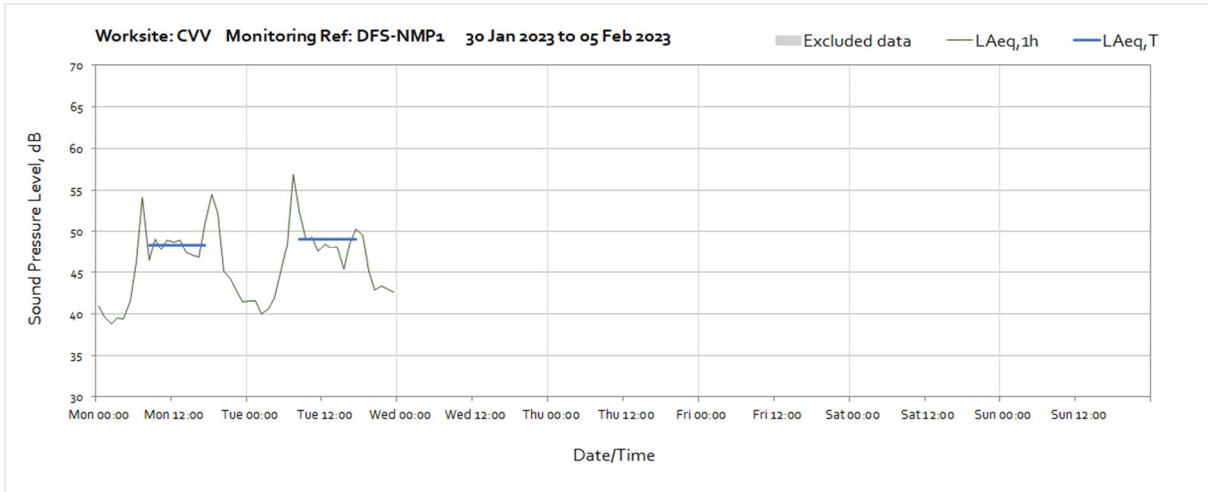




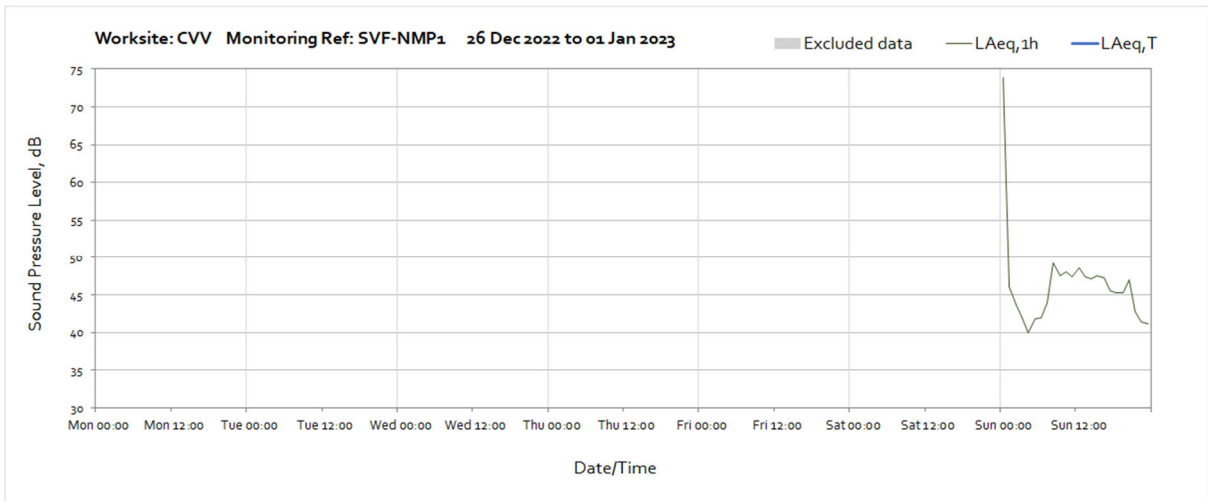
Worksite: CVV – Monitoring Ref: DFS-NMP1



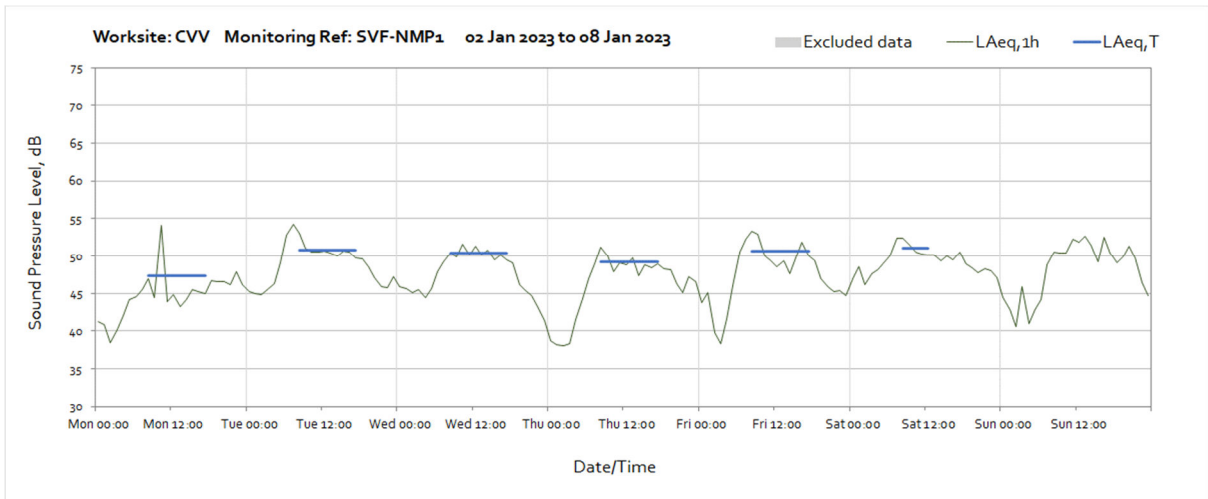


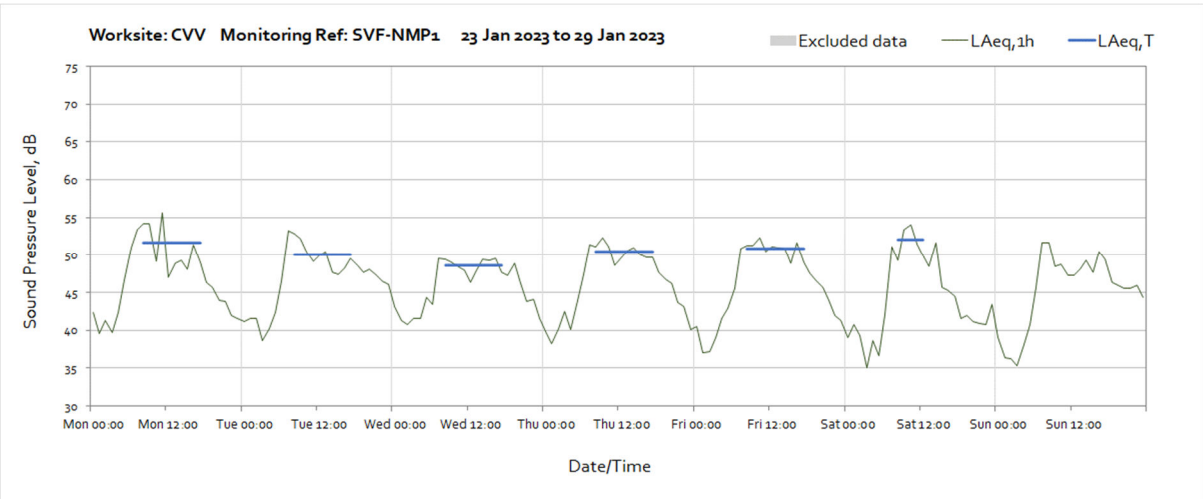
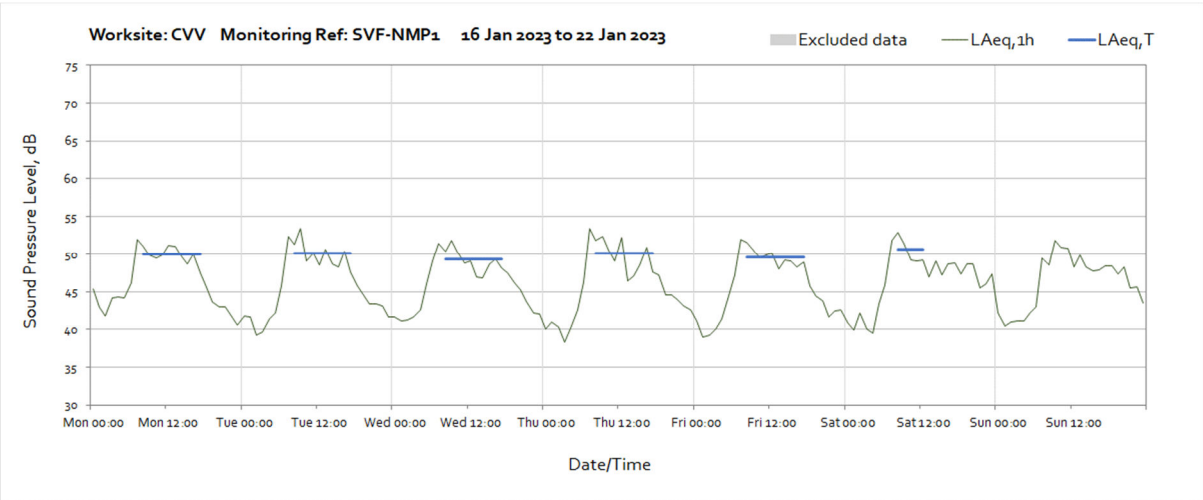
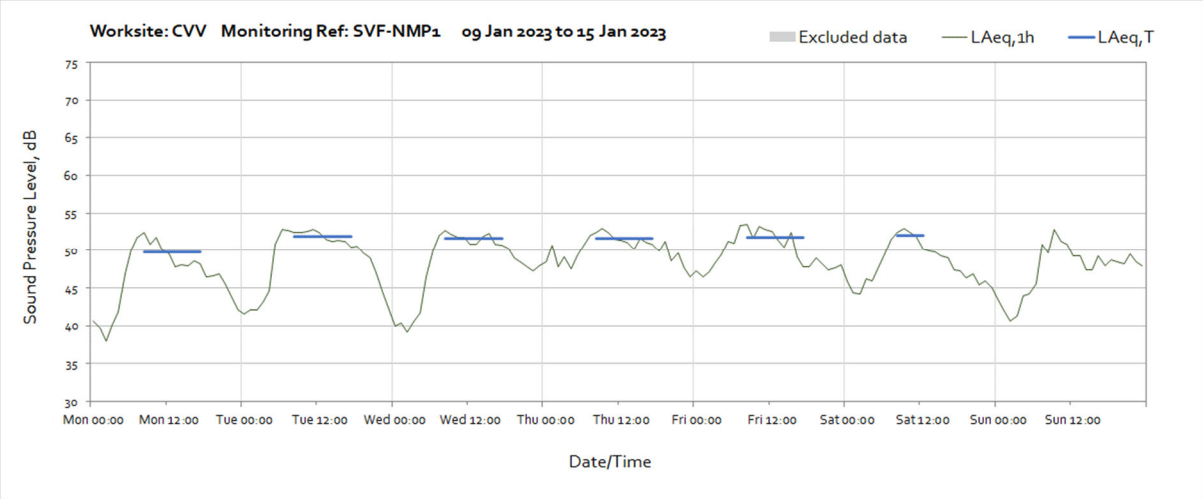


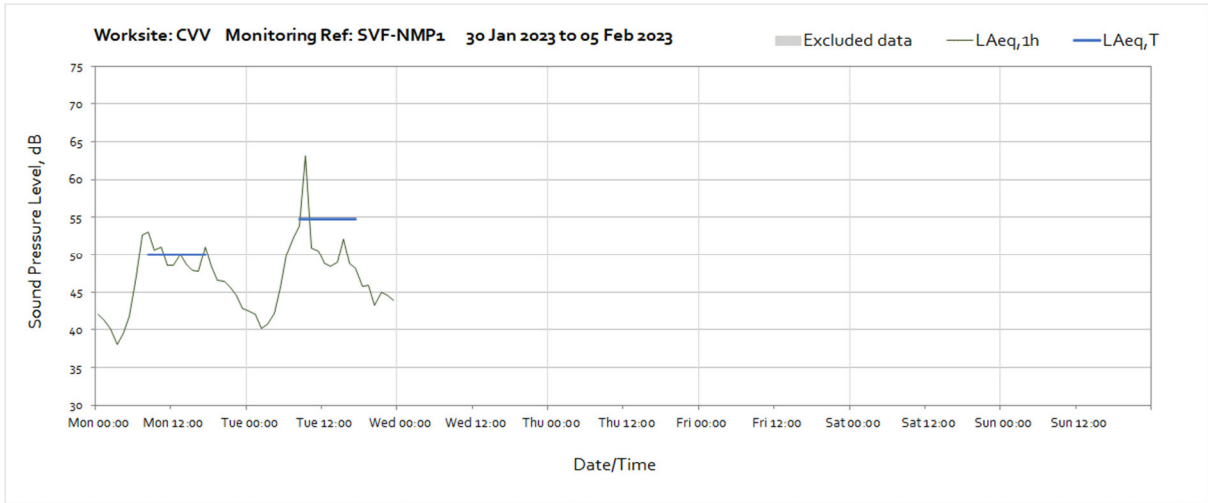
Worksite: CVV – Monitoring Ref: SVF-NMP1



Note: High noise levels measured at 00:00 on Sunday 1st January were due to New Year Night celebration.



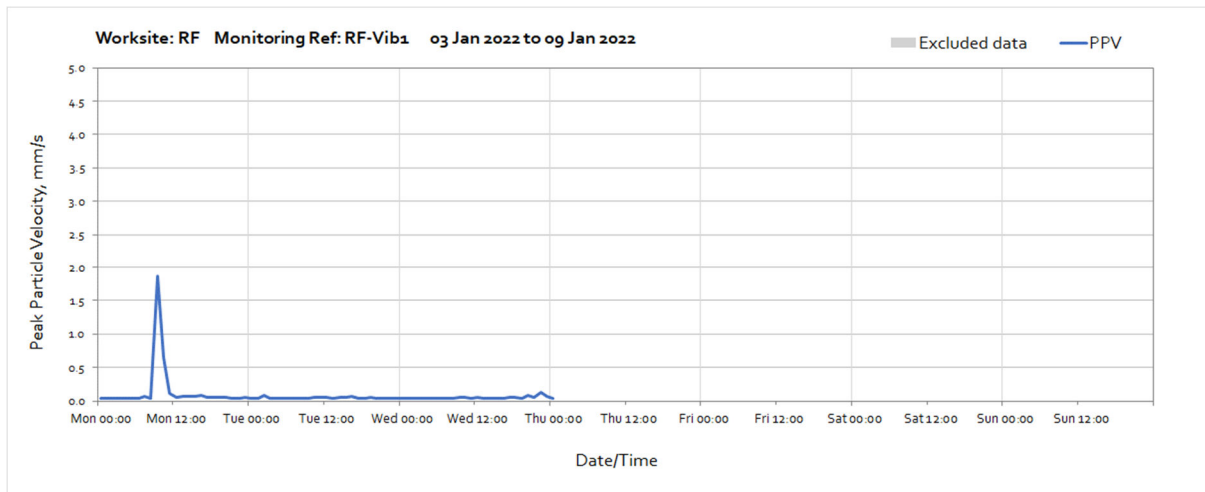
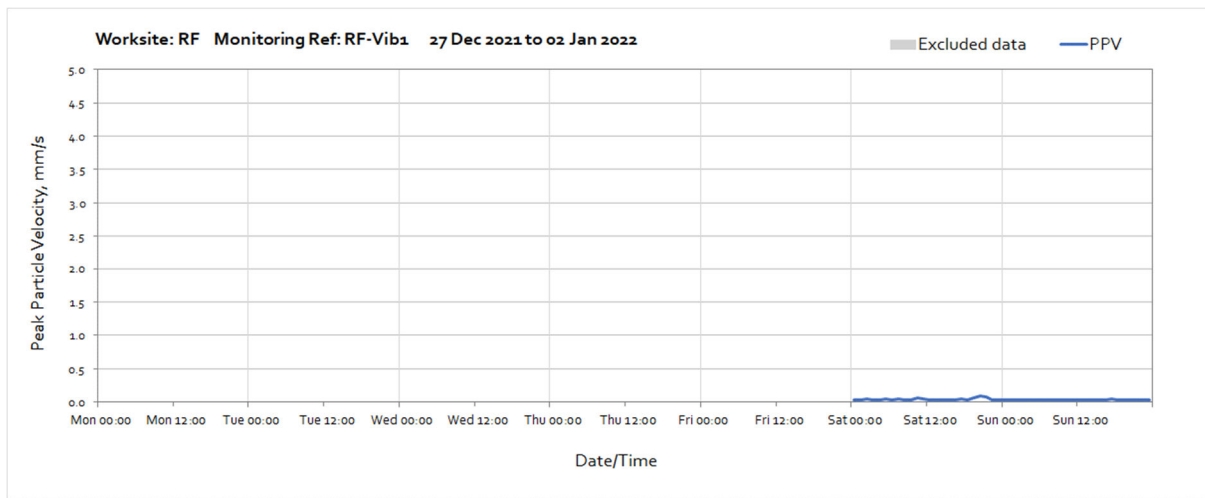




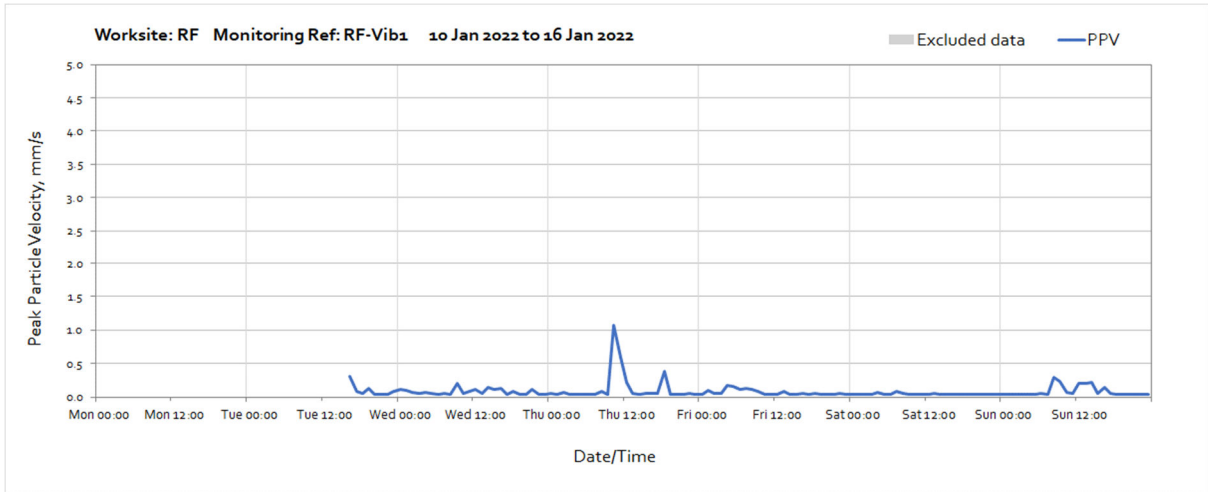
Vibration

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

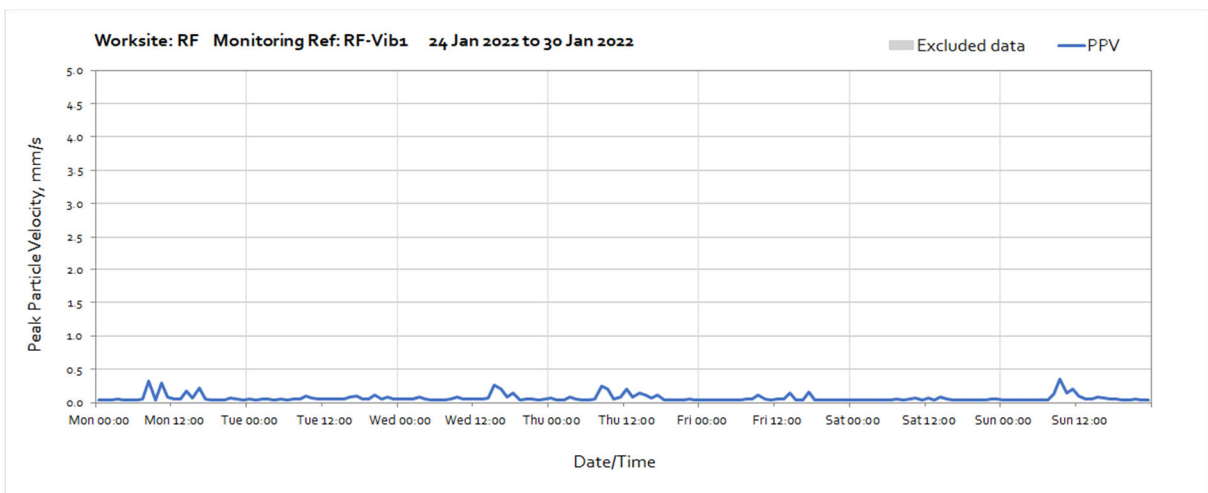
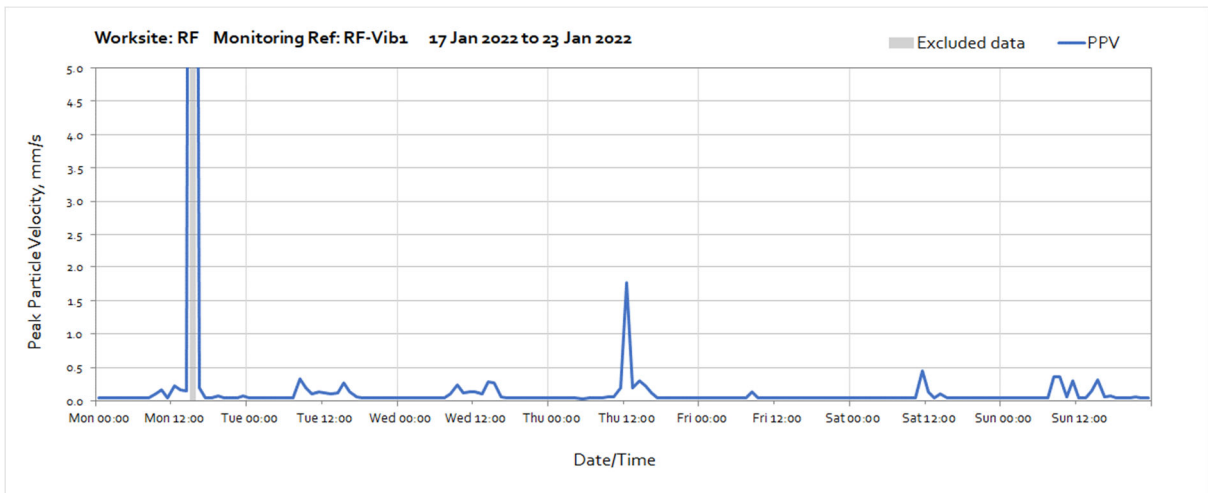
Worksite: RF – Monitoring Ref: RF-Vib 1

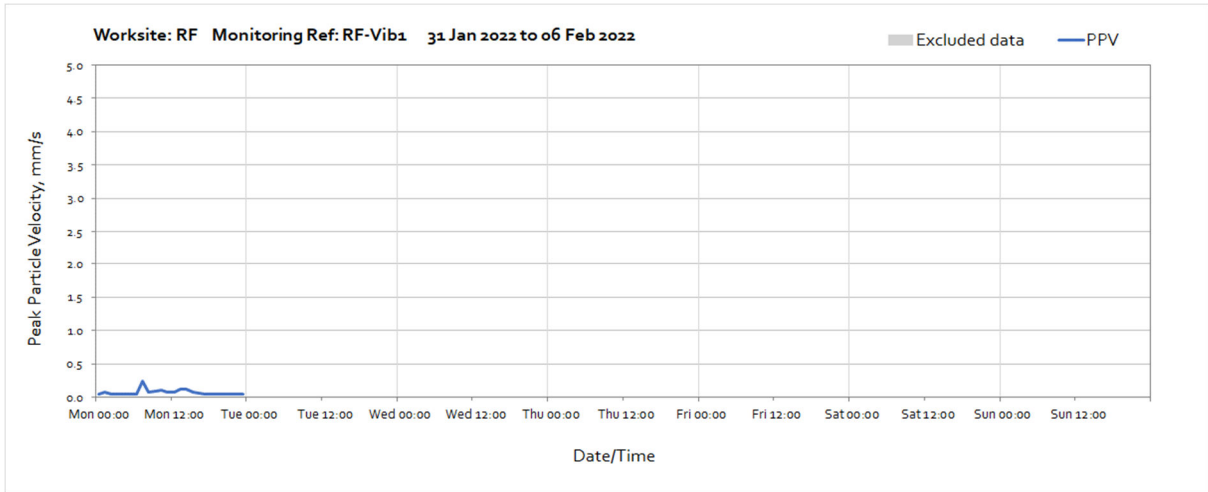


Note: Missing data between 01:00 on 6th January until 16:00 on 11th January was due to loss of power to the monitor.

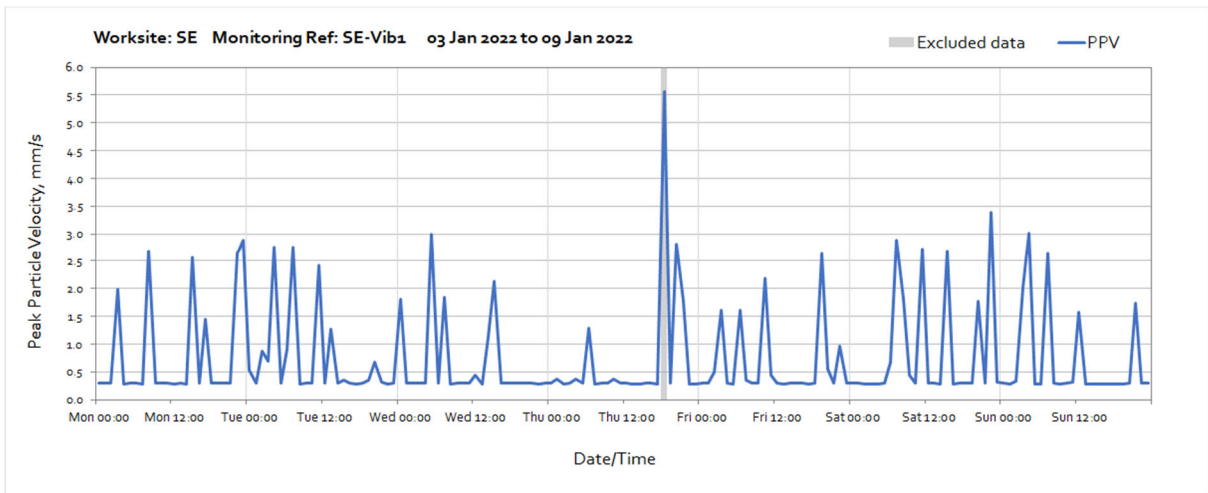
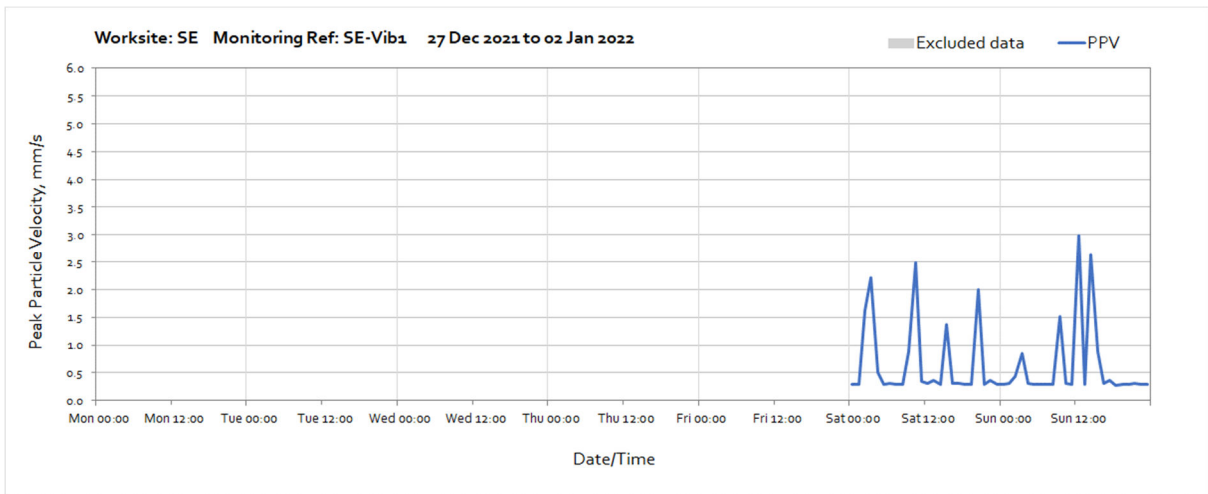


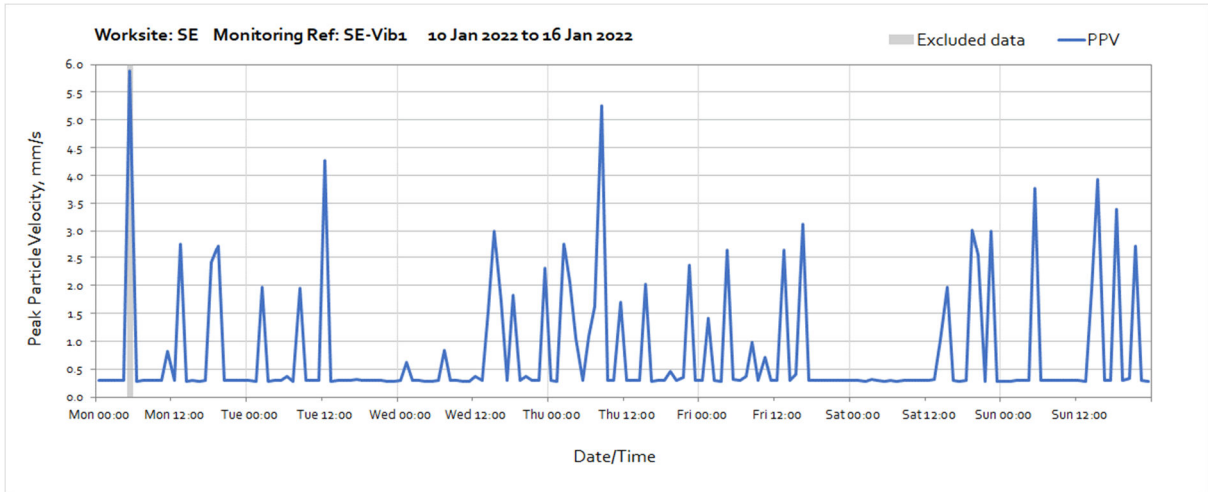
Note: Missing data between 01:00 on 6th January until 16:00 on 11th January was due to loss of power to the monitor.



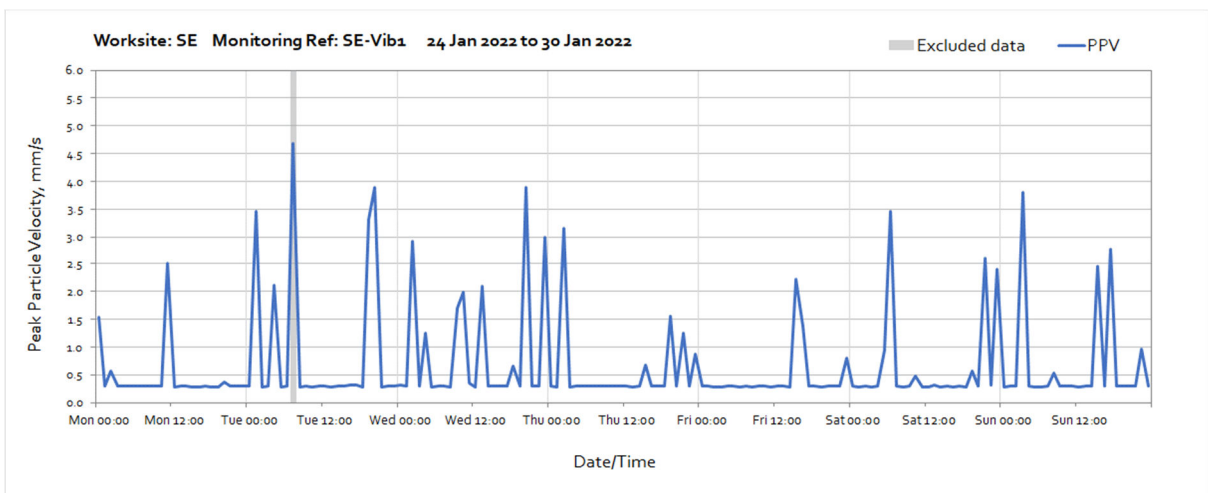
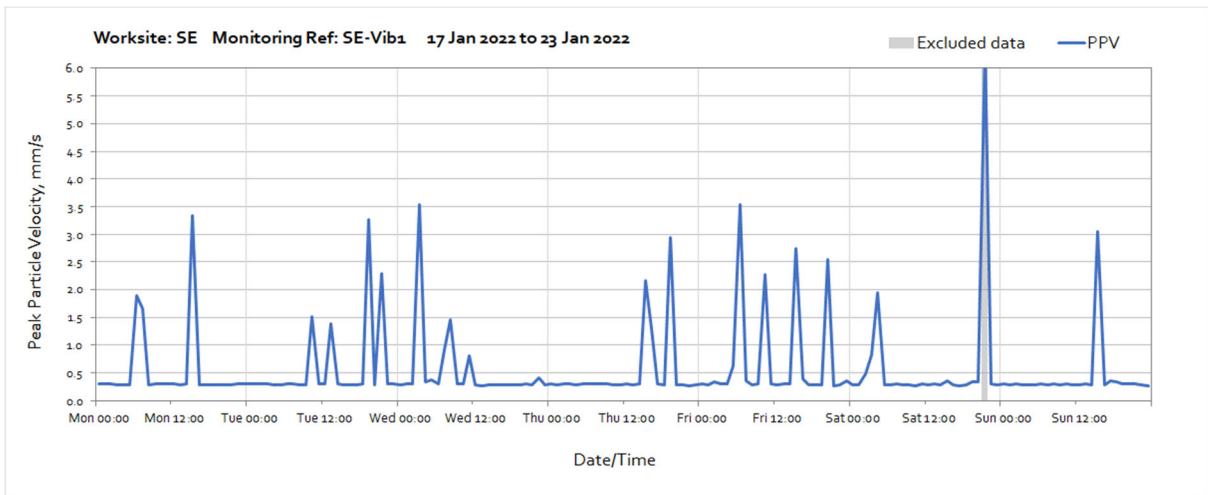


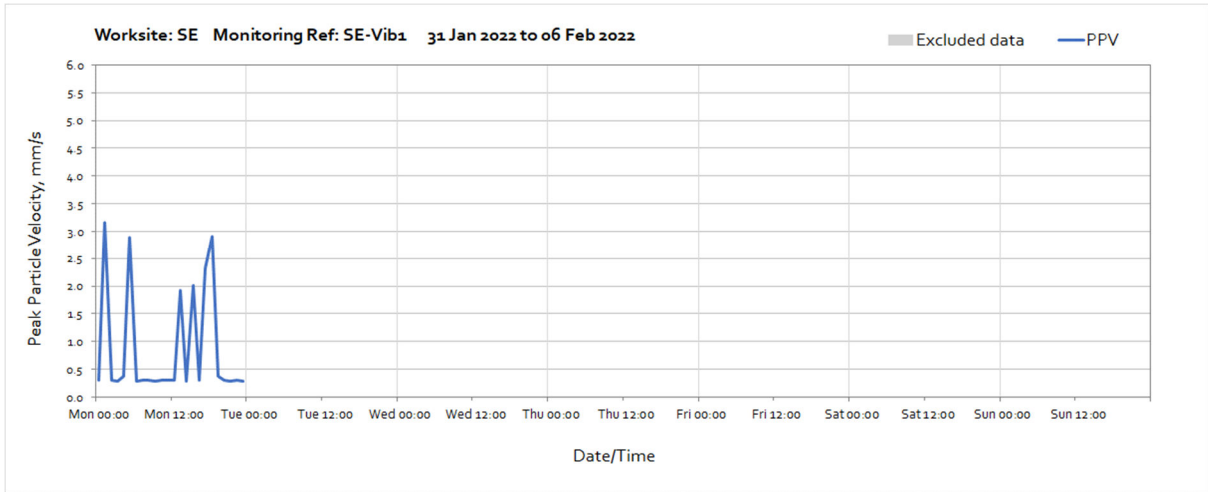
Worksite: SE - Monitoring Ref: SE-Vib 1



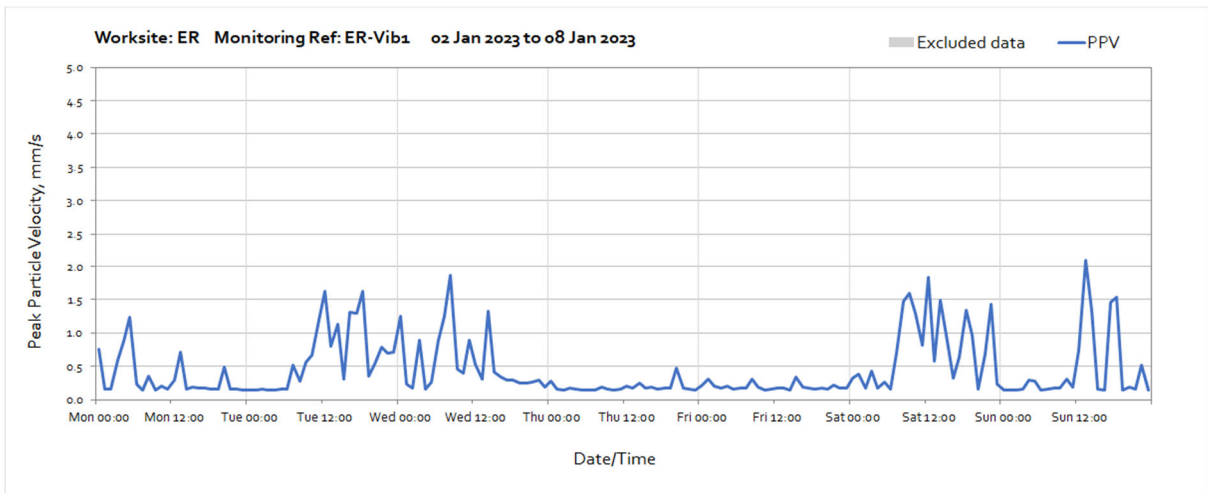
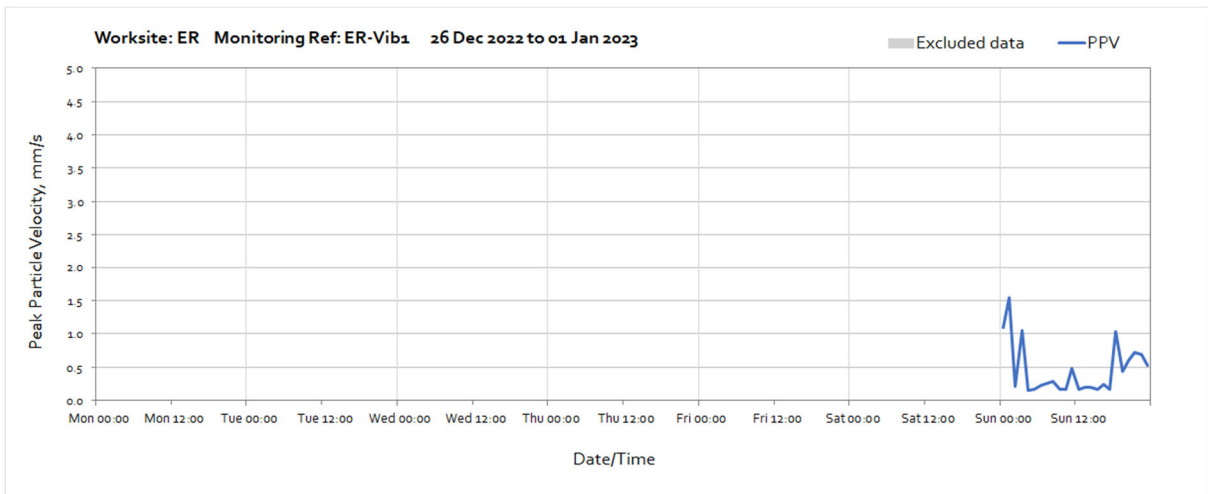


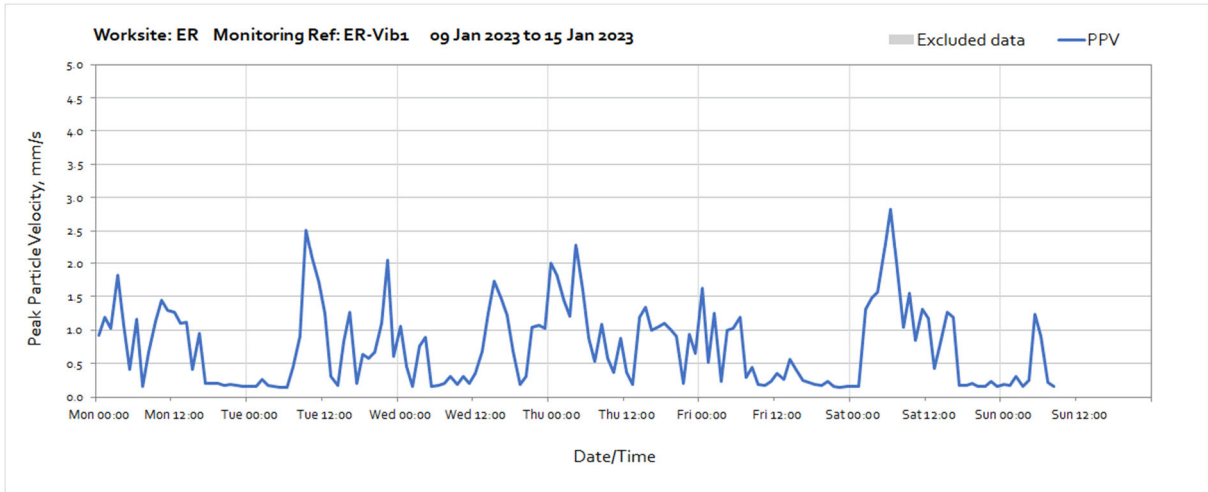
Note: High vibration levels during working hours are due to plant movements near to the vibration monitor. The nearest receptor is 50 metres away.



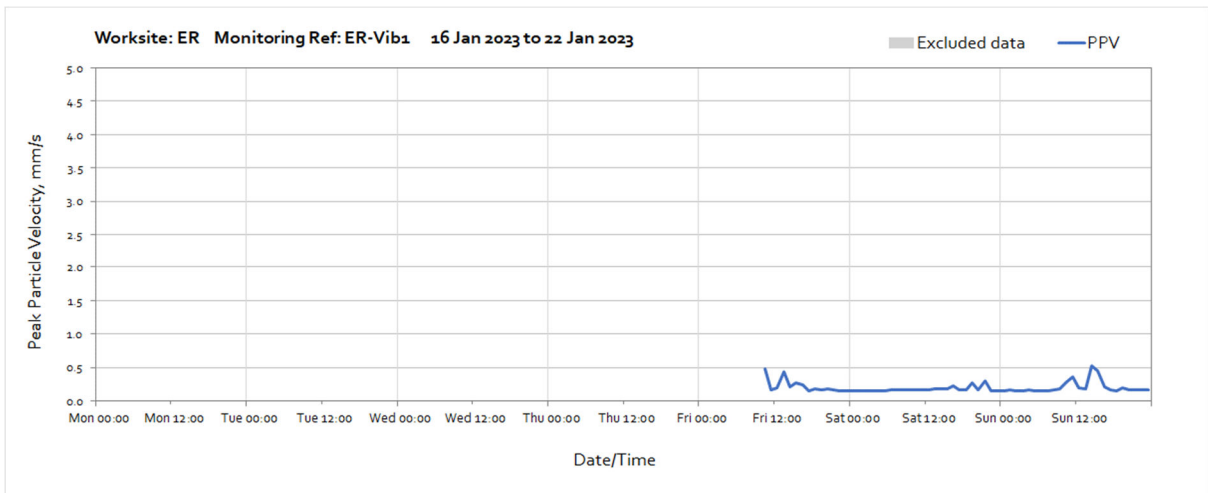


Worksite: WGT - Monitoring Ref: ER-Vib 1

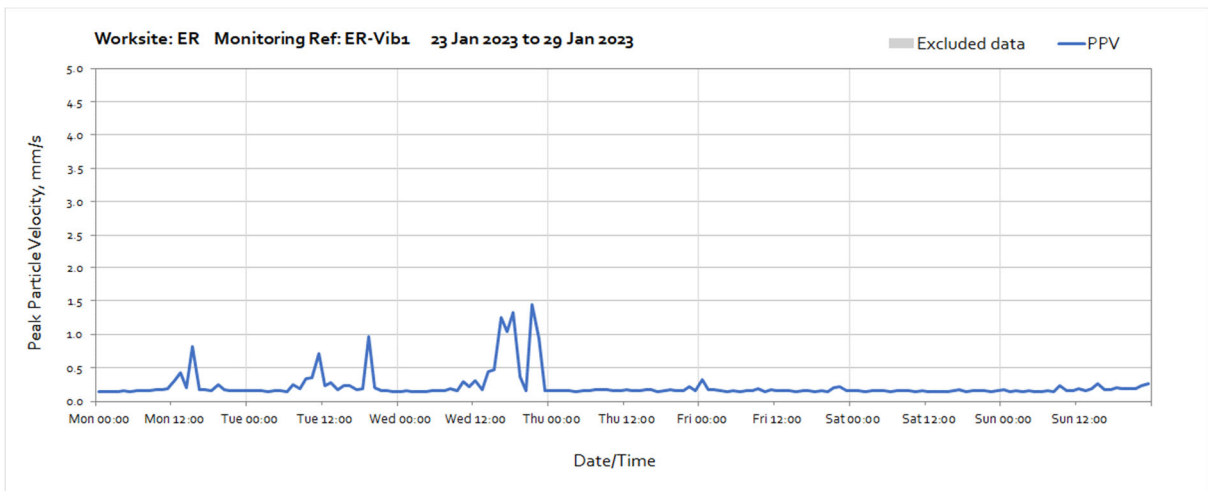


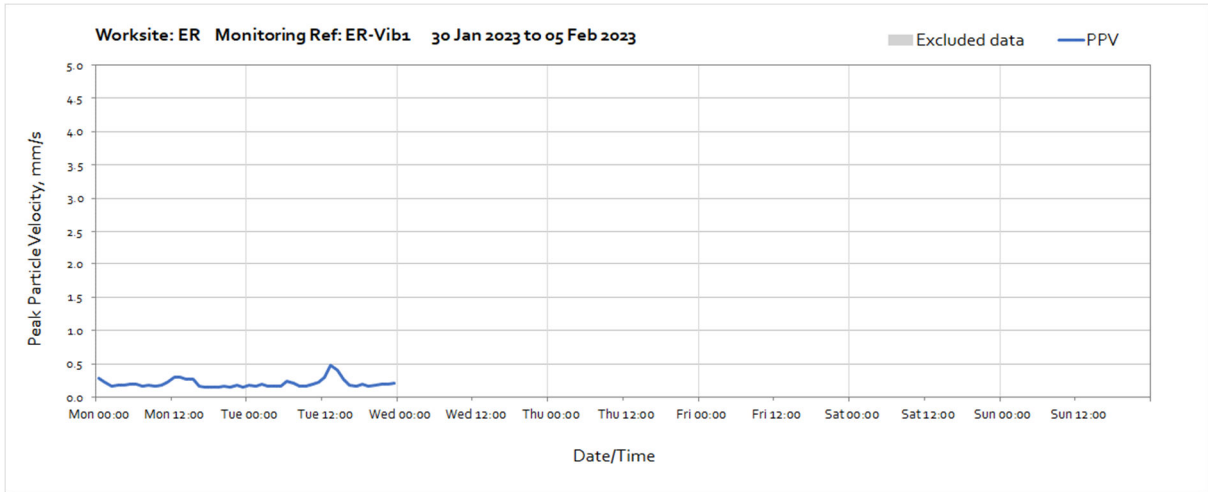


Note: Missing data between 09:00 on 15th January and 10:00 on 20th January was due to depleted monitor battery.

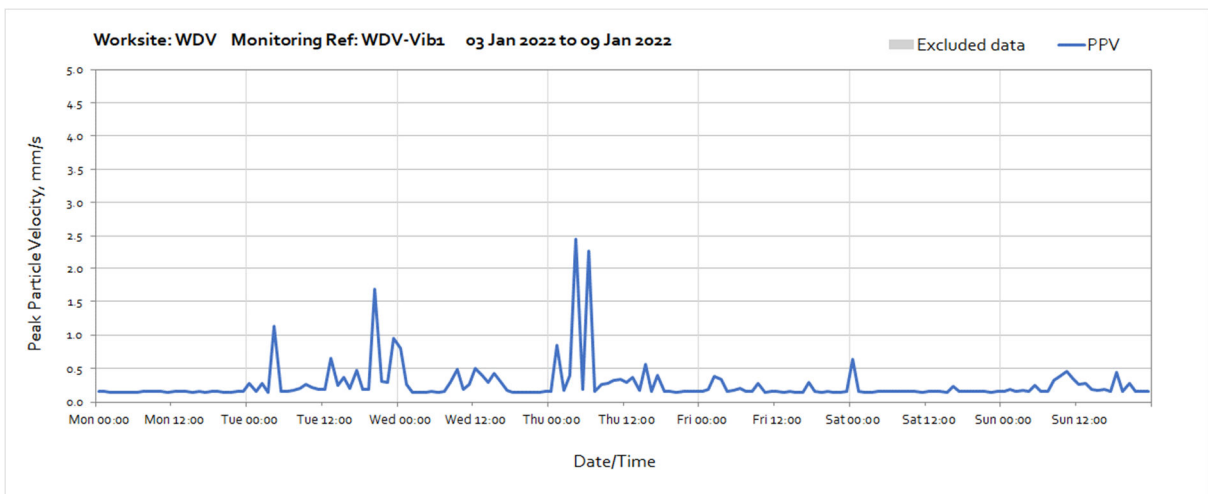
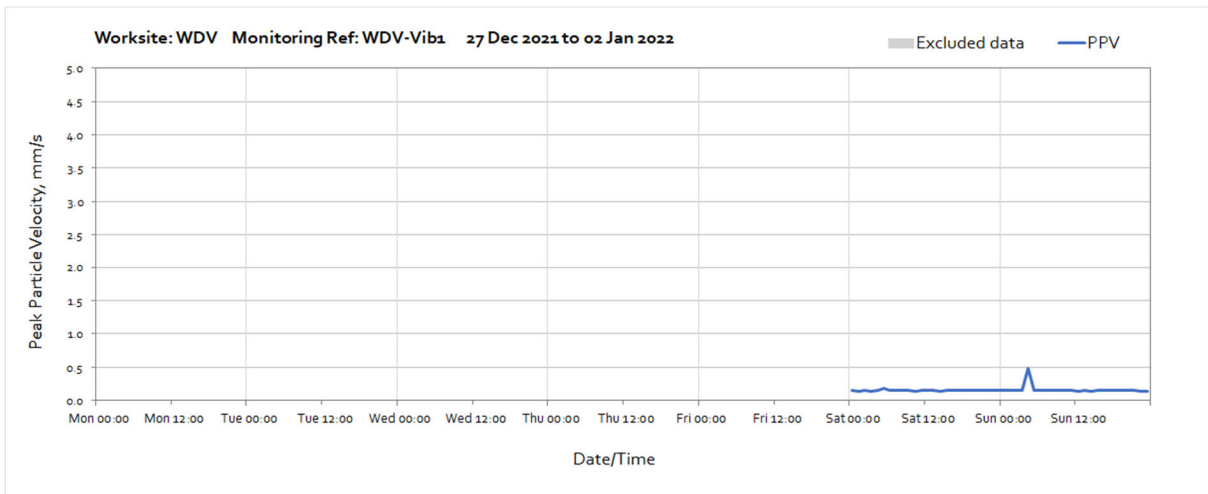


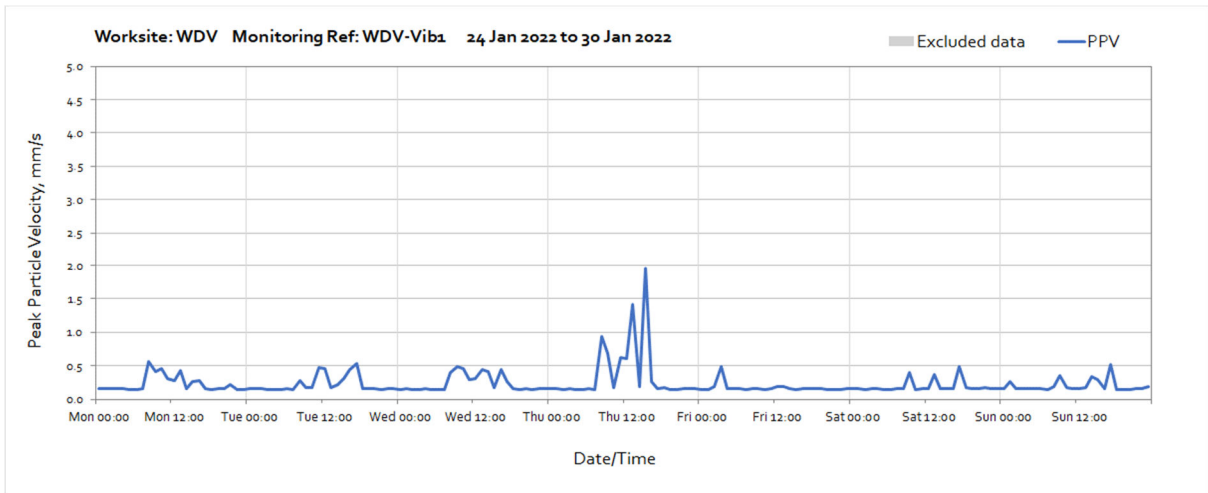
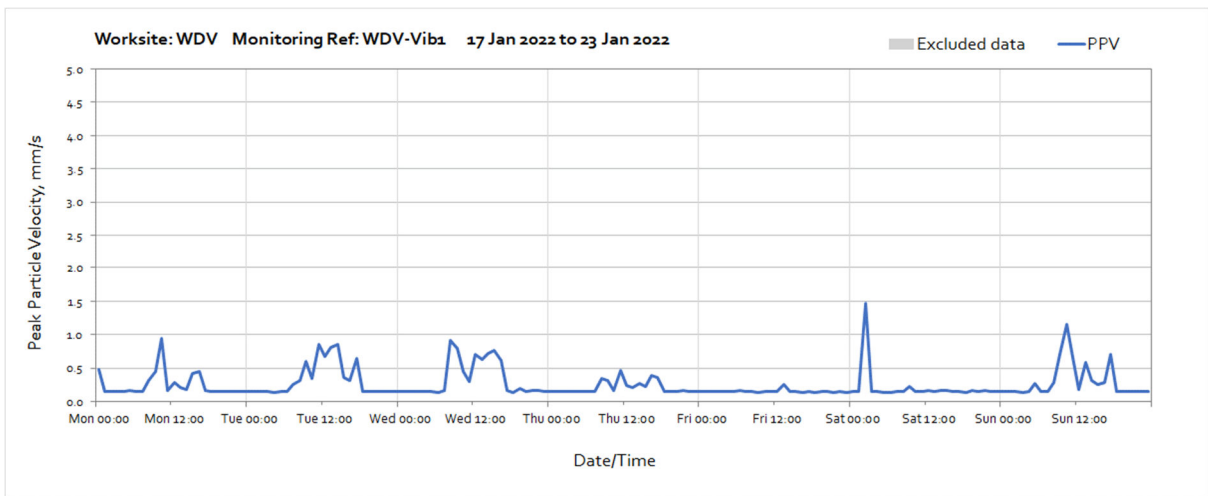
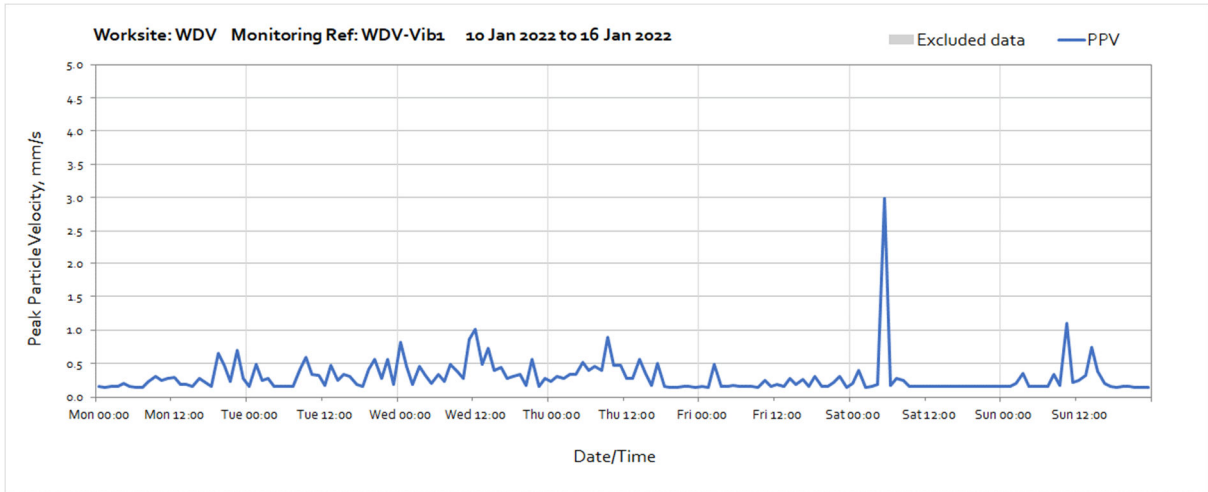
Note: Missing data between 09:00 on 15th January and 10:00 on 20th January was due to depleted monitor battery.

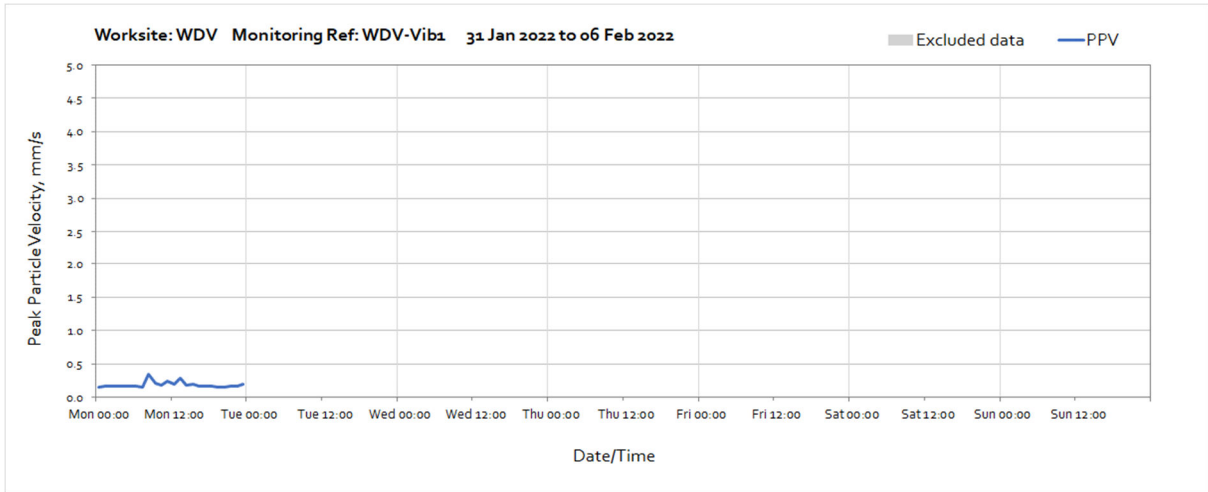




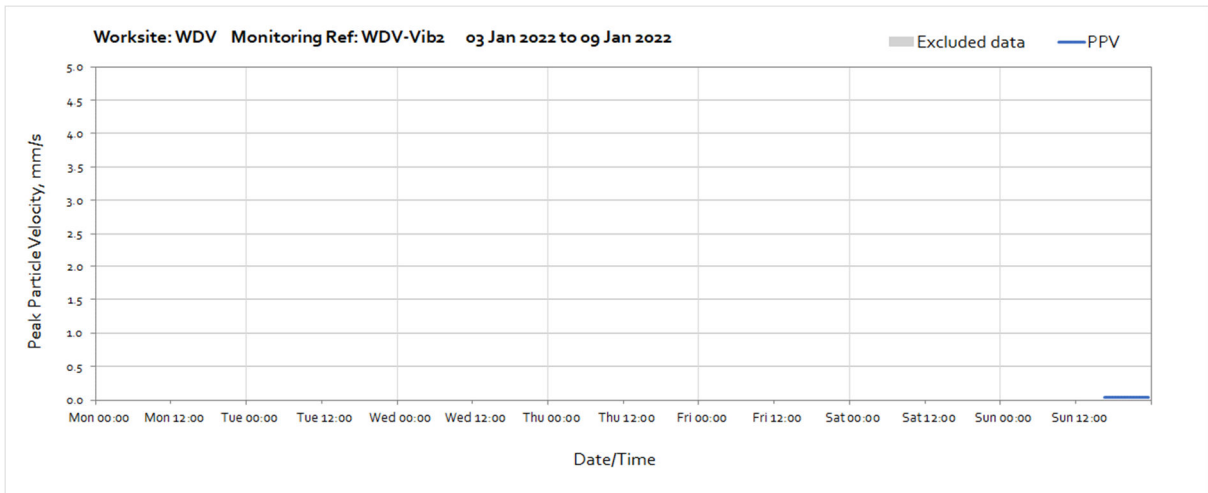
Worksite: WDV - Monitoring Ref: WDV-Vib 1



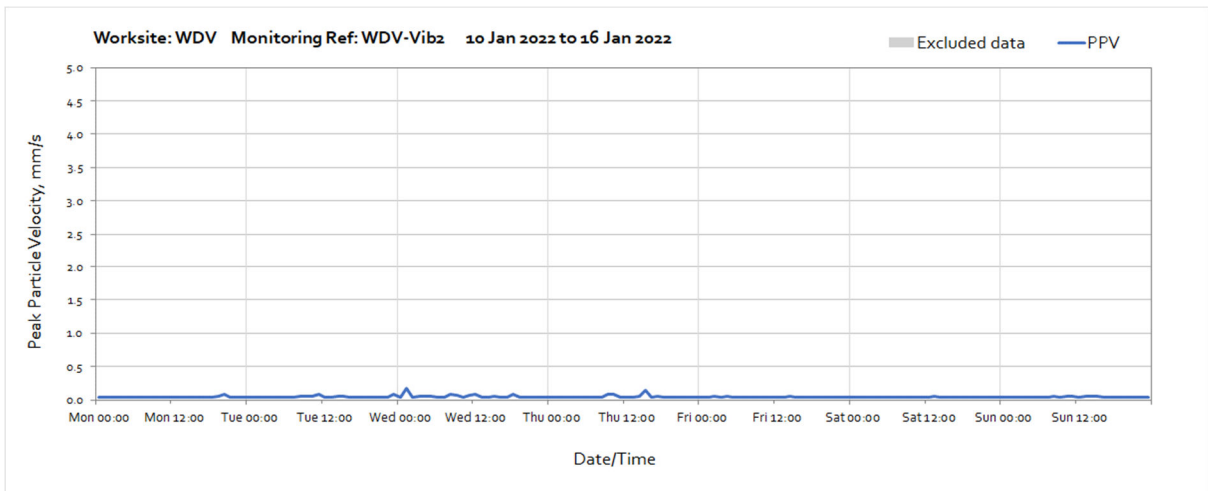


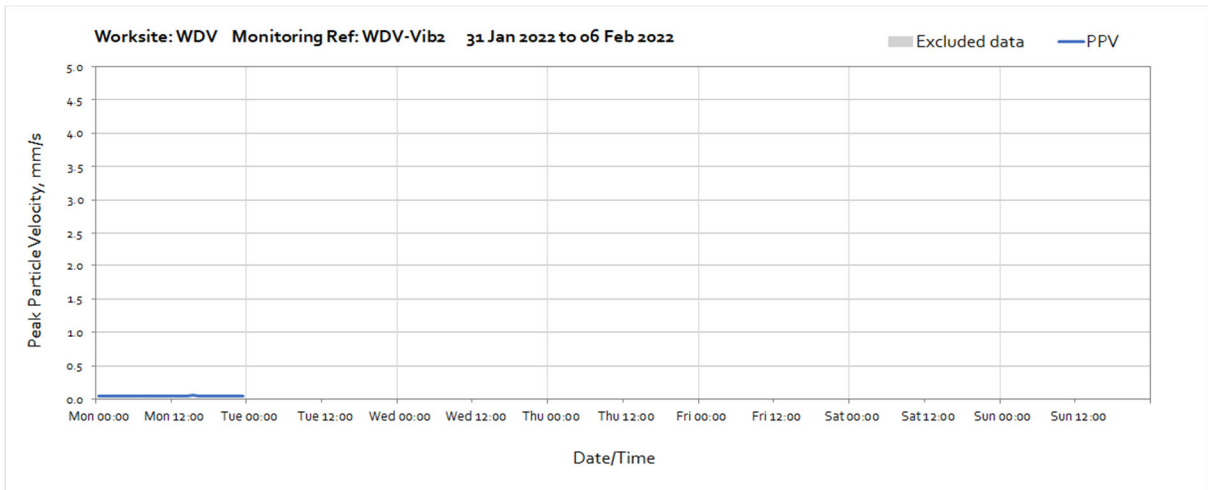
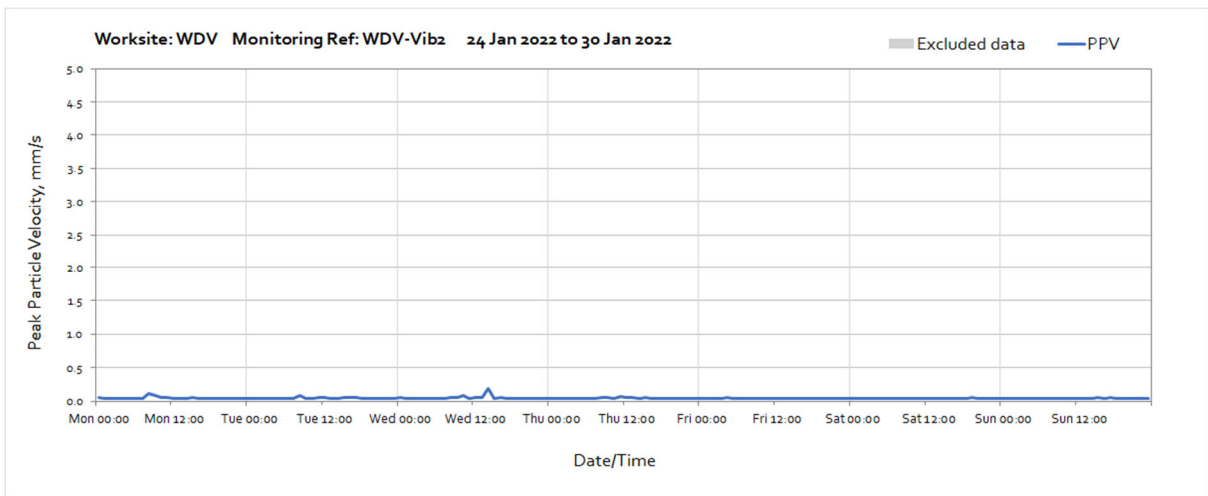
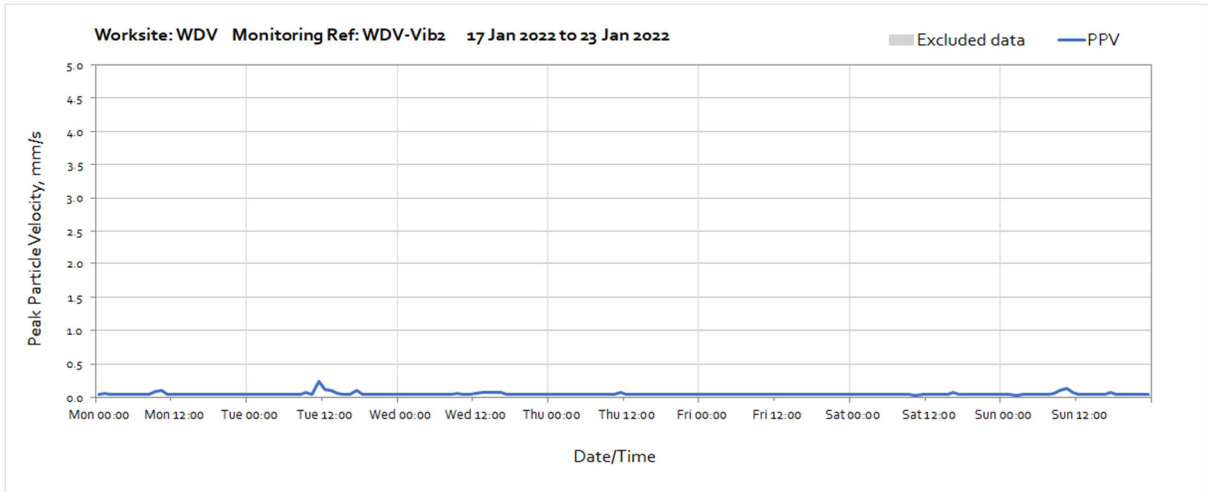


Worksite: WDV – Monitoring Ref: WDV-Vib 2

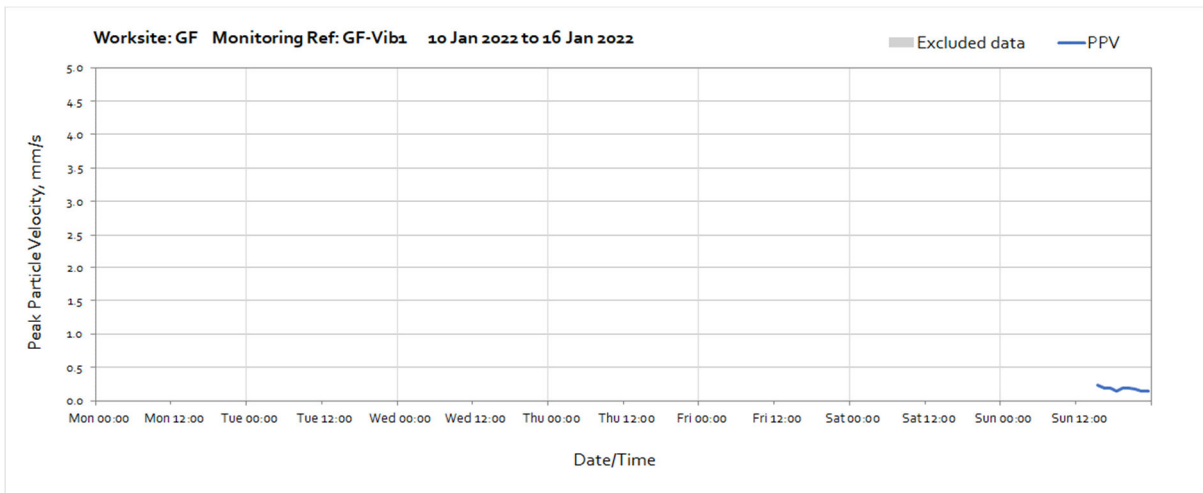


Note: Monitor was installed on 9th January.

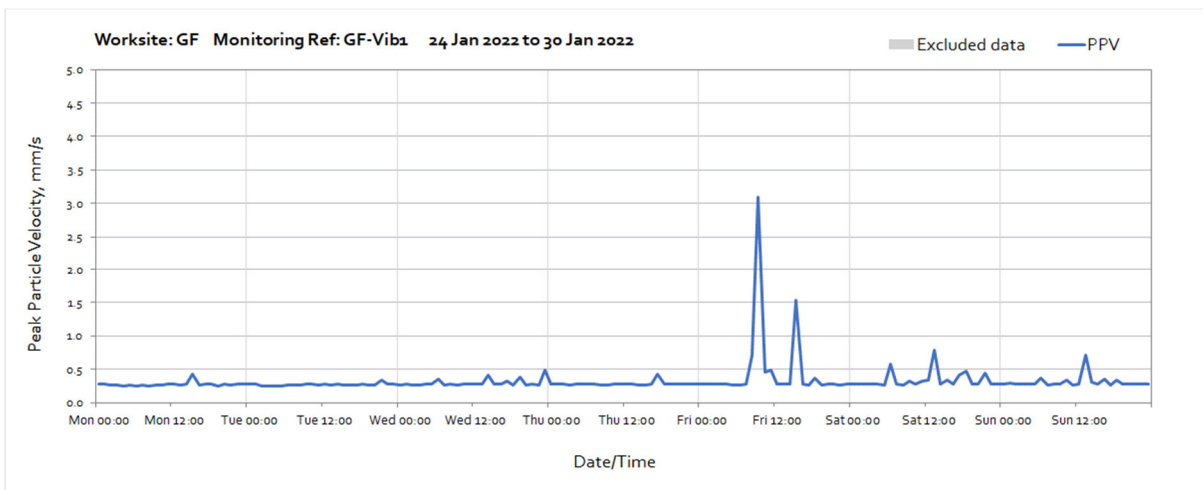
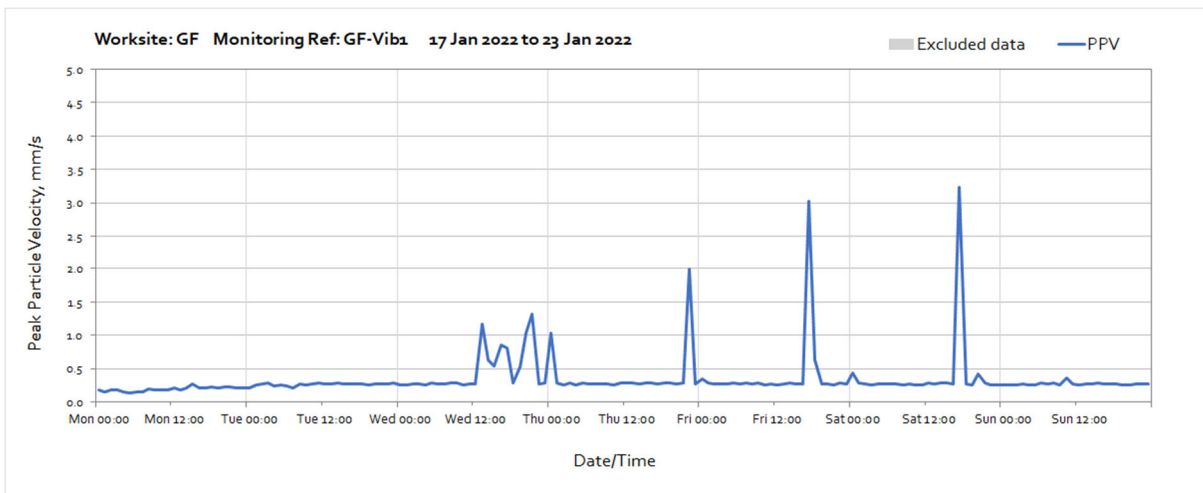




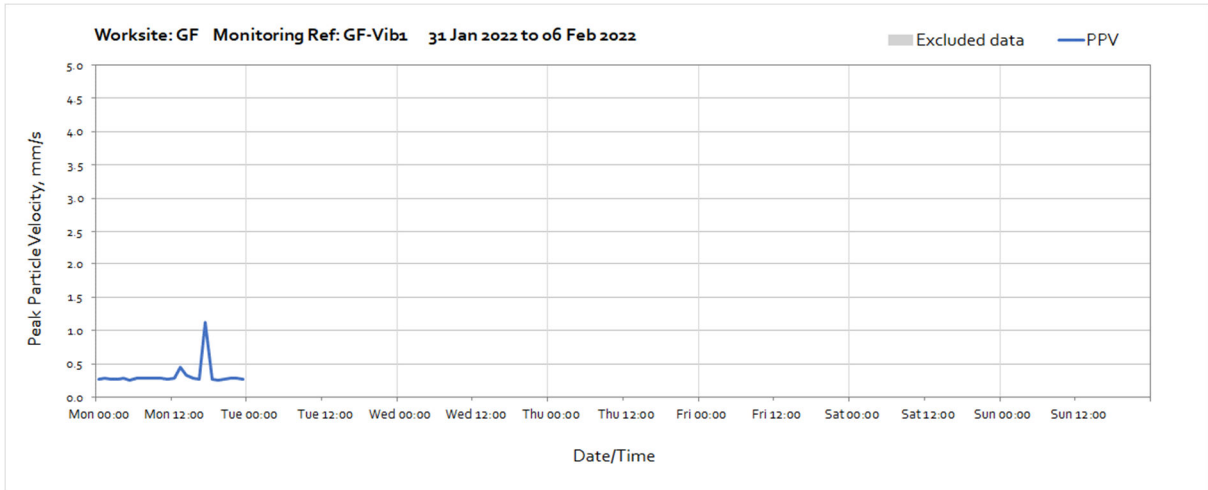
Worksite: GF – Monitoring Ref: GF-Vib1



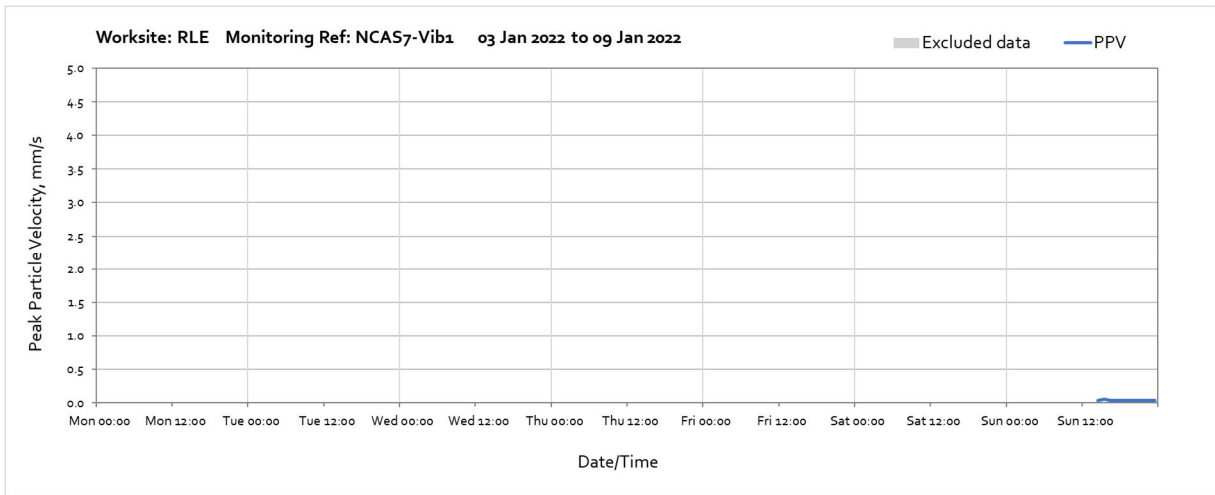
Note: Monitor was installed on 16th January.



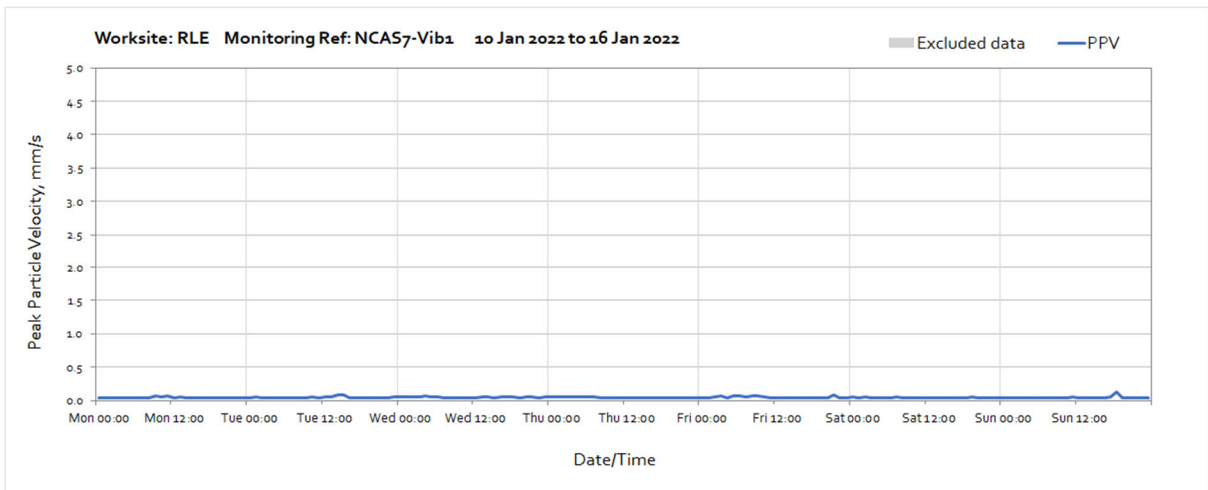
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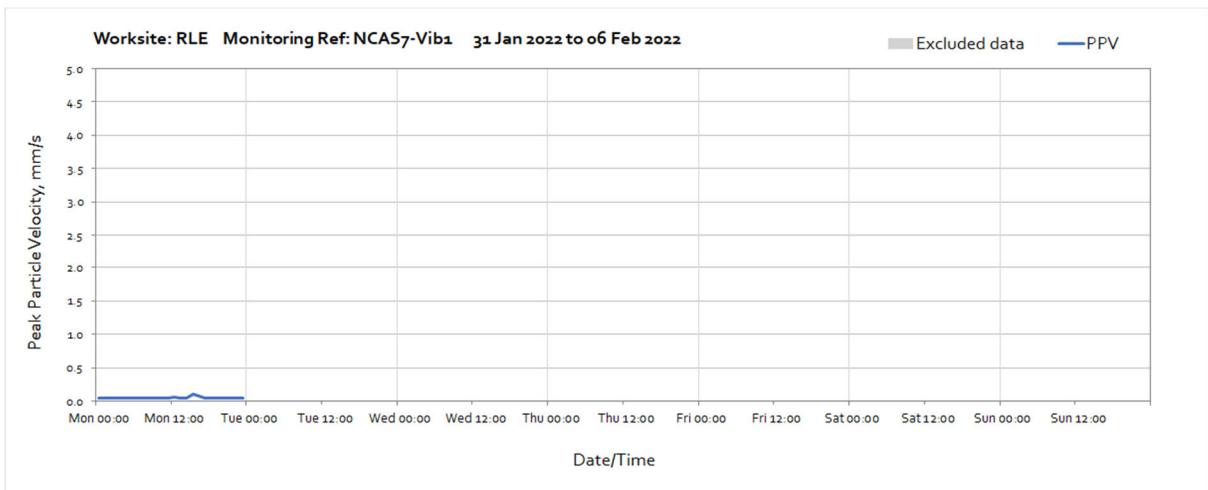
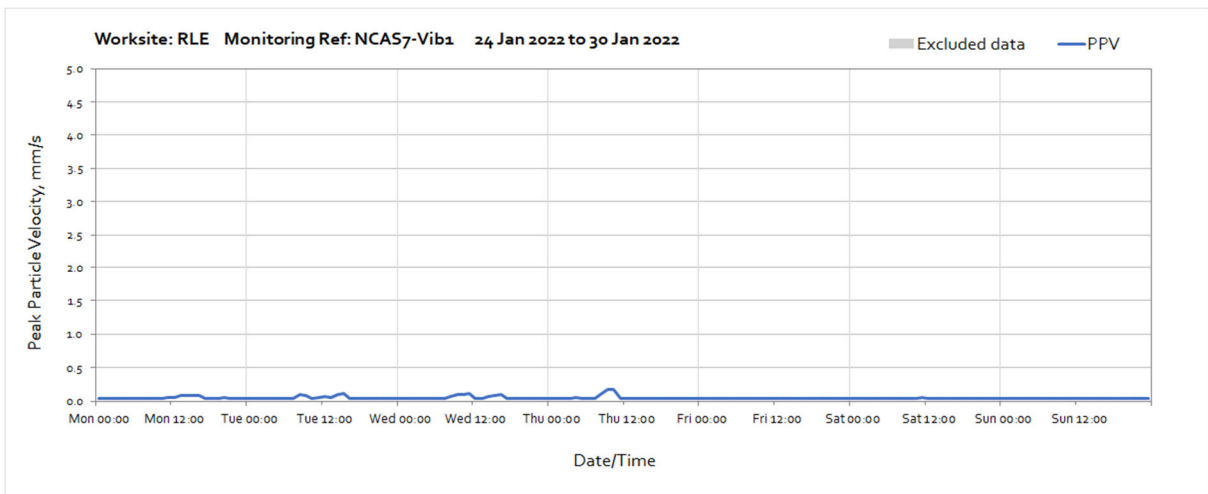
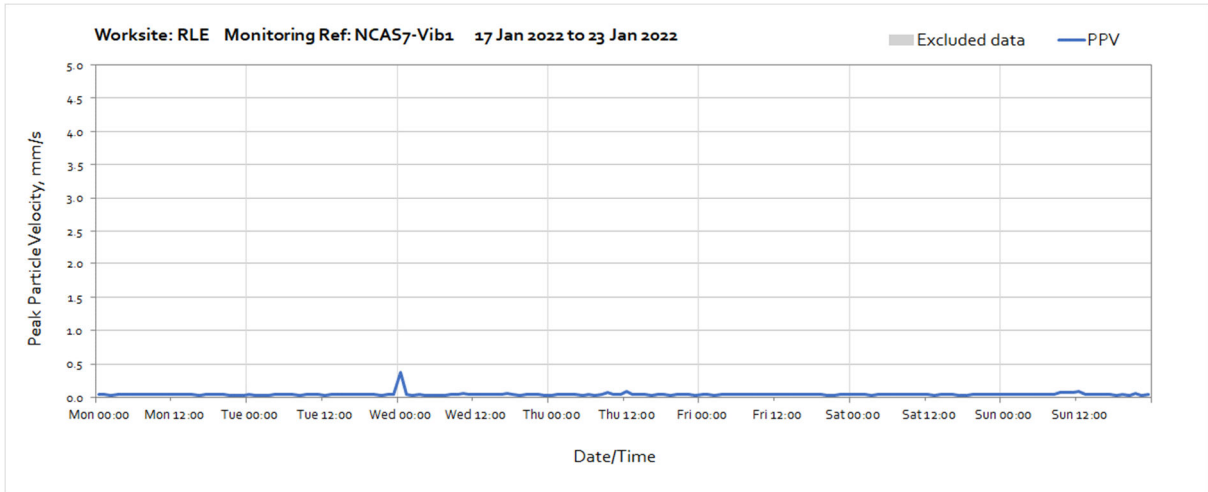


Worksite: RLE – Monitoring Ref: NCAS7-Vib1

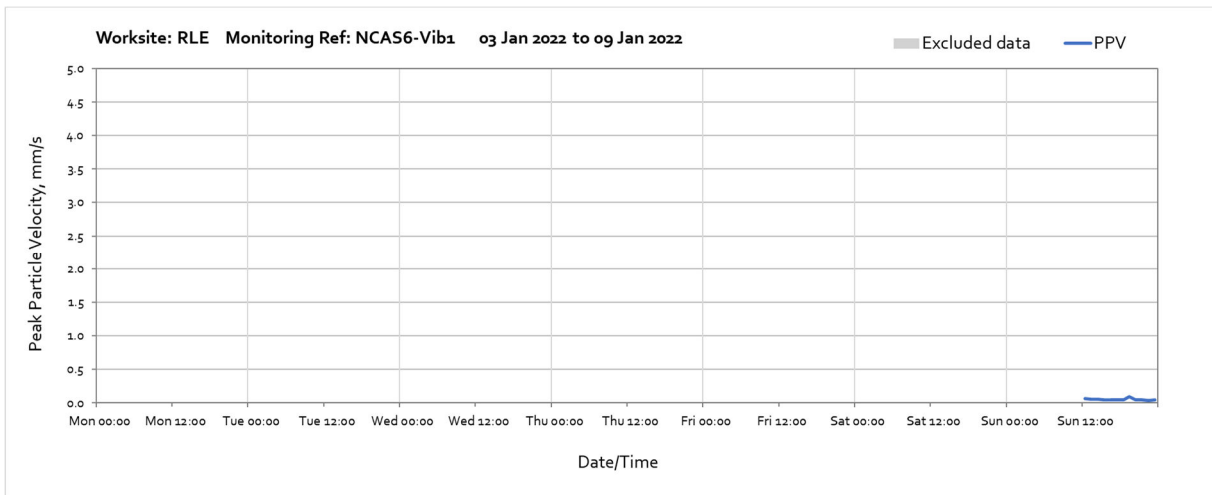


Note: Monitor was installed on 9th January.

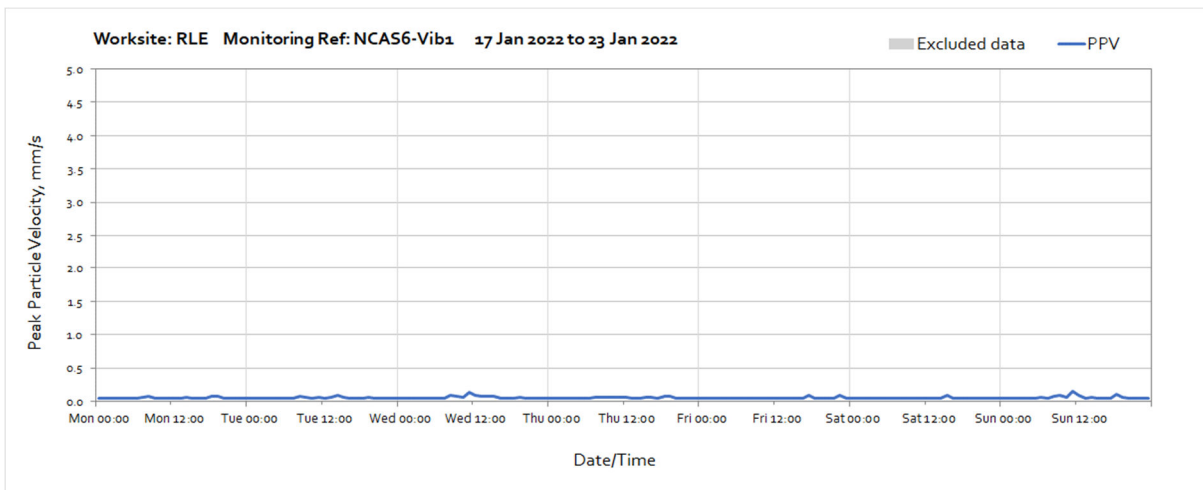
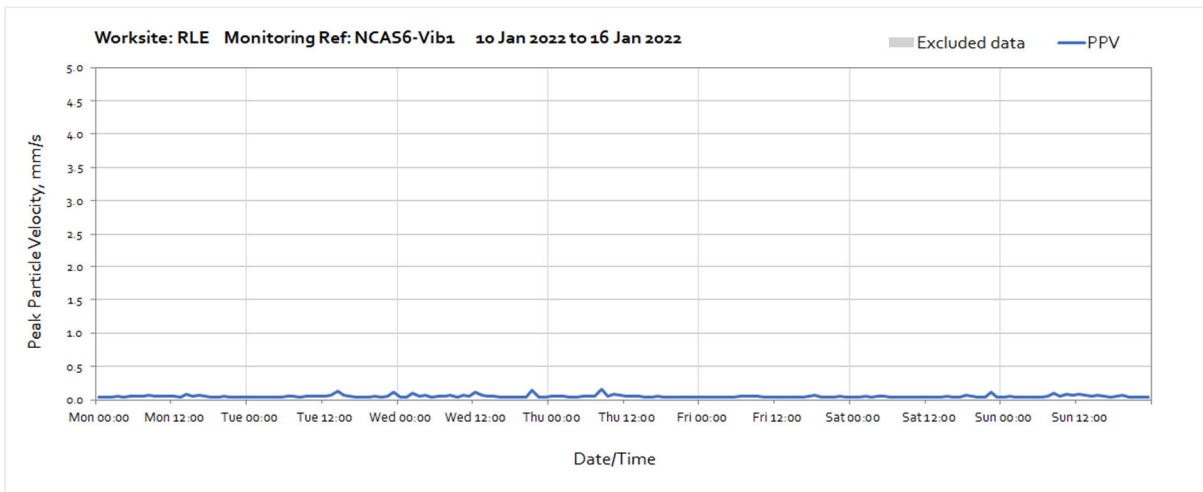




Worksite: RLE – Monitoring Ref: NCAS6-Vib1



Note: Monitor was installed on 9th January.



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