HS2

January 2022

Construction noise and vibration Monthly Report – November 2021

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 November 2021.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of School End worksite (ref.: SE) where site haul road works, roadworks, construction of the culvert crossing, drainage works, stockpiling, stone deliveries, demolition works and platform construction works were undertaken.
- Noise monitoring was undertaken in the vicinity of Rosehill Farm worksite (ref.: RF) where site haul road works, roadworks, construction of the culvert crossing, drainage works, stockpiling, stone deliveries, demolition works and platform construction works were undertaken
- Noise monitoring was undertaken in the vicinity of West Street Overbridge worksite (ref.: WSO) where extension of car park, were undertaken.
- Noise monitoring was undertaken in the vicinity of School Hill Compound worksite (ref.: SHC) where construction of civil structures within the site compound, underground utility works, and testing of batching plant were underway.
- Noise monitoring was undertaken in the vicinity of the School Hill UTX worksite (ref.: SHU) where roadworks and horizontal drilling were underway.
- Noise monitoring was undertaken in the vicinity of the FCC Sidings worksite reference (ref: FCC) where fencing and stockpiling were underway.
- Noise monitoring was undertaken in the vicinity of Quainton Access Road (ref: QAR), where construction of drainage, remedial works and installation of handrails were underway.
- Noise monitoring was undertaken in the vicinity of Hall Farm worksite (ref: HF) where installation of ducting, grass and surface course and landscaping works were undertaken.
- Noise monitoring was undertaken in the vicinity of Meadoway, Aylesbury worksite (ref: MW) where construction of the A418 Oxford Road Main Compound and piling platform construction were undertaken.
- Noise monitoring was undertaken in the vicinity of Oat Close Worksite (ref: OC) where earthworks were underway.

- Noise monitoring was undertaken in the vicinity of Rocky Lane Embankment worksite (ref: RLE) where roadworks and enabling works for Rocky Lane Compound were underway.
- Noise monitoring was undertaken in the vicinity of Leather Lane worksite (ref: LL) where construction of haul road and installation of attenuation pond were undertaken.
- Noise monitoring was undertaken in the vicinity of South Heath Cutting worksite (ref: SHCW) where construction of haul and access road were undertaken.
- Noise monitoring was undertaken in the vicinity of North Portal Worksite (ref: NP) where site set-up, fencing, site accommodation set-up, construction of piling platform, utility works and mobilisation of diaphragm wall equipment were underway.
- Noise monitoring was undertaken in the vicinity of Chesam Road Worksite (ref: CR) where cofferdam installation and sheet piling were undertaken.
- Noise monitoring was undertaken in the vicinity of Little Missenden Vent Shaft worksite (ref.: LM) where operation of general plant, earthworks, stockpile management, construction of diaphragm wall, water treatment, and A413 roadworks were underway.
- Noise monitoring was undertaken in the vicinity of Amersham Vent Shaft worksite (ref.: AM), where operation of general plant, earthworks, stockpile management, diaphragm wall works, shaft excavation works and ground treatment works were underway.
- Noise and vibration monitoring were undertaken in the vicinity of Bottom House Farm Lane worksite (ref.: BHFL), where landscaping works, earthworks and asphalting works for widening Bottom House Farm Lane, stockpiling, fencing works, vegetation clearance, and installation of road signage were underway.
- Noise monitoring was undertaken in the vicinity of Chalfont St Giles Vent Shaft worksite (ref.: CSG) where site operations and general plant operations, earthworks, drilling and grounding works, water treatment, concrete breakouts and piling works were underway.
- Noise monitoring was undertaken in the vicinity of Chalfont St Peter Vent Shaft worksite (ref.: CSP), where operation of general and auxiliary plant, construction of shaft base slab, stockpile management, basement secant piling works, shaft dewatering and excavation, post treatment injection works and road maintenance works were underway.

- Noise monitoring was undertaken in the vicinity of Load Test Pile 1 worksite (ref.: LTP #1), where piling for the construction of the jetty, construction of a cofferdam, main piling works, construction of retaining wall, compound operation and de-sanding, civil works, construction of north abutment pile wall, general compound work, core drilling, ground investigation works, realignment of River Colne, and water utility diversions were underway.

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

- Aylesbury, as part of water utility works.
- Addison Road overbridge where topsoil stripping works were underway.
- Charndon Lodge underbridge and East West Rail overbridge, Calvert where concrete pouring and formworks for foundation of wingwalls and abutments were underway.
- Perry Hill overbridge, Calvert, where piling works were undertaken.
- Calvert North where site access road expansion from Perry Hill to West Street were undertaken .
- Oxford railway line, Calvert where removal of ballast, vegetation clearance, stockpile preparation, temporary drainage installation, removal of the embankment and creation of earthwork screening bunds were underway.
- Calvert Cutting, where vegetation clearance works were undertaken.
- Calvert South Access Road, where replacement of existing culverts, topsoil stripping, laying and compacting of the South Access Road surface were underway.
- Small Dean Viaduct and London Road (A413) south of Wendover, Aylesbury, where sheet piling works, vegetation clearance and construction of compound were underway.
- Twyford & Padbury where bat mitigation, vegetation clearance, installation of badger and ditch crossing were undertaken.
- Chetwode and Barton Hill where bat mitigation, vegetation clearance, installation of badger were undertaken.
- Park Hill where landscaping works were underway.
- Fleet Marston where vegetation clearance and archaeological works were undertaken.
- Hartwell Shape 11a where archaeological works, installation of fencing and ecological mitigations were underway.

- Aylesbury Gold Course where mitigation works were underway.
- Hunts Green Farm were extension of trenching works and installation of fencing were underway.
- Supershape 14 where vegetation clearance and bat mitigations were underway..

There was one (1) exceedance of the HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (https://www.gov.uk/government/publications/hs2-information-papers-environment), during the reporting period.

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

Four (4) 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 8 of this report.

Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

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

1 Introduction

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

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

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the Buckinghamshire (BS) Local Authority area for the period 1st to 30th November 2021.

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

- School End worksite reference SE (see Plan 1 in Appendix A), where works activities included:
  - site haul road works;
  - roadworks;
  - construction of the culvert crossing;
  - drainage works (including installation of attenuation ponds);
  - stockpiling;
  - stone deliveries;
  - demolition works; and
  - platform construction works.
- Rosehill Farm (see Plan 1 in Appendix A), where works activities included:
  - site haul road works;

- roadworks;
- construction of the culvert crossing;
- drainage works (including installation of attenuation ponds);
- stockpiling;
- stone deliveries;
- demolition works; and
- platform construction works

- West Street Overbridge (see Plan 1 in Appendix A), where works activities included:
  - extension of car park.
- School Hill Compound worksite reference SHC (see plan 2 in Appendix A), where works activities included:
  - construction of civil structures within site compound;
  - underground utility works; and
  - testing of batching plant.
- School Hill UTX worksite reference - SHU (see plan 2 in Appendix A), where works activities included:
  - roadworks; and
  - horizontal drilling.
- JFCC Sidings, near Calvert, reference - FCC (see plan 2 in Appendix A), where works activities included:
  - installation of fencing; and
  - stockpiling.
- Quainton Access Road Worksite, reference - QAR (see plan 3 in Appendix A), where works activities included:
  - remedial works; and
  - installation of handrails.
- Hall Farm, Bicester Road Worksite, reference – HF (see plan 4 in Appendix A), where works activities included:
  - installation of ducting, grass and surface course; and
  - landscaping works.
- Meadoway, Aylesbury Worksite, reference – MW (see plan 5 in Appendix A), where works activities included:

- construction of the A418 Oxford Road Main Compound; and
- piling platform construction, including excavations and construction of aggregate base.

- Oat Close Worksite, reference – OC (see plan 5 in Appendix A), where works activities included:
  - earthworks.
- Rocky Lane Embankment Worksite, reference – RLE (see plan 6 in Appendix A), where works activities included:
  - roadworks, including form works, steel fixing and concrete pouring; and
  - enabling works for Rocky Lane Compound.
- Leather Lane Worksite, reference – LL (see plan 7 in Appendix A), where works activities included:
  - construction of haul road and attenuation pond.
- South Heath Cutting Worksite, reference – SHCW (see plan 7 in Appendix A), where works activities included:
  - construction of haul road and access road.
- North Portal Worksite, reference – NP (see plan 7 in Appendix A), where works activities included:
  - site set-up and installation of fencing;
  - site accommodation set-up;
  - construction of piling platform, including ducting works, drainage works and hardstanding;
  - temporary utility works, including water and information technology connections; and
  - mobilisation of diaphragm wall equipment.
- Chesam Road Worksite reference – CR (see plan 7 in Appendix A), where works activities included:
  - cofferdam installation and sheet piling.
- Little Missenden Vent Shaft worksite reference LM (see plan 8 in Appendix A), where works activities included:
  - operation of general plant;
  - earthworks including stockpile management;
  - diaphragm wall construction, which include civil works, construction of guide walls, excavation, concreting, de-sanding, mud treatment, delivery, and assembly;

- water treatment; and
- A413 road closure, which include traffic management, road planning, earthworks, ducting, concreting, surfacing, line marking and installation of site access traffic light schemes.

- Amersham Vent Shaft Worksite, reference –AM (see plan 9 in Appendix A), where works activities included:
  - operation of general plant;
  - earthworks including stockpile management;
  - ground water treatment, including testing, concrete pouring and cast-in-situ construction works;
  - diaphragm wall works, which includes excavations, concreting, de-sanding, mud treatment; and
  - shaft excavation works, including cleaning and inspection of the diaphragm wall;
- Bottom House Farm Lane Worksite, reference - BHFL (see plan 10 in Appendix A), where work activities included:
  - landscaping works along temporary access route;
  - fencing works;
  - vegetation clearance;
  - earthworks and asphalting works for widening Bottom House Farm Lane; and
  - installation of road signage.
- Chalfont St Giles Vent Shaft Worksite, reference - CSG (see plan 10 in Appendix A), where works activities included:
  - operation of general plant;
  - earthworks (stockpile management);
  - ground post treatment (drilling and grouting);
  - water treatment;
  - temporary capping of beams (breakout and formation); and
  - secant piling works.
- Chalfont St Peter Vent Shaft Worksite, reference –CSP (see plan 11 in Appendix A), where works activities included:
  - operation of general and auxiliary plant on site;

- construction of shaft base slab (preparation works);
- basement secant piling works (including construction of guide wall and shallow box retaining wall, contiguous and secant piles, excavation, cutting of contiguous and secant piles);
- roadworks;
- stockpiling management;
- shaft dewatering and excavation; and
- post treatment injection works.

- Colne Valley Viaduct - Load Test Pile 1 Worksite, reference – CVV-LTP #1 (see plan 12 in Appendix A), where works activities included:
  - piling for the construction of the jetty;
  - construction of a cofferdam (including piling and operation of support plant, excavations, dewatering and installation of walling beams and concrete plugs);
  - main piling works including boring pile, de-sanding, installation of reinforcement cage and concrete pile, break-out of bored pile to prepare pile cap and installation of grout curtain around viaduct pile;
  - civil works on haul road;
  - compound operations;
  - ground investigation works;
  - construction of retaining wall;
  - Denham Water Ski Club and North Embankment compound operation and de-sanding;
  - realignment of River Colne;
  - diversion of water utilities;
  - construction of north abutment pile wall;
  - yard support for north abutment works; and
  - core drilling for integrity test of concrete piles.

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

- Aylesbury, as part of water utility works.
- Addison Road overbridge where topsoil stripping works were underway.

- Charndon Lodge underbridge and East West Rail overbridge, Calvert where concrete pouring and formworks for foundation of wingwalls and abutments were underway.
- Perry Hill overbridge, Calvert, where piling works were undertaken.
- Calvert North where site access road expansion from Perry Hill to West Street were undertaken.
- Oxford railway line, Calvert, where removal of ballast, vegetation clearance, stockpile preparation, temporary drainage installation, removal of the embankment and creation of earthwork screening bunds were underway.
- Calvert Cutting, where vegetation clearance works were undertaken.
- Calvert South Access Road, where replacement of existing culverts, topsoil stripping, laying and compacting of the South Access Road surface were underway.
- Small Dean Viaduct and London Road (A413) south of Wendover, Aylesbury, where sheet piling works, vegetation clearance and construction of compound were underway.
- Twyford & Padbury where bat mitigation, vegetation clearance, installation of badger and ditch crossing were undertaken.
- Chetwode and Barton Hill where bat mitigation, vegetation clearance, installation of badger were undertaken.
- Park Hill where landscaping works were underway.
- Fleet Marston where vegetation clearance and archaeological works were undertaken.
- Hartwell Shape 11a where archaeological works, installation of fencing and ecological mitigations were underway.
- Aylesbury Gold Course where mitigation works were underway.
- Hunts Green Farm were extension of trenching works and installation of fencing were underway.
- Near School Hill Compound where vegetation clearance and bat mitigations were underway.

1.1.5 The applicable standards, guidance, and monitoring methodology are outlined in the construction noise and vibration monitoring methodology report which can be found at the following location https://www.gov.uk/government/collections/monitoring-the-environmental-effects-

of-hs2. Noise and vibration monitoring reports for previous months can also be found at this location.

1.2 Measurement Locations

1.2.1 Thirty-three (33) noise and two (2) vibration monitoring installations were active in November in the BS area. Table 2 summarises the positions of noise and vibration monitoring installations within the BS area in November 2021.

1.2.2 An additional noise monitor (ref.: CR-NMP1) was installed in proximity of Chesham Road worksite, ref.: CR, on the 1st of November. The monitor has been relocated on the 25th of November onto Meadow Leigh Cottage (new ref.: MDL-NMP1).

1.2.3 An additional noise monitor (ref.: NP-NMP1) was installed in proximity of North Portal worksite, ref.: NP, on the 1st of November.

1.2.4 An additional noise monitor (ref.: OC-NMP1) was installed in proximity of Oat Close worksite, ref.: OC, on the 19th of November.

1.2.5 An additional noise monitor (ref.: WSO-NMP2) was installed at Twyford, in proximity to the West Street Overbridge worksite, ref.: WSO, on the 1st of November.

1.2.6 Noise monitor FCC-NMP1 installed in proximity of FCC Sliding worksite (ref.: FCC) has been paused during the monitoring period due to power supply issues.

1.2.7 Maps showing the positions of noise and vibration monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
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
WSO	WSO-NMP1	West Street, Twyford
	WSO-NMP2	Twyford
SHC	SHC-NMP1	School Hill Compound, Calvert
SHU	SHU-NMP1	70 Cotswold Way, Calvert
QAR	QAR-NMP1	Woodlands Barn, Quainton
HF	HF-NMP1	Hall Farm, Bicester Road, Waddesdon

Worksite Reference	Measurement Reference	Address
MW	MW-NMP1	Aylesbury, Buckinghamshire
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury
RLE	SDVC-NMP1	Rocky Lane, Wendover
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover
	NCAS5-NMP1	Chesham Lane, The Lee, 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
	SH-NMP1	Bury Farm, South Heath
NP	NP-NMP1	North Portal worksite, Great Missenden
CR	CR-NMP1	Eastern site boundary, Chesham Road
	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
BHFL	BHFL-NMP1	Elm Tree Cottage, Bottom House Farm Lane
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
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-LTP #1	CVV-LTP #1-NMP1	Northern boundary, Load Test Pile 1 Worksite, Denham Water Ski Club
	CVV-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham, Denham Garden Village
	CVV-DFS-NMP1	Denham Film Studio, Uxbridge
CVV-MR*	CVV-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
SE	SE-NMP1	School End, Chetwode	Free-field	47.3	53.4	44.0	41.3	41.4	43.7	47.2	48.8	49.0	39.4	44.2	39.6
				(56.3)	(60.1)	(50.5)	(47.6)	(54.5)	(48.5)	(50.1)	(52.5)	(70.4)	(45.4)	(50.6)	(48.9)
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	Free-field	46.7	49.3	45.1	45.0	43.9	48.2	47.9	51.6	48.0	42.9	47.2	43.7
				(50.4)	(54.0)	(50.1)	(51.9)	(53.0)	(52.1)	(53.4)	(57.5)	(57.2)	(55.1)	(57.0)	(51.9)
WSO	WSO-NMP1	West Street, Twyford	Free-field	50.2	52.8	47.5	44.2	40.3	47.9	49.8	50.3	48.7	39.0	47.8	39.7
				(54.3)	(79.2)	(58.4)	(55.8)	(50.6)	(53.5)	(54.1)	(55.3)	(55.0)	(44.3)	(54.5)	(47.8)
	WSO-NMP2	Twyford	Free-field	44.1	59.3	43.2	42.8	41.4	45.8	47.0	47.9	47.7	39.2	44.4	38.0
				(47.4)	(64.6)	(59.1)	(55.6)	(54.8)	(54.6)	(54.4)	(55.5)	(56.0)	(46.9)	(53.7)	(47.3)
SHC	SHC-NMP1	School Hill Compound, Calvert	Free-field	47.5	55.3	45.1	42.7	40.9	46.5	48.5	49.1	47.0	41.2	47.3	39.4
				(50.3)	(66.7)	(53.2)	(57.0)	(57.6)	(55.5)	(54.5)	(58.0)	(56.7)	(50.6)	(61.7)	(49.1)
SHU	SHU-NMP1	70 Cotswold Way, Calvert	Free-field	50.3	56.0	45.5	43.2	40.4	47.5	56.3	62.5	56.6	37.4	51.7	39.8
				(53.7)	(64.0)	(52.8)	(66.7)	(50.9)	(48.7)	(58.3)	(73.3)	(74.6)	(44.1)	(67.8)	(50.2)
QAR	QAR-NMP1	1 Woodlands Farm Cottages, Quainton	Façade	45.6	48.3	40.5	40.6	41.9	44.1	45.4	41.8	42.4	42.4	45.4	42.8
				(52.5)	(54.8)	(45.4)	(48.3)	(46.2)	(46.4)	(48.1)	(43.5)	(50.4)	(46.3)	(58.1)	(45.9)

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
HF	HF-NMP1	Hall Farm, Bicester Road, Waddesdon	Free-field	60.8	63.1	61.2	58.5	54.6	57.3	61.5	62.1	60.1	52.9	59.9	55.0
				(62.9)	(65.6)	(64.7)	(65.0)	(65.2)	(61.1)	(64.7)	(66.1)	(64.8)	(56.8)	(63.8)	(60.1)
MW	MW-NMP1	Aylesbury, Buckinghamshire	Free-field	62.9	62.1	61.7	59.8	55.9	60.4	63.0	63.1	61.4	54.5	61.2	55.5
				(64.1)	(63.3)	(62.7)	(62.6)	(62.0)	(61.9)	(64.9)	(64.8)	(64.5)	(59.2)	(63.1)	(61.7)
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury	Free-field	48.0	49.9	46.4	45.9	45.9	48.9	49.9	50.8	49.1	44.9	47.5	43.0
				(50.2)	(53.4)	(48.8)	(50.5)	(55.5)	(53.0)	(54.0)	(57.4)	(54.7)	(47.7)	(51.6)	(47.8)
RLE	SDVC-NMP1	Rocky Lane, Wendover	Free-field	62.9	61.2	61.8	58.8	55.5	59.7	61.2	62.3	60.3	54.4	60.3	55.2
				(63.9)	(62.6)	(62.9)	(61.3)	(62.8)	(62.2)	(64.2)	(65.2)	(64.6)	(58.5)	(62.3)	(62.6)
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	51.5	56.8	50.1	47.9	44.6	49.1	53.7	53.0	52.3	43.4	49.7	42.6
				(55.9)	(62.3)	(53.9)	(54.5)	(54.9)	(51.5)	(58.8)	(58.8)	(63.6)	(49.7)	(64.6)	(50.8)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	57.4	59.8	56.0	52.9	49.1	53.4	56.3	57.0	55.7	47.2	56.5	47.4
				(59.2)	(66.4)	(57.7)	(57.9)	(57.3)	(54.4)	(57.5)	(58.8)	(64.7)	(51.4)	(75.0)	(56.6)
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee	Free-field	49.5	55.3	48.3	46.2	46.1	48.3	51.0	51.2	49.1	47.1	48.4	42.0
				(57.9)	(69.9)	(57.6)	(52.0)	(58.9)	(54.6)	(53.7)	(59.0)	(56.6)	(59.9)	(56.9)	(55.4)
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	48.8	51.7	47.6	46.9	46.4	48.4	50.8	50.3	50.8	46.2	48.0	44.7
				(51.5)	(56.7)	(56.6)	(58.9)	(58.2)	(53.4)	(54.4)	(58.3)	(59.9)	(53.4)	(52.8)	(48.7)
SHCW	PR-NMP1	Potters Row, South Heath	Free-field	53.5	59.0	48.2	47.8	46.7	50.4	57.1	52.0	50.3	44.0	48.8	44.7
				(60.3)	(61.7)	(53.1)	(56.8)	(59.2)	(52.1)	(58.7)	(57.6)	(57.5)	(53.5)	(57.3)	(51.8)

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
	SH-NMP1	Bury Farm, South Heath	Free-field	47.0	55.2	45.4	44.3	41.0	46.8	53.8	48.8	47.5	39.4	45.6	40.0
				(54.1)	(65.6)	(52.1)	(59.5)	(55.2)	(48.5)	(61.9)	(51.0)	(61.9)	(44.5)	(51.0)	(49.9)
NP	NP-NMP1	North Portal worksite, Great Missenden	Free-field	52.8	60.8	47.1	45.1	42.8	51.5	58.6	51.9	50.5	44.5	47.6	41.8
				(57.9)	(65.7)	(53.0)	(52.8)	(59.9)	(56.6)	(64.7)	(61.3)	(61.5)	(55.1)	(54.1)	(49.4)
CR	CR-NMP1 (until 25/11/2021)	Eastern site boundary, Chesham Road	Free-field	46.1	51.7	54.9	54.8	53.3	44.8	41.9	46.1	55.7	54.3	55.3	54.9
				(48.3)	(58.7)	(62.4)	(61.6)	(66.5)	(48.1)	(46.7)	(48.8)	(60.5)	(61.2)	(65.1)	(69.6)
	MDL-NMP1 (From 25/11/2021)	Meadow Leigh Cottage, Firth Hill, South Heath	Free-field	59.0	58.6	56.5	54.4	51.6	57.9	61.3	63.4	60.0	49.1	55.5	48.2
				(60.0)	(59.6)	(57.7)	(57.4)	(57.5)	(57.9)	(61.3)	(63.4)	(63.0)	(54.3)	(58.1)	(54.2)
AM	AM-NMP1	Whielden Lane, Amersham	Free-field	65.2	68.9	66.8	65.3	53.8	66.8	66.6	61.2	59.1	52.8	59.3	53.3
				(68.5)	(72.9)	(70.8)	(74.3)	(62.5)	(70.1)	(69.1)	(64.0)	(63.6)	(60.5)	(64.5)	(61.0)
LM	LM-NMP1	Little Missenden, A413, Amersham	Free-field	55.4	54.0	59.2	58.9	58.9	52.8	48.4	44.4	58.4	59.1	56.8	59.6
				(62.5)	(56.9)	(64.2)	(63.9)	(63.6)	(53.5)	(48.7)	(45.0)	(62.5)	(62.7)	(63.8)	(62.5)
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham	Free-field	59.8	59.0	58.9	55.6	51.2	55.5	58.3	59.1	57.9	49.5	56.3	50.0
				(61.2)	(65.1)	(61.2)	(59.1)	(58.0)	(56.1)	(59.1)	(60.5)	(67.2)	(54.7)	(58.4)	(59.0)
BHFL	BHFL-NMP1	Elm Tree Cottage, Bottom House Farm Lane	Free-field	56.9	56.6	54.9	51.3	47.8	52.1	55.9	55.0	54.5	46.1	54.8	47.4
				(59.5)	(64.1)	(65.2)	(55.6)	(56.6)	(54.3)	(57.2)	(56.6)	(63.4)	(51.2)	(63.7)	(54.2)
CSG	CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane	Free-field	55.6	59.4	44.9	43.3	42.3	49.2	51.2	51.4	48.6	42.6	49.7	42.7
				(69.0)	(62.7)	(59.5)	(61.3)	(55.6)	(56.8)	(53.5)	(58.5)	(57.7)	(52.7)	(59.2)	(49.2)

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-NMP2	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane	Free-field	60.1 (65.7)	62.0 (65.2)	49.8 (59.2)	46.4 (60.4)	48.0 (59.7)	52.6 (57.7)	52.0 (54.0)	51.3 (56.5)	49.2 (57.0)	46.0 (53.4)	49.9 (56.4)	47.9 (58.5)
CSP	CSP-NMP1	Chalfont St Peter Vent Shaft Worksite	Free-field	55.0 (57.7)	56.5 (58.2)	53.7 (59.8)	51.6 (60.3)	46.9 (53.9)	56.4 (65.4)	59.5 (67.5)	59.3 (67.3)	57.4 (67.5)	48.0 (55.4)	53.8 (58.9)	46.6 (52.9)
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	47.1 (50.3)	49.9 (52.1)	46.6 (57.8)	46.7 (59.9)	42.0 (55.7)	45.8 (50.4)	50.9 (53.1)	52.2 (58.8)	51.8 (69.0)	42.3 (51.1)	48.0 (53.2)	41.0 (46.5)
	CSP-NMP3	Chalfont St Peter Vent Shaft Worksite	Free-field	58.9 (60.8)	58.1 (60.2)	57.3 (60.1)	55.3 (61.0)	50.7 (58.0)	55.1 (55.7)	58.7 (60.0)	59.3 (61.3)	57.6 (66.5)	50.0 (55.2)	56.7 (60.0)	49.7 (57.0)
CVV-LTP #1	CVV-LTP #1-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	61.9 (63.8)	62.0 (65.7)	60.1 (62.5)	57.7 (72.6)	54.9 (61.9)	60.2 (62.2)	61.8 (65.3)	61.7 (63.8)	60.0 (68.9)	53.7 (62.0)	58.5 (62.4)	55.1 (63.1)
	CVV-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	Free-field	57.8 (59.3)	58.7 (63.5)	55.3 (56.9)	52.3 (55.6)	50.2 (58.2)	54.0 (55.6)	56.8 (57.4)	57.7 (59.1)	57.3 (70.3)	49.2 (62.4)	55.7 (68.0)	49.7 (57.5)
	CVV-DFS-NMP1	Denham Film Studio, Uxbridge	Free-field	49.8 (54.6)	51.2 (64.6)	50.4 (59.1)	48.4 (59.6)	43.2 (55.0)	49.6 (51.8)	49.9 (52.0)	48.9 (53.9)	51.8 (60.1)	43.1 (49.8)	49.3 (60.0)	41.5 (50.5)
CVV-MR	CVV-SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire	Free-field	50.0 (52.5)	51.6 (54.8)	48.0 (62.8)	47.1 (77.0)	42.9 (51.2)	47.1 (48.6)	49.9 (51.9)	49.3 (52.5)	48.0 (54.1)	40.0 (45.0)	46.7 (50.5)	41.5 (50.0)

* No data available for this period due to monitor relocation.

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-Vib 1	School End, Chetwode	5.25* (Y-axis)
RF	RF-Vib 1	Old Stable Cottage, Rosehill Farm, Chetwode	1.16 (Z-axis)

*High vibration levels are due to the proximity of the construction activities to the vibration monitor. The nearest residential receptors are further away from the works and vibration levels at the receptor will therefore be 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
SE	SE-NMP1	School End, Chetwode	All days	All periods	No exceedance	No exceedance
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	All days	All periods	No exceedance	No exceedance
WSO	WSO-NMP1	West Street, Twyford	Weekday	08:00-18:00	1	1
	WSO-NMP2	Twyford	Weekday	08:00-18:00	4	No exceedance
SHC	SHC-NMP1*	School Hill Compound, Calvert	Weekday	08:00-18:00	1	No exceedance
SHU	SHU-NMP1	70 Cotswold Way, Calvert	Weekday	08:00-18:00	1	No exceedance
QAR	QAR-NMP1	Woodlands Barn, Quainton	All days	All periods	No exceedance	No exceedance
HF	HF-NMP1	Hall Farm, Bicester Road, Waddesdon	All days	All periods	No exceedance	No exceedance
MW	MW-NMP1	Aylesbury, Buckinghamshire	Weekday Saturday	08:00-18:00 08:00-13:00	13 4	No exceedance No exceedance
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury	All days	All periods	No exceedance	No exceedance
RLE	SDVC-NMP1	Rocky Lane, Wendover	Weekday Saturday	08:00-18:00 08:00-13:00	3 1	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
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Weekday	08:00-18:00	6	No exceedance
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Weekday	08:00-18:00	1	No exceedance
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath	Weekday	08:00-18:00	1	No exceedance
	GD-NMP1	Grimms Ditch, The Lee, South Heath	All days	All periods	No exceedance	No exceedance
SHCW	PR-NMP1	Potters Row, South Heath	All days	All periods	No exceedance	No exceedance
	SH-NMP1	Bury Farm, South Heath	Weekday	08:00-18:00	3	No exceedance
NP	NP-NMP1	North Portal worksite, Great Missenden	All days	All periods	No exceedance	No exceedance
CR	CR-NMP1	Eastern site boundary, Chesham Road	All days	All periods	No exceedance	No exceedance
	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	All days	All periods	No exceedance	No exceedance
AM	AM-NMP1*	Whielden Lane, Amersham	All days	All periods	No exceedance	No exceedance
LM	LM-NMP1*	Little Missenden Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham	Weekday Saturdays	08:00-18:00 18:00-19:00 19:00-22:00 14:00-22:00	1 2 20 22	No exceedance
BHFL	BHFL-NMP1	Elm Tree Cottage, Bottom House Farm Lane	Weekday	08:00-18:00	1	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
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
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	Saturdays	14:00-22:00	1	No exceedance
CVV-LTP #1	CVV-LTP #1-NMP1*	Northern boundary, Load Test Pile 1 Worksite	All days	All periods	No exceedance	No exceedance
	CVV-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	Weekday	08:00-18:00	2	No exceedance
	CVV-DFS-NMP1	Denham Film Studio, Uxbridge	Weekday	08:00-18:00	1	No exceedance
CVV-MR	CVV-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.

2.2.6 Exceedances of the LOAEL were recorded at 15monitoring locations during November 2021.

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

Table 6: Summary of Total Exceedances of SOAEL

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
WSO	WSO-NMP1	West Street, Twyford	1

2.2.8 One exceedance of the SOAEL at monitoring location WSO-NMP1 was recorded due to HS2 construction works during core hours on a weekday in November 2021. The exceedance was due to vegetation clearance works.

2.3 Exceedances of Trigger Level

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

Table 7: Summary of Exceedances of Trigger Levels

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

2.4 Complaints

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

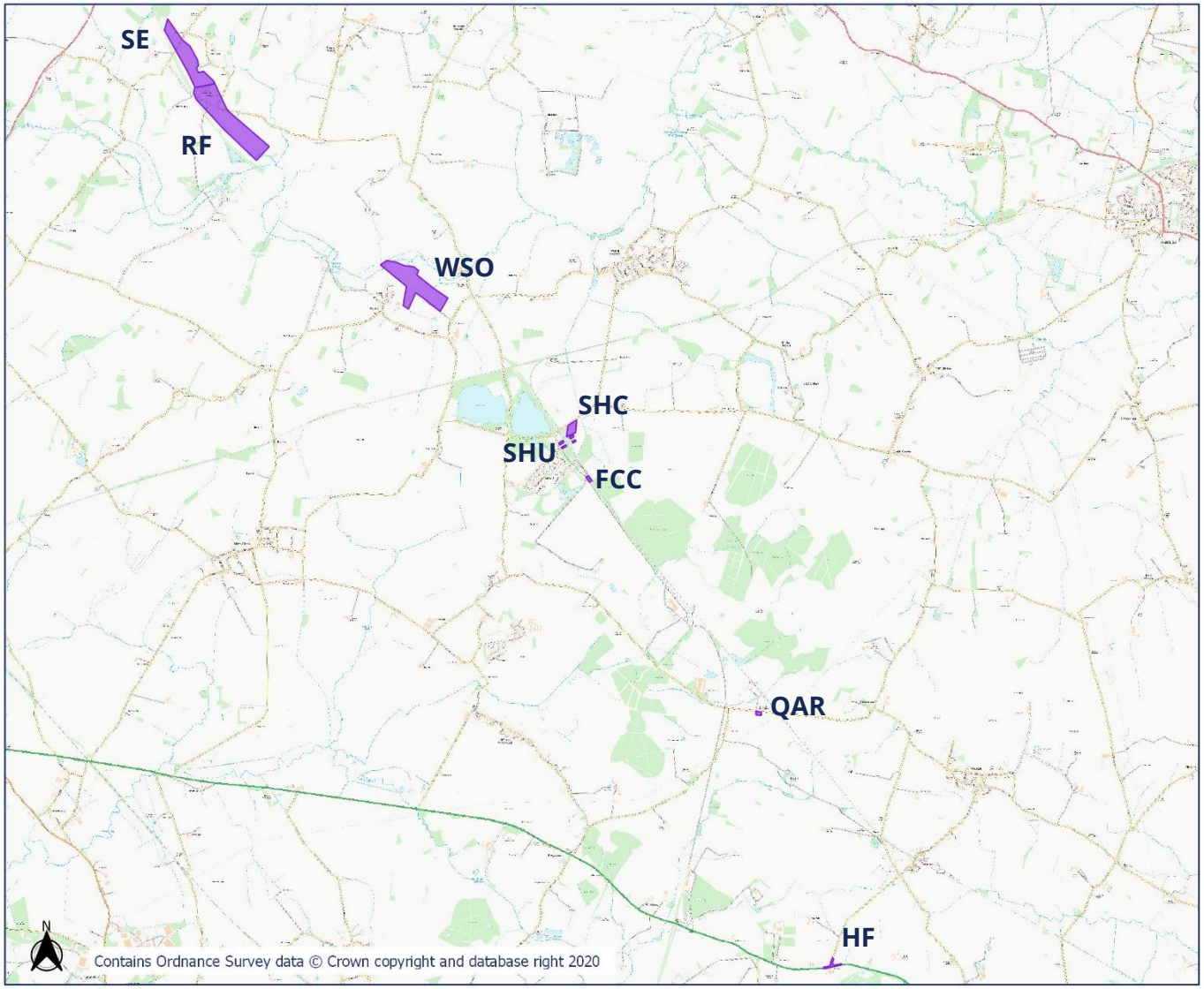
Table 8: Summary of Complaints

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-21-42874-C	CVV-LTP #1	Complaint regarding noise disturbance due to works at the South Portal of the construction site.	Works were undertaken at the time of the complaint.	Discussion with the stakeholder about the necessity to install a noise monitor in proximity to this area are underway.
HS2-21-42895-C	NP	Complaint regarding generator noise during daytime and night-time. Asking for noise mitigations to be put in place.	The generator is feeding the security lighting tower which is operating at night.	The unit will be moved further away from the stakeholder in order to alleviate the noise and acoustic insultation will be added.

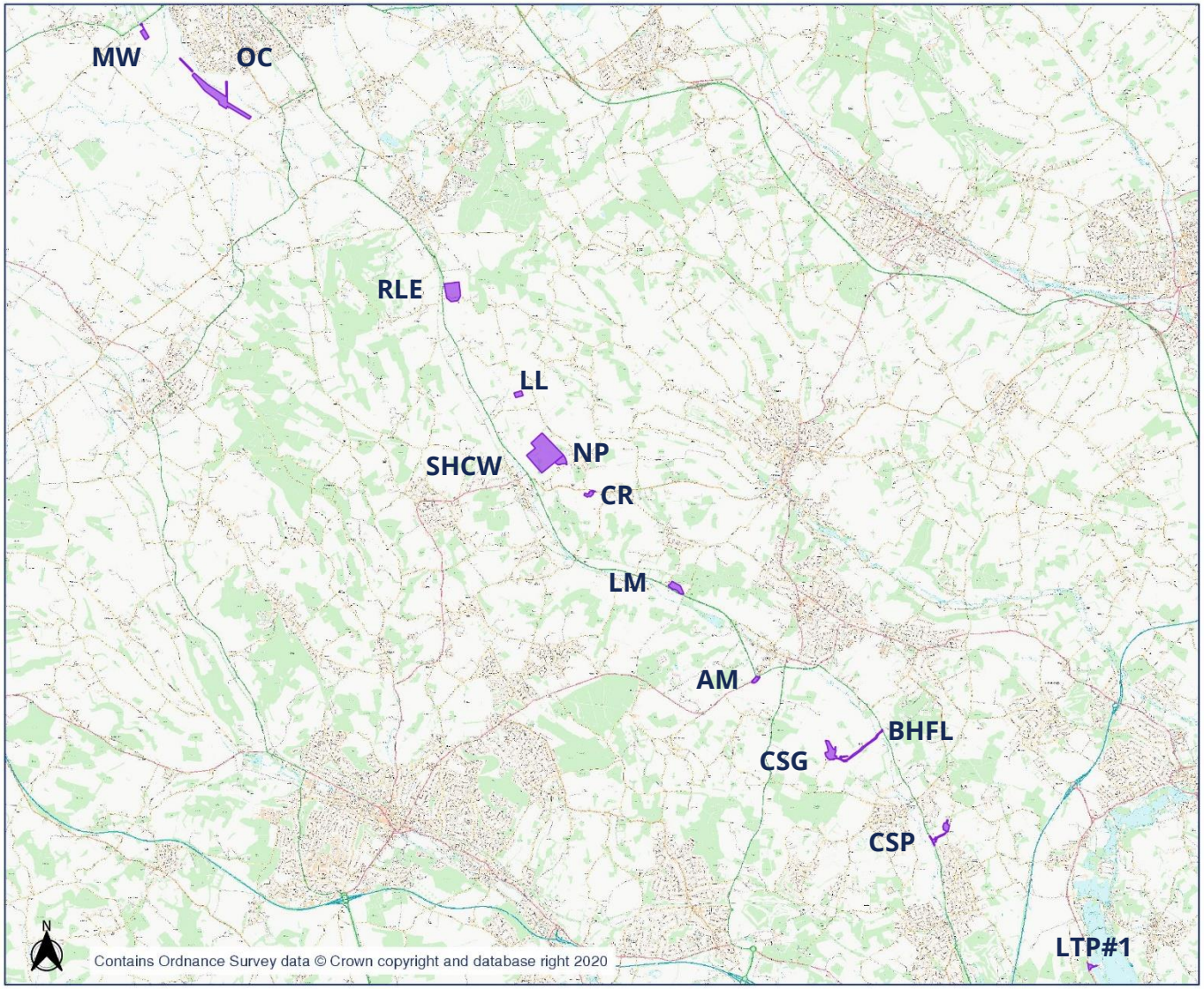
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-21-42912-C	SH	Complaint regarding noise and vibration disturbance during daytime.	Site team and environmental manager investigated the dates provided by stakeholder and found no activity that would have caused the noise disturbances reported.	Confirmed the results of the investigation to the stakeholder, and confirmed that works being carried out are within consents. Also confirmed to stakeholder that is not eligible for any noise insulation.
HS2-21-42945-C	CVV-LTP#1	Complaint regarding noise disturbance during daytime and night-time due to concrete casting factories.	Investigations has confirmed that works were undertaken in line with Section 61 application consent.	No evidence found that noise levels were or have been exceeded and works are being undertaken in accordance with consents. Due to the nature of the stakeholder's business the contractor reached a temporary goodwill agreement to pay for the use of the stakeholder's facilities, to ensure that the stakeholder was not being unduly affected. However, as stated there is no evidence that this has been done on anything other than a goodwill basis given noise limits have not been exceeded. Stakeholders business has been reassured that they will not be adversely affected during their working hours.

Appendix A Site Locations

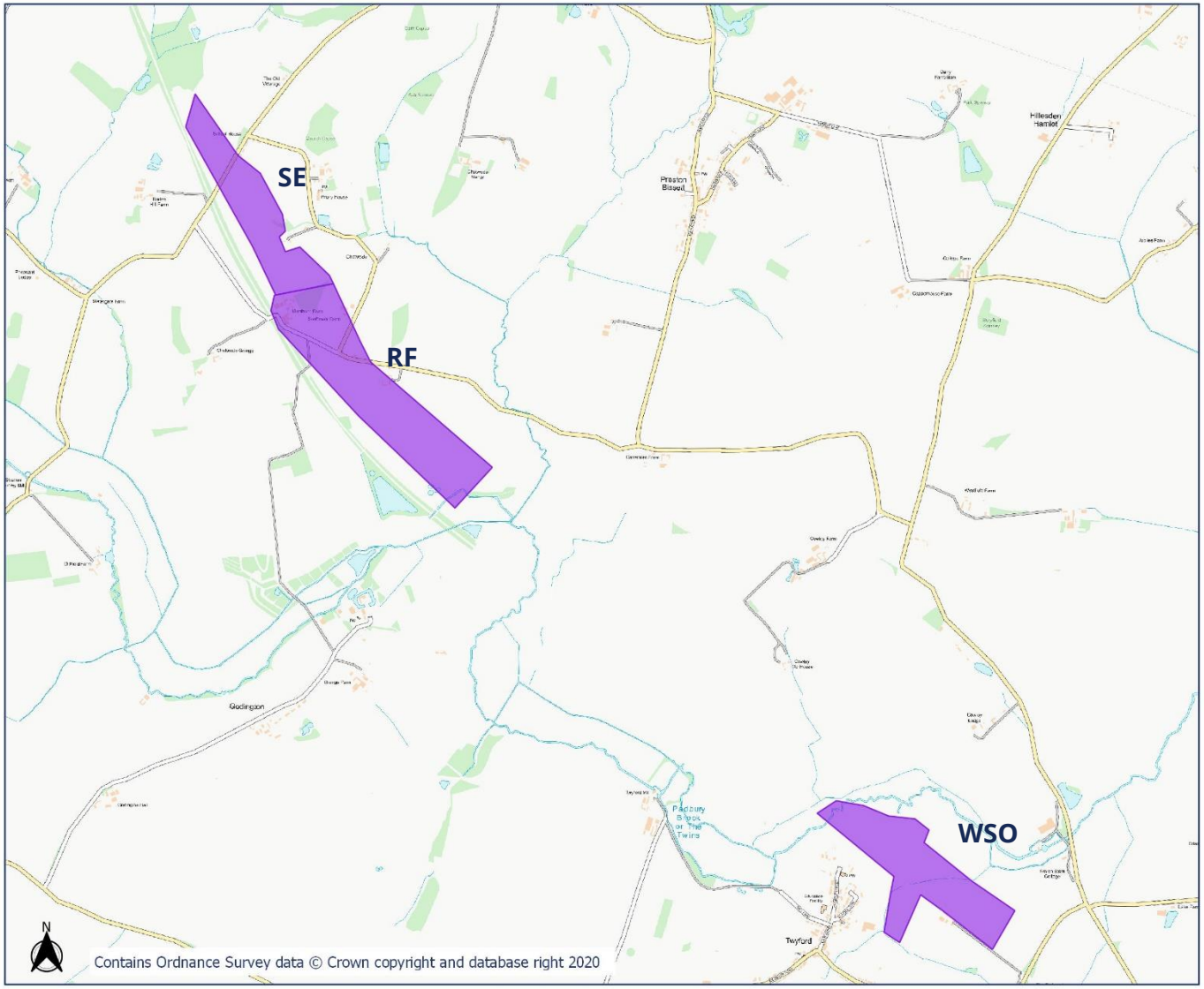
HS2 Worksite Identification Plan - Overview 1



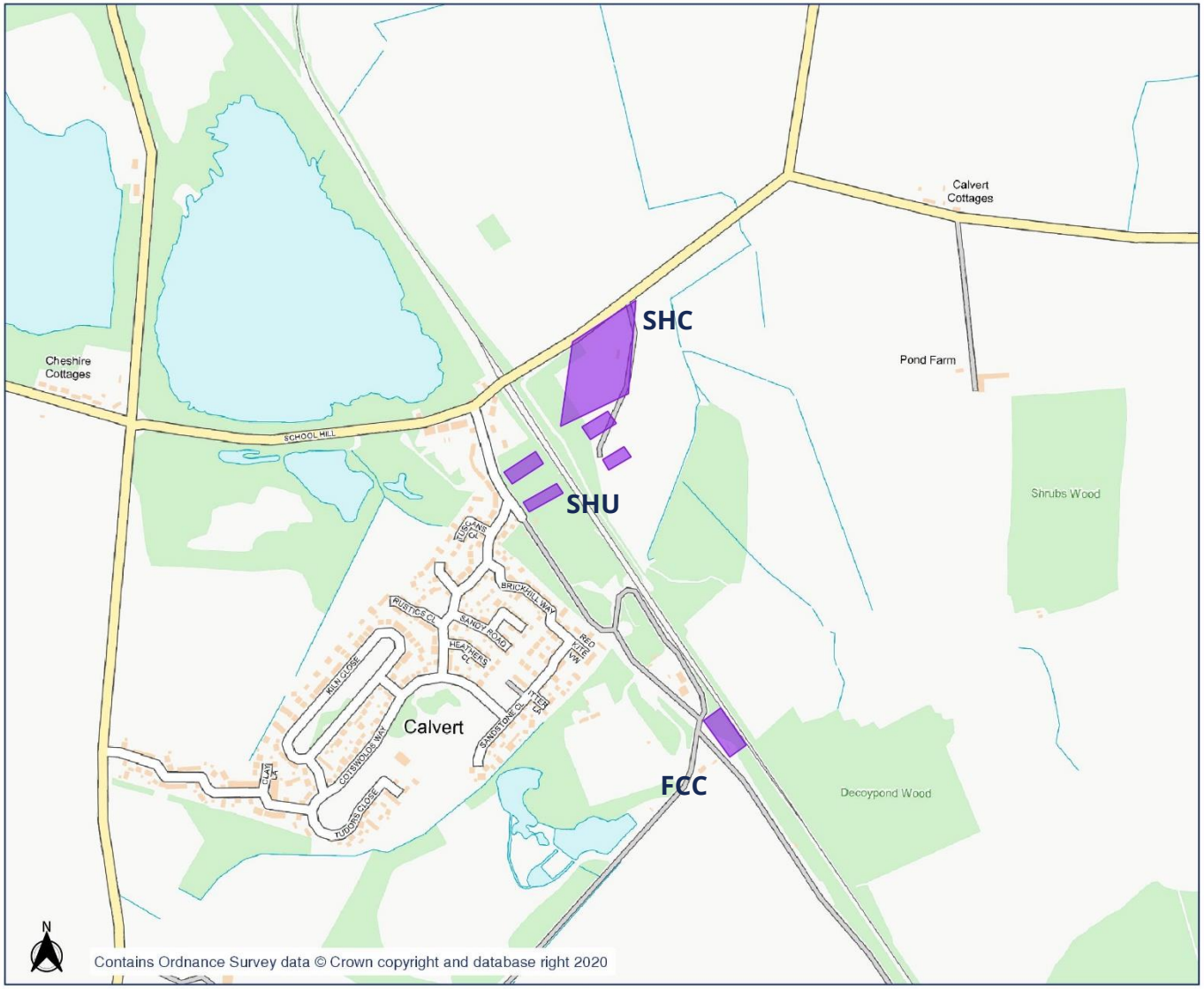
HS2 Worksite Identification Plan - Overview 2



Worksite Identification Plan - 1

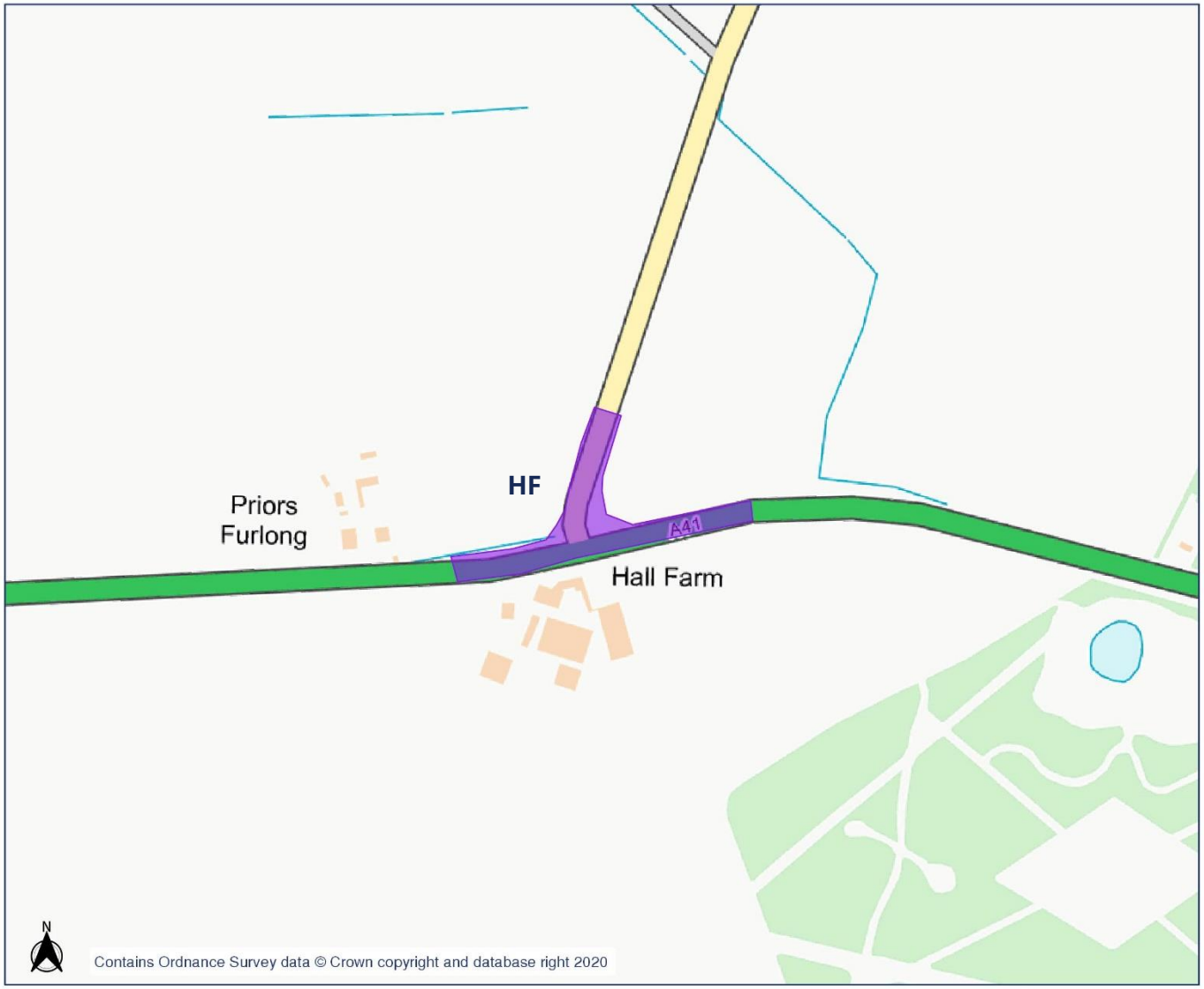


Worksite Identification Plan - 2



Worksite Identification Plan - 3

Worksite Identification Plan - 4



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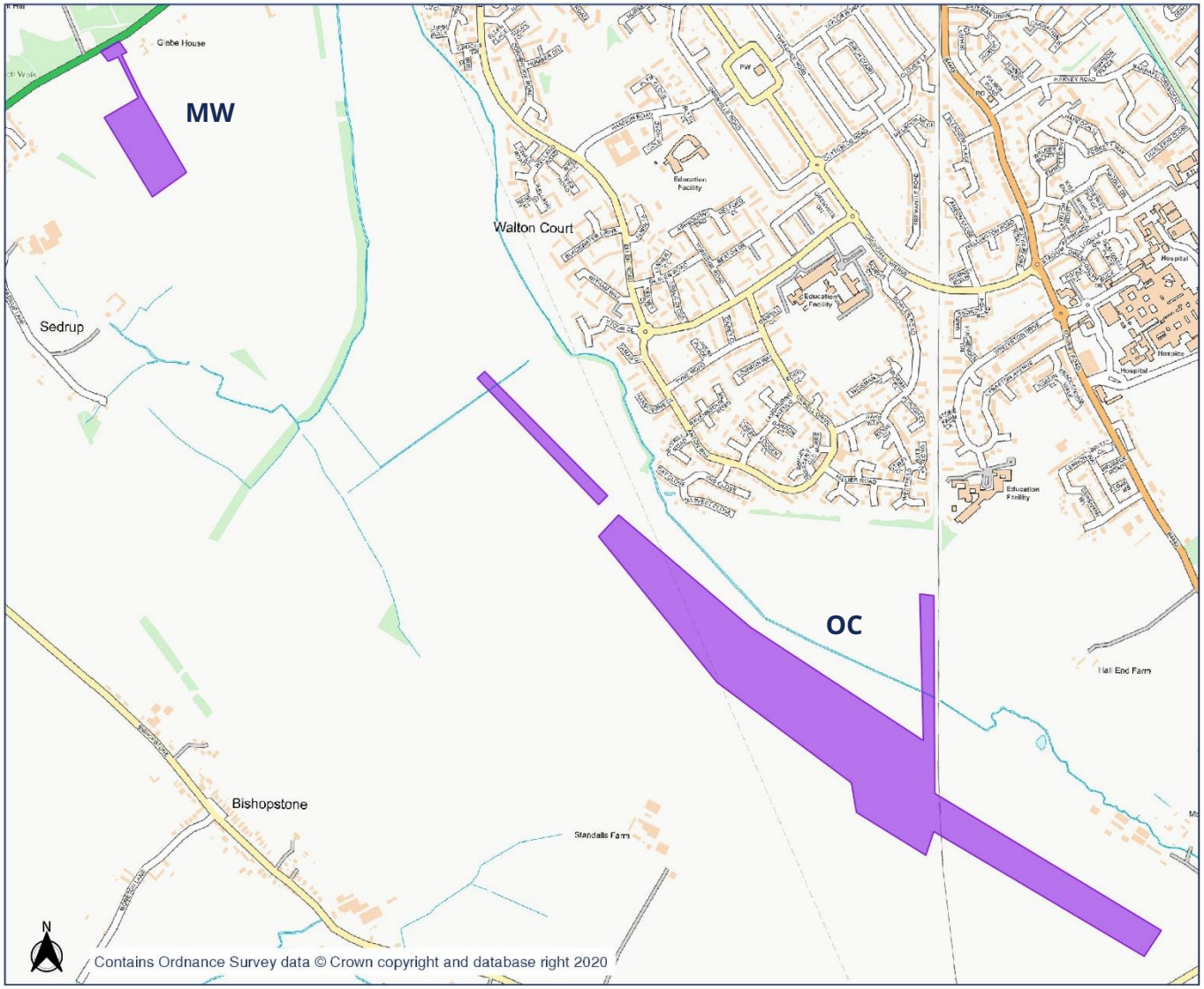
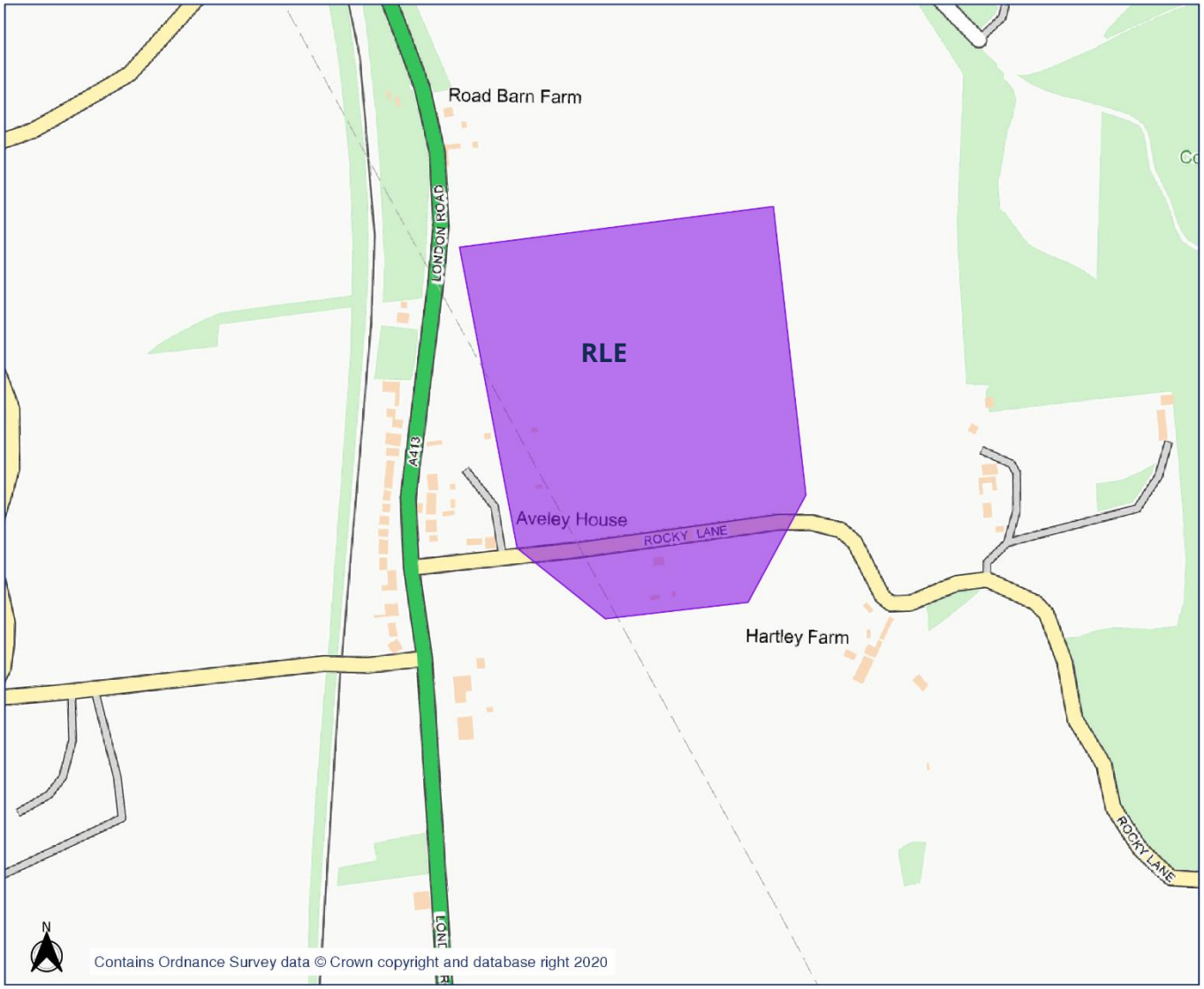


Worksite Identification Plan - 6



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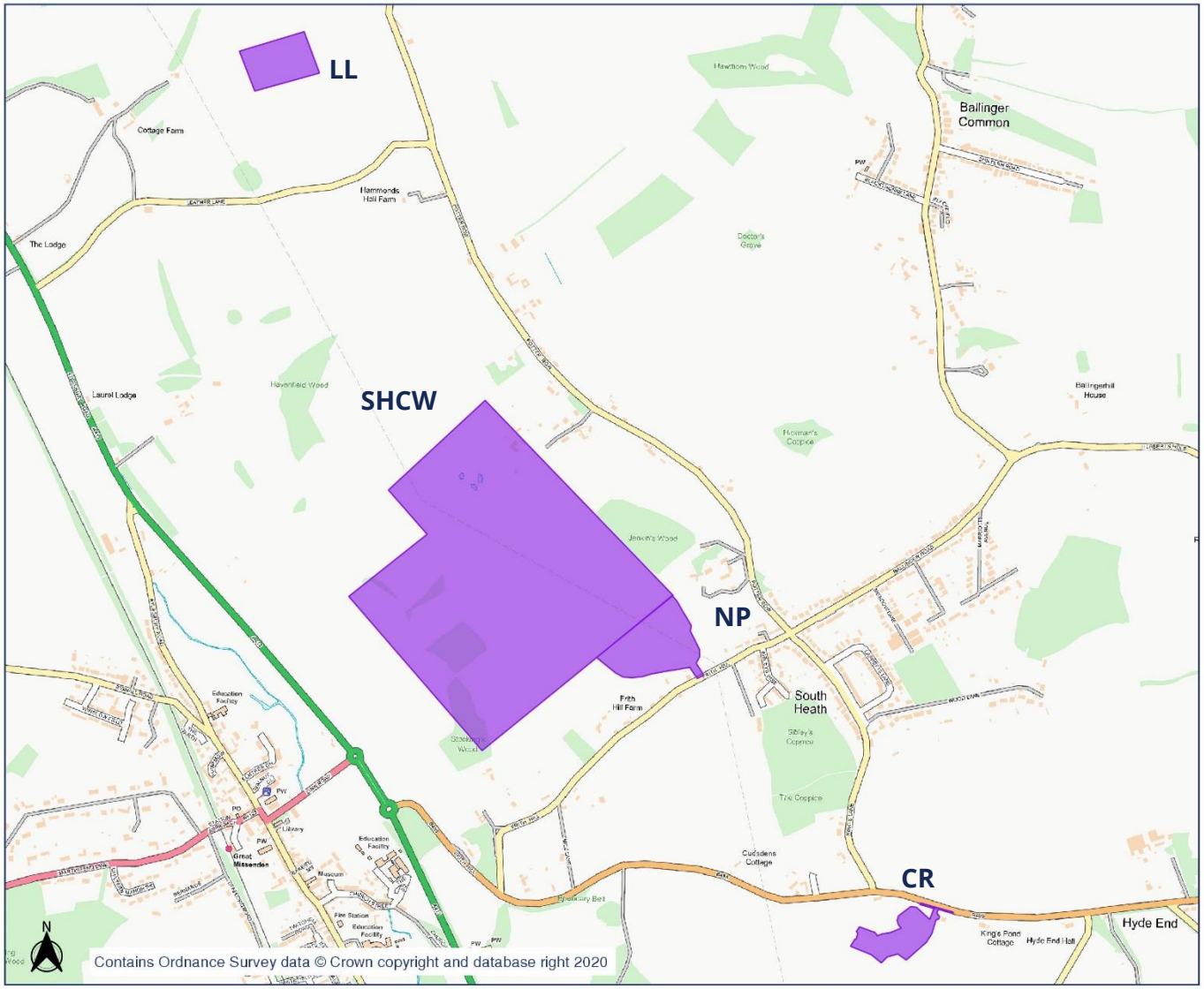
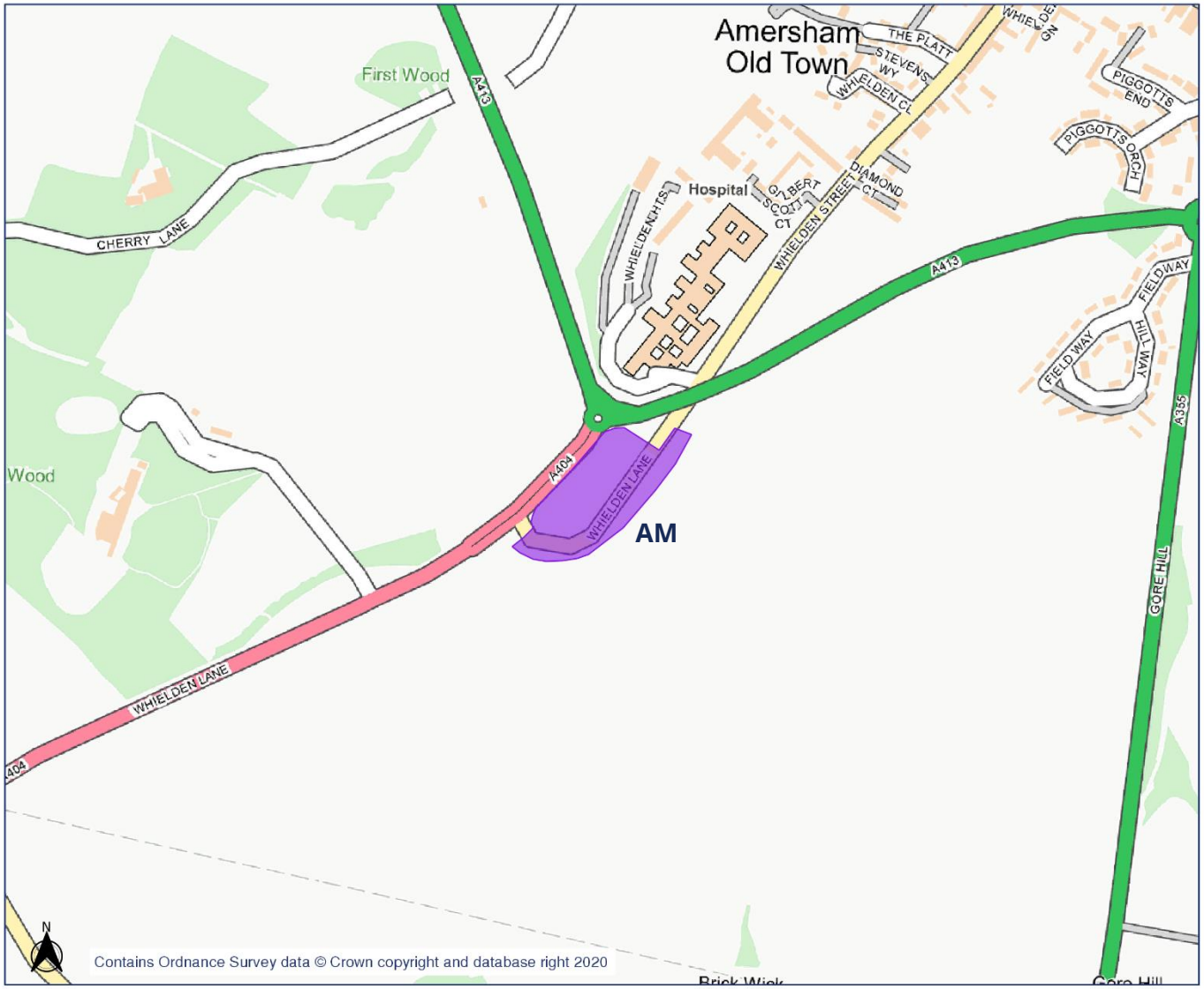


Worksite Identification Plan - 8

Legend

Active Worksites

Worksite Identification Plan - 9



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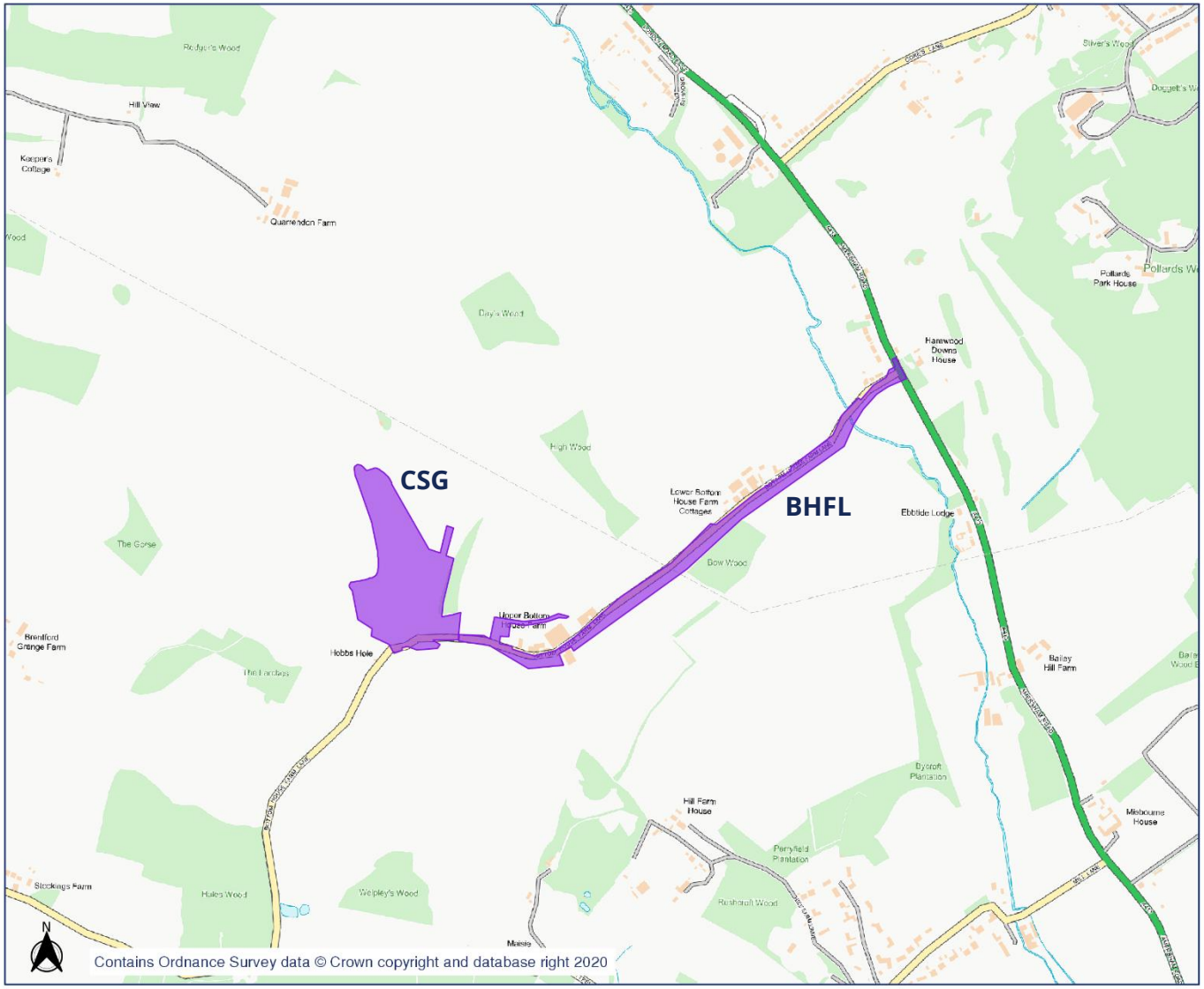
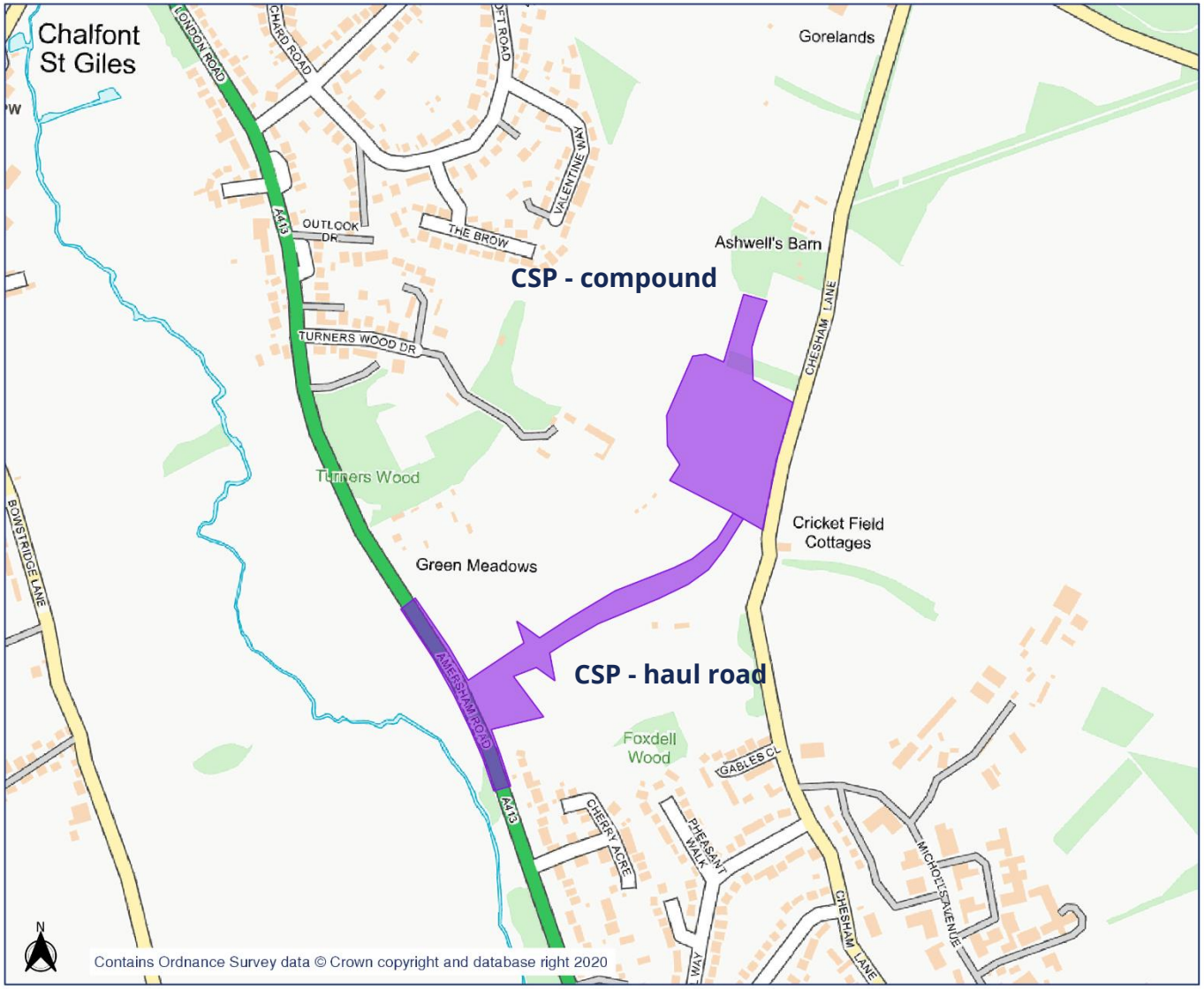
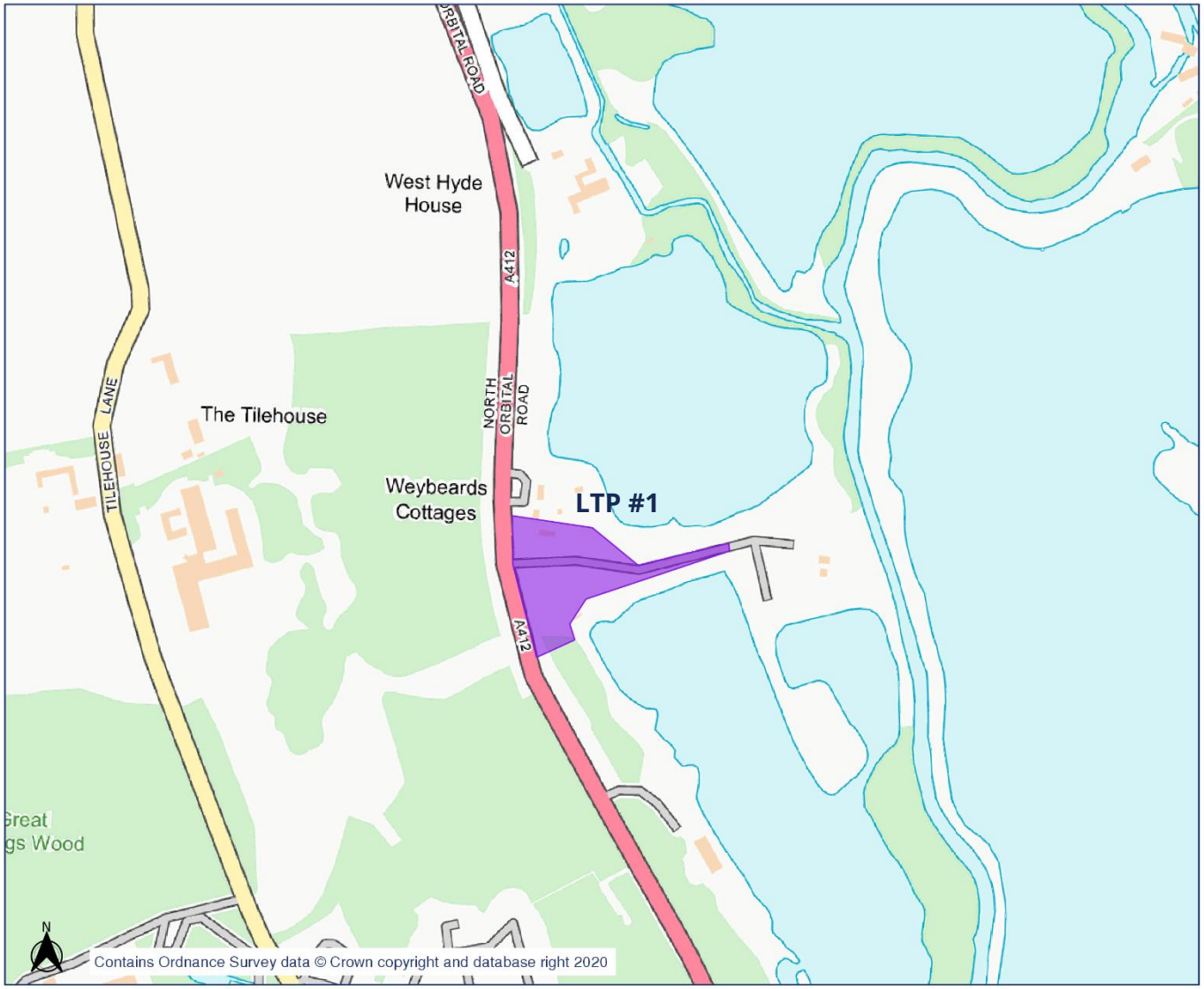


Worksite Identification Plan - 11

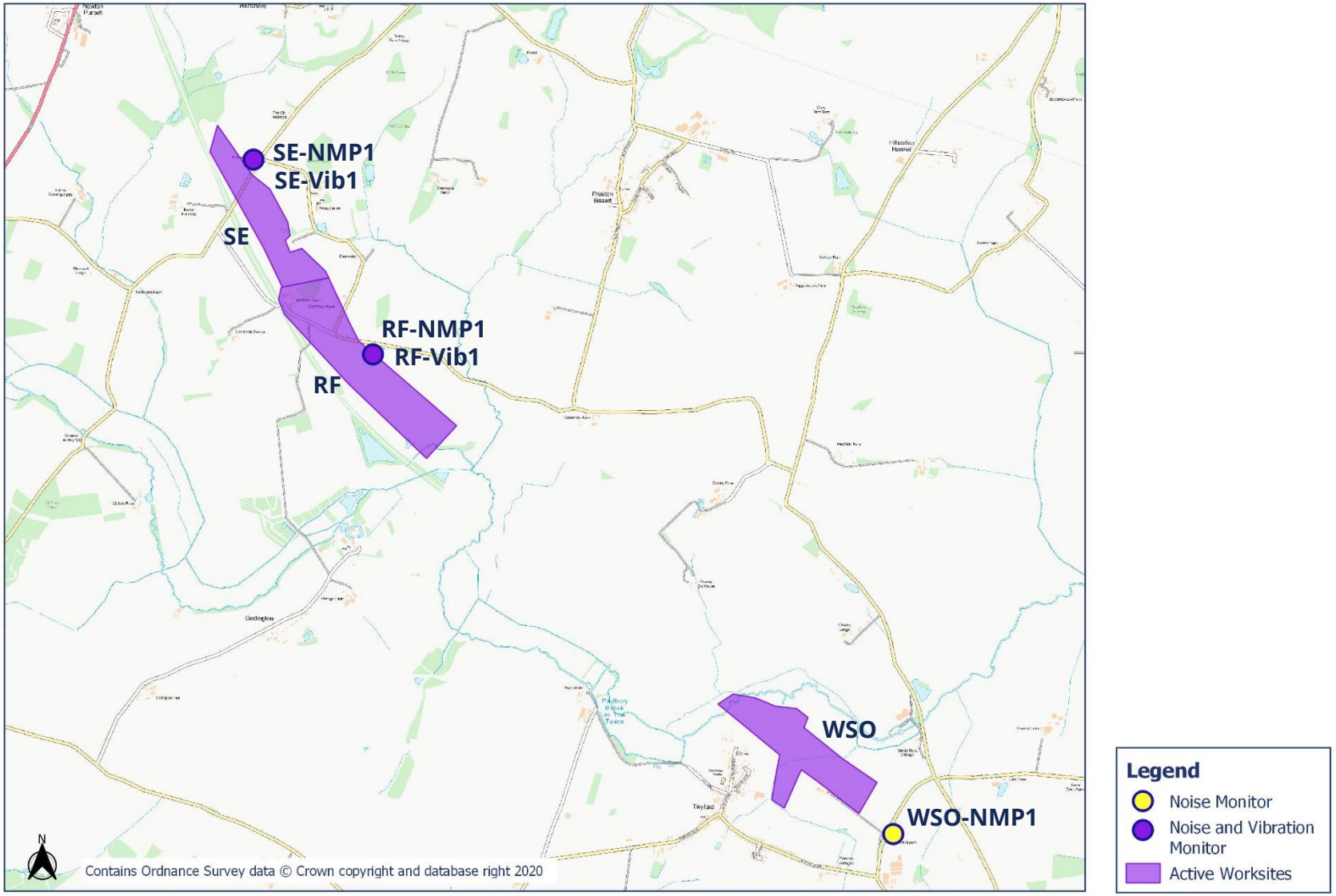


Worksite Identification Plan - 12

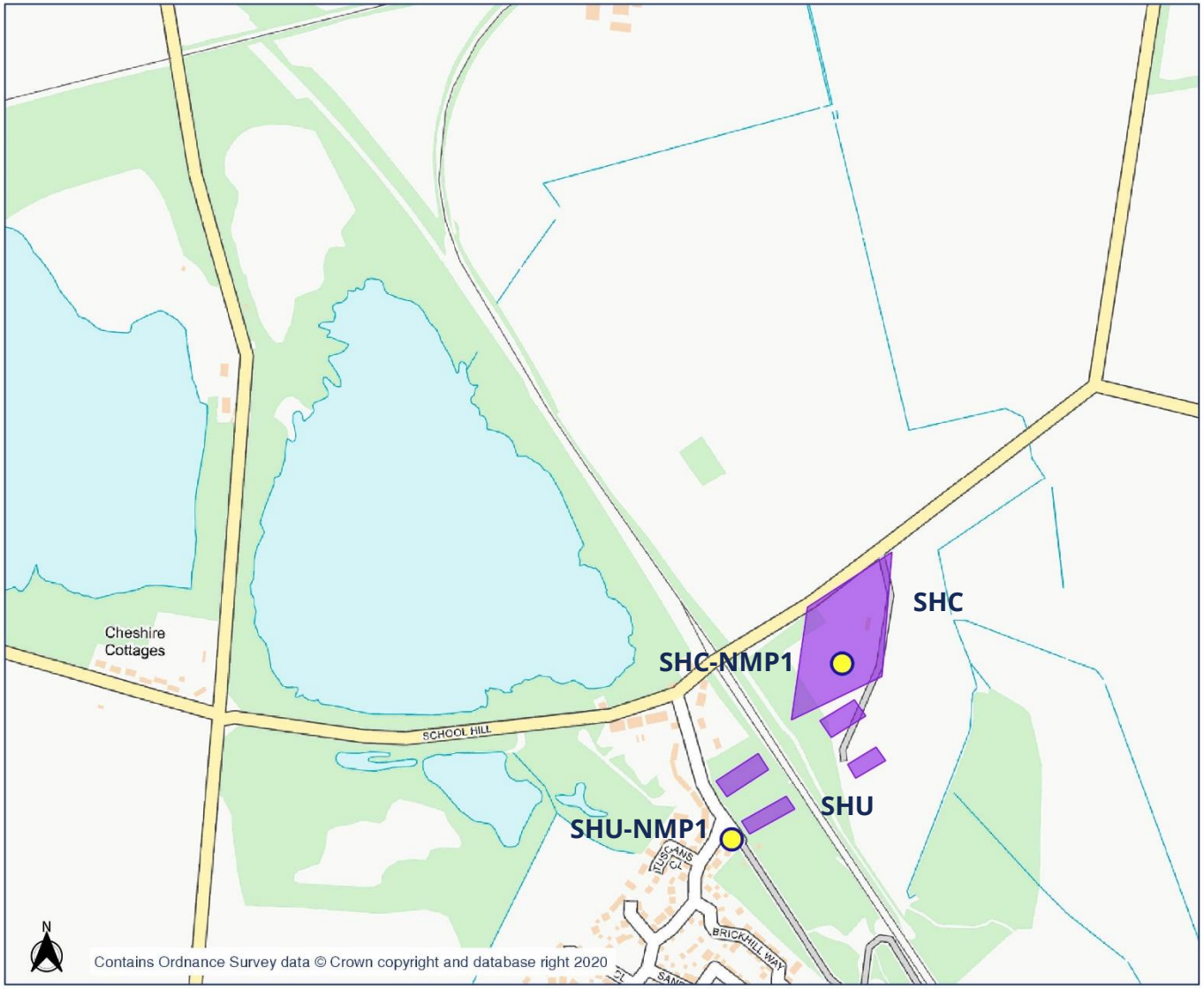


Appendix B Monitoring Locations

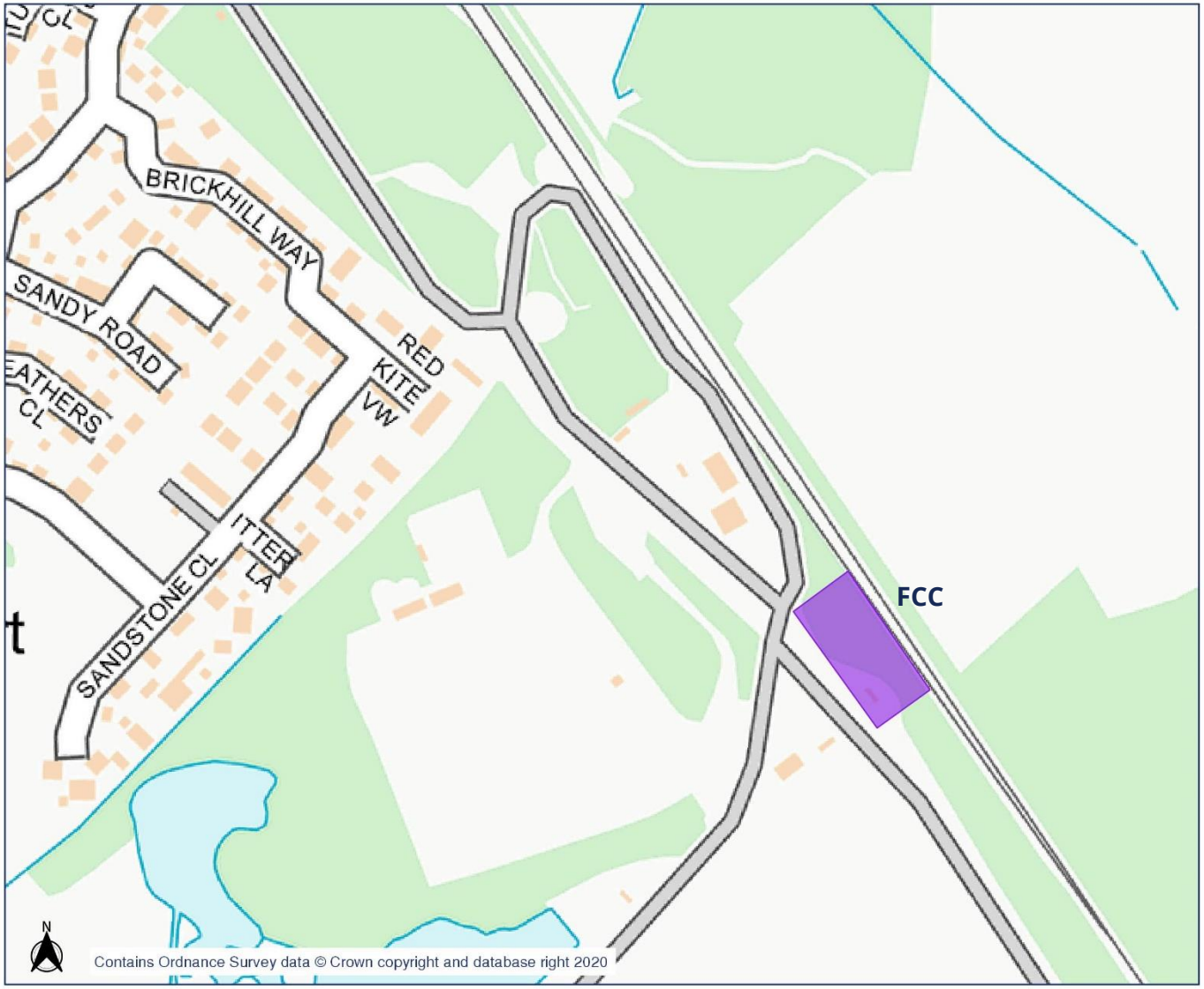
Noise and Vibration Monitoring Plan - 1



Noise and Vibration Monitoring Plan - 2



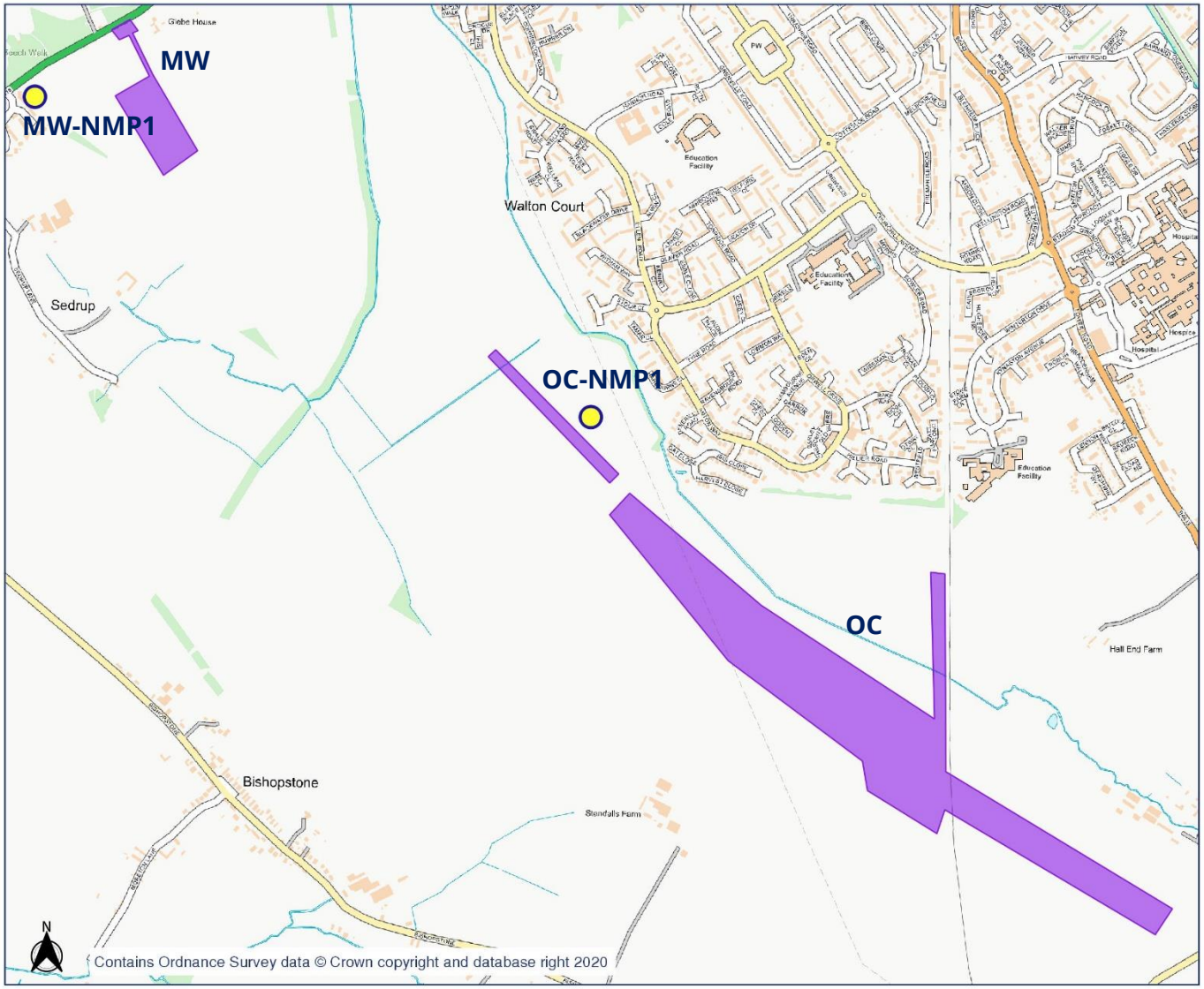
HS2 Noise and Vibration Monitoring Plan - 3



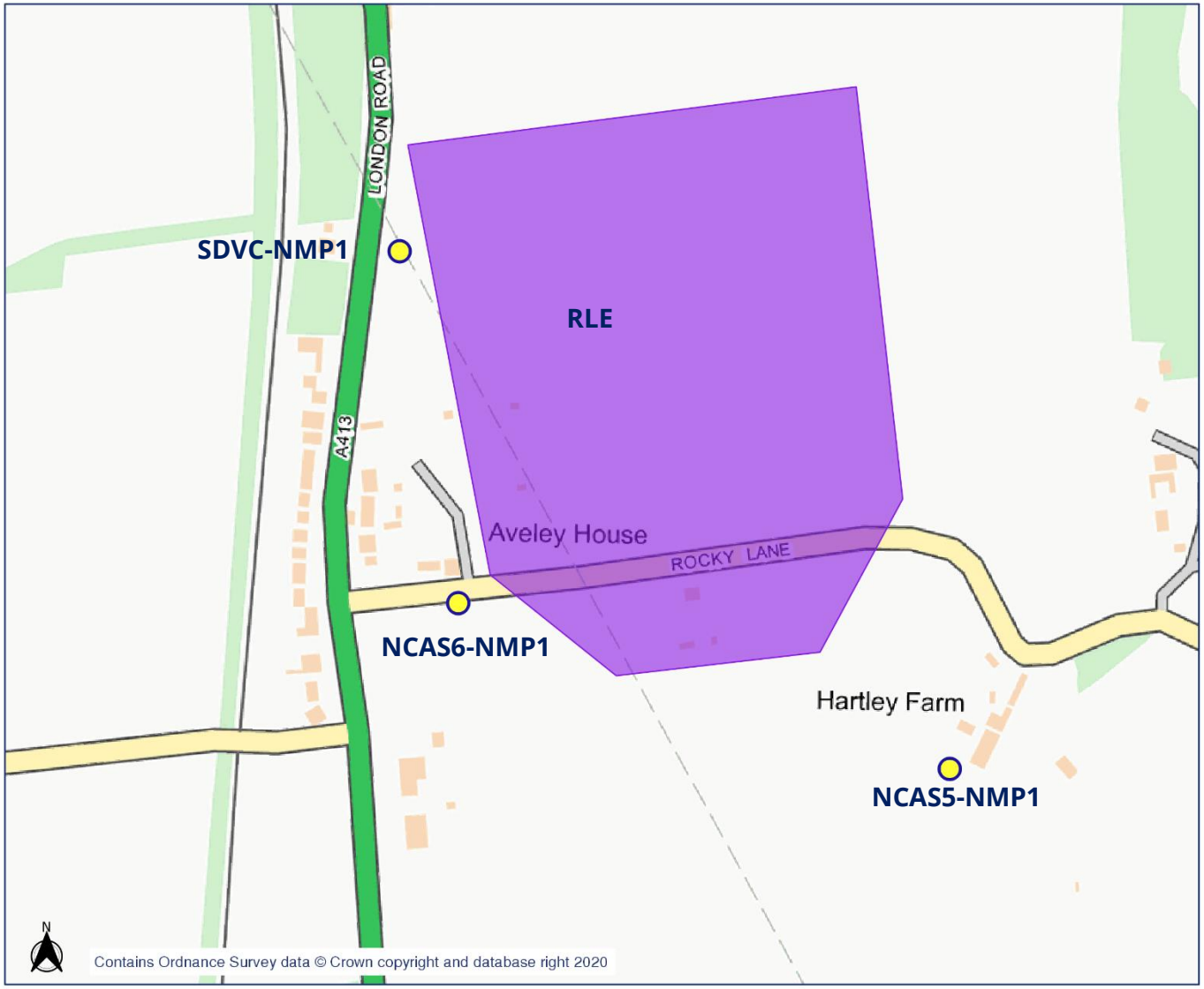
Noise and Vibration Monitoring Plan - 4

Noise and Vibration Monitoring Plan - 5

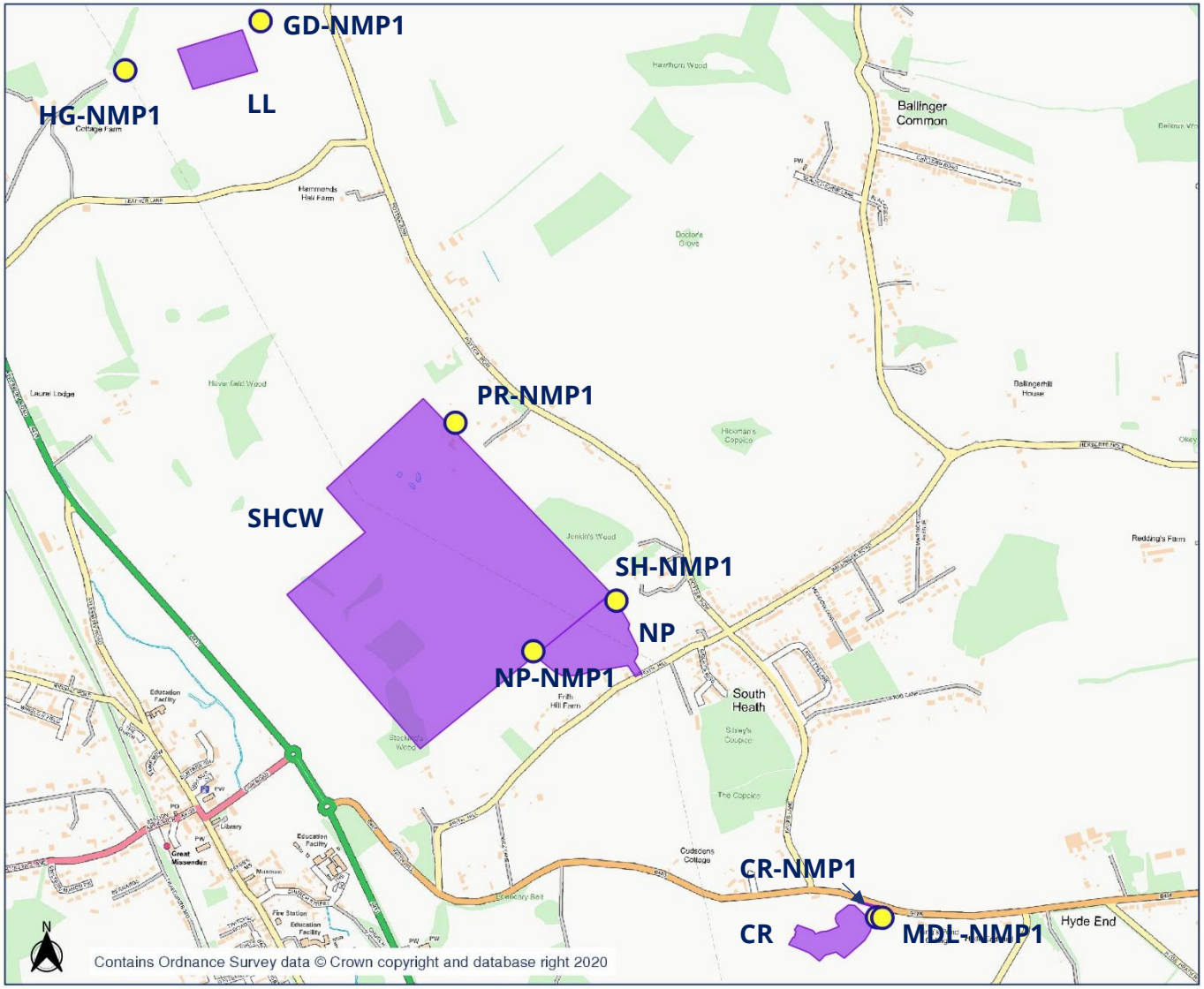
Noise and Vibration Monitoring Plan - 6



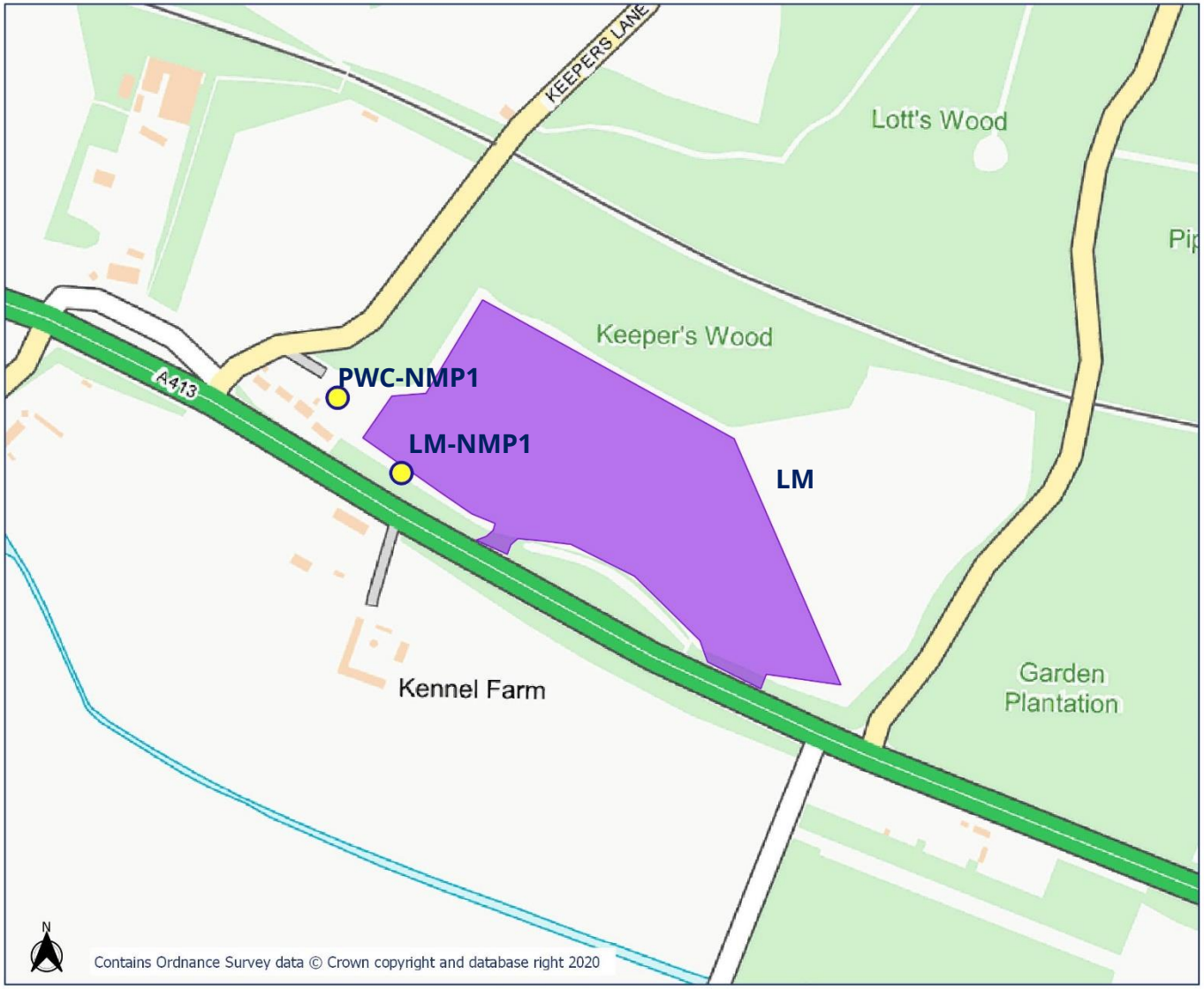
Noise and Vibration Monitoring Plan - 7



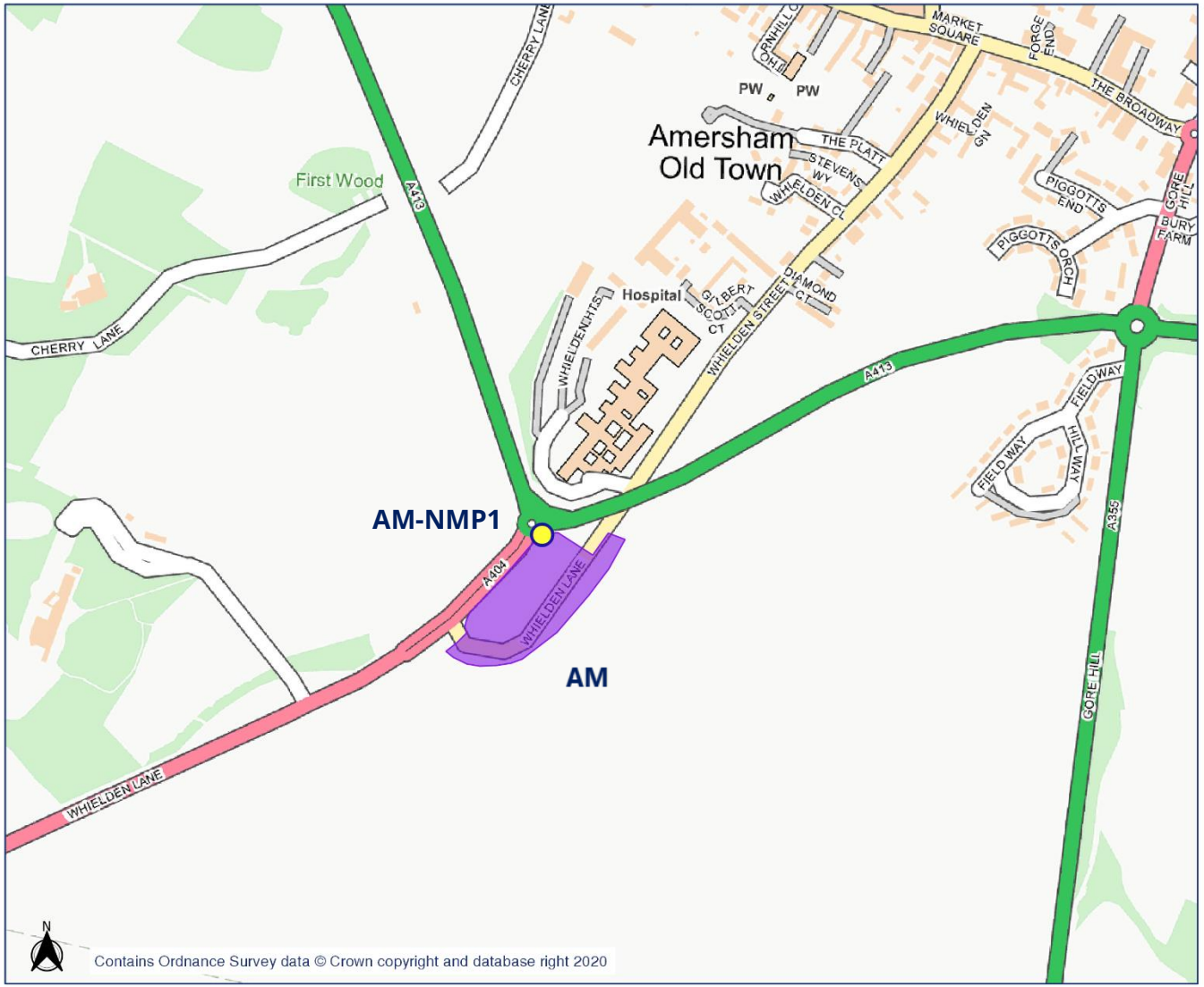
Noise and Vibration Monitoring Plan - 8



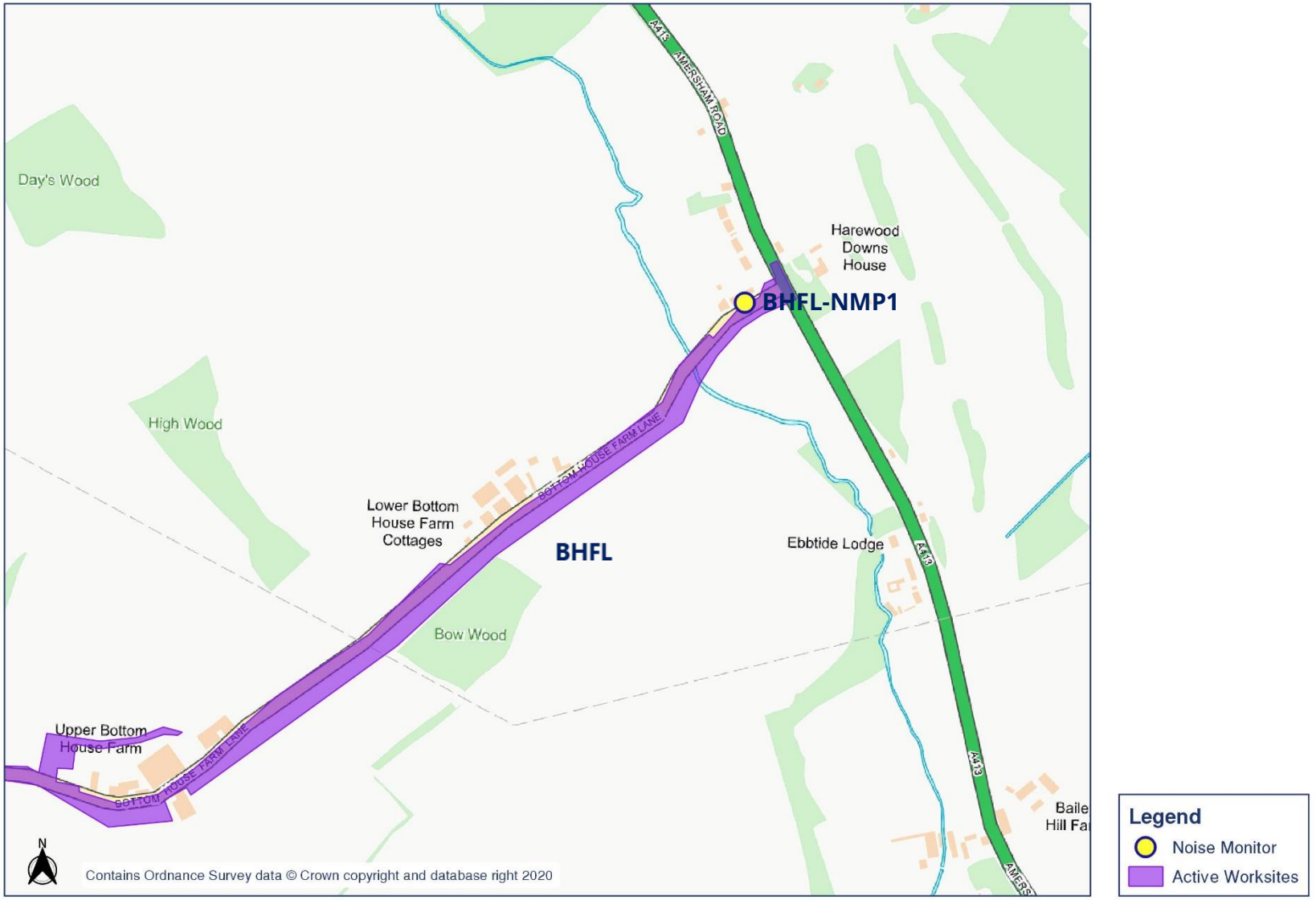
Noise and Vibration Monitoring Plan - 9



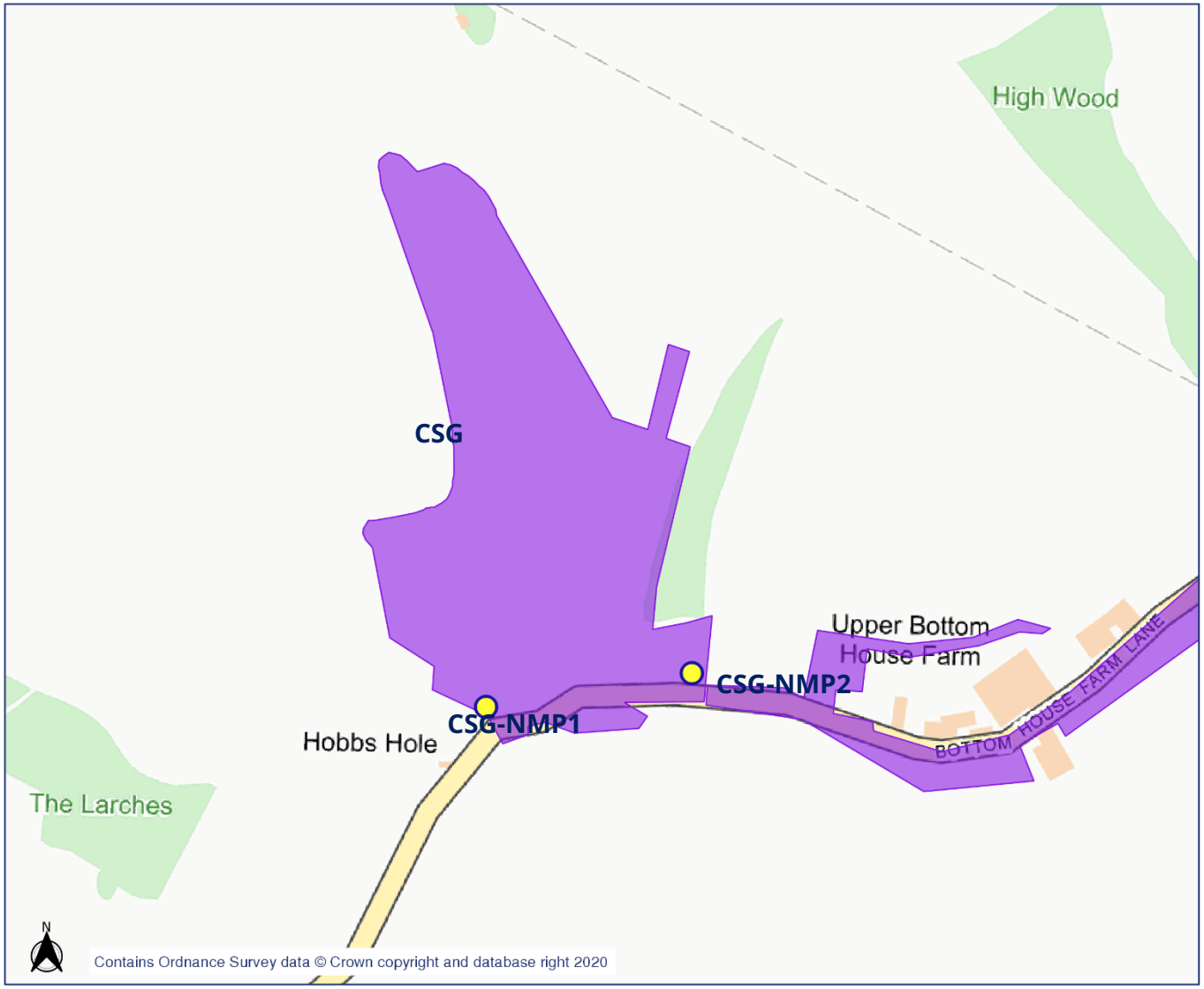
HS2 Noise and Vibration Monitoring Plan - 10



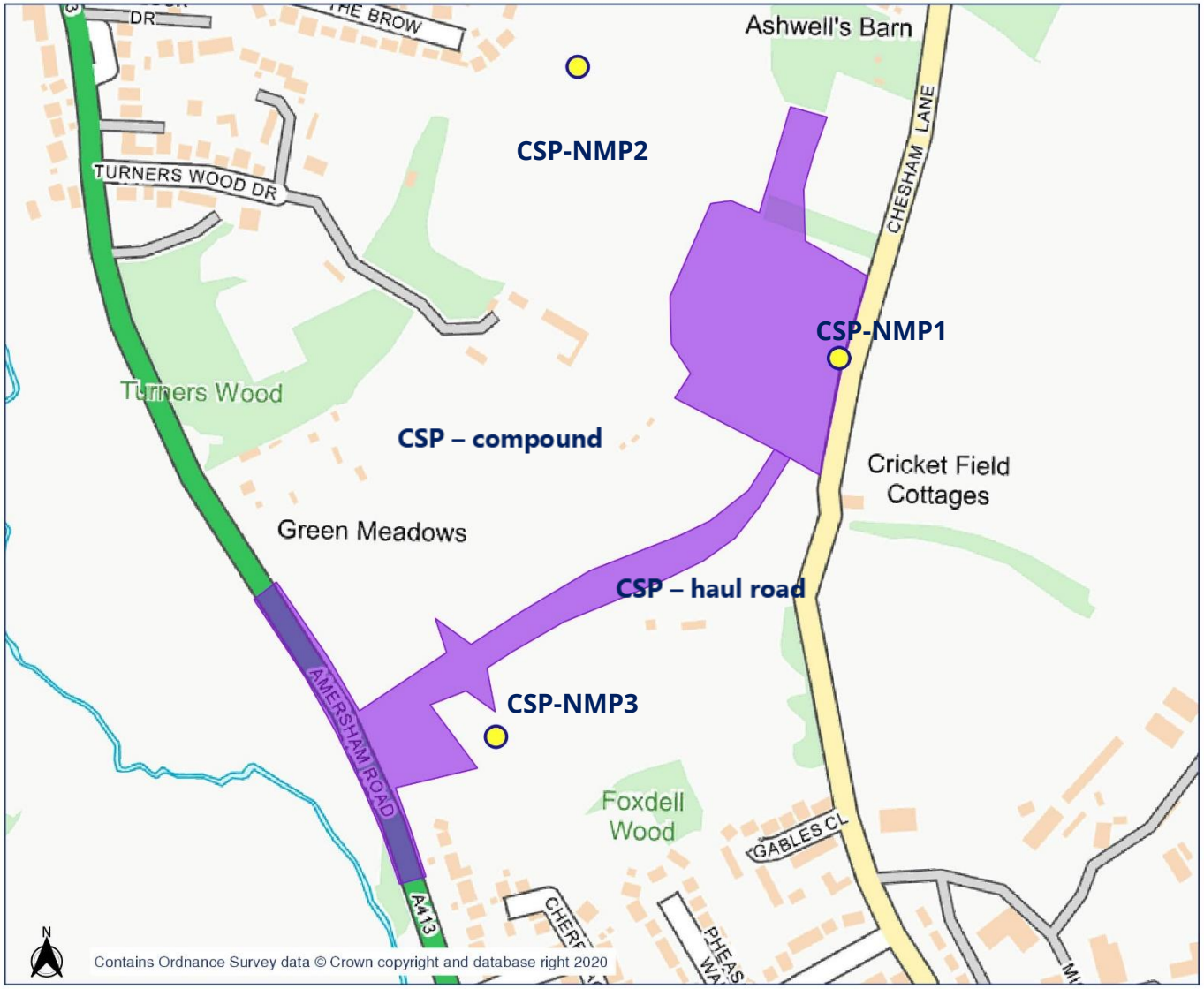
HS2 Noise and Vibration Monitoring Plan - 11



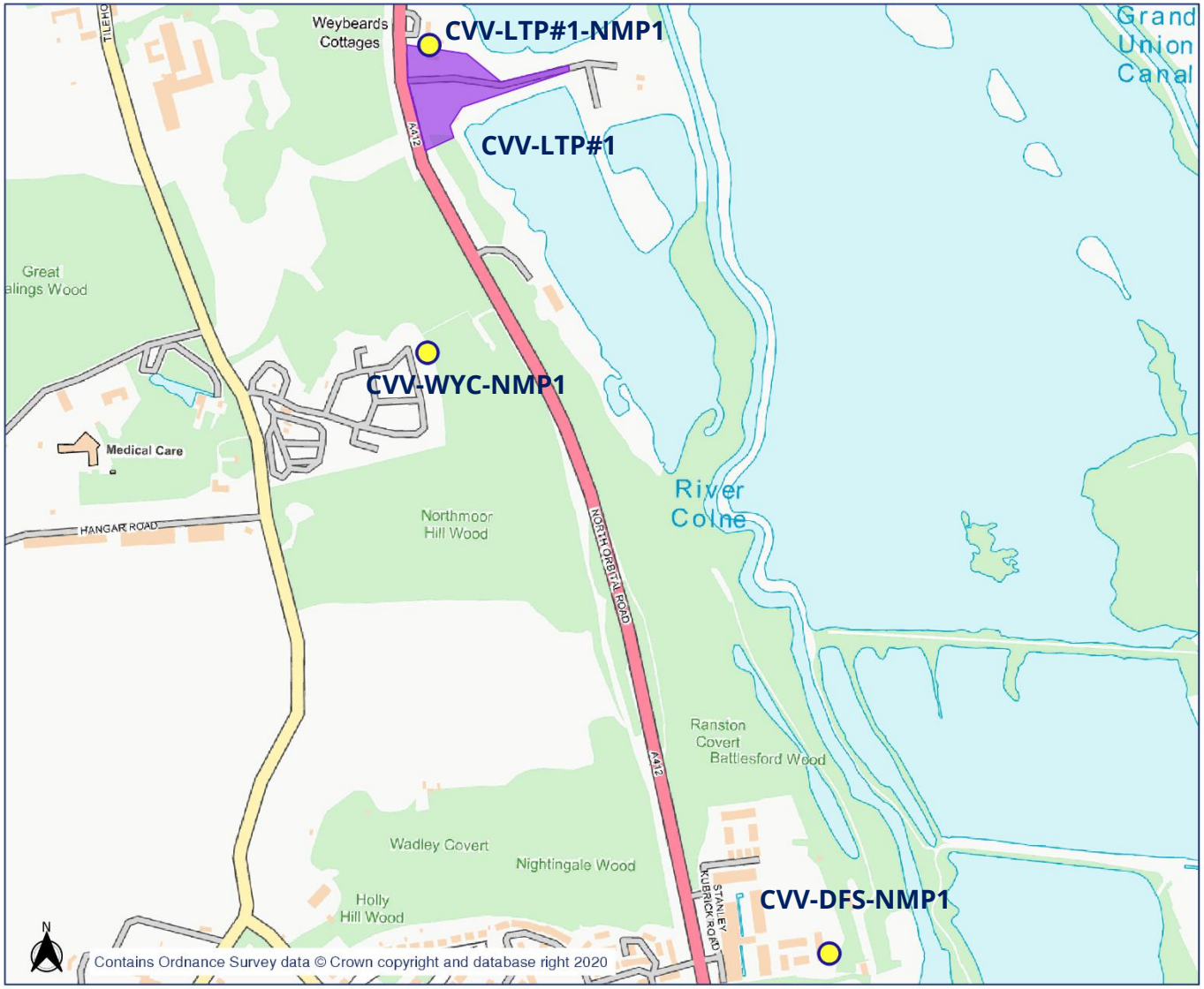
Noise and Vibration Monitoring Plan - 12



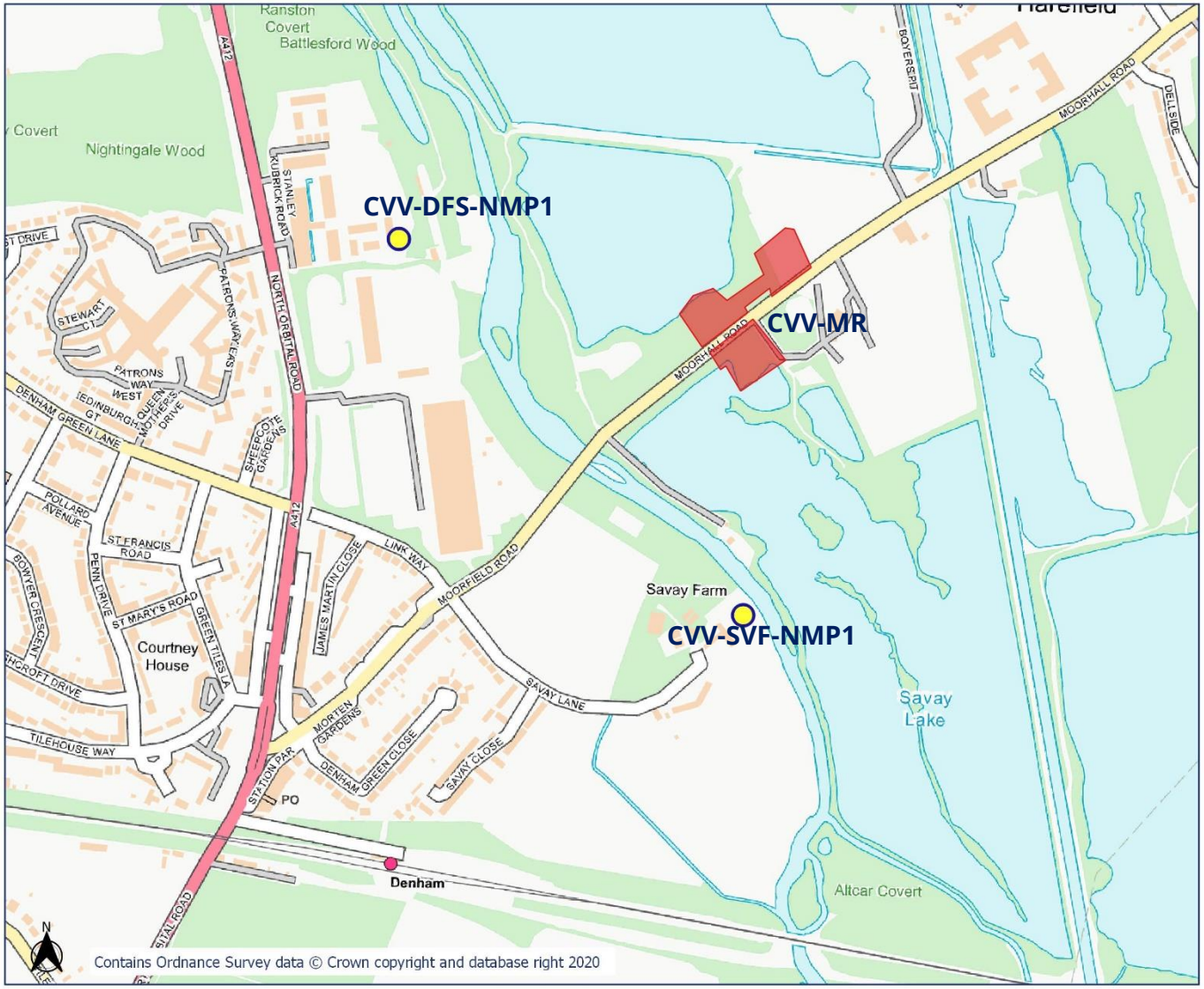
HS2 Noise and Vibration Monitoring Plan - 13



HS2 Noise and Vibration Monitoring Plan - 14



HS2 Noise and Vibration Monitoring Plan - 15

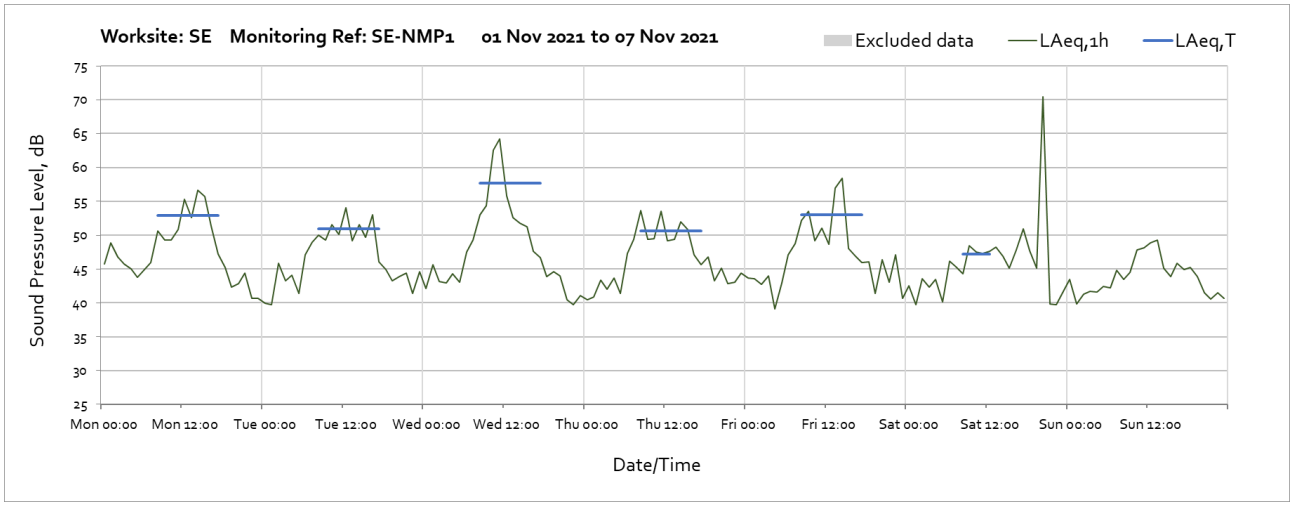


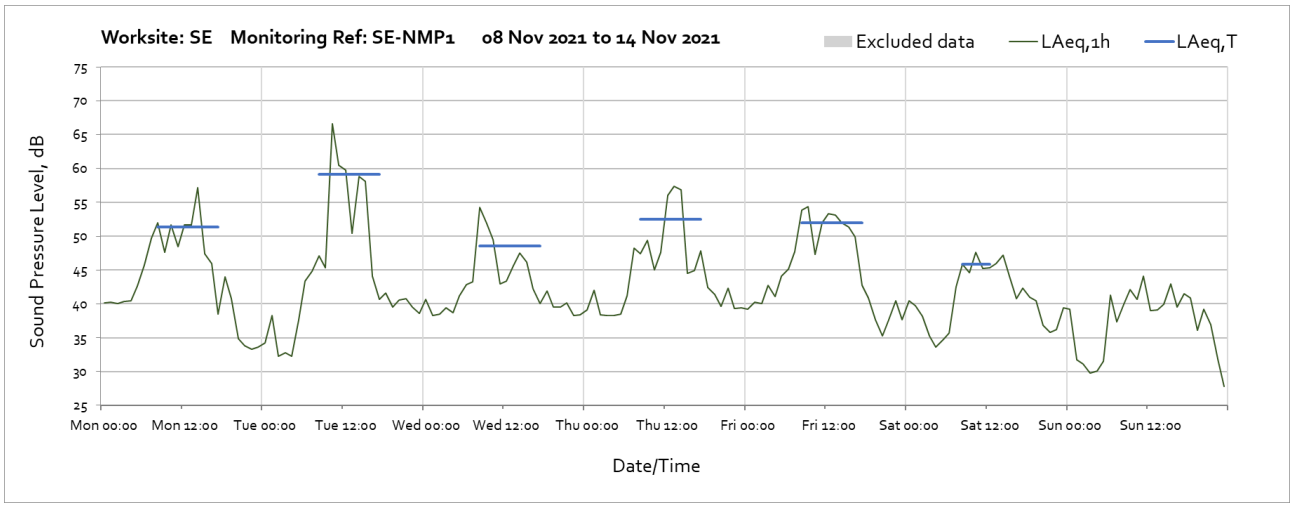
Appendix C Data

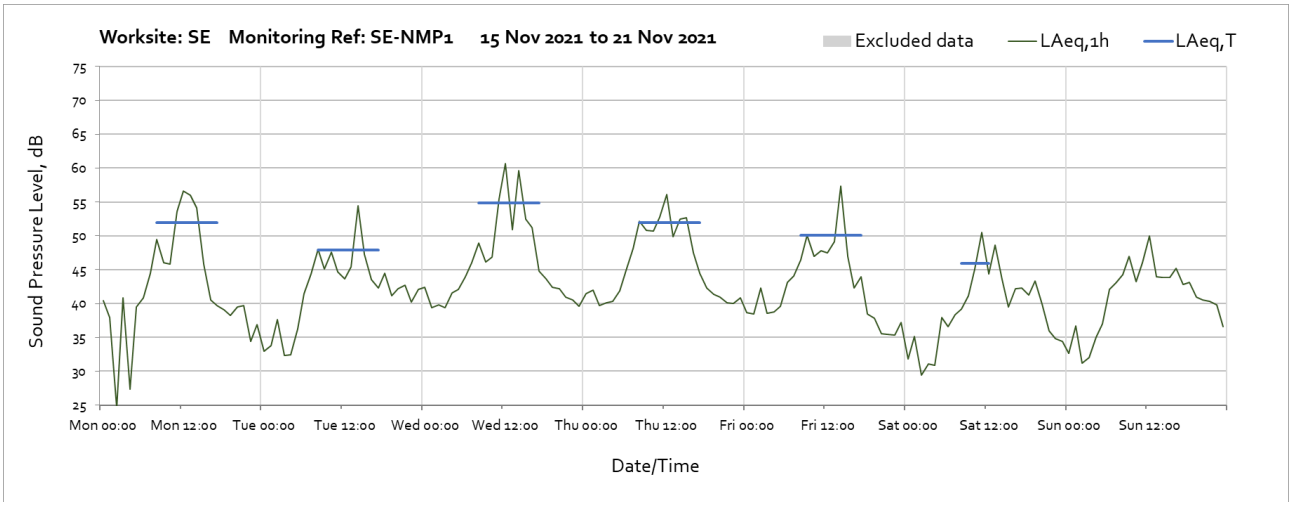
Noise

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: SE – Monitoring Ref: SE-NMP1






Worksite: SE Monitoring Ref: SE-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
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50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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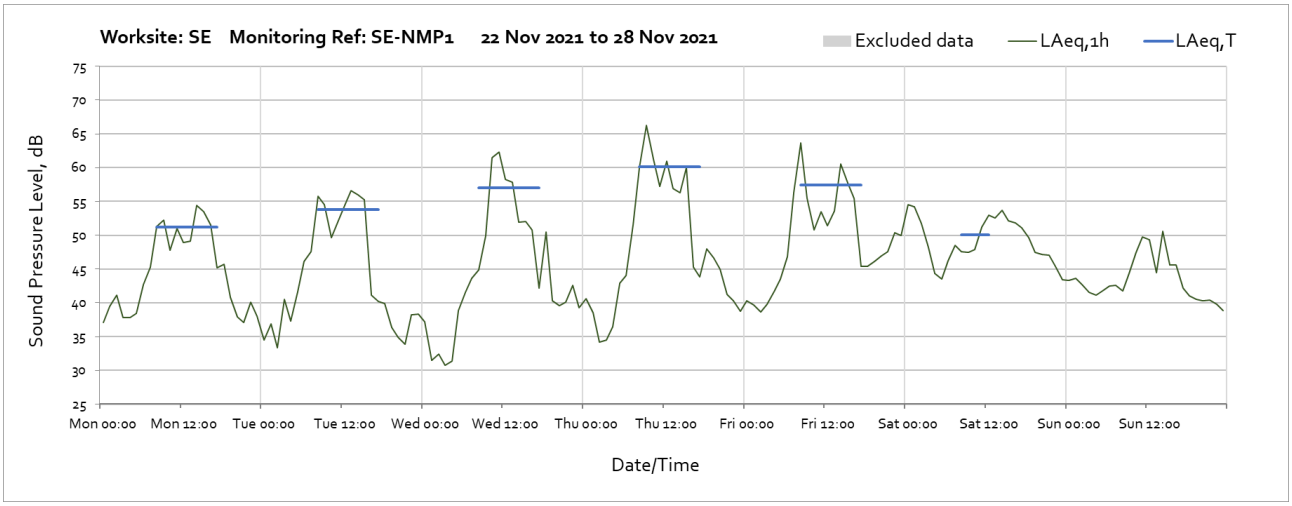
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: SE Monitoring Ref: SE-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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65
60
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Mon 12:00
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Tue 12:00
Wed 00:00
Wed 12:00
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Fri 12:00
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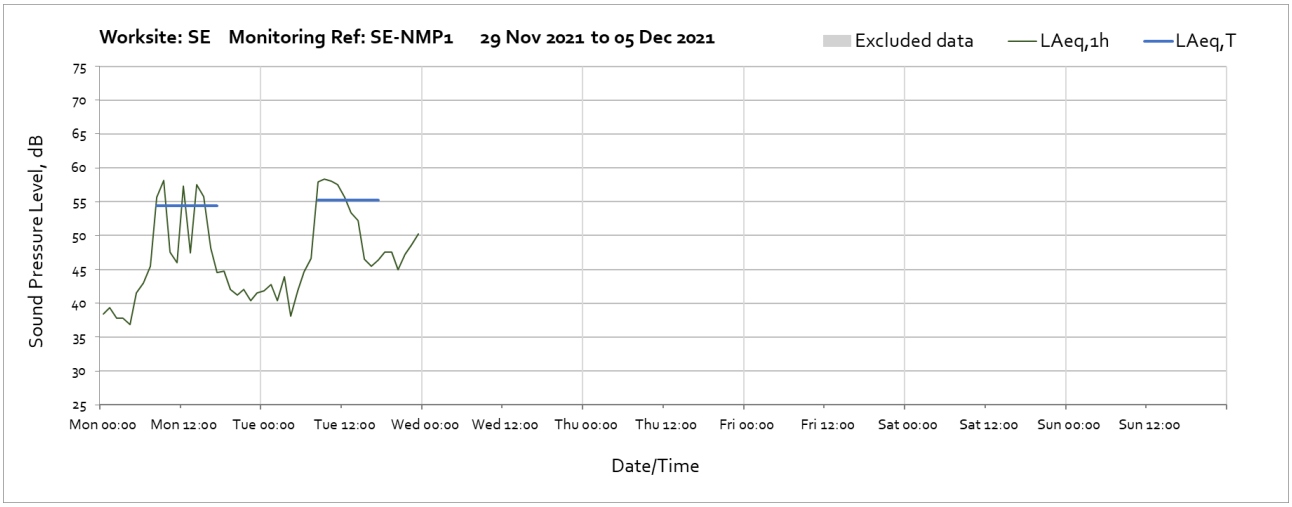
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: SE Monitoring Ref: SE-NMP1 29 Nov 2021 to 05 Dec 2021
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LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
65
60
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Tue 12:00
Wed 00:00
Wed 12:00
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Thu 12:00
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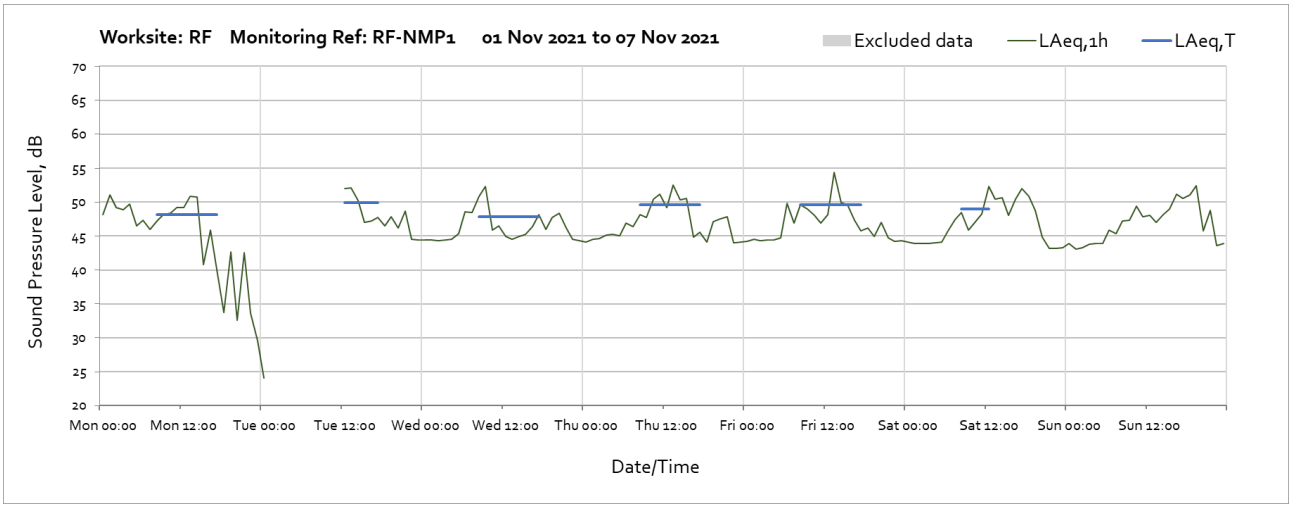
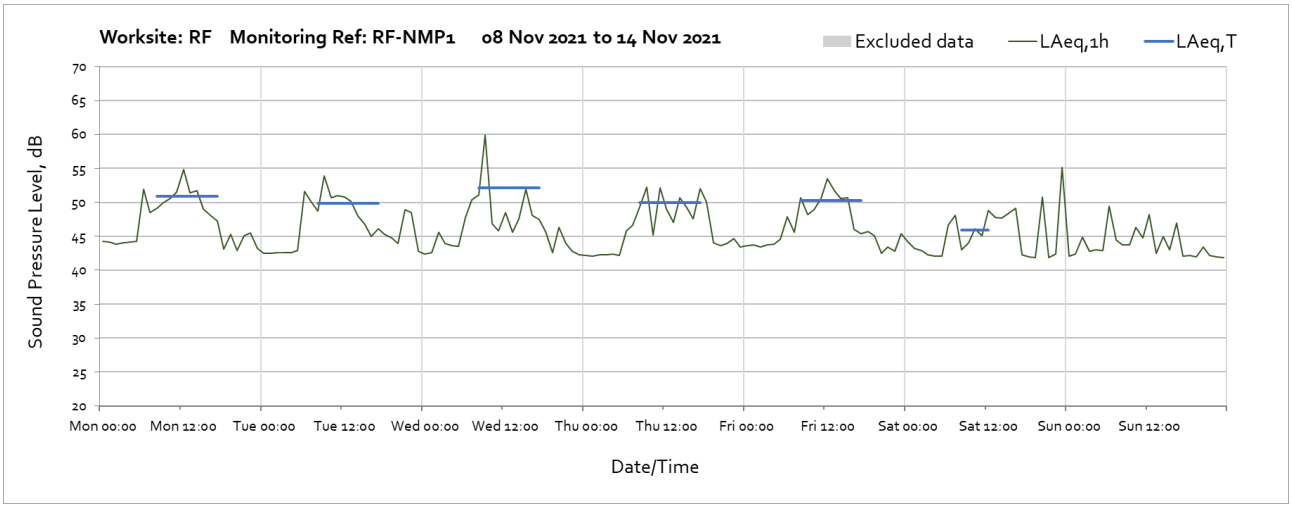
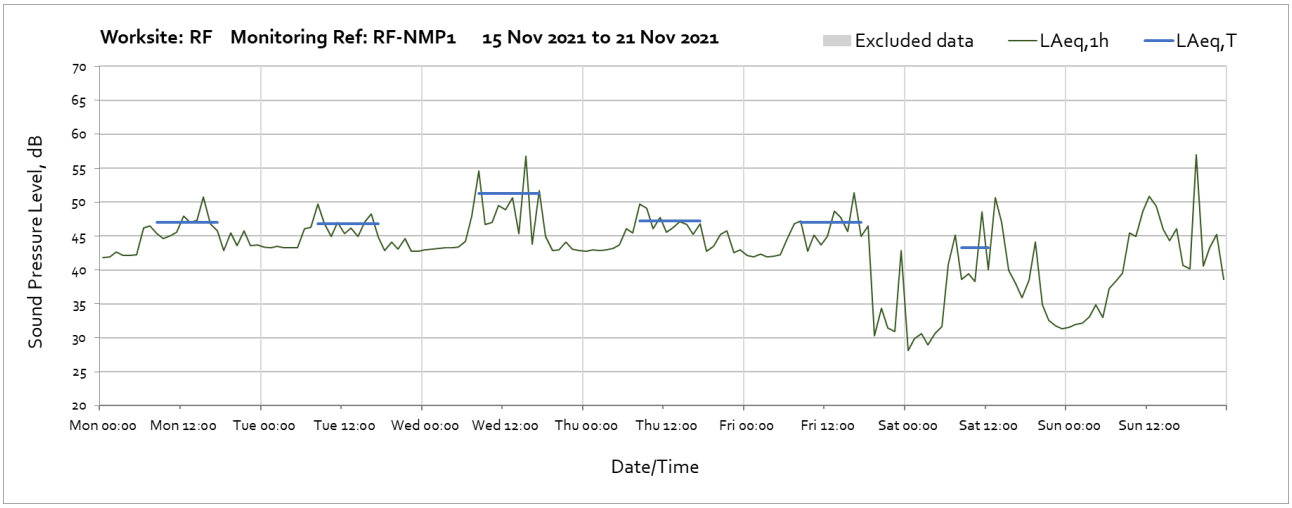
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

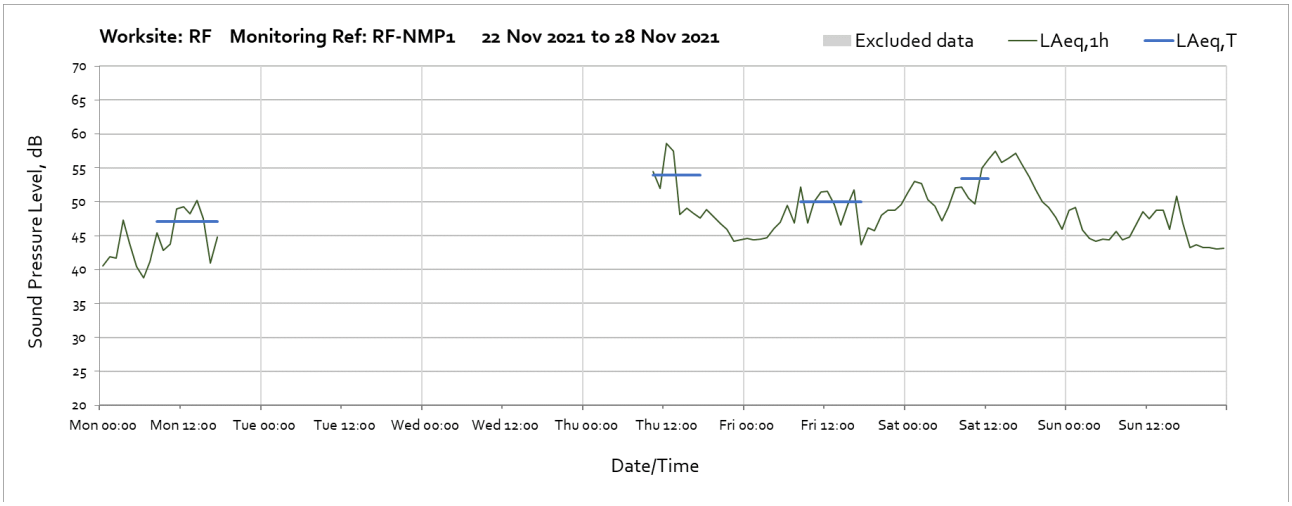
Worksite: RF – Monitoring Ref: RF-NMP1



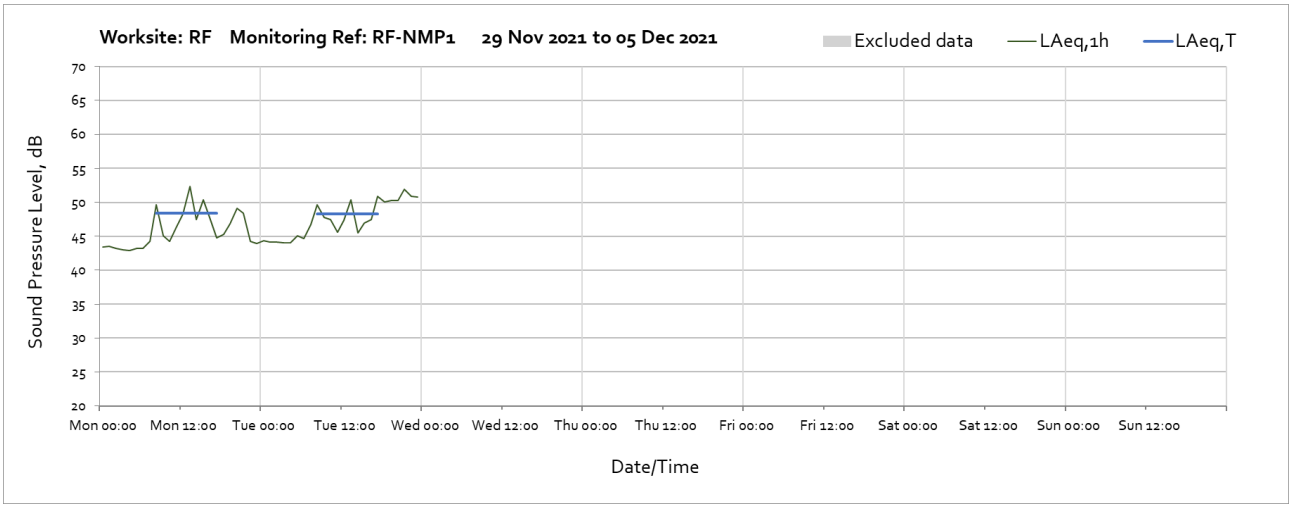
Note: Missing data between 01:00 and 12:00 on Tuesday 2nd was due to loss of continious site power from the hydrogen generator.



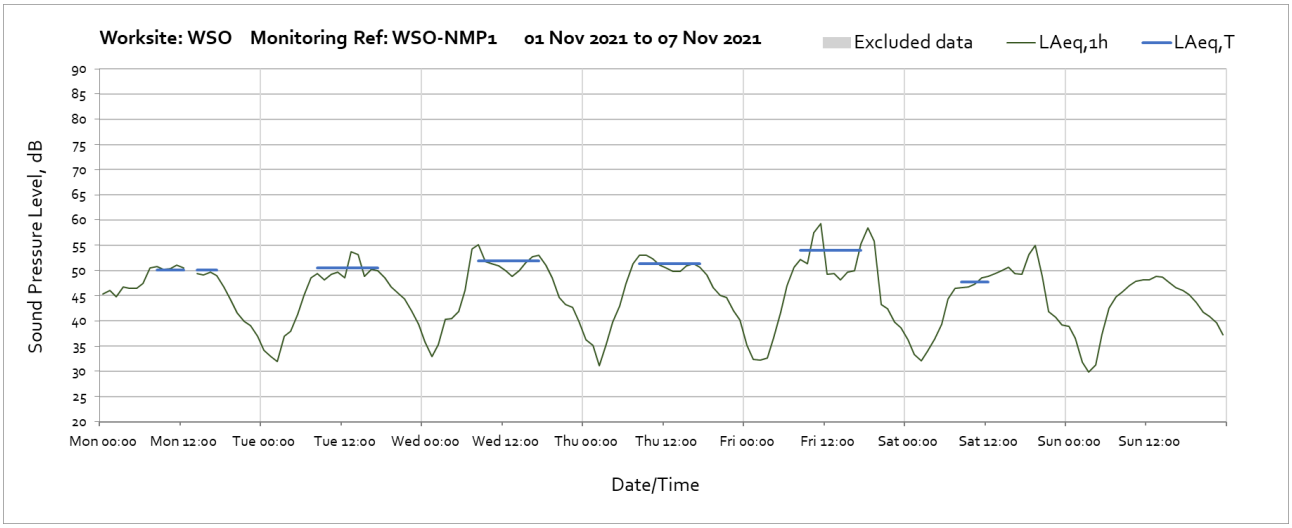




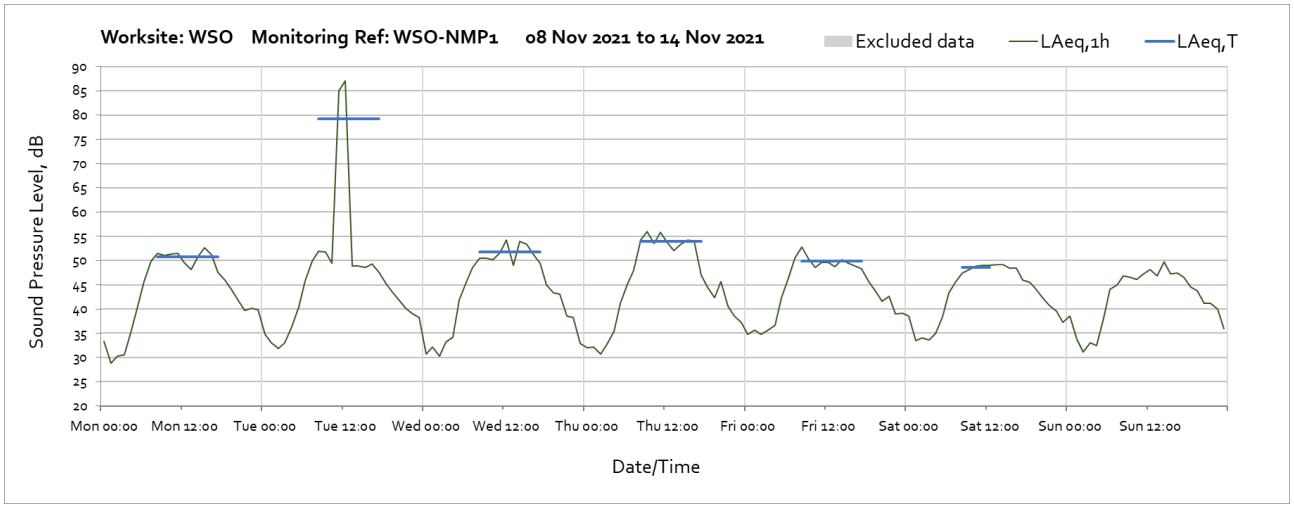
Note: Missing data between 18:00 on Monday 22nd November and 10:00 on Thursday 25th November was due to loss of continious site power from the hydrogen generator.



Worksite: WSO – Monitoring Ref: WSO-NMP1



Note: Missing data at 13:00 on Monday 1st Novemeber was due to lack of power supply at the monitor location.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LAeq,T
Sound Pressure Level, dB
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80
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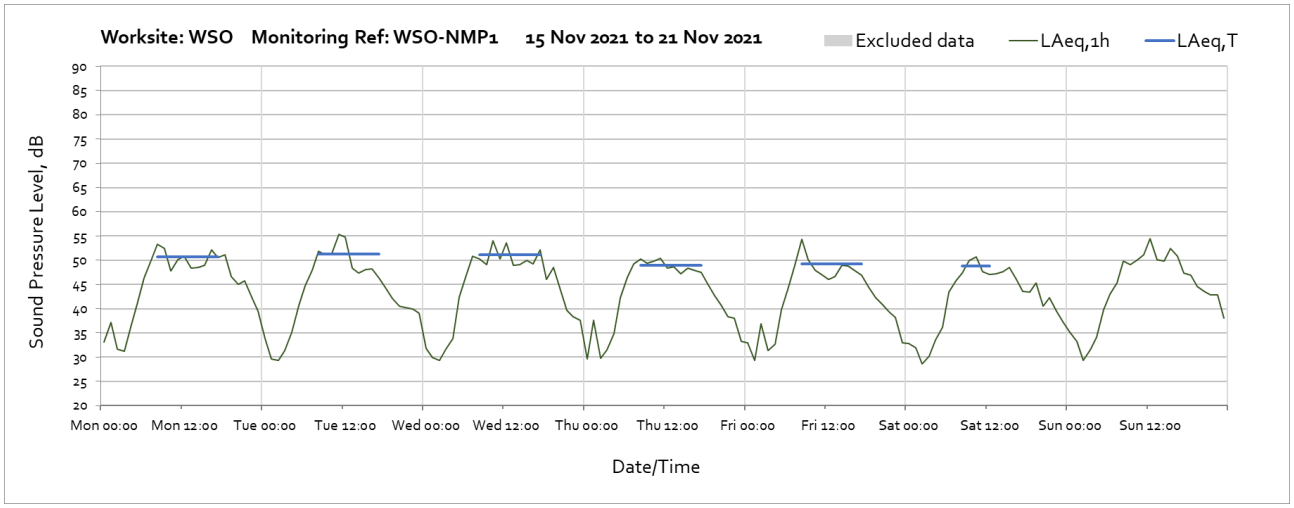
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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85
80
75
70
65
60
55
50
45
40
35
30
25
20
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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Sat 00:00
Sat 12:00
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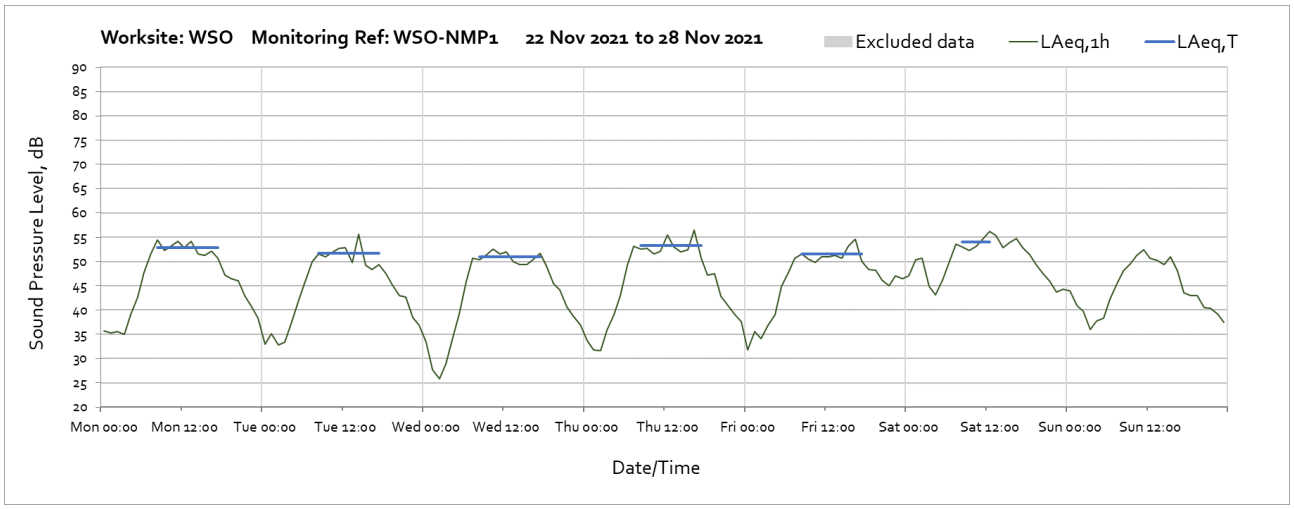
Sun 12:00
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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80
75
70
65
60
55
50
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40
35
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Mon 00:00
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Tue 00:00
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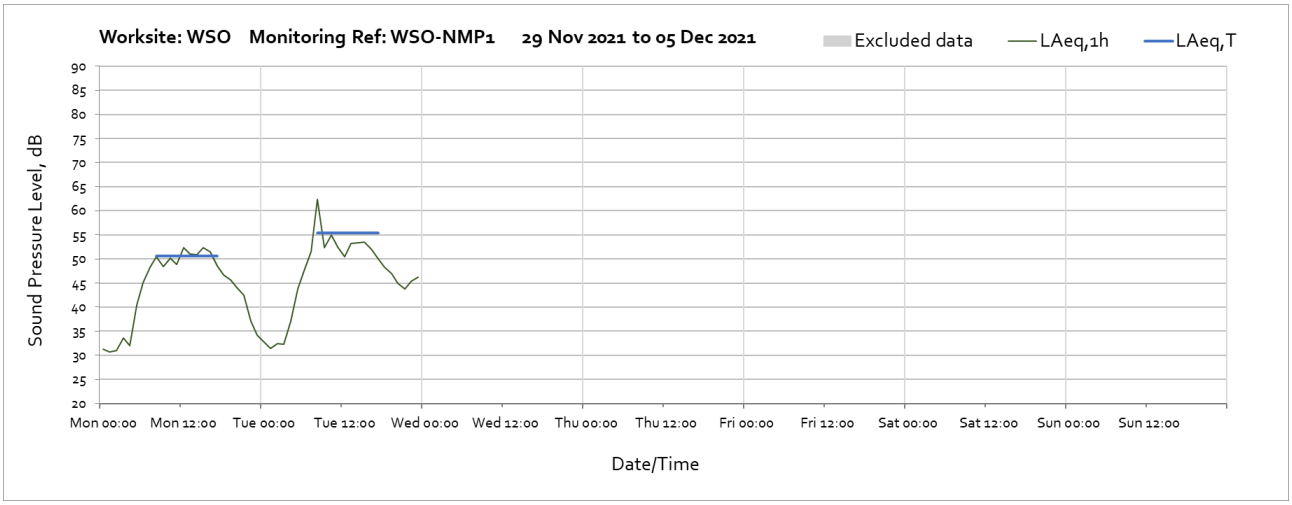
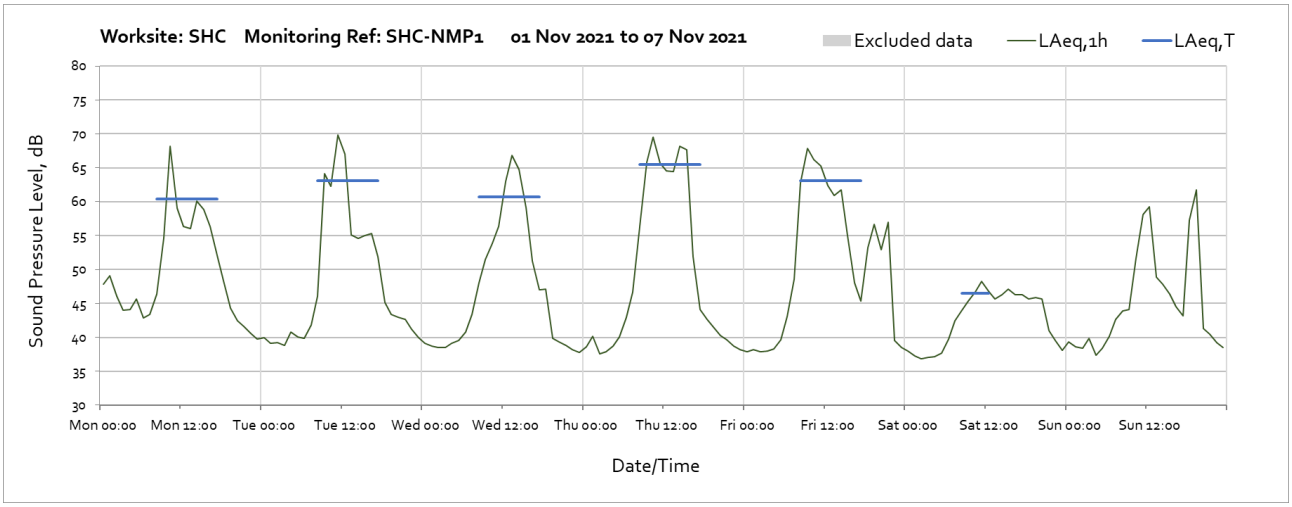
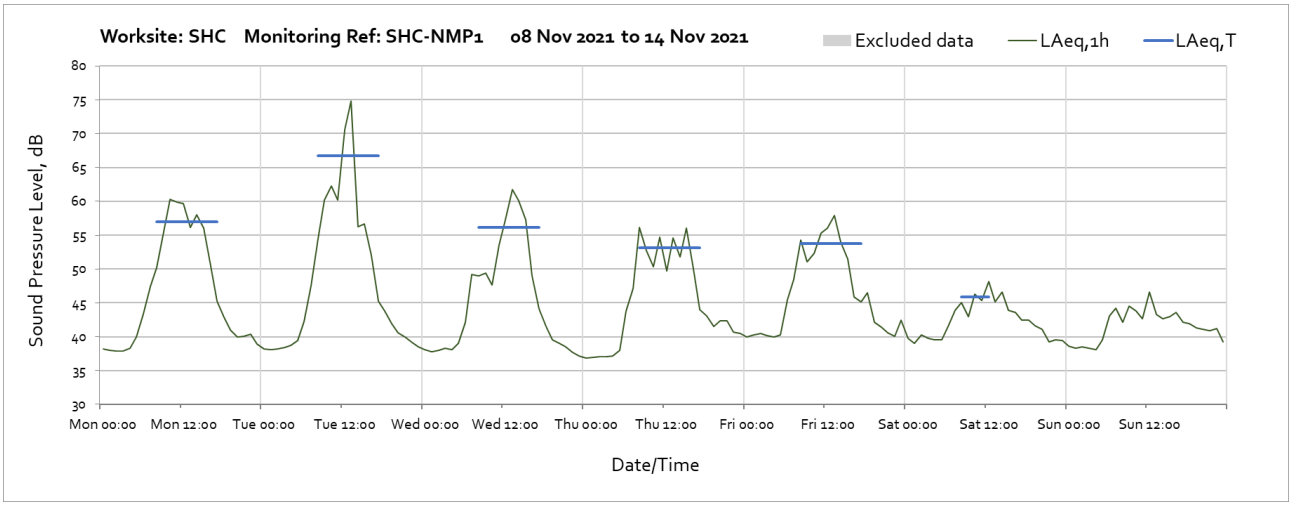
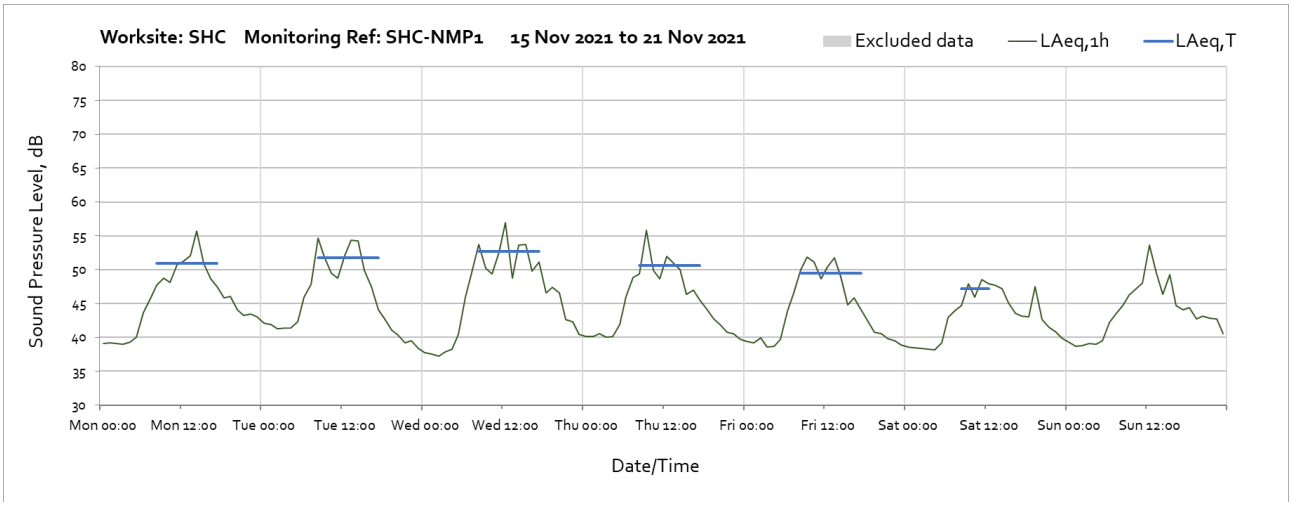
Date/Time



Worksite: SHC – Monitoring Ref: SHC-NMP1



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LAeq,T
Sound Pressure Level, dB
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75
70
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Tue 12:00
Wed 00:00
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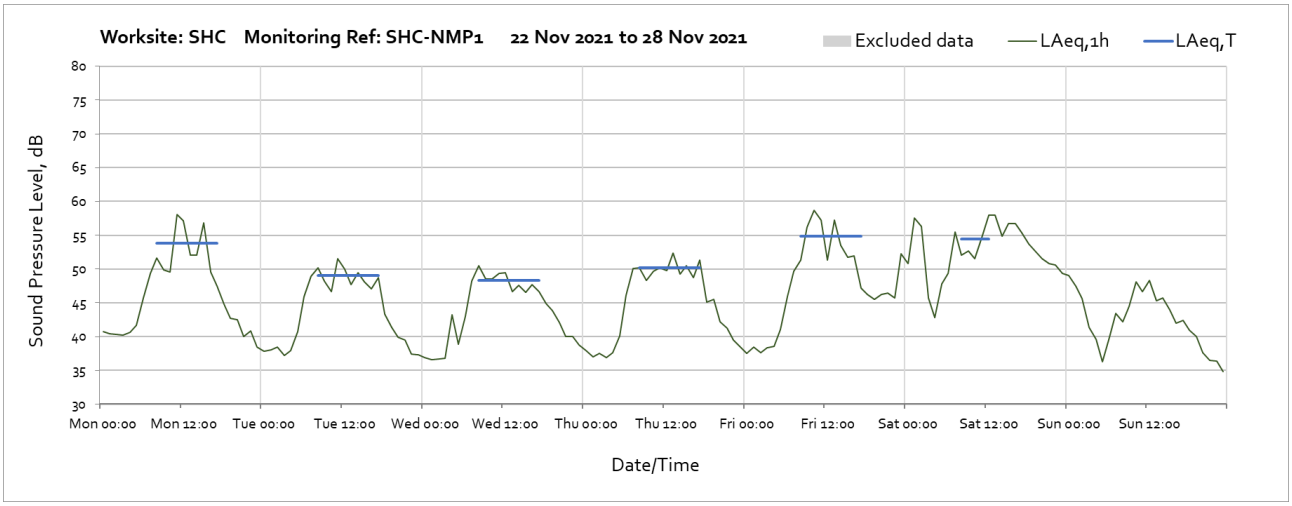
Date/Time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Sound Pressure Level, dB
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Tue 12:00
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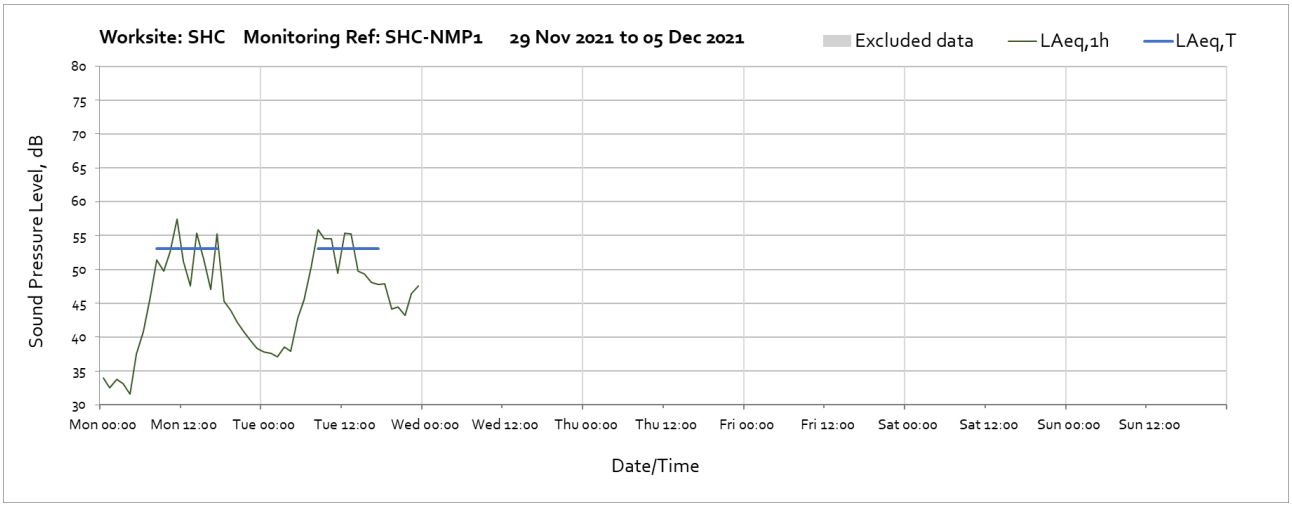
Date/Time


Worksite: SHC Monitoring Ref: SHC-NMP1 29 Nov 2021 to 05 Dec 2021
Excluded data
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LAeq,T
Sound Pressure Level, dB
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75
70
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Sat 12:00
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Sun 12:00
Date/Time

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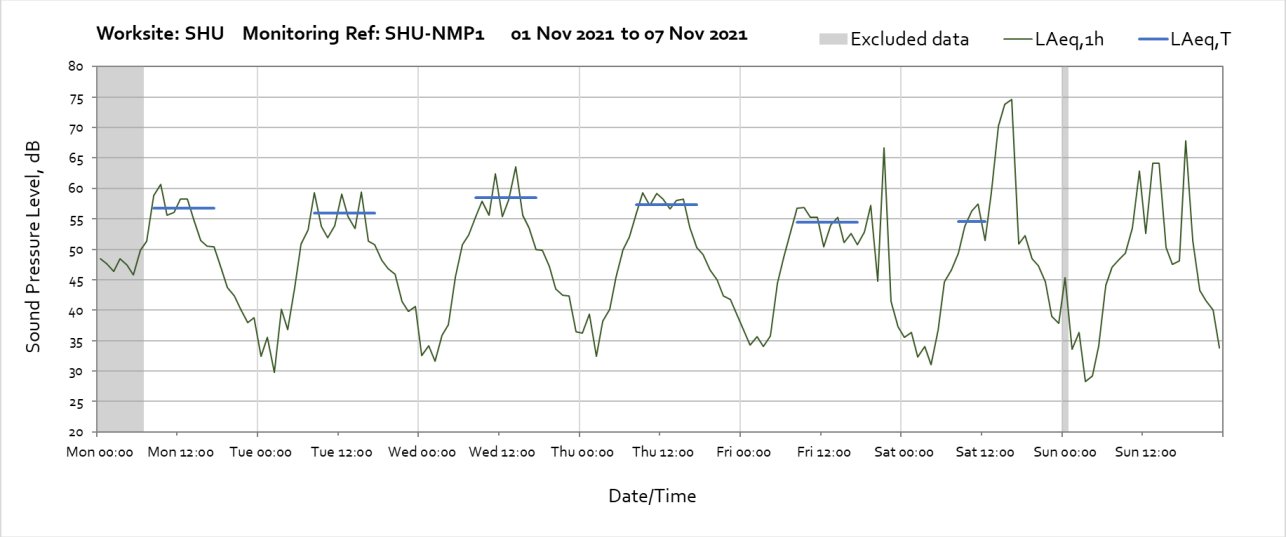
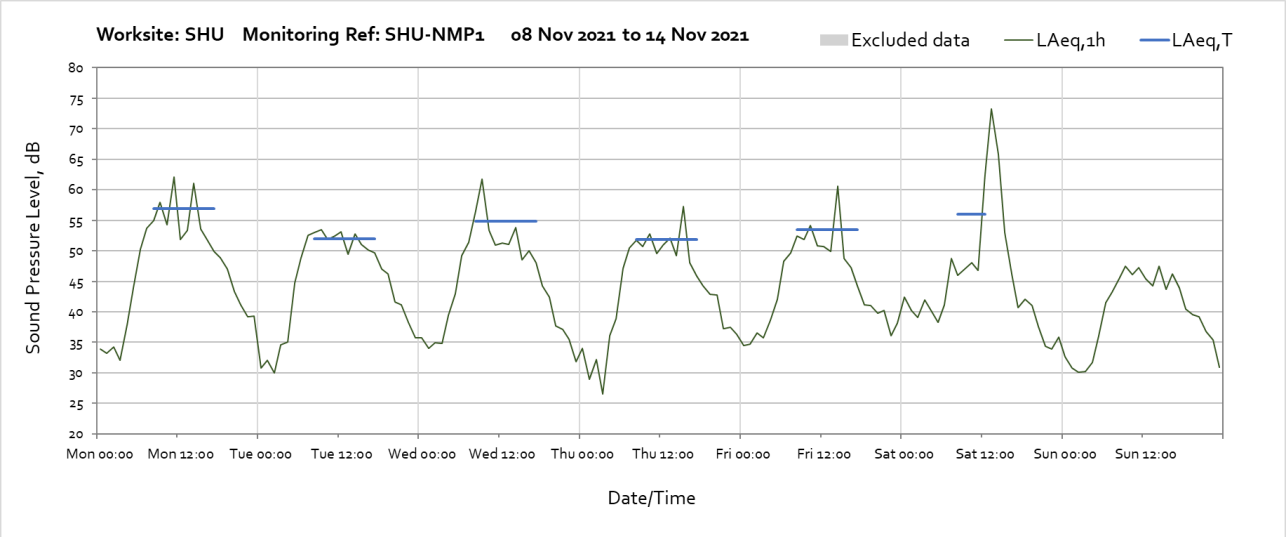
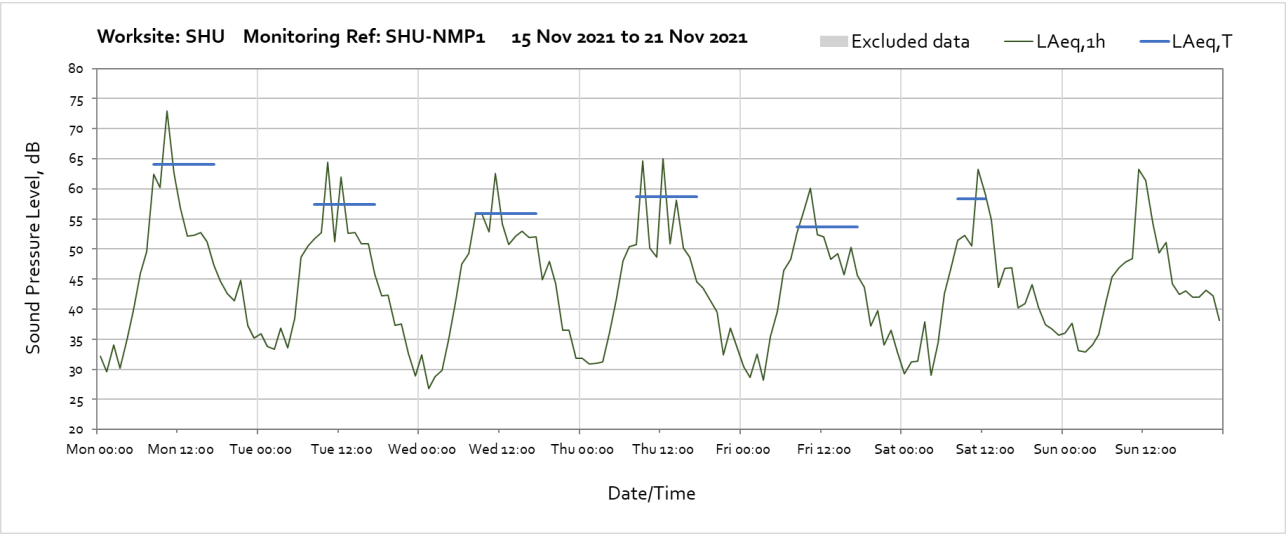
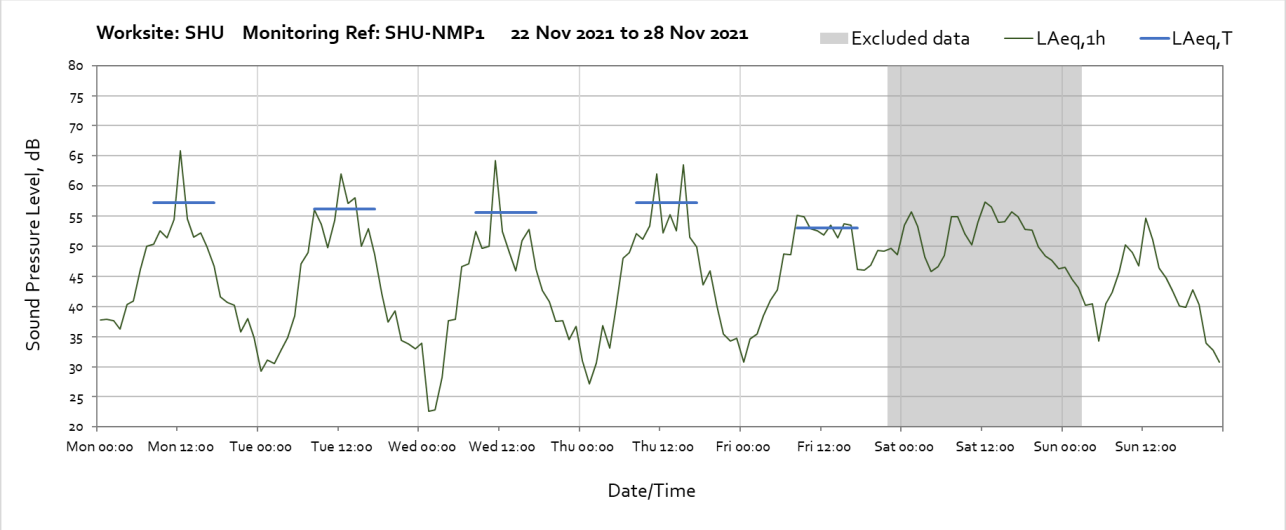
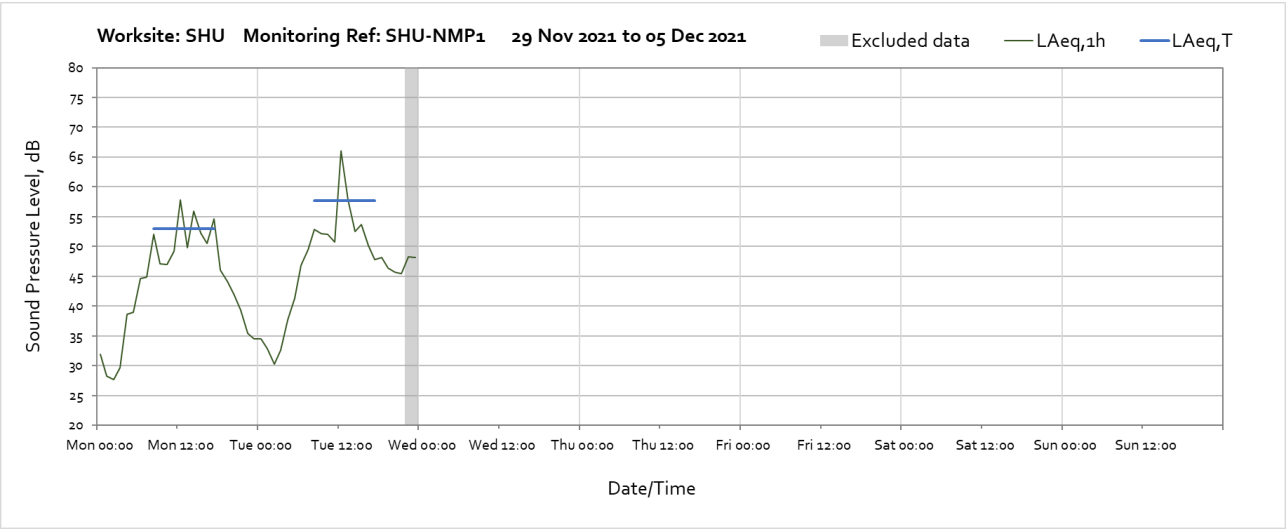


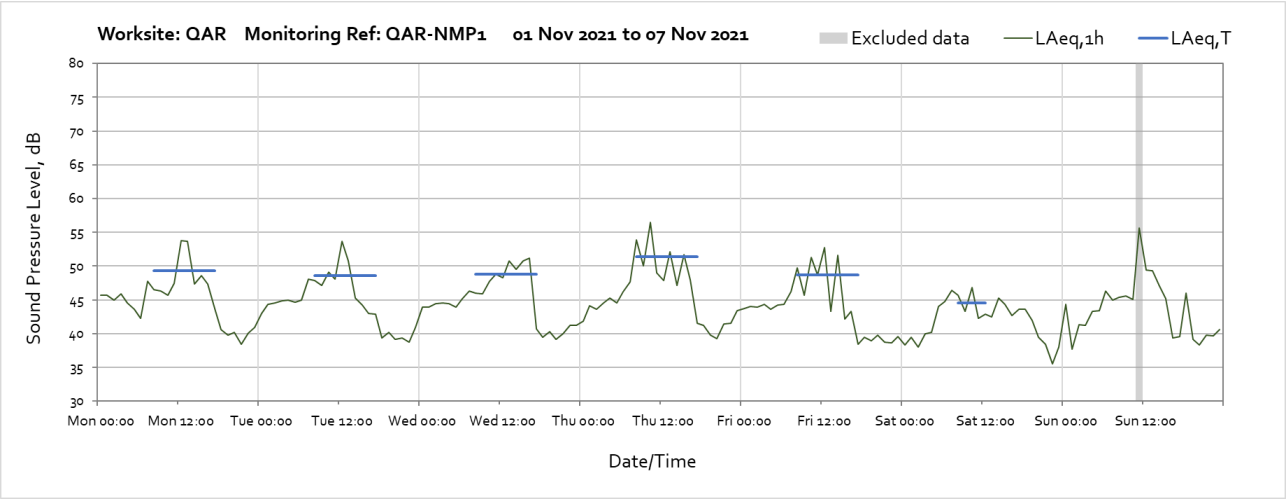


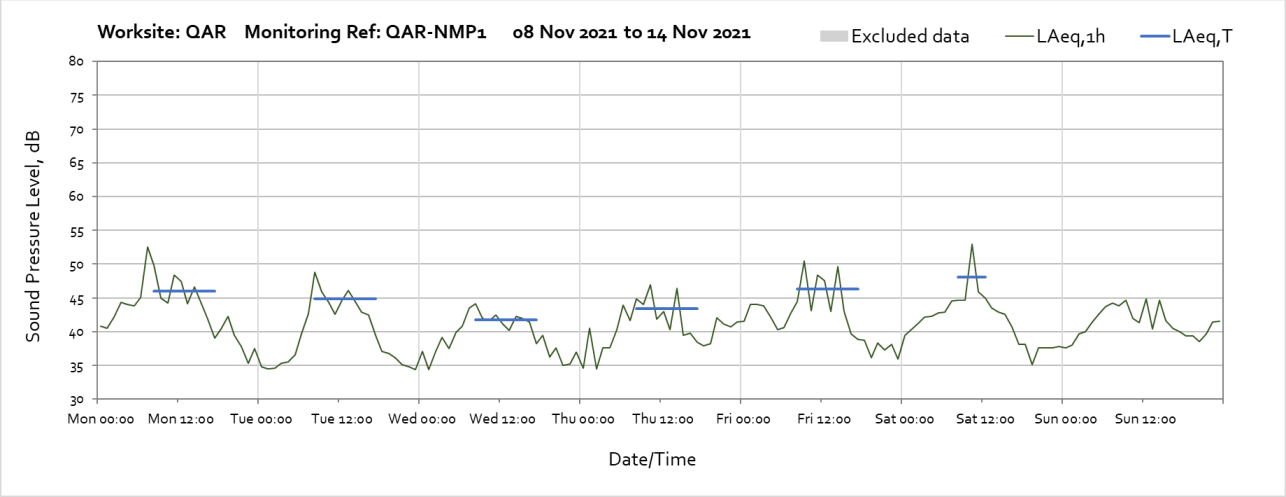






Worksite: QAR – Monitoring Ref: QAR-NMP1

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Sound Pressure Level, dB
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Wed 00:00
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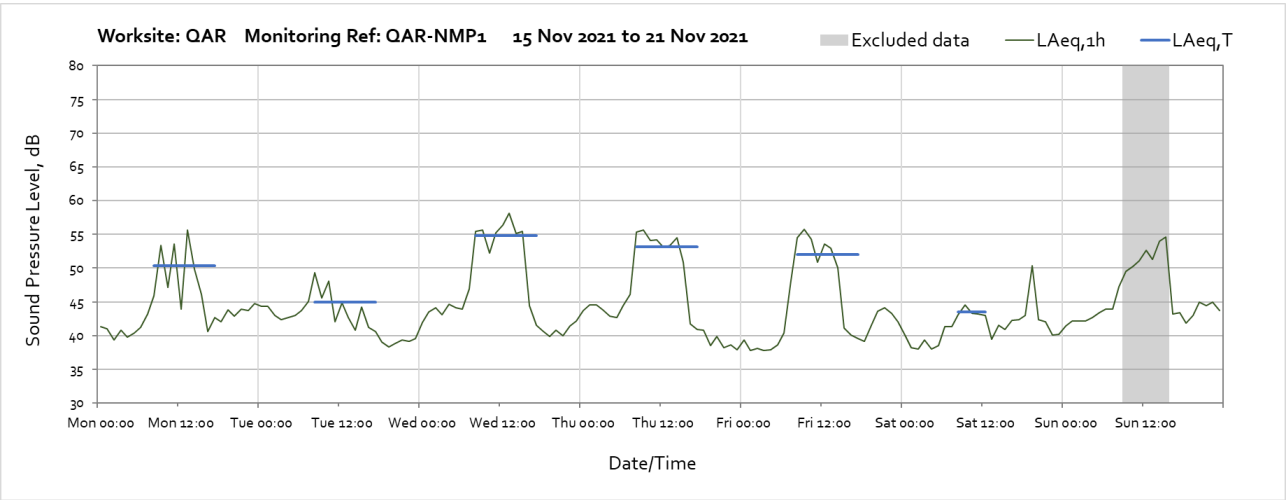
Date/Time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LAeq,T
Sound Pressure Level, dB
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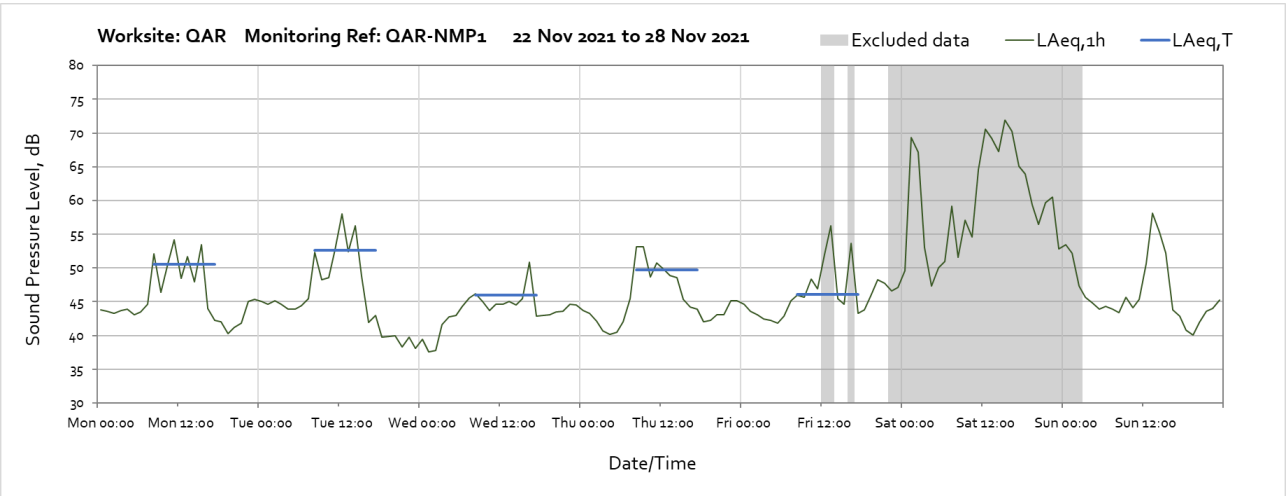
Sun 12:00
Date/Time


Worksite: QAR Monitoring Ref: QAR-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
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35
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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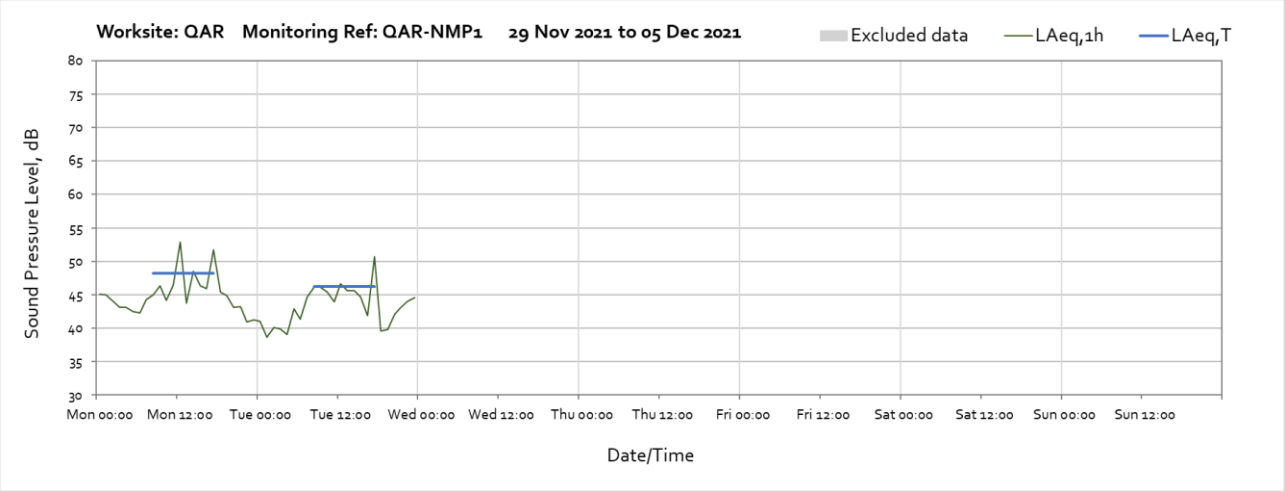
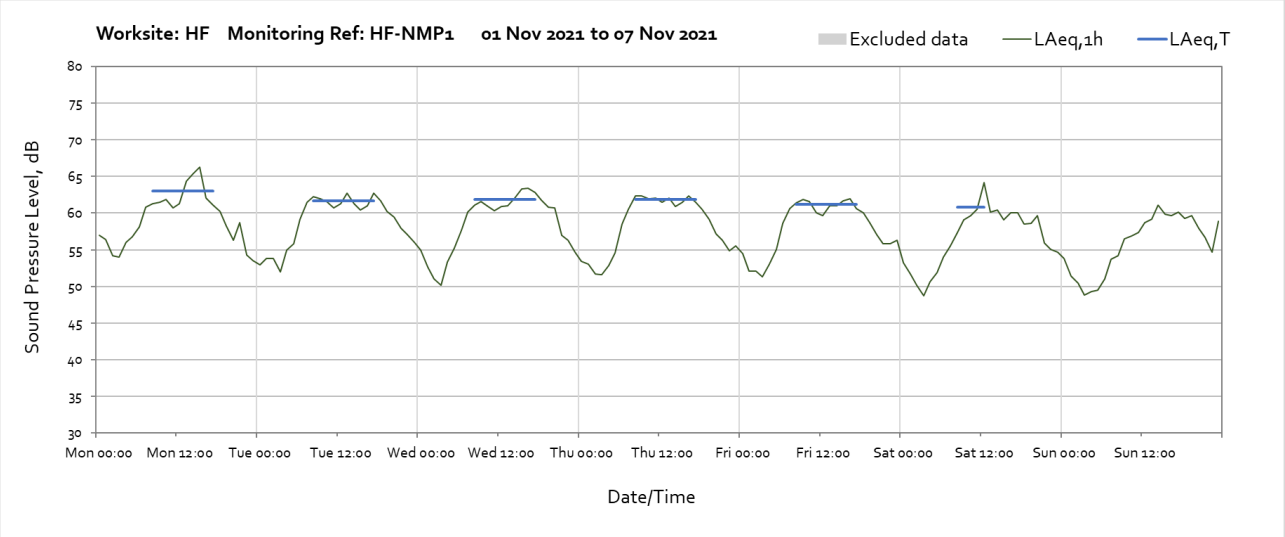
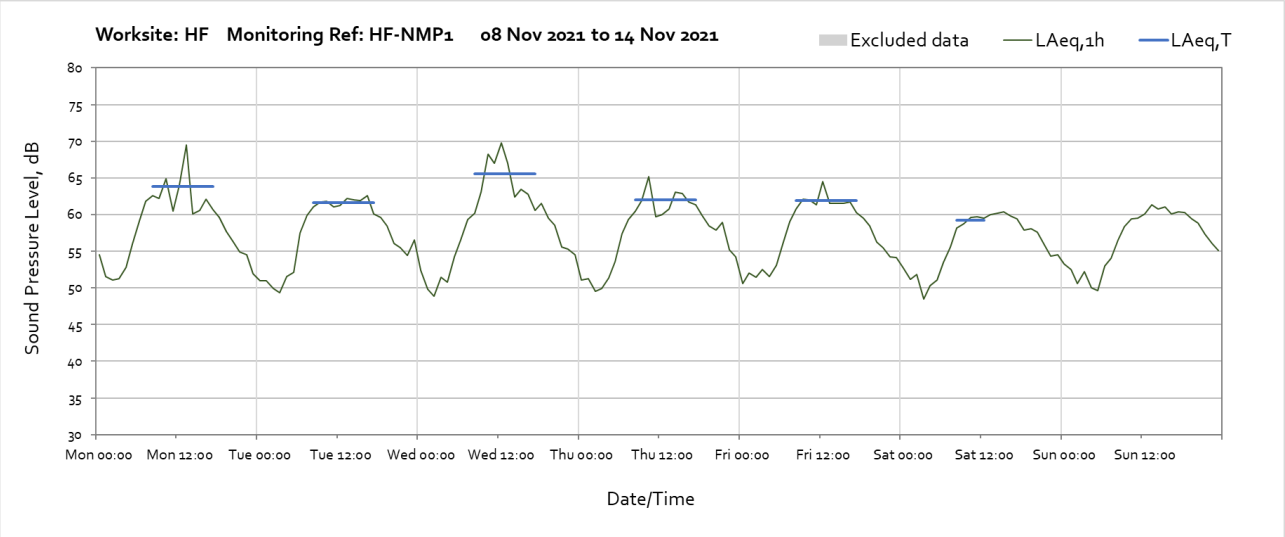
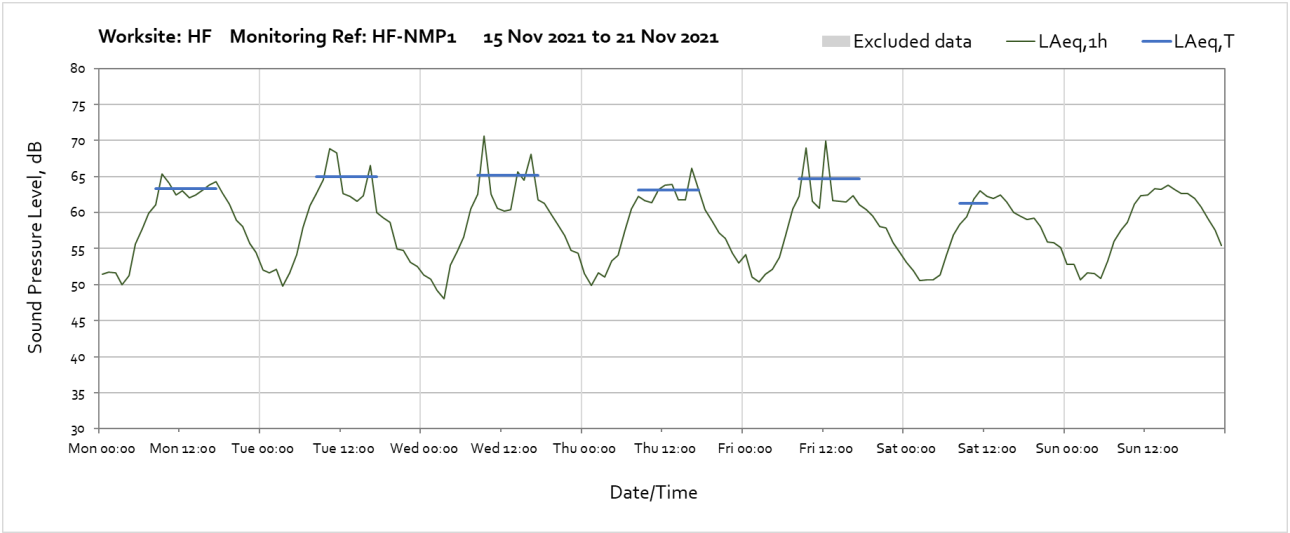
Sun 00:00
Sun 12:00
Date/Time

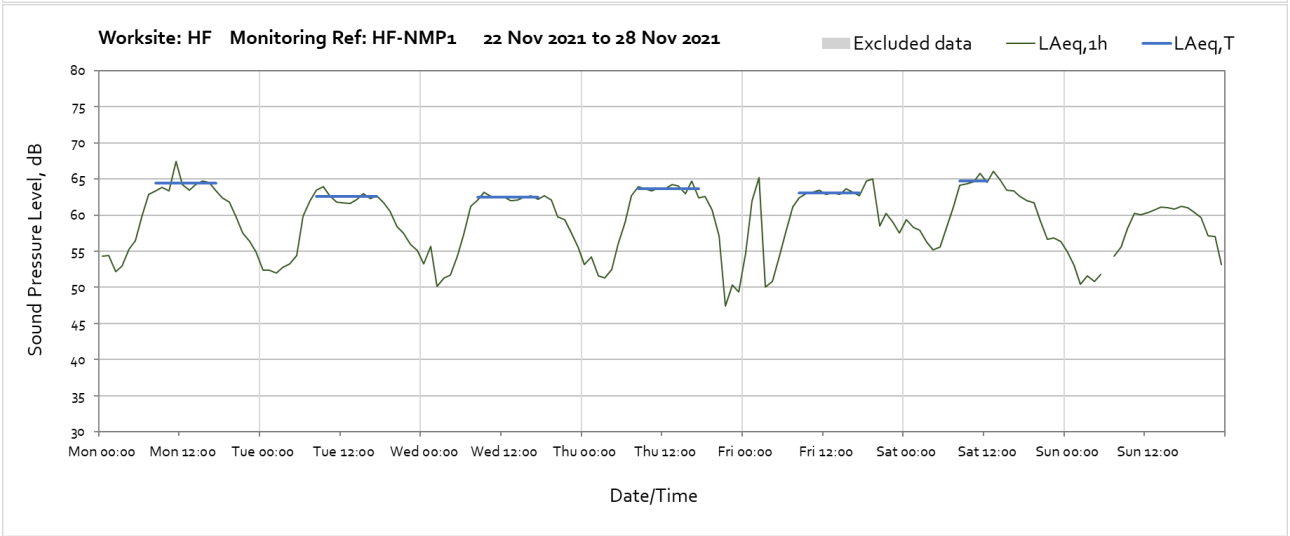


Worksite: HF – Monitoring Ref: HF-NMP1

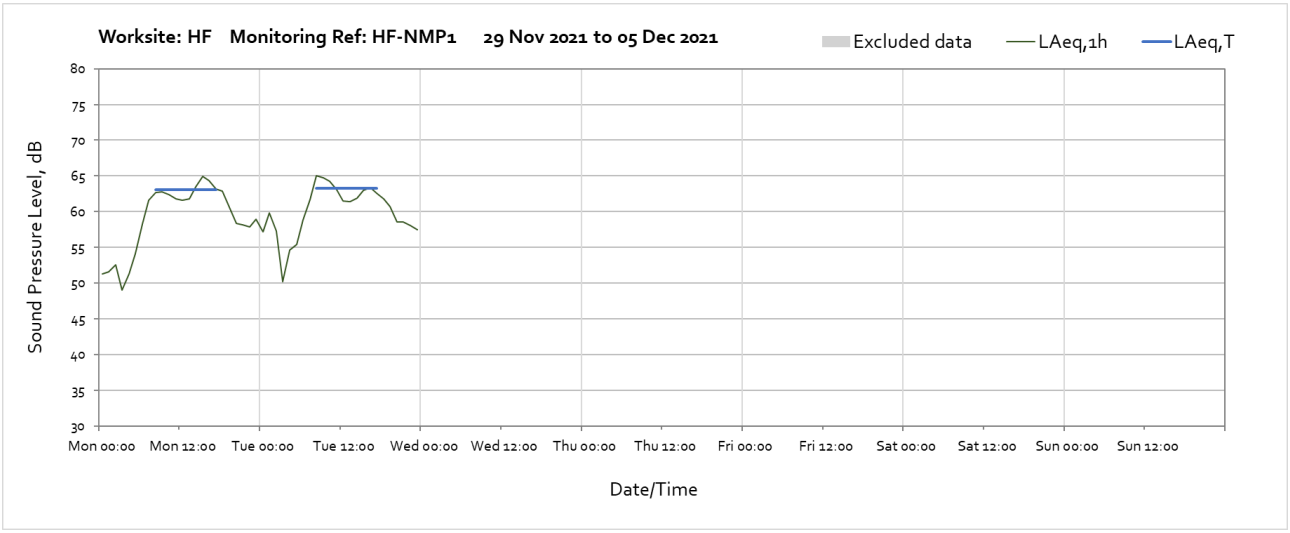




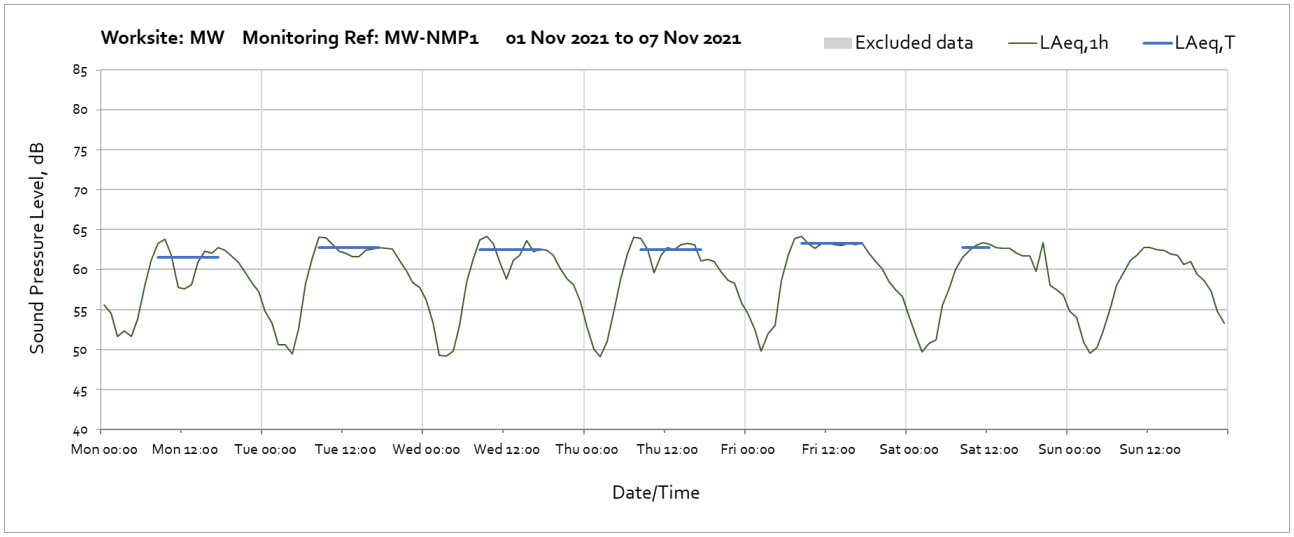


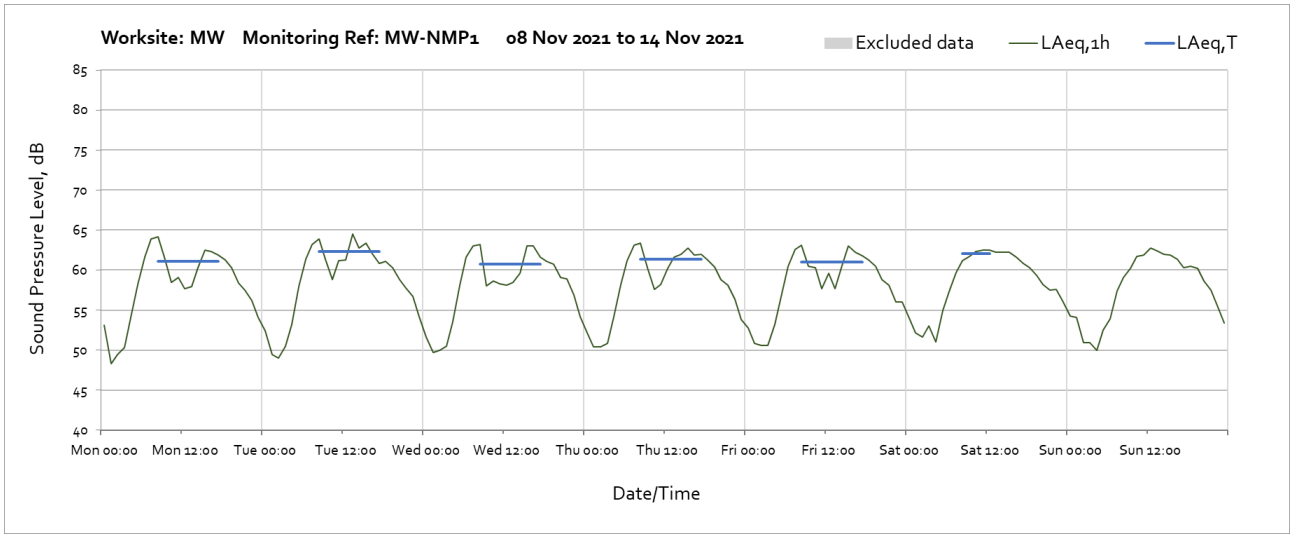


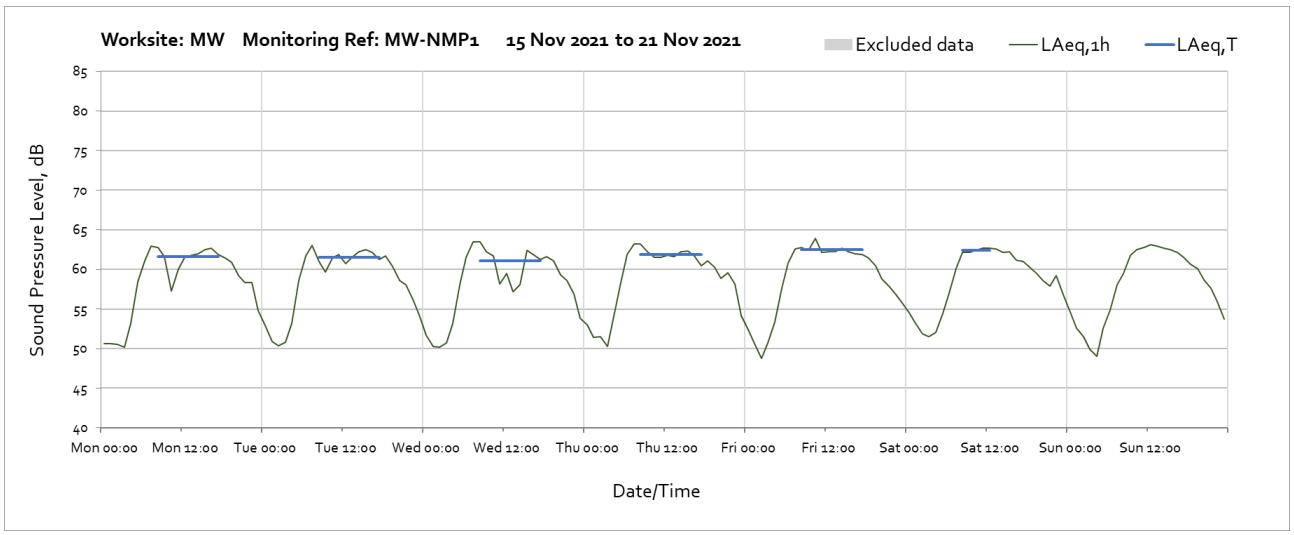
Note: Missing data at 06:00 on Sunday 28th November was due to a monitoring station system error .

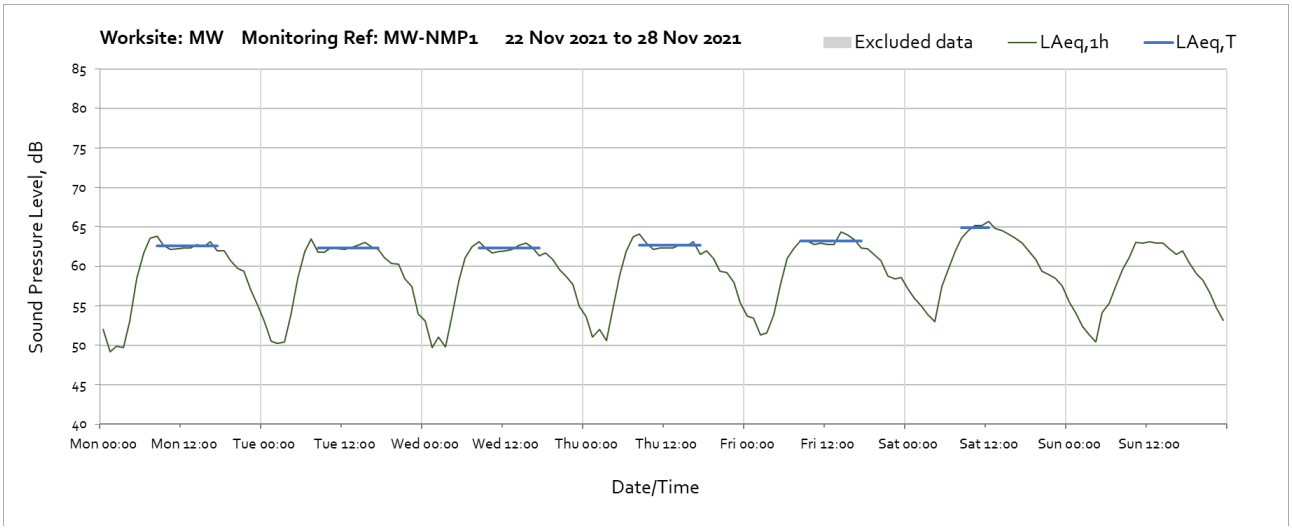


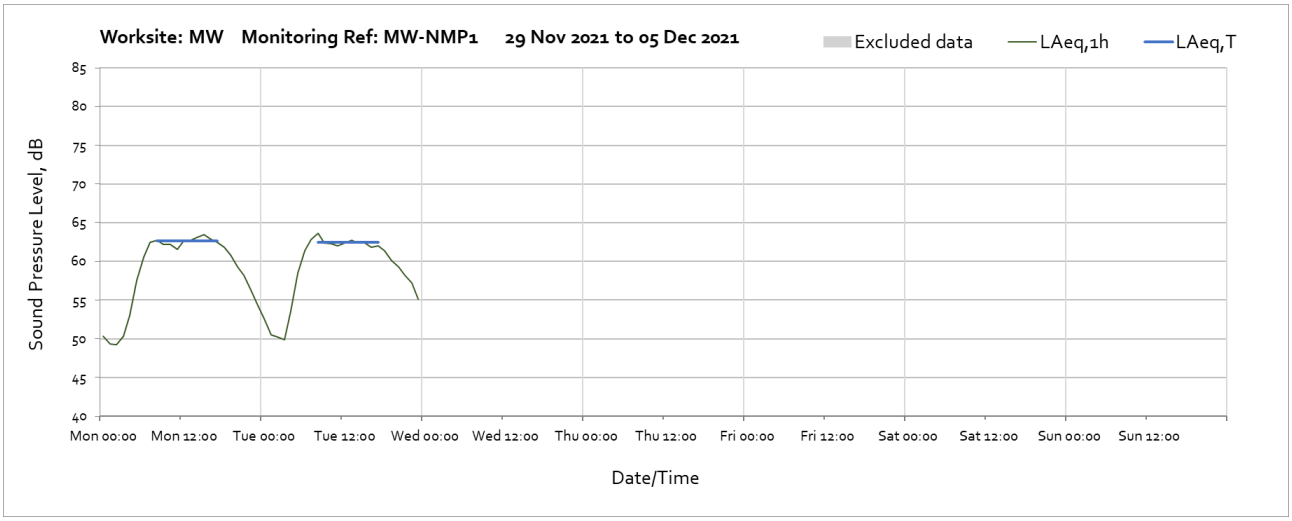
Worksite: MW – Monitoring Ref: MW-NMP1



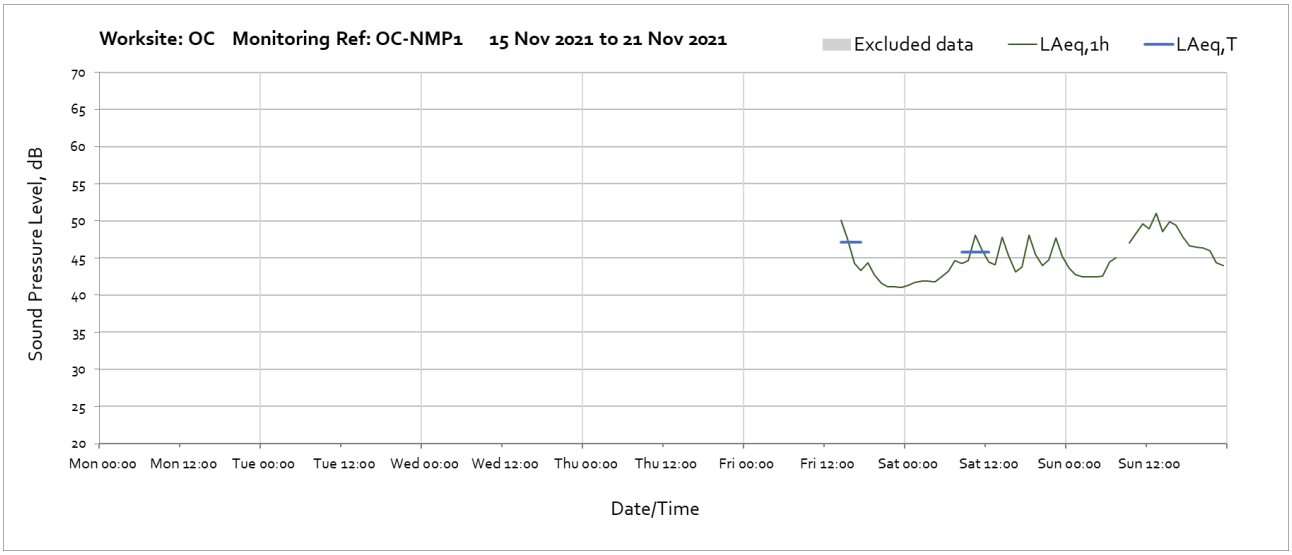




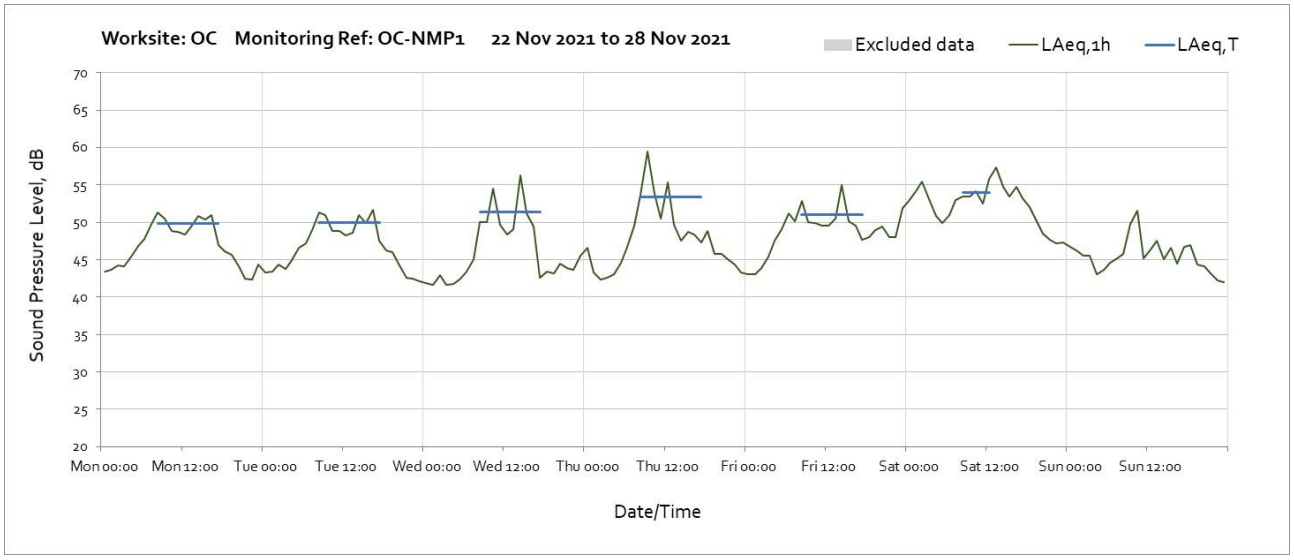


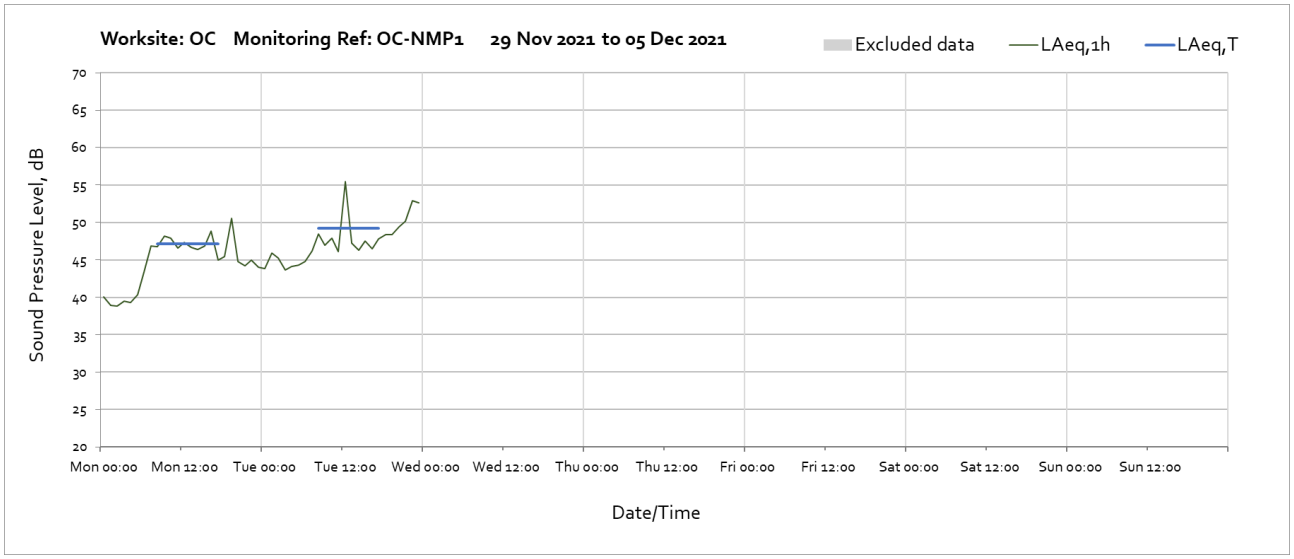


Worksite: OC – Monitoring Ref: OC-NMP1

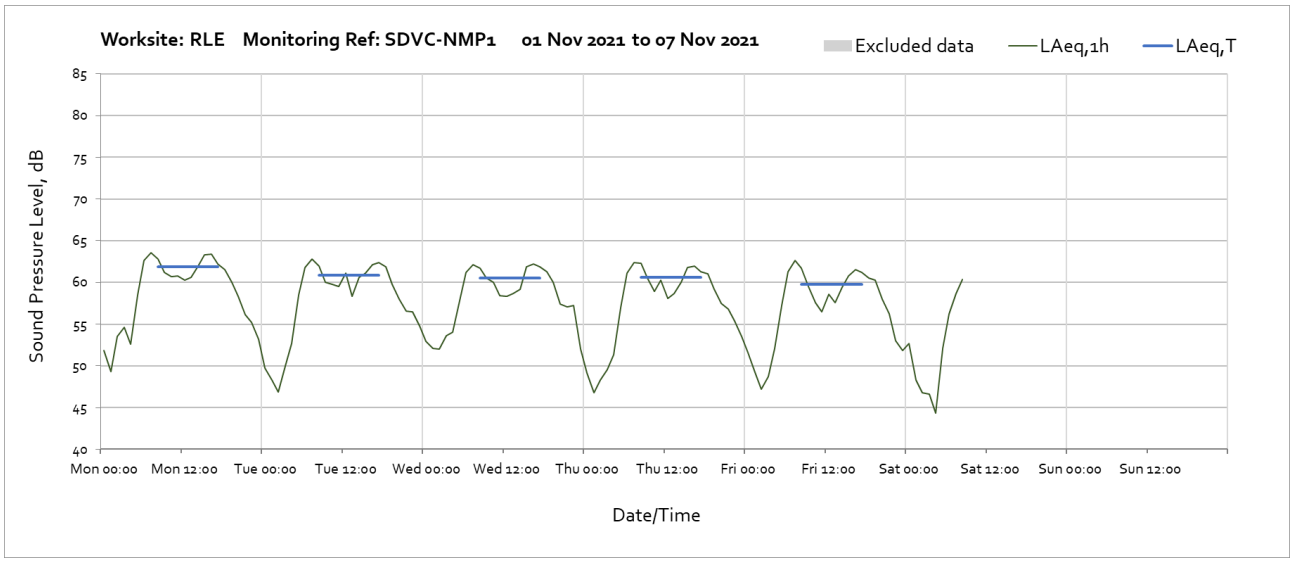


Note: Noise Monitor has been isntalled on Friday 19th November. Reason for missing data at 08:00 on Sunday 21st November is unknow.



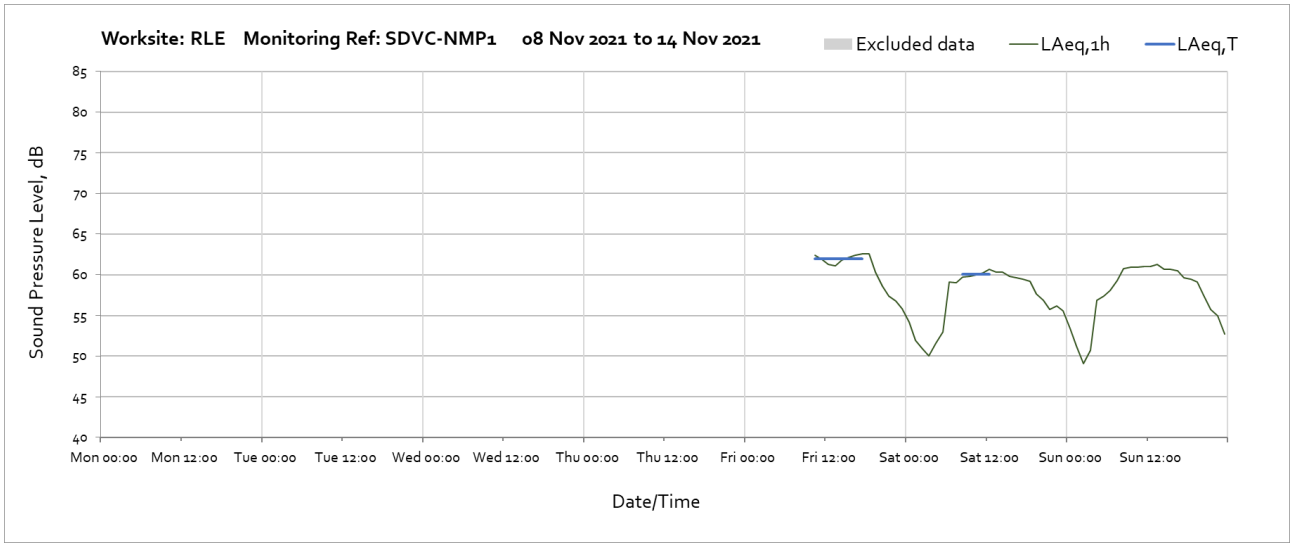


Worksite: RLE – Monitoring Ref: SDVC-NMP1

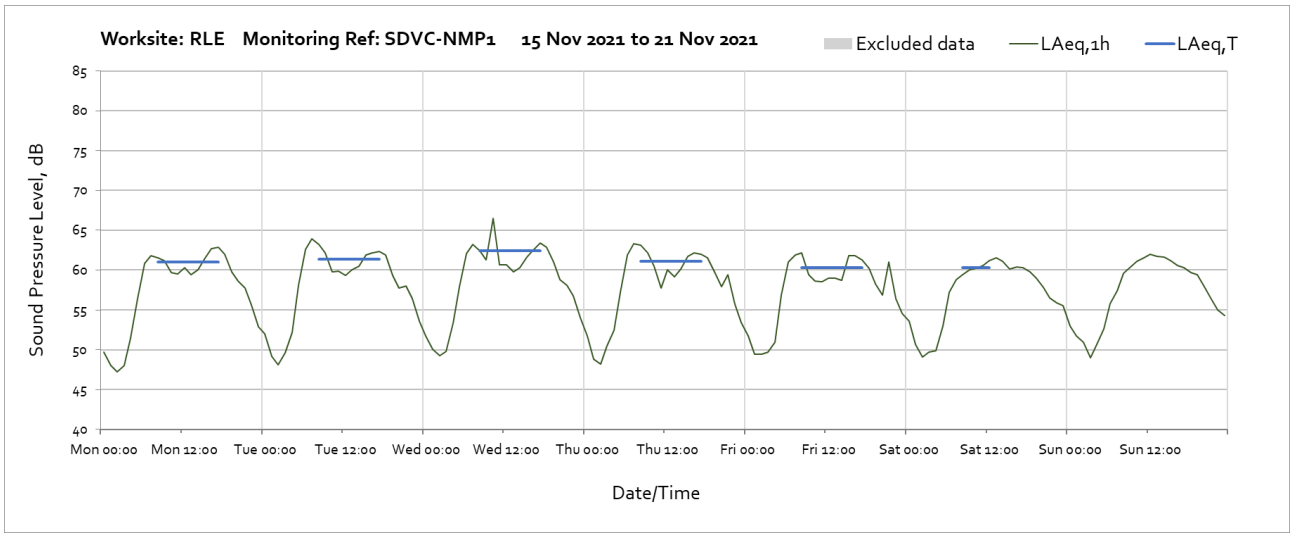


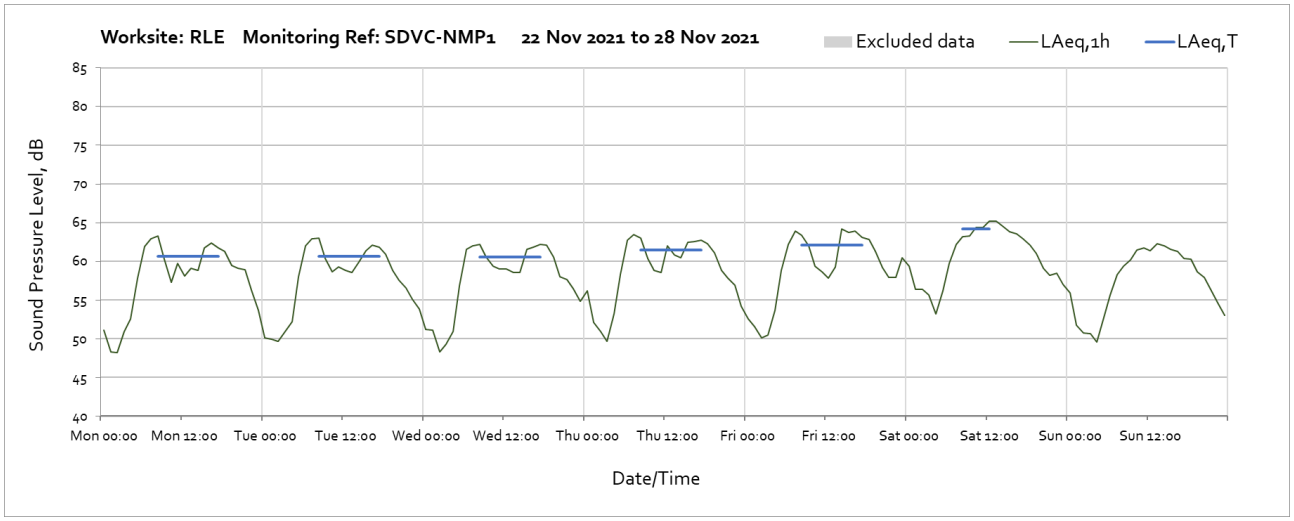
Note: Missing data between 09:00 on Saturday 6th November and 10:00 on Friday 12th November was due

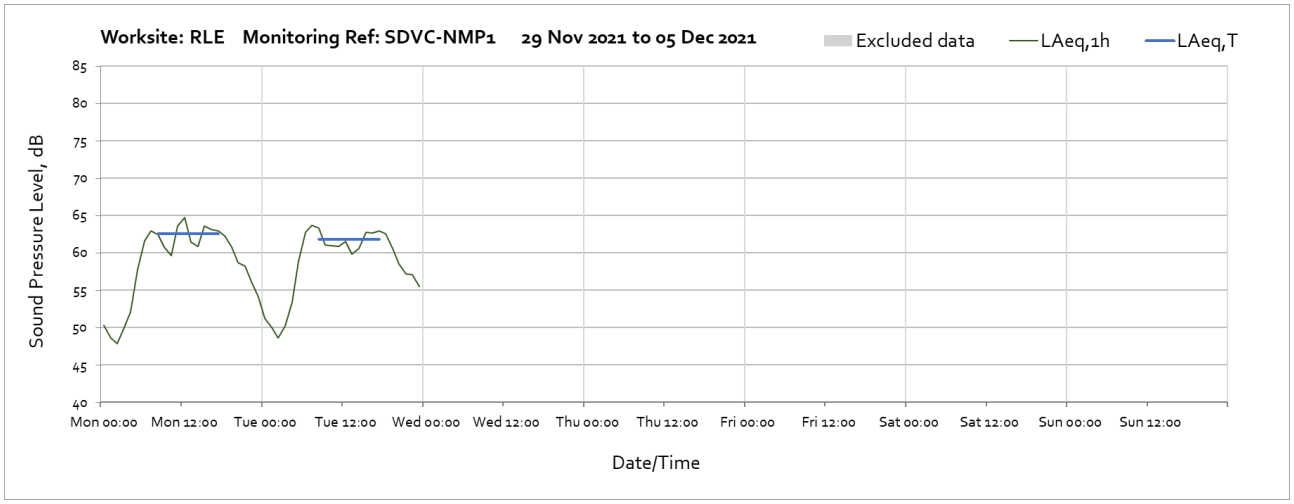
to poor solar coverage and backup battery being out of power. The contractor is aiming to install wind turbines to aid the solar panels system.



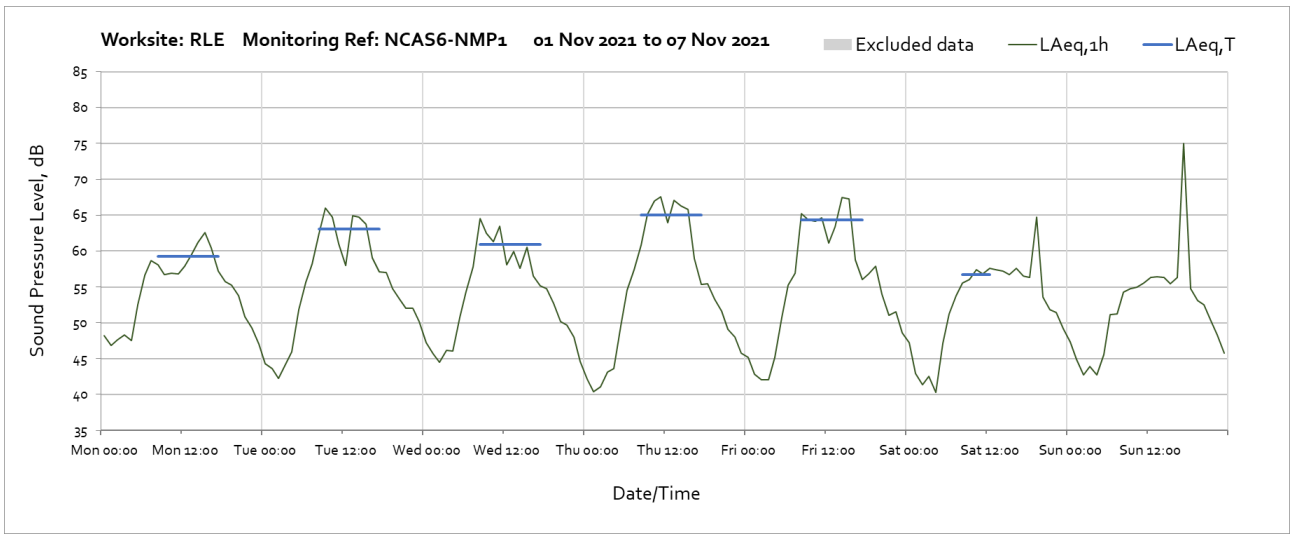
Note: Missing data between 09:00 on Saturday 6th November and 10:00 on Friday 12th November was due to poor solar coverage and backup battery being out of power. The contractor is aiming to install wind turbines to aid the solar panels system.

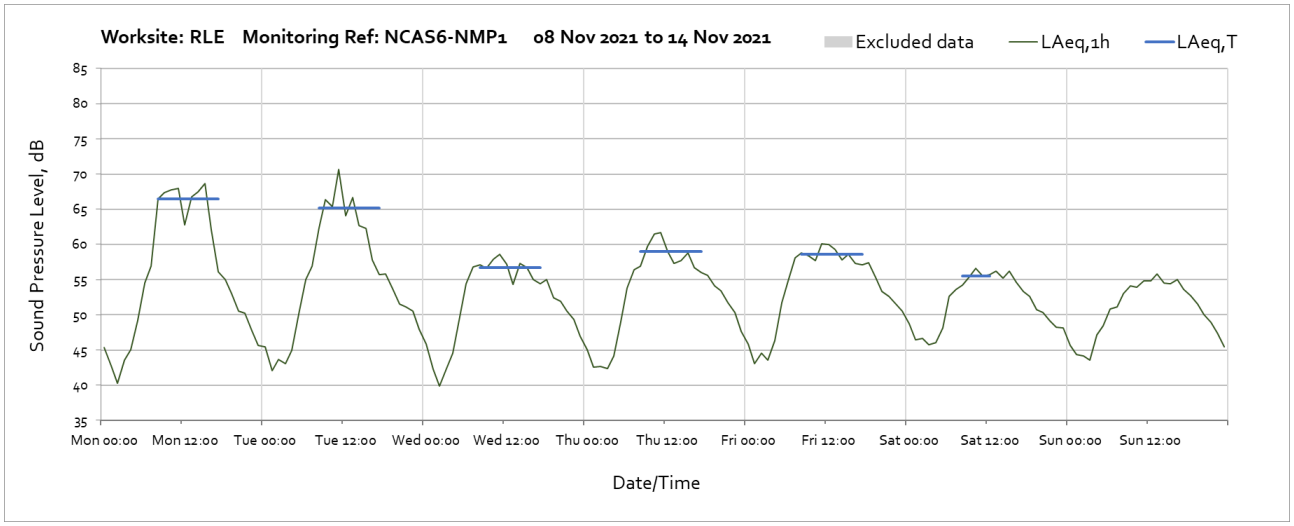






Worksite: RLE – Monitoring Ref: NCAS6-NMP1




Worksite: RLE Monitoring Ref: NCAS6-NMP1 08 Nov 2021 to 14 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
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40
35
Mon 00:00
Mon 12:00
Tue 00:00
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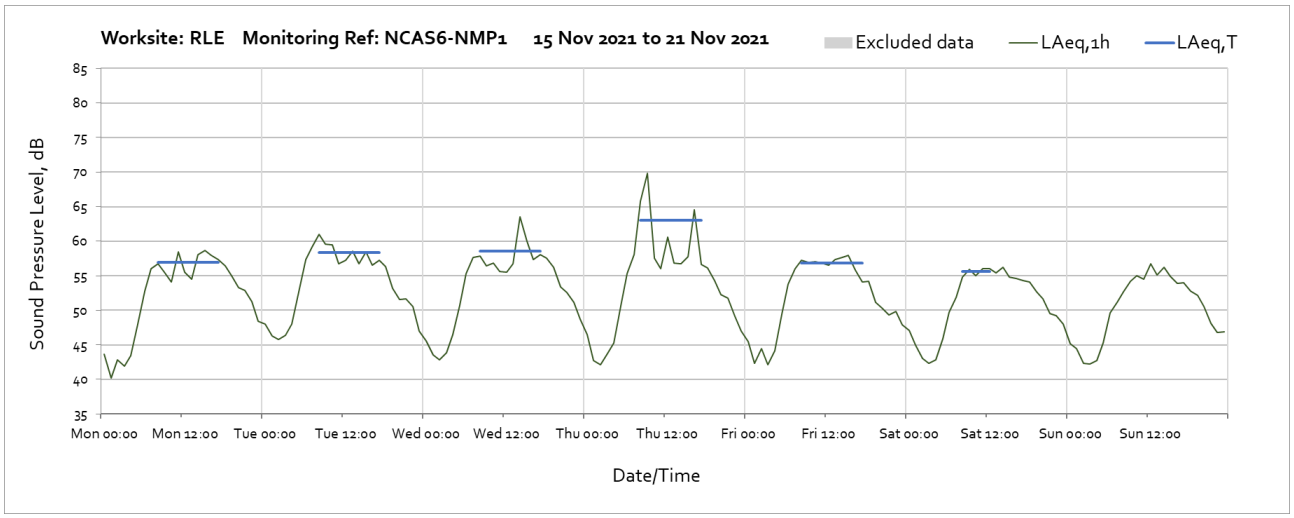
Sun 12:00
Date/Time


Worksite: RLE Monitoring Ref: NCAS6-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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70
65
60
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
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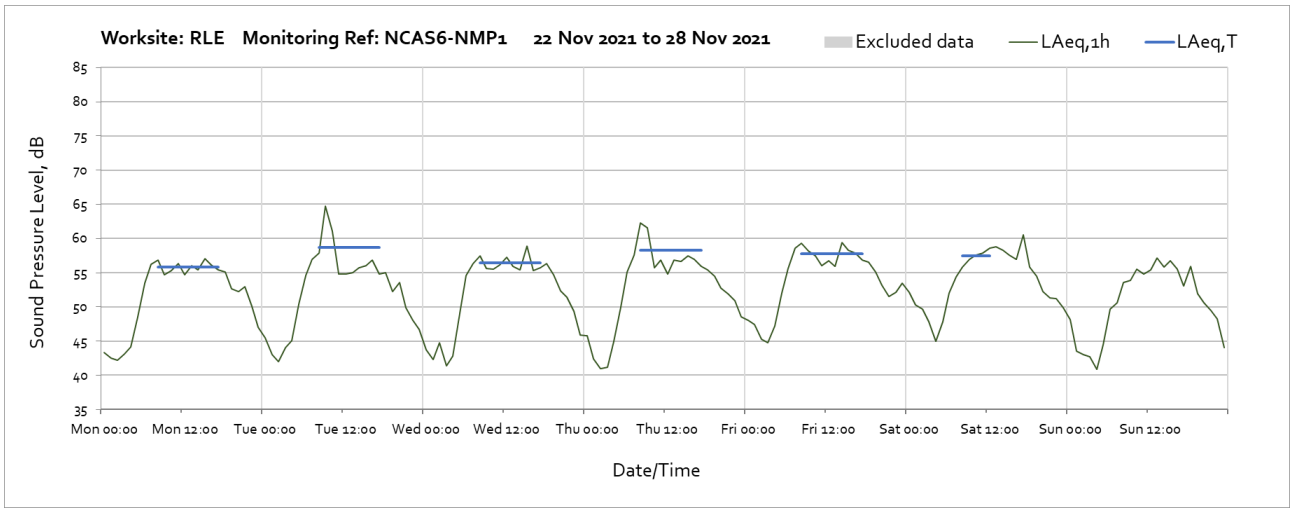
Sun 12:00
Date/Time


Worksite: RLE Monitoring Ref: NCAS6-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
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Mon 00:00
Mon 12:00
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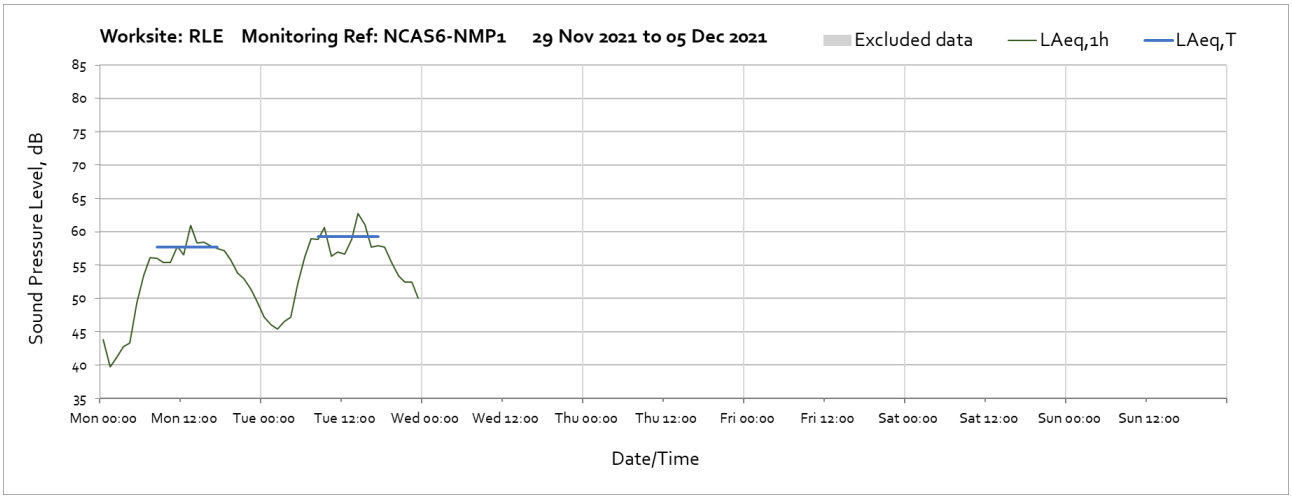
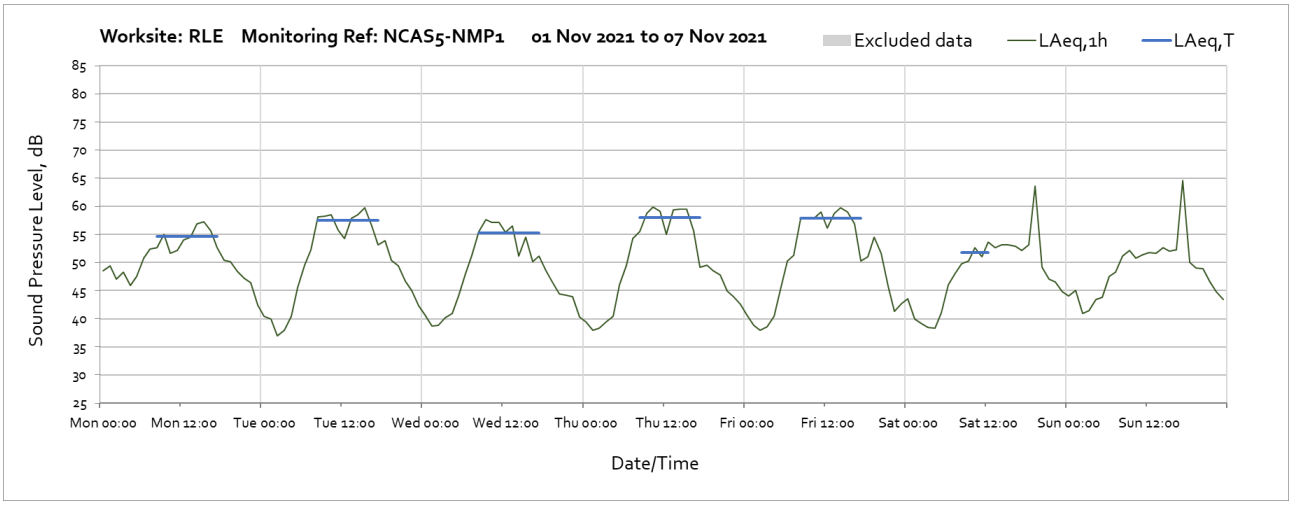
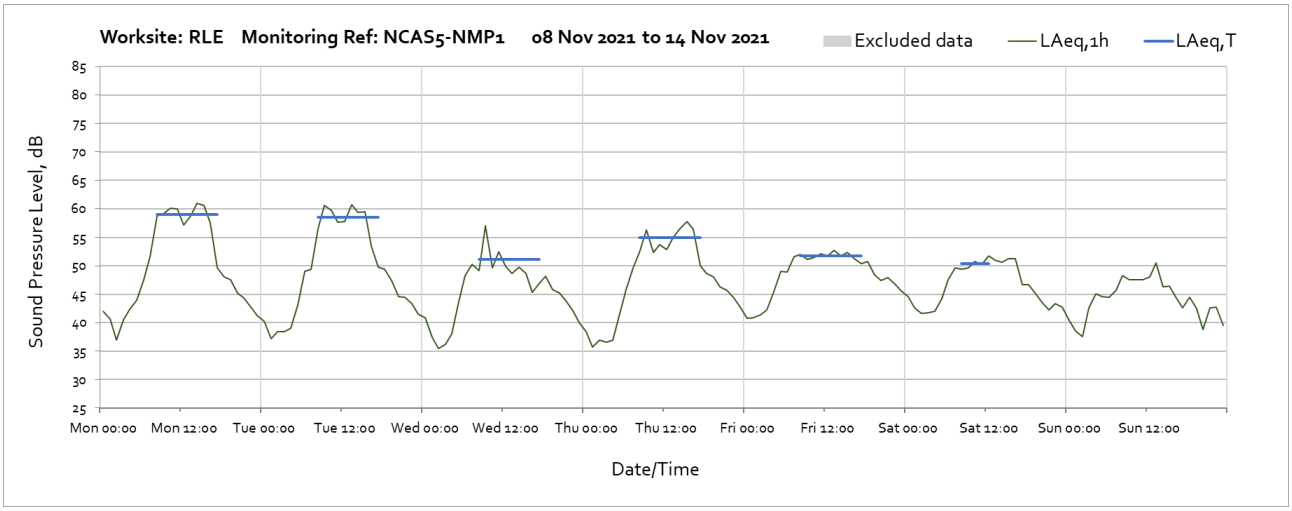
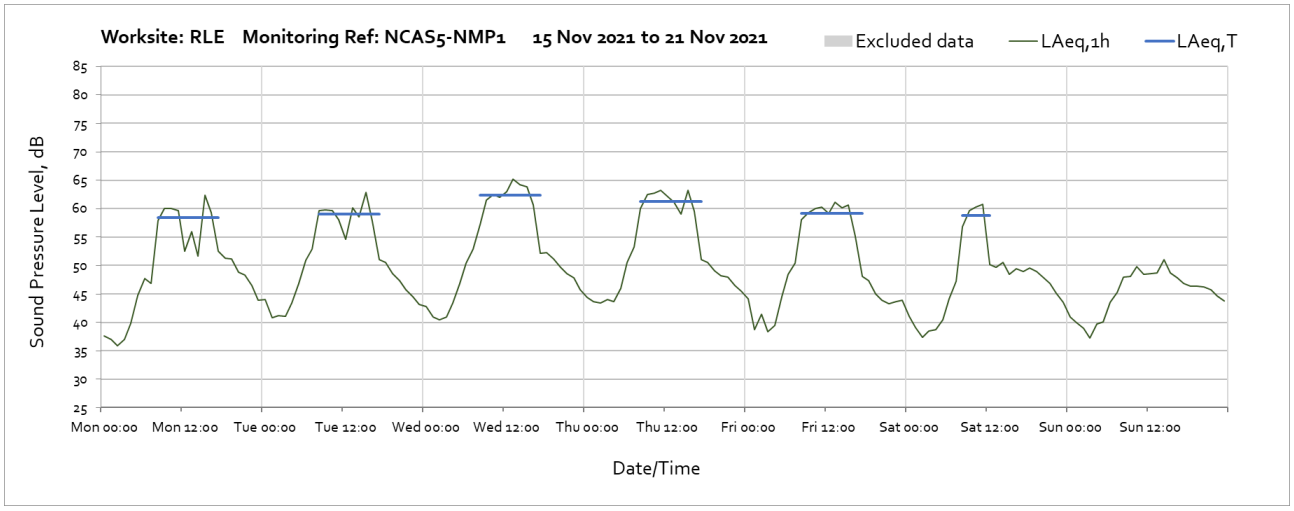
Sun 12:00
Date/Time



Worksite: RLE – Monitoring Ref: NCAS5-NMP1






Worksite: RLE Monitoring Ref: NCAS5-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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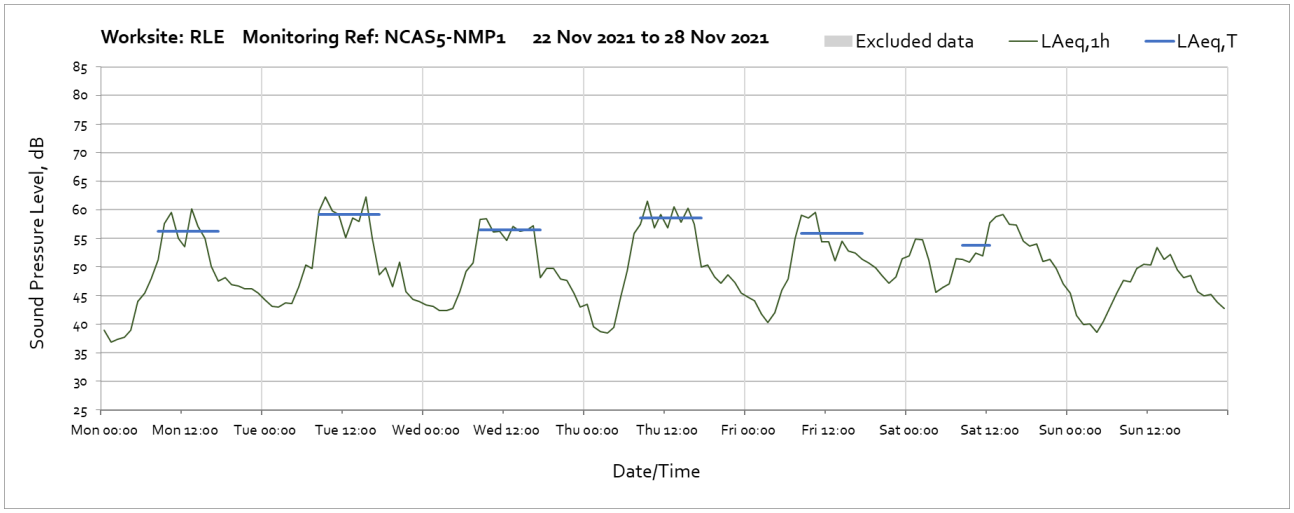
Date/Time


Worksite: RLE Monitoring Ref: NCAS5-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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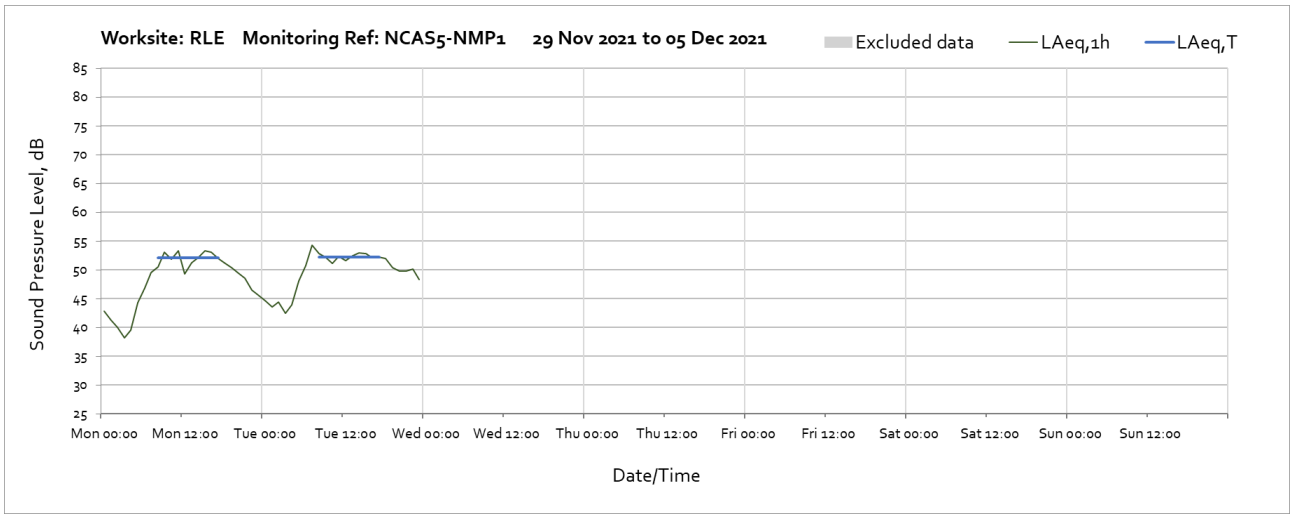
Sun 12:00
Date/Time


Worksite: RLE Monitoring Ref: NCAS5-NMP1 29 Nov 2021 to 05 Dec 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
Mon 12:00
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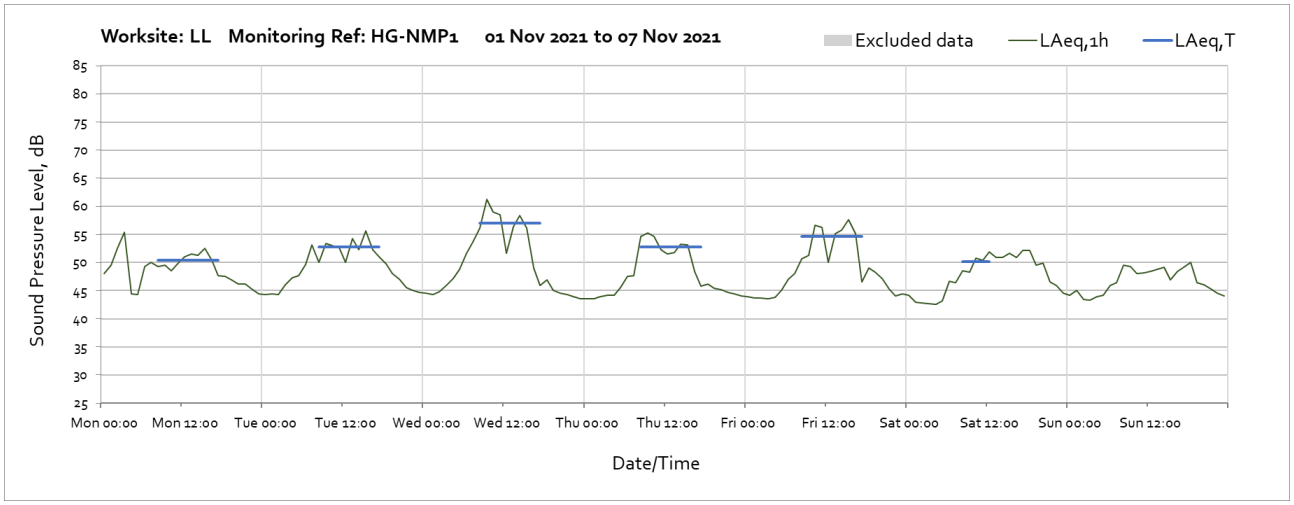
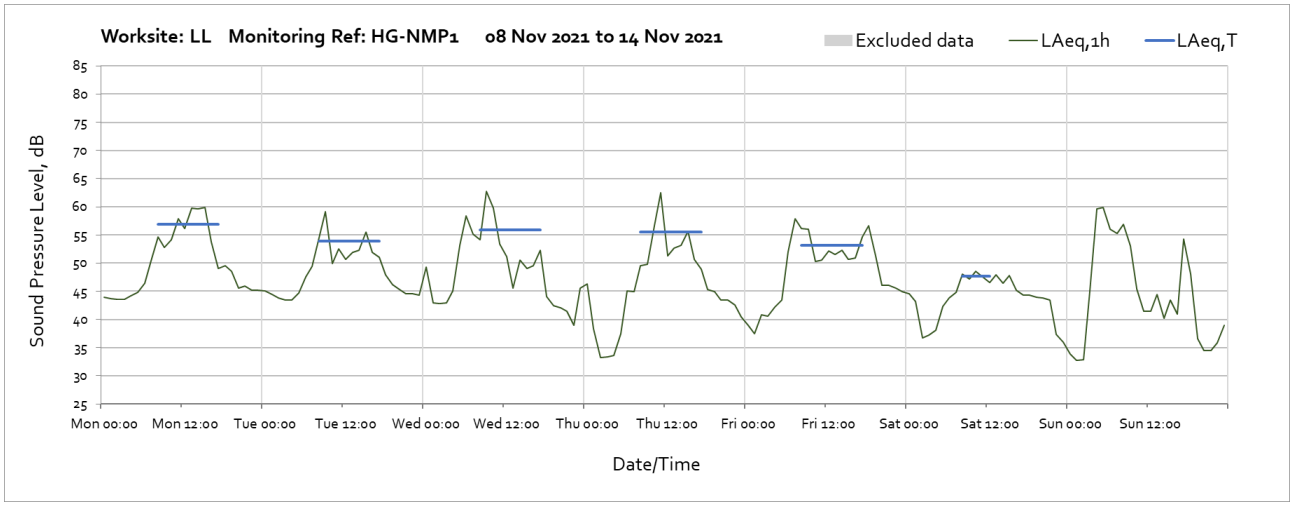
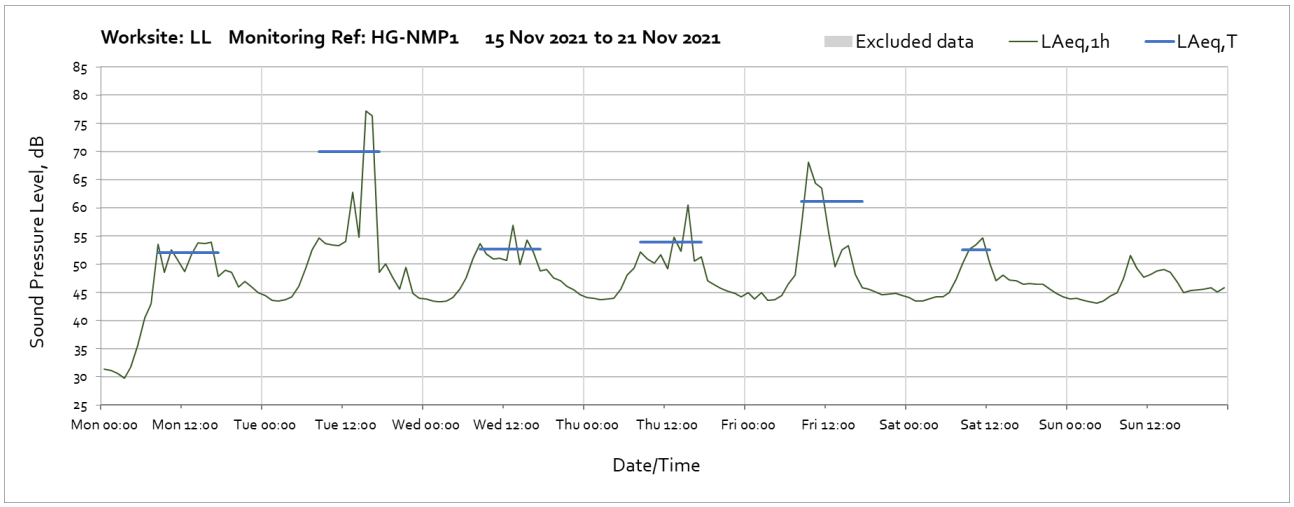
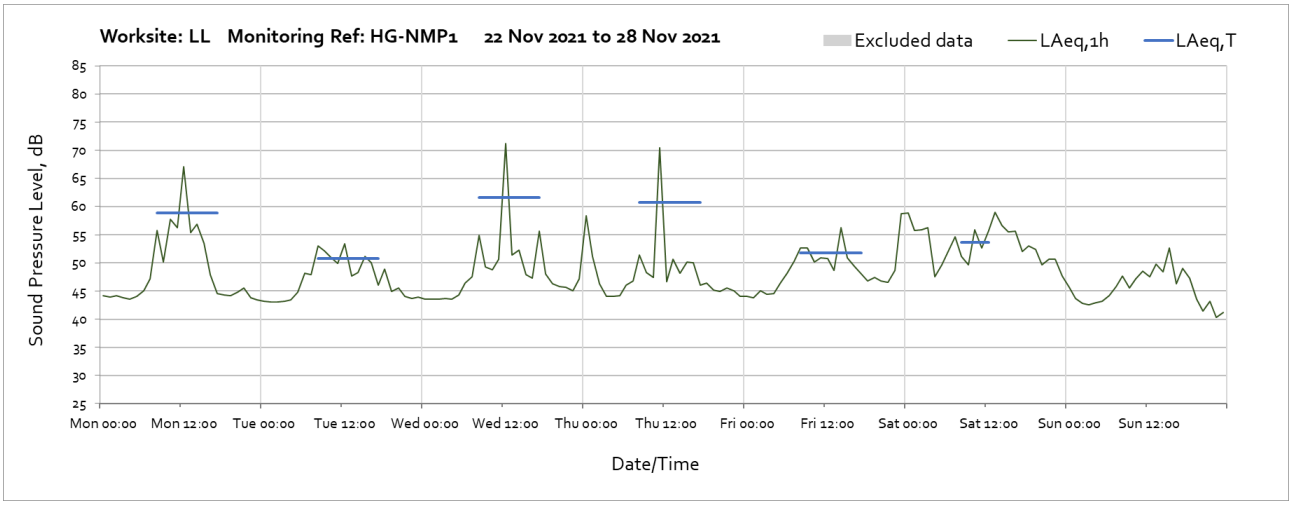
Sun 12:00
Date/Time

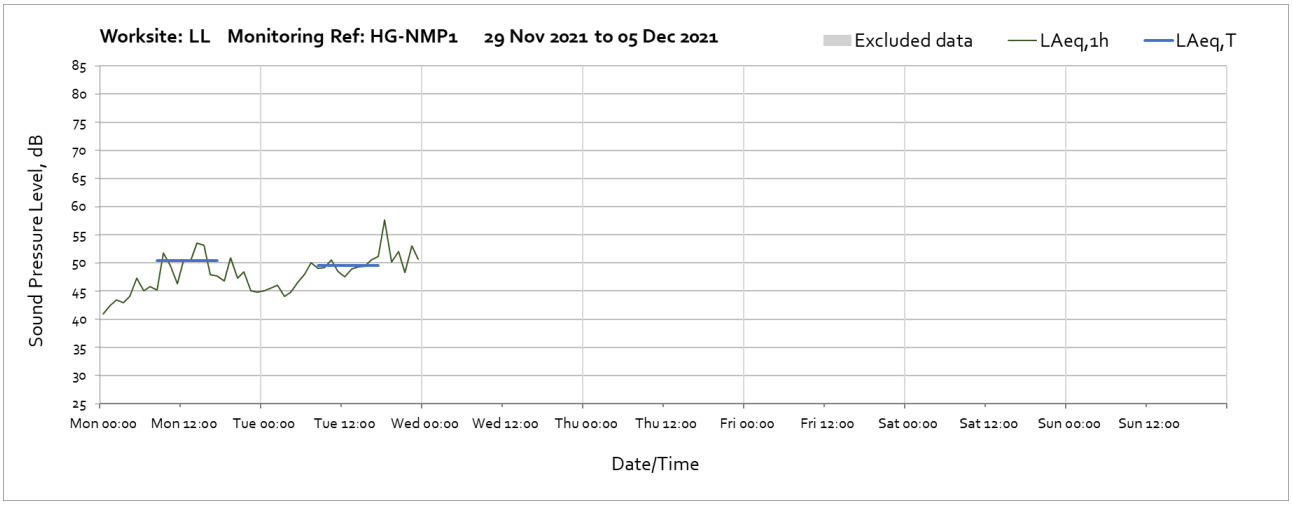
Worksite: LL – Monitoring Ref: HG -NMP1



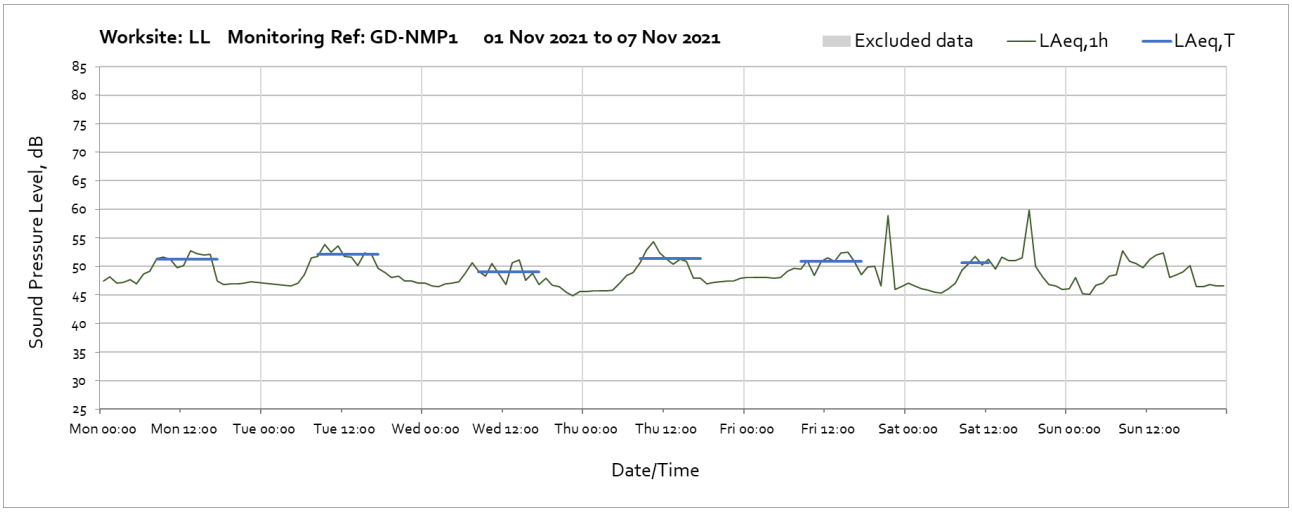


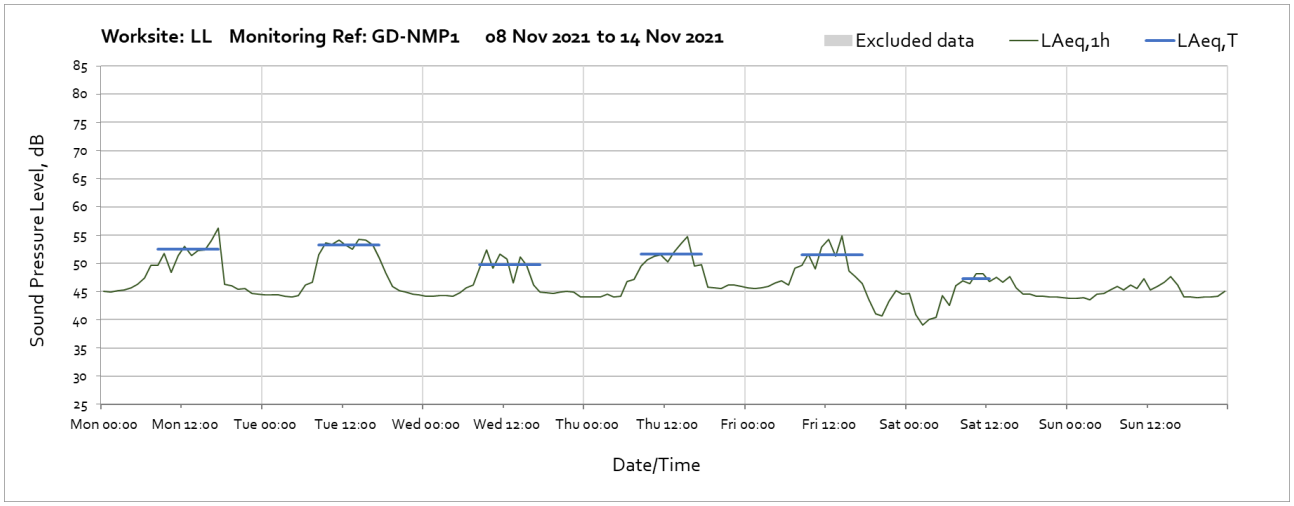






Worksite: LL – Monitoring Ref: GD-NMP1




Worksite: LL Monitoring Ref: GD-NMP1 08 Nov 2021 to 14 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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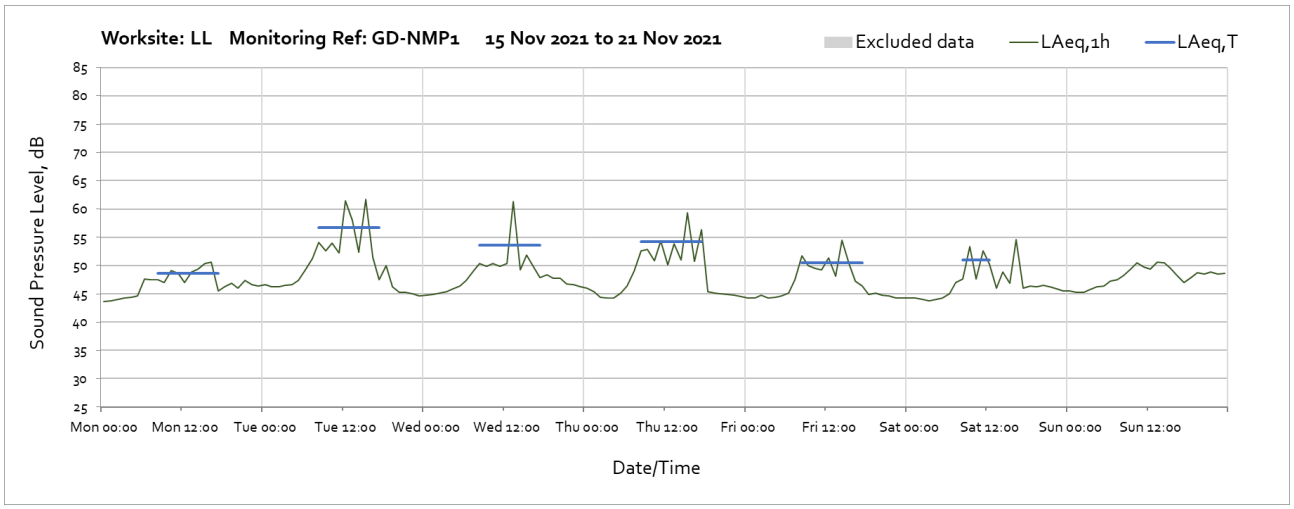
Date/Time


Worksite: LL Monitoring Ref: GD-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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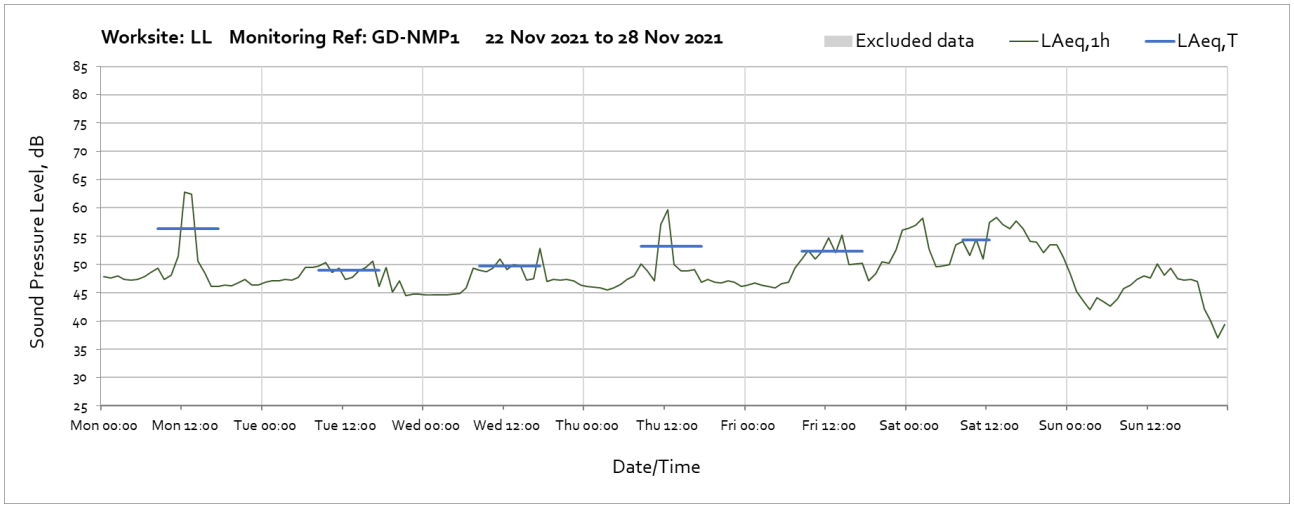
Sun 12:00
Date/Time


Worksite: LL Monitoring Ref: GD-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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65
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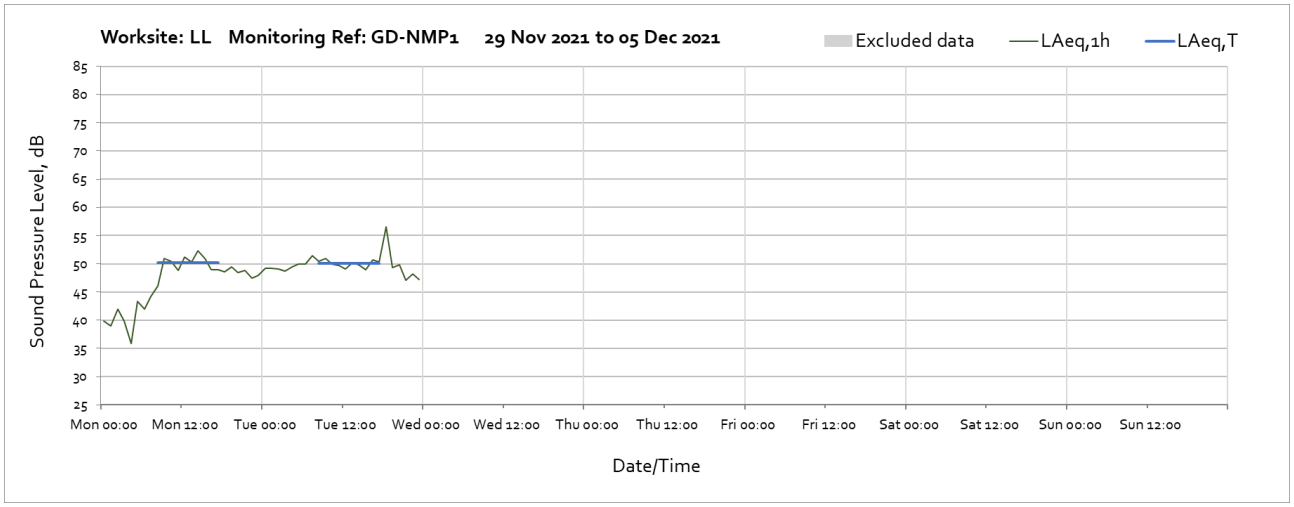
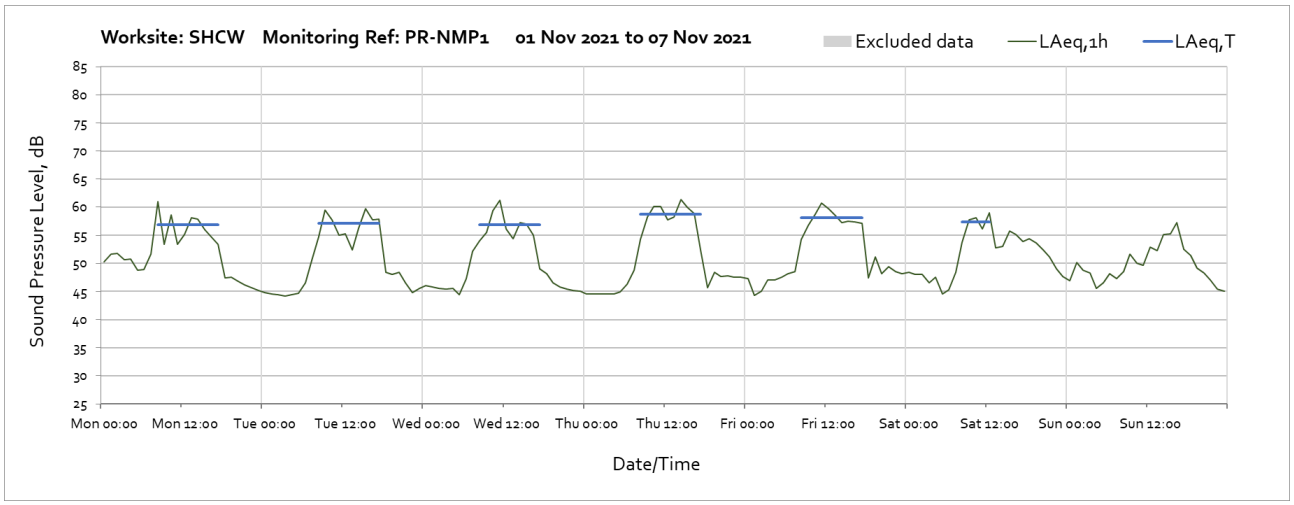
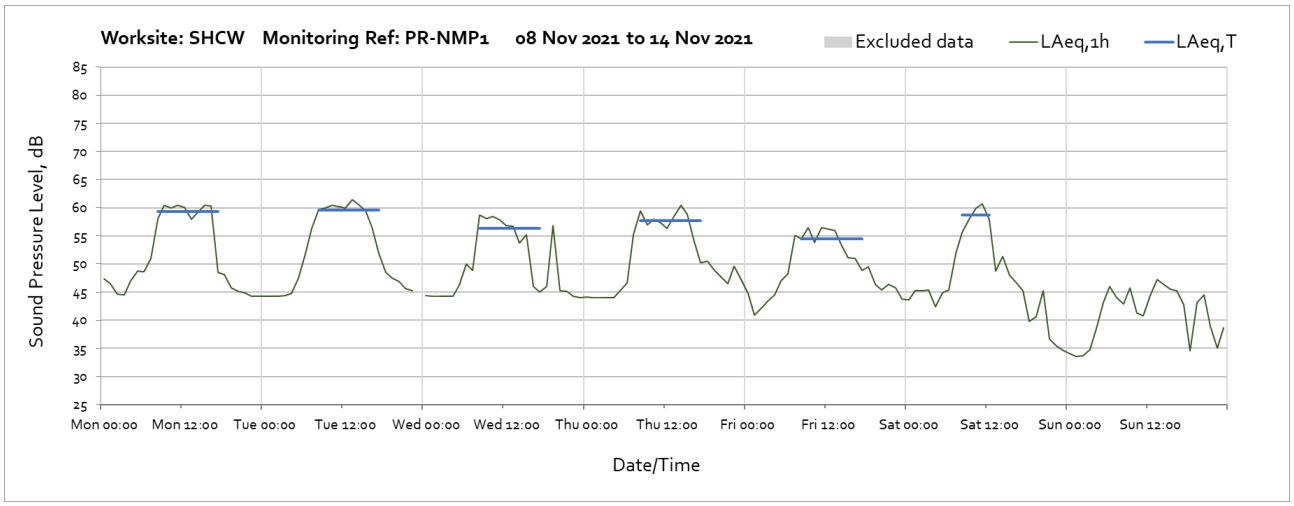
Date/Time

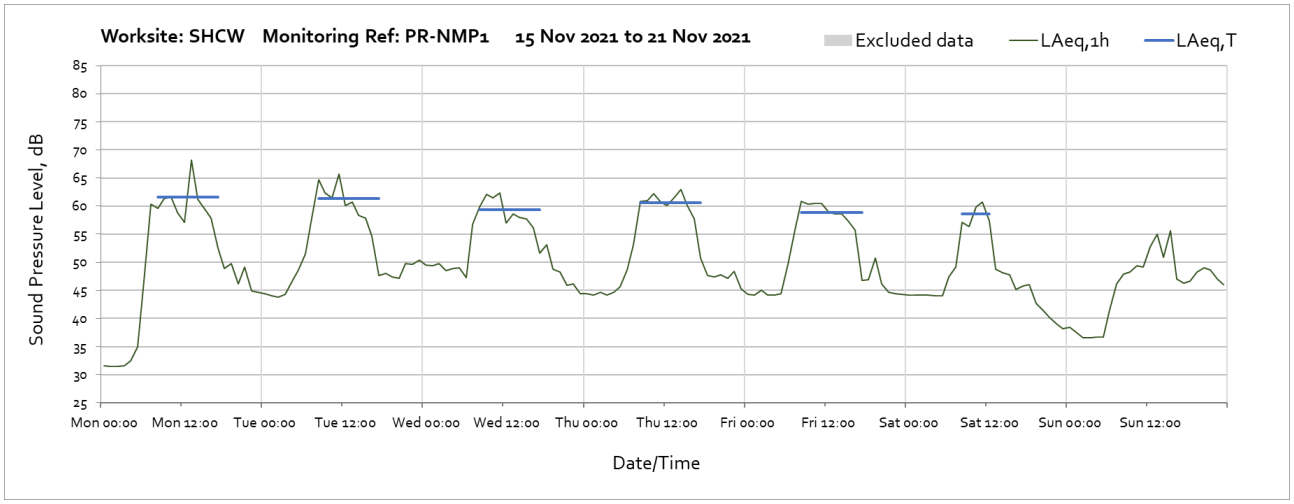


Worksite: SHCW – Monitoring Ref: PR-NMP1





Note: Missing data at 23:00 on Tuesday 9th November was due to poor solar coverage and backup battery being out of power. The contractor is aiming to install wind turbines to aid the solar panels system.


Worksite: SHCW Monitoring Ref: PR-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
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60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
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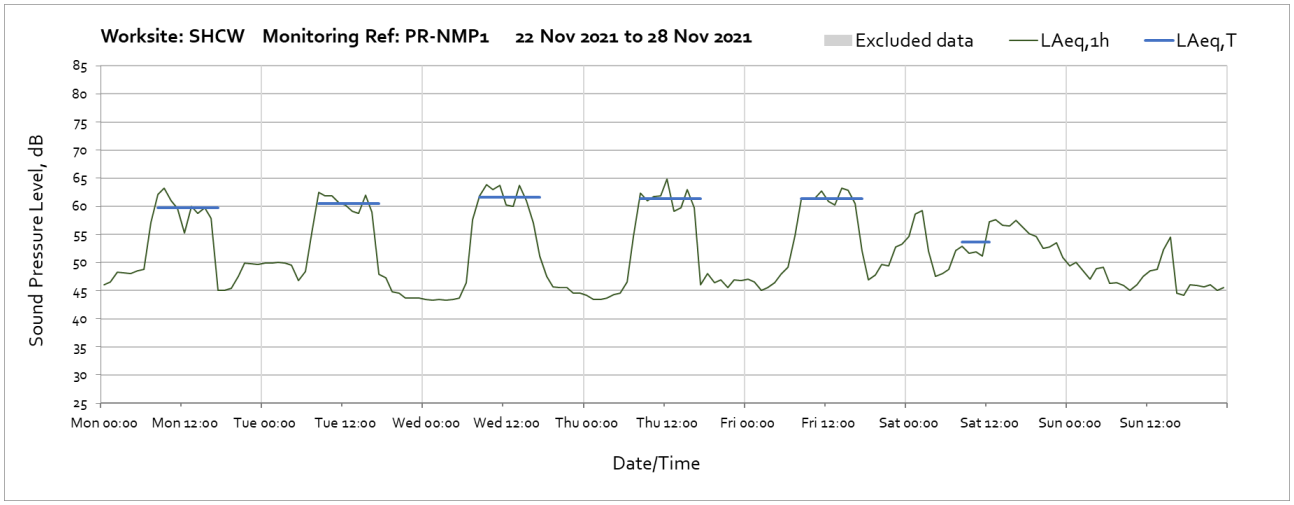
Sun 12:00
Date/Time


Worksite: SHCW Monitoring Ref: PR-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
Mon 12:00
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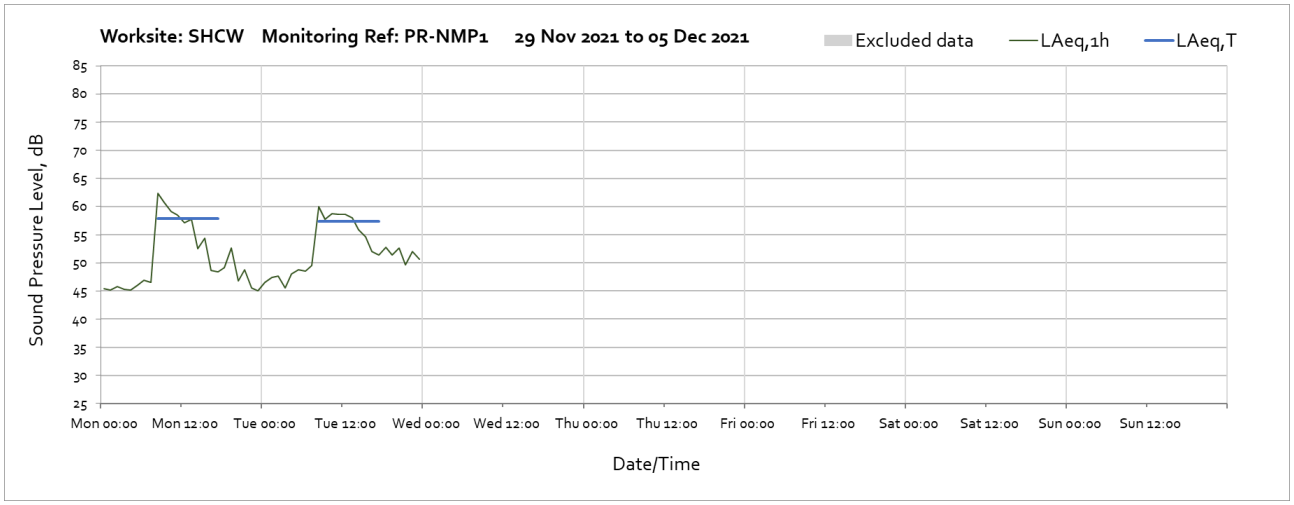
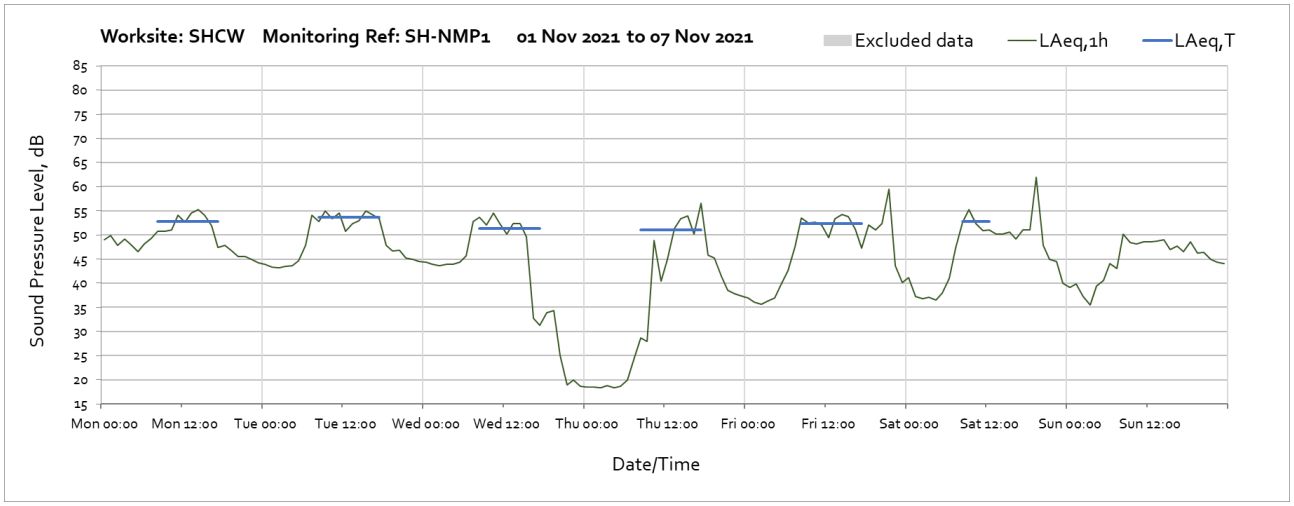
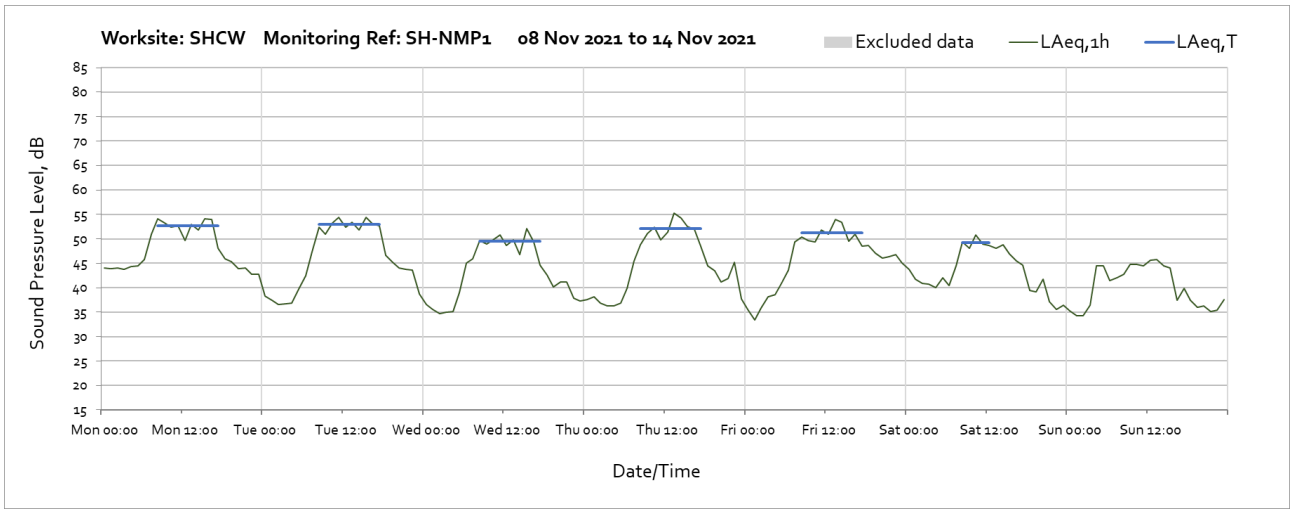
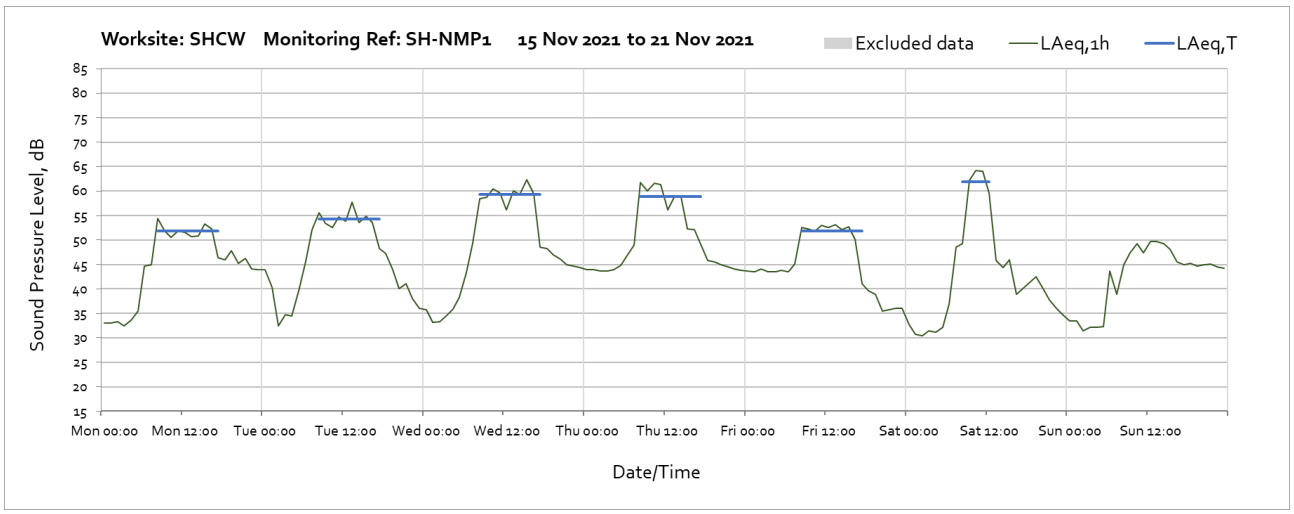
Sun 12:00
Date/Time

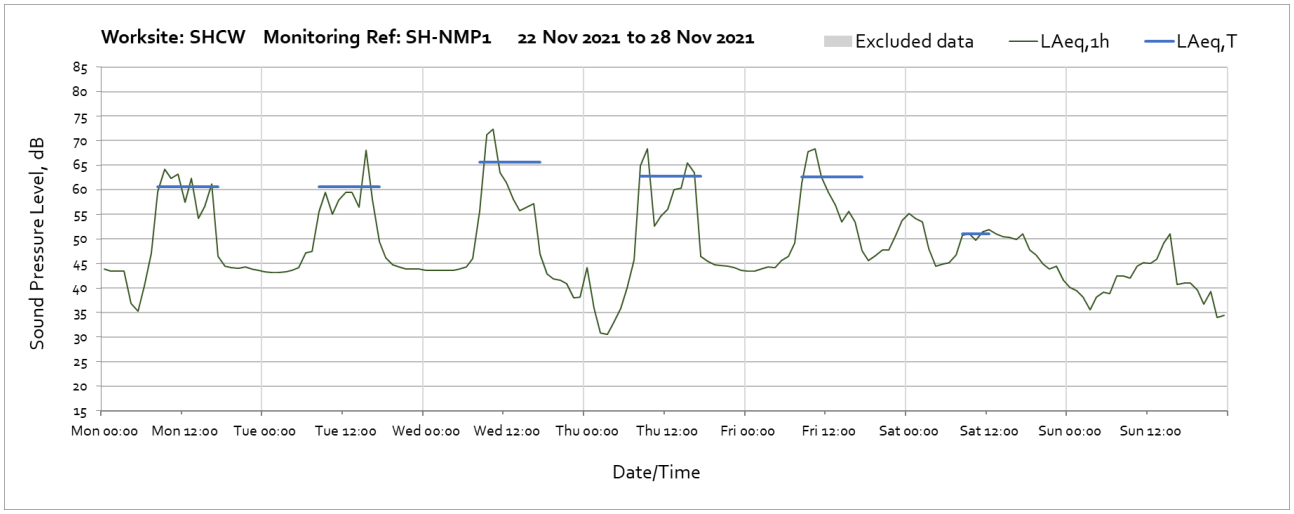

Worksite: SHCW Monitoring Ref: PR-NMP1 29 Nov 2021 to 05 Dec 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

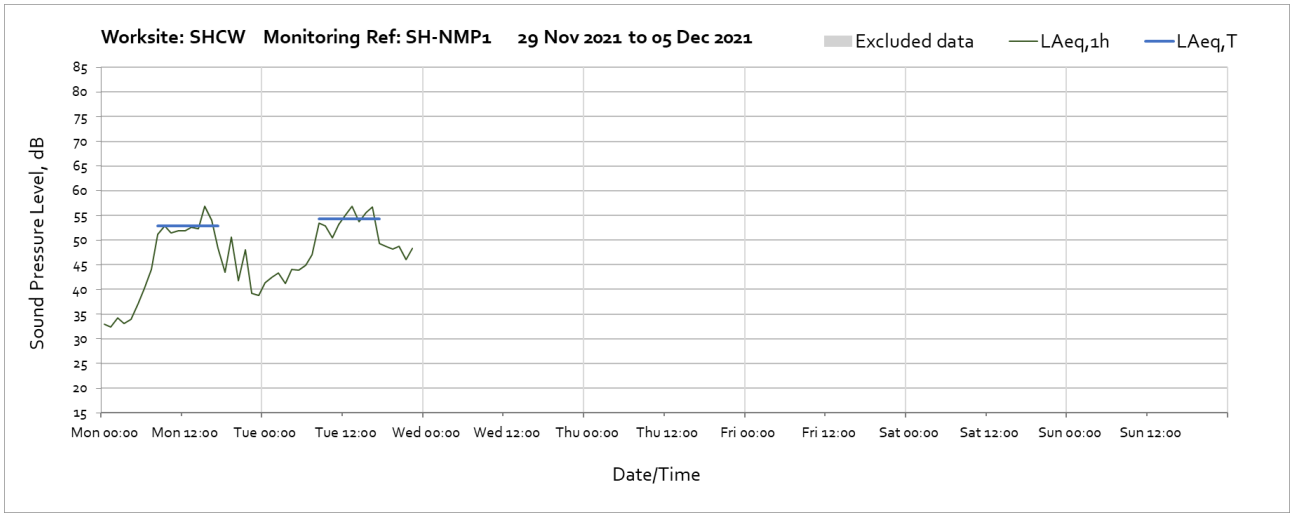
Worksite: SHCW – Monitoring Ref: SH-NMP1





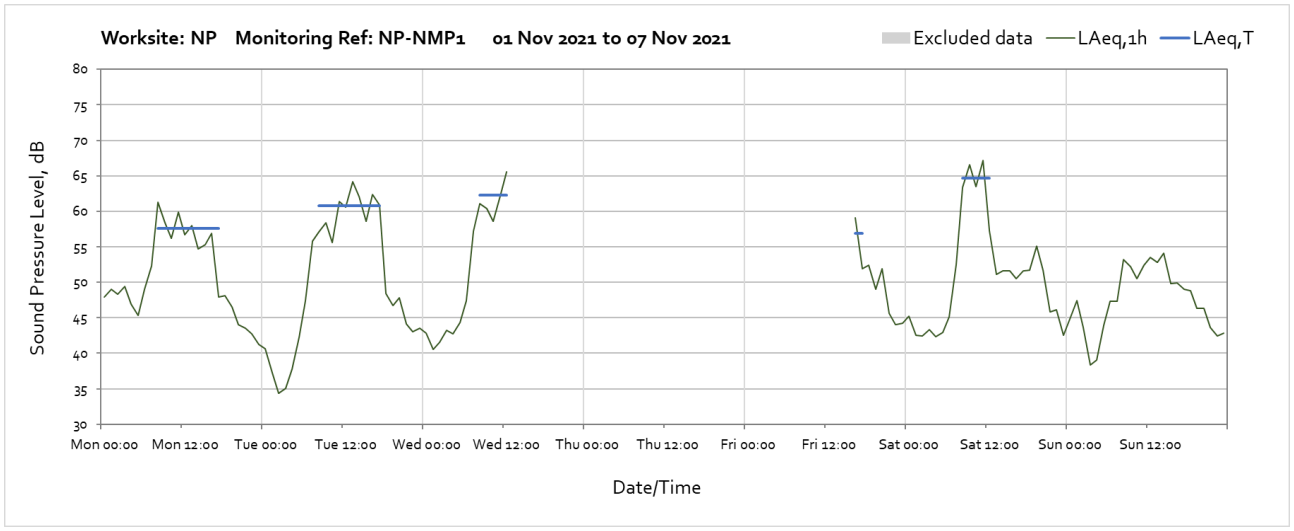




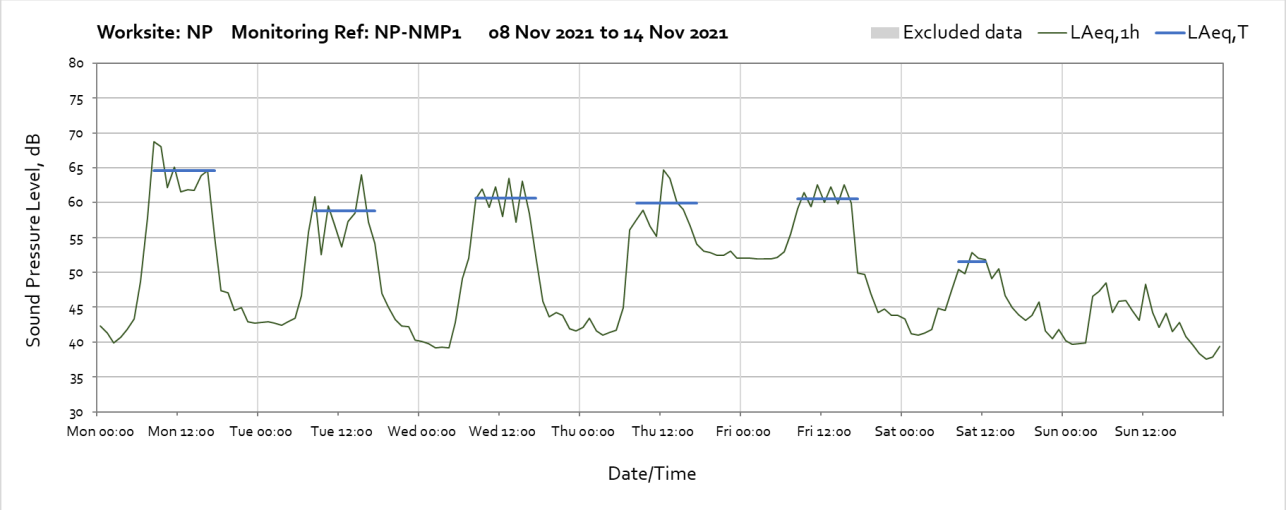


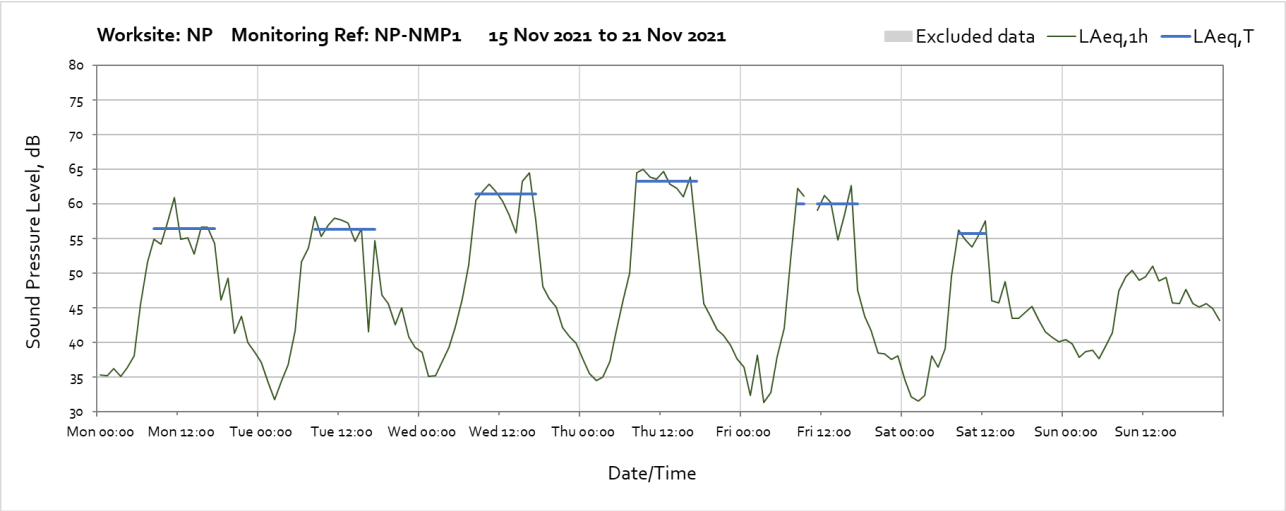
Note: Missing data at 23:00 on Tuesday 30th November was due to poor solar coverage and backup battery being out of power. The contractor is aiming to install wind turbines to aid the solar panels system.

Worksite: NP – Monitoring Ref: NP-NMP1

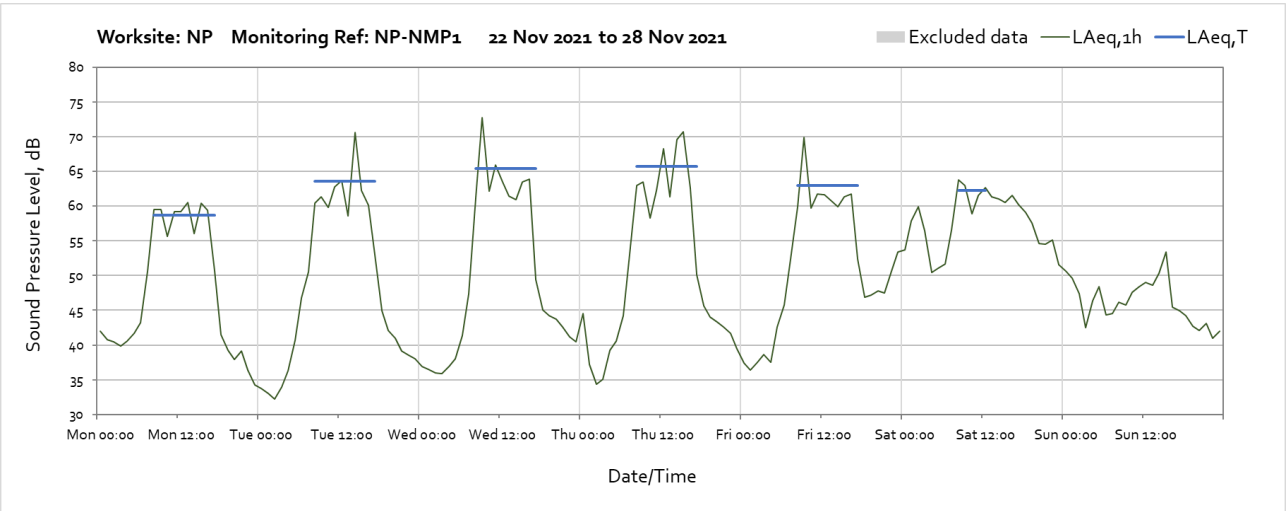


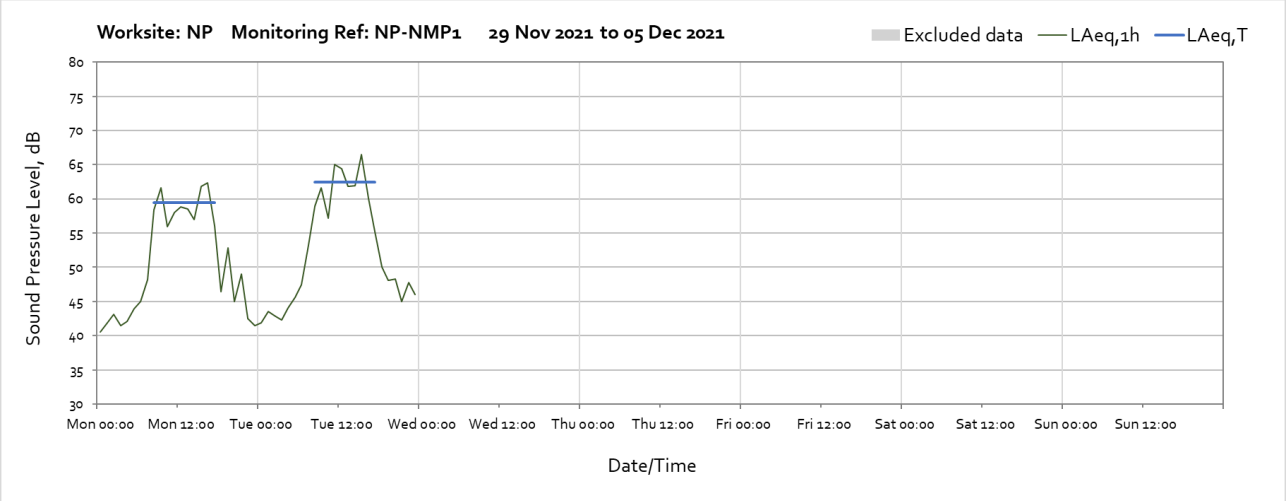
Note: Missing data between 13:00 on Wednesday 3rd Novemeber and 16:00 on Friday 5th November was due to lack of power supply at the monitor location.



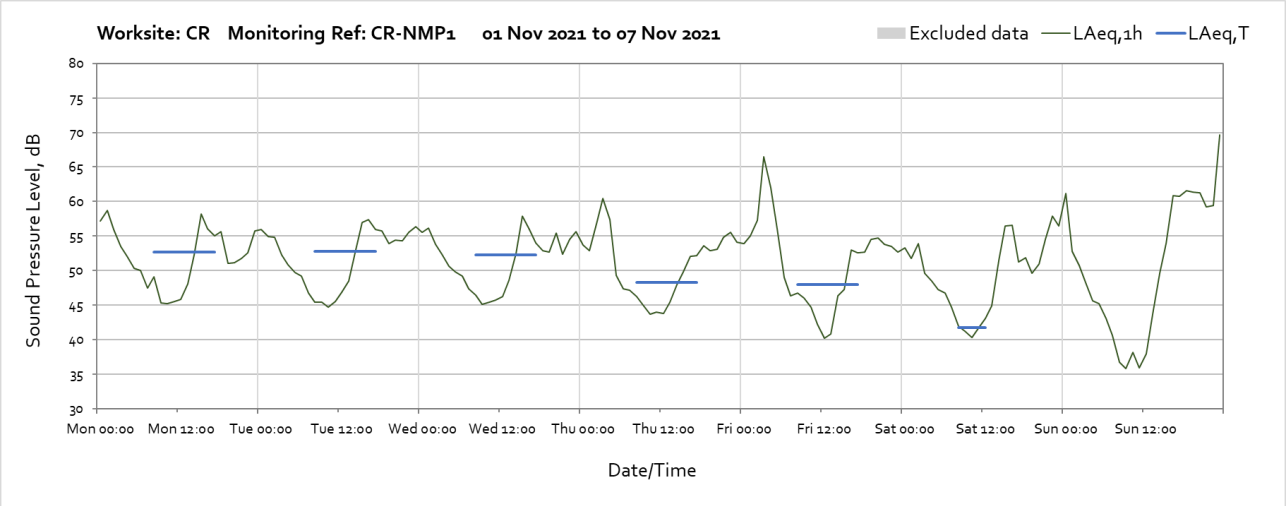


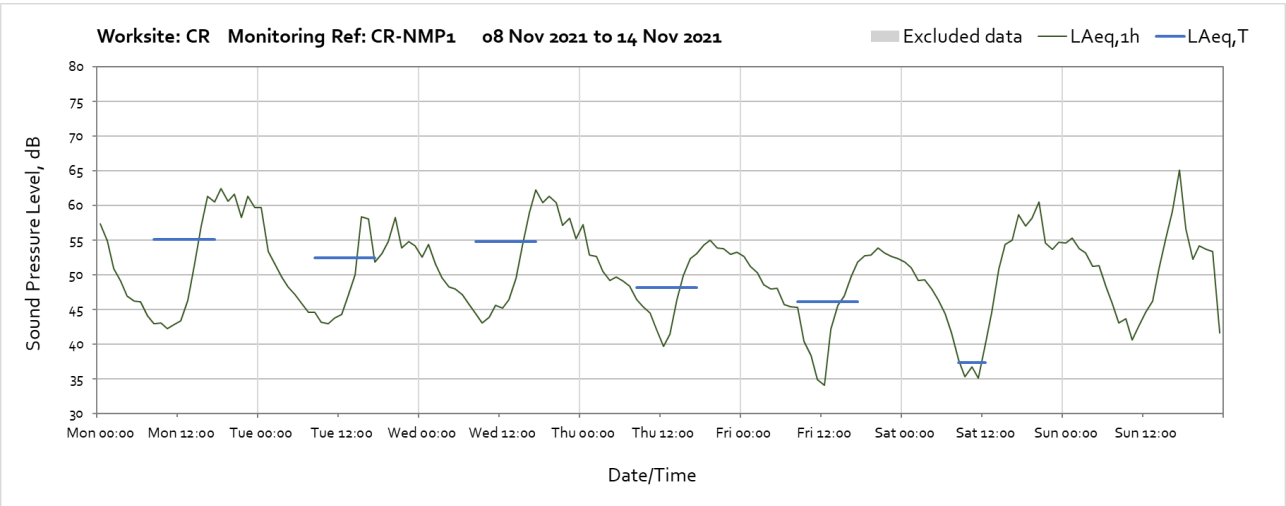
Note: Missing data at 10:00 on Friday 19th November was due to maitanance of the monitor location.

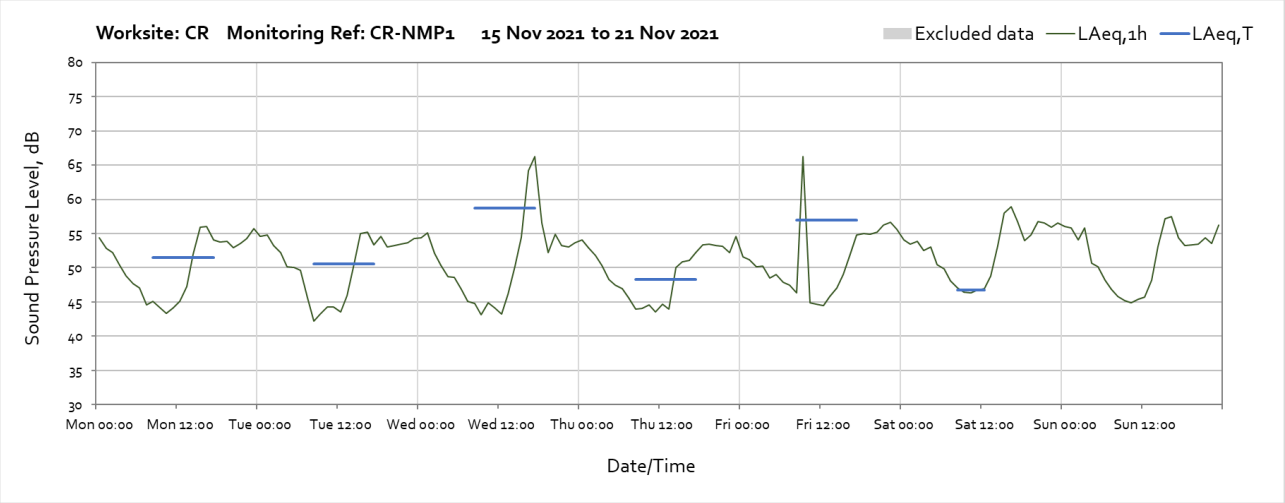


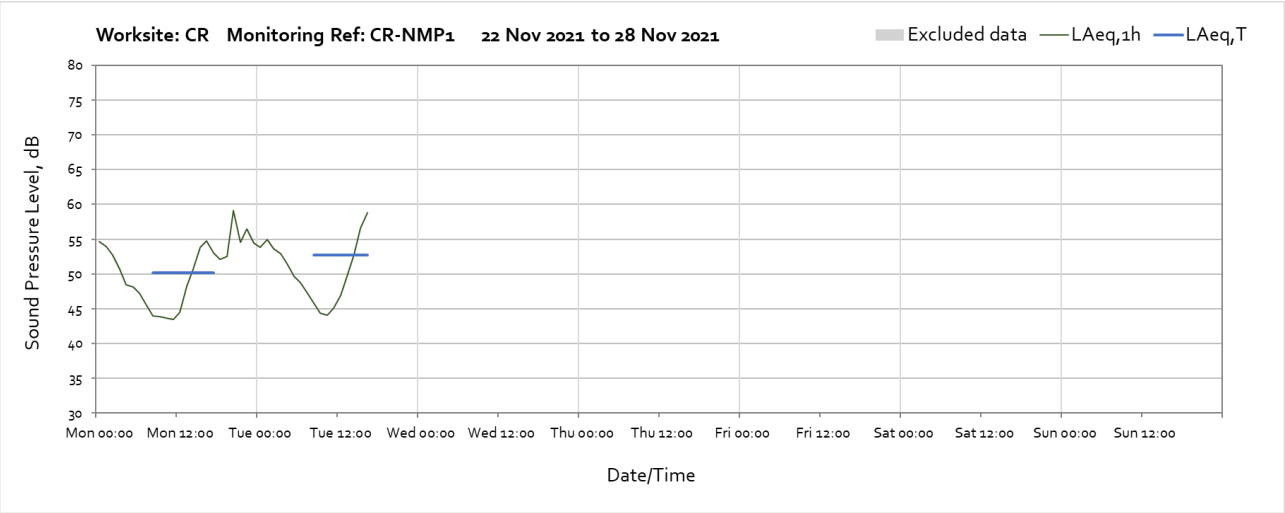


Worksite: CR – Monitoring Ref: CR-NMP1



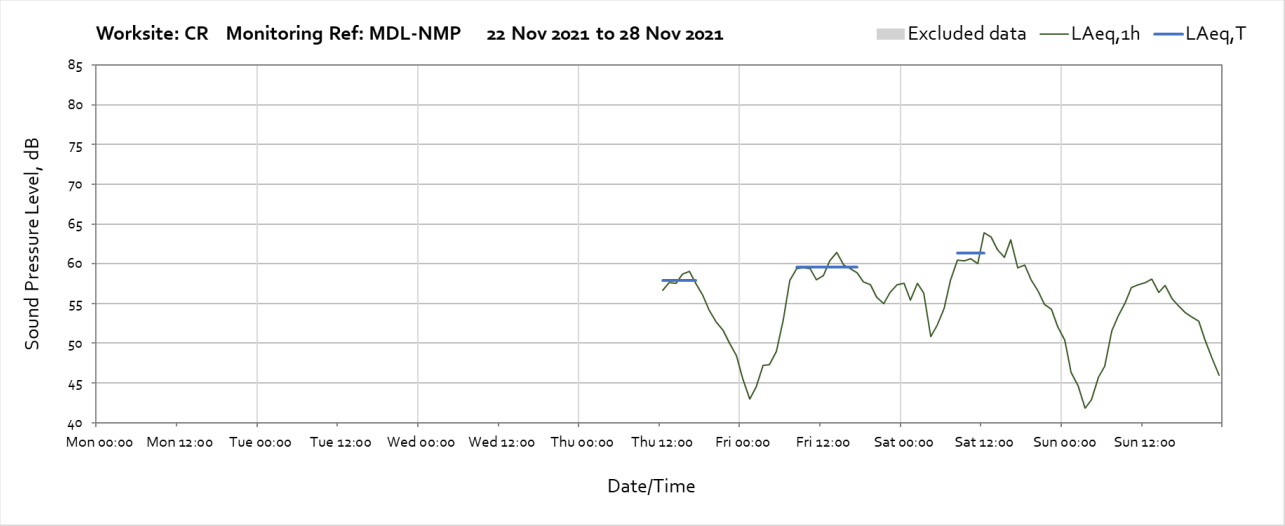




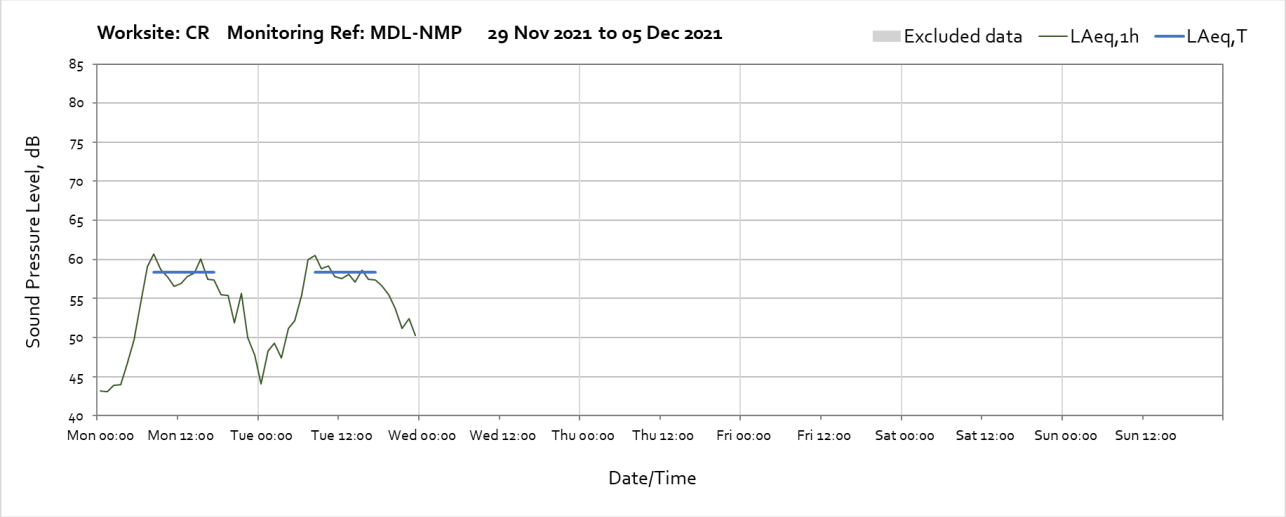


Note: The noise monitor has been relocated on Tuesday 23rd November to MDL-NMP1 monitor location.

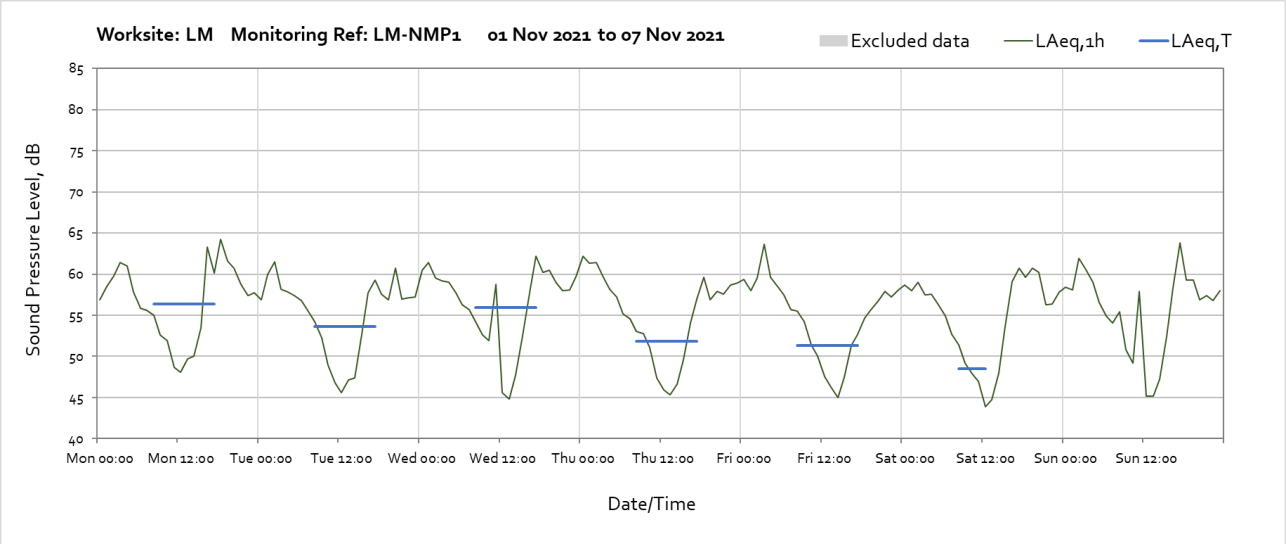
Worksite: CR – Monitoring Ref: MDL-NMP1

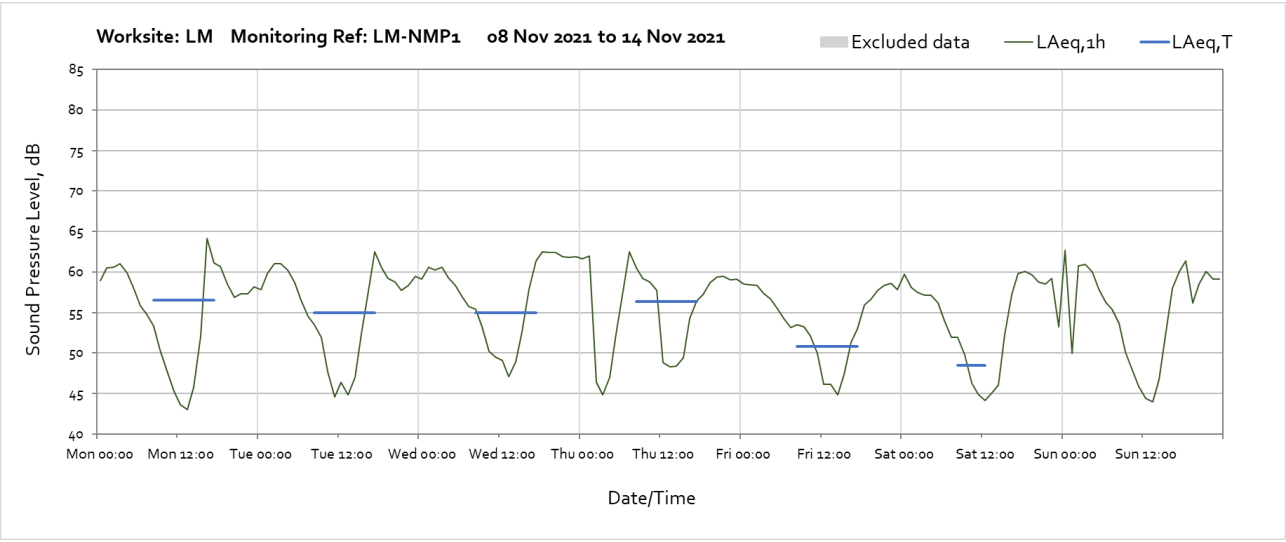


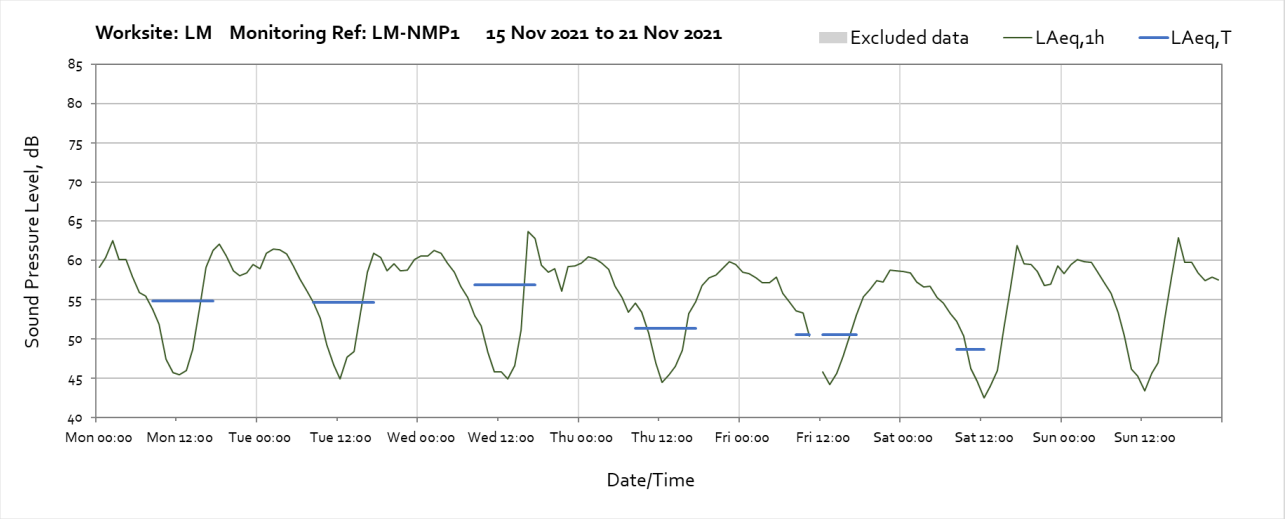
Note: Noise monitor has been installed on Thursday 25th November.



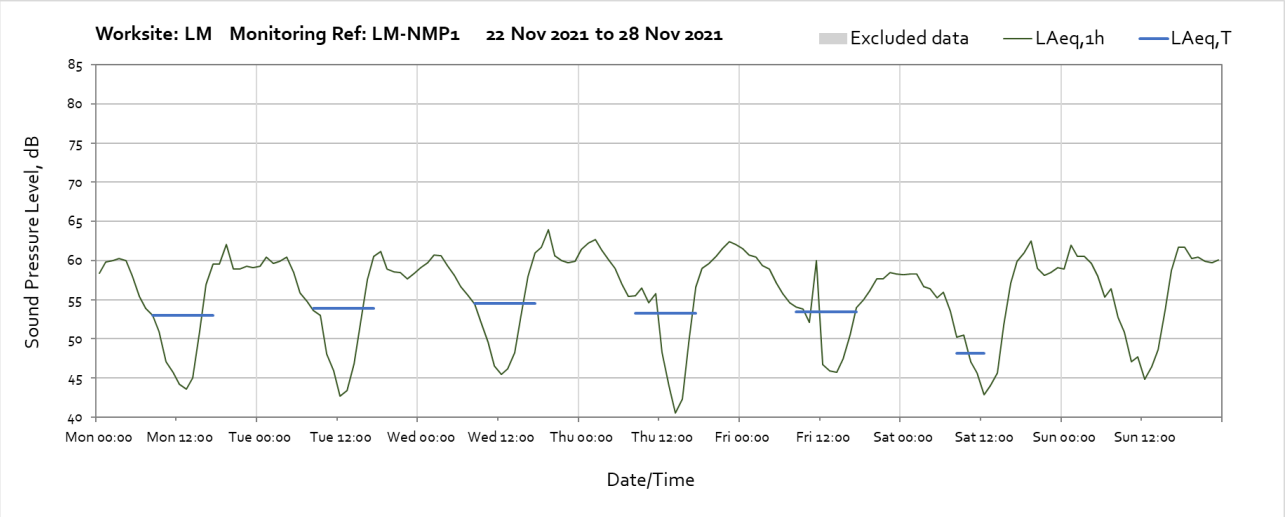
Worksite: LM – Monitoring Ref: LM-NMP1

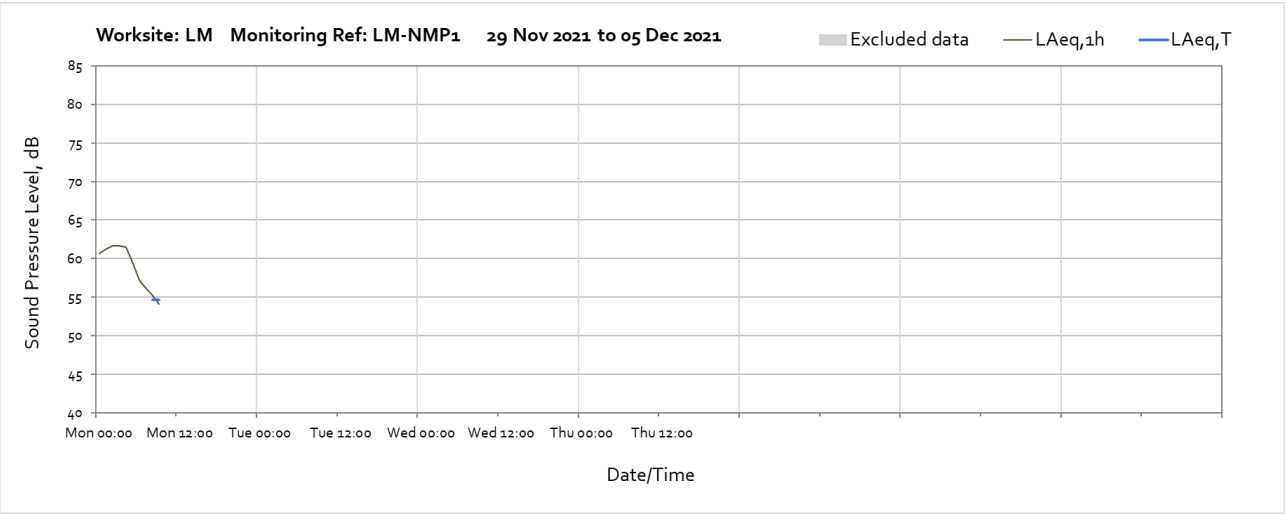






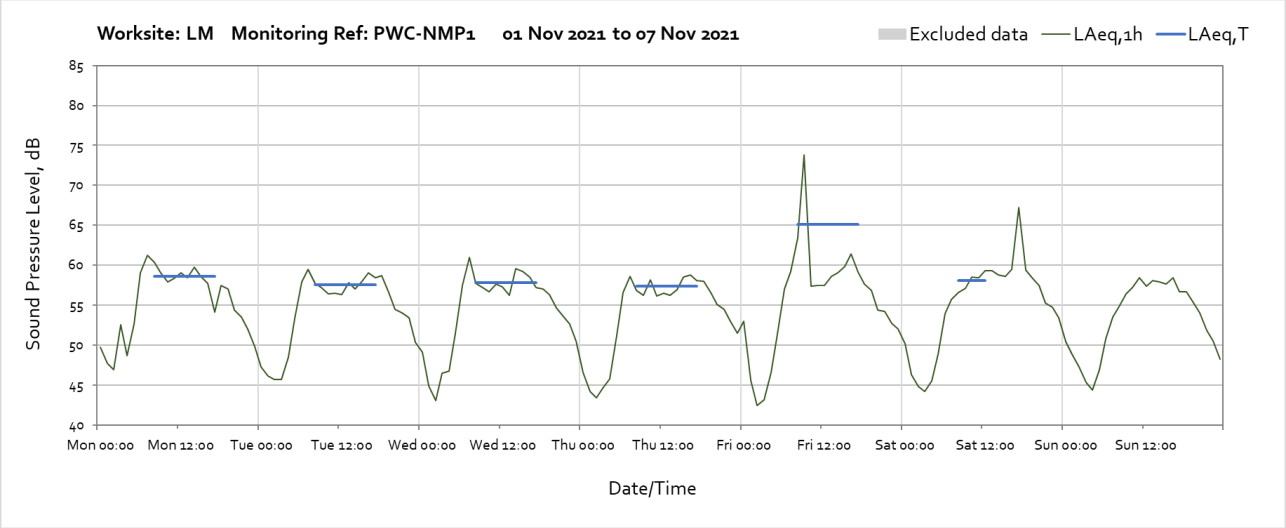
Note: Missing data at 11:00 on Friday 19th November was due to maitenance of the monitor station.

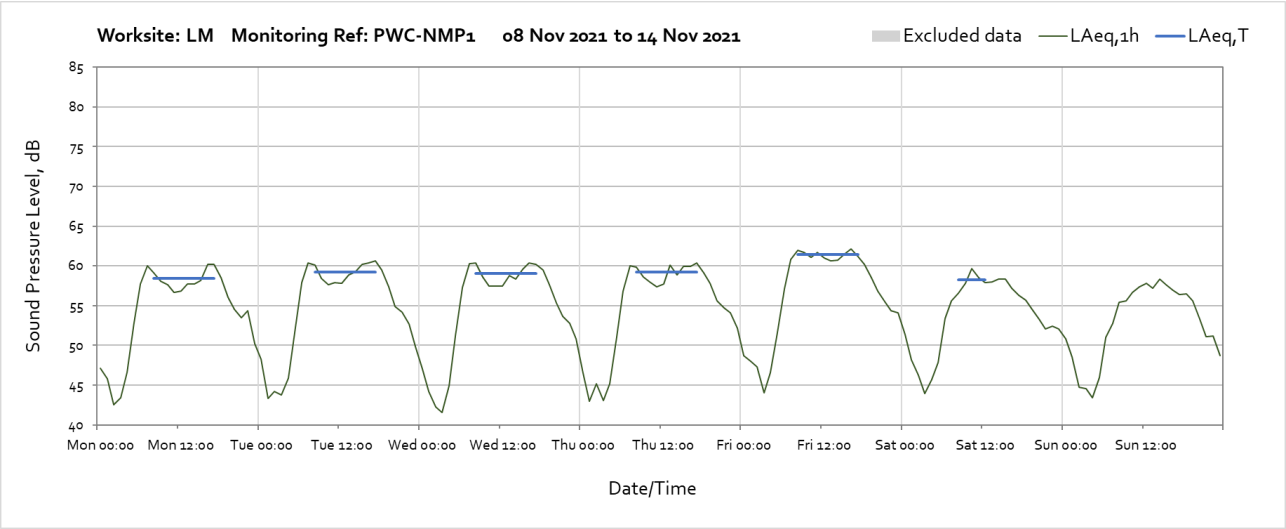


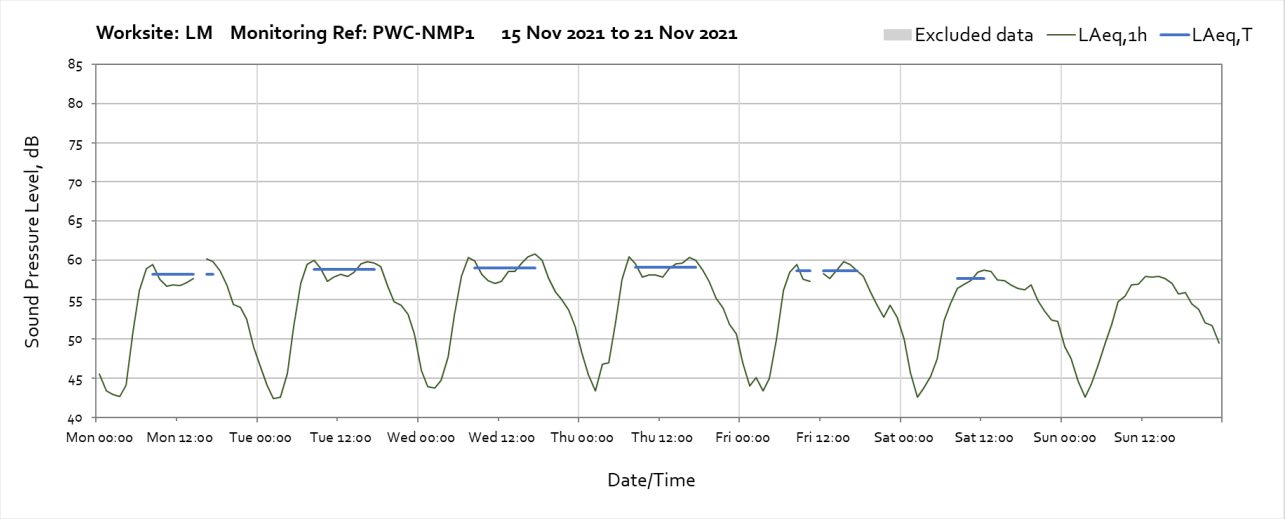


Note: Missing data from 10:00 on Monday 29th November was due to loss of solar power at the monitor location.

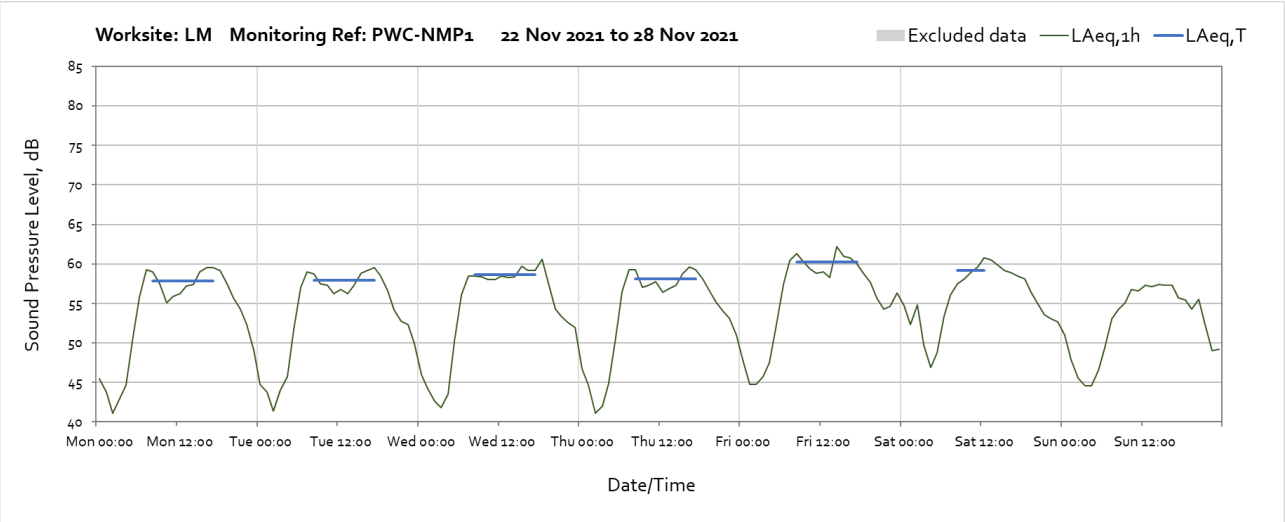
Worksite: LM – Monitoring Ref: PWC-NMP1

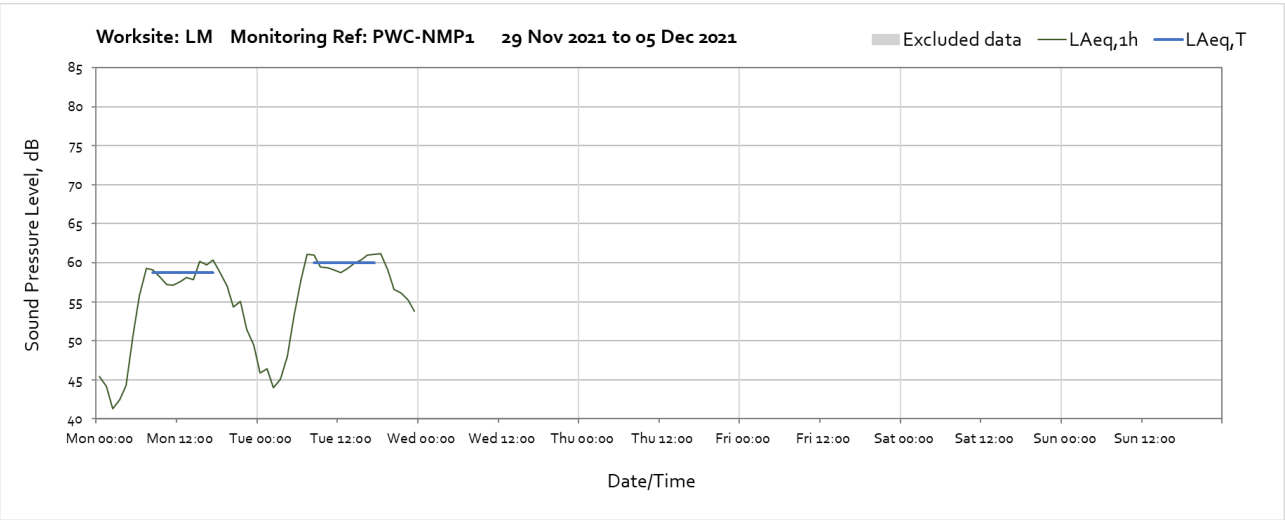




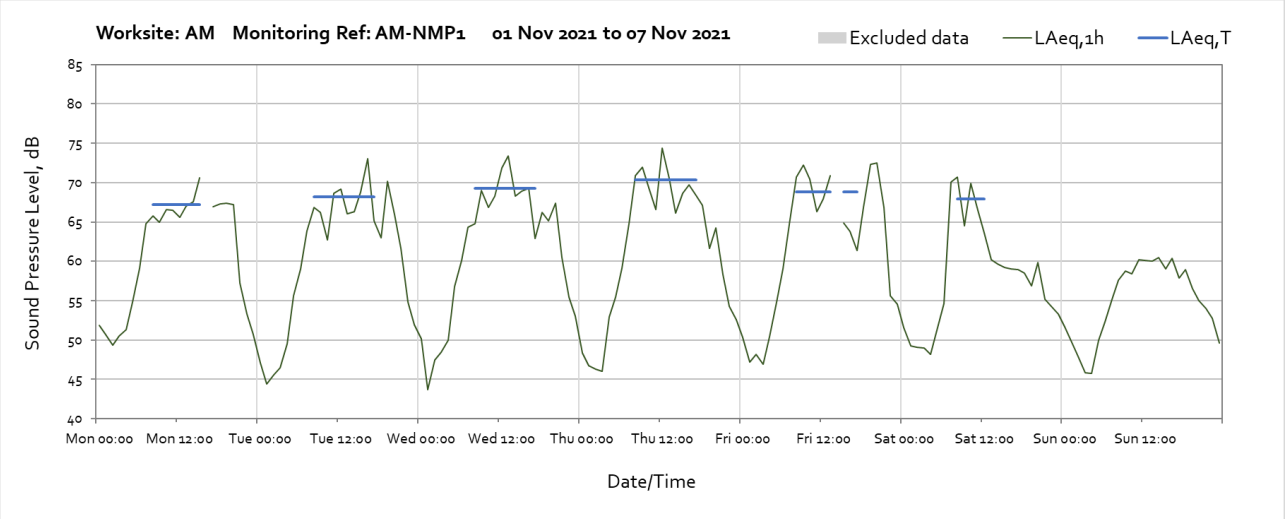


Note: Missing data at 15:00 on Monday 15th November and at 11:00 on Friday 19th November was due to maitenance of the monitor station.

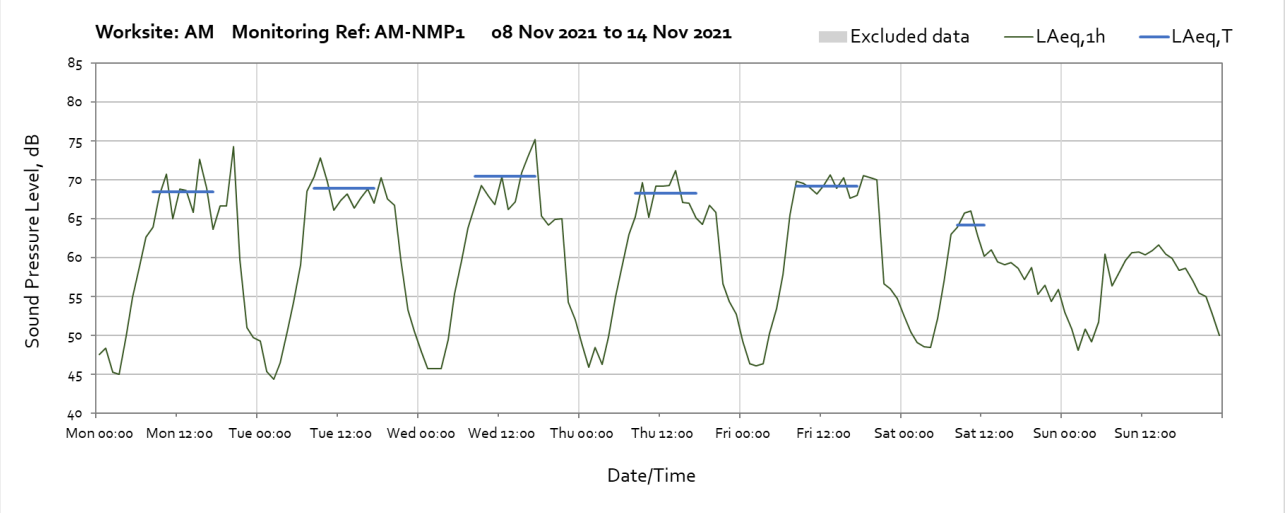


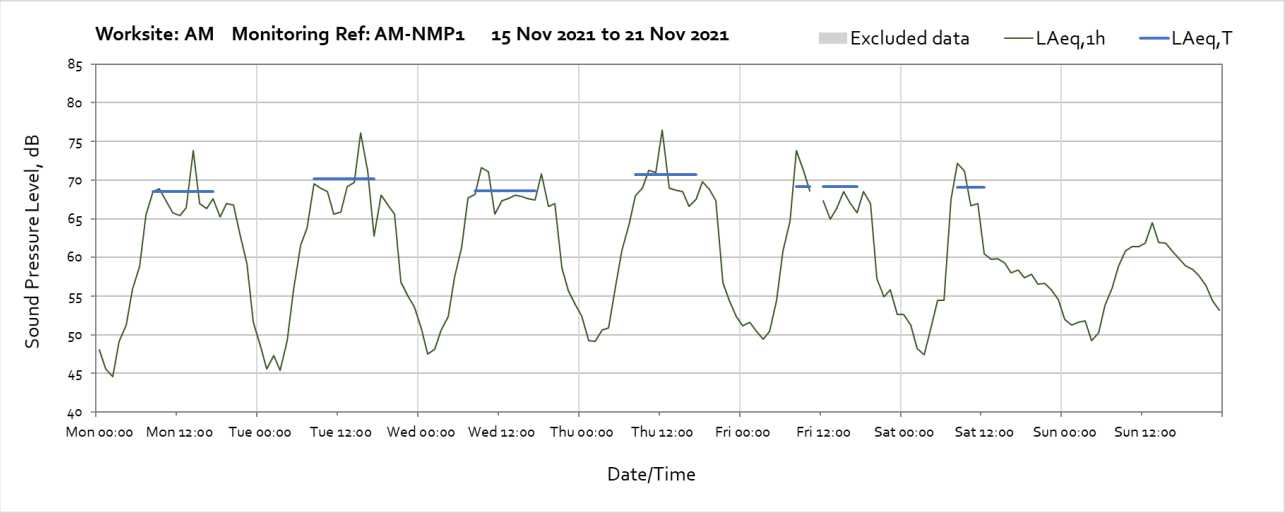


Worksite: AM – Monitoring Ref: AM-NMP1

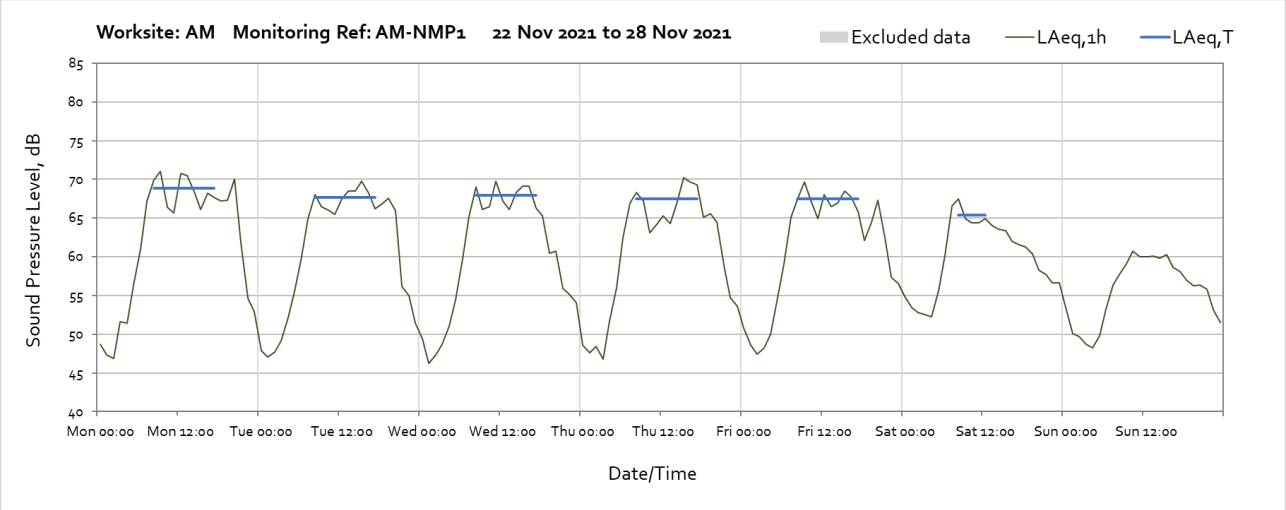


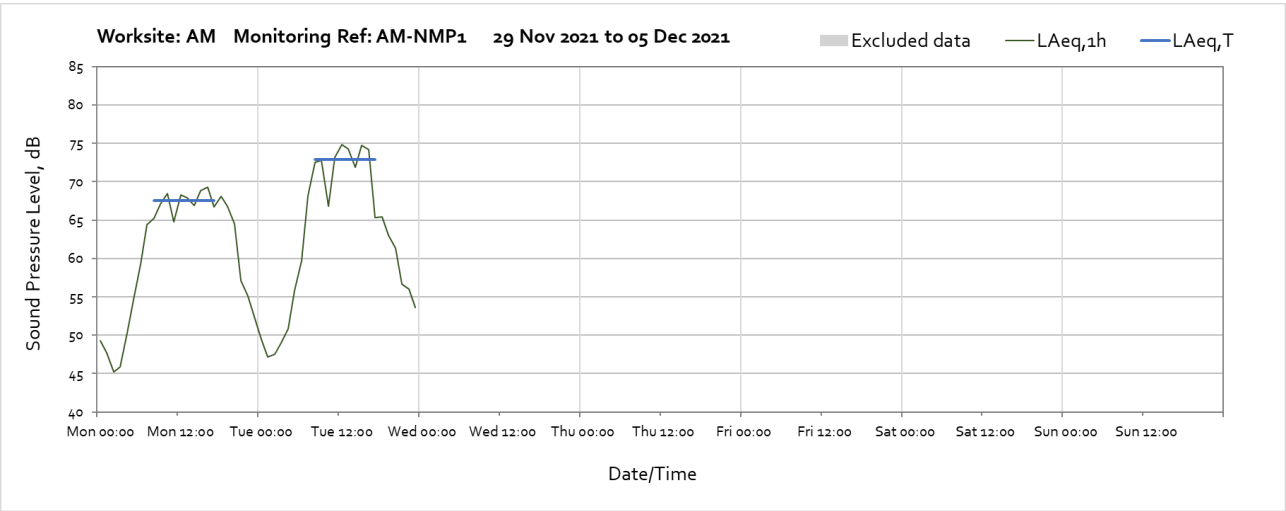
Note: Missing data at 16:00 on Monday 1st and at 14:00 on Friday 5th November was due to maitenance of the monitor station.



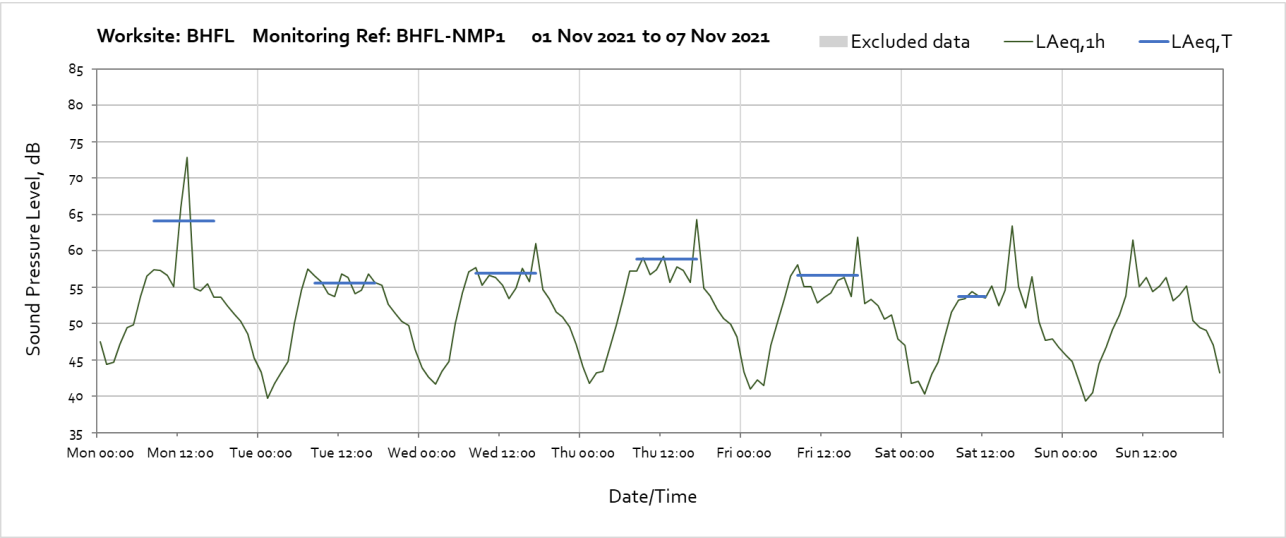


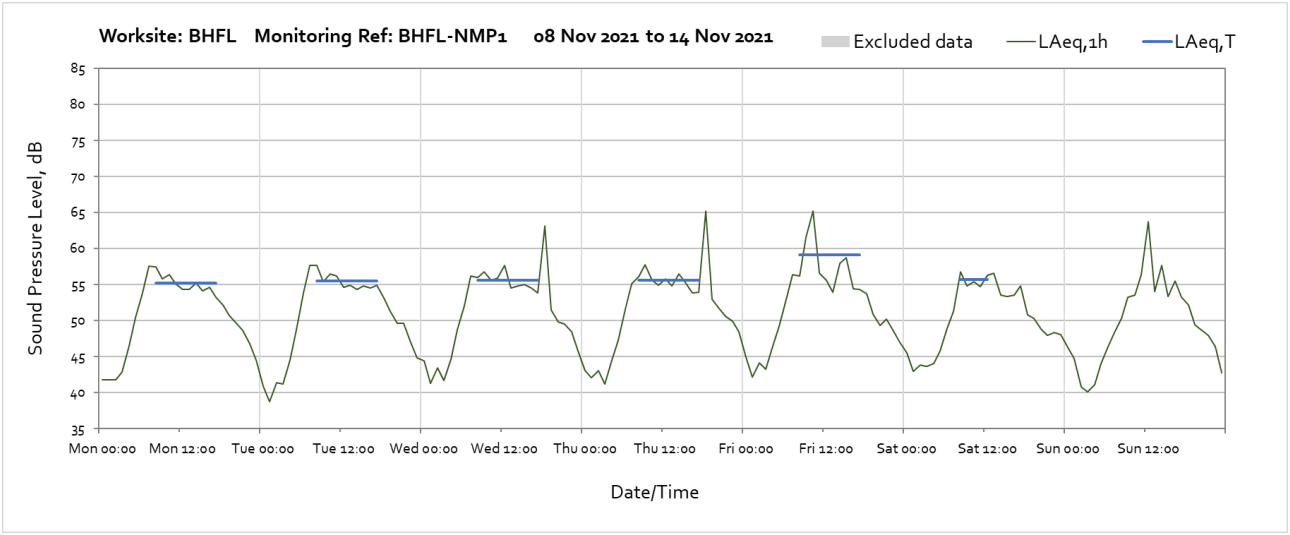
Note: Missing data at 11:00 on Friday 19th November was due to maitenance of the monitor station.

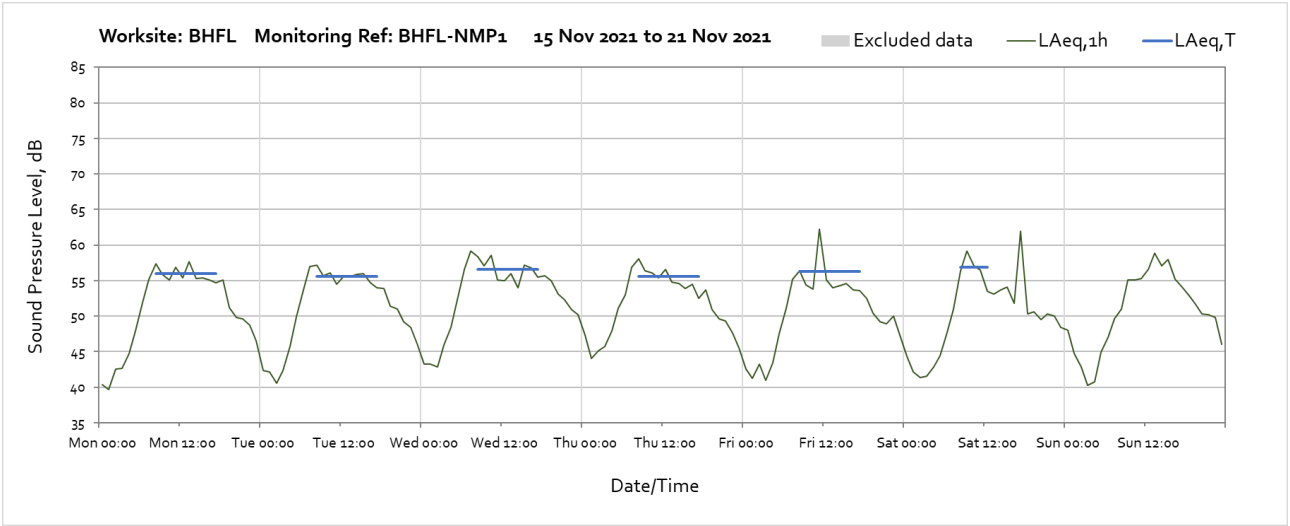


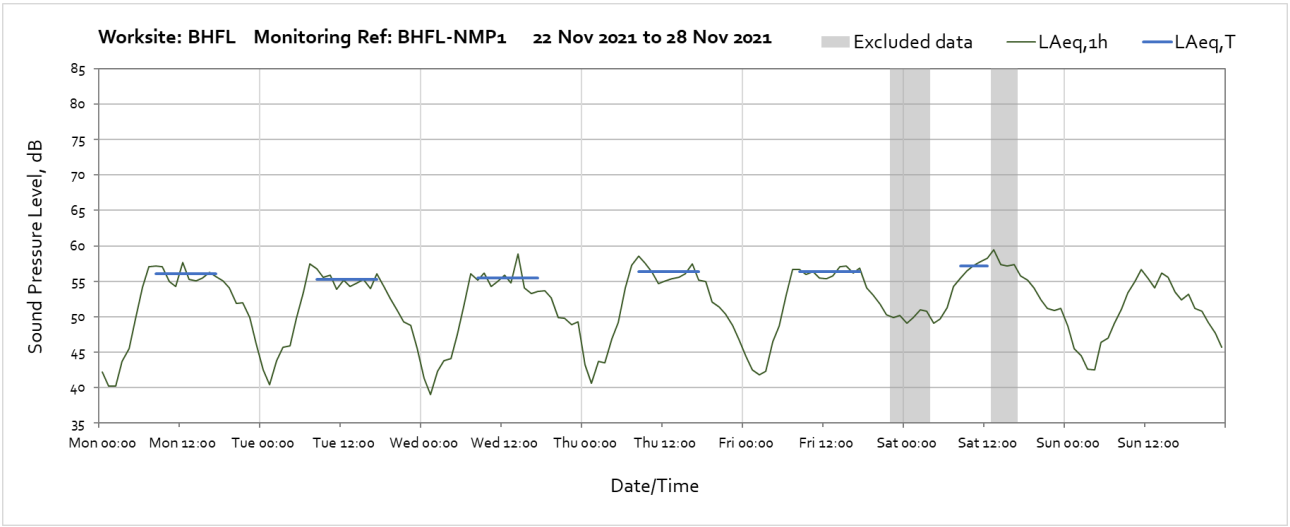


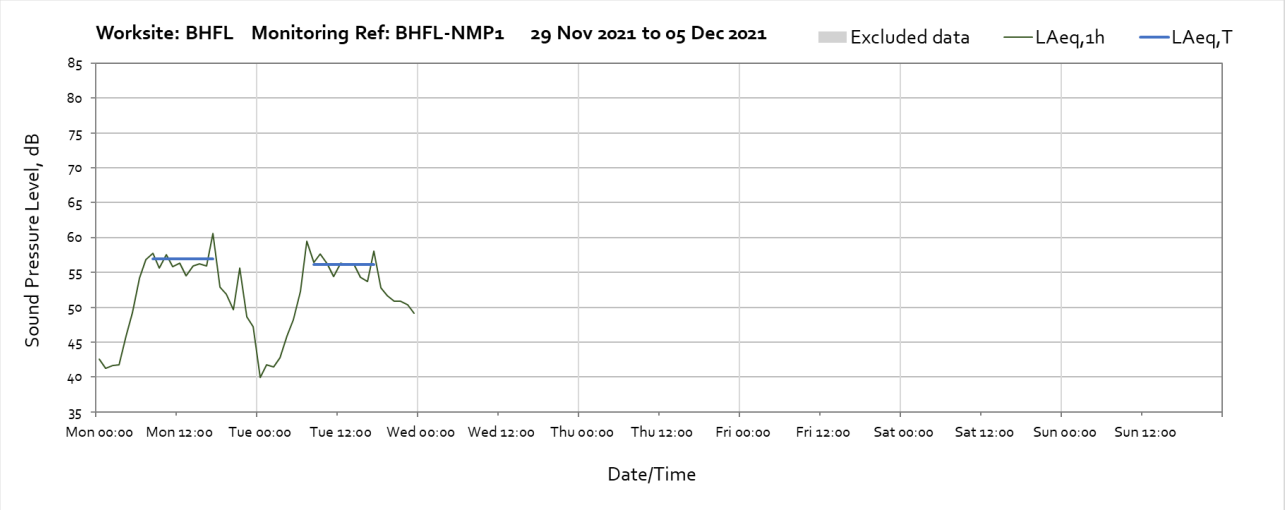
Worksite: BHFL – Monitoring Ref: BHFL-NMP1



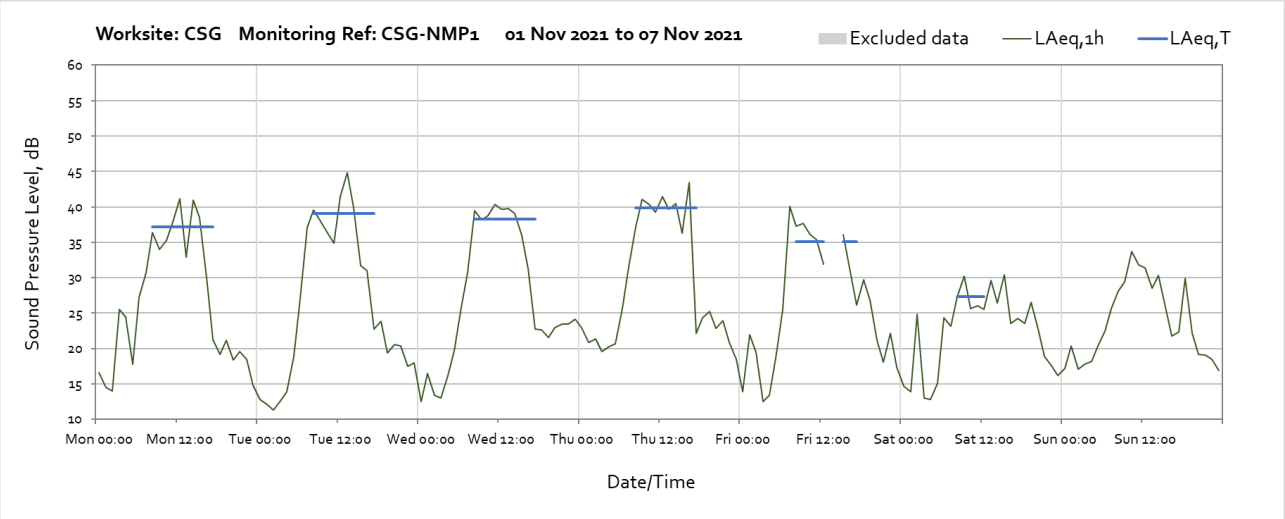

Worksite: BHFL Monitoring Ref: BHFL-NMP1 08 Nov 2021 to 14 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: BHFL Monitoring Ref: BHFL-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

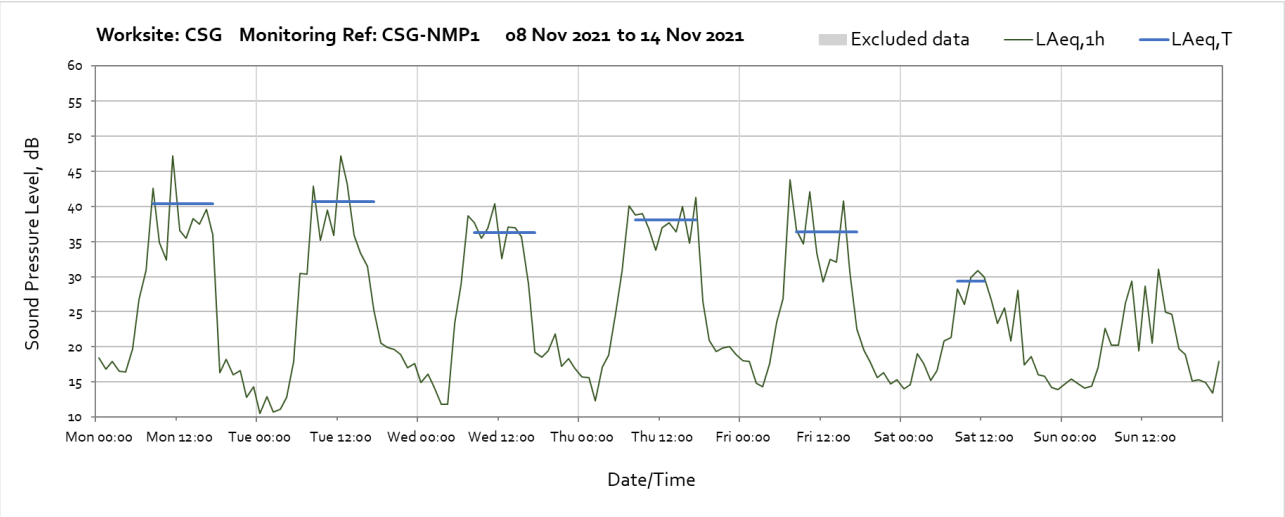

Worksite: BHFL Monitoring Ref: BHFL-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

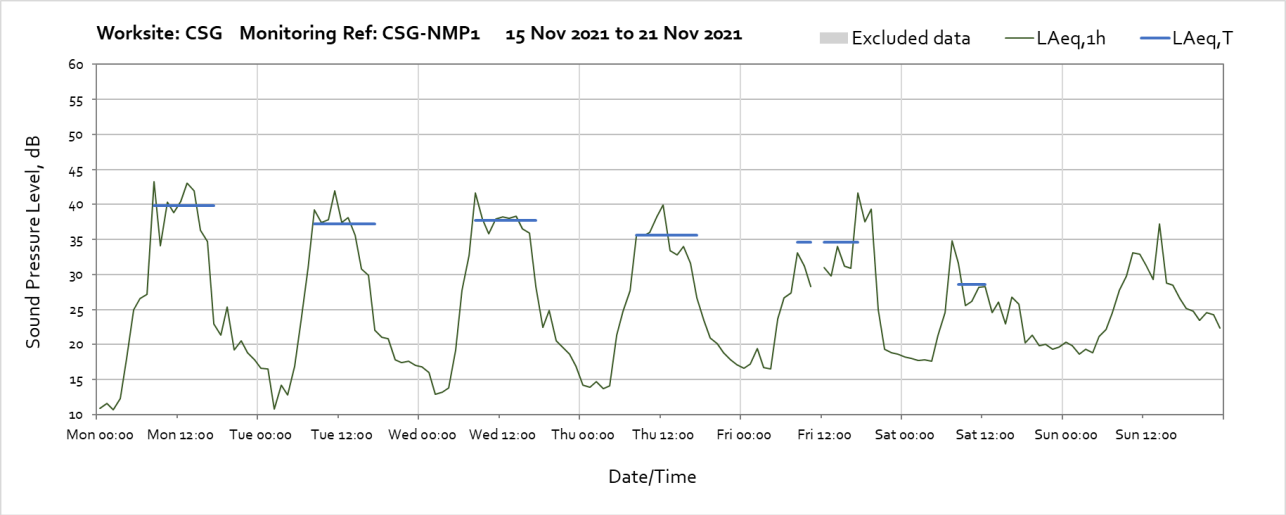


Worksite: CSG – Monitoring Ref: CSG-NMP1

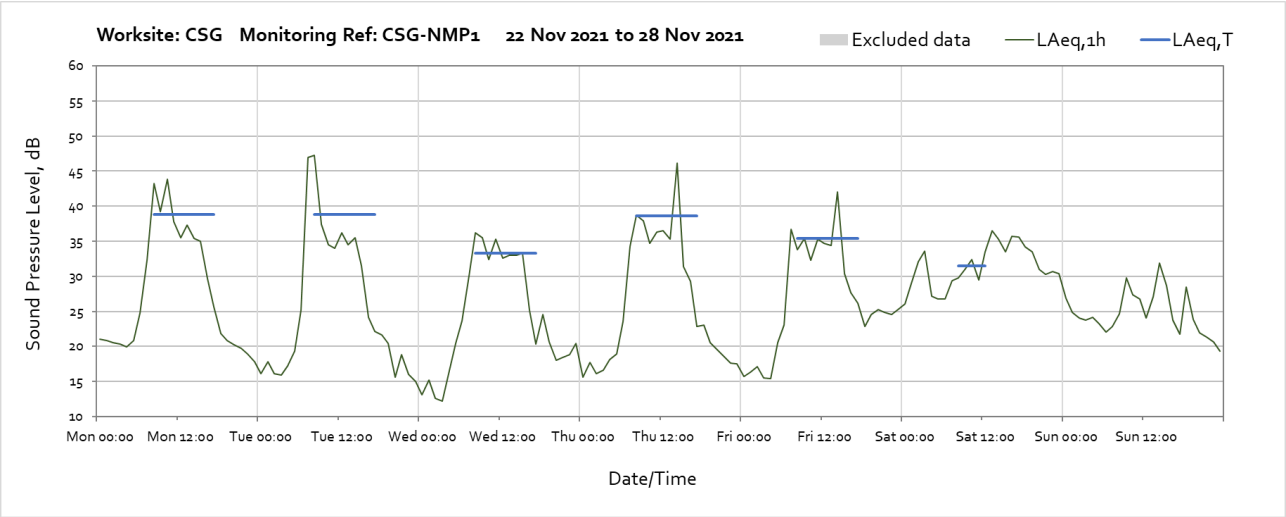


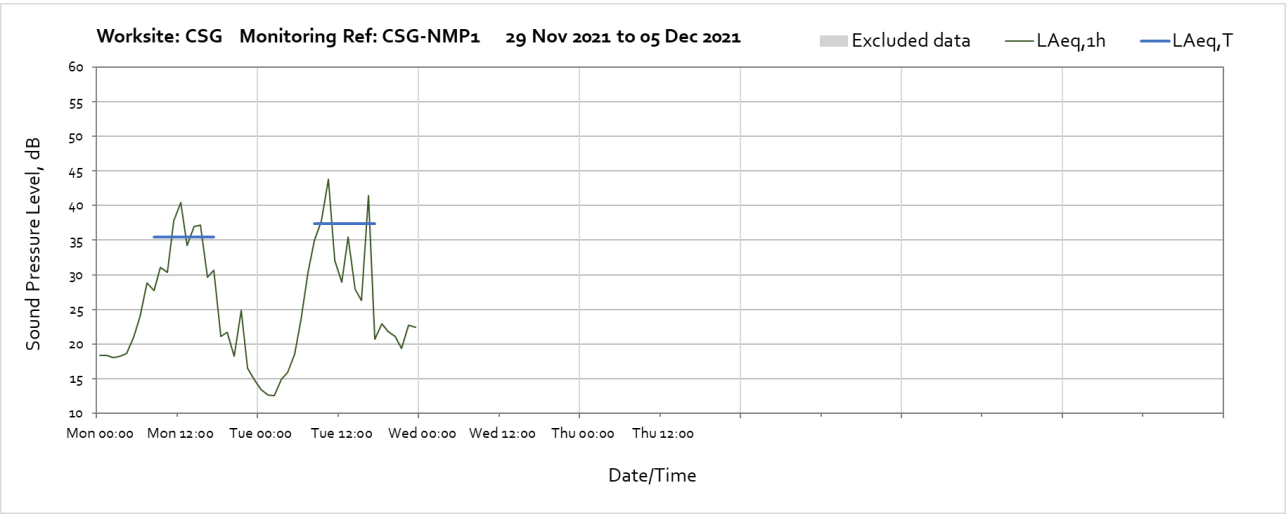
Note: Missing data between 13:00 and 15:00 on Friday 5th November was due to maitenance of the monitor station.



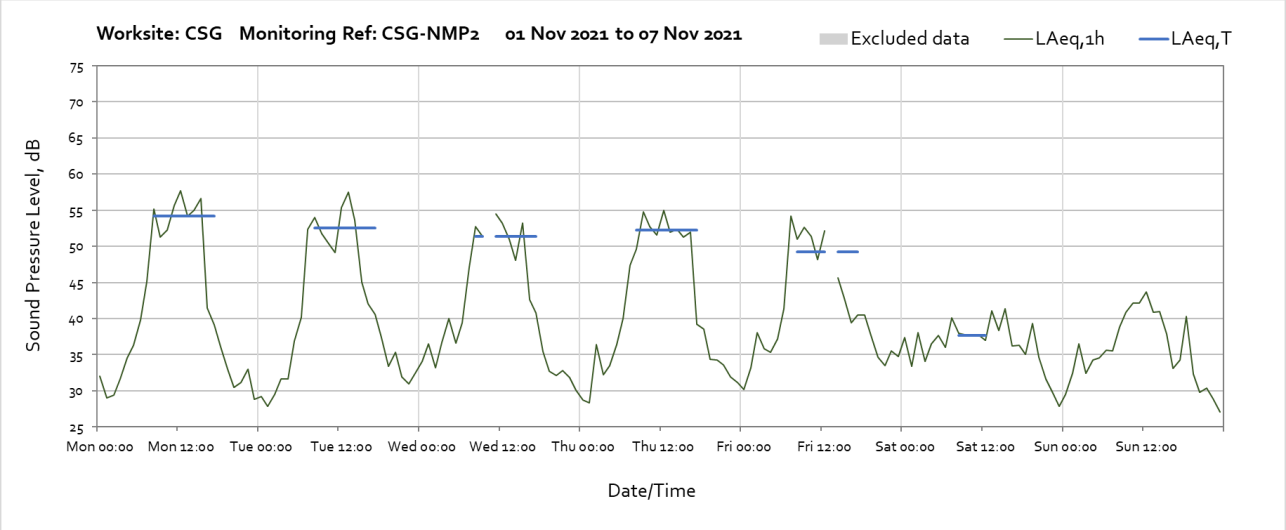


Note: Missing data at 11:00 on Friday 19th November was due to maitenance of the monitor station.

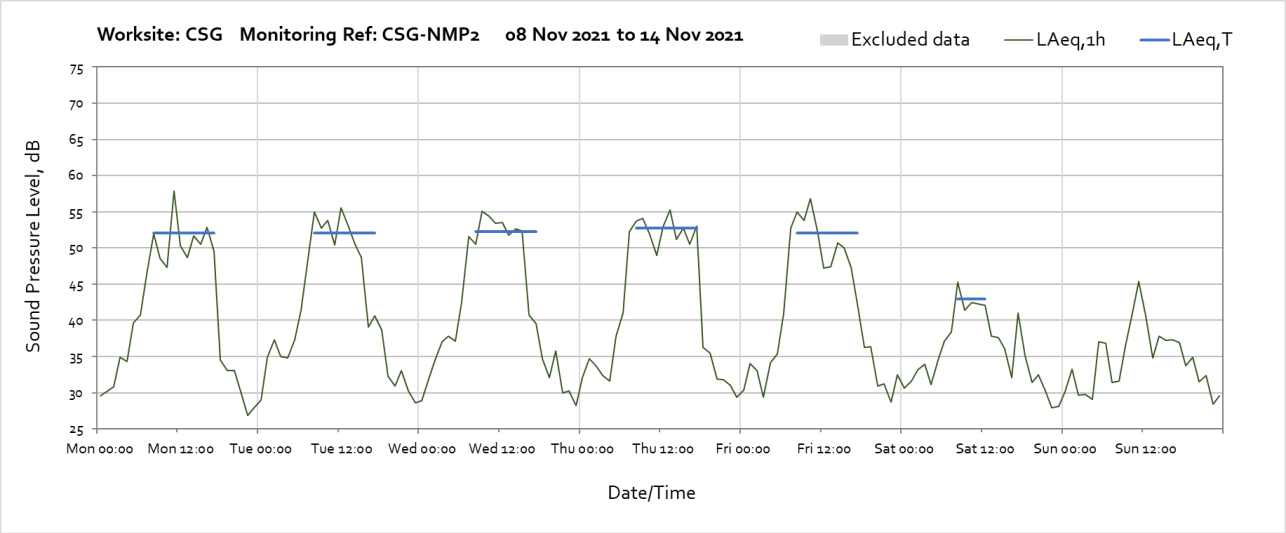


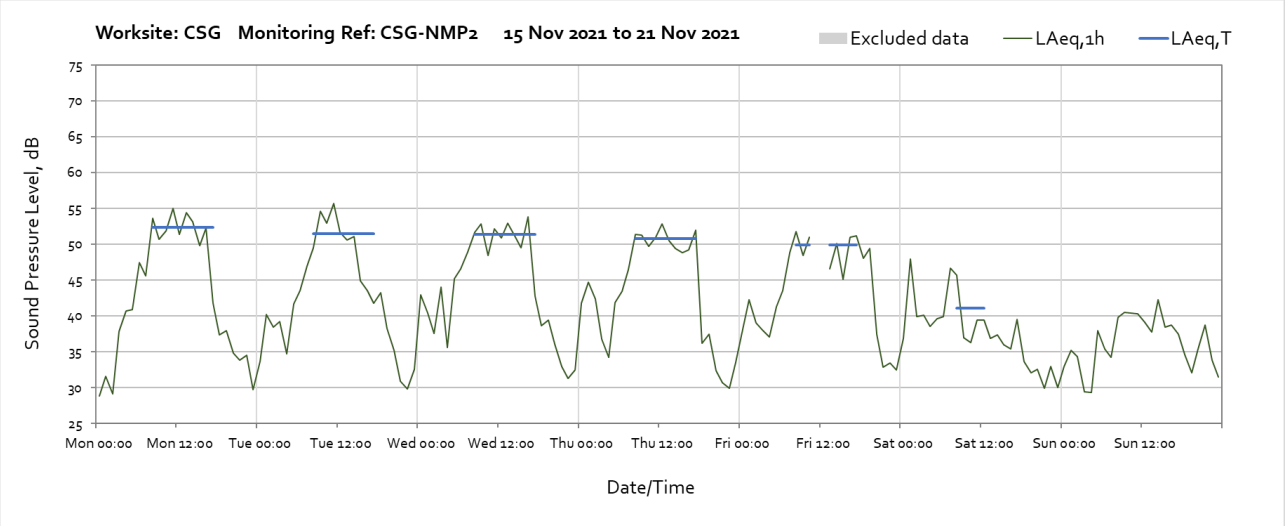


Worksite: CSG – Monitoring Ref: CSG-NMP2

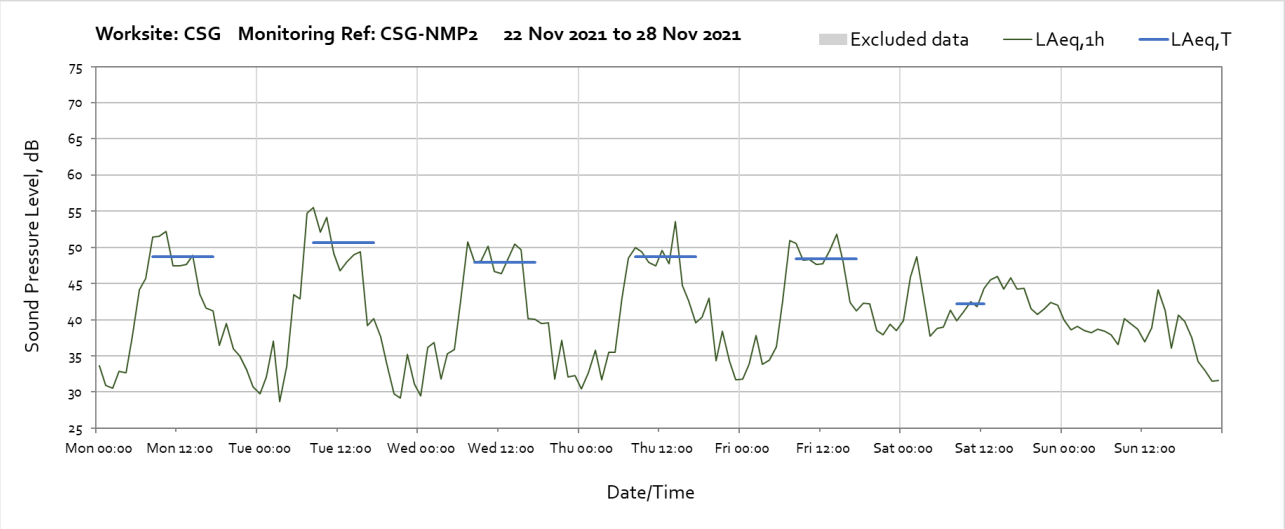


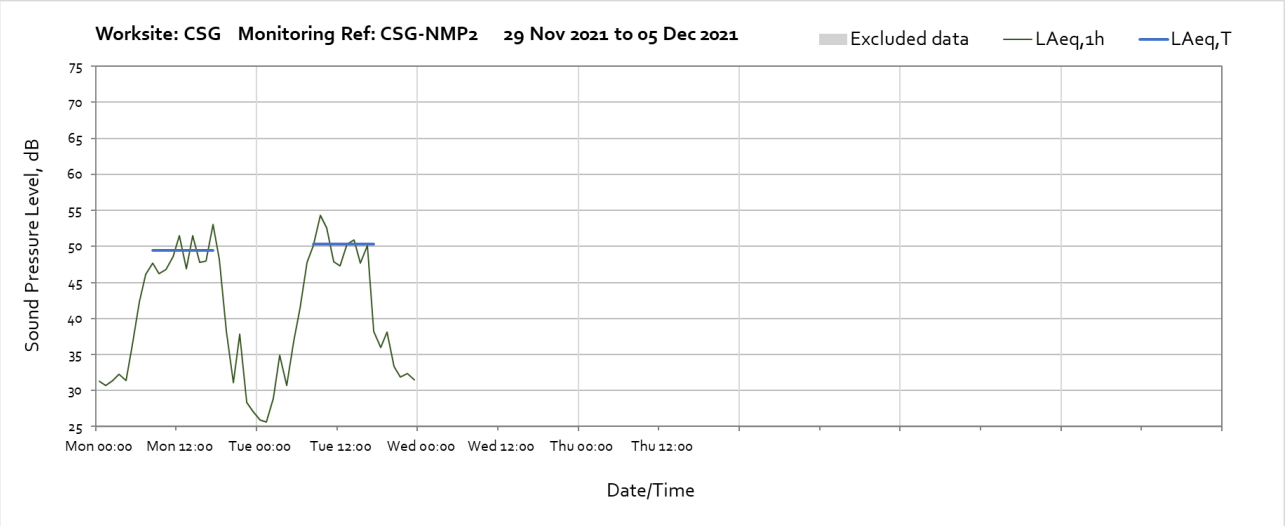
Note: Missing data at 10:00 on Wednesday 3rd November and at 13:00 on Friday 5th November was due to maitenance of the monitor station.



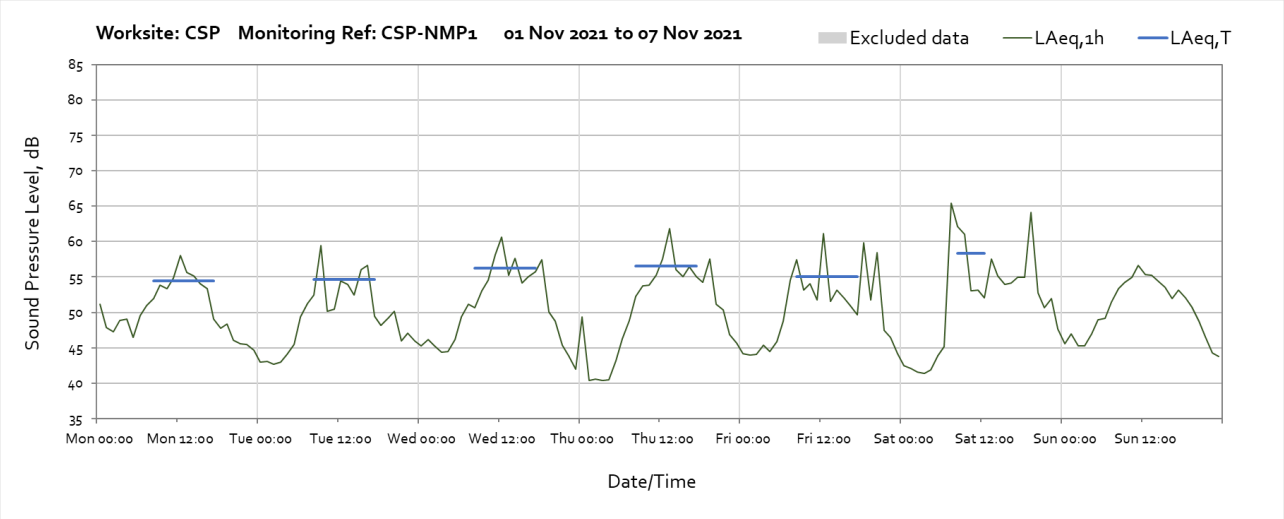


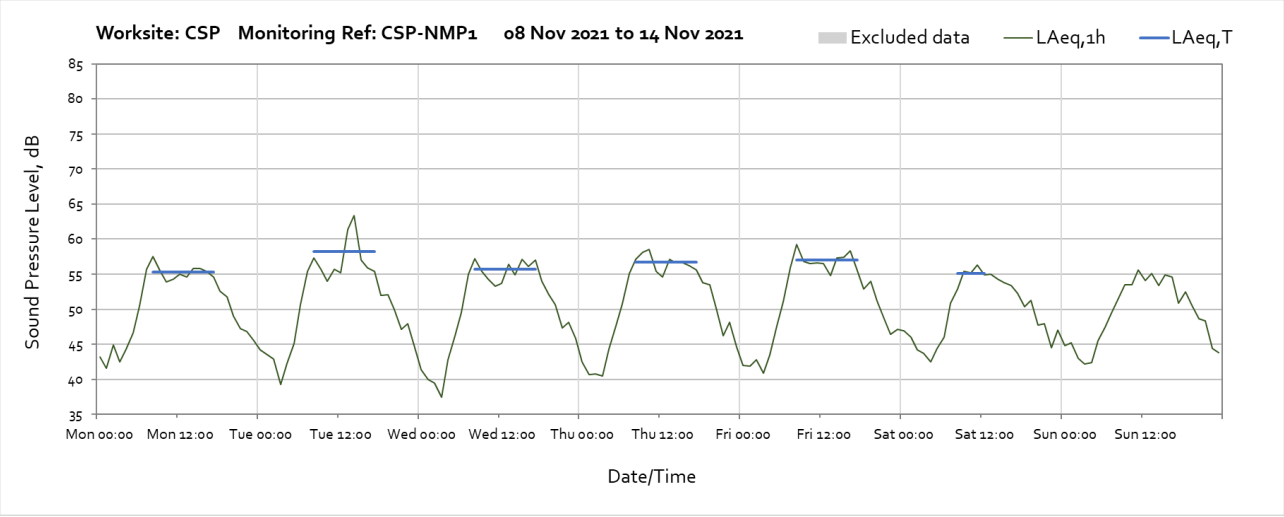
Note: Missing data between 11:00 and 13:00 on Friday 19th November was due to maitenance of the monitor station.

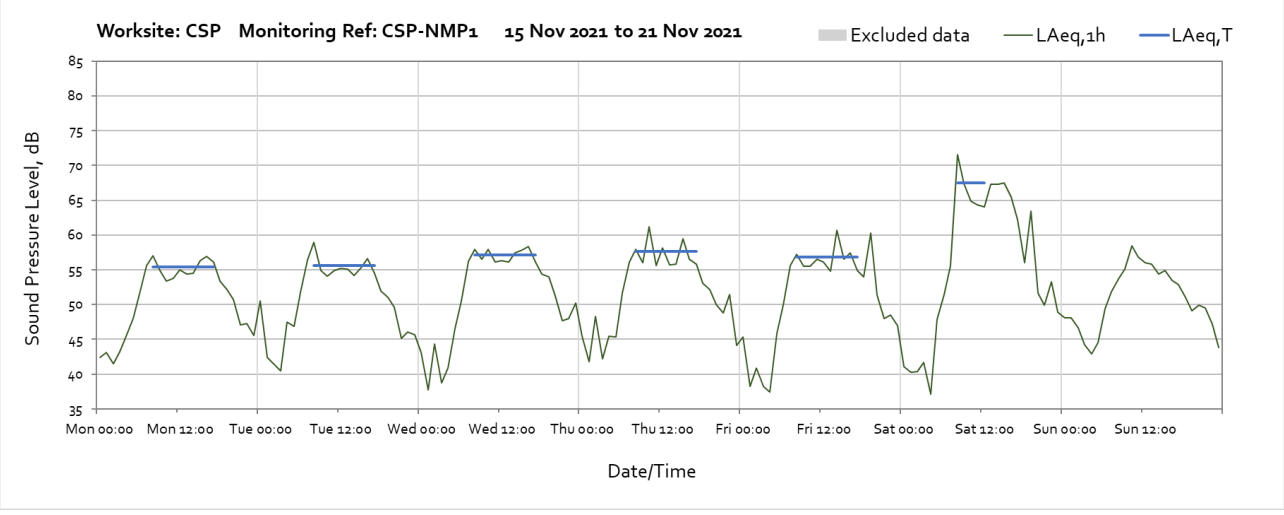


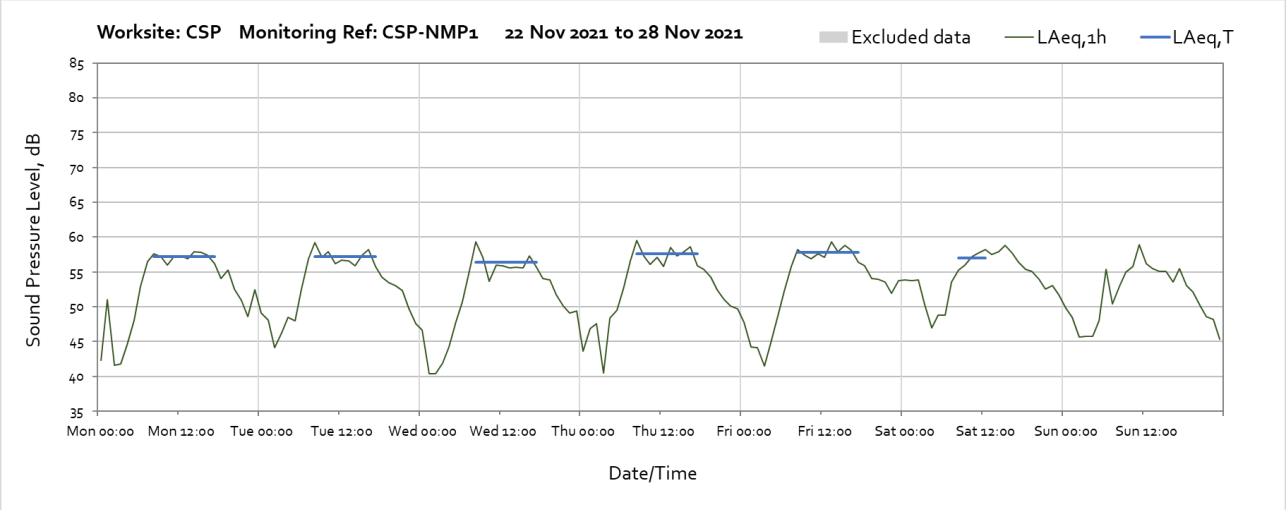


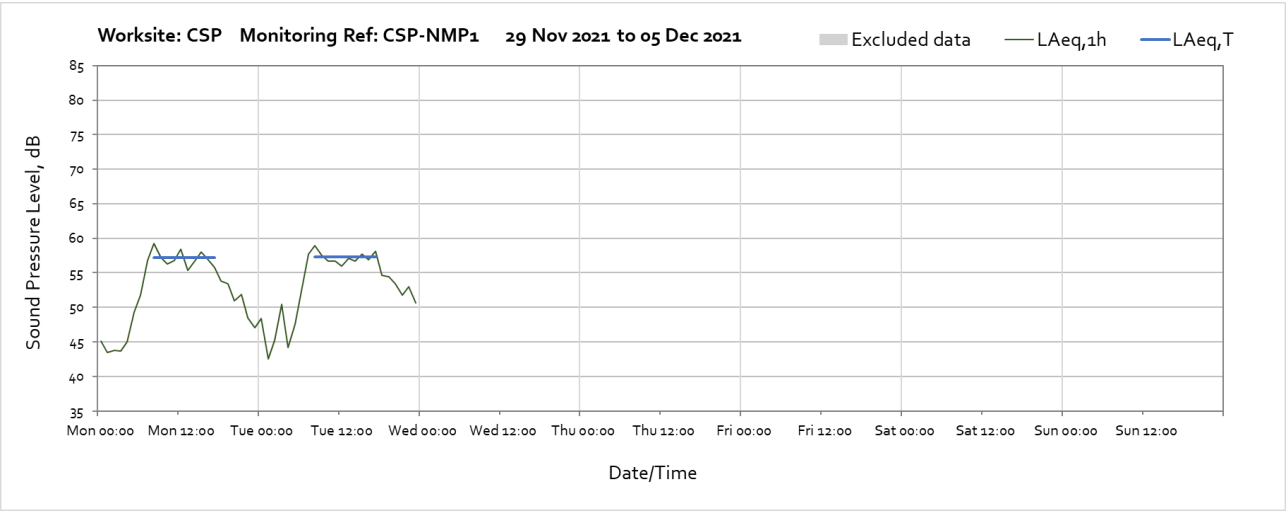
Worksite: CSP – Monitoring Ref: CSP-NMP1



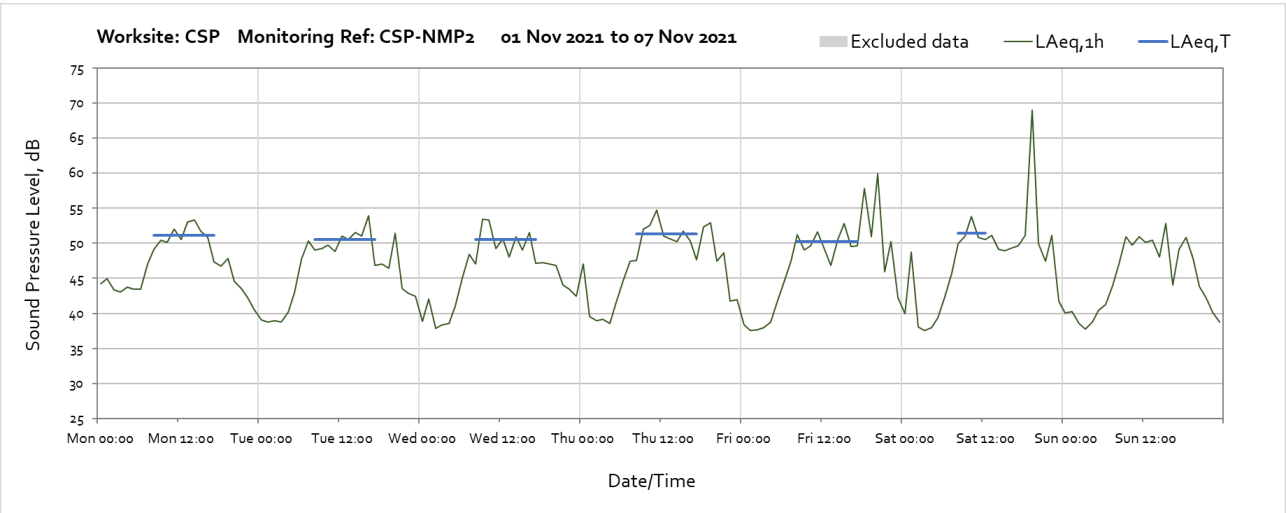


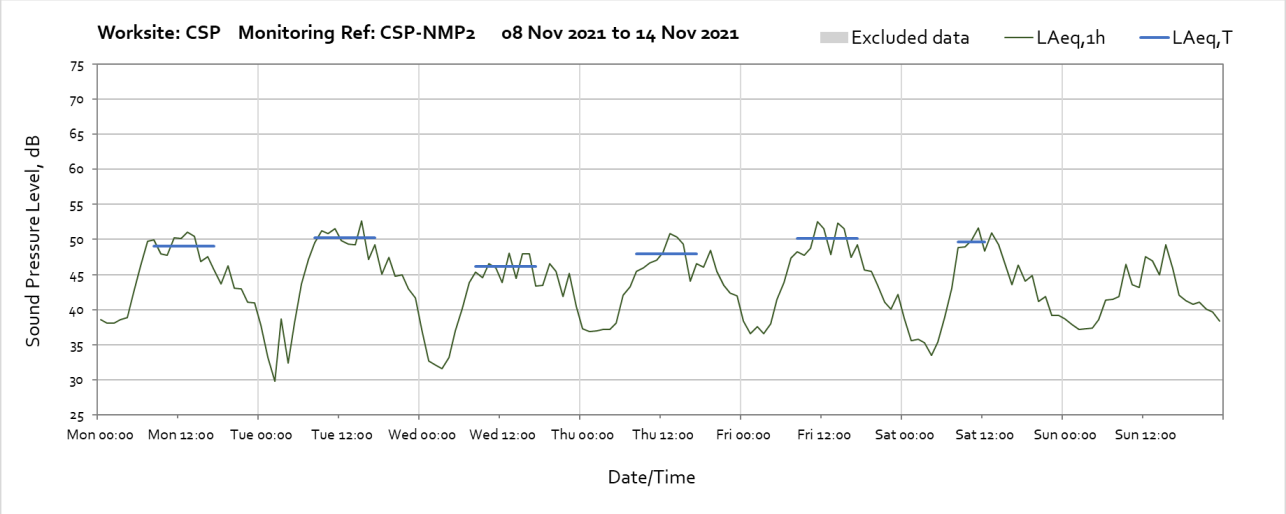


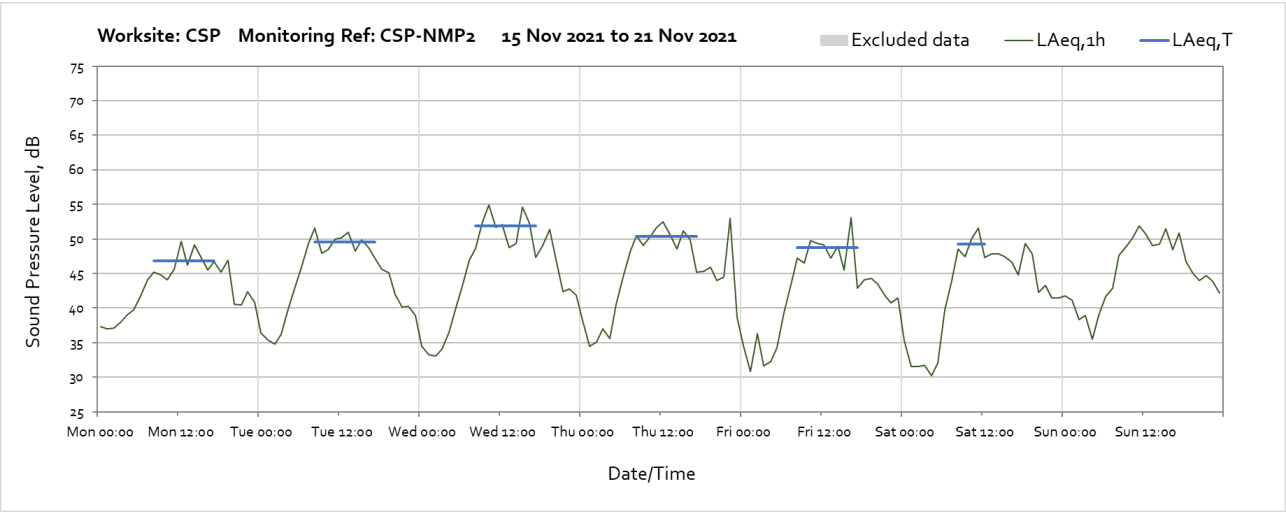




Worksite: CSP – Monitoring Ref: CSP-NMP2




Worksite: CSP Monitoring Ref: CSP-NMP2 08 Nov 2021 to 14 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: CSP Monitoring Ref: CSP-NMP2 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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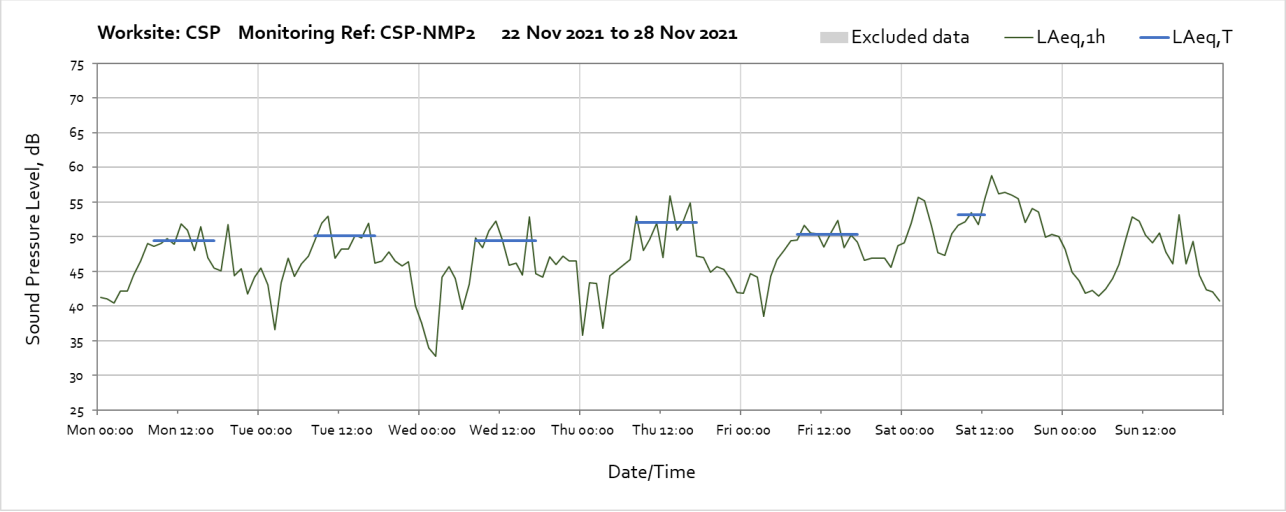
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: CSP Monitoring Ref: CSP-NMP2 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
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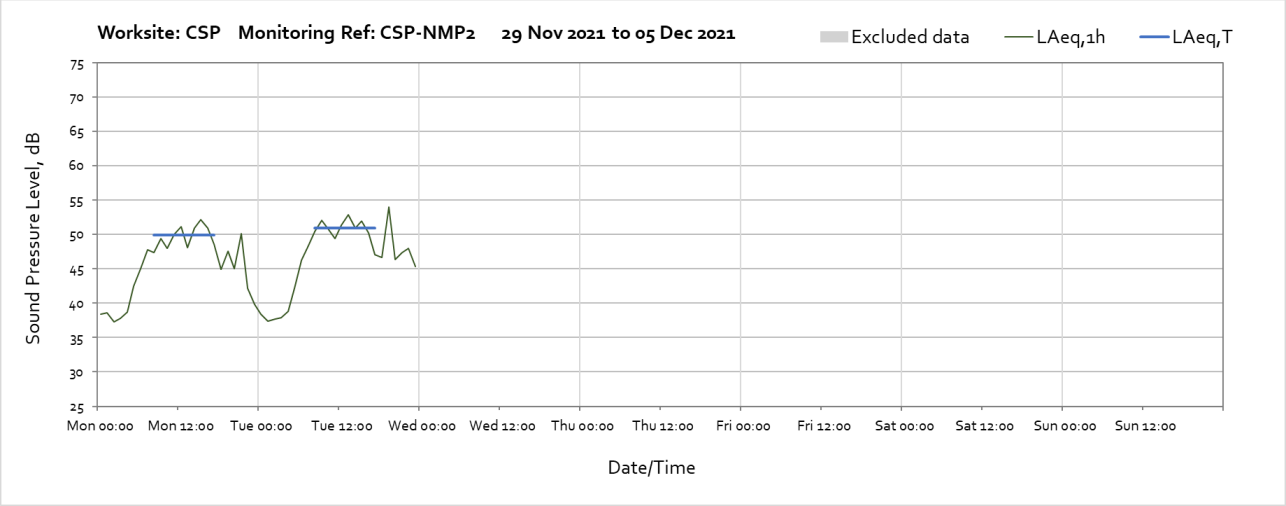
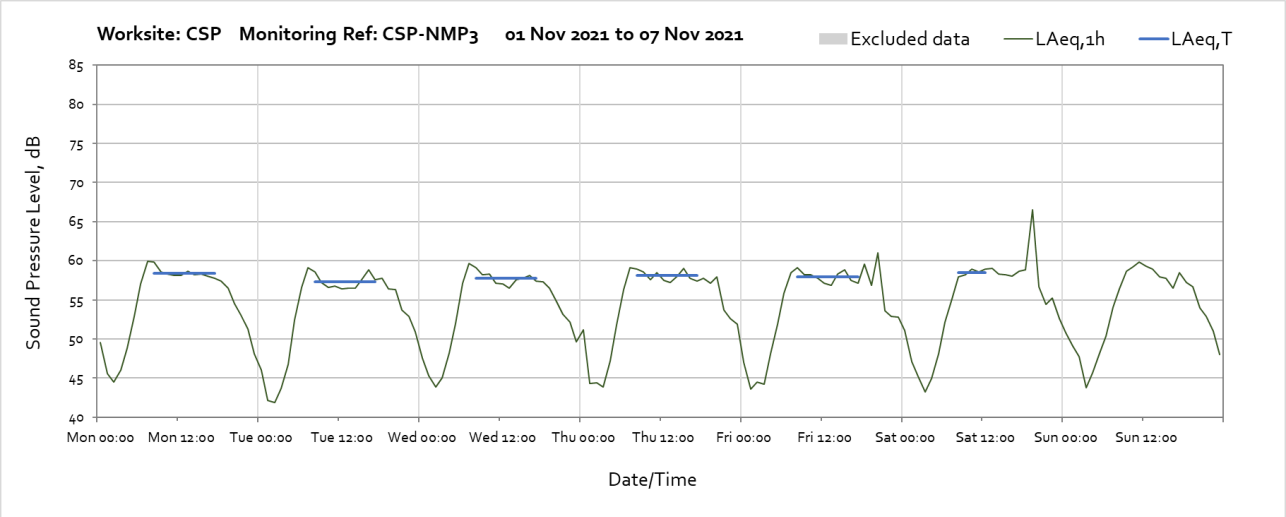
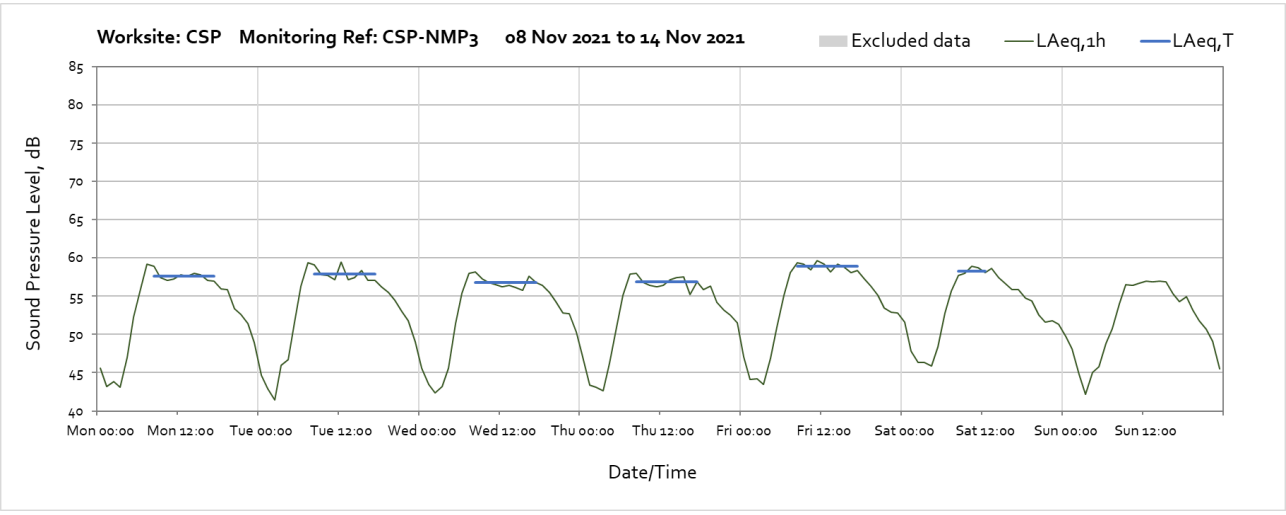
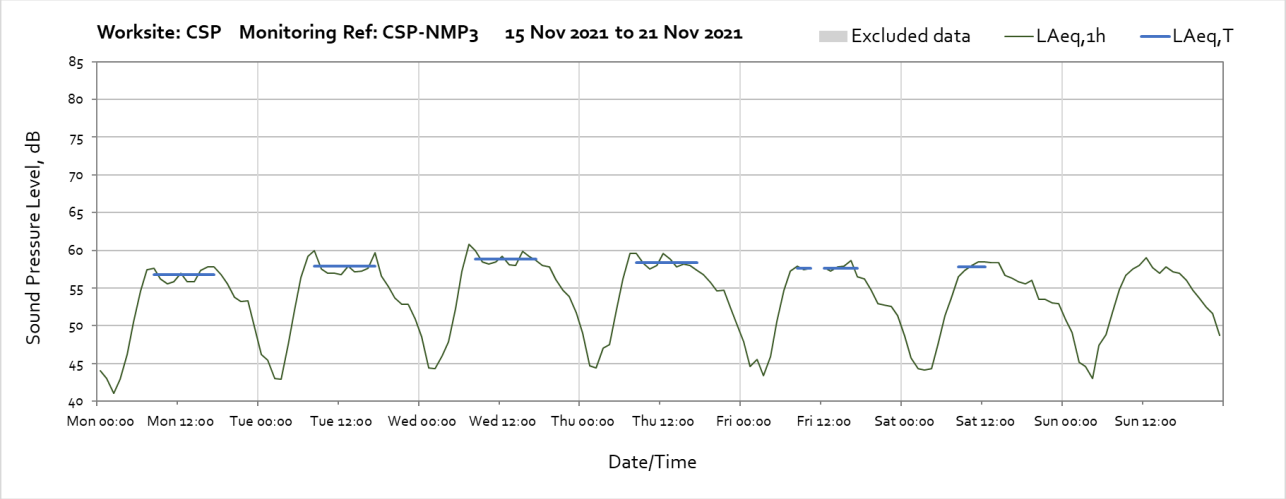
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



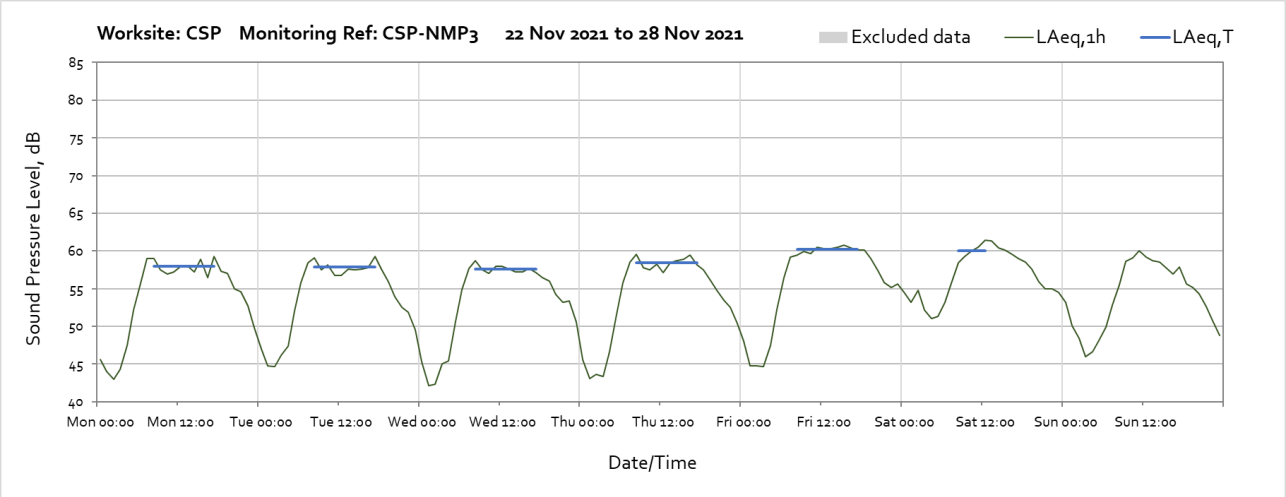
Worksite: CSP – Monitoring Ref: CSP-NMP3

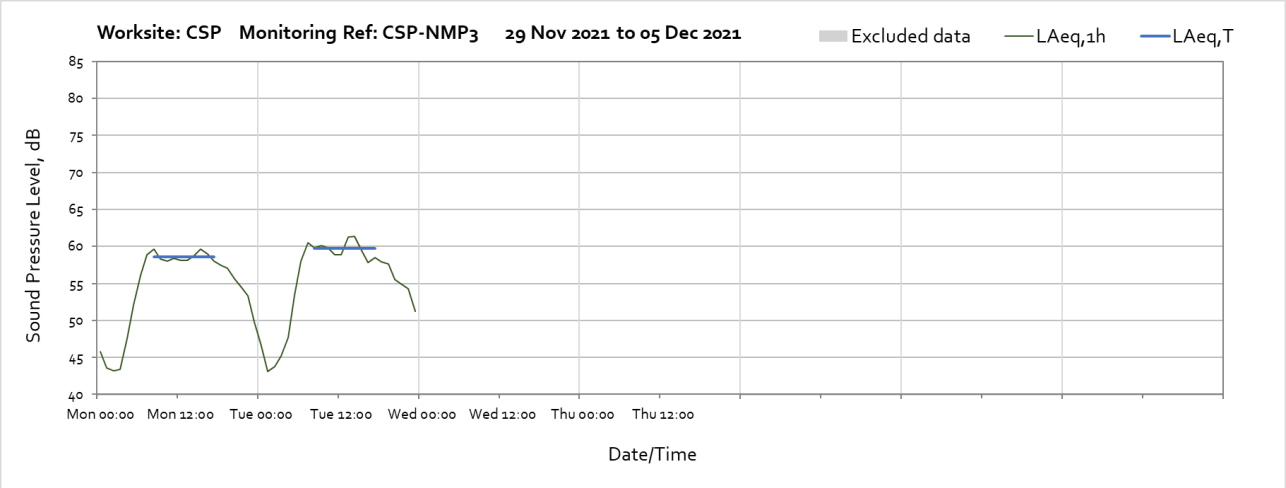




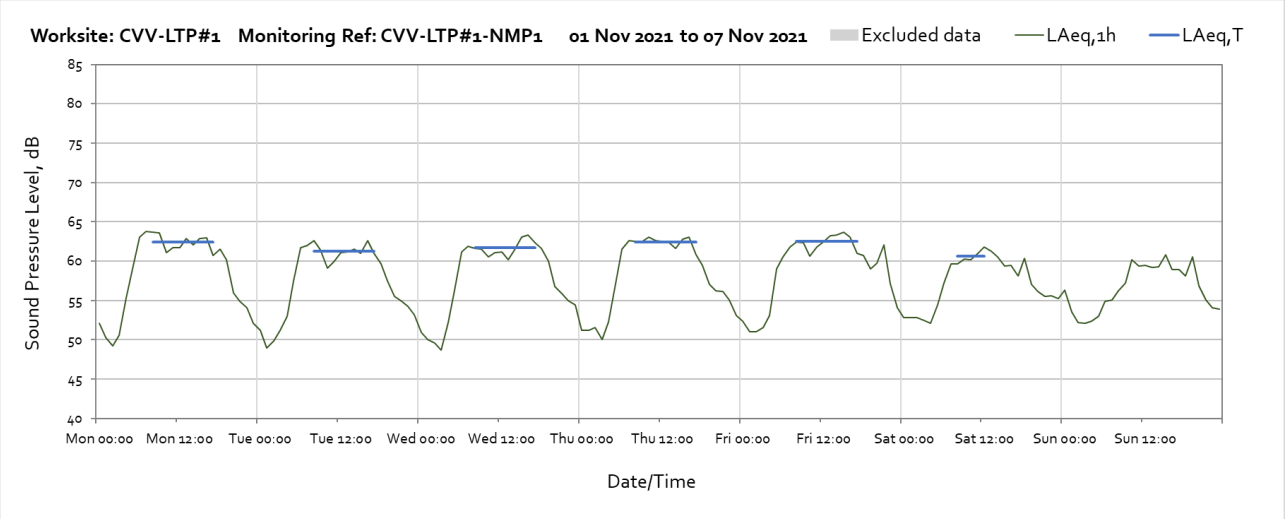


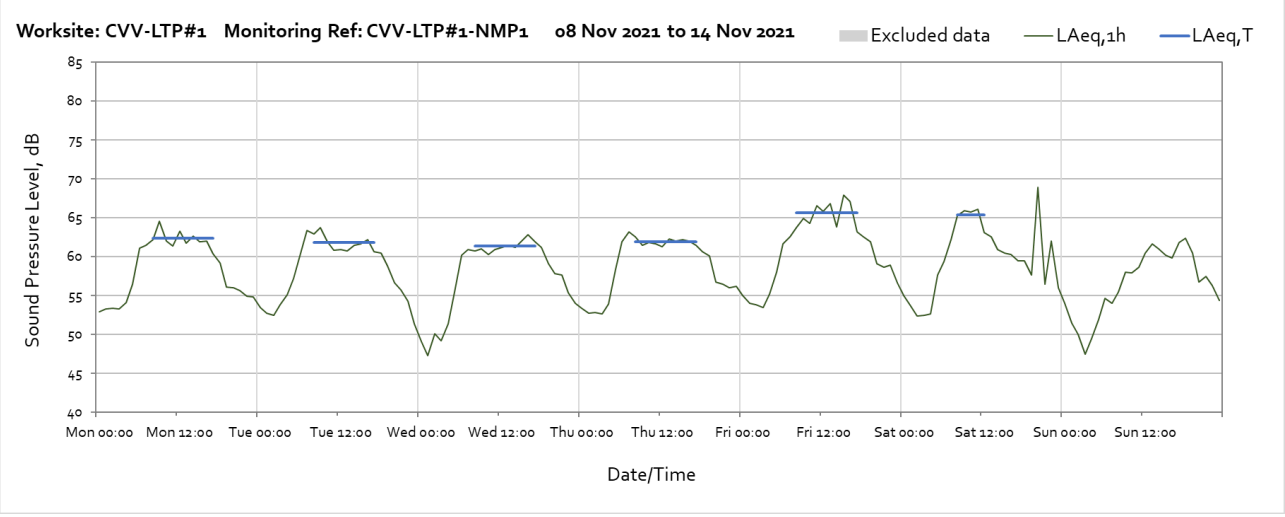
Note: Missing data at 11:00 on Friday 19th November was due to maitenance of the monitor station.

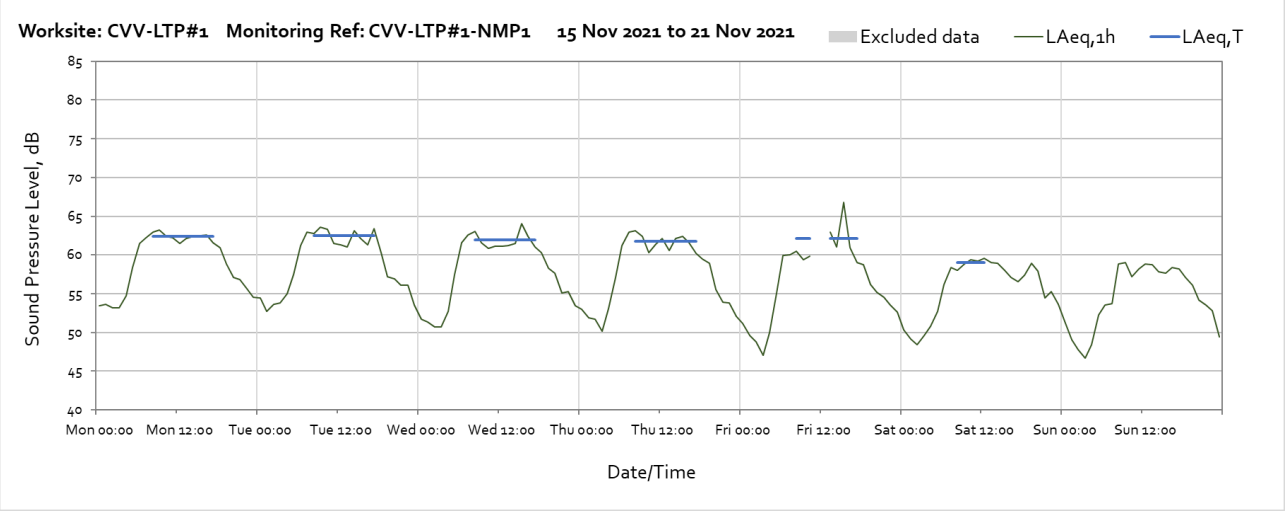




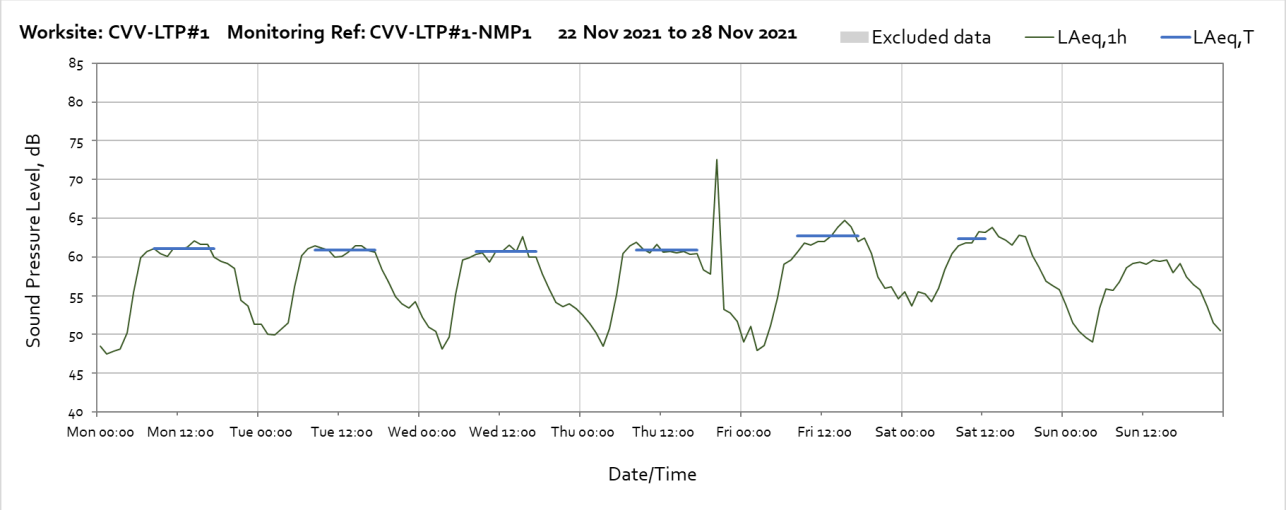
Worksite: CVV-LPT#1 – Monitoring Ref: CVV-LPT#1-NMP1

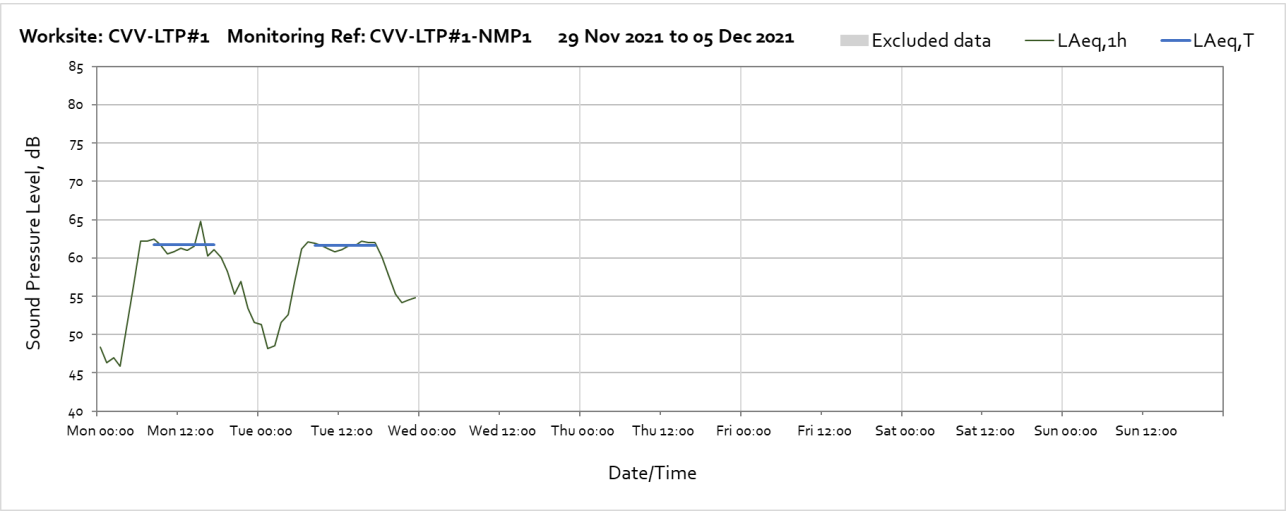




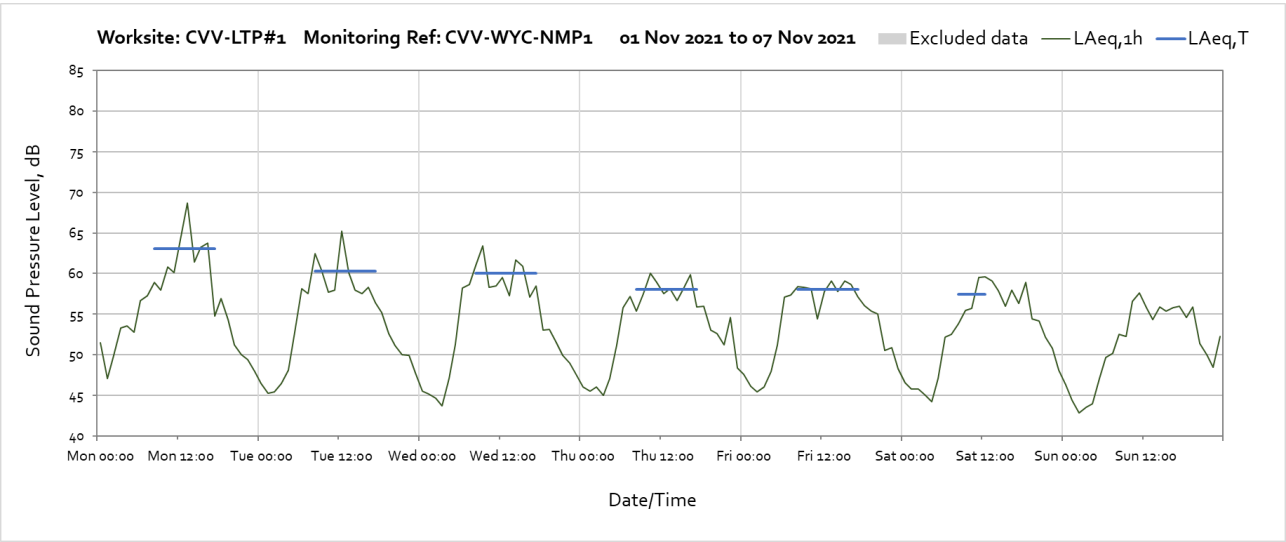


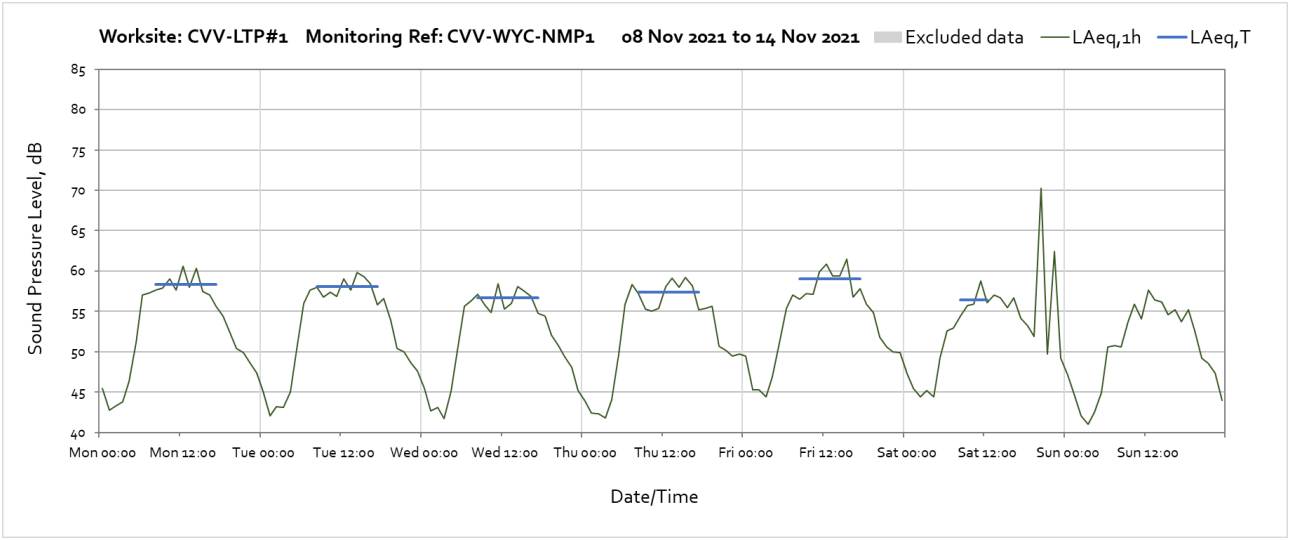
Note: Missing data at 09:00 on Friday 19th November was due to loss of power at the monitor station.

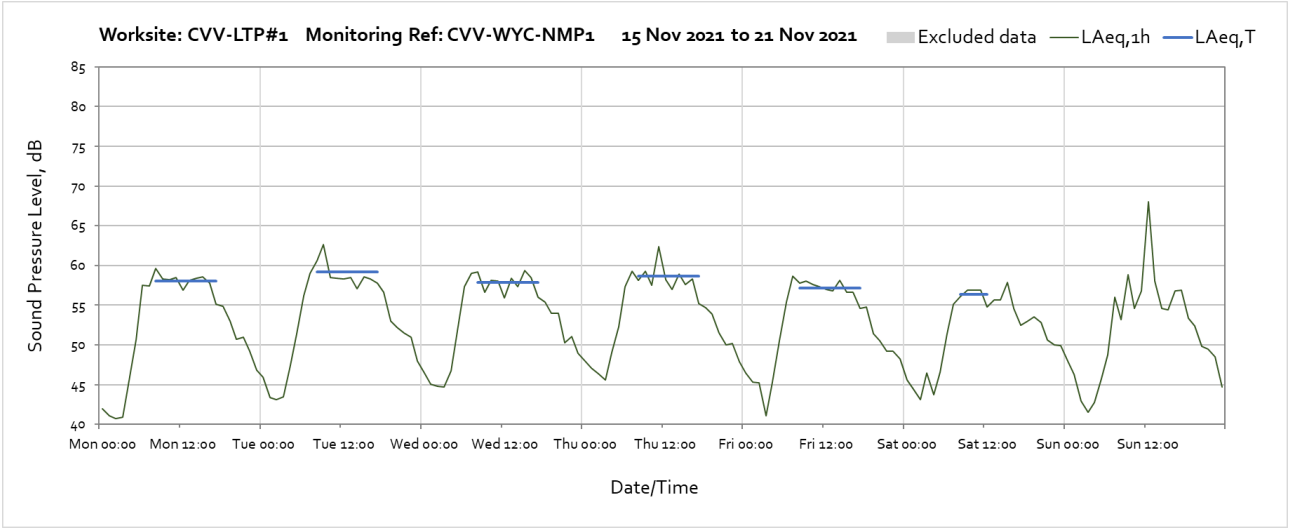




Worksite: CVV-LPT#1 – Monitoring Ref: CVV-WYC-NMP1




Worksite: CVV-LTP#1 Monitoring Ref: CVV-WYC-NMP1 08 Nov 2021 to 14 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: CVV-LTP#1 Monitoring Ref: CVV-WYC-NMP1 15 Nov 2021 to 21 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
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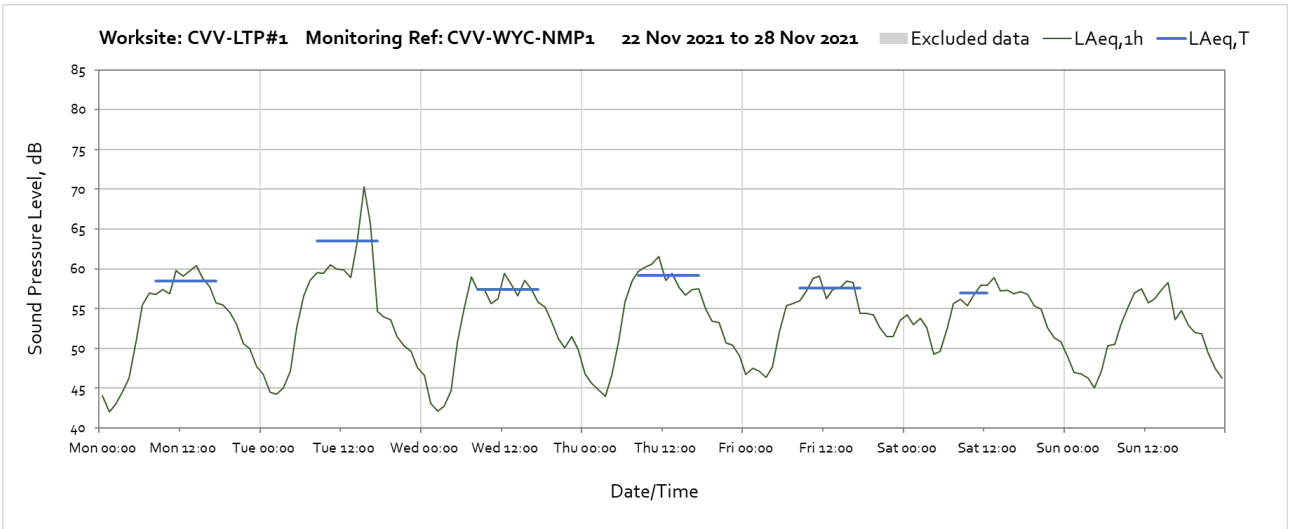
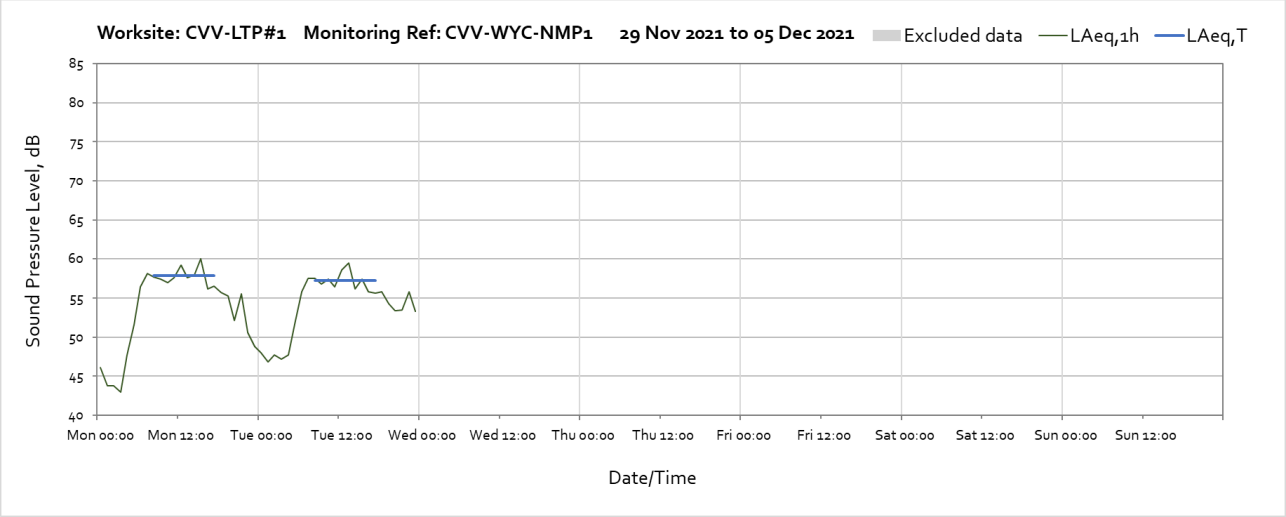
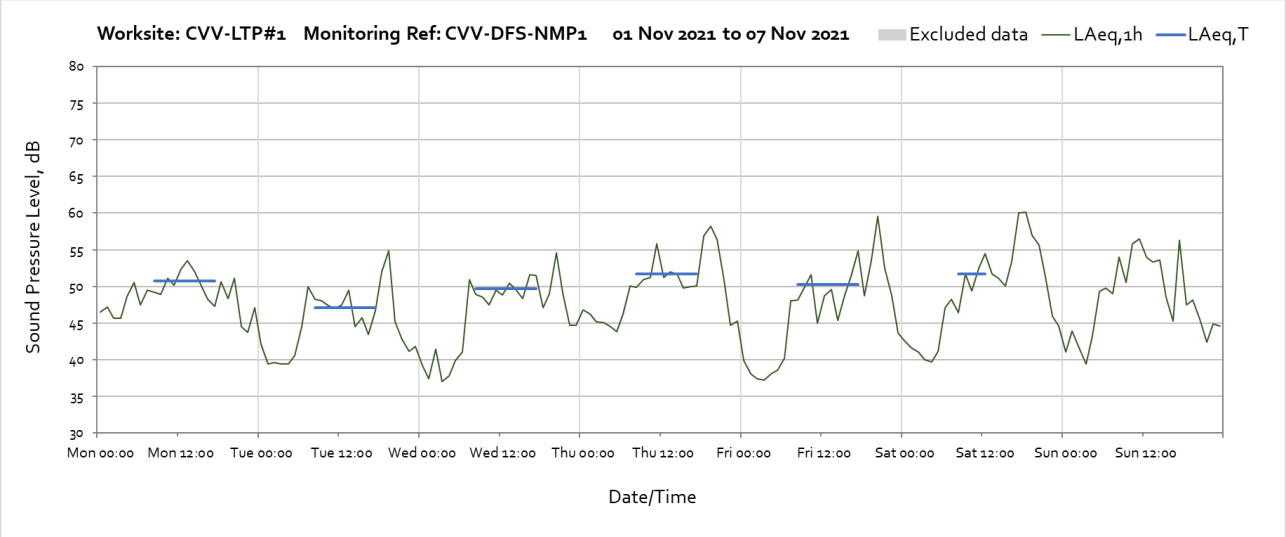
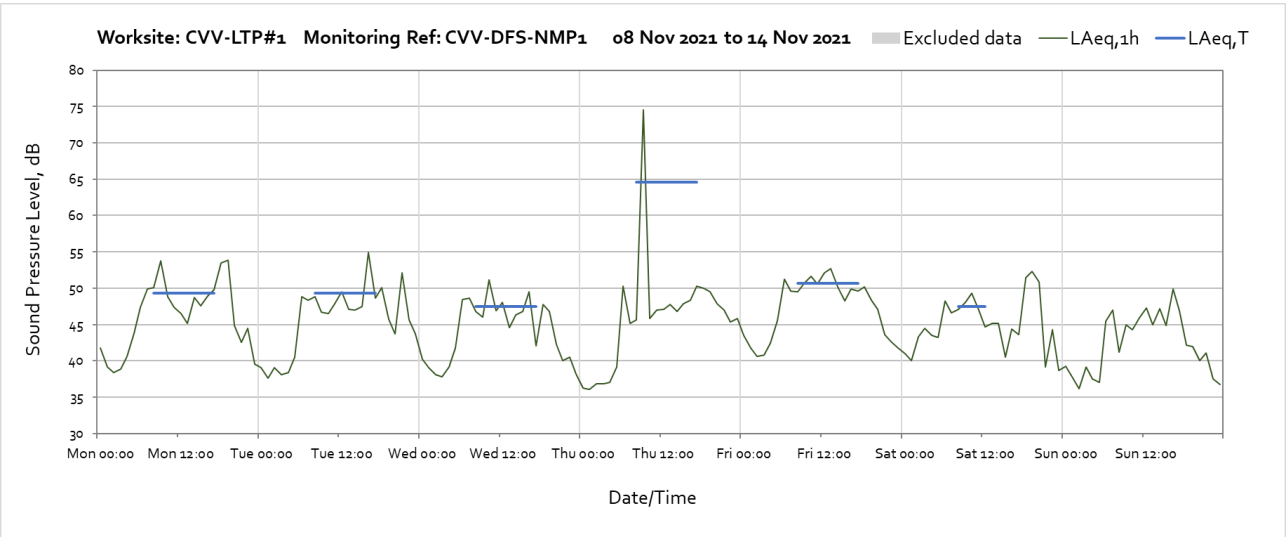
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

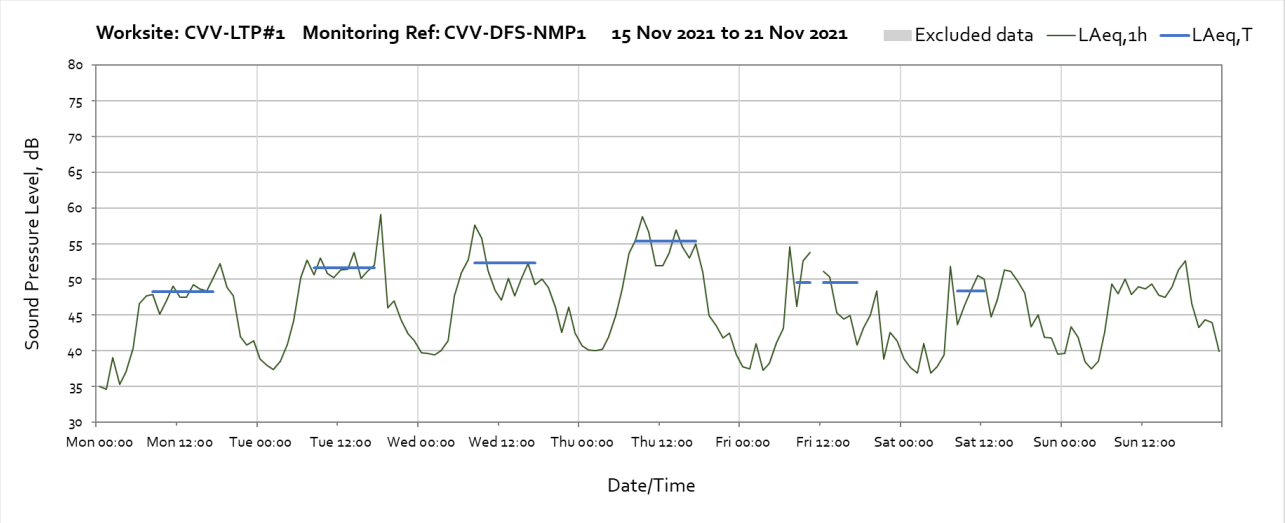

Worksite: CVV-LTP#1 Monitoring Ref: CVV-WYC-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



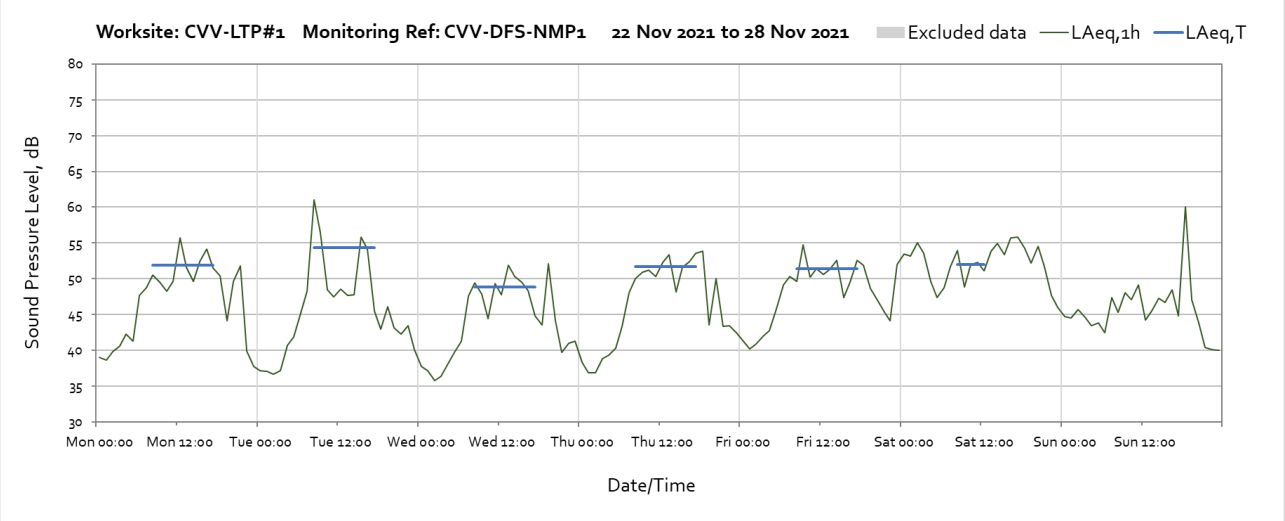
Worksite: CVV-LTP#1 – Monitoring Ref: CVV-DFS-NMP1

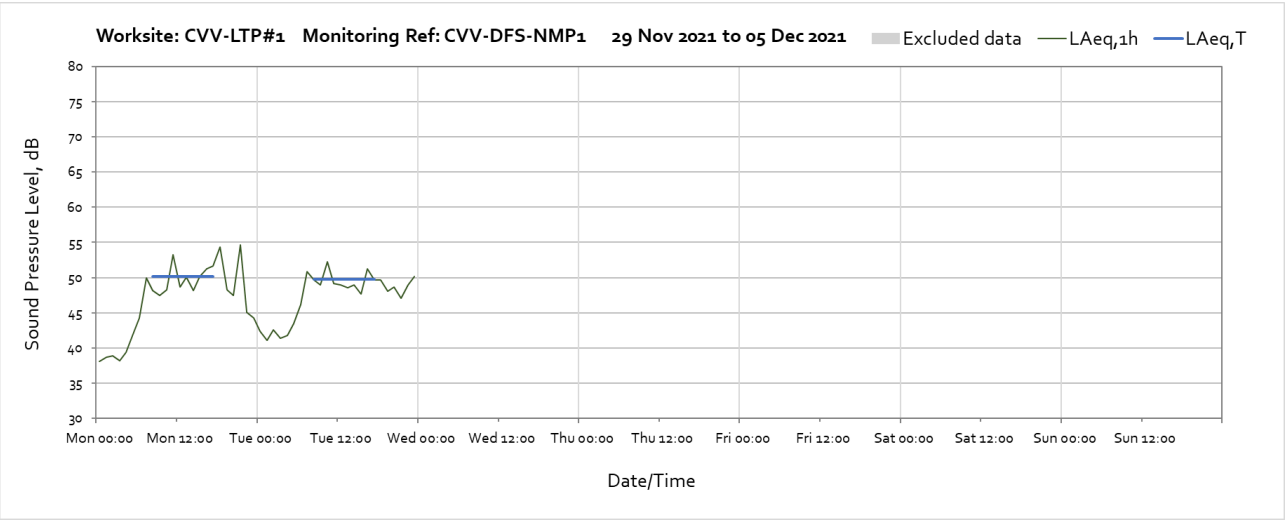




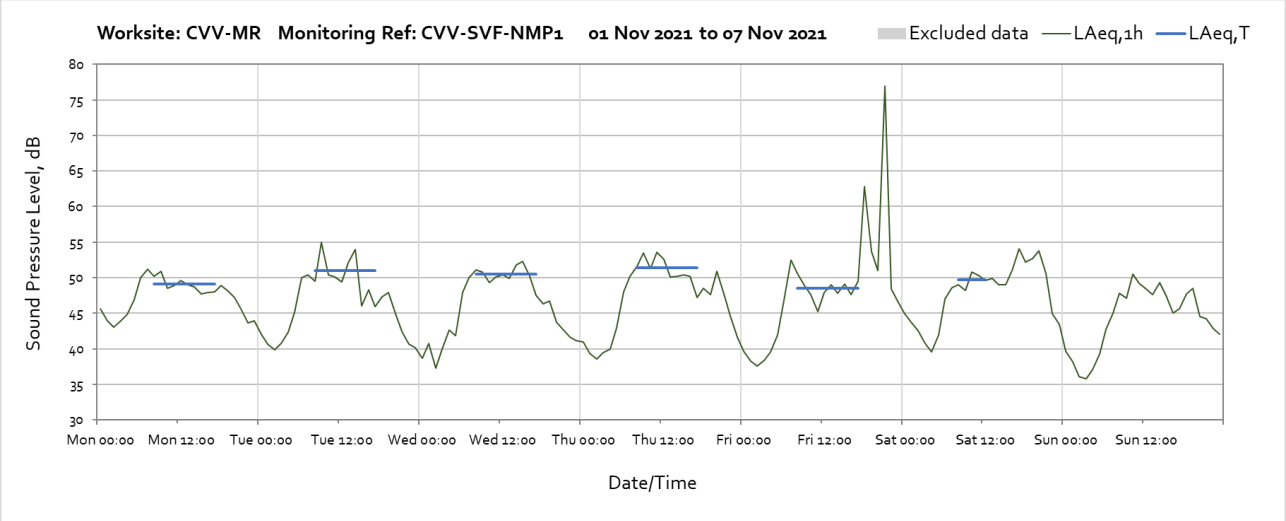


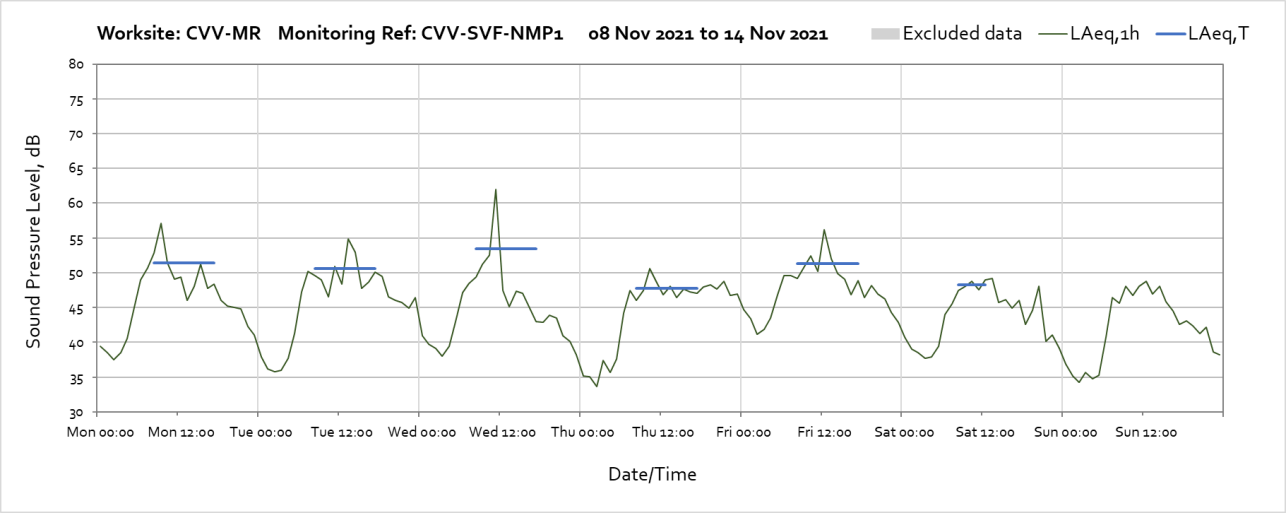
Note: Missing data at 11:00 on Friday 19th November was due to maitanance of the monitor station.

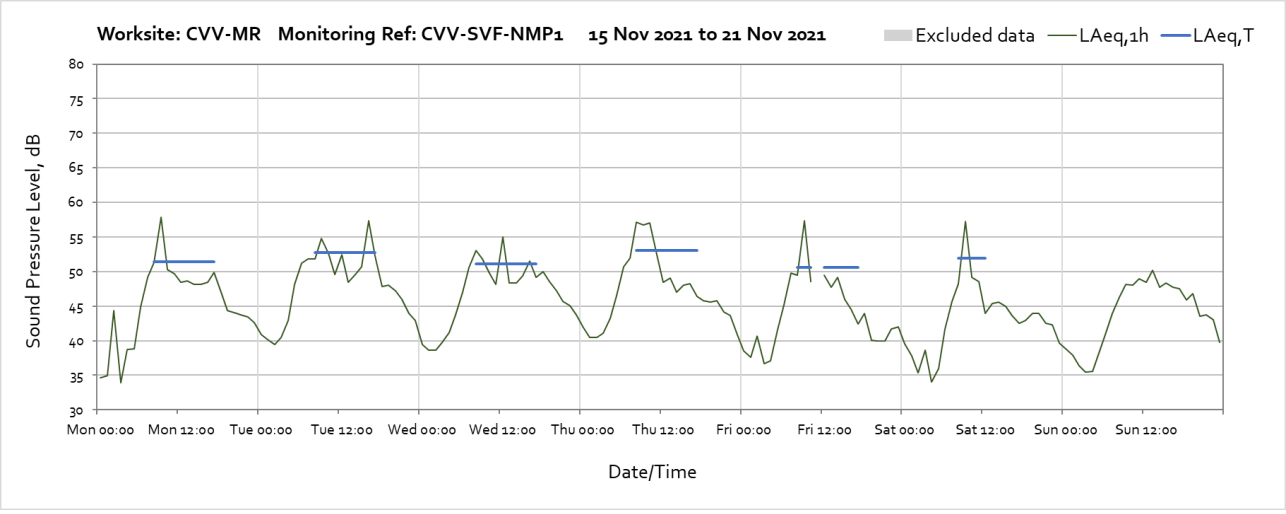




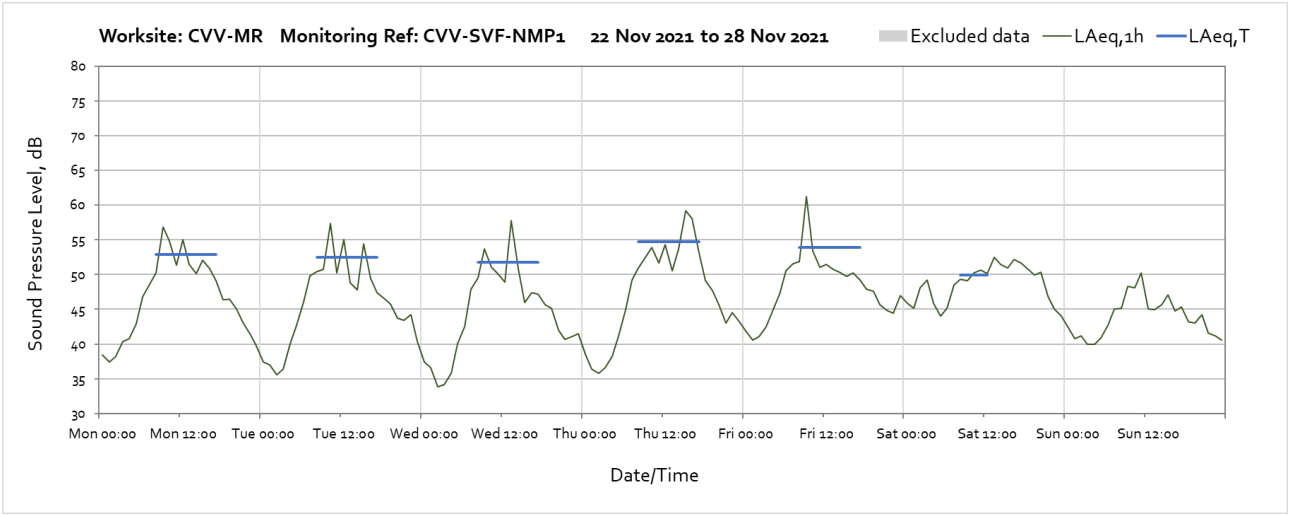
Worksite: CVV-MR – Monitoring Ref: CVV-SVF-NMP1







Note: Missing data at 11:00 on Friday 19th November was due to maitanance of the monitor station.


Worksite: CVV-MR Monitoring Ref: CVV-SVF-NMP1 22 Nov 2021 to 28 Nov 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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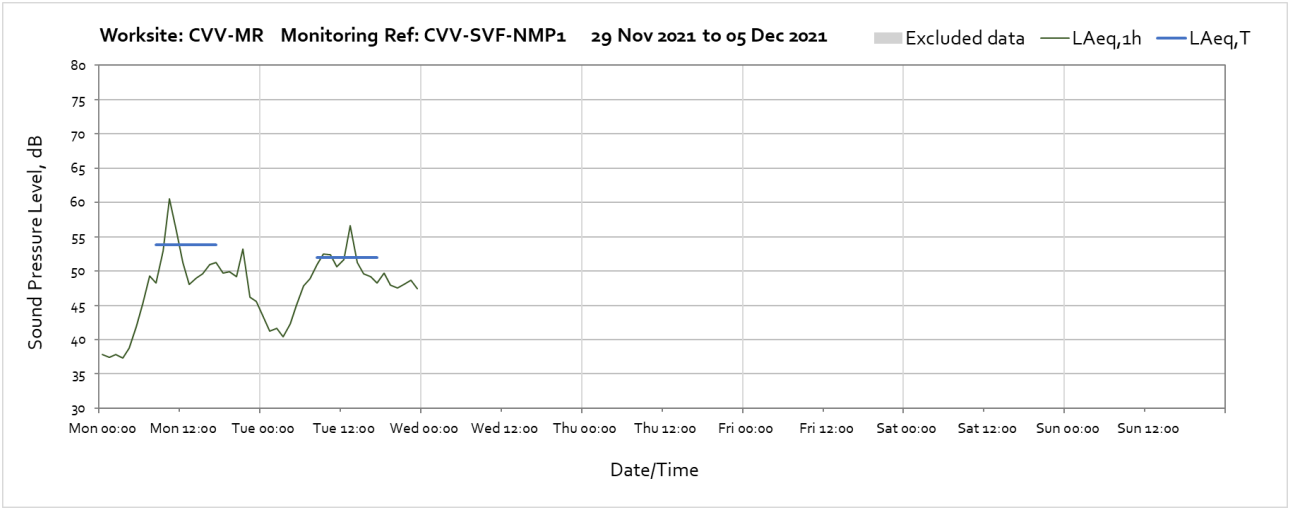
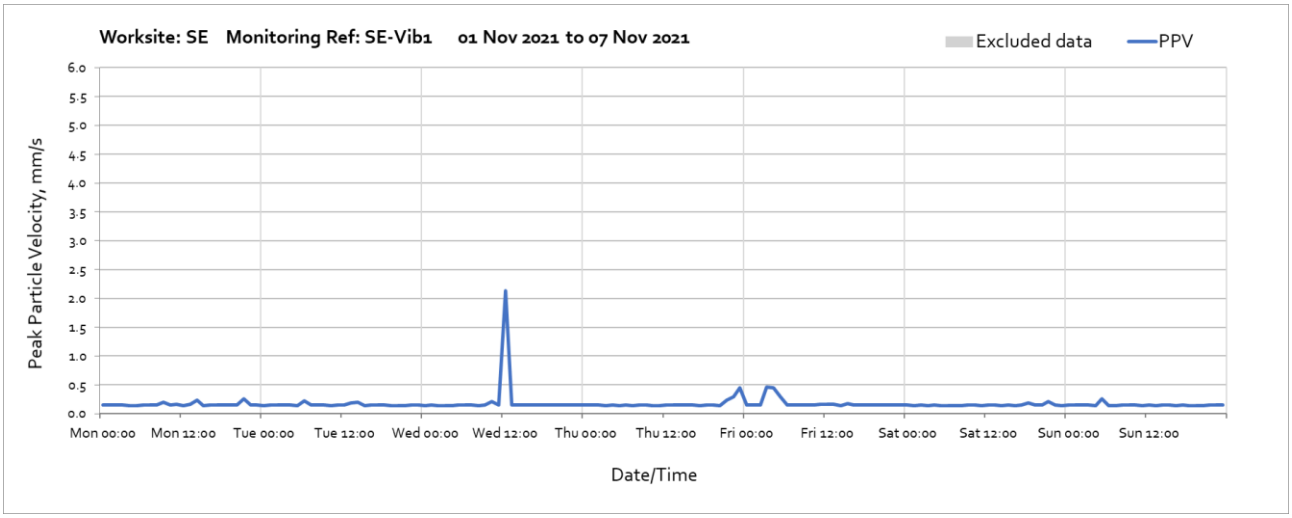
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

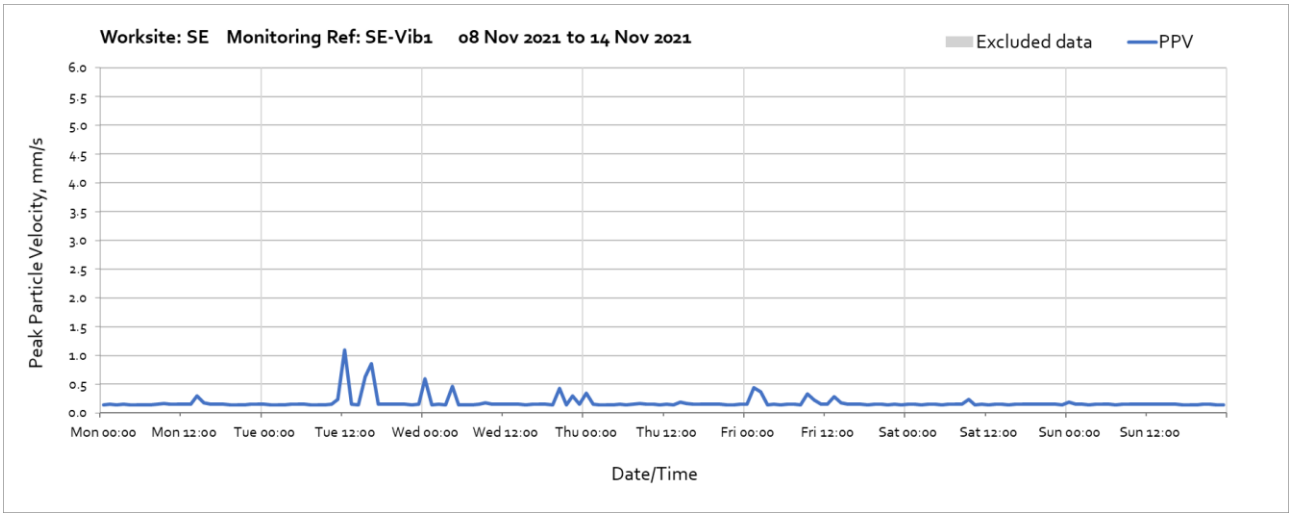

Worksite: CVV-MR Monitoring Ref: CVV-SVF-NMP1 29 Nov 2021 to 05 Dec 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

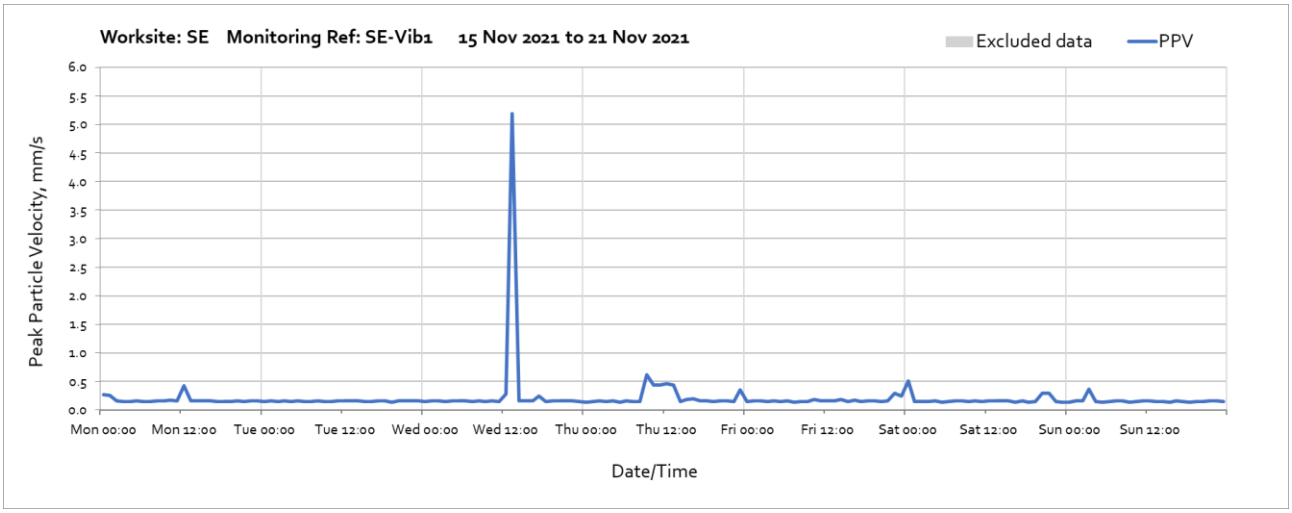
Vibration

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.

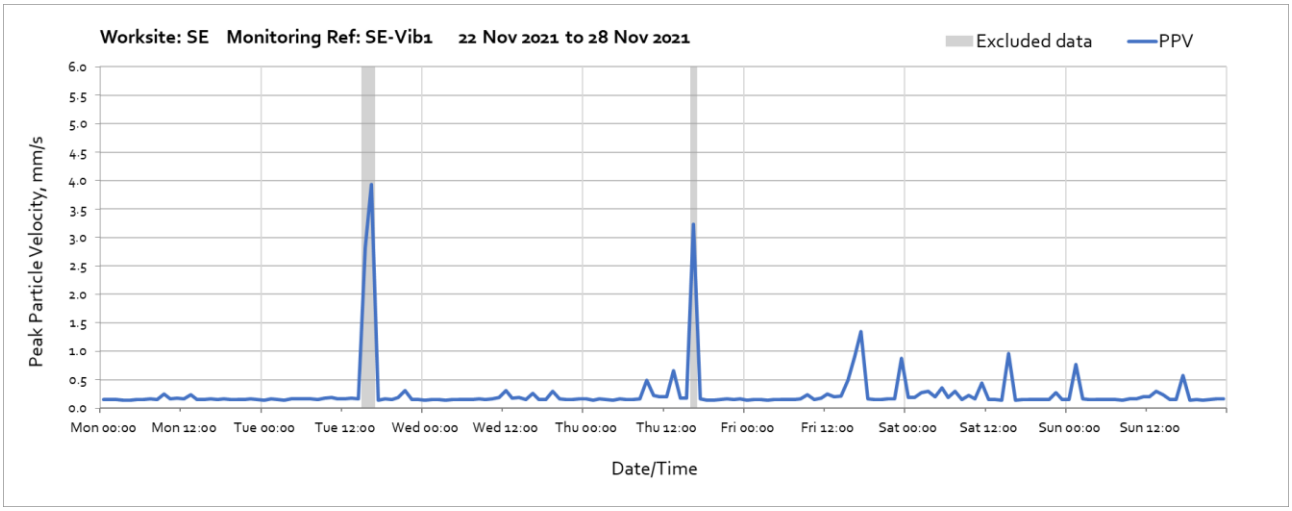
Worksite: SE – Monitoring Ref: SE-Vib 1



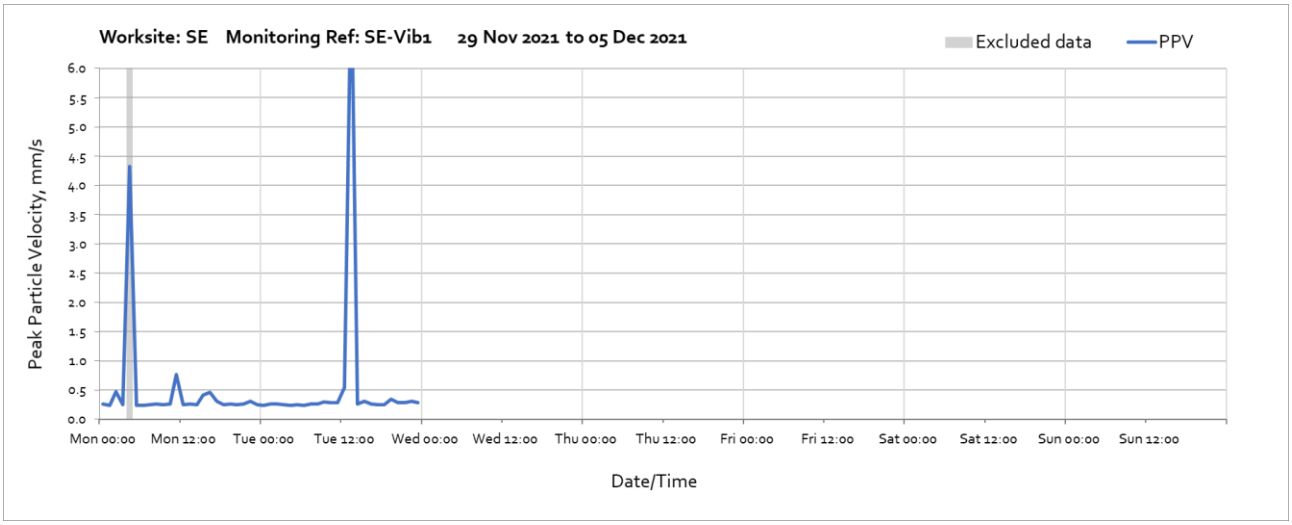




Note: High levels of vibration measured at 13:00 on Wednesday 17th November were due HGV movements and stone deliveries undertaken in poximity of the vibration monitor. The nearest residential receptors are further away from the works and vibration levels at the receptor will therefore be lower.

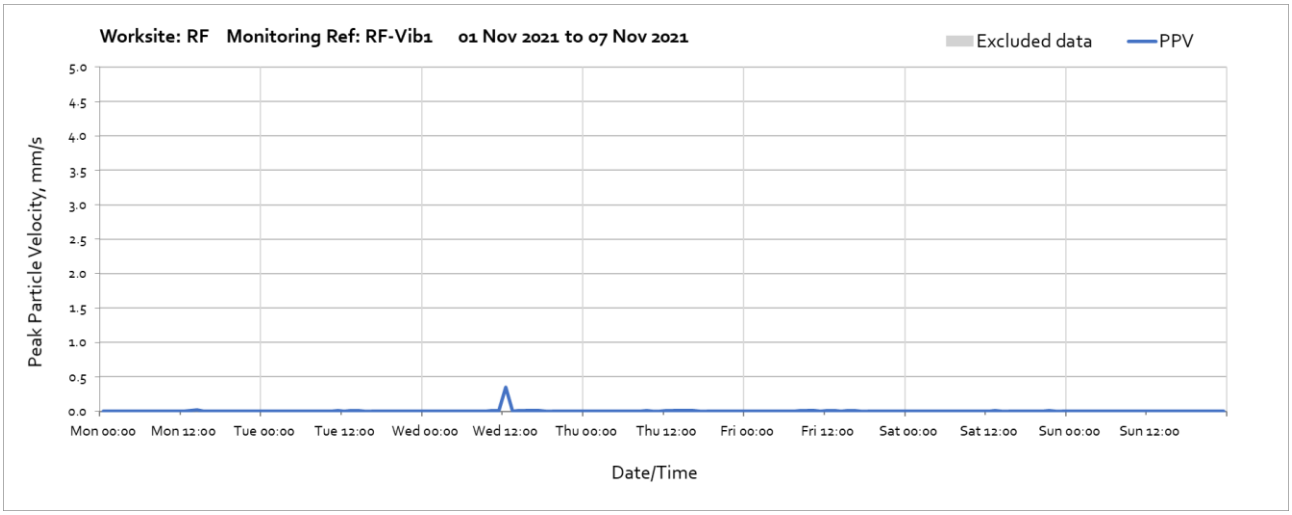


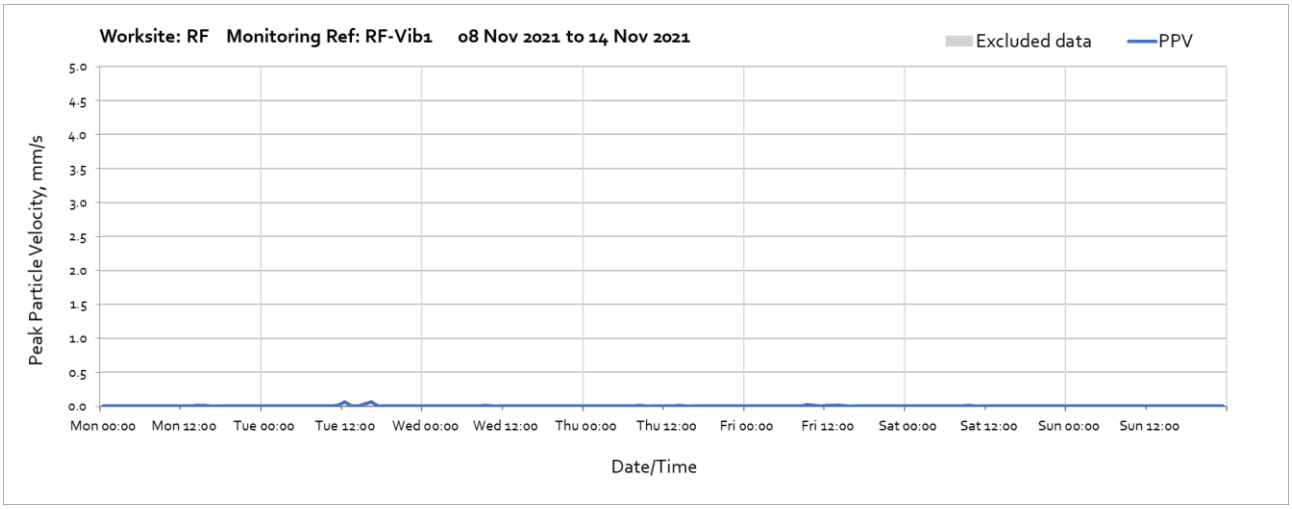
Note: High levels of vibration measured between 15:00 and 16:00 on Tuesday 23rd November and at 16:00 on Thursday 25th November were due to local disturbance at the vibration monitor and are not representative of HS2 vibration levels at the receptor.

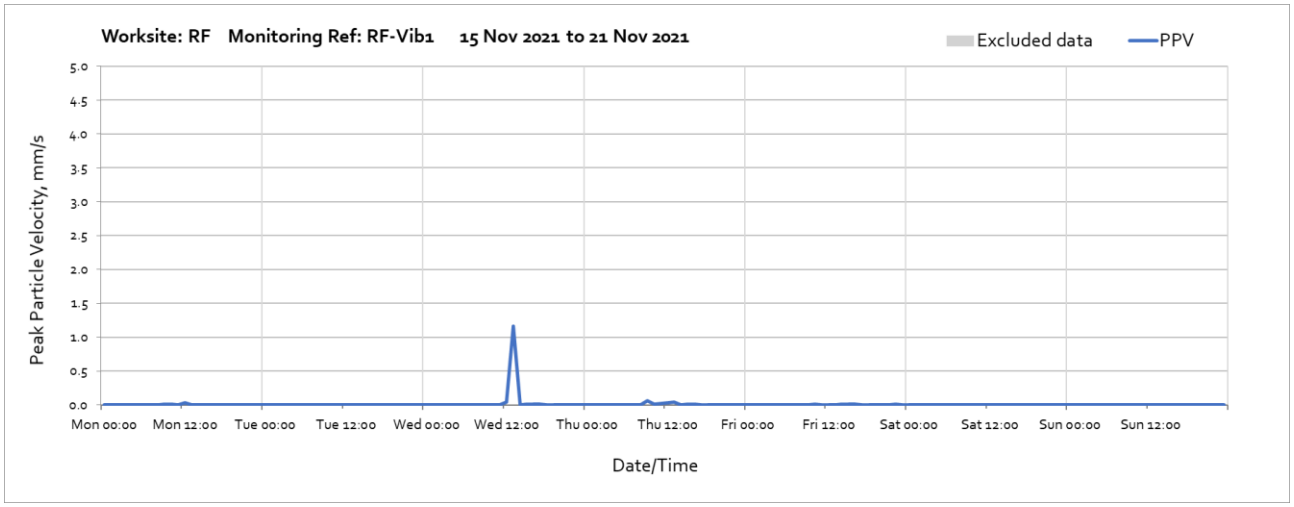


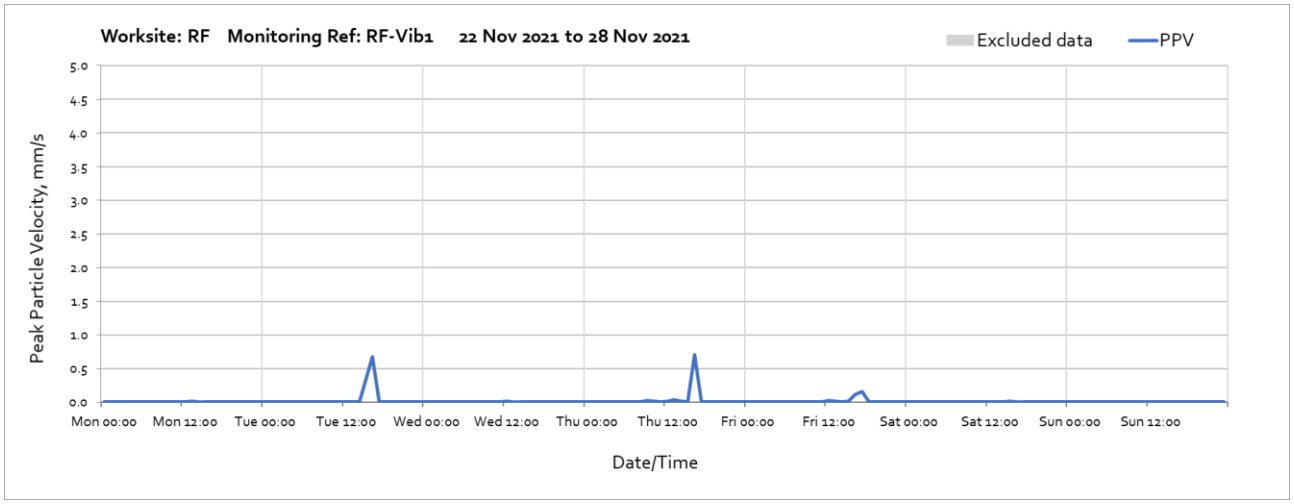
Note: High vibration levels measured at 04:00 on Monday 29th was due to local disturbance at the monitor location and not representative of HS2 vibration levels. High levels of vibration measured at 13:00 on Tuesday 30th November were due HGV movements and stone deliveries undertaken in poximity of the vibration monitor. The nearest residential receptors are further away from the works and vibration levels at the receptor will therefore be lower.

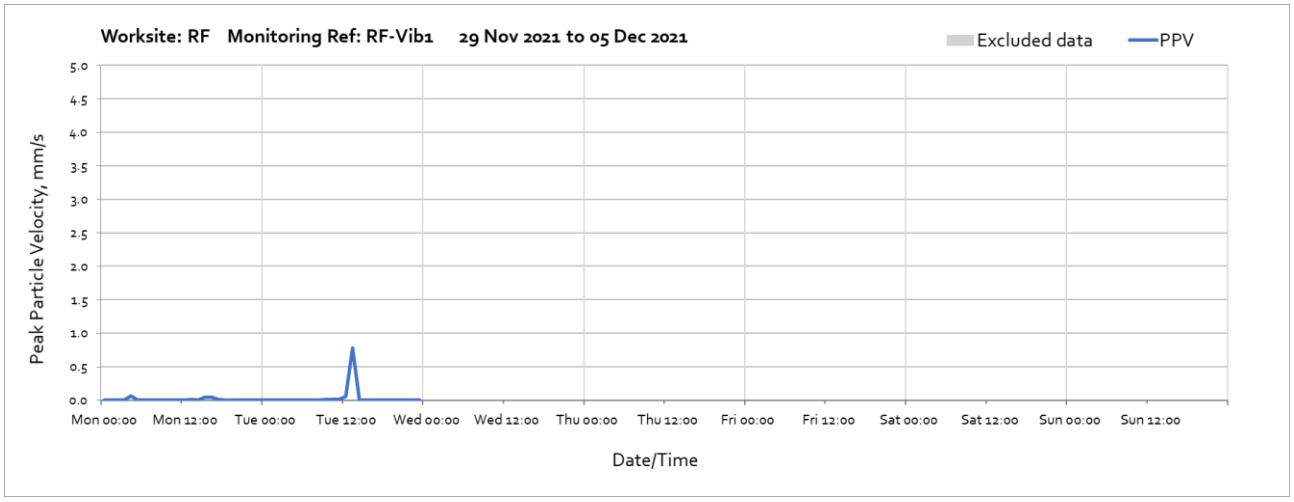
Worksite: RF – Monitoring Ref: RF-Vib 1






Worksite: RF Monitoring Ref: RF-Vib1 15 Nov 2021 to 21 Nov 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: RF Monitoring Ref: RF-Vib1 22 Nov 2021 to 28 Nov 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: RF Monitoring Ref: RF-Vib1 29 Nov 2021 to 05 Dec 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time