HS2

October 2021

Construction noise and vibration Monthly Report – August 2021

London Borough of Ealing

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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 and vibration monitoring carried out within the London Borough of Ealing (LBE) (including one monitoring location on the boundary with the London Borough of Hammersmith and Fulham) during the month of August 2021.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of the Atlas Road worksite (ref. AR) where drainage works, bored piling works, construction of site haul road, excavation works, pile trimming, concrete pouring, access ramp construction, cast-in-situ concrete works, breaking out works, main power and water connection works, site wide works, including installation of fencing and construction of working platform were underway.
- Noise and vibration monitoring were undertaken in the vicinity of the Willesden EuroTerminal worksite (ref. WET), where inert and non-inert stockpile works, construction of ramps, excavation works, concrete works, power utility works, fitting out works of Breadbin Building, relocation of pedestrian bridge and installation of conveyors were underway.
- Noise monitoring was undertaken in the vicinity of the Victoria Road Crossover Box worksite (worksite ref. VRCB), where:
    - backfilling and excavations, works to welfare facilities, works to guide walls, groundworks, diaphragm walling works and testing of walling rigs, concrete works, deliveries, power utility diversion works, construction of footpath and new entrance area, drainage works, extension works for the piling platform, hoarding works and works on security gates and site haul road; and
    - At the Victoria Road Ancillary Shaft, excavation works and application of sprayed concrete lining, removal of spoil and equipment, caulking works, inspections, and preparation works for installation of drainage were underway.
- Noise monitoring was undertaken in the vicinity of the Flat Iron compound (worksite ref. FIC), where vegetation clearance, installation of conveyors, drainage works, groundworks, reinforced concrete works and construction and fitting out work for the new laboratory building were underway.
- Noise and vibration monitoring were undertaken in proximity of the Old Oak Common depot worksite (ref. OOC), where ground reduction works, construction of permanent accommodation building, vegetation clearance, demolition works, construction of site haul road, drainage works, piling and excavation works, construction of platforms, guide walls and removal of spoil were underway.

- Noise monitoring was undertaken in proximity of the Mandeville Road Ventilation Shaft worksite (ref.: MRVS), where construction of working platforms, installation of new offices, removal of tracks and installation of hoardings were underway.
- Noise and vibration monitoring were undertaken in proximity of the Green Park Way Ventilation Shaft worksite (ref. GPWVS), where site management and site security works, excavations, hoarding works, removal of spoil, construction of working platforms, installation of concrete cable troughs, bearing tests, preparation works for grouting works, deliveries, installation of barriers, drainage works, installation of lights, main power connection works and borehole works were underway.
- Noise monitoring was undertaken in proximity of the Westgate Ventilation Shaft (ref. WVS), where deliveries, construction of shaft collar, cast-in-situ concrete works, installation of steel cutting edge and rings and main power and water connection works were underway.

Further works, where monitoring was not undertaken, were also underway at:

- School Road, Bethune Road, Chase Road, Victoria Road and Atlas Road as part of power utility works;
- Horsenden Lane, Perivale, as part of water utility works.
- Wormwood Scrubs, where topsoil striping works, excavation and backfilling works were underway.

The HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (https://www.gov.uk/government/publications/hs2-information-papers-environment), were exceeded on one (1) occasion due to HS2 works 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.

Five (5) complaints were received during the monitoring period. A description of complaints, the results of investigation and any actions taken are detailed in Table 8 of this report.

Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

Acronym/Term	Definition
$L_{Aeq,T}$	See equivalent continuous sound pressure level
Ambient sound	A description of the all-encompassing sound at a given location and time which will include sound from many sources near and far. Ambient sound can be quantified in terms of the equivalent continuous sound pressure level, $L_{pAeq,T}$
Decibel(s), or dB	Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure (measured in Pascal (Pa)). Because of this wide range, a level scale called the decibel (dB) scale, based on a logarithmic ratio, is used in sound measurement. Audibility of sound covers a range of approximately 0-140dB.
Decibel(s) A-weighted, or dB(A)	The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure sound is weighted to represent the performance of the ear. This is known as the 'A weighting' and is written as 'dB(A)'.
Equivalent continuous sound pressure level, or $L_{Aeq,T}$	An index used internationally for the assessment of environmental sound impacts. It is defined as the notional unchanging level that would, over a given period of time (T), deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating sound levels can be described in terms of an equivalent single figure value, typically expressed as a decibel level.
Exclusion of data	Measurement of noise levels can be affected by weather conditions such as prolonged periods of rain, winds speeds higher than 5m/s and snow/ice ground cover. Noise levels measured during these periods are considered not representative of normal noise conditions at the site and, for the purposes of this report, are excluded from the assessment of exceedances and calculation of typical noise levels and are also greyed out in charts. Identifiable incongruous noise and vibration events not attributable to HS2 construction noise are also excluded.
Façade	A facade noise level is the noise level 1m in front of a large reflecting surface. The effect of reflection, is to produce a slightly higher (typically +2.5 to +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 London Borough of Ealing (LBE) (including one monitoring location on the boundary with the London Borough of Hammersmith and Fulham) during the month for the period 1st to 31st August 2021.

1.1.3 Active construction sites in the local authority area, where noise and vibration monitoring were conducted during this period, include:

- Atlas Road worksite, ref. AR (see plan 5 in Appendix A), where work activities included:
  - Drainage works, including installation of manholes, carrier pipe, gully spurs, bypass separators, drainage channels and flow meters and excavation of attenuation tank;
  - Bored piling works and removal of redundant sheet piles and demobilisation of the plant;
  - Construction of site haul road, including construction of concrete slabs;
  - Excavation works and pile trimming;
  - Concrete pouring of the wheel wash base and installation of the shutters;
  - Preparation works for the access ramp;
  - Construction of pile caps, including stell fixing and shuttering;

- Installation of conveyors, including cast-in-situ concrete works and breaking out work;
- Main power and water connection works; and
- Site wide works, including installation of fencing excavation works and construction of working platform.

- Willesden EuroTerminal worksite, ref. WET (see plan 5 in Appendix A), where work activities included:
  - Inert and non-inert stockpile works, including deliveries, erection of access stairs and water proofing works;
  - Construction of ramps;
  - Excavation works and concrete works;
  - Installation of the main power cable ducting;
  - Fitting out works of Breadbin Building;
  - Relocation and removal of pedestrian bridge; and
  - Prefabrication of steel cages and shutters for conveyor bases and installation of reinforcement cages.
- Victoria Road Crossover Box worksite, ref. VRCB (see plan 6 in Appendix A), where work activities included:
  - Backfilling and excavation works;
  - Works to the welfare facilities;
  - Works to guide walls, including groundworks, steel fixing and installation of shutters, concrete works and backfilling works.
  - Diaphragm walling works, including testing of diaphragm walling rigs and concrete works;
  - Deliveries of steel reinforcement cages;
  - Power utility diversion works;
  - Construction of the footpath, drainage works and concrete works for the new entrance area;
  - Works to extend the piling platform;
  - Drainage works; and
  - Works on hoardings, security gates and site haul road.

- At the Victoria Road Ancillary Shaft activities included, excavation works and application of Sprayed Concrete Lining (SCL), removal of spoil and equipment, caulking works, inspections, and preparation works for installation of drainage.

- Flat Iron compound, worksite ref. FIC (see plan 6 in Appendix A), where work activities included:
  - Vegetation clearance;
  - Installation of conveyors, including excavation works, steel fabrication and construction of concrete bases;
  - Drainage works,
  - Groundworks and reinforced concrete works; and
  - Construction and fitting out works for the new laboratory building, including groundworks, shuttering, steel fixing, installation of modules and power utility works.
- Old Oak Common depot worksite, located in the London Borough of Hammersmith and Fulham (LBHF), ref. OOC (see plan 7 in Appendix A), where work activities included:
  - Ground reduction works;
  - Construction of permanent accommodation building;
  - Vegetation clearance;
  - Railway siding demolition works;
  - Construction of temporary site haul roads;
  - Drainage installation;
  - Piling and excavation works; and
  - Construction of platforms, guide walls and removal of spoil.
- Mandeville Road Ventilation Shaft worksite, reference MRVS (see plan 1 in Appendix A), where work activities included:
  - Construction of working platforms;
  - Works on new offices;
  - Removal of redundant tracks; and
  - Installation of hoardings;

- Green Park Way Ventilation Shaft worksite, reference GPWVS (see plan 2 in Appendix A), where work activities included:
    - Site management and site security works, including adjustment to site walkway, installation of additional signage, installation of survey posts and setup of permanent control points.
    - Excavation of trenches;
    - Installation of hoardings;
    - Removal of spoil and construction of working platforms;
    - Installation of concrete cable troughs;
    - Bearing tests;
    - Preparation works for future grouting works, including deliveries and construction of lagoons at the working platform area;
    - Installation of barriers;
    - Drainage works, including excavations, backfilling works, fitting works, installation of manholes and rockers and concrete pouring;
    - Installation of lights around welfare area;
    - Main power connection works; and
    - Borehole works.
- Westgate Ventilation Shaft worksite, reference WVS (see plan 3 in Appendix A), where work activities included:
    - Deliveries of plant items and pre-cast concrete segments;
    - Construction of the shaft collar, including cast-in-situ concrete works;
    - Installation of steel cutting edge and rings; and
    - Main power and water connection works.

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

- School Road, Bethune Road, Chase Road, Victoria Road and Atlas Road as part of power utility works;
- Horsenden Lane, Perivale, as part of water utility works.
- Wormwood Scrubs, where topsoil striping works, excavation and backfilling works were underway.

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

1.2 Measurement Locations

1.2.1 Nineteen noise and nine vibration monitoring installations were active in August 2021 in the LBE area. Table 2 summarises the position of noise and vibration monitoring installations within the LBE area in August 2021.

1.2.2 Maps showing the position of noise and vibration monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
AR	N032	Shaftesbury Gardens
	N033	Outside The Collective, Atlas Road / Victoria Road
	N060	Atlas Road next to Bashey Road
WET	N034	Stephenson Street (north)
	N035	Stephenson Street (south)
	N041	Junction of Stephenson Street / Goodhall Street
	V052	Stephenson Street (north)
	V057	37, Stephenson Street
VRCB	N031	School Road, outside Acton Business Centre
	N050	Acton Square, outside North Acton Station
FIC	N029	Braitrim House, Victoria Road
	N042	Boden House Car Park
	N049	Flat Iron compound railway fence, Victoria Rd North Acton

Worksite Reference	Measurement Reference	Address
OOC	OOC-N01	Old Oak Common Lane
	OOC-N02	Old Oak Common Lane, Hilltop Works
	OOC-V01	25 Wells House Road
	OOC-V02	Kildun Court, Old Oak Common Lane
	OOC-V03	Wells House Road Alleyway
MRVS	N040	Badminton Close
	N058	Mandeville Road
	N063	Mandeville Road
	V055	Mandeville Road
	V056	Mandeville Road
GPWVS	N059	Green Park Way Ventilation Shaft
	N064	Green Park Way Ventilation Shaft
	V053	Green Park Way, Greenford
	V054	Green Park Way Ventilation Shaft
WVS	N062	Westgate Ventilation Shaft

2 Summary of Results

2.1 Summary of Measured Noise and Vibration 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
AR	N032	Shaftesbury Gardens	Free-field	60.4 (64.0)	64.8 (68.4)	60.1 (63.2)	59.0 (66.4)	55.4 (63.2)	57.0 (57.2)	63.3 (66.0)	62.4 (65.4)	59.6 (64.0)	54.1 (60.0)	57.8 (60.1)	54.7 (60.1)
	N033	Outside The Collective, Atlas Road/Victoria Road	Free-field	66.0 (67.5)	67.3 (69.0)	65.1 (68.8)	63.9 (69.2)	60.5 (70.2)	62.4 (62.8)	64.2 (65.8)	64.7 (66.6)	63.6 (66.3)	58.8 (62.2)	62.7 (69.2)	59.4 (64.3)
	N060	Atlas Road next to Bashey Road	Façade	51.5 (55.3)	64.4 (69.7)	55.1 (65.0)	52.9 (59.8)	52.3 (65.0)	55.3 (57.5)	62.1 (73.8)	49.2 (50.3)	51.3 (57.1)	48.1 (52.9)	49.4 (54.2)	51.3 (59.0)
WET	N034	Stephenson Street (north)	Free-field	49.7 (54.6)	55.2 (61.5)	52.4 (60.4)	51.2 (61.9)	45.5 (52.6)	48.5 (49.5)	55.5 (57.5)	52.7 (57.9)	52.0 (55.9)	45.4 (52.8)	52.0 (62.9)	47.4 (53.0)
	N035	Stephenson Street (south)	Free-field	53.5 (56.9)	56.4 (61.1)	52.3 (60.3)	50.3 (57.6)	46.2 (53.2)	51.3 (54.5)	55.1 (58.3)	52.2 (58.1)	49.9 (54.7)	45.8 (51.8)	48.8 (56.4)	45.5 (50.6)
	N041	Junction of Stephenson Street/Goodhall Street	Free-field	54.2 (58.6)	59.0 (65.0)	56.1 (63.4)	55.2 (60.1)	48.9 (61.3)	49.7 (50.5)	53.8 (55.1)	54.6 (55.2)	55.6 (61.1)	48.4 (60.1)	54.4 (66.0)	48.3 (54.1)

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
VRCB	N031	School Road, outside Acton Business Centre	Free-field	55.3	66.8	55.7	54.2	55.4	54.3	64.7	61.8	56.2	51.4	52.0	51.5
				(64.9)	(71.8)	(62.1)	(59.9)	(65.4)	(56.4)	(69.7)	(70.1)	(67.4)	(63.6)	(65.4)	(59.5)
	N050	Acton Square, outside North Acton Station	Free-field	63.0	63.3	62.9	61.8	58.3	61.3	63.7	66.5	61.9	57.4	61.7	58.0
				(64.1)	(64.4)	(65.5)	(64.9)	(69.2)	(63.6)	(65.5)	(75.0)	(66.8)	(61.9)	(70.9)	(65.1)
FIC	N029	Braitrim House, Victoria Road	Free-field	51.1	63.0	54.2	52.6	53.2	50.9	54.3	50.5	51.6	45.2	48.0	49.5
				(59.9)	(75.7)	(61.1)	(61.8)	(69.6)	(55.4)	(62.6)	(51.5)	(60.6)	(52.3)	(56.6)	(58.0)
	N042	Bodens car park	Free-field	56.6	63.3	54.4	52.8	50.4	52.6	57.2	53.8	53.5	48.7	51.8	49.4
				(59.8)	(67.9)	(57.6)	(57.8)	(57.8)	(54.9)	(59.7)	(56.2)	(61.5)	(55.3)	(59.0)	(55.2)
	N049	Flat Iron compound	Free-field	56.5	61.1	55.6	53.4	50.0	51.8	60.5	54.5	53.8	48.3	52.6	48.3
				(61.2)	(64.2)	(60.3)	(59.9)	(60.9)	(52.8)	(64.9)	(55.0)	(57.7)	(56.7)	(58.3)	(53.4)
OOC	OOC-N01	Old Oak Common Lane	Free-field	64.8	69.8	61.2	59.0	55.9	59.5	63.4	59.5	58.9	57.7	57.7	55.2
				(68.9)	(74.0)	(64.7)	(63.0)	(62.7)	(61.1)	(66.1)	(59.8)	(60.8)	(62.3)	(61.9)	(59.1)
	OOC-N02	Old Oak Common Lane, Hilltop Works	Free-field	65.9	68.7	66.2	64.7	60.0	62.7	65.0	65.3	65.0	59.4	63.4	59.5
				(67.7)	(70.6)	(71.1)	(71.1)	(67.5)	(63.6)	(65.5)	(65.5)	(70.6)	(63.1)	(67.1)	(63.9)
MRVS	N040	Badminton Close	Free-field	55.0	56.9	53.3	53.4	50.1	51.7	56.4	53.3	53.1	49.9	53.3	50.0
				(60.4)	(60.0)	(58.4)	(58.7)	(56.1)	(53.5)	(62.8)	(54.4)	(56.3)	(55.0)	(57.3)	(55.0)
	N058	Mandeville Road	Free-field	54.3	62.5	53.8	54.3	50.7	52.4	59.9	52.7	54.0	48.8	52.5	48.8
				(56.8)	(70.9)	(58.1)	(59.1)	(58.4)	(53.4)	(69.0)	(54.2)	(56.3)	(53.7)	(60.7)	(52.9)

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
	N063	Mandeville Road	Free-field	61.7	64.1	61.2	61.9	57.8	60.0	63.4	60.2	61.4	56.0	60.5	56.3
				(63.4)	(68.6)	(62.8)	(63.7)	(63.5)	(60.3)	(66.3)	(60.5)	(62.7)	(61.7)	(62.4)	(61.5)
GPWVS	N059	Green Park Way Ventilation Shaft	Façade	52.9	62.3	52.0	52.6	50.5	51.7	59.4	56.5	52.7	48.0	53.7	48.2
				(58.0)	(67.2)	(54.6)	(54.9)	(60.9)	(54.6)	(64.8)	(61.7)	(62.9)	(51.8)	(76.1)	(53.5)
	N064	Green Park Way Ventilation Shaft	Façade	58.1	63.2	57.2	55.4	50.9	54.8	57.0	57.1	54.2	47.7	53.4	49.5
				(62.4)	(67.3)	(61.9)	(62.5)	(60.1)	(55.5)	(59.6)	(60.9)	(59.0)	(53.2)	(57.8)	(55.7)
WVS	N062	Westgate Ventilation Shaft	Free-field	60.7	64.0	57.1	57.4	55.1	59.7	60.6	57.1	58.3	55.0	57.0	54.4
				(66.2)	(67.8)	(60.5)	(60.5)	(64.0)	(62.2)	(66.0)	(58.8)	(64.1)	(61.3)	(62.7)	(61.1)

2.1.2 Table 4 presents a summary of the measured vibration levels at each 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
WET	V052	Stephenson Street (north)	2.88 (Z-axis)
	V057	37, Stephenson Street	0.79 (Z-axis)
OOC	OOC-V01	25 Wells House Road	2.57 (Y-axis)
	OOC-V02	Kildun Court, Old Oak Common Lane	1.54 (Z-axis)
	OOC-V03	Wells House Road Alleyway	0.85 (Z-axis)
GPWVS	V053	Green Park Way, Greenford	1.78 (Z-axis)
	V054	Green Park Way Ventilation Shaft	2.74 (Z-axis)
MRVS	V055	Mandeville Road	9.76* (Z-axis)
	V056	Mandeville Road	4.42 (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 SOAEL

2.2.1 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."

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

2.2.3 Where reported construction noise levels exceed the SOAEL, relevant periods will be identified. Summary statistics to evaluate ongoing qualification for noise insulation and temporary rehousing are also presented where relevant.

2.2.4 Table 5 presents a summary of recorded exceedances of the SOAEL at each measurement location over the reporting period, including the number of exceedances during each time period.

Table 5: Summary of Exceedances of SOAEL

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
AR	N032	Shaftesbury Gardens	All days	All periods	No exceedance
	N033	Outside The Collective, Atlas Road / Victoria Road	All days	All periods	No exceedance
	N060*	Atlas Road next to Bashey Road	All days	All periods	No exceedance
WET	N034	Stephenson Street (north)	All days	All periods	No exceedance
	N035	Stephenson Street (south)	All days	All periods	No exceedance
	N041	Junction of Stephenson Street / Goodhall Street	All days	All periods	No exceedance
VRCB	N031	School Road, outside Acton Business Centre	All days	All periods	Not applicable**
	N050	Acton Square, outside North Acton Station	All days	All periods	No exceedance
FIC	N029	Braitrim House, Victoria Road	Weekday	0800-1800	1
	N042	Bodens Car Park	All days	All periods	No exceedance
	N049	Flat Iron compound	All days	All periods	No exceedance
OOC	OOC-N01	Old Oak Common Lane	All days	All periods	No exceedance
	OOC-N02	Old Oak Common Lane, Hilltop Works	All days	All periods	No exceedance

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
MRVS	N040	Badminton Close	All days	All periods	No exceedance
	N058*	Mandeville Road	All days	All periods	No exceedance
	N063	Mandeville Road	All days	All periods	No exceedance
GPWVS	N059	Green Park Way Ventilation Shaft	All days	All periods	Not applicable**
	N064	Green Park Way Ventilation Shaft	All days	All periods	Not applicable**
WVS	N062	Westgate Ventilation Shaft	All days	All periods	Not applicable**

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

** The defined SOAEL criteria are not applicable to non-residential properties

2.2.5 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
FIC	N029	Braitrim House, Victoria Road	1

2.2.6 1x no. exceedances of the SOAEL were recorded due to HS2 construction works during August 2021. The exceedance occurred at monitoring location N029 during 1x no. daytime period due to stockpiling works.

2.3 Exceedances of Trigger Level

2.3.1 Table 7 provides a summary of exceedances of the Section 61 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.

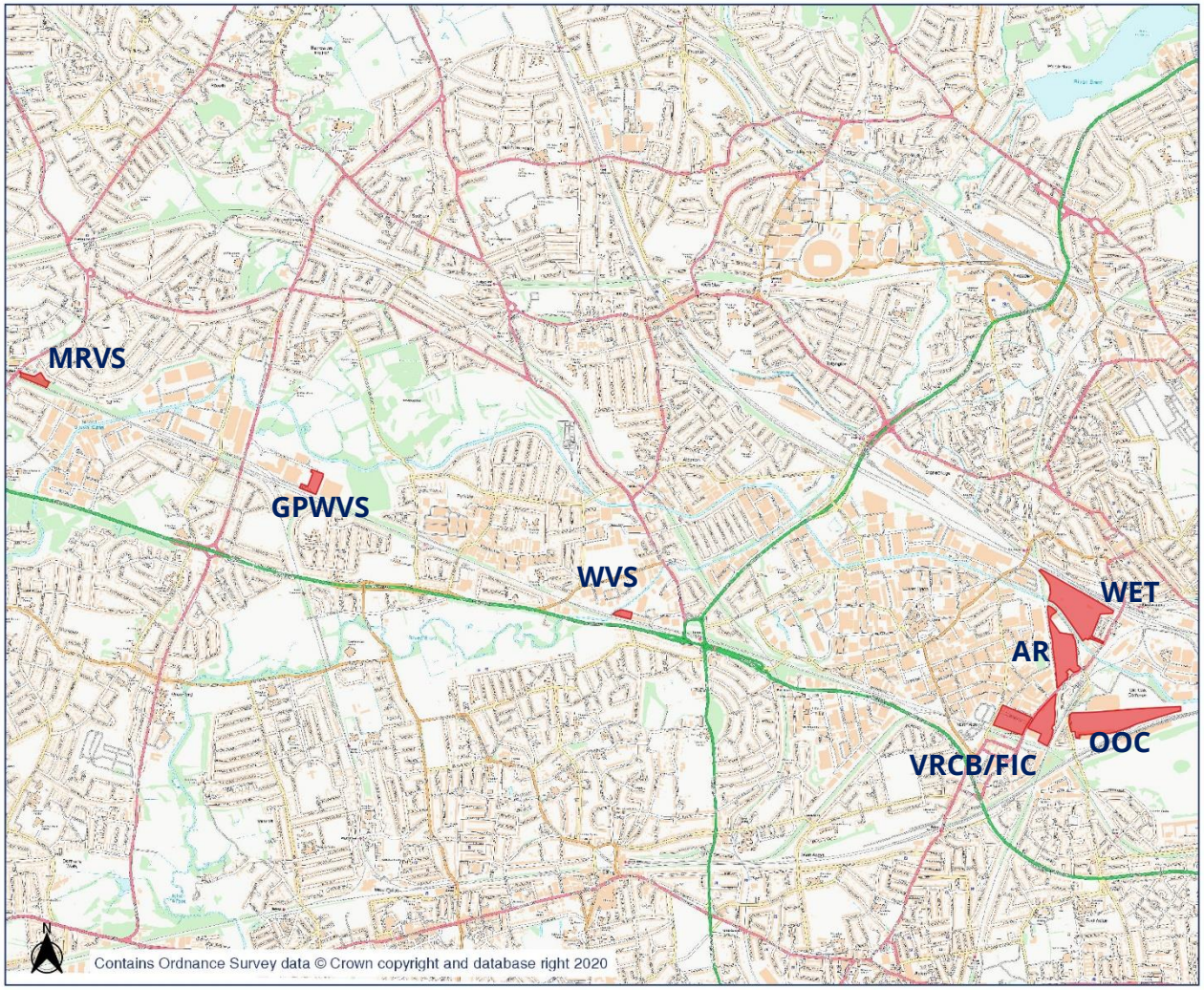
Table 8: Summary of Complaints

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-21-42426-C	AR	Complaint due to construction noise and lack of noise mitigation.	Investigations confirmed that works were undertaken with hammer machine that has been used without mitigation measures in place due to the nature of work being carried out.	The complainant has been contacted and reassured that the adoption of mitigation measures will always be employed where possible. Site team has been asked to review that all viable mitigation measures are being put in place and implement these mitigations moving forward where possible.
HS2-21-64135-E	WET	Complaint due to vibration felt at night.	Vibration monitoring at the site boundary in Stephenson Street have not shown any exceedance and/or significant vibration levels during the night-time period of the complaint.	The complainant has been contacted and information provided.
HS2-21-63893-E	VRCB	Complaint due to construction noise at night-time.	Investigations confirmed that works were carried out in line with Section 61 consent. Noise monitoring has been in place and no exceedances of noise levels have been	The complainant has been contacted and assured that no exceedances of the noise levels have been measured. Previous notification and information of the extended working hours were provided to the resident in March 2021.

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
			measured during the time of the complaint.	
HS2-21-42489-C	AR	Complaint due to noise and dust coming from the construction site.	On-going	On-going
HS2-21-42407-C	N/A, Utility works	Complaint due to absence of sound barriers at Midland/Shaftesbury Gardens.	Utility works were undertaken nearby Midland/Shaftesbury Gardens along Victoria Road.	Acoustic barriers have been now installed at the location of the complaint in order to minimize any disruption by noise from site.

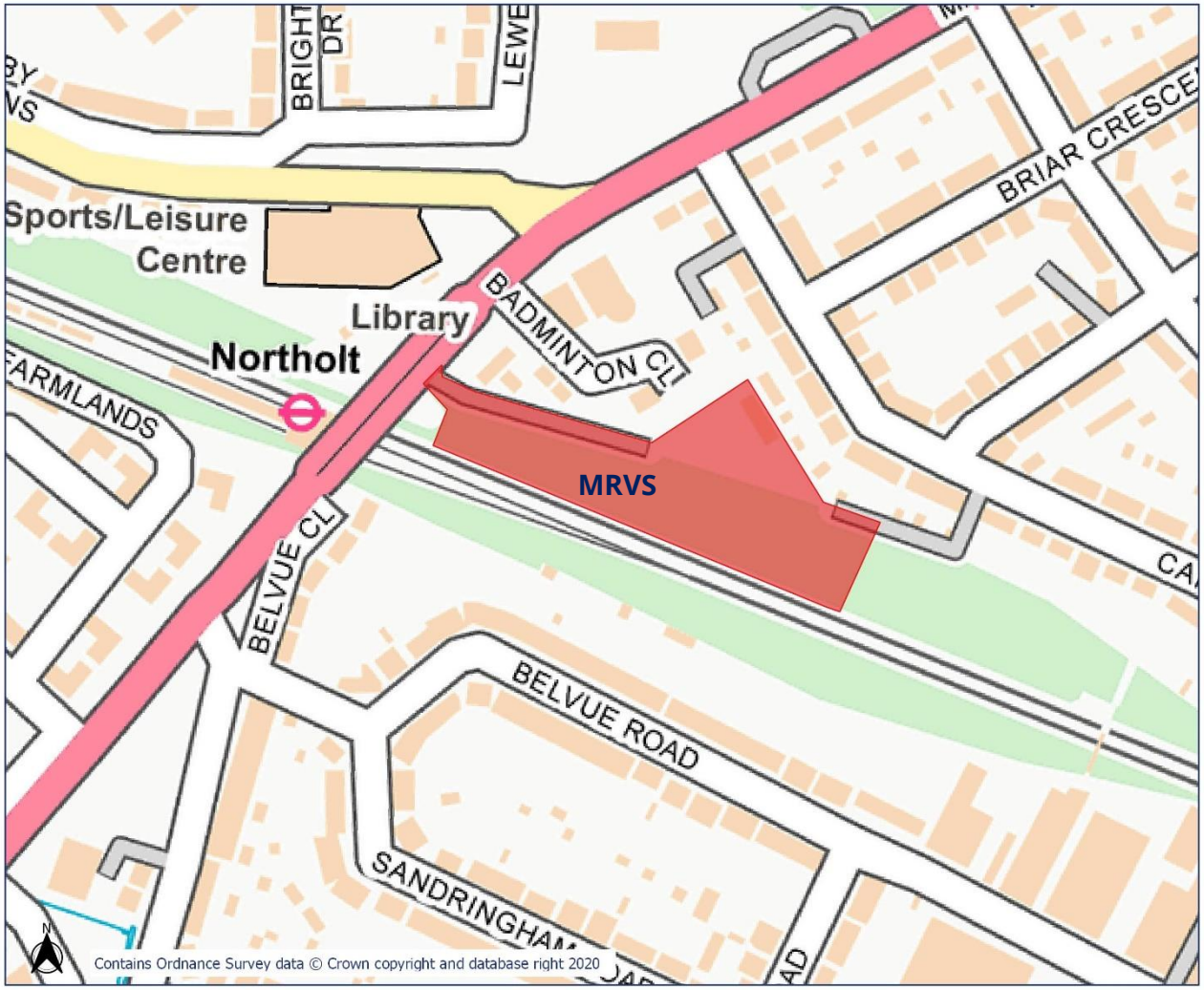
Appendix A Site Locations

HS2 Worksite identification plan - Overview

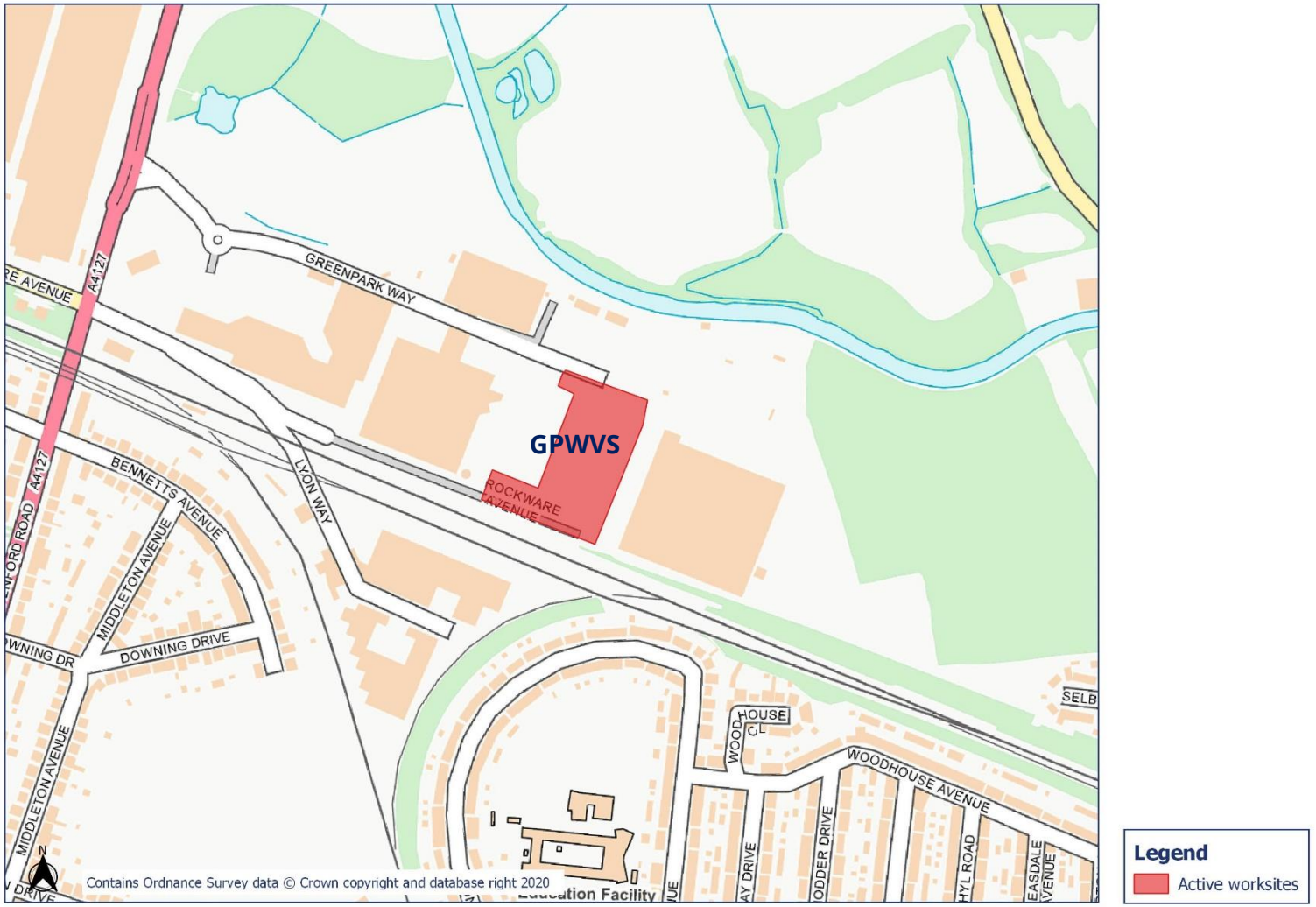


HS2

Worksite identification plan - 1

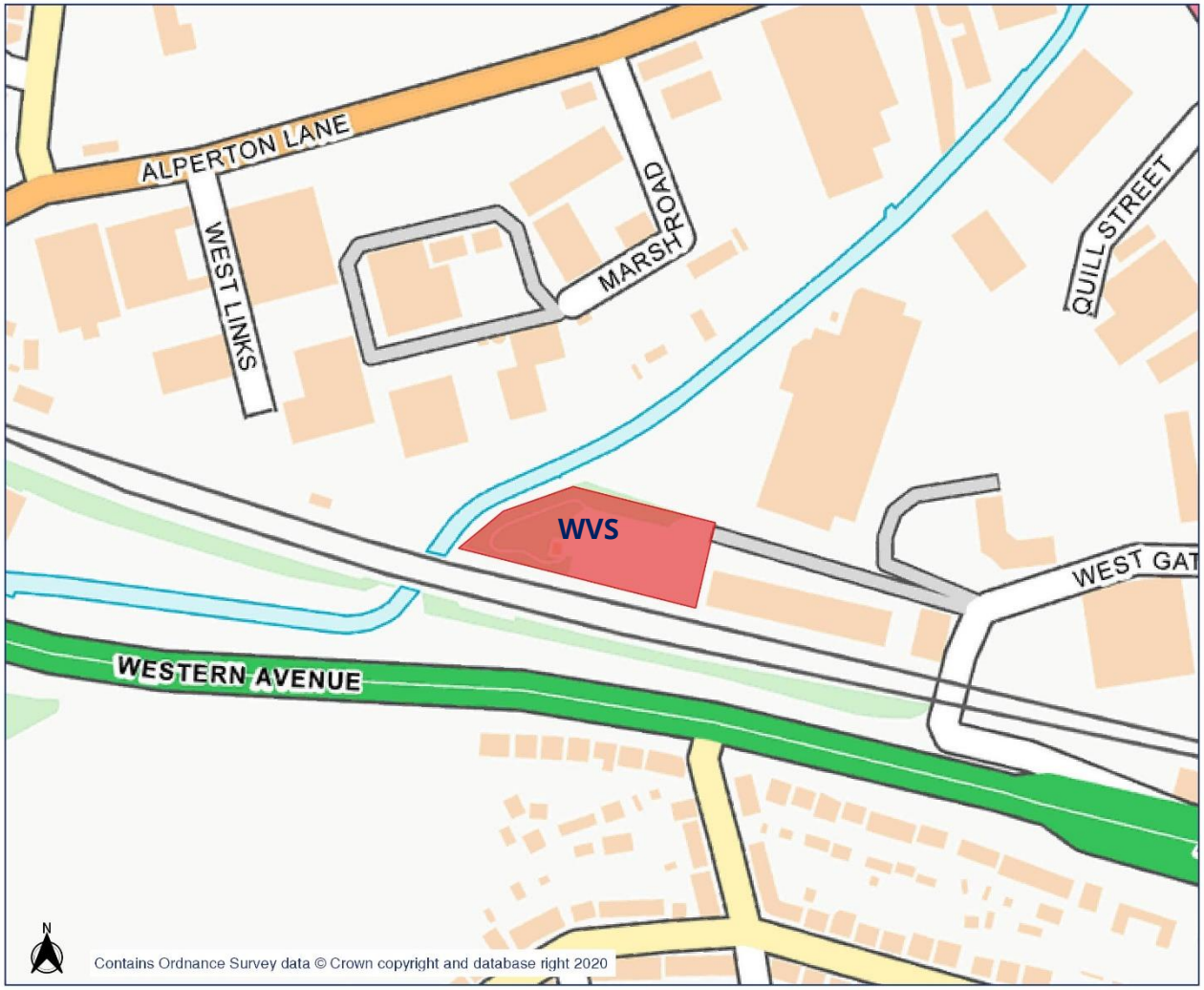


Worksite identification plan - 2

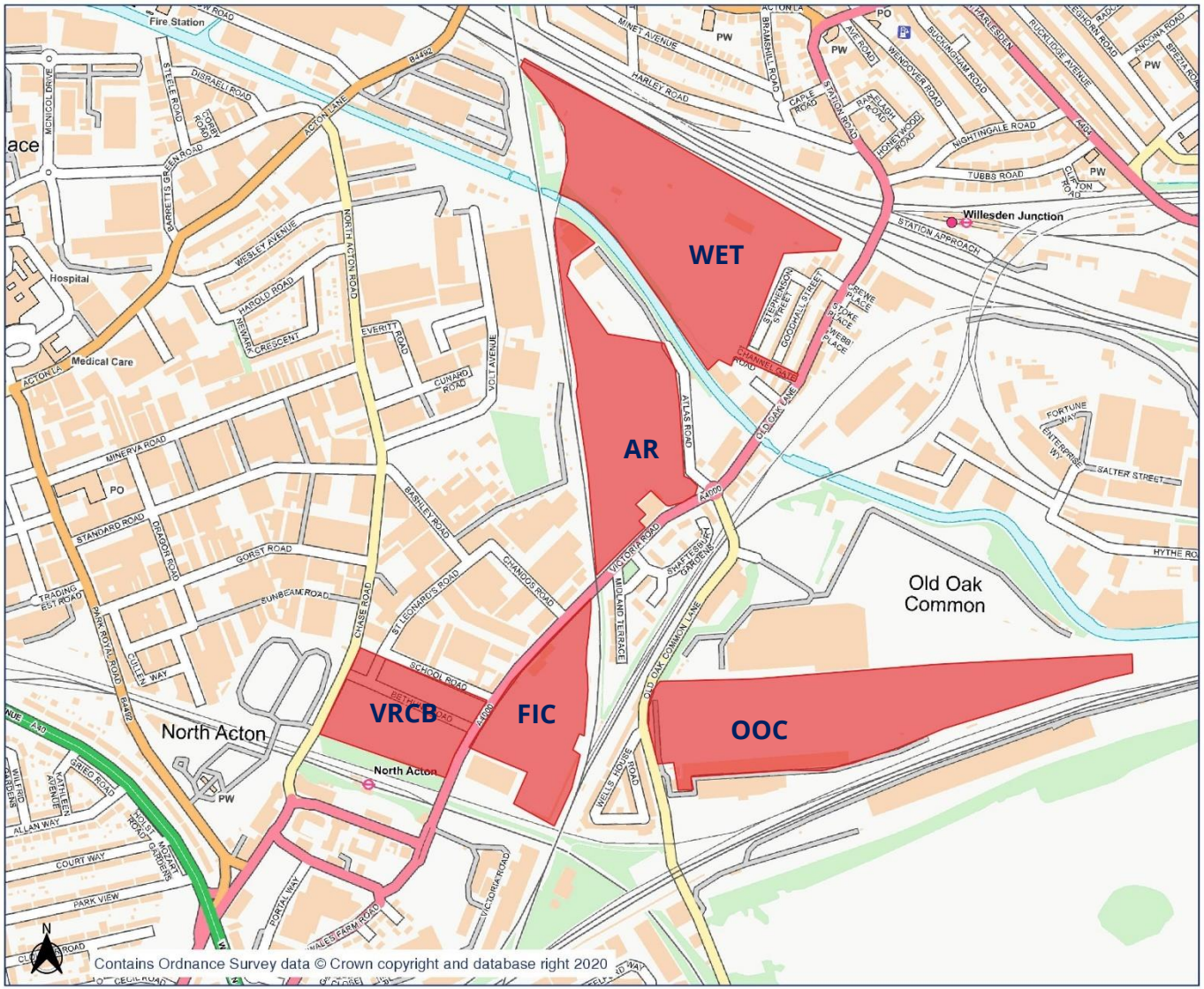


HS2

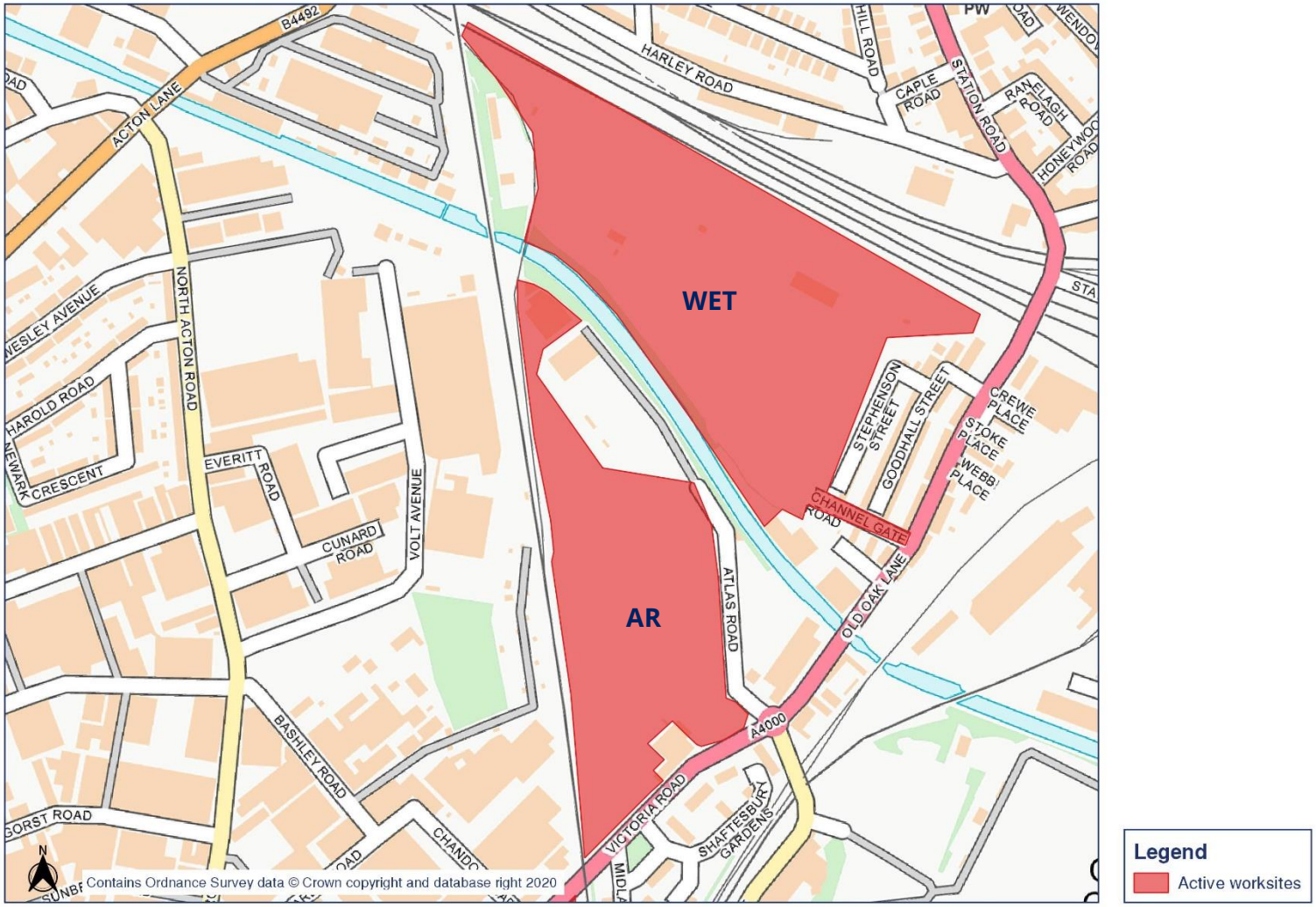
Worksite identification plan - 3



Worksite identification plan - 4

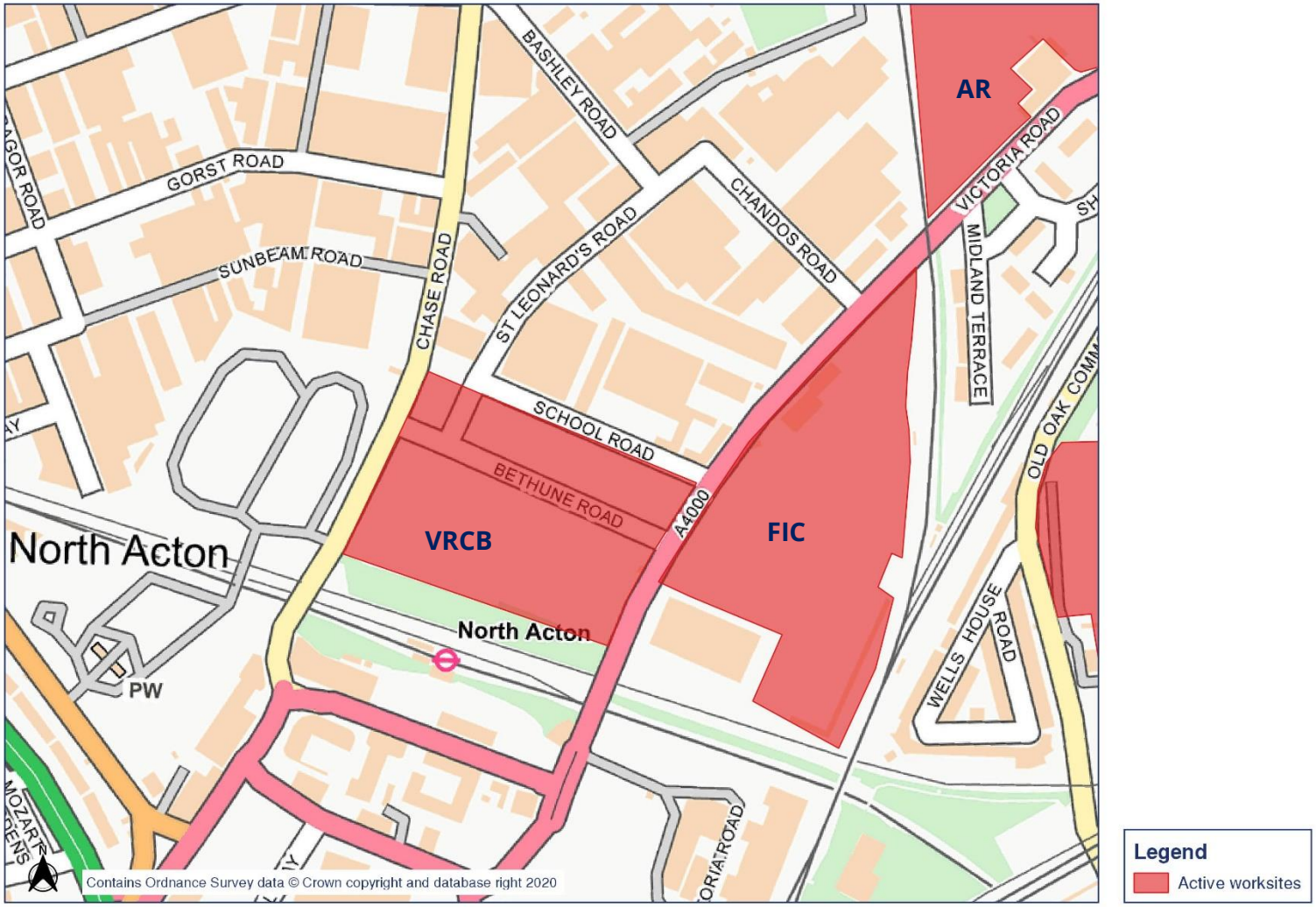


Worksite identification plan - 5

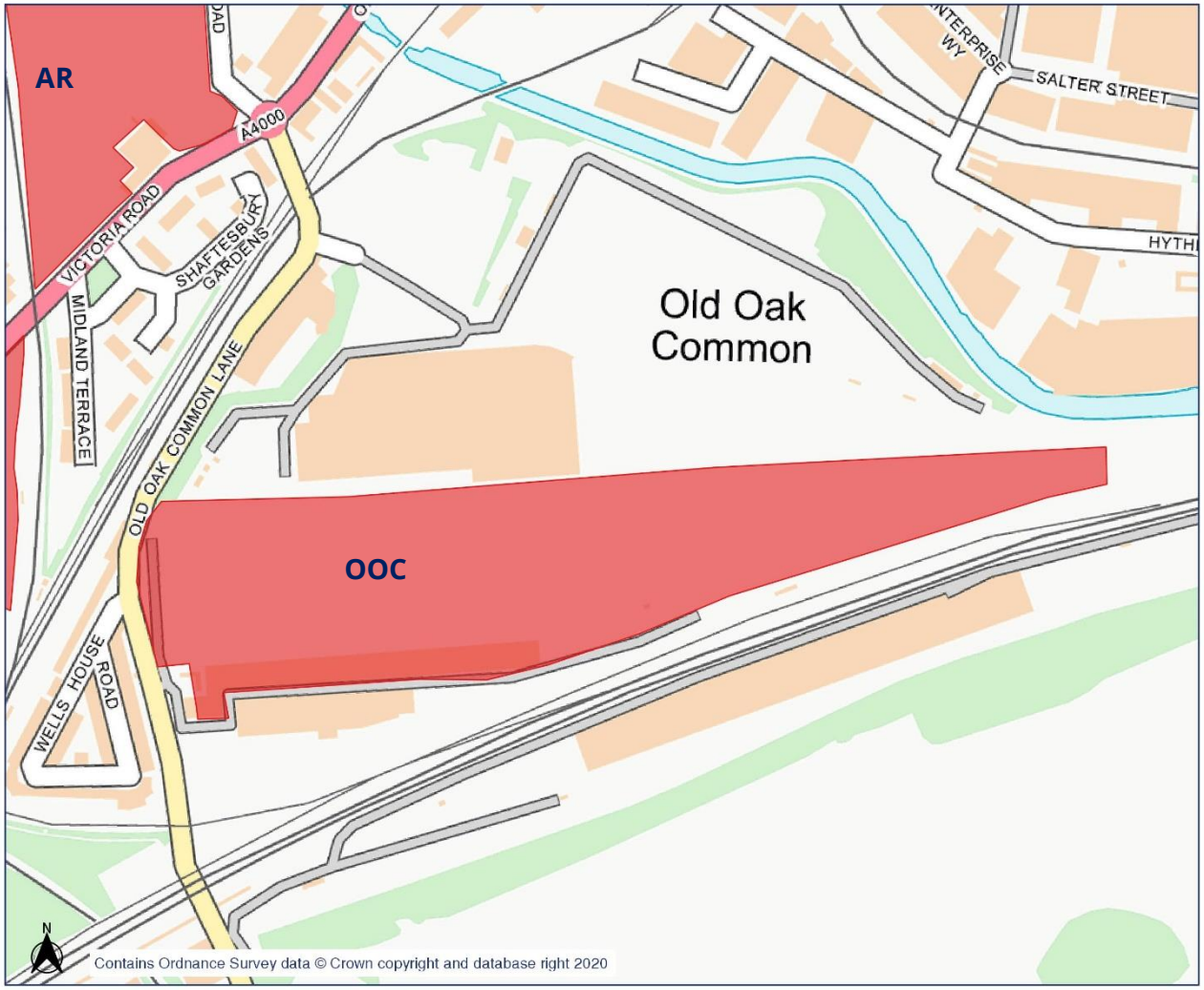


HS2

Worksite identification plan - 6

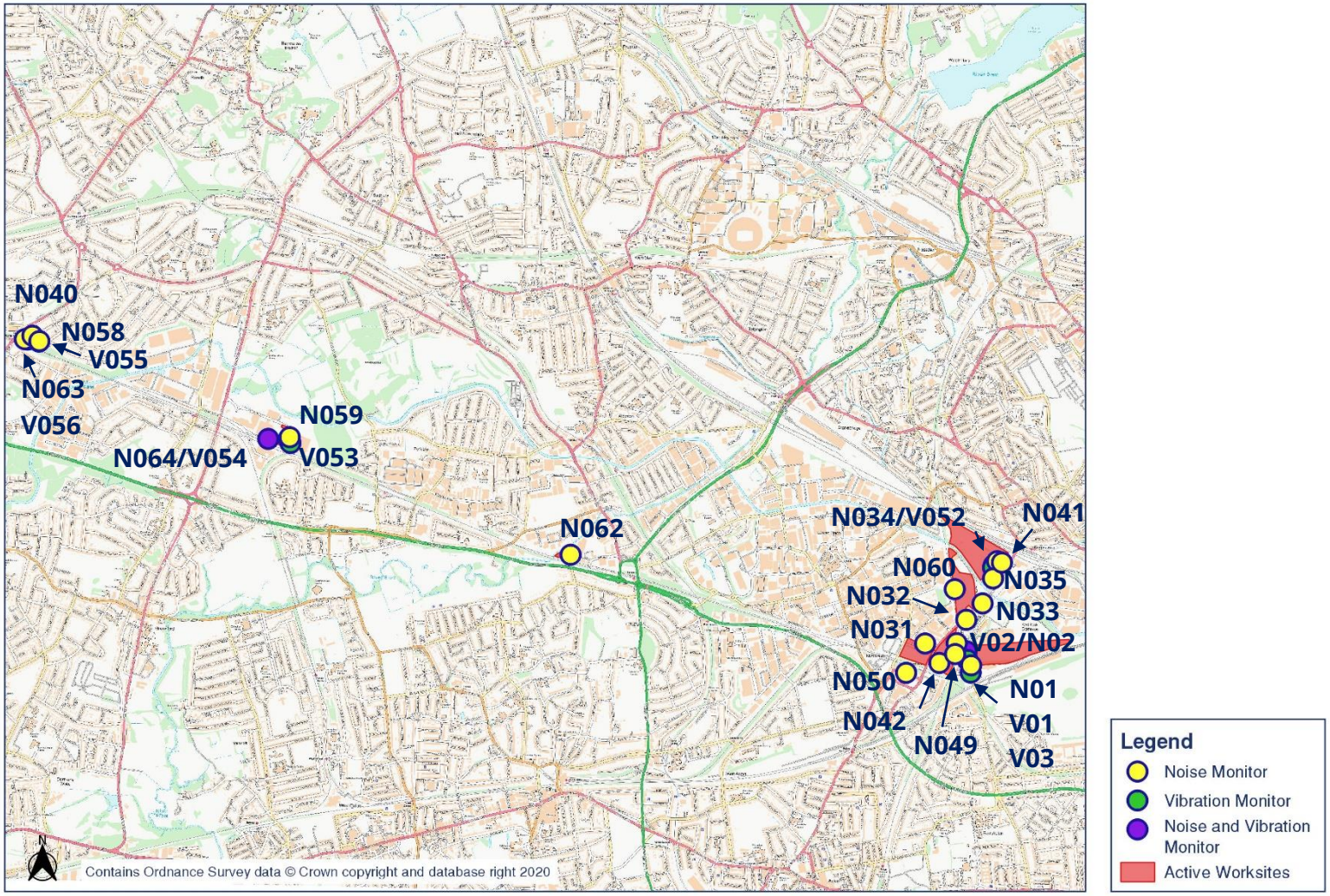


Worksite identification plan - 7

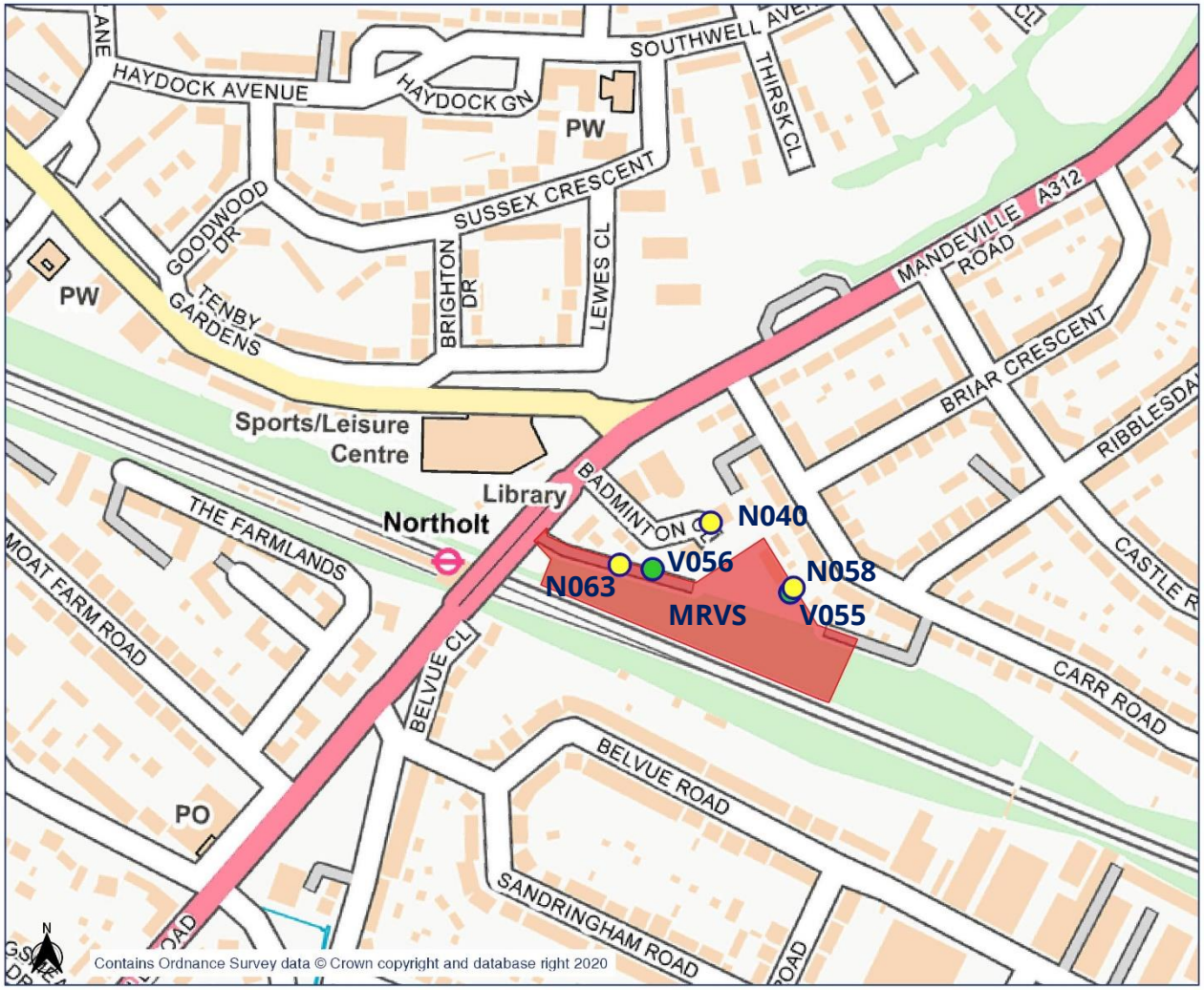


Appendix B Monitoring Locations

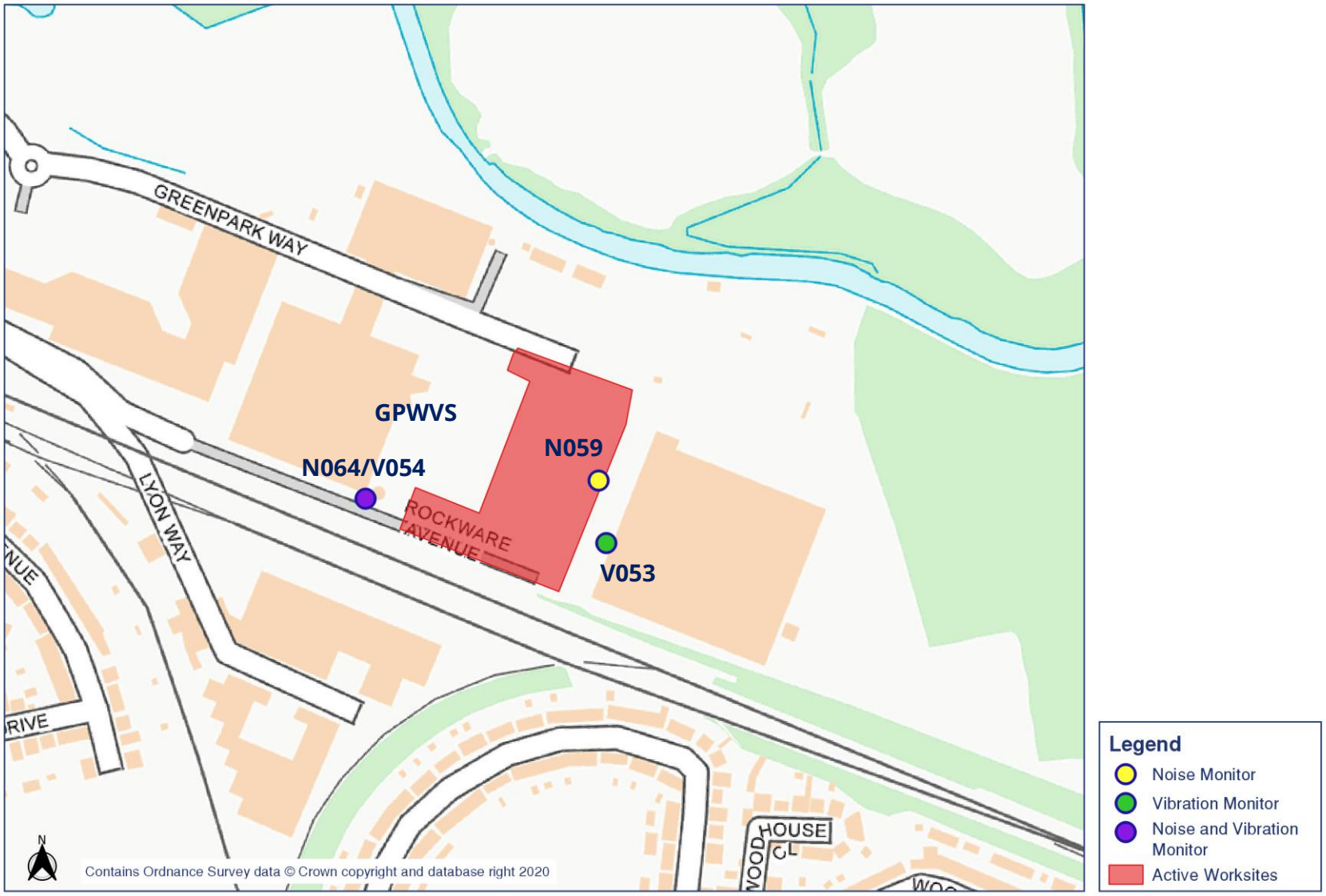
HS2 Noise and vibration monitoring plan - Overview



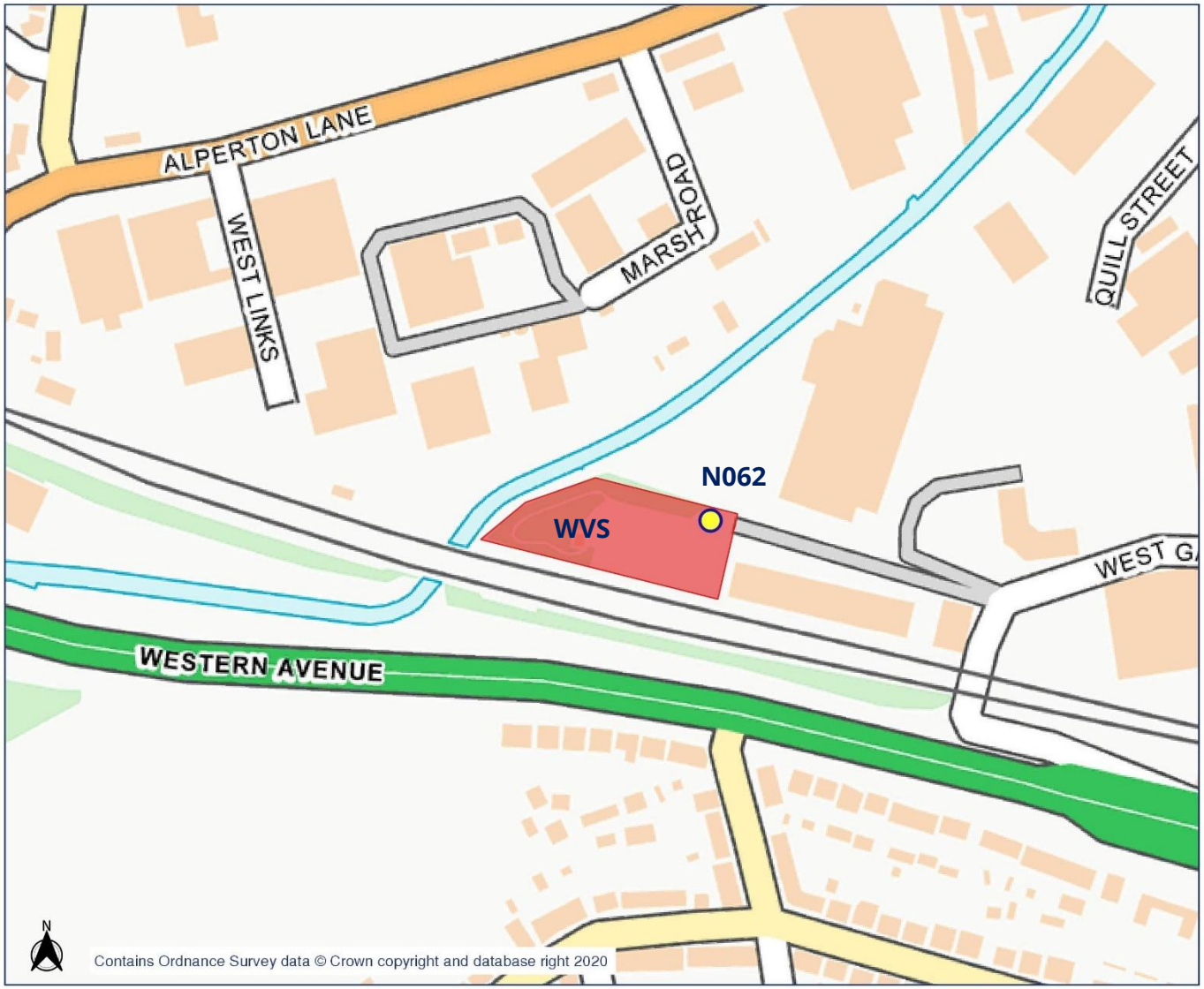
HS2 Noise and vibration monitoring plan - 1



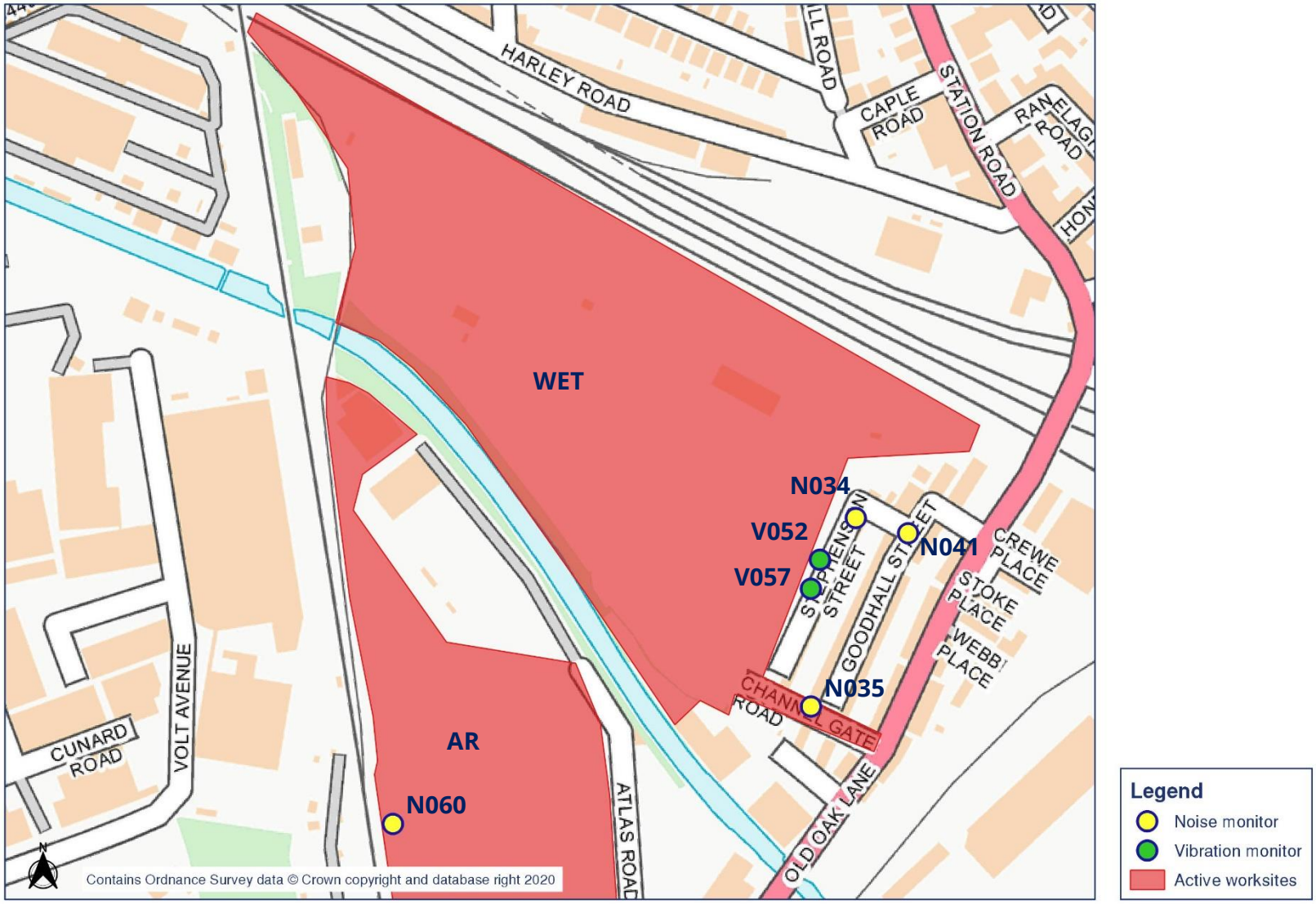
Noise and vibration monitoring plan - 2



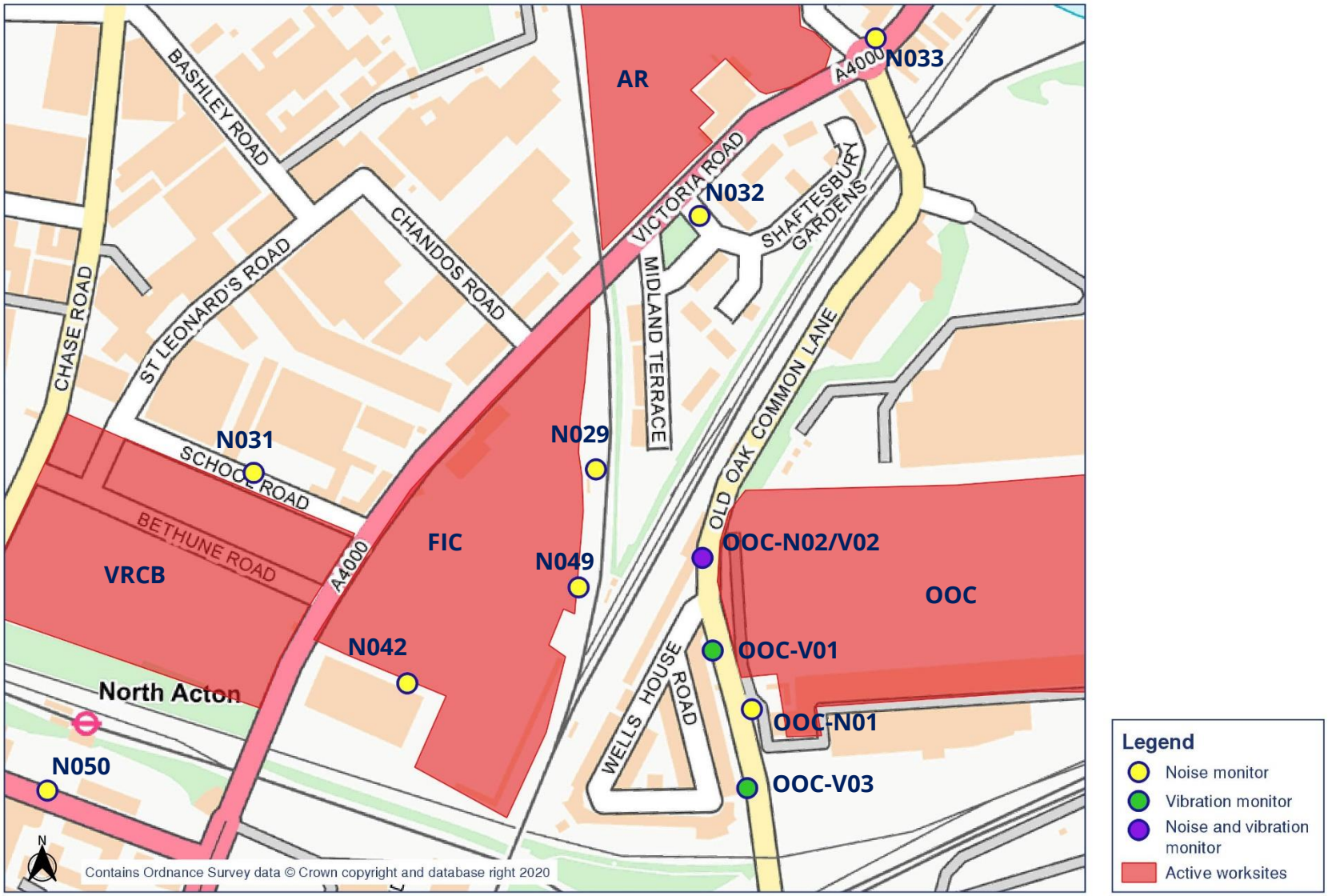
HS2 Noise and vibration monitoring plan - 3



Noise and vibration monitoring plan - 4



HS2 Noise and vibration monitoring plan - 5

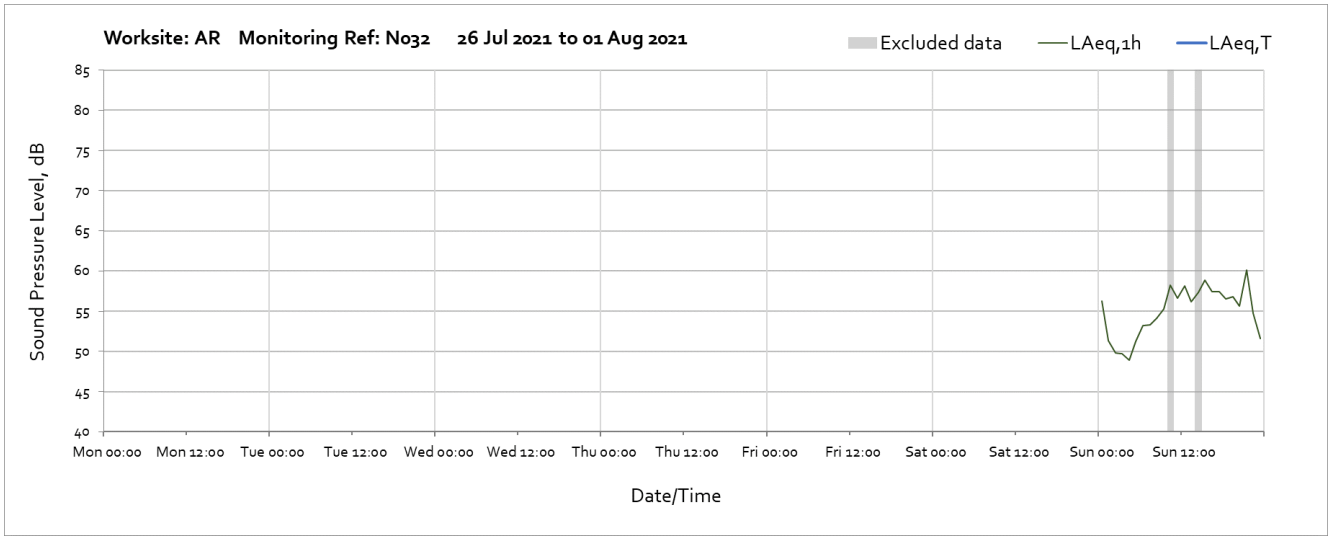


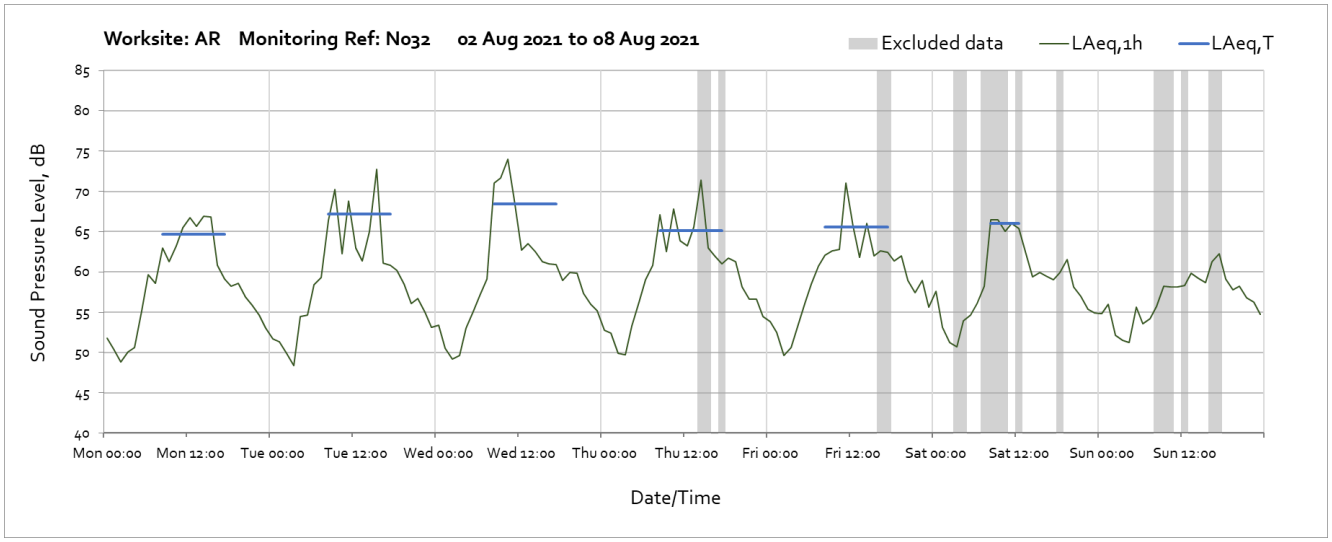
Appendix C Data

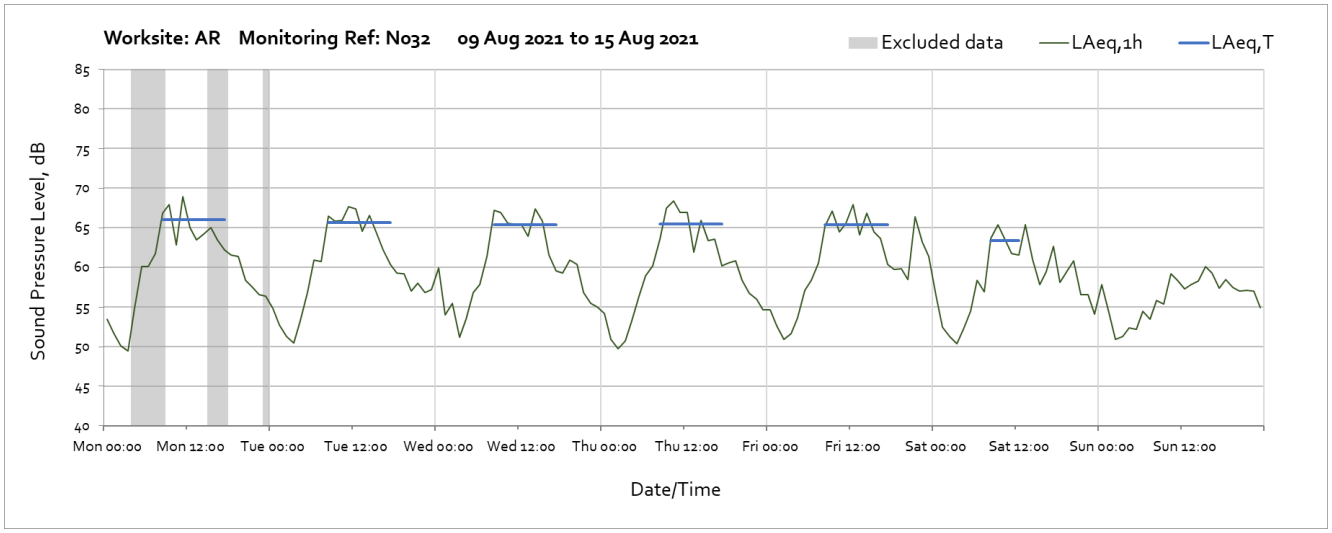
Noise

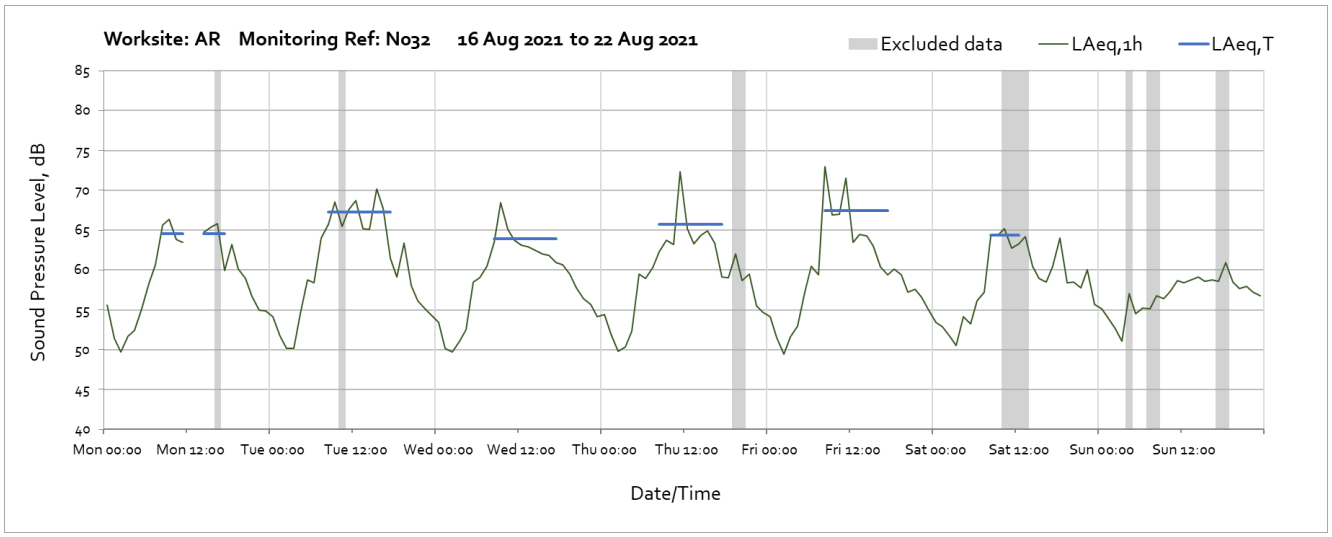
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods with adversely weather affected noise levels are greyed out and have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

Worksite: Atlas Road worksite (AR) – Monitoring Ref: N032

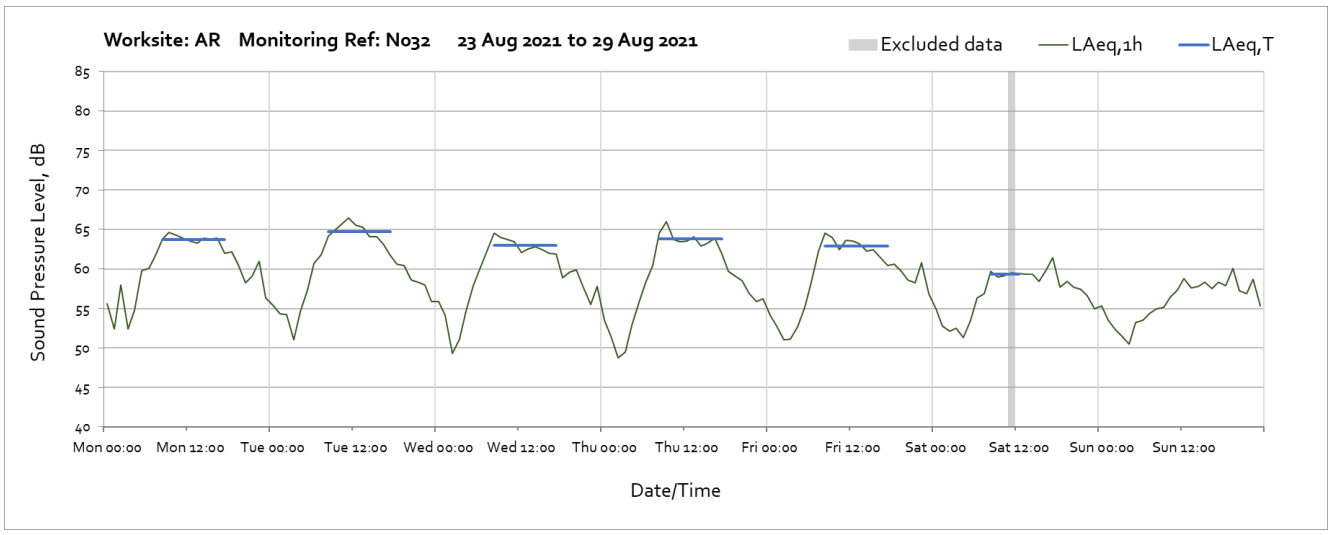


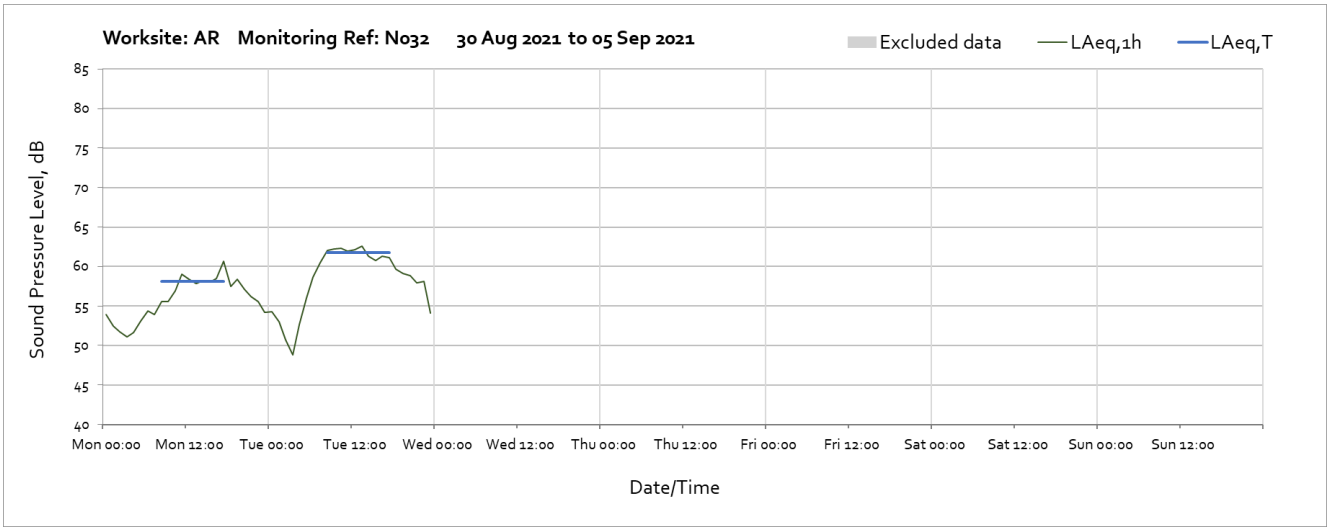






Note: Missing data between 12:00 and 13:00 on Monday 16th August 2021 was due monitoring station memory card error.





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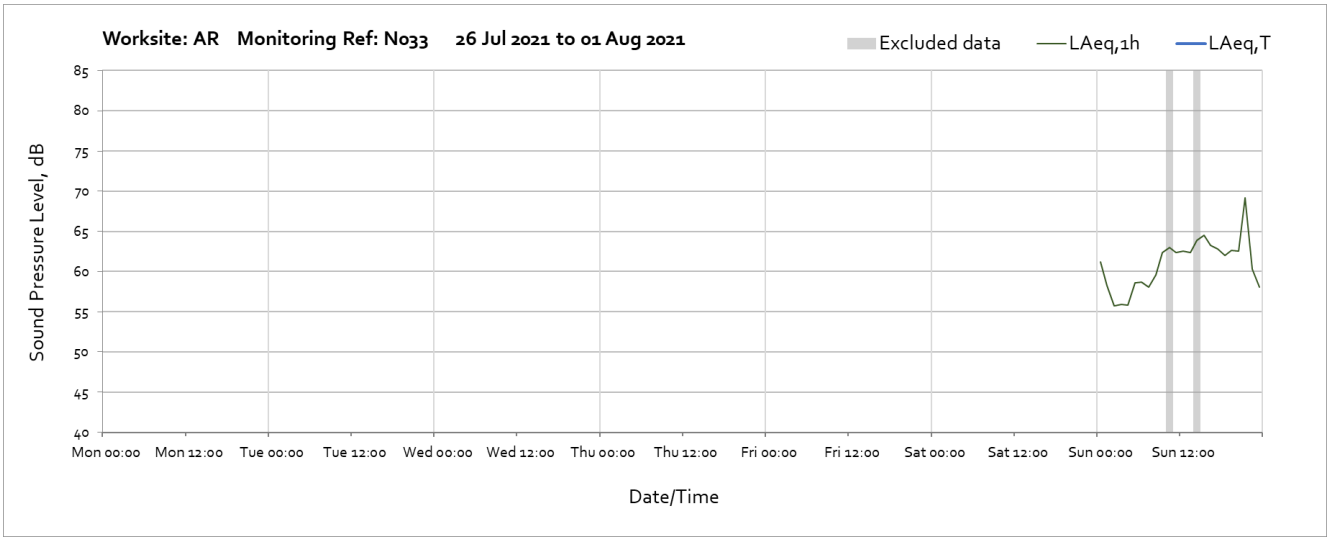

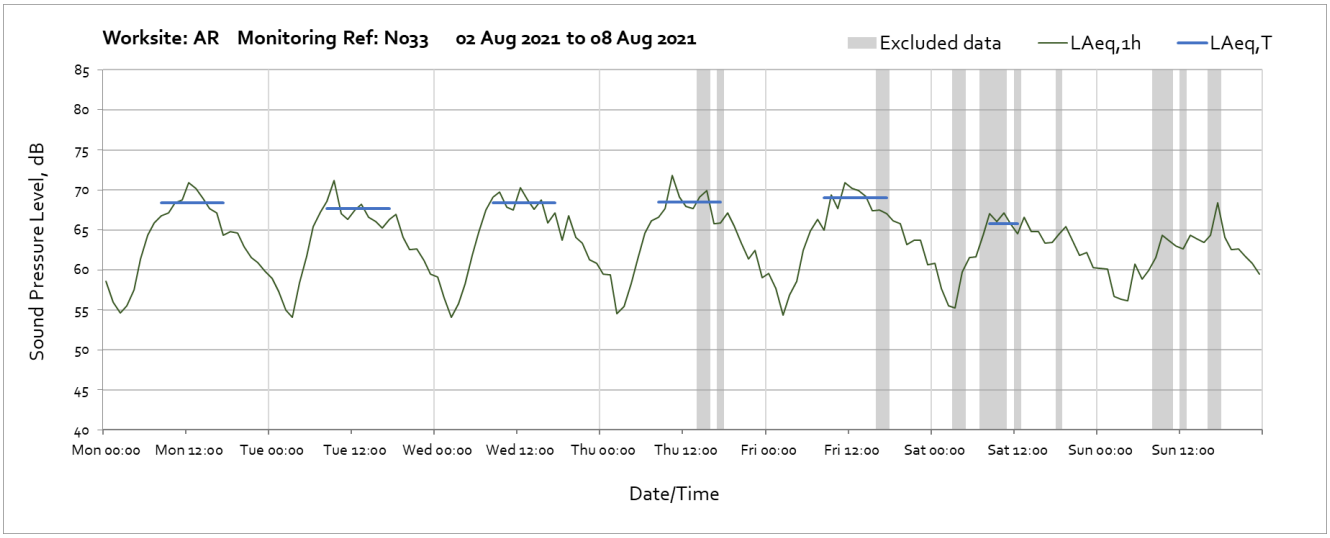

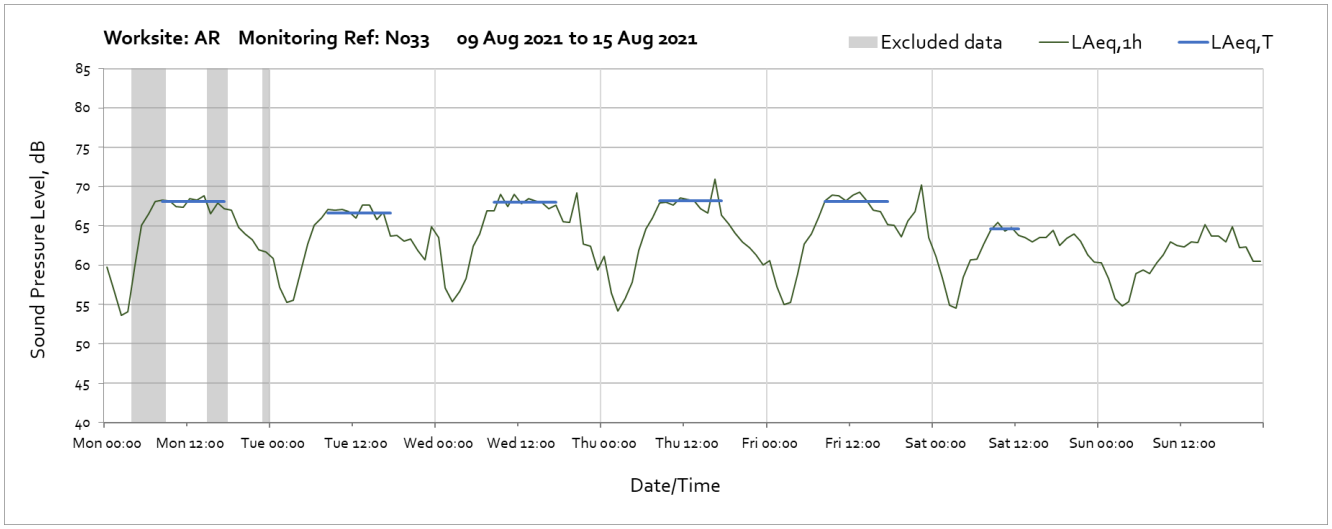

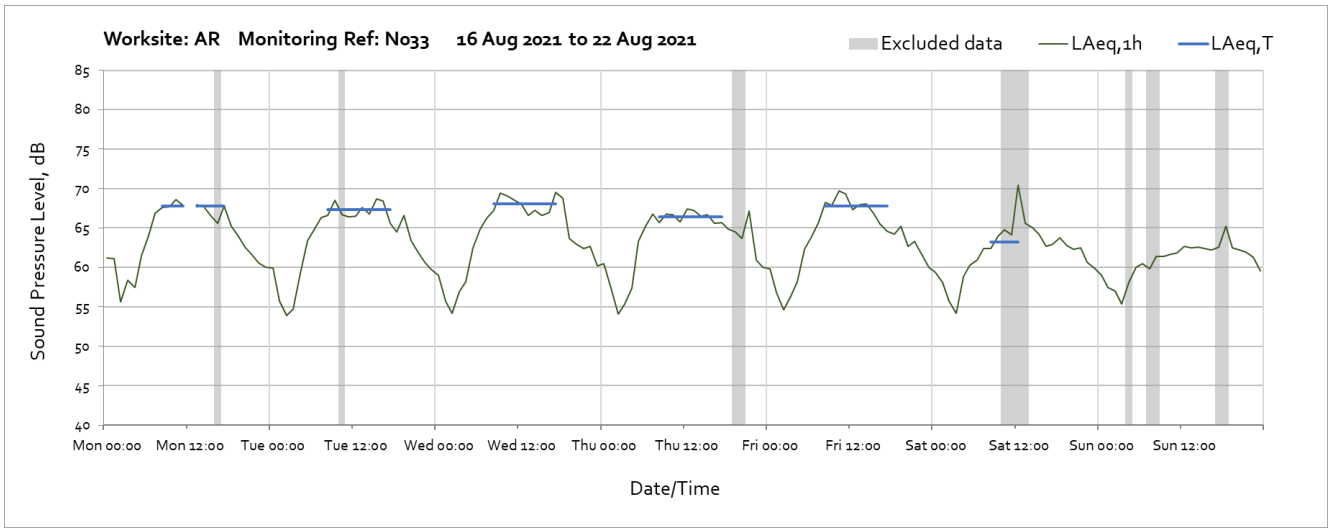

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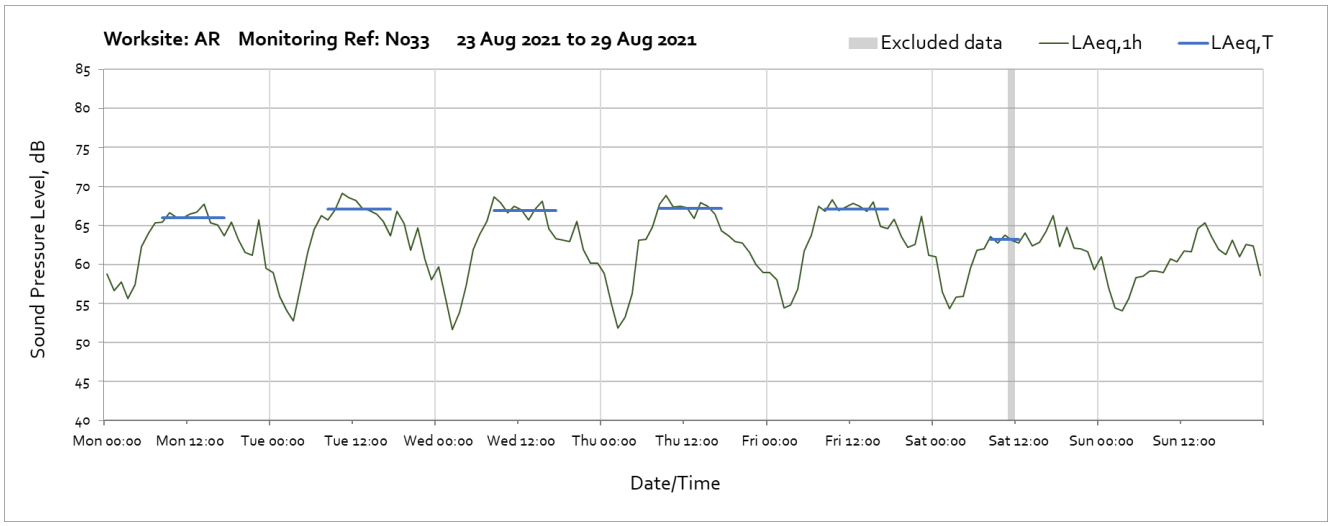

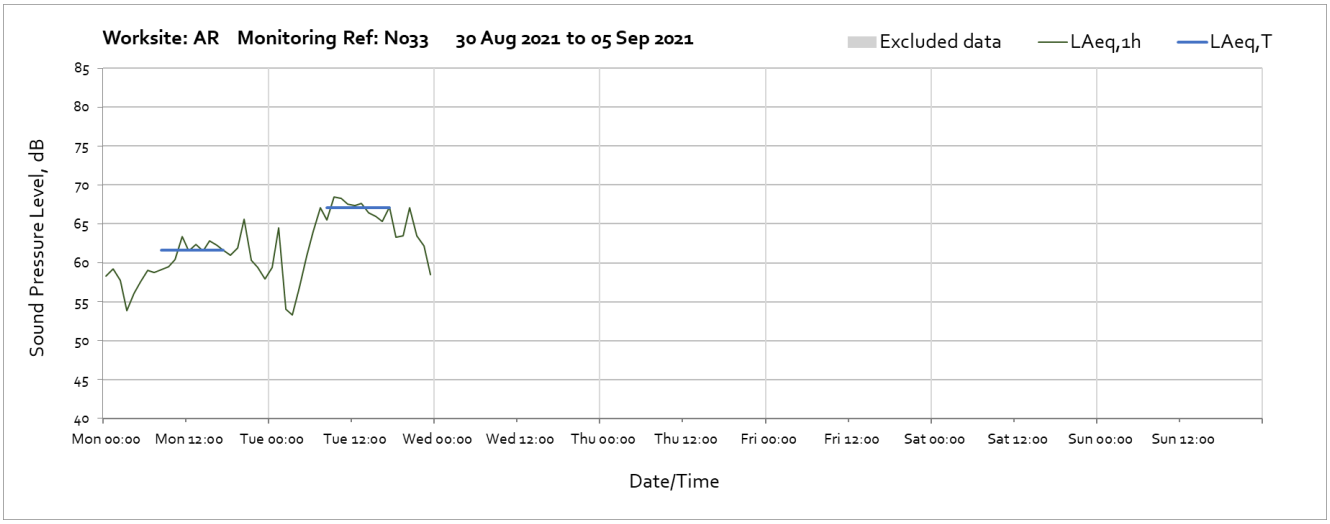

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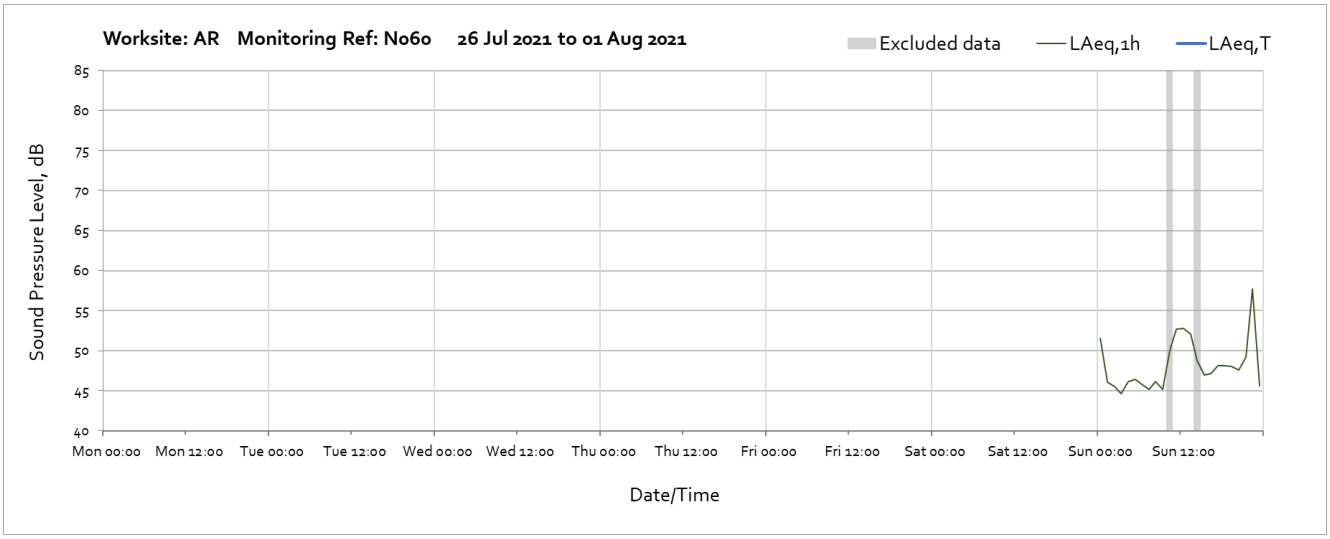

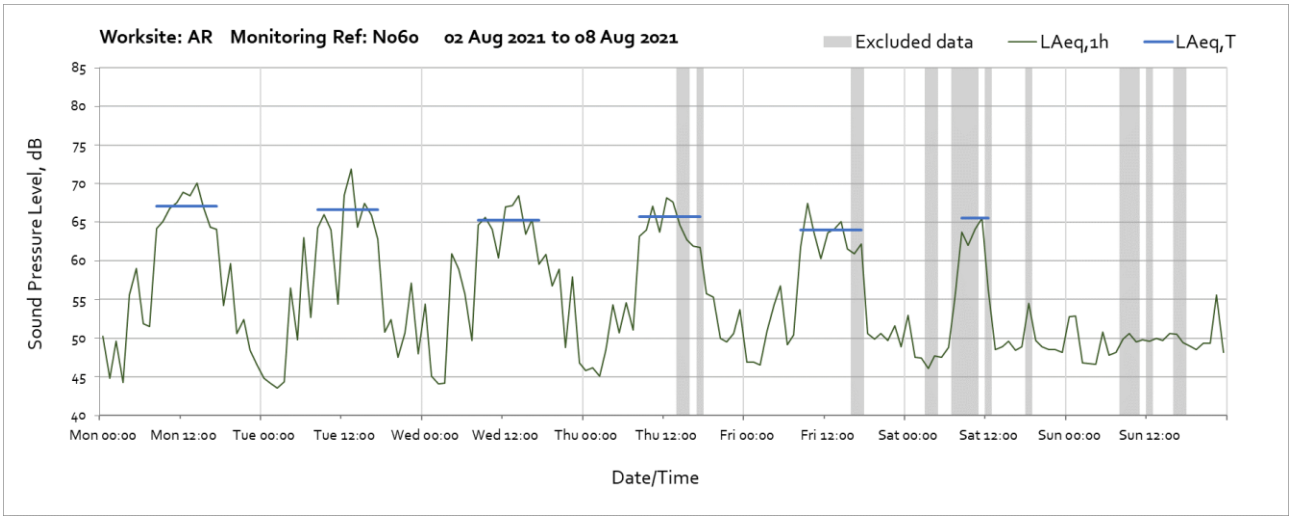

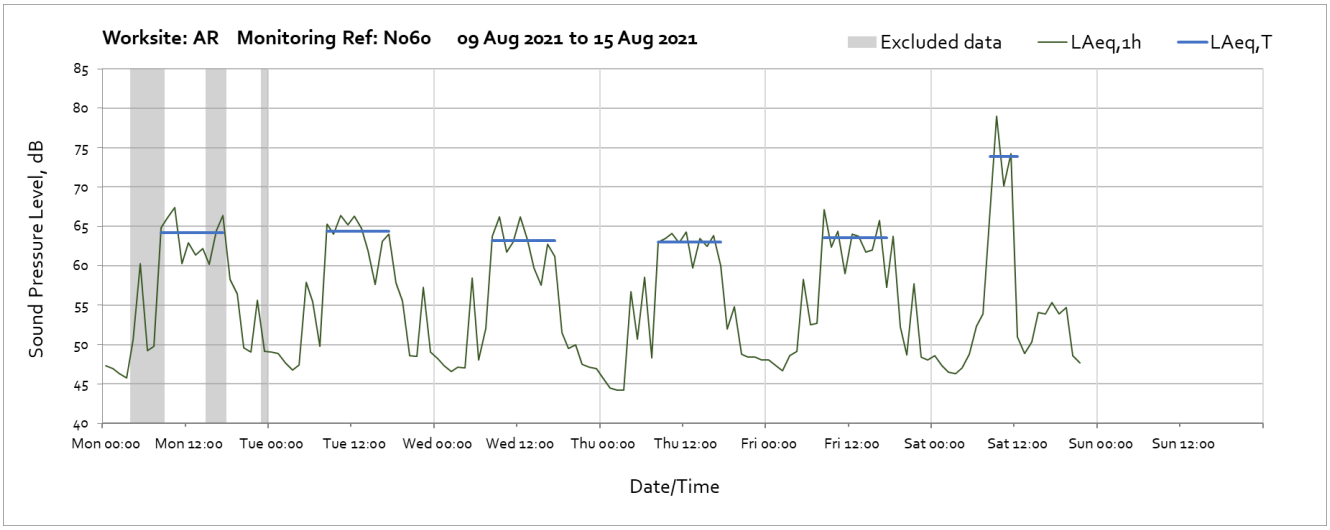

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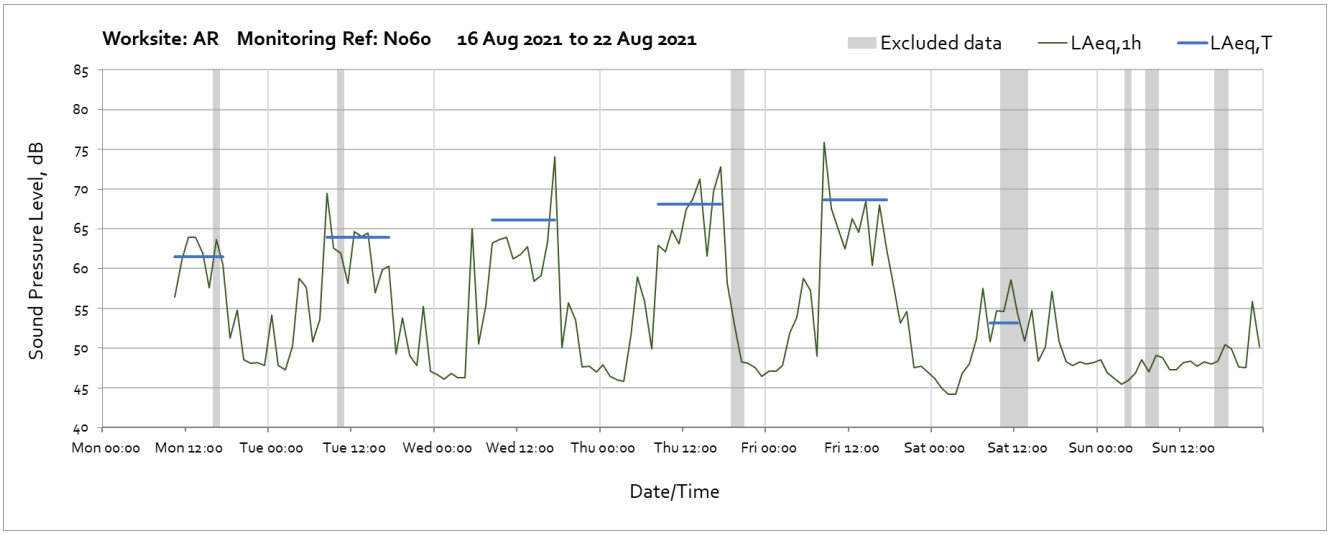

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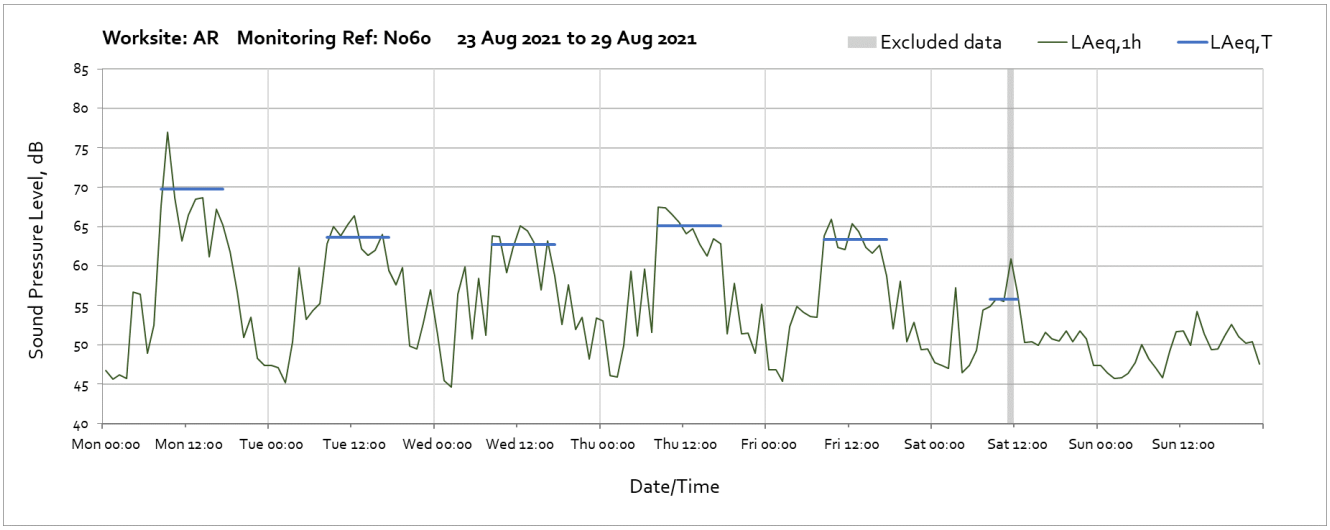

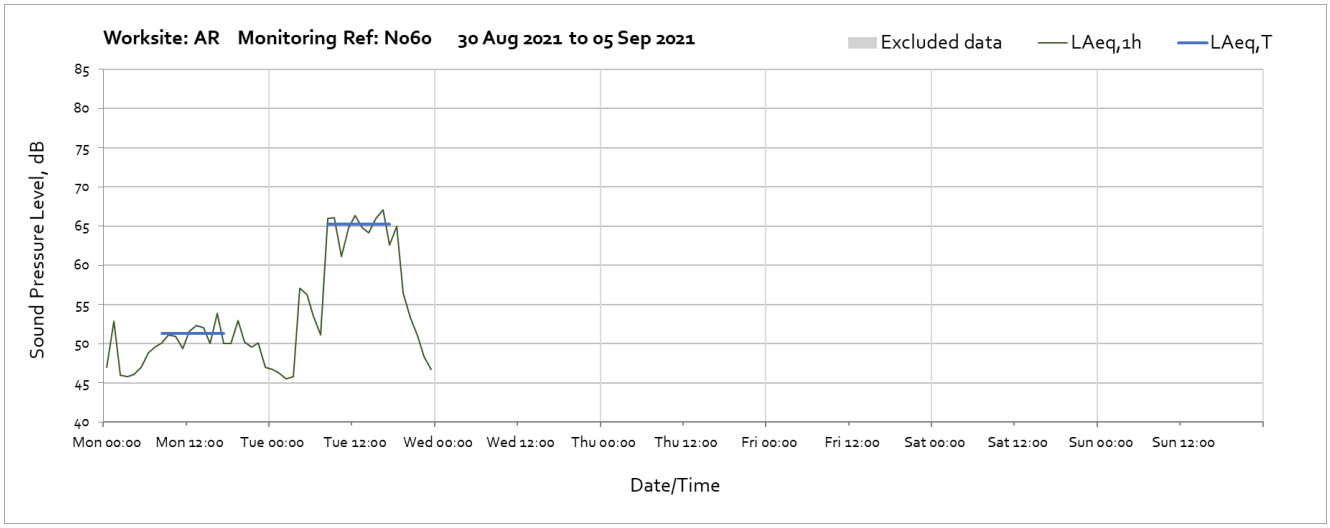

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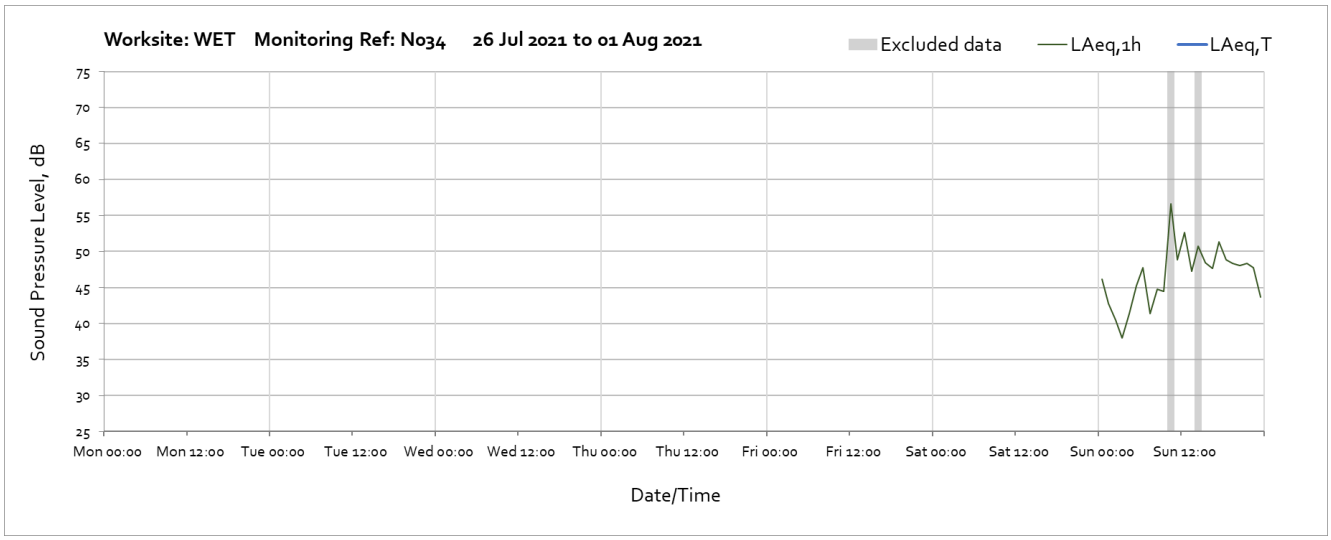

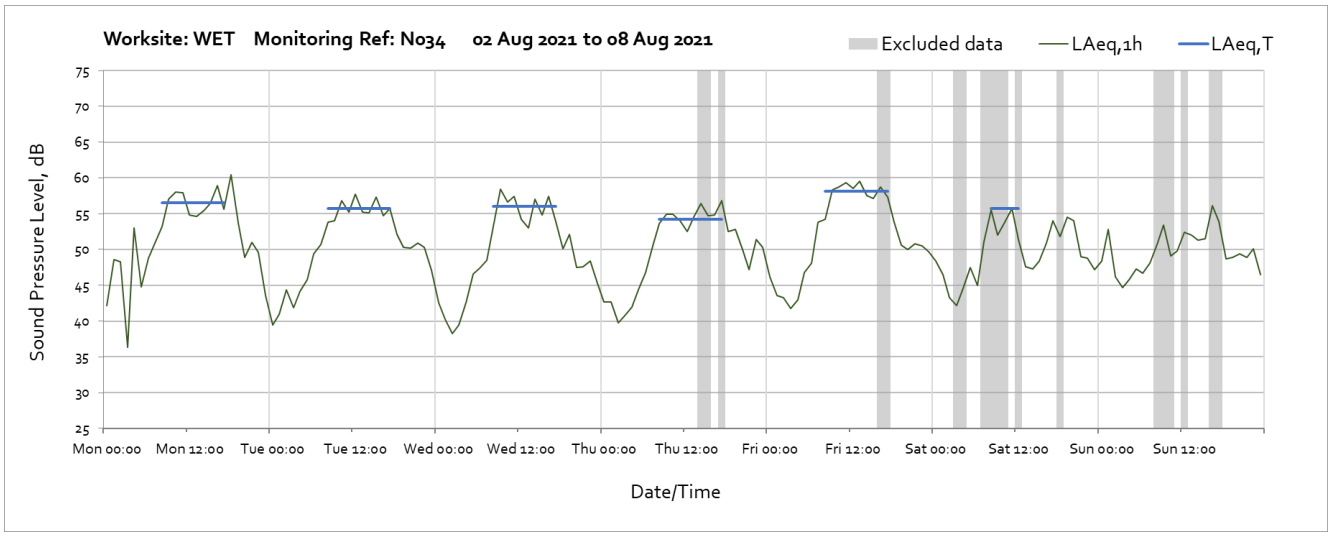

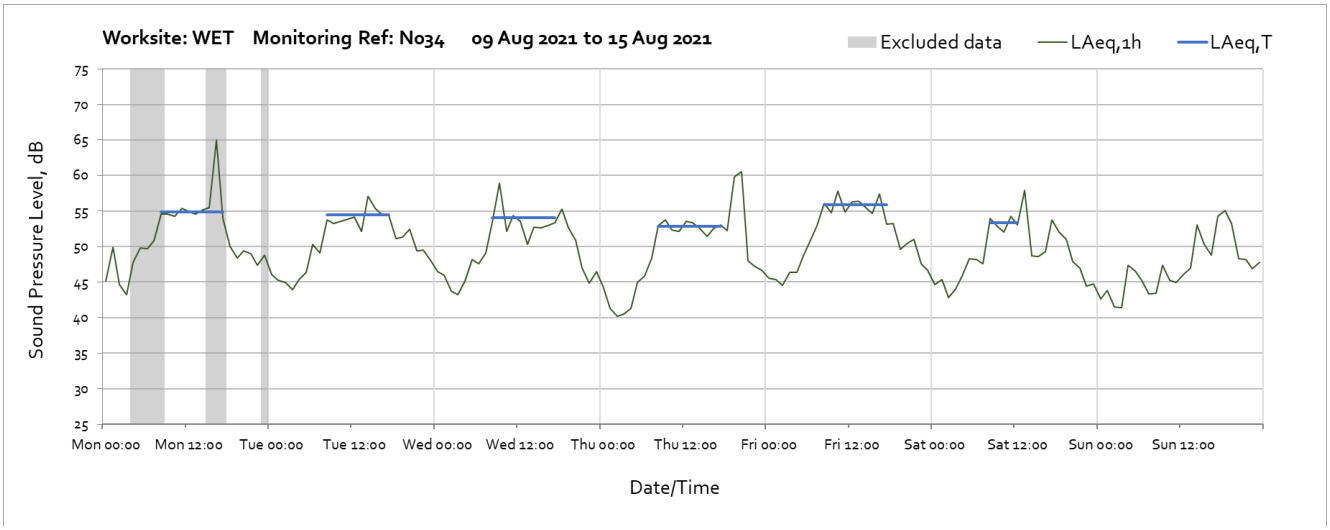

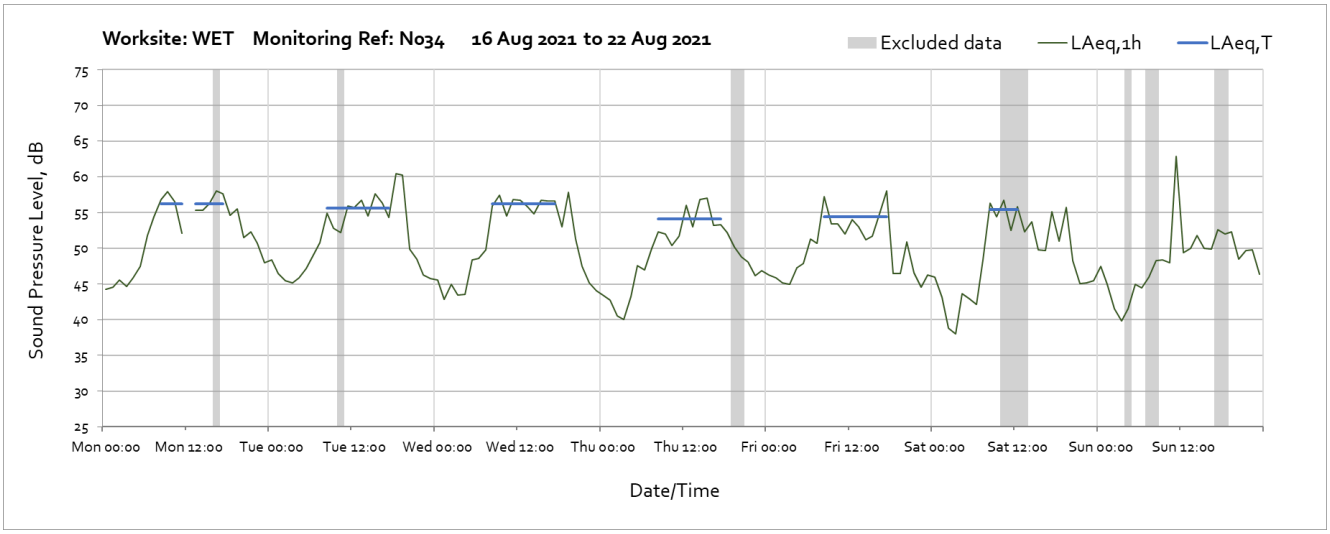

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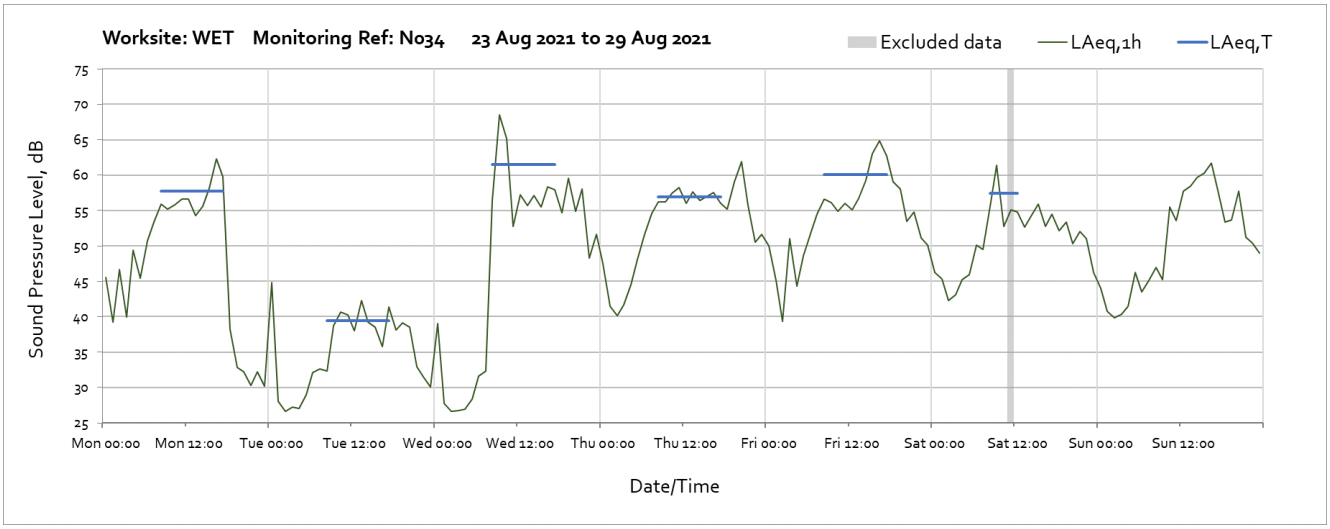

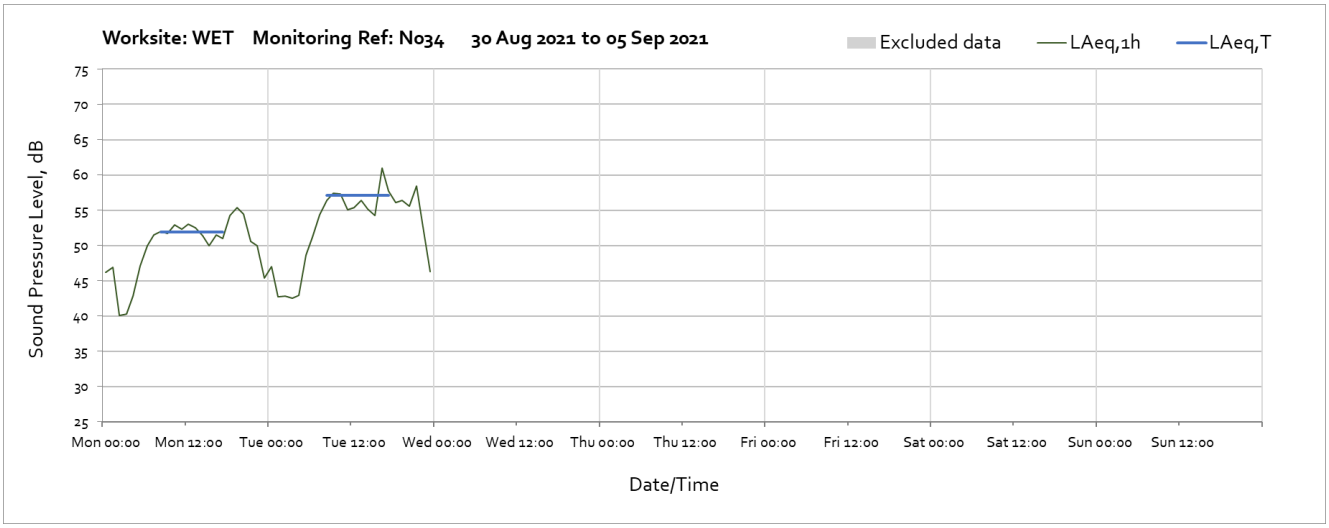

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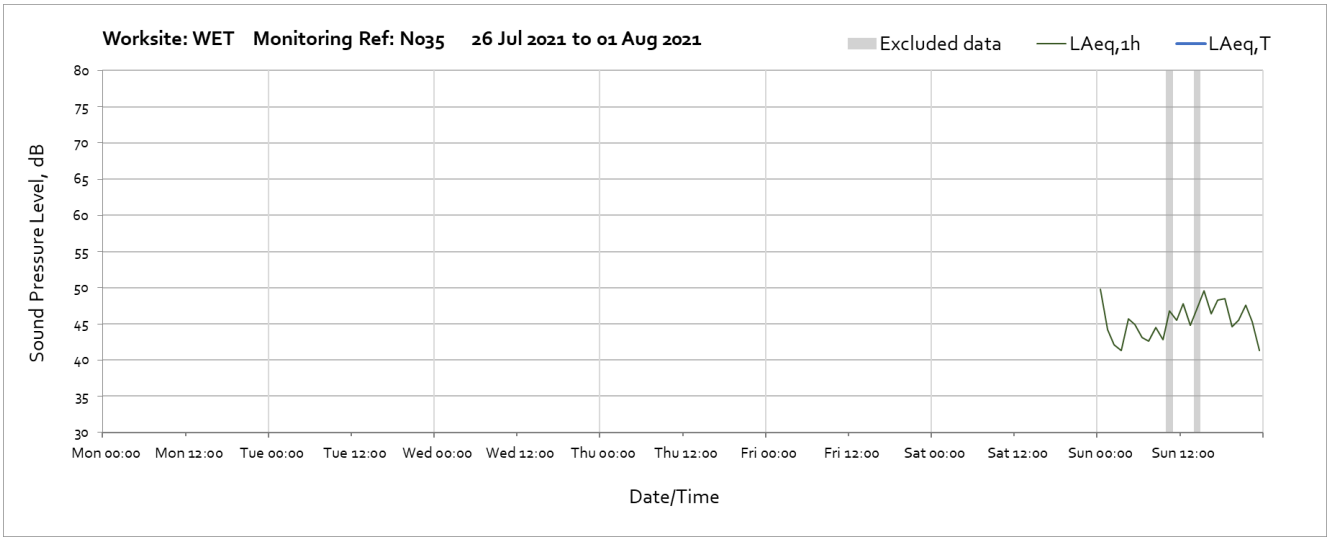

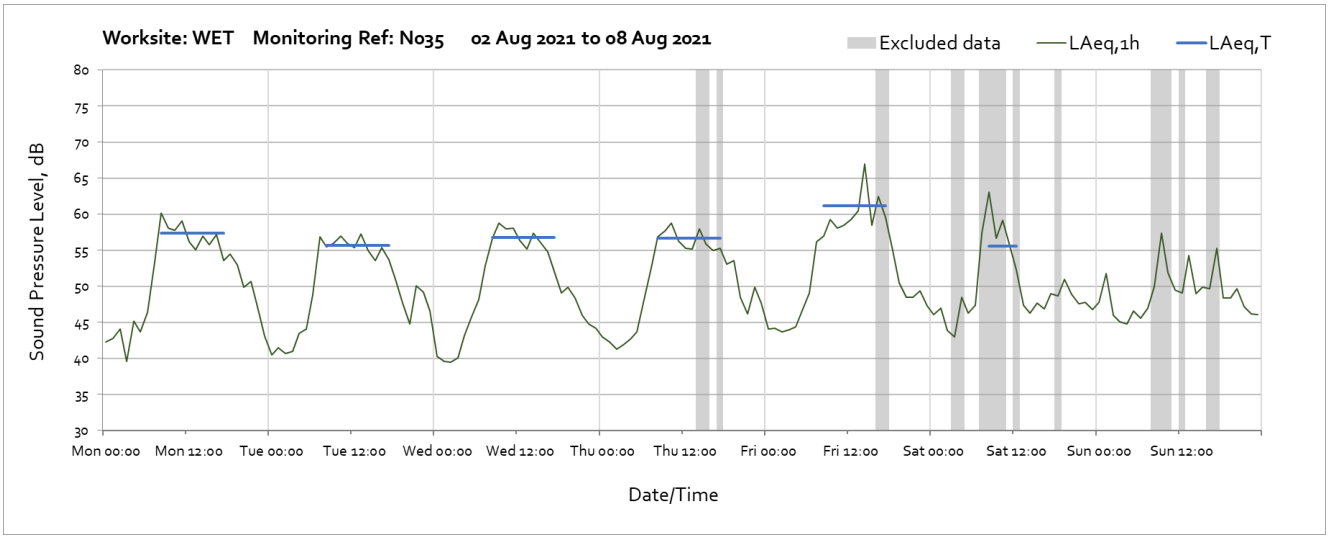

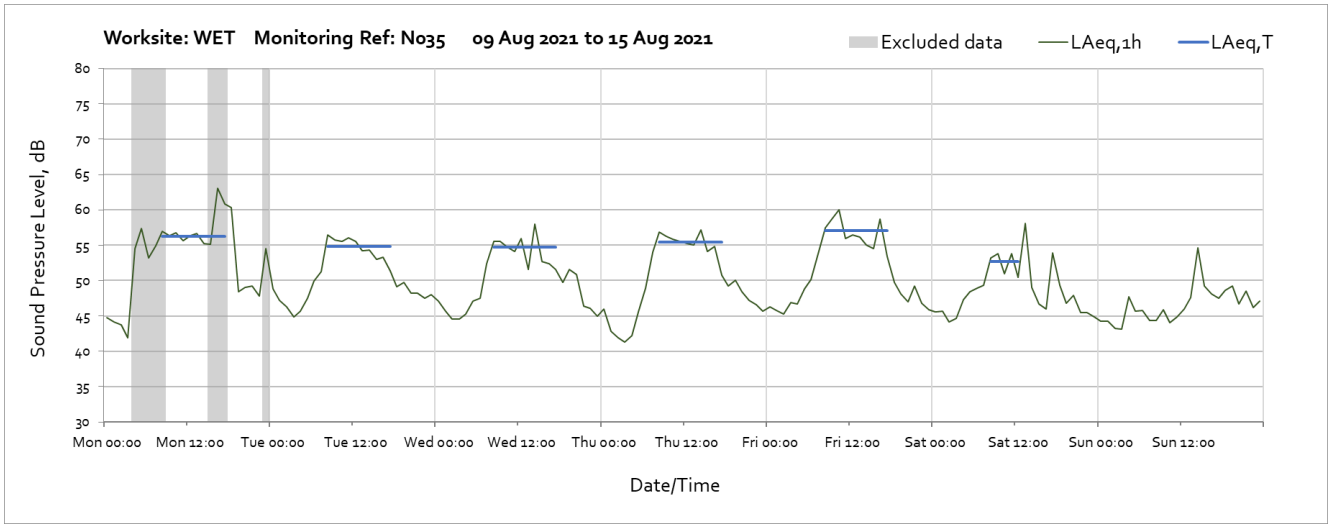

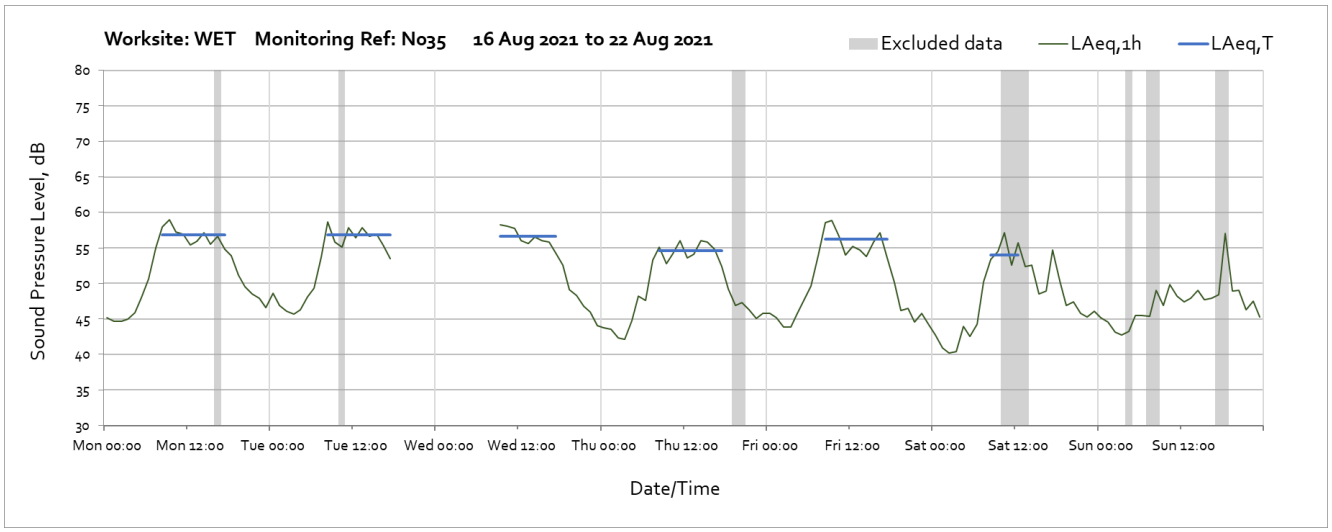

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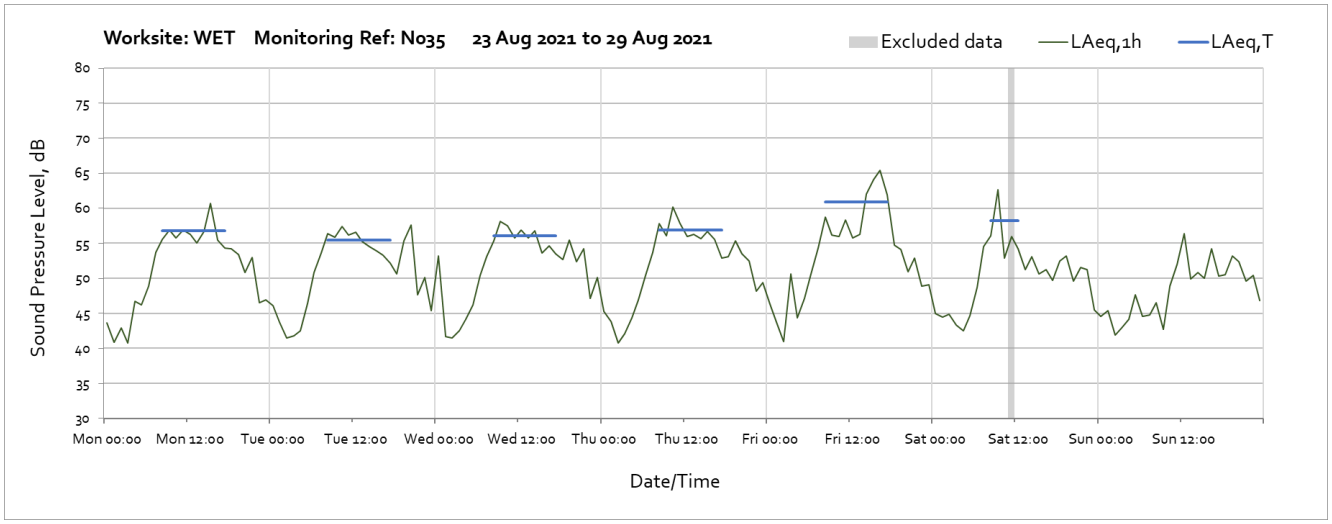

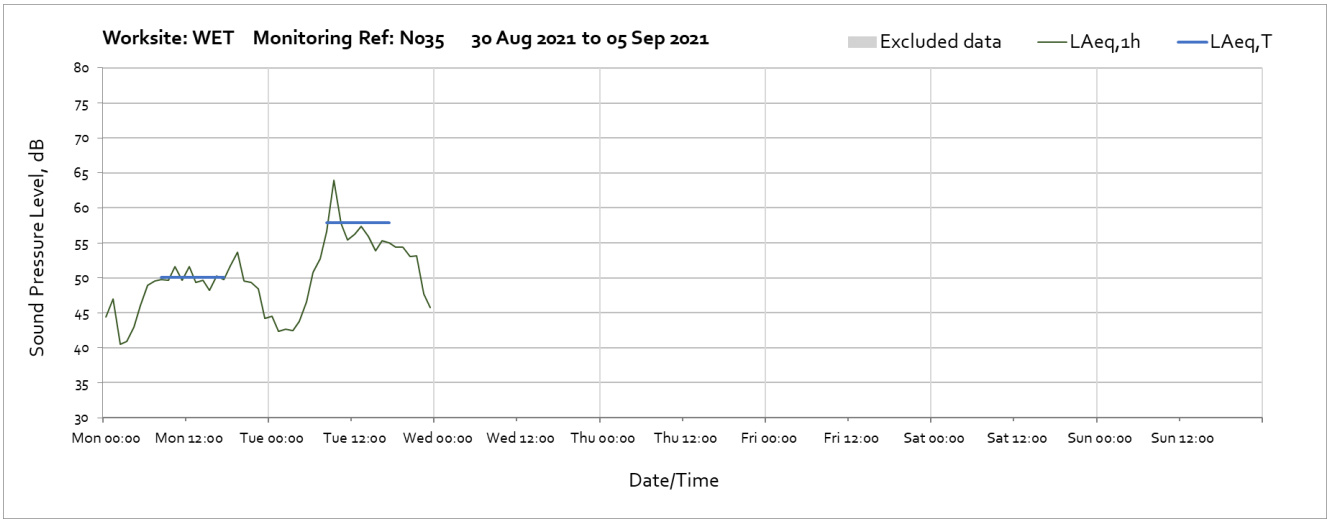

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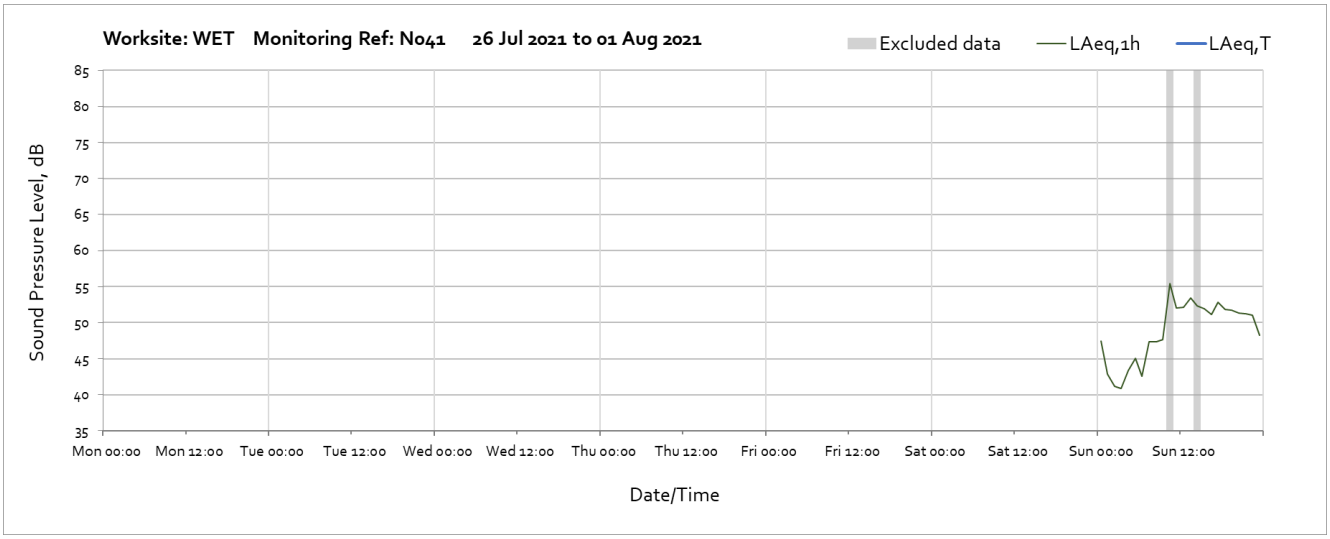
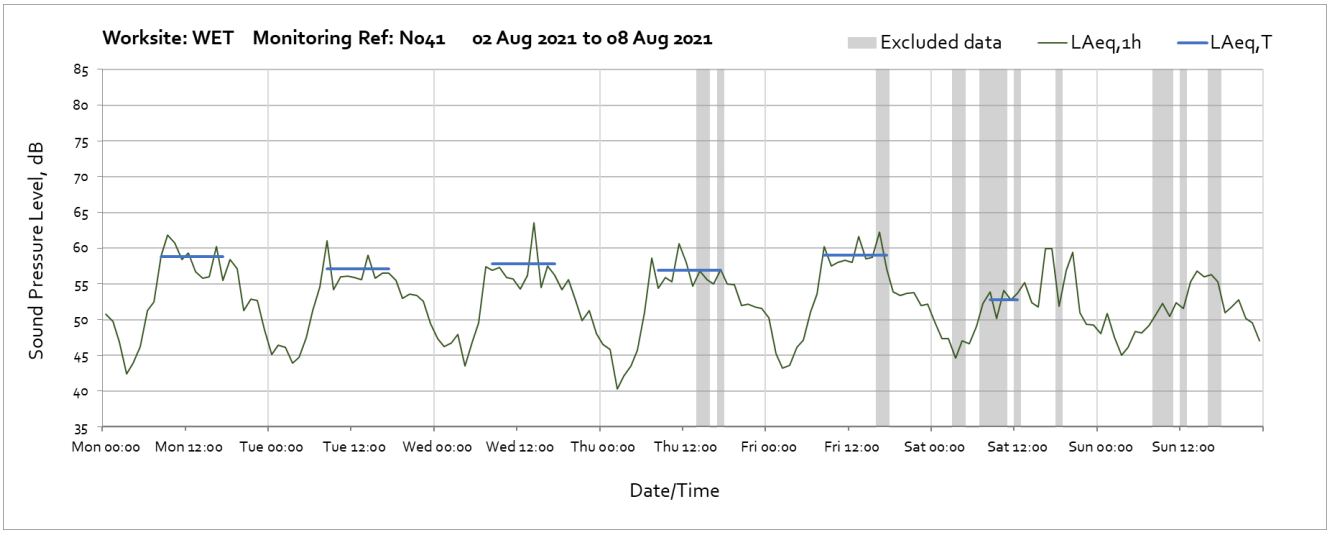
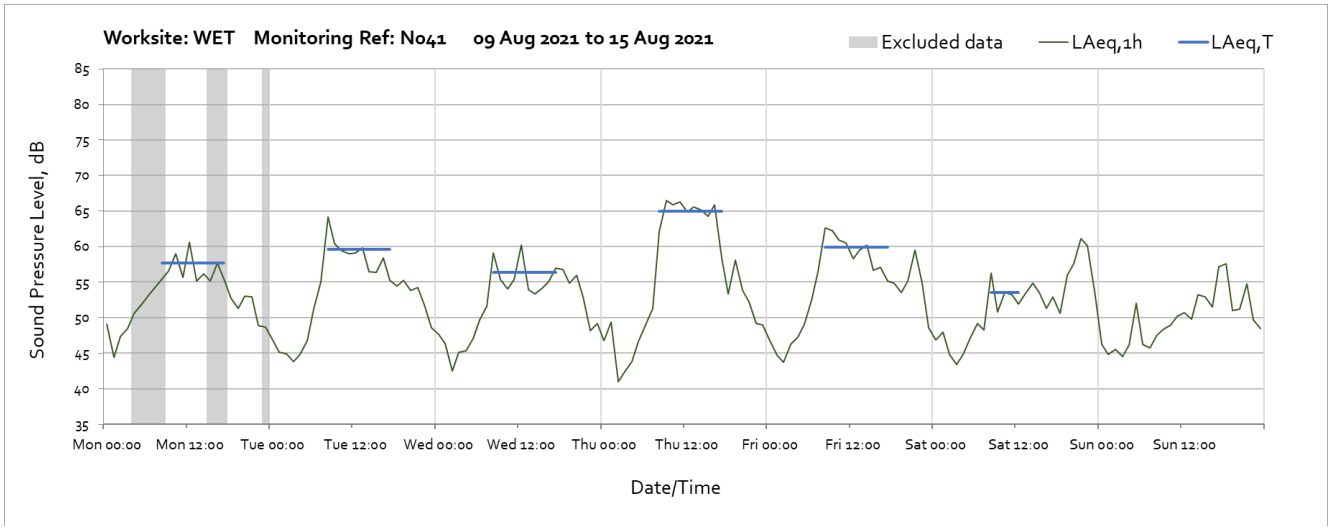
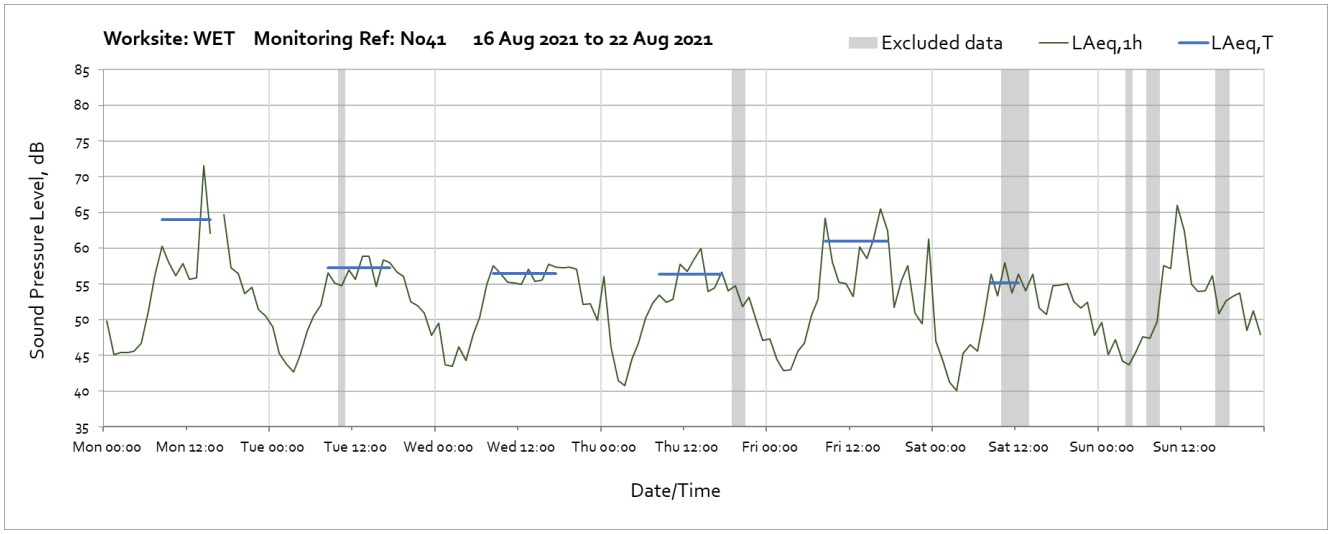
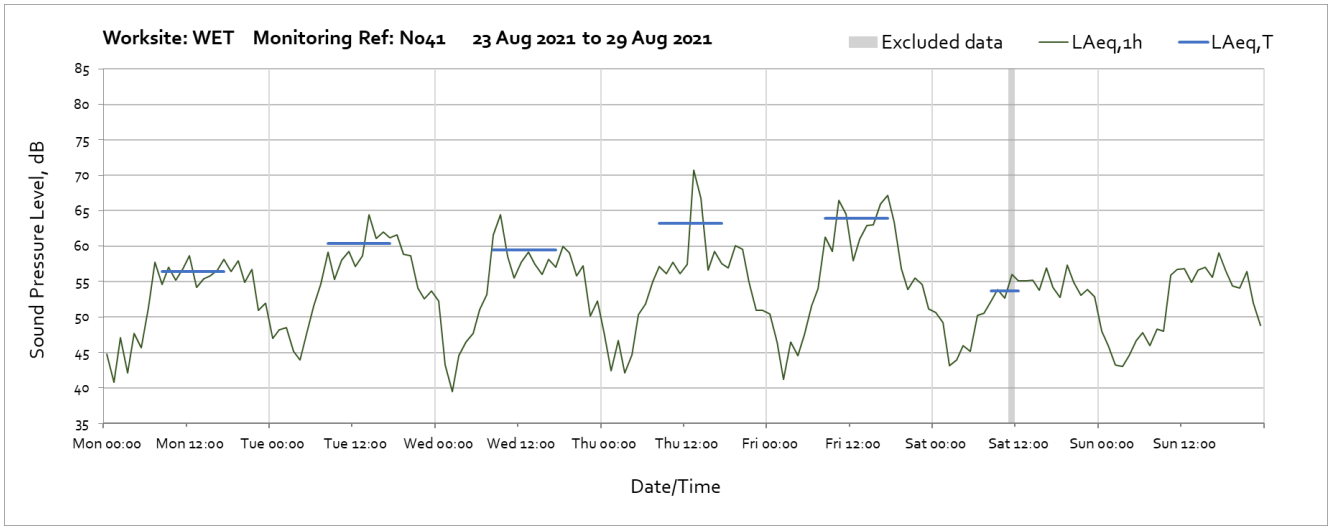


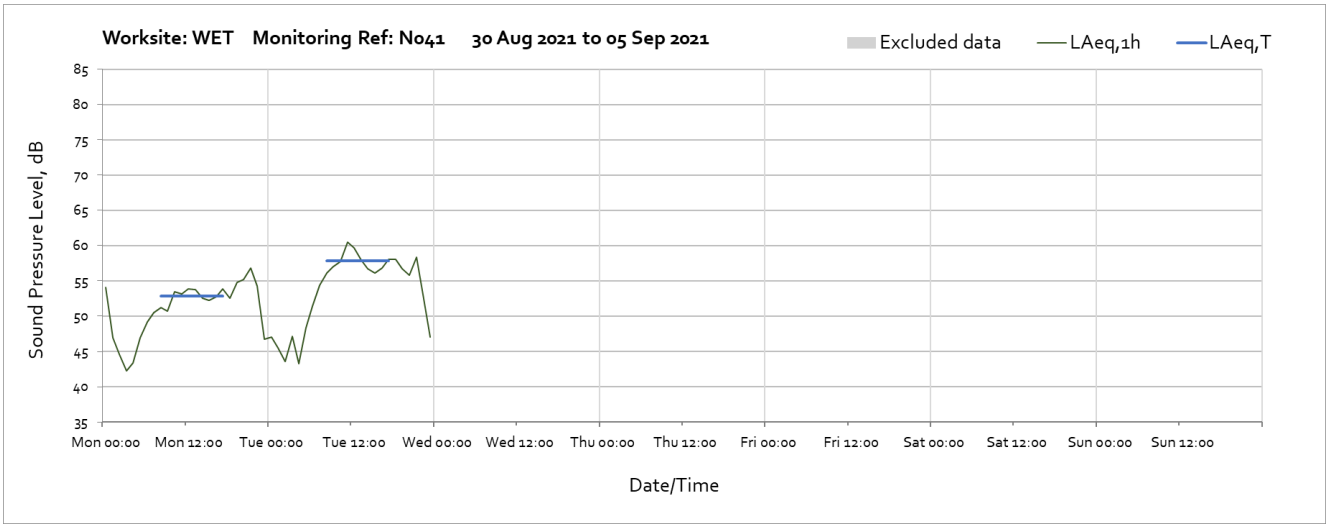




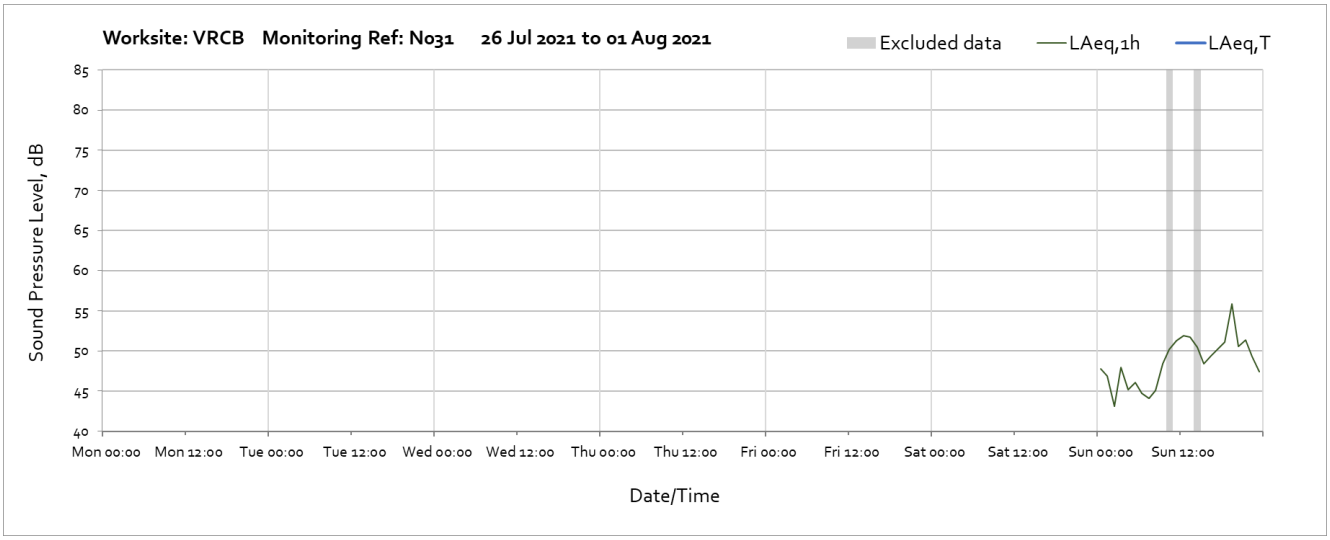


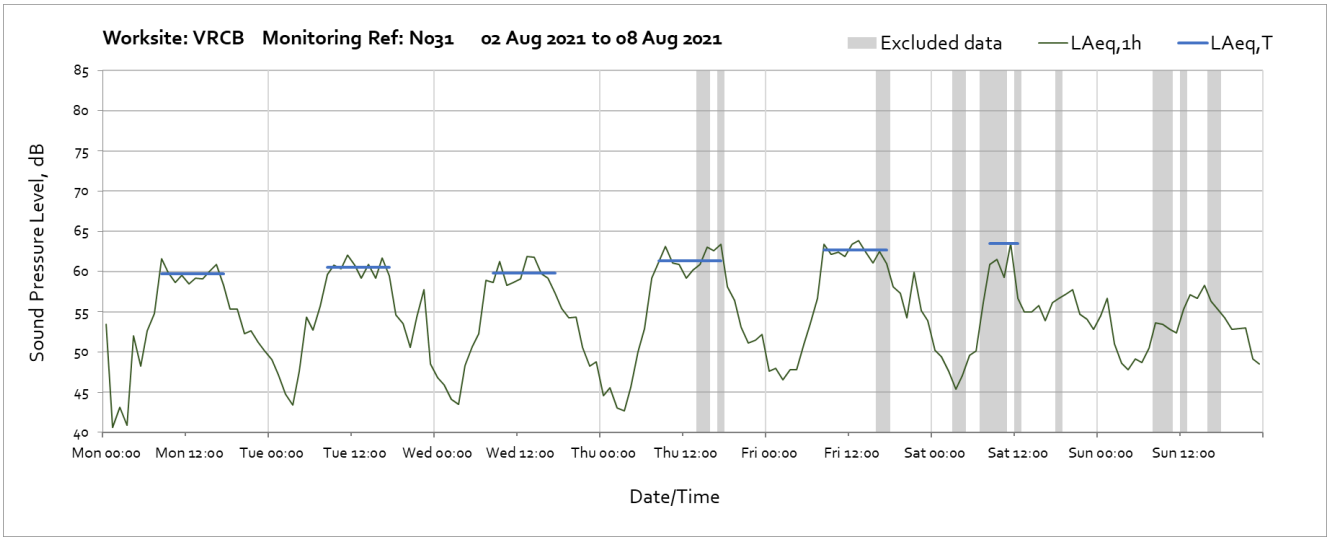
Note: Missing data at 16:00 on Monday 16th August 2021 was due to monitoring station memory card error.

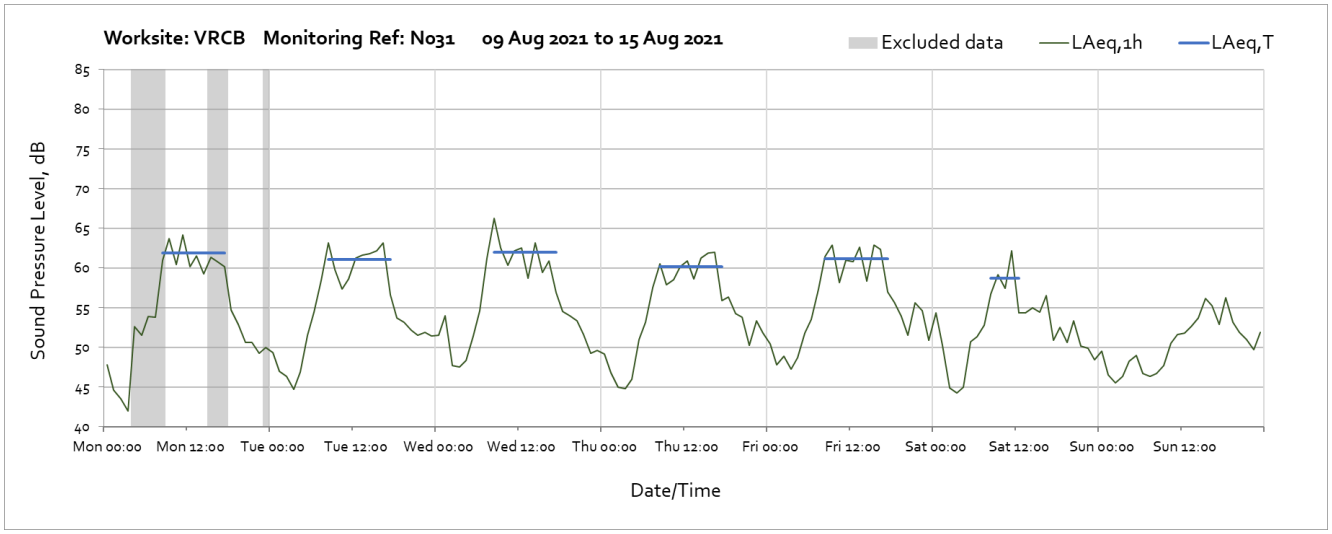




Worksite: Victoria Road Crossover Box (VRCB) – Monitoring Ref: N031






Worksite: VRCB Monitoring Ref: No31 09 Aug 2021 to 15 Aug 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
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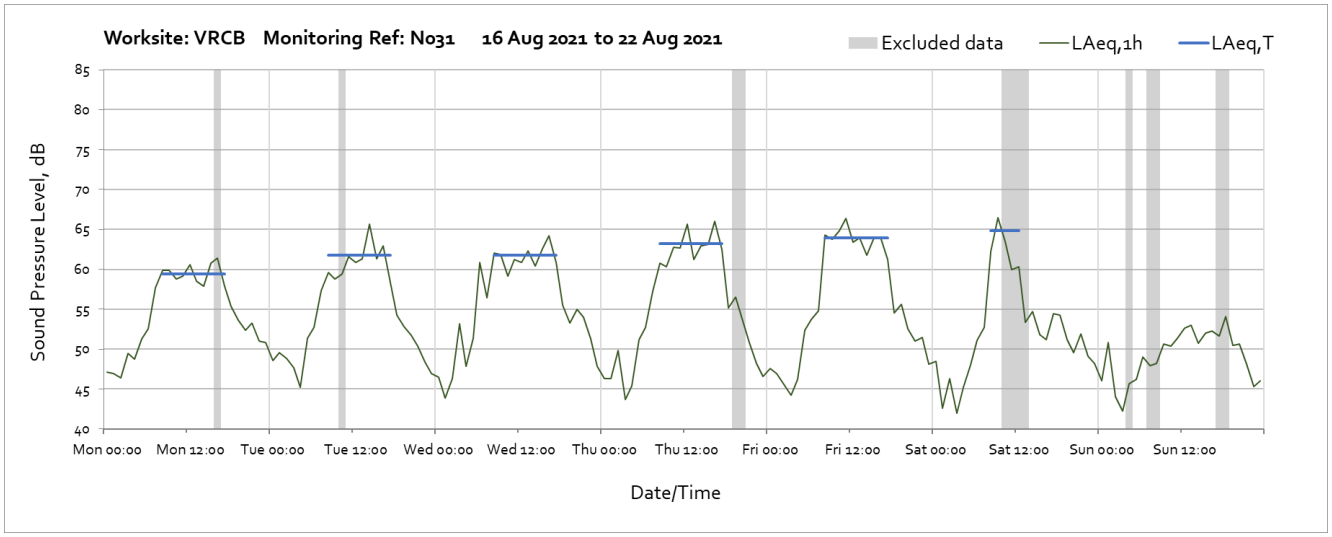
Date/Time


Worksite: VRCB Monitoring Ref: No31 16 Aug 2021 to 22 Aug 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
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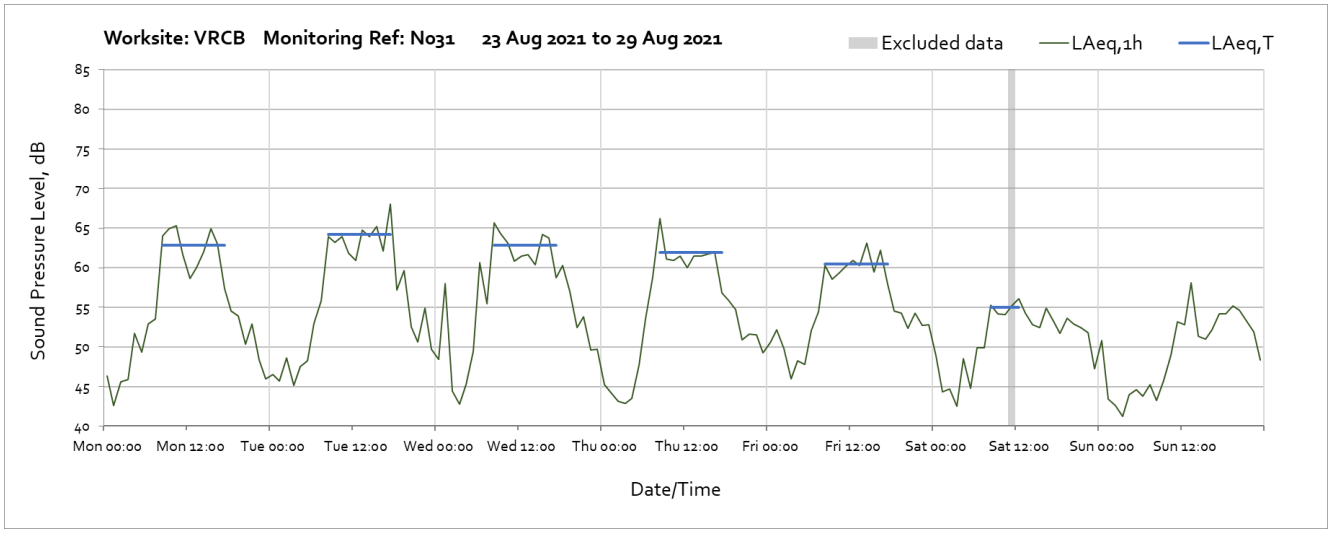
Date/Time


Worksite: VRCB Monitoring Ref: No31 23 Aug 2021 to 29 Aug 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
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Wed 12:00
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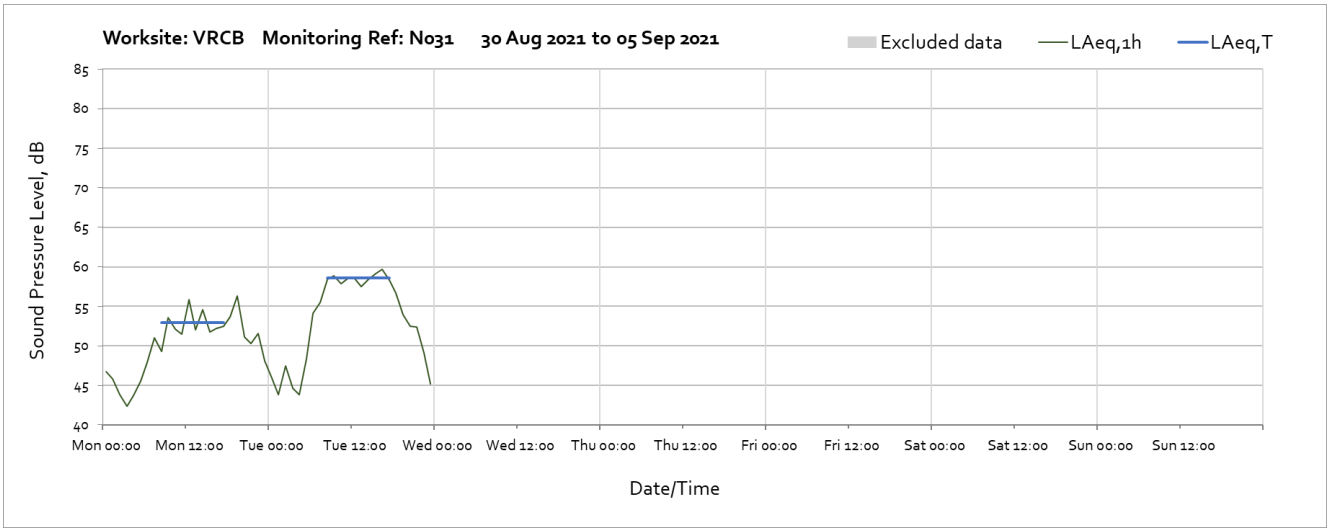
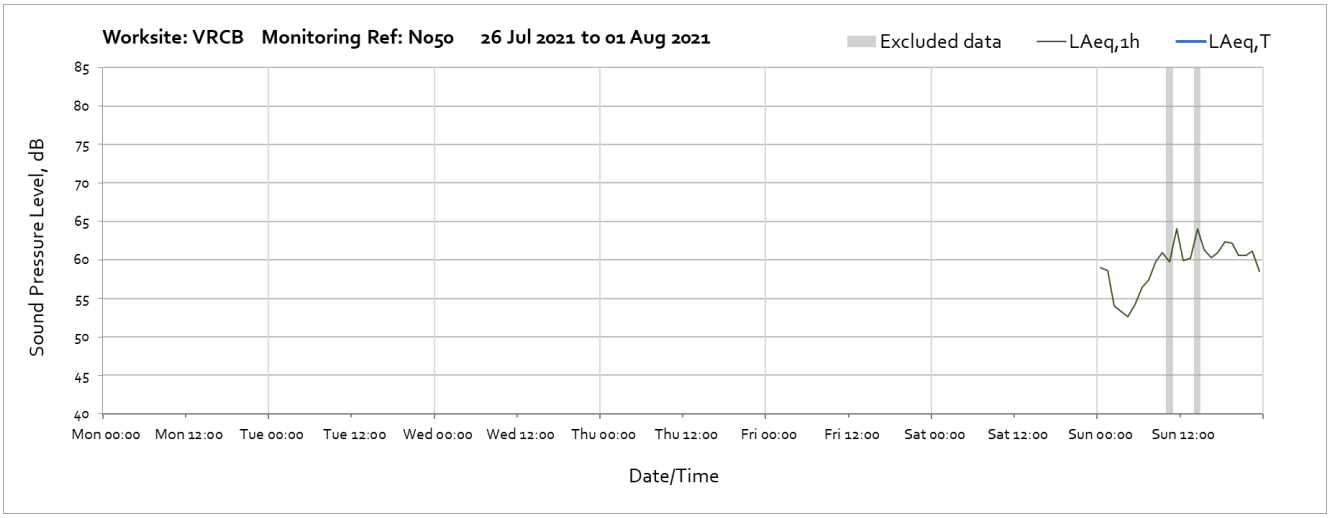
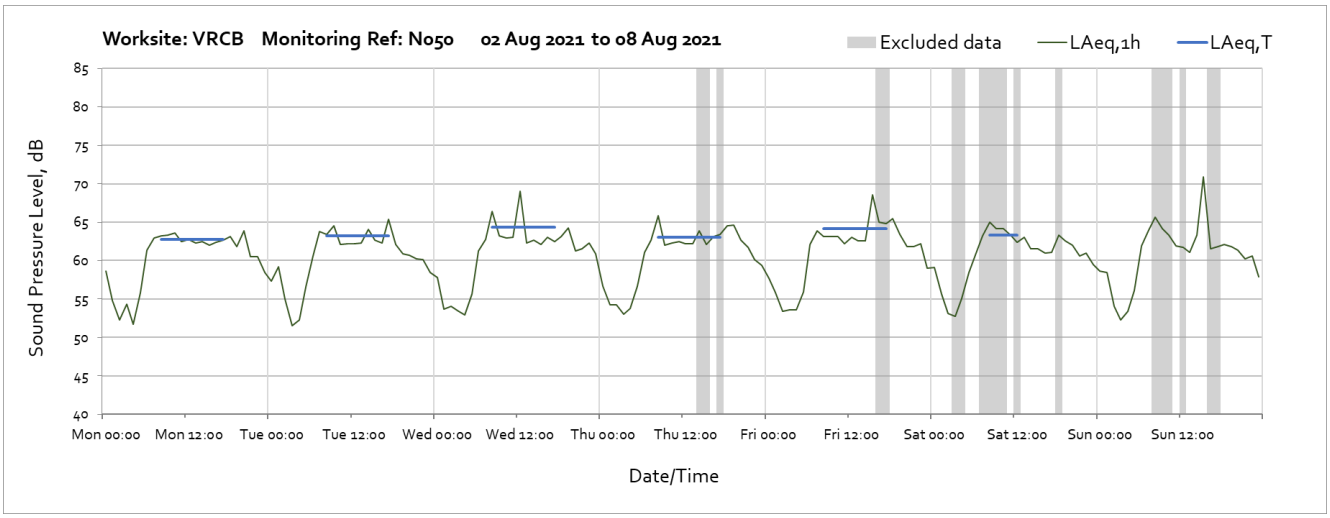
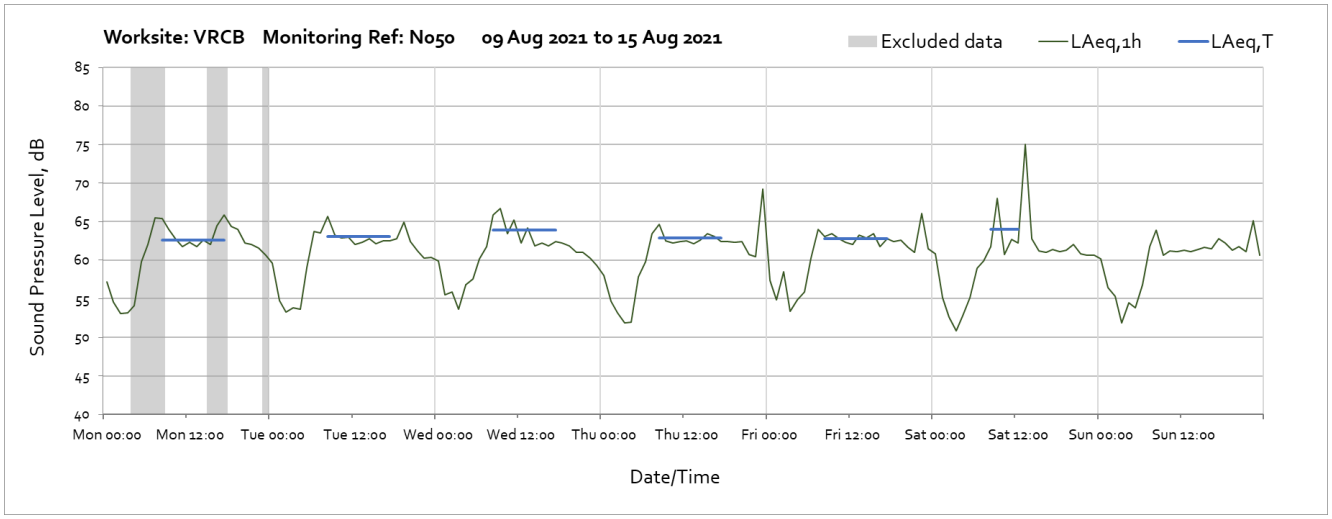
Date/Time

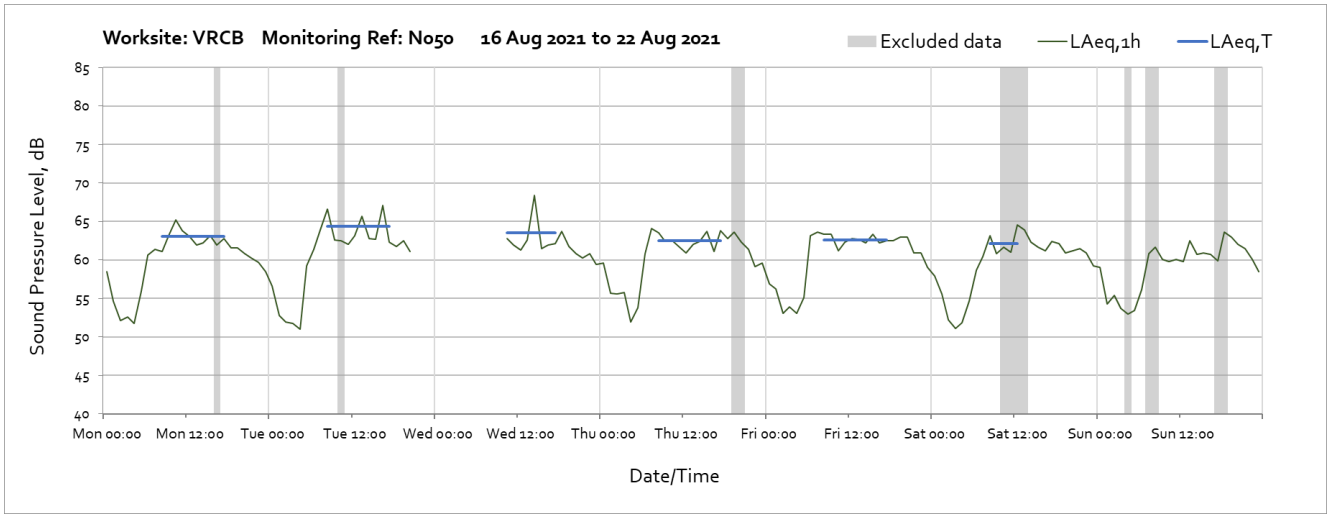


Worksite: Victoria Road Crossover Box (VRCB) – Monitoring Ref: N050

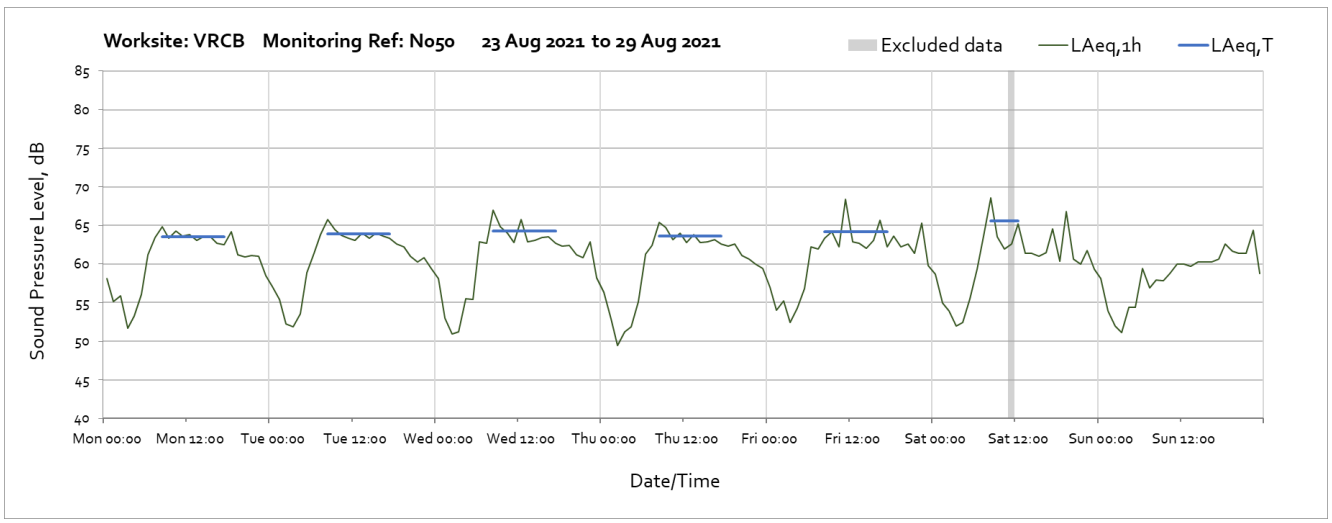


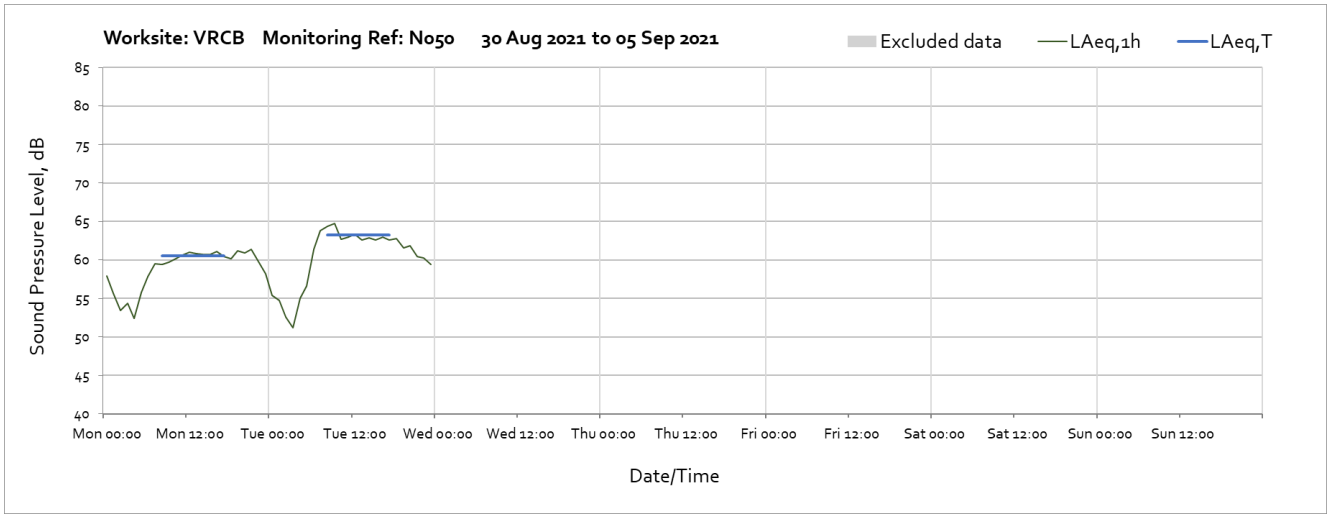




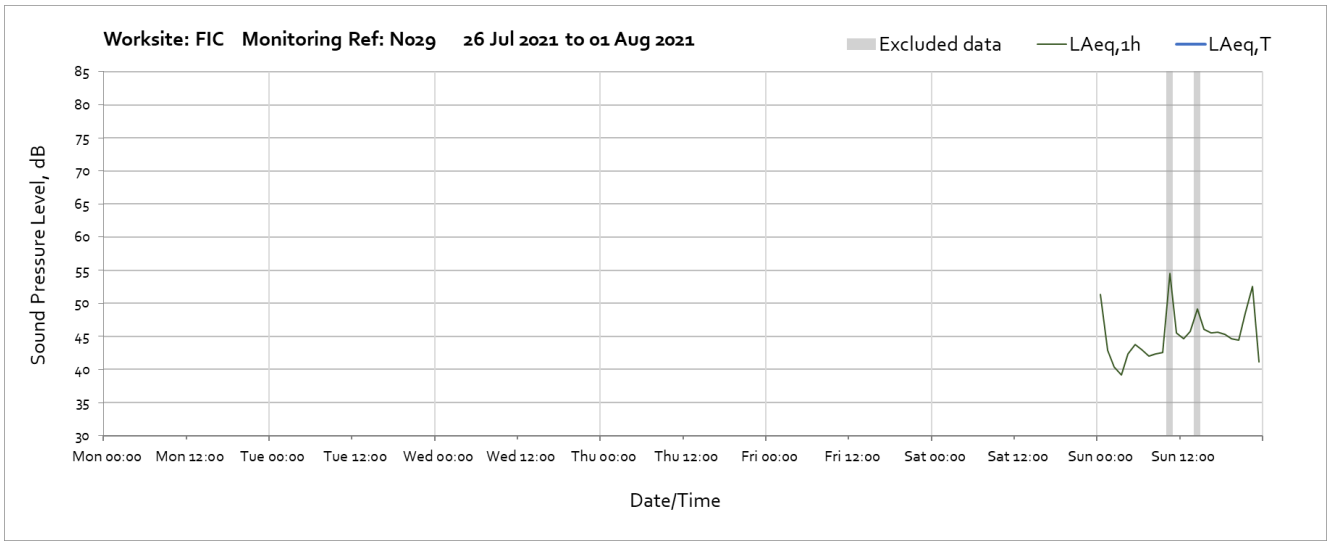


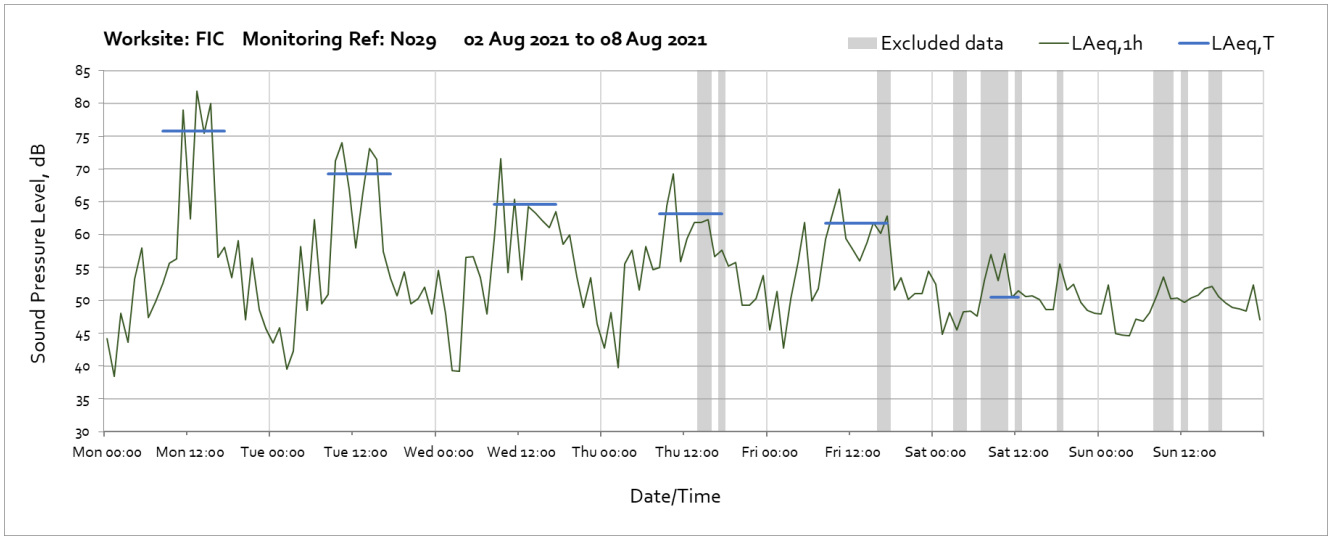
Note: Missing data between 21:00 on Tuesday 17th August and 10:00 on Wednesday 18th August 2021 was due to monitoring station memory card error.

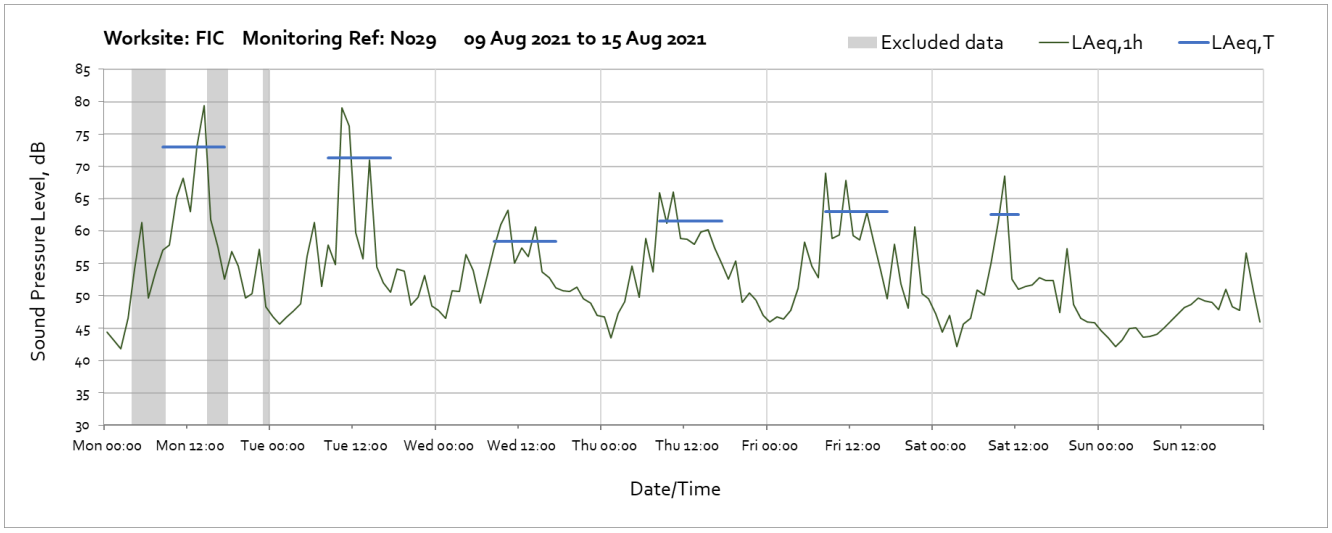




Worksite: Flat Iron Compound (FIC) – Monitoring Ref: N029






Worksite: FIC Monitoring Ref: No29 09 Aug 2021 to 15 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
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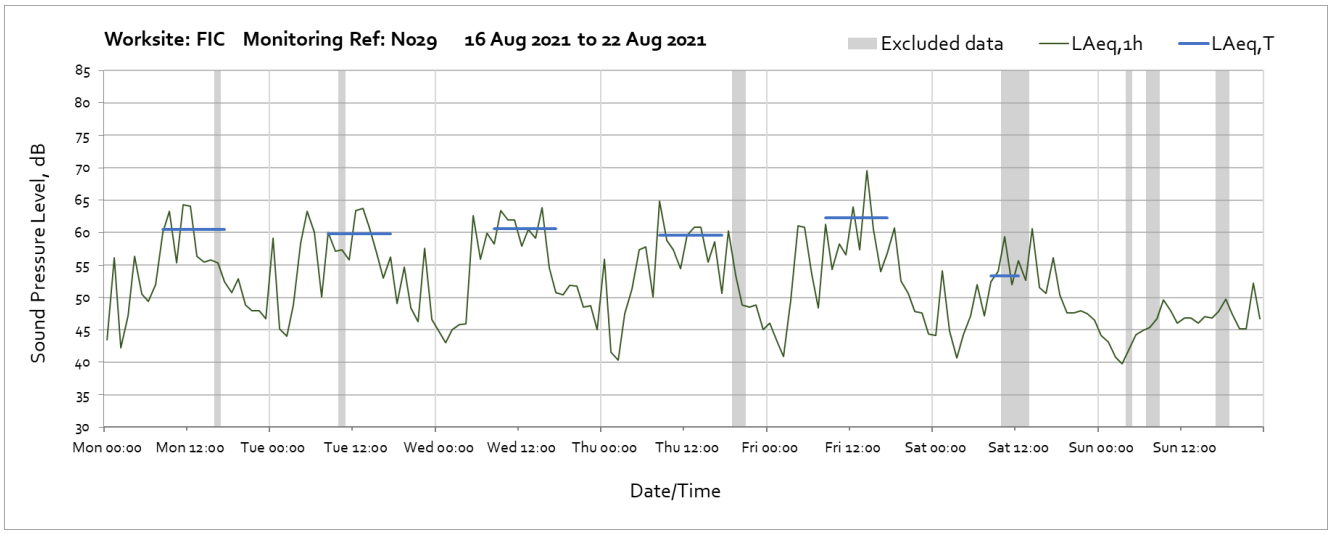
Date/Time


Worksite: FIC Monitoring Ref: No29 16 Aug 2021 to 22 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
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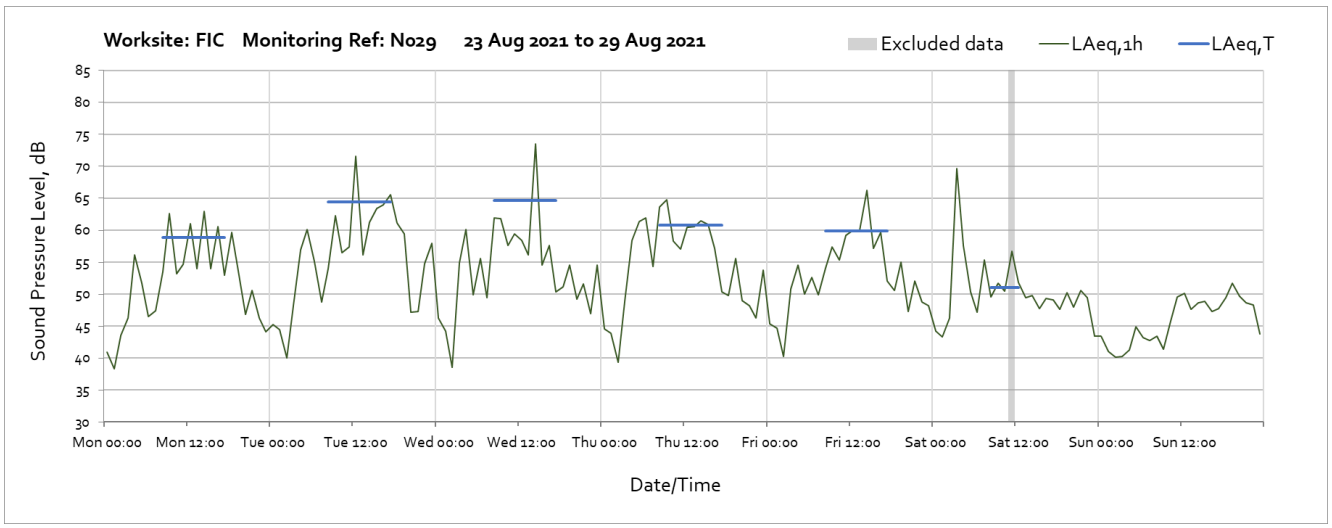
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No29 23 Aug 2021 to 29 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
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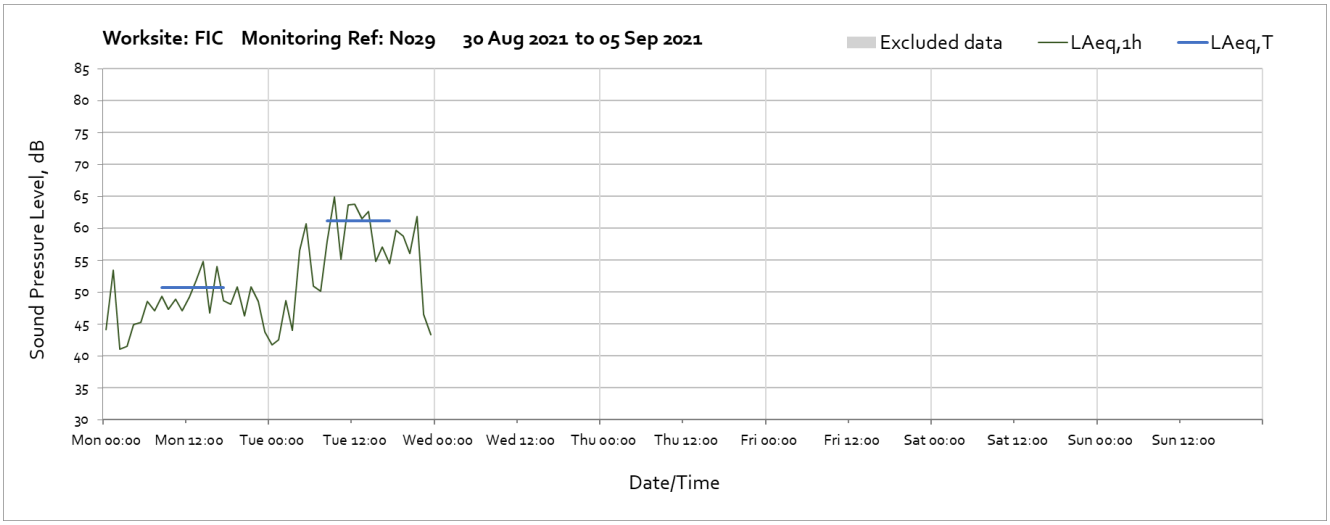
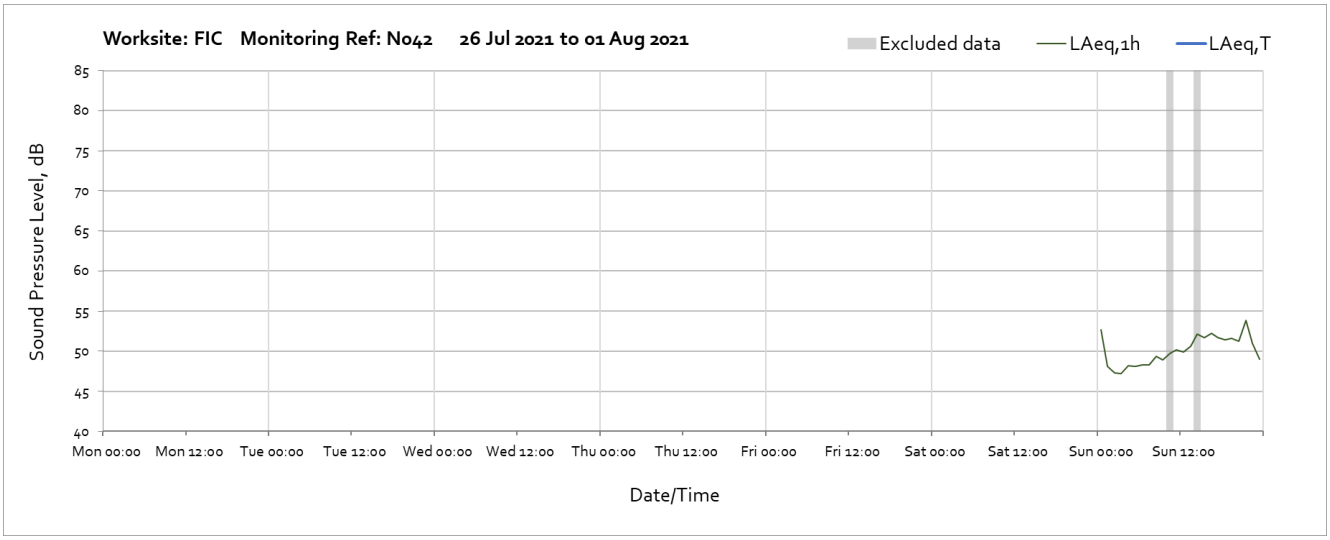
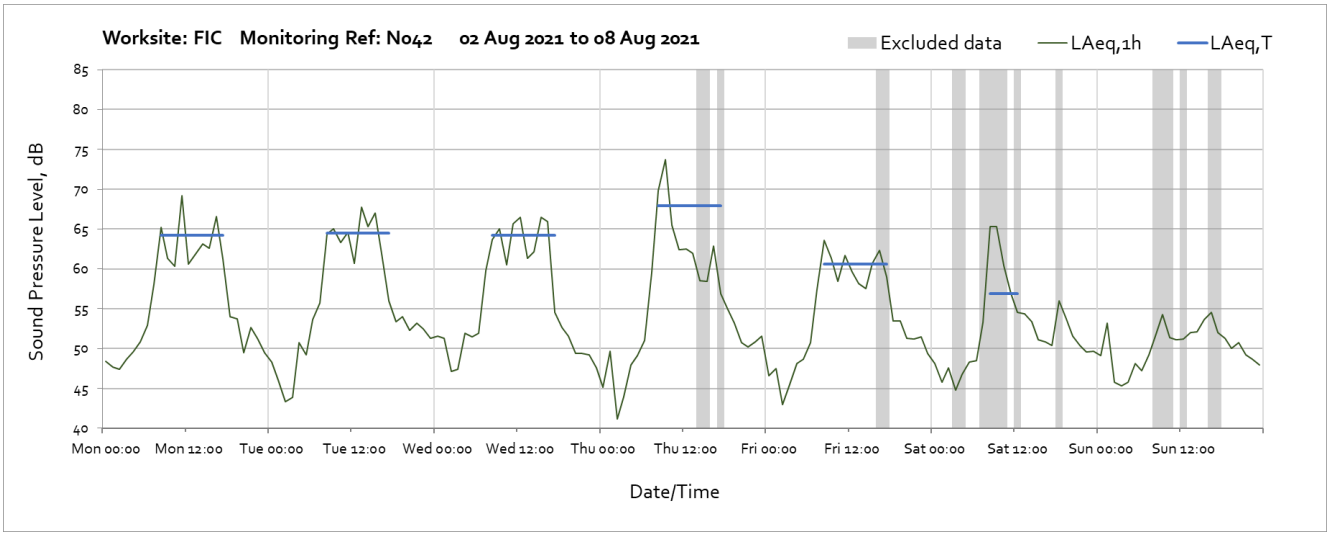
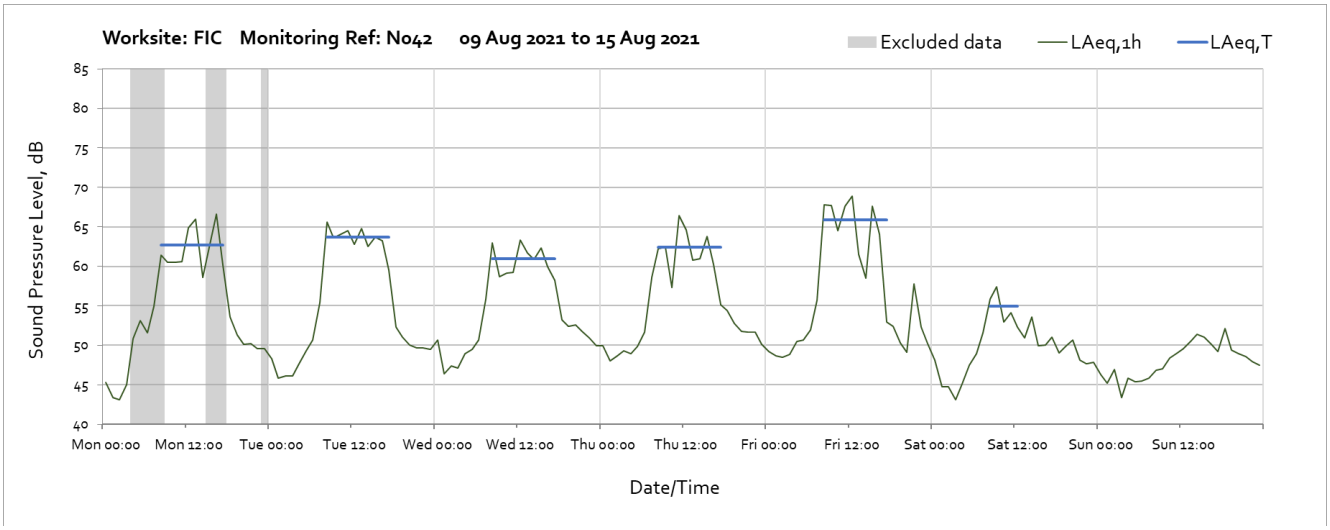
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

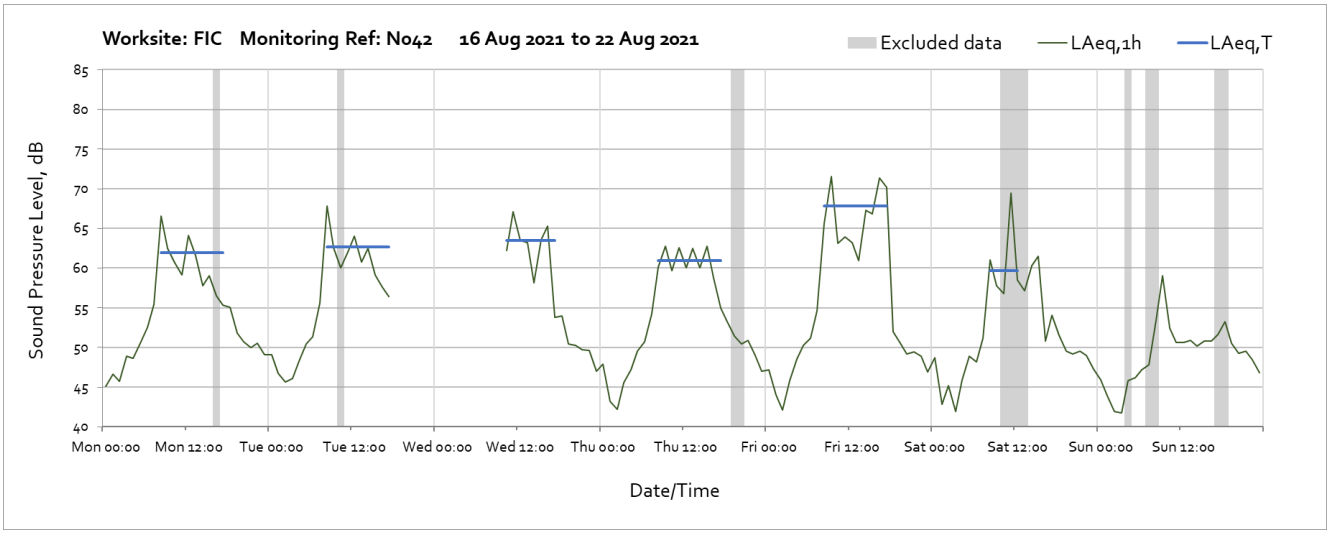


Worksite: Flat Iron Compound (FIC) – Monitoring Ref: N042

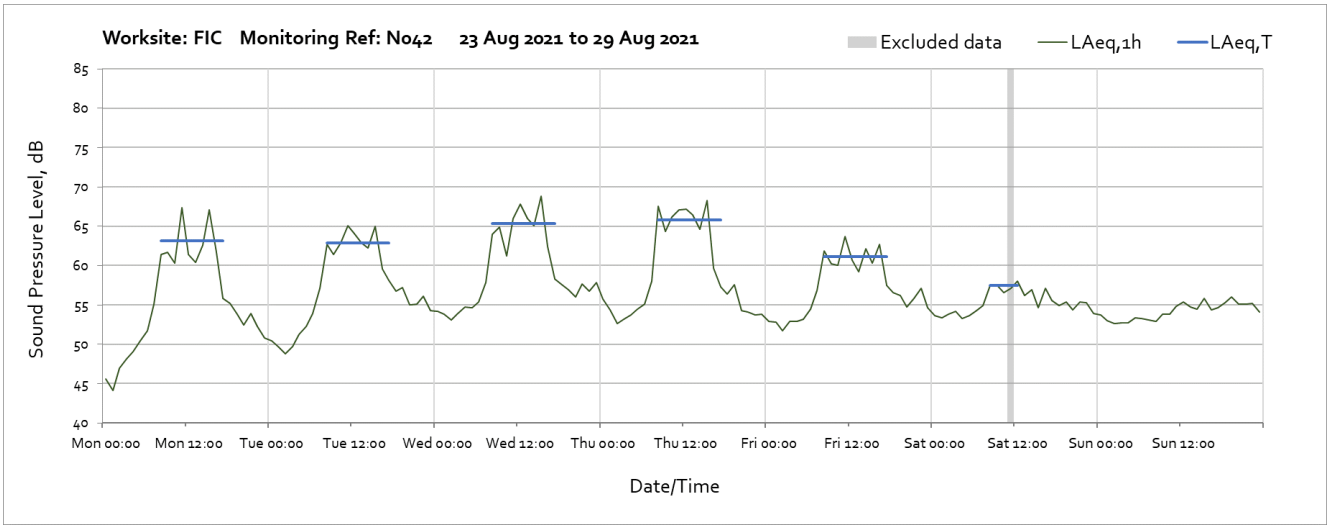


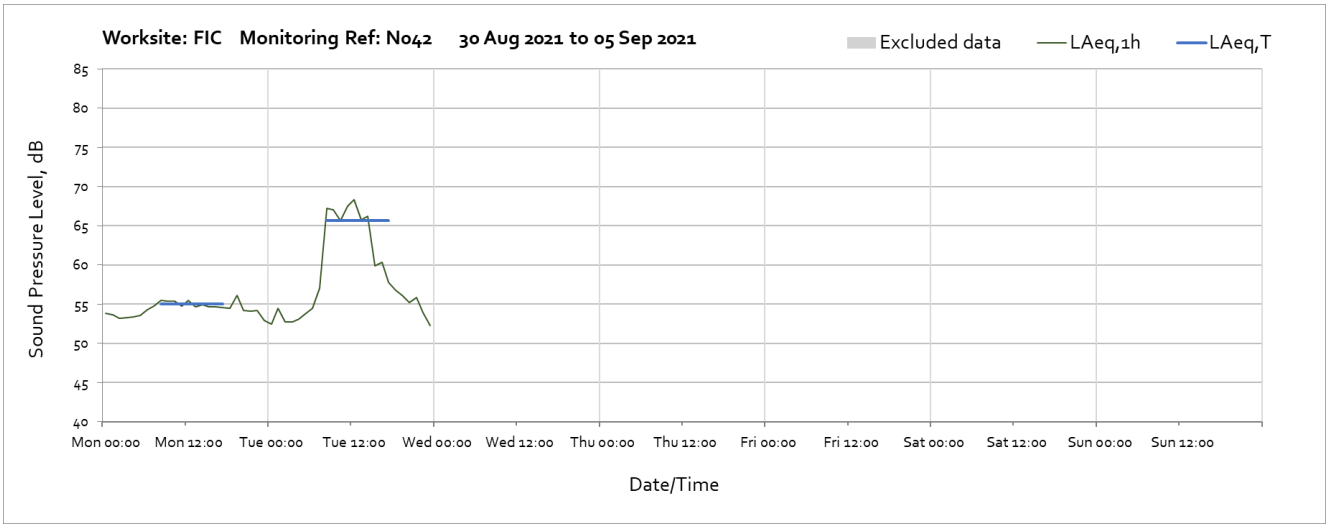




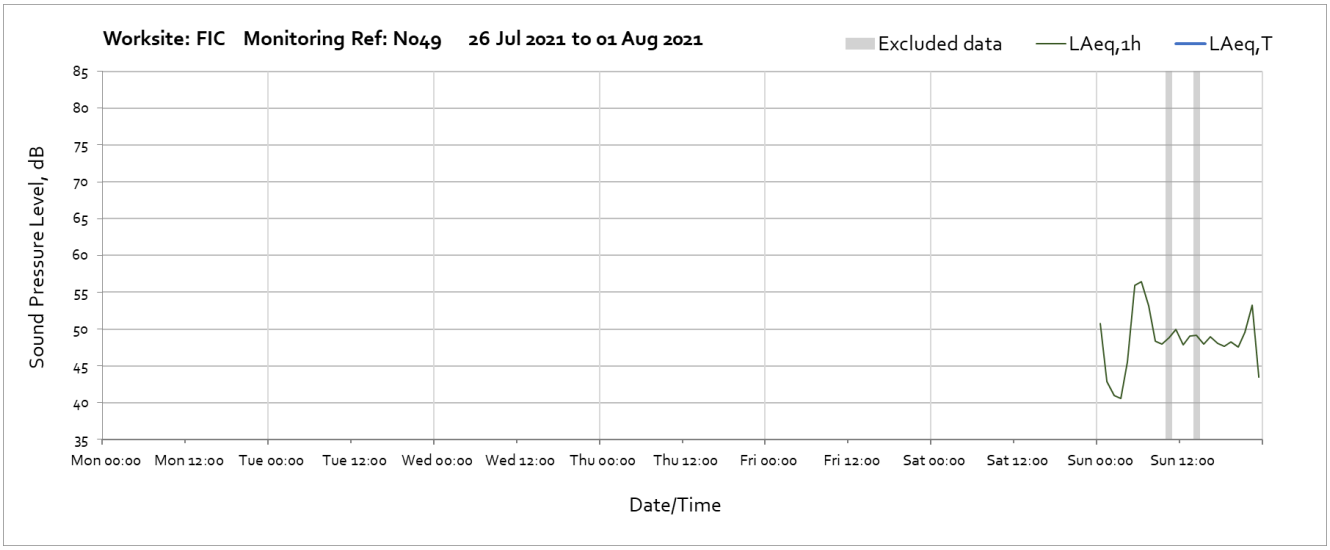


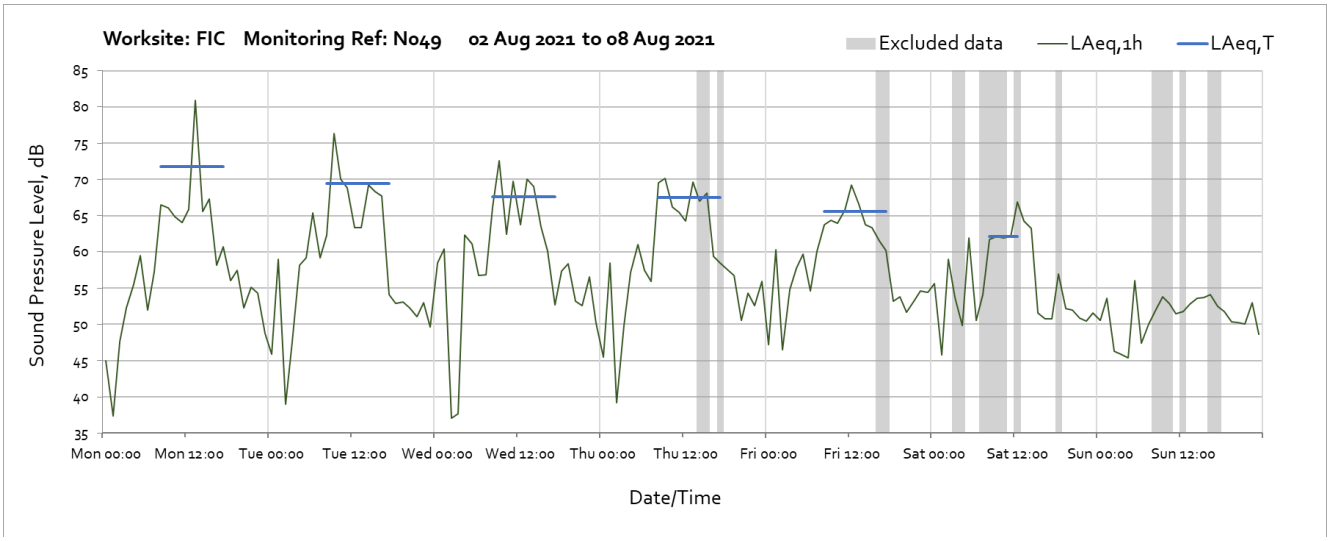
Note: Missing data between 18:00 on Tuesday 17th August and 10:00 on Wednesday 18th August was due to monitoring station memory card error.

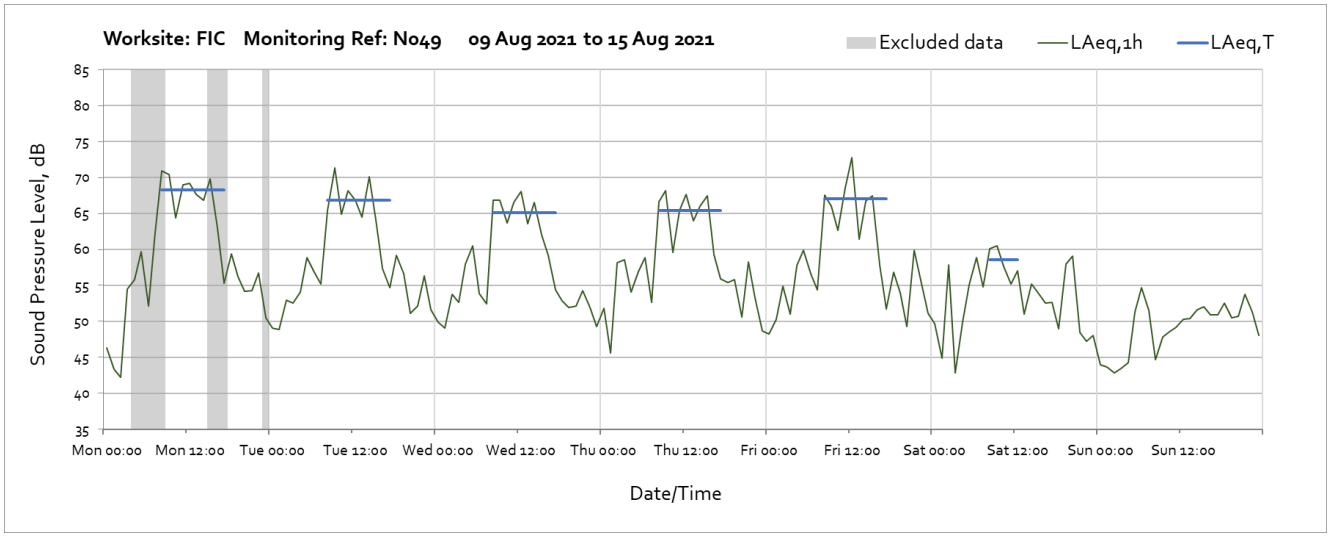




Worksite: Flat Iron Compound (FIC) – Monitoring Ref: N049






Worksite: FIC Monitoring Ref: N049 09 Aug 2021 to 15 Aug 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
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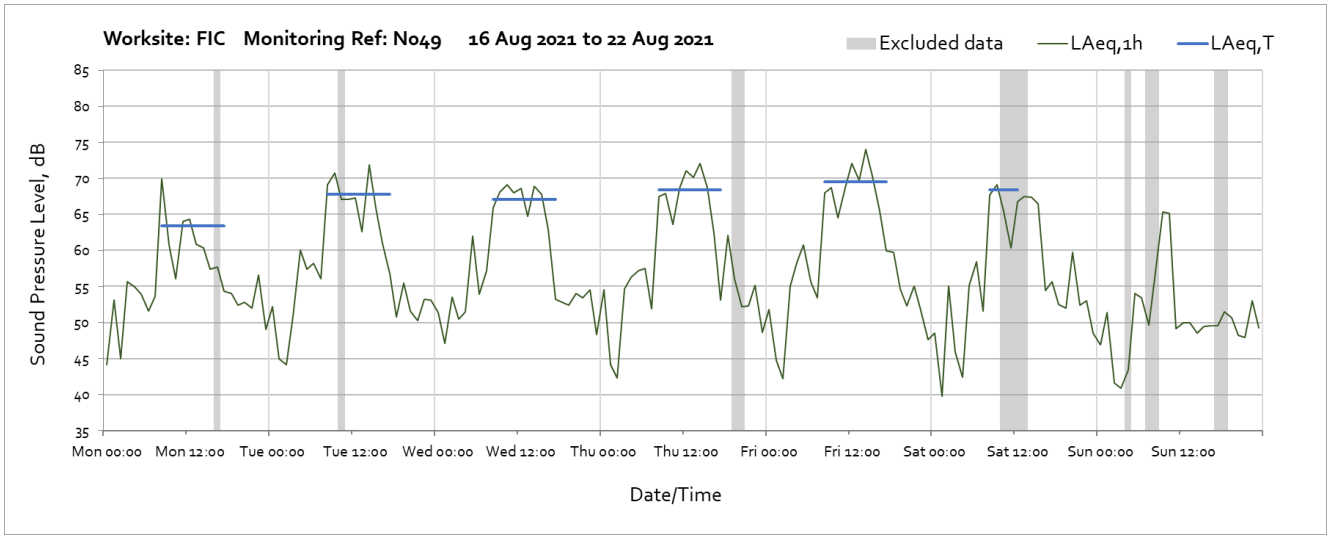
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: N049 16 Aug 2021 to 22 Aug 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
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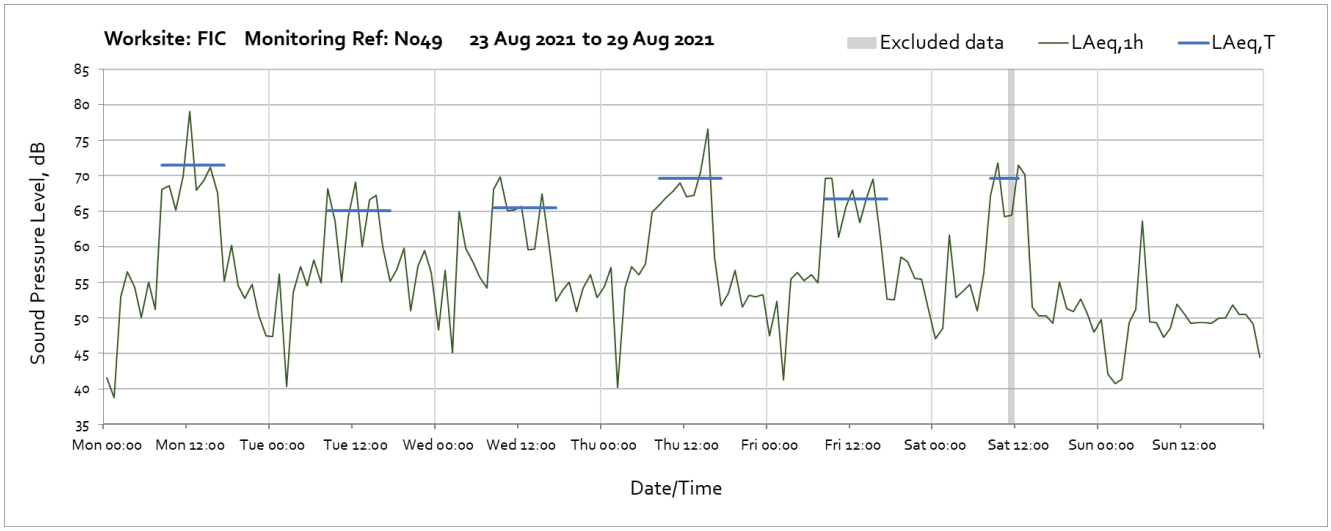
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: N049 23 Aug 2021 to 29 Aug 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
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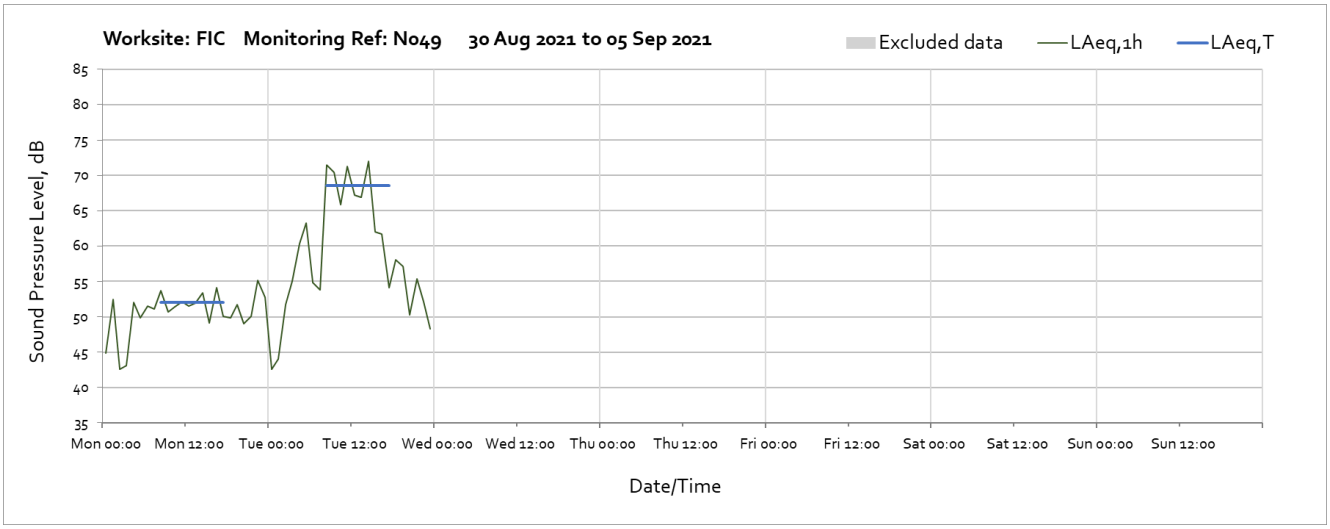
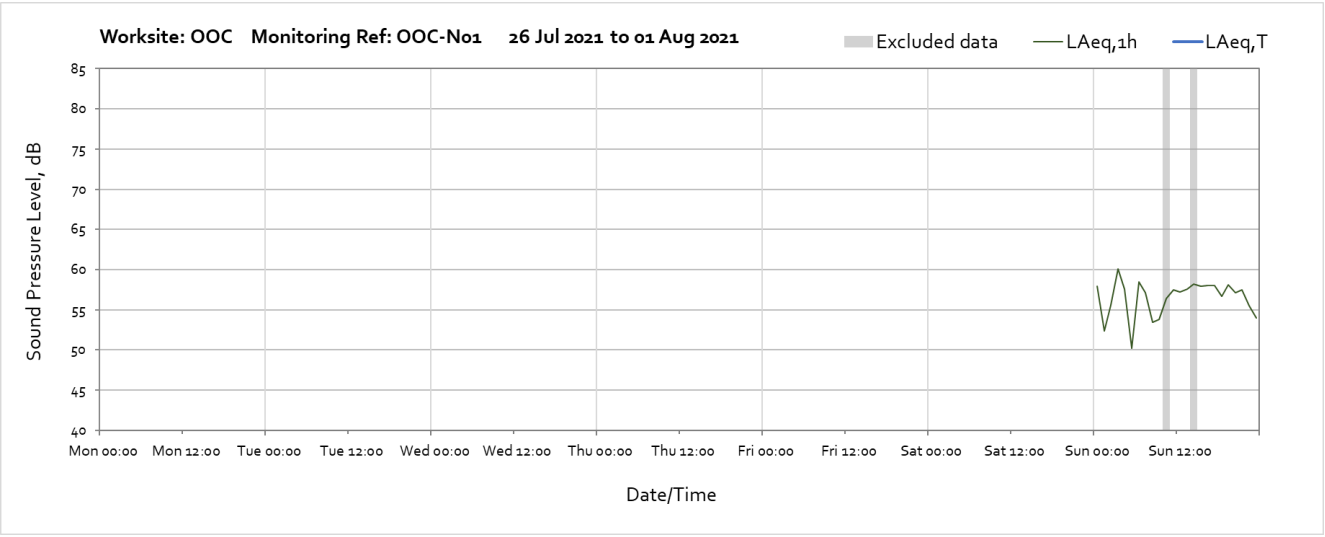
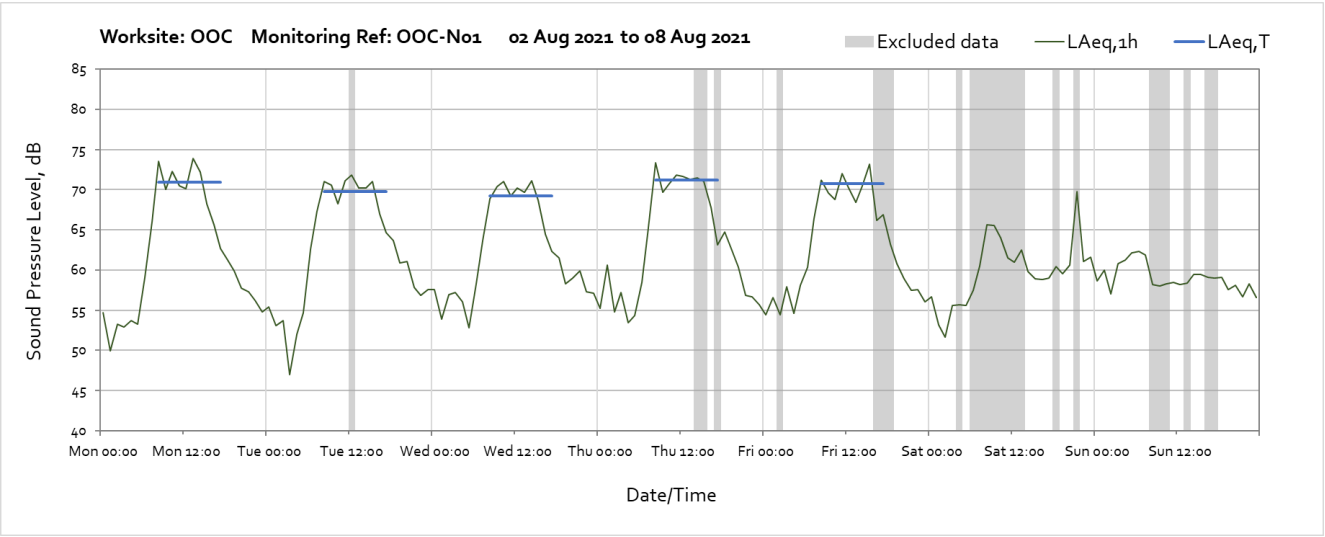
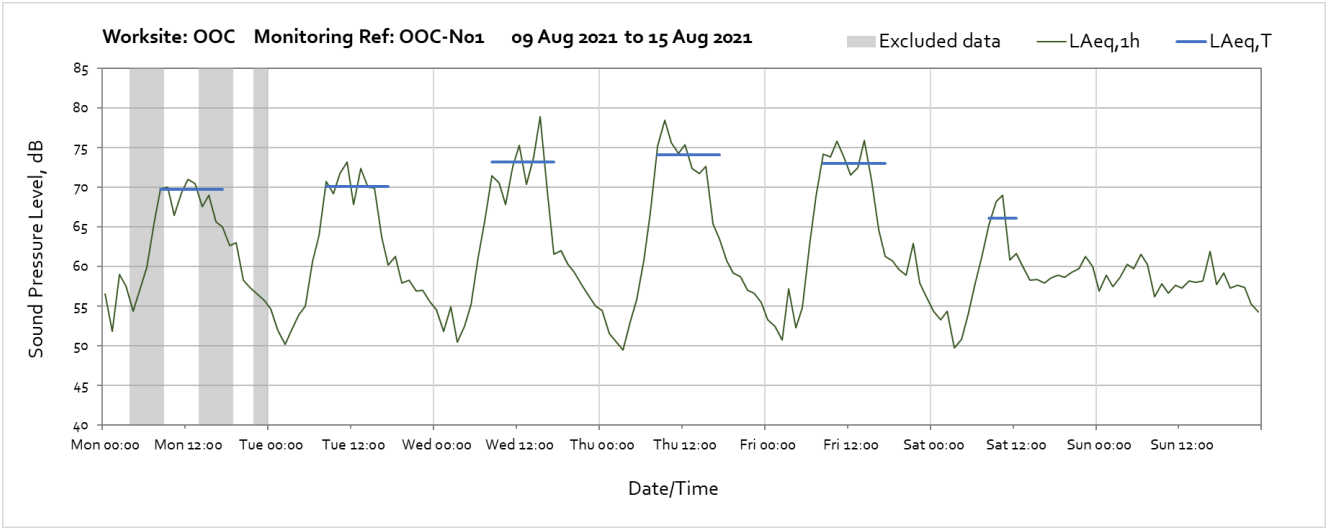
Sun 12:00
Date/Time



Worksite: Oal Oak Common (OOC) – Monitoring Ref: OOC-N01






Worksite: OOC Monitoring Ref: OOC-No1 09 Aug 2021 to 15 Aug 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
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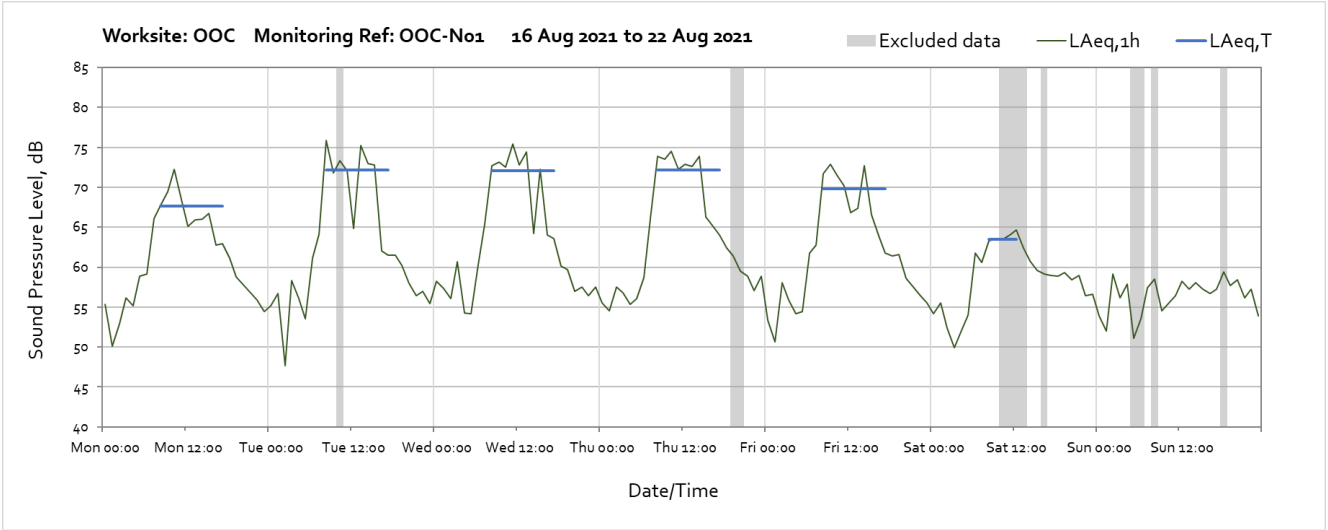
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No1 16 Aug 2021 to 22 Aug 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
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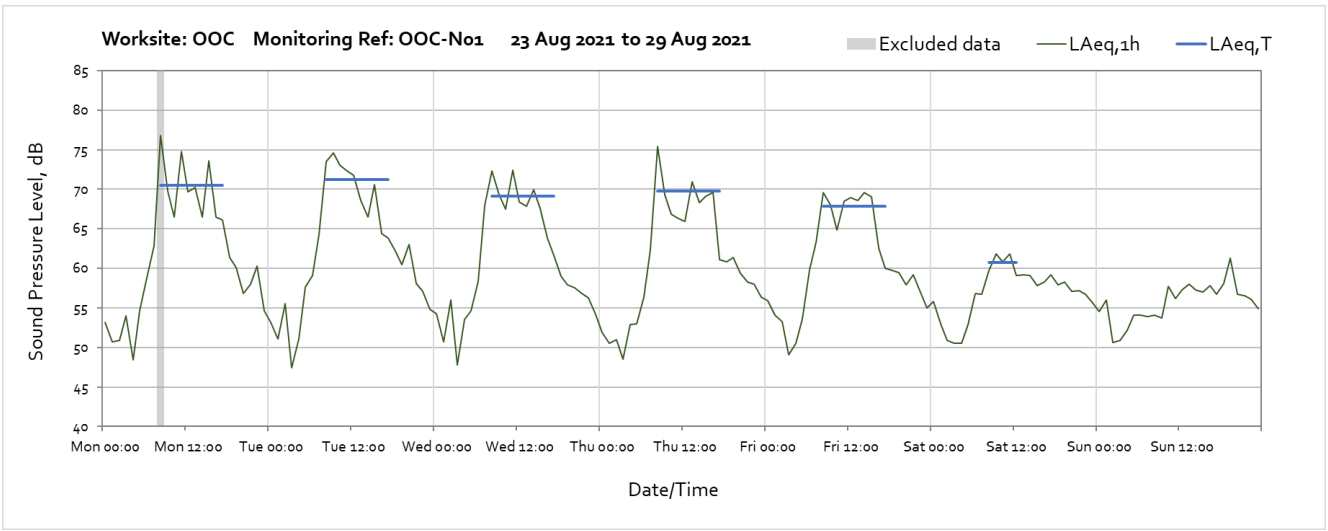
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No1 23 Aug 2021 to 29 Aug 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
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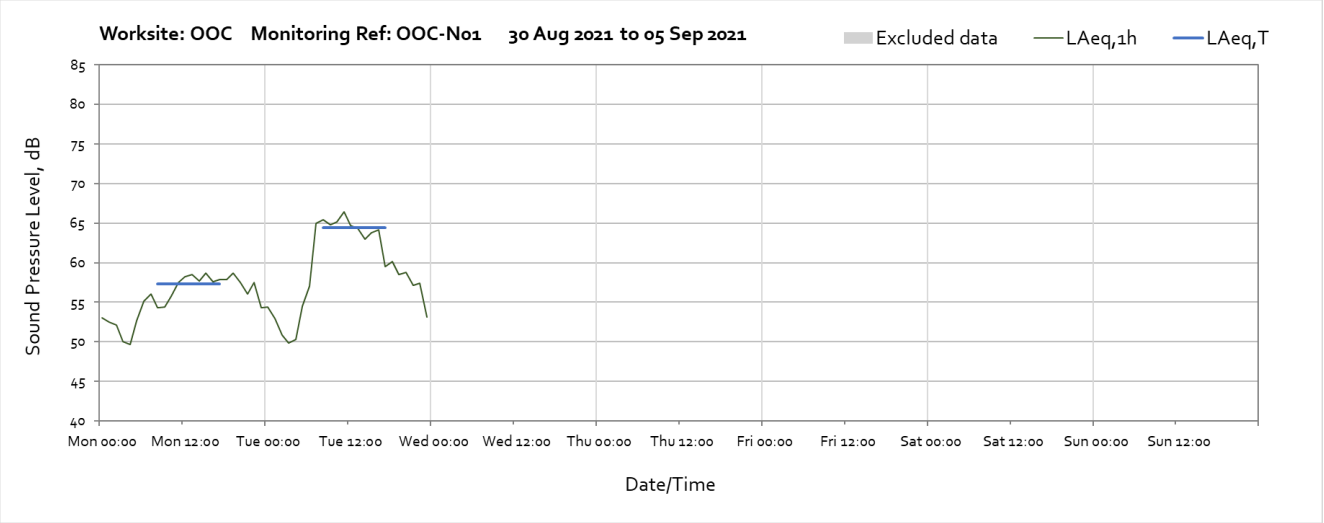
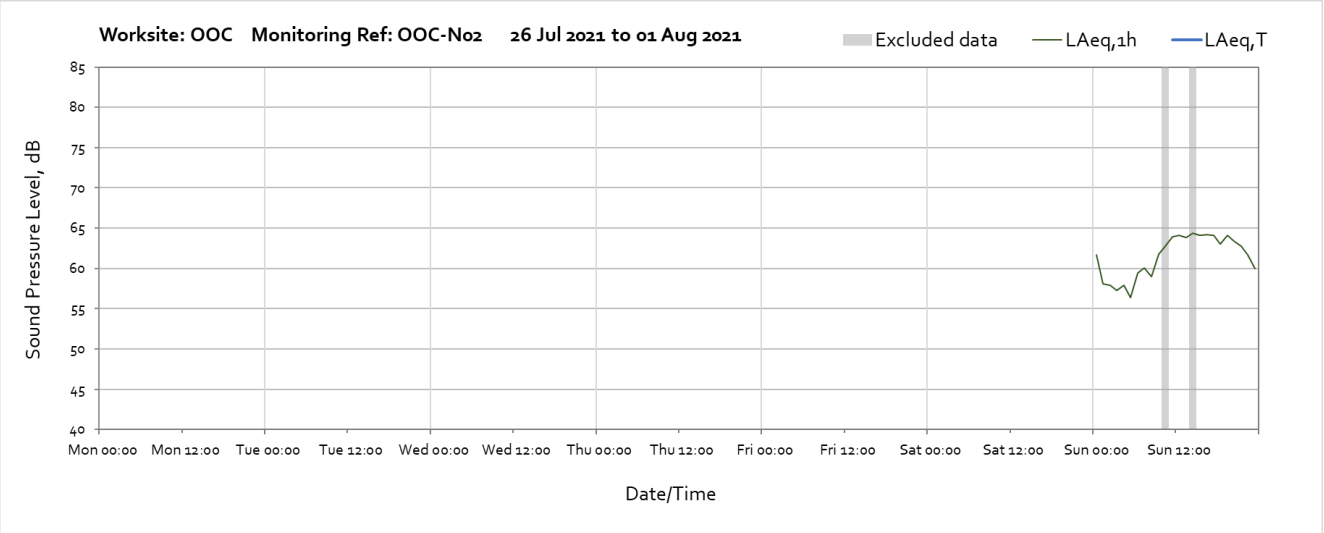
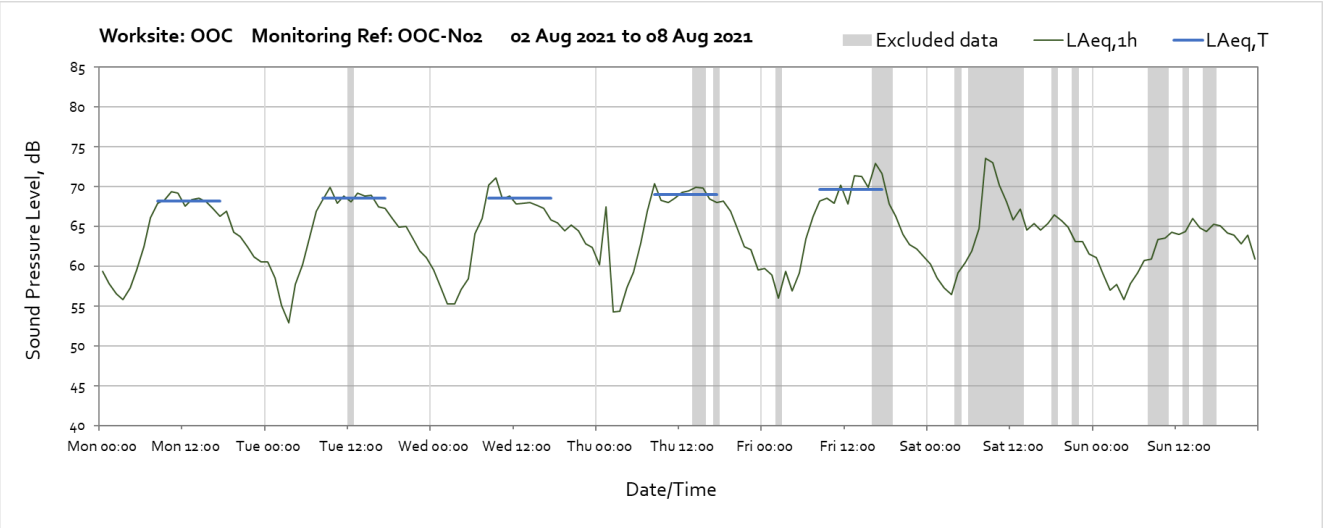
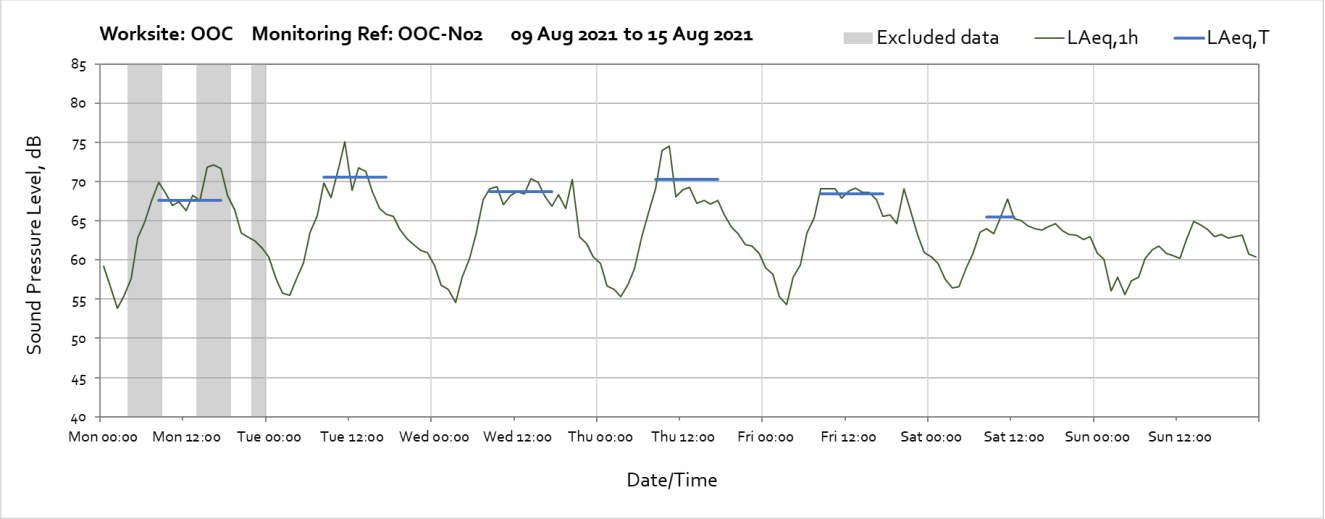
Sun 12:00
Date/Time



Worksite: Oal Oak Common (OOC) – Monitoring Ref: OOC-N02






Worksite: OOC Monitoring Ref: OOC-No2 09 Aug 2021 to 15 Aug 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
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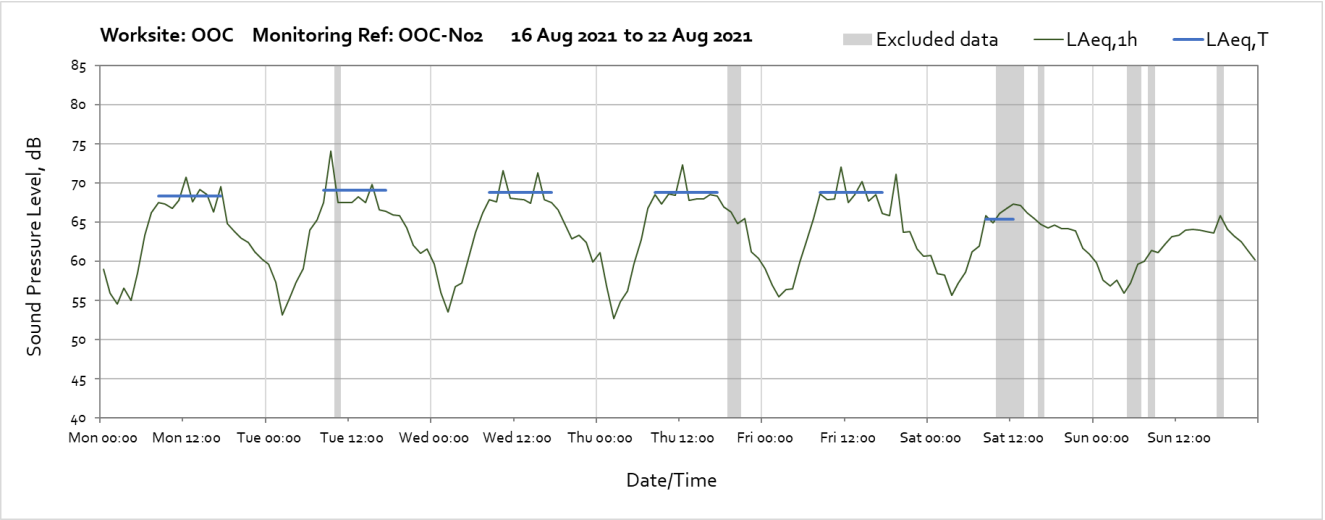
Date/Time


Worksite: OOC Monitoring Ref: OOC-No2 16 Aug 2021 to 22 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
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65
60
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50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
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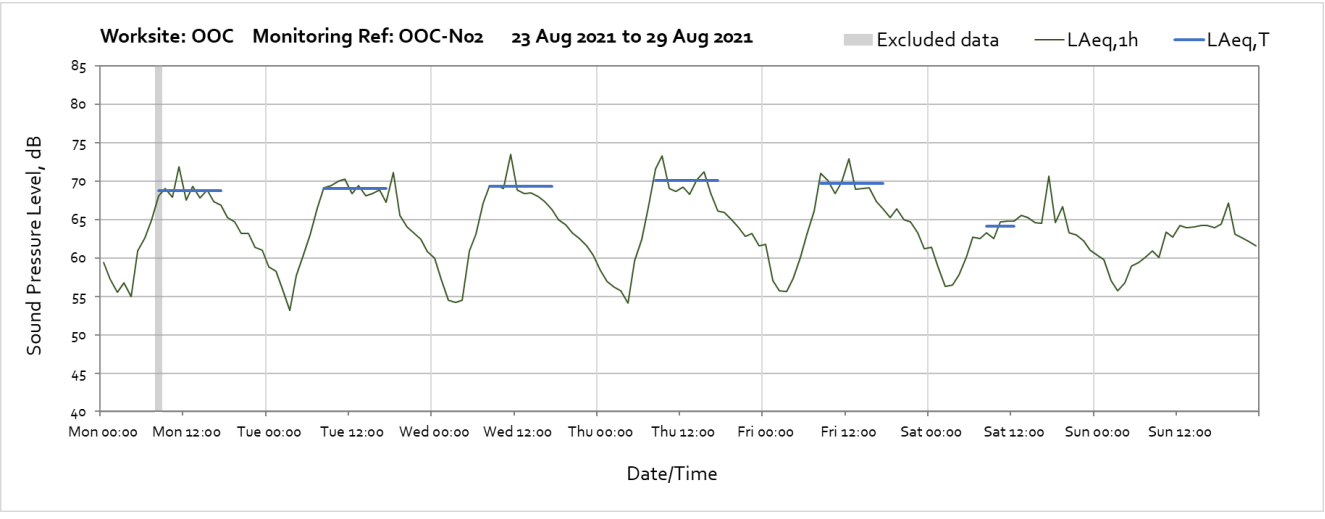
Date/Time


Worksite: OOC Monitoring Ref: OOC-No2 23 Aug 2021 to 29 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
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45
40
Mon 00:00
Mon 12:00
Tue 00:00
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Wed 00:00
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Thu 12:00
Fri 00:00
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Sat 00:00
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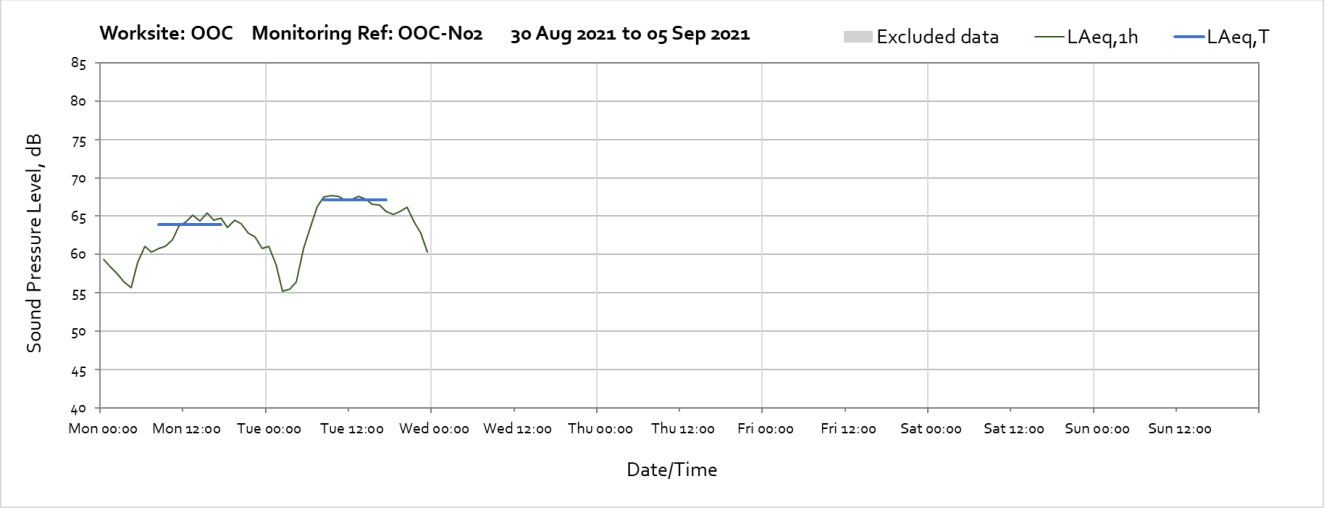
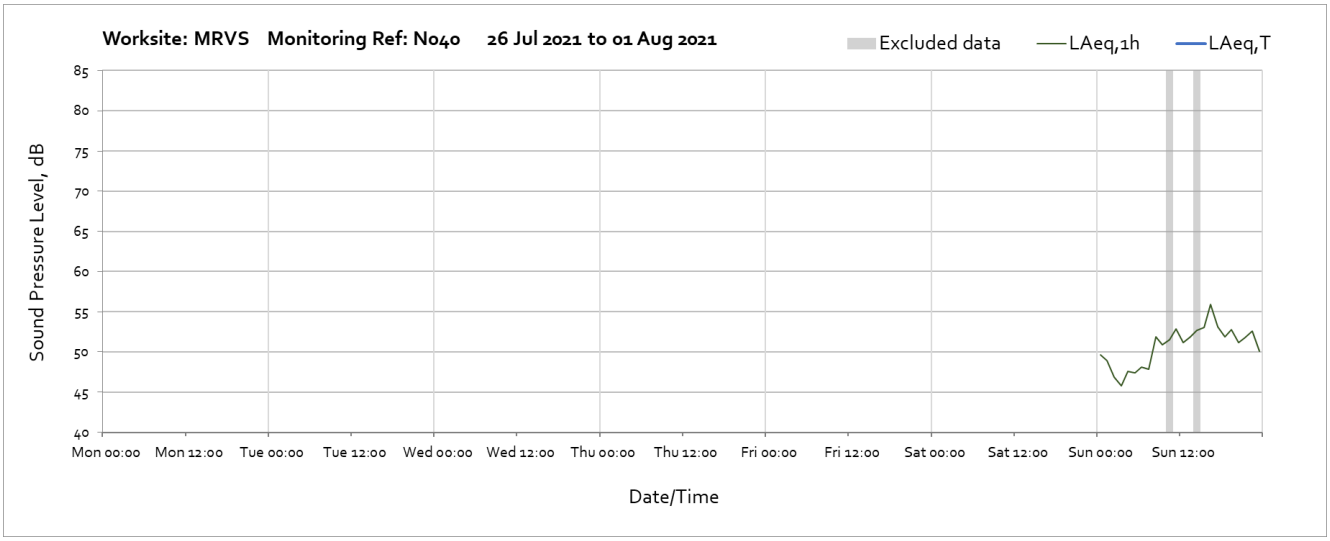
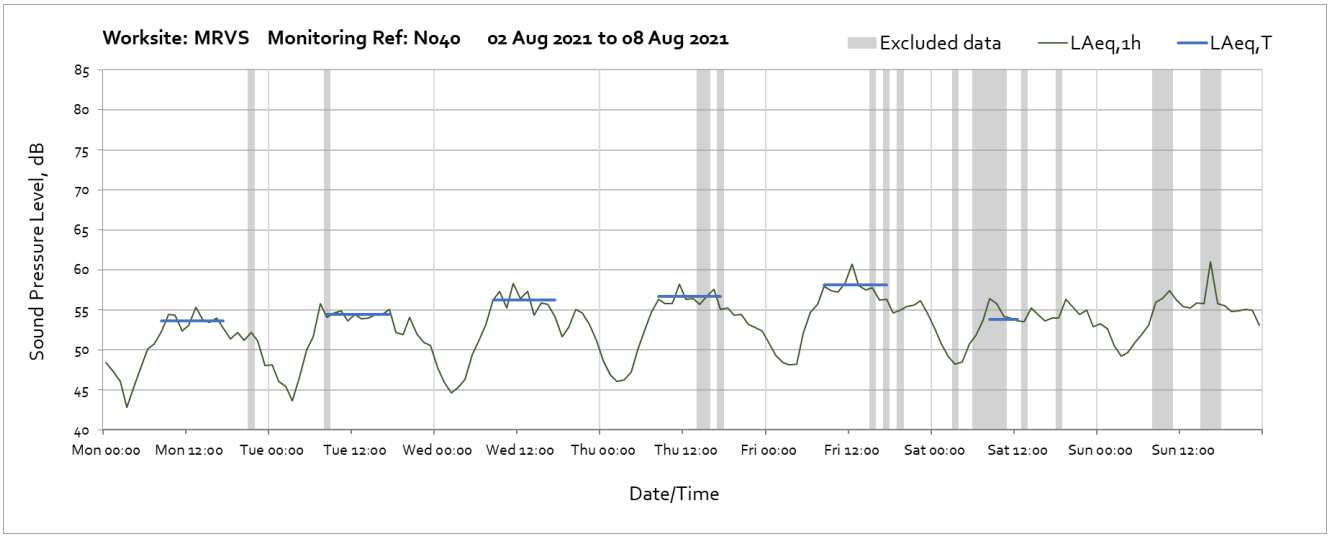
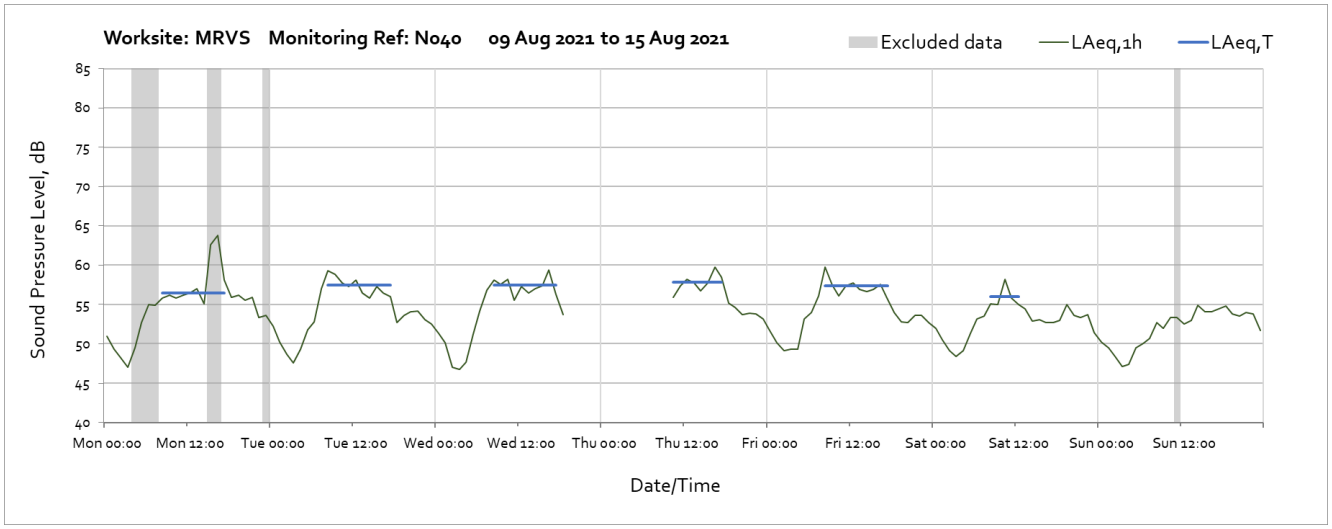
Sun 00:00
Sun 12:00
Date/Time



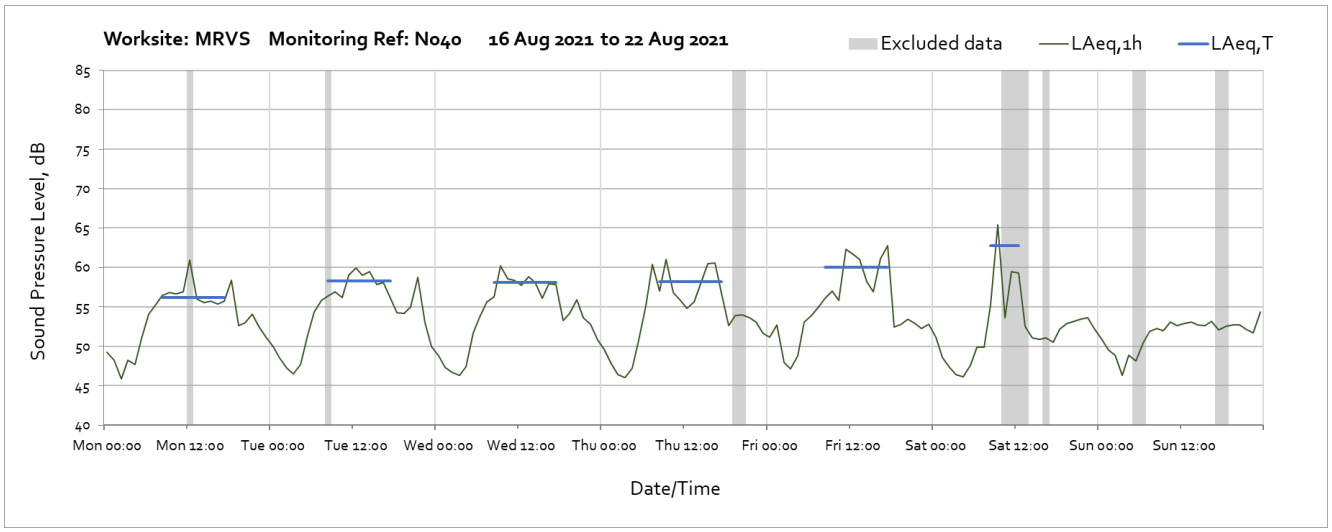
Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N040

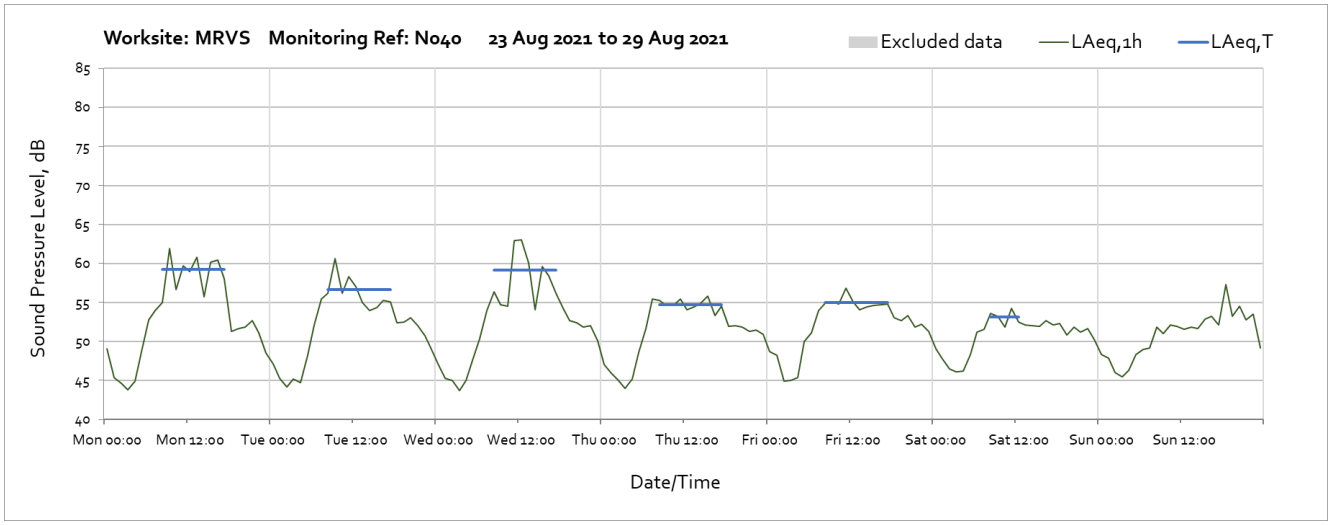


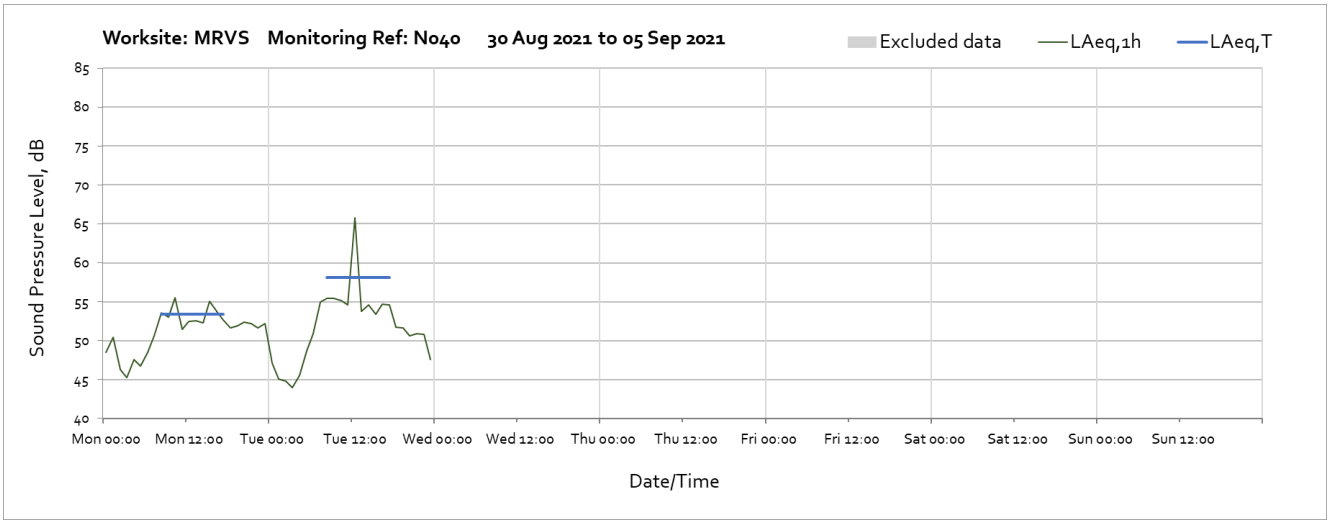




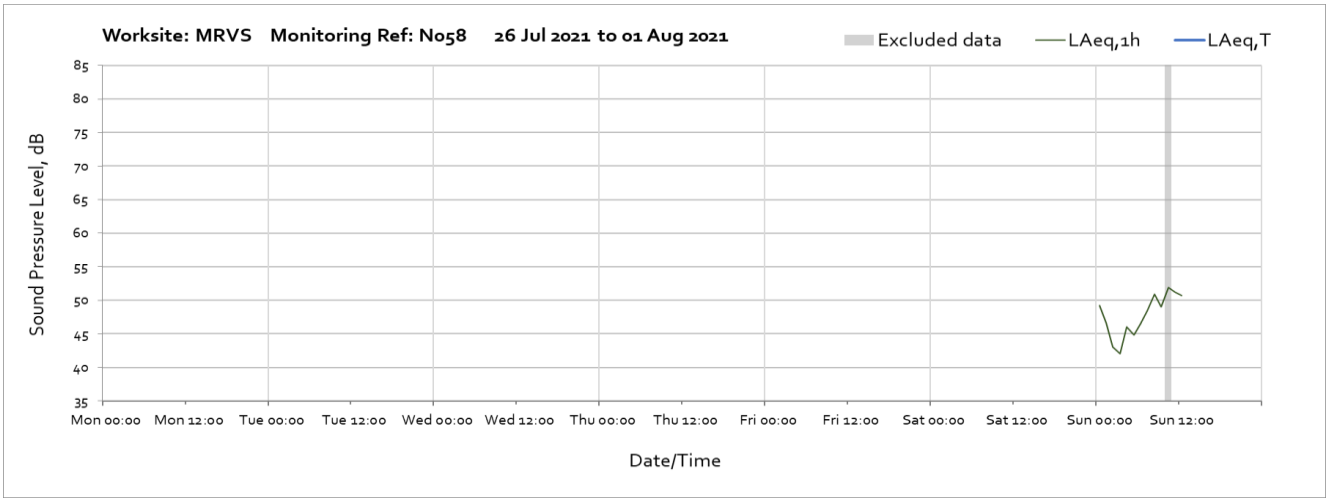
Note: Missing data between 19:00 on Wednesday 11th August and 10:00 on Thursday 12th August 2021 was due to configuration issue of the monitoring station.



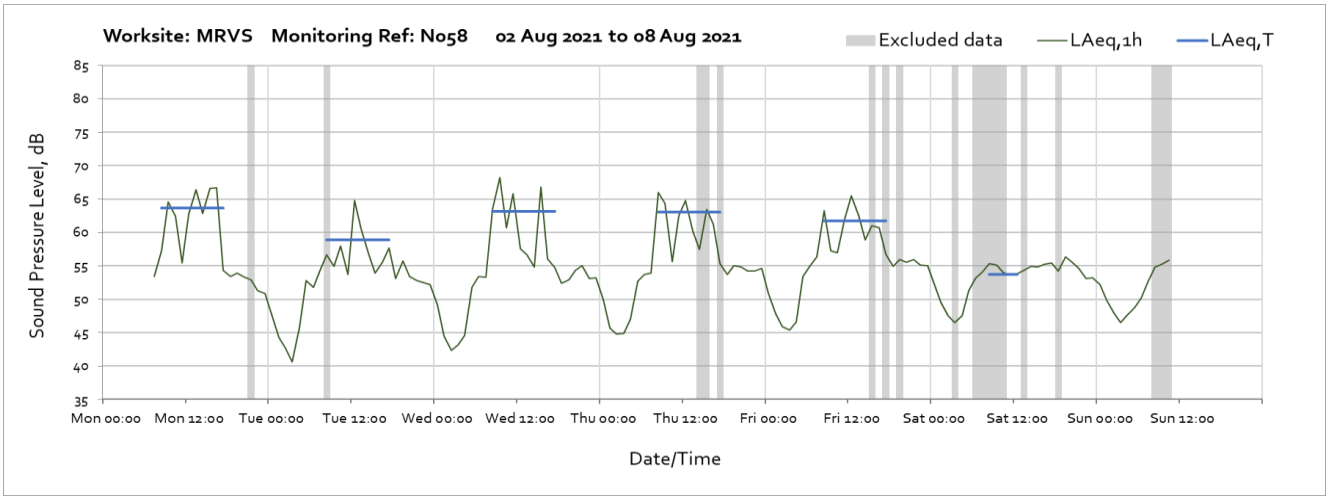




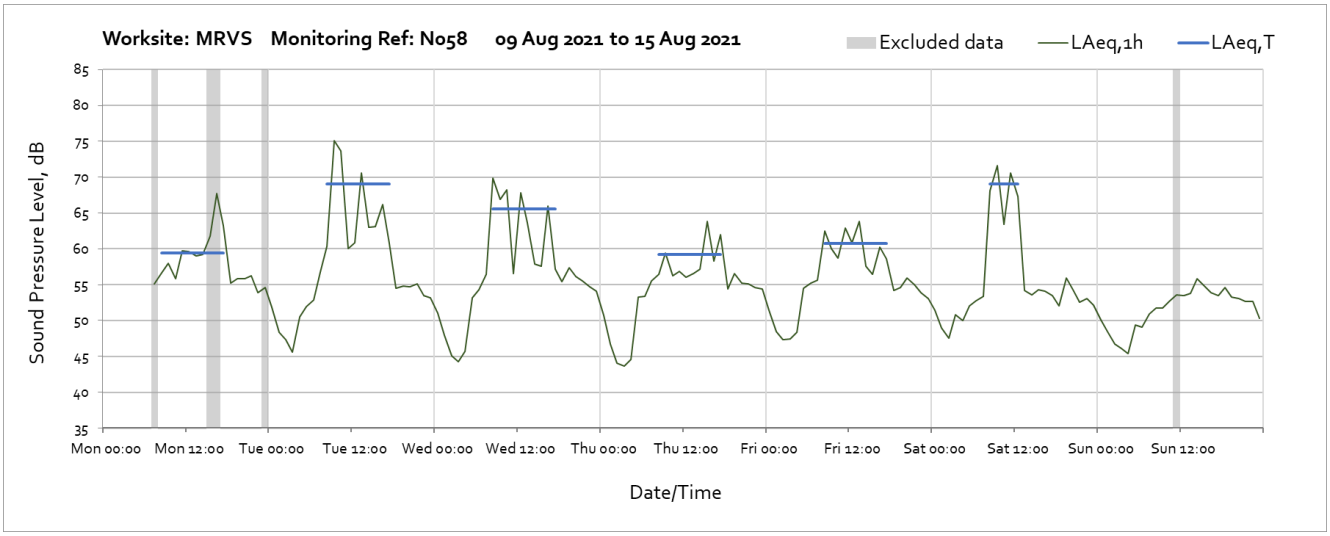
Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N058



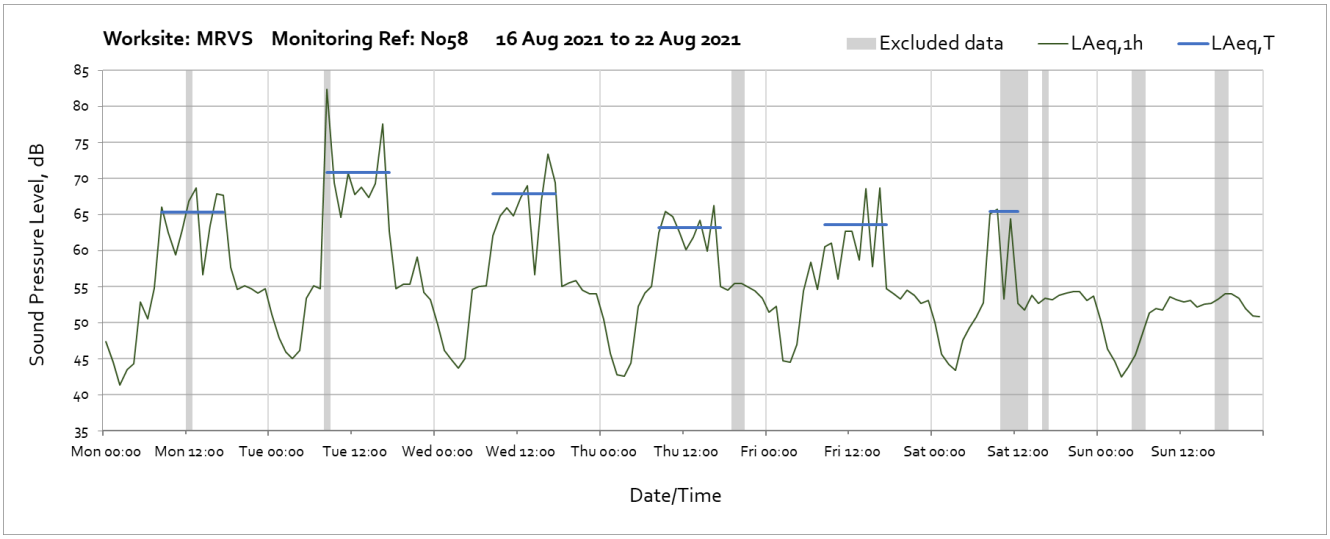
Note: Missing data between 13:00 on Sunday 1st August and 07:00 on Monday 2nd August 2021 was due to loss of power at the monitor location.

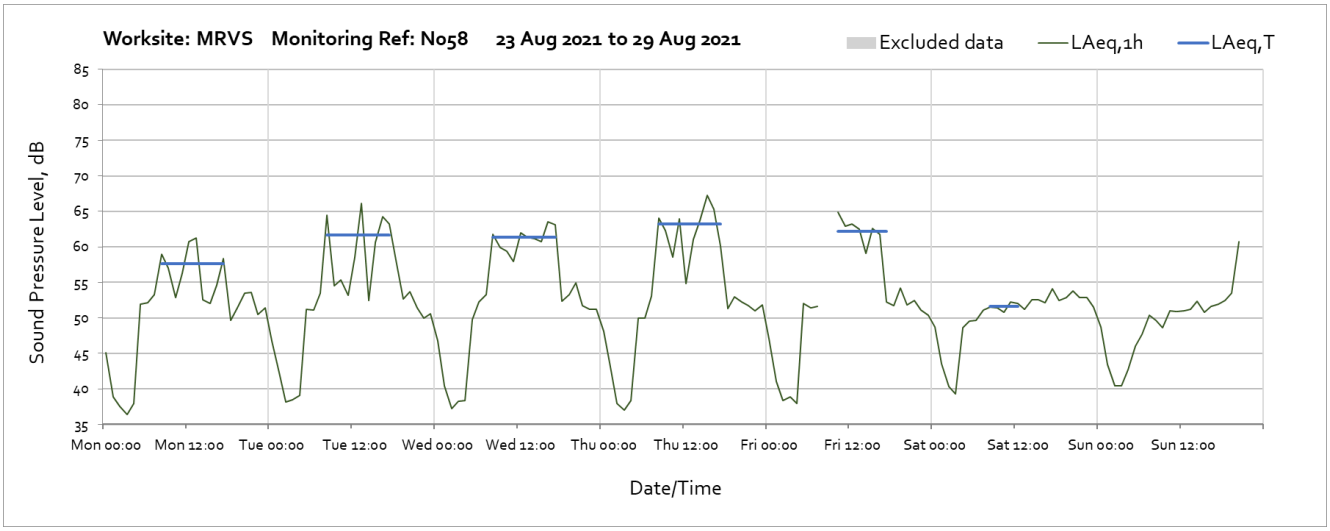


Note: Missing data between 13:00 on Sunday 1st August and 07:00 on Monday 2nd August 2021 and between 11:00 on Sunday 8th August and 07:00 on Monday 9th August 2021 was due to loss of power at the monitor location.

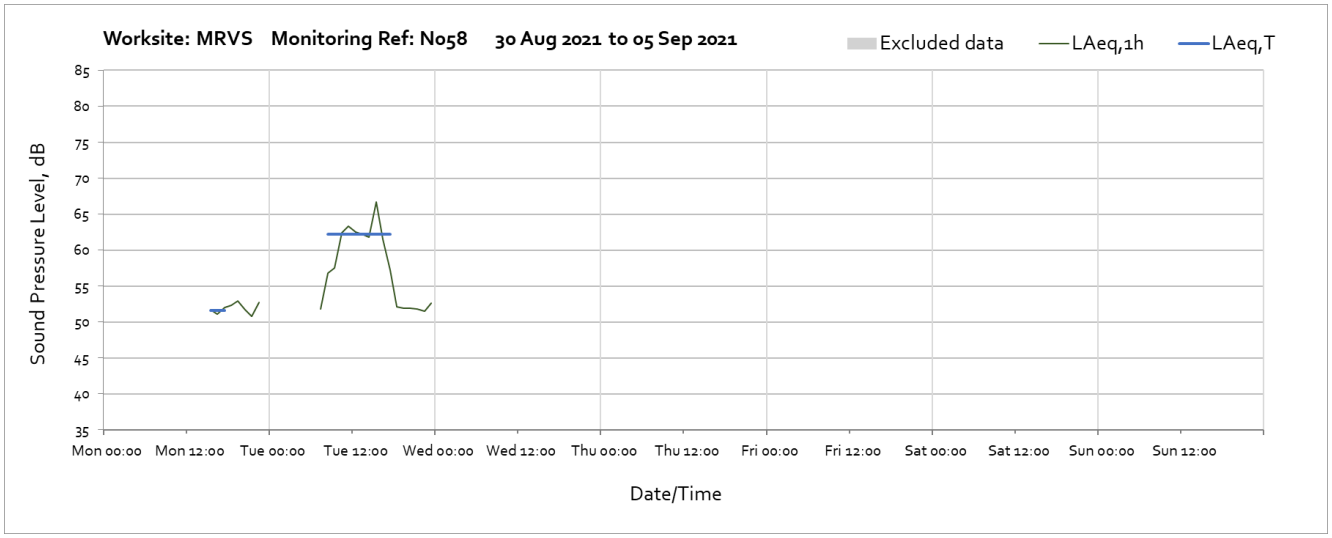


Note: Missing data between 11:00 on Sunday 8th August and 07:00 on Monday 9th August 2021 was due to loss of power at the monitor location.



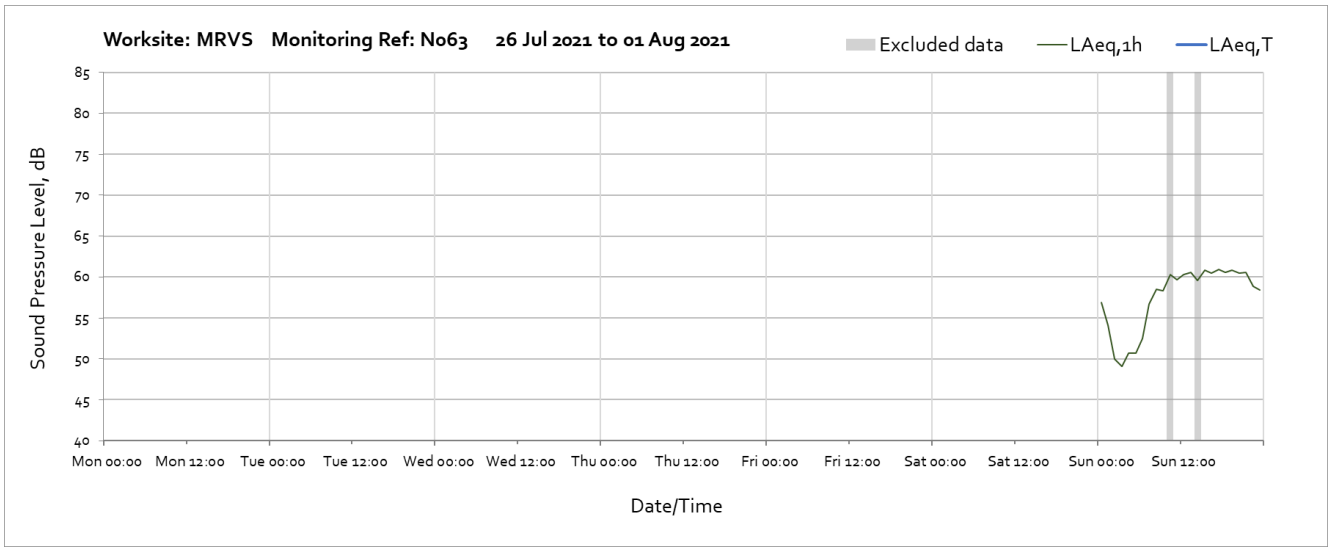


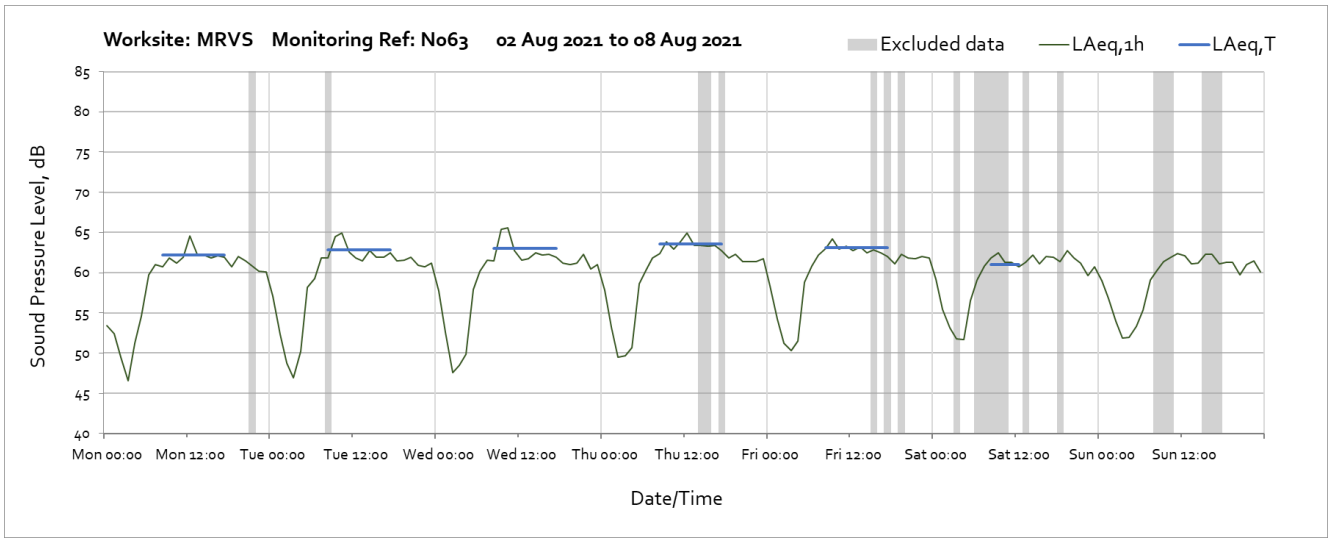
Note: Missing data at 08:00 and 09:00 on Friday 27th August was due to monitoring station memory card error.and between 21:00 on Sunday 29th August and 07:00 on Tuesday 31st August 2021 was due to loss of power at the monitor location.

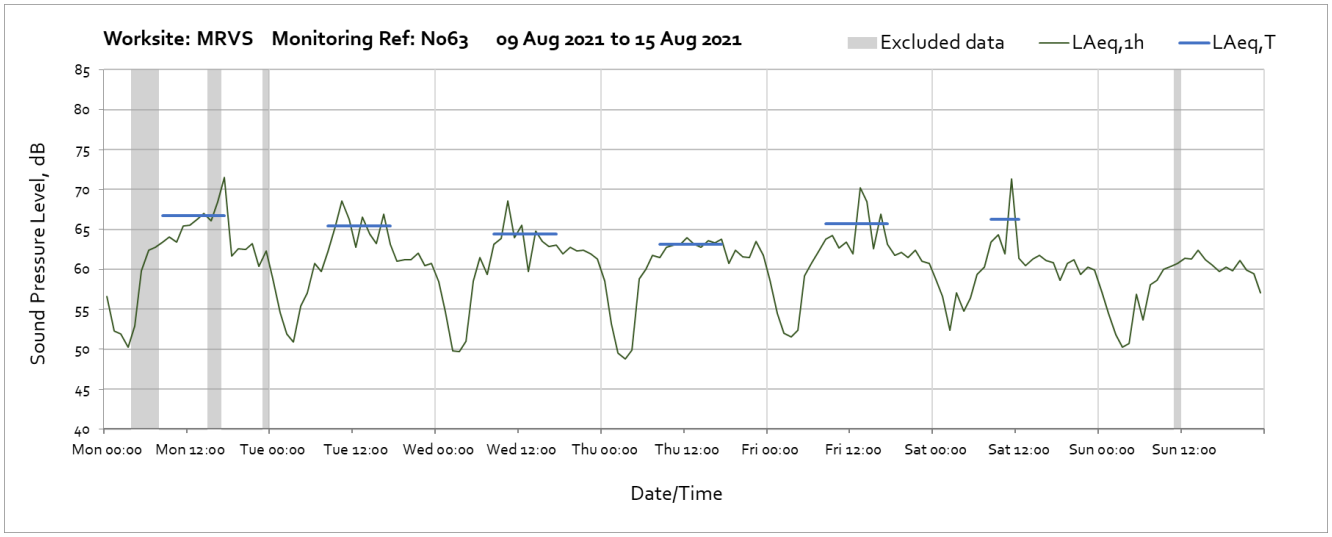


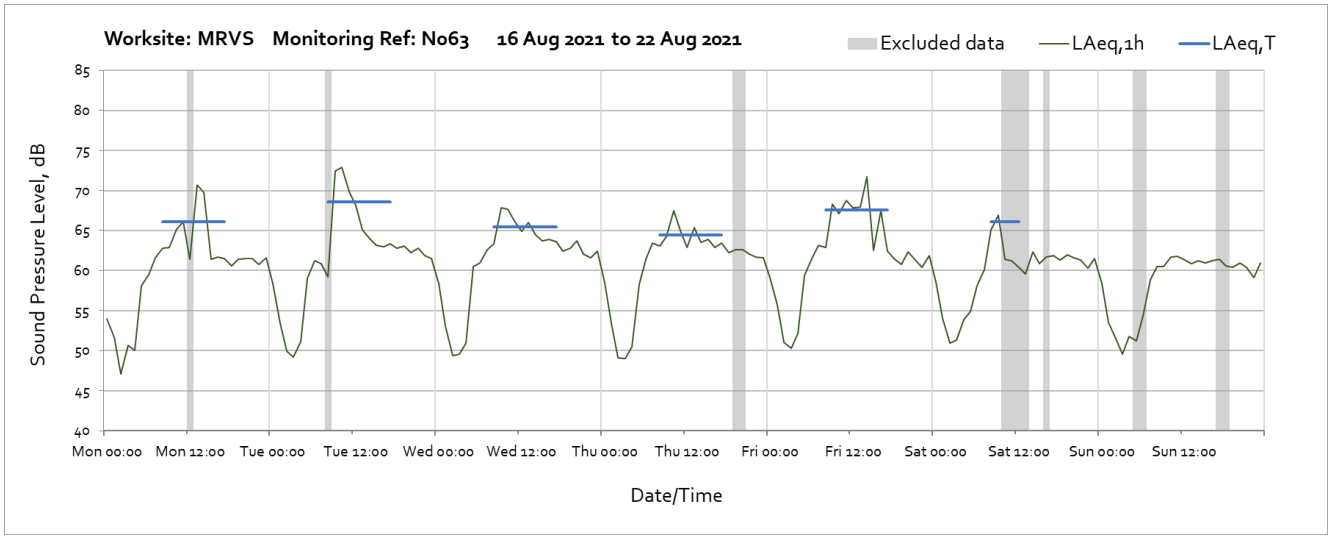
Note: Missing data between 21:00 on Sunday 29th August and 07:00 on Tuesday 31st August 2021 was due to loss of power at the monitor location.

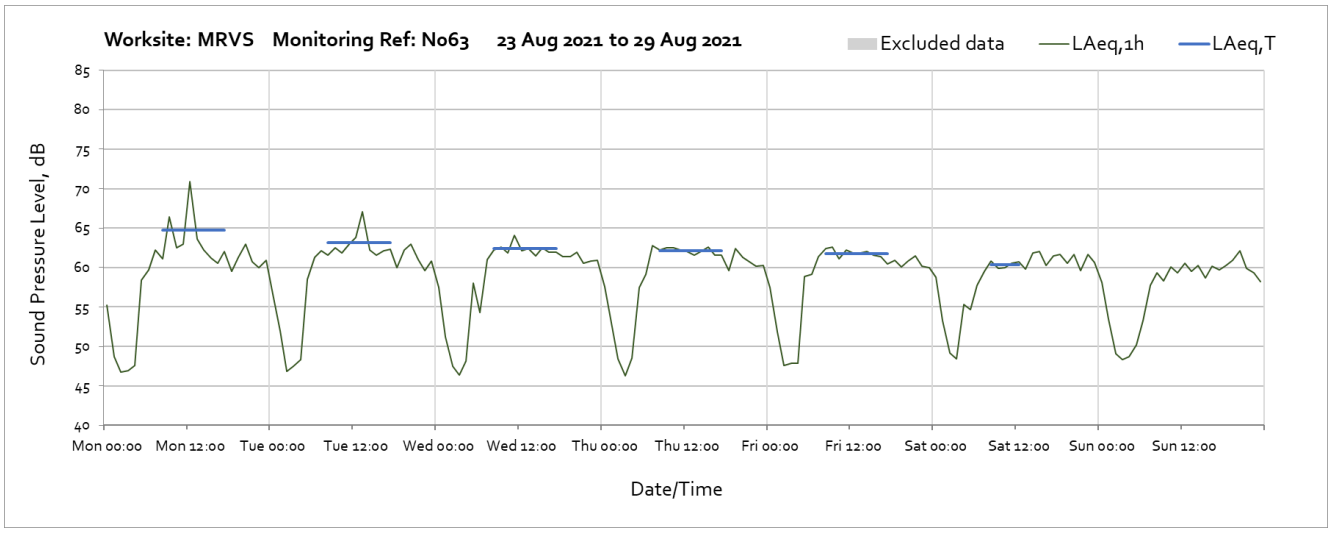
Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N063

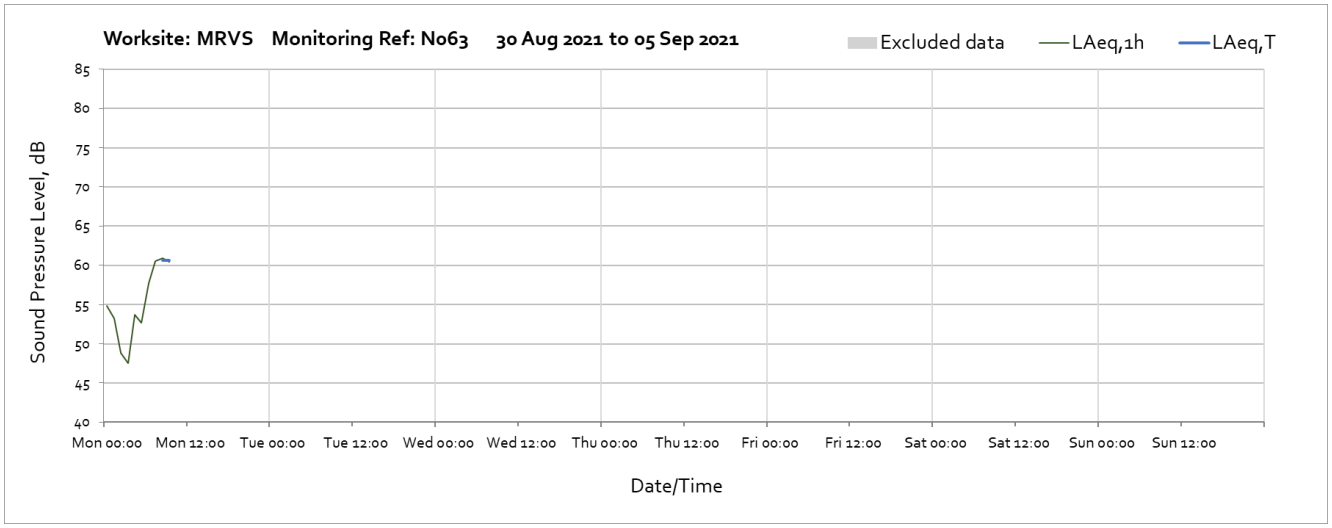





Worksite: MRVS Monitoring Ref: No63 09 Aug 2021 to 15 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

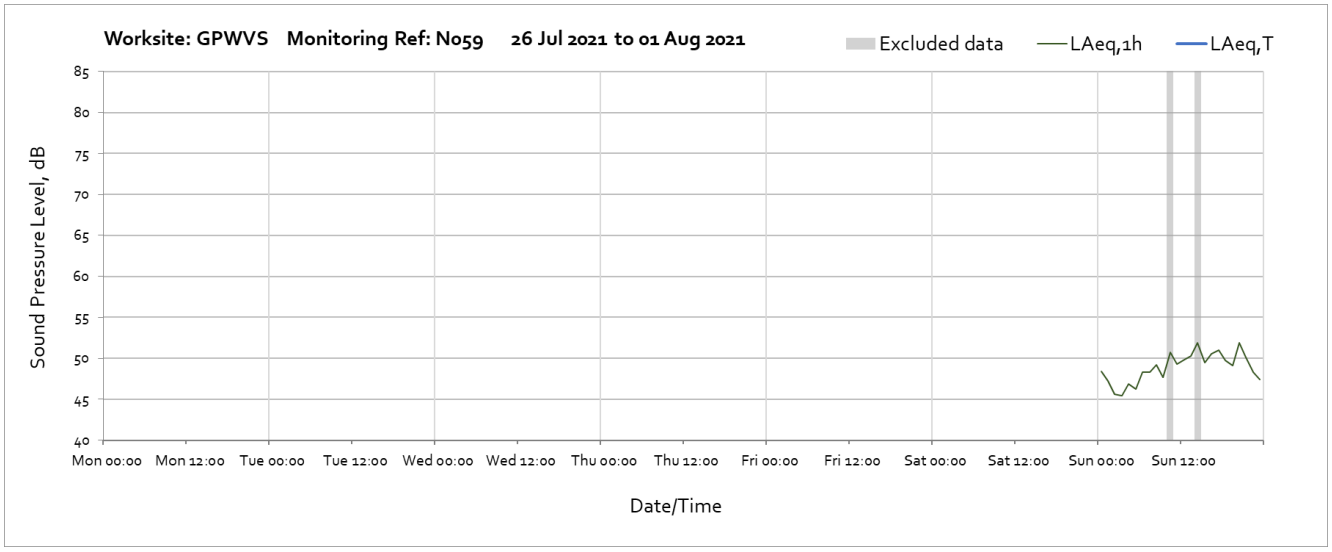

Worksite: MRVS Monitoring Ref: No63 16 Aug 2021 to 22 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

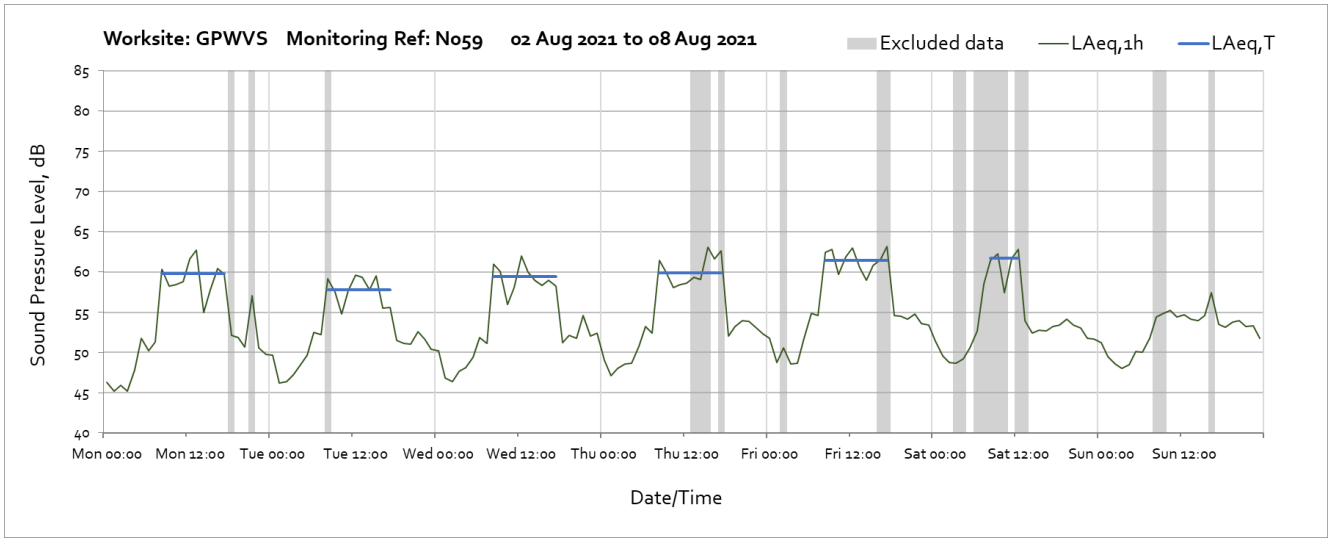

Worksite: MRVS Monitoring Ref: No63 23 Aug 2021 to 29 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

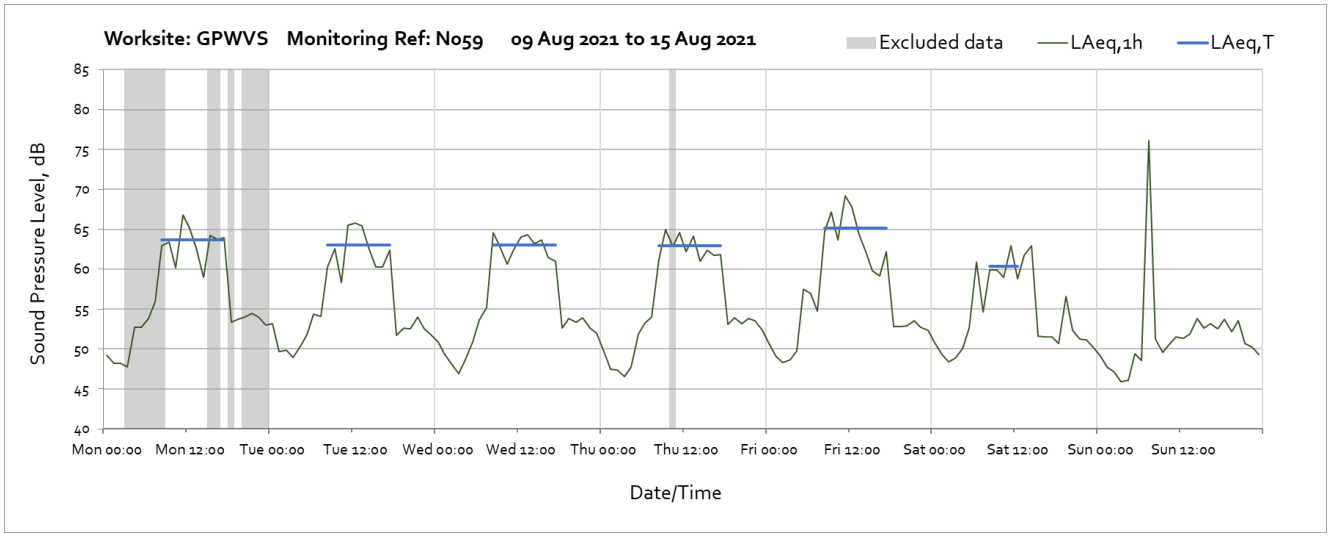


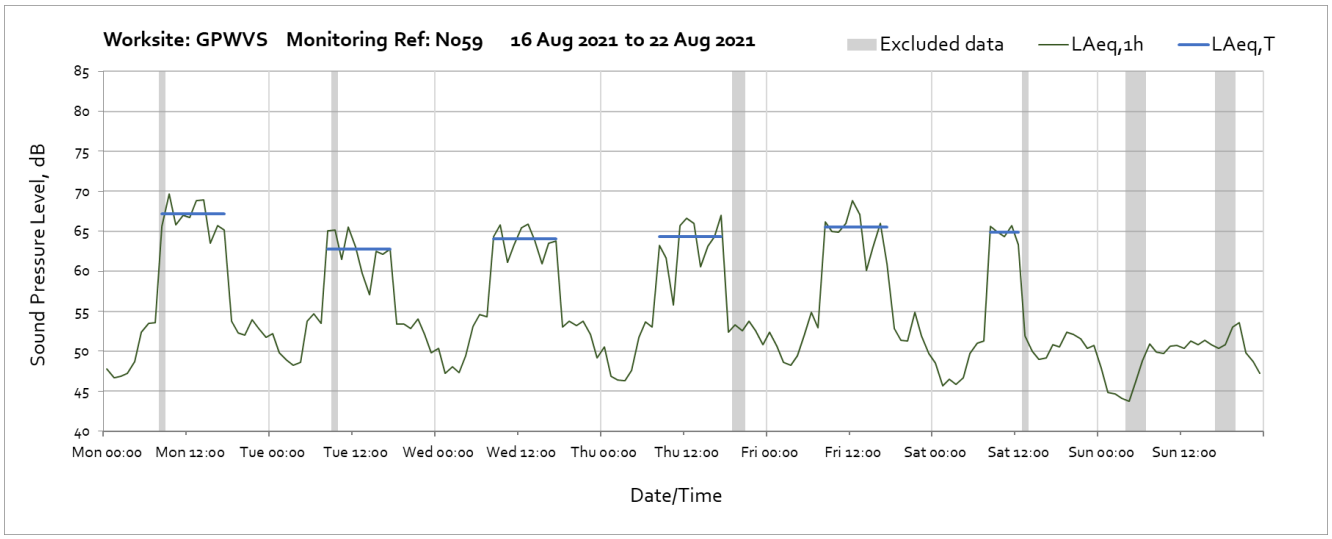
Note: Missing data from 10:00 on Monday 30th August to the end of the month was due to loss of power at the monitor location.

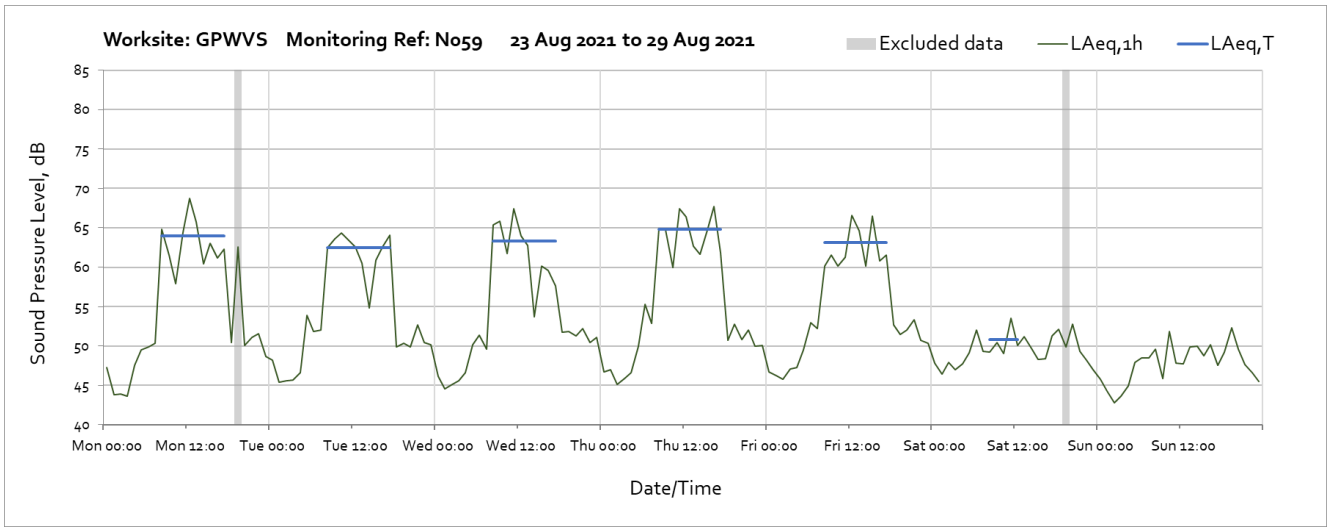
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: N059

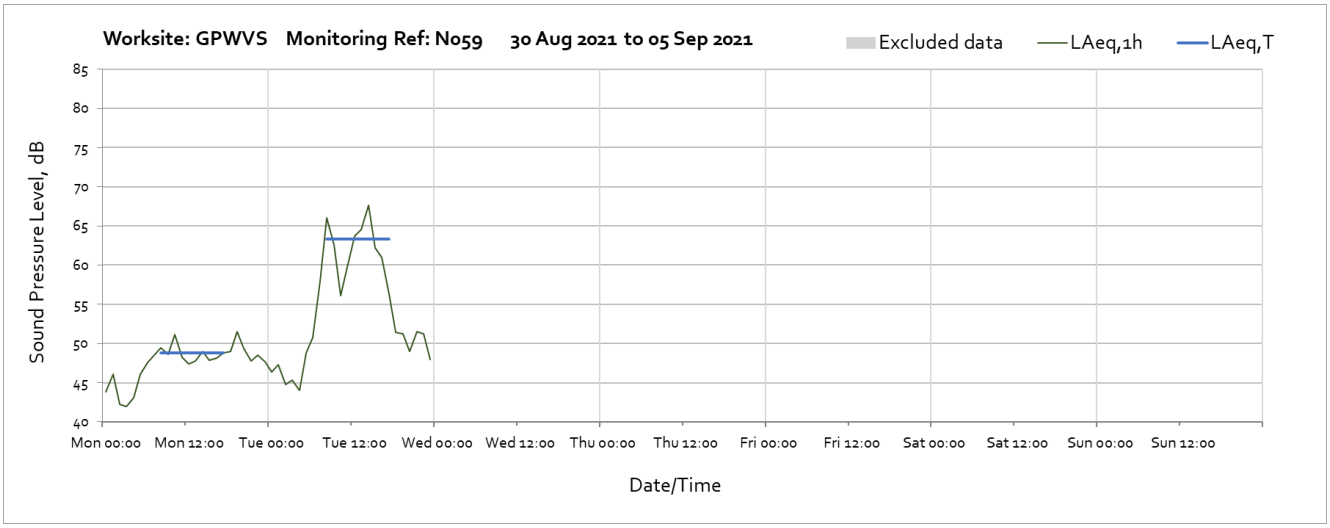




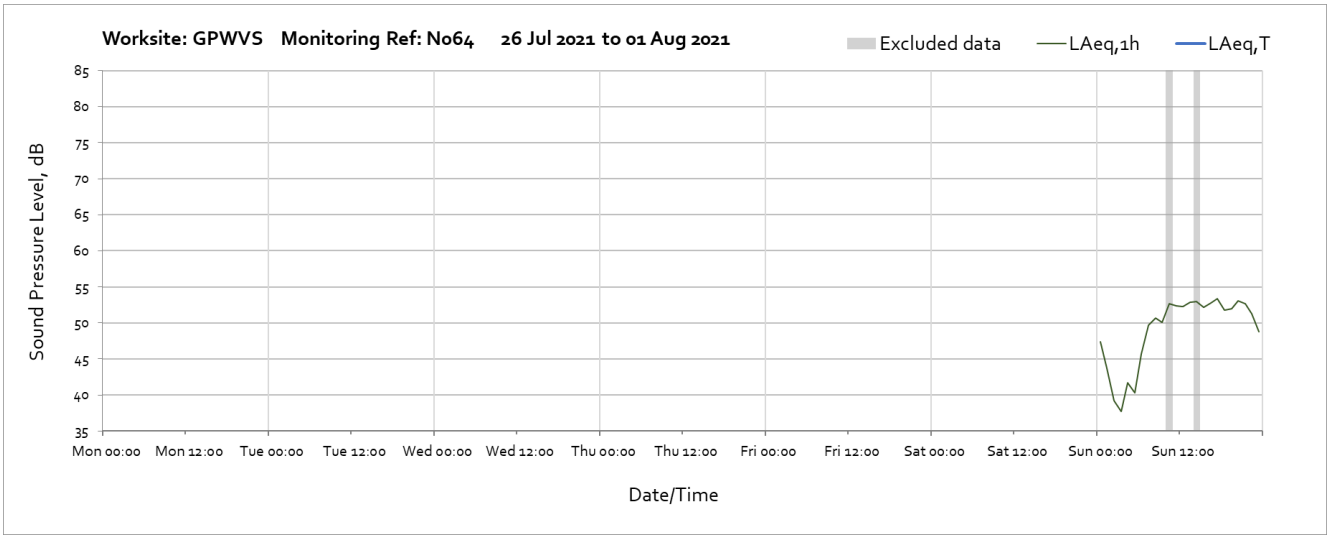

Worksite: GPWVS Monitoring Ref: No59 09 Aug 2021 to 15 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

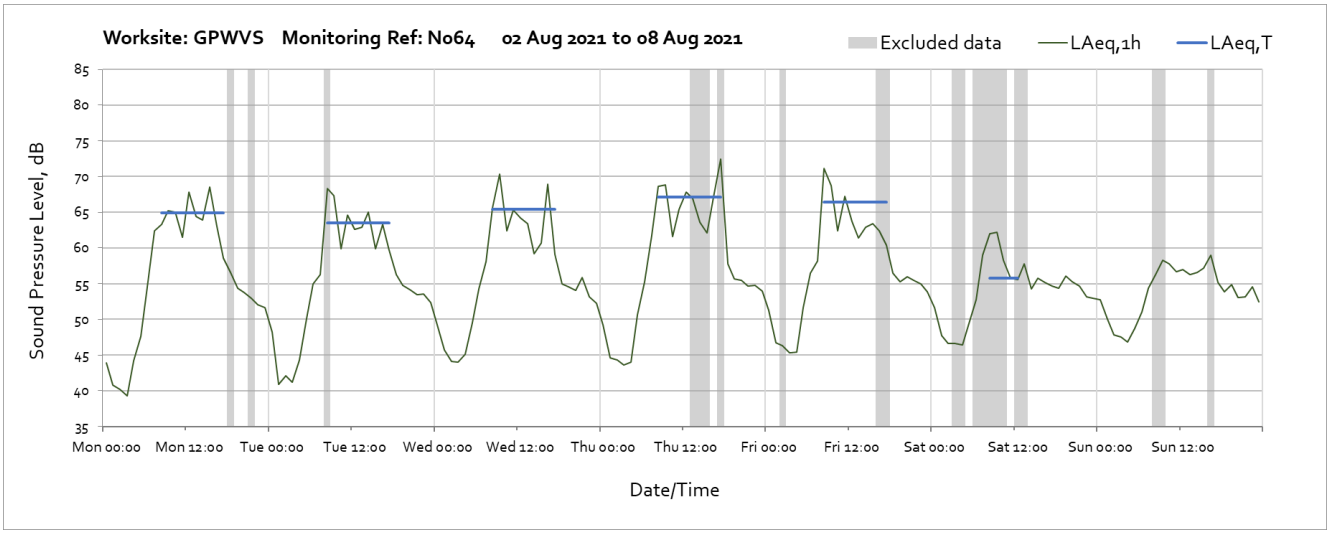

Worksite: GPWVS Monitoring Ref: No59 16 Aug 2021 to 22 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

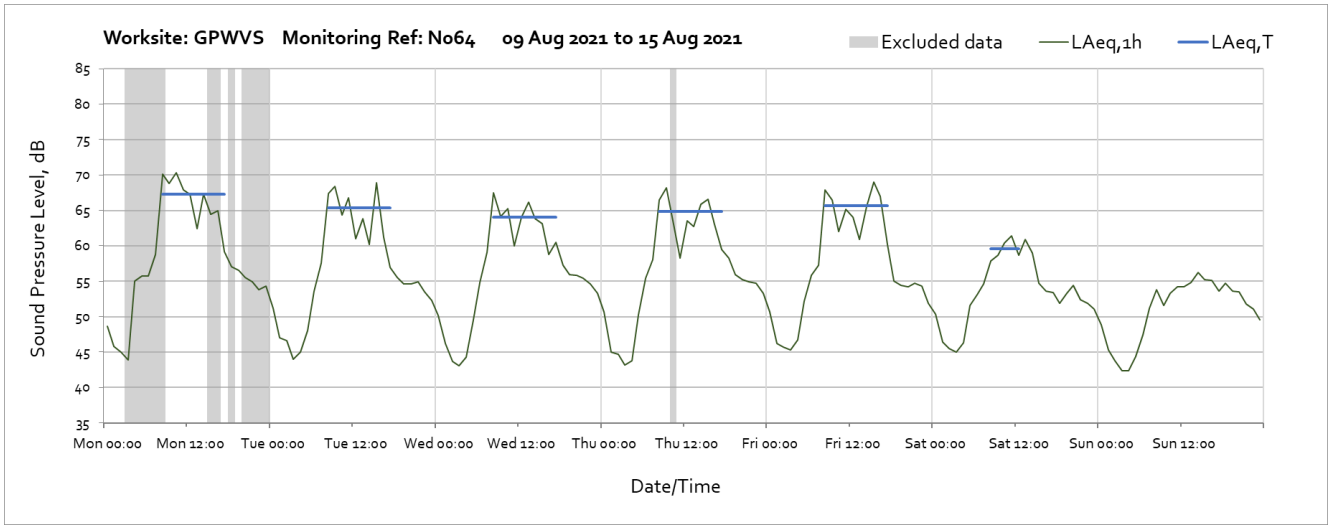

Worksite: GPWVS Monitoring Ref: No59 23 Aug 2021 to 29 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

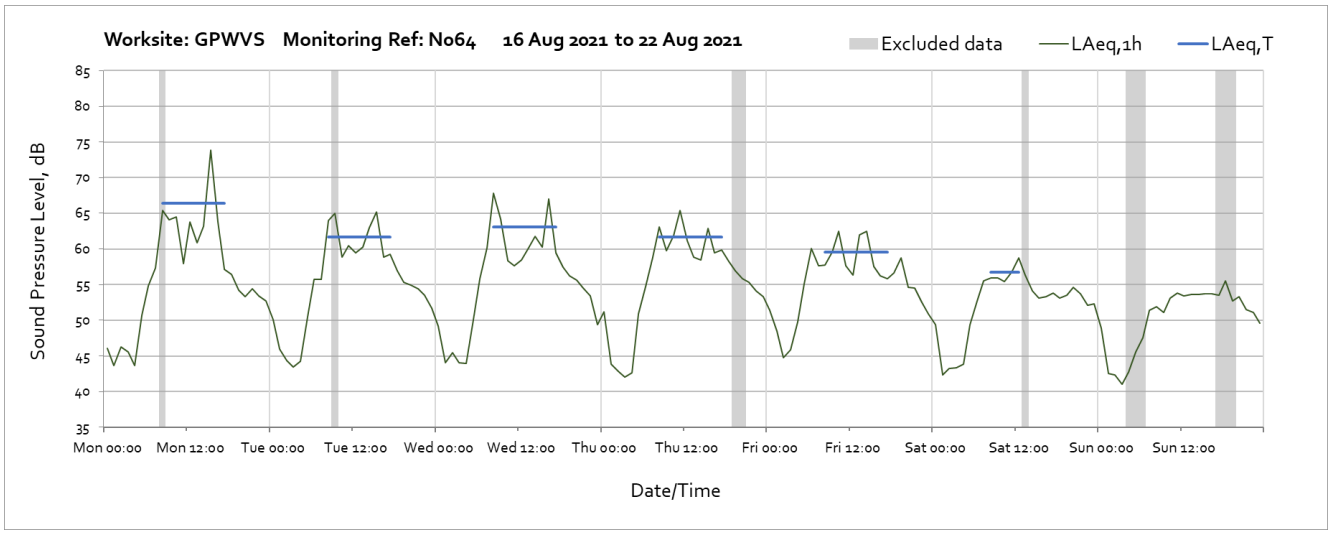


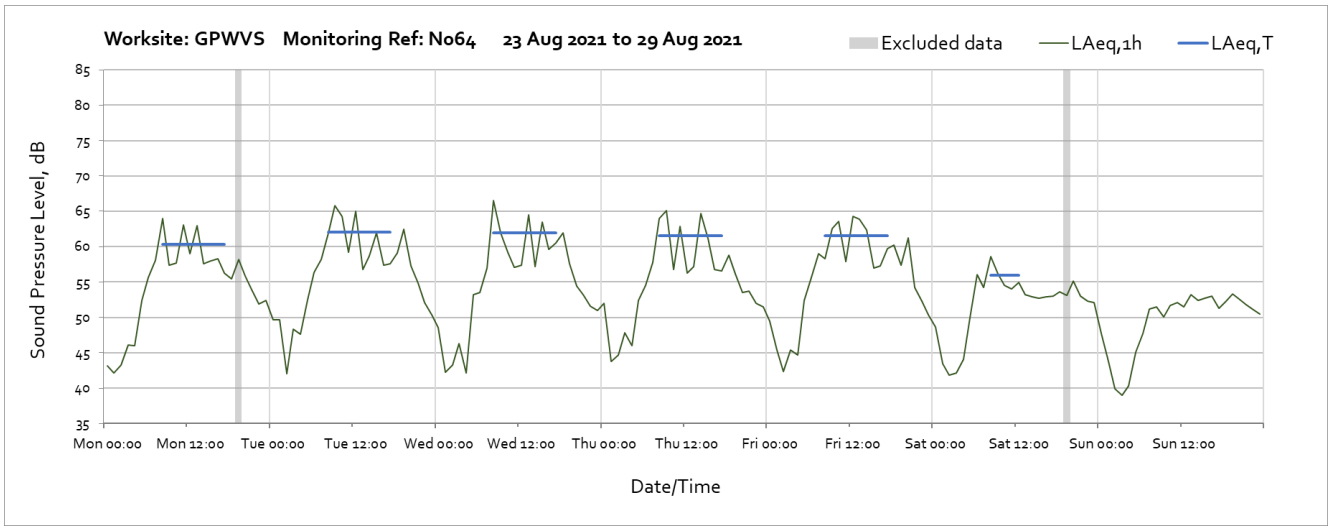
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: N064

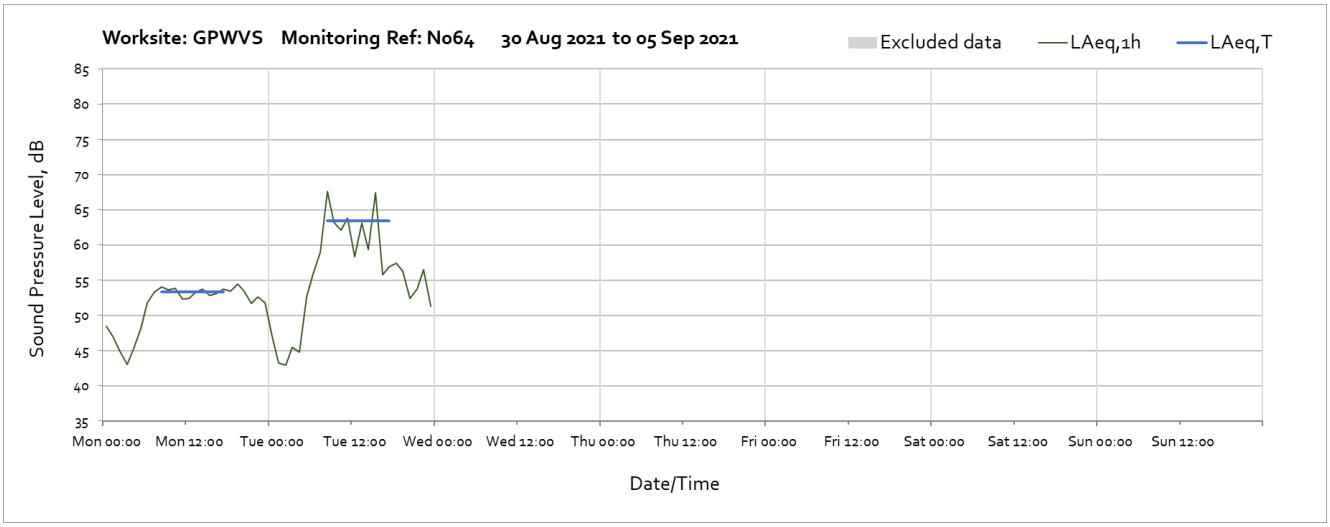




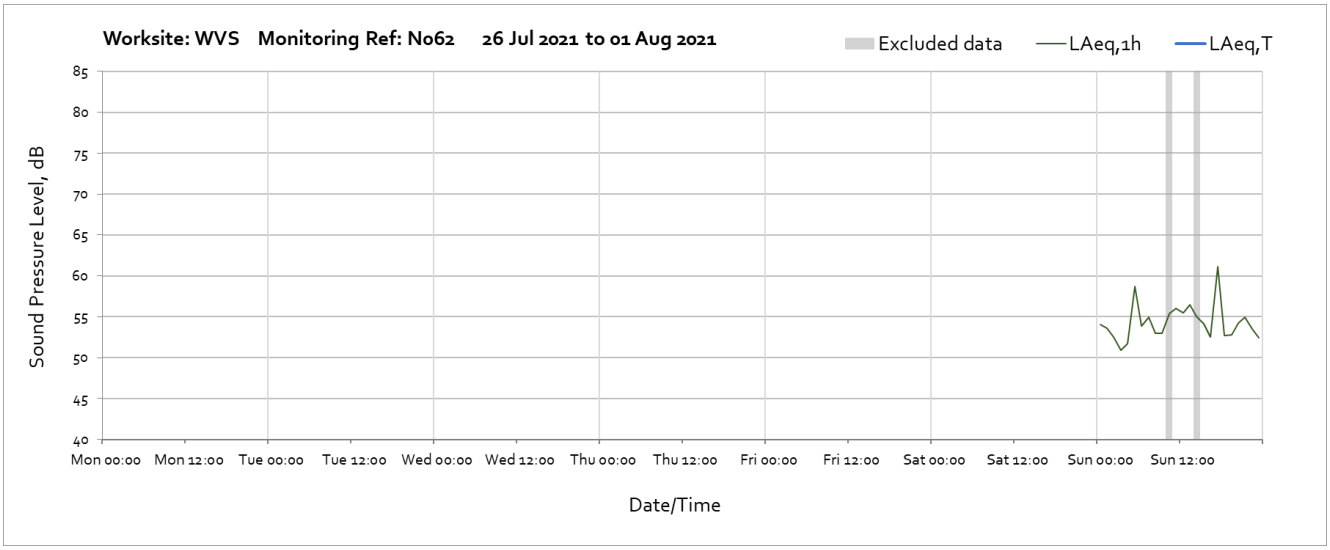

Worksite: GPWVS Monitoring Ref: No64 09 Aug 2021 to 15 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

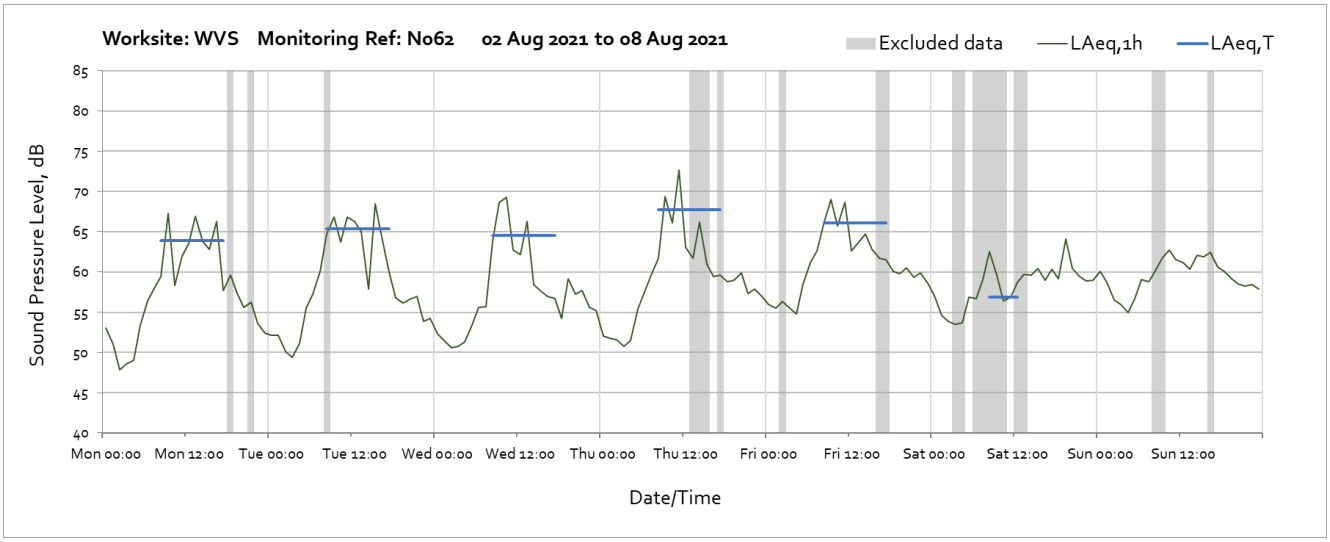

Worksite: GPWVS Monitoring Ref: No64 16 Aug 2021 to 22 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

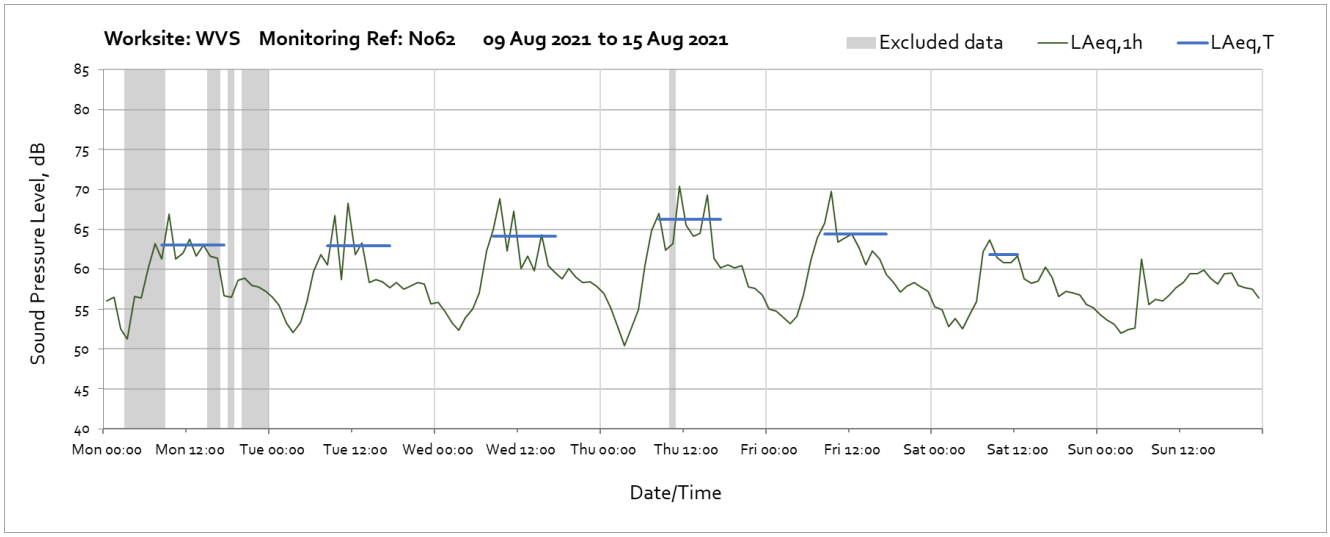

Worksite: GPWVS Monitoring Ref: No64 23 Aug 2021 to 29 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

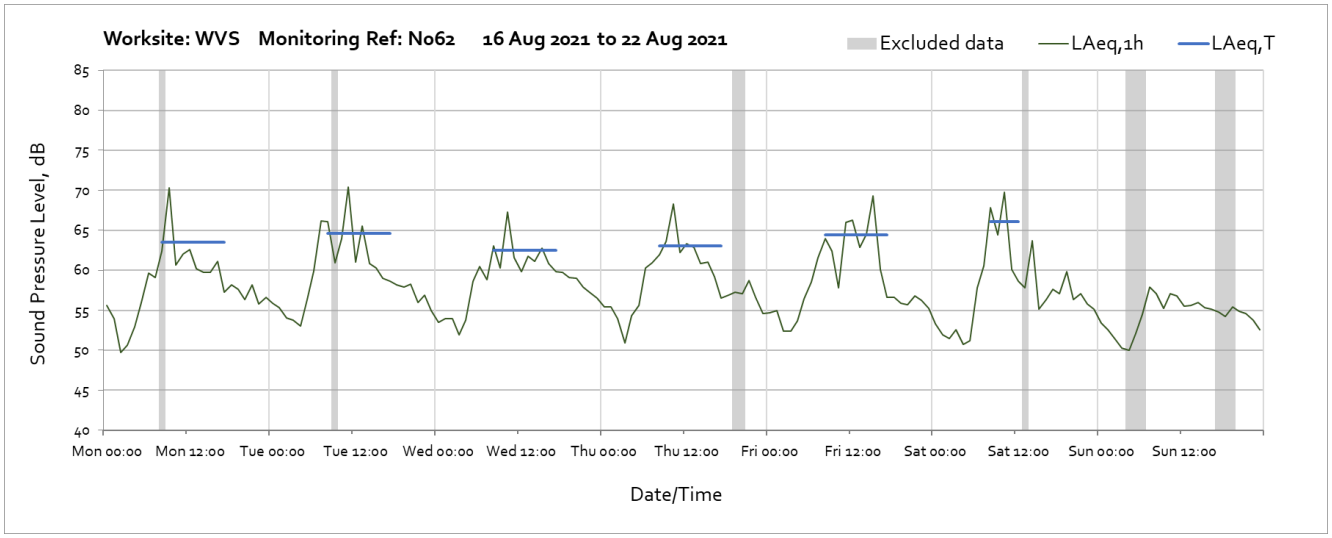


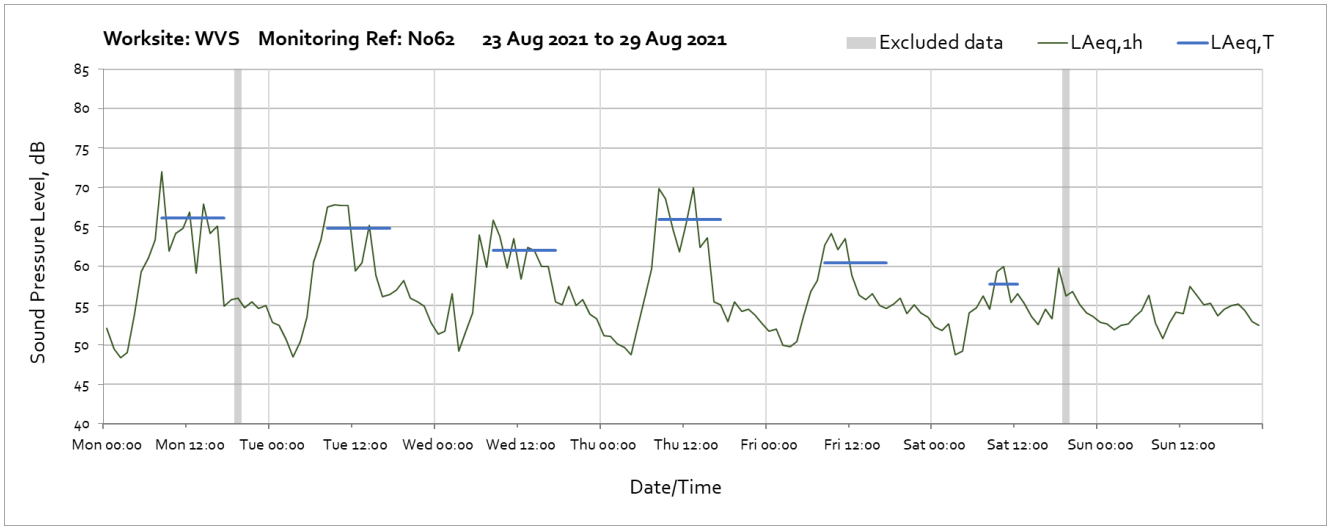
Worksite: Westgate Ventilation Shaft (WVS) – Monitoring Ref: N062

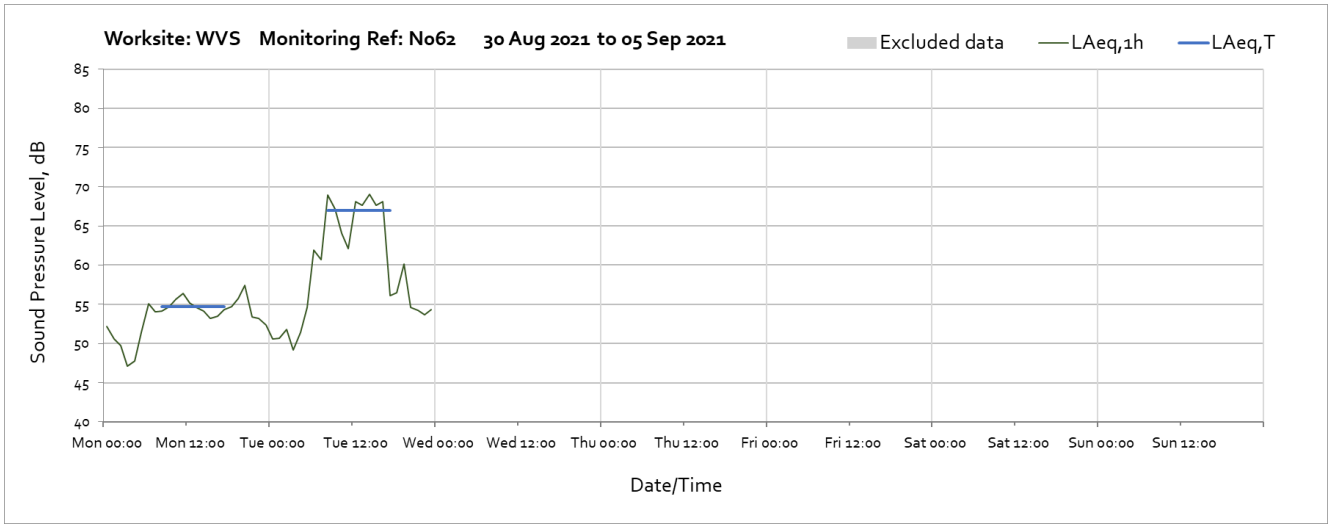





Worksite: WVS Monitoring Ref: No62 09 Aug 2021 to 15 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: WVS Monitoring Ref: No62 16 Aug 2021 to 22 Aug 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

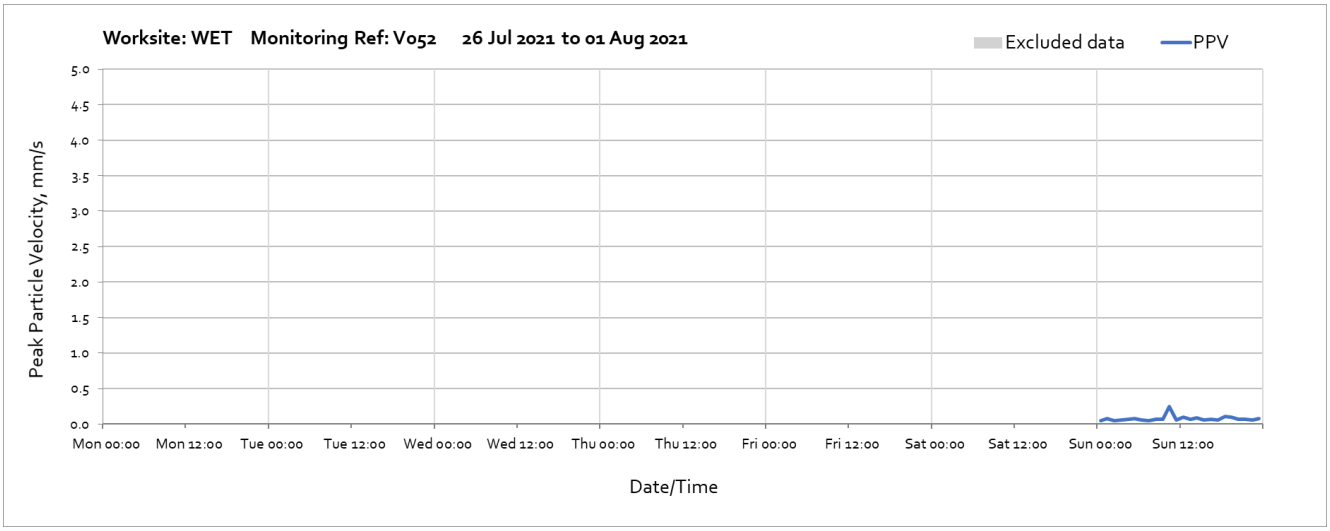

Worksite: WVS Monitoring Ref: No62 23 Aug 2021 to 29 Aug 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

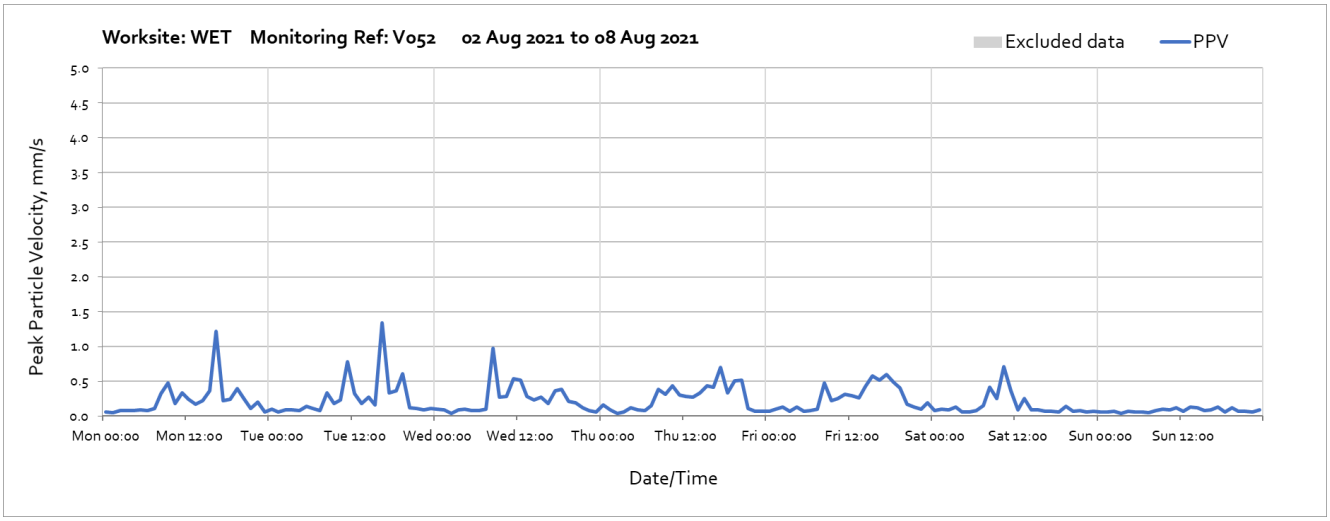

Worksite: WVS Monitoring Ref: N062 30 Aug 2021 to 05 Sep 2021
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

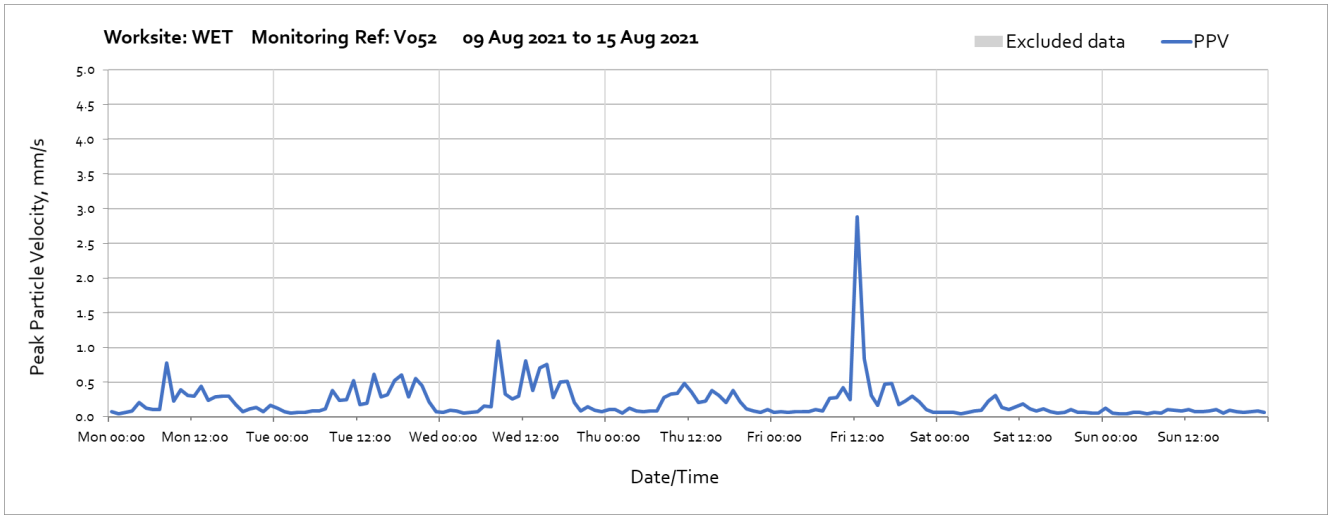
Vibration

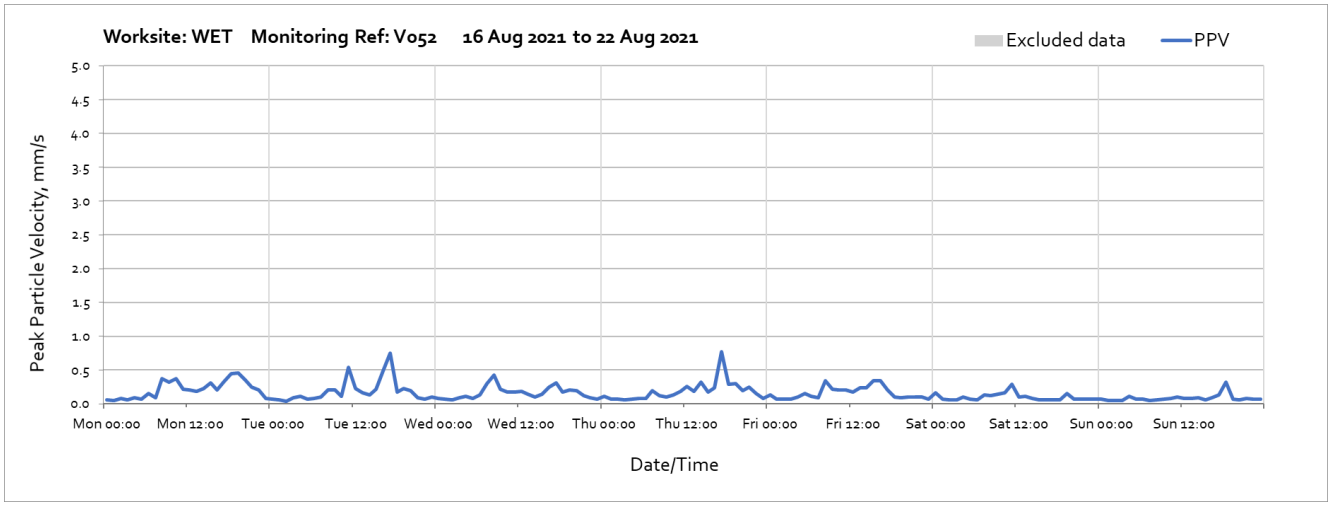
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axis x, y and z. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative 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.

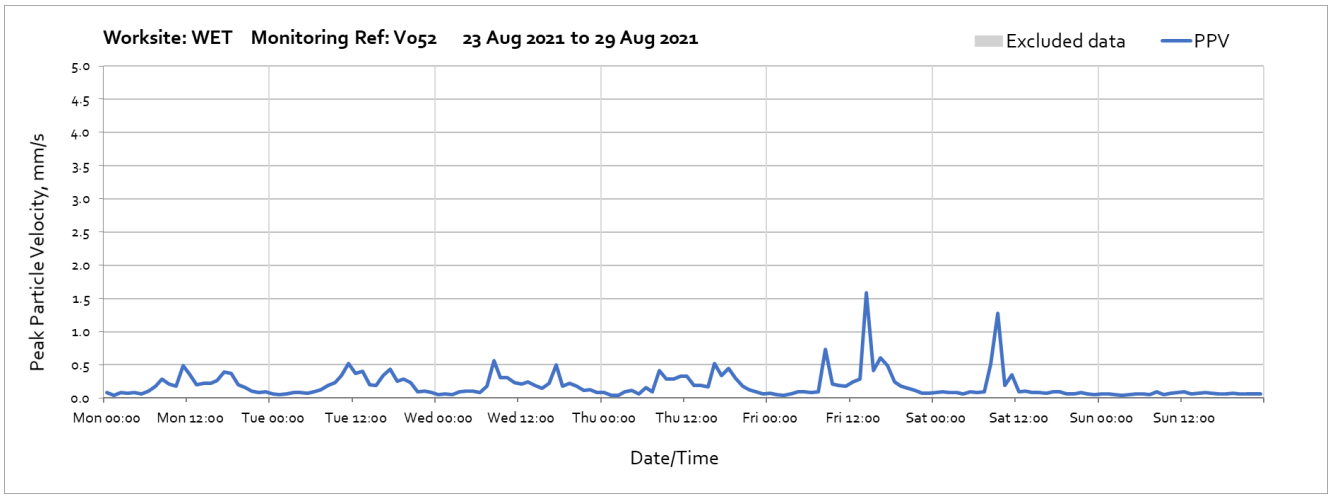
Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: V052

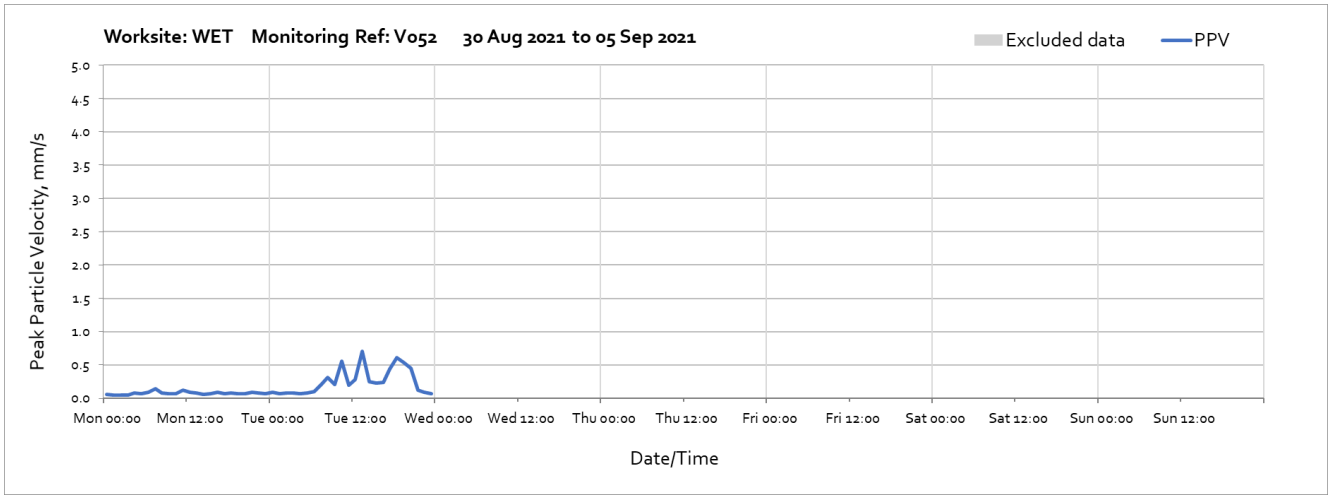




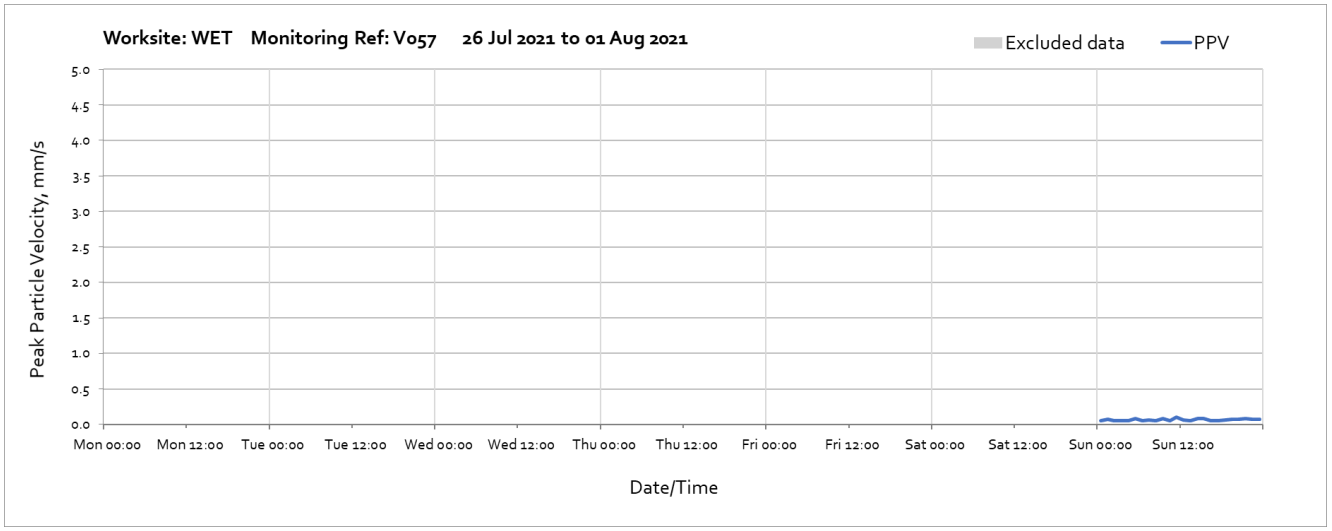

Worksite: WET Monitoring Ref: V052 09 Aug 2021 to 15 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

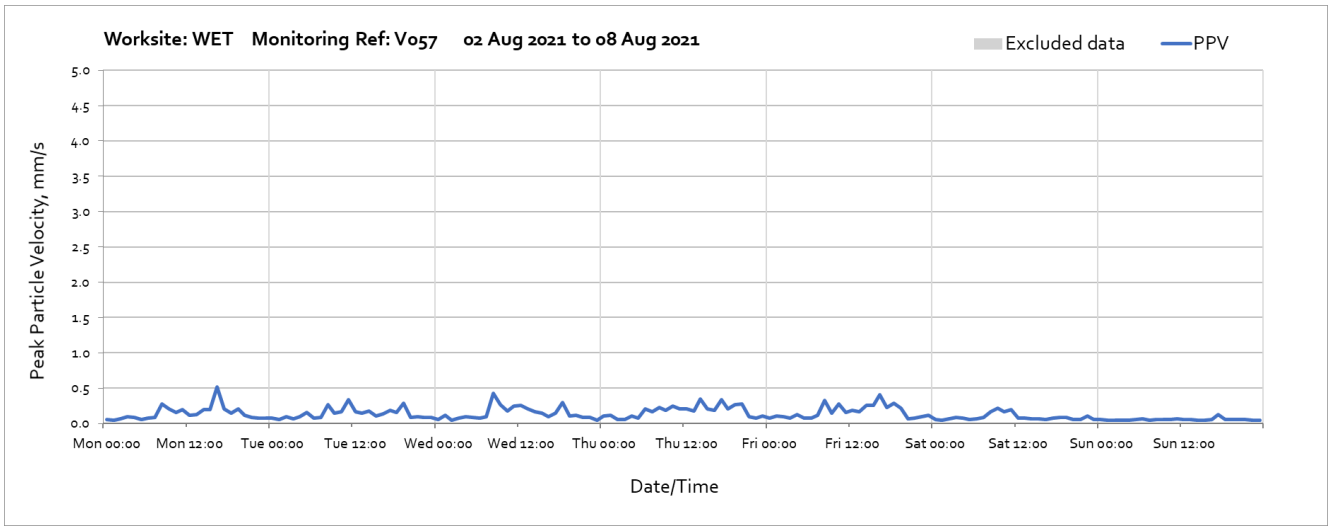

Worksite: WET Monitoring Ref: V052 16 Aug 2021 to 22 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

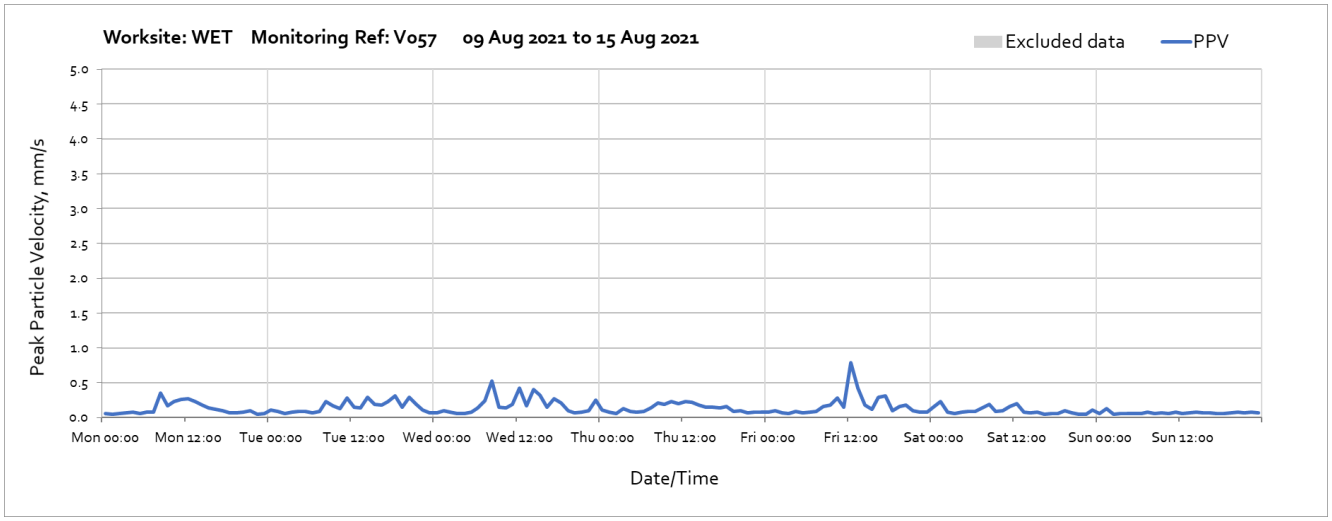

Worksite: WET Monitoring Ref: V052 23 Aug 2021 to 29 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

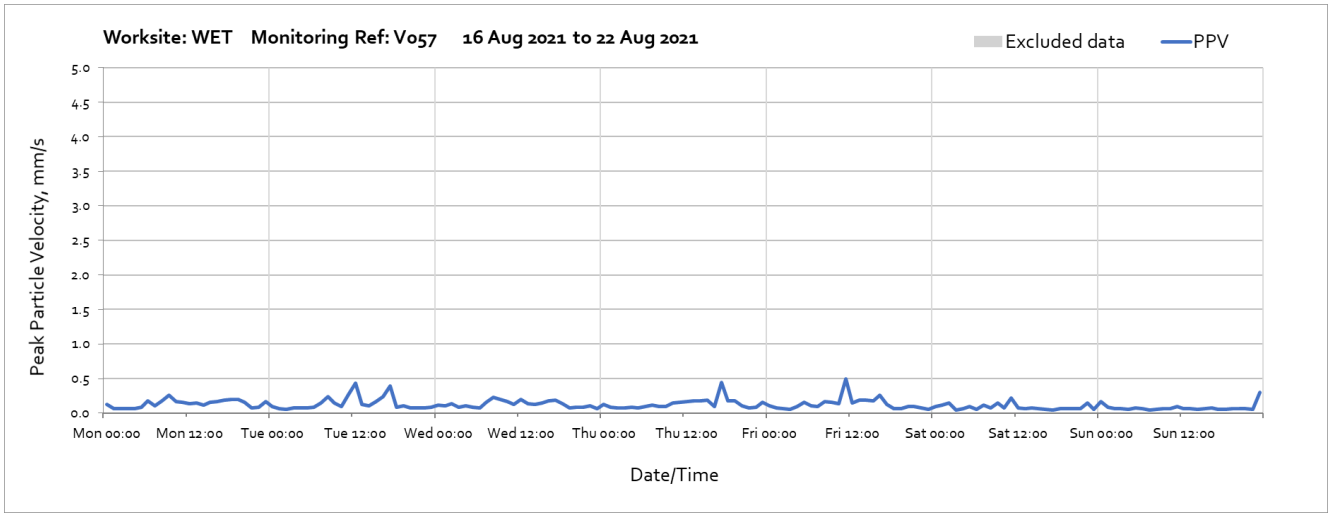


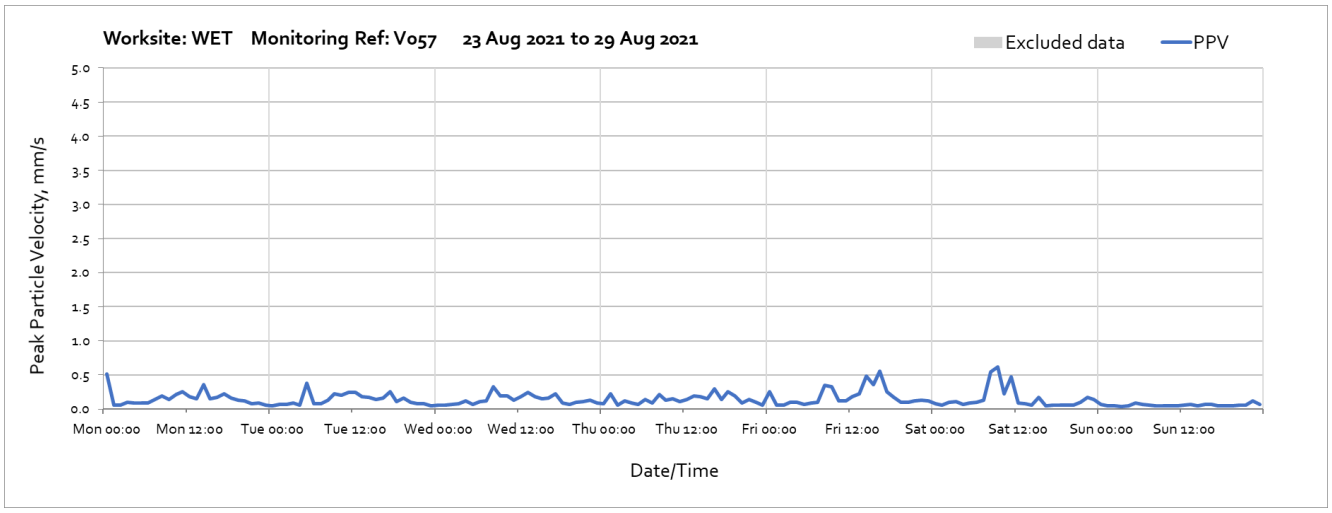
Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: V057

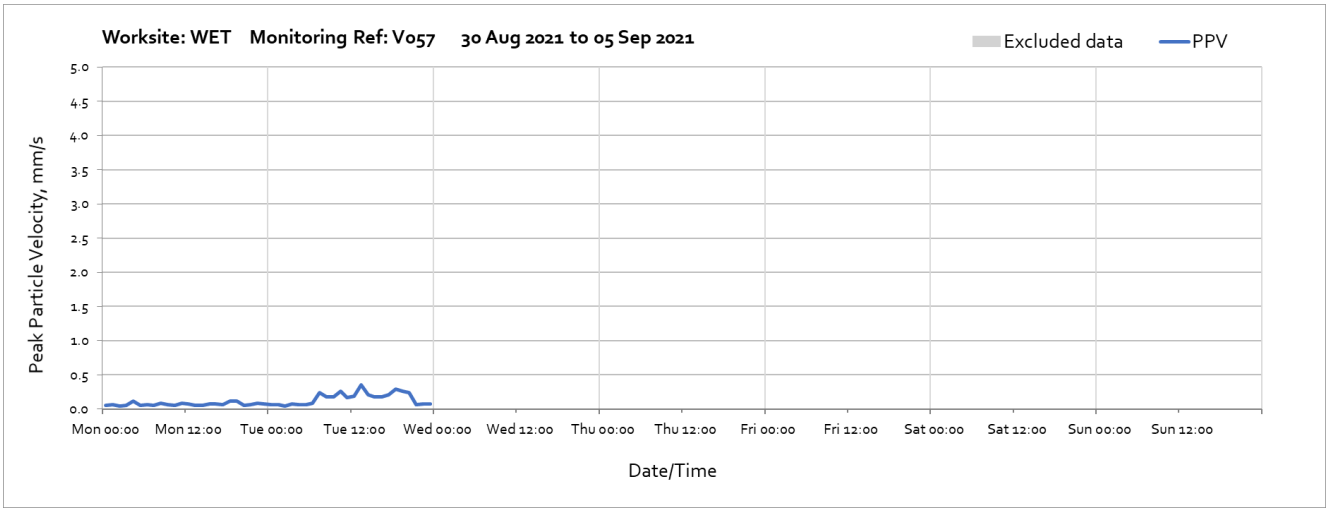




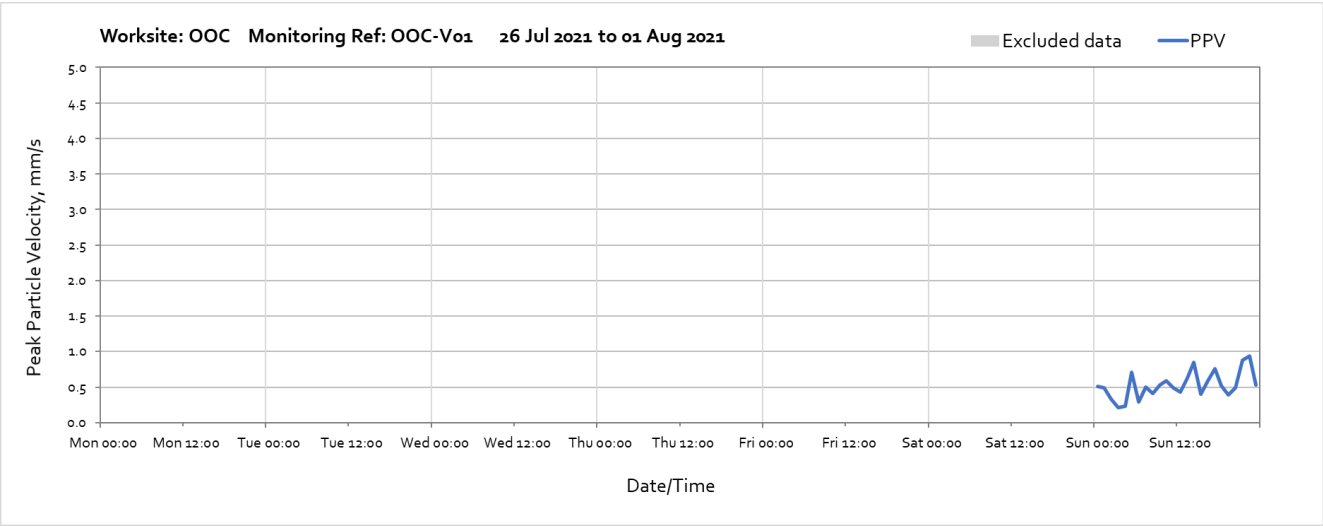

Worksite: WET Monitoring Ref: V057 09 Aug 2021 to 15 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

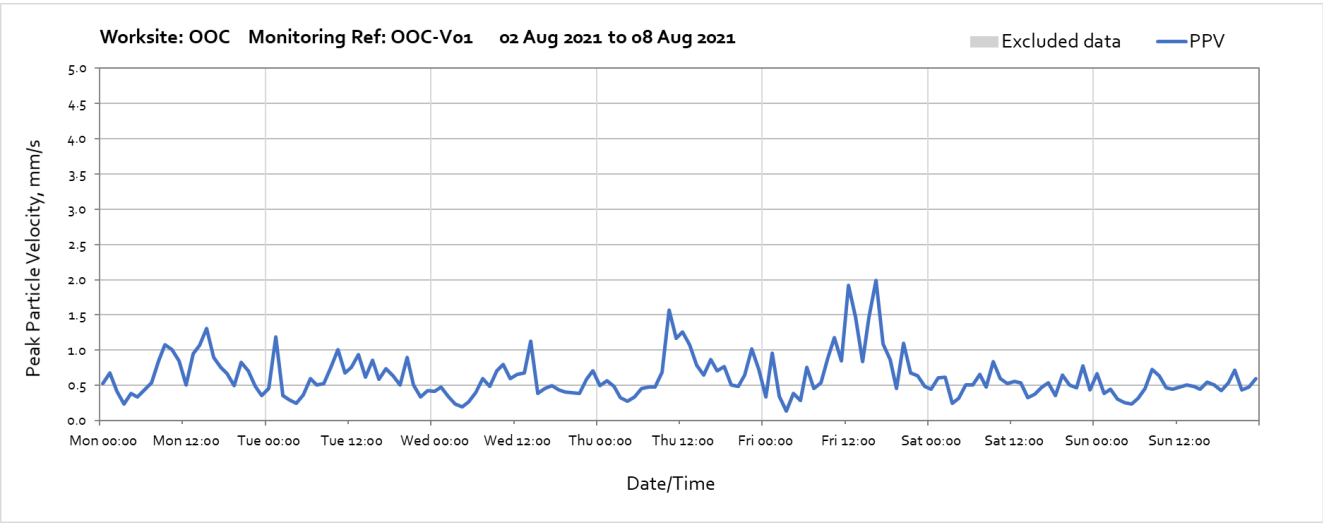

Worksite: WET Monitoring Ref: V057 16 Aug 2021 to 22 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

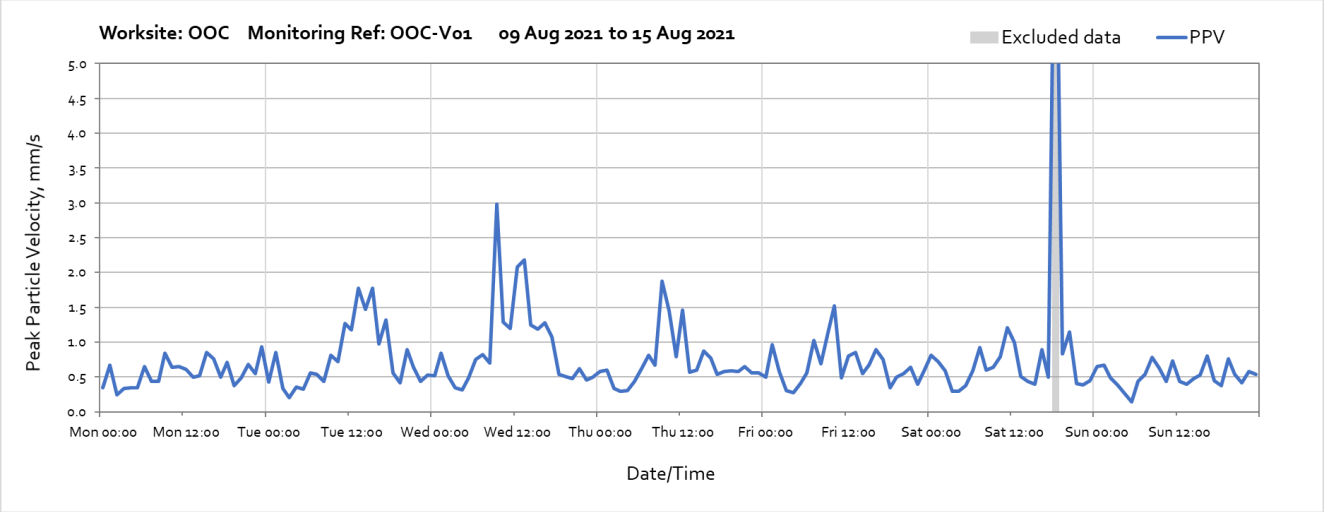

Worksite: WET Monitoring Ref: V057 23 Aug 2021 to 29 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



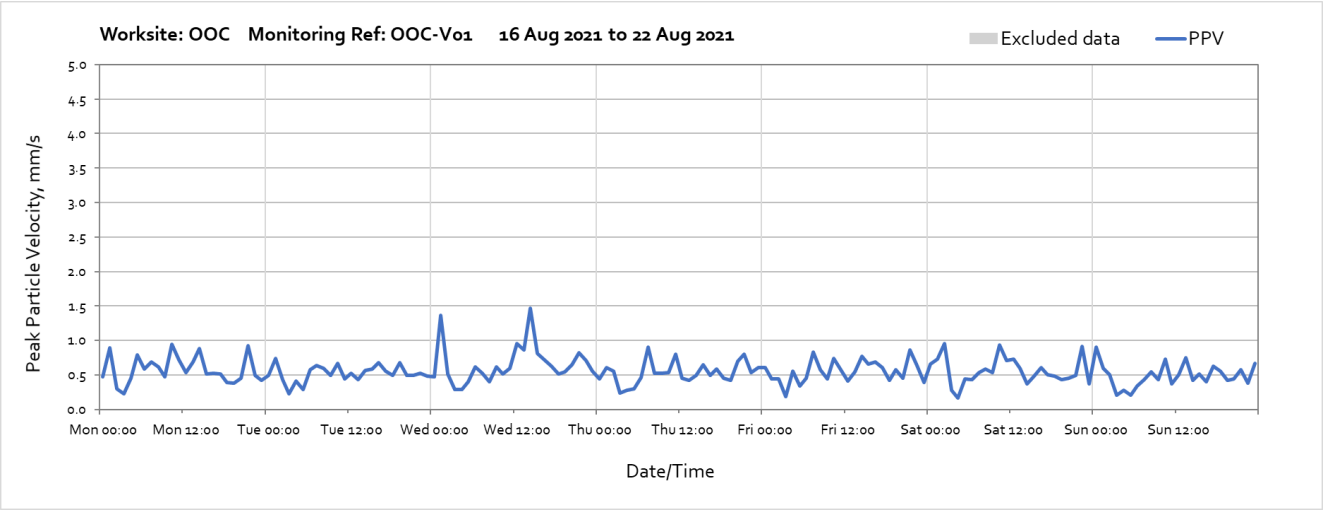
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V01

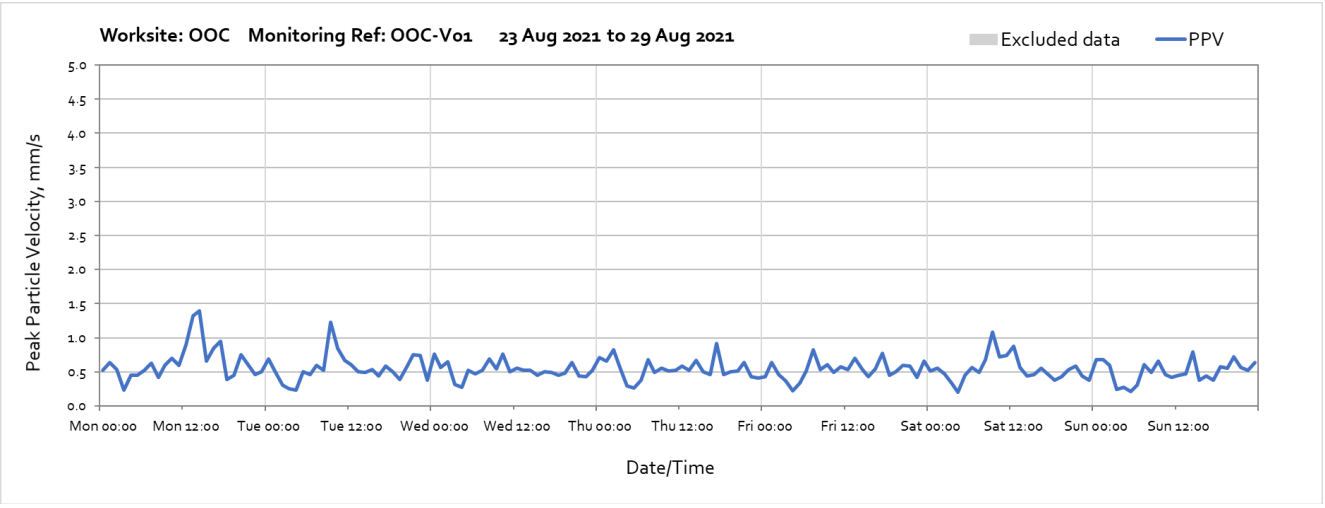


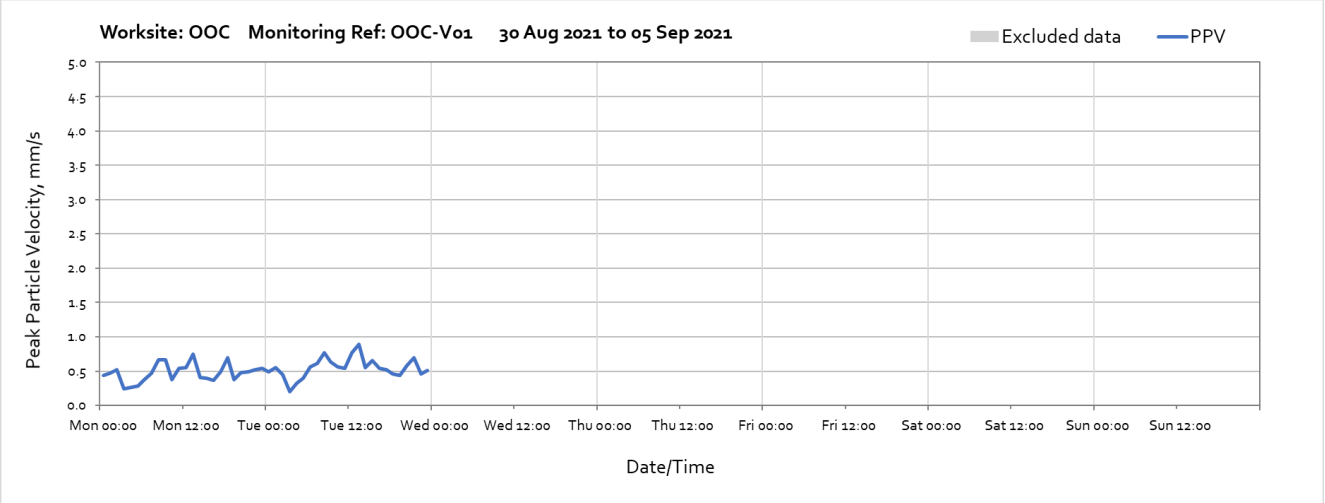




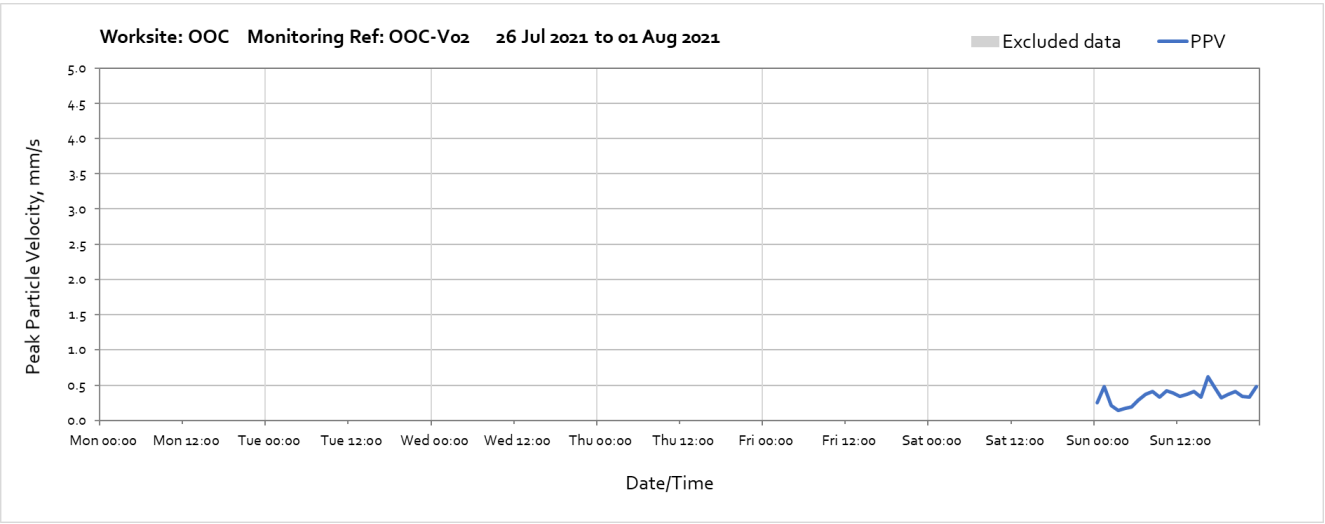
Note: High vibration levels measured at 18:00 on Saturday 14th August 2021 was due to local disturbance at the monitor station and not representative of HS2 vibration levels.

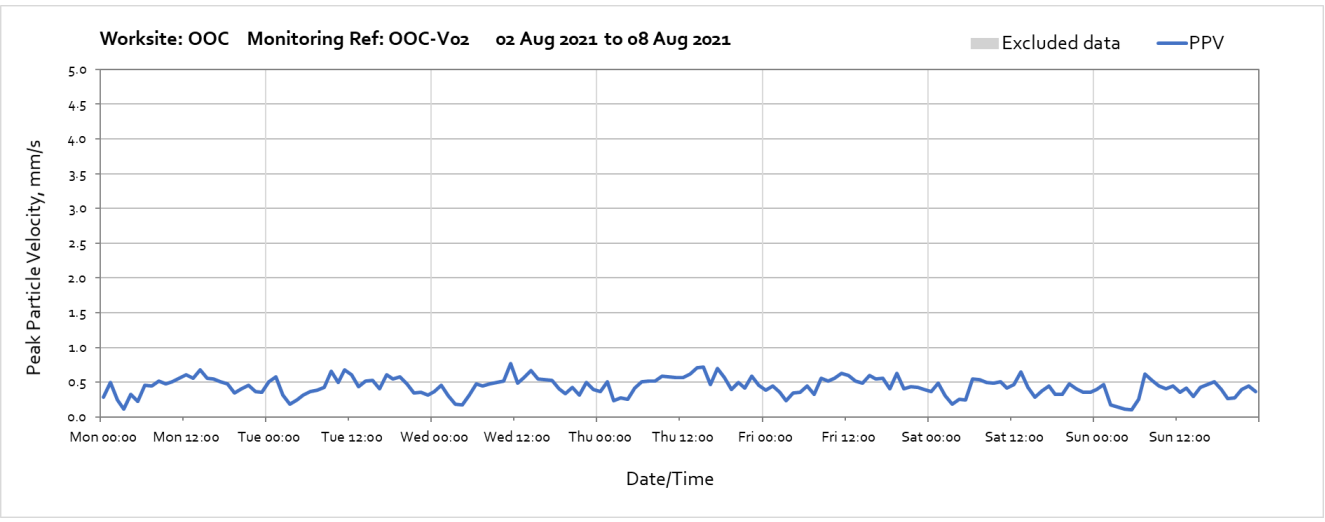


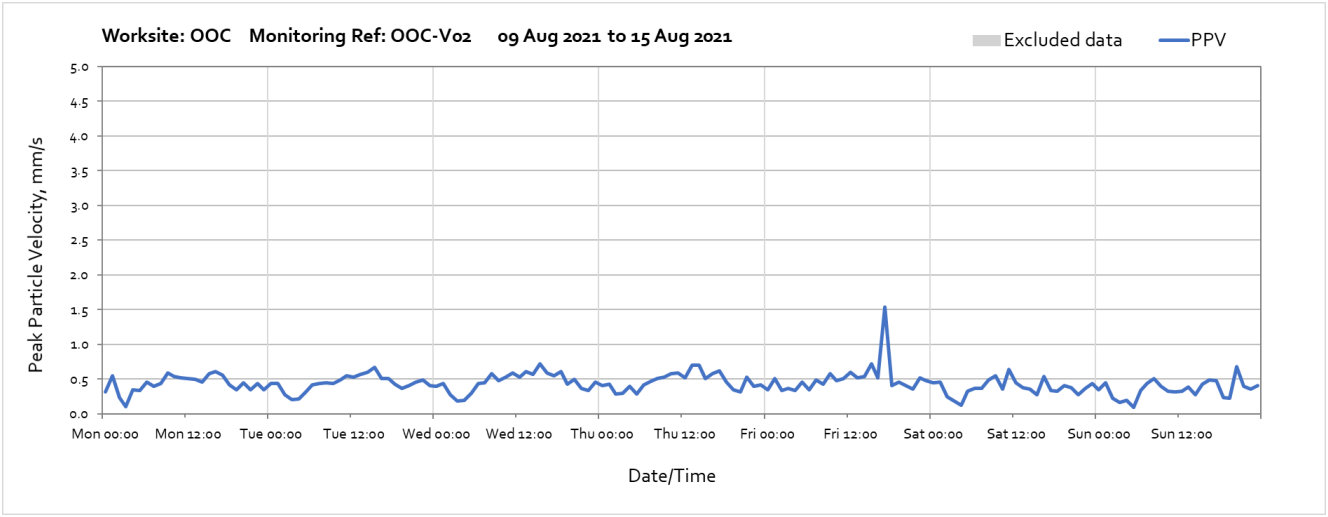


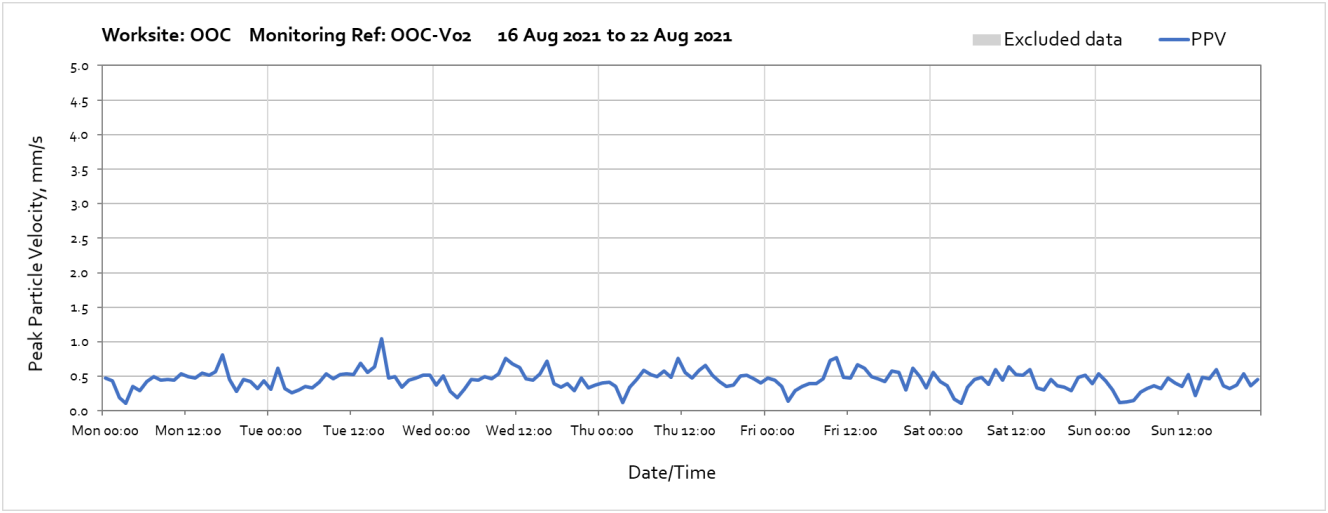


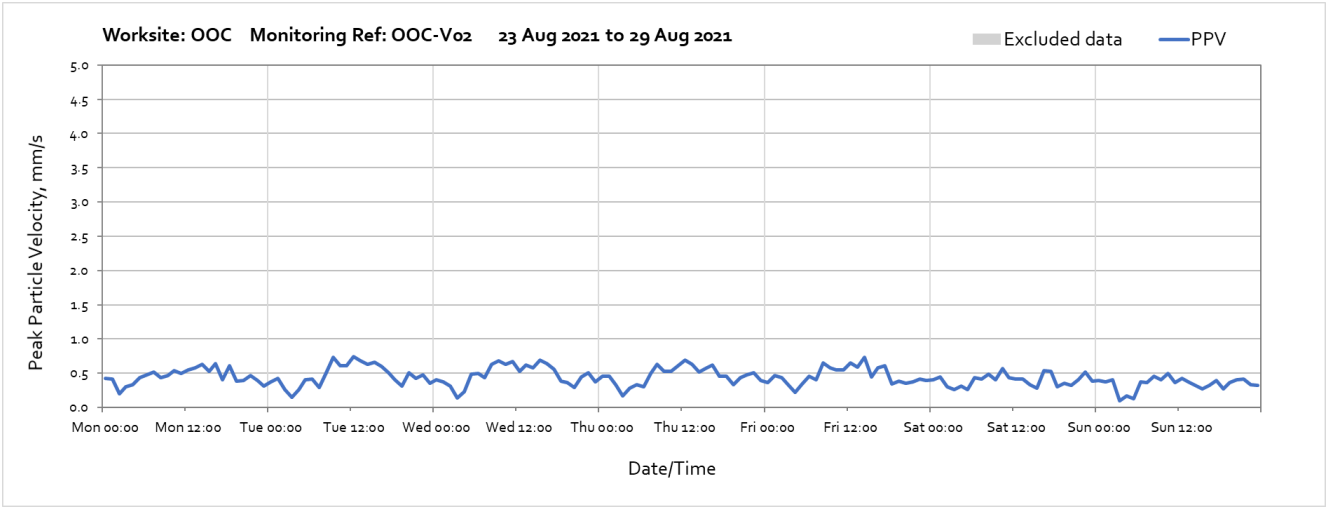
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V02

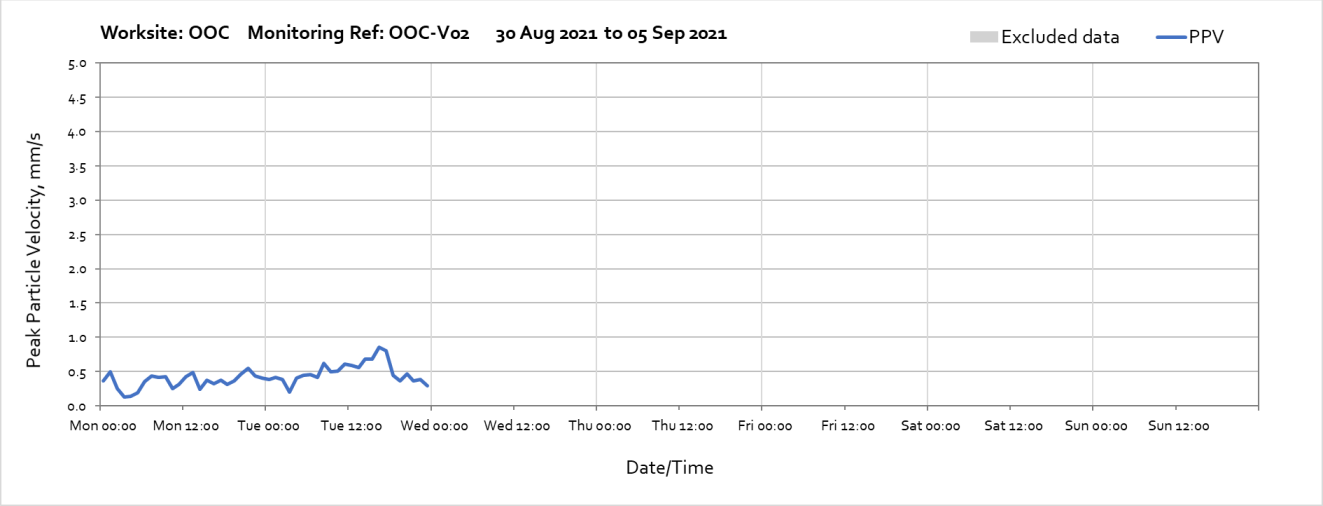




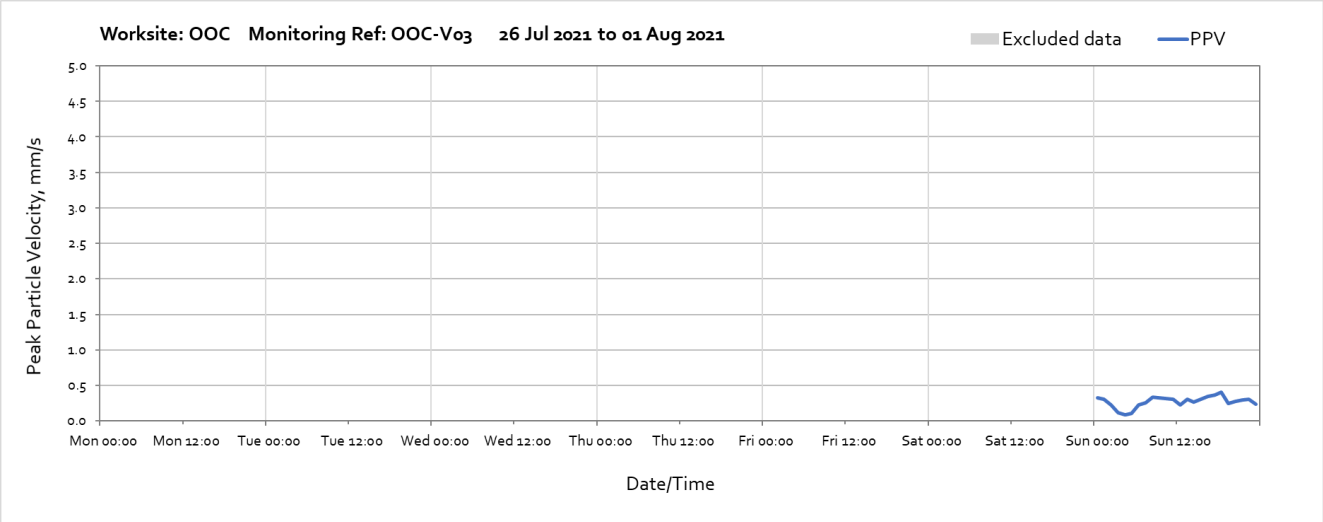

Worksite: OOC Monitoring Ref: OOC-V02 09 Aug 2021 to 15 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

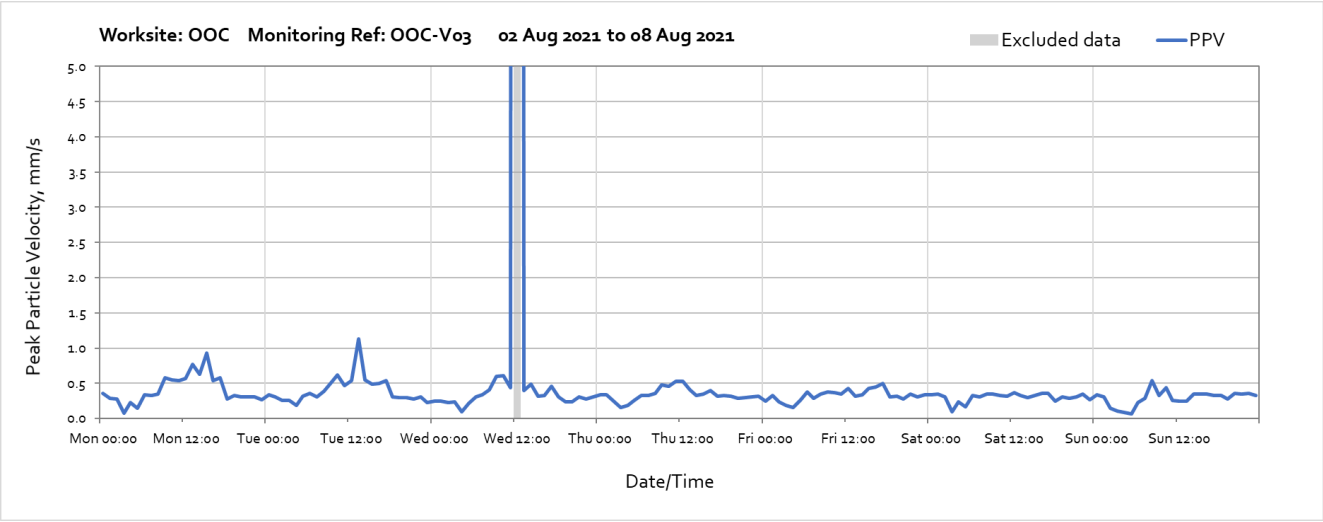

Worksite: OOC Monitoring Ref: OOC-V02 16 Aug 2021 to 22 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-V02 23 Aug 2021 to 29 Aug 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

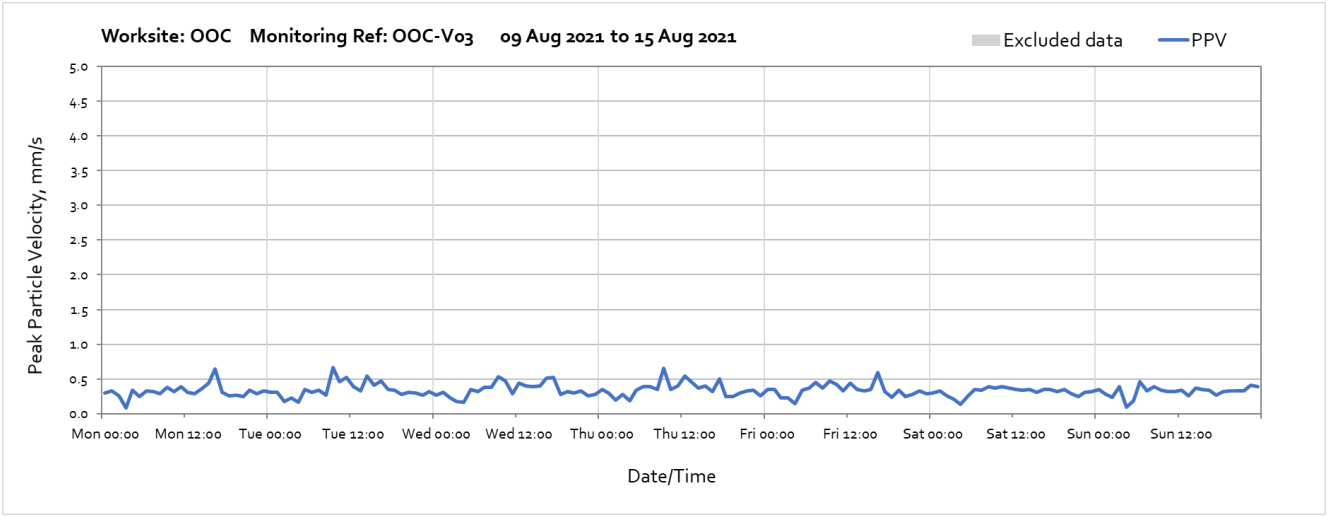


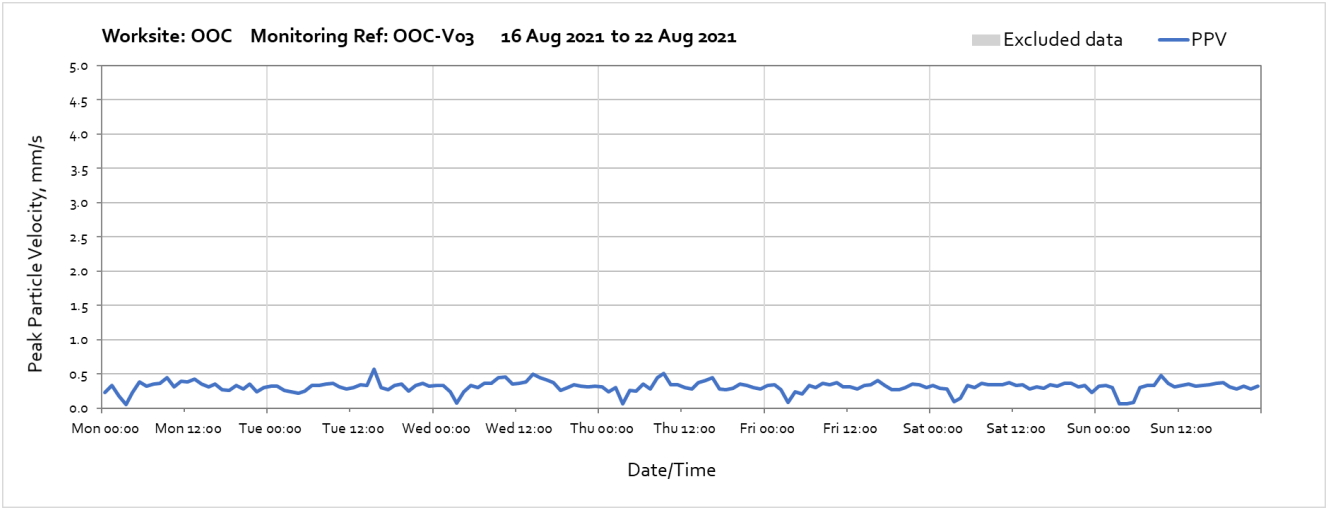
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V03

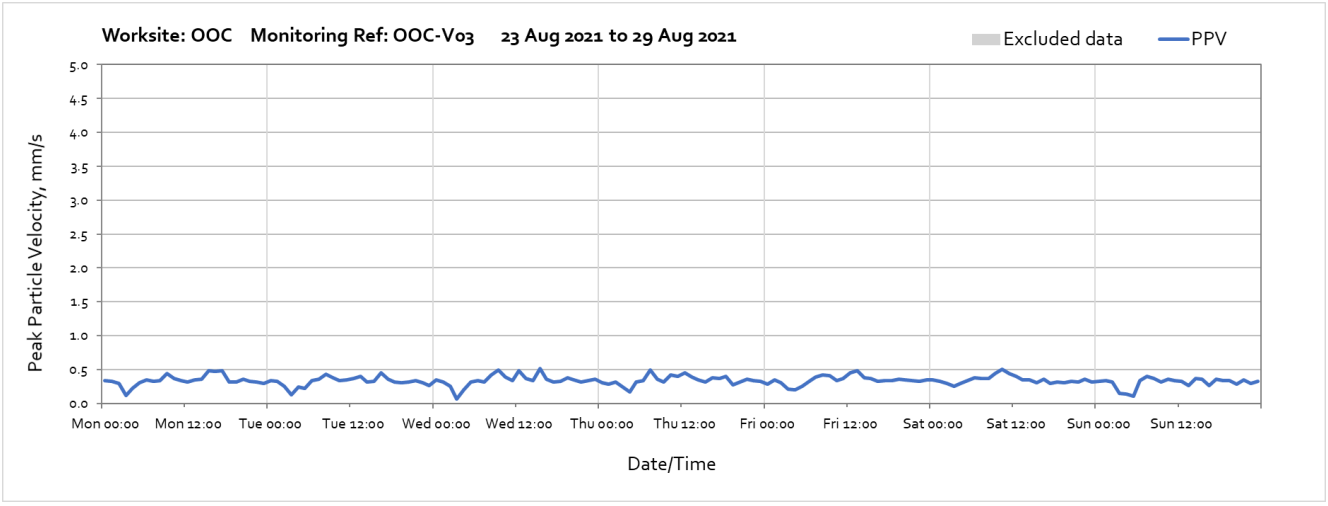


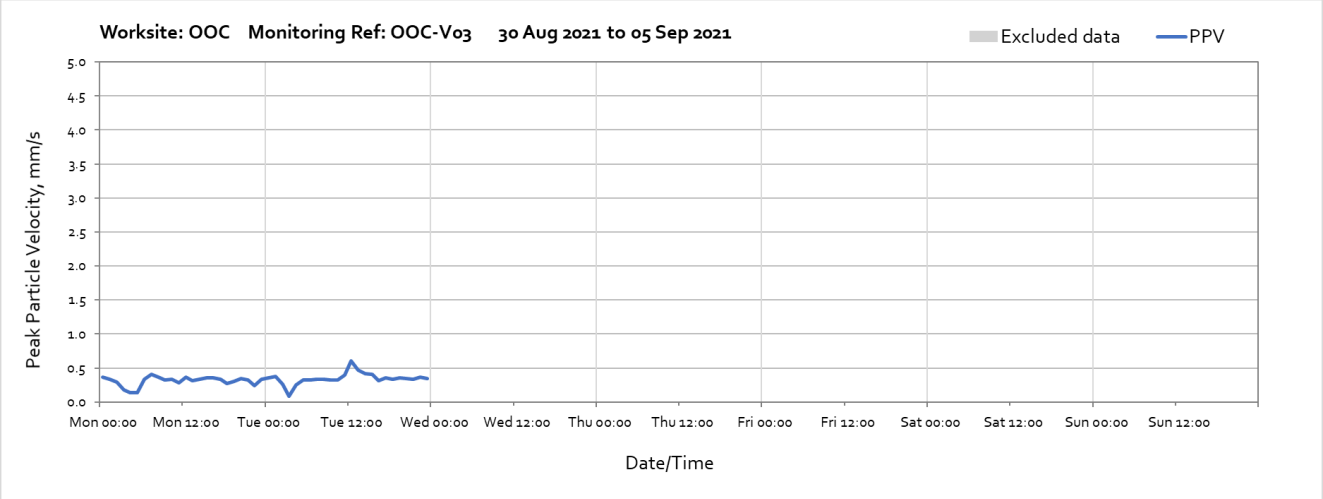


Note: High vibration levels measured at 12:00 on Wednesday 4th August 2021 was due to local disturbance at the monitor station and not representative of HS2 vibration levels.

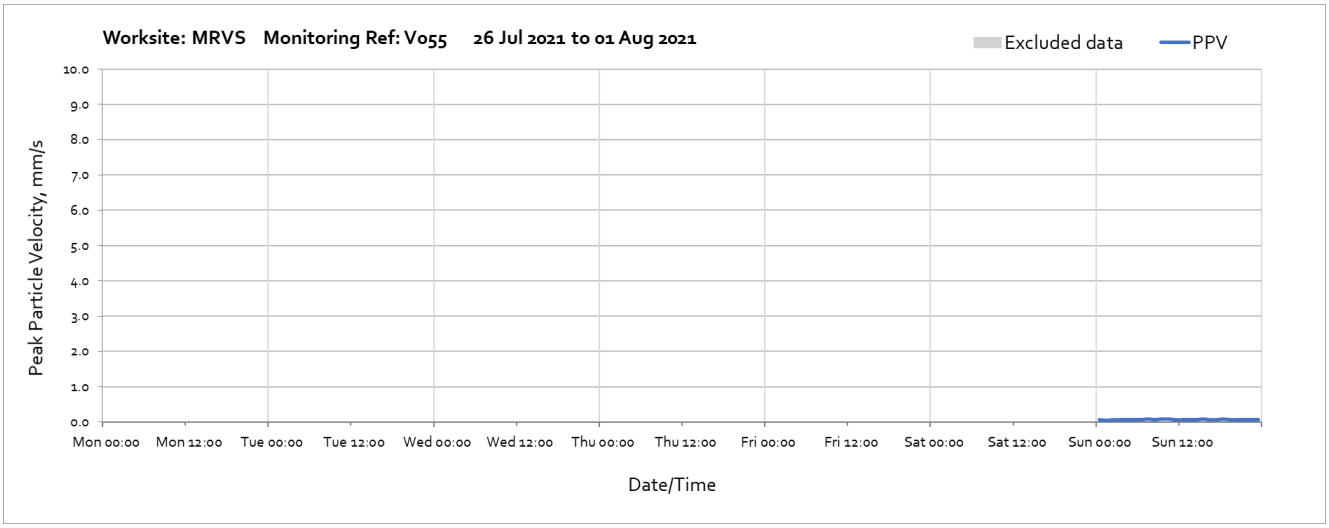

Worksite: OOC Monitoring Ref: OOC-V03 09 Aug 2021 to 15 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

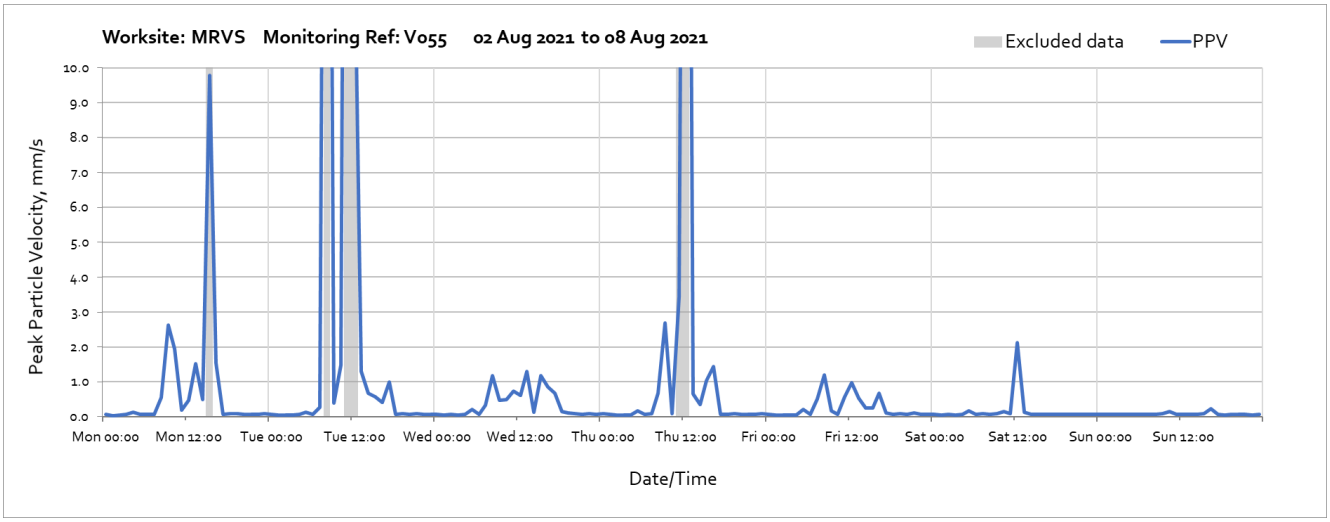

Worksite: OOC Monitoring Ref: OOC-V03 16 Aug 2021 to 22 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-V03 23 Aug 2021 to 29 Aug 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

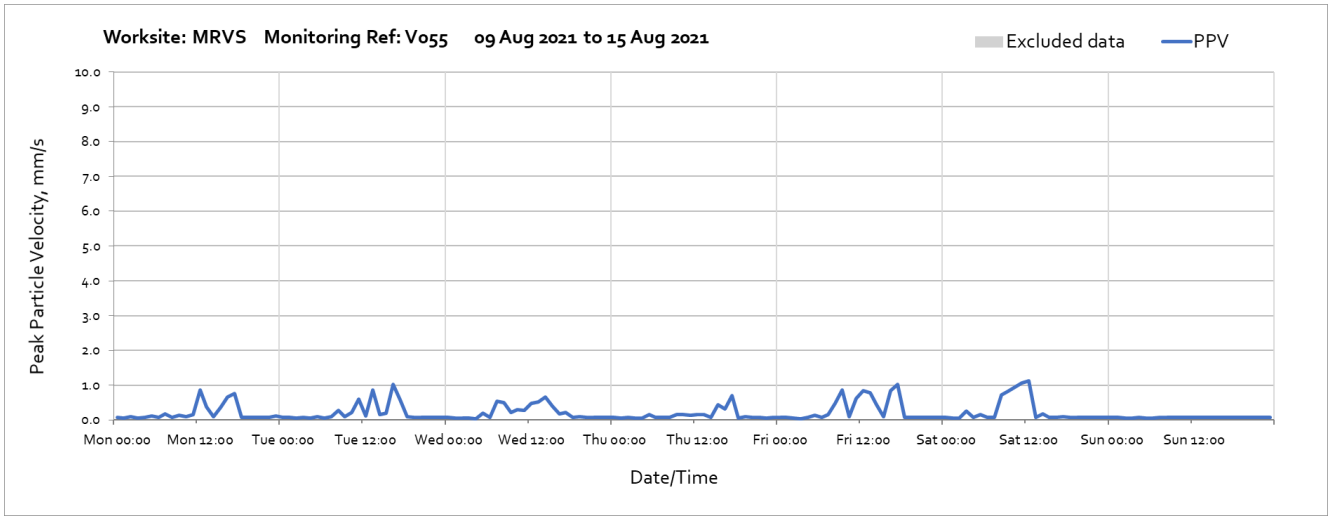


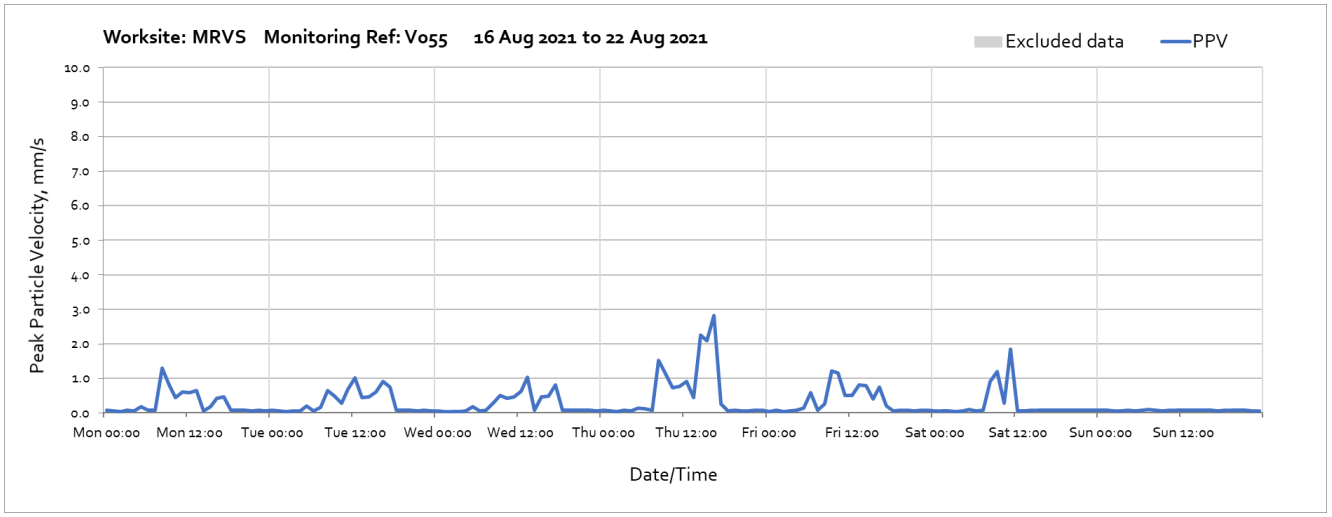
Worksite: Mandeville Road Vent Shaft (MRVS) – Monitoring Ref: V055

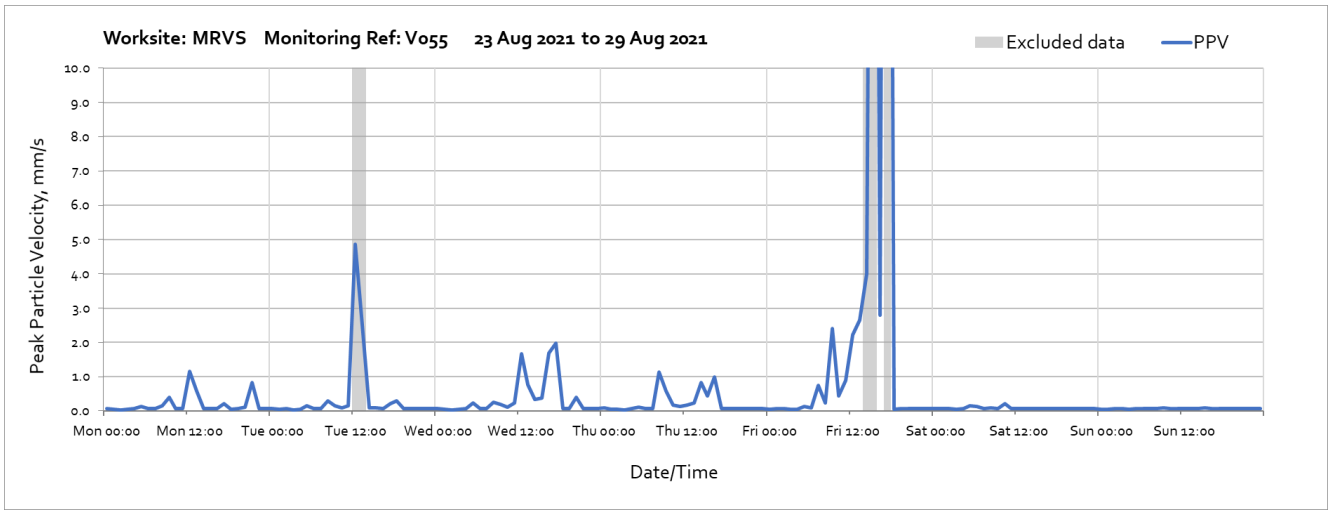




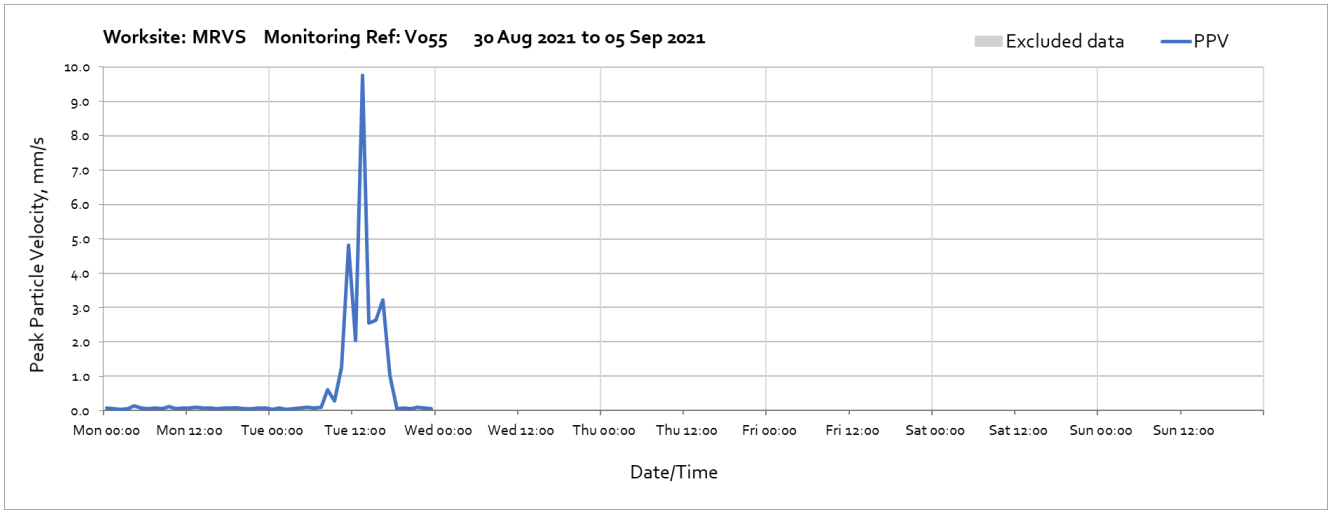
Note: High vibration measured across the week were due to due to local disturbance at the monitor station and not representative of HS2 vibration levels.





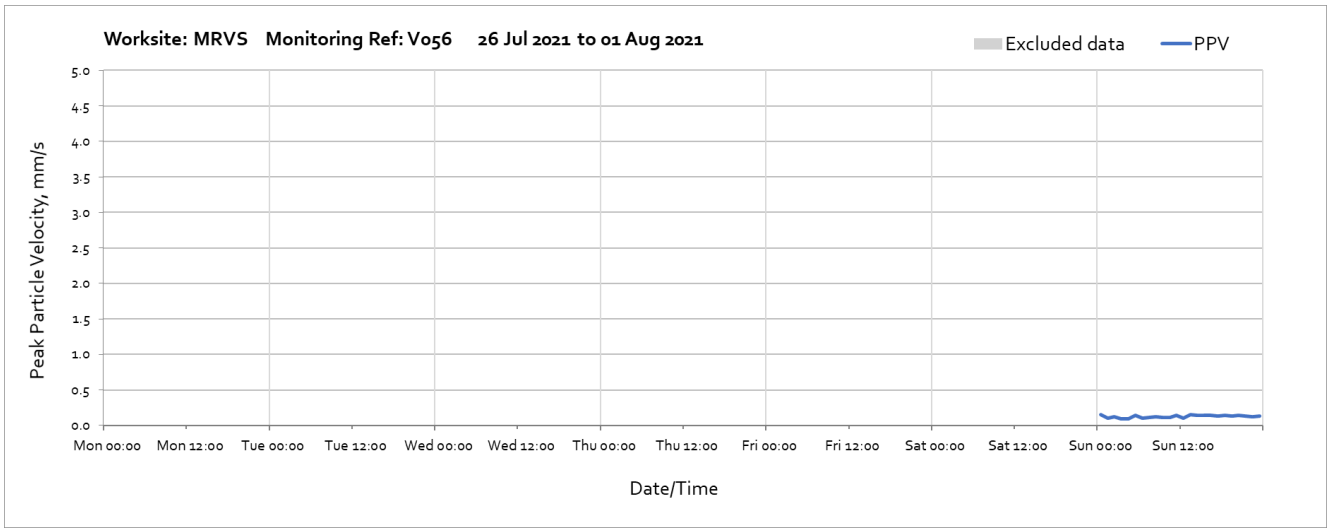


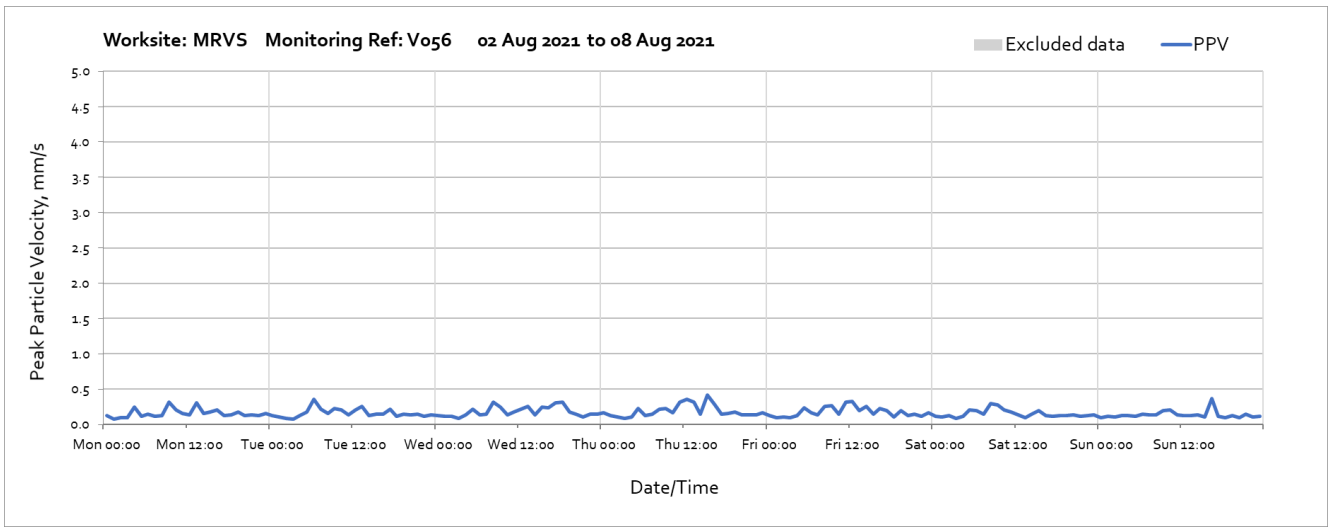
Note: High vibration levels measured at 12:00 and 13:00 on Tuesday 24th August and between 14:00 and 17:00 on Friday 27th August 2021 were due to due to local disturbance at the monitor station and not representative of HS2 vibration levels.

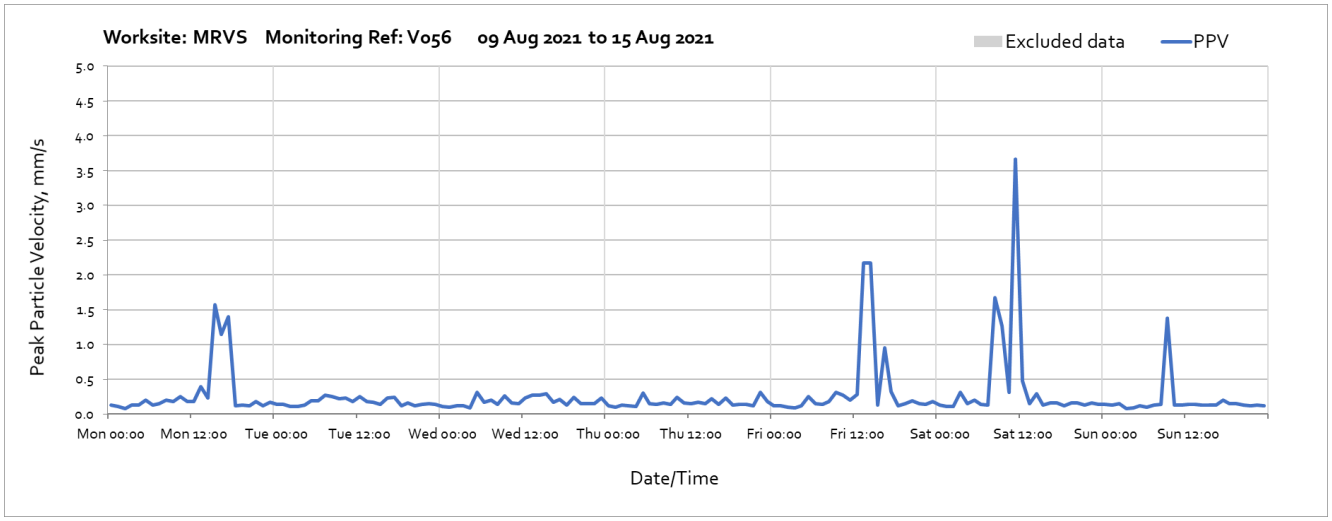


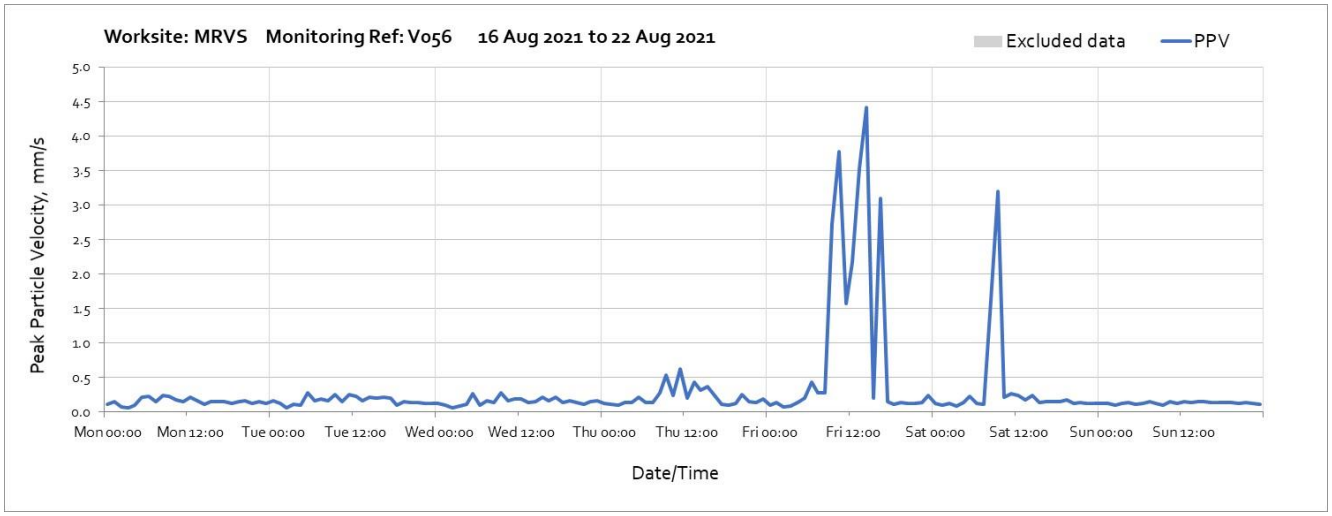
Note: High vibration levels measured between 11:00 and 16:00 on Tuesday 31st August 2021 were due sheet piling works undertaken near to the monitoring location. The nearest residential receptors are further away from the works and vibration levels at the receptors will therefore be lower.

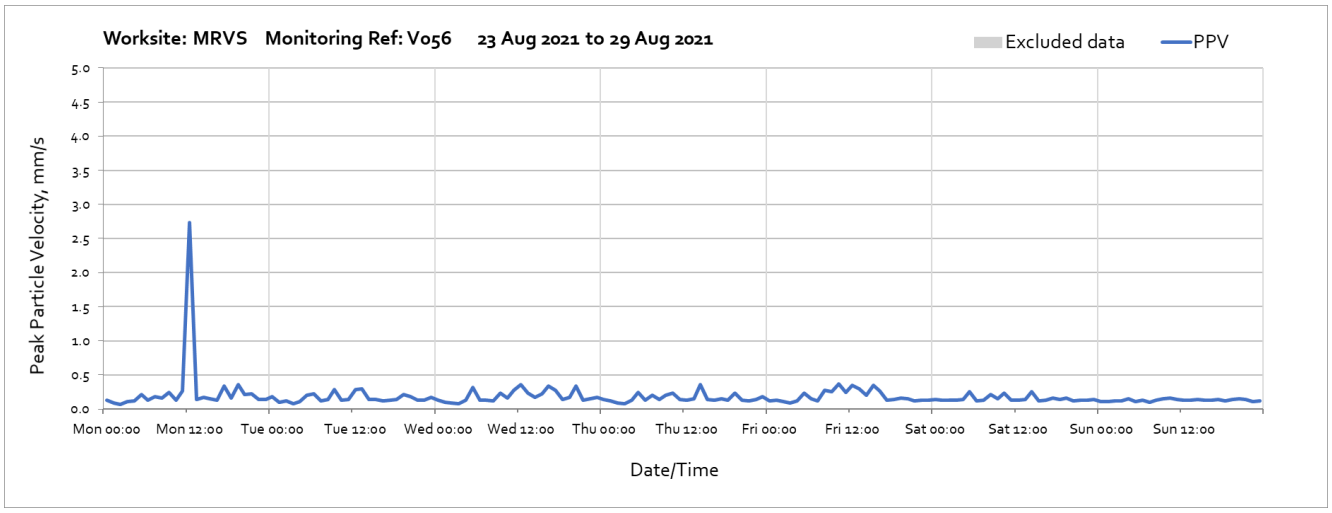
Worksite: Mandeville Road Vent Shaft (MRVS) – Monitoring Ref: V056

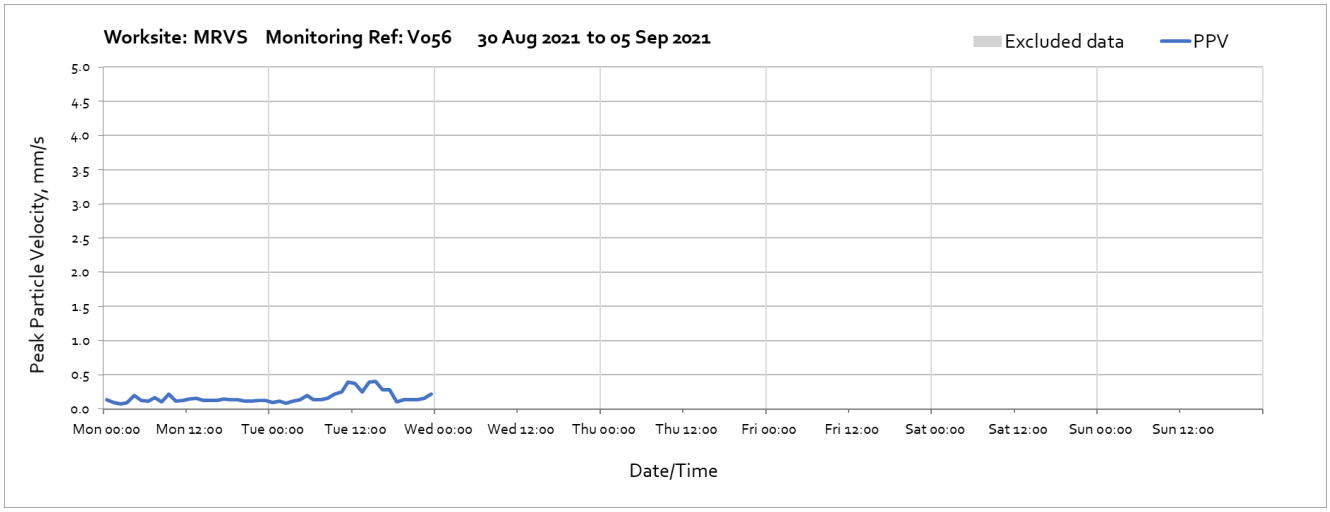




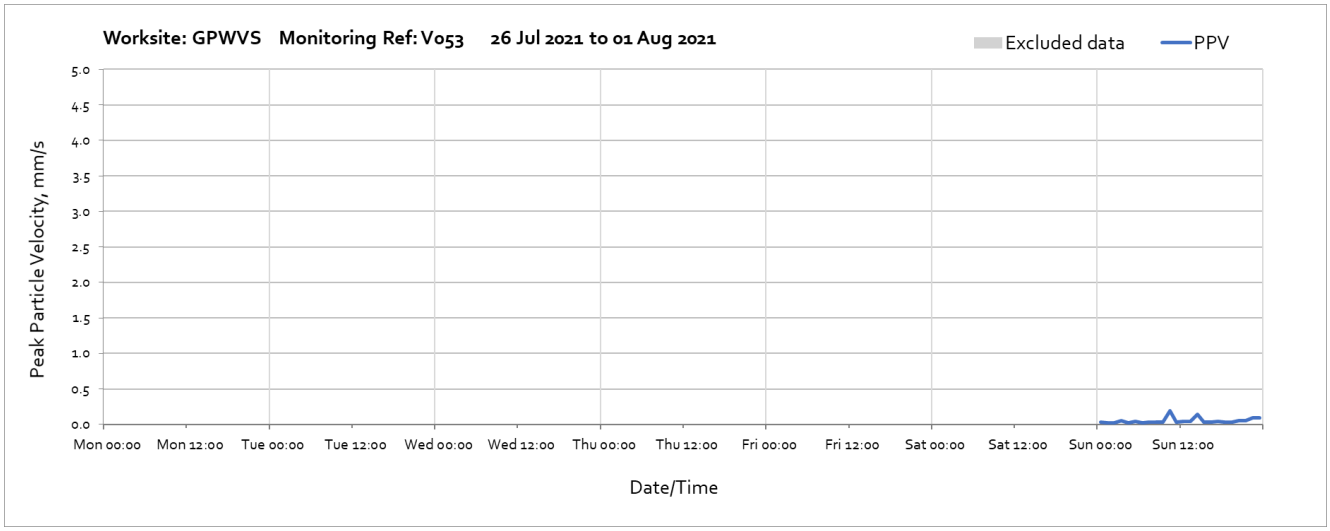

Worksite: MRVS Monitoring Ref: V056 09 Aug 2021 to 15 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

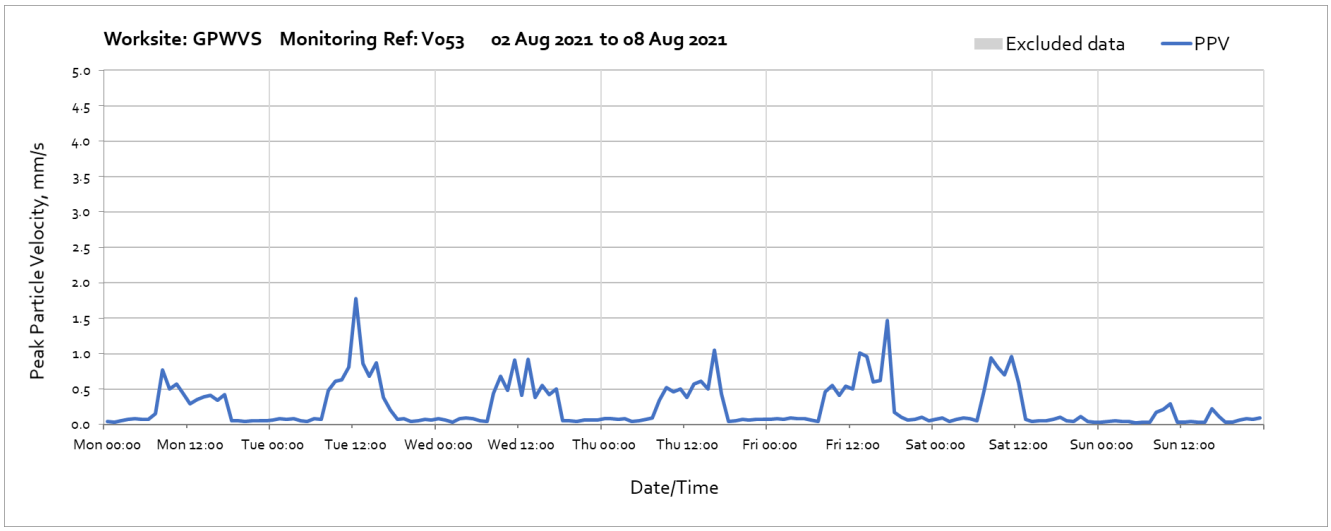

Worksite: MRVS Monitoring Ref: V056 16 Aug 2021 to 22 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

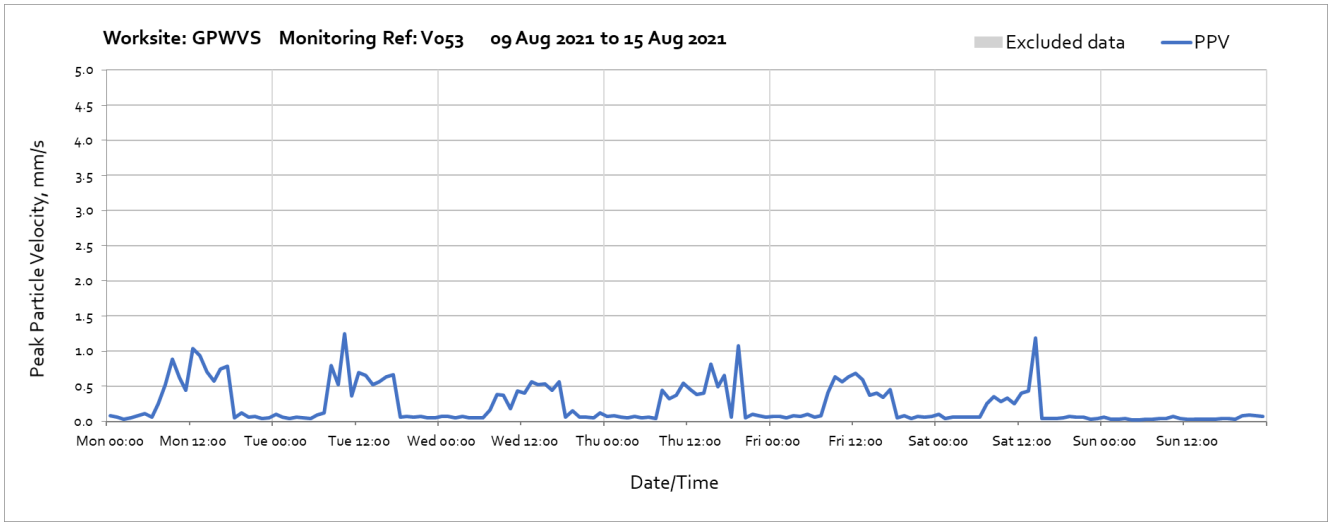

Worksite: MRVS Monitoring Ref: V056 23 Aug 2021 to 29 Aug 2021
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

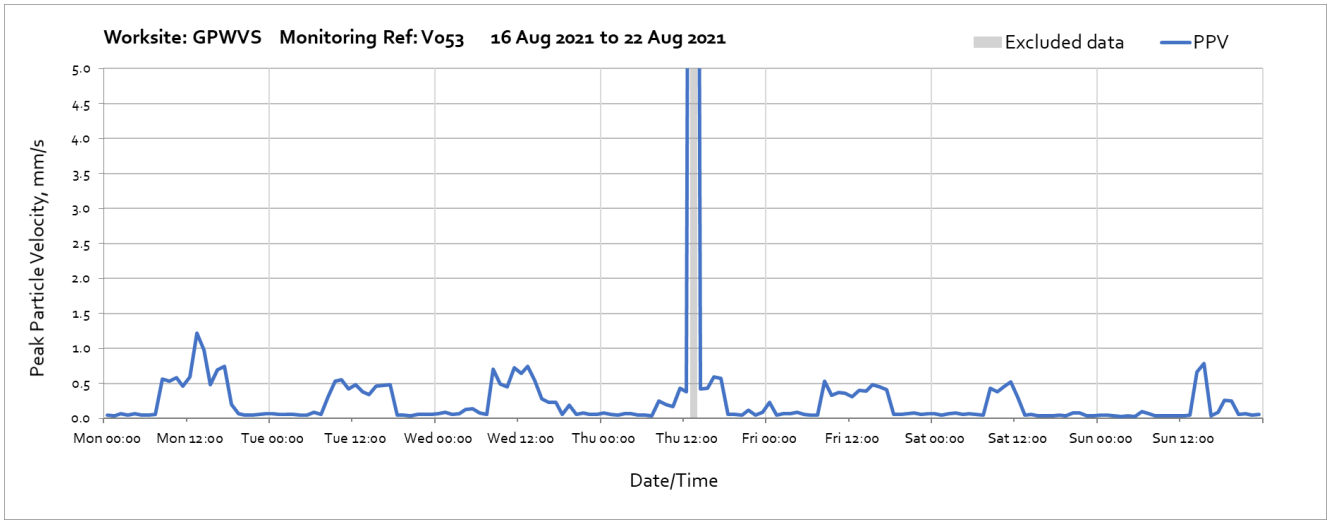


Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: V053

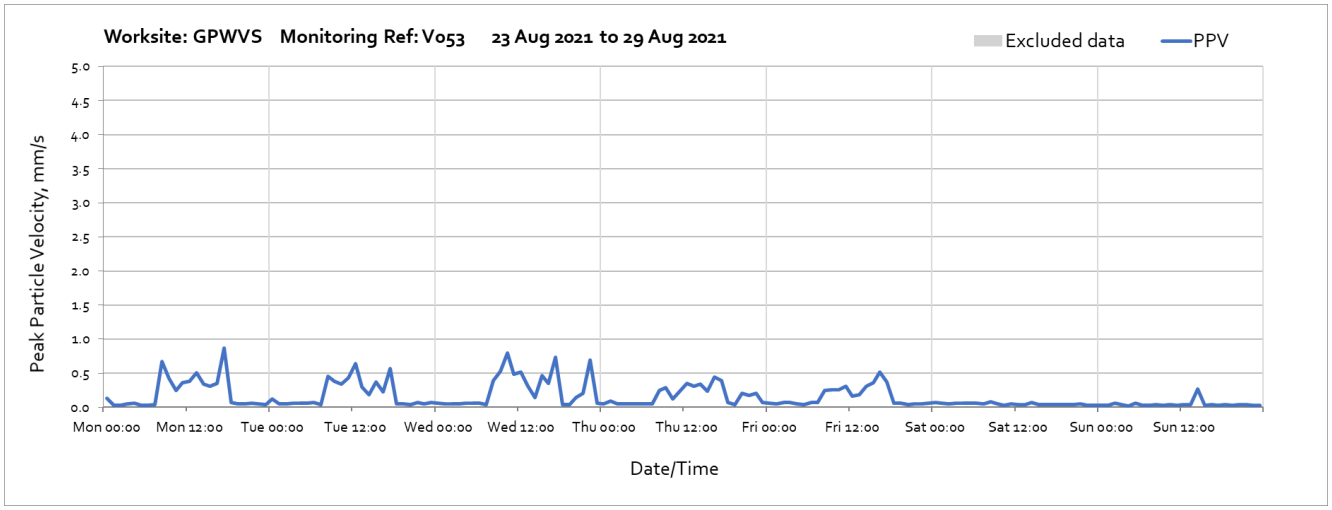


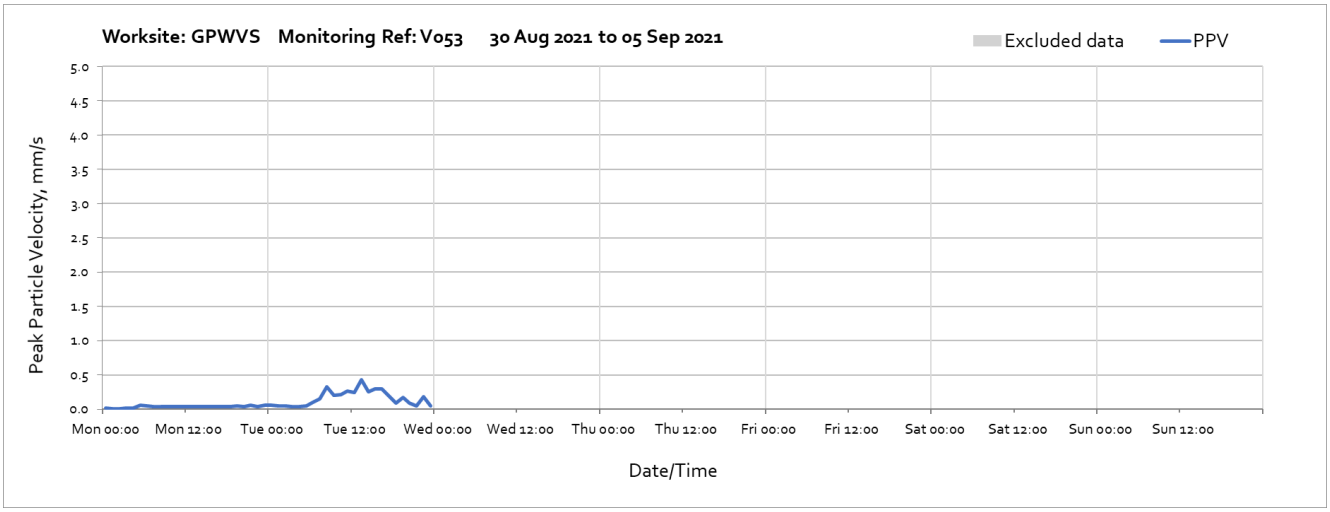




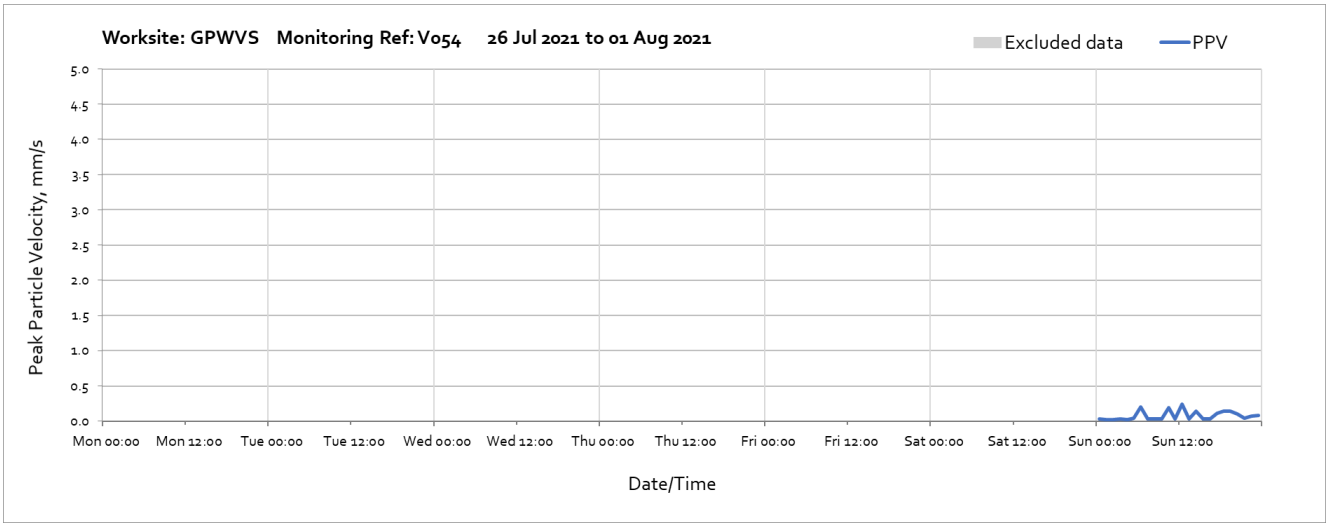


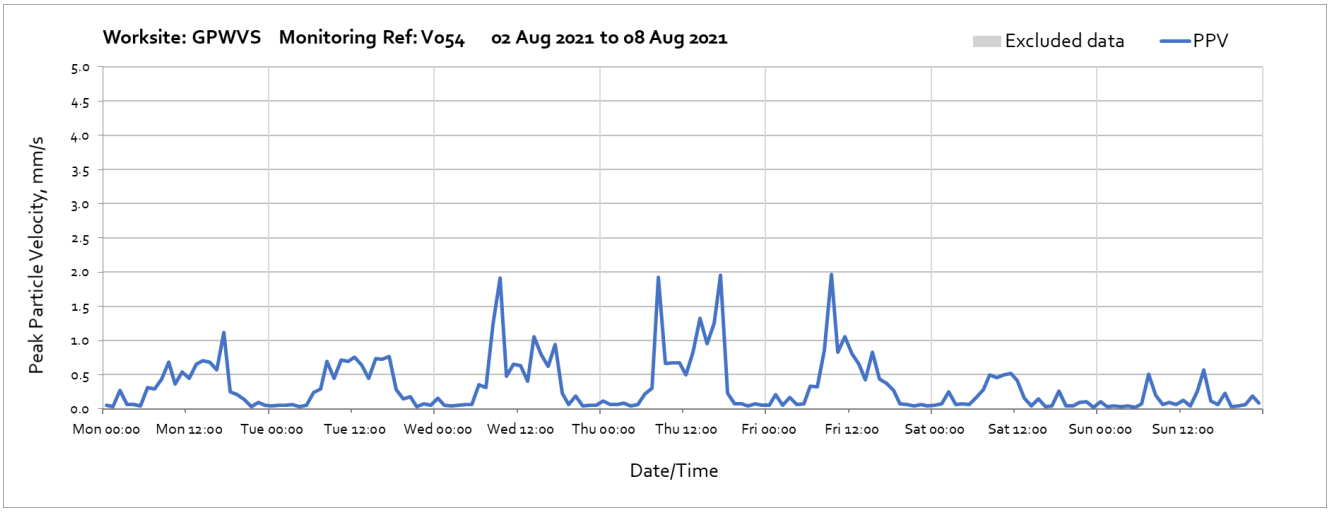
Note: High vibration levels measured at 13:00 on Sunday 22nd August 2021 were due to due to local disturbance at the monitor station and not representative of HS2 vibration levels.

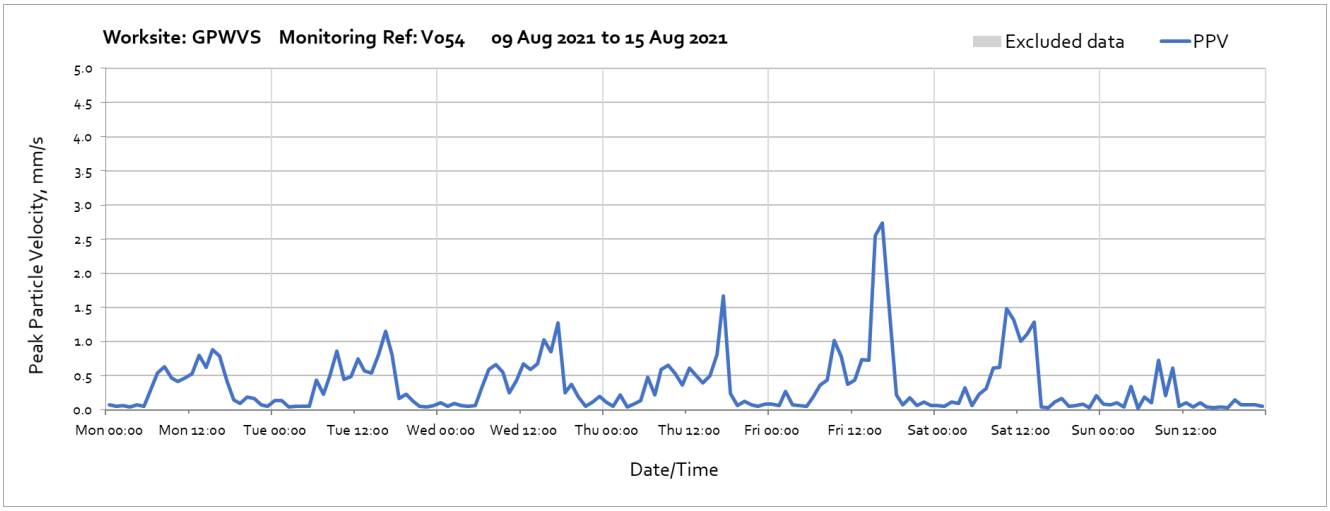




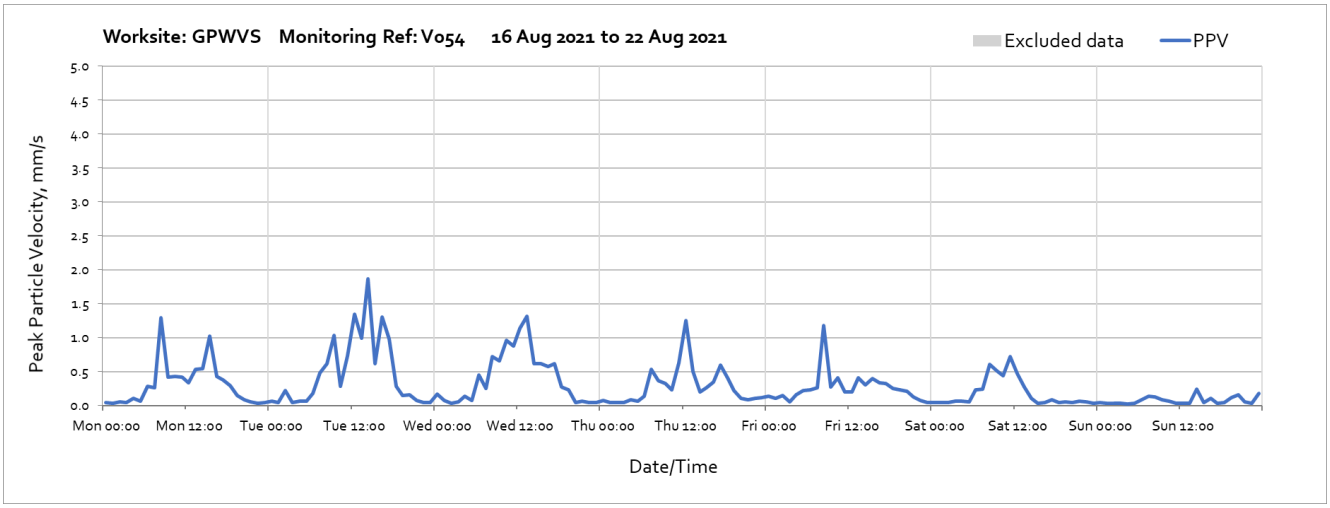
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: V054

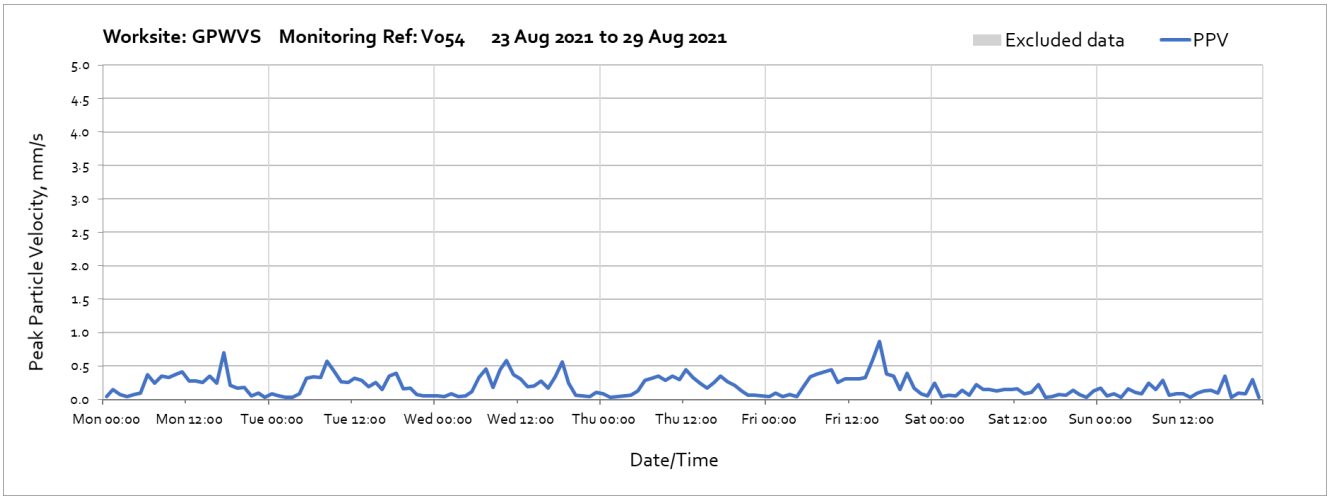


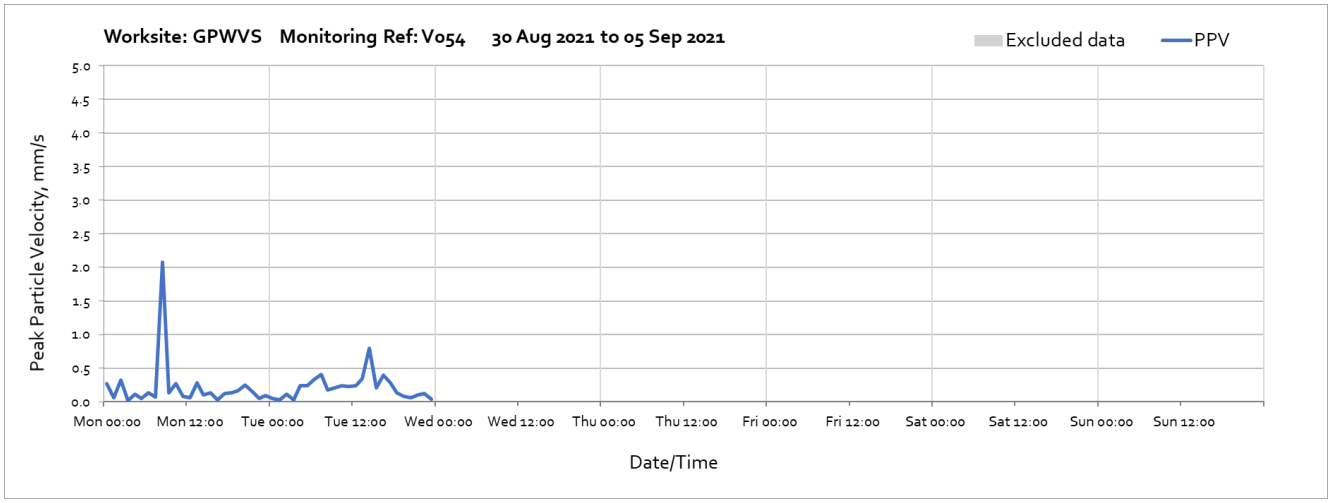




Note: High vibrations levels measured between 15:00 and 17:00 on Friday 13th August 2021 was due to works undertaken with a vibration roller in proximity of the vibration monitor. The nearest residential receptors are further away from the works and vibration levels at the receptors will therefore be lower.






Worksite: GPWVS Monitoring Ref: V054 30 Aug 2021 to 05 Sep 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