HS2

June 2019

Construction noise and vibration Monthly Report – April 2019

London Borough of Camden

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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 Camden (LBC) during the month of April 2019.

A number of worksites were active during the reporting month in the LBC area. Works to overhead line equipment (OLE), movement of plant and removal of spoil, tools and materials were underway at Network Rail worksite B. Works at Network Rail worksites C, D and E mainly included deliveries, surveys, cabling works, drainage works, installation of controlled emission toilets (CET) and de-vegetation. Installation of boundary fence, works at HV and LV electrification systems, internal and external lighting and fittings works were underway at Network Rail worksite F. Installation of pile foundations and pile caps were carried out at Network Rail worksite G. Ancillary activities were undertaken at the DB Cargo and former Addison Lee worksite (ref. S001-WS01). Demolition was underway at 132 and 140 Hampstead Road and Petrol Station, worksite (ref. S001-WS02), at the former National Temperance Hospital, Insull Wing worksite (ref. S003-WS02) and at the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05). Archaeological excavations and construction of screening structures were underway at St James's Garden worksite (ref. S003-WS01). Removal of fixtures and fittings, demolition and scaffolding were carried out at the Walkden House, 67-75 & 77-79 Euston Rd worksite (ref. S003-WS03) and at the Thistle Hotel worksite (ref. S003-WS04). Deliveries were carried out at the former National Temperance Hospital, 110-122 Hampstead Road worksite (ref. S003-WS06). Removal of fixtures and fittings and scaffolding were carried out at the 93-103 Drummond Street, 11-15 Melton Street, 54-64 Euston Street, 69 Cobourg Street worksite (ref. S003-WS07) and at the One Euston Square, 40 Melton Street, Grant Thornton House, 22 Melton Street worksite (ref. S003-WS09). Utilities diversions were also undertaken around Granby Terrace Bridge, along Stanhope Street, and Hampstead Road. Works for the installation of main pipes were also undertaken at Gloucester Gate, Robert Street, Redhill Street and Albany Street. Details of works undertaken at each worksite are presented in the report.

Noise monitoring was undertaken in the vicinity of Network Rail worksites B, C, D, E, F and G, the DB Cargo worksite (ref. S001-WS01), 132 and 140 Hampstead Road and Petrol Station worksite (ref. S001-WS02), St James's Gardens worksite (ref. S003-WS01), Walkden House, 67-75 & 77-79 Euston Rd worksite (ref. S003-WS03), the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05), former National Temperance Hospital, 110-122 Hampstead Road worksite (ref. S003-WS06), Drummond Street / Euston Street worksites (ref. S003-WS07), Ibis Hotel, Euston Square Gardens (west) worksite (ref. S003-WS08) and the Thistle Hotel (ref. S003-WS04). Further noise monitoring was also undertaken at Regents Park Estate and in the vicinity of Regents Park Lorry Holding Area. Noise monitor JC was relocated at the beginning of April to

a new location more representative of surrounding residential properties. Monitor N015 was removed following closure of Maria Fidelis School.

Vibration monitoring was undertaken in the vicinity of the former National Temperance Hospital, 110 Insull Wing worksite (ref. S003-WS02), the Walkden House, 67-75 & 77-79 Euston Road worksite (ref. S003-WS03), the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05) and the Ibis Hotel, Euston Square Gardens (west) worksite (ref. S003-WS08).

Exceedances of the SOAELs were measured at some monitoring positions surrounding worksites B and F. Fourteen complaints were received during the monitoring period. Description of exceedance of trigger levels, complaints, results of investigations and any actions taken are detailed in the report.

Abbreviations and descriptions

The abbreviations, descriptions and project terminology used within this report can be found in the Project Dictionary (HS2-HS2-PM-GDE-000-000002).

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.
Equivalent continuous sound pressure level, or $L_{pAeq,T}$	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.
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.
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 The nominated undertaker 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.

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 Camden (LBC) for the period 1st to 30th April 2019.

1.1.2 Active construction sites in the local authority area during this period include:

- Network Rail on-networks HS2 preparatory works: worksite ref. B (see plan 1 in Appendix A)
  - Works activities include installation of cantilevers, small part steel works (SPS), new wire run and remedial works at overhead line equipment (OLE), movement of plant and removal of spoil, tools and materials.
- Network Rail on-networks HS2 preparatory works: worksite ref. C, D and E (see plan 2 in Appendix A)
  - Works activities include surveys (including cable tag and trace, drainage, points and cutline surveys) installation of inline cable route, cable re-routing, cable recovery, delivering cable drums to under track crossing (UTX), SPS works, signalling correlation, reinstallation of lighting bollards, installation and tie-in of controlled emission toilet (CET), de-vegetation works, drainage works, removing rail defect, material deliveries delivery of rails and stripping out MEP assets.

- Network Rail on-networks HS2 preparatory works: worksite ref. F (see plan 2 in Appendix A)
  - Works activities include installation of boundary fence, hoarding alteration to allow footpath reinstatement, temporary fire stopping for NR building, installation of cladding to substation building, internal and external lighting works, works at HV and LV circuits including cable works, connections, energization of panel and transformer and commissioning, install fibre raceway trunking, painting works, installation of heaters.
- Network Rail on-networks HS2 preparatory works: worksite ref. G (see plan 2 in Appendix A)
  - Works activities include installation of pile foundations and pile caps.
- DB Cargo shed and adjacent land on Granby Terrace, worksite ref. S001-WS01 (see plan 2 in Appendix A)
  - Works activities include ancillary activities at the former Addison Lee site.
- 132 and 140 Hampstead Road and Petrol Station, worksite ref. S001-WS02 (see plan 3 in Appendix A)
  - Works activities include demolition and processing.
- St James' Gardens, worksite ref. S003-WS01 (see plan 3 in Appendix A)
  - Works activities include archaeological excavations and construction of screening structures.
- Former National Temperance Hospital, Insull Wing, worksite ref. S003-WS02 (see 3 in Appendix A)
  - Works activities include demolition and backfilling.
- Wolfson House, Walkden House, 67-75 & 77-79 Euston Rd, worksite ref. S003-WS03 (see plan 3 in Appendix A)
  - Works activities include removal of fixtures and fittings, scaffolding and demolition.
- Thistle Hotel, Cardington Street, worksite ref. S003-WS04 (see plan 3 in Appendix A)
  - Works activities include removal of fixtures and fittings, asbestos removal, scaffolding and demolition.
- Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street, worksite ref. S003-WS05 (see plan 3 in Appendix A)
  - Works activities include demolition.
- Former National Temperance Hospital, 110-122 Hampstead Road, worksite ref. S003-WS06 (see plan 3 in Appendix A)

- Site activities include deliveries.

- 93-103 Drummond Street, 11-15 Melton Street, 54-64 Euston Street, 69 Cobourg Street, worksite ref. S003-WS07 (see plan 3 in Appendix A)
  - Works activities include removal of fixtures and fittings and scaffolding.
- One Euston Square, 40 Melton Street, Grant Thornton House, 22 Melton Street, worksite ref. S003-WS09 (see plan 3 in Appendix A)
  - Works activities include removal of fixtures and fittings and scaffolding.

1.1.3 Further works were also undertaken as part of the Granby Terrace Bridge utilities diversion (GTB Utilities) on Stanhope Street and Hampstead Road. Works to install main pipes were also undertaken at Gloucester Gate, Robert Street, Redhill Street and Albany Street, consisting of road cutting, laying of pipes, backfilling and reinstatement.

The applicable standards, guidance, and monitoring methodology is 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. Noise and vibration reports prior to 2018 can be found at the following location www.gov.uk/government/publications/monitoring-noise-and-vibration-on-the-hs2-phase-one-route.

1.2 Measurement locations

1.2.1 Table 2 summarises the position of noise and vibration monitoring installations within the LBC area in April 2019.

1.2.2 Monitor ref. JC was relocated within the Juniper Crescent compound on the 4th of April to a new location less exposed to railway noise and more representative of surrounding residential receptors. Monitor ref. N015, Maria Fidelis School, has been removed following school closure and ahead of demolition.

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

Table 2: Monitoring locations.

Worksite Reference	Measurement Reference	Address
B	CC	Whittlebury Mews West
	JC	Juniper Crescent
C	MT2	Lamppost opposite to 49 Mornington Terrace
	N022	External to 34 Mornington Terrace
	N024	External to Park Village Studios, Park Village East

Worksite Reference	Measurement Reference	Address
D	N004	Mornington Terrace, lamppost #7 (junction of Mornington Terrace, Mornington Place and Clarkson Row)
E	N005	5A Granby Terrace
F	BS	Roof of Stockbeck House, Barnby Street
	N023	Lamppost #21 on Hampstead Road
G	HH	Euston Station Parcel Deck, Barnby Street
S001-WS01	N001	Park Village East, lamppost #1 (external to Cubitt Court, 100 Park Village East)
	N002	Park Village East, lamppost #2 (external to Richmond Court)
	N003	Park Village East, lamppost #9 (external to Silsoe House)
	N021	Stanhope Street, lamppost #2
S001-WS02	N018	Outside replacement housing, Hampstead Road
	N019	Outside Cartmel, Hampstead Road
S003-WS02	N016	Margaret Centre roof
	V009	Margaret Centre
S003-WS03	N006	Royal College of General Practitioners roof level
	N008	Stephenson's Way lamppost (external to RCGP)
	N010	Wesley Hotel
	N011	Euston Street, lamppost #4 (external to 82 Euston Street)
	V002	Royal College of General Practitioners basement boiler room by Stephenson Way
S003-WS05	N014	Starcross Street lamppost (external to Exmouth Arms)
	V021	42-44 Cobourg Street
S003-WS06	N017	Hampstead Road, lamppost #48
S003-WS07	N012	Drummond Street, lamppost #14 (opposite to 92-94 Drummond Street)
S003-WS08	N007	Royal College of General Practitioners, Melton Street
	V003	Royal College of General Practitioners basement vaults under Melton St
Not near worksite	N020	Mackworth Street, lamppost #1
Not near worksite	N025	External to 3 Prince Albert Road
Not near worksite	N026	Thames Water Compound

2 Summary of results

2.1 Exceedances of SOAEL

2.1.1 The significant observed adverse effect levels (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."

2.1.2 Where construction noise levels exceed the SOAEL, relevant periods will be identified and summary statistics provided in order to evaluate ongoing qualification for noise insulation and temporary rehousing.

2.1.3 Table 3 presents a summary of recorded exceedances of the SOAEL due to HS2 related construction noise at each measurement location over the reporting period, including the number of exceedances during each time period.

Table 3: Summary of exceedances of LOAEL and SOAEL.

Worksite Reference	Measurement Reference	Monitor Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
B	CC	Whittlebury Mews West	Night	2200-0700	1
	JC	Juniper Crescent	Night	2200-0700	1
C	MT2	Lamppost opposite to 49 Mornington Terrace	All days	All periods	No exceedance
	N022	External to 34 Mornington Terrace	All days	All periods	No exceedance
	N024	External to Park Village Studios, Park Village East	All days	All periods	No exceedance
D	N004	Mornington Terrace, lamppost #7	All days	All periods	No exceedance
E	N005	5A Granby Terrace	All days	All periods	No exceedance
F	BS	Barnby Street	All days	All periods	No exceedance
	N023	Ampthill Estate, lamppost #21, Hampstead Road	Weekday	1900-2200	1
G	HH	Euston Station Parcel Deck, Barnby Street	All days	All periods	No exceedance

Worksite Reference	Measurement Reference	Monitor Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
S001-WS01	N001	DB Cargo shed and adjacent land on Granby Terrace	All days	All periods	No exceedance
	N002	DB Cargo shed and adjacent land on Granby Terrace	All days	All periods	No exceedance
	N003	DB Cargo shed and adjacent land on Granby Terrace	All days	All periods	No exceedance
	N005	5A Granby Terrace	All days	All periods	No exceedance
	N021	Stanhope Street, lamppost #2	All days	All periods	No exceedance
S001-WS02	N018	132 and 140 Hampstead Road and Petrol Station	All days	All periods	No exceedance
	N019	132 and 140 Hampstead Road and Petrol Station	All days	All periods	No exceedance
S003-WS02	N016	Margarete Centre roof	All days	All periods	No exceedance
S003-WS03	N006	Royal College of General Practitioners Roof level	All days	All periods	No exceedance
	N008	Walkden House, 67-75 & 77-79 Euston Rd	All days	All periods	No exceedance
	N010	Wesley Hotel	All days	All periods	No exceedance
	N011	Walkden House, 67-75 & 77-79 Euston Rd	All days	All periods	No exceedance
S003-WS05	N014	Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street	All days	All periods	No exceedance
S003-WS06	N017	Hampstead Road, lamppost #48	All days	All periods	No exceedance
S003-WS07	N012	93-103 Drummond Street, 11-15 Melton Street, 54-64 Euston Street, 69 Cobourg Street	All days	All periods	No exceedance
S003-WS08	N007	Euston Square Gardens (west)	All days	All periods	No exceedance
Not near worksite	N020	Mackworth Street, lamppost #1	All days	All periods	No exceedance
Not near worksite	N025	External to 3 Prince Albert Road	All days	All periods	No exceedance
Not near worksite	N026	Thames Water Compound	All days	All periods	No exceedance

2.1.4 Over the reporting period the SOAEL was exceeded at measurement locations in the vicinity of worksite B and F. These were due to movements of plant and night time works at Juniper Crescent, and to cutline demolition works at Granby Terrace during an evening period.

2.1.5 Construction and demolition works taking place at worksites B, C, D, E, F, G, S001-WS02, S003-WS02, S003-WS03, S003-WS04, S003-WS05, along with utility diversion works for

Granby Terrace were ongoing for the majority of the period and are likely to have given rise to noise which would have been audible beyond the site boundary and, at times, in excess of the LOAEL at sensitive receptors.

2.1.6 Activities taking place at other worksites were either intermittent or not considered to give rise to substantial levels of HS2 related construction noise during this period, with the measured noise levels largely dominated by the underlying ambient noise, acknowledging that intermittent HS2 works may on occasion be taking place within the area.

2.1.7 For the purpose of assessing eligibility for noise insulation or temporary rehousing, multiple exceedances of the SOAEL in a 24-hour period would be counted as a single exceedance during that day. Over the reporting period, the overall number of SOAEL exceedances at each measurement location is shown in Table 4 and may be lower than the total sum of individual exceedances reported in Table 3 for each location.

Table 4: Summary of total exceedances of SOAEL.

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
B	CC	Whittlebury Mews West	1
	JC	Juniper Crescent	1
F	N023	Ampthill Estate, lamppost #21, Hampstead Road	1

2.1.8 Monitoring of vibration peak particle velocity (PPV) was undertaken with the purpose of ensuring that construction generated vibration are not of such a magnitude to damage adjacent buildings, in accordance with Annex 1: Code of Construction Practice of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements. There are no LOAEL and SOAEL criteria based on PPV applicable to HS2 construction vibration.

2.1.9 Transient vibration from demolition activities at S003-WS05 may have been perceptible on occasions within the closest residential premises in the area, although below levels representative of significant adverse effects.

2.2 Summary of measured noise and vibration levels

2.2.1 Table 5 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.

2.2.2 Noise monitoring in the vicinity of worksites B, C, D, E, F, G, S001-WS02, S003-WS02, S003-WS03, S003-WS04, S003-WS05 and around Granby Terrace Bridge is considered representative of HS2 Area South works during periods of construction works. Other worksites were not considered to be giving rise to substantial levels of HS2 related construction noise, with the measured noise levels largely dominated by the underlying ambient noise, acknowledging that intermittent HS2 works may on occasion be taking place within the area.

Table 5: Summary of measured dB L_{Aeq} data over the monitoring period.

Worksite Reference	Measurement Reference	Monitor Address	Free-field or Façade measurement	Weekly 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
B	CC	Whittlebury Mews West	Free-field	61.6 (65.2)	59.4 (67.1)	62.8 (65.5)	62.4 (66.3)	57.3 (64.9)	57.3 (63.7)	60.1 (64.6)	54.4 (56.4)	58.4 (63.5)	56.2 (74.4)	59.0 (65.0)	56.0 (68.7)
	JC	Juniper Crescent	Free-field	61.3 (68.5)	61.2 (68.9)	59.9 (68.5)	60.5 (68.7)	57.7 (70.5)	57.3 (58.4)	58.7 (63.7)	58.1 (62.2)	58.0 (61.7)	54.7 (60.3)	56.3 (60.5)	55.3 (66.2)
C	MT2	Lamppost opposite to 49 Mornington Terrace	Free field	62.3 (63.7)	63.6 (70.2)	63.0 (64.9)	61.4 (64.1)	57.7 (62.2)	58.6 (62.1)	60.3 (63.5)	59.6 (63.6)	61.4 (66.4)	56.5 (63.2)	59.2 (63.6)	55.9 (62.2)
	N022	External to 34 Mornington Terrace	Free-field	59.0 (61.5)	60.7 (66.2)	59.7 (62.2)	58.2 (62.1)	54.4 (59.2)	56.1 (58.6)	57.9 (61.4)	57.2 (61.1)	58.7 (63.3)	53.7 (59.8)	56.1 (59.8)	53.2 (59.8)
	N024	External to Park Village Studios, Park Village East	Free-field	55.7 (58.2)	61.4 (71.2)	58.3 (66.9)	55.7 (65.0)	52.1 (62.2)	53.3 (54.8)	55.5 (58.0)	54.8 (56.4)	54.8 (57.5)	52.1 (56.2)	54.5 (59.7)	51.2 (55.0)
D	N004	Mornington Terrace, lamppost #7	Free-field	63.0 (65.2)	64.0 (66.1)	64.4 (67.8)	64.2 (68.8)	59.9 (69.6)	60.1 (65.6)	62.5 (65.3)	60.3 (65.1)	62.7 (72.9)	60.2 (72.5)	62.0 (70.8)	58.2 (67.7)
E	N005	5A Granby Terrace	Free-field	66.0 (68.0)	67.2 (70.5)	67.9 (70.1)	66.4 (69.0)	64.0 (68.2)	64.7 (66.2)	66.2 (68.1)	65.9 (67.6)	66.1 (69.6)	64.4 (67.3)	65.2 (67.8)	63.7 (67.7)

Worksite Reference	Measurement Reference	Monitor Address	Free-field or Façade measurement	Weekly 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
F	BS	Roof of Stockbeck House, Barnby Street	Free-field	60.5 (63.7)	64.1 (67.2)	62.5 (65.9)	61.0 (64.2)	57.0 (62.5)	59.1 (61.7)	62.0 (64.4)	60.1 (62.1)	60.0 (64.2)	56.6 (63.1)	59.3 (63.6)	56.5 (66.4)
	N023	Ampthill Estate, Hampstead Road	Free-field	69.8 (71.7)	69.7 (71.6)	69.8 (73.9)	70.1 (74.9)	67.7 (73.8)	68.3 (69.6)	69.1 (69.6)	70.3 (73.6)	69.3 (71.0)	67.7 (71.8)	69.0 (73.1)	67.4 (72.2)
G	HH	Euston Station Parcel Deck, Barnby Street	Free-field	69.8 (71.7)	69.7 (71.6)	69.8 (73.9)	70.1 (74.9)	67.7 (73.8)	68.3 (69.6)	69.1 (69.6)	70.3 (73.6)	69.3 (71.0)	67.7 (71.8)	69.0 (73.1)	67.4 (72.2)
S001-WS01	N001	External to Cubitt Court, 100 Park Village East	Façade	56.6 (62.7)	63.3 (69.0)	58.6 (61.7)	57.0 (60.4)	52.1 (57.2)	54.5 (57.6)	62.9 (67.0)	59.4 (62.4)	58.5 (65.0)	53.1 (58.0)	55.7 (59.4)	51.4 (57.2)
	N002	Richmond Court, Park Village East	Free-field	58.9 (61.8)	61.4 (62.3)	61.3 (64.3)	59.7 (63.5)	54.5 (61.9)	56.3 (58.8)	59.6 (60.8)	59.7 (60.8)	59.7 (62.5)	54.8 (60.2)	59.6 (71.6)	54.9 (66.1)
	N003	Silsoe House, Park Village East	Free-field	58.8 (61.1)	61.2 (62.9)	61.4 (65.8)	60.0 (63.8)	54.9 (64.9)	56.2 (58.1)	58.8 (60.0)	59.3 (60.3)	59.8 (61.9)	55.9 (62.7)	59.5 (73.0)	55.4 (67.3)
	N021	Stanhope Street, lamppost #2	Free-field	51.2 (53.1)	67.5 (77.7)	52.8 (58.9)	51.8 (59.6)	47.9 (59.8)	50.4 (53.9)	63.9 (75.3)	59.3 (65.0)	58.9 (75.2)	47.0 (50.7)	49.7 (54.6)	46.8 (51.8)
S001-WS02	N018	Outside replacement housing, Hampstead Road	Free-field	71.3 (73.0)	73.8 (76.7)	72.8 (76.1)	72.3 (76.1)	70.8 (78.2)	69.8 (70.8)	72.2 (74.4)	70.8 (71.1)	72.4 (77.4)	70.9 (75.1)	71.8 (78.0)	70.0 (74.9)
	N019	Outside Cartmel, Hampstead Road	Free-field	69.5 (70.7)	72.7 (76.2)	71.3 (74.1)	70.9 (74.7)	69.4 (73.8)	68.8 (69.9)	72.2 (76.2)	70.4 (73.3)	70.7 (75.2)	69.1 (72.2)	70.0 (74.1)	68.7 (72.3)

Worksite Reference	Measurement Reference	Monitor Address	Free-field or Façade measurement	Weekly 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
S003-WS03	N006	RCGP Roof level	Free-field	51.8 (57.9)	62.3 (66.3)	51.4 (55.2)	51.6 (59.5)	49.9 (54.3)	51.1 (53.6)	57.3 (64.0)	52.8 (54.7)	51.6 (53.7)	50.4 (52.4)	50.9 (52.9)	49.3 (52.5)
	N008	RCGP Stephenson Way	Façade	64.0 (70.1)	64.1 (70.2)	54.7 (55.9)	55.5 (63.1)	58.9 (75.4)	56.5 (59.6)	59.7 (62.4)	55.0 (55.4)	54.7 (57.9)	53.6 (58.2)	54.6 (62.6)	61.0 (75.0)
	N010	Wesley Hotel	Façade	66.4 (67.3)	67.3 (69.3)	65.8 (66.8)	66.0 (67.7)	62.1 (67.5)	66.0 (66.4)	66.6 (67.1)	66.0 (66.6)	66.0 (67.8)	61.4 (66.4)	65.9 (66.6)	60.1 (66.9)
	N011	Outside 82 Euston Street	Free-field	58.1 (65.2)	60.7 (65.4)	57.8 (66.4)	56.2 (61.1)	55.3 (66.9)	55.2 (55.9)	58.2 (59.8)	57.5 (58.4)	57.3 (62.8)	53.0 (58.8)	56.2 (61.0)	54.5 (62.7)
S003-WS05	N014	Starcross Street	Free-field	55.8 (61.8)	61.3 (67.8)	59.4 (68.4)	58.8 (68.7)	52.3 (60.0)	55.6 (59.0)	56.8 (58.8)	54.8 (57.1)	55.3 (59.5)	51.4 (58.3)	55.4 (69.7)	50.7 (58.9)
S003-WS06	N016	Margaret Centre roof	Free-field	56.0 (59.4)	60.3 (62.1)	55.6 (58.9)	55.6 (60.1)	54.9 (67.6)	55.4 (57.3)	60.7 (65.9)	61.9 (74.0)	57.1 (70.6)	54.0 (59.1)	54.2 (56.2)	54.2 (59.5)
	N017	Hampstead Road, lamppost #48	Free-field	70.6 (72.6)	72.2 (76.0)	71.5 (74.8)	71.1 (74.7)	69.5 (74.4)	69.0 (70.4)	70.9 (71.6)	69.8 (71.1)	71.2 (76.0)	69.9 (74.9)	70.7 (74.2)	69.6 (77.6)
S003-WS07	N012	Opposite 92-94 Drummond Street	Free-field	58.5 (62.5)	62.7 (68.0)	59.4 (63.3)	60.0 (63.0)	56.7 (61.9)	57.3 (58.2)	59.4 (60.6)	59.6 (60.7)	58.9 (60.3)	56.5 (59.3)	58.6 (65.7)	56.2 (60.6)
S003-WS08	N007	RCGP, Melton Street	Free-field	67.2 (69.3)	67.3 (69.3)	65.4 (66.7)	65.0 (68.0)	64.4 (76.0)	65.3 (68.2)	67.0 (69.1)	65.8 (68.1)	65.2 (69.4)	63.9 (68.5)	64.6 (69.5)	62.9 (66.4)

Worksite Reference	Measurement Reference	Monitor Address	Free-field or Façade measurement	Weekly 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
Not near worksite	N020	Mackworth Street	Free-field	52.6 (57.6)	61.8 (73.0)	52.7 (54.9)	52.3 (57.0)	50.8 (56.7)	52.3 (54.7)	56.9 (64.3)	52.5 (54.3)	52.4 (56.3)	50.1 (55.2)	51.1 (56.9)	50.0 (56.2)
Not near worksite	N025	External to 3 Prince Albert Road	Free-field	68.0 (70.4)	68.0 (69.5)	67.7 (70.9)	67.0 (71.5)	65.1 (73.7)	65.9 (67.2)	67.7 (68.8)	67.3 (68.3)	67.2 (68.6)	65.8 (69.8)	66.9 (72.1)	64.2 (67.6)
Not near worksite	N026	Thames Water Compound	Free-field	57.4 (59.6)	61.5 (72.0)	56.6 (60.4)	56.0 (59.6)	53.1 (57.9)	55.2 (55.6)	61.2 (76.6)	55.3 (57.4)	56.0 (59.2)	52.8 (56.1)	54.8 (58.2)	52.1 (56.4)

2.2.3 Table 6 presents a summary of the measured vibration levels at monitoring locations V002, V003, V009 and V021 over the reporting period. During the monitoring high values of PPV were measured at V021 which were due to local disturbance of the vibration monitors and are not representative of HS2 construction works. These have been greyed out in the charts alongside other periods of local disturbance of the monitor as shown in Appendix B, and have been excluded to calculate values in Table 6. The highest PPV measured during the monitoring along any axis is presented in the table.

Table 6: Summary of measured PPV data over the monitoring period.

Worksite Reference	Measurement Reference	Monitor Address	Highest PPV measured in any axis, mm/s
S003-WS02	V009	Margarete Centre	2.57 (Y-axis)
S003-WS03	V002	Royal College of General Practitioners basement boiler room by Stephenson Way	0.63 (Z-axis)
S003-WS05	V021	42-44 Cobourg Street	1.89 (Z-axis)
S003-WS08	V003	Royal College of General Practitioners basement vaults under Melton St	0.37 (Z-axis)

2.2.4 Appendix C presents graphs of noise and vibration monitoring data over the month for each of the measurement locations. Noise data presented consist 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.

2.3 Exceedances of trigger level

2.3.1 Table 7 provides a summary of exceedances of the S61 trigger noise levels determined to be due to HS2 related construction 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
-	-	-	-	-	-

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

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
HS2-19-01973-C	F	Complaint regarding noise from lorries parked in Harrington Square.	-	All contractors re-briefed not to park on Harrington Square. Compliance checks were put in place. Contractor Customer Service Representatives also increased their patrols in area to help monitor the situation.
HS2-19-02021-C	B	Complaint from resident of Sunny Mews about noise from works at Camden Carriage Sidings.	Complaint related to noise from a generator located in a car park area.	Location of the generator reviewed and exhaust pipe moved slightly to point away from fence. Staff briefed to only run generator when needed. Additional cleaning carried out. Barrier put in place to screen the area. Daily monitoring regime put in place.

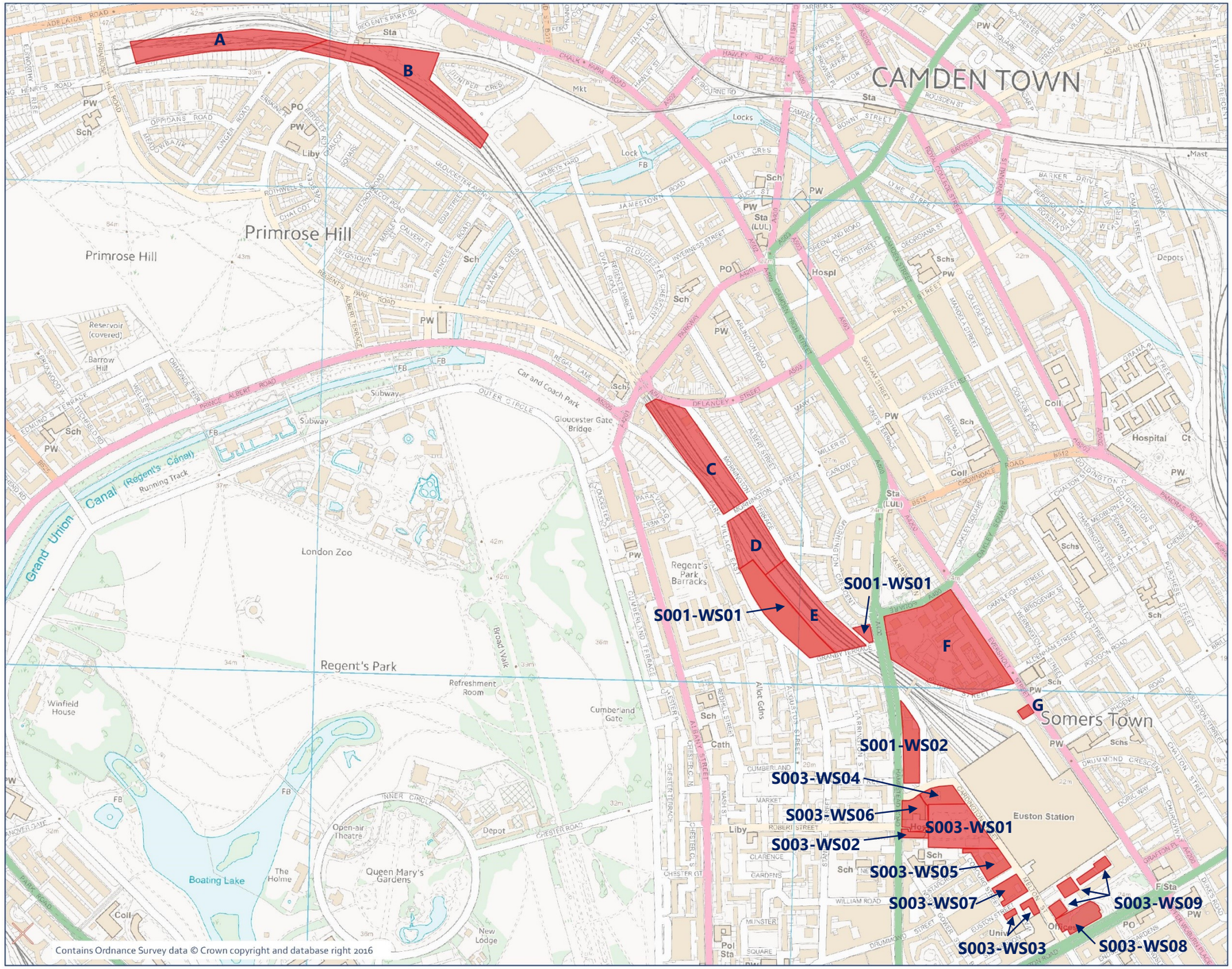
Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
HS2-19-02082 -C HS2-19-02121 HS2-19-02151-C HS2-19-02153-C HS2-19-02336-C	S003-WS05	Complaints regarding potential building damage due to vibration within property.	Demolition of ground slab was ongoing at Ibis hotel at the time of the complaint. Ongoing vibration monitoring at Cobourg Street indicates that the highest intermittent transient vibration levels from the vibration events are likely to have been perceptible within the premises, however below levels considered to represent a significant effect and substantially below that at which any potential cosmetic building damage is likely to occur.	Ongoing vibration monitoring to take place to monitor compliance with requirements and allow intervention where necessary to review methodology.
HS2-19-02368-C	S001-WS02	Complaint from resident regarding vibration from the UCL demolition site perceived within property.	Works methodology for demolition were compliant with S61. Vibration data from adjacent monitoring locations did not demonstrate elevated levels of vibration and works on site ceased shortly after time of onset identified within complaint.	No action taken.
HS2-19-02375-C	S003-WS03	Complaint from non-residential property on Stevenson Way regarding intermittent vibration perceived within property.	Site visit could not identify any specific activities which might be giving rise to any significant levels of vibration. Monitoring data from adjacent premises did not identify any significant vibration events (less than 0.5mm/s).	No action taken.
HS2-19-02380-C HS2-19-02425 HS2-19-02582	-	Complaint from resident regarding noise at Varndell Street night.	Following investigation, this was likely emergency works on Hampstead Road.	Explanation provided to complainant with additional information about HS2 works taking place near Varndell Street.

Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
-	B	Complaint from resident on Gloucester Avenue about noise from works at Camden Carriage Sidings.	No exceedances of noise thresholds was recorded at the time of the complaint.	No action taken.
-	Works at Gloucester Gate	Complaint regarding noise from Gloucester Gate worksite out of working hours.	Site security was informed and confirmed there was no one on site and no activities taking place.	No action taken.

Appendix A Site Locations

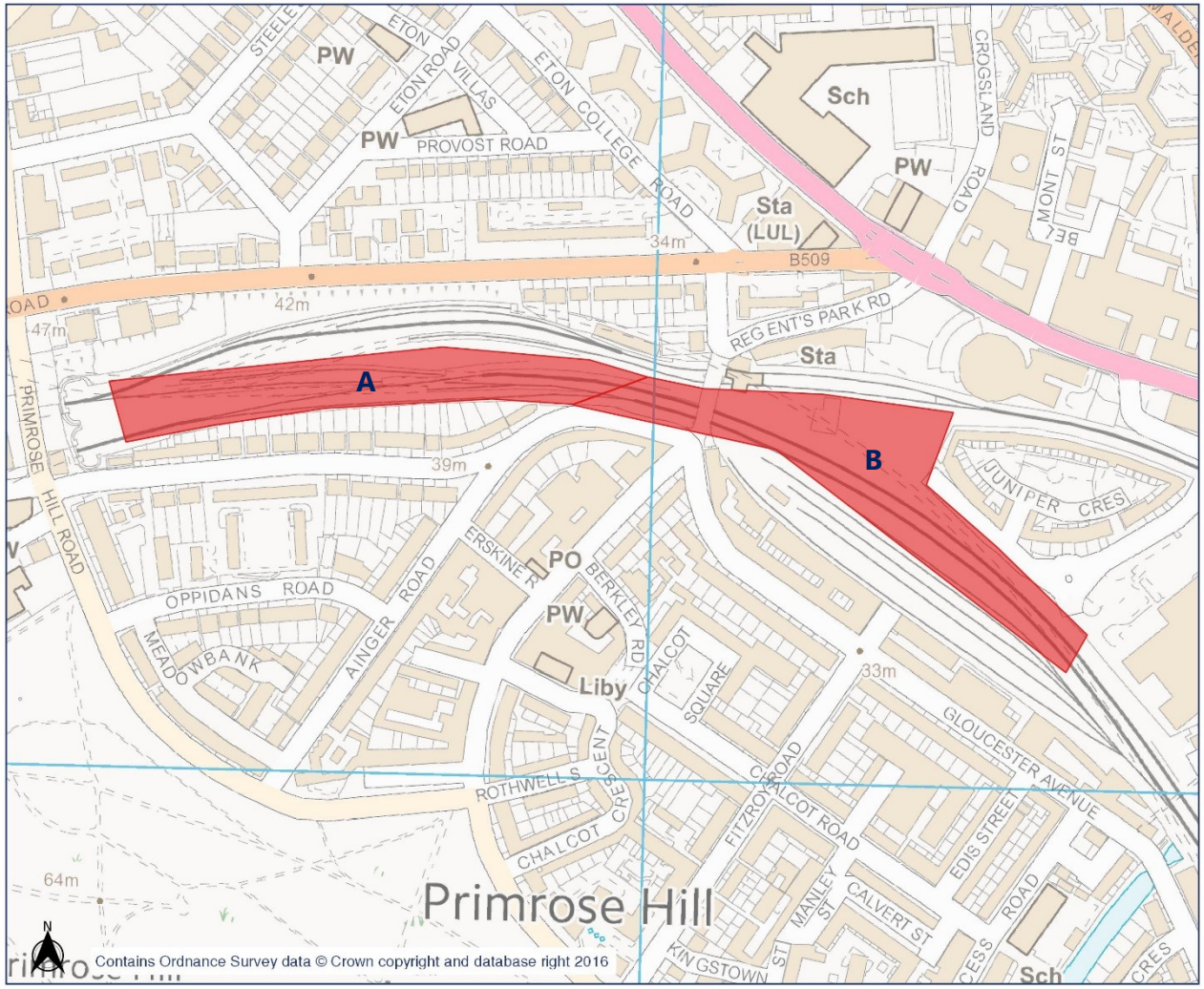
HS2

Worksite identification plan - Overview

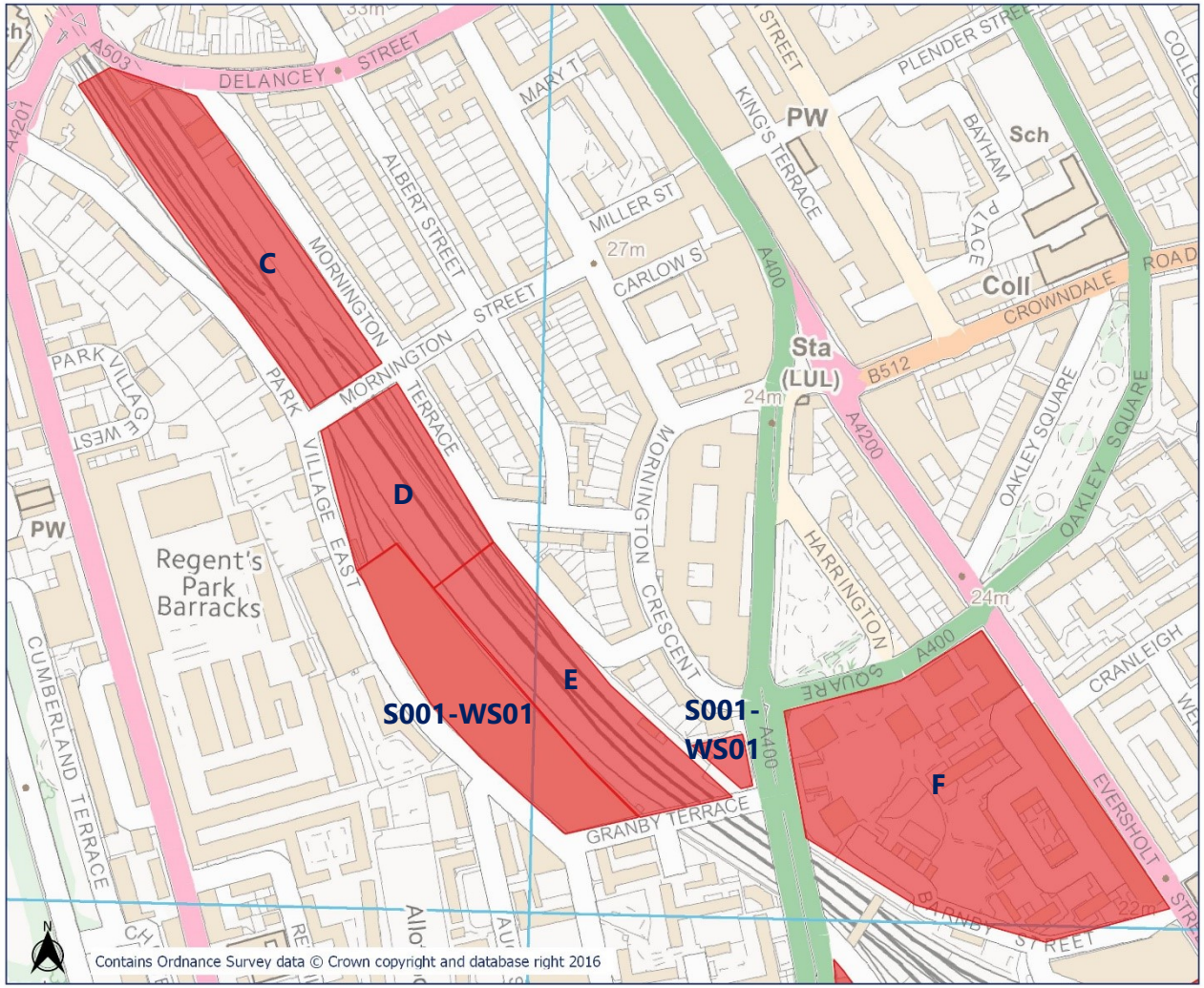


HS2

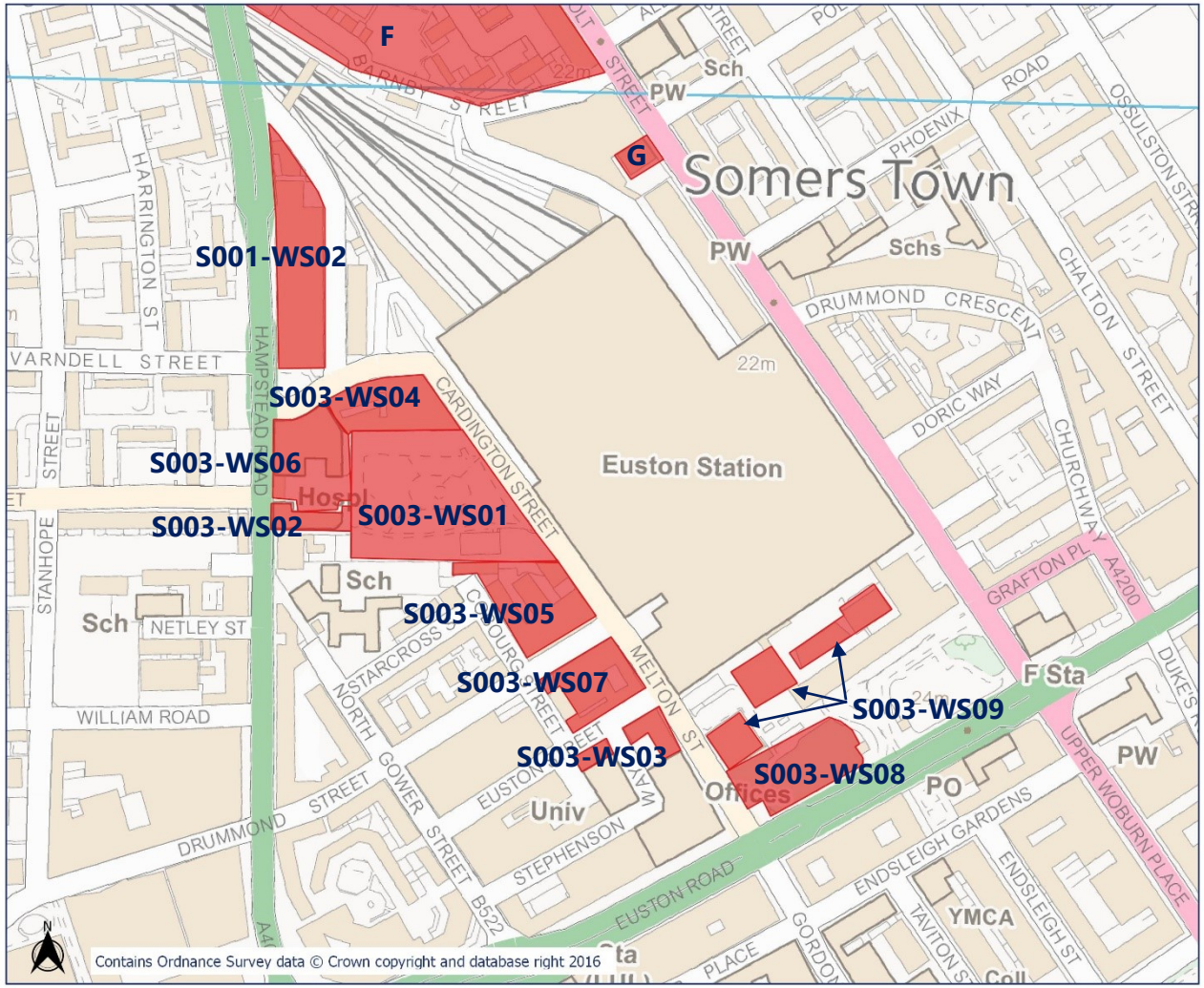
Worksite identification plan - 1



Worksite identification plan - 2



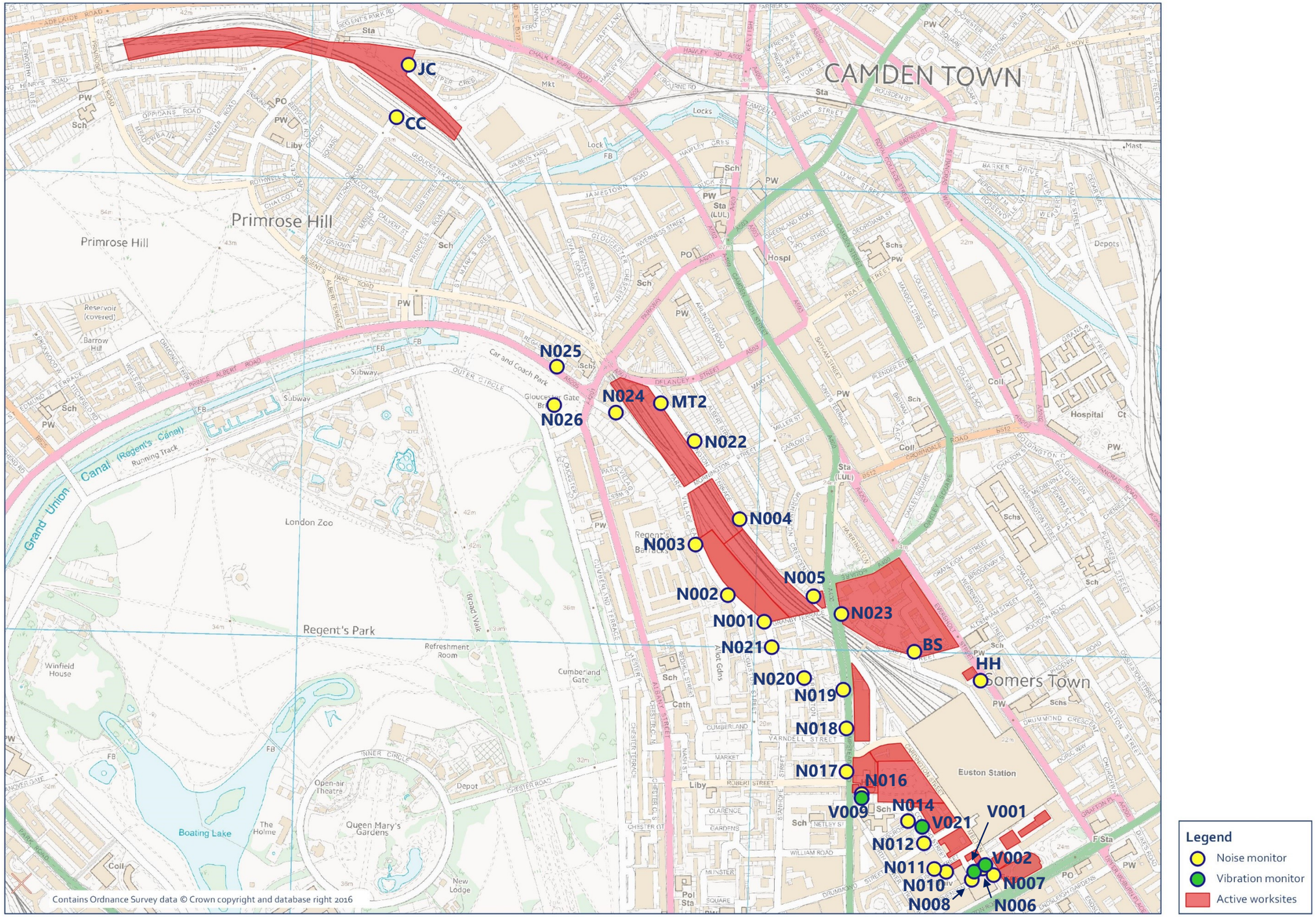
Worksite identification plan - 3



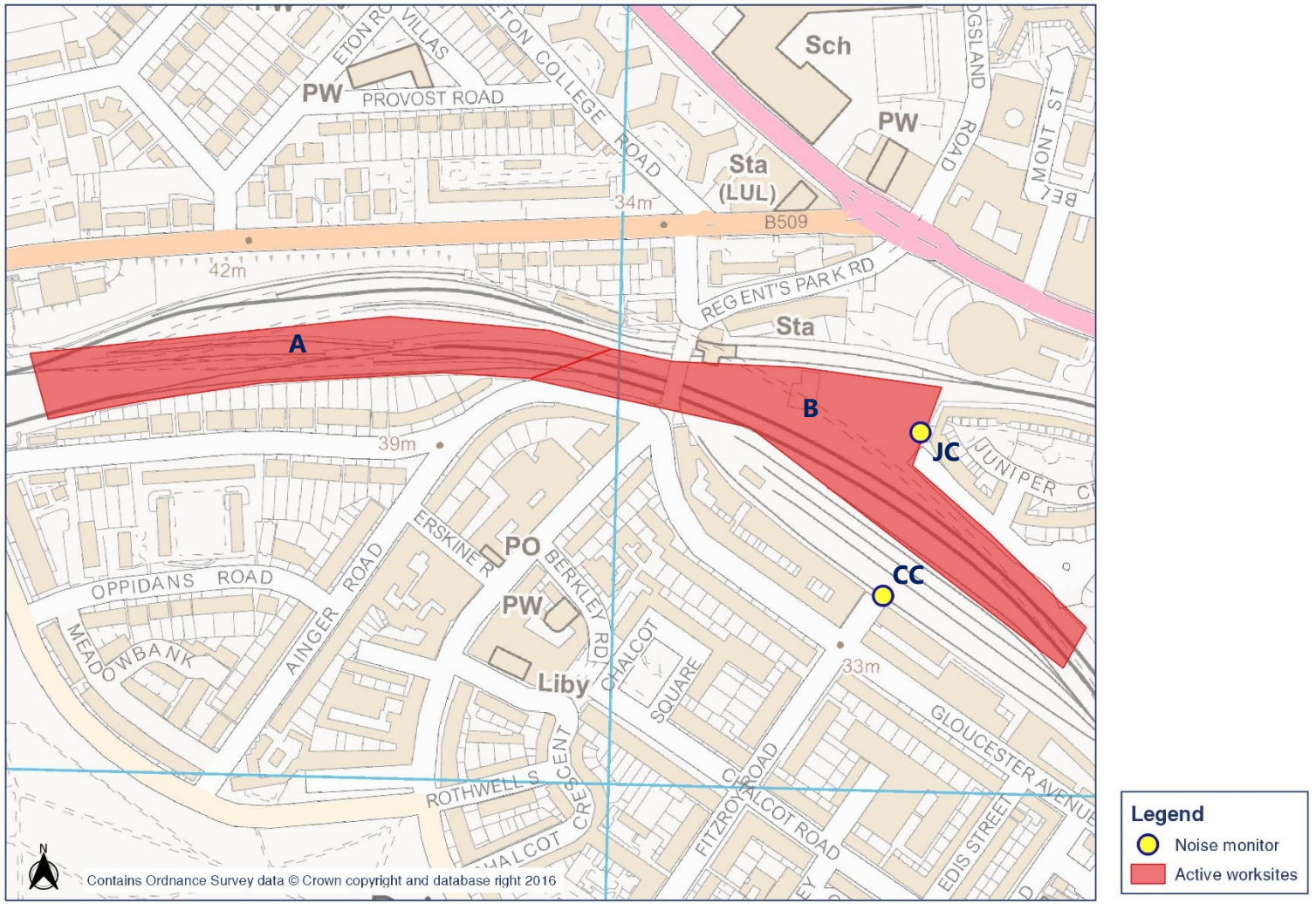
Appendix B Monitoring Locations

HS2

Noise monitoring plan - Overview

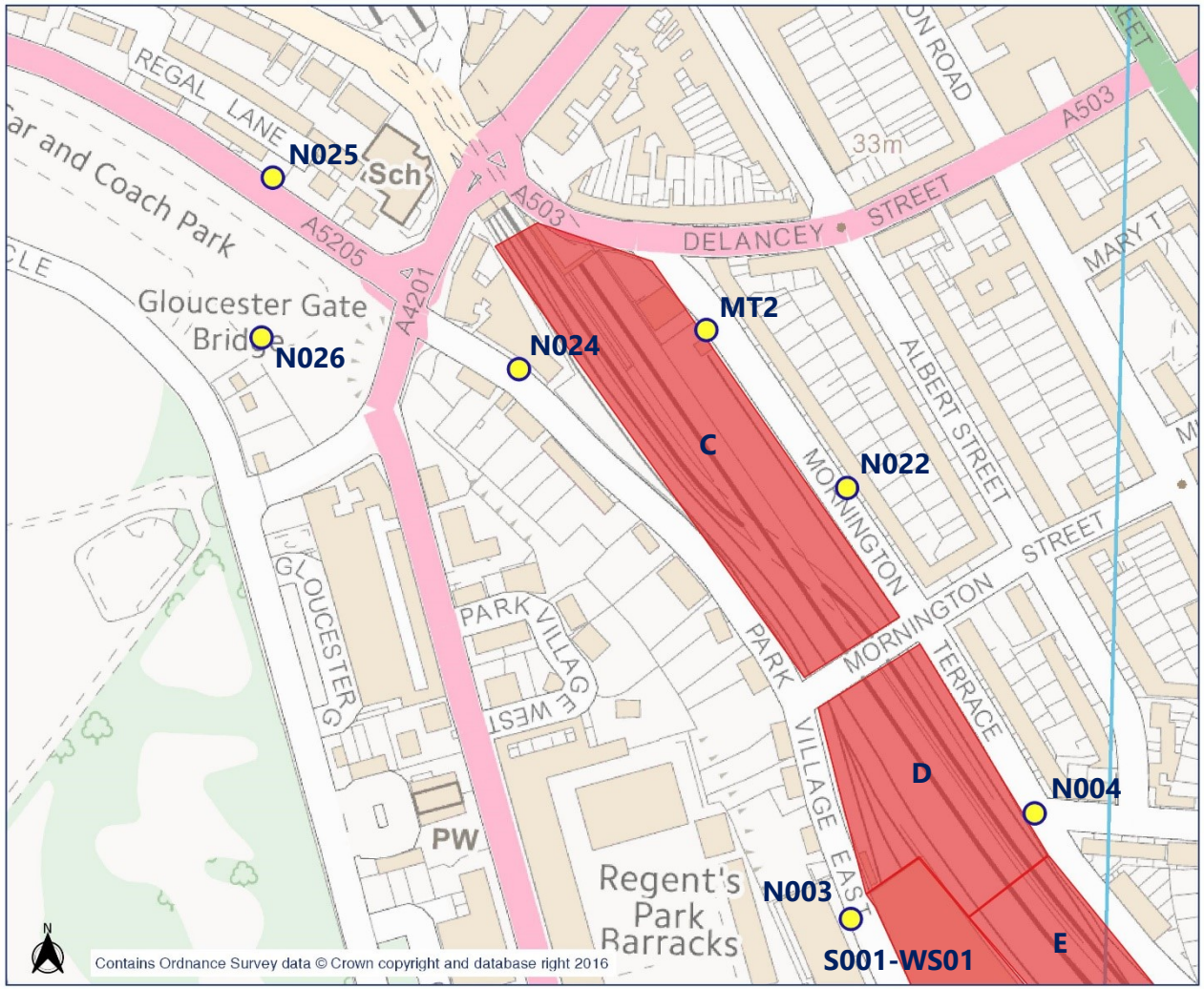


Noise monitoring plan - 1

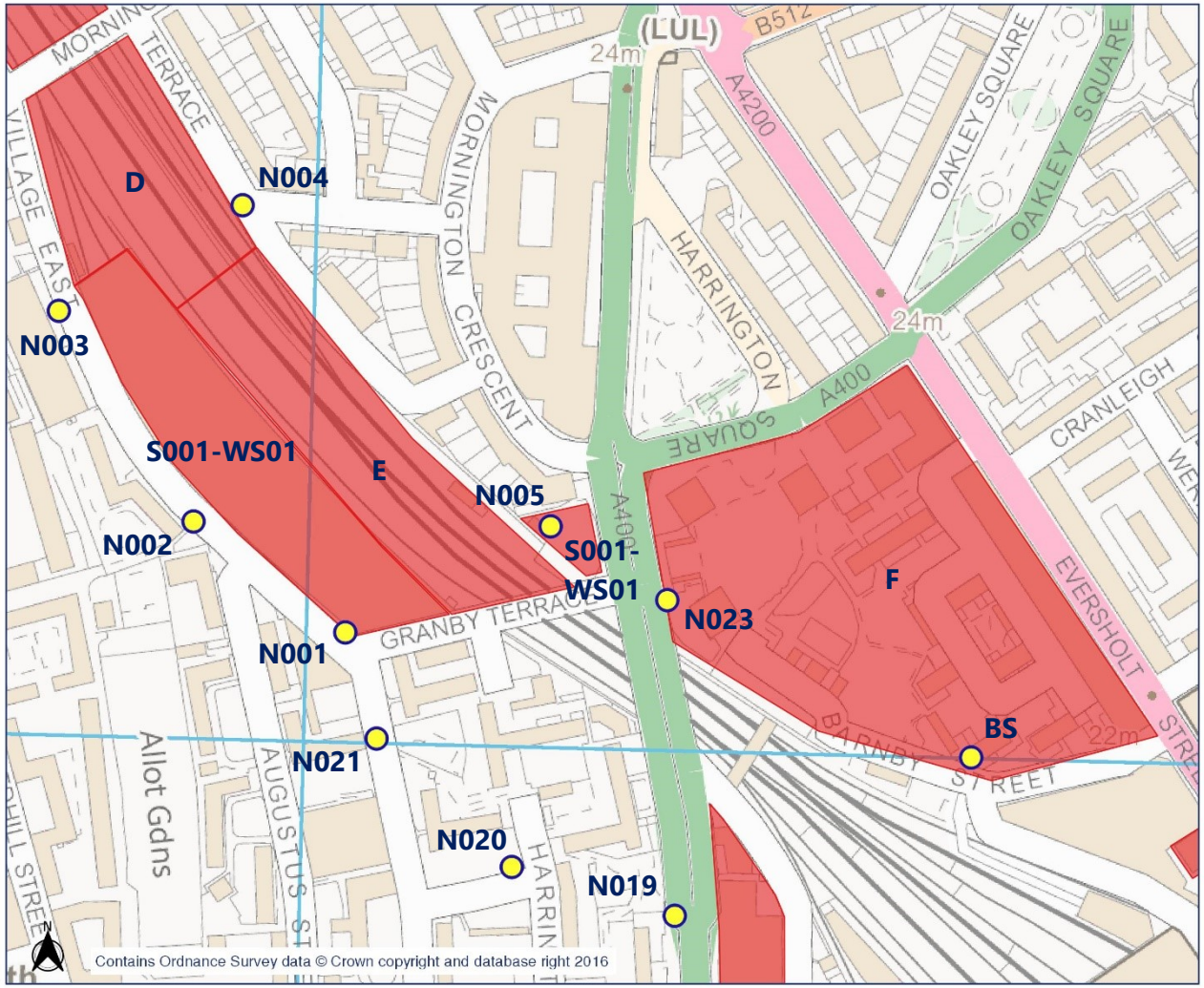


HS2

Noise monitoring plan - 2

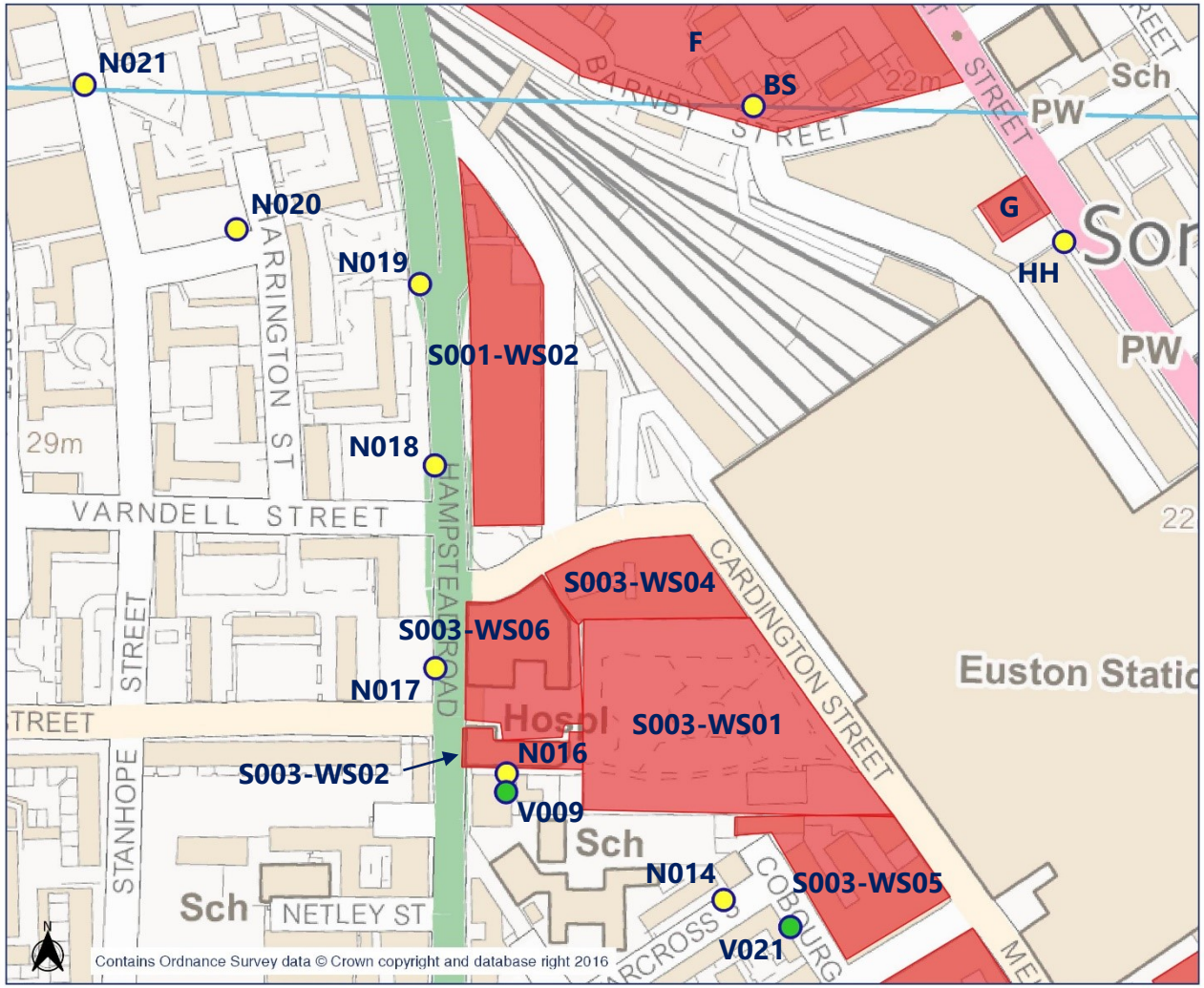


Noise monitoring plan - 3

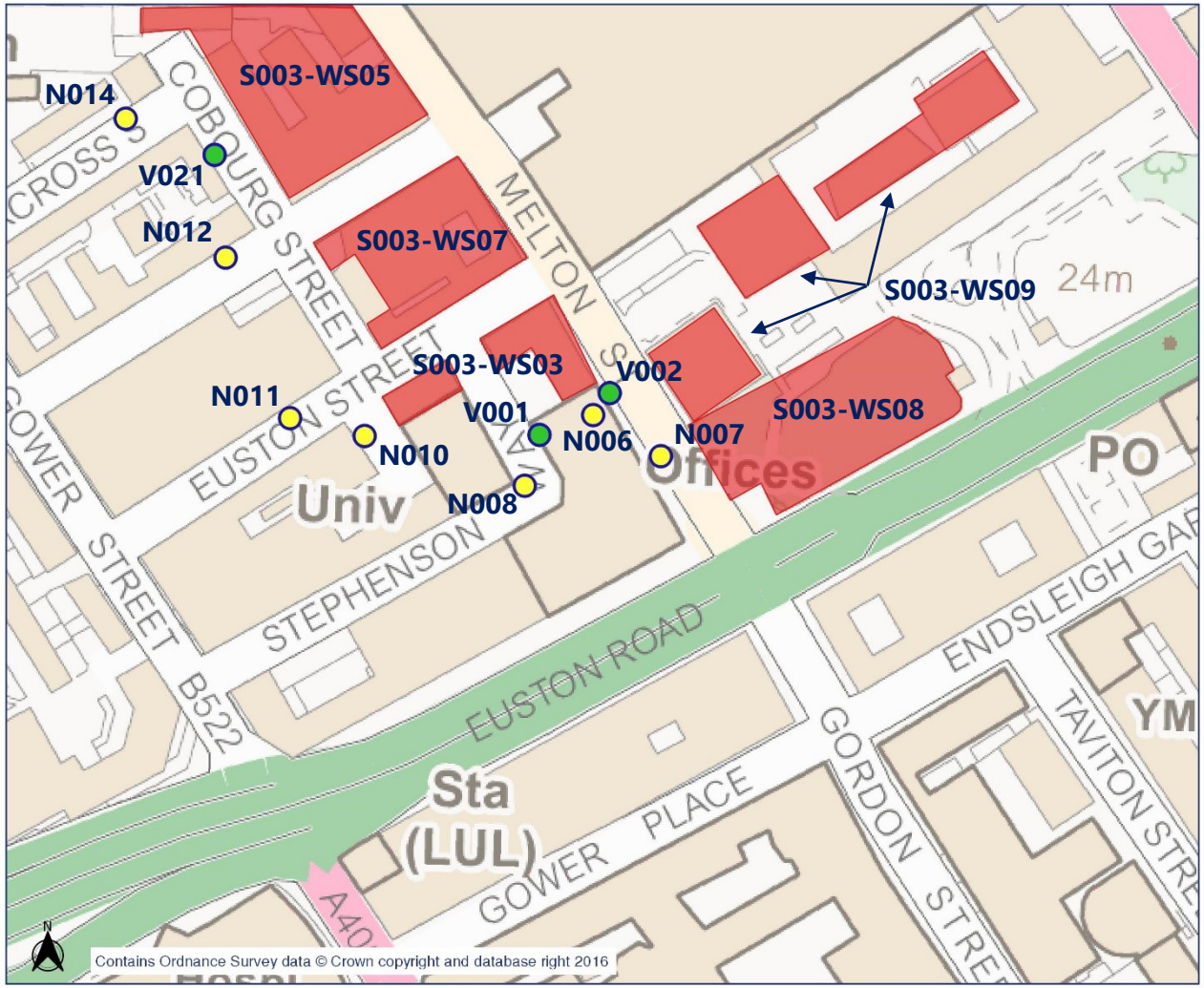


HS2

Noise monitoring plan - 4



Noise monitoring plan - 5

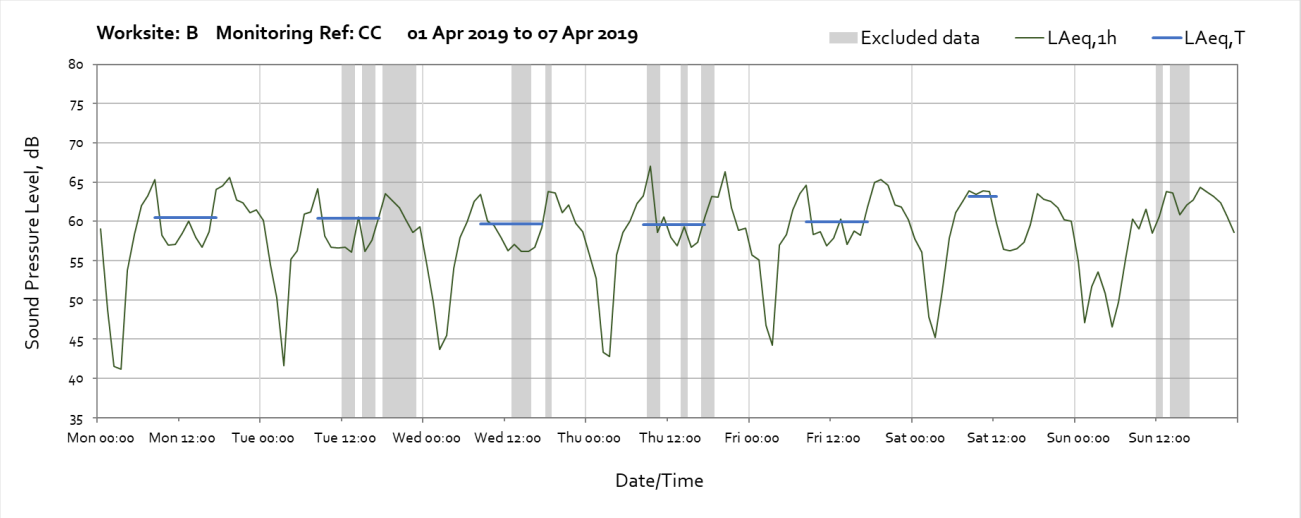


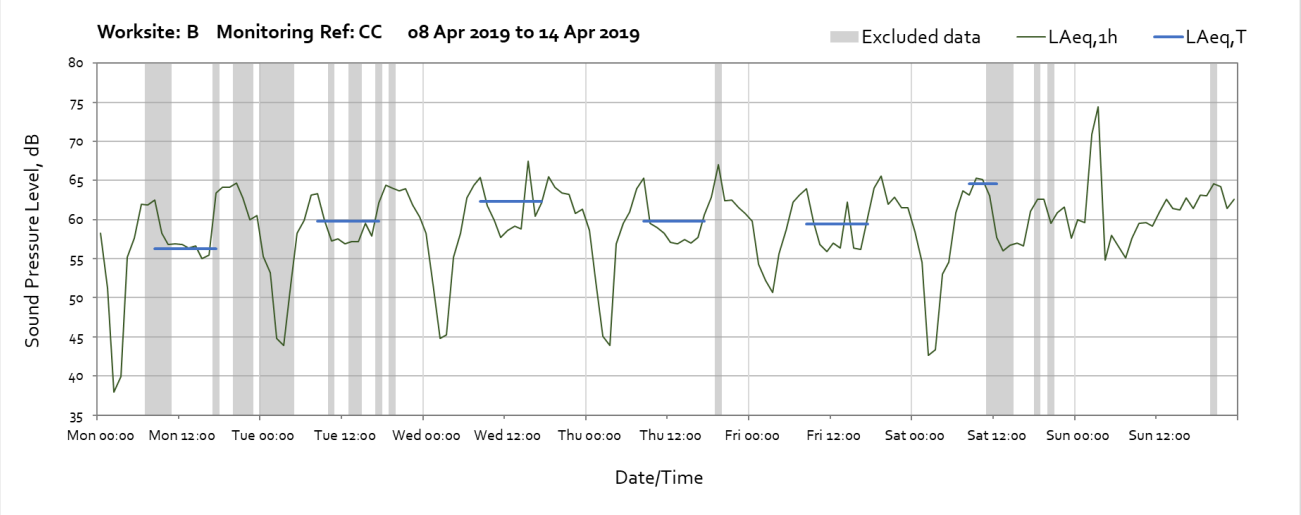
Appendix C Data

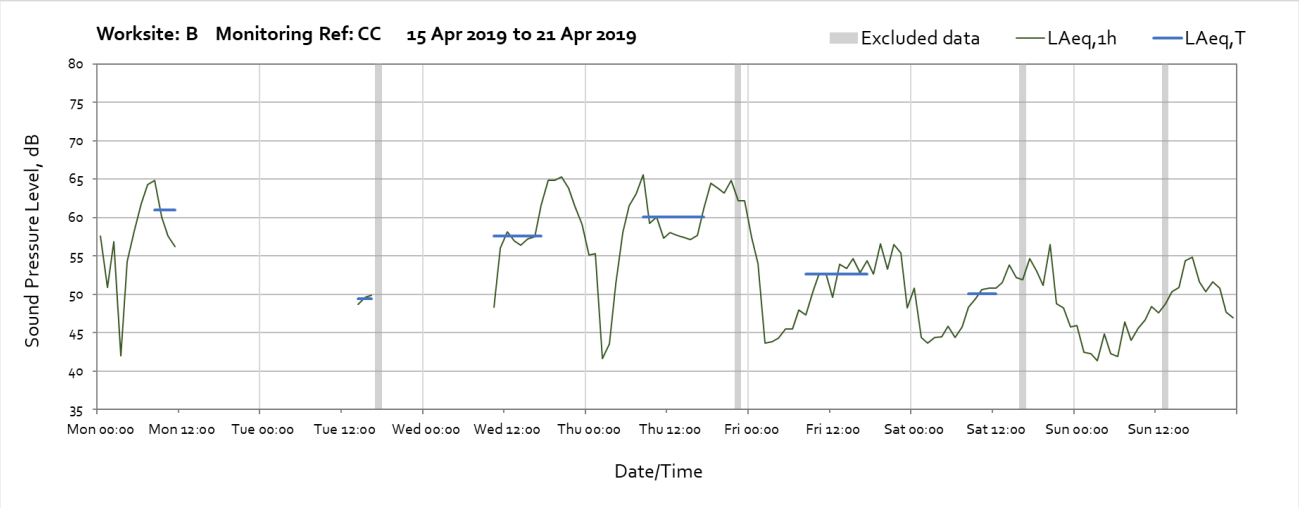
Noise

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 5.

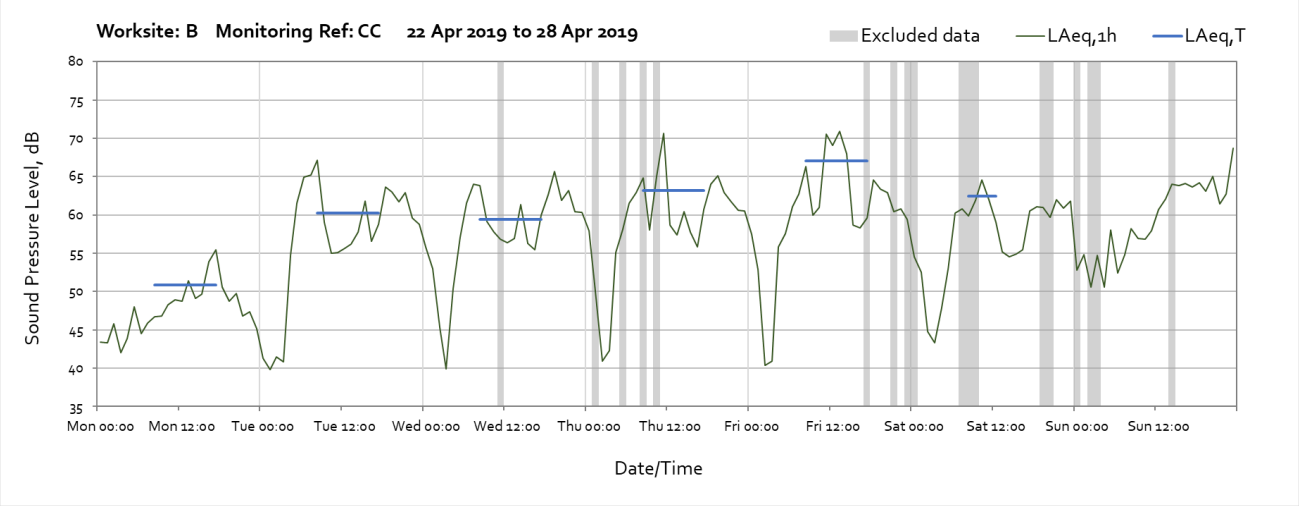
Worksite: B – Monitoring Ref: CC

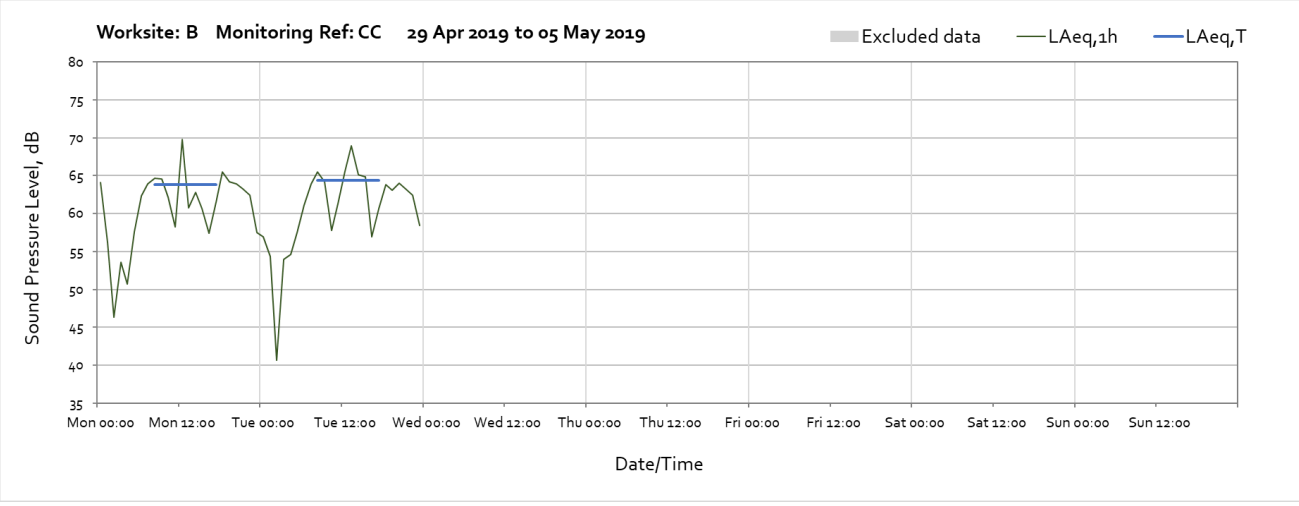




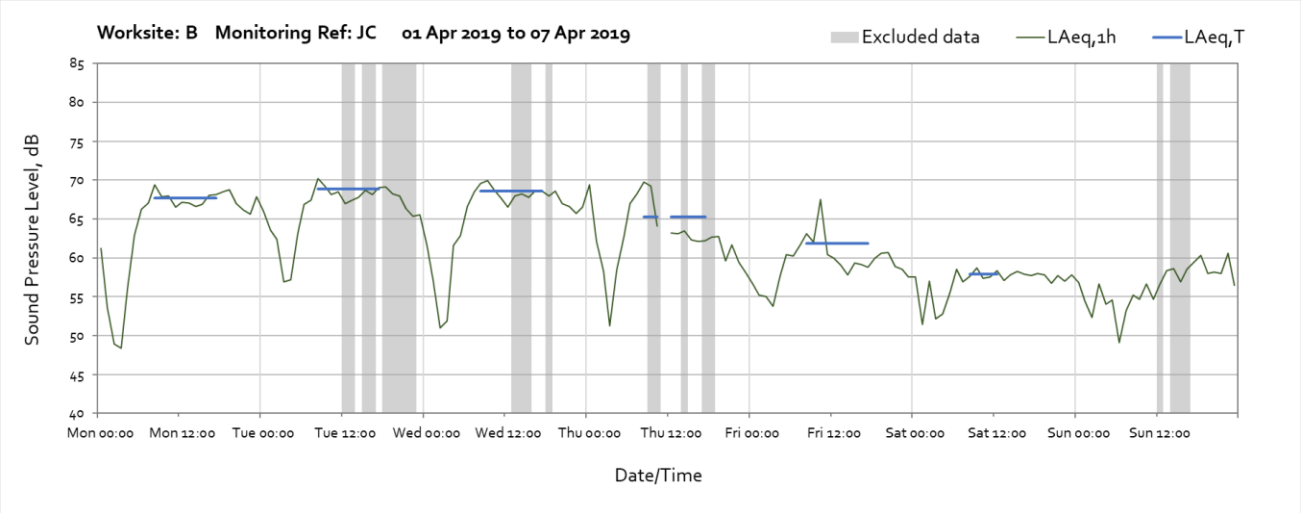


Note: Missing data between 12:00 on Monday 15th of April and 13:00 on Tuesday 16th April and between 17:00 on Tuesday 16th April and 09:00 on Wednesday 17th April was due to loss of power at the monitoring station.

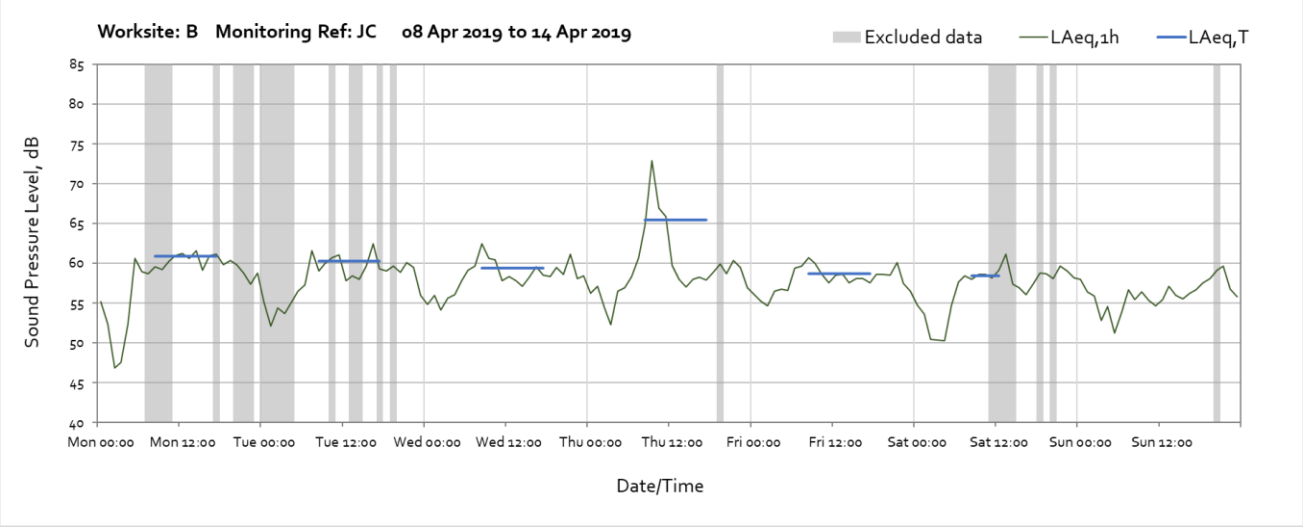


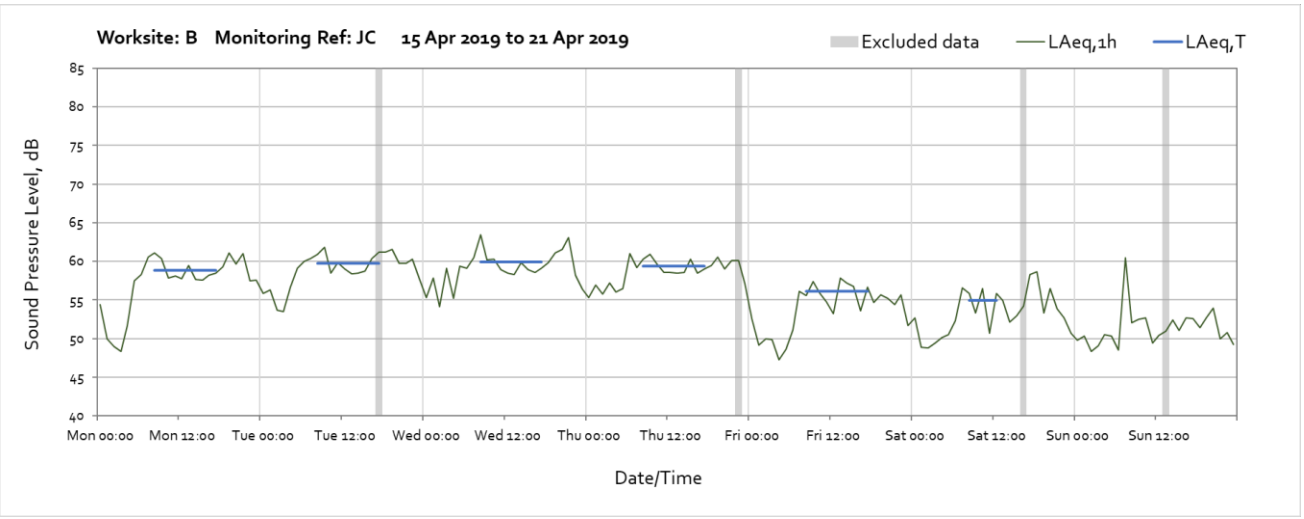


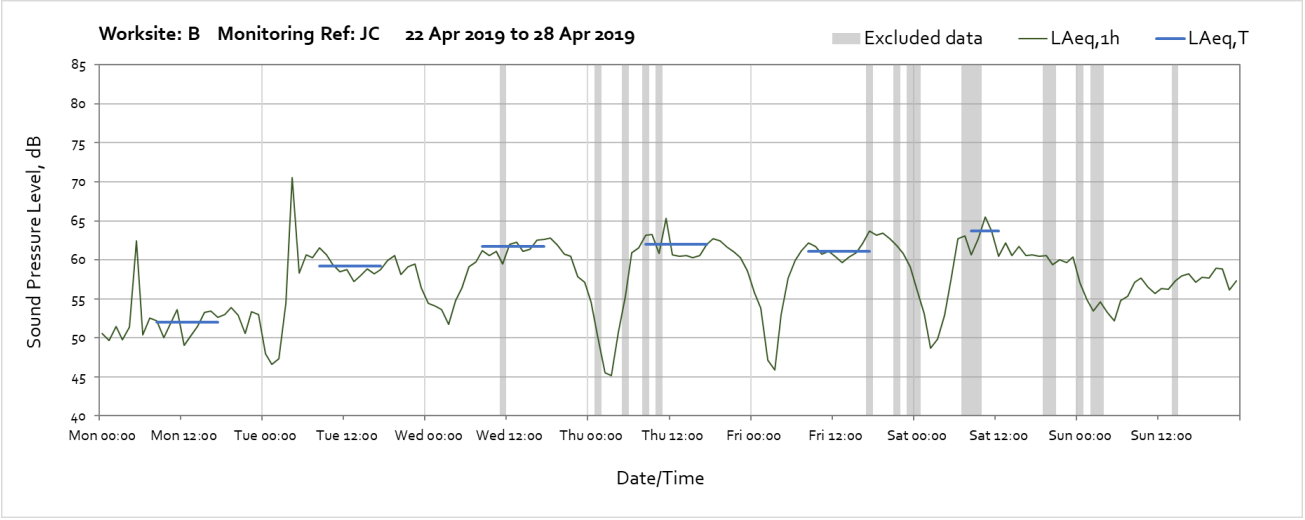
Worksite: B – Monitoring Ref: JC

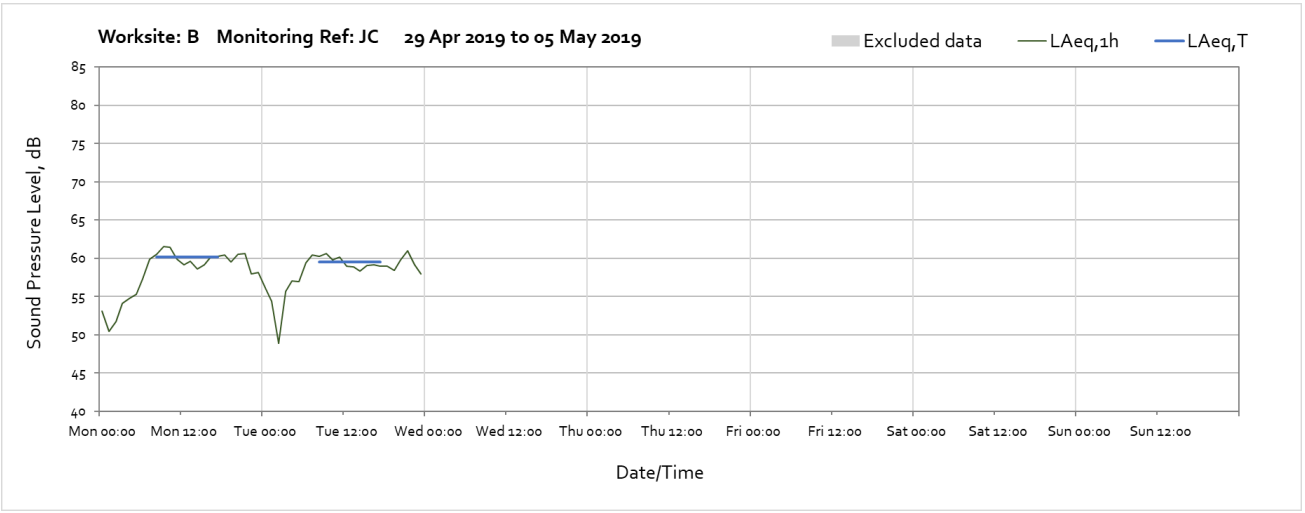


Note: Missing data between 11:00 and 12:00 on Thursday 4th of April was due to loss of power at the monitoring station.

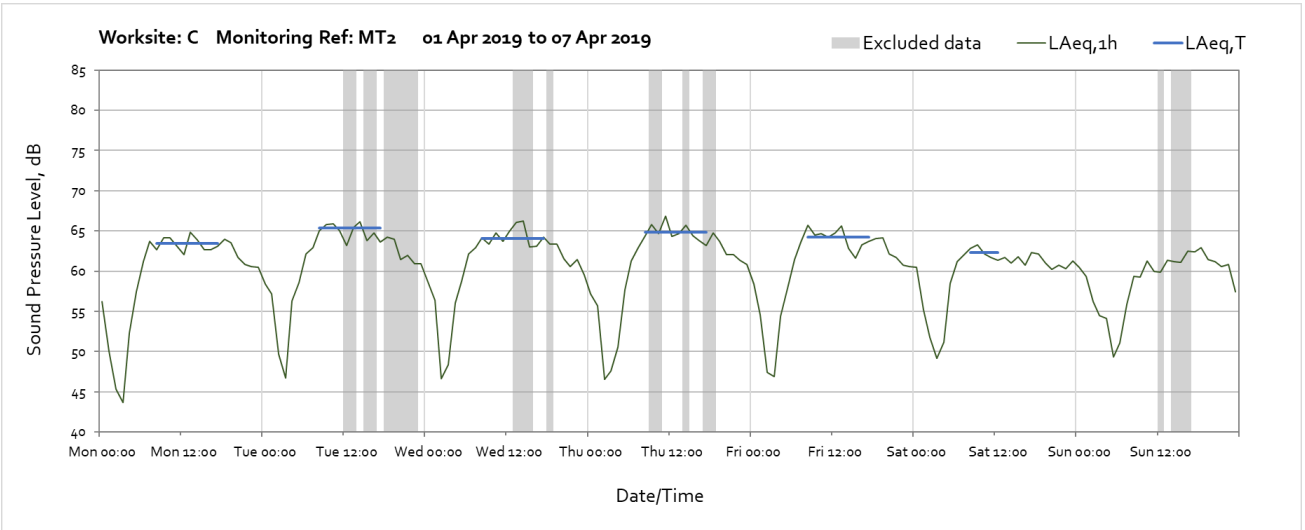


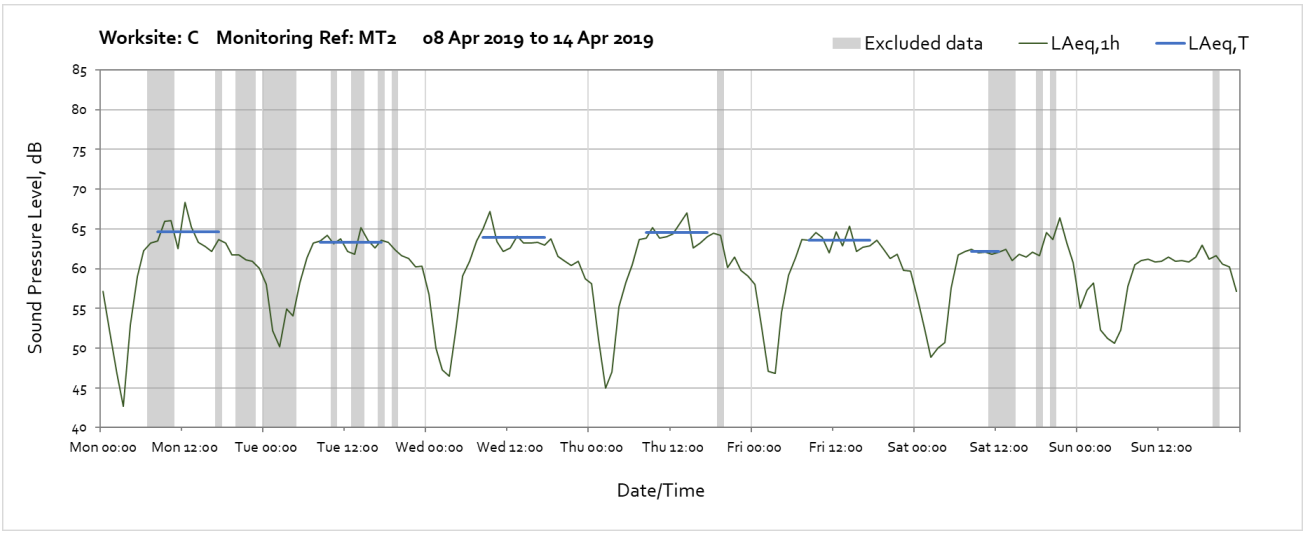






Worksite: C – Monitoring Ref: MT2

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LAeq,T
Sound Pressure Level, dB
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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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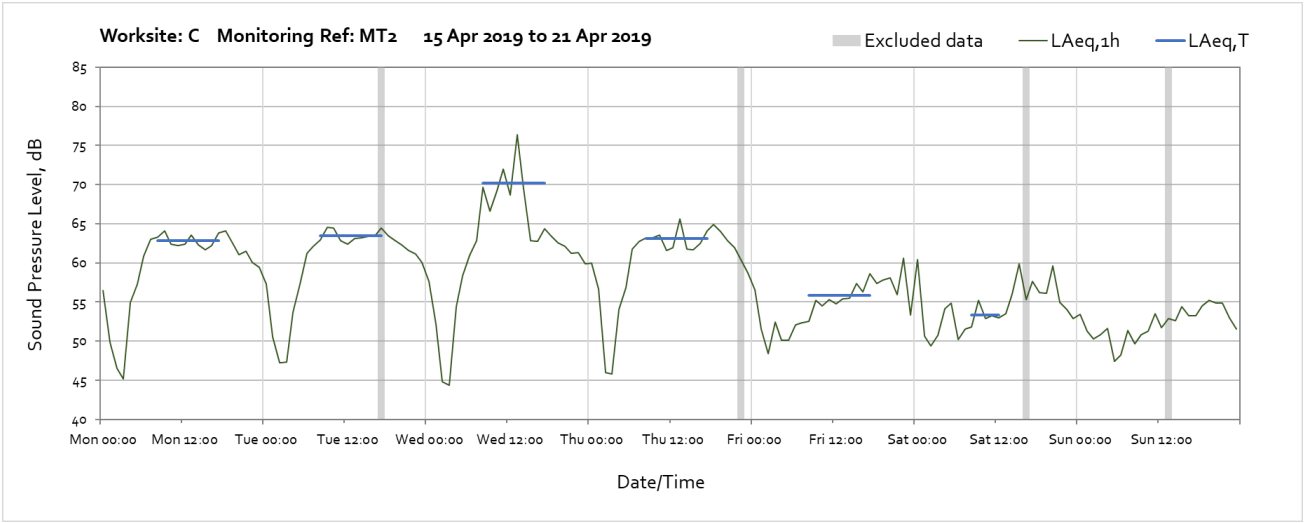
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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LAeq,1h
LAeq,T
Sound Pressure Level, dB
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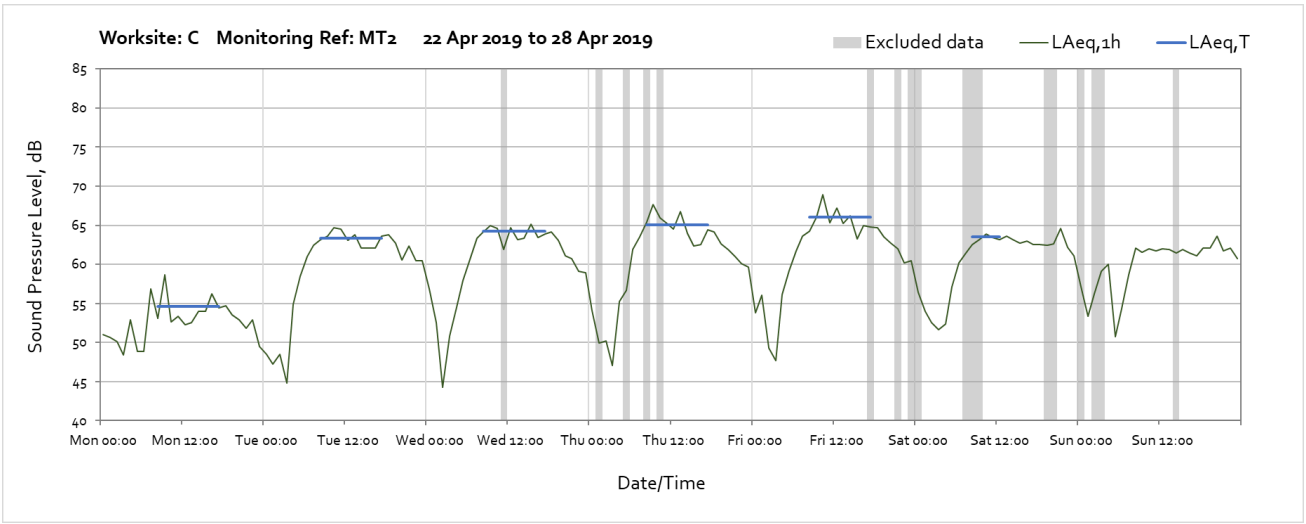
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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LAeq,T
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75
70
65
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Wed 00:00
Wed 12:00
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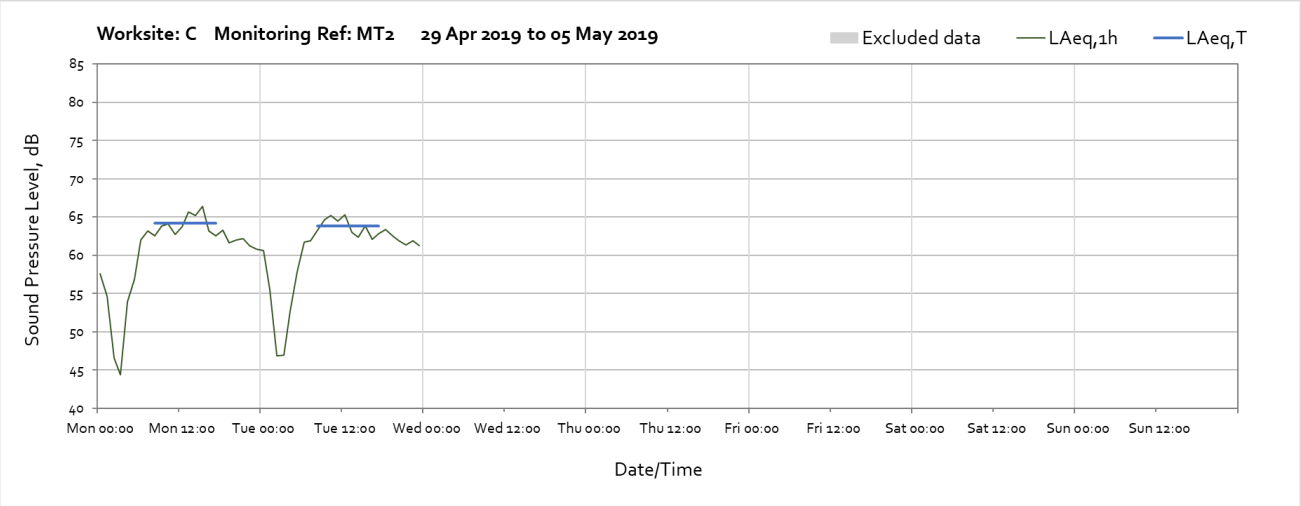
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



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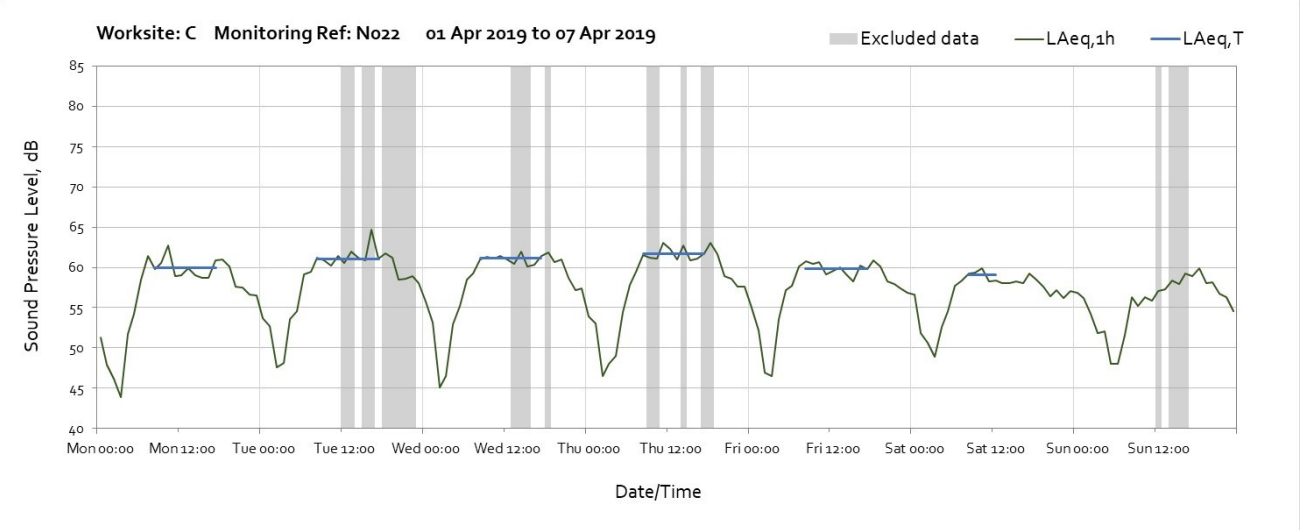

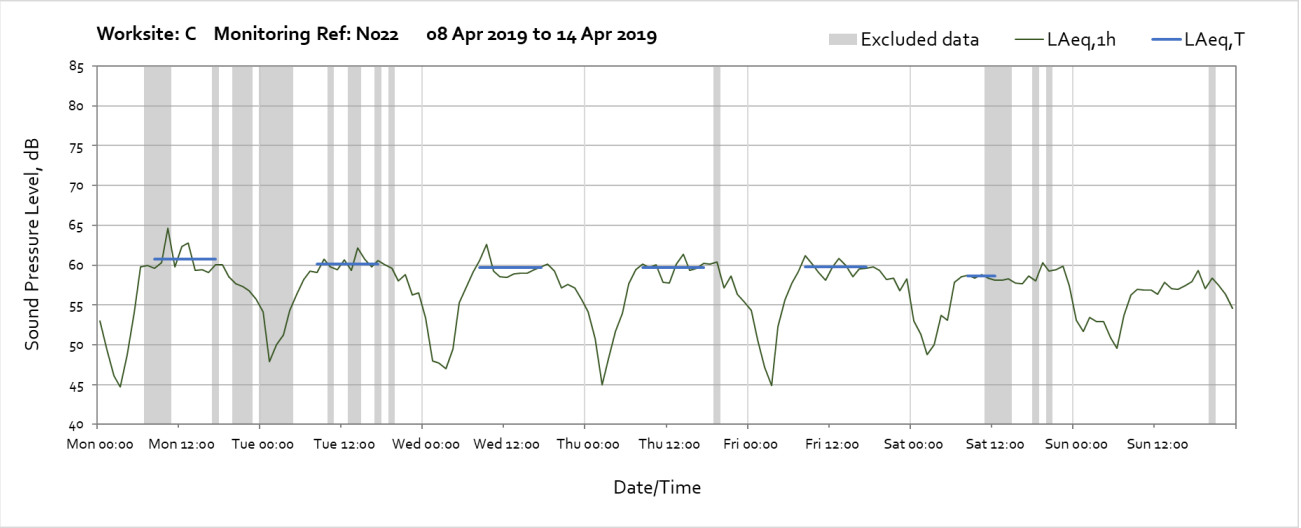

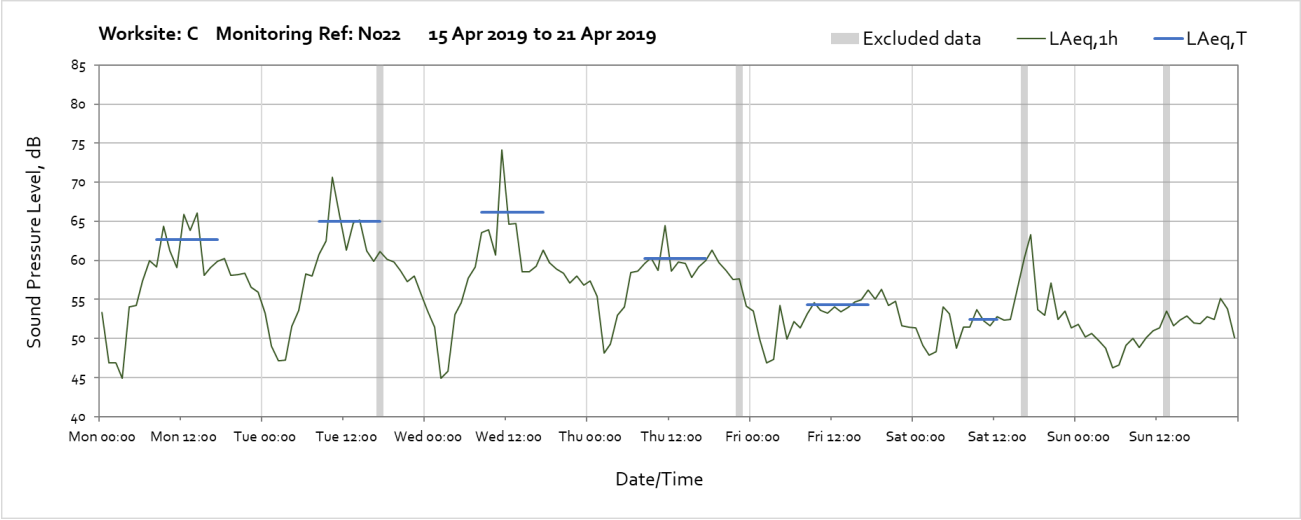
Worksite: C Monitoring Ref: No22 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
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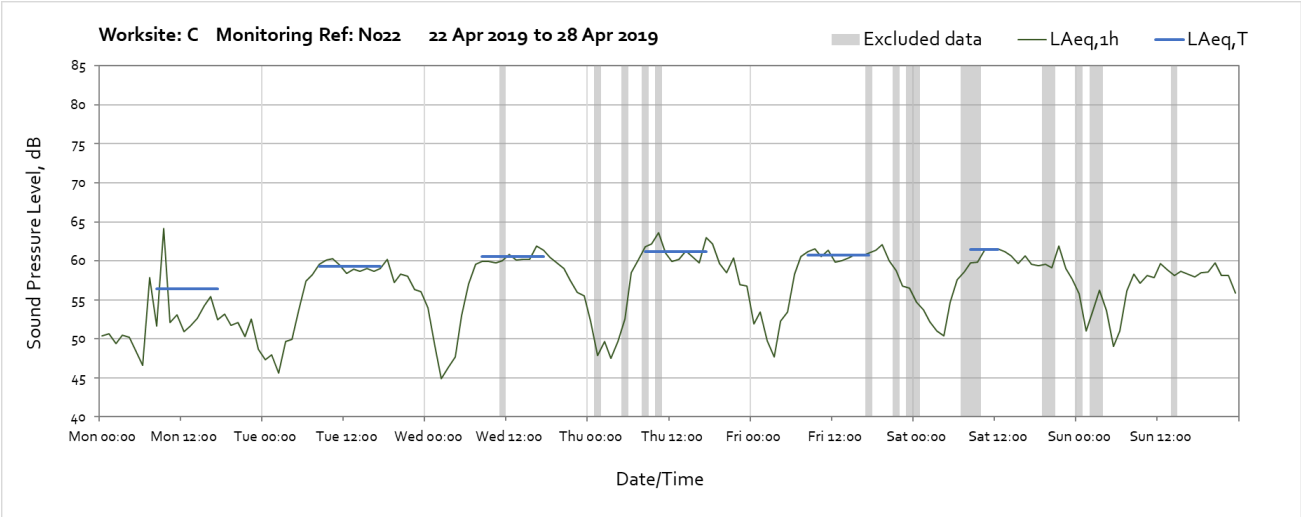
Date/Time


Worksite: C Monitoring Ref: No22 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
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Mon 00:00
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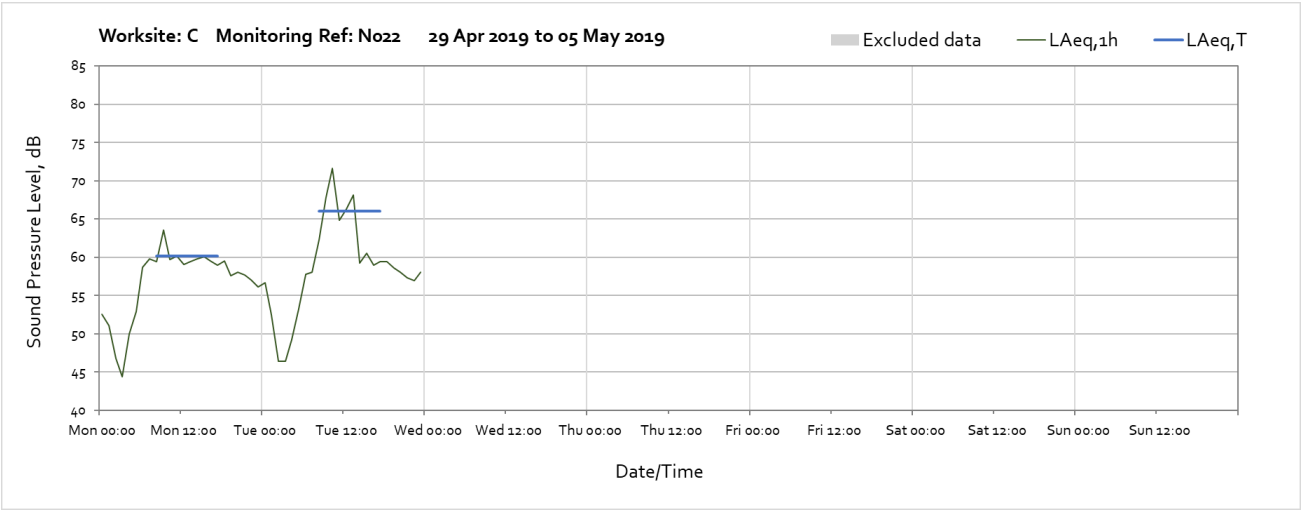
Date/Time


Worksite: C Monitoring Ref: No22 29 Apr 2019 to 05 May 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
Mon 12:00
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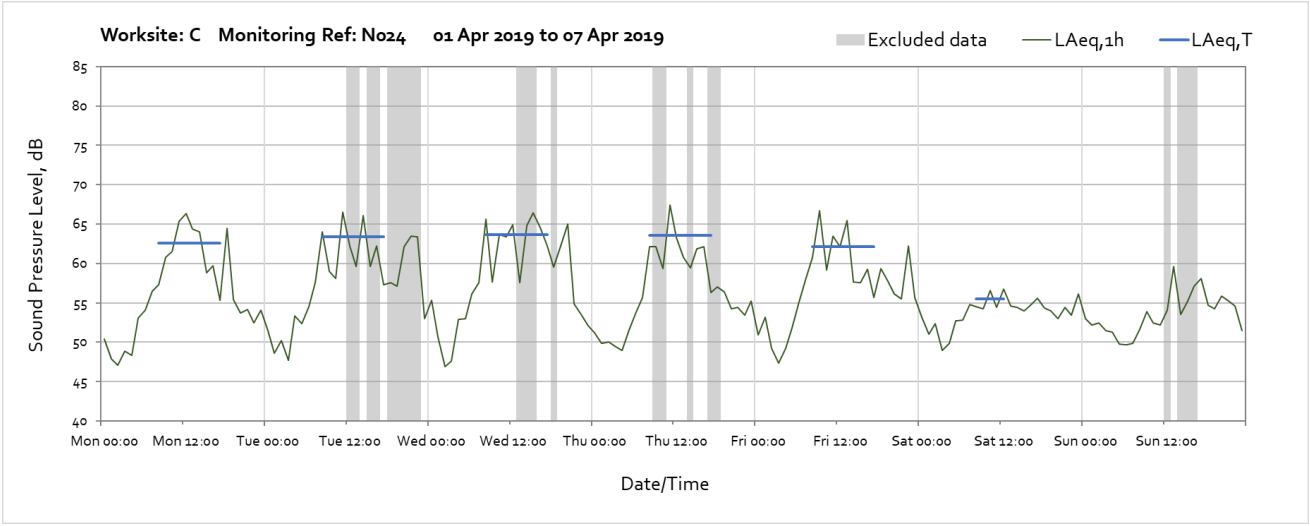
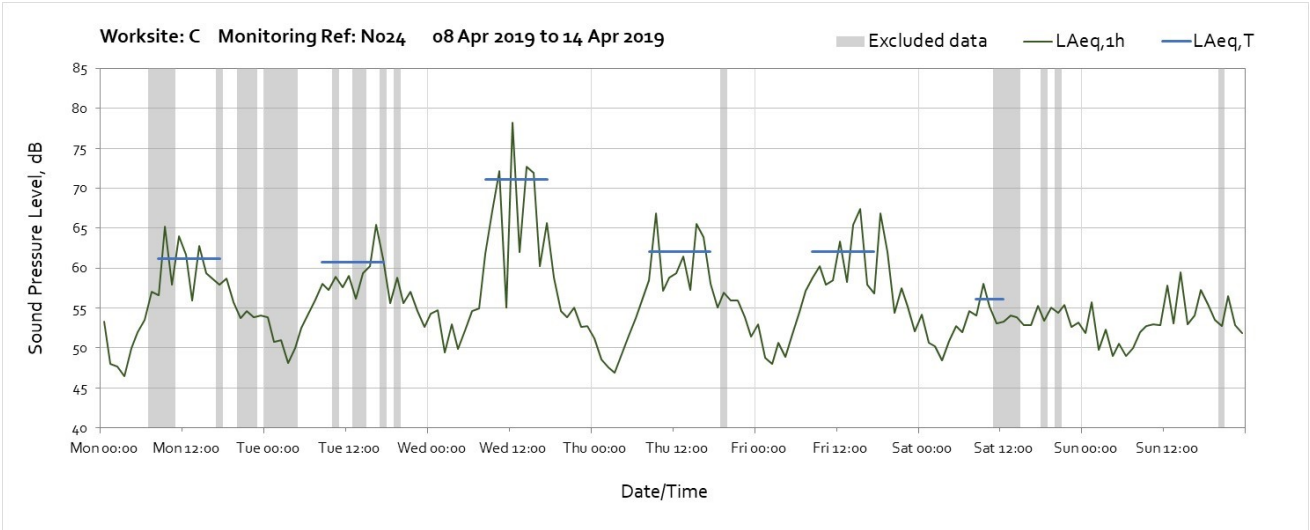
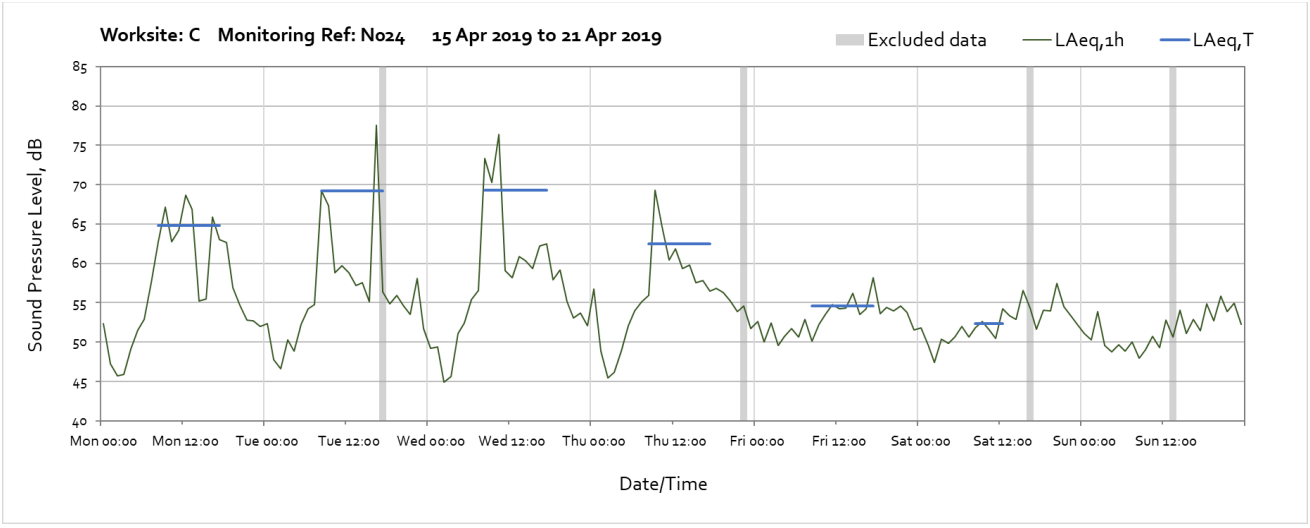
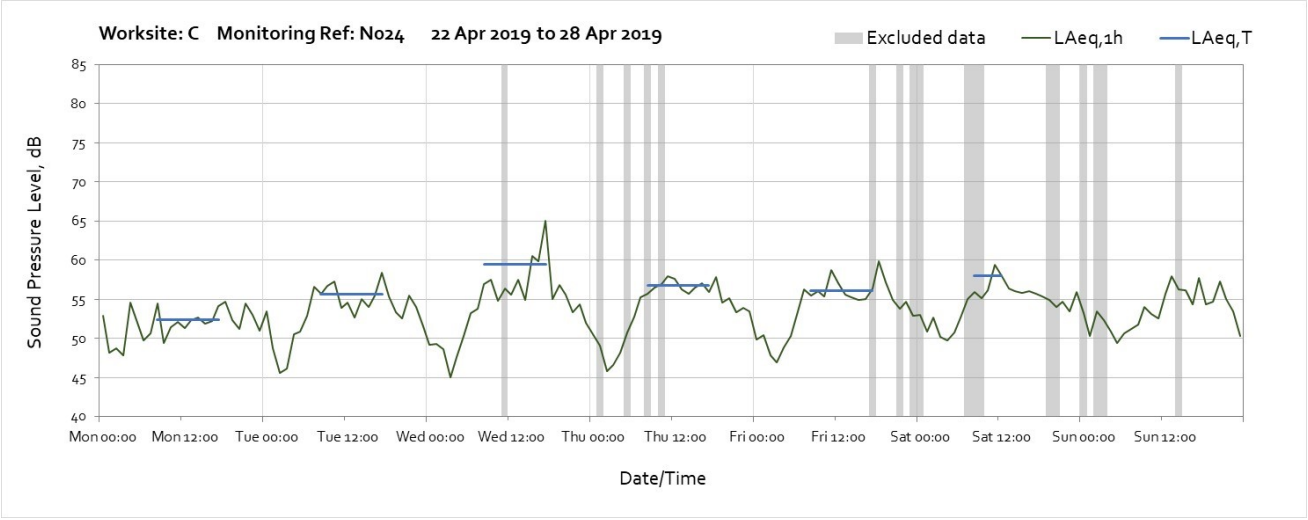
Date/Time

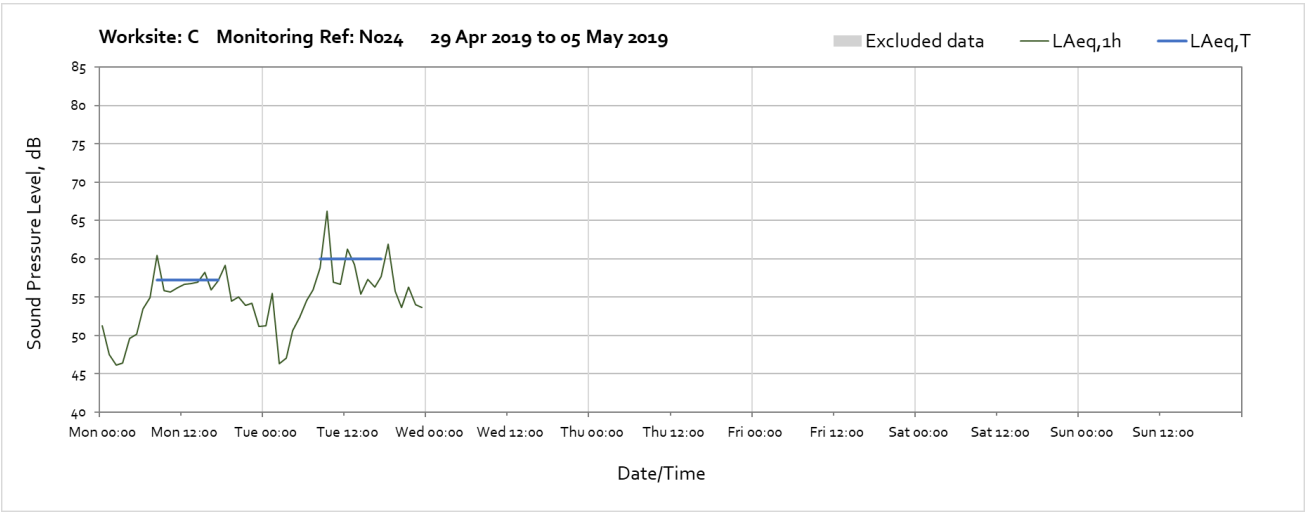
Worksite: C – Monitoring Ref: N024



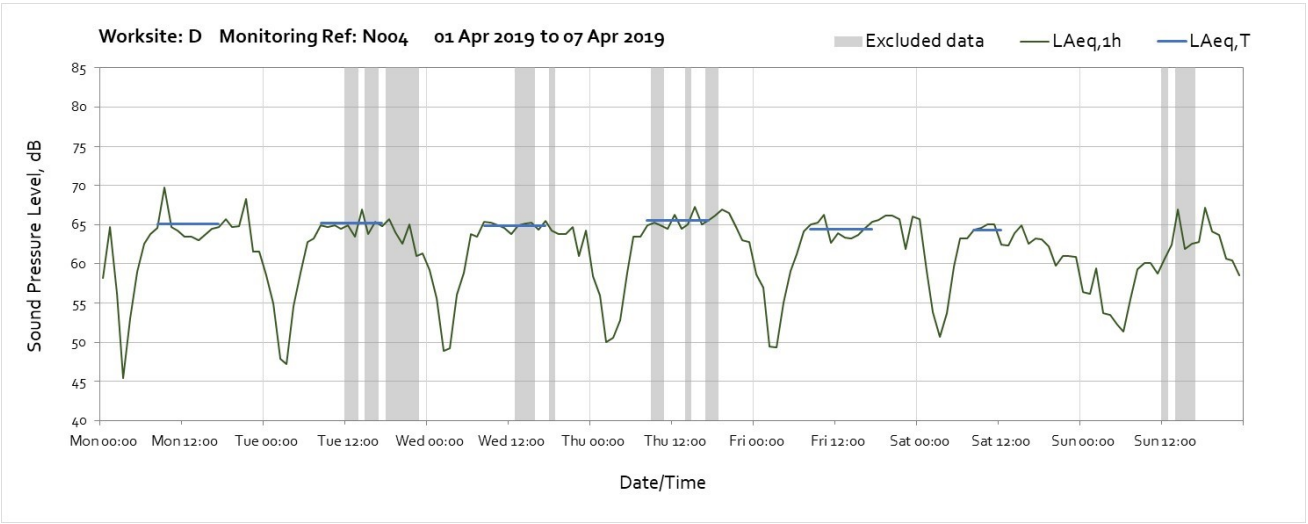


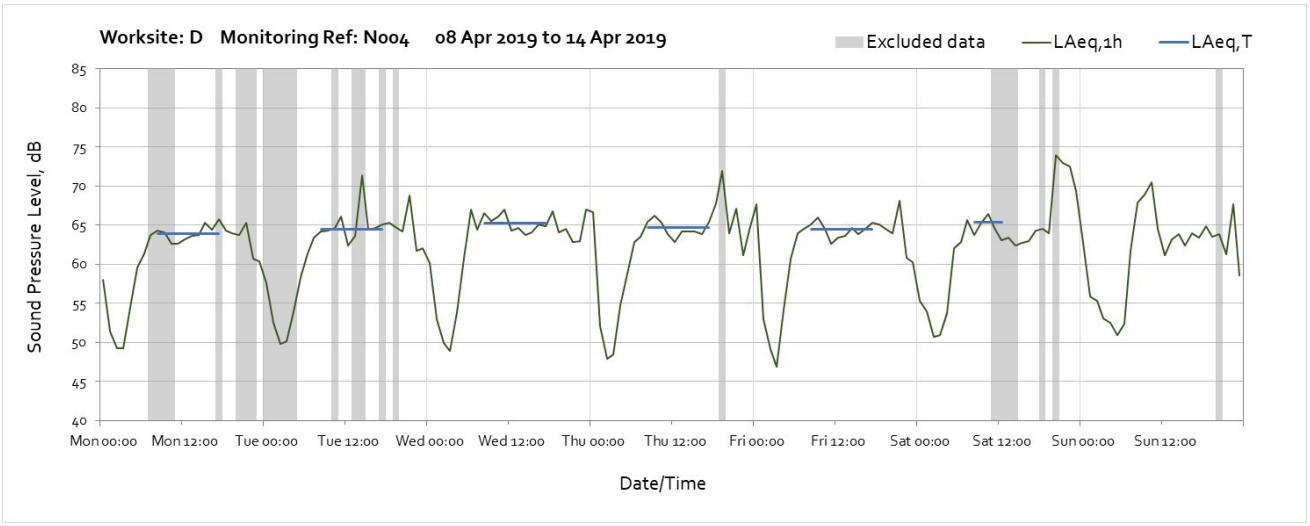






Worksite: D – Monitoring Ref: N004




Worksite: D Monitoring Ref: No04 08 Apr 2019 to 14 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
Mon 12:00
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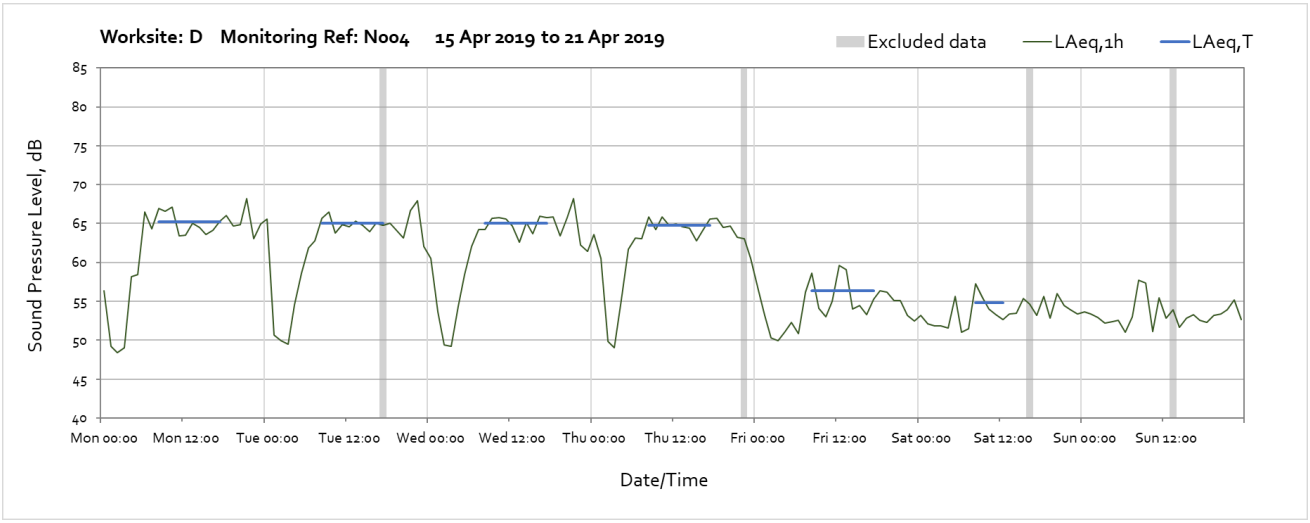
Date/Time


Worksite: D Monitoring Ref: No04 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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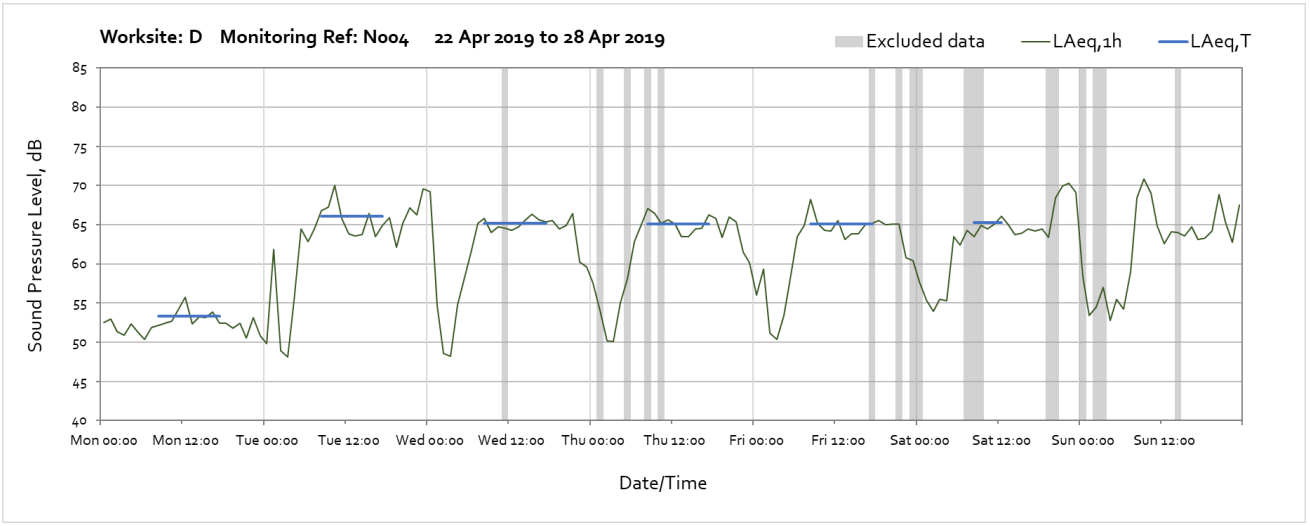
Date/Time


Worksite: D Monitoring Ref: No04 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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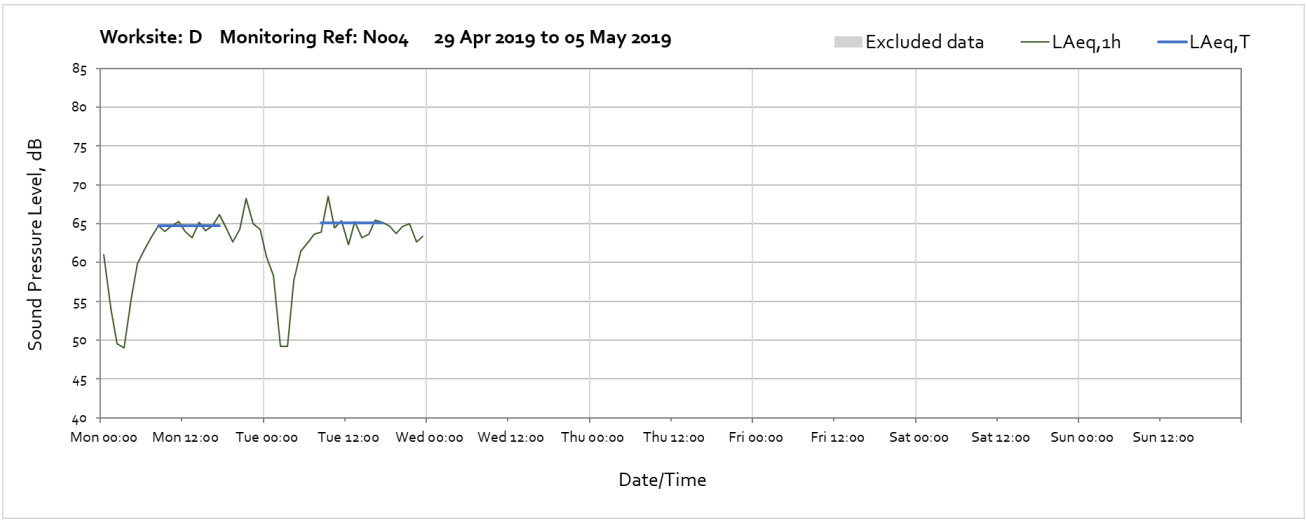
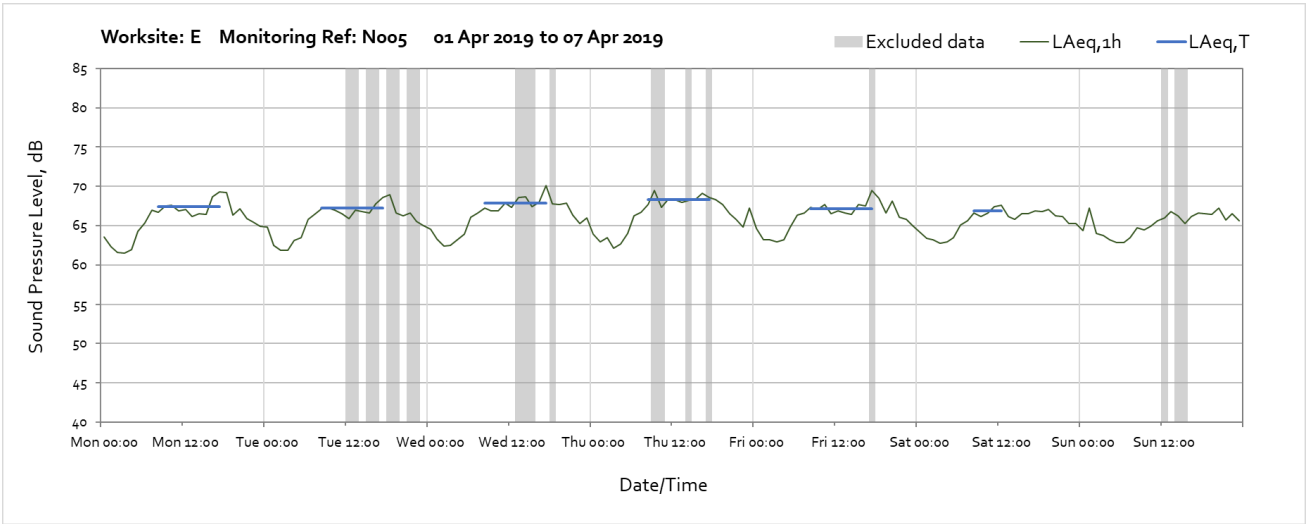
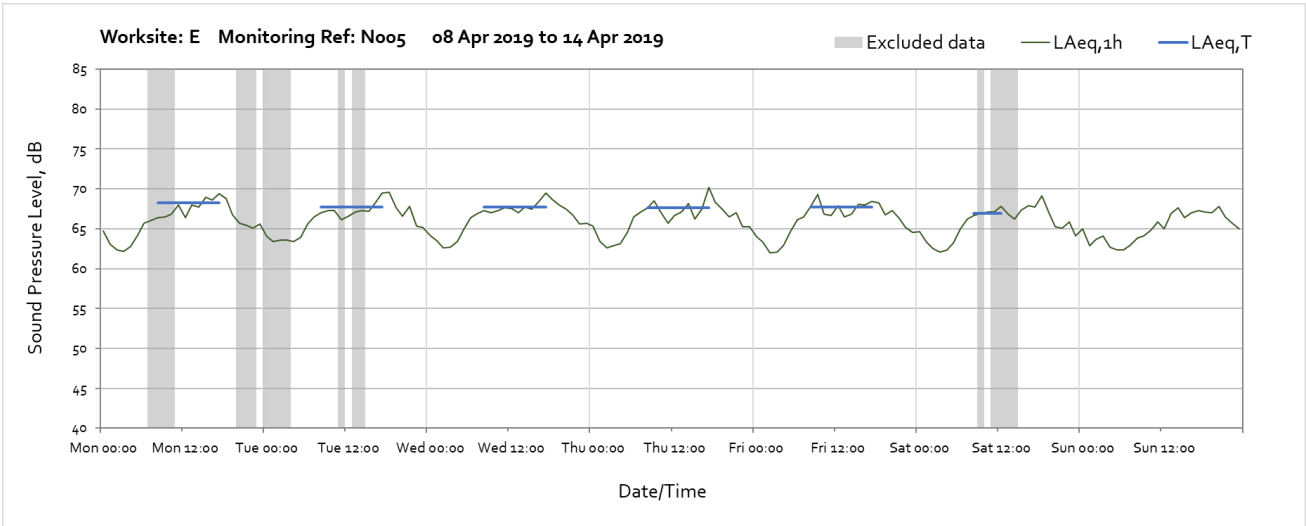
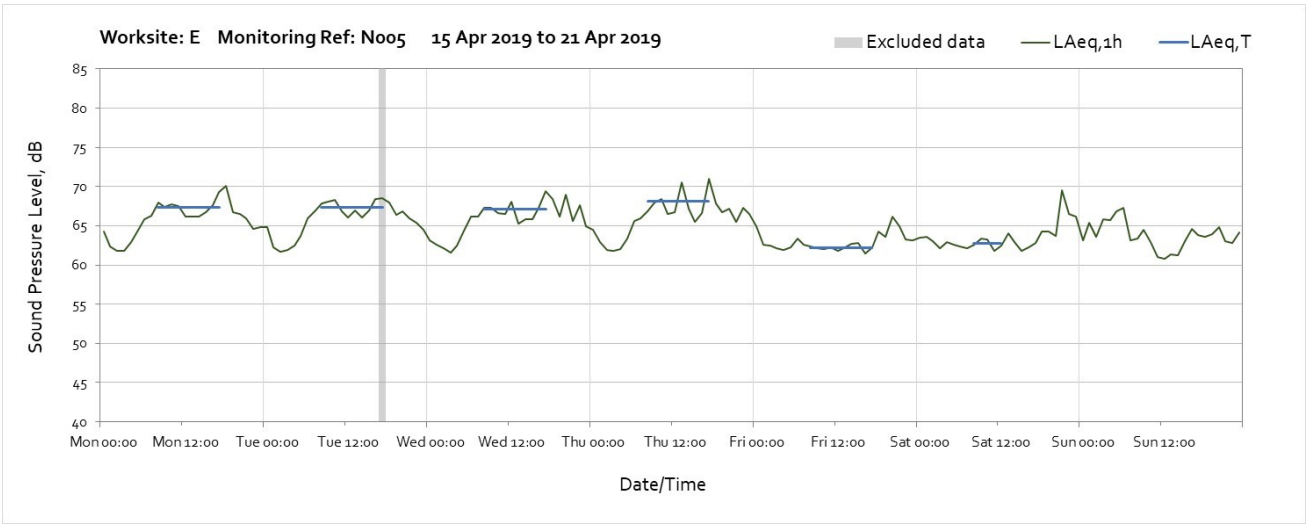
Date/Time



Worksite: E – Monitoring Ref: N005






Worksite: E Monitoring Ref: No05 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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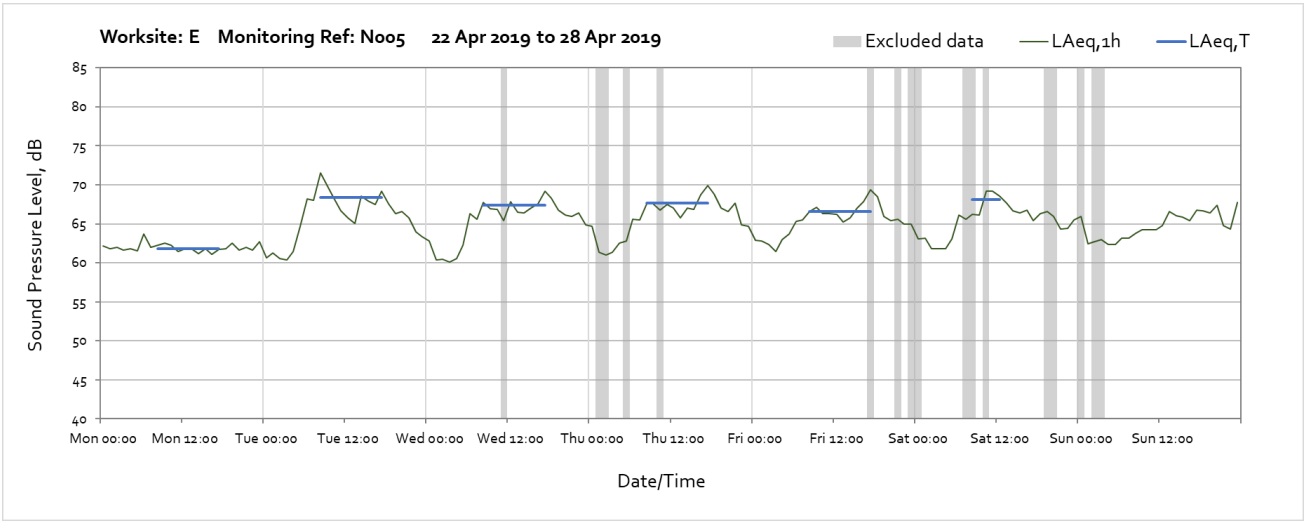
Date/Time


Worksite: E Monitoring Ref: No05 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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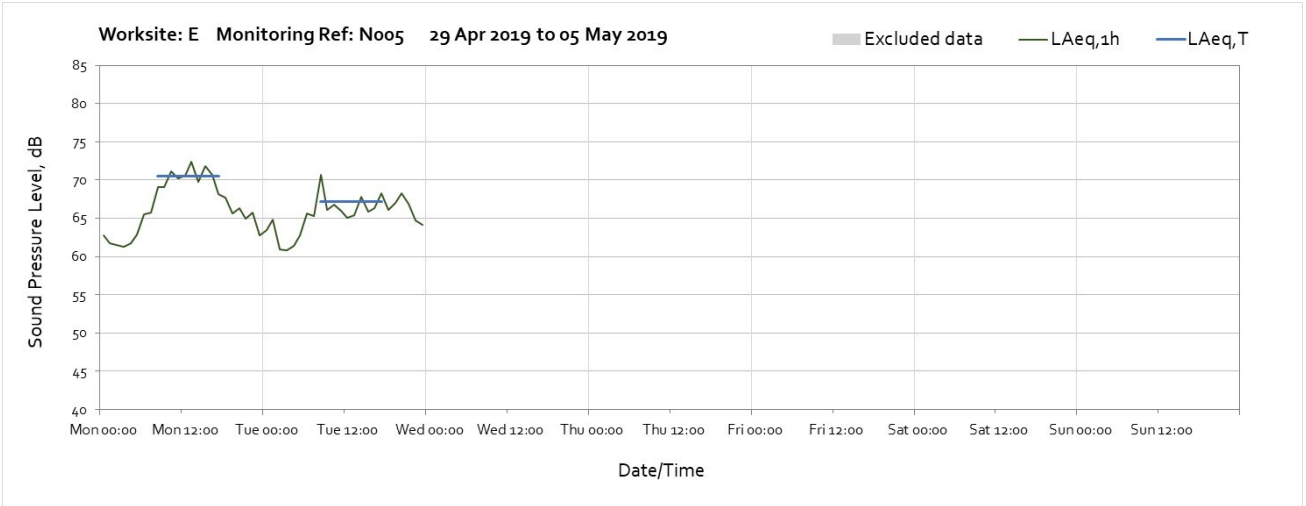
Date/Time


Worksite: E Monitoring Ref: No05 29 Apr 2019 to 05 May 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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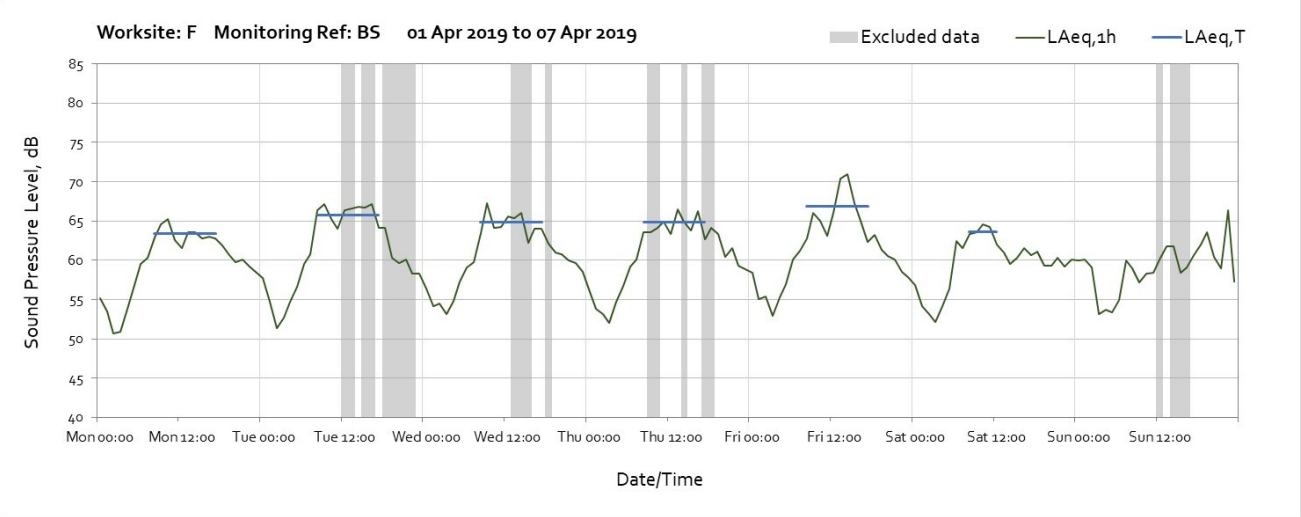
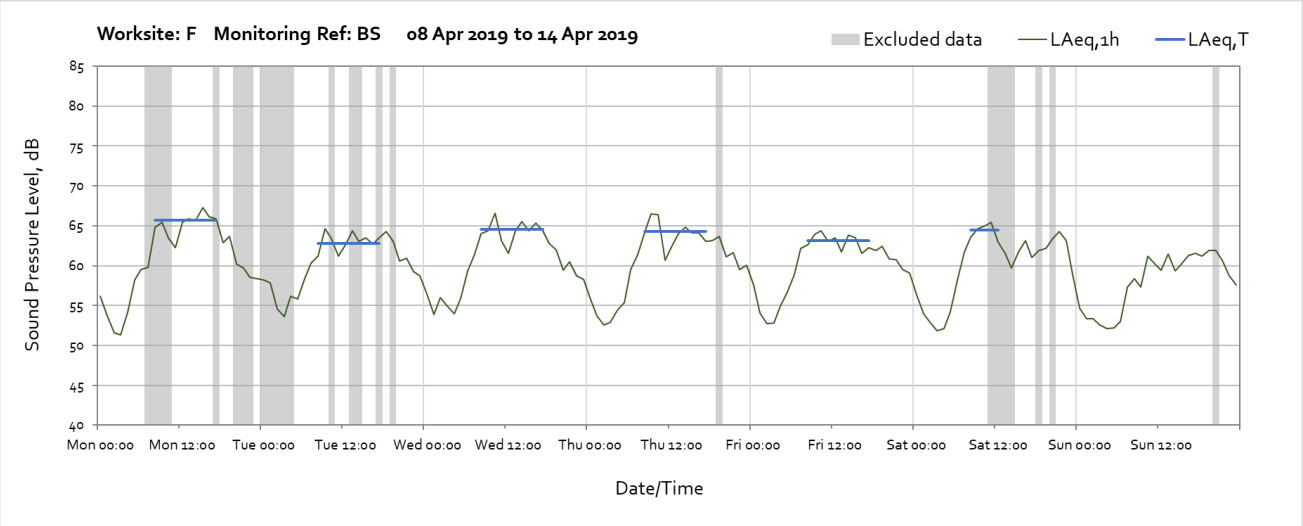
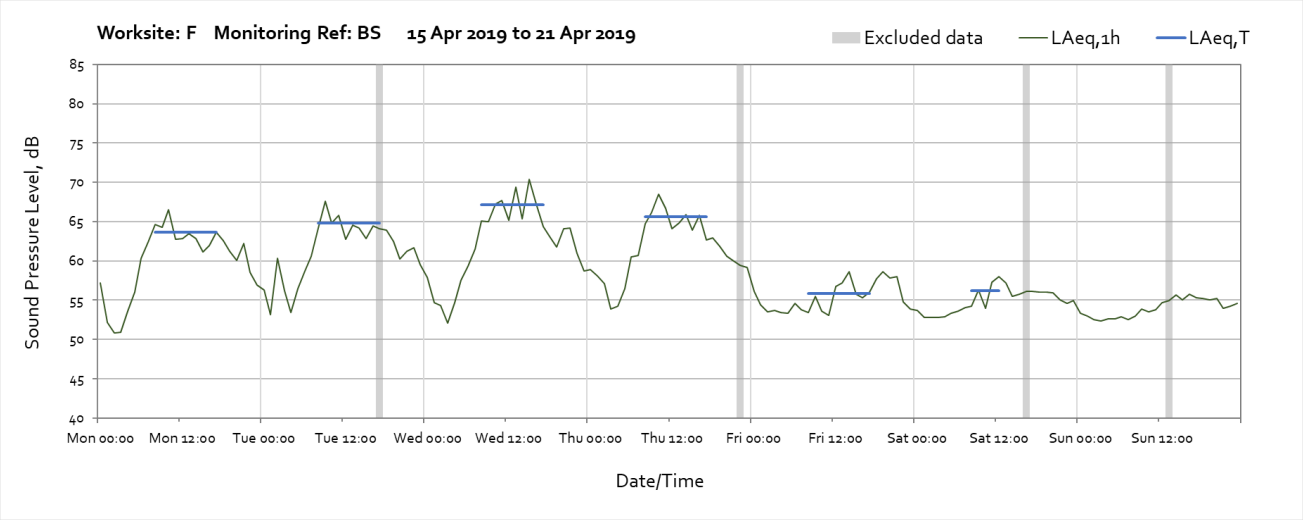
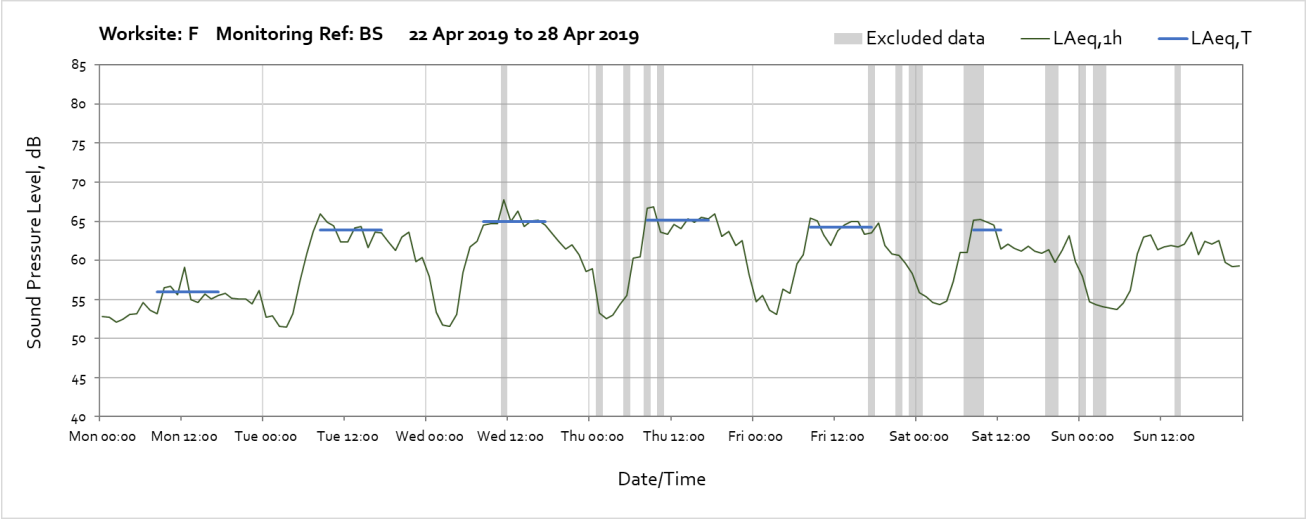
Date/Time

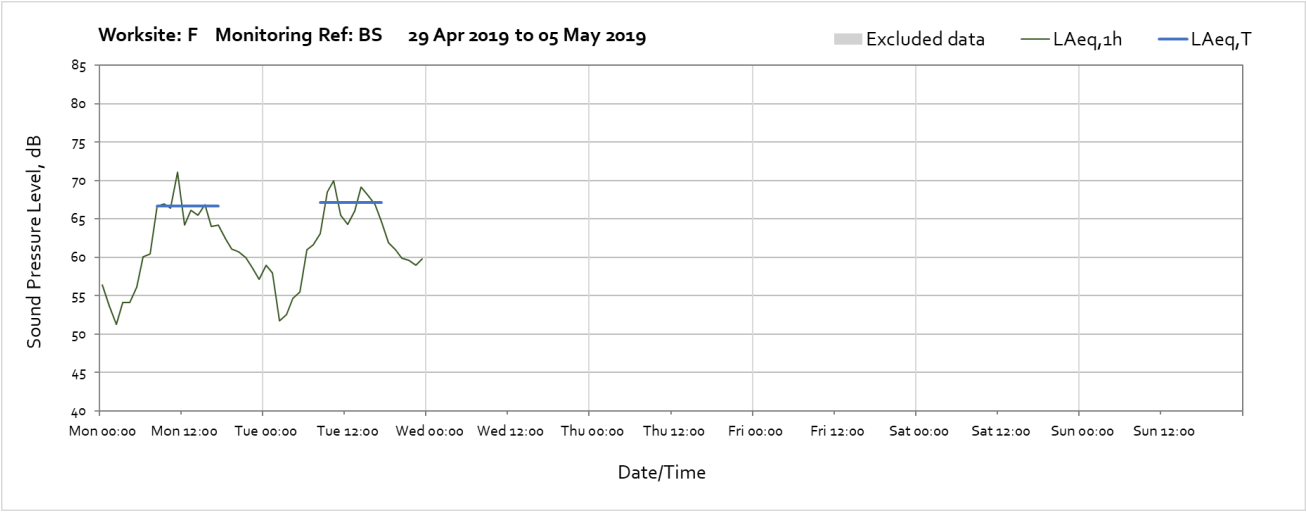
Worksite: F – Monitoring Ref: BS



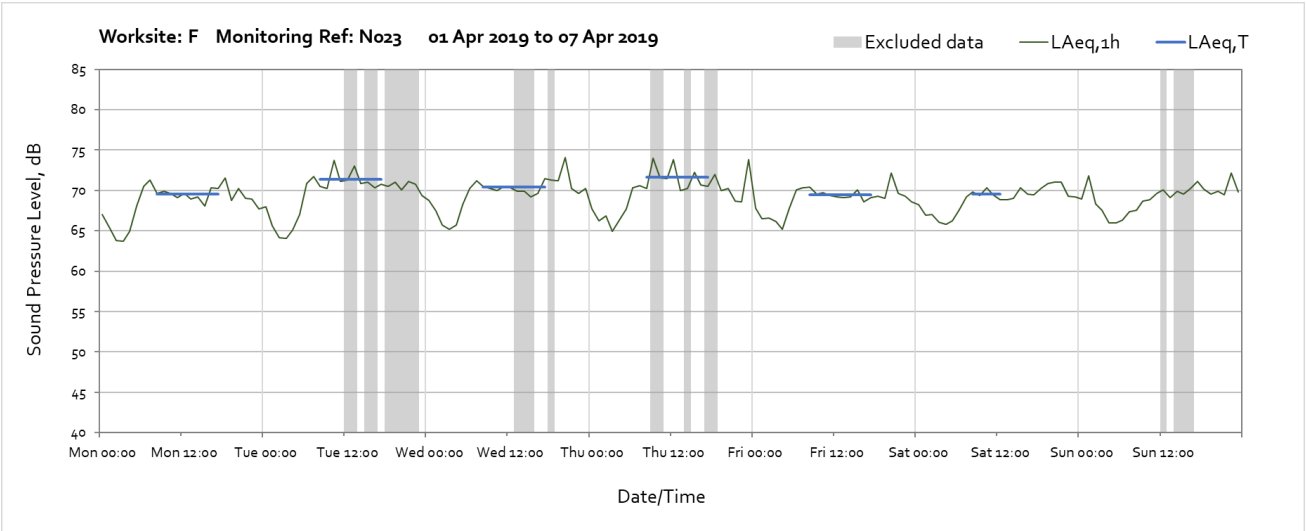


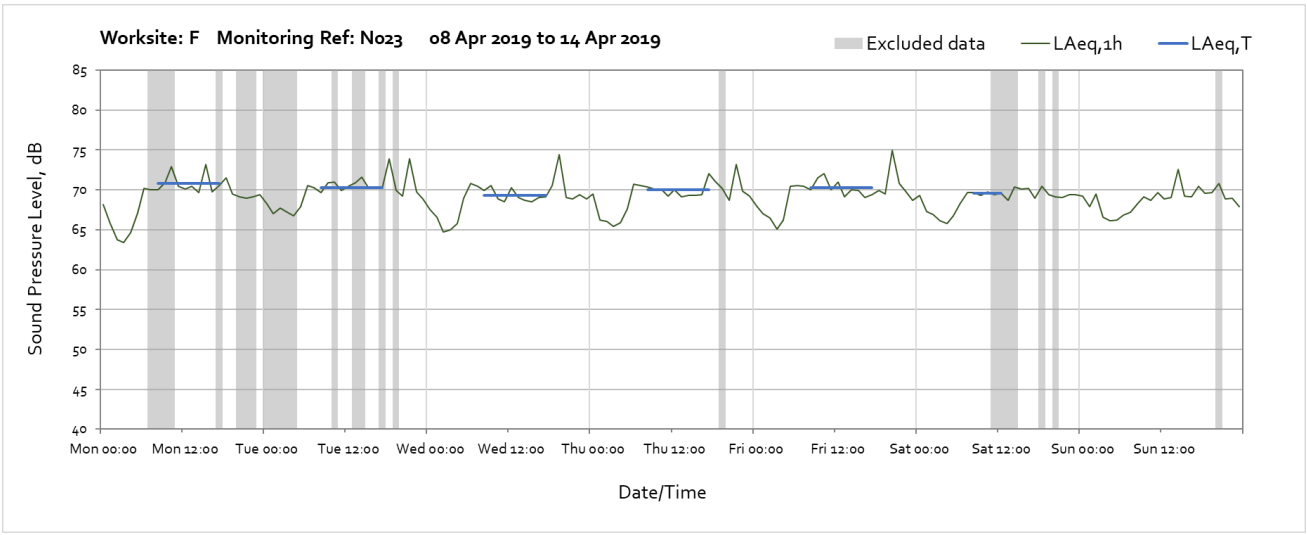






Worksite: F – Monitoring Ref: N023




Worksite: F Monitoring Ref: No23 08 Apr 2019 to 14 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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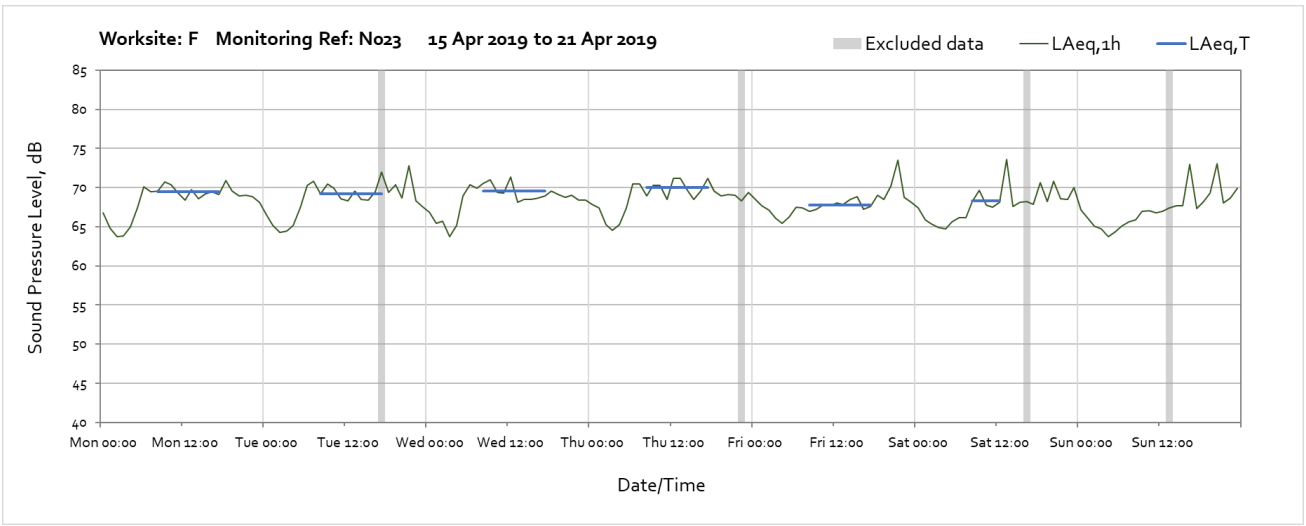
Date/Time


Worksite: F Monitoring Ref: No23 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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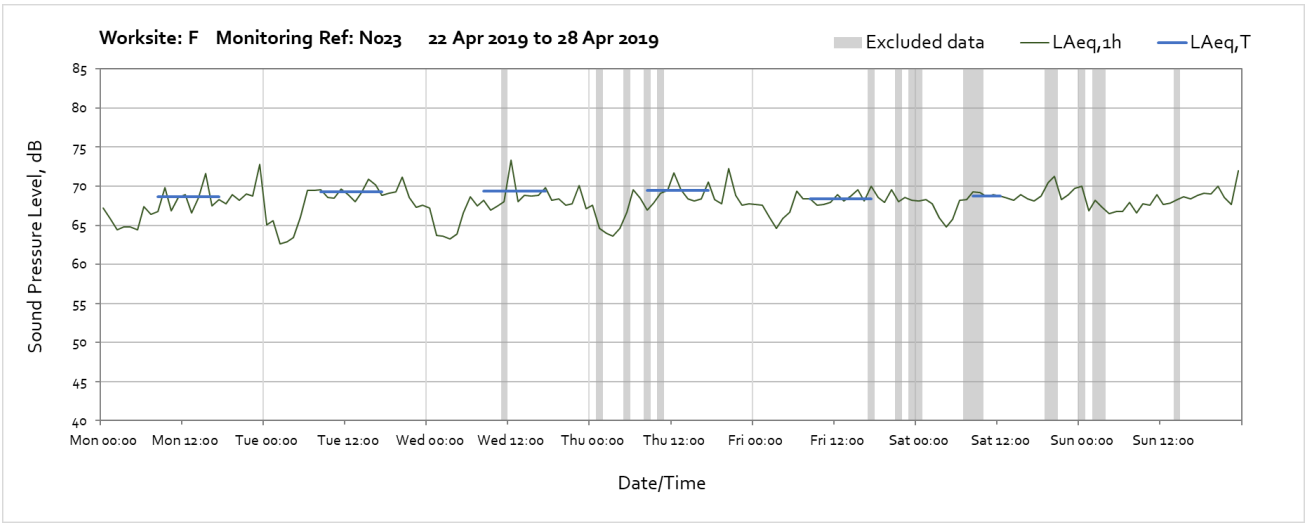
Date/Time


Worksite: F Monitoring Ref: No23 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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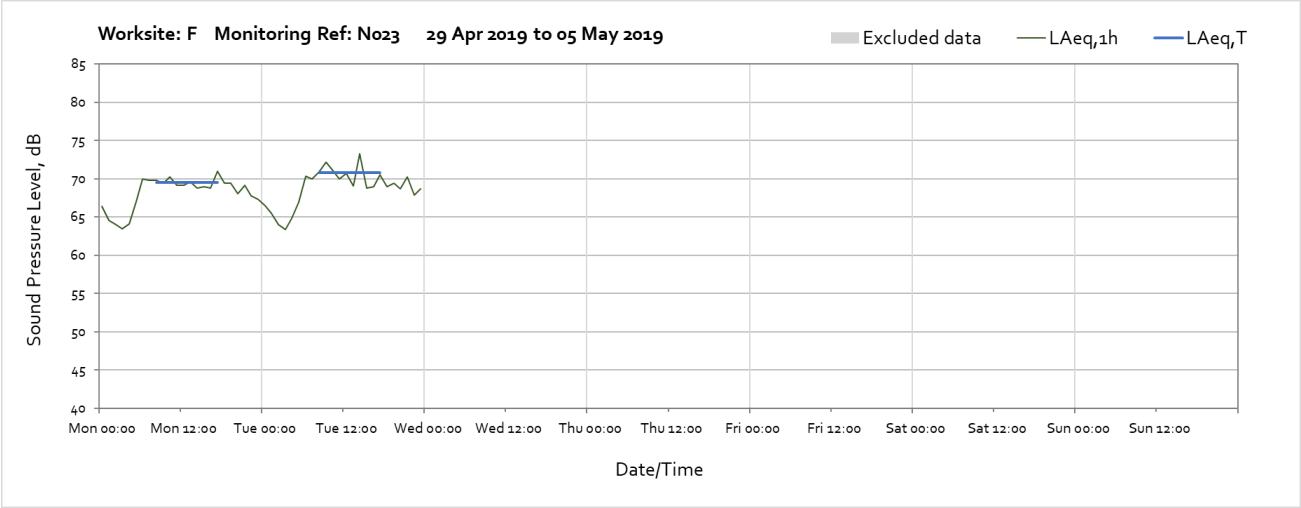
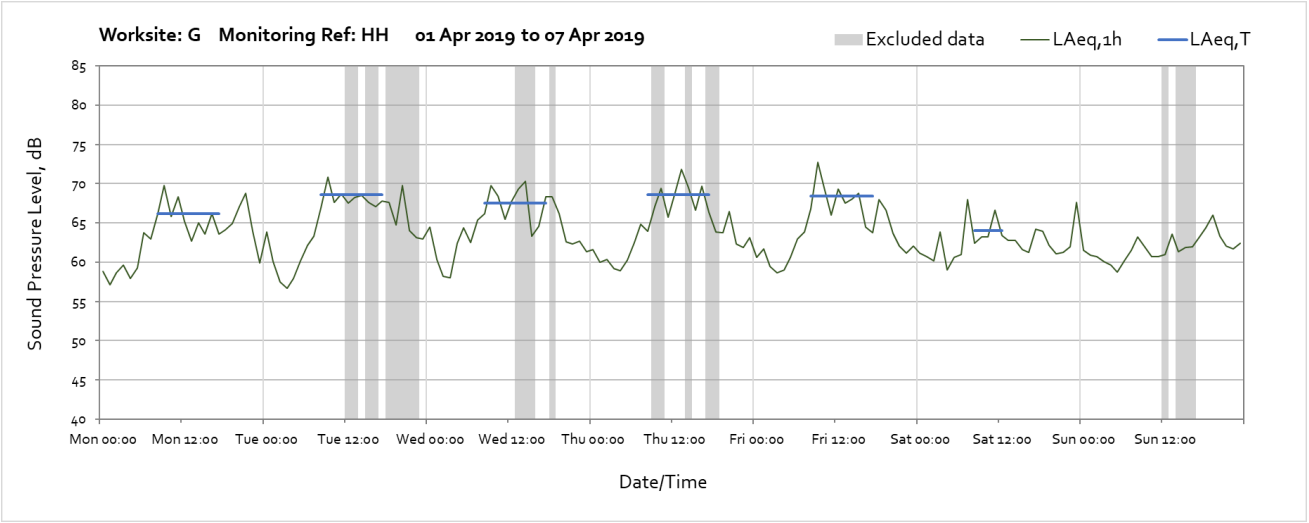
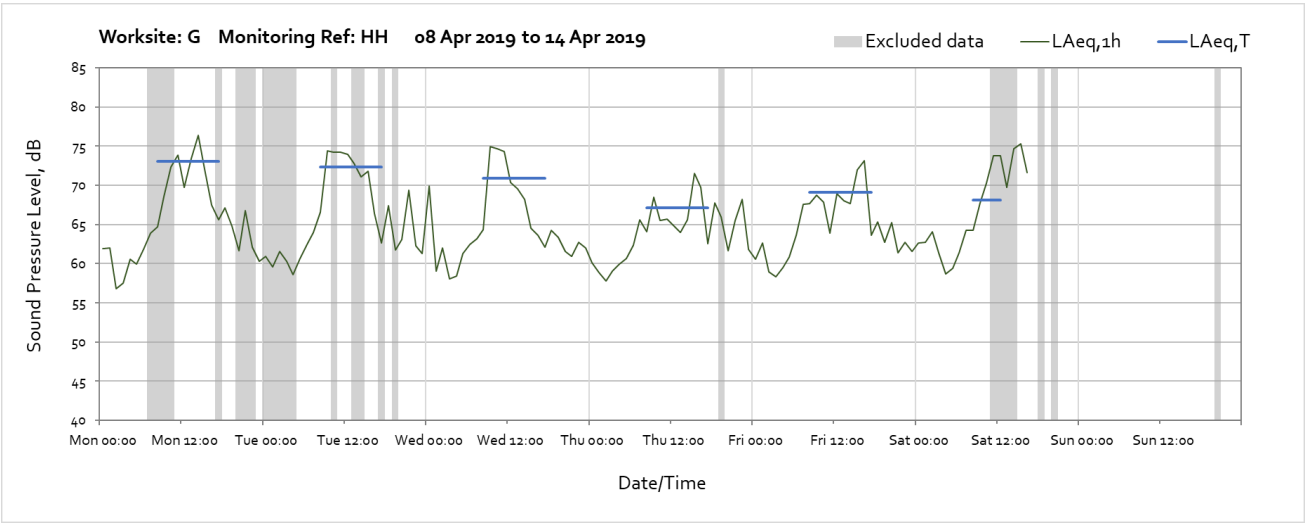
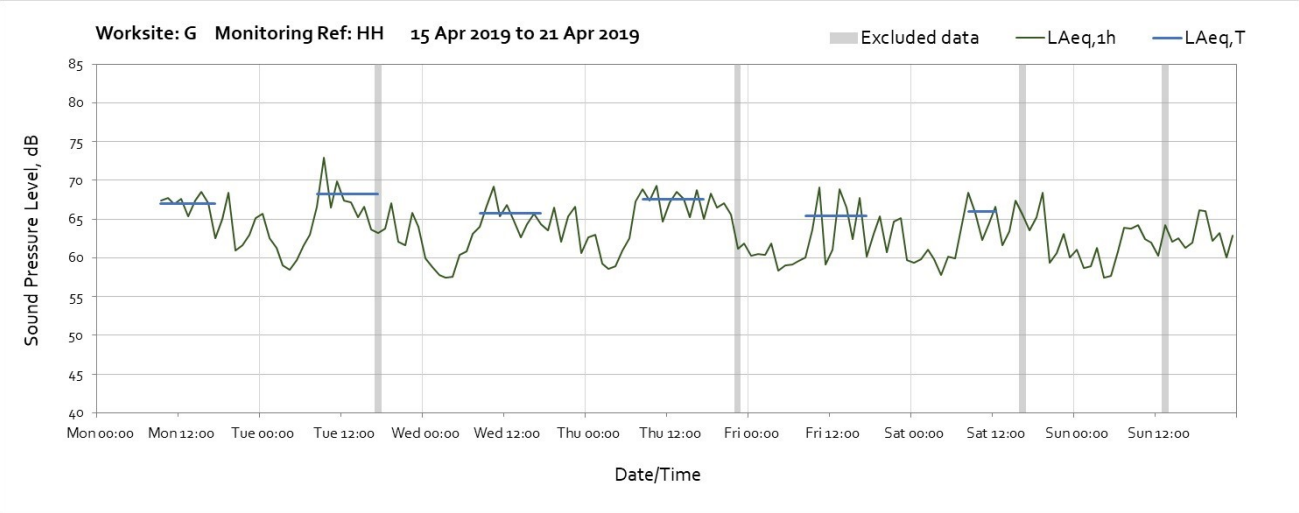
Date/Time



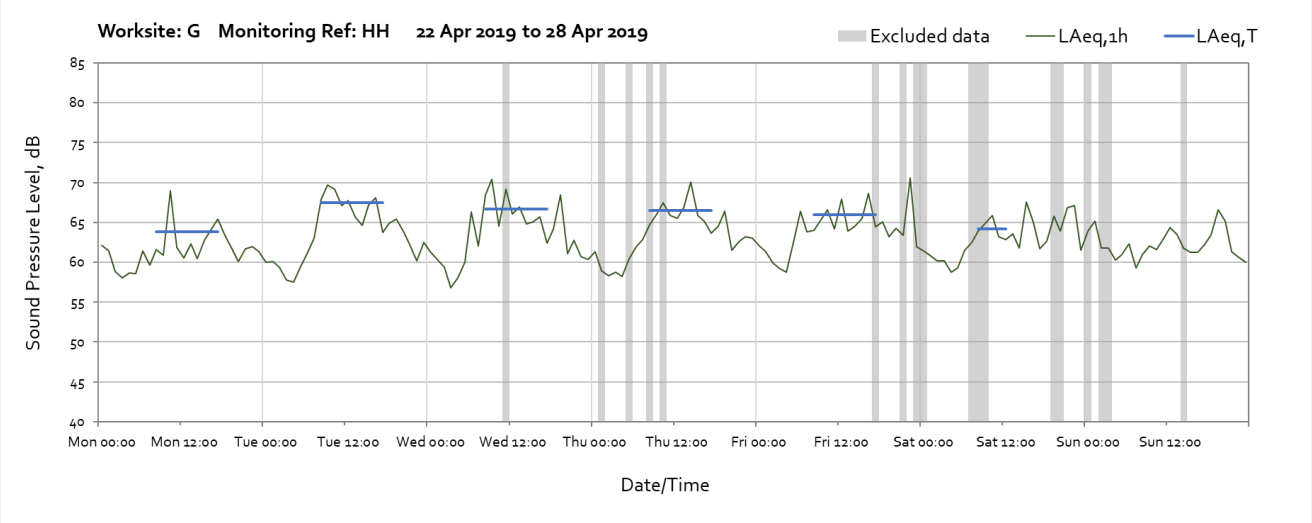
Worksite: G – Monitoring Ref: HH

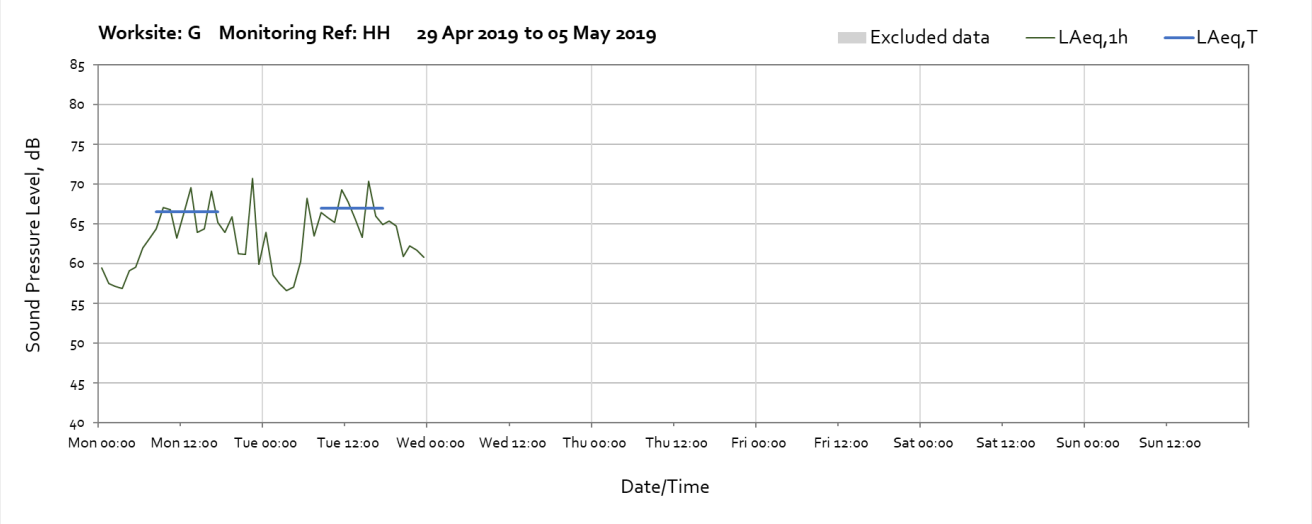




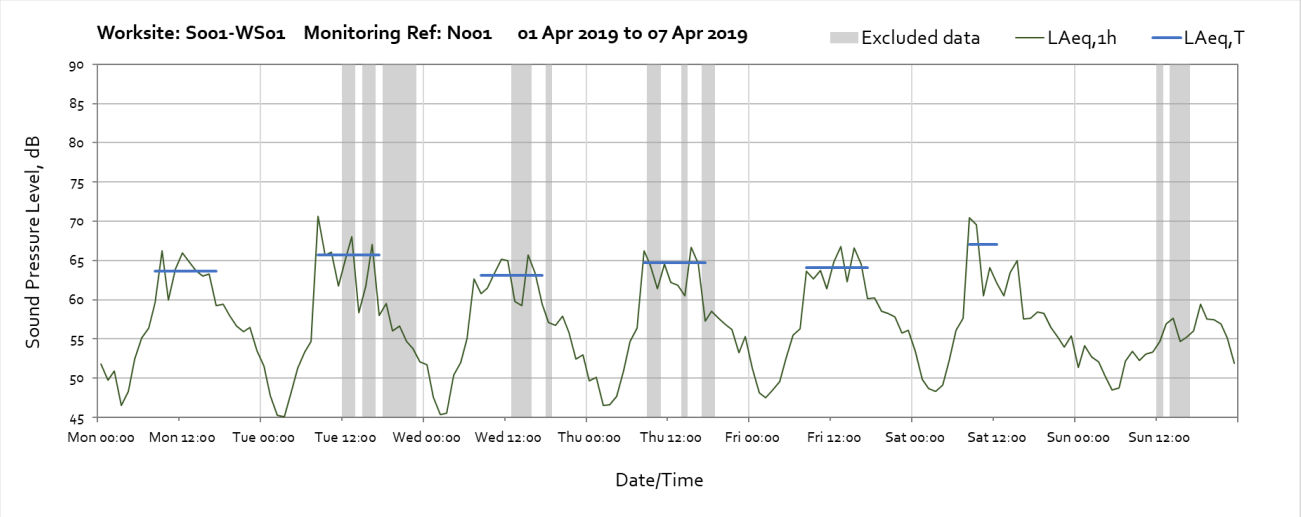


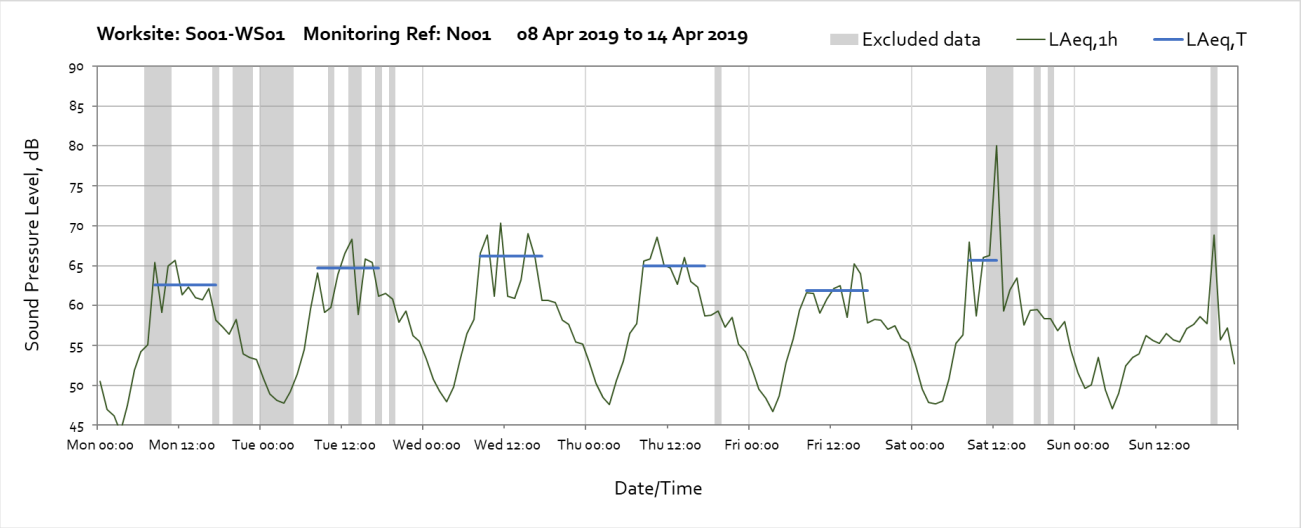
Note: Missing data between 17:00 on Saturday 13th of April and 18:00 on Monday 15th of April was due to loss of power at the monitoring station

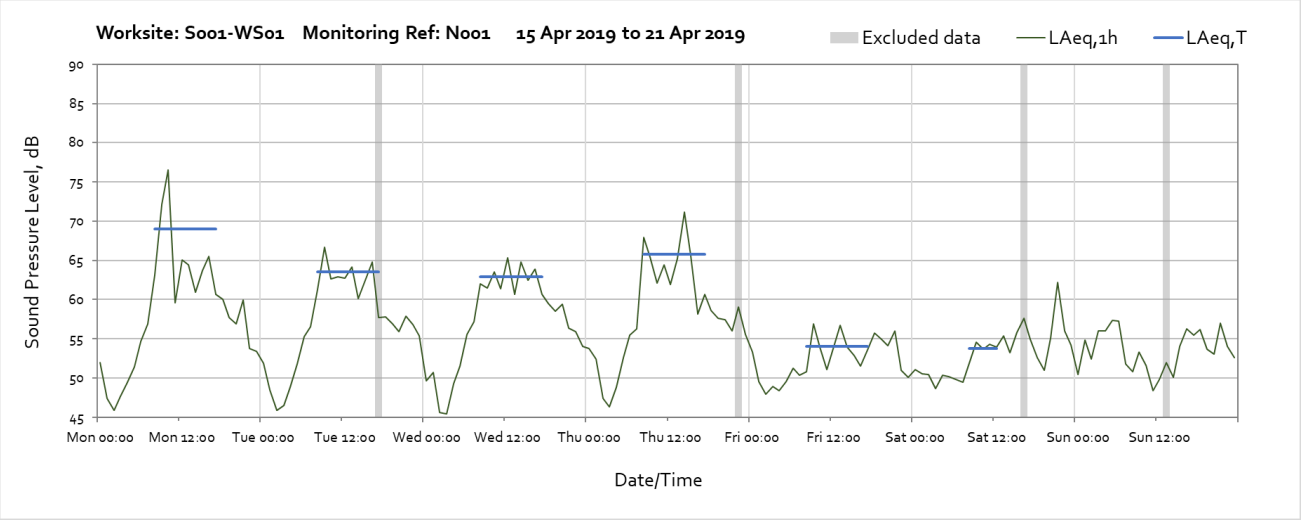


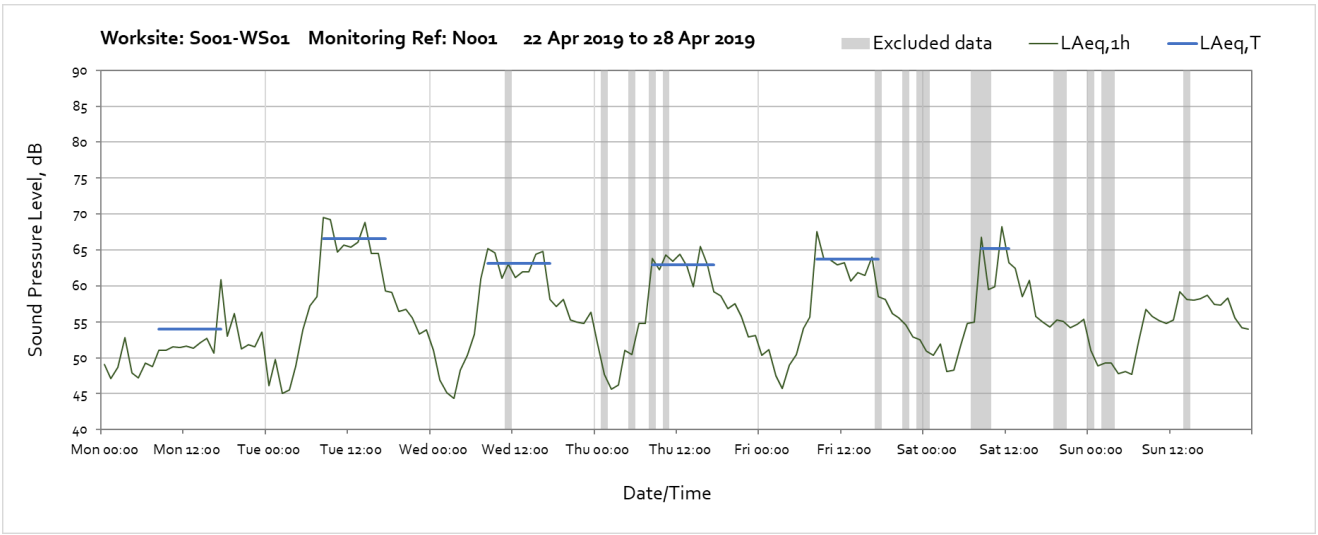


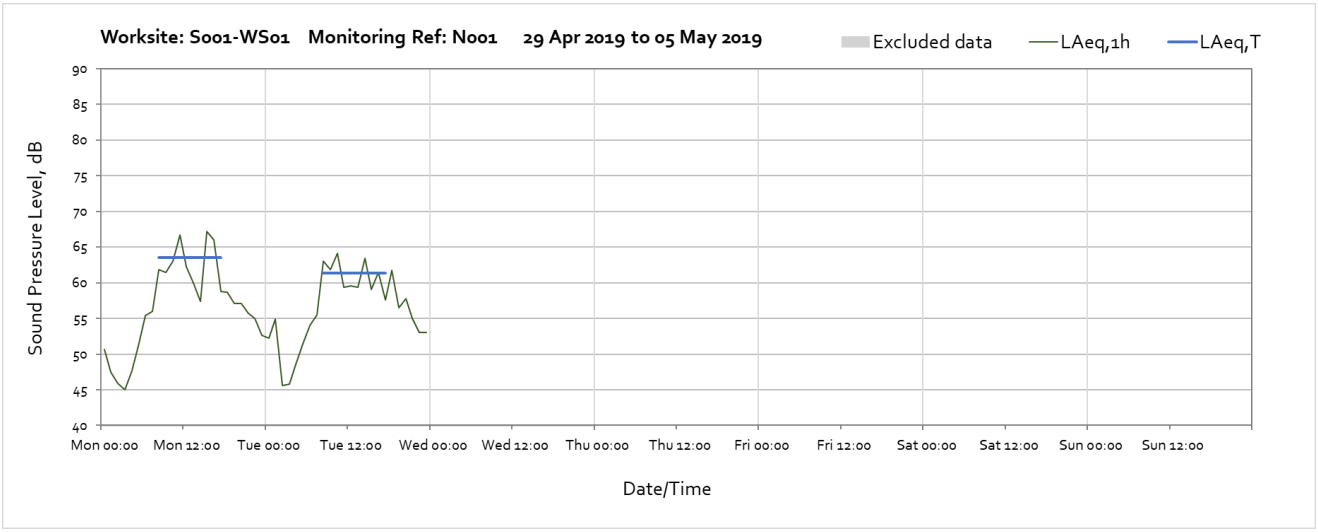
Worksite: S001-WS01 – Monitoring Ref: N001



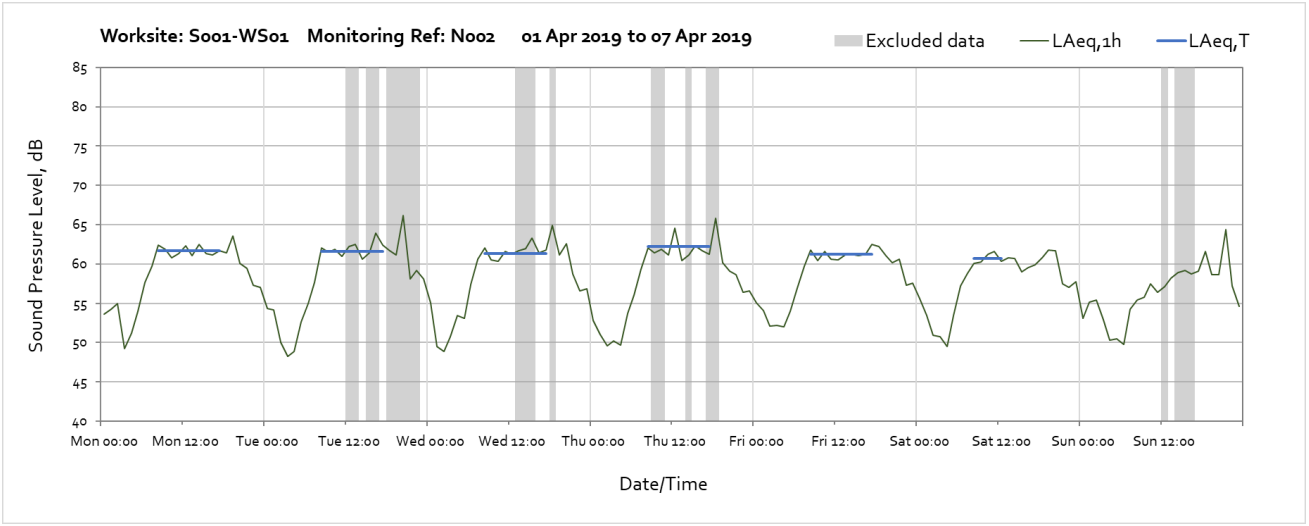


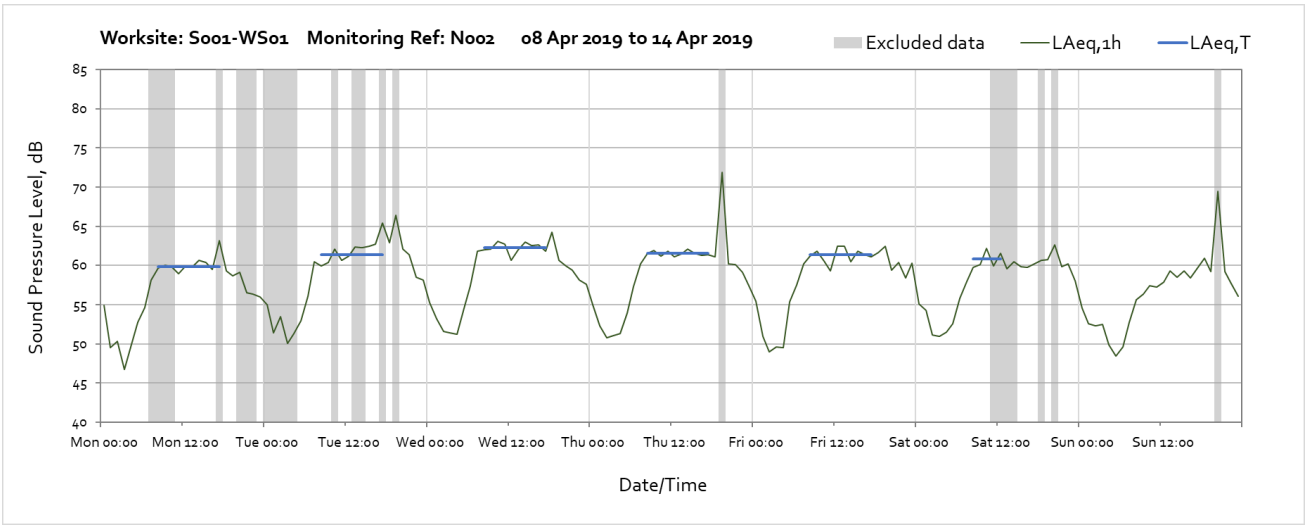






Worksite: S001-WS01 – Monitoring Ref: N002




Worksite: S001-WS01 Monitoring Ref: N002 08 Apr 2019 to 14 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
Mon 12:00
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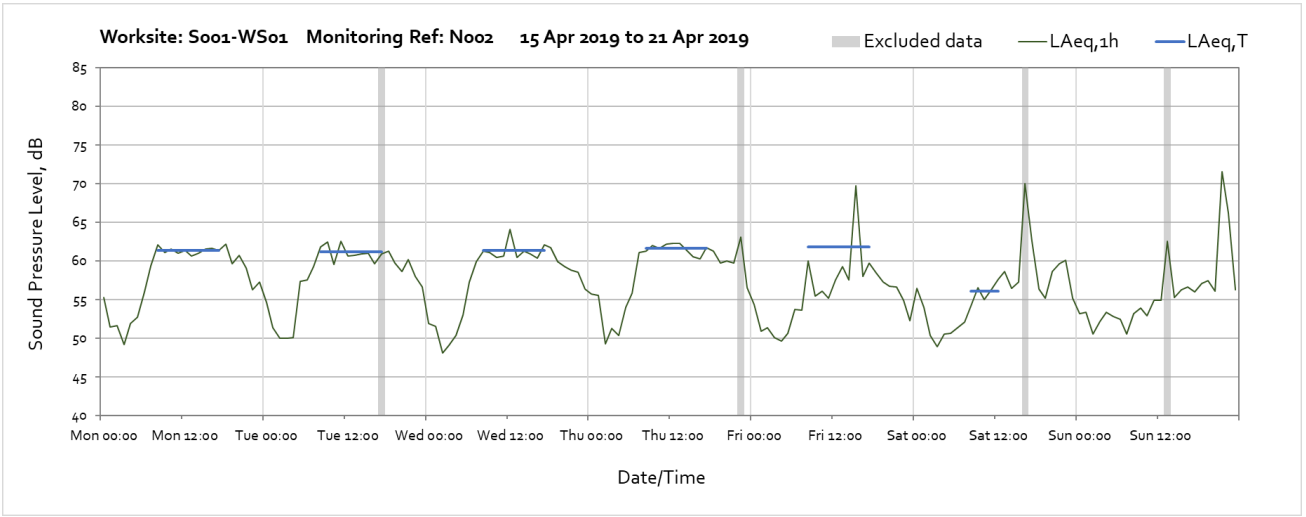
Date/Time


Worksite: S001-WS01 Monitoring Ref: N002 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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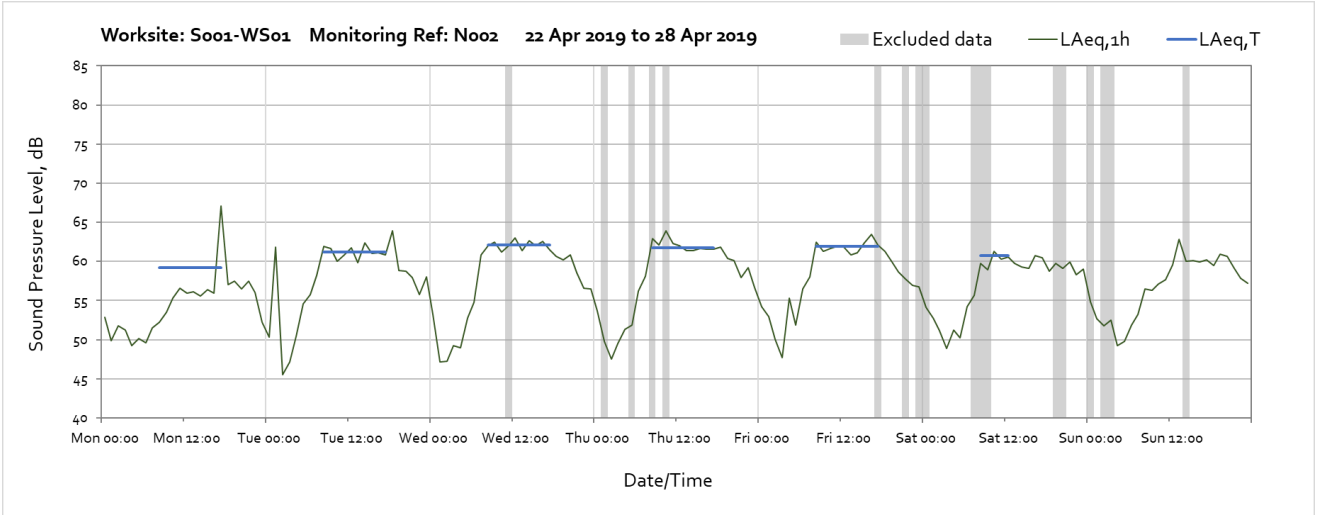
Date/Time


Worksite: S001-WS01 Monitoring Ref: N002 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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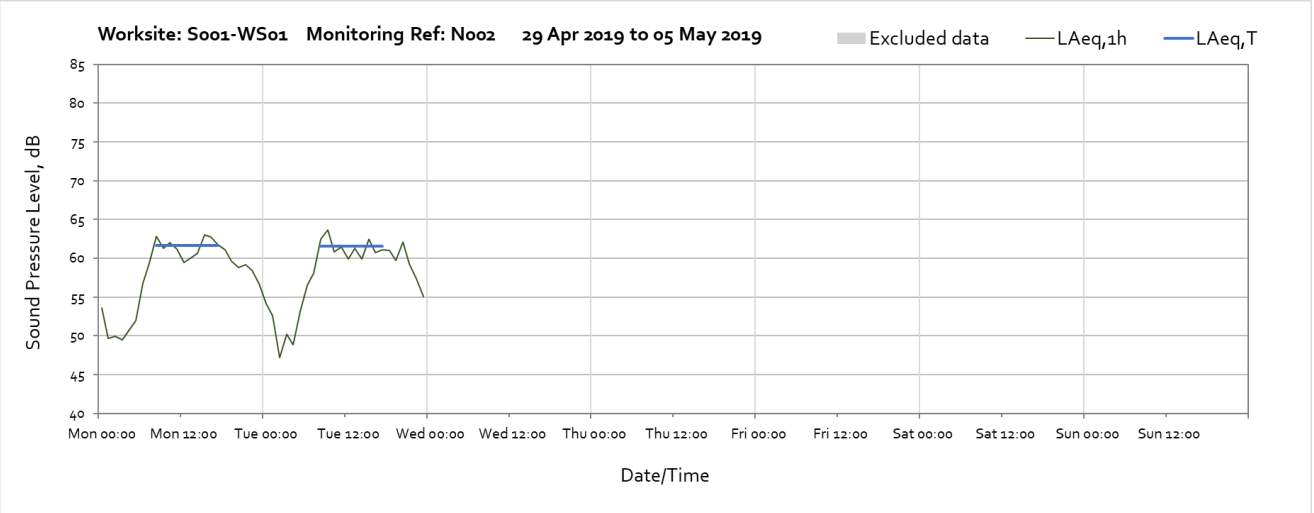
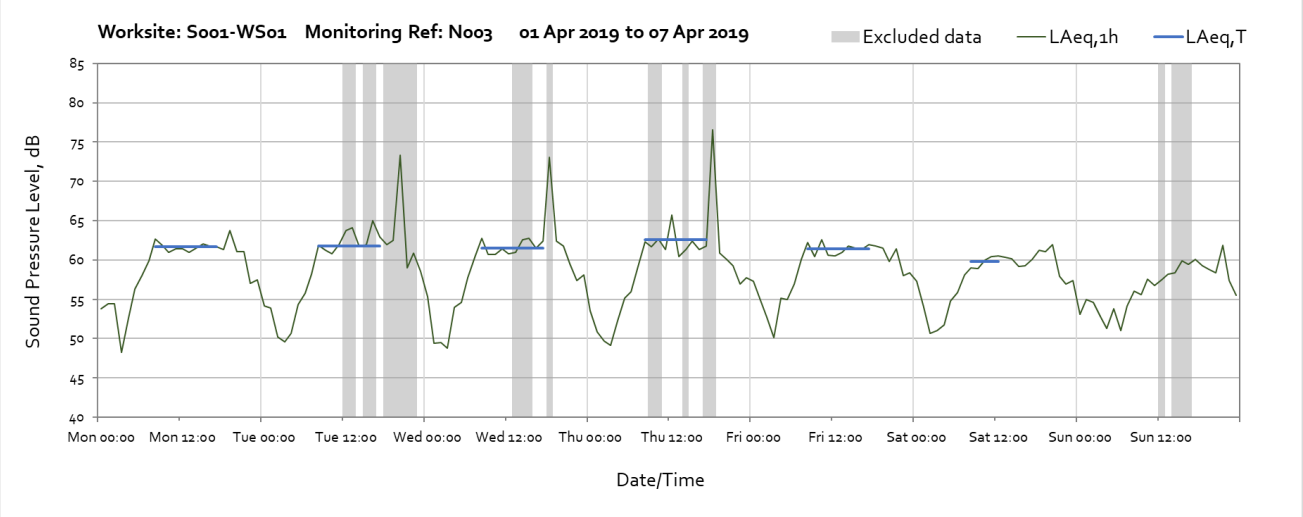
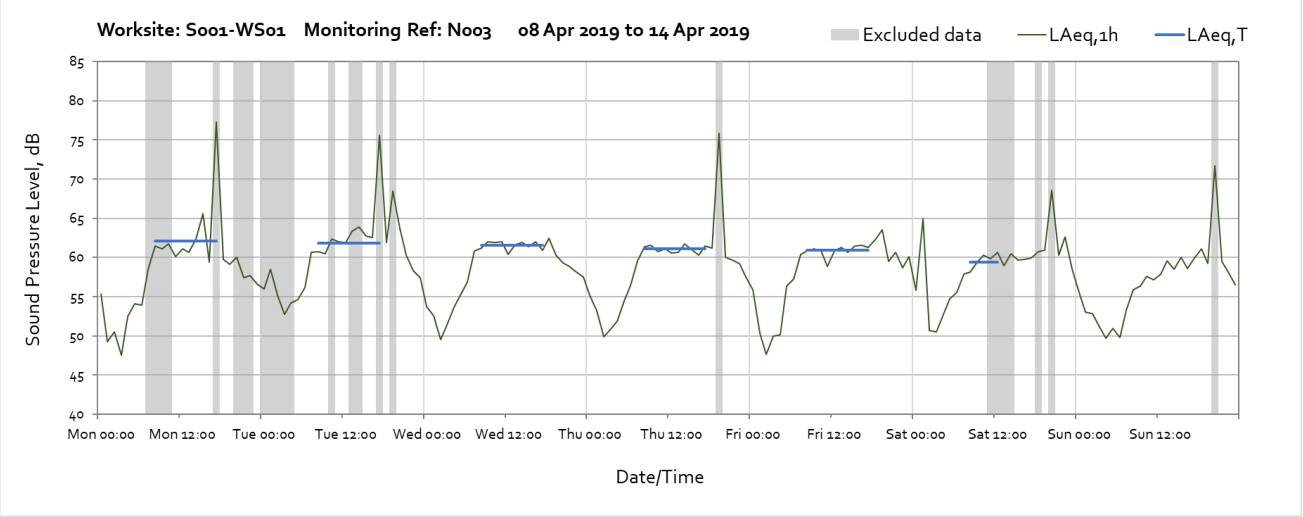
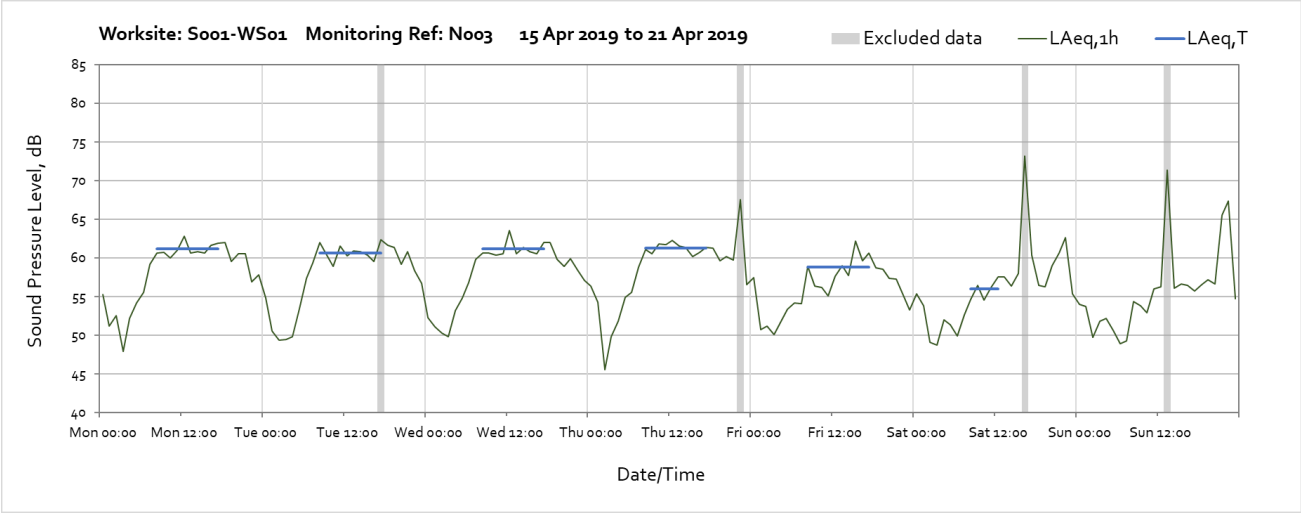


Worksite: S001-WS01 – Monitoring Ref: N003






Worksite: S001-WS01 Monitoring Ref: N003 15 Apr 2019 to 21 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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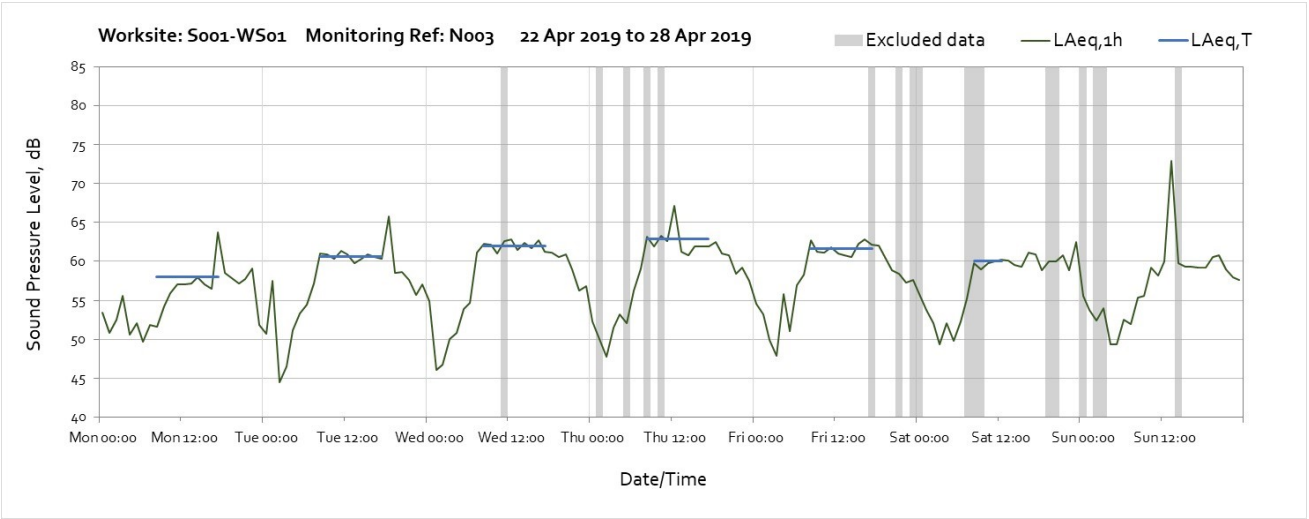
Date/Time


Worksite: S001-WS01 Monitoring Ref: N003 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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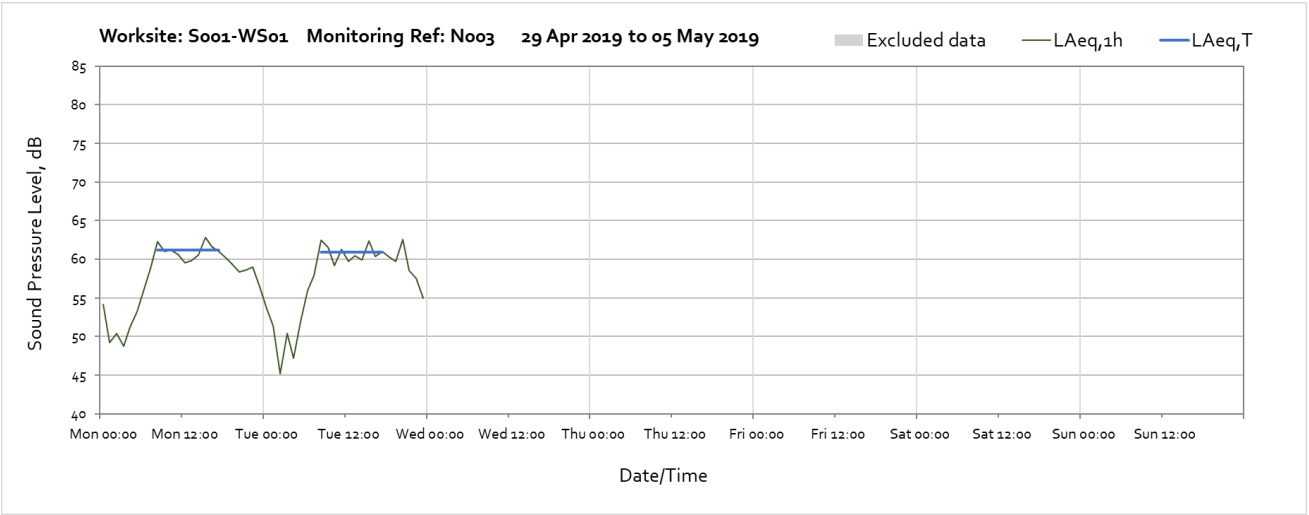
Date/Time


Worksite: S001-WS01 Monitoring Ref: N003 29 Apr 2019 to 05 May 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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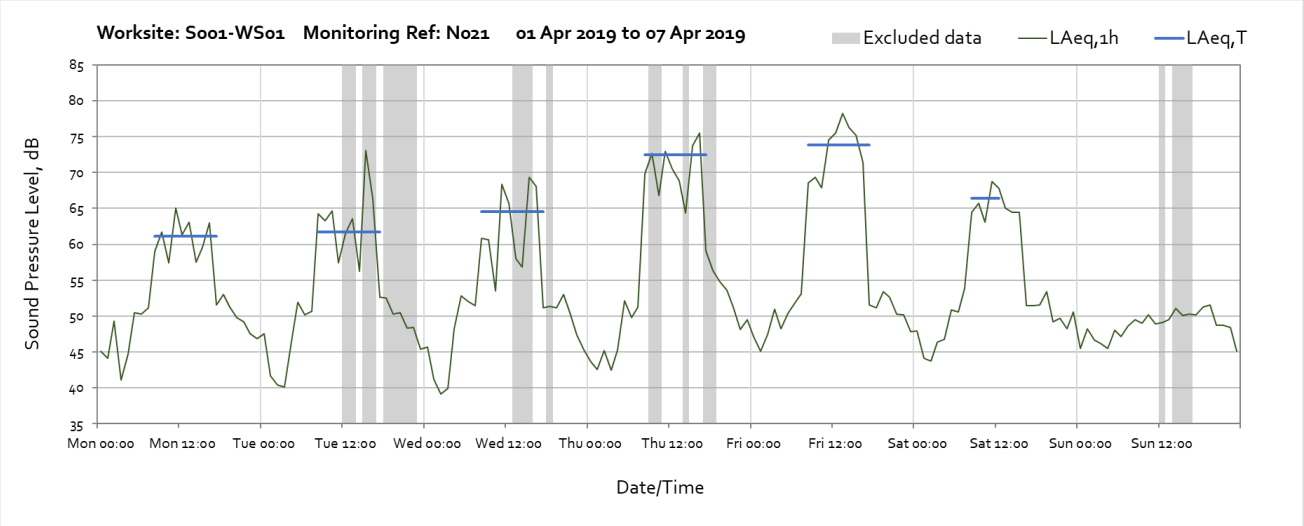
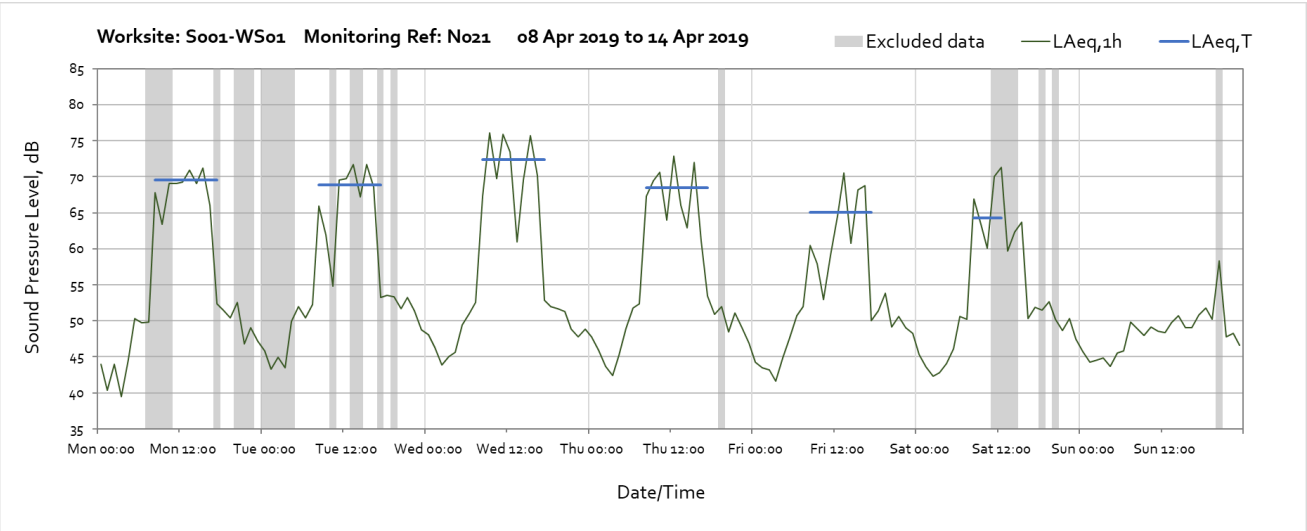
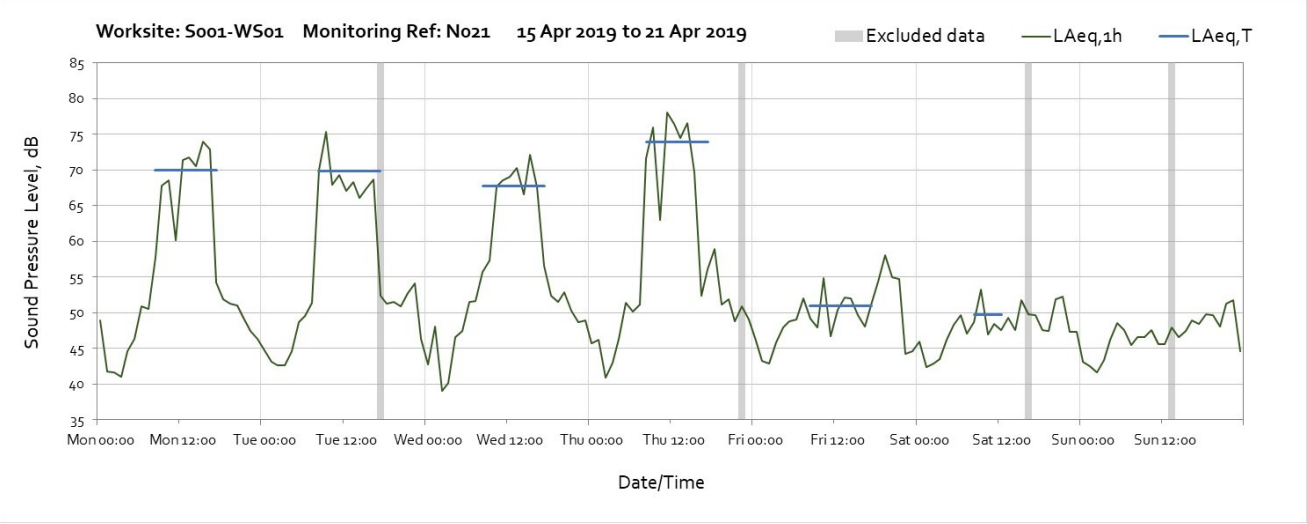
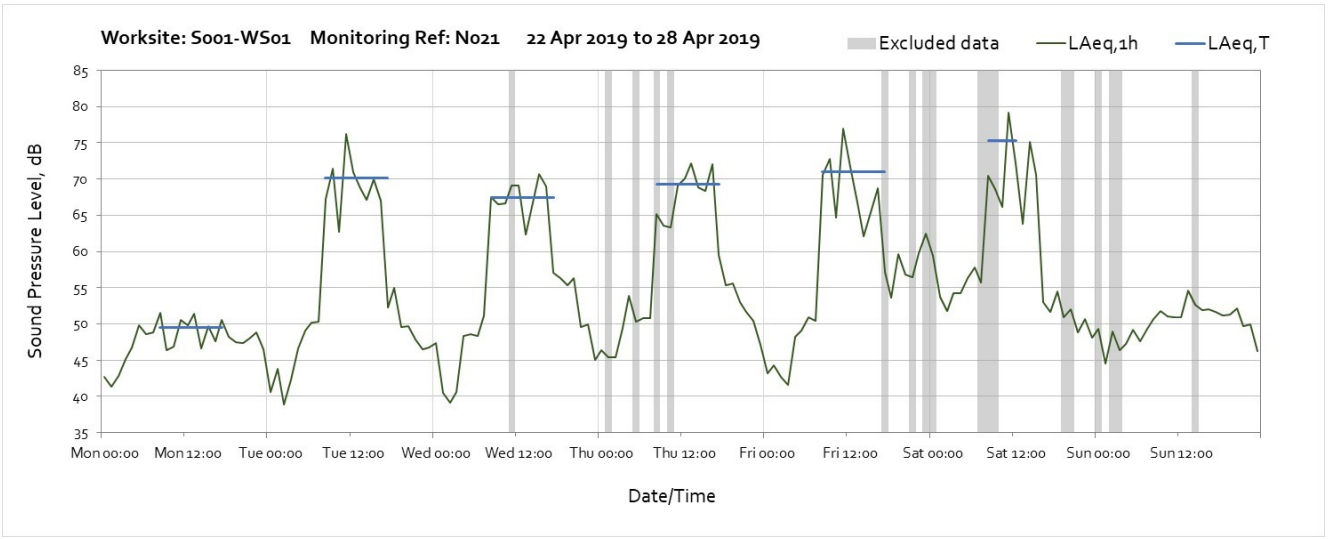
Date/Time

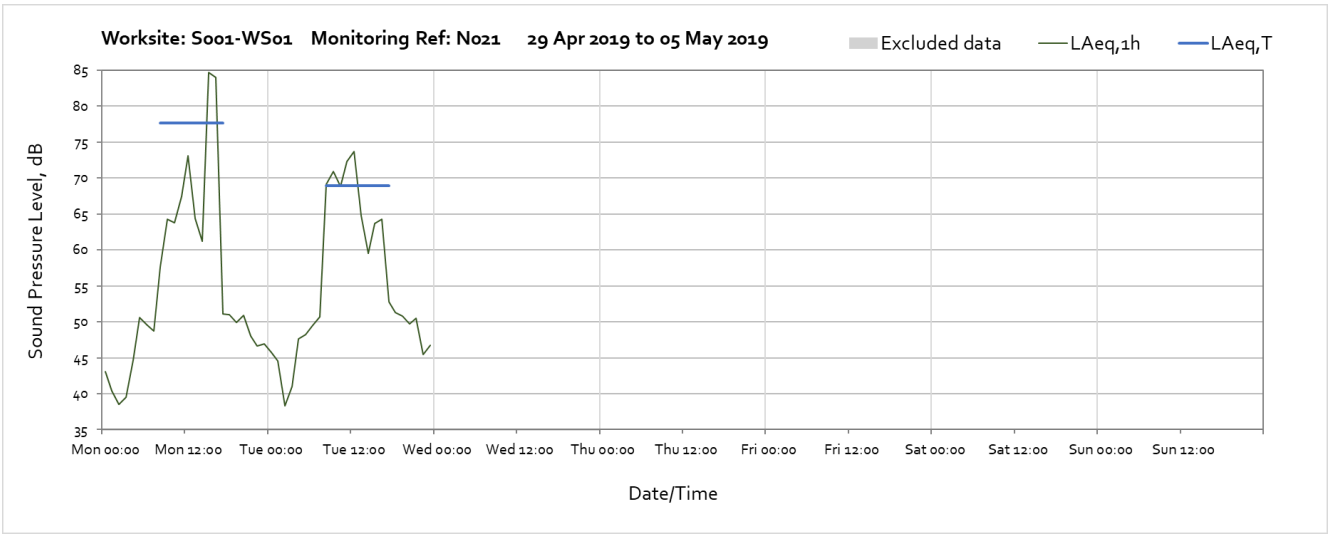
Worksite: S001-WS01 – Monitoring Ref: N021



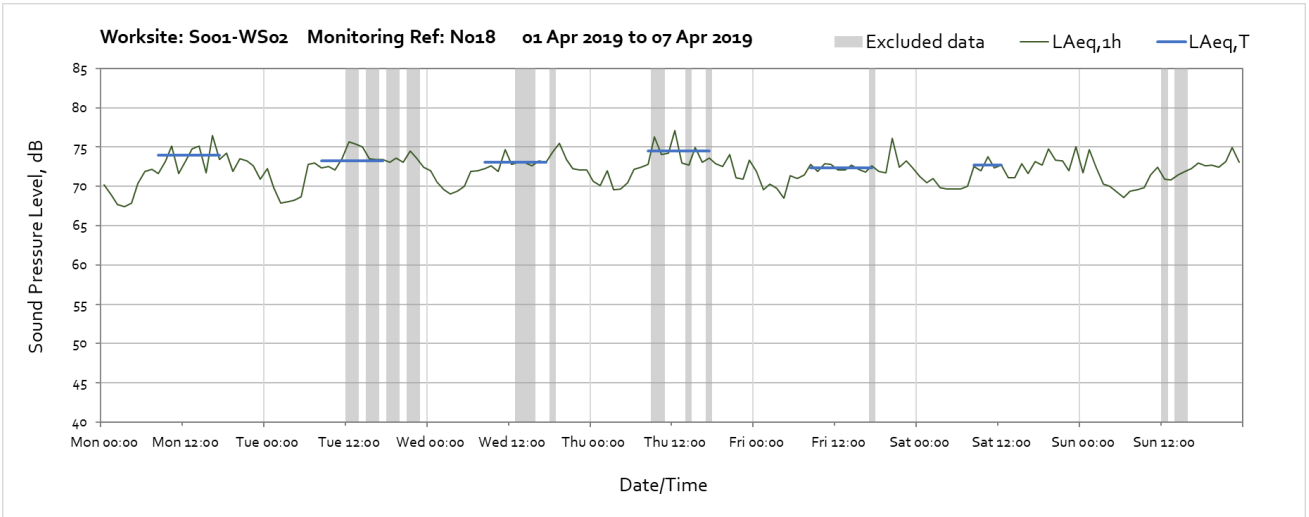


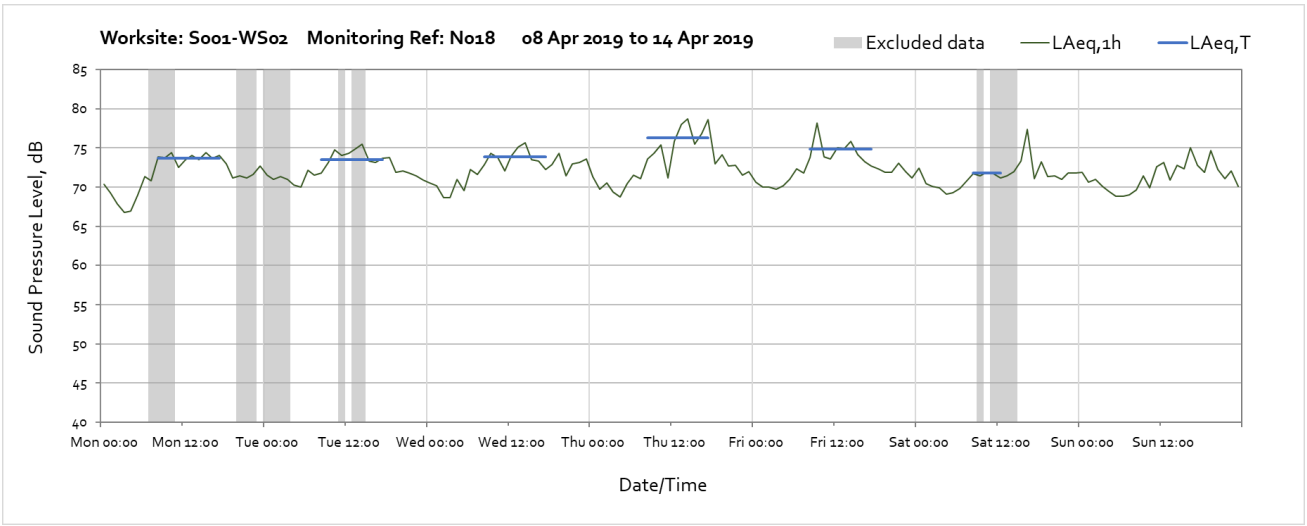






Worksite: S001-WS02 – Monitoring Ref: N018




Worksite: S001-WS02 Monitoring Ref: N018 08 Apr 2019 to 14 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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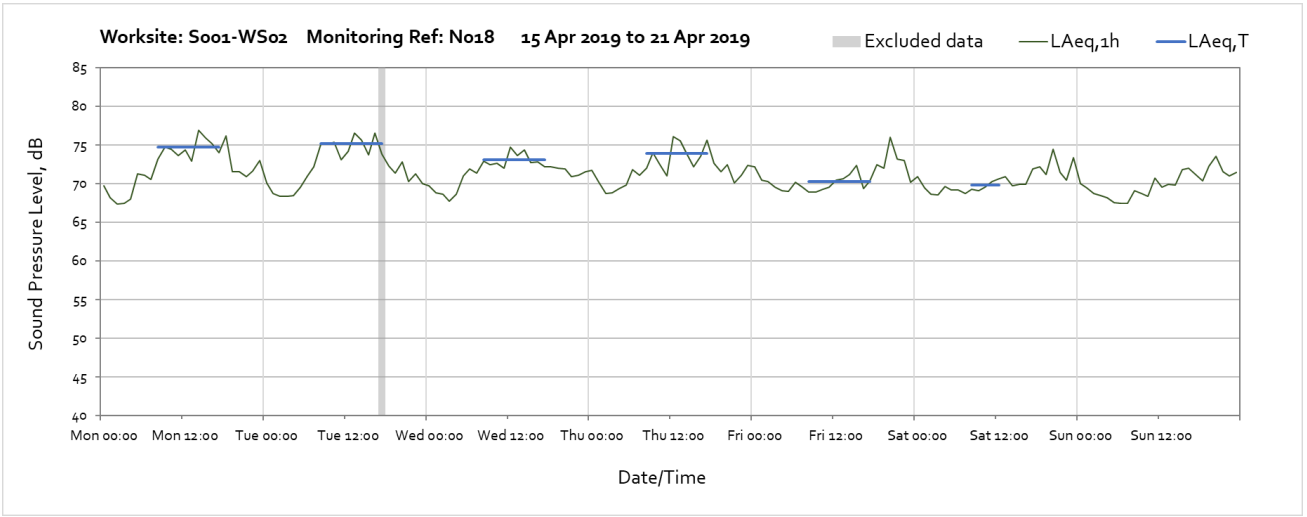
Date/Time


Worksite: S001-WS02 Monitoring Ref: N018 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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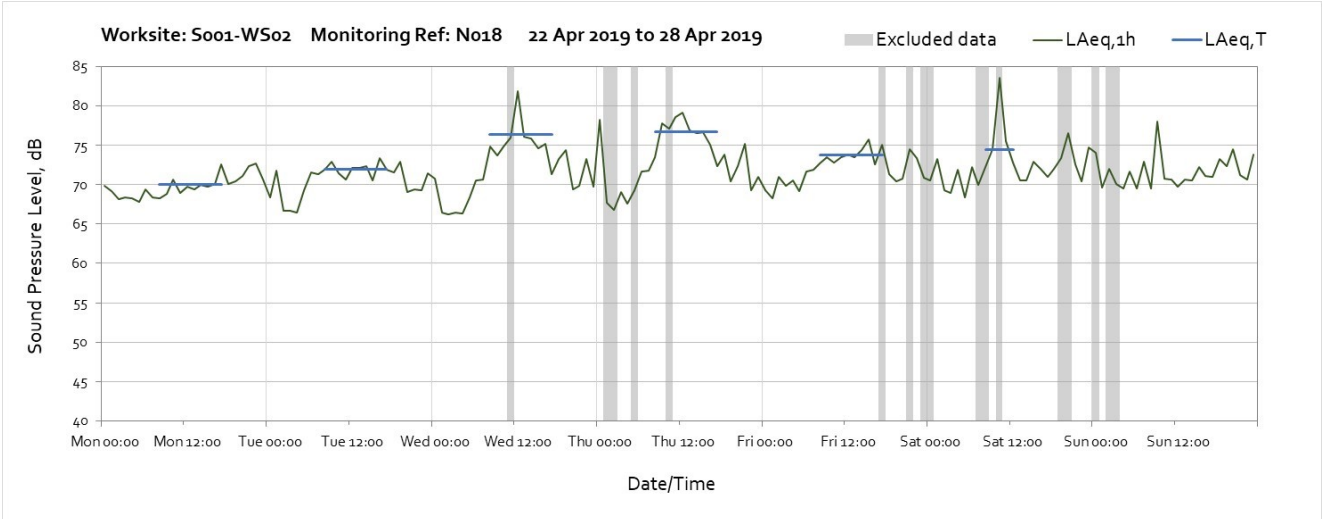
Date/Time


Worksite: S001-WS02 Monitoring Ref: N018 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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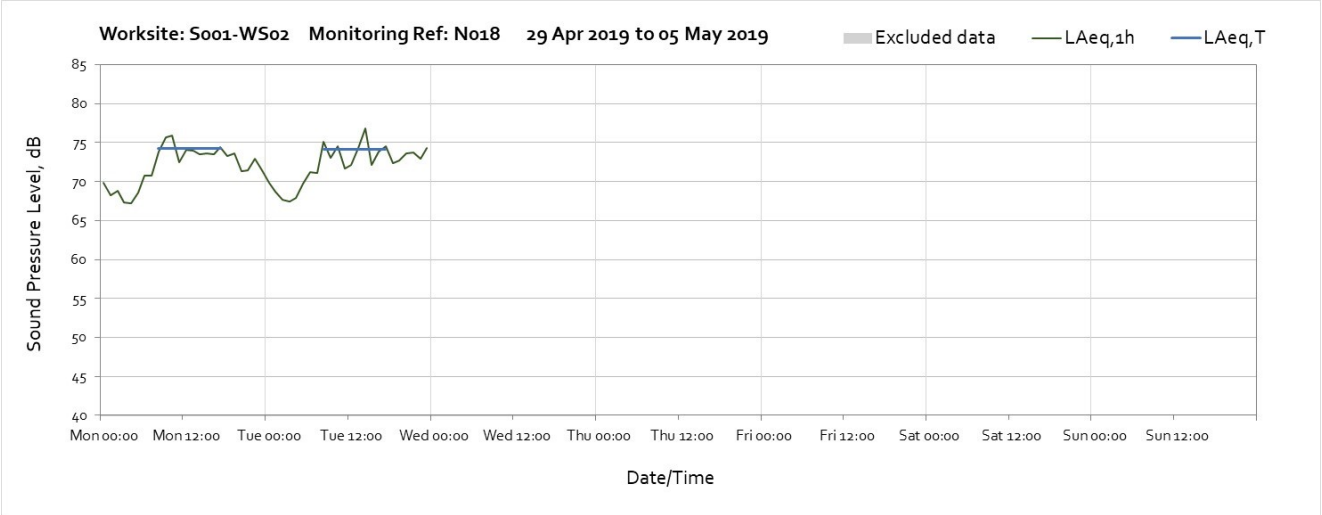
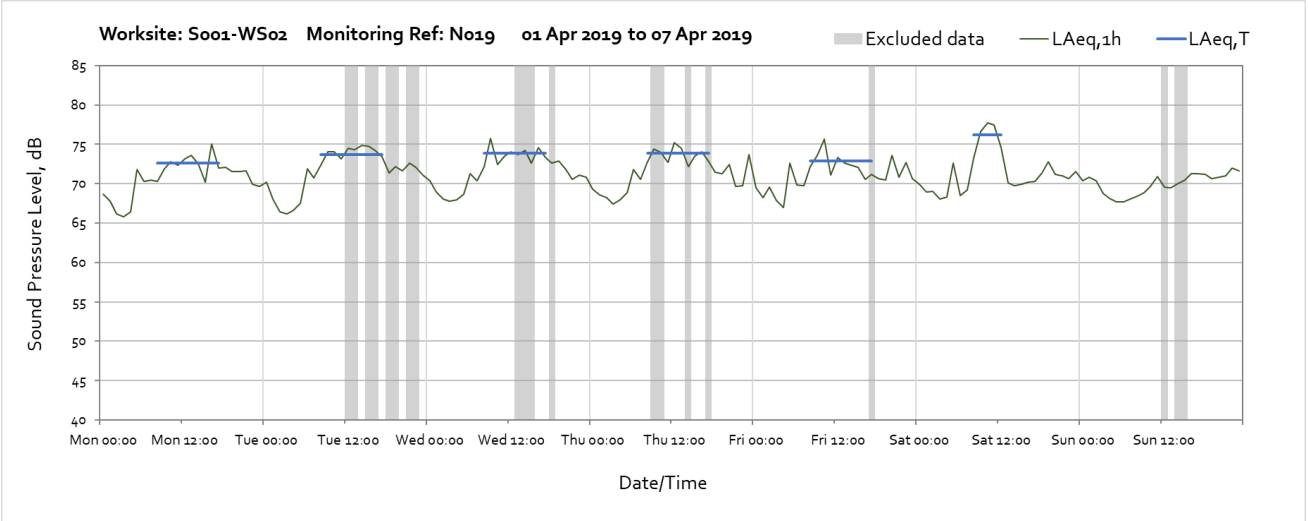
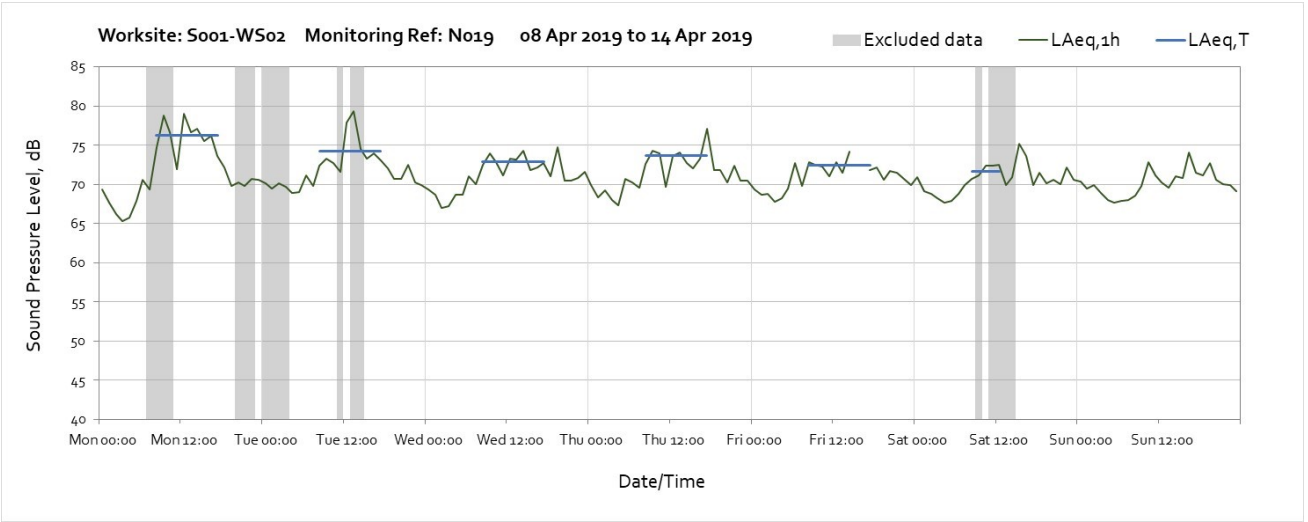
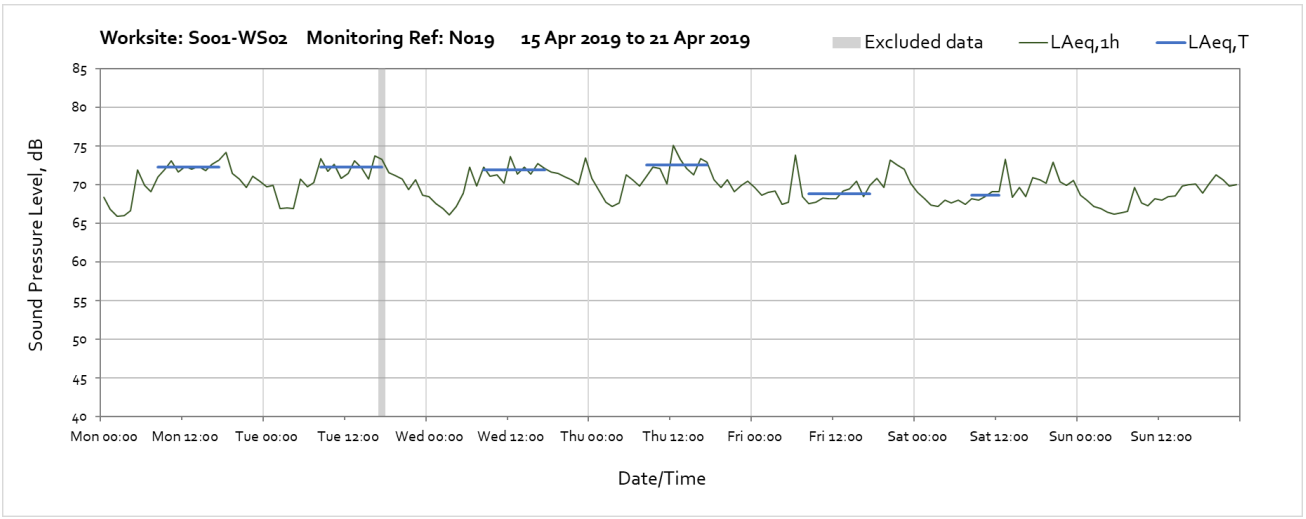


Worksite: S001-WS02 – Monitoring Ref: N019






Worksite: S001-WS02 Monitoring Ref: N019 15 Apr 2019 to 21 Apr 2019
Excluded data
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Sound Pressure Level, dB
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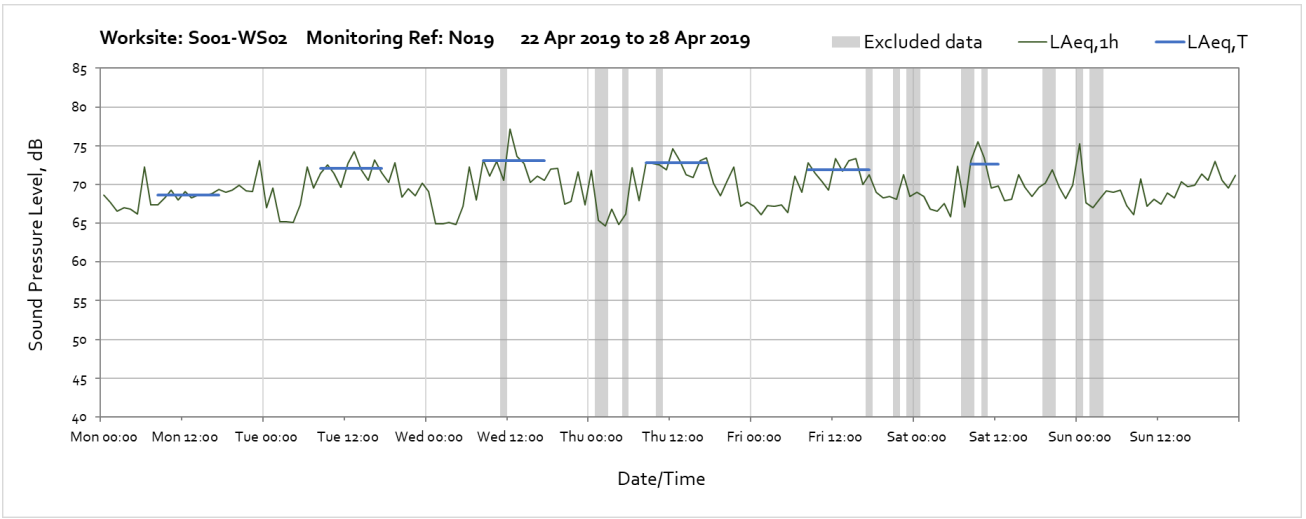
Worksite: S001-WS02 Monitoring Ref: N019 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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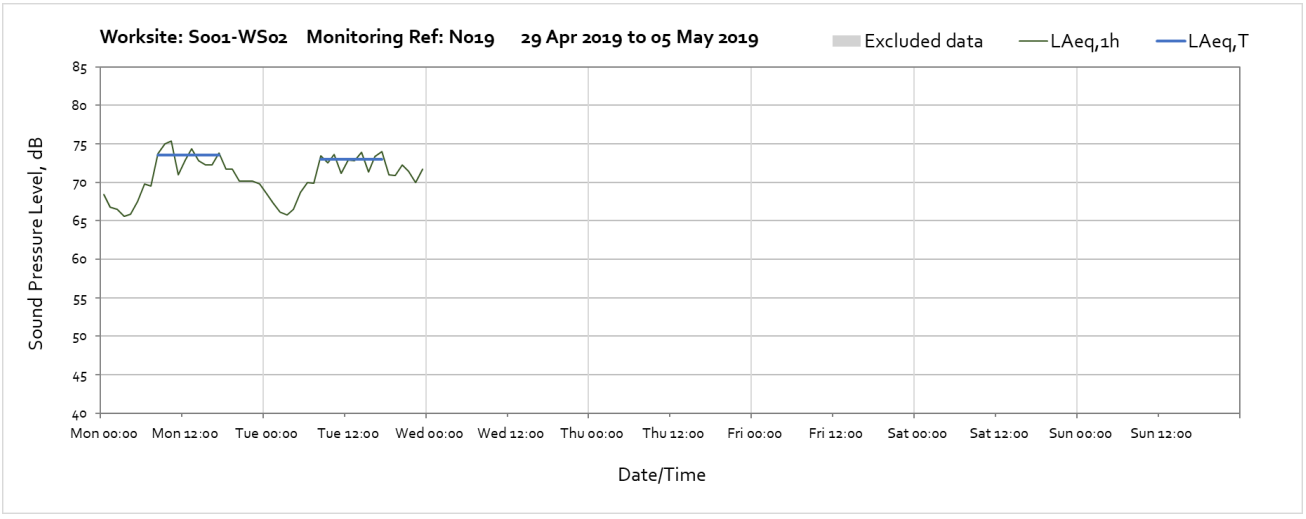
Date/Time


Worksite: S001-WS02 Monitoring Ref: N019 29 Apr 2019 to 05 May 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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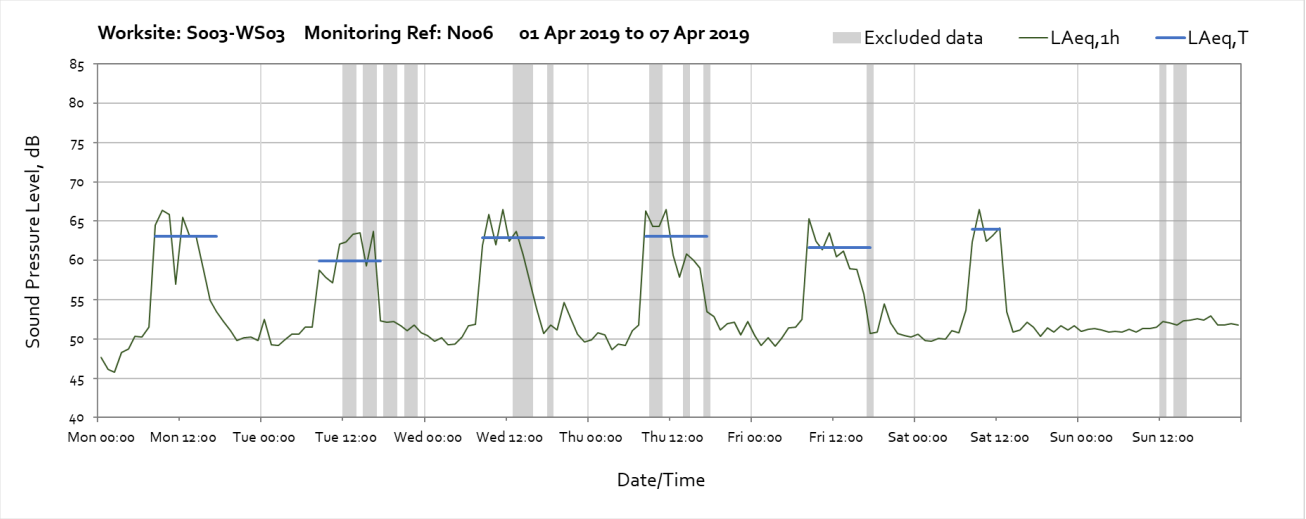
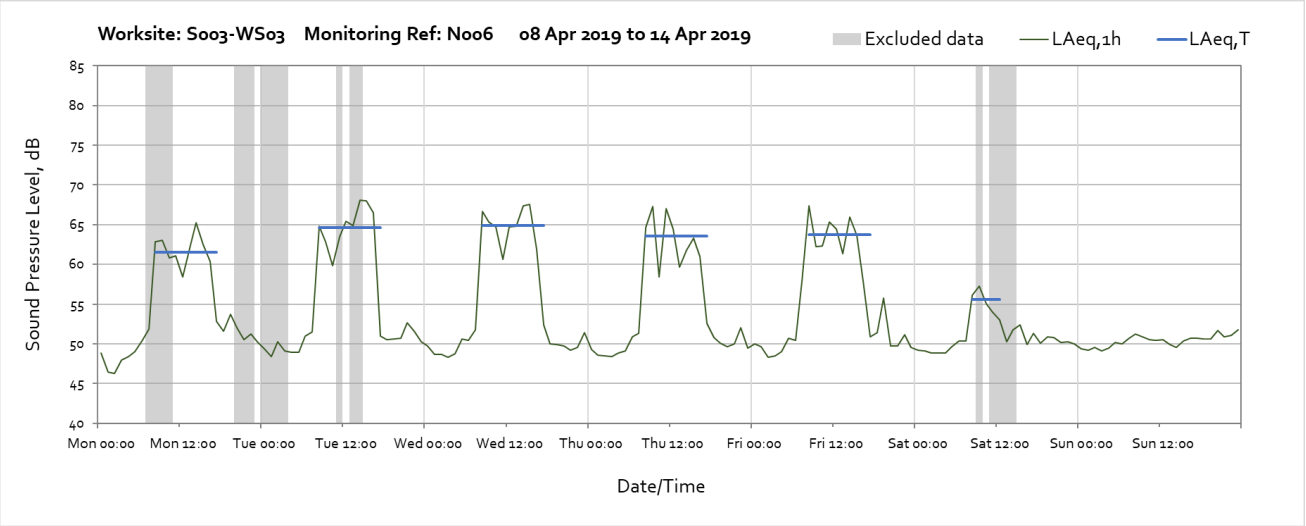
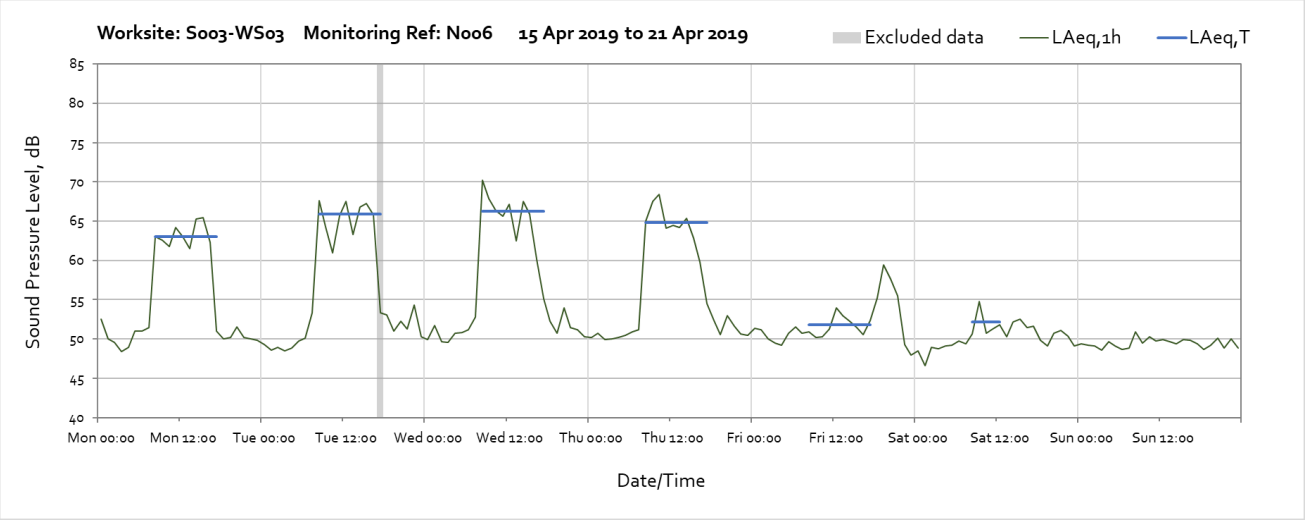
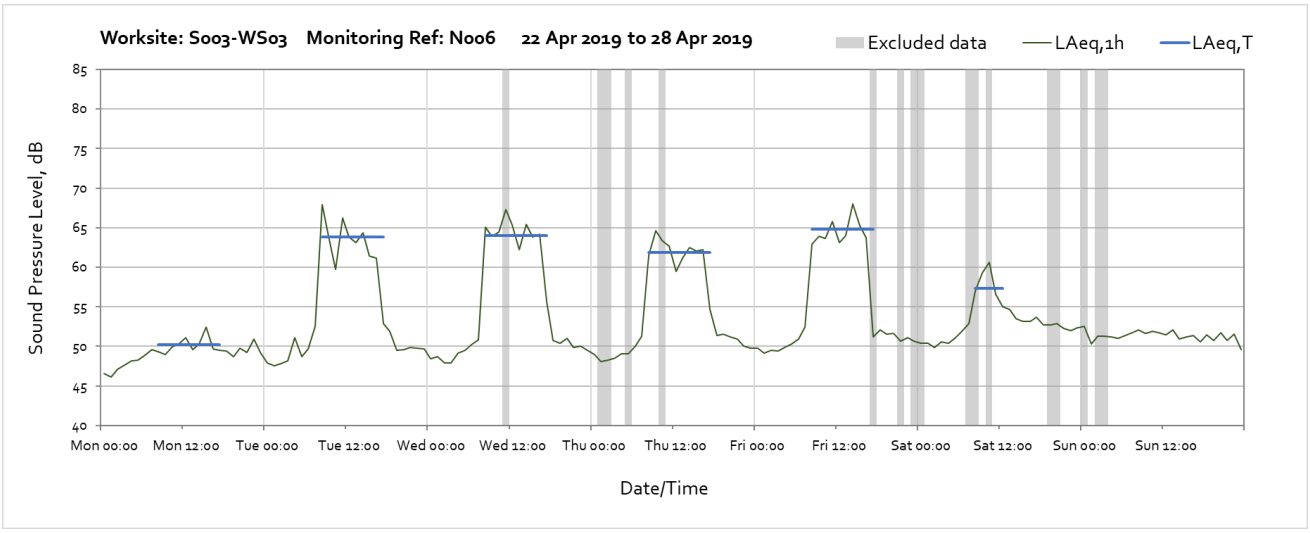
Date/Time

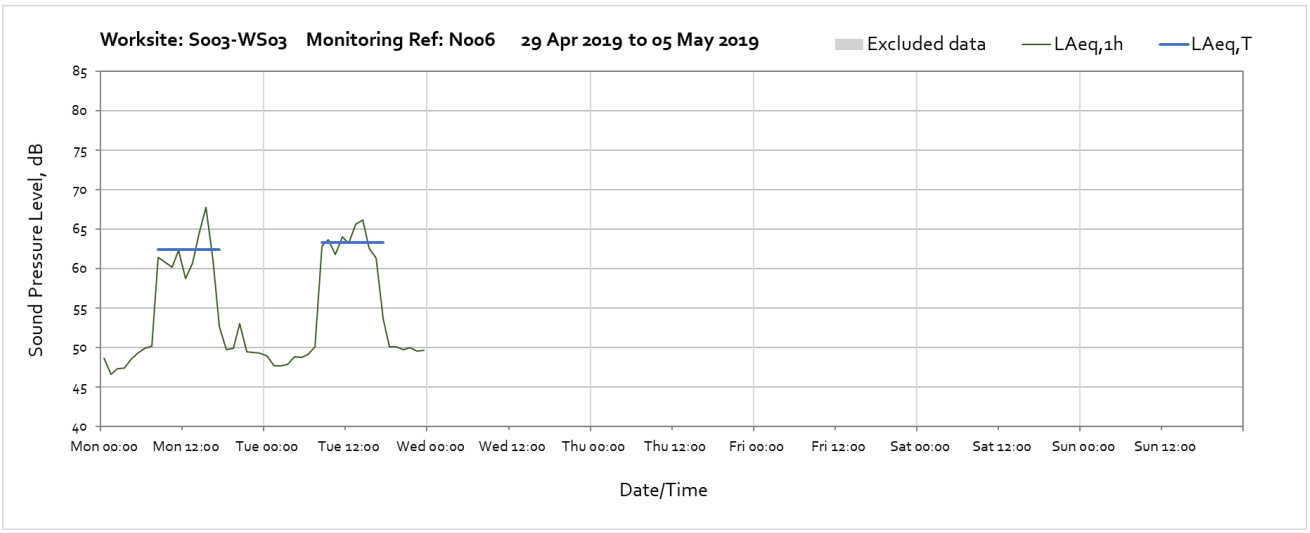
Worksite: S003-WS03 – Monitoring Ref: N006



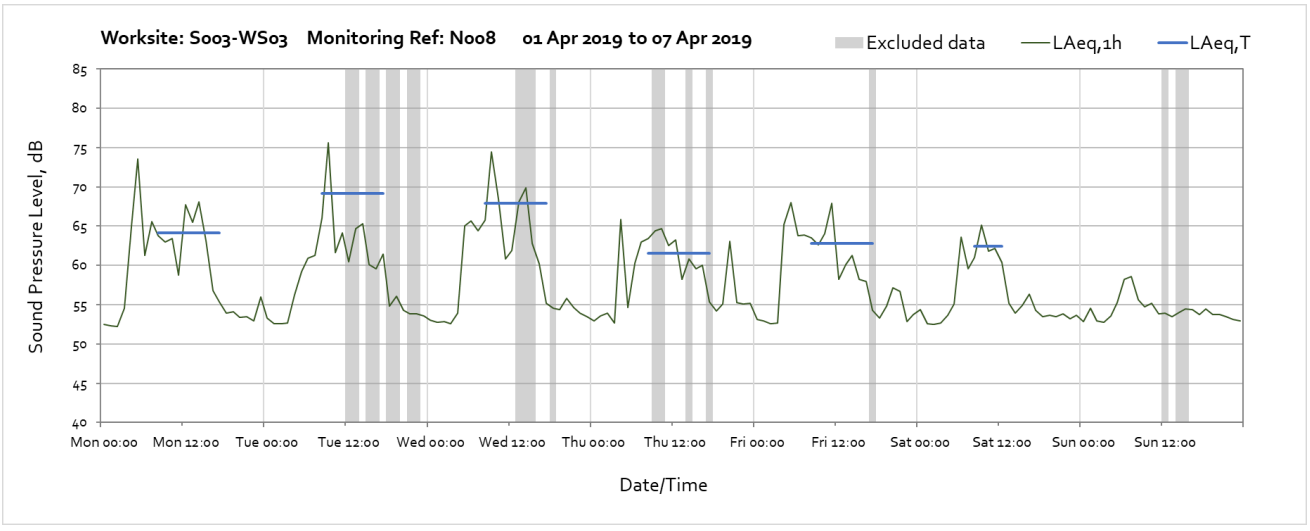


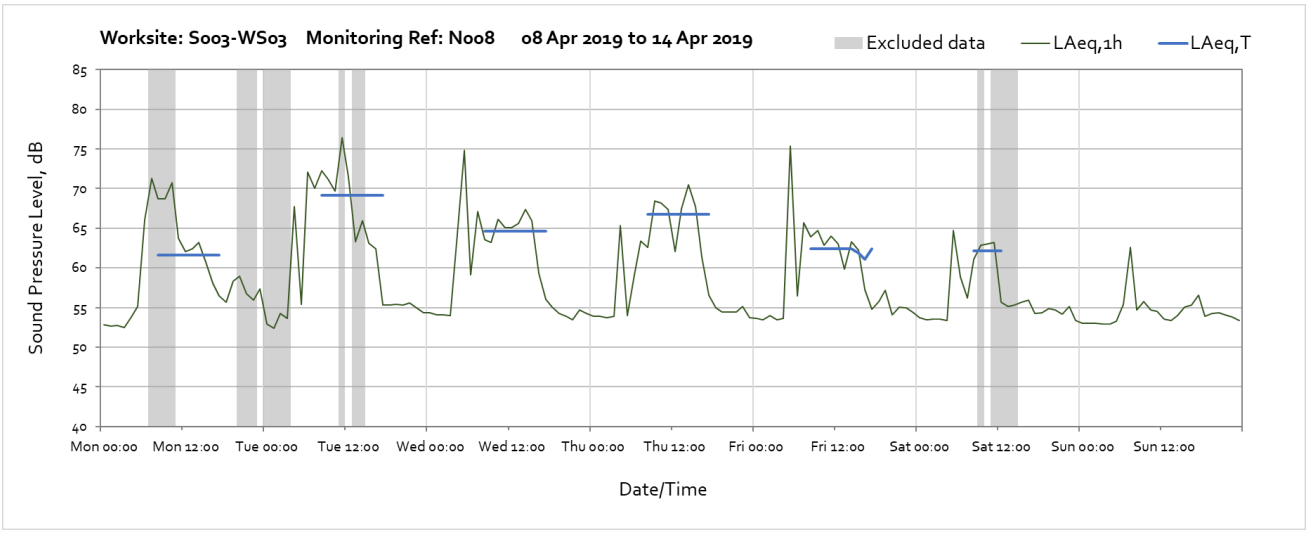






Worksite: S003-WS03 – Monitoring Ref: N008




Worksite: S003-WS03 Monitoring Ref: N008 08 Apr 2019 to 14 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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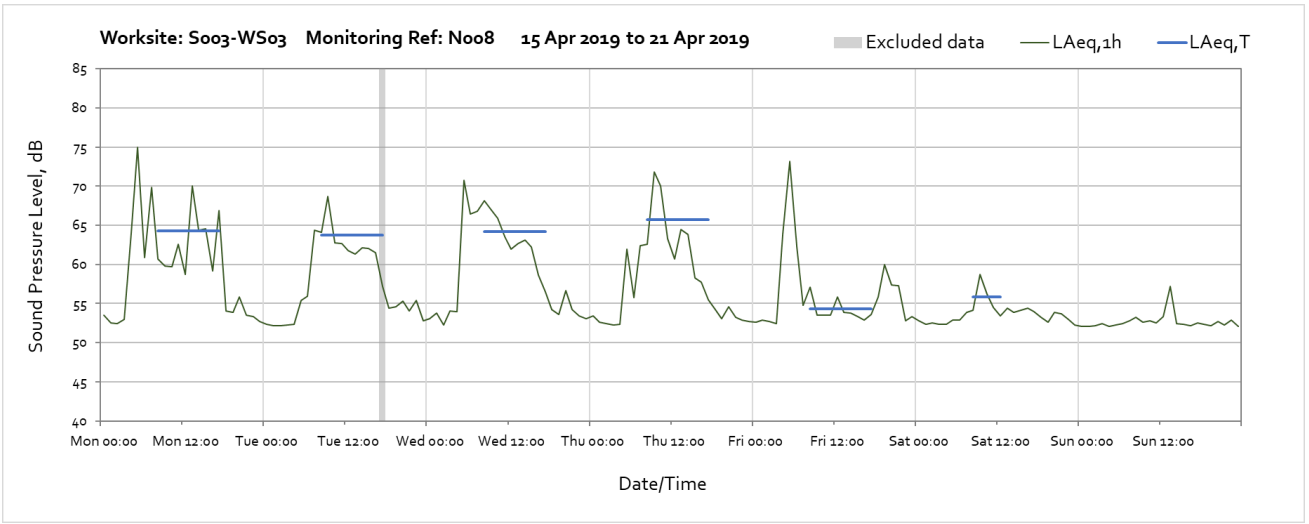
Date/Time


Worksite: S003-WS03 Monitoring Ref: N008 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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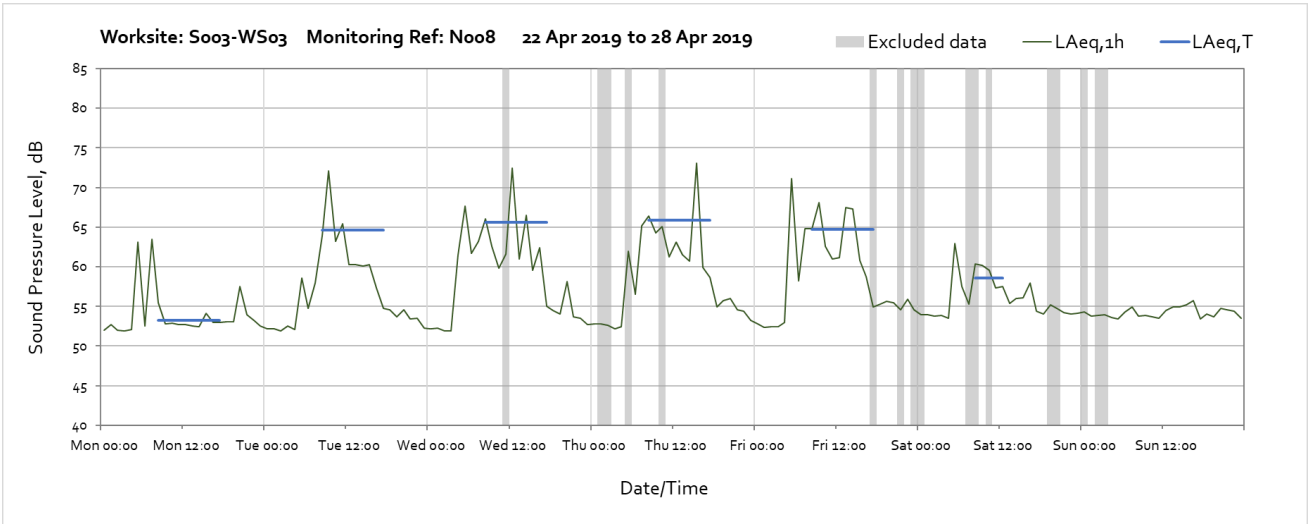
Date/Time


Worksite: S003-WS03 Monitoring Ref: N008 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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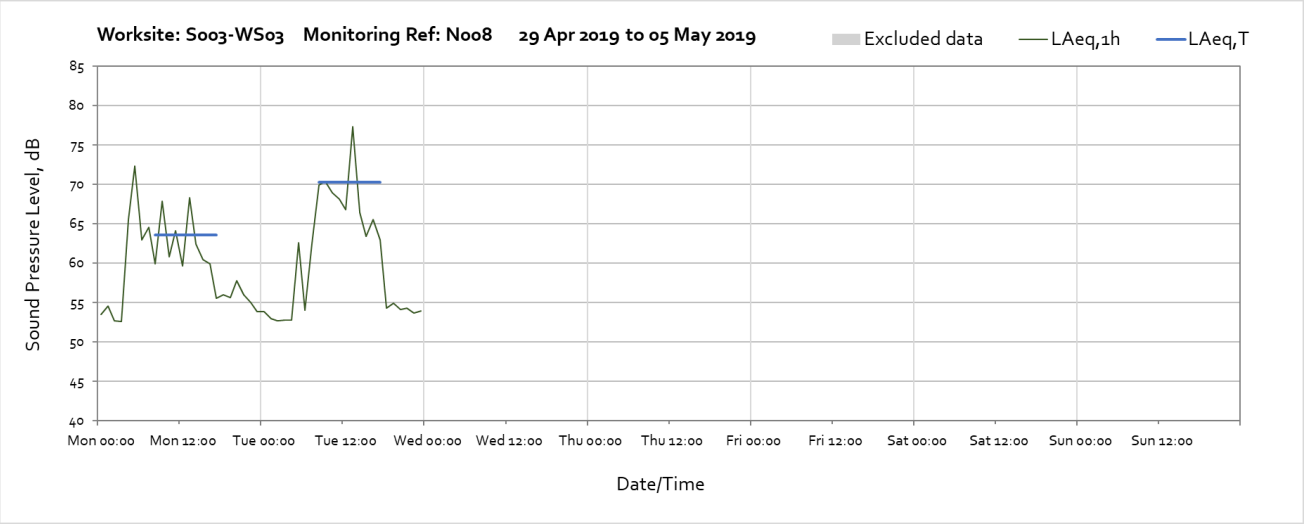
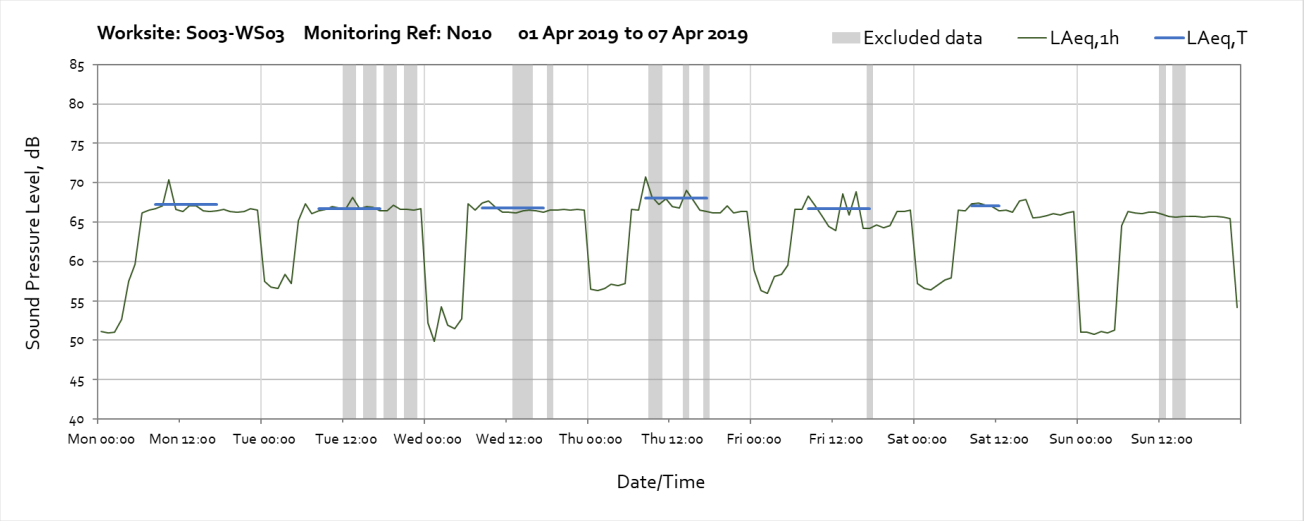
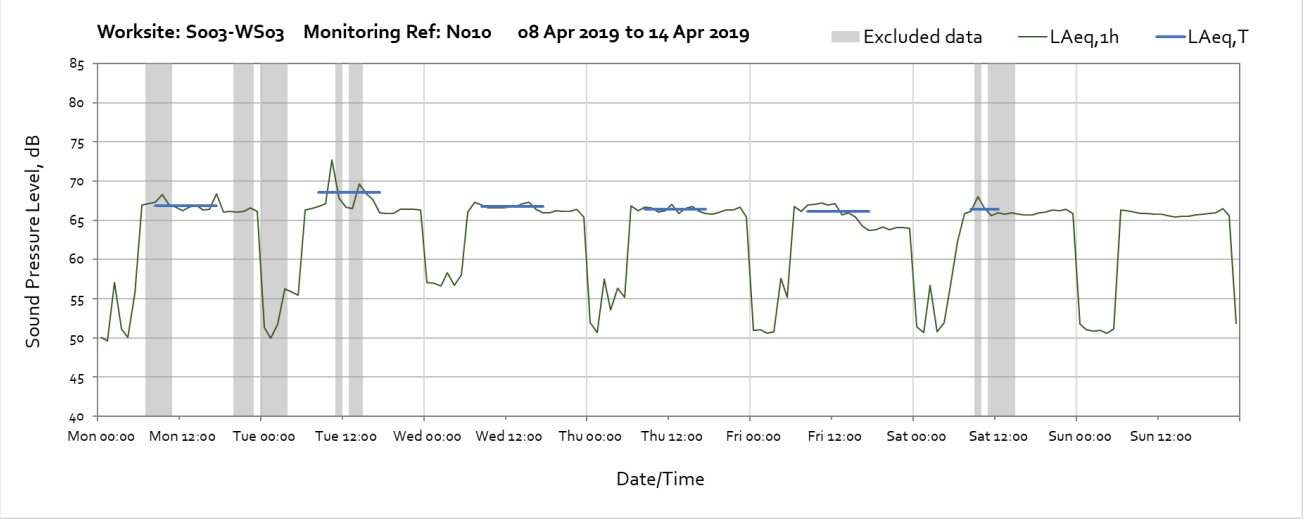
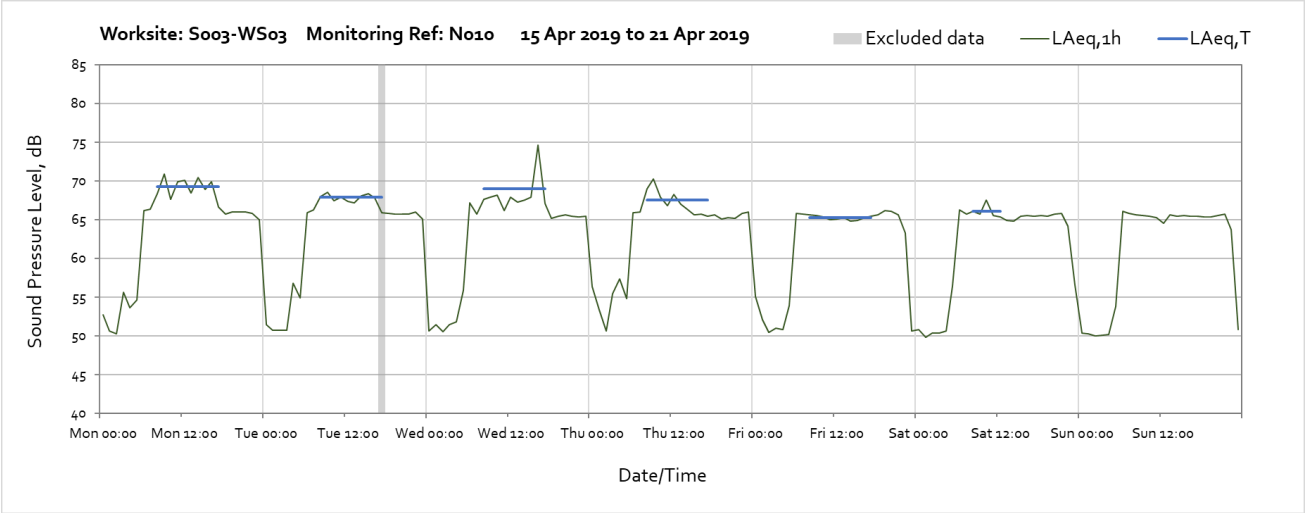
Date/Time



Worksite: S003-WS03 – Monitoring Ref: N010






Worksite: S003-WS03 Monitoring Ref: N010 15 Apr 2019 to 21 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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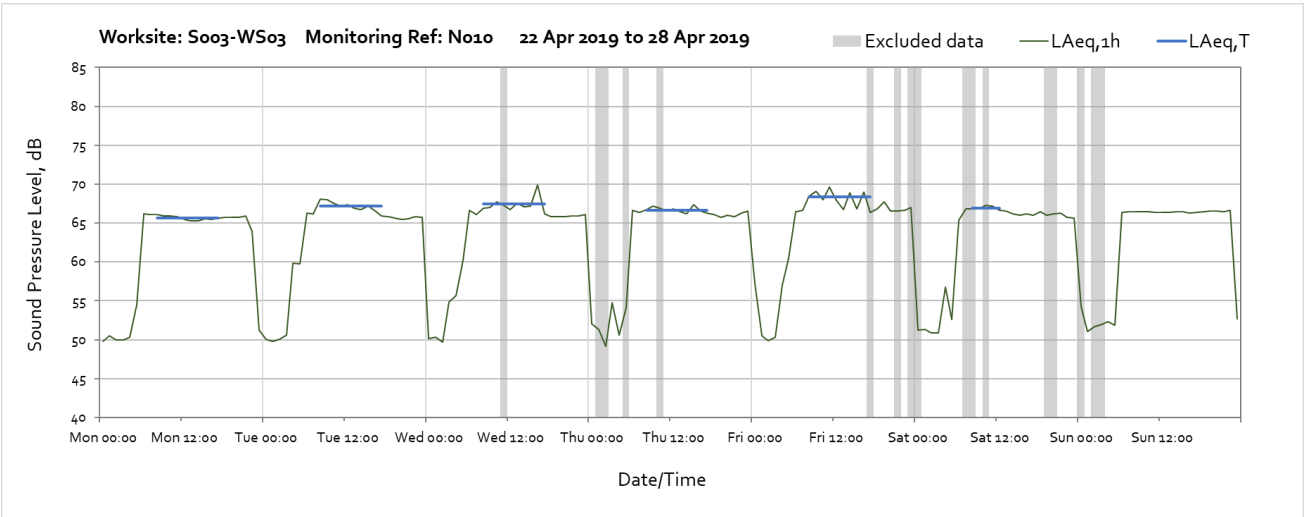
Date/Time


Worksite: S003-WS03 Monitoring Ref: N010 22 Apr 2019 to 28 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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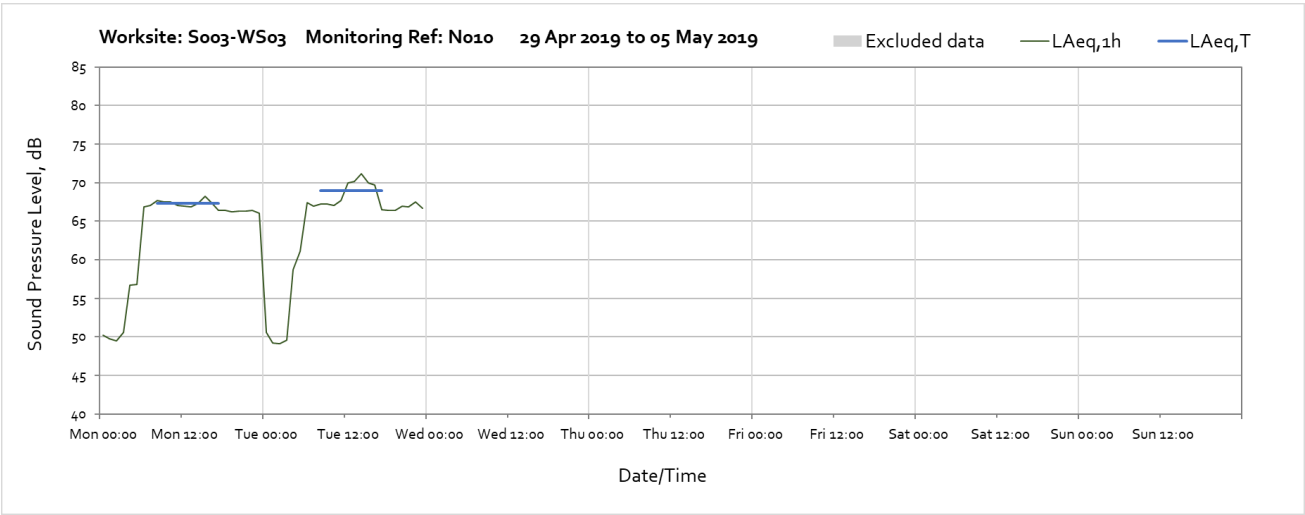
Date/Time


Worksite: S003-WS03 Monitoring Ref: N010 29 Apr 2019 to 05 May 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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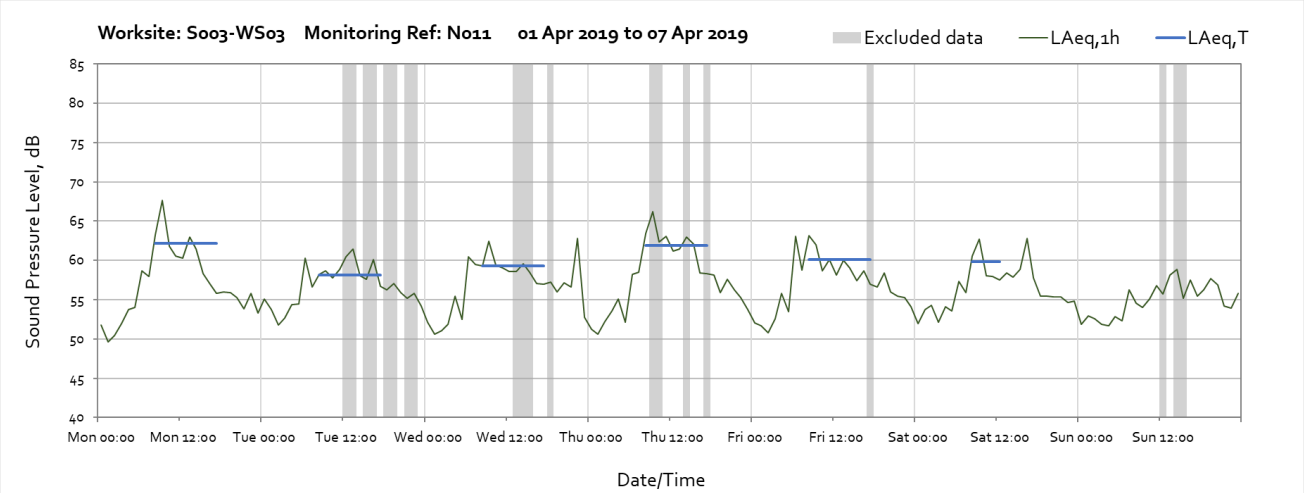
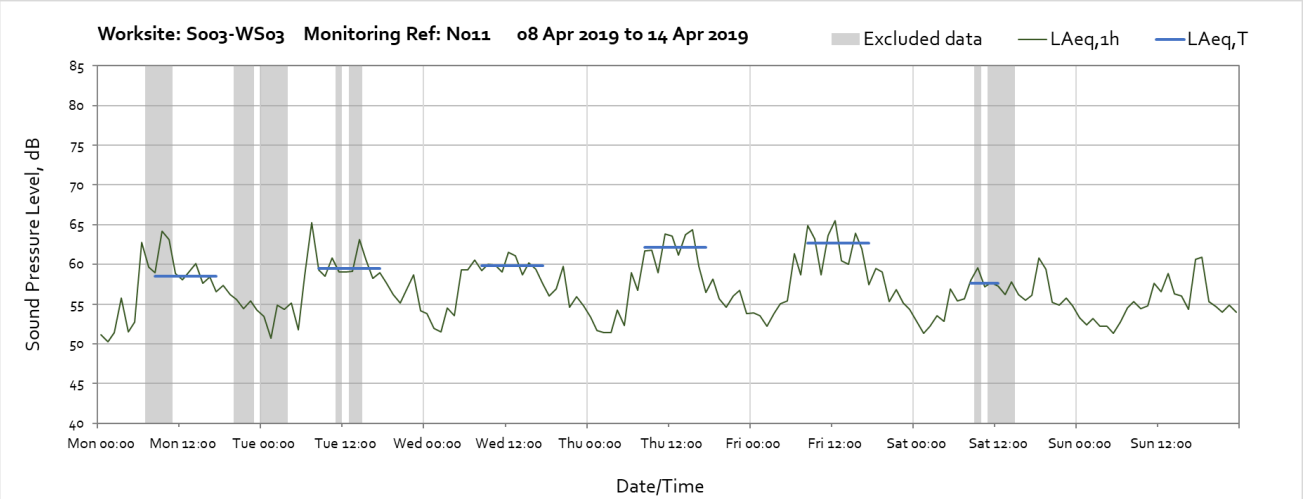
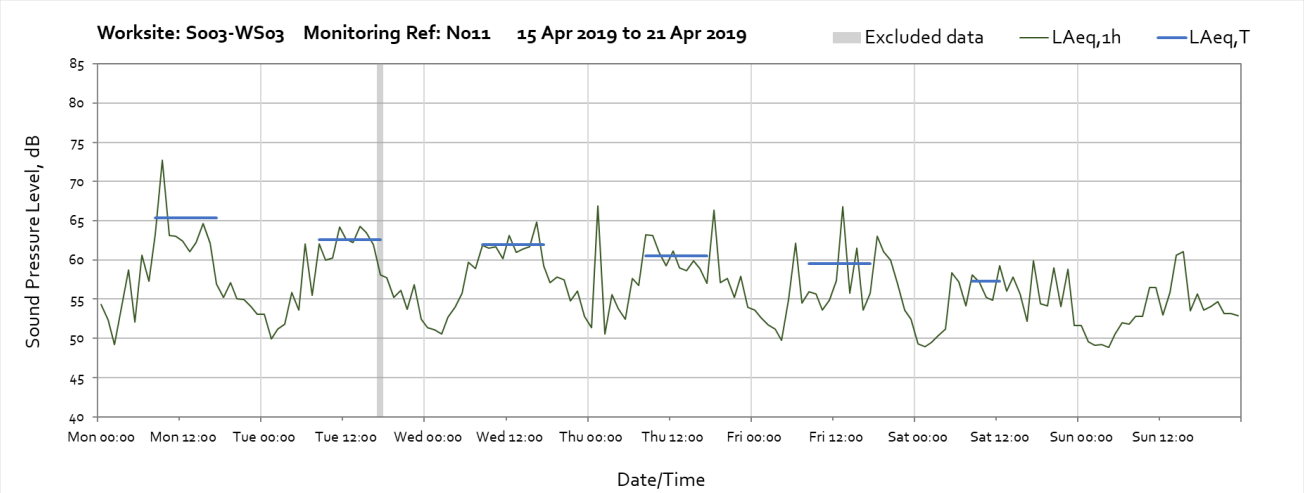
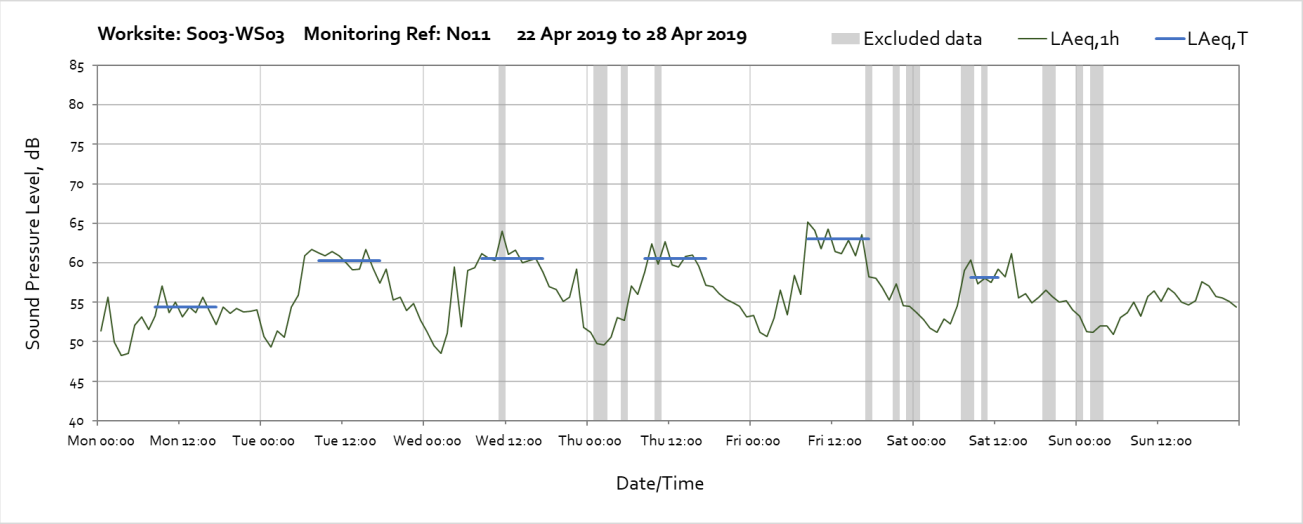
Date/Time

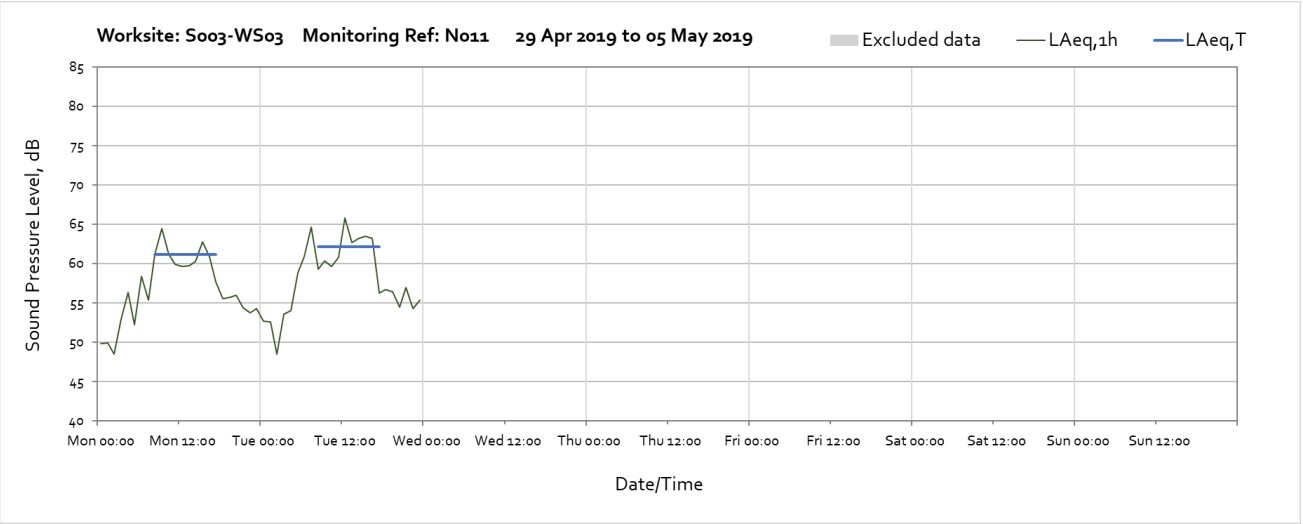
Worksite: S003-WS03 – Monitoring Ref: N011



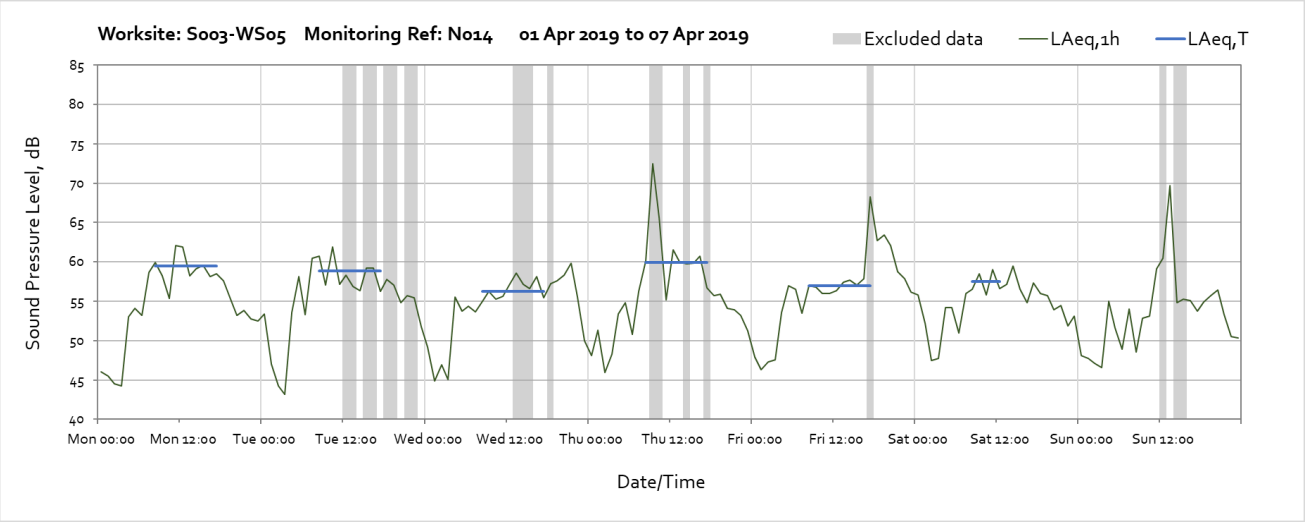


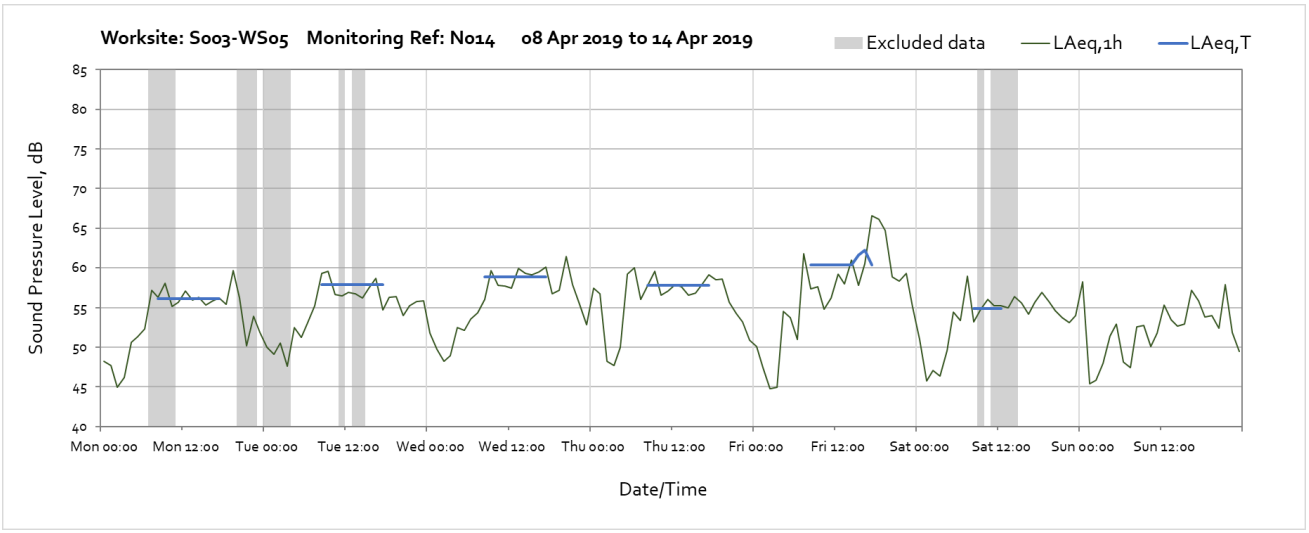






Worksite: S003-WS05 – Monitoring Ref: N014




Worksite: S003-WS05 Monitoring Ref: N014 08 Apr 2019 to 14 Apr 2019
Excluded data
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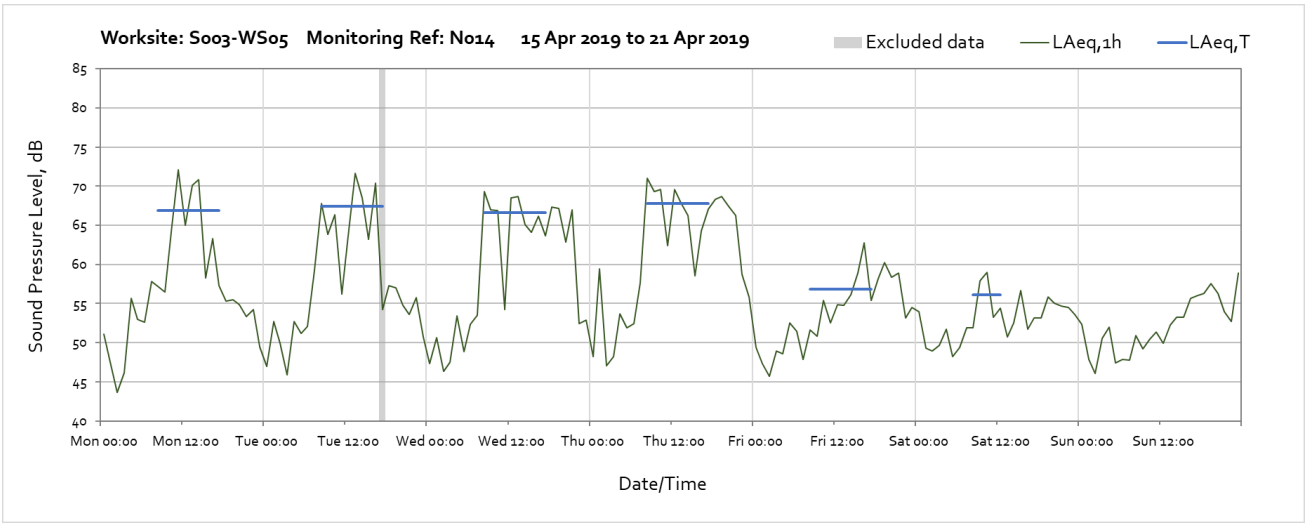
Date/Time


Worksite: S003-WS05 Monitoring Ref: N014 15 Apr 2019 to 21 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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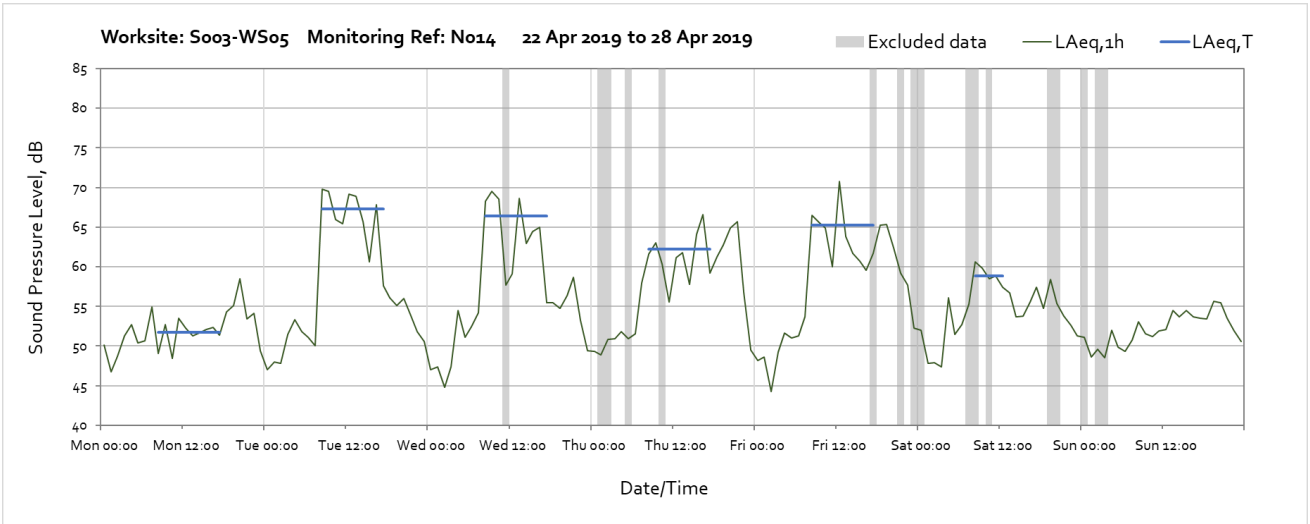
Date/Time


Worksite: S003-WS05 Monitoring Ref: N014 22 Apr 2019 to 28 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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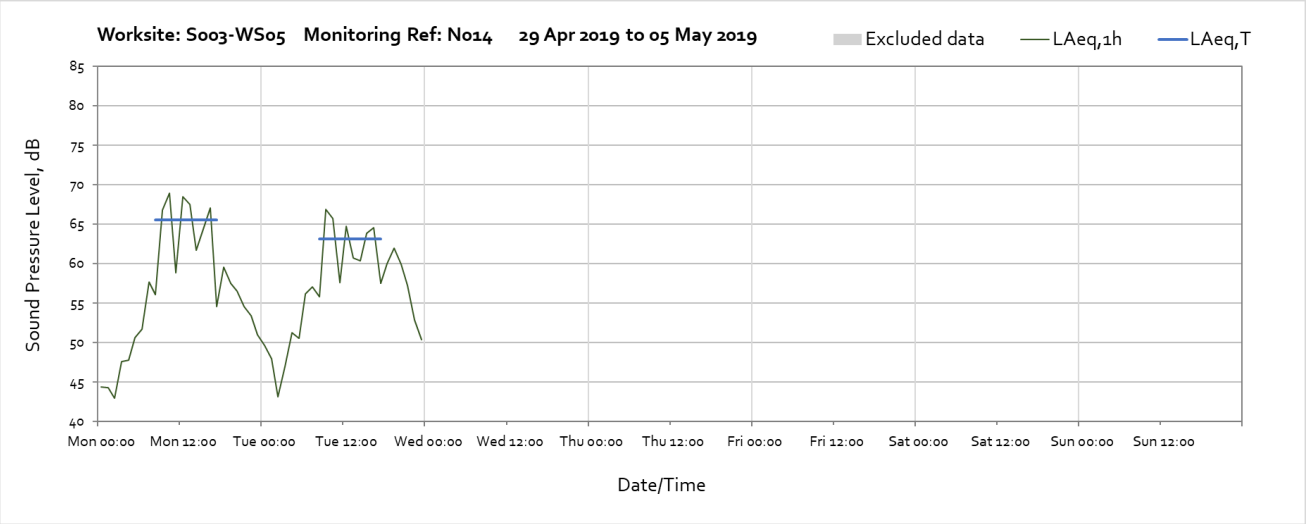
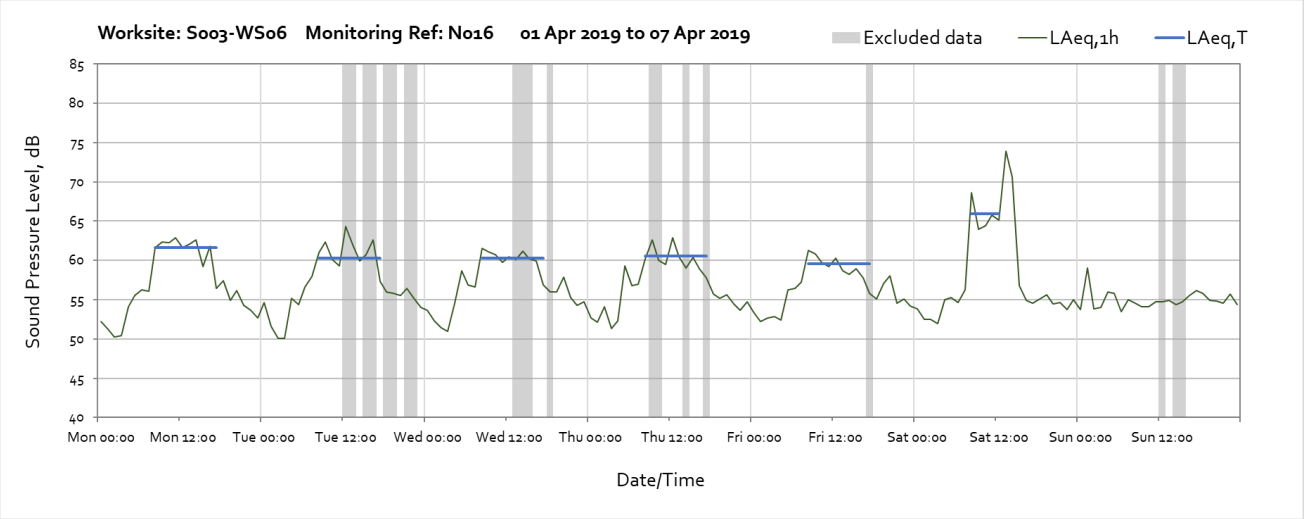
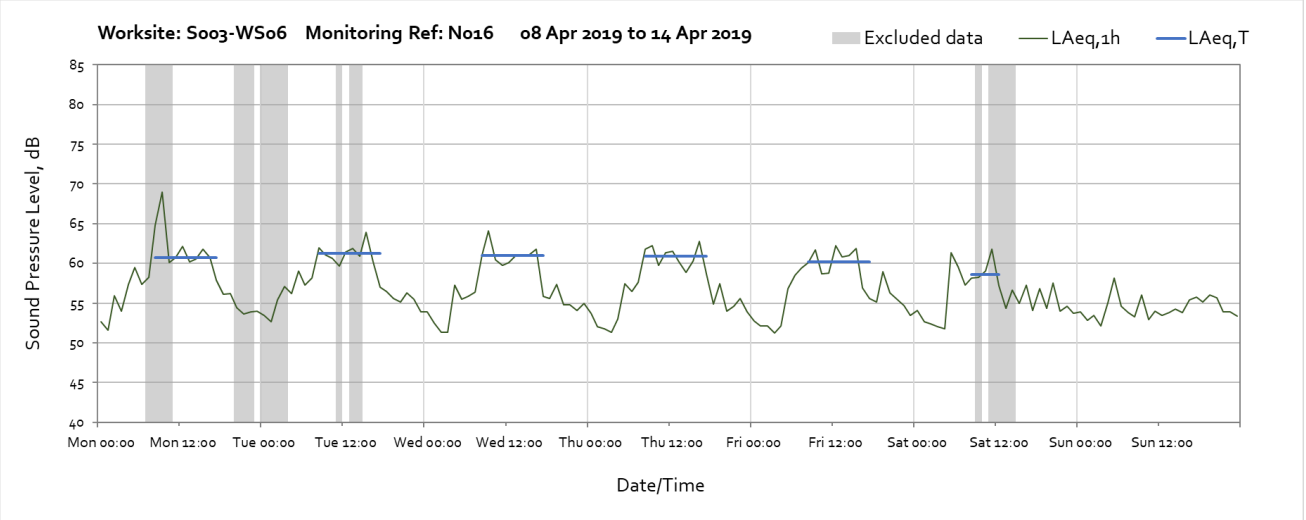
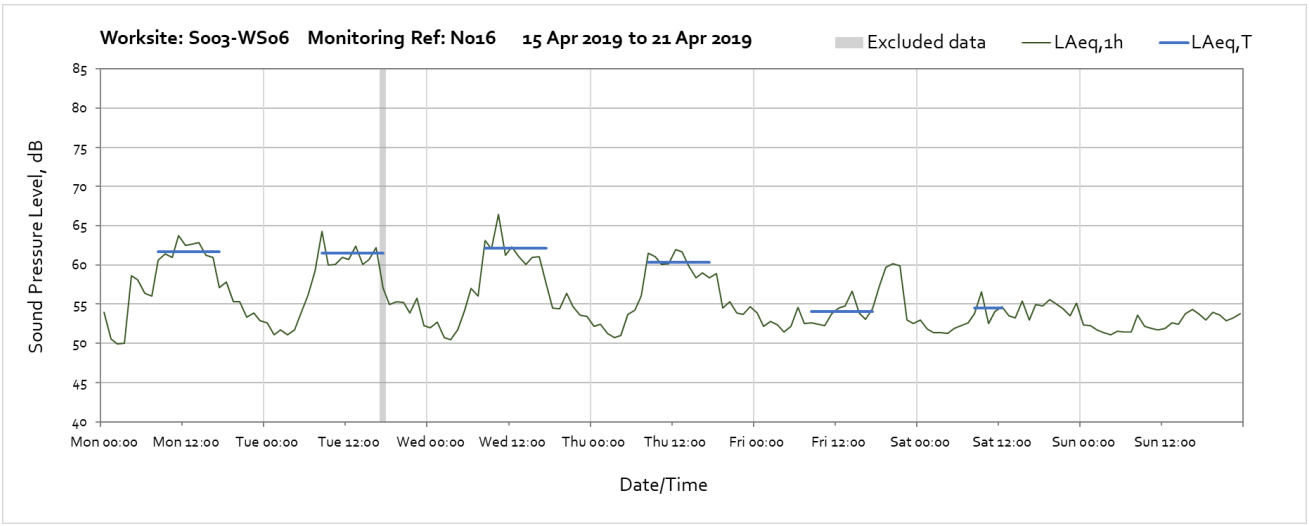


Worksite: S003-WS06 – Monitoring Ref: N016






Worksite: S003-WS06 Monitoring Ref: N016 15 Apr 2019 to 21 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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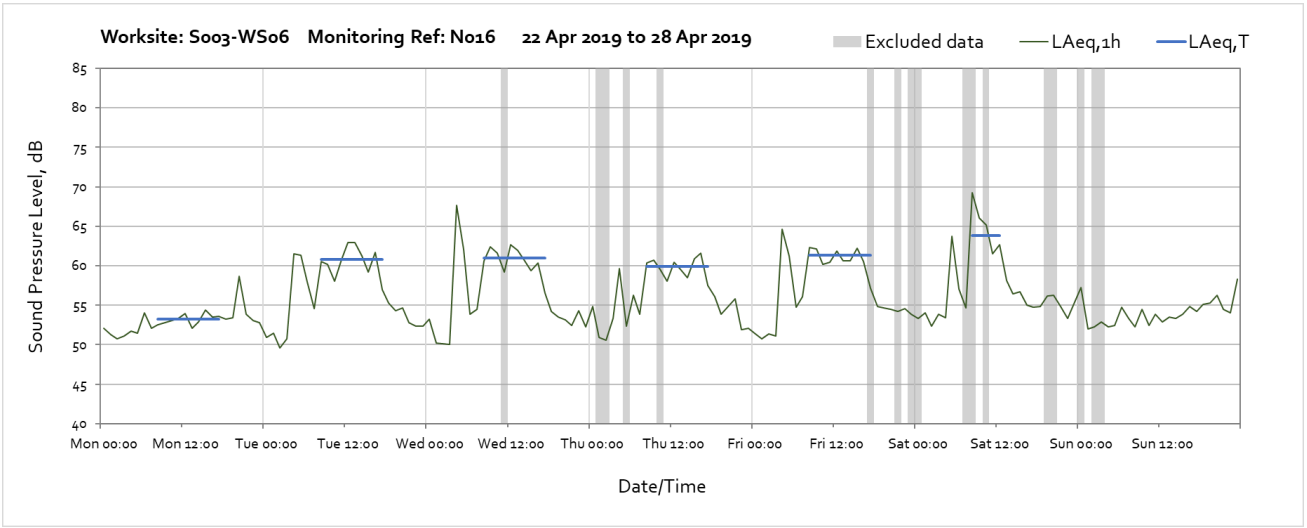
Date/Time


Worksite: S003-WS06 Monitoring Ref: N016 22 Apr 2019 to 28 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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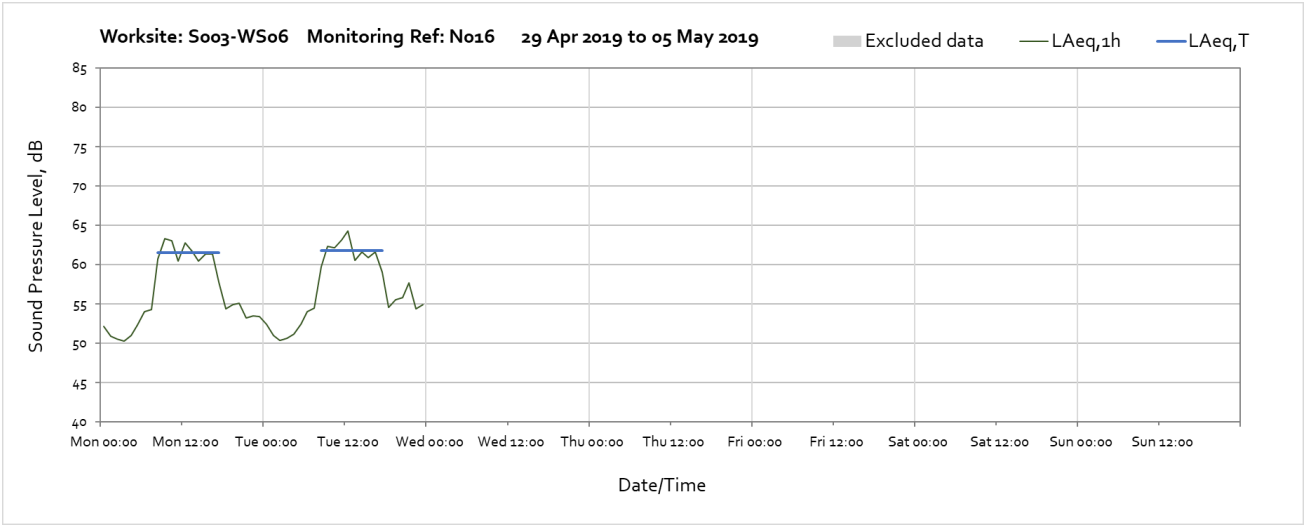
Worksite: S003-WS06 Monitoring Ref: N016 29 Apr 2019 to 05 May 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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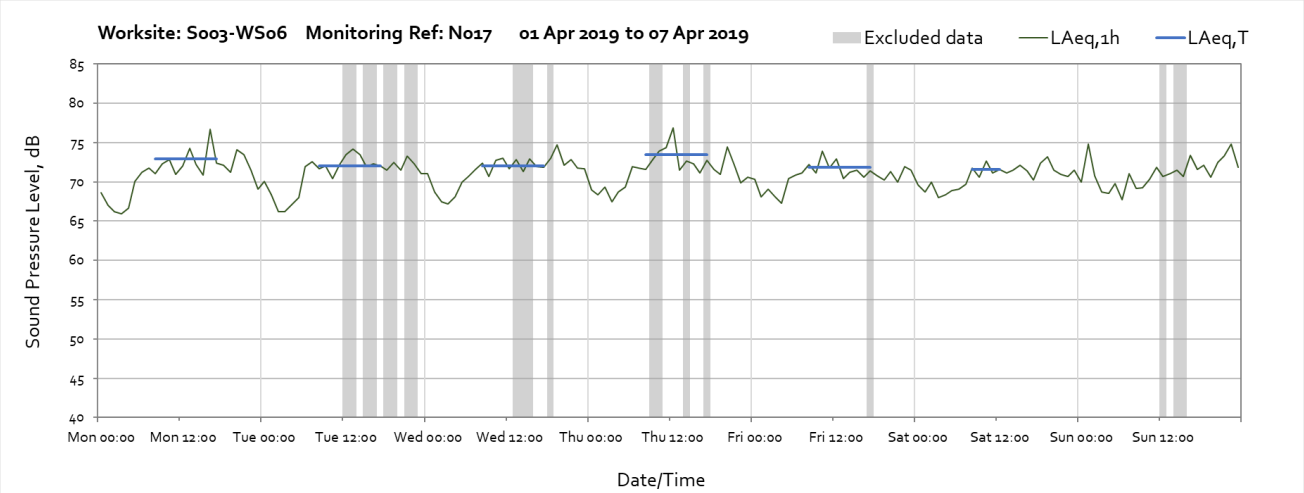
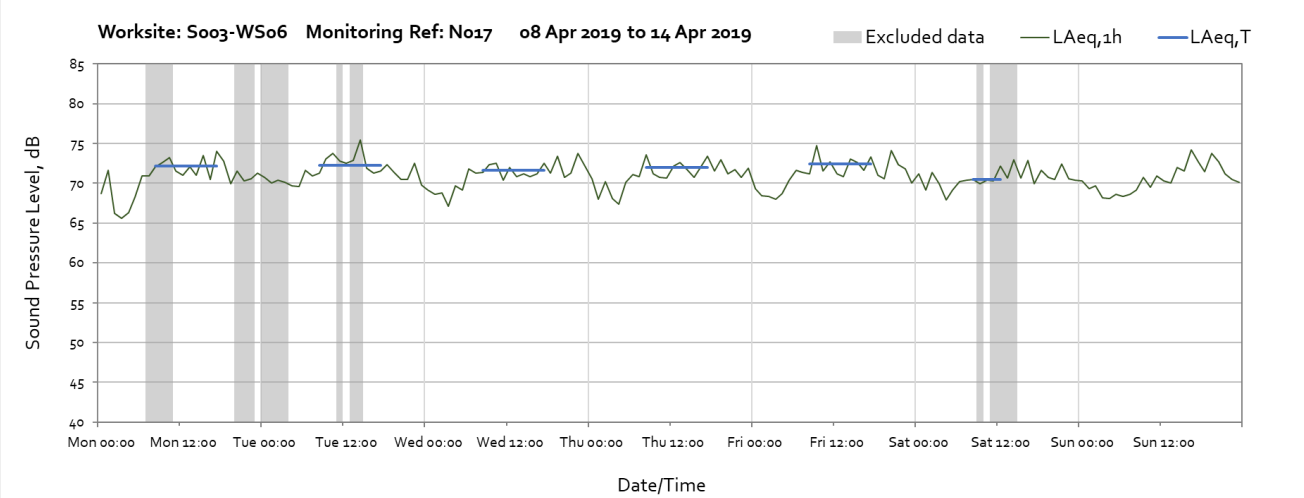
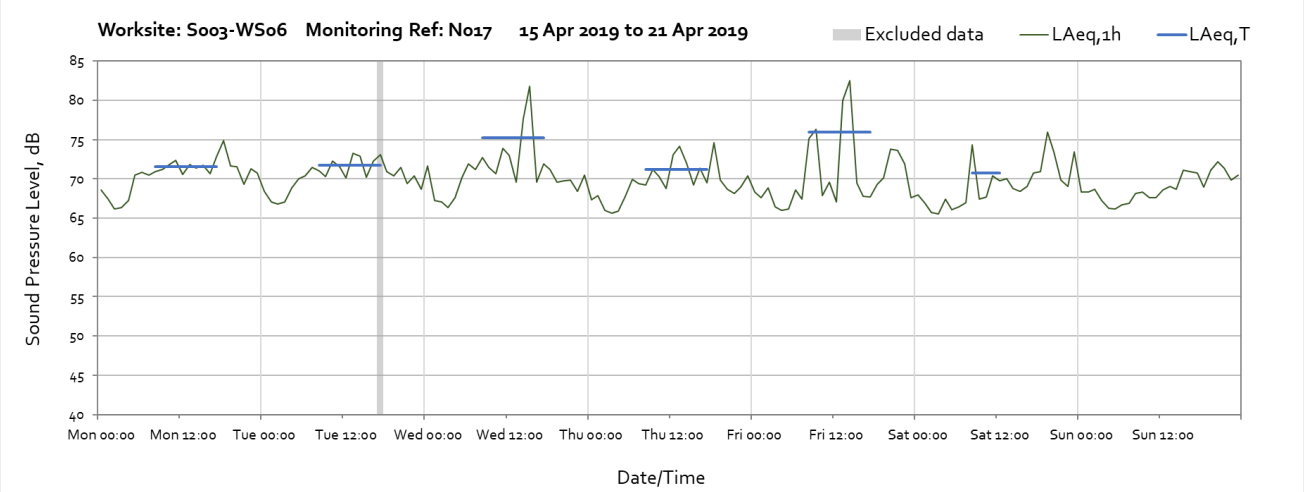
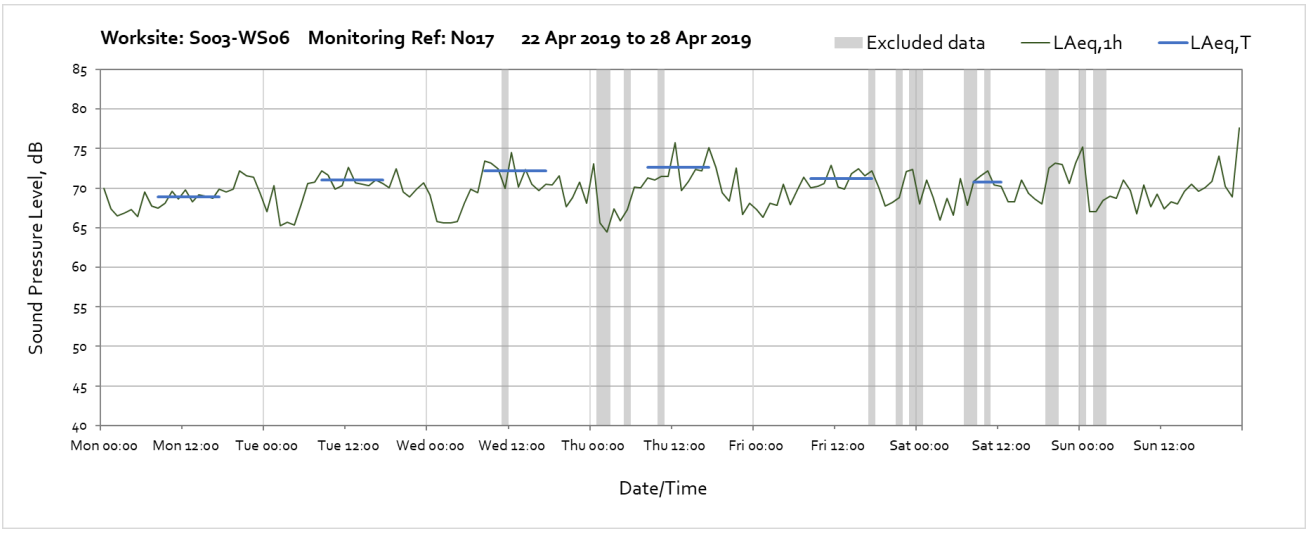
Date/Time

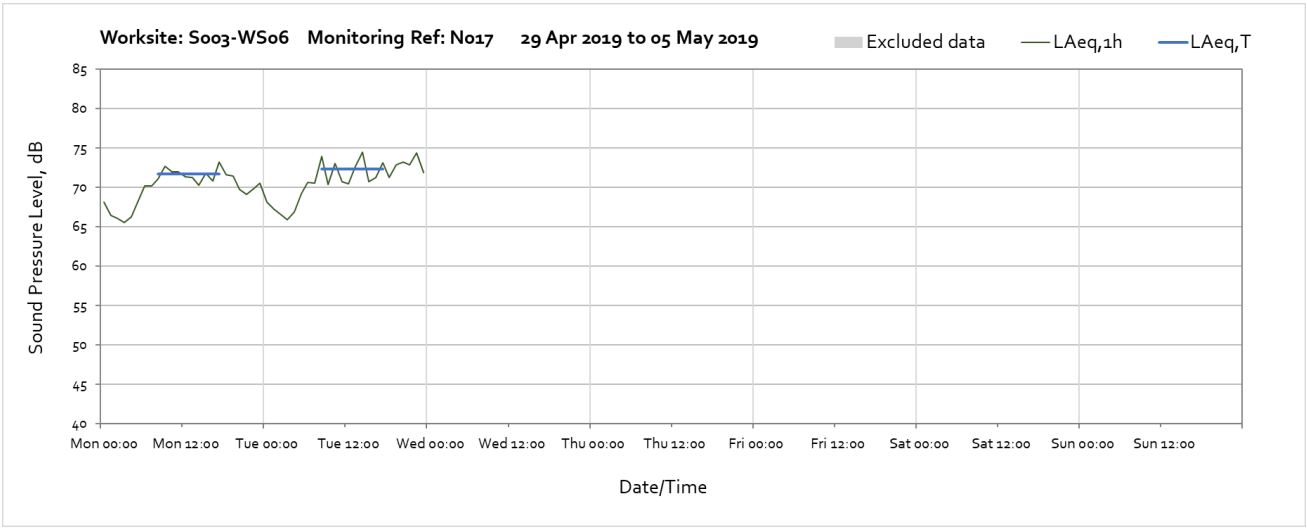
Worksite: S003-WS06 – Monitoring Ref: N017



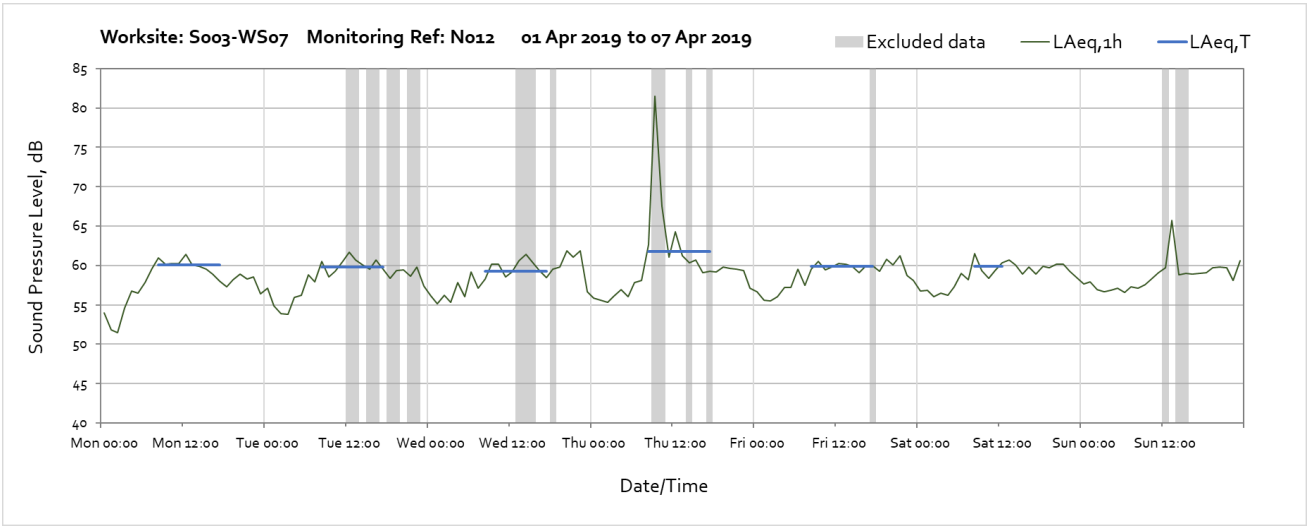


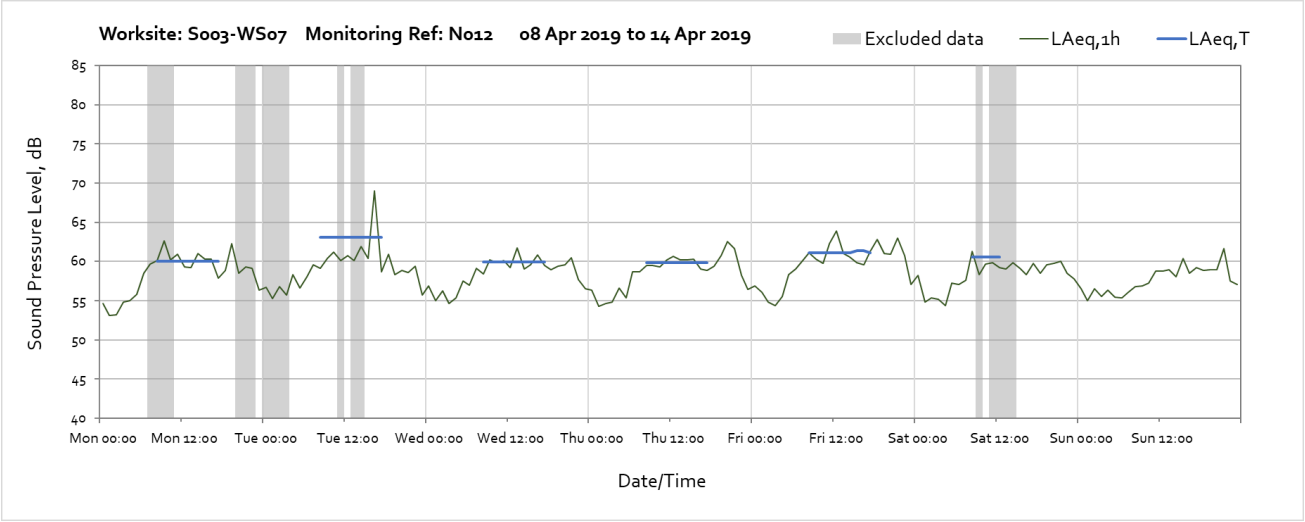






Worksite: S003-WS07 – Monitoring Ref: N012




Worksite: S003-WS07 Monitoring Ref: N012 08 Apr 2019 to 14 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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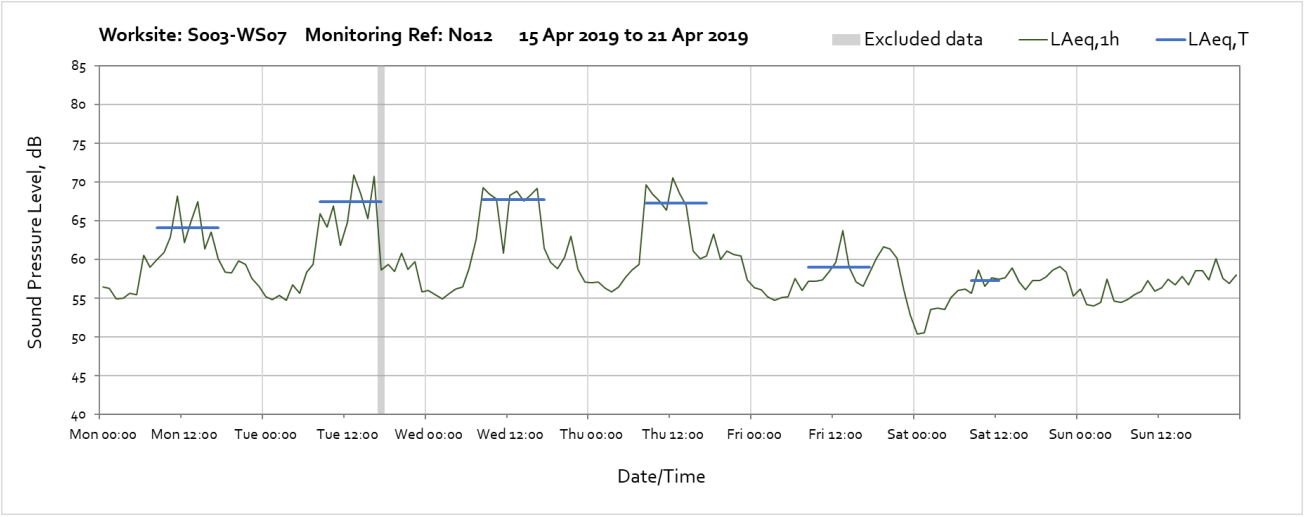
Date/Time


Worksite: S003-WS07 Monitoring Ref: N012 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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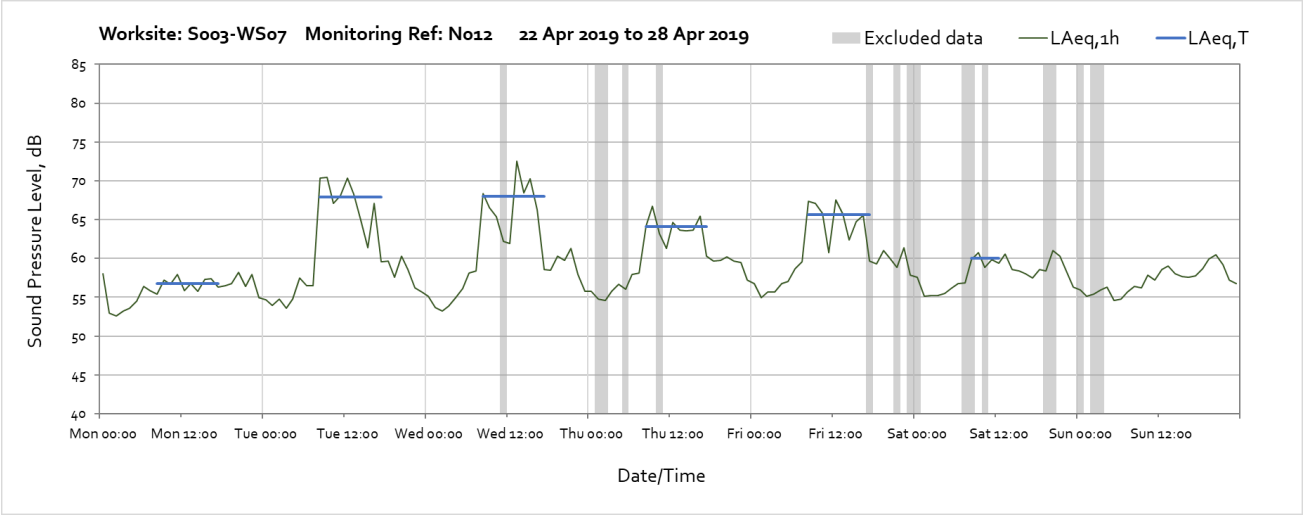
Date/Time


Worksite: S003-WS07 Monitoring Ref: N012 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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65
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Mon 00:00
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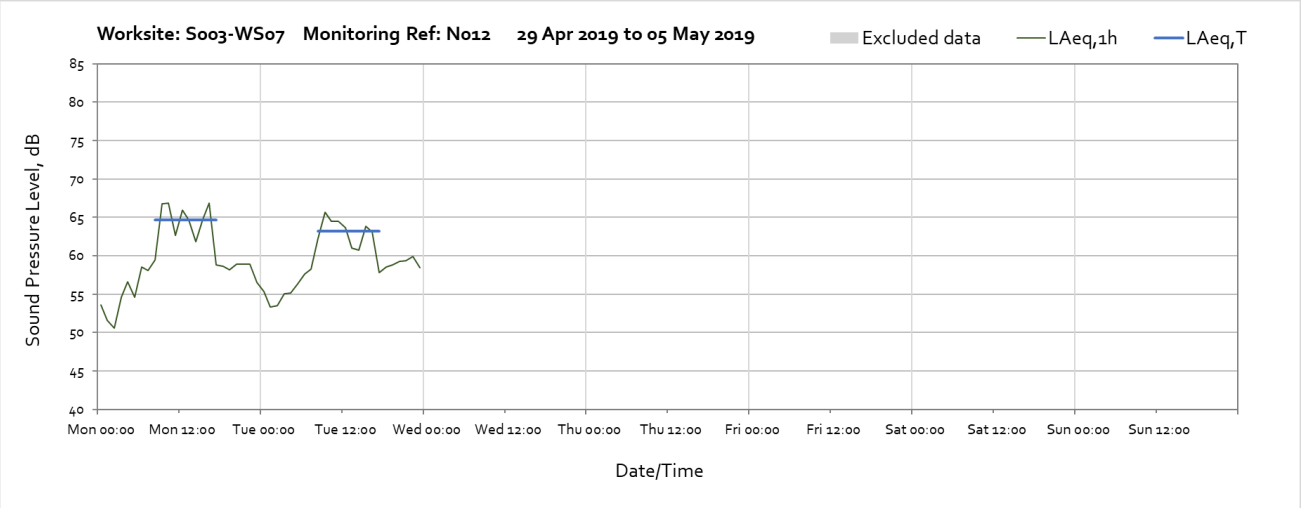
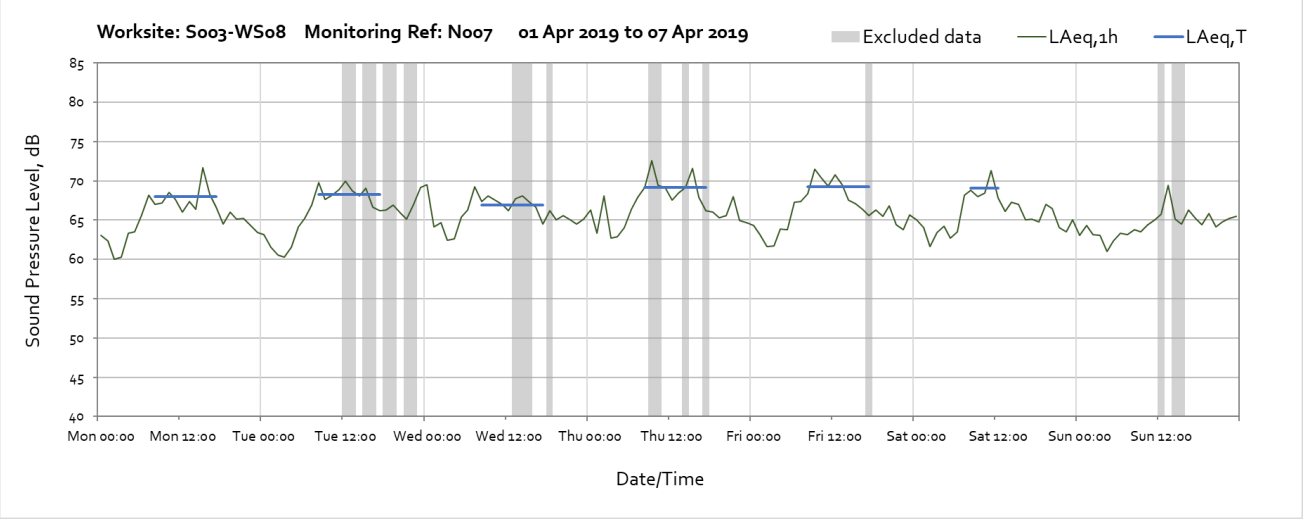
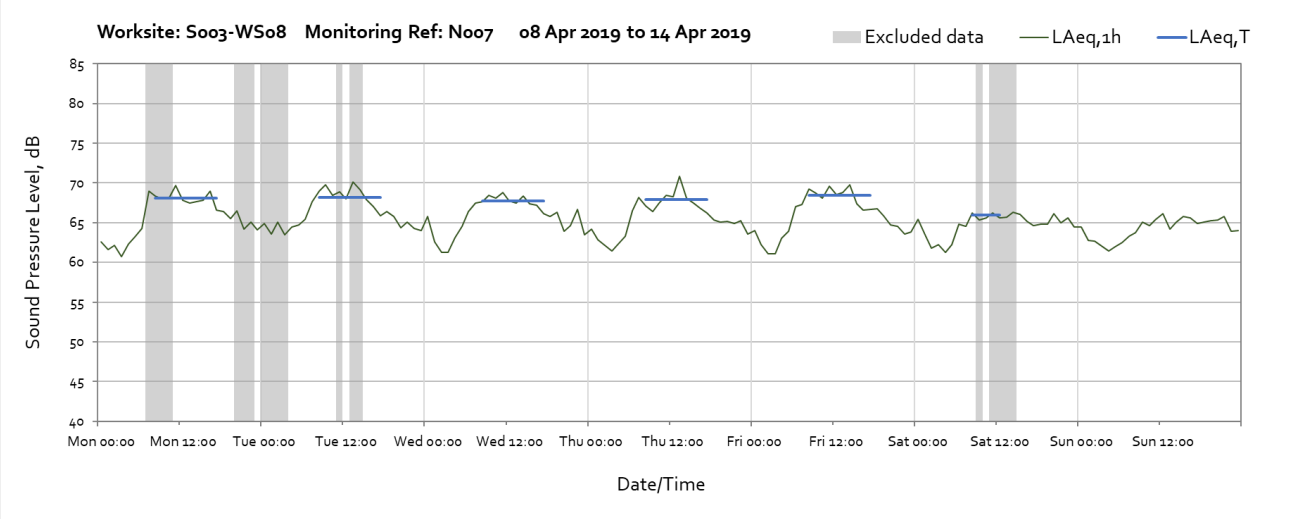
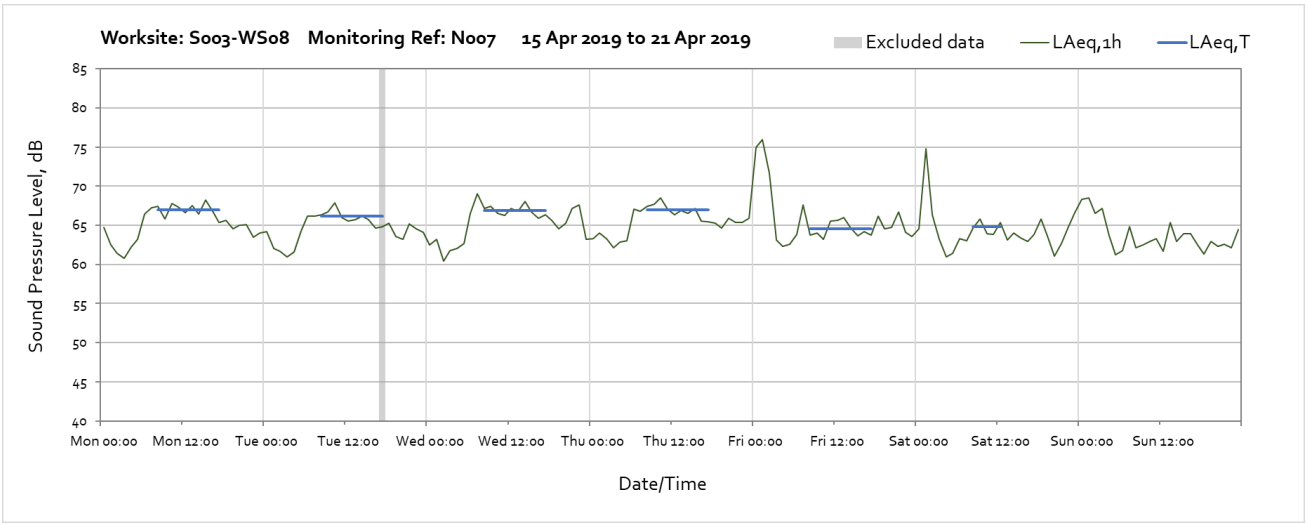
Date/Time



Worksite: S003-WS08 – Monitoring Ref: N007






Worksite: S003-WS08 Monitoring Ref: N007 15 Apr 2019 to 21 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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75
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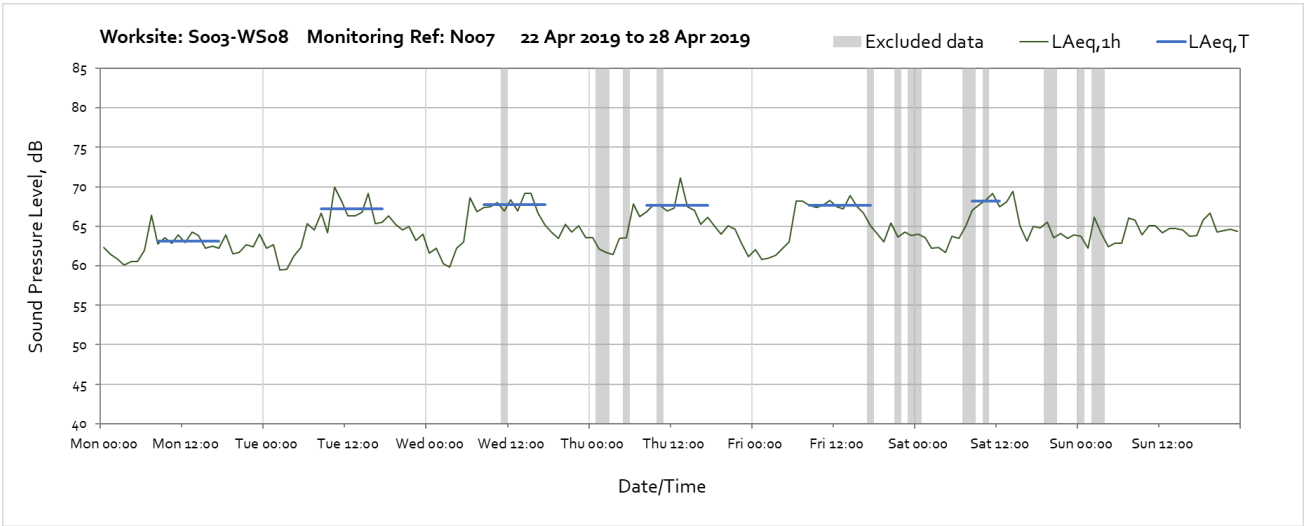
Date/Time


Worksite: S003-WS08 Monitoring Ref: N007 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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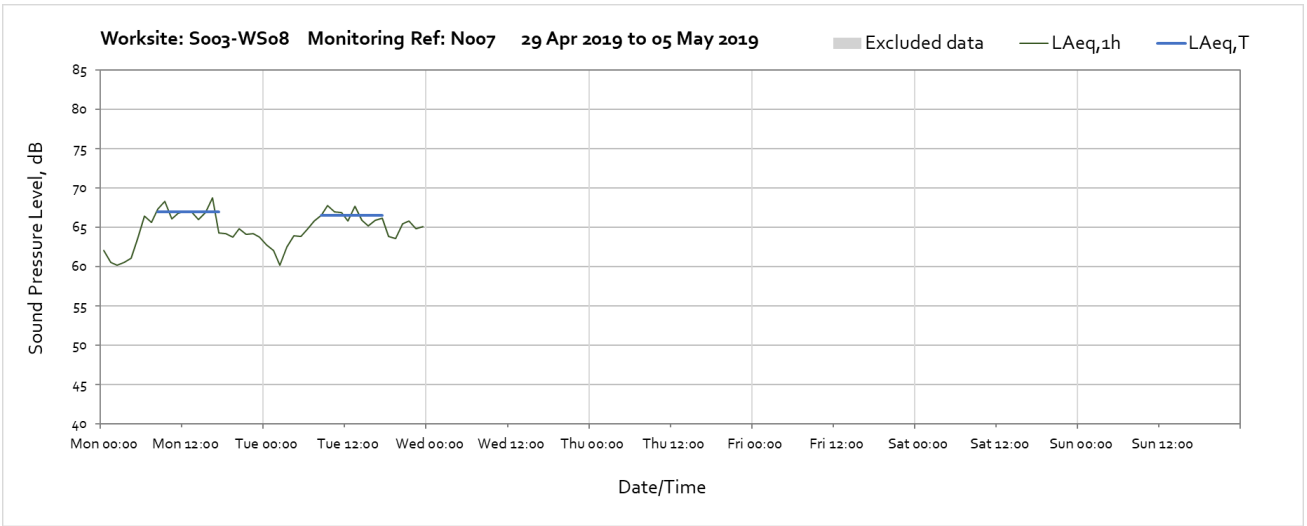
Date/Time


Worksite: S003-WS08 Monitoring Ref: N007 29 Apr 2019 to 05 May 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 12:00
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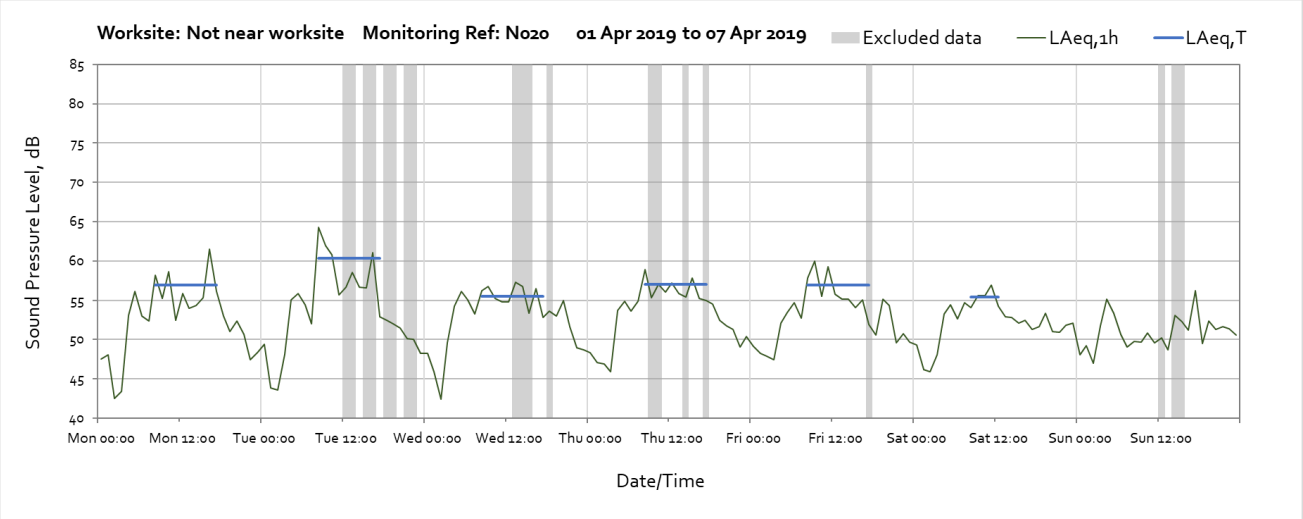
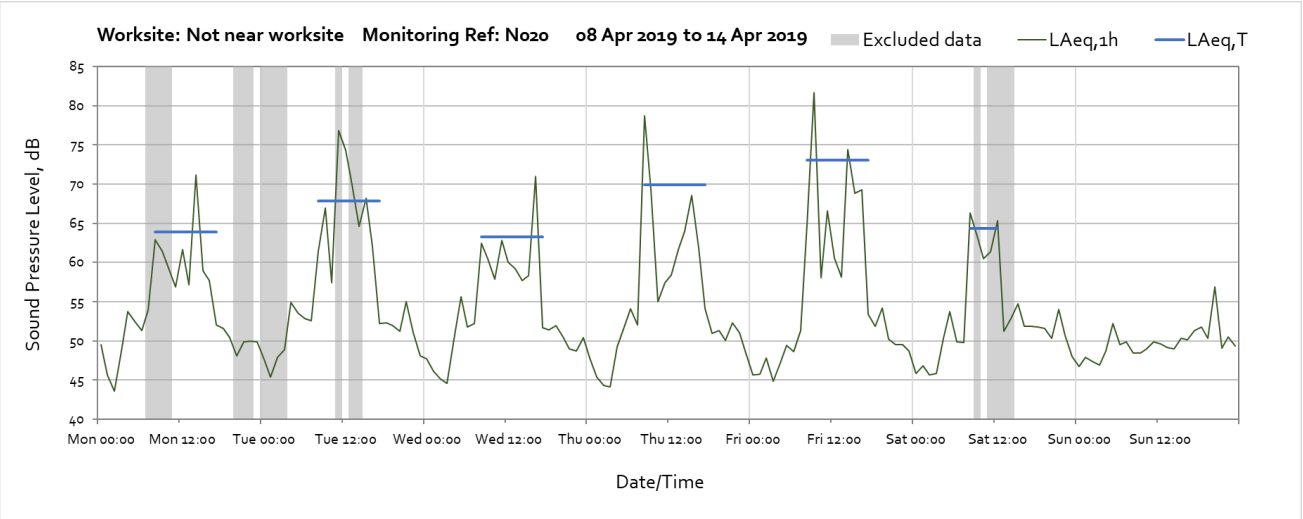
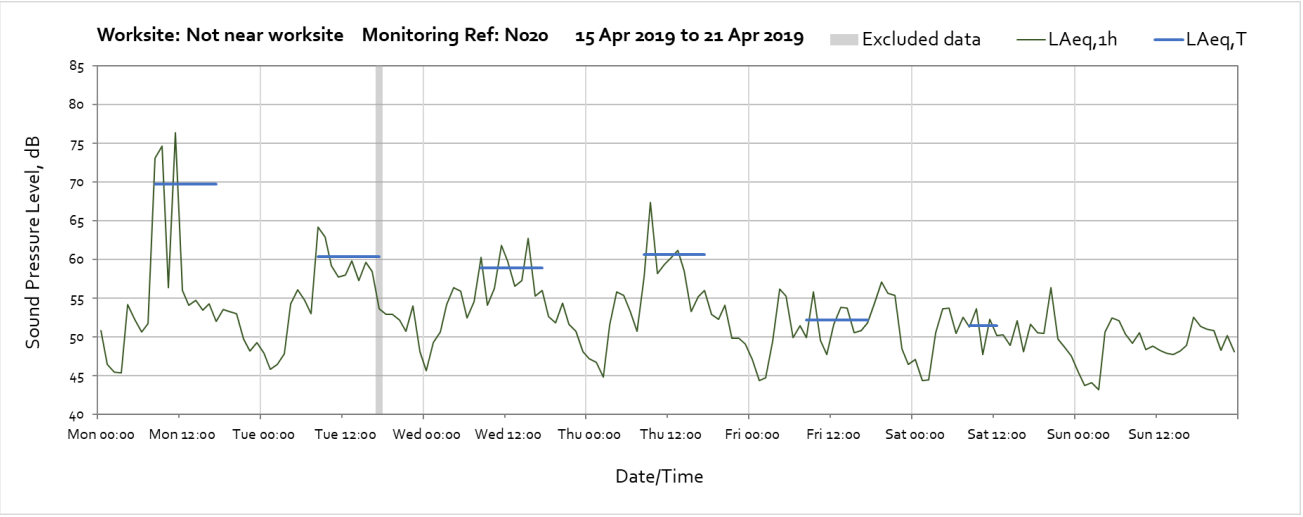
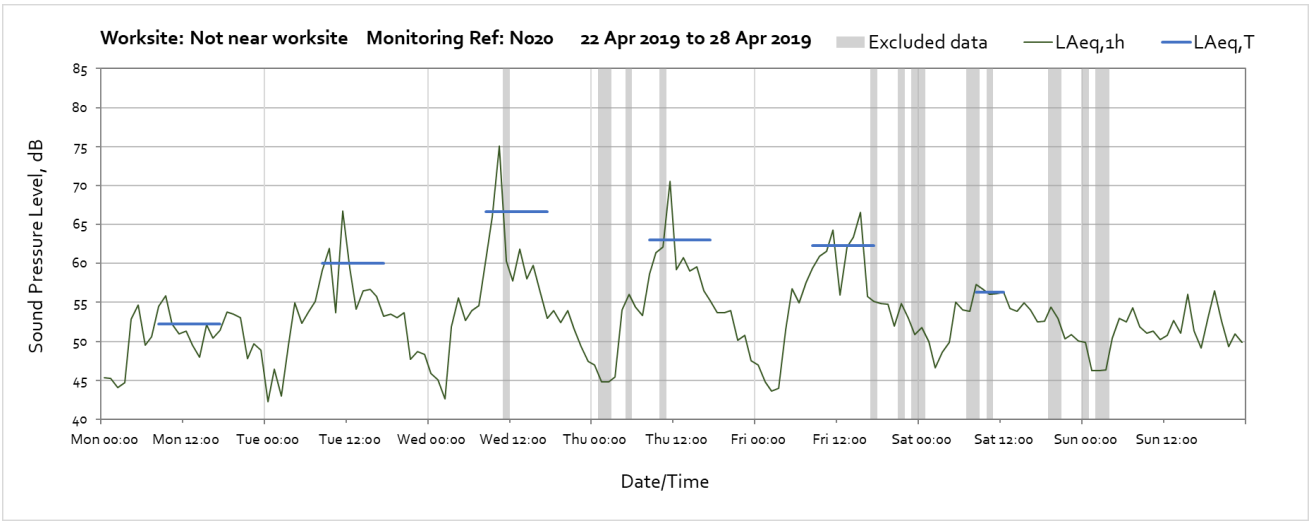
Date/Time

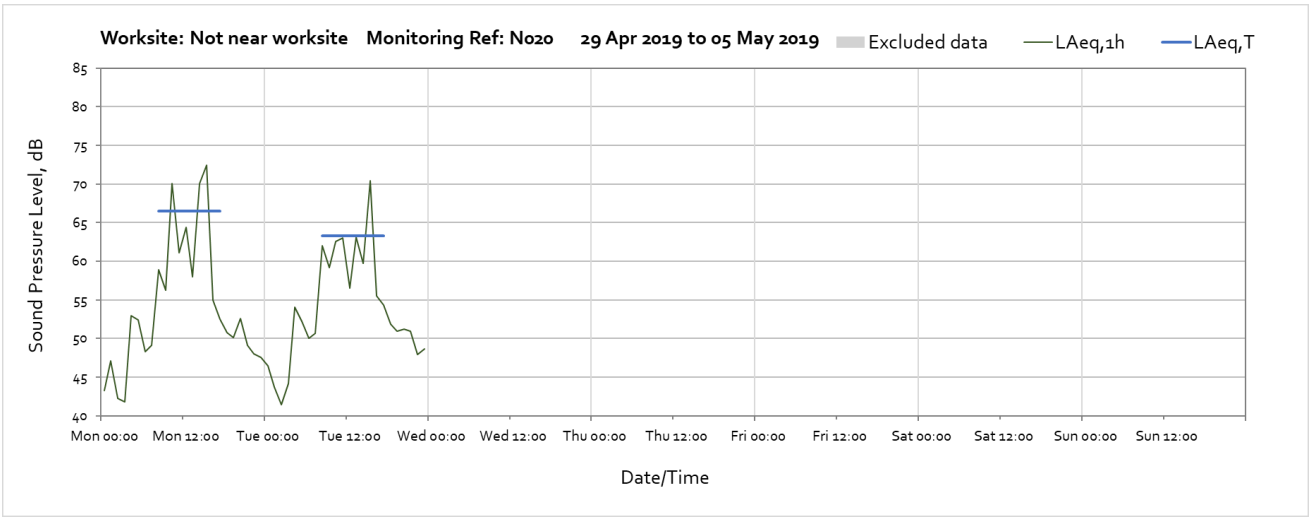
Monitoring Ref: N020



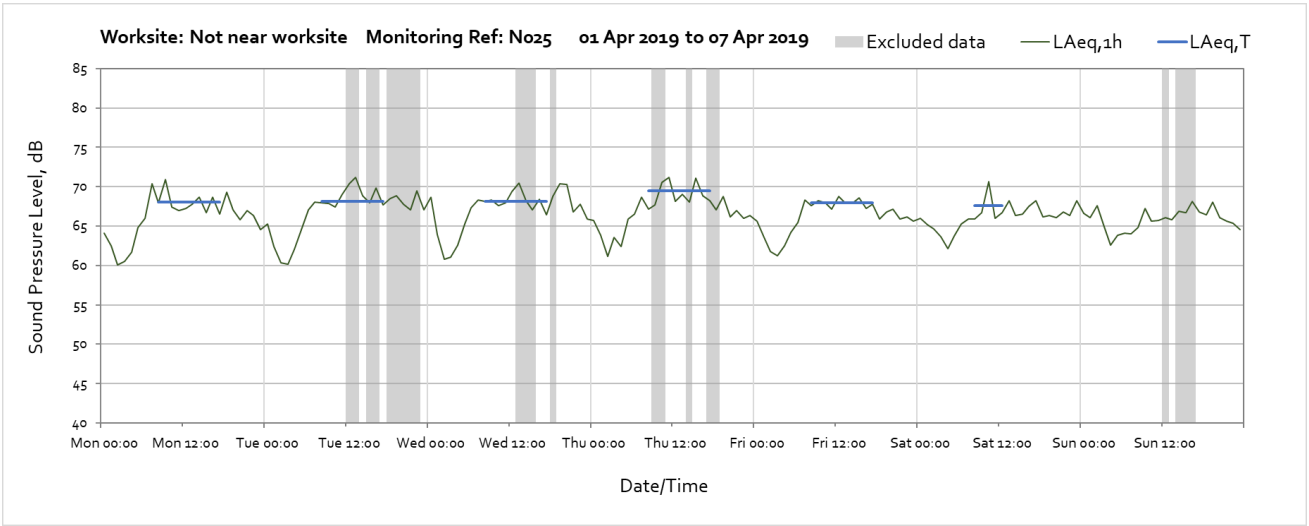


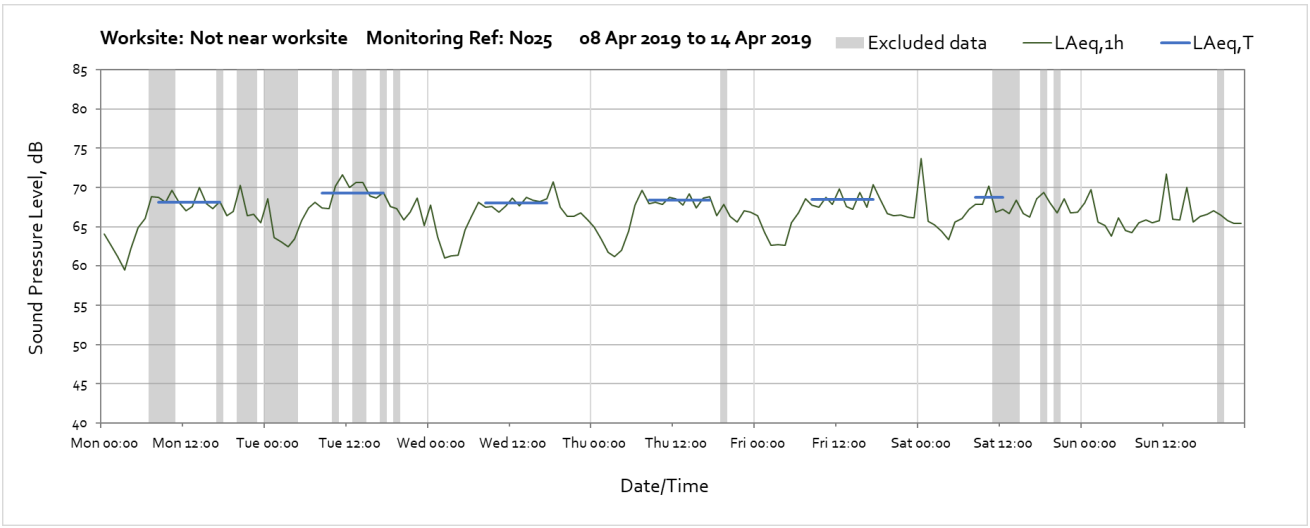






Monitoring Ref: N025




Worksite: Not near worksite Monitoring Ref: No25 08 Apr 2019 to 14 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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Mon 00:00
Mon 12:00
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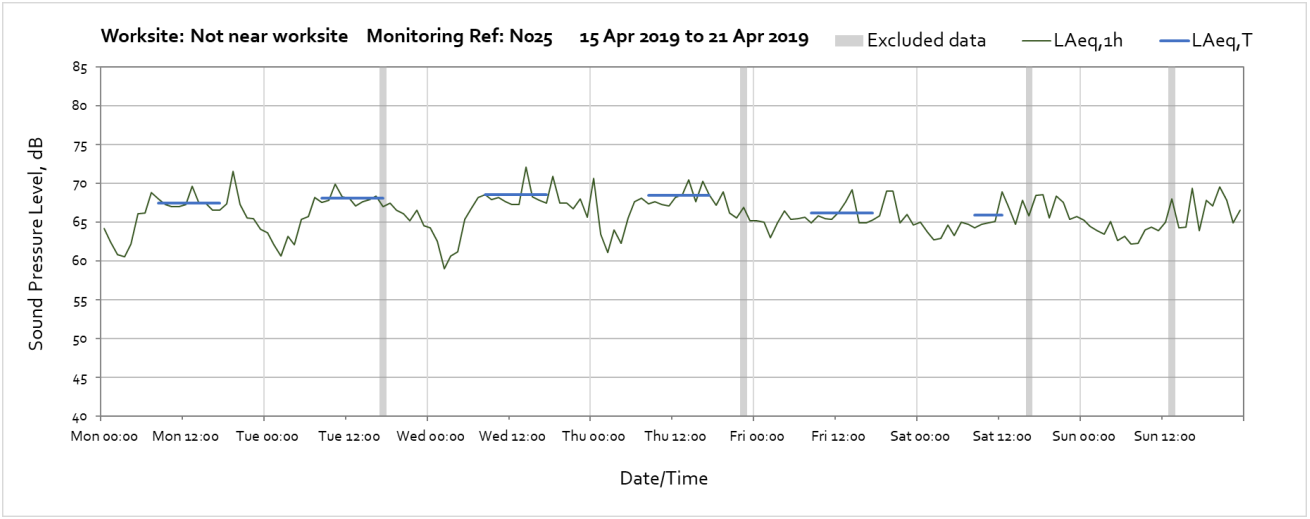
Sun 12:00
Date/Time


Worksite: Not near worksite Monitoring Ref: No25 15 Apr 2019 to 21 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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Mon 00:00
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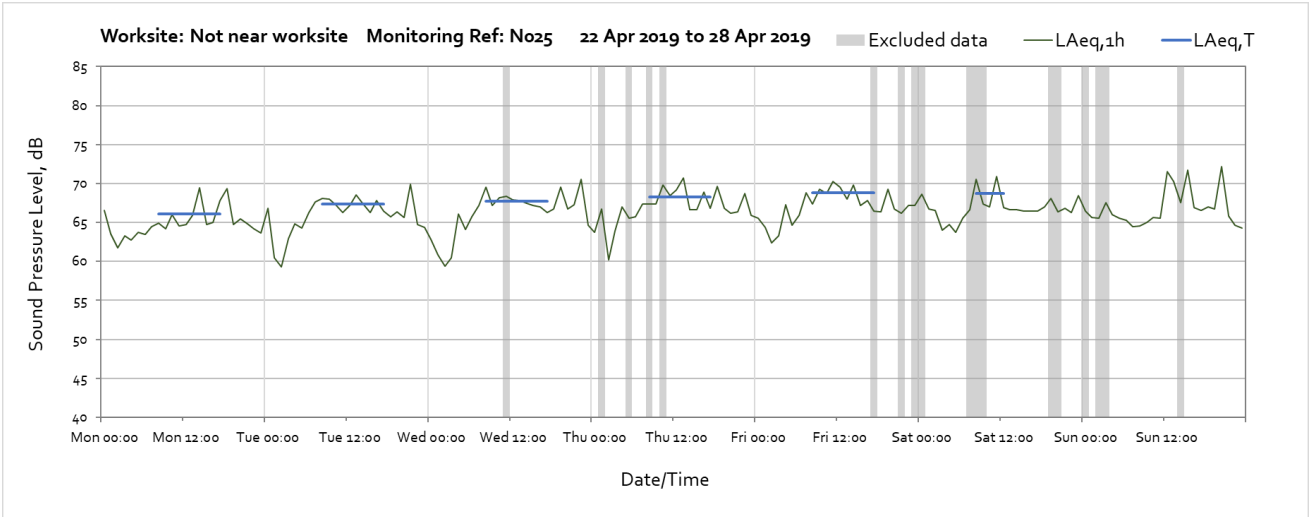
Sun 12:00
Date/Time


Worksite: Not near worksite Monitoring Ref: No25 22 Apr 2019 to 28 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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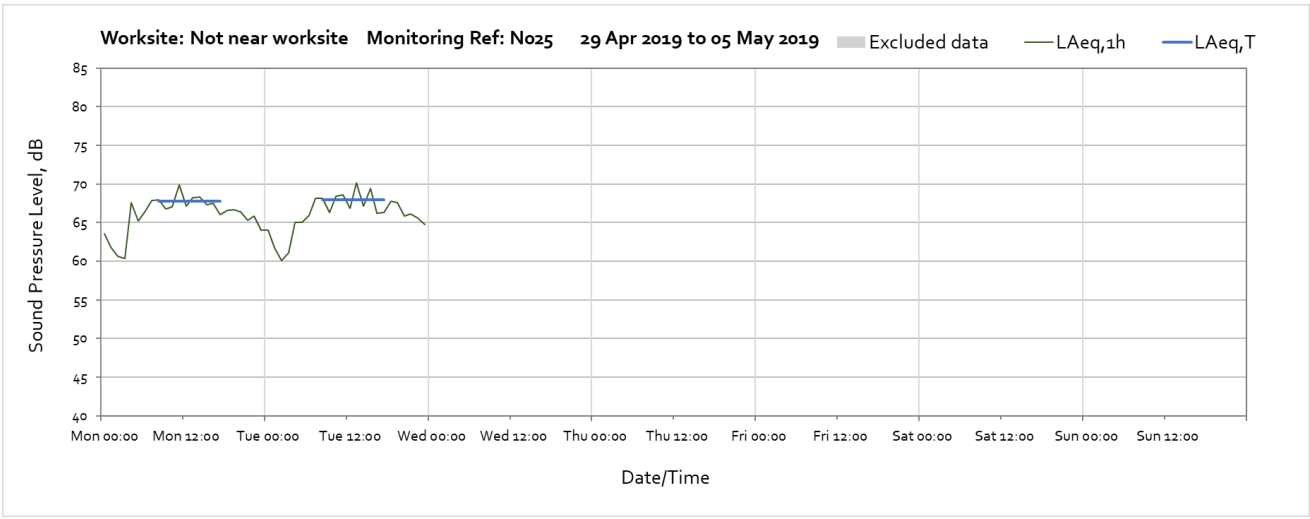
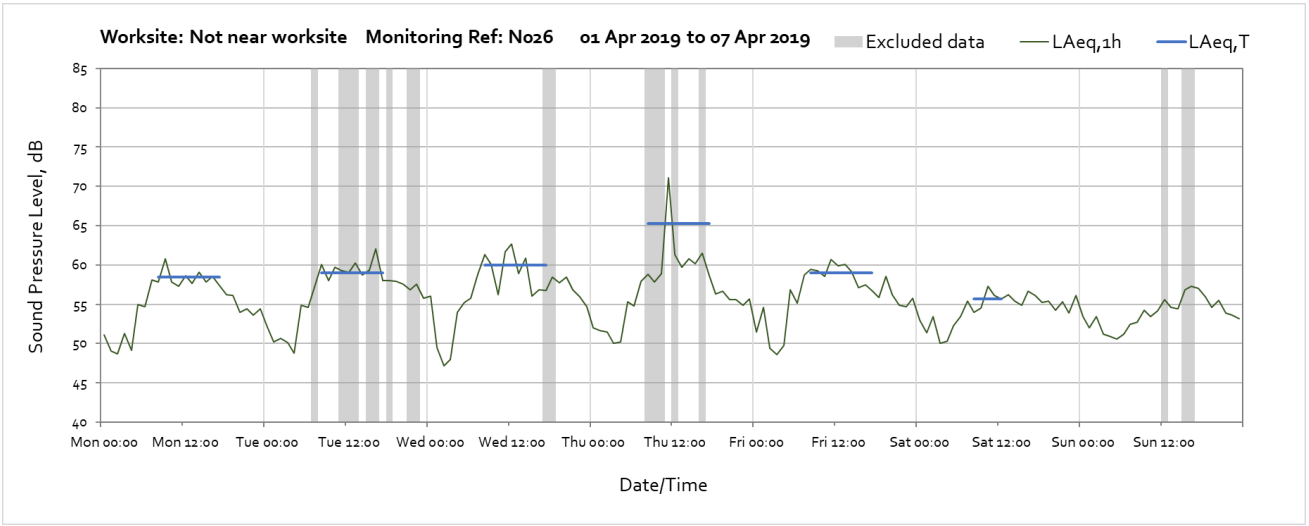
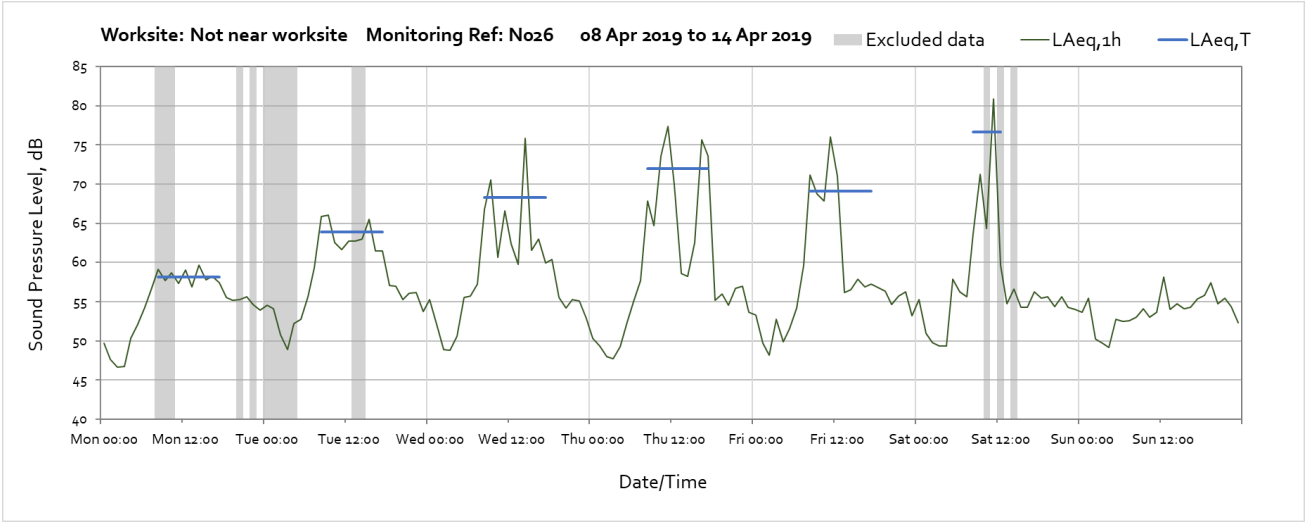
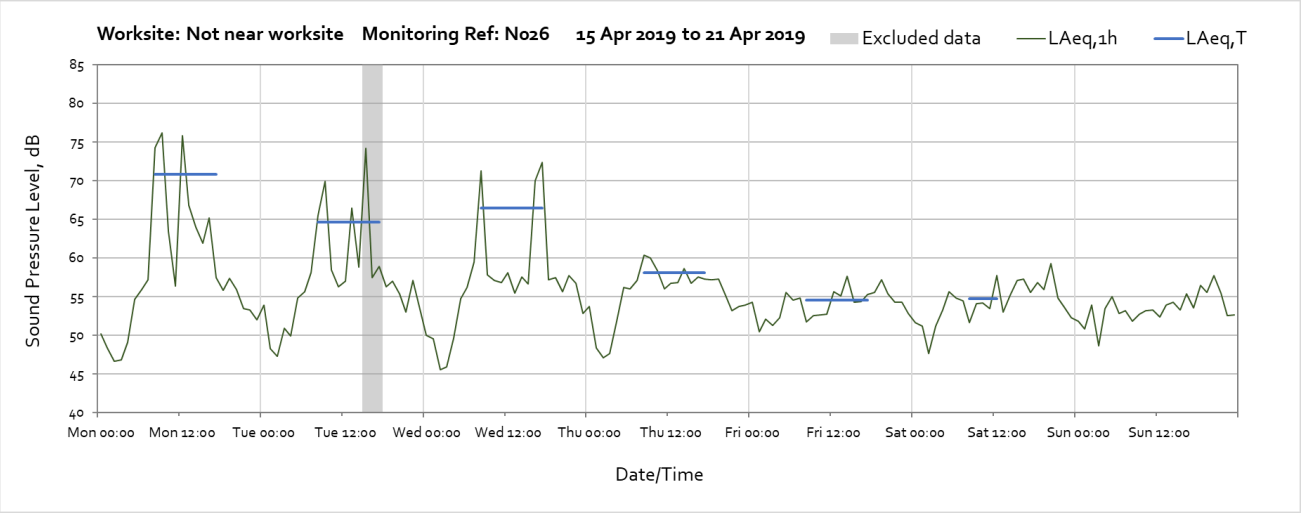
Date/Time



Monitoring Ref: N026






Worksite: Not near worksite Monitoring Ref: No26 15 Apr 2019 to 21 Apr 2019
Excluded data
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LAeq,T
Sound Pressure Level, dB
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Mon 00:00
Mon 12:00
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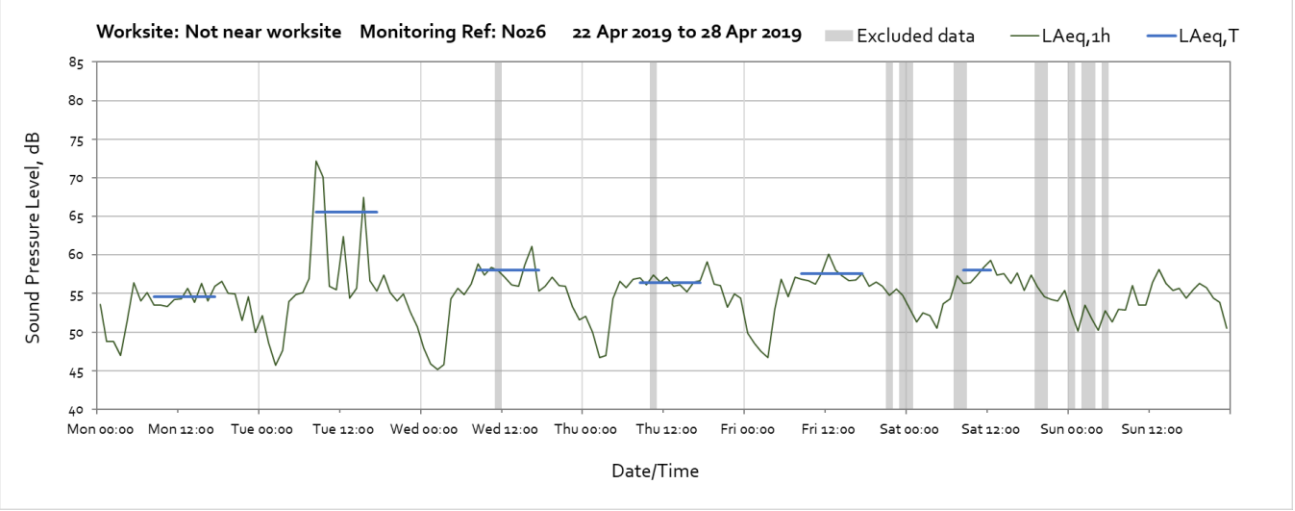
Date/Time


Worksite: Not near worksite Monitoring Ref: No26 22 Apr 2019 to 28 Apr 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
Mon 12:00
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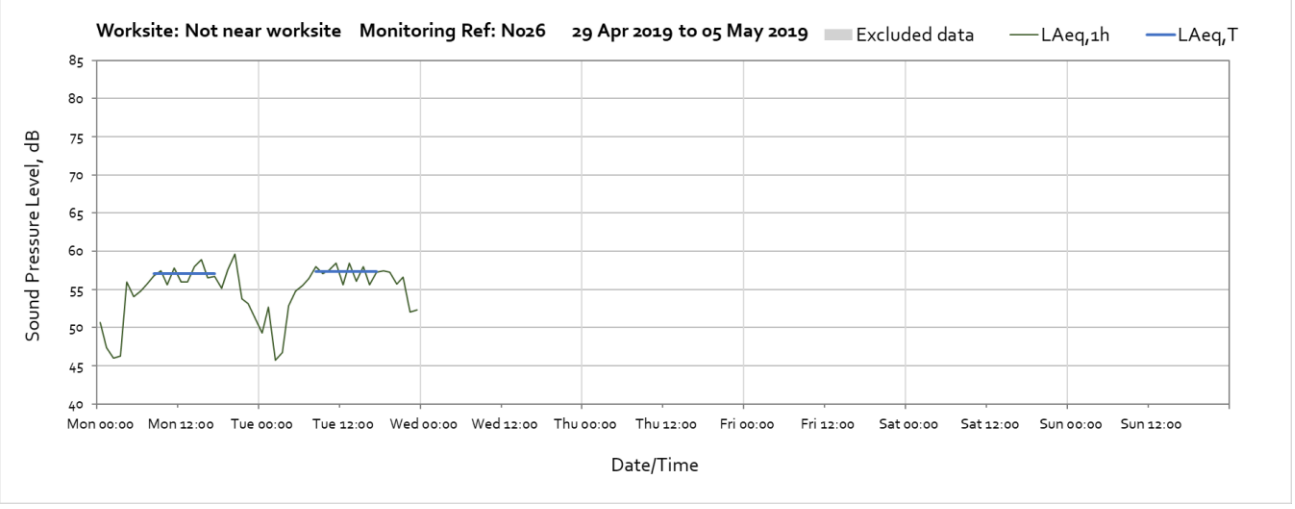
Date/Time


Worksite: Not near worksite Monitoring Ref: No26 29 Apr 2019 to 05 May 2019
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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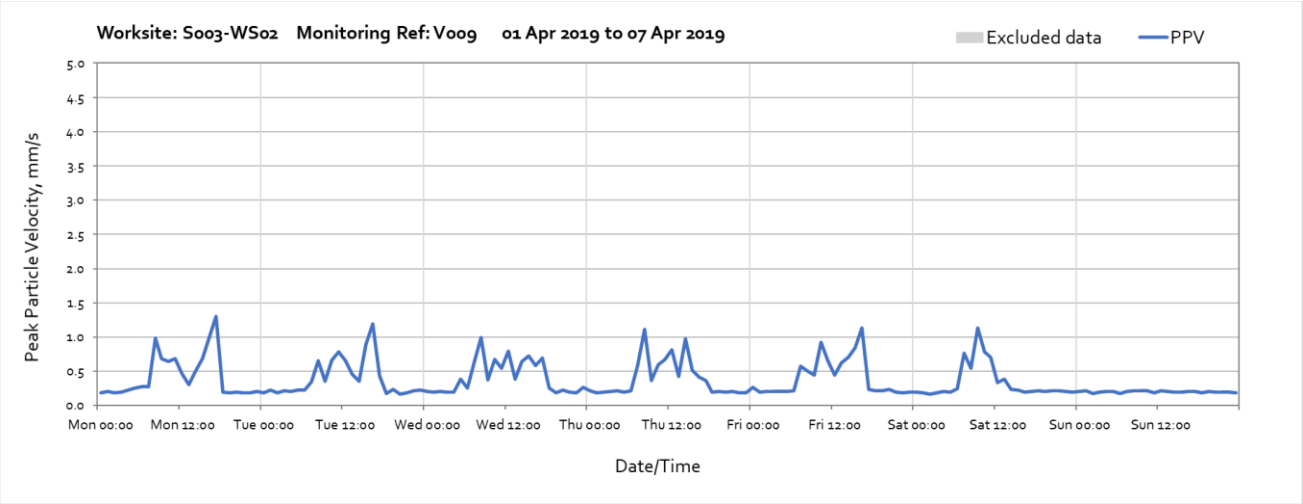
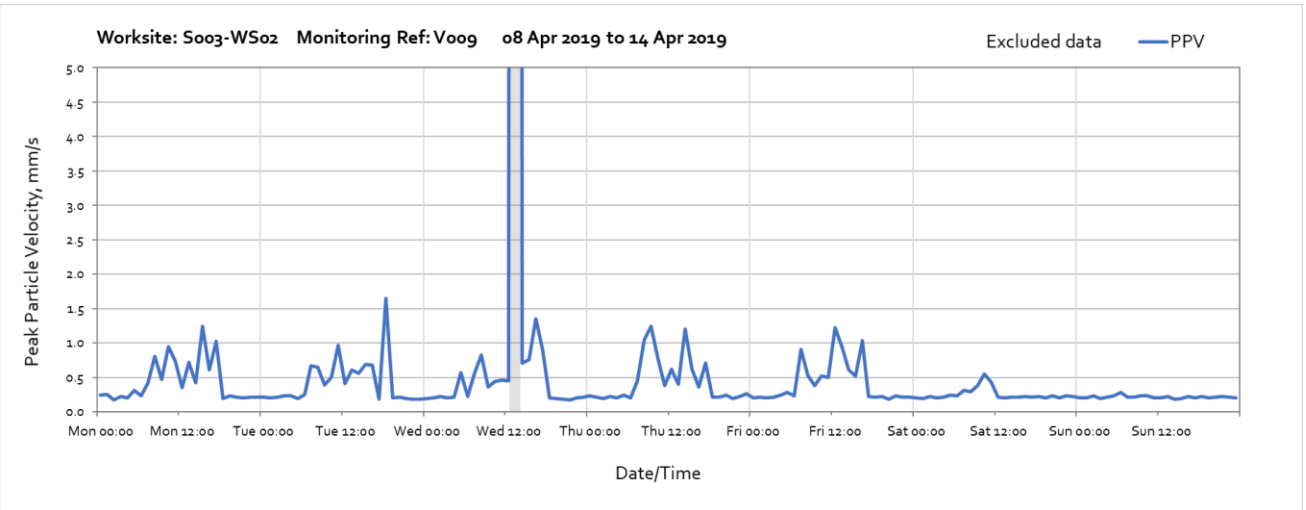
Date/Time

Vibration

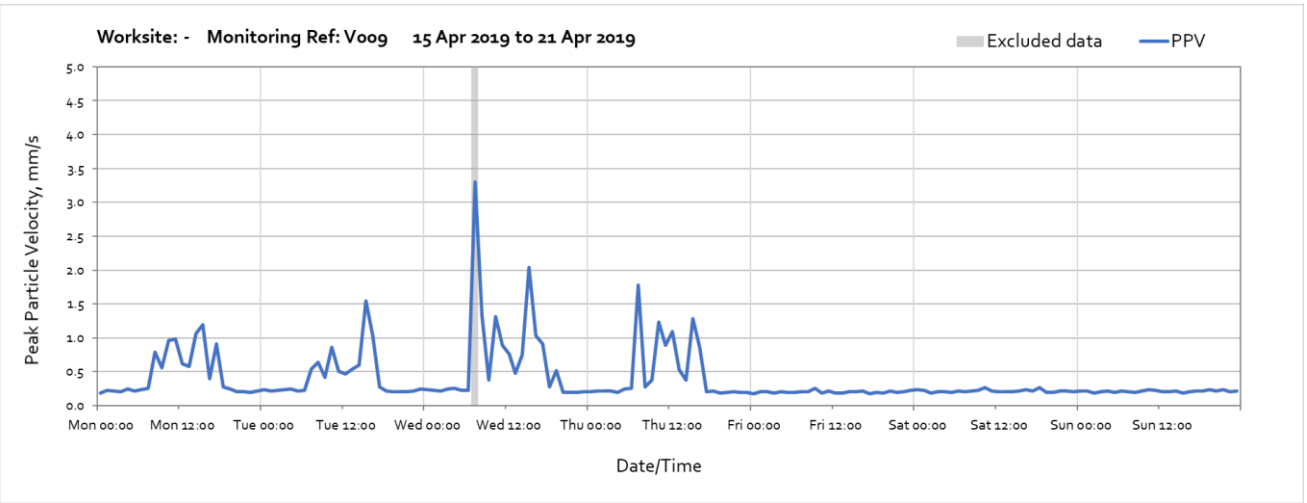
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the resultant PPV due to vibration components on three orthogonal axis x, y and z. High values of PPV were measured on occasions at V021. These were due to local interference with the vibration monitor and are not representative of HS2 construction works. These data entries have been greyed out in the following charts and have been excluded to calculate values in Table 6.

Worksite: S003-WS02 – Monitoring Ref: V009

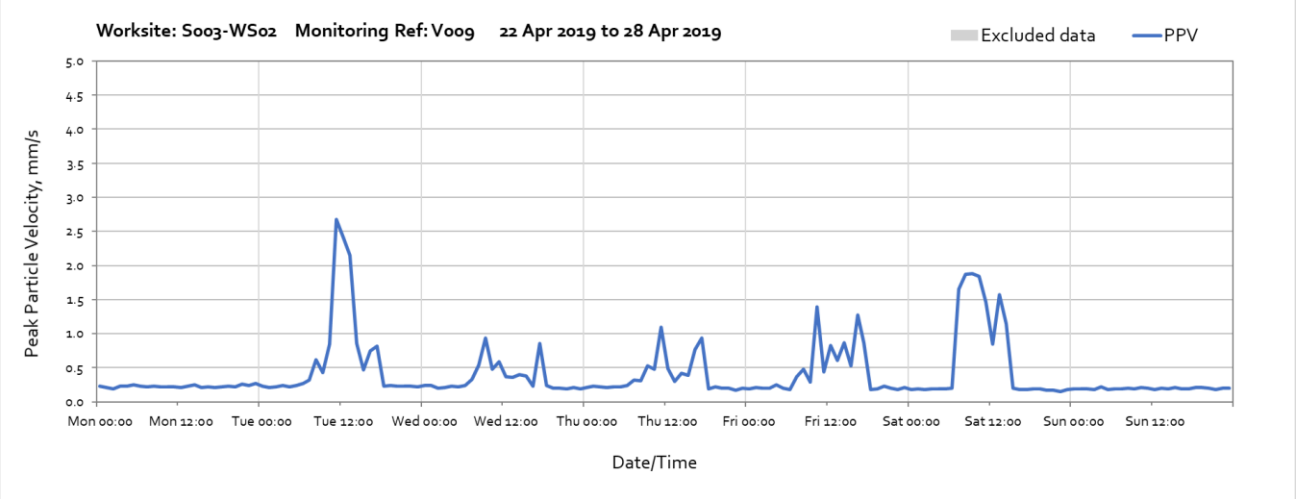


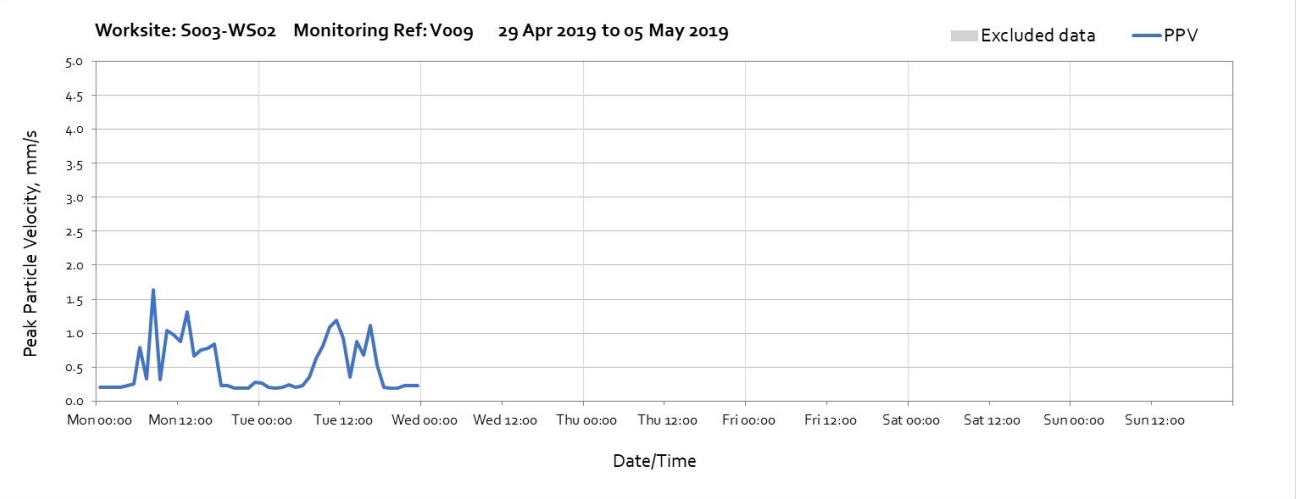


Note: High vibration levels at 12:00 on Thursday 10th of April were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

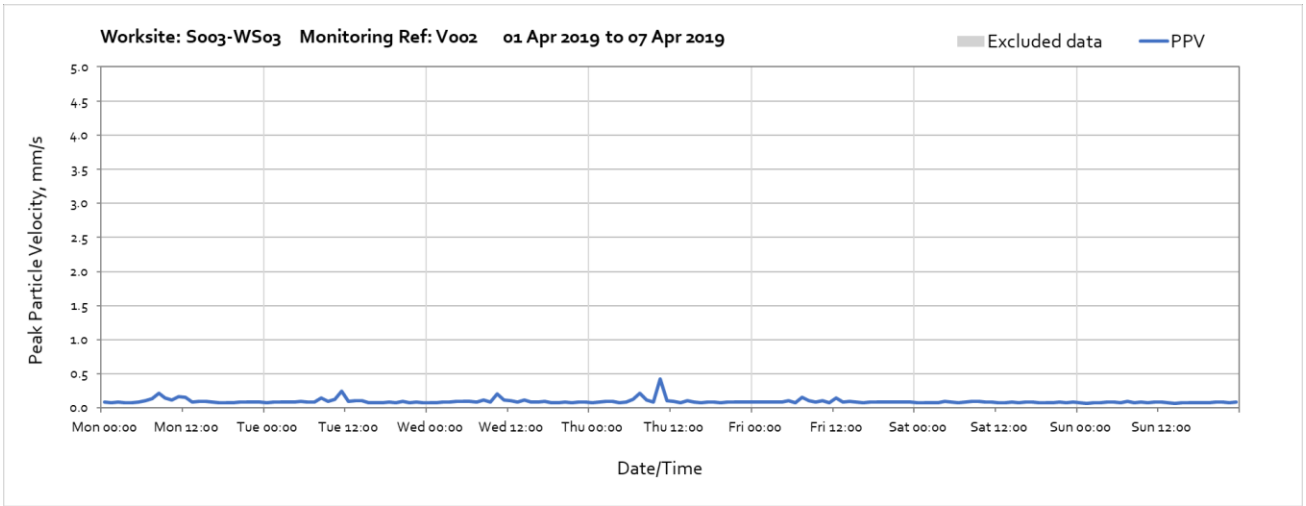


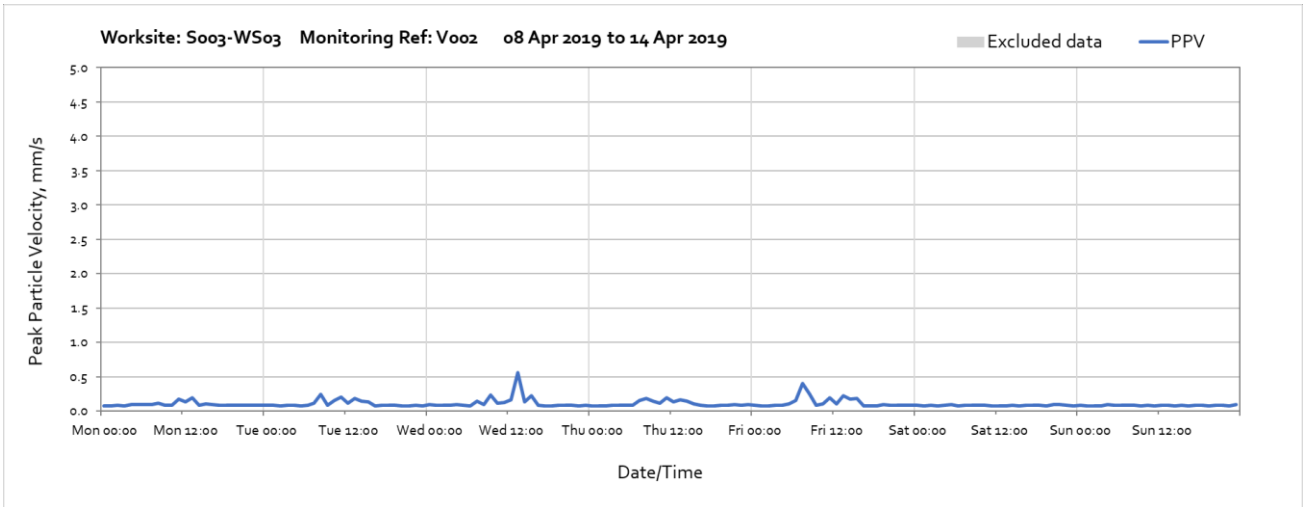
Note: High vibration levels at 07:00 on Wednesday 17th of April were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

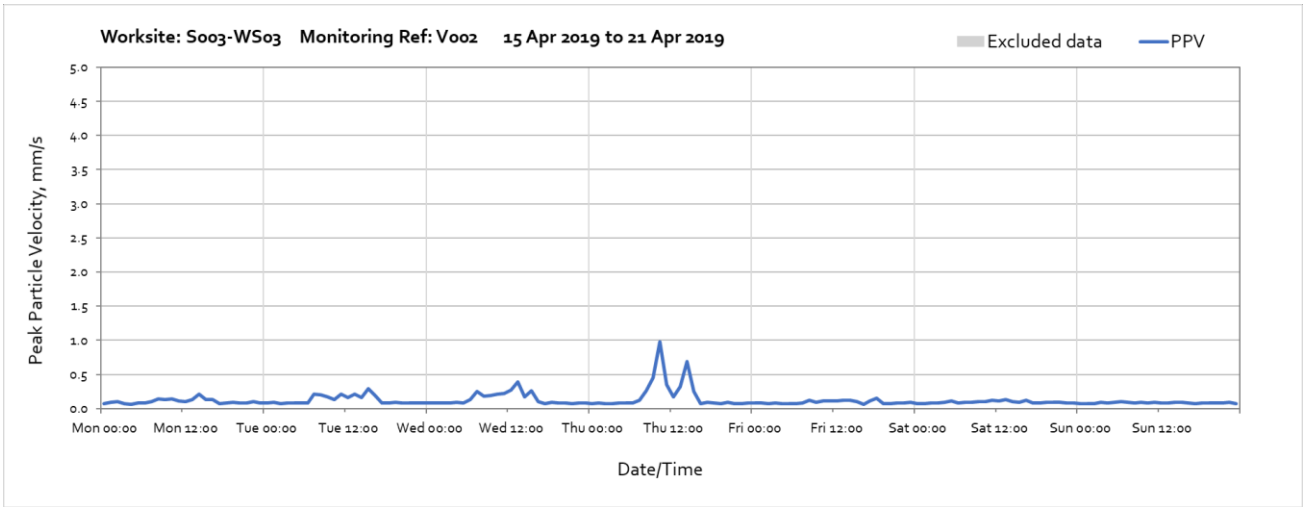


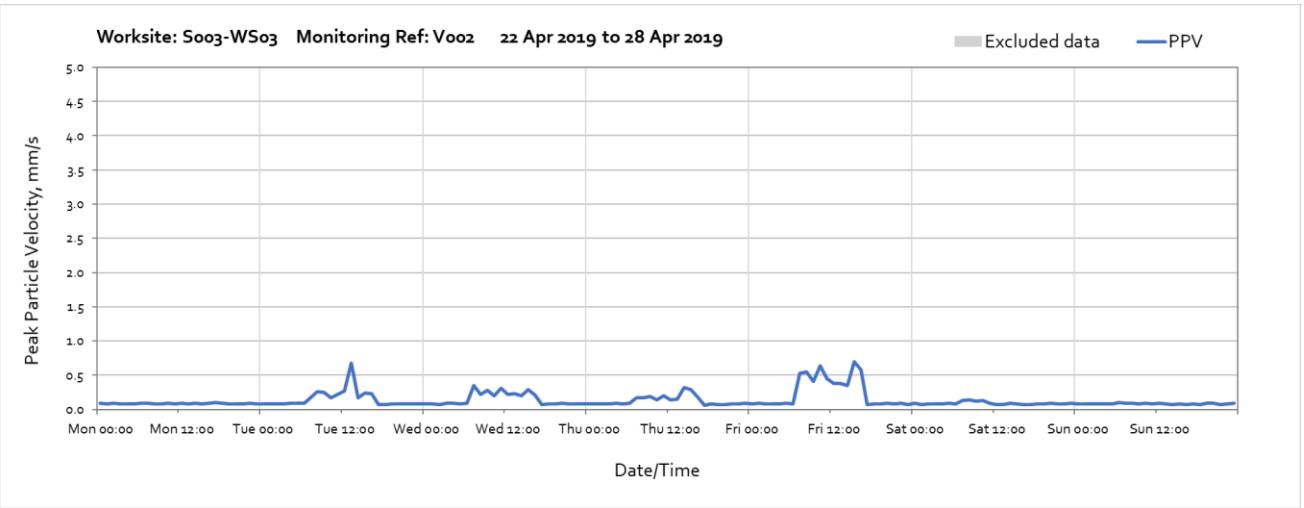


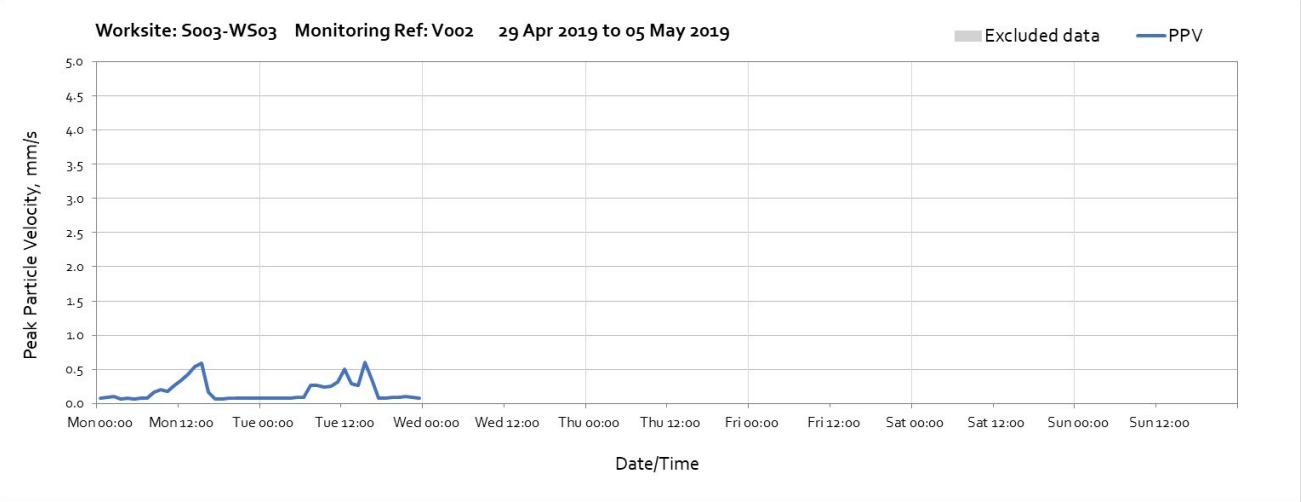
Worksite: S003-WS03 – Monitoring Ref: V002



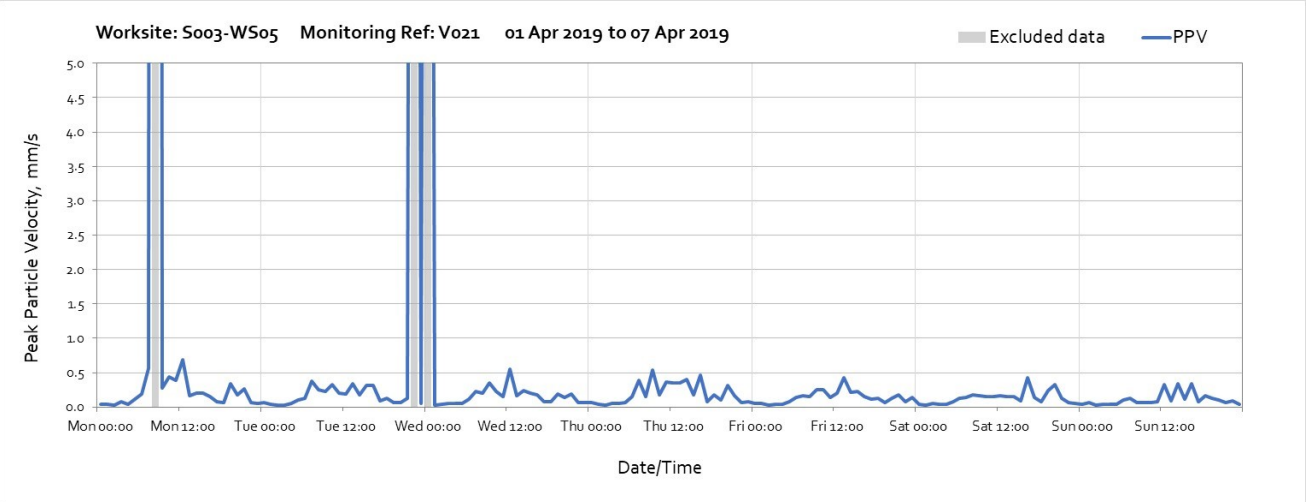




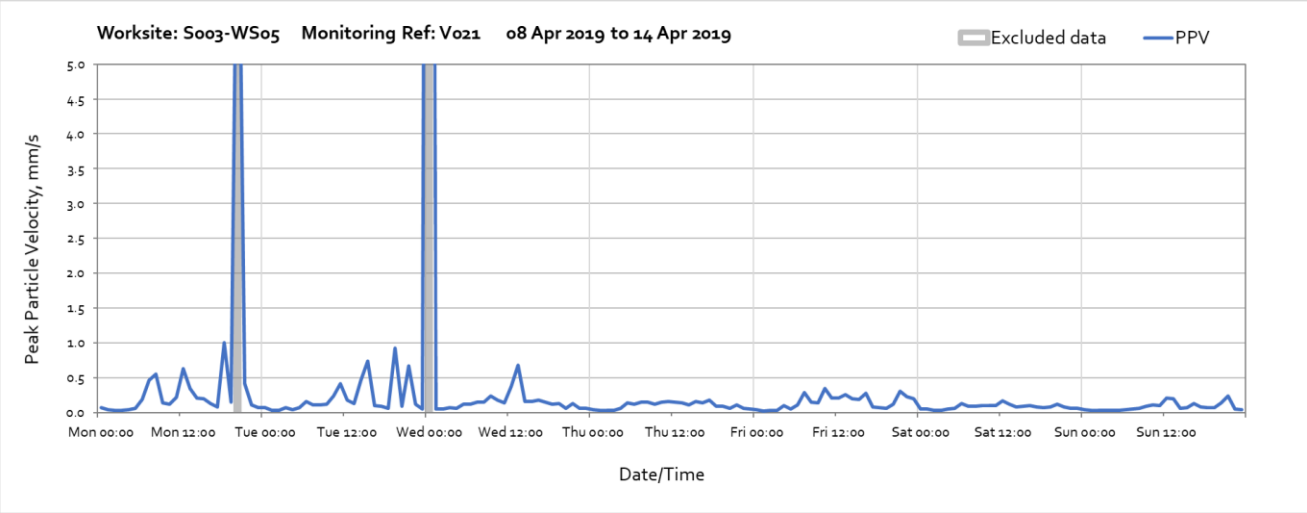




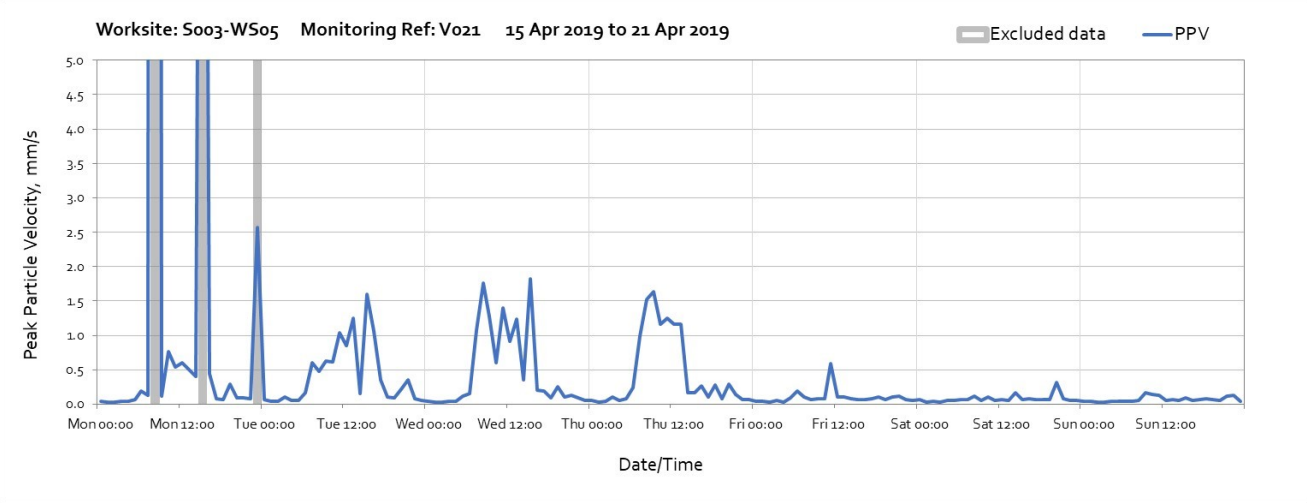
Worksite: S003-WS05 – Monitoring Ref: V021



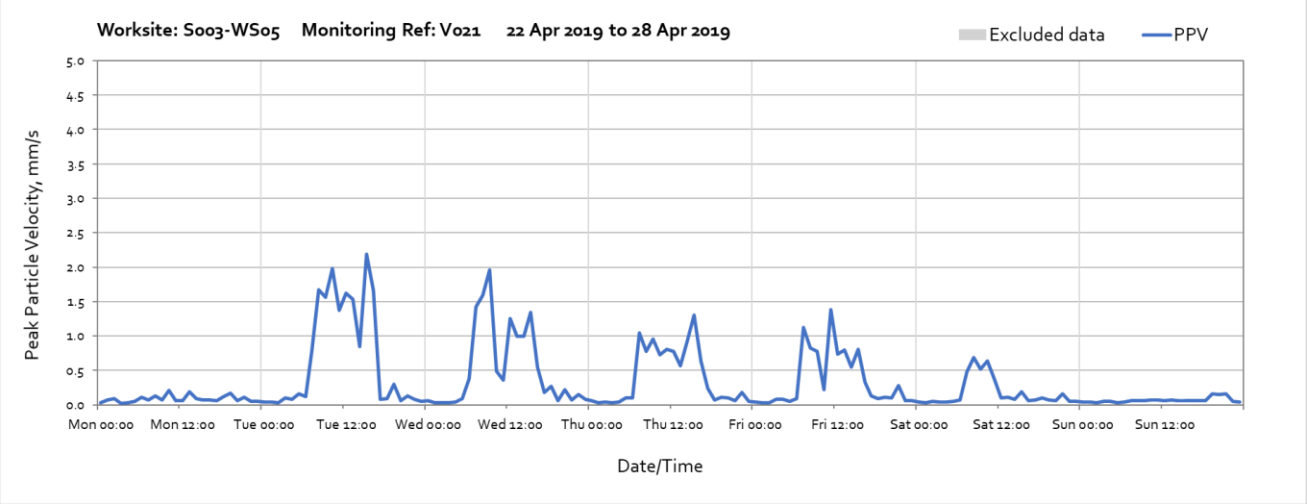
Note: High vibration levels at 08:00 on Monday 1st, at 22:00 on Tuesday 2nd and at 00:00 on Wednesday 3rd of April were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

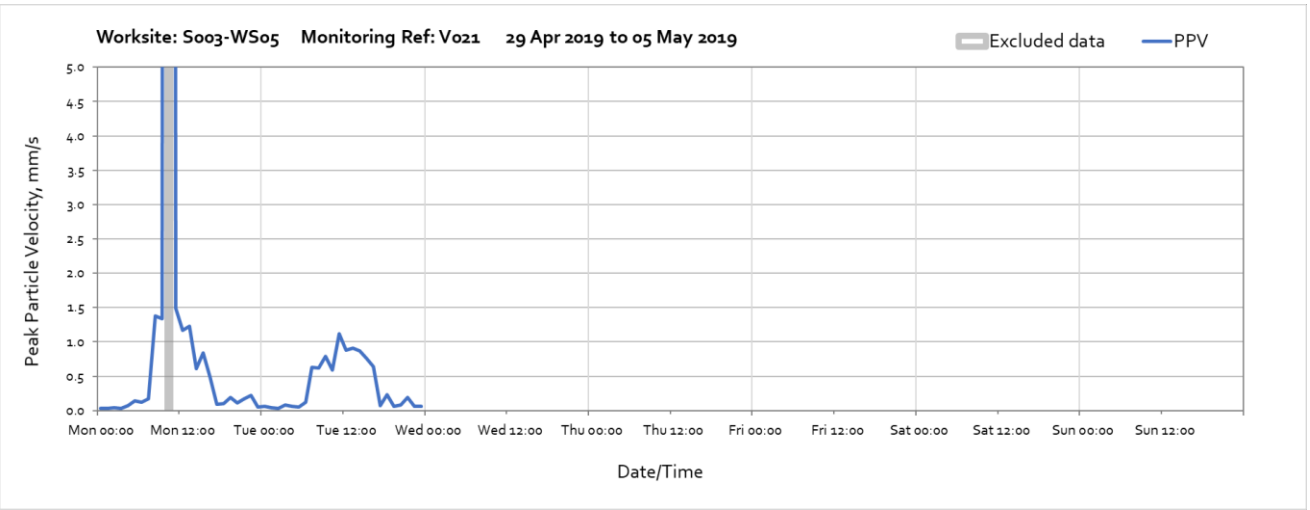


Note: High vibration levels at 20:00 on Monday 8th and 23:00 on Tuesday 9th of April were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.



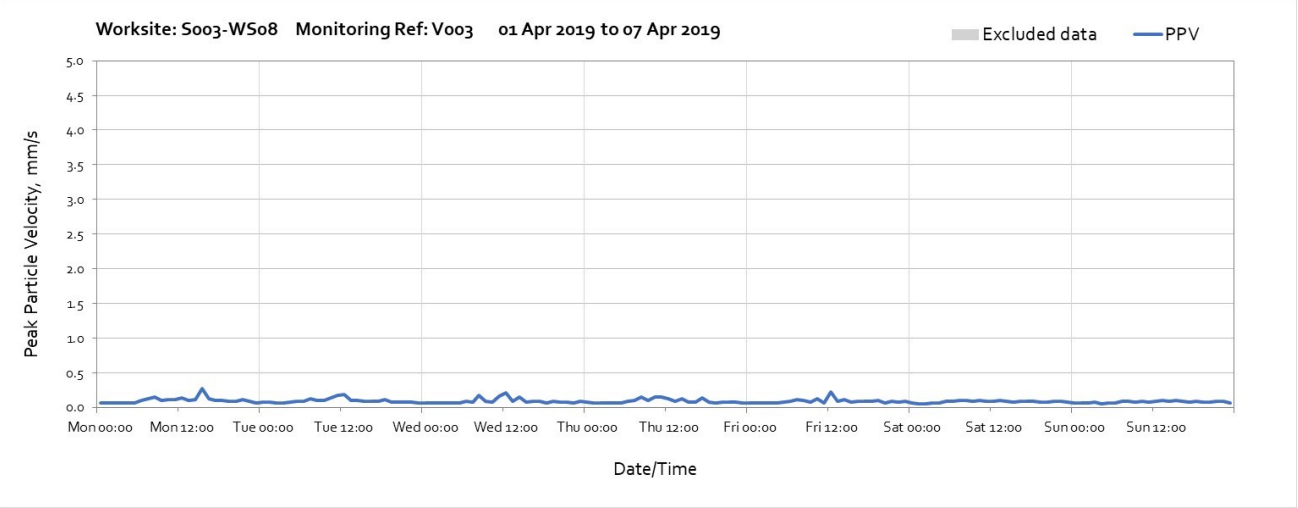
Note: High vibration levels at 08:00 and, 15:00 on Monday 15th and at 23:00 on Tuesday 16th of April were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

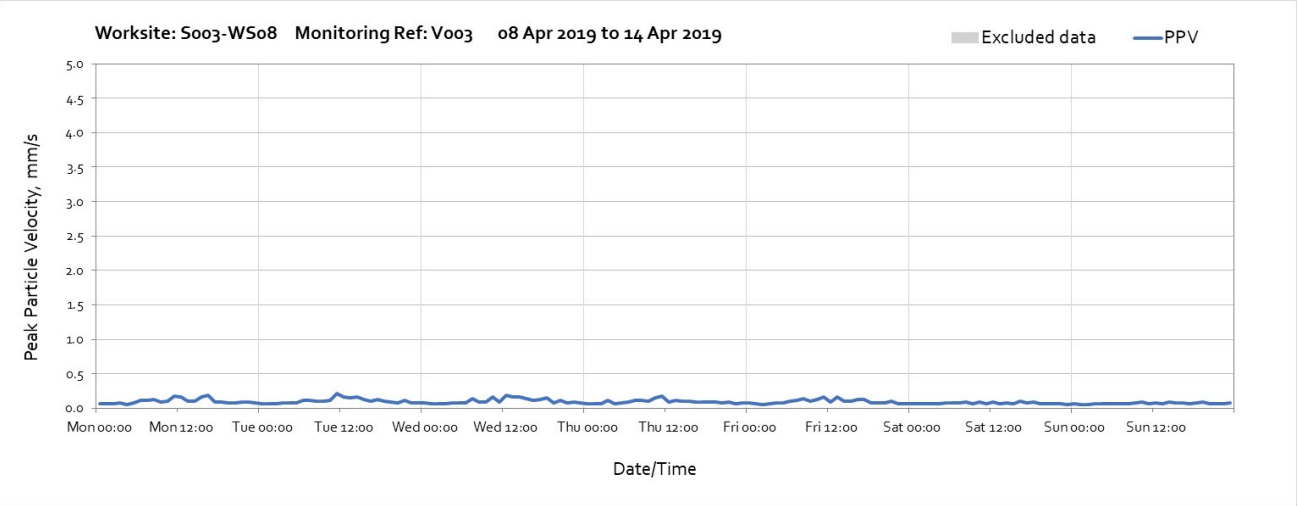


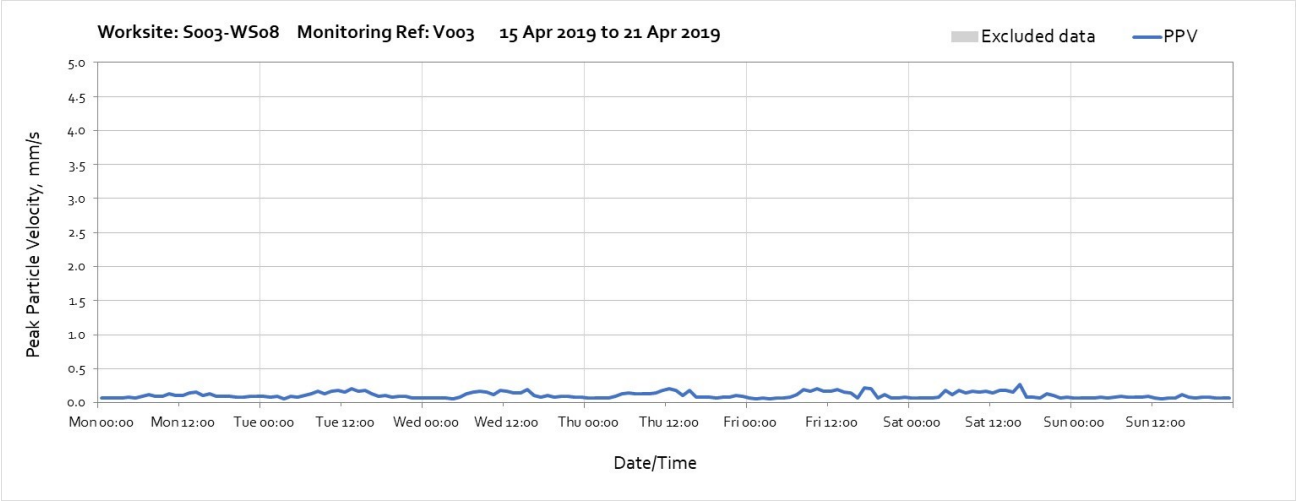


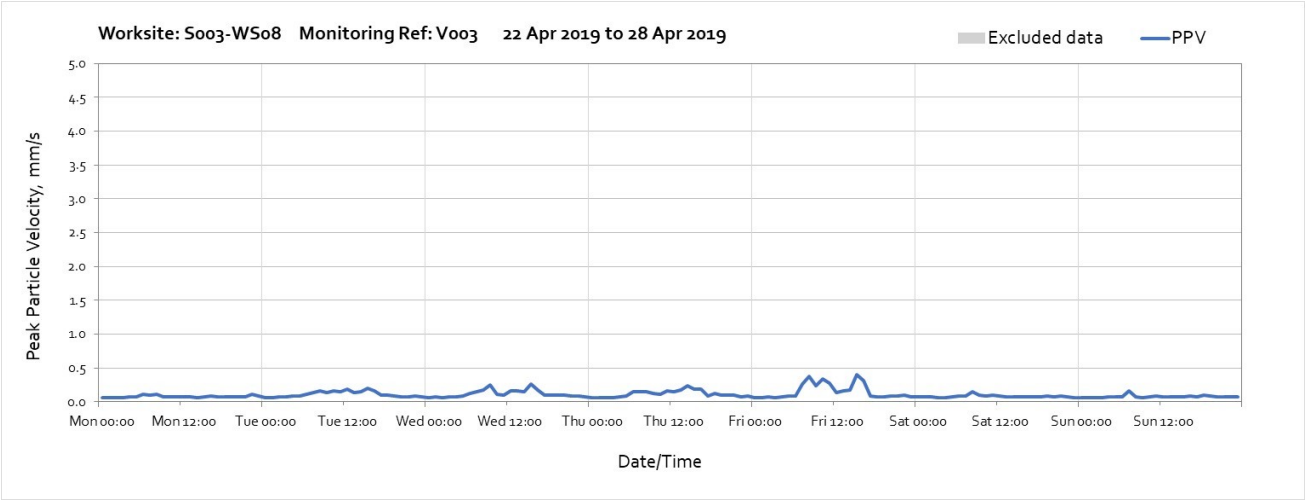
Note - High vibration levels at 10:00 on Monday 29th of April were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

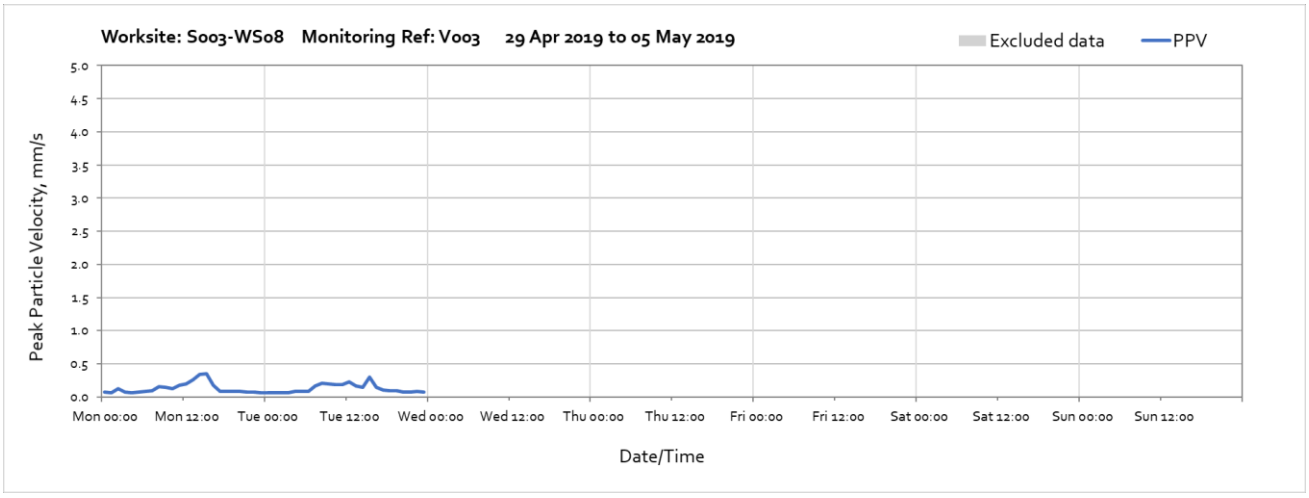
Worksite: S003-WS08 – Monitoring Ref: V003






Worksite: S003-WS08 Monitoring Ref: V003 15 Apr 2019 to 21 Apr 2019
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: S003-WS08 Monitoring Ref: V003 22 Apr 2019 to 28 Apr 2019
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: S003-WS08 Monitoring Ref: V003 29 Apr 2019 to 05 May 2019
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