

Construction noise and vibration Monthly Report – July 2018

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 July 2018.

A number of worksites were active during the reporting month in the LBC area. Demolition was undertaken at the DB Cargo worksite (ref. S001-WS01), along with site establishment works at the former Addison Lee site. Archaeological excavations, foundation construction and encapsulation of structures were underway at St James' Gardens worksite (ref. S003-WS01). Scaffolding and soft strip were underway at the former National Temperance Hospital, 110 Insull Wing worksite (ref. S003-WS02). Taxi ranks construction were undertaken at Euston Square Gardens (west) worksite (ref. S003-WS08). Pre-demolition surveys, hoarding and soft strip of buildings were carried out at Walkden House worksite (ref. S003-WS03), Drummond Street / Euston Street worksites (ref.: S003-WS07), the Thistle Hotel worksite (ref. S003-WS04) and the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05). Preparatory works were underway in the Camden Carriage Works area and machinery on and off track were active at Network Rail worksite B. Extension of the track, installation of buffer stop and construction of walk way were underway at Network Rail worksite C. Realignment of the track, renewal of points and piling were undertaken by the DB Cargo and in the west side clearance at Network Rail worksites D and E. Further non-intrusive activities were underway at other worksites around Euston Station (worksites ref. S001-WS02, S003-WS01, S003-WS06, S003-WS09). Details of works undertaken at each worksite is presented in the report.

Noise monitoring was undertaken in the vicinity of the DB Cargo worksite (ref.: S001-WS01), 132 and 140 Hampstead Road and Petrol Station worksite (ref.: S001-WS02), St James' Gardens worksite (ref.: S003-WS01), Walkden House worksite (ref.: S003-WS03), 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05), 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 Network Rail worksites B, C, D, E and F. Further noise monitoring installations were also installed at Regents Park Estate, in the vicinity of Regents Park Lorry Holding Area, at Edinboro Castle on Mornington Terrace and on Eversholt Street.

Exceedances of the SOAELs were measured at some monitoring positions surrounding worksites S001-WS01, B, C, D, E and F, which were caused by activities at on-network HS2 construction sites outside core working hours. No exceedances of S61 trigger levels due to HS2 related works were measured during the monitoring period. A number of complaints were received during the monitoring

period. These related to works being undertaken at the DB Cargo worksite, the former National Temperance Hospital worksite and at Network Rail worksite C. Description of the complaints, results of investigation and any action 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	Meaning
$L_{Aeq,T}$	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 $L_{pAeq,T}$	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.
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.
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.
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.
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.

Acronym	Meaning
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 31st July 2018.

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 preparatory works at the Camden Carriage Works area.
- Network Rail on-networks HS2 preparatory works: worksite ref. C (see plan 2 in Appendix A)
 - Works activities include extension to the siding, installation of buffer stop and the creation of a driver walk way.
- Network Rail on-networks HS2 preparatory works: worksite ref. D and E (see plan 2 in Appendix A)
 - Works activities include renewal of 2068B points, realignment of the track and piling.

- DB Cargo shed and adjacent land on Granby Terrace, worksite ref. S001-WS01 (see plan 2 in Appendix A)
 - Works activities include demolition. Works at the former Addison Lee site include scaffolding and ancillary activities.
- 132 and 140 Hampstead Road and Petrol Station, worksite ref. S001-WS02 (see plan 3 in Appendix A)
 - Works activities include pre-demolition surveys.
- St James' Gardens, worksite ref. S003-WS01 (see plan 3 in Appendix A)
 - Works activities include archaeological excavations, foundation construction and erection of encapsulation structures.
- National Temperance Hospital, Insull Wing, worksite ref. S003-WS02 (see 3 in Appendix A)
 - Works activities include scaffolding and soft strip.
- Walkden House, 67-75 & 77-79 Euston Rd, worksite ref. S003-WS03 (see plan 3 in Appendix A)
 - Works activities include pre-demolition surveys, hoarding and utilities disconnections.
- Thistle Hotel, Cardington Street, worksite ref. S003-WS04 (see plan 3 in Appendix A)
 - Works activities include pre-demolition surveys, soft strip and asbestos removal.
- Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street, worksite ref. S003-WS05 (see plan 3 in Appendix A)
 - Works activities include scaffolding and soft strip.
- 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 pre-demolition surveys and hoarding.
- Euston Square Gardens (west), worksite ref. S003-WS08 (see plan 3 in Appendix A)
 - Works activities include taxi rank construction.

- 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 hoarding.

1.1.3 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

www.gov.uk/government/publications/monitoring-noise-and-vibration-on-the-hs2-phase-one-route.

1.2 Measurement Locations

1.2.1 The following table summarises the position of noise monitoring installations within the LBC area in July 2018.

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

Table 2: Monitoring locations

Worksite Reference	Measurement Reference	Address
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)
S003-WS08	N007	Royal College of General Practitioners, Melton Street
S003-WS03	N008	Stephenson's Way lamppost (external to RCGP)
	N011	Euston Street lamppost #4 (external to 82 Euston Street)
S003-WS07	N012	Drummond Street lamppost #14 (opposite to 92-94 Drummond Street)
S003-WS05	N014	Starcross Street lamppost (external to Exmouth Arms)
S003-WS01	N015	Maria Fidelis School
S003-WS06	N017	Hampstead Road, Lamppost #48
S001-WS02	N018	Outside replacement housing, Hampstead Road
	N019	Outside Cartmel, Hampstead Road
Not near worksite	N020	Mackworth Street lamppost #1
Not near worksite	N021	Stanhope Street, Lamppost #2
Not near worksite	N025	External to #3 Prince Albert Road

Worksite Reference	Measurement Reference	Address
Not near worksite	N026	Thames Water Compound
B	JC	Juniper Crescent, London, NW1 8HA
C	N022	External to #34 Mornington Terrace
	N024	External to Park Village Studios, Park Village East
	EC	The Edinboro Castle, 57 Mornington Terrace, London, NW1 7RU
D	N004	Mornington Terrace lamppost #7 (junction of Mornington Terrace, Mornington Place and Clarkson Row)
	MT	13 Mornington Terrace, Kings Cross, London, NW1 7RR
E	GT	5A Granby Terrace, Kings Cross, London, NW1 3SA
F	N023	Amphill Estate lighting column #21, Hampstead Road
	BS	Roof of Stockbeck House, Barnby Street, Kings Cross, London, NW1 2RS
Not near worksite	HH	Euston Station Parcel Deck, Barnby Street, Euston, London, NW1 2RS

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 SOAEL.

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL ⁽¹⁾
S001-WS01	N001	DB Cargo shed and adjacent land on Granby Terrace	Night	2200-0700	1
			Sunday	0700-2200	1
	N002	DB Cargo shed and adjacent land on Granby Terrace	Night	2200-0700	5
			Sunday	0700-2200	1
	N003	DB Cargo shed and adjacent land on Granby Terrace	Night	2200-0700	1
S003-WS08	N007	Euston Square Gardens (west)	All days	All periods	No exceedance
S003-WS03	N008	Walkden House, 67-75 & 77-79 Euston Rd	All days	All periods	No exceedance
	N011	Walkden House, 67-75 & 77-79 Euston Rd	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-WS05	N014	Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street	All days	All periods	No exceedance
S003-WS01	N015	Maria Fidelis School	All days	All periods	No exceedance
S003-WS06	N017	Hampstead Road, Lampost #48	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
Not near worksite	N020	Mackworth Street lamppost #1	All days	All periods	No exceedance
Not near worksite	N021	Stanhope Street, Lampost #2	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
B	JC	Juniper Crescent	Night	2200-0700	8
			Sunday	0700-2200	1

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL ⁽¹⁾
C	N022	External to #34 Mornington Terrace	Night	2200-0700	4
			Sunday	0700-2200	2
	N024	External to Park Village Studios, Park Village East	Sunday	0700-2200	2
D	N004	Mornington Terrace lamppost #7 (junction of Mornington Terrace, Mornington Place and Clarkson Row)	Weekday	1900-2200	1
			Night	2200-0700	12
			Saturday	1400-2200	1
Sunday			0700-2200	2	
	MT	Mornington Terrace	Night	2200-0700	2
E	GT	Granby Terrace	Night	2200-0700	15
			Sunday	0700-2200	4
F	N023	Amphill Estate lighting column #21, Hampstead Road	Night	2200-0700	2
	BS	Barnby Street	All days	All periods	No exceedance
Not near worksite	HH	Euston Station Parcel Deck, Barnby Street, Euston, London, NW1 2RS	All days	All periods	No exceedance

2.1.4 Over the reporting period the SOAEL was exceeded at a number of measurement locations in the vicinity of worksites S001-WS01, B, C, D, E and F. These were caused by activities at Network Rail on-network HS2 construction sites mainly during night-time periods and during weekend days. Outside of these times any exceedances of the SOAEL were caused by the underlying ambient noise levels or other construction activities not related to HS2, rather than being attributable to HS2 construction noise.

2.1.5 For the purpose of assessing eligibility for noise insulation or temporary rehousing, multiple exceedances of the SOAEL in a 24-hour period would be counted as a single exceedance during that day. Over the reporting period, the overall number of SOAEL exceedances at each measurement location is

shown in Table 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	Site Address	Total of SOAEL exceedances in the month
S001-WS01	N001	DB Cargo shed and adjacent land on Granby Terrace	2
	N002	DB Cargo shed and adjacent land on Granby Terrace	6
	N003	DB Cargo shed and adjacent land on Granby Terrace	1
B	JC	Juniper Crescent	9
C	N022	External to #34 Mornington Terrace	4
	N024	External to Park Village Studios, Park Village East	2
	EC	The Edinboro Castle, 57 Mornington Terrace, London, NW1 7RU	15
D	N004	DB Cargo shed and adjacent land on Granby Terrace	12
	MT	Mornington Terrace	2
E	GT	Granby Terrace	14
F	N023	Amphill Estate lighting column #21, Hampstead Road	2

2.2 Summary of Measured Noise 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 Appendix C presents graphs of the noise monitoring data over the month for each of the measurement locations. Data presented includes 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). The full data set for the monitoring equipment can be found at the following location www.DATA.gov.uk.

2.2.3 Noise monitoring in the vicinity of worksites S001-WS01, S003-WS01, S003-WS08, B, C, D and E 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	Site 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
S001-WS01	N001	External to Cubitt Court, 100 Park Village East	Free-field	61.4 (63.7)	65.7 (68.7)	61.4 (71.0)	59.6 (70.8)	55.7 (70.9)	56.8 (57.6)	61.2 (63.3)	59.7 (60.5)	60.1 (66.8)	54.4 (58.9)	59.2 (66.9)	54.8 (60.0)
	N002	Richmond Court, Park Village East	Free-field	62.1 (64.6)	64.1 (69.6)	62.5 (69.7)	60.1 (65.5)	57.2 (70.2)	59.0 (61.4)	62.3 (63.6)	60.5 (61.8)	60.6 (63.9)	55.9 (59.6)	60.5 (67.8)	56.3 (63.3)
	N003	Silsoe House, Park Village East	Free-field	60.9 (61.9)	61.7 (63.2)	61.8 (70.0)	60.0 (64.7)	56.1 (65.0)	58.1 (58.7)	60.3 (61.7)	60.2 (60.7)	60.1 (62.0)	55.6 (60.0)	60.0 (64.8)	55.6 (61.0)
S003-WS08	N007	RCGP, Melton Street	Free-field	68.6 (70.3)	70.2 (71.5)	68.4 (73.1)	67.2 (69.9)	65.1 (71.8)	66.0 (66.4)	68.4 (69.2)	68.2 (68.5)	66.9 (71.0)	63.9 (69.3)	66.9 (70.8)	64.5 (70.2)
S003-WS03	N008	RCGP Stephenson Way	Free-field	63.5 (67.4)	62.6 (65.4)	58.5 (69.1)	57.3 (60.9)	59.2 (71.8)	58.1 (60.2)	58.1 (60.0)	55.6 (56.0)	57.1 (60.1)	55.1 (61.0)	56.7 (61.0)	57.5 (63.5)
	N011	Outside #82 Euston Street	Free-field	61.5 (65.9)	62.7 (66.6)	60.8 (63.1)	60.3 (68.5)	57.1 (65.4)	58.5 (59.6)	59.7 (61.4)	58.5 (59.5)	58.7 (63.5)	54.6 (58.1)	59.7 (68.6)	56.5 (61.1)
S003-WS07	N012	Opposite #92-94 Drummond Street	Free-field	59.4 (61.7)	63.5 (67.7)	60.3 (68.9)	59.6 (63.6)	56.7 (67.1)	57.7 (60.1)	60.7 (62.4)	59.8 (62.2)	59.7 (69.3)	55.9 (59.8)	59.0 (62.8)	55.4 (59.8)
S003-WS05	N014	Starcross Street	Free-field	53.6 (57.8)	59.6 (63.0)	60.1 (65.3)	61.2 (69.0)	53.9 (67.9)	55.9 (57.3)	56.5 (57.1)	57.1 (59.1)	57.5 (60.3)	51.1 (58.5)	55.0 (60.4)	50.5 (57.0)
S003-WS01	N015	Maria Fidelis School	Free-field	54.1 (55.6)	63.4 (66.0)	55.2 (64.5)	54.4 (61.4)	52.0 (60.1)	53.3 (55.9)	61.7 (65.9)	58.5 (62.0)	58.0 (67.5)	51.7 (56.6)	53.4 (60.9)	51.3 (55.3)
S003-WS06	N017	Hampstead Road, Lampost #48	Free-field	71.4 (73.5)	73.2 (77.3)	71.6 (73.8)	71.3 (77.4)	69.9 (74.8)	69.6 (71.3)	70.6 (72.1)	69.2 (71.1)	71.5 (77.0)	69.6 (73.3)	70.2 (75.7)	68.6 (74.7)

Worksite Reference	Measurement Reference	Site 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
S001-WS02	N018	Outside replacement housing, Hampstead Road	Free-field	71.7 (73.8)	73.3 (75.2)	72.7 (74.7)	71.9 (75.7)	70.5 (74.8)	70.5 (71.5)	71.5 (72.1)	70.6 (71.5)	71.7 (74.6)	70.8 (74.7)	71.3 (75.2)	69.6 (73.0)
	N019	Outside Cartmel, Hampstead Road	Free-field	70.1 (72.1)	71.0 (71.8)	70.9 (72.8)	70.3 (74.0)	69.3 (76.0)	69.4 (69.8)	69.8 (70.6)	68.9 (70.0)	70.1 (72.4)	69.3 (72.9)	70.0 (75.6)	68.6 (73.3)
-	N020	Mackworth Street	Free-field	51.1 (54.9)	55.5 (62.7)	55.6 (71.4)	52.5 (64.2)	48.1 (68.2)	49.6 (52.9)	51.3 (54.1)	53.3 (57.3)	53.1 (58.5)	47.5 (53.2)	51.0 (56.0)	47.6 (52.9)
-	N021	Stanhope Street, Lampost #2	Free-field	60.9 (70.4)	63.0 (65.1)	59.9 (61.9)	58.2 (66.3)	53.7 (69.0)	56.0 (59.9)	59.0 (61.1)	60.0 (63.0)	61.1 (72.0)	52.9 (57.2)	57.6 (62.7)	52.9 (59.3)
-	N025	External to #3 Prince Albert Road	Free-field	67.4 (71.2)	67.7 (68.9)	66.6 (70.2)	65.6 (70.2)	64.0 (71.3)	65.0 (65.3)	66.2 (68.2)	67.3 (72.3)	66.8 (71.0)	64.3 (68.3)	65.7 (72.9)	62.8 (67.1)
-	N026	Thames Water Compound	Free-field	56.8 (59.5)	58.3 (61.3)	56.5 (60.5)	55.7 (60.6)	52.7 (62.6)	56.9 (60.4)	56.2 (58.9)	57.0 (60.8)	56.4 (61.7)	52.1 (56.8)	55.3 (60.8)	51.1 (55.3)
B	JC	Juniper Crescent, London, NW1 8HA	Free-field	69.1 (70.5)	68.4 (70.0)	68.8 (70.5)	67.9 (70.0)	64.2 (75.1)	68.2 (69.3)	67.6 (68.1)	66.7 (67.0)	67.6 (69.9)	65.1 (76.9)	65.9 (70.7)	64.4 (71.8)
C	N022	External to #34 Mornington Terrace	Free-field	58.9 (60.5)	60.2 (64.7)	60.2 (61.9)	59.0 (61.2)	54.4 (59.9)	58.9 (60.2)	59.2 (60.6)	59.3 (61.1)	58.9 (62.2)	56.6 (66.9)	59.8 (65.9)	54.2 (59.0)
	N024	External to Park Village Studios, Park Village East	Free-field	62.4 (65.7)	63.2 (67.6)	63.2 (70.9)	60.9 (67.3)	57.8 (70.5)	59.6 (60.3)	62.0 (65.5)	60.8 (63.5)	61.6 (69.5)	56.9 (64.0)	60.7 (66.0)	56.8 (62.5)
	EC	The Edinboro Castle, 57 Mornington Terrace, London, NW1 7RU	Free field	66.1 (67.2)	65.8 (67.3)	68.3 (73.4)	69.7 (75.2)	62.0 (71.4)	66.1 (66.8)	65.1 (66.6)	65.3 (67.4)	69.4 (74.9)	59.2 (67.4)	65.9 (70.1)	61.4 (66.8)
D	N004	Junction of Mornington Terrace and Clarkson Row	Free-field	64.2 (66.9)	64.9 (66.1)	64.6 (66.0)	64.3 (68.5)	61.4 (70.5)	63.9 (66.8)	64.1 (64.7)	63.1 (63.3)	64.3 (70.5)	59.9 (70.7)	64.7 (74.5)	62.1 (71.6)

Worksite Reference	Measurement Reference	Site 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
	MT	13 Mornington Terrace, Kings Cross, London, NW1 7RR	Free-field	55.5 (57.8)	58.5 (61.7)	58.4 (59.8)	56.8 (60.7)	51.4 (59.3)	55.7 (57.3)	57.1 (58.9)	57.8 (60.1)	57.1 (60.9)	53.2 (56.6)	56.9 (62.3)	50.9 (54.8)
E	GT	5A Granby Terrace, Kings Cross, London, NW1 3SA	Free-field	70.5 (73.5)	70.1 (71.9)	70.1 (72.5)	68.9 (71.0)	66.3 (70.7)	68.8 (69.4)	70.6 (71.3)	69.6 (72.2)	68.7 (71.0)	63.8 (68.2)	68.4 (78.6)	66.3 (71.3)
F	N023	Amphill Estate, Hampstead Road	Free-field	71.6 (74.0)	70.4 (71.1)	70.0 (72.4)	69.5 (73.2)	67.9 (72.8)	68.8 (69.3)	69.8 (70.9)	68.7 (69.6)	69.6 (73.2)	68.0 (71.7)	69.2 (72.0)	67.5 (72.9)
	BS	Roof of Stockbeck House, Barnby Street, Kings Cross, London, NW1 2RS	Free-field	61.8 (64.8)	64.5 (65.9)	62.4 (64.5)	62.2 (65.5)	58.7 (68.2)	61.6 (62.2)	64.0 (67.2)	63.6 (68.3)	61.5 (64.2)	57.0 (62.5)	60.4 (64.2)	58.9 (64.6)
-	HH	Euston Station Parcel Deck, Barnby Street, Euston, London, NW1 2RS	Free-field	64.0 (66.9)	65.0 (68.0)	63.7 (67.9)	63.8 (70.1)	60.0 (72.1)	64.3 (67.3)	63.2 (64.1)	62.0 (63.3)	63.8 (70.9)	60.8 (66.3)	62.5 (68.1)	60.0 (65.6)

2.3 Exceedances of Trigger Level

2.3.1 Table 6 provides a summary of exceedances of the S61 trigger noise levels determined to be due to HS2 related construction measured during the reporting period, along with the findings of any investigation.

Table 6: Summary of exceedances of trigger levels.

Complaint reference number (if applicable)	Worksite reference	Date and time period	Identified Source	Results of investigation (including noise monitoring results)	Actions taken
-	-	-	-	-	-

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

2.4 Complaints

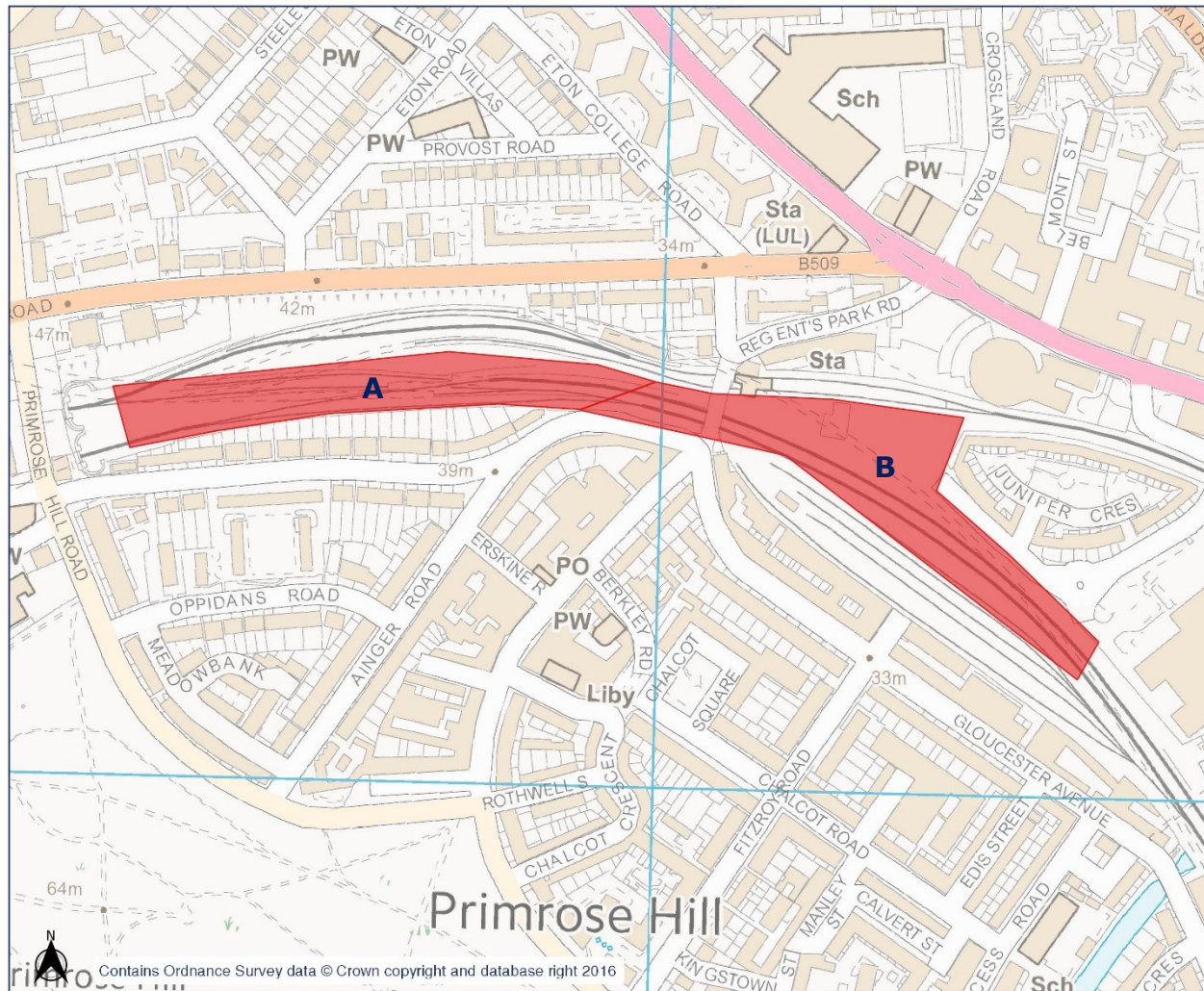
2.4.1 Table 7 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

Table 7: Summary of complaints.

Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
-	S003-WS02	Complaint from non-residential premises regarding scaffolding and behaviour of site operatives.	Scaffolding works taking place in close proximity to receptor.	Site operatives briefed on sensitivities, BPM and conduct.
-	S003-WS02	Complaint from non-residential premises regarding scaffolding.	Scaffolding works taking place in close proximity to receptor.	Methodology altered to avoid use of powered torque wrenches and respite/scheduling of works to be agreed.
-	S001-WS01	Complaint to LB Camden regarding alarm/siren during night time.	Nothing reported by security or alarm dashboard associated with HS2 construction site.	None.
-	-	Complaint regarding drilling works taking place on Hampstead Rd.	UKPN emergency works to repair HV cable - unrelated to HS2. No acoustic screening	None.

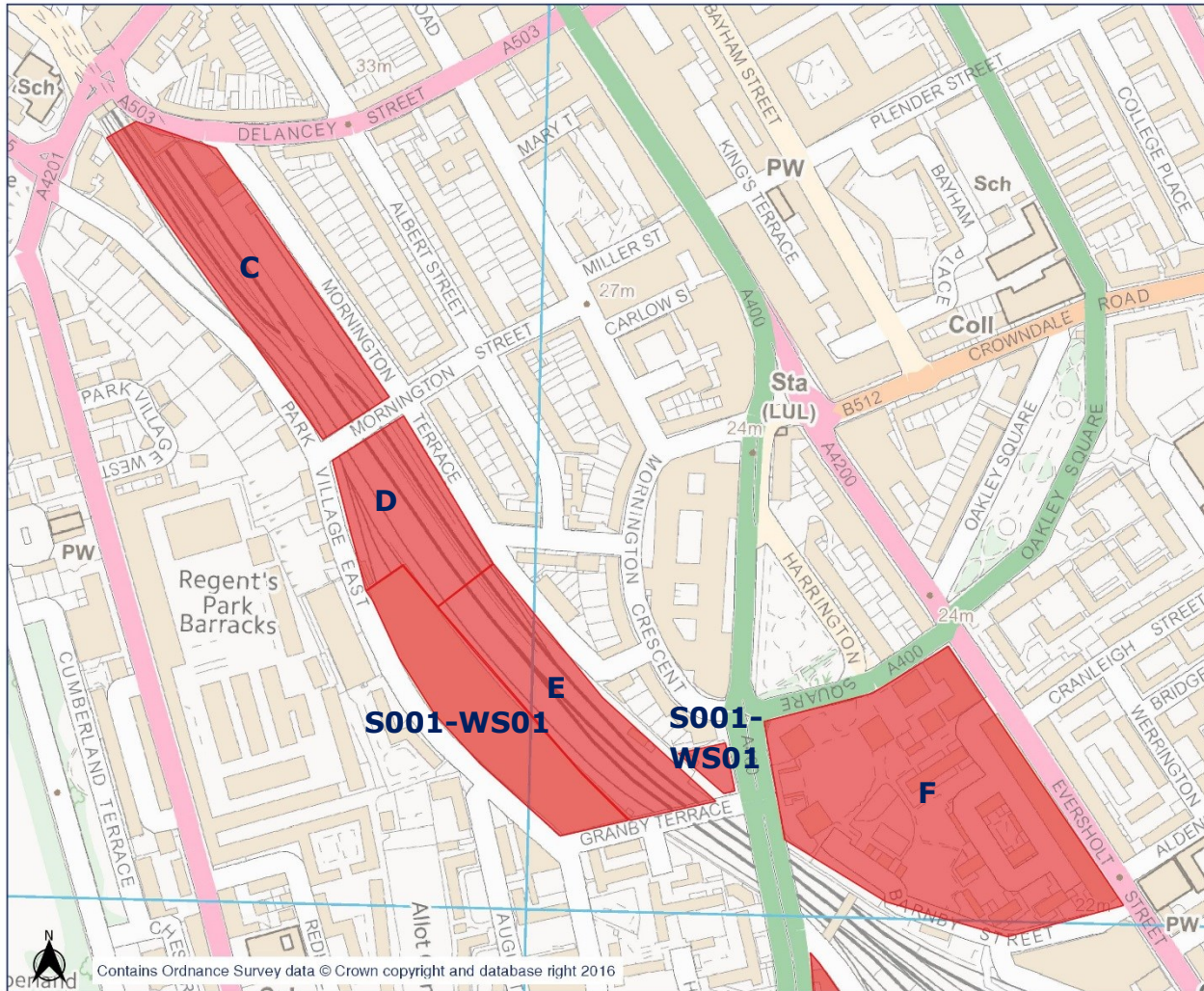
			being employed around excavation.	
-	S001-WS01	Complaint to LB Camden regarding alarm / siren during night time	Air monitor within the site developed a fault, causing an alarm to be raised.	Fault rectified.
-	C	Several complaints regarding noise and dust from NR works in cutting	Network Rail up sidings re-ballasting activities	All ballast works stopped and incident review undertaken.
-	C	Complaint about noise from cutting, and complicated notification letters from NR.	Network Rail up siding activities. Works undertaken in line with S61 consent	Response provided outlining the activities being undertaken and the reasons for the work. HS2 will liaise with Network Rail to endeavour to make notification letters clearer.
-	S001-WS01	Complaint about noise from generator in cutting.	Generator operation as per S61 consent and housed in an acoustic enclosure. Attended monitoring undertaken - results indicate no exceedance of LOAEL or S61 predictions.	Permanent electrical connection being expedited.
-	C	Complaint about noise from cutting over the weekend.	Network Rail up siding activities. Works undertaken in line with S61 consent	None.
-	C	Complaint about alarm going off on track behind property	No works being undertaken at time of complaint. On site investigation undertaken but source could not be identified. Concluded alarm was not due to Network Rail.	Response explaining the alarm was not due to their works issued.
-	C	Noise disturbance	Network Rail undertaking enabling works in the Camden Cutting. Works undertaken in line with S61 consent	None.

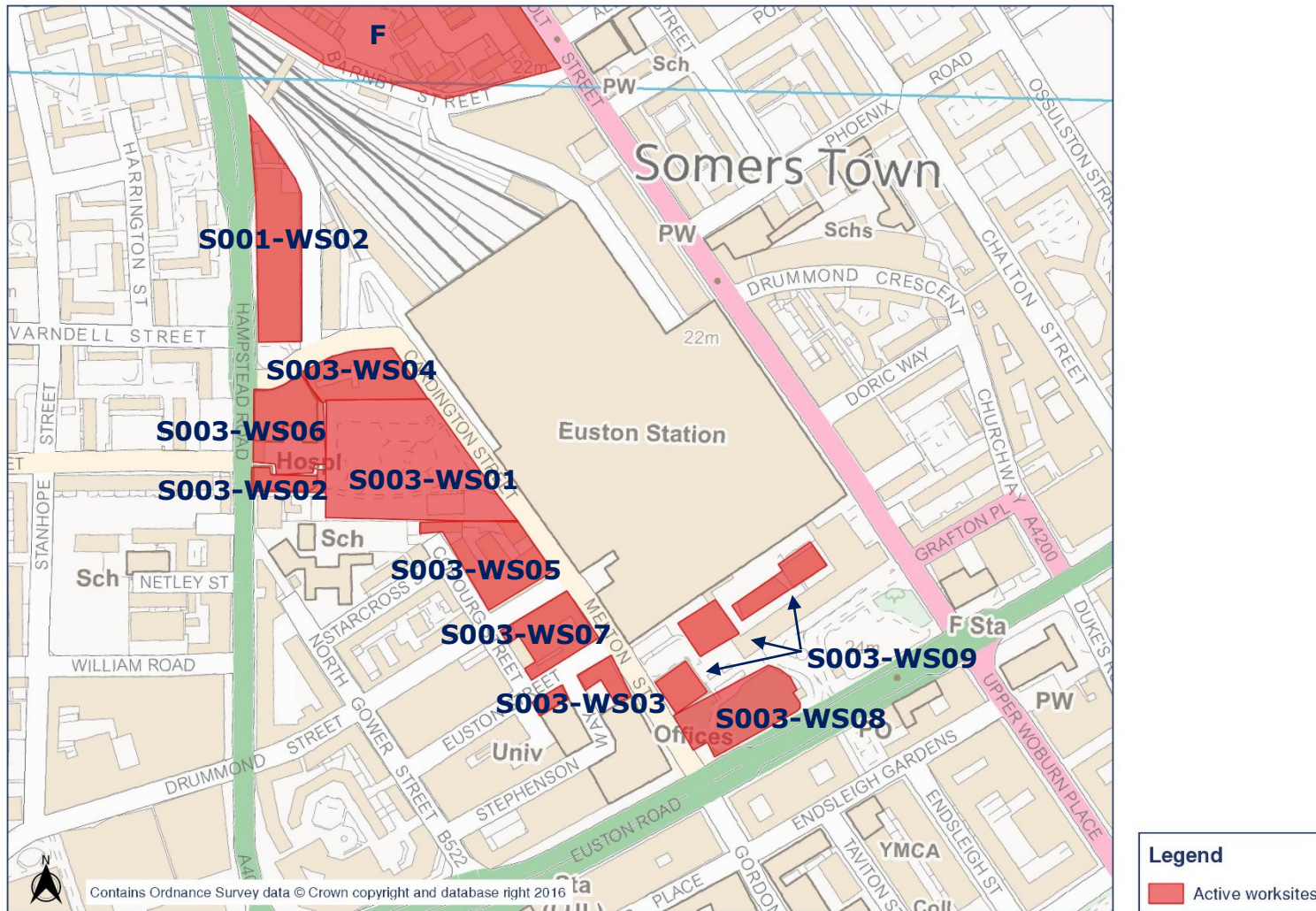
Appendix A Site Locations



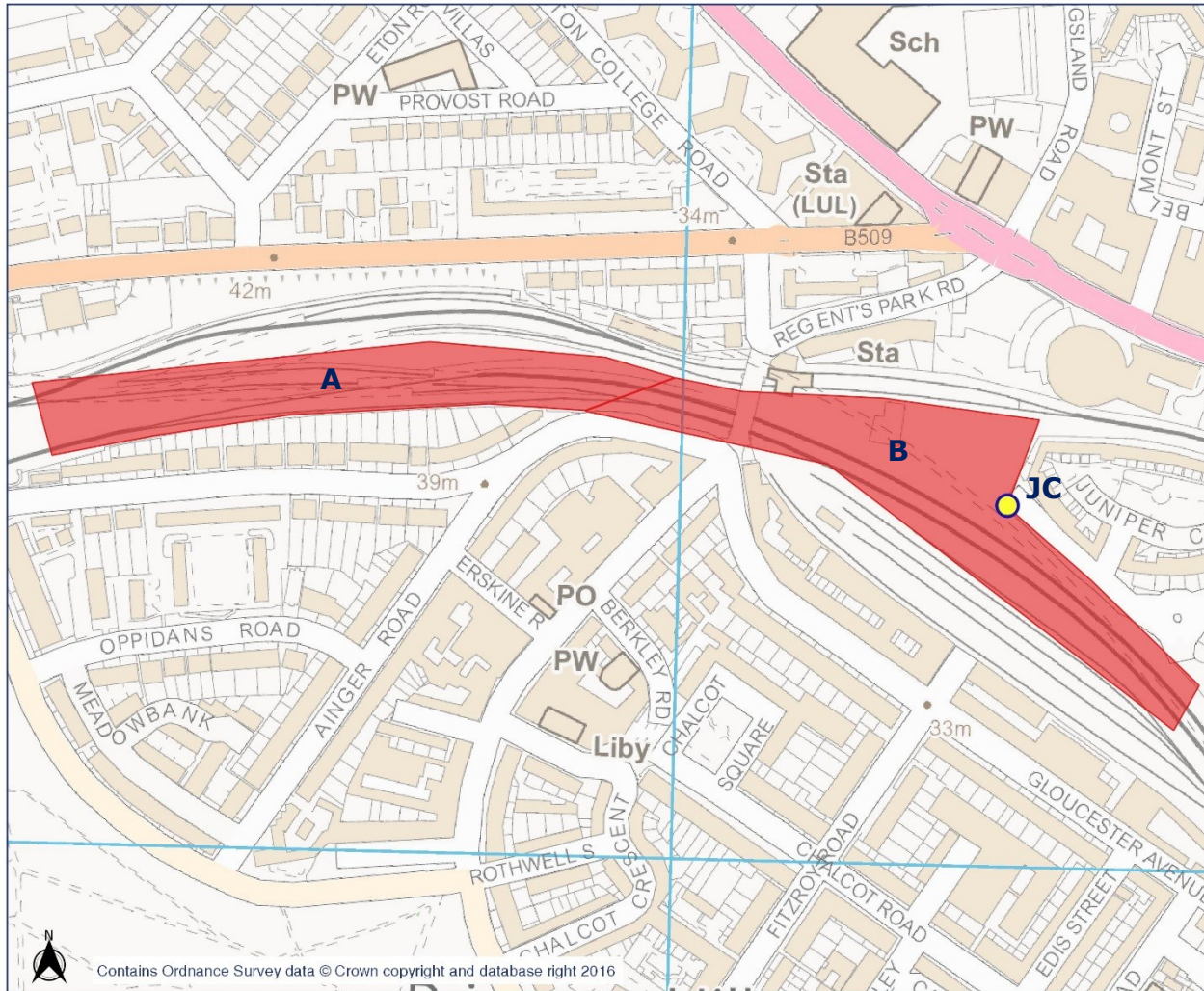
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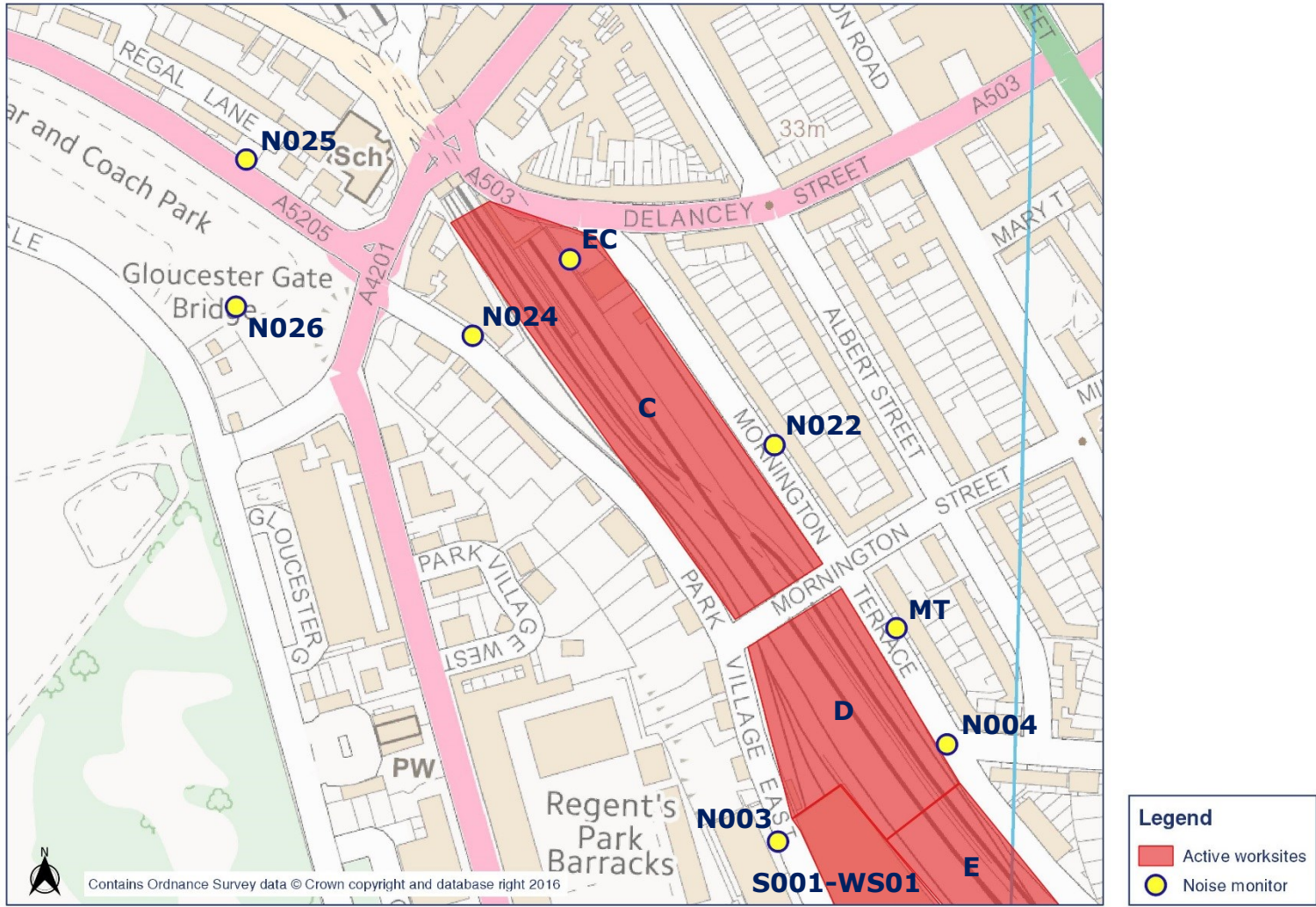
- Active worksites

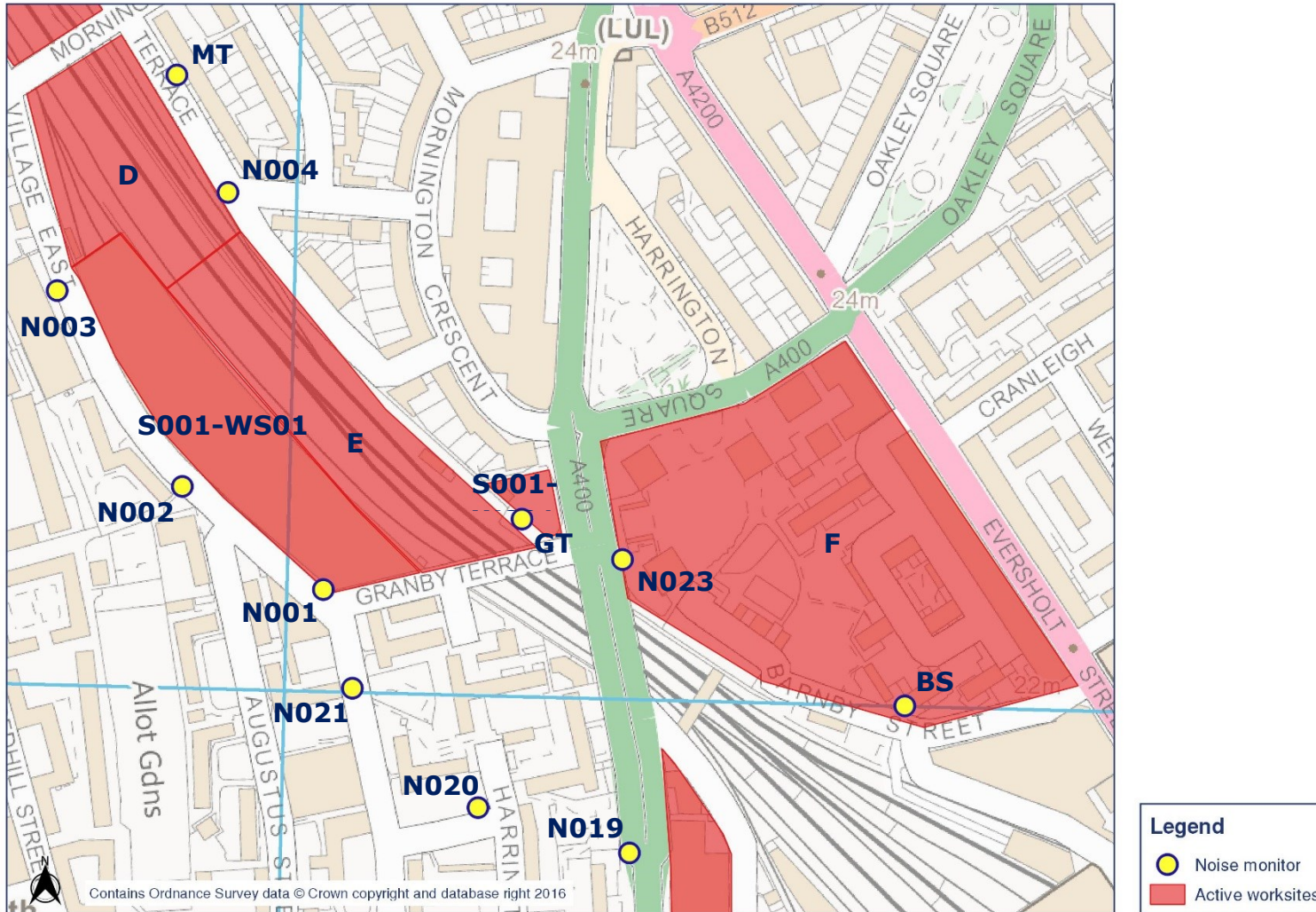


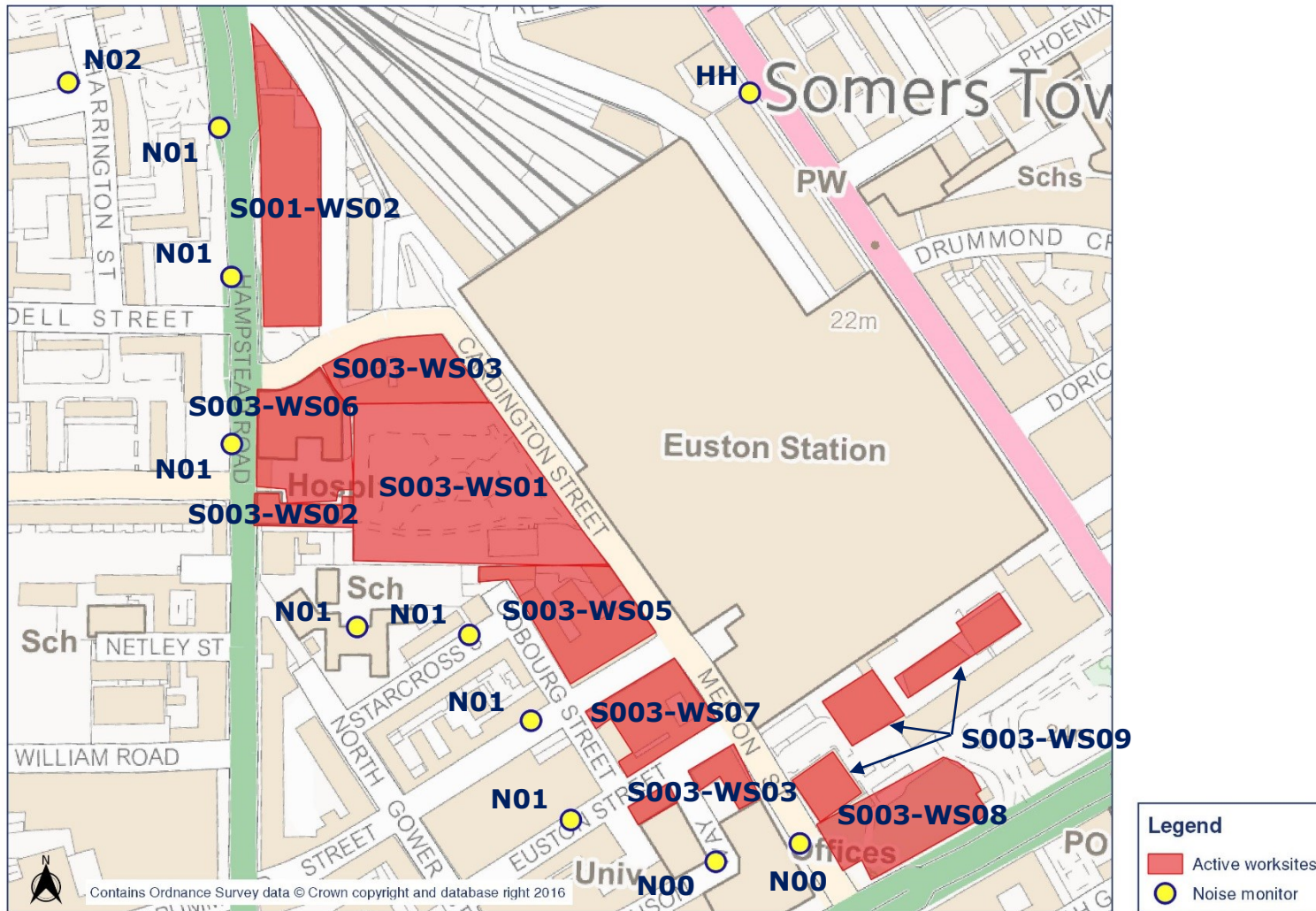


Appendix B Monitoring Locations





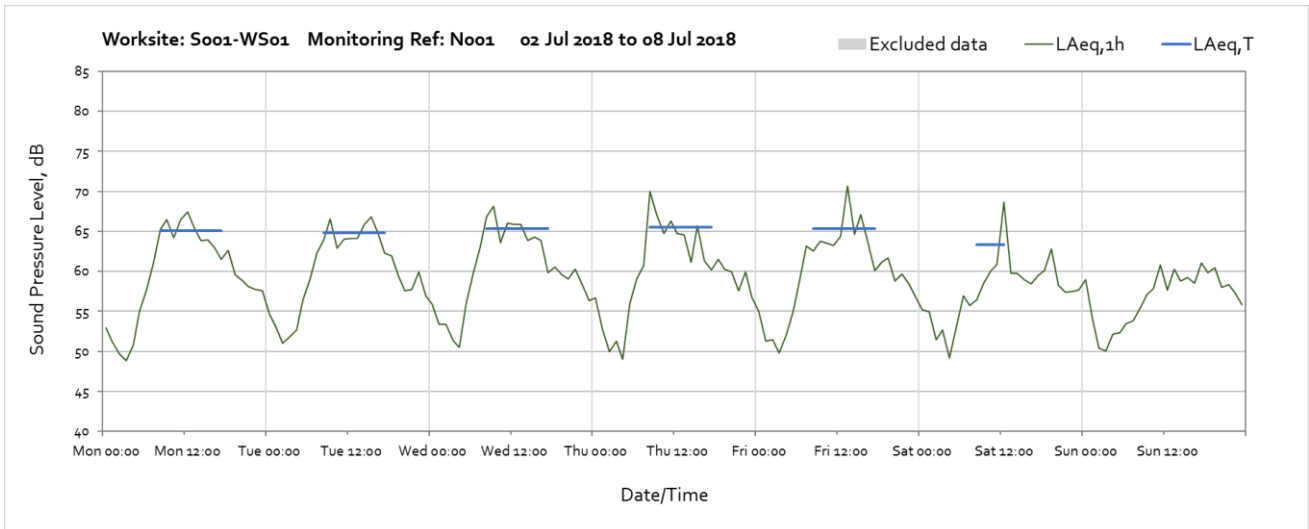
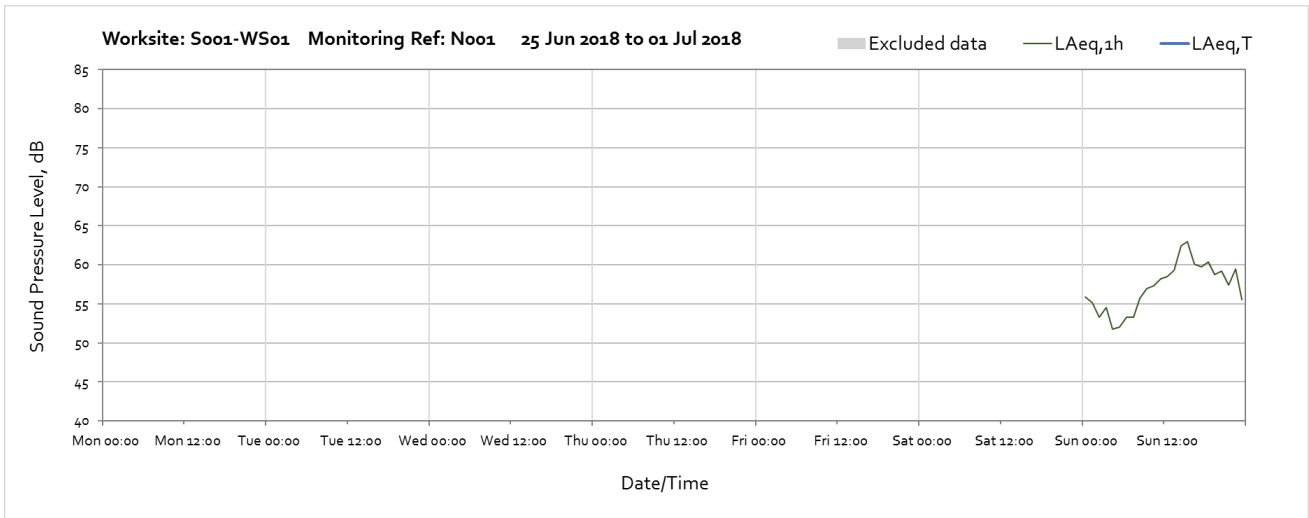


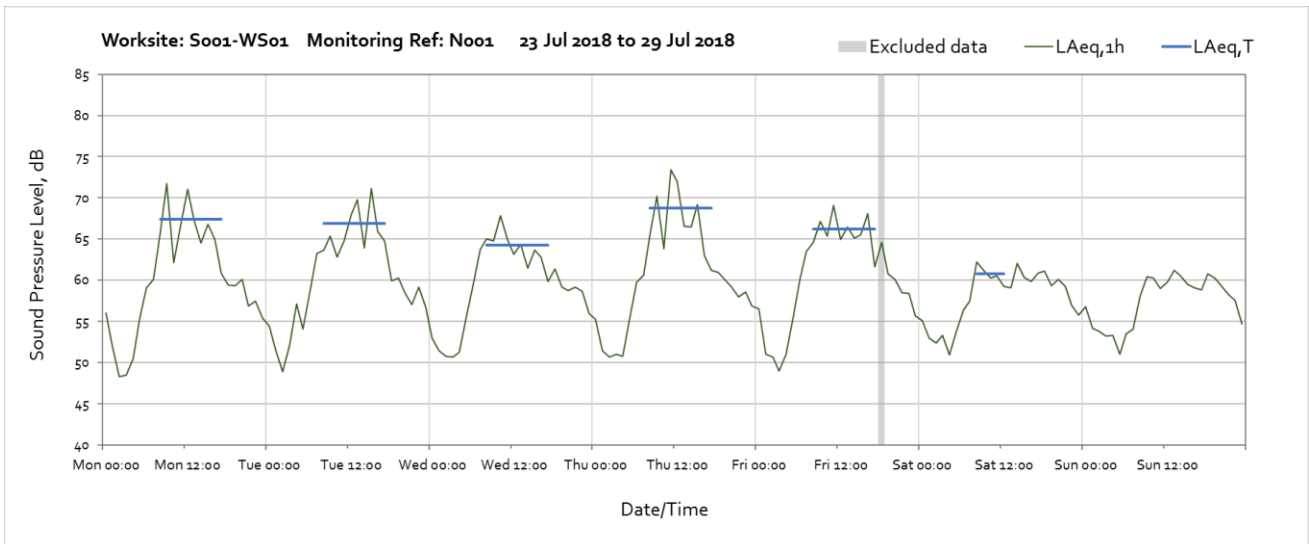
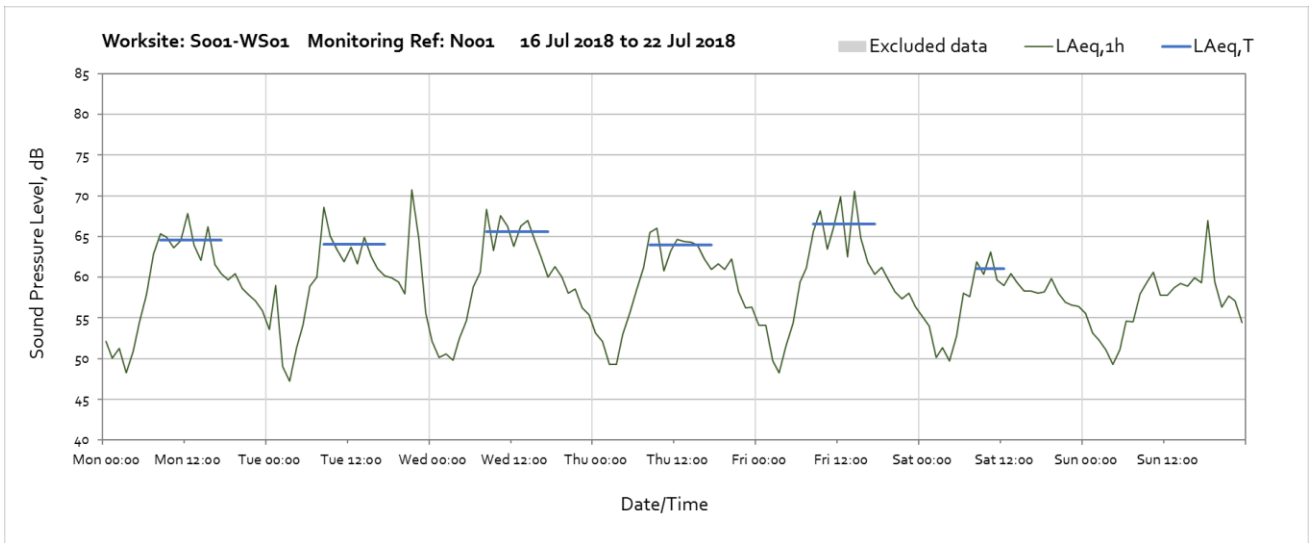
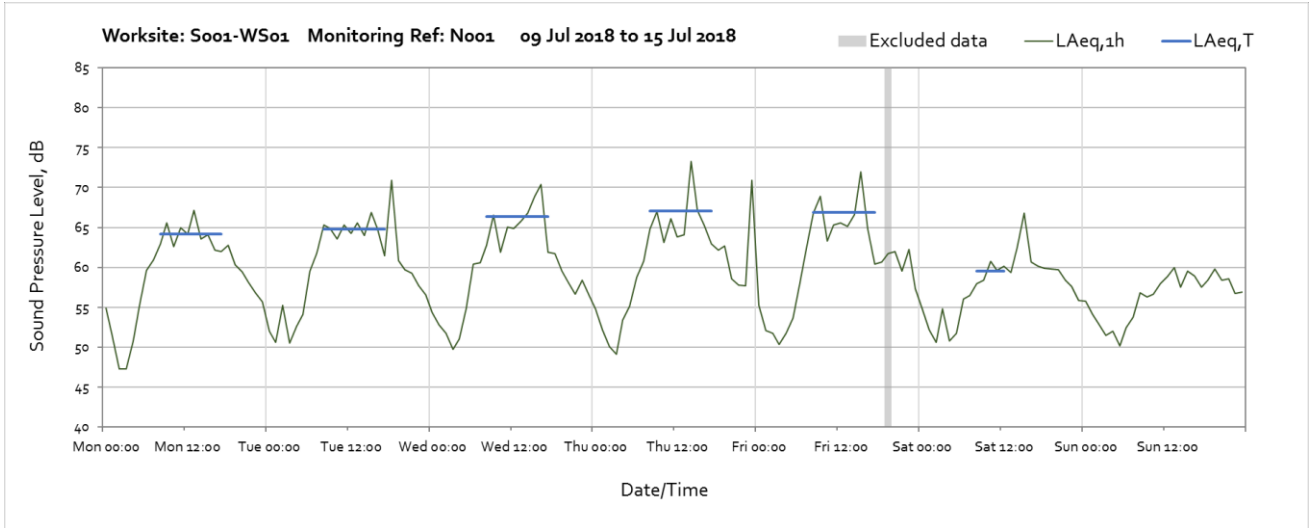


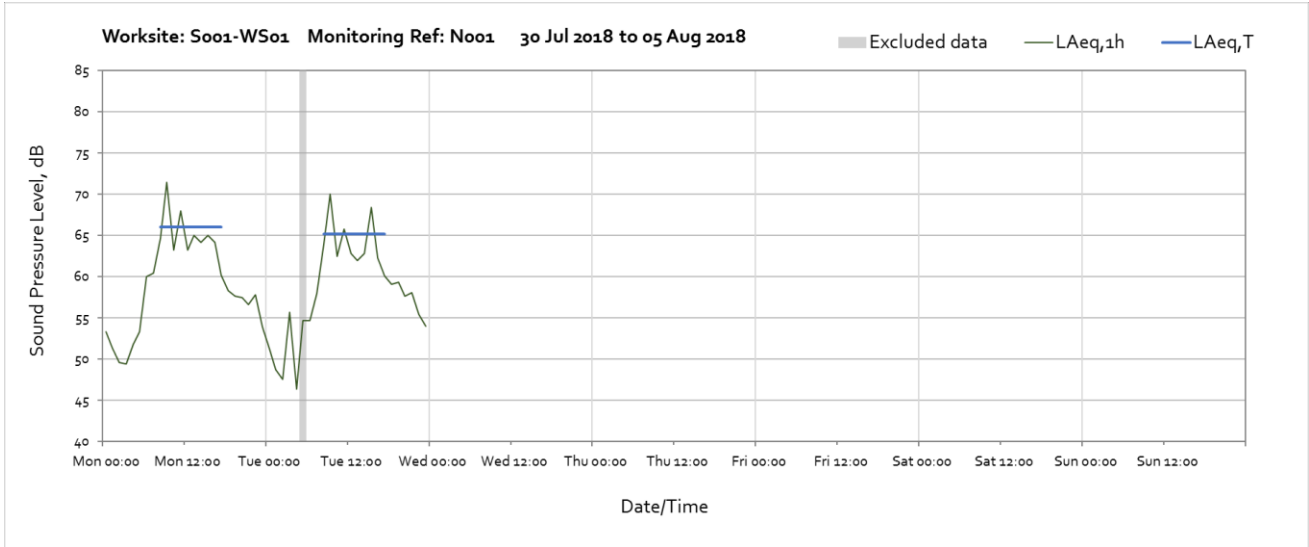
Appendix C Data

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.

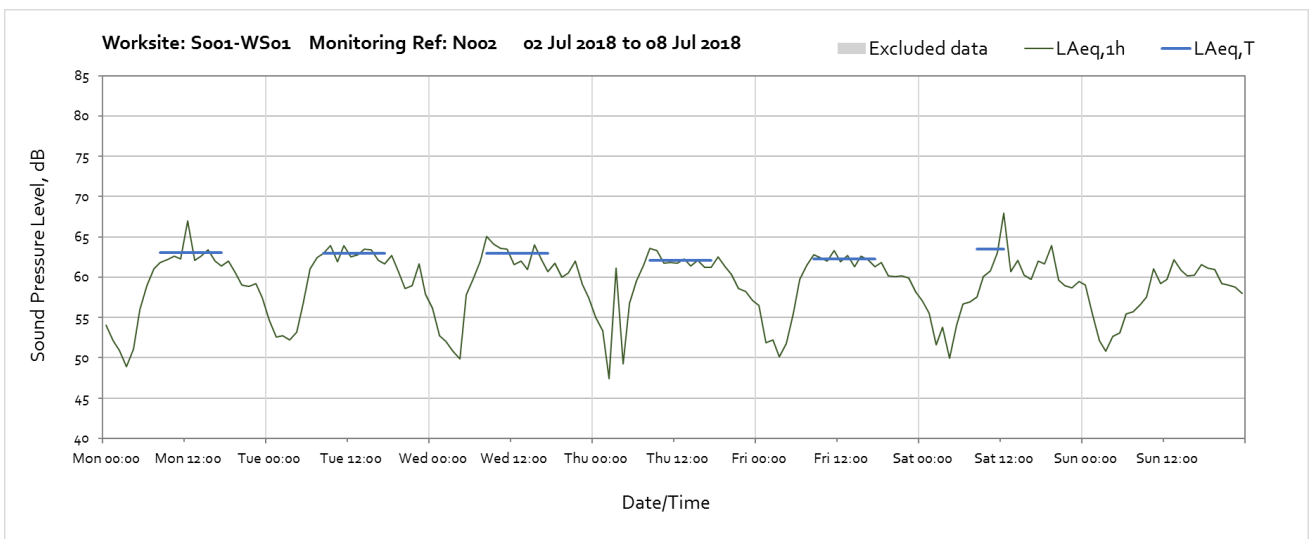
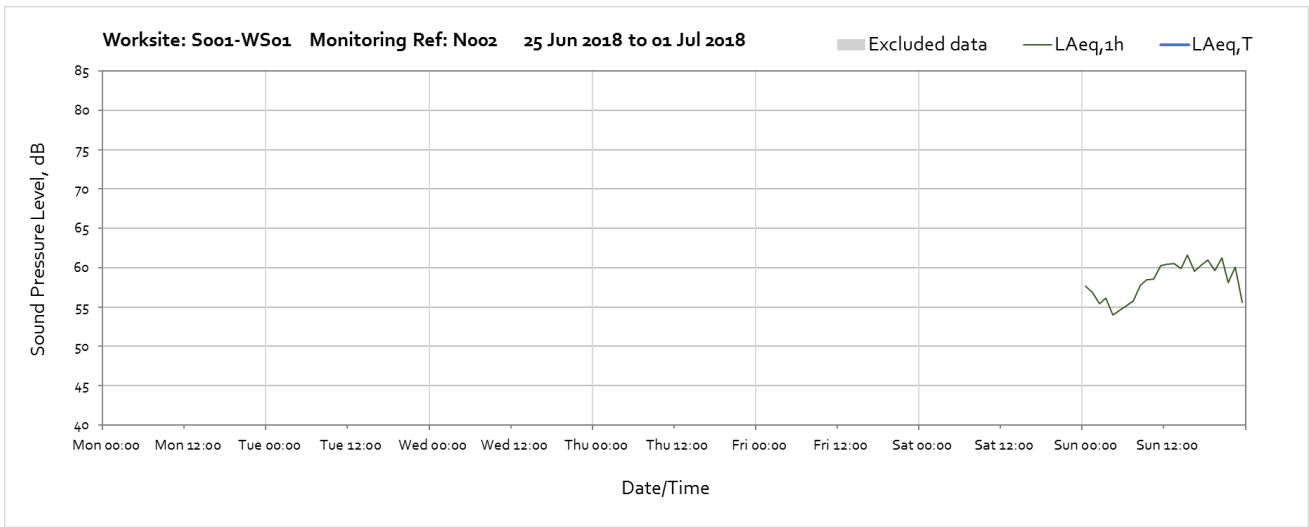
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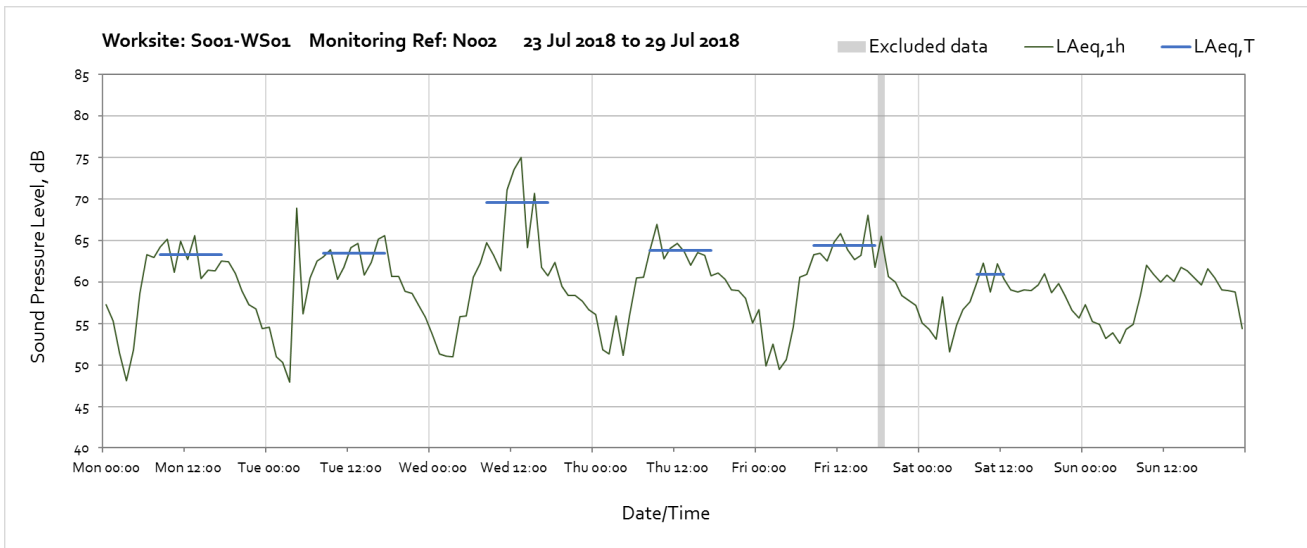
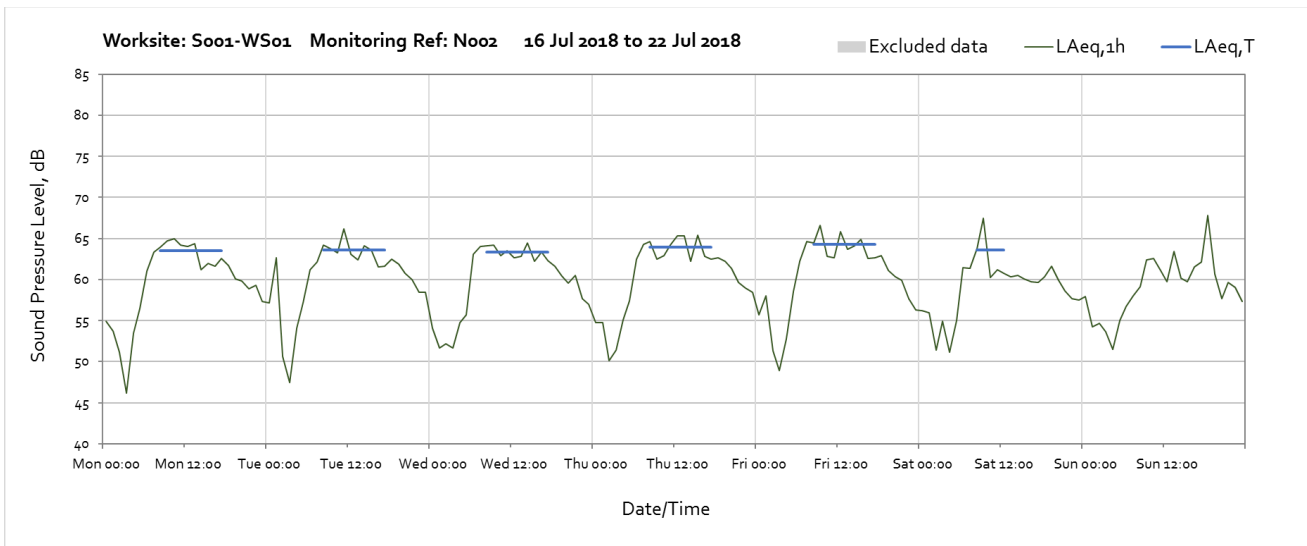
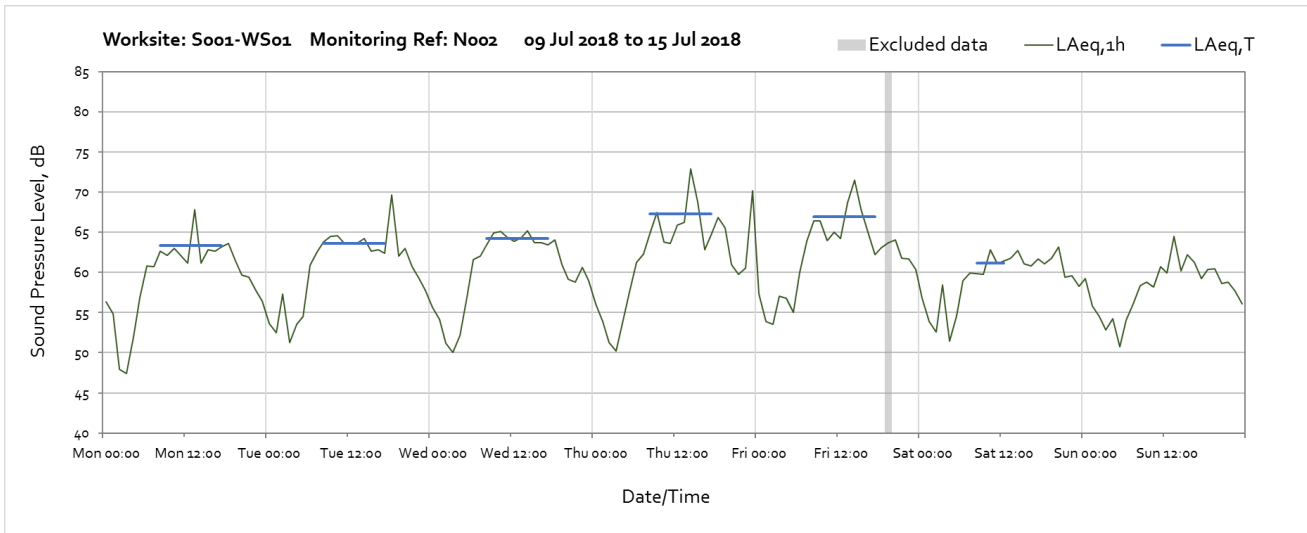


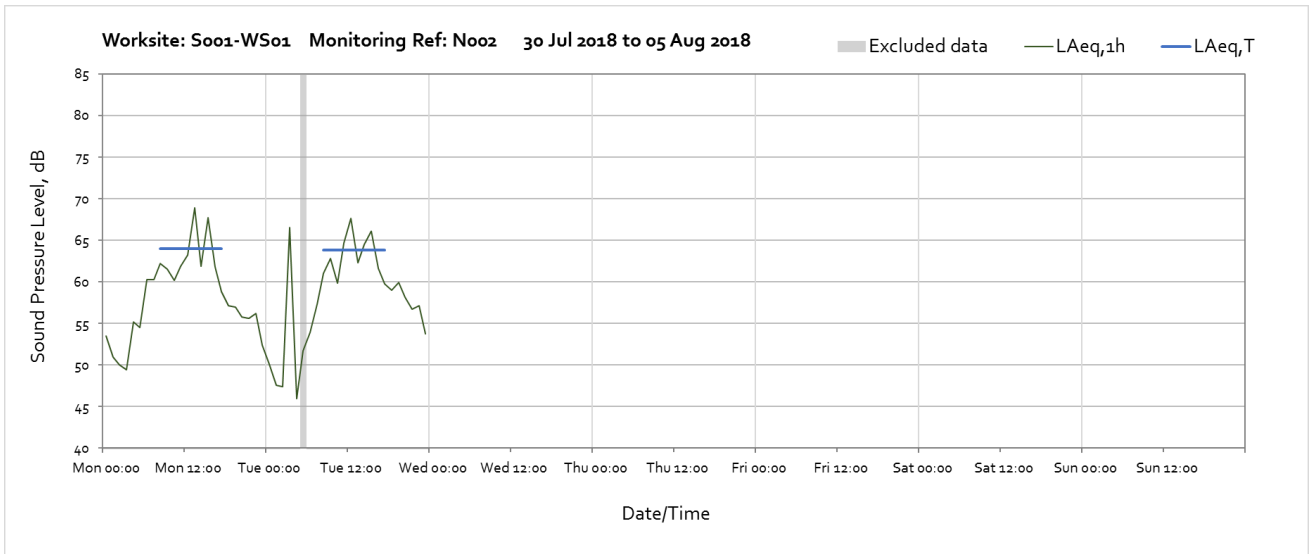




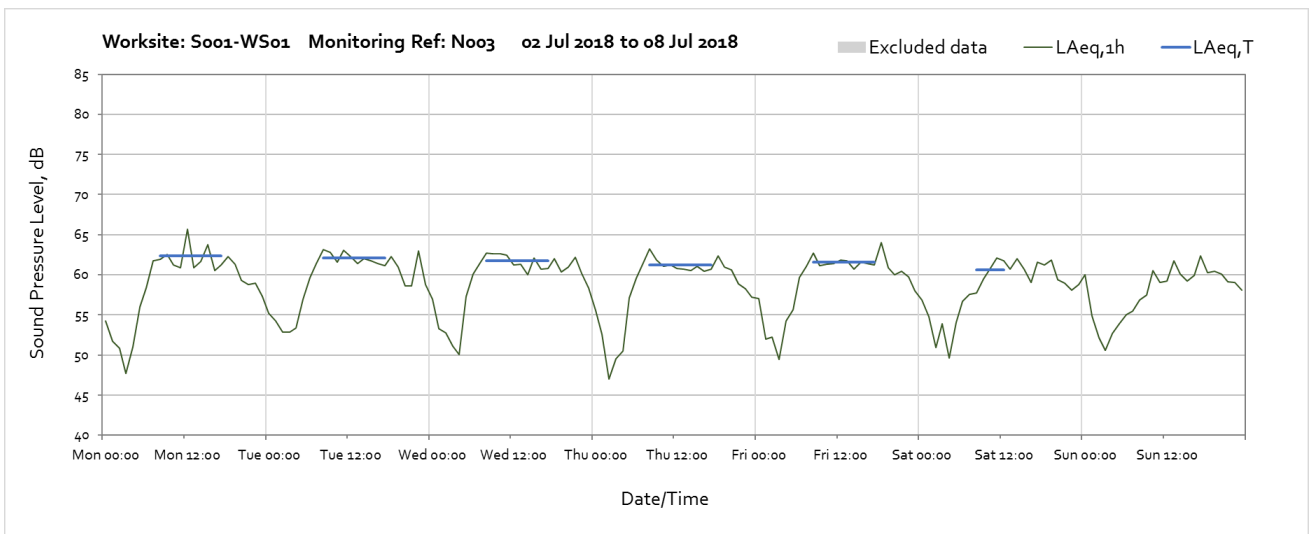
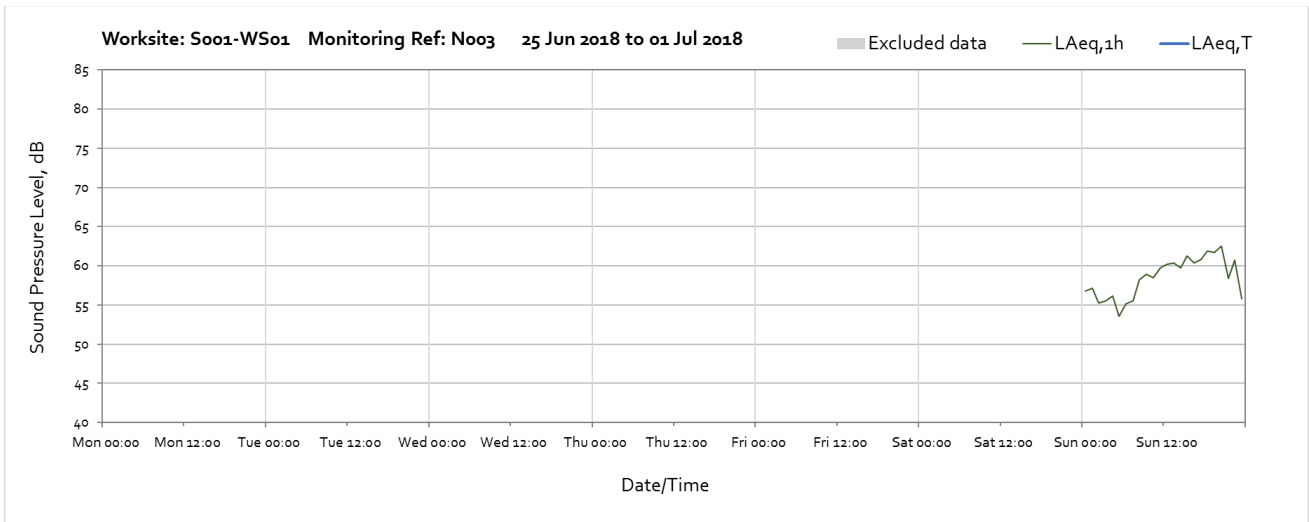
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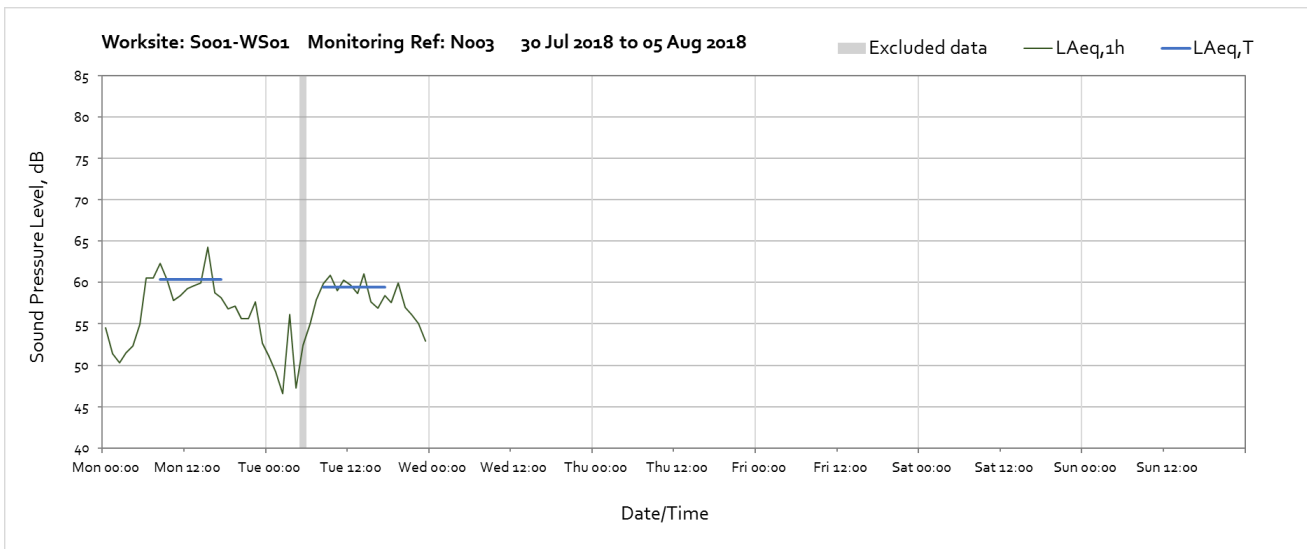
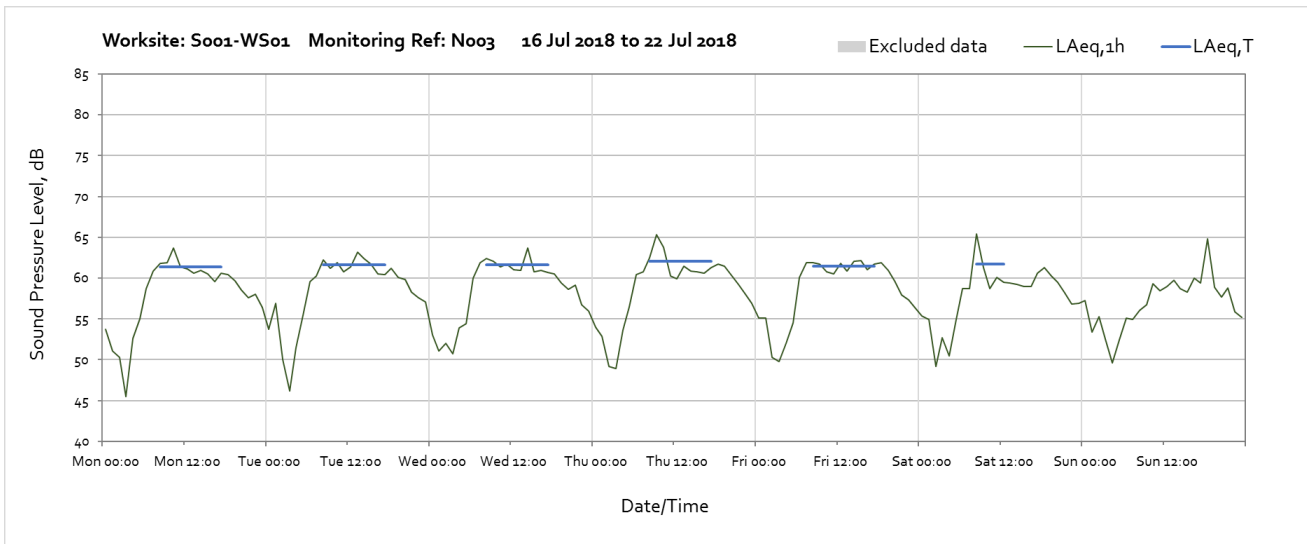
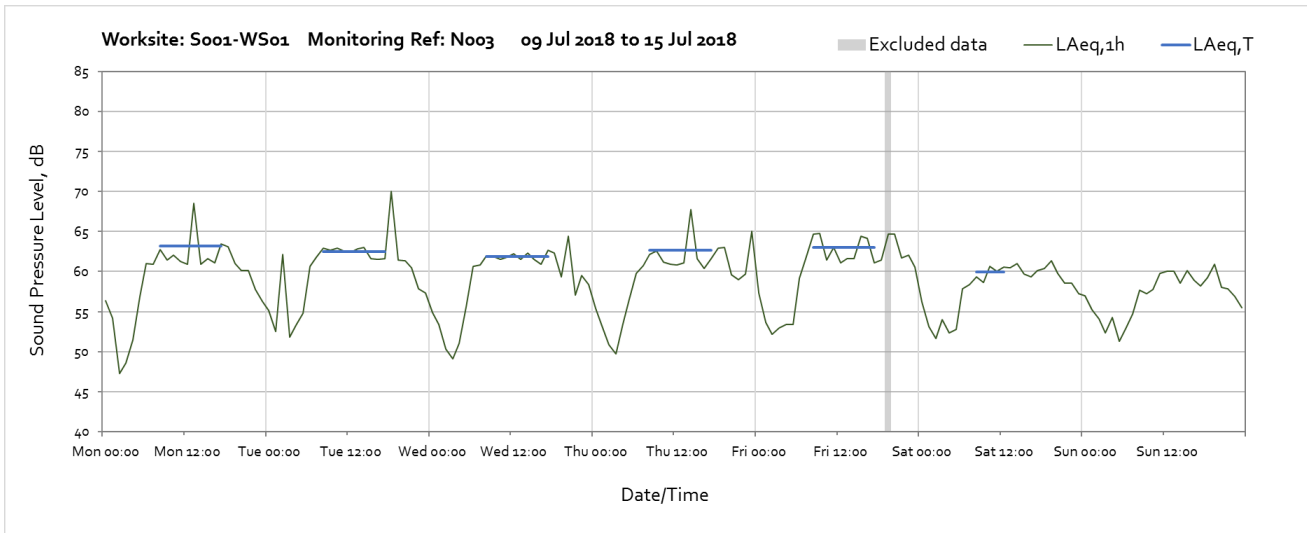




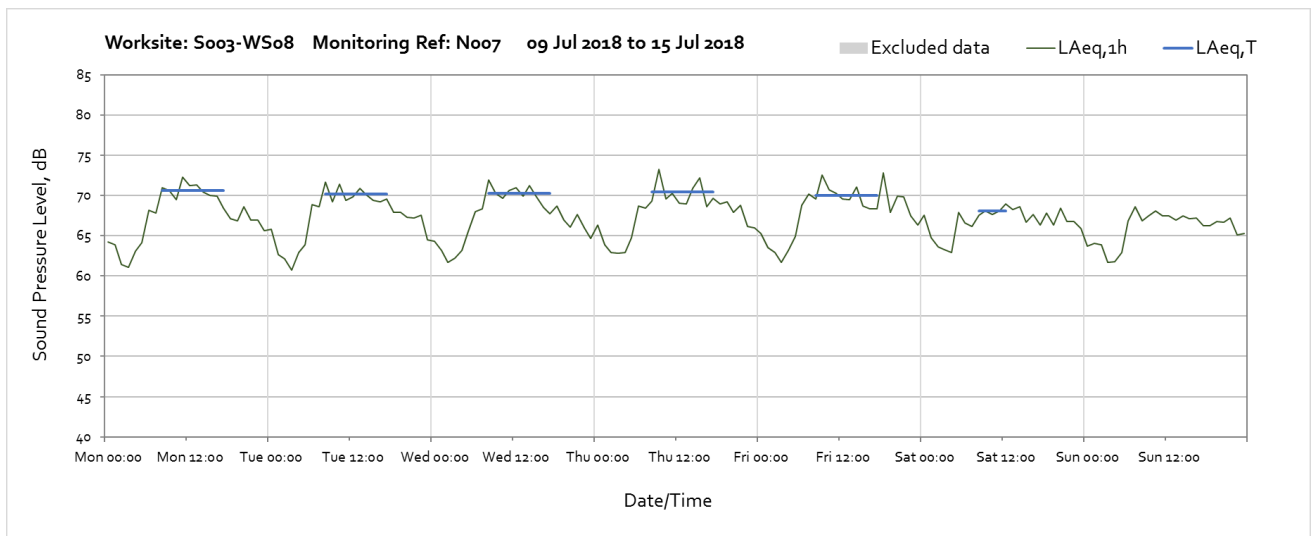
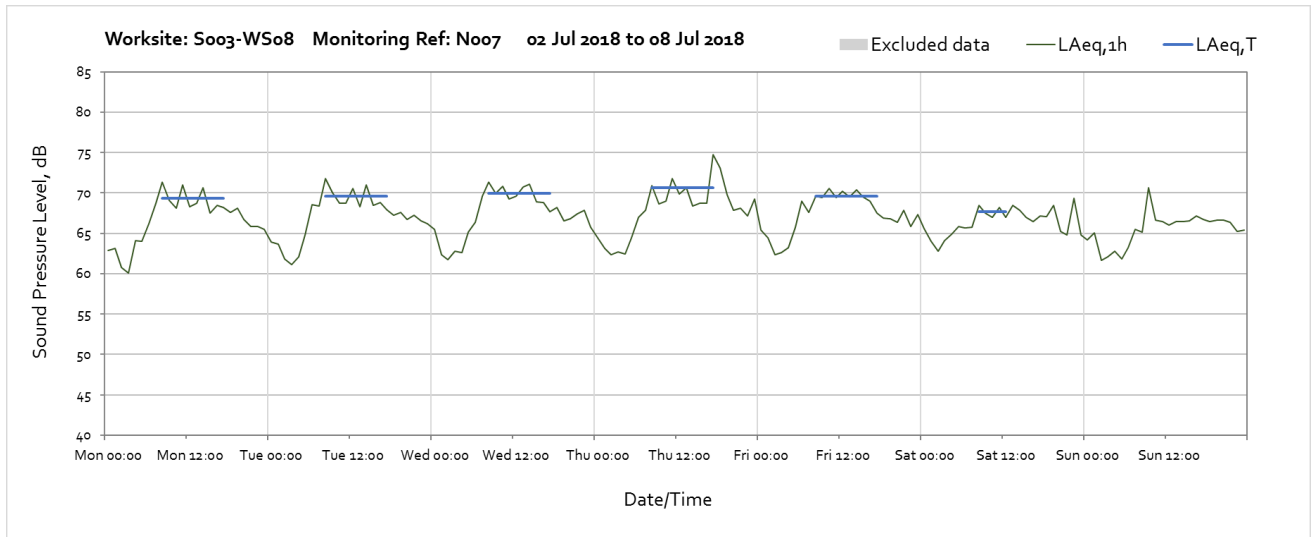
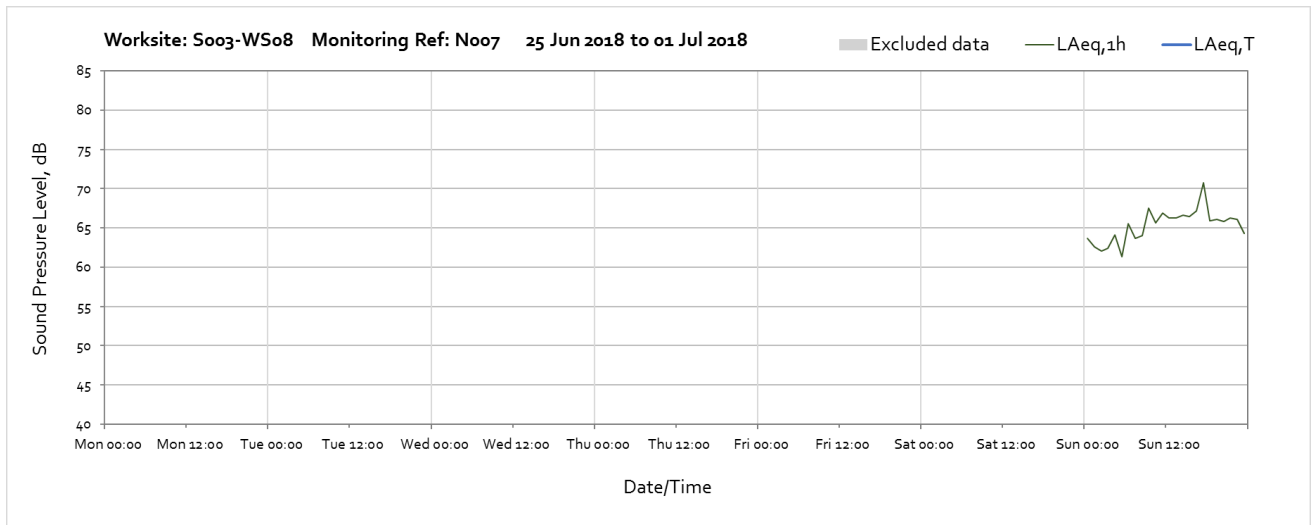


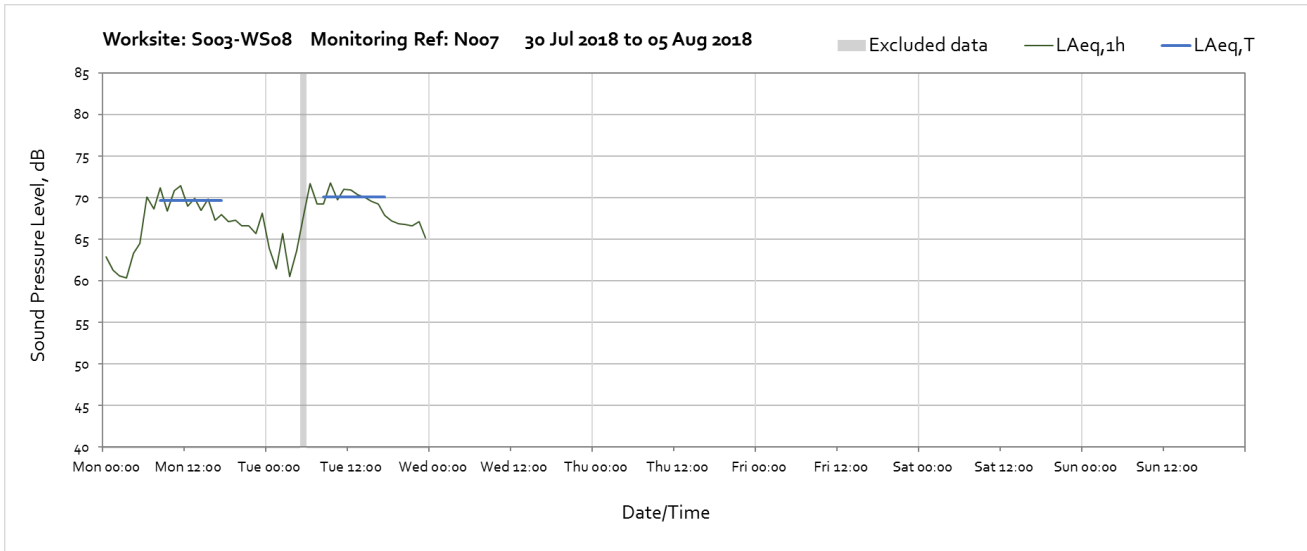
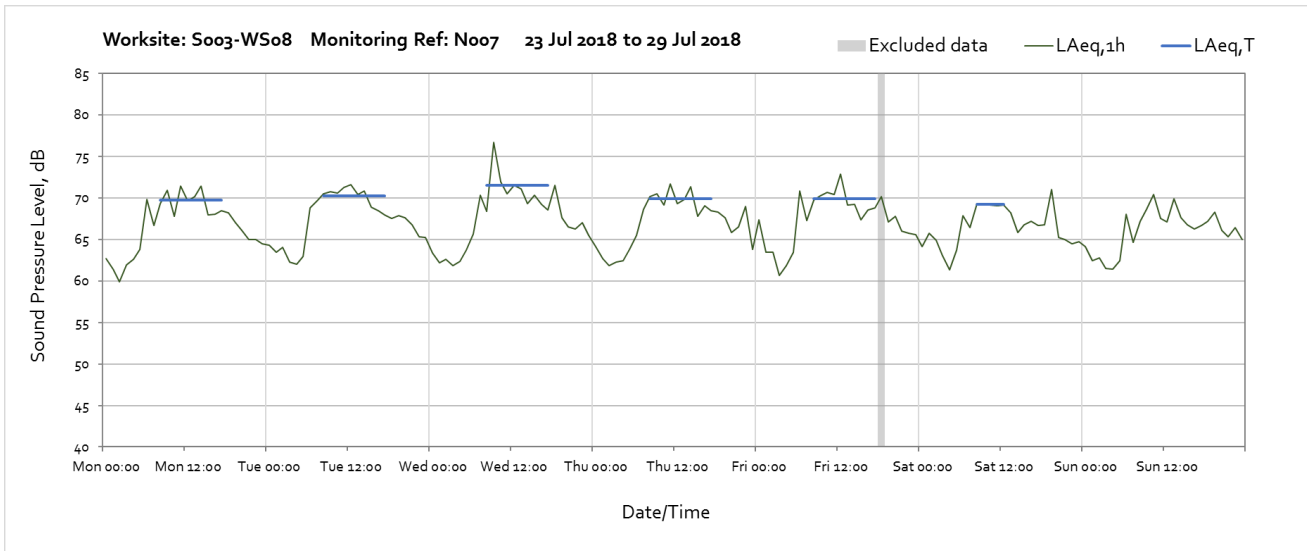
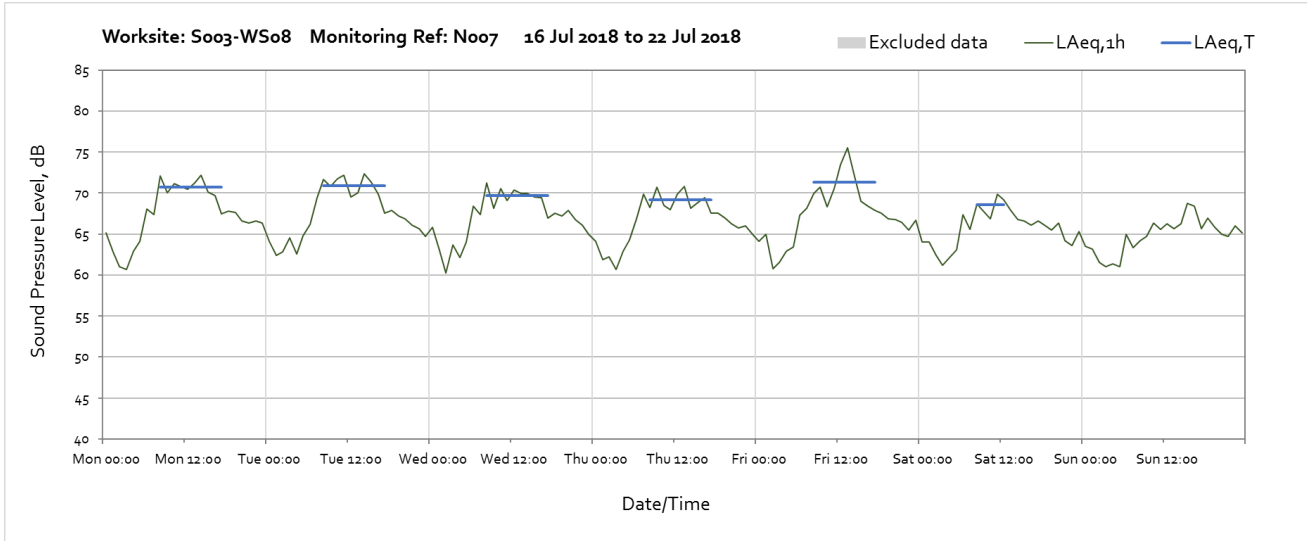
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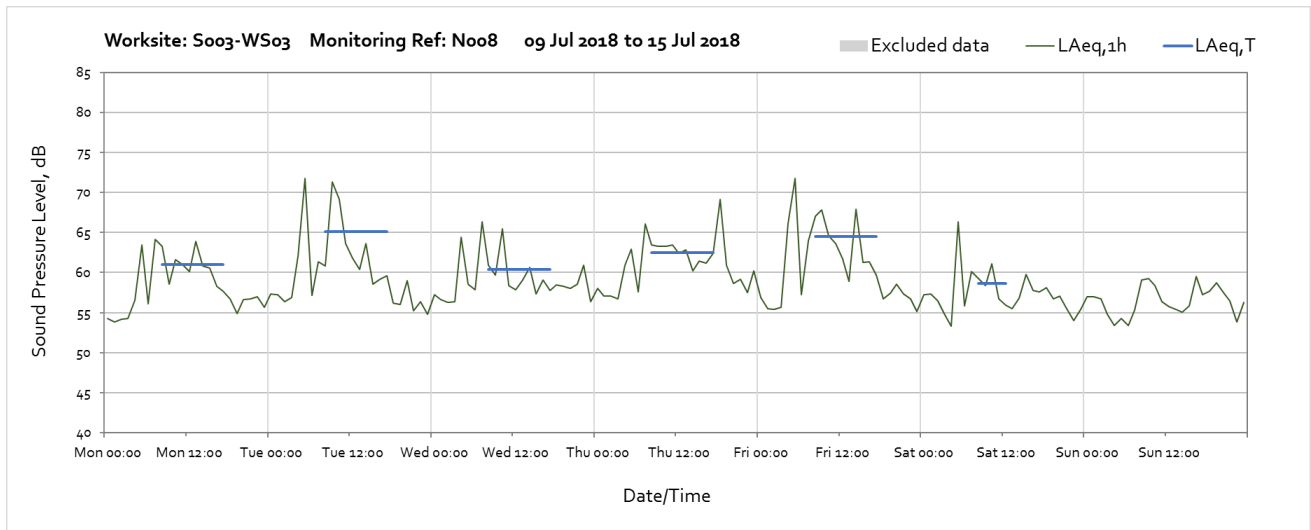
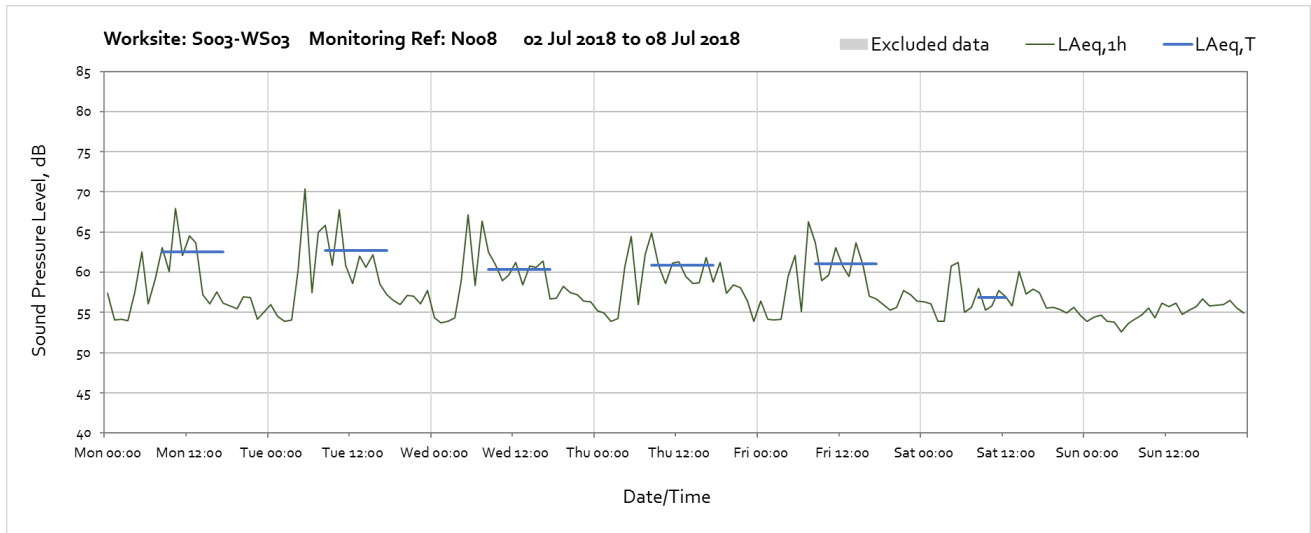
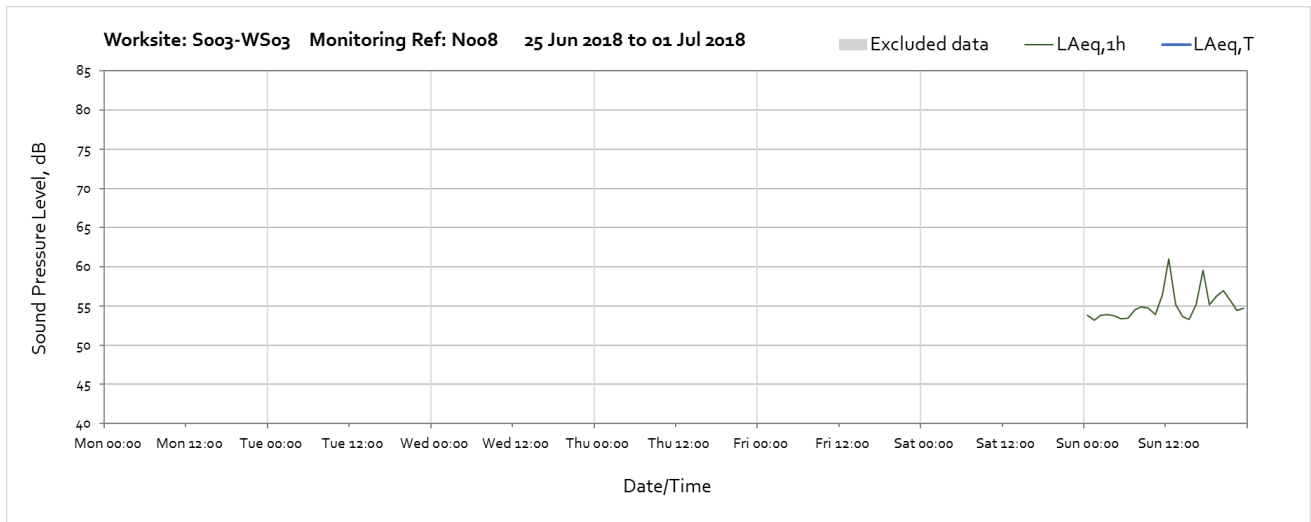


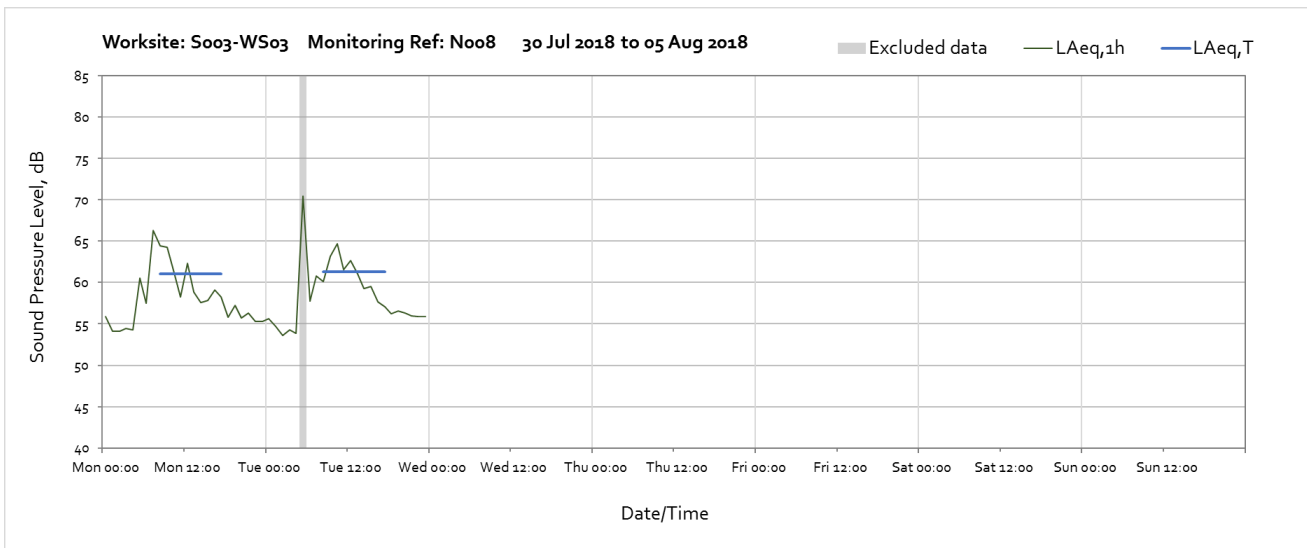
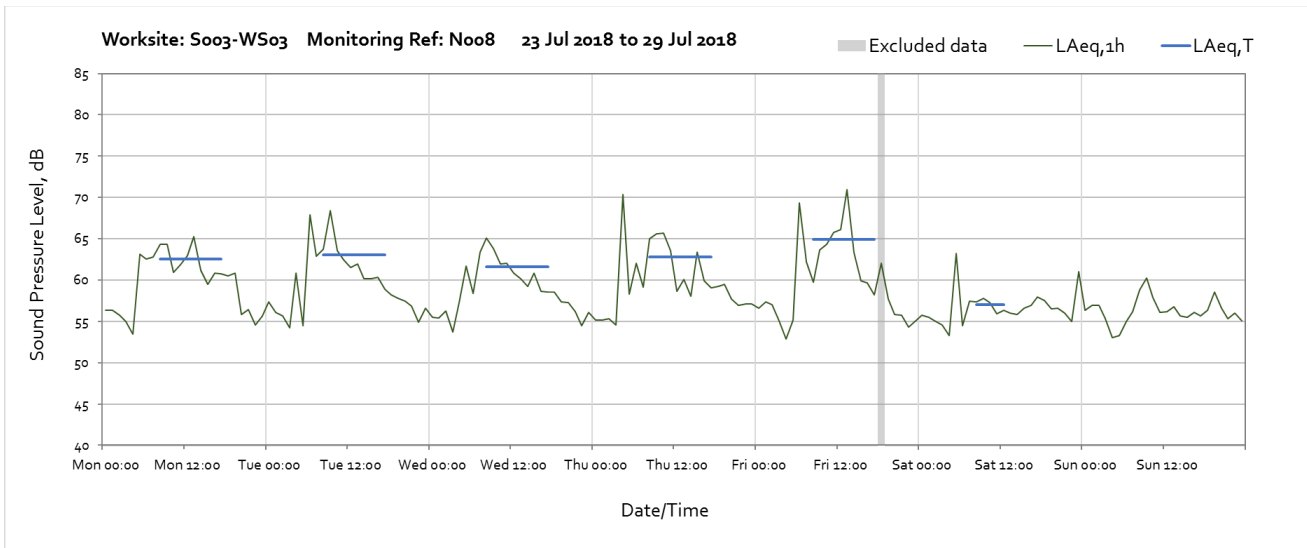
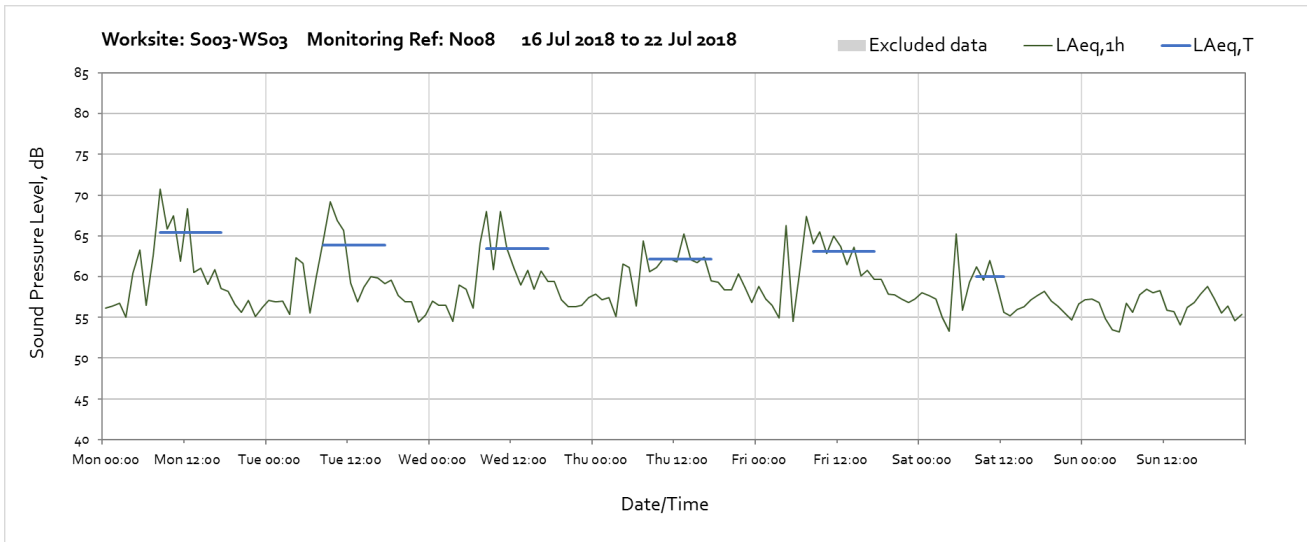
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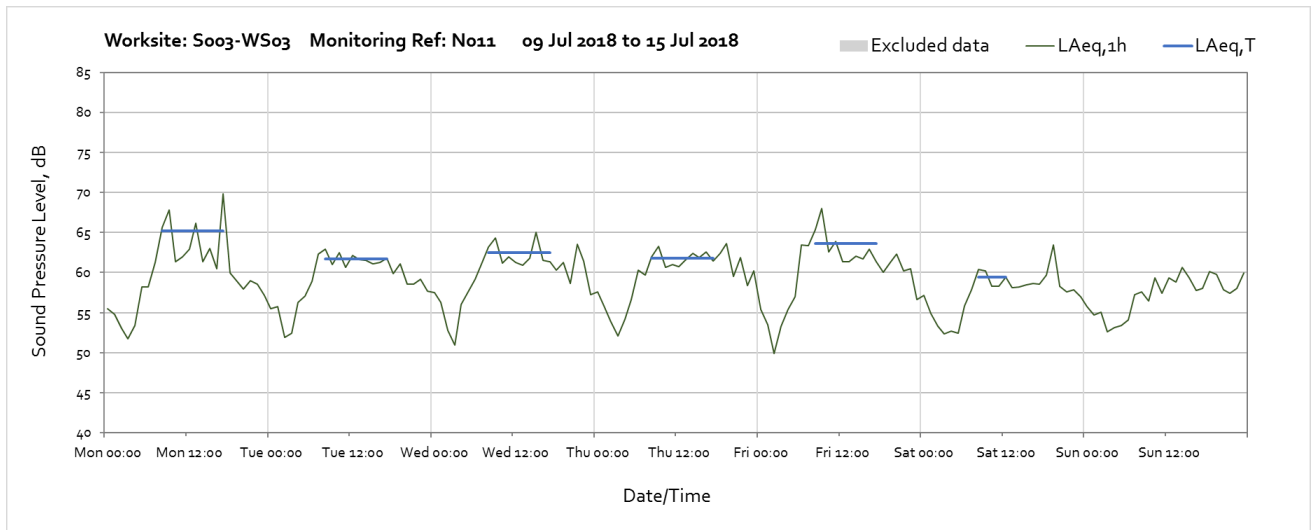
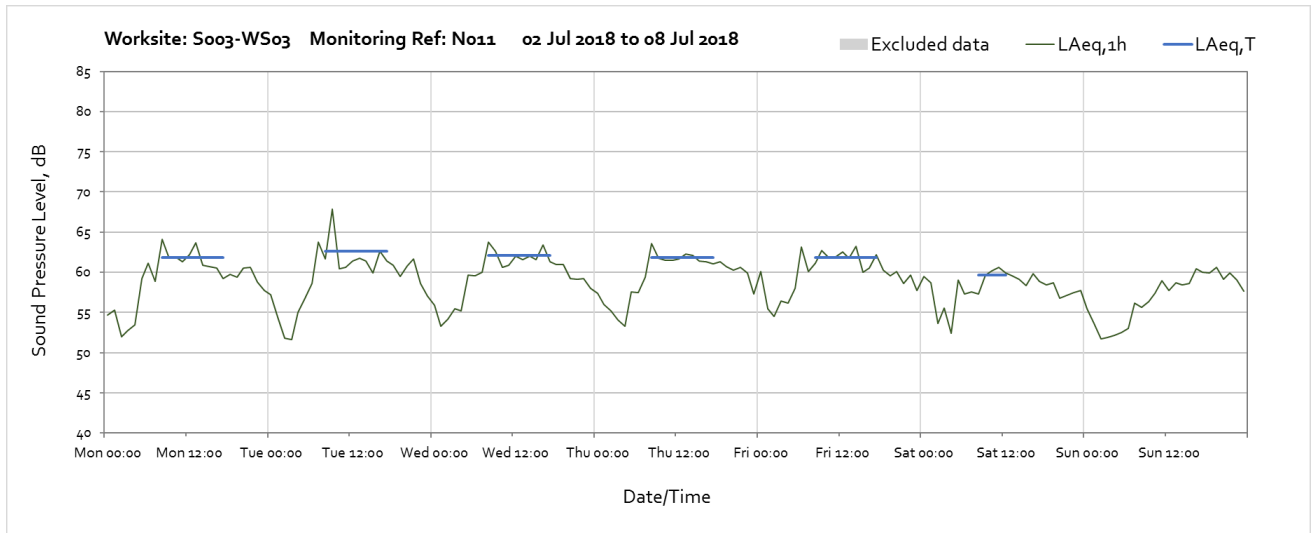
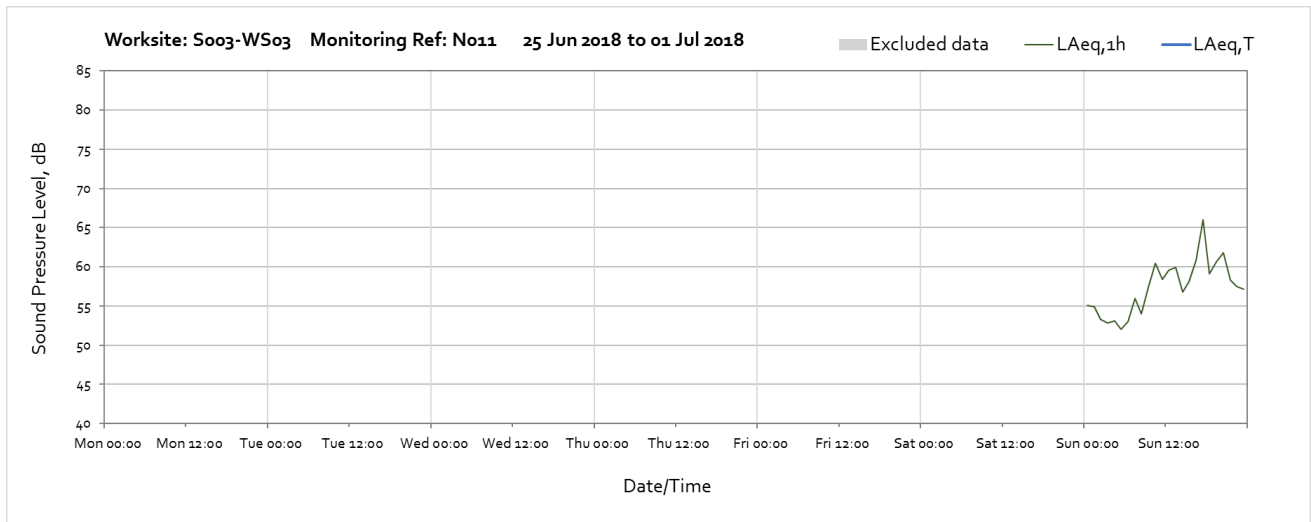


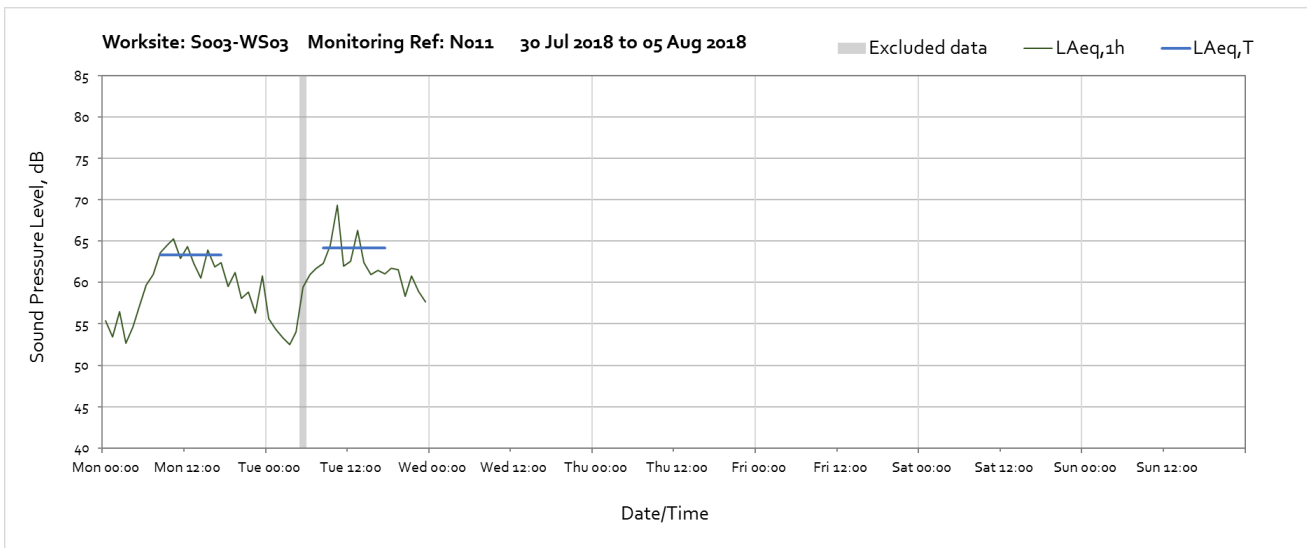
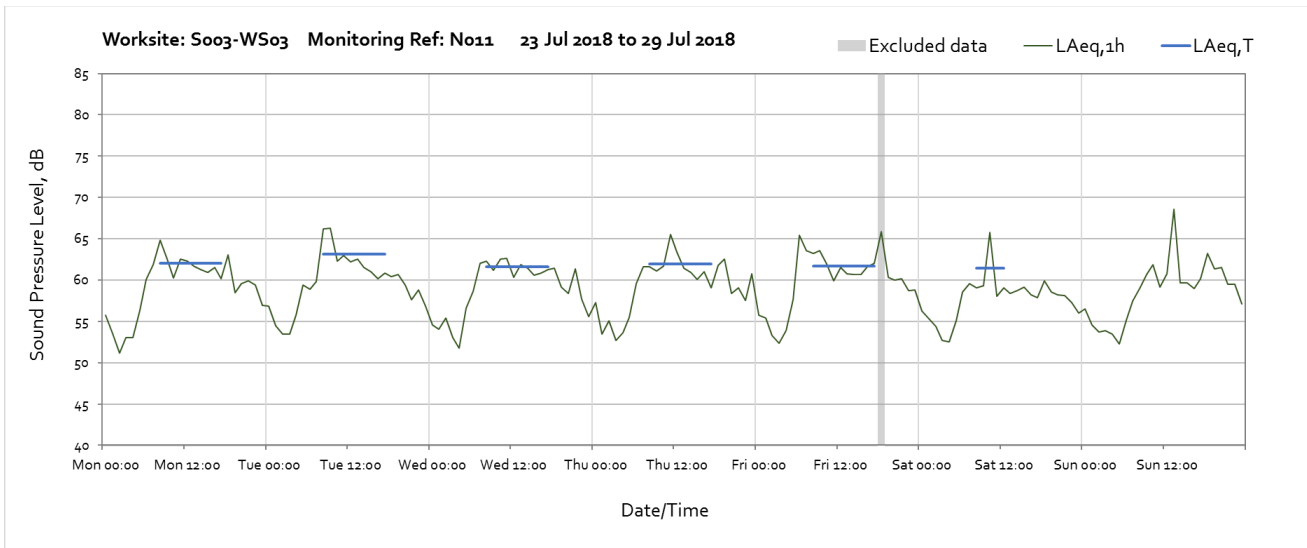
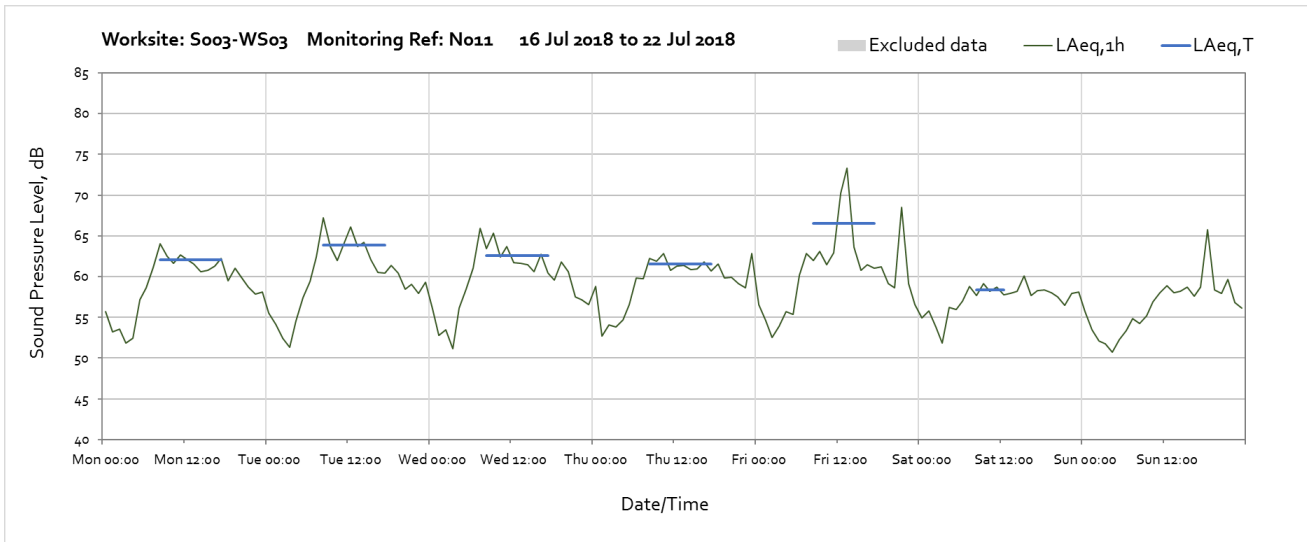
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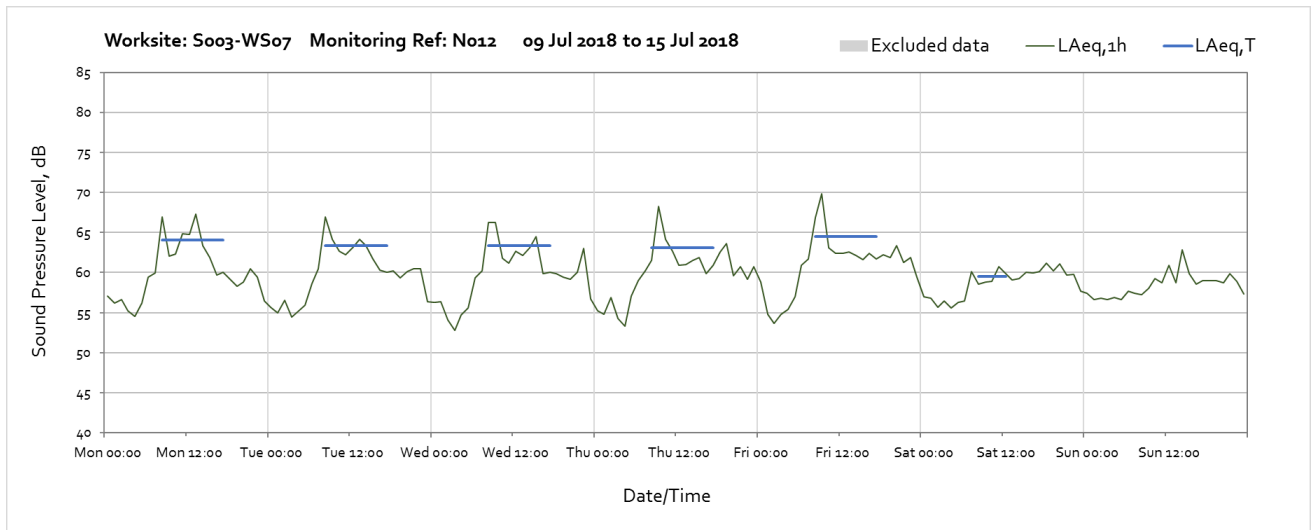
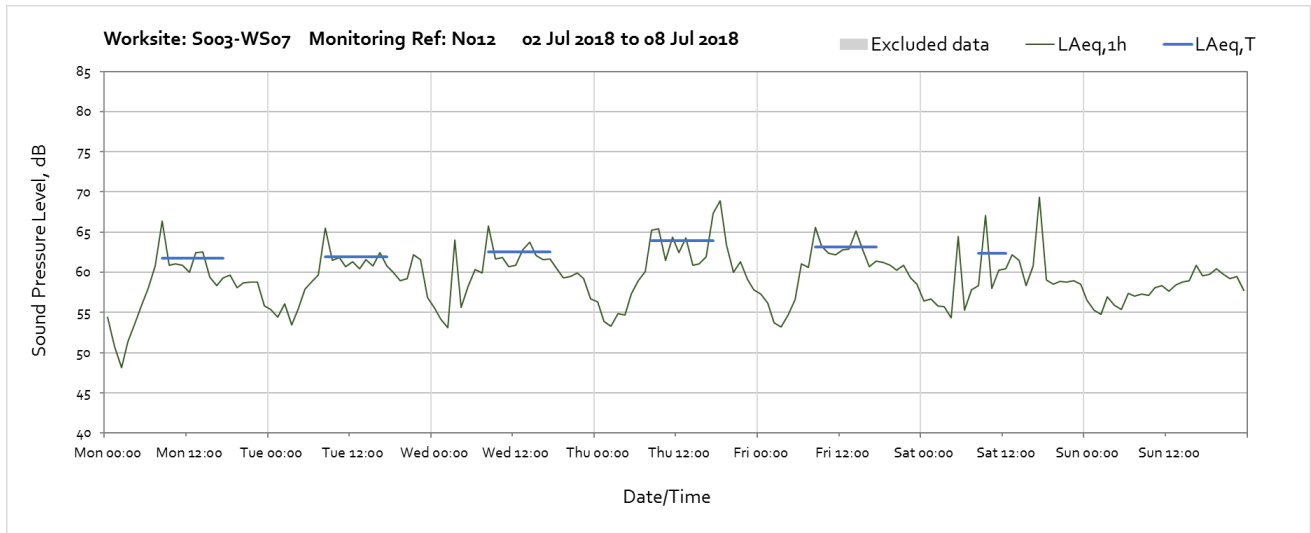
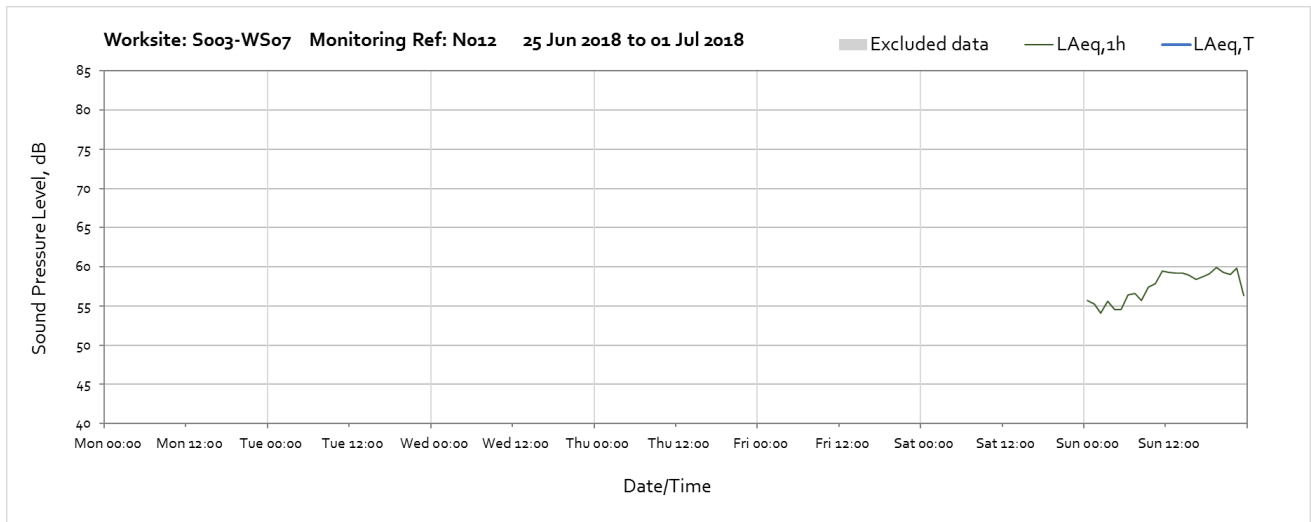


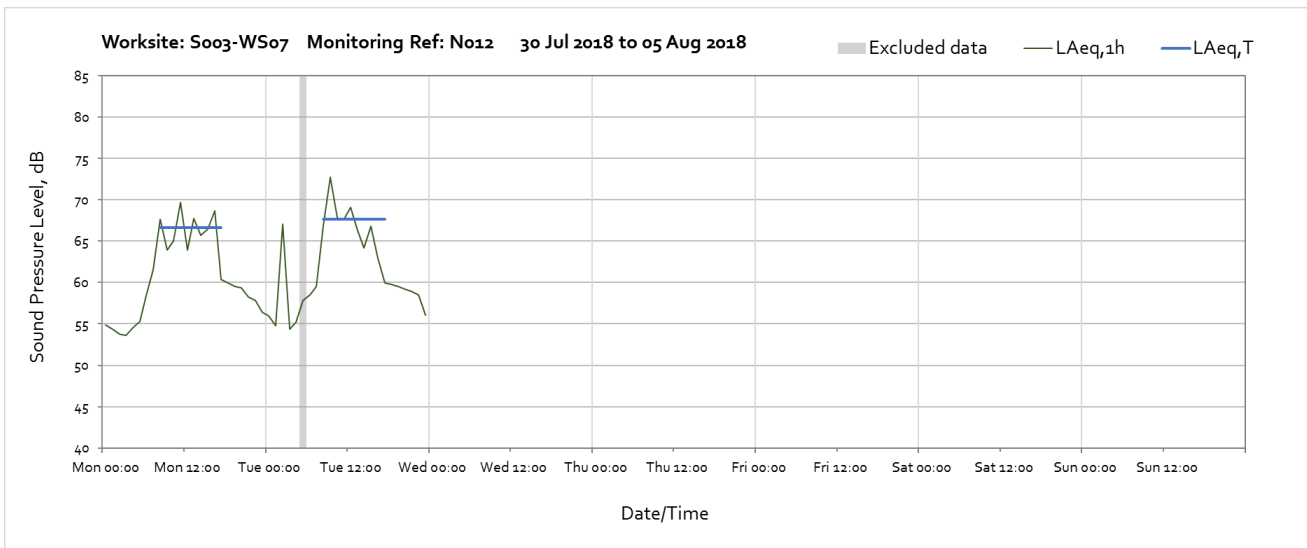
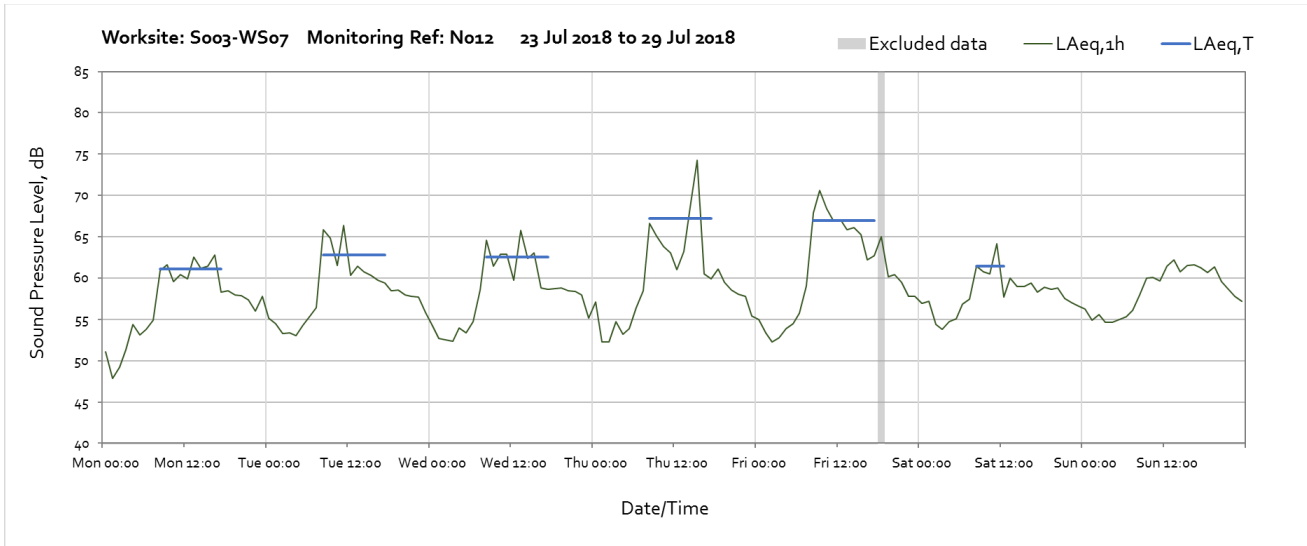
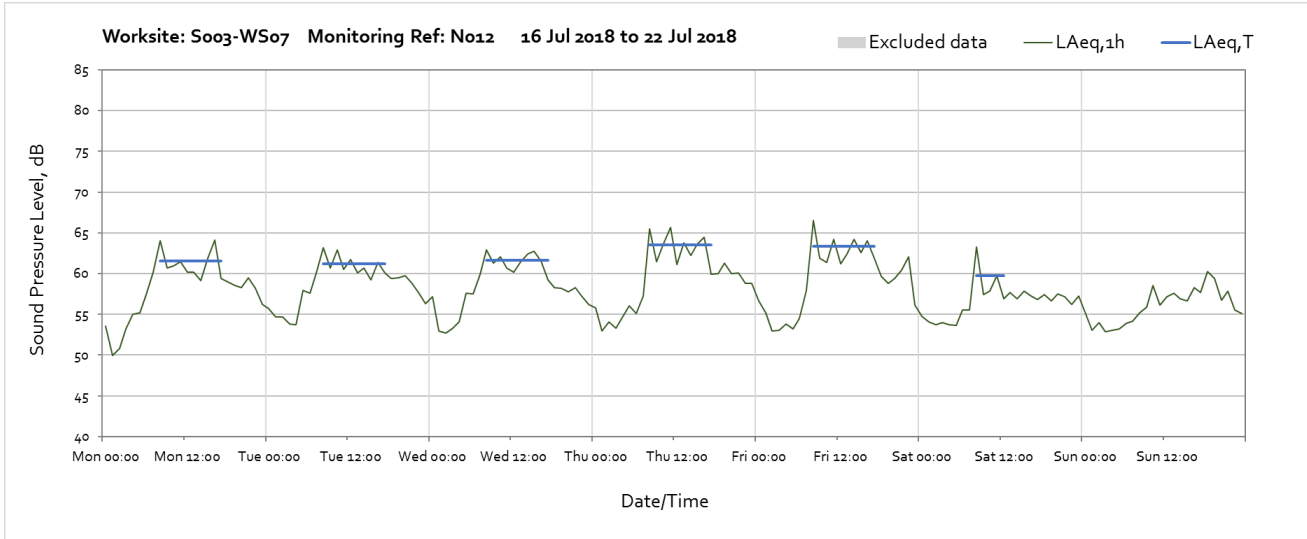
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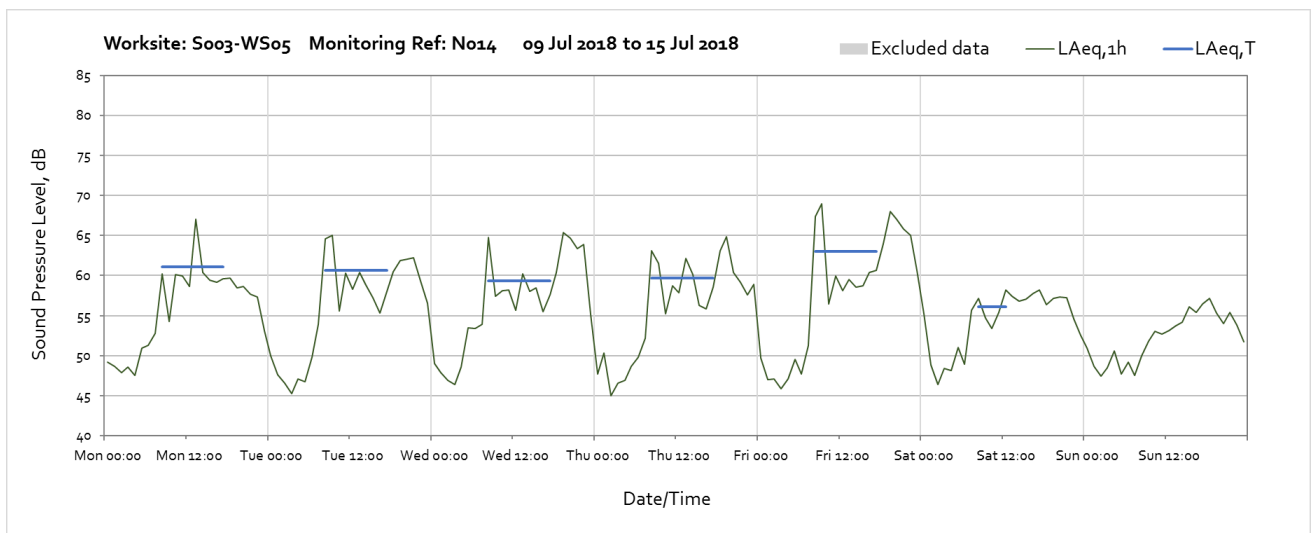
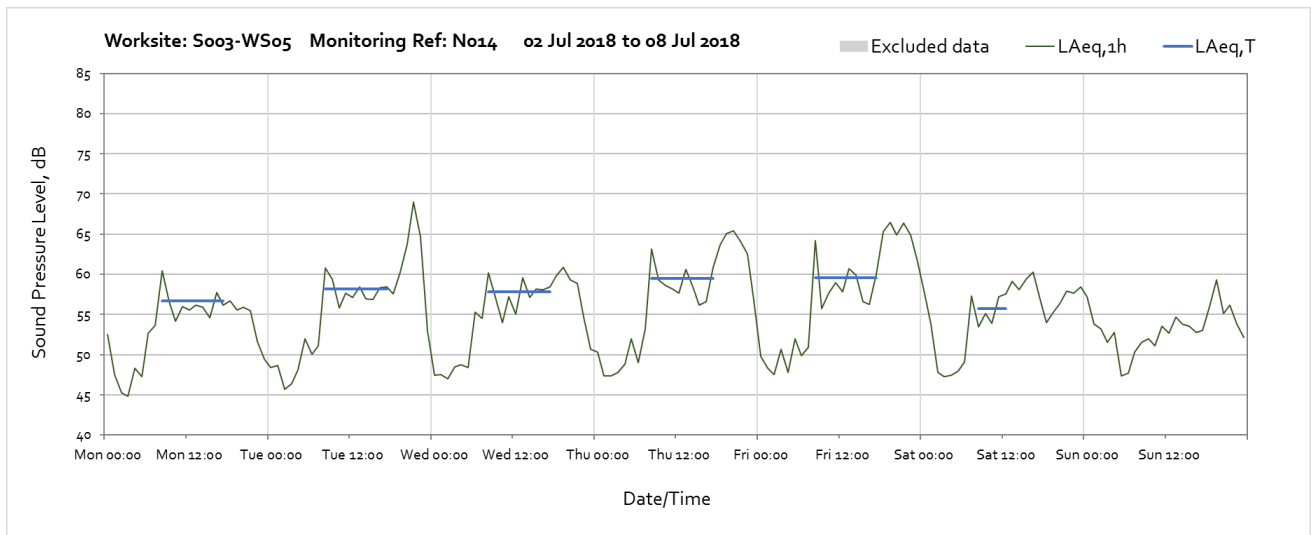
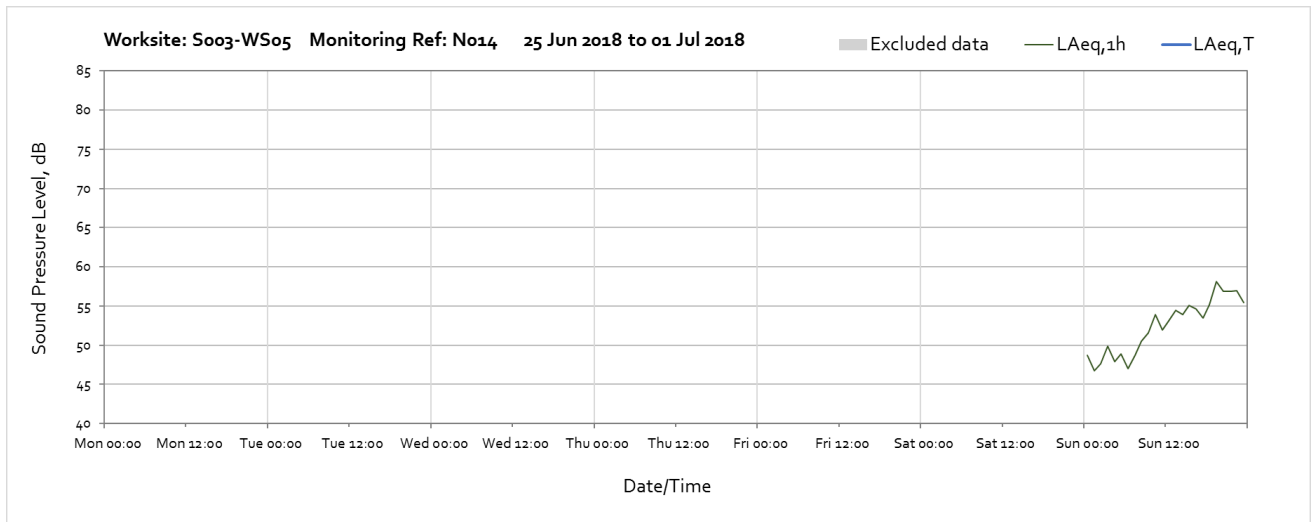


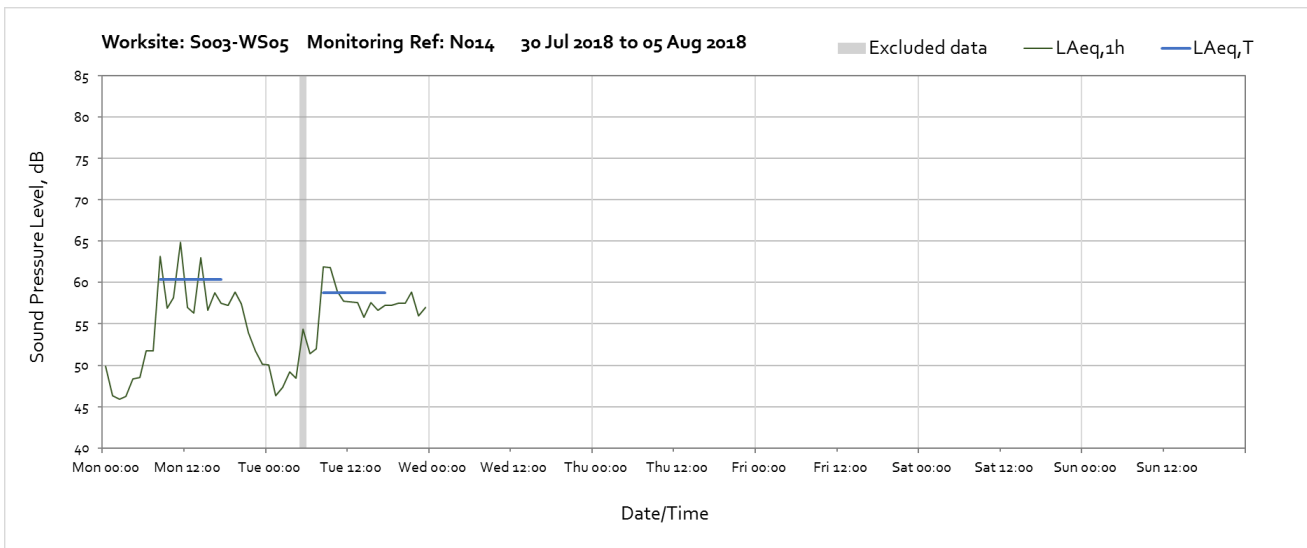
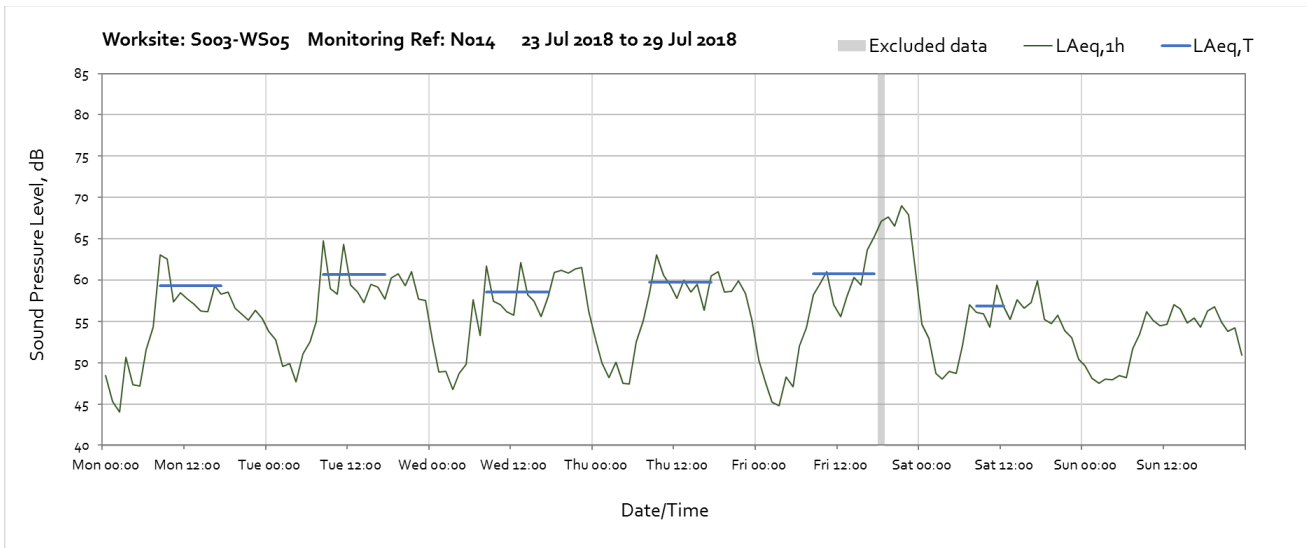
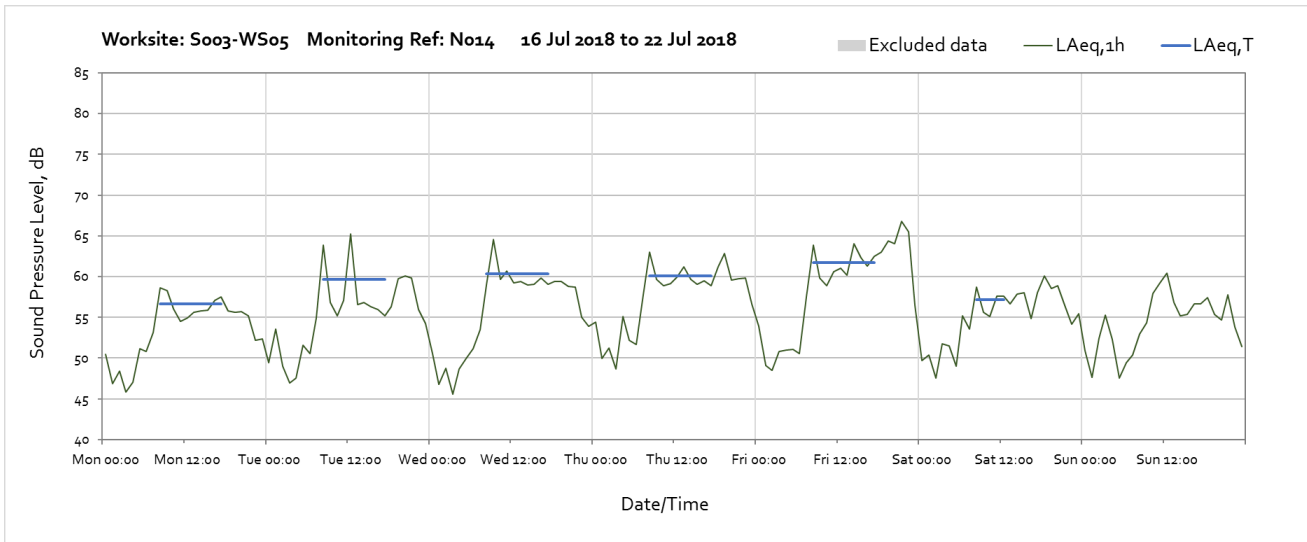
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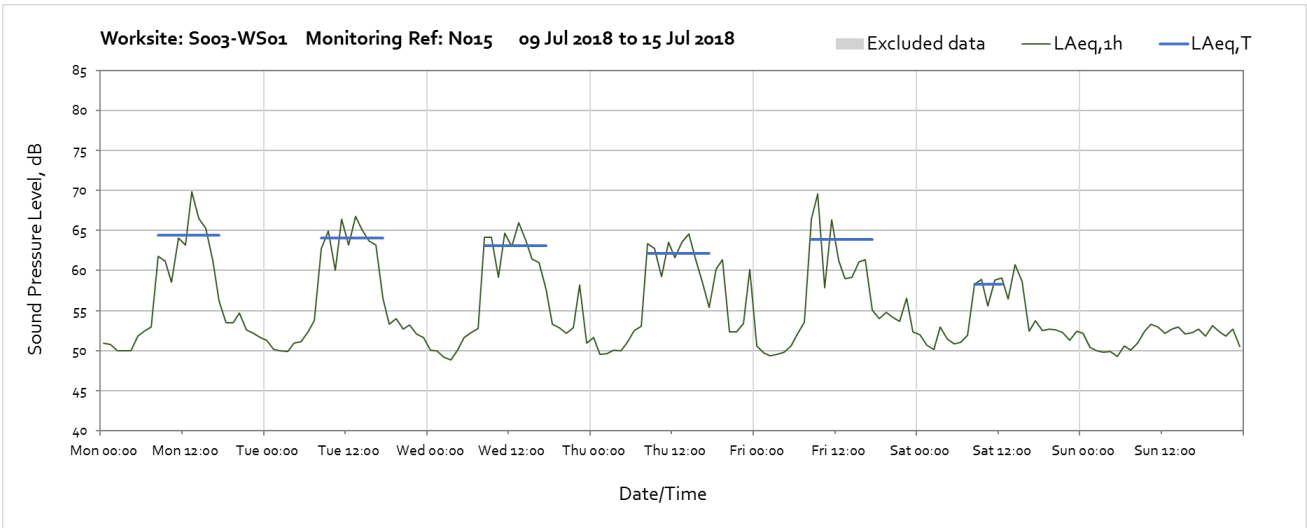
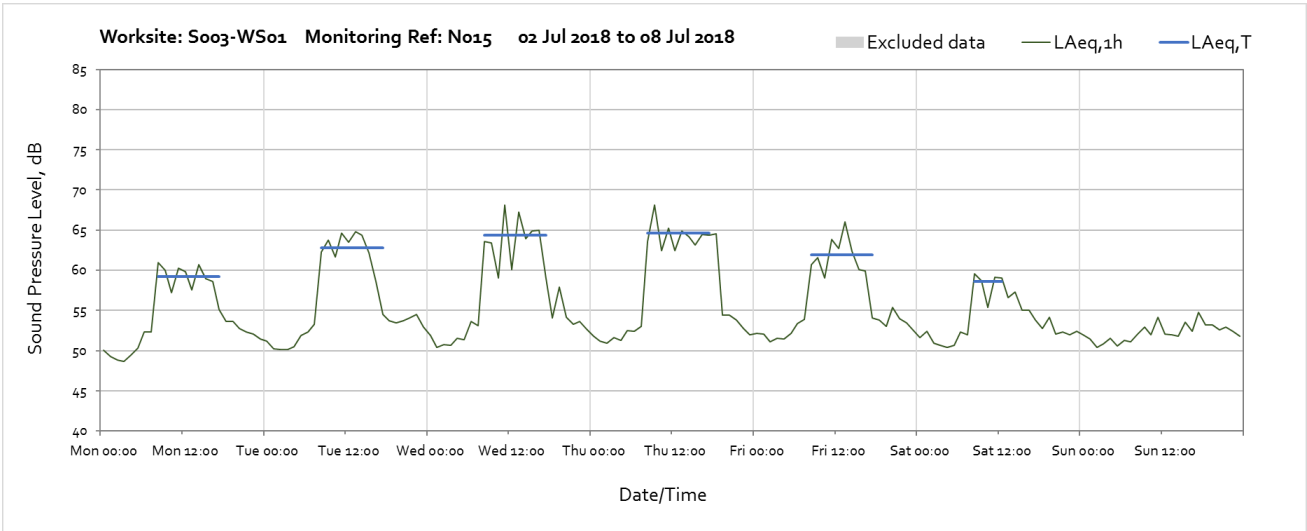
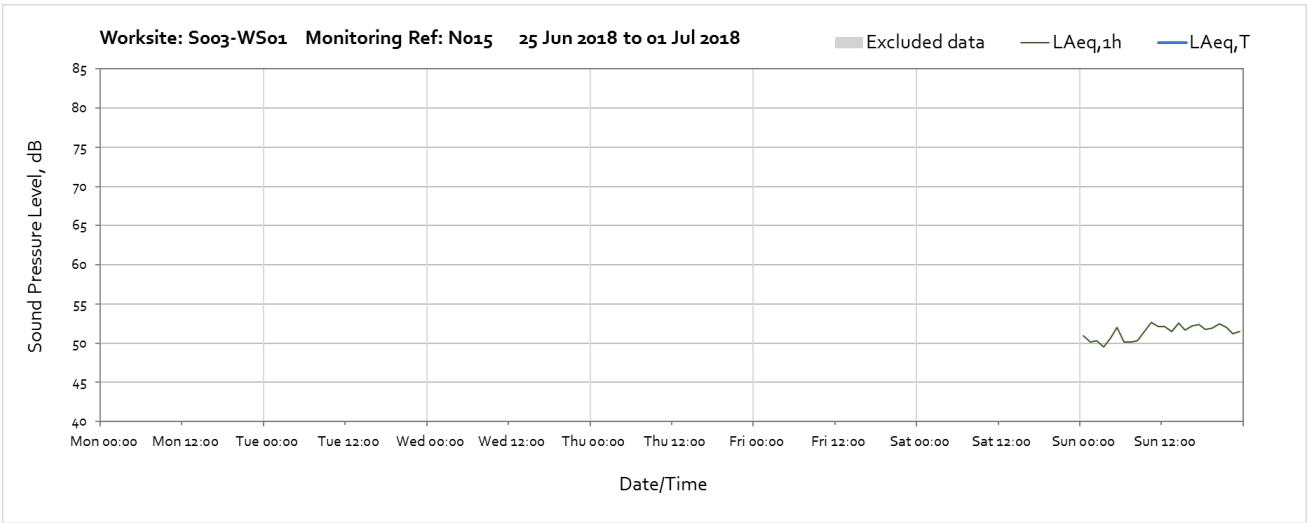


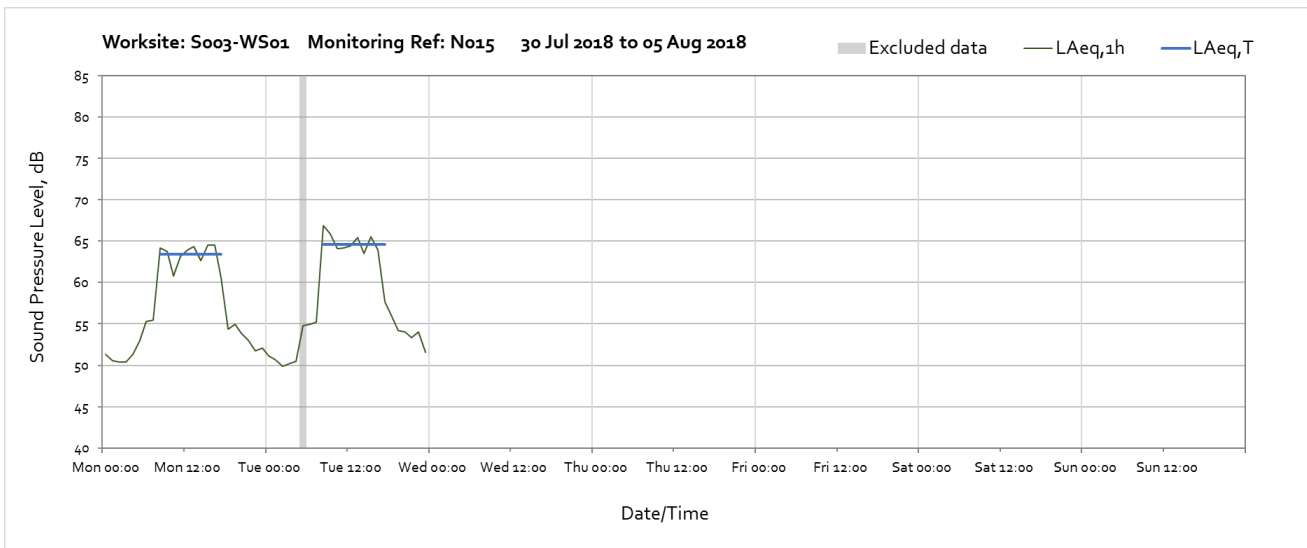
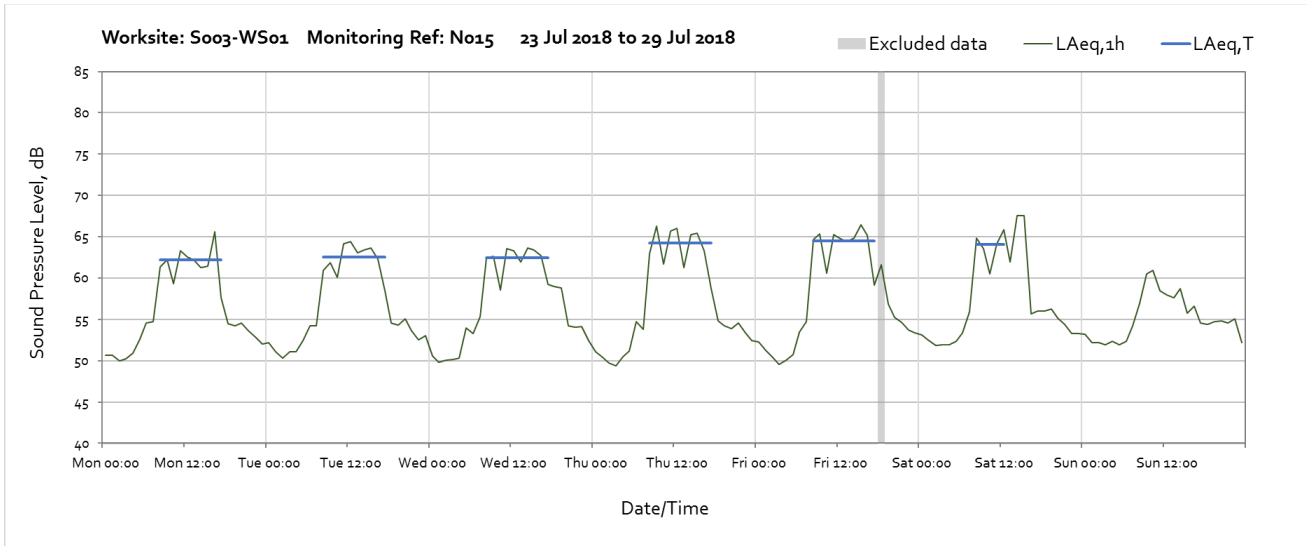
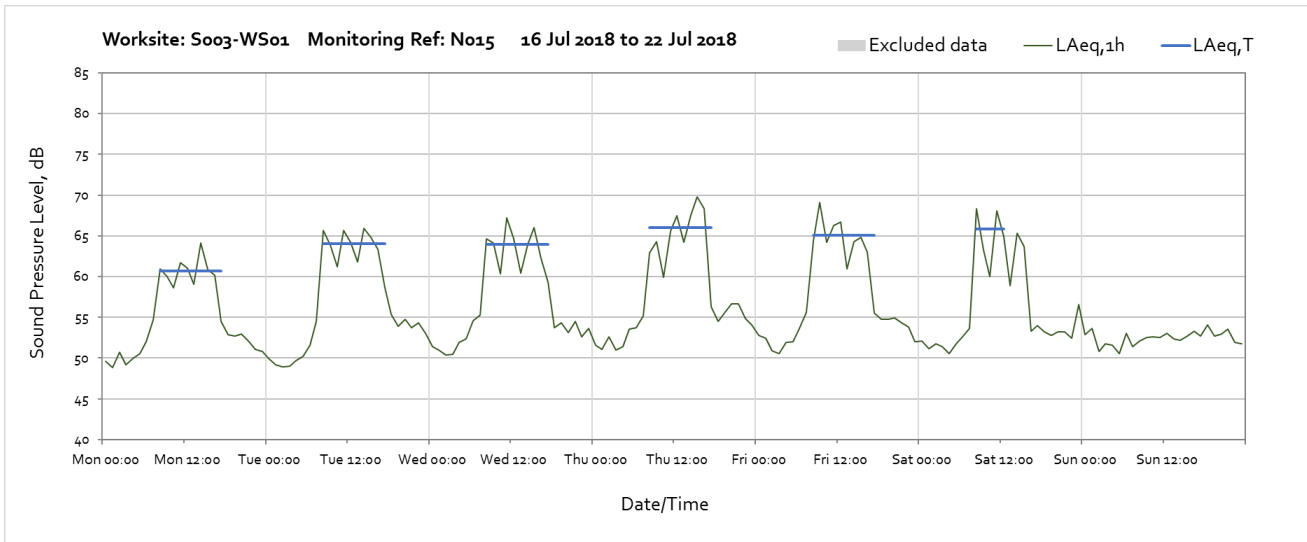
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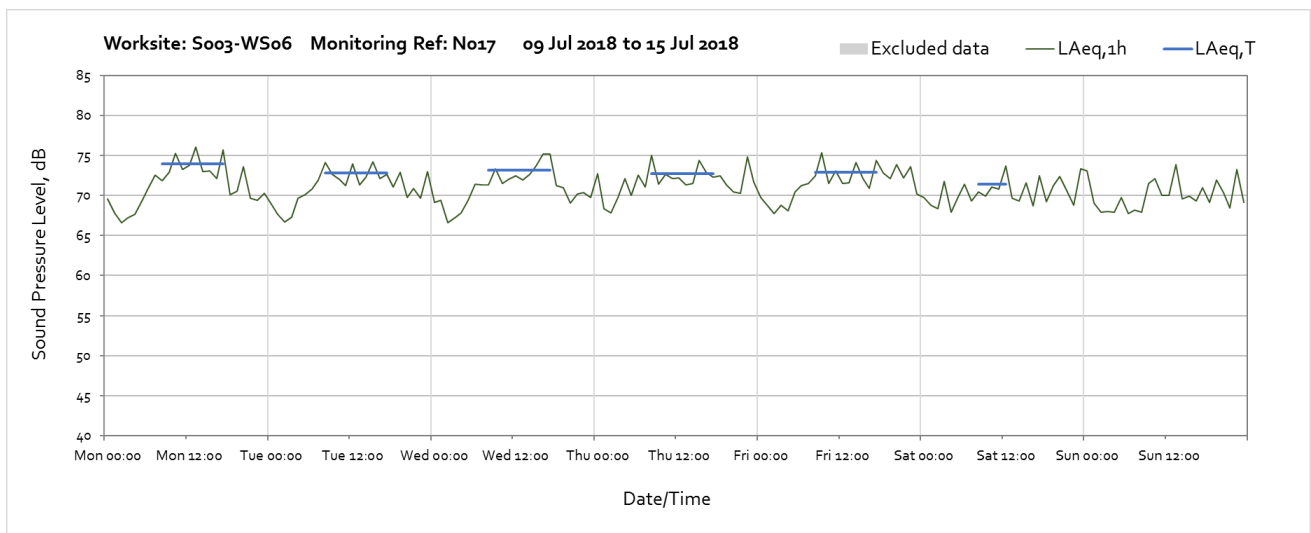
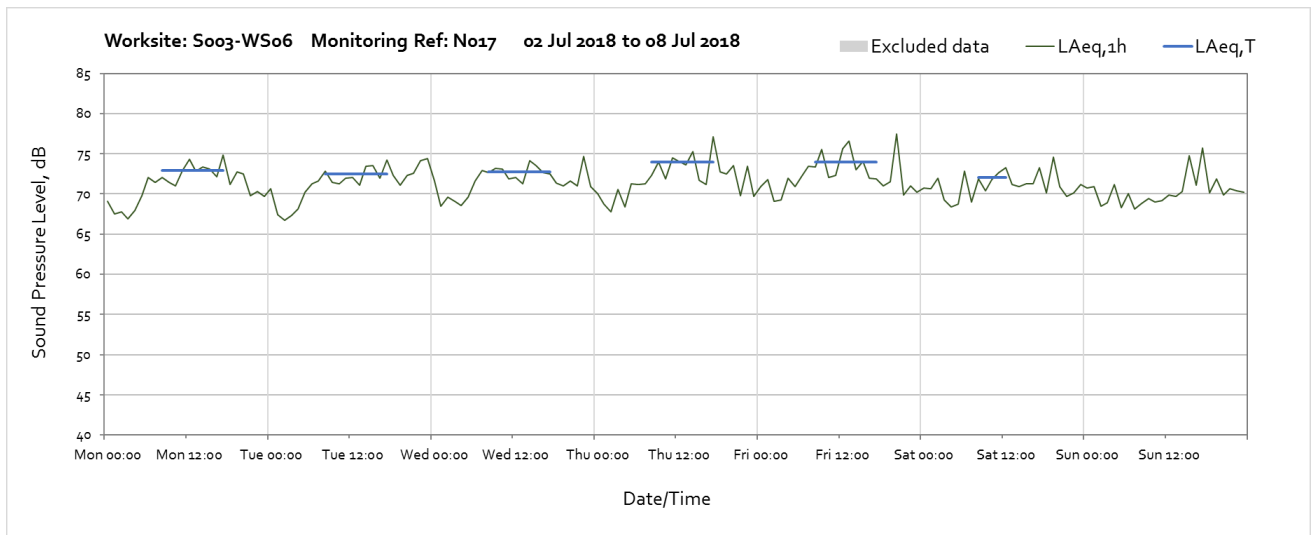
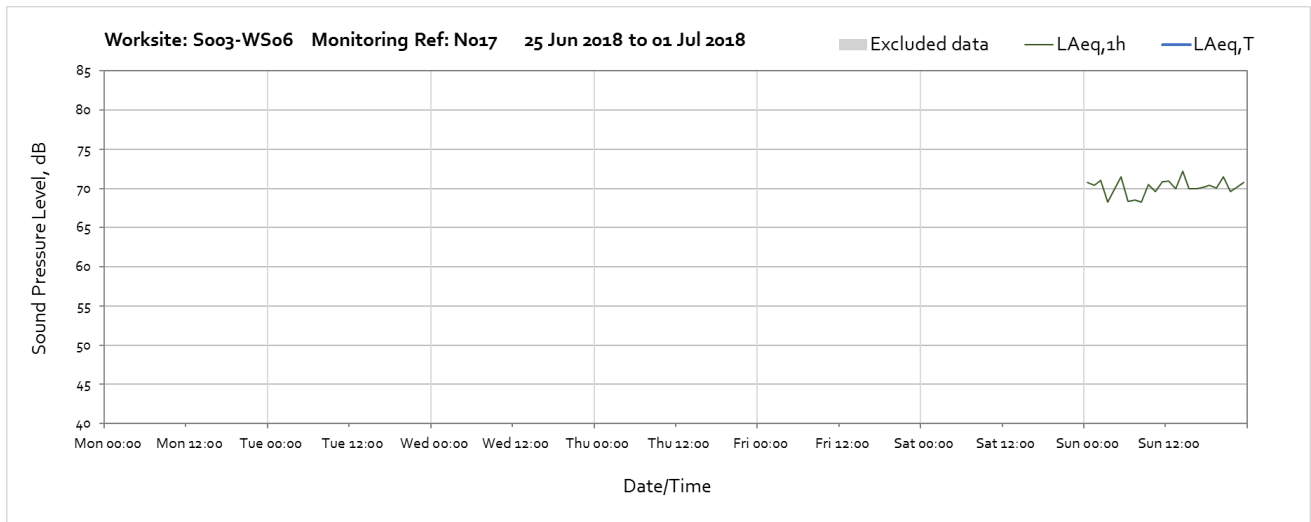


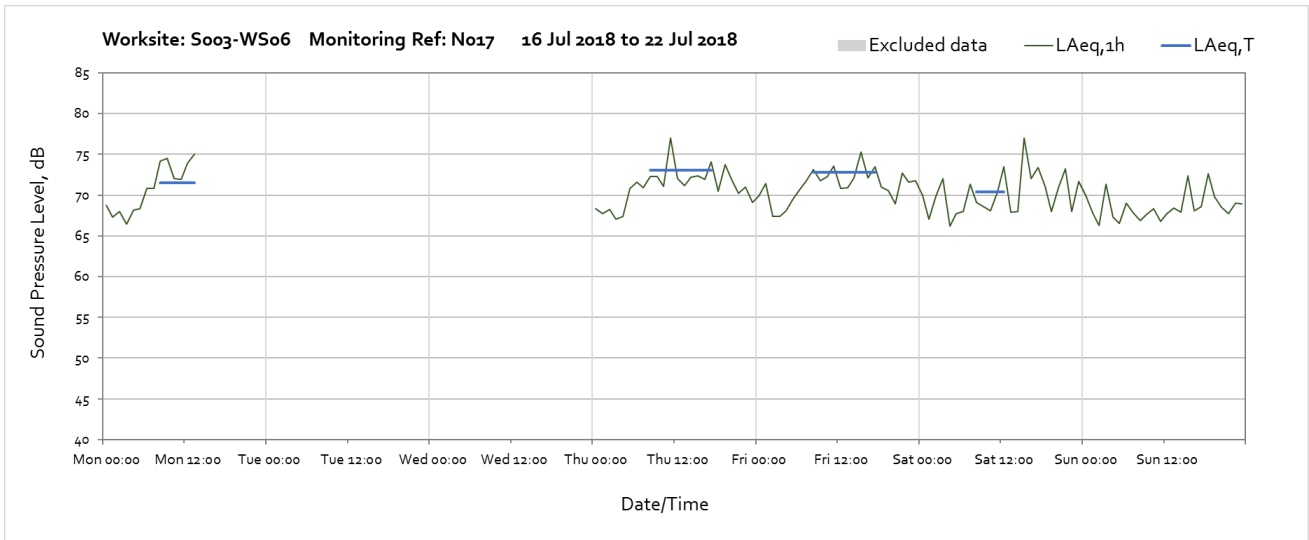
Worksite: S003-WS06 – Monitoring Ref: N015



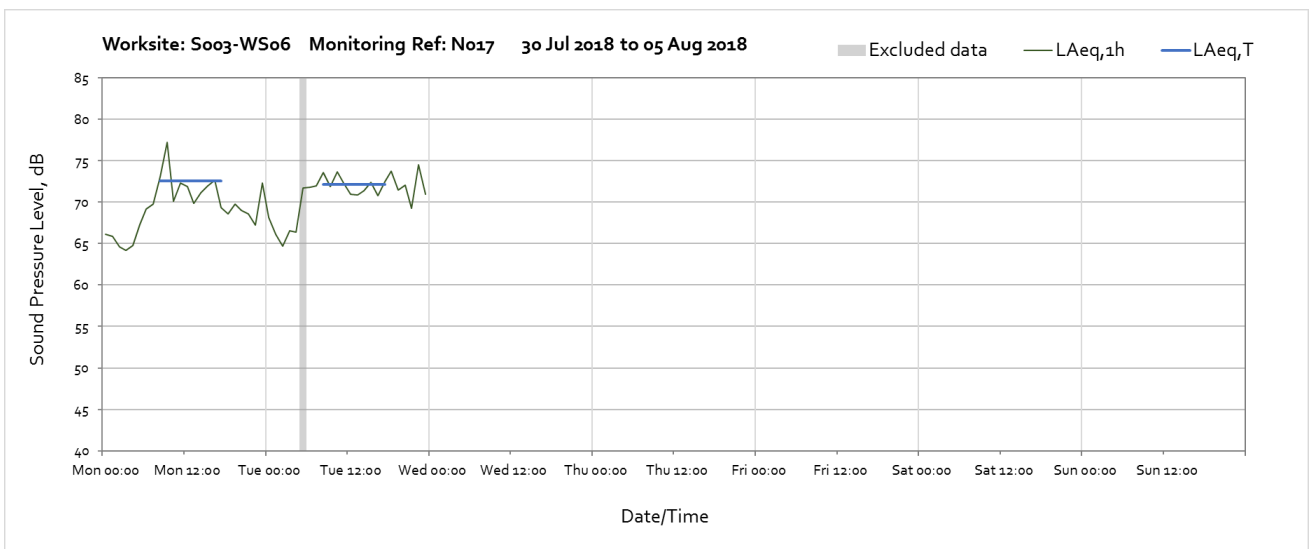
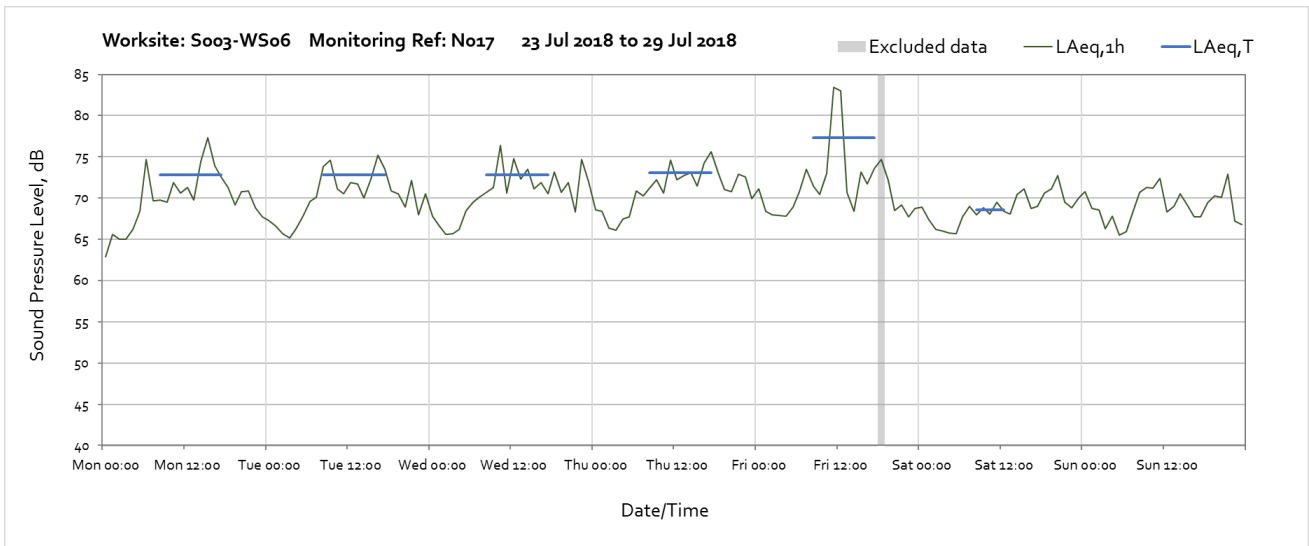


Worksite: S003-WS06 – Monitoring Ref: N017

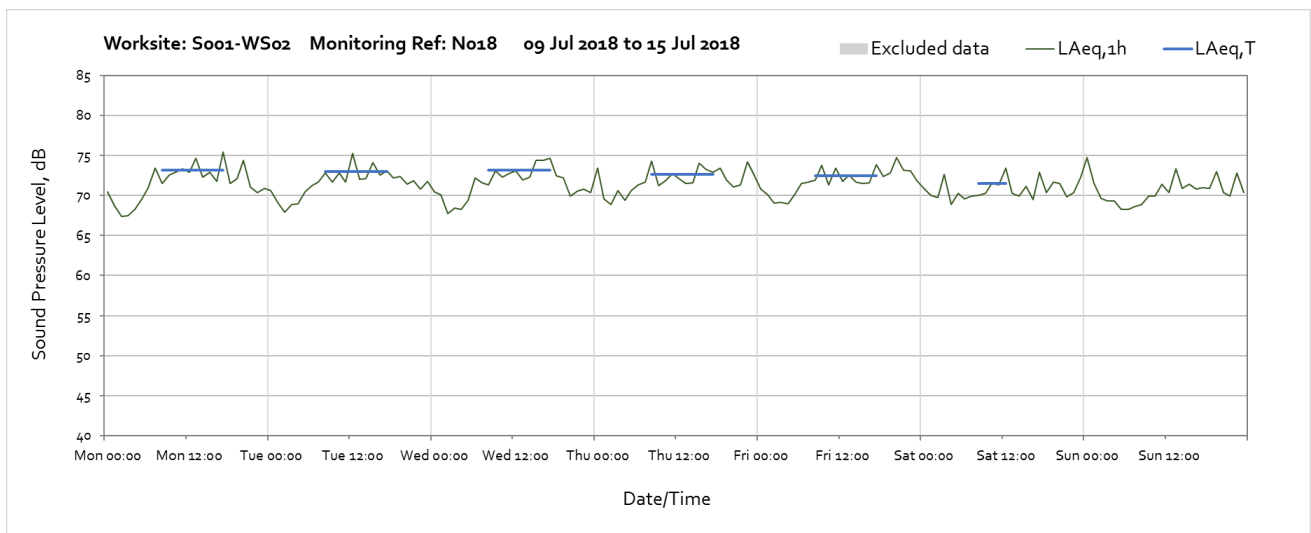
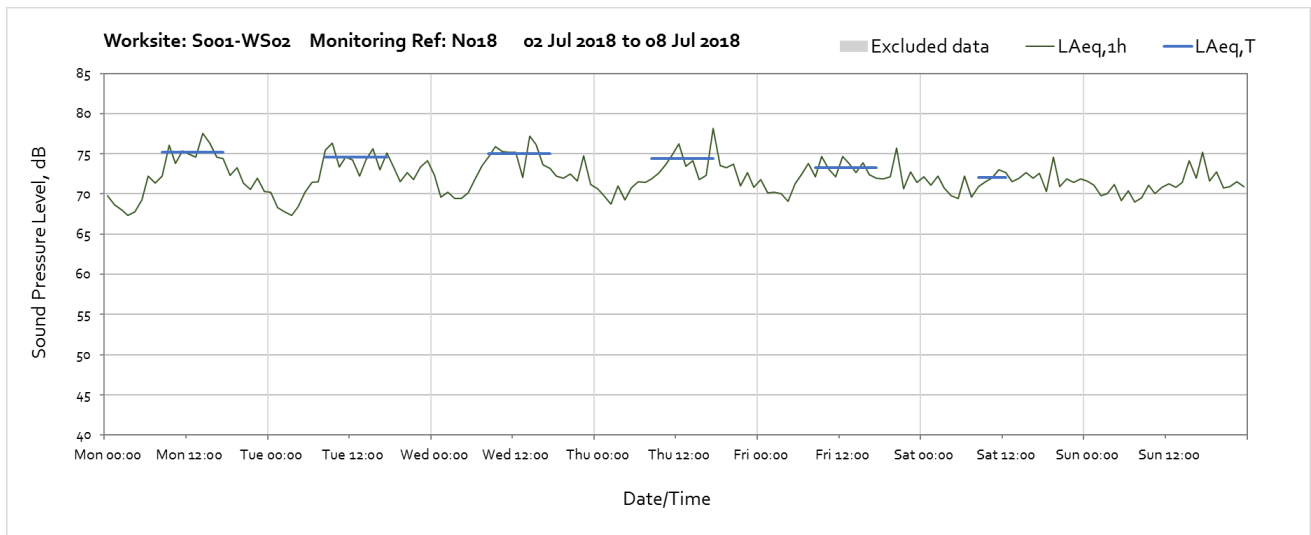
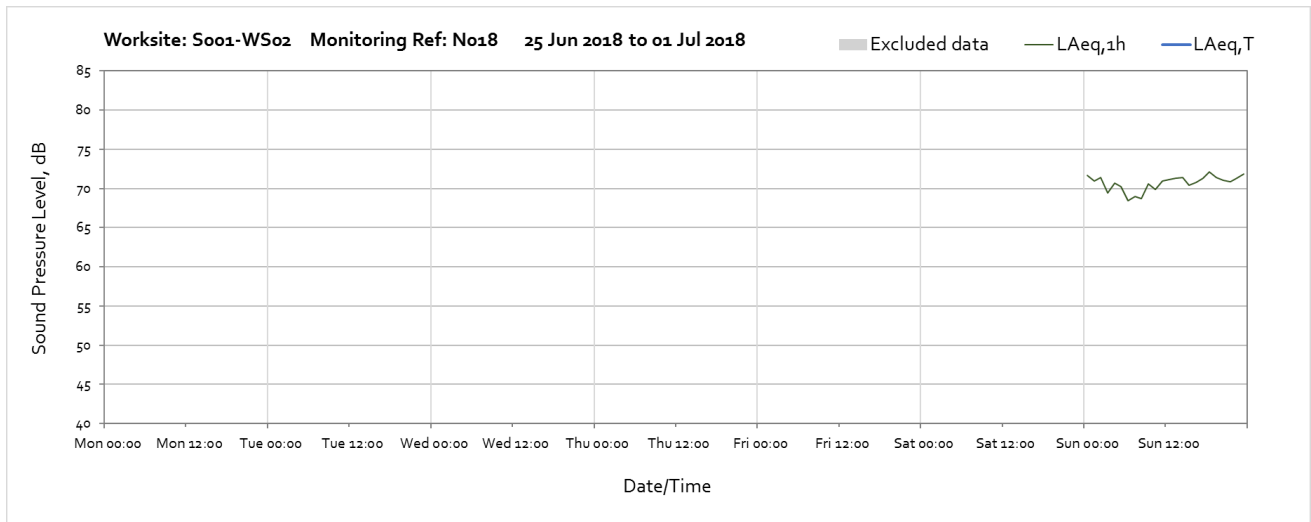


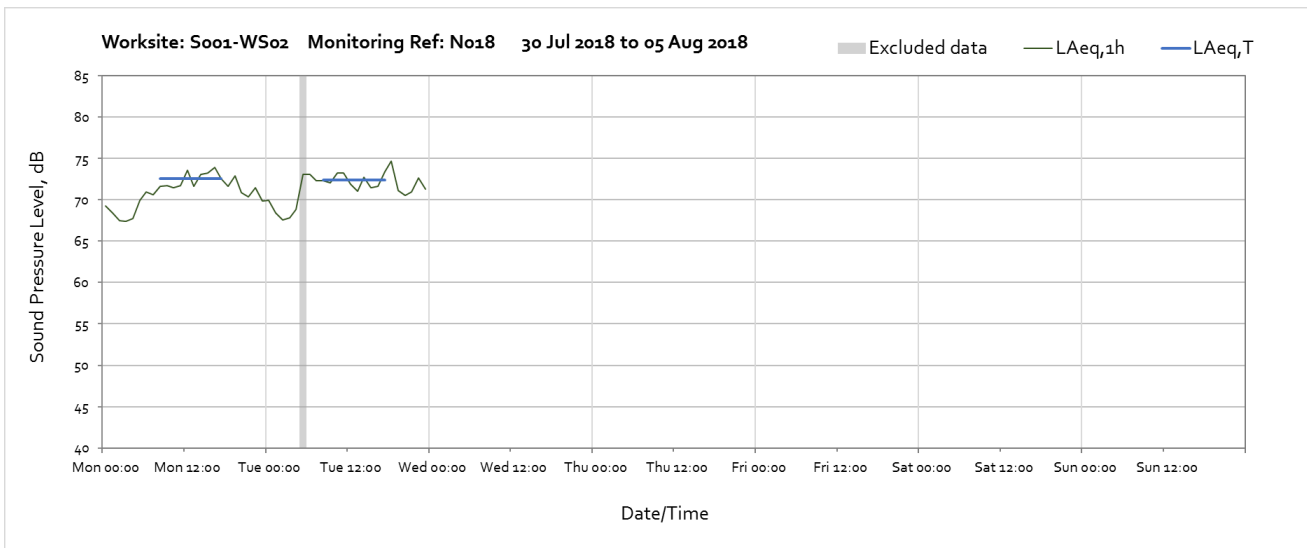
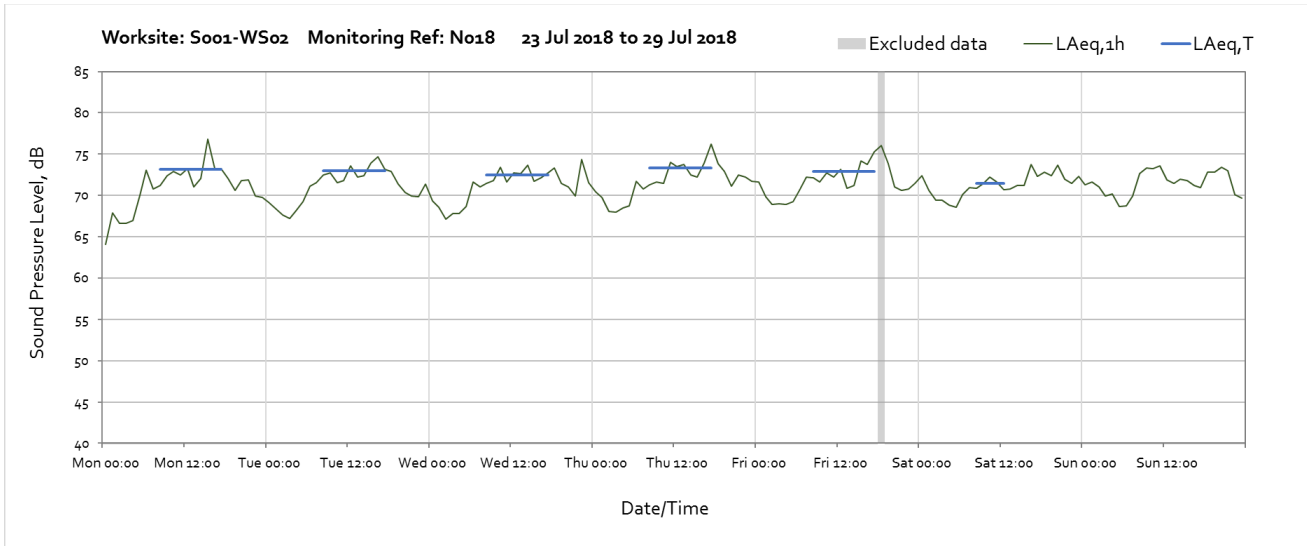
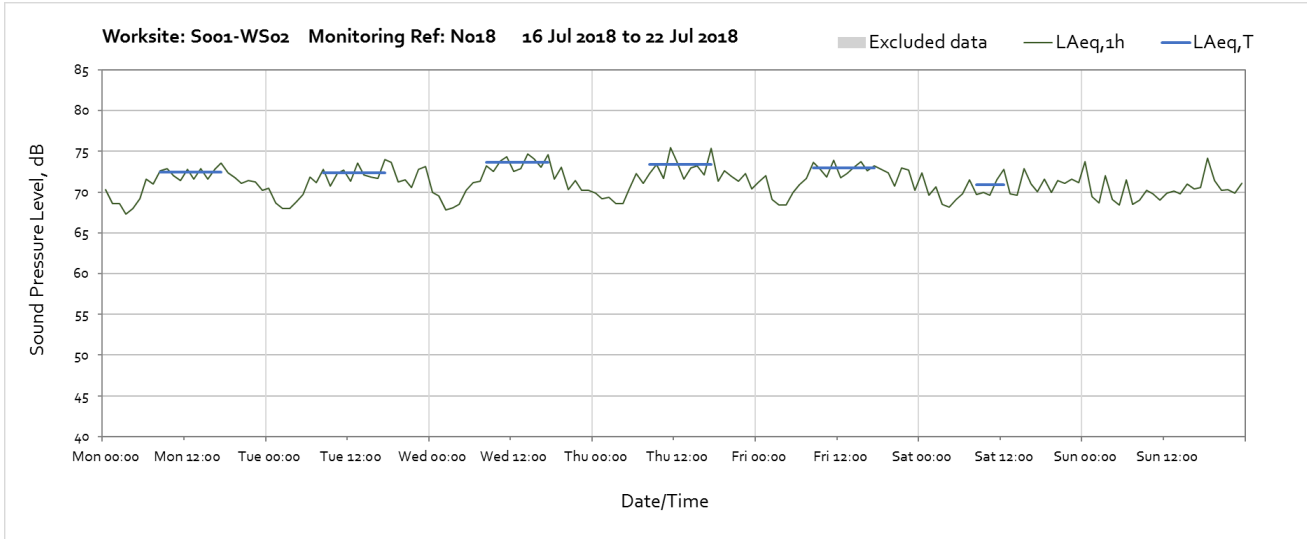


Note – Missing data between 13:00 on Monday 16 and 09:00 on Thursday 19 due to incorrect instrument setup after software update.

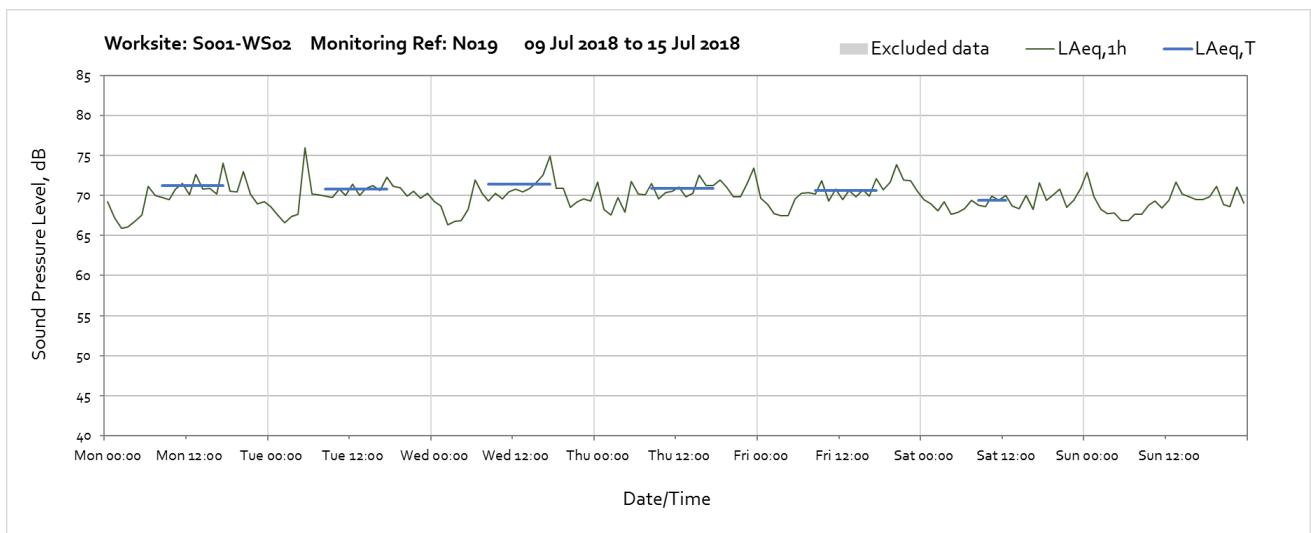
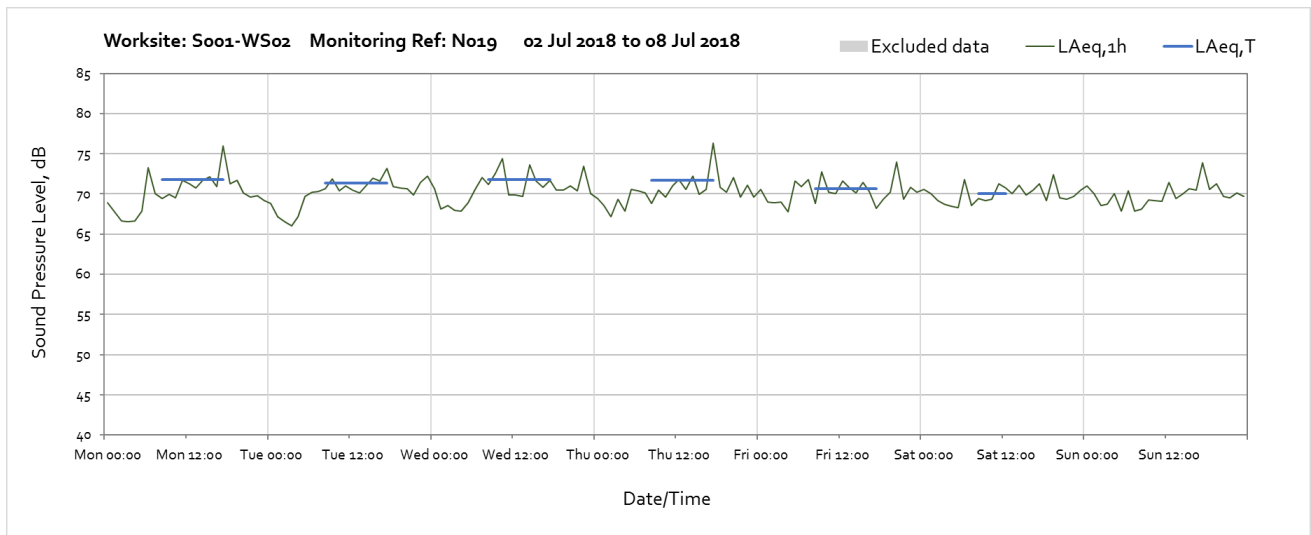
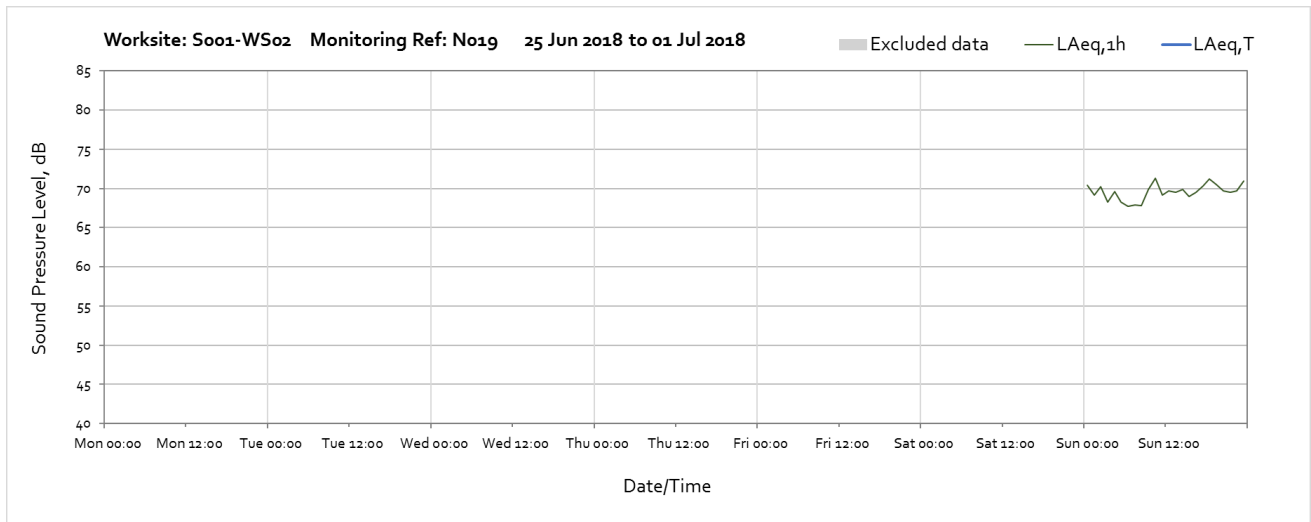


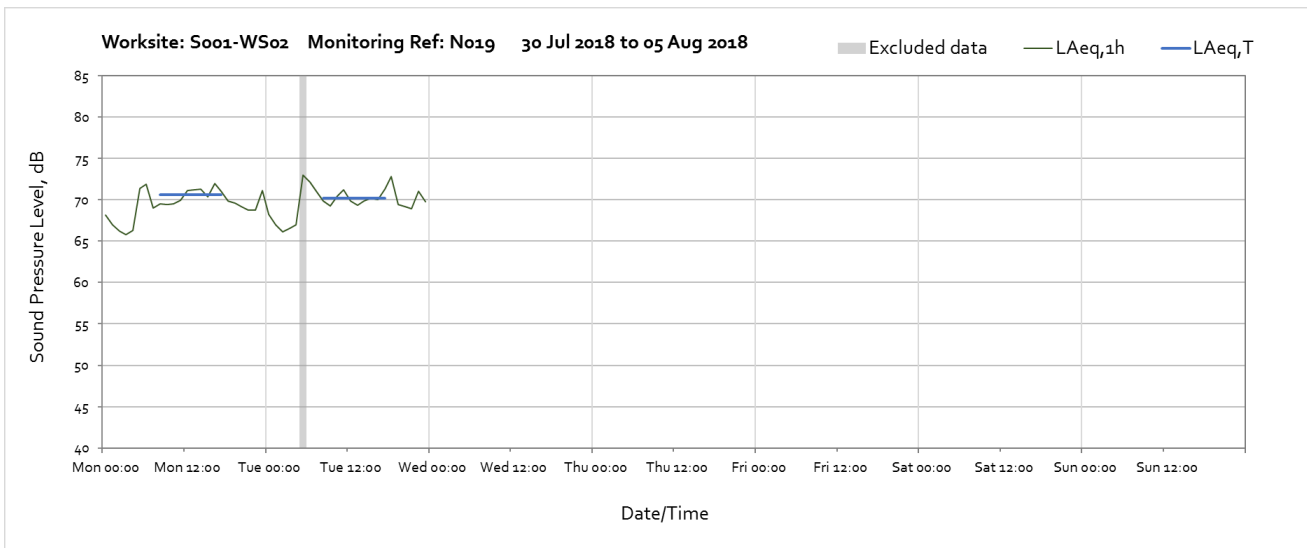
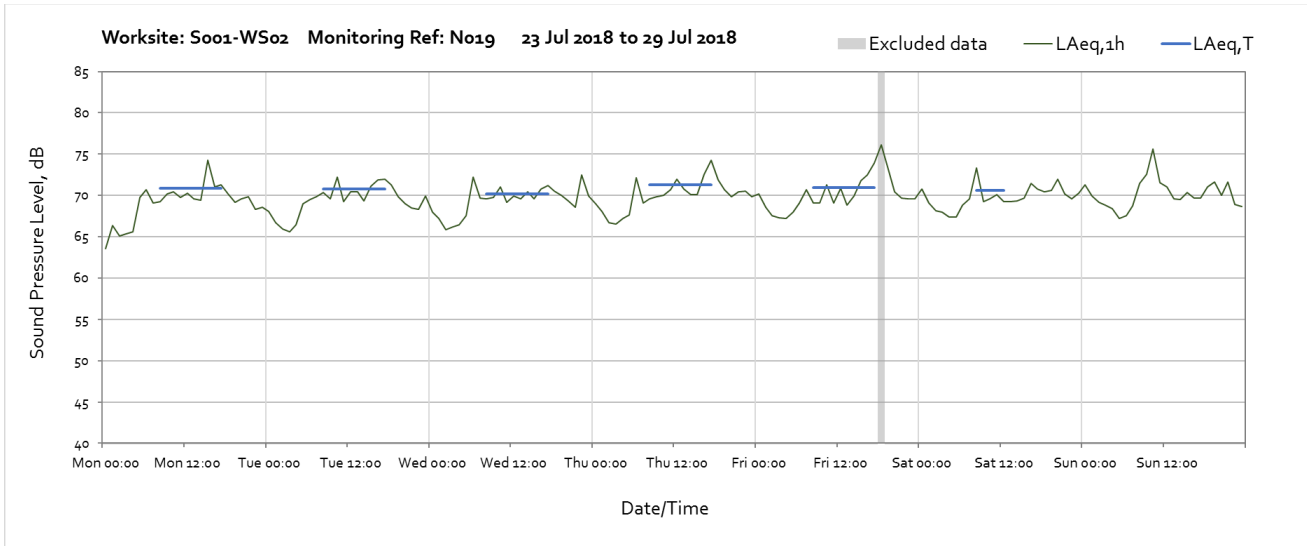
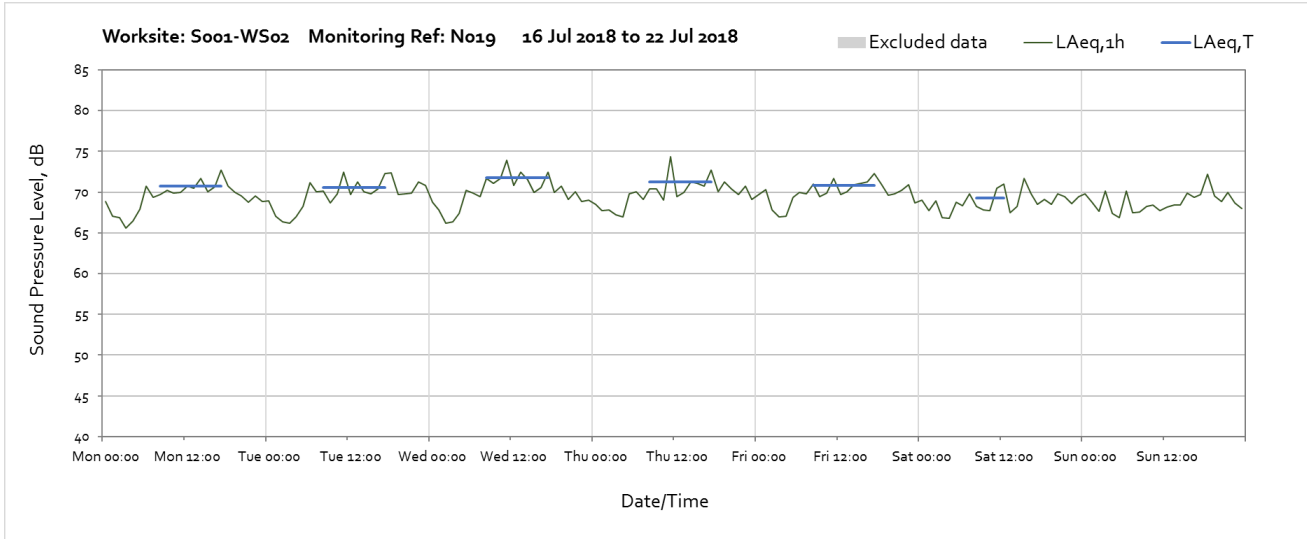
Worksite: S001-WS02 – Monitoring Ref: N018



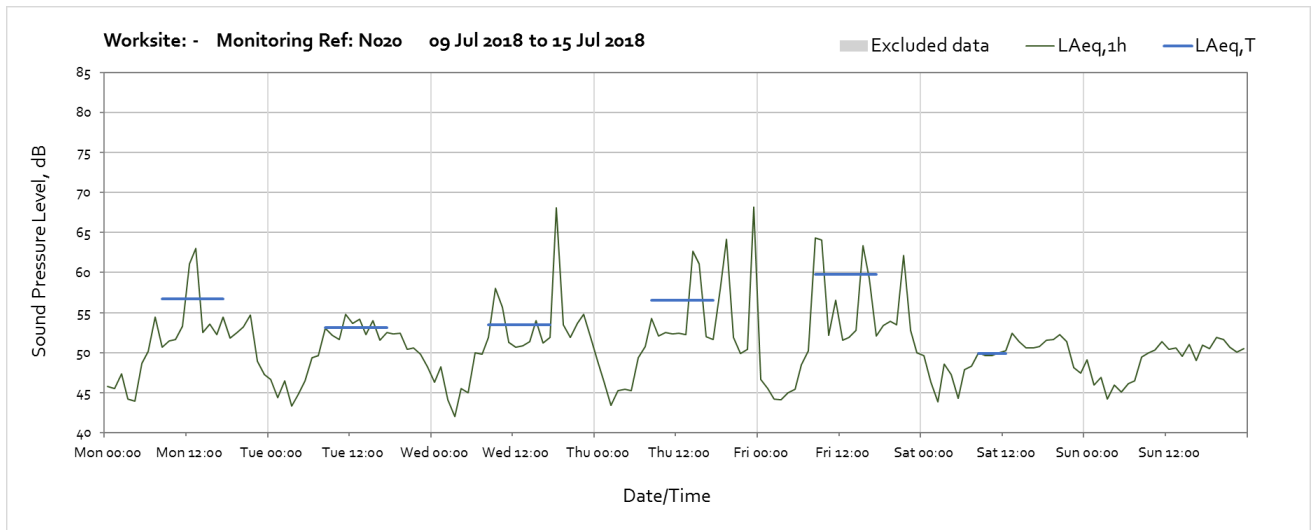
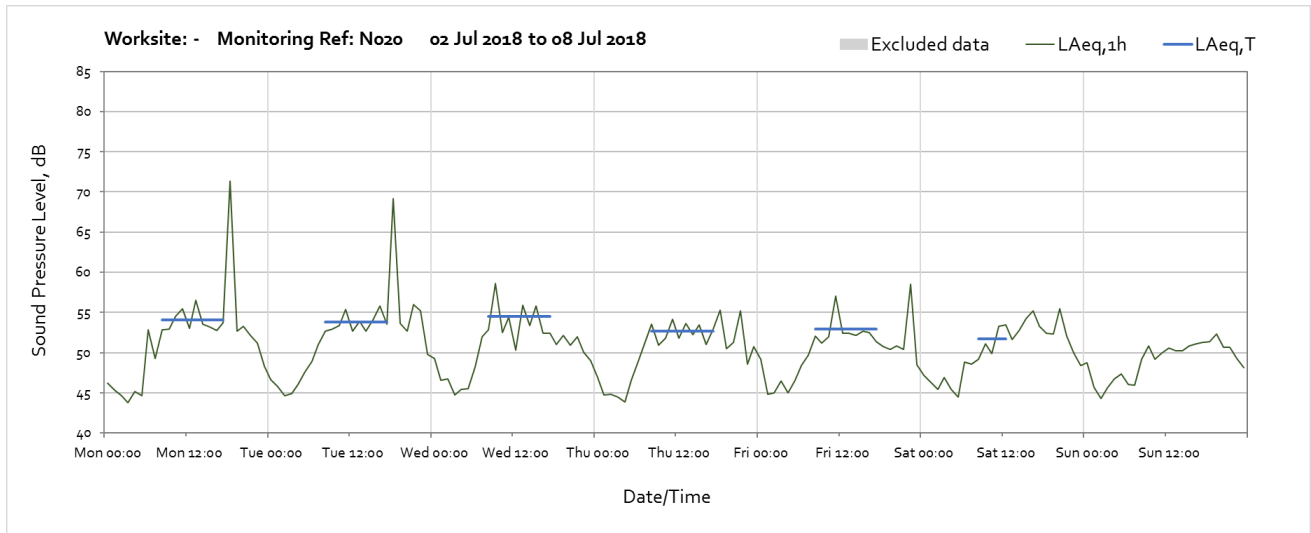
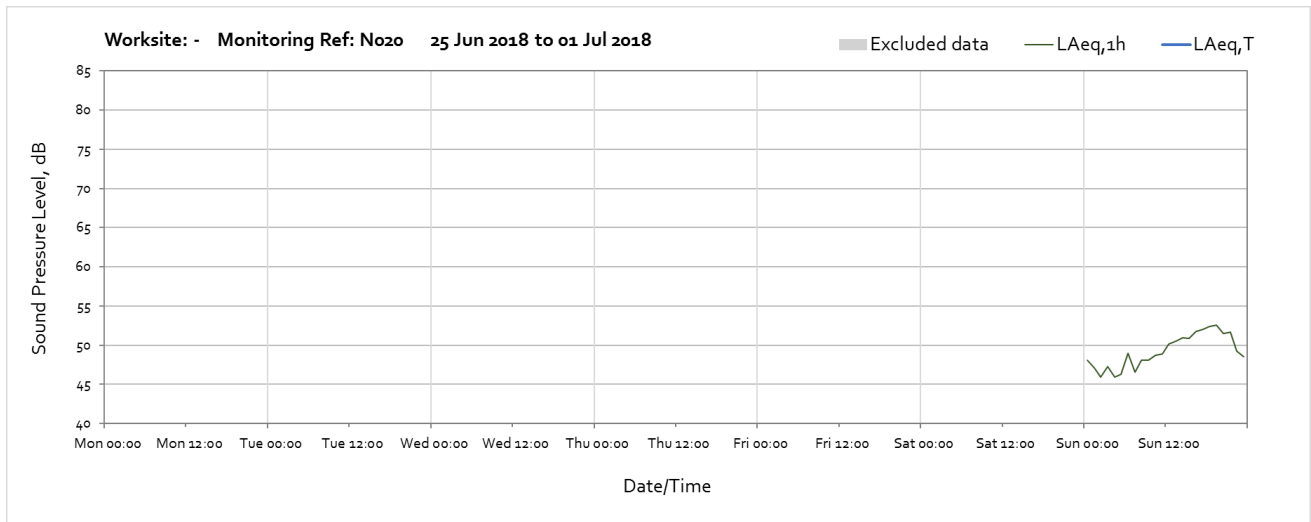


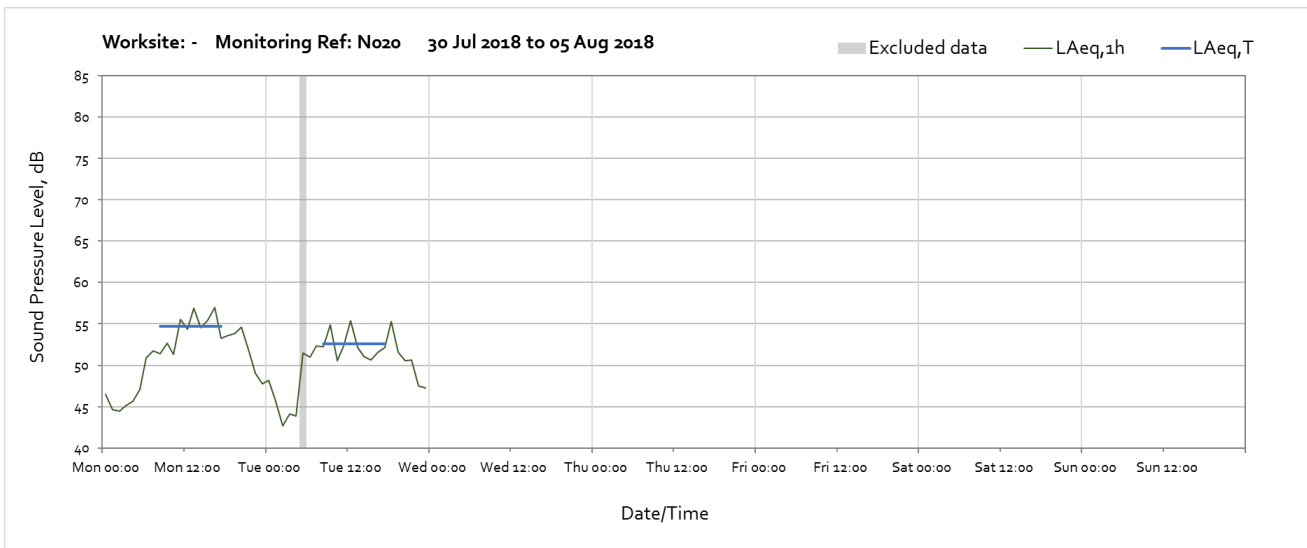
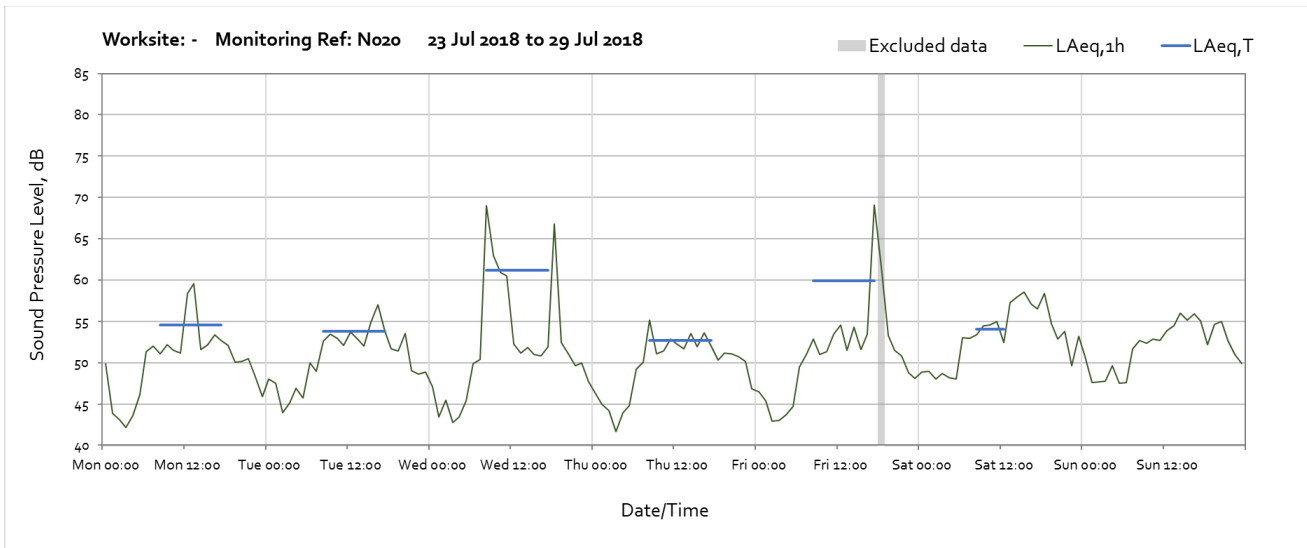
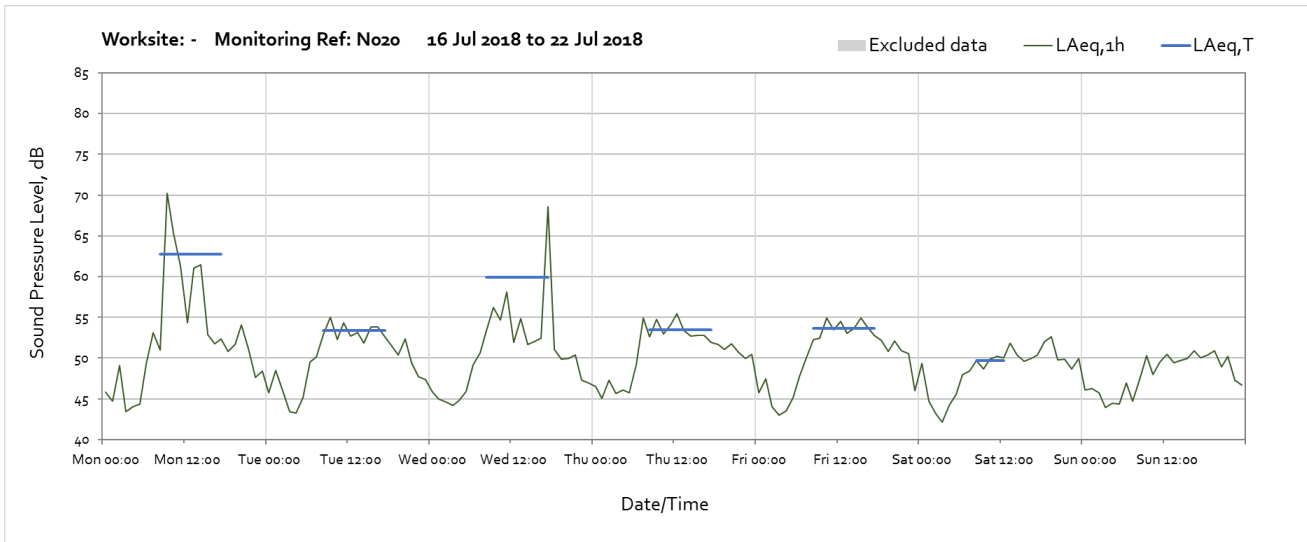
Worksite: S001-WS02 – Monitoring Ref: N019



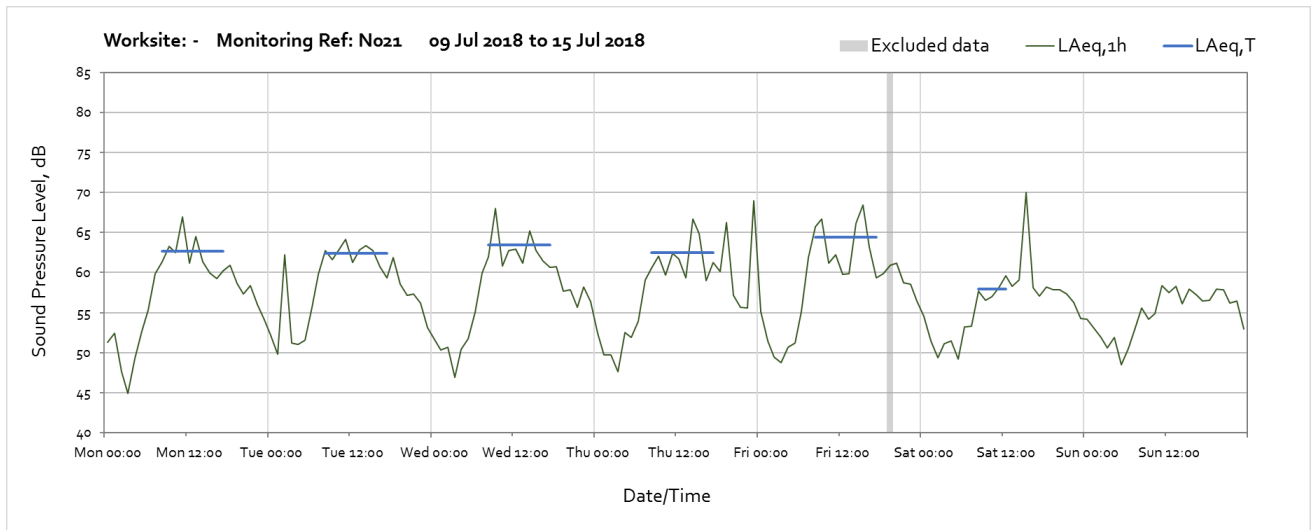
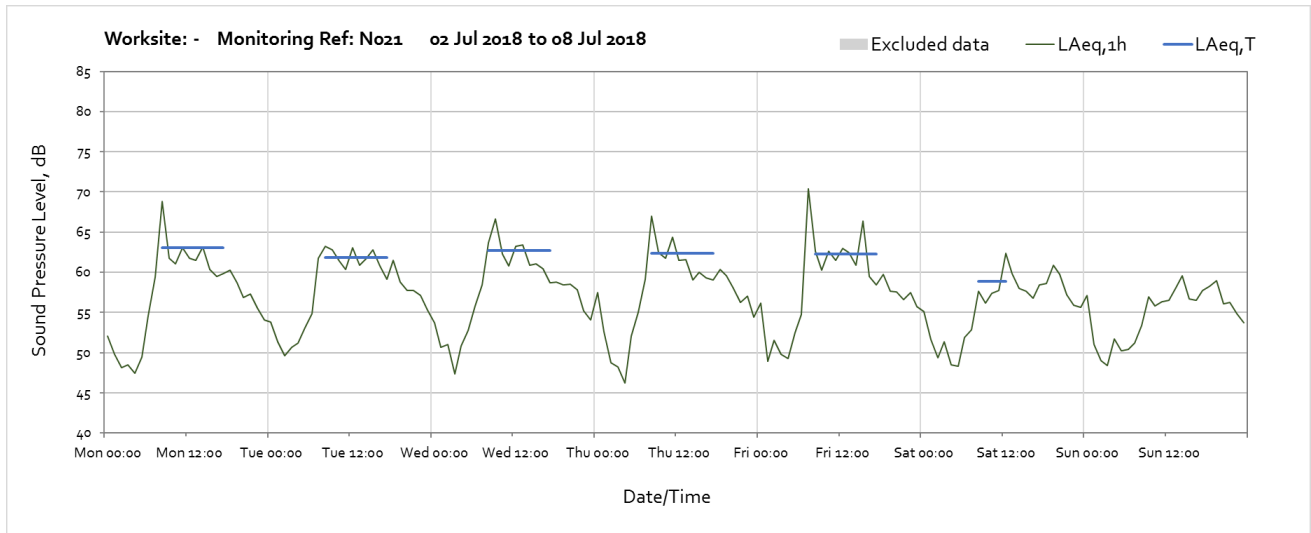
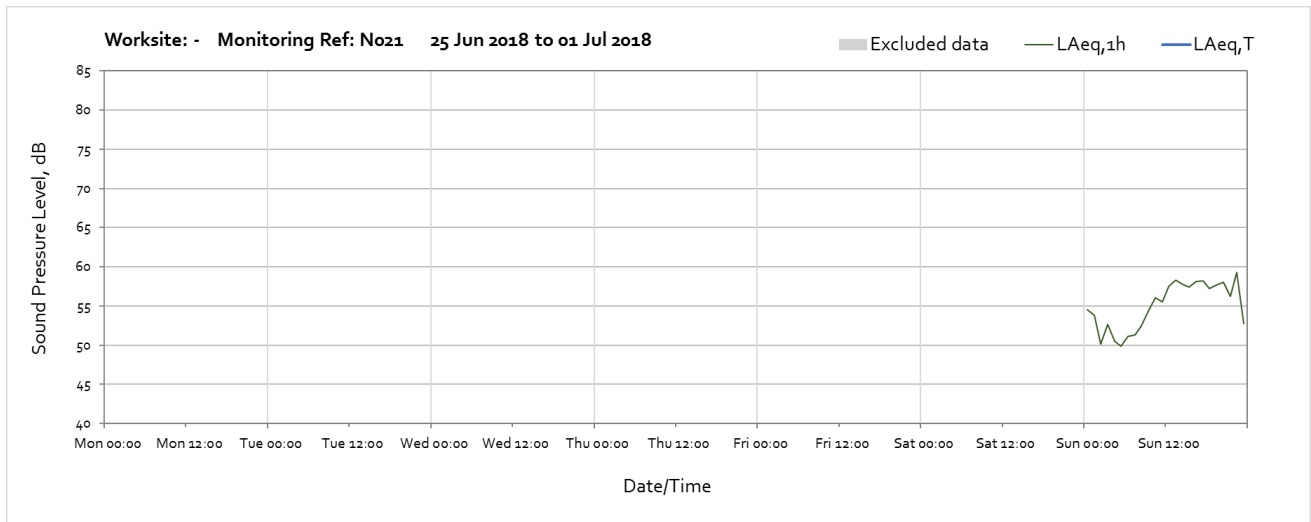


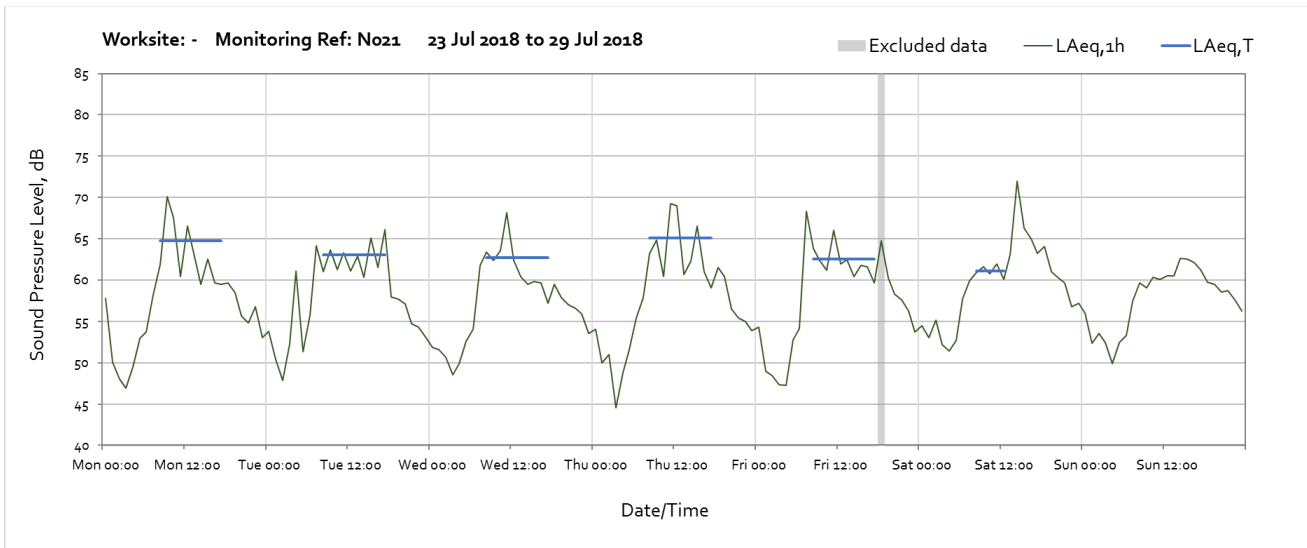
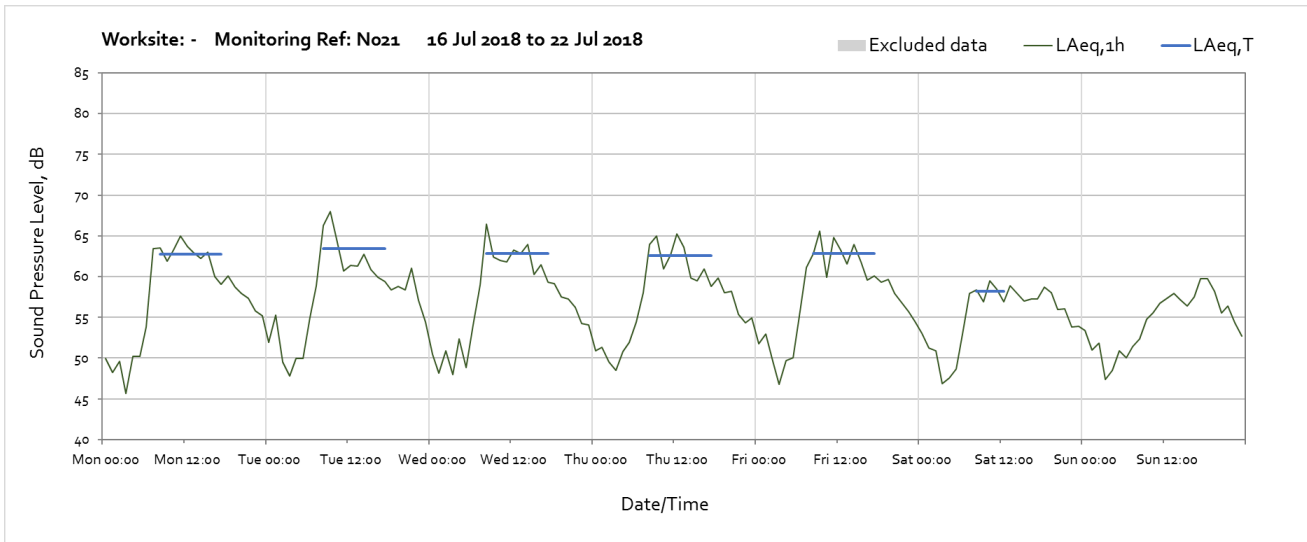
Monitoring Ref: N020



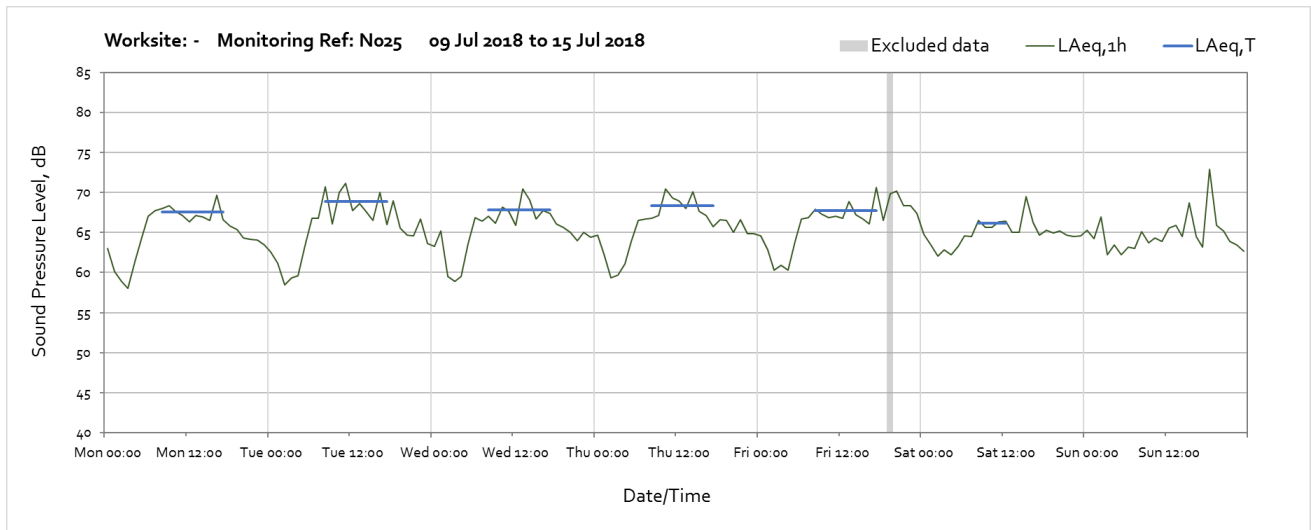
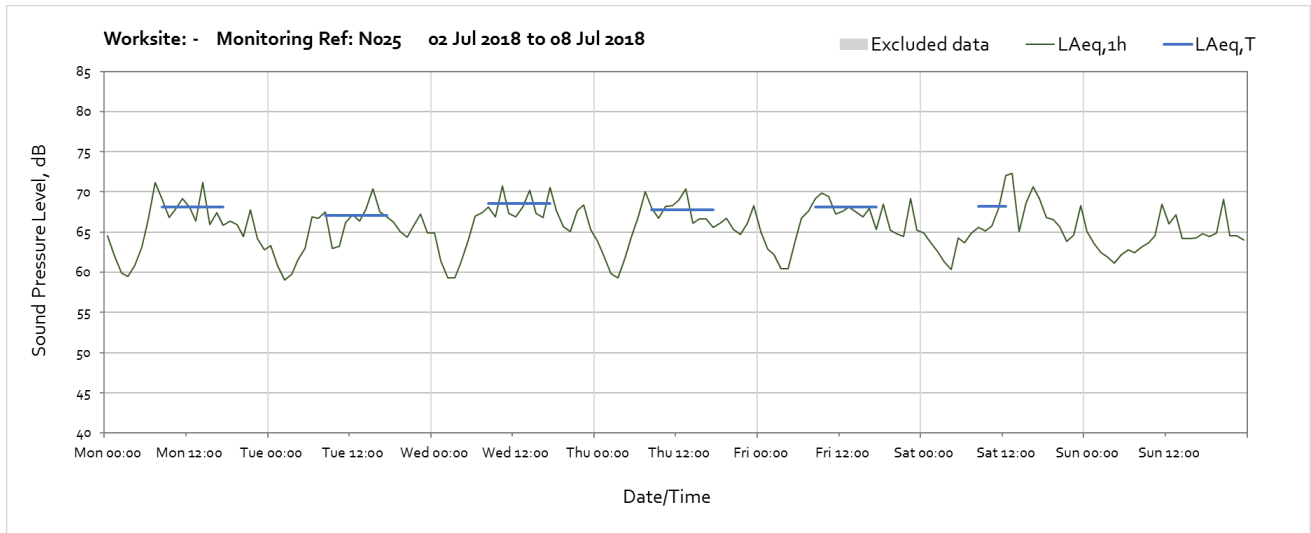
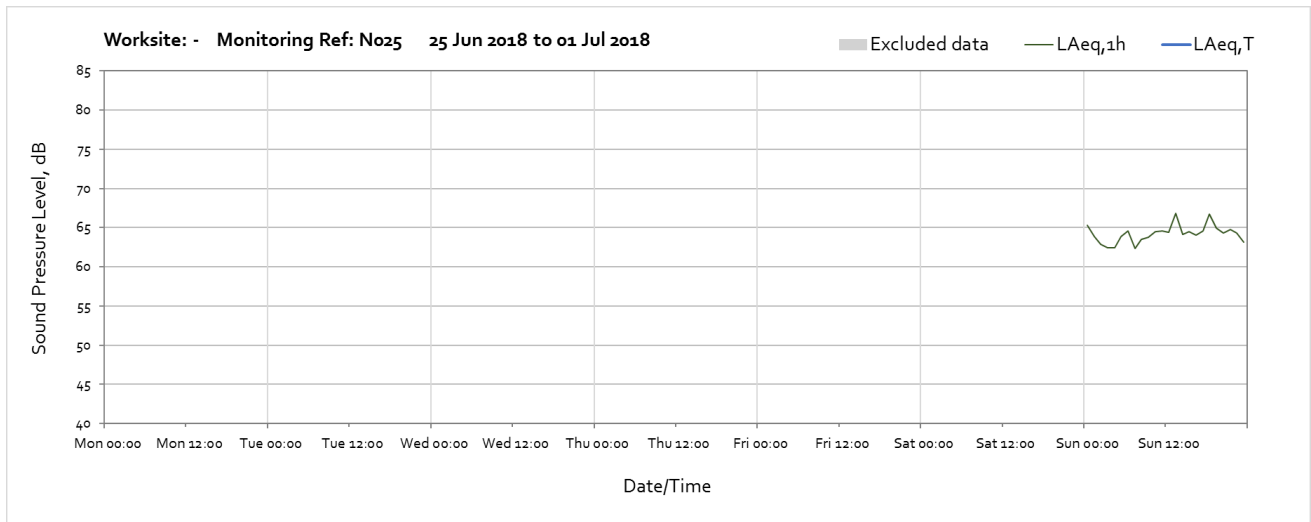


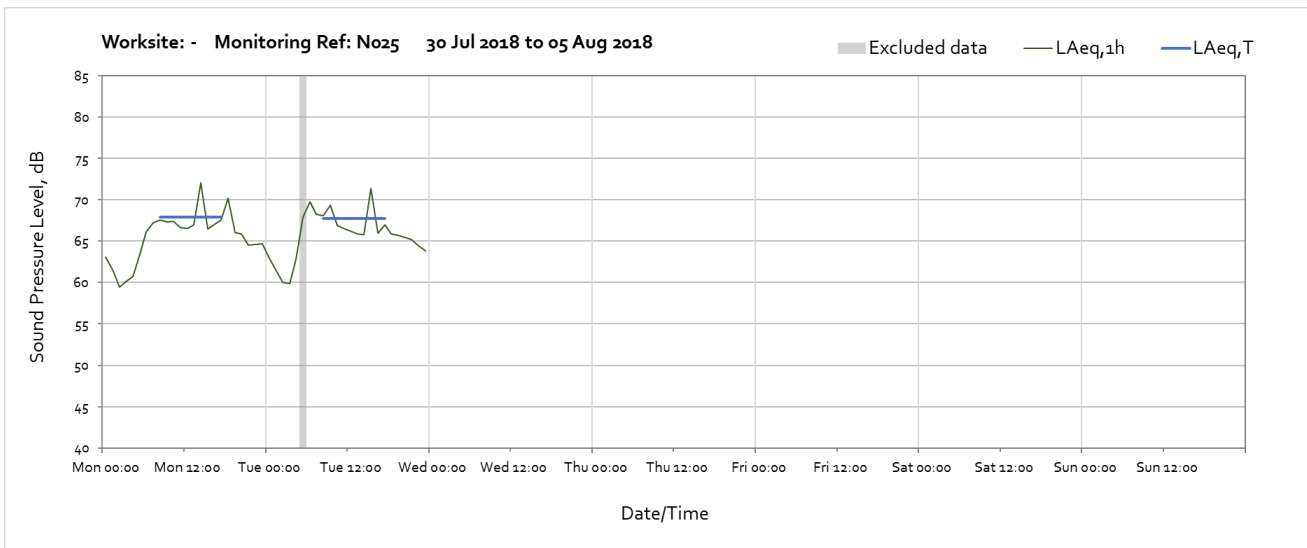
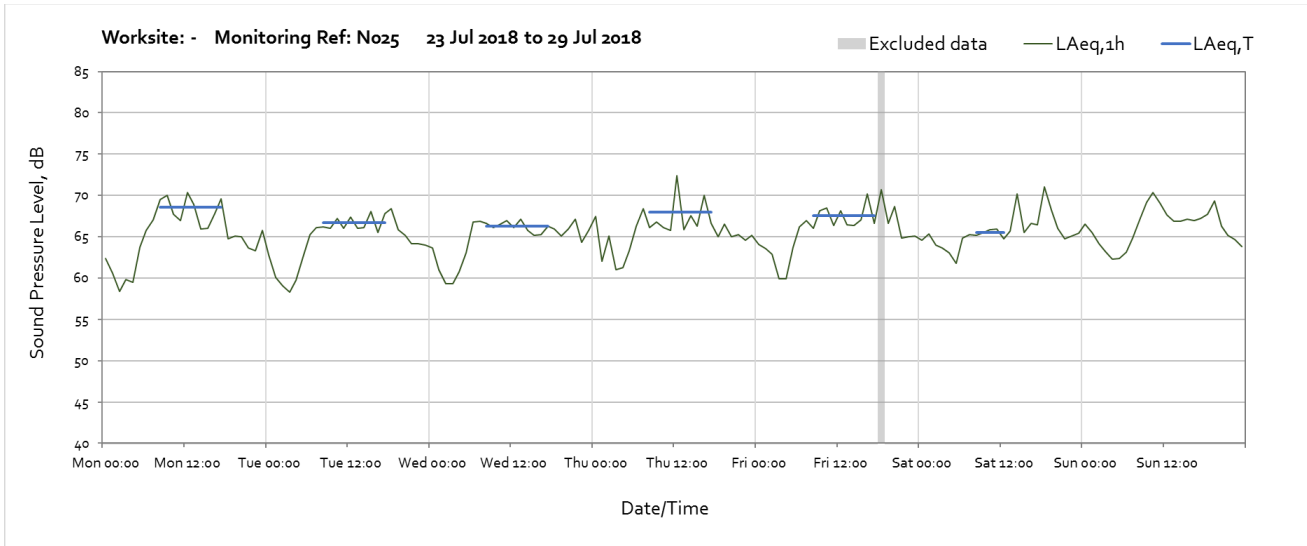
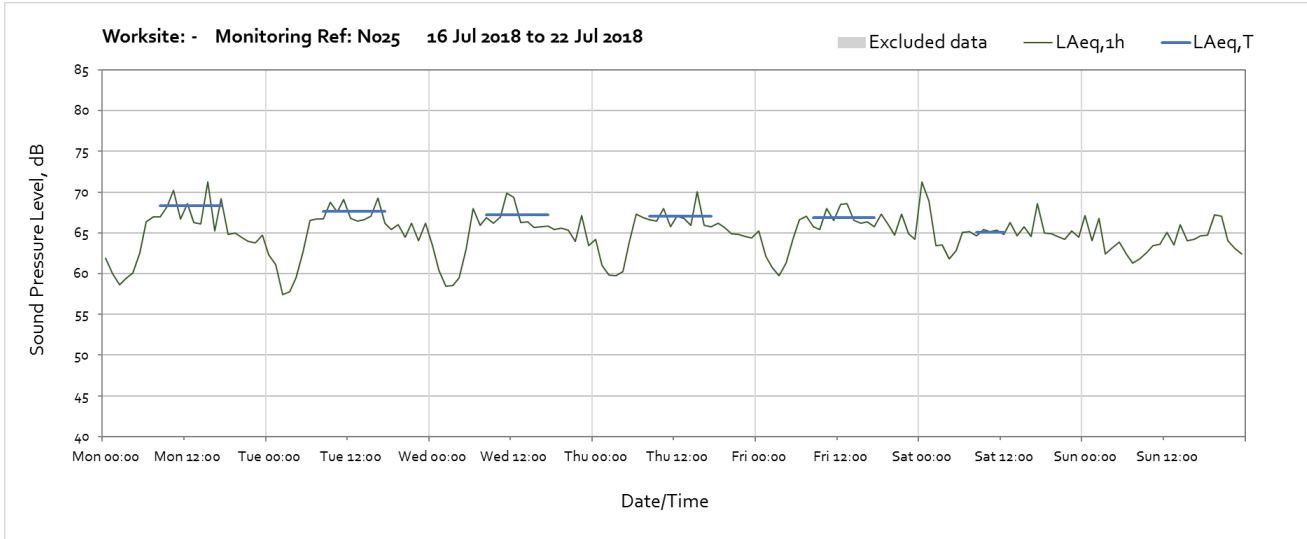
Monitoring Ref: N021



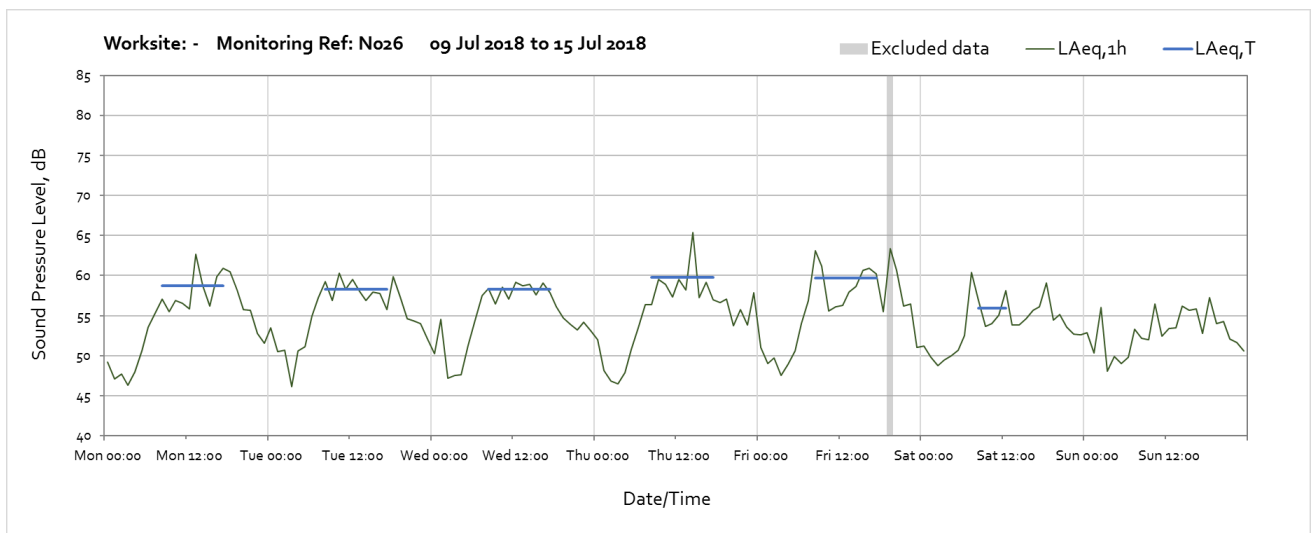
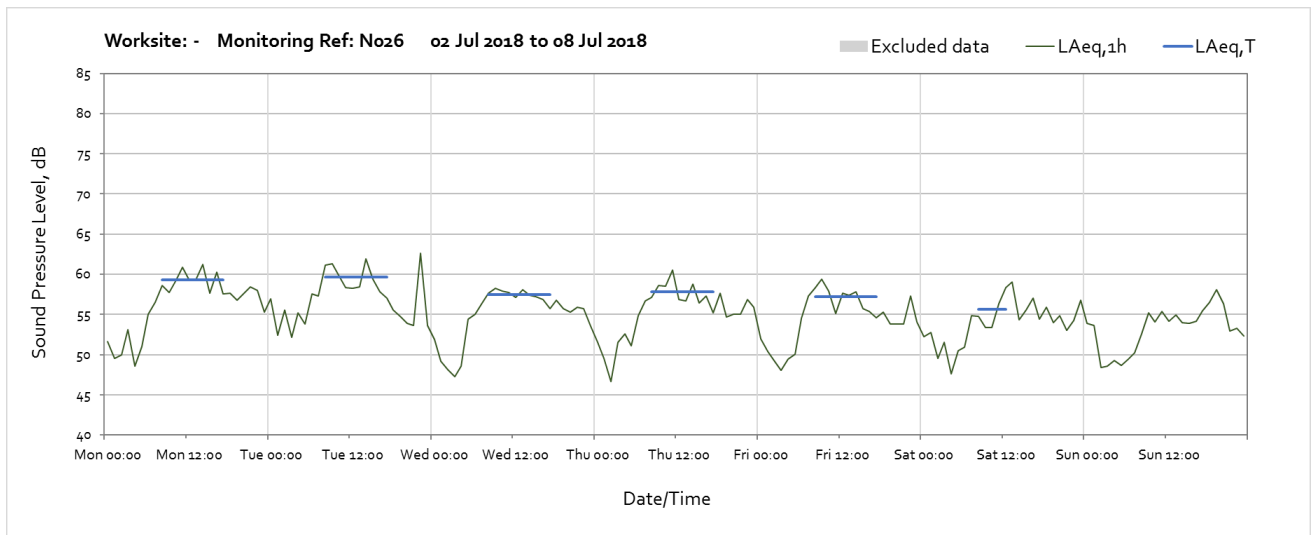
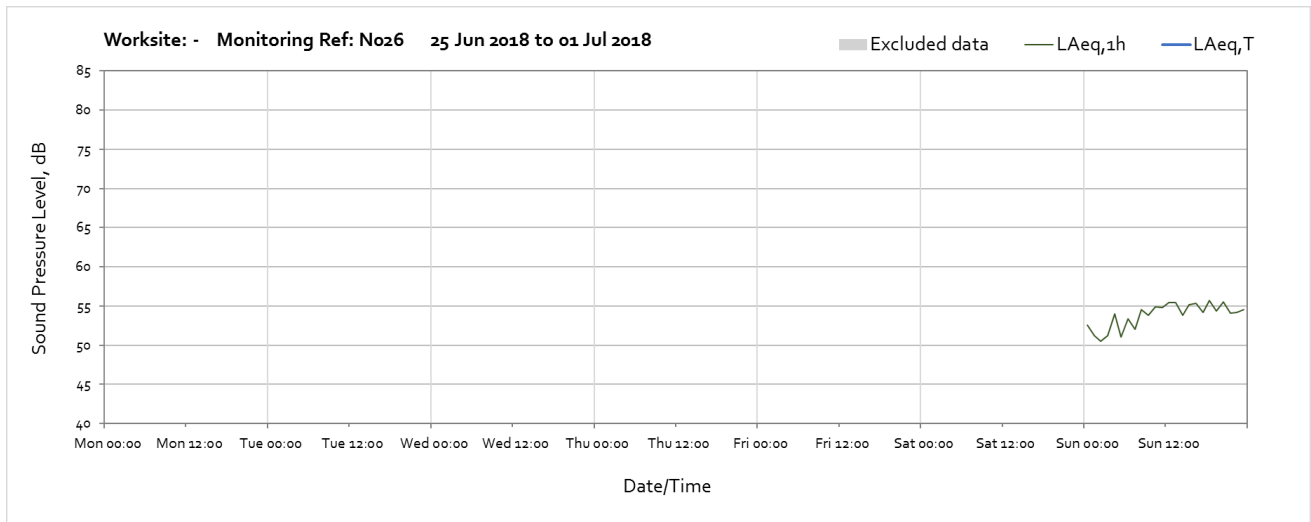


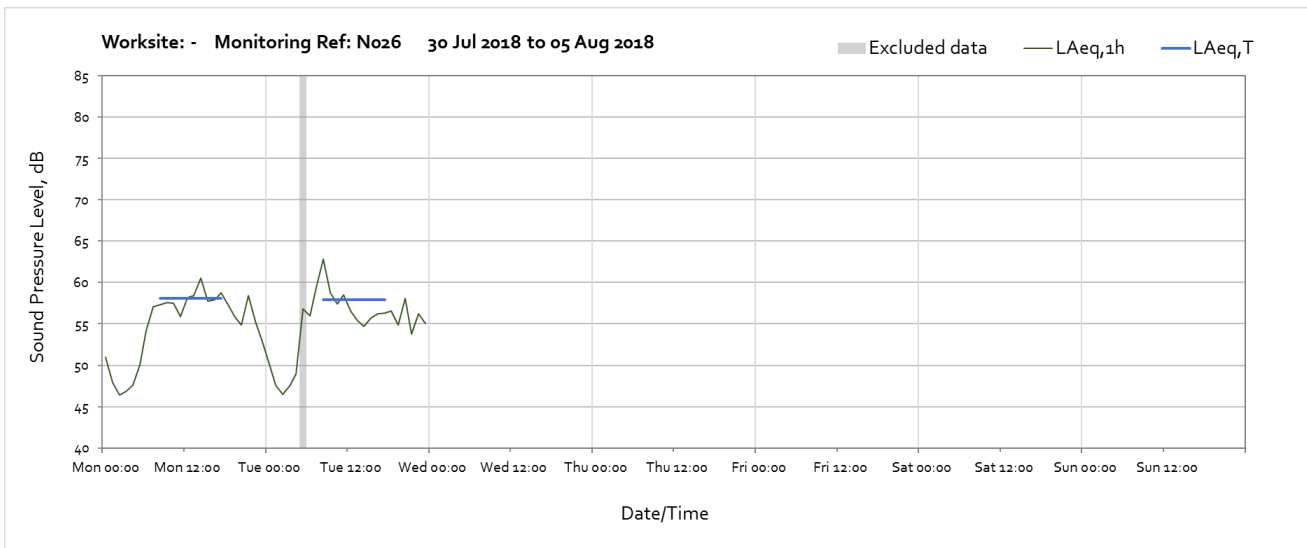
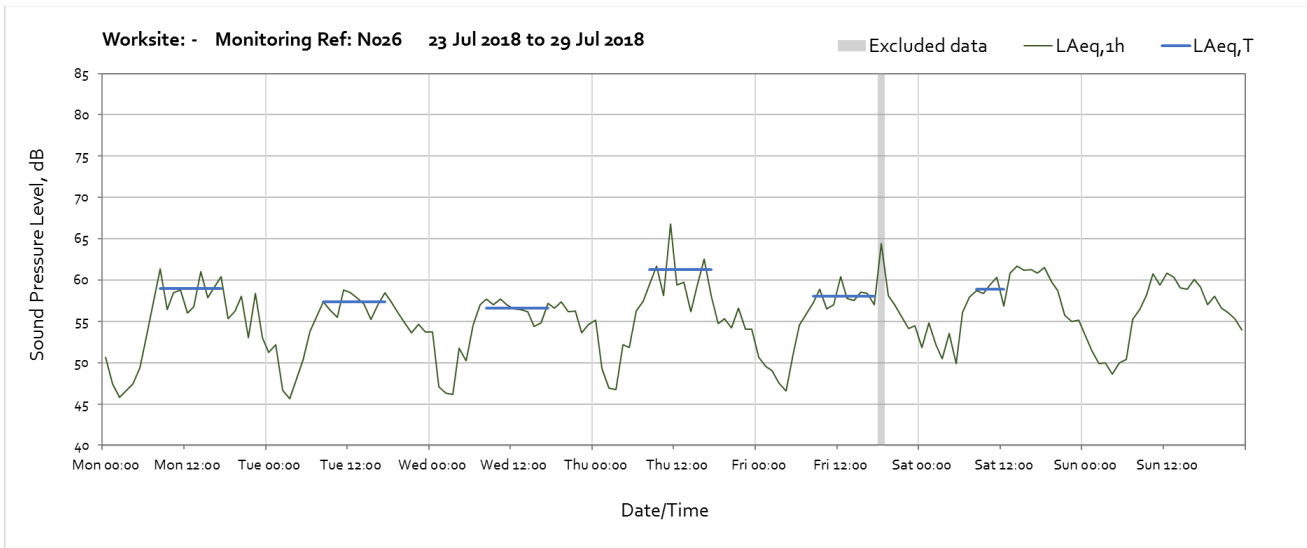
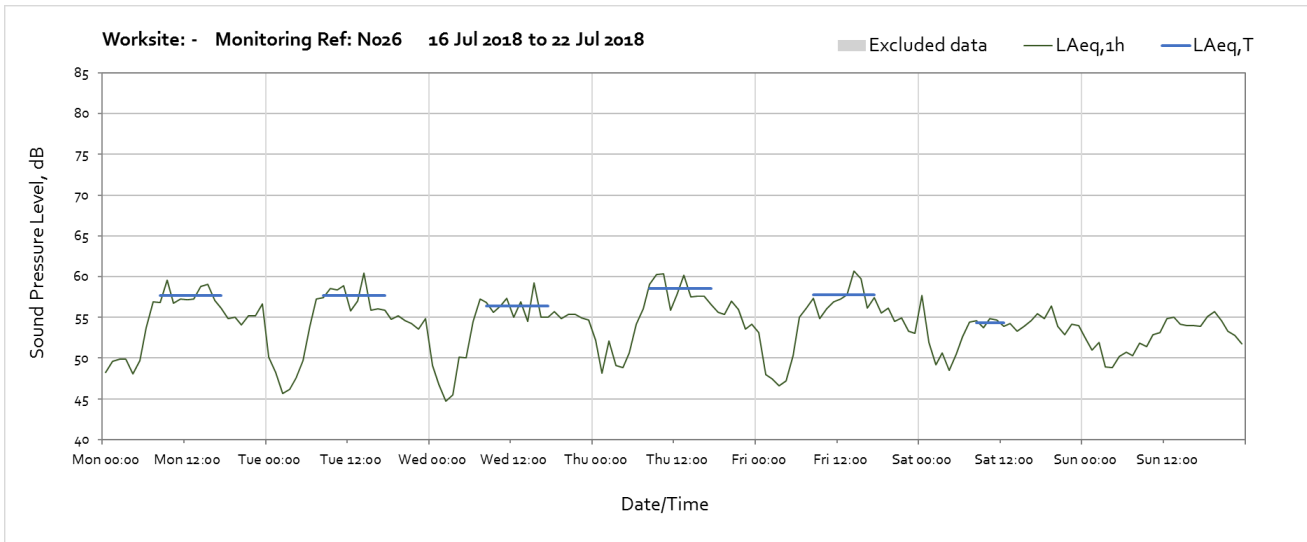
Monitoring Ref: N025



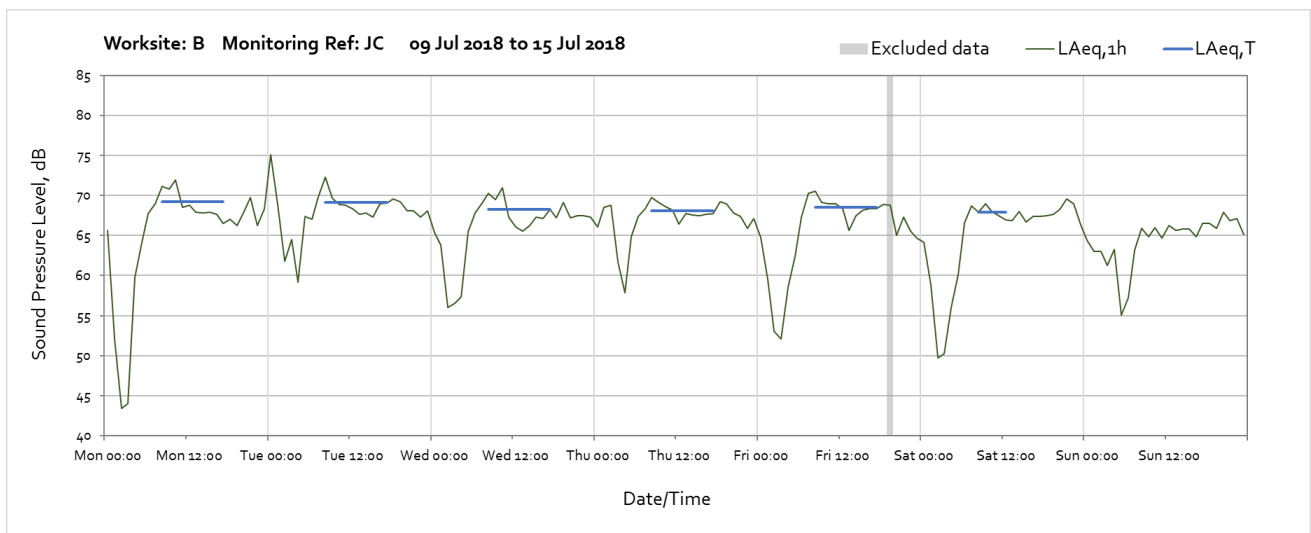
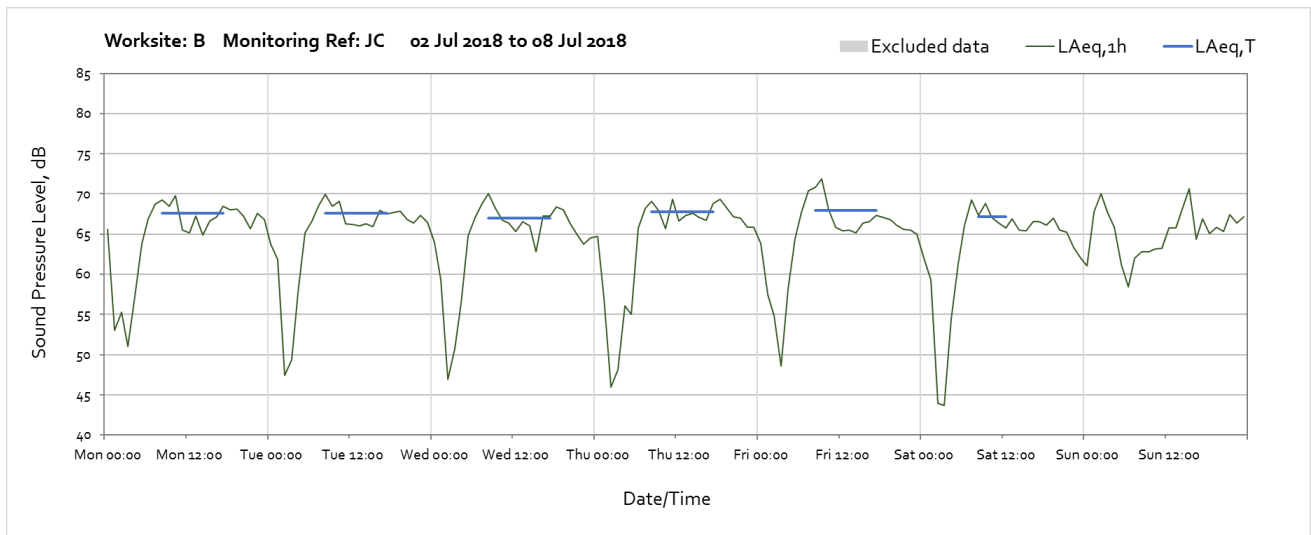
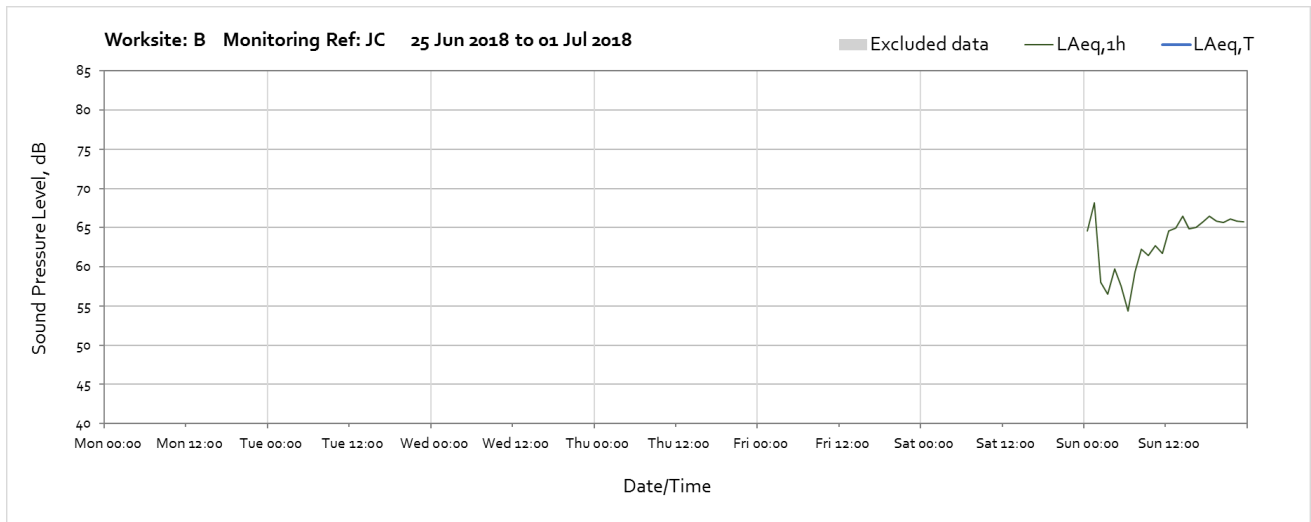


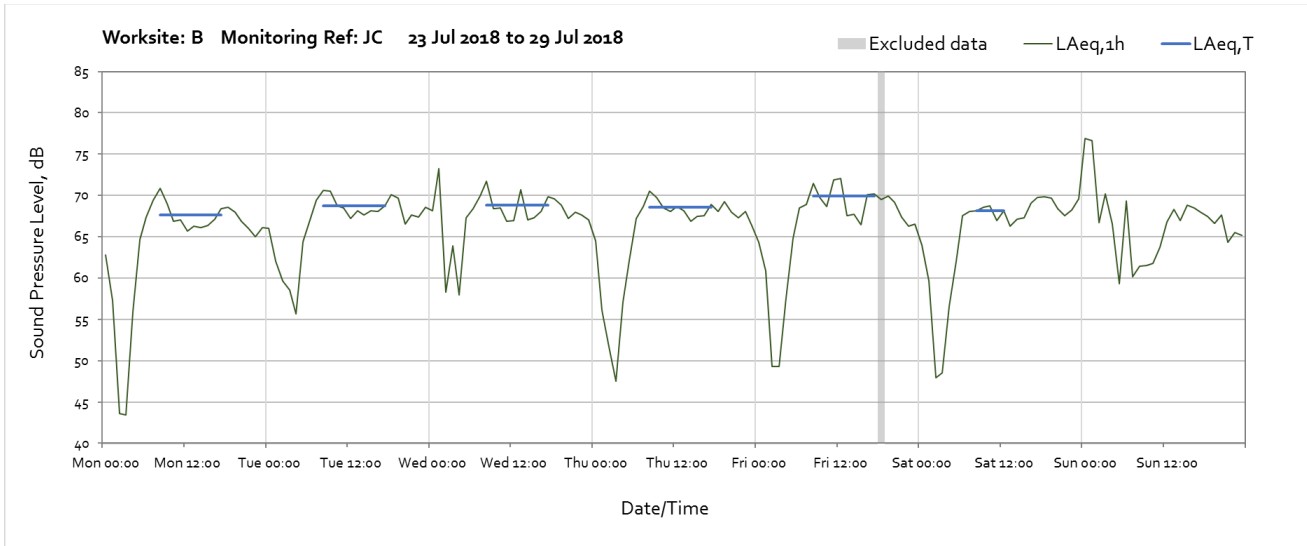
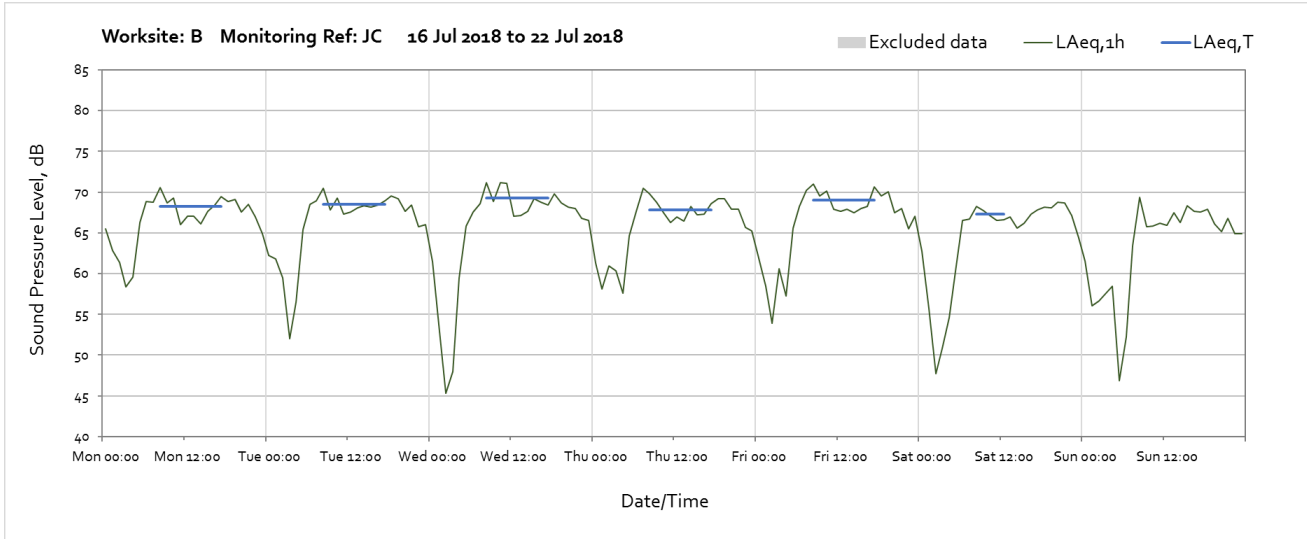
Monitoring Ref: N026



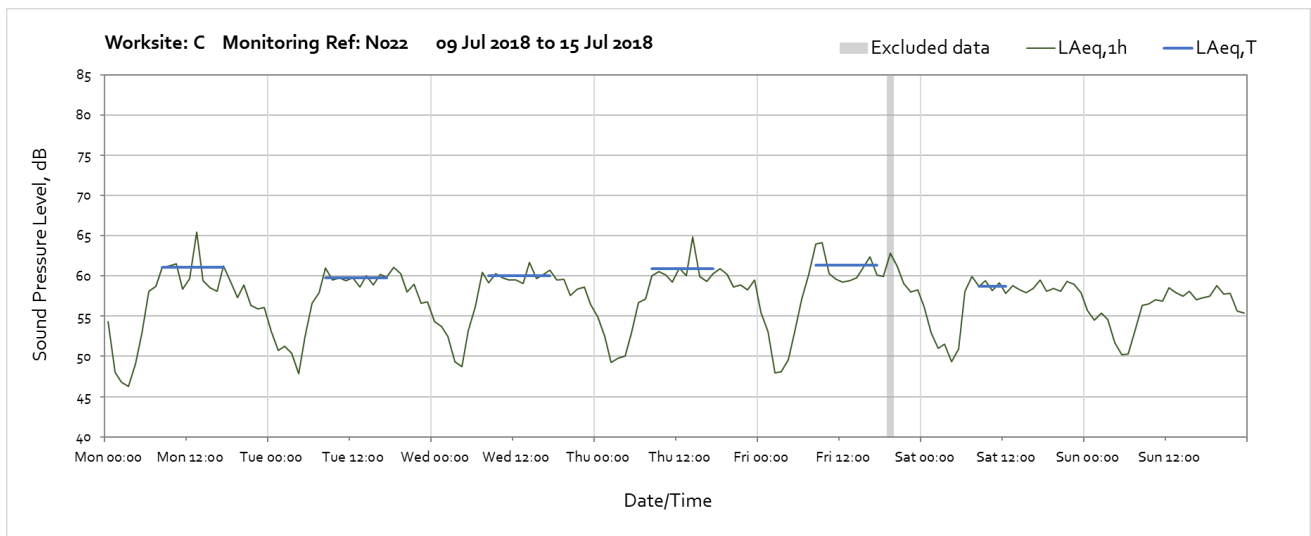
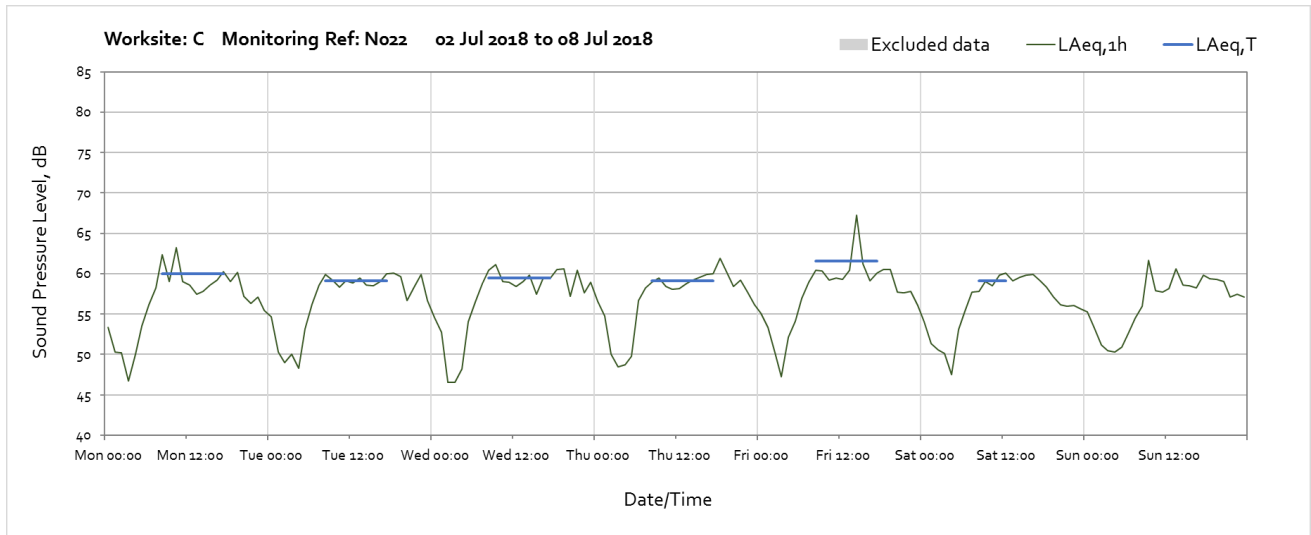
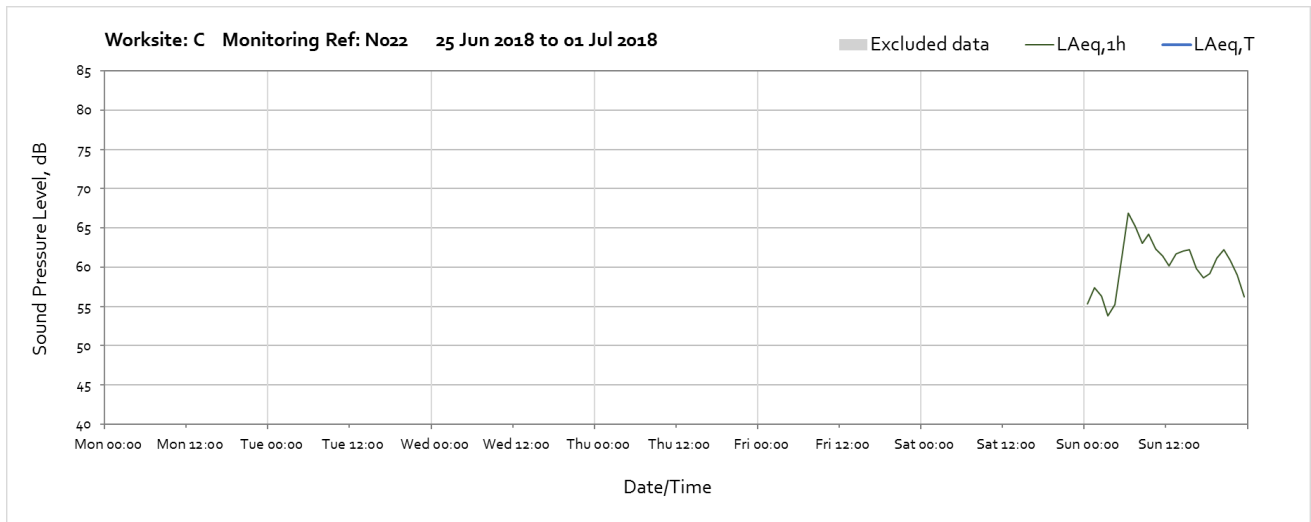


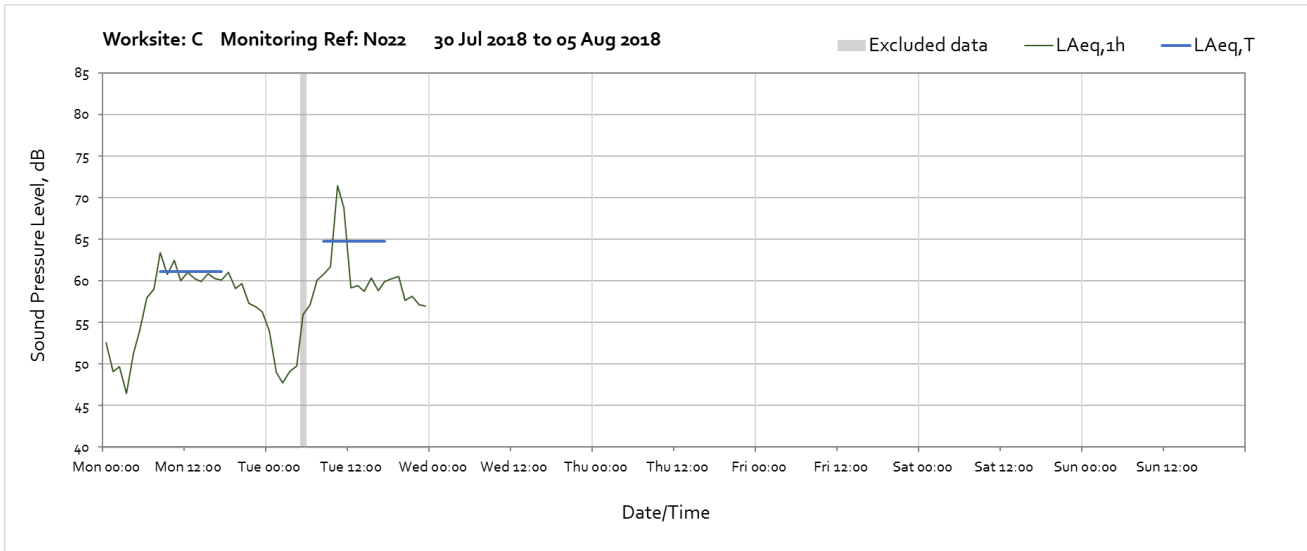
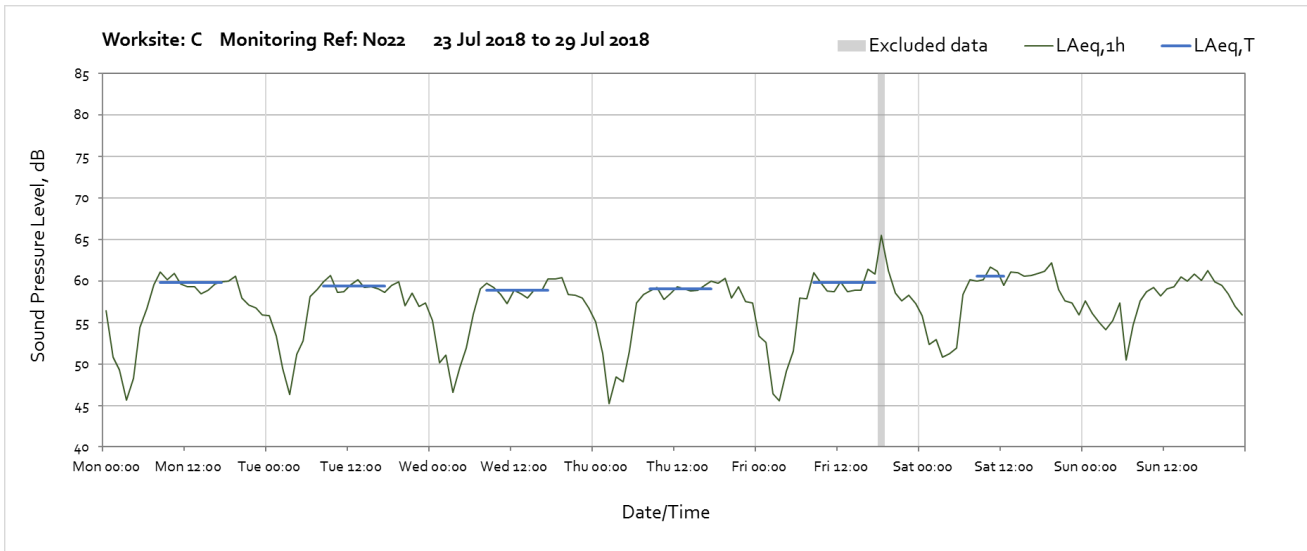
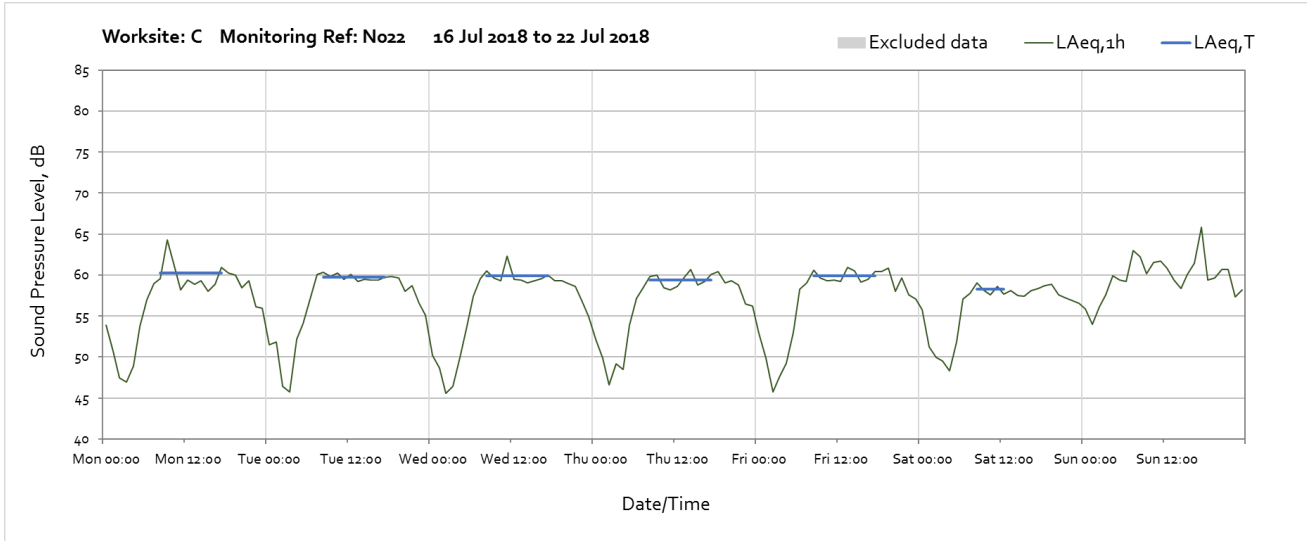
Worksite: B – Monitoring Ref: JC



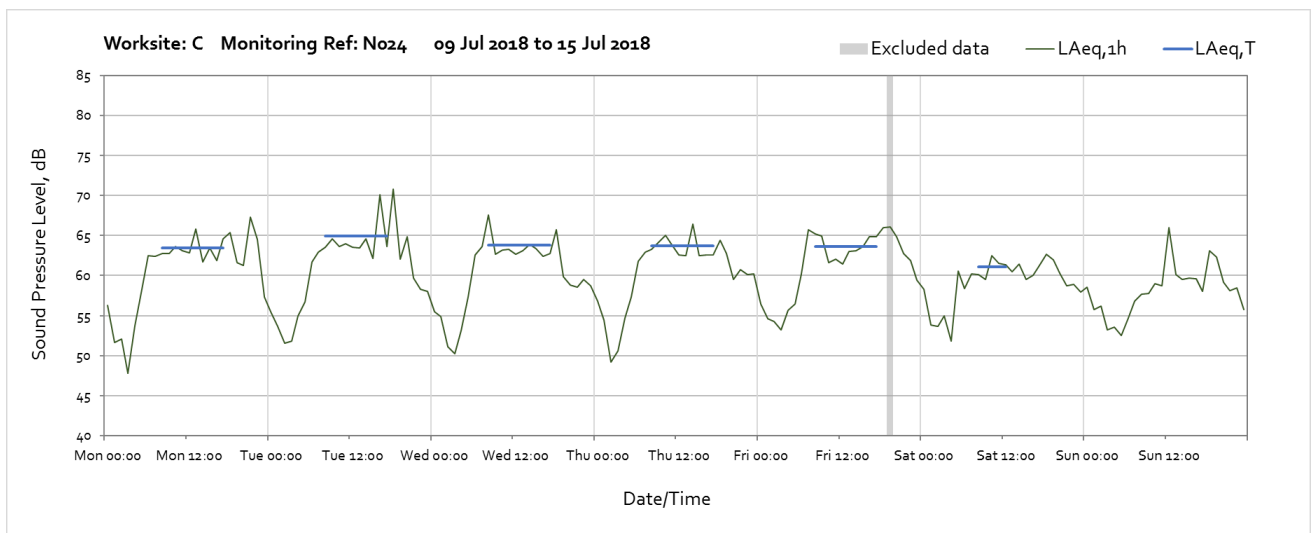
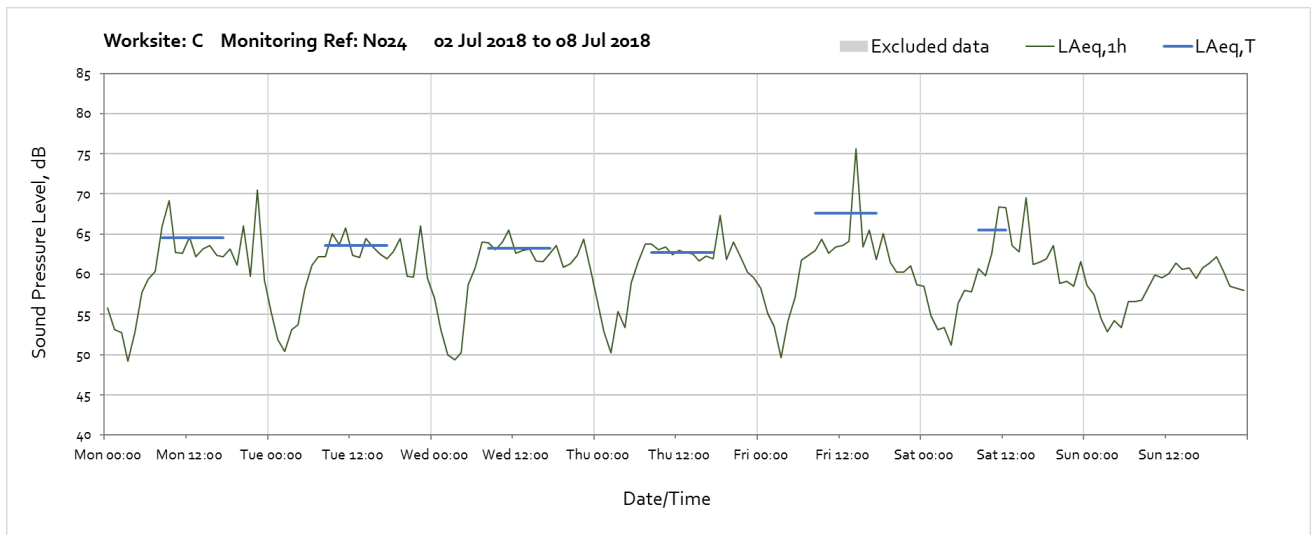
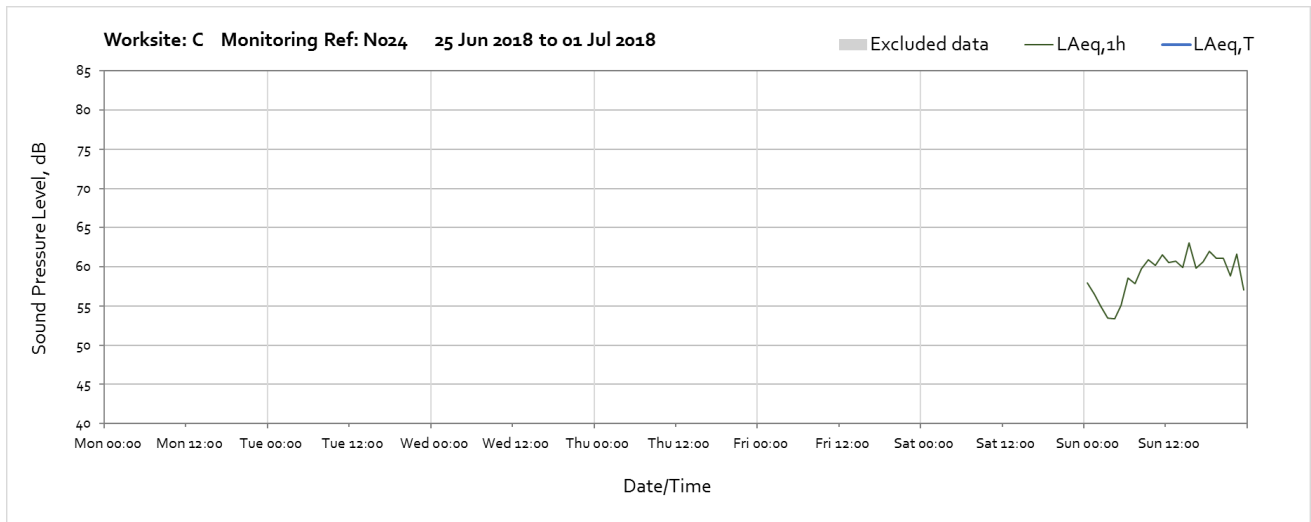


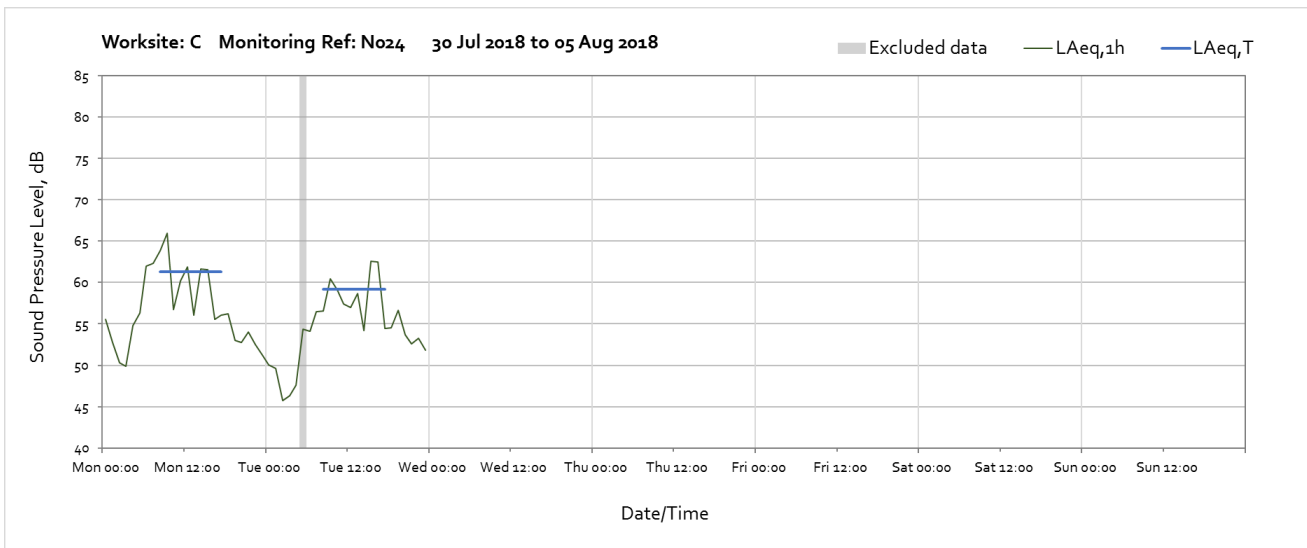
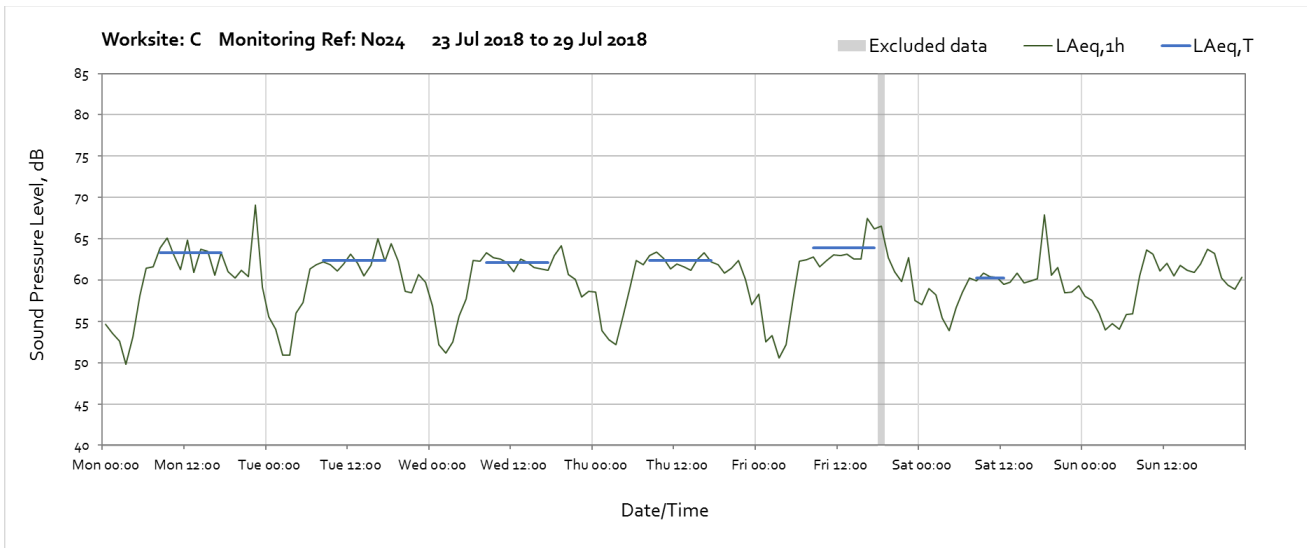
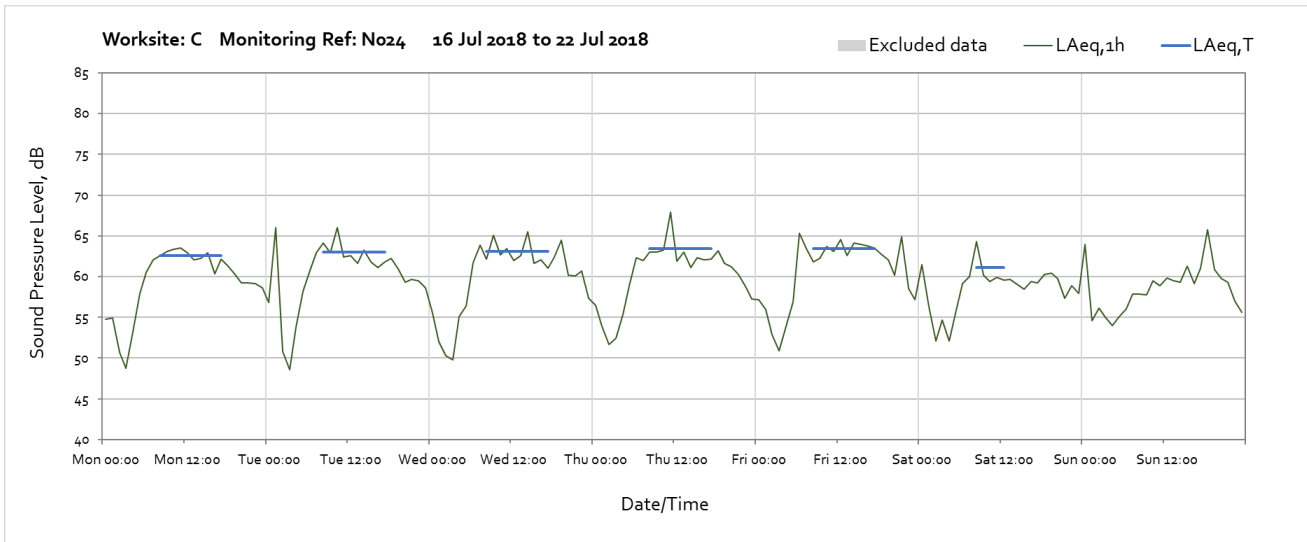
Worksite: C – Monitoring Ref: N022



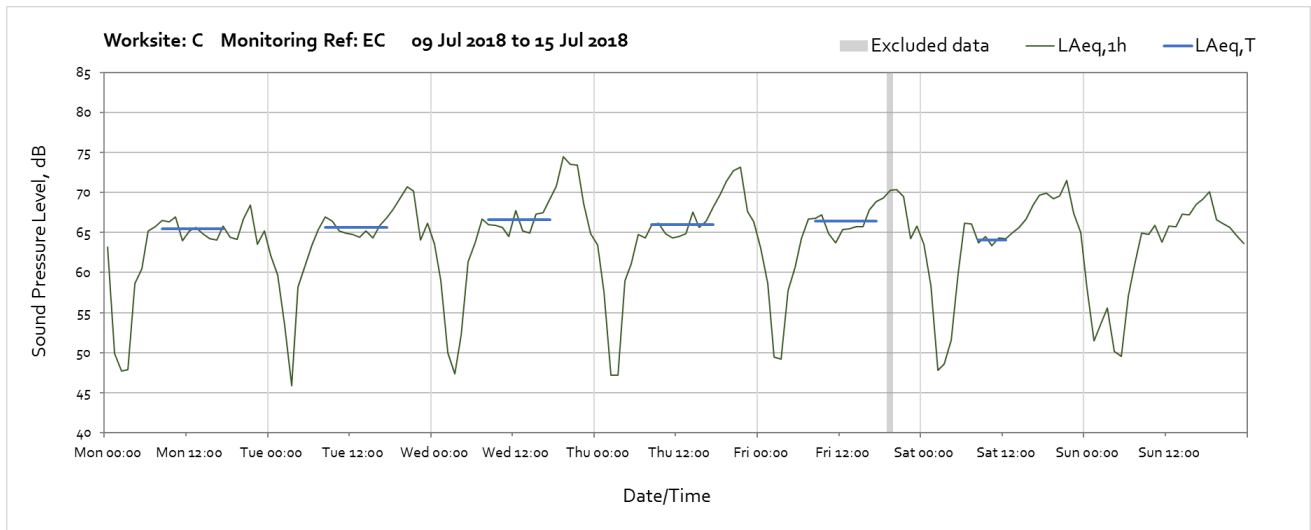
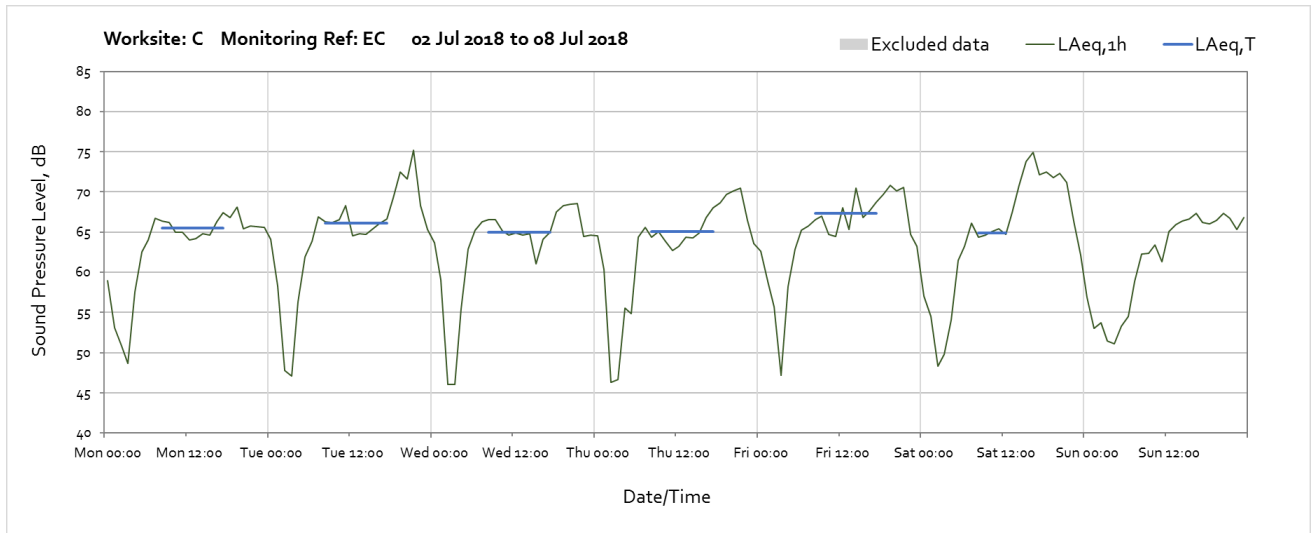
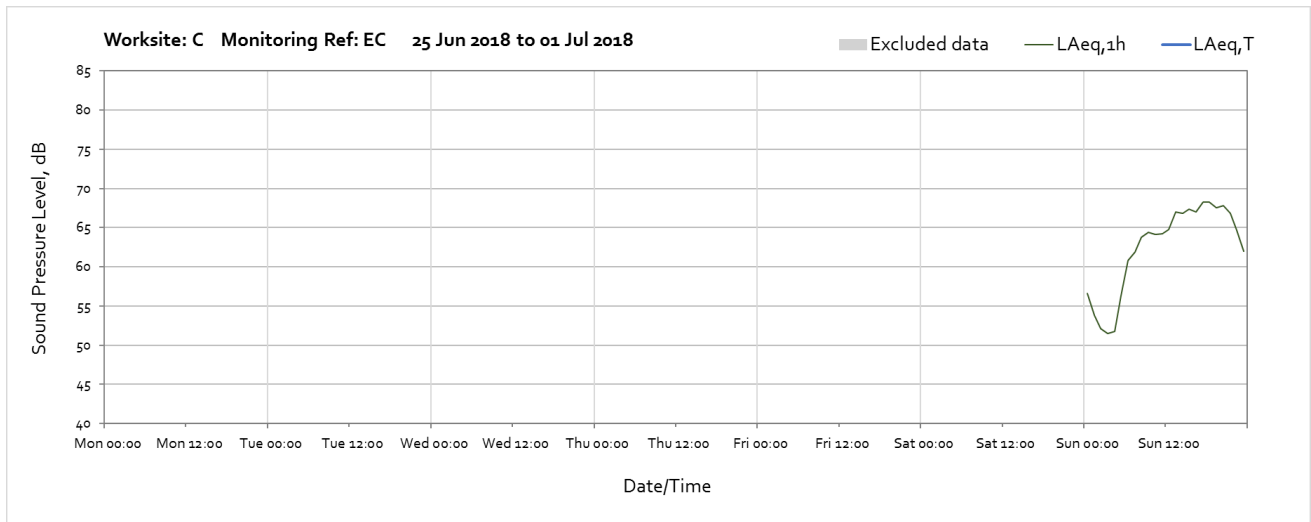


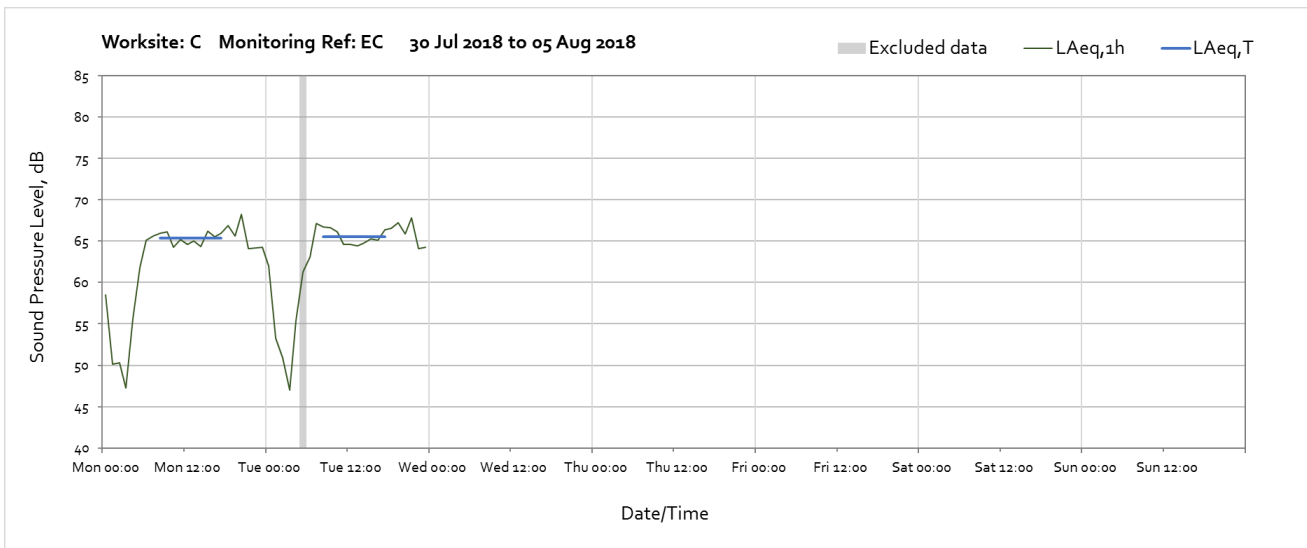
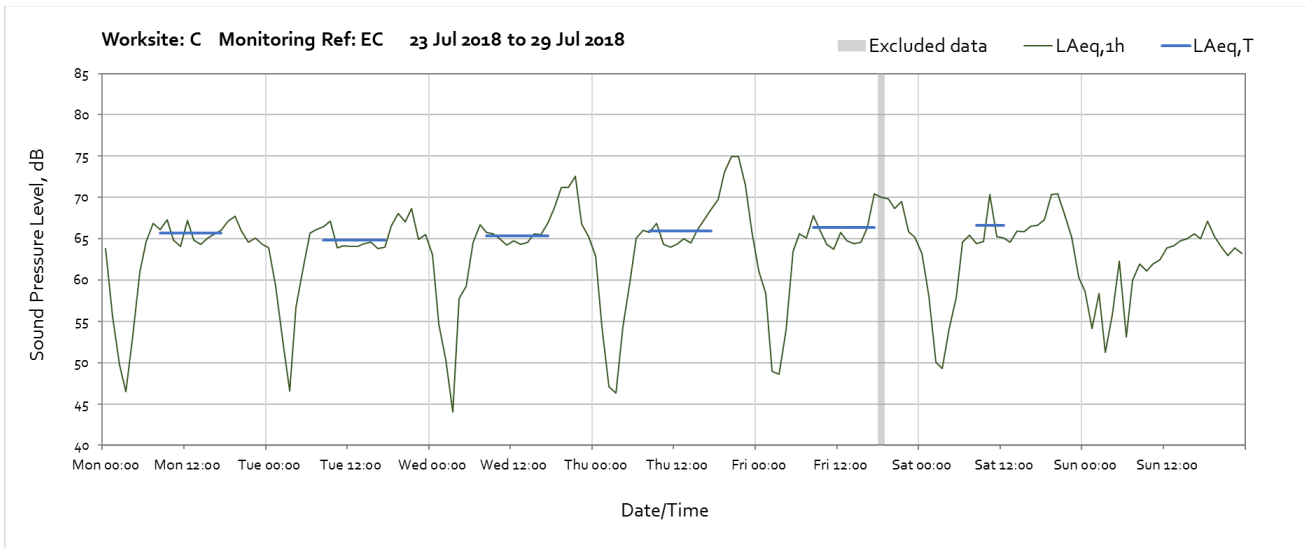
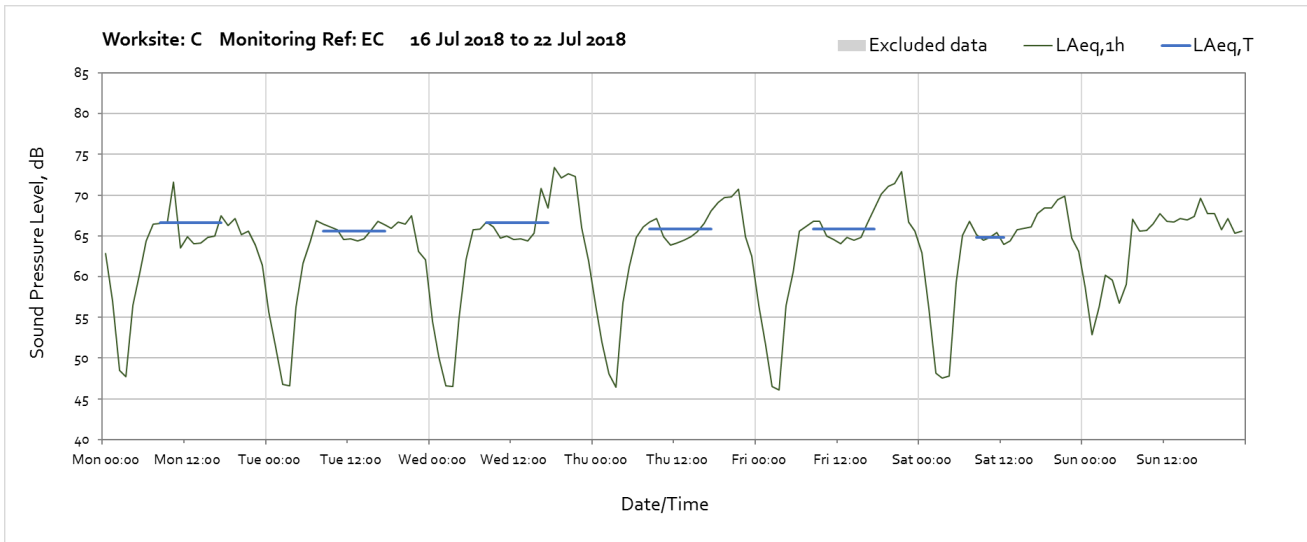
Worksite: C – Monitoring Ref: N024



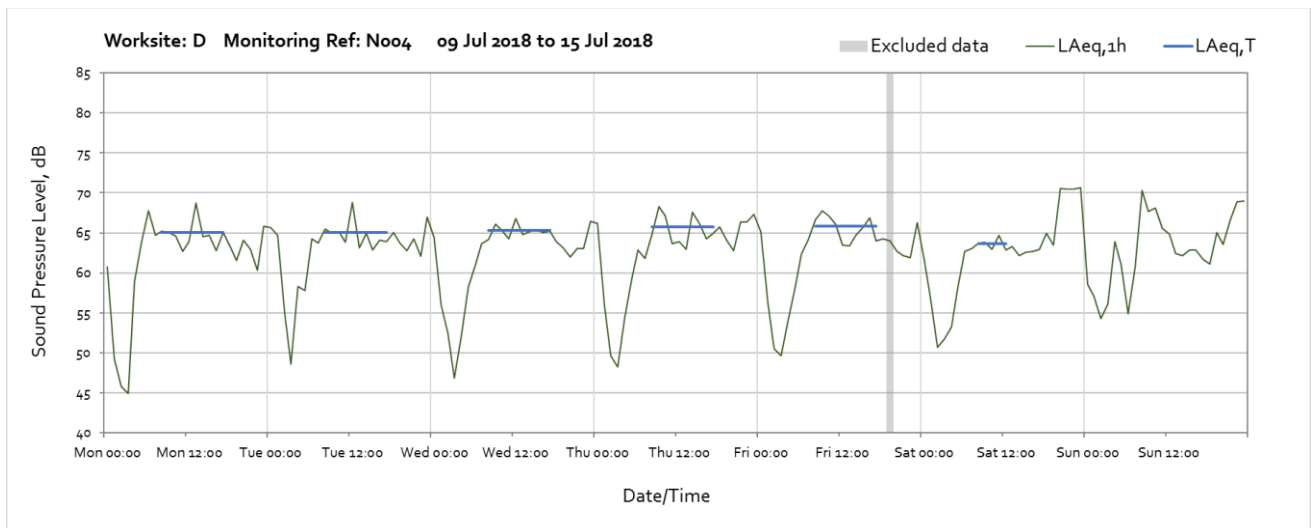
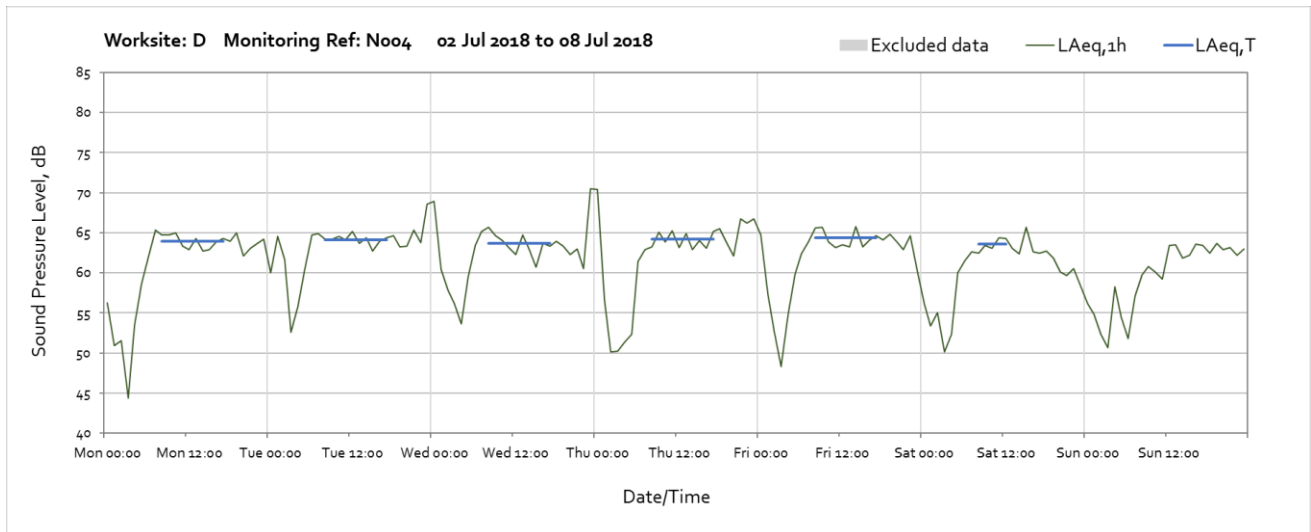
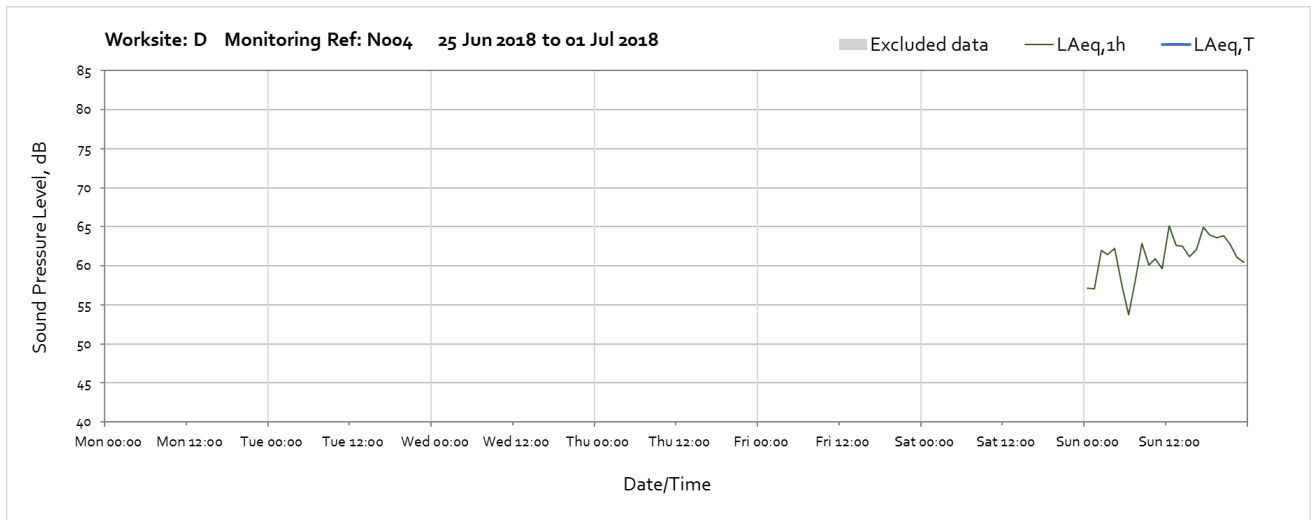


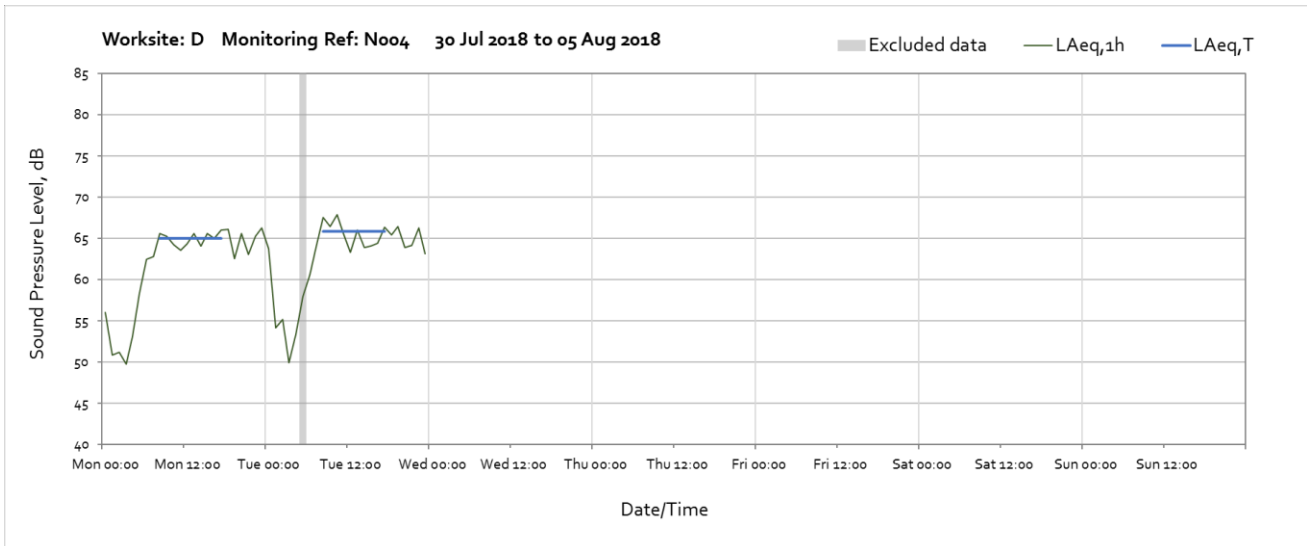
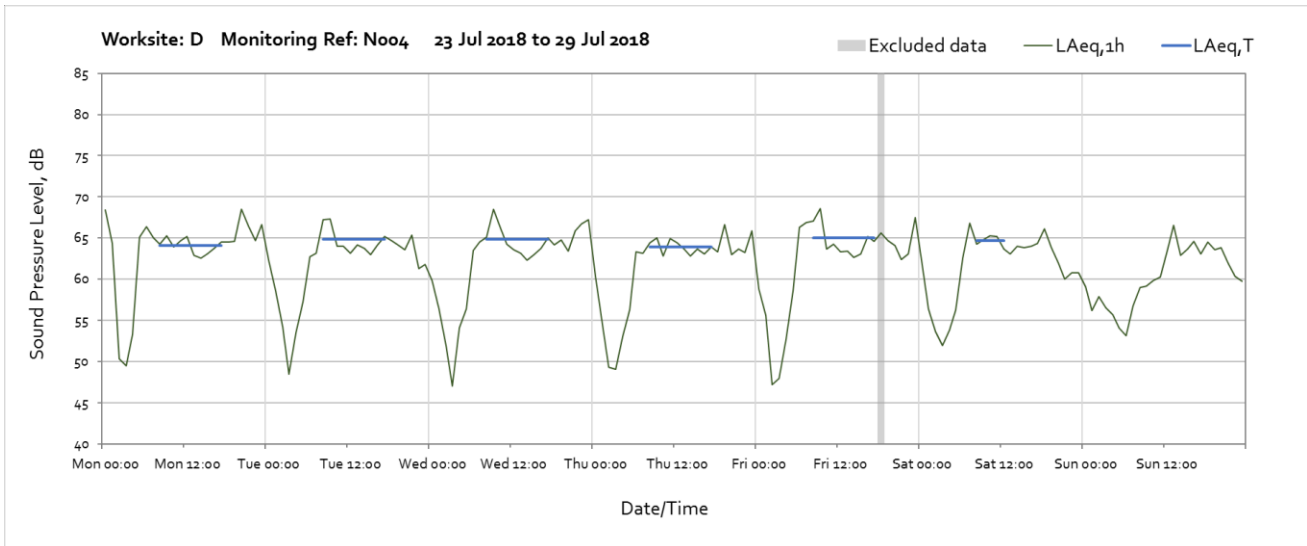
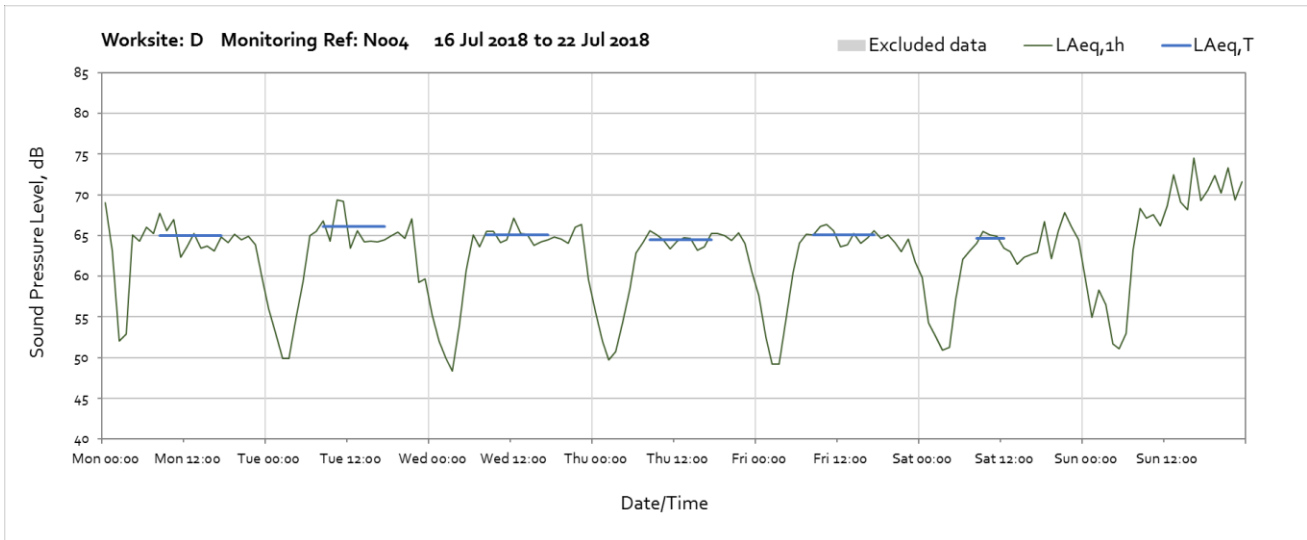
Worksite: C – Monitoring Ref: EC



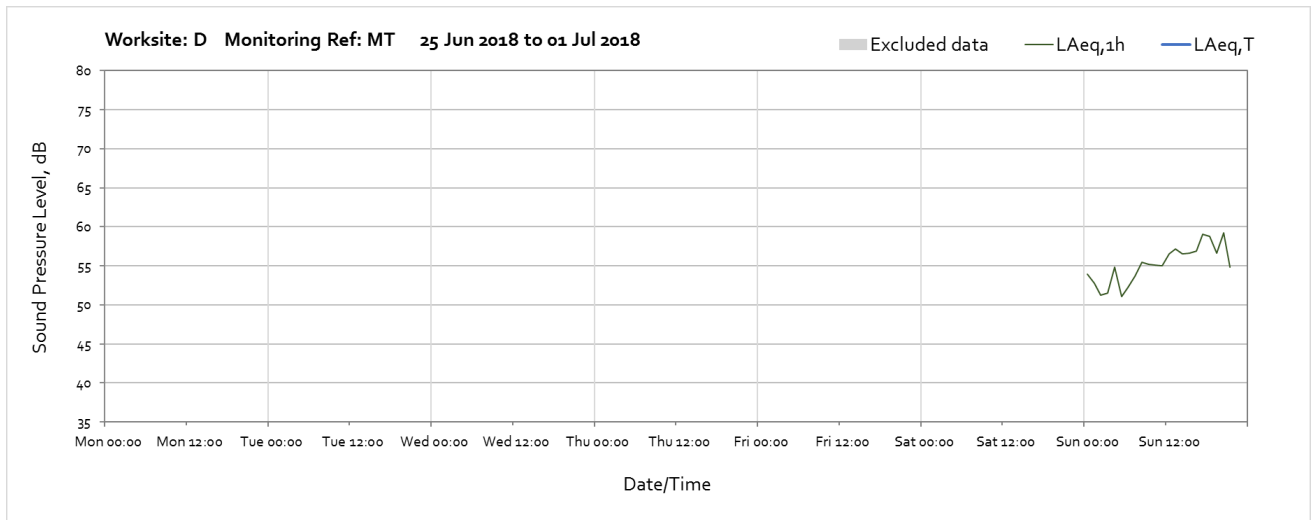


Worksite: D – Monitoring Ref: N004

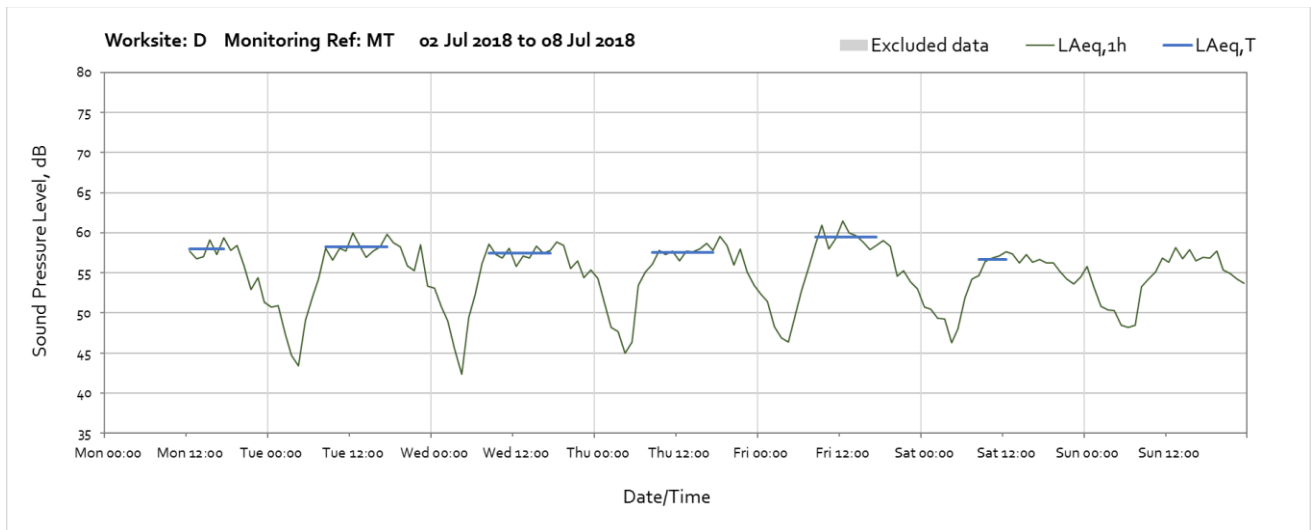




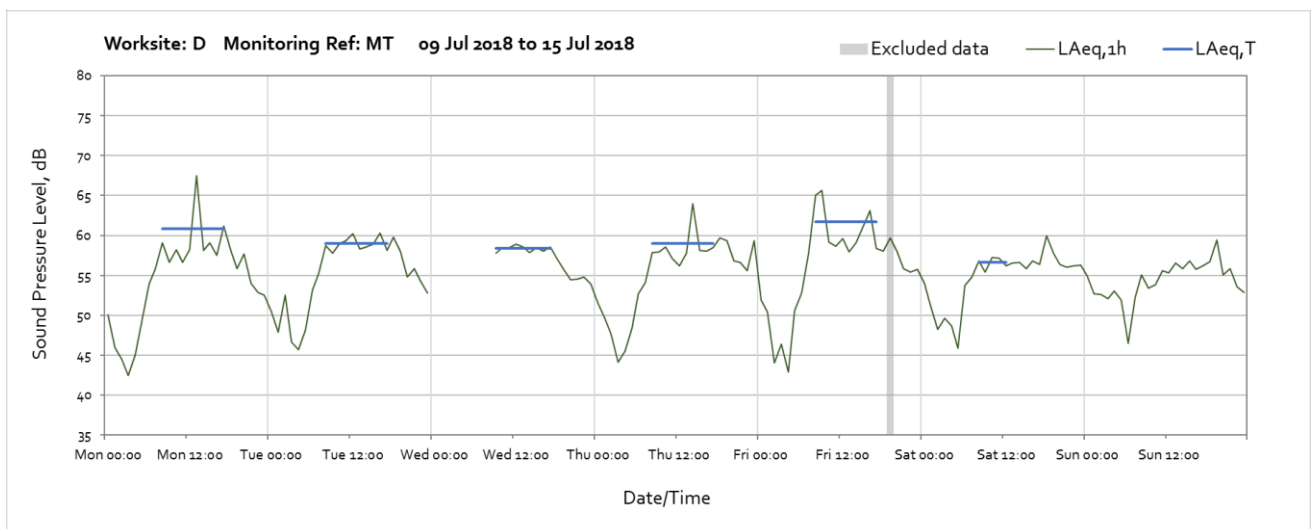
Worksite: D – Monitoring Ref: MT



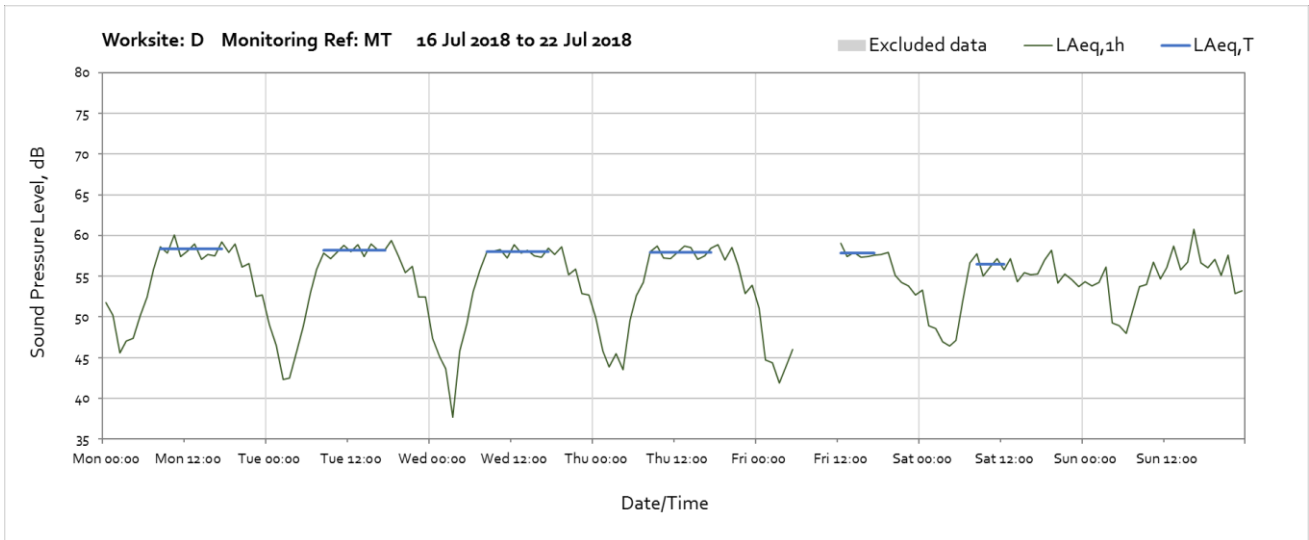
Note – Missing data between 22:00 on Sunday 1 and 12:00 on Monday 2 due to power failure.



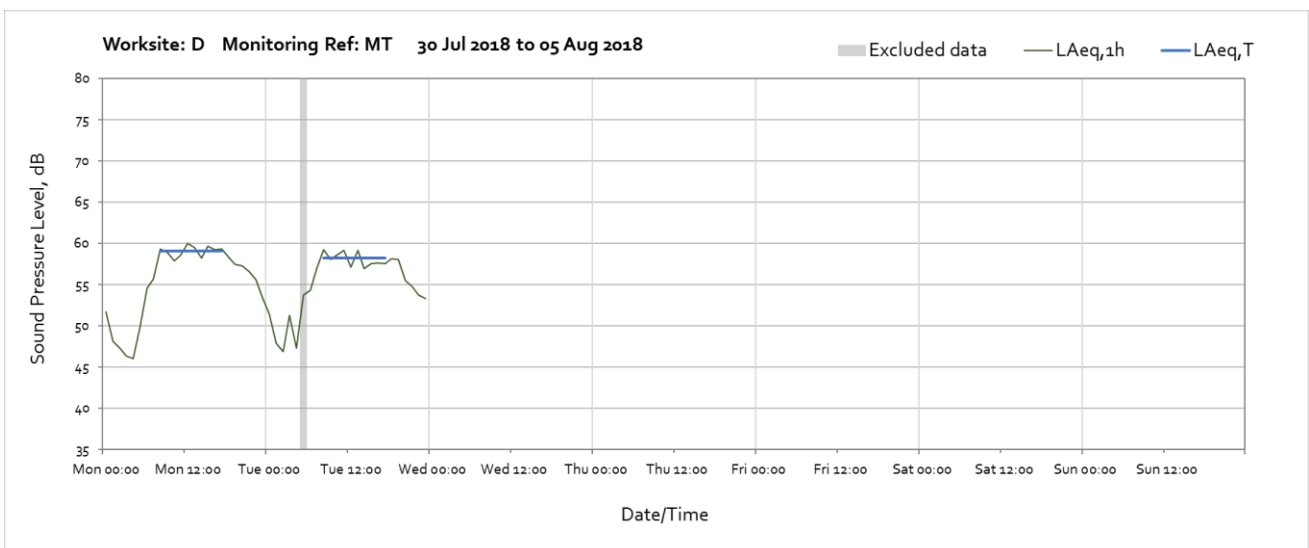
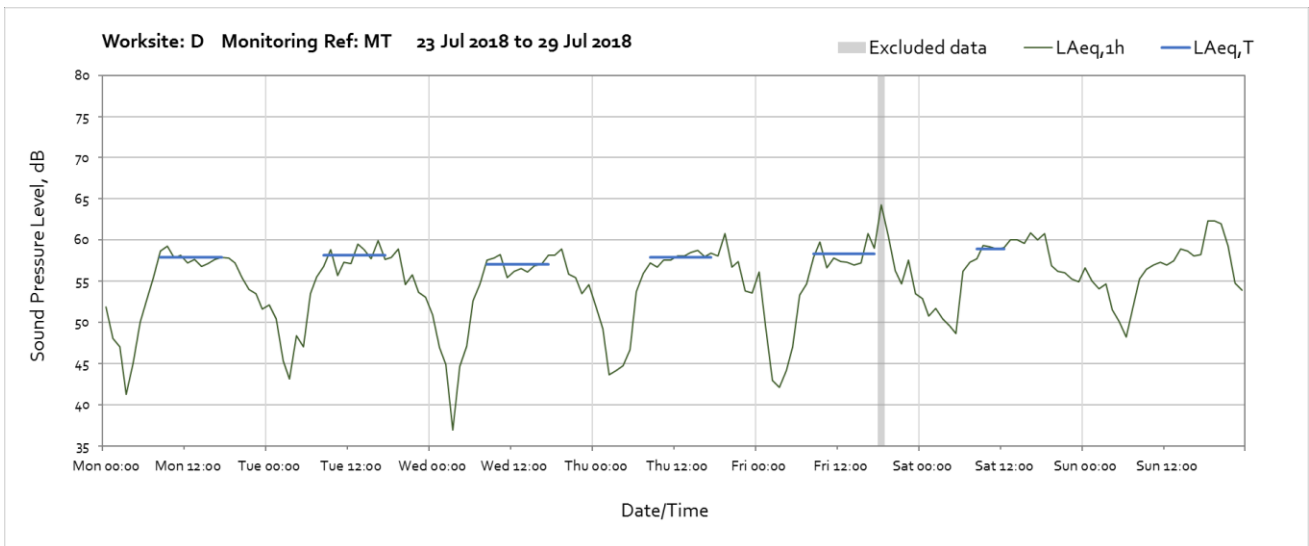
Note – Missing data between 22:00 on Sunday 1 and 12:00 on Monday 2 due to power failure.



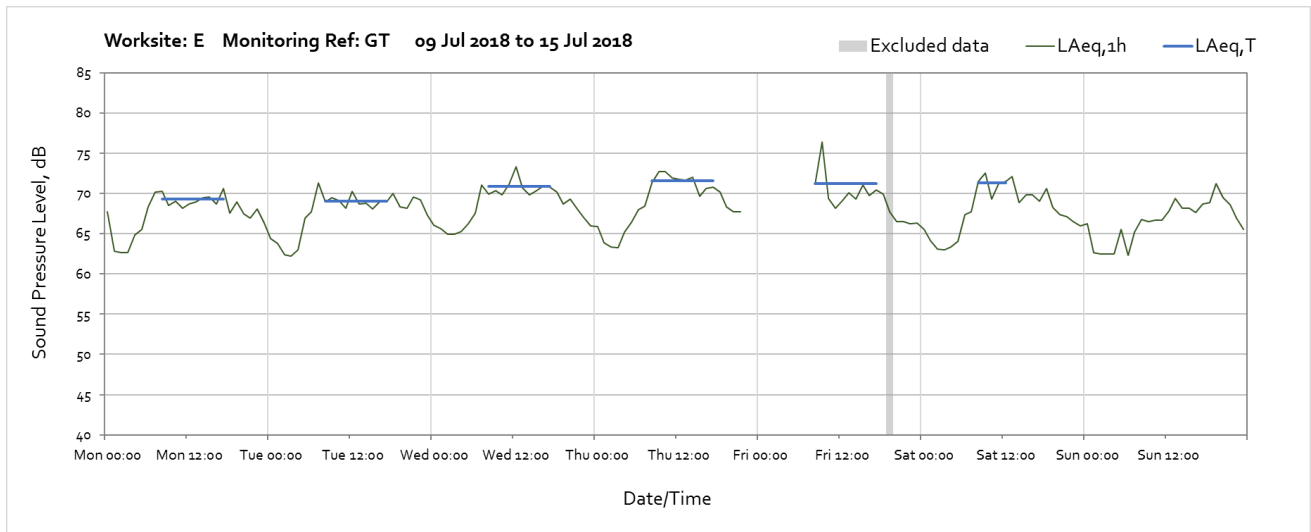
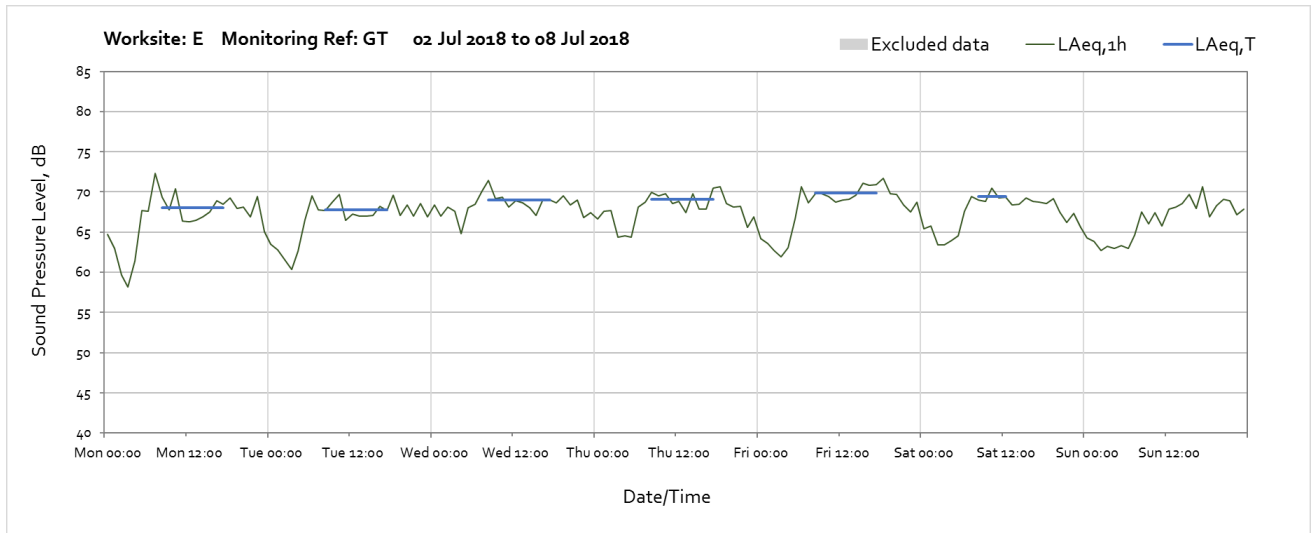
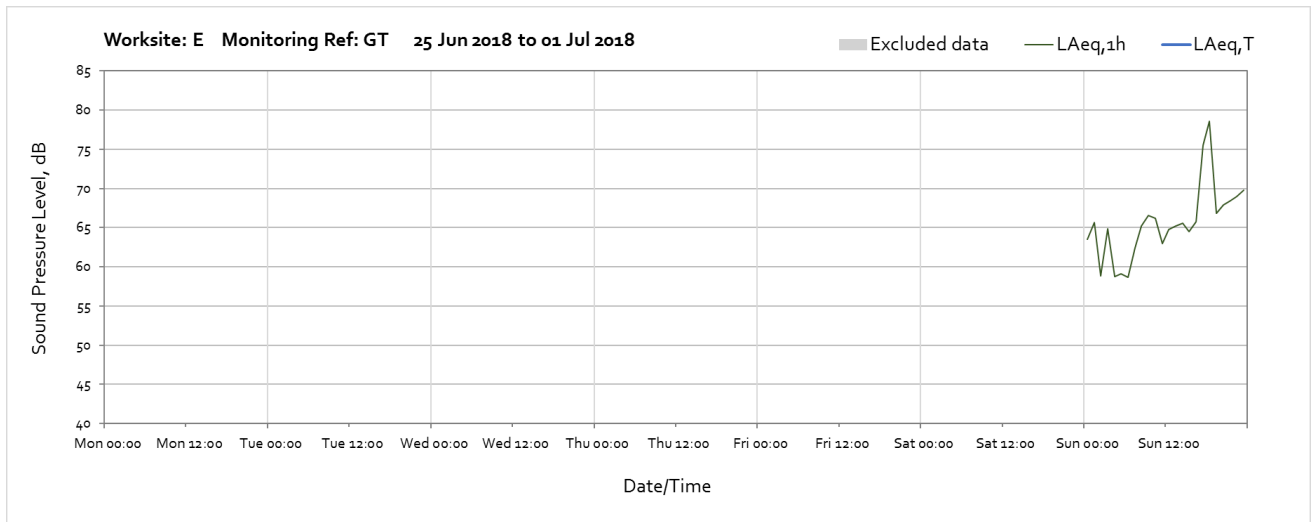
Note – Missing data between 00:00 and 09:00 on Wednesday 11 due to dropout of the signal uploading data to remote database.



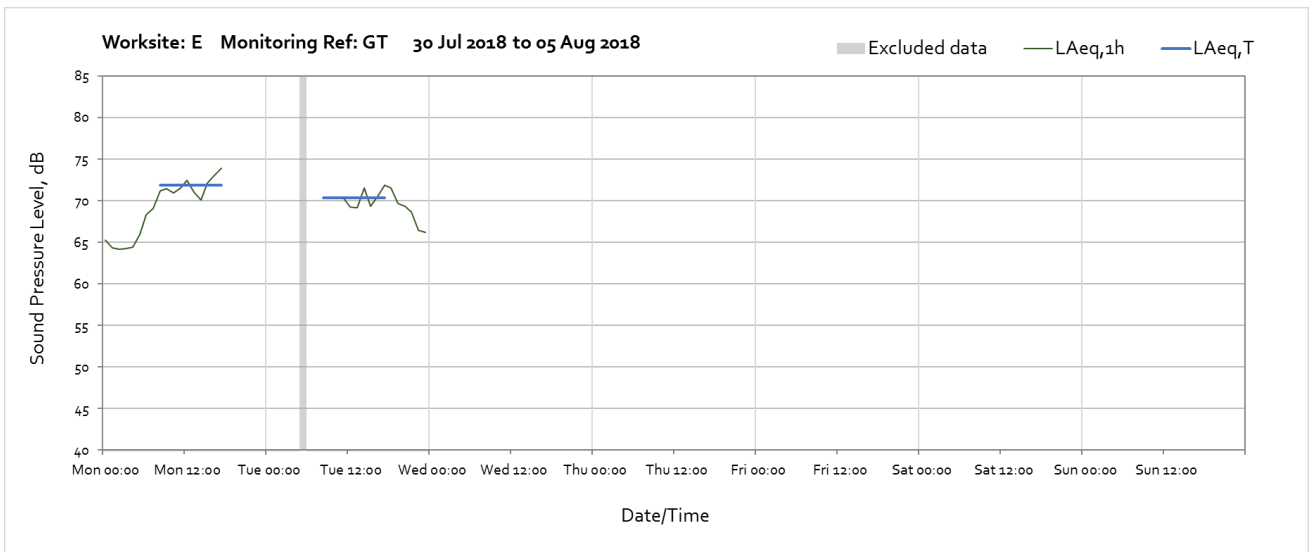
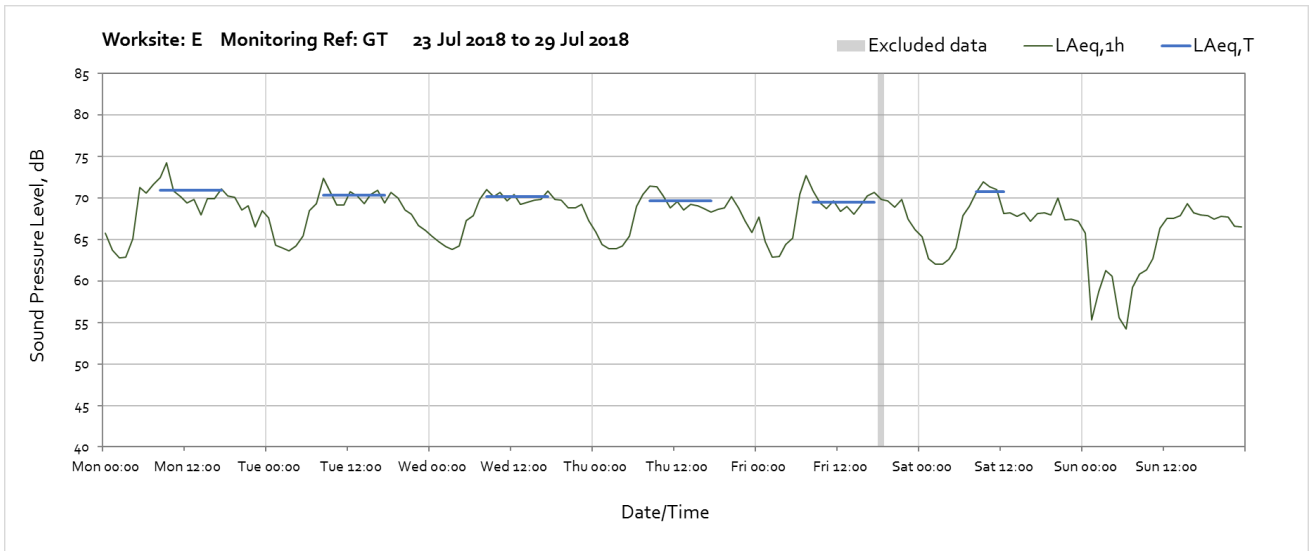
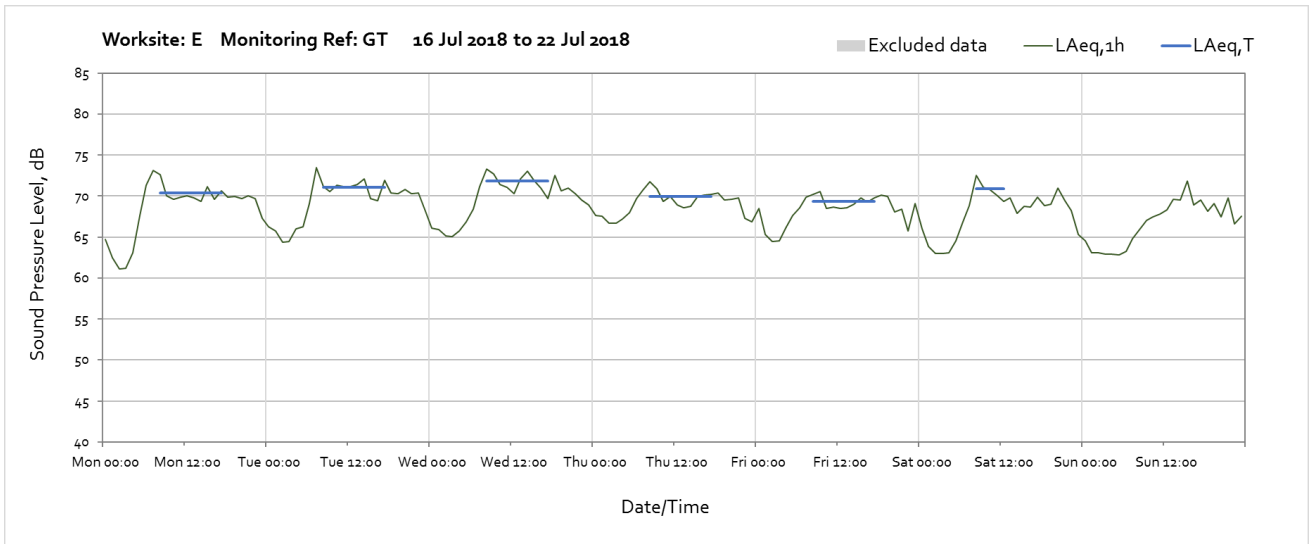
Note – Missing data between 06:00 and 12:00 on Friday 20 due to dropout of the signal uploading data to remote database.



Worksite: E – Monitoring Ref: GT

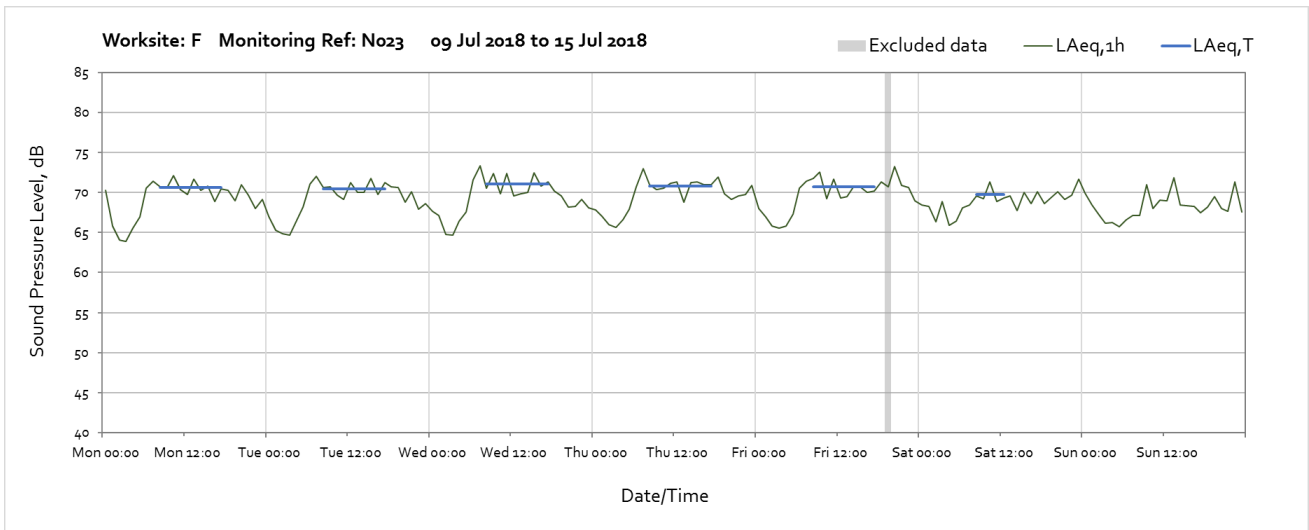
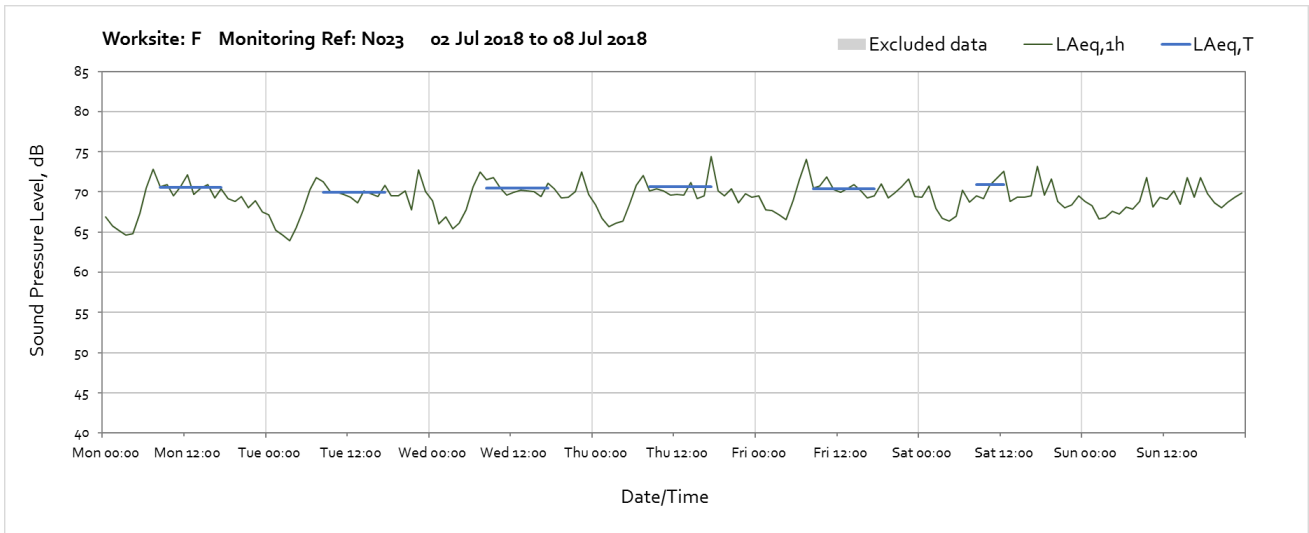
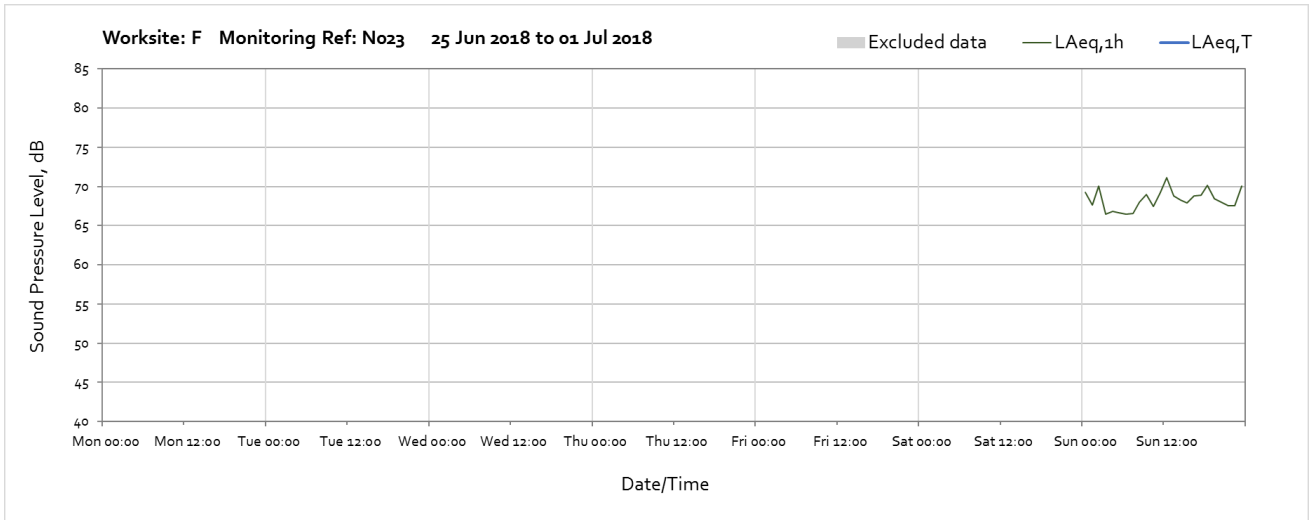


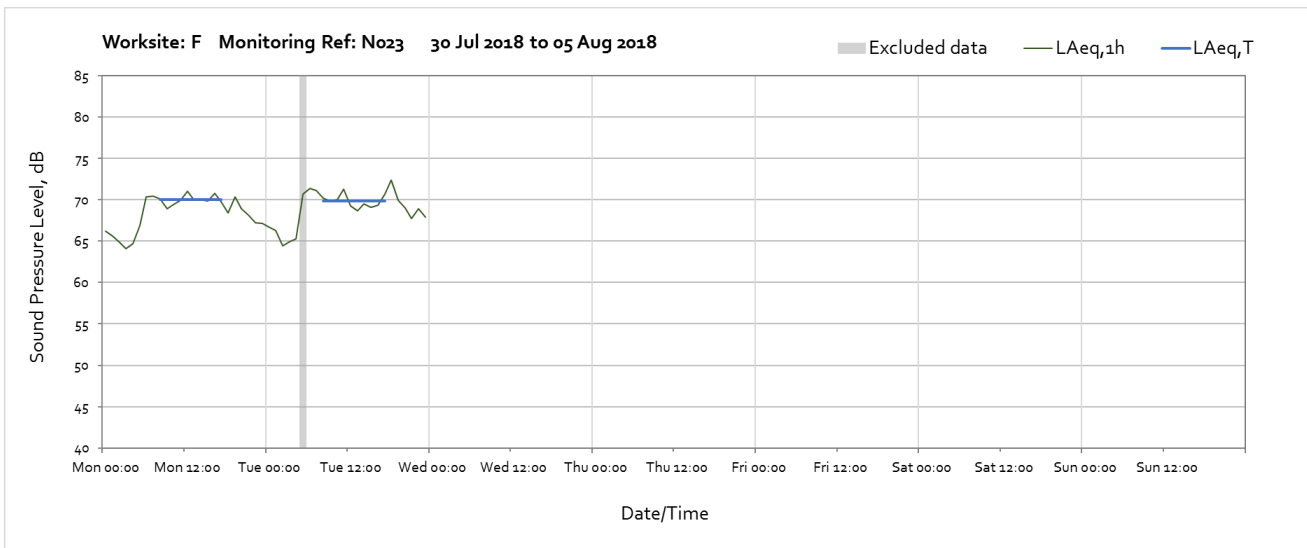
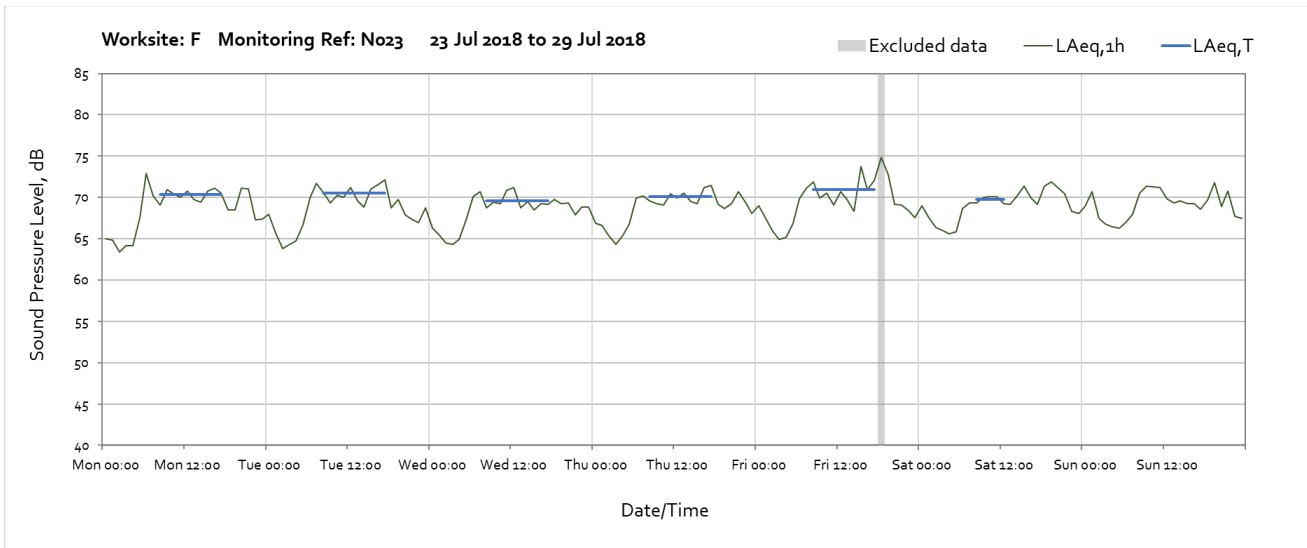
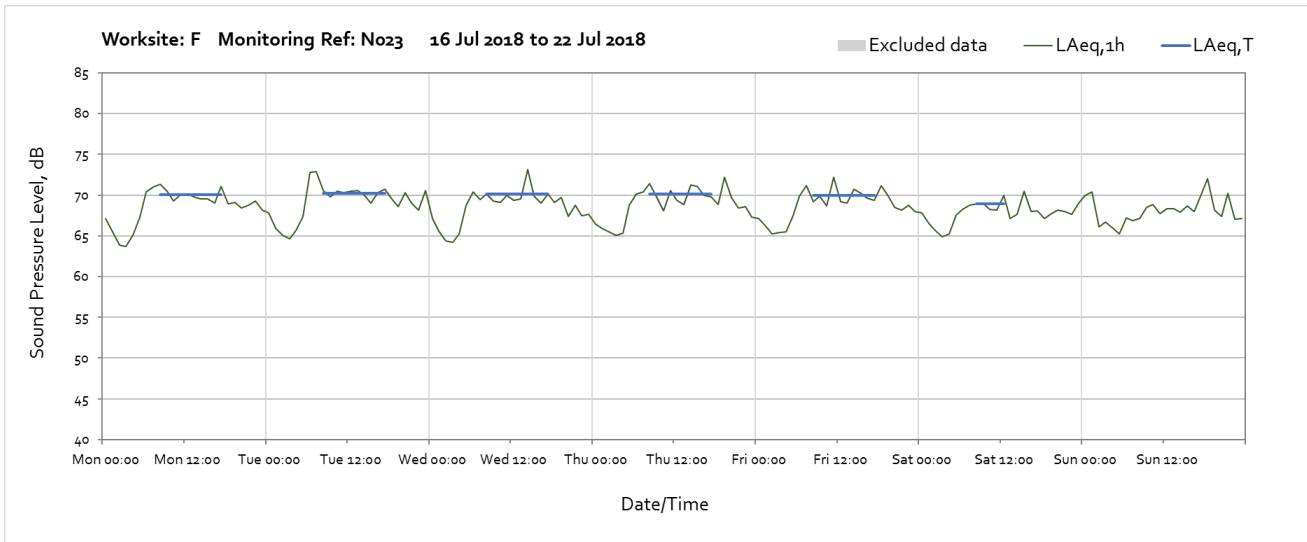
Note – Missing data between 22:00 on Thursday 12 and 08:00 on Friday 13 due to dropout of the signal uploading data to remote database.



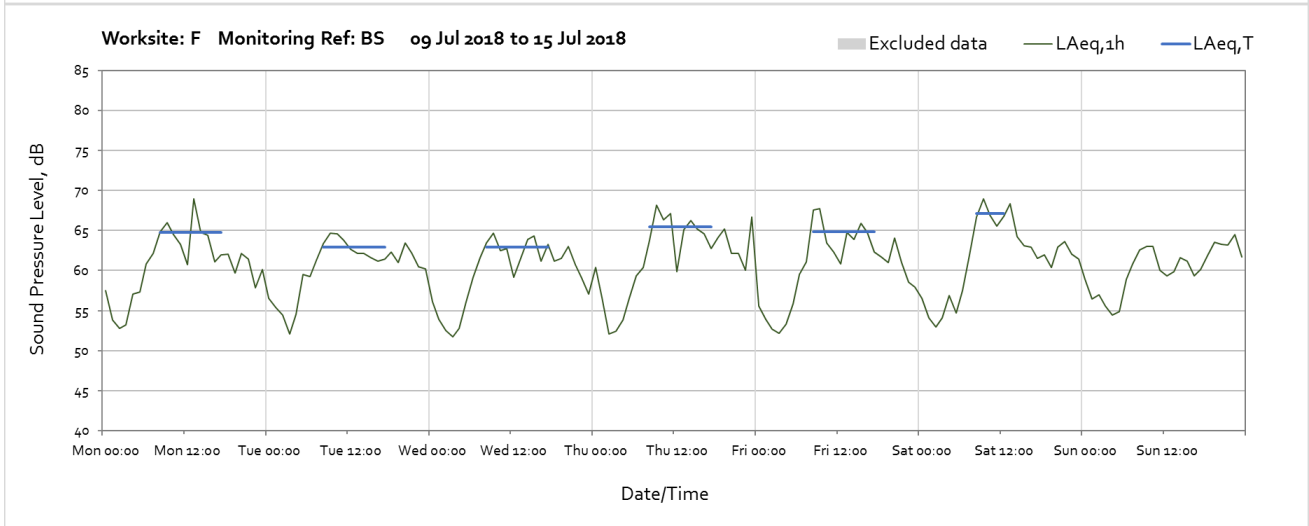
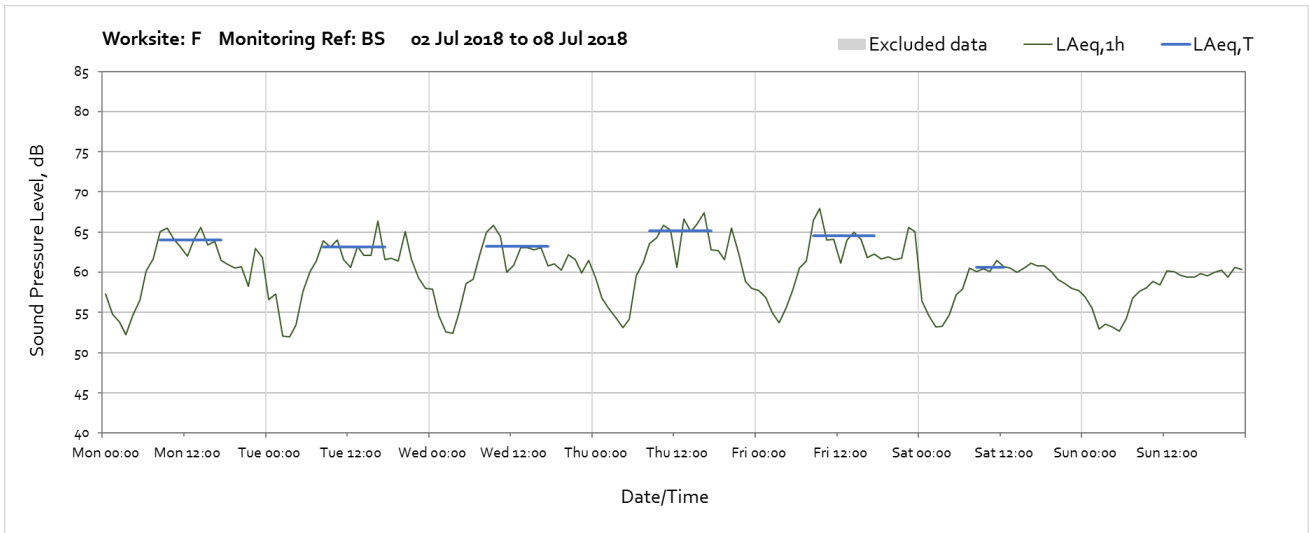
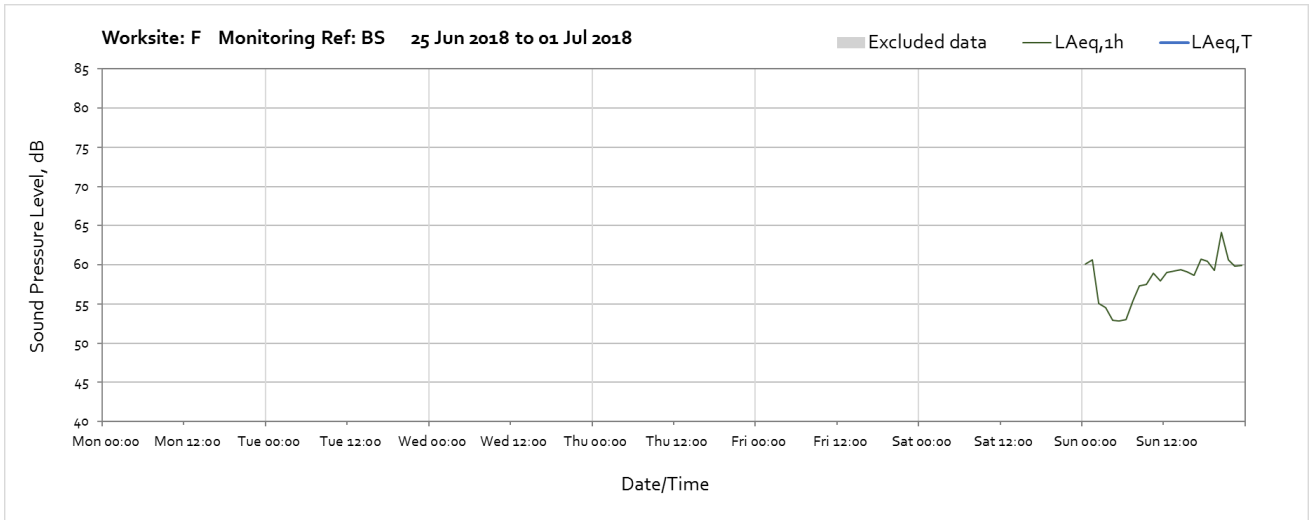
Note – Missing data between 18:00 on Monday 30 and 11:00 on Tuesday 31 due to dropout of the signal uploading data to remote database.

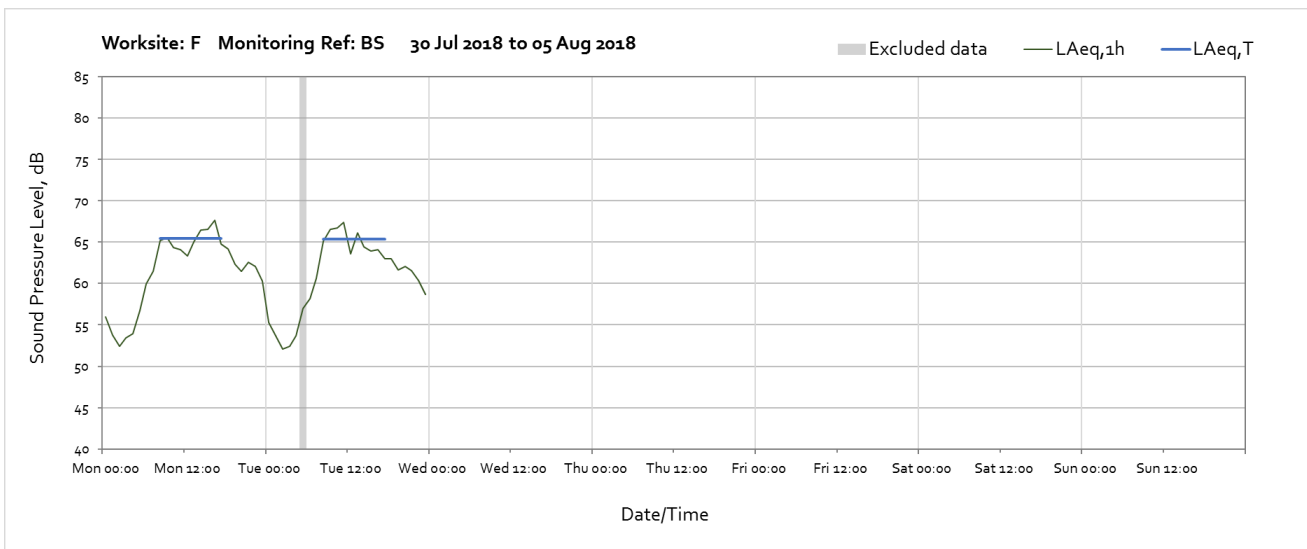
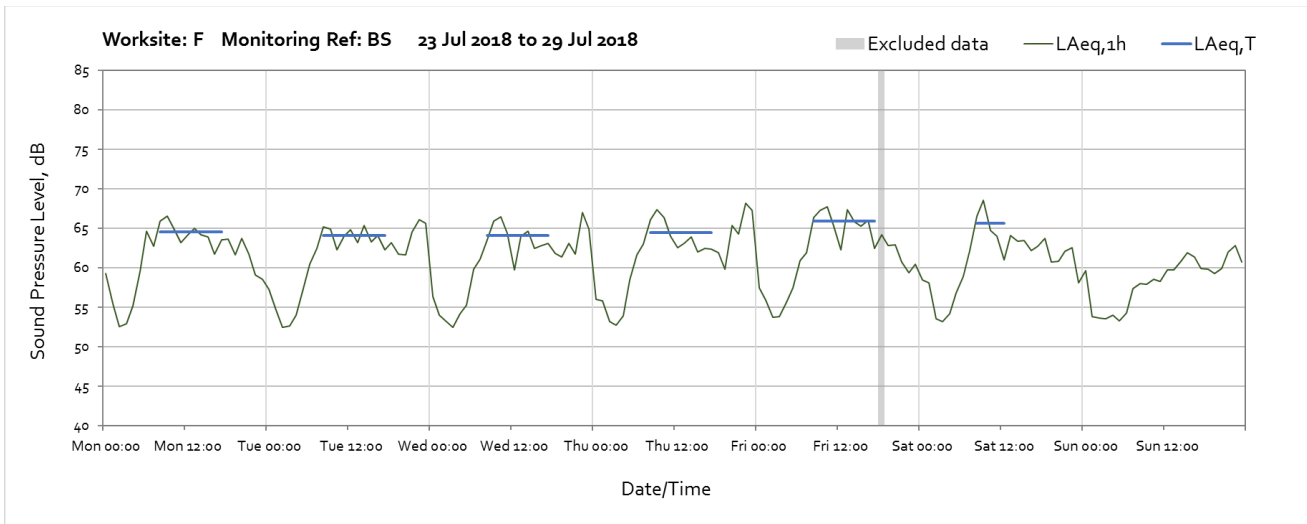
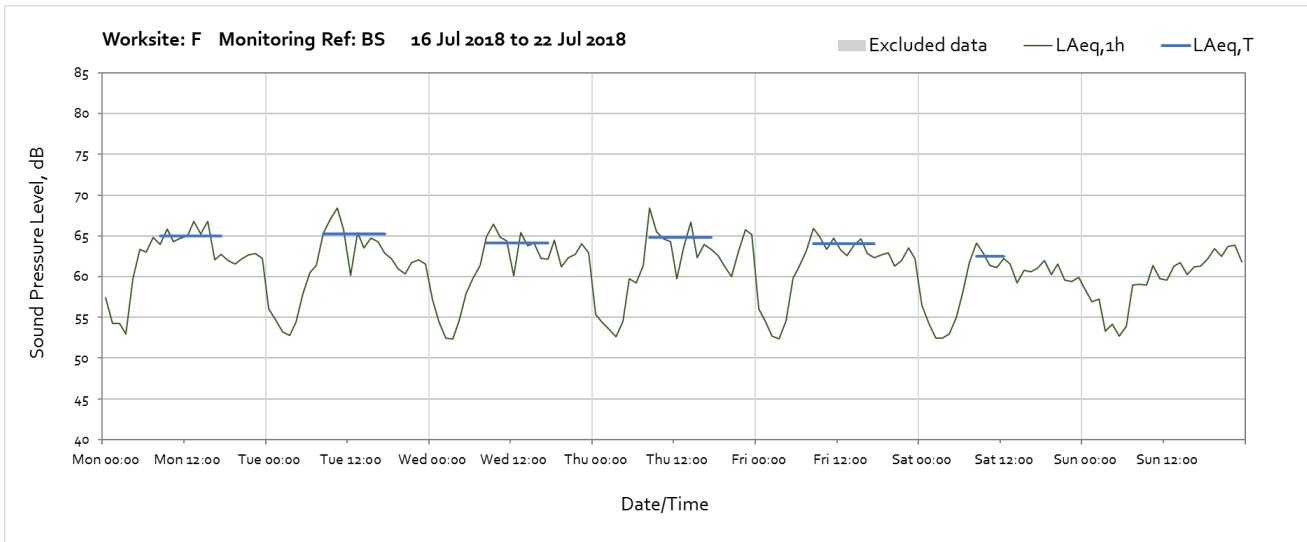
Worksite: F – Monitoring Ref: N023





Worksite: F – Monitoring Ref: BS





Monitoring Ref: HH

