HS2

August 2023

Construction Noise and Vibration Monthly Report – June 2023

Lichfield District Council

gov.uk/hs2

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Non-Technical Summary

This Noise and Vibration Monitoring Report fulfils HS2 Limited's commitment detailed in the Environmental Minimum Requirements (EMRs), Annex 1, Code of Construction Practice, to present the results of noise monitoring carried out within the Lichfield District Council (LDC) area during the month of June 2023.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of the Shaw Lane Embankment (ref.: SLE) worksite where no works were undertaken.

- Noise and vibration monitoring was undertaken in the vicinity of the Fradley Wood Embankment (ref.: FEW) worksite where no works were undertaken.

- Noise and vibration monitoring was undertaken in the vicinity of the A38 Southbound Slip Road Realignment (ref: A38SSRR) worksite where utility works were underway.

- Noise and vibration monitoring was undertaken in the vicinity of the Streethay Cutting Retaining Structure (ref: SCRS) worksite where no works were undertaken.

- Noise and vibration monitoring was undertaken in the vicinity of the Staffs Lane (ref: SSL) worksite where piling works were underway.

- Noise and vibration monitoring was undertaken in the vicinity of the Cappers Lane Compound (ref.: CLC) worksite, where Earthworks, including vibratory rolling and concrete scabbling, and delivery works were underway.

- Noise monitoring was undertaken in the vicinity of Whittington Common Cutting (ref: WCC) worksite where no works were undertaken.

- Noise and vibration monitoring was undertaken in the vicinity of the Tamworth Road Overbridge Satellite (ref.: TROS) worksite where no works were undertaken.

- Noise and vibration monitoring was undertaken in the vicinity of the Swinfen Cutting South (ref: SCS) worksite where no works were undertaken.

- Noise monitoring was undertaken in the vicinity of the Trunk's Road (ref.: N23) worksite where no works were undertaken.

- Noise monitoring was undertaken at Brockhurst Lane Realignment (ref.: BLR) worksite where no works were undertaken.

- Noise and vibration monitoring was undertaken in the vicinity of the Sutton Road Overbridge (ref.: SRO) worksite where manual works including hand digging was underway.
- Noise monitoring was undertaken in the vicinity of the Drayton Lane Cutting (ref.: DLC) worksite where works included trial hole excavations, environmental and ecological maintenance including strimming works were underway.

The HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (https://www.gov.uk/government/publications/hs2-information-papers-environment), were not exceeded during June 2023.

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

Nine (9) complaint were received during the reporting period.

Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

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

1 Introduction

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

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

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the Lichfield District Council (LDC) area for the period 1st to 30th June 2023.

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

- Shaw Lane Embankment ref: SLE (see Works Identification Plan 1 in Appendix A), where no works were undertaken.
- Fradley Wood Embankment ref: FEW (see Works Identification Plan 2 in Appendix A), where no works were undertaken.
- A38 Southbound Slip Road Realignment ref: A38SSRR (see Works Identification Plan 3 in Appendix A), where utility works were underway.
- Streethay Cutting Retaining Structure ref: SCRS (see Works Identification Plan 3 in Appendix A), where no works were undertaken.
- South Staffs Lane ref: SSL (see Works Identification Plan 3 in Appendix A), where work activities included:
    - Piling works.

- Cappers Lane Compound ref: CLC (see Works Identification Plan 4 in Appendix A), where work activities included:
    - Earthworks (including vibratory rolling and concrete scabbling).
    - Deliveries.
- Whittington Common Cutting ref: WCC (see Works Identification Plan 4 in Appendix A), where no works were undertaken.
- Tamworth Road Overbridge Satellite ref: TROS (see Works Identification Plan 5 in Appendix A), where no works were undertaken.
- Swinfen Cutting South ref: SCS (see Works Identification Plan 4 in Appendix A), where no works were undertaken.
- Trunk's Road ref: N23 (see Works Identification Plan 6 in Appendix A), where no works were carried out.
- Brockhurst Lane Realignment worksite: ref.: BLR (see Plan 7 in Appendix A), where no works were undertaken.
- Sutton Road Overbridge ref: SRO (see Works Identification Plan 8 in Appendix A), where work activities included:
    - Manual works.
- Drayton Lane Cutting ref: DLC (see Works Identification Plan 9 in Appendix A), where work activities included:
    - Trial hole excavations,
    - Environmental and ecological maintenance

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

1.2 Measurement Locations

1.2.1 Eighteen (18) noise monitoring and eight (8) vibration monitoring installations were active in June 2023 in the LDC area. Table 2 summarises the positions of the noise and vibration monitoring installations within the LDC area in June 2023.

1.2.2 No data was measured at vibration monitor ref: SCS-V3 at worksite Swinfen Cutting South (ref: SCS) due to difficulty in obtaining consent from the resident for reinstallation of the vibration monitor.

1.2.3 Maps showing the positions of the noise monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
SLE	SLE-N1	Traveller Site, Shaw Lane, Lichfield
	SLE-N2	Shaw Lane Carpark, Tuppenhurst Lane
	SLE-V1	Shaw Lane Carpark, Tuppenhurst Lane
FEW	FEW-N1	Wood End Farm, Wood End Lane, Lichfield
	FEW-V3	Wood End Farm, Wood End Lane, Lichfield
A38SSRR	A38SSRR-N1	Thompson Way, Streethay
SCRS	SCRS-N1	Manor House, Burton Road, Streethay
	SCRS-N2	Kings Orchard Marina, Broad Ln, Huddlesford, Lichfield
	SCRS-V1	Manor House, Burton Road, Streethay
SSL	SSL-N1	Ash Tree Lane, Hill Farm, Fradley and Streethay
CLC	CLC-N1	Ivy Cottage, Park Lane, Fradley and Streethay
	CLC-N4	Huddlesford Lane, Fradley and Streethay, Lichfield
	CLC-V1	Ivy Cottage, Park Lane, Fradley and Streethay,
WCC	WCC-N1	Whittington Hill Farm, Darnford Lane, Whittington, Lichfield
TROS	TROS-N1	West side of Tamworth Road Overbridge Site, Tamworth Road, Whittington
	TROS-N2	The Bungalow, Tamworth Road, Whittington
	TROS-V2	The Bungalow, Tamworth Road, Lichfield
SCS	SCS-N1	The Lodge, Rock Hill, Hints
	SCS-V3	11 Flats Lane, Weeford
N23	N23-N1	21 Roman Road, Lichfield
BLR	BLR-N1	The Vicarage, School Lane, Hints, Tamworth
SRO	SRO-N1	Sutton Road, Drayton Bassett, Mile Oak, Lichfield
	SRO-N2	White House Farm
	SRO-V1	Sutton Road, Drayton Bassett, Mile Oak, Lichfield
	SRO-V2	Bangley Lane, Hints, Lichfield, Staffordshire, England
DLC	DLC-N1	Oak Dairy Farm, Drayton Lane, Lichfield

2 Summary of Results

2.1 Summary of Measured Noise and Vibration Levels

2.1.1 Table 3 presents a summary of the measured noise levels at the monitoring locations over the reporting period. The LAeq,T is presented for each of the relevant time periods averaged over the calendar month, along with the highest single period LAeq,T that was found to occur within the month.

Table 3: Summary of Measured dB L_{Aeq} Data over the Monitoring Period

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	**0800 - 1800**	**1800 - 1900**	**1900 - 2200**	**2200 - 0700**	**0700 - 0800**	**0800 - 1300**	**1300 - 1400**	**1400 - 2200**	**2200 - 0700**	**0700 - 2200**	**2200 - 0700**
SLE	SLE-N1	Traveller Site, Shaw Lane	Free-field	60.9 (62.5)	60.7 (63.4)	62.9 (65.2)	61.0 (64.1)	57.3 (62.2)	56.6 (59.8)	57.4 (59.8)	57.4 (60.2)	57.7 (60.8)	48.2 (54.4)	56.6 (61.3)	52.5 (59.5)
	SLE-N2	Shaw Lane Carpark, Tuppenhurst Lane	Free-field	51.5 (58.1)	53.5 (57.5)	51.9 (55.6)	51.8 (57.3)	48.6 (57.2)	49.8 (54.2)	50.1 (53.5)	49.4 (53.3)	50.3 (54.4)	48.5 (58.8)	51.0 (58.8)	47.7 (54.6)
A38SSRR	A38SSRR-N1	Thompson Way, Streethay	Free-field	61.9 (64.2)	61.3 (63.3)	60.6 (63.9)	59.0 (62.0)	57.3 (63.0)	57.7 (58.7)	59.1 (60.2)	59.2 (60.1)	58.4 (60.4)	54.5 (57.5)	58.0 (60.7)	56.3 (62.3)
FEW	FEW-N1	Wood End Farm, Wood End Lane	Free-field	60.5 (61.9)	60.1 (61.8)	59.4 (64.4)	58.7 (62.8)	55.6 (62.9)	56.0 (58.1)	58.6 (58.9)	58.6 (61.3)	58.1 (62.2)	52.2 (56.5)	58.5 (66.4)	54.1 (59.3)
SCRS	SCRS-N1	West of Manor House, Burton Road, Streethay	Free-field	54.4 (54.5)	56.2 (56.7)	52.5 (54.1)	51.1 (52.0)	50.0 (54.3)	48.6 (48.6)	50.0 (50.0)	49.7 (49.7)	50.1 (51.2)	48.5 (49.1)	N/A* (N/A)	N/A* (N/A)
	SCRS-N2	Kings Orchard Marina, Broad Ln, Huddlesford	Free-field	48.6 (52.8)	51.4 (60.8)	48.3 (51.9)	46.8 (53.7)	46.4 (53.8)	44.6 (45.1)	47.2 (50.8)	44.5 (47.8)	45.1 (50.9)	42.6 (46.4)	47.9 (55.7)	47.0 (52.7)
SSL	SSL-N1	Ash Tree Lane, Hill Farm, Fradley and Streethay	Free-field	55.9 (60.2)	56.4 (61.5)	54.4 (58.8)	53.2 (58.3)	53.2 (68.3)	50.7 (53.3)	51.6 (55.3)	50.0 (54.8)	50.1 (55.6)	49.5 (59.9)	51.3 (57.9)	52.9 (60.0)
CLC	CLC-N1	Ivy Cottage, Park Lane, Fradley and Streethay	Free-field	61.4 (69.5)	61.3 (64.9)	58.8 (66.3)	58.1 (70.9)	56.6 (74.7)	57.5 (61.7)	60.6 (64.8)	58.0 (60.4)	57.0 (65.1)	54.9 (68.0)	58.1 (65.4)	56.1 (63.3)

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	**0800 - 1800**	**1800 - 1900**	**1900 - 2200**	**2200 - 0700**	**0700 - 0800**	**0800 - 1300**	**1300 - 1400**	**1400 - 2200**	**2200 - 0700**	**0700 - 2200**	**2200 - 0700**
	CLC-N4	Huddlesford Lane, Fradley and Streethay	Free-field	63.1 (65.7)	63.0 (64.5)	65.6 (67.8)	62.1 (65.4)	58.9 (64.4)	58.8 (62.2)	59.0 (61.7)	59.7 (60.8)	60.3 (66.4)	44.6 (55.1)	59.2 (63.5)	53.6 (60.8)
WCC	WCC-N1	Whittington Hill Farm, Darnford Lane, Whittington	Free field	45.5 (49.8)	45.3 (49.3)	44.4 (48.4)	43.7 (50.0)	41.9 (51.3)	43.7 (47.5)	45.5 (47.2)	43.8 (52.3)	43.2 (55.7)	38.3 (42.1)	44.2 (54.6)	43.5 (49.7)
TROS	TROS-N1	South Lodge, Tamworth Road, Whittington	Free-field	59.9 (61.2)	58.3 (59.6)	58.1 (60.2)	56.2 (59.2)	51.3 (58.3)	54.1 (54.9)	57.3 (58.2)	57.2 (58.3)	56.5 (58.6)	50.1 (55.1)	56.2 (59.7)	51.1 (57.8)
	TROS-N2	The Bungalow, Tamworth Road, Whittington	Free-field	48.9 (62.5)	49.0 (60.8)	45.9 (54.9)	44.8 (52.7)	45.6 (57.0)	46.7 (48.8)	46.3 (47.7)	45.5 (46.9)	44.8 (53.3)	45.7 (52.8)	45.9 (53.8)	45.3 (55.0)
SCS	SCS-N1	The Lodge, Rock Hill, Hints	Free-field	56.9 (58.0)	55.6 (57.0)	54.5 (56.1)	52.1 (59.6)	49.0 (55.1)	50.2 (52.5)	54.4 (54.9)	54.9 (55.6)	54.3 (64.5)	46.7 (55.4)	53.6 (60.7)	48.5 (54.6)
N23	N23-N1	21 Roman Road	Free-field	58.7 (60.2)	57.5 (59.2)	56.3 (58.8)	54.1 (64.7)	51.5 (57.5)	51.8 (53.3)	55.6 (56.6)	55.9 (56.9)	54.3 (57.2)	48.6 (54.1)	54.6 (58.4)	51.2 (57.0)
BLR	BLR-N1	The Vicarage, School Lane, Hints, Tamworth	Free-field	48.5 (52.1)	49.1 (55.5)	49.5 (82.1)	48.9 (61.0)	49.7 (64.9)	47.5 (52.5)	50.2 (53.3)	46.1 (48.4)	52.7 (67.0)	48.8 (58.6)	48.0 (55.8)	49.3 (57.1)
SRO	SRO-N1	Sutton Road, Drayton Bassett, Mile Oak	Free-field	48.7 (54.1)	49.6 (66.1)	48.0 (52.7)	47.6 (52.6)	44.8 (52.1)	45.9 (47.2)	47.8 (50.0)	47.9 (53.1)	47.6 (53.0)	43.8 (46.9)	46.5 (49.5)	43.5 (48.8)

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	**0800 - 1800**	**1800 - 1900**	**1900 - 2200**	**2200 - 0700**	**0700 - 0800**	**0800 - 1300**	**1300 - 1400**	**1400 - 2200**	**2200 - 0700**	**0700 - 2200**	**2200 - 0700**
	SRO-N2	White House Farm	Free-field	47.5 (52.2)	49.3 (64.2)	46.6 (50.8)	45.9 (51.0)	45.9 (59.3)	46.1 (51.0)	48.5 (50.3)	48.2 (55.7)	46.3 (53.6)	45.7 (54.5)	47.1 (53.2)	45.9 (55.6)
DLC	DLC-N1	Oak Dairy Farm, Drayton Lane, Lichfield	Free-field	48.4 (53.6)	48.6 (64.0)	46.2 (54.5)	44.6 (48.5)	46.1 (60.8)	44.6 (46.4)	48.3 (50.0)	46.0 (47.5)	45.5 (51.7)	46.8 (58.0)	46.6 (55.0)	47.0 (58.3)

* No data available for Sundays and Public Holidays.

2.1.2 Table 4 presents a summary of the measured vibration levels at each monitoring location over the reporting period. The highest PPV measured during the monitoring along any axis is presented in the table.

Table 4: Summary of Measured PPV Data over the Monitoring Period

Worksite Reference	Measurement Reference	Monitor Address	Highest PPV measured in any axis, mm/s
SLE	SLE-V1	Shaw Lane Carpark, Tuppenhurst Lane	2.80 (Z-axis)
FEW	FEW-V3	Wood End Farm, Wood End Lane	1.47 (Y-axis)
SCRS	SCRS-V1	Manor Farm House, Burton Road, Streethay	0.56 (Y-axis)
CLC	CLC-V1	Ivy Cottage, Park Lane, Fradley and Streethay, Whittington	1.93 (Z-axis)
TROS	TROS-V2	The Bungalow, Tamworth Road	1.05 (X-axis)
SCS	SCS-V3	11 Flats Lane, Weeford	0.00 (X-axis)
SRO	SRO-V1	Sutton Road, Drayton Bassett, Mile Oak	0.42 (Z-axis)
	SRO-V2	Bangley Lane, Hints	3.13 (Z-axis)

2.1.3 Appendix C presents graphs of the noise and vibration monitoring data over the month for each of the measurement locations. Noise data presented consists of the hourly L_{Aeq} values and, where relevant, the $L_{Aeq,T}$ values (where the time period T has been taken to be the averaging period as specified in Table 1 of HS2 Information Paper E23). Vibration data presented consist of hourly PPV values. The full data set for the monitoring equipment can be found at the following location: https://data.gov.uk/dataset/24542ae7-dd44-444f-b259-871c4cc43b5e/environmental-monitoring-data.

2.2 Exceedances of the LOAEL and SOAEL

2.2.1 The lowest observed adverse effect level (LOAEL) is defined in the Planning Practice Guidance – Noise (PPG) as the level above which "noise starts to cause small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life".

2.2.2 The significant observed adverse effect level (SOAEL) is defined in the 'Planning Practice Guidance – Noise' as the level above which "noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area."

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

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

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

Table 5: Summary of Exceedances of LOAEL and SOAEL

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
SLE	SLE-N1	Traveller Site, Shaw Lane, Lichfield	Weekday	All periods	No exceedance	No exceedance
	SLE-N2	Shaw Lane Carpark, Tuppenhurst Lane	All days	All periods	No exceedance	No exceedance
FEW	FEW-N1	Wood End Farm, Wood End Lane, Lichfield	Weekday	All periods	No exceedance	No exceedance
A38SSRR	A38SSRR-N1	Thompson Way, Streethay	Weekday	All periods	No exceedance	No exceedance
SCRS	SCRS-N1	West of Manor House, Burton Road, Streethay	All days	All periods	No exceedance	No exceedance
	SCRS-N2	Kings Orchard Marina, Broad Lane, Huddlesford,	Weekday	All periods	No exceedance	No exceedance
SSL	SSL-N1	Ash Tree Lane, Hill Farm, Fradley and Streethay	All days	All periods	No exceedance	No exceedance
CLC	CLC-N1	Ivy Cottage, Park Lane, Fradley and Streethay, Whittington	Weekday Saturday	0800-1800 0800-1300	3 1	No exceedance No exceedance

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
	CLC-N4	Huddlesford Lane, Fradley and Streethay	All days	All periods	No exceedance	No exceedance
WCC	WCC-N1	Whittington Hill Farm, Darnford Lane, Whittington	All days	All periods	No exceedance	No exceedance
TROS	TROS-N1	South Lodge, Tamworth Road, Whittington, Lichfield	All days	All periods	No exceedance	No exceedance
	TROS-N2	The Bungalow, Tamworth Road, Whittington	All days	All periods	No exceedance	No exceedance
SCS	SCS-N1	The Lodge, Rock Hill, Hints	All days	All periods	No exceedance	No exceedance
N23	N23-N1	21 Roman Road, Lichfield	All days	All periods	No exceedance	No exceedance
BLR	BLR-N1	The Vicarage, School Lane, Hints, Tamworth	All days	All periods	No exceedance	No exceedance
SRO	SRO-N1	Sutton Road, Drayton Bassett, Mile Oak, Lichfield	All days	All periods	No exceedance	No exceedance
	SRO-N2	White House Farm	All days	All periods	No exceedance	No exceedance
DLC	DLC-N1	Oak Dairy Farm, Drayton Lane, Lichfield	All days	All periods	No exceedance	No exceedance

2.2.6 Exceedances of the LOAEL were recorded at nine monitoring locations during weekday daytime periods only.

2.2.7 No exceedances of SOAEL were recorded due to HS2 construction works during May 2023.

2.3 Exceedances of Trigger Level

2.3.1 Table 6 provides a summary of exceedances of the Section 61 trigger noise levels determined to be due to HS2 related construction noise measured during the reporting period, along with the findings of any investigation.

Table 6: Summary of Exceedances of Trigger Levels

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

2.4 Complaints

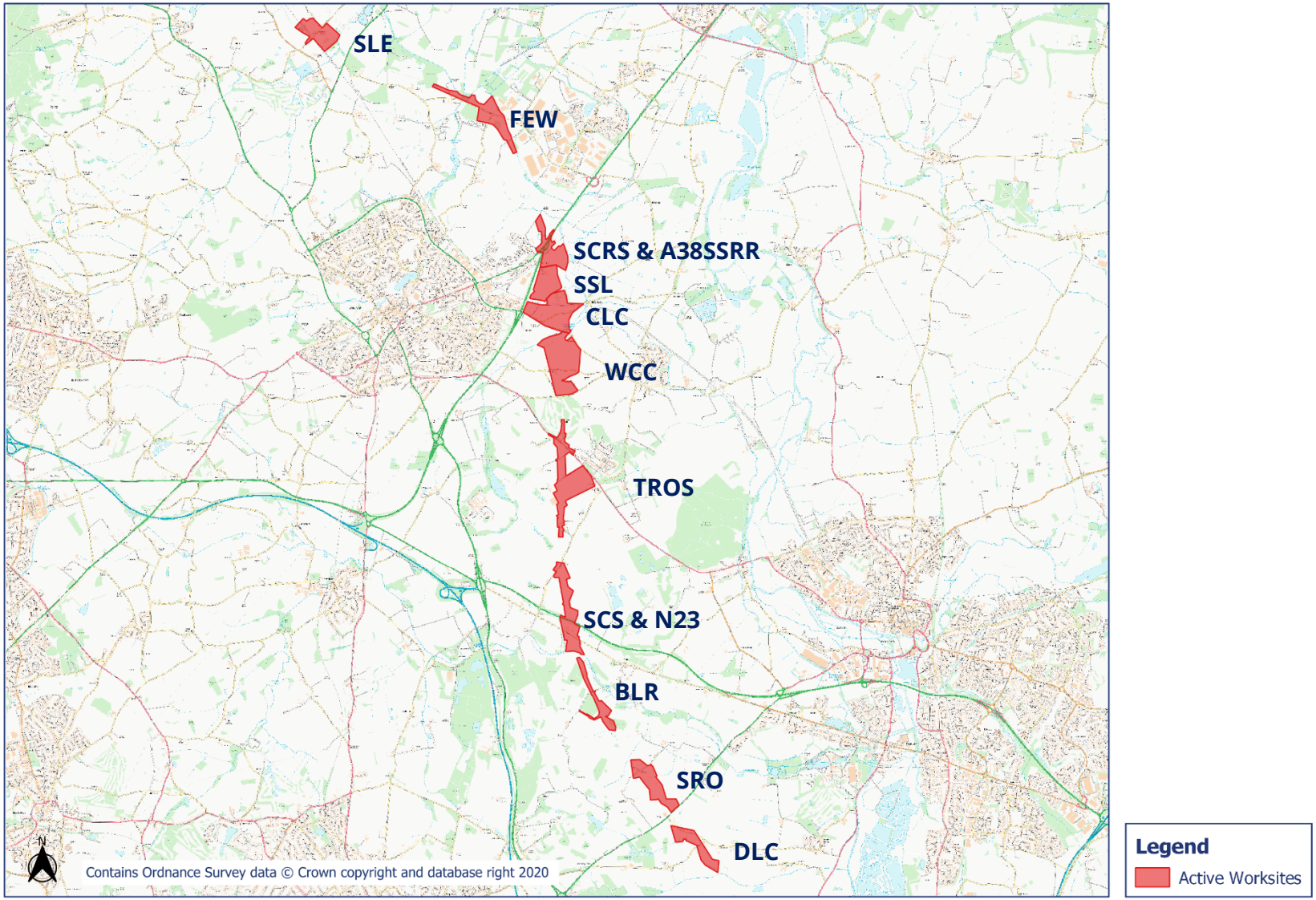
2.4.1 Table 7 provides a summary of complaint information related to noise received during the reporting period, along with the findings of any investigation.

Table 7: Summary of Complaints

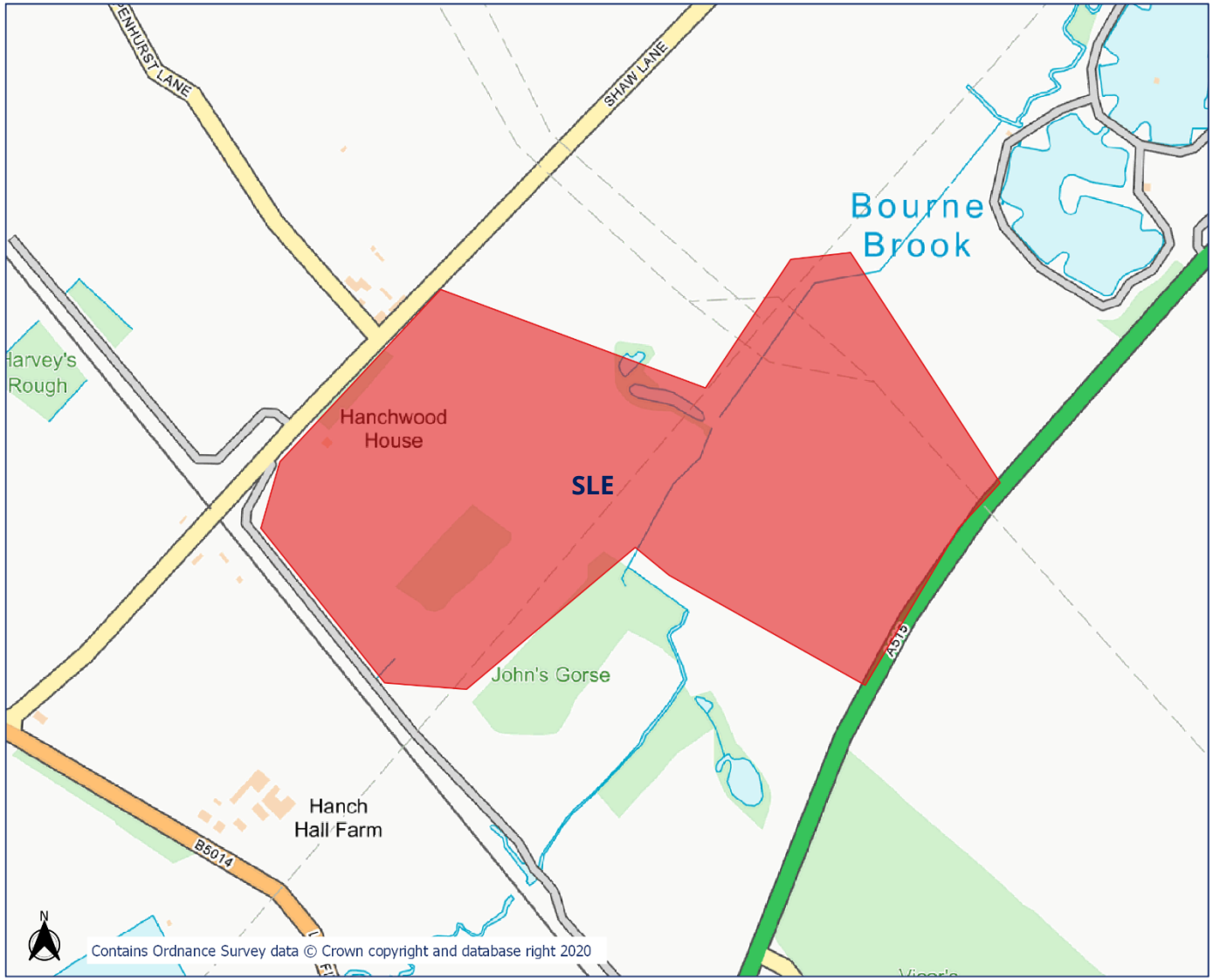
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-23-44714-C	SCRS	Complaint about night-time noise from site	Investigations show noise were due to infrastructure work on a nearby A-road.	Consent for night works have been approved and local residents were informed about the works.
HS2-23-44742-C HS2-23-96131-E-C HS2-23-96153-E-C HS2-23-96071-E-C HS2-23-96275-E-C HS2-23-96289-E-C HS2-23-96393-E-C HS2-23-96734-E-C	SCRS	Multiple complaints regarding night-time noise, drilling noise and piling noise.	Noise was due to piling works associated with a bridge building.	Actions were taken to reduce the construction noise. An old piling rig is being replaced by a newer model, completing as much piling activity as possible during the day, adjusting the method of cleaning the piling rig, offering respite for some residents and increasing noise monitoring

Appendix A Site Locations

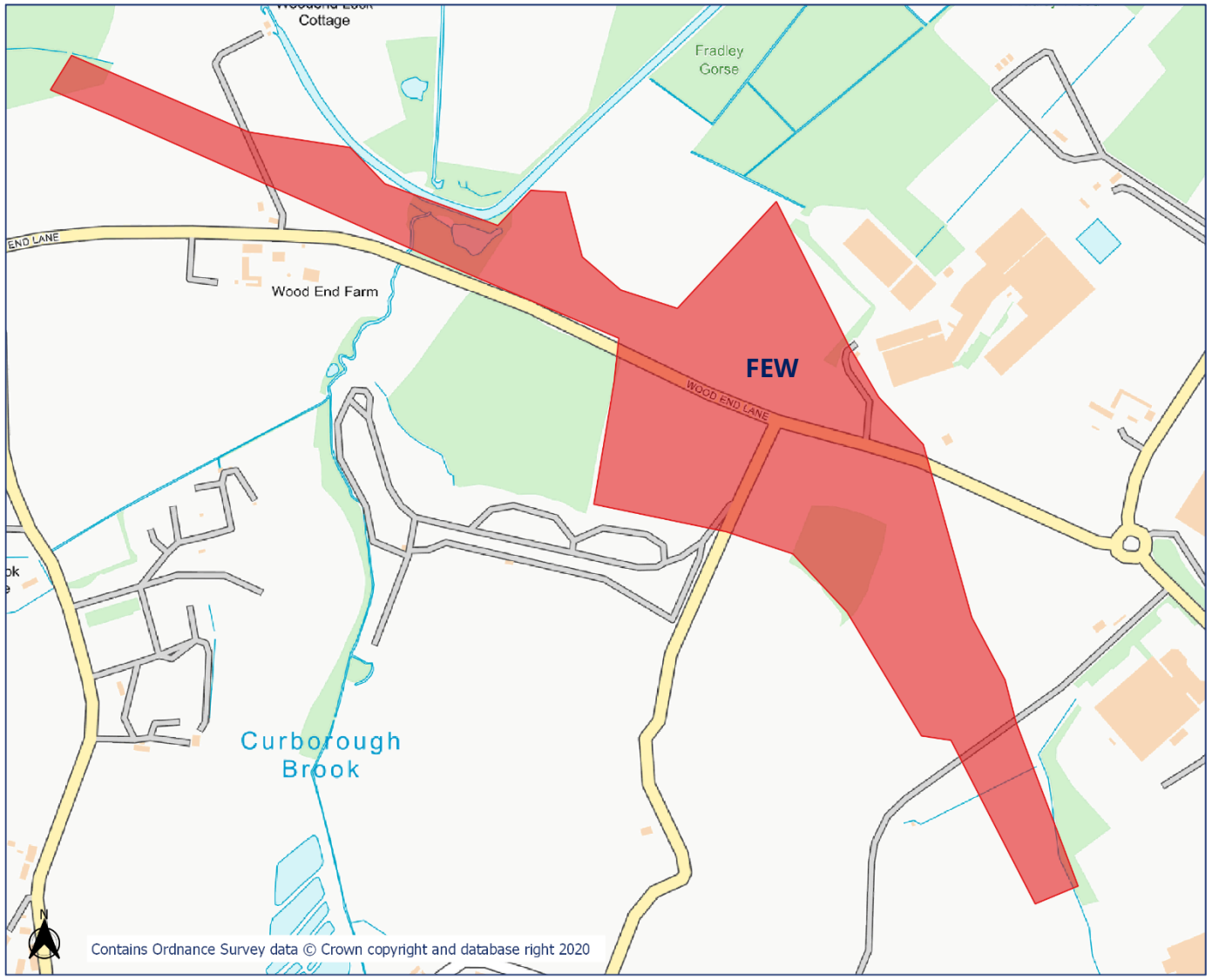
Worksite Identification Plan - Overview



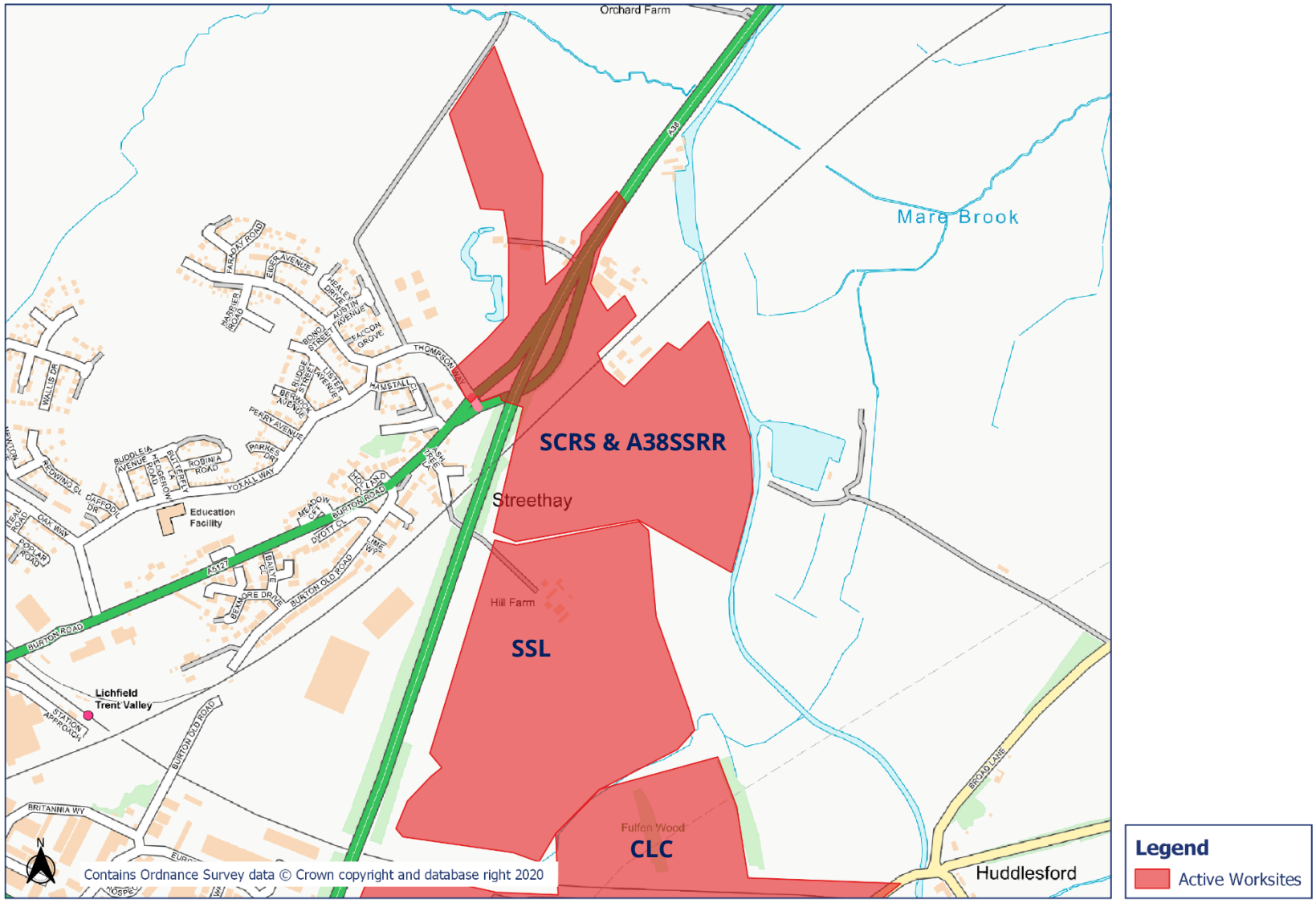
Worksite Identification Plan - 1



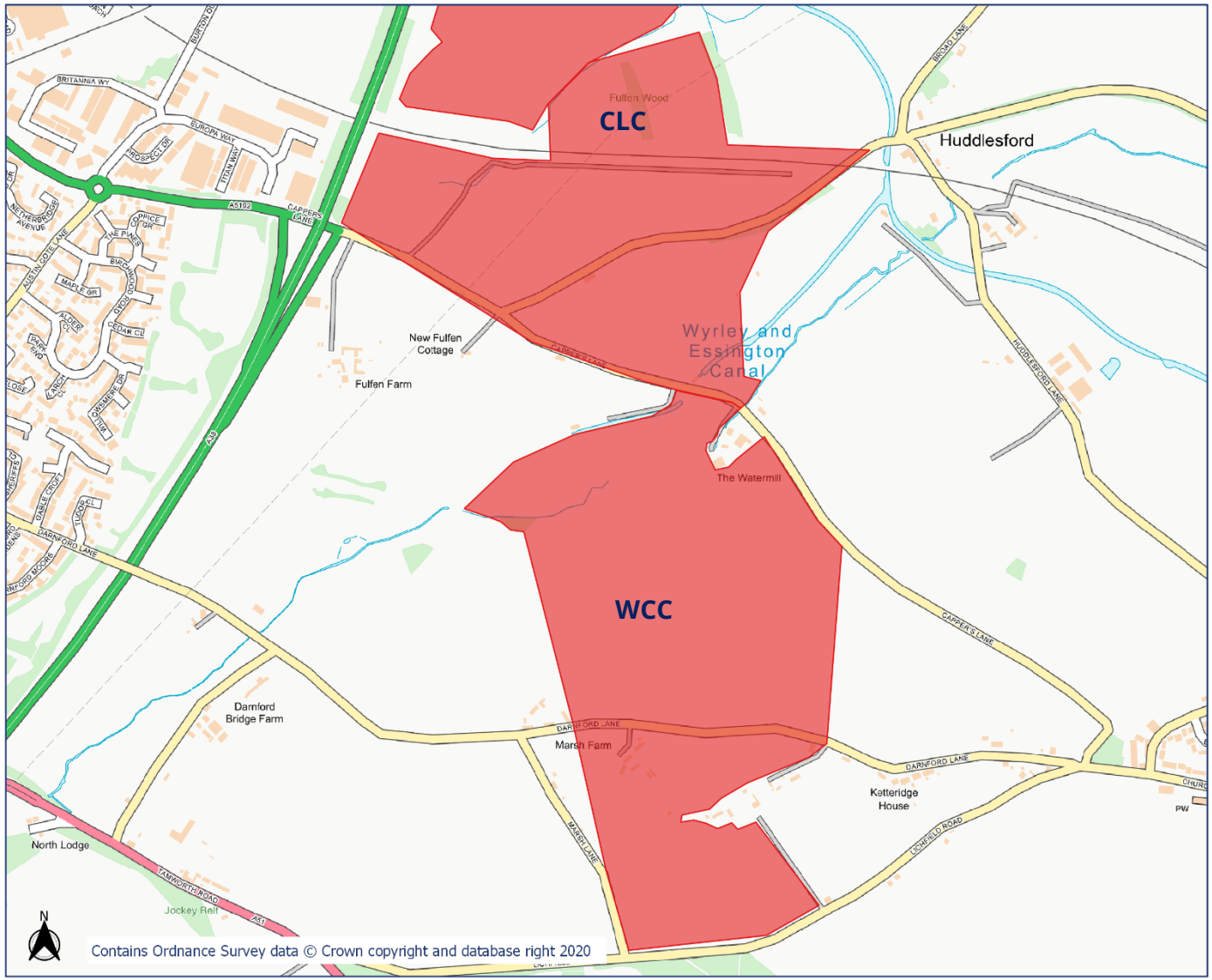
Worksite Identification Plan - 2



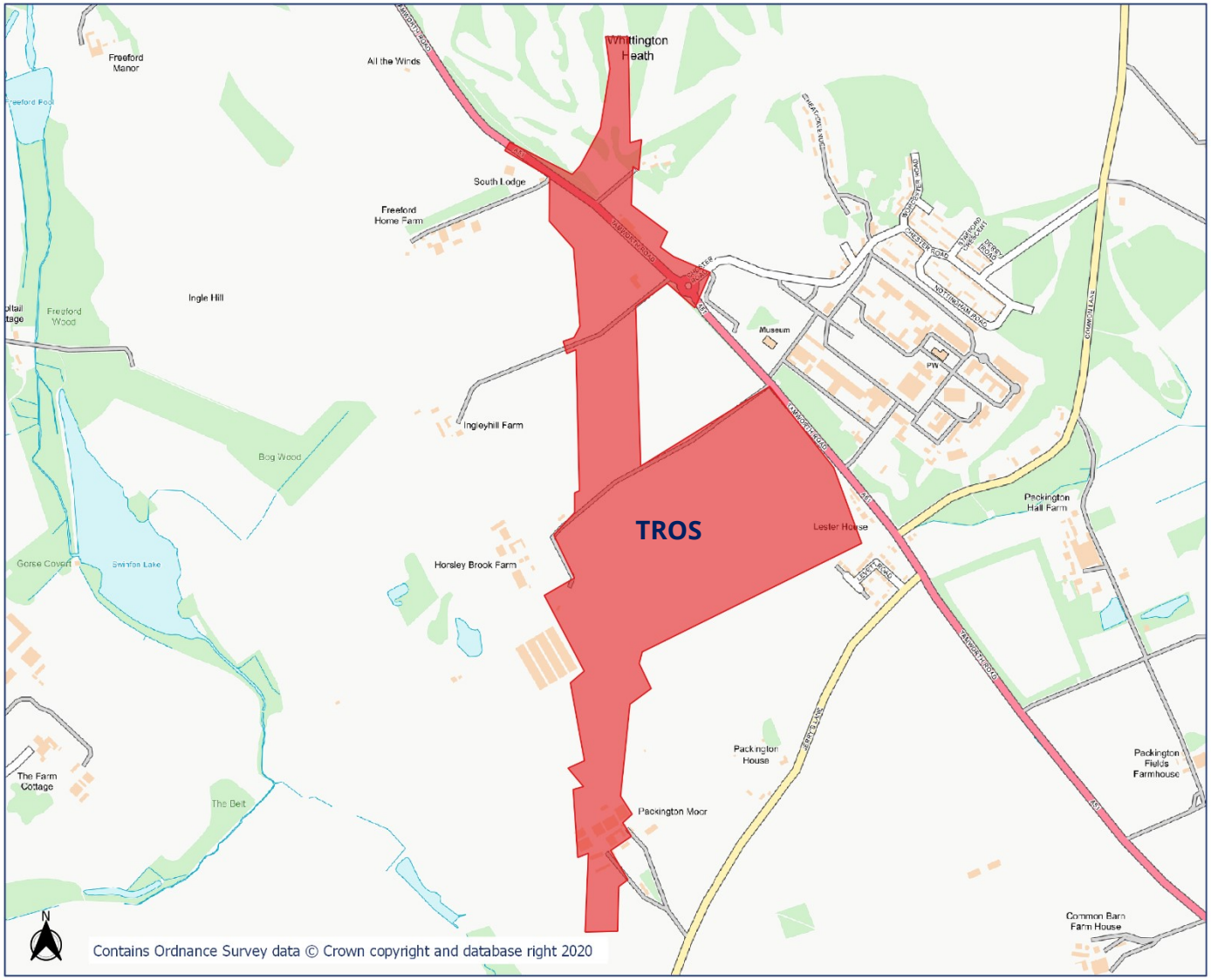
Worksite Identification Plan - 3



Worksite Identification Plan - 4



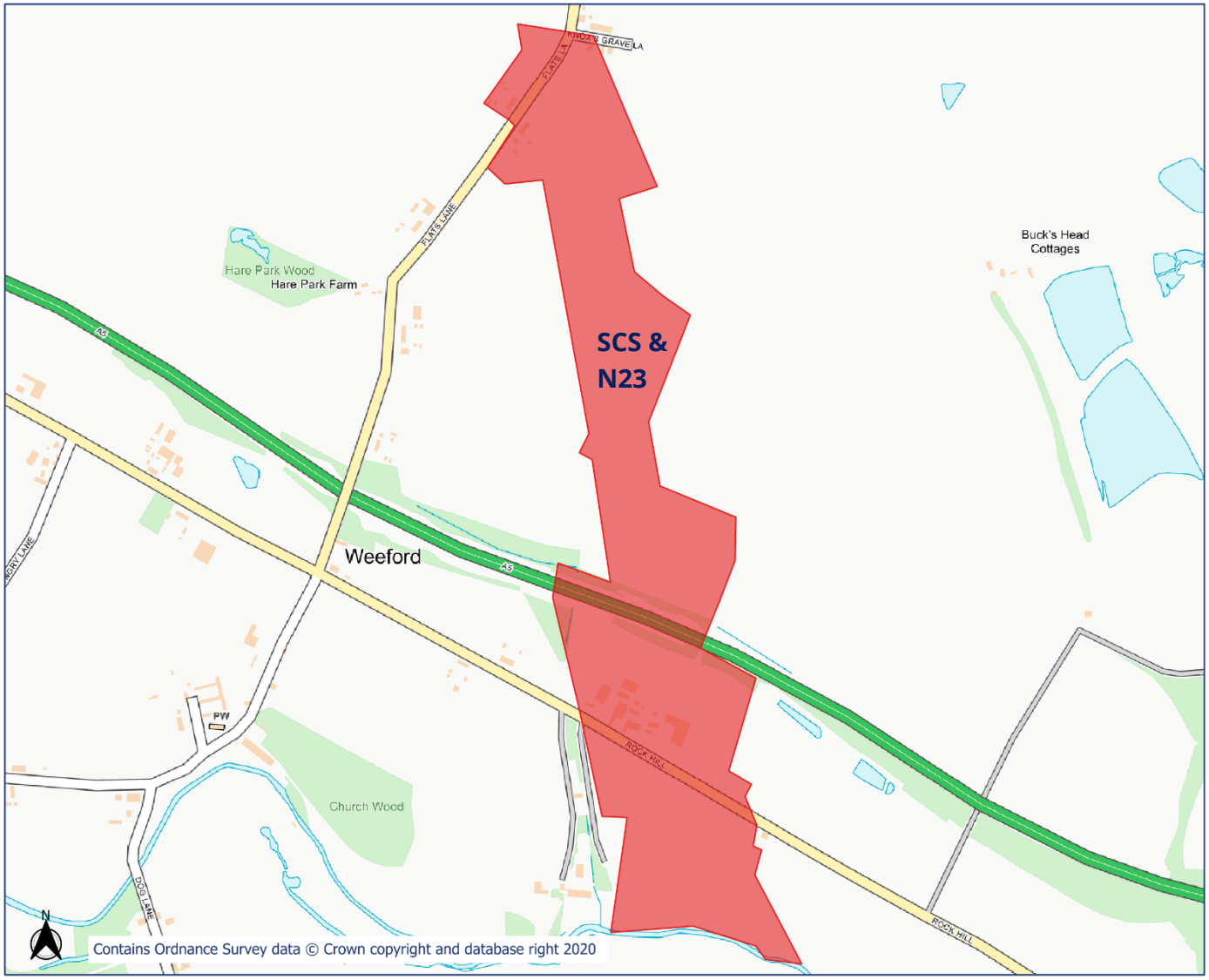
Worksite Identification Plan - 5



Legend

Active Worksites

Worksite Identification Plan - 6



Legend

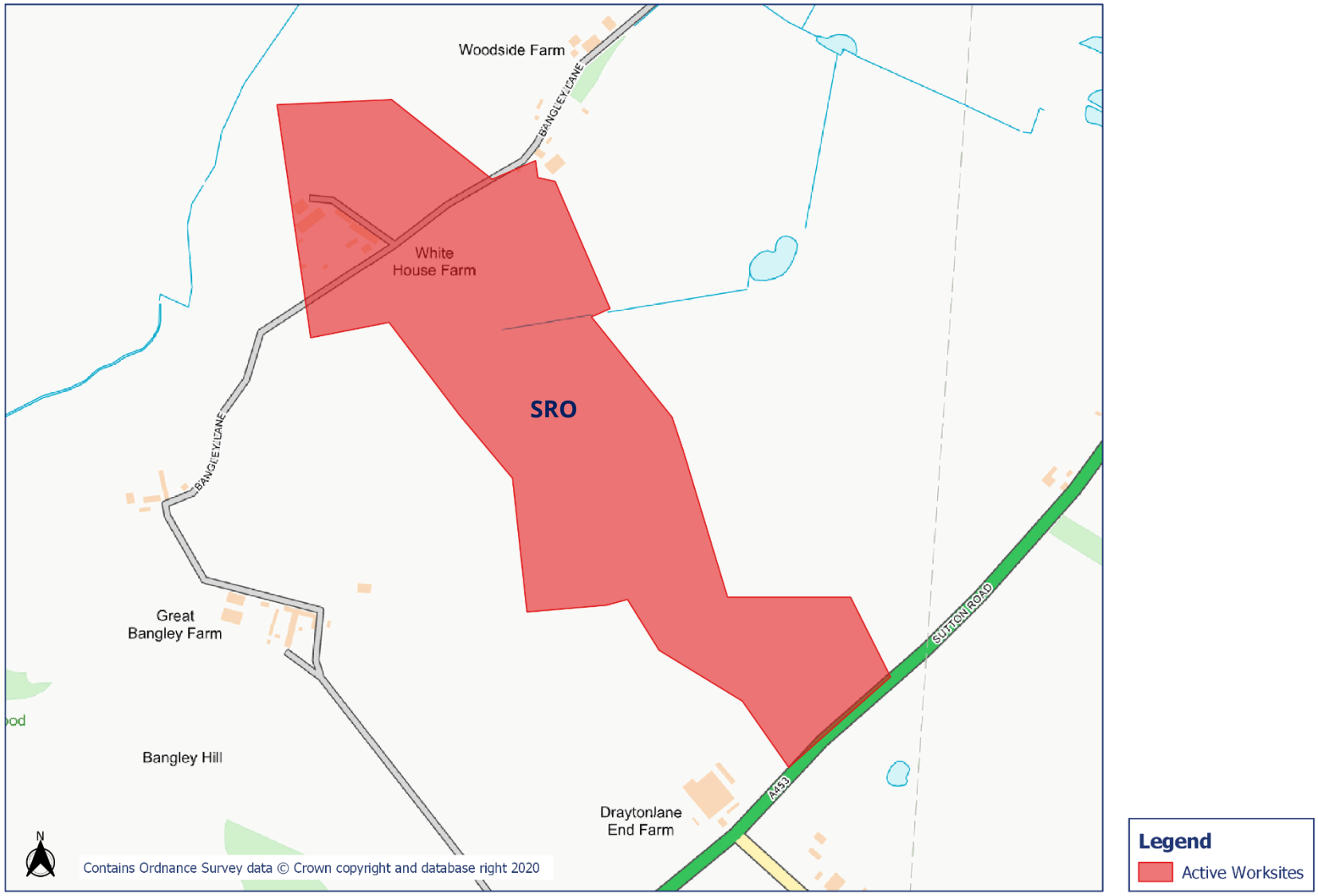
Active Worksites

Worksite Identification Plan - 7

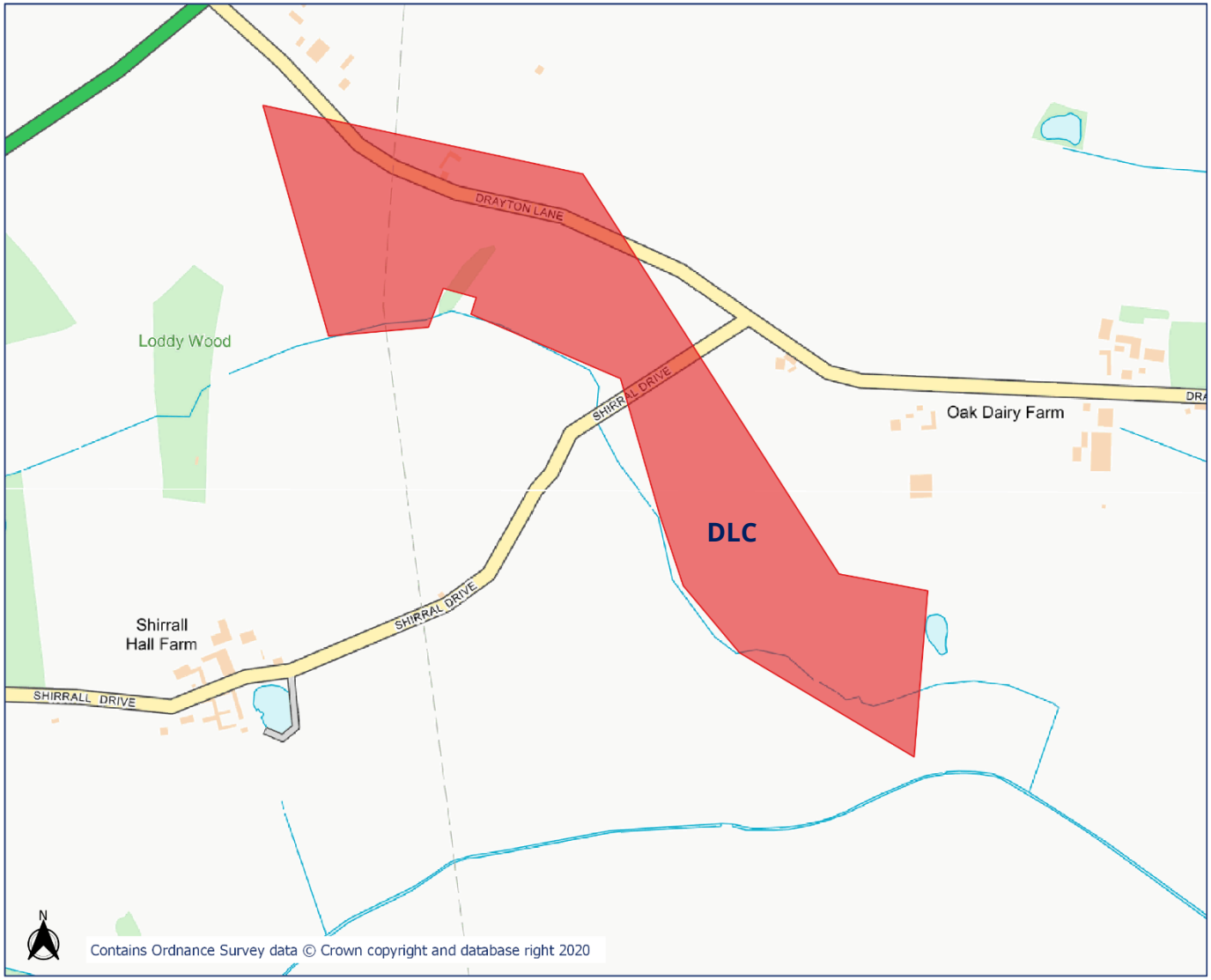
Legend

Active Worksites

Worksite Identification Plan - 8

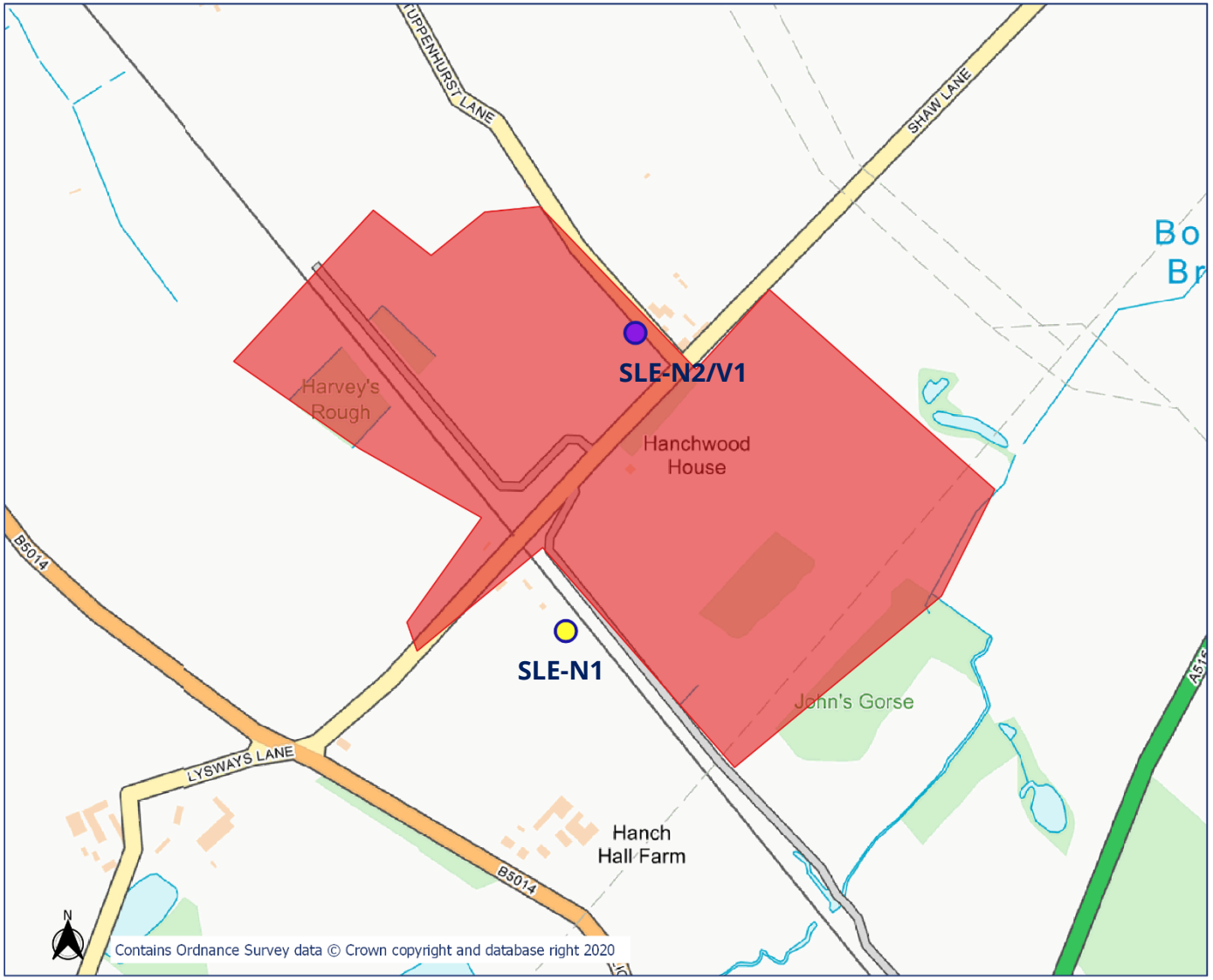


Worksite Identification Plan - 9

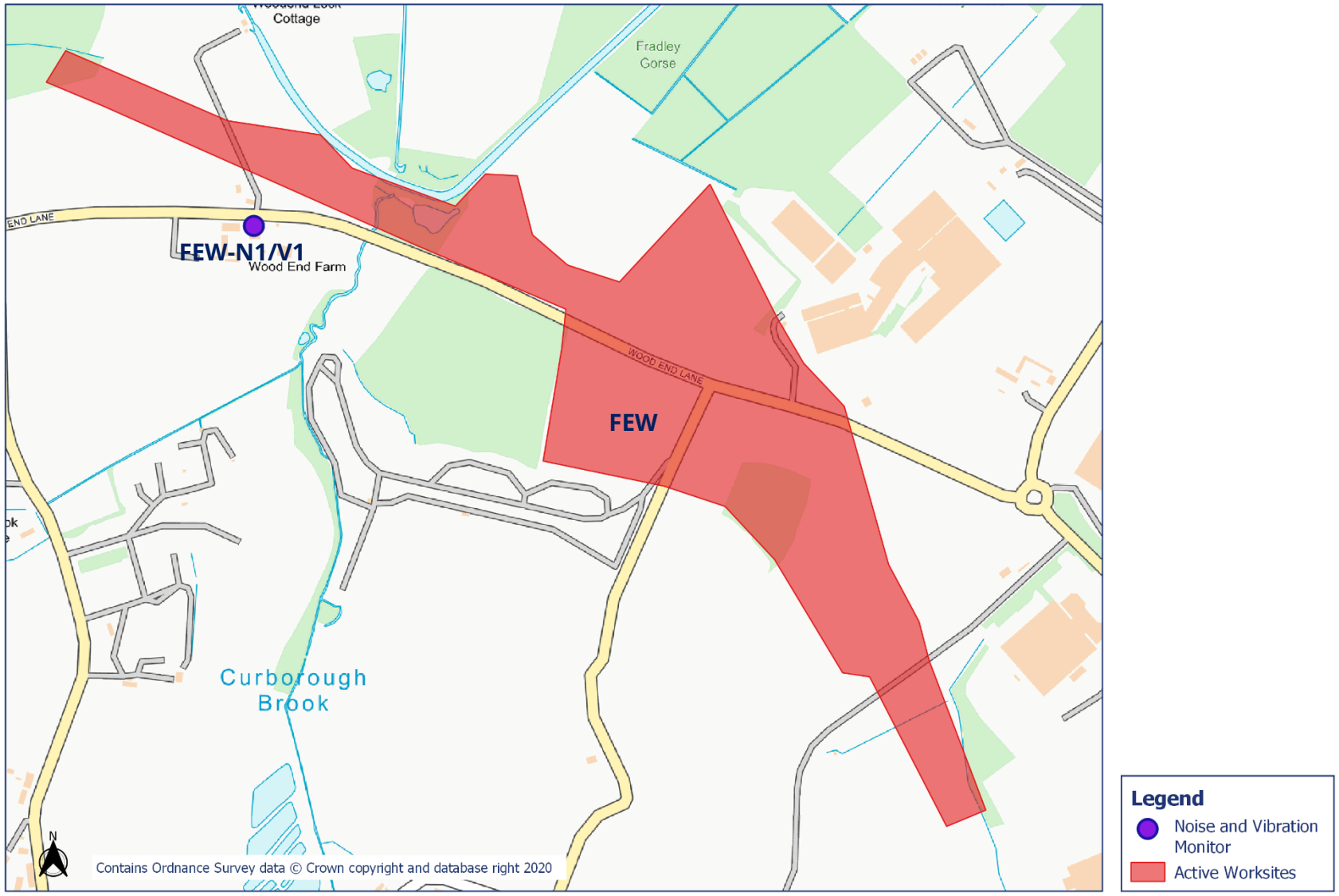


Appendix B Monitoring Locations

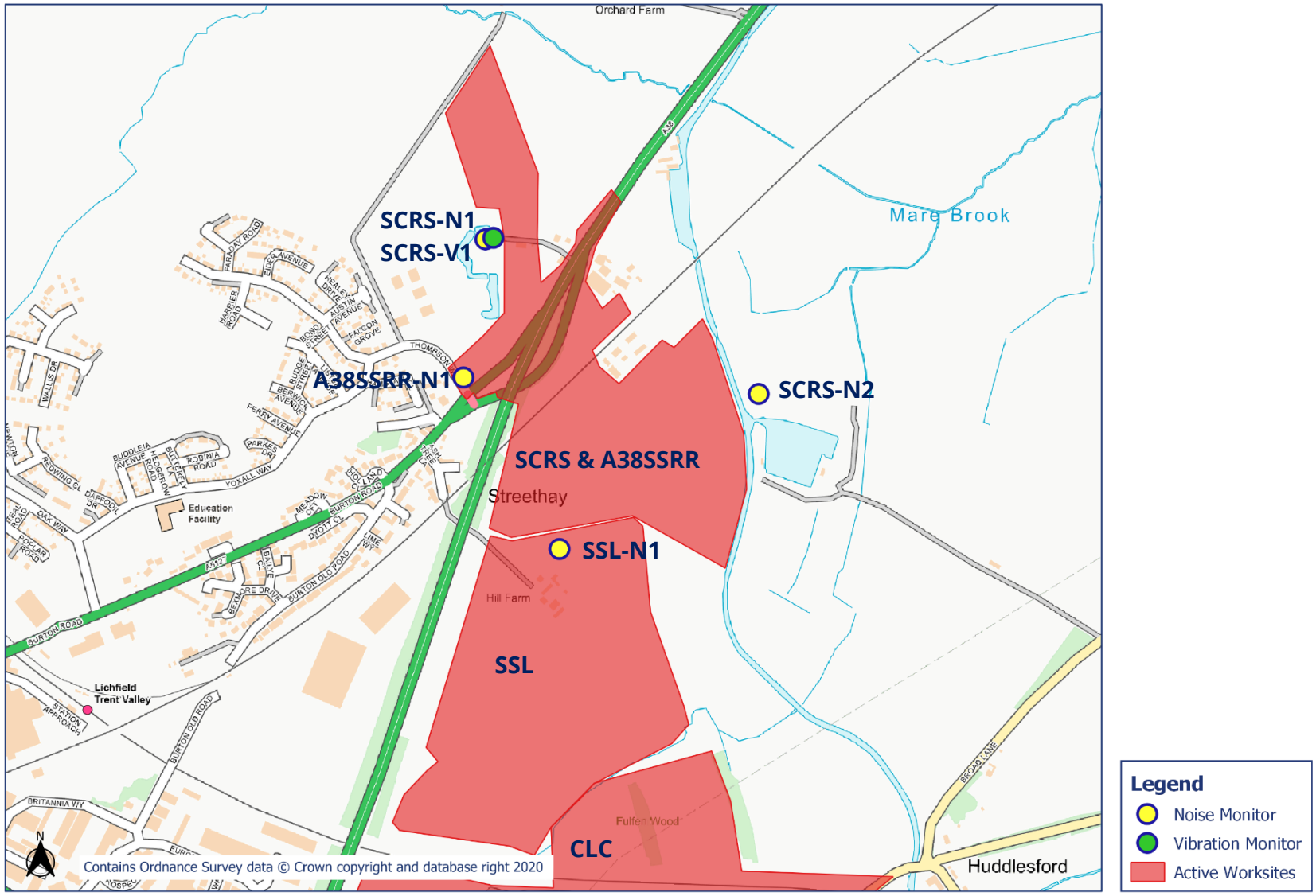
Noise and Vibration Monitoring Plan - 1



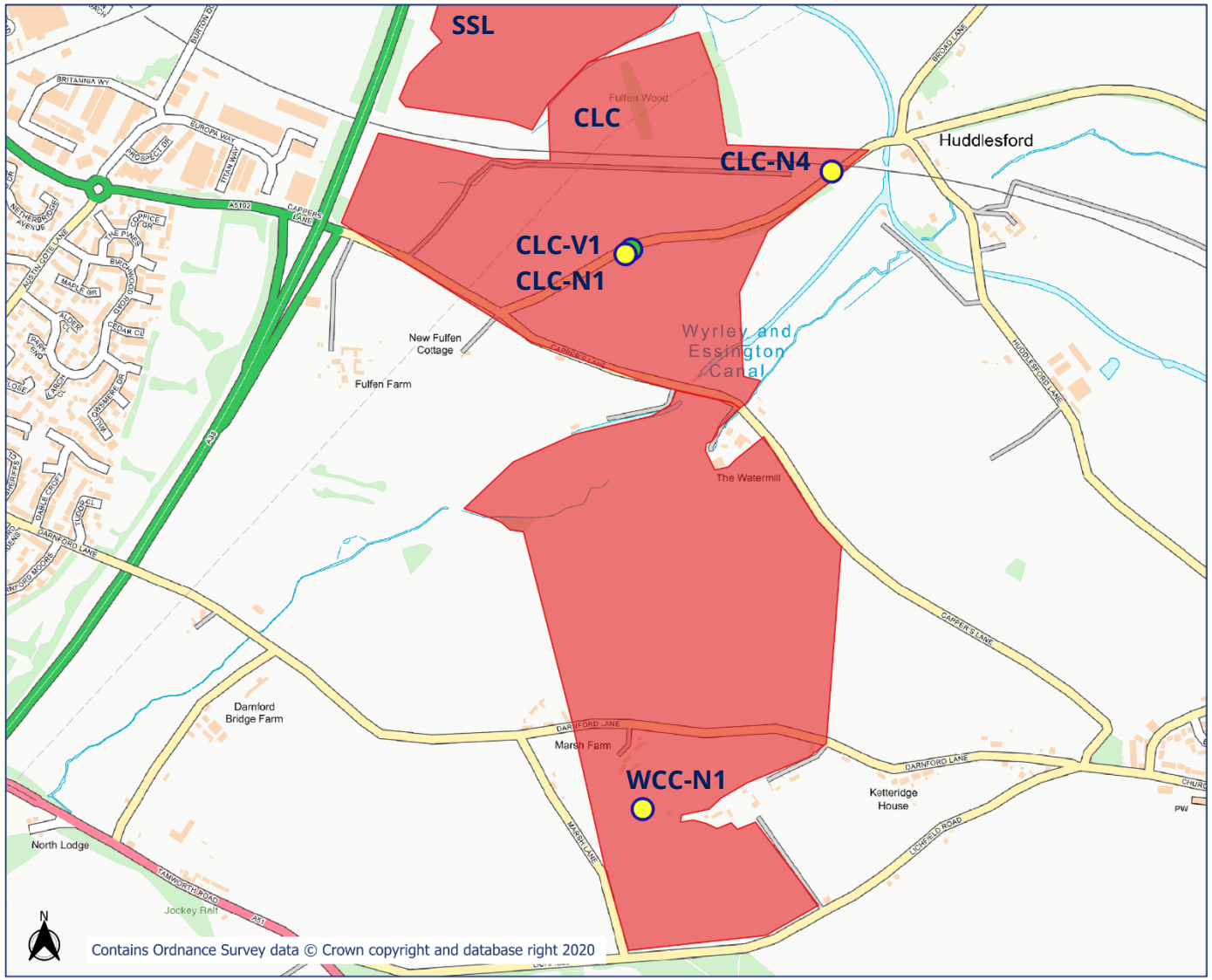
Noise and Vibration Monitoring Plan - 2



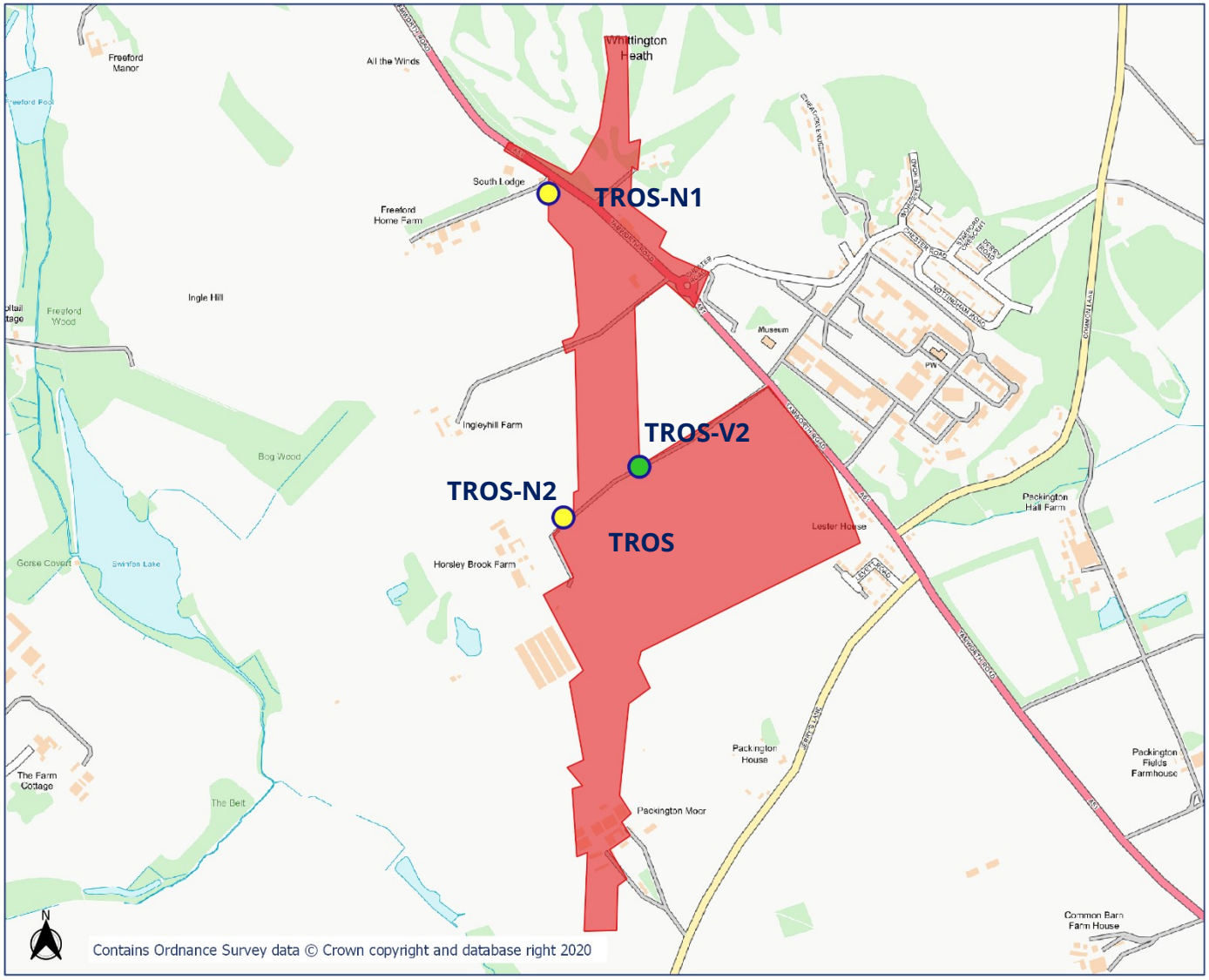
Noise and Vibration Monitoring Plan - 3



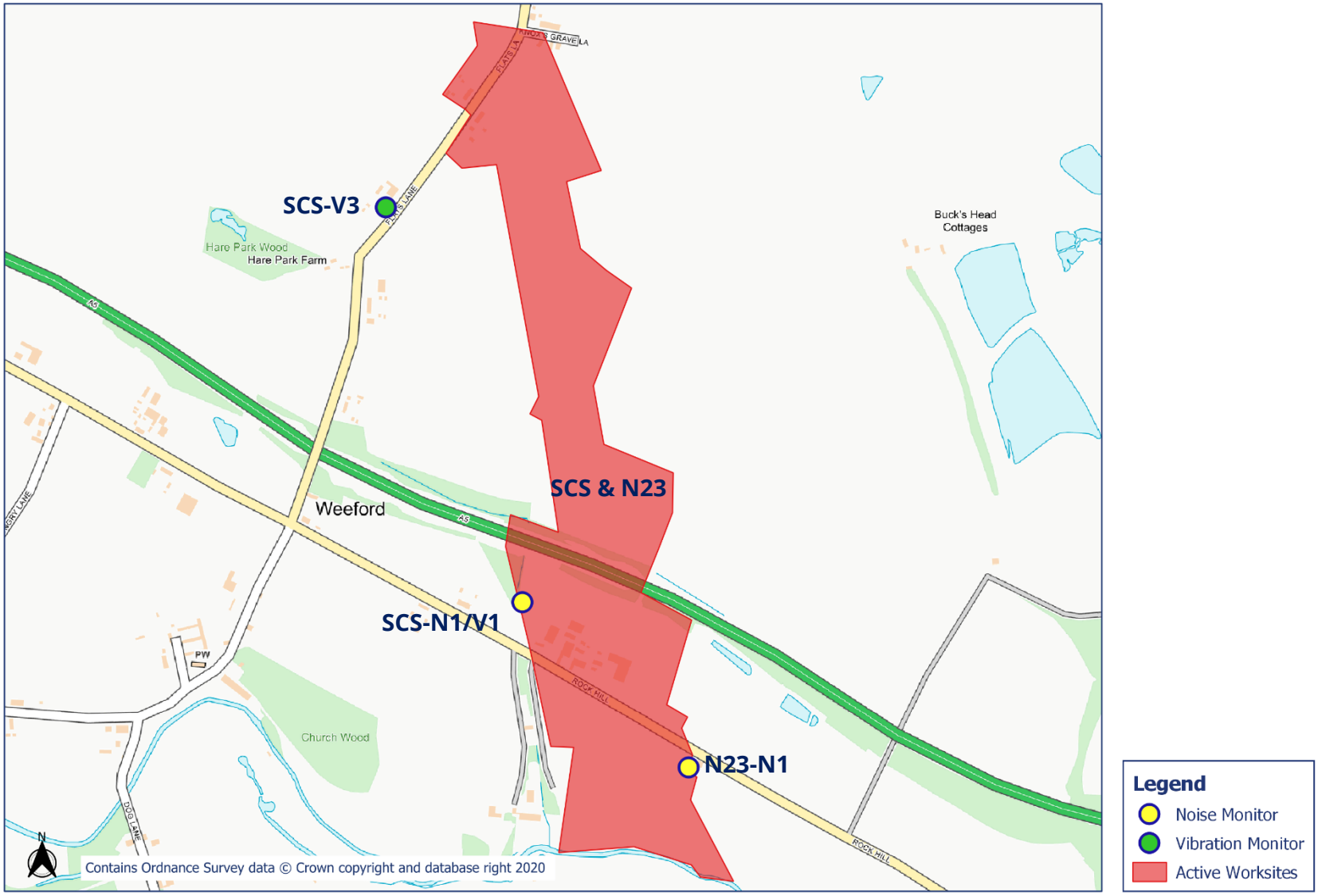
Noise and Vibration Monitoring Plan - 4



Noise and Vibration Monitoring Plan - 5

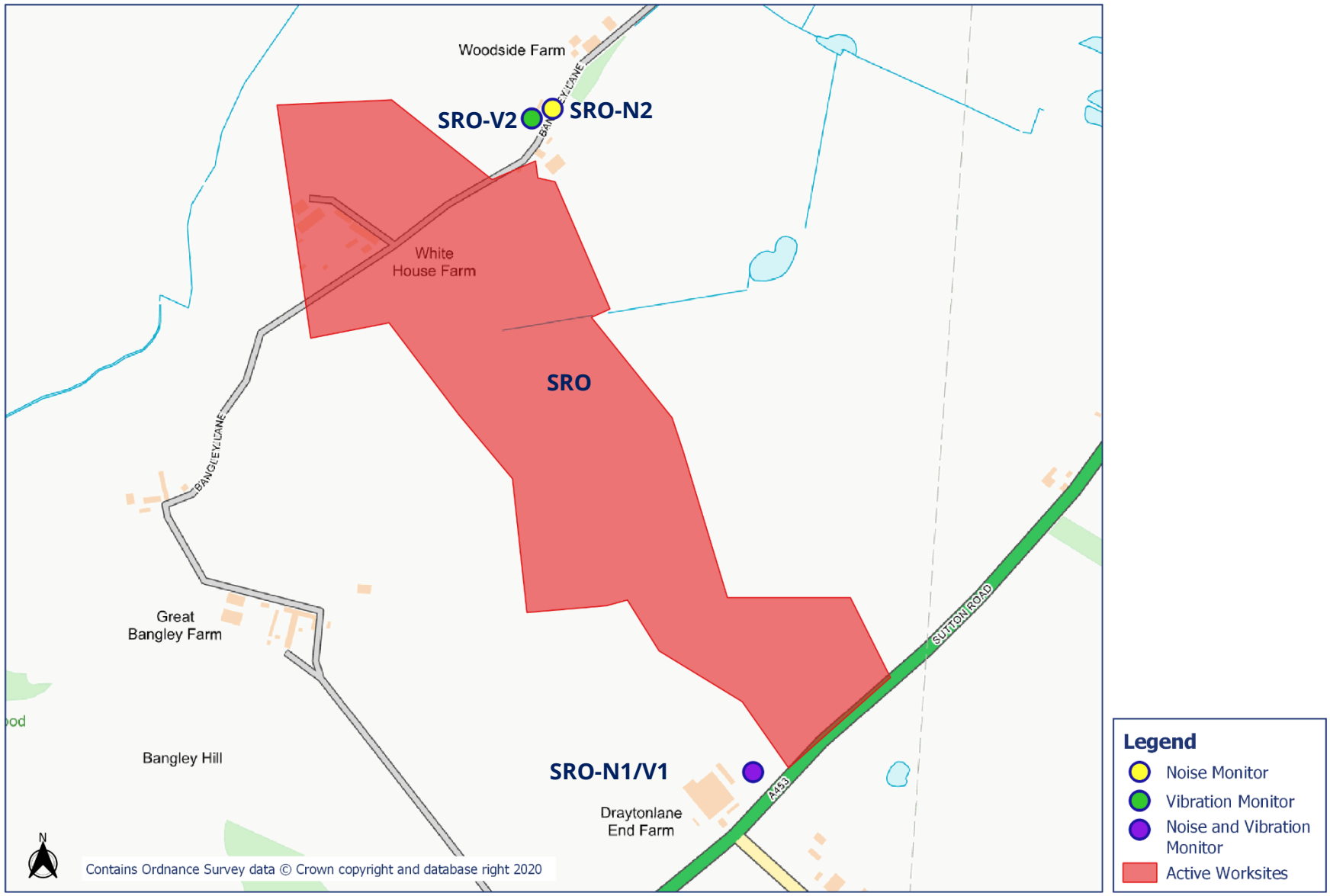


Noise and Vibration Monitoring Plan - 6

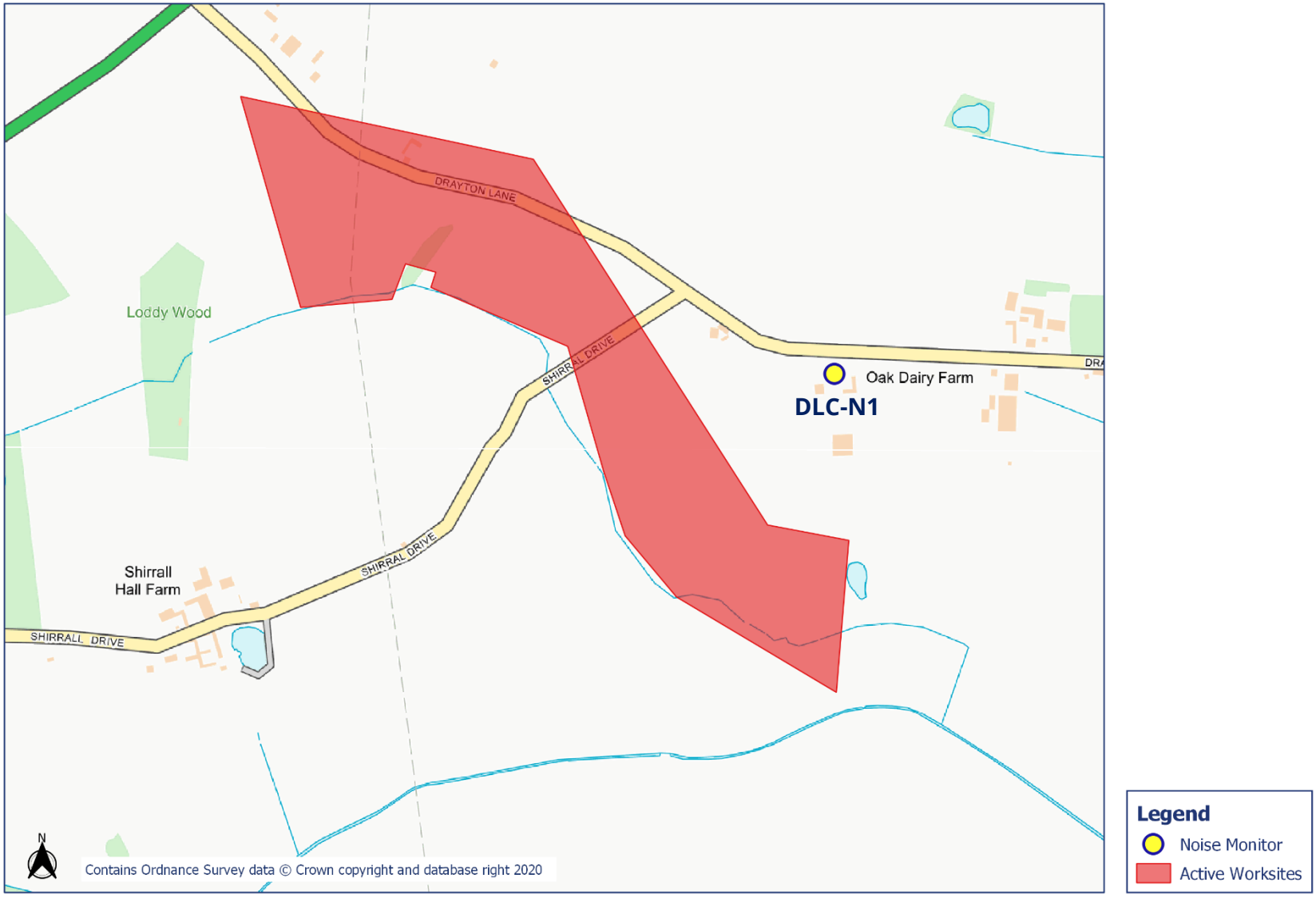


Noise and Vibration Monitoring Plan - 7

Noise and Vibration Monitoring Plan - 8



Noise and Vibration Monitoring Plan - 9

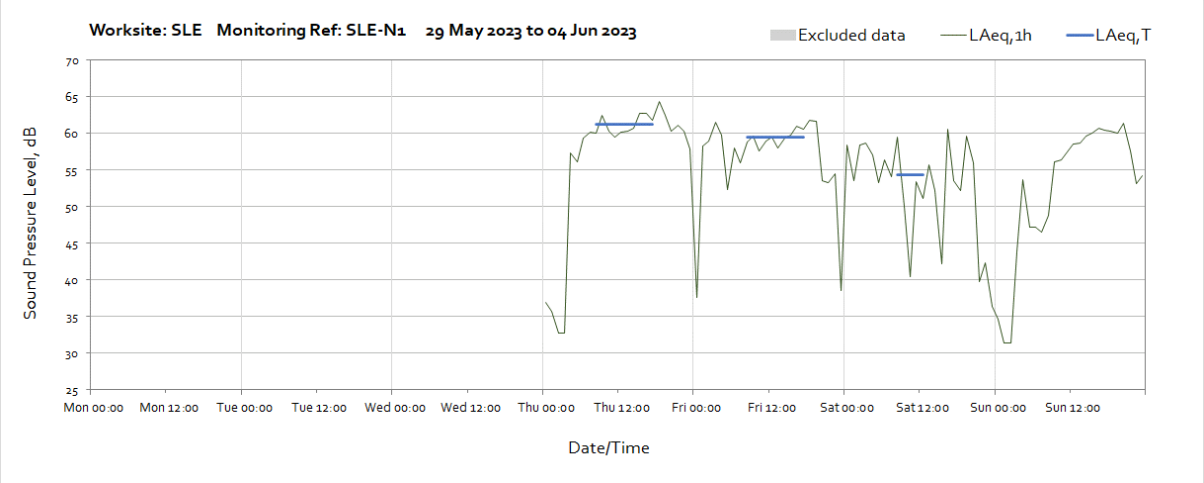


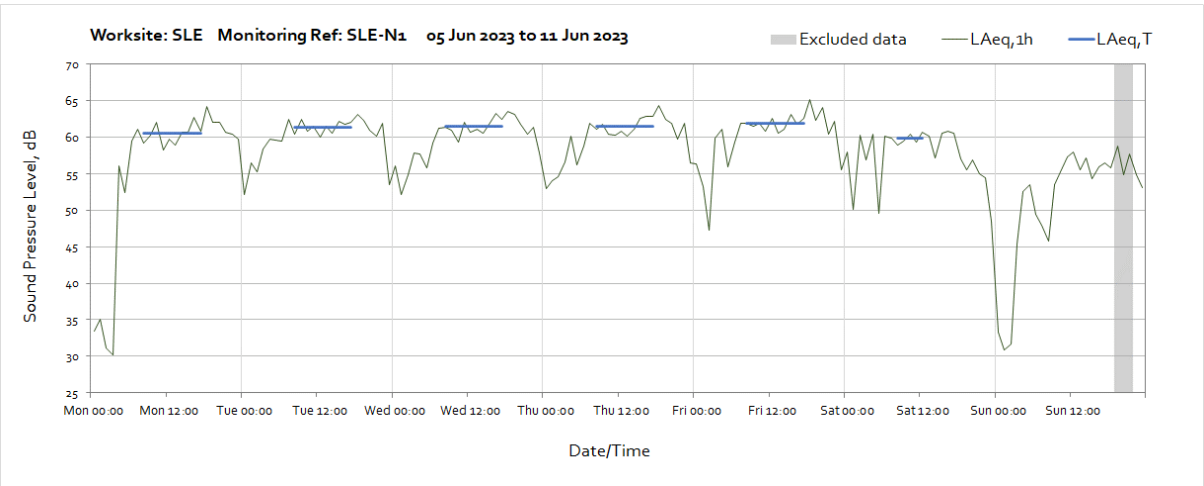
Appendix C Data

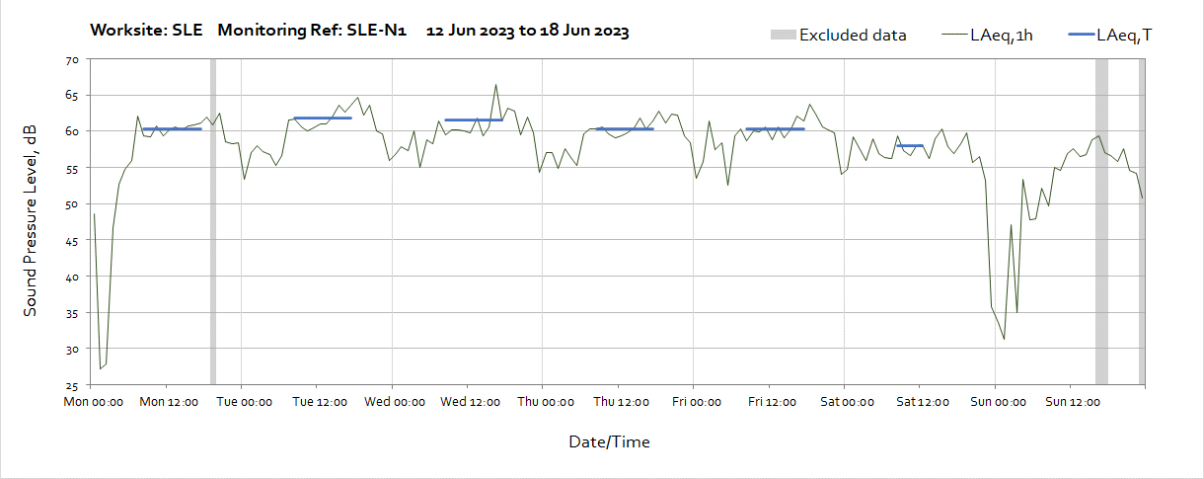
Noise

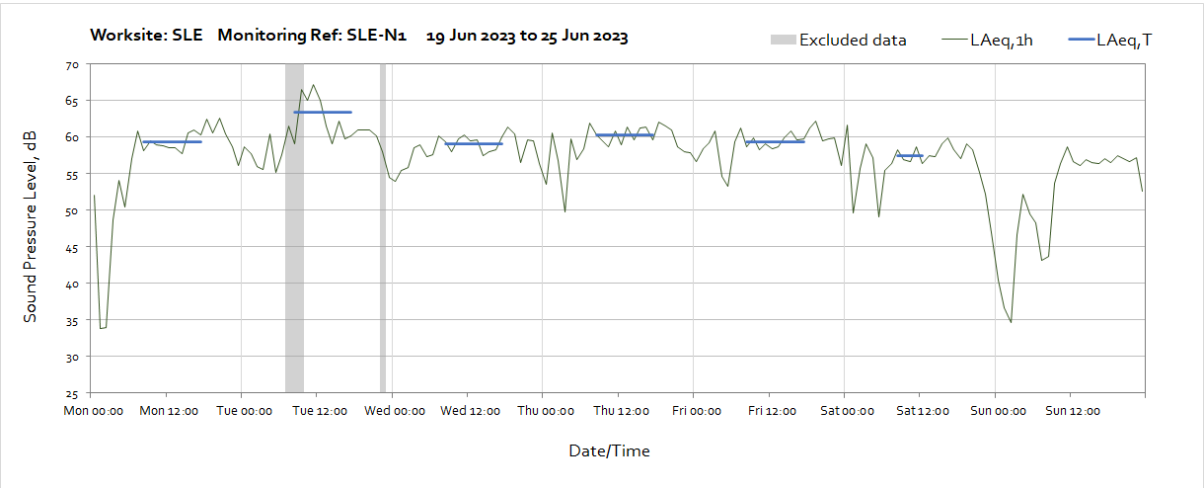
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods with adversely weather affected noise levels are greyed out and have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

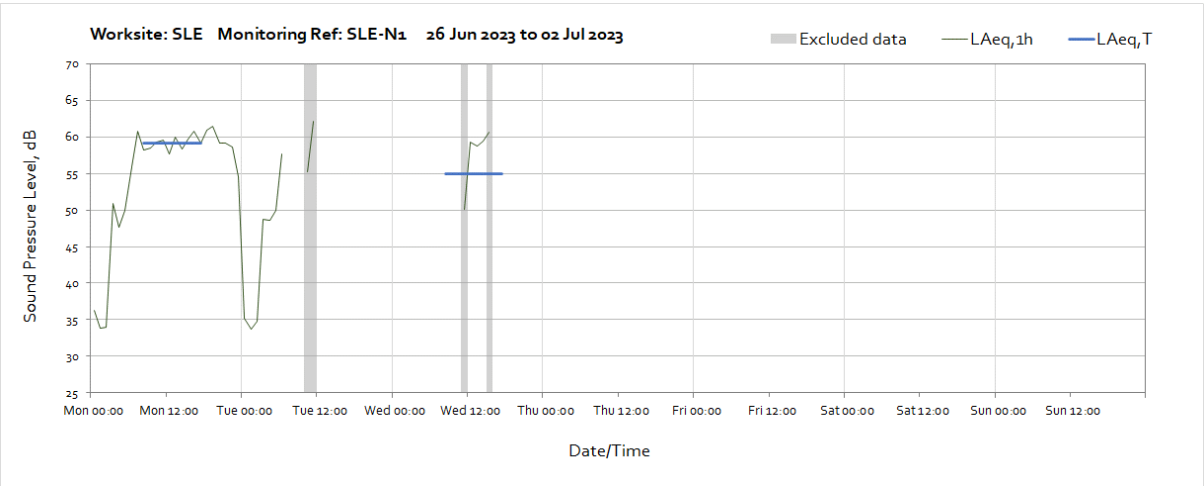
Worksite:SLE – Monitoring Ref: SLE-N1





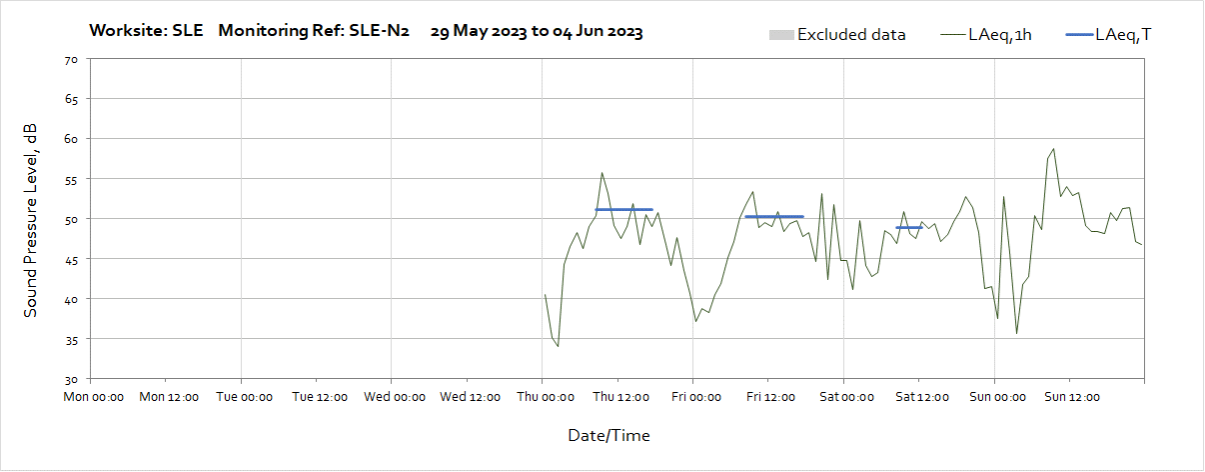


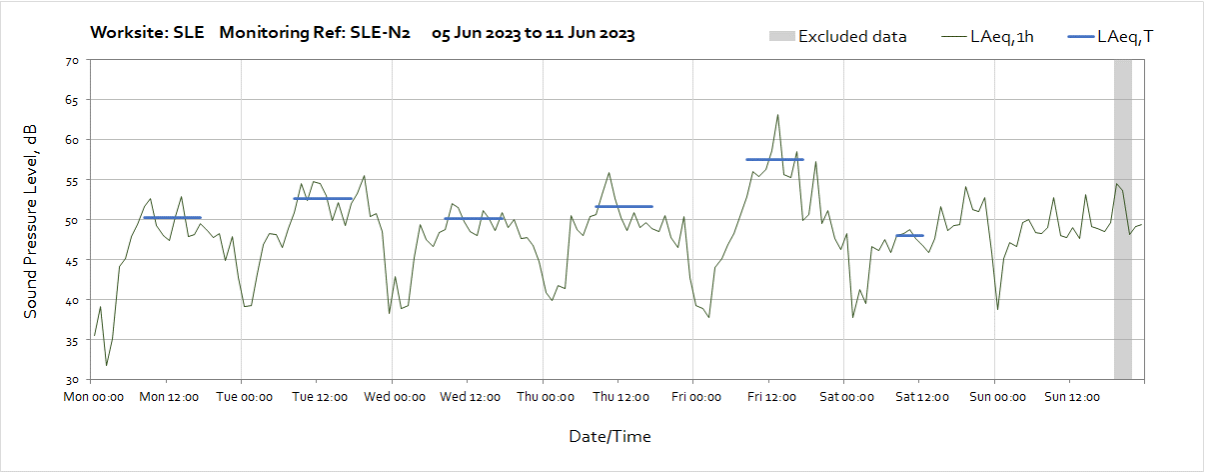


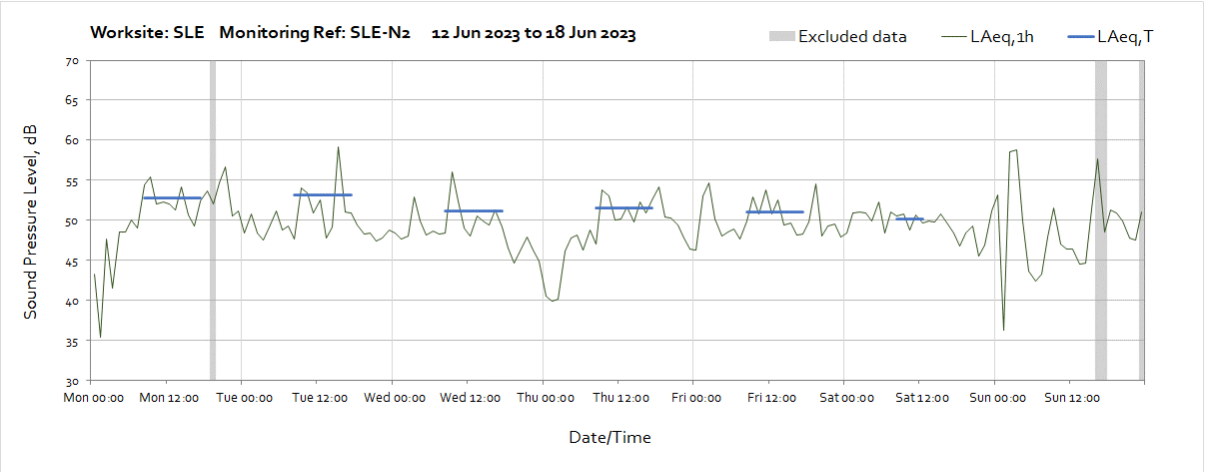


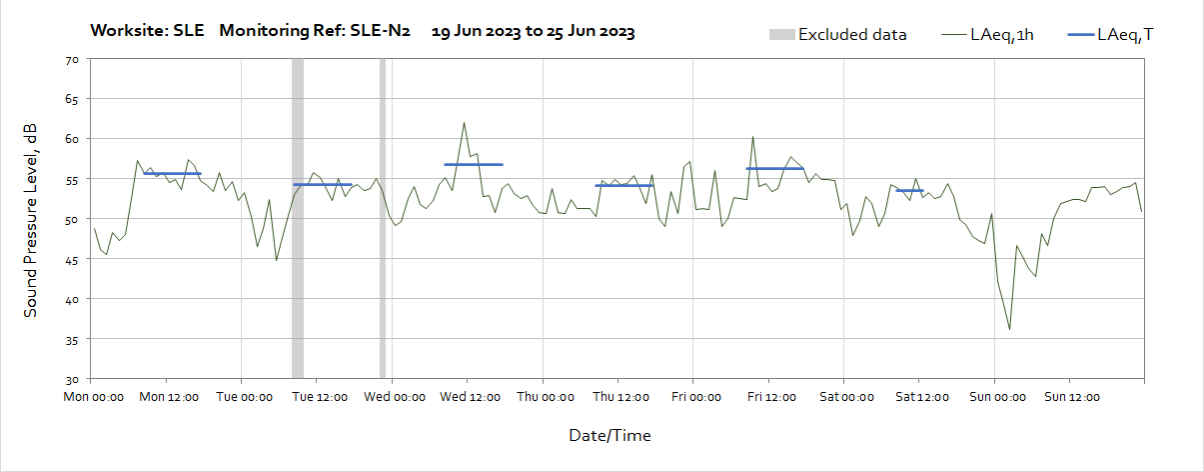
Note: Missing data between 07:00 on 27th June to 23:00 on 30th June was due to monitoring being paused for vegetation clearance.

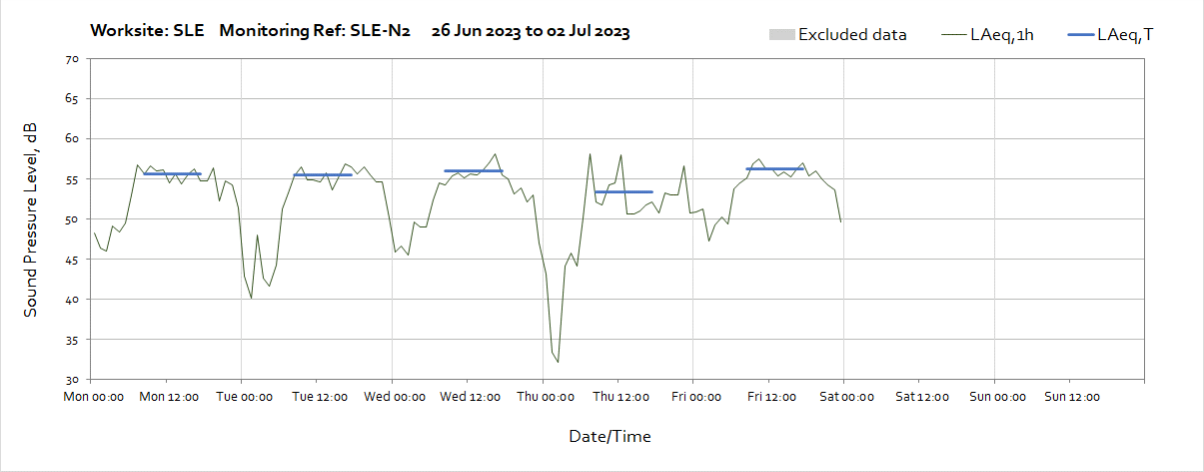
Worksite:SLE – Monitoring Ref: SLE-N2



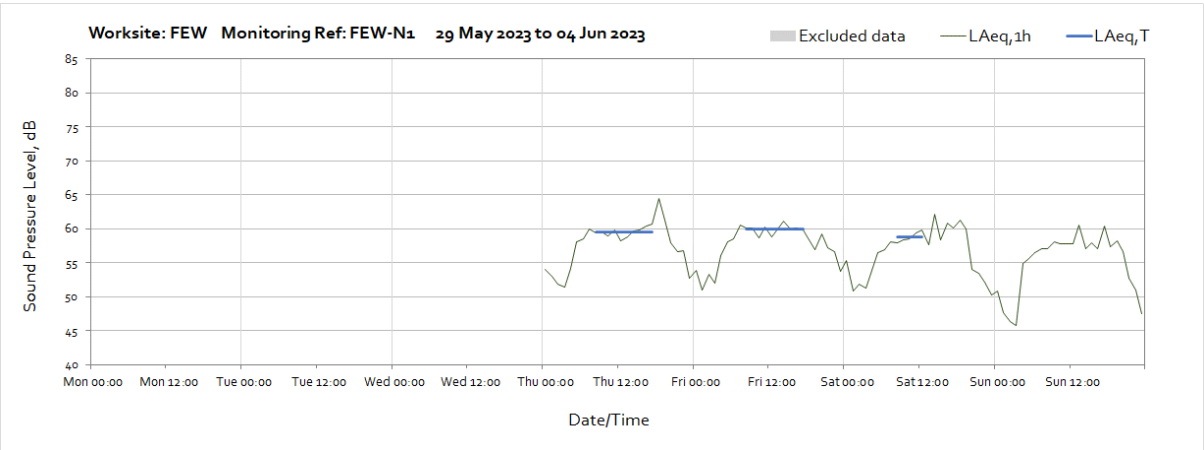


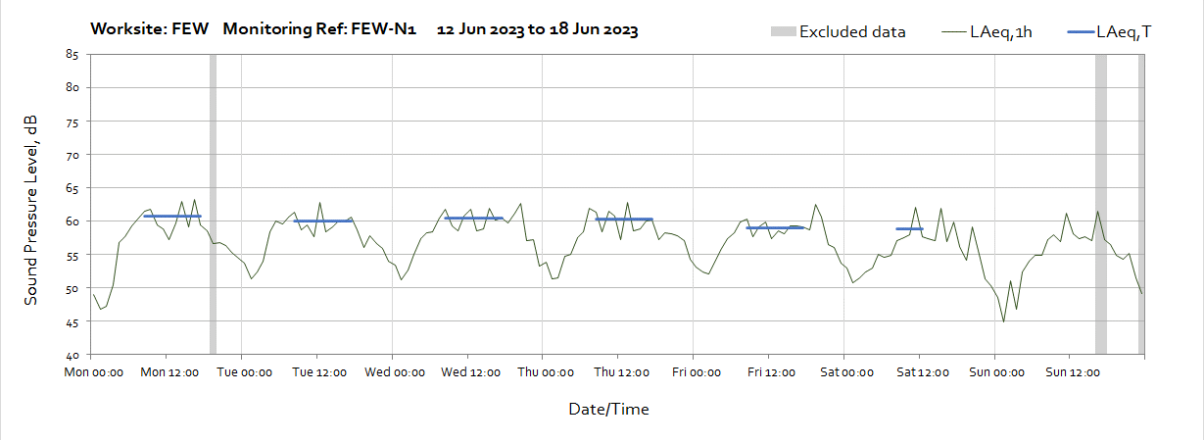


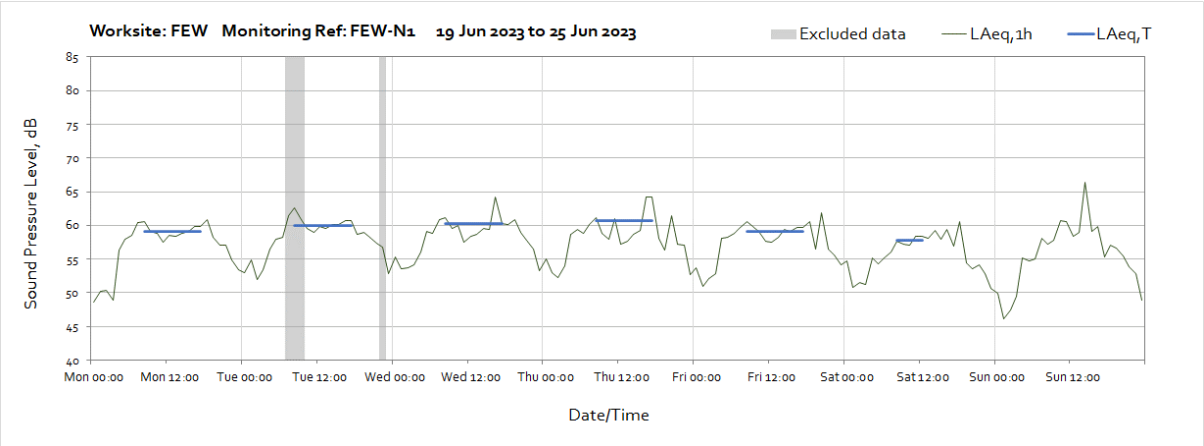




Worksite:FEW – Monitoring Ref: FEW-N1




Worksite: FEW Monitoring Ref: FEW-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: FEW Monitoring Ref: FEW-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
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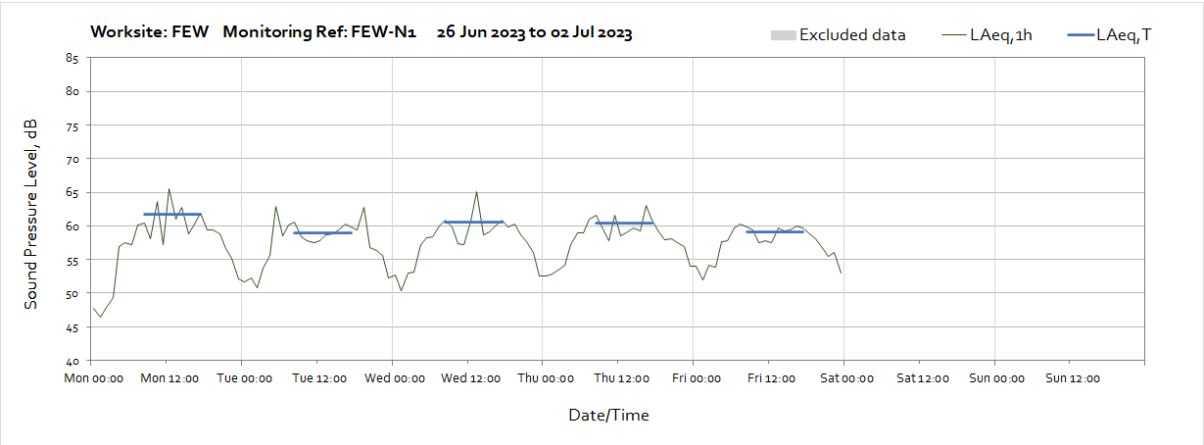
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: FEW Monitoring Ref: FEW-N1 26 Jun 2023 to 02 Jul 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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80
75
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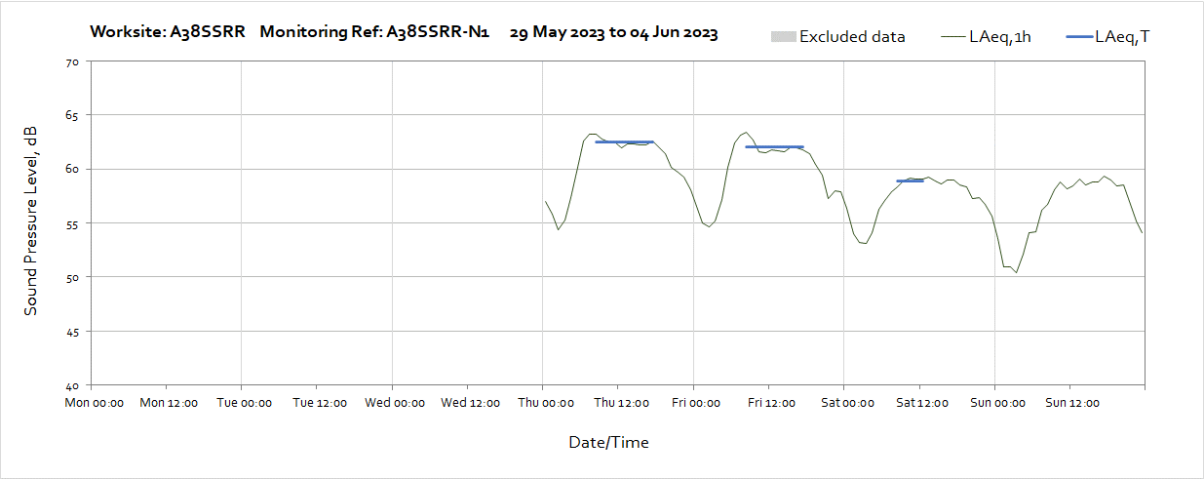
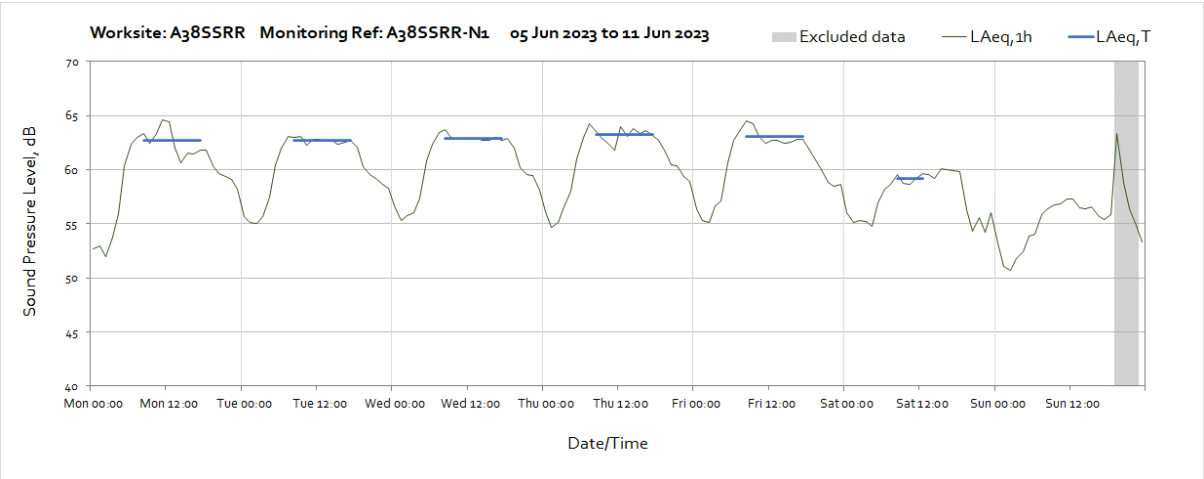
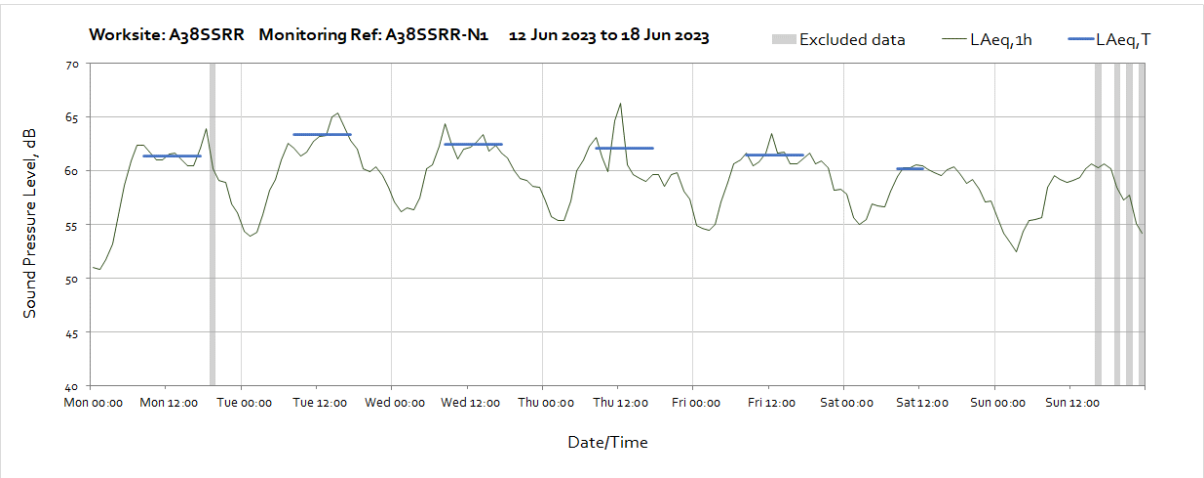
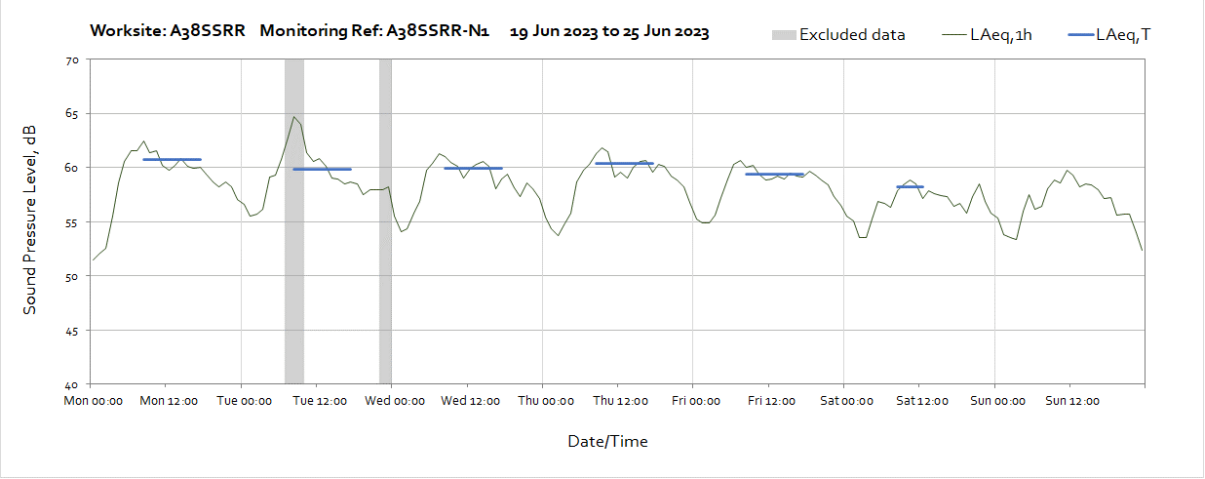
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

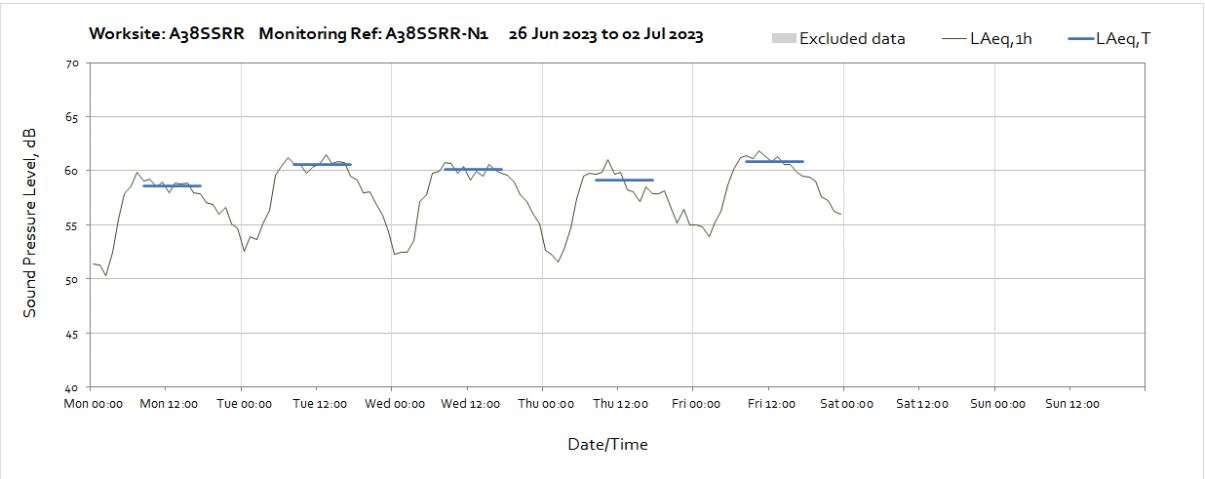
Worksite:SCRS – Monitoring Ref: A38SSRR-N1



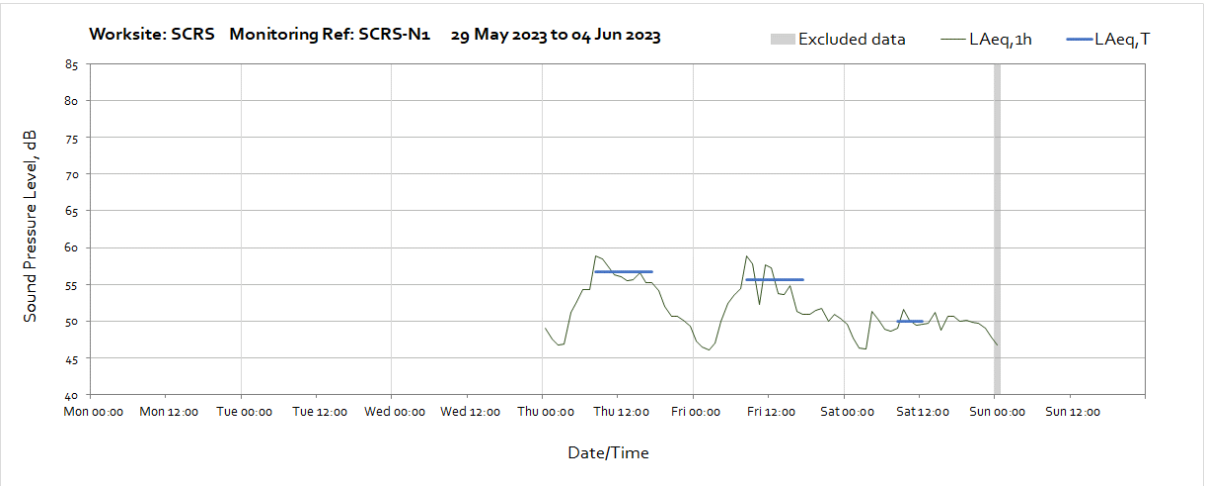






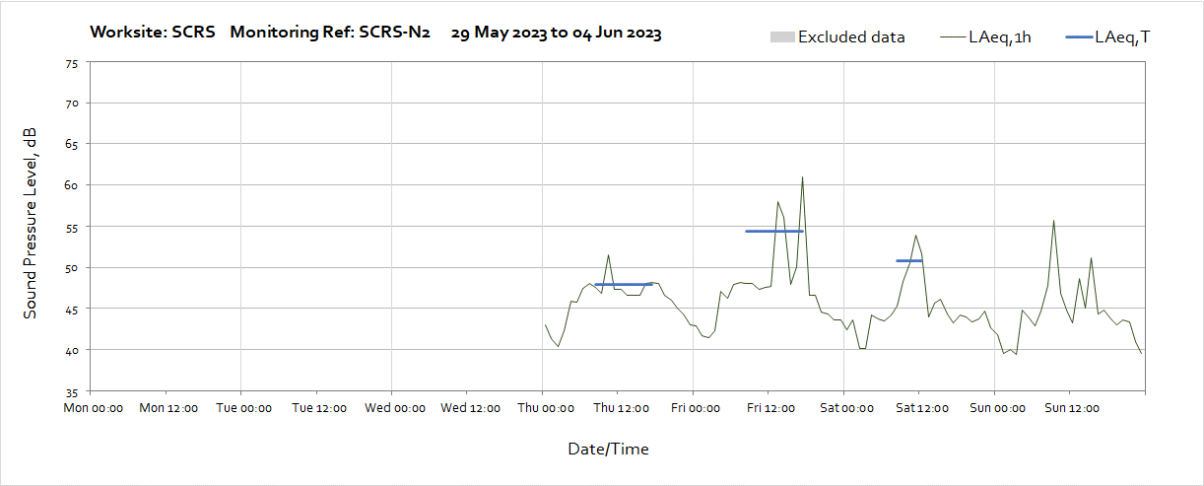


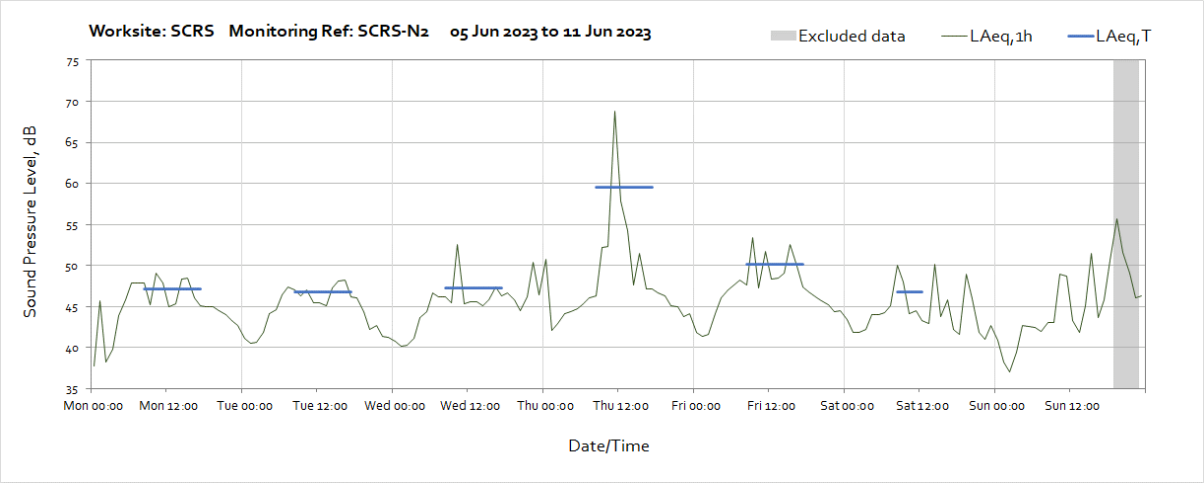
Worksite:SCRS – Monitoring Ref: SCRS-N1

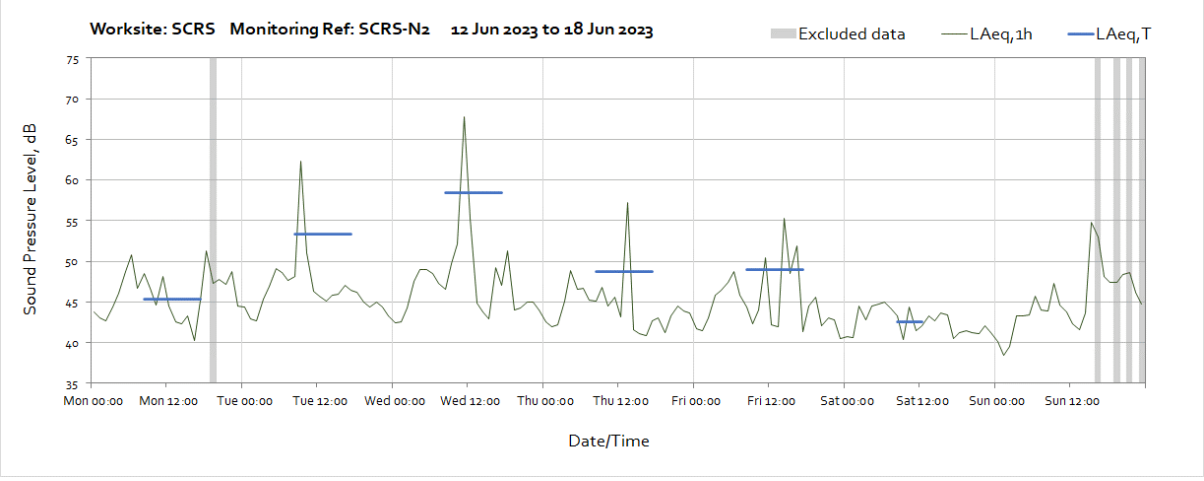


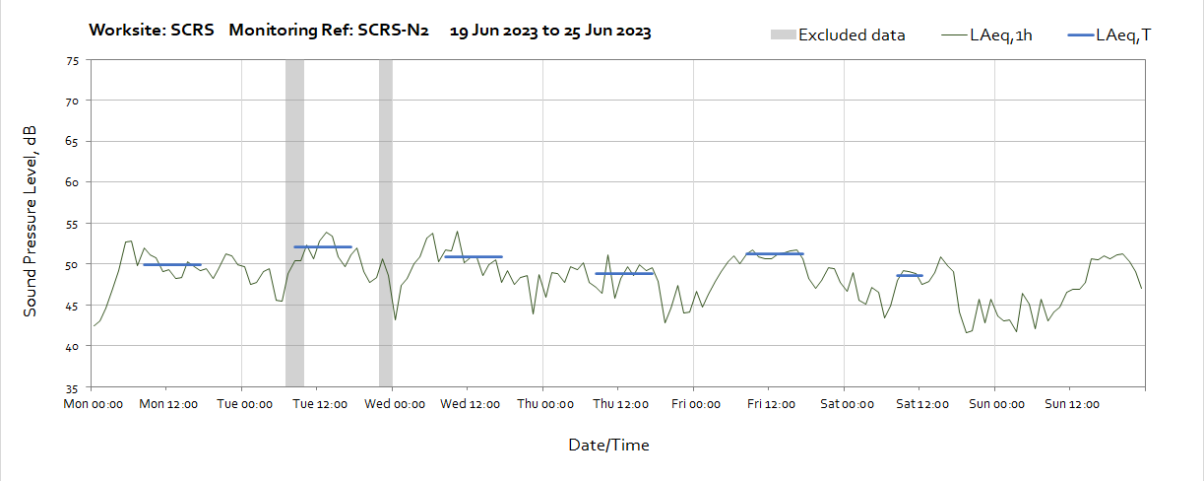
Note: Missing data between 01:00 on 4th June and 00:00 on 30th June were due to monitor being paused for vegetation clearance. Through the vegetation clearance was complete, the monitor required a full battery replacement which delayed the reinstallation of the monitor.

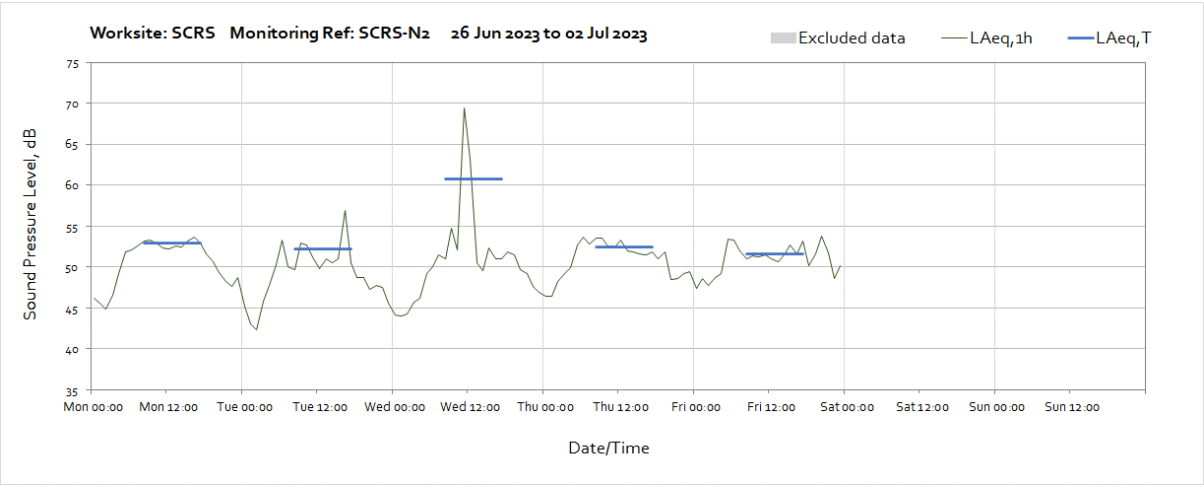
Worksite:SCRS – Monitoring Ref: SCRS-N2



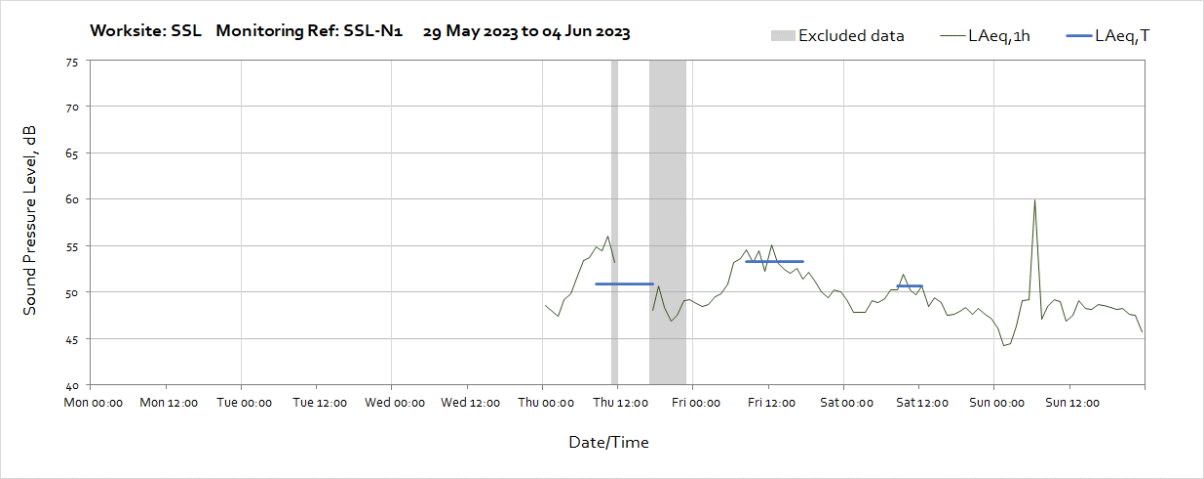




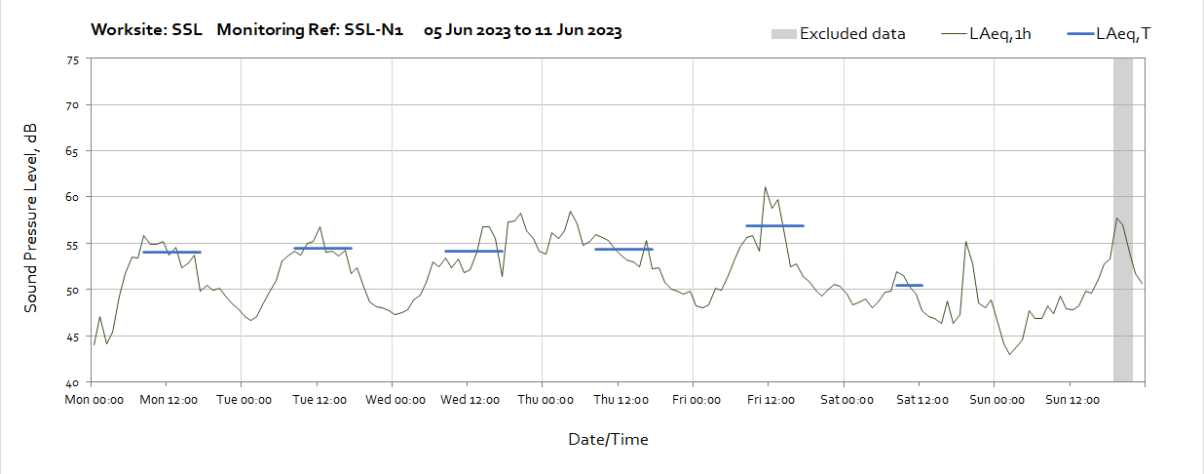




Worksite: SCRS – Monitoring Ref: SSL-N1



Note: Missing data between 12:00 and 16:00 on 01st June were due to data buffering which has since been resolved.


Worksite: SSL Monitoring Ref: SSL-N1 05 Jun 2023 to 11 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
65
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55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
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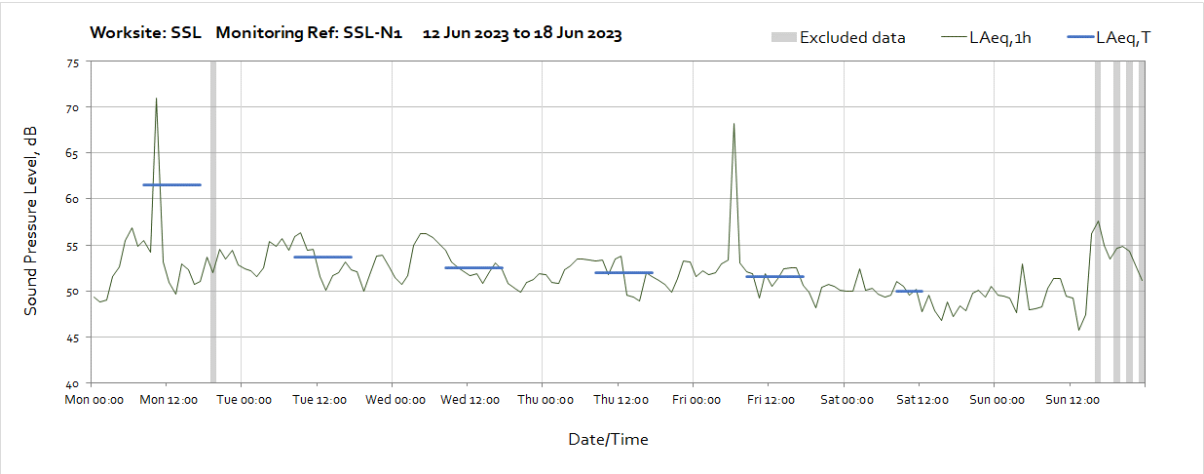
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: SSL Monitoring Ref: SSL-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
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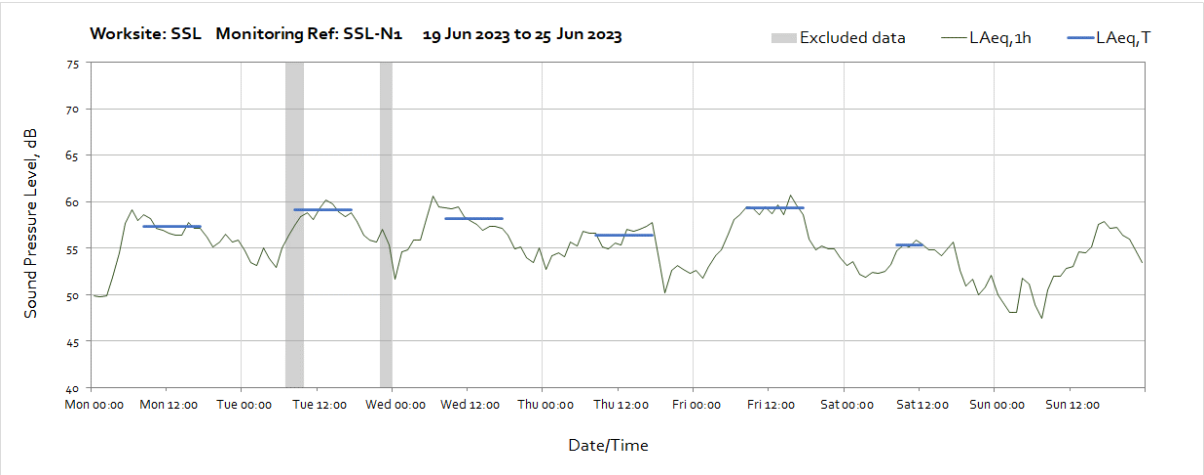
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: SSL Monitoring Ref: SSL-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
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40
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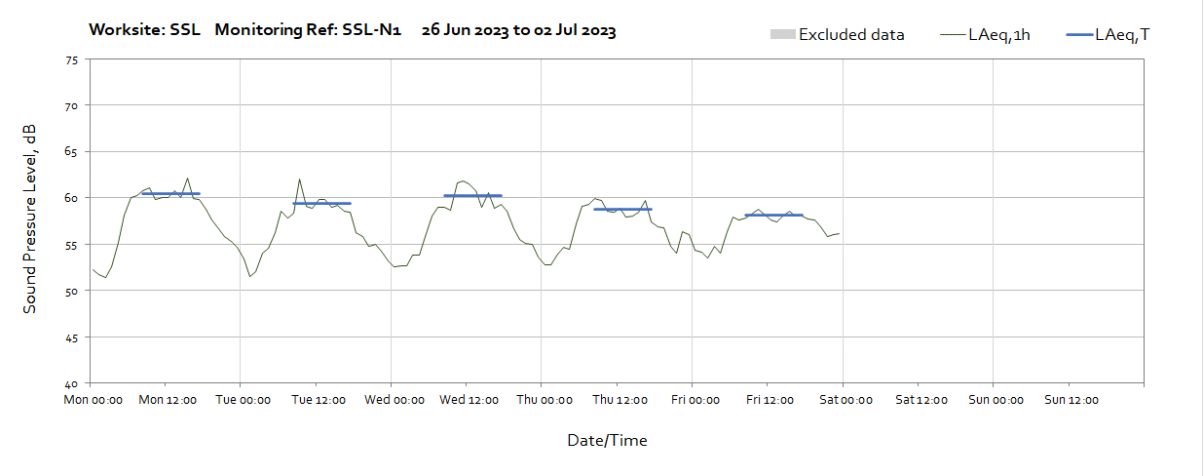
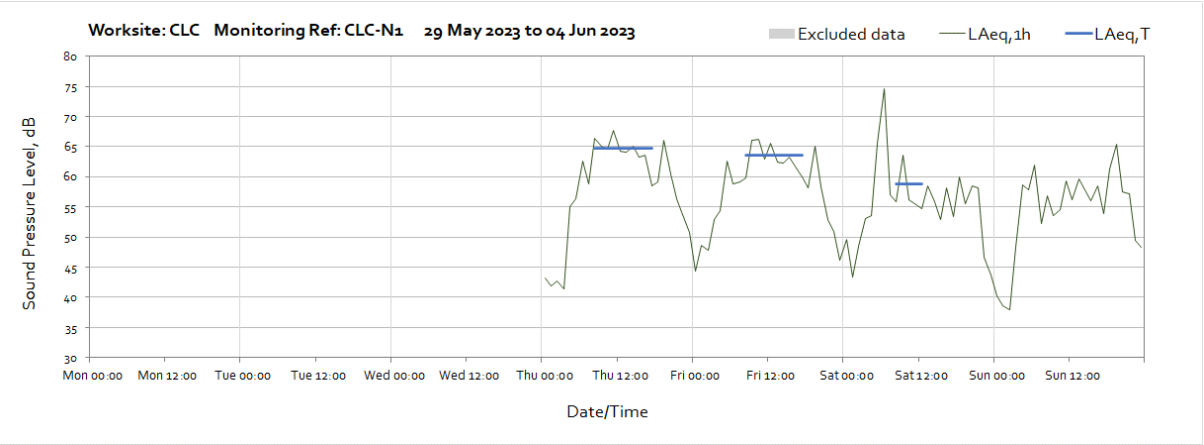
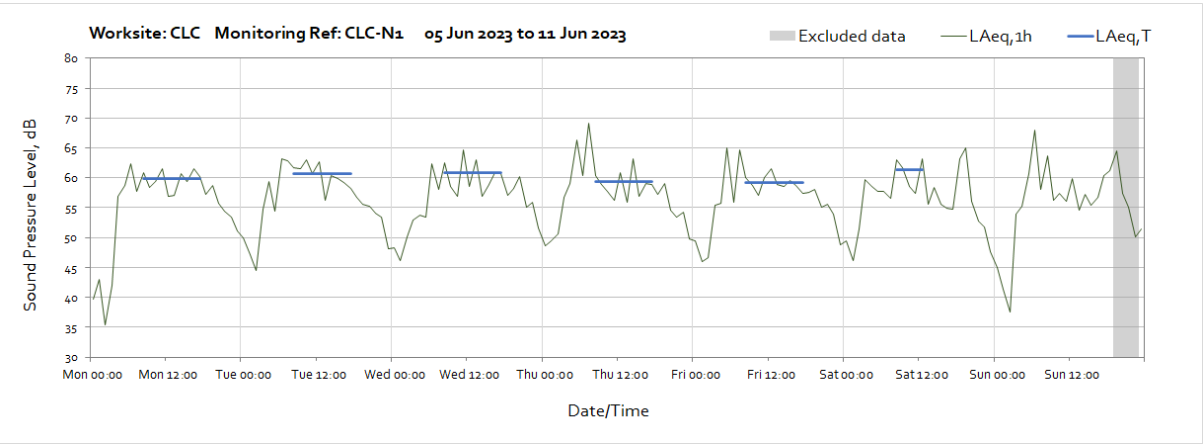
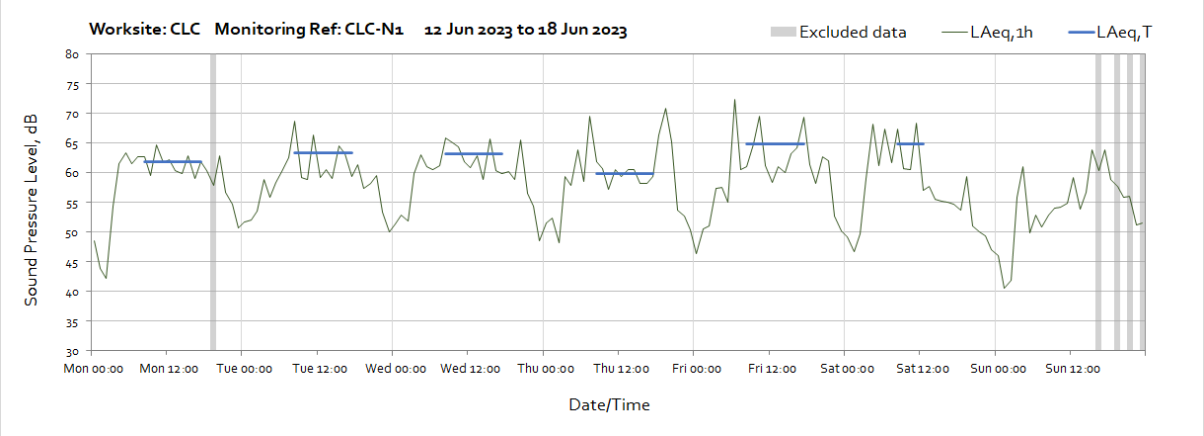
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



Worksite: CLC – Monitoring Ref: CLC-N1






Worksite: CLC Monitoring Ref: CLC-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
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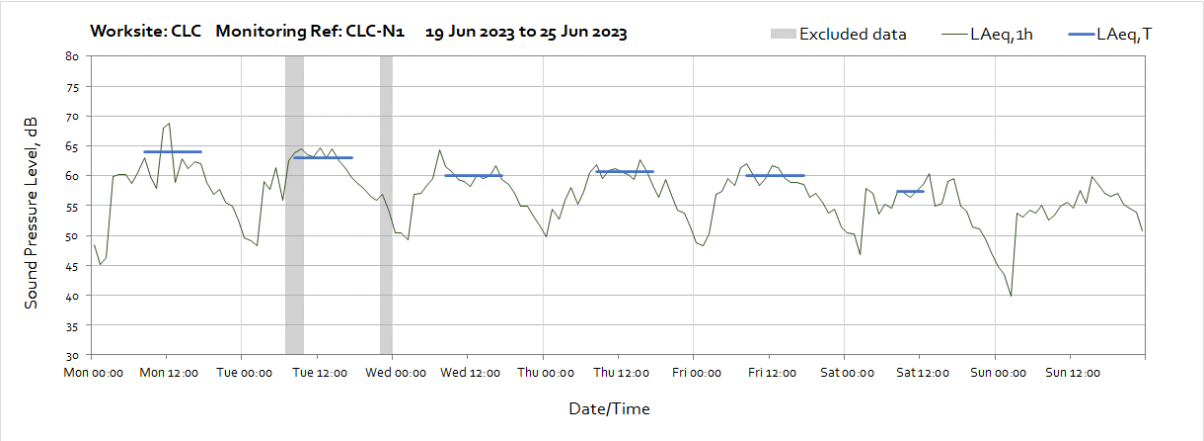
Date/Time


Worksite: CLC Monitoring Ref: CLC-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
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Mon 00:00
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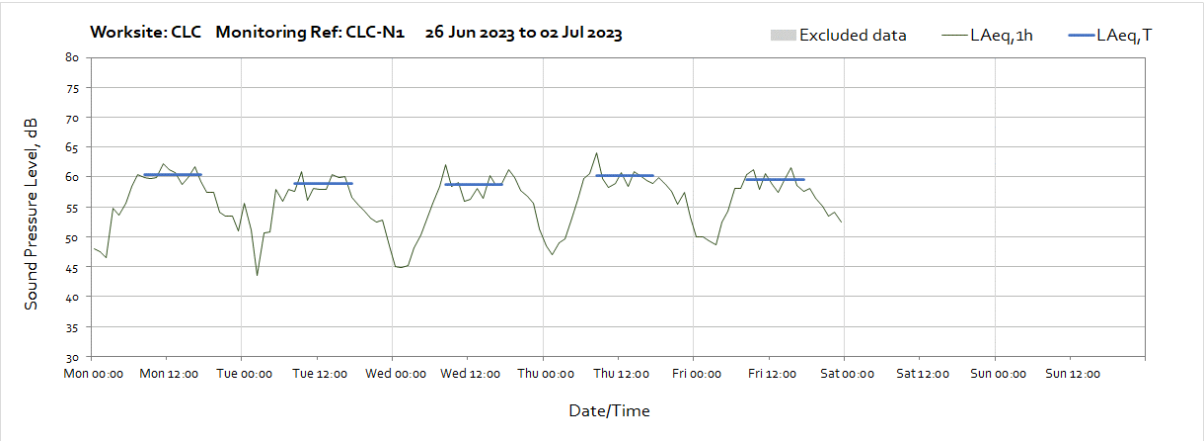
Date/Time


Worksite: CLC Monitoring Ref: CLC-N1 26 Jun 2023 to 02 Jul 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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Mon 00:00
Mon 12:00
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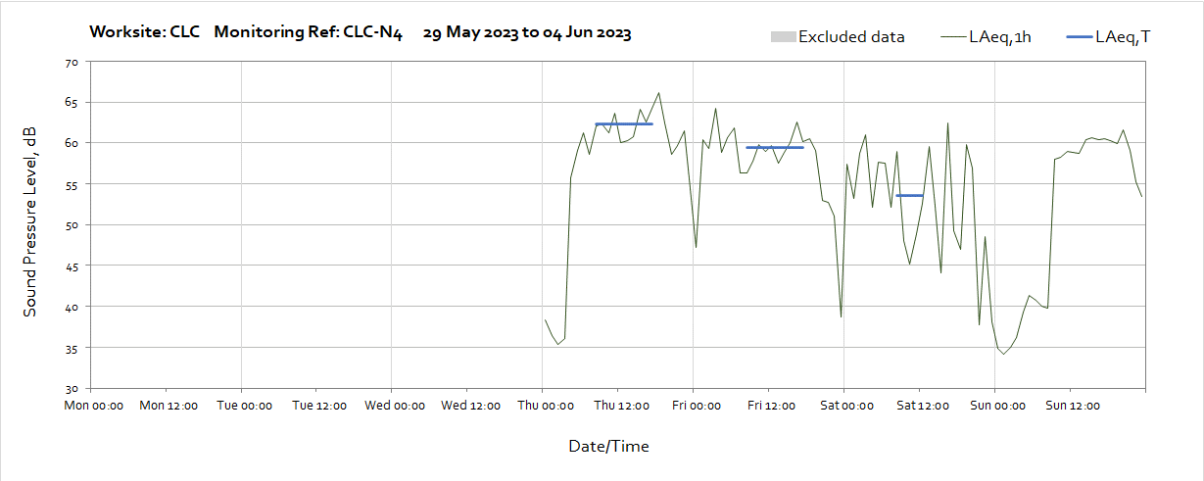
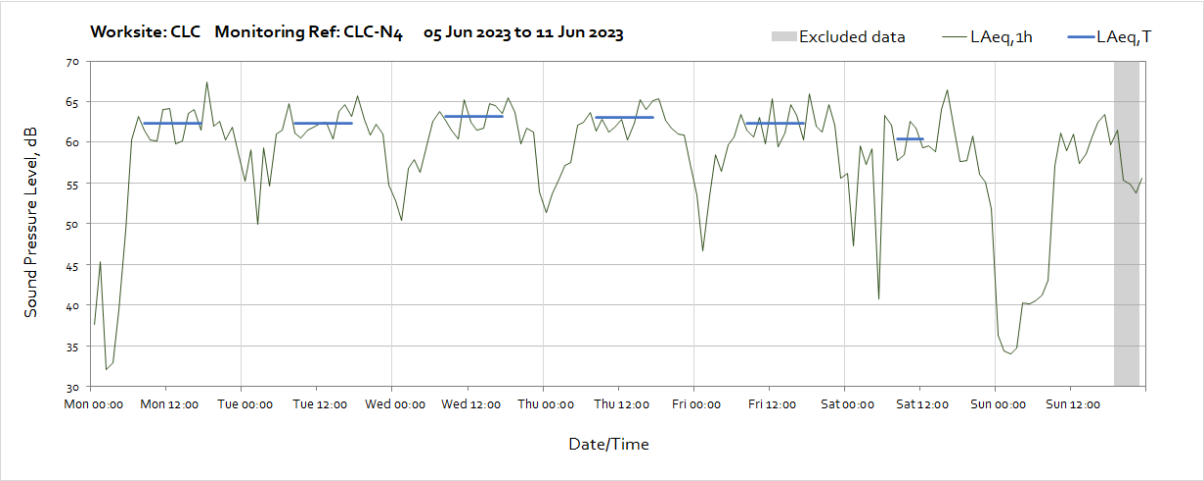
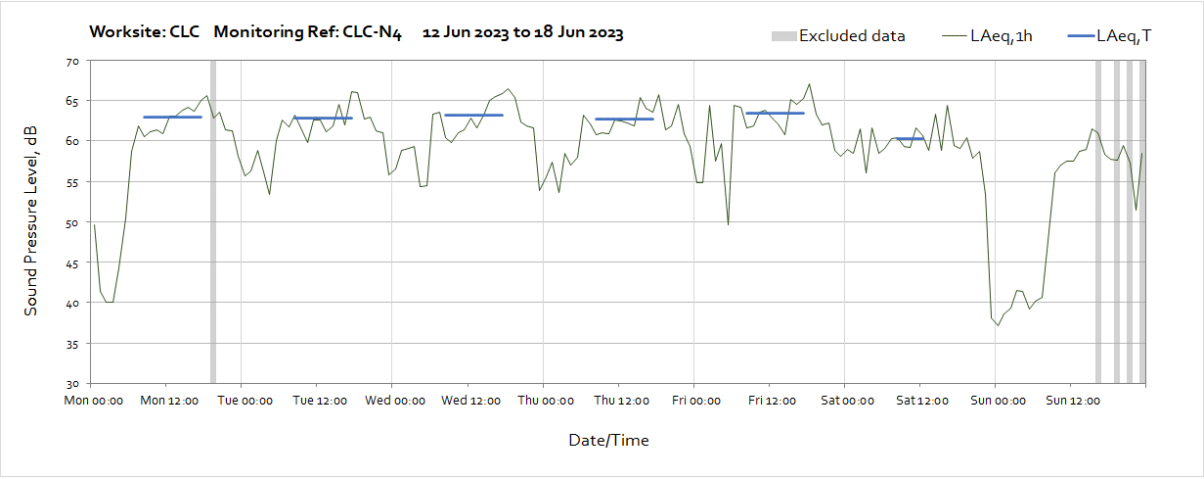
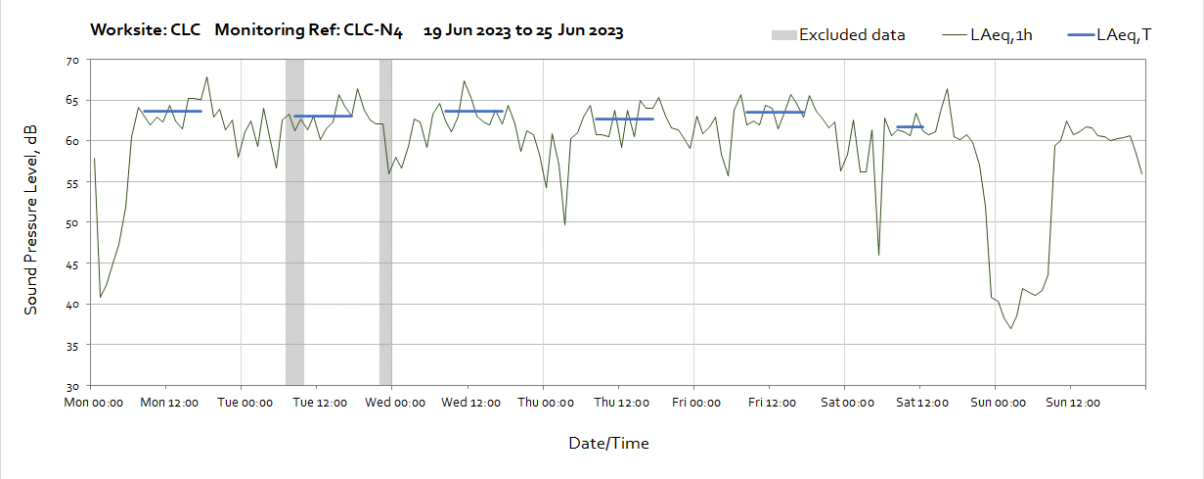
Date/Time

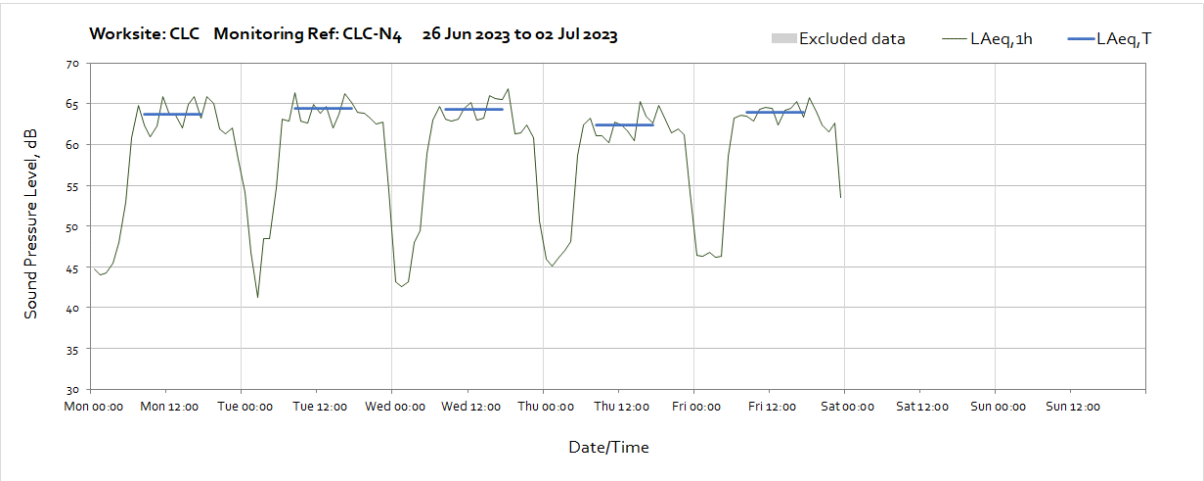
Worksite: CLC – Monitoring Ref: CLC-N4



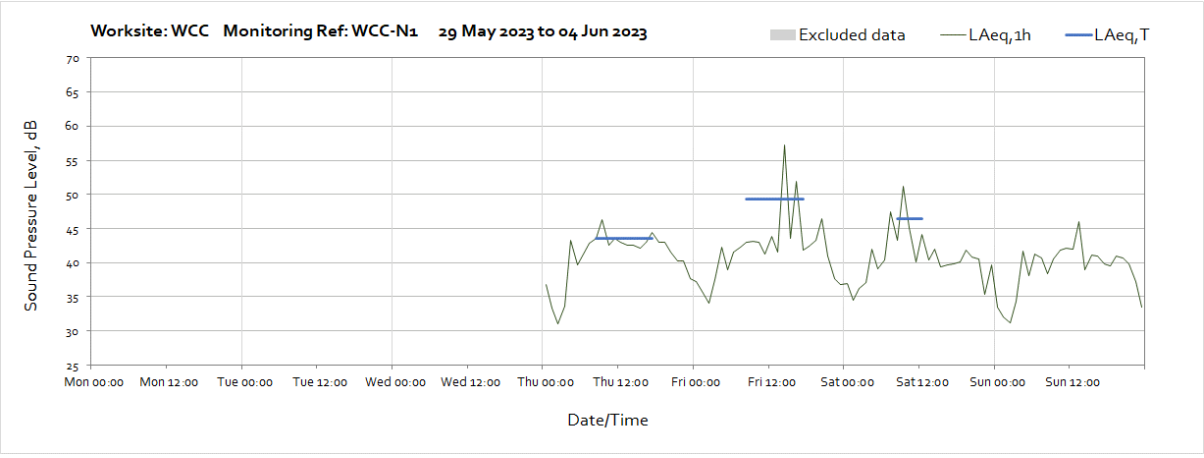


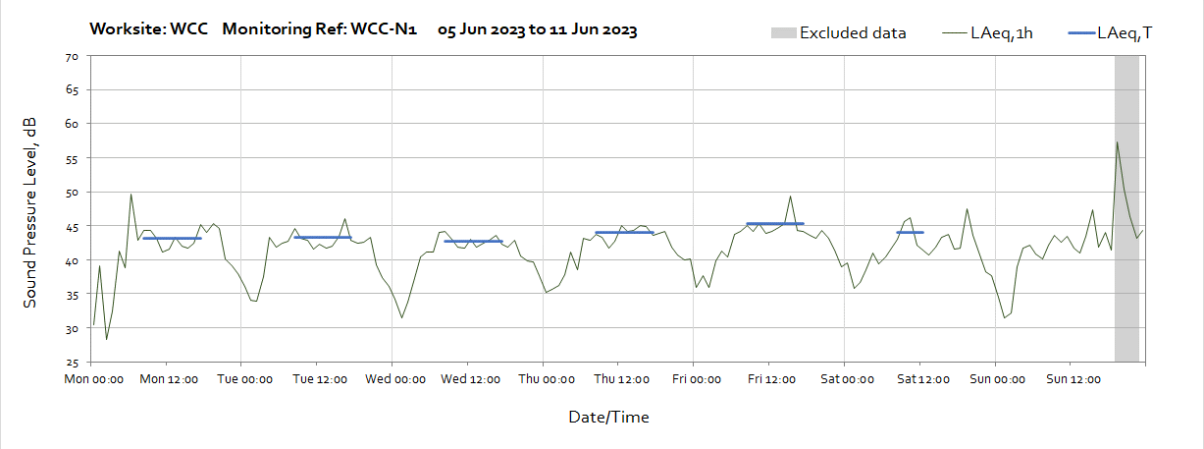






Worksite:WCC – Monitoring Ref: WCC-N1




Worksite: WCC Monitoring Ref: WCC-N1 05 Jun 2023 to 11 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
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25
Mon 00:00
Mon 12:00
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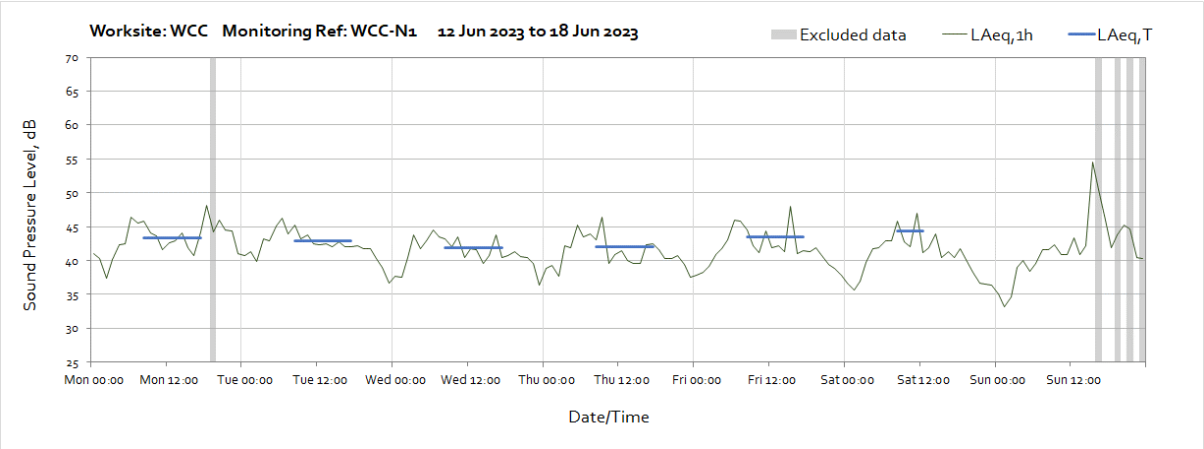
Date/Time


Worksite: WCC Monitoring Ref: WCC-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
Mon 12:00
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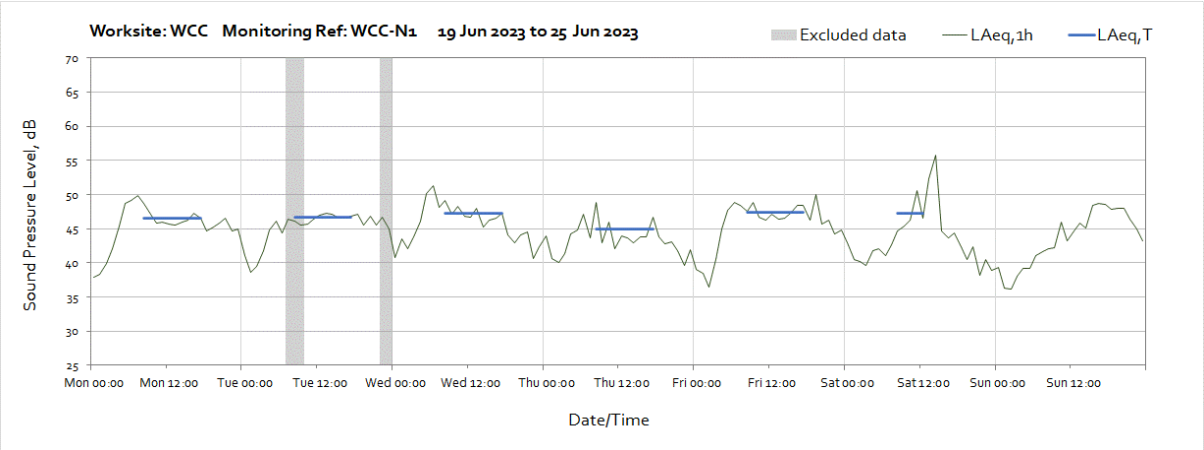
Date/Time


Worksite: WCC Monitoring Ref: WCC-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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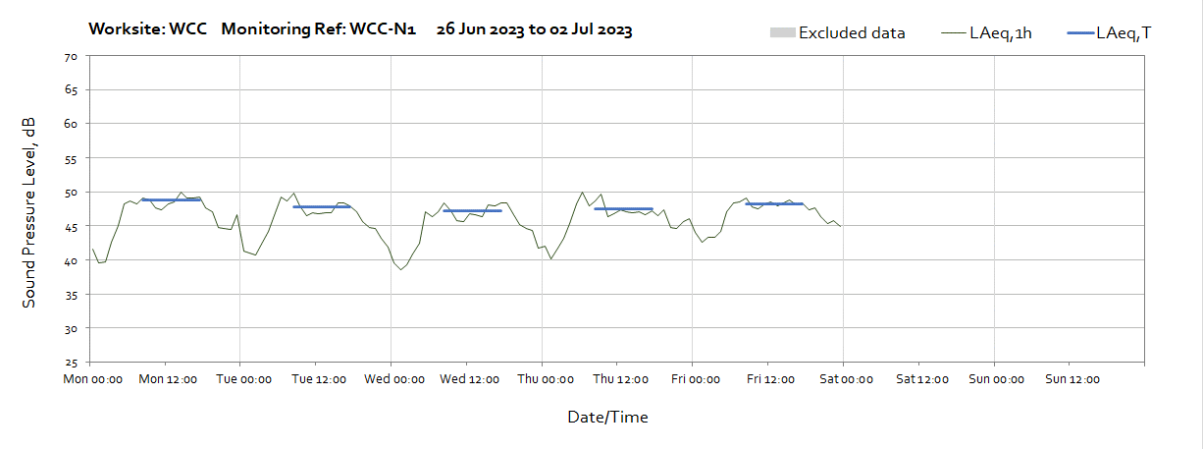
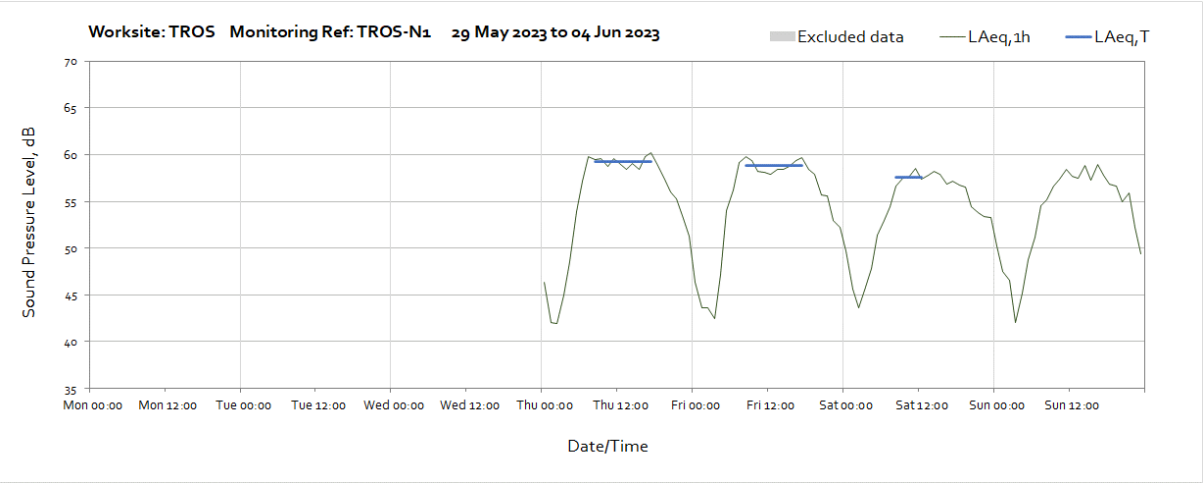
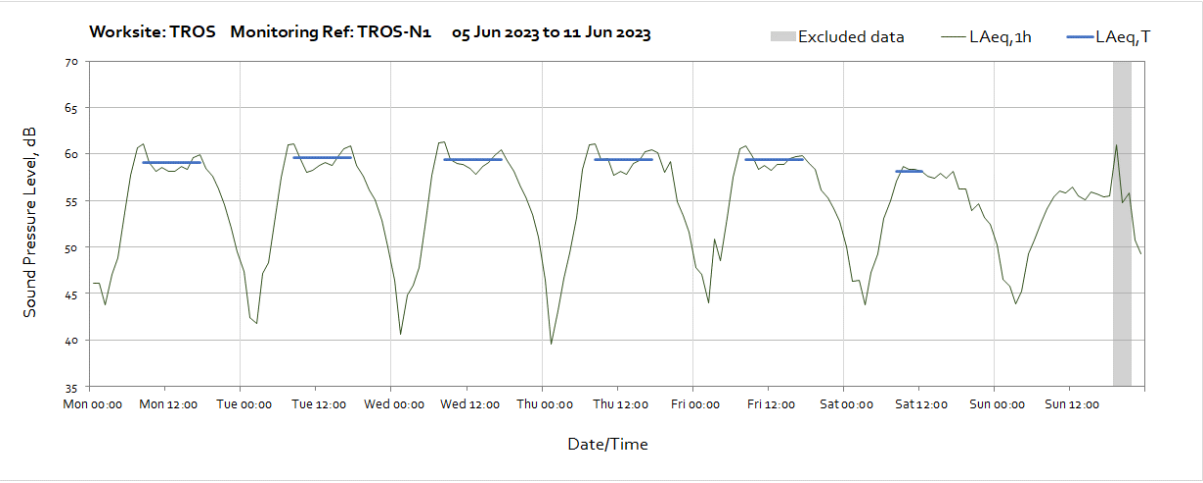
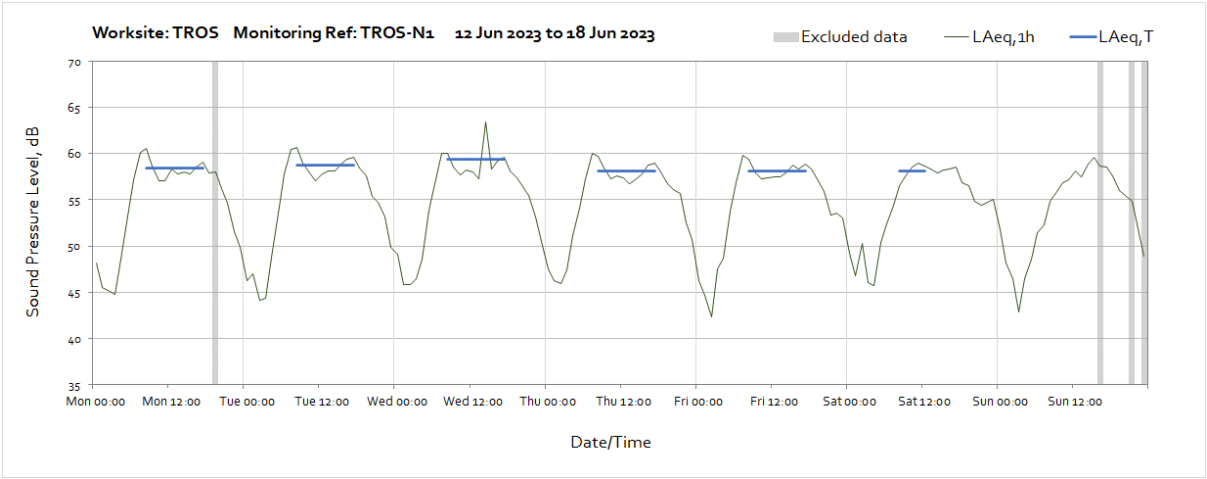
Date/Time



Worksite:TROS – Monitoring Ref: TROS-N1






Worksite: TROS Monitoring Ref: TROS-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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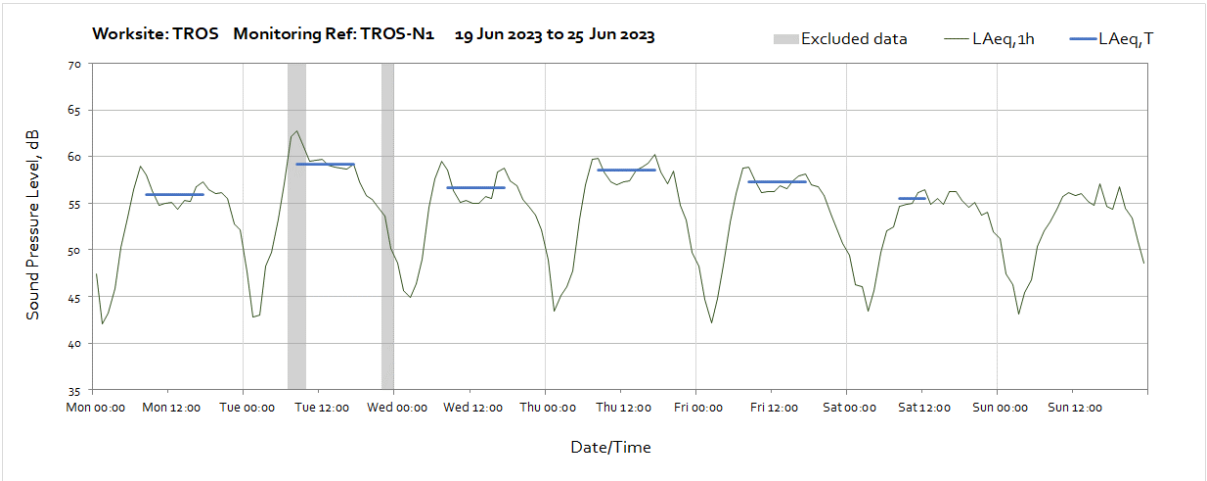
Worksite: TROS Monitoring Ref: TROS-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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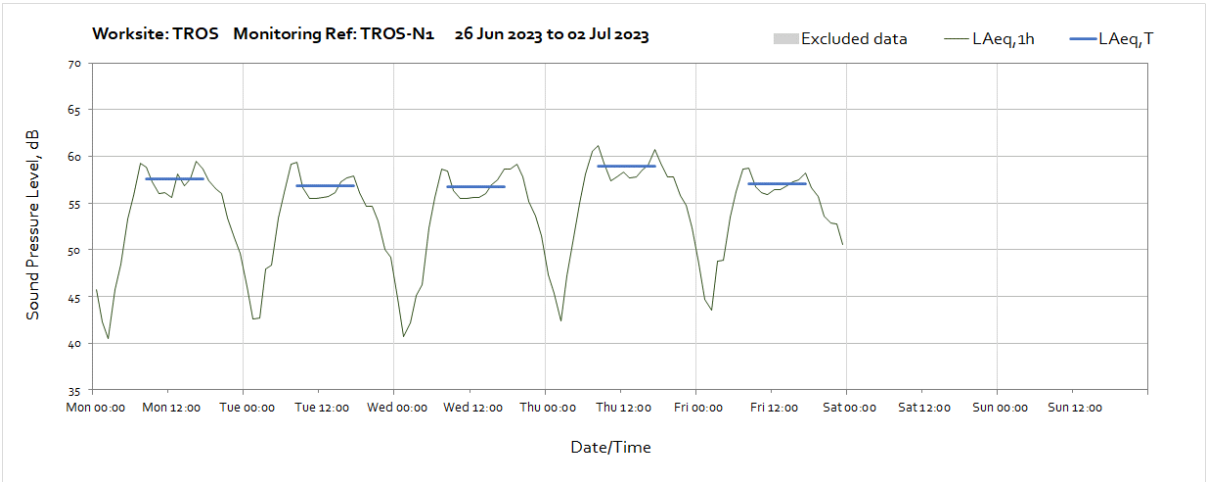
Date/Time


Worksite: TROS Monitoring Ref: TROS-N1 26 Jun 2023 to 02 Jul 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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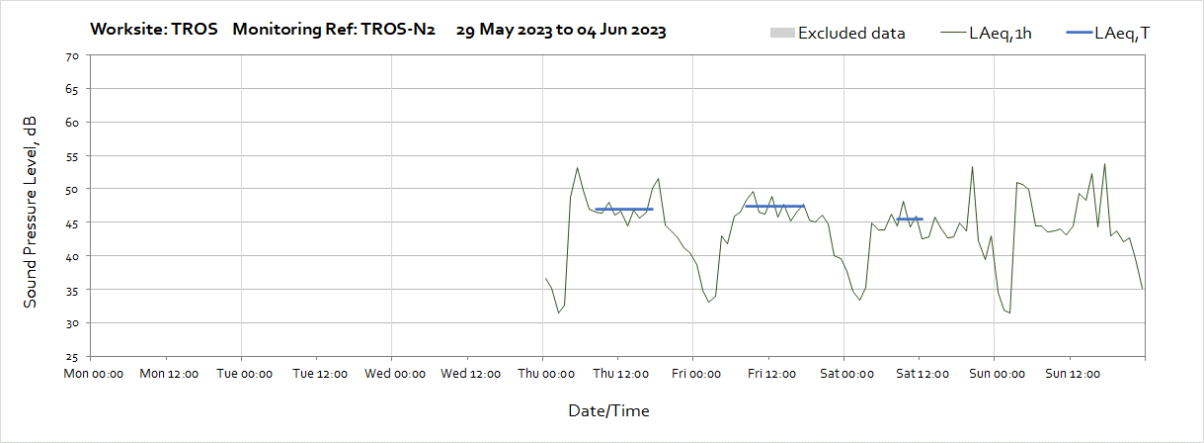
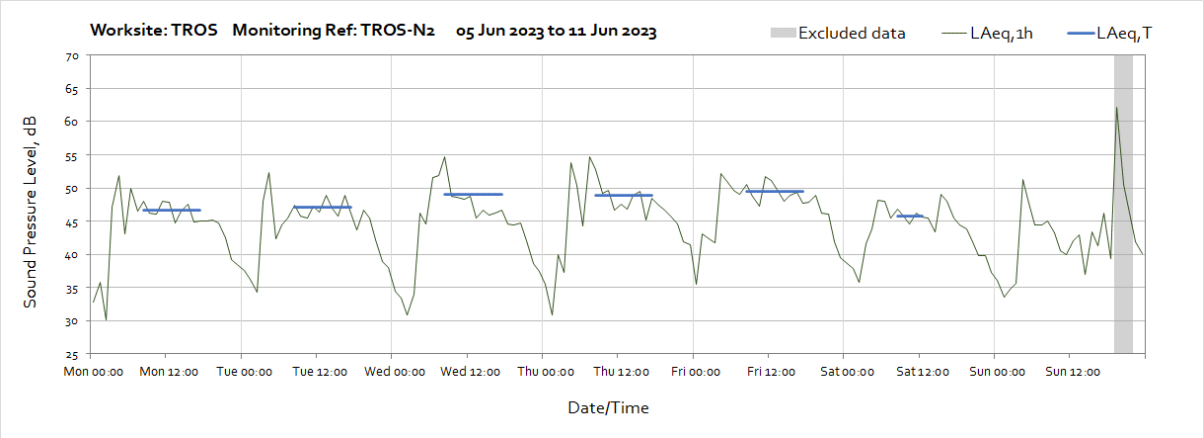
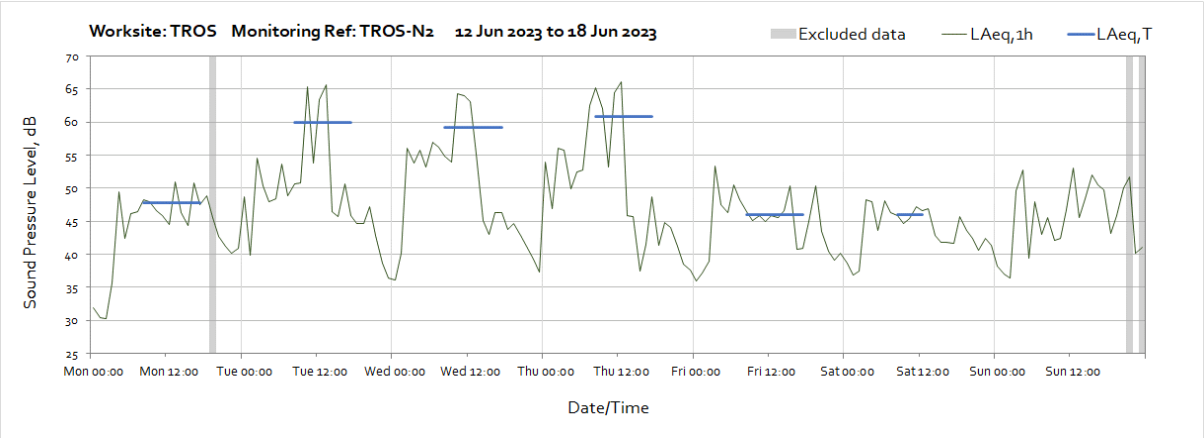
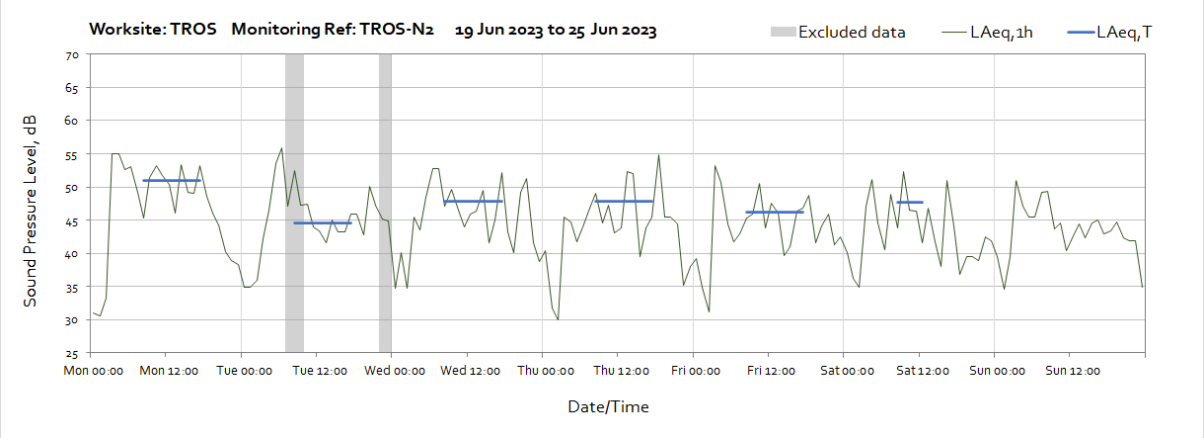
Date/Time

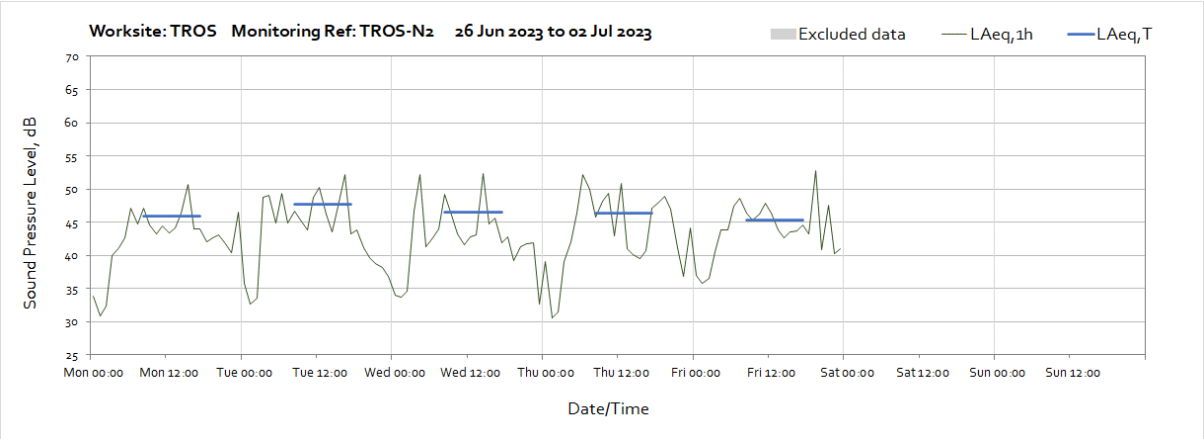
Worksite:TROS – Monitoring Ref: TROS-N2



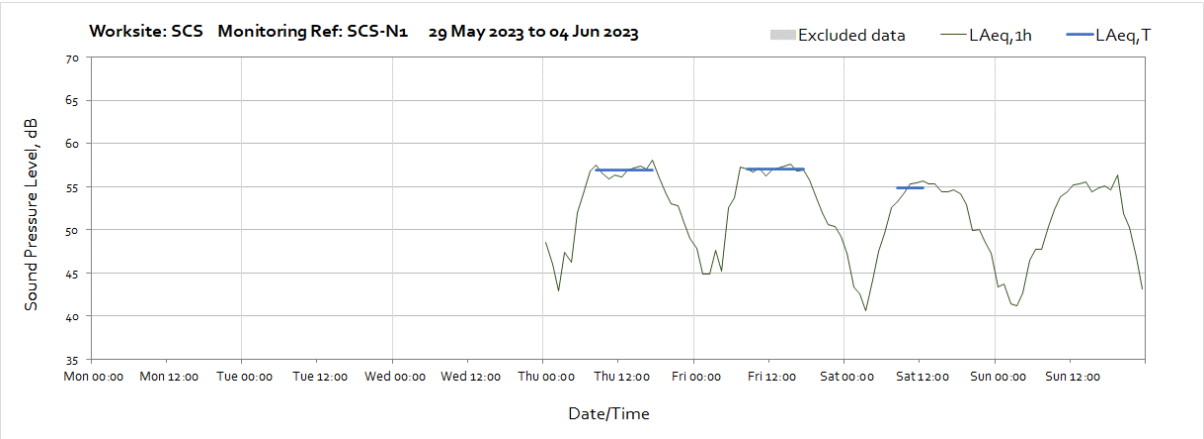


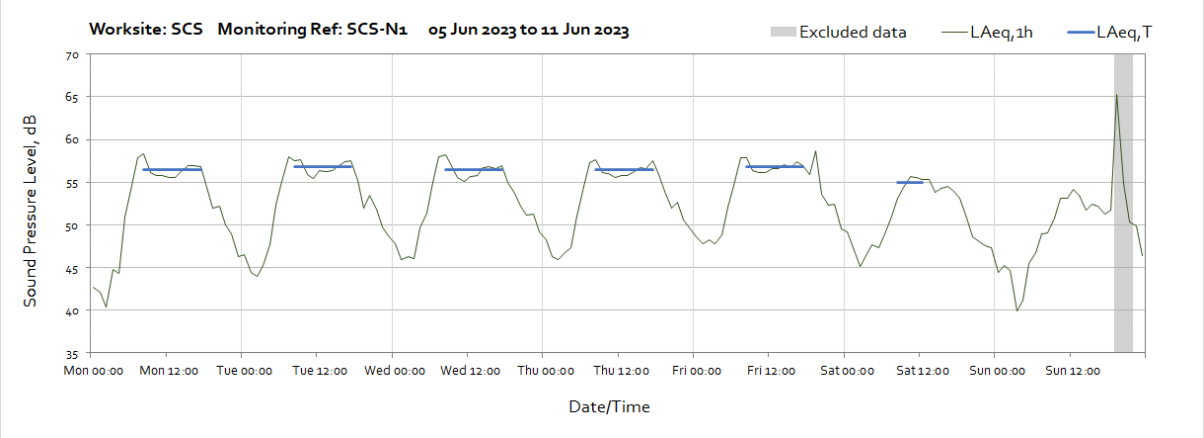






Worksite:TROS – Monitoring Ref: SCS-N1




Worksite: SCS Monitoring Ref: SCS-N1 05 Jun 2023 to 11 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
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Mon 00:00
Mon 12:00
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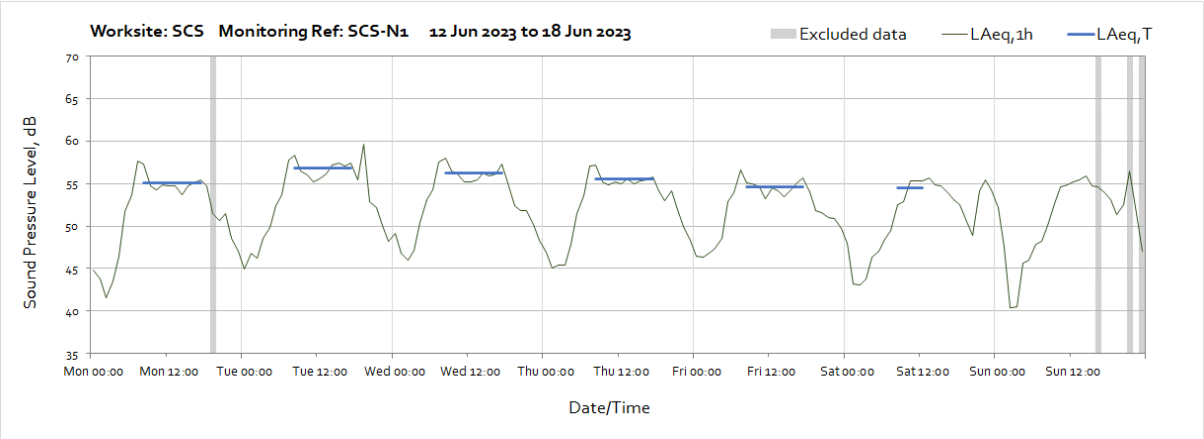
Date/Time


Worksite: SCS Monitoring Ref: SCS-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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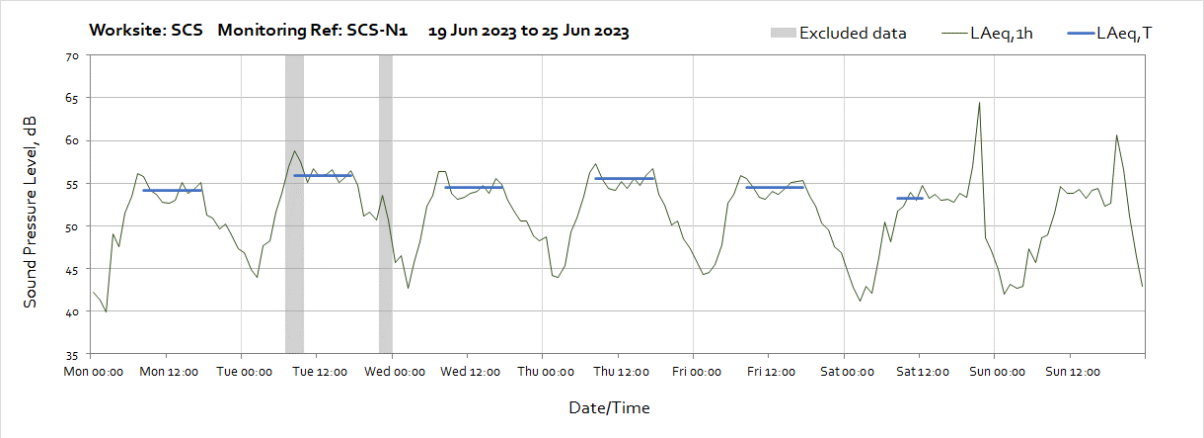
Date/Time


Worksite: SCS Monitoring Ref: SCS-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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Mon 12:00
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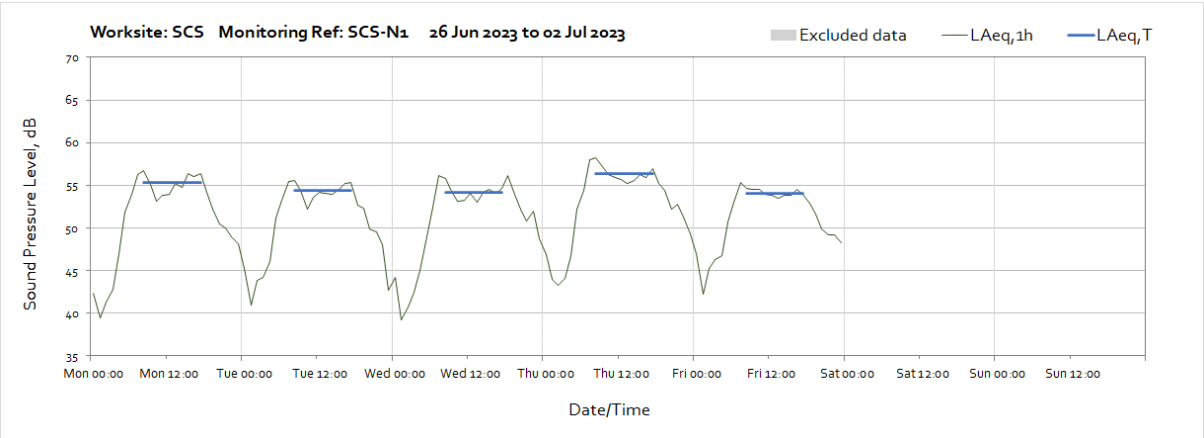
Date/Time


Worksite: SCS Monitoring Ref: SCS-N1 26 Jun 2023 to 02 Jul 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
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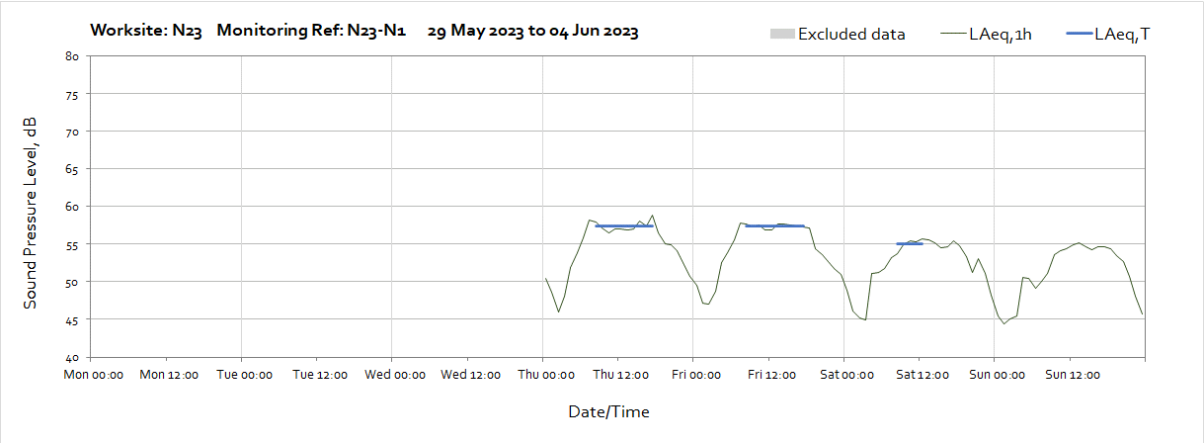
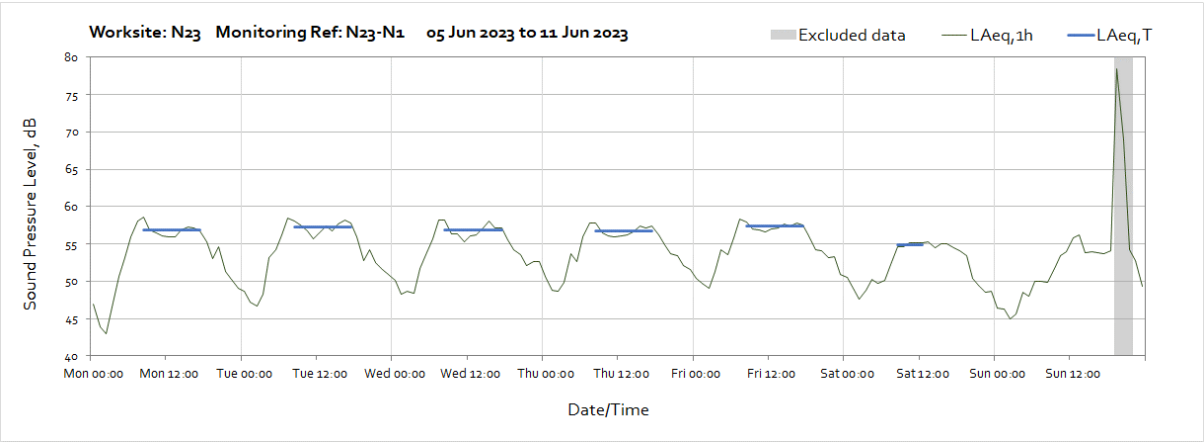
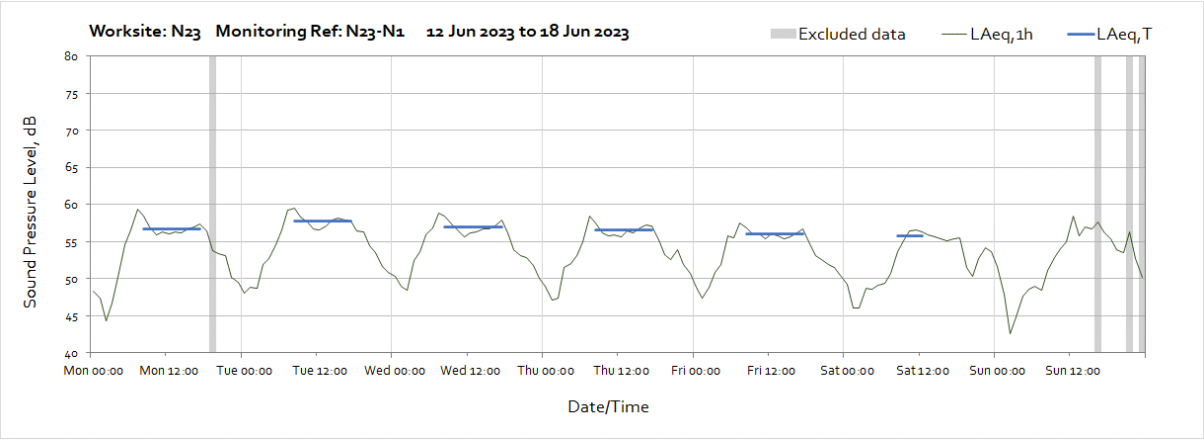
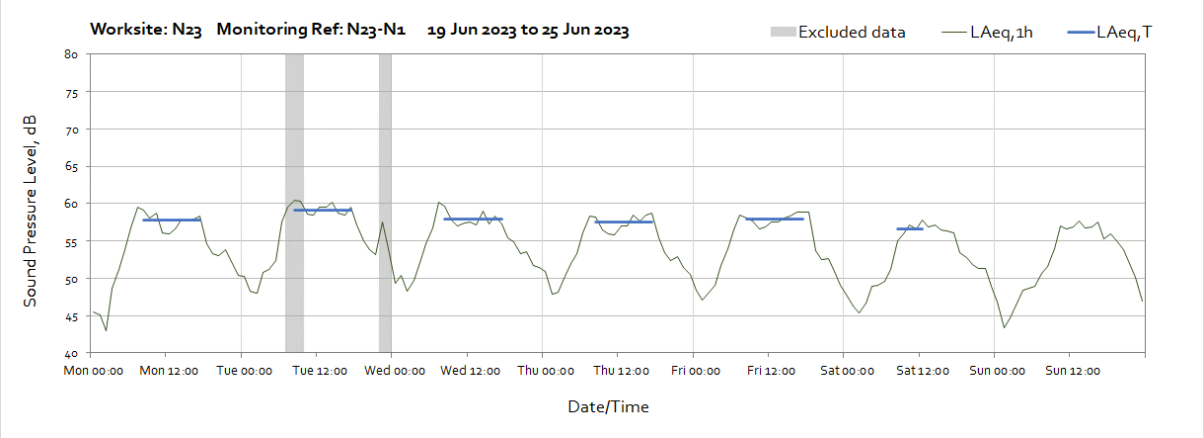
Date/Time

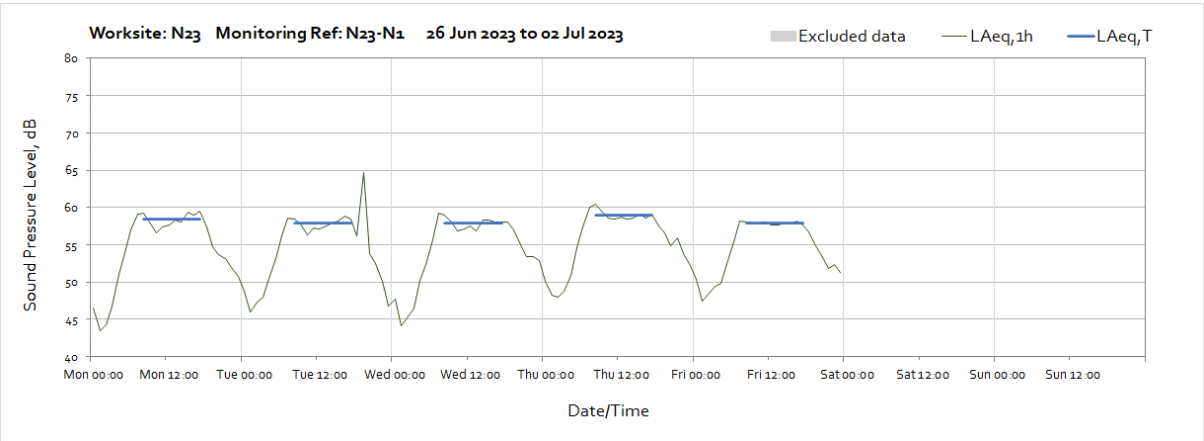
Worksite:N23 – Monitoring Ref: N23-N1



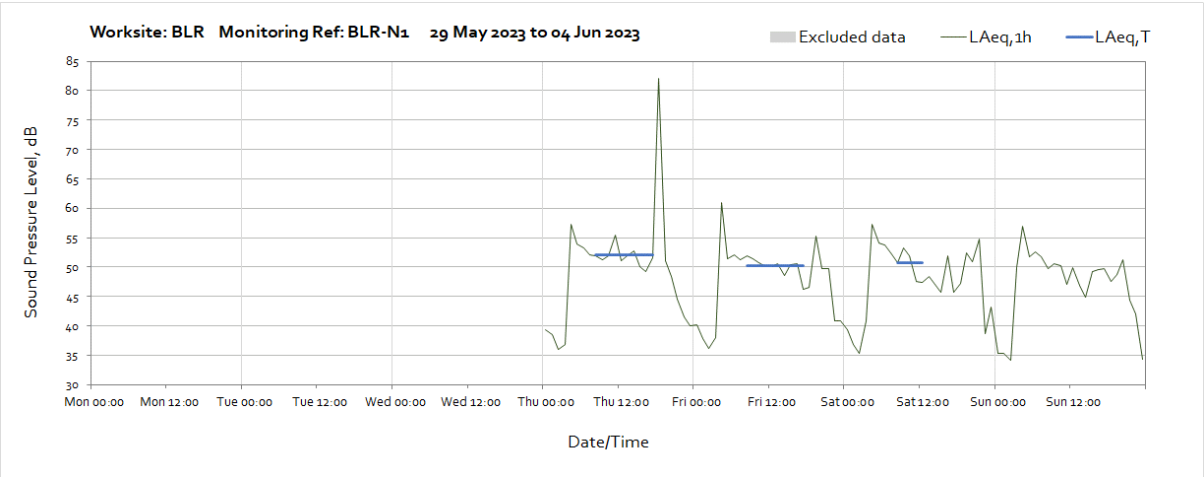


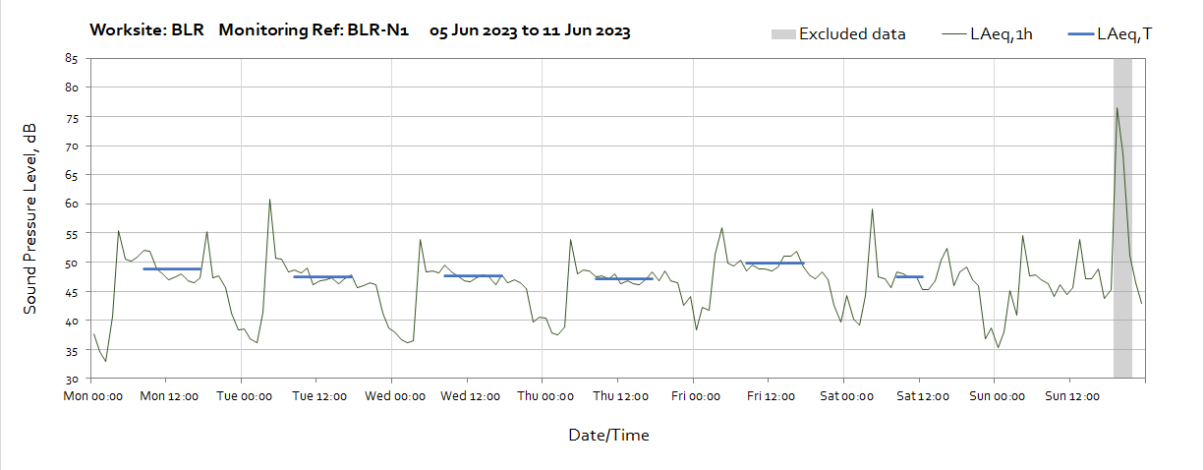






Worksite: BLR – Monitoring Ref: BLR-N1




Worksite: BLR Monitoring Ref: BLR-N1 05 Jun 2023 to 11 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
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Mon 00:00
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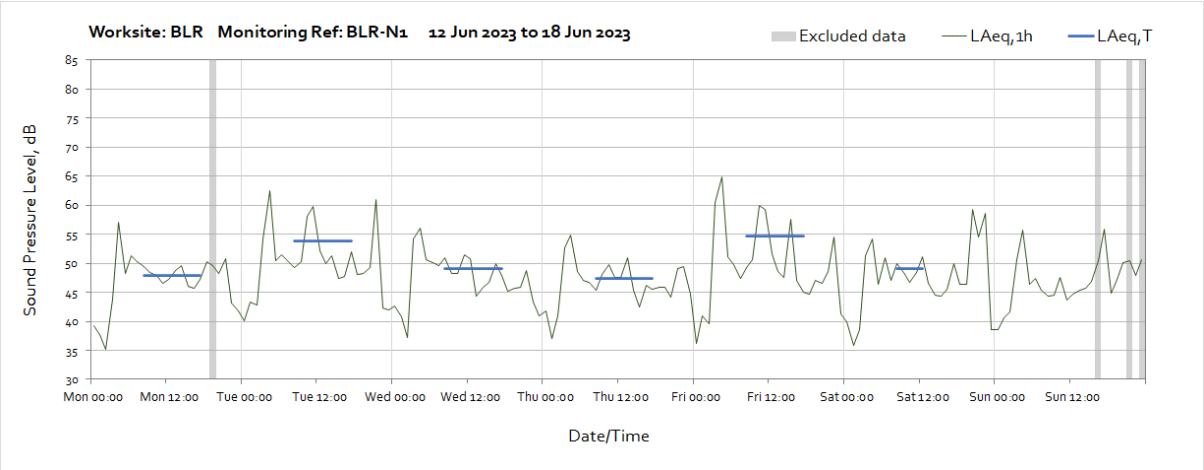
Date/Time


Worksite: BLR Monitoring Ref: BLR-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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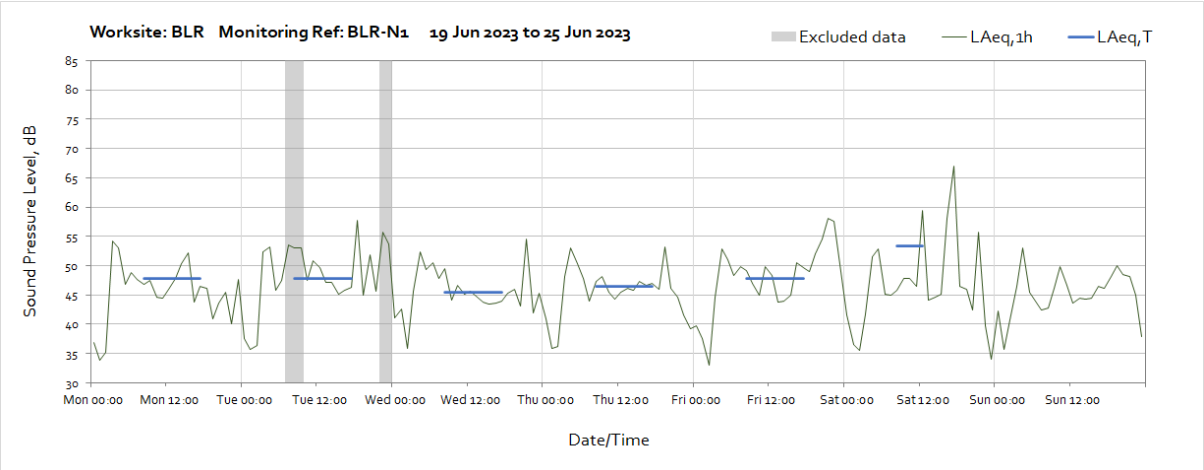
Date/Time


Worksite: BLR Monitoring Ref: BLR-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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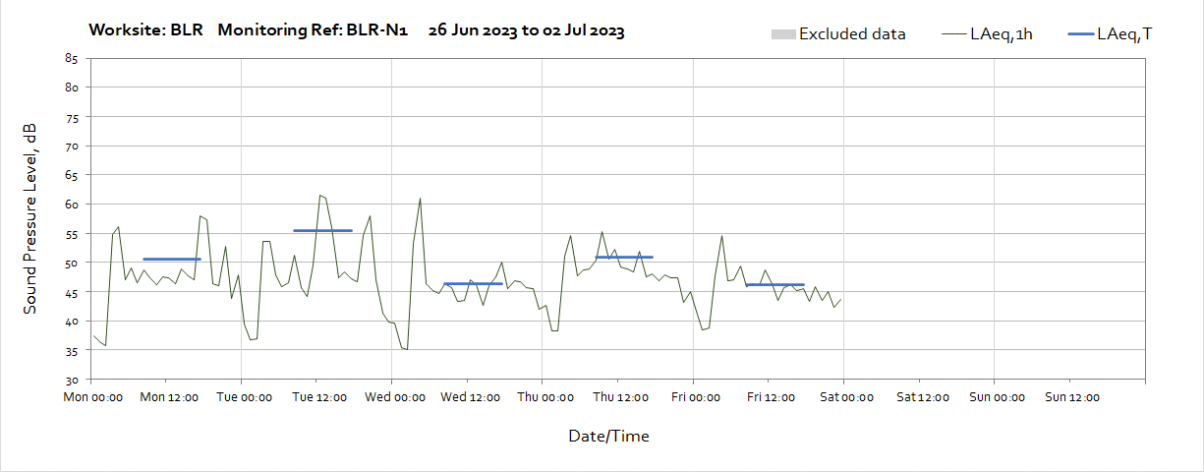
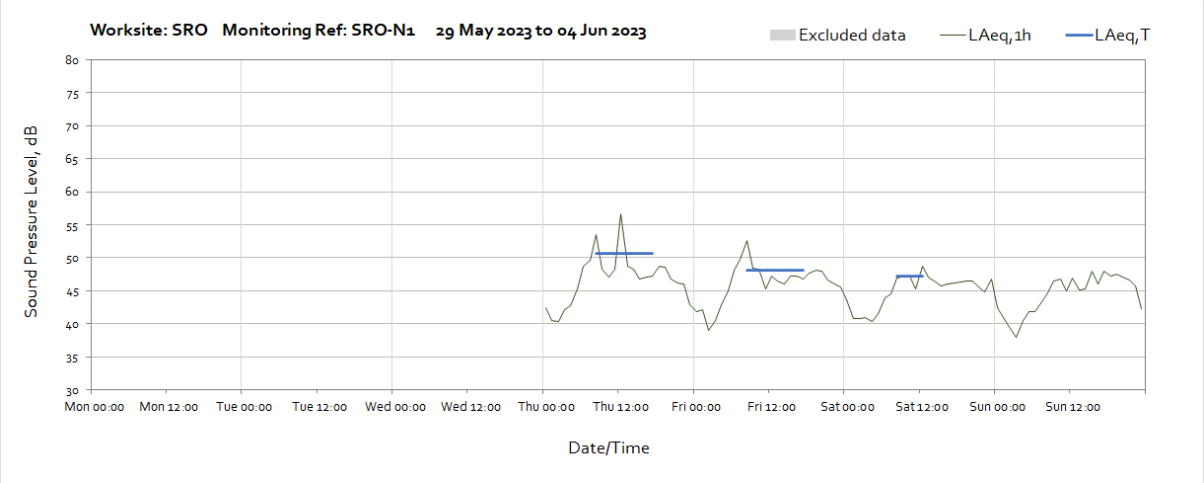
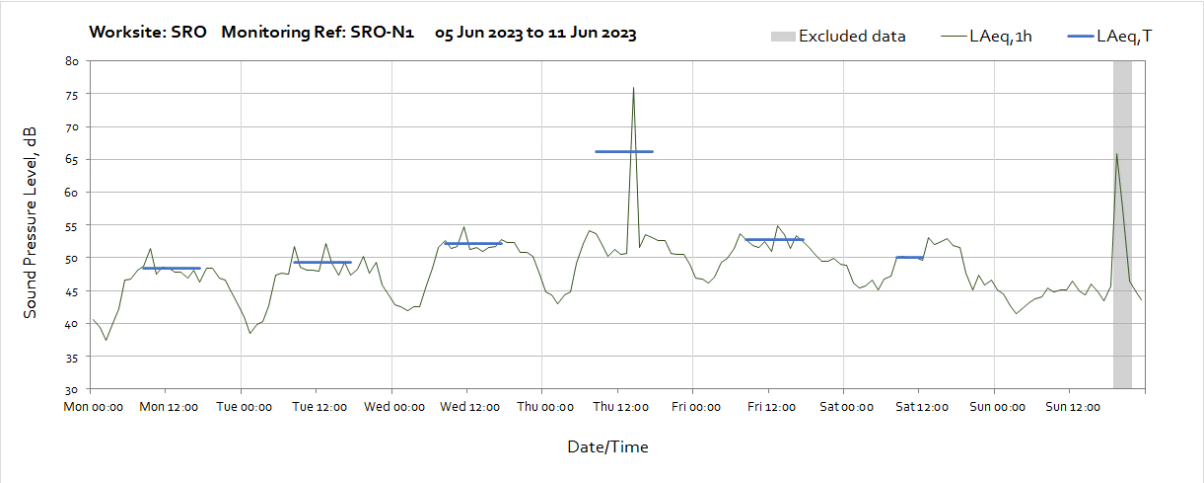
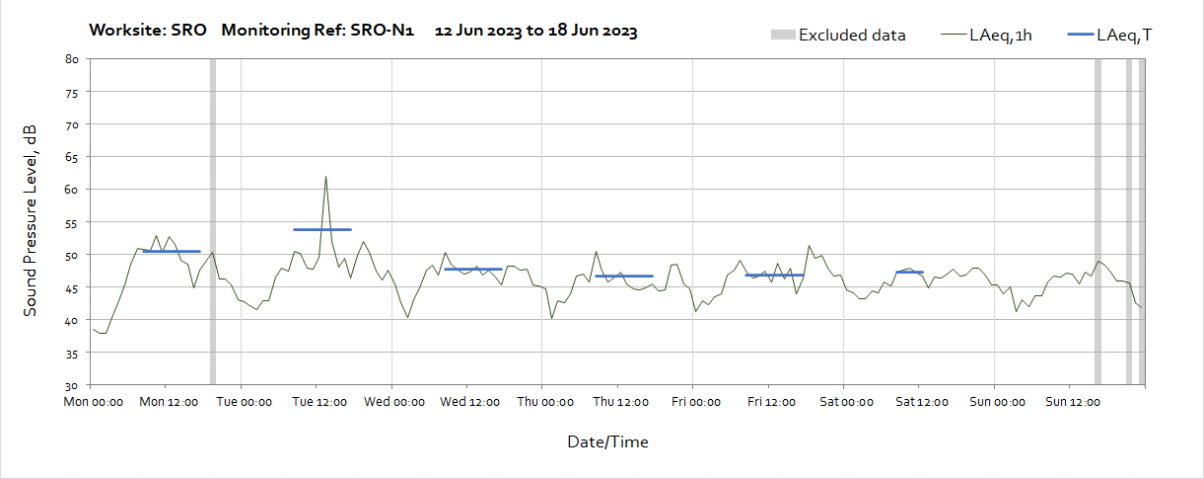
Date/Time



Worksite: SRO – Monitoring Ref: SRO-N1






Worksite: SRO Monitoring Ref: SRO-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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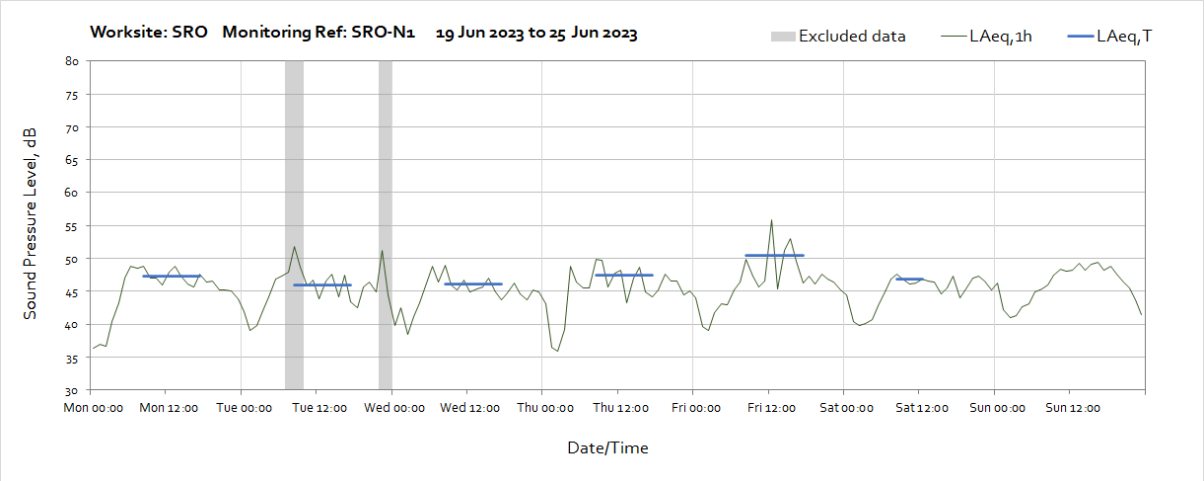
Date/Time


Worksite: SRO Monitoring Ref: SRO-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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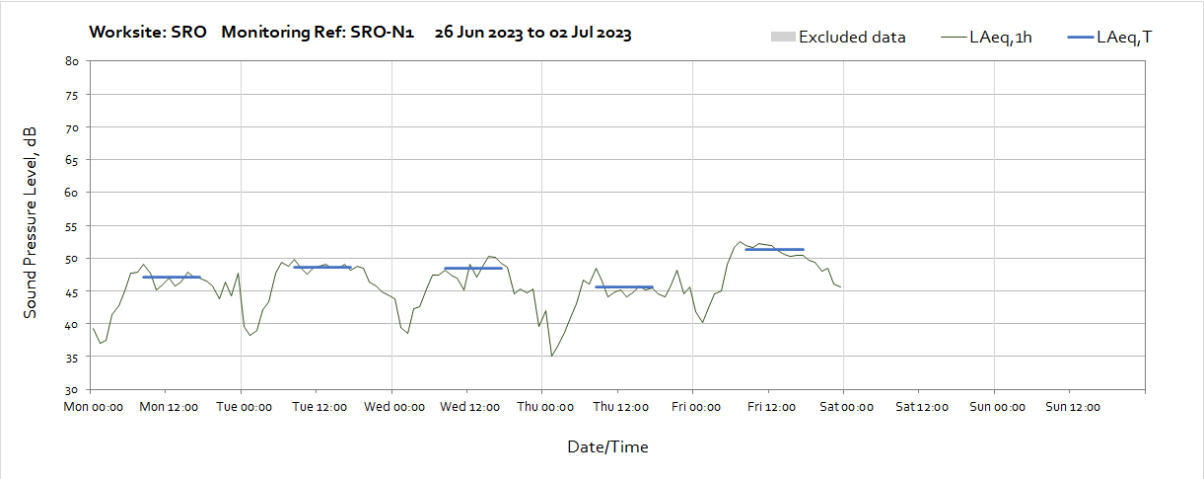
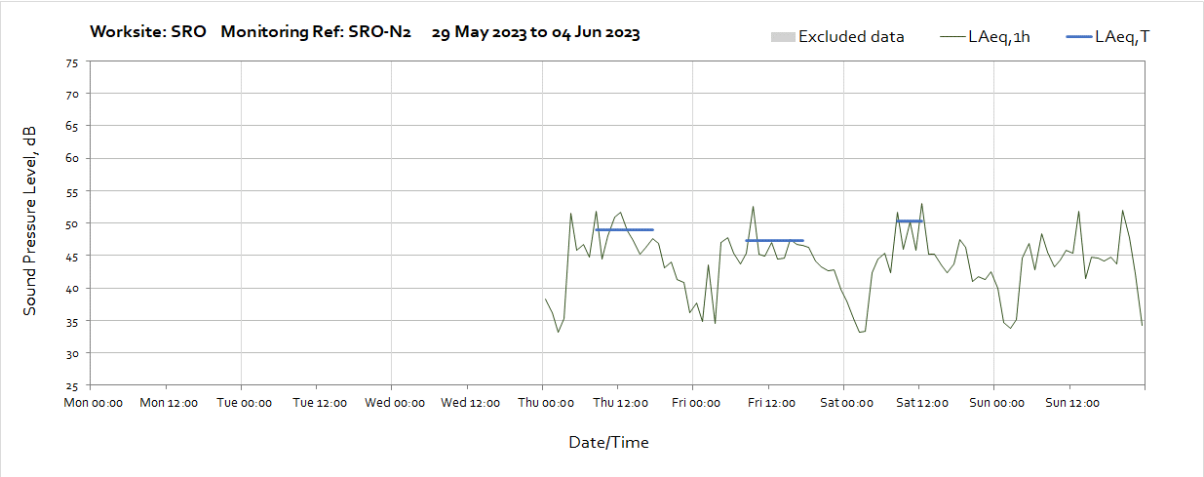
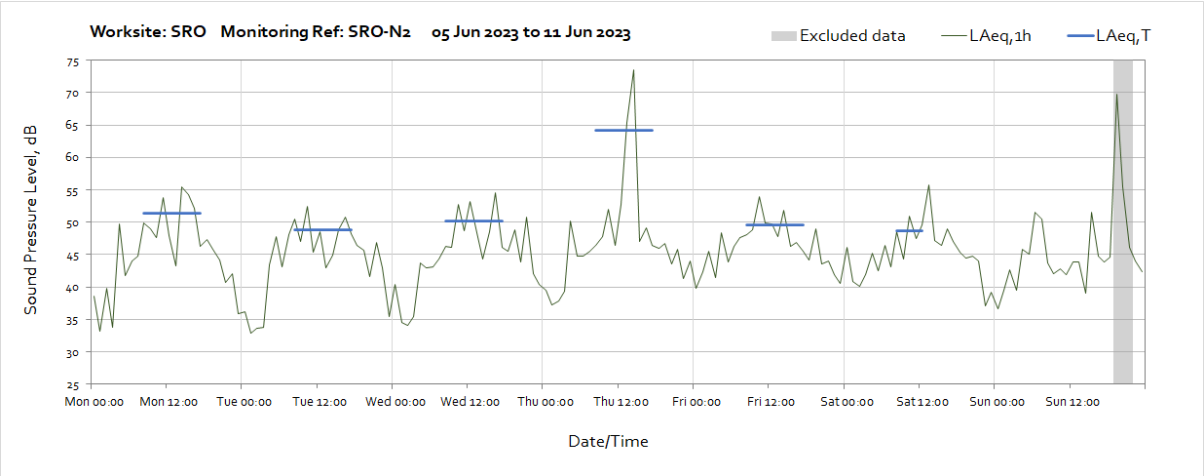
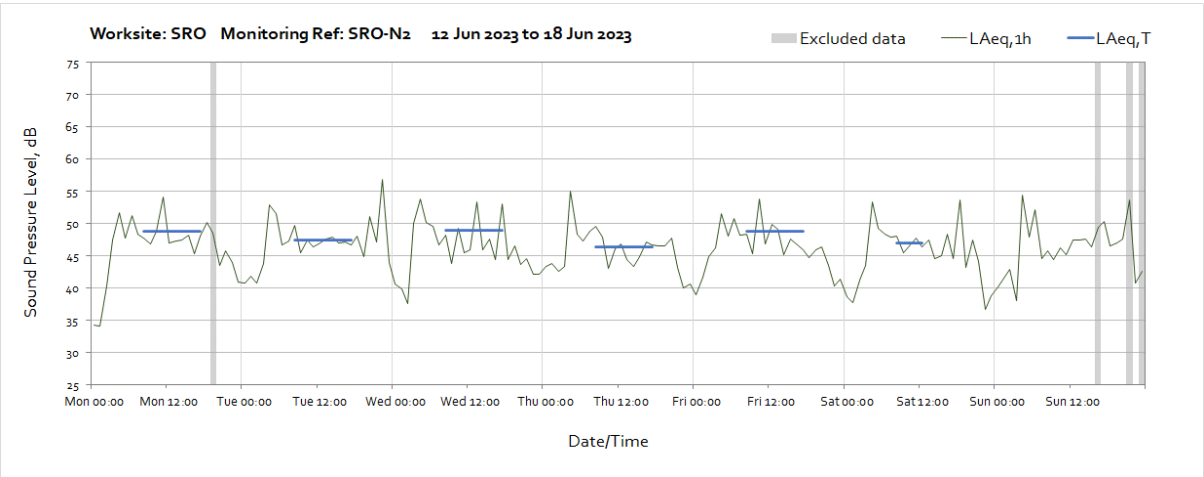
Sun 12:00
Date/Time

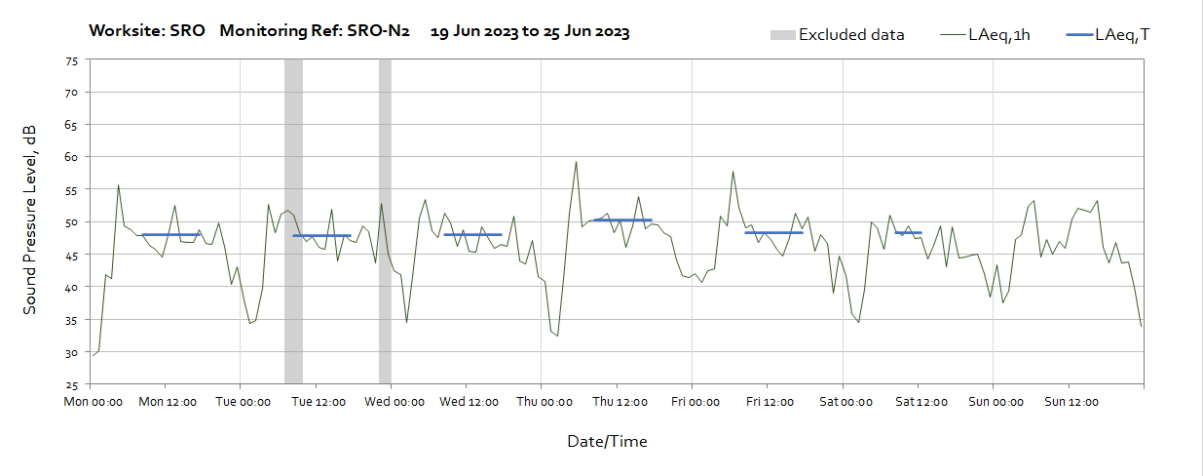

Worksite: SRO Monitoring Ref: SRO-N1 26 Jun 2023 to 02 Jul 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
35
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

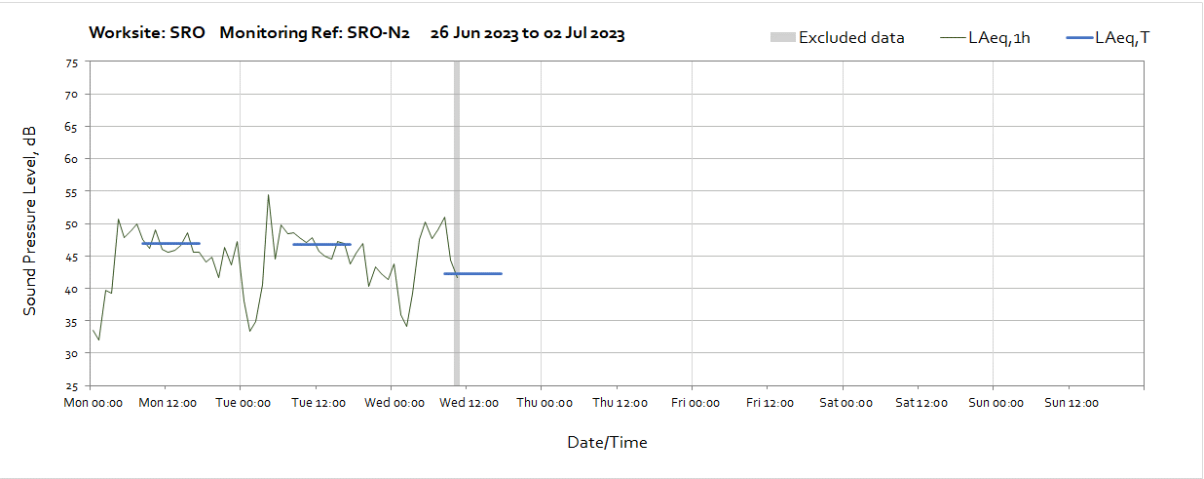
Worksite: SRO – Monitoring Ref: SRO-N2





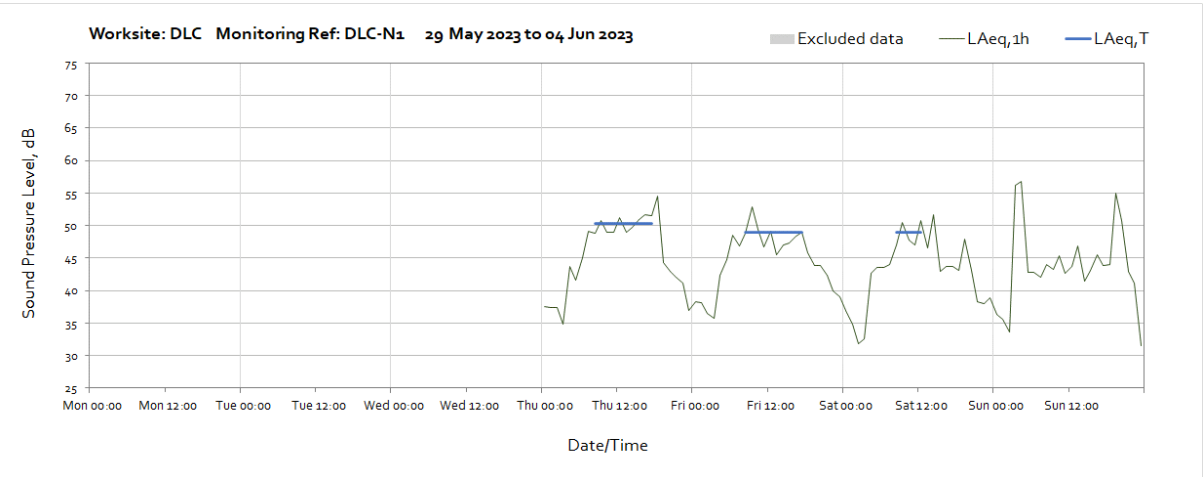


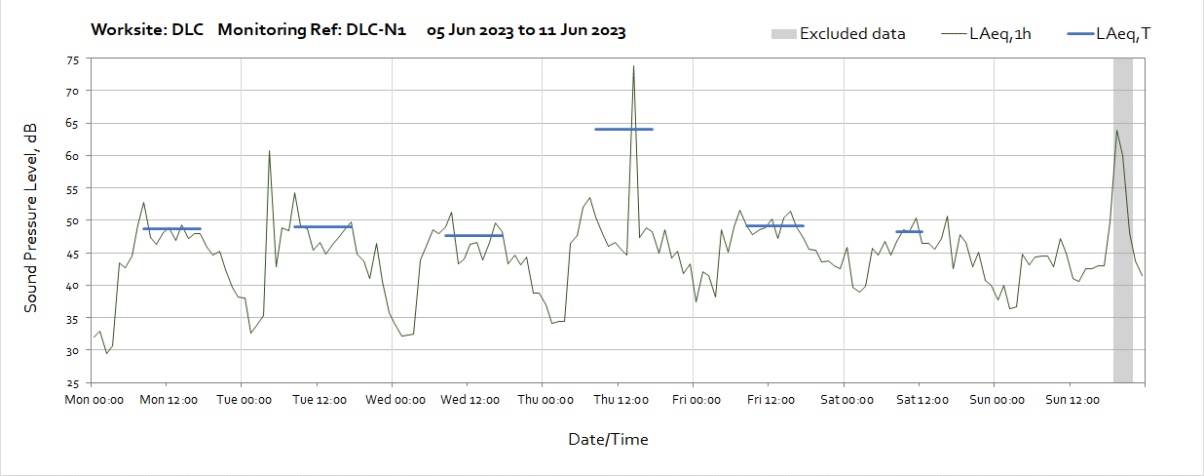


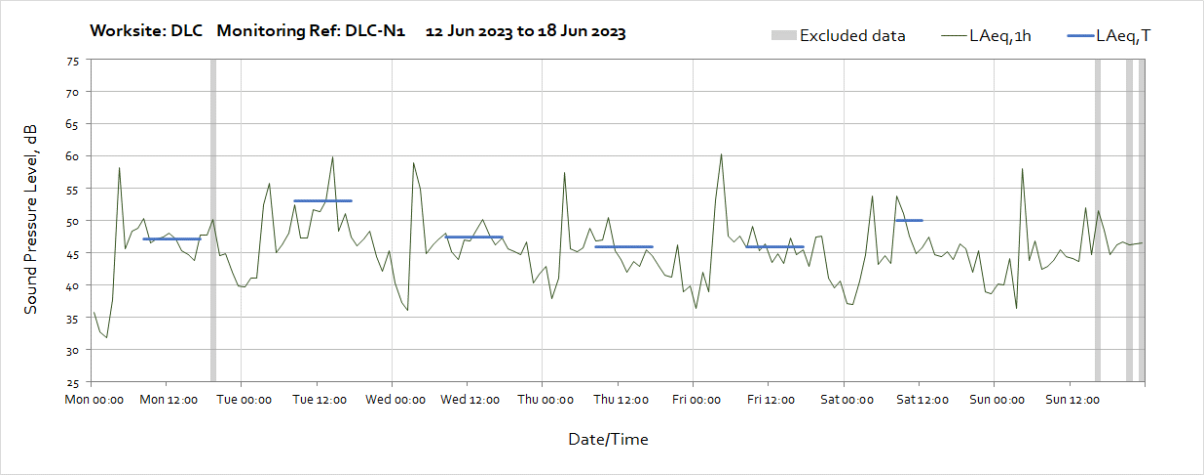


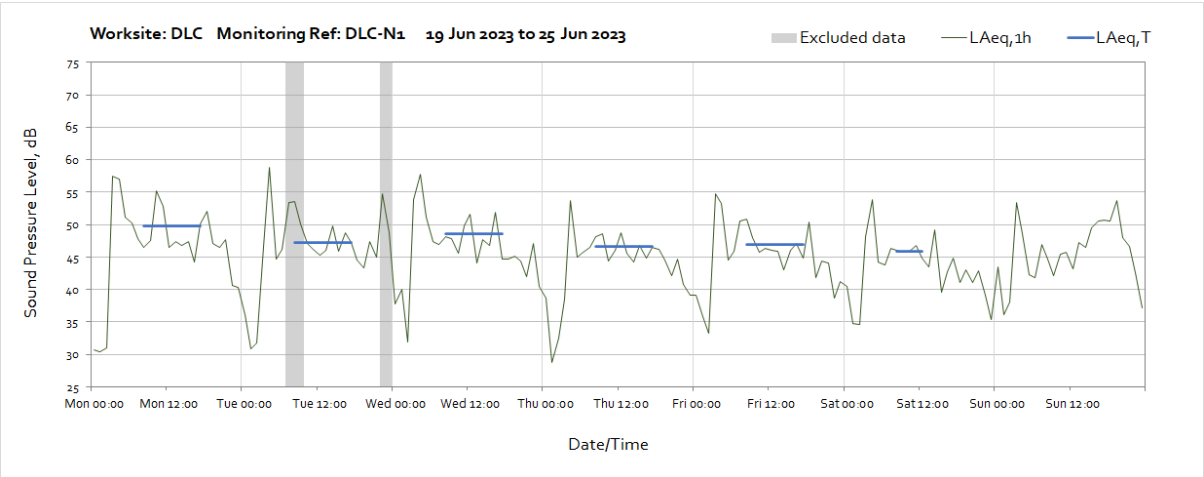
Note: Missing data between 11:00 on 26th June and 00:00 on 30th June ware due to stolen solar panels which is currently being resolved.

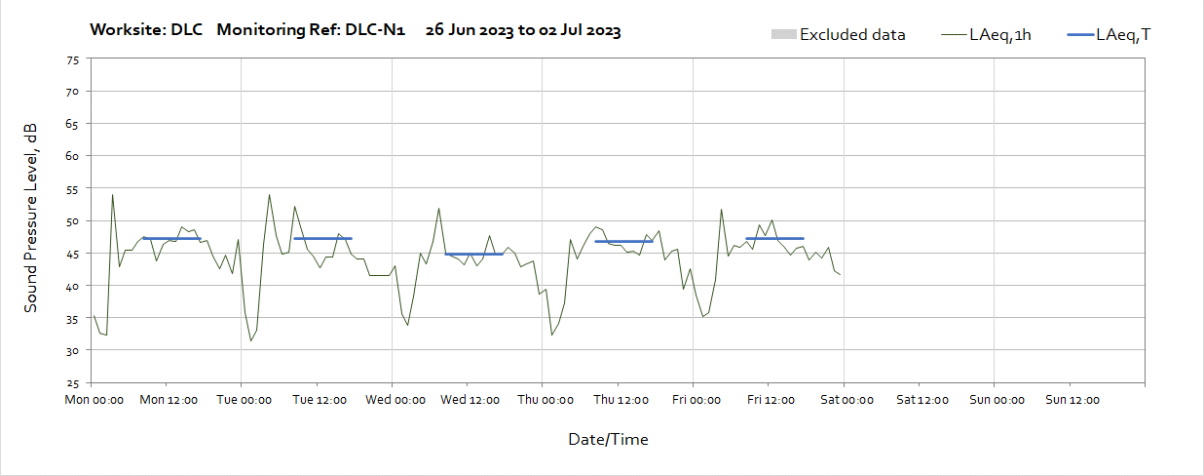
Worksite: DLC – Monitoring Ref: DLC-N1




Worksite: DLC Monitoring Ref: DLC-N1 05 Jun 2023 to 11 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: DLC Monitoring Ref: DLC-N1 12 Jun 2023 to 18 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

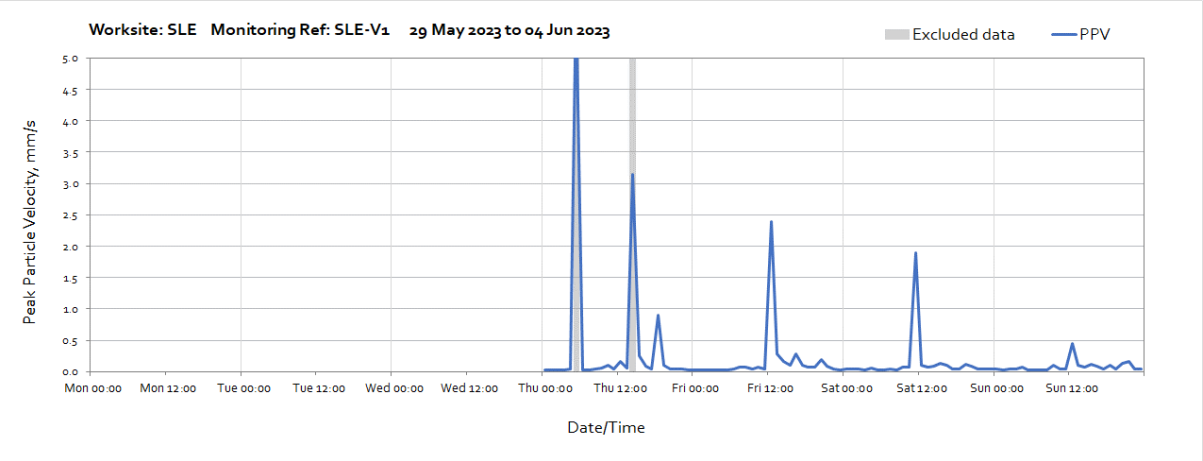

Worksite: DLC Monitoring Ref: DLC-N1 19 Jun 2023 to 25 Jun 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

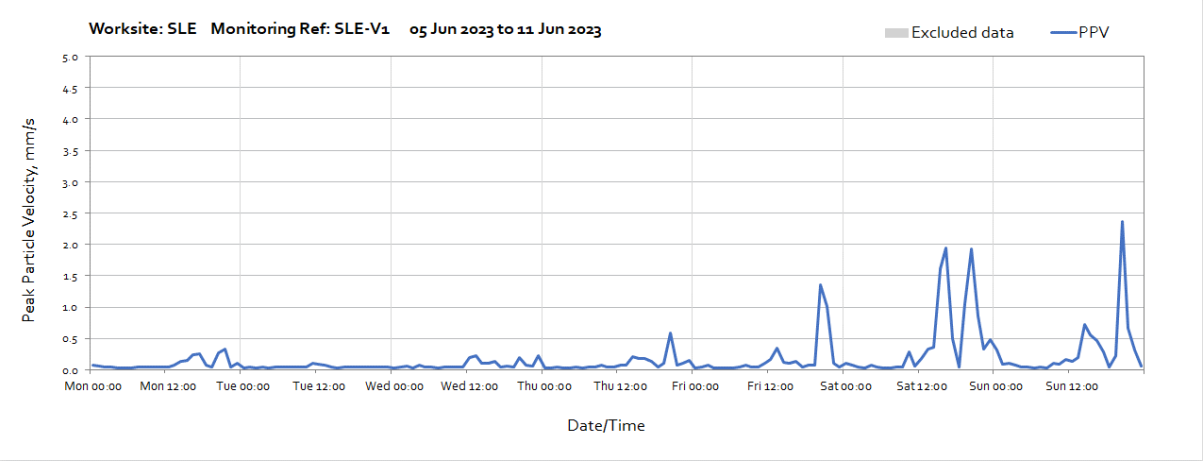

Worksite: DLC Monitoring Ref: DLC-N1 26 Jun 2023 to 02 Jul 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
35
30
25
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

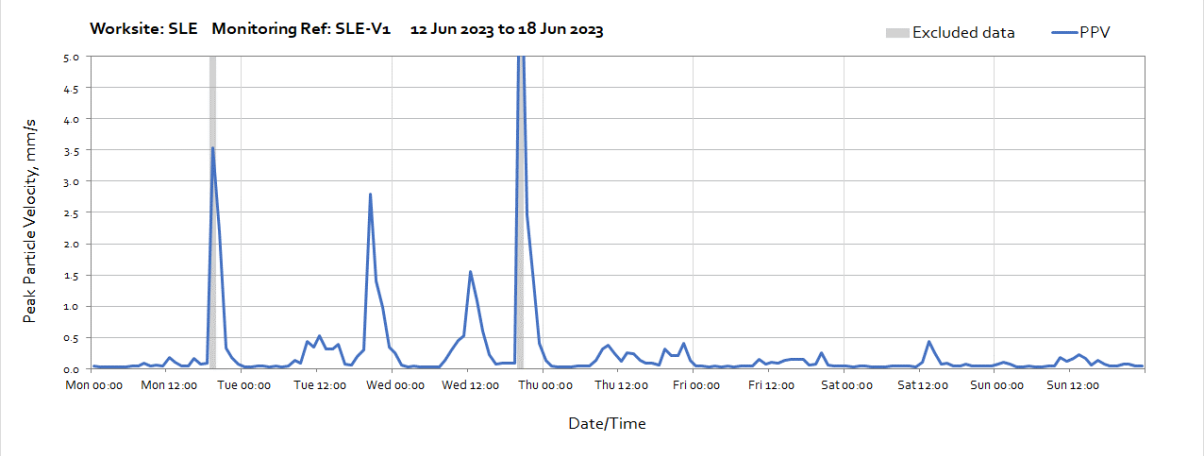
Vibration

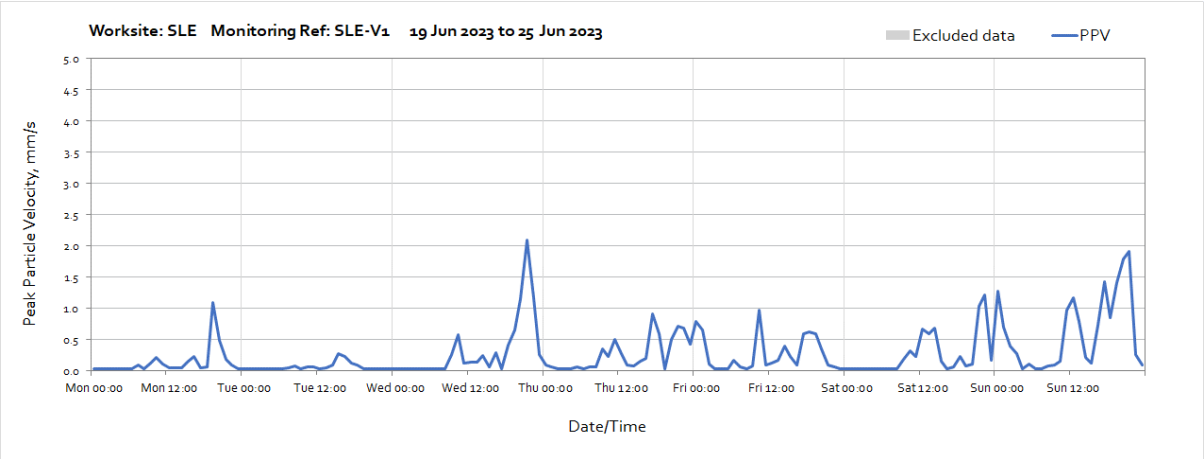
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the resultant PPV due to vibration components on three orthogonal axis x, y, and z. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative of HS2 construction works, these values have been greyed out in the following charts and have been excluded to calculate values in Table 4 of the main report.

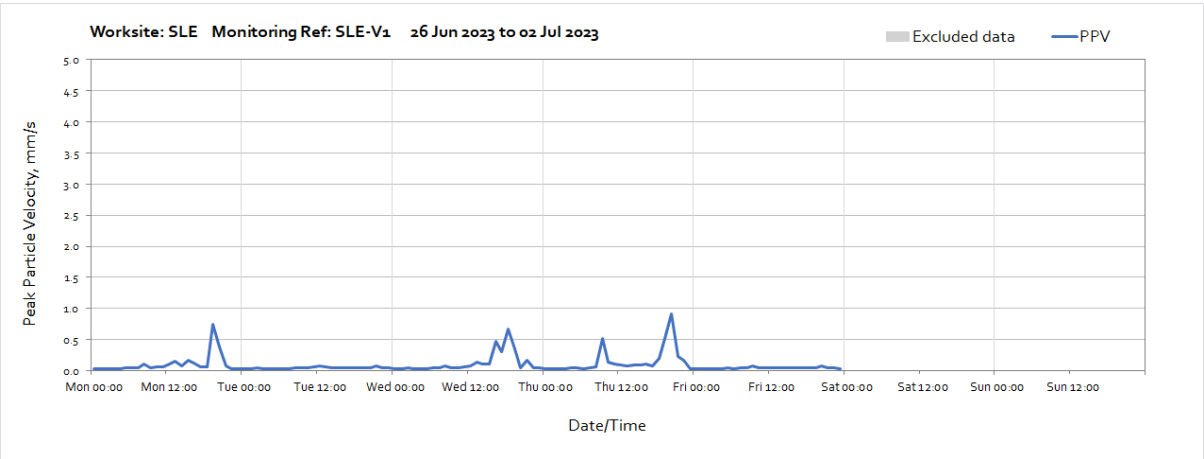
Worksite: FEW – Monitoring Ref: SLE-V1



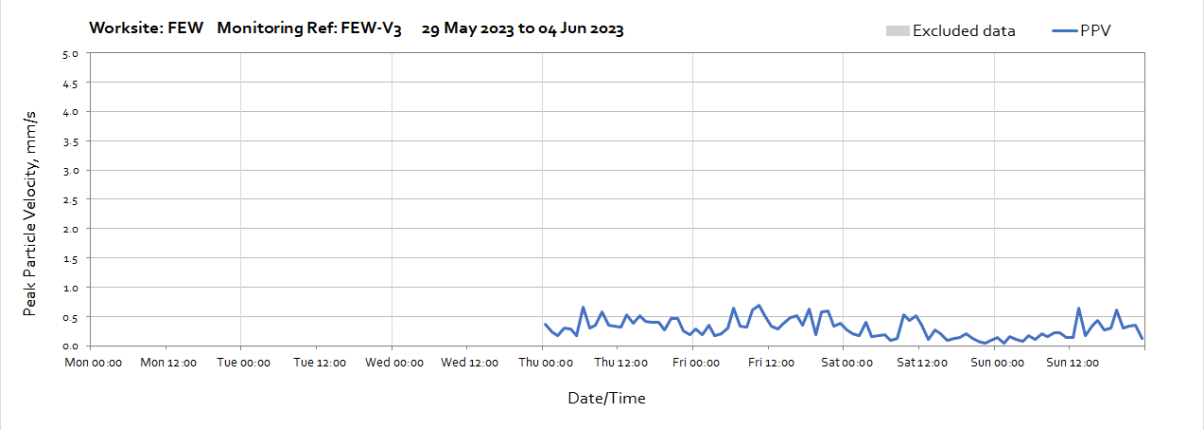


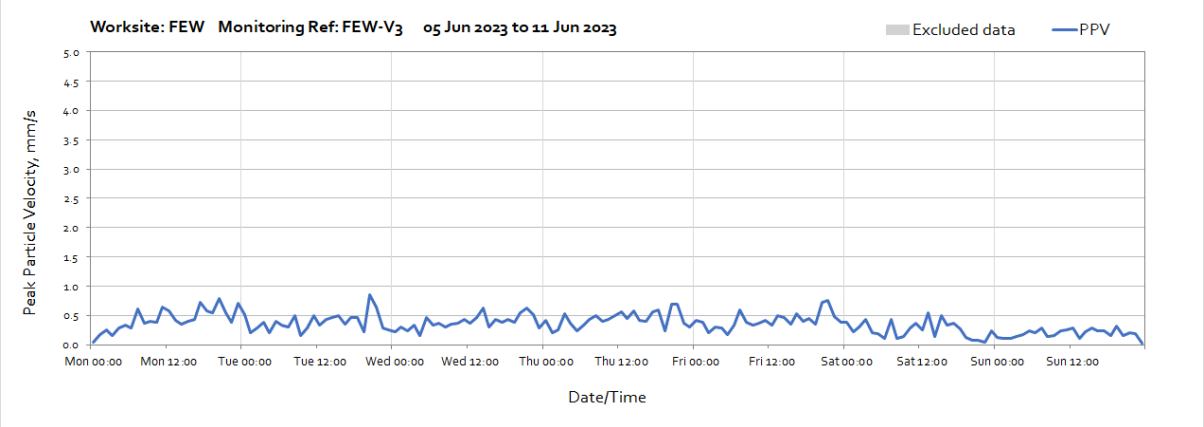

Worksite: SLE Monitoring Ref: SLE-V1 12 Jun 2023 to 18 Jun 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

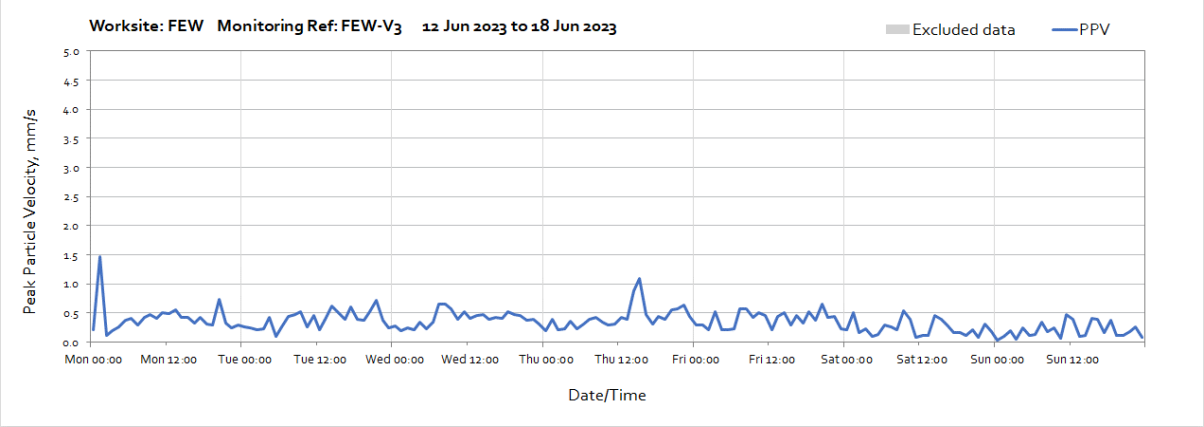

Worksite: SLE Monitoring Ref: SLE-V1 19 Jun 2023 to 25 Jun 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

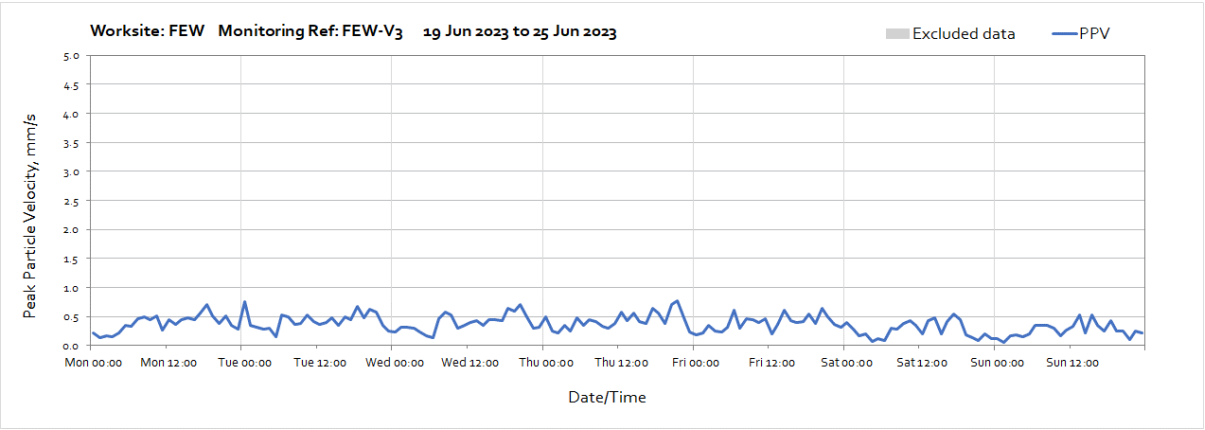

Worksite: SLE Monitoring Ref: SLE-V1 26 Jun 2023 to 02 Jul 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

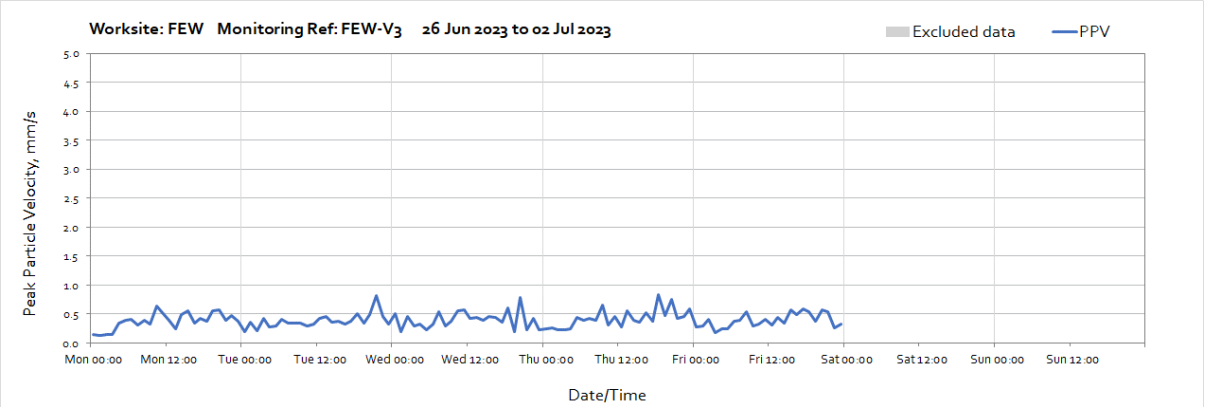
Worksite: FEW – Monitoring Ref: FEW-V3



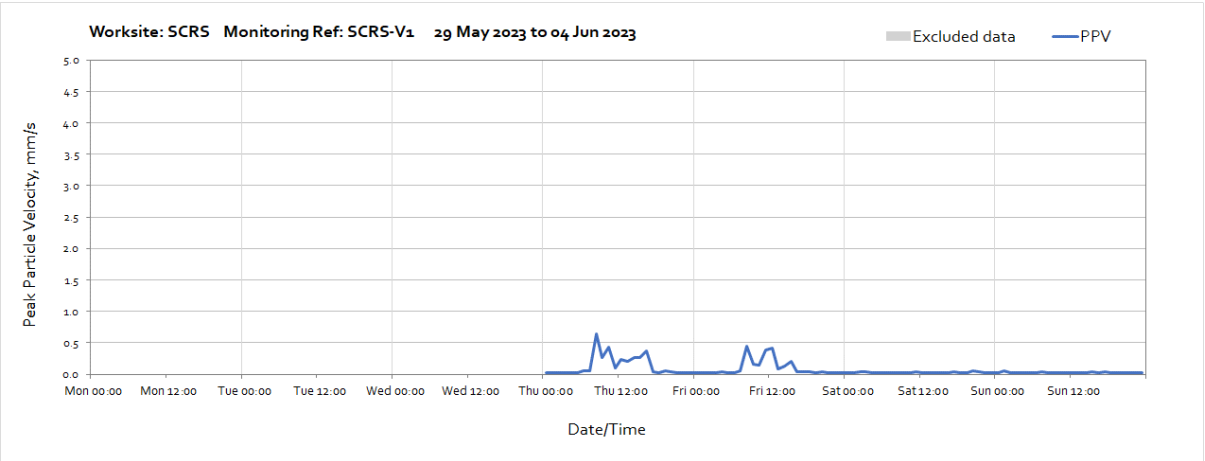


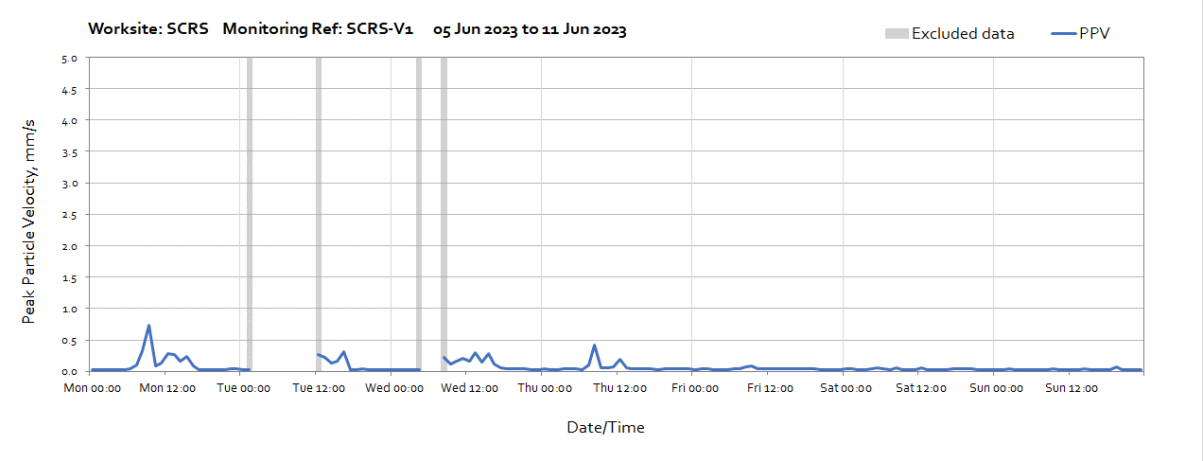




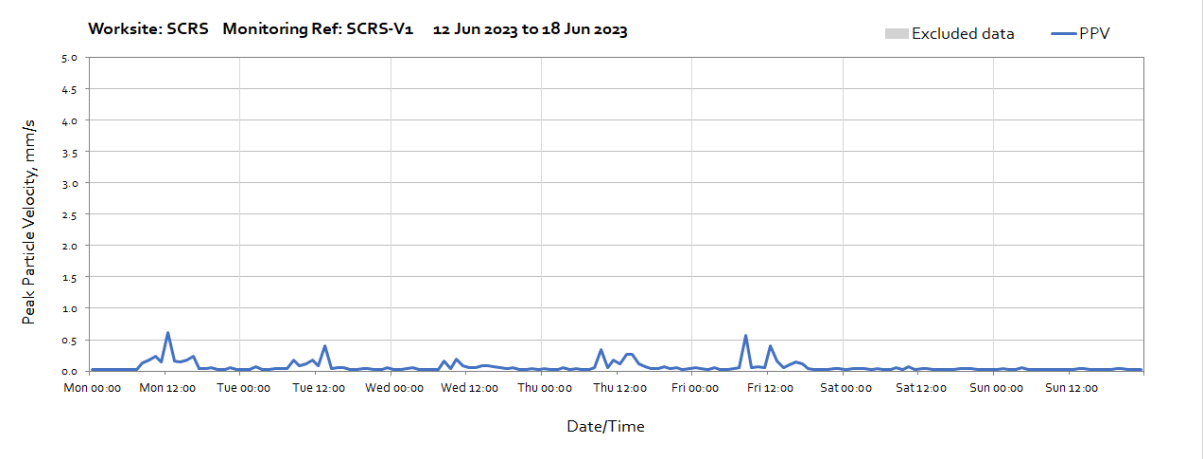


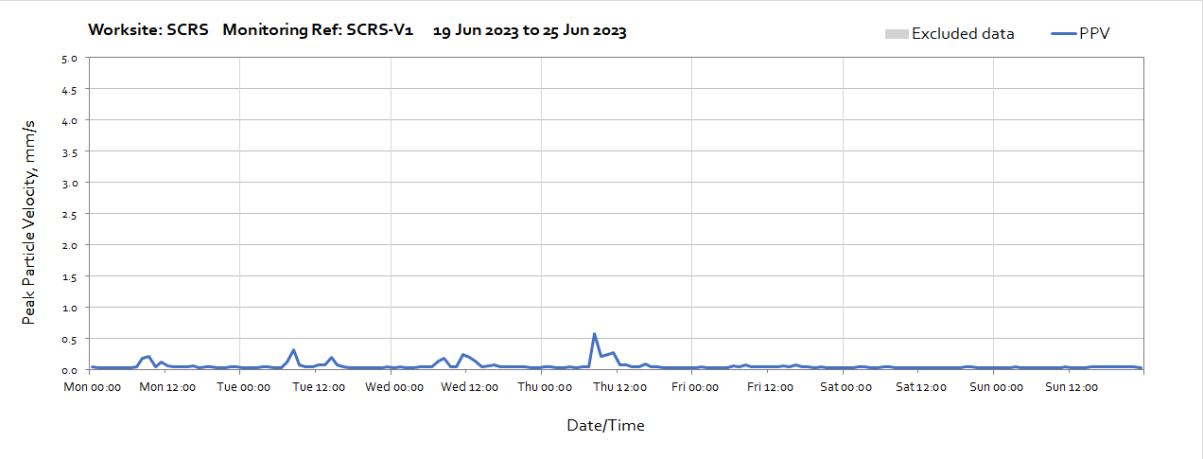
Worksite: SCRS – Monitoring Ref: SCRS-V1

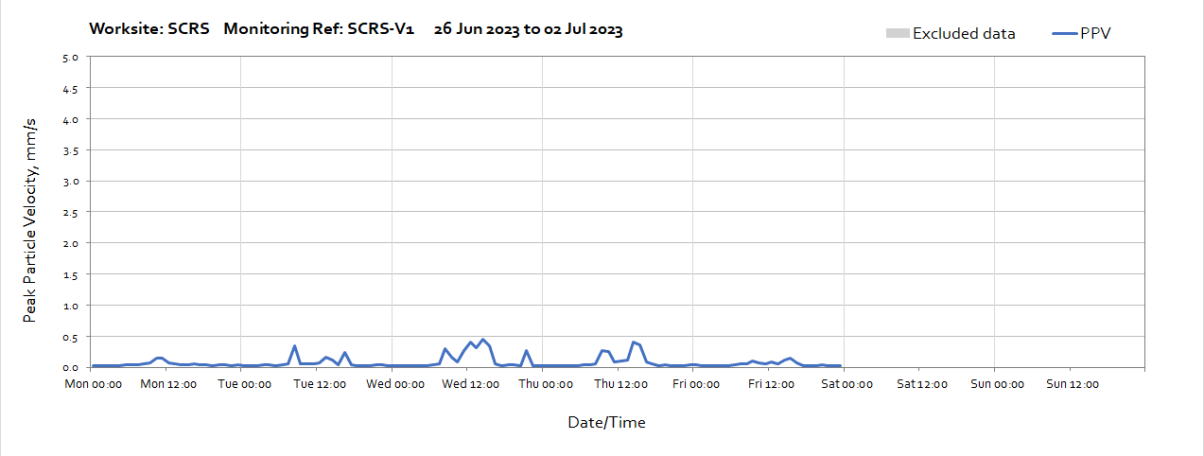




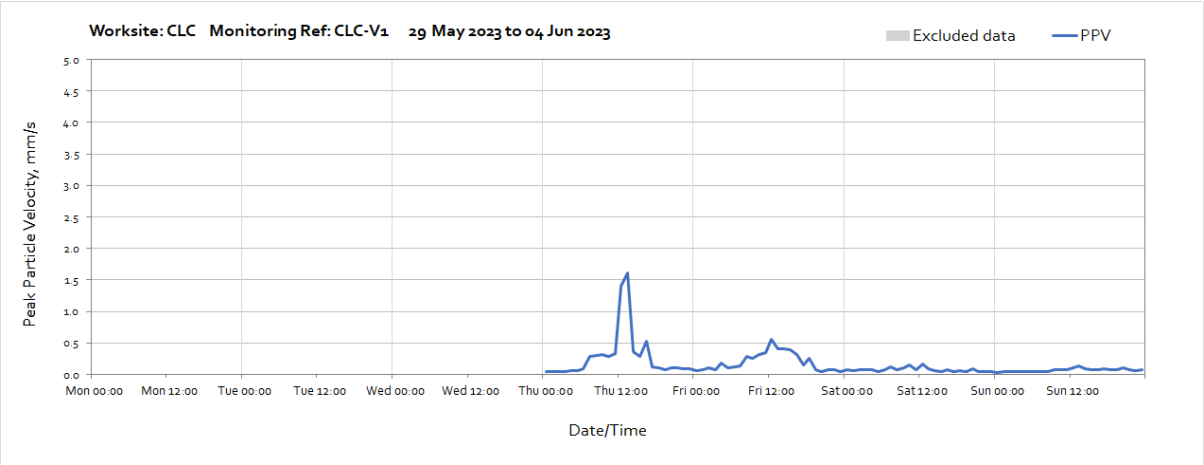
Note: Missing data between 02:00 and 11:00 on 6th June, and between 05:00 and 07:00 on 7th June was due to vegetation clearance.

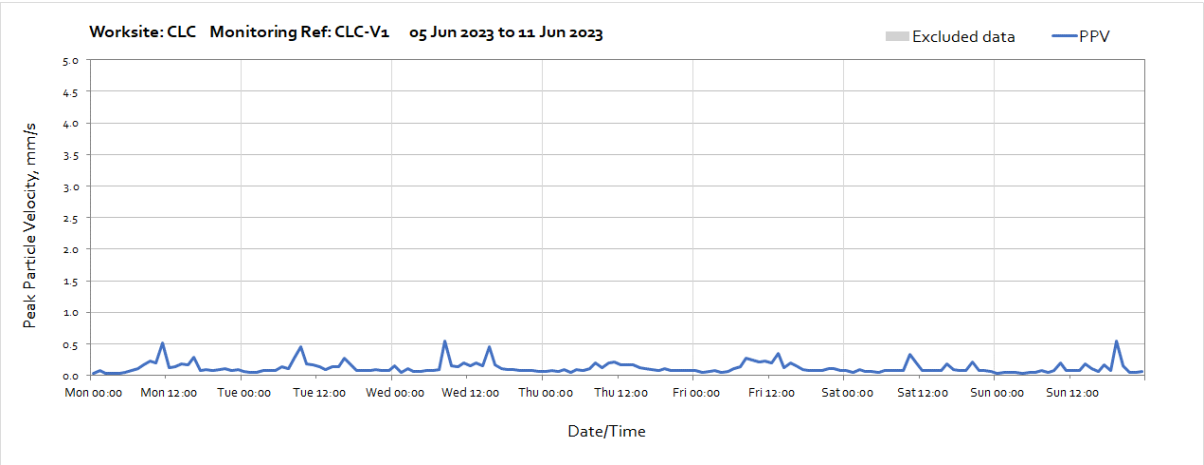


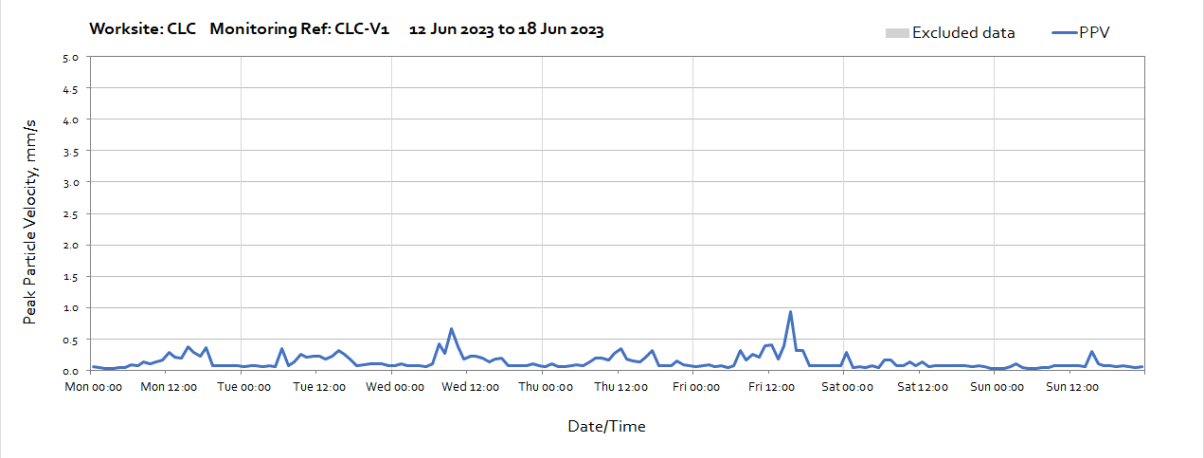


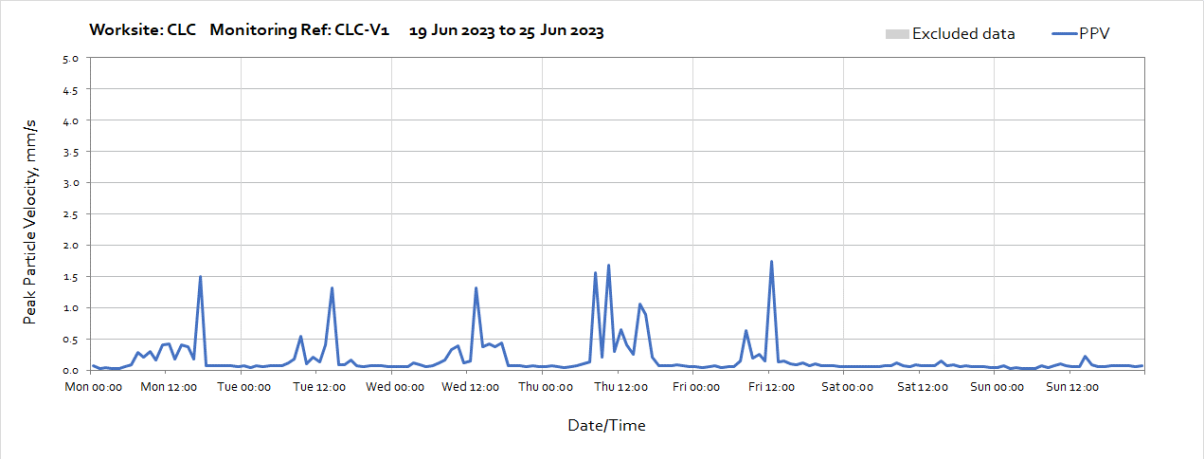


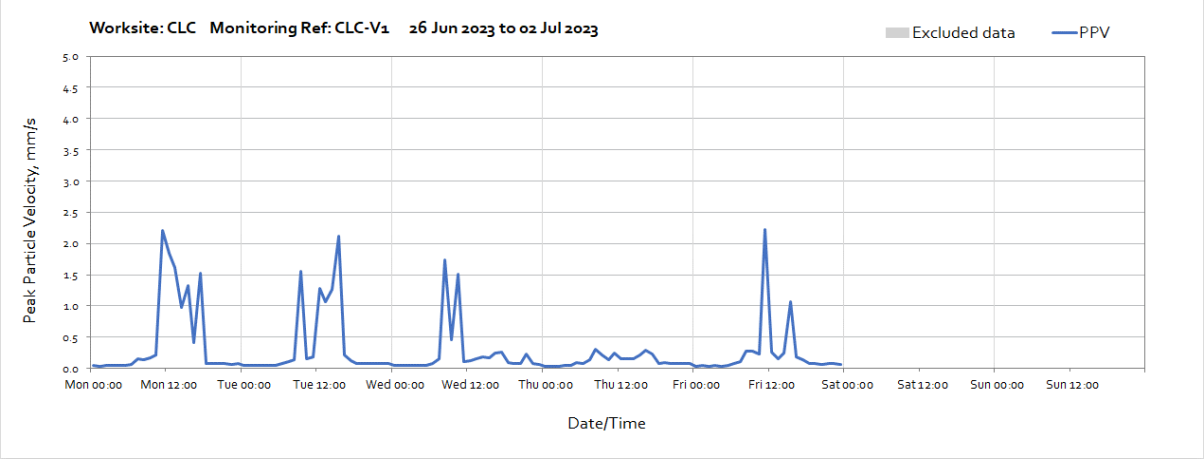
Worksite: CLC – Monitoring Ref: CLC-V1



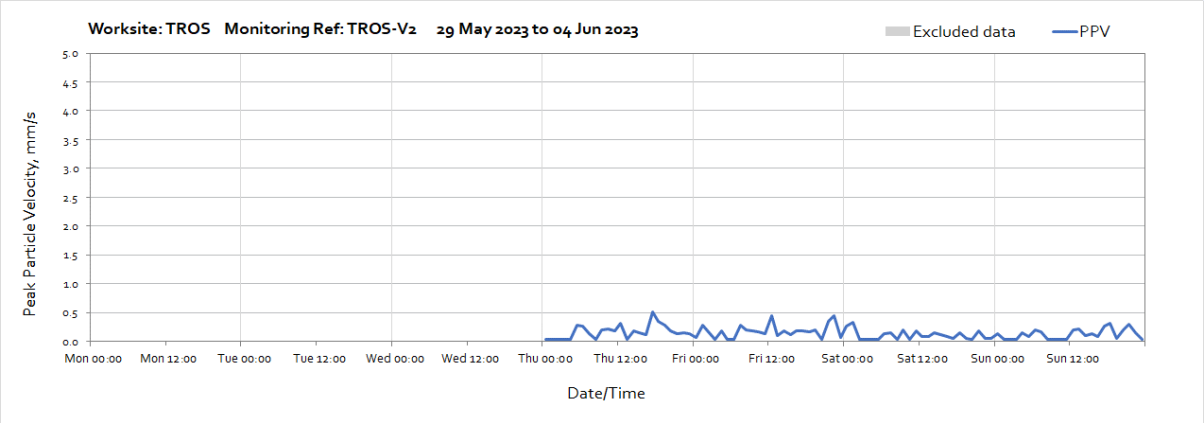


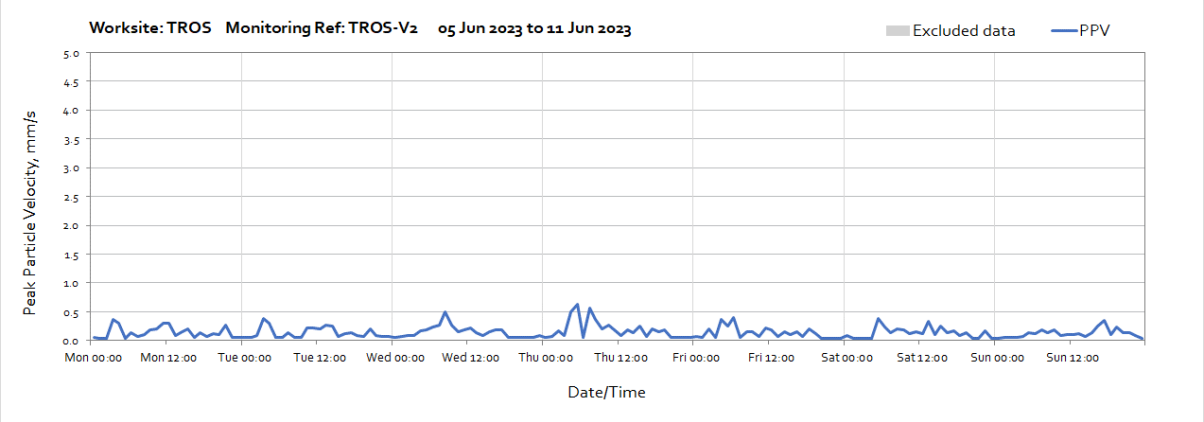

Worksite: CLC Monitoring Ref: CLC-V1 12 Jun 2023 to 18 Jun 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

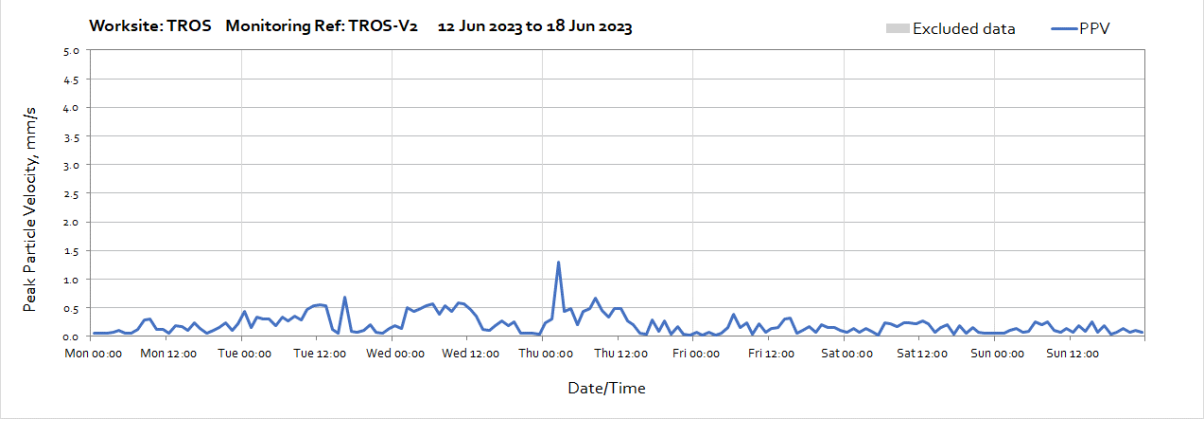

Worksite: CLC Monitoring Ref: CLC-V1 19 Jun 2023 to 25 Jun 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

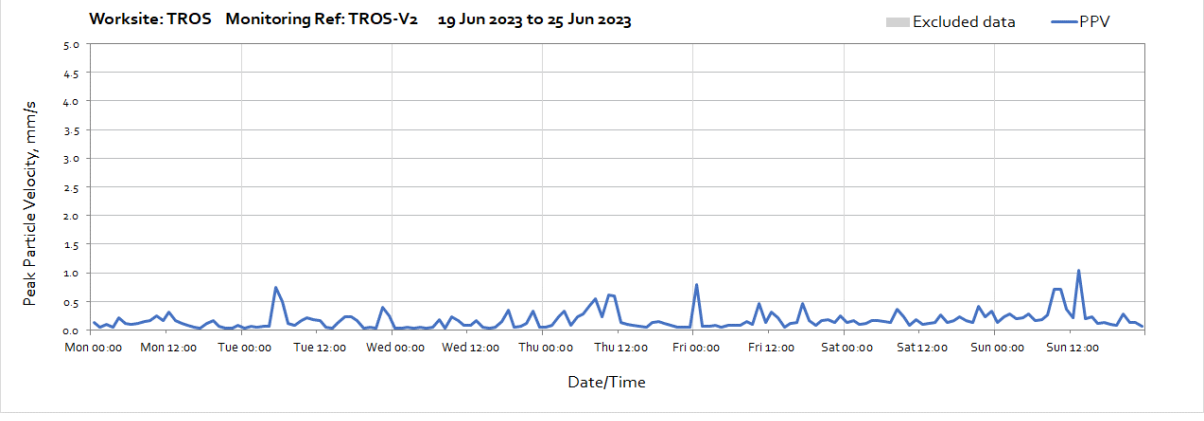

Worksite: CLC Monitoring Ref: CLC-V1 26 Jun 2023 to 02 Jul 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

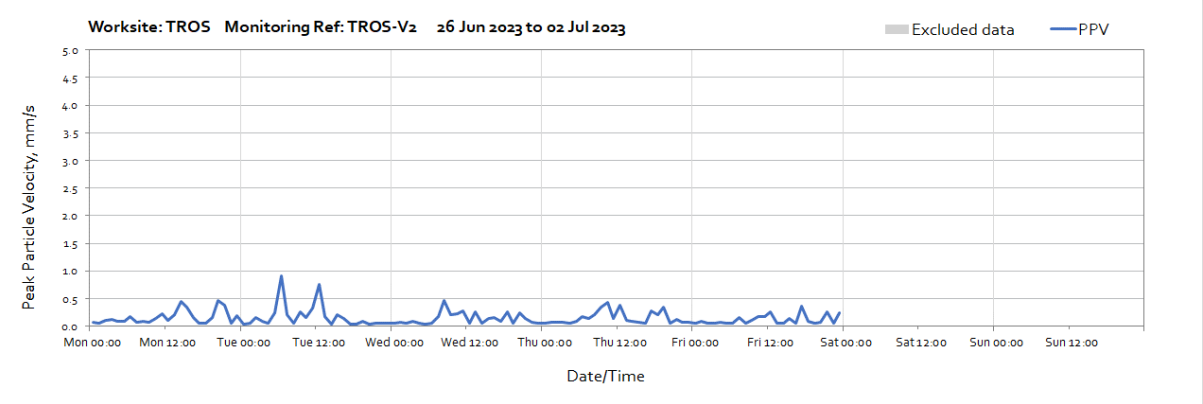
Worksite: TROS – Monitoring Ref: TROS-V2



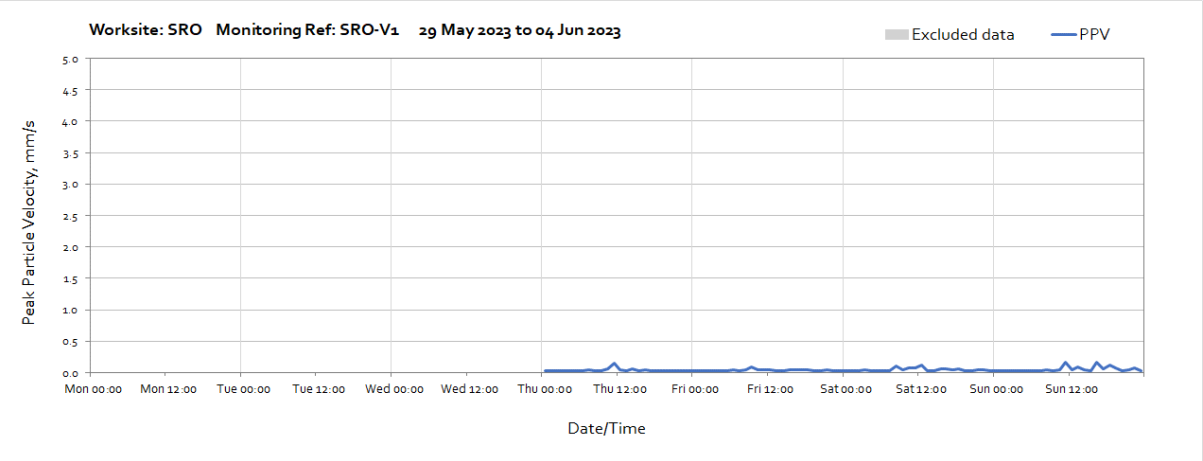


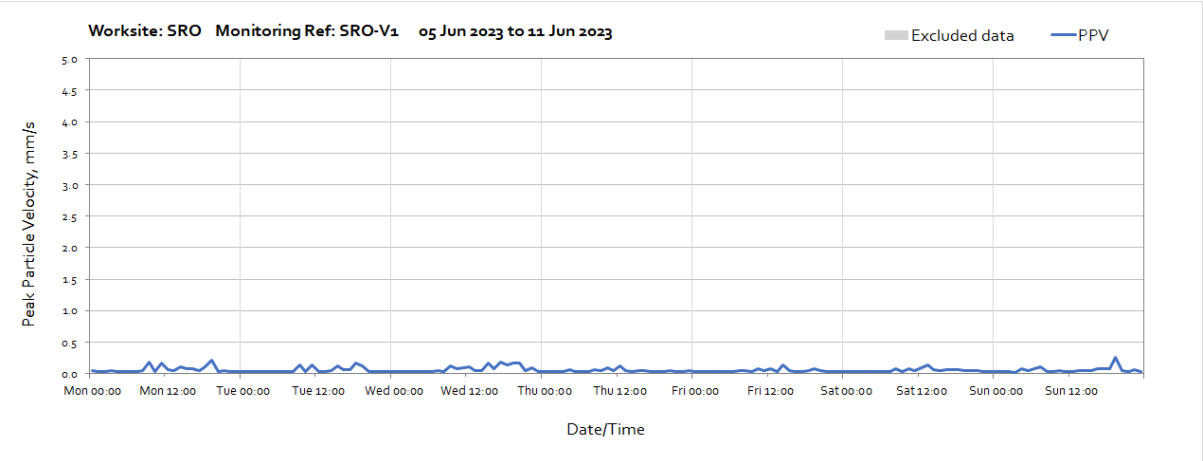


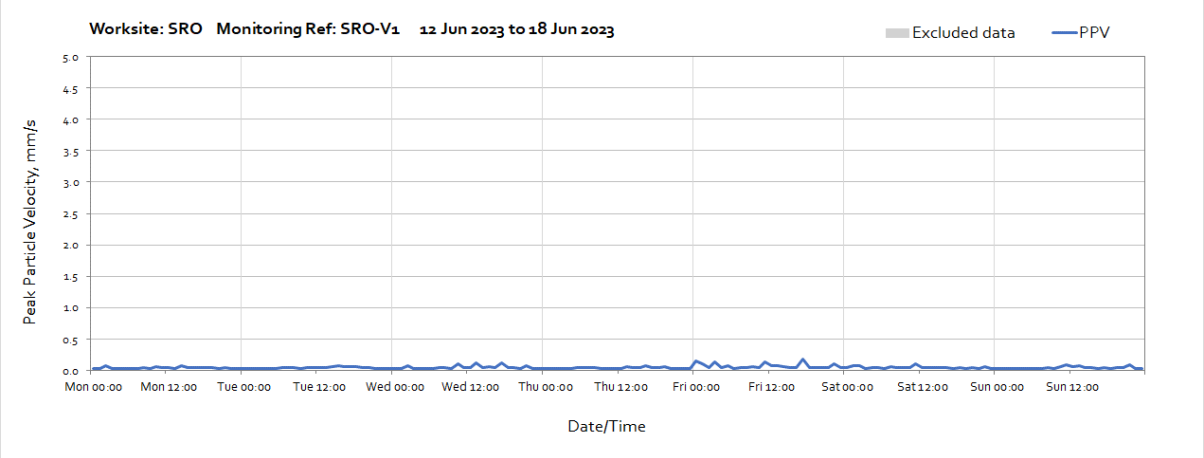


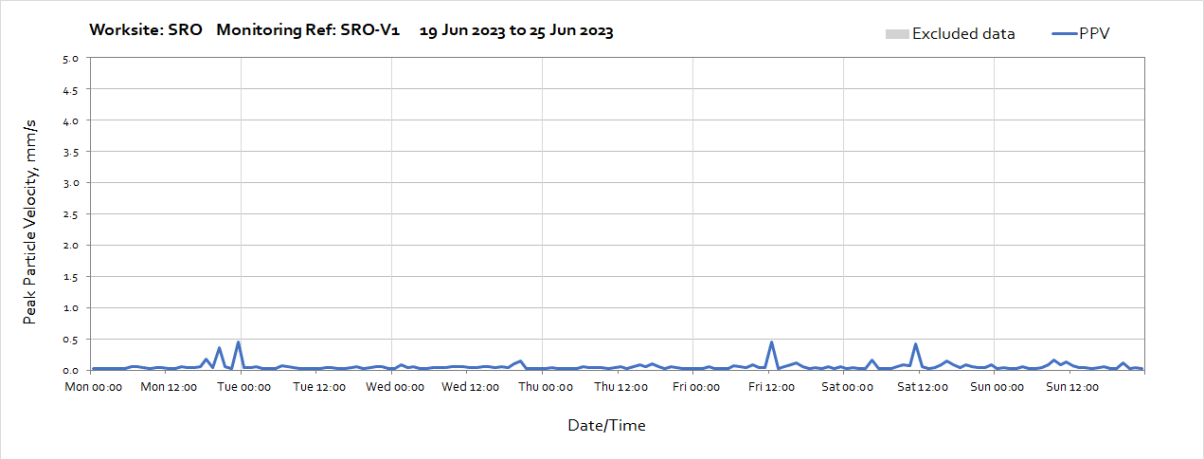


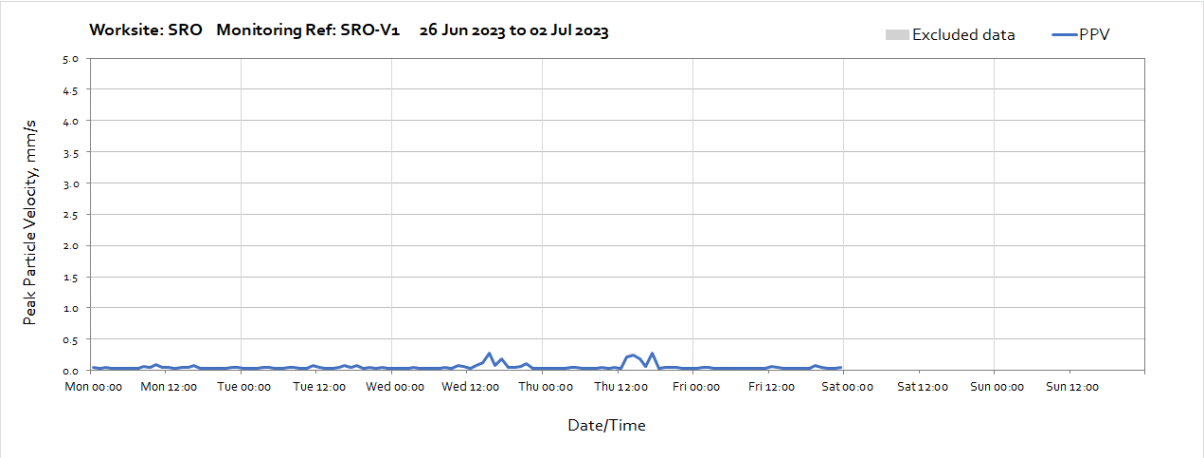
Worksite: SRO – Monitoring Ref: SRO-V1



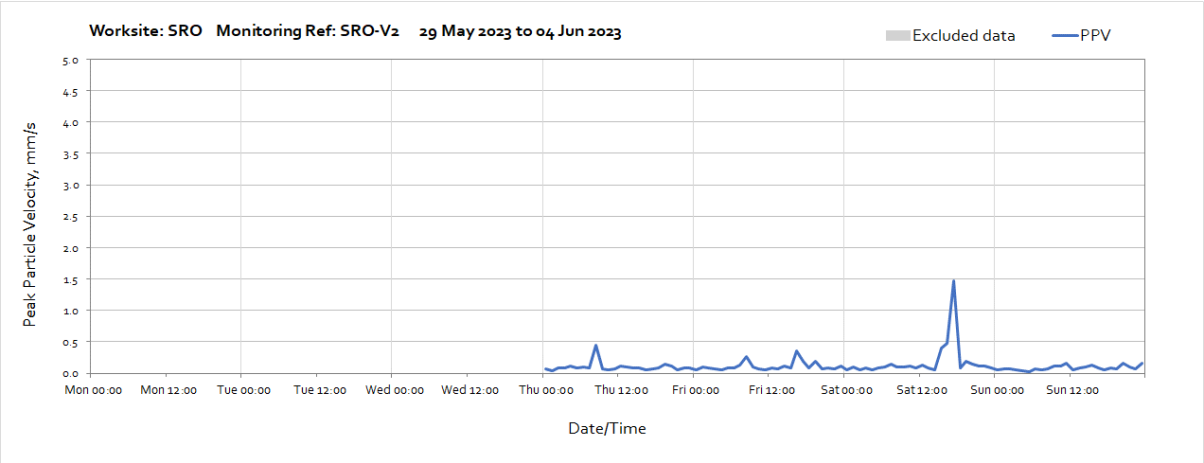


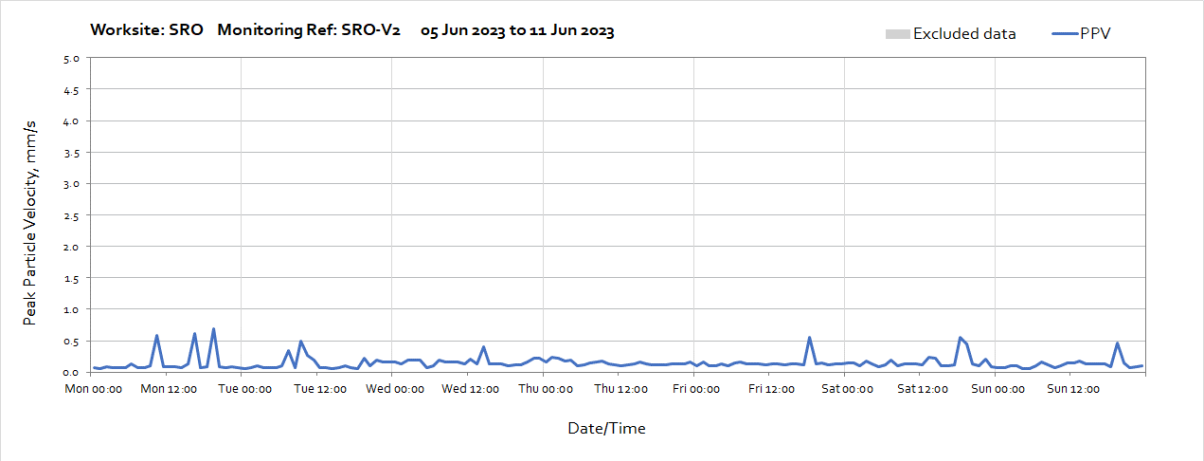

Worksite: SRO Monitoring Ref: SRO-V1 12 Jun 2023 to 18 Jun 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

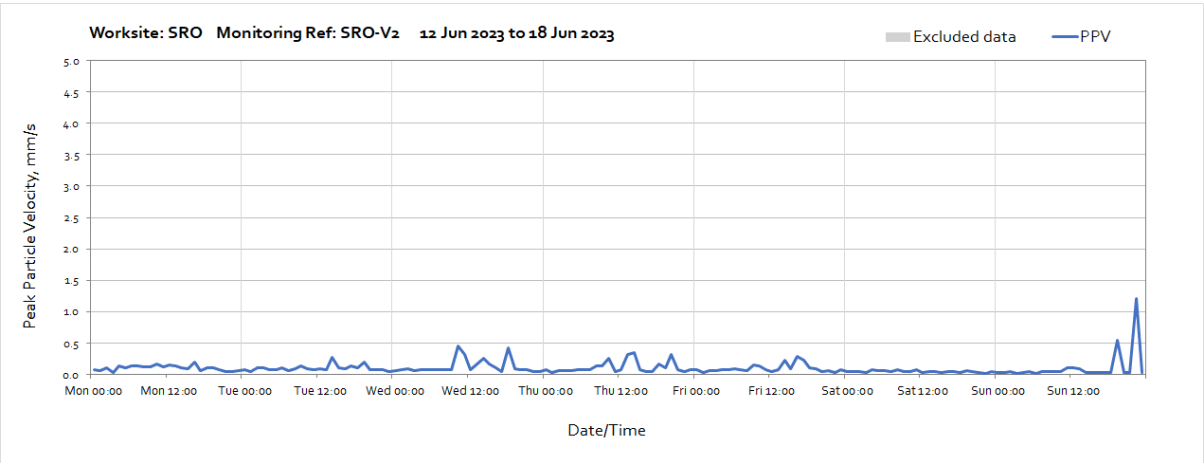

Worksite: SRO Monitoring Ref: SRO-V1 19 Jun 2023 to 25 Jun 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

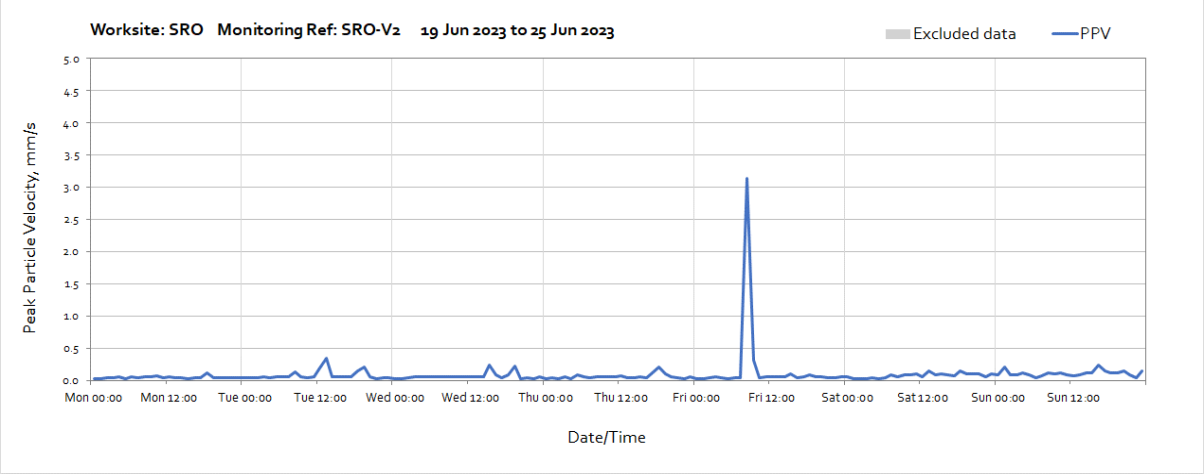

Worksite: SRO Monitoring Ref: SRO-V1 26 Jun 2023 to 02 Jul 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

Worksite: SRO – Monitoring Ref: SRO-V2









Note: High vibration levels at 08:00 on 23rd June was due to HS2 related utility works undertaken in the vicinity of the monitor.