



ABN: 73 254 053 305

PO Box 61
PATERSON NSW 2421

0407 385 866
bridgesacoustics@gmail.com

**TRAP GULLY
OVERBURDEN EMPLACEMENT EXTENSION PROJECT**

NOISE IMPACT ASSESSMENT

REPORT J0257-06-E1

22 OCTOBER 2025

Prepared for:
Hansen Environmental Consulting
Level 4, 303 Coronation Drive
MILTON QLD 4000

Prepared by:
Mark Bridges BE Mech (Hons) MAAS
Principal Consultant

CONTENTS

1	INTRODUCTION	1
1.1	Environmental Noise Policies	1
1.2	Sensitive Receptors	4
2	EXISTING ACOUSTIC ENVIRONMENT	4
2.1	Background Noise Levels	4
2.2	Existing Daytime Trap Gully Noise Levels	7
3	NOISE CRITERIA	8
3.1	Mining Noise	8
3.1.1	Environmental Authority	8
3.1.2	EPP Noise 2019	8
3.1.3	Health Effects of Environmental Noise	9
3.1.4	Adopted Noise Criteria	9
3.2	Cumulative Noise	9
3.3	Low Frequency Noise	9
3.4	Construction Noise	10
4	ASSESSMENT	10
4.1	Terrain Details	10
4.2	Atmospheric Conditions	11
4.2.1	General Discussion	11
4.2.2	Prevailing Winds	11
4.2.3	Temperature Inversions	12
4.3	Overburden Emplacement Extension Noise Sources	12
4.4	Overburden Emplacement Extension Calculated Noise Levels	13
4.4.1	Baseline Trap Gully Noise Levels	13
4.4.2	Noise Calculation Procedure – Project Phase 1	15
4.4.3	Noise Calculation Procedure – Project Phase 2	16
4.4.4	Calculated Project Noise Levels	16
4.5	Other Project Components	16
4.6	Low Frequency Noise	17
4.7	Cumulative Noise Levels	17
4.8	Construction Noise Levels	18
4.8.1	Haul Road, ROM Stockpile and Parking Area	19
4.8.2	Mine Access Road and Administration Area Earthworks	19
4.8.3	Mine Administration Area Completion	20
4.8.4	Construction Noise Level Summary	20
4.9	Road Traffic Noise	21
5	CONCLUSION	21
6	REFERENCES	22
	APPENDIX A – NOISE SOURCE DETAILS	23
	APPENDIX B – NOISE CONTOUR FIGURES	25
	APPENDIX C – LONG TERM NOISE SURVEY DETAILS	31
	APPENDIX D – INSTRUMENT CALIBRATION CERTIFICATES	51

FIGURES

Figure 1 – Location Plan	2
Figure 2 – Project Layout Plan	3
Figure 3 – Sensitive Receptors	5
Figure 4 – Initial Comparison, Modelled vs Monitored Noise Levels, LAeq,1hr	14
Figure 5 – Modelled vs Monitored Noise Levels, Corrected with Half Wind Speed, LAeq,1hr	15
Figure A2 – Modelled Noise Source Locations	24
Figure B1 – Noise Contours, Existing Trap Gully Mine, Day Calm, LAeq,1hr	25
Figure B2 – Noise Contours, Existing Trap Gully Mine, Day East Wind, LAeq,1hr	26
Figure B3 – Noise Contours, Link Road Construction, Day Calm, LAeq,1hr	27
Figure B4 – Noise Contours, Link Road Construction, Day East Wind, LAeq,1hr	28
Figure B5 – Noise Contours, Overburden Reshaping, Day Calm, LAeq,1hr	29
Figure B6 – Noise Contours, Overburden Reshaping, Day East Wind, LAeq,1hr	30

GLOSSARY AND ABBREVIATIONS

The following acoustical terms and abbreviations are used in this report:

- **Sound Pressure** Small air pressure variations above and below normal atmospheric pressure that are perceived by human ears as sound;
- **Frequency** The rate of sound pressure fluctuations per second, expressed as cycles per second or hertz (Hz). Human ears in good condition can typically detect sound in the frequency range 20 Hz to 20,000 Hz (20 kHz), depending on sound level;
- **Decibels, dB** A noise level unit based on a logarithmic scale of pascals of sound pressure above and below atmospheric pressure. Human ears in good condition can typically detect sound pressures from the threshold of perception at 0 dB (20 uPa) to the threshold of pain at 140 dB (200 Pa). An increase of 10 dB is perceived as an approximate doubling of sound level by an average human ear;
- **dBL** Linear decibels, the same as dB but used to explicitly define a decibel scale in the absence of any frequency weighting;
- **dBA** A-weighted decibels, where the A weighting means frequencies below 500Hz and above 10kHz are artificially reduced to approximate the frequency response of an average human ear. Most sound monitoring instruments include an A-weighting option, enabling direct measurement of noise levels in dBA;
- **LA1** The A-weighted noise level exceeded 1% of the time (which can be thought of as the loudest 1% of the time) over a measurement period defined as 10 minutes in the EA;
- **LA10** The A-weighted noise level exceeded 10% of the time (which can be thought of as the loudest 10% of the time) over a measurement period defined as 10 minutes in the EA;
- **LA90** The A-weighted noise level exceeded 90% of the time (which can be thought of as the quietest 10% of the time) over a defined measurement period, usually 15 minutes or one hour, and widely accepted as the background noise level;
- **LAeq** The A-weighted equivalent continuous, or logarithmic average, noise level over a defined time period either measured or predicted at a specific location;
- **Sound Power** Sound energy emitted by a source, measured in watts (W) or expressed on a decibel scale with 0 dB representing 1 picowatt (1 pW) of sound power. While both sound pressure and sound power can be expressed on a decibel scale, the two are not interchangeable or directly comparable. Sound power levels are most commonly expressed as unweighted decibels (dBL) but can be expressed as A-weighted decibels (dBA);
- **Mtpa** Million tonnes per annum;
- **ML** Mining Lease;
- **AS1055** Australian Standard 1055:2018 Acoustics – Description and measurement of environmental noise;
- **DETSI** Qld Department of the Environment, Tourism, Science and Innovation;
- **EA** Environmental Authority;
- **ENM** RTA Technology's Environmental Noise Model software;
- **EPP Noise 2019** Environmental Protection (Noise) Policy 2019 (Qld);
- **PNCG** Qld Planning for Noise Control Guideline;
- **NPI** NSW Noise Policy for Industry;
- **ROM** Run-of-mine.

1 INTRODUCTION

Bridges Acoustics was commissioned by Hansen Environmental Consulting, on behalf of Batchfire Resources (Batchfire), to complete a Noise Impact Assessment as part of the Environmental Assessment Report (EAR) for the Trap Gully Overburden Emplacement Extension Project (the project).

Callide Mine is an operating open cut coal mine producing approximately 10 Million tonnes per annum (Mtpa) of product coal. The mine has been operating since 1944 and is located approximately 20 km north of Biloela in Central Queensland (Figure 1). Callide Mine produces thermal coal for the domestic and export markets. Callide Mine includes mining in four discrete mining areas: Dunn Creek, Trap Gully, The Hut and Boundary Hill. The project is located at the Trap Gully mining area.

The project involves an extension of the existing Trap Gully overburden emplacement to the west, including the realignment of the existing Link Road, and the construction and operation of ancillary mine infrastructure to support the existing Trap Gully mining operations (Figure 2). The overburden emplacement extension and ancillary mine infrastructure will be located on new mining lease (ML) areas adjoining the existing Trap Gully MLs (Figure 2). The project ancillary infrastructure will include the following:

- haul road connection, run of mine (ROM) coal stockpile area and heavy vehicle parking area to the south of the existing open cut pit;
- new mine access road off Forestry Road;
- mine administration area (MAA) to the west of the overburden emplacement extension area including office buildings (including new demountable buildings and use of existing buildings) and car parking area;
- incorporation of an existing off-site heavy mobile equipment assembly and major rebuild/shut down area into the new ML area; and
- drainage infrastructure for the overburden emplacement extension and ancillary infrastructure areas including catch drains, diversion drains and sediment dams.

The project will not involve any additional mining, increase in production, extension of the mine life or any other changes to the existing approved mining operations. In order to limit noise impacts from the project on neighbouring residents, the extension of the overburden emplacement and construction of project infrastructure are proposed to be limited to the day only.

1.1 Environmental Noise Policies

The Queensland Department of the Environment, Tourism, Science and Innovation (DETSI) has developed or adopted policies and recommended procedures to assess environmental noise levels from various noise source categories including industrial and mining developments in Queensland. The following policy and guidance documents are relevant to this assessment, listed in chronological order:

- *Environmental Protection Act 1994* (Qld, 1994) (EP Act 1994);
- *Planning for Noise Control Guideline* (EPA now DETSI, July 2004) (PNCG);
- *Draft Ecoaccess Guideline for the Assessment of Low Frequency Noise* (EPA now DETSI, November 2004) (Low Frequency Noise Guideline);
- *Noise Measurement Manual* (EHP now DETSI, 2013);
- *New South Wales Noise Policy for Industry* (NSW EPA, 2017) (NPI);
- *Australian Standard 1055:2018 Acoustics – Description and measurement of environmental noise* (Standards Australia, 2018) (AS1055);
- *The health effects of environmental noise* (Commonwealth of Australia, 2018);

Figure 1: Location Plan

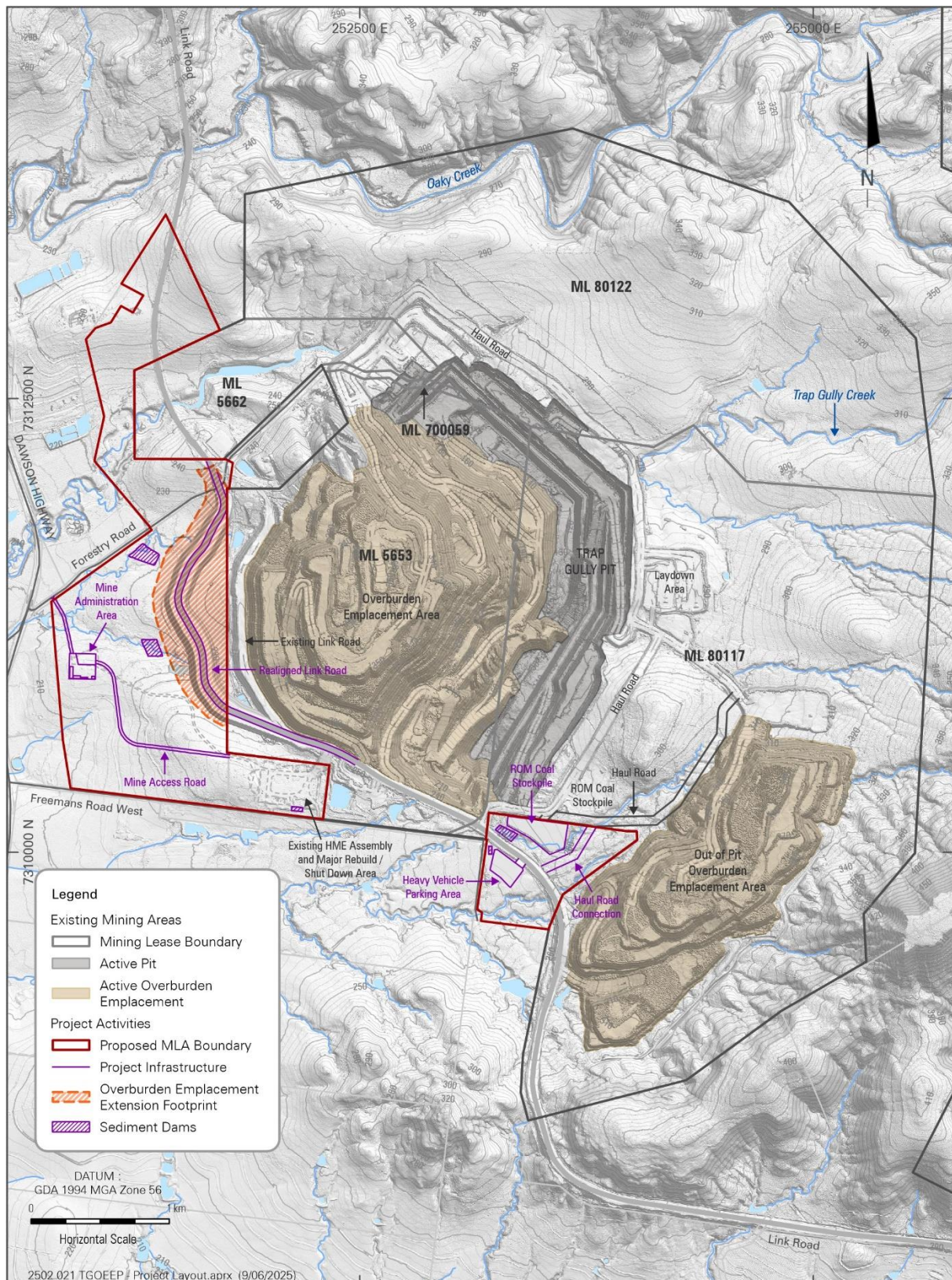


TRAP GULLY OVERBURDEN EMPLACEMENT EXTENSION PROJECT



Location Plan

Figure 2: Project Layout Plan



TRAP GULLY OVERBURDEN EMPLACEMENT
EXTENSION PROJECT

Project Layout



- The *Environmental Protection (Noise) Policy 2019* (Qld, August 2019) (EPP Noise 2019); and
- *Guideline – Application requirements for activities with noise impacts* (DETSI, July 2025).

The PNCG is generally considered to be outdated, however is referred to in the more recent Noise Measurement Manual and therefore remains relevant to this assessment.

Batchfire currently operates Callide Mine including the Trap Gully mining area under Environmental Authority (EA) EMPL00720413. Schedule E of the EA provides conditions to control impacts from noise at Callide Mine as described in Section 3.1.1.

1.2 Sensitive Receptors

A number of sensitive receptors closest to the project have been assessed and are listed in Table 1 generally from north to south, including their distance and direction from the project and distance from the project Mining Lease Area (MLA). Assessed receptors are also shown in Figure 3 and in Figures B1 to B6 in Appendix B.

Table 1: Assessed Receptors

Receptor	Distance from Project	Direction from Project	Distance from MLA
Brosnan 1	1.1 km	North-west	0.4 km
Brosnan 2	0.4 km	West	0.4 km
Brosnan 3	0.5 km	West	0.5 km
B & D Johnstone	0.5 km	West	0.1 km
J Scoleri	0.9 km	West	0.5 km
Durnsford	0.3 km	South	0.1 km
P & D Scoleri	0.4 km	South	0.1 km

All other receptors are located further from the project than the assessed receptors listed in Table 1 and would therefore receive lower noise levels from the project.

2 EXISTING ACOUSTIC ENVIRONMENT

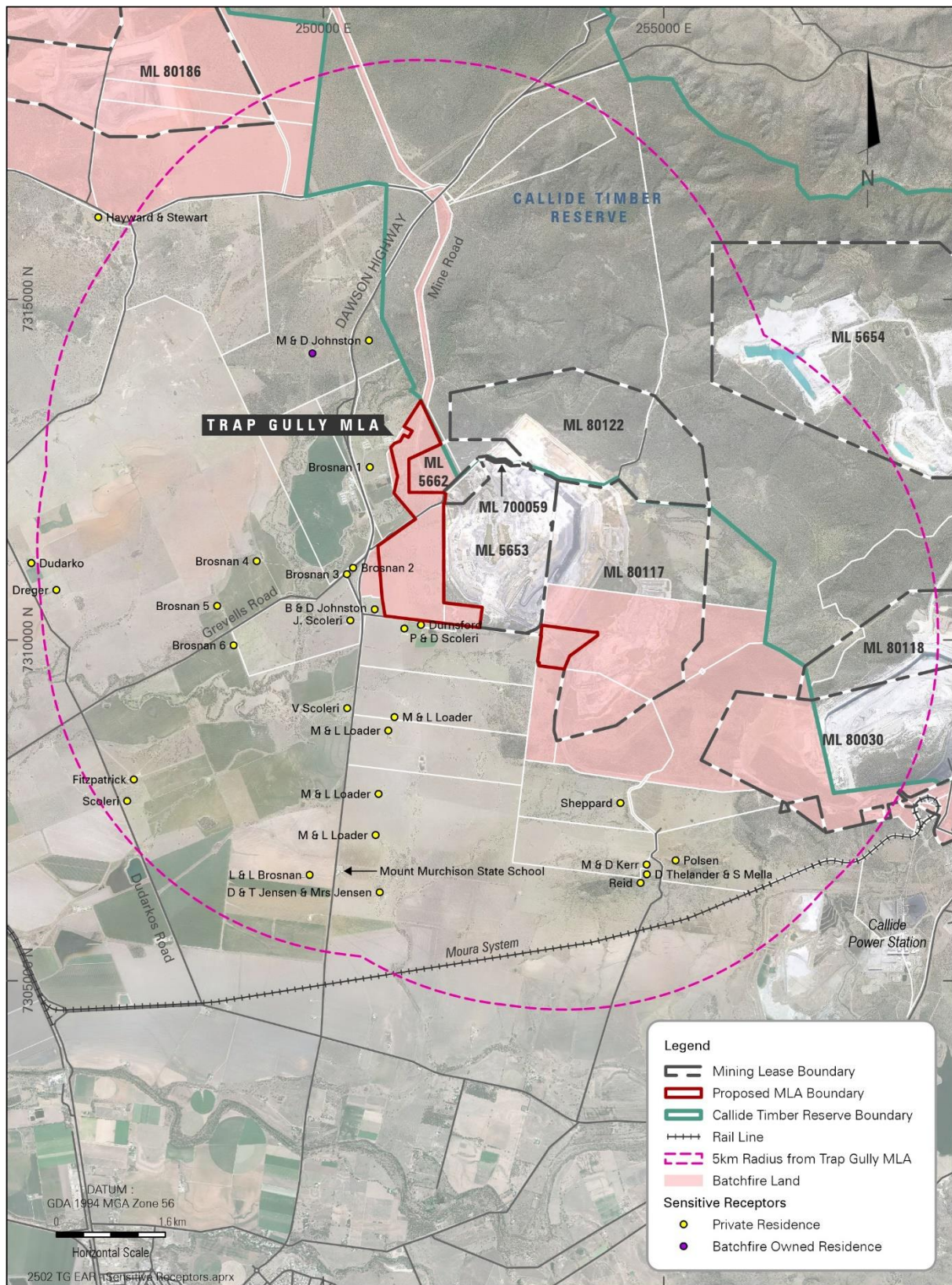
Existing environmental noise levels at locations representing assessed receptors were measured during the period 4 to 20 December 2024. The noise survey included a combination of long term unattended and short term attended noise measurements at locations close to and more remote from the project site. Relatively remote locations were primarily intended to measure background noise levels in the absence of mining noise while noise monitoring locations closer to the project were primarily intended to measure existing noise levels from Trap Gully.

2.1 Background Noise Levels

Long term background noise levels were measured at one location close to the project site and at two remote locations as further described below and shown on the noise contour figures in Appendix B:

- Location M1: on the western side of the Dawson Highway between Grevells Road and Freemans Road, approximately 1.4 km west of the existing Trap Gully mining area and approximately 330 m west of the proposed MLA;
- Location M2: approximately 30 m east of Mallinsons Road and 3 m north of Callide Kilburnie Road, approximately 6.9 km north-west of the existing Trap Gully mining area and approximately 5.8 km north-west of the proposed MLA; and

Figure 3: Sensitive Receptors



TRAP GULLY OVERBURDEN EMPLACEMENT EXTENSION PROJECT

- Location M3: approximately 20 m east of Dudarkos Road and 5 m north of Shepherds Road, approximately 7.2 km south-west of the existing Trap Gully mining area and approximately 6.3 km south-west of the proposed MLA;

Noise monitors consisted of Svan 977 (M1) or 955 (M2 and M3) sound level meters which measure noise levels to Class 1 accuracy according to IEC 61672. Monitor calibration was checked before and after the noise survey using a Svan SV36 acoustic calibrator producing 94 dB at 1 kHz. Instrument calibration certificates, from a NATA-accredited calibration laboratory, are attached in Appendix D.

Each monitor was housed in a weather resistant case and installed within a wire security cage chained to a power pole or tree, with the microphone attached via an extension cable and mounted approximately 1.4 m above the ground as required by relevant standards. The three monitors operated continuously from 4 to 21 December, a period of 17 days.

Each monitor was programmed to measure and store 1-second average noise levels. Monitor M1 measured noise levels in octave frequency bands from 31.5 to 16,000 Hz and total dBA, dBC and dBZ levels while monitors M2 and M3 measured total dBA levels. Data from each monitor were subsequently processed to determine LA90,15min background noise levels for the day, evening and night periods separately after excluding data affected by high wind speeds, rain or other atypical sources. Photographs of each monitor and detailed charts showing measured noise levels are attached in Appendix C. Table 2 presents a summary of daily background and ambient noise levels during the day period (7:00 am to 6:00 pm) at the three long term monitoring locations. The last row of the table includes the median background levels and average ambient levels over the entire monitoring period.

Table 2: Measured Background and Ambient Noise Levels, Day, December 2024

Day	Background Level LA90,15min			Ambient Level LAeq,15min		
	M1	M2	M3	M1	M2	M3
Wednesday 4 Dec	33	34	25	62	49	56
Thursday 5 Dec	33	32	27	62	50	59
Friday 6 Dec	32	30	29	61	49	55
Saturday 7 Dec	29	27	22	61	46	56
Sunday 8 Dec	29	27	22	59	49	55
Monday 9 Dec	30	35	26	62	50	57
Tuesday 10 Dec	31	33	27	62	49	56
Wednesday 11 Dec	31	30	28	62	49	57
Thursday 12 Dec	31	35	28	60	48	58
Friday 13 Dec	31	30	27	63	50	56
Saturday 14 Dec	31	30	29	60	48	57
Sunday 15 Dec	33	33	28	60	50	52
Monday 16 Dec	36	30	34	63	61	58
Tuesday 17 Dec	40	35	36	63	54	65
Wednesday 18 Dec	35	30	28	64	49	57
Thursday 19 Dec	36	32	33	62	50	57
Friday 20 Dec	31	27	26	60	46	57
Saturday 21 Dec	36	30	29	60	50	66
Median / Average	31	30	28	61	52	59

Table 2 indicates median background noise levels of 31, 30 and 28 LA90,15min at monitoring locations M1, M2 and M3 respectively. Ambient LAeq,15min noise levels are higher at M1 due to traffic on the nearby Dawson Highway with other locations receiving only intermittent noise from local traffic. Other significant sources at all locations include wind, birds and insects.

2.2 Existing Daytime Trap Gully Noise Levels

Existing noise levels from Trap Gully during the day were surveyed at the three long term monitoring locations and at four additional locations representing potentially affected receptors. All monitoring locations are shown on the noise contour figures in Appendix B and are further described below:

- Location T1: within a small parking area on the western side of the Dawson Highway approximately 3.3 km north of Forestry Road, 2.1 km south of Argoon Kilburnie Road, 2.8 km north-west of the project and 1.5 km north-west of the proposed MLA;
- Location T2: On the side of the Dawson Highway adjacent to the driveways of the Brosnan 1 and 2 properties listed in Table 1, approximately 950 m north of Forestry Road, 1.2 km north-west of the project and 490 m from the proposed MLA;
- Location T3: On the side of the Dawson Highway adjacent to the driveway of the Loader 2 property approximately 1.8 km south of Freemans Road West, 2.2 km south-west of the project and 1.8 km from the proposed MLA; and
- Location T4: Adjacent to Shorts Road near the driveway of the M & D Kerr property approximately 1.1 km south of the private haul road between the Trap Gully and Dunn Creek mining areas, 4.7 km south-east of the project and 3 km south-east of the proposed MLA.

Short term noise measurements over 15 minute periods were taken at each location on 4 December 2024 as the long term monitors were installed and again on 21 December 2024 as the monitors were retrieved. A Svan 977 class 1 sound level meter, mounted on a tripod with the microphone approximately 1.5 m above the ground, was programmed to measure and store 1-second 1/3 octave LAeq levels over each 15 minute period. Audible sounds were also recorded for later review. Sound level meter calibration was checked before and after each series of noise measurements using a Svan SV36 acoustic calibrator producing 94 dB at 1 kHz. Instrument calibration certificates, from a NATA-accredited calibration laboratory, are attached in Appendix D.

Subsequent analysis to determine noise levels from Trap Gully alone, by separating measured noise levels by time and/or frequency band as appropriate, was completed for each measurement period. Table 3 presents summary data from the short term noise survey including total measured noise levels and the separate noise contribution from Trap Gully operating alone.

Estimated levels are provided where the separate Trap Gully mine noise contribution could not be determined accurately, typically due to Trap Gully mining sources being only a small component of the total acoustic environment and therefore difficult to separate from other sources. In addition, mine noise can be separated from insect and bird noise by frequency band, however other sources such as traffic and wind cannot readily be separated from mine noise by frequency band.

Table 3: Measured Short Term Daytime Noise Levels, dBA, December 2024

Date, Start Time	Location	Total Measured Levels			Trap Gully Alone	
		LA1	LAeq	LA90	LA1	LAeq
4 Dec, 08:35	M3	57	44	26	Inaudible	Inaudible
4 Dec, 09:20	M2	58	50	34	Inaudible	Inaudible
4 Dec, 10:21	M1	76	62	32	Est 28	Est 25
4 Dec, 12:51	T1	81	68	43	Est 28	Est 25

Date, Start Time	Location	Total Measured Levels			Trap Gully Alone	
		LA1	LAeq	LA90	LA1	LAeq
4 Dec, 13:15	T2	75	65	61	Est 35	Est 33
4 Dec, 13:39	T3	72	58	29	Est 28	Est 25
4 Dec, 14:12	T4	64	60	52	40	Est 25
21 Dec, 09:02	T4	56	44	34	34	29
21 Dec, 09:32	T3	83	68	33	29	Est 25
21 Dec, 10:05	M1	77	64	38	Inaudible	Inaudible
21 Dec, 10:27	T2	75	63	39	Est 37	33
21 Dec, 10:48	T1	73	59	51	Est 32	Est 27
21 Dec, 13:05	M2	47	38	41	Inaudible	Inaudible
21 Dec, 13:46	M3	65	51	40	Inaudible	Inaudible

Results in Table 3 indicate Trap Gully mining activity was not a dominant noise source at most monitoring locations compared to other sources such as traffic, insects, birds and wind. Estimated or calculated average maximum LA1 noise levels from Trap Gully did not exceed the measured background noise level at any location during the day while LAeq levels from Trap Gully were in all cases significantly lower than the measured day-time background noise level.

3 NOISE CRITERIA

3.1 Mining Noise

3.1.1 Environmental Authority

Schedule E of EA EMPL00720413 includes conditions to limit noise at sensitive places. Conditions related to noise impact at receptors are reproduced below:

- E1** *Noise from the mining activity must not cause an environmental nuisance at any sensitive place.*
- E2** *When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place, and the results must be notified within **ten (10) business days** to the administering authority following completion of monitoring.*
- E3** *The method of measurement and reporting of noise levels must comply with the latest edition of the administering authority's 'Noise Measurement Manual'.*

3.1.2 EPP Noise 2019

The EPP Noise 2019, made under the EP Act 1994, defines acoustic quality objectives to protect health, wellbeing and amenity for residents and the occupants of other public and private premises including parks and gardens. The acoustic quality objectives in Schedule 1 of the EPP Noise 2019 applicable to residences are reproduced below.

Schedule 1 Acoustic Quality Objectives

<i>Sensitive receptor</i>	<i>Time of day</i>	<i>Acoustic quality objectives (measured at the receptor) dBA</i>			<i>Environmental value</i>
		<i>L_{Aeq,adj,1hr}</i>	<i>L_{A10,adj,1hr}</i>	<i>L_{A1,adj,1hr}</i>	
<i>residence (outdoors)</i>	<i>day and evening</i>	50	55	65	<i>health and wellbeing</i>
<i>residence (indoors)</i>	<i>day and evening</i>	35	40	45	<i>health and wellbeing</i>
	<i>night</i>	30	35	40	<i>health and wellbeing in relation to sleep</i>

3.1.3 Health Effects of Environmental Noise

Section 7.4 of *The Health Effects of Environmental Noise* concludes the following health based limits on environmental noise are warranted at residences:

- A limit of 55 dBA at the external façade of a residence during the night; and
- A limit of 60 L_{Aeq,16hr} at the external façade during the day.

The recommended limits are intended to minimise adverse health effects, not to protect amenity.

3.1.4 Adopted Noise Criteria

The EPP Noise 2019 noise criteria are lower than criteria in *The Health Effects of Environmental Noise* and are therefore adopted for this assessment. The EPP Noise 2019 acoustic quality objectives are also relevant to the requirements of EA Condition E1 to prevent mining activity causing an environmental nuisance.

Trap Gully operates 24 hours per day, however project mining activities will be limited to the day to avoid the more sensitive evening and night periods. Noise criteria adopted for this assessment for all sensitive places, for the day period, are therefore:

- 50 L_{Aeq,adj,1hr};
- 55 L_{A10,adj,1hr}; and
- 65 L_{A1,adj,1hr}.

3.2 Cumulative Noise

Cumulative or combined noise levels from more than one industrial or mining development are also subject to the EPP Noise 2019 acoustic quality objectives. Cumulative noise criteria are therefore identical to the project noise criteria listed in Section 3.1.

3.3 Low Frequency Noise

The Low Frequency Noise Guideline suggests a criterion of 50 dBL inside a residence for the frequency range 10 Hz to 200 Hz to minimise the potential for impacts on noise sensitive receivers such as residences. This includes frequencies in the range 100 Hz to 200 Hz which are produced by heavy vehicle engine exhausts, which are likely to be the main sources of low frequency noise from the project.

It should be noted that dBL means unweighted decibels, without the usual A-weighting correction that is normally applied to approximate the frequency response of an average human ear. There is no standard dBA equivalent to the suggested criterion of 50 dBL.

The Low Frequency Noise Guideline requires an assessment of low frequency noise to assume windows and doors are closed to reduce background noise levels and to avoid contamination of the noise measurement with wind noise or other extraneous external noise sources. This approach is adopted because low frequency noise inside a dwelling is more audible when windows and doors are closed, thereby lowering background noise levels in the dwelling.

A conservative difference of 10 dBA has been adopted between inside and outside noise levels with windows and doors closed, therefore the 50 dBL indoor criterion is approximately equivalent to an external criterion of 60 dBL. An external level of 60 dBL has been adopted as the low frequency noise criterion for this assessment.

3.4 Construction Noise

Construction works associated with the project have the potential to be audible at receptors depending on the particular construction activity and weather conditions occurring at the time. The Queensland Government has not developed a specific construction noise policy, therefore the EPP Noise 2019 acoustic quality objectives described in Section 3.1 are adopted for the construction noise assessment.

The adopted outdoor acoustic quality objectives for construction work associated with the project are therefore 50 LAeq,1hr, 55 LA10,1hr and 65 LA1,1hr during the day.

4 ASSESSMENT

Predicted environmental noise levels from the project have been calculated using RTA Technology's Environmental Noise Model (ENM) software. ENM is a general purpose noise modelling package that combines terrain and noise source information with other input parameters such as weather conditions to predict noise levels at specific receiver locations or as contours over a specified receiver area. It is recognised as one of the most appropriate choices of model software for situations involving complex topography and a large number of individual noise sources, and where a detailed assessment of the effects of atmospheric conditions on noise propagation is required.

The standard ENM package includes data input modules to allow terrain and noise source information to be entered and amended, plus an initial setup page containing terrain and source lists and modelled weather conditions for each scenario. All terrain and source files were prepared for this assessment using a combination of AutoCad and Excel based data then automatically converted to ENM format terrain and source files using custom software. All outputs were obtained using equivalents to ENM's standard sectioning and contouring algorithms. Figure A2 in Appendix A shows the terrain and noise source locations included in the model. Noise contour figures are presented in Appendix B for the project operating in conjunction with normal Trap Gully operations.

The noise model was set up to calculate LAeq,1hr noise levels from the project and Trap Gully mining operations during the day under calm and noise enhancing weather conditions as further described below.

4.1 Terrain Details

Batchfire provided terrain data over the Trap Gully mining area and immediate surrounds in the form of ground contours in 2 m vertical intervals. The terrain file was extended to include all potentially significant receptors based on 1 metre Digital Elevation Models (DEMs) obtained from Geosciences Australia's web portal, converted to ground elevation contours in 1 m vertical intervals. Minor adjustments were required to match the two datasets at their common boundary. Ground surface types including forest, grassland, loose packed earth and hard-packed gravel were assigned to various areas based on the visual appearance of each area of terrain from Google Earth.

Ground contours over the Trap Gully mining area and receptor area are shown in the figures in Appendices A and B.

4.2 Atmospheric Conditions

4.2.1 General Discussion

A review of atmospheric conditions that occur in the vicinity of the project site is required to determine the effect of such conditions on noise propagation from the project. Parameters such as air temperature, relative humidity, wind speed profile and vertical temperature gradient can significantly influence noise levels at distances of a few kilometres from a source, with wind and vertical temperature gradient being the dominant factors.

The Planning for Noise Control Guideline (PNCG) recommended the following default weather conditions should be modelled:

- A 3°C/100m inversion during the night where inversions occur for at least 30% of the time during winter evenings and nights plus a 2m/s drainage flow from source to receiver where the source is on higher ground than the receiver with no intervening hills; or
- A gradient wind of up to 3 m/s from source to receiver where such a wind occurs for at least 30% of the time in any season or time period.

The PNCG has been superseded by EPP Noise 2019, however it is the most recent Queensland policy document that provided guidance on the treatment of weather effects on noise propagation. Noise policies in other Australian states, such as the NSW Noise Policy for Industry (NPI), include similar recommendations.

A weather data file produced by the project air quality consultants, based on a combination of The Air Pollution Model (TAPM) and the CALMET meteorological model representing the approximate centre of Trap Gully, was analysed to determine prevailing air temperature and wind conditions in the area.

4.2.2 Prevailing Winds

Analysis of the CALMET dataset supplied by the project air quality consultants was completed by:

- Sorting the data by season and time period (day, evening and night) and discard data for the evening and night periods;
- For each season, separating the data into 16 compass directions; and
- For each compass direction, summing the hours in which vector wind speeds remain in the range 0.5 to 3 m/s, considering winds up to 45° from the compass direction, and expressing these hours as a percentage of the total time in that season.

The result of this process is the percentage occurrence of potentially noise enhancing winds during the day in each season and direction, as presented in Table 4. Winds from any direction occur less than 30% of the time and are therefore considered insignificant enough to not require consideration in this assessment according to the PNCG and more recent noise policies in other Australian states.

Table 4: Analysis of Prevailing Winds, Day, CALMET Data.

Wind Direction	Occurrence of Daytime Noise Enhancing Winds, % of Time per Season			
	Summer	Autumn	Winter	Spring
N	14	5	12	14
NNE	18	8	11	14
NE	16	13	12	14
ENE	20	18	15	12
E	15	22	17	8

Wind Direction	Occurrence of Daytime Noise Enhancing Winds, % of Time per Season			
	Summer	Autumn	Winter	Spring
ESE	9	20	19	7
SE	8	16	20	4
SSE	4	14	22	4
S	3	8	20	3
SSW	2	5	14	3
SW	1	2	12	3
WSW	1	0	9	3
W	0	0	8	4
WNW	1	1	10	5
NW	4	2	11	8
NNW	6	3	10	9

Table 4 shows prevailing winds in the range 0.5 to 3 m/s do not occur during the day period, primarily due to prevailing winds regularly exceeding 3 m/s during the day and therefore falling outside this speed range. Winds over 3 m/s do not cause significant noise enhancement to a remote receptor as high wind speeds tend to cause a turbulent air stream which disrupts and dissipates sound waves and sound energy.

Results indicate prevailing winds are not required to be considered during the day, however further analysis of wind speeds reported during the noise monitoring periods in December 2024 is included in Section 4.4.1.

4.2.3 Temperature Inversions

A temperature inversion occurs when cold air pools below warmer air due to the ground surface cooling at night. The project is only proposed to operate during the day therefore temperature inversions are not expected to affect noise propagation to receptors and have not been considered.

The opposite of a temperature inversion is a temperature lapse. A lapse occurs when the ground surface is heated by the sun and in turn heats a layer of air just above the ground, resulting in air temperature decreasing with increasing height. In conjunction with air turbulence which results from warm air trying to rise past cooler air, a lapse results in noise propagation over long distances being inhibited and received noise levels being reduced.

Calm atmosphere conditions during the early morning and evening, with the same ground and air temperature in the absence of solar heating or the ground radiating heat to space, result in a vertical temperature gradient of -0.9 °C/100m due to reducing air pressure with height which is known as the adiabatic lapse rate. A typical sunny day results in a lapse rate in the range -2 to -3 °C/100m.

4.3 Overburden Emplacement Extension Noise Sources

The Trap Gully mining area does not include coal processing equipment as all Run-of-Mine (ROM) coal is transported to the Dunn Creek mining area for stockpiling, processing and transport from site. Noise sources at Trap Gully are therefore limited to mobile and semi-mobile mining machines and smaller sources such as lighting plants, water pumps and light vehicles.

Sound power levels produced by each type of machine depend on a number of factors including the make, model, age and condition of each machine. Table 5 presents typical sound power levels for each

machine type based on manufacturer's data and/or noise measurements around similar machines at other mines in NSW and Queensland. More detailed source spectra in 1/3 octave bands are attached to this report in Appendix A.

Table 5: Modelled Sound Power Levels.

Source Code	Description	Representative Type	Sound Power Level, dBA
DL	Dragline	P&H 9020	118
D	Drill	C700D	119
E	Excavator	PC7000, EX5500	122
Z	Dozer	D10, D11	117
L	Loader	992	116
T	Truck	930E, 789, EH4500	120
G	Grader	18M, 24H	115
W	Watercart	777	119

Batchfire provided detailed Global Positioning System (GPS) location and operating data for Trap Gully mining equipment covering two periods of over 24 hours in early and late December 2024, coinciding with the short term noise survey periods described in Section 2.2. GPS data covered all excavators, loaders, haul trucks, dozers, graders and water carts and included operating status including switched off, idling or operating. These data allowed the number of mining machines and their exact operating locations to be determined for correlation with measured noise levels, permitting a series of site-specific calibrated noise models to be constructed.

The dragline and drills were not included in the GPS data therefore these machines were assumed to operate continuously at locations specified by Batchfire for that time period.

4.4 Overburden Emplacement Extension Calculated Noise Levels

4.4.1 Baseline Trap Gully Noise Levels

The availability of GPS equipment tracking data for the existing Trap Gully mining area allowed for a detailed assessment of existing daytime mine noise levels. The following noise modelling strategy was adopted to calculate baseline daytime mine noise levels for direct comparison with results from the short term noise survey reported in Table 3:

- Assign representative equipment operating locations over the Trap Gully mining area and along the section of realigned Link Road. A total of 127 locations were assigned as shown in Figure A2 in Appendix A;
- Identify all equipment operating and location entries in the GPS tracking files for each 15 minute daytime noise monitoring period;
- For each item of equipment tracked by GPS, determine the operating location(s) and percentage of time the machine was operating at or near each location. Only periods of machine operation were included, ignoring periods of time the machine was switched off or idling. Multiple short periods of idling shown for excavators, in which the excavator's engines are likely to have remained operating at full speed, were included as operating time;
- Add each machine's noise contribution to the total sound power level for each source location;
- Add sound power for equipment not tracked by GPS, including the dragline and two drills, at representative working locations as advised by Batchfire;

- Include specific weather data in the noise model for each 15 minute period as reported by the Bureau of Meteorology's Thangool Airport weather station. A vertical temperature gradient of -3 °C/100m represented the sunny conditions noted during the noise surveys. Wind speeds over 3 m/s reported by the weather station, in which air turbulence would limit wind-related noise enhancement, were changed to a lower value of wind speed using the equation:

$$\text{Modelled wind speed} = (6 \text{ m/s} - \text{reported wind speed})$$

- Calculate received noise levels to the noise monitoring location for comparison with measured noise levels at that location.

Initial calculated noise levels were compared to the measured or estimated Trap Gully noise contribution at each monitoring location to determine if any site-specific calibration factor or other adjustment was required to the noise model. Results from that comparison are shown in Figure 4 excluding the following two periods in which a meaningful comparison could not be made:

- The first noise monitoring period at M1 in which the GPS equipment tracking system showed all machines switched off or at idle; and
- The second noise monitoring period at T4 which included significant audible noise from an unidentified mining vehicle on the Link Road from Trap Gully to Dunn Creek, however the GPS tracking system did not report any vehicle movements on this section of the Link Road.

Figure 4: Initial Comparison, Modelled vs Monitored Noise Levels, Day LAeq,1hr.

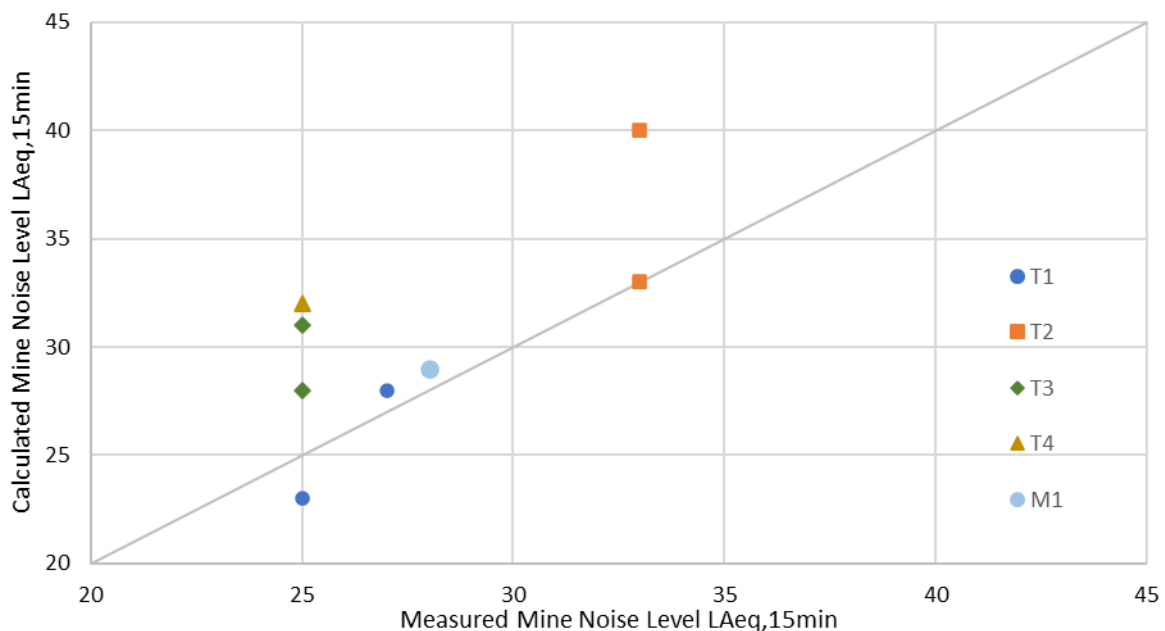


Figure 4 shows modelled or calculated noise levels are higher than measured noise levels for all except two noise monitoring periods, indicating the noise model over-predicts noise levels from Trap Gully and is unnecessarily conservative.

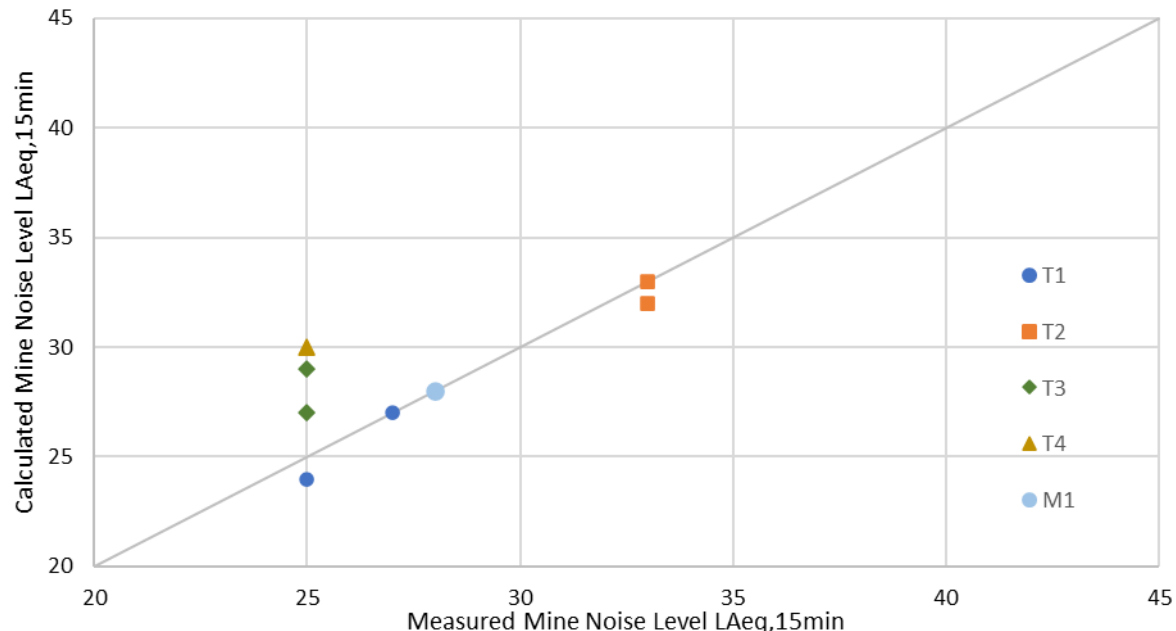
A better correlation between modelled and measured noise levels was obtained when the modelled wind speeds were halved with results shown in Figure 5. This adjustment to the noise model is considered appropriate for the following reasons:

- Wind speeds noted during the noise survey were generally inconsistent with and lower than the reported wind speeds, including an approximate correction for wind speeds at the standard height of 10 m above the ground and the speed observed at a height of approximately 1.8 m above the ground; and

- The noise model software is widely acknowledged to over-state received noise levels under downwind conditions.

Figure 5 indicates calculated noise levels remain higher and more conservative than measured noise levels for the majority of noise monitoring periods. The modified noise model under-predicts noise levels in only two out of eight noise monitoring periods with a maximum difference of 1 dBA.

Figure 5: Modelled vs Monitored Noise Levels With Halved Wind Speed, Day LAeq,1hr.



Average mining equipment operating durations and locations from the various noise monitoring time periods were used to calculate average existing noise levels from the Trap Gully mining area, as a baseline for comparison with calculated project phase 1 and 2 noise levels. Average noise levels for existing mining operations were calculated under calm conditions and with a reasonable worst case 1.5 m/s easterly wind.

4.4.2 Noise Calculation Procedure – Project Phase 1

The proposed extension of the main Trap Gully in-pit Overburden Emplacement (OBE) includes two principal phases:

Phase 1: Realignment of a section of the Link Road located on a low bench of the existing OBE; and

Phase 2: Shaping and rehabilitation of the western face of the OBE.

Phase 1 includes redirecting overburden trucks to the new road alignment to deposit overburden and form the road, then shaping this material and grading the road surface. All machines will travel from existing heavy vehicle haul roads to the Link Road realignment from the southern end of the new alignment. No additional mining machines are required or proposed for this phase.

Noise levels were calculated for this phase, beginning with the baseline noise model of existing Trap Gully mining operations described in Section 4.4.1, via the following procedure:

- Redirect 50% of overburden trucks that previously hauled overburden to the southern face of the in-pit OBE to the realigned Link Road route;
- Redirect 50% of dozer, grader and water cart operating time from the southern OBE face to the Link Road route, consistent with the haul trucks; and

- The remaining 50% of these trucks, dozers, graders and water carts continued travelling to and operating in the original locations on the southern face of the OBE. Equipment working in other OBE locations, including the northern face of the in-pit OBE and the out-of-pit OBE to the south-east, remained unchanged in the noise model.

Reasonable worst case site-specific weather conditions were adopted including calm conditions and a 1.5 m/s easterly wind, consistent with the typical weather conditions noted during the noise survey.

4.4.3 Noise Calculation Procedure – Project Phase 2

Phase 2 of the project includes operating up to five dozers on the western face of the OBE to shape overburden material and create an appropriate landform for rehabilitation. Noise levels from this phase have been calculated via the following procedure:

- Calculate noise levels from the 5 dozers, including typical time corrections for each dozer as noted in the GPS tracking data; and
- Add noise levels from baseline Trap Gully mining operations to noise levels from the proposed dozer movements to determine noise levels from this phase of the project, for both calm wind and reasonable worst case 1.5 m/s easterly wind conditions.

4.4.4 Calculated Project Noise Levels

Calculated noise levels for existing Trap Gully mining operations (baseline) and for project phases 1 and 2 described above, are presented in noise contour figures B1 to B6 in Appendix B and in Table 5 for the closest receptors for comparison with the 50 LAeq,1hr criterion. Calculated noise levels in Table 5 comply with the 50 LAeq,1hr daytime noise criterion at all assessed receptors.

Table 5: Calculated Baseline and Project Noise Levels, Day LAeq,1hr

Receptor	No Wind			East Wind		
	Baseline	Project Phase 1	Project Phase 2	Baseline	Project Phase 1	Project Phase 2
Brosnan 1	30	33	36	33	35	38
Brosnan 2	26	35	37	30	38	39
Brosnan 3	26	35	36	30	37	39
B & D Johnstone	27	36	38	32	39	40
J Scoleri	27	34	35	31	37	38
Durnsford	34	39	40	38	42	42
P & D Scoleri	32	38	39	36	41	41

4.5 Other Project Components

In addition to the OBE extension assessed in Section 4.4, the project includes a number of other components that are unlikely to have a significant effect on noise levels at receptors including:

- ROM coal stockpile, heavy vehicle parking area and haul road connection. These facilities will replace similar nearby facilities and will be located immediately adjacent to a number of busy areas including a haul road, the Link Road, active mining areas and OBE areas. Heavy vehicles using these facilities will visit for relatively short periods of time. Noise from these areas will be difficult to distinguish from existing noise from heavy vehicles operating on the adjacent haul roads and within adjacent mining and OBE areas;

- Mine access off Forestry Road and MAA. Excluding heavy vehicles and earthmoving vehicles required to construct these facilities as assessed in Section 4.8, noise sources associated with the mine access road and MAA will include light vehicle movements, occasional delivery and waste truck movements and air conditioners on administration and other buildings. Noise from these sources will be insignificant at any receptor compared to noise from heavy mining equipment in the nearby mining and OBE areas;
- Incorporating an existing off-site heavy equipment assembly and shutdown area into the new MLA. No changes are proposed to activities and noise sources within this area; and
- Drainage infrastructure including catch drains, diversion drains and sediment dams. These project components do not produce noise during normal operations.

Receptor noise levels will not be affected by these minor project components. A detailed assessment of each component is therefore not required.

4.6 Low Frequency Noise

Low frequency noise levels, defined in the Low Frequency Noise Guideline as all project noise in the frequency range 10 Hz to 200 Hz, have been assessed using the noise model in the following configuration:

- Include source sound power levels up to and including the 200 Hz 1/3 octave band, with noise levels in all higher frequency bands set to zero. As the noise model itself is limited to the range 25 Hz to 20 kHz, all source noise below the 25 Hz band was included in the 25 Hz band;
- Calculate dBL noise levels, rather than the usual dBA noise levels, to the worst case receptor Durnsford for comparison with relevant low frequency noise criteria. Calculations were completed for the day period, for baseline Trap Gully noise levels and for project phases 1 and 2, with a reasonable worst case 1.5 m/s east wind.

Calculated low frequency noise levels in 1/3 octave bands and total dBL levels are presented in Table 6 to Durnsford. This is the closest receptor to Trap Gully and is predicted to receive the highest noise levels according to Table 5.

Table 6: Predicted Project Low Frequency Noise Levels, Day East Wind, Leq,1hr.

Frequency Band, Hz	≤25	31	40	50	63	80	100	125	160	200	Tot.	External Noise Limit
	Predicted Noise Level, dBL, to Durnsford											
Baseline	43	45	43	46	51	39	43	41	38	37	55	60
Project Phase 1	47	49	47	50	55	43	47	45	42	41	59	
Project Phase 2	44	46	45	47	51	40	47	42	39	38	56	

Results in Table 6 indicate total low frequency noise levels would remain below the 60 Leq,1hr external noise criterion at the closest receptor and therefore at all receptors, for baseline Trap Gully mining noise and for both project phases.

4.7 Cumulative Noise Levels

Receptors may receive audible noise from more than one industrial or mining development. Other known industrial developments in the region include:

- Callide Mine's Boundary Hill, The Hut and Dunn Creek mining areas;

- Callide Power Station, a coal-fired power station located south of Callide Mine's Dunn Creek mining area and east of monitoring location T4 as shown in Figure 3; and
- BettaPork, a pig breeding and raising business based near the Dawson Highway just north of Forestry Road and represented by monitoring location T2.

Short term noise monitoring described in Section 2.2 was also intended to determine cumulative noise levels where other industrial and mining sources may be audible. Noise from either Callide Power Station or the Dunn Creek mining area was generally audible at monitoring location T4, at an estimated noise level reaching 30 dBA. This source may contribute up to 30 LAeq,1hr at five receptors close to monitoring location T4 depending on wind speed, wind direction and other factors.

No other industrial noise sources were noted at any other location, including at monitoring location T2 which did not receive audible noise from the BettaPork facilities during the day. Cumulative noise levels have therefore been calculated in Table 7 for the five Trap Gully receptors located closest to Callide Power Station and the Dunn Creek mining area. All other assessed receptors are not expected to receive significant noise from other industrial developments therefore cumulative noise levels do not require calculation for those receptors.

Table 7: Calculated Cumulative Noise Levels, LAeq,1hr

Receptor	Project			Callide Power Station	Cumulative Level		
	Baseline	Phase 1	Phase 2		Baseline	Phase 1	Phase 2
Sheppard	33	33	33	30	35	35	35
Polsen	25	25	25	30	31	31	31
M & D Kerr	26	26	26	30	31	31	31
D Thelander & S Melia	24	24	24	30	31	31	31
Reid	21	21	21	30	31	31	31

Calculated cumulative noise levels in Table 7 do not exceed 35 LAeq,1hr which is well within the 50 LAeq,1hr EPP Noise 2019 acoustic quality objectives.

4.8 Construction Noise Levels

The project includes various components, some of which involve a distinct construction phase while other components do not. The following two project components have been assessed in Section 4.4 as an extension of mining noise rather than as construction noise:

- Construction of the realigned section of the Link Road on a low bench of the extended in-pit OBE; and
- Shaping of the western face of the OBE prior to rehabilitation.

The following project components have a distinct construction phase followed by an operational phase, are located relatively close to receptors and therefore require construction noise levels to be considered separately:

- haul road connection, run of mine (ROM) coal stockpile area and heavy vehicle parking area to the south of the existing open cut pit; and
- new mine access road off Forestry Road;
- MAA to the west of the overburden emplacement extension area, including office buildings (including new demountable buildings and use of existing buildings) and car parking area; and

- drainage infrastructure for ancillary infrastructure areas including catch drains, diversion drains and sediment dams.

Other project components either do not require significant construction work or are located too far from receptors to cause construction noise impacts:

- incorporation of an existing off-site heavy mobile equipment assembly and major rebuild/shut down area into the new ML area.

4.8.1 Haul Road, ROM Stockpile and Parking Area

The haul road connection, ROM coal stockpile area and heavy vehicle parking area to the south of the existing open cut pit are all located adjacent to active mining areas and heavy equipment haul roads. Nearest receptors are at least 1.8 km from these components.

Noise from earthmoving machines required to construct these components is likely to be inaudible and, if audible occasionally, will be indistinguishable from existing heavy mining machines operating nearby. A detailed construction noise assessment is not required for these relatively small scale and remote project components.

4.8.2 Mine Access Road and Administration Area Earthworks

Construction of the mine access road off Forestry Road and earthworks associated with the MAA is expected to be completed using a separate fleet of smaller earthmoving machines rather than large mining machines. This fleet is also expected to construct drainage infrastructure including catch drains, diversion drains and sediment dams.

Machines included in the construction fleet would depend on the contractor engaged for the work and other factors, however the following indicative machines and average sound power levels have been considered:

One excavator in the 15 to 30 tonne range	108 dBA;
Three highway trucks	104 dBA each;
One backhoe	106 dBA;
One grader	106 dBA;
One sheepfoot roller	102 dBA;
One smooth drum roller	102 dBA;
One road-type water cart	104 dBA;
One skid-steer loader	102 dBA;
Various smaller machines including light vehicles	106 dBA total
Total assumed construction sound power level	115 dBA

Construction of the mine access road and bulk earthworks to construction the MAA has been assessed in Table 8 to the five nearest receptors, assuming all machines in the fleet operating simultaneously and distributed evenly along the road alignment including the MAA area. Calculated noise levels in Table 8 are predicted to meet the 50 LAeq,1hr criterion.

Table 8: Calculated Mine Access Road and MAA Construction Noise Levels, Day LAeq,1hr

Receptor	Distance Receptor to Mine Access Road, m		Received Level, LAeq,1hr
	Closest	Furthest	
Brosnan 2	480	1,440	47
Brosnan 3	590	1,495	45
B & D Johnston	480	1,020	48
P & D Scoleri	430	1,270	48
Durnsford	350	1,310	49

4.8.3 Mine Administration Area Completion

Additional construction work associated with the MAA would be required after bulk earthworks is completed. Additional construction tasks include preparing foundations for demountable administration buildings, constructing trenches and installing buried services, delivering and installing demountable buildings and finishing carparking and other hardstand areas.

Machines likely to be required for these tasks and average sound power levels per machine include:

One highway truck to deliver materials	103 dBA;
One backhoe	104 dBA;
One grader	104 dBA;
One smooth drum roller	102 dBA;
One road-type water cart	102 dBA;
One mobile crane	102 dBA;
Various smaller machines including light vehicles	104 dBA total
Total assumed construction sound power level	112 dBA

Construction work to complete the MAA has been assessed in Table 9 to the three nearest receptors, assuming all machines in the fleet operating simultaneously in the approximate centre of the MAA. Calculated noise levels in Table 9 are predicted to meet the 50 LAeq,1hr criterion.

Table 9: Calculated Mine Administration Area Construction Noise Levels, Day LAeq,1hr

Receptor	Distance Receptor to Mine Administration Area	Received Level, LAeq,1hr
Brosnan 2	540 m	49
Brosnan 3	640 m	47
B & D Johnston	610 m	48

4.8.4 Construction Noise Level Summary

Tables 8 and 9 indicate construction work associated with the mine access road and MAA, including drainage work associated with these project components, is likely to be audible at the five closest receptors, however reasonable worst case construction noise calculations indicate exceedances of the EPP Noise 2019 acoustic quality objectives are unlikely to occur at any receptor.

Construction of the OBE extension and OBE shaping prior to rehabilitation has been considered as mining noise rather than construction noise as it would be completed using the mining machine fleet. No separate assessment of construction noise associated with these components is therefore required.

The existing off-site heavy mobile equipment assembly and major rebuild area will continue to be used intermittently. The project does not propose any significant changes to this area apart from incorporating the proposed mine access road into the area, therefore no construction work specifically associated with this area is required.

4.9 Road Traffic Noise

A detailed traffic noise assessment is not required for this project for the following reasons:

- Construction of the proposed realigned Link Road and in-pit OBE extension will use the existing mining equipment fleet, staff, fuel and other existing resources. These project components will not affect road traffic flows associated with the Trap Gully mining area or Callide Mine;
- The proposed mine access road will meet Forestry Road less than 250 m east of the Dawson Highway. Traffic associated with construction of the mine access road and MAA, and future vehicle movements to and from the MAA, will primarily travel on the Dawson Highway which is a major regional road carrying significant light and heavy vehicle traffic in all time periods. Minor additional traffic noise from vehicles accessing the mine access road and the MAA would be insignificant at any receptor compared to existing traffic noise from the Dawson Highway.

5 CONCLUSION

The results of this assessment indicate the project would produce acceptable environmental noise levels at all receptors compared to the EPP Noise 2019 acoustic quality objectives.

Application requirements for activities with noise impacts requires any noise generating development to be operated in a way that protects the environmental values of the acoustic environment. This requirement will be satisfied by the project meeting the EPP Noise 2019 acoustic quality objectives. It also sets a performance objective that sound released into the environment is managed so that adverse impacts on environmental values, including health and wellbeing and sensitive ecosystems, are prevented or minimised. This performance objective will be met by the project as compliance with both the EPP Noise 2019 acoustic quality objectives and the *Health Effects of Environmental Noise* criteria will be met at all receptors.

As environmental values are protected and adverse impacts due to the project have been avoided by limiting works to the least sensitive day period, no additional noise mitigation or management measures are required.

Construction of the proposed mine access road and MAA is likely to be audible at the five closest receptors however construction noise levels are also predicted to meet the EPP Noise 2019 acoustic quality objectives.

No low frequency, road traffic or other acoustic impacts are expected due to the project.

Based on the results of this assessment, the project can operate within relevant criteria without requiring specific noise mitigation measures.

6 REFERENCES

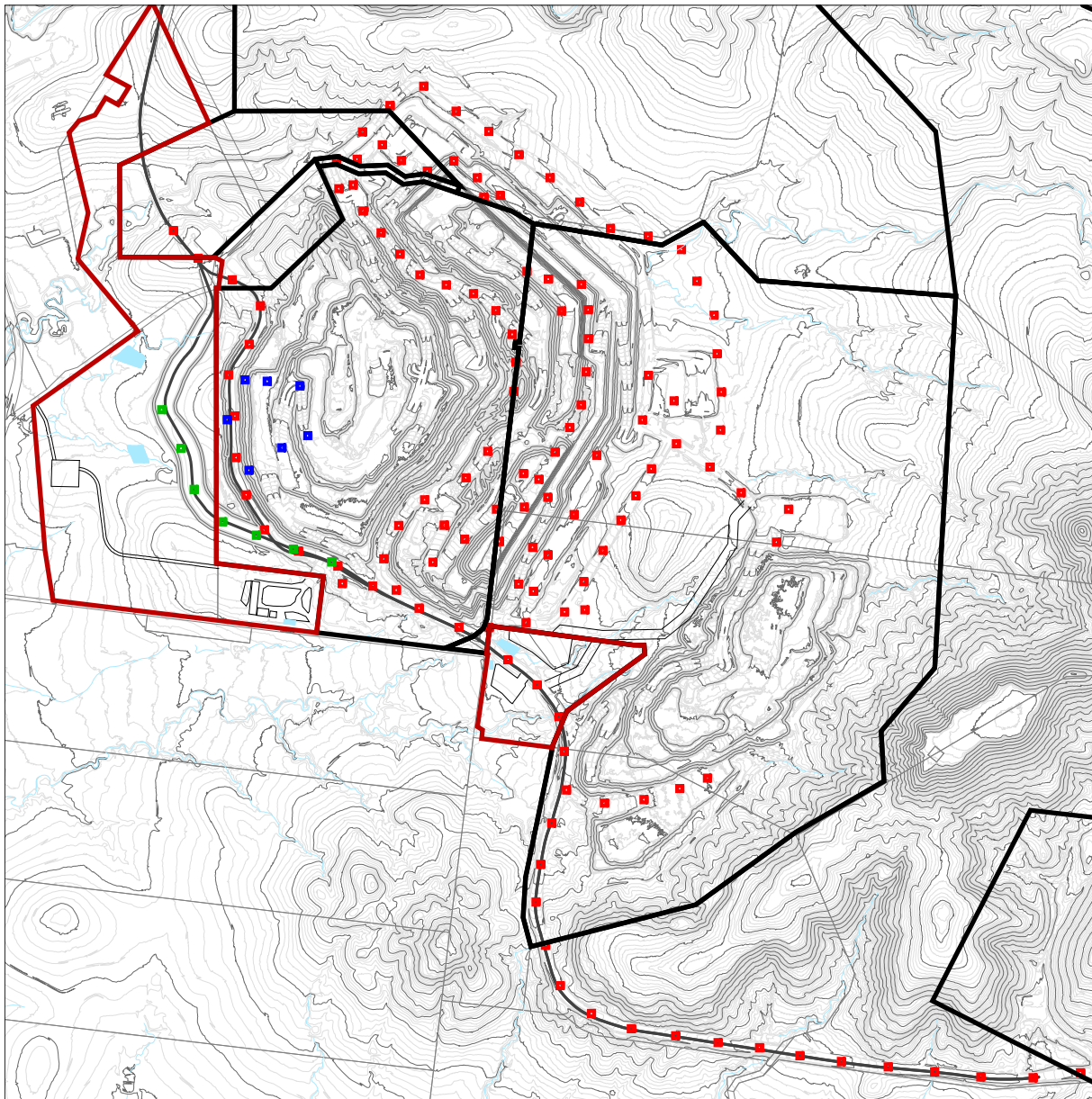
Environmental Protection Act 1994 (Qld, 1994) (EP Act 1994);
Planning for Noise Control Guideline (EPA now DETSI, July 2004) (PNCG);
Draft Ecoaccess Guideline for the Assessment of Low Frequency Noise (EPA now DETSI, November 2004) (Low Frequency Noise Guideline);
Noise Measurement Manual (EHP now DETSI, 2013);
New South Wales Noise Policy for Industry (NSW EPA, 2017) (NPI);
Australian Standard 1055:2018 Acoustics – Description and measurement of environmental noise (Standards Australia, 2018) (AS1055);
The health effects of environmental noise (Commonwealth of Australia, 2018);
The Environmental Protection (Noise) Policy 2019 (Qld, August 2019) (EPP Noise 2019);
Environmental Protection Regulation 2019 (Qld, September 2019); and
Guideline – Application requirements for activities with noise impacts (DETSI, July 2025).

APPENDIX A – NOISE SOURCE DETAILS

Table A1: Equipment Sound Power Levels, LAeq,1hr

Code, Description	1/3 Octave Band Centre Frequency, Hz									Total	
	25 31.5 40	50 63 80	100 125 160	200 250 315	400 500 630	800 1000 1250	1600 2000 2500	3150 4000 5000	6000 8000 10000		
	Sound Power Level, LA10,10min, per 1/3 Octave Band									dBL	dBA
DL, Dragline	115 115 115	115 115 115	107 107 107	115 115 115	110 110 110	108 108 108	105 105 105	103 103 103	94 94 94	126	118
D, Drill	107 105 104	106 115 122	127 116 115	122 110 107	110 108 108	108 107 107	107 105 103	100 100 98	94 92 89	130	119
E, Excavator	118 117 118	121 118 120	120 118 118	112 108 108	113 114 111	111 111 109	110 110 107	106 103 100	95 88 81	129	121
L, Loader	104 107 107	108 109 114	120 118 120	119 114 115	106 102 104	102 102 103	102 100 100	97 95 94	90 90 85	127	116
T, Truck	108 112 111	117 127 113	117 122 115	114 115 115	114 112 111	109 109 108	109 106 106	104 102 102	99 95 92	130	120
Z, Dozer	103 109 109	109 110 108	123 111 110	110 109 108	108 113 108	107 107 108	107 105 104	100 98 98	96 96 93	126	117
G, Grader	99 100 98	103 107 111	117 107 107	115 108 108	107 106 106	107 105 104	103 103 102	100 98 94	92 88 85	122	115
W, Water cart	104 117 107	110 114 115	123 115 119	116 112 112	111 115 109	109 108 107	106 105 103	100 98 96	92 89 85	128	119

Figure A2: Modelled Noise Source Locations



Legend:

Red symbols indicate noise source locations for the baseline Trap Gully noise model. Noise from all baseline or existing mining equipment was assigned to one or more of these locations based on GPS equipment tracking data or, for the dragline and drills that are not GPS tracked, at representative locations advised by Batchfire.

Green symbols indicate the additional locations used to calculate project phase 1 noise levels (construction of the Link Road realignment).

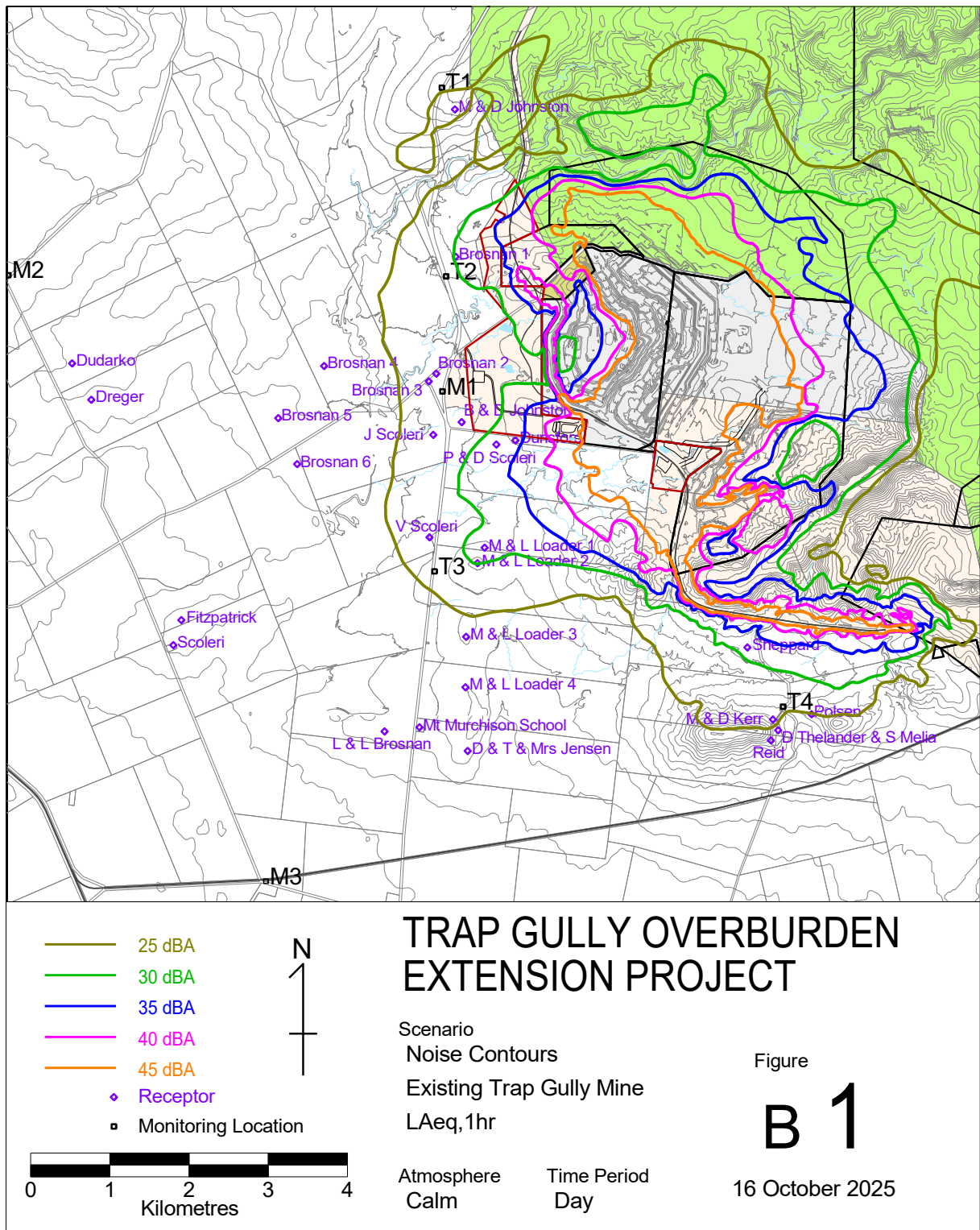
Blue symbols indicate the modelled noise source locations to calculate project phase 2 noise levels (shaping the western OBE face). Sound power from the proposed five dozers was distributed evenly over these representative locations.

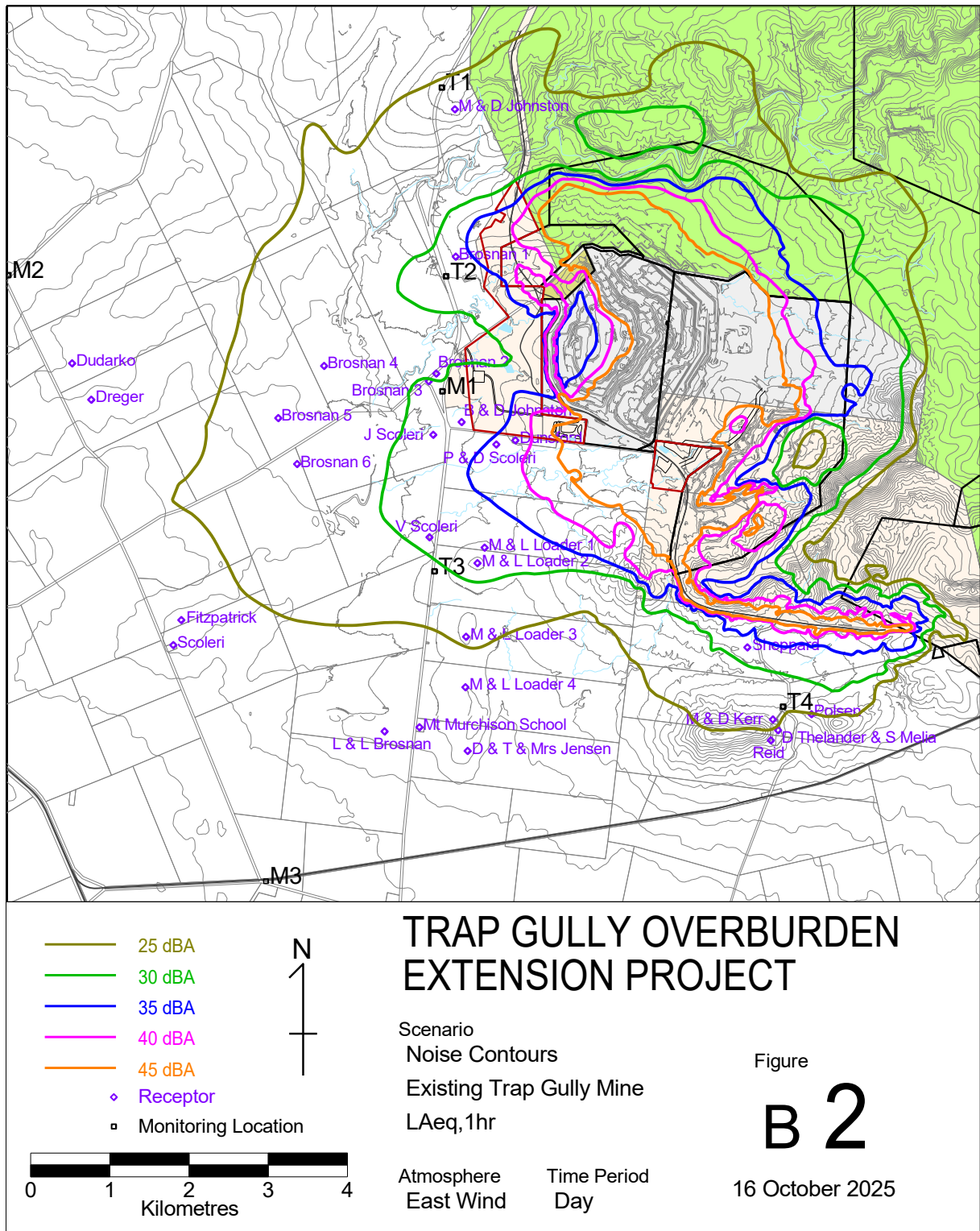
Existing MLA boundaries are shown with black lines.

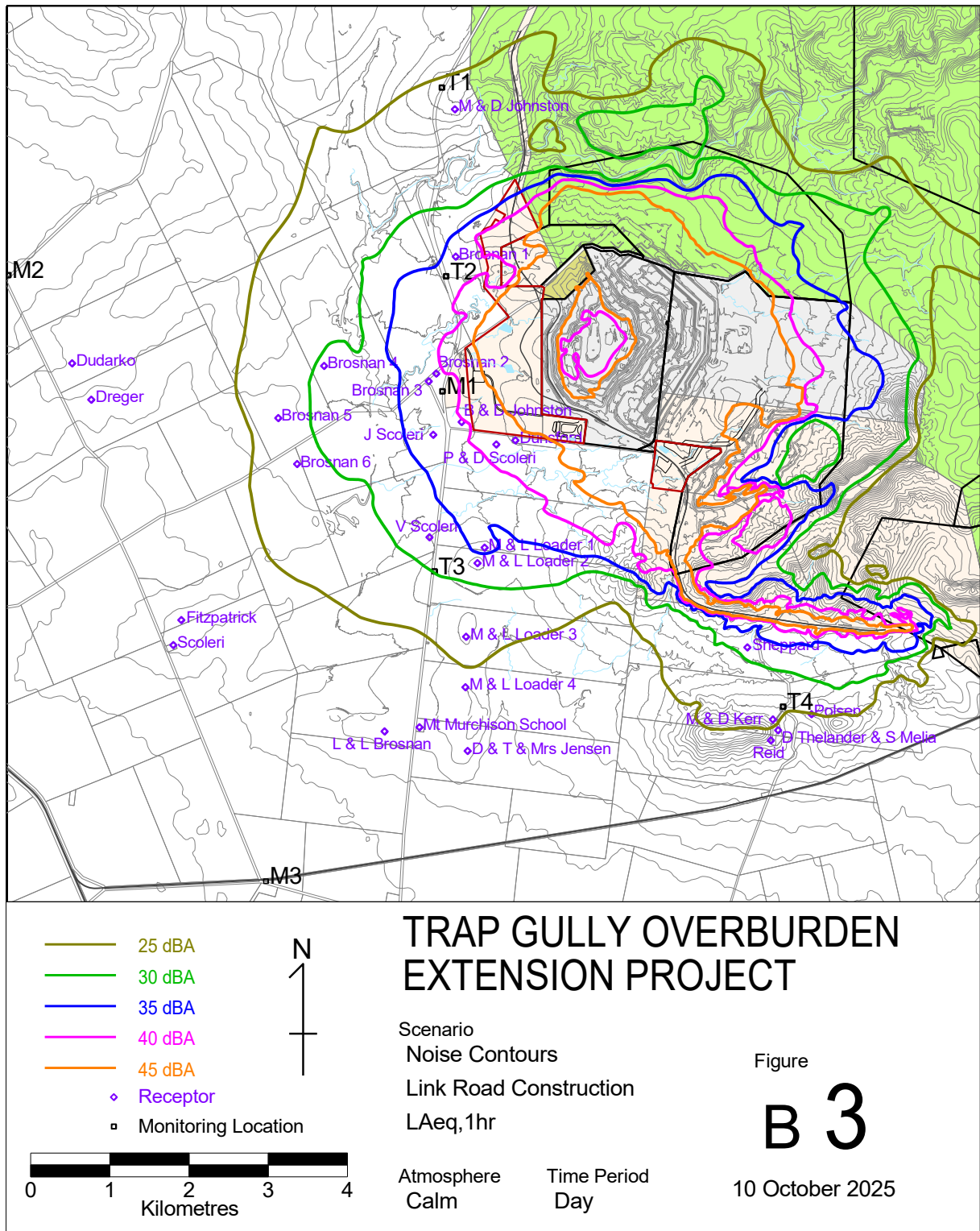
Proposed MLA boundaries are shown with red lines.

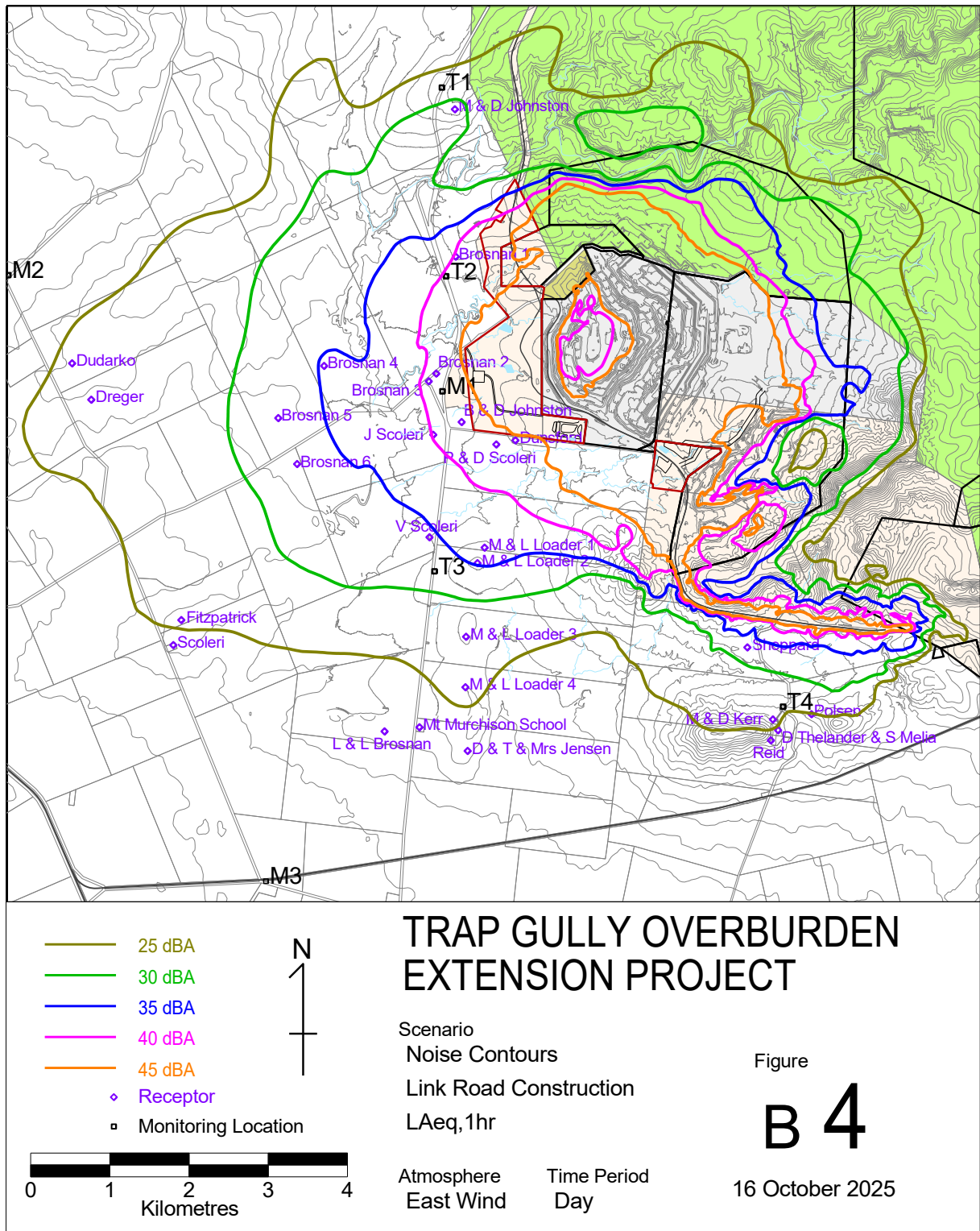
APPENDIX B – NOISE CONTOUR FIGURES

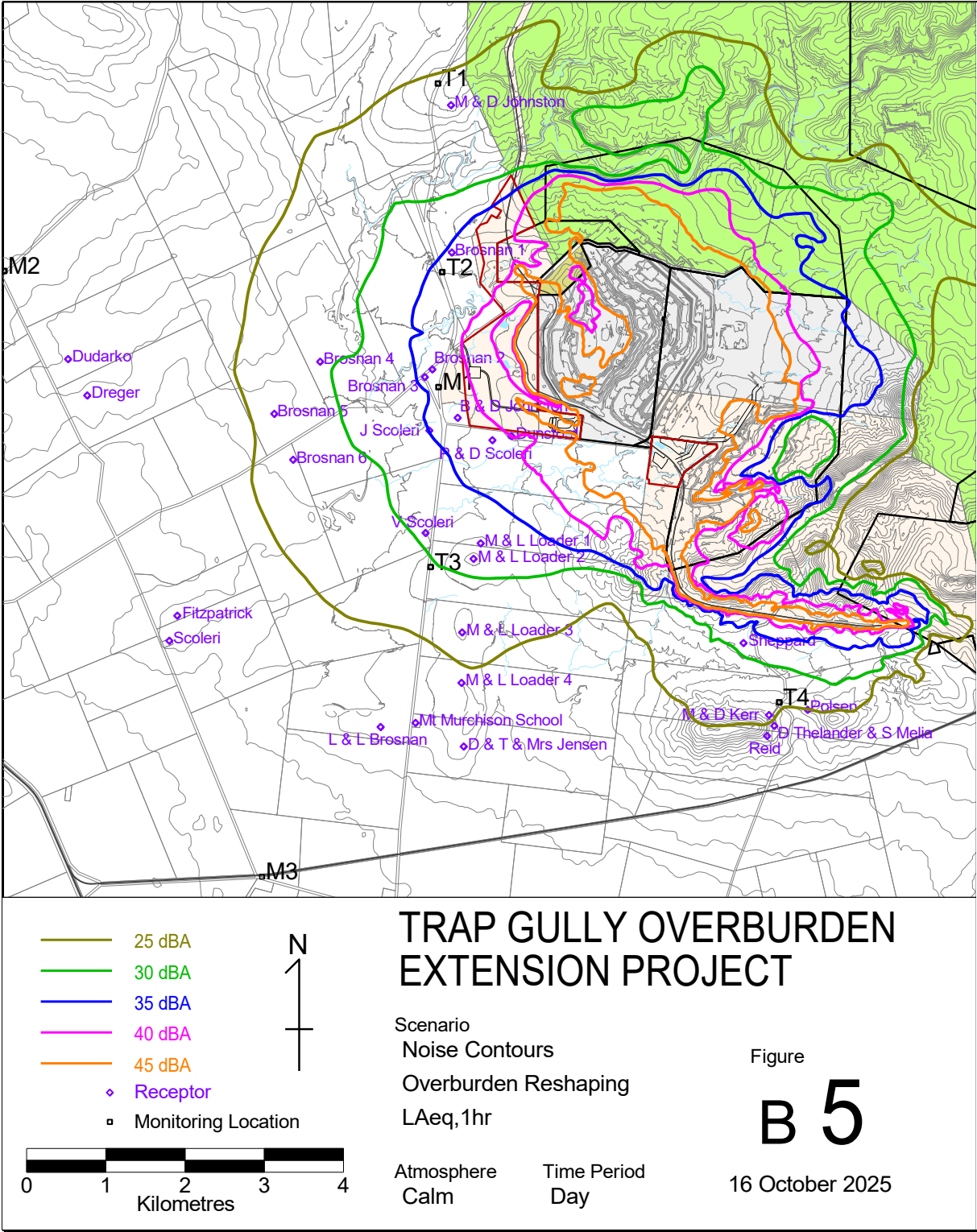
All noise contour figures only show major ground elevation contours in 10 m vertical intervals to improve the visibility of other details.

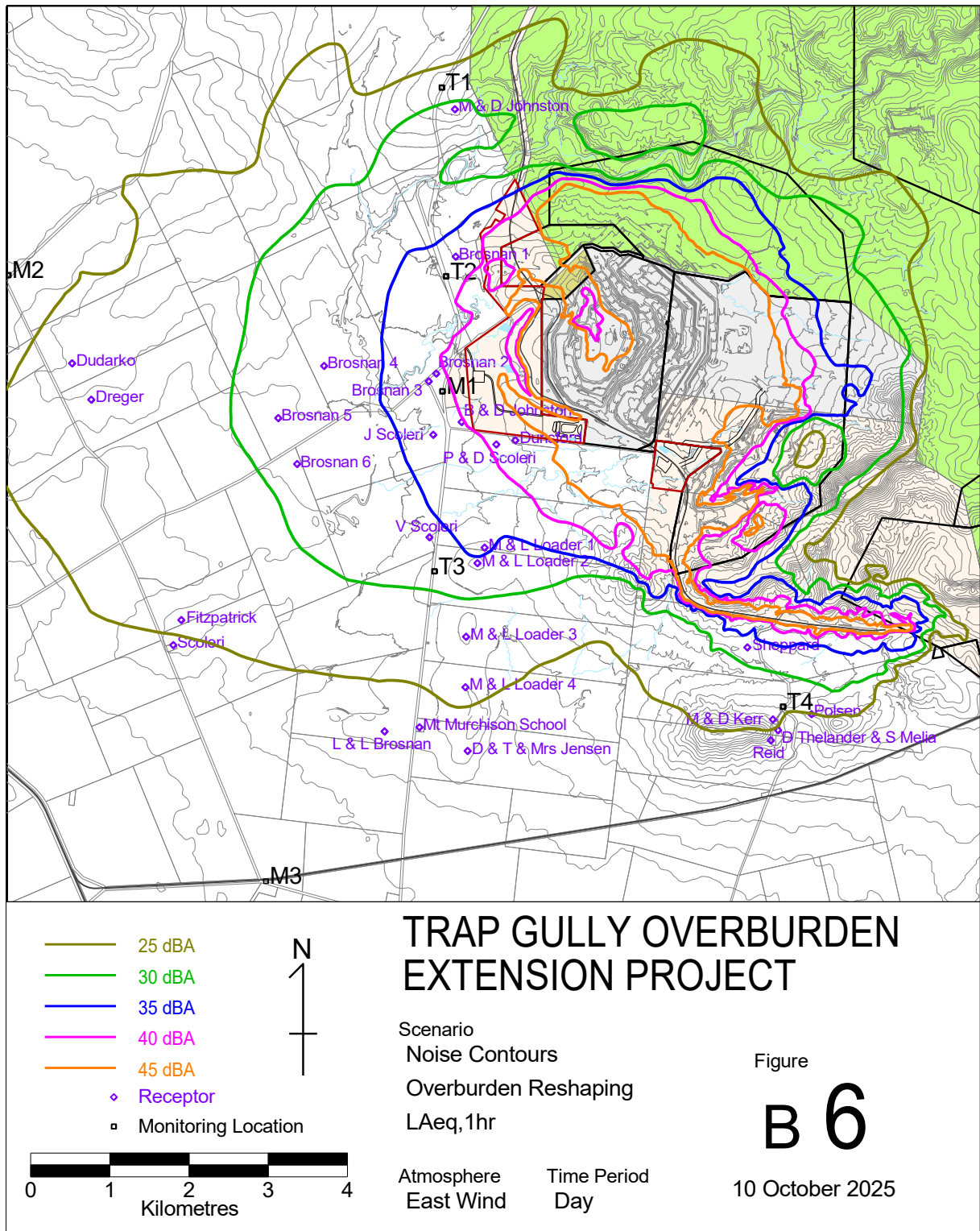












APPENDIX C – LONG TERM NOISE SURVEY DETAILS

Photographs of each long term noise monitor installed within security cages are provided below.



Monitor M1 looking south.



Monitor M1 looking east past the monitor towards Trap Gully Mine. The tripod-mounted short term monitor is also visible.



Monitor M2 looking north



Monitor M2 looking south-west



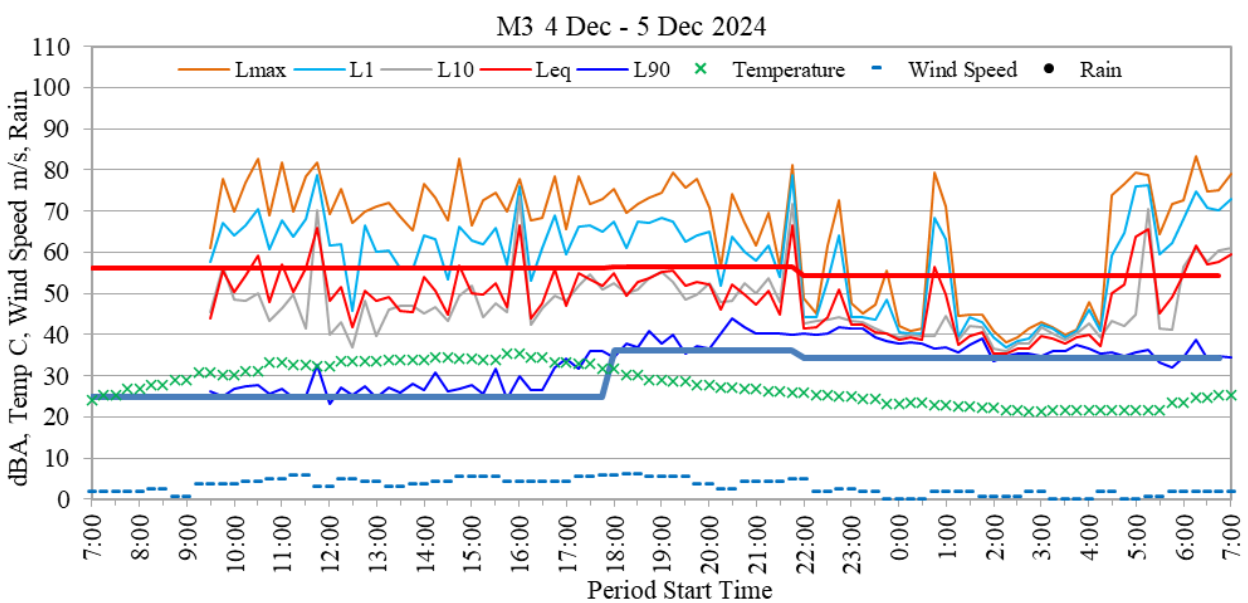
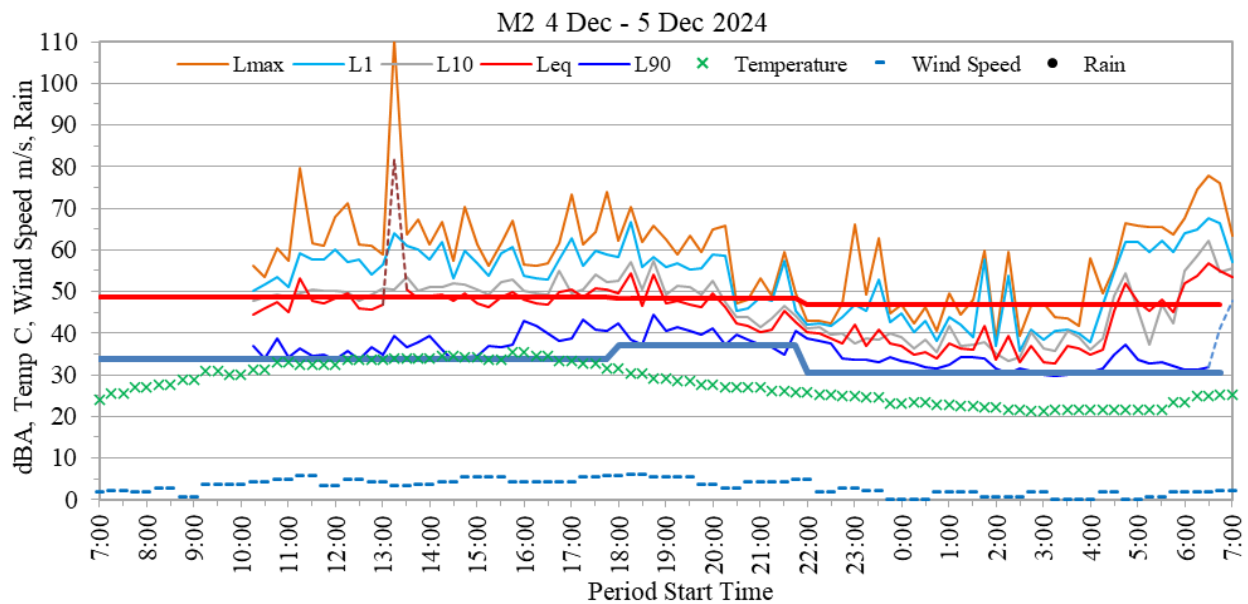
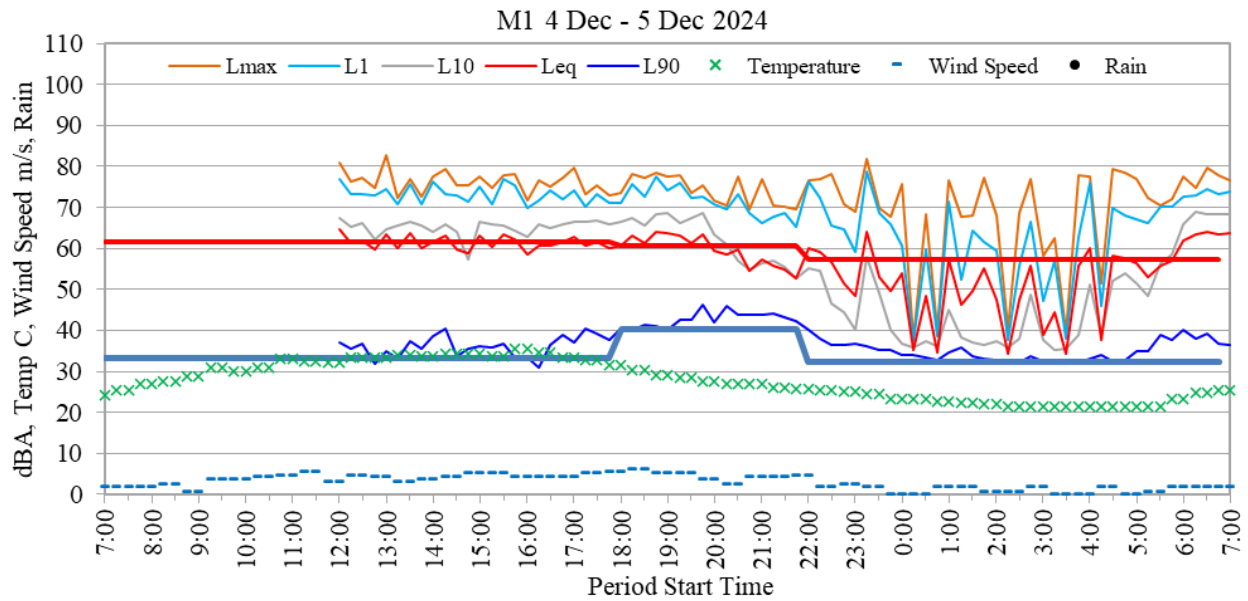
Monitor M3 looking north-west

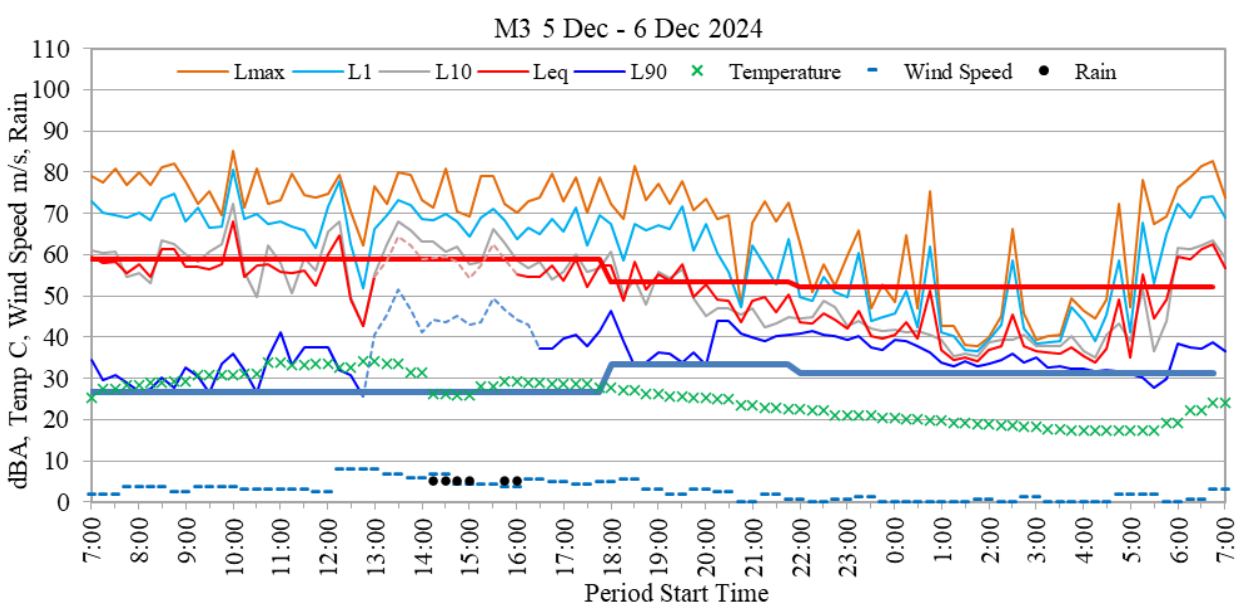
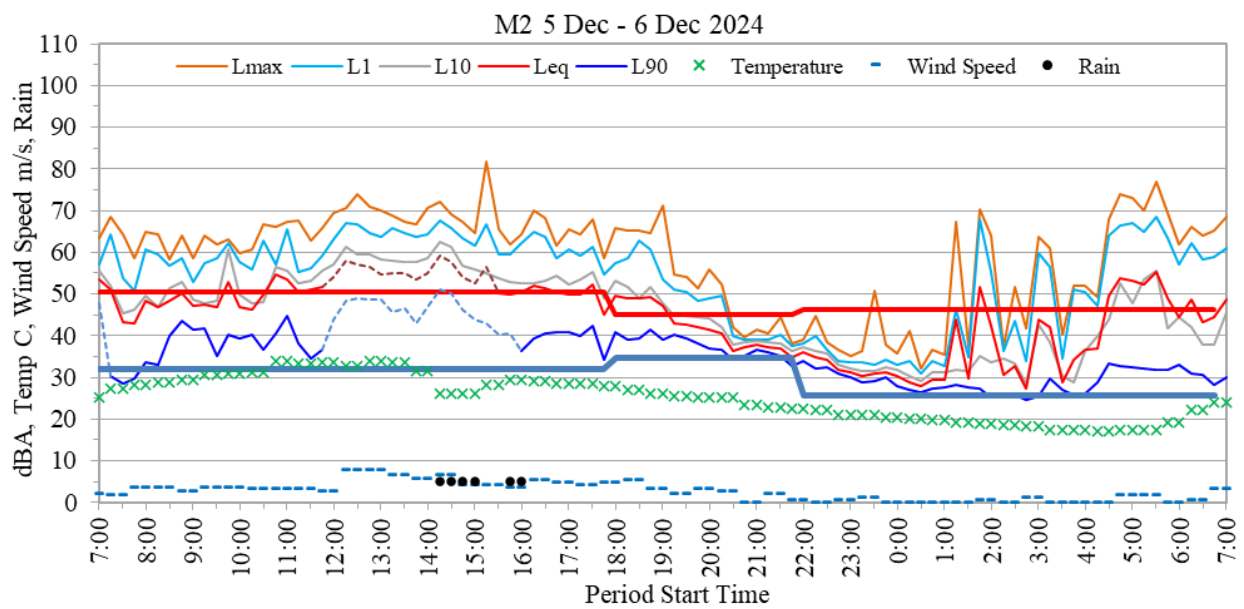
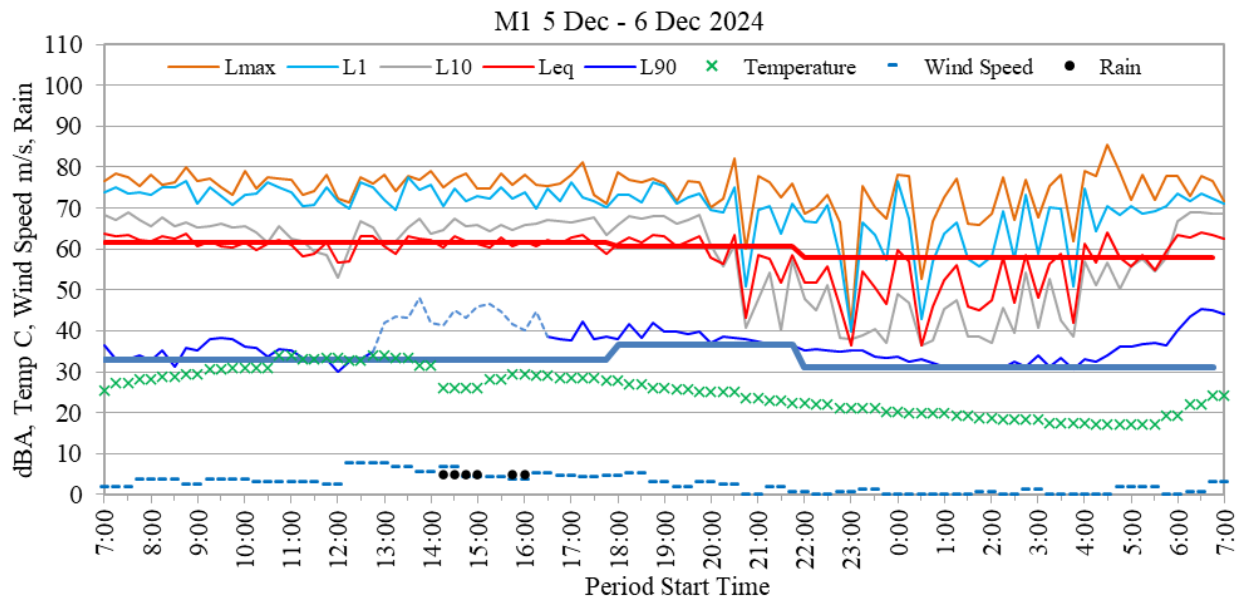
The tripod-mounted short term monitor is also visible.

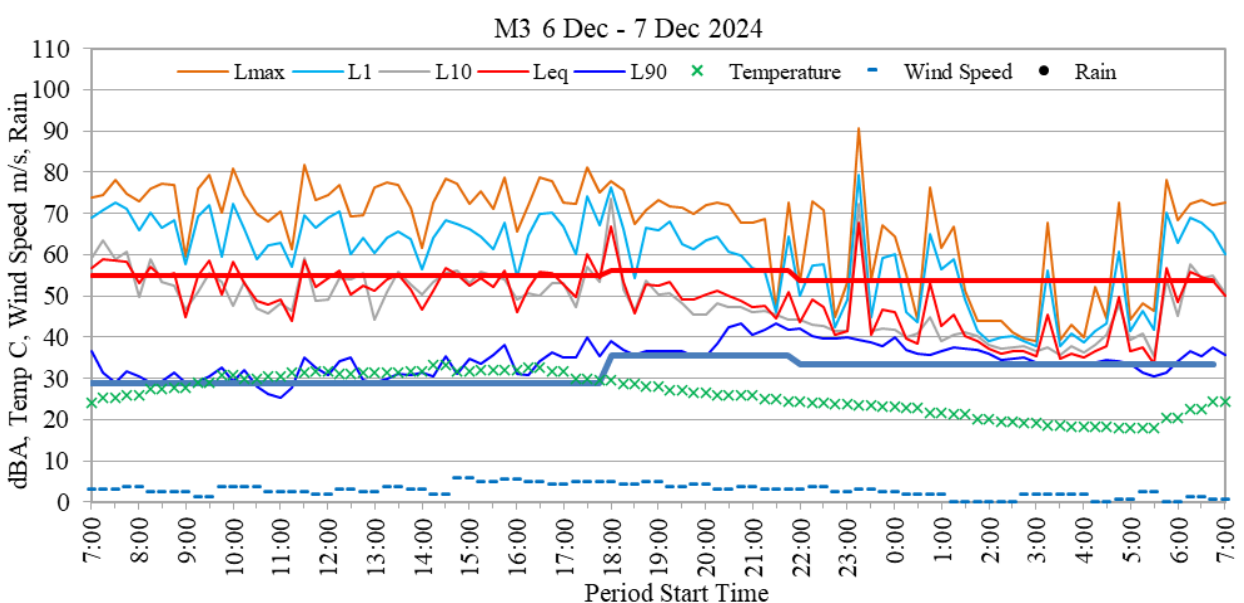
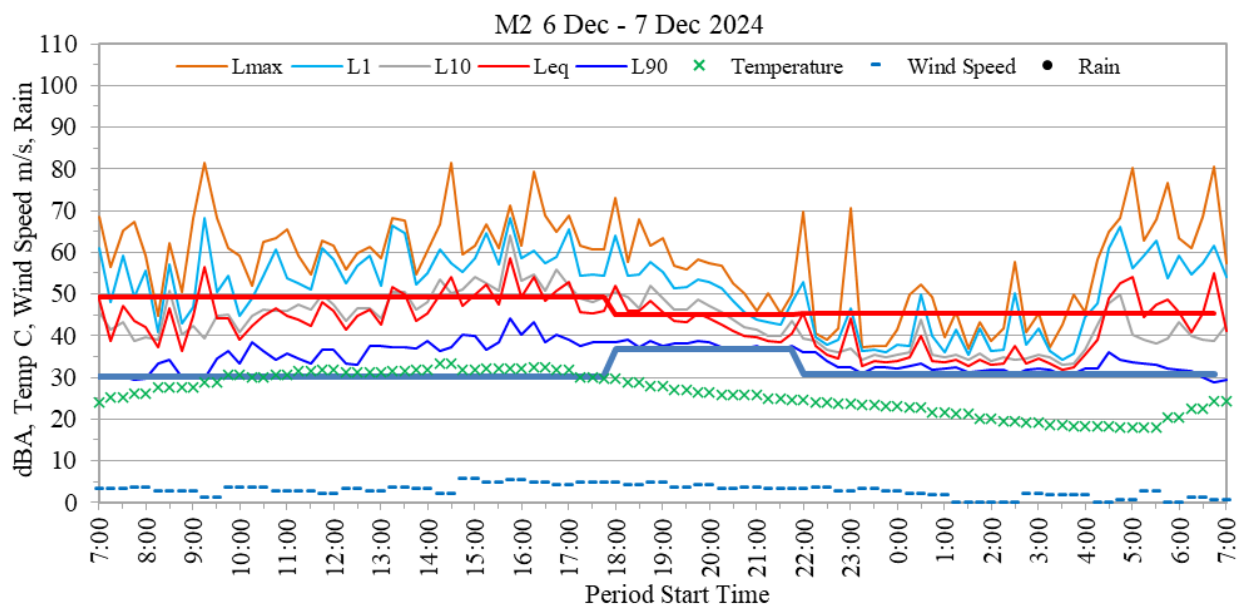
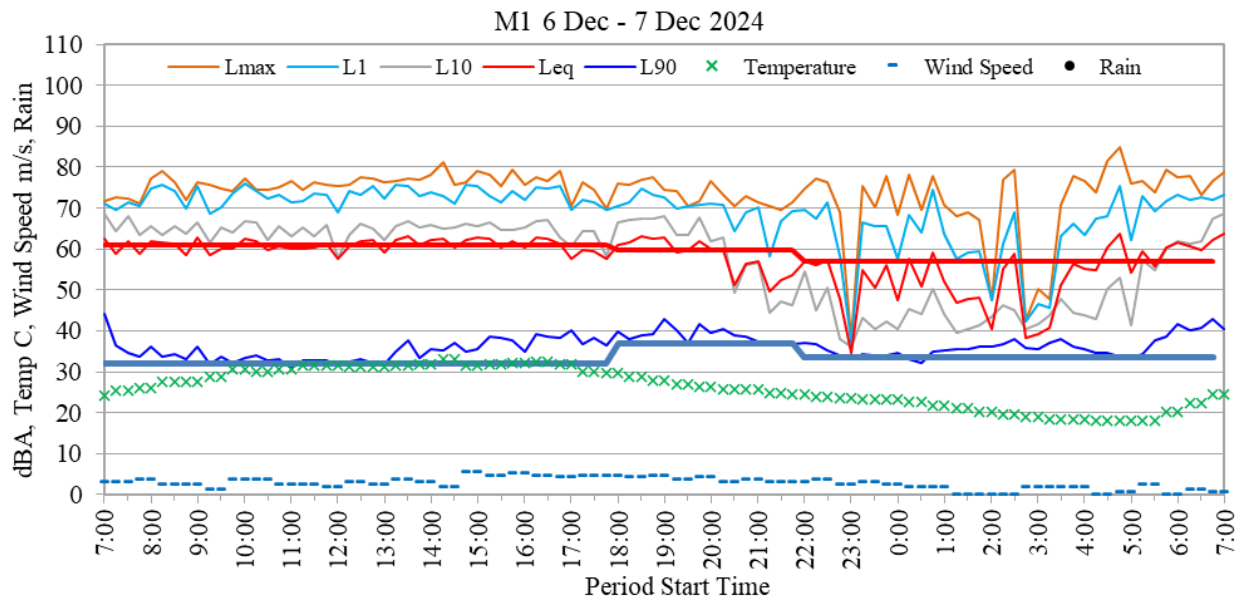


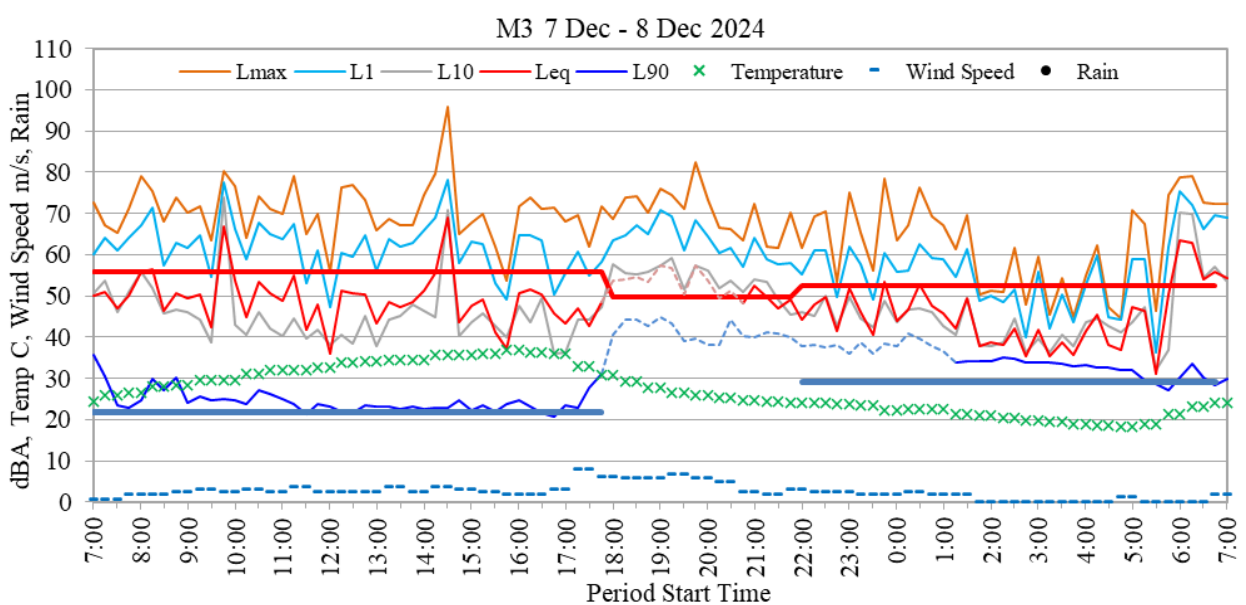
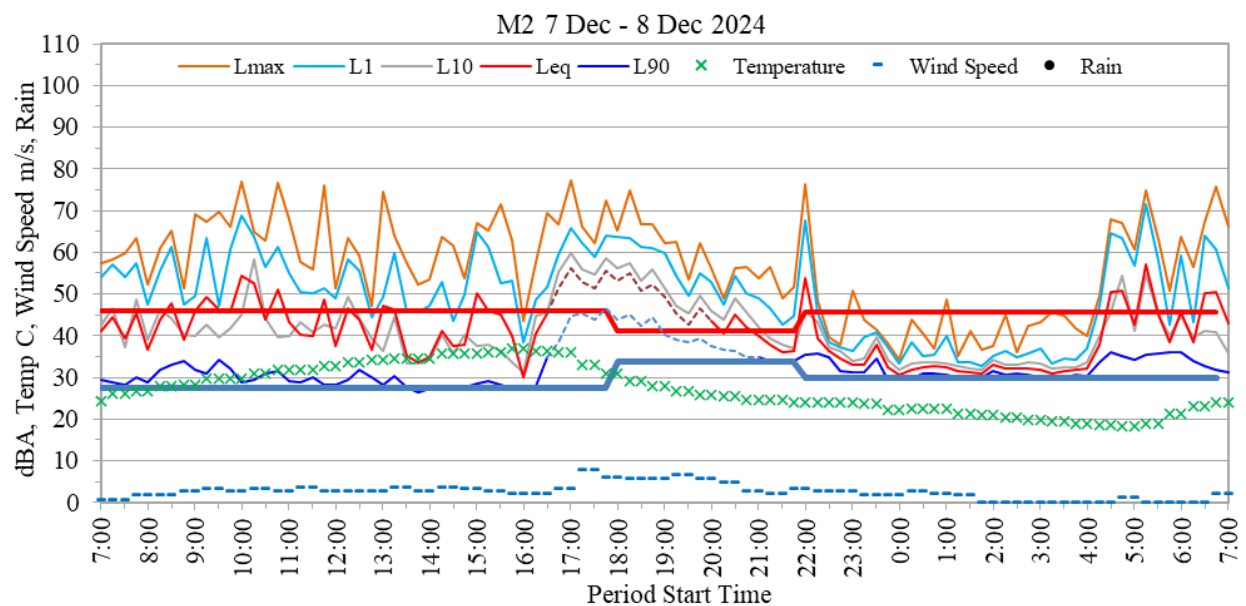
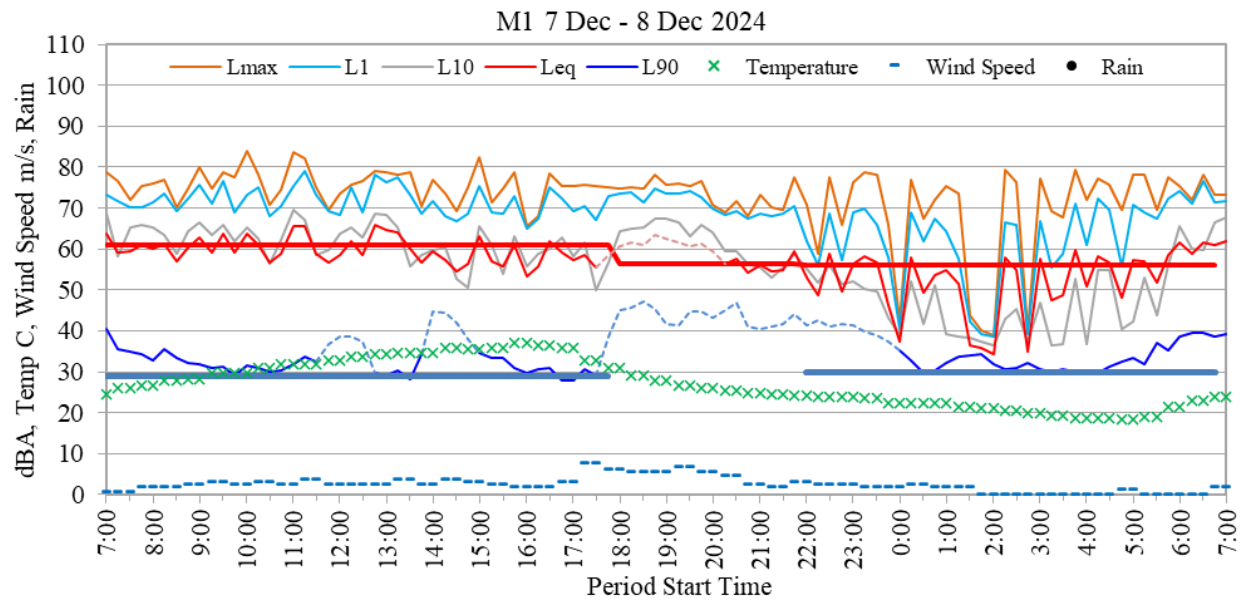
Monitor M3 looking north

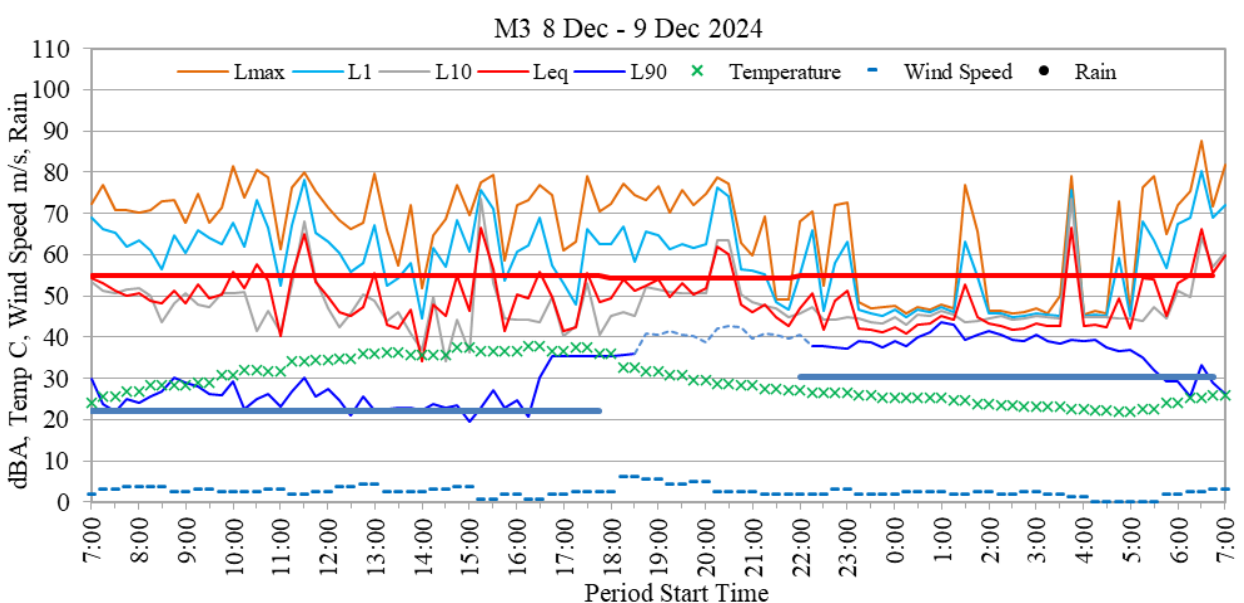
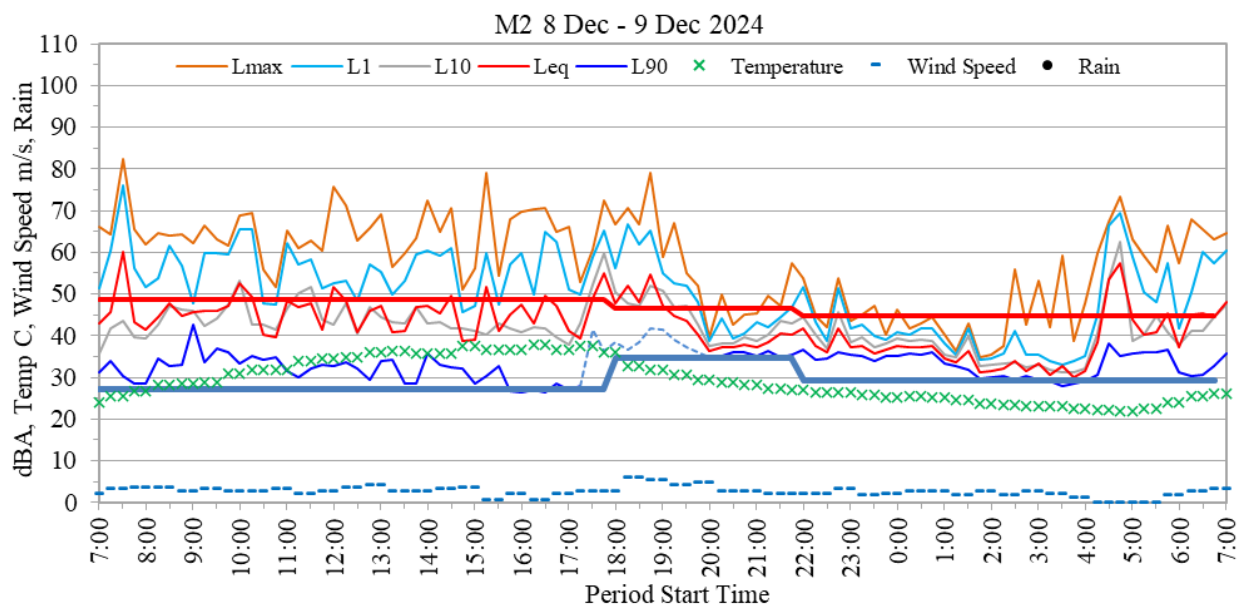
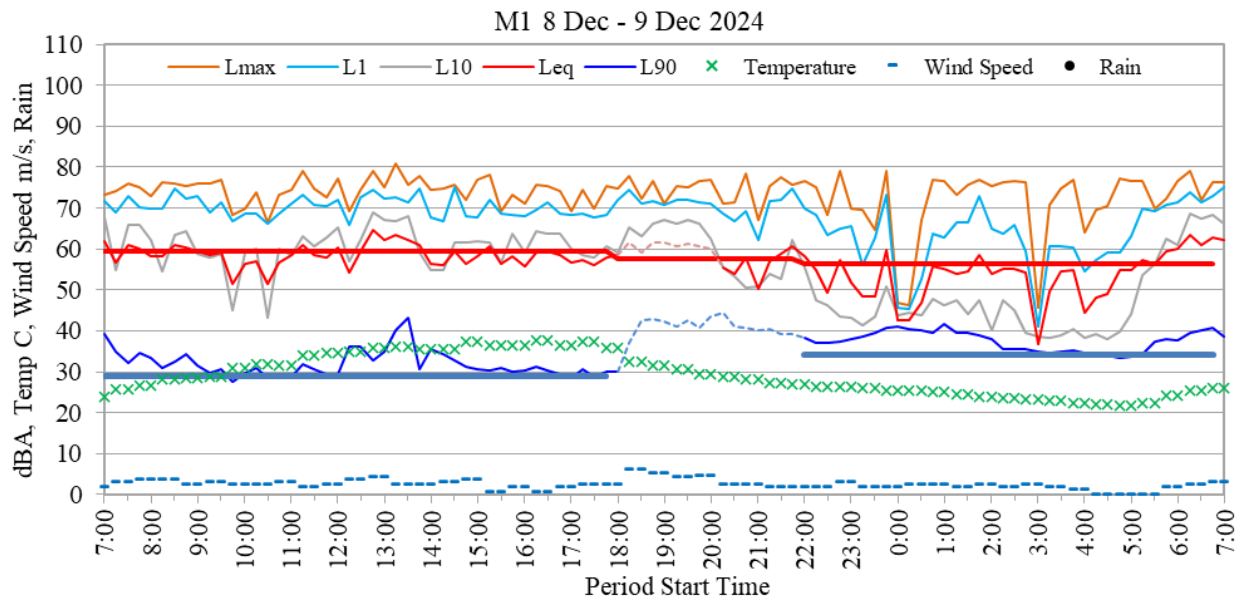
Charts on the following pages show measured noise levels from each monitor, with each chart showing a 24 hour period from 7:00 am (start of the day period) to 7:00 am (end of the night period).

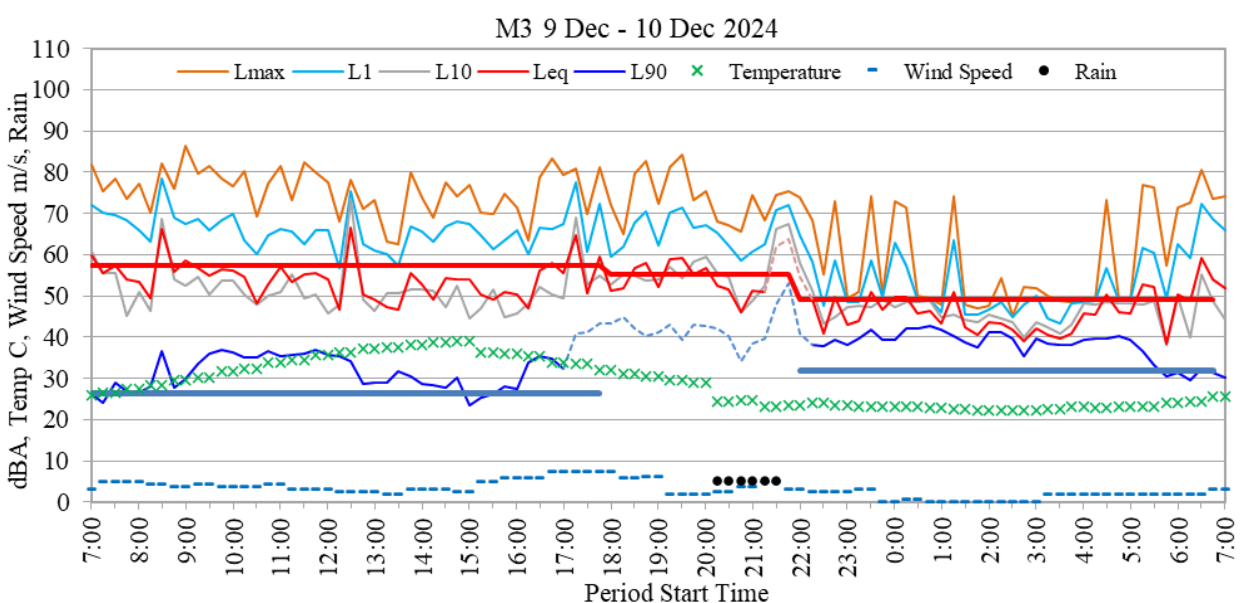
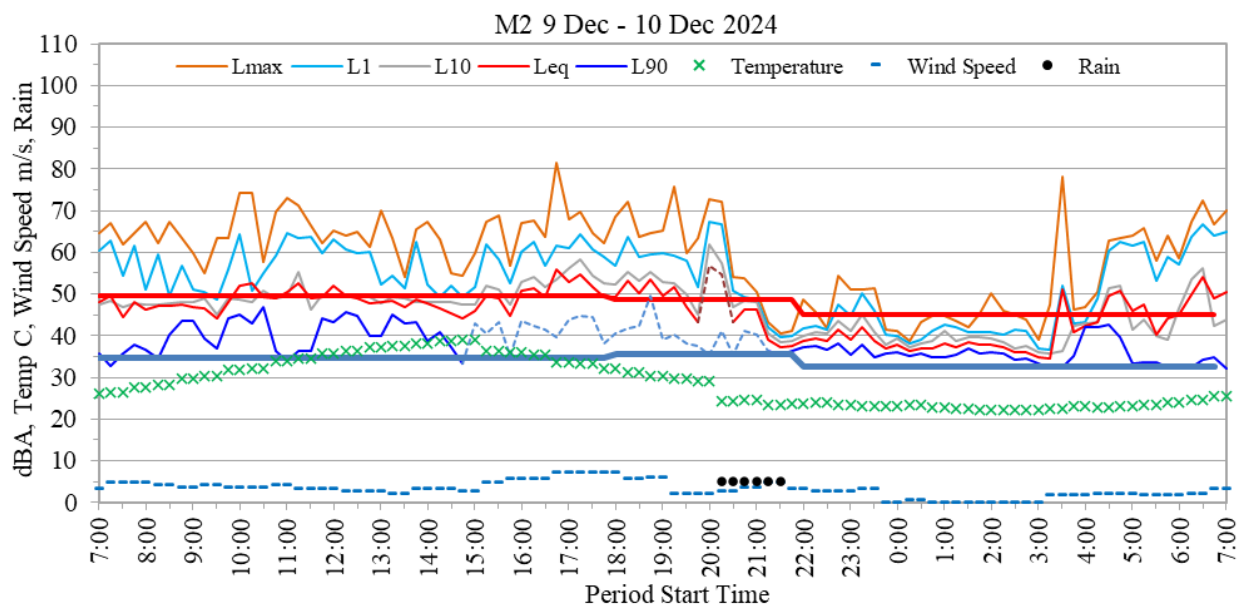
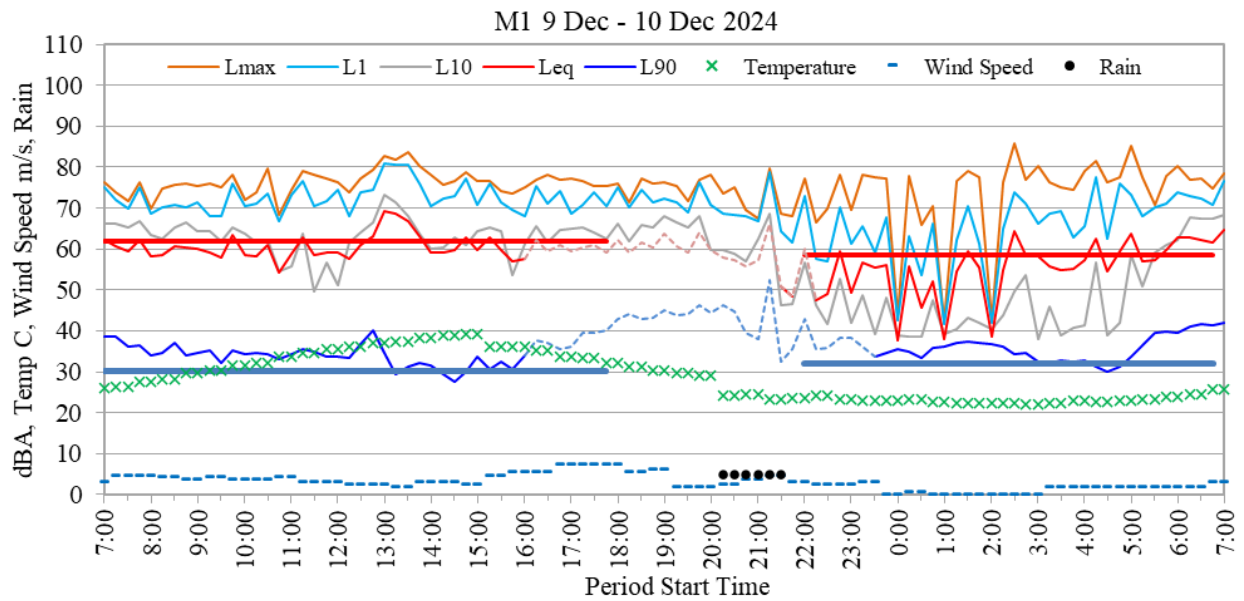


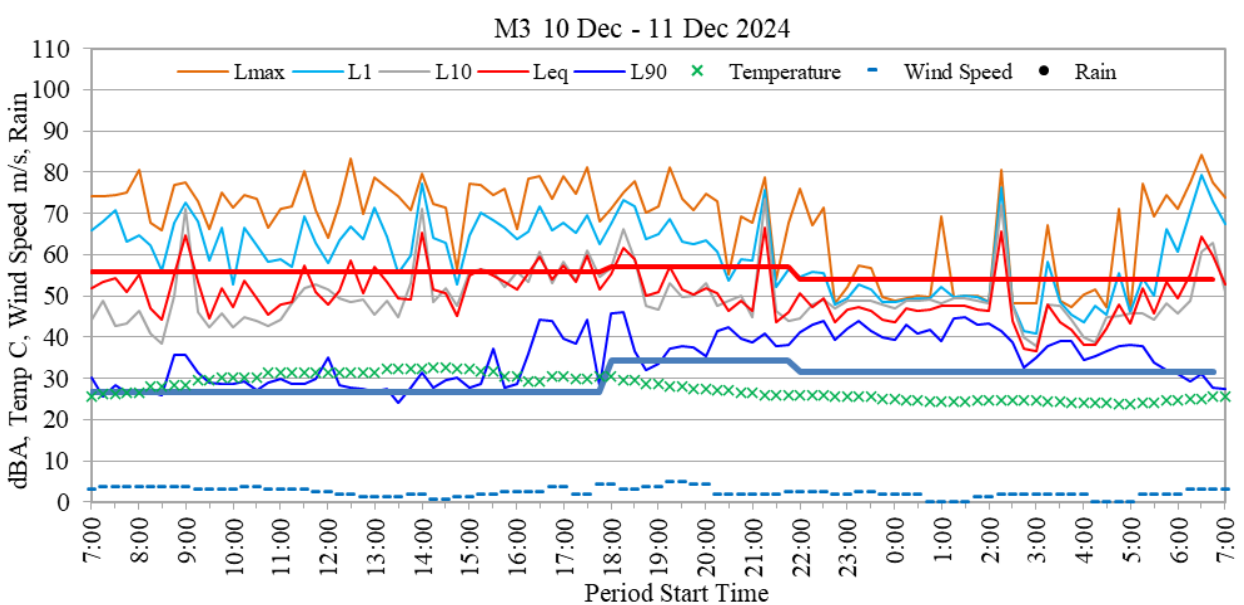
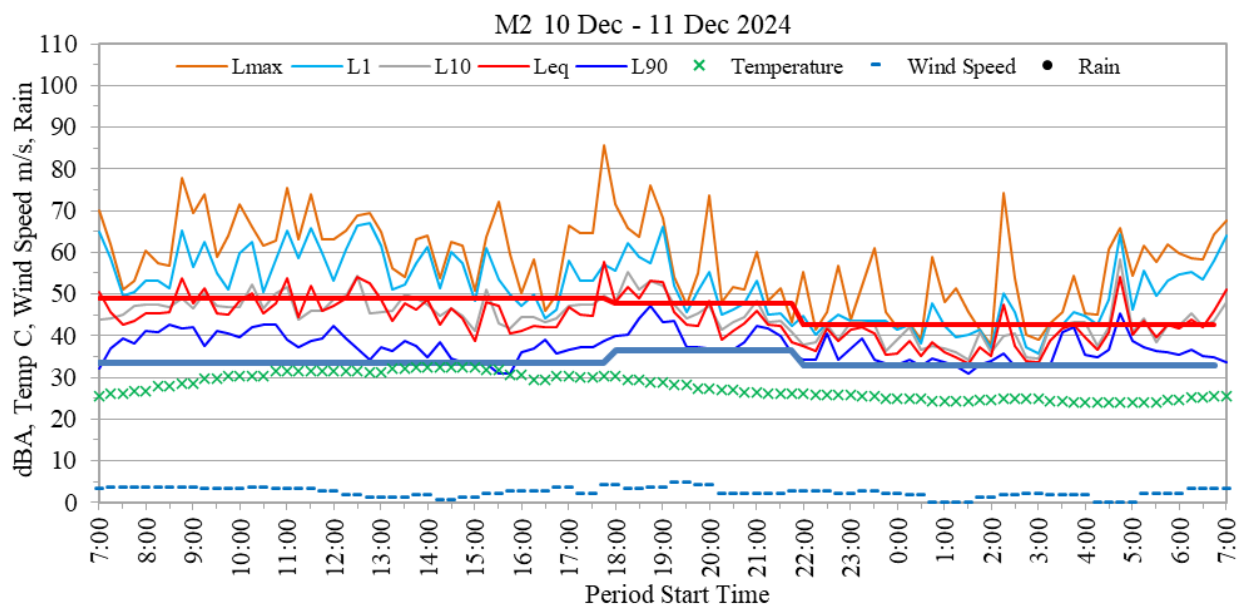
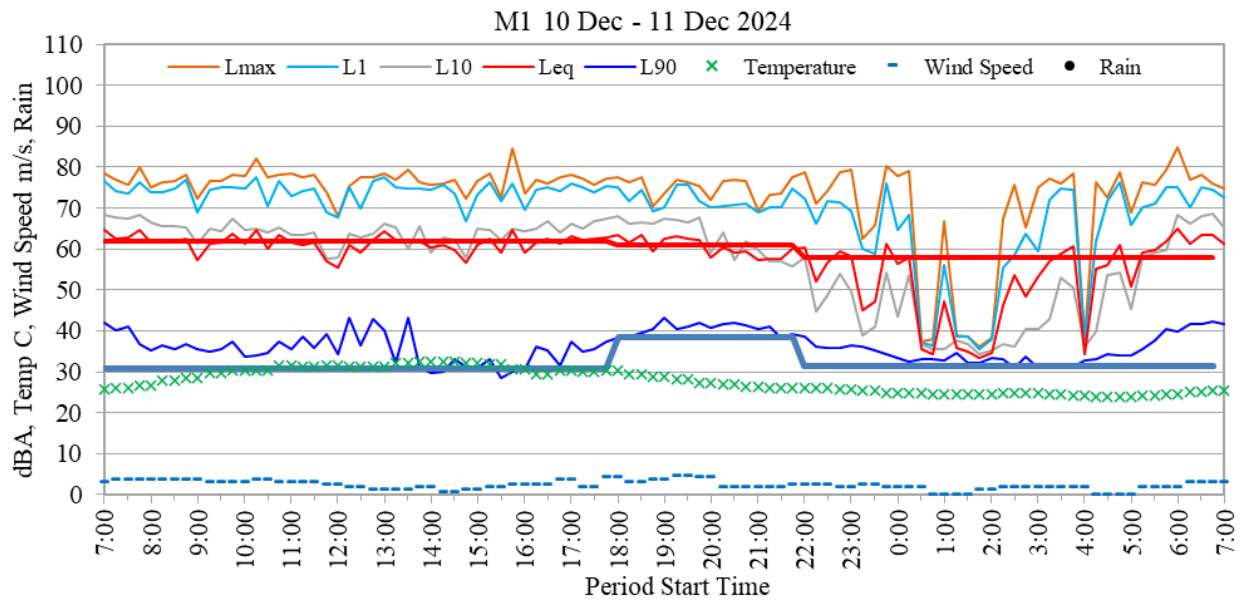


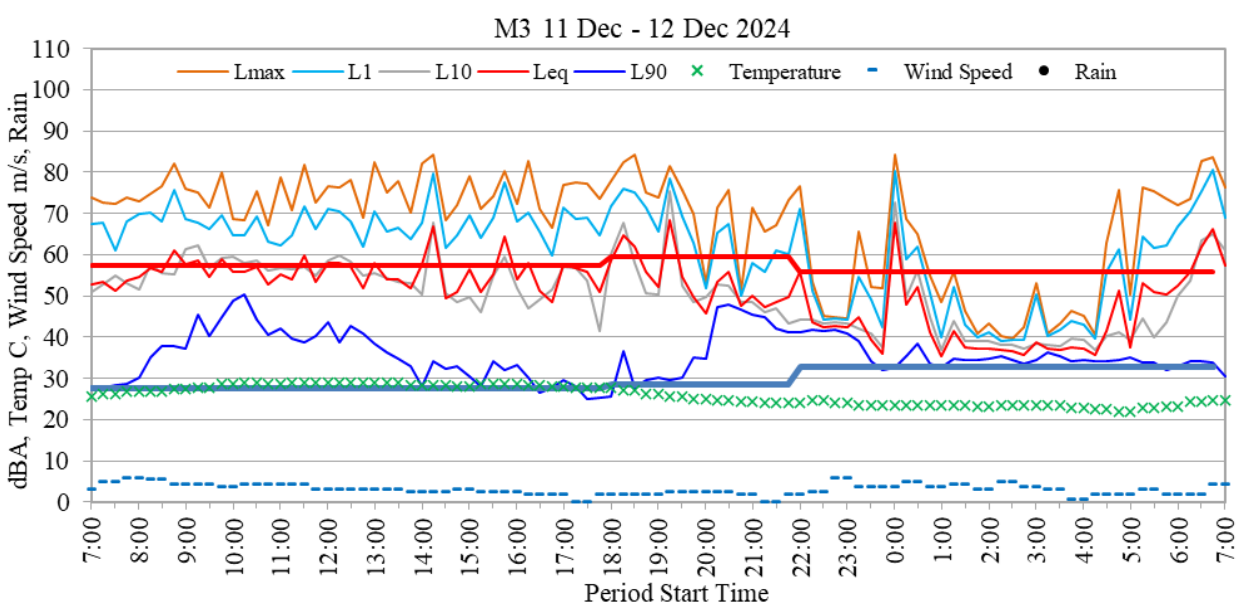
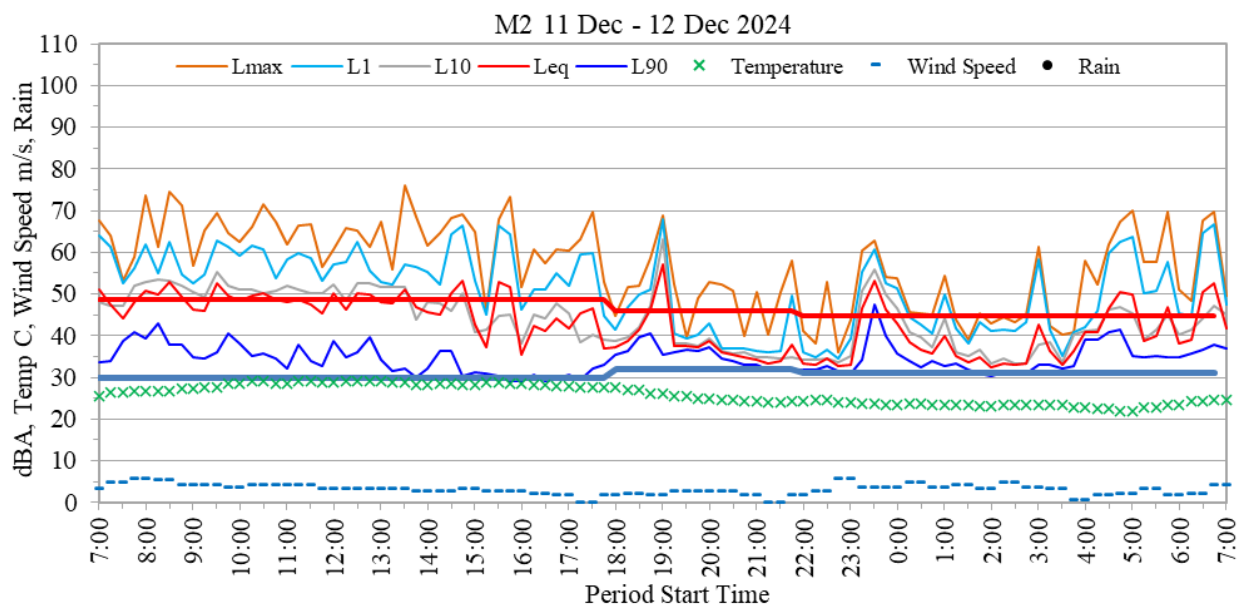
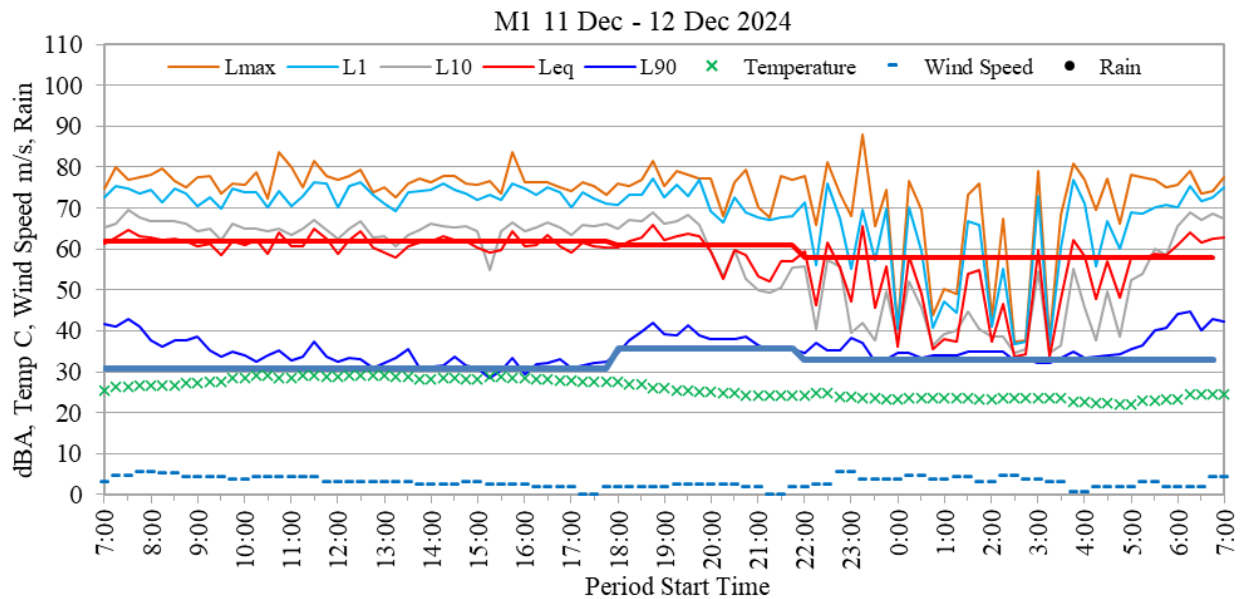


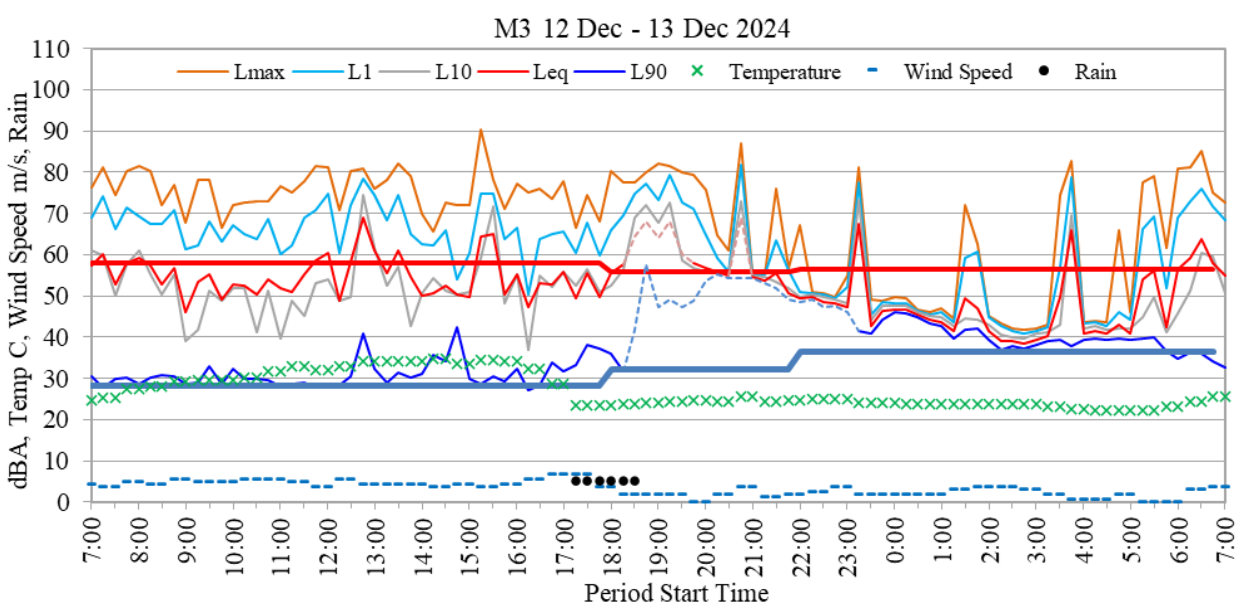
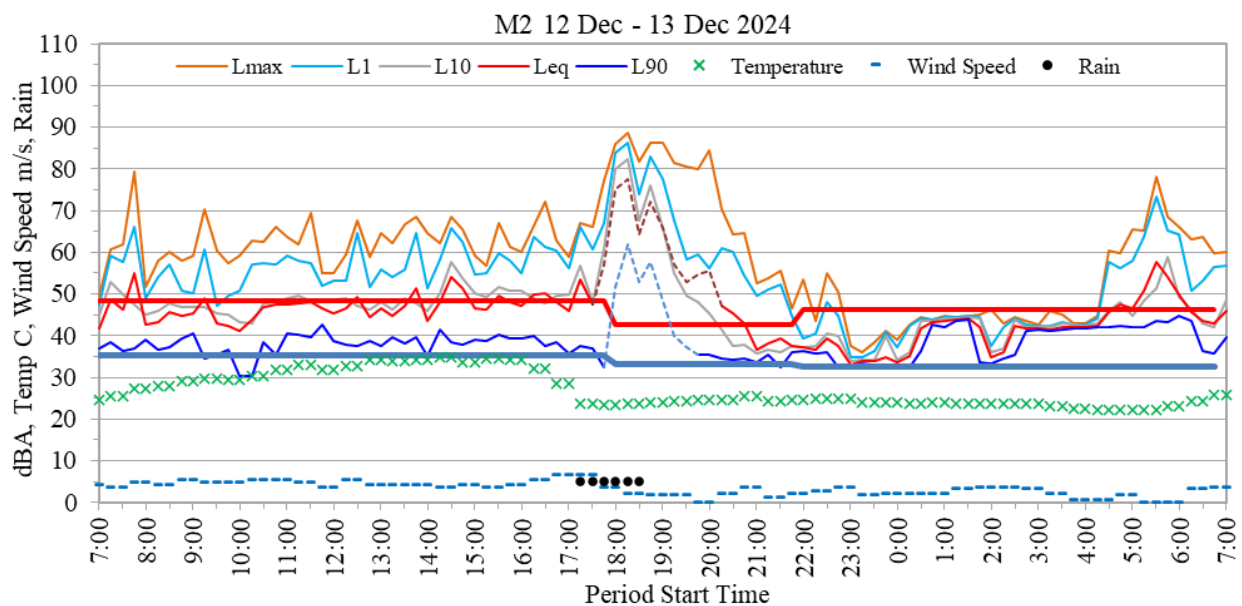
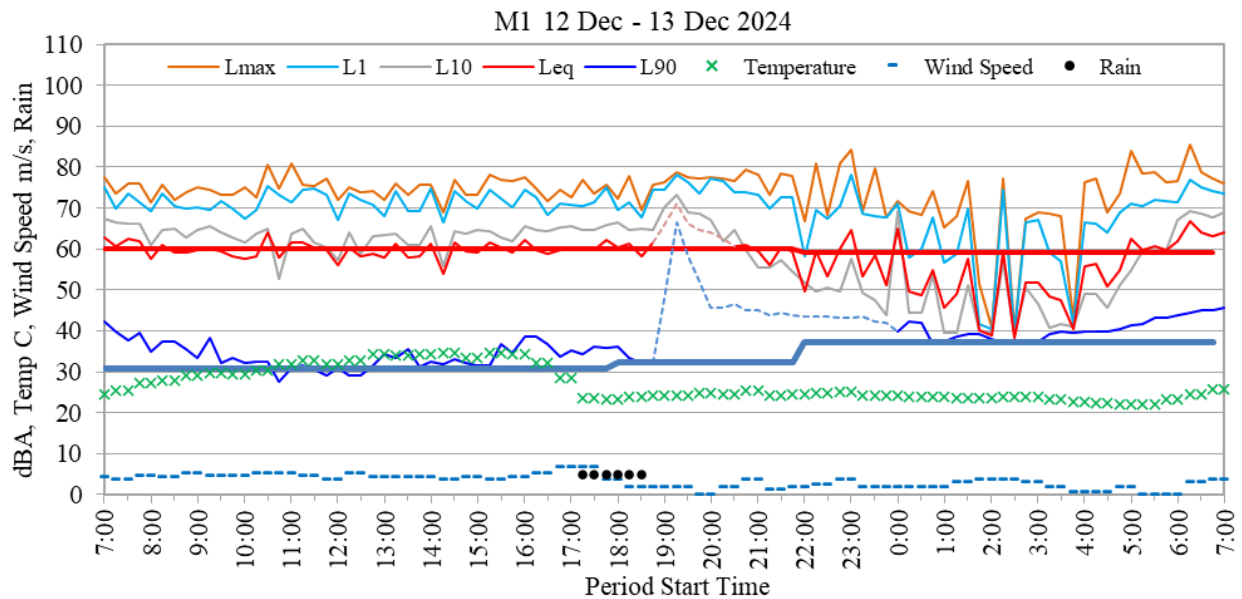


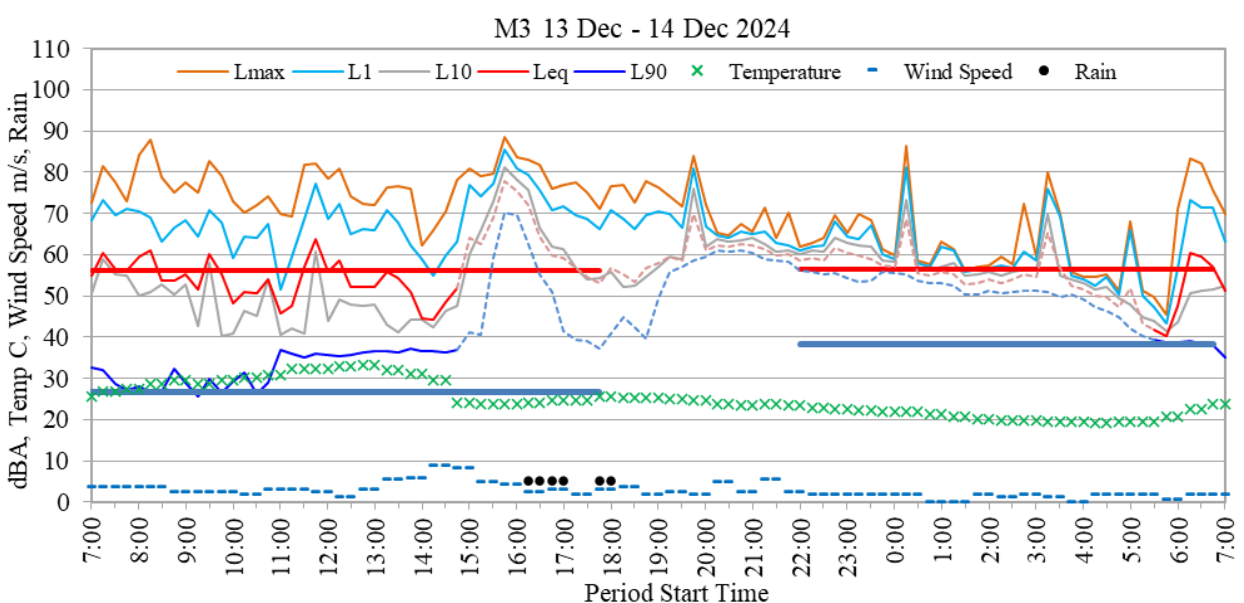
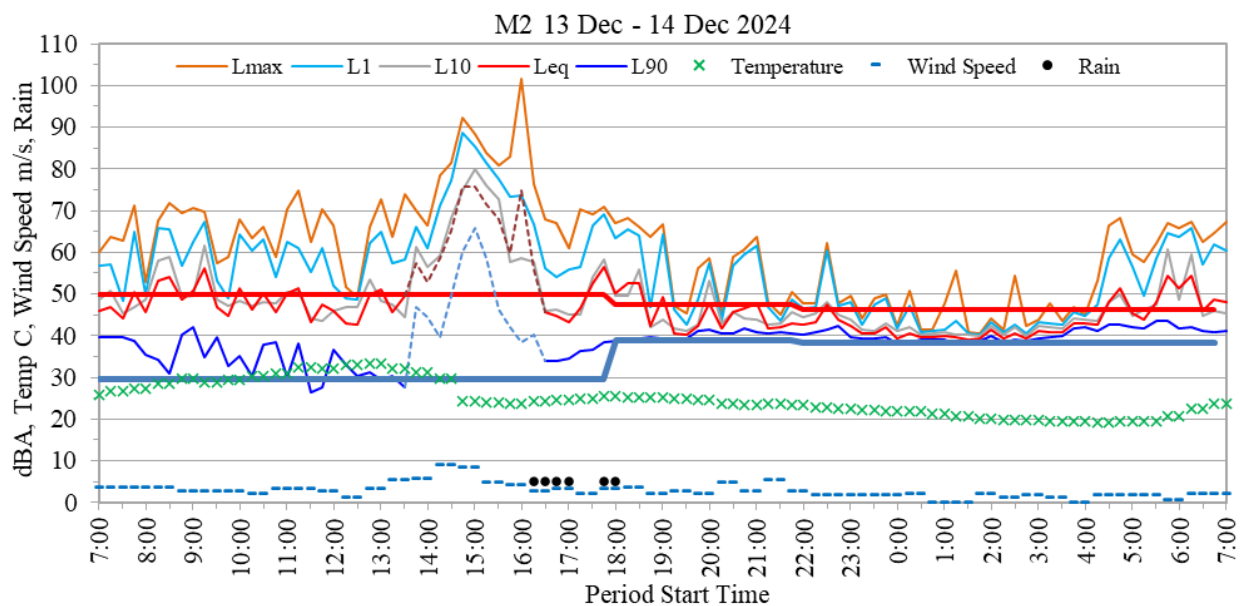
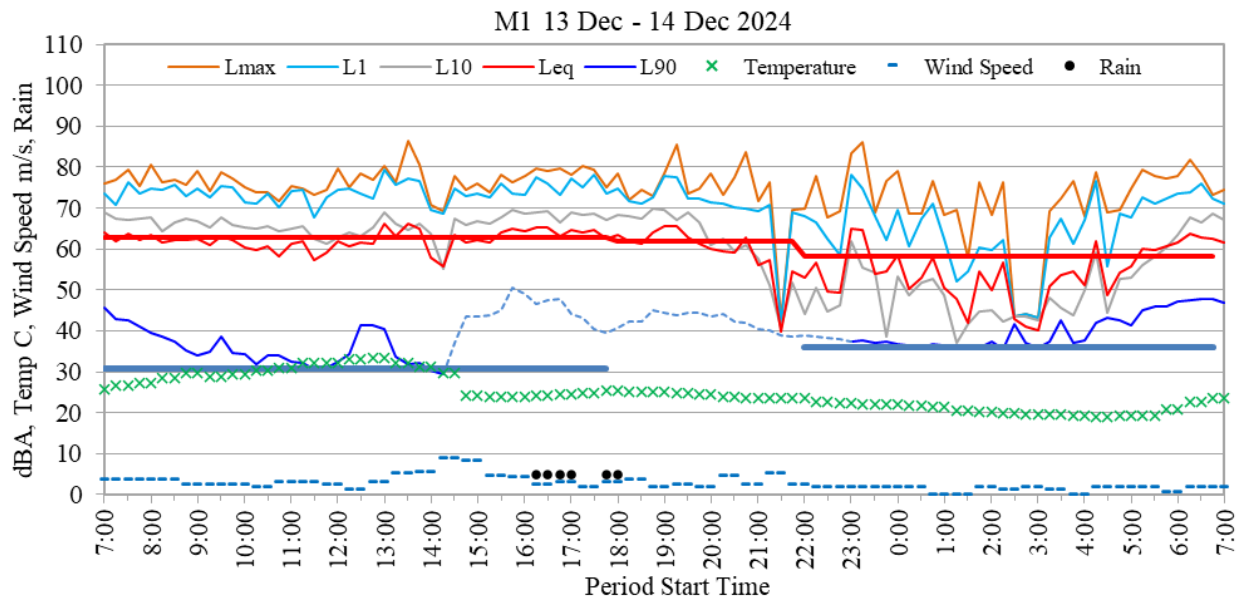


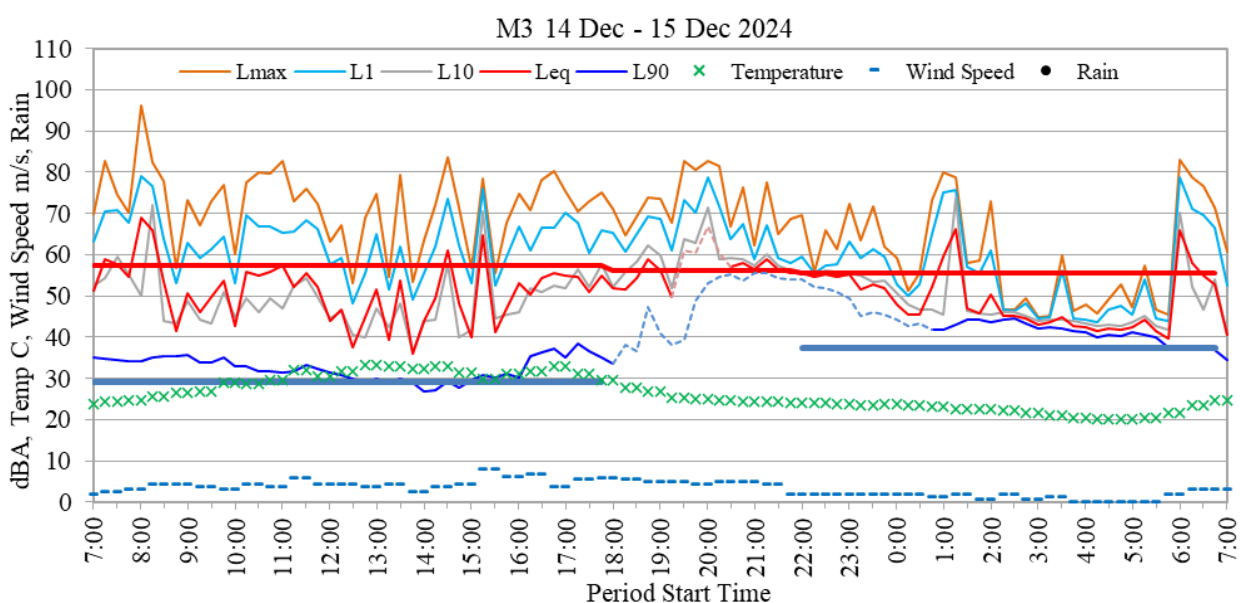
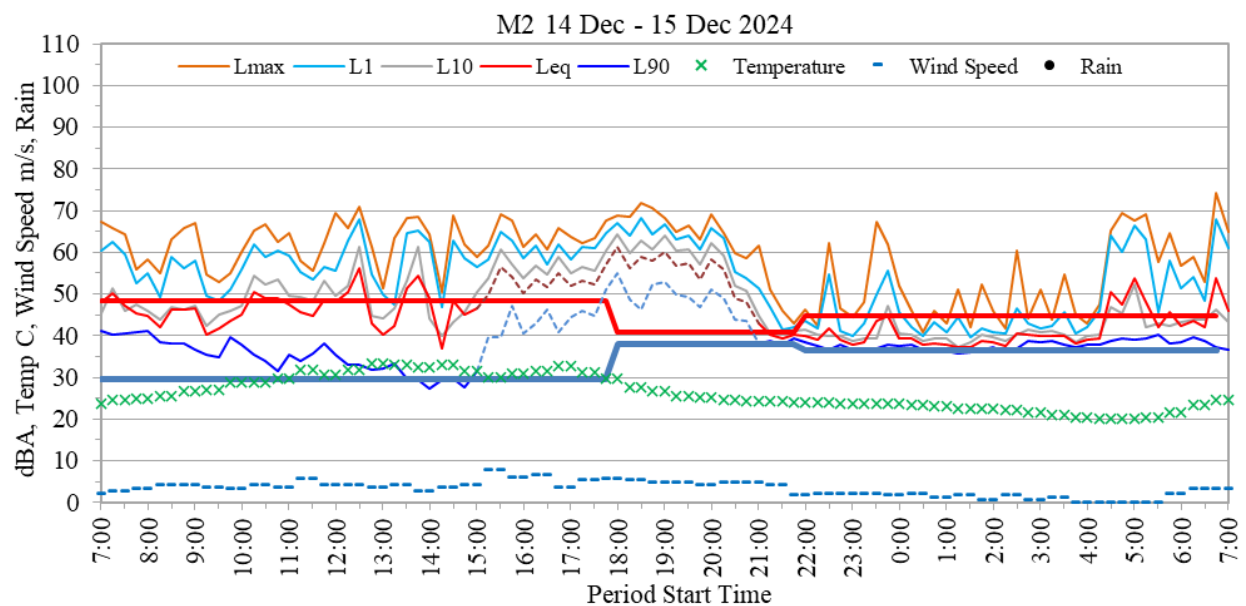
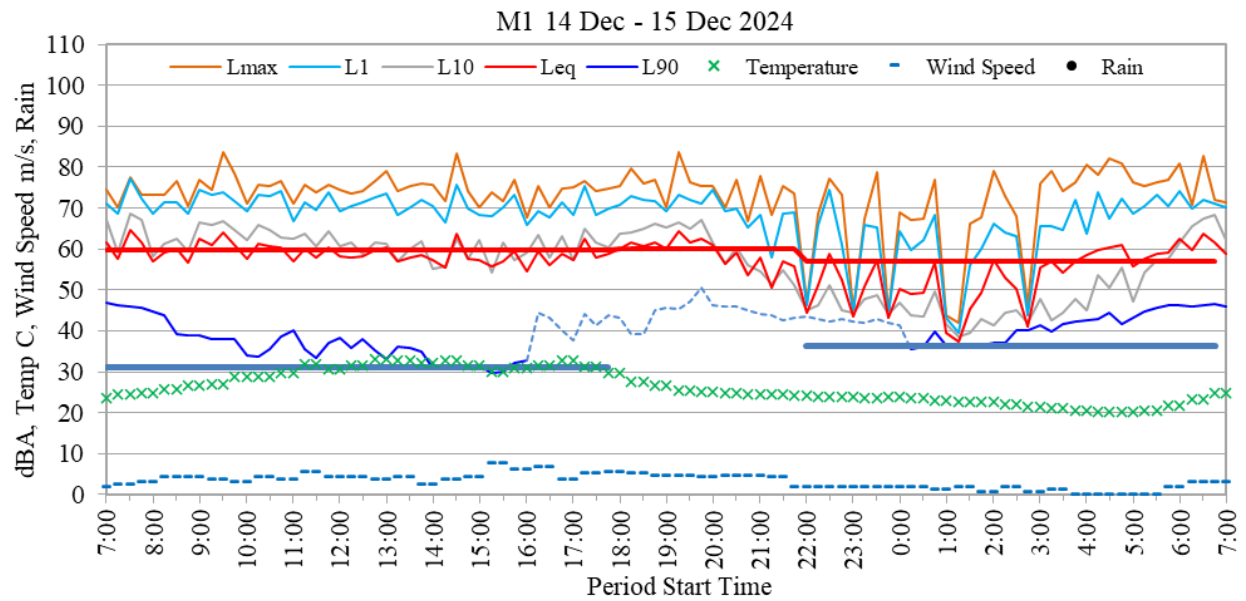


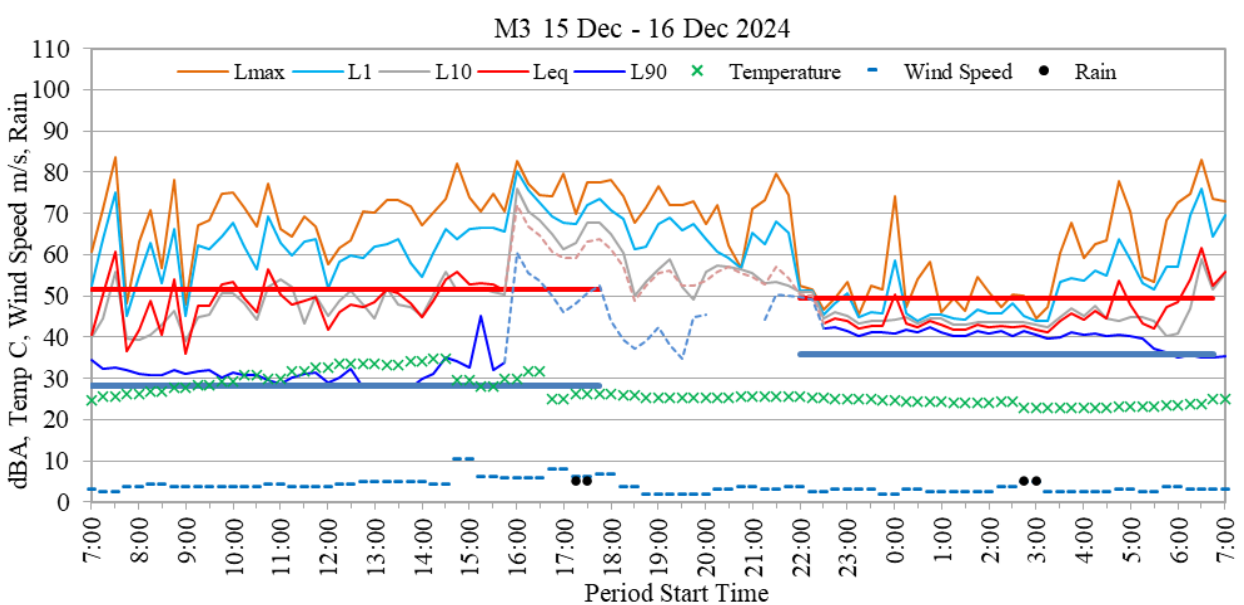
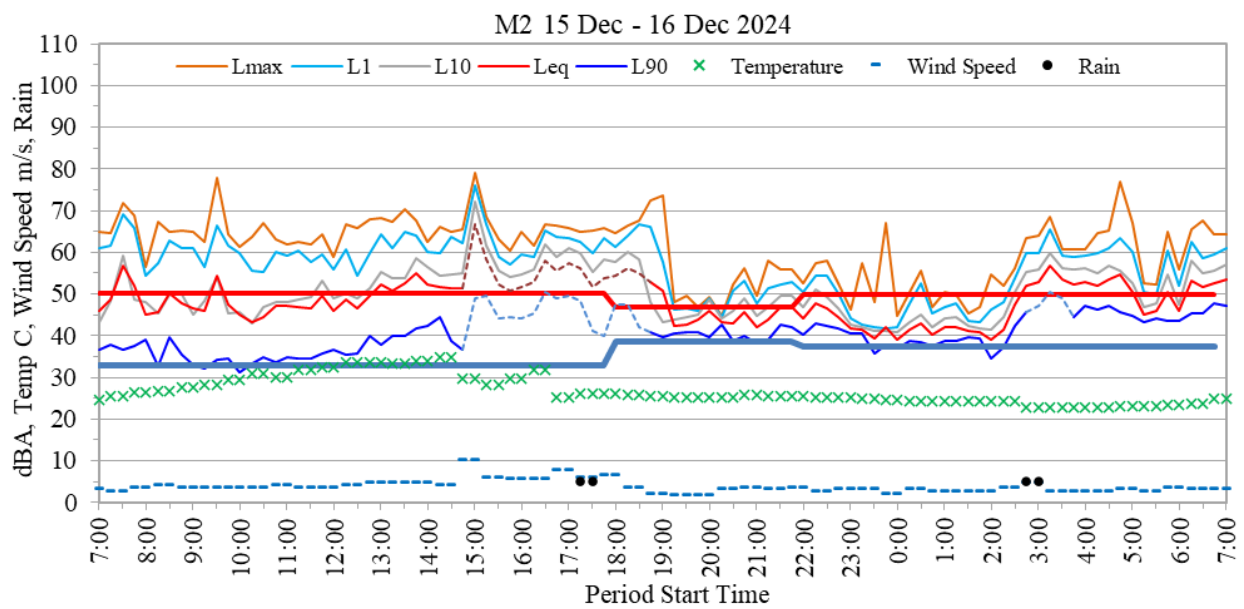
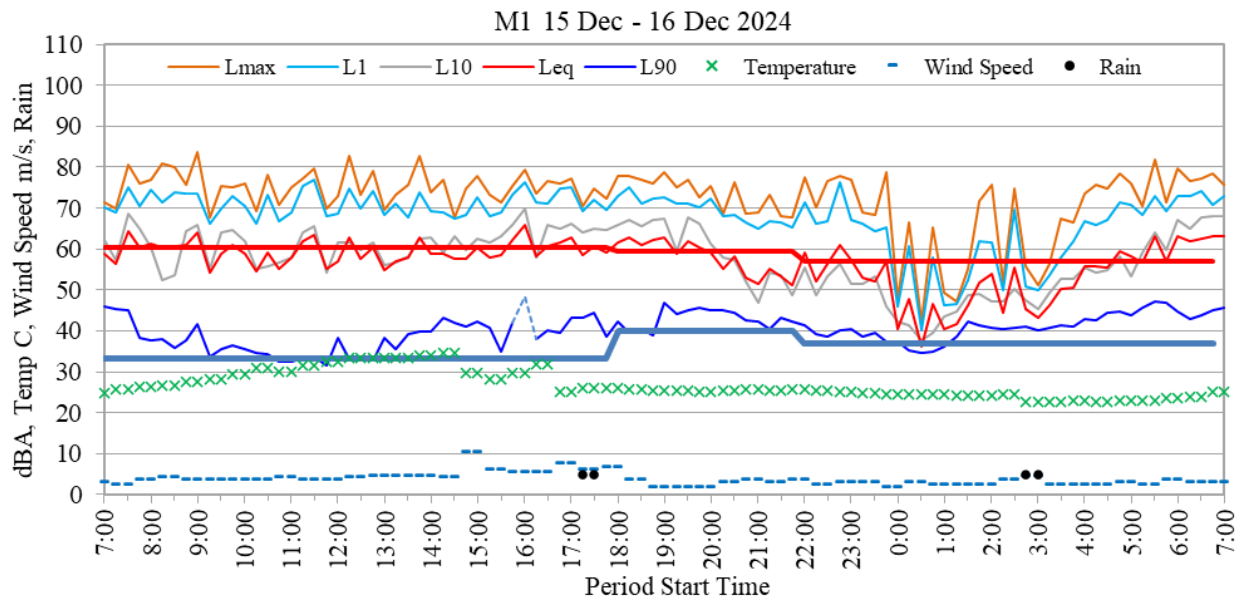


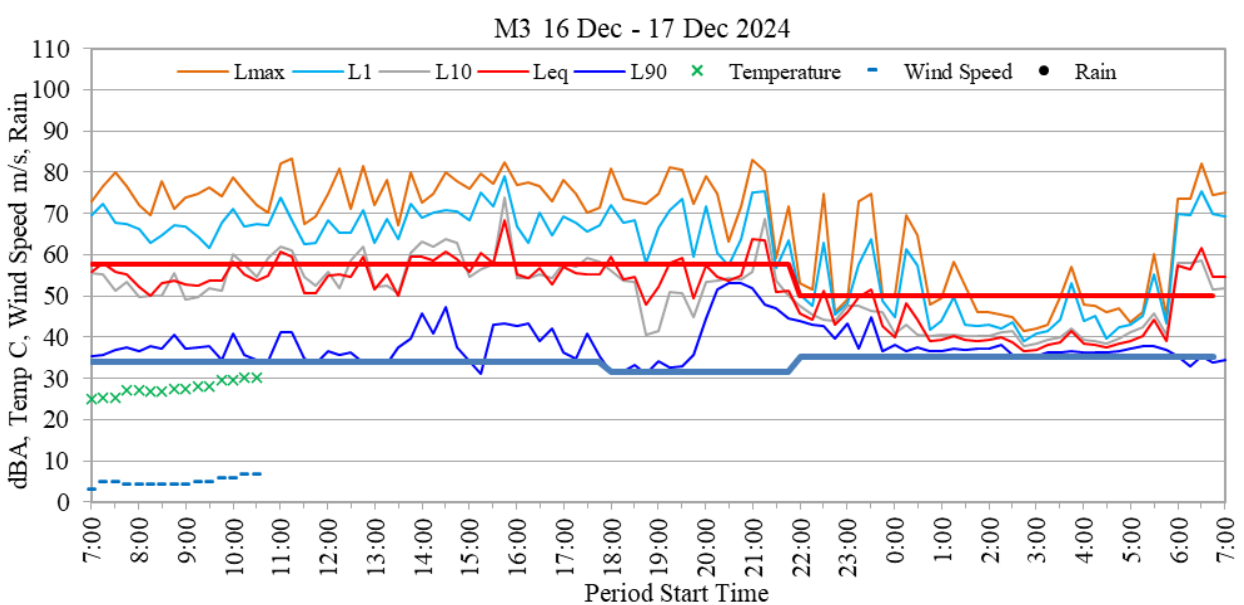
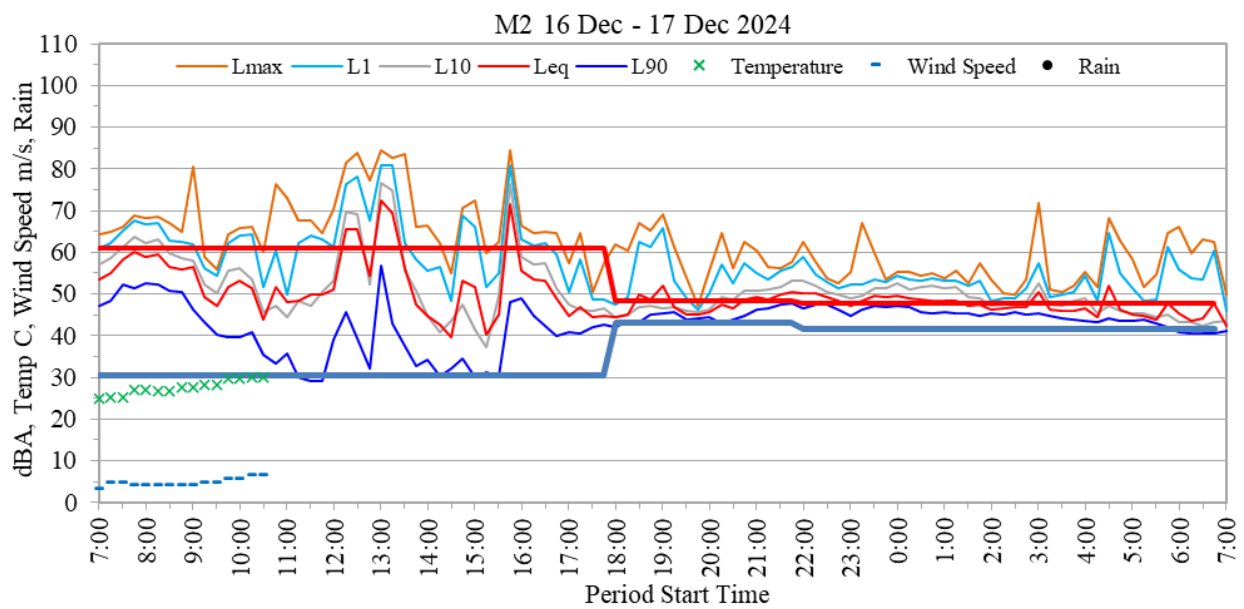
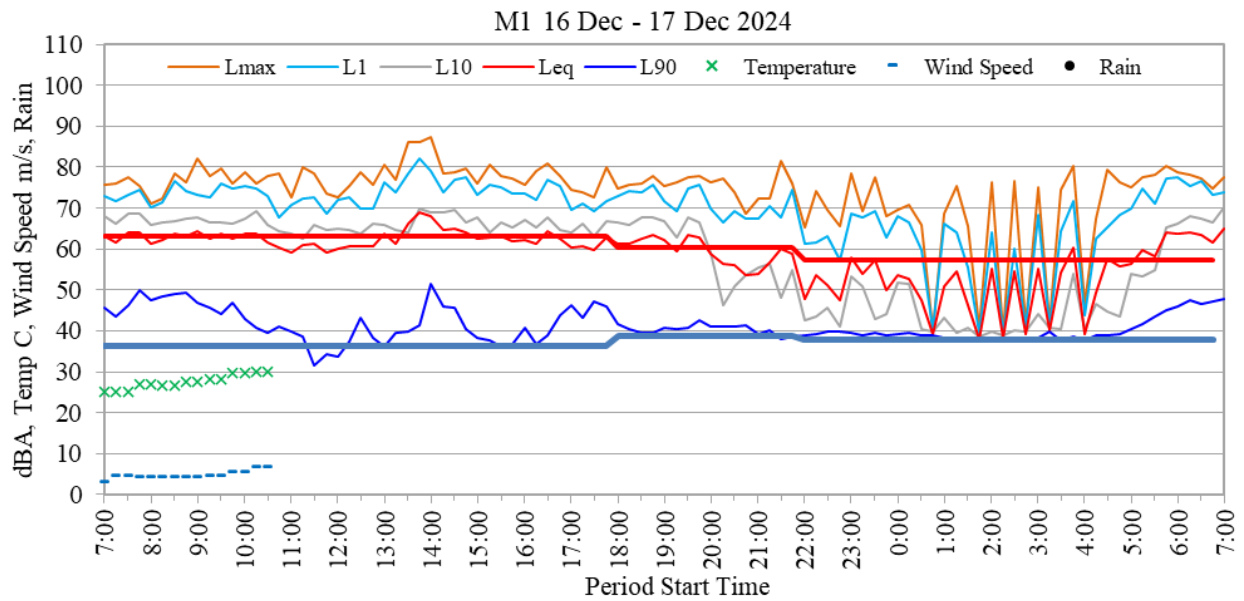


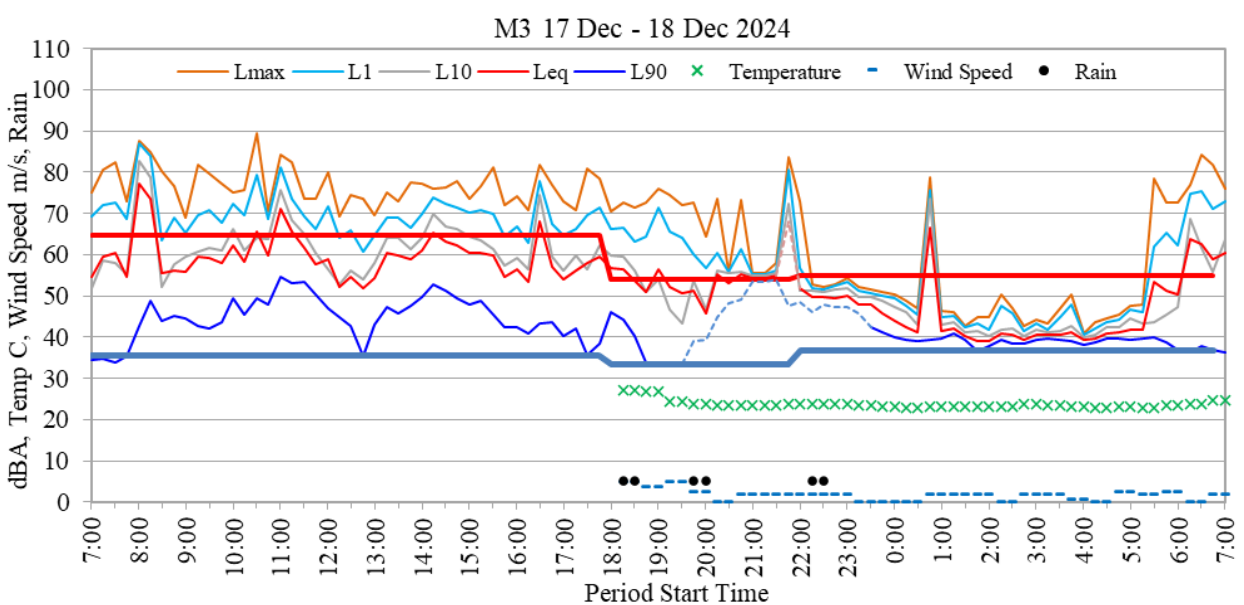
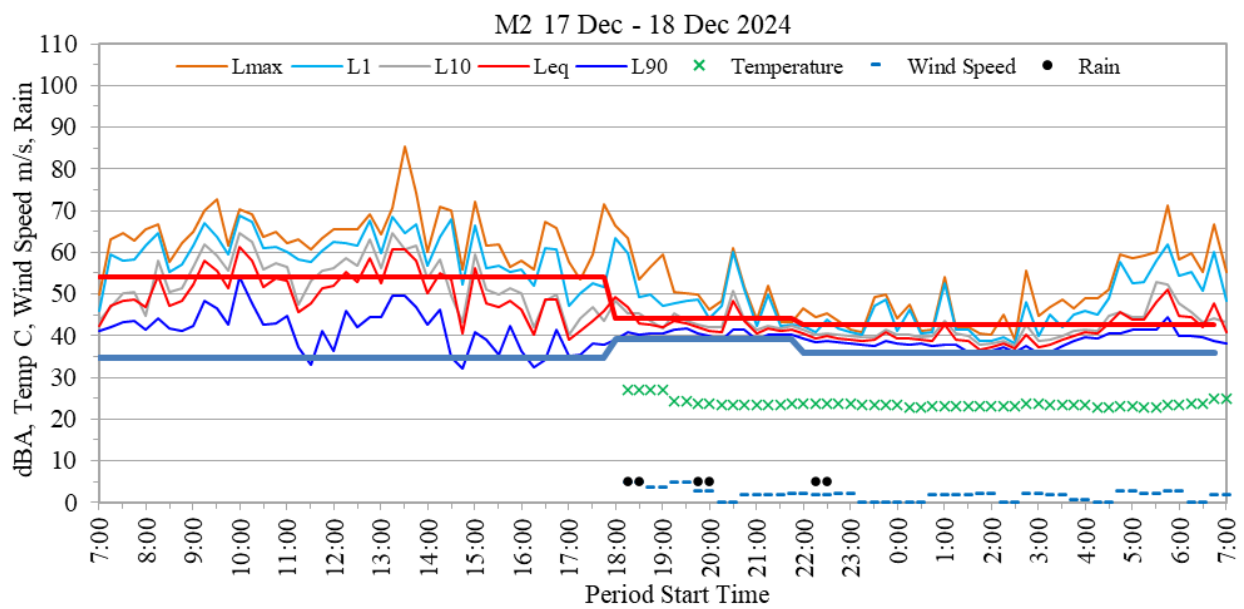
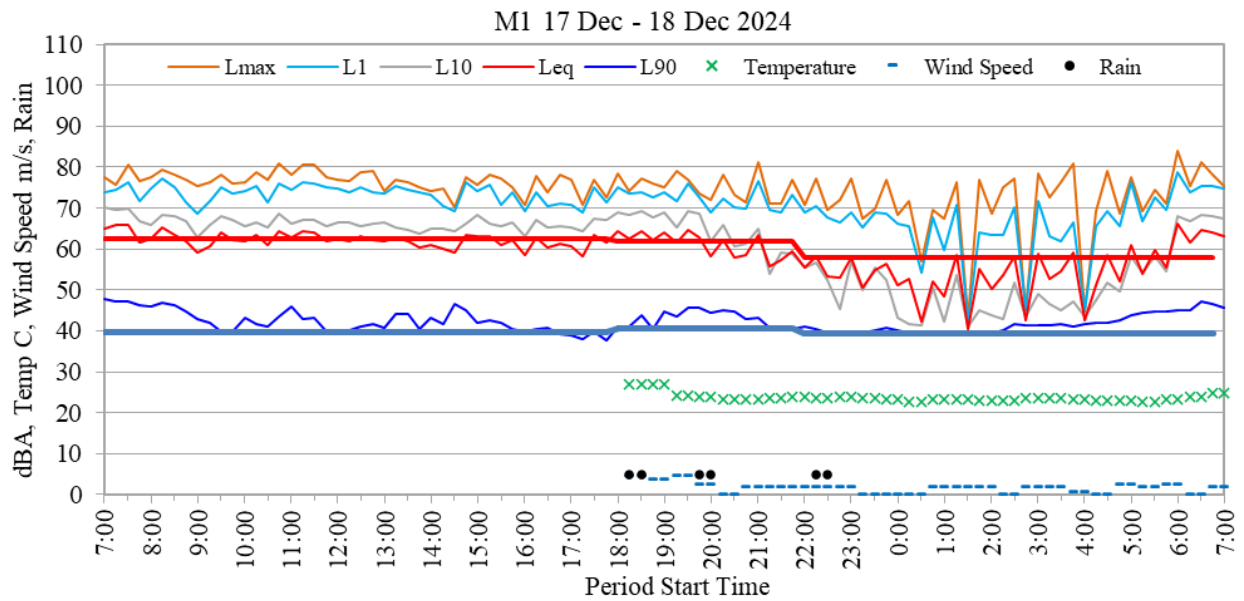


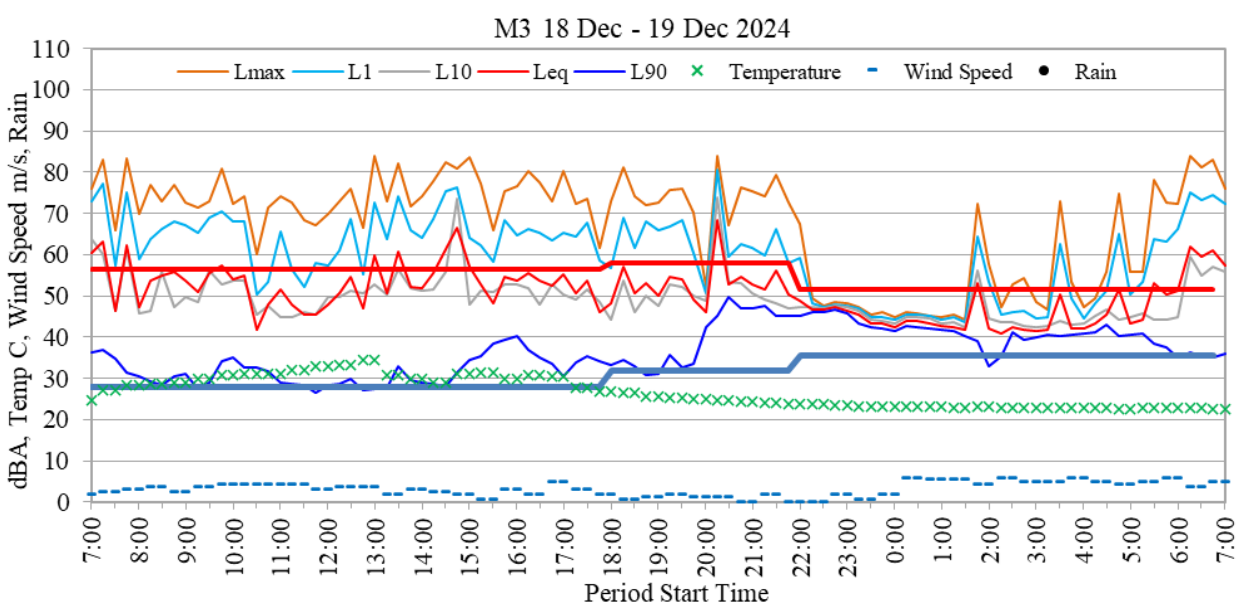
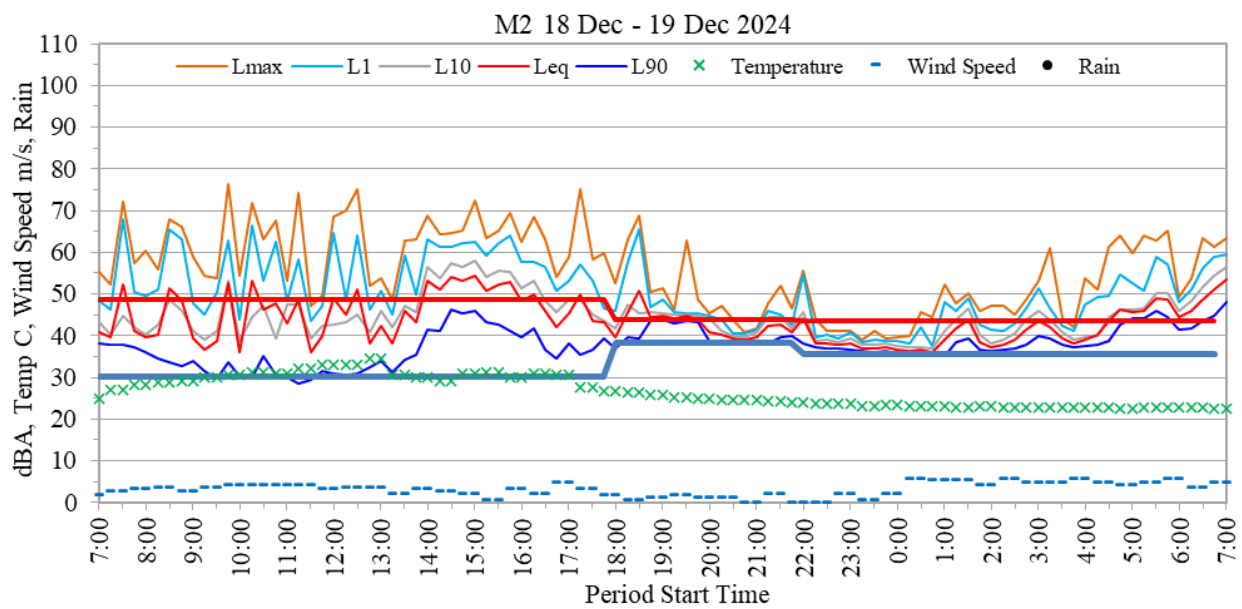
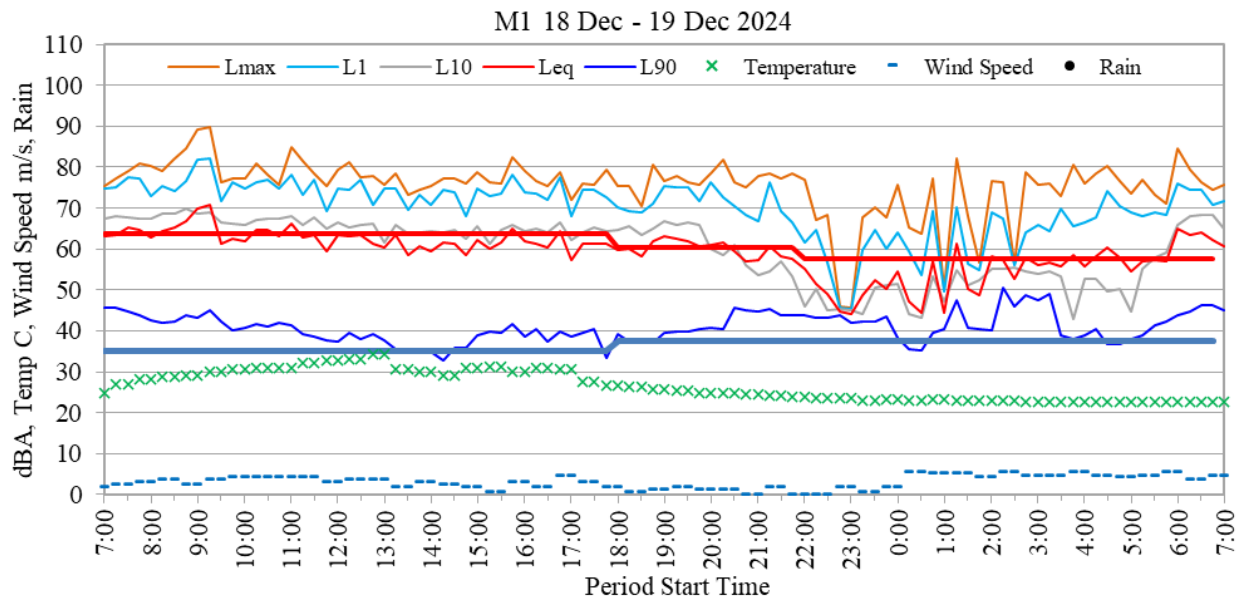


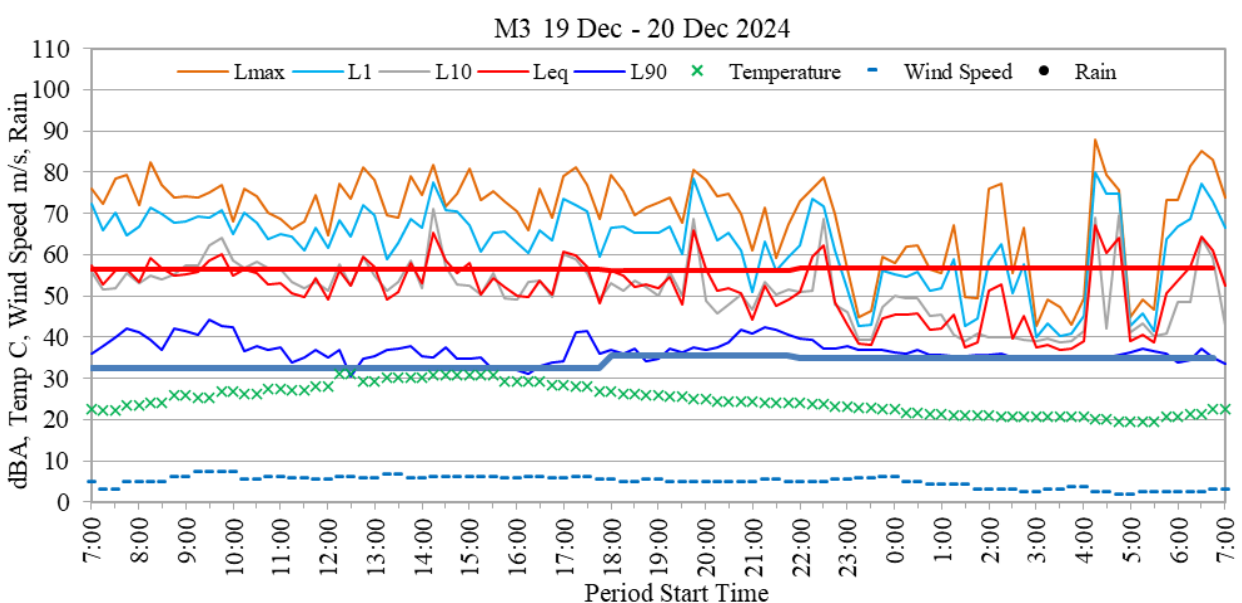
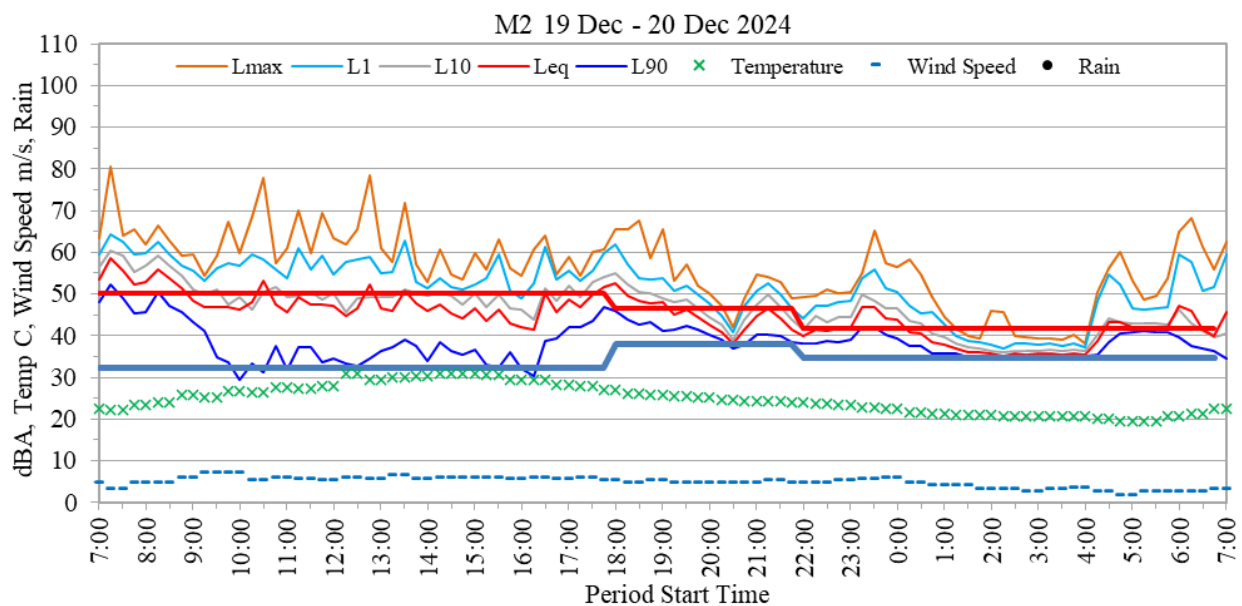
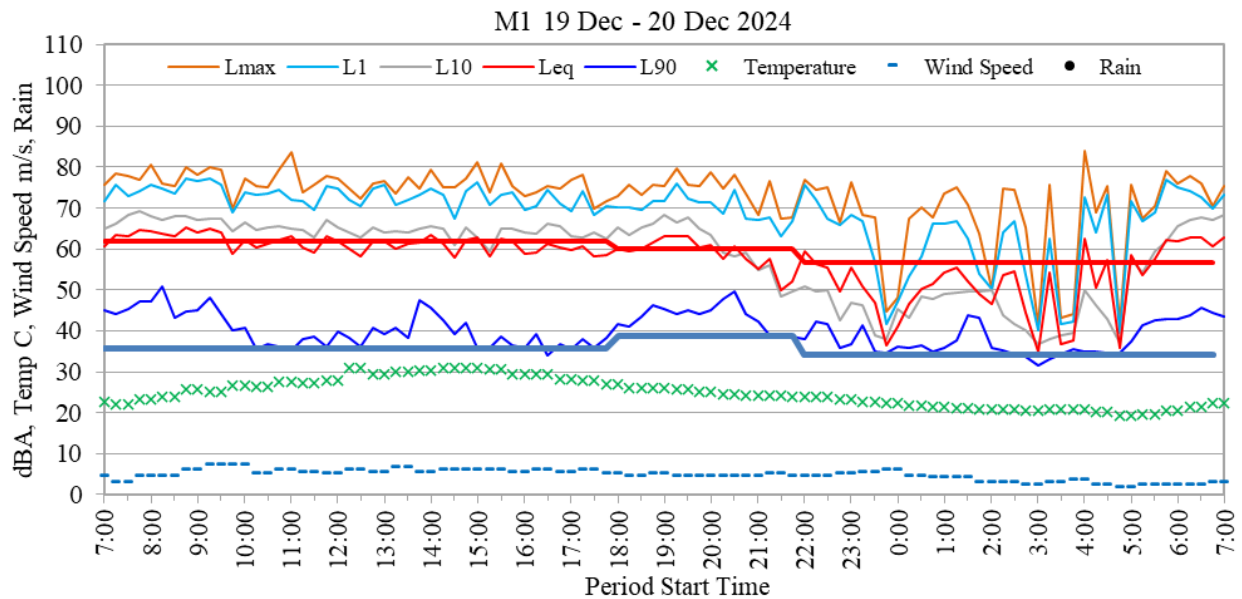


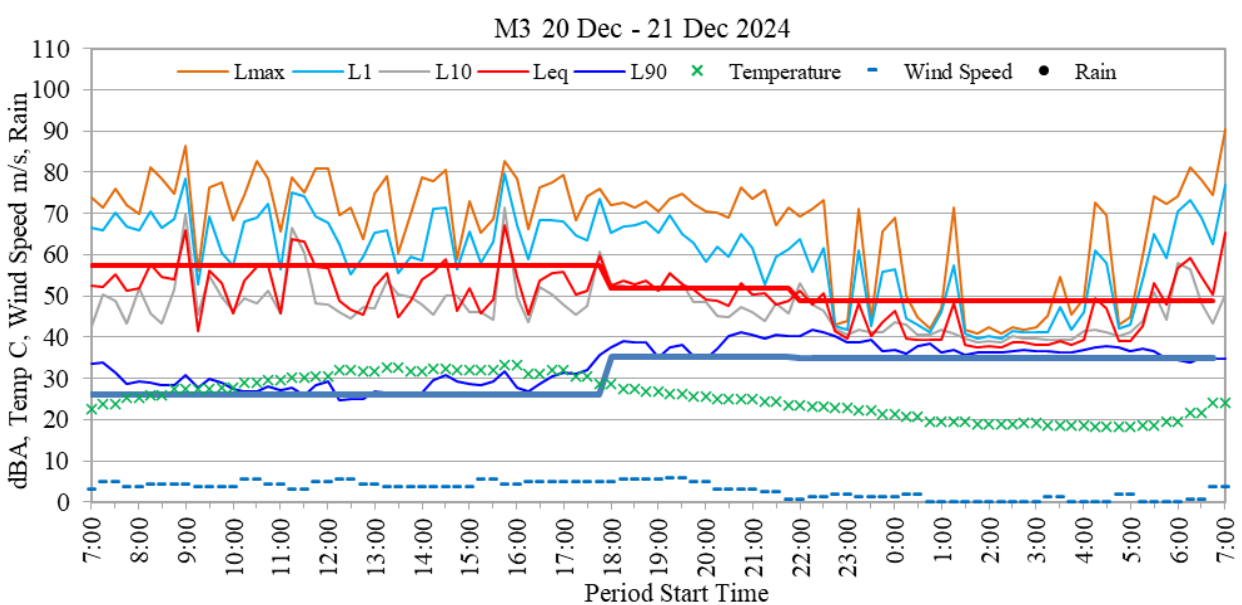
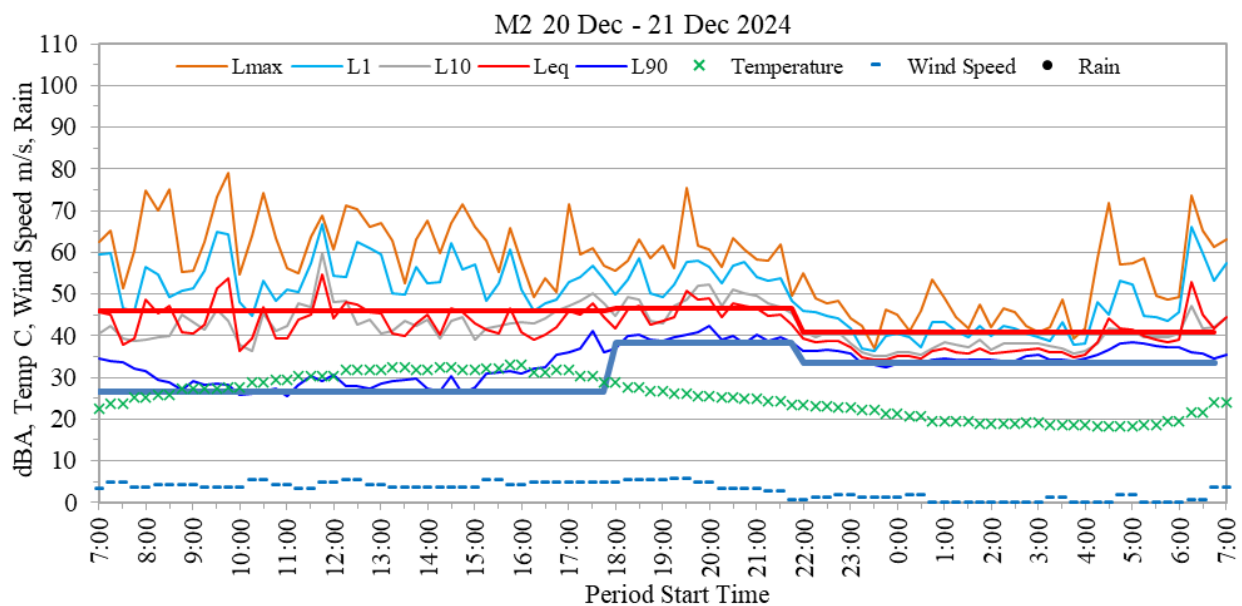
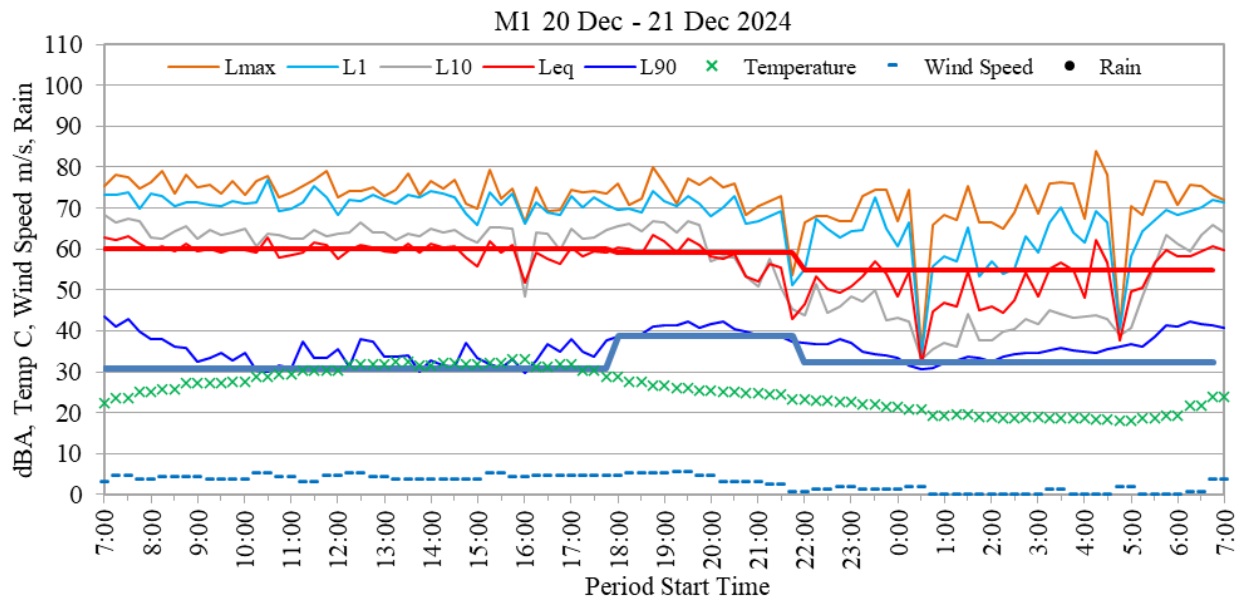


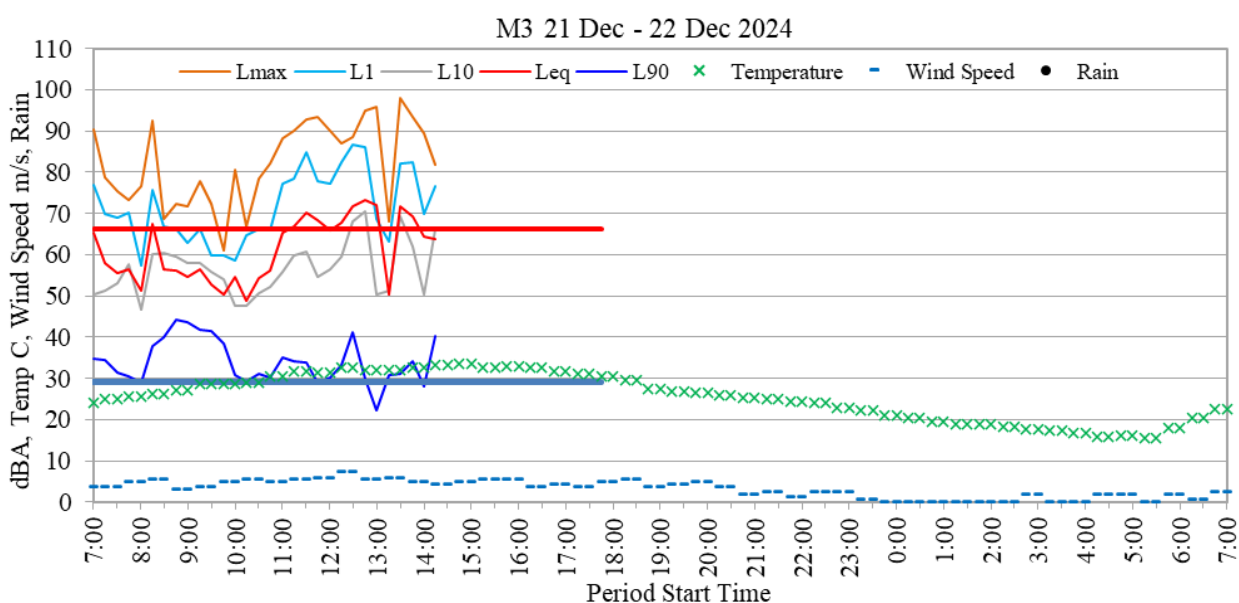
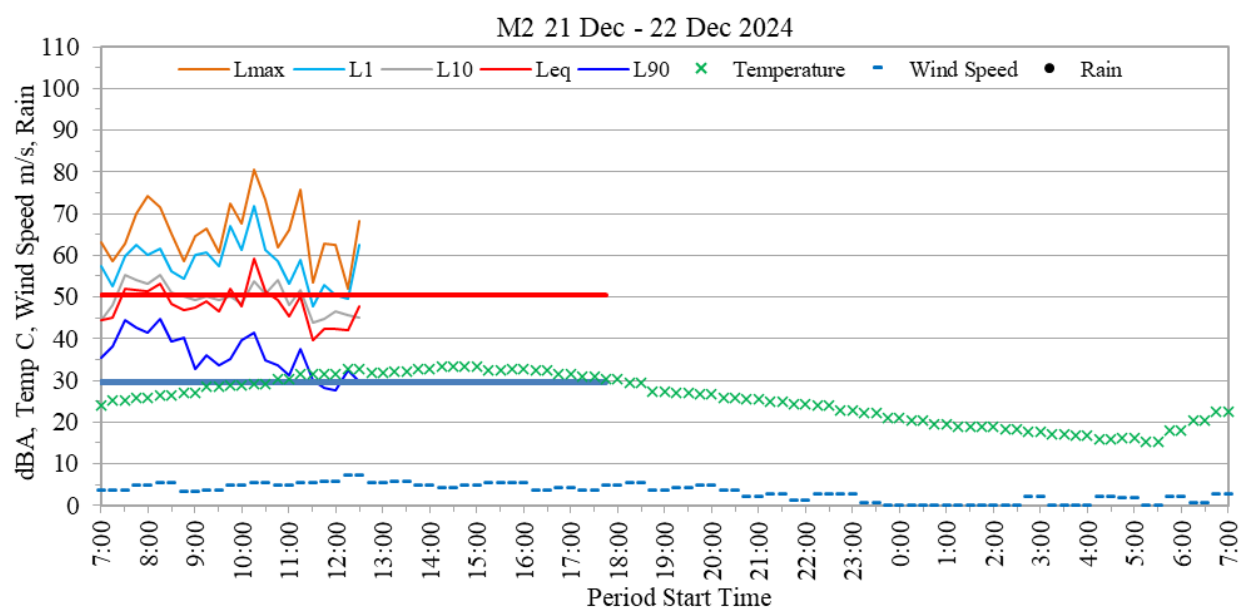
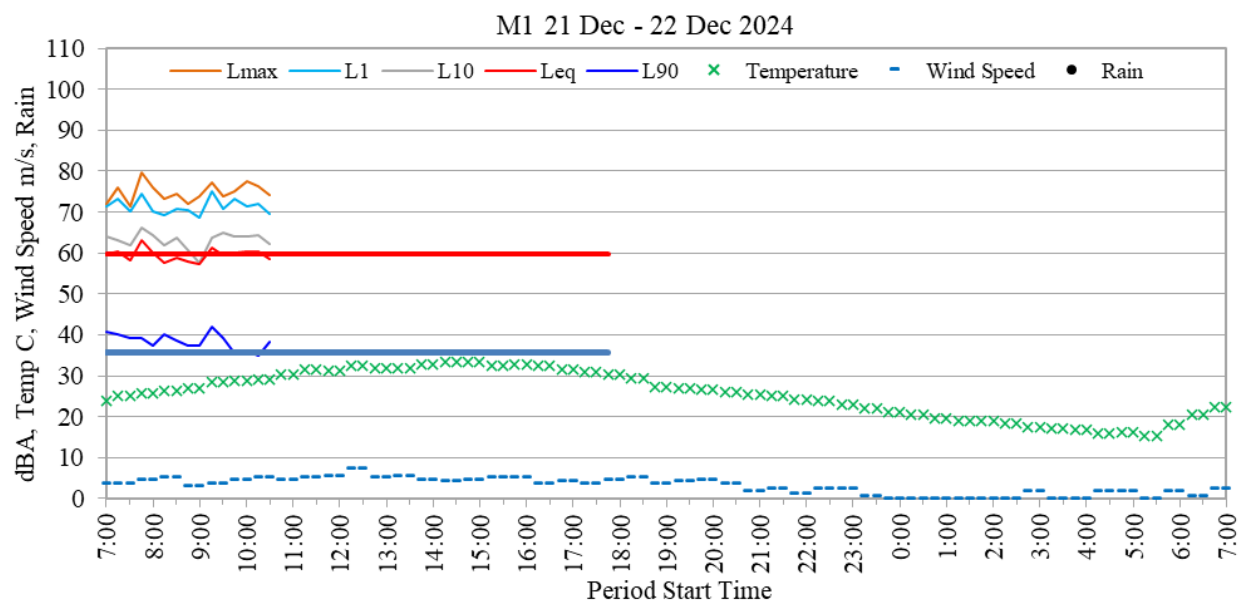












APPENDIX D – INSTRUMENT CALIBRATION CERTIFICATES

CERTIFICATE OF CALIBRATION

CERTIFICATE No: SLM37666

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Svantek

Type No: SVAN 977 **Serial No:** 36414

Mic. Type: ACO 7052E **Serial No:** 56728

Pre-Amp. Type: SV 12L **Serial No:** 41566

Filter Type: 1/1 Octave **Test No:** F037667

Owner: Bridges Acoustics
78 Woodglen Close
Paterson, NSW 2421

Tests Performed: IEC 61672-3:2013 & IEC 61260-3:2016

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	1013 hPa ± 1 hPa	Date of Receipt :	10/10/2023
Temperature	23 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$	Date of Calibration :	17/10/2023
Relative Humidity	38 % $\pm 5\%$	Date of Issue :	17/10/2023

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: **AUTHORISED SIGNATURE:**
Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.


WORLD RECOGNISED ACCREDITATION
Accredited Lab No. 9262
Acoustic and Vibration Measurements


Acu-Vib Electronics
CALIBRATIONS SALES RENTALS REPAIRS

Head Office & Calibration Laboratory
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

Page 1 of 2 Calibration Certificate
AVCERT10.3 Rev.2.0 14/04/2021

Calibration certificate for Monitor M1

CERTIFICATE OF CALIBRATION

CERTIFICATE No: SLM51875

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Svantek

Type No: SVAN 955 **Serial No:** 23643

Mic. Type: ACO 7052E **Serial No:** 47913

Pre-Amp. Type: SV 12L **Serial No:** 25501

Owner: Bridges Acoustics
78 Woodglen Close
Paterson, NSW 2421

Tests Performed: IEC 61672-3:2013

Comments: All Tests passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	1002 hPa ± 1 hPa	Date of Receipt :	07/11/2024
Temperature	24 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$	Date of Calibration :	13/11/2024
Relative Humidity	52 % $\pm 5\%$	Date of Issue :	15/11/2024

Acu-Vib Test Procedure: AVP10 (SLM) based on IEC 61672-3.

CHECKED BY: **AUTHORISED SIGNATURE:**
Hein Soc

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

Acu-Vib Electronics
ACOUSTICS AND VIBRATIONS

Head Office & Calibration Laboratory
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

NATA
WORLD RECOGNISED
ACCREDITATION
Accredited Laboratory
No. 9262
Acoustic and Vibration
Measurements

Page 1 of 2 Calibration Certificate
AVCERT10.12 Rev.2.0 14/04/2021

Calibration certificate for Monitor M2

CERTIFICATE OF CALIBRATION

CERTIFICATE No: SLM 51869

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Svantek
Type No: SVAN 955
Mic. Type: ACO 7052E
Pre-Amp. Type: SV 12L

Serial No: 23644
Serial No: 47912
Serial No: 25502

Owner: Bridges Acoustics
78 Woodglen Close
Paterson, NSW 2421

Tests Performed: IEC 61672-3:2013

Comments: All Tests passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	1004 hPa ± 1 hPa	Date of Receipt :	07/11/2024
Temperature	24 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$	Date of Calibration :	12/11/2024
Relative Humidity	54 % $\pm 5\%$	Date of Issue :	15/11/2024

Acu-Vib Test Procedure: AVP10 (SLM) based on IEC 61672-3.

CHECKED BY:
AUTHORISED SIGNATURE:
Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.
The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

Acu-Vib Electronics
ACOUSTICS AND VIBRATIONS
Head Office & Calibration Laboratory
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

NATA
WORLD RECOGNISED
ACCREDITATION
Accredited Laboratory
No. 9262
Acoustic and Vibration
Measurements

Page 1 of 2 Calibration Certificate
AVCERT10.12 Rev.2.0 14/04/2021

Calibration certificate for Monitor M3

CERTIFICATE OF CALIBRATION

CERTIFICATE No: SLM50379

EQUIPMENT TESTED: Sound Level Meter

Manufacturer: Svantek
Type No: SVAN 977
Mic. Type: ACO 7052E
Pre-Amp. Type: SV 12L

Serial No: 36198
Serial No: 57327
Serial No: 41518

Filter Type: 1/3 Octave
Test No: F050382

Owner: Bridges Acoustics
78 Woodglen Close
Paterson, NSW 2421

Tests Performed: IEC 61672-3:2013 & IEC 61260-3:2016

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	1015 hPa ± 1 hPa	Date of Receipt :	27/06/2024
Temperature	24 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$	Date of Calibration :	02/07/2024
Relative Humidity	45 % $\pm 5\%$	Date of Issue :	03/07/2024

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: *KB*

AUTHORISED SIGNATURE: *Hein Soe*

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.
The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

Acu-Vib Electronics
ACOUSTICS AND VIBRATIONS
Head Office & Calibration Laboratory
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

NATA
WORLD RECOGNISED
ACCREDITATION
Accredited Laboratory
No. 9262
Acoustic and Vibration
Measurements

Page 1 of 2 Calibration Certificate
AVCERT10.3 Rev.2.0 14/04/2021

Calibration certificate for the short term attended sound level meter

CERTIFICATE OF CALIBRATION

CERTIFICATE No: C50386

EQUIPMENT TESTED : Acoustic Calibrator

Manufacturer: Svantek
Type No: SV 36 **Serial No:** 155477
Class: 1
Owner: Bridges Acoustics
78 Woodglen Close
Paterson, NSW 2421

Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1019 hPa ± 1 hPa	Date of Receipt :	27/06/2024
Temperature	21 $^{\circ}\text{C} \pm 1^{\circ}\text{C}$	Date of Calibration :	03/07/2024
Relative Humidity	49 % $\pm 5\%$	Date of Issue :	03/07/2024

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY:  **AUTHORISED SIGNATURE:** 
Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.
The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.


Acu-Vib Electronics
ACOUSTICS AND VIBRATIONS
Head Office & Calibration Laboratory
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au


NATA
WORLD RECOGNISED
ACCREDITATION
Accredited Laboratory
No. 9262
Acoustic and Vibration
Measurements

Page 1 of 2 Calibration Certificate
AVCERT02.1 Rev.2.0 14.04.2021

Calibration certificate for the acoustic calibrator