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Proposed Tyre Recycling Facility

Noise and Vibration Impact Assessment

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1 EXECUTIVE SUMMARY

A noise and vibration impact assessment has been prepared for Jackson Environment and Planning Pty Ltd on behalf of Rutherford Tyre Recycling. It accompanies an Environmental Impact Statement (EIS) in support of a Development Application for the Tyre Recycling Facility located at 9 Burlington Place, Rutherford.

The site is legally described as Lot 3005 DP1040568 and currently consists of an existing industrial shed in which will be altered to facilitate the tyre recycling factory, further detail is as described in Section 6 of this report.

This assessment addresses the SEARs related to noise and vibration impacts, including:

- Construction noise and vibration impacts.
- Operational noise and vibration emissions.
- Noise impacts from additional traffic on nearby public roads generated by the development.

Ambient noise levels have been measured at the site using EPA recommended methodologies to establish rating background noise levels at residential receivers, and typical noise/ground vibration levels from the local sources identified as potentially impacting the site.

Assessment criteria for noise and vibration impacts have been established based on EPA guidelines, and other standards relevant to the potential impacts identified. The predicted likely impacts have been assessed against those criteria.

Based on the outcomes of the assessment, controls and mitigation have been proposed to prevent adverse environmental noise and vibration impacts at the surrounding properties, and to maintain acceptable amenity throughout construction. Section 9.3.2 of the report summarises the controls and mitigation recommended.

The assessment indicates that the adoption of the recommended controls and mitigation will:

- Adequately mitigate impacts at the surrounding receivers from construction and operational noise emissions.

Acoustic Logic confirms that the proposal will comply with the noise emission criteria outlined in the EPA Noise Policy for Industry (2017) during operation and construction noise has been assessed against the noise management levels of the EPA Interim Construction Noise Guideline (2009).

Furthermore, the assessment concludes that the road traffic generated by the development will also comply with the criteria in the EPA's Road Noise Policy (2011).

2 INTRODUCTION

A noise and vibration impact assessment has been prepared for Jackson Environment and Planning Pty Ltd on behalf of Rutherford Tyre Recycling. It accompanies an Environmental Impact Statement (EIS) in support of a Development Application for the Tyre Recycling Facility located at 9 Burlington Place, Rutherford.

The site is legally described as Lot 3005 DP1040568 and currently consists of an existing industrial warehouse in which will be altered to facilitate the tyre recycling factory, further detail is as described in Section 6 of this report.

This assessment addresses the SEARs related to noise and vibration impacts, including:

- Construction noise and vibration impacts.
- Operational noise and vibration emissions.
- Noise impacts from additional traffic on nearby public roads generated by the development.

The subject site and local context are indicated in Figure 1.

The report has been prepared for the sole purpose of a development application assessment and should not be used or relied on for any other purpose.

3 RESPONSE TO SEARS

The assessment addresses the project Secretary's Environmental Assessment Requirements (SEARs) in the following table.

Table 1 – SEARs Item

SEARs Item	
Key Issues	• noise and vibration – including: - a description of all potential noise and vibration sources during construction and operation, including road traffic noise - a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines - a description and appraisal of noise and vibration mitigation and monitoring measures.

4 REFERENCED DOCUMENTS

4.1 BACKGROUND INFORMATION USED

The assessment is based on the following drawings, reports and other information:

- Architectural Drawings prepared by Jackson Environment and Planning Pty Ltd.
- Rutherford Tyre Recyclers – Operational Analysis.

4.2 GUIDELINES

The following planning instruments and guidelines have been used in the assessment:

- NSW EPA – 'Noise Policy for Industry' ("**NPfI**") October 2017
- NSW EPA – 'Interim Construction Noise Guideline' ("**ICNG**") July 2009

5 ABBREVIATIONS AND DEFINITIONS

The following Abbreviations and definitions are used in this noise impact assessment.

dB	Decibels - unit for the measurement of sound
dB(A)	A-weighted decibels. Unit of measurement for broadband sound with the A-frequency weighting applied to approximate human loudness perception to sounds of different pitch.
L_{eq}	Energy, time averaged sound level
L_{max}	Maximum sound pressure level, fast response
L_{90}	Sound level exceeded for 90% of the measurement period
R_w	Frequency weighted sound reduction index.
NRC	Average absorption co-efficient for the octave bands with centre frequencies of 250Hz to 2 kHz inclusive.
Day*	For noise emissions assessment - the period from 7 am to 6 pm (Monday to Saturday) and 8 am to 6 pm(Sundays and public holidays). For transportation noise - the period from 7 am to 10 pm
Evening*	Refers to the period from 6 pm to 10 pm.
Night*	The period from 10 pm to 7 am (Monday to Saturday), and 10 pm to 8 am(Sundays and public holidays). For transportation noise - the period from 10 pm to 7am
Project Trigger Level	Target receiver noise levels for a particular noise-generating facility.
Assessment Background Level (ABL)	A-weighted background noise level representative of a single period. (Calculated in accordance with NPfI unless noted otherwise)
Rating Background Level (RBL)	The overall, single-figure A-weighted background level representing each assessment period (day/evening/night) over the whole monitoring period. (Calculated in accordance with NPfI unless noted otherwise)

* Unless nominated otherwise.

6 SITE AND PROPOSAL DESCRIPTION

6.1 DESCRIPTION OF THE PROPOSAL

Rutherford Tyre Recyclers Pty Ltd are seeking approval to establish a tyre recycling facility within an existing shed located at 9 Burlington Place, Rutherford (Lot 3005 / DP1040568) (the Proposal). The operation can be defined as a 'resource recovery facility'. The materials produced will be crumb rubber, recovered steel, recovered cotton, rubber pavers and rubber matting.

The Site covers an area of 1,655m^2, with a ~290m^2 existing shed on the site that has a ~35m^2 office attached on the eastern side of the shed. The Site is supported by an outdoor concrete hardstand area with access to the Site from Burlington Place via a driveway. The driveway provides access to the outdoor hardstand which has access to the shed, open awning and office. The office contains staff amenities and is located on the western side of the Site, near the Site entrance.

Prior to operations, minor infrastructure changes to the industrial shed and Site are proposed to enable the fit-out and use of the Site as a best practice tyre recycling facility. This will involve enclosing the existing open awning at the back of shed, removing the dividing wall and installing two roller doors, creating a larger, fully enclosed industrial shed on Site. The total area of the new shed will be ~638m^2. The two new roller doors will allow access into the industrial shed. A 9m above ground weighbridge will be installed on the hardstand area close to the access point of the Site. The Site will have new markings to show the loading bay area and five car spaces for staff.

The Site will receive an average of 15 tonnes of used whole tyres per day, approximately 4,500 tonnes per annum. No other material will be received on-site. All incoming whole tyre deliveries are delivered into the Site by a 7.5 tonnes medium rigid vehicle (MRV), with access onto Site from Burlington Place. There will be four (4) deliveries of tyres per day. The MRV will proceed to the 9m above ground weighbridge to be weighed before proceeding to the loading area. The loading area is located outside the roller doors to the industrial shed and tyres will be unloaded by hand and immediately stacked in the Whole Tyre Storage Area. The MRV will be backloaded with products produced onsite before exiting the Site by proceeding further onto site, reversing back through the industrial building roller doors and turning right onto the weighbridge. The MRV will be weighed on the weighbridge to track the amount of product being removed from Site and will then exit the Site via the driveway access onto Bulington Place. An average of 18 vehicle movements (9 inbound and 9 outbound) will be generated by the Site per day. This includes up to five (5) staff vehicles and two trips by two 7.5 tonnes medium rigid vehicle (MRV) trucks. There will be one weekly waste collection on site.

All tyre recycling activities will occur inside the shed, including storage of all materials. No tyres or residual materials will be stored outside on the hardstand area. The used whole tyres are turned into crumb rubber on the Waste Tyre Recycling Production Line, which has a 98% efficiency. The first step involves the tyre de-beader to remove the metal wiring from inside the tyre. The tyre is then cut into a long rubber strip using the tyre strip cutter before being placed onto a conveyor belt and loaded into the whole tyre shredder. The next stage involves crushing the rubber blocks into mesh rubber powder using the double roller rubber breaker. A vibration screen is then used to separate the different sized pieces of crumb rubber. The Waste Tyre Recycling Production Line produces crumb rubber, residual steel and residual cotton from the whole tyres.

Some of the crumb rubber produced on-site will be used to produce rubber tiles and rubber mats in the Rubber Tiles Production area. This involves a small thermal-moulding process that coverts crumb rubber into rubber matting or rubber tiles. The first step involves mixing the rubber crumb with glue to create the bottom of the rubber tile. The top part of the rubber tile involves mixing rubber crumb, pigment and glue together in a barrel mixer. A vulcanizing machine is used to create vulcanized rubber tiles by compressing the rubber into dense, ultra durable, non-porous rubber tiles. The production of tiles or mats depends on the size of the mould used.

The facility will have two storage areas, both located on the eastern side of the industrial building. The Whole Tyre Storage Area will be used to stack the whole tyres after they have been delivered to the Site. The area capacity is 24m^3 with a maximum height of 3.5m. The Crumb Rubber Storage Area is used to store materials produced on site, including crumb rubber, recovered steel and cotton from the tyre recycling process and rubber tiles and mats produced on site. The rubber tiles and mats will be stored on pallets. The area capacity is 24m^3 with a maximum height of 3.5m. The storage areas will be marked on the concrete floor using hard wearing paint.

The tyre recycling facility will operate 6 days a week, with times varying for deliveries and recycling operations. A breakdown of the weekly operation is as follows:

- Crumb Rubber Production
  - Monday – Friday: 5am – 6pm
  - Saturday: 8am – 1pm
  - Sunday & Public Holidays – Closed
- Tyre Delivery
  - Monday – Friday: 7am – 6pm
  - Saturday: 8am – 1pm
  - Sunday & Public Holidays – Closed

6.2 SENSITIVE RECEIVERS

The following table lists the nearest/potentially most impacted sensitive receivers surrounding the site. An aerial photo of the site indicating nearby noise sensitive receivers and measurement locations is presented in Figure 1.

Table 2 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Aged Care Development located southeast of the site at 3 Discovery Way
R2	Residential	Residential Receivers located east of the site situated along Victory Way
R3	Residential	Residential Receivers north of the site situated along Grevillia Avenue
C1	Commercial	RSPCA NSW Shelter located west of the project site at 6 Burlington Place
I1	Industrial	Surrounding Industrial Warehouses located on Burlington Place

6.3 AMBIENT NOISE

A survey of ambient noise has been undertaken to characterise the existing acoustic environment. The survey data is summarised in Appendix A.

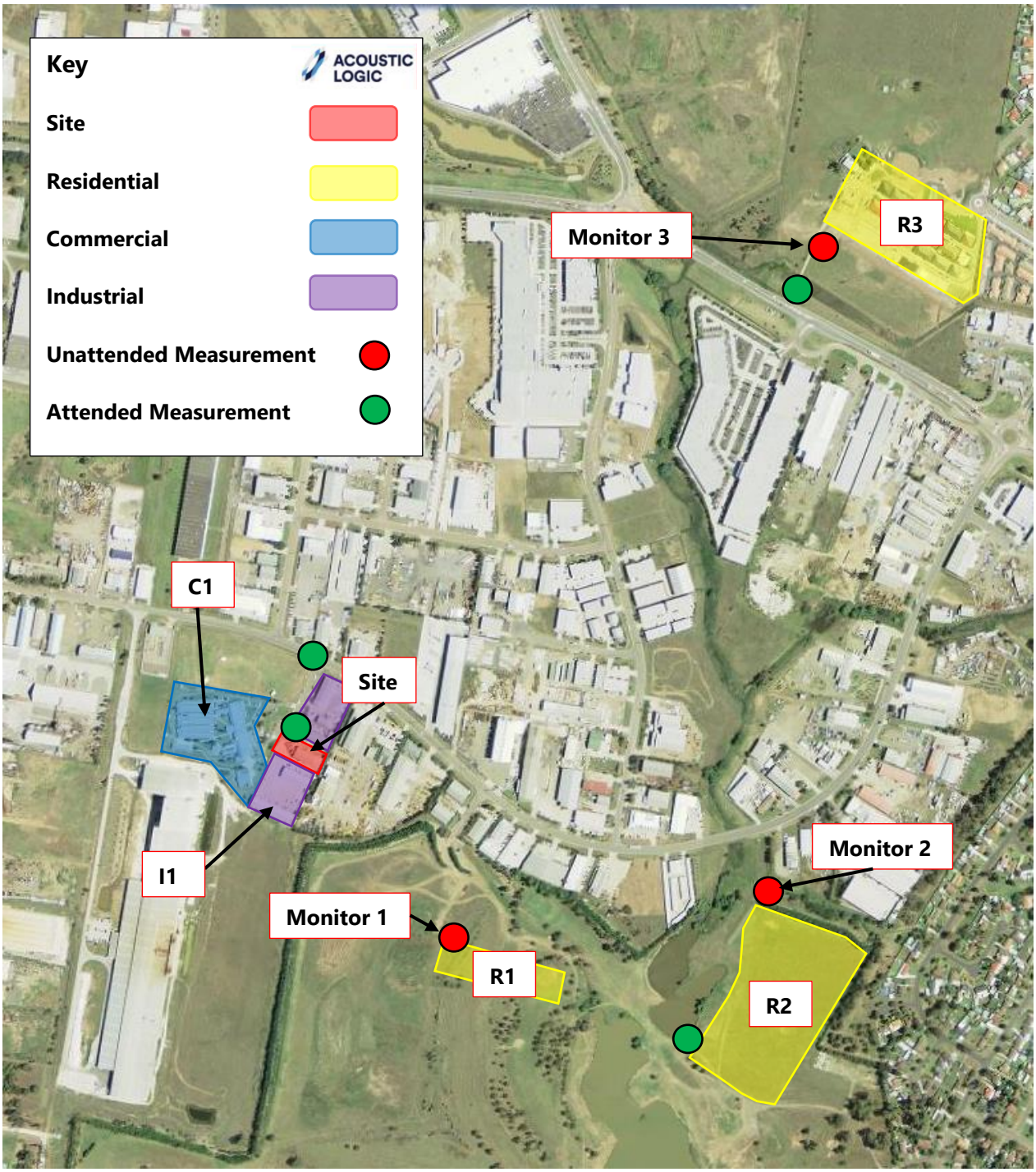


Figure 1– Site Plan Showing Local Context and Monitoring Locations

7 SITE OPERATIONAL NOISE EMISSIONS ASSESSMENT

7.1 ENVIRONMENTAL NOISE AND VIBRATION SOURCES

The following significant noise and vibration sources have been identified as requiring assessment:

- Internal activities and process equipment and plant.
- External truck loading activities.
- Forklift movements throughout the site.
- Truck and commercial vehicle movements on the site and on local roads.

7.2 NOISE ASSESSMENT CRITERIA FOR ON-SITE NOISE SOURCES

Criteria to assess noise emissions from the operation of the proposed development have been developed using the NPfI. This policy was primarily developed to assess noise impacts from industrial development but can also be adapted to assess other types of development such as commercial buildings and air conditioning plant.

For each receiver type:

- Receivers have been grouped into "catchments". These are receivers that have been assessed as having similar characteristics (receiver type and ambient noise level). These are shown in Figure 1.
- For each catchment, representative noise assessment trigger levels have been determined based on NPfI guidelines. The trigger levels have been adopted in this assessment as criteria. These will be used to indicate whether additional mitigation is needed to manage noise emissions.
- For each catchment, noise emissions have been assessed to the most impacted receiver. This means that impacts at all other receivers within that catchment will be less. Compliance at the most impacted receiver will therefore also result in compliance at all other receivers within the catchment.

For residential receivers, three criteria are assessed:

- Intrusive assessment– that is, how audible is the emitted noise compared to ambient, background noise). Criteria are determined relative to the measured rating background noise level.
- Amenity assessment – that is, how loud is the absolute level of industrial noise, including cumulative noise from other industrial sources. The NPfI nominates appropriate amenity noise levels depending on the receiver type and prevailing noise environment/zoning.
- Maximum Noise assessment – will high level, short term noise events cause adversely impact sleep at night? Trigger levels are determined relative to the measured night rating background, and assessed outside rooms where sleep is likely to occur.

For residential receivers, noise emissions are assessed against the trigger levels to determine the likely extent of impacts. The lower of the relevant intrusiveness and amenity trigger levels are adopted. Noise emissions lower than the trigger levels indicate there is no adverse impact. A maximum noise level assessment is separately undertaken if night time emissions occur.

For other receiver types, only an "amenity" assessment is required.

Appendix A summarises the results of ambient noise monitoring. Appendix B provides the derivation of NPfI trigger levels for each of the receivers. These are summarised in the following table.

Table 3 – Project Trigger Levels

Receiver	Period	Trigger Noise Level (dB(A) $L_{eq,15min}$)
R1 (Residential)	Day	48
	Evening	48
	Night	43 L_{eq} 61 L_{max}
R2 (Residential)	Day	50
	Evening	48
	Night	43 L_{eq} 57 L_{max}
R3 (Residential)	Day	53
	Evening	48
	Night	43 L_{eq} 56 L_{max}
C1 (Commercial)	All times	63
I1 (Industrial)	All times	68

7.3 RECEIVER NOISE PREDICTIONS

SoundPlan noise modelling software (version 8.0) has been used to predict noise impacts from the subject site to the receivers. Modelling included:

- A geo-model of the site, noise sources on the subject site and surrounding land and built forms. Data indicating the surrounding land and built forms were obtained from Geoscape.
- Noise emission levels in Appendix C for the noise sources.
- The modelling incorporates the effect of the complying mitigating treatment indicated in Section 7.4.3.
- ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation standard. This model assumes the most favourable conditions for noise propagation from the source to the receiver, hence details of the direction are not required for predictions made using this model.
- Meteorological Conditions used for the soundplan noise model is outlined in Table 4.

Table 4 – Meteorological Conditions Used for Soundplan Models

Factor	Neutral	Day, Evening and Night Enhancing	Night Enhancing
Temperature	20°C	20°C	20°C
Humidity	70%	70%	70%
Wind Speed	0	3 m/s	2 m/s
Wind Direction	0	Towards receiver	Towards receiver
Temperature Inversion	Stability Cat A-D	Stability Cat A-D	Stability Cat F

7.3.1 General Modelling Assumptions

- All residential receivers were modelled at 1.5m above ground level, and at 4.5m above ground level for two level dwellings. Multi-storey developments were also assessed at 1.5m above floor level.
- Ground absorption of 0.6.
- Key L_{max} events have been separately modelled to determine any influence of night time operations on sleep disturbance. Specifically, car door slamming has been modelled as a point source at 1m above the on-grade carpark finished floor height.

7.3.2 Operational Assumptions

The following information provided to this office, as well as assumptions made by this office, are features of the existing operational noise SoundPlan model:

- AL assumes in a worst 15-minute period, there will be:
    - Day time period (7:00am – 6:00pm):
        - 4 car movements.
        - 1 HRV movement.
        - 1 forklift moving constantly throughout the site.
    - Night time period (5:00am – 7:00am)
        - 2 car movements.
        - 1 forklift moving constantly throughout the site.
- Tyre Recycling operation between 5:00am to 6:00pm. All machinery running simultaneously.
- Tyre Delivery between 7:00am to 6:00pm.

7.3.2.1 Acoustic Data

The following noise level data for vehicle-related noise sources have been used for the assessment. These noise levels have been taken from measurements conducted by this office.

Table 5 – Sound Power Levels of Typical Automotive Movements Within the Site

Item	Sound Power Level, dB(A)
Car Door Slamming	96 L_{max}
Tyre Recycling Operation (Internal)	110 L_{max}
Car Travelling at 10km/h	84 dB(A) L_{eq}
Diesel Forklift	100 L_{eq}
Truck Manoeuvring @ 10km/h (HRV/delivery truck under 12.5 metres)	100 $L_{eq(15\ min)}$
Truck Reversing @ 5km/h (HRV/delivery truck under 12.5 metres)	*105 $L_{eq(15\ min)}$

*A 5 dB(A) penalty has been applied for the reversing beacon.

7.3.3 Machinery Sound Power Level Assumptions

Acoustic Logic note that relevant sound power levels of the proposed machinery to be used within the Recycling Facility was not provided to this office at the time of assessment. As a result, this office has made the following assumptions based on similar plant and equipment modelled in our investigations for the proposed machinery:

- Tyre De-Beader – 80dB(A) SWL.
- Whole Tyre Shredder – 100dB(A) SWL.
- Double Roller Rubber Breaker – 100dB(A) SWL.
- Vibration Screen – 90dB(A) SWL.
- Steel Separation Magnet – 80dB(A) SWL.
- Cotton Separator – 85dB(A) SWL.
- Diesel Forklift – 100dB(A) SWL

The overall sound pressure level of the facility was calculated to be approximately 87dB(A) based on the assumed sound power levels presented above. To take a conservative approach, this office has conducted noise emission modelling based on an absolute sound pressure level of **95dB(A)** within the Tyre Recycling Facility throughout operation.

Additionally, internal noise modelling was undertaken assuming a worst case scenario with all roller doors open throughout operation.

7.4 SOUNDPLAN MODELLING RESULTS

7.4.1 Noise Modelling Charts

7.4.1.1 Cumulative Noise Modelling Results - Daytime

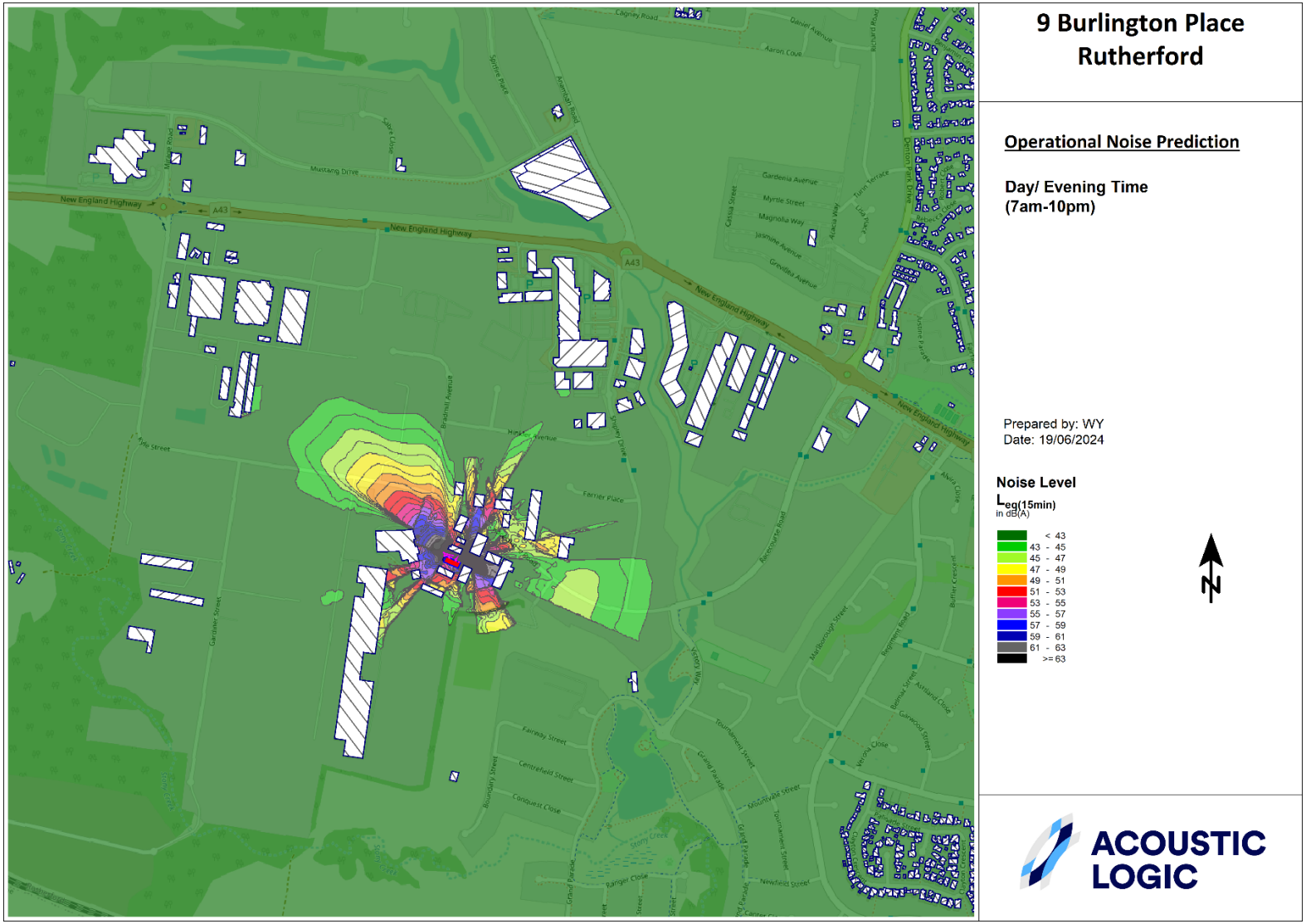


Figure 2 – Day Time Noise Prediction (far)

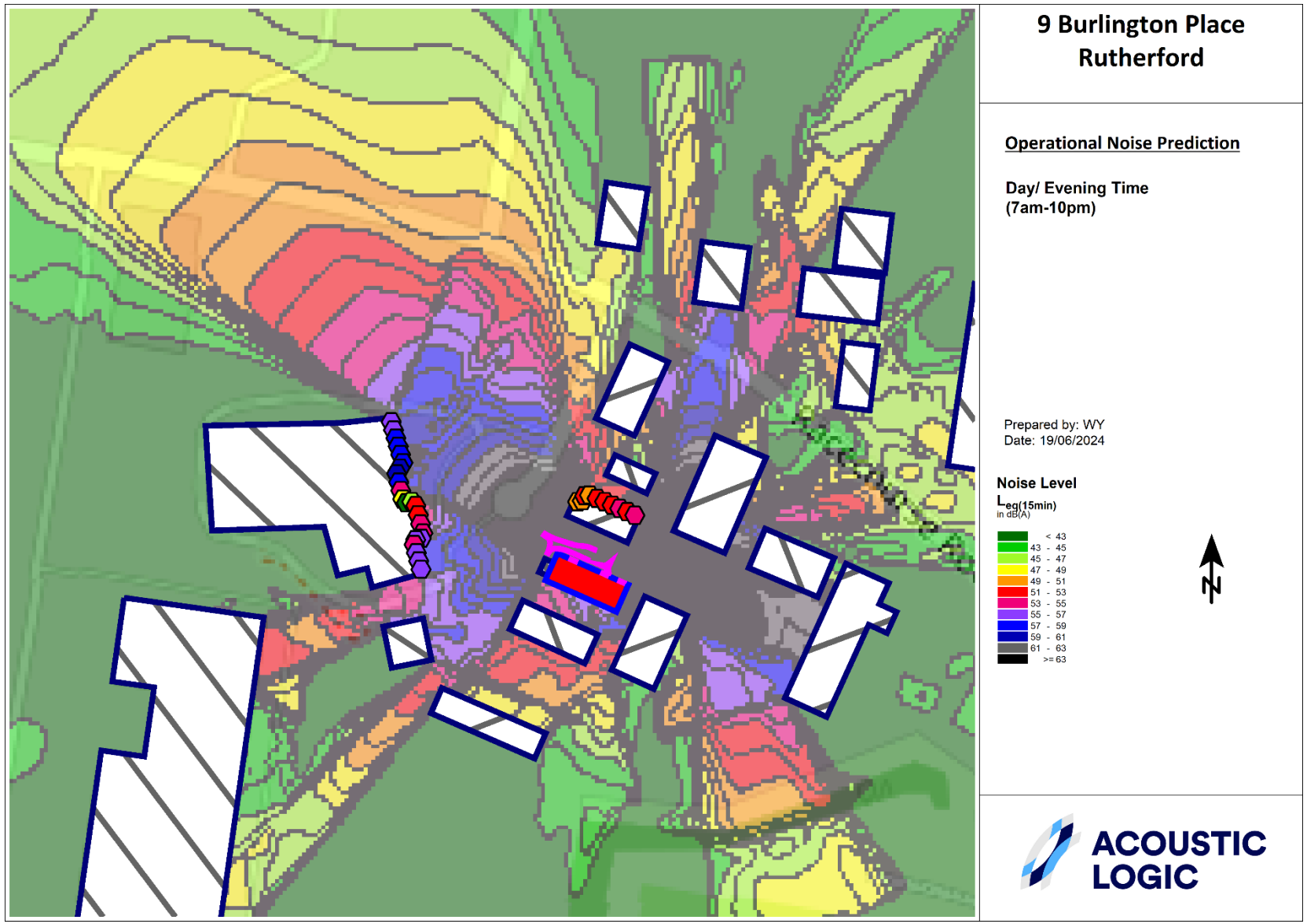


Figure 3 – Day Time Noise Prediction (close)

7.4.1.2 Cumulative Noise Modelling Results – Night

Figure 4 – Night Time Noise Prediction (far)

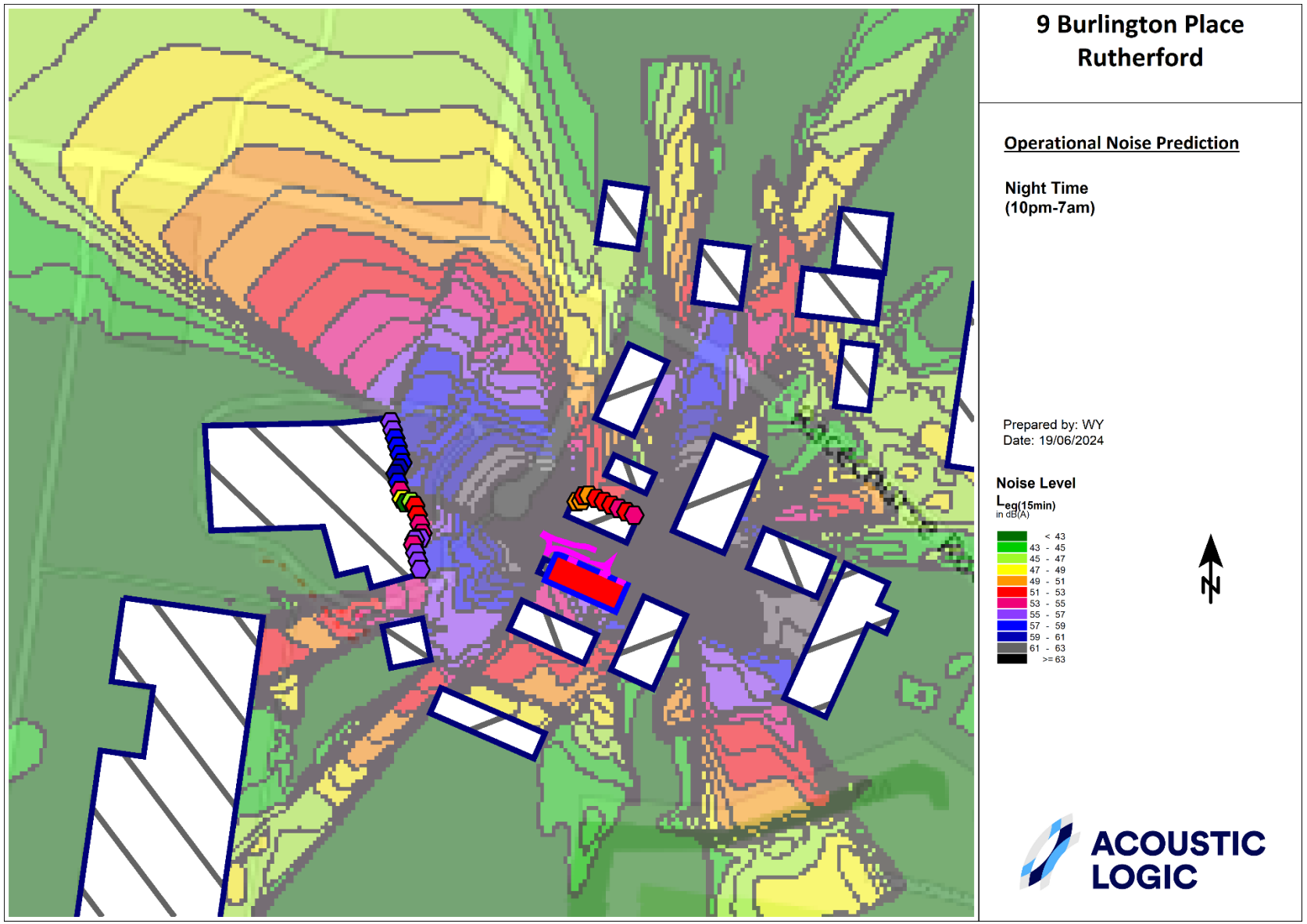


Figure 5 – Night Time Noise Prediction (close)

7.4.1.3 Cumulative Noise Modelling Results – Peak L_{Max} Events

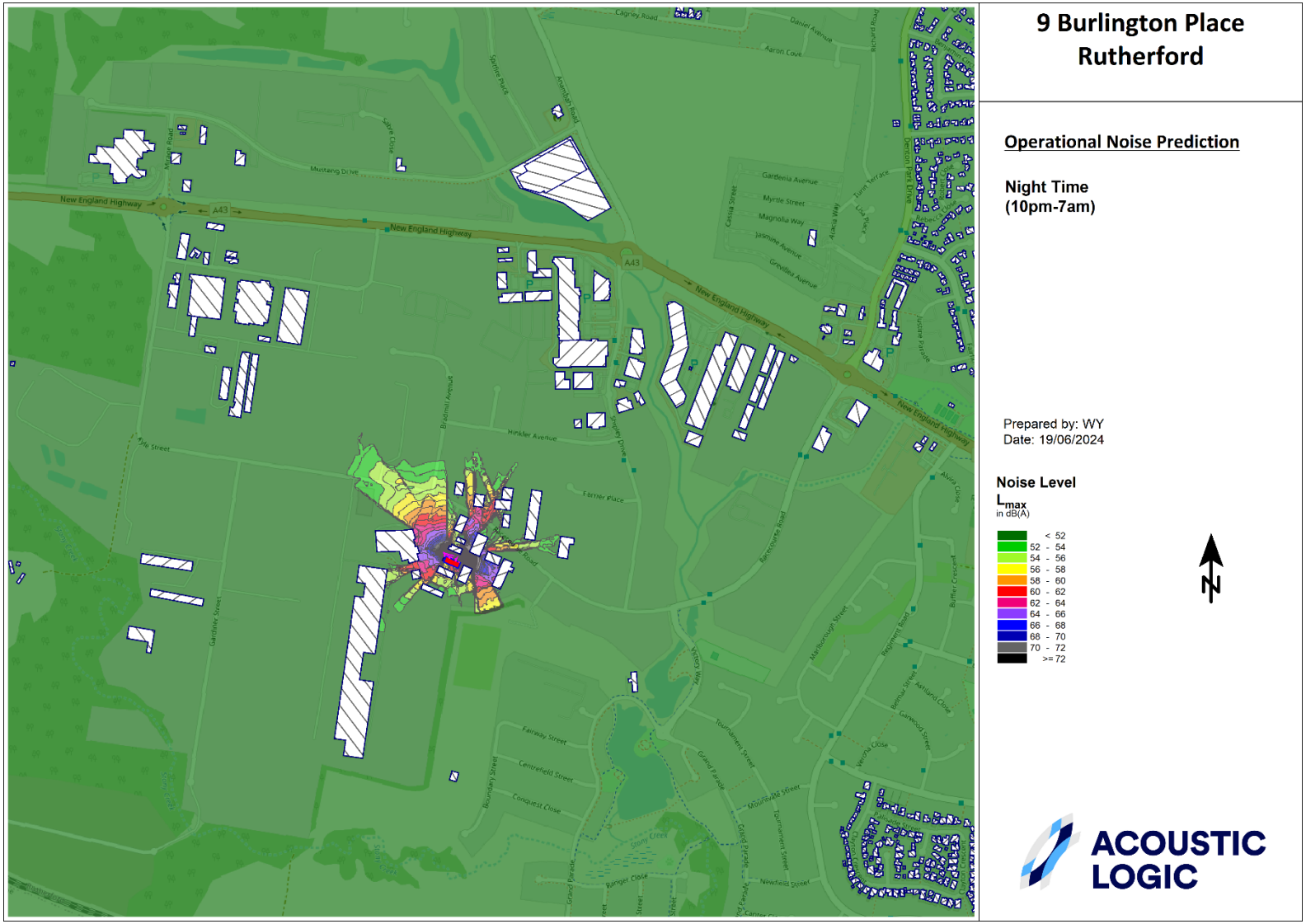


Figure 6 – Peak L_{Max} Noise Prediction (far)

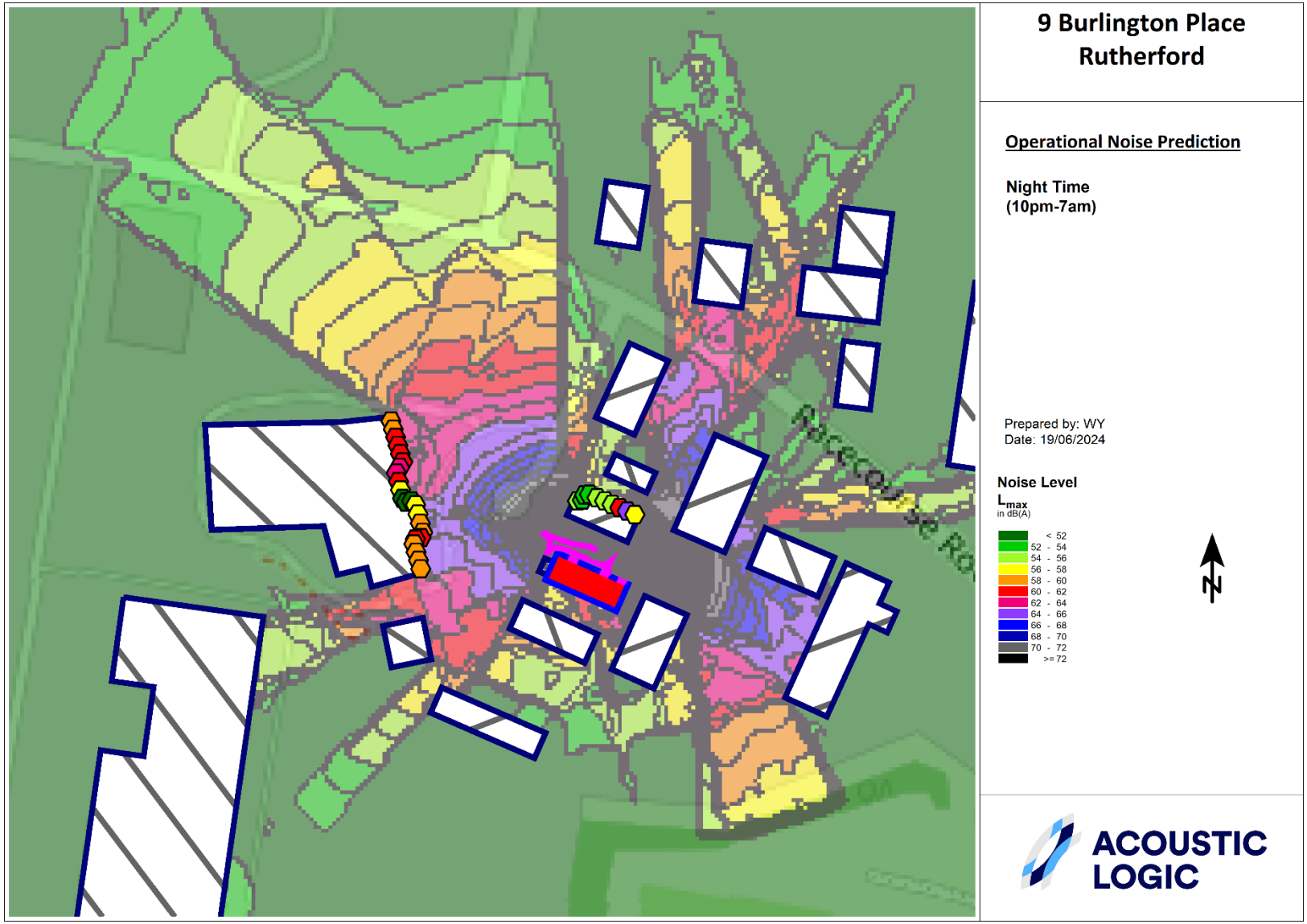


Figure 7 – Peak L_{Max} Noise Prediction (close)

7.4.2 Predicted Cumulative Noise Levels

The predicted noise levels are assessed against the project trigger levels in the following table.

Table 6 – Predicted Cumulative Noise Levels (Residential Receivers)

Operational Source	Receiver Location	Predicted Noise Level	Criteria	Comment
Cumulative Noise from Site Operation	**R1**	<43	48 dB(A) L_{eq} Daytime (7am–6pm)	Meets NSW EPA Noise Emission Requirements
			48 dB(A) $L_{eq,}$ Evening (6pm–10pm)	
			43 dB(A) $L_{eq,}$ Night (10pm–7am)	
Maximum Noise Event (Refer Section 7.2)		<52	58 dB(A) L_{max} (external)	
Cumulative Noise from Site Operation	**R2**	<43	50 dB(A) L_{eq} Daytime (7am–6pm)	
			48 dB(A) $L_{eq,}$ Evening (6pm–10pm)	
			43 dB(A) $L_{eq,}$ Night (10pm–7am)	
Maximum Noise Event (Refer Section 7.2)		<52	57 dB(A) L_{max} (external)	
Cumulative Noise from Site Operation	**R3**	<43	53 dB(A) L_{eq} Daytime (7am–6pm)	
			48 dB(A) $L_{eq,}$ Evening (6pm–10pm)	
			43 dB(A) $L_{eq,}$ Night (10pm–7am)	
Maximum Noise Event (Refer Section 7.2)		<52	61 dB(A) L_{max} (external)	

Table 7 – Predicted Cumulative Noise Levels (Commercial Receiver)

Operational Source	Receiver Location	Predicted Noise Level	Criteria	Comment
Cumulative Noise from Site Operation	**C1**	59-61	63 dB(A) $L_{eq,}$ (External)	Meets NSW EPA Noise Emission Requirements*
	I1	53-55	68 dB(A) $L_{eq,}$ (External)	

Soundplan "grid noise map" contours include a 2.5dB façade reflection increase close to a façade. The NPfI adopts non-façade reflection affected noise levels, so that, when assessing noise levels close to a façade, 2.5 dB has been subtracted from the grid map noise levels. Soundplan "façade noise maps" do not include a façade reflection allowance, and therefore do not require correction.

7.4.3 Discussion

7.4.3.1 Intrusiveness and Amenity Assessment

The receiver noise predictions indicate that with the complying mitigations incorporated, noise emissions will not exceed the trigger levels and there are no residual noise impacts.

7.4.3.2 Maximum Noise Level Assessment

The predictions indicate that night time noise events will not exceed the NPfI maximum noise trigger levels no adverse impact on sleep will occur.

8 ROAD TRAFFIC NOISE GENERATED BY THE DEVELOPMENT

The impact of additional traffic generated by the proposed development has been assessed using the EPA RNP, which states the following:

- Section 2.3 of the RNP provides noise assessment criteria at residential (Table 3) and non-residential receivers (Table 4), and for different road classifications.
- Where existing traffic noise is already close to or exceeds the criteria in Tables 3 or 4, the RNP indicates the increase in noise should be assessed instead of the absolute level. For sensitive land uses affected by additional traffic on existing roads, any increase in the total traffic noise level should be limited to 2dB above that of the corresponding 'no build option'. The RNP indicates that an increase of up to 2dB(A) represents a minor impact that is considered barely perceptible to the average person.
- Where night time traffic movements are proposed, the impact on sleep from maximum noise events generated by these movements should also be considered for residential receivers.

Traffic noise data obtained from Jackson Environment and Planning Pty Ltd indicates the proposed development will generate the following traffic movements:

- Daily traffic flows are proposed to be less than the site historically may have generated, being that of 12-13 vehicles per day split equally inbound and outbound.

The "no build" traffic movements are:

- Racecourse Road south of New England Highway is 532 vehicles in the AM peak and 628 vehicles in the PM peak.
- Burlington Place being 350 vehicles in the AM peak and 502 in the PM peak.

8.1 GENERAL TRAFFIC NOISE

The increase in noise levels have been predicted based on the FHWA noise prediction model using the following:

- The no-build and predicted development vehicle movement numbers.
- Vehicle speed of 50 km/hr
- Hard ground between the source and the measurement location.
- Neutral weather conditions.

The predicted increase in the L_{eq} noise level is <1dB(A).

As the increase in road traffic noise levels are predicted to be ≤2dB, it is concluded that any increase in road traffic noise as a result of the proposal would be inaudible, would not adversely impact any residential receiver, and is compliant with the objectives of the RNP.

9 CONSTRUCTION NOISE AND VIBRATION

A quantitative evaluation of the proposed works has been undertaken to identify those activities that have the potential to adversely impact nearby properties.

The assessment uses site specific noise and vibration management levels developed using the EPA ICNG. The predicted, receiver noise and vibration levels will be compared to the management levels to identify those activities that are likely to require additional management, above what is considered to be normal good practice.

9.1 CONSTRUCTION NOISE MANAGEMENT LEVELS

9.1.1 Residential Receivers

Residential noise management levels are based on the "rating background noise level" ("**RBL**") applicable to the receivers. RBL's are typically determined by measuring the ambient noise environment using the methodology in the EPA NPfI. The measurements, analysis and RBL's determined for this project are summarised in Appendix A.

The ICNG construction noise management levels are summarised in the following table, along with how they should be used to manage impacts.

Table 8 – Construction Noise Management Levels

Management Level $L_{Aeq,(15min)}$*	**How to Apply**
Noise affected Management Level ("**NML**") RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur.

*** Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.**

The ICNG recommended standard hours are as follows:

- Monday to Friday – 7:00am to 6:00pm
- Saturday – 8:00am to 1:00pm
- No work on Sundays or public holidays

9.1.2 Other Land Uses

For other land uses, the management levels are absolute noise levels, independent of the prevailing noise environment, so monitoring of the prevailing environment is not generally required for these uses. The ICNG construction noise management levels for uses other than residential dwellings are summarised in the following table.

Table 9 – Construction Noise Management Levels – Non Residential Uses

Land Use	Management Level, $L_{Aeq\ (15min)}$ (applies for times when properties are being used)
Commercial and Retail Outlets	70 (external)
Industrial Premises	75 (external)

9.1.3 Receiver Noise Management Levels

The project specific NML's for the most impacted receivers are summarised in the following table using the objectives tabled above and the adopted RBL's.

Table 10 – Noise Management Levels for Most Impacted Receivers

Location/Receiver	RBL dB(A) L_{90}	NML dB(A) L_{eq}	HANML dB(A) L_{eq}
R1	43	53	75
R2	45	55	75
R3	48	58	75
C1	-	70	-
I1	-	75	-

9.2 CONSTRUCTION VIBRATION MANAGEMENT LEVELS

9.2.1 Amenity Management

Vibration goals for the amenity of nearby land users are those recommended by the EPA document *Assessing Vibration: A technical guideline*. These levels (extracted from Tables 2.2 and 2.4 of the guideline) are presented in the following table for various types of vibration:

Table 11 -(Table 2.2 Assessing Vibration: A Technical Guideline) – Preferred and Maximum Weighted RMS Values for Continuous and Impulsive Vibration Acceleration (m/s2) 1-80Hz

Location	Assessment Period [1]	Preferred values		Maximum Values	
		z-axis	x- and y-axes	z-axis	x- and y-axes
Continuous Vibration					
Critical areas[2]	Day or night-time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0071	0.02	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
Workshops	Day or night-time	0.04	0.029	0.080	0.058
Impulsive Vibration					
Critical areas[2]	Day or night-time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

1 Daytime is 7:00am to 10:00pm and night-time is 10:00pm to 7:00am.

2 Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate task require more stringent criteria than the human comfort criteria specified above. Stipulation of such criteria is outside the scope of this policy, and other guidance documents (e.g. relevant standards) should be referred to. Source: BS6472-1992.

Table 12 -(Table 2.4 Assessing Vibration: A technical guideline) – Acceptable Vibration Dose Values for Intermittent Vibration (m/s1.75)

Location	Daytime[1]		Night-time[1]	
	Preferred value	Maximum Value	Preferred value	Maximum Value
Critical areas[2]	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

1 Daytime is 7:00am to 10:00pm and night-time is 10:00pm to 7:00am.
2 Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative, and there may be a need to assess intermittent values against the continuous or impulsive criteria for critical areas. Source: BS6472-1992.

9.2.2 Structure Damage Risk Criteria

9.2.2.1 Generally

German Standard DIN 4150-3 (2016) provides a guideline for acceptable levels of vibration velocity in building foundations, to assess the effects of vibration on structures. The table give guidance on the maximum accepted values of velocity at the foundation and in the plane of the highest floor of various types of buildings, to prevent any structural damage.

The table following lists the peak particle velocity, which is the maximum absolute value of the velocity signals for the three orthogonal components. This is measured as a maximum value of any of the three orthogonal component particle velocities when measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

It is noted that if measured vibration levels do not exceed the guidelines listed in the following table, damage that will reduce the serviceability of the building will not occur, and if damage to the building does occur, it is assumed that the damage is related to other causes. Furthermore, the DIN4150-3 guideline states the following regarding the limits presented in Table 1 of the standard:

"Exceeding the guideline values does not necessarily lead to damage. Should they be exceeded, however, further investigations may be necessary, such as determining and evaluating the stresses as detailed in 4.3 and 4.4.".

Table 13 -(Table 1 – DIN 4150-3 (2016)) – Guideline Values for Vibration Velocity, $v_{i,max}$, for Evaluating the Effects of Short-Term Vibration on Structures

	TYPE OF STRUCTURE	Guideline values for $v_{i,max}$ in mm/s				
		Foundation, all directions, i = x, y, z, at a frequency of			Topmost floor, horizontal direction, i = x, y	Floor slabs, vertical direction, i = z
		1Hz to 10Hz	10Hz to 50Hz	50Hz to 100Hz [a]	All Frequencies	All Frequencies
L/C	1	2	3	4	5	6
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 **and** are of great intrinsic value (e.g. listed buildings) buildings that are under a preservation order)	3	3 to 8	8 to 10	8	20[b]

NOTE Even if guideline values as in line 1, columns 2 to 5, are complied with, minor damage cannot be excluded.

a At frequencies above 100 Hz, the guideline values for 100 Hz can be applied as minimum values.

b It may be necessary to lower the guideline value markedly to prevent minor damage

9.3 CONSTRUCTION NOISE ASSESSMENT

9.3.1 Predictions

Construction noise emissions to nearby development depend on the activities being undertaken at the time, and where on the site the activities occur.

Construction noise levels at the surrounding receivers have been predicted based on the following inputs.

- The plant sound power levels indicated in Appendix C. These have been corrected for estimated typical operation duty indicated in the table using 10 x log(% duty/100).
- Corrections for source to receiver distance attenuation including air absorption (20°C , 70% RH, neutral wind conditions).
- Barrier or directivity attenuation where present.
- Source heights – 1.5m above the ground/building level of the noise source location, unless noted otherwise.
- Source locations are indicated Figure 1.

9.3.1.1 Demolition of Wall and Construction of External Façade

The predicted noise levels are summarised in the following table.

Table 14 – Predicted Noise Impacts

Location/Receiver	Highest Predicted Level dB(A) L_{eq}	NML dB(A) L_{eq}	HANML dB(A) L_{eq}	Requires Assessment of Additional Management
R1	47	53	75	No
R2	40	55	75	
R3	<30	58	75	
C1	58	70	-	
I1	68	75	-	

* Assessed at 1.5m above ground level.

The analysis indicates that:

- No receiver will be subject to noise exceeding the NML.
- No receiver will be subject to noise exceeding the HANML.
- The distance separation between the closest residential receivers and tyre recycling facility is substantial. The operational impact of the industrial premises to the surrounding residential receivers will be minimal.
- Screening affects from the industrial premises to the neighbouring commercial premises ensures that the NML is not exceeded.

9.3.2 Site Specific Recommendations

In light of the above, we recommend:

- The scheduling of construction activities should be undertaken to reasonably minimise noise impacts to all surrounding land uses.
    - In this regard, highly noise intrusive works such as hammering should not take place prior to 8am.
- Materials handling/vehicles:
    - Trucks to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours.
    - Avoid careless dropping of construction materials into empty trucks.
    - Trucks, trailers and concrete trucks (if feasible) should turn off their engines during idling to reduce noise impacts (unless truck ignition needs to remain on during concrete pumping).
- High Noise Generating Demolition:
    - Where high noise generating demolition are proposed to be undertaken, respite hours should be implemented to reduce the impact on surrounding receivers.
- Complaints handling:
    - An after hours contact number is to be displayed outside of the building site, so that in the event that surrounding developments believe that a noise breach is occurring, they may contact the site.

9.4 ASSESSMENT OF VIBRATION

9.4.1 Vibration Producing Activities

Demolition of the existing structures has the potential to produce significant ground vibration.

9.4.2 Vibration Management

The following principles should be considered to manage adverse vibration impacts:

- Obtaining separate structural or specialist advice for critical or fragile structures as to the level of damage risk.
- Selection of processes that minimise structure and ground vibration – generally avoiding percussive methods.
- Use smallest plant that is able to efficiently undertake the work activity.
- Lay vibration absorbing mats to cushion impacts from falling debris.
- Application of vibration dampening pads to metal surfaces subject to impacts.
- When demolishing, cut control joints in structures to form vibration "breaks", or work away from sensitive receiver locations to form natural vibration breaks in propagation path.
- Monitoring of structures using attended and/or unattended monitors with alarms.
- Time scheduling works to minimise amenity impacts.
- Communicating with affected receivers.

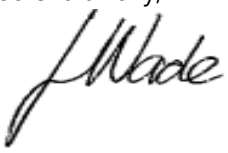
10 CONCLUSION

This report summarises the noise and vibration impact assessment undertaken for the proposed Tyre Recycling Facility at 9 Burlington Place, Rutherford. Construction and operational impacts have been assessed. The outcomes are:

- An assessment of operational noise emissions has been undertaken using the Noise Policy for Industry guideline. Site noise emissions from the development have been predicted and assessed against criteria adopted from the trigger levels determined using the guidelines and found to be compliant.
- With the implementation of the mitigation in Section 9, construction noise emissions from the proposed development will comply with noise criteria established for the site.
- Additional road traffic noise generated by the proposed development has been assessed using the EPA "Road Noise Policy" guideline and found to be compliant.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,



Acoustic Logic Pty Ltd
Justine Wade

APPENDIX A – AMBIENT NOISE MONITORING

This appendix summarises the ambient noise data measured near the subject site, and the calculated noise level descriptors adopted to characterise the existing noise environment.

Monitoring has been undertaken to provide the following ambient data:

- Background noise levels at the surrounding residential properties.

A.1 NOISE DESCRIPTORS

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15 minute measurement interval is typically utilised. Noise levels are monitored on a continuous basis over this period, and statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters are:

L_{eq} - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of steady state and quasi-steady state noise sources (such as traffic noise).

L_{90} – This is commonly used as a measure of the background noise level as it represents the noise level heard in the quieter periods during the measurement interval. The L_{90} parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

L_{10} is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event, and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft noise and ground vibration induced noise from railways.

L_1 is sometimes used in place of L_{max} to represent a typical noise level from a number of high level, short term noise events.

A.2 UNATTENDED LONG TERM NOISE MONITORING

A.2.1 EQUIPMENT USED

Unattended noise monitoring was conducted using the following equipment:

- Rion NL-42 (Type 2)
- Norsonics Sound Level Calibrator Type 1251

Monitoring was continuous, with statistical noise levels recorded at 15-minute intervals throughout the monitoring period. Measurements were taken on "A" frequency weighting and fast time response, unless noted otherwise.

All monitoring equipment used retains current calibration - either manufacturers' calibration or NATA certified calibration. The monitors were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

A.2.2 LOCATIONS MONITORED

The locations monitored are indicated in Figure 8.

A.2.3 WEATHER AFFECTED AND EXTRANEOUS/OUTLYING DATA

Periods affected by adverse weather conditions (as defined by Fact Sheet B) are indicated on the following data graphs, and have been excluded from the assessment. Weather data was obtained from records provided by the Bureau of Meteorology for the following station:

As the Bureau of Meteorology wind data is typically obtained at an exposed location at 10m above ground level, and the monitoring locations were at approximately 1.5m above ground in more sheltered locations a wind multiplying factor of 0.5 has been applied to the BOM data to estimate the wind speed at the microphone location.

- Maitland Weather Station

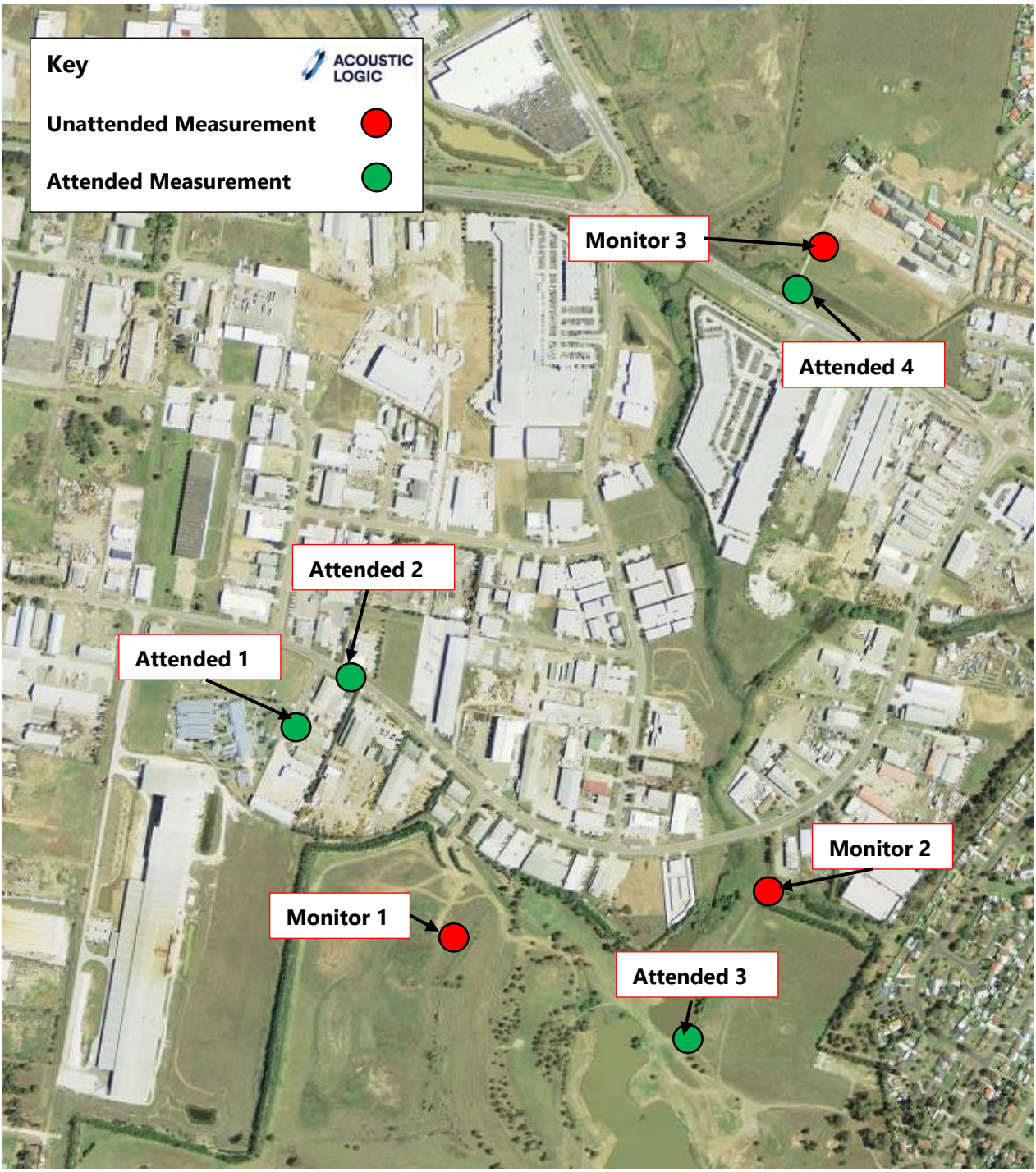


Figure 8– Noise Monitoring Locations

A.3 CALCULATION OF REPRESENTATIVE AMBIENT NOISE LEVELS

The ambient, assessment and rating background levels have been determined from the unattended, long-term noise monitoring data based on the methodology in the Noise Policy for Industry Fact Sheet B.

A.3.1 RATING BACKGROUND NOISE LEVELS

The following tables summarise the assessment background noise levels (ABL) for each location. Note that where no ABL is indicated, this is because that period was significantly affected by adverse weather or other extraneous noise.

In accordance with the NPfI, if the calculated:

- evening rating background noise level is higher than the day level, the day rating background noise level has been adopted for the evening period.
- night rating background noise level is higher than the evening level, the evening rating background noise level has been adopted for the evening period.
- day rating background noise level was less than 35 dB(A), a "default" background of 35 dB(A) has been adopted.
- evening or night rating background noise level was less than 30 dB(A), a "default" background of 30 dB(A) has been adopted.

Where monitoring was conducted within 3m of a significant sound reflecting surface, 2.5 dB(A) has been subtracted from the calculated rating background to account for an increase in noise from reflections.

Table 15 –Assessment Background Noise Levels – Monitor 1

Location	Date	ABL		
		Day	Evening	Night
Monitor 1	Wednesday, 3 April 2024	-	41	40
	Thursday, 4 April 2024	42	43	43
	Friday, 5 April 2024	44	49	45
	Saturday, 6 April 2024	47	58	47
	Sunday, 7 April 2024	44	51	48
	Monday, 8 April 2024	43	46	45
	Tuesday, 9 April 2024	43	48	48
	Wednesday, 10 April 2024	42	47	47
	Thursday, 11 April 2024	41	45	46
	Calculated RBL	**43**	**47**	**46**
	Adopted RBL	**43**	**43**	**43**

Table 16 –Assessment Background Noise Levels – Monitor 2

Location	Date	ABL		
		Day	Evening	Night
Monitor 2	Wednesday, 3 April 2024	0	44	42
	Thursday, 4 April 2024	45	48	43
	Friday, 5 April 2024	47	49	42
	Saturday, 6 April 2024	43	46	39
	Sunday, 7 April 2024	41	46	44
	Monday, 8 April 2024	45	44	42
	Tuesday, 9 April 2024	48	44	42
	Wednesday, 10 April 2024	47	44	43
	Thursday, 11 April 2024	44	43	42
	Calculated RBL	**45**	**44**	**42**
	Adopted RBL	**45**	**44**	**42**

Table 17 –Assessment Background Noise Levels – Monitor 3

Location	Date	ABL		
		Day	Evening	Night
Monitor 3	Wednesday, 3 April 2024	0	46	42
	Thursday, 4 April 2024	53	50	42
	Friday, 5 April 2024	55	49	41
	Saturday, 6 April 2024	48	49	42
	Sunday, 7 April 2024	42	47	41
	Monday, 8 April 2024	44	49	39
	Tuesday, 9 April 2024	49	47	38
	Wednesday, 10 April 2024	53	47	38
	Thursday, 11 April 2024	46	49	37
	Calculated RBL	**48**	**49**	**41**
	Adopted RBL	**48**	**48**	**41**

A.4 ATTENDED MONITORING

A.4.1 EQUIPMENT USED

Attended noise monitoring was conducted using:

- Rion NL-42 (Type 2) sound level meter

The sound level meter equipment used retain current calibration - either manufacturers' calibration or NATA certified calibration, and were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

A.4.2 LOCATIONS MONITORED

The attended monitoring locations are indicated in Figure 8 and are described below.

- Attended 1 – Background Noise Measurement at 9 Burlington Place, Rutherford to record the sites current ambient noise levels.
- Attended 2 – Traffic Noise Measurement at 153 Racecourse Road, 3m from curb
- Attended 3 – Background Noise Measurement at Oak Tree Retirement Village.
- Attended 4 – Traffic Noise Measurement at 343 New English Highway, 3m from curb.

A.4.3 RESULTS

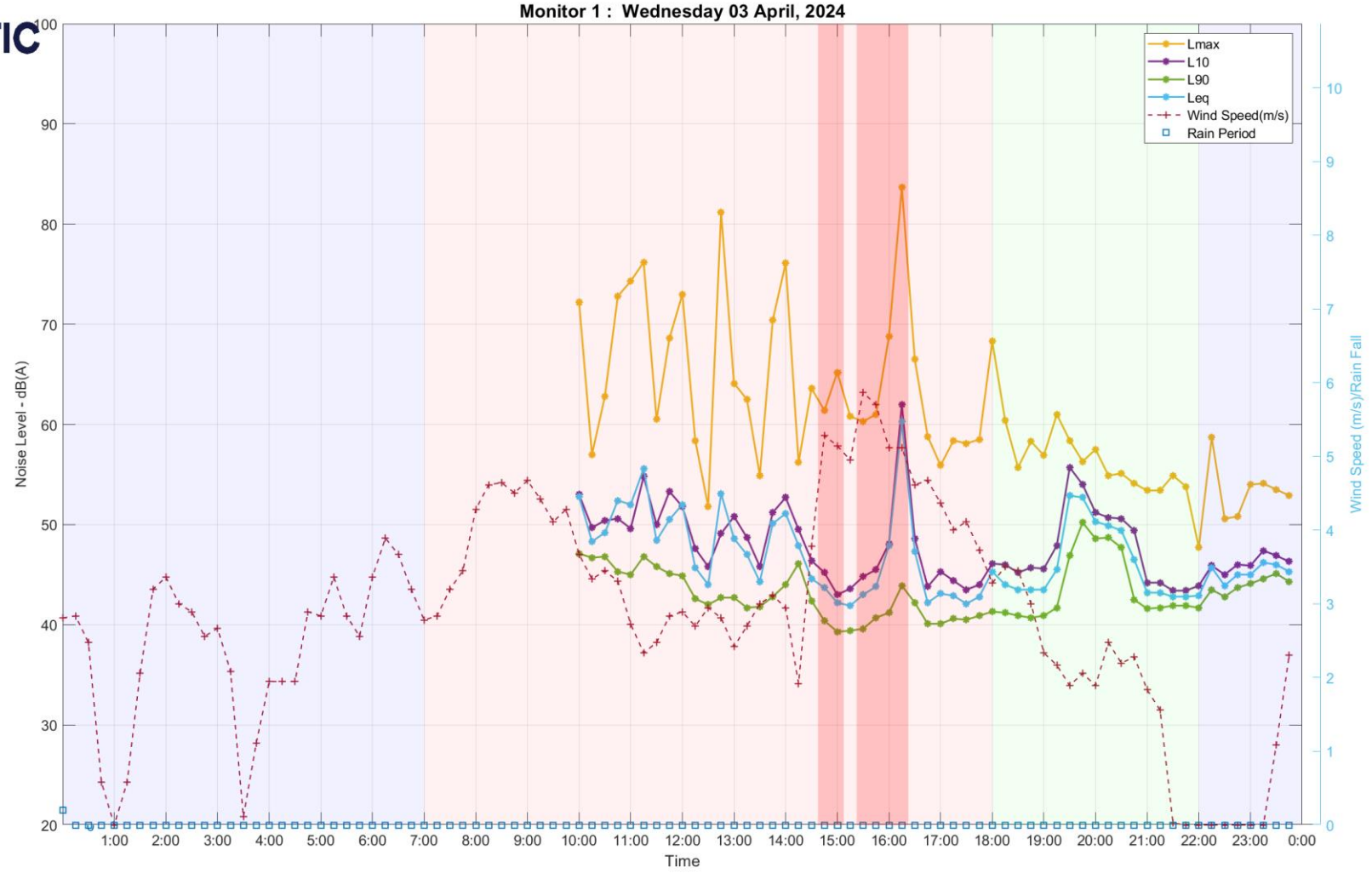
The attended monitoring results have been presented in the below table:

Table 18 – Attended Monitoring Results

Measurement Location	Time of Measurement	Measured Noise Level
Attended 1 (Ambient)	09:40am	65dB(A)L_{90}
Attended 2 (Traffic)	09:45am	64dB(A)L_{Aeq}
Attended 3 (Ambient)	10:20am	63dB(A)L_{90}
Attended 4 (Traffic)	11:00am	73dB(A)L_{Aeq}

A.5 UNATTENDED MONITORING DATA GRAPHS

A.5.1 LOCATION 1


Monitor 1 : Wednesday 03 April, 2024
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0
1:00
2:00
3:00
4:00
5:00
6:00
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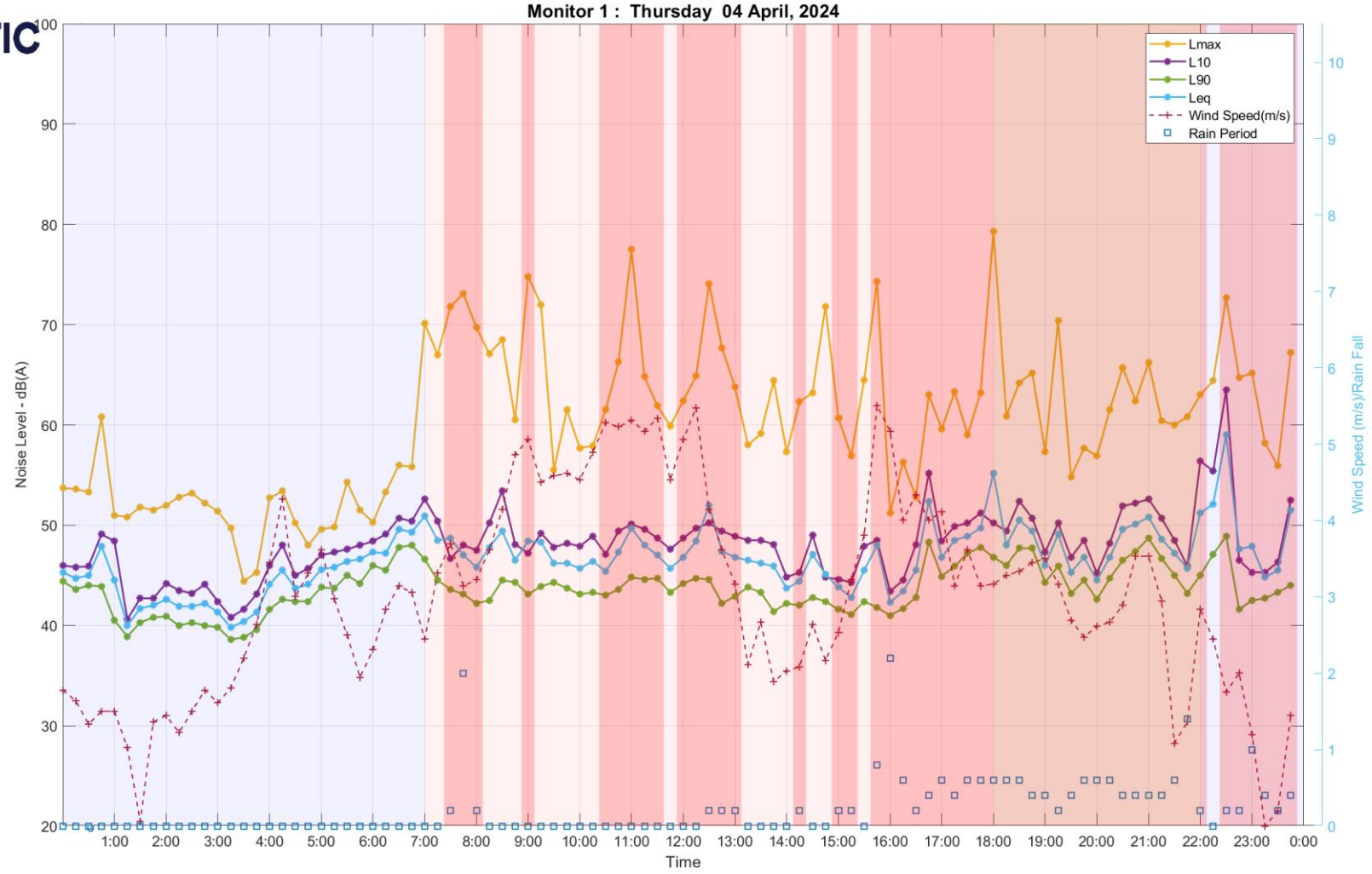
0:00


Monitor 1 : Thursday 04 April, 2024
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0
1:00
2:00
3:00
4:00
5:00
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23:00
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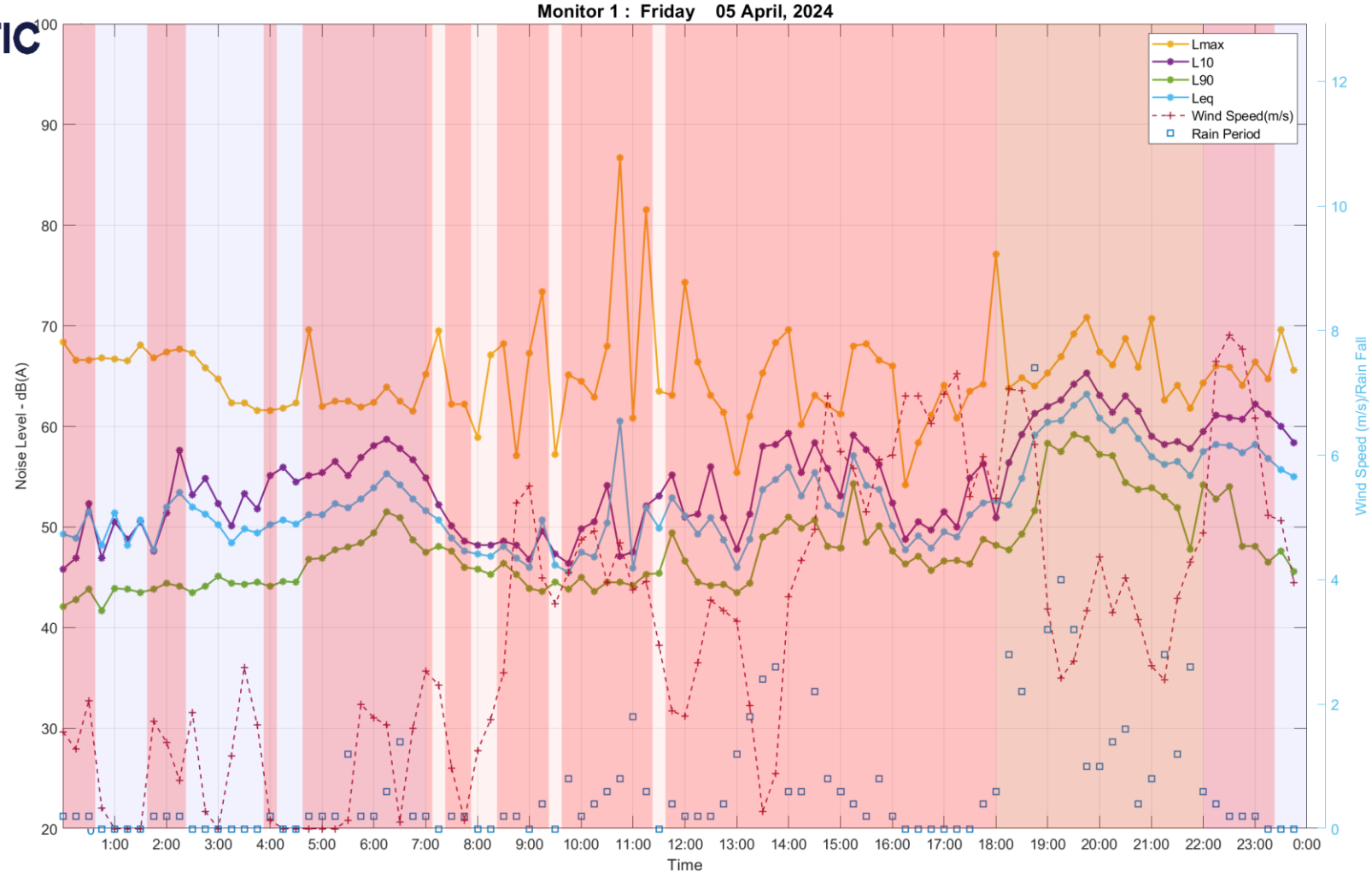
Monitor 1 : Friday 05 April, 2024
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
12
10
8
6
4
2
0
1:00
2:00
3:00
4:00
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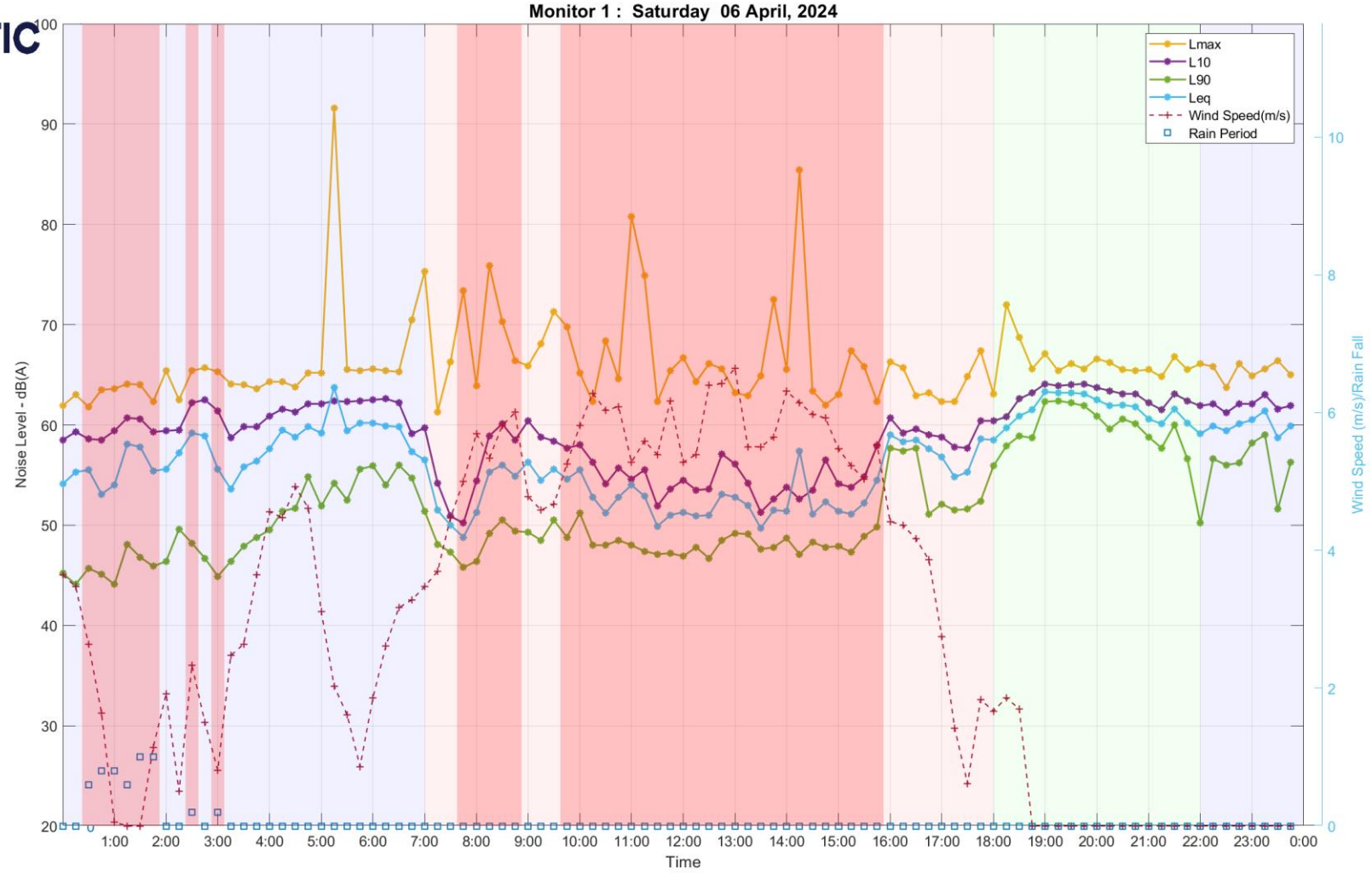
Monitor 1 : Saturday 06 April, 2024
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
10
8
6
4
2
0
1:00
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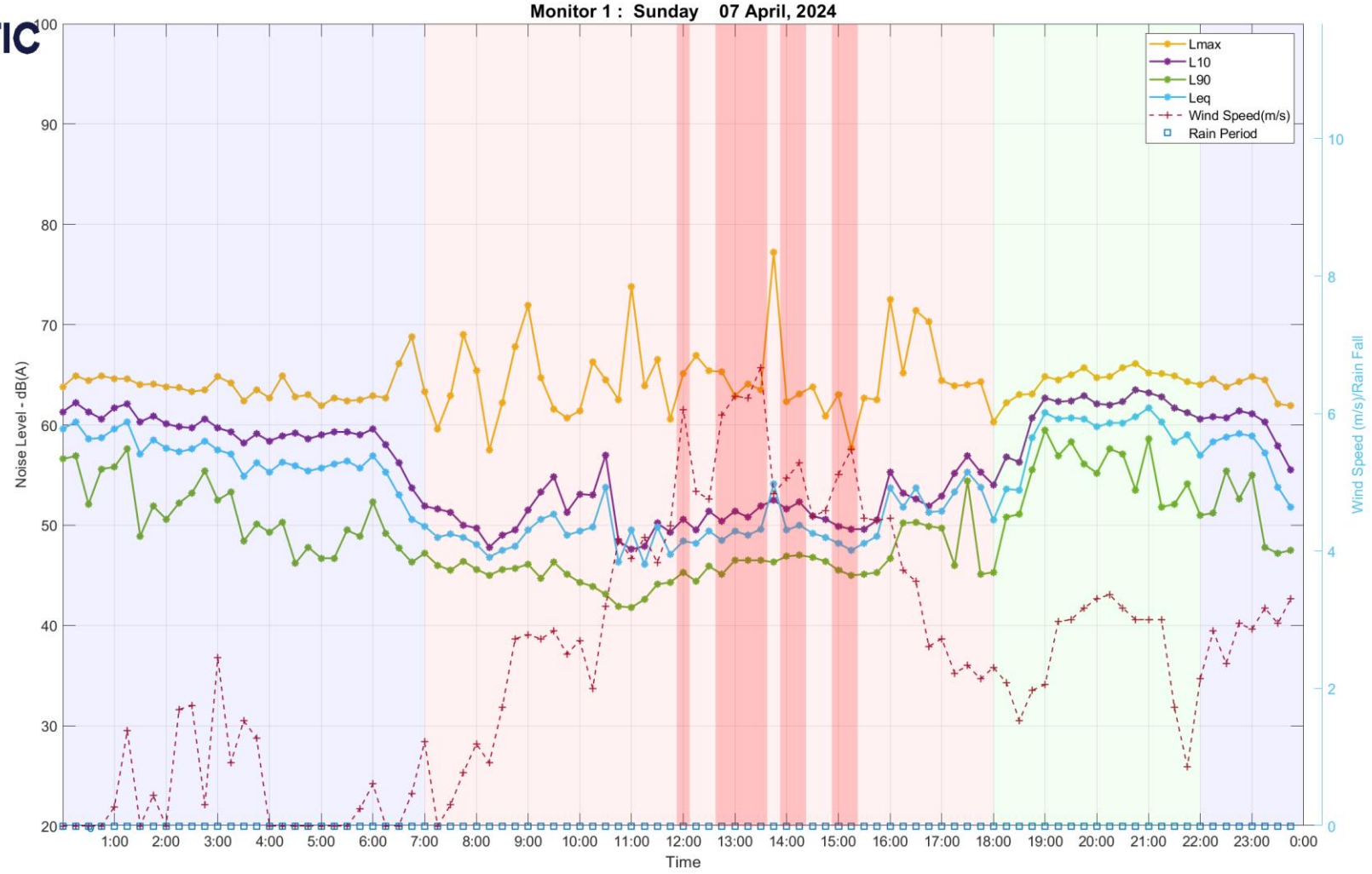
Monitor 1 : Sunday 07 April, 2024
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
10
8
6
4
2
0
1:00
2:00
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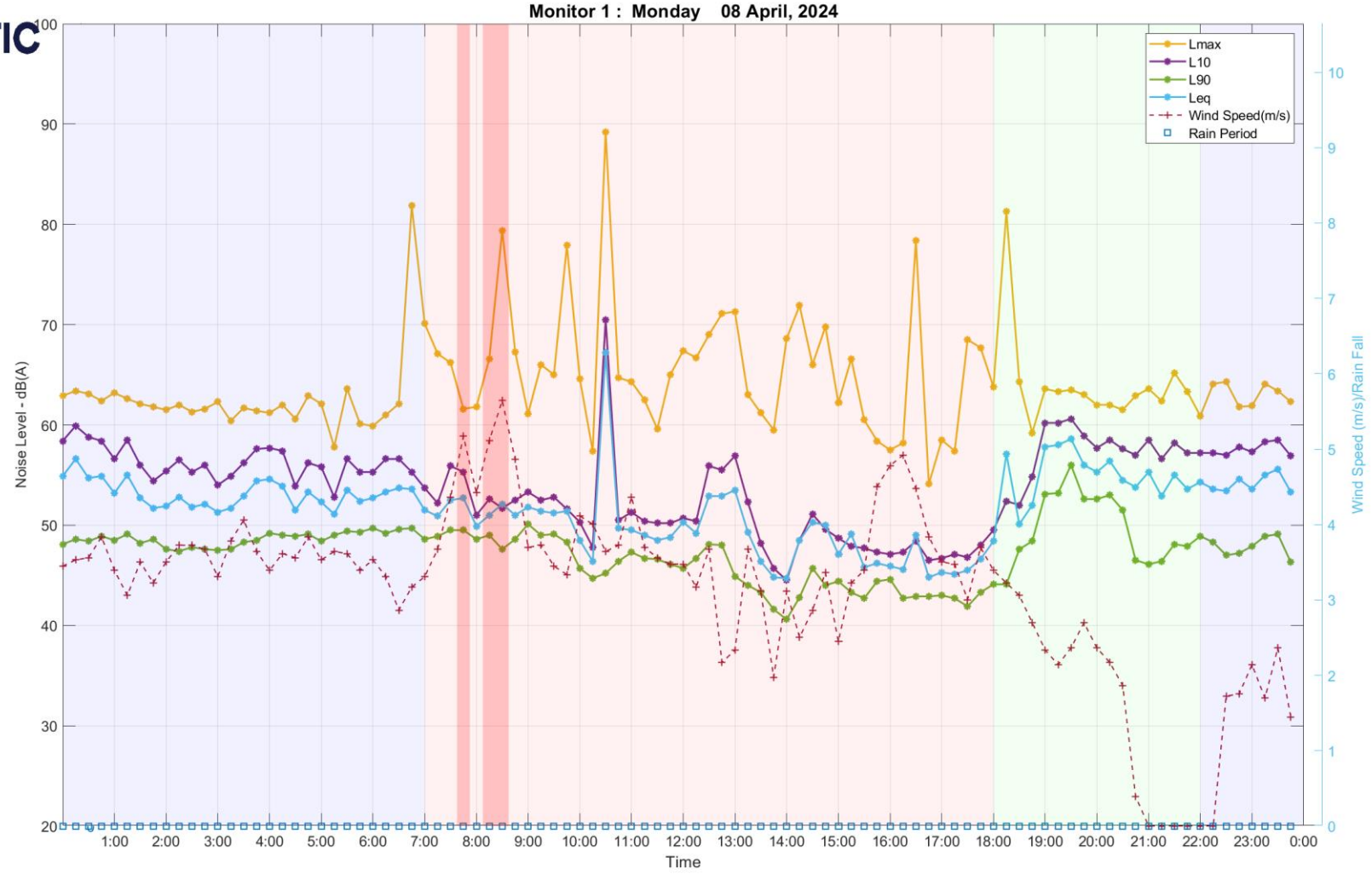
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Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
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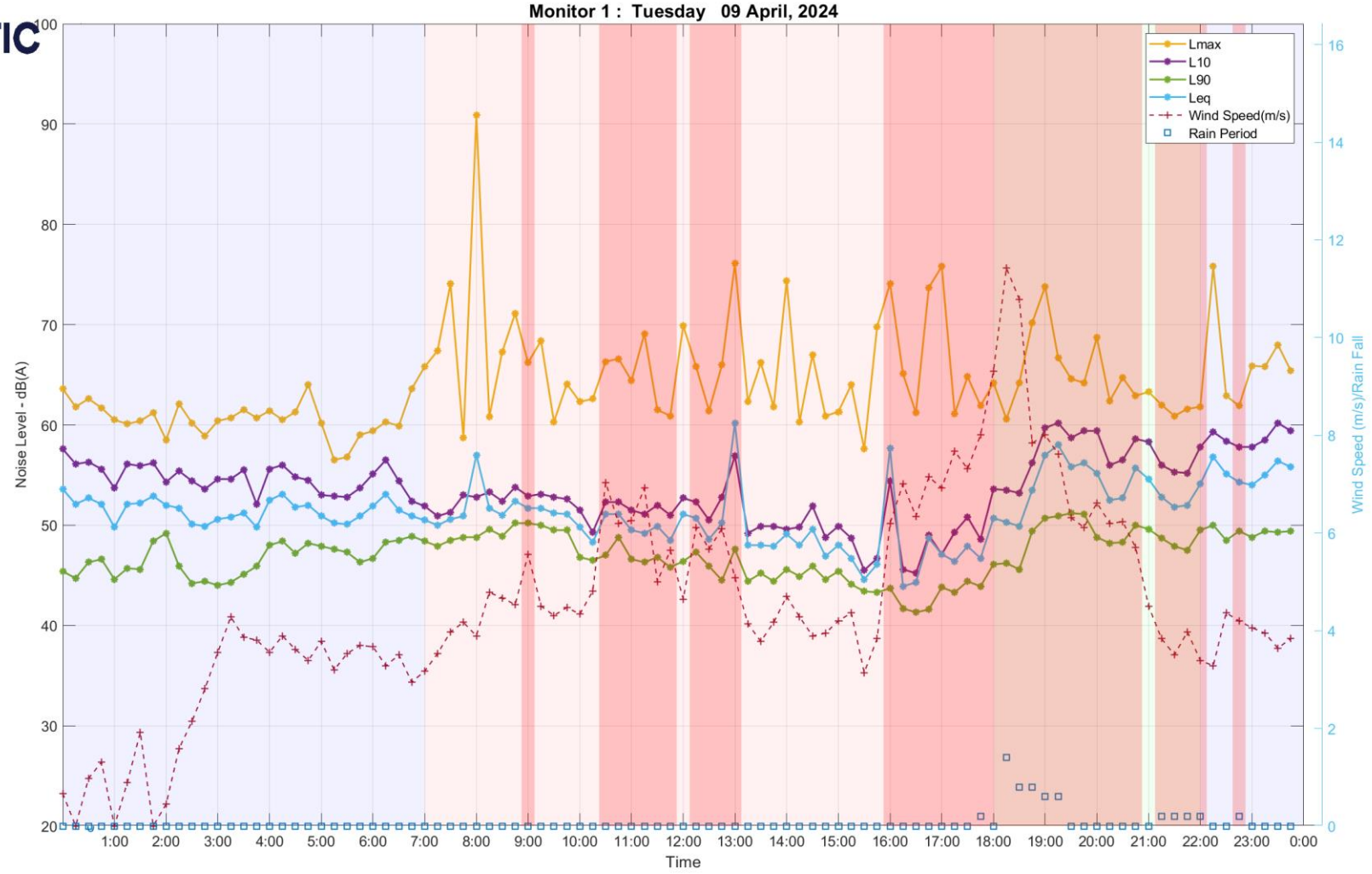
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Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
16
14
12
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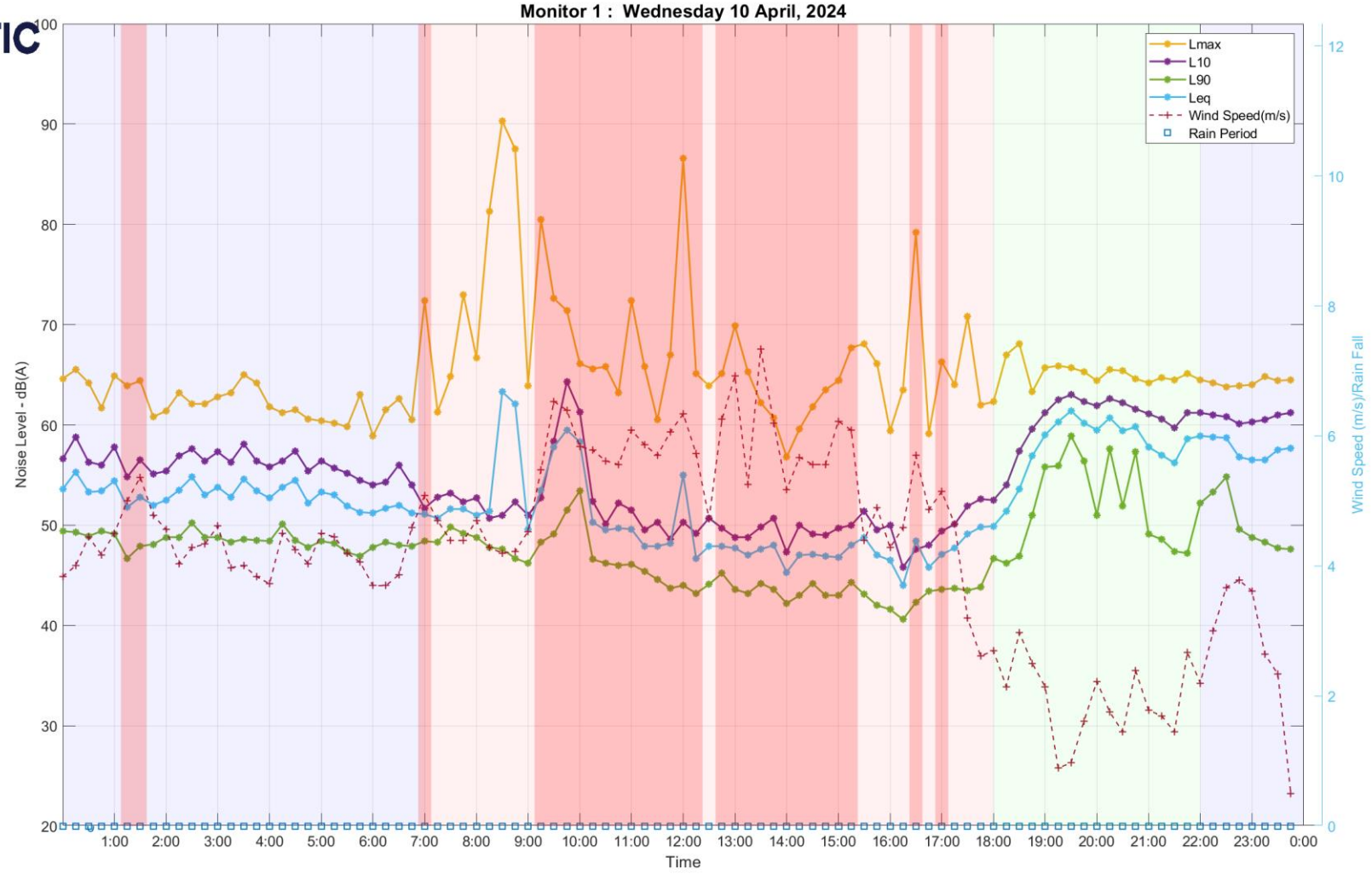
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Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
12
10
8
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4
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0
1:00
2:00
3:00
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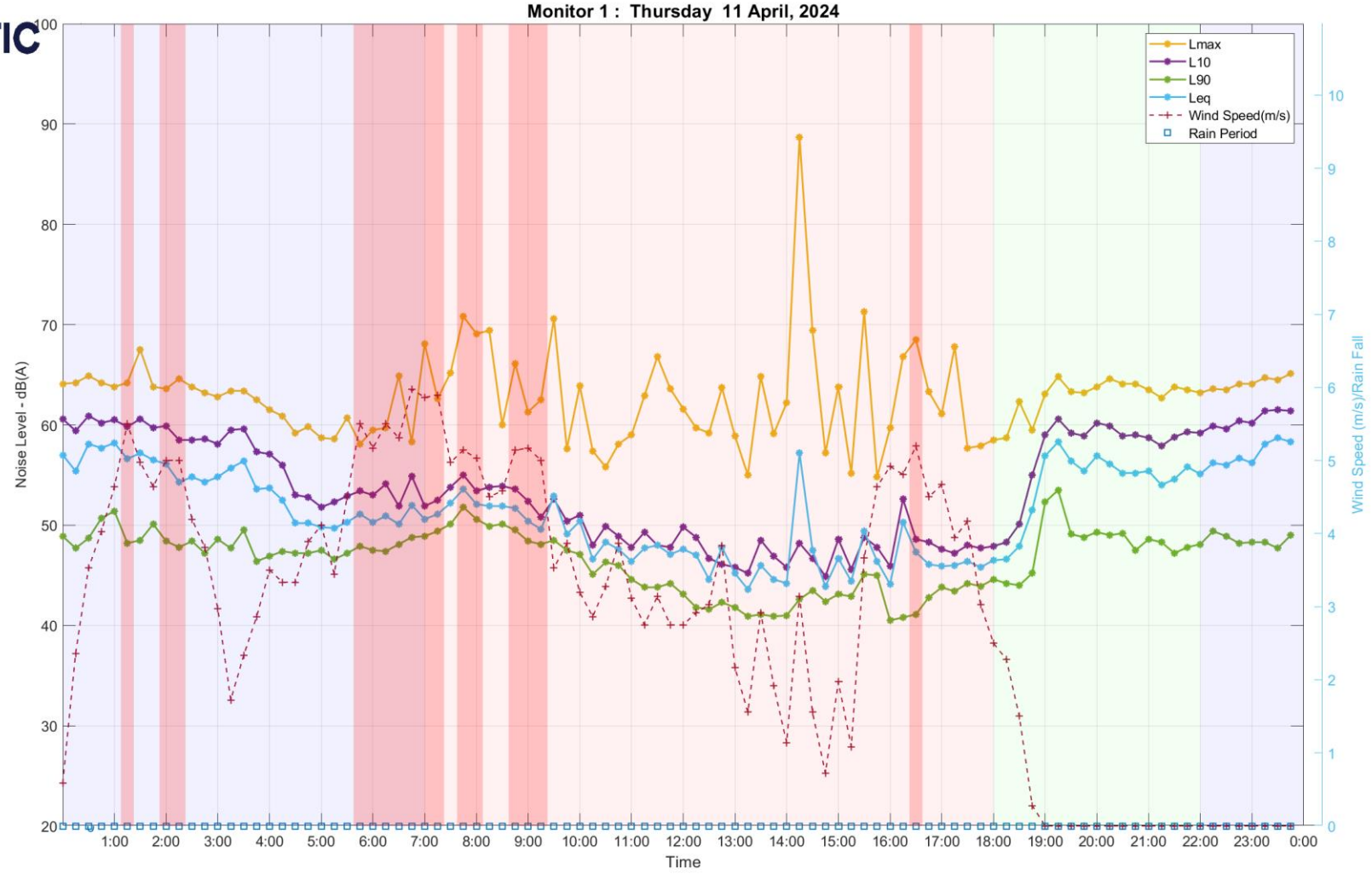
Monitor 1 : Thursday 11 April, 2024
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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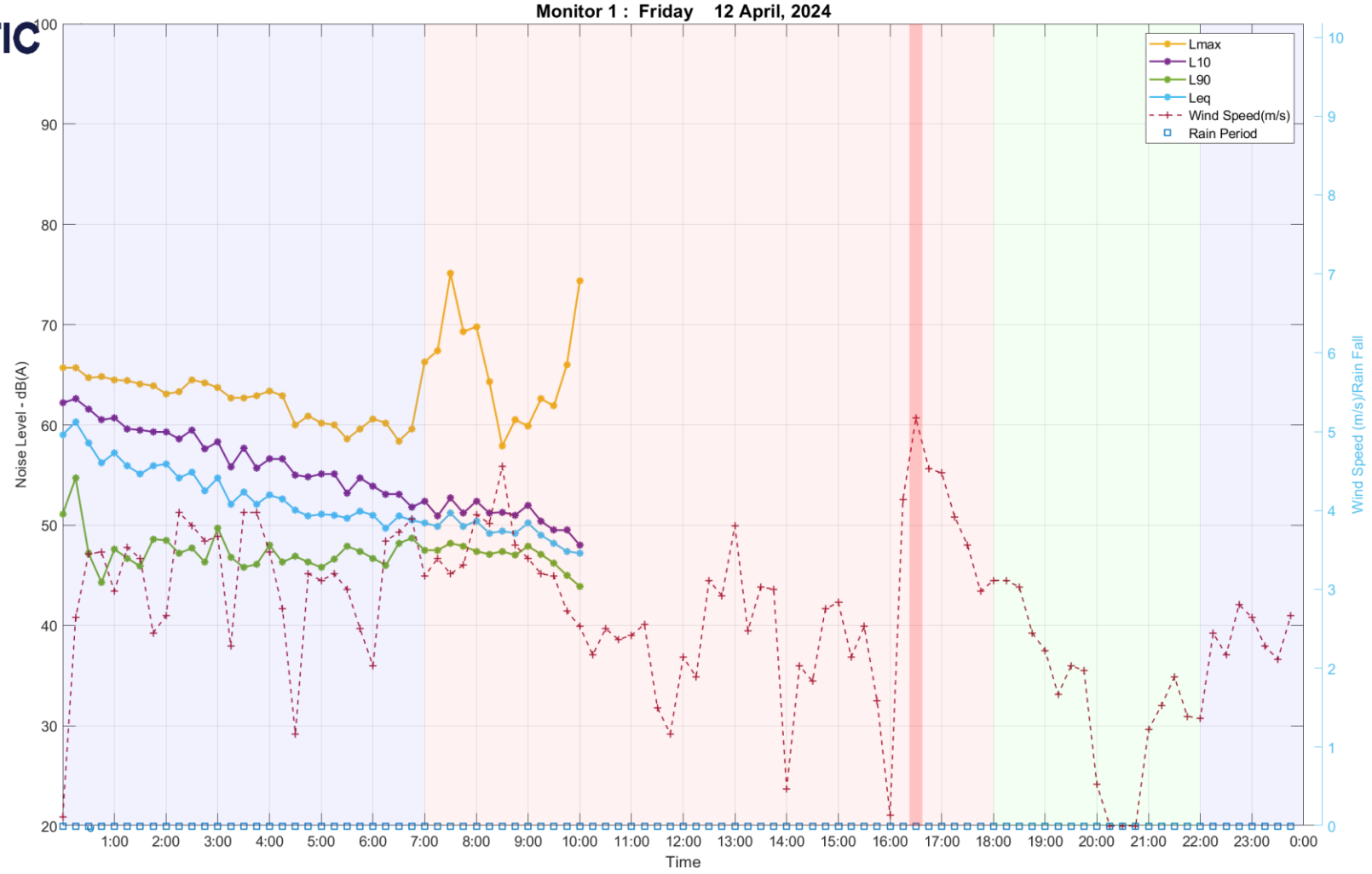
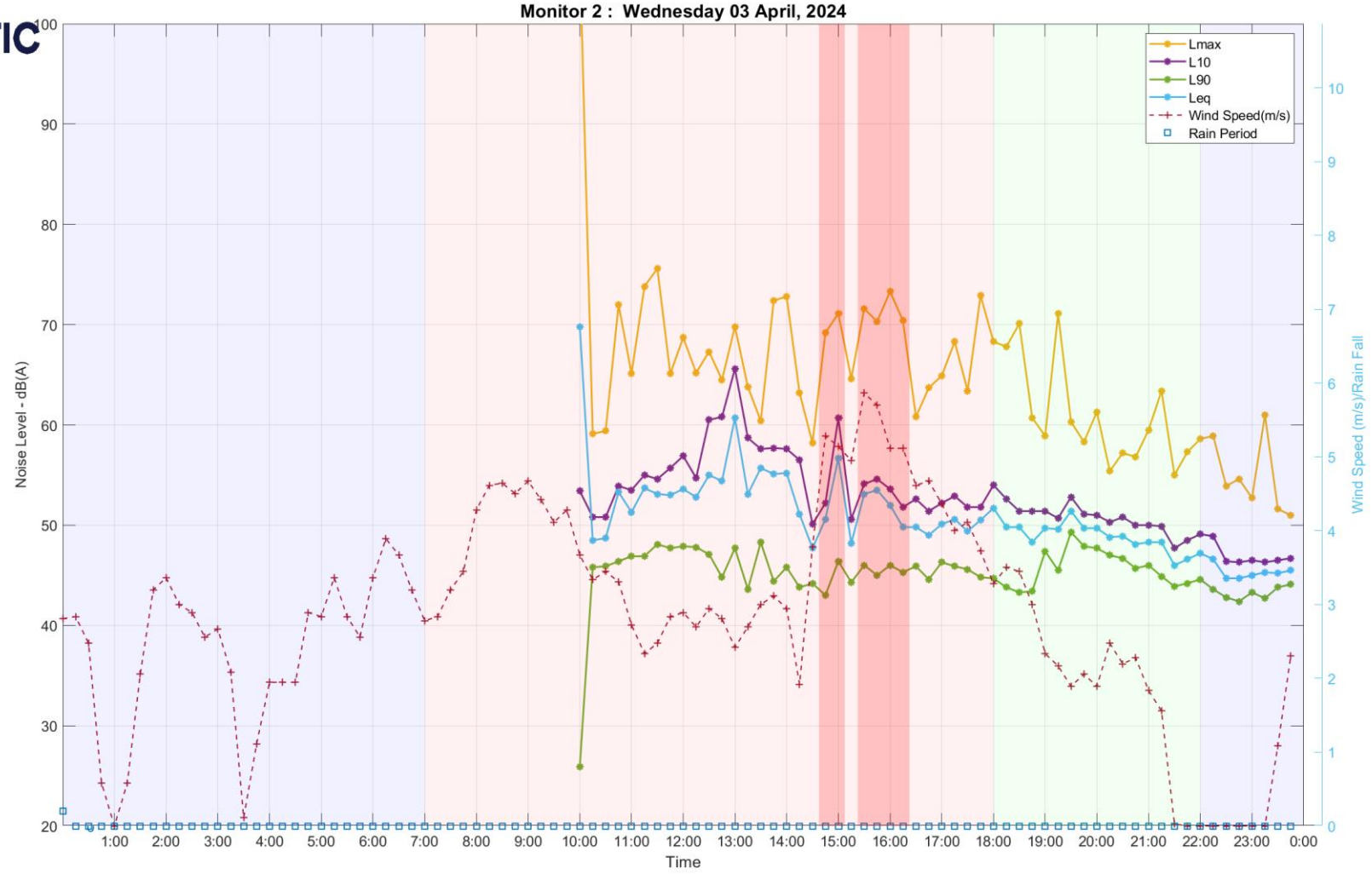


Wind Speed is corrected using factor 1.0000 based on logger location

A.5.2 LOCATION 2


Monitor 2 : Wednesday 03 April, 2024
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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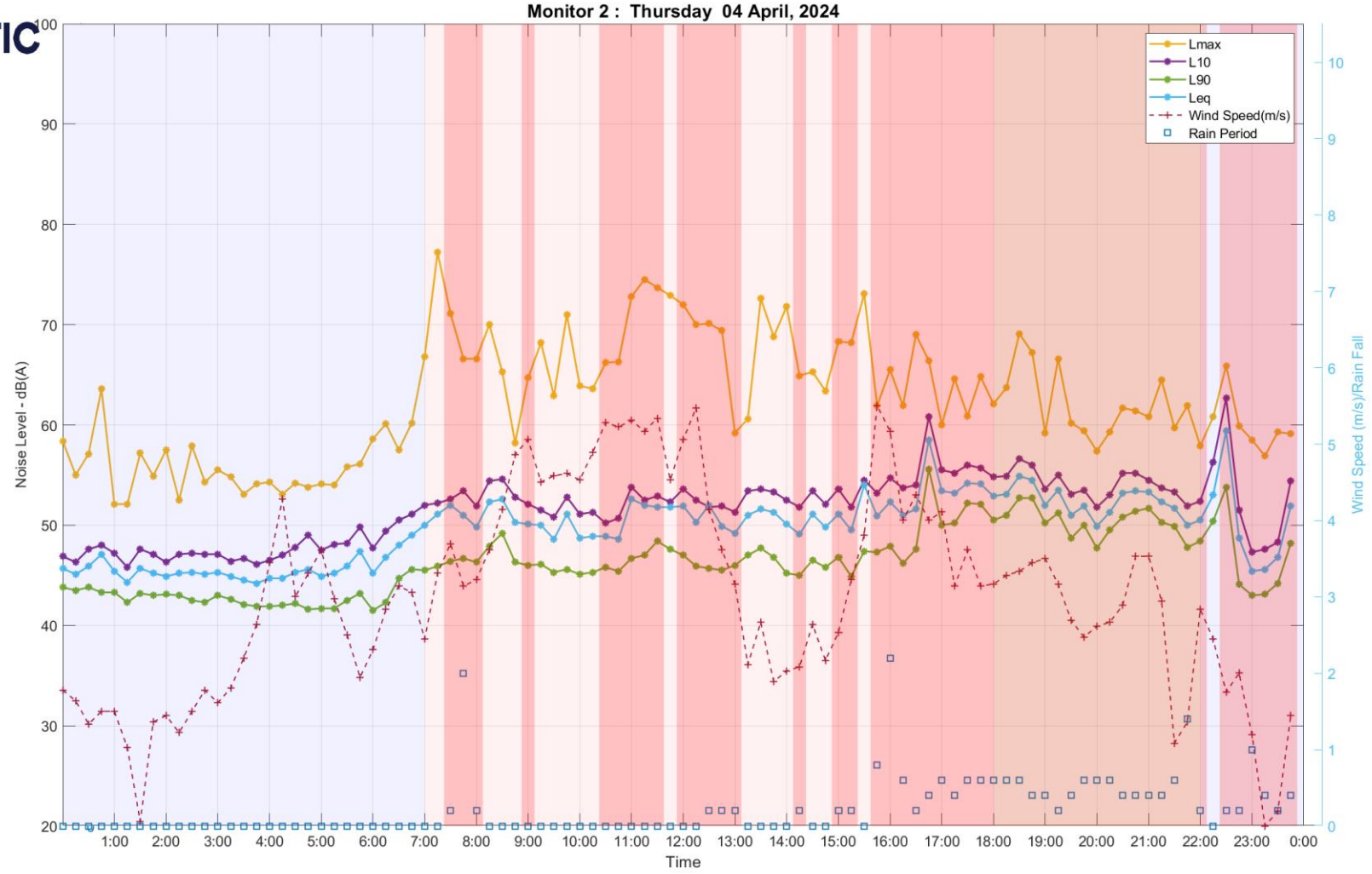
Monitor 2 : Thursday 04 April, 2024
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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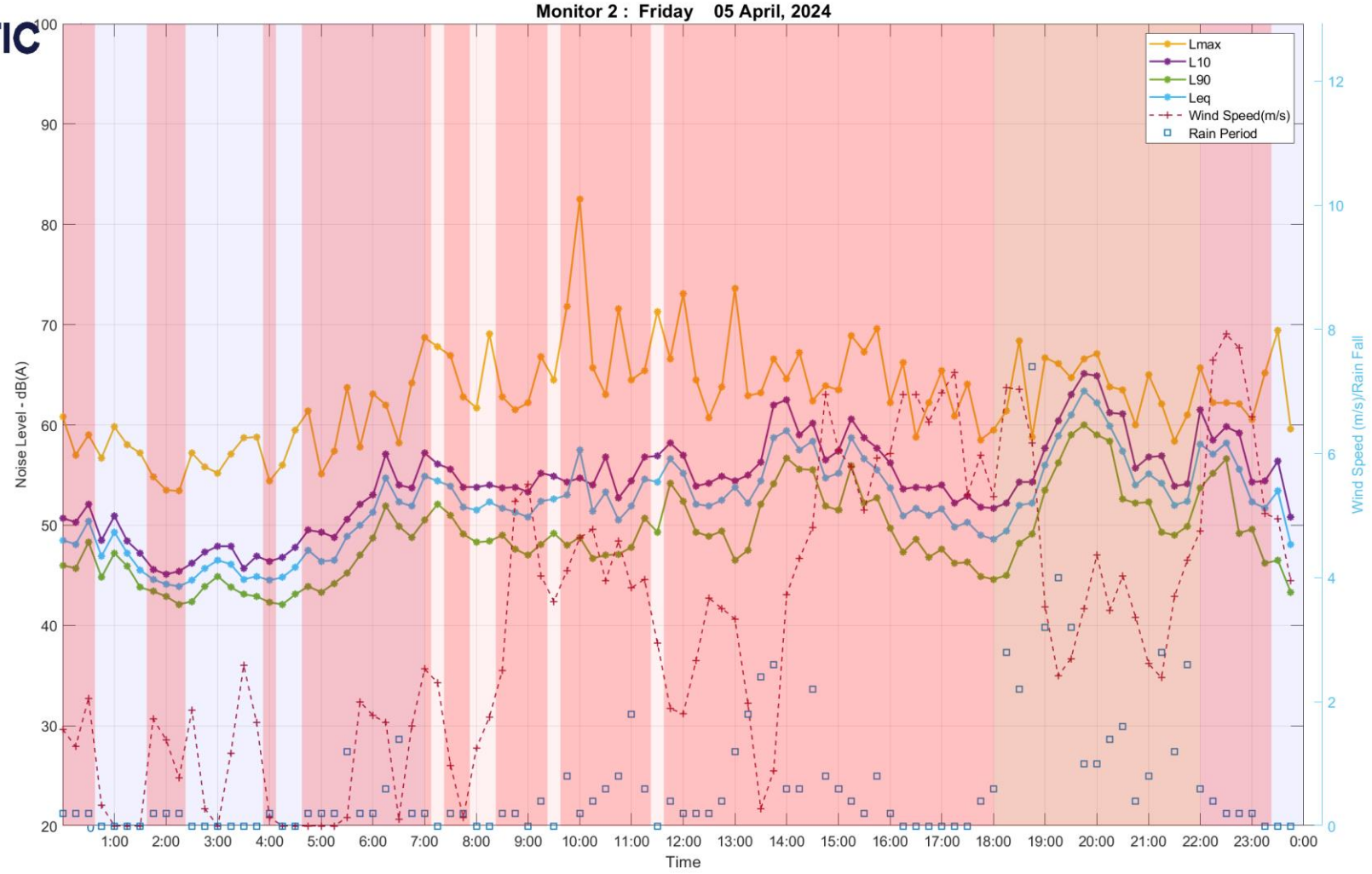
Monitor 2 : Friday 05 April, 2024
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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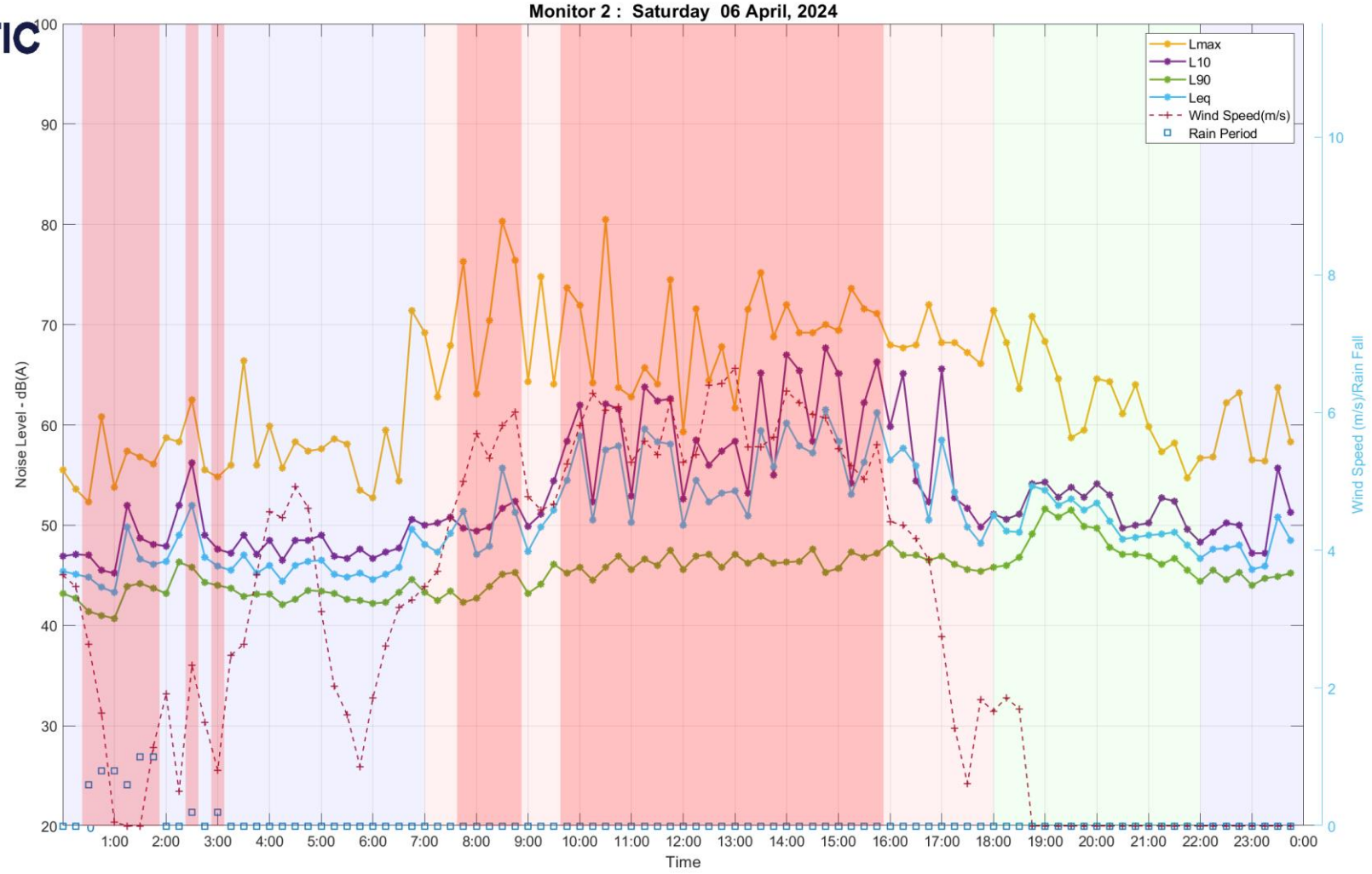
Monitor 2 : Saturday 06 April, 2024
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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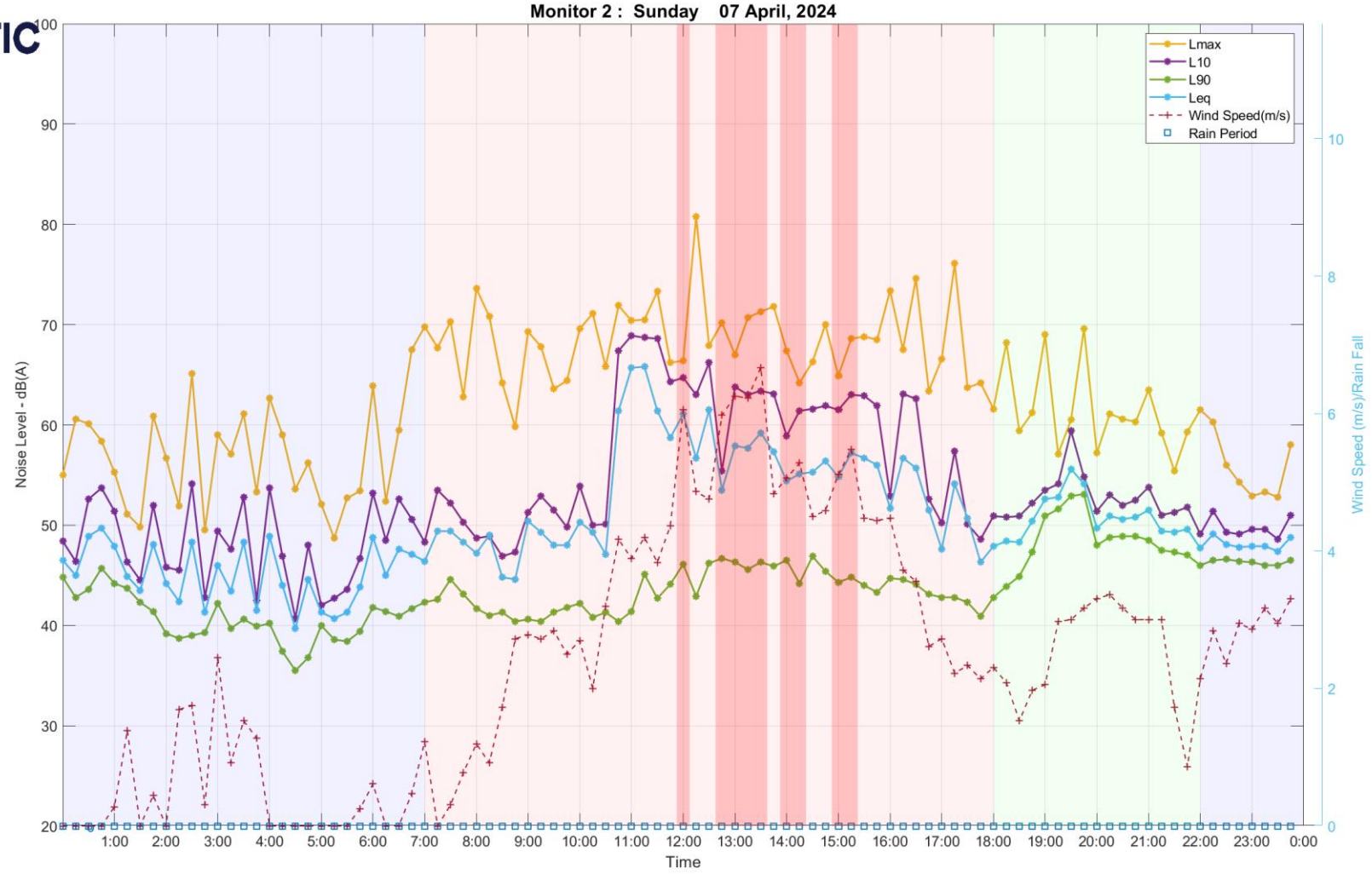
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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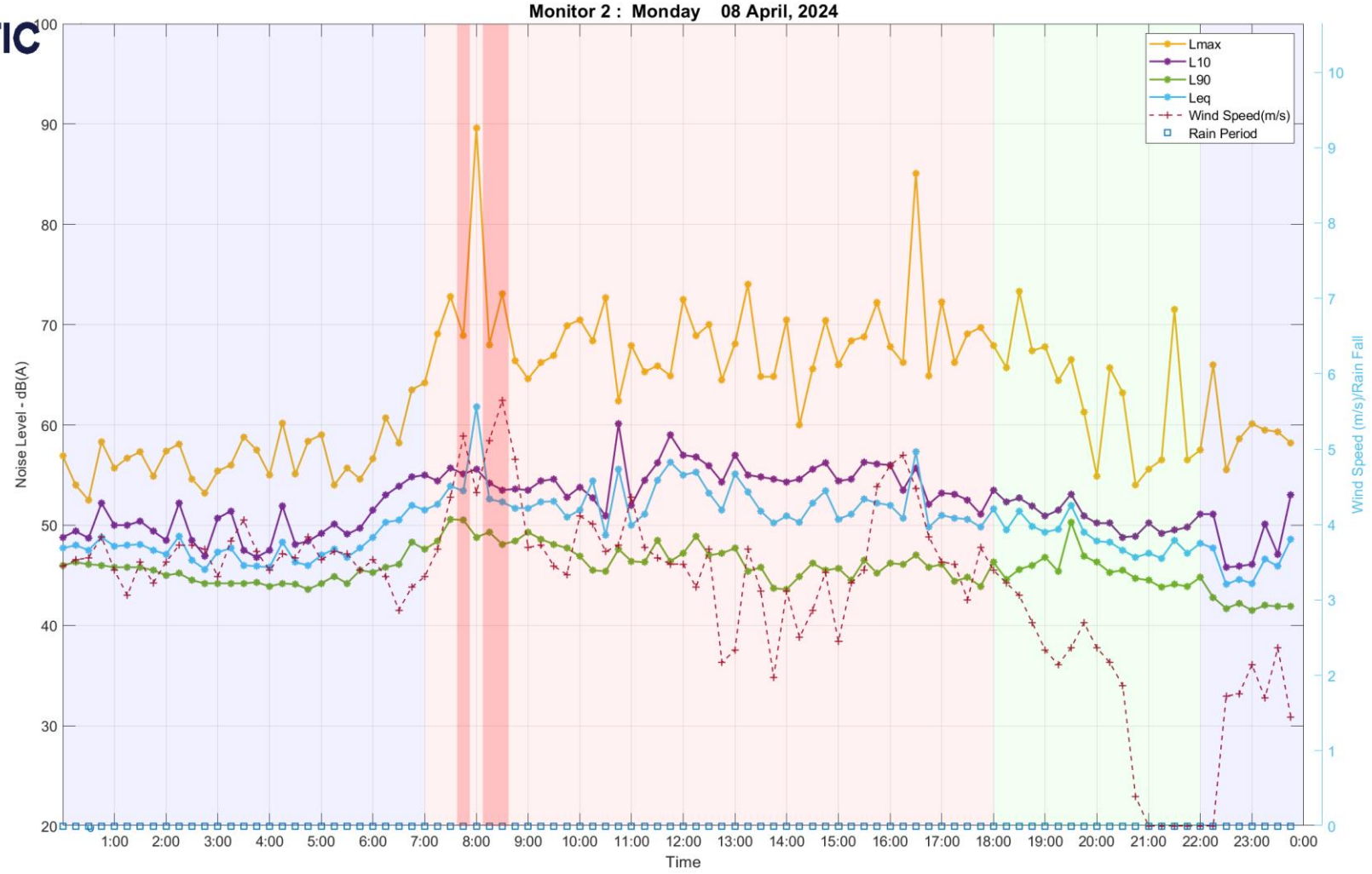
Monitor 2 : Monday 08 April, 2024
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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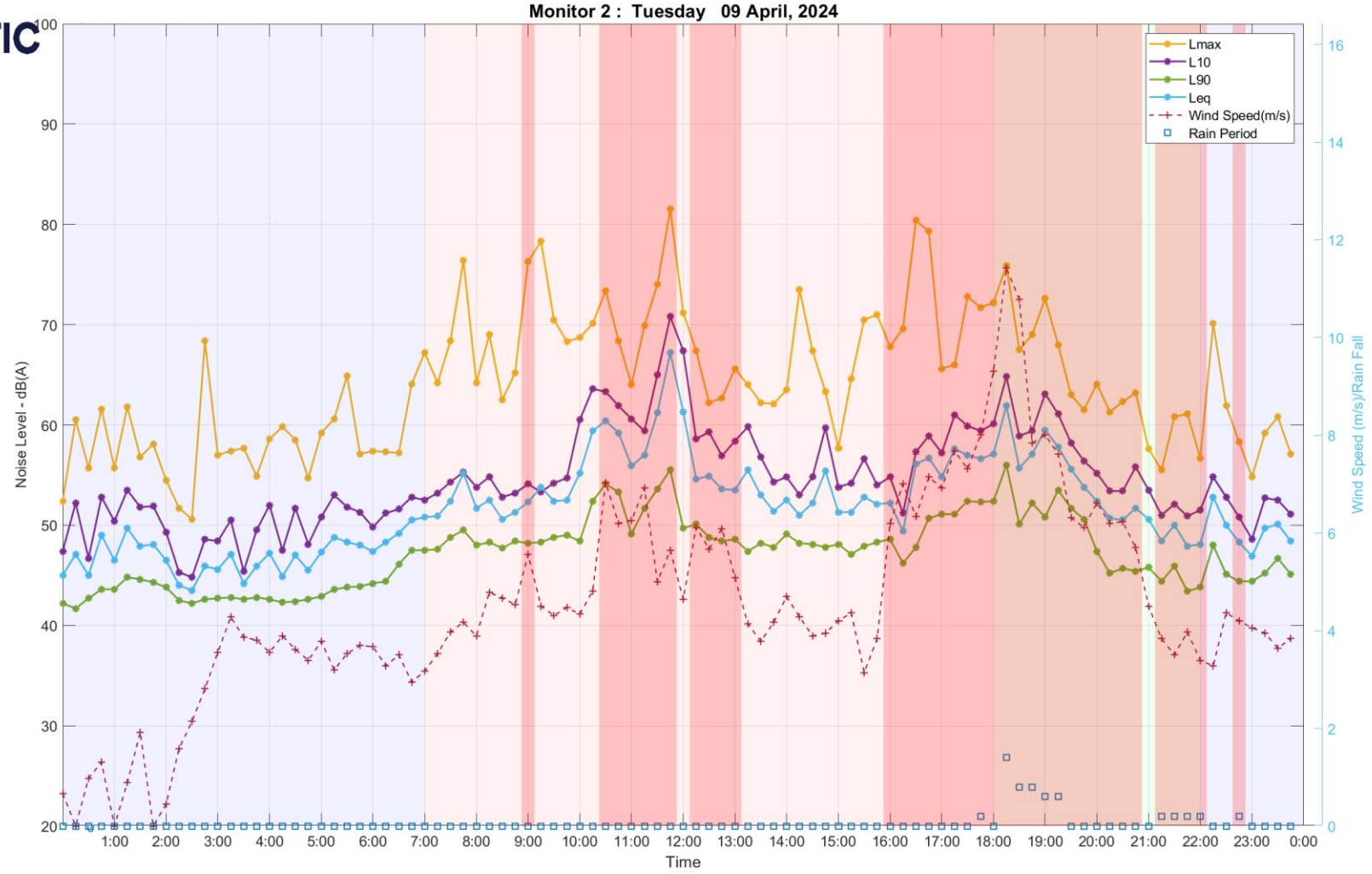
Monitor 2 : Tuesday 09 April, 2024
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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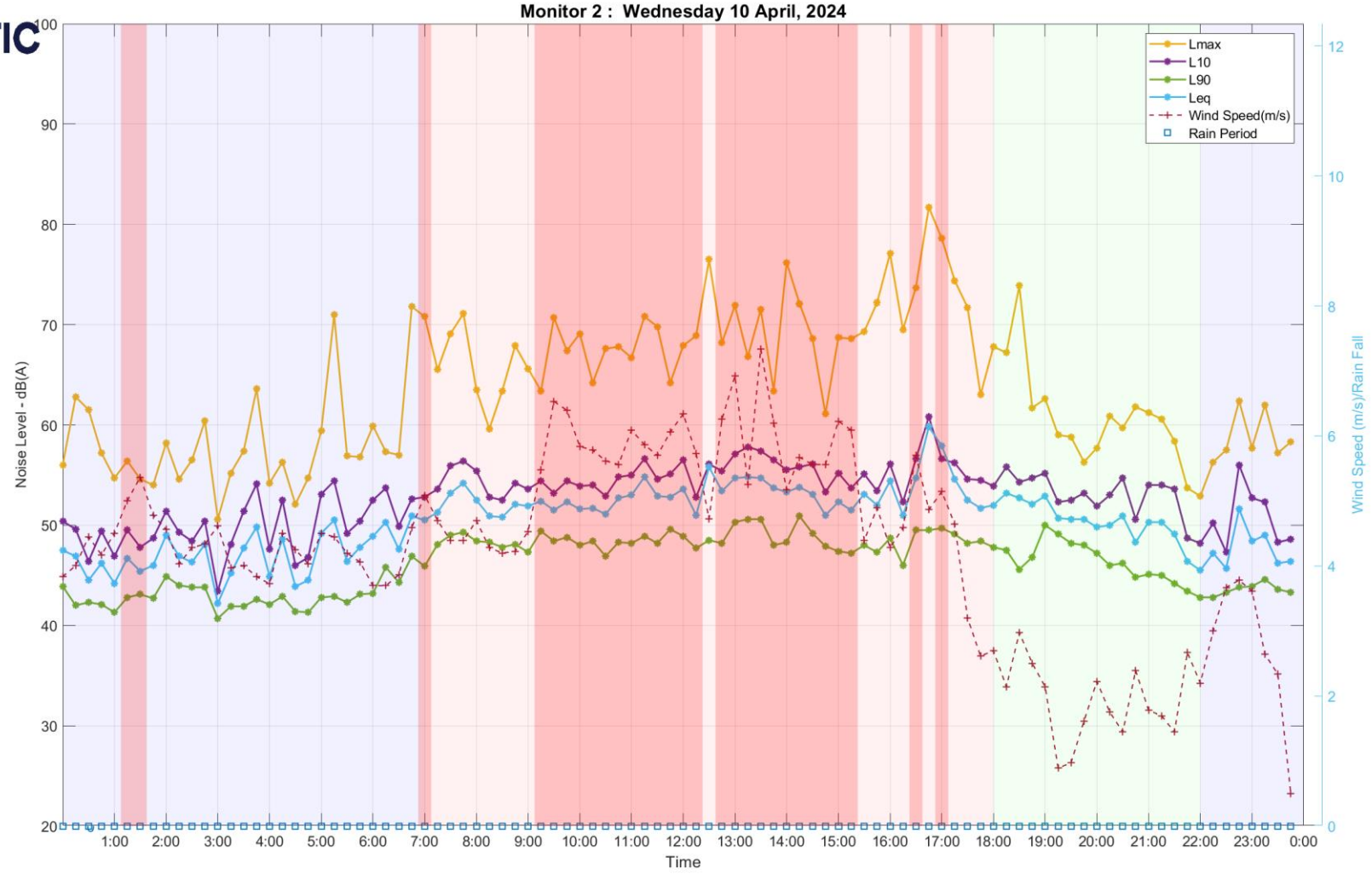
Monitor 2 : Wednesday 10 April, 2024
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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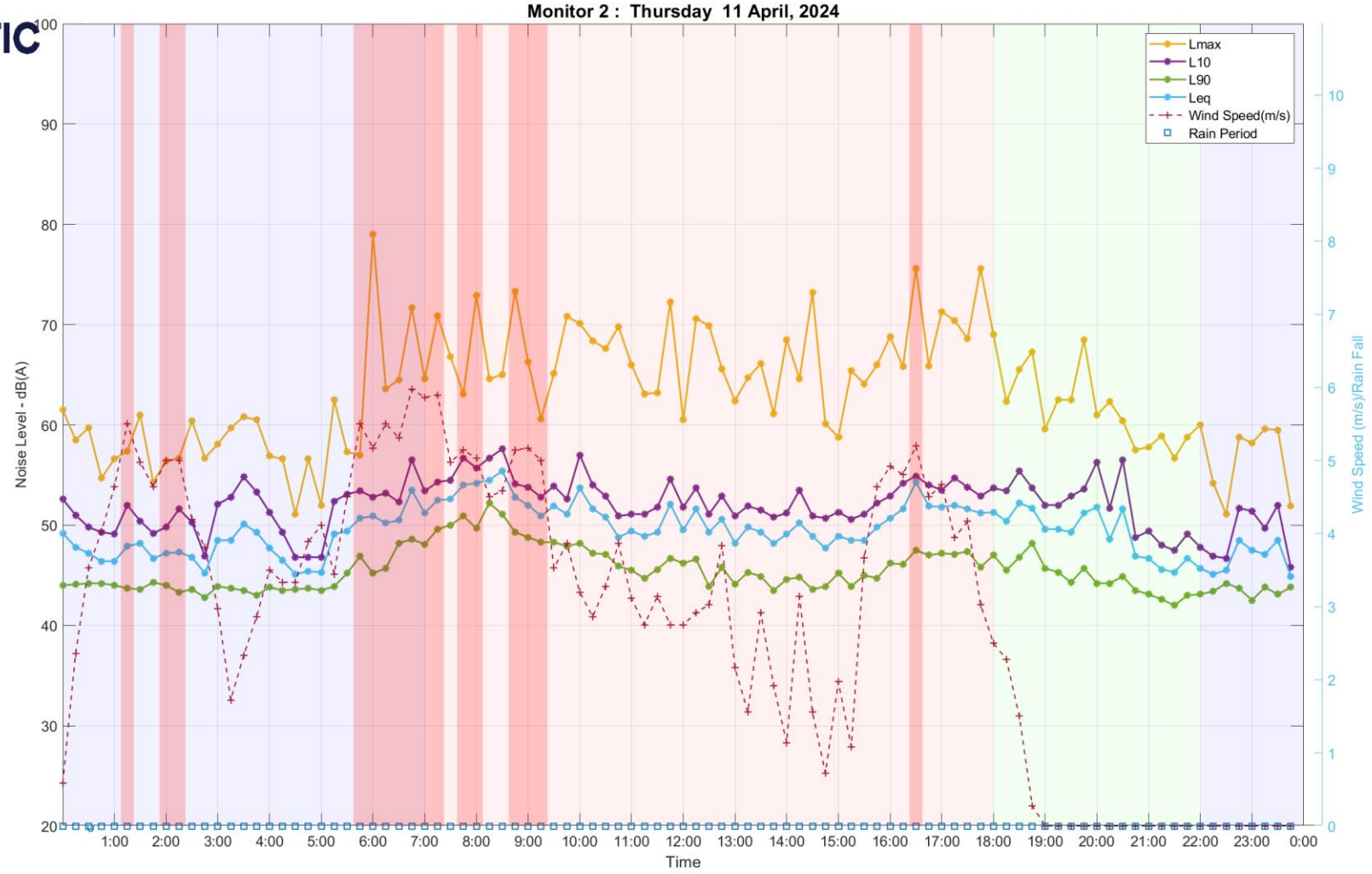
Monitor 2 : Thursday 11 April, 2024
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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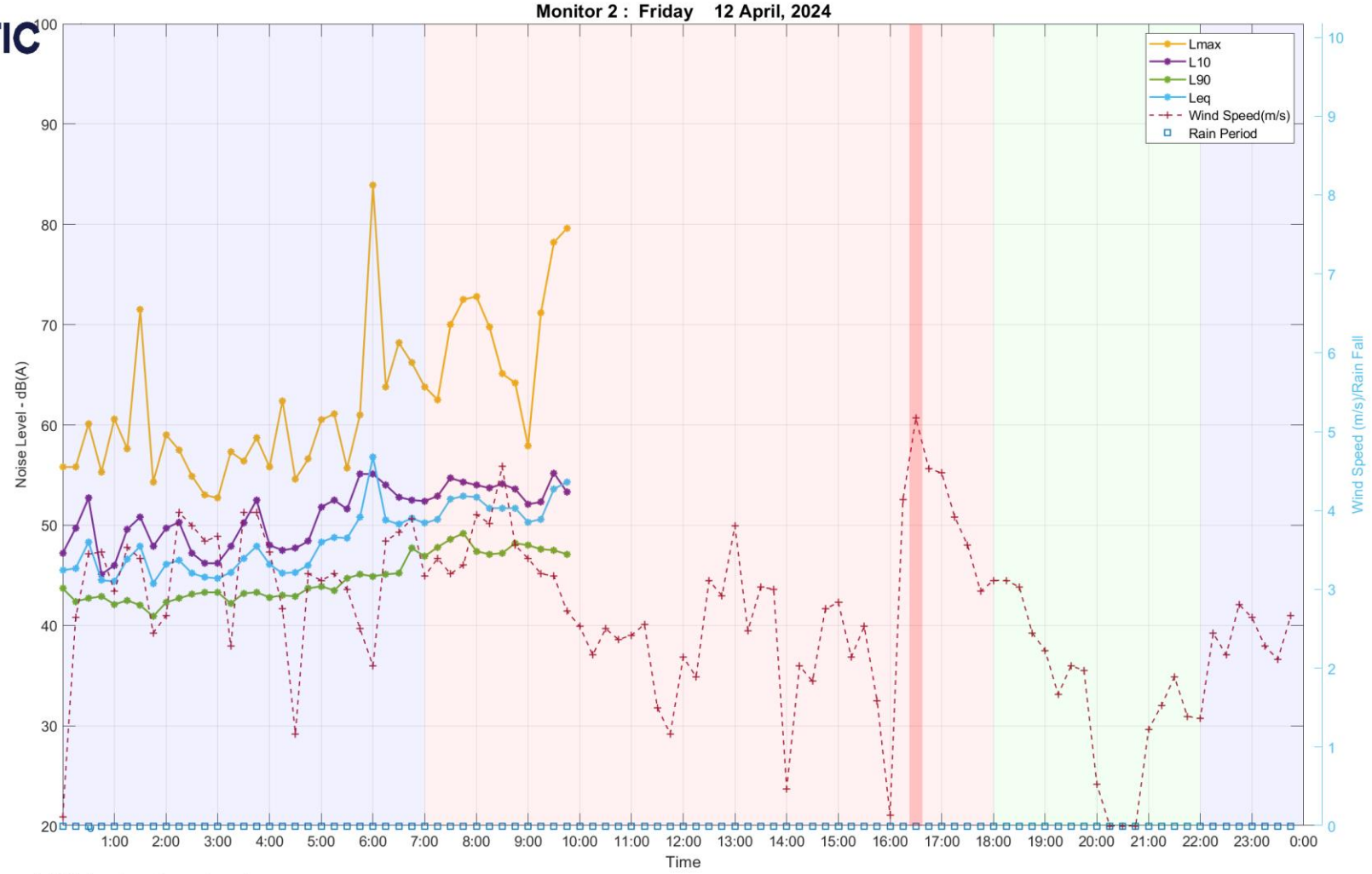
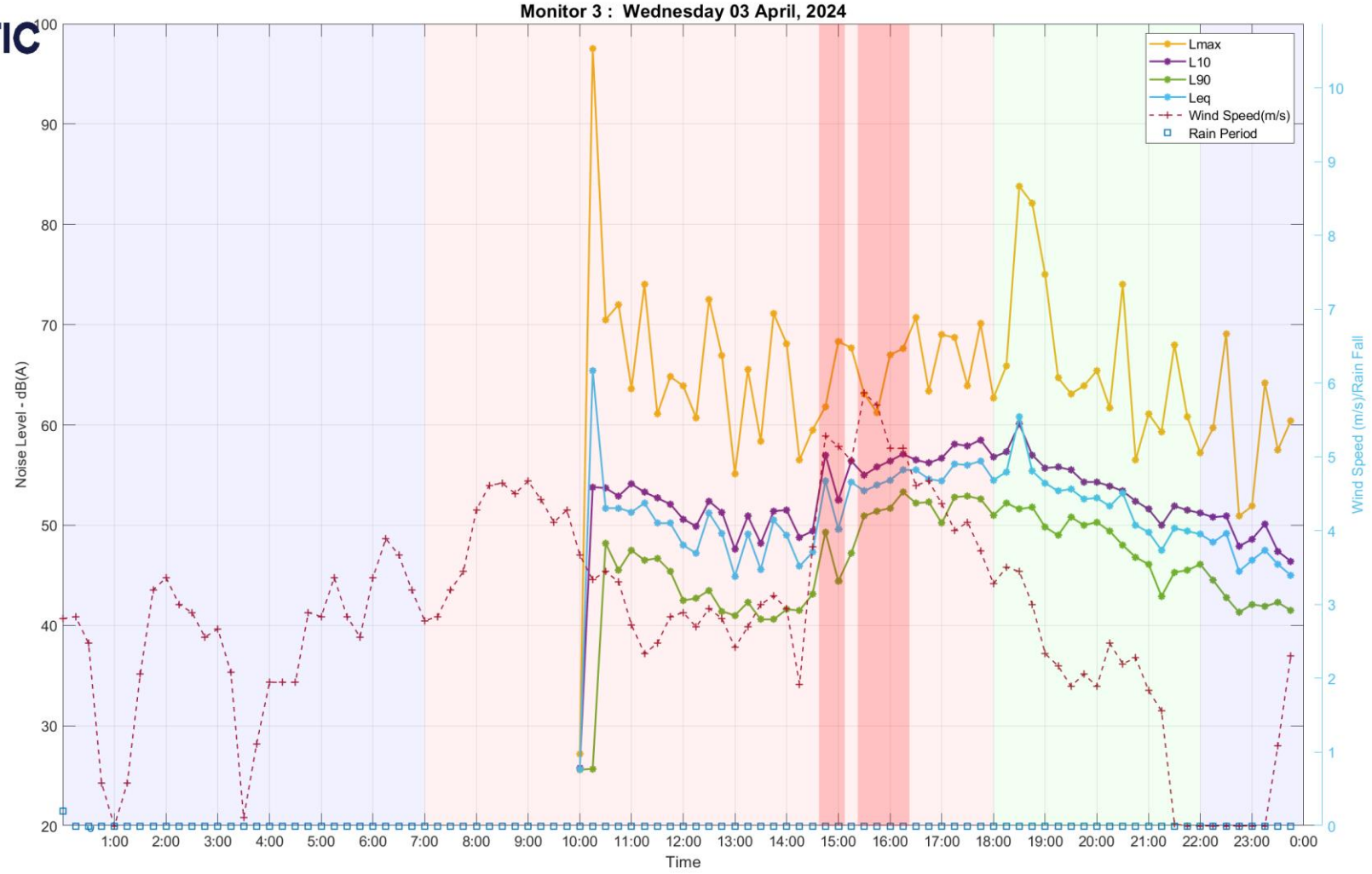


Wind Speed is corrected using factor 1.0000 based on logger location

A.5.3 LOCATION 3


Monitor 3 : Wednesday 03 April, 2024
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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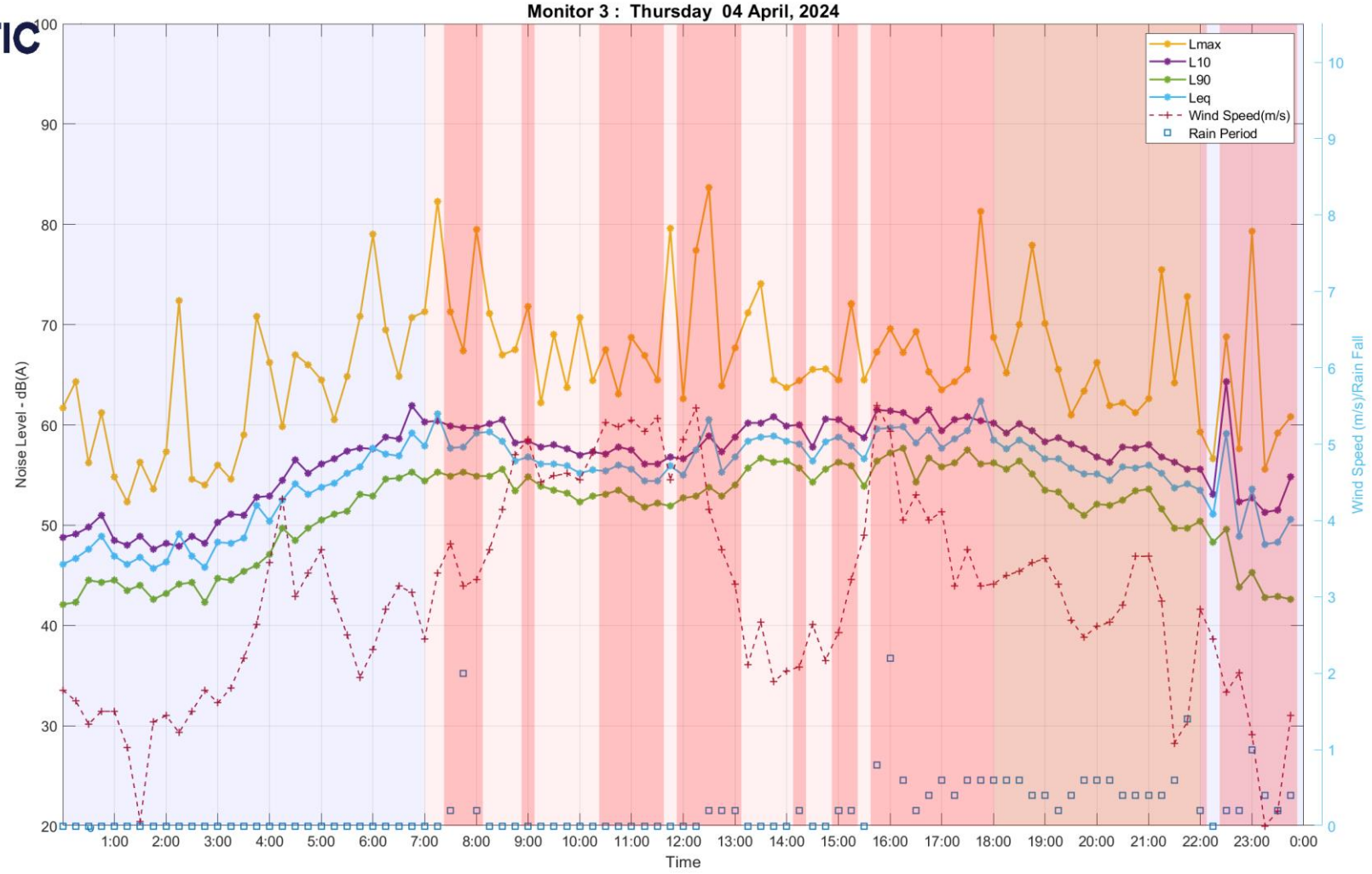
Monitor 3 : Thursday 04 April, 2024
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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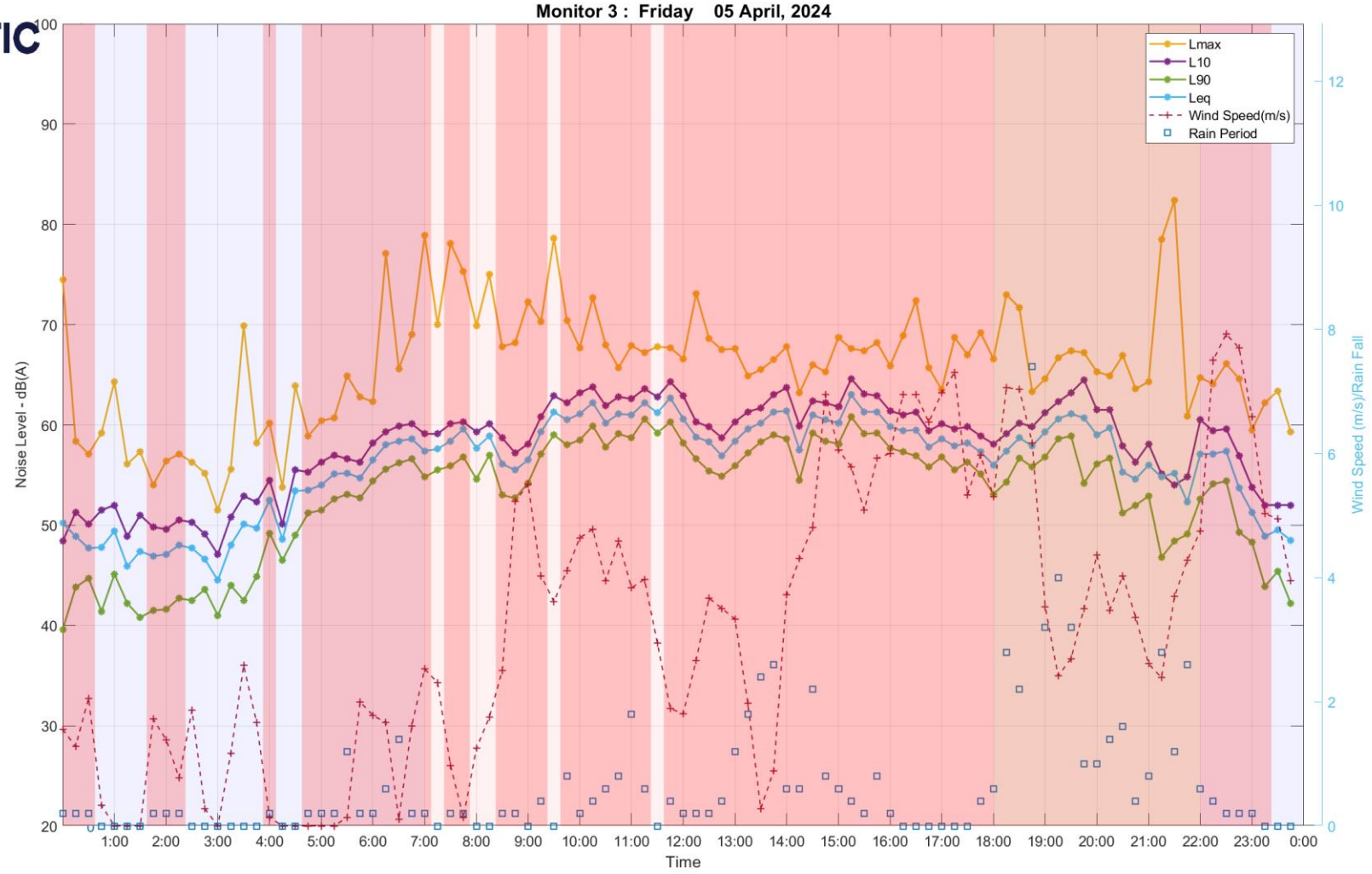
Monitor 3 : Friday 05 April, 2024
Lmax
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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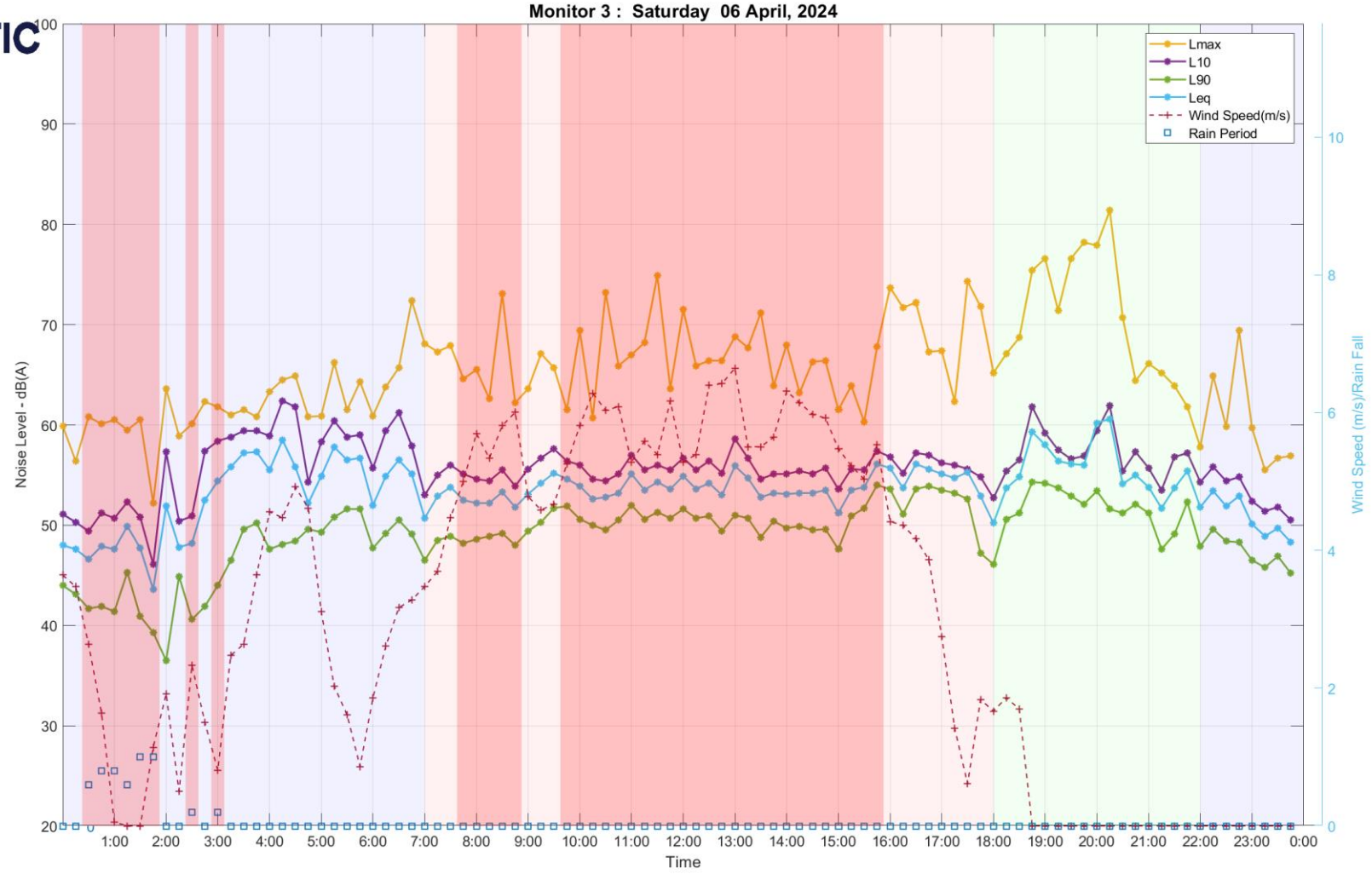
Monitor 3 : Saturday 06 April, 2024
Lmax
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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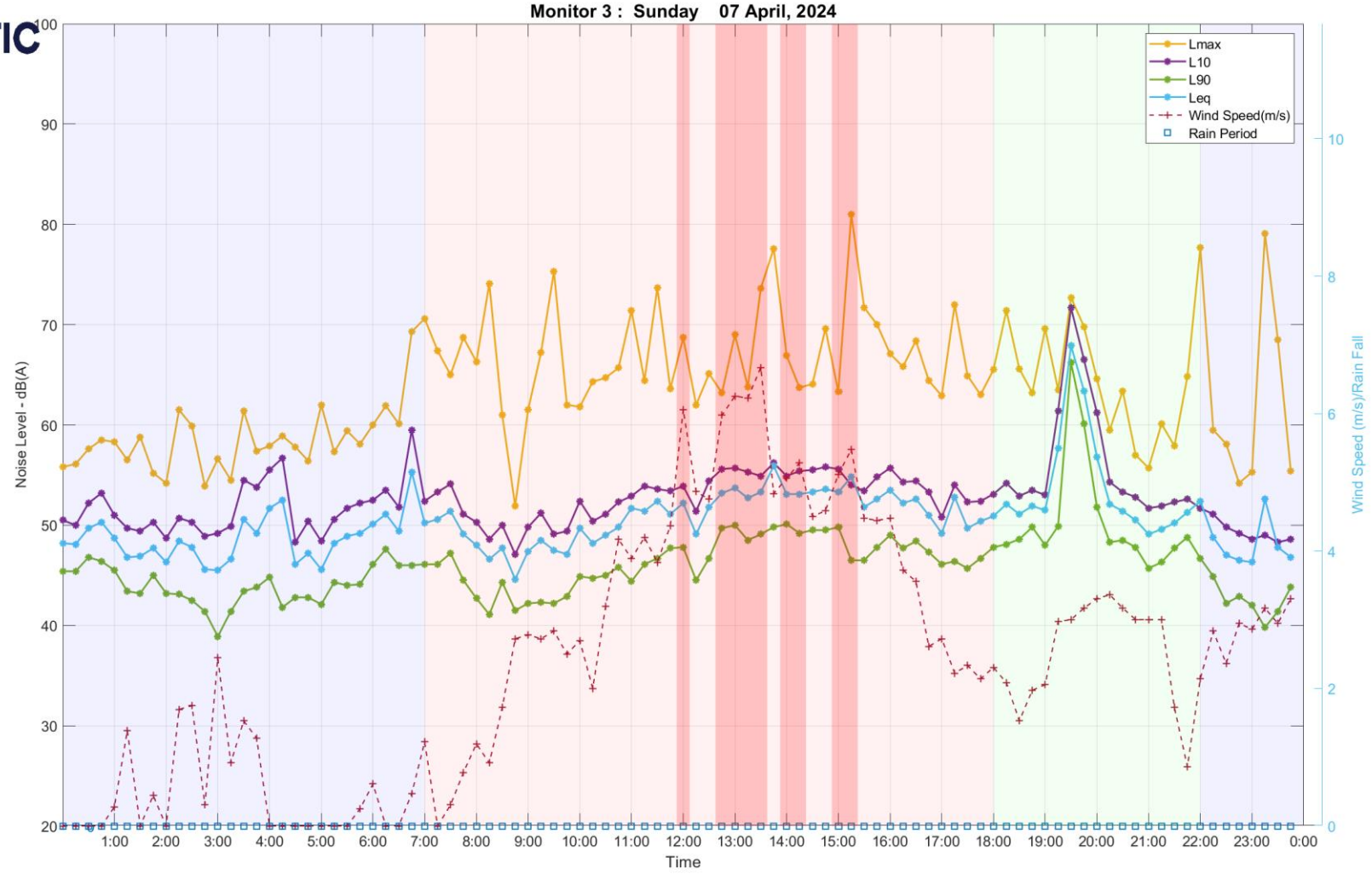
Monitor 3 : Sunday 07 April, 2024
Lmax
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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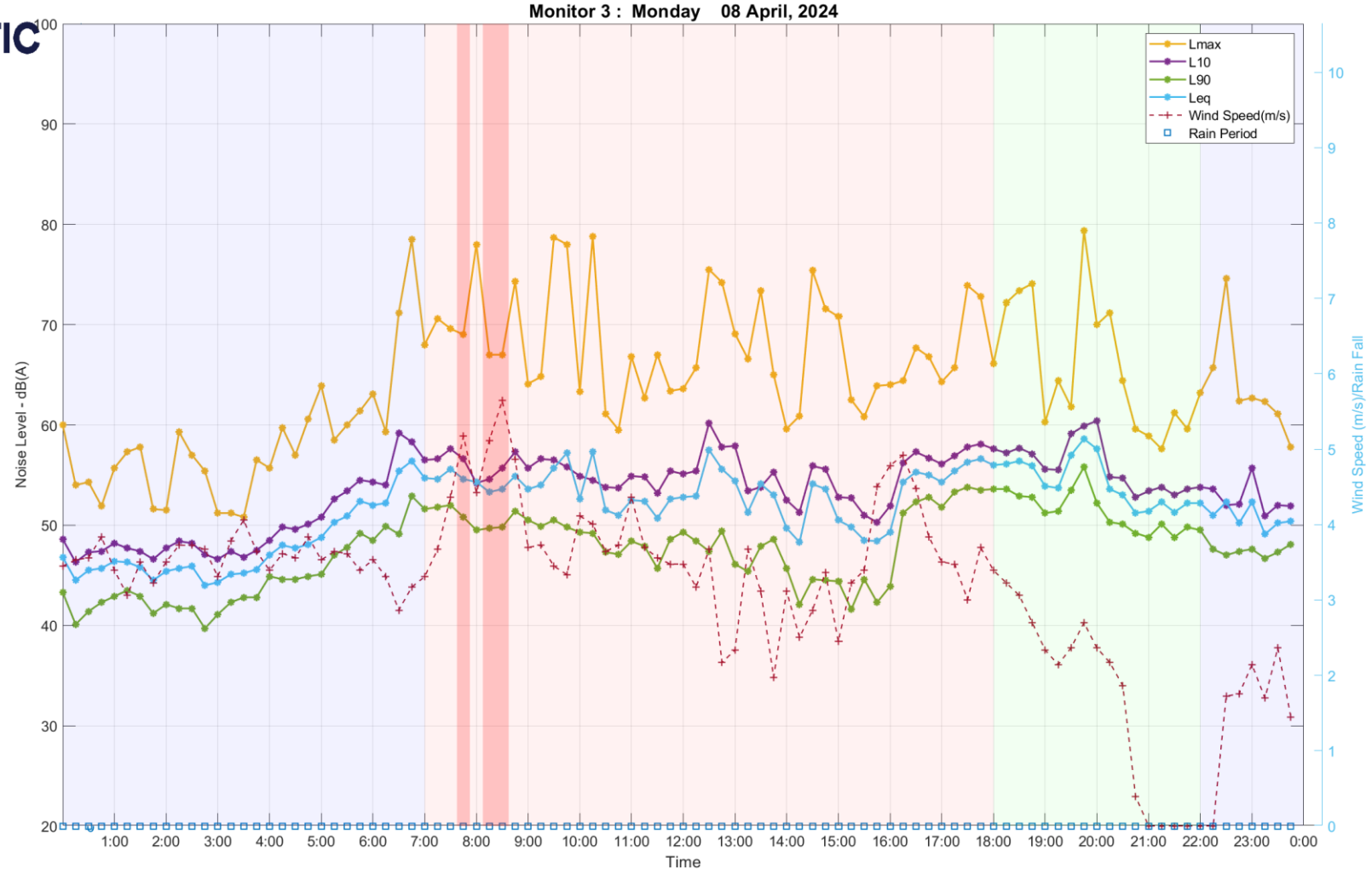
Monitor 3 : Monday 08 April, 2024
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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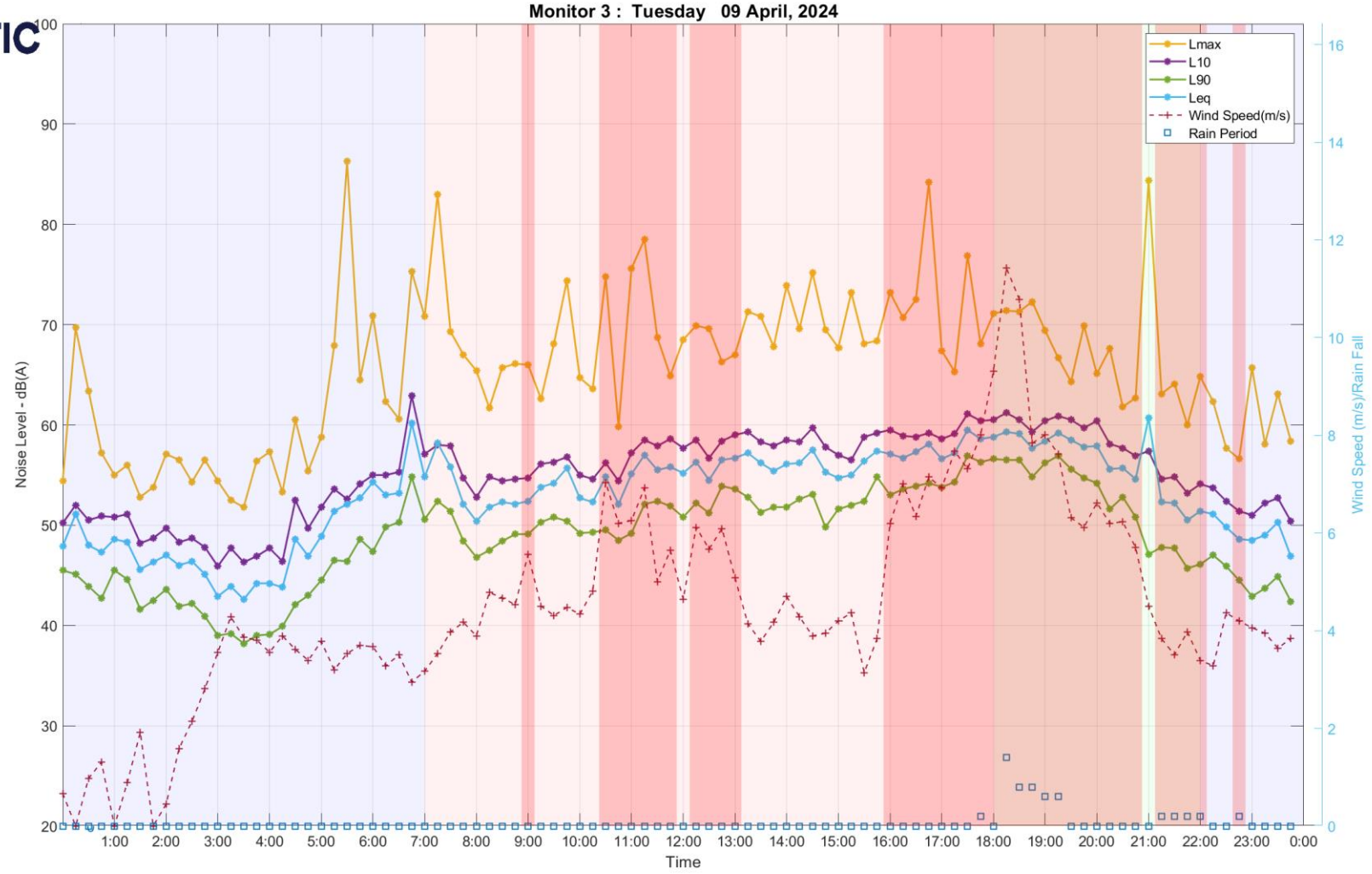
Monitor 3 : Tuesday 09 April, 2024
Lmax
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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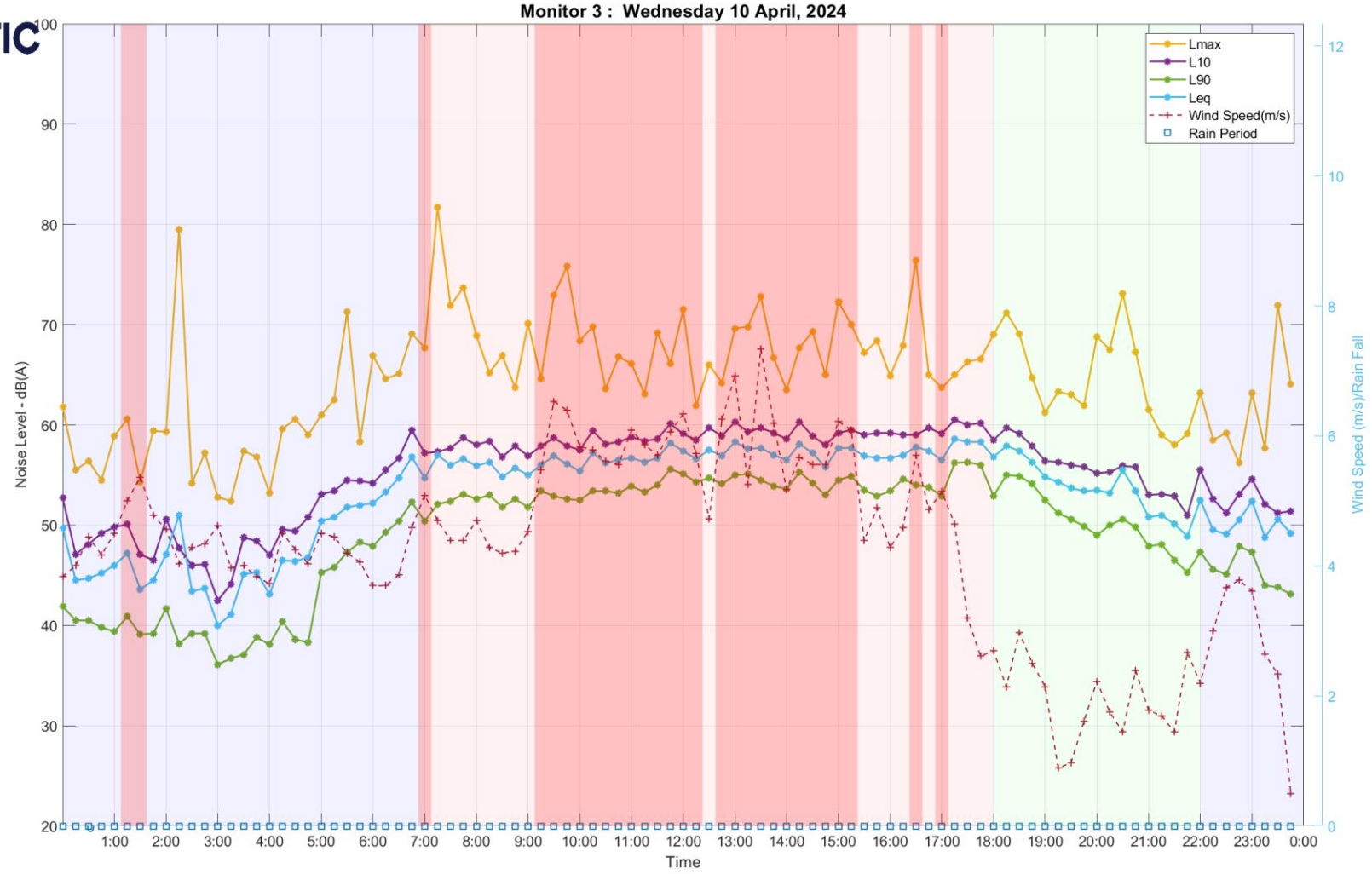
Monitor 3 : Wednesday 10 April, 2024
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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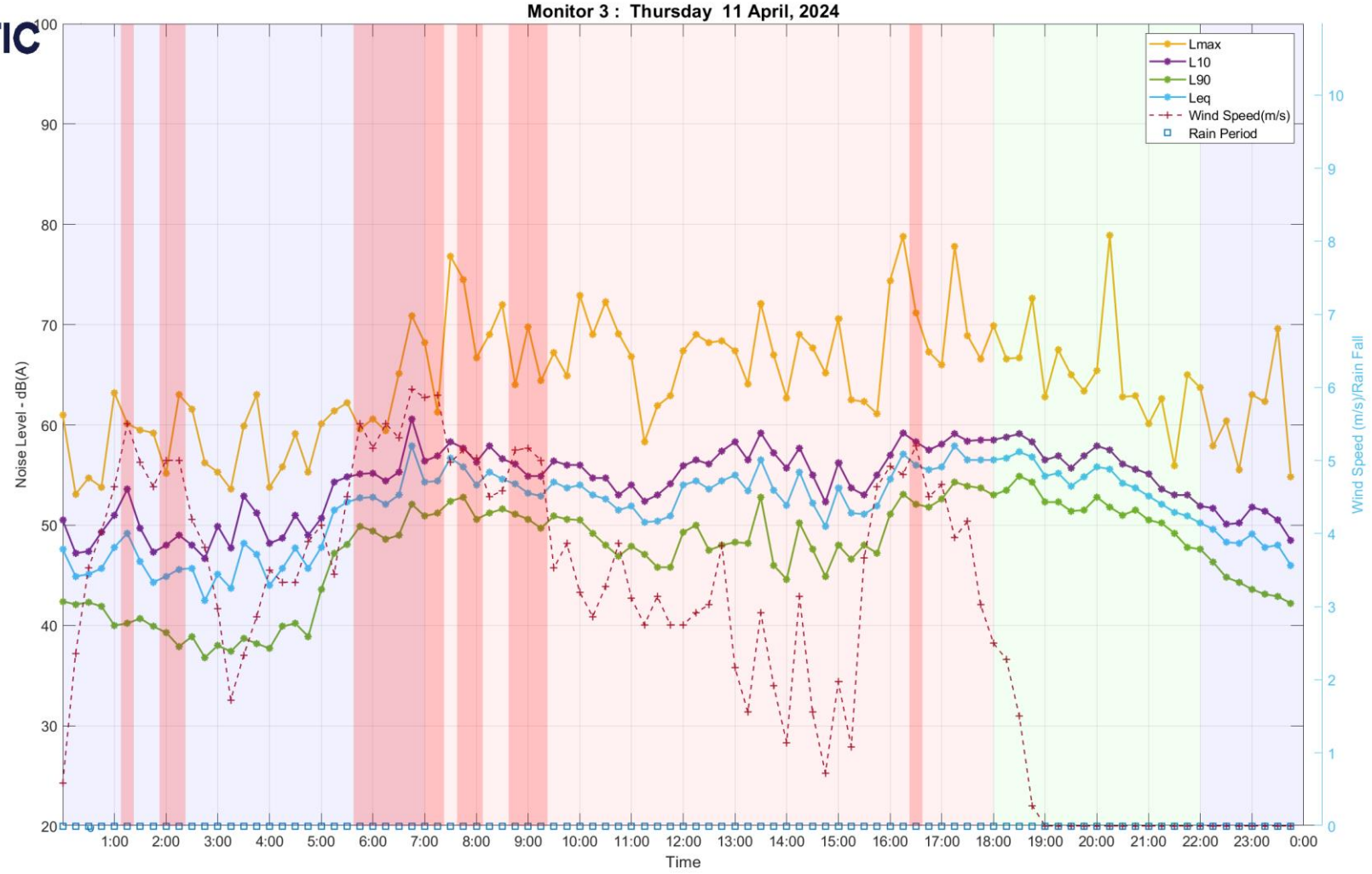
Monitor 3 : Thursday 11 April, 2024
Lmax
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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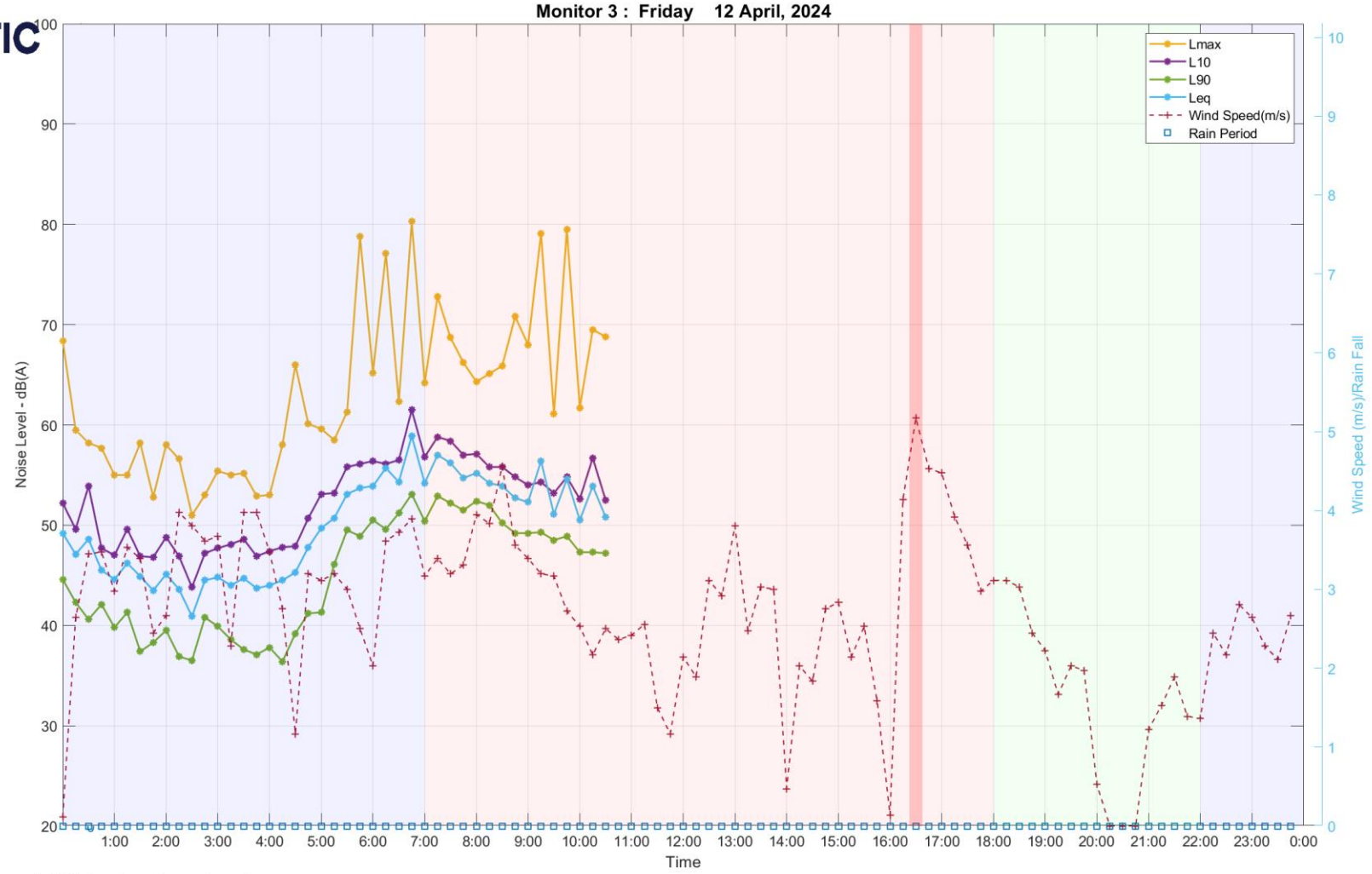

Wind Speed is corrected using factor 1.0000 based on logger location

APPENDIX B EPA NOISE POLICY FOR INDUSTRY TRIGGER LEVELS

Project specific assessment trigger levels have been determined for each noise source applying at the identified potentially most impacted receivers.

B.1 NPFI TRIGGER LEVELS

The NPfI requires noise impacts at residential receivers to be assessed in 3 ways:

- Whether the emitted noise is unreasonably loud relative to ambient background noise. (which the EPA calls the "intrusiveness" trigger level).
- Whether the noise emitted is unreasonably loud in an absolute sense, and consistent with surrounding land use and environment. ("amenity" trigger level)
- For night noise emissions, whether discrete noise events are likely to adversely impact sleep ("maximum noise level" trigger levels).

For other receiver types only the amenity trigger level is relevant.

B.1.1.1 INTRUSIVENESS

The $L_{eq,15min}$ descriptor is used for the intrusiveness trigger level, and is set at a level that is 5dB(A) above the rating background noise level for the relevant period.

B.1.1.2 AMENITY

Table 2.2 of the NPfI (repeated below) sets out acceptable noise levels for various receiver types.

There are 3 categories of residential receivers - rural, suburban, urban. The nearest residential receivers to the subject site are categorised as urban receivers. Categories for non-residential uses are also indicated in the table.

The NPI typically requires project amenity noise levels to be calculated in the following manner:

$$L_{Aeq,15min} = \textit{Recommended Amenity Noise Level} - 5\ dB(A) + 3\ dB(A)$$

NPfI Table 2.2: Amenity Noise Levels			
Receiver	***Noise Amenity Area***	***Time of Day***	***Recommended Amenity Noise Level L_{Aeq}***
Residential	*Rural*	*Day*	*50*
		Evening	*45*
		Night	*40*
	Suburban	*Day*	*55*
		Evening	*45*
		Night	*40*
	Urban	*Day*	*60*
		Evening	*50*
		Night	*45*
Hotels motels caretakers' quarters holiday accommodation permanent resident caravan parks	*See column 4*	*See column 4*	*5 dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day*
School classroom – internal	*All*	*Noisiest 1-hour period when in use*	*35 (see notes for table)*
Hospital ward internal external	*All* *All*	*Noisiest 1-hour* *Noisiest 1-hour*	*35* *50*
Place of worship – internal	*All*	*When in use*	*40*
Area specifically reserved for passive recreation (e.g. national park)	*All*	*When in use*	*50*
Active recreation area (e.g. school playground golf course)	*All*	*When in use*	*55*
Commercial premises	*All*	*When in use*	*65*
Industrial premises	*All*	*When in use*	*70*
Industrial interface (applicable only to residential noise amenity areas)	*All*	*All*	*Add 5 dB(A) to recommended noise amenity area*

Notes: The recommended amenity noise levels refer only to noise from industrial sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as follows:

• rural residential – see Table 2.3

• suburban residential – see Table 2.3

• urban residential – see Table 2.3

• industrial interface – an area that is in close proximity to existing industrial premises and that extends out to a point where the existing industrial noise from the source has fallen by 5 dB or an area defined in a planning instrument. Beyond this region the amenity noise level for the applicable category applies. This category may be used only for existing situations (further explanation on how this category applies is outlined in Section 2.7)

• commercial – commercial activities being undertaken in a planning zone that allows commercial land uses

• industrial – an area defined as an industrial zone on a local environment plan; for isolated residences within an industrial zone the industrial amenity level would usually apply.

Time of day is defined as follows:

• day – the period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays

• evening – the period from 6 pm to 10 pm

• night – the remaining periods.

(These periods may be varied where appropriate, for example, see A3 in Fact Sheet A.)

In the case where existing schools are affected by noise from existing industrial noise sources, the acceptable L_{Aeq} noise level may be increased to 40 dB $L_{Aeq(1hr)}$.

B.1.2 MAXIMUM NOISE LEVEL ASSESSMENT

The purpose of this assessment is to identify whether discrete, night time noise events have the potential to produce adverse sleep impacts.

Section 2.5 of NPfI recommends the following procedure to assess the potential for adverse sleep disturbance.

Where the subject development/ premises night -time noise levels at a residential location exceed:

- $L_{eq(15min)}$ 40 dB(A) or the prevailing RBL (L_{90}) plus 5 dB, whichever is the greater, and/or
- L_{max} 52 dB(A) or the prevailing RBL (L_{90}) plus 15 dB, whichever is the greater,

a detailed maximum noise level event assessment should be undertaken.

The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period. Some guidance on possible impact is contained in the review of research results in the NSW Road Noise Policy.

Other factors that may be important in assessing the extent of impacts on sleep include:

- *how often high noise events will occur*
- *the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the subject development*
- *whether there are times of day when there is a clear change in the noise environment (such as during early-morning shoulder periods)*
- *current scientific literature available at the time of the assessment regarding the impact of maximum noise level events at night.*

Maximum noise level event assessments should be based on the L_{AFmax} descriptor on an event basis under 'fast' time response. The detailed assessment should consider all feasible and reasonable noise mitigation measures with a goal of achieving the above trigger levels.

B.2 PROJECT SPECIFIC TRIGGER LEVELS

The following table summarises the trigger levels applying at each of the identified "most impacted" receivers. These have been determined based on the NPfI methodology described above and the measured rating background noise levels.

The trigger levels in bold indicate the most stringent trigger level at each location.

Table 19 –Project Specific Trigger Levels

Location/Receiver Type	Time	RBL dB(A) L_{90}	Trigger Noise Level (dB(A) $L_{eq,15min}$)		
			Intrusiveness	Amenity	Max Event
R1 - Residential	Day	43	**48**	58	n/a
	Evening	47 (43)*	**48**	48	n/a
	Night	46 (43)*	48	**43**	48 L_{eq} **58 L_{max}**
R2 - Residential	Day	45	**50**	58	
	Evening	44	49	**48**	
	Night	42	47	**43**	47 L_{eq} **57 L_{max}**
R3 - Residential	Day	48	**53**	58	
	Evening	49 (48)*	48	**48**	
	Night	46	43	**43**	51 L_{eq} **61 L_{max}**
C1 - Commercial	Day	n/a	n/a	63	n/a

**In line with the requirements of the NSW EPA, 'Noise Policy for Industry 2017,' the evening and night-time periods have been corrected to be equal to the daytime rating background noise level at the monitoring locations if applicable.*

B.2.1 NOISE CHARACTERISTIC MODIFYING FACTORS

Where applicable, the emitted intrusive noise level should be modified (increased or decreased) to account for characteristics such as tonality, low frequency, duration, etc according to NPfI Fact Sheet C.

APPENDIX C – CONSTRUCTION PLANT NOISE EMISSION LEVELS

This section provides the plant noise emission levels adopted in the assessment.

C1 NOISE

The following table presents typical sound power levels for construction plant used in this assessment.

The following have been considered to establish typical plant A-weighted sound power levels:

- Transport for NSW Construction Noise and Vibration Strategy (April 2018).
- Previous measurements undertaken by Acoustic Logic.
- AS 2436-2010 "Guide to noise and vibration control on construction, demolition and maintenance sites (Appendix A).

The equipment sound power spectra are based on information in the DEFRA database, and when not available from that source, from manufacturer's data or from measured spectra taken by this office of similar machinery.

Items identified as having annoying characteristics have been penalised by adding 5dB to the levels in the Transport for NSW's noise data base.

The emission levels in the table assume that machinery operates continuously (i.e. 100% duty), which is not always be the case. For example, excavators may load trucks intermittently for 5 minutes in every 15-minute assessment period so their duty would be 33%. The duty correction used in the assessment is indicated in the table.

Table 20 - Sound Power Levels of the Proposed Equipment

Stage	Equipment/Process	Sound Power Level dB(A)
Demolition and Construction	12.5m HRV	105
	Truck Idling	105
	Power Hand Tools	102
	Concrete Pump	108
	Concrete Truck	108
	Excavator	105

APPENDIX D - DRAWINGS AND NOISE SOURCE INFORMATION

The following drawings provided by Jackson Environment and Planning Pty Ltd (dated 28/05/2024) has been reproduced below.

CHANGE OF USE OF AN EXISTING INDUSTRIAL SHED AND DEVELOPMENT OF A TYRE RECYCLING FACILITY

9 Burlington Place, Rutherford, NSW
Lot 3005, DP 1040568

PROPERTY INFORMATION

NATIONAL CONSTRUCTION CODE BUILDING CLASS: CLASS 7 (STORAGE BUILDING)
OCCUPANCY GROUP: GENERAL INDUSTRY
ZONE NO: GENERAL INDUSTRIAL (E4)

GOVERNING CODES

- MAITLAND LOCAL ENVIRONMENTAL PLAN 2011;
- MAITLAND DEVELOPMENT CONTROL PLAN 2011

SCOPE OF WORK

CHANGE OF USE OF AN EXISTING INDUSTRIAL SHED AND DEVELOPMENT A TYRE RECYCLING FACILITY

SHEET INDEX

DA101	COVER PAGE
DA102	SITE PLAN, FLOOR PLAN
DA103	ELEVATIONS, SECTIONS
DA104	NOTIFICATION PLAN

SITE AREA ANALYSES.
SITE: 1,655 SQMT

EXISTING INDUSTRIAL AREA:	475 SQMT
NEW ADDITIONAL INDUSTRIAL AREA:	163 SQMT
TOTAL INDUSTRIAL AREA:	638 SQMT
EXISTING OFFICE AREA:	35 SQVT
TOTAL FLOOR AREA:	673 SQMT

FLOOR AREA RATIO:
673 / 1,655 = X 100 = 40.6 %

Date	Plan Number	Cover Page
28-05-2024	101	9 Burlington Place, Rutherford, NSW, 2320 (Lot 3005, DP 1040569)

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JACKSON ENVIRONMENT AND PLANNING

Client	Rutherford Tyre Recycling
Project	Proposed Tyre Recycling Facility
Title	Cover Page
Scale	
Source	Jackson Environment and Planning Pty Ltd

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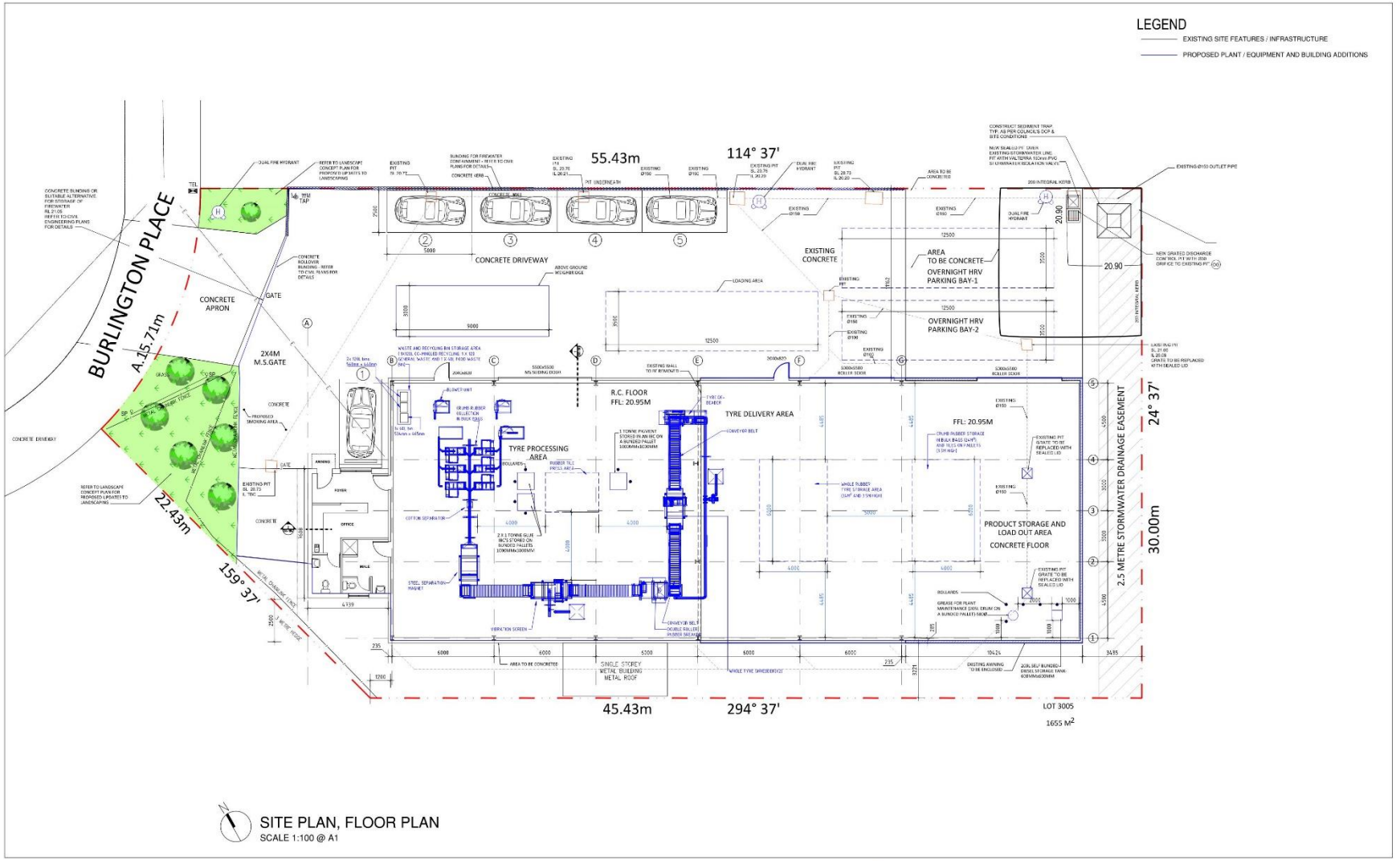
DA



Date	Plan Number	Site Plan, Floor Plan
28-05-2024	102	9 Burlington Place, Rutherford, NSW, 2320 (Lot 3005, DP 1040569)

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JACKSON ENVIRONMENT AND PLANNING

Client	Rutherford Tyre Recycling
Project	Proposed Tyre Recycling Facility
Title	Site Plan, Floor Plan
Scale	1:100
Source	Jackson Environment and Planning Pty Ltd

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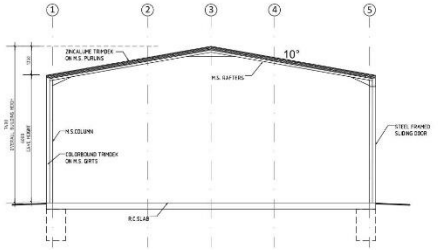
DA



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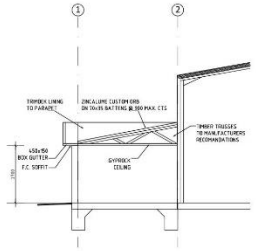

SECTION-2
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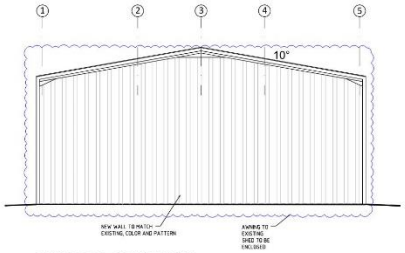
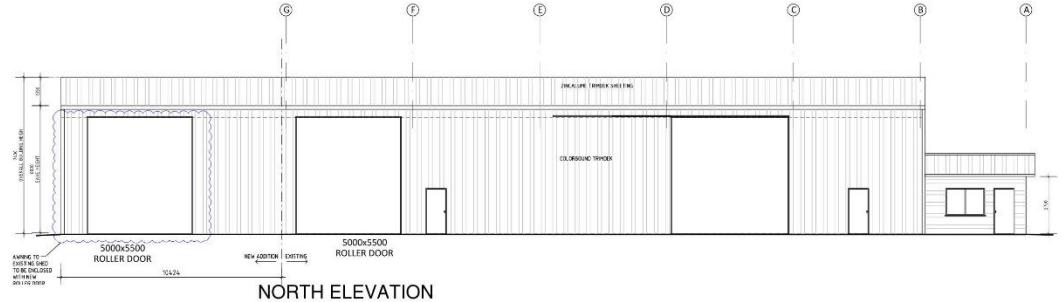
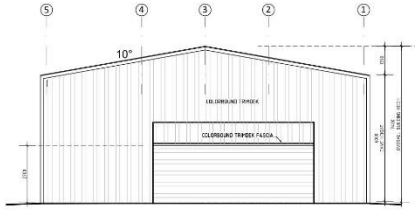


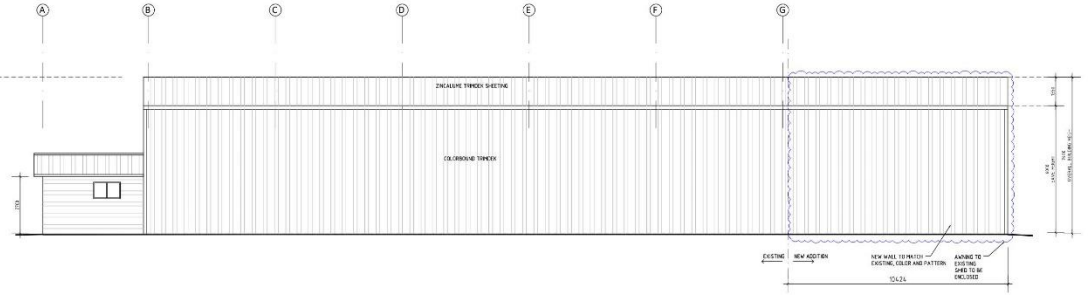
EAST ELEVATION
SCALE 1:100 @ A1



NORTH ELEVATION
SCALE 1:100 @ A1



WEST ELEVATION
SCALE 1:100 @ A1



SOUTH ELEVATION
SCALE 1:100 @ A1

Date	Plan Number	Elevations, Sections
28-05-2024	103	9 Burlington Place, Rutherford, NSW, 2320 (Lot 3005, DP 1040569)

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JACKSON ENVIRONMENT AND PLANNING

Client	Rutherford Tyre Recycling
Project	Proposed Tyre Recycling Facility
Title	Elevations, Sections
Scale	1:100
Source	Jackson Environment and Planning Pty Ltd

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DA

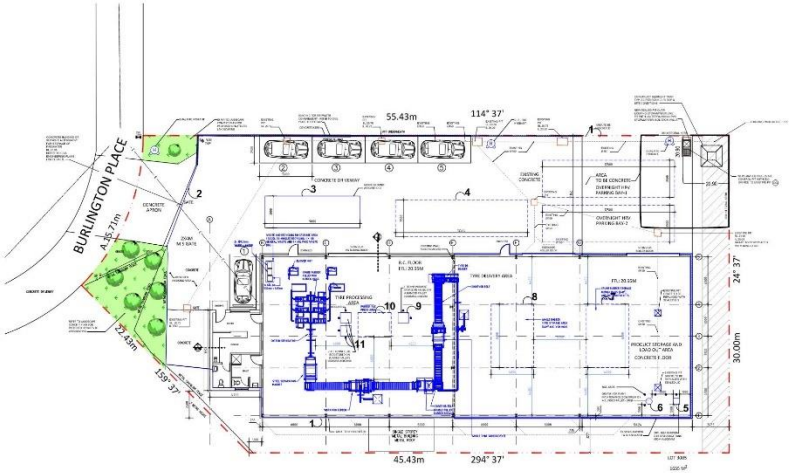
Key notes:

1- Area to be Concreted
2- Concrete Rollover Bunding - Refer to Civil Plans for Details
3- Above Ground Weighbridge
4- Loading Area
5- 200l Self Bunded Diesel Storage Tank-600mmx600mm
6- Grease for Plant Maintenance (205l Drum on a Bunded Pallet)-580Ø
7- Crumb Rubber Storage in Bulk Bags (24m²), and Tiles on Pallets (3.5m High)
8- Whole Rubber Tyre Storage Area (24m² and 3.5m High)
9- 1 Tonne Pigment Stored in an ibc on a Bunded Pallet 1000mmx1000mm
10- Rubber Tile Press area
11- 2 x 1 Tonne Glue ibc's Stored on Bunded Pallets 1000mmx1000mm
12- Awning to Existing Shed to be Enclosed

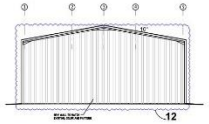
LEGEND

EXISTING SITE FEATURES / INFRASTRUCTURE

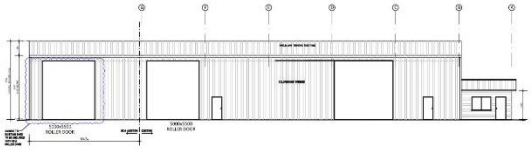
PROPOSED PLANT / EQUIPMENT AND BUILDING ADDITIONS



SITE PLAN, FLOOR PLAN
SCALE 1:200 @ A1



EAST ELEVATION
SCALE 1:200 @ A1



NORTH ELEVATION
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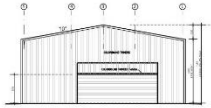

WEST ELEVATION
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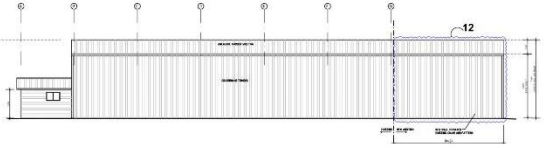

SOUTH ELEVATION
SCALE 1:200 @ A1

Date	Plan Number	Notification Plan
28-05-2024	104	9 Burlington Place, Rutherford, NSW, 2320 (Lot 3005, DP 1040569)

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JACKSON ENVIRONMENT AND PLANNING

Client	Rutherford Tyre Recycling
Project	Proposed Tyre Recycling Facility
Title	Notification Plan
Scale	1:200
Source	Jackson Environment and Planning Pty Ltd

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