

Port Kembla Bulk Liquids Tanks Repurposing Noise and Vibration Impact Assessment

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TABLE OF CONTENTS

1	EXECUTIVE SUMMARY	5
2	INTRODUCTION	6
3	REFERENCED DOCUMENTS.....	7
3.1	BACKGROUND INFORMATION USED	7
3.2	GUIDELINES.....	7
4	SITE DESCRIPTION AND THE PROPOSAL.....	7
4.1	DESCRIPTION OF THE PROPOSAL	7
4.2	HOURS OF OPERATION	7
4.3	NOISE SENSITIVE RECEIVERS	8
5	ABBREVIATIONS AND DEFINITIONS	9
6	NOISE EMISSION CRITERIA	10
6.1	NOISE EMISSION GUIDELINE	10
6.2	SUMMARISED NOISE EMISSION CRITERIA	11
7	NOISE EMISSION ASSESSMENT	12
7.1	OPERATIONAL NOISE ASSESSMENT	12
7.1.1	SoundPLAN Modelling.....	12
7.1.2	Proposed Operational Noise Sources	13
7.1.3	Approved Operational Noise Sources.....	14
7.1.4	Modelling Results	14
7.1.5	Discussion	15
7.2	MECHANICAL PLANT NOISE	15
7.2.1	Preliminary Mechanical Treatment Advice.....	15
8	ROAD TRAFFIC NOISE GENERATED BY THE PROPOSED DEVELOPMENT	16
9	CONSTRUCTION NOISE AND VIBRATION ASSESSMENT	17
9.1	CONSTRUCTION NOISE MANAGEMENT LEVELS	17
9.2	CONSTRUCTION VIBRATION OBJECTIVES	18
9.2.1	Assessing Amenity (Human Comfort Guidelines).....	18
9.2.2	Structure Borne Vibration (Damage Criteria)	19
9.3	CONSTRUCTION NOISE EMISSION ASSESSMENT	20
9.3.1	Source Noise Data	20
9.3.2	Methodology	21
9.3.3	Recommended Hours of Work.....	21
9.3.4	Predicted Noise Levels	21
9.4	GENERAL DISCUSSION.....	23
9.5	CUMULATIVE NOISE IMPACT FROM OPERATION AND CONSTRUCTION ACTIVITIES	23
10	NOISE AND VIBRATION MANAGEMENT AND CONTROLS.....	24
10.1	NOISE AND VIBRATION MONITORING, REPORTING AND RESPONSE PROCEDURES	24
10.1.1	Reporting Requirements	24
10.1.2	Response Procedures	25
10.2	GENERAL NOISE CONTROL METHODS.....	25
10.2.1	Selection of Alternate Appliance or Process.....	25
10.2.2	Acoustic Barriers.....	26
10.2.3	Silencing Devices.....	26
10.2.4	Treatment of Specific Equipment	26

10.2.5	Establishment of Site Practices	26
10.2.6	Notification.....	26
10.3	SITE SPECIFIC RECOMMENDATIONS.....	27
11	CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PROCEDURAL STEPS	28
12	CONCLUSION	29
APPENDIX A	AMBIENT NOISE MONITORING	30
A.1	UNATTENDED LONG TERM NOISE MONITORING.....	30
A.1.1	Ambient Noise Descriptors	30
A.1.2	Equipment Used	31
A.1.3	Locations Monitored.....	31
A.1.4	Weather Affected and Extraneous/Outlying Data.....	31
A.2	CALCULATION OF REPRESENTATIVE AMBIENT NOISE LEVELS	32
A.2.1	Rating Background Noise Levels	32
A.3	UNATTENDED MONITORING DATA GRAPHS	34
APPENDIX B	EPA NOISE POLICY FOR INDUSTRY TRIGGER LEVELS.....	59
B.1	NPI TRIGGER LEVELS	59
B.1.1	Intrusiveness	59
B.1.2	Amenity.....	59
B.1.3	Maximum Noise Level Assessment	61
B.2	PROJECT SPECIFIC TRIGGER LEVELS	62
APPENDIX C	PROPOSED PUMP LOCATIONS	63
APPENDIX D	SOUNDPLAN MODELLING RESULTS.....	66

1 EXECUTIVE SUMMARY

This *Noise and Vibration Impact Assessment* has been prepared by Acoustic Logic as part of the Development Application for the proposed alternations and additions to the Graincorp Bulk Liquid Terminal on Tom Thumb Road at Port Kembla.

The site is located in the Port Kembla Lease Area on DP1046295 Lot 20 with an area of approximately 1.9 ha.

The report has been prepared to address the NSW Department of Planning, Housing and Infrastructure Statement of Environmental Effects (SEE) issued for the project on 11 June 2025. The application seeks approval for the alterations and additions of the site in order to repurpose this facility to store and handle different types of oil.

This report concludes that the proposed development appropriately considers any potential noise and vibration impacts to neighboring receivers and no additional acoustic attenuation methods are required.

2 INTRODUCTION

This *Noise and Vibration Impact Assessment* has been prepared by Acoustic Logic as part of the Statement of Environmental Effects (SEE) for a Development Application for the commercial development at Port Kemble.

The report has been prepared to address the Statement of Environmental Effects Requirements (SEE) issued for the project on 11 June 2025 as detailed in the table below.

Table 1 – SEE Requirement

Item	Description of SEE Requirement	Section of Report Where Response is Provided
Noise and Vibration	A quantitative noise impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines and Australian Standards, including: - o identification of impacts associated with construction, site emissions and traffic generation at noise affected sensitive receivers, including sleep disturbance impacts - o the cumulative impacts of the development and all current operations of the site - o details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise following application of these measures and details of any proposed compliance monitoring programs.	Assessment in accordance with relevant EPA guidelines: Sections 6 and 7.
		Construction noise and vibration assessment: Section 9
		Outline of proposed management and mitigation measures: Sections 10 & 11

In summary, this document addresses noise impacts associated with the following:

- Operational noise emissions from project site to nearby receivers.
- Noise impacts from the traffic generation associated with the proposed development, and
- Noise and vibration emissions from construction activities from the site.

3 REFERENCED DOCUMENTS

3.1 BACKGROUND INFORMATION USED

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

- Architectural drawings provided to us.
- Transport Assessment prepared by Arc traffic+transport (Ref: *P0566r2v7 GrainCorp BLT Port Kembla Transport Assessment*, Project No. 0566, dated 9/2/2026).

3.2 GUIDELINES

AL have utilised the following documents and regulations in the noise assessment of the development:

- NSW Environmental Protection Authority (**EPA**) *Noise Policy for Industry (NPI)* 2017.
- NSW DECC *Interim Construction Noise Guideline (ICNG)* 2009.
- German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*.
- NSW Department of Environment and Conservation (**DECC**) *Assessing Vibration: A Technical Guideline* (Feb 2006).

4 SITE DESCRIPTION AND THE PROPOSAL

4.1 DESCRIPTION OF THE PROPOSAL

The application seeks approval for the following:

- Addition of heating capability: installation of hot water heating coils, tank agitators, steam supply and condensate return reticulation and replace the boiler inside of the shed enclosure.
- Addition of export functionality: Modifying the manifold at each tanker truck gantry to allow receiving and pumping product adding pumps to the ships.
- Addition of a hot water cleaning system.
- Addition of a receival pretreatment system.

4.2 HOURS OF OPERATION

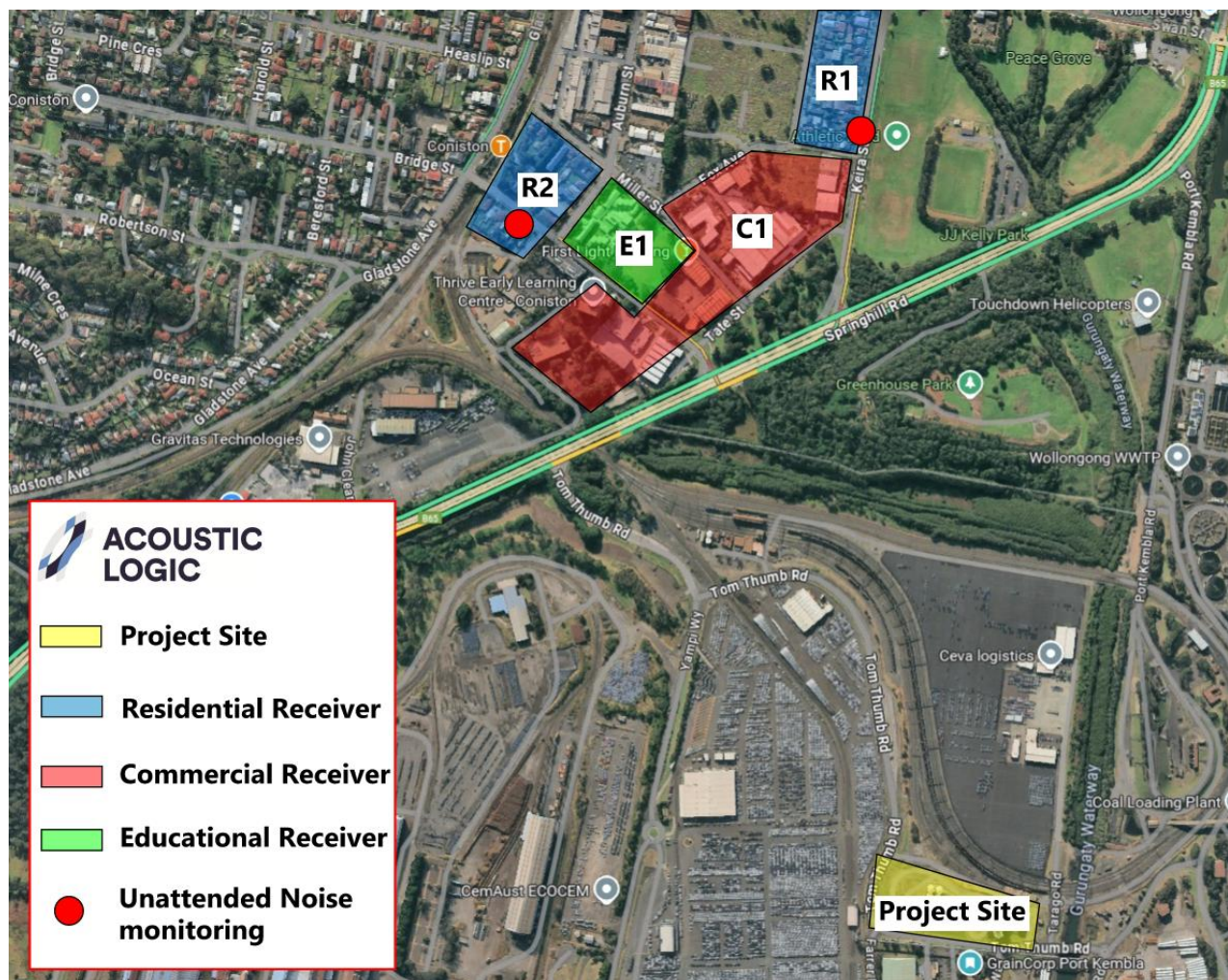
The proposed hours of operation of the site will be 24 hours which is in line with the current operating condition.

4.3 NOISE SENSITIVE RECEIVERS

The project site surrounded by industrial receivers. The nearest noise receivers around the site are identified as follows:

- **R1:** Residential Receiver 1 – Residential houses to the far north of the site along Keira St, Wollongong.
- **R2:** Residential Receiver 2 – Residential houses to the north of the site close to Coniston Station along Bridge St.
- **C1:** Commercial Receiver 1 – Commercial receivers to the north of the site along Springhill Rd and Tate St.
- **E1:** Commercial Receiver 2 – Coniston Public School.

A site map, measurement locations and surrounding receivers are presented in Figure 1.



**Figure 1 – Site Plan Showing Local Context and Noise Monitoring Locations
(Source: Google Map)**

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
L₉₀	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).
Evening*	For transportation noise - the period from 7 am to 10 pm 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).
Project Trigger Level	For transportation noise - the period from 10 pm to 7am 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 NPI 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 NPI unless noted otherwise)

* Unless nominated otherwise.

6 NOISE EMISSION CRITERIA

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

- Operational noise from project site.
- Noise impacts from the traffic generation associated with the proposed development.

6.1 NOISE EMISSION GUIDELINE

The noise emission guideline applied to the project site is NSW Environmental Protection Authority *Noise Policy for Industry (NPI)* 2017.

Criteria to assess noise emissions from the operation of the proposed development have been developed using the NPI. 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 NPI 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 NPI 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 NPI trigger levels for each of the receivers. These are summarised in the following table.

6.2 SUMMARISED NOISE EMISSION CRITERIA

Table 2 – 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 & R2 Residential	Day	47	52	53	N/A
	Evening	44	49	43	N/A
	Night	40	45	38	45 L_{eq} 55 L_{max}
C1 Commercial	When in use	N/A	N/A	63	N/A
E1 Educational	When in use	N/A	N/A	35 (internal)	N/A

The project noise trigger levels are indicated by the bolded values in the table above.

7 NOISE EMISSION ASSESSMENT

7.1 OPERATIONAL NOISE ASSESSMENT

7.1.1 SoundPLAN Modelling

SoundPLAN noise modelling software (version 9.1) 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 Table 4 for the noise sources.
- ISO 9613-2:2024 "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.
- The following meteorological conditions were used in the SoundPLAN model.

Table 3 – 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

- 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.
- Source locations are indicated in APPENDIX C.
- Ground absorption of 0.6 for green area and 0 for any hard surfaces.

7.1.2 Proposed Operational Noise Sources

Assessment of operational noise emissions have been modelled with the following delineations:

1. Noise emissions from B-Doubles/Semi-Trailer trucks entering and/or exiting the driveway for deliveries at 10km/h. Up to 4 event per hour for trip to the north of BLT and upto 8 events for trucks travelling to south for GT weight bridge according to the *Traffic Assessment Report*.
2. Noise emissions from on-site equipment including pumps, agitator and boiler.

Key L_{max} events have been separately modelled to determine any influence of nighttime operations on sleep disturbance. Specifically, truck air brake has been modelled at 1.5m above the floor height.

The following noise level data for potential noise sources have been used for the assessment. These noise levels have been provided by the client or taken from measurements conducted by this office.

Table 4 – Noise Levels of Proposed Equipment

Equipment Name (Number)	Description	Noise levels (dB)
PU-207	HOT WATER SUPPLY PUMP*	85 dB(A) SWL
PU-208	HOT WATER RECIRCULATION PUMP*	85 dB(A) SWL
PU-XX	HEATING HOT WATER RECIRC PUMP	85 dB(A) SWL
PU-210	PRE-RECEIVAL TANK TRANSFER PUMP	85 dB(A) SWL
PU-211	SHIPS LINES PUMPS	2 units each 80 dB(A) @ 1m
PU-212	TANKER GANTRY 1 PUMP	80 dB(A) @ 1m
PU-213	TANKER GANTRY 2 PUMP	80 dB(A) @ 1m
-	TANKER GANTRY 3 PUMP	78dB(A) @ 4m
AG-215	BULK TANK 01 AGITATOR*	85 dB(A) SWL
AG-216	BULK TANK 02 AGITATOR*	85 dB(A) SWL
AG-217	BULK TANK 03 AGITATOR*	85 dB(A) SWL
AG-218	BULK TANK 04 AGITATOR*	85 dB(A) SWL
AG-219	BULK TANK 05 AGITATOR*	85 dB(A) SWL
AG-220	BULK TANK 06 AGITATOR*	85 dB(A) SWL
AG-221	BULK TANK 07 AGITATOR*	85 dB(A) SWL
AG-222	BULK TANK 08 AGITATOR*	85 dB(A) SWL
AG-223	BULK TANK 09 AGITATOR*	85 dB(A) SWL
AG-224	BULK TANK 10 AGITATOR*	85 dB(A) SWL
-	BULK TANK 11-15 AGITATOR*	85 dB(A) SWL
-	Boiler	82dB(A) @ 1m
-	B-Doubles/Semi-Trailer Truck (Tallow and used cooking Oil)	108 dB(A) SWL @ 10km/h
-	Truck Air Brake**	114 dB(A) L_{max}

*SWL of 85 dB(A) is adopted for typical pump and agitator noise levels.

**For sleep disturbance assessment only.

7.1.3 Approved Operational Noise Sources

A comparative study has been conducted to assess if the proposed development will result in any significant increase in the noise levels for the surrounding environment comparing to approved operating conditions.

The following approved noise sources have been used for the assessment:

Table 5 – Noise Levels of Approved Equipment

Equipment Name (Number)	Description	Noise levels (dB)
PU-212	TANKER GANTRY 1 PUMP	80 dB(A) @ 1m
-	TANKER GANTRY 1 PUMP 2	78dB(A) @ 4m
PU-213	TANKER GANTRY 2 PUMP	80 dB(A) @ 1m
PU-213	TANKER GANTRY 3 PUMP	80 dB(A) @ 1m
AG-215	BULK TANK AGITATOR*	85 dB(A) SWL
-	Boiler	82dB(A) @ 1m
-	B-Doubles/Semi-Trailer Truck (Material Oil)**	108 dB(A) SWL @ 10km/h
-	Truck Air Brake**	114 dB(A) L _{max}

*SWL of 85 dB(A) is adopted for typical pump and agitator noise levels.

**Maximum 4 truck trips in a single hour according to *Traffic Assessment Report*.

***For sleep disturbance assessment only.

7.1.4 Modelling Results

SoundPLAN modelling outputs are provided in the APPENDIX D. The predicted noise levels are assessed against the project trigger levels in the following table.

Table 6 – Predicted Cumulative Noise Levels – Proposed Development

Operational Source	Receiver	Predicted Noise Level (Approved on site)	Predicted Noise Level (Proposed in this application)	Criteria	Comment
Cumulative Noise from Site Operation, including operating noise from pumps, Truck movement (Refer to Section 7.1.2)	R1	23 dB(A) L _{eq}	23 dB(A) L _{eq}	D 52 dB(A) L _{eq} E 43 dB(A) L _{eq} N 38 dB(A) L _{eq}	Meets NSW EPA Noise Emission Requirements
	R2	26 dB(A) L _{eq}	26 dB(A) L _{eq}		
	C1	35 dB(A) L _{eq}	35 dB(A) L _{eq}	63 dB(A) L _{eq}	
	E1	<20 dB(A)* L _{eq}	<20 dB(A)* L _{eq}	35 dB(A) L _{eq} (Internally)	
Maximum Noise Event (Truck air brake) (Refer Section 7.1.2)	R1	46 dB(A) L _{max}	46 dB(A) L _{max}	55 dB(A) L _{max}	
	R2	46 dB(A) L _{max}	46 dB(A) L _{max}		

*10dB(A) reduction has been applied for internal noise level with an open window façade.

SoundPLAN “grid noise map” contours include a 2.5dB façade reflection increase close to a façade. The NPI 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.

7.1.5 Discussion

7.1.5.1 Intrusiveness and Amenity Assessment

The receiver noise predictions indicate that noise emissions are 10dB below the NPI noise emission criteria and will not exceed the trigger levels and there are no residual noise impacts.

The operation of the proposed development will not result in significant additional impact comparing to approved operating conditions given the distance attenuation.

7.1.5.2 Maximum Noise Level Assessment

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

Proposed development will not result in any additional impact for sleep disturbance comparing to approved operating conditions given noise source (truck air brake) and routine remain unchanged.

7.2 MECHANICAL PLANT NOISE

Detailed plant selection and location has not been undertaken at this stage. Satisfactory levels will be achievable through appropriate plant selection, location and if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures.

Noise emissions from all mechanical services to the closest residential, childcare and commercial receivers are capable to complying with the requirements of Section 6.2.

7.2.1 Preliminary Mechanical Treatment Advice

An assessment of initial design of primary plant items is presented below.

- Major fans (typically with a sound power over 80dB(A) – such as kitchen exhaust, major toilet exhaust and major relief air fans). It is recommended that axial (as opposed to roof mounted fans) are to be used as this will enable acoustic treatment to be incorporated within ductwork running to atmosphere and with attenuators if necessary. In addition to the location of the equipment, acoustic treatments to the major plant items may include silencers, treatment to ducting, time control, operational limitations, and vibration isolation.
- Supply and exhaust fans may be located within plant rooms or in rooftop plant areas. It is unlikely that any acoustic attenuation treatments are required given the distance of any receivers.
- Other minor plant items, such as bathroom or kitchen exhaust fans, may also be required. These items typically emit relatively low noise levels and unlikely to require any acoustic treatments.

Cumulative assessment of both plant noise with other noise sources is recommended when conducting acoustic design of plant items. Compliance with EPA acoustic criteria (as set out in Section 6.2) will be achievable, provided that detailed acoustic review of plant items is undertaken once plant is selected, and acoustic treatments similar to those outlined above are adopted.

The above recommendations are indicative. Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels.

8 ROAD TRAFFIC NOISE GENERATED BY THE PROPOSED DEVELOPMENT

It is noted in the *Transport Assessment* prepared for this project by Arc traffic+transport (Ref: P0566r2v7 *GrainCorp BLT Port Kembla Transport Assessment*, Project No. 0566, dated 9/2/2026) that there will be no change in the total number of daily or peak hour inbound trucks travelling between Springhill Road and the GrainCorp's Bulk Liquids Terminal (GC BLT) compared with the approved number of outbound trucks travelling between Springhill Road and the GC BLT. Hence, there will be no additional noise impact on the public road and the amenity of the nearby receivers will not be affected.

9 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

9.1 CONSTRUCTION NOISE MANAGEMENT LEVELS

Noise associated of construction activities on the site will be assessed in accordance with the NSW DECC *Interim Construction Noise Guideline (ICNG)* 2009.

The “quantitative” assessment procedure, as outlined in the ICNG will be used. The quantitative assessment method requires: Determination of noise generation goals (based on ambient noise monitoring); Prediction of operational noise levels at nearby development; and if necessary, recommendation of noise controls strategies in the event that compliance with noise emission goals is not possible.

DECC guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- **“Noise affected” level** where construction noise is predicted to exceed the “noise affected” level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the “noise affected level”. For residential properties, the “noise affected” level occurs when construction noise exceeds ambient levels by more than 10dB(A) $L_{eq(15min)}$.
- **“Highly noise affected level”** where noise emissions are such that nearby properties are “highly noise affected”, noise controls such as respite periods should be considered. For residential properties, the “highly noise affected” level occurs when construction noise exceeds 75dB(A) $L_{eq(15min)}$ at nearby residences.

A summary of the above recommended noise levels from the ICNG is presented below.

Table 7 – Noise Management Levels at Residential Receiver

Receiver	“Noise Affected” Level dB(A) $L_{eq(15min)}$	“Highly Noise Affected” Level dB(A) $L_{eq(15min)}$
R1 – R2	67 (BG+10) externally at façade	75

Where noise from the construction works is above the “noise affected” level, the proponent should apply any feasible and reasonable work practices to minimise noise. The “noise affected level is representative of a level where there may be some community reaction to noise.

If noise emissions are likely to exceed 75 dB(A) $L_{eq(15min)}$ “highly noise affected” at the boundary of surrounding affected residential receivers, the receiver is deemed to be “highly noise affected”. The “highly noise affected” level is representative of a level where strong community reaction to noise is expected. Introduction of management controls such as scheduling of noisy periods, or respite periods is then recommended.

Section 4.1.2 and 4.1.3 of the ICNG also nominates management levels for other sensitive land uses (other than residences). Criteria relevant to this assessment is detailed below;

Table 8 – Noise Management Levels at Other Receivers

Location	“Noise Affected” Level – dB(A) $L_{eq(15min)}$
Surrounding Commercial Receiver C1	70 externally at façade
Educational Receiver E1	45 internally

9.2 CONSTRUCTION VIBRATION OBJECTIVES

Vibration associated with demolition and excavation activities on the site will be assessed in conjunction with the following guidelines:

- **For human exposure to vibration** – Department of Environment and Conservation *NSW Assessing Vibration: A Technical Guideline* (Feb 2006) is based on the guidelines contained in BS 6472:1992 *Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80Hz)* for low probability of adverse comment.
- **For structural damage vibration** – German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*.

9.2.1 Assessing Amenity (Human Comfort Guidelines)

The NSW EPA's *Assessing Vibration – a technical guideline* is based on the guidelines contained in British Standard BS 6472-1992 '*Guide to Evaluate Human Exposure to Vibration Buildings (1Hz to 80Hz)*'. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline should be adopted to assess and manage vibration from the site during construction. Where vibration exceeds, or is likely to exceed, the recommended levels then an assessment of reasonable and feasible methods for the management of vibration should be undertaken.

Table 9 – BS 6472 Vibration Criteria

		RMS acceleration (m/s ²)		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices	Day or night-time	0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices	Day or night-time	0.64	1.28	13	26	18	36
Workshops		0.64	1.23	13	26	18	36

Note 1: Continuous vibration relates to vibration that continues uninterrupted for a defined period (usually throughout the daytime or night-time), e.g. continuous construction or maintenance activity. (DECC, 2009).

Note 2: Impulsive vibration relate to vibration that builds up rapidly to a peak followed by a damped decay and that may or may not involve several cycles of vibration (depending on frequency and damping), with up to three occurrences in an assessment period, e.g. occasional loading and unloading, or dropping of heavy equipment. (DECC, 2009).

9.2.2 Structure Borne Vibration (Damage Criteria)

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 10 – 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 EMISSION ASSESSMENT

As detailed in Section 4.1, the main construction activities related to this application are cutting concrete, cutting steel pipes, dismantling a boiler, material and equipment delivery and installation of the new equipment.

It is envisaged that construction scope and staging would be further refined in subsequent stages of the development approval and documented (along with additional impacts or considerations) within a *Construction Environmental Management Plan*.

9.3.1 Source Noise Data

In this section, typical equipment/processes anticipated to be used during the construction of the project site are outlined in the table below with A-weighted sound power levels. The equipment list is prepared based on our experience with similar projects. Typically, the most significant sources of noise or vibration generated during a construction project will be demolition and excavation.

Table 11 – Sound Power Levels of Equipment

Equipment /Process	Typical Sound Power Level dB(A)	Duty
Excavator with 10T hydraulic hammer	118	75%
Jackhammer	113	75%
Concrete Saw	118	75%
1t skidsteer loader	110	75%
Piling Rig	112	100%
Mobile Crane	113	25%
Concrete pump	109	100%
Concrete Pump Truck	109	100%
20m Semi-Trailer Trucks*	105	10%
Powered Hand Tools (Electric)	102	50%

*There will be no more than 1 truck (2 truck trips) generated in a single hour across the day (*Traffic Assessment Report*).

The noise levels presented in the above table are derived from the following sources, namely:

- On-site measurements.
- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

Noise levels take into account correction factors (for tonality, intermittency where necessary).

9.3.2 Methodology

Noise from the loudest typical construction activities for all stages of works have been predicted to the nearest most affected sensitive receivers.

Predictions take into account:

- The distance between the noise source and the receiver.
- The screening effect provided by any building structure or building shell, if applicable. In particular, noise from works proposed during the fit-out stages when the building shell will screen these activities from the surrounding sensitive receivers.

Recommended standard hours for construction work presented in Section 2.2 of the NSW DECC ICNG 2009 has been adopted for this project.

9.3.3 Recommended Hours of Work

The following construction hours are proposed under the standard hours noise management levels of the ICNG:

- Monday to Friday – 7:00am to 6:00pm.
- Saturdays – 8:00am to 1:00pm.
- Sundays and Public Holidays – No works.

9.3.4 Predicted Noise Levels

Maximum noise impacts from the construction equipment listed above have been predicted to the nearest noise receivers and presented below. Given the size of the site, predicted noise levels will change significantly depending on where the noise source is located. As such, a noise level range has been presented, giving expected noise levels for activities 'farthest from' to 'nearest to' the receiver.

Table 12 – Predicted Construction Noise Levels – R1 & R2

Activity	Predicted Noise Level	Criteria	Comment
Excavator with 10T hydraulic hammer	42-47	NML 67dB(A) HNML 75dB(A)	Predicted noise levels below the NML 67dB(A)
Jackhammer	37-42		
Concrete Saw	42-47		
1t Skid-steer loader	34-39		
Piling Rig	37-43		
Mobile Crane	32-38		
Concrete pump	34-40		
Concrete Pump Truck	36-42		
20T Medium Rigid Trucks	18-24		
Powered Hand Tools (Electric)	24-30		

Table 13 – Predicted Construction Noise Levels – C1

Activity	Predicted Noise Level	Criteria	Comment
Excavator with 10T hydraulic hammer	43-49	NML 70dB(A)	Predicted Noise Levels below the NML 70dB(A) all the time
Jackhammer	38-44		
Concrete Saw	43-49		
1t Skid-steer loader	35-41		
Piling Rig	38-45		
Mobile Crane	33-40		
Concrete pump	35-42		
Concrete Pump Truck	37-44		
20T Medium Rigid Trucks	20-26		
Powered Hand Tools (Electric)	25-32		

Table 14 – Predicted Construction Noise Levels – E1

Activity	Predicted Internal Noise Level*	Criteria	Comment
Excavator with 10T hydraulic hammer	<33	NML 45dB(A) internally	Predicted Noise Levels below the internal NML 45dB(A) all the time
Jackhammer	<28		
Concrete Saw	<33		
1t Skid-steer loader	<25		
Piling Rig	<28		
Mobile Crane	<23		
Concrete pump	<24		
Concrete Pump Truck	<24		
20T Medium Rigid Trucks	<10		
Powered Hand Tools (Electric)	<15		

*Internal noise is obtained by taking 10dB(A) off from façade noise level assuming windows open.

9.4 GENERAL DISCUSSION

Noise

Noise impacts on nearby development will be dependent on the activity and where on the site the activity is undertaken.

Initial analysis indicates:

- For **Residential Receivers R1** and **R2**, construction noise levels are predicted below the NML all the time.
- Similarly, construction noise levels at **Commercial receivers C1** and **Educational receiver E1** are predicted to comply with the NML 70dB(A) and 45dB(A) internally for all equipment.

Detailed construction noise planning is typically undertaken after engagement of a builder and a construction program is prepared (i.e., after DA stage) and therefore, detailed planning is not possible at this stage.

In light of the above, it is noted that proposed construction activities on site are unlikely to cause any significant noise impacts on the nearby residents.

Vibration

The highest levels of vibration are likely to be produced when excavation activities are undertaken with the use of piling rig. This activity would only produce a moderate level of vibration close to the work site. Given the distance attenuation between existing residential receivers and the project site, the impact at the surrounding properties is negligible considering amenity and structure damage.

Where required, vibration monitors may be installed at critical locations to determine any impact. Ongoing review and assessment of vibration impact will be conducted throughout the construction process to determine appropriate vibration levels. The specific location and quantity of vibration monitors to monitor residential houses are to be determined in consultation with the builder and structural engineer.

9.5 CUMULATIVE NOISE IMPACT FROM OPERATION AND CONSTRUCTION ACTIVITIES

This section has been prepared in response to Department of Planning's RFI regarding cumulative noise impacts from operational and construction activities.

Acoustic Logic note that while the site will remain in operation during construction stage, the noise emission criteria for the above two activities are different and independent. As detailed in Section 6.2, noise emission criteria for the operation of the project site were developed based on NSW Environmental Protection Authority *Noise Policy for Industry* (NPI) 2017 while construction noise management levels are established in Section 9.1 based on the NSW DECC *Interim Construction Noise Guideline* (ICNG) 2009.

However, to provide an indication of the potential combined noise impact on the receivers, comparisons between predicted operational noise levels (Table 6) and construction noise levels (Table 12, Table 13, Table 14) have been made. Results show that noise generated by operational activities are generally 10dB(A) below construction noise levels. In general, noise that is 7-10dB(A) below the dominant noise level is considered inaudible and does not contribute to any increase above and beyond the higher noise level (per logarithmic addition), in this case, the predicted construction noise levels. Combined noise levels will hence be driven by construction activities while still comply with the construction management levels and daytime operational noise criteria.

10 NOISE AND VIBRATION MANAGEMENT AND CONTROLS

Notwithstanding that the assessment indicates noise and vibration emissions will generally comply with the noise and vibration management levels, emissions should be minimised as part of best practice endeavours, and contingency measures should be put into place to respond to complaints or if it is found the processes needed to complete the tasks vary from those envisaged in this assessment.

The recommended measures are provided below.

10.1 NOISE AND VIBRATION MONITORING, REPORTING AND RESPONSE PROCEDURES

Given the relatively low level of impact predicted, monitoring would only be required in response to complaints, if the processes needed to complete the tasks vary from those envisaged in this assessment, or if works outside of standard hours are proposed.

Noise and vibration monitoring may either consist of manned and/or unmanned measurements. Active monitoring may be undertaken during the construction work phase of the project if required in the event complaints are received from neighbours.

In the event that complaints are received from neighbours the following process should be considered:

1. Assessing impacts and determining the offending plant/equipment/process.
2. Locating the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implementing additional acoustic treatment in the form of localised barriers, silencers etc.
4. Selecting alternative equipment/processes.

Where monitoring is required and indicates exceedances of the predicted noise impacts immediate action should be taken to identify any further controls as required to reduce noise emissions so that the noise limits are complied with. Monitoring of the activities following the implementation of these additional controls will be undertaken to confirm compliance.

10.1.1 Reporting Requirements

The following is an example of reporting which may be kept on site:

1. A register of complaints received/communication with the local community shall be maintained and kept on site with information as detailed below.
2. Where noise/vibration complaints require noise/vibration monitoring, results from monitoring shall be retained on site at all times.
3. Any noise exceedances occurring including, the actions taken and results of follow up monitoring.
4. A report detailing complaints received and actions taken shall be presented.
5. All monitoring and reporting shall be conducted in conjunction with the conditions of consent.

10.1.2 Response Procedures

Complaints associated with noise and vibration generated by site activities shall be recorded on a Noise Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the site manager and the general public and their contact telephone number.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form may list:

- The name and address of the complainant (if provided).
- The time and date the complaint was received.
- The nature of the complaint and the time and date the noise was heard.
- The name of the employee who received the complaint.
- Actions taken to investigate the complaint, and a summary of the results of the investigation.
- Indicate what operations were occurring on site at the time of the complaint.
- Required remedial action, if required
- Validation of the remedial action.
- Summary of feedback to the complainant.

The flow chart that follows illustrate the process followed to assess construction activities prior to the start of work on site and well as the ongoing investigation into noise during the construction period.

10.2 GENERAL NOISE CONTROL METHODS

The determination of appropriate additional noise control measures will be dependent on the particular activities and the construction equipment and plant identified as requiring future acoustic treatments to those already identified in this report. This section provides an outline of available methods which have previously been used on similar construction sites and may be possible on this site.

10.2.1 Selection of Alternate Appliance or Process

Where a particular activity or plant and equipment is found to generate noise levels that exceed the management levels, it may be possible to select an alternative approach or plant and equipment. For example, the use of excavator mounted hydraulic hammers of the site may potentially generate high levels of noise. By carrying this activity by using concrete saws or smaller plant here practical, construction noise levels and/or length of exposure to construction noise levels may be reduced.

10.2.2 Acoustic Barriers

The placement of barriers at the source is generally only effective for static plant. Placing barriers at the source cannot effectively attenuate equipment which is on the move or working in rough or undulating terrain.

The degree of noise reduction provided by barriers is dependent on the amount by which the line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15 dB(A) can be affected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8 dB(A) may be achieved. Where the barrier does not obstruct line of sight, generally no noise reduction will occur.

Barriers are used to provide shielding and do not act as an enclosure. The material they are constructed from should have a noise reduction performance which is approximately 10dB(A) greater than the maximum reduction provided by the barrier screening. In this case, the use of a material such as 15mm plywood (or equivalent material) would be acceptable for the barriers.

10.2.3 Silencing Devices

Where construction methodologies or plant and equipment permit, investigate the use of silencing devices. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts, for example.

10.2.4 Treatment of Specific Equipment

In certain cases, it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

10.2.5 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes investigating the possibility of locating fixed plant items as far as possible from residents as well as rotating plant and activities to provide respite to receivers.

10.2.6 Notification

Notification of affected receivers of the progress of works, particularly when short-term activities likely to create higher noise levels occur, can in many cases minimise community reaction.

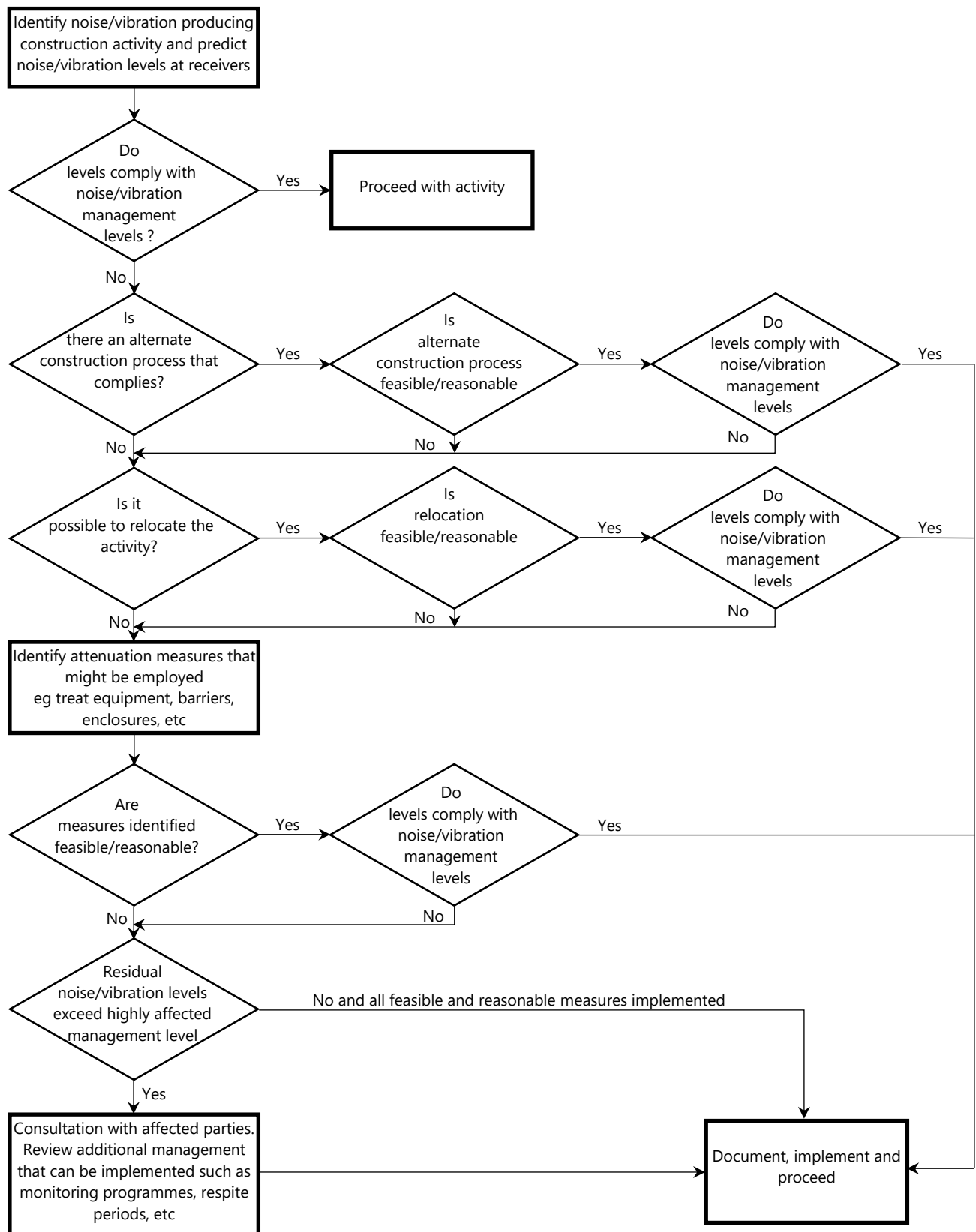
10.3 SITE SPECIFIC RECOMMENDATIONS

In light of the above, we recommend:

- **Quiet Work Methods/Technologies:**
 - Excavation is conducted initially using excavator with bucket (quietest excavation method), then use of rock saws or rippers if required. Use of the loudest excavation equipment is used only when other options are not available.
 - It is recommended to use rock saws near all boundaries to reduce vibration and noise levels if required.
 - Materials handling/vehicles:
 - Trucks and bobcats 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).
- **Complaints handling:**
 - A contact number is displayed outside of the building site, so that in the event that surrounding development believes that a noise breach is occurring, they may contact the site.
 - In the event of complaint, the procedures outlined in Section 11 are adopted. Additional methods of control of construction noise and additional noise control measures which may be adopted by the site are detailed in Section 10.
- **Noise and vibration monitoring:** in case of complaints received from neighbouring residents, long term noise and vibration monitoring shall be conducted at closest receivers.

11 CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PROCEDURAL STEPS

The flow chart presented below illustrates the process that will be followed in assessing construction activities.



12 CONCLUSION

This report presents an assessment of noise and vibration impacts associated with the proposed Port Kembla Bulk Liquids Tanks Repurposing application. Based on the information provided above we conclude the following:

Noise emission from the operational of the development has been assessed and compliance with noise emission criteria in NSW Environmental Protection Authority *Noise Policy for Industry (NPI)* 2017 can be achieved.

Comparison between approved and proposed operating conditions shows that there will not be any significant increase in noise impacts associated with the proposed development.

Construction noise and vibration management levels have been established and preliminary assessed in this report. The assessment shows that construction noise emissions will be able to achieve relevant criteria. A full construction noise and vibration management plan can be prepared in CC stage ensuring compliance with the following:

- NSW DECC Interim Construction Noise Guideline 2009.
- German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*.
- NSW Department of Environment and Conservation *Assessing Vibration: A Technical Guideline* (Feb 2006).

Yours faithfully,



Acoustic Logic Pty Ltd
PeiPei Feng

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 background noise levels for the project site.

A.1 UNATTENDED LONG TERM NOISE MONITORING

A.1.1 Ambient 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).

L₉₀ – 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 L₉₀ 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 L₉₀ level.

L₁₀ 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 and railway ground vibration induced noise.

L₁ 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.1.2 Equipment Used

Unattended noise monitoring was conducted using the following equipment:

- Rion NL-42 (Type 2).
- Rion Sound Level calibrator Type NC 74.

The 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.1.3 Locations Monitored

Detailed locations of the noise monitoring are presented in Figure 1.

A.1.4 Weather Affected and Extraneous/Outlying Data

Periods affected by adverse weather conditions are indicated on the following data graphs. Weather data was obtained from records provided by the Bellambi Bureau of Meteorology weather station.

A.2 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.2.1 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 NPI, 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 – RBL – 388 Keira St, Wollongong (R1)

Date	Noise Level dB(A) L ₉₀ , period		
	Day	Evening	Night
Thursday 10/07/2025	-	45	44
Friday 11/07/2025	48	44	40
Saturday 12/07/2025	45	44	41
Sunday 13/07/2025	42	40	36
Monday 14/07/2025	46	39	36
Tuesday 15/07/2025	47	44	41
Wednesday 16/07/2025	47	46	38
Thursday 17/07/2025	47	44	44
Friday 18/07/2025	50	47	44
Saturday 19/07/2025	45	43	41
Sunday 20/07/2025	46	45	36
Calculated	47	44	41

Table 16 – RBL – 17 Bridge St, Coniston (R2)

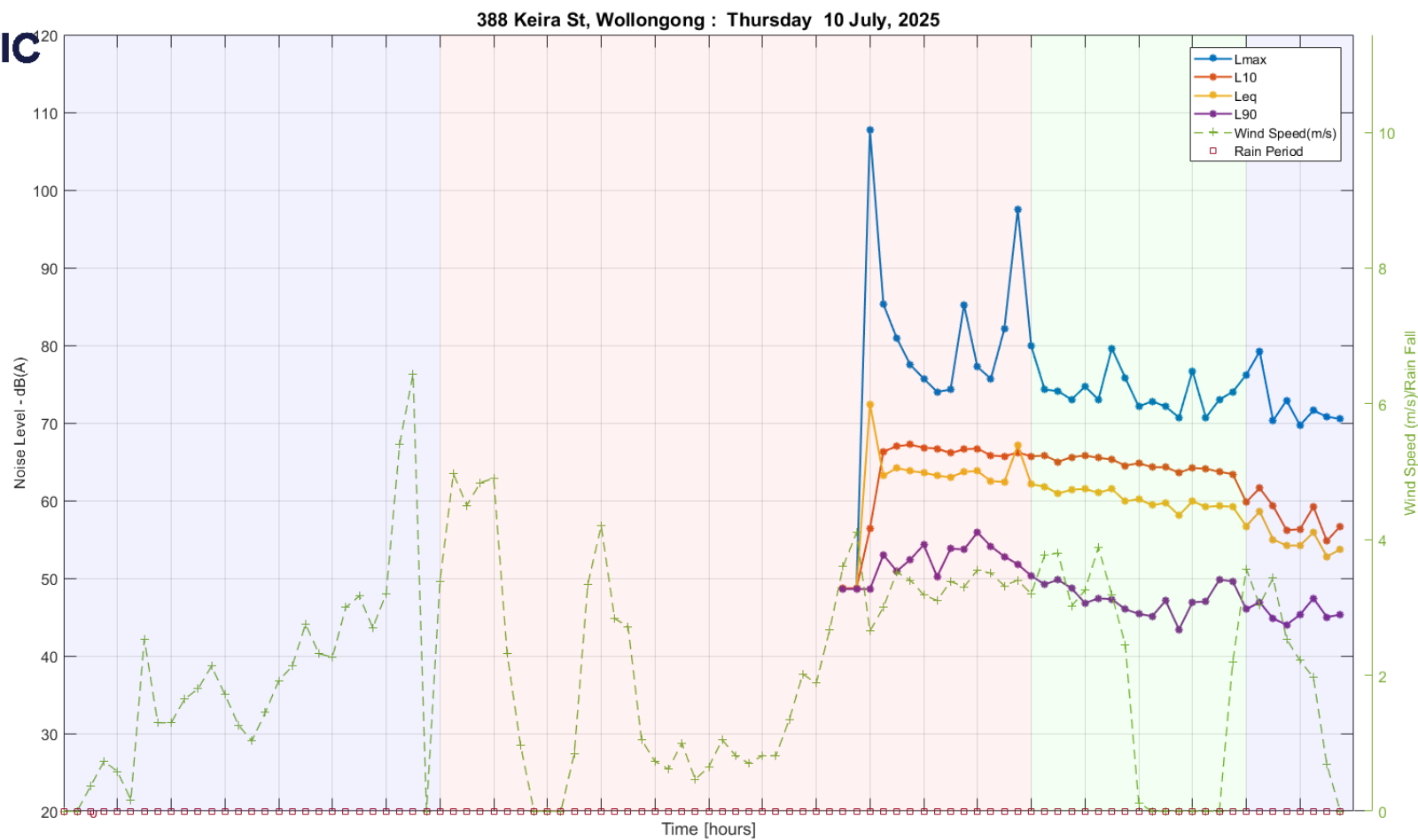
Date	Noise Level dB(A) L₉₀, period		
	Day	Evening	Night
Thursday 10/07/2025	-	46	45
Friday 11/07/2025	50	46	40
Saturday 12/07/2025	46	45	41
Sunday 13/07/2025	44	39	37
Monday 14/07/2025	47	40	38
Tuesday 15/07/2025	48	44	40
Wednesday 16/07/2025	47	44	38
Thursday 17/07/2025	47	44	43
Friday 18/07/2025	50	47	43
Saturday 19/07/2025	46	43	39
Sunday 20/07/2025	46	40	36
Calculated	47	44	40

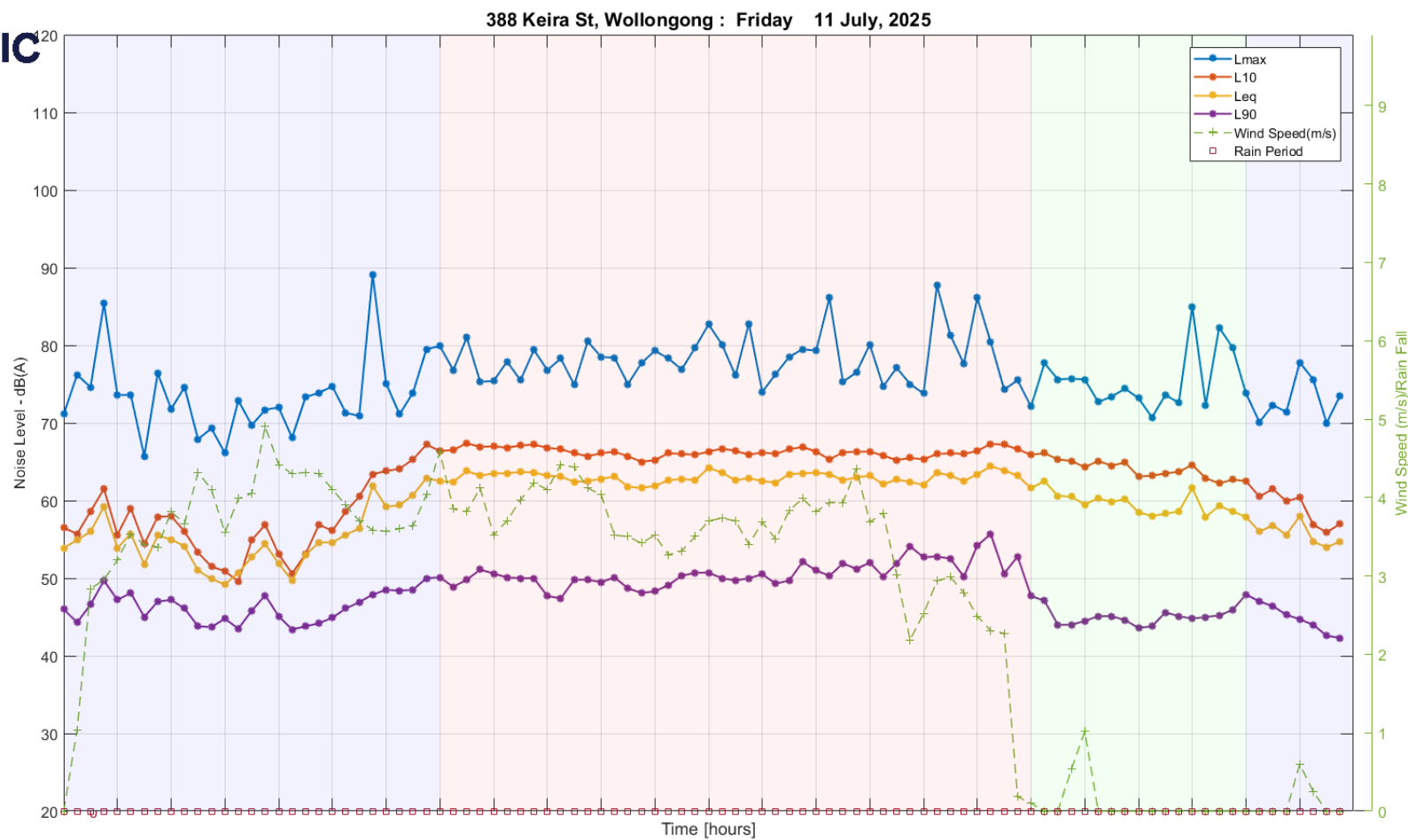
Given the daytime and evening time RBLs for both receivers are the same and to provide a conservative noise emission assessment, following RBLs will be adopted for both residential receivers R1 and R2 (being the lower values from the two monitors):

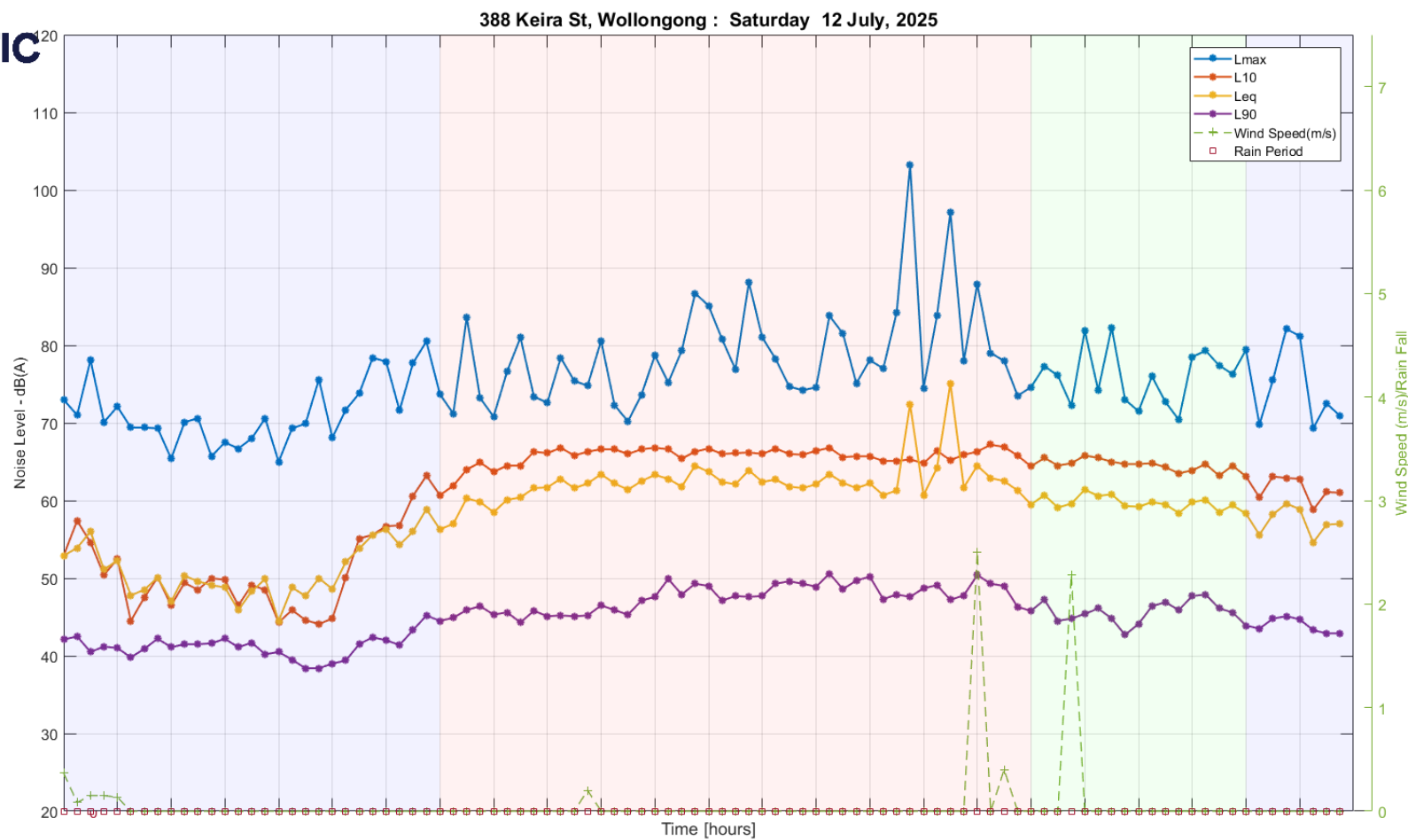
Table 17 – Adopted RBL for Residential Receivers

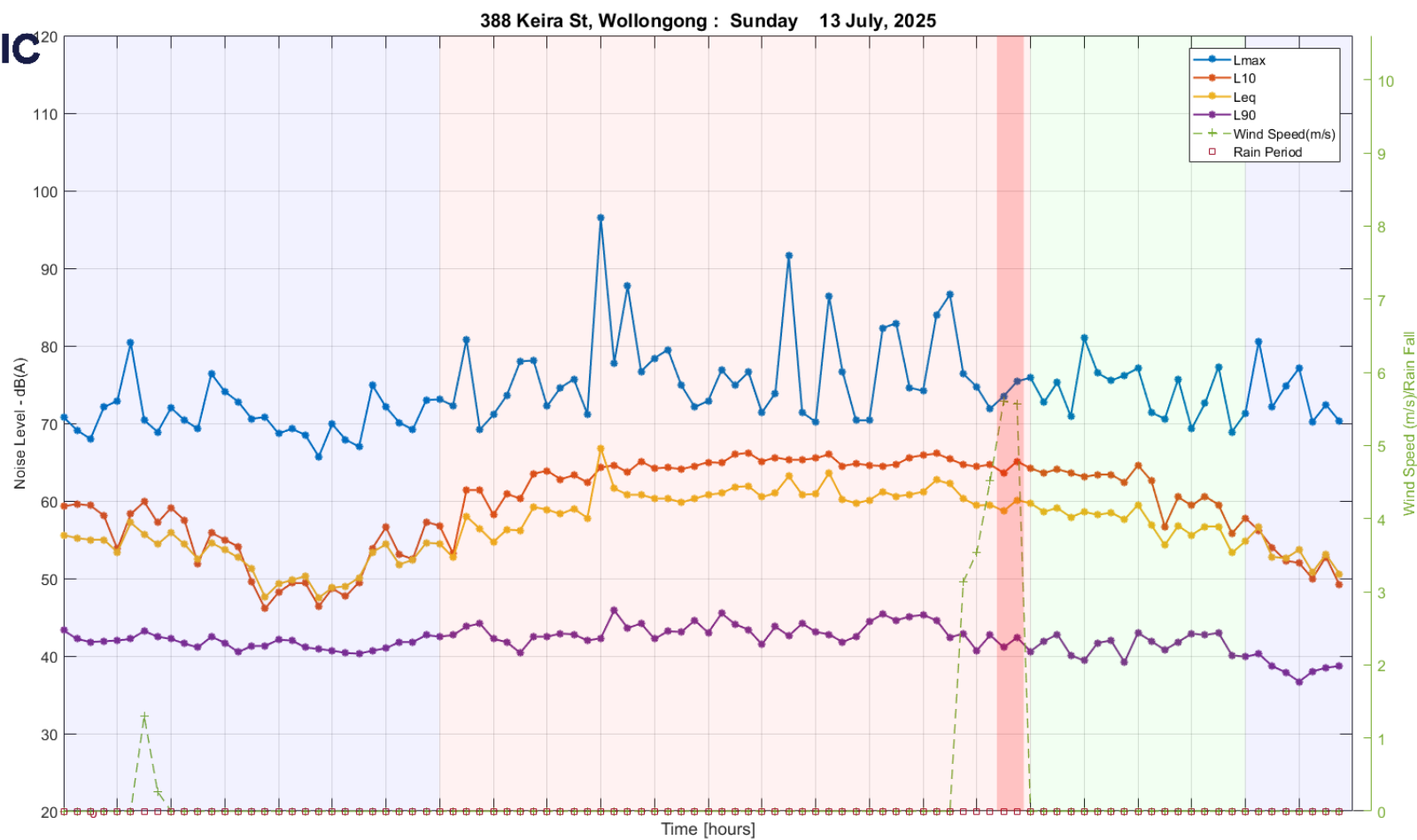
Receivers	Noise Level dB(A) L₉₀, period		
	Day	Evening	Night
R1 & R2	47	44	40

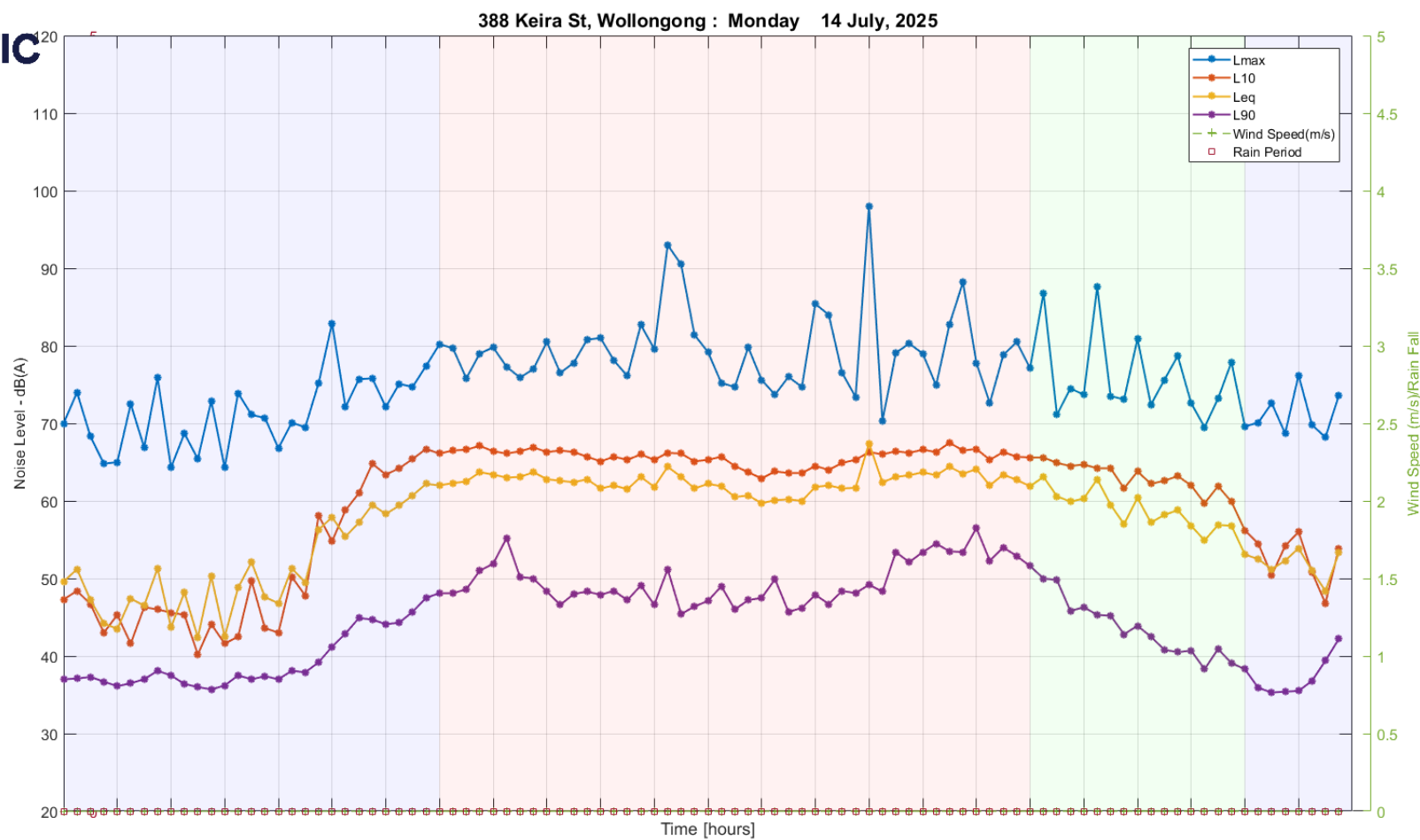
A.3 UNATTENDED MONITORING DATA GRAPHS





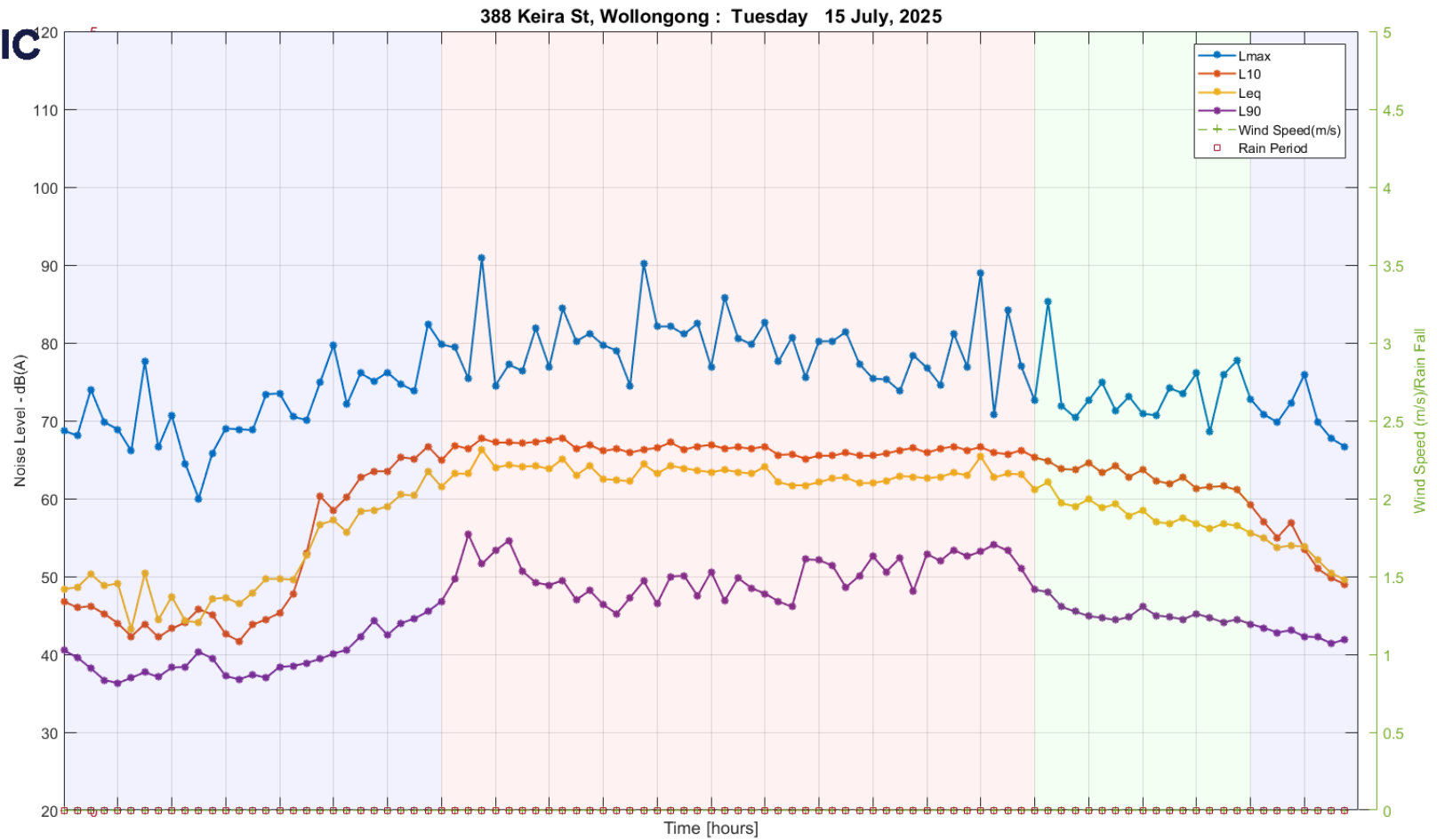


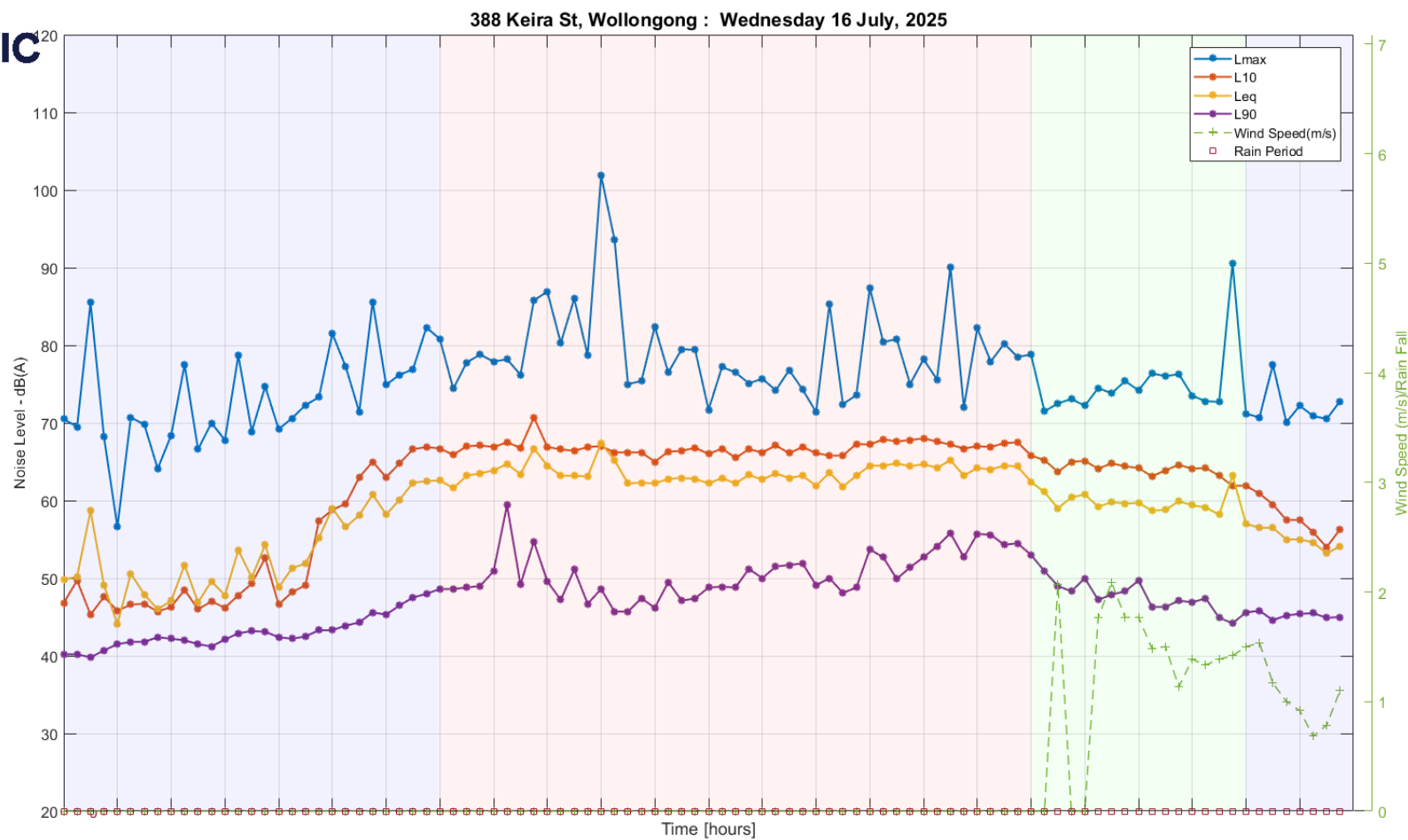


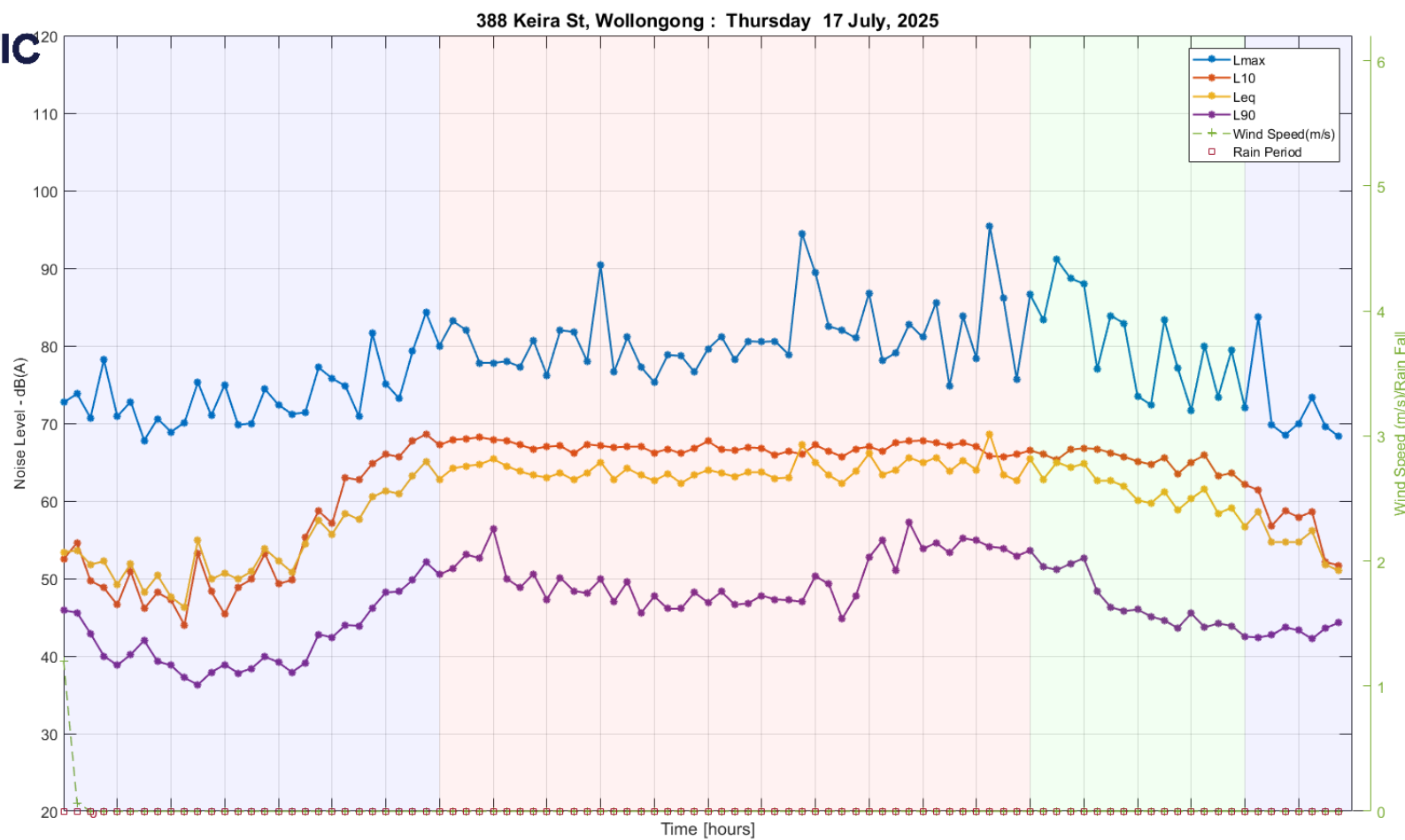




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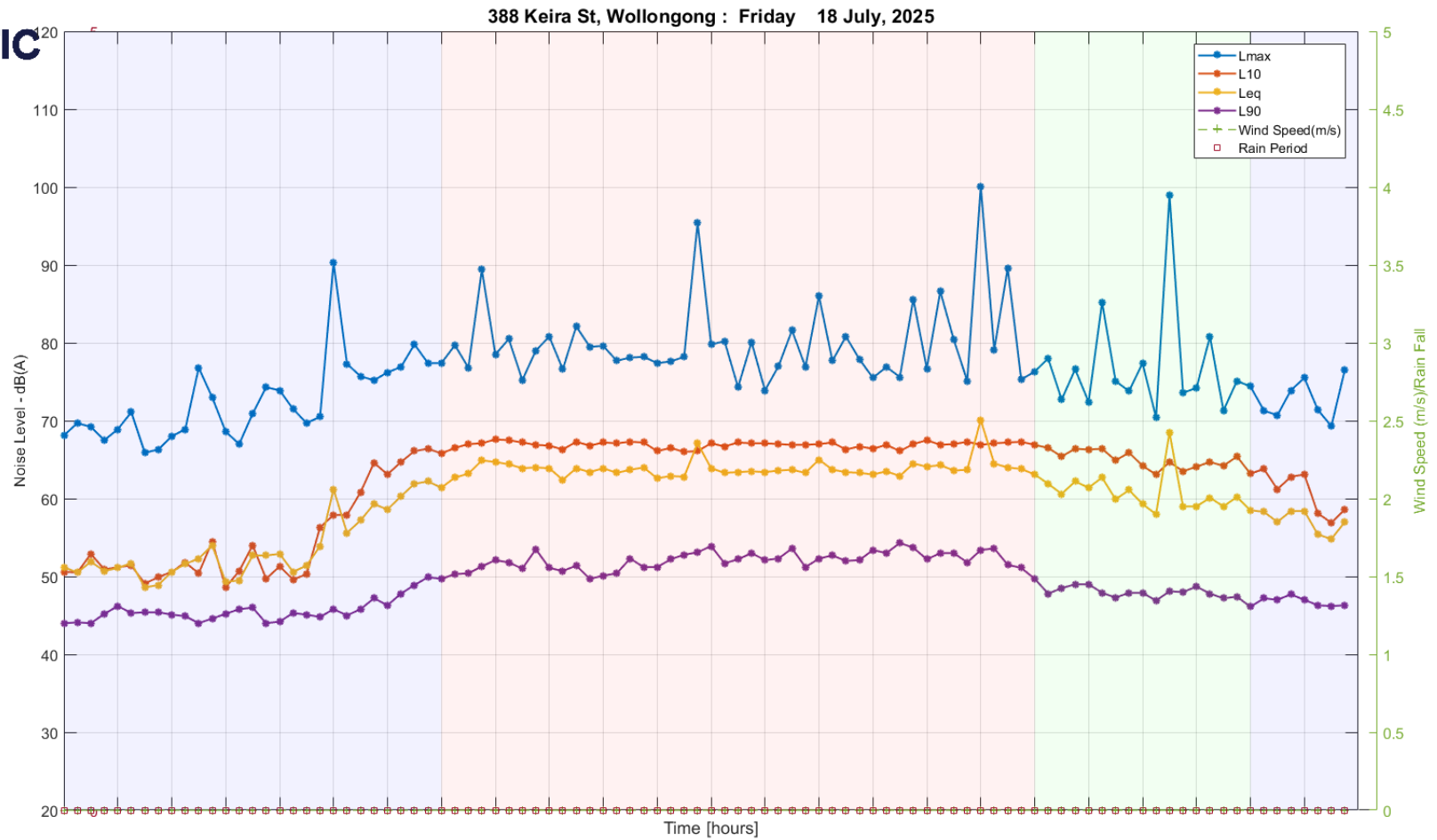


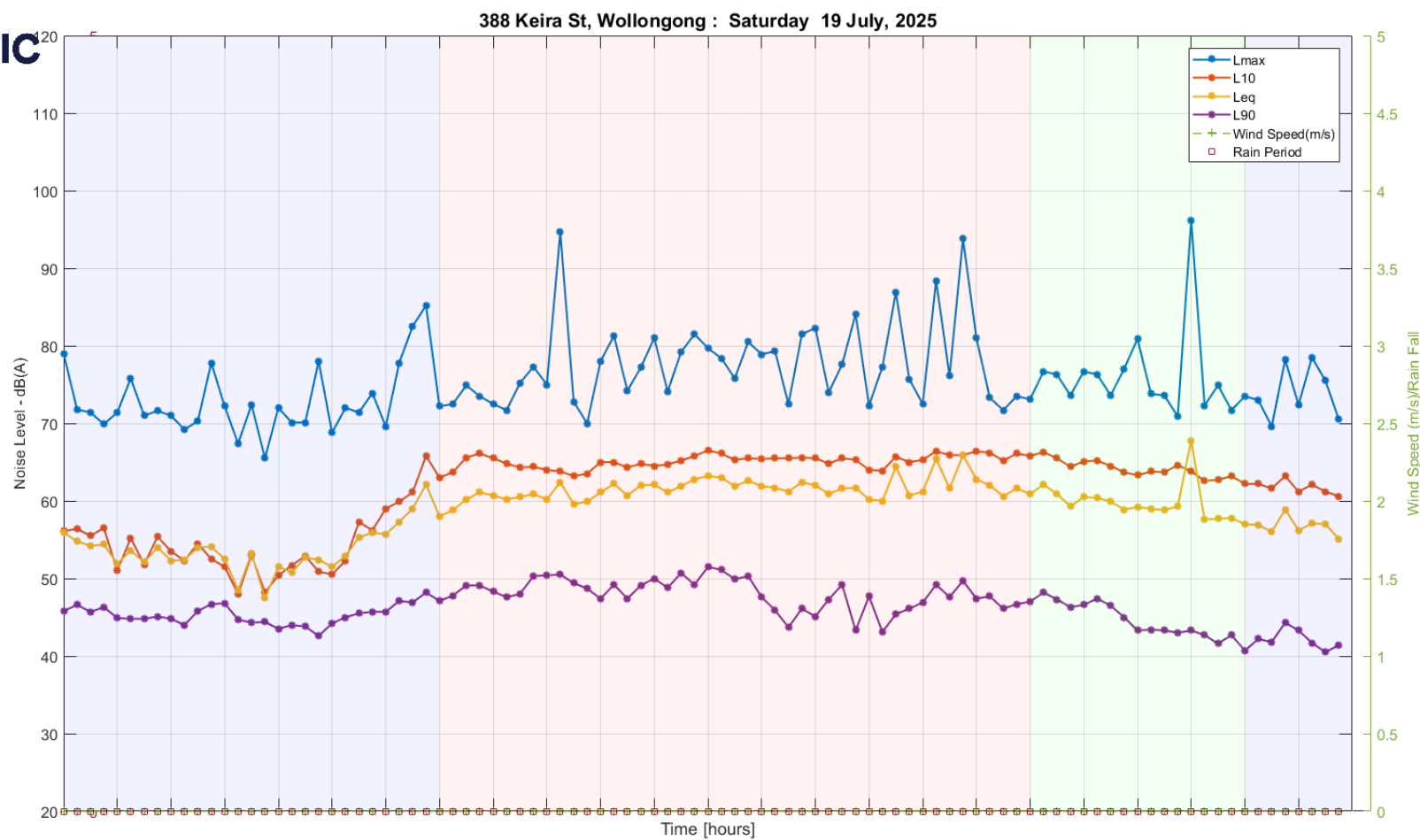


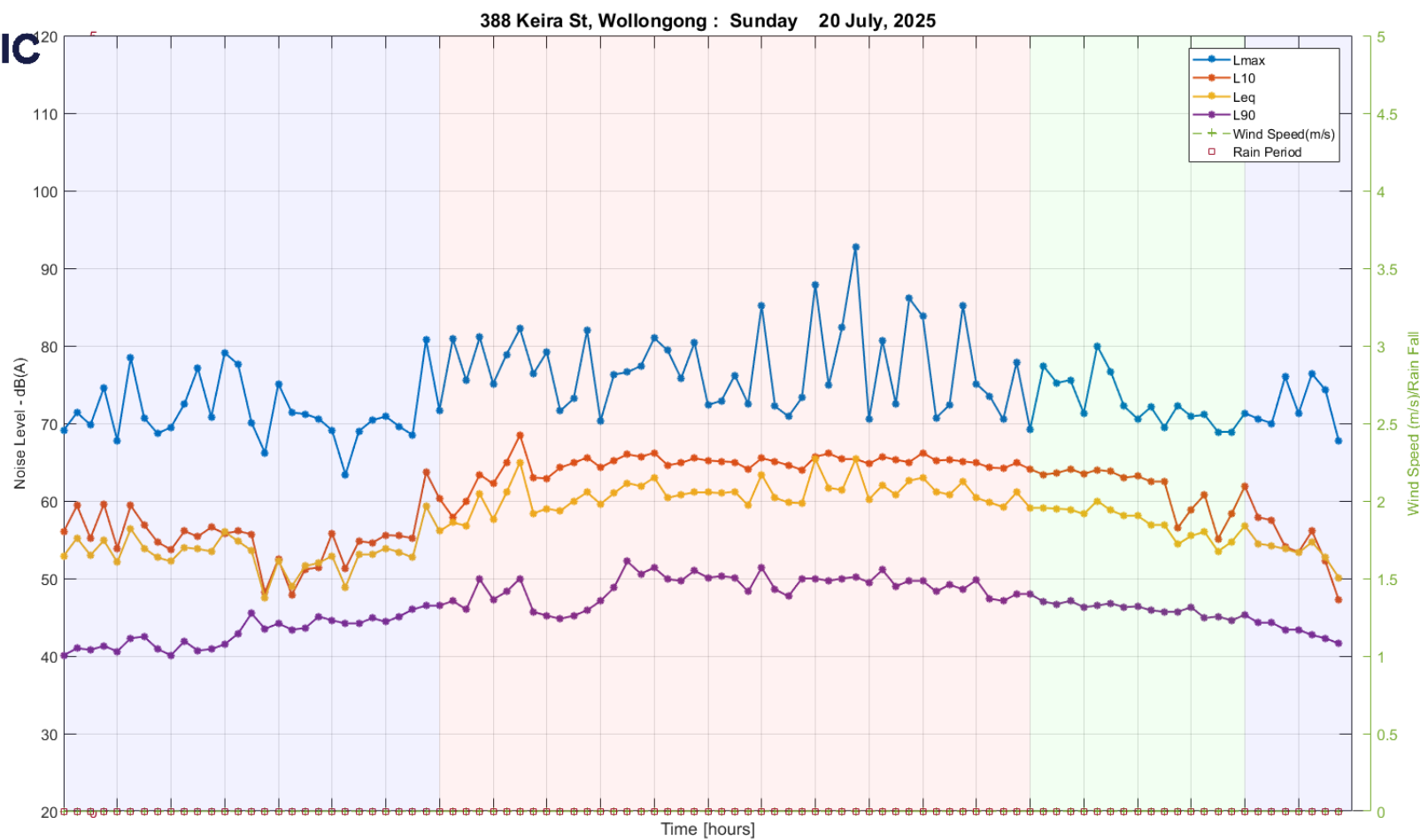


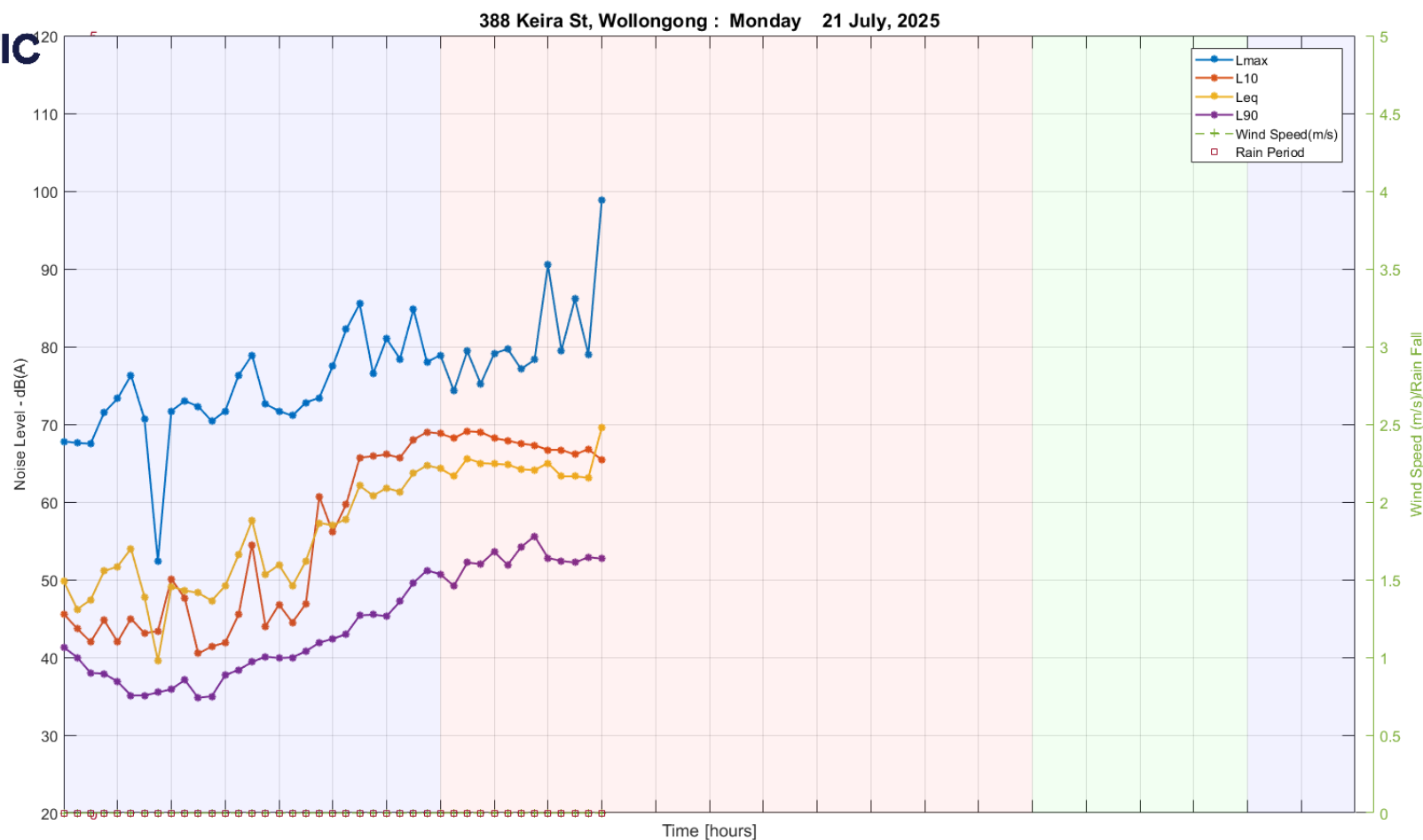


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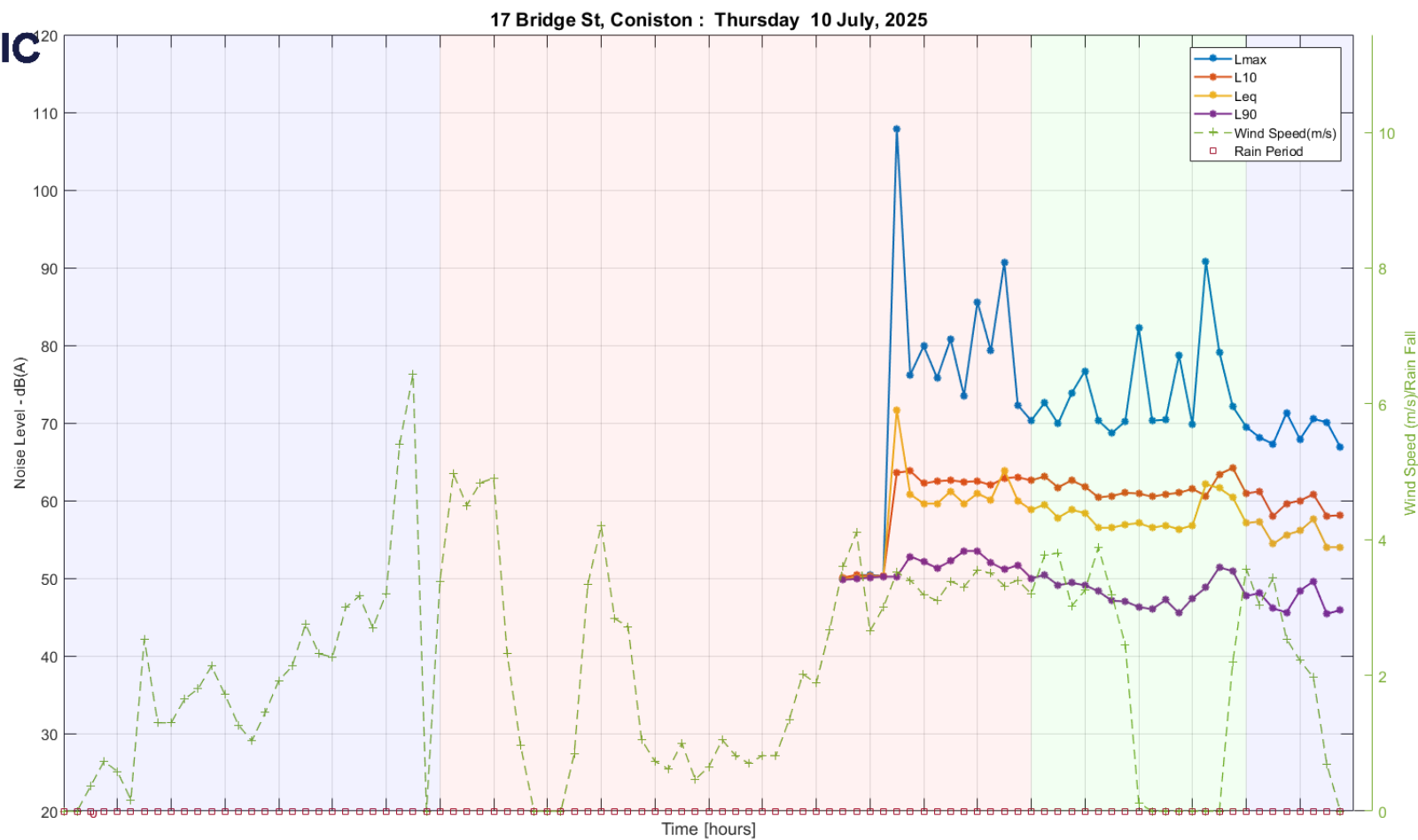


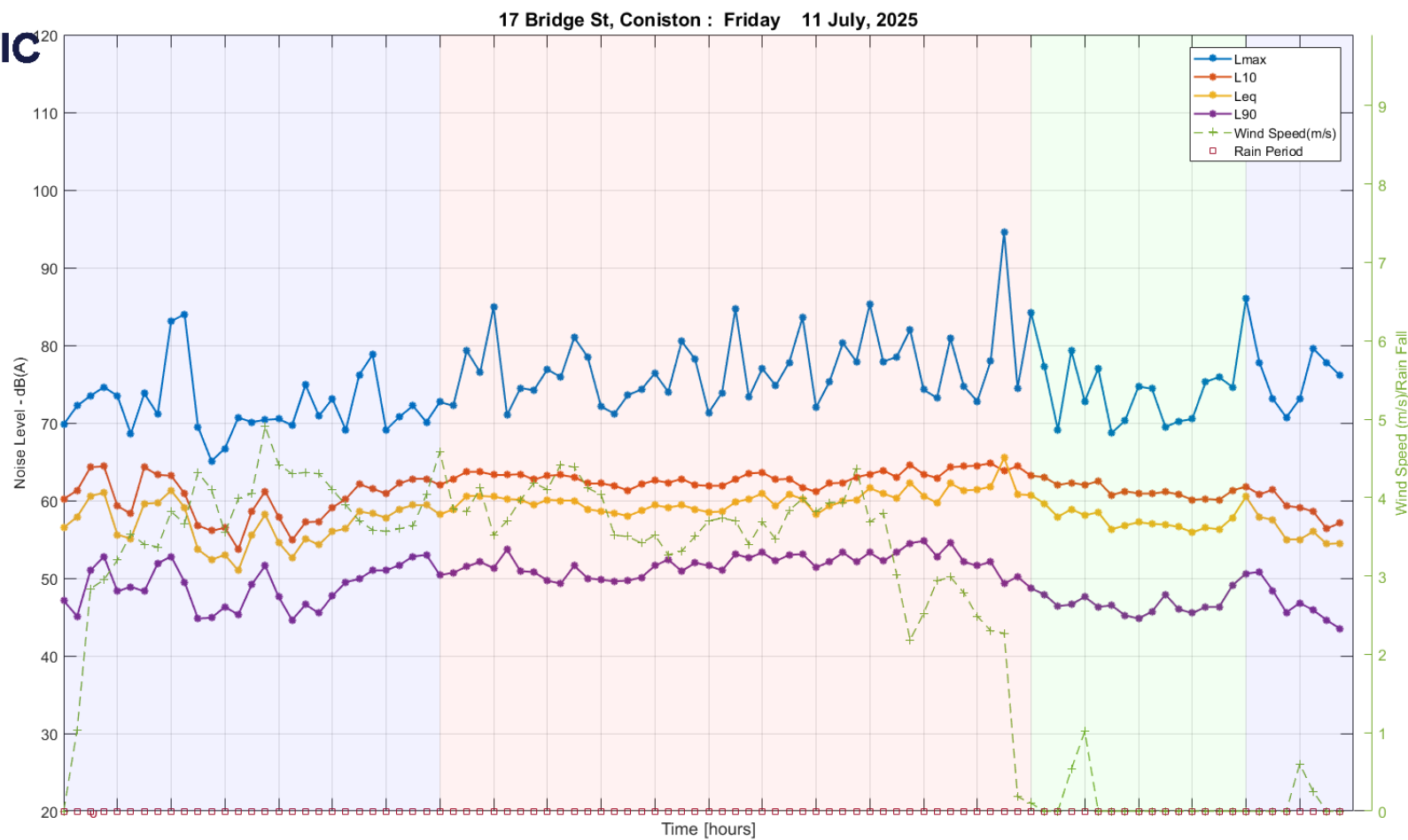


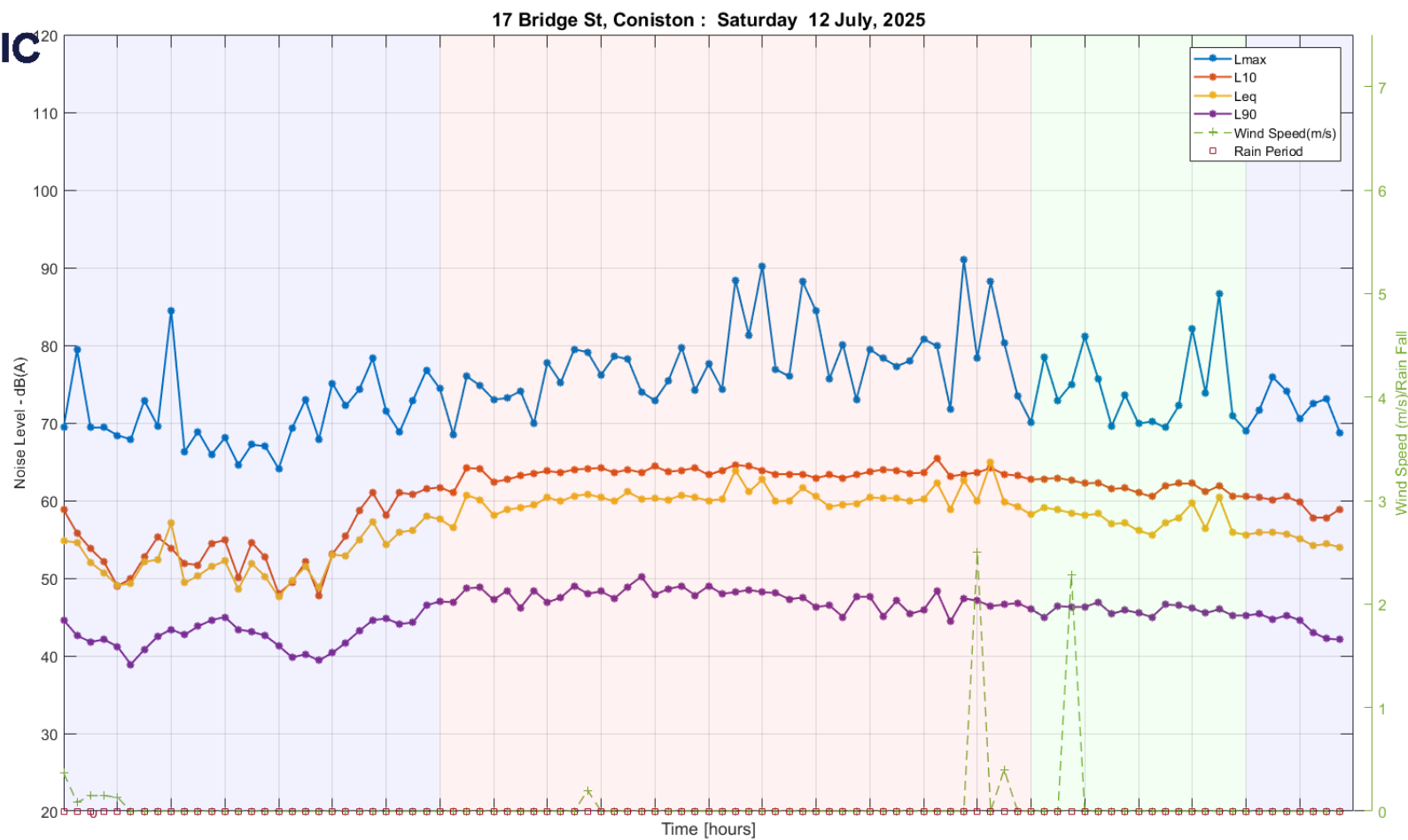




Wind Speed is corrected using factor 0.60 based on logger location

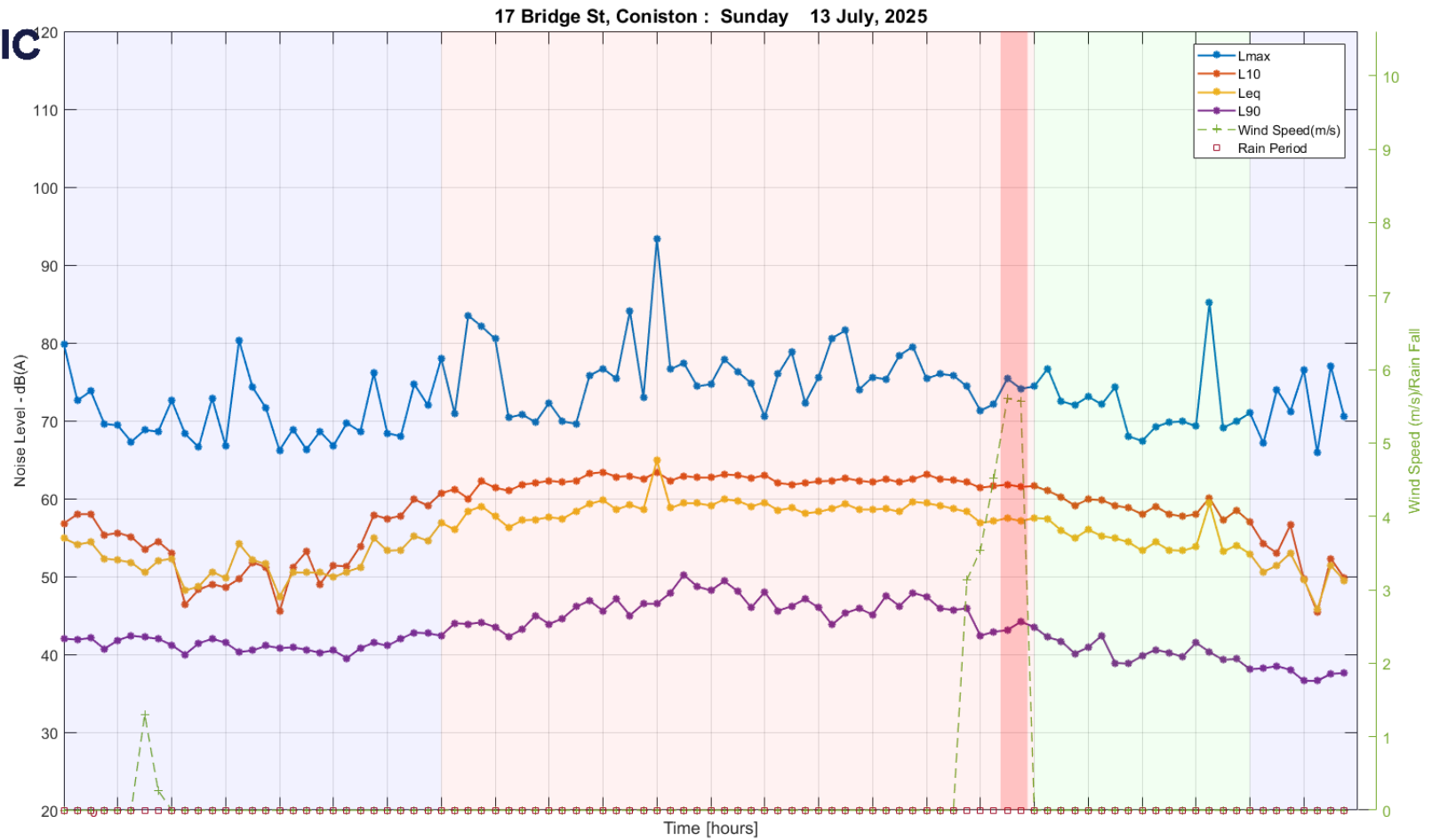


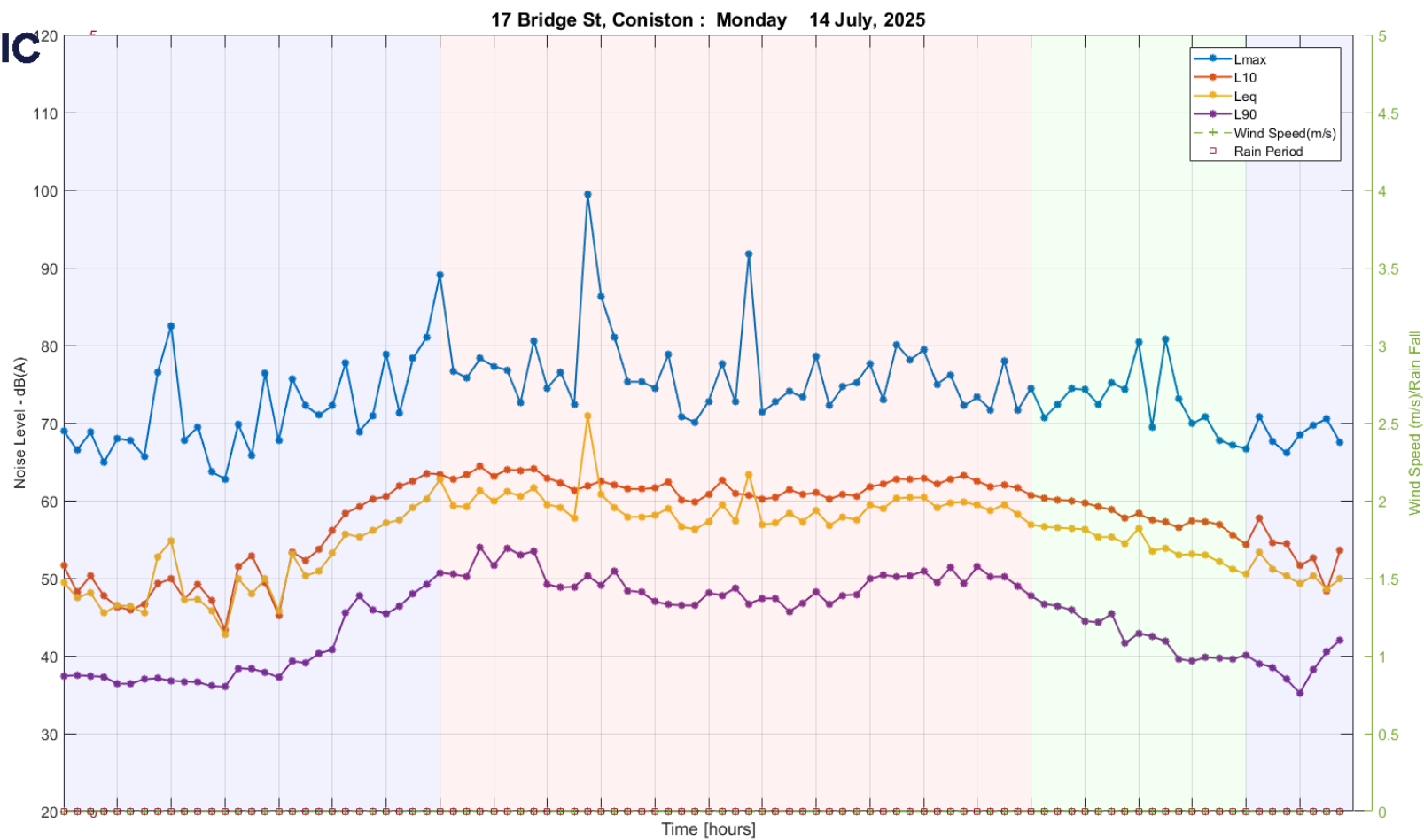






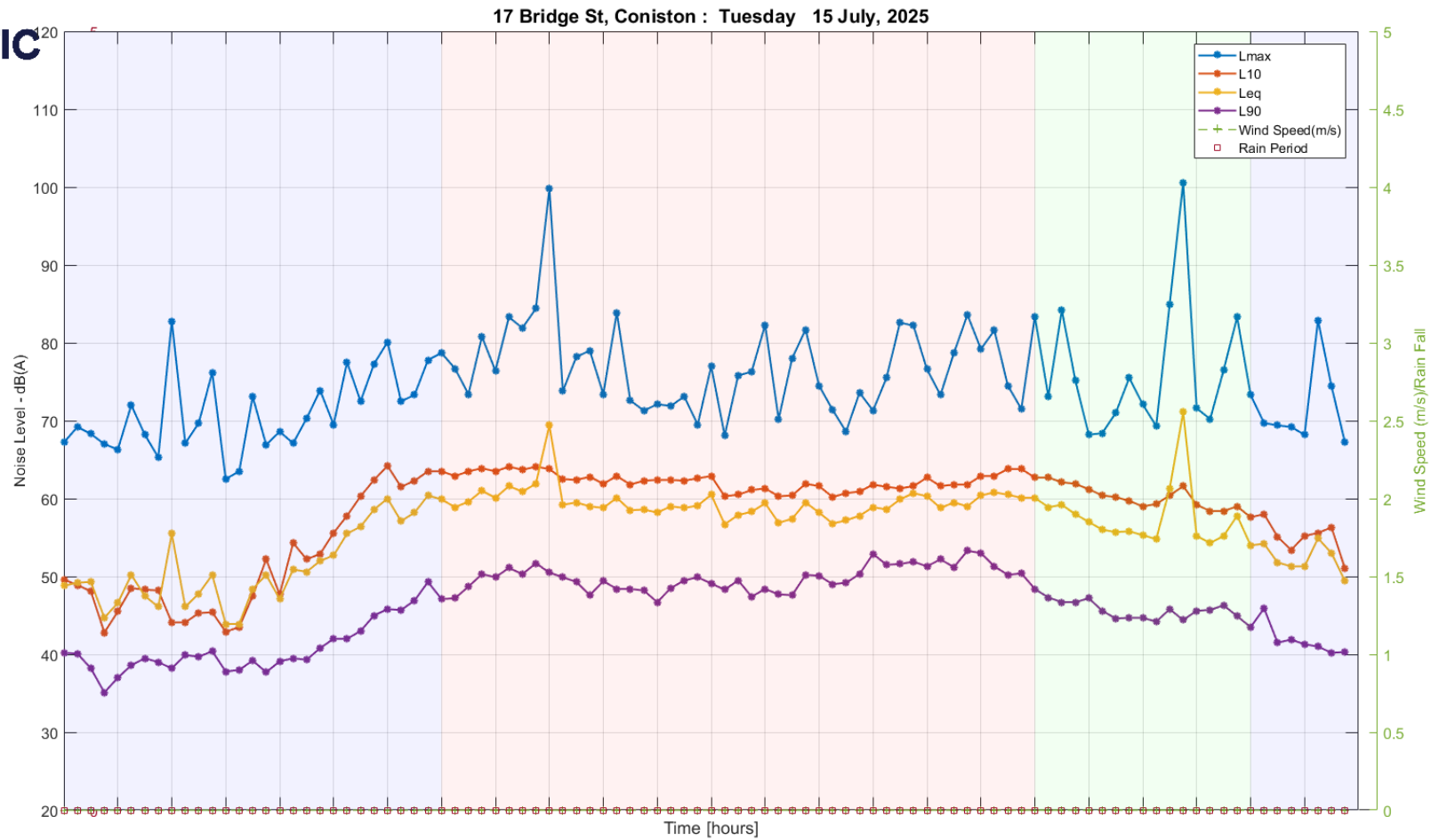
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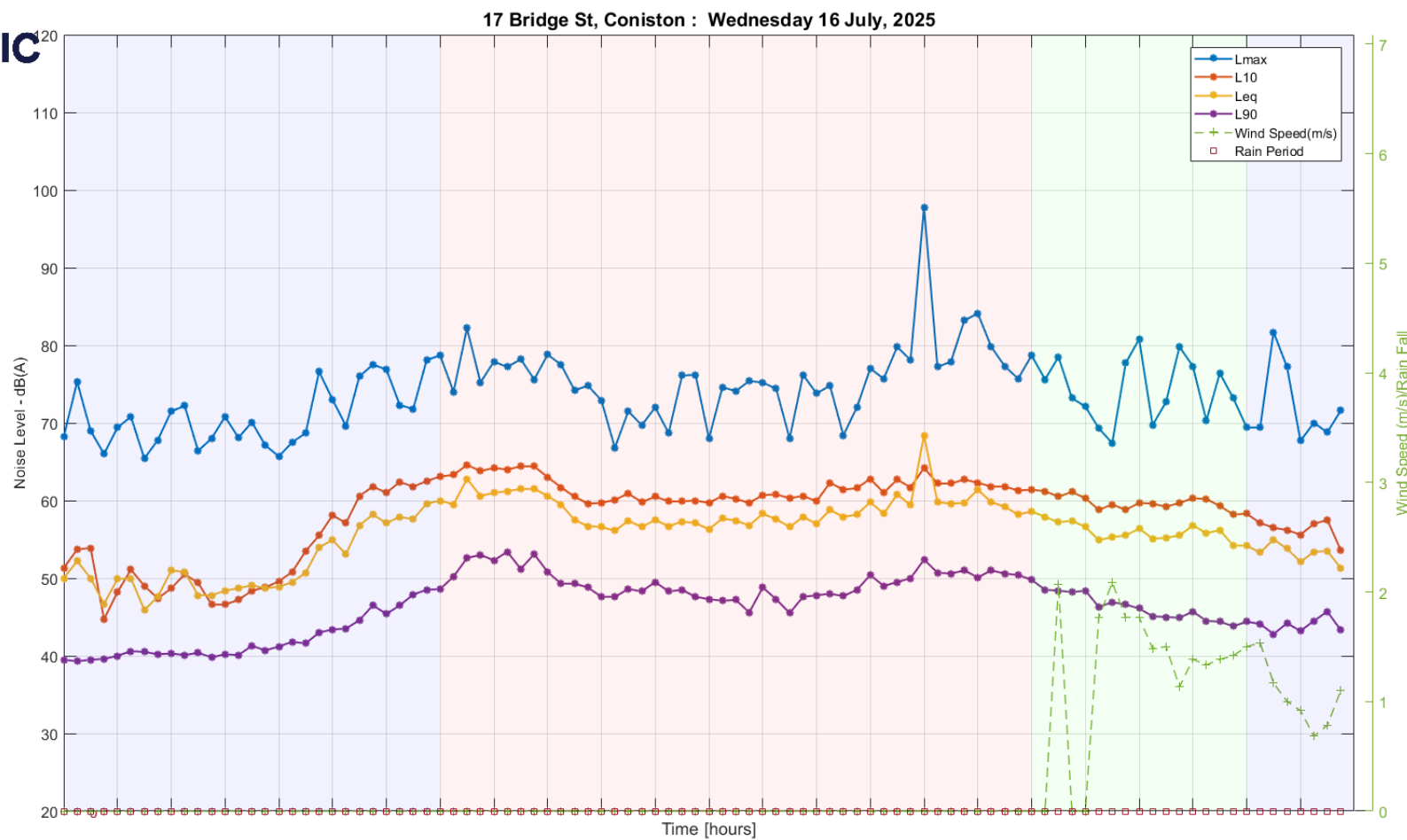


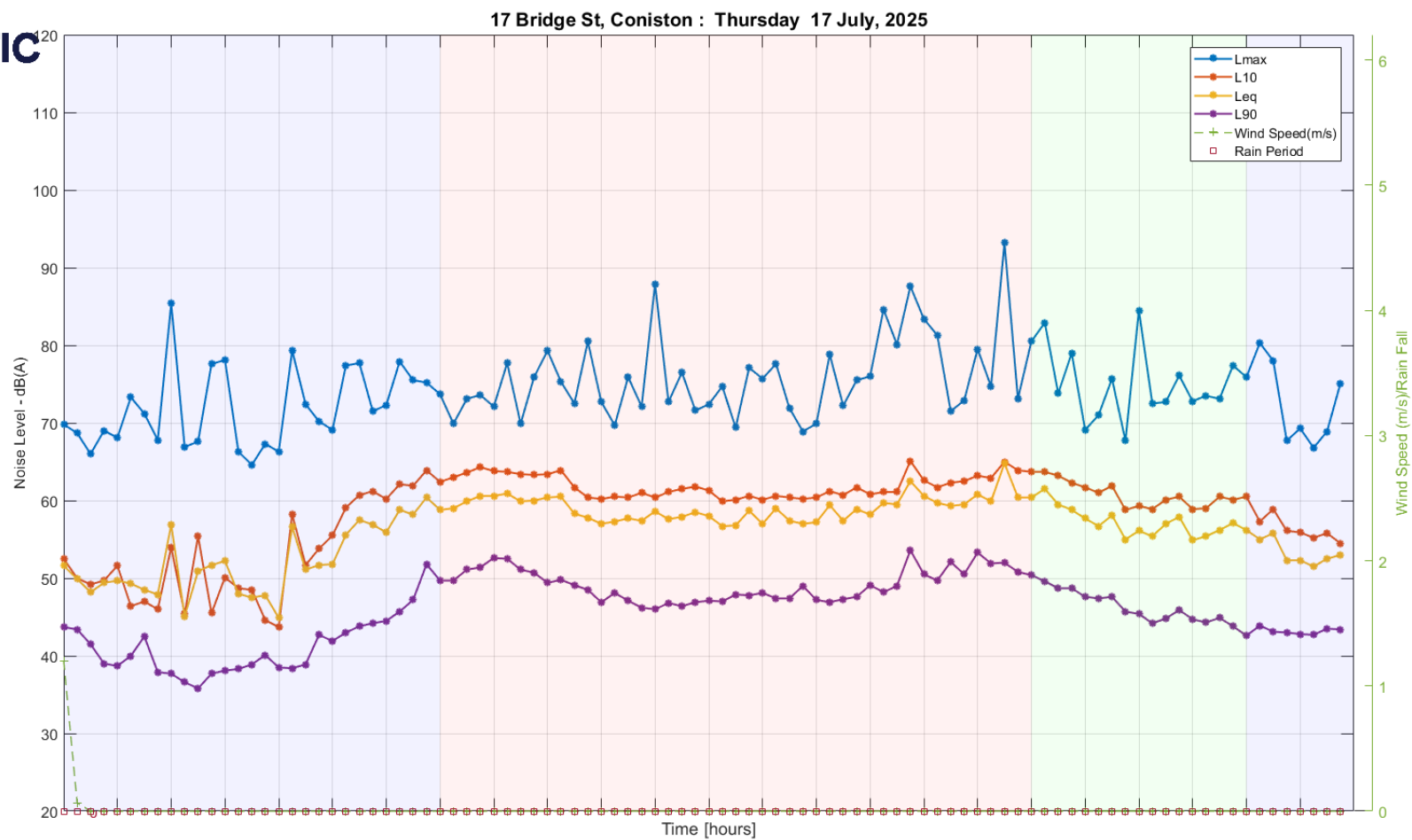


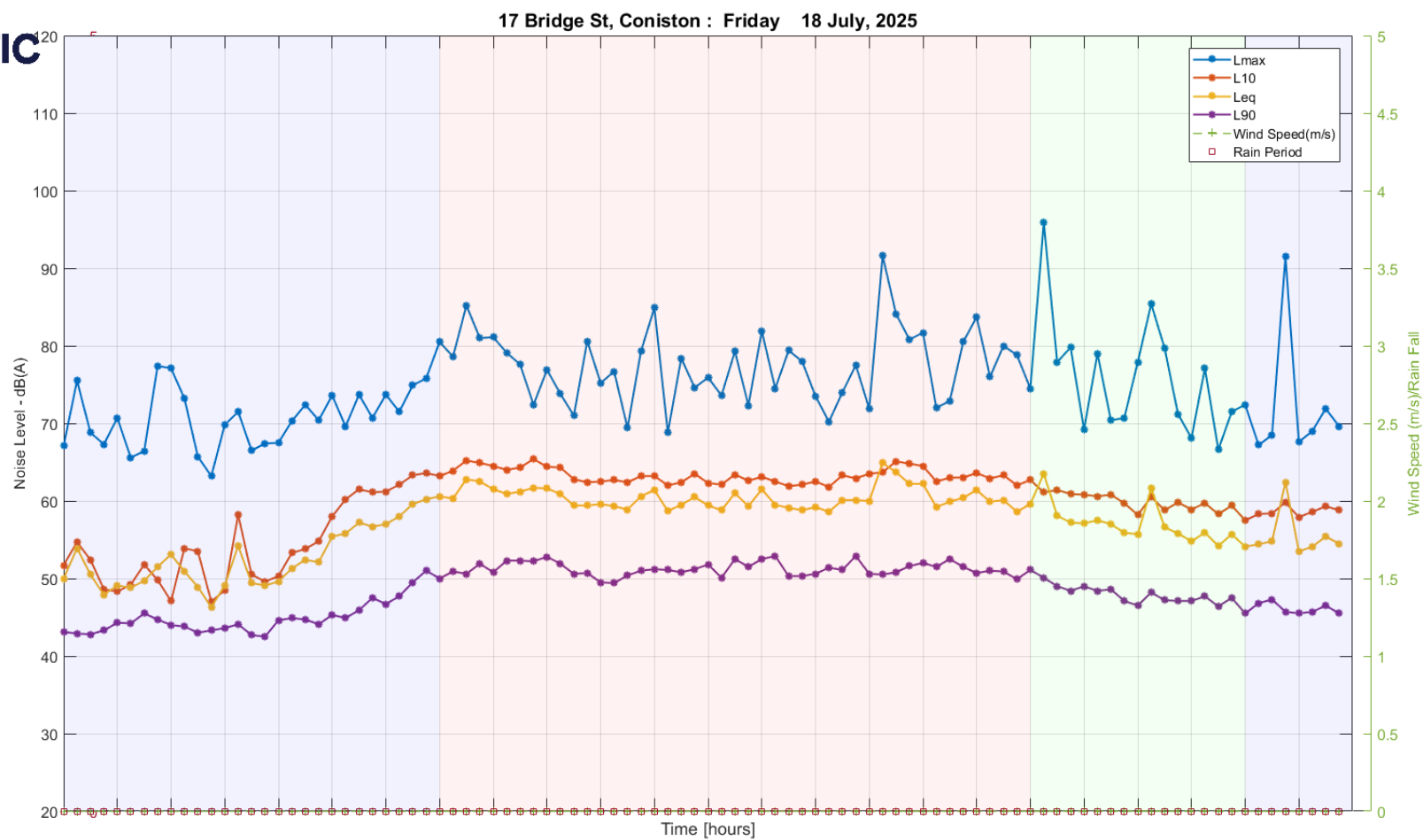


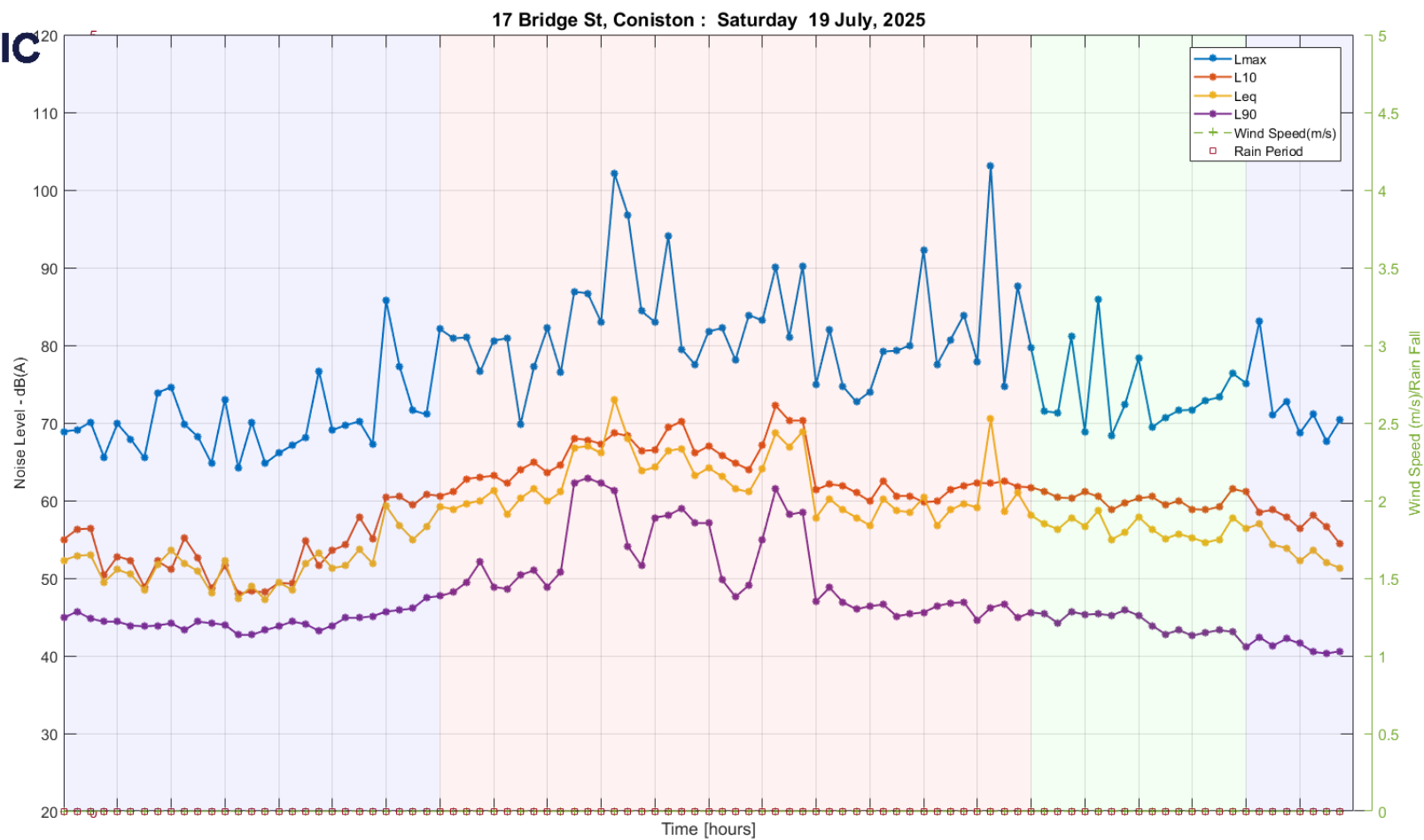
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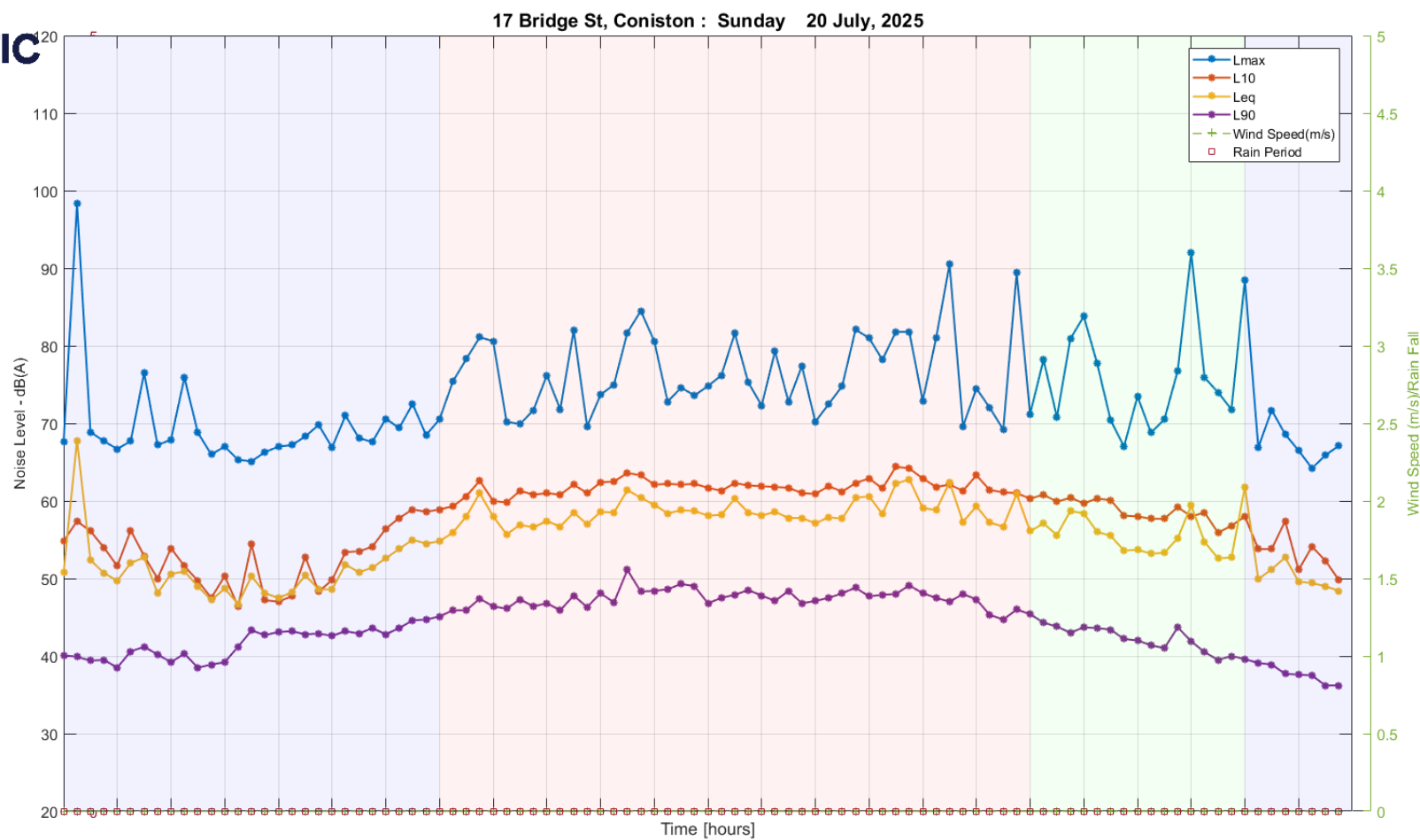


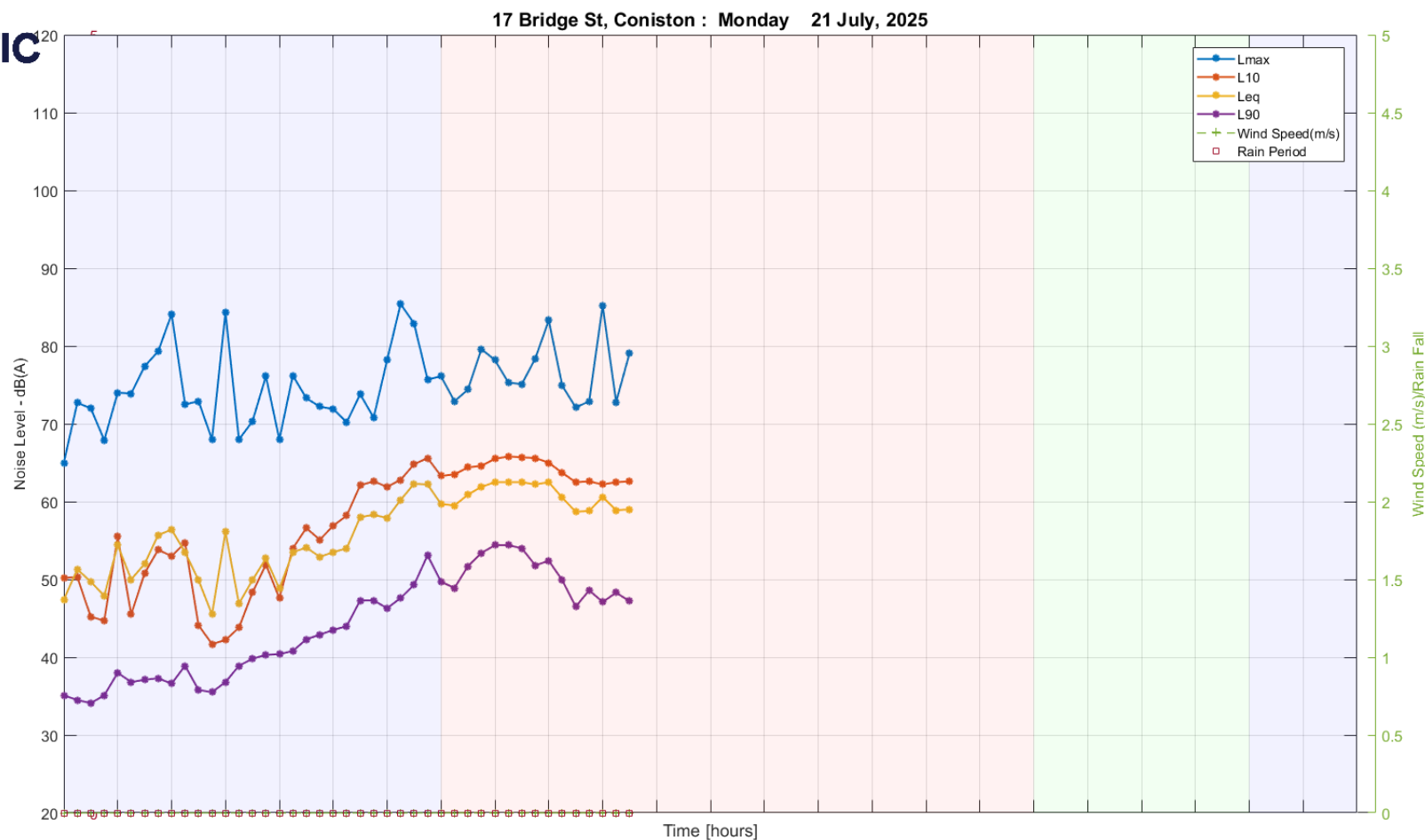












Wind Speed is corrected using factor 0.60 based on logger location

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 NPI TRIGGER LEVELS

The NPI 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 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.1.2 Amenity

Table 2.2 of the NPI (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 "suburban" 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:

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

NPI Table 2.2: Amenity Noise Levels			
Receiver	Noise Amenity Area	Time of Day	Recommended Amenity Noise Level <i>L_{Aeq}</i>
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	Noisiest 1-hour	35
	All	Noisiest 1-hour	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.1.3 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 NPI 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 NPI methodology described above and the measured rating background noise levels.

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

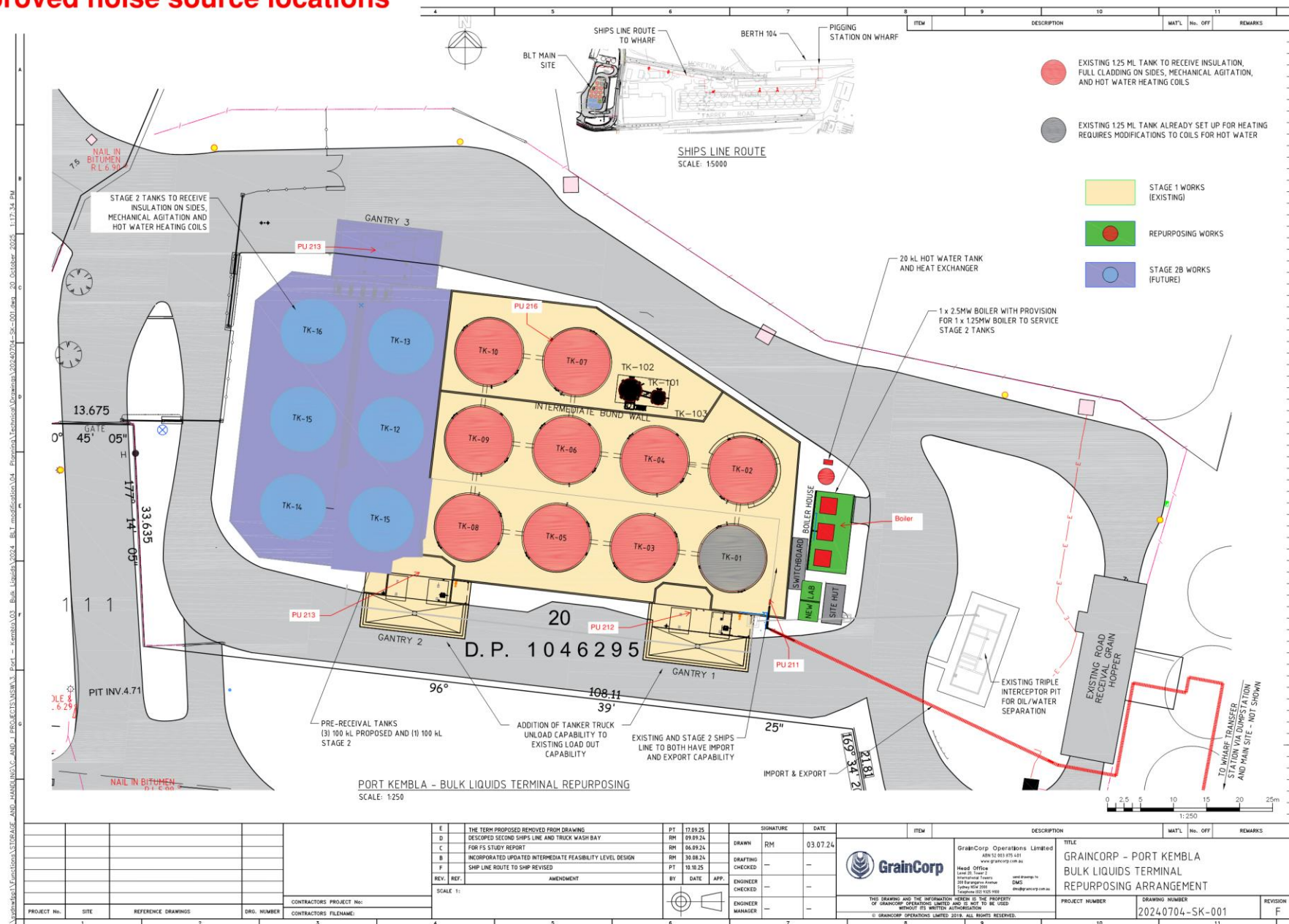
Table 18 – Project Specific Trigger Levels

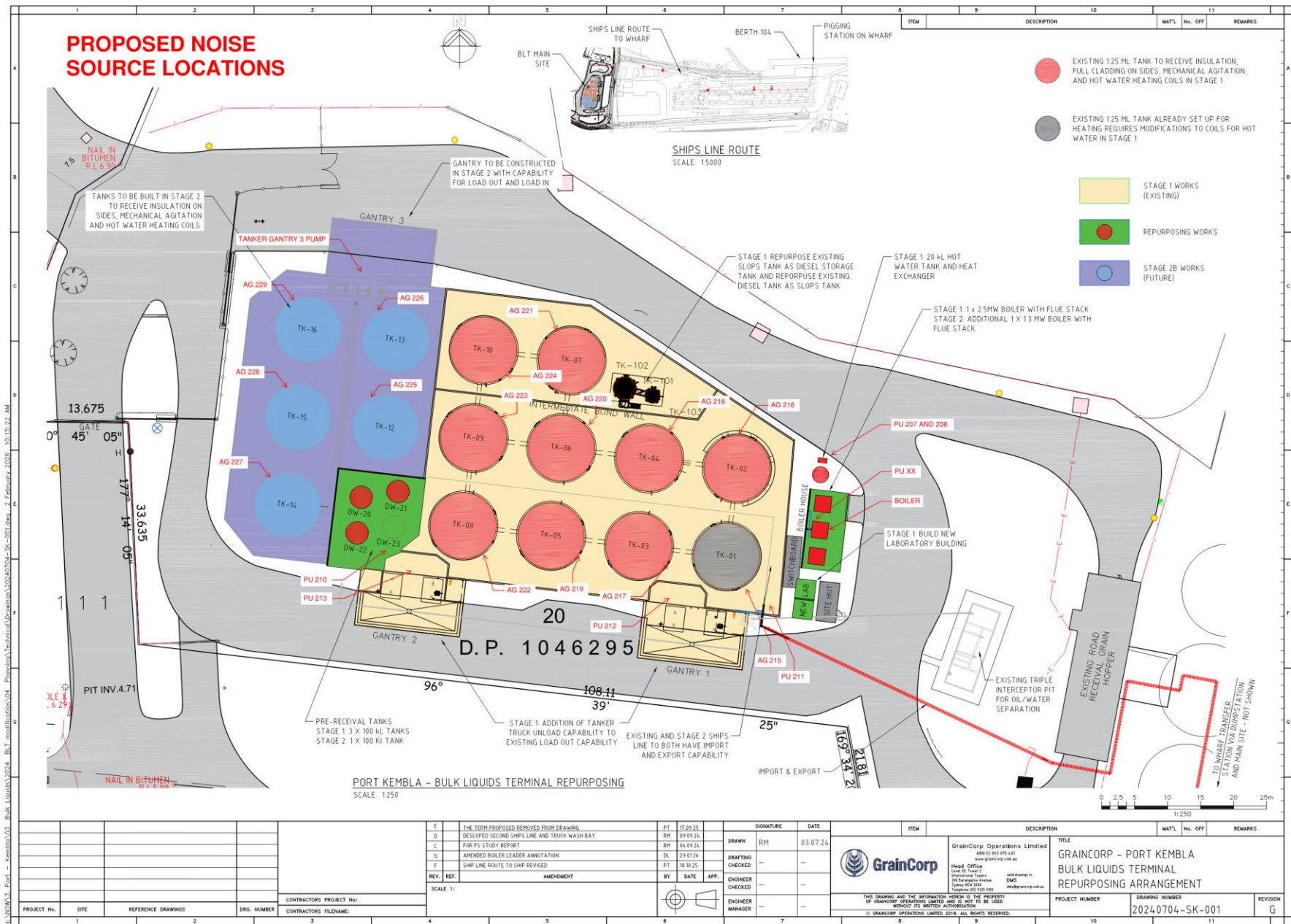
Location/Receiver Type	Time	RBL dB(A) L ₉₀	Trigger Noise Level (dB(A) L _{eq,15min})		
			Intrusiveness	Amenity	Max Event
R1 & R2 Residential	Day	47	52	53	N/A
	Evening	44	49	43	N/A
	Night	40	45	38	45 L_{eq} 55 L_{max}
C1 Commercial	When in use	N/A	N/A	63	N/A
E1 Educational	When in use	N/A	N/A	35 (internal)	N/A

Project trigger levels are highlighted in bold.

APPENDIX C PROPOSED PUMP LOCATIONS

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APPENDIX D SOUNDPLAN MODELLING RESULTS

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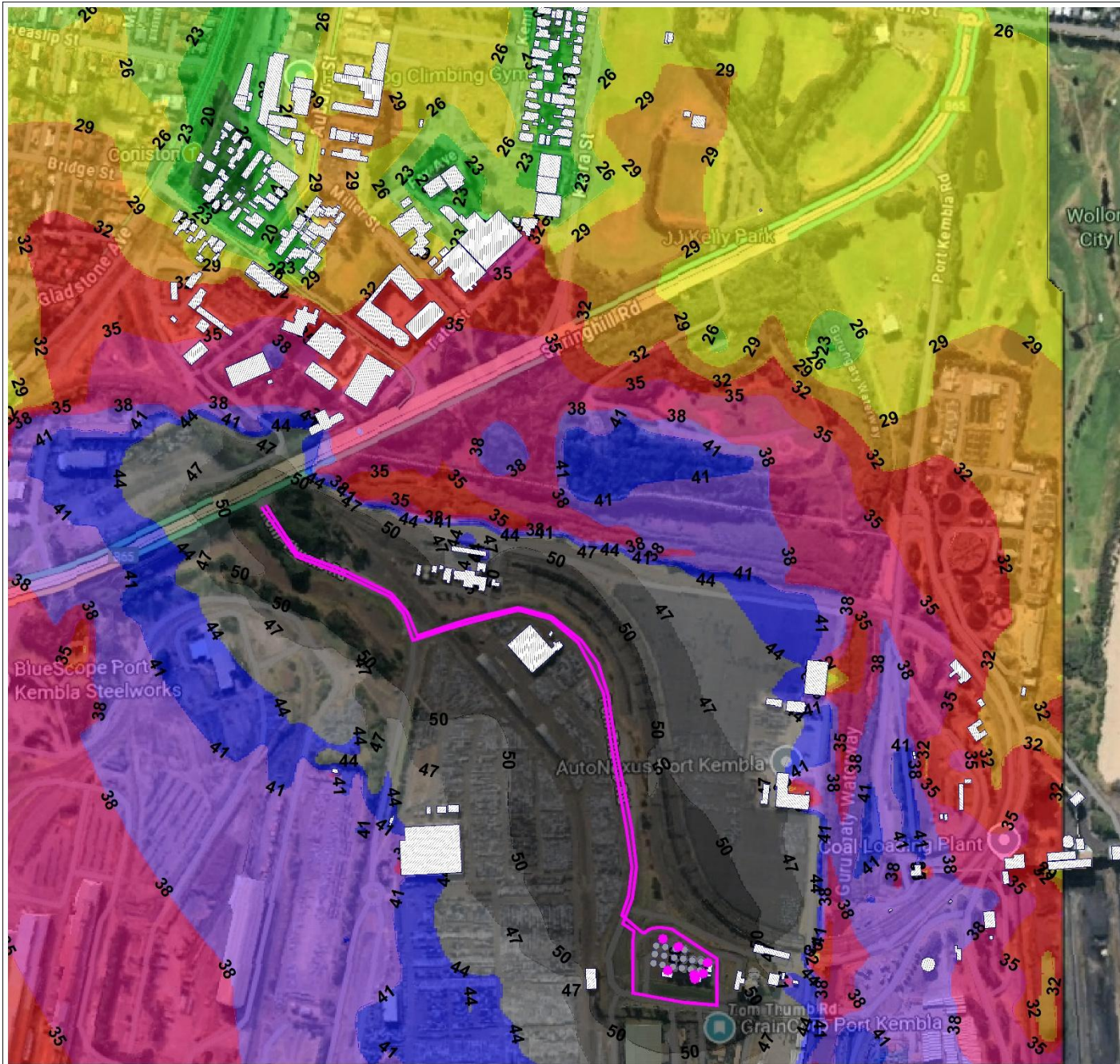
**Operation Noise Emission Prediction:
(at 1.5m above ground)**

Approved Development

Prepared by: P. Feng
Date: 30/01/2026

Noise Level

L_{eq}
in dB(A)



GrainCorp Port Kembla

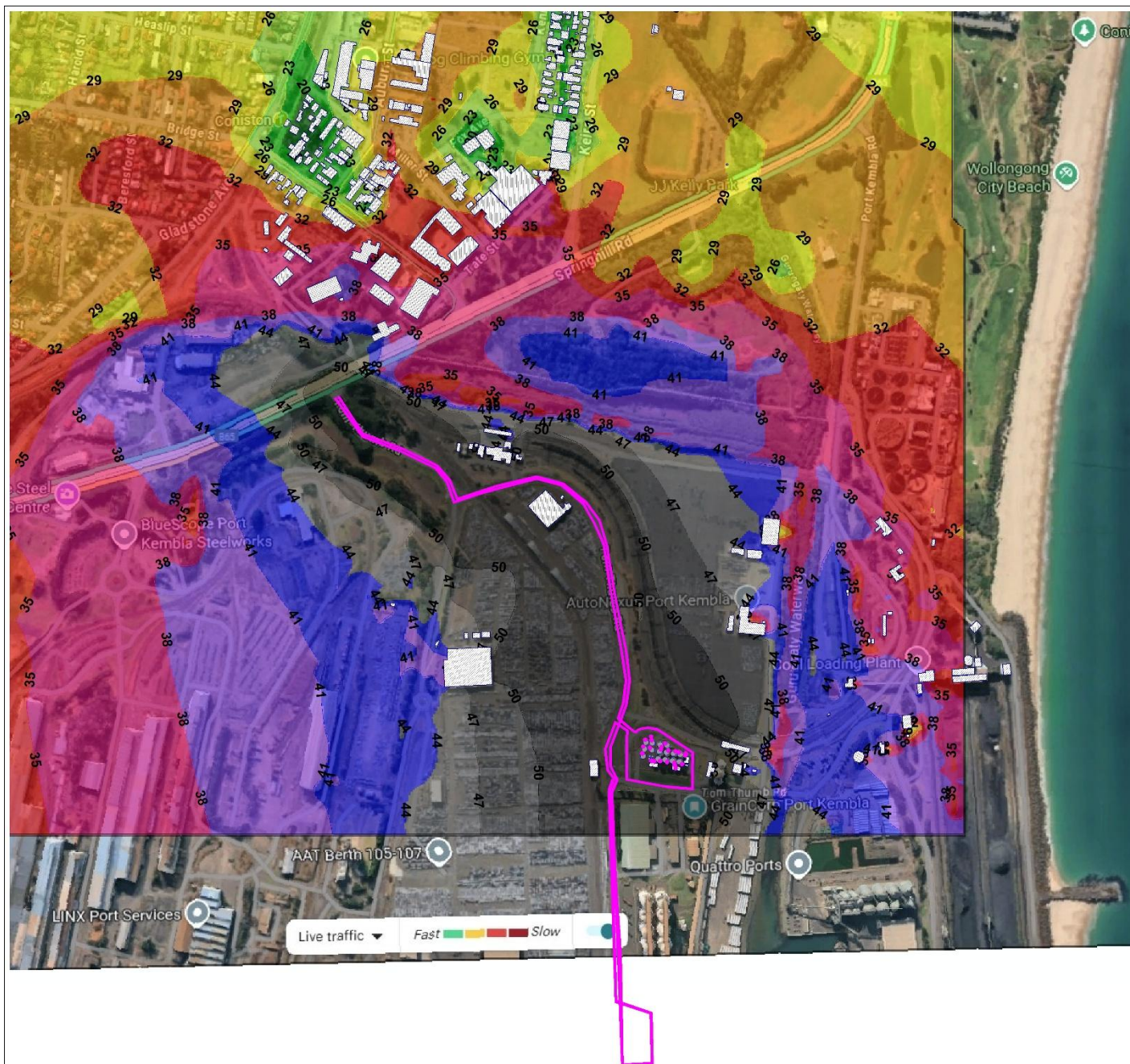
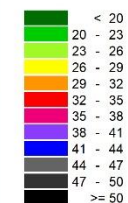
Operation Noise Emission Prediction: (at 1.5m above ground)

Proposed Development

Prepared by: P. Feng
Date: 30/01/2026

Noise Level

Leq
in dB(A)



GrainCorp Port Kembla

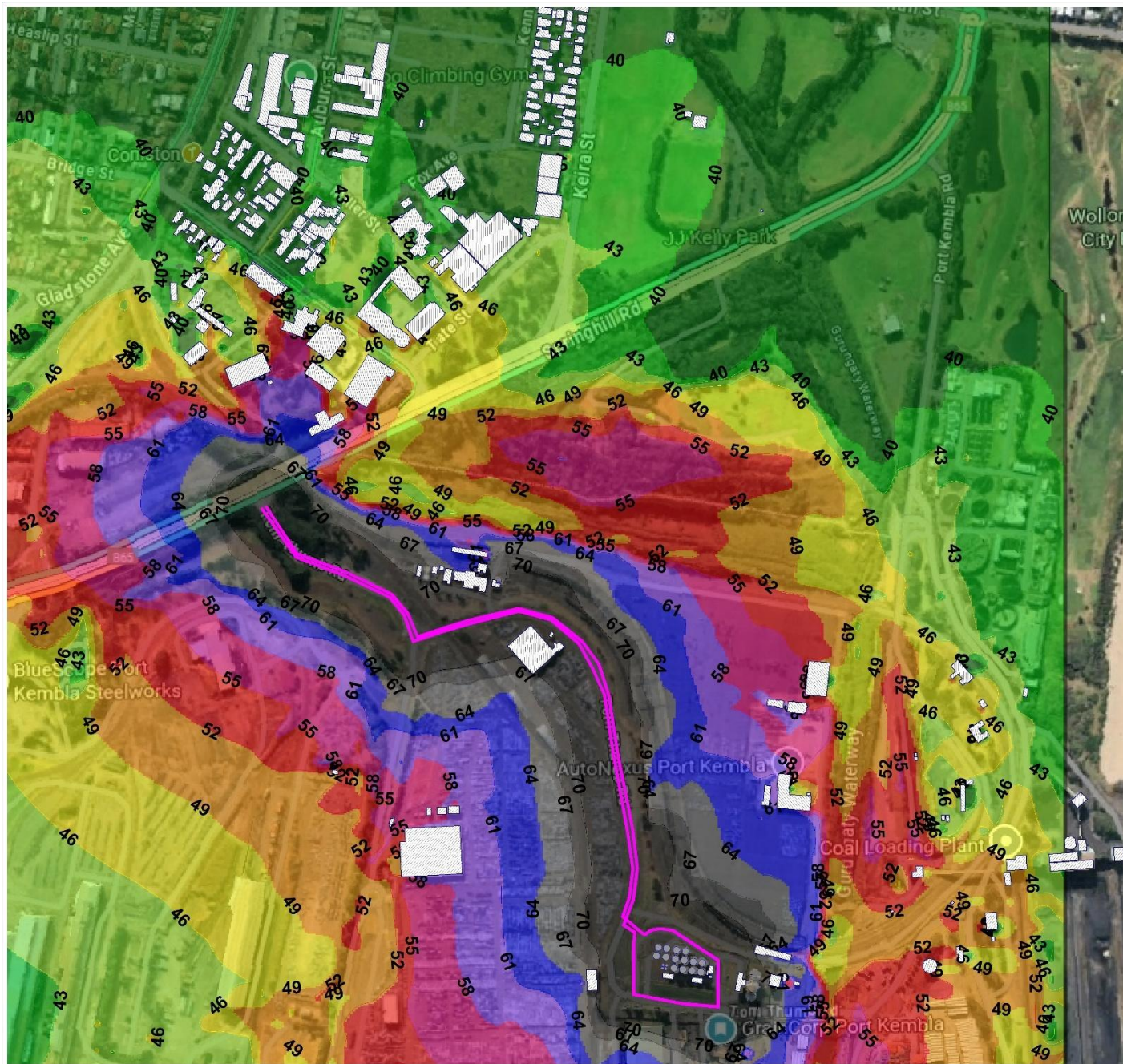
Sleep Disturbance Prediction:
(at 1.5m above ground)

Approved condition

Prepared by: P. Feng
Date: 20/01/2026

Noise Level

L_{max}
in dB(A)



GrainCorp Port Kembla

Sleep Disturbance Prediction: (at 1.5m above ground)

Proposed condition

Prepared by: P. Feng
Date: 20/01/2026

Noise Level

L_{max}
in dB(A)

