

MANAGING DIRECTORS

MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS

MATTHEW SHIELDS
BEN WHITE



**Operational Noise Assessment -
Lot 8A and 8B(IMCD)**

585-649 Mamre Road, Orchard Hills

SYDNEY

A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au

ABN: 11 068 954 343

The information in this document is the property of Acoustic Logic Consultancy Pty Ltd ABN 11 068 954 343 and shall be returned on demand. It is issued on the condition that, except with our written permission, it must not be reproduced, copied or communicated to any other party nor be used for any purpose other than that stated in particular enquiry, order or contract with which it is issued.

TABLE OF CONTENTS

1	INTRODUCTION	4
2	SITE DESCRIPTION AND PROPOSED WORKS.....	4
3	NOISE DESCRIPTORS	7
4	SURVEY OF AMBIENT NOISE.....	8
5	NOISE EMISSION CRITERIA	10
5.1	THE MAMRE WEST DCP	10
5.2	THE PENRITH DCP.....	10
5.3	EPA NOISE POLICY FOR INDUSTRY.....	11
5.3.1	NPfl - Intrusiveness Assessment.....	11
5.3.2	NPfl – Project Amenity Assessment	11
5.4	SLEEP AROUSAL ASSESSMENT.....	12
5.5	NOISE FROM INCREASED TRAFFIC GENERATION ON PUBLIC STREETS.....	13
5.6	CONSTRUCTION NOISE AND VIBRATION IMPACTS.....	15
5.6.1	EPA Interim Construction Noise Guidelines	15
5.6.2	Construction Vibration	16
6	NOISE EMISSION ASSESSMENT.....	17
6.1	WAREHOUSE 8A1 AND 8A2 (IMCD).....	17
6.1.1	On-site noise (vehicle ingress/egress, materials handling, refrigerated container).	17
6.1.2	Noise Generated by Additional Traffic on Public Roads.....	19
6.1.3	Transient Noise Events (Sleep Arousal).....	19
6.1.4	Mechanical plant	19
6.2	CONSTRUCTION IMPACTS.....	20
6.2.1	Construction Noise	20
6.2.2	Construction Vibration	21
7	DISCUSSION/RECOMMENDATIONS	21
8	CONCLUSION	22
	Appendix 1.....	23
	Appendix 2.....	24

1 INTRODUCTION

Acoustic Logic Consultancy has been engaged to undertake an assessment of the proposed development on Lot 8 of the industrial subdivision at 585-649 Mamre Road, Orchard Hills.

The proposed works at Lot 8 consist of the development of two warehouses (8A and 8B). While the proposed use of 8A is not known at this stage, warehouse 8B is proposed to be used by IMCD as a logistics warehouse.

This assessment includes:

- An assessment of noise generated by the operational activities created by Lot 8.
- An assessment of construction noise associated with the development.

In this report, we will:

- Identify nearby noise sensitive receivers and operational noise sources with the potential to adversely impact nearby development.
- Identify relevant Penrith City Council and Environmental Protection Agency (EPA) acoustic criteria applicable to the development.
- Identify operational and construction noise sources and predict operational noise emissions and assess them against acoustic criteria.
- If necessary, determine building and/or management controls necessary to ensure ongoing compliance with noise emission goals.

This report is based on drawings by Nettletontribe Architects, Revision P7 dated 6 July 2018.

2 SITE DESCRIPTION AND PROPOSED WORKS

The Mamre Road industrial subdivision is located at 585-649 Mamre Road, Orchard Hills.

The subject site is Lot 8 in the nine lot subdivision.

Lot 8 is divided into three sub-lots :

- Lot 8A1, in the south-eastern corner of Lot 8.
- Lot 8A2 in the south-western corner of Lot 8.
- Lot 8B, in the northern half of Lot 8.

Lot 8B is not a part of this development proposal.

The proposed development consists of the construction of two warehouses (8A and 8B):

- Lot 8A1 (11,980m²) – The use of this lot has not been determined. This lot has five external loading docks, a hard stand area and an on-grade passenger parking area.
- Lot 8A2 (5,500m²) – This site is proposed to be used as a warehouse/distribution centre for IMCD. This lot has two external loading docks, a hard stand area, an on-grade passenger vehicle parking and a designated outdoor space for two refrigerated containers.

Permission is sought for the potential use of the site to operate twenty four hours per day.

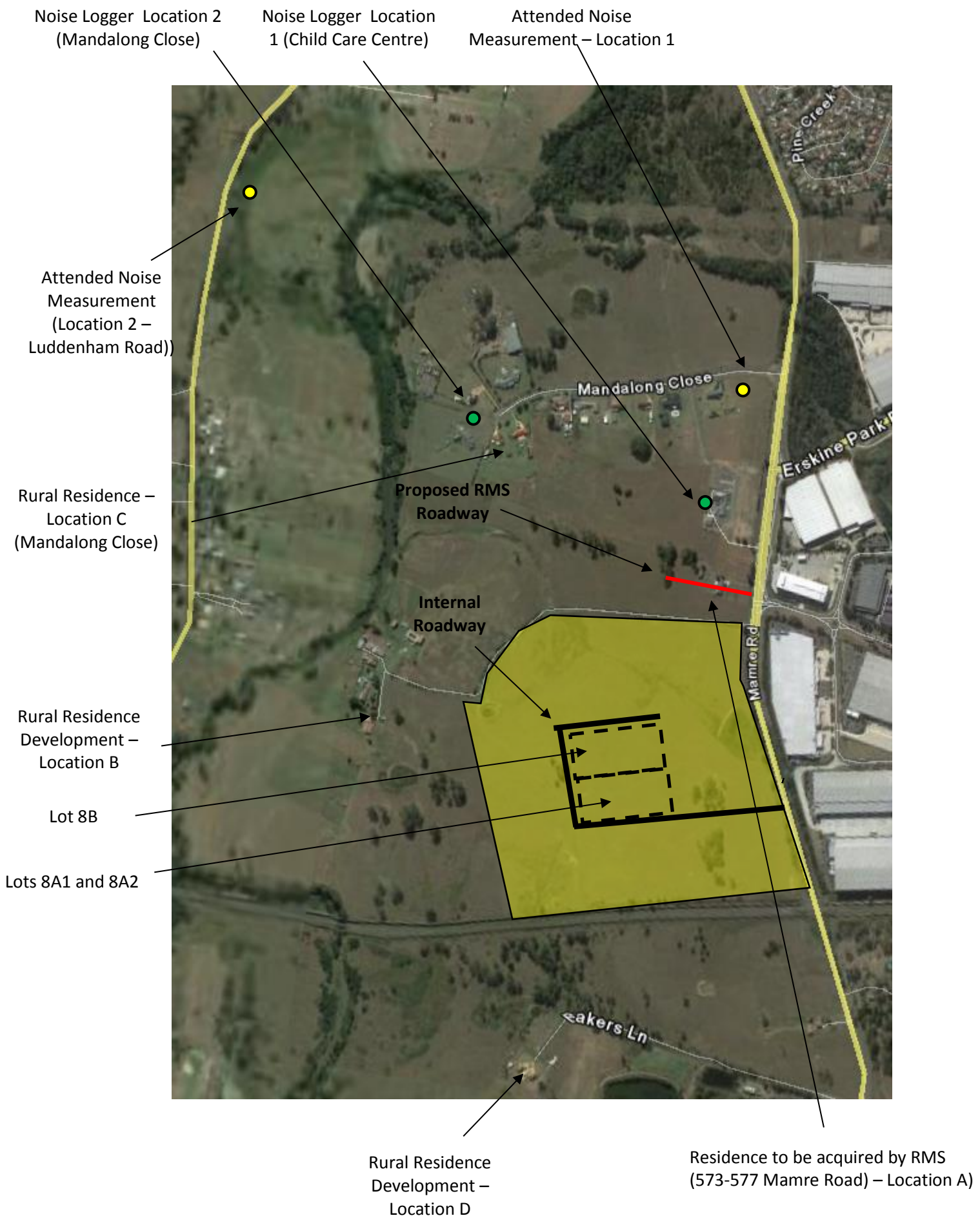
Vehicular access to the subdivision is via internal roadways within the subdivision, off Mamre Road.

Development in the vicinity of Lot 8 is as follows:

- Lot 8 is the central Lot within the subdivision, and bounded in all directions by other industrial lots (with internal roadways separating the lots in some circumstances).
- The nearest residential development to Lot 8 is as follows:
 - The nearest residential development (Residence – Location A, 573-577 Mamre Road) Bakers Lane) lies approximately 500m to the north-east, although we note that this site is proposed to be acquired by the Roads and Maritime Service.
 - The next nearest residence is at Location B, 570m away, which is owned by the developer of the subdivision.
 - The nearest residences that are not proposed for imminent acquisition or owned by the developer are:
 - Those on Mandalong Close (Location C – north of the site), approximately 750m away and
 - Residence on Bakers Lane (Location D – south of the site), approximately 750m away.

The primary existing noise source in the vicinity of the site is road traffic from Mamre Road.

See aerial photograph below.



3 NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principle measurement parameters are used, namely L_{Max} , L_{90} and L_{eq} .

The L_{90} measurement parameter is a statistical level that represent the average minimum noise levels (quietest 10%), over the measurement intervals.

The L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new 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.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15 minute period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

L_{Max} level represents is the loudest noise event during a measurement period, and is used in the assessment of sleep disturbance for intermittent peak noise events at night time.

4 SURVEY OF AMBIENT NOISE

At the project approval stage for the rezoning and subdivision of the precinct, both long term unattended noise logging, and attended noise measurements were conducted to quantify the existing acoustic environment at the site (*Operational Noise Assessment – Proposed Industrial Rezoning Mamre West Land Investigation Area* by Acoustic Logic , ref 20151211.2/1013A/R10/TT dated 23/2/2016).

Unattended noise monitoring was conducted between 4 to 11 September 2015. Monitoring was conducted using two Acoustic Research Laboratories monitors set on A-weighted fast response mode. The monitors were calibrated before and after the measurements using a Rion Type NC-73 calibrator. No significant drift was recorded. The monitoring location is shown in section 2.

In addition, an attended measurement was made on 11 September 2015 to measure existing noise levels generated by traffic on Mamre and Luddenham Roads. This measurement was made using a Norsonic 118 Type 1 Sound Analyser set on A-weighted, fast response mode.

All measurement locations are marked in the aerial photograph in Section 2.

Periods of adverse weather have been eliminated when determining the rating background noise level at the site, which is presented below. Weather monitoring data has been taken from the Badgery’s Creek weather station.

Measured noise levels (both the average/ L_{eq} and rating background noise level) are presented below. Average/ L_{eq} noise levels at the residences are dominated by distant road traffic noise.

Table 1 – Long Term Noise Logging Data

Location	Time of Day		
	Daytime (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
Noise Logger Location 1 (applicable to 573-577 Mamre Road – Resident A)	50dB(A) $L_{eq(Period)}$ 38dB(A) L_{90}	50dB(A) $L_{eq(Period)}$ 38dB(A) L_{90}	46dB(A) $L_{eq(Period)}$ 33dB(A) L_{90}
Noise Logger Location 2 (applicable to Residents B, C and D)*	50dB(A) $L_{eq(Period)}$ 38dB(A) L_{90}	50dB(A) $L_{eq(Period)}$ 34dB(A) L_{90}	46dB(A) $L_{eq(Period)}$ 34dB(A) L_{90}

*See aerial photo, section 2. This logger will be representative of noise receivers located away from Mamre Road.

Table 2 – Attended Noise Measurement (Road Traffic Noise)

Location	Measured Noise Level - Daytime
Attended Measurement – Location 1 (40m from Mamre Road)	64dB(A) _{Leq(15hr)}
Attended Measurement – Location 2 (10m from Luddenham Road)	68dB(A) _{Leq(15hr)}

5 NOISE EMISSION CRITERIA

The following noise controls and guidelines will be used in the acoustic assessment of the site:

- Mamre West DCP.
- The Penrith DCP.
- The EPA Noise Policy for Industry.
- The EPA Road Noise Policy
- The EPA document –Assessing Vibration, A Technical Guideline.
- The EPA Interim Construction Noise Guidelines.

5.1 THE MAMRE WEST DCP

Section 6.5 of the Mamre West DCP addresses noise and vibration from the site. It is an objective of the DCP to “avoid significant environmental impacts arising from industrial development”.

The DCP, however, does not state any specific numerical noise emission goals. In the absence of this, the noise emission criteria of the EPA Industrial Noise Policy will be adopted, as this is the most commonly used guideline for the assessment of industrial noise. The noise emission requirements of the Industrial Noise Policy are set out in section 5.3 of this report.

We note that the “Controls” section of part 6.5 requires that where feasible, building form be used to provide noise screening, and the, amongst other things, any acoustic assessment should address vehicle movements, noise external activities (such as use of forklifts or similar) and to recommend any necessary noise attenuation treatments or management controls. Assessment of typical noise sources is set out in section 6 of this report, and the necessary building./management controls set out in section 7.

5.2 THE PENRITH DCP

Sections 12.1 and 12.4 of the Penrith DCP address noise impacts associated with industrial development.

Both sections of DCP note the importance of maintaining residential amenity.

Section 12.4 refers to the EPA Industrial Noise Policy (now the Noise Policy for Industry) in the assessment of plant and equipment noise generated by the site. This is discussed in detail below.

Section 12.1 deals with noise from traffic associated with a site, and refers to the guidelines of relevant state government authorities. In this case, this will be the EPA Road Noise Policy (also discussed below).

5.3 EPA NOISE POLICY FOR INDUSTRY

Noise sources covered by this code will include vehicle noise (generated on the site) and any activity/mechanical services noise generated on site.

Both the Intrusiveness and the Amenity criteria (as set out below) must be complied with.

5.3.1 NPfl - Intrusiveness Assessment

Intrusiveness criteria permit noise generation to be no more than 5dB(A) above existing background noise levels. The criteria are as follows:

Table 3 – EPA Intrusiveness Criteria (Residential Receiver A – 573-577 Mamre Road)

Location	Time of Day	Background noise Level - dB(A) _{L90}	Intrusiveness Noise Objective dB(A) _{Leq(15min)} (Background + 5dB)
All Potentially Affected Residential Properties	Day Time (7am - 6pm)	38	43
	Evening (6pm - 10pm)	38	43
	Night (10pm - 7am)	33	38

Table 4 – EPA Intrusiveness Criteria (Residential Receivers B, C and E)

Location	Time of Day	Background noise Level - dB(A) _{L90}	Intrusiveness Noise Objective dB(A) _{Leq(15min)} (Background + 5dB)
All Potentially Affected Residential Properties	Day Time (7am - 6pm)	38	43
	Evening (6pm - 10pm)	34	39
	Night (10pm - 7am)	34	39

5.3.2 NPfl – Project Amenity Assessment

The Amenity criteria set additional criteria based on the land use of the noise sensitive receivers.

Amenity criteria are as follows:

Table 5 – EPA Project Amenity Criteria

Receiver Location	Land Type	Time of Day	Amenity Noise Objective dB(A) _{Leq(15min)}
All Potentially Affected Residential Properties	Rural Residential	Day Time (7am – 6pm)	48
		Evening (6pm – 10pm)	43
		Night (10pm-7am)	38
Child Care Centre	All	When in use	55
Commercial	All	When in use	65
Industrial	All	When in use	70

5.4 SLEEP AROUSAL ASSESSMENT

Potential sleep arousal impacts should be considered for noise generated after 10pm.

Sleep arousal is a function of both the noise level and the duration of the noise.

As recommended in the NPfI, to assess potential sleep arousal impacts, a two-stage test is carried out:

- Step 1 – Section 2.5 *Maximum noise level event assessment* from the NPfI states the following:

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

- *$L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
- *L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater,*
a detailed maximum noise level event assessment should be undertaken.

Based on the above the following noise objectives apply:

Table 6 – Sleep Arousal Criteria (Average/ L_{eq} Noise Levels)

Location	Rating Background Level $dB(A)L_{90}$	Rating Background Level + 5 $dB(A)$	Governing Criteria $dB(A)L_{eq}(15mins)$
Receiver A	33	38	40
Receivers B and C	34	39	40

Table 7 – Sleep Arousal Criteria (Maximum/ L_{Max} Noise Events)

Location	Rating Background Level $dB(A)L_{90}$	Rating Background Level + 15 $dB(A)$	Governing Criteria $dB(A)L_{(Max)}$
Receiver A	33	48	52
Receivers B and C	34	49	52

- Step 2 - If there are noise events that could exceed the average/maximum criteria detailed in the tables above, then an assessment of sleep arousal impact is required to be carried out taking into account the level and frequency of noise events during the night, existing noise sources, etc. This test takes into account the noise level and number of occurrences of each event with the potential to create a noise disturbance. As is recommended in the explanatory notes of the EPA Industrial Noise Policy, this more detailed sleep arousal test is conducted using the guidelines in the EPA Road Noise Policy. Most relevantly, the Road Noise Policy states:

For the research on sleep disturbance to date it can be concluded that:

- *Maximum internal noise levels below 50-55 $dB(A)$ are unlikely to awaken people from sleep.*
- *One to two noise events per night with maximum internal noise levels of 65-70 $dB(A)$ are not likely to affect health and wellbeing significantly.*

5.5 NOISE FROM INCREASED TRAFFIC GENERATION ON PUBLIC STREETS

For land use developments with the potential to create additional traffic on public streets the development should comply with the EPA Road Noise Policy.

Noise levels generated by traffic should not exceed the noise levels set out in the table below when measured at a nearby building facade.

Table 8 – Criteria for Traffic Noise Generated By New Developments

Road Type	Time of day	Permissible Noise Generation
Sub-Arterial (Mamre Road)	Day (7am to 10pm)	60dB(A) _{Leq(15hr)}
	Night (10pm to 7am)	55dB(A) _{Leq(9hr)}

However, if existing noise levels exceed those in the table above, section 3.4 of the Road Noise Policy is applicable, which requires noise impacts are reduced through feasible and reasonable measures. However, in determining what is feasible/reasonable, the Policy notes that an increase of less than 2dB(A) is a minor impact and would be barely perceptible.

5.6 CONSTRUCTION NOISE AND VIBRATION IMPACTS

5.6.1 EPA Interim Construction Noise Guidelines

EPA 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 effected” level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the “noise effected level”. For residential properties, the “noise effected” level occurs when construction noise exceeds ambient levels by more than:
 - 10dB(A) $L_{eq(15min)}$ for work during standard construction hours (7am-6pm Monday to Friday and 8am to 1pm on Saturdays) and
 - 5dB(A) $L_{eq(15min)}$ for work outside of standard construction hours.
- *“Highly noise affected level”.* Where noise emissions are such that nearby properties are “highly noise effected”, noise controls such as respite periods should be considered. For residential properties, the “highly noise effected” level occurs when construction noise exceeds 75dB(A) $L_{eq(15min)}$ at nearby residences.

A summary of noise emission goals for both standard hours of construction and outside standard hours are presented.

Table 9 – Construction Noise Emission Goals

Location	“Noise Affected” Level - dB(A) $L_{eq(15min)}$	“Highly Noise Affected” Level - dB(A) $L_{eq(15min)}$
Residences	48 (Standard Construction Hours)	75
Commercial	70	N/A
Industrial	75	N/A

5.6.2 Construction Vibration

Vibration goals for the amenity of nearby land users are those recommended by the EPA document *Assessing Vibration: A technical guideline*. These levels are presented below:

Table 10 – Construction Vibration Goals

Location	Time	Peak velocity (mm/s)	
		Preferred	Maximum
Continuous Vibration			
Residences	Daytime	0.28	0.56
Commercial/Industrial	When in use	0.56	1.12
Impulsive Vibration			
Residences	Daytime	8.6	17
Commercial/Industrial	When in use	18	36

6 NOISE EMISSION ASSESSMENT

An assessment of operational and construction noise is presented below. The following noise sources are assessed:

- Operational noise from the proposed IMCD site (Warehouse 8B) and Warehouse 8A, consisting of:
 - Noise from internal activities within the warehouses (use forklifts or similar for materials handling).
 - Heavy vehicles on site (in external areas).
 - An assessment of noise from mechanical plant.
 - Noise from a refrigerated container (Lot 8B only).
- An assessment of construction noise.

6.1 WAREHOUSE 8A1 AND 8A2 (IMCD)

6.1.1 On-site noise (vehicle ingress/egress, materials handling, refrigerated container).

Noise generated on the site is assessed with reference to the EPA Noise Policy for Industry.

In predicting operational noise emissions, the following assumptions have been made:

- That there are heavy vehicle movements on site. During a typical 15 minute period, we have assumed:
 - There will be one inbound or outbound semitrailer movement to/from Warehouse 8A or 8B (ie – two movements at the site in a 15 minute period).
 - A sound power of 100-105dB(A) has been adopted for the heavy vehicle (b-double).
- The continuous operation of two compressors serving refrigerated containers in the hardstand area of Warehouse 8A2. The compressor is assumed to have a sound pressure level of 85dB(A) at 1m distance (typical in our experience).
- Continuous operation of a forklift (sound power 94dB(A)) in the hardstand area.
- The cumulative impact of both the vehicle noise, compressor noise and the internal activity noise is taken into account.

In addition, the predictions also take into account:

- Air-absorption.
- For night time operations, the noise increase as a result of adverse weather (temperature inversion at night) is taken into account.

No noise reduction for shielding from warehouses on other lots has been taken into account. As the remaining lots within the precinct are developed, noise from Lot 8 will become increasingly shielded by new warehouses that will lie between the sites. Ignoring this screening makes this assessment extremely conservative.

As is consistent with EPA guidelines when assessing rural development, the noise emissions are assessed at point on the residential properties which is 30m from the location of the house.

Table 11 – Noise Impact Assessment (Evening/Night)

Noise Source	Noise Receiver Location	Predicted Noise Level * dB(A) _{Leq(15min)}	Compliance
Vehicles on Site, Internal Activities, Refrigeration Container	Residential Receiver A (573-577 Mamre Road)	30dB(A) _{Leq(15min)} *	Complies – Night time criteria (38dB(A) _{Leq(15min)} , table 4)
	Residential Receiver B (West of Site)	35dB(A) _{Leq(15min)} *	Complies – Night time criteria (39dB(A) _{Leq(15min)} , table 4)
	Residential Receiver C (Mandalong Close)	33dB(A) _{Leq(15min)} *	Complies – Night time criteria (39dB(A) _{Leq(15min)} , table 4)
	Residential Receiver D (Bakers Lane)	36dB(A) _{Leq(15min)} *	Complies – Night time criteria (39dB(A) _{Leq(15min)} , table 4)
	Old McDonald Child Care Centre	30dB(A) _{Leq(15min)}	Complies – When in use (55dB(A) _{Leq(15min)} , table 5)

* Predictions takes into account air absorption and adverse weather conditions (wind or temperature inversion at night time). Calculation done as per table 5.10 *Engineering Noise Control* Beis and Hansen 1988.

We note that analysis of noise emissions indicates that even an even an extremely conservatively high level of assumed level of vehicle use will still be compliant with EPA noise emission guidelines, even during the night time period.

In addition, we note:

- Predicted noise emissions are at least 4dB(A) below noise emission goals, even when adopting an extremely conservatively high level of use at the site (multiple band saws).
- Being 4dB(A) or more below criteria will ensure that other development within the sub-division can occur without risk that Lot 8 will contribute significantly to an excessive cumulative noise impact.
- Given that Lot 8 is located in the middle of the industrial subdivision, the predicted noise emission presented above will further decrease as the remaining lots are developed, with the warehouses creating noise barriers between Lot 8 and the residences.

6.1.2 Noise Generated by Additional Traffic on Public Roads

Noise generated by additional traffic generated by the precinct as a whole has been addressed in the acoustic assessments conducted for the rezoning and subdivision of the industrial precinct as a whole (*Operational Noise Assessment – Proposed Industrial Re-zoning Mamre West Land Investigation Area* by Acoustic Logic , ref 20151211.2/1013A/R10/TT dated 23/2/2016).

6.1.3 Transient Noise Events (Sleep Arousal)

Noise events occurring between 10pm and 7am should be assessed for potential sleep disturbance impacts on nearby residents.

The primary potential noise source will be the use of the pneumatic valve which engages when a truck stops. Based on measurements conducted by this office, the sound power of this noise event is 113dB(A)_{L_{Max}}.

The noise emissions at the window of the nearest residences are presented below. Predictions take into account distance correction and air absorption.

Table 12 – Sleep Arousal Assessment (Truck Air-brake)

Receiver Location	Noise Source	Predicted Noise Level	Noise Limit	Compliance
Residential Receiver A (573-577 Mamre Road)	Truck Brake	37dB(A) _{L_{Max}} *	52dB(A) _{L_{Max}}	Complies.
Residential Receiver B (West of Site)	Truck Brake	42dB(A) _{L_{Max}} *	52dB(A) _{L_{Max}}	Complies.
Residential Receiver C (Mandalong Close)	Truck Brake	40dB(A) _{L_{Max}} *	52dB(A) _{L_{Max}}	Complies.
Residential Receiver D (Bakers Lane)	Truck Brake	40dB(A) _{L_{Max}} *	52dB(A) _{L_{Max}}	Complies.

* Prediction takes into account air absorption and adverse weather conditions (wind or temperature inversion). Calculation done as per table 5.10 *Engineering Noise Control* Beis and Hansen 1988.

Noise emissions from the truck brake are predicted to be less than the 52dB(A) noise limit set for intermittent peak noise events in table 7.

On this basis, use of the site between 10pm and 7am to allow for vehicles to enter/leave the site) is compliant with EPA sleep disturbance guidelines.

6.1.4 Mechanical plant

Detailed review of all external mechanical plant should be undertaken at construction certificate stage (once plant selections and locations are finalised). Acoustic treatments should be determined in order to control plant noise emissions to the required levels set out in section 5 of this report.

Compliance with noise emission requirements will be achievable with appropriate acoustic treatment. It is unlikely that any large externally located equipment (even if used at night) will require acoustic treatment.

We note:

- Noise from the operation of a refrigeration compressor serving proposed outdoor refrigeration containers in Lot 8A2 has been addressed in section 6.1.1.
- Primary external mechanical plant is likely to consist of air-conditioner condensers serving office areas and smoke exhaust fans.
- Smoke exhaust fans operate only in emergency, and are exempt for typical operational noise controls.
- Condensers serving office areas will typically have a noise pressure level of no more than 65dB(A) at 1m distance, and will not require any form of acoustic treatment to ensure compliant noise emissions.
- If an occupant of warehouse 8A1 or 8A2 was to install large external equipment which is operated at night time (such as refrigeration plant or generator), in the event that the sound power of the plant exceeds 100dB(A), it is likely that a noise screen around the equipment item will be required (such that the line of sight between the equipment item and any residence is broken).

Detailed acoustic review should be undertaken at construction certificate stage, once equipment selections are finalised.

6.2 CONSTRUCTION IMPACTS

6.2.1 Construction Noise

With respect to construction noise, the impact on nearby development will be dependent on the activity in question and where on the site the activity is undertaken. Given that civil works at the site are complete, asphaltting works are likely to be the loudest construction activities associated with the site.

Equipment items will typically have sound power levels of approximately 110-115dB(A) $L_{eq(15min)}$. Predicted noise levels at nearby development are:

- Up to 49dB(A) L_{eq} , at the nearest residence (Receiver A - to the east) during construction of the Lot 8.
- This is minor exceedance of the EPA “Background+10dB(A)” noise emission goal for construction noise (48dB(A), during the daytime as per table 8), and would not typically require further noise management.
- Noise levels at other residences (Locations B, C and D to the west, north and south respectively) will comply with the 48dB(A) noise goal.

In light of the above, for Lot 8, construction noise management is not likely to be required, given the distance from the site to the nearest residences.

6.2.2 Construction Vibration

Excavation, earth retention and civil works are the primary vibration generating activities.

Given the distance between the Estate and the nearest residential buildings, it is unlikely that construction vibration will exceed EPA guidelines (for amenity) and *highly* unlikely to approach vibration levels with the potential to cause building damage. Construction vibration mitigation is not warranted.

7 DISCUSSION/RECOMMENDATIONS

Acoustic analysis indicates that:

- Operational noise from Lot 8 can comply with relevant EPA noise emission requirements.
- Given the comfortable degree of compliance, it is unlikely that Lot 8 will result in any significant cumulative noise impact when remaining Lots are taken into account.
- Noise from construction works in Lot 8 will generally comply with EPA construction noise guidelines.

To ensure ongoing compliance with EPA requirements:

- Between 10pm and 7am - It is assumed that there would not be more than two truck movements to the site in a 15 minute period.
- Trucks with tonal reversing beacons and use of diesel forklifts in external areas are not recommended in external areas on the site.
- Detailed review of any proposed external mechanical plant should be undertaken at CC stage (once equipment selections are known). Given the distance from the site to nearby residences, it is unlikely that any form of acoustic treatment will be needed, however this should be confirmed once equipment selections are finalised. This should include analysis of any external refrigeration equipment proposed for refrigerated containers for Warehouse 8B.
- An acoustic report accompanying any DA for use of Warehouse 8A should assess the precise level of vehicle noise anticipated for that site.

8 CONCLUSION

Noise emissions associated with the use of Lot 8 (warehouses 8A and 8B) at 585-649 Mamre Road, Orchard Hills have been assessed with reference to relevant EPA and Penrith Council acoustic guidelines.

An analysis of typical operational noise (vehicle, mechanical plant/equipment) indicates that:

- The proposed use of Lot 8 will be compliant with noise emission requirements provided that the recommendations in section 7 of this report are adopted.
- For the remaining units in the sub-division - the site is capable of complying with relevant noise emission criteria, even when considering the cumulative impact of multiple potential users of the Estate.

Noise associated with Lot 8 indicates that it is unlikely that exceedances of EPA construction noise goals will occur at nearby residences and it is unlikely that a detailed Construction Noise and Vibration Management Plan should be required in the event the development application for the site is approved.

Please contact us if you have any queries.

Yours faithfully,



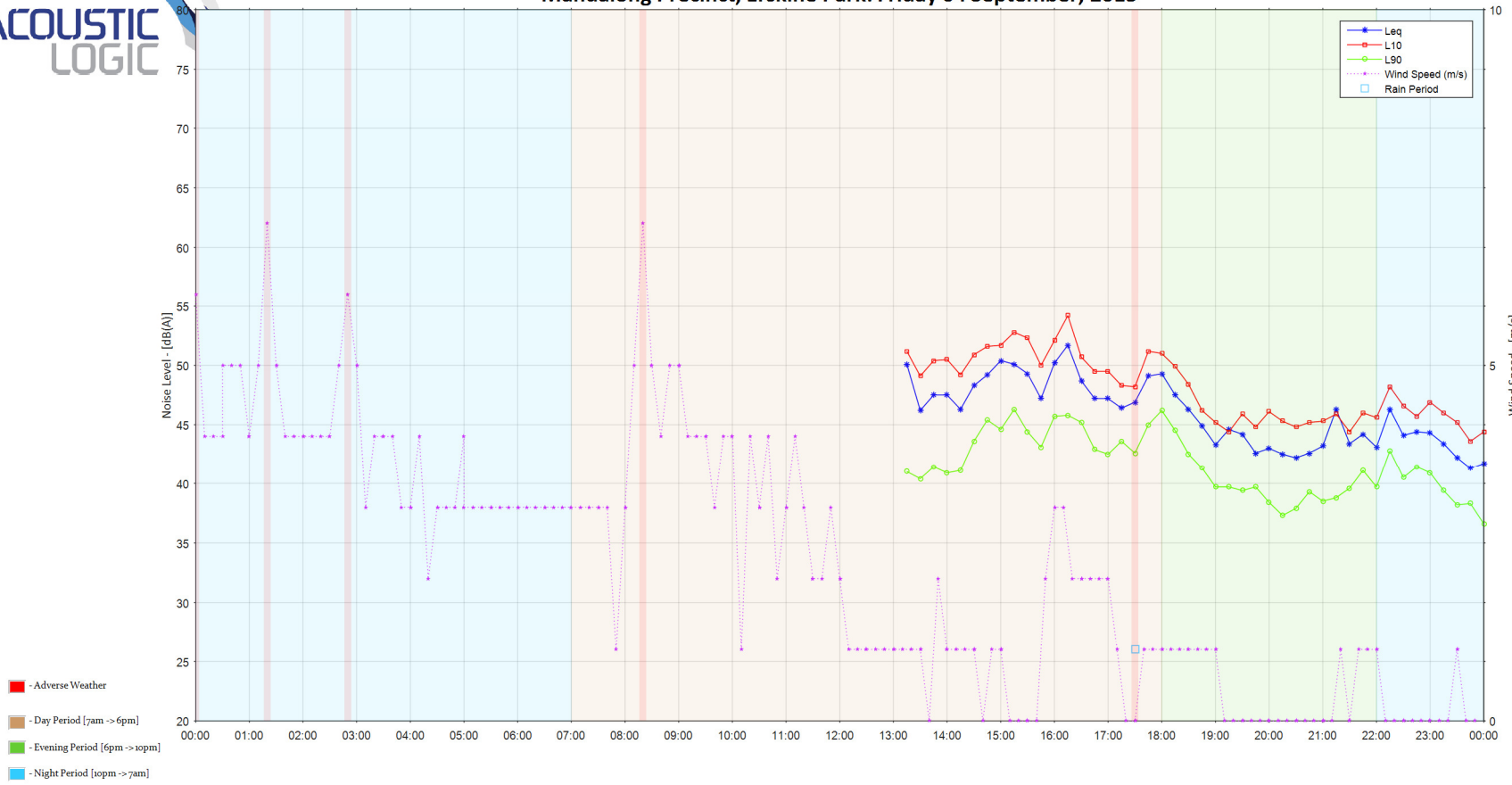
Acoustic Logic Consultancy Pty Ltd
Thomas Taylor

Appendix 1

Noise Logging Data – Location 1

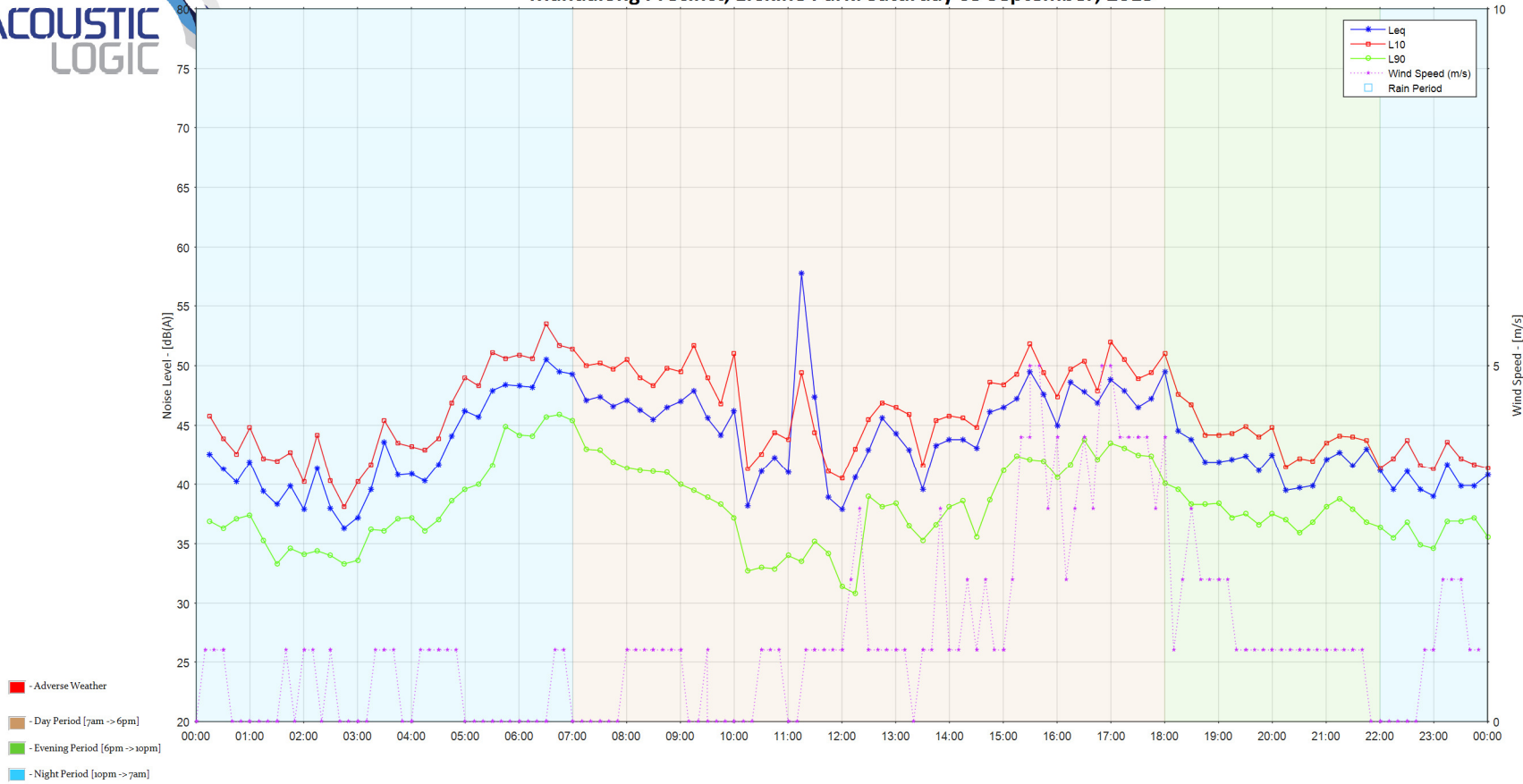


Mandalong Precinct, Erskine Park: Friday 04 September, 2015



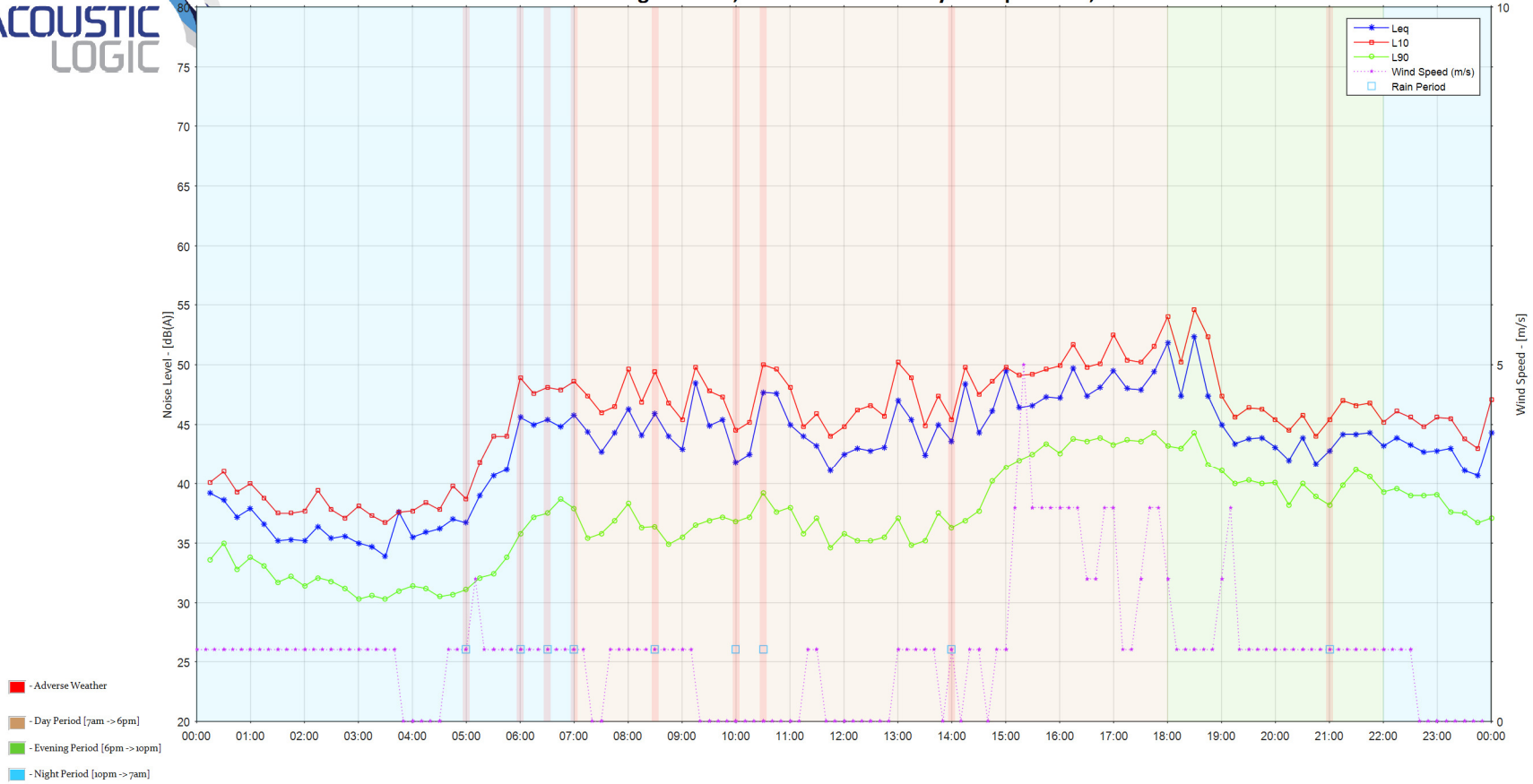


Mandalong Precinct, Erskine Park: Saturday 05 September, 2015



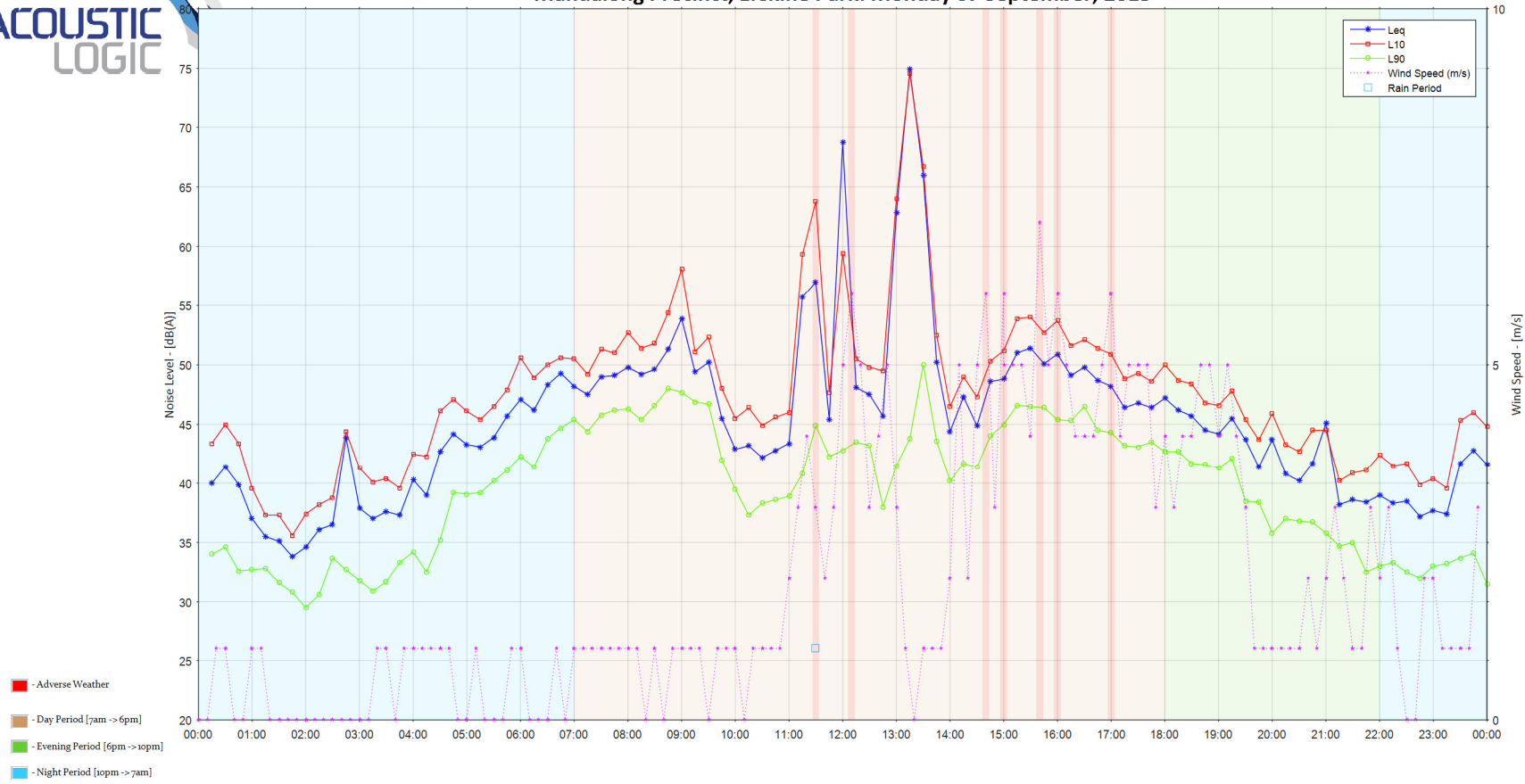


Mandalong Precinct, Erskine Park: Sunday 06 September, 2015



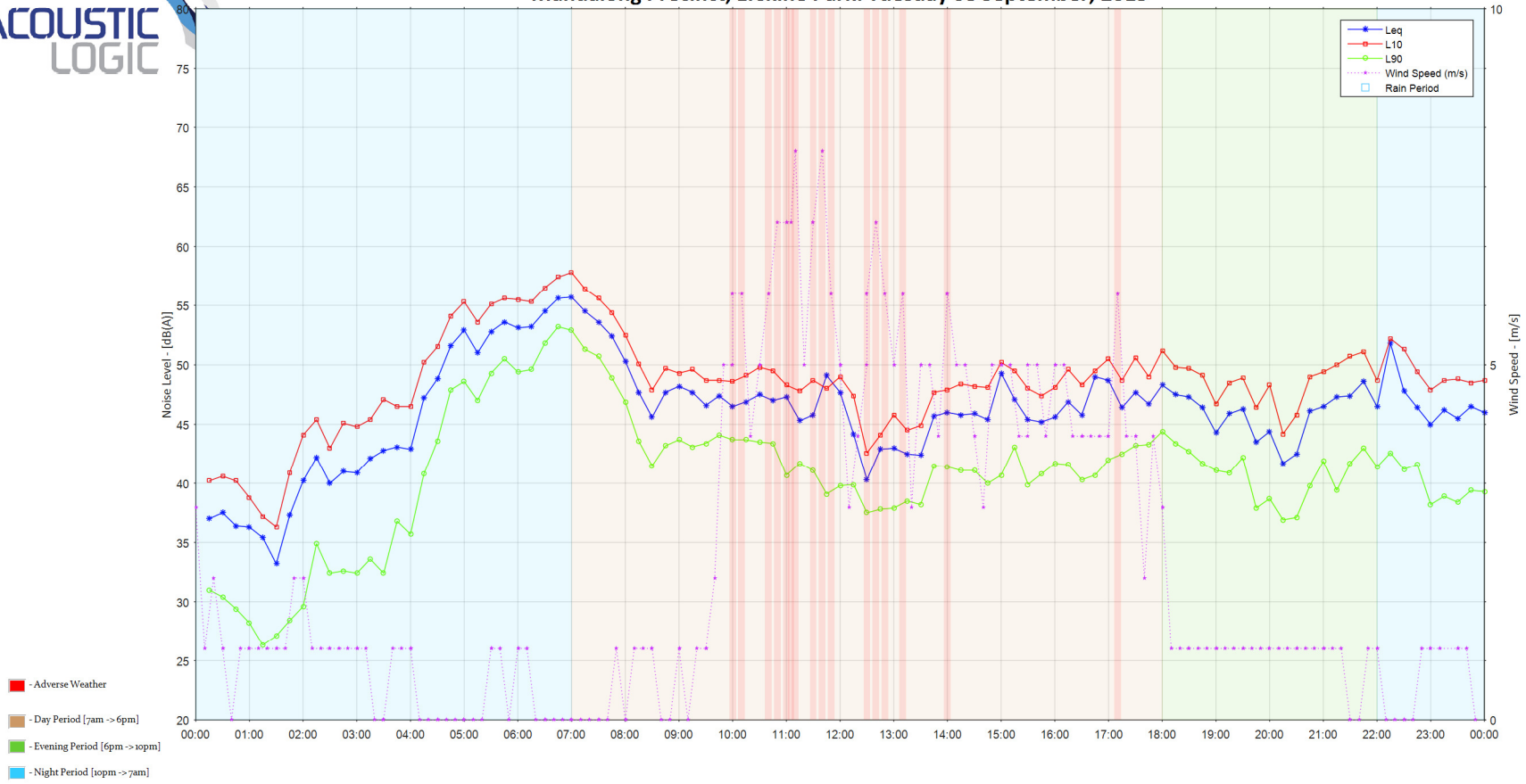


Mandalong Precinct, Erskine Park: Monday 07 September, 2015



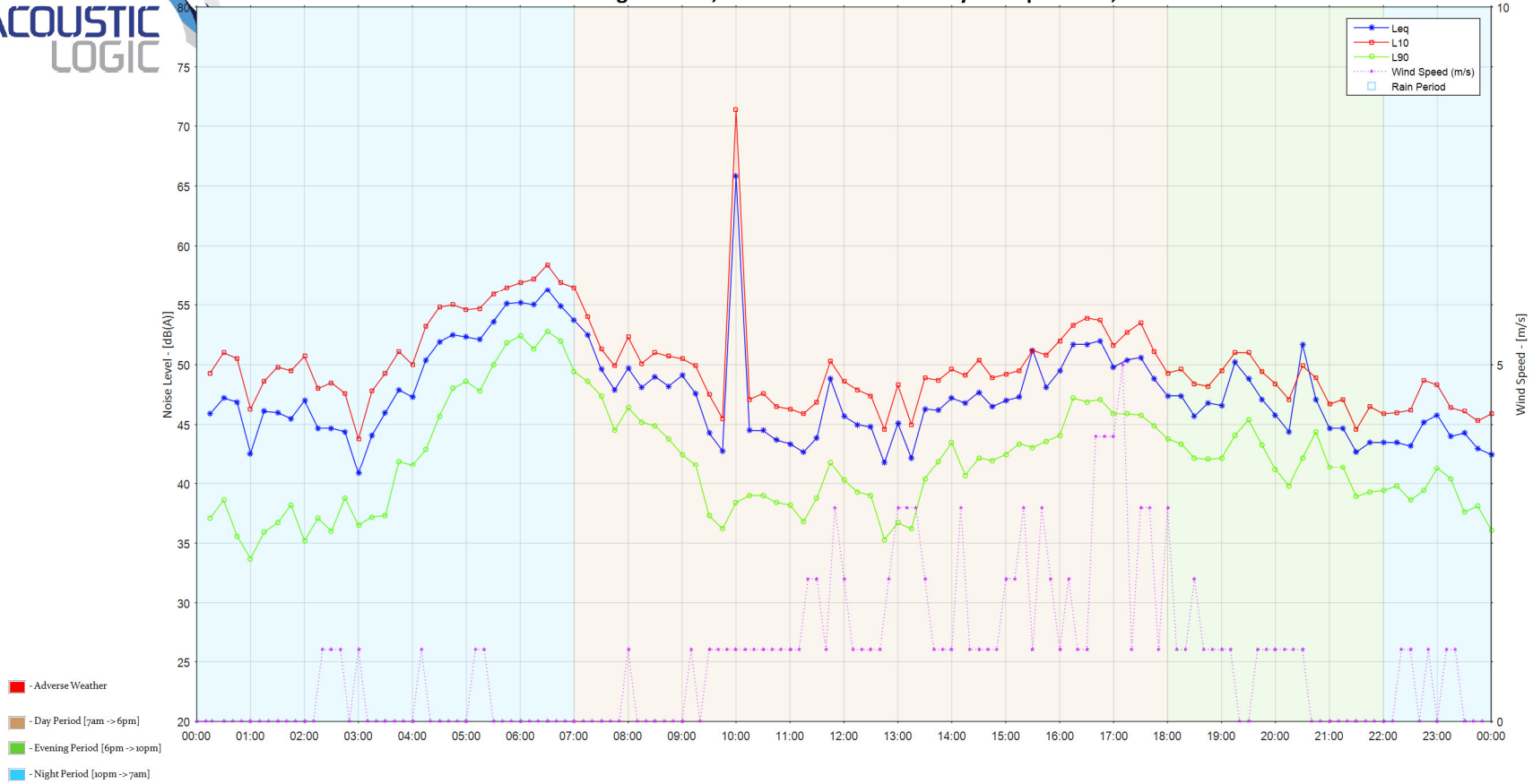


Mandalong Precinct, Erskine Park: Tuesday 08 September, 2015



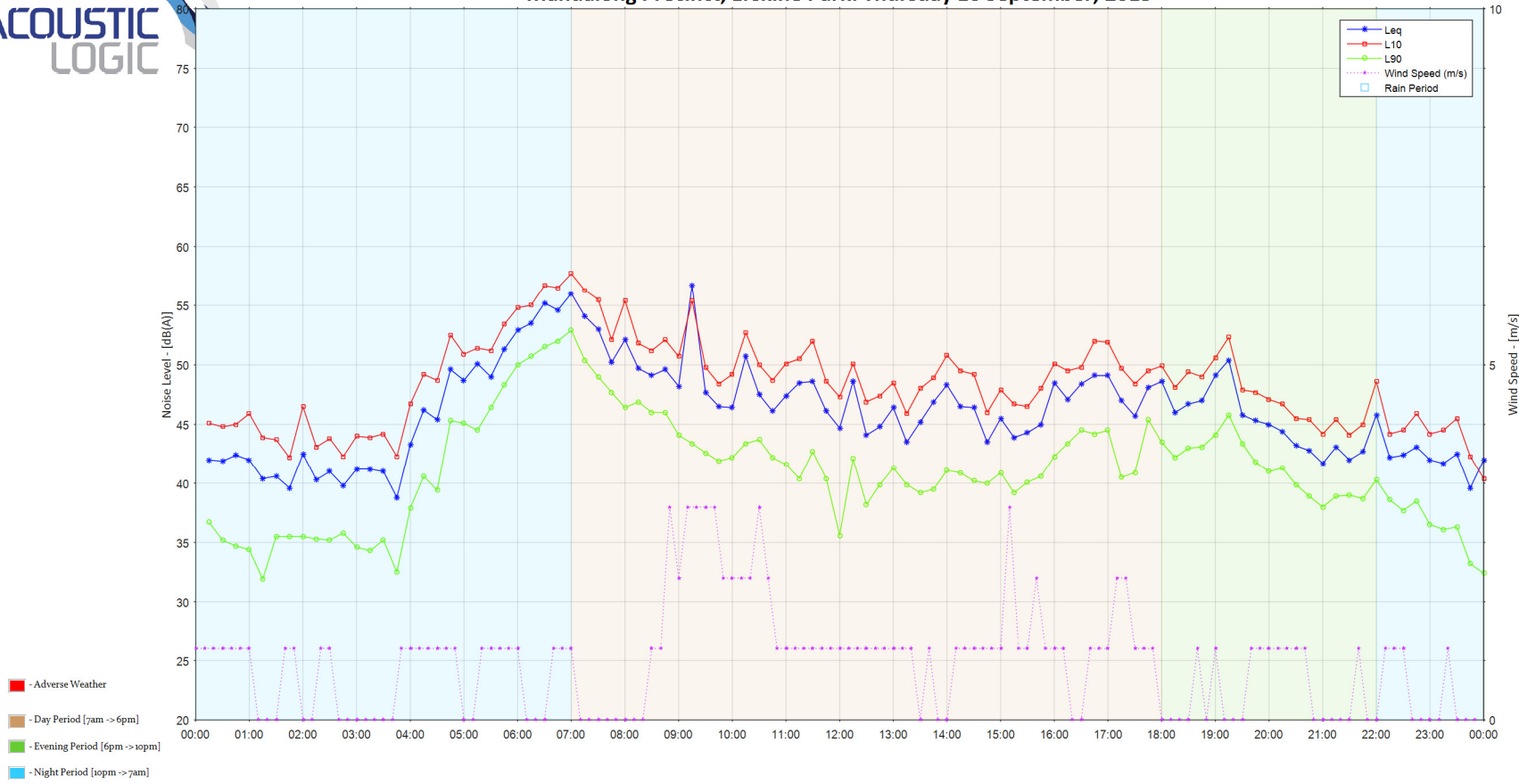


Mandalong Precinct, Erskine Park: Wednesday 09 September, 2015



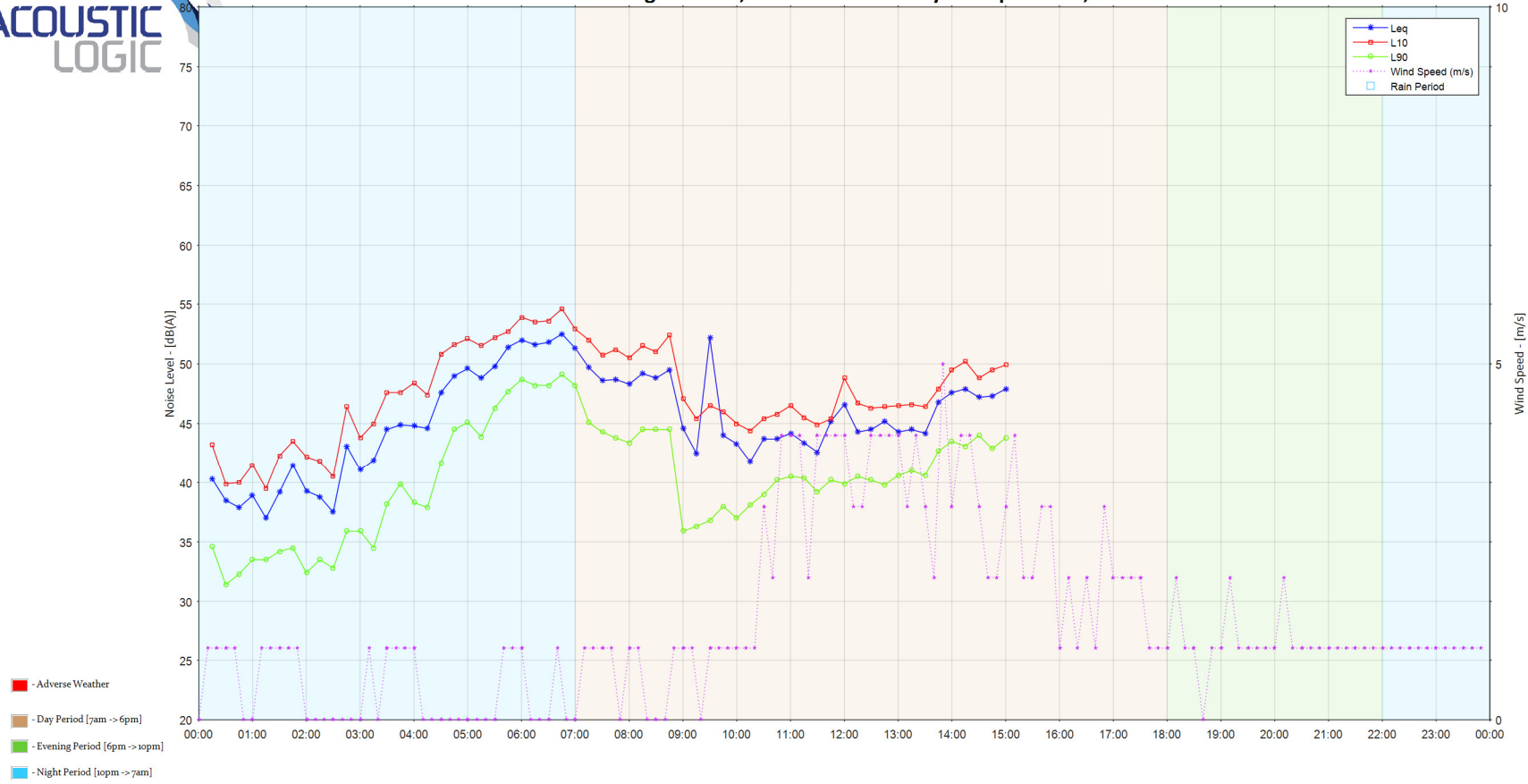


Mandalong Precinct, Erskine Park: Thursday 10 September, 2015





Mandalong Precinct, Erskine Park: Friday 11 September, 2015

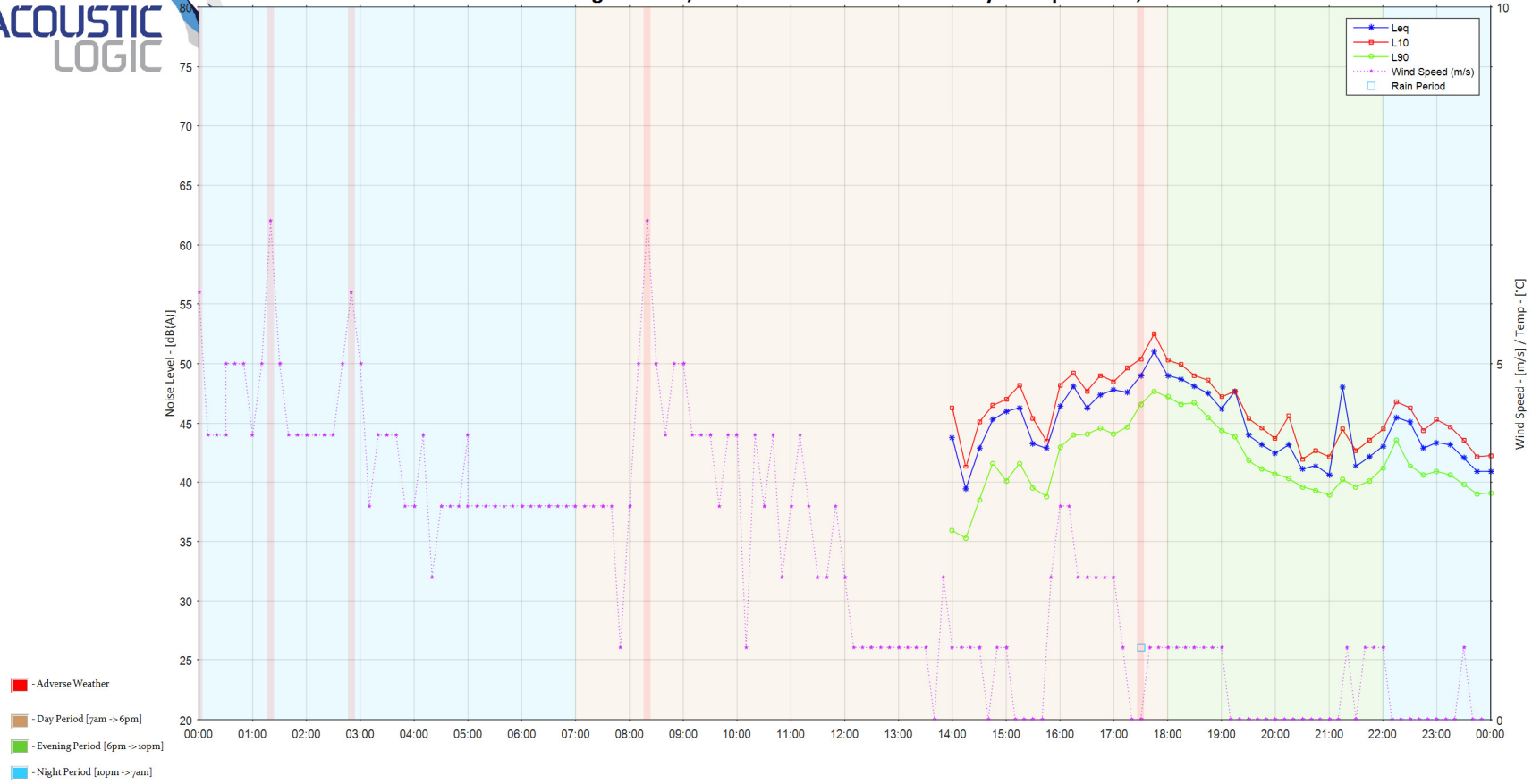


Appendix 2

Noise Logging Data – Location 2

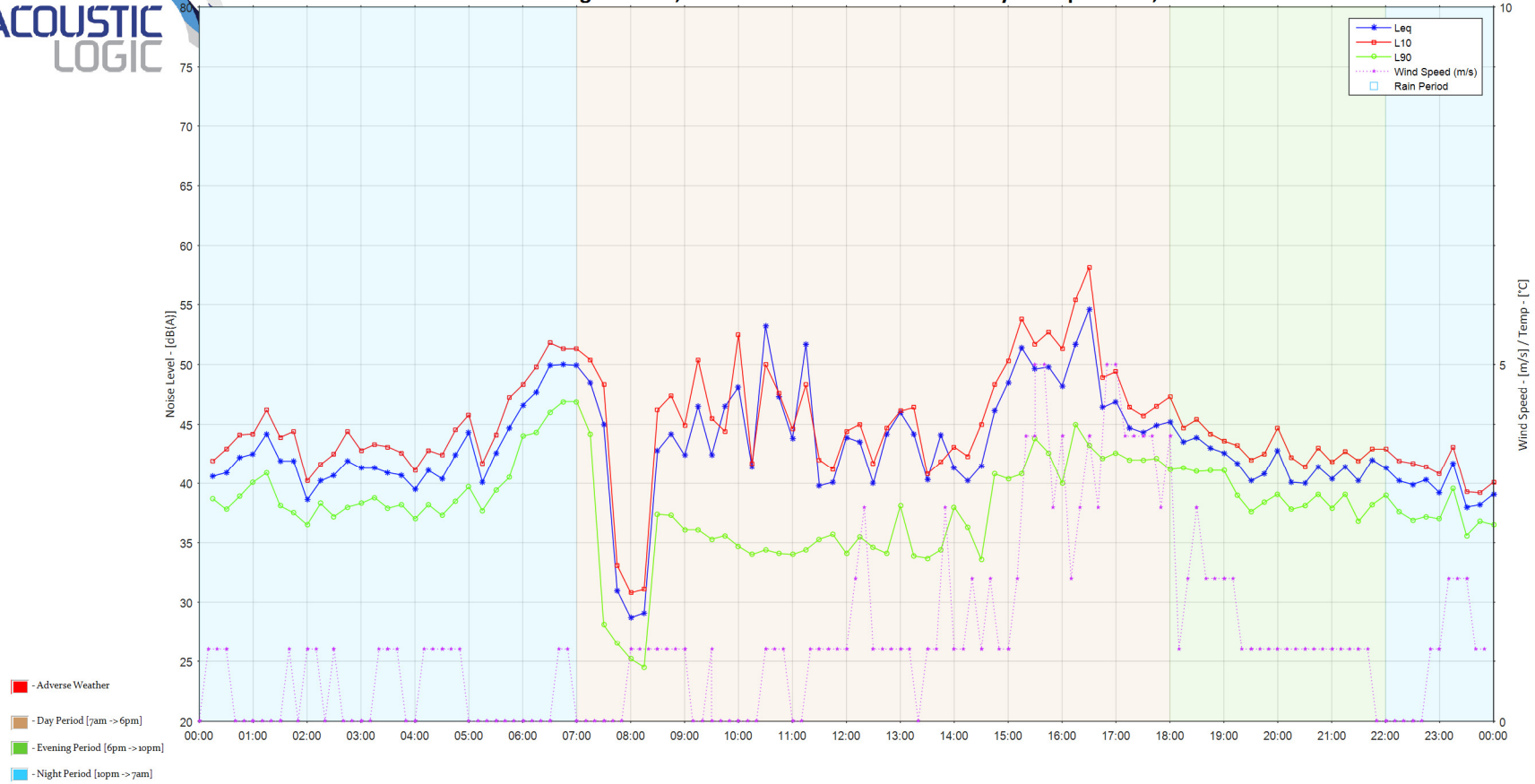


Mandalong Precinct, Erskine Park Location 2: Friday 04 September, 2015



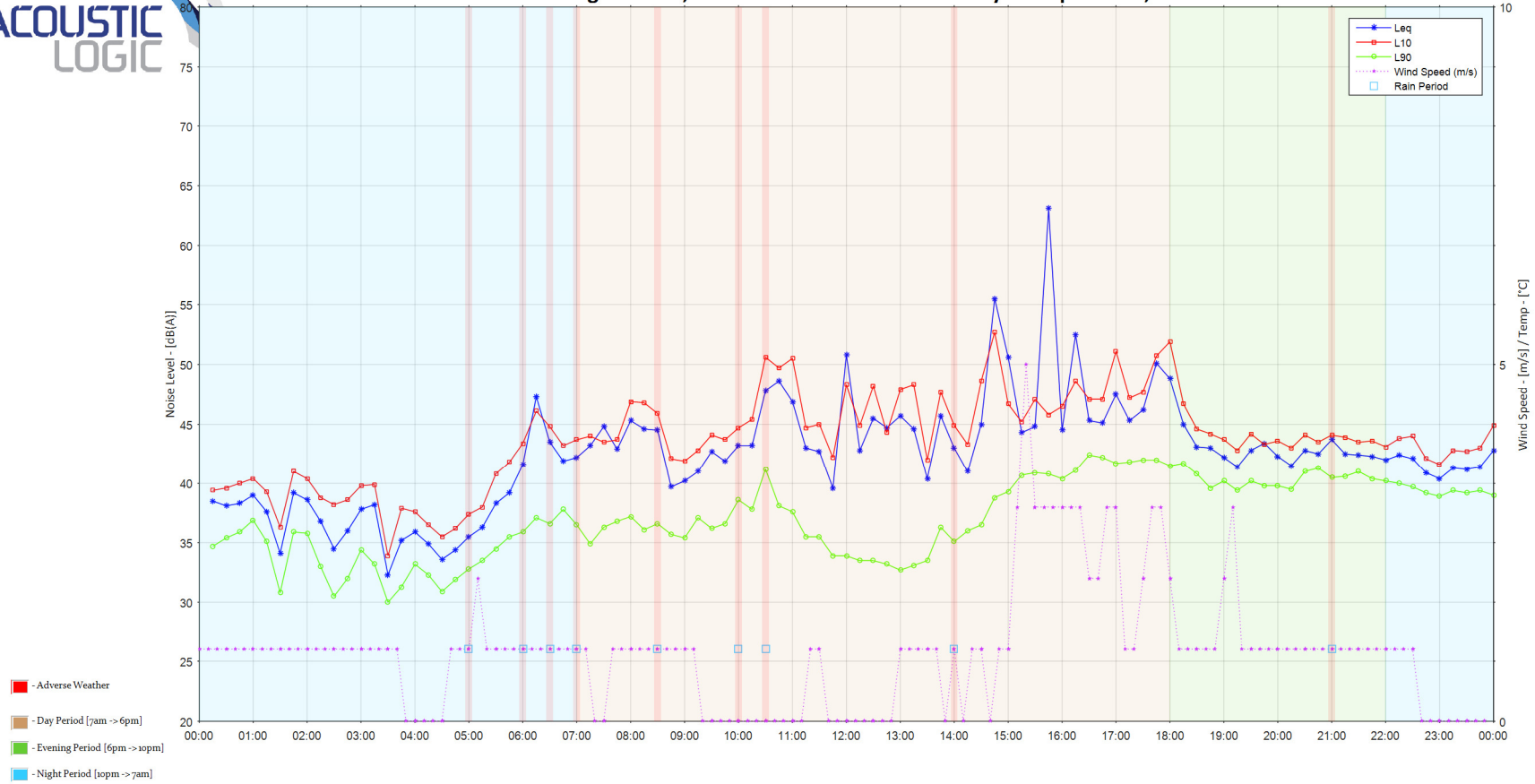


Mandalong Precinct, Erskine Park Location 2: Saturday 05 September, 2015



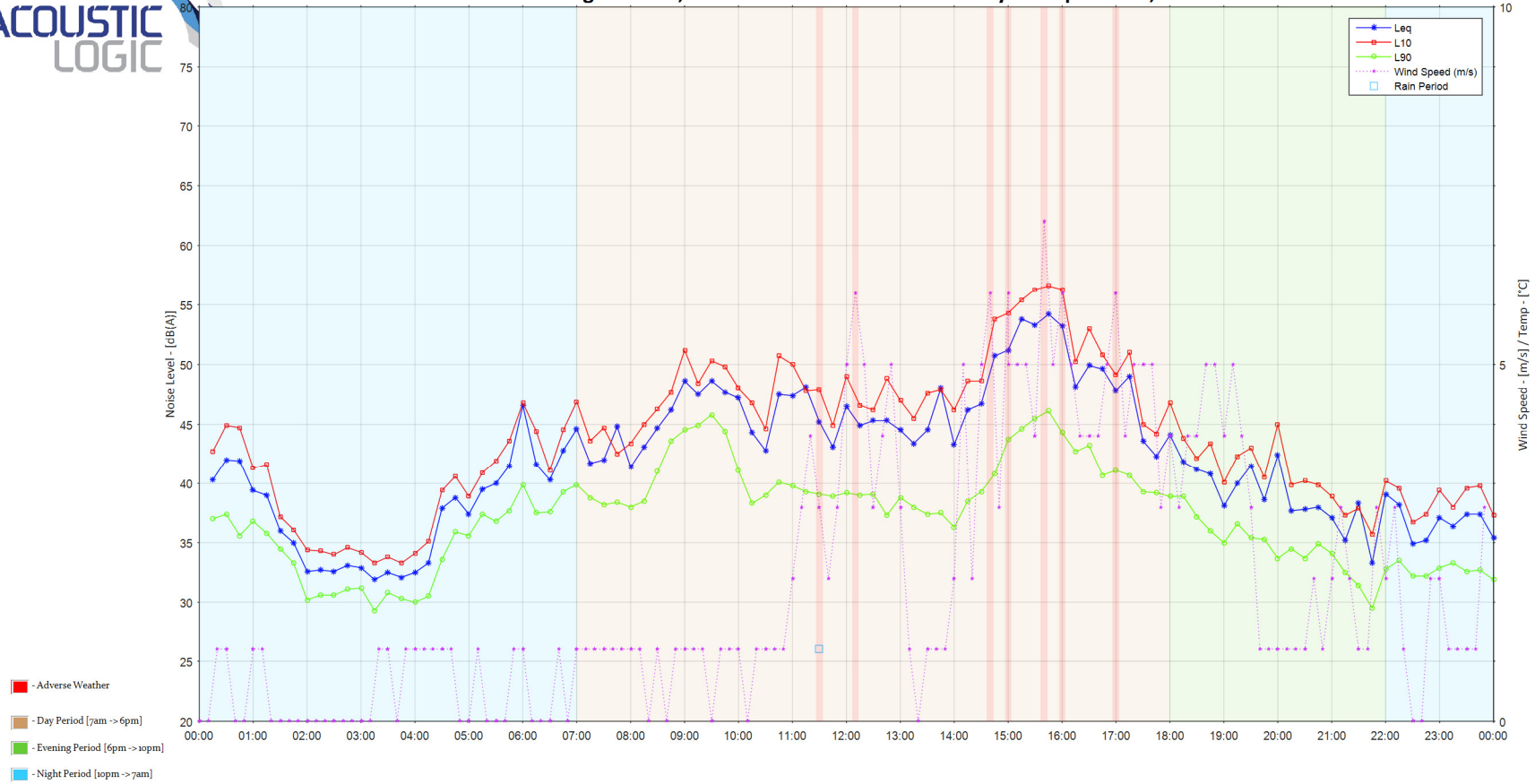


Mandalong Precinct, Erskine Park Location 2: Sunday 06 September, 2015



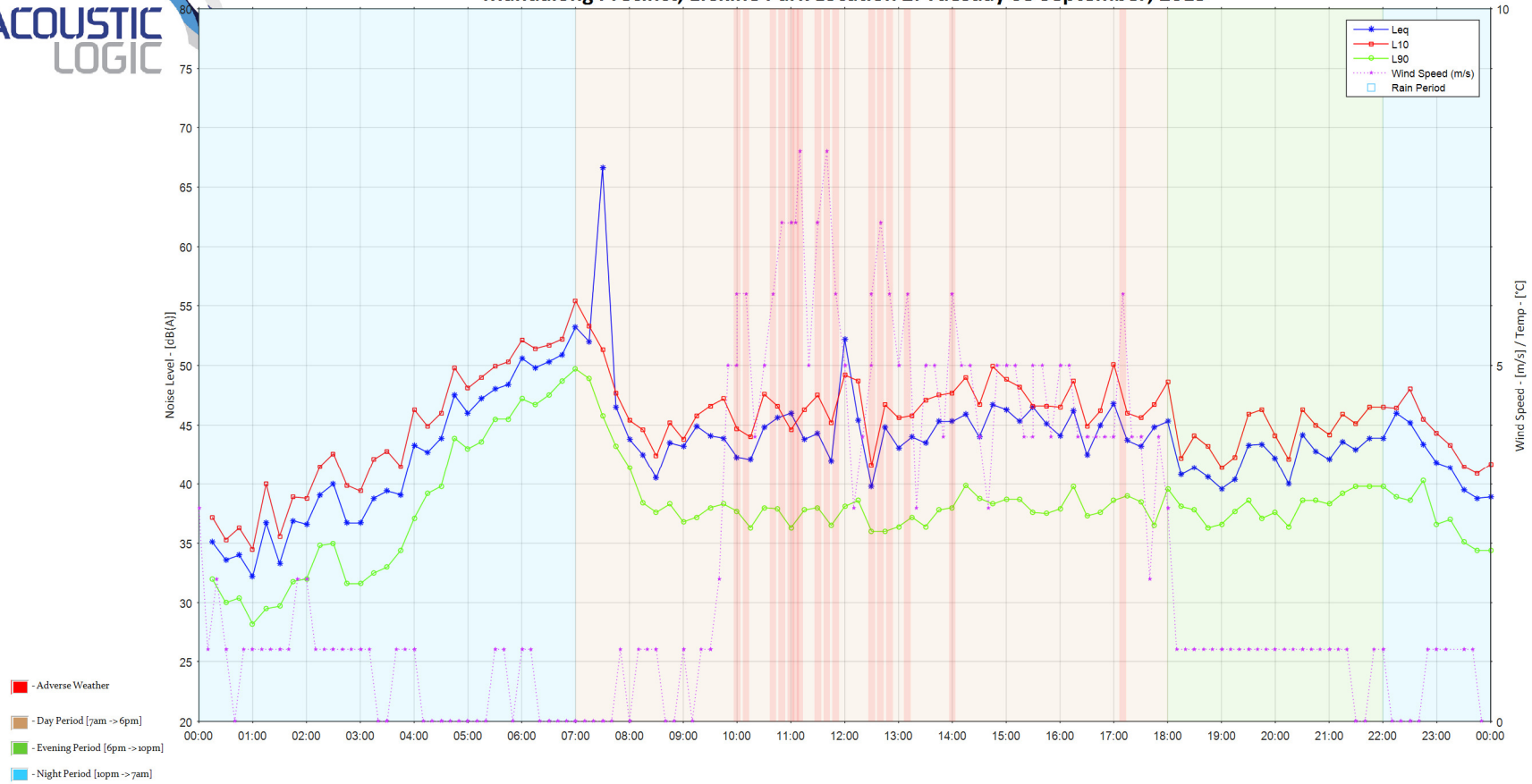


Mandalong Precinct, Erskine Park Location 2: Monday 07 September, 2015





Mandalong Precinct, Erskine Park Location 2: Tuesday 08 September, 2015



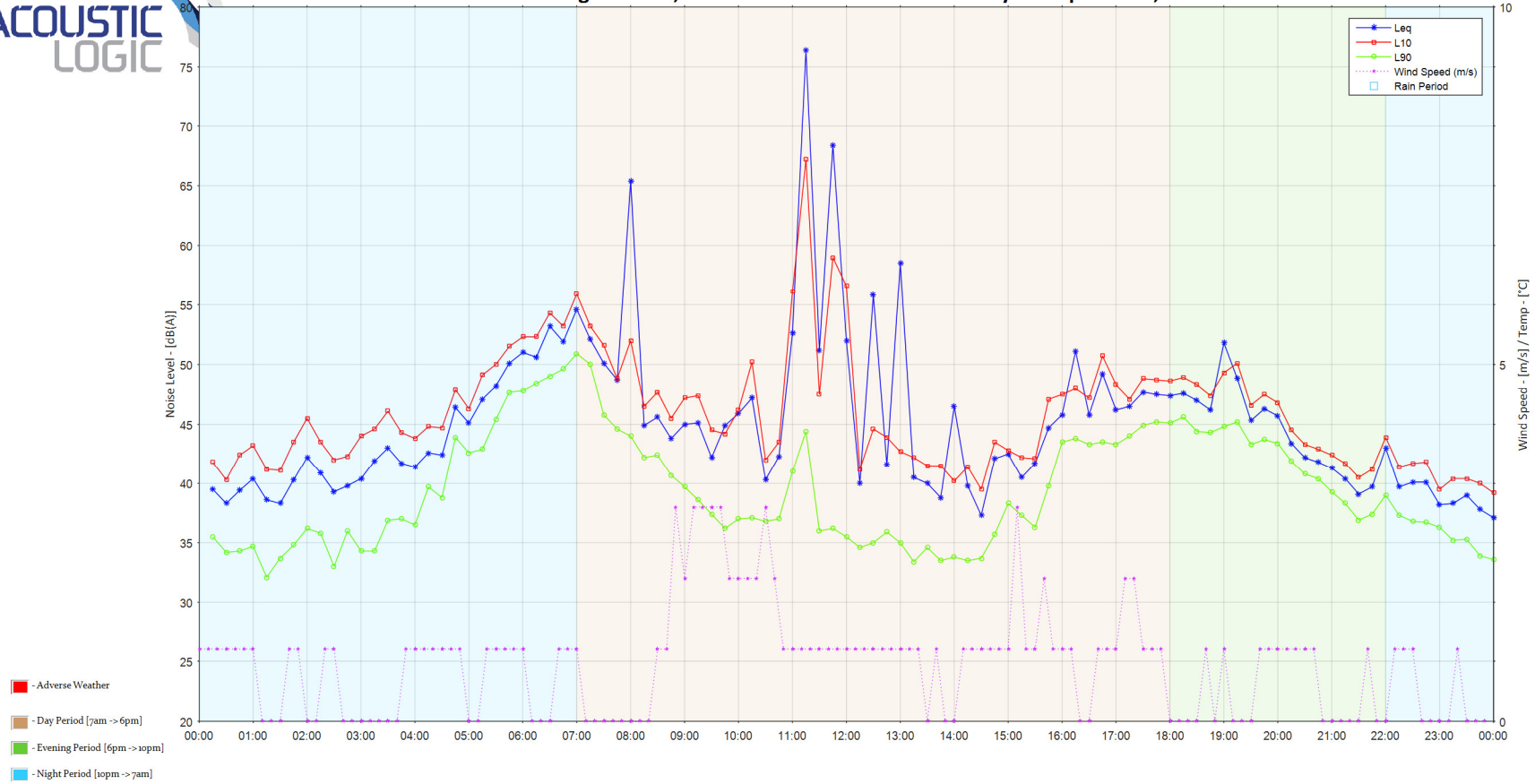


Mandalong Precinct, Erskine Park Location 2: Wednesday 09 September, 2015





Mandalong Precinct, Erskine Park Location 2: Thursday 10 September, 2015





Mandalong Precinct, Erskine Park Location 2: Friday 11 September, 2015

