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Department of Infrastructure, Transport,
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Western Sydney International (Nancy-Bird Walton) Airport – Airspace and flight path design

Environmental Impact Statement

Technical paper 1: Aircraft noise

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Terms and abbreviations

Term/abbreviation	Definition
Axxx	Airbus (type of aircraft, e.g. A220-300)
ABS	Australian Bureau of Statistics
AEDT	Aviation Environmental Design Tool (US FAA)
AIP	Aeronautical Information Package
ALC	Airport Lessee Company (ALC) – see also WSA
ANEC	Australian Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
ANEI	Australian Noise Exposure Index
ANO	Aircraft Noise Ombudsman
ANP	Aircraft noise performance (characteristics)
ANSP	Air Navigation Service Provider (in Australia this is Airservices Australia)
AS	Australian Standard
Bxxx	Boeing (type of aircraft, e.g. B787-9)
BoM	Bureau of Meteorology
CACGs	Community Aviation Consultation Groups
CASA	Civil Aviation Safety Authority
CBD	Central Business District
CCO	Continuous climb operation (can deliver environmental and economic benefits of reduced fuel burn and cost, emissions and noise)
CDO	Continuous descent operation (can deliver similar potential benefits as for CDO – see above)
ceo	Conventional Engine Option
CO_2	Carbon dioxide (greenhouse gas emission)
Cth	Commonwealth of Australia
dB(A)	A-weighted decibel
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Australian Government)
EA	Environmental Assessment
EIS	Environmental Impact Statement
ENR	En route
EPA	Environment Protection Authority (NSW Government)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth).
EPNdB	Effective perceived noise level in decibels

Term/abbreviation	Definition
FAA	Federal Aviation Administration (United States)
FoWSA	Forum on Western Sydney Airport
ft	feet (unit of distance or height equivalent to 0.3048 m)
FTS	Fast Time Simulation
GA	General Aviation
GBMA	Greater Blue Mountains Area (World Heritage property)
GHG	Greenhouse gas
GIS	Geographic information system
HIAL	High intensity approach lighting
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument landing system
INM	Integrated Noise Model
km	kilometre (unit of distance equivalent to 1,000 m)
KPA	Key Performance Area (preliminary airspace design process)
kt	knot (unit of speed equivalent to 1.852 km/h)
LGA	Local Government Area (New South Wales)
LPLD	Low power/low drag (noise abatement technique)
LTOP	Long Term Operating Plan (Sydney (Kingsford Smith) Airport)
m	metres (unit of distance or height equivalent to 3.281 ft)
M4, M7	Codes for various Motorways
MAP	Million Annual Passengers
MDP	Major Development Plan (Airports Act) (Cth)
MSA	Generic expression Minimum safe altitude (not to be confused with the ICAO acronym and definition of minimum sector altitude)
MTOW	Maximum Take-off Weight
N60/N70	Number above (noise metric)
NADP	Noise abatement departure procedure
NASF	National Airports Safeguarding Framework
NCIS	Noise Complaints and Information Service (Airservices Australia)
NEF	Noise Exposure Forecast
neo	New Engine Option
NFPMS	National flight path monitoring system (Airservices Australia database)
NIPA	Noise insulation and property acquisition
nm	nautical mile (unit of distance equivalent of 1.852 kilometres)

Term/abbreviation	Definition
NS	Northern Summer (IATA Definition)
NSR	Noise sensitive receiver
NSW	New South Wales (state of Australia)
NW	Northern Winter (IATA Definition)
OEM	Original Equipment Manufacturer
PAAM	Plan for Aviation Airspace Management
PAL	Planned Activity Level (as per WSA demand schedule forecast)
PBN	Performance Based Navigation
PCF	Planning Coordination Forum
PEA	Preliminary environmental assessment
RAAF	Royal Australian Air Force
RBL	Rating Background Level (noise metric)
RMO	Runway modes of operation
RNP	Required Navigation Performance
RNP AR	Required Navigation Performance Authorization Required
RRO	Reciprocal Runway Operations (head-to-head mode)
RPT	Regular Public Transport (air service)
SAF	Sustainable Aviation Fuel
SARP	Standards and Recommended Practices (ICAO)
SID	Standard Instrument Departure
SPL	Sound power level
STAR	Standard Instrument Arrival (route)
VFR	Visual Flight Rules
WSA Co.	Western Sydney Airport Company Limited (airport operator)
WSI	Western Sydney International (Nancy-Bird Walton) Airport

Key messages

Summary of key findings:

- The modelling of projected aircraft noise exposure presented in this technical paper is for the preliminary airspace design of Western Sydney International (Nancy-Bird Walton) Airport (WSI), which forms the second part of a 4-phase airspace development process. The preliminary airspace design will then be subject to formal community and stakeholder consultation. Feedback received will then be considered and used to inform the final design of the flight paths that are required to commence operations at WSI.
- In designing the flight paths for WSI, safety of operations is the most important consideration. In addition to operational considerations, the preliminary airspace design process also considered, to the extent practical, noise mitigation and environmental impacts associated with single runway operations at WSI when opened.
- Preliminary airspace design development was guided by Condition 16 and the 12 Airspace Design Principles of the Western Sydney Airport Plan (the Airport Plan) as detailed in Chapter 6 (Project development and alternatives) of the EIS and aligned with the Airservices Australia's Flight Path Design Principles[1] that have been developed to provide a basis for implementation and operation. These Principles are the result of national consultation with community, industry and government stakeholders, and are consistent with international global practices. This guidance has minimised the impact of aircraft noise on the surrounding community by directing aircraft away from overflying populated areas and visually sensitive areas where possible (whilst prioritising operational safety).
- The aircraft noise modelling and analysis used the Aviation Environmental Design Tool (AEDT), an internationally recognised aircraft noise and emissions calculation program developed by the United States Federal Aviation Administration (US FAA).
- The aircraft noise modelling and analysis was focused on transparency, presenting a comprehensive suite of noise metrics, explanatory text, and conclusions to help all stakeholders understand the potential implications of single runway operations at WSI.
- The Sydney Basin airspace is likely the most complex and busiest airspace in Australia. It comprises an extensive network of flight paths and operational procedures associated with existing civil airports (Sydney (Kingsford Smith), Bankstown, Camden, Shellharbour); Defence facilities (Royal Australian Air Force (RAAF) Base Richmond, Holsworthy Military Airport); overflight restrictions at the Defence Establishment Orchard Hills (DEOH) munitions facility; recreational aviation activities (gliders, ballooning, parachuting); and transiting flights. Most parts of the Sydney Basin including Western Sydney currently experience some level of daily aircraft overflight.
- Increased exposure to aircraft noise in areas in the vicinity of WSI and under its proposed arrival and departure flight paths will be an unavoidable consequence of aircraft operations at WSI. This technical paper presents the extent and nature of likely short-term (year 2033), mid-term (2040) and long-term (year 2055) aircraft noise impacts of single runway operations at WSI and discusses where any increase in absolute sound levels and any increase in aircraft noise compared to existing background and ambient noise surrounding WSI would impact on residences and sensitive areas.
- New South Wales (NSW) Government planning controls have been in place for several decades and have to the extent practical prevented incompatible noise sensitive developments around WSI.
- The aircraft noise modelling and analysis identified 5 runway modes of operation (RMOs) for single runway operations at WSI (2 during the day and 3 during the night). The analysis then identified 7 runway operating scenarios, each prioritising different RMOs during the day and night. The analysis focussed on 3 primary runway operating scenarios to generally cover the envelope of potential impacts of aircraft noise, presenting extensive model generated output data in a comprehensive suite of charts, contour maps, infographics and tables. While consistent with accepted best practice and recent precedent (e.g., Melbourne Third Runway Major Development Plan (MDP) and the Perth New Runway Project MDP), the analysis was tailored to consider a completely new airport and the limitations of comparison with existing conditions.

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[1] See https://engage.airservicesaustralia.com/flight-path-design-principles accessed 14/12/22

- Residential and rural-residential areas to the immediate north-east and south-west of WSI, located on the extended single runway (05/23) centreline, and close to the proposed arrival flight paths and initial departure turns will be subjected to a significant and unavoidable level of noise exposure.
- Modelling generated expected aircraft noise exposure to noise sensitive receptors (NSRs) in areas near WSI and under its proposed flight paths and made comparisons to measured existing background and ambient noise levels.
- The preliminary airspace design took advantage of additional airspace flexibility availability at night (11 pm to 5:30 am) with Sydney (Kingsford Smith) Airport under curfew between 11 pm and 6 am (local time), to design an alternate suite of proposed WSI "Night" Standard Instrument Departures (SIDs) and Standard Instrument Arrivals (STARs). This initiative results in a level of respite and noise sharing to some areas impacted by the proposed higher traffic volumes of WSI "Day" operations and a significant reduction in dwelling and population counts, reflected in the tables contained in this technical paper, particularly when the Reciprocal Runway Operation (RRO) mode can be applied.
- Possible noise abatement procedures and mitigation measures are discussed, without recommending any specific option, so as not to pre-empt any outcome from downstream consultative processes.

Similarly objective evidence is provided on comparative aircraft noise exposure and impacts between alternative RMOs, to inform decision making by others.

Chapter 1 Overall context

1.1 Introduction

This technical paper details the approach to model projected aircraft noise exposure associated with the proposed introduction of new flight paths and changes to existing Sydney Basin airspace structure that are required for the Western Sydney International (Nancy-Bird Walton) Airport (WSI). To aid the understanding of the assessment of aircraft noise this technical paper explains how aircraft noise is described and provides an overview of the different metrics of aircraft noise, discussing the methodology used to develop aircraft noise modelling and the material incorporated in the Environment Impact Statement (EIS).

Presented in this technical paper are the outcomes of the modelling for single runway operations at WSI. Existing and projected noise exposure results are presented and compared under 3 different Planned Activity Levels (PAL) across 3 assessment years: PAL 1 (2033), PAL 2 (2040) and PAL 3 (2055). Assumptions and limitations inherent to the modelling of aircraft noise are also explained, including the day and night runway modes of operation (RMOs), meteorology and seasonality variations and flight allocation rules. The projected exposure of aircraft noise around WSI is assessed and compared using different metrics, population and dwelling count data and a range of charts, contour maps, infographics and tables.

The geographic extent of the study area for WSI as shown in Figure 1.1 is a nominal 45 nautical mile (nm) or approximately 83 kilometre (km) radius from the centre of the new single runway (05/23). This 45 nm (approximately 83 km) radius encompasses areas that are most likely to be affected by the noise of aircraft using WSI's flight paths at a level and frequency that could be considered disruptive. Any areas that sit outside of the 45 nm (approximately 83 km) radius that are impacted by similar noise levels have also been considered.



Figure 1.1 Study area

Aircraft using flight paths to arrive at or depart from WSI may be audible and/or visible beyond the extent of the 45 nm (approximately 83 km) study area boundary. Within the 45 nm (approximately 83 km) study area boundary, aircraft are expected to operate up to approximately 20,000 feet (ft) and higher depending on the flight path in use, type of aircraft and its origin-destination, weather, pilot technique, and other factors.

The study area for WSI extends further than those adopted for the Melbourne and Perth new runway projects.

The technical paper concludes with opportunities to manage and minimise aircraft noise.

Since the exhibition of the Draft EIS for the project, an additional aircraft noise assessment has been completed to account for the following changes:

- removal of flight path Runway 23 Departure Northeast Night (RRO) for jet aircraft and reallocation of those aircraft to Runway 23 Departure Southeast Night (RRO)
- the proposed RRO noise abatement procedure for aircraft travelling to the north and west of WSI.

This assessment is documented in Addendum to Technical paper 1 – Aircraft Noise. In the event of any inconsistency with this technical paper, the addendum aircraft noise assessment takes precedence.

This technical paper should be read in conjunction with the EIS document, the addendum aircraft noise assessment and other technical papers, particularly those chapters of the EIS dealing with the preliminary airspace design processes.

1.2 The project, the EIS and the aircraft noise assessment

The Australian Government has committed to delivering the Stage 1 Development of the new WSI by the end of 2026. Aircraft noise in the vicinity of flight paths will be an unavoidable consequence of aircraft operations at WSI. Noise emissions will vary depending on the type of aircraft and its origin or destination, and whether it is landing or taking off. The impact on the ground will depend on how far away the aircraft is from a residence or a sensitive receiver. These new operations must also integrate into the operations of the broader Sydney Basin airspace[2]. The preliminary airspace design must also comply with Condition 16 of the approved Western Sydney Airport Plan (Airport Plan).

Prior to the opening of WSI, some changes to the existing Sydney Basin airspace architecture will be required to maintain safe altitude separations where existing and proposed flight paths cross. This may result in some changes to the lateral and vertical profiles of existing Sydney Basin operations to minimise the likelihood of airspace conflicts. These changes are discussed in a Chapter 8 (Facilitated changes) of the EIS.

As explained further in Chapter 6 (Project development and alternatives) of the EIS, the preliminary airspace design took advantage of additional airspace flexibility availability at night with Sydney (Kingsford Smith) Airport under curfew, to design an alternate suite of proposed WSI “Night” Standard Instrument Departures (SIDs) and Standard Instrument Arrivals (STARs). The Sydney (Kingsford Smith) Airport curfew applies to aircraft operations between 11 pm to 6 am (local time). With aircraft scheduled to land at Sydney (Kingsford Smith) Airport at 6 am already in the adjacent Sydney Basin airspace prior to this time, the flexibility for implementing WSI “night” flight paths is limited notionally to between 11 pm to 5:30 am. Hence, throughout this analysis, unless otherwise stated, for WSI flight path operations and assessment metrics the “night” period adopted is from 11 pm to 5:30 am.

The project involves flight paths for all-weather operations on Runway 05 and Runway 23 during the day (5:30 am to 11 pm) and night (11 pm to 5:30 am), as well as head-to-head Reciprocal Runway Operations (RRO) during the night period when meteorological conditions (calm winds with a tailwind of less than 5 knots (kt) or 9 kilometres per hour (km/h) and a dry runway surface) and low air traffic demand permit, to minimise the number of residences subjected to potential noise disturbance. The proposed RRO mode during the night involves landings on Runway 05 and take-offs on Runway 23.

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[2] Sydney Basin refers to the airspace area encompassing an extensive network of flight paths associated with existing airports, recreational aviation activities, medical, helicopter and transiting flights. The land beneath the Sydney Basin airspace (for the purposes of community and stakeholder engagement and any relevant terrestrial studies) is referred to as Greater Sydney.

The noise assessment has considered the proposed RMO for WSI, and the number and type of aircraft, as well as other operational and environmental factors. Most aircraft movements at WSI are anticipated to be commercial airline Regular Public Transport (RPT) services, including both jet and non-jet RPT operations to a range of regional, interstate and international destinations. There will also be some domestic and international dedicated freighter operations.

Departure flight trajectories are typically specific to aircraft, airlines, meteorological conditions, destination and take-off weight. Different procedures may dictate different rates of climb and use of engine power (thrust) settings. These will alter the noise level on the ground. Aircraft performance during the departure phase of flight, is affected by many factors including temperature, pressure, humidity and wind speed and direction. Climb profiles also depend on wind and other meteorological conditions that influence aircraft performance (e.g., departures with a stronger headwind will follow a steeper profile than those with less headwind).

While noise modelling attempts to replicate the conditions that will result in expected noise exposure levels, the materiality of each assumption will vary significantly. The limitations of noise modelling are further discussed in Section 8.14.

The assessment of WSI's preliminary airspace design in terms of aircraft noise exposure considered the location of flight paths, the distribution of operations to these paths and the relationship to noise sensitive receivers (NSRs). The range of metrics used in the assessment reflects currently accepted practice for this type of study. It covers a breadth and depth which is appropriate for a major airport airspace and flight path design in proximity to both a large urban catchment, but also adjacent to the Greater Blue Mountains Area (GBMA).

A requirement of the Airport Plan and the resulting key design principle adopted by the Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) in collaboration with Airservices Australia for WSI's preliminary airspace design has been to minimise the impact of aircraft noise on the surrounding community where possible by directing overflights away from populated areas and visually sensitive areas. An analysis to inform the distribution of aircraft across WSI's new flight paths is based on the RMOs, runway operating scenarios and air traffic forecasts described in Chapter 8.

The Aviation Environmental Design Tool (AEDT), an internationally recognised aircraft noise and emissions calculation program developed by the United States Federal Aviation Administration (US FAA) was used to calculate noise levels based on the input assumptions. For transparency and repeatability of process, all modelling for noise (and greenhouse gas (GHG) emissions) was done in AEDT Version 3e based on the assumptions detailed in Chapter 8. The outputs were exported to specialist software, such as a Geographic Information System (GIS), where required to create informative charts, contour maps, infographics and tables.

1.3 Background

In April 2014, the Australian Government announced that Badgerys Creek would be the location of a new airport for Western Sydney. WSI will be a 24-hours, 7 days a week (24/7) operation capable of handling domestic and international passengers and freight services and will:

- cater for ongoing growth in demand for air travel, particularly in the rapidly expanding Western Sydney region, as well as provide additional aviation capacity in the Sydney region more broadly
- provide a more accessible and convenient international and domestic airport facility for the large and growing population of Western Sydney
- provide long term economic and employment opportunities in the surrounding area
- accelerate the development of critical infrastructure and urban development.

WSI will initially handle up to 10 million annual passengers and around 81,000 air traffic movements per year by 2033 (PAL 1), including freight operations. Single runway operations are expected to be operating at near capacity at around 37 million annual passengers and 226,000 air traffic movements per year in 2055 (PAL 3).

The development of a completely new airport at Badgerys Creek was the subject of an EIS (2016 EIS). Following the finalisation of the 2016 EIS, the Airport Plan was approved in December 2016. The Airport Plan authorised the construction and operation of the Stage 1 Development. It also set the requirements for the further development and assessment of the preliminary airspace design for WSI.

The 2016 approval provided for the construction of the aerodrome (including the single runway), terminal and landside layout and facilities, and ground infrastructure such as the instrument landing systems and high intensity approach lighting. The runway is orientated on an approximate north-east/south-west or 50/230 degrees orientation (referred to as Runway 05 and Runway 23). Construction of the Stage 1 Development commenced in 2018. The Australian Government has committed to develop and deliver WSI to be ready for scheduled flight operations by late 2026.

Proof of concept flight path designs were developed and presented in the 2016 EIS to demonstrate that a new airport was feasible. The design and assessment process for the next phase of the airspace design (referred to as the preliminary airspace design) was set by Condition 16 of the Airport Plan. This included the future airspace design principles and the establishment of an Expert Steering Group to guide the development of the preliminary airspace design. Key to these design principles was the need to minimise the impact on the community and other airspace users while maximising safety, efficiency and capacity of WSI and the Sydney Basin airspace. The preliminary airspace design must also meet the requirements of Airservices and civil aviation safety regulatory standards.

The project (preliminary airspace design) was referred to the Minister for the Environment and Water in 2021 (EPBC 2022/9143) in accordance with Section 161 of the Commonwealth (Cth) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Condition 16 of the Airport Plan. In response, the delegate for the Minister for the then Environment and Water determined that an EIS would be required and the EIS Guidelines were issued on 26 April 2022 (EIS Guidelines). This EIS has been prepared to address these requirements.

The DITRDCA, Airservices and the Civil Aviation Safety Authority (CASA) each have a role in the development and/or approval of the project. Pursuant to section 161 of the EPBC Act, the DITRDCA (representing the Australian Government) is nominated as the designated proponent for the project and is responsible for leading the airspace design for single runway operations at WSI. Once the environmental assessment and community consultation process is complete, the DITRDCA alongside Airservices Australia will be responsible for the detailed design of the flight paths. Airservices will prepare the Airspace Change Proposal (ACP) for final approval by CASA once the detailed design process is complete. Airservices Australia will ultimately be responsible for the implementation and management of the proposed airspace and flight paths. Advice from the Minister for the Environment and Water must be obtained and considered before Airservices Australia authorises the actions for which it is responsible.

1.4 Project description

The project is the development and implementation of proposed flight paths and a new controlled airspace volume for single runway operations at WSI. The project also includes the associated air traffic control procedures and noise abatement procedures, RMOs and facilitated changes. The preliminary airspace design is for single runway operations, as approved by the Airport Plan, and has been developed on the requirement for WSI to operate on a 24/7 basis.

The project does not consider the operation of aircraft on the Airport Site when performing manoeuvring operations to enter or exit the runway or on the taxiway system to and from their parking positions at the terminals (as assessed in the 2016 EIS). No construction works or changes to the physical ground infrastructure approved and currently under construction are required for the project. This includes the airfield, terminal, landside layout and facilities, instrument landing systems and high intensity approach lighting arrays.

Operating the new airport will require changes to the current Sydney Basin airspace and its airspace classification structure through the introduction of a new controlled airspace volume and flight paths, which will determine where and how aircraft arrive and depart WSI. In developing the preliminary airspace design for WSI, changes facilitated to the established Sydney Basin airspace system have been minimised to the extent practical.

Since the exhibition of the Draft EIS, refinements to the project have been incorporated into the preliminary flight path design. The final preliminary flight path design is presented in Chapter 7 (The project) of the EIS.

1.5 Purpose of this technical paper

This technical paper has been prepared as part of the EIS to document the process and outcomes of the assessment of potential aircraft noise outcomes for residential areas and other NSRs. The assessment considers the impacts that may occur during the operational phases of the project.

Condition 16 of the Airport Plan includes requirements relevant to this technical paper, that:

(5) The airspace and flight path design must take account of the following principles, in addition to the principles in section 2.2.5 of the Airport Plan:

> *(a) airspace and flight path design must explicitly consider the Aircraft Overflight Noise mitigation options presented in chapters 7 and 10 of the EIS;*
>
> *(b) airspace and flight path design must have regard to the social and economic impacts on existing airspace users in the Sydney basin;*
>
> *(c) airspace and flight path design must explicitly consider whether arrangements are required for managing Aircraft Overflight Noise at night; and*
>
> *(d) airspace and flight path design must minimise to the extent practicable the impact of Aircraft Overflight Noise on the following:*
>
> > *(i) residential areas;*
> >
> > *(ii) Sensitive Receptors;*
> >
> > *(iii) the Greater Blue Mountains World Heritage Area – particularly areas of scenic or tourism value; and*
> >
> > *(iv) Wilderness Areas.*

(6) The airspace and flight path design for the Airport, once developed, must include or be accompanied by noise modelling of a range of realistic airport capacity and meteorological scenarios.

In addition, Section 2.2.5 of the Airport Plan presents the following airspace design principles:

Future airspace design principles

The following principles will apply to the comprehensive airspace design process for single runway operations:

1. Overflights of residential areas and noise sensitive facilities will be avoided to the maximum extent possible.
    - The most advanced satellite-based navigation technologies will be used to guide the design of flight paths that avoid residential and other noise sensitive areas as far as it is possible to do so.
2. Where flight paths are unable to avoid residential areas:
    - to the extent practicable, residential areas overflown by aircraft arrivals should not also be overflown by aircraft departing the airport; and
    - noise abatement procedures should be optimised to achieve the lowest possible overall impact on the affected community, taking into account safety and other operational factors.
3. Specific noise abatement procedures will be developed to minimise the community impacts of aircraft operations at night while not constraining airport operations and the economic benefits they would bring for Western Sydney.
    - When comparing options, operations that are conducted at night or on weekends will be treated as being more sensitive than those that occur during the daytime or on weekdays.
    - The use of head-to-head operations to and from the south-west, when it is safe to do so, is an important preferred option for managing aircraft noise at night. This preferred option will be thoroughly evaluated through further detailed assessment.
4. Noise mitigation measures will be developed consistent with Airservices commitment to aircraft noise management and the strategies developed by ICAO in its *Balanced Approach to Aircraft Noise Management*.
5. Aircraft arrivals will use a continuous descent approach where possible to keep aircraft at higher altitudes with low power settings and reduced noise (and greenhouse) emissions.
6. Aircraft arrivals will not converge through a single merge point over any single residential area.
7. Consideration will be given to the impacts of aircraft operations on natural and visually sensitive areas such as the Greater Blue Mountains World Heritage Area.
8. In determining the final flight paths, the community, aerodrome operators and airspace users will be consulted extensively and flight path designs will be subject to referral under the EPBC Act.
9. Changes to current noise sharing arrangements at Sydney Airport will be avoided.
10. Current airspace restrictions such as those associated with military establishments will be reviewed to improve efficiency and environmental impacts from commercial operations, while meeting Australia's future defence requirements.
11. The Australian Government will work with the New South Wales and local governments to ensure land use planning continues to prevent noise sensitive development in the highest noise exposure areas.
12. Safety is non-negotiable – only practical solutions that uphold Australia's long tradition of world-leading aviation safety will be implemented.

References to where this technical paper addresses the requirements of Condition 16 for the content of a EIS, relevant to the assessment of aircraft noise impacts are presented in Table 1.1.

Table 1.1 Guidelines for the content of a EIS relevant to aircraft noise impact assessment

EIS Guidelines reference	Information required	Location in this technical paper
(5) The airspace and flight path design must take account of the following principles, in addition to the principles in section 2.2.5 of the Airport Plan:	*(a) airspace and flight path design must explicitly consider the Aircraft Overflight Noise mitigation options presented in chapters 7 and 10 of the EIS;*	Sections 6.1, 6.3, Chapters 7 to 9
	(b) airspace and flight path design must have regard to the social and economic impacts on existing airspace users in the Sydney basin;	Sections 6.6, 7.3,7.4 Chapter 8 and Chapter 9
	(c) airspace and flight path design must explicitly consider whether arrangements are required for managing Aircraft Overflight Noise at night;	Chapters 7 to 10
	(d) airspace and flight path design must minimise to the extent practicable the impact of Aircraft Overflight Noise on the following: *(i) residential areas;* *(ii) Sensitive Receptors;* *(iii) the Greater Blue Mountains World Heritage Area – particularly areas of scenic or tourism value; and* *(iv) Wilderness Areas.*	Sections 5.1.3, 8.10, 8.11, Chapter 9
(6) The airspace and flight path design for the Airport, once developed, must include or be accompanied by noise modelling of a range of realistic airport capacity and meteorological scenarios.		Chapters 7 to 9
Future Airspace Design Principles	1. Overflights of residential areas and noise sensitive facilities will be avoided to the maximum extent possible. • The most advanced satellite-based navigation technologies will be used to guide the design of flight paths that avoid residential and other noise sensitive areas as far as it is possible to do so.	Sections 7.2, 8.9 and 10.4
	2. Where flight paths are unable to avoid residential areas: • To the extent practicable, residential areas overflown by aircraft arrivals should not also be overflown by aircraft departing the airport. • Noise abatement procedures should be optimised to achieve the lowest possible overall impact on the affected community, taking into account safety and other operational factors.	Sections 8.9, 9.2, 9.3, 9.6 and 10.2

EIS Guidelines reference	Information required	Location in this technical paper
	3. Specific noise abatement procedures will be developed to minimise the community impacts of aircraft operations at night while not constraining airport operations and the economic benefits they would bring for Western Sydney. • When comparing options, operations that are conducted at night or on weekends will be treated as being more sensitive than those that occur during the daytime or on weekdays. • The use of head-to-head operations to and from the south-west, when it is safe to do so, is an important preferred option for managing aircraft noise at night. This preferred option will be thoroughly evaluated through further detailed assessment.	Sections 6.1.3, 7.1.2, 8.1, 8.2, 8.3, 8.9 and 9.6.2
	4. Noise mitigation measures will be developed consistent with Airservices commitment to aircraft noise management and the strategies developed by ICAO in its *Balanced Approach to Aircraft Noise Management*.	Chapter 10
	5. Aircraft arrivals will use a continuous descent approach where possible to keep aircraft at higher altitudes with low engine power (thrust) settings and reduced noise (and greenhouse) emissions.	Section 9.8.5 and 10.2.4
	6. Aircraft arrivals will not converge through a single merge point over any single residential area.	Sections 2.1, 8.9, 9.2 and 9.3
	7. Consideration will be given to the impacts of aircraft operations on natural and visually sensitive areas such as the GBMA World Heritage property.	Sections 4.3, 4.4, 7.1.3, 8.12, 9.8.5, 9.10.1
	8. In determining the final flight paths, the community, aerodrome operators and airspace users will be consulted extensively and flight path designs will be subject to referral under the EPBC Act (Cth).	Sections 6.2, 8.9, 10.1.6, 10.2.3 and 10.4
	9. Changes to current noise sharing arrangements at Sydney (Kingsford Smith) Airport will be avoided.	Section 6.4
	10. Current airspace restrictions such as those associated with military establishments will be reviewed to improve efficiency and environmental impacts from commercial operations, while meeting Australia's future Defence requirements.	Section 4.2 and 4.4
	11. The Australian Government will work with the NSW Government and local governments to ensure land use planning continues to prevent noise sensitive development in the highest noise exposure areas.	Sections 4.4, 4.5, 7.3.1, 7.4, 10.1 and 10.4
	12. Safety is non-negotiable – only practical solutions that uphold Australia's long tradition of world-leading aviation safety will be implemented.	Sections 6.1, 6.5, 7.1 and 10.2

1.6 Dependencies and interactions with other technical papers

The outcomes of the aircraft noise exposure modelling presented in this report have been used to assess the potential impacts of noise exposure in other technical papers as follows:

- **Technical paper 6: Land use and planning** (Technical paper 6) **–** used to inform the impact of aircraft noise on existing land use and future planning or approvals.
- **Technical paper 7: Landscape and visual amenity** (Technical paper 7) **–** used to inform the assessment of landscape and visual impacts associated with the project.
- **Technical paper 8: Biodiversity** (Technical paper 8) **–** used to inform the impact of aircraft noise on fauna associated with the project.
- **Technical paper 9: Heritage** (Technical paper 9) **–** used to inform the assessment of aircraft noise on places of heritage value.
- **Technical paper 10: Social** (Technical paper 10) **–** used to determine the significance of noise impact in relation to social amenity.
- **Technical paper 11: Economic** (Technical paper 11) **–** used to inform the economic impact of the project as relevant to aircraft noise, including property values.
- **Technical paper 12: Human health** (Technical paper 12) **–** used to determine the significance of aircraft noise impacts in relation to human health.
- **Technical paper 14: Greater Blue Mountains Area World Heritage Area** (Technical paper 14) – used to inform the assessment of impact to biodiversity attributes in relation to environment and World Heritage.

Chapter 2 Background and previous assessment

2.1 Airspace and flight paths in the 2016 EIS

Minimising impacts of aircraft overflight noise to the greatest extent possible is a key issue in the development of the WSI preliminary airspace design. Many comments were made in response to the 2016 EIS on aircraft noise issues including the timing of future noise modelling processes and the potential for, and effectiveness of noise management and mitigation measures. Submissions made during the public exhibition expressed concern about the uncertainties associated with the aircraft noise exposure contours presented in the 2016 EIS included:

- the accuracy and reality of the synthetic forecast demand schedules
- the indicative flight paths used
- the operational limitations of Continuous Climb Operations (CCO) or Continuous Descent Operations (CDO)
- the absence of specific noise abatement measures
- the concentration of flights and noise over established communities resulting from the application of a “point-merge” design strategy for arrival aircraft.

As noted in the 2016 EIS, environmental assessments of airport proposals that involve the introduction of new operating procedures are commonly based on indicative flight paths. A description of the design phases required to deliver an approved airspace system for WSI is provided in Chapter 6 (Project development and alternatives) of this EIS. The use of indicative airspace arrangements was particularly relevant to the WSI concept presented in the 2016 EIS, given the length of time before commencement of airport operations (i.e., more than 10 years). Designing air traffic management arrangements for a new airport is a substantial, resource intensive and complex technical task that takes several years and numerous iterations to complete. In these circumstances it would not have been prudent in 2016 to ‘lock in’ such arrangements prematurely and deny benefits that could be realised from evolving airspace management infrastructure and technologies, and aircraft navigation modernisation using satellite-based systems.

The indicative flight paths assessed in the 2016 EIS provided an appropriate and contemporary basis for a high-level assessment of the extent and intensity of potential impacts associated with the introduction of aircraft operations at WSI. It was never intended that the draft flight paths presented in the 2016 EIS would be implemented without further analysis, including detailed consideration of noise abatement opportunities, and feedback from community and other stakeholder consultation. Submissions to the 2016 EIS stated that the airspace EIS should provide more details about a future noise amelioration plan, its timing and the eligibility criteria that would apply. Some submissions commented that the assessment of noise based on noise exposure levels, or a noise ‘dose’ did not fully encompass the population potentially affected as it did not consider more sensitive people or noise annoyance, given the WSI impact of a new major airport on a large newly exposed residential community and large areas of rural and rural-residential land-use.

The assessment process undertaken for the 2016 EIS, including noise modelling and impact assessment criteria, was consistent with other comparable and contemporary airport environmental impact assessments. However, as explained above, a preferred operating strategy and a preferred RMO, and potential noise abatement procedures for WSI were not considered in detail at that stage.

Identification and testing of alternative modes of operation was undertaken as part of the preliminary airspace design process having regard to the safety of all aircraft, other airspace users, aircraft fuel consumption and opportunities to minimise noise and amenity impacts on communities and other noise sensitive environments. The impacts of operations on natural areas including the GBMA were also considered as part of this phase of airspace development.

Most data on subjective reaction to aircraft noise is based on studies of communities exposed to existing noise. There is evidence that the reaction of people exposed to an increase in aircraft noise[3], or to new noise imposed on an existing community is higher than would be expected from these studies. This outcome was recognised in the 2016 EIS. While some estimates can be made of the level of reaction to new noise (in terms of, for example, the proportion of people who may consider themselves "highly annoyed"), these are subject to considerable uncertainty. Current best practice is to provide full transparency with a suite of measures of noise exposure, designed to be meaningful and understandable to both residents and decision-makers, allowing all stakeholders to understand the likely resulting noise environment.

In addition to the Australian Noise Exposure Forecast (ANEF) and Australian Noise Exposure Concept (ANEC) being land-use planning targeted metrics, the use of "number above" (N-above) noise metrics has proved to be useful for residents and others for a better understanding of their potential future noise environment, and their use has become standard in Australia. However, like all metrics, some explanation of their derivation and limitations is required for their interpretation. For example, in an area where exposure is dominated by one specific type of operation, there will be a point where the noise level from that operation drops just below 70 A-weighted decibels (dB(A)). At that point there will be a large reduction in the number of events shown in typical N-above figures as exceeding 70 dB(A), or N70, although the actual noise level of those events may only be marginally different. On the other hand, contours based on a single event noise metric, will only illustrate the noise footprint for either an arrival or a departure by a specific aircraft on a specific trajectory, without any consideration of the time of day or frequency, both of which are known to be essential to understand or predict community reaction. For this reason, it is necessary to consider several metrics including N-above and maximum noise levels, to gain a complete understanding of the potential noise environment.

The 2016 EIS presented an indicative airspace concept showing that night-time noise would have the potential to cause sleep disturbance and awakenings in some areas closest to WSI. Minimising this while ensuring the operational viability of WSI air traffic was a cornerstone of the preliminary airspace design process. The Sydney (Kingsford Smith) Airport curfew period between 11 pm to 6 am (local time) reduces air traffic complexity in the Sydney Basin which then enables greater flexibility in applying WSI RMOs and designing arrival and departure routes for night operations at WSI. This provides opportunities to minimise aircraft noise impacts from these particularly sensitive operations.

Noise levels from aircraft at higher altitudes (above 10,000 (ft) is generally less than 60 dB(A) but increases modelling uncertainty when compared to that associated with the higher noise levels from aircraft operating at lower altitudes closer to the Airport Site in climb and descent phases. For this reason, in areas subjected to these relatively low noise levels (i.e., less than 60 dB(A)), the number of overflight events experienced is more important than their absolute noise levels.

This technical paper presents the existing or potential areas of aircraft noise exposure around WSI using computer-generated contours. The contours for the various metrics are represented by a series of lines on a map of the environs surrounding WSI. They represent various levels of maximum sound exposure (typically shown in 5 dB(A) and frequency increments. Locations beyond each noise contour boundary may still be subjected to noise exposure from aircraft overflights. Even at low exposure levels, individuals may still experience annoyance, because individual reaction to aircraft overflight noise is highly subjective. Therefore, for completeness, this assessment also provides information on aircraft noise levels on the ground under the flight paths at higher altitudes at a considerable distance from the Airport Site.

Visual amenity impacts associated with the preliminary design airspace solution have been assessed with the findings presented in Chapter 15 (Landscape and visual amenity) and in Technical paper 7 of the EIS.

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[3] See discussion in Attachment to NASF Guideline A - "Supplementary Aircraft Noise Metrics" - https://www.infrastructure.gov.au/sites/default/files/documents/1.3_Guideline_A_attachment1.pdf accessed 14/12/22

2.2 Interaction with other airports and facilitated changes

Single runway operations at WSI will also lead to changes to the current Sydney Basin airspace and its airspace classification structure through the introduction of a new controlled airspace volume and flight paths that will determine where and how aircraft arrive and depart the Airport Site. As a result of WSI and its proximity to other existing Sydney Basin Airports and airspace activities, some limited and specific changes will be required to the existing Sydney Basin airspace architecture and the existing flight paths for Sydney (Kingsford Smith) Airport which are discussed in Chapter 4 (Project setting) of the EIS.

2.3 WSI traffic forecasts

A fundamental input to projecting future potential aircraft noise impacts from aircraft operations at any airport are the air traffic movements and fleet mix forecasts, which are often based on growth rate projections from current air traffic. However, WSI is a completely new airport with no historic record of air traffic from which to project forward. The best available source currently available to support the EIS in general and the aircraft noise studies in particular are the air traffic forecasts provided by Western Sydney Airport Company Limited (WSA Co), the Airport Lessee Company (ALC), as the owner of the airport lease granted by the Australian Government, and responsible for the development and operation of WSI.

Air traffic forecasts were developed and provided by WSA Co as a full week for several assessment years for both Northern Summer (NS) and Northern Winter (NW) schedule seasons. The details of these are provided in Chapter 7 (The project) of the EIS. The potential implications of aircraft noise impacts from future flight activity by schedule season, day of the week, time of day and fleet mix are discussed in Chapters 7, 8 and 9.

Chapter 3 The source of aircraft noise

Sound is a vibration that propagates as an acoustic wave through the air. It is transmitted to the human ear where such waves are received and processed by the brain as a sound or noise. The power of a sound can be measured with a metric called the decibel. The decibel is a relative sound metric based on the sound power level on a logarithmic scale where 0 is at the threshold of hearing.

Noise is when a sound is either loud or unpleasant to the receptor. However, the perception of what is noise varies from person to person based a range of acoustic and non-acoustic factors.

The human ear does not perceive sound the same way across all frequencies. To take account of the variation of this perception, various methods of frequency weighting have been developed. The decibel A-Weighted scale (dB(A)) is the most used scale for sound impacting humans because it gives lower weight to low and high frequency noises which are less perceptible to the human ear, as shown in Figure 3.1.

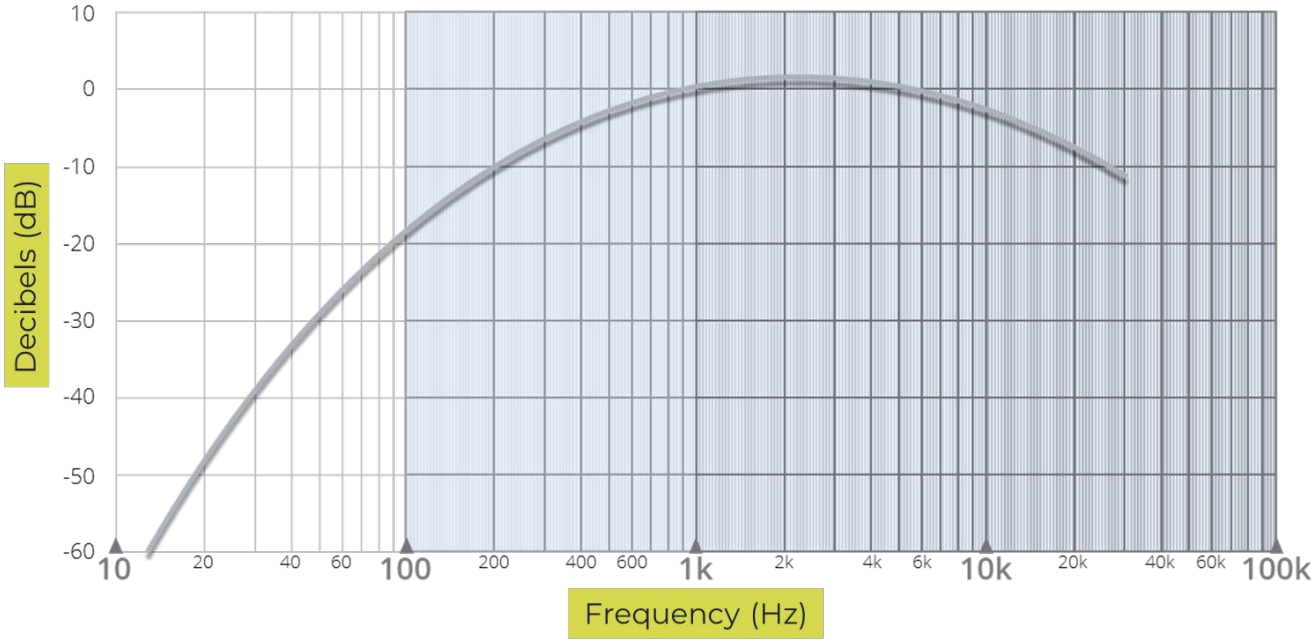

Figure 3.1 Sound pressure level – A-weighting

Most sounds we hear in our daily lives have sound-pressure levels in the range of 30 dB(A) to 90 dB(A). The daytime background indoor sound level in a typical home is about 40 dB(A) and the average noise level of conversation is about 60-65 dB(A). Background noise at or above this level can lead to speech interference and disrupt conversations. For a conversation inside and noise is outside, there will be some attenuation (reduction in volume heard inside the house) depending on the building fabric and whether the windows are open or closed. Figure 3.2 shows indicative A-weighted decibel (dB(A)) noise levels for a range of common situations. It also shows the distance from the source where this is relevant, such as a jet aircraft departure.

The minimum change in sound level that most people can detect is around 2 to 3 decibels, while every 10 dB(A) increase in sound level is perceived as a doubling of loudness.

Additionally, individuals may perceive or be affected by the same sound differently. The frequency of a sound is what gives it a distinctive pitch or tone. The rumble of distant thunder has a low frequency, while a whistle has a high frequency. The ear is more sensitive to high frequency noise events than low frequency ones.

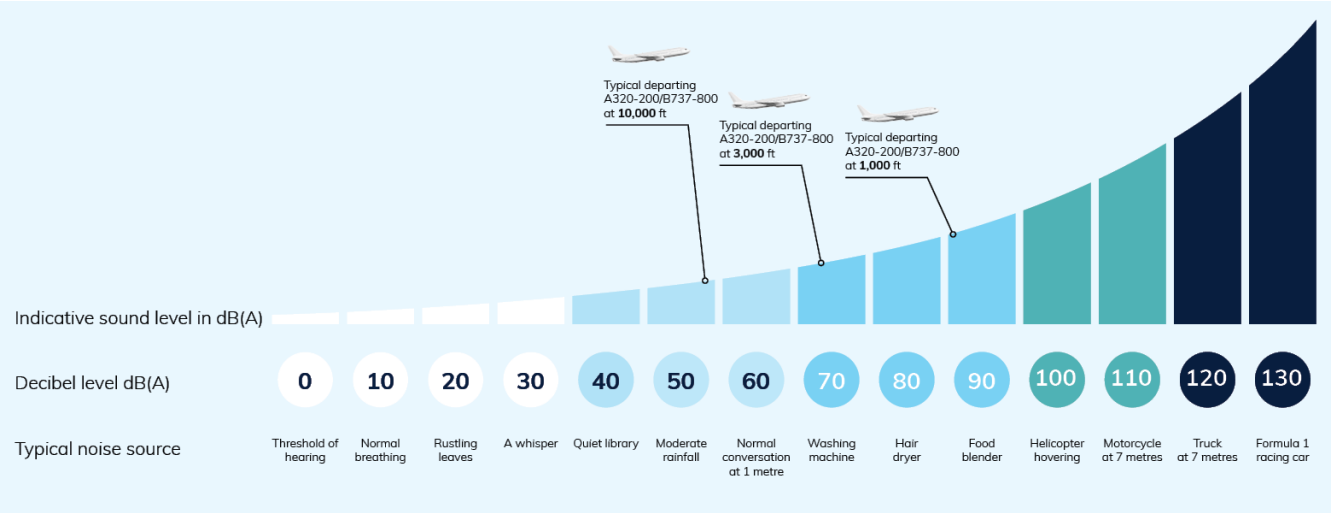

Figure 3.2 Indicative A-weighted decibel noise levels in typical situations

Most environmental sounds contain a broad range of frequencies. While middle to high frequency sounds tend to annoy most people, low frequency noise from aircraft-induced rattling, rumbling or vibration can also cause annoyance. Sound waves travel out equally in all directions from their source. This is like the way ripples travel when a rock is thrown into a calm pond. As soundwaves travel away from a source, they become less intense as the energy is spread out over an ever-increasing area and absorbed by the atmosphere. Higher frequencies are absorbed at shorter distances, while lower frequencies can travel further before they are absorbed. As a result, an aircraft can sound different depending on how far away it is flying. For example, a distant jet aircraft is often heard as a low frequency rumble.

The amount of noise created varies according to the way in which an aircraft is flown, even for identical aircraft. Experience has shown that many factors can influence an individual's response to aircraft noise, including:

- the specific characteristics of the noise (e.g., the frequency, intensity and duration of noise events) and the time-of-day noise events occur
- background noise levels, and whether background noise is natural, industrial, desirable (e.g., bird song) or undesirable (e.g., road traffic)
- their personal circumstances and expectations about the number, frequency, loudness and timing of noise events
- their individual sensitivities and lifestyle (e.g., whether they spend a lot of time outdoors, work from home or sleep with a window open)
- their reaction to a new noise source (in the case of a new airport or new runway) or to changed airport operational procedures
- their understanding of whether the noise is avoidable and their notions of fairness
- their attitudes towards the source of the noise (e.g., general views about aviation activities and airports).

Aircraft noise is the sound emitted through the operation of aircraft in flight, as illustrated in Figure 3.3. It is induced primarily by the engines (or propellers) and when air passes over the fuselage (the aircraft's body) and its wings. This causes friction and turbulence, which make noise. This is exacerbated when the landing gear and control surfaces are in use.

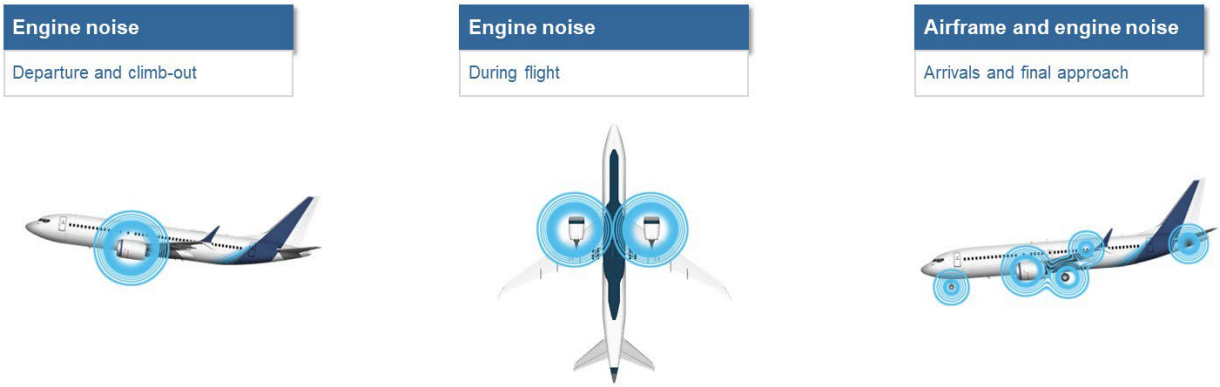

Figure 3.3 Noise sources from an aircraft in flight

Jet aircraft engine noise is caused by the sound of the compressor fans and by the sound of fuel being combusted and expelled at high velocity as exhaust gases mix with ambient air once it has passed through the engine. Propeller aircraft and helicopters can also create noise from their rotating propellers cutting through the air. The amount of noise depends on the size of the propellers and the velocity of the propeller tips through the air.

The sound made by different aircraft can vary depending on factors such as the type of engine (e.g., propeller or jet) and the height of the aircraft above the ground.

Generally, noise on the ground from departing aircraft is louder than from that of an arriving aircraft. On departure, the noise level experienced on the ground from a particular aircraft is influenced by:

- the aircraft type and size
- the way the aircraft is flown by the pilot, the engine power (thrust) settings and the control surfaces (i.e., ailerons, elevators, spoilers and the rudder and extendable/retractable flaps and slats)
- the rate at which the aircraft climbs
- meteorological conditions.

On departure long range heavy, wide-body jet aircraft such as the Airbus A380[4] and A350 or Boeing B747, B777 and B787 with a full payload (including fuel) climb more slowly than smaller narrow-body jet aircraft and non-jet turbo-props and therefore can be heard at higher noise levels for longer.

On approach, arriving aircraft are operating at a lower altitude further out from the Airport Site at reduced engine power (thrust) settings but with the increased deployment of control surfaces and the landing gear (e.g. landing gear, slats, flaps) which may cause noise impacts at large distances as well.

Improvements in both airframe and engine propulsion technology have resulted in modern civil aircraft being more efficient and quieter. Within the international and local regulations for noise certification of aircraft, the fleet mix is in the first instance determined by the airlines serving an airport and taking account of the operational requirements for the flight routes being served.

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4 While WSI is designed to accommodate the A380 aircraft, it is not specifically included in the WSA air traffic forecasts, seeming to indicate that it is not anticipated to be regularly scheduled on WSI airline routes.

Chapter 4 Overview of the study area

4.1 Introduction

The site of the new WSI lies within the localities of Badgerys Creek and Luddenham, and within the Liverpool local government area (LGA). The northern boundary of the WSI site adjoins the Penrith LGA boundary. WSI covers 1,780 hectares (ha) of land and is situated about 50 km west of the Sydney Central Business District (CBD) and Sydney (Kingsford Smith) Airport. The major population centres of Campbelltown, Fairfield, Liverpool and Penrith are all located within 15 to 20 km of WSI, with Parramatta located around 30 km to the north-east.

The assessment considers potential significant noise impacts from aircraft overflights within the study area discussed and illustrated in Section 1.1.

There are existing flight paths already in operation and aircraft activity over the study area, with associated aircraft noise impacts.

4.2 Existing aircraft overflights

The Sydney Basin airspace supports a range of aircraft operations. It is historically overflown to varying degrees by aircraft arriving or departing from Sydney (Kingsford Smith) Airport, Bankstown and Camden Airports, as well as military flights at RAAF Base Richmond and Holsworthy Military Airport and aircraft in transit. The actual distribution of aircraft operations within the Sydney Basin varies according to numerous factors. Aircraft noise is currently audible and noticeable across most of the Sydney Basin and many locations around the site of WSI. According to Airservices Australia reporting for movements at Australian airports, in calendar year 2019, more than 700,000 aircraft movements were recorded at Sydney (Kingsford Smith) Airport, Bankstown and Camden Airports in the Sydney Basin airspace.

Most parts of the Sydney Basin including Western Sydney currently experience some level of daily aircraft overflight activity. Figure 4.1 provides a weekly snapshot of flight movement activity in March 2019 across the Sydney Basin for Sydney (Kingsford Smith) Airport, Bankstown and Camden Airports, and RAAF Base Richmond.

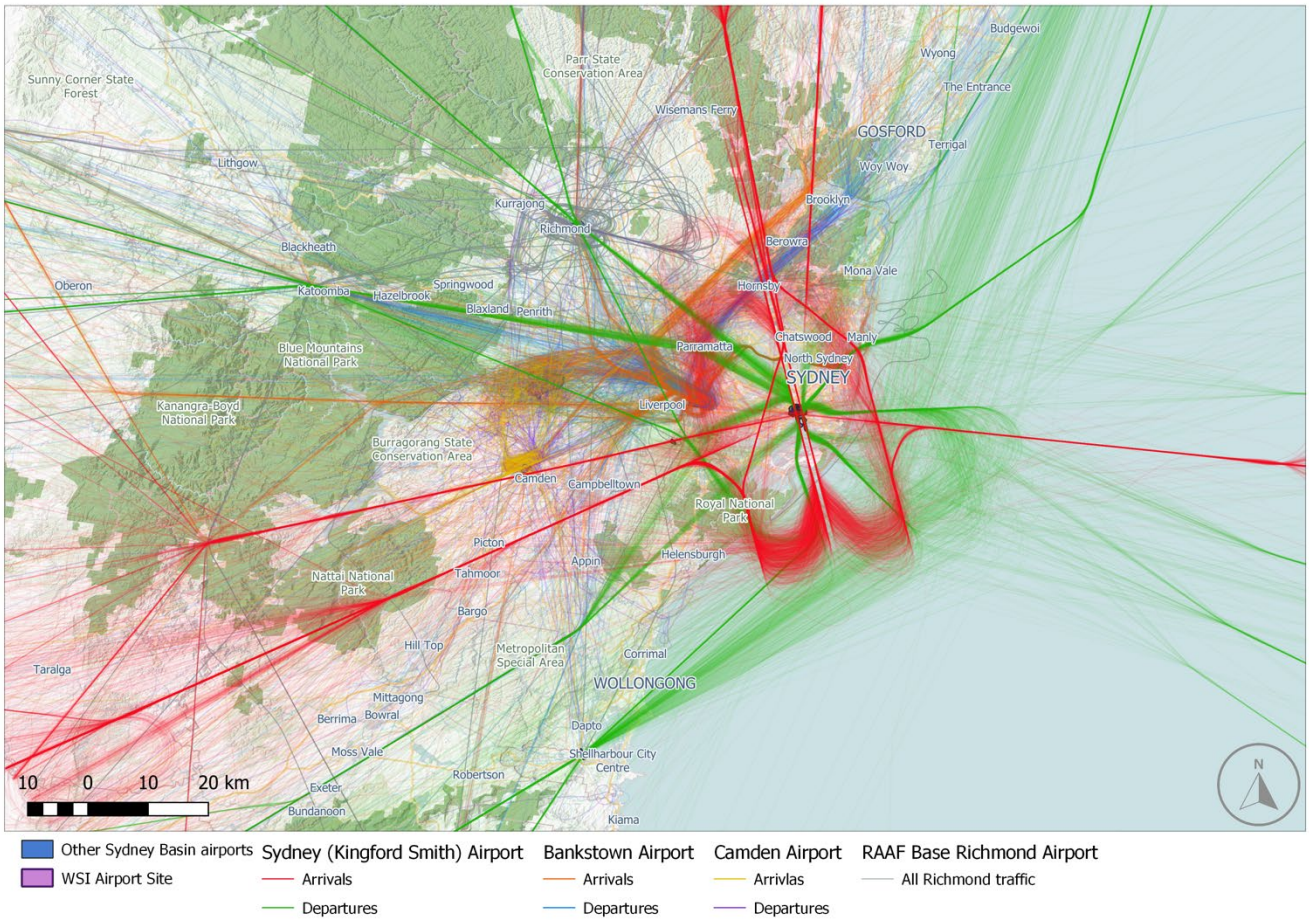

Figure 4.1 One-week snapshot in March 2019 of Sydney Basin flight path movement activity (Bankstown, Camden and Sydney (Kingsford Smith) Airports, and RAAF Base Richmond only)

4.3 Description of the surroundings

Most of the land within and immediately surrounding the WSI site comprises low density rural residential and agricultural land uses with a few residential areas adjacent to The Northern Road and Park Road intersection and further south of The Northern Road. Surrounding rural residential tenancies range from approximately one to 40 ha in area. Agricultural land uses include cattle grazing and horticulture.

The villages of Luddenham and Wallacia are located immediately west of the Airport Site, generally straddling The Northern Road between Park Road and Adams Road, and Mulgoa Road, north and south of the intersection of Park and Silverdale Roads. As of 2021, the estimated resident populations living in Luddenham and Wallacia was around 2,000 (Australian Bureau of Statistics (ABS) 2021). Luddenham village comprises neighbourhood retail shops and low-density residential housing with average lot sizes of around 500 square metres (m^2).

South-west of WSI in the locality of Greendale, land use is predominantly large lot rural-residential. The villages of Silverdale and Warragamba support an estimated resident population of around 5,000 people in some 2,000 dwellings (ABS 2021).

Around 5 km north of WSI is the Twin Creeks Golf and Country Club, a 340 ha estate comprising an 18-hole golf course, function centre, restaurant and over 200 residential dwellings housing close to 1,000 people[5]. The Defence Establishment Orchard Hills (DEOH) facility is located approximately 9 km north of the Airport Site and is used for storage, distribution and Defence explosive ordnance training.

To the north-east and east of WSI are the localities of Badgerys Creek, Kemps Creek and Mount Vernon. These localities support an estimated resident population of around 1,800 living in rural residential dwellings with average lot sizes of 10 ha (ABS 2021). The Badgerys Creek riparian corridor defines the eastern boundary of the WSI site. The land to the east of Badgerys Creek is largely used for agriculture. Also located to the east of WSI are the recreational areas of Kemps Creek Nature Reserve and the Western Sydney Parklands.

The gently undulating hills and expansive valleys of the Cumberland Plain extend westwards incised by an extensive network of tributaries draining to the main channel of the Nepean-Hawkesbury River before intersecting the foothills of the World Heritage-listed GBMA. The GBMA is an amalgam of plateau escarpments, eucalypt forests, mountain peaks and valleys rich in biodiversity, Aboriginal values and other historic places that rises to 3,901 ft (1,187 m) at its highest point to the north-east of Lithgow. Lake Burragorang, formed behind Warragamba Dam a man-made reservoir which supplies a major part of Sydney's water supply, is also located to the south-west of WSI.

Beyond the immediate LGAs, the Blue Mountains LGA lies to the west; Wollondilly, Camden and Campbelltown LGAs lie generally to the south; and Bankstown and Fairfield LGAs lie generally to the east; and the Blacktown LGA lies to the north of the WSI site. Together these LGAs and the City of Parramatta, Cumberland Council, Hawkesbury City and the Hills Shire make up the Western Sydney LGA, which encompasses a land area of nearly 9,000 km^2. According to the ABS, in 2021 the estimated resident population of the Western Sydney LGA was 2.6 million people occupying more than 870,000 dwellings.

The Liverpool and Penrith LGAs cover a total land area of 710 km^2 and in 2021, the estimated resident population was reported to be around 450,000 (ABS 2021) equating to a population density of around 6.5 persons per km^2.

The network of roads currently serving WSI are:

- Elizabeth Drive – a classified road which forms the northern border of the Airport Site.
- The Northern Road – a classified road bounds the western part of the Airport Site on a north-west to south-east alignment.
- Badgerys Creek Road – a local road which intersects the eastern part of the Airport Site on a north to south alignment, connecting Elizabeth Drive to The Northern Road.

Additional road infrastructure under construction to integrate WSI to the arterial network includes the M12 Motorway and associated connections.

4.4 Ambient noise environments

There are a variety of acoustic environments within the WSI study area. Ambient noise environments within the study area range from urban areas such as Penrith's CBD to rural areas that are largely removed from human-induced noise to the natural environments of the GBMA.

The existing ambient noise environment is mostly dominated by road traffic noise which is audible at nearly all locations emanating from a combination of relatively busy roads, up to and including the Western Motorway (M4), Westlink (M7 Motorway) and a hierarchy of other connector and local roads that carry varying levels of traffic. As highlighted in Section 4.5 and illustrated in Figure 4.1, there is significant existing overflight activities driven by a combination of General Aviation (GA) activity primarily from Bankstown and Camden Airports, as well as existing RPT services at Sydney (Kingsford Smith) Airport and military flights at RAAF Base Richmond.

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5 ABS (2021) – SA1 census area (12403146323 and 12403146332)

Table 4.1 shows the representative average background and ambient noise levels for various areas. The values will be compared to data from the noise monitoring undertaken in the area for this project as well as projections of average aircraft noise exposure from the modelling. While the amenity noise levels were extracted from NSW Government policy, it broadly reflects the levels of AS1055:1997, which has since been superseded by AS1055:2018.

Table 4.1 Ambient and background recommended amenity noise levels[1]

Receiver category	Description	Recommended amenity noise level (L_{Aeq}) dB(A)			Typical existing background noise levels (RBL) dB(A)		
Residential		**Day**	**Evening**	**Night**	**Day**	**Evening**	**Night**
Rural residential	An area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse.	50	45	40	<40	<35	<30
Suburban residential	An area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has evening ambient noise levels defined by natural environment and human activity.	55	45	40	<45	<40	<35
Urban residential	An area with an acoustical environment that is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources; has through-traffic with characteristically heavy and continuous traffic flows during peak periods; is near commercial districts or industrial districts, or any combination of the above.	60	50	45	<45	<40	<35
Other	**Description**	**Recommended amenity noise level (L_{Aeq}) dB(A)**			**Typical existing background noise levels (RBL) dB(A)**		
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks		5 dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day			N/A		
School – internal	Noisiest 1-hour when in use	35[2]			N/A		
School – external	Noisiest 1-hour when in use	45			N/A		

Other	Description	Recommended amenity noise level (L_{Aeq}) dB(A)	Typical existing background noise levels (RBL) dB(A)
Hospital – internal	Noisiest 1-hour when in use	35	N/A
Hospital – external	Noisiest 1-hour when in use	50	N/A
Place of Worship – internal	When in use	40	N/A
Passive Recreation	Area reserved specifically for passive recreation (e.g., national park)	50	N/A
Active Recreation	Area reserved specifically for active recreation (e.g. golf course)	55	N/A
Commercial Premises	Commercial activities being undertaken in a planning zone that allows commercial land uses	65	N/A

1. Source: Based on NSW EPA – "Noise Policy for Industry" (2017)
2. 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 $L_{Aeq(1hr)}$

The perceived prominence of aircraft noise events is dependent on those events becoming distinct from the ambient noise environment. Average background and ambient noise levels have been established by field measurements for various environments around WSI through correlation with an ambient noise monitoring program. This includes the definition of a Rating Background Level (RBL) noise used for assessment purposes, as determined by the method outlined in NSW Environment Protection Authority (EPA) Fact Sheets A and B and notes that – *"The objective of carrying out long-term background noise monitoring at a location is to determine existing background noise levels that are indicative of levels during the entire year. However, the RBL for evening or night periods calculated from long-term unattended background noise monitoring can sometimes be higher than the RBL for the daytime period. This situation can arise due to increased noise from, for example, insects or frogs during the evening and night in the warmer months, or due to temperature inversion conditions during winter."*

4.5 Existing noise conditions around WSI

A comprehensive field study using noise monitoring terminals (NMTs) was conducted from August to October 2022 to establish ambient noise levels in areas surrounding WSI. Twenty-nine NMTs were installed to continually measure ambient sound levels for a 2-to-4-week period. Figure 4.2 shows the location of the ambient noise monitoring sites.

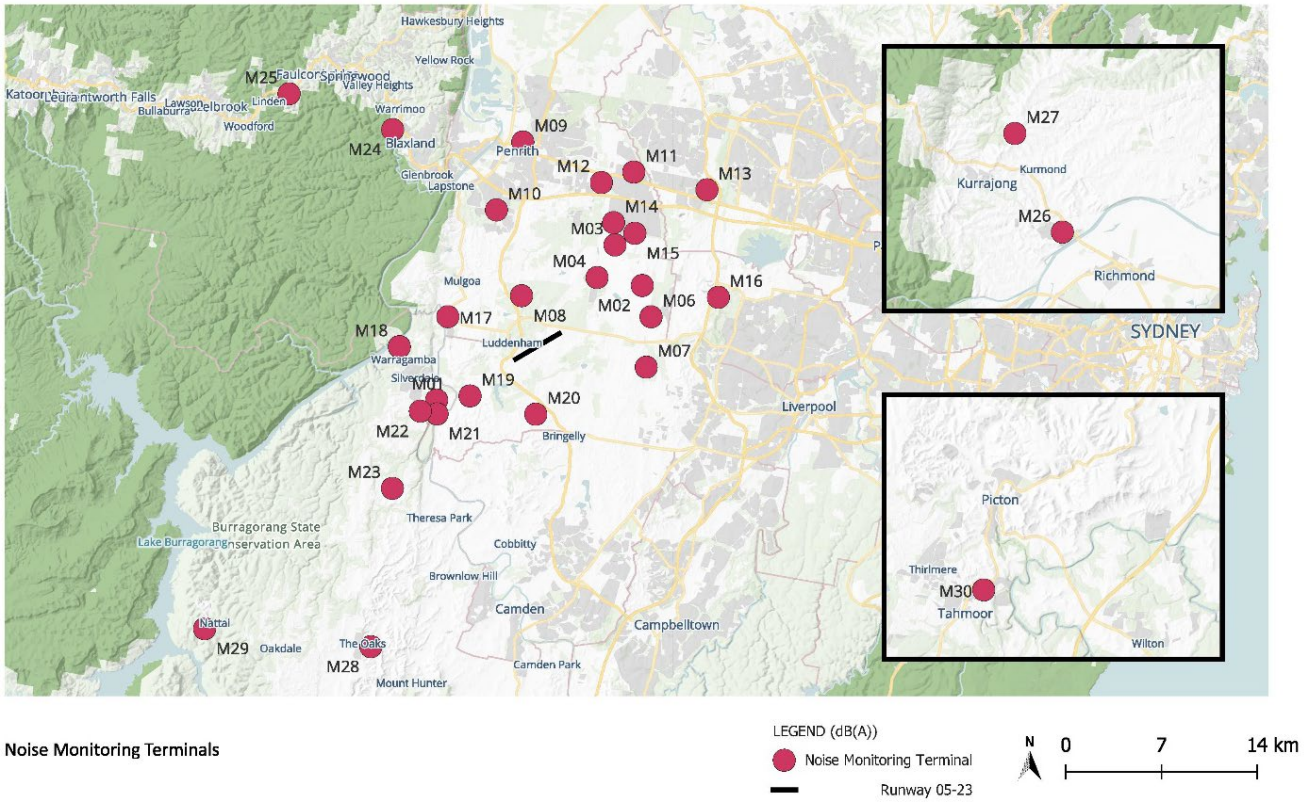

Figure 4.2 Ambient noise survey locations (noise monitoring terminals)

Table 4.2 provides a summary of average and background measured noise levels at each of the 29 NMTs (M01 to M30, excluding M05 which was not installed).

The L_{Aeq} descriptor represents the level of average noise energy over the period of measurement and takes account of noise peaks and fluctuations. It was determined over an assessment period (day, evening and night) at each NMT[6].

The RBL is defined by the NSW EPA as the overall background noise level for each assessment period (day/evening/night) measured over the entire monitoring period. Where the rating background noise level is found to be less than 30 dB(A) for the evening and night periods, then it is set to 30 dB(A); where it is found to be less than 35 dB(A) for the daytime period, then it is set to 35 dB(A) as outlined in the NSW's EPA Noise Policy for Industry. While this policy specifically excludes transportation corridors such as flight paths, it provides an ambient noise metric to assess changes in noise levels associated with aircraft operations. The assessment excludes the cumulative impact of train and road noise, present and future, which could be a contributing factor in some areas to the ambient noise level.

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6 Day (7 am to 6 pm), Evening (6 pm to 10 pm) and Night (10 pm to 7 am) definition for monitoring differs from the assessment definition of Day (5:30 am to 7 pm), Evening (7 pm to 11 pm) and Night (11 pm to 5:30 am).

Table 4.2 Average and background noise levels from ambient noise monitoring survey

ID	Area	Latitude	Longitude	L_{Aeq} (dB(A))			RBL (dB(A))		
				Day	Evening	Night	Day	Evening	Night
M01	South West Departure (Wallacia)	-33.92	150.63	58	49	43	33	32	27
M02	North East Departure	-33.84	150.80	63	47	44	36	37	36
M03	North East Runway	-33.82	150.77	67	53	53	47	45	39
M04	Twin Creeks	-33.84	150.76	49	47	45	34	35	33
M06	Mount Vernon	-33.86	150.80	51	53	50	37	49	42
M07	Kemps Creek Nature Reserve	-33.90	150.80	58	45	45	36	37	32
M08	Luddenham	-33.85	150.70	62	59	58	47	45	39
M09	Penrith	-33.75	150.70	52	46	42	36	36	33
M10	Glenmore Park	-33.79	150.68	57	51	46	39	39	30
M11	Oxley Park	-33.77	150.79	72	47	44	36	38	32
M12	St. Marys	-33.78	150.76	57	50	44	37	37	31
M13	Rooty Hill	-33.78	150.85	54	47	46	38	40	36
M14	St. Clair	-33.80	150.77	57	45	49	37	36	29
M15	Erskine Park	-33.81	150.79	59	51	43	39	36	33
M16	Sydney Int. Equestrian Centre	-33.85	150.86	55	51	50	45	45	40
M17	Wallacia	-33.86	150.64	53	49	45	40	34	26
M18	Warragamba	-33.88	150.60	51	46	46	36	41	41
M19	Greendale	-33.92	150.66	49	50	45	31	38	33
M20	Bringelly	-33.93	150.71	52	48	44	34	39	34
M21	Bents Basin	-33.93	150.63	63	51	47	36	44	38
M22	Silverdale	-33.93	150.62	51	48	44	34	36	32
M23	Werombi	-33.98	150.60	58	47	45	30	36	30
M24	Blaxland	-33.74	150.60	50	42	42	33	32	26
M25	Linden	-33.72	150.52	51	45	43	35	36	28
M26	North Richmond	-33.58	150.71	53	47	41	40	35	26
M27	Kurrajong	-33.53	150.69	51	44	44	36	37	34
M28	The Oaks	-34.08	150.58	56	48	44	29	36	32
M29	Lake Burragorang	-34.07	150.45	46	42	44	25	27	24
M30	Tahmoor	-34.22	150.60	56	46	48	40	39	38

Furthermore, each site was attended for a total period of 1 hour for each period of the day (i.e. day, evening and night). During this 3-hour period, a range of aircraft movements were observed and measured, as presented in Table 4.3. Despite the sample being small, it highlighted that most sites near measurement terminals are overflown by existing movements across the day, evening and night, sometimes by movements above 60 dBA.

Table 4.3 Aircraft noise levels from attended ambient noise monitoring survey

ID	Area	Latitude	Longitude	L_{Amax} (dB(A))		
				Day	Evening	Night
M01	South West Departure (Wallacia)	-33.92	150.63	58	57	58
M02	North East Departure	-33.84	150.80	52	57	70
M03	North East Runway	-33.82	150.77	61	62	
M04	Twin Creeks	-33.84	150.76	54		
M06	Mount Vernon	-33.86	150.80	67	59	50
M07	Kemps Creek Nature Reserve	-33.90	150.80	65	50	46
M08	Luddenham	-33.85	150.70		50	
M09	Penrith	-33.75	150.70	59		
M10	Glenmore Park	-33.79	150.68	59		
M11	Oxley Park	-33.77	150.79	45	45	
M12	St. Marys	-33.78	150.76	59	59	
M13	Rooty Hill	-33.78	150.85	56	56	
M14	St. Clair	-33.80	150.77	56	40	
M15	Erskine Park	-33.81	150.79		49	
M16	Sydney Int. Equestrian Centre	-33.85	150.86	54	60	61
M17	Wallacia	-33.86	150.64	56	50	
M18	Warragamba	-33.88	150.60	53	42	52
M19	Greendale	-33.92	150.66	58	59	
M20	Bringelly	-33.93	150.71	56	54	49
M21	Bents Basin	-33.93	150.63	60	57	
M22	Silverdale	-33.93	150.62	56	56	
M23	Werombi	-33.98	150.60	60	52	37
M24	Blaxland	-33.74	150.60	60	52	
M25	Linden	-33.72	150.52	55	51	54
M26	North Richmond	-33.58	150.71	49		
M27	Kurrajong	-33.53	150.69	47		

ID	Area	Latitude	Longitude	L_{Amax} (dB(A))		
				Day	Evening	Night
M28	The Oaks	-34.08	150.58	61	55	
M29	Lake Burragorang	-34.07	150.45	50	47	
M30	Tahmoor	-34.22	150.60	53	58	64

A complete suite of ambient noise monitoring reports presenting the results collected at each NMT are provided in Appendix E. The key characteristics of the noise environment at select noise monitoring sites (including from any observed aircraft flyovers) have been summarised in the following paragraphs to represent the different receiving environments. Note that the levels in Table 4.2 refer to average noise levels over the assessment period (per table note 6). The observed aircraft flyovers noted below are short-term observations between 30 seconds and one minute (refer to Table 4.3), which do not contribute in a meaningful way to the levels in Table 4.2.

Location M01 is situated in a rural residential area of Wallacia, as typified by low background noise levels with occasional traffic passbys on local roads. The local noise environment was dominated by natural sounds, with cicadas audible during evening periods, and birds audible during the night periods. Several aircraft passbys were observed overhead at this location with maximum noise levels observed to be in the order of 35 to 58 dBA for durations of 30 seconds and one minute during the day, evening and night time periods.

Measurements conducted at Sydney International Equestrian Centre (M16) indicated a background acoustic environment typical of a suburban area, due to constant traffic on the nearby M7 Westlink Motorway. Ambient noise sources also included various animal and insect sounds. Aircraft were observed at a distance with a maximum sound level in the range of 47 dBA to 54 dBA for up to one minute passbys during the day, and aircraft overhead observed during evening and night periods for between 30 seconds to a minute in the range of 50 to 61 dBA.

Observations at the Bents Basin Road Picnic Area (M21) identified aircraft noise levels in the range of 36 to 60 dBA for passbys between 30 seconds to one minute during the day, and between 43 dBA and 57 dBA during the evening period. The background noise environment was typified by distant traffic during the day, cicadas during the evening and night time periods, typical of a suburban residential environment.

Measurements taken in suburban areas such as Penrith (M09) suburban areas were found to be affected by suburban traffic noises, with several aircraft flyovers observed between 30 seconds to 1 minute up to with maximum levels of 38 dB to 59 dBA during the day period. Evening and night time ambient levels were influenced by local traffic and suburban hum, with no flyovers observed.

Measurements at Erskine Park were made at location M15, located in the vicinity of some industrial land uses. Noise levels at this location were found to be dominated by local industrial noise activities, local traffic and occasional mechanical plant noise from adjacent residences. Aircraft were observed during the day period at this location however levels were not sufficient over ambient noise to quantify over other sources. During the evening period one passby of up to 49 dBA was observed for approximately 1 minute. Noise levels are dominated by other noise sources at this location.

Background noise levels were measured at Twin Creeks (M04) active recreation area. The noise environment was found to be dominated by natural sounds, with occasional vehicle passbys audible on local roads. Several flight passbys were noted, with maximum levels between 43 and 54 dBA for durations up to 30 seconds during day time periods. During evening periods, several aircraft flybys were observed but not quantifiable over background noise levels associated with wind, natural noise and insect noise.

Chapter 5 Assessment scenarios

Several scenarios were considered to assess the potential noise impacts from single runway operations at WSI (aircraft operating along the new flight paths to approach and depart R05/23 and join the Sydney Basin enroute structures).

Noise exposure calculations for WSI air traffic are based on projected aircraft movements in the projected demand schedules developed and provided by WSA Co. The calculations are also based on assumptions derived from historic meteorological conditions and proposed flight paths and air traffic control procedures set out in the Plan for Aviation Airspace Management (PAAM).

Three PALs and assessment years were assessed as described in the following section and shown in Figure 5.1.

5.1 Assessment years and runway operating mode scenarios

5.1.1 Assessment years

Projected average weekly air traffic schedules for 3 PALs in 3 different assessment years were provided by WSA Co. Separate NS and NW schedules accounted for seasonal time changes to flights. All forecast traffic schedules included fleet mix projections (2033, 2040, 2055). They were translated to aircraft classes and the standard aircraft types used to represent aircraft noise in the AEDT noise modelling program.

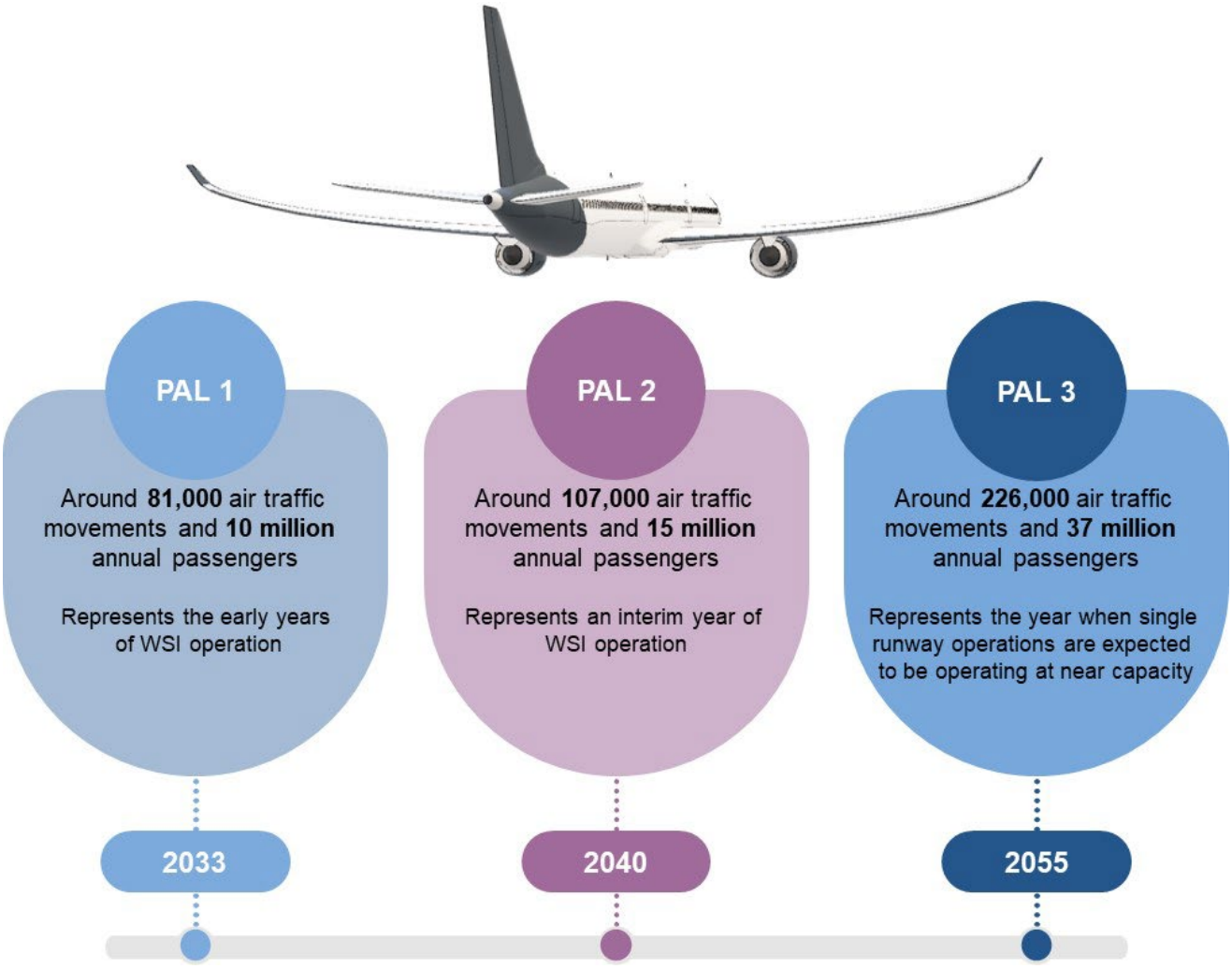

Figure 5.1 Assessment years for assessment of aircraft noise exposure

5.1.2 Runway Modes of Operation (RMOs)

The single runway (05/23) at WSI can operate in 2 possible runway directions giving 2 possible RMO options for this single runway system. Another option discussed in Section 8.1.1 is the RRO mode. The previous 2016 EIS highlighted that *"The use of head-to-head operations to and from the south-west, when it is safe to do so, is an important preferred option for managing aircraft noise at night."* All proposed RMOs are presented in Figure 5.2.

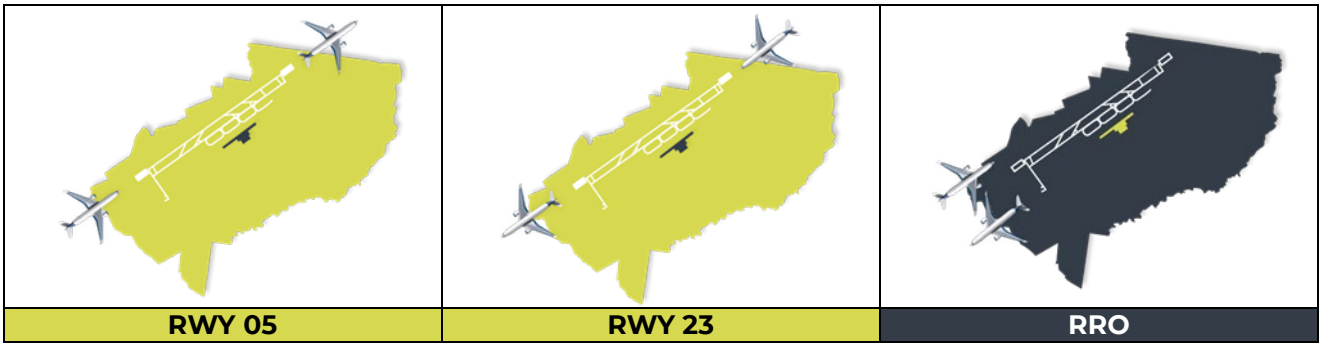

Figure 5.2 Proposed runway modes of operation – (RMOs)

As shown in Figure 5.2, the availability and selection of an arrival and departure runway by air traffic control under a specific set of circumstances (such as time of day) is referred to as the runway operating scenario.

The set of scenarios, including the 'selection rules' that define the conditions under which each mode would be selected by air traffic control are also described in detail in Section 8.1. These scenarios were applied to the reference year 2033, 2040 and 2055 schedules to allocate the projected air traffic by runway and then by flight path.

The mode selection rules consider the meteorological conditions, hourly flight arrivals and departures, and the 'priority' assigned to each mode. Preferences for each mode including assumptions on aircraft noise management and mitigation opportunities. The average weekly schedules were annualised and combined with historic meteorological data, to generate the likely RMO scenario availability and usage. Aircraft operating in a mode were assigned to flight paths based on the arrival or departure runway in use (i.e., 05 or 23), the type of aircraft, and the geographic location relative to WSI of the airport of origin or its destination.

5.1.3 Noise metrics, dwelling counts and noise sensitive receptors

The number of dwellings within noise exposure contours was calculated for the scenarios. Based on the noise metrics described in Section 7.4, the dwelling counts are presented in Section 9.6.

As well as dwellings, used to assess population counts within noise contour bands, consideration was given to the location, number and type of NSR. NSRs in the area around WSI includes residences, schools and other educational facilities, hospitals and other health care facilities, community centres, nursing homes, churches, places of worship and childcare centres.

Potential location-based impacts specific to noise sensitive areas or NSRs were assessed using several descriptors of noise exposure. This included changes in noise exposure and the number of receivers experiencing a given level of noise exposure. GIS overlays of current[7] dwellings and populations within the study area were based on latest available census data from the ABS (2021). Data on future growth was not readily available in a form suitable for quantitative analysis, so qualitative comparisons of aircraft noise contours relative to potential future urban growth corridors is dealt with qualitatively.

The impact assessment of the GBMA can be found in Technical Paper 14 property impact assessment of the EIS and similarly Matters of National Environmental Significance (MNES) assessments are assessed in Chapter 23 (Matters of National Environmental Significance) of the EIS.

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7 https://www.abs.gov.au/census/2021-census-data-release-plans/2021-census-product-release-guide

5.2 Facilitated changes

Consideration was also given to the adjustments required to Sydney Basin operations prior to the opening of WSI in 2026 to facilitate its new flight paths and airspace arrangements. This is covered in Chapter 8 (Facilitated changes) and Chapter 21 (Facilitated impacts) of the EIS.

Chapter 6 Statutory and Policy requirements

6.1 ICAO Balanced Approach to Aircraft Noise Management

The International Civil Aviation Organization (ICAO) is a specialised agency of the United Nations (UN) responsible for establishing the global regulatory framework for the safety of international civil aviation. One of its strategic objectives is to provide policies and practices for ICAO and its Member States to address and minimise the adverse environmental effects of civil aviation activities, including aircraft noise.

Australia is a Member State and therefore incorporates the agreed ICAO regulatory and guidance policies into Australian Government legislative and policy frameworks in relation to civil aviation.

In 2001, ICAO adopted the concept of Balanced Approach to Aircraft Noise Management[8] and reaffirmed in all the subsequent Assembly Sessions[9] with this approach gaining wide acceptance within the industry.

The balanced approach consists of 4 pillars, as shown in Figure 6.1.

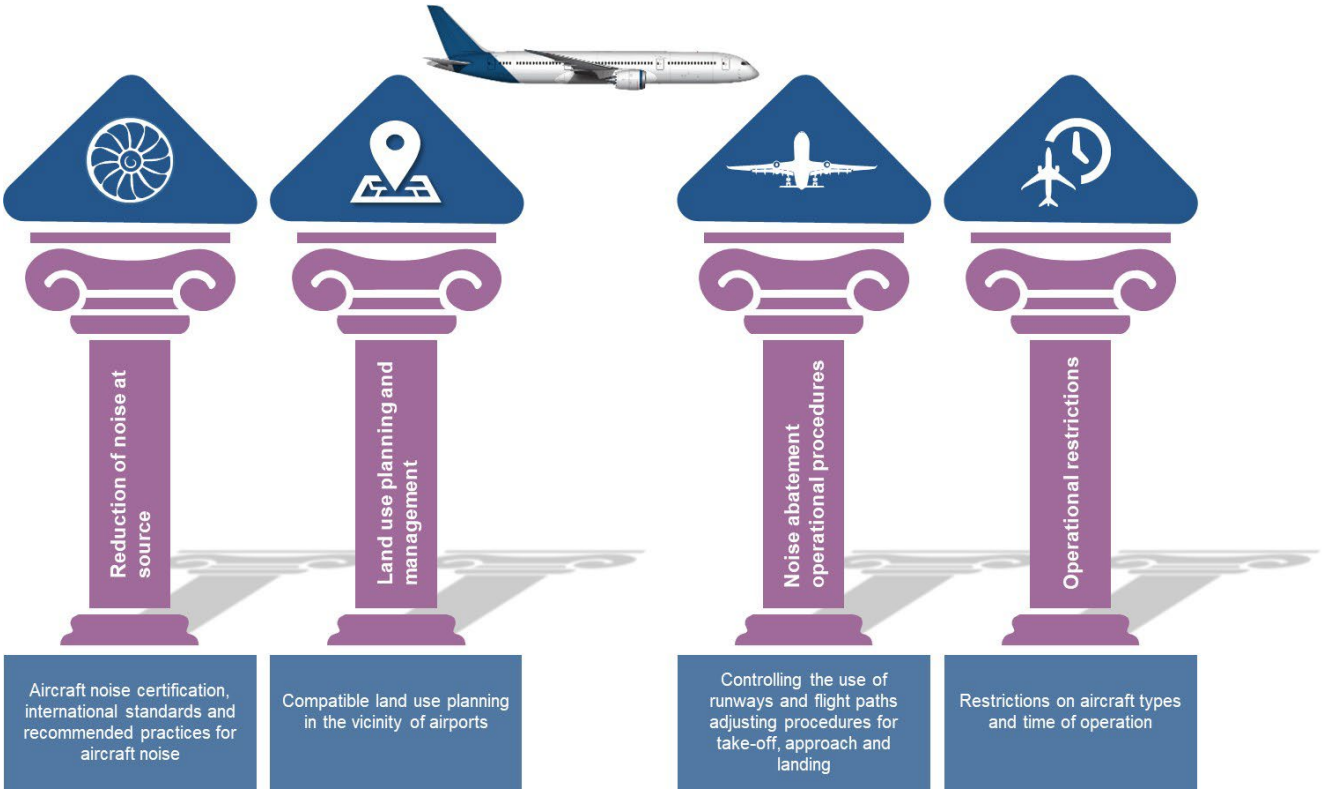

Figure 6.1 ICAO's Balanced Approach to Aircraft Noise Management

The balanced approach consists of identifying noise occurrences at an airport classified into 4 principal elements and analysing various measures available to reduce noise. The goal of using the 4 pillars is to address noise occurrences on an individual airport basis and to identify the most appropriate noise-related measures that achieve maximum environmental benefit cost-effectively using objective and measurable criteria.

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8 ICAO, Doc 9829

9 https://www.icao.int/environmental-protection/Documents/Resolution_A39_1.PDF

6.1.1 Reduction of noise at the source

Aerospace manufacturers (aircraft and engine) work to reduce noise at the source with variants of current aircraft and ongoing development of new design. The airlines that eventually operate at WSI will ultimately determine the aircraft fleet using the flight paths.

The major airlines expected to operate to WSI have a predominately modern fleet of aircraft and continue to undertake fleet renewal programs to maintain this status. While freight airlines may lag in achieving similar outcomes, they also renew periodically their fleet through the acquisition of new freighters or the conversion of older passenger aircraft. The benefits of aircraft modernisation are described in Section 10.3.

6.1.2 Land use planning and management

Land use planning controls are implemented by state and local government. In Australia there is a National Airport Safeguarding Framework (NASF). Guideline A provides guidance to Australian, State, Territory and Local Government decision makers to manage the impacts of noise around airports. This includes protection of an airport as a significant community transport and connectivity asset from incompatible land use in the vicinity. The corollary is to guide urban growth to minimise populations exposed to annoyance from aircraft noise. In the case of WSI this includes consideration of consequences of the economic activity and growth stimulated by the development of WSI.

The land-use planning controls that are in place for WSI are described in Technical paper 6.

6.1.3 Noise abatement operational procedures

Of the 4 pillars, the “Noise Abatement Operational Procedures” is the most directly relevant to the design of flight paths and management of airspace.

In addition to the PAAM initiative of positioning proposed flight paths over less sensitive land uses, noise abatement operational procedures will be further considered in the detailed design phase of the airspace design process. The RRO mode of operation (RRO is described in Section 8.1.1) seeks to minimise the numbers of population and dwellings exposed to aircraft overflight noise at night when conditions allow it to be applied. Noise abatement procedures are further discussed in Chapter 3 (Introduction to airspace) of the EIS.

6.1.4 Operating restrictions

Operating restrictions are a last resort when the first 3 pillars have not fully succeeded in limiting the exposure of populations to annoyance from aircraft noise. It is recognised that where restrictions cannot be avoided there are costs and consequences for the community being served by an airport in compromised connectivity for business and leisure passengers and freight, efficiency and economic benefit.

It is Australian Government policy that operating restrictions will not be considered for WSI.

In the second edition of the ICAO guidance on the balanced approach to aircraft noise management[10], strategies for airports to address ‘community issues’ were introduced. These included communication strategies and community engagement techniques[11].

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10 https://global.ihs.com/doc_detail.cfm?&input_search_filter=ICAO&item_s_key=00507943&item_key_date=890221&input_doc_number=9829&input_doc_title=&org_code=ICAO

11 https://www.icao.int/Meetings/AMC/MA/Assembly%2035th%20Session/wp101_en.pdf

6.2 Environment Protection and Biodiversity Conservation Act (EPBC Act) (Cth)

The development of a completely new airport at Badgerys Creek was the subject of an EIS. This was finalised and approved in 2016 by the then Minister for the Environment under the Commonwealth EPBC Act.

Background on previous environmental assessments in relation to the development of WSI and the associated airspace and flight paths was provided in Chapter 2.

The PAAM was referred to the Minister for the Environment by the Minister for Infrastructure, CASA and Airservices, as required under section 160 of the EPBC Act. The Minister for the Environment and Water has advised that an EIS is required and has issued the EIS Guidelines (EPBC 2022/9143) setting out the matters that the EIS must address. The assessment is designed to meet these obligations and was undertaken in collaboration with Airservices Australia.

The assessment for the EIS also considers recognised international and Australian national standards and recommended practices.

The PAAM which is the subject of the environmental assessment represents a clean-sheet-of-paper design from what was exhibited in 2015-2016 in the EIS for the Stage 1 Development of WSI. The PAAM has been developed following the principles and conditions set out in the Airport Plan.

6.3 Condition 16 of the approved Western Sydney Airport Plan (Airport Plan)

The requirements for preliminary airspace design for WSI is addressed in Condition 16 of the Airport Plan (refer to Section 1.5). The PAAM includes defining the flight paths, airspace changes, air traffic control and noise abatement procedures.

6.4 Sydney (Kingsford Smith) Airport Long Term Operating Plan (LTOP)

To integrate into the operations of the broader Sydney Basin airspace, the preliminary airspace design for WSI must consider the operating procedures and runway configurations for arrivals and departures using Sydney (Kingsford Smith) Airport. The Long Term Operating Plan for Sydney (Kingsford Smith) Airport and Associated Airspace (LTOP[12]), which was implemented to facilitate sharing aircraft noise associated with Sydney (Kingsford Smith) Airport air traffic. An important element of this is a preferential runway mode selection system. This is briefly described in Chapter 3 (Introduction to airspace) of the EIS. One of the functional requirements in developing the PAAM was, where possible, to avoid changes to the current noise sharing arrangements at Sydney (Kingsford Smith) Airport without affecting the safety of aircraft operations. This requires the preliminary airspace design for WSI not to impact the availability of noise sharing modes at Sydney (Kingsford Smith) Airport.

6.5 CASA airspace regulatory standards

The preliminary airspace design must meet civil aviation safety regulatory standards. To achieve this, the DITRDCA has collaborated closely with Airservices Australia, CASA, aerodromes/airports in the Sydney Basin, Defence, WSA Co and industry stakeholders.

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[12] https://sacf.infrastructure.gov.au/ltop; https://sacf.infrastructure.gov.au/sites/default/files/documents/ltop_general_information_fact_sheet_2015.pdf and https://www.airservicesaustralia.com/aviation-reporting/sydney-airport-and-associated-airspace-ltop/

6.6 Description of significance

The quantitative evaluation of aircraft noise exposure is driven by cumulative effects of individual noise events, their frequency, duration and time of day. The Australian NASF includes information to guide state, territory and local governments in regulating and safeguarding both airports and communities from inappropriate on and off-airport developments[13]. Guideline A includes measures for managing intrusion by aircraft noise and has Attachment 1 which deals with Supplementary Aircraft Noise Metrics.

As noted in Guideline A (Paragraphs 5 and 6) *"…governments recognise the merits of utilising a range of noise measures and tools in conjunction with the ANEF system to better inform strategic planning and to provide more comprehensive and understandable information on aircraft noise for communities"* and the Attachment provides *"…a brief overview of other aircraft noise measures and tools for the purposes of public communication…"*. It also notes that the Australian Standard AS 2021 is supplemented by a handbook (Acoustics – Guidance on producing information on aircraft noise) *"..to provide assistance on the preparation of information to describe aircraft noise to the public."*

The emphasis of these documents is to ensure that information provided by airports and related parties can *"..assist the individual in making their own decision on what is an acceptable level of aircraft noise in their circumstances"* and also provides guidance to state/territory and local governments that are responsible for the land use planning in the vicinity of airports.

The above referenced documents describe a range of noise measures including ANEC, N70 day and evening, N70 24-hours, N60 night and N60 24-hours. However, they do not regulate the environmental assessment of flight path changes for existing or new airports.

The assessments undertaken for noise impacts from the preliminary WSI airspace and flight path design considers these metrics in absolute terms as well as soundscape change. For a completely new airport like WSI, this includes comparison to ambient noise measurements.

Other non-acoustic descriptors of the impact of aircraft overflights include the number of arrivals or departures on a specific flight path (total, or broken down by time of day), as well as the concept of respite (proportion of time when a community in the vicinity of an airport can expect to have no overflights at all) if the options for RMOs can facilitate this. Respite is recognised internationally of being highly valued by communities in the vicinity of major airports.

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[13] *Principles - National Airports Safeguarding Framework. Retrieved June 7th 2023.* https://www.infrastructure.gov.au/sites/default/files/documents/0.3.1-NASF-Principles.pdf

Chapter 7 Aircraft noise assessment methodology

7.1 Introduction

This chapter explains how the aircraft noise exposure from the introduction of single runway operations at WSI was calculated. It describes the modelling tool and input assumptions, and the aircraft noise metrics and charts used to assess, compare and communicate noise impacts across the different operational scenarios.

7.1.1 Flight paths and track spread

Flight paths are 3-dimensional routes that safely guide aircraft between origin and destination airports. In this EIS they are shown as a broad band or corridor, based around a centreline (backbone) track. Unlike a train on a railway track, an aircraft cannot track precisely along a designated path without any deviation. This is influenced by meteorological conditions, pilot techniques and variations in aircraft performance.

The modelling of flight paths assumes most aircraft will be concentrated around the centreline path, decreasing proportions are allocated towards the outer edge of the corridor. For other airports this corridor is derived from radar data of actual paths flown by each aircraft over a period (day, week, month or year). Operations have not commenced at WSI and therefore no WSI historic data or baseline can be applied. Instead, actual radar track data from recently implemented Performance Based Navigation (PBN) based SIDs and STARs at Brisbane Airport was used as a basis to inform the allocation of proportion of aircraft within a flight path corridor. The flight path corridor spread from Brisbane Airport is considered a closer representation of the proposed similar PBN based air traffic procedures at WSI than at associated with Sydney (Kingsford Smith) Airport which operates on a different flight path design and airspace management model.

7.1.2 Guiding principles in preliminary airspace design development

The preliminary airspace design development has involved considerations of safety, noise abatement rules and interaction with other airspace users. The airspace design principles adopted in the developing the PAAM comply with existing regulatory requirements and standards, existing Airservices Australia traffic management practices, and aircraft capability. The development of the PAAM has been aligned with the Airservices Australia's Flight Path Design Principles[14] (Airservices Australia, 2020). These Principles address: safety and compliance; noise and community; efficiency and environment and operational. The noise and community principles address concentration to avoid defined NSRs; where high-density residential areas are exposed to noise consider designs that distribute aircraft operations so that noise can be shared; where noise exposure is unavoidable, consider noise abatement procedures to mitigate where possible and to consider current and expected future noise exposure in the preliminary airspace design.

7.1.3 Noise assessment objectives and elements

The primary objective of the noise assessment is to confirm that the proposed preliminary airspace design and associated procedures avoid any significant environmental and social impacts to greatest extent practical (whilst prioritising operational safety which is appropriately non-negotiable).

The key elements of the aircraft noise assessment are (refer to Figure 7.1):

1. Development and agreement on criteria and then identification of NSRs.
2. Characterising the current ambient noise environment across Western Sydney and the GBMA, including background noise levels and current noise exposure from aircraft operating inbound to and outbound from Sydney (Kingsford Smith) Airport and other Sydney Basin airports.

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[14] See https://engage.airservicesaustralia.com/flight-path-design-principles accessed 14/12/22

3. Noise exposure forecasts associated with aircraft operations into and out of WSI using a range of metrics and for a range of scenarios described below.
4. Correlating the above noise exposure forecasts with the potential impact on the identified NSRs and using qualitative and quantitative descriptors of potential impact due to the implementation of the project.



Figure 7.1 Key elements of aircraft noise assessment

The assessment considers:

a. the projection of noise levels on the ground from specific aircraft along WSI's proposed arrival and departure flight path corridors.

b. the impacts of operational procedures, including the selection of a RMO based on meteorological conditions, and any runway bias considered for noise abatement.

c. respite opportunities, specifically if RRO, which directs arrivals and departures away from urban areas (towards the south-west) can be used during the sensitive night period between 11 pm and 5:30 am (local time) when decreased Sydney Basin air traffic with the Sydney (Kingsford Smith) Airport curfew creates this opportunity.

7.2 Core assessment considerations

The environs in the study area differ in their land use patterns. It is therefore appropriate to consider different noise metrics and thresholds to assess the potential impacts of aircraft overflights of urban and rural areas, NSRs and scenic and wilderness areas.

The initial noise assessment in developing the PAAM considered some mitigation measures, such as positioning flight paths to minimise the number of persons and dwellings affected (avoiding overflight of urban residential areas where possible, and positioning flight paths over urban green space and industrial zones). This assumption was further considered (e.g., implicit concentration versus spread of the flight paths) in the environmental assessment phase.

This aircraft noise assessment considers:

- the flight path, its lateral and vertical profile and the nature of the terrain overflown, the level of precision assumed for visual, instrument or satellite-based navigation
- the typical operating aircraft, jet or non-jet, size and weight category and whether the operation is a departure or arrival
- stage lengths as classified in AEDT (i.e., stage 1 from 0 to 500 nm (926 km) from WSI to stage 9 over 6,500 nm (12,038 km) from WSI), fuel loads on departure and take-off weight, engine power (thrust) settings and vertical profiles
- the frequency of use and time of day (day or night definitions and weightings depending on the metric involved)
- the proximity of NSRs.

7.3 Descriptors of aircraft noise

This section considers the aircraft noise descriptors available and considered most suitable for use in this noise assessment. The noise descriptors address the following aspects which are then translated into the noise metrics defined in the following section:

- nature of noise events (intensity, tonal content, spectrum and duration)
- frequency of events
- time of events.

7.3.1 Noise events

Noise events are generated by aircraft movements on the ground (ground-based noise is not part of the scope of this EIS) and during all phases of flight in the air. All modern airline fleets must meet international aircraft noise and performance (ANP) characteristics through a noise certification process outlined in ICAO's Annex 16: Environmental Protection – Volume I Aircraft Noise. In practice, actual recorded noise levels will vary depending on a range of considerations including aircraft weight, engine thrust, aircraft speed, altitude, terrain level and meteorological conditions (humidity, temperature, wind speed and direction, cloud cover, etc.).

7.3.2 Frequency of events

The frequency of events is driven by the air traffic forecast to operate at WSI. For the purposes of this EIS this is based on projected typical NS and NW weekly demand schedules for the 3 different PALs across 3 assessment years at 2033 (PAL 1), 2040 (PAL 2) and 2055 (PAL 3) and have been developed and provided by WSA Co.

Once WSI is operational, the actual frequency of events at a given location will depend on the number of aircraft movements assigned to a runway and flight path that will result in a noise event at that specific location. This assignment will in turn be based on wind speed and direction, origin or destination of the flight, airport mode of operation (based on time of day) and the type of aircraft (jet or non-jet).

7.3.3 Time of events

The time of day for individual noise events uses the projected air traffic demand schedules provided by WSA Co. While some metrics include a weighting factor for the time of operation, other metrics provide the flexibility to illustrate customised times to acknowledge the sensitivity of the community at certain times of the day (day/night, or a more refined distinction of evening flights). For example: the ANEF system weights night operations (7 pm to 7 am) by a factor of 4 or 6 dB(A)), recognising heightened sensitivities during that period.

Seasonality (summer versus winter demand) is another expression of event timing. In addition, on an annualised basis, significant differences can be observed when comparing summer wind patterns (more easterly) to the winter wind patterns (more westerly), in addition to temperature conditions, which may affect runway direction usage and consequently flight path usage.

7.4 Noise metrics

There are a wide range of noise metrics that have been used to describe aircraft noise impacts (refer to Figure 7.2). A few are included in national regulatory standards for land use planning such as *AS 2021:2015 Acoustics – Aircraft noise intrusion – building siting and construction* (AS 2021) (Australian Standard 2015). Others have evolved to become national or international accepted best practice in similar airspace and flight path environmental assessments and community information initiatives.

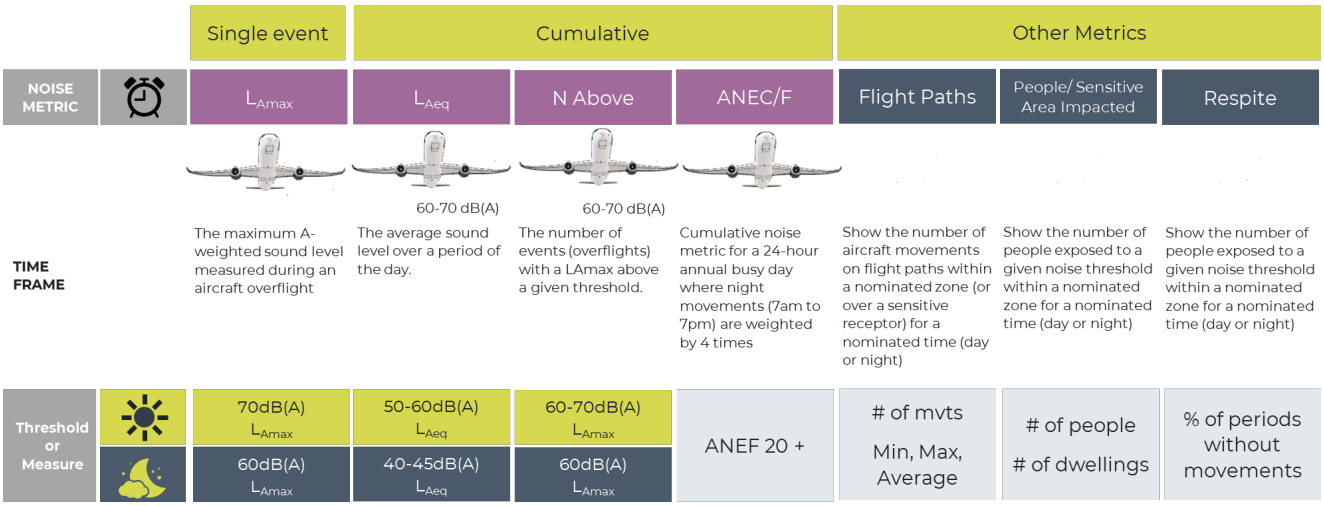

Figure 7.2 Selection of noise metrics to describe aircraft noise impacts

Most assessments in Australia are for individual or groups of flight path changes or for new runway developments at existing airports, such as those recent examples for Brisbane, Melbourne and Perth Airports. The flight path changes and changes in noise exposure patterns for a new runway are similar to the preliminary airspace design process for WSI. However, in terms of projecting traffic for various activity levels there is no current baseline traffic at WSI on which to build projections or for anchoring changes in distribution to current air traffic volumes and operating patterns.

Several metrics describe a location's level of aircraft noise exposure, each used for a different purpose. Figure 7.3 highlights the relationship between various metrics used to assess aircraft noise and are further described in Table 7.1.

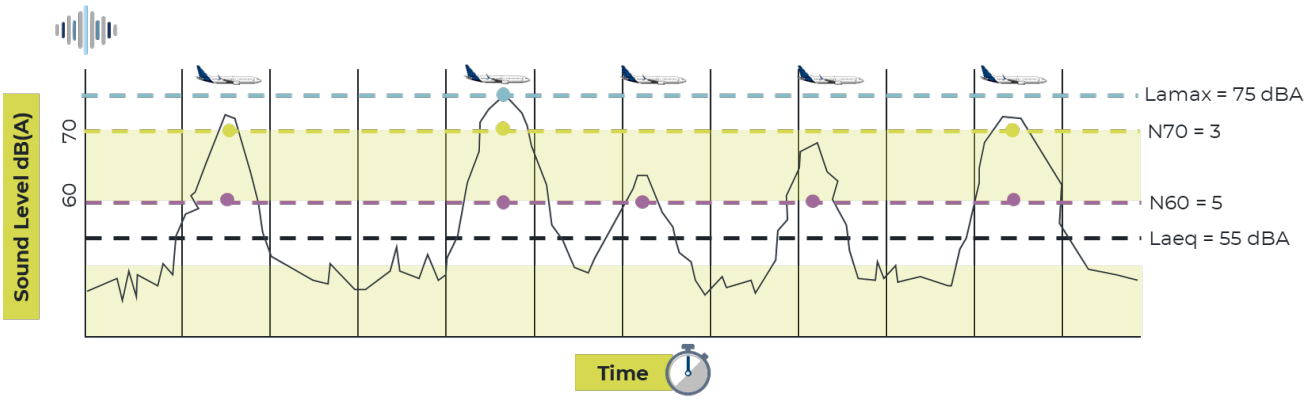

Figure 7.3 Relationship between different noise metrics

Figure 7.3 is a generic graphic illustration of the relationship between various noise metrics and is not intended to depict a WSI operational day. It illustrates how N60 and N70 metrics include overflights which exceed 60 dB(A) and 70 dB(A) sound levels. It also shows how an L_{Aeq} value as an averaging metric are exceeded by maximum noise levels by an individual overflight events across the day.

Table 7.1 Family of noise metrics used to assess noise from aircraft using WSI proposed flight paths

Metric	Noise Event	Frequency	Time	Assessment
N70	Yes. Trigger level based on Maximum Sound Level	Yes. Number of events over a given period (5, 10, 20, 50, 100 events)	Yes. 24-hours for design day	Contour for illustration – population and dwelling counts.
N60	Yes. Trigger level based on Maximum Sound Level	Yes. Number of events over a given period (2, 5, 10, 20, 50, 100 events)	Yes. 24-hours and night (11 pm to 5.30 am)	Contour for illustration – population and dwelling counts.
L_{Amax}	Yes. Maximum Sound Level for various aircraft types	No	No	Contour for illustration – population and dwelling counts.
L_{Aeq}	Yes. Average Sound Level	Yes. Cumulates all noise events to determine the average	Yes. Assessed for Day, Evening and Night	Metric is assessed at each NSR. Comparison with data from NMTs.
ANEC	Yes. Cumulative exposure considers profile of aircraft noise (level, duration, tonal content)	Yes. Cumulative exposure considers number of events	Yes. Average day metric which applies a penalty to movements between 7 pm and 7 am	Contour for illustration – population and dwelling counts. Land-use planning tool.
Flight path movement charts (swoosh diagrams)	No	Yes. Focus is on the number of overflights	Yes. Assessed for Day, Evening and Night	Minimum, Average and Maximum number of movements.
Respite charts	No	Yes. Percentage of days without movements	Yes. Respite is assessed for Day and Night.	Percentage of days and nights when little or no aircraft movements are expected on a specific arrival or departure flight path.
Proportion of respite	No	Yes. Proportion of days without overflights	Yes. Respite is assessed for Day, Evening and Night	Proportion of days without overflight at specific noise sensitive areas based on whether these areas are directly overflown or within one km of a flight path corridor.

7.4.1 Australian Noise Exposure Forecast (ANEF) metric

The metric adopted for land use planning in the vicinity of airports in Australia is the Australian Noise Exposure Forecast (ANEF) system. It is based on the international NEF (Noise Exposure Forecast) metric, which uses a cumulative aircraft noise for an average day based on one year of projected future air traffic movements. The ANEF system guides land use based on a "noise-dose" response curve from data from carefully designed social surveys. It correlates the noise exposure with the proportion of people who describe themselves as "seriously affected by aircraft noise". It is the basis of Australian Standard AS 2021:2015 – Acoustics – Aircraft Noise Intrusion – Building Siting and Construction. AS 2021 contains advice on the acceptability of building sites based on ANEF zones. The acceptability criteria vary depending on the type of land use as shown in Table 7.2 which identifies the recommended development types acceptable within ANEF zones, as outlined in AS 2021. For example, residential development is considered 'acceptable' in areas with ANEF lower than 20, 'conditionally acceptable' in areas with ANEF between 20 and 25 and 'unacceptable' in areas with ANEF greater than 25. In conditionally acceptable areas, AS 2021 recommends that new buildings should incorporate acoustic treatment to achieve specified internal noise levels. The objective of this is both for "airport safeguarding" and also safeguarding the community from inappropriate developments and introducing populations into noise impacted areas.

The building-type acceptability for ANEF zones is shown in Table 7.2 and adapted from AS 2021 (refer to Table 1.1 of AS 2021). Table 7.3 is to be read in conjunction with Table 7.2 which has also been adapted from AS 2021 (refer to Table 3.3 of AS 2021). While AS 2021 provides guidance, the implementation of land use planning is a matter for state/territory or local government.

The NSW planning framework takes a precautionary approach to residential land use for WSI operations, which includes requirements under the Western Parkland City SEPP on the application of the ANEF (refer to Technical paper 6).

Table 7.2 Building site acceptability based on ANEF zones

Building type	ANEF zone of site		
	Acceptable	Conditionally Acceptable	Not Acceptable
House, home unit, flat, caravan park	Less than 20 ANEF[1]	20-25 ANEF[2]	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25-30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF[1]	20-25 ANEF[2]	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF	20-25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF[1]	20-30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25-35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30-40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Notes:

1. The actual location of the 20 ANEF contour is in aircraft flight paths. Because of this, the procedure of Clause 2.3.2 may be followed for building sites outside but near to the 20 ANEF contour.
2. Within 20 ANEF to 25 ANEF, some people may find that the land is not compatible with residential or educational uses. Land use authorities may consider that the incorporation of noise control features in the construction of residences or schools is appropriate (refer also to Figure A1 of Appendix A).
3. There will be cases where a building of a particular type will contain spaces used for activities which would generally be found in a different type of building (e.g., an office in an industrial building). In these cases, Table 1.1 should be used to determine site acceptability, but internal design noise levels within the specific spaces should be determined by Table 3.3 of AS 2021.
4. This Standard does not recommend development in unacceptable areas. However, where the relevant planning authority determines that any development may be necessary within existing built-up areas designated as unacceptable, it is recommended that such development should achieve the required ANR determined according to Clause 3.2. For residences, schools, etc., the effect of aircraft noise on outdoor areas associated with the buildings should be considered.
5. In no case should new development take place in greenfield sites deemed unacceptable because such development may impact airport operations.

Table 7.3 Indoor design sound levels for determination of aircraft noise reduction

Building type and activity	Indoor design sound level dB(A)
Houses, home units, flats, caravan parks	
Sleeping areas, dedicated lounges	50
Other habitable spaces	55
Bedrooms, toilets, laundries	60
Hotels, motels, hostels	
Relaxing, sleeping	55
Social activities	70
Service activities	75
Schools, universities	
Libraries, study areas	50
Teaching areas, assembly areas	55
Workshops, gymnasiums	75
Hospitals, nursing homes	
Wards, theatres, treatment and consulting rooms	50
Laboratories	65
Service areas	75
Public buildings	
Churches, religious activities	50
Theatres, cinemas, recording studios	40
Court houses, libraries, galleries	50
Commercial buildings, offices, shops	
Private offices, conference rooms	55
Drafting, open offices	65
Typing, data processing	70
Shops, supermarkets, showrooms	75
Industrial	
Inspection, analysis, precision work	75
Light machinery, assembly, bench work	80

The relationship between an ANEF and the proportion of people seriously affected by aircraft noise is shown in Figure 7.4. This has been adapted from AS 2021.

The ANEF definition is complex, and as a single-number index, it does not provide the level of information generally sought by community stakeholders. For these reasons, the ANEF is limited in its applicability to an assessment of changing aircraft noise exposure and land-use planning implications of an airport operation. The production of an ANEF chart endorsed for technical accuracy by Airservices Australia is a requirement of the *Airports Act 1996* (Airports Act) (Cth) for all major Australian airports and a key compliance element of their 5-yearly master planning processes.

An Australian Noise Exposure Concept (ANEC) is a noise exposure chart produced for a projected future airport usage scenario and is useful for considering the land use planning consequences of alternative operating strategies. ANEC noise exposure contours are calculated using the same methods as the ANEF. However, they use indicative data on aircraft types, aircraft operations and flight paths and are generally used in environmental assessments to depict and compare noise exposure levels for different runway or flight path options.

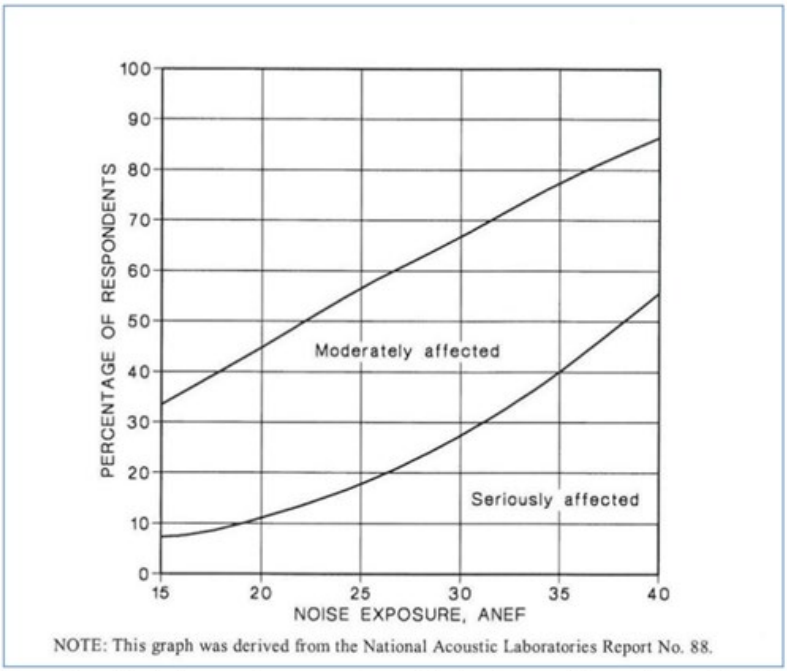

Figure 1: Reaction between noise exposure forecast level and community reaction in residential areas

Figure 7.4 Relationship between ANEF and proportion of people "seriously affected" by aircraft noise (AS 2021:2015)

The third type of contour is the Australian Noise Exposure Index (ANEI). ANEI contours are prepared from historic actual usage data (previous year), compared to the ANEC and ANEF, which are forecasts for future years. When produced over successive years ANEI's can be a useful comparison metric for the effects of growth in movements, changes in operating conditions and/or airspace change initiatives. This will only be relevant to WSI once it commences operations.

7.4.2 The 1985 and 2016 EIS ANEC

A series of ANECs were developed for the 1985 *Second Sydney Airport Site Selection Programme Draft Environmental Impact Statement* (1985 Draft EIS) (Kinhill Stearns 1985). These contours have guided subsequent planning controls implemented by the NSW Government and relevant local councils in the vicinity of WSI. Planning controls that are implemented based on an ANEF (the 1985 Draft EIS ANEC in the case of WSI) typically serve to limit the types of development permitted to occur within certain noise exposure zones.

The key planning decision made after the 1985 Draft EIS is the ministerial direction under section 117(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (NSW). The direction applies to all land within the ANEF in the local government areas of Fairfield, Liverpool, Penrith and Wollondilly and requires that planning instruments do not contain provisions enabling development that could hinder the potential for development of a Second Sydney Airport. The direction has subsequently been given effect through the *Penrith Local Environmental Plan 2010* and *Liverpool Local Environmental Plan 2008,* with the inclusion of provisions aimed at preserving noise related buffers around WSI.

As part of the 2016 EIS, ANEC contours were developed for a 2050 assessment scenario. They were found to extend along the extended runway centreline for a distance of approximately 12–15 km, without reaching major population areas. To the sides of the runway (05/23), the contours extended approximately 1.5 km from the centreline of the runway.

The 20 ANEC contours for the 2050 scenario were found to cover areas that are currently mostly rural residential in nature, with some industrial use. No densely populated areas or built-up residential development would be included in the 20 ANEC contour under any scenario.

However, the ANEC contours presented in the 2016 EIS were not used for land use planning purposes. Further information on the land use planning for WSI is provided in Technical paper 6.

7.4.3 Number above (N-above) contours

It is recognised that the ANEF, while a useful tool for land use planning, has certain limitations and is a less useful and transparent tool for describing information about aircraft noise to residents. The National Airports Safeguarding Advisory Group (NASAG) has formalized the use of metrics to quantify a range of frequency-based aircraft noise events.

They are referred to as N-above (number above) contour levels. N-above contours provide information about aircraft noise that can be more easily understood by the community.

A typical N-above level used is the N70, which represents the number of aircraft noise events that exceed 70 dB(A) within a day or a given period of time. Outdoor maximum sound levels of 70 dB(A) can lead to indoor sound levels around 60 dB(A), enough to disturb a normal conversation, although this may vary based on whether windows are closed and the quality of the dwelling insulation. Typical housing building fabric will result in a 10 dB(A) reduction of external noise when indoors, even with doors and windows open.

At night, the N-above level used is the N60, which reflects an indoor maximum noise level of 50 dB(A) with windows open. This level was found to trigger awakenings with some people, an important factor to assess in the context of this EIS.

N-above contours can be calculated for different periods, indicating the average number of events experienced during that time block. N70 and N60 contours will be produced for runway operating mode scenarios. N-above values for future operating scenarios will be calculated via the application of an average day schedule based on historical meteorological data (i.e., wind speed and direction) to allocate the flight paths to distribute the traffic. Projections will be made for each nominal reference year (2033, 2040 and 2055) based on different proposed operating scenarios, for different event levels as follows:

- N60 (24-hours) = 10, 20, 50, 100 and 200 events per day
- N70 (24-hours) = 5, 10, 20, 50 and 100 events per day
- N60 (night – 11pm to 5:30am) = 2, 5, 10, 20 and 50 events per day.

The number of dwellings and noise sensitive sites within these N-above contours will be estimated to form the basis of the aircraft noise assessment presented in the EIS. These thresholds were adopted because they represent levels above which aircraft noise would be considered a regular feature of the ambient noise environment. N70 values of 5 or more are considered appropriate for describing aircraft noise in areas currently experiencing aircraft noise, as well as areas which would be newly affected by aircraft overflights. They also provide sufficient resolution to describe the change in aircraft noise for both existing and newly affected areas.

These N-above contours use the representative average ‘weekly’ demand schedules provided by WSA Co, using detailed historical meteorological wind data from a 10-year period. The N-above metrics are related to the time that flights are allocated to:

- 24-hours
- night (11 pm to 5:30 am local time).

As previously explained the selection of the hours 11 pm to 5:30 am for the WSI “Night” period for these N-above metrics is based on the availability of RRO and a suite of proposed flight paths that vary to the proposed “Day” flight paths during these hours which is dependent on the Sydney (Kingsford Smith) Airport curfew, meaning that there is capacity in the airspace to make this design initiative viable. It is acknowledged that for other airports and studies the hours 11 pm to 6 am have typically been selected for the N-above night metrics.

7.5 Noise modelling

The noise modelling process calculates the values for the various noise metrics for the defined scenarios. The various factors driving noise exposure are discussed in this chapter. A tabulation of assumptions and operational input assessments is provided in Chapter 8.

Figure 7.5 shows the main steps for analysing and presenting aircraft noise exposure as part of the noise modelling process.

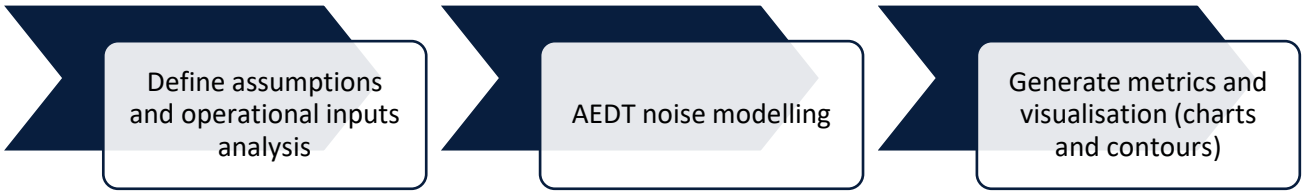

Figure 7.5 Noise modelling process

7.5.1 Operational inputs analysis

This step defines the assumptions required for the AEDT noise model. It analyses the various RMOs against the historic meteorological data set and the projected demand (flight) schedules to assign each operation to a runway (Runway 05 or Runway 23) and flight path (arrival and departure by day and night). The main inputs are:

- projected demand schedules (inclusive of flight time, fleet mix, origin-destination routes) for each assessment year (2033, 2040, 2055)
- modes of operations priority rules based on:
  - historic (10-year) meteorological data set
  - air traffic management rules (priorities, runway mode change)
- aircraft flight paths and profiles
- aircraft noise and performance data.

The values for these inputs are detailed in Chapter 8.

7.5.2 AEDT noise modelling

The US FAA's Office of Environment and Energy (FAA-OAEE) AEDT aircraft noise and emissions prediction software models aircraft noise scenarios. The latest version 3e of the AEDT software was used for this assessment. AEDT supersedes the previous INM software used in Australia for the past several decades to generate aircraft noise metrics and contours.

AEDT helps the analyst answer questions of interest about the environmental consequences of aviation activities. These are evaluated within AEDT through various metrics, many of which are defined by regulatory standards.

All assumptions for the aircraft noise modelling are described in detail, including those that are native to the software and those that are user defined. All modelling for the EIS for noise has been done in AEDT and any pre- or post-processing where justified is transparent and auditable.

7.5.3 Noise metrics visualisation

While the modelling of the noise contours and other metrics are generated in AEDT, consistent with convention in the application of AEDT model outputs, some post-processing was undertaken in a GIS software to assess and compare contours.

7.5.4 Sensitivity analysis

A core model was created from a baseline and maintained throughout. Rather than using multivariate analysis to test changes to multiple parameters at one time, individual sensitivities were run for individual parameters (e.g., a sensitivity to a track spread assumption, a separate sensitivity run for a track change, a separate sensitivity analysis for change to a RMO or noise abatement procedure assumptions). This methodology ensures a robust base, an understanding of the sensitivity to any single parameter and ensuring clarity in technical assessments and by stakeholder audiences.

An internal register and graphical database of sensitivity runs was used to comparison and classify parameters as significant or secondary in relation to their impact on noise contours or other related assessment criteria. These sensitivity runs were generated and reviewed throughout the modelling process.

All sensitivities have been reviewed to determine if changes to the selected model parameter will result in a significant change to the outcome. This is distinct from the “materiality” or significance of the noise impact. Its purpose is just to test sensitivity of outcomes to adopted assumptions and level of detail. This also provides a view on the baseline value adopted for each specific parameter for the modelling and assessment (e.g., temperature and humidity setting in the model inputs, adjustment to one or more aircraft noise profiles, etc.).

Sensitivity runs have been limited to those needed to test impact on outcomes (significant or secondary), and subsequently for agreement on adopted paraments or ranges for the significant parameters. Those deemed as secondary are subsequently described qualitatively. Sensitivities tested include:

- temperature and weather (aircraft performance (temperature), noise propagation (temperature) and runway use (prevailing winds)
- traffic (fleet mix, weekday vs weekend splits)
- aircraft operations (Aircraft Noise Calibration and Hold down procedures).

Sensitivities are further described and analysed in Section 9.8.

7.5.5 Previous assumptions

The modelling undertaken for the PAAM adopted many of the assumptions and methodologies used to support the development of the latest Melbourne Airport Master Plan 2022 and its current preliminary draft Third Runway Major Development Plan (MDP).

This includes the aircraft noise level (refer to Table 8.6) as well as the adjusted climb profiles and stage lengths (refer to Table 8.8) which were developed using noise monitoring data from Perth, Brisbane and Melbourne airports to calibrate the aircraft noise model. Those assumptions have been reviewed for use in this EIS and noise assessment, and where appropriate adopted with supporting justification, to ensure consideration of data gathered through previous EIS and to elicit regulatory endorsement.

7.5.6 Alignment and assumptions review

At regular and frequent intervals technical specialists have met (virtually or in-person) to discuss and review assumptions in the AEDT model, the sensitivity run register and other AEDT model elements to ensure those involved collectively endorse the robustness of inputs, processes and outcomes.

This included a full day technical workshop exclusively for the modelling experts to review the AEDT model “line-by-line” on screen to ensure appropriate fidelity and robustness of the assumptions and their application in the model. This was a separate task involving representatives from the DITRDCA, their technical advisors and Airservices Australia to review the AEDT model outputs, especially the various noise contours generated.

Chapter 8 Aircraft noise assumptions and operational inputs

This chapter describes, discusses and tabulates the key assumptions that were needed to undertake the noise modelling using the AEDT noise modelling tool, for the proposed WSI flight paths and procedures and, after that, the assessments. These included:

- RMOs and runway operating scenarios based on these
- meteorological data and associated operational analysis of this
- air traffic forecasts and operational analysis based on these
- aircraft fleet mix
- flight tracks
- NSRs
- terrain
- other modelling considerations and limitations.

Table 8.1 lists the assumptions used in the noise assessment, sources of, and the organisations that provided data. Where appropriate they draw on and then update those previously used in the 2016 EIS and PAAM modelling.

Table 8.1 Data sources and assumption attribution

Parameter	Assumption/data source	Provided by/attribution
Runway specifications	DITRDCA	DITRDCA
Flight path layout	PAAM 1.72 (1)	DITRDCA
Flight corridor spread	TWG / Airservices	DITRDCA
Runway usage/ operating modes	TWG / Airservices	DITRDCA
Flight path usage	TWG	DITRDCA
Fleet mix	Demand schedule (2033, 2040 and 2055)	WSA Co
Aircraft noise profile	Standard aircraft noise profiles PAAM aircraft noise modelling calibrated noise profile	AEDT (FAA) SoundIn, reviewed by Airservices Australia
Stage length	PAAM aircraft noise modelling calibrated stage length	SoundIn, reviewed by Airservices Australia
Temperature	Average Maximum Temperature (Annual)	Bureau of Meteorology (BoM)
Headwind	Average Headwind (Annual)	BoM
Humidity	Average Humidity (Annual)	BoM
Barometric pressure	Average Pressure (Annual)	BoM
Day versus Night splits	Demand schedule (2033, 2040 and 2055)	WSA Co
Terrain	SRTM 3 arc second data	SRTM

Parameter	Assumption/data source	Provided by/attribution
Grid spacing–- ANEC	0.1 nm	Airbiz
Grid spacing–- N-Above	0.1 nm	Airbiz
Absorption	SAE-ARP-5534	Airbiz
Population exposure	Dwelling/population counts	ABS/WSP
AEDT Version	AEDT 3e	Airservices Australia

1. PAAM v1.72 is the subject of assessments being undertaken for the EIS noting that some additional items related to the ODALE/AKMIR STAR to Sydney (Kingsford Smith) Airport and refinement of Runway 23 and Runway 05 SIDs (east and south) at WSI.

8.1 Runway modes of operation (RMO)

Table 8.2 describes the runways used for the various operational modes – Runway 05, Runway 23 and RRO. The availability and priorities for mode usage and the runway operating scenarios are described in this section. The runway operating scenarios indicate the RMO selection priorities and consider meteorological conditions by time of day. This in turn determines runway mode availability and then usage. Based on the runway allocation, the route to or from an origin or destination airport and the aircraft category or type determines the flight path allocation for each operation. Figure 8.1 depicts the process applied to allocate a WSI operation to a runway and flight path.

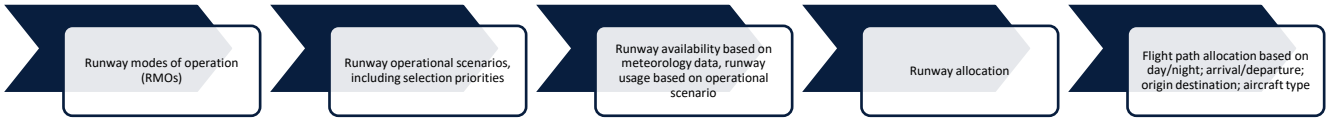

Figure 8.1 Process to allocate a WSI flight operation to a runway and flight path

As previously noted, the definition of hours of operation for night are determined by the availability of airspace capacity once the Sydney (Kingsford Smith) Airport curfew commences and early in the morning when aircraft bound for Sydney (Kingsford Smith) Airport are already in the Sydney Basin airspace, preparing for landing after the curfew end time of 6 am. This affects not only the availability of RRO, but also the flight paths for arrivals and/or departures for Runway 05 and 23 modes.

As shown in Table 8.2 and discussed in Section 8.2, the proposed WSI flight paths at "Night" vary to the proposed "Day" (5:30 am to 11 pm) flight paths, with reduced operations by other Sydney Basin airports (predominately Sydney (Kingsford Smith) Airport, creating greater airspace design flexibility. Areas overflown are different. This is facilitated by the fact that most of the airspace directly associated with WSI flight paths is north (and west) of Sydney (Kingsford Smith) Airport. When Sydney (Kingsford Smith) Airport is in "curfew" operations are restricted to the main runway in a southerly direction. All arrivals are from the south to Runway 34L and all departures are to the south on Runway 16R. This removes the "Day" constraints on airspace available for WSI operations.

The aircraft noise impact assessment considers a strict transition between day and night modes of operation – a transition at 11 pm and again at 5:30 am. However, in practice, the actual time window may vary slightly particularly as it is also dependent on the curfew transition at Sydney (Kingsford Smith) Airport – 11 pm and 6 am. Again, it is important to realise that the WSI transition from night to day at 5:30 am precedes the end of the Sydney (Kingsford Smith) Airport curfew, as there is already traffic for that airport arriving in the Sydney Basin and needing to be separated from WSI operations and vice versa. The transition at 11 pm at WSI and Sydney (Kingsford Smith) Airport is considered feasible as the volume of air traffic associated with Sydney (Kingsford Smith) Airport from 10 pm onwards is usually significantly less than the anticipated air traffic already in transit to arrive at Sydney (Kingsford Smith) Airport at 6 am (post-curfew).

Table 8.2 Runway modes of operation (RMOs) options by time of day

Time	Hours of Operation	Runway Mode	Description
Day	5:30 am to 11 pm	05	All aircraft arrive from the south-west and take-off to the north-east
		23	All aircraft arrive from the north-east and take-off to the south-west
Night	11 pm to 5:30 am	RRO	All aircraft arrive from the south-west onto Runway 05 and take-off on Runway 23 turning immediately to the south or north-west *(suitable during Sydney (Kingsford Smith) Airport curfew hours only)*
		05	All aircraft arrive from the south-west and take-off to the north-east *(suitable during Sydney (Kingsford Smith) Airport curfew hours only)*
		23	All aircraft arrive from the north-east and take-off to the south-west *(suitable during Sydney (Kingsford Smith) Airport curfew hours only)*

8.1.1 Reciprocal runway operations (RRO)

The RRO mode directs night-time operations over less densely populated area to the west and south-west of WSI. As outlined in the 2016 EIS, *"The use of head-to-head operations to and from the south-west, when it is safe to do so, is an important preferred option for managing aircraft noise at night"*". The RRO mode positions arriving traffic to land on Runway 05 from the south-west and departing traffic on Runway 23 towards the south-west, when weather conditions and schedule allow.

RRO weather criteria requires tailwind of no more than 5 kt (9 km/h) and a dry runway surface. In addition to the weather requirements, the largest variable in determining the availability of RRO is the actual distribution of the arriving and departing aircraft at the time. Where all aircraft in a rolling 60 minute period are arriving flights, then up to 30 aircraft in that hour could be safely accommodated. Where all aircraft in the rolling 60 minute period are departures, then up to 40 aircraft in that hour could be safely accommodated. Where there is a balance between arriving and departing aircraft, the number that could be safely accommodated is less than 30 movements per hour.

The 2016 EIS indicated that RRO could occur if "the number of arriving and departing aircraft is not more than 20 per hour". This figure is based on rates experienced at similar, single runway airports in Australia.

8.1.2 Unidirectional assessment

While the runway operating scenarios will establish preferential use of the RMOs, prevailing wind conditions may support operations using the runway in one direction across an entire day. While the use of RRO described above will significantly reduce this occurrence (for operating scenario 3 (S3)and 4 (S4)), review of historical wind data shows that under a no preference scenario, described in the following section, unidirectionality could occur approximately 34 per cent of the time, as presented in Table 8.3.

Table 8.3 Unidirectional runway operations by operating scenario based on historical wind data

Scenario	2012-2021
S1	33.9 per cent
S3	4.4 per cent
S4	5.0 per cent

Unidirectional operations occur throughout the year but are typically more likely towards the north-east (Runway 05) during NS (April-September) and towards the south-west (Runway 23) during the NW (October-March). Figure 8.3 and Figure 8.4 highlight the relationship of unidirectional operations (i.e., all Runway 05 or all Runway 23) to other operating scenarios from the perspective of the runway direction and the runway end usage. Appendix C presents the impact of unidirectionality on N70 contours. As highlighted, these impacts compared to the average operating condition of each runway operating scenario are limited due to the single runway system which reduces the potential RMOs compared to a multi-runway system airport.

8.2 Runway operating scenarios

Several runway operating scenarios have been modelled to generally cover the envelope of potential impacts of aircraft noise for each reference year (2033, 2040, 2055). Consideration was also given to any sensitivities to seasonal (summer versus winter), the time of the week (weekday versus weekend) and the time of day (day, evening, night, 24-hours).

The scenarios in terms of RMO selection are shown in Figure 8.3 and Table 8.4. They show daytime and night-time priorities where relevant. These runway operating scenario definitions were used in the operational input analysis leading into the noise modelling. The analysis compared runway availability, runway directional usage and end usage for the scenarios. All the runway operating scenarios, scenario 1 (S1) to scenario 7 (S7), were assessed at this level. Based on this, a selection of these scenarios was taken forward into the noise modelling to create an outer envelope (composite of contours for selected scenarios) to illustrate a geographic extent of potential impacts. This is important for assessment of potential impacts where there is still flexibility in finalisation of airspace concepts and designs.



Figure 8.2 Process to create scenarios and model noise envelopes

The significance of impacts was then assessed using the ABS 2021 census data for population and occupied dwelling counts.

Table 8.4 Runway operating scenario definitions

Scenario	RMO selection criteria	Day RMO priority (5:30 am – 11 pm)	Night RMO priority (11 pm – 5:30 am)
S1	No Preference	No Preference	No Preference
S2	No Preference with RRO	No Preference	1. RRO 2. No Preference
S3	Prefer 05 with RRO	Runway 05 Preferred	1. RRO 2. No Preference
S4	Prefer 23 with RRO	Runway 23 Preferred	1. RRO 2. No Preference
S5	Prefer 05 with RRO. Limited Peak-Time Change	Runway 05 Preferred	1. RRO 2. No Preference
S6	Prefer 23 with RRO Limited Peak-Time Change	Runway 23 Preferred	1. RRO 2. No Preference
S7	Prefer 23 with a period of no priority during the day With RRO	**Non-Peak:** Runway 23 Preferred **Peak:** No Preference	1. RRO 2. No Preference

Other than the selection of a preferential runway, the RMO selection may involve ensuring that mode changes are minimised, especially during peak period as proposed by scenarios 5 (S5) and 6 (S6). If no mode is available for the entire peak period, the mode with the longest availability from the start of the peak period is used, until a mode change is necessitated by unavailability of the current mode.

Figure 8.3 highlights how the different scenarios vary in terms of runway direction and runway-end exposure. In the "Day", the preferred scenario will be scenario 3 (S3) and scenario 4 (S4) as other scenarios will only marginally reduce the runway use in either direction. A more detailed quantitative assessment is provided in Figure 8.11.

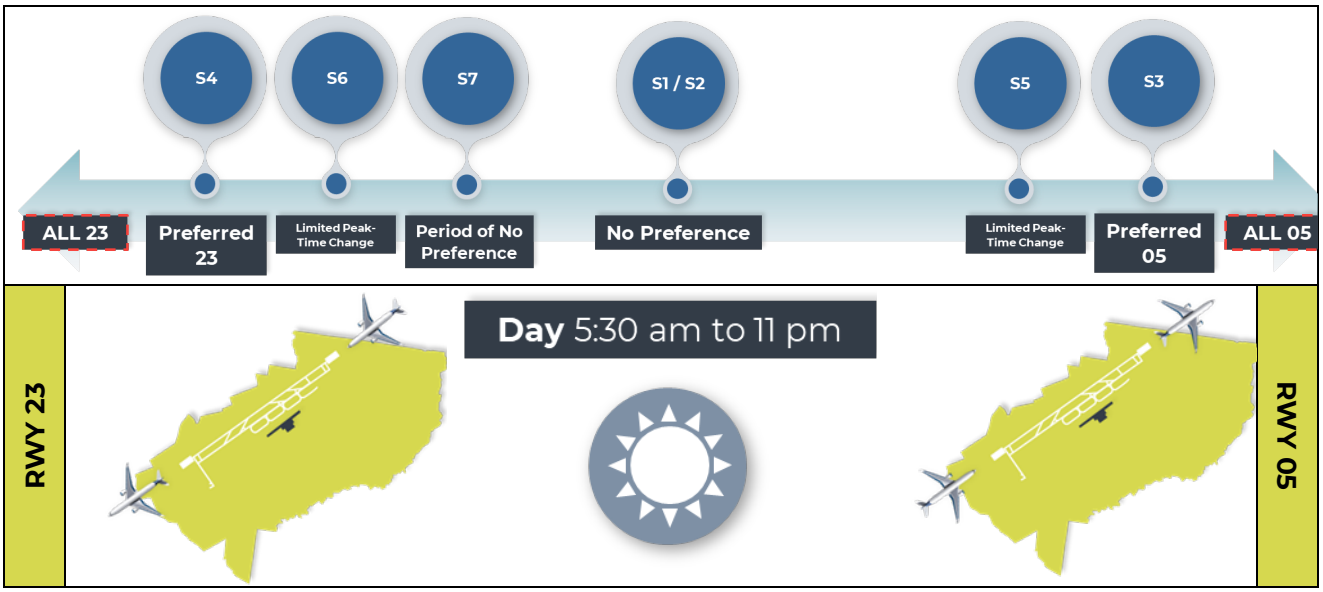

Figure 8.3 Runway direction by scenario

During the "Night" (depicted in Figure 8.4), the RRO mode makes the assessment by runway direction less relevant and moves the focus towards a comparison of the runway end exposure to aircraft movements. In this case, scenario 1 (S1) provides another important perspective based on the inability to use the RRO mode. Based on recommendations from the 2016 EIS, no scenarios were developed with a bias towards the Runway 05 end. A more detailed quantitative assessment is provided in Figure 8.12.



Figure 8.4 Runway end usage by scenario

A single AEDT model was created for each representative operating scenario with runway and flight path allocation rules sourced from the preliminary macro-assessment of all operating scenarios. An iterative process has been undertaken to review sensitivity of different parameters and their significance in impacting outcomes of the modelling process.

Subsequently, the AEDT noise model has applied the adjusted/calibrated values for the relevant aircraft types based on the calibration outcomes undertaken at the 3 above airports to better reflect reality for the resulting noise metrics generated and presented in this Paper.

Flight path movement charts with numbers of movements on each track, and respite diagrams were prepared for selected scenarios to illustrate the variation of noise events and exposure (refer to Sections 9.2 and 9.3).

The proposed preliminary airspace design and resulting flight paths presented in the PAAM are PBN based with procedural SIDs and STARs, and the modelling and noise assessment is based on aircraft always following these. In practice, especially during early years when traffic levels are relatively low, individual flights may be permitted to fly off-procedure flight paths for more direct tracking to the enroute paths, for greater efficiency in terms of flight time, fuel and emissions. This is discussed in further detail in Chapter 12 (Air quality and greenhouse gas) of the EIS.

8.3 Air traffic forecasts

WSA provided an average weekly traffic schedule for both the NS and NW schedule seasons. The average weekly traffic schedules were “annualised” by taking the relative proportions of days in the NW schedule season and the NS schedule season to create a table with 365 days’ worth of aircraft movements.

There is little difference between the NS and NW schedules as provided by WSA Co. The number of weekly movements and breakdown by aircraft type and route was the same. The only difference was a shift in arrival or departure time for the flights due to seasonal time changes. Figure 8.5 compares the weekly schedules projected for aircraft traffic in 2033, 2040 and 2055. They also show the breakdown for day versus night (11 pm to 5:30 am). Consequently, in terms of seasonality influence on schedules, there was no need to generate separate noise assessment for NS and NW. The only difference in “seasonality” could be from the effects of meteorological data on mode availability or usage which is discussed in Section 9.8.

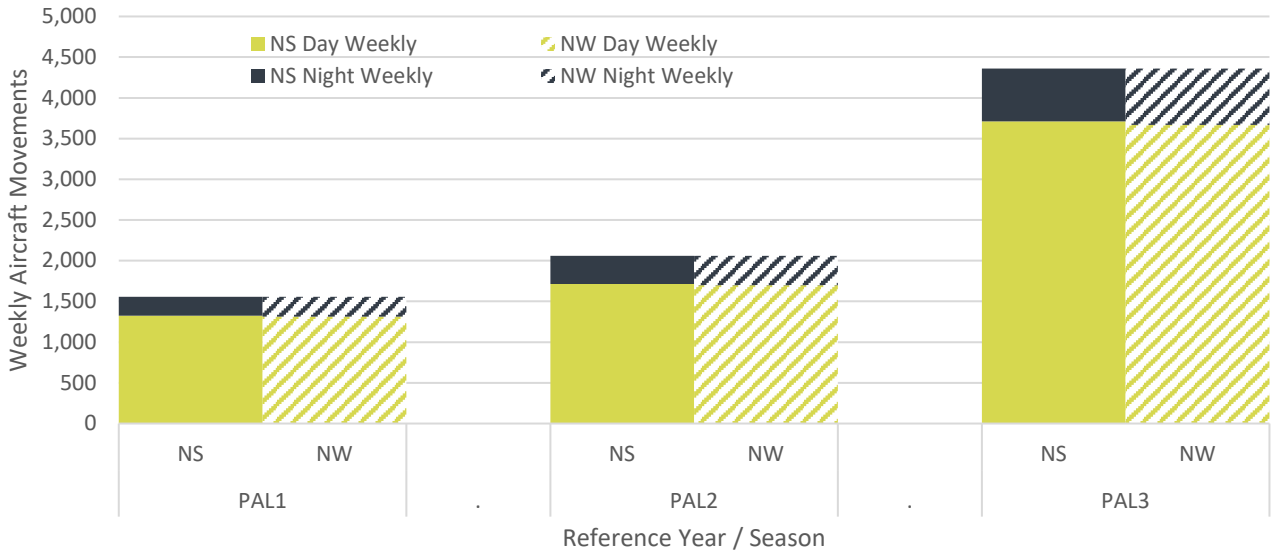

Figure 8.5 Comparison of NS and NW weekly schedules (total aircraft movements)

It is expected that the WSI single runway system (05/23) will be capable of processing around 48 to 49 aircraft movements per hour subject to adverse weather influences and a reasonable balance in arrival and departure demand. Figure 8.6 highlights the average daily profile for each representative year, including a notional capacity of 20 hourly movements per hour for RRO operations between 11 pm and 5:30 am. As demand grows closer to WSI capacity in 2055 (PAL 3), RRO may become unavailable as a RMO in some night-time time blocks as 15-minute demand grows above 5 movements and hourly demand above 20 movements.

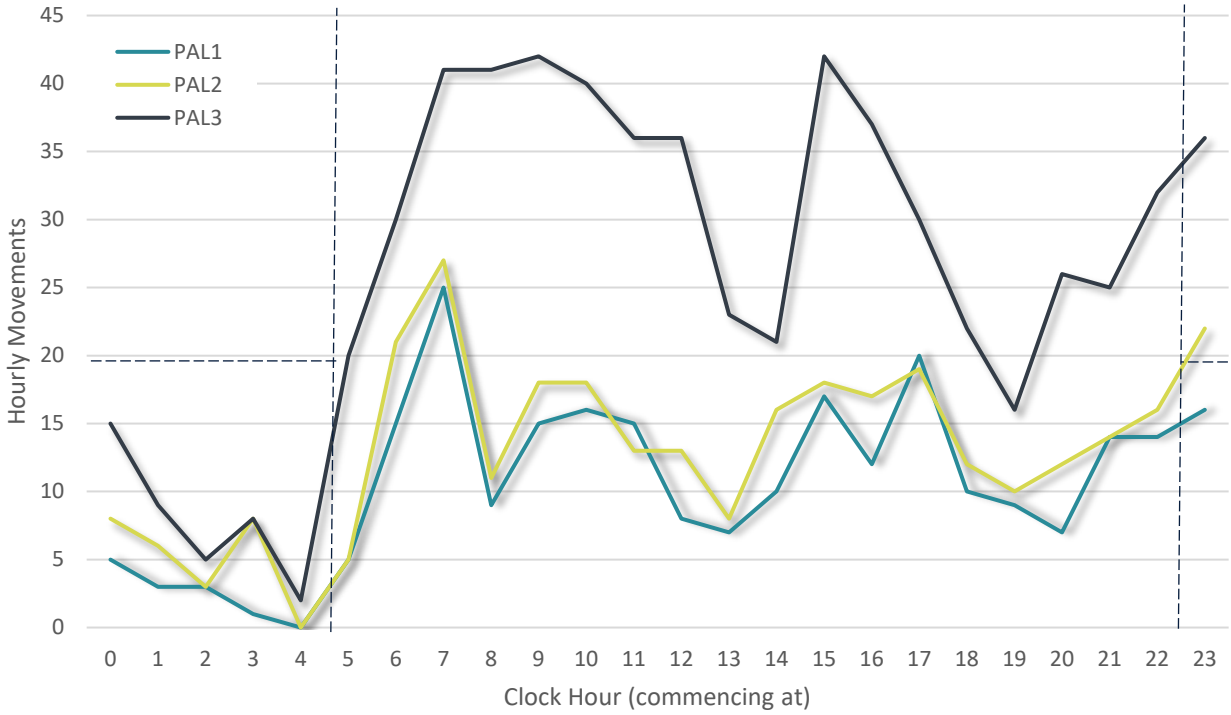

Figure 8.6 Daily demand profile by reference year and season

Weekends, evenings and night-times are more sensitive to noise impacts. Any variation across the days of the week or by time of day could be significant for assessment. The number of movements by day of the week, including splits between day and night are compared in Figure 8.7 to Figure 8.9. They show that in the earlier years there is a difference between weekday and weekend, particularly lower number of movements on Sunday. There is less difference in 2040 and almost no difference between days of the week in 2055 (refer to Figure 8.10).

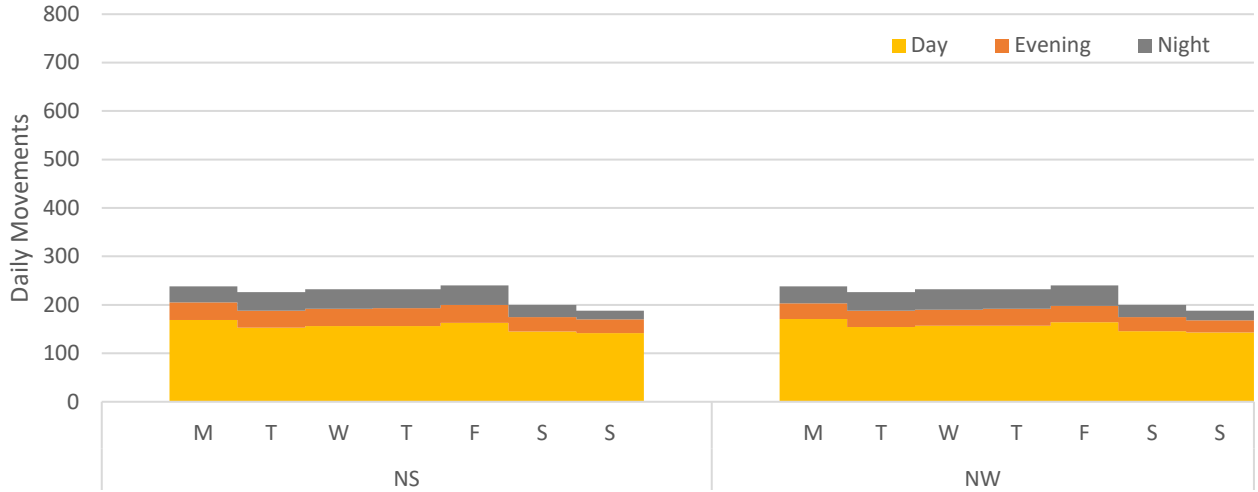

Figure 8.7 Day, evening and night demand by day of week – 2033 (PAL 1)

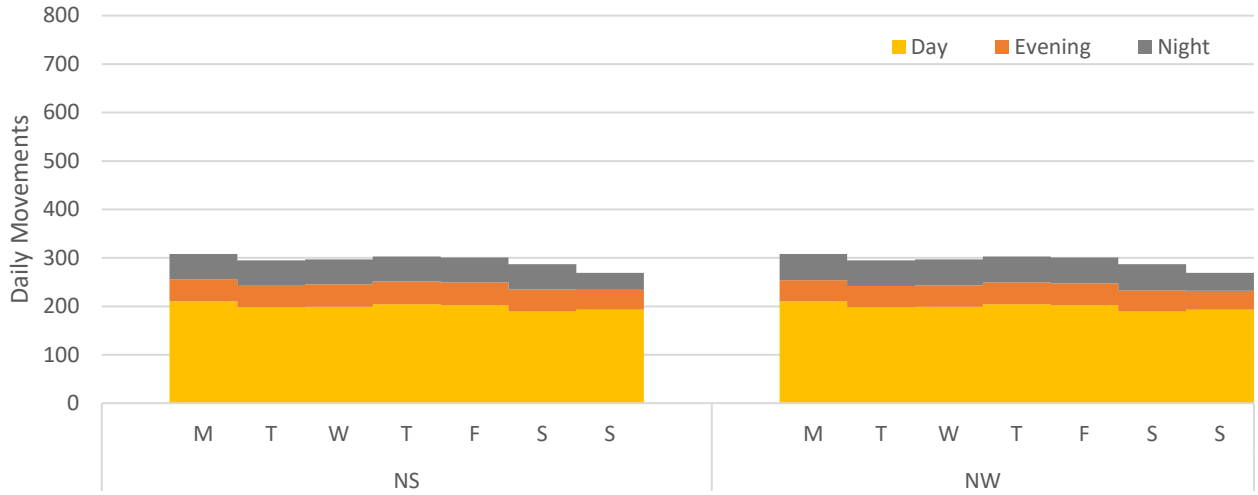

Figure 8.8 Day, evening and night demand by day of week – 2040 (PAL 2)

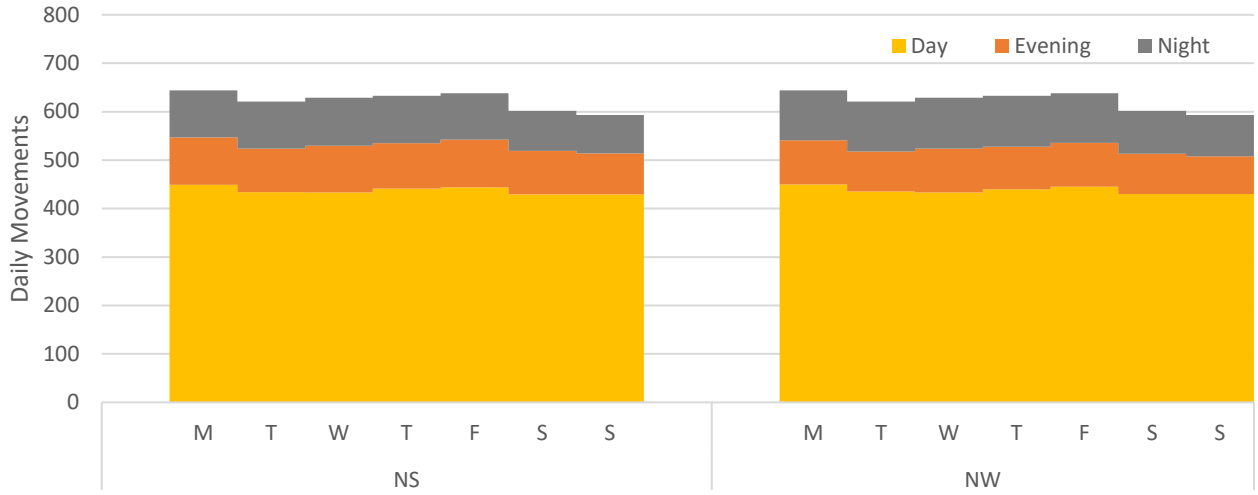

Figure 8.9 Day, evening and night demand by day of week – 2055 (PAL 3)

8.4 Operational inputs analysis

8.4.1 Introduction

The methodology in Chapter 7 describes this step as defining the assumptions required for the AEDT noise model. The various runway modes of operations were analysed against the historic meteorological data set and the projected traffic demand (flight) schedules to assign each operation to a runway (05/23) and flight path (arrival and departure by day and night). The inputs were:

- projected demand schedules (inclusive of flight time, fleet mix, origin-destination routes) for each assessment year (2033, 2040, 2055)
- modes of operations priority rules based on:
  - historic (10 year) meteorological data set
  - air traffic management rules (priorities, runway mode change)
- aircraft flight paths and profiles
- aircraft noise and performance data.

An initial assessment of the various operating scenarios from Table 8.4 was undertaken based on the demand for each reference year (2033, 2040, 2055). Using a runway allocation emulator, each movement was allocated to a runway based on the criteria of each operating scenario, using actual weather conditions from the last 10 years (2012-2021). Figure 8.11 and Figure 8.12 present the resulting cumulative runway end exposure and runway usage for each scenario and projected activity level, for daytime and night-time operations respectively.

8.4.2 Runway usage and end impacts

The macro analysis generated runway usage (percentage of annual aircraft movements for Runway 05 versus Runway 23) comparisons for the scenarios listed in Table 8.4. However, in terms of noise exposure it is more important to consider runway end impacts.

The runway usage and end impacts were generated using 10 years of historic weather data. The process to generate "annualised" air traffic forecasts was described in the previous section. Combining the forecasts, runway availability from the weather data, and the mode selection rules for each RMO scenario created the usage and runway end impact comparison.

The main difference between runway mode scenario 1 (S1) and the other 6 scenarios is that it does not include the use of RRO. For the other scenarios RRO could be used between 11 pm and 5:30 am when there are no constraints from Sydney (Kingsford Smith) Airport flight paths and traffic during Sydney (Kingsford Smith) Airport curfew hours. The availability of RRO is then dependent on actual weather conditions (less than 5 kt (9 km/h) tailwind with dry runway conditions) as well as low traffic demand (typically less than 20 movements per hour on average).

As shown in Figure 8.10, as traffic increases towards levels expected in 2040 (PAL 2) and 2055 (PAL 3), the number of flights will approach and occasionally exceed the nominal limit of 5 movements per 15 minutes (equivalent to 20 movements per hour).

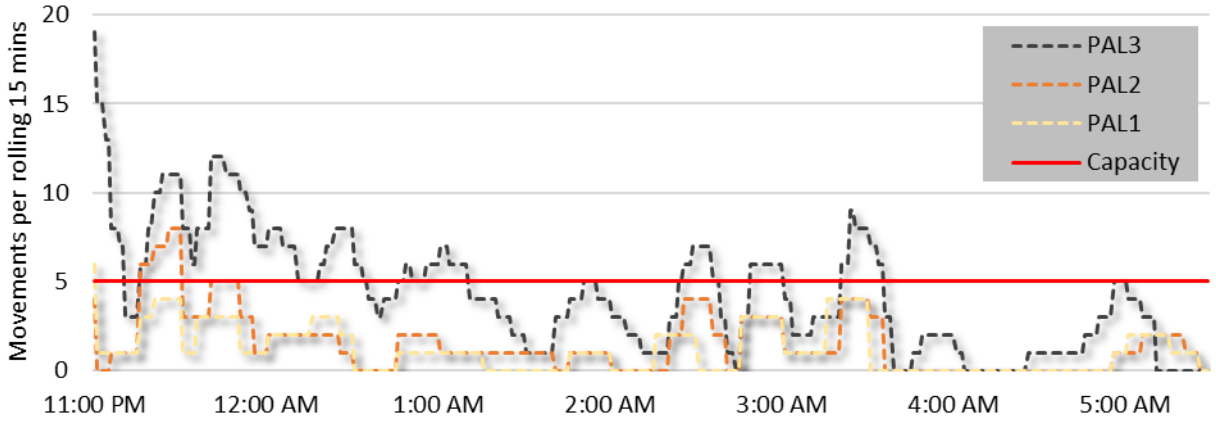

Figure 8.10 Forecast demand versus RRO capacity by reference year

As discussed in Section 8.1.1 above, the availability of RRO in these later years will depend on how the balance between numbers of arriving or departing aircraft varies over time. Ultimately, WSI's actual schedule (along with any natural day-to-day variation from schedule) will be the key determining factor. Because of this, the noise assessment process has not considered the potential reduction in RRO availability in the 2040 (PAL 2) and 2055 (PAL 3) forecast schedules and assumed the application of RRO to the extent possible, only constrained by weather conditions based on the trend analysis of 10 years of meteorological data. Scenario 1 (S1) provides a meaningful comparison of potential night time noise exposure if RRO were not used at all.

In considering proposed WSI "Day" (5:30 am to 11 pm) operations, the initial scenario where no priority is given (scenario 1 (S1)) is balanced both in terms of runway use and runway-end exposure. This indicates that both runway ends are exposed to a similar proportion of arrivals and departures on an annualised basis.

The outer bounds of runway usage (and by implication the extents of the noise exposure contours) is defined by scenario 4 (S4 – 82 per cent on Runway 23) and scenario 3 (S3 – 74 per cent on Runway 05). However, both runway ends are experiencing a balanced exposure based on total movements. This indicates that scenario 3 (S3) and scenario 4 (S4) will primarily vary in terms of bias for the type of operation (arrival or departure), not in terms of total movements. All other scenarios will operate somewhere between the outer bounds of runway usage.

Although these other scenarios are focussed on specific measures to mitigate the potential impact of aircraft noise exposure, composite noise contours associated with scenarios 1, 3 and 4 (S1, S3, S4) will provide a level of confidence around the likely "worst case" noise exposure of communities in the vicinity of WSI, and the flexibility for operating scenarios to be tailored in the detailed design or to pre-empt potential divergence between the preferred operating scenario and actual operations.

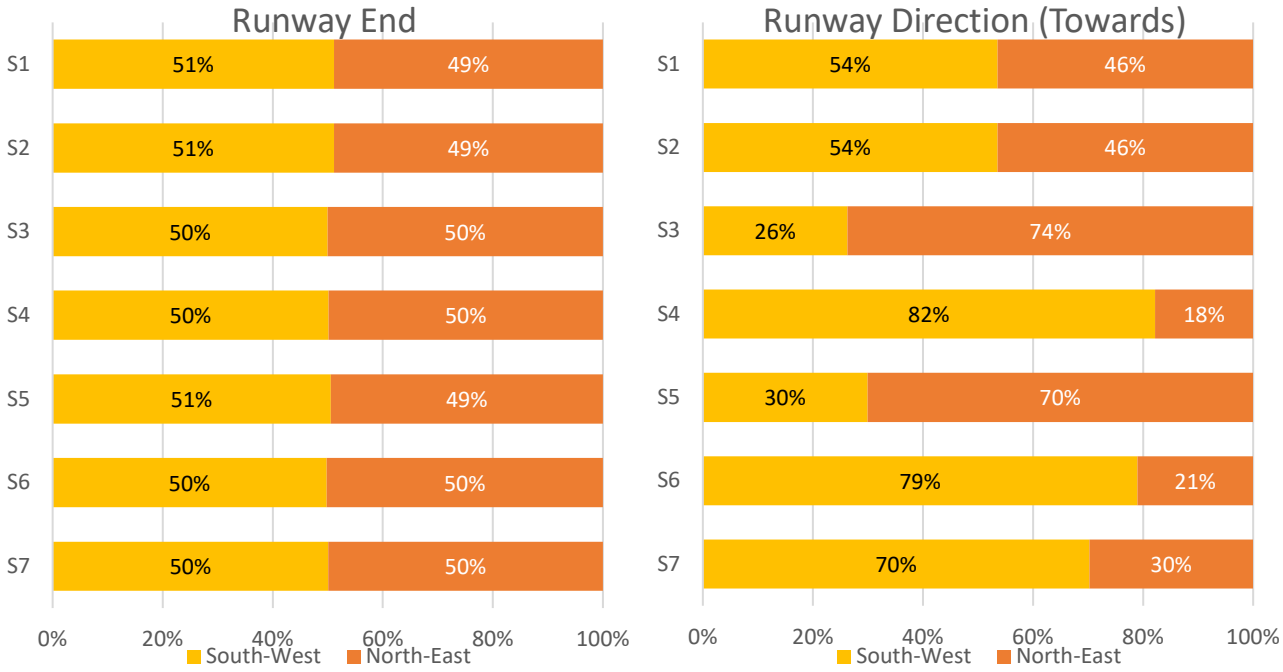

Figure 8.11 Operational scenarios and runway modal splits (Day – 5:30 am to 11 pm)

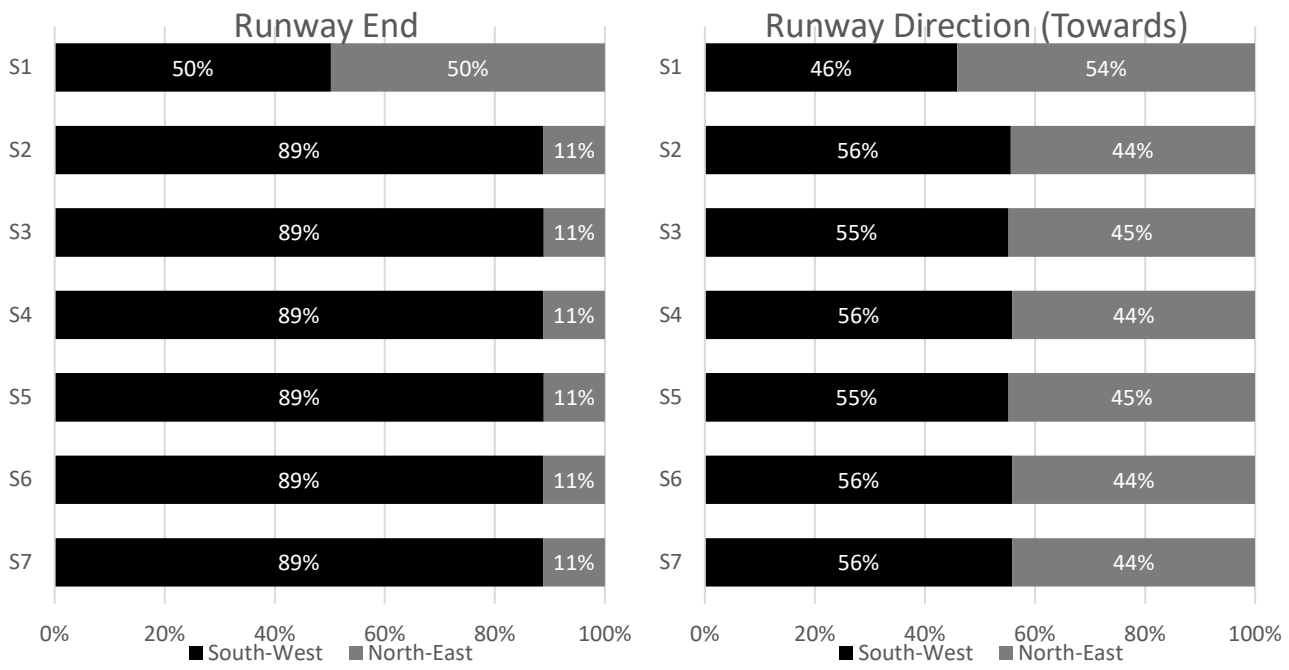

Figure 8.12 Operational scenarios and runway modal splits (Night – 11 pm to 5:30 am)

For "Night" operations, the initial scenario where no priority is given (scenario 1 (S1)) is balanced both in terms of runway use and runway-end exposure with similar proportion of arrivals and departures on an annualised basis. However, the other scenarios introduce the RRO mode of operation which consists of arrivals on Runway 05 and departures in the opposite direction, on Runway 23. Hence, while runway usage is generally balanced across the night, runway-end usage highlights that almost 90 per cent of night-time movements could operate over the south-west end of the Airport Site, on an annualised basis.

This assessment assumes that the RRO mode of operation can be sustained across the night when weather conditions (i.e., wind, precipitation) are suitable. However, as night-time demand grows over time, capacity constraints may prevent the use of RRO. This would in turn progressively increase the proportion of movements at the northeast end of WSI.

Scenario 1 (S1) provides an assessment of impacts at night without RRO operations (which will occur on those nights that meteorological conditions prevent its application).

8.5 Meteorological conditions

The meteorological conditions are an important consideration to determine runway usage, aircraft performance and noise propagation. The design day schedule based on the average meteorological conditions for the annual and the split between summer and winter seasons was modelled as shown in Table 8.5. Baseline noise modelling uses annual weather, but a sensitivity was modelled with seasonal weather data to demonstrate the materiality of noise contour differences for seasonal operations.

Table 8.5 Average meteorological conditions for WSI

Season	Months	Conditions	Temperature	Humidity	Wind Speed
Annual	Jan to Dec	Average	16.9 °C (62.5 °F)	72.1 %	3.4 kt
		Average Maximum	–	–	–
Northern Summer	Apr to Sept	Average Maximum	20 °C (68.6 °F)	71.2 %	3.3 kt
Northern Winter	Oct to Mar	Average Maximum	27.8 °C (82.1 °F)	72.9 %	3.4 kt

The definition of modes of operations usage and associated runway allocation were based on a more granular review of the synthetic schedule against historical wind speed and direction data for the annual and/or summer and winter seasons. When the RMO selection required a dry runway criterion to enable tailwind operations, meteorological conditions over 10 years were reviewed to determine whether precipitations had occurred during the clock hour.

8.6 Fleet mix

The aircraft types used in this model are based on demand schedules projected by WSA Co. While most aircraft types used the default aircraft noise modelling profile in AEDT, some aircraft have an equivalent model (substitution) with adjusted noise levels to reflect the differences between the substitute aircraft and the new modelled aircraft. This is especially applicable to newer aircraft types that have yet to be included in the AEDT database. In the absence of certified noise data, the Boeing B777-9 was substituted for the existing Boeing B777-300ER without adjustments.

While there is an observed ongoing trend towards the operation of quieter aircraft, the assessment is based on a conservative assumption around the introduction of new aircraft. For example, the Boeing B777-9 will enter the market around 2025 but its noise certification has not yet been completed. As such, equivalent sound levels from the existing Boeing B777-300ER have been used to represent this soon to be operating new aircraft, which consistent with the progressive improvements in noise and emissions generation associated with the ongoing evolution of aircraft models, will result in noise reductions and community benefits.

While the aviation industry commitments to carbon goals include both use of Sustainable Aviation Fuels (SAF) and also development of alternative propulsion systems (powerplants) for aircraft such as electric, hybrid or hydrogen engine-aircraft, there is no reliable evidence base to create a timeframe for any assumed integration into the WSI fleet mix. These aircraft are in very early stages of development and noise emission data is also not available for the type of modelling used in this assessment of WSI flight paths.

For reference, the number of operations by aircraft type in Table 8.6 are based on total arrivals and departures on an average day (based on annualised weekly schedules provided with weighted combination of NS and NW). They are compared for the 3 planned activity levels (PAL 1, PAL 2, PAL 3) projected for assessment years 2033, 2040 and 2055 provided by WSA.

Table 8.6 Fleet mix – total average day operations

IATA AC Type	Aircraft Class	AEDT ID	AEDT ANP Airframe	PAL1 2033	PAL2 2040	PAL3 2055	Note / Sound Level Adjustment
				NS	NS	NS	
748	J	6630	7478	0.6	1.1	1.4	
359	J	6200	A350-941	2.0	8.0	26.6	
35F	J	6200	A350-941	0.0	2.0	2.6	
351	J	6200	A350-941	0.0	0.0	20.0	
77F	J	687	777300	3.4	2.0	2.6	
779	J	*665	7773ER	0.0	0.0	16.0	Adj. 0 Dep, 0 Arr
77W	J	665	7773ER	2.0	2.0	0.0	
773	J	687	777300	0.0	0.0	16.0	
789	J	6227	7879	2.6	6.9	30.9	
788	J	3616	7878R	3.4	16.0	30.0	
33F	J	1064	A330-301	3.1	3.1	4.3	

IATA AC Type	Aircraft Class	AEDT ID	AEDT ANP Airframe	PAL1 2033	PAL2 2040	PAL3 2055	Note / Sound Level Adjustment
				NS	NS	NS	
339	**J**	***1064**	**A330-343**	1.4	3.1	9.7	Adj. -2.2 Dep, +1.4 Arr
332	**J**	**1064**	**A330-301**	4.0	5.7	0.0	
333	**J**	**1064**	**A330-301**	6.6	15.1	35.4	
321	**J**	**1021**	**A321-232**	29.4	42.9	67.4	A321ceo
320	**J**	**5975**	**A320-271N**	46.0	34.0	125.9	A320neo
7M8	**J**	**4129**	**737MAX8**	8.6	13.1	127.1	
738	**J**	**203**	**737800**	59.1	73.1	61.1	
73H	**J**	**203**	**737800**	12.0	24.0	0.0	
739	**J**	**203**	**737800**	0.0	0.0	2.0	
220	**J**	***178**	**737700**	21.1	21.1	19.0	Adj. -3 Dep, -2 Arr
DH4	**P**	***1694**	**DHC830**	12.9	12.9	12.9	Adj. +8 Dep., +8 Arr
SF3	**P**	**811**	**SF340**	4.0	8.0	12.0	
		Grand Total		**222.3**	**294.3**	**622.9**	

*User-defined/modified profile

Most activity in early operational years at WSI is anticipated to be short-haul operations serving domestic and regional routes. This comprises around 70 per cent of all movements by narrow-body (single aisle) jets from the Airbus 320 and Boeing 737 families in 2033. The proportion of WSI narrow-body jets operations is forecast to decrease to 62 per cent by 2055 as the growth of international services is expected to exceed the growth in domestic services.

The shape and extent of aircraft noise contours forecast for future years is initially influenced by the rate of replacement of narrow-body jets (Airbus A319/320/321 and Boeing B737) in the current airline fleet by new, lower noise and emissions generating variants (Airbus 320neo and Boeing 737MAX) and then by fleet upgrades and modernisation of international airline wide-body (twin aisle) jet fleets.

8.7 Stage length

Longer flights generally require aircraft to carry more fuel on departure, increasing take-off weight and thus requiring more engine power (thrust) and/or a shallower climb rate. The combination of these factors means that long haul departures typically generate higher noise levels than short haul departures. In the AEDT software, departures are defined for several 'stage lengths', representing different distances to the destination.

Noise levels on departure can be calculated for various stage lengths for each aircraft type. The noise of arriving aircraft is generally independent of the distance flown because minimal thrust is required and much of the noise on arrival is generated by air flowing over and around the airframe. Figure 8.13 and Figure 8.14 illustrate the various destinations from the flight schedules provided by WSA Co for 2033, 2040 and 2055 along with their associated stage length.



Figure 8.13 Stage length – domestic, regional, Indonesian, South Pacific and Trans-Tasman destinations

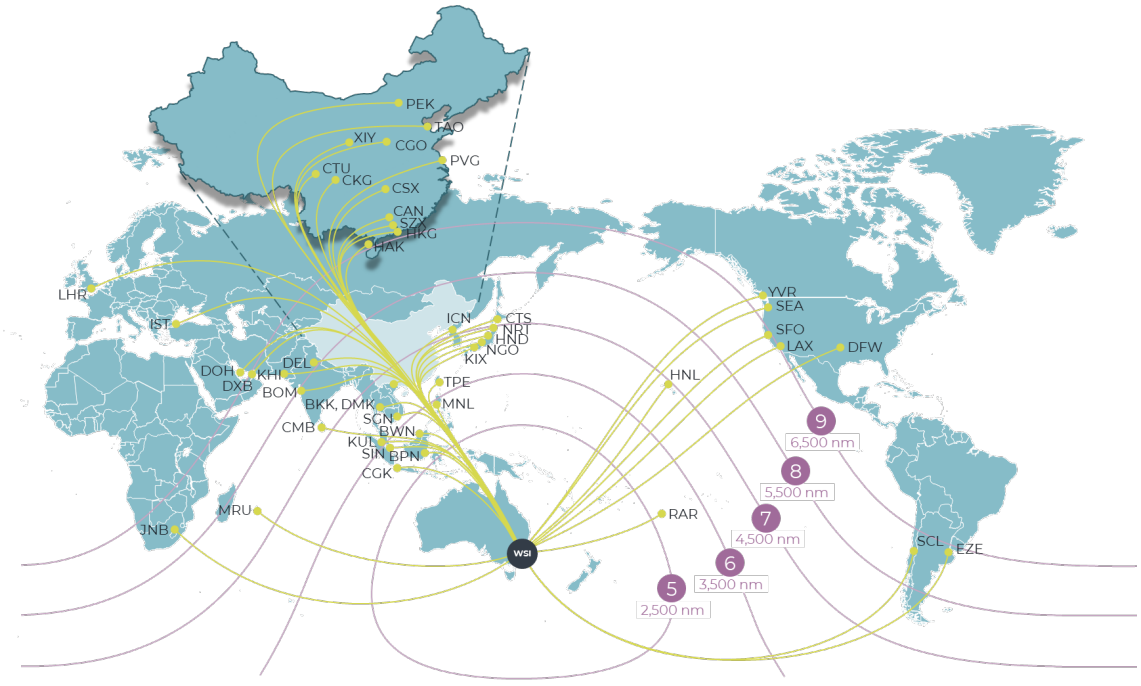

Figure 8.14 Stage length – medium and long-haul international destinations

Table 8.7 presents the various AEDT departure stage lengths for the destinations in the demand schedules provided by WSA.

Table 8.7 Stage lengths and list of destinations

Stage length	Distance to destination airport nautical miles (nm)		Typical destinations from schedules (3-letter IATA airport codes)
	From	To	
1	0	500	MEL, BNE, OOL, CBR, MCY, LST, BNK, CFS, TMW, ABX, ARM, DBO, MQL, PQQ, AVV, WTB, OAG
2	500	1,000	ADL, HBA, TSV, HTI, ROK
3	1,000	1,500	WLG, ZQN, AKL, CHC, CNS, AYQ, VLI, ASP, NOU
4	1,500	2,500	PER, DRW, NAN, DPS, APW, SUV
5	2,500	3,500	MNL, GUM, SIN, RAR, BPN, CGK, BWN
6	3,500	4,500	HNL, HAN, HKT, KIX, NRT, SGN, CSX, HAK, DMK, HKG, ICN, KUL, NGO, CAN, BKK, TPE, SZX, HND, PVG
7	4,500	5,500	CGO, TAO, XIY, BOM, CMB, PEK, MRU, CTS, CTU, CKG
8	5,500	6,500	DEL, DXB, JNB, SCL, SFO, EZE, KHI, DWC
9	6,500	and over	DOH, YVR, LAX, IST, DFW, LHR, SEA, BAH

8.8 Flight profiles and procedures

This section shows the aircraft procedures and associated flight and noise profiles for each aircraft in the fleet mix. The profile combines altitude, thrust and speed and results in a sound level being emitted and received on the ground. While AEDT has standard procedures and profiles, it is possible to develop customized profiles to calibrate the noise model based on actual recorded noise levels from Airservices Australia's Noise and Flight Path Monitoring System (NFPMS) data.

Consistent with methodologies adopted in recent similar Australian studies reviewed or endorsed by Airservices Australia an aircraft profile has been modified, regardless of the destination, so that the modelling of typical departures reflects the noise profile recorded at selected airports from the Airservices Australia's NFPMS. Following accepted practice, this has been done by modifying the stage length assigned to each operation.

The latest version of AEDT (Version 3e) was used, as it has the widest range of latest aircraft types as listed in Table 8.8. Detailed specifications on the climb profile and adjusted stage length used in AEDT are included. This calibration formed the basis of the noise assessment for the project and was retained for the noise modelling analysis in this EIS. The calibration was conducted by SoundIn using NFPMS data for the year 2019, correlating noise and radar data. AEDT's standard profiles were used to model noise levels that were compared to actual monitored noise levels. Where there was misalignment in the predicted results, departure and/or stage length were modified to provide better correlation with the measured results. This calibration approach adopted was discussed and agreed with Airservices Australia noise specialists.

Table 8.8 Fleet mix – aircraft profiles

IATA AC type	Adjusted profile	AEDT ANP airframe	Adjusted stage length									Comment
			1	2	3	4	5	6	7	8	M	
748	**STANDARD**	**7478**	1	2	3	4	5	6	7	8	9	
359	**CLIMB_2000FT_RT15**	**A350-941**	5	5	5	5	6	8	M	M		
35F	**CLIMB_2000FT_RT15**	**A350-941**	5	5	5	5	6	8	M	M		
351	**CLIMB_2000FT_RT15**	**A350-941**	5	5	5	5	7	8	M	M	M	
77F	**CLIMB_3000FT**	**777300**	5	5	7	7	7	7	7			
779	**CLIMB_3000FT**	**7773ER**	6	6	8	8	8	8	9	9	9	
77W	**CLIMB_3000FT**	**7773ER**	6	6	8	8	8	8	9	9	9	
773	**CLIMB_3000FT**	**777300**	5	5	7	7	7	7	7			
789	**MODIFIED_RT15**	**7878R**	5	5	9	9	9	9	9	9	9	
788	**CLIMB_2000FT_RT15**	**7878R**	5	5	5	7	7	8	9	9	9	
33F	**CLIMB_3000FT_RT15**	**A330-301**	5	5	7	7	7	7	7			
339	**CLIMB_3000FT_RT15**	**A330-343**	5	5	7	7	7	7	7			
332	**CLIMB_2000FT_RT15**	**A330-301**	5	5	7	7	7	7	7			
333	**CLIMB_3000FT_RT15**	**A330-301**	5	5	7	7	7	7	7			
321	**CLIMB_2000FT_RT15**	**A320-271N**	5	5	5	5	5					
320	**CLIMB_2000FT**	**A320-271N**	5	5	5	5	5					
7M8	**STANDARD**	**737MAX8**	5	5	6	6	6	6				
738	**STANDARD**	**737800**	5	5	6	6	6	6				
73H	**STANDARD**	**737800**	5	5	6	6	6	6				
739	**CLIMB_3000FT_RT15**	**737800**	5	5	6	6	6	6				
220	**CLIMB_2000FT_RT15**	**737700**	4	4	5	6	6	6				
DH4	**CLIMB_3000FT**	**DHC830**	1									
SF3	**CLIMB_3000FT**	**SF340**	1									

While the Airbus A380 is not included in the fleet mix that would form part of scheduled aircraft movement patterns at WSI, the Airport Site is designed to accommodate this aircraft and other wide-body Code 4F models (e.g., the Boeing B747-8F). Considering the retirement of both the Airbus A380 (2021) and B747-8 (2023), the inclusion of some B747-8F movements in the schedule (1.4 daily movements by 2055) reflects the limited nature of movements by these 4-engine aircraft (e.g., diversions, chartered freight operations).

8.9 Flight paths

In modelling aircraft noise on any specified flight path, a lateral dispersion either side of the “backbone” (described as a centreline in space) is specified. As the WSI flight paths are not yet operational, assumptions on the dispersion spread are based on data from other Australian airports and any qualifications that Airservices Australia may have considered for local operational reasons (i.e., handling and turning capabilities of different aircraft flying to different destinations (under different payloads) at different altitudes).

Different sets of arrival and departure flight paths are designed for daytime (5:30 am to 11 pm) and night-time (11 pm to 5:30 am) use, as detailed in Chapter 7 (The project) of the EIS. These are shown for both runway ends in Figure 8.15 with their associated flight path corridors. With the exception of those areas located very close to WSI and on extended runway alignment, this will mean that depending on the RMO scenario and even without RRO, there will be opportunities for respite as the night-time arrival paths for each runway are different for each runway direction, differ from departure flight paths in any direction, the arrival flight paths in the other direction and also to those used in the day. While the impacts for a scenario without RRO may not demonstrate “respite” closest to a runway end, once the arrival and departure paths turn away from the extended runway centreline, there will be changes in the distribution of aircraft on flight paths between (day versus night); (arrivals versus departures) and operational runway (05 versus 23).

The flight paths also have vertical separation at cross-over points which cannot be discerned from these 2-dimensional images. However, the difference in flight path altitude at a distance from the Airport Site is indicated by the fading of the flight path colour shading from dark (lower altitude) to light (higher altitude).

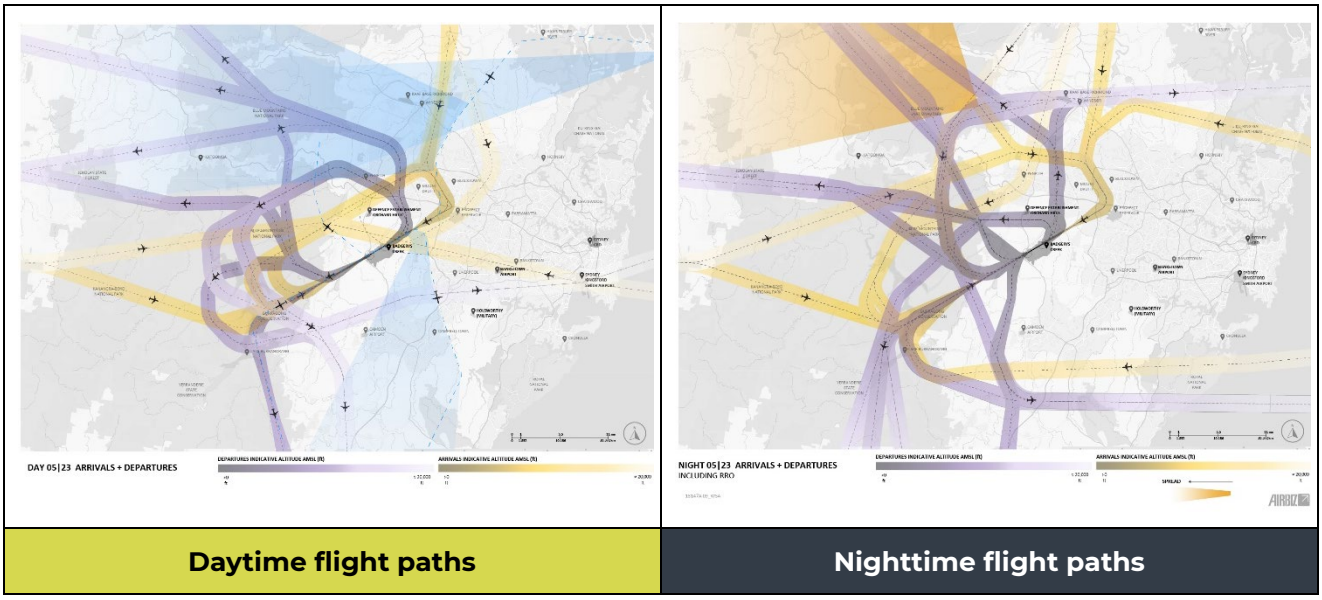

Figure 8.15 Arrival and Departure flight path corridors

8.10 Flight path allocation

Aircraft movement will use a flight path assigned based on a range of operational considerations including the RMO, the time of day (day, night) and the origin/destination. Table 8.9 and Table 8.10 provide a summary of key markets, and their respective flight paths (departures and arrivals) for day, night and RRO operations, as named in the noise modelling software.

Table 8.9 Flight path allocation – departures

IATA CODE	Direction	Day		Night (inc. RRO)	
		05 SID	23 SID	05 NIGHT	23 NIGHT
ADL	WEST	05_WEST_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
ABX	SOUTH	05_SOUTH_DAY	23_SOUTH_DAY	05_SOUTH_X_NIGHT	23_SOUTH_X_NIGHT
AKL	SOUTHEAST	05_EAST_DAY	23_EAST_DAY	05_EAST_NIGHT	23_EAST_NIGHT
AVV	SOUTH	05_SOUTH_DAY	23_SOUTH_DAY	05_SOUTH_X_NIGHT	23_SOUTH_X_NIGHT
DPS	WEST	05_WNW_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
DMK	WEST	05_WNW_DAY	23_WEST_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
BNE	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
CNS	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
CBR	SOUTH	05_SOUTH_DAY	23_SOUTH_DAY	05_SOUTH_X_NIGHT	23_SOUTH_X_NIGHT
CSX	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
CHC	SOUTHEAST	05_EAST_DAY	23_EAST_DAY	05_EAST_NIGHT	23_EAST_NIGHT
CFS	NORTHEAST	05_EAST_DAY	23_EAST_DAY	05_NE_NIGHT	23_NE_NIGHT
DRW	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
DXB	WEST	05_WNW_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
APW	NORTHEAST	05_EAST_DAY	23_EAST_DAY	05_NE_NIGHT	23_NE_NIGHT
OOL	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
HAK	WEST	05_WNW_DAY	23_WEST_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
DOH	WEST	05_WNW_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
HBA	SOUTH	05_SOUTH_DAY	23_SOUTH_DAY	05_SOUTH_X_NIGHT	23_SOUTH_X_NIGHT
HKG	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
HNL	NORTHEAST	05_EAST_DAY	23_EAST_DAY	05_NE_NIGHT	23_NE_NIGHT
JED	WEST	05_WNW_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
JNB	SOUTH	05_SOUTH_DAY	23_SOUTH_DAY	05_SOUTH_X_NIGHT	23_SOUTH_X_NIGHT
KUL	WEST	05_WNW_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
LAX	NORTHEAST	05_EAST_DAY	23_EAST_DAY	05_NE_NIGHT	23_NE_NIGHT

IATA CODE	Direction	Day		Night (inc. RRO)	
		05 SID	23 SID	05 NIGHT	23 NIGHT
MNL	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
MEL	SOUTH	05_SOUTH_DAY	23_SOUTH_DAY	05_SOUTH_X_NIGHT	23_SOUTH_X_NIGHT
NAN	NORTHEAST	05_EAST_DAY	23_EAST_DAY	05_NE_NIGHT	23_NE_NIGHT
NRT	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
DEL	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
PER	WEST	05_WEST_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
TAO	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
SCL	SOUTHEAST	05_EAST_DAY	23_EAST_DAY	05_EAST_NIGHT	23_EAST_NIGHT
SIN	WEST	05_WNW_DAY	23_WEST_DAY	05_WEST_NIGHT	23_WEST_NIGHT
SGN	WEST	05_WNW_DAY	23_WEST_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
WLG	SOUTHEAST	05_EAST_DAY	23_EAST_DAY	05_EAST_NIGHT	23_EAST_NIGHT
XIY	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT
CGO	NORTH	05_NORTH_DAY	23_NORTH_DAY	05_NORTH_NIGHT	23_NORTH_NIGHT

Table 8.10 Flight path allocation – arrivals

IATA CODE	Direction	Day / Night (inc. RRO)	
		05 STAR	23 STAR
ADL	WEST	05_WEST_DAY	23_WEST_DAY
ABX	WEST	05_WEST_DAY	23_WEST_DAY
AKL	EAST	05_EAST_DAY	23_EAST_DAY
AVV	WEST	05_WEST_DAY	23_WEST_DAY
DPS	WEST	05_WEST_DAY	23_WEST_DAY
DMK	WEST	05_WEST_DAY	23_WEST_DAY
BNE	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT
CNS	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT
CBR	WEST	05_WEST_DAY	23_WEST_DAY
CSX	WEST	05_WEST_DAY	23_WEST_DAY
CHC	EAST	05_EAST_DAY	23_EAST_DAY
CFS	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT
DRW	WEST	05_WEST_DAY	23_WEST_DAY

IATA CODE	Direction	Day / Night (inc. RRO)	
		05 STAR	23 STAR
DXB	WEST	05_WEST_DAY	23_WEST_DAY
APW	EAST	05_EAST_DAY	23_EAST_DAY
OOL	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT
HAK	WEST	05_WEST_DAY	23_WEST_DAY
DOH	WEST	05_WEST_DAY	23_WEST_DAY
HBA	WEST	05_WEST_DAY	23_WEST_DAY
HKG	WEST	05_WEST_DAY	23_WEST_DAY
HNL	EAST	05_EAST_DAY	23_EAST_DAY
JED	WEST	05_WEST_DAY	23_WEST_DAY
JNB	WEST	05_WEST_DAY	23_WEST_DAY
KUL	WEST	05_WEST_DAY	23_WEST_DAY
LAX	EAST	05_EAST_DAY	23_EAST_DAY
MNL	WEST	05_WEST_DAY	23_WEST_DAY
MEL	WEST	05_WEST_DAY	23_WEST_DAY
NAN	EAST	05_EAST_DAY	23_EAST_DAY
NRT	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT
DEL	WEST	05_WEST_DAY	23_WEST_DAY
PER	WEST	05_WEST_DAY	23_WEST_DAY
TAO	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT
SCL	WEST	05_WEST_DAY	23_WEST_DAY
SIN	WEST	05_WEST_DAY	23_WEST_DAY
SGN	WEST	05_WEST_DAY	23_WEST_DAY
WLG	EAST	05_EAST_DAY	23_EAST_DAY
XIY	WEST	05_WEST_DAY	23_WEST_DAY
CGO	NORTH	05_NORTH_NIGHT	23_NORTH_NIGHT

8.11 Noise sensitive receivers (NSRs)

Projected sound levels from WSI aircraft operations were calculated from the AEDT noise model for the locations of specific NSRs. These included schools, community centres, hospitals, aged-care centres, childcare, residential areas, shopping malls, recreation areas and places of worship. The comprehensive list of NSRs was based on the 2016 EIS, additional sites provided by Airservices Australia based on location in relation WSI and was complemented by 29 NMTs that were installed in Q4 2022 in the broader Western Sydney area for this EIS. Readings from these NMTs allowed a comparison of the current ambient/background soundscape with projected sound levels under different operating scenarios. Further details are provided in the assessment in Section 9.7.

8.12 Terrain

The height of terrain relative to the aircraft altitude determines the distance between the noise source (the aircraft) and the receptors on the ground. This is particularly relevant for the proposed flight paths over the GBMA. Terrain data was sourced from the United States Geological Survey (USGS)'s Digital Elevation - Shuttle Radar Topography Mission (SRTM) Non-Void Filled. The resolution of the terrain is 3 arc-seconds (about 90 m), in line with the data already used in the early PAAM assessment. Terrain data was processed in to eliminate any void areas that could impact the modelling. While terrain is used in the noise modelling to account for variations in altitude, the line-of-sight blockage feature (shielding of receptors from a noise source) is not modelled.

8.13 Other modelling considerations

Atmospheric absorption is not explicitly specified in the modelling. AEDT uses the inherent atmospheric absorption according to SAE-ARP-5534 which means that noise data is adjusted for temperature, relative humidity, and atmospheric pressure values (study-specific airport conditions). It is assumed that all aircraft will use the SAE-ARP-5662 standard which provides analytical methods for calculating the attenuation of the level of the sound propagating from an aircraft to locations on the ground and to the side of the flight path of an aircraft during ground roll, climb out after take-off, and landing operations.[15]

8.14 Modelling limitations

Technical accuracy of modelling was predicated on the combination of careful selection of key assumptions including supporting analytics of projected schedules, long-term historic meteorological data, understanding sensitivity variations from adopted parameters, supported by a clear description of anticipated air traffic levels and variations from future aircraft operations at WSI. The outcomes illustrate what the community can expect to experience in the vicinity of WSI when operations commence and progressively increase in number over coming decades.

However, projecting into the future using noise modelling must rely on assumptions, which are either averaged or simplified for modelled purposes. They cannot replicate actual operations for every aircraft on every day. Actual operating conditions and human factors means that no 2 aircraft on any day will follow the exact flight path (vertical and lateral extents). The precise path will differ due to variations in altitude, thrust, payload, environmental conditions or other operational or human factors. Ambient conditions and physical characteristics will also impact how sound propagates due to ground or surface reflections, how sound is shielded due to obstructions, and how localised weather conditions may impact propagation. The impact assessment based on clearly articulated and reasonable assumptions and accepted modelling practice, has the benefit of providing comparison between scenarios. It uses metrics that reflect a range of perception factors such as the number of noise events, the number of noise events during sleeping hours, the maximum registered sound level by any operation, respite and the total noise exposure level. It is now well accepted that a range of non-acoustic factors also play a role in how individuals will respond to different noise events. As such, the noise contours and metrics provided do not predict an exact level of annoyance for any community or every individual. They can inform community stakeholders about the likely exposure and possible variations.

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15 https://www.sae.org/standards/content/air5662/

Chapter 9 Aircraft noise assessment

This chapter sets out the assessment of projected aircraft noise exposure from the future operational use of WSI's flight paths. The assessment quantifies the impacts based on the air traffic forecasts provided by WSA Co, overflights, the number of movements above a representative noise threshold and the cumulative noise exposure.

Aircraft noise assessed is that produced by aircraft during departure and arrival at the Airport Site. This EIS assesses noise impacts in the air and on the runway but not for engine start up or during ground maintenance.

On departure, it is assessed:

- from the point at which an aircraft commences its departure roll
- proceeds along the runway to the point of leaving the ground
- climbs into the air and departs the vicinity of the Airport Site up to an altitude of around 20,000 ft.

On arrival, aircraft noise is assessed:

- from the point at which an aircraft approaches the vicinity of the Airport Site at an altitude of around 20,000 ft
- as it descends to the runway and touches down
- slows down along the runway to the point of exiting onto a taxiway
- uses reverse thrust if that is required to slow the aircraft down on the runway.

9.1 Description of the assessment

The impact of aircraft noise exposure has been assessed based on a combination of proposed runway operating scenarios (S1, S3, S4) and projected activity levels for 3 assessment years in 2033, 2040 and 2055.

A range of metrics and tools has been used to describe the projected noise exposure levels and changes in comparison to ambient noise levels and the frequency and timing of these events. These included:

- flight path movement charts
- respite charts
- single event contours
- cumulative noise contours.

In addition to noise levels and frequency of event, population counts were calculated for the areas within the various noise exposure levels. Where appropriate, separate metrics and counts were generated for night-time (11 pm to 5:30 am).

Projected changes in the ambient noise environment surrounding WSI that will be subjected to overflight by WSI operations were calculated. The expected change in noise exposure has been compared to ambient/background noise data collected in Q4 2022 by 29 NMTs in the areas around WSI with the projected noise from WSI aircraft operations for the assessment years 2033 (represents the early years of operation), 2040 (represents an interim year of operation) and 2055 (represents the year when single runway operations are expected to be operating at near capacity). The focus of the ambient noise data collection and comparison was for populated urban areas and other noise sensitive sites expected to be subjected to noticeable noise exposure from the proposed WSI flight operations based on the recommended amenity noise levels presented in Table 4.1.

9.2 Flight path movement charts

Flight path movement charts show the number of aircraft movements on each flight path, segment or group of flight paths for a nominated time (day (5:30 am to 11 pm) or night (11 pm to 5:30 am)). These charts are also often referred to as “swoosh diagrams.”

Charts were generated for the operating scenarios 1 (S1), 3 (S3) and 4 (S4) (refer to Section 8.2) using projected activity levels (PAL 1, PAL 2, PAL 3) in each assessment year, and with runway direction of operation based on 10 years of historic meteorological data (2012-2021). For each combination on each swoosh, the average, maximum and minimum daily (or nightly) movements are given, as illustrated in example Figure 9.1.

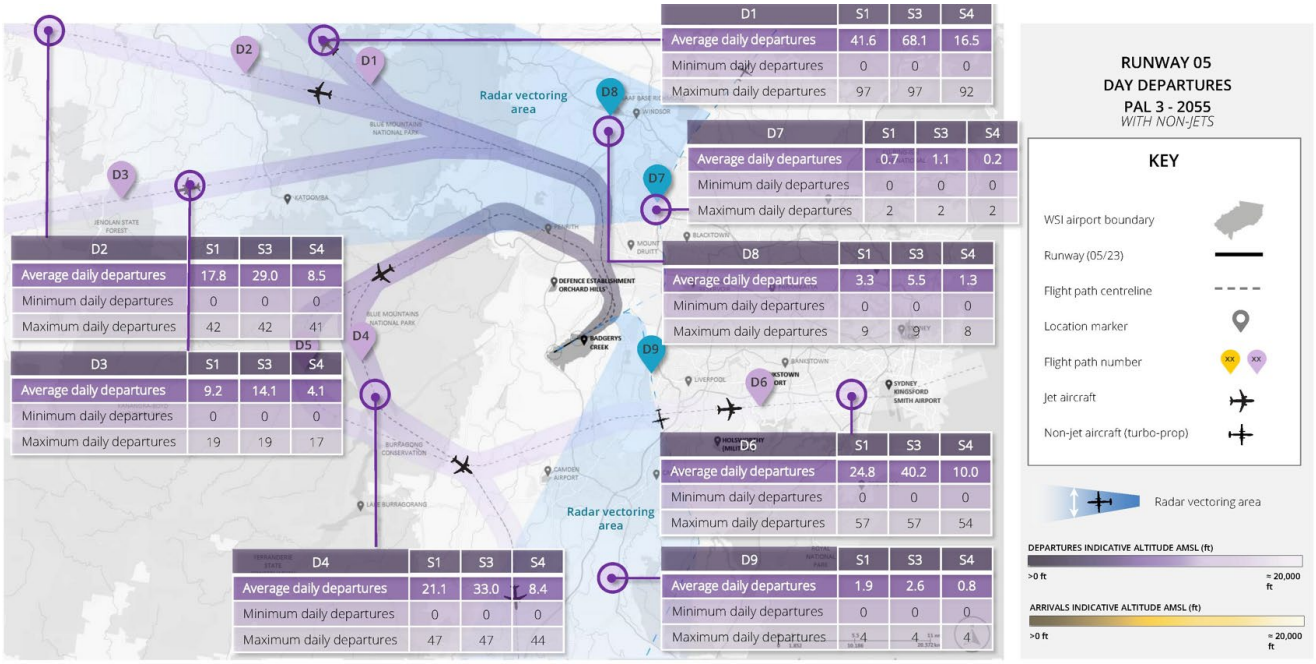

Figure 9.1 Example aircraft movement chart for Runway 05 Day departures

Figure 9.2 lists the complete suite of flight path movement charts that are provided in Appendix B.

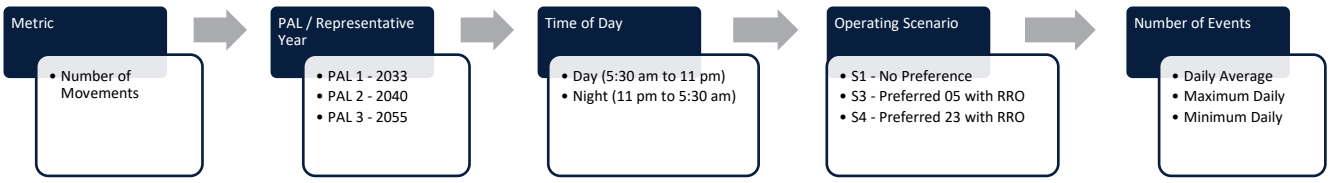

Figure 9.2 Flight path movement charts scenarios

9.3 Respite charts

Respite charts show the percentage of days and nights when no aircraft movements are expected on a specific arrival or departure flight path. Respite charts (refer to the example in Figure 9.3) show those areas under for each flight path. Separate charts are shown for day flight paths (5:30 am to 11 pm) for night flight path (11 pm to 5:30 am) and RRO flight paths (11 pm to 5:30 am). Respite ranges from 0 per cent (no respite - at least one daily movement every day of the year) to 100 per cent (full respite - no projected movements on all days of the year).

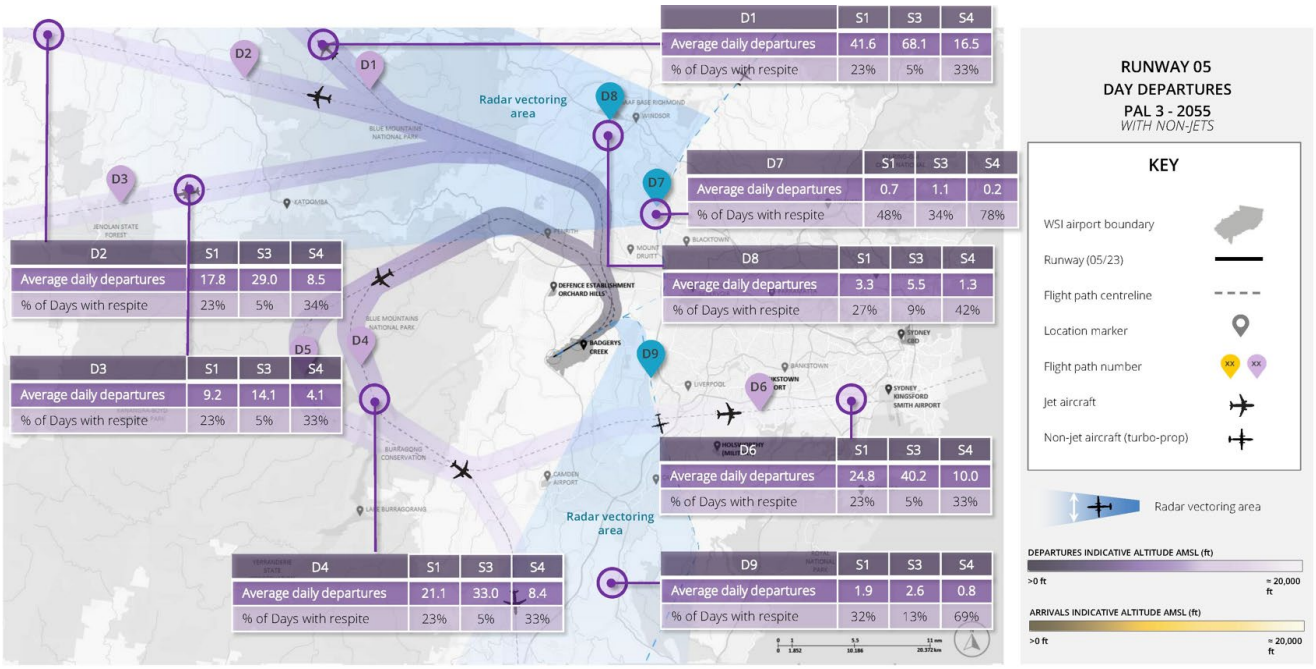

Figure 9.3 Example respite chart for Runway 05 Day departures

Figure 9.4 lists the complete suite of respite charts that are provided in Appendix B.

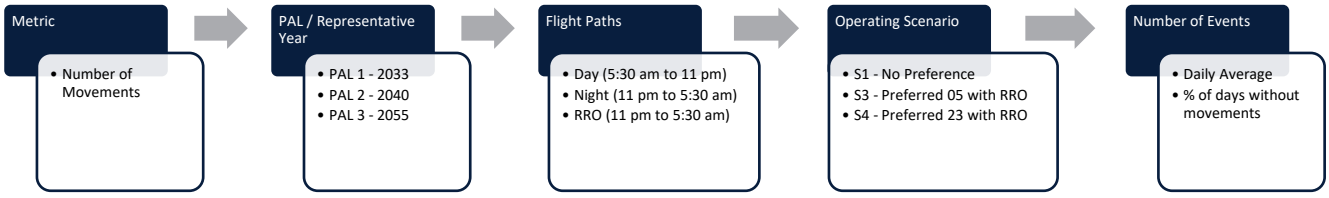

Figure 9.4 Respite charts scenarios

The respite charts focus on the individual flight paths. Section 9.7 presents an assessment of respite at a range of NSRs based on whether they are directly overflow or within one km of a flight path corridor. This provides greater focus for assessment of respite in specific rural, rural residential, and urban communities. Furthermore, Appendix D provides a detailed respite assessment of noise sensitive areas for 15 sites, including minimum, average, 90th percentile and maximum movements for day, evening and night, as well as the proportion of days with respite. The sites were selected because they were representative of those most affected under one or more scenarios.

9.4 Cumulative noise contours

Cumulative noise contours provide an assessment associated with the sustained exposure to aircraft noise. Cumulative contours relate either to the number of events above a noise level threshold (N-above), the maximum noise level (L_{Amax}), or to a calculation of the cumulative noise load that a receptor may be typically exposed to over a day or a night (L_{Asel}), or ANEC. For an ANEC which is a land-use planning metric, the metric includes a night weighting (in the case of an ANEC, night is considered 7 pm to 7 am) to reflect increased sensitivity to evening and night-time noise and the potential for sleep disturbance.

9.4.1 N60 and N70 contours

As discussed in Section 7.4.3, N-above contours are often used to provide easily understood information on noise exposure to community stakeholders. Potential noise impacts are described based on the number of overflights exceeding a certain noise level threshold for a receptor at ground level – 60 dB(A) or 70 dB(A). For example, a contour based on a threshold of 70 dB(A) and 10-19 movements during the day. They were developed from research and consultations following events where the cumulative acoustic metrics with night weighting (such as the ANEC which correlates against noise-dose response in terms of annoyance) were found to be too complex and not suited to informing the community of the resulting exposure to aircraft noise (refer to Section 7.4.1). The use of N-above contours is outlined in the NASF Guidelines, Part A.

The N70 contours are typically used in daytime to reflect the likely impact of an outside noise event (such as aircraft flyover) resulting in an indoor sound level of 60 dB(A) when windows are opened. Night-time sleep disturbance potential is often assessed with N60-night contours that defines areas where an outside noise event results in indoor attenuated sound levels as low as 40 dB(A) when windows are closed.

For this assessment, N-above contours were developed for the full day (24-hours, N60 and N70 contours) and night N60 contours (night defined as 11 pm to 5:30 am local time for this EIS). These were prepared for the 3 assessment years (2033, 2040, 2055) using the 3 operating scenarios (S1, S3, S4). These contours are based on a typical average day for aircraft movement numbers but consider seasonal variations associated with different wind patterns influencing the runway and flight paths used. As indicated in Section 8.1.2, N70 contours also include a set of contours, for 5 events or above, based on the unidirectional use of the single-runway system. As previously highlighted, the impact of unidirectionality on such a metric is minimal compared to a multi-runway system airport.

Figure 9.5 shows an example of N70 24-hour, for a composite of the 3 operating scenarios (S1, S3 S4) for projected traffic levels in 2055 (PAL 3). The composite scenario is developed to provide a worst-case scenario based on the use of noise-sharing strategies rather than the consistent use of a single operating strategy or runway allocation scenario.

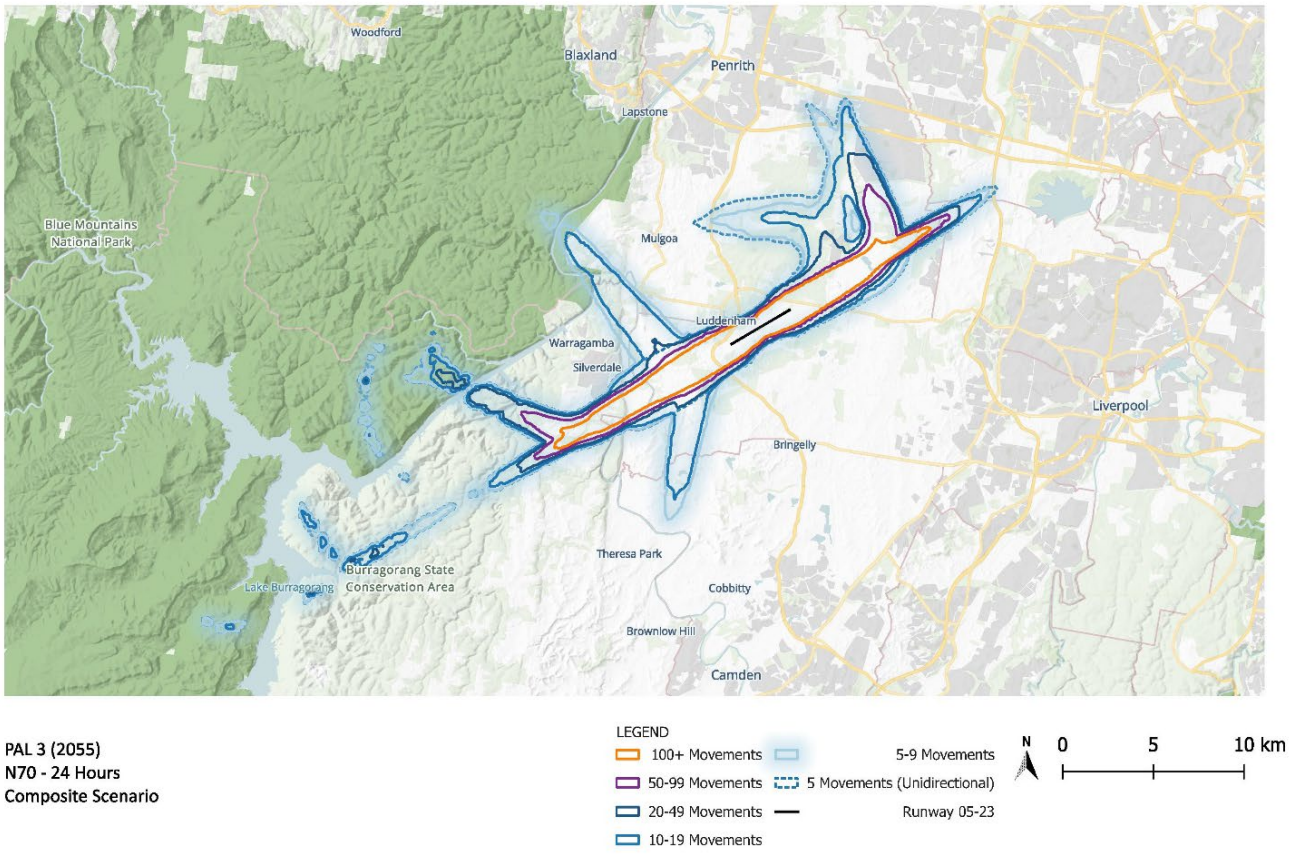

Figure 9.5 Example N70 24-hour – composite scenario – 2055 (PAL 3)

Figure 9.6 lists the complete suite of N-above contour charts that are provided in Appendix C.

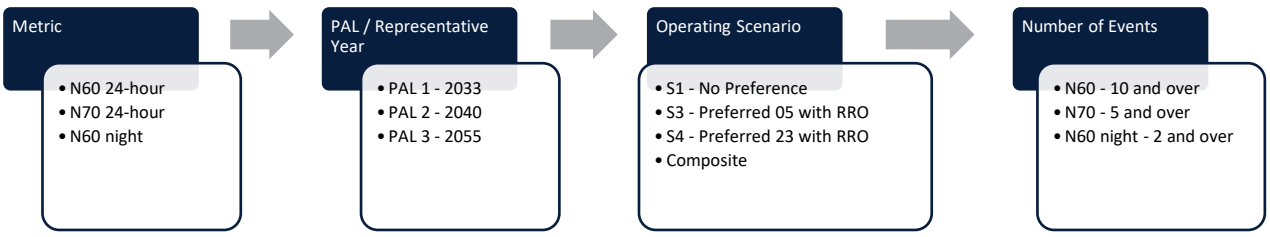

Figure 9.6 N-above contours scenarios

9.4.2 ANEC/ANEF contours

Contours using the ANEF/ANEC metric inform land use planning controls in the vicinity of Australia's major airports. The ANEF system is generally based on a 20-year or longer forecast average day (annual movements divided by 365), with a weighting factor applied to operations between 7 pm and 7 am local time. Section 7.4.1 provides more detail on the ANEF metric and the difference between an ANEC and ANEF chart.

ANEC charts were prepared for each assessment year (2033, 2040, 2055) and for each selected operating scenario (S1, S3, S4). While the scenario 1 (S1) contours are balanced at both ends of the single runway (05/23), the scenario 3 (S3) and scenario 4 (S4) contours shape reflect the more biased operations in the Runway 05 direction (scenario 3 (S3)) and in the Runway 23 direction (scenario 4 (S4)).

An example ANEC contour for 2033 for composite operating scenarios is shown in Figure 9.7.

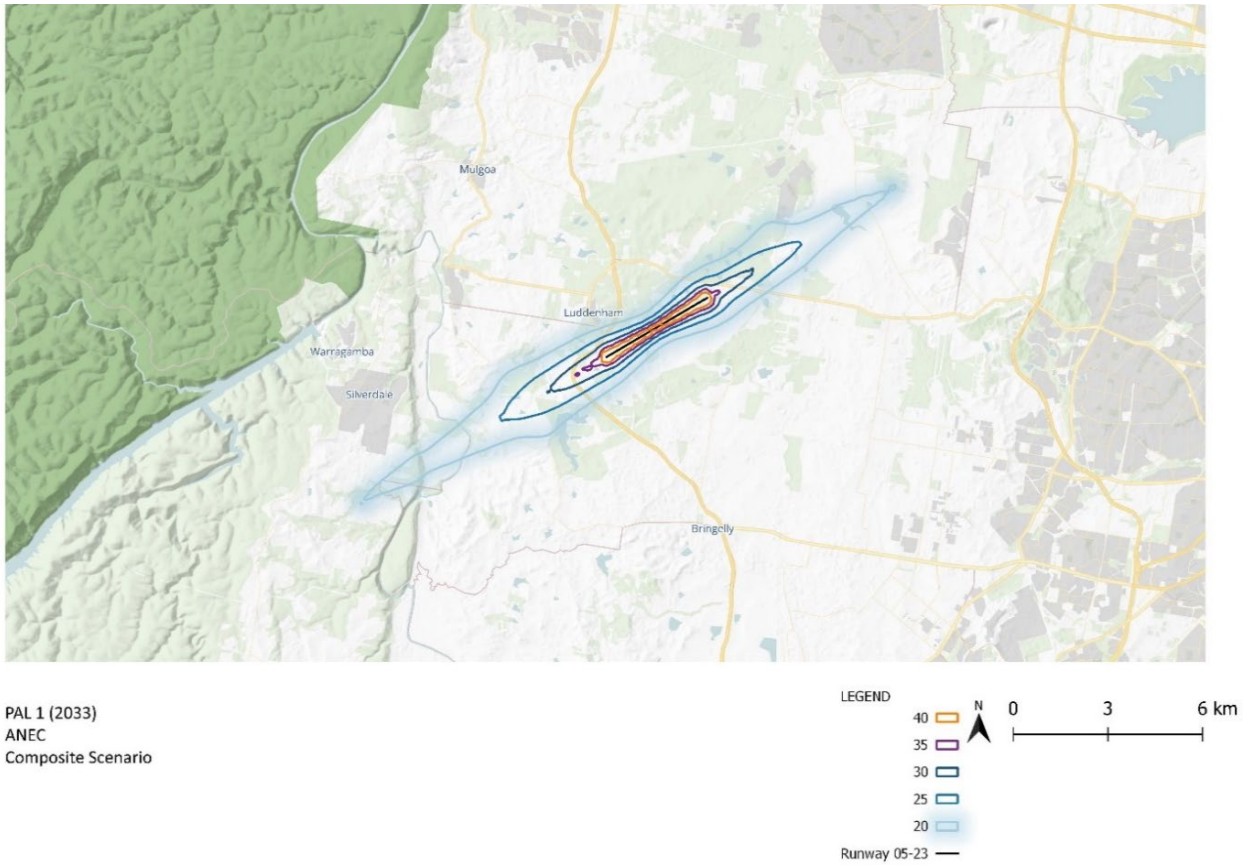

Figure 9.7 Example ANEC contour – composite scenario in 2033 (PAL 1)

Figure 9.8 lists the complete suite of ANEC charts that are provided in Appendix C. For each scenario the 20, 25, 30, 35 and 40 contours are plotted.

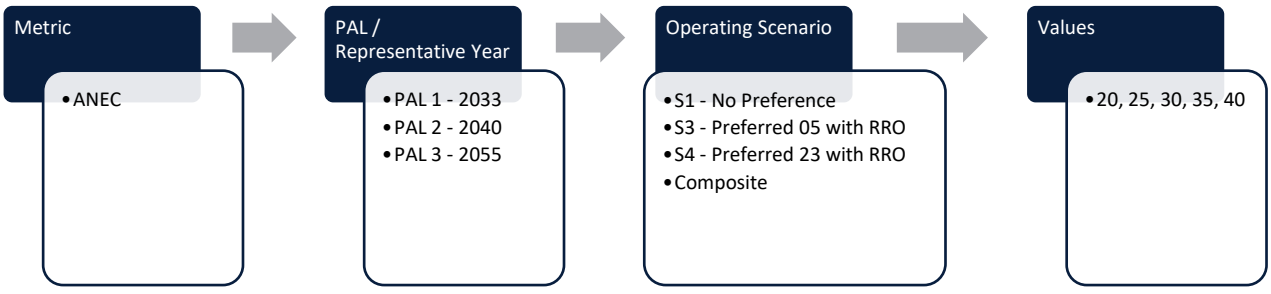

Figure 9.8 ANEC contours and scenarios

9.5 Single event noise contours

Single event noise contours for a selection of representative aircraft types provides information about the maximum sound level likely to be experienced by receptors at ground level from a specific aircraft along a flight path.

9.5.1 Maximum sound level contours

Maximum sound level noise contours (based on the L_{Amax} metric (refer to Section 7.4) were produced for a sample of typical aircraft types expected to operate at WSI, paired with specific arrival or departure routes from origins or destinations, to reflect the flight paths used and the resulting stage lengths. The stage length (distance to be flown to a destination) will determine the flight trajectory (rate of climb after take-off) based on the weight of aircraft (including airframe, passenger and cargo and especially fuel load).

L_{Amax} contours were produced for 11 aircraft types to illustrate the maximum expected sound level for an overflight event. As an example, Figure 9.9 depicts an operation on a daytime flight path and the contour envelope which covers arrivals and departures on Runways 23 and 05 for a Boeing B787-9 on an international route.

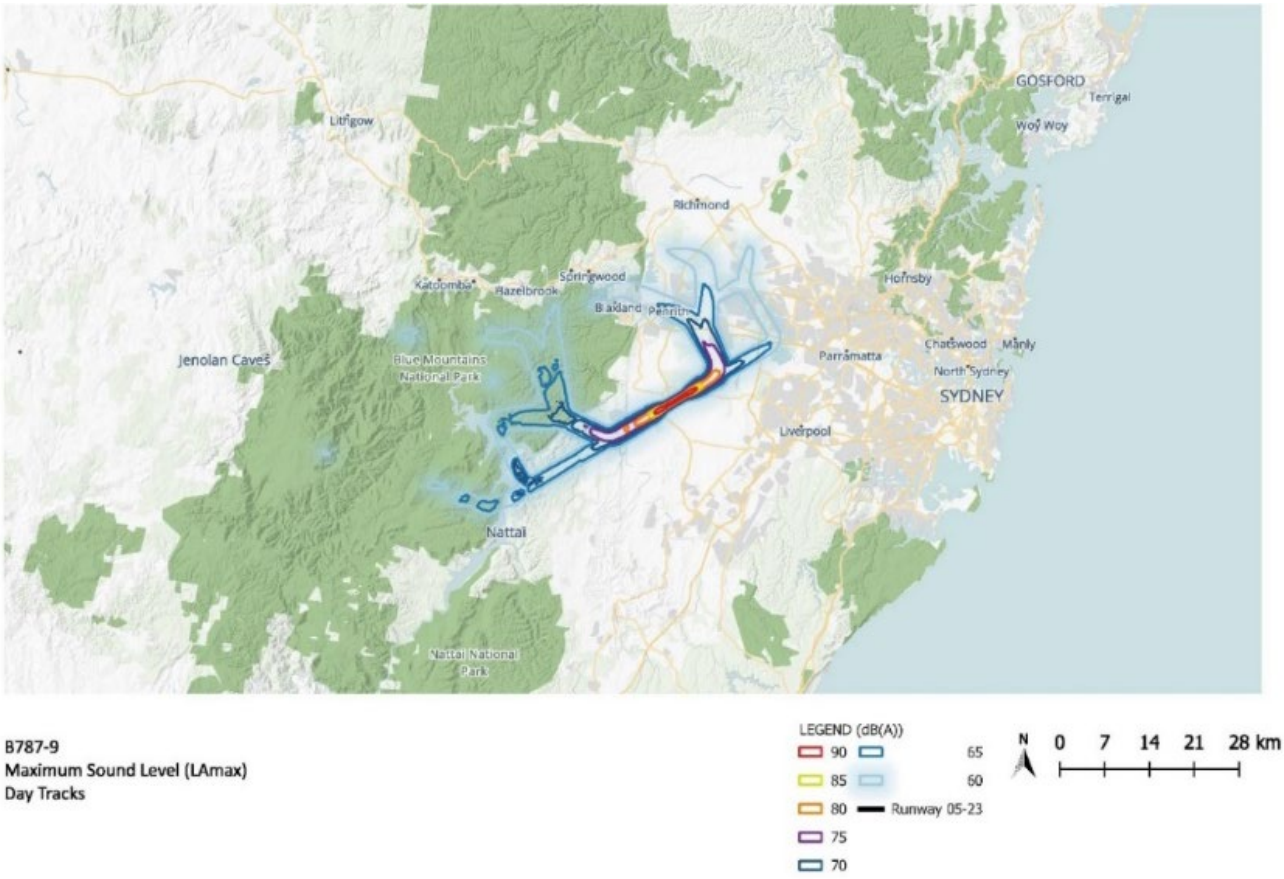

Figure 9.9 Example single event noise contour for Boeing B787-9 Day flight paths (5:30 am to 11 pm)

Table 9.1 lists the aircraft types for which single event contours were produced with the contours provided in Appendix C.

Table 9.1 Single event contours by representative aircraft type

Aircraft	Model	Tracks	L_{Amax} (dBA) Contours
B738	Boeing 737-800 NG	Based on destination and different flight paths used for each runway end for Day; Night and RRO	60, 65, 70, 75, 80, 85, 90
B7M8	Boeing 737MAX8		
B74F	Boeing 747-8F		
B773ER	Boeing 777-300ER		
B777300	Boeing 777-300		
B788	Boeing 787-8		
B789	Boeing 787-9		
A221	Airbus 220-100		
A320NEO	Airbus 320neo		
A321LR	Airbus 321		
DH8D	DeHavilland Dash8-Q400		

As noted previously, while WSI is designed to accommodate the Airbus A380 aircraft, it is not specifically included in the WSA Co air traffic forecasts, seeming to indicate that it is not anticipated to be regularly scheduled on WSI's flight route network.

While maximum sound levels exceeding 70 dB(A) typically align with the runway centreline, noise exposure between 60 dB(A) and 70 dB(A) will extend further along the arrival and departure flight paths. As previously explained, these charts are very useful to simply illustrate what may be heard or measured by a sound level meter at ground level from a single arrival or departure operation. However, they do not provide the context of frequency of operation on a route, with frequency of overflight most often correlated with annoyance and impact, as is explained in the following sections.

9.6 Population and dwellings

This section provides an estimate of the number of people and dwellings potentially impacted by aircraft noise, based on the metrics discussed in Chapter 7.

Although WSI is a completely new airport, the surrounding areas are already subject to aircraft noise. The source of this aircraft noise is from the existing operations of Sydney (Kingsford Smith) Airport, Bankstown and Camden Airports, and RAAF Base Richmond, and is noticeable and audible, but has not been quantified. Furthermore, the Sydney Basin is also overflown by aircraft transiting from outside the area to a mix of domestic and international destinations. These operations have not been considered in the assessment, but it was noted that these operations were perceptible based on the ambient noise monitoring described in Section 4.5. The population and dwellings potentially exposed to aircraft noise are therefore assessed solely on new traffic introduced by operations at WSI and does not consider current broader Sydney Basin airspace uses. In Chapter 8 (Facilitated changes) of the EIS, there is a description of the facilitated changes required to allow single runway operations at WSI to commence, and specifically addresses the nature of impacts associated with the adjustments required to Sydney Basin operations prior to the opening of WSI in 2026 to facilitate its new flight paths and airspace structure.

9.6.1 Population and dwelling data and analysis

Population and dwelling data were sourced from the 2021 Australian Census, issued by the ABS, on 28 June 2022. Mesh Blocks are the smallest geographic areas defined by the ABS and form the building blocks for the larger regions of the Australian Statistical Geography Standard (ASGS). Mesh blocks reflect dominant land use where possible. For example, residential areas are separated from commercial or industrial areas. Wherever possible, each mesh block is designed to have a single land use, for example parkland, but this is not always possible.[16]

The assessment of population and dwellings was undertaken by overlaying the different noise contours over census data using a GIS software tool. Census areas located wholly within the contours provided a direct input in population and dwelling numbers impacted, for census areas (mesh blocks) that are only partially covered by noise contours populations were calculated by proportioning the area within the contour in relation to the total census (mesh block) area.

The assessment provides a population and dwelling count for each RMO scenario (S1, S3, S4), as well as a cumulative count based on a worst-case composite contour of the 3 operating scenarios.

9.6.2 N60 night-time population and dwelling counts

The assessment of population and dwellings exposed to an average of more than 2 movements above 60 dB(A) between 11 pm and 5:30 am daily - (Night), indicates the potential for disturbances during sleep hours. Figure 9.10 highlights the growth in population numbers, likely to be exposed to different thresholds of aircraft noise events exceeding 60 dB(A) during night-time (11 pm to 5:30 am) as WSI operational demand increases from the forecast of 2033 (PAL 1) to 2055 (PAL 3).

A review of the above charts highlights that both scenario 3 (S3) and scenario 4 (S4) (which incorporate RRO operations) decreases the number of people impacted by various night-time noise event thresholds when compared to a baseline scenario without RRO. While the baseline scenario initially exposes up to 27,600 people to at least 2 noise events above 60 dB(A) per night (between 11 pm and 5:30 am) in year 2033 (PAL 1), this grows to over 84,500 people in 2055 (PAL 3). Scenario 3 (S3) and scenario 4 (S4) minimises numbers of people exposed to approximately 23,000 people in 2055. This number is less than the number that can be expected to be exposed to 2 noise events above 60 dB(A) per night under the baseline scenario (S1) in 2033.

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16 https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/main-structure-and-greater-capital-city-statistical-areas/mesh-blocks

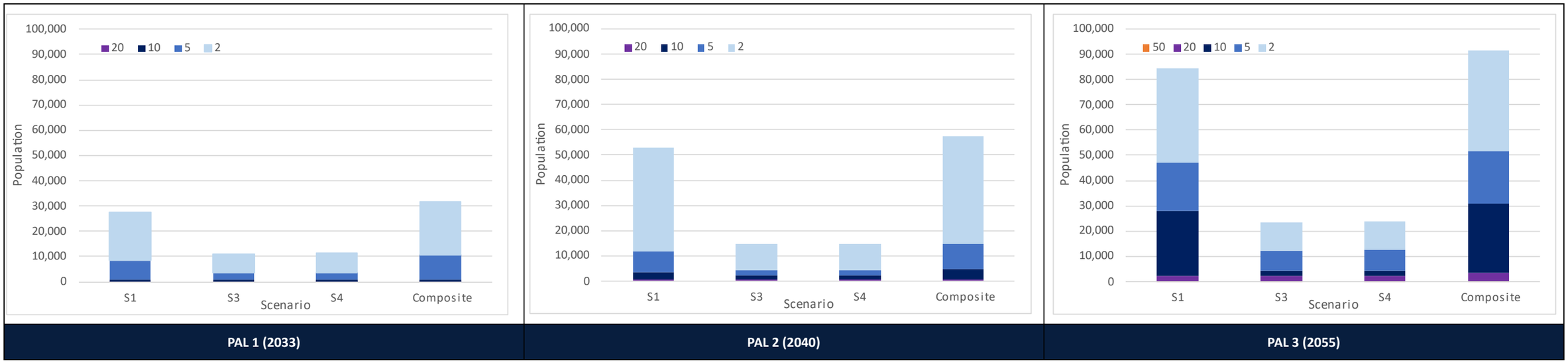

Figure 9.10 Population counts – Night N60 contours for all scenarios

Population and dwelling counts are based on June 2022 census data (ABS) and in the absence of availability of suitable residential development forecast data, do not reflect potential growth in population and dwelling numbers for those Western Sydney areas within the respective contours, up to year 2055 – PAL3.

Table 9.2 provides the detailed population and dwelling estimates for N60 Night contours.

Table 9.2 N60 night-time population and dwellings counts

Specifications			Population				Dwellings			
Metric	Year	Mvts	S1	S3	S4	Composite	S1	S3	S4	Composite
N60 (Night)	2033	2	27,600	11,000	11,300	31,700	10,000	3,600	3,700	11,400
		5	8,400	3,600	3,600	10,800	2,700	1,200	1,200	3,500
		10	770	730	730	920	240	230	230	280
		20	38	149	149	154	14	45	45	47
		50	0	0	0	0	0	0	0	0
N60 (Night)	2040	2	52,700	14,600	14,800	57,500	18,700	4,800	4,800	20,400
		5	11,800	4,200	4,300	14,600	3,700	1,400	1,500	4,700
		10	3,400	2,200	2,200	4,800	1,000	740	740	1,600
		20	530	550	550	650	160	170	170	200
		50	0	0	0	0	0	0	0	0
N60 (Night)	2055	2	84,500	23,500	23,800	91,600	29,200	7,600	7,700	31,700
		5	47,100	12,400	12,700	51,500	16,800	4,100	4,200	18,300
		10	28,100	4,200	4,200	30,800	10,300	1,400	1,400	11,300
		20	2,200	2,240	2,240	3,700	640	760	760	1,180
		50	61	230	230	230	20	68	68	71

9.6.3 N60 24-hour population and dwelling counts

The assessment of population and dwellings exposed to an average of more than 10 daily movements above 60 dB(A) reflects disturbance associated with the frequency of events, especially in rural areas where movements will be more noticeable at a lower noise threshold. Figure 9.11 highlights the growth in population living likely to be exposed to different thresholds of aircraft noise events exceeding 60 dB(A) over a 24-hour period.

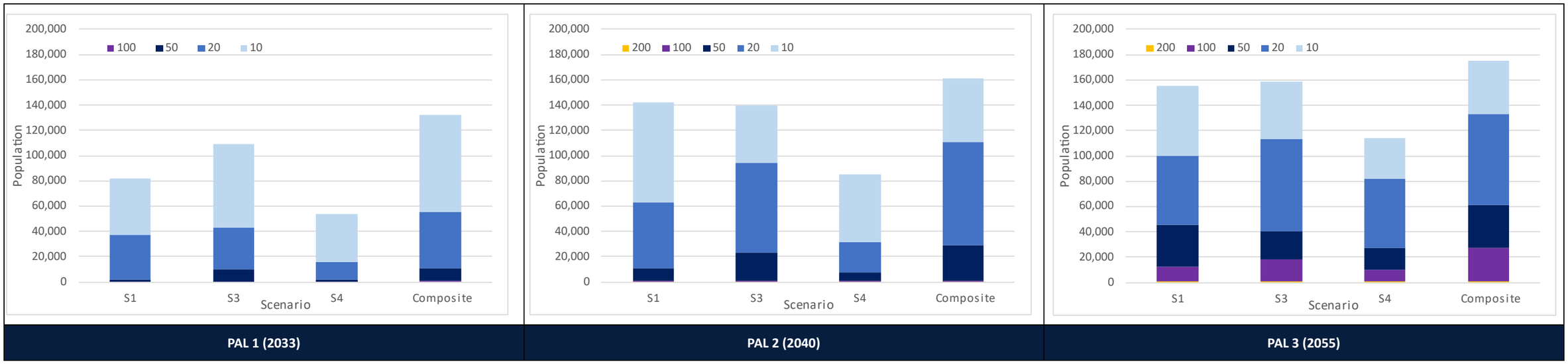

Figure 9.11 Population counts – N60 24-hour contours for all scenarios

A review of the above charts in Figure 9.11 shows that scenario 4 (S4) (Priority to Runway 23 operations with RRO operations at night) has the lowest number of people impacted by various noise event thresholds. While other scenarios expose over 150,000 people to at least 10 noise events above 60 dB(A) per day in 2055, scenario 4 (S4) decreases the number of people exposed to approximately 114,000 by 2055, lower than the numbers that can be expected under other scenarios at the earlier year of 2040. Table 9.3 provides detailed population and dwelling estimates for N60 24-hour contours.

Table 9.3 N60 24-hour population and dwellings counts

Specifications			Population				Dwellings			
Metric	**Year**	**Mvts**	**S1**	**S3**	**S4**	**Composite**	**S1**	**S3**	**S4**	**Composite**
N60 (24-hour)	2033	10	81,600	109,000	53,900	132,000	28,900	42,700	18,000	50,000
		20	37,400	42,900	15,400	55,600	13,200	15,400	4,900	19,500
		50	1,800	10,300	1,900	11,100	560	3,360	590	3,600
		100	430	340	470	550	140	110	150	170
		200	0	0	0	0	0	0	0	0
N60 (24-hour)	2040	10	142,000	140,000	84,800	161,000	53,900	54,000	29,500	61,000
		20	63,200	94,400	31,300	111,000	22,400	37,300	10,200	42,800
		50	10,900	22,900	7,900	29,400	3,500	8,000	2,400	9,900
		100	800	770	1,100	1,200	250	240	340	370
		200	22	27	5	31	6	9	1	10
N60 (24-hour)	2055	10	155,000	159,000	114,000	175,000	58,100	60,300	40,100	65,600
		20	100,200	113,000	82,100	133,000	36,100	43,700	28,600	50,300
		50	45,600	40,500	27,000	61,600	15,800	14,500	8,700	21,400
		100	12,900	18,100	10,300	27,300	4,100	6,400	3,300	9,300
		200	750	790	1,100	1,300	240	240	350	400

9.6.4 N70 24-hour population and dwelling counts

The assessment of population and dwellings exposed to an average of more than 5 daily movements above 70 dB(A) reflects disturbance associated with noisier events that can impact a normal conversation, even in urban areas. Figure 9.12 highlights the growth in population likely to be exposed to different thresholds of aircraft noise events exceeding 70 dB(A) over a 24-hour period) as WSI operational demand increases from the forecast of 2033 (PAL 1) to 2055 (PAL 3).

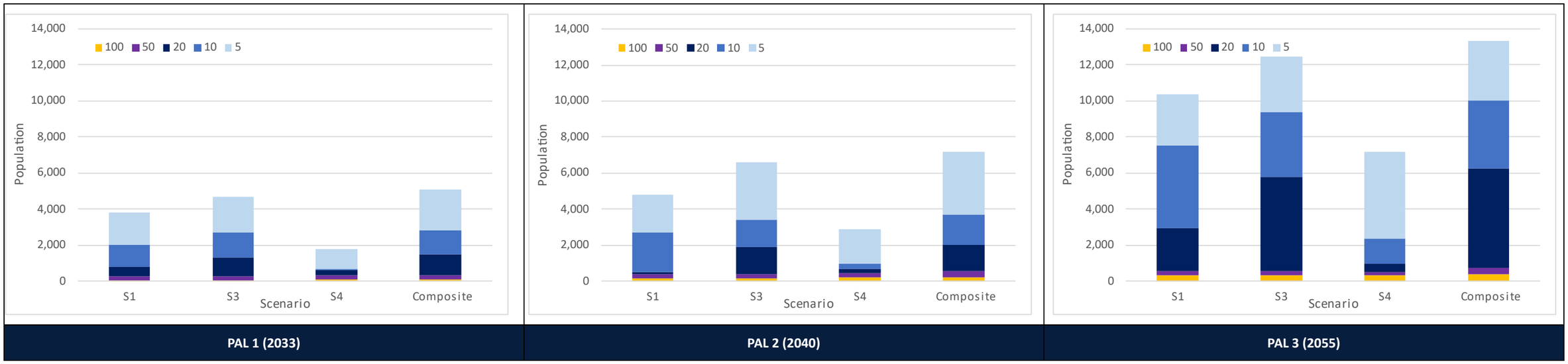

Figure 9.12 Population counts – N70 24-hour contours for all scenarios

Similar to the N60 24-hour contours, the review highlights that scenario 4 (S4) (Priority to Runway 23 operations with RRO operations at night) has the lowest number of people impacted by various noise event thresholds. While other scenarios initially expose up to 5,000 people to at least 5 noise events above 70 dB(A) per day, growing to over 12,000 people by 2055, scenario 4 (S4) minimises the number of people exposed to 5 N70 or above noise events to approximately 7,000 people by 2055, approximately the same level that can be expected under other runway scenarios at the earlier year of 2040. Table 9.4 provides detailed population and dwelling estimates for N70 24-hour contours.

Table 9.4 N70 24-hour population and dwellings counts

Specifications			Population				Dwellings			
Metric	**Year**	**Mvts**	**S1**	**S3**	**S4**	**Composite**	**S1**	**S3**	**S4**	**Composite**
N70 (24-hour)	2033	5	3,800	4,700	1,800	5,100	1,200	1,500	570	1,700
		10	2,000	2,700	700	2,800	640	870	230	910
		20	780	1,300	610	1,500	230	410	190	480
		50	270	240	300	340	82	75	94	106
		100	58	61	71	78	18	18	21	24
N70 (24-hour)	2040	5	4,800	6,600	2,900	7,200	1,500	2,200	930	2,300
		10	2,700	3,400	970	3,700	840	1,100	300	1,200
		20	500	1,900	660	2,000	160	590	210	650
		50	380	400	440	570	120	130	140	180
		100	160	150	200	210	49	42	62	65
N70 (24-hour)	2055	5	10,100	12,200	7,000	13,000	3,400	4,100	2,300	4,300
		10	7,300	9,100	2,200	9,700	2,400	3,000	680	3,200
		20	2,700	5,500	820	5,900	880	1,800	260	1,900
		50	570	580	500	720	180	180	160	220
		100	330	310	340	390	100	90	110	120

9.6.5 ANEC population and dwelling counts

The assessment of population and dwellings within each ANEC contour will highlight potential land-use compatibility issues. Figure 9.13 highlights the growth in population living within various ANEC noise contour levels according to the definition of AS 2021 for each reference year (2033, 2040, 2055).

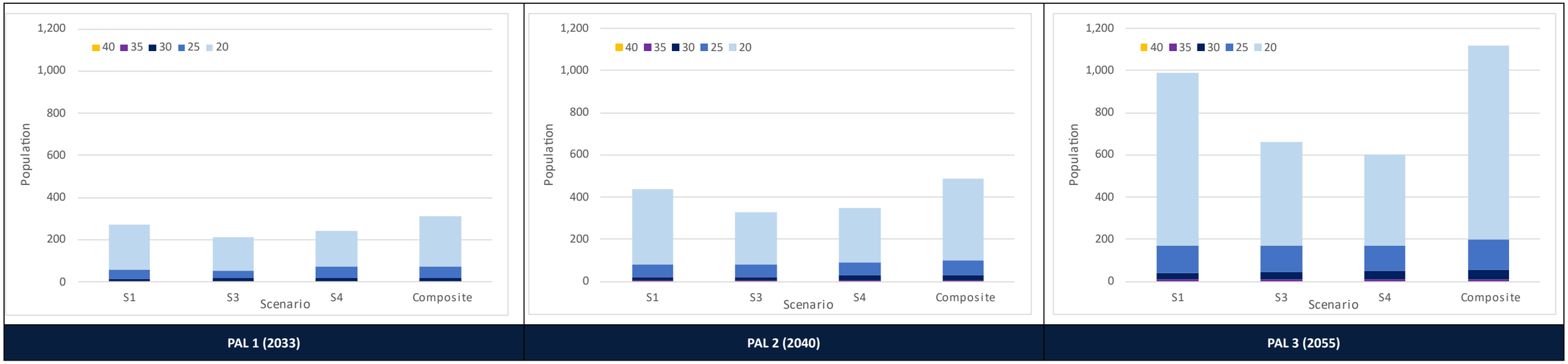

Figure 9.13 Population counts – ANEC contours for all scenarios

The review highlights that less than 1,000 people may be living within the 20 ANEF contours by 2055, up from initially approximately 250 people, regardless of the operational scenario. Table 9.5 provides detailed population and dwelling estimates for the ANEC contours.

Table 9.5 ANEC contours population and dwellings counts

Specifications			Population				Dwellings			
Metric	Year	Contour	S1	S3	S4	Composite	S1	S3	S4	Composite
ANEC	2033	20	270	210	240	310	79	65	74	93
		25	57	55	72	74	17	16	22	22
		30	13	16	19	20	3	4	5	6
		35*	4	4	4	4	1	1	1	1
		40*	2	2	2	2	0	0	0	0
ANEC	2040	20	440	330	350	490	130	100	110	150
		25	80	80	90	100	20	20	30	30
		30	23	23	31	32	6	7	9	9
		35*	4	5	5	5	1	1	1	1
		40*	2	2	2	2	0	1	0	1
ANEC	2055	20	990	660	600	1,120	290	210	190	320
		25	170	170	170	200	50	50	50	60
		30	42	45	52	54	12	13	15	15
		35*	9	12	13	13	3	4	4	4
		40*	3	3	2	3	1	1	1	1

*Estimate based on interpolation of census data. More granular review of specific properties required to identify specific dwellings impacted, especially at 35 and 40 ANEC.

9.6.6 Single event noise contours population and dwelling counts

The assessment of population and dwellings will highlight the potential for having an indoor conversation disrupted by an aircraft noise event (within the 70 dB(A) L_{Amax} contour) or for being awoken by a night-time aircraft movement (within the 60 dB(A) L_{Amax} contour). Figure 9.14 highlights the growth in population likely to be exposed to different aircraft noise thresholds by either one of the operational scenarios. While this assessment does not provide an assessment of the frequency, it does provide an order of magnitude of the population likely to be exposed to at least one event above a 60 dB(A) noise threshold in 5 dB(A) increments. It should be noted that this assessment excludes any considerations of overflight by existing operations at Sydney (Kingsford Smith) Airport, Bankstown and Camden Airports or RAAF Base Richmond.

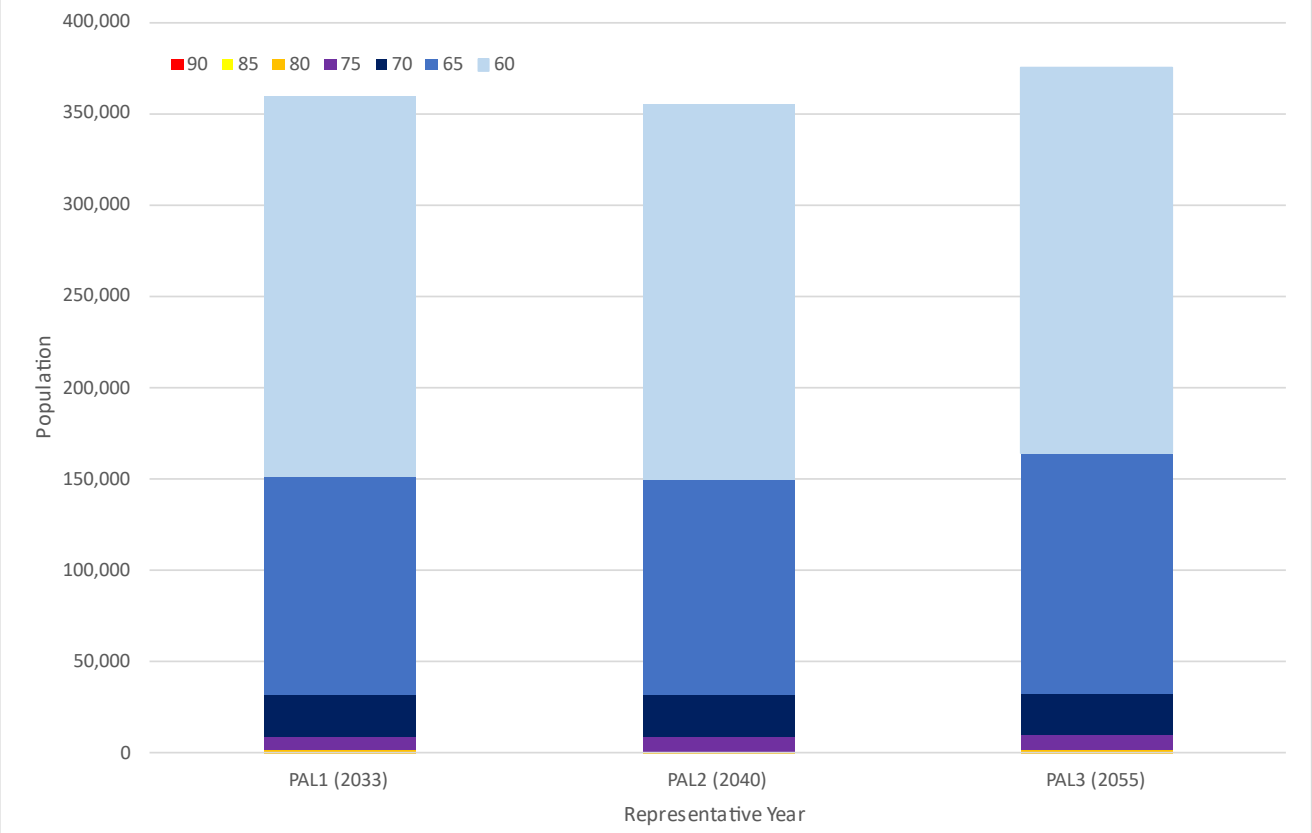

Figure 9.14 Population counts – projected maximum sound level

This assessment highlights that the number of people exposed to at least one noise event above 60 dB(A) will remain steady, based on the existing census data. In practice, the outcome will depend on the evolution of the aircraft fleet and on their operation on all flight paths to and from WSI. Table 9.6 provides detailed population and dwelling estimates.

Table 9.6 Population and dwellings counts – projected maximum sound level

Specifications		Population			Dwellings		
Metric	Contour	PAL1	PAL2	PAL3	PAL1	PAL2	PAL3
L_{Amax}	60	360,000	355,000	375,000	126,000	125,000	132,000
	65	152,000	150,000	164,000	56,500	55,900	61,300
	70	32,300	32,300	33,300	11,700	11,700	12,000
	75	9,700	9,500	9,900	3,200	3,100	3,300
	80	1,500	1,200	1,500	400	320	420
	85	180	100	220	50	30	58
	90	34	35	36	10	10	11

9.7 Noise sensitive areas

This section provides an impact assessment at different noise sensitive areas across the Western Sydney region. These noise sensitive areas shown in Figure 9.15 were identified based on the 2016 EIS. They were supplemented with a range of residential, commercial and community facilities such as schools, hospital, childcare centres and places of worship within a 15 km radius from WSI. Additional sites were considered up to 50 km in rural areas where aircraft noise is more likely to be noticeable due to the lower ambient soundscape.

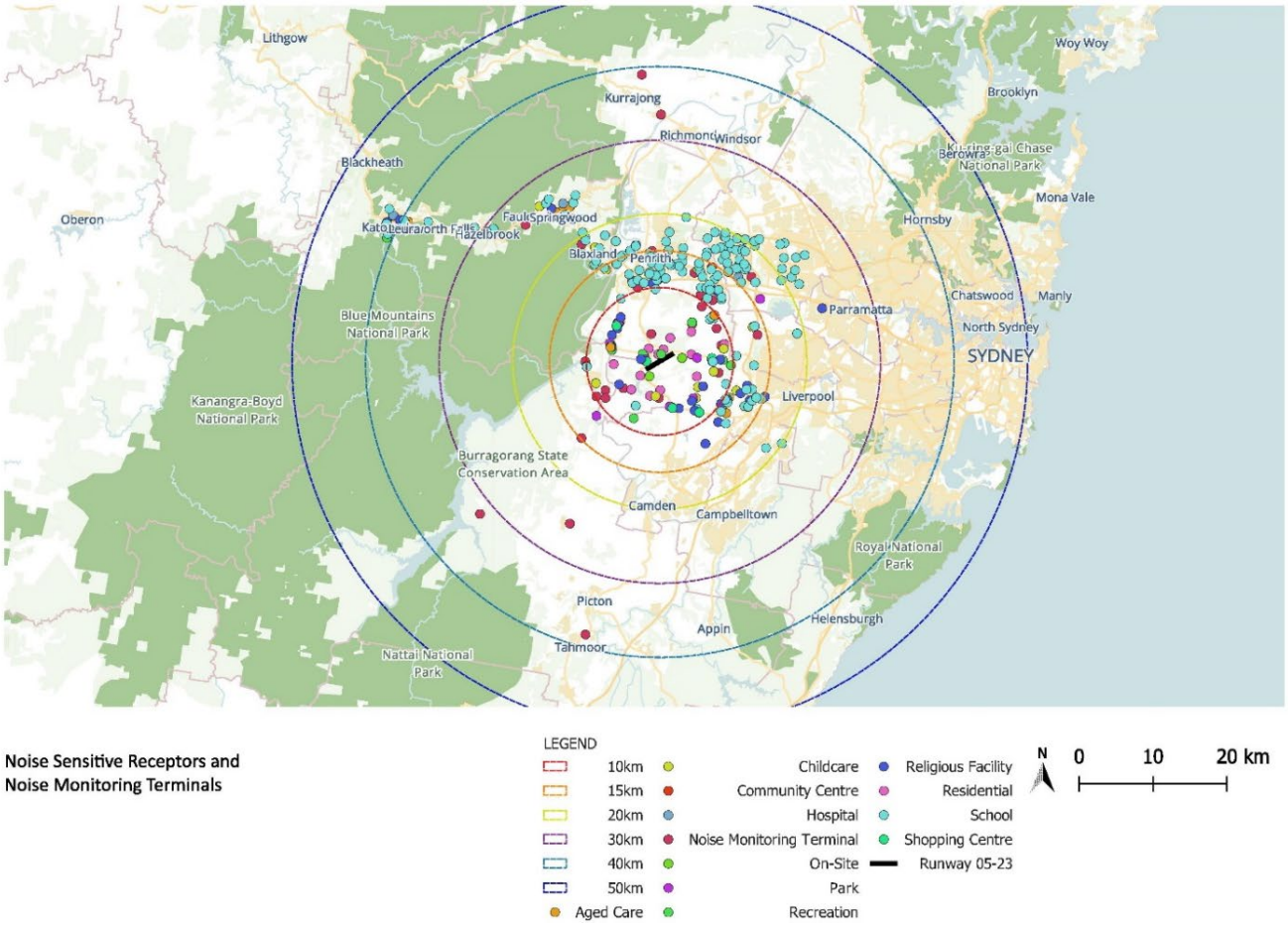

Figure 9.15 Noise sensitive receptors (NSRs) and noise monitoring terminals (NMTs)

Figure 9.16 shows the sites of the NMTs used to collect ambient noise data in Q4 2022. This is to help cross-reference the results from the ambient noise measurement process with the modelled results of aircraft noise levels and aircraft movements.

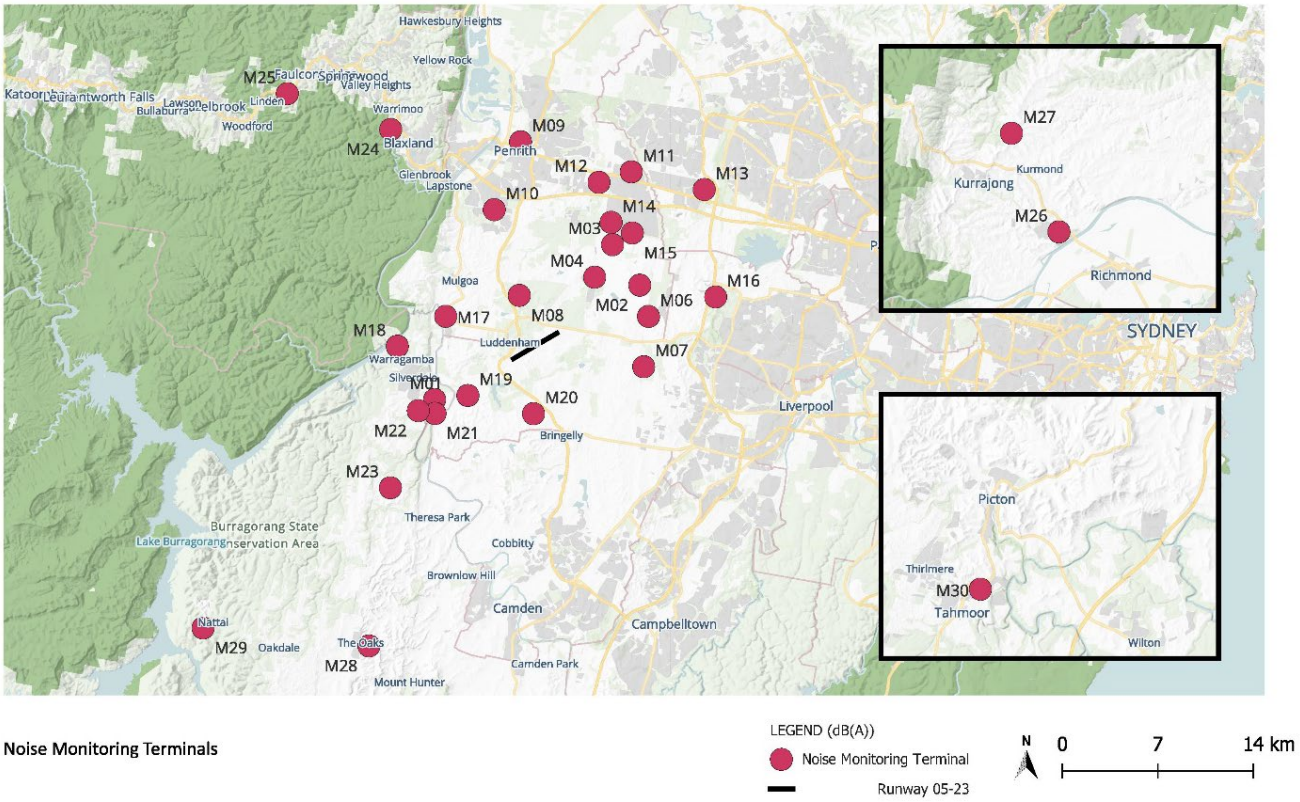

Figure 9.16 Noise monitoring terminals (NMTs)

Because this assessment relates to a new airport, it reviews impacts in absolute levels for the different metrics. It also compares impacts between the operating scenario 3 (S3) and scenario 4 (S4) (preferential runway with RRO) and operation scenario 1 (S1) (no preferential runway without RRO).

9.7.1 Noise Sensitive Receptors – projected average sound level

An assessment of projected average sound level (L_{Aeq}) was undertaken for all noise sensitive areas. These absolute sound levels are based on the preliminary airspace design as well as projections of the fleet mix across the various flight paths.

Figure 9.17 presents an example of a map highlighting the projected average sound level at various noise sensitive receptors across the Sydney Basin.

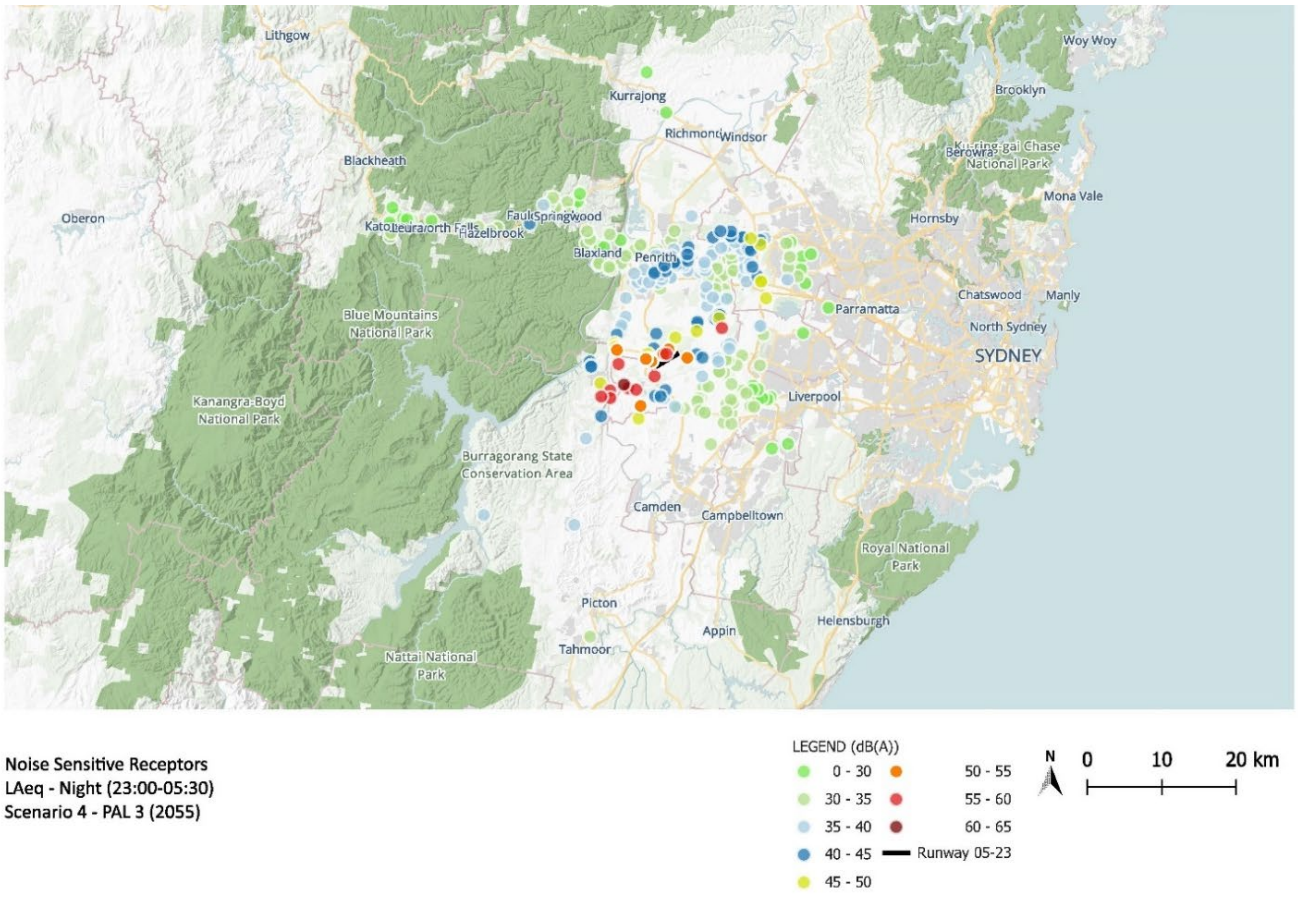

Figure 9.17 Noise sensitive receptor (NSR) – Average sound level (L_{Aeq}) – Night – scenario 4 – 2055 (PAL 3)

The projected average sound level assessment scenarios (L_{Aeq}) in Figure 9.18 below, are provided in Appendix C.

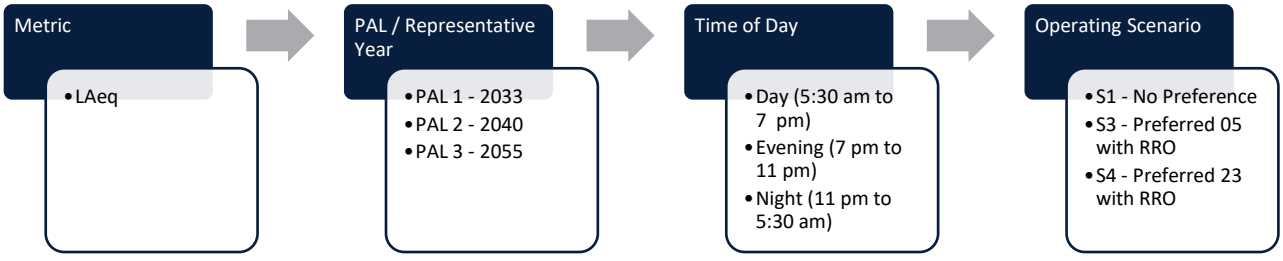

Figure 9.18 Noise sensitive receptors (NSRs) projected average noise level scenarios (L_{Aeq})

9.7.2 Noise sensitive receptors – projected maximum sound level

In addition to the development of noise contours highlighting areas, dwellings and population exposed to different maximum sound levels, an assessment of projected maximum sound level (L_{Amax}) was undertaken for all noise sensitive areas. These absolute sound levels are based on the airspace design as well as projections of the fleet mix across the various flight paths. Changes to maximum sound level over time would be driven by the actual fleet mix using each track.

Figure 9.19 presents an example of a map highlighting the projected maximum sound level at various noise sensitive receptors across the Sydney Basin.

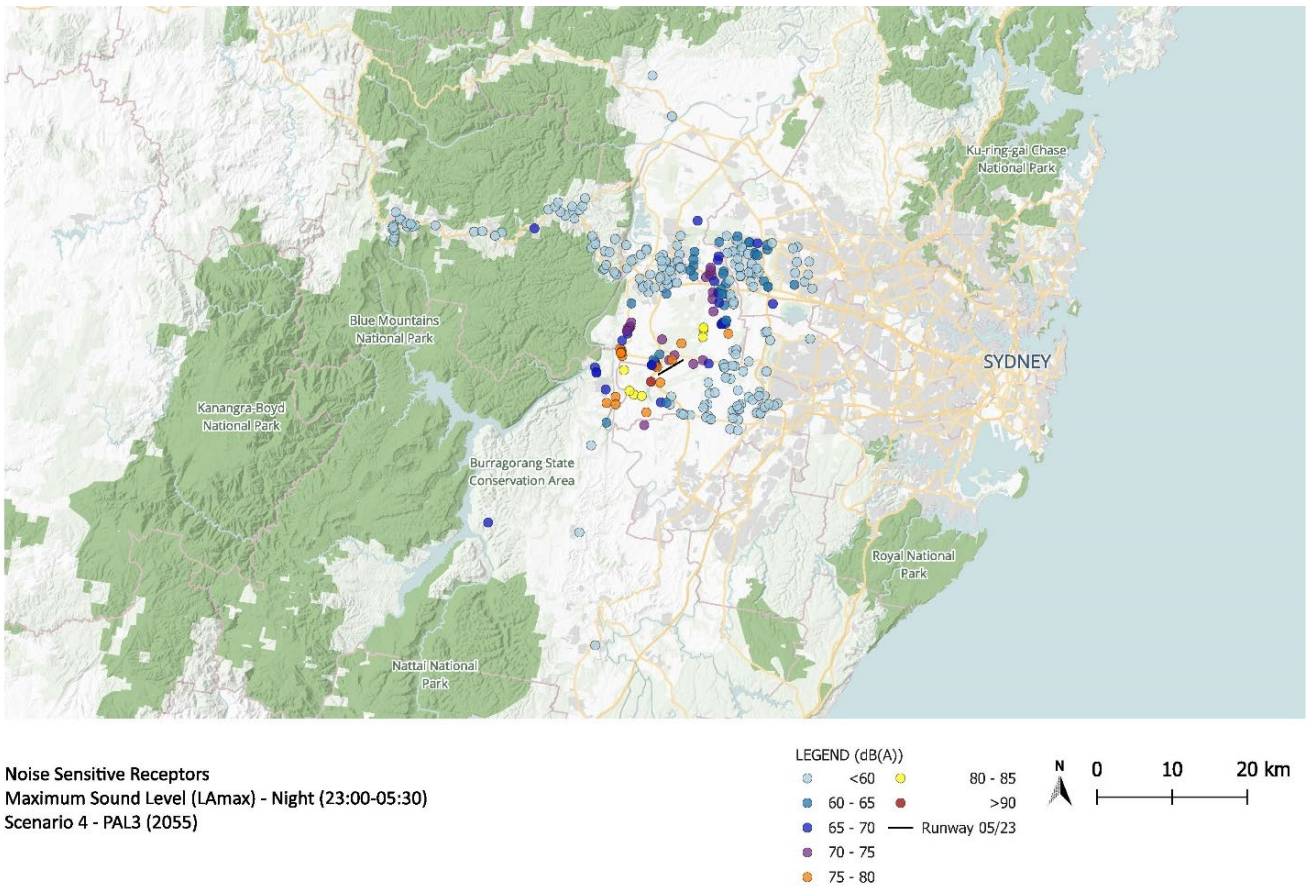

Figure 9.19 Noise sensitive receptors (NSR) – maximum sound level (L_{Amax}) – Night – scenario 4 – 2055 (PAL 3)

The projected average sound level assessment scenarios (L_{Amax}) in Figure 9.20 below are provided in Appendix C.

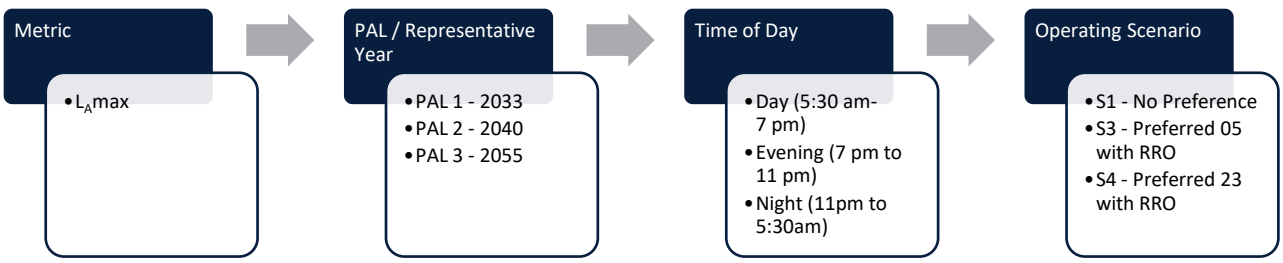

Figure 9.20 Noise sensitive receptors (NSRs) - projected maximum noise level scenarios (L_{Amax})

By correlating the maximum sound level (L_{Amax}) with the average sound level (L_{Aeq}), it is possible to identify suburbs that are likely to be more impacted by aircraft noise, by representative year, by time of day and by operating scenario. Figure 9.21 assesses the suburbs based on the NSRs located within its boundaries.

It highlights that during the night at PAL 3 (2055) and under the preferred use of Runway 23 (scenario 4), the suburbs of Greendale, Luddenham, Silverdale and Wallacia could be exposed to single events exceeding 70 dB(A) and an average sound level of 50 dB(A) between 11 pm and 5:30 am. Other scenarios are presented in Appendix D.

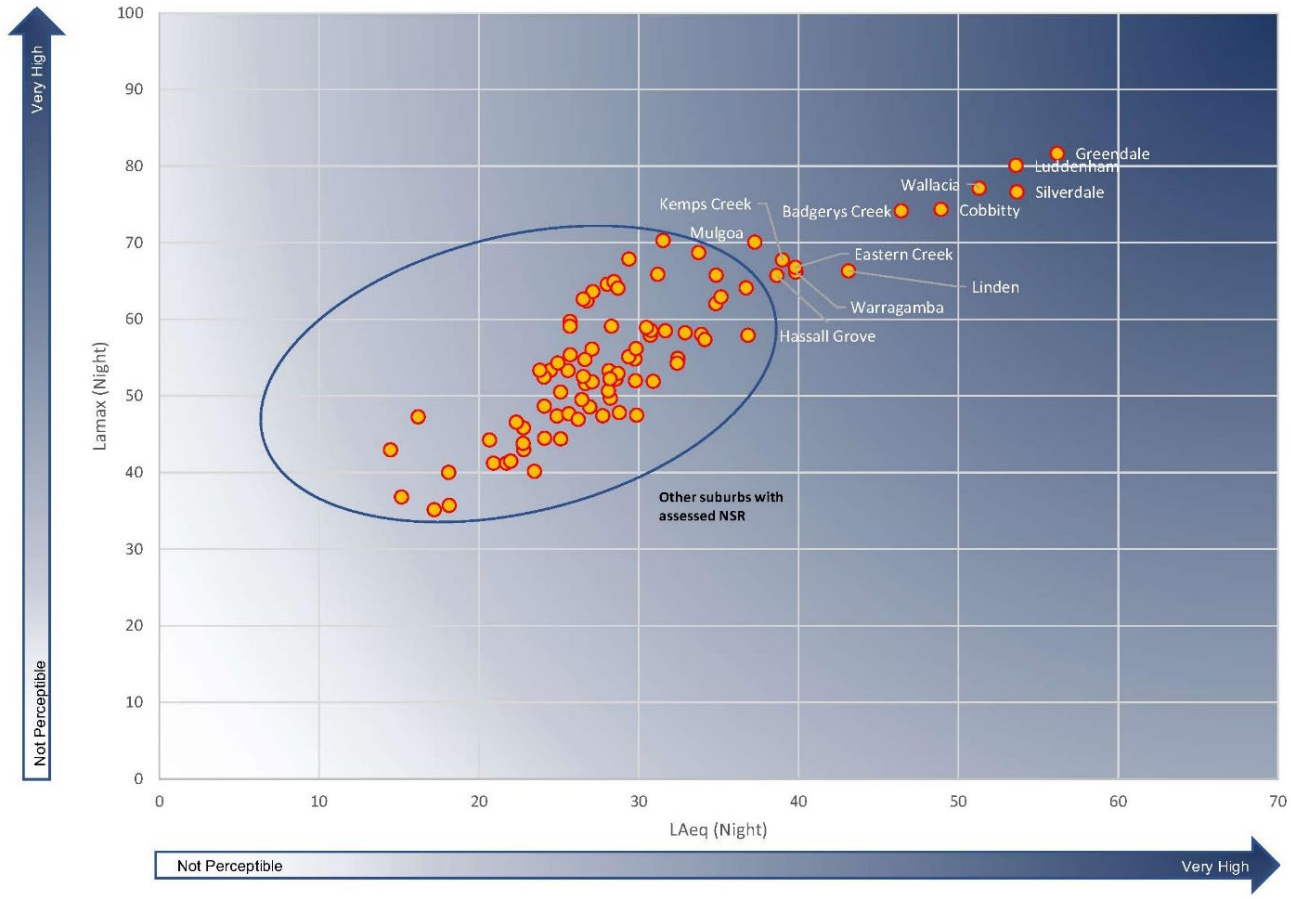

Figure 9.21 Suburbs – Maximum sound level versus average sound level – Night – scenario 4 – 2055 (PAL 3)

A similar assessment was undertaken for specific NSRs such as schools. Appendix D identifies schools that are likely to be more impacted by aircraft noise during the day, by 2055 and by operating scenario.

9.7.3 Noise sensitive receptors (NSRs) – projected respite

As indicated in Section 9.3, an assessment of respite was undertaken at each NSR. It is based on direct overflights, or flights within a 1 km width from a flight path corridor, regardless of sound level. This means that some NSRs may be exposed to a high volume of overflights at low sound levels while others may see no direct overflights but may still be exposed to noticeable sound levels.

Figure 9.22 presents an example of a map highlighting the projected proportion of respite at various NSRs across the Sydney Basin.

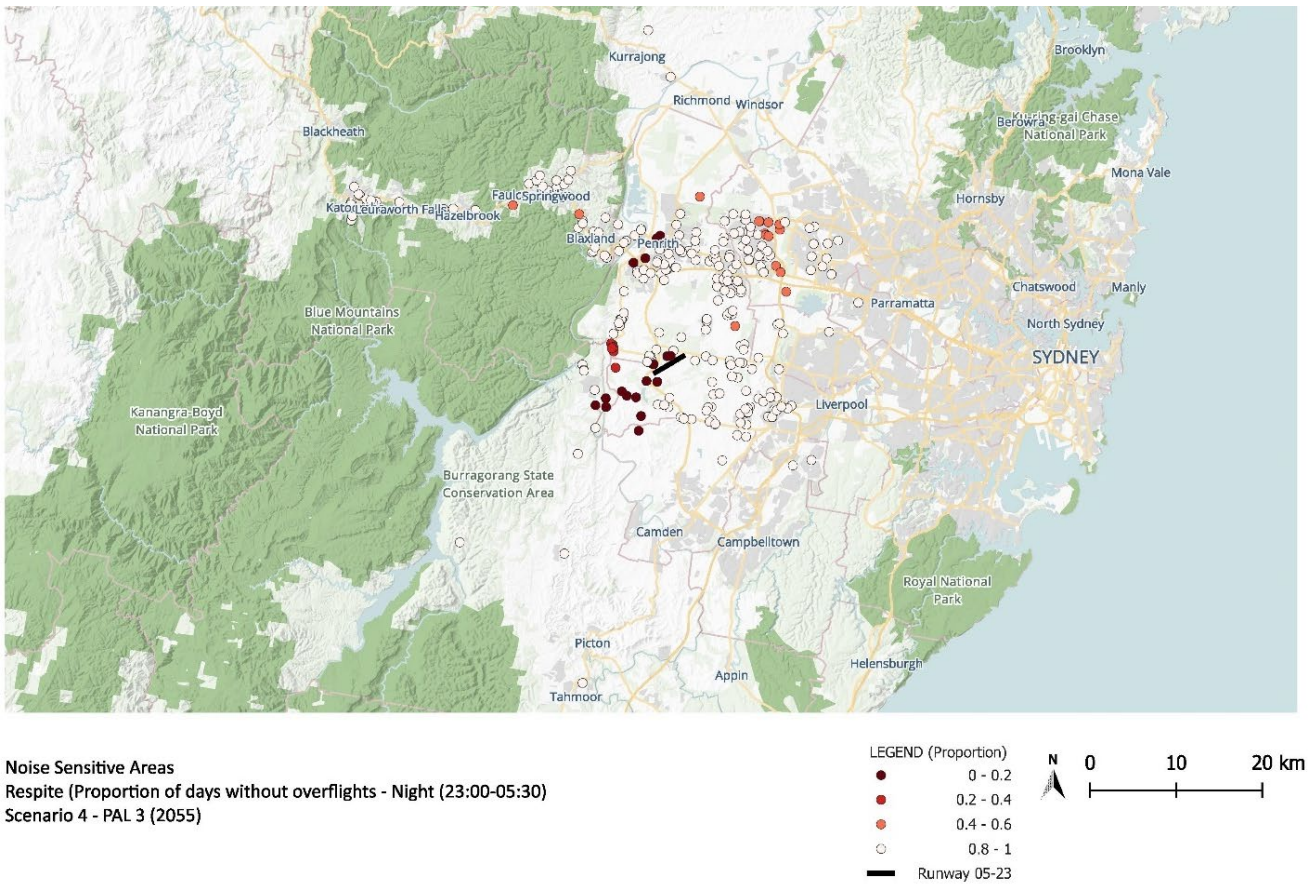

Figure 9.22 NSRs – proportion of respite – Night – scenario 4 – 2055 (PAL 3)

The projected proportion of respite charts in Figure 9.23 below are provided in Appendix B. This is supported by tables showing the proportion of respite for each noise sensitive area in Appendix A.

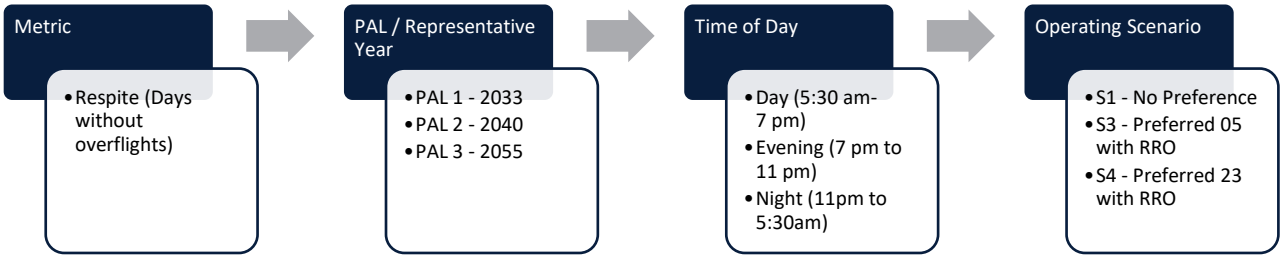

Figure 9.23 NSRs – proportion of respite

By correlating the proportion of respite with the average daily frequency of aircraft movements, it is possible to identify NSRs based on the extent of respite that they are likely to experience, by representative year, by time of day and by operating scenario. Figure 9.24 presents a typical scenario, highlighting the NSR without respite, and with a high average frequency of movements.

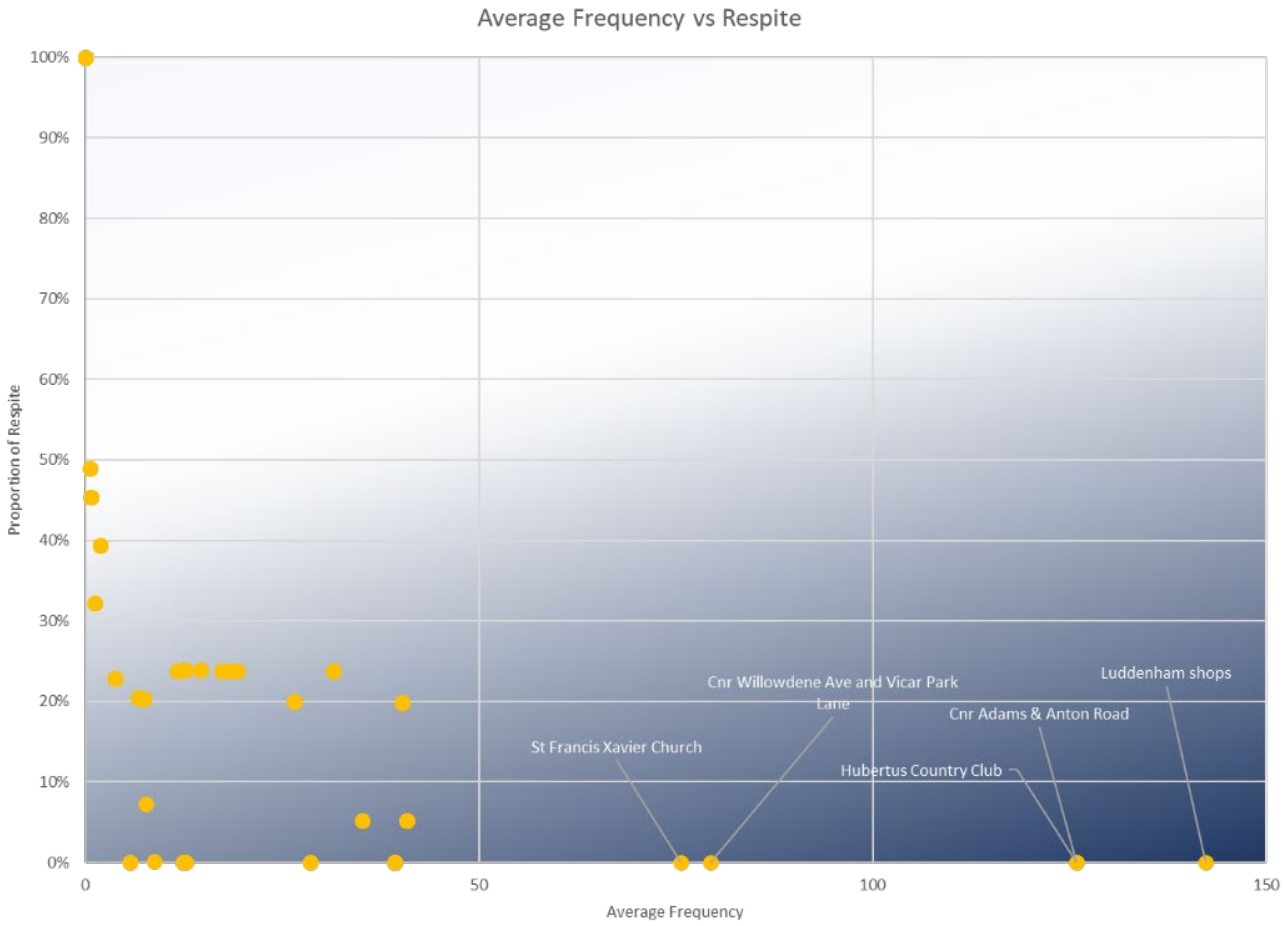

Figure 9.24 NSRs – proportion of respite versus average movements frequency – Day – scenario 1 – 2033 (PAL 1)

Other scenarios are presented in Appendix D.

9.7.4 Noise monitoring – projected average sound level variations

As outlined in Section 4.5, the ambient noise conditions were assessed at 29 locations over a two-to-4-week period in Q4 2022. From this assessment, the RBL (Rating Background Level)[17] was measured to determine the ambient noise levels, as presented in Table 4.2.

Figure 9.25 presents an example of a map highlighting the variation of projected average sound level at the NMTs across the Sydney Basin.

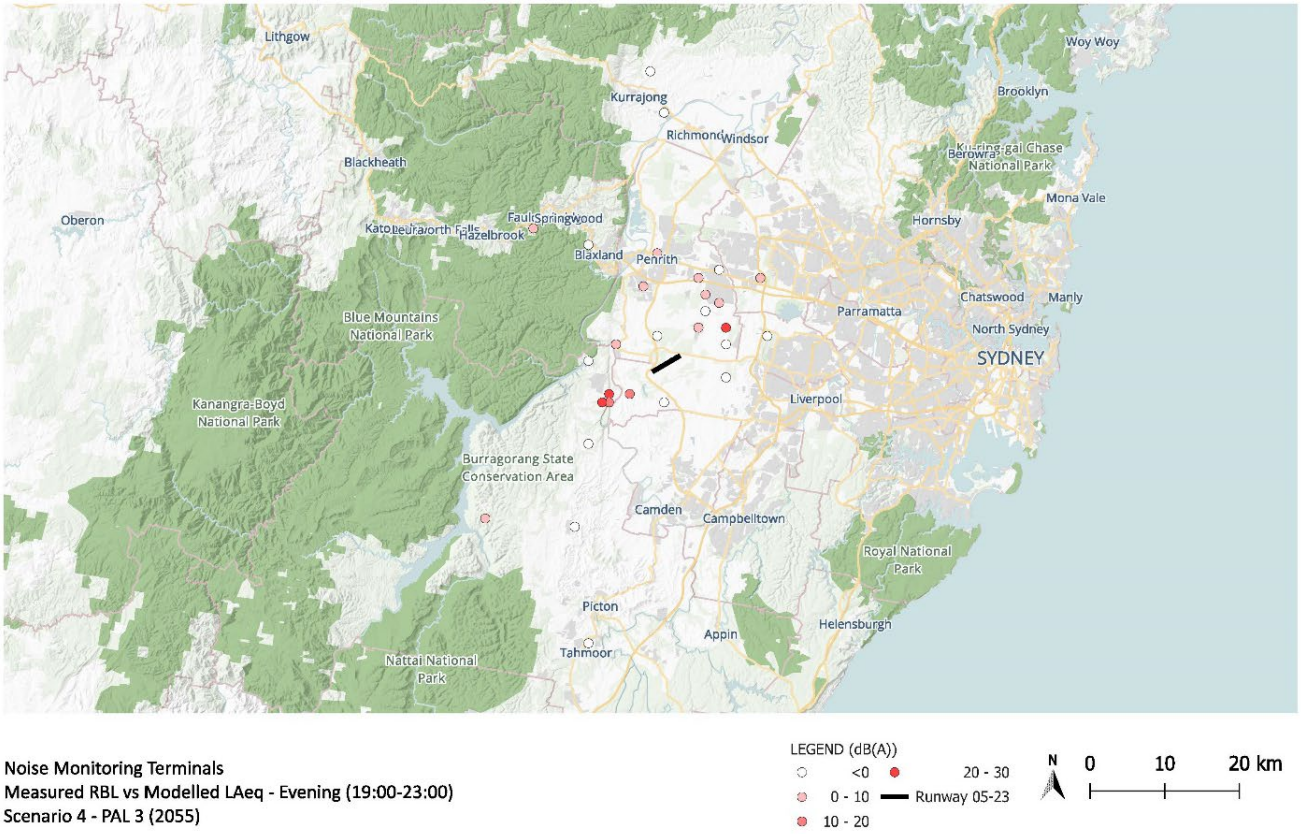

Figure 9.25 NSR – average sound level variation (L_{Aeq}) – Night – scenario 4 – 2055 (PAL 3)

The scenarios for the assessment of the projected variation in the projected average sound level (L_{Aeq}) compared to the ambient RBL in Figure 9.26 are provided in Appendix C.

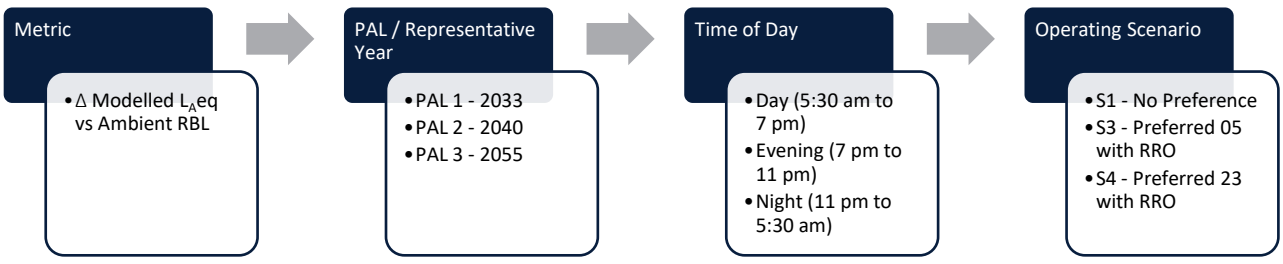

Figure 9.26 NSRs - projected average noise level scenarios (L_{Aeq})

[17] RBL – Rating Background Level – Refer to NSW Environment Protection Authority – Noise Policy for Industry

9.8 Sensitivity analysis

As previously outlined, a range of factors may potentially impact noise levels. This section presents the different variables and their relative impacts on noise exposure.

9.8.1 Temperature and weather

Temperature and weather are inputs in noise modelling that impacts noise levels in 3 different ways:

- aircraft performance
- noise propagation
- runway use (prevailing winds).

While high temperature may impact aircraft performance by reducing lift upon take-off, low temperature provide marginally more lift but is more conducive to the propagation of noise. More importantly, the summer and winter schedules have the same number of movements and the same fleet mix. As such, a sensitivity comparison of NS and NW contours in Figure 9.27 using ANEC contours, and Figure 9.28 using N70 contours highlights minimal differences based on average daily maximum seasonal temperatures highlighted in Table 8.5. As such, differences between modelling of summer and winter operations are deemed not to be material.

Extreme temperature operations do not form part of the baseline modelling but could result in areas being subject to single event exposure when SIDs for hot weather operations are used.

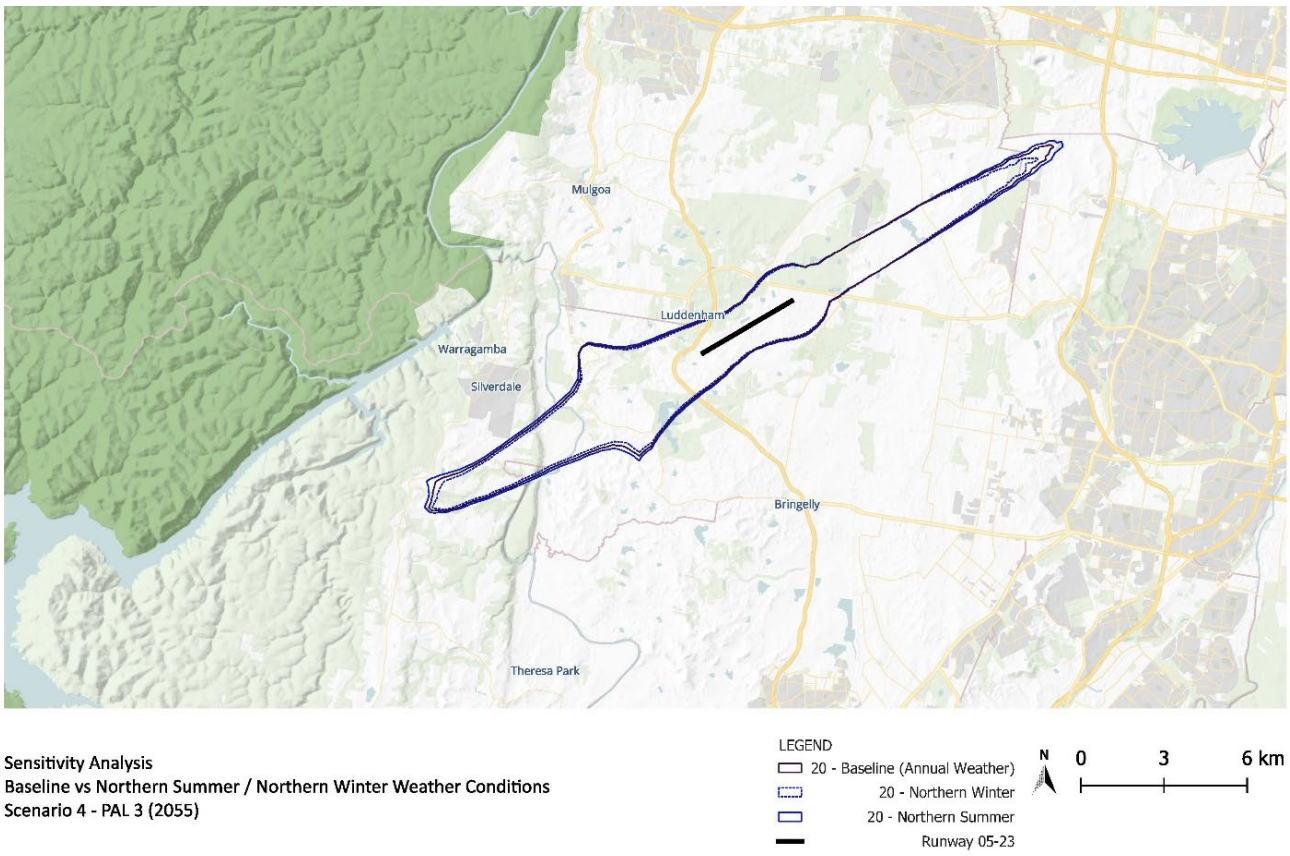

Figure 9.27 Sensitivity analysis – temperature and weather – comparison of 20 ANEC contours

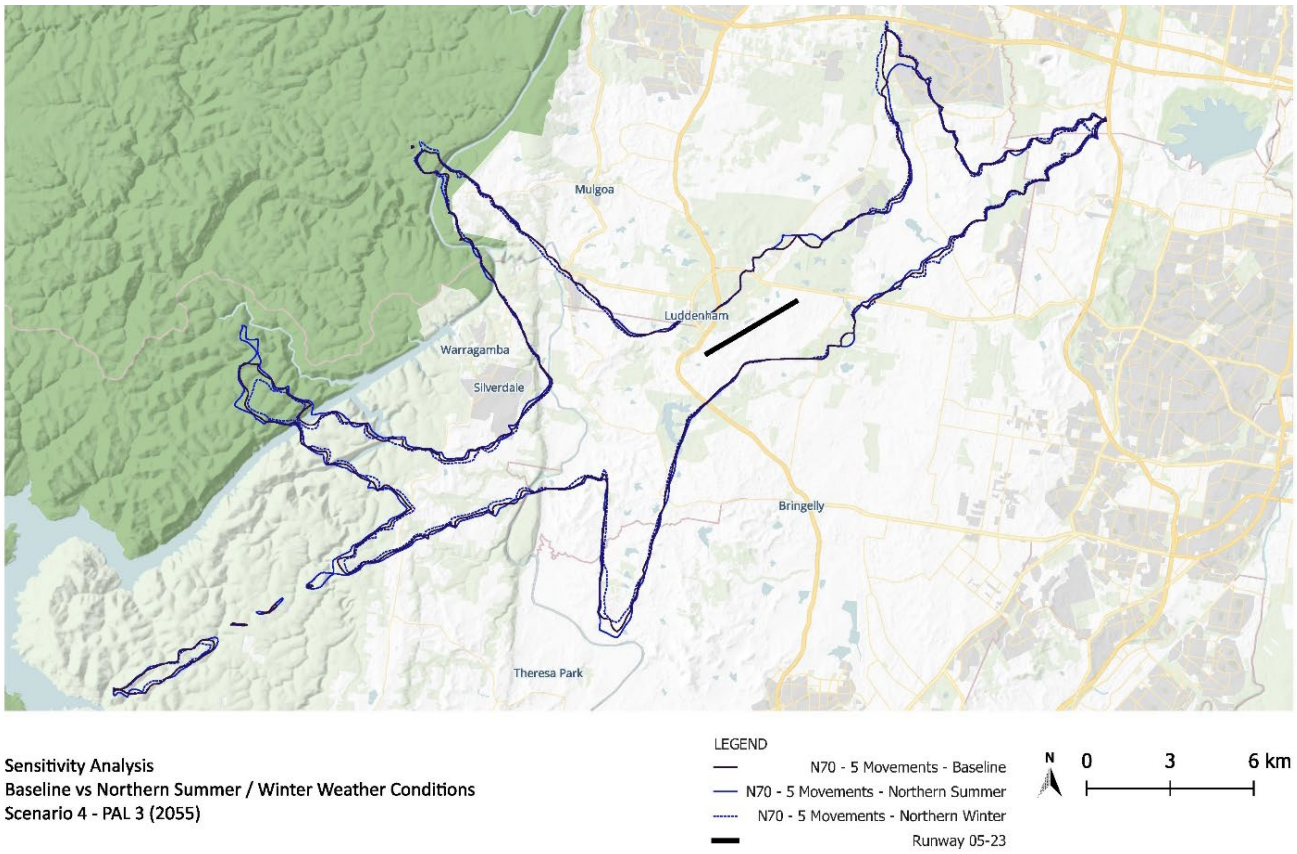

Figure 9.28 Sensitivity analysis –- temperature and weather – comparison of N70 Contours – 5 movements

9.8.2 Fleet mix

The fleet mix is a critical consideration that is driven by the schedule. Using an older Airbus A320ceo (current engine option) instead of a newer Airbus A320neo (new engine option) model (updated quieter engines, wing design for greater range and fuel efficiency) results in no changes to the N-above contours and minimal changes to the ANEC contours (refer to Figure 9.29 and Figure 9.30). While the A320neo is noticeably quieter aircraft compared to the A320ceo, this highlights that the number of movements is the prime driver of noise contours, as well as the noise footprint of the loudest aircraft. This confirms that the most material impact would come from a significant fleet change among wide-body jet operations.

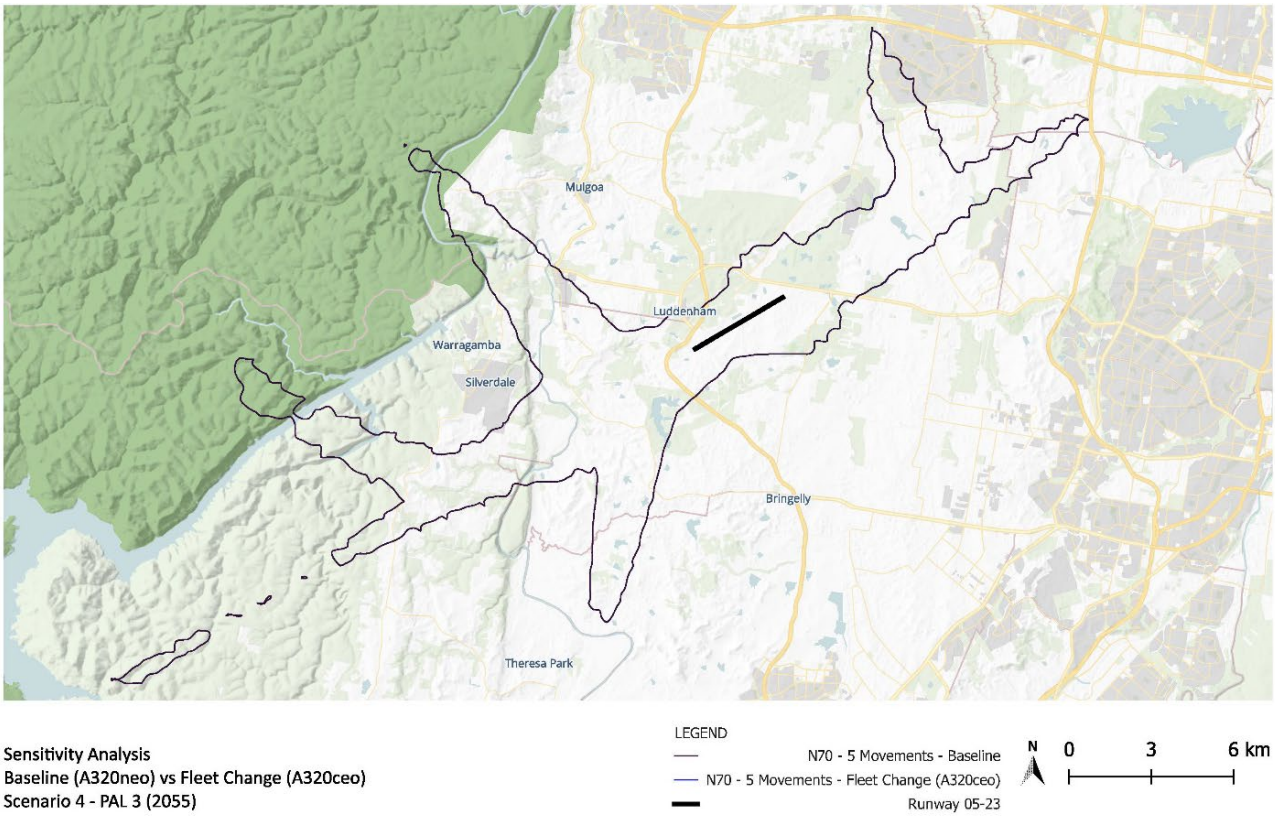

Figure 9.29 Sensitivity analysis – fleet mix A320ceo versus A320neo – comparison of N70 contours – 5 movements

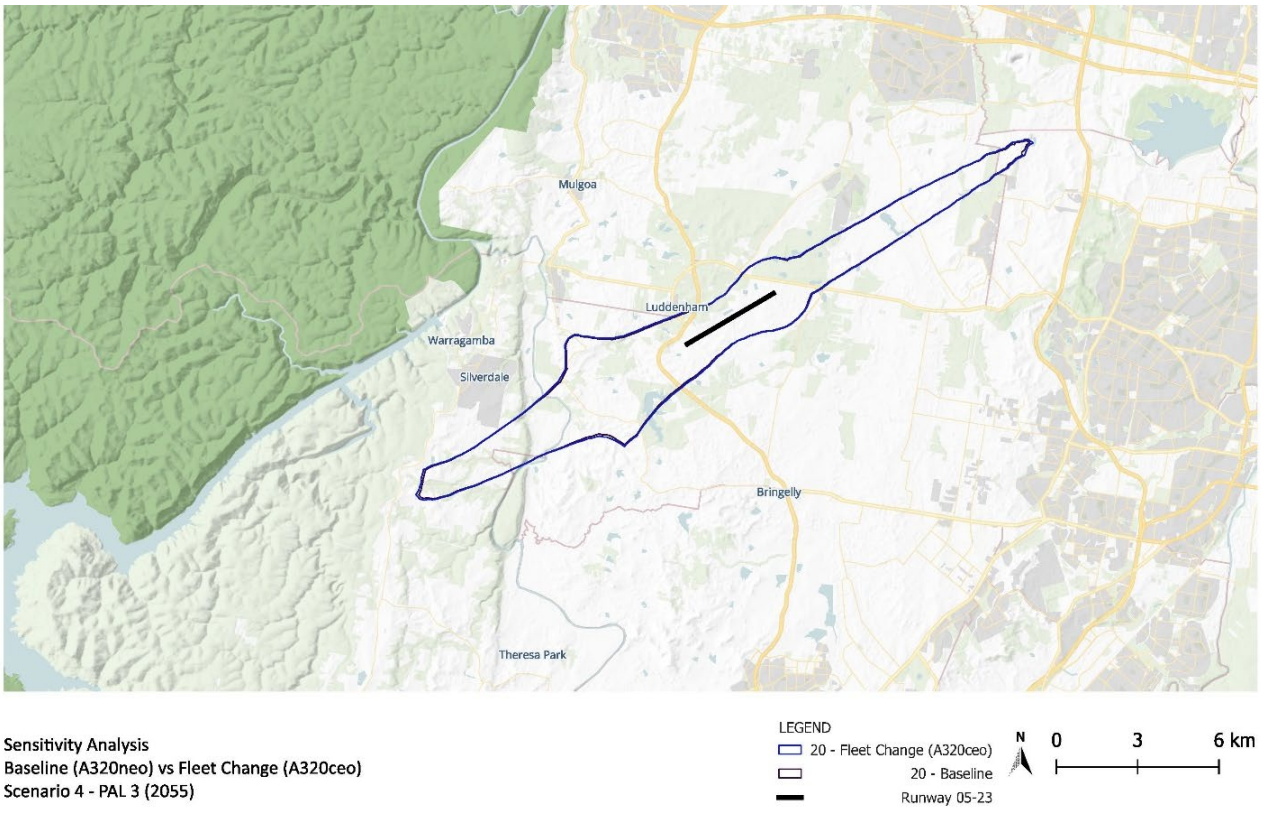

Figure 9.30 Sensitivity analysis – fleet mix A320ceo versus A320neo – comparison of 20 ANEC contours

9.8.3 Weekday versus weekend

The comparison of modelling of weekday operations against weekend operations is non-material (refer to Figure 9.31 and Figure 9.32). While a slight reduction of the ANEC contours highlights the lower number of weekend movements compared to weekday, the N70 contours shown in Figure 9.31 are identical as they are driven by the operations of larger, wide-body aircraft types in the schedules.

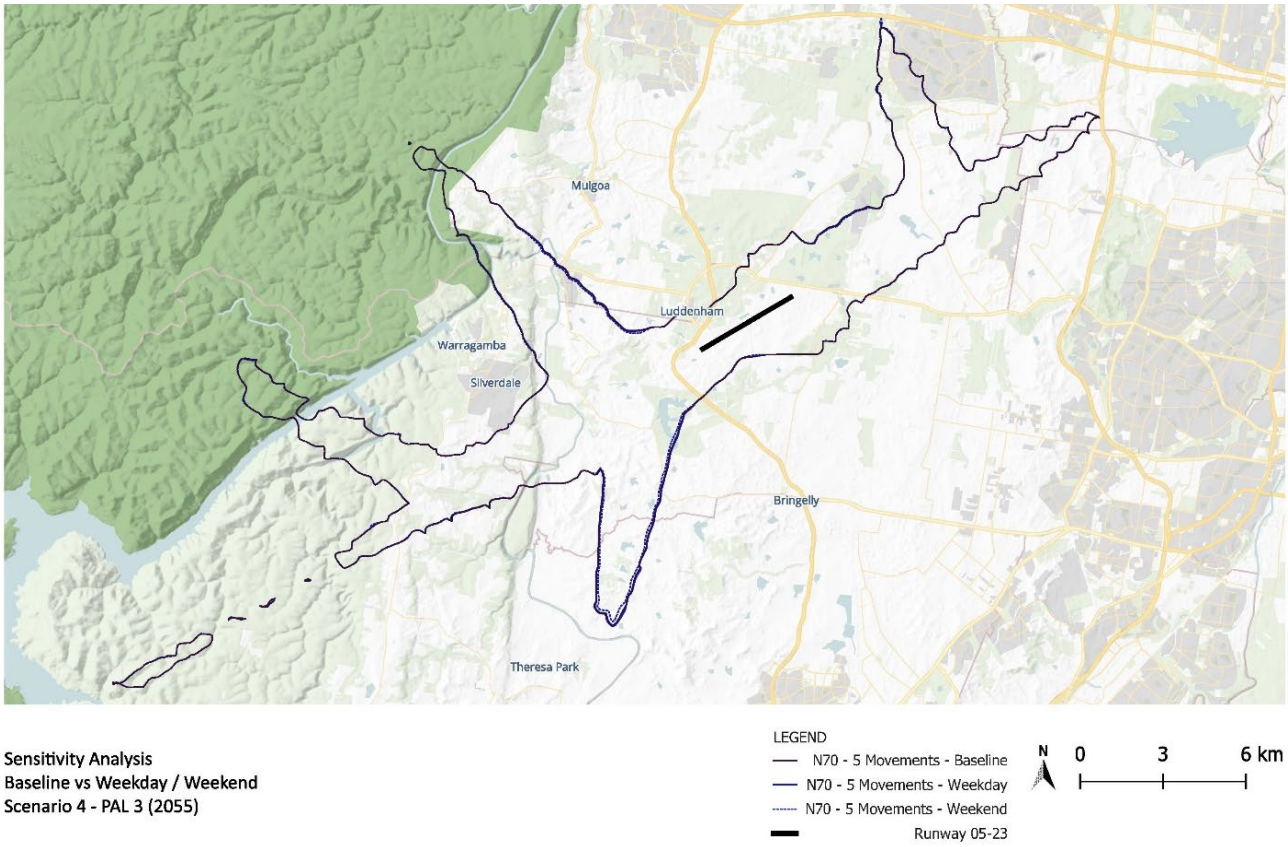

Figure 9.31 Sensitivity analysis – day of the week – comparison of N70 contours – 5 movements

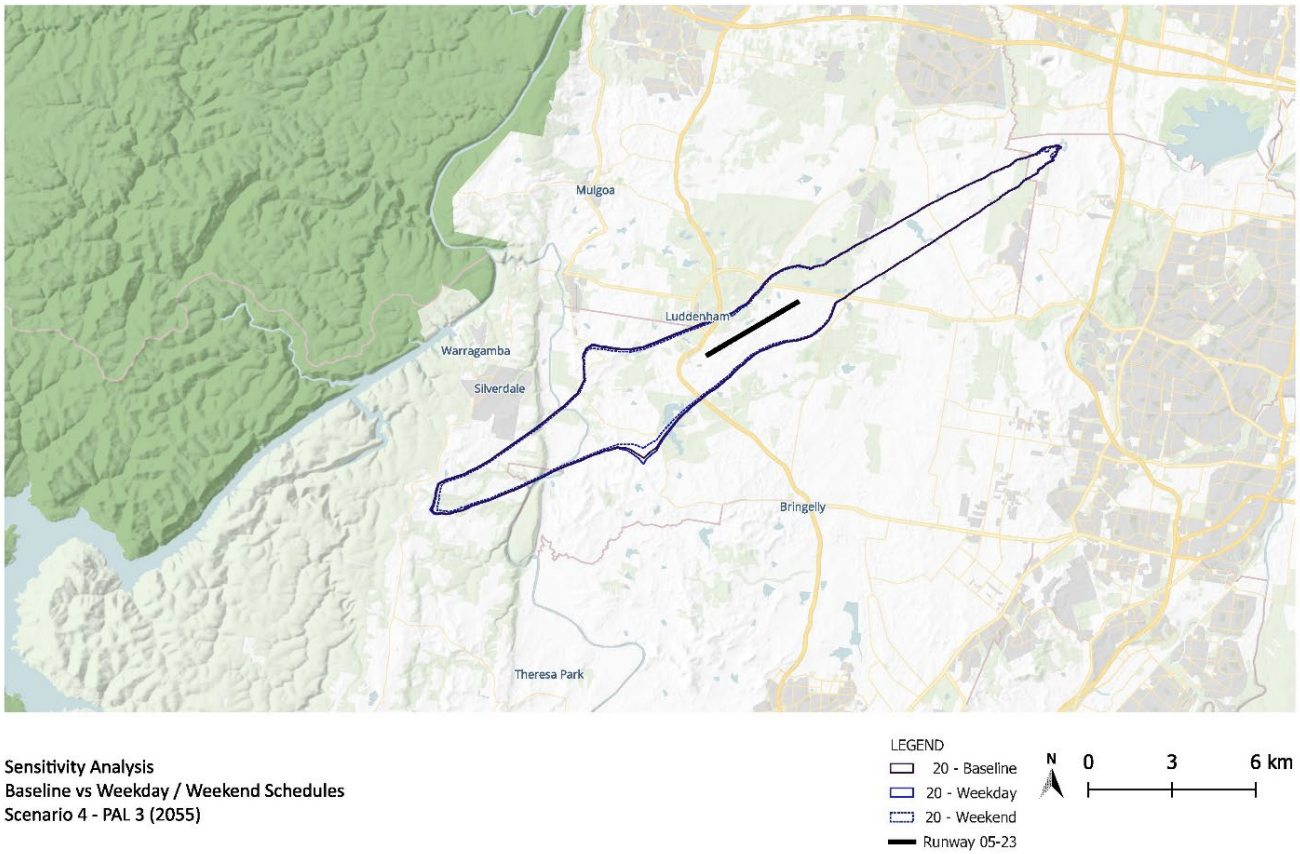

Figure 9.32 Sensitivity analysis – day of week – comparison of 20 ANEC contours

9.8.4 Aircraft noise calibration

AEDT has default noise profiles for the aircraft types used in this assessment. However, using historical and measured data from the Airservices Australia's NFPMS systems at Brisbane, Melbourne and Perth Airports, calibration adjustments of profiles of various aircraft types was undertaken in the modelling inputs which better reflected the actual noise levels recorded by NMTs for different aircraft types when compared to the default values contained in AEDT. These assumptions were carried over to this analysis.

Figure 9.33 and Figure 9.34 highlight the material impact of the calibration process. Of all the sensitivities tested, this calibration adjustment proved to be the variable with the most material impact on the noise contours.

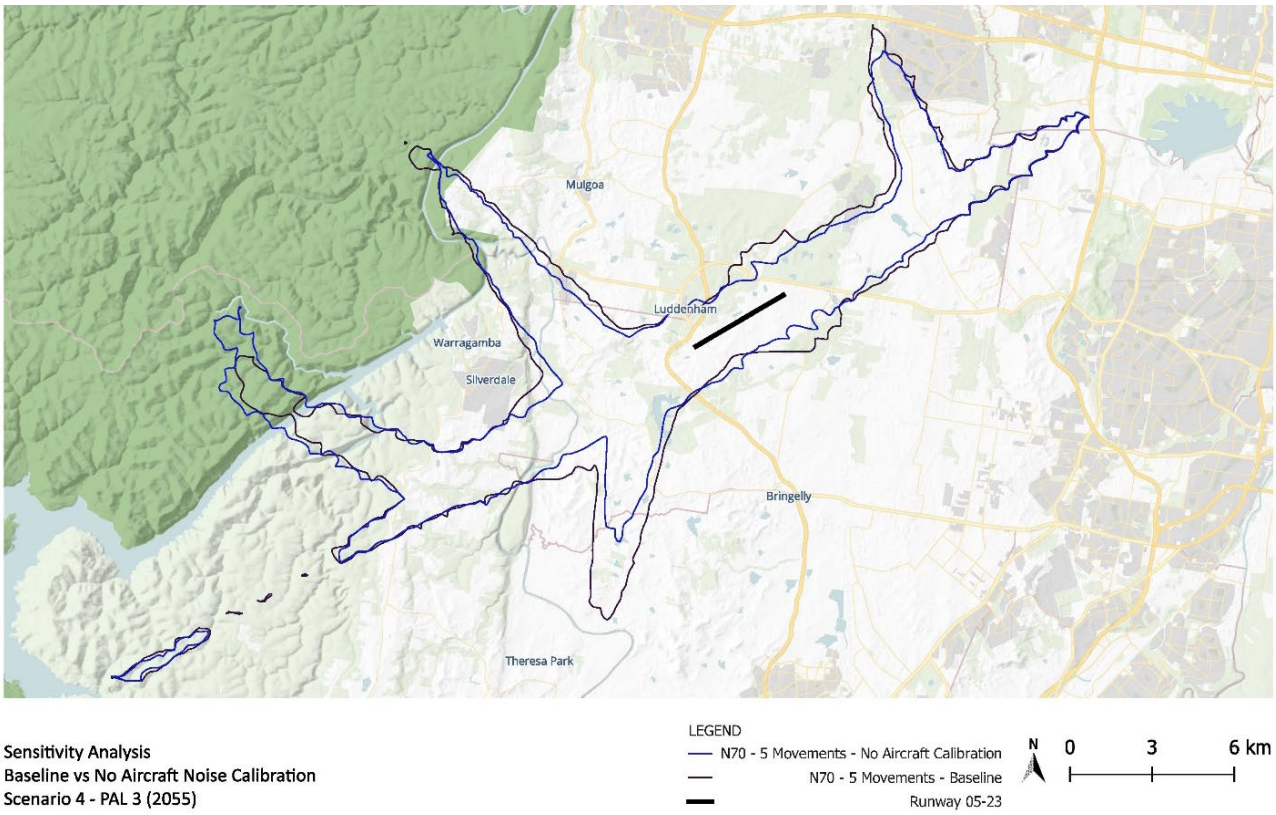

Figure 9.33 Sensitivity analysis – aircraft noise calibration – comparison of N70 contours – 5 movements

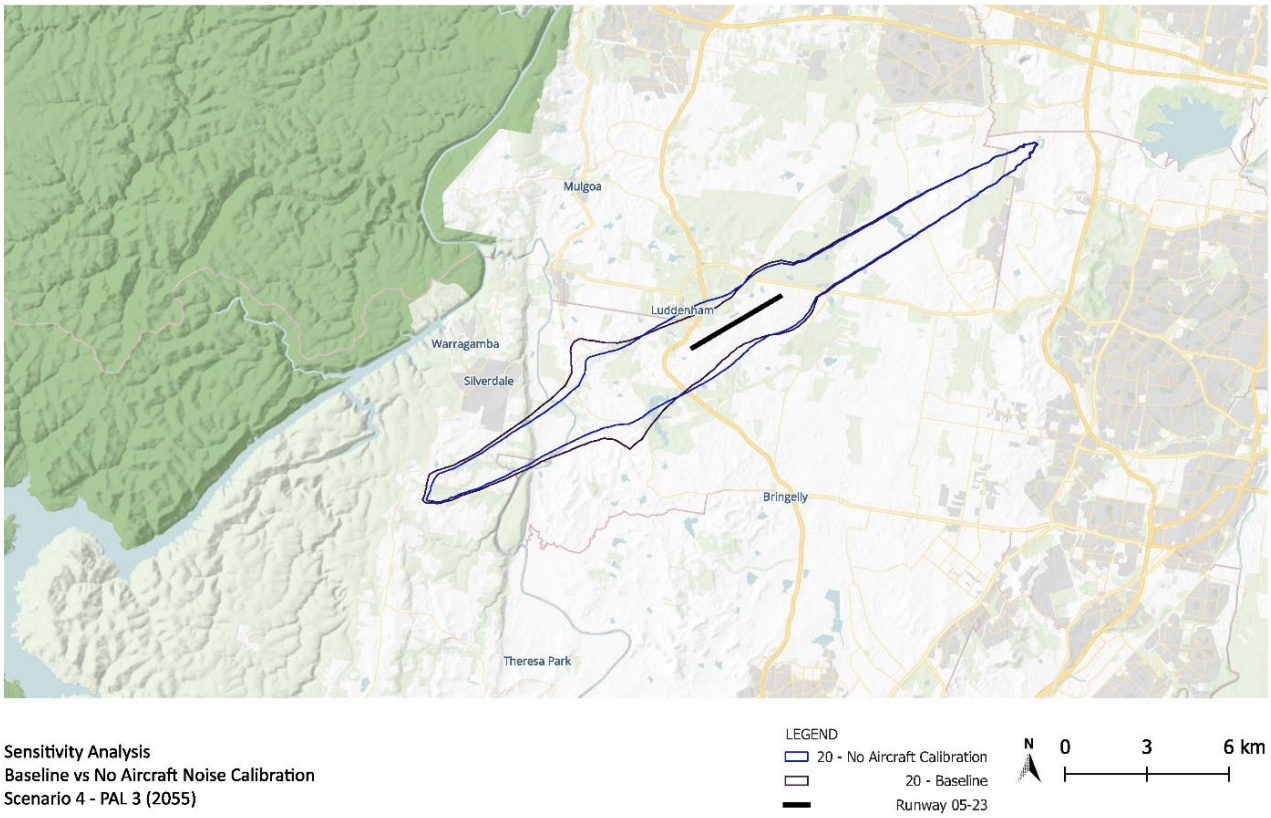

Figure 9.34 Sensitivity analysis – aircraft noise calibration – comparison of 20 ANEC contours

9.8.5 Hold down procedures

The flight paths described in the PAAM include level restrictions across some of the proposed procedures. The altitude restrictions being proposed for departing WSI traffic, include level hold downs at specific waypoints with altitudes ranging between 4,000 ft, and 15,000 ft. The specified altitudes are intended to keep aircraft procedurally below both Sydney (Kingsford Smith) Airport departure and WSI arrival aircraft. Some arrival procedures also require aircraft to descended to below their nominal flight path on but occasion, but this generally applies further from the Airport Site at higher altitudes.

Hold downs may be occasionally cancelled when traffic permits but it is important to note that the opportunity to cancel procedures decreases as traffic levels at WSI increase beyond PAL 1 (2033).

To assess the noise impact of a hold-down of departing aircraft, the team responsible for modelling tested the use of hold down procedures within the modelling environment. The team found that there are several ways to model the same procedure which produce diverging results. After assessing the impact of two different methods modelling a procedural altitude restriction, the inclusion of altitude restrictions was deemed a limitation of the current modelling effort without more detailed input from stakeholders, especially airline operators.

Acknowledging that AEDT can include altitude restrictions in a variety of ways with varied results, a conservative assessment of some of the departure altitude restrictions over the GBMA has been undertaken, using the method which is most likely to extend the noise footprint of a departing aircraft. This assessment utilises the larger noise footprint, which models the reapplication of climb thrust, resulting in a contour that demonstrates potential impact of holding departing aircraft at lower altitudes. The altitude restrictions have been added to the cumulative single event runs presented in Section 9.5.1.

This conservative approach allowed the production of single event L_{Amax} contours, for typical aircraft types, that can be compared to the contours produced based on the standard climb profile. The comparison of these contours highlights the potential effects of holding lower altitudes over the GBMA.

The sensitivity profiles show that the inclusion of a hold down procedure can elongate the noise footprint of a specific operation and has the potential to generate standalone noise impact (a noise island) further along the flown track often directly under the point where altitude restriction are eased and the aircraft is again allowed to climb with increased engine power (more noise can be expected as additional engine power (thrust) is applied). These new contours show an extension in the L_{Amax} noise contours beyond the contours generated under a continuous climb. As an example of the impact the 60 dB(A) contour for the Boeing B777-300ER extends approximately 5 nm (9 km) further towards Wisemans Creek.

The resulting extension of the cumulative L_{Amax} 60 dB(A) are illustrated in Figure 9.35 and Figure 9.36.

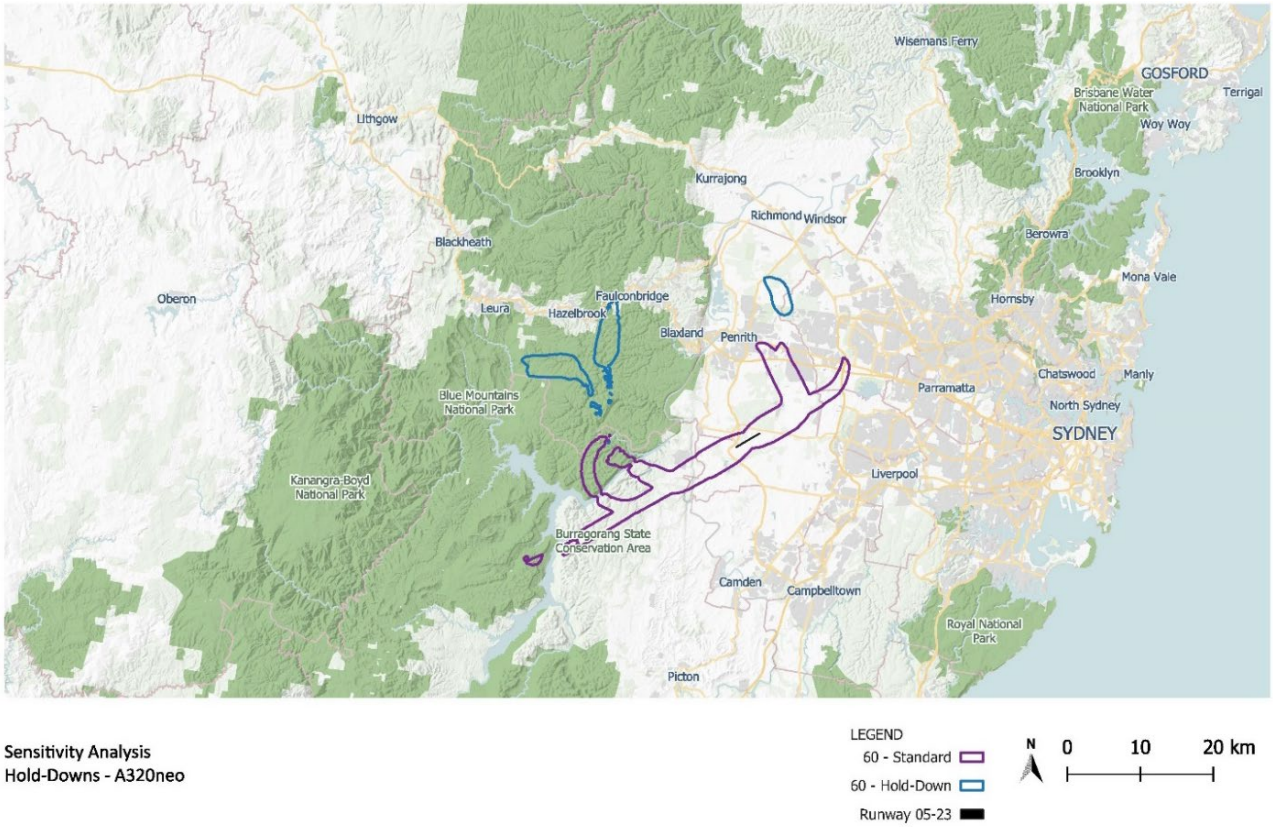

Figure 9.35 Sensitivity analysis – Hold Down – comparison of L_{Amax} contours (A320neo)

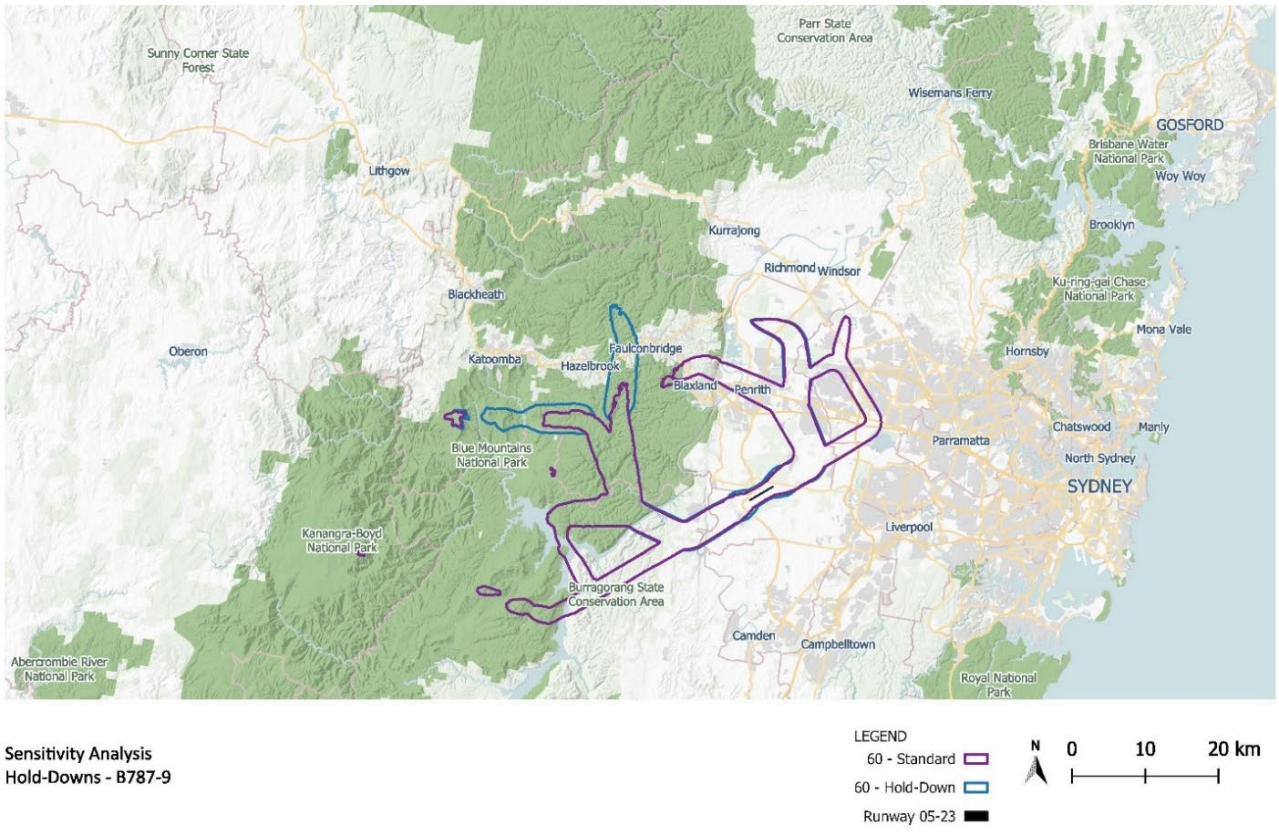

Figure 9.36 Sensitivity analysis – Hold Down – comparison of L_{Amax} contours (B787-9)

Based on this conservative high level sensitivity analysis the communities impacted by hold downs are the same communities that are already impacted by continuous climb operations. This is because the contours do not represent the start or end of noise annoyance. They represent a noise metric threshold. Since the hold-downs involve a variation of altitude/thrust along the same flight path, the same communities will be impacted.

This assessment has been performed to show the potential impacts but has not modelled every altitude restriction or every aircraft. This analysis also assumed an aggressive altitude restriction built into departure procedures, in the form of custom AEDT profiles, which may be more conservative than airlines chose to operate.

9.8.6 Summary of sensitivity analysis

A review of various sensitivities has highlighted the material impact of various variables of the modelling. The single-most important variable is the flight schedule which includes the number of movements, the aircraft type, the time of day and the origin-destination. While the schedules provide realistic projections based on the facilities available, noise impacts would vary primarily based on changes to the quantity and type of wide-body aircraft movements.

Fleet change among narrow-body aircraft have been found to have no material impact on the outcome of the assessment. However, the calibration of aircraft noise levels in the AEDT model, based on monitoring at Brisbane, Perth and Melbourne airports have been found to be material in providing a more conservative assessment of the likely impacts of aircraft noise.

Furthermore, variables such as weather, temperature and wind direction have been found to have minimal material impacts on cumulative noise exposure compared to other variables. However, some single events for specific aircraft may be perceptible when the use of SIDs procedures for hot days are required.

Finally, the use of operational procedures such as hold-downs could be perceptible for specific aircraft types (single events) but would not have a material impact on cumulative noise exposure.

9.9 Noise induced vibration

At high noise levels, the low frequency components of aircraft noise can result in vibration of loose elements in buildings, notably windows.

Even at the highest expected noise levels, the levels of vibration due to low frequency noise would be well below those which may cause structural damage to buildings. With typical light building structures, noise induced vibration may begin to occur where the maximum external noise level reaches approximately 90 dB(A). The effect is more common on departure than for arrival because the noise spectrum for a departure close to the Airport Site has stronger low frequency noise components.

Figure 9.37 below depicts the 90 dB(A) L_{Amax} footprint for WSI confirming that it is largely contained within the Airport Site.

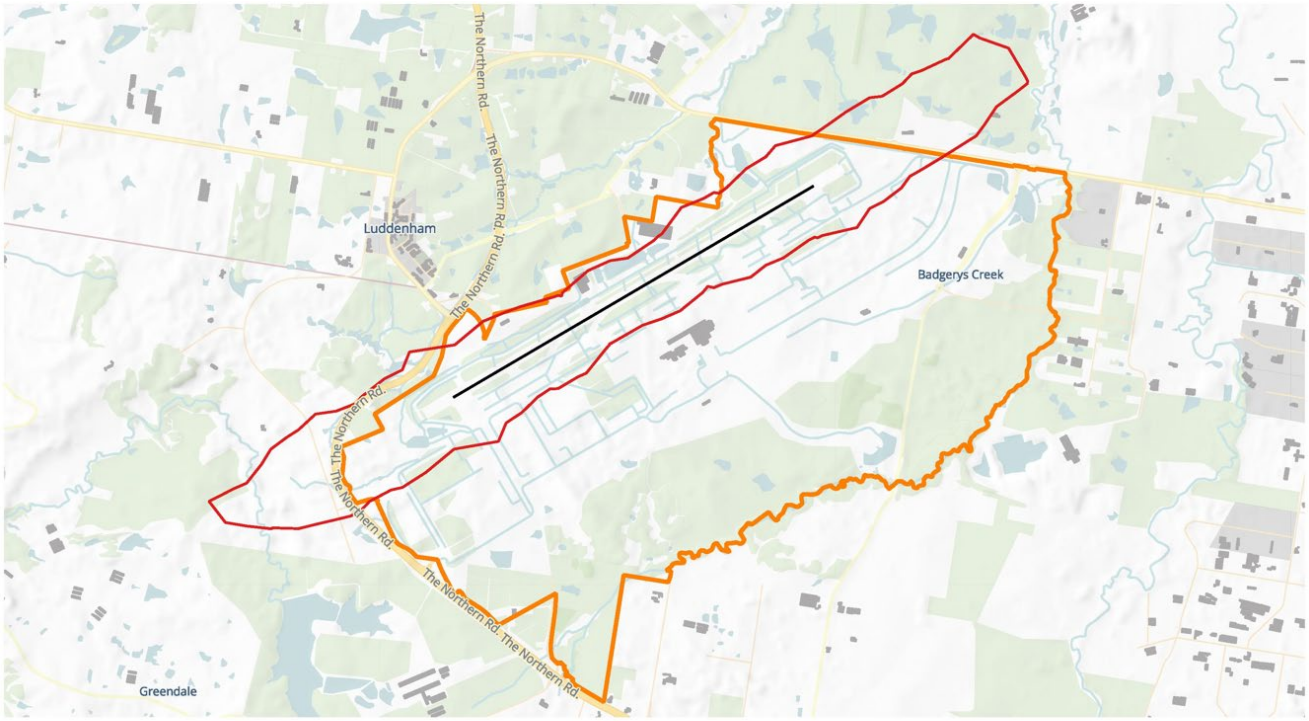

Figure 9.37 Noise induced vibration

9.10 Matters of National Environmental Significance (MNES) and other heritage considerations

A 45 nm (approximately 83 km) MNES search radius centred on WSI was used to capture the Sydney Basin airports (Sydney (Kingsford Smith), Bankstown, Camden and RAAF Base Richmond) where WSI's new flight paths and operating procedures require adjustments to existing flight paths at these airports. This 45 nm (83 km) radius was chosen on the basis that it would be unlikely any potential significant noise and vibration impacts from aircraft overflights would be beyond this distance.

It should be noted that a large proportion of this search area is already currently overflown by the other Sydney Basin airports. These airports include operations from the existing Sydney (Kingsford Smith) Airport as seen earlier in Figure 4.1 which shows a one-week sample of flight path movement activity from March 2019 over the Sydney Basin.

The heritage and RAMSAR Wetlands MNES items for each of the proposed changes to existing flight paths at Sydney Basin airports are shown in Table 9.7, alongside a discrete set of Commonwealth Heritage items that are located within 45 nm (83 km) of WSI. These more discrete set were identified as being sites that would be directly overflown.

These areas and other MNES items are assessed in more detail within Technical paper 9 and Technical paper 14 of the EIS. Matters relating to biodiversity MNES, including threatened species and ecological communities that not listed in this technical paper, are addressed in Technical paper 8.

Table 9.7 WSI proposed flight paths near heritage and RAMSAR Wetlands items of MNES

Place Name	Listing	Approx distance to flight path (km)	Approx Altitude (MSL) ((ft)	Approx Noise Level L_{Amax} (dBA)	Daily Frequency (PAL 3 - 2055)
Greater Blue Mountains Area	World Heritage	Directly overflown	2,000 - 10,000	50 - 65	< 10 mvt@N60
Australian Convict Sites (Cockatoo Island Convict Site)	World Heritage	> 10	>10,000	Below 42	–
Australian Convict Sites (Old Government House and Domain)	World Heritage	Directly overflown	>10,000	Below 50	< 10 mvt@N60
Australian Convict Sites (Old Great North Road)	World Heritage	> 10	>10,000	Below 42	–
Parramatta Female Factory and Institutions Precinct	National heritage	Directly overflown	>10,000	Below 50	< 10 mvt@N60
Ku-ring-gai Chase National Park, Lion, Long and Spectacle Island Nature Reserves	National heritage	Directly overflown	>10,000	Below 42	< 10 mvt@N60
Royal National Park and Garawarra State Conservation Area	National heritage	Directly overflown	>10,000	50 - 60	< 10 mvt@N60
Towra Point Nature Reserve	Wetlands of International Importance	> 5	>10,000	Below 42	–
Malabar Headland Franklin St	Commonwealth Heritage	Directly overflown	>10,000	Below 50	< 10 mvt@N60

Place Name	Listing	Approx distance to flight path (km)	Approx Altitude (MSL) ((ft)	Approx Noise Level L_{Amax} (dBA)	Daily Frequency (PAL 3 - 2055)
Orchard Hills Cumberland Plain Woodland The Northern Rd	Commonwealth Heritage	Directly overflown	3,500 - 5,000	70 - 80	> 100 mvt@N60, 5-10 mvt@N70
Lancer Barracks Smith St	Commonwealth Heritage	Directly overflown	>10,000	Below 50	< 10 mvt@N60
Lancer Barracks Precinct Smith St	Commonwealth Heritage	Directly overflown	>10,000	Below 50	< 10 mvt@N60
North Base Trig Station Dight St	Commonwealth Heritage	Directly overflown	>5,000	50 - 55	< 10 mvt@N60
RAAF Base Richmond McNamara Av	Commonwealth Heritage	Directly overflown	>5,000	50 - 55	< 10 mvt@N60
Shale Woodland Llandilo Stony Creek Rd	Commonwealth Heritage	Directly overflown	7,500 - 8,500	65 - 70	20 to 50 mvt@N60

9.10.1 Greater Blue Mountains Area considerations

A specific Matter of National Environmental Significance is the GBMA. A summary of the potential noise impacts associated with the proposal are briefly described in this section.

9.10.1.1 Ambient noise environments

There are a variety of acoustic environments within the GBMA and surrounding environments. Ambient noise environments range from urban areas (adjacent to the GBMA such as the various townships dotted along the Great Western Highway) to rural areas such as those along the Bells Line of Road and Putty Road areas and wilderness areas that are largely removed from human-induced noise to the natural environments within the defined boundaries of the GBMA.

9.10.1.2 Sensitive receivers

A number of different noise sensitive areas existing within and surrounding the GBMA. Noise sensitive areas are defined as specific sensitive receivers or geographic points that were selected to report on the maximum sound level and are representative of either a residential area, or a non-residential land use that is sensitive to noise – for example, a recreational area, hospital, school, library, church etc. Recreational areas range from sports areas used for active pursuits such as horse riding, bowling or golf to nature reserves which may be used for more passive activities such as camping or bushwalking.

Most of these receivers would generally be located outside of the formal boundary of the GBMA, however many of these receivers would located near or associated with the GBMA and are assessed earlier in this section.

Additional sites specific to the GBMA were assessed using metrics specific to the unique features of the area.

9.10.1.3 Noise modelling and assessment

There are a wide range of noise metrics that have been used to describe aircraft noise impacts. A few are included in national regulatory standards for land use planning such as Australian Standard *AS 2021:2015 Acoustics – Aircraft noise intrusion – building siting and construction* (AS 2021), while others have evolved to become national or international accepted best practice in similar airspace and flight path environmental assessments and community information initiatives.

Overall, no specific aircraft noise criteria for conservation and wilderness areas has currently been developed.

In Australia, assessments of new airport developments use the 70 dB(A) L_{Amax} and 60 dB(A) L_{Amax} noise exposure levels as impact thresholds for day and night time operations respectively. The overflight noise assessment for the project shows that a majority of the broader GBMA is largely outside the area predicted to experience aircraft noise at or above these threshold values (with the exception of some sections of the Blue Mountains National Park and between Lake Burragorang and the Great Western Highway, which at times may experience slightly higher noise levels – as discussed in the sections below).

In order to recognise the natural amenity and wilderness values of the GBMA, the assessment has considered the topography of the area and as such, the height of aircraft above ground level as they overpass the GBMA. This captured the variance in noise across peaks and valleys within the GBMA.

Furthermore, previous studies have highlighted the need for a tailored approach to quantitative noise assessment in the context of the GBMA. This will include the following metrics:

- maximum sound pressure levels of individual aircraft overflights
- number of audible aircraft overflights.

While the maximum sound pressure was assessed using the L_{Amax} noise metric, the number of audible aircraft overflights was assessed using the N60 metrics. Although modelling has limitations in terms of its validated range of assessment for lower noise thresholds, a review of sites of interest within this area exposed to a sound level below 60 dB(A) were identified to consider the lower ambient noise levels typically experienced in the GBMA.

9.10.1.4 Noise levels over 24-hours (L_{Amax})

Composite scenario (i.e., no preference, prefer Runway 05 and prefer Runway 23 operating scenarios) L_{Amax} cumulative noise contours are shown on Figure 9.38 and Figure 9.39 for assessment years 2033 and 2055 respectively. These contours present the maximum noise level for any single aircraft movement over a 24-hour period for L_{Amax} noise levels exceeding 60 dB(A).

The composite scenario is presented to provide a worst-case scenario based on using full suite of possible RMOs (including RRO) rather than the consistent use of a single operating strategy or runway allocation scenario.

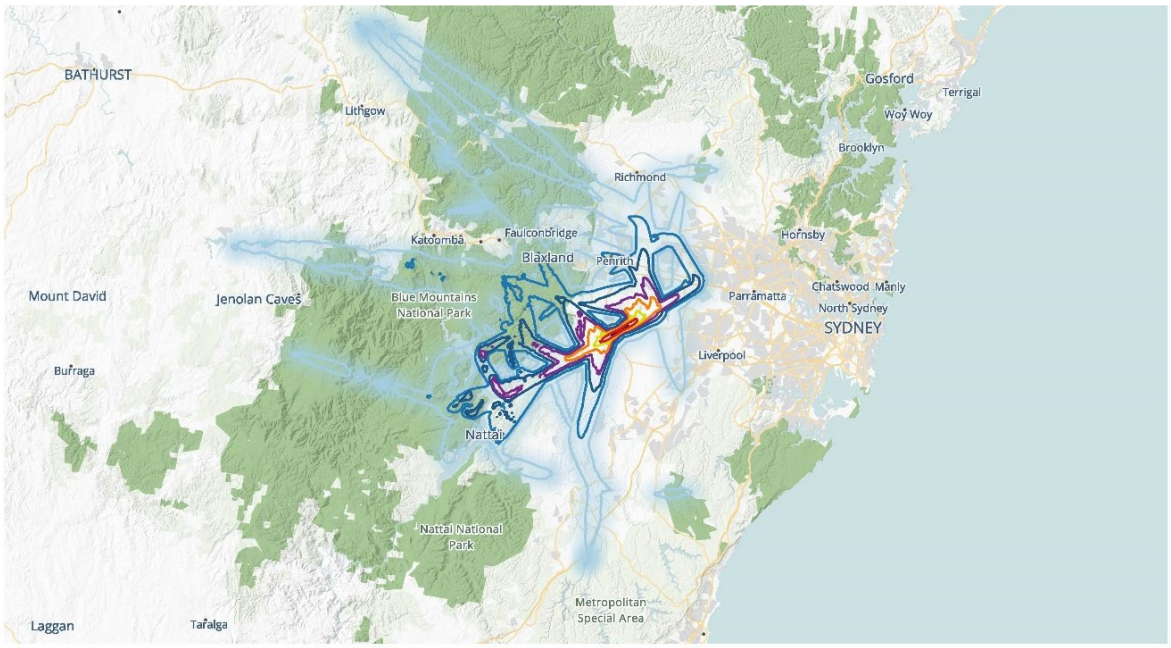

Figure 9.38 L_{Amax} 24-hour contours (cumulative) – 2033

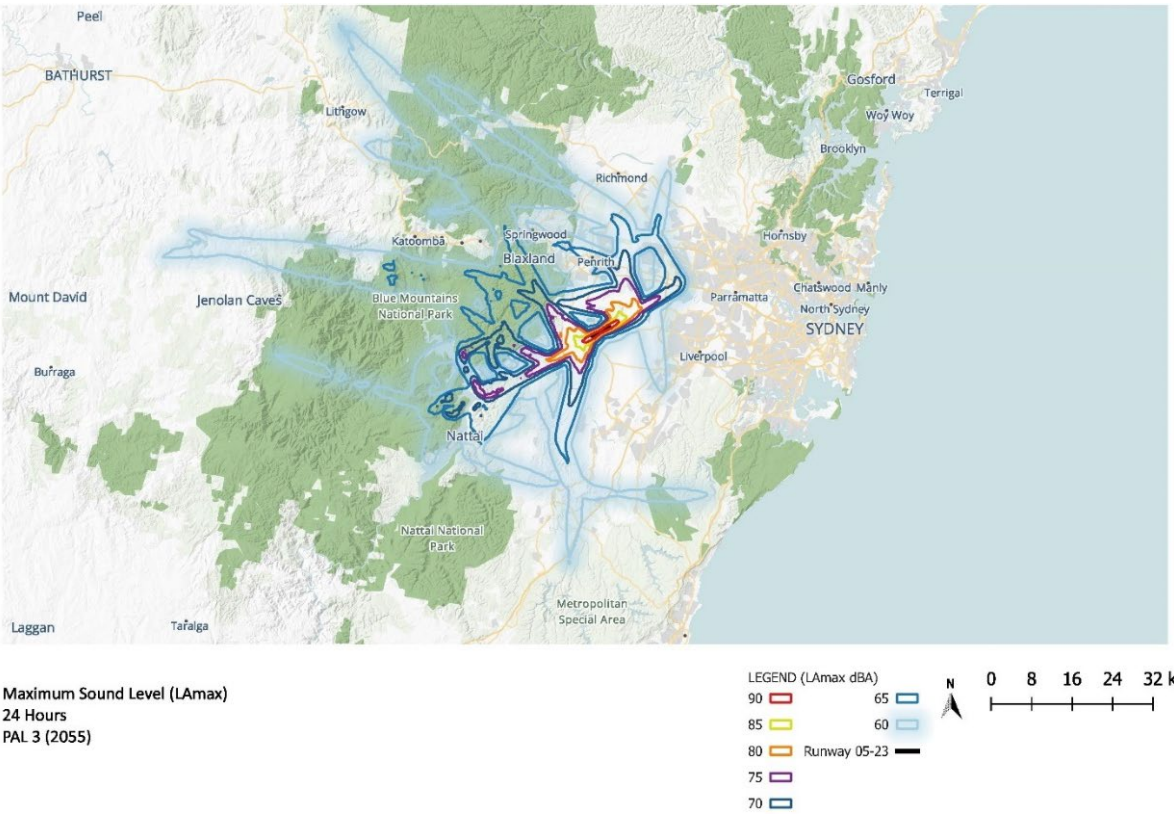

Figure 9.39 L_{Amax} 24-hour contours (cumulative) – 2055

The PAL1 (2033) and PAL3 (2055) layouts are almost identical as the fleet mix was conservatively assumed to remain consistent with changes driven by new services on specific flight paths. A review of specific sites of interest within the GMBA provided the following maximum sound levels for day, evening and night periods.

Both layouts show extension of noise levels of 60 dB(A) and greater extending into some areas above the GBMA, typically in the region between the Great Western Highway and Lake Burragorang (Warragamba Dam). Within the GBMA, the affected areas would include sites such as the Cleary Memorial lookout, the Nepean lookout and Mt Banks picnic area and lookout. At night, sites such as the Oaks picnic area, the Nepean lookout, the Burragorang Lookout and the Ruined Castle lookout are impacted by the RRO mode of operation.

Table 9.8 Estimated maximum sound levels at key sensitive areas within the GBMA

Location	L_{Amax} dB(A) Day Range	L_{Amax} dB(A) Night Range
Ruined Castle lookout	62-64	57-58
Mt Banks picnic area and lookout	51-62	60-62
Sublime lookout	53-55	49-50
Wentworth Falls	47-50	48-49
Echo Point	42-43	50-51
Cleary Memorial lookout, Kedumba Pass	62-63	62-63
Walls Lookout	47-58	59-62
Wynnes Rock Lookout	59-61	60-62
Baltzer Lookout, Hanging Rock	42-52	59-61
Burragorang lookout, Warragamba Dam	48-65	47-53
Burragorang Lookout, The Bluff	66-67	60-62
Portal lookout	49-51	49-52
Nepean lookout	64-70	56-62
The Rock lookout	64-65	53-58
Victoria Falls	41-50	59-61
Victoria Creek cascades	42-51	58-60
Wentworth Lookout	47-50	48-49
Katoomba falls	53-55	49-51
Euroka campground	56-57	50-55
Acacia Flat campground	42-53	54-56
Burralow Creek campground	57-57	45-47
Dunphys campground	57-58	61-63
Katoomba River crossing campground	61-61	60-61
Murphys Glen campground	60-62	62-62
Ingar campground	55-61	60-60

Location	L_{Amax} dB(A) Day Range	L_{Amax} dB(A) Night Range
Perrys Lookdown campground	43-54	58-60
Burra Korain campground	44-54	58-60
Jenolan Caves	47-49	49-51
Kanangra Walls Lookout	41-47	41-47
The Oaks Picnic area	62-69	49-52

While the range of noise levels provided highlight the contribution of narrow-body and wide-body jet movements, the frequency of the typically quieter narrowbody jet aircraft is higher at each representative assessment year, as outlined in Figure 9.40 below.

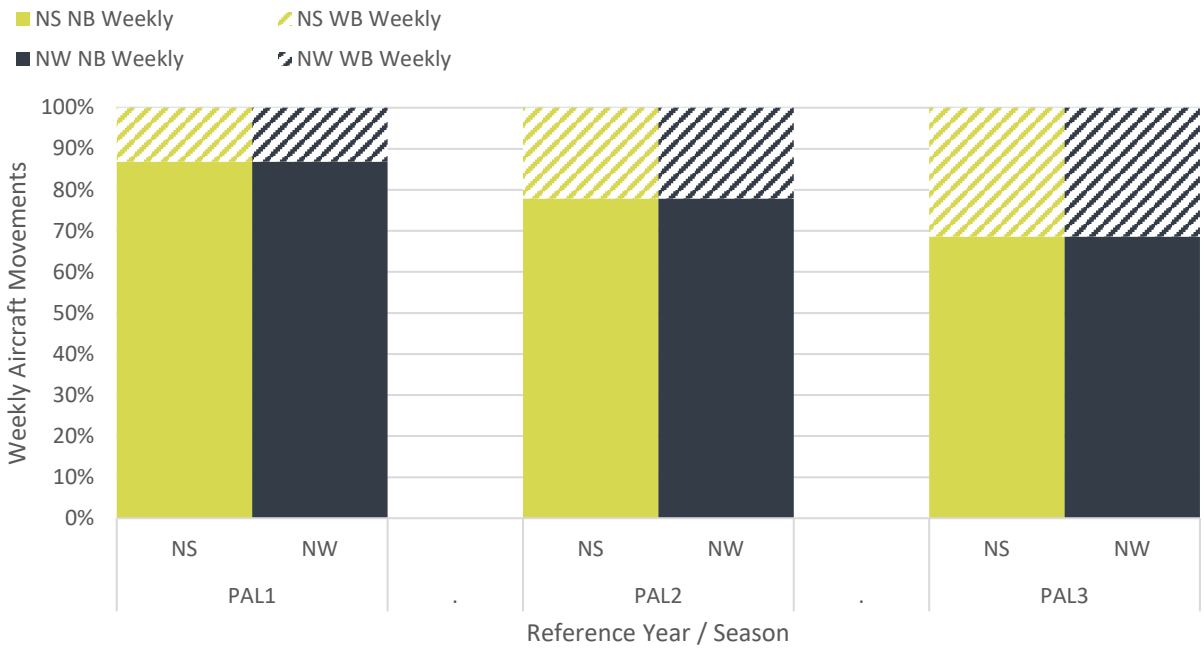

Figure 9.40 Narrowbody vs Widebody Aircraft Movements by Representative Design Year

When taking into account the frequency of these movements, Nepean lookout is the most overflown area during the day and night because of its location near the eastern boundary of the Blue Mountains National Park. Other sites of interest are presented in Table 9.9.

Table 9.9 Estimated frequency at key sensitive areas within the GBMA

Location	N60 (24-Hours)			N60 (Night)		
	S1	S3	S4	S1	S3	S4
Ruined Castle lookout	<10 mvts	<10 mvts	<10 mvts	2-4 mvts	2-4 mvts	2-4 mvts
Mt Banks picnic area and lookout	<10 mvts	<10 mvts	<10 mvts	0 mvt	2-4 mvts	2-4 mvts
Sublime lookout	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Wentworth Falls	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Echo Point	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Cleary Memorial lookout, Kedumba Pass	<10 mvts	<10 mvts	10-19 mvts	<2 mvts	2-4 mvts	2-4 mvts
Walls Lookout	<10 mvts	<10 mvts	<10 mvts	0 mvt	0 mvt	0 mvt
Wynnes Rock Lookout	<10 mvts	<10 mvts	<10 mvts	<2 mvts	<2 mvts	<2 mvts
Baltzer Lookout, Hanging Rock	<10 mvts	<10 mvts	<10 mvts	0 mvt	0 mvt	0 mvt
Burragorang lookout, Warragamba Dam	0 mvt	<10 mvts	<10 mvts	0 mvt	<2 mvts	<2 mvts
Burragorang Lookout, The Bluff	<10 mvts	<10 mvts	<10 mvts	<2 mvts	<2 mvts	<2 mvts
Portal lookout	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Nepean lookout	10-19 mvts	20-49 mvts	20-49 mvts	5-9 mvts	10-19 mvts	10-19 mvts
The Rock lookout	<10 mvts	<10 mvts	<10 mvts	5-9 mvts	<2 mvts	<2 mvts
Victoria Falls	<10 mvts	<10 mvts	<10 mvts	0 mvt	0 mvt	0 mvt
Victoria Creek cascades	<10 mvts	<10 mvts	<10 mvts	0 mvt	0 mvt	0 mvt
Wentworth Lookout	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Katoomba falls	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Euroka campground	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Acacia Flat campground	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Burralow Creek campground	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Dunphys campground	<10 mvts	<10 mvts	<10 mvts	0 mvt	0 mvt	0 mvt
Katoomba River crossing campground	<10 mvts	<10 mvts	<10 mvts	<2 mvts	<2 mvts	<2 mvts
Murphys Glen campground	10-19 mvts	10-19 mvts	<10 mvts	<2 mvts	<2 mvts	<2 mvts
Ingar campground	<10 mvts	<10 mvts	<10 mvts	0 mvt	<2 mvts	<2 mvts
Perrys Lookdown campground	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Burra Korain campground	<10 mvts	<10 mvts	<10 mvts	0 mvt	0 mvt	0 mvt
Jenolan Caves	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
Kanangra Walls Lookout	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt	0 mvt
The Oaks Picnic area	<10 mvts	<10 mvts	<10 mvts	<2 mvts	<2 mvts	<2 mvts

As shown in Table 9.9, 12 of the 30 areas identified for this assessment do not experience noise levels at or above 60 dB(A) L_{Amax}, during the day, and 18 of those areas at night. Three other areas are impacted specifically by RRO operations at night (S3 and S4).

No areas of the GBMA would experience noise levels above the general assessment level of 60 dB(A) L_{Amax} on a regular basis during operation of the project for any aircraft type considered.

The highest predicted noise levels are typically associated with wide-body aircraft such as the Boeing 777-300ER, Boeing 747-8 and Airbus A330 aircraft. However, the more common and likely noise levels are represented by Airbus A320neo and Boeing 737max aircraft.

Figure 9.41 and Figure 9.42 show the indicative noise contours for a single event departure and arrival (for both 05 and 23 directions) for the Boeing 777-300ER and Airbus A320neo respectively on all indicative arrival and departure flight paths during the day time period.

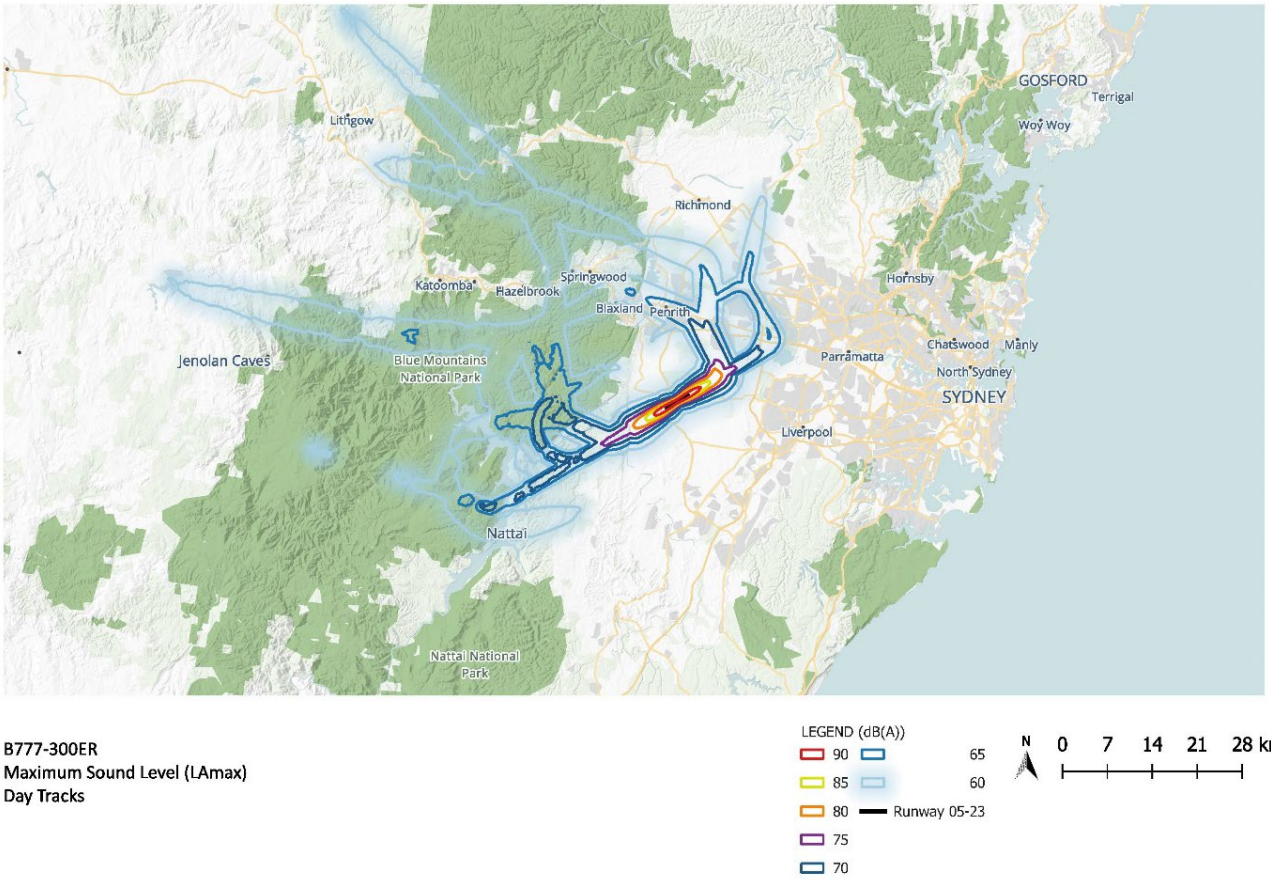

Figure 9.41 L_{Amax} Day flight paths for a Boeing B777-300ER

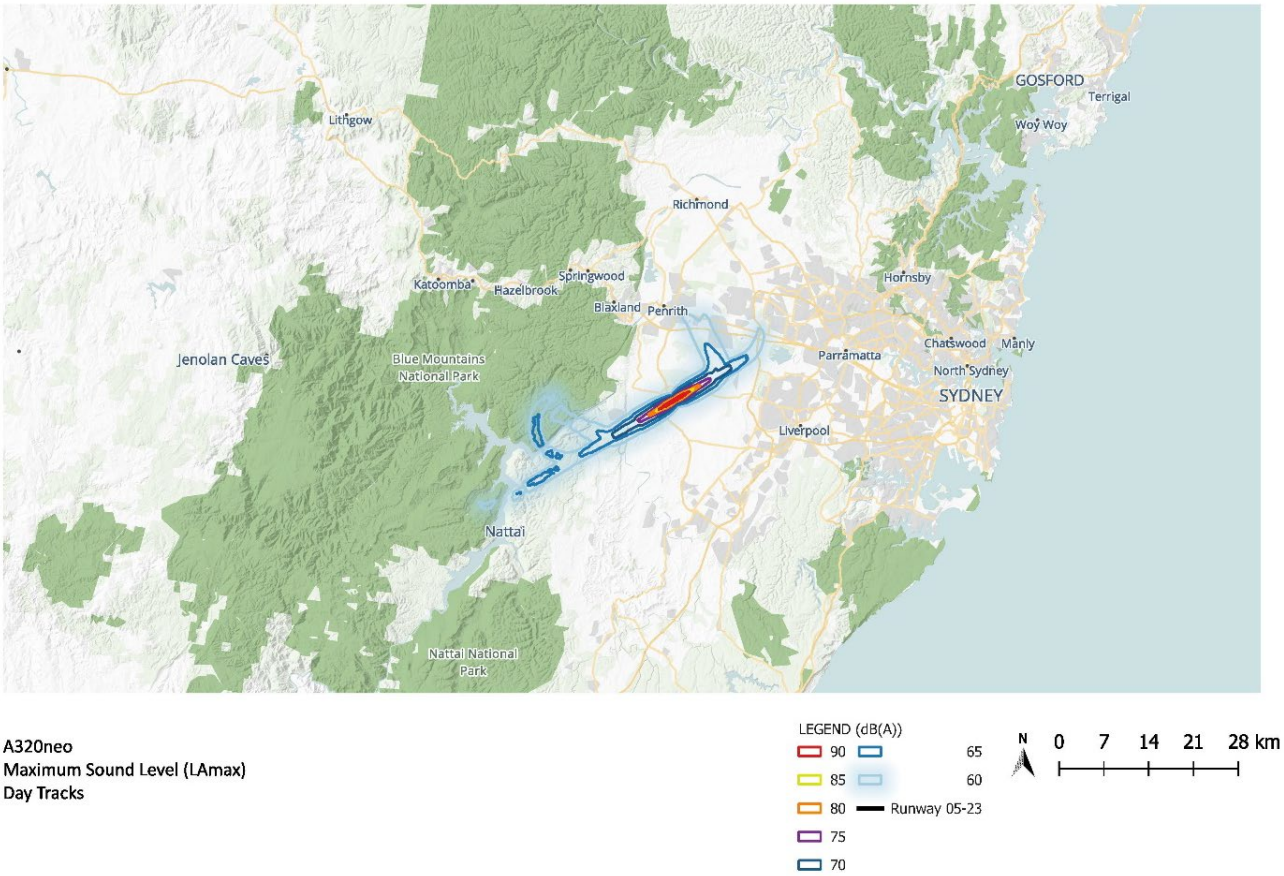

Figure 9.42 L_{Amax} Day flgith paths for an Airbus A320neo

While the Boeing B777-300ER would be a critical aircraft in terms of noise exposure, it is important to note that only 2 daily movements of this aircraft type were modelled up 2040 (PAL 2), growing to 16 daily movements by 2055 (PAL 3). The Airbus A320neo, which shows limited exposure to events above 60 dB(A) in the GBMA, would operate over 30 daily movements by 2040 (PAL 2), growing to over 125 projected daily movements by 2055 (PAL 3). Generally, across the GBMA, areas exposed to noise levels above 60 dB(A) from Airbus A320 operations would be limited.

The estimated maximum sound levels (across 24-hours) at different sites of interest in the GBMA were overlaid on the L_{Amax} cumulative 2055 (PAL 3) contours, including an estimate of the exposure to noise levels as low as 50 dB(A).

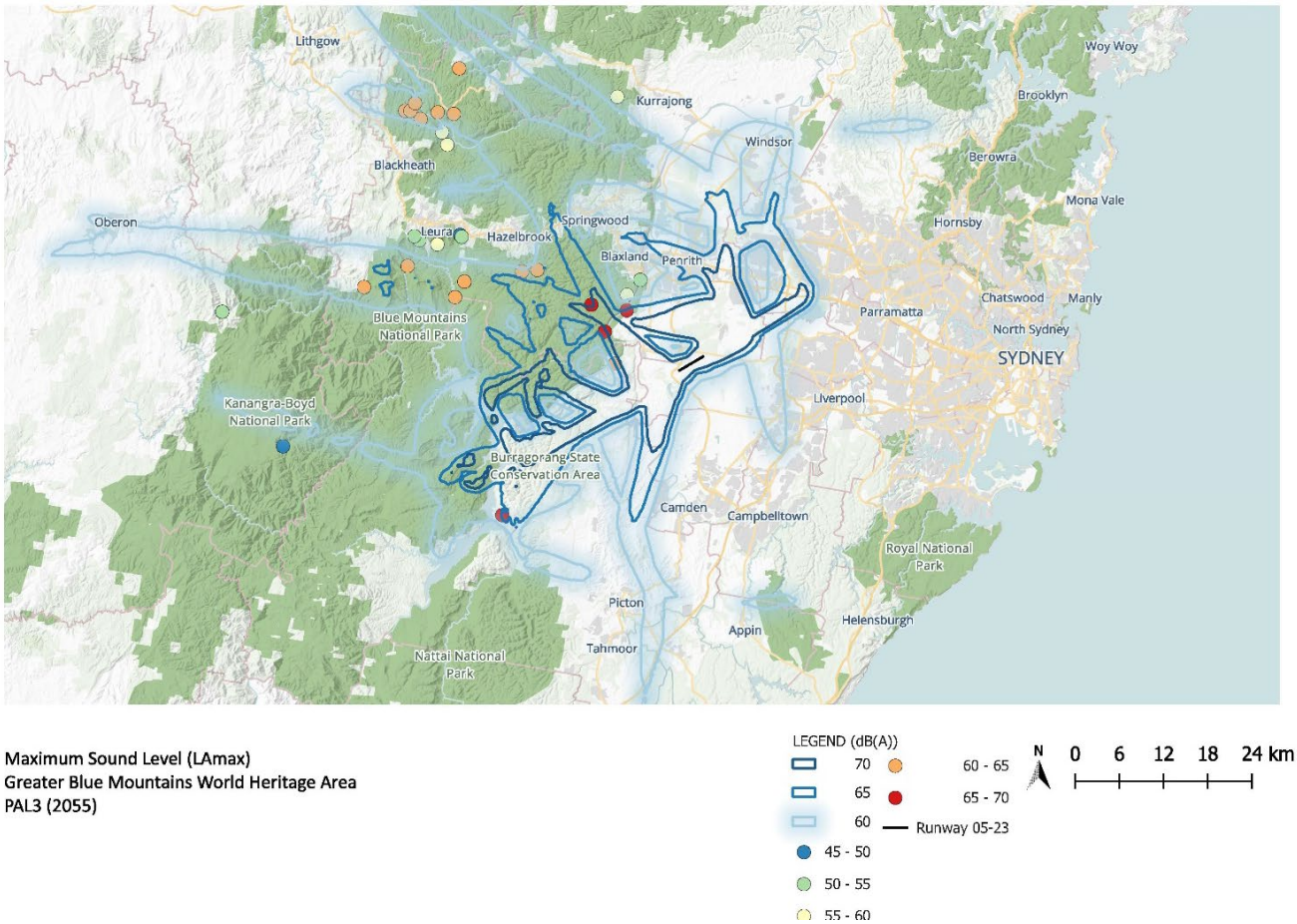

Figure 9.43 Estimated maximum sound level at key sensitive areas within the GBMA

Noise levels over 70 dB(A) L_{Amax} may be experienced occasionally by users of walking trails and camp sites within the areas of the Blue Mountains National Park near the Nepean River, and Warragamba dam. However, maximum sound exposure levels will more typically range from below 50 dB(A) to 60 dB(A) based on the aircraft type, with some noisier wide-body jets reaching closer to 65 dB(A) near the flight paths.

Chapter 10 Aircraft noise management and mitigation opportunities

Aircraft noise is an unavoidable consequence of an operating major airport conducting its core function in providing the community it serves with connectivity for commerce and leisure. Effective noise mitigation often requires several small, incremental improvements that, when combined, could result in a substantial and noticeable reduction in aircraft noise impacts. However, it is important to maintain a careful balance because the need to ensure the safe and efficient operation of WSI may limit the availability of noise-mitigation options and may also result in an undesirable increase in fuel burn and subsequent emissions.

The 3 fundamental options to mitigate aircraft noise exposure outlined in Section 6.1 are:

1. Reduce noise emissions from the aircraft itself – airframe and engine.
2. Develop land-use planning or other controls to ensure future noise-sensitive uses are not located in noise affected areas.
3. Plan flight paths, air traffic control procedures and noise abatement procedures and airport operating strategies that achieve lower impact over noise sensitive areas without impacting safety and significantly reducing airport capacity.

This section focuses on the third option as that most relevant to an environmental assessment of airspace and flight paths.

In addition to the planned mitigation options, the provision of transparent, complete and understandable information to existing and potential new residents in areas likely to be affected by noise is vital. For existing residents, this information will allow them to understand the anticipated aircraft noise (including the number, frequency, loudness, and timing of events and periods of respite). For potential new residents, comprehensive and accurate information enables their informed consideration of a move into the area. The results of the noise assessment are constructed to support this process.

This section provides an initial description of the types of aircraft noise management and mitigation measures that could be implemented at WSI. Further consideration will be given to these measures at the appropriate stages indicated.

10.1 Noise management mechanisms

10.1.1 Operational framework

The WSI operational framework would consist of a range of mechanisms to manage aircraft noise, including planning, policy and consultative measures. Planning protections are described in Technical paper 6 and consultative measures are described in Section 10.1.3 to 10.1.6.

Under Condition 16(7) of the Western Sydney Airport Plan, DITRDCA has developed a Noise Insulation and Property Acquisition Policy (NIPA) in relation to aircraft overflight noise for buildings outside the Airport Site and having regard to the 24-hour, 7 days a week operation. Further information is available in Chapter 11 (Aircraft noise) of the EIS.

10.1.2 Noise and flight path monitoring

Airservices Australia's NFPMS currently collects noise and flight path data at Brisbane, Cairns, Canberra, Gold Coast, Sydney, Melbourne, Essendon, Adelaide and Perth airports. This system operates on a 24/7 basis, collecting data from every aircraft operating to and from each of these airports. The system uses radar data correlated with acoustic readings from aircraft overflight noise events with the aircraft and flight path details. As described earlier in this technical paper, baseline ambient noise measurements have been undertaken in locations proximity to WSI and locations that will be exposed to aircraft overflight. As a major new airport, it is expected that a system of permanent NMTs will be installed at suitable locations around WSI and incorporated into the Airservices Australia's NFPMS network and reporting systems. The NMTs are incorporated into the Airservices Australia's "WebTrak" system which is publicly accessible in a close to

real-time web portal, and presents informative detail (altitude, aircraft type, origin or destination, airline, etc.) on all aircraft operations at the Australian major airports mentioned above, including the ambient and actual aircraft noise readings from aircraft operations near the permanent noise monitors. Noise monitoring reports are also available from the Airservices website.

Airservices Australia's NFPMS uses permanent noise monitors located within local communities and is the world's largest, most geographically spread system of its type.

Airservices Australia also undertakes short-term noise monitoring in locations that do not require long-term monitoring or where a long-term monitor cannot be installed. Short-term noise monitors can be deployed for a limited period, typically 3 months to validate issues and test procedural and airspace management option trials.

Long-term aircraft noise monitoring data is used by a variety of organisations for different purposes, including the DITRDCA, the airports and airport consultative committees to:

1. Provide accurate information on aircraft flight paths and noise to the community, external stakeholders (including the DITRDCA and the Aircraft Noise Ombudsman (ANO)), and for internal use by Airservices Australia.
2. To reduce uncertainty around aviation noise impacts on the community, while ensuring the provision of safe and efficient air navigation services.
3. To provide data to determine potential environmental (noise) impacts from existing and proposed new flight paths and noise abatement trials, including post-implementation reviews.
4. To provide data to validate aircraft noise modelling results produced using specialist software for a range of purposes (including environmental impact assessment of proposed flight path changes).
5. To provide a framework to identify the acoustic impacts of current and historic aviation activity, and to guide decisions on proposed future changes to aircraft operations.

The aircraft noise certification process is briefly discussed in Section 6.1.1 and 10.3. In accordance with the Air Navigation (Aircraft Noise) Regulations 1028, most aircraft operating in Australia must meet international ICAO standards and can then be issued a Noise Certificate by Airservices Australia. This limits noise at the source (aircraft).

In Australia there are no specific regulations which specify aircraft noise exposure levels or limits at a specific location. As described above, noise monitoring in the vicinity of an airport using the Airservices Australia's NFPMS is used for reporting rather than compliance. Information is provided to the community about actual or future anticipated noise levels including metrics to guide land use planning. It is also useful in calibration for modelling such as that described in this study.

Short-term noise monitors can be installed for a range of reasons including to address a specific community concern, at the request of a Minister, as part of an Australian Government approval condition, or to support a study, report or review undertaken by Airservices Australia.

The results of short-term noise monitoring can be used to:

- detail noise impacts on communities
- validate noise modelling
- measure the impact of changes in procedures (e.g., a flight path modification or a noise abatement initiative)
- provide evidence to inform decisions on long term monitoring locations.

As an aircraft flies over a monitor, the noise level rises above the background noise level, peaks (usually within 10 seconds) and then slowly returns to the background level. This is a noise event, and it lasts for around 20–40 seconds but varies depending on the height, type and loudness of the aircraft.

A noise monitor captures each individual noise event. An event begins when the noise level exceeds a certain threshold value set in the noise monitor (which will be above the background noise level) and ends when the noise level drops below it. The peak level and the noise level for each second of the event is stored. Noise monitors also measure average noise levels and flight path trends. This data is then matched with Airservices Australia's radar data. Data is usually averaged over a period, to reduce extreme results that may arise from unusual weather conditions or other noise sources (e.g., machinery, motorcycles).

10.1.3 Airservices Australia – Noise Complaints and Information Service

Complaints and enquiries about aircraft noise and operations help identify issues of community concern and provide opportunities for improvement.

The Airservices Australia's Noise Complaints and Information Service (NCIS) handles complaints and enquiries about noise from most civilian aircraft – including private and commercial aeroplanes, helicopters and aircraft operations – but not drones. The NCIS is the Australian aviation industry's main interface on civil aircraft noise and related issues for the community.

10.1.4 Aircraft Noise Ombudsman (ANO)

The ANO is an independent administrative office that conducts reviews of Airservices Australia and Defence's management of aircraft noise-related activities, including:

- reviewing the handling of complaints or enquiries made to Airservices Australia or Defence about aircraft noise
- monitors and reports on the effectiveness of community consultation processes related to aircraft noise undertaken by Airservices Australia and Defence
- monitors and reports on the effectiveness of the presentation and distribution of aircraft noise-related information
- provides targeted reviews of specific aspects of aircraft noise management as requested by Airservices Australia and Defence
- the ANO may make recommendations to the Airservices Australia's Board or the Chief of Air Force for improvements relating to these matters
- if an individual has a complaint about aircraft noise, they should first make their complaint directly to Airservices Australia's NCIS or with Defence and if they are not satisfied with the way their complaint was handled, they can make a complaint to the ANO by filling out the **online complaint form**. (Alternatively, they can make a complaint by phone, email or mail.)

10.1.5 Community Aviation Consultation Groups (CACGs)

Community Aviation Consultation Groups (CACGs) are a mechanism to ensure appropriate community engagement on airport planning and operations. A CACG should be chaired by a person who is independent of the airport's management and able to manage the deliberations of the CACG in an impartial manner. To meet their obligations under the Airports Act, the Australian Government has provided guidelines[18] for federally leased airports to operate (CACGs).

The size and membership of the CACG will depend upon local circumstances but should be both manageable and sufficient to achieve its objectives. Membership of the CACG should include persons who can contribute views representative of:

- aviation services and operators at WSI
- community organisations, resident groups or individuals, ensuring the representation of residents affected by airport development and operations
- representatives from state, territory or local government bodies
- local tourism bodies and business groups.

As a privatised major airport, it is expected that WSI will evolve the current Forum on Western Sydney Airport (FoWSA) into a contemporary WSI CACG. CACGs in operation at other major Australian airports have had a high level of political, agency, airline and community support, and have proven to have been a key resource to hear community feedback on aircraft operations, and report on aircraft noise issues and consider submissions and options from all stakeholders for improvements.

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[18] https://www.infrastructure.gov.au/sites/default/files/migrated/aviation/airport/planning/files/CACG_Guidelines_2016.pdf

Major capital city airports are also required to establish Planning Coordination Forums (PCFs). The purpose of PCFs is to support a strategic dialogue between the airport operator and the Australian, State/Territory (in the case of WSI being NSW) and local government agencies responsible for development control, land use planning and infrastructure investment. Effective collaboration in PCFs helps to identify workable solutions to manage aircraft noise and better integrate those solutions into land use planning to benefit the surrounding community.

Many of the major airports have established a specific committee/forum to consider operational improvement opportunities. With representation from Airservices Australia, airlines and the DITRDCA, these groups are positioned to identify and test solutions or measure and report on trials that may be the result of international initiatives or submissions through the CACG or made directly to any of the participating entities.

10.1.6 Communication and coordination

Community engagement and communication are an essential element of noise mitigation. ICAO considers them as an adjunct to its 4-pillar framework for a balanced approach to noise management (refer to Section 6.1) and "the key link between environmental stewardship and mitigating environmental constraints to aviation operation and growth"[19].

Mitigation requires improved access to clear, understandable and transparent information and processes for both existing and potential residents in areas likely to be affected by aircraft noise. For example, it allows existing residents to be fully informed on the expected aircraft noise impacts and for potential residents to make properly informed decisions before moving into an area likely to overflown by aircraft or exposed to aircraft noise.

Chapter 9 (Community and stakeholder engagement) of the EIS details the community and stakeholder engagement. It gives a summary of the consultation that occurred during the project development and environmental assessment process, and the consultation proposed during public exhibition, detailed design, and delivery.

10.2 Noise abatement procedures

10.2.1 Introduction

Day-to-day aircraft operational procedures directly influence aircraft noise impacts. Low noise operational procedures should be a priority, while ensuring they are safe and cost-effective. The possibilities include noise preferential runways and routes and noise abatement procedures for take-off and landing. The applicability and effectiveness of any of these measures depends on the airport layout and relative positioning and runway alignment to surrounding urban areas. In all instances safety considerations are still given the highest priority. Some measure may only be appropriate in specific off-peak hours or days when lower air traffic demand may exist.

Every major airport has noise abatement procedures. These operational initiatives seek to mitigate noise created by aircraft on departure and arrival when they are flying over residential areas or NSRs and can cover the following topics:

- Preferred arrival and departure routes and/or runway modes of operation subject to certain meteorological conditions applicable to crosswind, tailwind and runway conditions (wet, damp or dry) specified in the Aeronautical Information Package (AIP) Australia, Part 2 – En Route (ENR); this can include directing aircraft to depart over green space or away from more densely populated areas at night.
- Flight track dispersion or concentration, which can also rely on Required Navigation Performance (RNP).
- Approach procedures such as CDO and Low Power/Low Drag (LPLD) techniques, reduced wing flap settings on approach and/or delayed deployment of undercarriage (landing gear), steep approach procedures.
- Departure procedures such as CCO, departure speed controls below certain altitudes, modified flight path angles to adjust climb gradients and specifying NADP 1 or NADP 2 (refer to Figure 10.2 and Figure 10.3) suggested limitations on the use of reverse thrust, especially during noise sensitive periods.

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[19] https://www.icao.int/environmental-protection/Pages/Community-engagement-for-aviation-environmental-management.aspx

Noise abatement procedures will also include a list of exemptions such as medical or emergency or rescue flights or aircraft subject to an in-flight emergency or a technical issue.

The environmental benefits of any noise abatement procedure must be considered against any reduction in operational flexibility or potential negative consequences on safety or efficiency of aircraft and airport operations.

Communities near airports may be sensitive to operations at different times of the day and night. To minimise the noise impacts on these communities, noise abatement procedures may be time specific, including nominating the preferred runway use.

Noise abatement procedures that generate delay and congestion should be examined with care, as this can cause unintended consequential noise and emission impacts. Air traffic control or pilots may not be able to use them in certain situations, for example adverse weather conditions or operational requirements.

Noise abatement procedures are published for an airport in AIP ENR publications and implemented by air traffic control, airports or airport owners. Airservices as Australia's ANSP develops and reviews noise abatement procedures in consultation with stakeholders, including aircraft operators, airlines, the airport operator and CACGs. In the case of WSI – FoWSA which (as discussed above), is expected to transition to a CACG prior to the commencement of operations at WSI. Unlike restrictions such as curfews, it is understood that in Australia noise abatement procedures are promulgated and applied as described above, they are not legally enforceable.

10.2.2 Preferential runways

The PAAM considered several operational modes and developed flight paths to facilitate preferred RMOs. As a single runway airport in its current Stage 1 Development, there are limited options at WSI in terms of preferential runways which were previously described in Chapter 8.

10.2.3 Preferential flight paths

The PAAM provides different arrival and departure flight paths between day (5:30 am to 11 pm) and night (11 pm to 5:30 am) operations. The specific use of these was assessed at a high level to consider the noise mitigation potential in terms of respite – refer to Section 10.4.

As previously noted, the complexity and high volume of air traffic in the Sydney Basin airspace and design criteria to minimise changes to existing Sydney Basin flight operations to the extent practical, there are limited design options for WSI flight paths and runway operational scenarios. Airspace is 3-dimensional with aircraft separation achieved both laterally and vertically. Where tracks cross in the lateral plane, there must be vertical separation where the design ensures that the aircraft performance can meet altitude requirements. If CCO and CDO opportunities are to be created (refer to Section 10.2.1), this introduces further constraints and consequently reduces flexibility in the design process.

Alternate sets WSI "Night" (11 pm to 5:30 am) SIDs and STARs have been proposed which take advantage of reduced activity in the Sydney Basin airspace including the Sydney (Kingsford Smith) Airport curfew. This initiative of different day and night flight paths results in a level of respite and noise sharing to some areas impacted by the proposed higher traffic volumes of WSI "Day" operations. The reduction in dwelling and population counts are reflected in the tables contained in this technical paper, particularly when the RRO mode can be applied.

10.2.4 Arrival operations

Modern aircraft generate significantly less noise on departure and arrival than their predecessors because of technological innovation and the use of noise abatement operating procedures. While generally noise from departing aircraft has been greater than that for arrivals, modern aircraft now generate significantly less noise because of technological innovation, particularly in improvements in aero engines. However, the following aspects of approach noise remain:

- The heights of aircraft on final approach are determined by the Instrument Landing System (ILS), which involves aircraft flying at lower altitudes compared to departures at equivalent distances from the Airport Site, albeit requiring lower levels of thrust.
- The increasing size of aircraft with the increased airframe noise that this can generate, which can be a significant component of the total approach noise when engine power is low.

Aircraft arriving at WSI will normally be cleared by air traffic control to join a pre-determined STAR that provides standard vertical and lateral tracking guidance when leaving the enroute cruise phase of flight and tracking to their landing runway. Arriving aircraft will generally be processed to join the final runway aligned flight path segment using agreed instrument flight procedures such as an ILS approach. The glideslope associated with the ILS (vertical profile used during a landing approach) at WSI is expected to be set at 3 degrees. This is the angle recommended by ICAO for commercial aviation for safety reasons and adopted universally at major Australian airports.

In 2017, London Heathrow Airport conducted 2 extensive trials of steeper glideslope approaches to determine if such approaches would result in any noise reduction benefits to overflown communities. An approach slope of 3.2 degrees (versus the generally adopted 3 degrees) was tested over the established noise monitor network. The noise reduction averages resulting from the marginally higher altitudes of arriving aircraft were:

- Trial 1 – Min: +0.1 dB(A) / Average: -0.5 dB(A) / Max: 1.4 dB(A) (SEL).
- Trial 2 – Min: +0.1 dB(A) / Average: -0.5 dB(A) / Max: 1.9 dB(A) (SEL)[20].

An average reduction of 0.5 dB(A) is well below the level of 3 dB(A) which is considered to be “just perceptible”.

The WSI preliminary airspace design has incorporated CDOs to the extent practical within the bounds of the complexity of the numerous crossing tracks in the Sydney Basin airspace.

In contrast to a conventional approach, when a CDO procedure is flown the aircraft stays higher for longer, descending continuously from the lowest level of the holding pattern or enroute segment of flight (or higher if possible) and avoiding any extended level segments of flight prior to intercepting the 3-degree glidepath. A continuous descent also requires significantly less engine power (thrust) than required for level flight. CDO descent rates vary, such that an optimal CDO will require idle power (thrust) from the engines, whereas in some cases CDO is achieved by applying a reduced rate of descent, requiring engine power (thrust) above idle. This applies even for an aircraft in turning flight.

It is sometimes not possible to achieve a CDO due to a range of factors, including air traffic control instructions and information, airspace constraints, overriding safety requirements and weather influences. CDO achievement rates over time may show seasonal peaks and troughs in its application. In addition, when flying a CDO an aircraft may still require a short segment of level flight to reduce speed and/or to reconfigure.

The noise benefit of a CDO will vary depending on the altitude and length of level flight associated with a non-CDO, as well as the descent rate and associated thrust settings of the CDO flight. Previous analysis has shown that a typical non-CDO has approximately 5 nm (around 9 km) of level flight at altitudes from 3,000 ft to 6,000 ft. Compared to a perfect CDO, this results in noise increases of up to 2.5 to 5 dB(A), varying over distances from touchdown of 10 to 20 nm (around 19 to 37 km).[21]

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20 The 2nd 3.2° LHR Slightly Steeper Approach Trial Report. V1.0 May 2018

21 Review of Arrival Noise Controls – Civil Aviation Authority – United Kingdom

It should also be noted that more precise and predictable navigation procedures such as RNP AR and including CDO will tend to concentrate overflights within the flight path envelope compared to legacy systems. Figure 10.1 below shows how RNP AR compares to vectored and standard RNP procedures.

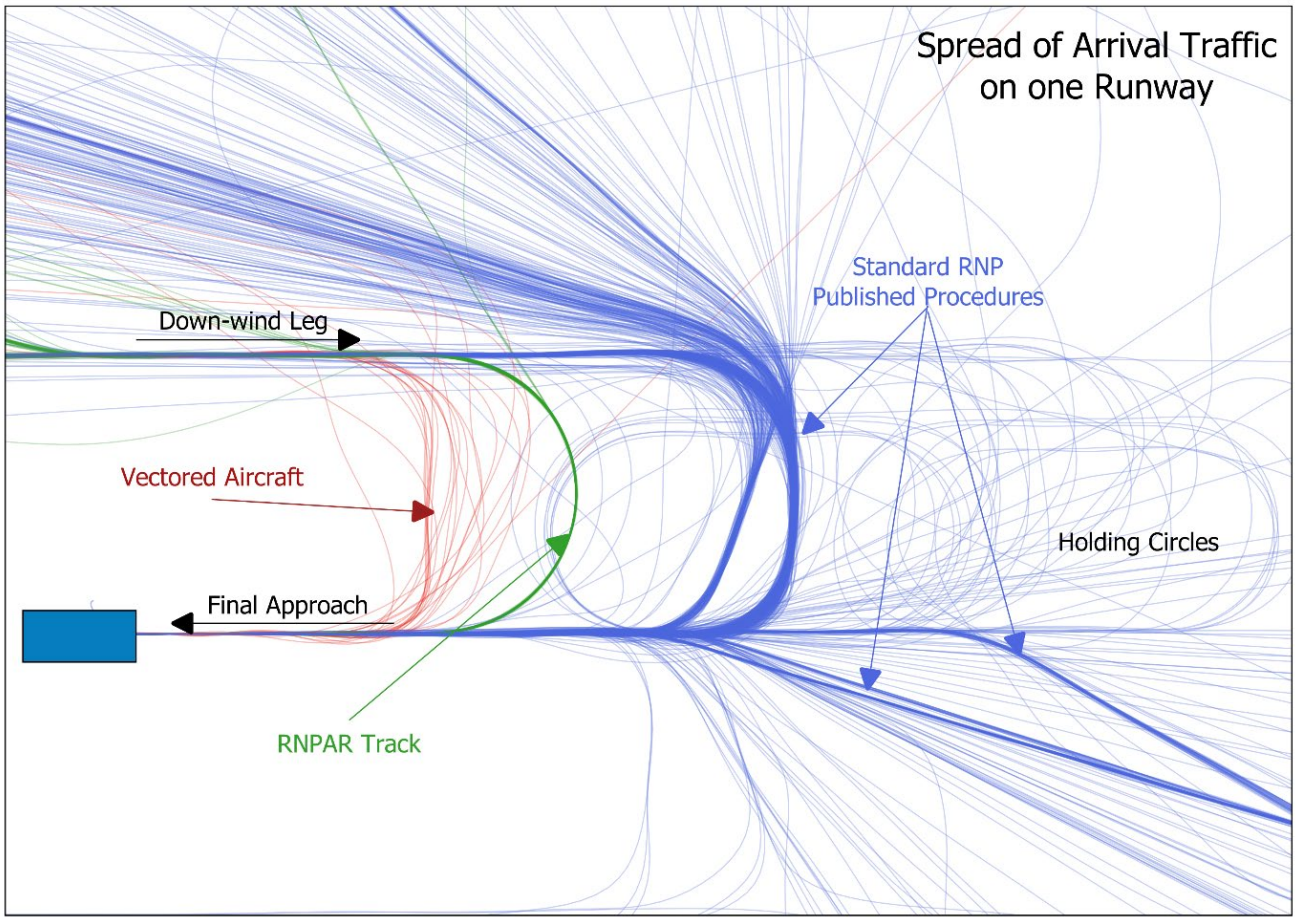

Figure 10.1 RNP-AR Flight Path Concentration

LPLD is the collective term used for describing the lowest noise configuration for a given speed and/or altitude during the approach. Selecting more flap than is required for a given speed will typically lead to more airframe noise, higher engine power to overcome the greater drag (for a given descent angle and speed) and thus higher noise. Selecting more flap than is required for a given speed will typically lead to more airframe noise, higher engine power due to greater drag and thus higher noise. The effect is however small, typically no more than 1 dB(A). Most aircraft are certificated with 2 or more landing flap settings. The full landing setting, which sets the flaps at their maximum angle, also produces their maximum drag and allows the aircraft to fly at the slowest speed, reducing runway occupancy time and less reliance on reverse thrust. Reduced landing flap settings set the flap angle to less than their maximum, resulting in lower drag and thereby requiring less engine power during the approach and resulting in less noise being emitted.

Reduced landing flap requires the approach to be flown at higher speeds, and therefore increases the touchdown speed, which can lead to increased brake wear, increased use of reverse thrust and increased or decreased runway occupancy time (depending on the location of runway rapid exit taxiways). However, it also reduces fuel burn and engine emissions and reduces stress on the flap system leading to maintenance savings for some aircraft. Consequently, reduced landing flap is a widely adopted technique by many operators, where it is safe to do so, and some airports recommend this in their noise abatement procedures.

Reduced landing flap can result in noise reductions of 0.5 to 1.5 dB(A), the larger figure typically being associated with older aircraft types. Since the landing flap is adopted just after the landing gear is deployed, it is typically selected at heights of 1,200 ft to 1,500 ft, i.e., 4 to 5 nm (7 to 9 km) from touchdown. As such, reduced landing flap reduces noise very close to landing.

Deployment of landing gear (wheels down) increases aircraft drag, requiring higher engine power to be used, again emitting more noise. Landing gear also generates air turbulence causing additional noise. Noise measurements indicate that early landing gear deployment can increase noise by 3 to 5 dB(A) in the region 5 to 10 nm (around 9 to 19 km) from the landing threshold, which can be greater than the difference in noise between the latest generation of aircraft and the generation they replaced.

10.2.5 Departure operations

On departure there are 2 internationally accepted standard noise abatement procedures where a stepped departure climb is being used. They are designated “NADP 1” and “NADP 2” (Noise Abatement Departure Procedure) and with the indicative climb performance of aircraft using each procedure shown in Figure 10.2.

Figure 10.3 provides an indicative representation of NADP 1 versus NADP 2.

NADP 1 is sometimes applied where there are noise sensitive areas close to the airport on extended runway alignment. NADP 2 is more universally applied and is designed to attempt to reduce the departing aircraft’s noise footprint in an area further away, to around 25 km from an aircraft’s start of departure roll on the airport runway.

NADP 1 involves:

- power or thrust reduction at or above the prescribed minimum altitude of 800 ft (244 m) above aerodrome elevation
- initial climbing speed is not less than V2 (Takeoff Safety Speed) + 10 kt or V2 + 20 km/h and below V2 + 20 kt or V2 + 40 km/h
- delay of flaps /slats retraction until the prescribed maximum altitude of 3,000 ft (914 m) is attained
- at the prescribed maximum altitude of 3,000 ft (914 m), the aircraft is accelerated, and the flaps/slats are retracted on schedule while maintaining a positive rate of climb, to complete the transition to normal enroute climb speed.

NADP 2 involves:

- power or thrust reduction at or above the prescribed minimum altitude of 800 ft (244 m) above aerodrome elevation
- flats/slats retraction at or above the prescribed minimum altitude of 800 ft (244 m) above aerodrome elevation but before the prescribed maximum altitude of 3,000 ft (914 m)
- flaps/slats are retracted on schedule while maintaining a positive rate of climb
- intermediate flap retraction, if required for performance may be accomplished
- aircraft body angle of pitch is decreased, aircraft is accelerated towards Vzf (Minimum Safe Manoeuvring Velocity with Zero Flaps)
- initial climbing speed is not less than V2 + 10 kt or V2 + 20 km/h
- engine power or thrust reduction is initiated at a point along the acceleration segment that ensure satisfactory acceleration performance
- at the prescribed maximum altitude of 3,000 ft (914 m), the aircraft is accelerated to complete the transition to normal enroute climb speed.

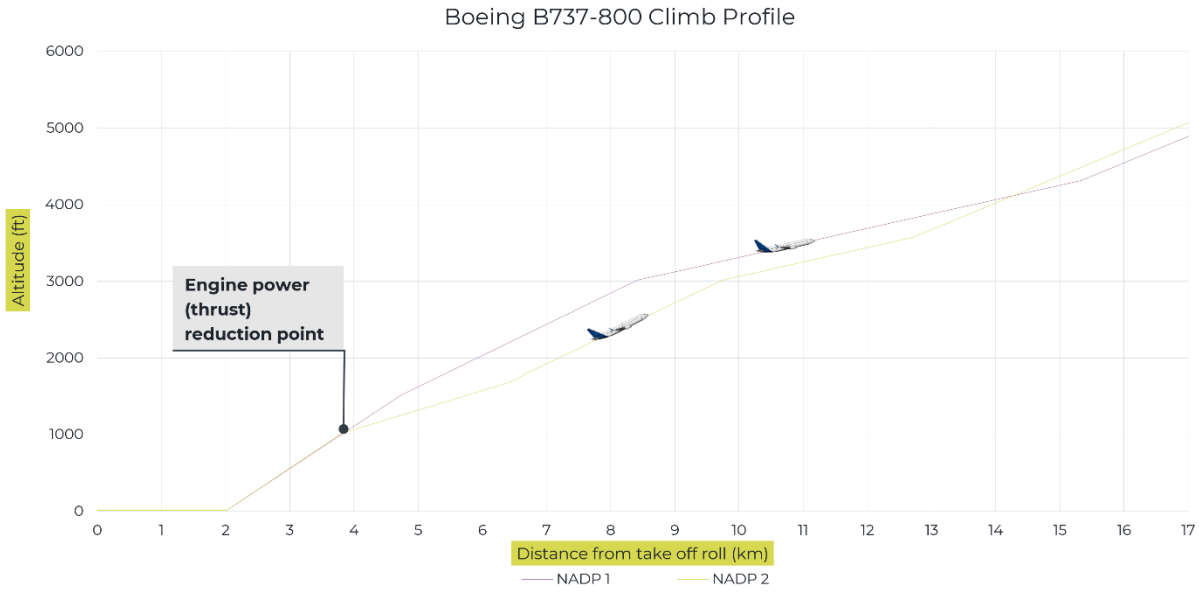

Figure 10.2 NADP 1 versus NADP 2 generic depiction of climb performance

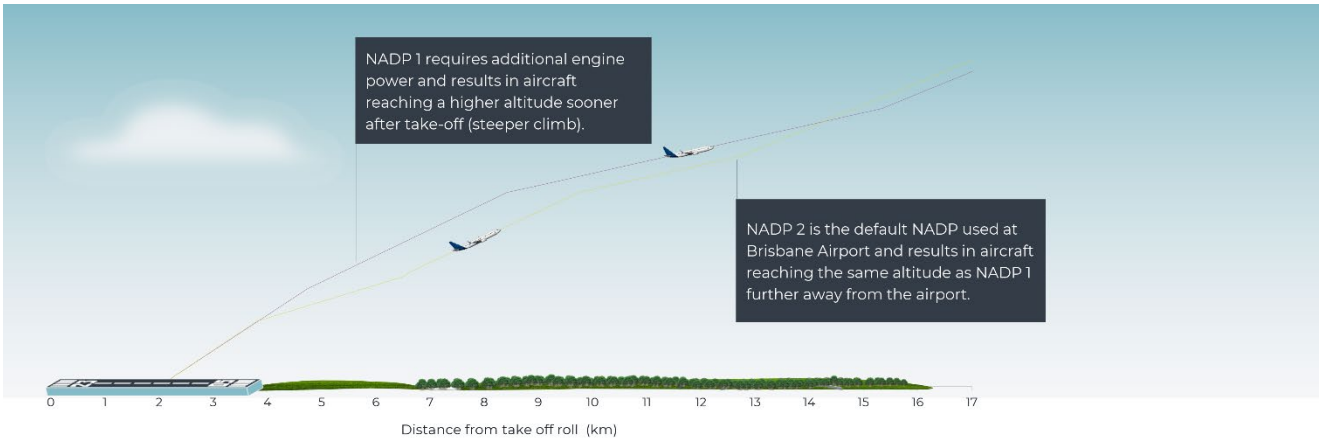

Figure 10.3 Comparing NADP 1 versus NADP 2 at WSI (indicative illustration)

In response to submissions to its consultation process for finalisation of the airspace and procedures for the parallel runway project, Brisbane Airport conducted trials of NADP 1 and NADP 2 over fixed NMTs to determine if community benefits would result from mandating either of these 2 standard departure procedure profiles.

An important part of the trial measurement was to consider the difference in carbon dioxide (CO_2) emissions between NADP 1 and NADP 2. The trial did not show a reduction in noise level and/or duration of greater than 3 dB(A) across the aircraft fleet, but modelling using flight information from the trial as a result of NADP 1 did indicate substantial increases in fuel use and emissions (CO_2). This is shown in Table 10.1.

Table 10.1 Noise and emissions differences by aircraft type departing Brisbane Airport Runway 19L during the NADP1 trial in October-November 2019

	Tables Noise improvement AVE LA max (dB(A))	Tables Noise improvement AVE SEL (dB(A))		*Fuel Increase kg (over 12 months)	*CO_2 increase kg (over 12 months)
B738 Northern destinations	1.0 (dB(A))	0.4 (dB(A))	B738 North and South	560,440 kg	1,797,406 kg
B738 Southern destinations	1.1 (dB(A))	0.5 (dB(A))			
A320 Northern destinations	3.6 (dB(A))	2.0 (dB(A))	A320 North and South	295,694 kg	937,760 kg
A320 Southern destinations	2.0 (dB(A))	1.6 (dB(A))			
A330	2.6 (dB(A))	1.5 (dB(A))	A330	178,800 kg	554,280 kg
B787	3.1 (dB(A))	2.8 (dB(A))	B787	75,600 kg	239,910 kg
B777	1.5 (dB(A))	1.4 (dB(A))	8777	52,800 kg	168,000 kg
A350	3.4 (dB(A))	2.7 (dB(A))	A350	54,180 kg	171,570 kg



A **B738** departing to Mackay flying **NADP1** uses an extra **24kg** of fuel and produces an additional **77kg** of CO_2, when compared to **NADP2**.



By comparison, an average family car would need to travel **422km** (Brisbane to Roma) to produce the same amount of CO_2



A **B777** departing to Los Angeles flying **NADP1** uses an extra 88kg of fuel and produces an additional **278kg** of CO_2, when compared to **NADP2**.



An average family car would need to travel **1,530km** (Brisbane to Melbourne) to produce the same amount of $_{CO2}$

Noise improvement outcomes

As a result of the investigation and trial, the below improvements are included in the xx Airport Noise Abatement Procedures which commenced on 21 May 2020 :



Clear instructions to always fly a Noise Abatement Departure Procedure.



Speed restrictions on departing aircraft to reduce the number of lower flying aircraft.



If pilots cancel the standard flight path, they will be directed to fly the steeper **noise abatement departure (NADP1).**



When on the last stage of flight before landing, pilots will use the **lowest flap setting** when possible to reduce airframe noise.

The results of the recent Brisbane Airport NADP Trial, identified that the application of NADP 1 resulted in relatively significant cumulative fuel burn and CO_2 emissions penalties, while only delivering noise reductions in areas out to 15 km from start of departure roll, of no discernible or marginally discernible levels.

10.3 Improvements in aircraft technology

Reduction of Noise at Source (Technology Standards) is first of the ICAO's 4-pillars of aircraft noise management as discussed in Section 6.1.

Over the past 60 years, aircraft have reduced their noise output by around 75 per cent when compared to the first-generation jet aircraft like the Boeing B707 and B727 jets, and the aerospace manufacturers and airlines continue to work together to develop newer, quieter aircraft. Today's aircraft entering service have on average, a noise footprint that is between 30-50 per cent that of the aircraft they are replacing thanks to technological advancements in airframe and engine design (refer to Figure 10.4).

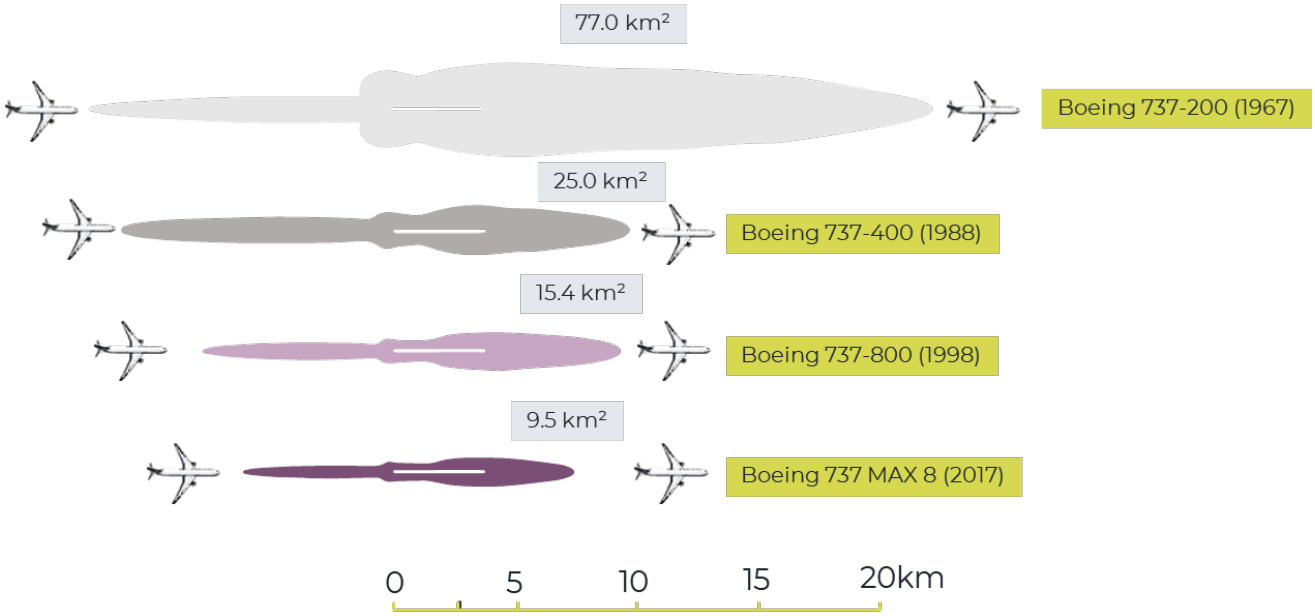

Figure 10.4 Improvement in noise performance for the Boeing B737

Figure 10.4 above shows that noise performance for the Boeing B737 has improved significantly despite a 40 per cent increase in MTOW between the Boeing B737-200 (58 tonnes) and the Boeing B737 MAX 8 (82 tonnes).[22]

The first noise certification standards for jet and propeller driven aircraft were introduced by ICAO in 1972. Their aim was to ensure that aircraft design was taking advantage of the latest technological advancements and innovation. Progressively these standards have become more stringent in line with the noise reduction offered by new technology. This trend in the noise certification of aircraft is illustrated in Figure 10.5. Most of the aircraft operating in Australian airspace meet the latest permissible noise limit stringencies set by ICAO under the Chapter 4 standard with many aircraft meeting the even more stringent Chapter 14 noise limits.

ICAO Chapter 14 noise limits apply to all new aircraft entering service after 31 December 2017 (31 December 2022 for aircraft less than 55 tonnes in mass). Certification standards use the effective perceived noise in decibels (the EPNdB metric[23]. These limits are set at 7 dB lower on aggregate than Chapter 4 limits which apply to all new aircraft entering service after 2006. Chapter 4 limits are on aggregate 10 EPNdB lower than Chapter 3 limits. To the human ear, a 10 Effective Perceived Noise in decibels (EPNdB) reduction equates to about 50 per cent less noise. The EPNdB metric is a measure of human annoyance relative to the noisiness of an individual aircraft pass-by event. It is used for aircraft noise certification and applies to an individual aircraft, not the noise exposure from an airport.

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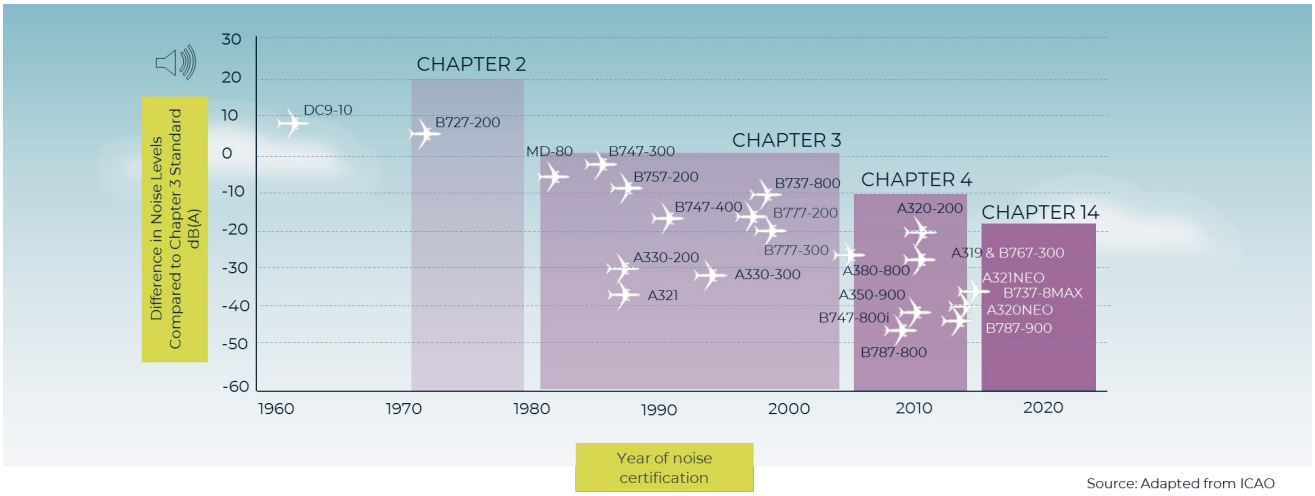
22 Source – Departure Noise Mitigation: Main Report 2018 – CAP 1691 – Civil Aviation Authority – United Kingdom

23 Effective perceived noise in decibels (EPNdB) or Effective Perceived Noise Level (EPNL) is a measure of the relative noisiness of an individual aircraft pass-by event. It is used for aircraft noise certification and applies to an individual aircraft, not the noise exposure from an airport.



Source: Adapted from ICAO

ICAO NOISE CERTIFICATION STANDARDS

CHAPTER 2 : Type certificate required before 6 October 1977 for first generation turbofans & nacelles.

CHAPTER 3 : Type certificate required from 6 October 1977 for second generation turbofans & advanced nacelles.

CHAPTER 4 : Type certificate required from 1 January 2006 for new bypass ratio engines, nacelle technology & airframe design. Introduced a cumulative reduction of 10dB relative to Chapter 3 standard at all three noise measurement points.

CHAPTER 14: Type certificate required from 31 December 2017 (31 December 2020 for aircraft <55t) for advanced high bypass ratio engines & nacelles. Introducing a cumulative reduction of 7dB relative to Chapter 4 cumulative levels at all three noise measurement points.

Figure 10.5 Downward trend in the noise certification of aircraft

It is difficult to predict future reductions in resulting aircraft noise exposure because this is primarily the role of aircraft airframe and aircraft engine original equipment manufacturers (OEMs) like Airbus, Bombardier, The Boeing Company, CFM International, GE Aviation, International Aero Engines, Pratt and Whitney and Rolls-Royce.

Even without further technological advances, it is reasonable to assume that aircraft noise exposure around WSI would decrease over time as quieter new generation aircraft make up a greater proportion of the fleet mix. For example, Singapore Airlines retired its last Boeing B747 from passenger services in 2012 with Cathay Pacific following suite in 2016. After nearly 5 decades in service, Qantas also retired its last Boeing B747 in 2020, announcing the order of next generation, fuel efficient Airbus A220, A320neo and A321XLR to replace its ageing Boeing B737-800 and B717 fleet. Airbus A350-1000 aircraft have also been ordered by Qantas to operate ultra-long-haul, non-stop flights to Europe, North and South America, and South Africa.

Aircraft types assessed and modelled for this EIS are conservatively based on those currently in service. With continual modernisation of airline fleets and incentives for airlines and freight companies to use aircraft equipped with the newest noise reduction technologies the contours could contract, but on the other hand an increase in aircraft movements or change in fleet (shift to the operation of larger, heavier aircraft on more routes) can off-set these improvements to some extent.

10.4 Aircraft noise management and mitigation opportunities

Various operating strategies for managing aircraft noise will have differing impacts on different populations, particularly at night, when greater airspace flexibility and lower demand permits the use of different RMOs and flight paths. This could be achieved by prioritising, when operationally possible, night-time flights over wedges of low-density rural land and natural areas to the south-west, west and south of WSI. However, it is noted that these “green corridors/wedges” could be more “noise sensitive” than urban areas experiencing similar levels of noise exposure.

As stated in the introduction to this chapter, effective noise mitigation often constitutes several small, incremental improvements that, when combined, could result in a substantial and noticeable reduction in aircraft noise impacts. The challenge for WSI and the community that its operations will subject to varying levels of noise exposure is that despite the Western Sydney area already being overflown by current Sydney Basin operations, it will be largely a new experience that will have a high degree of trepidation and focus by the community.

Several, but not an exhaustive list of potential noise abatement procedures and their potential noise reduction benefits have been briefly discussed in this technical paper. The further identification and refinement of noise abatement procedures at WSI will be part of future design phases of the airspace flight path and management development process. Noise abatement procedure refinement may require the actual commencement of operations and measurement and monitoring of the benefits or disbenefits individual initiatives deliver.

Feedback from community and industry stakeholders on the EIS and ongoing formal engagement forums such as the CACG and PCF will ensure stakeholders can review emerging issues, performance data, provide feedback and submit initiatives to be considered by regulatory agencies, airlines, WSI and its industry partners.

10.4.1 Project specific mitigation measures

Table 10.2 provides a summary of aircraft noise mitigation and management measures identified for the project.

Table 10.2 Summary of mitigation and management measures

ID No.	Issue	Mitigation	Owner	Timing
N1	Noise insulation and property acquisition	DITRDCA will implement the NIPA policy which will apply to eligible properties that are significantly impacted by aircraft overflight noise from WSI.	DITRDCA	**Pre-operation** (Detailed design, 2024–2026) and **Operation** (Implementation, 2026 – conclusion of program)
N2	Noise abatement	Airservices Australia will develop and review noise abatement procedures in consultation with stakeholders, including aircraft operators, airlines, WSA and FoWSA/WSI Community Aviation Consultation Group (CACG) following a draft proposal developed by the Expert Steering Group in response to feedback on the EIS.	Airservices Australia/ DITRDCA	**Pre-operation** (Initial proposal as part of the final EIS, with any further refinements in detailed design, 2024–2026) and **Operation** (Implementation, 2026–ongoing)
N3	Communication	WSA Co will establish a CACG to ensure appropriate community engagement on airport planning and operations. This will ensure community and industry have a forum for the groups best positioned to identify, share and test solutions or measures including relevant national or international best practice initiatives.	WSA Co	**Pre-operation** (At the conclusion of detailed design, 2024–2026)

ID No.	Issue	Mitigation	Owner	Timing
N4	Noise complaints	The Airservices Australia Noise Complaints and Information Service will handle complaints and enquiries about aircraft noise and operations associated with the project to help identify issues of community concern and provide opportunities for improvement.	Airservices Australia	**Operation** (Implementation, 2026–ongoing)
N5	Aircraft noise	The Aircraft Noise Ombudsman (ANO) provides independent reviews of aircraft noise-related activities to ensure appropriate governance and oversight of operations. The ANO is also available to make targeted reviews on specific issues as they are identified or arise.	Airservices Australia	**Operation** (Implementation, 2026–ongoing)
N6	Flight path design	Airservices Australia will undertake a post-implementation review (PIR) of the flight path design and implementation.	Airservices Australia	**Operation** (2026 – within 2 years of implementation)

Table 10.3 provides a summary of aircraft noise monitoring programs identified for the project.

Table 10.3 Summary of proposed monitoring programs

ID No.	Issue	Monitoring measure	Owner	Timing
M1	Aircraft noise	Airservices Australia will install a system of permanent and temporary noise monitoring terminals at suitable locations and incorporated into the Airservices Australia NFPMS network and reporting systems. The interface will allow community and other stakeholders to see where aircraft fly and explore historical trends and patterns. The system will provide accurate noise monitoring data for reporting, validation and noise model calibration. With an established baseline it could give an evidence base for any future flight path modification or noise abatement initiatives. This system will operate 24-hours-a-day, 7-days-a-week, collecting data from every aircraft operating to and from WSI. Noise monitoring will consider the requirements of the WSI Stage 1 Development Noise OEMP.	Airservices Australia	**Operation** (Implementation, 2026–ongoing)

10.4.2 Dependencies and interactions with other mitigation measures

As outlined in Section 1.6, this technical paper has interactions with other studies supporting the EIS. Interactions between mitigation measures in these technical papers that are relevant to the minimisation and management of aircraft noise impacts include:

- **Technical paper 6: Land use and planning** – specifically the requirement for continued liaison between the DITRDCA and WSA Co with State and local government agencies to ensure applicable environmental planning instruments have regard ANEC forecasts produced for the project.
- **Technical paper 10: Social** – specifically the requirement for WSI CACG to undertake consultation with stakeholders and community, including social organisations, to seek feedback on social issues and to promote social and economic welfare of the community.

Appendix A

List of noise sensitive areas and noise monitoring terminals

A1 List of noise sensitive areas and noise monitoring terminals

ID	Type	Area	Latitude	Longitude
M01	Noise Monitoring Terminal	South West Departure (Wallacia)	-33.91887	150.63309
M02	Noise Monitoring Terminal	North East Departure	-33.84327	150.79625
M03	Noise Monitoring Terminal	North East Runway	-33.81652	150.77464
M04	Noise Monitoring Terminal	Twin Creeks	-33.83801	150.76040
M06	Noise Monitoring Terminal	Mount Vernon	-33.86395	150.80319
M07	Noise Monitoring Terminal	Kemps Creek Nature Reserve	-33.89717	150.79941
M08	Noise Monitoring Terminal	Luddenham	-33.85003	150.70046
M09	Noise Monitoring Terminal	Penrith	-33.74853	150.70149
M10	Noise Monitoring Terminal	Glenmore Park	-33.79340	150.68056
M11	Noise Monitoring Terminal	Oxley Park	-33.76837	150.78950
M12	Noise Monitoring Terminal	St. Marys	-33.77534	150.76381
M13	Noise Monitoring Terminal	Rooty Hill	-33.78010	150.84758
M14	Noise Monitoring Terminal	St. Clair	-33.80179	150.77343
M15	Noise Monitoring Terminal	Erskine Park	-33.80880	150.79037
M16	Noise Monitoring Terminal	Sydney International Equestrian Centre	-33.85107	150.85662
M17	Noise Monitoring Terminal	Wallacia	-33.86386	150.64195
M18	Noise Monitoring Terminal	Warragamba	-33.88364	150.60350
M19	Noise Monitoring Terminal	Greendale	-33.91611	150.65957
M20	Noise Monitoring Terminal	Bringelly	-33.92817	150.71174
M21	Noise Monitoring Terminal	Bents Basin	-33.92799	150.63338
M22	Noise Monitoring Terminal	Silverdale	-33.92616	150.62011
M23	Noise Monitoring Terminal	Werombi	-33.97701	150.59795
M24	Noise Monitoring Terminal	Blaxland	-33.74040	150.59817
M25	Noise Monitoring Terminal	Linden	-33.71669	150.51594
M26	Noise Monitoring Terminal	North Richmond	-33.58187	150.71484
M27	Noise Monitoring Terminal	Kurrajong	-33.53291	150.68651
M28	Noise Monitoring Terminal	The Oaks	-34.08129	150.58088
M29	Noise Monitoring Terminal	Lake Burragorang (Natai, Brownlow Hill)	-34.06947	150.44893
M30	Noise Monitoring Terminal	Tahmoor	-34.21626	150.60386
R1	Residential	Bringelly	-33.94024	150.73148
R2	Residential	Luddenham	-33.86786	150.69682
R3	Residential	Greendale, Greendale Road	-33.91787	150.67114

ID	Type	Area	Latitude	Longitude
R6	Residential	Kemps Creek	-33.83999	150.64956
R7	Residential	Wallacia	-33.86590	150.64281
R8	Residential	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	-33.84717	150.75933
R14	Residential	Lawson Road, Badgerys Creek	-33.87503	150.75926
R15	Residential	Mersey Rd, Greendale	-33.91845	150.71357
R17	Residential	Luddenham Road	-33.85490	150.72835
R18	Residential	Cnr Adams & Elizabeth Drive	-33.86896	150.71839
R19	Residential	Cnr Adams & Anton Road	-33.87481	150.71053
R21	Residential	Cnr Willowdene Ave and Vicar Park Lane	-33.90079	150.68450
R22	Residential	Rossmore, Victor Ave	-33.90180	150.76730
R23	Residential	Wallacia, Greendale Road	-33.88685	150.64539
R24	On-Site	Badgerys Creek 1 NE	-33.87941	150.74557
R25	On-Site	Badgerys Creek 2 SW	-33.90164	150.69795
R27	Residential	Greendale, Dwyer Rd	-33.92542	150.69872
R30	Residential	Rossmore residential	-33.94557	150.77129
R31	Residential	Mt Vernon residential	-33.86239	150.80789
R34	Aged Care	Emmaus Residential Aged Care	-33.82725	150.79314
R35	Childcare	Mamre After School and Vacation Care	-33.83176	150.78633
R37	Childcare	Schoolies at Mulgoa	-33.88055	150.68686
R38	Childcare	Do-re-mi Day Care Centre	-33.86802	150.80689
R39	Childcare	Little Amigos Austral Early Learning Centre	-33.93500	150.80819
R40	Childcare	Little Smarties Childcare Centre	-33.83186	150.78646
R41	Childcare	The Grove Academy	-33.89576	150.79238
R42	Childcare	Horsley Kids	-33.84144	150.84966
R44	Childcare	Bringelly Child Care Centre	-33.92592	150.70681
R46	Childcare	Chementson Drive Early Educational Centre	-33.91477	150.76895
R48	Childcare	Kids Korner West Hoxton Early Learning Centre	-33.91922	150.82562
R49	Childcare	Luddenham Child Care Centre	-33.87654	150.69000
R52	Childcare	The Frogs Lodge	-33.92778	150.81481
R54	Childcare	Mulgoa Preschool	-33.83434	150.65496
R55	Childcare	Jillys Educational Childcare Centre	-33.92804	150.76619
R59	Community Centre	Bringelly Community Centre	-33.93877	150.72856
R63	Community Centre	Luddenham Progress Hall	-33.88087	150.68976
R64	Community Centre	Mulgoa Hall	-33.83658	150.65330

ID	Type	Area	Latitude	Longitude
R65	School	Emmaus Catholic College	-33.83109	150.79198
R66	School	University of Sydney Farms	-33.93748	150.67757
R68	School	Christadelphian Heritage College Sydney	-33.88367	150.79092
R69	School	Mamre Anglican School	-33.83186	150.78629
R72	School	Irfan College	-33.87658	150.82563
R73	School	Luddenham Public School	-33.88104	150.69183
R74	School	Kemps Creek Public School	-33.88358	150.79019
R75	School	Trinity Catholic Primary School	-33.82944	150.78910
R76	School	Bringelly Public School	-33.93950	150.73075
R78	School	Mulgoa Public School	-33.83625	150.65116
R79	School	Rossmore Public School	-33.94611	150.77069
R80	School	Wallacia Public School	-33.86296	150.64179
R82	School	Bellfield College - Junior Campus	-33.94152	150.76703
R84	Park	Bringelly Park	-33.93851	150.72752
R85	Park	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	-33.94990	150.61997
R86	Park	Blaxland Crossing Reserve	-33.86151	150.63979
R87	Park	Bill Anderson Reserve	-33.88070	150.78933
R91	Park	Western Sydney Parklands	-33.80727	150.86064
R93	Park	Rossmore Grange	-33.92842	150.76202
R94	Park	Freeburn Park	-33.87905	150.69076
R95	Park	Overett Reserve	-33.87910	150.76775
R97	Park	Mulgoa Park	-33.83623	150.65249
R98	Recreation	Wallacia Bowling and Recreation Club	-33.86975	150.64302
R99	Recreation	Hubertus Country Club	-33.87453	150.71503
R100	Recreation	Sugarloaf Cobbitty Equestrian Club	-33.95285	150.67460
R102	Recreation	Panthers Wallacia (country club)	-33.86520	150.64202
R103	Recreation	Twin Creeks Gold and Country Club	-33.83588	150.76047
R104	Recreation	Sydney International Shooting Centre	-33.88836	150.81754
R108	Recreation	Luddenham Showground	-33.87442	150.68789
R109	Recreation	Kemps Creek Sporting and Bowling Club	-33.88189	150.80559
R110	Religious Facility	St James Luddenham	-33.88267	150.69160
R111	Religious Facility	Lin Ying Temple	-33.91387	150.77657
R112	Religious Facility	Vat Ketanak Khmer Kampuchea Krom	-33.93185	150.76025
R114	Religious Facility	Anglican Church Sydney Diocese	-33.94344	150.76409

ID	Type	Area	Latitude	Longitude
R115	Religious Facility	Anglican Parish of Mulgoa	-33.82955	150.65572
R117	Religious Facility	Bringelly Vineyard Church	-33.94082	150.74111
R120	Religious Facility	Our Lady Queen of Peace	-33.81872	150.95159
R122	Religious Facility	St Anthony	-33.92935	150.81228
R123	Religious Facility	St Marys Church	-33.84302	150.65067
R124	Religious Facility	Wallacia Christian Church	-33.86590	150.64281
R126	Religious Facility	St Francis Xavier Church	-33.91161	150.65336
R127	Religious Facility	Luddenham Uniting Church	-33.88116	150.68979
R131	Religious Facility	Science of the Soul Study Centre	-33.88134	150.80207
R132	Shopping Centre	Bringelly shops	-33.94024	150.73148
R134	Shopping Centre	Kemps Creek shops	-33.87958	150.78953
R135	Shopping Centre	Luddenham shops	-33.88346	150.69340
R136	Shopping Centre	Mulgoa shops	-33.83999	150.64956
R137	Shopping Centre	Rossmore shops	-33.94557	150.77129
R138	Shopping Centre	Wallacia Shops	-33.86531	150.64090
R140	School	Holy Family Catholic Primary and Church	-33.88089	150.68557
N1	Aged Care	CATHOLIC HEALTHCARE EMMAUS VILLAGE	-33.82726	150.79316
N2	Aged Care	JOHN EDMONDSON VC GARDENS	-33.93308	150.80979
N3	Aged Care	REGAL OAKS VILLAGE	-33.86642	150.64068
N4	Aged Care	SCALABRINI VILLAGE AUSTRAL	-33.94648	150.81047
N5	Aged Care	TOBRUK VILLAGE	-33.93343	150.81045
N6	Childcare	BLAXLAND PRE-SCHOOL	-33.74421	150.61772
N7	Childcare	GLENBROOK PRE-SCHOOL	-33.76618	150.61581
N8	Childcare	KEMPS CREEK CHILDRENS COTTAGE	-33.89590	150.79228
N9	Childcare	LAPSTONE PRE-SCHOOL	-33.77160	150.63428
N10	Childcare	MindChamps Early Learning & Preschool Kemps Creek	-33.89590	150.79228
N11	Childcare	MY FIRST SCHOOL CHILDCARE CENTRE	-33.77133	150.76900
N12	Childcare	SILVERDALE CHILD CARE CENTRE	-33.91012	150.61907
N13	Childcare	WARRAGAMBA PRE-SCHOOL	-33.88915	150.60548
N14	Hospital	MINCHINBURY COMMUNITY HOSPITAL	-33.78079	150.82842
N15	Hospital	MOUNT DRUITT HOSPITAL	-33.76581	150.82964
N16	Hospital	NEPEAN HOSPITAL	-33.75926	150.71409
N17	Hospital	NEPEAN PRIVATE HOSPITAL	-33.75780	150.71328
N18	Religious Facility	AUSTRAL CHURCH OF CHRIST	-33.93316	150.81159

ID	Type	Area	Latitude	Longitude
N19	Religious Facility	GOOD SHEPHERD CATHOLIC CHURCH	-33.92945	150.86244
N20	Religious Facility	Grace West Anglican Church - Glenmore Park	-33.78532	150.67240
N21	Religious Facility	Holy Family Church	-33.88073	150.68535
N22	Religious Facility	HOLY SPIRIT CATHOLIC CHURCH	-33.93897	150.84277
N23	Religious Facility	Holy Spirit Parish	-33.79373	150.78165
N24	Religious Facility	HOXTON PARK ANGLICAN CHURCH	-33.93069	150.84550
N25	Religious Facility	Imagine Nations Church	-33.78420	150.70974
N26	Religious Facility	INSPIRE CHURCH	-33.92672	150.86729
N27	Religious Facility	Mt Hope Uniting Church Orchard Hills	-33.78206	150.72109
N28	Religious Facility	Orchard Hills Kingdom Hall of Jehovah's Witnesses	-33.78822	150.70253
N29	Religious Facility	Samoan Methodist Church	-33.98389	150.78006
N30	Religious Facility	SIKH MISSION CENTRE	-33.93523	150.80284
N31	Religious Facility	St Clair Anglican Church	-33.79937	150.79948
N32	Religious Facility	St Mary Mother of the Church	-33.95752	150.79882
N33	Religious Facility	ST ZAIA CATHEDRAL	-33.91299	150.84154
N34	Religious Facility	Uniting Church St Clair	-33.79538	150.78985
N35	Religious Facility	WEST HOXTON COMMUNITY CHURCH	-33.92239	150.83169
N36	School	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	-33.91110	150.81011
N37	School	AUSTRAL PUBLIC SCHOOL	-33.93364	150.81231
N38	School	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	-33.75924	150.82999
N39	School	BANKS PUBLIC SCHOOL	-33.79348	150.77356
N40	School	BENNETT ROAD PUBLIC SCHOOL	-33.78336	150.79293
N41	School	BETHANY CATHOLIC PRIMARY SCHOOL	-33.78764	150.67293
N42	School	BIDWILL PUBLIC SCHOOL	-33.73345	150.82713
N43	School	BLACKETT PUBLIC SCHOOL	-33.73923	150.81572
N44	School	BLACKTOWN NORTH PUBLIC SCHOOL	-33.75667	150.91297
N45	School	BLACKTOWN SOUTH PUBLIC SCHOOL	-33.78072	150.90645
N46	School	BLACKTOWN TAFE COLLEGE	-33.77217	150.91155
N47	School	BLACKTOWN WEST PUBLIC SCHOOL	-33.77029	150.89280
N48	School	BLACKWELL PUBLIC SCHOOL	-33.80608	150.78295
N49	School	BLAXLAND EAST PUBLIC SCHOOL	-33.74526	150.62423
N50	School	BLAXLAND HIGH SCHOOL	-33.73307	150.60391
N51	School	BLAXLAND PUBLIC SCHOOL	-33.73570	150.60398

ID	Type	Area	Latitude	Longitude
N52	School	CAMBRIDGE GARDENS PUBLIC SCHOOL	-33.73707	150.72207
N53	School	CAMBRIDGE PARK PUBLIC SCHOOL	-33.74805	150.72571
N54	School	CATHWEST INNOVATION COLLEGE MCCARTHY CAMPUS	-33.74158	150.67795
N55	School	CECIL HILLS PUBLIC SCHOOL	-33.88848	150.85159
N56	School	CHIFLEY COLLEGE BIDWILL CAMPUS	-33.73334	150.82638
N57	School	CHIFLEY COLLEGE DUNHEVED CAMPUS	-33.75034	150.78228
N58	School	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	-33.74438	150.81314
N59	School	CHIFLEY COLLEGE SENIOR CAMPUS	-33.76984	150.83004
N60	School	CHIFLEY COLLEGE SHALVEY CAMPUS	-33.73120	150.80814
N61	School	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	-33.88382	150.79099
N62	School	CLAIRGATE PUBLIC SCHOOL	-33.79615	150.79920
N63	School	CLAREMONT MEADOWS PUBLIC SCHOOL	-33.77398	150.74622
N64	School	COLYTON HIGH SCHOOL	-33.77878	150.79789
N65	School	COLYTON PUBLIC SCHOOL	-33.77429	150.81376
N66	School	DAWSON PUBLIC SCHOOL	-33.74483	150.81527
N67	School	EASTERN CREEK PUBLIC SCHOOL	-33.78688	150.85343
N68	School	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	-33.78694	150.85341
N69	School	EMERTON PUBLIC SCHOOL	-33.74475	150.80562
N70	School	EMU HEIGHTS PUBLIC SCHOOL	-33.73673	150.64847
N71	School	EMU PLAINS PUBLIC SCHOOL	-33.75390	150.65876
N72	School	ERSKINE PARK HIGH SCHOOL	-33.80790	150.80346
N73	School	GLENBROOK PUBLIC SCHOOL	-33.76482	150.61721
N74	School	GLENDENNING PUBLIC SCHOOL	-33.74220	150.85266
N75	School	GLENMORE PARK PUBLIC SCHOOL	-33.78445	150.68080
N76	School	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	-33.92948	150.86233
N77	School	GOOD SHEPHERD PRIMARY SCHOOL	-33.74627	150.83365
N78	School	GREENWAY PARK PUBLIC SCHOOL	-33.93803	150.83776
N79	School	HASSALL GROVE PUBLIC SCHOOL	-33.73456	150.83837
N80	School	HEBERSHAM PUBLIC SCHOOL	-33.74751	150.82490
N81	School	HOLY FAMILY PRIMARY SCHOOL	-33.74440	150.80215
N82	School	HOLY SPIRIT PRIMARY SCHOOL	-33.79422	150.78137
N83	School	HOLY SPIRIT PRIMARY SCHOOL	-33.93848	150.84284
N84	School	HORSLEY PARK PUBLIC SCHOOL	-33.84053	150.85240
N85	School	HOXTON PARK PUBLIC SCHOOL	-33.93143	150.84870

ID	Type	Area	Latitude	Longitude
N86	School	JAMES ERSKINE PUBLIC SCHOOL	-33.80533	150.80384
N87	School	JAMISON HIGH SCHOOL	-33.77461	150.69859
N88	School	JAMISONTOWN PUBLIC SCHOOL	-33.77219	150.68295
N89	School	JORDAN SPRINGS PUBLIC SCHOOL	-33.72565	150.72714
N90	School	KINGSWOOD PARK PUBLIC SCHOOL	-33.76296	150.72632
N91	School	KINGSWOOD PUBLIC SCHOOL	-33.76392	150.72670
N92	School	KINGSWOOD SOUTH PUBLIC SCHOOL	-33.76751	150.71222
N93	School	LAPSTONE PUBLIC SCHOOL	-33.76927	150.63161
N94	School	LEONAY PUBLIC SCHOOL	-33.76457	150.64974
N95	School	LEPPINGTON PUBLIC SCHOOL	-33.95915	150.81006
N96	School	LETHBRIDGE PARK PUBLIC SCHOOL	-33.73917	150.81567
N97	School	LLANDILO PUBLIC SCHOOL	-33.70751	150.75180
N98	School	LYNWOOD PARK PUBLIC SCHOOL	-33.75365	150.92601
N99	School	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	-33.98904	150.86909
N100	School	MACQUARIE FIELDS TAFE COLLEGE	-33.98346	150.89256
N101	School	MADANG AVENUE PUBLIC SCHOOL	-33.75937	150.80545
N102	School	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	-33.92770	150.85469
N103	School	MARAYONG HEIGHTS PUBLIC SCHOOL	-33.73910	150.89611
N104	School	MARAYONG PUBLIC SCHOOL	-33.75717	150.89527
N105	School	MIDDLETON GRANGE PUBLIC SCHOOL	-33.91760	150.84870
N106	School	MINCHINBURY PUBLIC SCHOOL	-33.78697	150.83234
N107	School	MONTGROVE COLLEGE	-33.77408	150.71425
N108	School	MOUNT DRUITT PUBLIC SCHOOL	-33.76386	150.81240
N109	School	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	-33.76332	150.81240
N110	School	MOUNT DRUITT TAFE COLLEGE	-33.76973	150.82584
N111	School	MOUNT RIVERVIEW PUBLIC SCHOOL	-33.72962	150.63252
N112	School	NEPEAN CHRISTIAN SCHOOL	-33.80683	150.65608
N113	School	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	-33.74821	150.66963
N114	School	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	-33.76467	150.73736
N115	School	NEPEAN TAFE COLLEGE PENRITH CAMPUS	-33.75146	150.69734
N116	School	NOUMEA PUBLIC SCHOOL	-33.73205	150.80976
N117	School	ORCHARD HILLS PUBLIC SCHOOL	-33.78203	150.72160
N118	School	OUR LADY OF THE ROSARY PRIMARY SCHOOL	-33.77352	150.77216

ID	Type	Area	Latitude	Longitude
N119	School	OUR LADY OF THE WAY PRIMARY SCHOOL	-33.75591	150.65586
N120	School	OXLEY PARK PUBLIC SCHOOL	-33.77138	150.78884
N121	School	PENOLA CATHOLIC COLLEGE EMU PLAINS	-33.74261	150.67754
N122	School	PENRITH ANGLICAN COLLEGE	-33.79524	150.70658
N123	School	PENRITH CHRISTIAN SCHOOL	-33.78422	150.70870
N124	School	PENRITH HIGH SCHOOL	-33.75644	150.70638
N125	School	PENRITH PUBLIC SCHOOL	-33.75588	150.70532
N126	School	PENRITH SOUTH PUBLIC SCHOOL	-33.76303	150.70100
N127	School	PLUMPTON HIGH SCHOOL	-33.74789	150.83496
N128	School	PLUMPTON PUBLIC SCHOOL	-33.74903	150.83844
N129	School	REGENTVILLE PUBLIC SCHOOL	-33.77692	150.66807
N130	School	ROOTY HILL HIGH SCHOOL	-33.77124	150.83800
N131	School	ROOTY HILL PUBLIC SCHOOL	-33.76911	150.84051
N132	School	ROPES CROSSING PUBLIC SCHOOL	-33.73321	150.78311
N133	School	SACRED HEART PRIMARY SCHOOL	-33.77382	150.81345
N134	School	SHALVEY PUBLIC SCHOOL	-33.72619	150.80936
N135	School	SHELLEY PUBLIC SCHOOL	-33.78899	150.91778
N136	School	ST AIDAN'S PRIMARY SCHOOL	-33.76480	150.83727
N137	School	ST ANDREWS PRIMARY SCHOOL	-33.74052	150.88995
N138	School	ST ANTHONY OF PADUA CATHOLIC COLLEGE	-33.93004	150.80921
N139	School	ST CLAIR HIGH SCHOOL	-33.78941	150.78604
N140	School	ST CLAIR PUBLIC SCHOOL	-33.79609	150.78660
N141	School	ST FINBAR'S PRIMARY SCHOOL	-33.76073	150.61959
N142	School	ST FRANCIS OF ASSISI PRIMARY SCHOOL	-33.73671	150.85223
N143	School	ST JOSEPH'S PRIMARY SCHOOL	-33.75623	150.72278
N144	School	ST MARY MACKILLOP PRIMARY SCHOOL	-33.77870	150.70675
N145	School	ST MARYS NORTH PUBLIC SCHOOL	-33.75481	150.78123
N146	School	ST MARYS PUBLIC SCHOOL	-33.76743	150.77039
N147	School	ST MARYS SENIOR HIGH SCHOOL	-33.76368	150.77071
N148	School	ST MARYS SOUTH PUBLIC SCHOOL	-33.78023	150.77596
N149	School	ST NICHOLAS OF MYRA PRIMARY SCHOOL	-33.75563	150.69973
N150	School	SURVEYORS CREEK PUBLIC SCHOOL	-33.78767	150.68973
N151	School	THOMAS HASSALL ANGLICAN COLLEGE	-33.91788	150.84046
N152	School	TREGEAR PUBLIC SCHOOL	-33.74616	150.79496

ID	Type	Area	Latitude	Longitude
N153	School	UNITY GRAMMAR COLLEGE	-33.94452	150.80304
N154	School	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	-33.76603	150.72933
N155	School	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	-33.76166	150.74619
N156	School	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	-33.76723	150.74145
N157	School	WALTERS ROAD PUBLIC SCHOOL	-33.78456	150.89178
N158	School	WARRAGAMBA PUBLIC SCHOOL	-33.89009	150.60550
N159	School	WARRIMOO PUBLIC SCHOOL	-33.72592	150.59953
N160	School	WERRINGTON COUNTY PUBLIC SCHOOL	-33.74504	150.74728
N161	School	WERRINGTON PUBLIC SCHOOL	-33.75394	150.74591
N162	School	WETHERILL PARK TAFE COLLEGE	-33.84940	150.91467
N163	School	WHALAN PUBLIC SCHOOL	-33.75303	150.80959
N164	School	WILLIAM DEAN PUBLIC SCHOOL	-33.73436	150.85919
N165	School	WILLMOT PUBLIC SCHOOL	-33.72585	150.79397
N166	School	YORK PUBLIC SCHOOL	-33.77658	150.69759
N167	Aged Care	AQUINAS COURT	-33.69838	150.57078
N168	Aged Care	BAPTISTCARE MORVEN GARDENS CENTRE	-33.71301	150.3434
N169	Aged Care	BLUE MOUNTAINS RETIREMENT VILLAGE	-33.70646	150.32313
N170	Aged Care	BUCKLAND	-33.69463	150.58073
N171	Aged Care	MARTYN CLAVER AGED CARE	-33.71434	150.33939
N172	Aged Care	WINGARA HAMLET	-33.70127	150.56063
N173	Childcare	CHILDRENS HOUSE MONTESSORI CHILD CARE	-33.69406	150.53608
N174	Childcare	KATOOMBA LEURA PRE-SCHOOL	-33.71544	150.3116
N175	Childcare	KEMPS CREEK CHILDRENS COTTAGE	-33.8959	150.79228
N176	Childcare	LAPSTONE PRE-SCHOOL	-33.7716	150.63428
N177	Hospital	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	-33.70497	150.32101
N178	Hospital	SPRINGWOOD HOSPITAL	-33.69051	150.57076
N179	Recreation	ECHO POINT LOOKOUT	-33.73256	150.31191
N180	Religious Facility	ANGLICAN	-33.71425	150.33164
N181	Religious Facility	ANGLICAN	-33.71327	150.31208
N182	Religious Facility	BAPTIST	-33.71696	150.31004
N183	Religious Facility	BAPTIST	-33.71049	150.33112
N184	Religious Facility	UNITING	-33.69682	150.5535

ID	Type	Area	Latitude	Longitude
N185	School	BLUE MOUNTAINS STEINER SCHOOL	-33.72167	150.46864
N186	School	ELLISON PUBLIC SCHOOL	-33.68991	150.58579
N187	School	FAULCONBRIDGE PUBLIC SCHOOL	-33.69065	150.54572
N188	School	HAZELBROOK PUBLIC SCHOOL	-33.72543	150.459
N189	School	KATOOMBA HIGH SCHOOL	-33.72777	150.31327
N190	School	KATOOMBA NORTH PUBLIC SCHOOL	-33.69713	150.31553
N191	School	KATOOMBA PUBLIC SCHOOL	-33.7192	150.31372
N192	School	KINGSWOOD PARK PUBLIC SCHOOL	-33.76296	150.72632
N193	School	KINGSWOOD PUBLIC SCHOOL	-33.76392	150.7267
N194	School	KINGSWOOD SOUTH PUBLIC SCHOOL	-33.76751	150.71222
N195	School	LAPSTONE PUBLIC SCHOOL	-33.76927	150.63161
N196	School	LAWSON PUBLIC SCHOOL	-33.72072	150.42876
N197	School	LEURA PUBLIC SCHOOL	-33.71139	150.33683
N198	School	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	-33.72028	150.44061
N199	School	SPRINGWOOD HIGH SCHOOL	-33.6853	150.5499
N200	School	SPRINGWOOD PUBLIC SCHOOL	-33.70476	150.57381
N201	School	ST CANICES PRIMARY SCHOOL	-33.71544	150.3116
N202	School	ST THOMAS AQUINAS PRIMARY SCHOOL	-33.68043	150.58906
N203	School	WENTWORTH FALLS PUBLIC SCHOOL	-33.71309	150.37263

A2 Noise Sensitive Areas – Modelled Average Sound Levels L_{Aeq} dB(A) – PAL1 – 2033

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	54.2	53.8	54.4	53.4	53.6	53.0	51.8	51.2	51.2
M02	North East Departure	53.8	52.3	54.8	53.0	51.1	55.5	49.3	45.2	45.4
M03	North East Runway	48.0	50.3	44.5	47.8	49.1	40.0	38.3	28.1	27.6
M04	Twin Creeks	44.1	46.0	41.2	43.7	44.8	38.3	48.4	37.3	36.5
M06	Mount Vernon	39.7	41.3	37.4	38.1	38.8	35.6	30.6	26.6	26.6
M07	Kemps Creek Nature Reserve	34.2	35.5	32.3	30.7	30.9	30.0	25.6	24.9	24.9
M08	Luddenham	38.8	38.8	38.8	35.8	35.7	36.0	38.6	34.1	34.0
M09	Penrith	38.9	40.7	36.5	38.8	40.0	32.6	22.6	18.4	18.3
M10	Glenmore Park	35.7	34.9	36.4	34.0	32.7	35.8	30.5	23.8	23.6
M11	Oxley Park	38.3	40.3	35.5	36.9	38.0	32.0	30.6	21.1	20.7
M12	St. Marys	44.6	46.9	41.2	44.1	45.4	37.3	38.7	27.4	26.7
M13	Rooty Hill	39.5	38.3	40.3	36.9	34.2	40.1	35.1	31.1	31.3
M14	St. Clair	46.7	49.0	43.1	46.3	47.6	38.7	37.6	26.9	26.4
M15	Erskine Park	44.0	46.2	40.6	43.3	44.6	36.6	31.2	23.6	23.5
M16	Sydney International Equestrian Centre	32.0	33.0	30.4	27.3	26.5	28.7	22.8	19.9	20.0
M17	Wallacia	38.2	36.0	39.7	31.7	31.4	32.3	32.3	43.2	43.2
M18	Warragamba	35.1	33.0	36.4	31.1	29.8	33.3	30.4	35.6	35.6
M19	Greendale	53.5	51.8	54.5	52.1	51.1	54.0	51.1	50.8	50.8
M20	Bringelly	36.6	36.1	37.1	34.0	34.1	33.9	31.6	33.4	33.4
M21	Bents Basin	52.4	51.5	53.0	51.1	51.0	51.6	49.9	48.8	48.8
M22	Silverdale	54.1	54.1	54.1	53.6	54.0	52.5	51.9	51.5	51.6
M23	Werombi	33.6	33.1	34.0	31.7	31.8	31.6	31.3	29.6	29.6
M24	Blaxland	37.3	38.5	36.2	36.1	37.4	28.5	23.5	23.6	23.6
M25	Linden	38.8	36.5	40.0	36.5	34.4	39.2	33.0	36.6	36.6
M26	North Richmond	29.2	29.6	28.9	22.2	23.2	18.0	18.4	10.2	10.0
M27	Kurrajong	26.3	26.4	26.3	18.4	19.1	16.2	15.7	8.5	8.2
M28	The Oaks	34.4	33.9	34.8	32.3	32.0	32.9	24.4	28.7	28.7
M29	Lake Burragorang (Natai, Brownlow Hill)	35.3	32.7	36.7	32.7	30.3	35.7	29.3	25.2	25.4
M30	Tahmoor	29.5	26.7	31.0	26.3	23.4	29.7	19.0	27.6	27.6
R1	Bringelly	32.9	32.8	33.1	30.7	30.8	30.6	26.8	28.0	28.0
R2	Luddenham	43.4	43.2	43.6	40.7	40.8	40.2	39.0	38.3	38.3

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R3	Greendale, Greendale Road	48.4	45.9	49.7	46.1	44.1	48.8	45.3	52.4	52.4
R6	Kemps Creek	35.2	34.2	36.1	31.1	31.3	30.2	40.6	33.1	32.8
R7	Wallacia	38.6	36.3	40.1	32.1	31.7	32.9	32.3	43.9	43.9
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	47.7	49.6	45.1	47.6	48.6	43.1	50.9	39.9	39.2
R14	Lawson Road, Badgerys Creek	48.5	50.4	45.7	47.9	49.0	43.2	43.5	36.8	36.7
R15	Mersey Rd, Greendale	39.3	38.9	39.7	36.8	36.9	36.4	34.6	35.5	35.5
R17	Luddenham Road	45.6	46.8	44.3	43.8	44.2	42.5	44.5	40.1	40.0
R18	Cnr Adams & Elizabeth Drive	51.3	51.6	51.0	49.3	49.2	49.7	47.6	47.4	47.4
R19	Cnr Adams & Anton Road	50.4	50.5	50.3	47.8	47.6	48.1	46.0	46.1	46.1
R21	Cnr Willowdene Ave and Vicar Park Lane	60.3	58.2	61.5	58.5	57.0	60.8	57.4	60.6	60.6
R22	Rossmore, Victor Ave	37.0	38.0	35.7	34.1	34.2	33.7	30.9	30.6	30.6
R23	Wallacia, Greendale Road	41.5	39.1	43.0	37.6	36.1	40.0	36.6	49.9	49.9
R24	Badgerys Creek 1 NE	51.3	52.8	49.5	50.2	51.0	47.6	47.7	44.3	44.3
R25	Badgerys Creek 2 SW	52.7	51.9	53.3	50.8	50.6	51.2	49.0	50.0	50.0
R27	Greendale, Dwyer Rd	38.9	38.0	39.7	36.4	36.0	37.1	34.4	37.9	37.9
R30	Rossmore residential	31.2	31.7	30.6	29.4	29.2	29.7	22.7	23.4	23.4
R31	Mt Vernon residential	38.8	40.3	36.6	36.9	37.5	34.9	29.7	25.9	25.9
R34	Emmaus Residential Aged Care	47.3	49.3	44.4	46.8	47.9	41.8	35.0	29.8	29.9
R35	Mamre After School and Vacation Care	50.4	52.7	47.2	50.2	51.4	43.8	36.8	30.8	30.9
R37	Schoolies at Mulgoa	49.3	48.6	49.9	47.0	47.1	46.8	44.9	45.0	45.0
R38	Do-re-mi Day Care Centre	37.8	39.4	35.4	35.7	36.4	33.1	28.5	25.1	25.1
R39	Little Amigos Austral Early Learning Centre	31.1	32.1	29.5	28.1	27.9	28.7	20.3	20.8	20.8
R40	Little Smarties Childcare Centre	50.4	52.6	47.2	50.2	51.4	43.9	36.9	30.9	31.0
R41	The Grove Academy	34.9	36.2	33.1	31.8	32.1	30.9	27.0	26.2	26.2
R42	Horsley Kids	35.1	35.4	34.6	31.8	30.0	34.2	28.1	24.5	24.6
R44	Bringelly Child Care Centre	37.8	37.2	38.4	35.2	35.2	35.4	33.0	35.3	35.3
R46	Chementson Drive Early Educational Centre	34.4	35.3	33.3	31.2	31.1	31.3	27.7	27.9	27.9
R48	Kids Korner West Hoxton Early Learning Centre	31.5	32.7	29.3	26.9	26.6	27.5	19.8	20.0	20.0
R49	Luddenham Child Care Centre	47.3	46.9	47.6	45.0	45.3	44.1	42.8	42.2	42.2
R52	The Frogs Lodge	31.3	32.5	29.4	27.6	27.4	28.2	20.3	20.6	20.6
R54	Mulgoa Preschool	34.7	33.9	35.5	31.0	31.2	30.5	42.7	33.1	32.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R55	Jillys Educational Childcare Centre	32.7	33.3	31.9	29.8	29.7	30.1	25.6	26.2	26.2
R59	Bringelly Community Centre	33.3	33.2	33.5	31.0	31.1	30.9	27.4	28.6	28.6
R63	Luddenham Progress Hall	50.2	49.8	50.6	48.3	48.5	47.6	46.0	45.7	45.7
R64	Mulgoa Hall	34.9	34.0	35.7	31.1	31.3	30.4	42.1	33.1	32.6
R65	Emmaus Catholic College	48.6	50.6	46.0	48.2	49.2	43.7	37.0	32.1	32.2
R66	University of Sydney Farms	37.1	35.5	38.2	34.7	33.6	36.7	33.3	46.8	46.8
R68	Christadelphian Heritage College Sydney	37.3	38.8	35.0	35.0	35.7	32.5	29.3	27.2	27.1
R69	Mamre Anglican School	50.5	52.7	47.2	50.2	51.4	43.9	36.9	30.9	30.9
R72	Irfan College	33.7	35.2	31.3	29.5	29.8	28.5	23.2	21.5	21.5
R73	Luddenham Public School	51.0	50.7	51.3	49.1	49.4	48.4	46.9	46.4	46.4
R74	Kemps Creek Public School	37.4	39.0	35.1	35.1	35.9	32.6	29.5	27.3	27.3
R75	Trinity Catholic Primary School	49.1	51.3	46.0	48.8	50.0	42.8	35.8	30.1	30.2
R76	Bringelly Public School	33.1	32.9	33.2	30.8	30.9	30.7	27.0	28.2	28.2
R78	Mulgoa Public School	34.9	34.0	35.7	31.0	31.2	30.3	42.1	33.2	32.7
R79	Rossmore Public School	31.2	31.6	30.7	29.4	29.2	29.8	22.7	23.4	23.4
R80	Wallacia Public School	38.1	35.9	39.6	31.6	31.3	32.2	32.4	42.8	42.8
R82	Bellfield College - Junior Campus	31.6	32.0	31.0	29.4	29.3	29.8	23.6	24.3	24.3
R84	Bringelly Park	33.4	33.3	33.6	31.1	31.2	31.0	27.6	28.8	28.8
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	41.6	39.9	42.6	39.4	38.4	41.1	38.6	37.1	37.2
R86	Blaxland Crossing Reserve	37.7	35.5	39.2	31.2	31.0	31.8	32.5	42.8	42.8
R87	Bill Anderson Reserve	38.2	39.9	35.8	36.3	37.1	33.3	30.3	27.6	27.6
R91	Western Sydney Parklands	43.8	41.4	45.2	42.5	39.4	45.8	39.4	35.5	35.7
R93	Rossmore Grange	32.9	33.4	32.2	30.1	29.9	30.4	26.1	26.6	26.6
R94	Freeburn Park	49.1	48.8	49.5	47.1	47.3	46.3	44.8	44.4	44.4
R95	Overett Reserve	43.7	45.4	41.2	42.7	43.7	38.7	37.8	33.4	33.3
R97	Mulgoa Park	34.9	34.0	35.7	31.0	31.3	30.3	42.1	33.1	32.6
R98	Wallacia Bowling and Recreation Club	39.2	36.8	40.7	32.7	32.2	33.8	32.3	45.8	45.8
R99	Hubertus Country Club	53.3	53.6	53.0	51.1	51.0	51.4	49.2	49.1	49.1
R100	Sugarloaf Cobbitty Equestrian Club	33.6	32.5	34.4	31.6	30.9	33.0	29.1	45.1	45.1
R102	Panthers Wallacia (country club)	38.4	36.2	39.9	31.9	31.5	32.6	32.2	43.8	43.8
R103	Twin Creeks Gold and Country Club	43.6	45.6	40.6	43.1	44.2	37.6	47.9	36.8	35.9
R104	Sydney International Shooting Centre	33.7	35.1	31.4	29.4	29.6	28.8	23.5	22.4	22.4
R108	Luddenham Showground	45.7	45.2	46.2	43.1	43.4	42.4	41.0	40.7	40.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R109	Kemps Creek Sporting and Bowling Club	35.7	37.2	33.2	32.5	33.1	30.6	26.4	24.5	24.4
R110	St James Luddenham	52.3	52.0	52.6	50.6	50.8	49.9	48.4	47.9	47.9
R111	Lin Ying Temple	33.9	34.9	32.6	30.6	30.6	30.6	26.7	26.9	26.9
R112	Vat Ketanak Khmer Kampuchea Krom	32.6	33.1	32.0	30.0	29.8	30.2	25.7	26.3	26.3
R114	Anglican Church Sydney Diocese	31.5	31.8	31.0	29.5	29.4	29.8	23.6	24.3	24.3
R115	Anglican Parish of Mulgoa	34.4	33.6	35.1	30.8	30.8	30.8	43.0	33.0	32.3
R117	Bringelly Vineyard Church	32.4	32.5	32.4	30.3	30.3	30.3	25.9	26.8	26.8
R120	Our Lady Queen of Peace	23.2	24.3	21.6	16.4	15.7	17.4	10.9	10.2	10.3
R122	St Anthony	31.2	32.4	29.5	27.8	27.5	28.3	20.4	20.8	20.8
R123	St Marys Church	35.5	34.4	36.4	31.2	31.5	30.3	39.2	33.1	32.9
R124	Wallacia Christian Church	38.6	36.3	40.1	32.1	31.7	32.9	32.3	43.9	43.9
R126	St Francis Xavier Church	57.5	57.5	57.4	57.2	57.6	56.4	55.3	55.3	55.3
R127	Luddenham Uniting Church	50.5	50.0	50.9	48.5	48.7	47.9	46.3	46.0	46.0
R131	Science of the Soul Study Centre	36.2	37.8	33.7	33.3	34.0	31.1	27.2	25.1	25.1
R132	Bringelly shops	32.9	32.8	33.1	30.7	30.8	30.6	26.8	28.0	28.0
R134	Kemps Creek shops	38.5	40.1	36.0	36.6	37.4	33.5	30.5	27.6	27.6
R135	Luddenham shops	53.8	53.6	54.1	52.2	52.4	51.5	50.0	49.5	49.5
R136	Mulgoa shops	35.2	34.2	36.1	31.1	31.3	30.2	40.6	33.1	32.8
R137	Rossmore shops	31.2	31.7	30.6	29.4	29.2	29.7	22.7	23.4	23.4
R138	Wallacia Shops	38.3	36.1	39.9	31.7	31.4	32.5	32.1	44.4	44.4
R140	Holy Family Catholic Primary and Church	49.2	48.4	49.9	46.7	46.7	46.8	44.7	45.1	45.1
R141	Edmund Rice Retreat and Conference Centre	36.4	34.7	37.6	30.9	31.0	30.5	35.3	36.8	36.8
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	47.3	49.3	44.4	46.8	47.9	41.8	35.0	29.8	29.9
N2	JOHN EDMONDSON VC GARDENS	31.1	32.2	29.5	28.0	27.7	28.5	20.3	20.8	20.8
N3	REGAL OAKS VILLAGE	38.5	36.2	40.0	31.8	31.4	32.7	32.1	45.0	45.0
N4	SCALABRINI VILLAGE AUSTRAL	30.8	31.8	29.5	28.6	28.3	29.3	19.2	19.7	19.7
N5	TOBRUK VILLAGE	31.1	32.2	29.5	28.0	27.7	28.5	20.2	20.7	20.7
N6	BLAXLAND PRE-SCHOOL	36.3	37.5	35.1	34.9	36.2	27.4	22.2	21.3	21.3
N7	GLENBROOK PRE-SCHOOL	34.3	34.0	34.6	30.4	31.4	26.8	24.1	23.3	23.3
N8	KEMPS CREEK CHILDRENS COTTAGE	34.9	36.2	33.1	31.8	32.1	30.9	27.0	26.3	26.3
N9	LAPSTONE PRE-SCHOOL	33.7	33.4	34.0	30.1	30.6	28.2	25.0	22.1	22.0

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N10	MindChamps Early Learning & Preschool Kemps Creek	34.9	36.2	33.1	31.8	32.1	30.9	27.0	26.3	26.3
N11	MY FIRST SCHOOL CHILDCARE CENTRE	43.9	46.1	40.6	43.2	44.4	36.8	37.9	26.6	26.0
N12	SILVERDALE CHILD CARE CENTRE	44.3	42.0	45.6	41.8	40.0	44.3	40.9	39.1	39.1
N13	WARRAGAMBA PRE-SCHOOL	35.8	33.7	37.2	32.2	30.6	34.5	31.1	34.9	34.9
N14	MINCHINBURY COMMUNITY HOSPITAL	35.3	36.3	33.8	30.7	30.3	31.5	26.2	22.2	22.3
N15	MOUNT DRUITT HOSPITAL	35.2	35.9	34.3	31.1	30.1	32.6	26.4	22.3	22.5
N16	NEPEAN HOSPITAL	40.7	42.1	39.1	40.6	41.5	37.5	24.2	19.1	19.0
N17	NEPEAN PRIVATE HOSPITAL	40.5	41.9	38.7	40.4	41.3	37.0	24.0	19.0	18.9
N18	AUSTRAL CHURCH OF CHRIST	31.1	32.2	29.4	28.0	27.7	28.5	20.1	20.6	20.6
N19	GOOD SHEPHERD CATHOLIC CHURCH	29.3	30.4	27.6	26.0	25.4	27.1	16.0	16.2	16.2
N20	Grace West Anglican Church - Glenmore Park	36.2	35.2	36.9	34.5	33.1	36.4	28.1	22.6	22.5
N21	Holy Family Church	49.1	48.2	49.8	46.6	46.5	46.6	44.5	45.0	45.0
N22	HOLY SPIRIT CATHOLIC CHURCH	30.4	31.6	28.6	27.3	26.8	28.3	17.0	17.4	17.4
N23	Holy Spirit Parish	43.7	45.9	40.3	43.0	44.3	36.1	33.7	23.8	23.4
N24	HOXTON PARK ANGLICAN CHURCH	30.3	31.5	28.3	26.7	26.2	27.6	17.2	17.6	17.6
N25	Imagine Nations Church	37.0	37.6	36.3	35.8	35.9	35.4	28.1	22.1	21.9
N26	INSPIRE CHURCH	29.0	30.1	27.3	25.6	25.0	26.7	15.7	15.9	15.9
N27	Mt Hope Uniting Church Orchard Hills	38.3	39.7	36.7	37.6	38.3	34.8	28.0	21.7	21.6
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	36.0	36.2	35.7	34.5	34.3	34.9	29.1	22.8	22.6
N29	Samoan Methodist Church	30.3	30.5	30.0	29.9	29.6	30.4	18.4	19.1	19.1
N30	SIKH MISSION CENTRE	31.1	32.1	29.7	28.3	28.0	28.8	20.9	21.3	21.3
N31	St Clair Anglican Church	39.2	41.3	36.1	37.8	39.0	32.3	28.0	21.6	21.5
N32	St Mary Mother of the Church	30.8	31.4	29.9	29.4	29.0	30.0	19.3	19.9	19.9
N33	ST ZAIA CATHEDRAL	30.8	32.1	28.7	26.0	25.6	26.8	18.6	18.7	18.7
N34	Uniting Church St Clair	41.4	43.6	38.1	40.4	41.7	34.0	30.5	22.1	21.9
N35	WEST HOXTON COMMUNITY CHURCH	31.1	32.3	28.9	26.7	26.3	27.5	18.9	19.2	19.2
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	32.4	33.6	30.4	28.1	27.9	28.3	22.3	22.4	22.4
N37	AUSTRAL PUBLIC SCHOOL	31.1	32.2	29.4	27.9	27.7	28.5	20.0	20.5	20.5
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	35.6	36.0	35.0	31.9	30.5	33.9	27.3	23.2	23.4
N39	BANKS PUBLIC SCHOOL	45.5	47.8	42.0	45.0	46.3	37.7	37.3	26.4	25.9
N40	BENNETT ROAD PUBLIC SCHOOL	38.7	40.8	35.6	37.3	38.5	31.6	29.2	20.9	20.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N41	BETHANY CATHOLIC PRIMARY SCHOOL	36.2	35.1	37.0	34.5	33.1	36.5	28.8	23.0	22.8
N42	BIDWILL PUBLIC SCHOOL	39.8	38.3	40.7	38.1	35.4	41.1	33.8	29.7	29.9
N43	BLACKETT PUBLIC SCHOOL	36.6	36.7	36.5	34.2	32.9	36.1	27.4	22.7	22.9
N44	BLACKTOWN NORTH PUBLIC SCHOOL	28.9	30.2	26.8	21.2	19.8	23.1	15.7	13.1	13.2
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	30.0	30.7	28.8	25.0	22.8	27.7	19.2	16.2	16.4
N46	BLACKTOWN TAFE COLLEGE	29.1	30.2	27.5	22.8	21.0	25.2	17.3	14.5	14.6
N47	BLACKTOWN WEST PUBLIC SCHOOL	32.3	32.5	31.9	28.6	26.0	31.6	23.1	19.6	19.9
N48	BLACKWELL PUBLIC SCHOOL	45.8	48.1	42.3	45.2	46.5	38.0	33.6	24.5	24.1
N49	BLAXLAND EAST PUBLIC SCHOOL	36.2	37.4	34.9	34.7	36.0	27.3	22.0	20.6	20.6
N50	BLAXLAND HIGH SCHOOL	37.6	38.9	36.2	36.7	38.0	28.6	24.6	23.1	23.2
N51	BLAXLAND PUBLIC SCHOOL	37.5	38.8	36.1	36.5	37.8	28.5	24.0	22.9	23.0
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	36.9	38.5	34.8	35.9	36.9	31.6	24.9	18.6	18.5
N53	CAMBRIDGE PARK PUBLIC SCHOOL	39.1	40.5	37.4	38.6	39.4	35.8	25.4	18.7	18.6
N54	CATHWEST INNOVATION COLLEGE	38.0	39.8	35.6	37.9	39.2	29.8	21.7	18.4	18.4
N55	CECIL HILLS PUBLIC SCHOOL	30.5	31.8	28.5	25.4	25.1	26.0	18.9	18.2	18.3
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	39.6	38.2	40.5	37.9	35.2	40.9	33.4	29.4	29.6
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	40.6	42.2	38.7	39.6	40.2	37.5	33.4	22.7	22.2
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	35.8	36.5	35.1	33.1	32.5	34.2	26.1	20.9	21.0
N59	CHIFLEY COLLEGE SENIOR CAMPUS	35.1	36.0	34.0	30.9	30.0	32.3	26.3	22.2	22.4
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	39.5	38.5	40.1	38.2	36.2	40.7	28.3	23.3	23.4
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	37.2	38.8	34.9	34.9	35.6	32.4	29.3	27.1	27.1
N62	CLAIRGATE PUBLIC SCHOOL	38.8	40.9	35.8	37.3	38.5	31.8	27.8	21.2	21.1
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	42.9	45.0	39.9	42.7	43.9	36.3	32.8	23.0	22.6
N64	COLYTON HIGH SCHOOL	37.2	39.1	34.4	35.3	36.4	30.3	27.7	20.0	19.9
N65	COLYTON PUBLIC SCHOOL	35.0	36.6	32.8	31.5	32.2	29.3	24.8	19.5	19.5
N66	DAWSON PUBLIC SCHOOL	35.8	36.3	35.1	32.9	32.2	34.1	26.3	21.3	21.4
N67	EASTERN CREEK PUBLIC SCHOOL	42.4	40.5	43.6	40.3	37.3	43.6	39.1	35.0	35.2
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	42.4	40.5	43.6	40.3	37.3	43.6	39.1	35.0	35.2
N69	EMERTON PUBLIC SCHOOL	36.3	37.1	35.4	34.2	34.0	34.6	26.4	19.9	19.9
N70	EMU HEIGHTS PUBLIC SCHOOL	37.4	39.1	35.2	37.0	38.3	28.5	21.9	19.3	19.3

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N71	EMU PLAINS PUBLIC SCHOOL	36.3	37.7	34.8	35.2	36.4	28.9	22.5	19.6	19.5
N72	ERSKINE PARK HIGH SCHOOL	39.6	41.5	36.8	38.2	39.2	33.9	28.7	23.4	23.4
N73	GLENBROOK PUBLIC SCHOOL	34.3	34.2	34.6	30.6	31.6	26.7	23.9	23.0	23.0
N74	GLENDENNING PUBLIC SCHOOL	40.7	38.8	41.8	39.0	36.0	42.3	35.9	31.9	32.1
N75	GLENMORE PARK PUBLIC SCHOOL	36.6	35.7	37.2	35.0	33.8	36.8	27.9	22.3	22.2
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	29.3	30.4	27.6	26.0	25.4	27.1	16.0	16.2	16.2
N77	GOOD SHEPHERD PRIMARY SCHOOL	38.4	37.4	39.0	36.2	33.6	39.2	32.6	28.5	28.8
N78	GREENWAY PARK PUBLIC SCHOOL	30.6	31.8	28.8	27.4	27.0	28.3	17.5	17.9	17.9
N79	HASSALL GROVE PUBLIC SCHOOL	41.7	39.7	42.9	40.3	37.3	43.6	37.2	33.2	33.4
N80	HEBERSHAM PUBLIC SCHOOL	36.0	36.2	35.8	32.9	31.4	35.1	28.1	23.9	24.1
N81	HOLY FAMILY PRIMARY SCHOOL	36.8	37.7	35.9	35.0	34.8	35.4	27.0	19.8	19.8
N82	HOLY SPIRIT PRIMARY SCHOOL	43.9	46.1	40.4	43.2	44.5	36.2	33.8	23.9	23.5
N83	HOLY SPIRIT PRIMARY SCHOOL	30.4	31.6	28.6	27.3	26.8	28.3	17.0	17.4	17.4
N84	HORSLEY PARK PUBLIC SCHOOL	34.7	35.0	34.2	31.4	29.5	33.8	27.7	24.0	24.2
N85	HOXTON PARK PUBLIC SCHOOL	30.1	31.3	28.2	26.6	26.1	27.6	17.0	17.3	17.3
N86	JAMES ERSKINE PUBLIC SCHOOL	39.1	41.0	36.3	37.6	38.6	33.1	28.2	22.8	22.8
N87	JAMISON HIGH SCHOOL	38.1	38.3	38.0	37.2	36.9	37.5	25.7	20.8	20.7
N88	JAMISONTOWN PUBLIC SCHOOL	36.7	36.9	36.6	35.5	35.3	35.6	25.1	20.7	20.6
N89	JORDAN SPRINGS PUBLIC SCHOOL	36.0	37.7	33.8	34.7	35.8	29.9	27.0	20.6	20.6
N90	KINGSWOOD PARK PUBLIC SCHOOL	41.6	42.9	40.2	41.4	42.1	39.0	26.1	19.7	19.5
N91	KINGSWOOD PUBLIC SCHOOL	41.8	43.1	40.3	41.6	42.3	39.0	26.2	19.8	19.6
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	40.4	41.5	39.3	40.1	40.6	38.3	24.9	19.9	19.8
N93	LAPSTONE PUBLIC SCHOOL	33.8	33.6	34.1	30.2	30.9	27.7	24.6	22.0	22.0
N94	LEONAY PUBLIC SCHOOL	34.5	34.9	34.2	32.0	32.8	28.8	24.0	20.8	20.8
N95	LEPPINGTON PUBLIC SCHOOL	30.8	31.5	29.7	29.2	28.9	29.9	18.3	18.9	18.9
N96	LETHBRIDGE PARK PUBLIC SCHOOL	36.6	36.7	36.5	34.2	32.9	36.1	27.4	22.7	22.9
N97	LLANDILO PUBLIC SCHOOL	40.1	42.3	36.9	39.2	40.5	32.9	35.8	28.9	28.9
N98	LYNWOOD PARK PUBLIC SCHOOL	27.8	29.3	25.4	18.7	17.9	20.0	13.0	11.1	11.1
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	28.9	30.0	27.3	26.5	25.8	27.7	13.8	14.0	14.0
N100	MACQUARIE FIELDS TAFE COLLEGE	28.1	29.0	26.8	26.0	25.3	27.4	12.8	13.1	13.1
N101	MADANG AVENUE PUBLIC SCHOOL	35.4	36.9	33.4	32.8	33.4	30.6	26.0	19.1	19.0
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	29.8	30.9	27.9	26.1	25.6	27.1	16.7	16.9	16.9
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	30.2	31.6	28.1	22.6	21.1	24.6	17.5	14.4	14.5

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N104	MARAYONG PUBLIC SCHOOL	30.9	31.8	29.6	25.4	23.3	28.0	20.4	17.0	17.2
N105	MIDDLETON GRANGE PUBLIC SCHOOL	30.2	31.4	28.2	25.7	25.3	26.7	17.7	17.8	17.8
N106	MINCHINBURY PUBLIC SCHOOL	36.0	36.8	35.0	31.6	30.6	33.2	28.3	24.3	24.4
N107	MONTGROVE COLLEGE	39.6	40.4	38.7	39.0	39.3	37.8	26.1	20.6	20.5
N108	MOUNT DRUITT PUBLIC SCHOOL	34.9	36.3	32.9	31.5	32.0	29.9	24.9	19.2	19.2
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	34.9	36.3	33.0	31.5	32.0	30.0	25.0	19.2	19.3
N110	MOUNT DRUITT TAFE COLLEGE	34.8	35.9	33.4	30.6	30.2	31.1	25.3	21.1	21.2
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	37.9	39.6	35.7	37.6	39.0	28.7	23.3	20.7	20.7
N112	NEPEAN CHRISTIAN SCHOOL	34.8	33.7	35.7	32.5	31.3	34.4	35.5	27.1	26.8
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	37.8	39.5	35.6	37.5	38.7	29.8	21.9	18.8	18.8
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	42.1	43.6	40.3	41.9	42.7	38.8	28.9	20.6	20.3
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	39.1	40.9	36.8	39.1	40.3	32.9	22.6	18.6	18.5
N116	NOUMEA PUBLIC SCHOOL	39.0	38.2	39.6	37.6	35.7	40.2	28.2	23.3	23.4
N117	ORCHARD HILLS PUBLIC SCHOOL	38.4	39.8	36.7	37.6	38.4	34.8	28.1	21.8	21.6
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	43.5	45.7	40.2	42.8	44.0	36.3	37.2	26.0	25.4
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	35.8	37.0	34.6	34.4	35.6	28.6	22.8	19.8	19.8
N120	OXLEY PARK PUBLIC SCHOOL	38.6	40.7	35.7	37.3	38.5	32.0	30.8	21.2	20.9
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	38.1	39.9	35.7	38.0	39.3	29.9	21.7	18.4	18.4
N122	PENRITH ANGLICAN COLLEGE	34.9	35.6	34.2	33.0	33.3	32.1	31.5	24.1	23.9
N123	PENRITH CHRISTIAN SCHOOL	36.9	37.5	36.4	35.8	35.8	35.5	28.1	22.1	21.9
N124	PENRITH HIGH SCHOOL	40.0	41.6	38.0	40.0	41.0	35.5	23.3	18.9	18.8
N125	PENRITH PUBLIC SCHOOL	39.9	41.5	37.8	39.8	40.9	35.2	23.2	18.8	18.8
N126	PENRITH SOUTH PUBLIC SCHOOL	39.4	40.7	38.0	39.1	39.9	36.3	23.8	19.5	19.4
N127	PLUMPTON HIGH SCHOOL	38.5	37.4	39.1	36.2	33.6	39.3	32.7	28.7	28.9
N128	PLUMPTON PUBLIC SCHOOL	39.5	38.1	40.3	37.5	34.7	40.7	34.2	30.2	30.4
N129	REGENTVILLE PUBLIC SCHOOL	35.5	35.1	35.8	33.6	33.0	34.5	26.1	21.6	21.5
N130	ROOTY HILL HIGH SCHOOL	36.4	36.5	36.1	32.7	30.8	35.3	29.4	25.4	25.6
N131	ROOTY HILL PUBLIC SCHOOL	37.1	36.8	37.2	33.9	31.6	36.7	30.8	26.8	27.0
N132	ROPES CROSSING PUBLIC SCHOOL	41.4	42.1	40.8	40.4	40.2	40.8	32.5	22.8	22.5
N133	SACRED HEART PRIMARY SCHOOL	35.0	36.6	32.8	31.6	32.2	29.3	24.8	19.5	19.5

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N134	SHALVEY PUBLIC SCHOOL	40.4	39.0	41.3	39.2	36.9	42.0	30.3	25.8	26.0
N135	SHELLEY PUBLIC SCHOOL	28.1	29.2	26.5	22.0	20.3	24.3	16.2	13.8	13.9
N136	ST AIDAN'S PRIMARY SCHOOL	36.6	36.5	36.5	33.2	31.1	35.8	29.5	25.6	25.8
N137	ST ANDREWS PRIMARY SCHOOL	30.9	32.1	29.2	24.3	22.5	26.6	19.4	16.0	16.2
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	31.3	32.4	29.6	27.9	27.7	28.4	20.7	21.1	21.1
N139	ST CLAIR HIGH SCHOOL	41.5	43.7	38.2	40.6	41.8	34.1	31.8	22.5	22.2
N140	ST CLAIR PUBLIC SCHOOL	42.6	44.8	39.2	41.8	43.1	35.1	31.7	22.8	22.5
N141	ST FINBAR'S PRIMARY SCHOOL	34.5	34.7	34.6	31.3	32.4	26.6	23.2	22.2	22.2
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	39.4	37.9	40.3	37.6	34.6	40.8	34.3	30.3	30.5
N143	ST JOSEPH'S PRIMARY SCHOOL	40.7	42.0	39.2	40.5	41.2	37.9	25.1	19.0	18.9
N144	ST MARY MACKILLOP PRIMARY SCHOOL	38.1	38.4	37.7	37.1	37.0	37.2	26.7	21.3	21.1
N145	ST MARYS NORTH PUBLIC SCHOOL	40.6	42.4	38.2	39.6	40.5	36.2	34.0	23.1	22.6
N146	ST MARYS PUBLIC SCHOOL	43.4	45.6	40.1	42.7	43.9	36.7	37.6	26.2	25.6
N147	ST MARYS SENIOR HIGH SCHOOL	43.1	45.3	40.0	42.4	43.6	36.9	37.4	26.1	25.4
N148	ST MARYS SOUTH PUBLIC SCHOOL	43.2	45.5	39.9	42.5	43.8	35.8	36.0	25.1	24.5
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	39.5	41.1	37.3	39.4	40.5	34.2	23.0	18.8	18.8
N150	SURVEYORS CREEK PUBLIC SCHOOL	36.3	35.8	36.7	34.8	33.8	36.3	28.8	22.7	22.6
N151	THOMAS HASSALL ANGLICAN COLLEGE	30.7	32.0	28.6	26.2	25.7	27.0	18.4	18.6	18.6
N152	TREGEAR PUBLIC SCHOOL	37.9	39.0	36.8	36.5	36.6	36.2	28.8	20.0	19.8
N153	UNITY GRAMMAR COLLEGE	30.9	31.8	29.6	28.7	28.4	29.2	20.0	20.5	20.5
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	42.0	43.4	40.3	41.8	42.6	38.9	26.9	20.1	19.9
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	42.3	43.9	40.4	41.9	42.7	39.0	31.9	21.9	21.5
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	42.3	44.1	40.1	42.1	43.1	38.0	30.4	21.4	21.0
N157	WALTERS ROAD PUBLIC SCHOOL	34.1	33.3	34.4	31.9	28.9	35.0	25.4	22.0	22.2
N158	WARRAGAMBA PUBLIC SCHOOL	36.0	33.8	37.3	32.3	30.7	34.8	31.2	34.7	34.8
N159	WARRIMOO PUBLIC SCHOOL	37.3	38.5	36.1	36.2	37.5	28.5	26.7	24.4	24.5
N160	WERRINGTON COUNTY PUBLIC SCHOOL	41.2	42.5	39.7	40.4	40.9	38.9	31.9	21.6	21.2
N161	WERRINGTON PUBLIC SCHOOL	41.8	43.1	40.5	41.2	41.6	39.8	31.5	21.5	21.1
N162	WETHERILL PARK TAFE COLLEGE	25.1	26.0	23.6	19.6	18.9	20.9	14.2	13.1	13.2

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N163	WHALAN PUBLIC SCHOOL	35.2	36.5	33.7	32.4	32.6	31.7	25.5	19.4	19.5
N164	WILLIAM DEAN PUBLIC SCHOOL	36.3	35.8	36.5	33.4	30.7	36.5	29.6	25.7	25.9
N165	WILLMOT PUBLIC SCHOOL	39.9	39.8	40.0	38.8	37.8	40.4	30.6	24.3	24.4
N166	YORK PUBLIC SCHOOL	37.9	37.9	37.9	36.8	36.4	37.4	26.1	21.0	20.9
N167	AQUINAS COURT	34.8	34.2	35.5	30.9	31.3	29.5	22.9	23.5	23.5
N168	BAPTISTCARE MORVEN GARDENS CENTRE	27.7	28.5	26.8	22.1	22.4	21.0	22.3	23.5	23.5
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	28.6	29.9	27.1	22.8	23.5	20.4	22.3	23.0	23.0
N170	BUCKLAND	34.7	34.3	35.2	30.6	31.4	28.1	22.1	21.8	21.8
N171	MARTYN CLAVER AGED CARE	27.5	28.4	26.7	21.8	22.2	20.7	22.6	23.8	23.8
N172	WINGARA HAMLET	35.0	34.1	35.8	31.3	31.4	31.2	24.1	25.4	25.5
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	36.5	34.7	37.6	33.6	32.1	35.9	28.1	29.7	29.7
N174	KATOOMBA LEURA PRE-SCHOOL	27.7	28.7	26.6	21.5	22.1	19.7	24.2	24.9	24.9
N175	KEMPS CREEK CHILDRENS COTTAGE	34.9	36.2	33.1	31.8	32.1	30.9	27.0	26.3	26.3
N176	LAPSTONE PRE-SCHOOL	33.7	33.4	34.0	30.1	30.6	28.2	25.0	22.1	22.0
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	28.9	30.2	27.3	23.1	23.8	20.4	22.2	22.8	22.8
N178	SPRINGWOOD HOSPITAL	34.7	34.1	35.4	30.6	31.0	29.4	22.1	22.5	22.6
N179	ECHO POINT LOOKOUT	26.9	26.8	27.0	20.2	20.3	19.9	27.5	28.5	28.5
N180	ANGLICAN	27.6	28.5	26.7	21.8	22.2	20.4	23.0	24.0	24.0
N181	ANGLICAN	27.9	29.0	26.7	21.8	22.4	19.8	23.8	24.4	24.4
N182	BAPTIST	27.5	28.5	26.5	21.4	21.9	19.6	24.6	25.2	25.2
N183	BAPTIST	28.0	29.1	26.8	22.2	22.8	20.5	22.5	23.4	23.4
N184	UNITING	35.1	34.0	36.0	31.6	31.1	32.4	24.6	26.2	26.3
N185	BLUE MOUNTAINS STEINER SCHOOL	33.5	32.0	34.5	31.1	29.7	33.2	25.6	27.3	27.3
N186	ELLISON PUBLIC SCHOOL	34.6	34.3	35.1	30.6	31.4	27.6	21.4	20.7	20.8
N187	FAULCONBRIDGE PUBLIC SCHOOL	35.5	34.2	36.5	32.2	31.3	33.7	25.8	27.1	27.1
N188	HAZELBROOK PUBLIC SCHOOL	32.3	31.1	33.0	29.8	28.8	31.5	24.3	25.8	25.8
N189	KATOOMBA HIGH SCHOOL	26.9	27.1	26.7	20.4	20.6	19.7	26.4	27.3	27.3
N190	KATOOMBA NORTH PUBLIC SCHOOL	30.0	31.6	28.1	24.5	25.4	20.7	21.4	21.8	21.8
N191	KATOOMBA PUBLIC SCHOOL	27.3	28.1	26.5	21.1	21.6	19.7	24.8	25.5	25.5
N192	KINGSWOOD PARK PUBLIC SCHOOL	41.6	42.9	40.2	41.4	42.1	39.0	26.1	19.7	19.5
N193	KINGSWOOD PUBLIC SCHOOL	41.8	43.1	40.3	41.6	42.3	39.0	26.2	19.8	19.6
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	40.4	41.5	39.3	40.1	40.6	38.3	24.9	19.9	19.8

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N195	LAPSTONE PUBLIC SCHOOL	33.8	33.6	34.1	30.2	30.9	27.7	24.5	22.0	22.0
N196	LAWSON PUBLIC SCHOOL	29.4	28.9	29.8	26.2	25.8	27.2	21.5	23.6	23.6
N197	LEURA PUBLIC SCHOOL	27.9	28.9	26.8	22.2	22.6	20.7	22.4	23.4	23.4
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	30.3	29.5	30.8	27.4	26.7	28.7	22.0	24.1	24.1
N199	SPRINGWOOD HIGH SCHOOL	35.3	34.3	36.0	31.8	31.3	32.8	24.7	25.6	25.6
N200	SPRINGWOOD PUBLIC SCHOOL	35.1	34.7	35.6	31.5	32.1	29.2	24.0	24.0	24.0
N201	ST CANICES PRIMARY SCHOOL	27.7	28.7	26.6	21.5	22.1	19.7	24.2	24.9	24.9
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	34.9	35.0	35.1	31.2	32.1	27.6	20.5	19.5	19.5
N203	WENTWORTH FALLS PUBLIC SCHOOL	27.7	28.3	27.3	22.7	22.8	22.5	21.1	22.8	22.8

A3 Noise Sensitive Areas – Modelled Average Sound Levels L_{Aeq} dB(A) – PAL2 – 2040

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	55.7	55.2	56.0	54.9	55.3	54.1	53.8	53.2	55.7
M02	North East Departure	55.1	53.6	56.0	54.5	52.4	57.3	51.3	47.2	55.1
M03	North East Runway	49.8	52.0	46.5	48.9	50.2	41.2	41.9	31.1	49.8
M04	Twin Creeks	45.5	47.4	42.7	44.1	45.1	39.6	50.9	39.6	45.5
M06	Mount Vernon	40.8	42.3	38.7	38.6	39.1	37.2	32.3	28.0	40.8
M07	Kemps Creek Nature Reserve	35.3	36.4	33.8	31.5	31.6	31.4	26.6	25.6	35.3
M08	Luddenham	40.1	40.1	40.1	36.6	36.6	36.7	39.2	34.9	40.1
M09	Penrith	41.1	43.0	38.5	40.7	41.9	35.2	24.7	19.9	41.1
M10	Glenmore Park	37.0	36.3	37.6	36.1	34.7	38.4	31.3	24.9	37.0
M11	Oxley Park	39.5	41.4	36.7	37.2	38.3	33.1	33.9	23.6	39.5
M12	St. Marys	46.1	48.3	42.9	44.5	45.8	38.1	42.3	30.7	46.1
M13	Rooty Hill	40.5	39.1	41.3	39.5	36.6	42.9	37.1	33.0	40.5
M14	St. Clair	48.3	50.6	45.0	46.9	48.2	39.5	41.7	30.5	48.3
M15	Erskine Park	45.4	47.6	42.2	43.7	44.9	37.4	34.5	25.8	45.4
M16	Sydney International Equestrian Centre	32.9	33.8	31.6	29.1	28.2	30.8	24.8	21.4	32.9
M17	Wallacia	38.9	37.0	40.3	32.4	32.2	32.8	33.0	45.2	38.9
M18	Warragamba	36.2	34.3	37.4	31.8	30.8	33.6	31.4	38.3	36.2
M19	Greendale	54.9	53.2	55.9	52.9	52.3	54.2	52.9	52.4	54.9
M20	Bringelly	37.9	37.5	38.3	34.7	34.7	34.6	32.4	34.0	37.9
M21	Bents Basin	53.9	52.9	54.5	52.6	52.6	52.6	51.8	50.7	53.9
M22	Silverdale	55.6	55.5	55.7	55.3	55.8	53.7	53.8	53.5	55.6
M23	Werombi	35.3	35.0	35.6	33.5	33.8	32.9	32.1	30.5	35.3
M24	Blaxland	39.2	40.7	37.5	38.0	39.3	30.6	25.9	26.2	39.2
M25	Linden	39.9	37.7	41.0	36.3	34.6	38.7	35.4	39.9	39.9
M26	North Richmond	29.5	30.0	29.1	21.6	22.5	17.6	21.6	12.8	29.5
M27	Kurrajong	26.6	26.7	26.5	17.4	18.1	15.1	18.6	11.0	26.6
M28	The Oaks	36.8	36.3	37.1	34.4	34.1	35.0	25.0	28.8	36.8
M29	Lake Burragorang (Natai, Brownlow Hill)	37.7	35.1	39.1	34.7	32.3	37.6	30.2	26.7	37.7
M30	Tahmoor	32.0	29.1	33.4	28.4	25.7	31.6	19.6	27.5	32.0
R1	Bringelly	34.6	34.5	34.6	31.9	31.9	31.8	27.6	28.6	34.6
R2	Luddenham	44.7	44.6	44.9	41.3	41.5	40.9	39.8	39.3	44.7

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R3	Greendale, Greendale Road	49.7	47.3	51.0	46.5	44.9	48.9	46.7	53.6	49.7
R6	Kemps Creek	36.2	35.5	36.8	32.6	33.0	31.5	41.2	34.7	36.2
R7	Wallacia	39.3	37.3	40.7	32.7	32.5	33.3	32.9	46.0	39.3
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	49.1	51.0	46.6	47.9	48.8	44.4	53.1	42.0	49.1
R14	Lawson Road, Badgerys Creek	49.9	51.8	47.3	48.4	49.4	44.2	44.8	37.8	49.9
R15	Mersey Rd, Greendale	40.6	40.3	40.9	37.3	37.4	37.1	35.3	36.0	40.6
R17	Luddenham Road	47.0	48.0	45.8	44.3	44.8	42.8	45.2	40.8	47.0
R18	Cnr Adams & Elizabeth Drive	52.7	53.0	52.5	49.9	49.8	50.0	48.3	48.3	52.7
R19	Cnr Adams & Anton Road	51.7	51.7	51.6	48.3	48.2	48.6	47.0	47.2	51.7
R21	Cnr Willowdene Ave and Vicar Park Lane	61.8	59.6	63.0	59.2	58.0	61.1	59.0	62.1	61.8
R22	Rossmore, Victor Ave	38.3	39.1	37.2	34.7	34.9	34.4	31.7	31.2	38.3
R23	Wallacia, Greendale Road	42.6	40.3	44.0	38.1	36.7	40.2	37.7	52.5	42.6
R24	Badgerys Creek 1 NE	52.7	54.2	51.0	50.7	51.5	48.0	48.6	45.1	52.7
R25	Badgerys Creek 2 SW	54.1	53.3	54.6	51.0	50.7	51.7	49.6	50.5	54.1
R27	Greendale, Dwyer Rd	40.2	39.4	40.8	36.8	36.5	37.6	35.2	38.5	40.2
R30	Rossmore residential	33.3	33.6	33.0	31.0	30.8	31.3	23.4	24.0	33.3
R31	Mt Vernon residential	39.9	41.3	37.9	37.5	37.9	36.5	31.4	27.3	39.9
R34	Emmaus Residential Aged Care	48.8	50.8	46.0	47.6	48.6	43.2	37.3	31.7	48.8
R35	Mamre After School and Vacation Care	52.2	54.3	49.1	51.2	52.4	45.2	39.2	32.8	52.2
R37	Schoolies at Mulgoa	50.6	50.0	51.2	47.3	47.2	47.4	45.5	45.7	50.6
R38	Do-re-mi Day Care Centre	38.9	40.4	36.7	36.2	36.7	34.7	30.2	26.3	38.9
R39	Little Amigos Austral Early Learning Centre	32.9	33.6	32.0	29.9	29.7	30.5	21.2	21.4	32.9
R40	Little Smarties Childcare Centre	52.1	54.3	49.1	51.2	52.4	45.3	39.2	32.9	52.1
R41	The Grove Academy	36.1	37.1	34.6	32.5	32.7	32.1	28.0	26.9	36.1
R42	Horsley Kids	36.1	36.2	35.9	33.6	31.6	36.3	30.2	26.3	36.1
R44	Bringelly Child Care Centre	39.1	38.6	39.6	35.8	35.7	36.0	33.8	35.9	39.1
R46	Chementson Drive Early Educational Centre	35.7	36.4	34.8	32.0	32.0	32.2	28.5	28.6	35.7
R48	Kids Korner West Hoxton Early Learning Centre	32.8	33.7	31.4	28.8	28.5	29.5	20.8	20.7	32.8
R49	Luddenham Child Care Centre	48.6	48.3	48.8	45.4	45.6	44.8	43.4	42.9	48.6
R52	The Frogs Lodge	32.9	33.7	31.7	29.4	29.1	30.0	21.2	21.3	32.9
R54	Mulgoa Preschool	35.8	35.3	36.3	32.6	32.8	31.9	43.5	34.3	35.8

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R55	Jillys Educational Childcare Centre	34.2	34.7	33.7	31.0	30.9	31.3	26.4	26.8	34.2
R59	Bringelly Community Centre	34.9	34.8	35.0	32.1	32.1	32.0	28.2	29.3	34.9
R63	Luddenham Progress Hall	51.6	51.3	51.9	48.6	48.6	48.3	46.7	46.3	51.6
R64	Mulgoa Hall	35.9	35.4	36.5	32.6	32.9	31.7	42.8	34.3	35.9
R65	Emmaus Catholic College	50.1	52.1	47.6	49.0	50.0	45.3	39.2	34.0	50.1
R66	University of Sydney Farms	38.5	37.0	39.4	35.3	34.4	36.8	34.4	47.7	38.5
R68	Christadelphian Heritage College Sydney	38.4	39.8	36.4	35.4	36.0	33.7	30.5	27.9	38.4
R69	Mamre Anglican School	52.2	54.3	49.2	51.2	52.5	45.3	39.2	32.8	52.2
R72	Irfan College	34.7	36.0	32.6	30.6	30.7	30.3	24.7	22.4	34.7
R73	Luddenham Public School	52.3	52.1	52.6	49.5	49.6	49.0	47.6	47.0	52.3
R74	Kemps Creek Public School	38.5	40.0	36.5	35.6	36.2	33.8	30.6	28.0	38.5
R75	Trinity Catholic Primary School	50.8	52.9	47.8	49.7	50.9	44.2	38.2	32.1	50.8
R76	Bringelly Public School	34.7	34.6	34.7	31.9	32.0	31.8	27.8	28.9	34.7
R78	Mulgoa Public School	35.9	35.3	36.5	32.6	32.9	31.7	42.8	34.5	35.9
R79	Rossmore Public School	33.3	33.6	33.0	31.0	30.8	31.4	23.4	24.0	33.3
R80	Wallacia Public School	38.8	36.9	40.1	32.3	32.2	32.6	33.0	44.8	38.8
R82	Bellfield College - Junior Campus	33.5	33.8	33.1	30.9	30.8	31.3	24.4	24.9	33.5
R84	Bringelly Park	35.0	34.9	35.1	32.2	32.2	32.0	28.3	29.5	35.0
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	43.0	41.3	44.1	40.6	40.0	41.7	40.1	38.6	43.0
R86	Blaxland Crossing Reserve	38.4	36.6	39.8	32.0	31.9	32.2	33.1	44.9	38.4
R87	Bill Anderson Reserve	39.4	40.9	37.2	36.7	37.3	34.4	31.5	28.4	39.4
R91	Western Sydney Parklands	45.2	42.6	46.5	44.2	41.1	47.6	41.5	37.4	45.2
R93	Rossmore Grange	34.4	34.8	33.9	31.2	31.1	31.5	26.8	27.2	34.4
R94	Freeburn Park	50.5	50.2	50.7	47.4	47.6	47.0	45.5	45.0	50.5
R95	Overett Reserve	45.0	46.7	42.7	43.1	44.0	39.6	39.0	34.2	45.0
R97	Mulgoa Park	35.9	35.4	36.4	32.6	32.9	31.7	42.9	34.4	35.9
R98	Wallacia Bowling and Recreation Club	39.9	37.8	41.3	33.3	32.9	34.1	33.1	47.8	39.9
R99	Hubertus Country Club	54.7	54.9	54.4	51.7	51.6	51.9	50.1	50.2	54.7
R100	Sugarloaf Cobbitty Equestrian Club	35.2	34.2	35.9	32.6	32.1	33.5	30.2	45.9	35.2
R102	Panthers Wallacia (country club)	39.1	37.2	40.5	32.6	32.3	33.0	32.9	45.9	39.1
R103	Twin Creeks Gold and Country Club	45.0	46.9	42.1	43.6	44.7	38.8	50.5	39.1	45.0
R104	Sydney International Shooting Centre	34.7	35.9	32.9	30.5	30.5	30.5	24.7	23.1	34.7
R108	Luddenham Showground	47.0	46.6	47.4	43.6	43.7	43.1	41.7	41.4	47.0

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R109	Kemps Creek Sporting and Bowling Club	36.7	38.1	34.6	33.1	33.5	32.1	27.7	25.3	36.7
R110	St James Luddenham	53.7	53.5	53.9	50.9	51.0	50.6	49.0	48.5	53.7
R111	Lin Ying Temple	35.2	35.9	34.2	31.5	31.5	31.6	27.5	27.5	35.2
R112	Vat Ketanak Khmer Kampuchea Krom	34.2	34.5	33.8	31.2	31.1	31.4	26.4	26.9	34.2
R114	Anglican Church Sydney Diocese	33.5	33.7	33.2	31.0	30.9	31.3	24.3	24.9	33.5
R115	Anglican Parish of Mulgoa	35.5	34.9	36.0	32.4	32.4	32.4	43.9	34.1	35.5
R117	Bringelly Vineyard Church	34.1	34.2	34.1	31.6	31.5	31.6	26.6	27.5	34.1
R120	Our Lady Queen of Peace	24.2	25.0	23.0	18.7	17.9	20.1	12.8	11.3	24.2
R122	St Anthony	32.9	33.7	31.8	29.6	29.3	30.1	21.3	21.4	32.9
R123	St Marys Church	36.4	35.7	37.1	32.6	33.0	31.4	39.8	34.8	36.4
R124	Wallacia Christian Church	39.3	37.3	40.7	32.7	32.5	33.3	32.9	46.0	39.3
R126	St Francis Xavier Church	58.9	58.8	58.9	58.6	59.2	57.0	57.2	57.3	58.9
R127	Luddenham Uniting Church	51.8	51.5	52.1	48.8	48.9	48.5	46.9	46.6	51.8
R131	Science of the Soul Study Centre	37.2	38.7	35.1	33.9	34.3	32.5	28.5	25.9	37.2
R132	Bringelly shops	34.6	34.5	34.6	31.9	31.9	31.8	27.6	28.6	34.6
R134	Kemps Creek shops	39.6	41.2	37.4	37.0	37.7	34.7	31.7	28.4	39.6
R135	Luddenham shops	55.2	55.0	55.4	52.5	52.6	52.2	50.6	50.0	55.2
R136	Mulgoa shops	36.2	35.5	36.8	32.6	33.0	31.5	41.2	34.7	36.2
R137	Rossmore shops	33.3	33.6	33.0	31.0	30.8	31.3	23.4	24.0	33.3
R138	Wallacia Shops	39.1	37.0	40.4	32.4	32.2	32.9	32.8	46.4	39.1
R140	Holy Family Catholic Primary and Church	50.5	49.8	51.1	47.1	46.9	47.4	45.3	45.8	50.5
R141	Edmund Rice Retreat and Conference Centre	37.2	35.9	38.3	32.1	32.4	31.3	35.8	38.9	37.2
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	48.8	50.8	46.0	47.6	48.6	43.2	37.3	31.7	48.8
N2	JOHN EDMONDSON VC GARDENS	32.9	33.6	31.9	29.8	29.5	30.4	21.2	21.4	32.9
N3	REGAL OAKS VILLAGE	39.2	37.1	40.6	32.5	32.2	33.1	32.8	47.1	39.2
N4	SCALABRINI VILLAGE AUSTRAL	33.1	33.6	32.3	30.5	30.2	31.1	20.0	20.3	33.1
N5	TOBRUK VILLAGE	32.9	33.6	31.9	29.8	29.5	30.4	21.1	21.3	32.9
N6	BLAXLAND PRE-SCHOOL	38.1	39.6	36.3	36.8	38.0	29.7	24.2	23.6	38.1
N7	GLENBROOK PRE-SCHOOL	35.3	35.6	35.2	32.2	33.1	28.3	25.0	25.6	35.3
N8	KEMPS CREEK CHILDRENS COTTAGE	36.1	37.1	34.6	32.5	32.7	32.1	28.0	26.9	36.1
N9	LAPSTONE PRE-SCHOOL	34.7	34.9	34.7	31.8	32.4	30.2	25.7	23.9	34.7

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N10	MindChamps Early Learning & Preschool Kemps Creek	36.1	37.1	34.6	32.5	32.7	32.1	28.0	26.9	36.1
N11	MY FIRST SCHOOL CHILDCARE CENTRE	45.2	47.4	42.1	43.5	44.7	37.5	41.5	29.9	45.2
N12	SILVERDALE CHILD CARE CENTRE	45.8	43.4	47.0	42.6	41.2	44.9	42.6	41.0	45.8
N13	WARRAGAMBA PRE-SCHOOL	37.0	34.9	38.2	32.8	31.6	34.8	32.2	37.6	37.0
N14	MINCHINBURY COMMUNITY HOSPITAL	36.0	36.9	34.7	32.3	31.2	34.0	28.6	24.1	36.0
N15	MOUNT DRUITT HOSPITAL	35.9	36.5	35.2	32.7	31.2	34.9	28.9	24.5	35.9
N16	NEPEAN HOSPITAL	42.9	44.5	41.0	42.7	43.5	40.2	26.4	20.5	42.9
N17	NEPEAN PRIVATE HOSPITAL	42.7	44.3	40.7	42.5	43.3	39.6	26.2	20.4	42.7
N18	AUSTRAL CHURCH OF CHRIST	32.9	33.6	31.9	29.8	29.5	30.3	21.0	21.2	32.9
N19	GOOD SHEPHERD CATHOLIC CHURCH	31.5	32.2	30.7	28.5	28.1	29.4	17.0	16.9	31.5
N20	Grace West Anglican Church - Glenmore Park	37.5	36.6	38.1	36.8	35.3	39.2	28.9	23.8	37.5
N21	Holy Family Church	50.4	49.6	51.0	46.9	46.7	47.2	45.1	45.6	50.4
N22	HOLY SPIRIT CATHOLIC CHURCH	32.6	33.3	31.6	29.5	29.1	30.3	18.0	18.1	32.6
N23	Holy Spirit Parish	45.1	47.3	41.8	43.4	44.6	36.7	37.6	26.9	45.1
N24	HOXTON PARK ANGLICAN CHURCH	32.2	33.0	31.1	28.9	28.5	29.7	18.2	18.2	32.2
N25	Imagine Nations Church	38.5	39.3	37.7	37.7	37.6	37.8	29.5	23.1	38.5
N26	INSPIRE CHURCH	31.2	31.8	30.4	28.2	27.8	29.1	16.8	16.6	31.2
N27	Mt Hope Uniting Church Orchard Hills	40.0	41.5	38.2	39.2	39.9	37.2	29.8	22.9	40.0
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	37.4	37.8	37.0	36.4	36.0	37.3	30.2	23.8	37.4
N29	Samoan Methodist Church	33.3	33.4	33.2	31.7	31.5	32.2	19.1	19.7	33.3
N30	SIKH MISSION CENTRE	33.0	33.6	32.1	30.0	29.8	30.5	21.7	21.9	33.0
N31	St Clair Anglican Church	40.4	42.5	37.5	38.2	39.3	33.5	31.1	23.5	40.4
N32	St Mary Mother of the Church	33.3	33.7	32.9	31.2	30.9	31.8	20.1	20.5	33.3
N33	ST ZAIA CATHEDRAL	32.2	33.1	30.8	28.1	27.7	29.0	19.7	19.4	32.2
N34	Uniting Church St Clair	42.7	44.8	39.5	40.7	42.0	34.7	34.0	24.6	42.7
N35	WEST HOXTON COMMUNITY CHURCH	32.5	33.5	31.2	28.7	28.4	29.5	19.9	19.8	32.5
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	33.5	34.5	32.1	29.4	29.2	29.9	23.3	23.0	33.5
N37	AUSTRAL PUBLIC SCHOOL	32.9	33.6	31.9	29.8	29.5	30.4	20.9	21.1	32.9
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	36.4	36.6	36.0	33.6	31.7	36.1	29.8	25.5	36.4
N39	BANKS PUBLIC SCHOOL	47.0	49.3	43.7	45.5	46.8	38.4	41.4	30.1	47.0
N40	BENNETT ROAD PUBLIC SCHOOL	39.9	41.9	36.9	37.6	38.8	32.5	32.6	23.2	39.9

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N41	BETHANY CATHOLIC PRIMARY SCHOOL	37.5	36.6	38.2	36.9	35.2	39.3	29.5	24.1	37.5
N42	BIDWILL PUBLIC SCHOOL	41.0	39.3	41.9	40.1	37.2	43.3	36.1	31.9	41.0
N43	BLACKETT PUBLIC SCHOOL	37.6	37.4	37.5	35.8	34.0	38.3	30.1	25.0	37.6
N44	BLACKTOWN NORTH PUBLIC SCHOOL	29.3	30.5	27.5	22.5	20.9	24.9	18.4	15.1	29.3
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	30.7	31.2	30.0	26.2	23.9	29.0	22.1	18.5	30.7
N46	BLACKTOWN TAFE COLLEGE	29.7	30.6	28.4	24.1	22.1	26.7	20.0	16.6	29.7
N47	BLACKTOWN WEST PUBLIC SCHOOL	33.2	33.0	33.1	29.8	27.2	33.0	26.1	22.2	33.2
N48	BLACKWELL PUBLIC SCHOOL	47.3	49.5	44.0	45.7	47.0	38.7	37.3	27.2	47.3
N49	BLAXLAND EAST PUBLIC SCHOOL	37.9	39.5	36.1	36.6	37.9	29.6	23.8	22.9	37.9
N50	BLAXLAND HIGH SCHOOL	39.6	41.3	37.6	38.6	39.9	30.9	27.2	25.8	39.6
N51	BLAXLAND PUBLIC SCHOOL	39.4	41.1	37.5	38.4	39.7	30.8	26.5	25.6	39.4
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	38.4	40.2	36.2	37.2	38.1	33.6	27.7	20.6	38.4
N53	CAMBRIDGE PARK PUBLIC SCHOOL	40.9	42.5	39.0	40.3	40.9	38.1	28.2	20.5	40.9
N54	CATHWEST INNOVATION COLLEGE	40.3	42.3	37.6	39.8	41.1	32.5	23.6	20.1	40.3
N55	CECIL HILLS PUBLIC SCHOOL	31.7	32.7	30.3	27.7	27.4	28.5	20.3	19.1	31.7
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	40.8	39.1	41.7	39.9	37.1	43.1	35.7	31.6	40.8
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	41.8	43.3	39.9	40.2	40.5	39.4	36.8	25.7	41.8
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	36.7	37.2	36.1	34.5	33.3	36.3	29.0	23.2	36.7
N59	CHIFLEY COLLEGE SENIOR CAMPUS	35.9	36.5	35.0	32.5	31.1	34.7	28.8	24.3	35.9
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	40.7	39.6	41.4	40.2	37.8	43.1	31.2	25.7	40.7
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	38.3	39.8	36.3	35.4	36.0	33.6	30.4	27.9	38.3
N62	CLAIRGATE PUBLIC SCHOOL	40.0	42.0	37.0	37.7	38.8	32.9	31.0	23.2	40.0
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	44.9	47.0	41.9	44.2	45.4	38.3	36.0	25.4	44.9
N64	COLYTON HIGH SCHOOL	38.3	40.2	35.5	35.7	36.7	31.5	30.9	22.2	38.3
N65	COLYTON PUBLIC SCHOOL	35.8	37.4	33.7	32.2	32.6	31.2	27.6	21.4	35.8
N66	DAWSON PUBLIC SCHOOL	36.6	37.0	36.1	34.3	33.0	36.2	29.0	23.6	36.6
N67	EASTERN CREEK PUBLIC SCHOOL	43.5	41.4	44.7	42.9	39.9	46.3	40.9	36.8	43.5
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	43.5	41.4	44.7	42.9	39.9	46.3	40.9	36.8	43.5
N69	EMERTON PUBLIC SCHOOL	37.3	38.0	36.5	35.4	34.6	36.8	29.4	22.3	37.3
N70	EMU HEIGHTS PUBLIC SCHOOL	39.6	41.5	37.0	38.9	40.2	31.2	23.9	21.4	39.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N71	EMU PLAINS PUBLIC SCHOOL	38.1	39.8	36.2	37.1	38.3	31.3	23.8	21.2	38.1
N72	ERSKINE PARK HIGH SCHOOL	40.8	42.7	38.2	38.7	39.6	35.4	31.3	25.2	40.8
N73	GLENBROOK PUBLIC SCHOOL	35.4	35.8	35.2	32.4	33.4	28.3	24.8	25.2	35.4
N74	GLENDENNING PUBLIC SCHOOL	41.9	39.8	43.0	41.1	38.0	44.5	38.2	34.1	41.9
N75	GLENMORE PARK PUBLIC SCHOOL	37.9	37.2	38.5	37.3	35.9	39.5	28.7	23.4	37.9
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	31.5	32.2	30.7	28.5	28.1	29.4	17.0	16.9	31.5
N77	GOOD SHEPHERD PRIMARY SCHOOL	39.4	38.2	40.2	38.1	35.4	41.3	34.9	30.8	39.4
N78	GREENWAY PARK PUBLIC SCHOOL	32.7	33.4	31.6	29.6	29.2	30.3	18.4	18.5	32.7
N79	HASSALL GROVE PUBLIC SCHOOL	43.0	40.8	44.2	42.3	39.3	45.7	39.4	35.3	43.0
N80	HEBERSHAM PUBLIC SCHOOL	36.9	36.8	36.8	34.6	32.7	37.3	30.6	26.1	36.9
N81	HOLY FAMILY PRIMARY SCHOOL	37.9	38.6	37.1	36.2	35.4	37.5	30.1	22.2	37.9
N82	HOLY SPIRIT PRIMARY SCHOOL	45.3	47.5	42.0	43.6	44.8	36.8	37.7	27.0	45.3
N83	HOLY SPIRIT PRIMARY SCHOOL	32.6	33.3	31.6	29.5	29.1	30.3	18.0	18.1	32.6
N84	HORSLEY PARK PUBLIC SCHOOL	35.8	35.8	35.5	33.2	31.2	35.9	29.8	25.9	35.8
N85	HOXTON PARK PUBLIC SCHOOL	32.1	32.9	31.1	28.9	28.5	29.7	18.0	17.9	32.1
N86	JAMES ERSKINE PUBLIC SCHOOL	40.3	42.2	37.6	38.0	39.0	34.6	30.9	24.6	40.3
N87	JAMISON HIGH SCHOOL	39.8	40.1	39.4	39.3	38.9	40.2	27.0	21.9	39.8
N88	JAMISONTOWN PUBLIC SCHOOL	38.3	38.7	37.9	37.6	37.3	38.2	26.2	21.9	38.3
N89	JORDAN SPRINGS PUBLIC SCHOOL	37.3	39.0	34.9	35.3	36.3	31.3	30.1	23.1	37.3
N90	KINGSWOOD PARK PUBLIC SCHOOL	43.8	45.2	42.1	43.5	44.1	41.7	28.7	21.2	43.8
N91	KINGSWOOD PUBLIC SCHOOL	43.9	45.4	42.2	43.7	44.3	41.8	28.8	21.3	43.9
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	42.4	43.6	41.1	42.2	42.6	41.1	26.8	21.1	42.4
N93	LAPSTONE PUBLIC SCHOOL	34.8	35.2	34.7	31.9	32.7	29.5	25.3	23.9	34.8
N94	LEONAY PUBLIC SCHOOL	35.8	36.7	35.1	33.8	34.6	31.0	25.0	22.5	35.8
N95	LEPPINGTON PUBLIC SCHOOL	33.3	33.7	32.8	31.1	30.8	31.7	19.1	19.5	33.3
N96	LETHBRIDGE PARK PUBLIC SCHOOL	37.6	37.5	37.6	35.8	34.0	38.3	30.1	25.0	37.6
N97	LLANDILO PUBLIC SCHOOL	41.3	43.4	38.2	39.2	40.4	33.2	39.0	31.7	41.3
N98	LYNWOOD PARK PUBLIC SCHOOL	28.2	29.5	26.0	20.0	18.9	21.9	15.6	12.8	28.2
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	31.7	32.2	31.0	29.0	28.6	29.9	14.6	14.6	31.7
N100	MACQUARIE FIELDS TAFE COLLEGE	31.3	31.7	30.8	28.7	28.2	29.7	13.7	13.6	31.3
N101	MADANG AVENUE PUBLIC SCHOOL	36.3	37.8	34.4	33.4	33.7	32.4	29.0	21.3	36.3
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	31.8	32.5	30.7	28.5	28.1	29.4	17.7	17.6	31.8
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	30.6	31.8	28.8	24.1	22.3	26.7	20.2	16.6	30.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N104	MARAYONG PUBLIC SCHOOL	31.5	32.1	30.6	26.9	24.6	29.8	23.2	19.4	31.5
N105	MIDDLETON GRANGE PUBLIC SCHOOL	31.8	32.6	30.5	28.1	27.7	28.9	18.8	18.5	31.8
N106	MINCHINBURY PUBLIC SCHOOL	36.8	37.5	36.0	33.5	31.9	35.8	30.3	26.1	36.8
N107	MONTGROVE COLLEGE	41.4	42.4	40.3	41.0	41.1	40.5	27.8	21.8	41.4
N108	MOUNT DRUITT PUBLIC SCHOOL	35.7	37.0	33.8	32.2	32.4	31.8	27.8	21.3	35.7
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	35.7	37.0	33.9	32.3	32.4	31.9	27.8	21.3	35.7
N110	MOUNT DRUITT TAFE COLLEGE	35.6	36.5	34.3	31.9	31.0	33.4	27.9	23.1	35.6
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	40.2	42.1	37.6	39.6	40.9	31.4	25.8	23.1	40.2
N112	NEPEAN CHRISTIAN SCHOOL	36.1	35.0	36.8	34.8	33.3	37.0	36.1	28.3	36.1
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	40.0	41.9	37.4	39.4	40.7	32.5	23.6	20.5	40.0
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	44.1	45.7	42.1	43.7	44.4	41.4	31.8	22.5	44.1
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	41.4	43.3	38.8	41.1	42.2	35.5	24.5	20.1	41.4
N116	NOUMEA PUBLIC SCHOOL	40.2	39.2	40.9	39.6	37.3	42.5	31.0	25.7	40.2
N117	ORCHARD HILLS PUBLIC SCHOOL	40.1	41.6	38.3	39.3	40.0	37.2	29.9	22.9	40.1
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	44.8	47.0	41.6	43.1	44.3	37.0	40.8	29.3	44.8
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	37.5	39.0	35.8	36.2	37.4	31.0	24.0	21.5	37.5
N120	OXLEY PARK PUBLIC SCHOOL	39.8	41.8	37.0	37.6	38.7	33.0	34.1	23.8	39.8
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	40.4	42.4	37.7	39.9	41.2	32.7	23.6	20.1	40.4
N122	PENRITH ANGLICAN COLLEGE	36.2	37.0	35.3	34.6	34.7	34.2	32.5	25.1	36.2
N123	PENRITH CHRISTIAN SCHOOL	38.4	39.1	37.7	37.6	37.5	38.0	29.4	23.1	38.4
N124	PENRITH HIGH SCHOOL	42.2	44.0	39.9	42.0	42.9	38.1	25.4	20.3	42.2
N125	PENRITH PUBLIC SCHOOL	42.1	43.9	39.8	41.9	42.9	37.8	25.2	20.2	42.1
N126	PENRITH SOUTH PUBLIC SCHOOL	41.5	42.9	39.7	41.2	41.8	39.0	25.5	20.8	41.5
N127	PLUMPTON HIGH SCHOOL	39.5	38.2	40.3	38.2	35.4	41.4	35.0	30.9	39.5
N128	PLUMPTON PUBLIC SCHOOL	40.6	39.0	41.6	39.5	36.6	42.8	36.5	32.4	40.6
N129	REGENTVILLE PUBLIC SCHOOL	36.8	36.6	36.9	35.7	34.9	37.1	27.0	22.9	36.8
N130	ROOTY HILL HIGH SCHOOL	37.2	37.0	37.1	34.9	32.6	37.8	31.7	27.5	37.2
N131	ROOTY HILL PUBLIC SCHOOL	38.0	37.4	38.3	36.1	33.6	39.3	33.1	28.9	38.0
N132	ROPES CROSSING PUBLIC SCHOOL	42.6	43.2	42.1	41.7	40.9	43.2	35.8	25.7	42.6
N133	SACRED HEART PRIMARY SCHOOL	35.9	37.4	33.7	32.2	32.6	31.2	27.6	21.4	35.9

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N134	SHALVEY PUBLIC SCHOOL	41.7	40.1	42.6	41.3	38.7	44.4	33.1	28.3	41.7
N135	SHELLEY PUBLIC SCHOOL	28.8	29.6	27.5	23.3	21.5	25.8	18.9	15.7	28.8
N136	ST AIDAN'S PRIMARY SCHOOL	37.4	37.1	37.5	35.2	32.8	38.2	31.9	27.7	37.4
N137	ST ANDREWS PRIMARY SCHOOL	31.4	32.4	30.0	25.9	23.8	28.7	22.1	18.3	31.4
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	32.9	33.7	31.8	29.7	29.4	30.2	21.5	21.7	32.9
N139	ST CLAIR HIGH SCHOOL	42.8	45.0	39.6	40.9	42.1	34.7	35.5	25.2	42.8
N140	ST CLAIR PUBLIC SCHOOL	43.9	46.1	40.7	42.1	43.4	35.7	35.4	25.4	43.9
N141	ST FINBAR'S PRIMARY SCHOOL	35.7	36.4	35.2	33.1	34.2	28.3	24.3	24.4	35.7
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	40.6	38.8	41.6	39.6	36.6	42.9	36.6	32.5	40.6
N143	ST JOSEPH'S PRIMARY SCHOOL	42.8	44.2	41.0	42.5	43.1	40.5	27.7	20.6	42.8
N144	ST MARY MACKILLOP PRIMARY SCHOOL	39.7	40.2	39.2	39.2	38.8	39.9	28.1	22.4	39.7
N145	ST MARYS NORTH PUBLIC SCHOOL	41.8	43.6	39.5	40.0	40.7	37.8	37.4	26.2	41.8
N146	ST MARYS PUBLIC SCHOOL	44.7	46.8	41.6	42.9	44.1	37.5	41.1	29.5	44.7
N147	ST MARYS SENIOR HIGH SCHOOL	44.4	46.5	41.5	42.6	43.7	37.9	40.9	29.3	44.4
N148	ST MARYS SOUTH PUBLIC SCHOOL	44.6	46.8	41.3	42.8	44.0	36.4	39.6	28.4	44.6
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	41.7	43.6	39.3	41.4	42.5	36.8	24.8	20.3	41.7
N150	SURVEYORS CREEK PUBLIC SCHOOL	37.6	37.2	37.9	36.9	35.7	38.9	29.7	23.8	37.6
N151	THOMAS HASSALL ANGLICAN COLLEGE	32.2	33.1	30.8	28.3	27.9	29.1	19.5	19.3	32.2
N152	TREGEAR PUBLIC SCHOOL	39.0	40.0	38.0	37.5	37.1	38.3	31.9	22.6	39.0
N153	UNITY GRAMMAR COLLEGE	33.1	33.6	32.3	30.5	30.2	31.0	20.8	21.2	33.1
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	44.1	45.7	42.2	43.9	44.5	41.6	29.5	21.6	44.1
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	44.0	45.6	42.0	43.2	43.8	41.4	35.0	24.5	44.0
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	44.3	46.1	41.9	43.7	44.6	40.3	33.4	23.5	44.3
N157	WALTERS ROAD PUBLIC SCHOOL	35.4	34.2	36.0	32.7	29.8	35.9	28.7	24.8	35.4
N158	WARRAGAMBA PUBLIC SCHOOL	37.1	35.1	38.4	33.0	31.7	35.1	32.4	37.3	37.1
N159	WARRIMOO PUBLIC SCHOOL	39.3	40.8	37.4	38.1	39.4	30.6	29.6	27.2	39.3
N160	WERRINGTON COUNTY PUBLIC SCHOOL	42.5	43.8	41.1	41.4	41.5	41.1	35.1	24.4	42.5
N161	WERRINGTON PUBLIC SCHOOL	43.3	44.6	42.0	42.4	42.5	42.2	34.7	24.1	43.3
N162	WETHERILL PARK TAFE COLLEGE	26.4	27.0	25.4	22.2	21.4	23.5	16.1	14.2	26.4

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N163	WHALAN PUBLIC SCHOOL	36.1	37.2	34.7	33.3	33.0	33.7	28.5	21.7	36.1
N164	WILLIAM DEAN PUBLIC SCHOOL	37.2	36.4	37.7	35.4	32.6	38.7	32.1	28.1	37.2
N165	WILLMOT PUBLIC SCHOOL	41.1	40.9	41.3	40.5	38.9	42.8	33.6	27.0	41.1
N166	YORK PUBLIC SCHOOL	39.5	39.6	39.3	39.0	38.4	40.2	27.3	22.2	39.5
N167	AQUINAS COURT	35.7	35.5	36.1	31.6	32.3	29.2	25.8	26.4	35.7
N168	BAPTISTCARE MORVEN GARDENS CENTRE	28.7	29.4	27.8	22.5	23.1	20.6	23.2	24.5	28.7
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	29.6	30.7	28.1	23.4	24.3	19.9	23.1	23.9	29.6
N170	BUCKLAND	35.6	35.6	35.8	31.4	32.3	27.9	25.0	24.7	35.6
N171	MARTYN CLAVER AGED CARE	28.5	29.3	27.7	22.2	22.9	20.4	23.5	24.7	28.5
N172	WINGARA HAMLET	36.0	35.5	36.5	31.9	32.3	30.8	26.9	28.4	36.0
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	37.4	35.9	38.4	33.3	32.1	35.3	30.9	32.8	37.4
N174	KATOOMBA LEURA PRE-SCHOOL	28.6	29.5	27.6	22.1	22.8	19.6	25.1	25.7	28.6
N175	KEMPS CREEK CHILDRENS COTTAGE	36.1	37.1	34.6	32.5	32.7	32.1	28.0	26.9	36.1
N176	LAPSTONE PRE-SCHOOL	34.7	34.9	34.7	31.8	32.4	30.2	25.7	23.9	34.7
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	29.8	31.0	28.3	23.7	24.6	19.9	23.0	23.7	29.8
N178	SPRINGWOOD HOSPITAL	35.5	35.3	35.9	31.0	31.6	28.9	25.0	25.5	35.5
N179	ECHO POINT LOOKOUT	28.0	27.8	28.1	21.0	21.2	20.7	28.4	29.4	28.0
N180	ANGLICAN	28.6	29.4	27.7	22.2	22.9	20.1	23.9	24.9	28.6
N181	ANGLICAN	28.9	29.8	27.7	22.4	23.2	19.6	24.7	25.3	28.9
N182	BAPTIST	28.5	29.3	27.6	21.9	22.6	19.6	25.4	26.1	28.5
N183	BAPTIST	29.0	29.9	27.8	22.7	23.5	20.1	23.3	24.3	29.0
N184	UNITING	36.0	35.2	36.7	31.8	31.7	31.8	27.5	29.3	36.0
N185	BLUE MOUNTAINS STEINER SCHOOL	34.7	33.4	35.5	31.1	30.2	32.7	28.2	30.0	34.7
N186	ELLISON PUBLIC SCHOOL	35.5	35.6	35.6	31.1	32.1	27.4	24.2	23.6	35.5
N187	FAULCONBRIDGE PUBLIC SCHOOL	36.4	35.3	37.2	32.1	31.5	33.1	28.6	30.1	36.4
N188	HAZELBROOK PUBLIC SCHOOL	33.4	32.6	34.1	30.0	29.5	31.0	26.9	28.3	33.4
N189	KATOOMBA HIGH SCHOOL	27.9	28.1	27.8	21.1	21.4	20.2	27.3	28.2	27.9
N190	KATOOMBA NORTH PUBLIC SCHOOL	30.9	32.4	29.1	25.3	26.4	20.2	22.2	22.8	30.9
N191	KATOOMBA PUBLIC SCHOOL	28.3	29.0	27.6	21.7	22.3	19.8	25.6	26.4	28.3
N192	KINGSWOOD PARK PUBLIC SCHOOL	43.8	45.2	42.1	43.5	44.1	41.7	28.7	21.2	43.8
N193	KINGSWOOD PUBLIC SCHOOL	43.9	45.4	42.2	43.7	44.3	41.8	28.8	21.3	43.9
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	42.4	43.6	41.1	42.2	42.6	41.1	26.8	21.1	42.4

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N195	LAPSTONE PUBLIC SCHOOL	34.8	35.2	34.7	31.9	32.7	29.5	25.3	23.9	34.8
N196	LAWSON PUBLIC SCHOOL	30.6	30.3	30.8	26.6	26.6	26.6	23.4	25.5	30.6
N197	LEURA PUBLIC SCHOOL	28.8	29.7	27.8	22.6	23.3	20.3	23.2	24.4	28.8
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	31.4	30.9	31.8	27.6	27.4	28.0	24.2	26.2	31.4
N199	SPRINGWOOD HIGH SCHOOL	36.1	35.4	36.8	31.6	31.4	32.1	27.6	28.6	36.1
N200	SPRINGWOOD PUBLIC SCHOOL	36.1	36.2	36.2	32.5	33.4	29.1	26.9	26.9	36.1
N201	ST CANICES PRIMARY SCHOOL	28.6	29.5	27.6	22.1	22.8	19.6	25.1	25.7	28.6
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	35.7	36.1	35.6	31.3	32.4	27.2	23.4	22.3	35.7
N203	WENTWORTH FALLS PUBLIC SCHOOL	28.8	29.2	28.3	23.0	23.4	21.9	22.2	24.0	28.8

A4 Noise Sensitive Areas – Modelled Average Sound Levels L_{Aeq} dB(A) – PAL3 – 2055

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	58.7	58.6	58.8	57.5	57.9	56.5	56.6	56.1	56.1
M02	North East Departure	58.6	56.7	59.7	57.1	54.9	60.0	54.3	50.2	50.4
M03	North East Runway	52.4	54.6	49.2	50.9	52.3	42.1	44.5	33.7	33.2
M04	Twin Creeks	47.8	49.7	45.2	45.9	47.0	41.1	54.2	42.7	42.0
M06	Mount Vernon	43.2	44.5	41.6	40.8	41.3	39.4	35.5	31.4	31.4
M07	Kemps Creek Nature Reserve	37.2	38.1	36.1	34.4	34.5	34.2	30.1	29.4	29.4
M08	Luddenham	41.6	41.6	41.6	38.3	38.2	38.4	42.3	38.4	38.3
M09	Penrith	42.8	44.5	40.6	42.2	43.4	36.6	28.1	23.4	23.4
M10	Glenmore Park	40.1	38.8	41.0	38.4	36.9	40.7	34.2	28.1	27.9
M11	Oxley Park	41.1	43.0	38.7	38.2	39.3	34.3	37.1	26.7	26.5
M12	St. Marys	48.6	50.7	45.6	46.4	47.7	38.9	45.7	33.8	33.3
M13	Rooty Hill	43.8	41.6	45.0	42.1	39.2	45.4	39.6	35.5	35.7
M14	St. Clair	51.0	53.2	47.8	49.1	50.5	40.4	44.3	33.0	32.5
M15	Erskine Park	47.7	49.9	44.7	45.4	46.7	38.3	37.2	28.8	28.6
M16	Sydney International Equestrian Centre	35.0	35.4	34.5	32.2	31.4	33.6	28.3	25.0	25.1
M17	Wallacia	40.0	38.4	41.1	34.4	34.3	34.7	36.2	47.5	47.5
M18	Warragamba	37.9	36.1	39.0	33.9	33.0	35.5	34.6	40.3	40.3
M19	Greendale	58.3	56.7	59.2	55.7	55.0	56.9	56.0	55.7	55.8
M20	Bringelly	39.3	39.1	39.6	36.1	36.2	35.9	35.9	37.5	37.5
M21	Bents Basin	56.8	56.2	57.2	55.1	55.2	54.8	54.6	53.6	53.7
M22	Silverdale	58.7	58.9	58.5	57.9	58.4	56.2	56.7	56.5	56.5
M23	Werombi	37.2	37.1	37.3	35.8	36.1	35.0	35.7	33.9	33.9
M24	Blaxland	40.4	42.0	38.6	39.2	40.5	30.8	29.1	29.5	29.5
M25	Linden	41.5	39.3	42.6	36.7	35.0	38.9	38.3	43.1	43.1
M26	North Richmond	30.3	31.0	29.6	23.2	24.3	19.0	25.2	16.4	16.2
M27	Kurrajong	27.3	27.7	27.1	19.6	20.4	17.1	22.1	14.6	14.5
M28	The Oaks	36.3	35.8	36.6	34.8	34.5	35.5	29.3	32.5	32.5
M29	Lake Burragorang (Natai, Brownlow Hill)	38.5	35.9	39.8	36.1	33.8	39.1	34.6	31.1	31.2
M30	Tahmoor	31.0	29.4	32.1	29.3	28.0	31.5	23.7	30.9	30.9
R1	Bringelly	36.4	36.3	36.5	34.4	34.4	34.2	31.1	32.1	32.1
R2	Luddenham	45.8	45.8	45.9	42.1	42.3	41.6	43.2	42.5	42.5
R3	Greendale, Greendale Road	52.2	49.9	53.4	48.6	47.0	50.9	49.8	57.0	57.0

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R6	Kemps Creek	38.0	38.0	38.2	35.4	35.9	33.8	44.1	37.3	37.0
R7	Wallacia	40.3	38.7	41.5	34.7	34.5	35.1	36.2	48.3	48.3
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	51.8	53.5	49.5	49.9	50.9	46.3	56.3	45.1	44.4
R14	Lawson Road, Badgerys Creek	51.8	53.6	49.5	49.6	50.6	45.4	47.9	41.4	41.3
R15	Mersey Rd, Greendale	41.9	41.7	42.0	38.3	38.5	37.8	38.9	39.4	39.4
R17	Luddenham Road	48.3	49.2	47.4	44.8	45.2	43.8	48.4	44.5	44.5
R18	Cnr Adams & Elizabeth Drive	54.3	54.3	54.2	50.6	50.3	51.2	51.6	51.8	51.8
R19	Cnr Adams & Anton Road	53.4	53.4	53.4	49.7	49.5	50.0	50.3	50.6	50.6
R21	Cnr Willowdene Ave and Vicar Park Lane	64.4	62.5	65.4	61.3	60.3	63.0	62.0	65.1	65.1
R22	Rossmore, Victor Ave	39.8	40.4	39.0	36.3	36.4	36.2	35.2	35.1	35.1
R23	Wallacia, Greendale Road	44.4	42.2	45.6	40.0	38.6	42.1	41.0	55.5	55.5
R24	Badgerys Creek 1 NE	54.3	55.6	52.9	51.4	52.1	49.0	51.8	48.8	48.7
R25	Badgerys Creek 2 SW	55.5	55.1	55.8	51.8	51.8	51.8	53.0	53.6	53.6
R27	Greendale, Dwyer Rd	41.7	41.0	42.3	38.1	37.8	38.6	38.7	41.9	41.9
R30	Rossmore residential	35.5	35.5	35.3	34.3	34.3	34.3	26.9	27.6	27.6
R31	Mt Vernon residential	42.2	43.4	40.8	39.8	40.1	38.8	34.7	30.7	30.8
R34	Emmaus Residential Aged Care	51.5	53.4	49.0	49.6	50.7	45.1	40.4	34.8	34.9
R35	Mamre After School and Vacation Care	55.0	57.1	52.2	53.4	54.7	47.0	42.3	35.9	35.9
R37	Schoolies at Mulgoa	51.8	51.6	52.1	48.0	48.2	47.4	48.9	48.7	48.7
R38	Do-re-mi Day Care Centre	41.1	42.4	39.3	38.5	39.0	37.0	33.4	29.8	29.8
R39	Little Amigos Austral Early Learning Centre	34.9	35.3	34.4	33.7	33.7	33.7	24.7	25.1	25.1
R40	Little Smarties Childcare Centre	54.9	57.0	52.2	53.3	54.6	47.0	42.3	36.0	36.0
R41	The Grove Academy	37.9	38.8	36.8	35.1	35.3	34.6	31.4	30.7	30.7
R42	Horsley Kids	38.8	38.0	39.2	36.3	34.4	38.8	33.5	29.7	29.8
R44	Bringelly Child Care Centre	40.5	40.1	40.9	37.0	37.0	37.1	37.3	39.3	39.3
R46	Chementson Drive Early Educational Centre	37.2	37.7	36.6	34.2	34.2	34.3	32.0	32.4	32.4
R48	Kids Korner West Hoxton Early Learning Centre	34.7	35.3	33.8	32.8	32.7	32.9	24.2	24.4	24.4
R49	Luddenham Child Care Centre	49.7	49.8	49.8	46.1	46.5	44.9	46.9	46.0	46.0
R52	The Frogs Lodge	34.8	35.3	34.1	33.3	33.2	33.3	24.6	25.0	25.0
R54	Mulgoa Preschool	37.7	37.7	37.9	35.3	35.7	34.3	46.3	37.2	36.6
R55	Jillys Educational Childcare Centre	35.9	36.2	35.6	33.8	33.7	33.8	29.9	30.5	30.5
R59	Bringelly Community Centre	36.6	36.5	36.7	34.5	34.5	34.3	31.7	32.8	32.8

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R63	Luddenham Progress Hall	52.9	52.9	53.0	49.4	49.8	48.4	50.1	49.3	49.3
R64	Mulgoa Hall	37.8	37.8	38.0	35.4	35.8	34.1	45.6	37.1	36.6
R65	Emmaus Catholic College	52.9	54.8	50.7	51.1	52.1	47.4	42.3	37.1	37.2
R66	University of Sydney Farms	40.7	39.2	41.7	37.4	36.5	39.0	37.7	50.8	50.8
R68	Christadelphian Heritage College Sydney	40.4	41.7	38.7	37.7	38.3	35.9	33.9	31.7	31.7
R69	Mamre Anglican School	55.0	57.1	52.2	53.4	54.7	47.0	42.3	35.9	36.0
R72	Irfan College	36.6	37.7	35.2	33.8	34.0	33.3	28.1	26.1	26.1
R73	Luddenham Public School	53.7	53.8	53.7	50.3	50.7	49.2	51.0	50.0	50.0
R74	Kemps Creek Public School	40.5	41.9	38.8	37.8	38.5	36.0	34.0	31.8	31.8
R75	Trinity Catholic Primary School	53.6	55.6	50.8	51.8	53.1	46.0	41.3	35.2	35.2
R76	Bringelly Public School	36.5	36.4	36.6	34.4	34.5	34.3	31.3	32.4	32.4
R78	Mulgoa Public School	37.8	37.8	37.9	35.4	35.8	34.0	45.7	37.2	36.8
R79	Rossmore Public School	35.5	35.5	35.4	34.3	34.3	34.4	26.9	27.5	27.5
R80	Wallacia Public School	39.8	38.3	41.0	34.4	34.3	34.5	36.2	47.1	47.1
R82	Bellfield College - Junior Campus	35.5	35.6	35.4	34.1	34.1	34.1	27.8	28.5	28.5
R84	Bringelly Park	36.7	36.6	36.8	34.5	34.5	34.3	31.9	33.0	33.0
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	45.3	44.0	46.1	42.7	42.2	43.5	42.9	41.6	41.7
R86	Blaxland Crossing Reserve	39.5	38.0	40.6	34.2	34.1	34.2	36.3	47.1	47.1
R87	Bill Anderson Reserve	41.4	42.9	39.6	38.8	39.5	36.5	34.9	32.2	32.1
R91	Western Sydney Parklands	48.8	45.8	50.3	46.8	43.7	50.1	44.9	40.8	41.0
R93	Rossmore Grange	36.1	36.3	35.8	33.9	33.8	33.9	30.3	30.9	30.9
R94	Freeburn Park	51.8	51.8	51.8	48.2	48.6	47.1	48.9	48.1	48.1
R95	Overett Reserve	46.9	48.5	44.8	44.4	45.4	41.0	42.3	38.0	37.9
R97	Mulgoa Park	37.8	37.8	37.9	35.4	35.8	34.1	45.7	37.2	36.7
R98	Wallacia Bowling and Recreation Club	40.9	39.1	42.2	35.2	34.8	36.0	36.4	50.2	50.2
R99	Hubertus Country Club	56.5	56.5	56.4	52.9	52.7	53.3	53.3	53.6	53.6
R100	Sugarloaf Cobbitty Equestrian Club	37.6	36.6	38.3	35.2	34.7	36.1	33.6	48.9	48.9
R102	Panthers Wallacia (country club)	40.2	38.5	41.4	34.6	34.4	34.9	36.1	48.2	48.2
R103	Twin Creeks Gold and Country Club	47.2	49.1	44.6	45.3	46.5	40.2	53.8	42.2	41.6
R104	Sydney International Shooting Centre	36.6	37.5	35.4	33.8	33.8	33.6	28.1	26.9	26.9
R108	Luddenham Showground	48.1	48.0	48.3	44.3	44.7	43.2	45.1	44.5	44.5
R109	Kemps Creek Sporting and Bowling Club	38.7	39.9	37.1	35.8	36.2	34.7	31.1	29.0	29.0
R110	St James Luddenham	55.2	55.3	55.1	51.8	52.2	50.8	52.4	51.5	51.5
R111	Lin Ying Temple	36.8	37.3	36.1	33.9	34.0	33.9	31.1	31.3	31.3

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R112	Vat Ketanak Khmer Kampuchea Krom	36.0	36.1	35.7	33.9	33.9	33.9	29.9	30.6	30.6
R114	Anglican Church Sydney Diocese	35.5	35.6	35.4	34.2	34.2	34.2	27.8	28.5	28.5
R115	Anglican Parish of Mulgoa	37.5	37.3	37.8	35.1	35.2	34.8	46.8	37.1	36.4
R117	Bringelly Vineyard Church	36.0	36.0	36.1	34.3	34.3	34.2	30.1	31.0	31.0
R120	Our Lady Queen of Peace	25.8	26.3	25.1	23.4	22.9	24.3	16.7	15.1	15.2
R122	St Anthony	34.8	35.3	34.2	33.4	33.3	33.4	24.7	25.1	25.1
R123	St Marys Church	38.2	38.1	38.4	35.4	35.9	33.7	42.7	37.4	37.2
R124	Wallacia Christian Church	40.3	38.7	41.5	34.7	34.5	35.1	36.2	48.3	48.3
R126	St Francis Xavier Church	62.3	62.4	62.3	61.4	61.9	60.0	60.2	60.3	60.3
R127	Luddenham Uniting Church	53.2	53.2	53.2	49.7	50.0	48.6	50.4	49.6	49.6
R131	Science of the Soul Study Centre	39.2	40.5	37.6	36.4	36.9	35.0	31.9	29.6	29.6
R132	Bringelly shops	36.4	36.3	36.5	34.4	34.4	34.2	31.1	32.1	32.1
R134	Kemps Creek shops	41.7	43.2	39.8	39.1	39.9	36.7	35.1	32.2	32.1
R135	Luddenham shops	56.7	56.8	56.6	53.4	53.8	52.4	54.0	53.1	53.1
R136	Mulgoa shops	38.0	38.0	38.2	35.4	35.9	33.8	44.1	37.3	37.0
R137	Rossmore shops	35.5	35.5	35.3	34.3	34.3	34.3	26.9	27.6	27.6
R138	Wallacia Shops	40.1	38.4	41.3	34.4	34.2	34.8	36.0	48.7	48.7
R140	Holy Family Catholic Primary and Church	51.7	51.3	52.1	47.7	47.8	47.3	48.7	48.8	48.8
R141	Edmund Rice Retreat and Conference Centre	38.6	37.8	39.2	34.7	35.1	33.4	38.8	41.2	41.1
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	51.5	53.4	49.0	49.6	50.7	45.1	40.4	34.8	34.9
N2	JOHN EDMONDSON VC GARDENS	34.9	35.3	34.3	33.6	33.5	33.6	24.7	25.1	25.1
N3	REGAL OAKS VILLAGE	40.2	38.5	41.4	34.5	34.3	35.0	36.0	49.4	49.4
N4	SCALABRINI VILLAGE AUSTRAL	35.3	35.5	34.9	34.3	34.3	34.4	23.5	24.0	24.0
N5	TOBRUK VILLAGE	34.9	35.3	34.3	33.6	33.6	33.7	24.6	25.0	25.0
N6	BLAXLAND PRE-SCHOOL	39.2	40.7	37.4	37.8	39.1	29.9	27.5	26.9	27.0
N7	GLENBROOK PRE-SCHOOL	36.3	36.7	36.1	33.4	34.3	29.5	28.1	28.7	28.7
N8	KEMPS CREEK CHILDRENS COTTAGE	37.9	38.8	36.8	35.1	35.3	34.6	31.5	30.7	30.7
N9	LAPSTONE PRE-SCHOOL	36.0	36.2	36.0	33.3	33.8	31.8	28.8	27.0	27.0
N10	MindChamps Early Learning & Preschool Kemps Creek	37.9	38.8	36.8	35.1	35.3	34.6	31.5	30.7	30.7
N11	MY FIRST SCHOOL CHILDCARE CENTRE	47.6	49.8	44.7	45.2	46.6	38.4	44.9	33.0	32.6
N12	SILVERDALE CHILD CARE CENTRE	48.0	45.9	49.1	44.6	43.3	46.6	45.3	43.7	43.8
N13	WARRAGAMBA PRE-SCHOOL	38.8	36.8	39.9	34.8	33.7	36.7	35.3	39.7	39.7
N14	MINCHINBURY COMMUNITY HOSPITAL	38.0	38.2	37.6	34.5	33.3	36.5	31.6	27.2	27.3

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N15	MOUNT DRUITT HOSPITAL	38.3	37.9	38.4	35.1	33.4	37.5	32.3	27.9	28.0
N16	NEPEAN HOSPITAL	45.1	46.2	43.8	44.4	45.1	42.1	29.6	23.9	23.8
N17	NEPEAN PRIVATE HOSPITAL	44.8	46.0	43.4	44.2	44.9	41.6	29.4	23.8	23.7
N18	AUSTRAL CHURCH OF CHRIST	34.9	35.3	34.3	33.6	33.5	33.6	24.5	24.9	24.9
N19	GOOD SHEPHERD CATHOLIC CHURCH	33.7	34.0	33.3	33.2	33.0	33.5	20.5	20.6	20.6
N20	Grace West Anglican Church - Glenmore Park	40.6	39.2	41.6	39.0	37.3	41.4	31.9	27.0	26.8
N21	Holy Family Church	51.5	51.1	51.9	47.5	47.6	47.2	48.5	48.7	48.7
N22	HOLY SPIRIT CATHOLIC CHURCH	34.7	35.0	34.2	33.8	33.7	34.1	21.4	21.7	21.7
N23	Holy Spirit Parish	47.3	49.5	44.2	44.9	46.3	37.1	40.2	29.6	29.2
N24	HOXTON PARK ANGLICAN CHURCH	34.3	34.7	33.7	33.3	33.2	33.5	21.7	21.9	21.9
N25	Imagine Nations Church	40.8	41.0	40.7	39.3	39.1	39.9	32.4	26.5	26.3
N26	INSPIRE CHURCH	33.4	33.7	33.1	33.0	32.8	33.3	20.3	20.3	20.3
N27	Mt Hope Uniting Church Orchard Hills	41.9	43.0	40.8	40.6	41.1	39.0	32.8	26.2	26.1
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	39.9	39.7	40.1	38.3	37.7	39.5	33.1	27.1	26.9
N29	Samoan Methodist Church	35.9	35.7	36.0	35.4	35.4	35.5	22.5	23.2	23.2
N30	SIKH MISSION CENTRE	35.0	35.3	34.5	33.7	33.7	33.7	25.2	25.6	25.6
N31	St Clair Anglican Church	42.3	44.3	39.6	39.6	40.7	34.8	34.0	26.7	26.7
N32	St Mary Mother of the Church	35.7	35.7	35.6	34.9	34.9	35.0	23.5	24.1	24.1
N33	ST ZAIA CATHEDRAL	34.2	34.7	33.4	32.4	32.3	32.7	23.2	23.1	23.1
N34	Uniting Church St Clair	44.6	46.8	41.6	42.1	43.4	35.4	36.8	27.5	27.3
N35	WEST HOXTON COMMUNITY CHURCH	34.5	35.0	33.7	32.9	32.8	33.0	23.3	23.6	23.6
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	35.4	36.0	34.4	32.9	32.9	33.0	26.8	26.8	26.8
N37	AUSTRAL PUBLIC SCHOOL	34.9	35.3	34.3	33.6	33.6	33.7	24.3	24.8	24.8
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	39.0	38.2	39.4	36.0	34.0	38.7	33.3	28.9	29.1
N39	BANKS PUBLIC SCHOOL	49.5	51.8	46.4	47.4	48.8	39.0	44.1	32.6	32.2
N40	BENNETT ROAD PUBLIC SCHOOL	41.5	43.5	38.8	38.7	39.9	33.4	35.6	26.3	26.1
N41	BETHANY CATHOLIC PRIMARY SCHOOL	40.7	39.2	41.7	39.1	37.4	41.5	32.5	27.3	27.1
N42	BIDWILL PUBLIC SCHOOL	44.5	42.1	45.8	42.6	39.8	45.9	39.3	35.2	35.3
N43	BLACKETT PUBLIC SCHOOL	40.5	39.5	41.1	38.1	36.1	40.8	33.6	28.6	28.7
N44	BLACKTOWN NORTH PUBLIC SCHOOL	30.6	31.2	29.8	25.5	24.2	27.7	22.6	19.2	19.3
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	32.9	32.5	33.0	29.0	27.1	31.7	26.6	22.9	23.0
N46	BLACKTOWN TAFE COLLEGE	31.4	31.6	31.0	27.1	25.6	29.4	24.3	20.8	20.9
N47	BLACKTOWN WEST PUBLIC SCHOOL	35.8	34.6	36.5	32.4	29.9	35.5	30.4	26.4	26.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N48	BLACKWELL PUBLIC SCHOOL	49.9	52.1	46.7	47.7	49.1	39.5	39.9	29.9	29.6
N49	BLAXLAND EAST PUBLIC SCHOOL	39.0	40.5	37.2	37.6	38.9	29.8	27.1	26.2	26.2
N50	BLAXLAND HIGH SCHOOL	40.9	42.6	38.8	39.9	41.3	31.2	30.4	29.1	29.1
N51	BLAXLAND PUBLIC SCHOOL	40.7	42.4	38.7	39.7	41.0	31.0	29.7	28.8	28.9
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	40.0	41.5	38.3	38.3	39.2	35.1	31.1	24.1	24.1
N53	CAMBRIDGE PARK PUBLIC SCHOOL	42.9	44.0	41.7	41.7	42.3	40.0	31.5	23.9	23.8
N54	CATHWEST INNOVATION COLLEGE	41.8	43.7	39.3	41.3	42.6	33.4	27.1	23.6	23.6
N55	CECIL HILLS PUBLIC SCHOOL	34.0	34.5	33.2	32.0	31.8	32.3	23.8	22.8	22.8
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	44.3	42.0	45.6	42.4	39.6	45.7	39.0	34.8	35.0
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	44.2	45.4	43.0	41.7	41.9	41.3	40.0	28.7	28.3
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	39.3	39.0	39.4	36.6	35.2	38.7	32.4	26.8	26.9
N59	CHIFLEY COLLEGE SENIOR CAMPUS	38.1	37.9	38.1	34.9	33.3	37.3	32.1	27.7	27.8
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	44.1	42.2	45.2	42.5	40.0	45.5	34.6	29.3	29.4
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	40.4	41.7	38.7	37.7	38.3	35.9	33.8	31.7	31.7
N62	CLAIRGATE PUBLIC SCHOOL	41.8	43.8	39.2	39.0	40.1	34.3	34.0	26.4	26.3
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	46.8	48.8	44.2	45.7	47.0	39.5	38.9	28.4	28.0
N64	COLYTON HIGH SCHOOL	39.8	41.7	37.4	36.8	37.8	32.9	34.0	25.4	25.3
N65	COLYTON PUBLIC SCHOOL	37.5	38.6	36.0	33.9	34.0	33.5	30.9	24.8	24.9
N66	DAWSON PUBLIC SCHOOL	39.2	38.8	39.4	36.4	34.9	38.7	32.5	27.2	27.3
N67	EASTERN CREEK PUBLIC SCHOOL	46.8	44.1	48.2	45.3	42.3	48.7	43.0	38.9	39.1
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	46.8	44.1	48.1	45.3	42.3	48.7	43.0	38.9	39.1
N69	EMERTON PUBLIC SCHOOL	39.8	39.8	39.7	37.2	36.2	39.0	32.8	25.8	25.8
N70	EMU HEIGHTS PUBLIC SCHOOL	40.9	42.8	38.5	40.3	41.6	31.7	27.4	24.9	24.9
N71	EMU PLAINS PUBLIC SCHOOL	39.4	41.0	37.6	38.3	39.5	32.4	27.1	24.6	24.5
N72	ERSKINE PARK HIGH SCHOOL	42.9	44.6	40.6	40.2	41.1	37.1	34.3	28.4	28.4
N73	GLENBROOK PUBLIC SCHOOL	36.4	36.8	36.1	33.5	34.5	29.5	28.0	28.3	28.3
N74	GLENDENNING PUBLIC SCHOOL	45.6	42.8	46.9	43.6	40.6	47.0	41.3	37.3	37.4
N75	GLENMORE PARK PUBLIC SCHOOL	41.1	39.7	42.0	39.5	37.9	41.8	31.7	26.7	26.5
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	33.7	34.0	33.3	33.2	33.0	33.5	20.5	20.6	20.6
N77	GOOD SHEPHERD PRIMARY SCHOOL	42.9	40.7	44.0	40.7	37.9	43.9	38.2	34.1	34.2
N78	GREENWAY PARK PUBLIC SCHOOL	34.7	35.1	34.2	33.8	33.7	34.0	21.9	22.2	22.2
N79	HASSALL GROVE PUBLIC SCHOOL	46.8	44.0	48.1	44.9	41.9	48.3	42.6	38.5	38.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N80	HEBERSHAM PUBLIC SCHOOL	39.7	38.7	40.3	37.0	34.9	39.8	34.1	29.6	29.8
N81	HOLY FAMILY PRIMARY SCHOOL	40.4	40.5	40.3	38.0	37.0	39.8	33.3	25.7	25.7
N82	HOLY SPIRIT PRIMARY SCHOOL	47.5	49.7	44.4	45.1	46.5	37.3	40.4	29.7	29.3
N83	HOLY SPIRIT PRIMARY SCHOOL	34.7	35.0	34.2	33.8	33.7	34.0	21.4	21.8	21.8
N84	HORSLEY PARK PUBLIC SCHOOL	38.4	37.6	38.8	35.9	34.0	38.4	33.2	29.3	29.4
N85	HOXTON PARK PUBLIC SCHOOL	34.2	34.6	33.7	33.4	33.2	33.6	21.4	21.6	21.6
N86	JAMES ERSKINE PUBLIC SCHOOL	42.3	44.0	40.0	39.6	40.5	36.4	33.9	27.8	27.8
N87	JAMISON HIGH SCHOOL	42.5	42.0	42.8	41.1	40.4	42.4	30.0	25.3	25.2
N88	JAMISONTOWN PUBLIC SCHOOL	40.8	40.5	41.0	39.3	38.7	40.4	29.2	25.2	25.1
N89	JORDAN SPRINGS PUBLIC SCHOOL	38.8	40.5	36.8	36.3	37.3	32.5	33.5	26.6	26.7
N90	KINGSWOOD PARK PUBLIC SCHOOL	46.0	47.0	45.1	45.3	45.8	43.8	31.8	24.6	24.5
N91	KINGSWOOD PUBLIC SCHOOL	46.2	47.2	45.2	45.4	46.0	43.8	31.9	24.7	24.5
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	44.7	45.4	44.1	43.9	44.1	43.2	30.0	24.5	24.4
N93	LAPSTONE PUBLIC SCHOOL	36.0	36.3	35.9	33.3	34.0	31.1	28.4	27.0	27.0
N94	LEONAY PUBLIC SCHOOL	37.2	37.9	36.6	35.1	35.9	32.6	28.1	25.7	25.6
N95	LEPPINGTON PUBLIC SCHOOL	35.7	35.8	35.5	34.9	34.9	35.1	22.5	23.1	23.1
N96	LETHBRIDGE PARK PUBLIC SCHOOL	40.5	39.5	41.1	38.1	36.1	40.8	33.6	28.6	28.7
N97	LLANDILO PUBLIC SCHOOL	43.4	45.6	40.5	40.6	42.0	33.7	42.3	34.8	34.9
N98	LYNWOOD PARK PUBLIC SCHOOL	29.2	30.2	27.7	23.4	22.6	24.9	19.8	16.8	16.9
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	33.9	34.2	33.6	33.7	33.6	34.0	18.0	18.2	18.2
N100	MACQUARIE FIELDS TAFE COLLEGE	33.7	33.8	33.5	33.7	33.5	34.1	17.1	17.2	17.2
N101	MADANG AVENUE PUBLIC SCHOOL	38.1	39.2	36.8	34.8	35.0	34.5	32.3	24.7	24.7
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	33.9	34.3	33.3	33.1	33.0	33.4	21.2	21.3	21.3
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	32.0	32.5	31.2	26.8	25.2	29.3	24.3	20.6	20.7
N104	MARAYONG PUBLIC SCHOOL	33.5	33.2	33.6	29.6	27.4	32.4	27.2	23.4	23.5
N105	MIDDLETON GRANGE PUBLIC SCHOOL	33.8	34.3	33.1	32.5	32.4	32.8	22.2	22.2	22.2
N106	MINCHINBURY PUBLIC SCHOOL	38.9	38.8	38.9	35.8	34.1	38.3	33.1	28.9	29.0
N107	MONTGROVE COLLEGE	43.7	44.1	43.4	42.6	42.6	42.7	30.9	25.2	25.1
N108	MOUNT DRUITT PUBLIC SCHOOL	37.4	38.4	36.3	33.9	33.8	34.1	31.1	24.8	24.8
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	37.4	38.4	36.3	33.9	33.8	34.2	31.2	24.8	24.8
N110	MOUNT DRUITT TAFE COLLEGE	37.6	37.8	37.2	34.1	33.0	36.0	31.2	26.5	26.6
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	41.6	43.5	39.0	41.0	42.4	31.8	29.2	26.5	26.5
N112	NEPEAN CHRISTIAN SCHOOL	39.0	37.8	39.9	37.0	35.7	39.1	39.0	31.3	30.9

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	41.4	43.3	39.0	40.8	42.1	33.4	26.9	23.9	23.9
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	46.3	47.5	45.0	45.4	46.0	43.4	34.8	25.7	25.5
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	43.1	44.8	40.9	42.6	43.8	37.0	27.8	23.5	23.5
N116	NOUMEA PUBLIC SCHOOL	43.6	41.8	44.7	41.9	39.5	44.9	34.5	29.3	29.4
N117	ORCHARD HILLS PUBLIC SCHOOL	42.0	43.1	40.8	40.6	41.2	39.0	32.8	26.3	26.1
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	47.1	49.2	44.1	44.6	45.9	37.6	44.2	32.4	31.9
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	38.8	40.2	37.2	37.4	38.5	32.2	27.2	24.8	24.8
N120	OXLEY PARK PUBLIC SCHOOL	41.5	43.4	38.9	38.6	39.7	34.1	37.3	26.9	26.6
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	41.9	43.8	39.4	41.4	42.7	33.6	27.1	23.6	23.6
N122	PENRITH ANGLICAN COLLEGE	38.3	38.7	37.9	36.3	36.3	36.3	35.4	28.4	28.1
N123	PENRITH CHRISTIAN SCHOOL	40.8	40.9	40.8	39.3	39.0	40.1	32.3	26.5	26.3
N124	PENRITH HIGH SCHOOL	44.1	45.6	42.4	43.6	44.6	39.9	28.6	23.7	23.6
N125	PENRITH PUBLIC SCHOOL	44.0	45.5	42.2	43.5	44.5	39.5	28.5	23.7	23.6
N126	PENRITH SOUTH PUBLIC SCHOOL	43.5	44.6	42.5	42.8	43.3	41.0	28.7	24.2	24.1
N127	PLUMPTON HIGH SCHOOL	43.0	40.8	44.1	40.8	38.0	44.0	38.3	34.2	34.3
N128	PLUMPTON PUBLIC SCHOOL	44.2	41.7	45.4	42.1	39.2	45.4	39.7	35.6	35.8
N129	REGENTVILLE PUBLIC SCHOOL	39.3	38.6	39.9	37.6	36.7	39.2	30.0	26.1	26.0
N130	ROOTY HILL HIGH SCHOOL	40.0	38.8	40.7	37.4	35.0	40.4	34.8	30.6	30.8
N131	ROOTY HILL PUBLIC SCHOOL	41.0	39.5	41.9	38.7	36.1	41.9	36.1	32.0	32.2
N132	ROPES CROSSING PUBLIC SCHOOL	45.6	45.6	45.7	43.7	42.7	45.5	39.1	28.9	28.7
N133	SACRED HEART PRIMARY SCHOOL	37.5	38.7	36.0	33.9	34.1	33.5	30.9	24.8	24.9
N134	SHALVEY PUBLIC SCHOOL	45.2	43.0	46.4	43.7	41.0	46.9	36.5	31.7	31.8
N135	SHELLEY PUBLIC SCHOOL	30.6	30.8	30.2	26.7	25.6	28.6	23.4	20.0	20.1
N136	ST AIDAN'S PRIMARY SCHOOL	40.3	39.0	41.1	37.8	35.3	40.8	35.2	31.0	31.2
N137	ST ANDREWS PRIMARY SCHOOL	33.1	33.2	32.7	28.5	26.6	31.2	26.1	22.2	22.4
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	34.9	35.3	34.3	33.4	33.4	33.5	25.0	25.4	25.4
N139	ST CLAIR HIGH SCHOOL	44.7	46.8	41.7	42.1	43.5	35.2	38.3	28.1	27.8
N140	ST CLAIR PUBLIC SCHOOL	46.0	48.2	42.9	43.5	44.9	36.2	38.1	28.3	28.0
N141	ST FINBAR'S PRIMARY SCHOOL	36.7	37.4	36.1	34.1	35.2	29.3	27.5	27.6	27.6
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	44.2	41.6	45.5	42.2	39.2	45.5	39.8	35.7	35.9
N143	ST JOSEPH'S PRIMARY SCHOOL	45.0	46.0	43.9	44.2	44.7	42.5	30.9	24.0	23.9
N144	ST MARY MACKILLOP PRIMARY SCHOOL	42.3	42.1	42.5	40.9	40.4	42.1	31.1	25.7	25.6

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N145	ST MARYS NORTH PUBLIC SCHOOL	44.0	45.6	42.2	41.4	42.0	39.6	40.6	29.1	28.8
N146	ST MARYS PUBLIC SCHOOL	47.1	49.2	44.2	44.6	45.9	38.5	44.5	32.6	32.2
N147	ST MARYS SENIOR HIGH SCHOOL	46.9	48.9	44.2	44.3	45.6	39.1	44.3	32.4	32.0
N148	ST MARYS SOUTH PUBLIC SCHOOL	46.7	48.8	43.6	44.2	45.5	36.8	42.8	31.2	30.8
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	43.5	45.1	41.6	43.0	44.1	38.5	28.1	23.7	23.6
N150	SURVEYORS CREEK PUBLIC SCHOOL	40.7	39.6	41.4	39.1	37.7	41.2	32.7	27.1	26.9
N151	THOMAS HASSALL ANGLICAN COLLEGE	34.2	34.7	33.4	32.6	32.5	32.8	23.0	23.0	23.0
N152	TREGEAR PUBLIC SCHOOL	41.5	41.9	41.2	39.1	38.5	40.4	35.1	25.9	25.7
N153	UNITY GRAMMAR COLLEGE	35.2	35.4	34.9	34.2	34.2	34.3	24.3	24.8	24.8
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	46.3	47.5	45.2	45.6	46.2	43.7	32.6	24.9	24.8
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	46.2	47.5	45.0	44.7	45.2	43.3	38.1	27.4	27.1
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	46.4	47.9	44.6	45.3	46.2	42.1	36.4	26.6	26.3
N157	WALTERS ROAD PUBLIC SCHOOL	38.5	36.5	39.5	35.3	32.6	38.5	33.5	29.5	29.6
N158	WARRAGAMBA PUBLIC SCHOOL	38.9	37.0	40.1	35.0	33.8	36.9	35.5	39.5	39.5
N159	WARRIMOO PUBLIC SCHOOL	40.5	42.1	38.6	39.4	40.8	30.8	32.6	30.4	30.5
N160	WERRINGTON COUNTY PUBLIC SCHOOL	45.0	45.8	44.2	43.0	42.9	43.2	38.3	27.4	27.1
N161	WERRINGTON PUBLIC SCHOOL	45.8	46.5	45.2	44.1	44.0	44.3	37.8	27.1	26.8
N162	WETHERILL PARK TAFE COLLEGE	28.5	28.7	28.1	26.8	26.4	27.6	20.0	18.1	18.1
N163	WHALAN PUBLIC SCHOOL	38.1	38.8	37.5	35.0	34.6	36.0	31.8	25.2	25.2
N164	WILLIAM DEAN PUBLIC SCHOOL	40.4	38.5	41.4	38.0	35.1	41.2	35.6	31.5	31.7
N165	WILLMOT PUBLIC SCHOOL	44.3	43.3	45.0	42.6	40.8	45.2	37.0	30.4	30.5
N166	YORK PUBLIC SCHOOL	42.2	41.6	42.7	40.9	40.0	42.4	30.3	25.5	25.4
N167	AQUINAS COURT	36.6	36.5	36.9	32.4	33.2	29.5	29.2	29.8	29.8
N168	BAPTISTCARE MORVEN GARDENS CENTRE	28.7	28.8	28.6	25.0	25.6	23.0	25.2	26.5	26.5
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	28.9	29.4	28.4	25.9	26.8	22.7	25.1	25.9	25.9
N170	BUCKLAND	36.5	36.6	36.5	32.3	33.3	28.4	28.4	28.1	28.1
N171	MARTYN CLAVER AGED CARE	28.6	28.6	28.5	24.8	25.4	22.9	25.5	26.7	26.7
N172	WINGARA HAMLET	36.9	36.5	37.3	32.6	33.2	31.0	30.2	31.7	31.8
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	38.7	37.1	39.7	33.8	32.8	35.4	33.9	36.0	36.1
N174	KATOOMBA LEURA PRE-SCHOOL	28.5	28.6	28.4	24.8	25.5	22.6	27.0	27.6	27.6
N175	KEMPS CREEK CHILDRENS COTTAGE	37.9	38.8	36.8	35.1	35.3	34.6	31.5	30.7	30.7
N176	LAPSTONE PRE-SCHOOL	36.0	36.2	36.0	33.3	33.8	31.8	28.8	27.0	27.0

ID	Area / Site	L_{Aeq} Day			L_{Aeq} Evening			L_{Aeq} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	29.1	29.6	28.5	26.2	27.1	22.7	25.0	25.7	25.7
N178	SPRINGWOOD HOSPITAL	36.4	36.3	36.7	31.8	32.6	29.3	28.4	28.9	28.9
N179	ECHO POINT LOOKOUT	29.0	28.0	29.6	24.0	24.0	24.0	30.2	31.2	31.2
N180	ANGLICAN	28.6	28.6	28.5	24.9	25.5	22.8	25.8	26.9	26.9
N181	ANGLICAN	28.6	28.8	28.3	25.1	25.8	22.5	26.6	27.2	27.2
N182	BAPTIST	28.5	28.5	28.4	24.7	25.3	22.6	27.3	27.9	27.9
N183	BAPTIST	28.7	29.0	28.4	25.3	26.0	22.7	25.3	26.3	26.3
N184	UNITING	37.1	36.3	37.7	32.4	32.6	32.0	30.8	32.6	32.6
N185	BLUE MOUNTAINS STEINER SCHOOL	36.1	34.6	36.9	31.8	31.0	33.0	31.5	33.2	33.2
N186	ELLISON PUBLIC SCHOOL	36.4	36.7	36.3	32.1	33.1	27.9	27.7	27.0	27.1
N187	FAULCONBRIDGE PUBLIC SCHOOL	37.6	36.5	38.3	32.7	32.3	33.3	31.8	33.4	33.4
N188	HAZELBROOK PUBLIC SCHOOL	34.8	33.7	35.5	30.8	30.5	31.4	30.1	31.4	31.4
N189	KATOOMBA HIGH SCHOOL	28.6	28.0	29.1	24.0	24.2	23.4	29.1	30.0	30.0
N190	KATOOMBA NORTH PUBLIC SCHOOL	29.8	30.6	28.8	27.6	28.7	23.0	24.2	24.9	24.9
N191	KATOOMBA PUBLIC SCHOOL	28.5	28.3	28.5	24.5	25.0	22.8	27.5	28.2	28.2
N192	KINGSWOOD PARK PUBLIC SCHOOL	46.0	47.0	45.1	45.3	45.8	43.8	31.8	24.6	24.5
N193	KINGSWOOD PUBLIC SCHOOL	46.2	47.2	45.2	45.4	46.0	43.8	31.9	24.7	24.5
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	44.7	45.4	44.1	43.9	44.1	43.2	30.0	24.5	24.4
N195	LAPSTONE PUBLIC SCHOOL	36.0	36.3	35.9	33.3	34.0	31.1	28.4	27.0	27.0
N196	LAWSON PUBLIC SCHOOL	31.7	31.1	32.2	27.8	27.9	27.5	26.4	28.3	28.3
N197	LEURA PUBLIC SCHOOL	28.7	28.9	28.5	25.2	25.9	22.9	25.3	26.4	26.4
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	32.6	31.9	33.2	28.7	28.6	28.7	27.4	29.2	29.2
N199	SPRINGWOOD HIGH SCHOOL	37.2	36.4	37.8	32.3	32.2	32.4	30.8	31.9	31.9
N200	SPRINGWOOD PUBLIC SCHOOL	37.0	37.2	37.0	33.4	34.3	29.5	30.2	30.3	30.3
N201	ST CANICES PRIMARY SCHOOL	28.5	28.6	28.4	24.8	25.5	22.6	27.0	27.6	27.6
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	36.7	37.3	36.3	32.2	33.3	27.7	26.9	25.8	25.8
N203	WENTWORTH FALLS PUBLIC SCHOOL	29.2	29.1	29.3	25.3	25.8	23.9	24.5	26.2	26.2

A5 Noise Sensitive Areas – Modelled Maximum Sound Levels L_{Amax} dB(A)

ID	Area / Site	L_{Amax} Day			L_{Amax} Evening			L_{Amax} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	81.4	81.4	81.4	79.2	79.2	79.2	79.1	79.1	79.1
M02	North East Departure	81.6	81.6	81.6	78.3	78.3	78.3	78.3	78.3	78.3
M03	North East Runway	78.5	78.5	78.5	76.5	76.5	76.5	72.7	72.7	72.7
M04	Twin Creeks	69.5	69.5	69.5	69.5	69.5	69.5	81.1	81.1	81.1
M06	Mount Vernon	65.8	65.8	65.8	65.8	65.8	65.8	59.0	59.0	59.0
M07	Kemps Creek Nature Reserve	60.4	60.4	60.4	53.5	53.5	53.5	51.9	51.9	51.9
M08	Luddenham	60.7	60.7	60.7	57.1	57.1	57.1	70.9	70.9	70.9
M09	Penrith	66.9	66.9	66.9	66.4	66.4	66.4	46.0	46.0	46.0
M10	Glenmore Park	63.2	63.2	63.2	59.4	59.4	59.4	58.3	58.3	58.3
M11	Oxley Park	61.0	61.0	61.0	59.9	59.9	59.9	62.4	62.4	62.4
M12	St. Marys	74.1	74.1	74.1	70.7	70.7	70.7	72.9	72.9	72.9
M13	Rooty Hill	63.3	63.3	63.3	63.3	63.3	63.3	61.8	61.8	61.8
M14	St. Clair	76.5	76.5	76.5	74.5	74.5	74.5	73.0	73.0	73.0
M15	Erskine Park	72.0	72.0	72.0	69.1	69.1	69.1	62.2	62.2	62.2
M16	Sydney International Equestrian Centre	57.5	57.5	57.5	50.8	50.8	50.8	47.2	47.2	47.2
M17	Wallacia	66.2	66.2	66.2	51.8	51.8	51.8	54.6	75.8	75.8
M18	Warragamba	57.3	57.3	57.3	53.8	53.8	53.8	53.3	66.8	66.8
M19	Greendale	81.8	81.8	81.8	81.8	81.8	81.8	81.8	82.9	82.9
M20	Bringelly	57.2	57.2	57.2	55.3	55.3	55.3	55.3	57.1	57.1
M21	Bents Basin	79.7	79.7	79.7	77.1	77.1	77.1	77.0	77.0	77.0
M22	Silverdale	81.3	81.3	81.3	79.4	79.4	79.4	79.3	79.3	79.3
M23	Werombi	57.5	57.5	57.5	54.2	54.2	54.2	58.0	58.0	58.0
M24	Blaxland	63.9	63.9	63.9	63.2	63.2	63.2	51.7	51.7	51.7
M25	Linden	62.8	62.8	62.8	62.1	62.1	62.1	62.4	66.3	66.3
M26	North Richmond	51.0	51.0	51.0	42.4	42.4	42.4	47.3	47.3	47.3
M27	Kurrajong	53.1	53.1	53.1	37.4	37.4	37.4	42.9	42.9	42.9
M28	The Oaks	56.2	56.2	56.2	56.2	56.2	56.2	54.9	54.9	54.9
M29	Lake Burragorang (Natai, Brownlow Hill)	60.4	60.4	60.4	61.3	61.3	61.3	65.9	65.9	65.9
M30	Tahmoor	54.6	54.6	54.6	54.6	54.6	54.6	47.1	51.9	51.9
R1	Bringelly	52.9	52.9	52.9	54.7	54.7	54.7	48.9	49.2	49.2
R2	Luddenham	62.2	62.2	62.2	61.2	61.2	61.2	61.2	61.2	61.2

ID	Area / Site	L_{Amax} Day			L_{Amax} Evening			L_{Amax} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R3	Greendale, Greendale Road	74.2	74.2	74.2	74.1	74.1	74.1	74.2	84.3	84.3
R6	Kemps Creek	59.5	59.5	59.5	57.4	57.4	57.4	70.8	70.8	70.8
R7	Wallacia	66.4	66.4	66.4	52.5	52.5	52.5	53.8	75.9	75.9
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	74.0	74.0	74.0	73.9	73.9	73.9	83.6	83.6	83.6
R14	Lawson Road, Badgerys Creek	73.9	73.9	73.9	73.8	73.8	73.8	73.3	73.3	73.3
R15	Mersey Rd, Greendale	59.4	59.4	59.4	58.7	58.7	58.7	58.7	58.7	58.7
R17	Luddenham Road	65.8	65.8	65.8	64.9	64.9	64.9	76.9	76.9	76.9
R18	Cnr Adams & Elizabeth Drive	71.7	71.7	71.7	71.9	71.9	71.9	73.0	73.0	73.0
R19	Cnr Adams & Anton Road	71.1	71.1	71.1	71.7	71.7	71.7	71.1	71.1	71.1
R21	Cnr Willowdene Ave and Vicar Park Lane	91.6	91.6	91.6	91.6	91.6	91.6	91.6	91.6	91.6
R22	Rossmore, Victor Ave	57.2	57.2	57.2	54.7	54.7	54.7	54.7	54.7	54.7
R23	Wallacia, Greendale Road	64.9	64.9	64.9	62.5	62.5	62.5	62.9	81.8	81.8
R24	Badgerys Creek 1 NE	75.5	75.5	75.5	74.8	74.8	74.8	74.9	74.9	74.9
R25	Badgerys Creek 2 SW	75.2	75.2	75.2	73.7	73.7	73.7	75.2	76.3	76.3
R27	Greendale, Dwyer Rd	59.6	59.6	59.6	57.5	57.5	57.5	57.9	65.2	65.2
R30	Rossmore residential	54.6	54.6	54.6	56.4	56.4	56.4	44.0	44.0	44.0
R31	Mt Vernon residential	64.6	64.6	64.6	64.6	64.6	64.6	57.5	57.5	57.5
R34	Emmaus Residential Aged Care	77.7	77.7	77.7	74.2	74.2	74.2	64.8	64.8	64.8
R35	Mamre After School and Vacation Care	81.3	81.3	81.3	79.3	79.3	79.3	69.5	69.5	69.5
R37	Schoolies at Mulgoa	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.8	69.8
R38	Do-re-mi Day Care Centre	63.3	63.3	63.3	62.7	62.7	62.7	57.0	57.0	57.0
R39	Little Amigos Austral Early Learning Centre	60.0	60.0	60.0	55.8	55.8	55.8	43.9	43.9	43.9
R40	Little Smarties Childcare Centre	81.3	81.3	81.3	79.3	79.3	79.3	69.5	69.5	69.5
R41	The Grove Academy	59.2	59.2	59.2	54.3	54.3	54.3	53.2	53.2	53.2
R42	Horsley Kids	60.2	60.2	60.2	53.6	53.6	53.6	53.6	53.6	53.6
R44	Bringelly Child Care Centre	58.5	58.5	58.5	56.6	56.6	56.6	56.6	60.2	60.2
R46	Chementson Drive Early Educational Centre	54.9	54.9	54.9	52.7	52.7	52.7	51.3	51.3	51.3
R48	Kids Korner West Hoxton Early Learning Centre	61.8	61.8	61.8	54.0	54.0	54.0	44.9	44.9	44.9
R49	Luddenham Child Care Centre	67.1	67.1	67.1	66.7	66.7	66.7	66.6	66.6	66.6
R52	The Frogs Lodge	60.8	60.8	60.8	55.1	55.1	55.1	44.5	44.5	44.5
R54	Mulgoa Preschool	57.5	57.5	57.5	56.3	56.3	56.3	71.1	71.1	71.1

ID	Area / Site	L_{Amax} Day			L_{Amax} Evening			L_{Amax} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R55	Jillys Educational Childcare Centre	54.3	54.3	54.3	54.4	54.4	54.4	47.9	47.9	47.9
R59	Bringelly Community Centre	53.1	53.1	53.1	54.4	54.4	54.4	50.4	50.4	50.4
R63	Luddenham Progress Hall	70.8	70.8	70.8	70.7	70.7	70.7	70.3	70.9	70.9
R64	Mulgoa Hall	58.2	58.2	58.2	56.7	56.7	56.7	71.2	71.2	71.2
R65	Emmaus Catholic College	79.9	79.9	79.9	77.0	77.0	77.0	66.2	66.2	66.2
R66	University of Sydney Farms	59.3	59.3	59.3	58.4	58.4	58.4	59.3	77.5	77.5
R68	Christadelphian Heritage College Sydney	59.8	59.8	59.8	59.3	59.3	59.3	57.3	57.3	57.3
R69	Mamre Anglican School	81.3	81.3	81.3	79.3	79.3	79.3	69.6	69.6	69.6
R72	Irfan College	63.3	63.3	63.3	55.1	55.1	55.1	51.0	51.0	51.0
R73	Luddenham Public School	71.7	71.7	71.7	71.6	71.6	71.6	71.3	71.9	71.9
R74	Kemps Creek Public School	60.0	60.0	60.0	59.4	59.4	59.4	57.5	57.5	57.5
R75	Trinity Catholic Primary School	80.4	80.4	80.4	77.6	77.6	77.6	67.4	67.4	67.4
R76	Bringelly Public School	52.8	52.8	52.8	54.6	54.6	54.6	49.2	49.4	49.4
R78	Mulgoa Public School	58.4	58.4	58.4	56.8	56.8	56.8	71.0	71.0	71.0
R79	Rossmore Public School	54.7	54.7	54.7	56.5	56.5	56.5	43.9	43.9	43.9
R80	Wallacia Public School	66.0	66.0	66.0	51.5	51.5	51.5	55.0	75.5	75.5
R82	Bellfield College - Junior Campus	54.2	54.2	54.2	56.0	56.0	56.0	45.0	45.0	45.0
R84	Bringelly Park	53.2	53.2	53.2	54.3	54.3	54.3	50.6	50.6	50.6
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	64.5	64.5	64.5	63.8	63.8	63.8	63.7	63.7	63.7
R86	Blaxland Crossing Reserve	65.8	65.8	65.8	51.2	51.2	51.2	55.6	75.2	75.2
R87	Bill Anderson Reserve	61.4	61.4	61.4	60.9	60.9	60.9	58.7	58.7	58.7
R91	Western Sydney Parklands	72.4	72.4	72.4	69.2	69.2	69.2	69.3	69.3	69.3
R93	Rossmore Grange	53.8	53.8	53.8	54.3	54.3	54.3	48.2	48.2	48.2
R94	Freeburn Park	69.4	69.4	69.4	69.2	69.2	69.2	68.8	68.8	68.8
R95	Overett Reserve	67.0	67.0	67.0	66.8	66.8	66.8	66.4	66.4	66.4
R97	Mulgoa Park	58.2	58.2	58.2	56.7	56.7	56.7	71.1	71.1	71.1
R98	Wallacia Bowling and Recreation Club	66.7	66.7	66.7	53.8	53.8	53.8	54.3	76.0	76.0
R99	Hubertus Country Club	75.0	75.0	75.0	75.9	75.9	75.9	76.1	76.1	76.1
R100	Sugarloaf Cobbitty Equestrian Club	55.4	55.4	55.4	54.3	54.3	54.3	54.7	74.3	74.3
R102	Panthers Wallacia (country club)	66.3	66.3	66.3	52.2	52.2	52.2	54.0	75.8	75.8
R103	Twin Creeks Gold and Country Club	69.1	69.1	69.1	69.0	69.0	69.0	80.4	80.4	80.4

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		S1	S3	S4	S1	S3	S4	S1	S3	S4
R104	Sydney International Shooting Centre	62.9	62.9	62.9	53.8	53.8	53.8	50.8	50.8	50.8
R108	Luddenham Showground	65.2	65.2	65.2	64.6	64.6	64.6	64.6	64.6	64.6
R109	Kemps Creek Sporting and Bowling Club	62.1	62.1	62.1	57.9	57.9	57.9	54.3	54.3	54.3
R110	St James Luddenham	73.2	73.2	73.2	73.5	73.5	73.5	73.1	74.3	74.3
R111	Lin Ying Temple	55.9	55.9	55.9	52.7	52.7	52.7	50.3	50.3	50.3
R112	Vat Ketanak Khmer Kampuchea Krom	53.5	53.5	53.5	54.7	54.7	54.7	47.6	47.6	47.6
R114	Anglican Church Sydney Diocese	54.3	54.3	54.3	56.1	56.1	56.1	44.9	44.9	44.9
R115	Anglican Parish of Mulgoa	56.9	56.9	56.9	55.1	55.1	55.1	71.7	71.7	71.7
R117	Bringelly Vineyard Church	53.3	53.3	53.3	55.1	55.1	55.1	47.6	47.6	47.6
R120	Our Lady Queen of Peace	49.5	49.5	49.5	43.3	43.3	43.3	36.8	36.8	36.8
R122	St Anthony	60.6	60.6	60.6	55.2	55.2	55.2	44.4	44.4	44.4
R123	St Marys Church	60.0	60.0	60.0	57.5	57.5	57.5	69.6	69.6	69.6
R124	Wallacia Christian Church	66.4	66.4	66.4	52.5	52.5	52.5	53.8	75.9	75.9
R126	St Francis Xavier Church	84.6	84.6	84.6	83.5	83.5	83.5	83.3	83.3	83.3
R127	Luddenham Uniting Church	71.1	71.1	71.1	71.0	71.0	71.0	70.6	71.3	71.3
R131	Science of the Soul Study Centre	61.7	61.7	61.7	58.7	58.7	58.7	55.3	55.3	55.3
R132	Bringelly shops	52.9	52.9	52.9	54.7	54.7	54.7	48.9	49.2	49.2
R134	Kemps Creek shops	62.0	62.0	62.0	61.4	61.4	61.4	59.1	59.1	59.1
R135	Luddenham shops	75.6	75.6	75.6	75.4	75.4	75.4	74.9	76.8	76.8
R136	Mulgoa shops	59.5	59.5	59.5	57.4	57.4	57.4	70.8	70.8	70.8
R137	Rossmore shops	54.6	54.6	54.6	56.4	56.4	56.4	44.0	44.0	44.0
R138	Wallacia Shops	66.4	66.4	66.4	52.0	52.0	52.0	53.9	75.7	75.7
R140	Holy Family Catholic Primary and Church	68.8	68.8	68.8	68.8	68.8	68.8	68.8	69.8	69.8
R141	Edmund Rice Retreat and Conference Centre	63.3	63.3	63.3	55.9	55.9	55.9	62.6	66.8	66.8
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	77.7	77.7	77.7	74.1	74.1	74.1	64.8	64.8	64.8
N2	JOHN EDMONDSON VC GARDENS	60.2	60.2	60.2	55.6	55.6	55.6	44.0	44.0	44.0
N3	REGAL OAKS VILLAGE	66.5	66.5	66.5	52.3	52.3	52.3	53.4	75.6	75.6
N4	SCALABRINI VILLAGE AUSTRAL	59.7	59.7	59.7	56.8	56.8	56.8	42.1	42.1	42.1
N5	TOBRUK VILLAGE	60.3	60.3	60.3	55.7	55.7	55.7	43.9	43.9	43.9
N6	BLAXLAND PRE-SCHOOL	60.6	60.6	60.6	60.1	60.1	60.1	48.0	48.0	48.0
N7	GLENBROOK PRE-SCHOOL	56.4	56.4	56.4	52.7	52.7	52.7	46.8	47.8	47.8

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		S1	S3	S4	S1	S3	S4	S1	S3	S4
N8	KEMPS CREEK CHILDRENS COTTAGE	59.1	59.1	59.1	54.3	54.3	54.3	53.2	53.2	53.2
N9	LAPSTONE PRE-SCHOOL	54.2	54.2	54.2	51.7	51.7	51.7	48.5	48.5	48.5
N10	MindChamps Early Learning & Preschool Kemps Creek	59.1	59.1	59.1	54.3	54.3	54.3	53.2	53.2	53.2
N11	MY FIRST SCHOOL CHILDCARE CENTRE	73.1	73.1	73.1	69.7	69.7	69.7	71.5	71.5	71.5
N12	SILVERDALE CHILD CARE CENTRE	67.9	67.9	67.9	67.9	67.9	67.9	67.6	69.0	69.0
N13	WARRAGAMBA PRE-SCHOOL	56.5	56.5	56.5	55.7	55.7	55.7	55.2	66.0	66.0
N14	MINCHINBURY COMMUNITY HOSPITAL	60.2	60.2	60.2	50.2	50.2	50.2	48.6	48.6	48.6
N15	MOUNT DRUITT HOSPITAL	60.4	60.4	60.4	51.7	51.7	51.7	50.8	50.8	50.8
N16	NEPEAN HOSPITAL	68.7	68.7	68.7	68.3	68.3	68.3	49.0	49.0	49.0
N17	NEPEAN PRIVATE HOSPITAL	68.4	68.4	68.4	68.1	68.1	68.1	48.7	48.7	48.7
N18	AUSTRAL CHURCH OF CHRIST	60.5	60.5	60.5	55.6	55.6	55.6	43.9	43.9	43.9
N19	GOOD SHEPHERD CATHOLIC CHURCH	58.4	58.4	58.4	55.5	55.5	55.5	40.9	40.9	40.9
N20	Grace West Anglican Church - Glenmore Park	63.4	63.4	63.4	59.5	59.5	59.5	54.6	54.6	54.6
N21	Holy Family Church	68.6	68.6	68.6	68.6	68.6	68.6	68.6	69.5	69.5
N22	HOLY SPIRIT CATHOLIC CHURCH	60.9	60.9	60.9	56.4	56.4	56.4	41.2	41.2	41.2
N23	Holy Spirit Parish	72.2	72.2	72.2	69.2	69.2	69.2	67.2	67.2	67.2
N24	HOXTON PARK ANGLICAN CHURCH	60.7	60.7	60.7	55.6	55.6	55.6	42.0	42.0	42.0
N25	Imagine Nations Church	61.5	61.5	61.5	58.3	58.3	58.3	55.7	55.7	55.7
N26	INSPIRE CHURCH	57.6	57.6	57.6	55.2	55.2	55.2	40.8	40.8	40.8
N27	Mt Hope Uniting Church Orchard Hills	61.7	61.7	61.7	61.8	61.8	61.8	55.5	55.5	55.5
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	60.8	60.8	60.8	57.6	57.6	57.6	57.2	57.2	57.2
N29	Samoan Methodist Church	56.1	56.1	56.1	57.9	57.9	57.9	38.2	38.6	38.6
N30	SIKH MISSION CENTRE	59.3	59.3	59.3	55.8	55.8	55.8	44.1	44.1	44.1
N31	St Clair Anglican Church	62.4	62.4	62.4	61.6	61.6	61.6	57.6	57.6	57.6
N32	St Mary Mother of the Church	57.7	57.7	57.7	57.5	57.5	57.5	41.1	41.1	41.1
N33	ST ZAIA CATHEDRAL	61.0	61.0	61.0	53.3	53.3	53.3	44.3	44.3	44.3
N34	Uniting Church St Clair	67.2	67.2	67.2	65.4	65.4	65.4	62.4	62.4	62.4
N35	WEST HOXTON COMMUNITY CHURCH	61.7	61.7	61.7	54.5	54.5	54.5	43.8	43.8	43.8
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	61.1	61.1	61.1	52.8	52.8	52.8	47.7	47.7	47.7

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		S1	S3	S4	S1	S3	S4	S1	S3	S4
N37	AUSTRAL PUBLIC SCHOOL	60.5	60.5	60.5	55.7	55.7	55.7	43.7	43.7	43.7
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	60.4	60.4	60.4	53.8	53.8	53.8	53.4	53.4	53.4
N39	BANKS PUBLIC SCHOOL	75.0	75.0	75.0	72.5	72.5	72.5	72.4	72.4	72.4
N40	BENNETT ROAD PUBLIC SCHOOL	61.6	61.6	61.6	60.6	60.6	60.6	60.8	60.8	60.8
N41	BETHANY CATHOLIC PRIMARY SCHOOL	63.8	63.8	63.8	59.8	59.8	59.8	55.5	55.5	55.5
N42	BIDWILL PUBLIC SCHOOL	67.2	67.2	67.2	64.1	64.1	64.1	63.1	63.1	63.1
N43	BLACKETT PUBLIC SCHOOL	59.6	59.6	59.6	56.9	56.9	56.9	52.9	52.9	52.9
N44	BLACKTOWN NORTH PUBLIC SCHOOL	53.8	53.8	53.8	44.1	44.1	44.1	43.0	43.0	43.0
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	54.7	54.7	54.7	51.1	51.1	51.1	51.1	51.1	51.1
N46	BLACKTOWN TAFE COLLEGE	54.1	54.1	54.1	47.0	47.0	47.0	47.0	47.0	47.0
N47	BLACKTOWN WEST PUBLIC SCHOOL	56.9	56.9	56.9	54.0	54.0	54.0	54.1	54.1	54.1
N48	BLACKWELL PUBLIC SCHOOL	75.5	75.5	75.5	72.7	72.7	72.7	66.6	66.6	66.6
N49	BLAXLAND EAST PUBLIC SCHOOL	59.5	59.5	59.5	59.2	59.2	59.2	46.9	46.9	46.9
N50	BLAXLAND HIGH SCHOOL	64.8	64.8	64.8	64.1	64.1	64.1	54.3	54.3	54.3
N51	BLAXLAND PUBLIC SCHOOL	64.5	64.5	64.5	63.8	63.8	63.8	53.1	53.1	53.1
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	59.9	59.9	59.9	59.9	59.9	59.9	52.4	52.4	52.4
N53	CAMBRIDGE PARK PUBLIC SCHOOL	64.4	64.4	64.4	64.3	64.3	64.3	53.3	53.3	53.3
N54	CATHWEST INNOVATION COLLEGE	66.0	66.0	66.0	65.5	65.5	65.5	43.0	43.0	43.0
N55	CECIL HILLS PUBLIC SCHOOL	59.1	59.1	59.1	52.1	52.1	52.1	45.8	45.8	45.8
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	67.0	67.0	67.0	63.9	63.9	63.9	62.7	62.7	62.7
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	66.2	66.2	66.2	64.2	64.2	64.2	65.7	65.7	65.7
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	58.4	58.4	58.4	54.4	54.4	54.4	52.1	52.1	52.1
N59	CHIFLEY COLLEGE SENIOR CAMPUS	60.5	60.5	60.5	51.7	51.7	51.7	50.2	50.2	50.2
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	68.3	68.3	68.3	65.1	65.1	65.1	55.6	55.6	55.6
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	59.8	59.8	59.8	59.2	59.2	59.2	57.2	57.2	57.2
N62	CLAIRGATE PUBLIC SCHOOL	61.7	61.7	61.7	60.9	60.9	60.9	57.7	57.7	57.7
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	70.2	70.2	70.2	70.0	70.0	70.0	64.6	64.6	64.6
N64	COLYTON HIGH SCHOOL	57.9	57.9	57.9	57.4	57.4	57.4	58.3	58.3	58.3

ID	Area / Site	L_{Amax} Day			L_{Amax} Evening			L_{Amax} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N65	COLYTON PUBLIC SCHOOL	58.3	58.3	58.3	51.3	51.3	51.3	51.7	51.7	51.7
N66	DAWSON PUBLIC SCHOOL	58.6	58.6	58.6	53.5	53.5	53.5	51.5	51.5	51.5
N67	EASTERN CREEK PUBLIC SCHOOL	66.3	66.3	66.3	66.3	66.3	66.3	64.7	64.7	64.7
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	66.3	66.3	66.3	66.3	66.3	66.3	64.7	64.7	64.7
N69	EMERTON PUBLIC SCHOOL	59.1	59.1	59.1	56.5	56.5	56.5	54.7	54.7	54.7
N70	EMU HEIGHTS PUBLIC SCHOOL	65.1	65.1	65.1	64.4	64.4	64.4	47.4	47.4	47.4
N71	EMU PLAINS PUBLIC SCHOOL	62.4	62.4	62.4	62.1	62.1	62.1	45.3	45.3	45.3
N72	ERSKINE PARK HIGH SCHOOL	62.3	62.3	62.3	61.8	61.8	61.8	56.1	56.1	56.1
N73	GLENBROOK PUBLIC SCHOOL	56.2	56.2	56.2	52.9	52.9	52.9	46.5	47.3	47.3
N74	GLENDENNING PUBLIC SCHOOL	68.0	68.0	68.0	64.8	64.8	64.8	64.7	64.7	64.7
N75	GLENMORE PARK PUBLIC SCHOOL	64.4	64.4	64.4	60.3	60.3	60.3	54.6	54.6	54.6
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	58.4	58.4	58.4	55.5	55.5	55.5	40.9	40.9	40.9
N77	GOOD SHEPHERD PRIMARY SCHOOL	64.6	64.6	64.6	61.7	61.7	61.7	61.3	61.3	61.3
N78	GREENWAY PARK PUBLIC SCHOOL	61.2	61.2	61.2	56.3	56.3	56.3	41.7	41.7	41.7
N79	HASSALL GROVE PUBLIC SCHOOL	69.0	69.0	69.0	65.8	65.8	65.8	65.7	65.7	65.7
N80	HEBERSHAM PUBLIC SCHOOL	59.7	59.7	59.7	55.5	55.5	55.5	54.8	54.8	54.8
N81	HOLY FAMILY PRIMARY SCHOOL	60.7	60.7	60.7	58.0	58.0	58.0	55.9	55.9	55.9
N82	HOLY SPIRIT PRIMARY SCHOOL	72.5	72.5	72.5	69.4	69.4	69.4	67.4	67.4	67.4
N83	HOLY SPIRIT PRIMARY SCHOOL	60.9	60.9	60.9	56.3	56.3	56.3	41.3	41.3	41.3
N84	HORSLEY PARK PUBLIC SCHOOL	60.0	60.0	60.0	53.3	53.3	53.3	53.4	53.4	53.4
N85	HOXTON PARK PUBLIC SCHOOL	60.3	60.3	60.3	55.6	55.6	55.6	41.7	41.7	41.7
N86	JAMES ERSKINE PUBLIC SCHOOL	61.3	61.3	61.3	60.9	60.9	60.9	55.6	55.6	55.6
N87	JAMISON HIGH SCHOOL	65.0	65.0	65.0	60.8	60.8	60.8	51.6	51.6	51.6
N88	JAMISONTOWN PUBLIC SCHOOL	61.6	61.6	61.6	58.5	58.5	58.5	50.5	50.5	50.5
N89	JORDAN SPRINGS PUBLIC SCHOOL	55.3	55.3	55.3	55.1	55.1	55.1	54.8	54.8	54.8
N90	KINGSWOOD PARK PUBLIC SCHOOL	69.2	69.2	69.2	68.8	68.8	68.8	53.4	53.4	53.4
N91	KINGSWOOD PUBLIC SCHOOL	69.5	69.5	69.5	69.1	69.1	69.1	53.6	53.6	53.6
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	67.7	67.7	67.7	67.4	67.4	67.4	49.6	49.6	49.6
N93	LAPSTONE PUBLIC SCHOOL	54.4	54.4	54.4	52.1	52.1	52.1	47.8	47.8	47.8
N94	LEONAY PUBLIC SCHOOL	56.1	56.1	56.1	56.3	56.3	56.3	47.7	47.7	47.7
N95	LEPPINGTON PUBLIC SCHOOL	59.1	59.1	59.1	57.5	57.5	57.5	40.4	40.4	40.4
N96	LETHBRIDGE PARK PUBLIC SCHOOL	59.7	59.7	59.7	56.9	56.9	56.9	52.9	52.9	52.9

ID	Area / Site	L_{Amax} Day			L_{Amax} Evening			L_{Amax} Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N97	LLANDILO PUBLIC SCHOOL	66.1	66.1	66.1	65.1	65.1	65.1	65.7	65.7	65.7
N98	LYNWOOD PARK PUBLIC SCHOOL	52.3	52.3	52.3	45.9	45.9	45.9	39.3	39.3	39.3
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	58.8	58.8	58.8	56.5	56.5	56.5	35.7	35.7	35.7
N100	MACQUARIE FIELDS TAFE COLLEGE	56.2	56.2	56.2	56.7	56.7	56.7	35.2	35.2	35.2
N101	MADANG AVENUE PUBLIC SCHOOL	57.2	57.2	57.2	53.6	53.6	53.6	55.0	55.0	55.0
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	59.5	59.5	59.5	55.3	55.3	55.3	41.7	41.7	41.7
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	55.6	55.6	55.6	44.2	44.2	44.2	44.2	44.2	44.2
N104	MARAYONG PUBLIC SCHOOL	55.9	55.9	55.9	48.4	48.4	48.4	48.8	48.8	48.8
N105	MIDDLETON GRANGE PUBLIC SCHOOL	60.1	60.1	60.1	54.0	54.0	54.0	43.2	43.2	43.2
N106	MINCHINBURY PUBLIC SCHOOL	60.8	60.8	60.8	52.6	52.6	52.6	50.5	50.5	50.5
N107	MONTGROVE COLLEGE	66.1	66.1	66.1	64.8	64.8	64.8	51.8	51.8	51.8
N108	MOUNT DRUITT PUBLIC SCHOOL	58.2	58.2	58.2	51.1	51.1	51.1	52.4	52.4	52.4
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	58.2	58.2	58.2	51.1	51.1	51.1	52.4	52.4	52.4
N110	MOUNT DRUITT TAFE COLLEGE	60.0	60.0	60.0	49.4	49.4	49.4	48.1	48.1	48.1
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	66.1	66.1	66.1	65.5	65.5	65.5	52.5	52.5	52.5
N112	NEPEAN CHRISTIAN SCHOOL	60.7	60.7	60.7	57.2	57.2	57.2	63.7	63.7	63.7
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	65.9	65.9	65.9	65.2	65.2	65.2	44.3	44.3	44.3
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	69.4	69.4	69.4	69.0	69.0	69.0	58.7	58.7	58.7
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	67.4	67.4	67.4	66.9	66.9	66.9	45.3	45.3	45.3
N116	NOUMEA PUBLIC SCHOOL	67.5	67.5	67.5	64.3	64.3	64.3	55.1	55.1	55.1
N117	ORCHARD HILLS PUBLIC SCHOOL	61.9	61.9	61.9	62.0	62.0	62.0	55.5	55.5	55.5
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	72.2	72.2	72.2	69.0	69.0	69.0	71.0	71.0	71.0
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	60.9	60.9	60.9	60.8	60.8	60.8	45.7	45.7	45.7
N120	OXLEY PARK PUBLIC SCHOOL	61.5	61.5	61.5	60.1	60.1	60.1	62.8	62.8	62.8
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	66.2	66.2	66.2	65.7	65.7	65.7	43.2	43.2	43.2
N122	PENRITH ANGLICAN COLLEGE	55.1	55.1	55.1	52.9	52.9	52.9	61.2	61.2	61.2
N123	PENRITH CHRISTIAN SCHOOL	61.8	61.8	61.8	58.5	58.5	58.5	55.7	55.7	55.7

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N124	PENRITH HIGH SCHOOL	68.2	68.2	68.2	67.8	67.8	67.8	46.9	46.9	46.9
N125	PENRITH PUBLIC SCHOOL	68.0	68.0	68.0	67.7	67.7	67.7	46.6	46.6	46.6
N126	PENRITH SOUTH PUBLIC SCHOOL	66.9	66.9	66.9	66.7	66.7	66.7	48.1	48.1	48.1
N127	PLUMPTON HIGH SCHOOL	64.7	64.7	64.7	61.8	61.8	61.8	61.4	61.4	61.4
N128	PLUMPTON PUBLIC SCHOOL	66.4	66.4	66.4	63.4	63.4	63.4	63.2	63.2	63.2
N129	REGENTVILLE PUBLIC SCHOOL	59.9	59.9	59.9	56.6	56.6	56.6	51.5	51.5	51.5
N130	ROOTY HILL HIGH SCHOOL	61.2	61.2	61.2	56.5	56.5	56.5	55.2	55.2	55.2
N131	ROOTY HILL PUBLIC SCHOOL	61.3	61.3	61.3	58.6	58.6	58.6	57.1	57.1	57.1
N132	ROPES CROSSING PUBLIC SCHOOL	68.4	68.4	68.4	65.2	65.2	65.2	64.1	64.1	64.1
N133	SACRED HEART PRIMARY SCHOOL	58.3	58.3	58.3	51.3	51.3	51.3	51.9	51.9	51.9
N134	SHALVEY PUBLIC SCHOOL	69.1	69.1	69.1	65.9	65.9	65.9	60.3	60.3	60.3
N135	SHELLEY PUBLIC SCHOOL	53.4	53.4	53.4	49.4	49.4	49.4	47.4	47.4	47.4
N136	ST AIDAN'S PRIMARY SCHOOL	61.1	61.1	61.1	56.6	56.6	56.6	55.3	55.3	55.3
N137	ST ANDREWS PRIMARY SCHOOL	56.4	56.4	56.4	46.5	46.5	46.5	46.6	46.6	46.6
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	60.2	60.2	60.2	55.3	55.3	55.3	44.6	44.6	44.6
N139	ST CLAIR HIGH SCHOOL	67.6	67.6	67.6	65.7	65.7	65.7	64.5	64.5	64.5
N140	ST CLAIR PUBLIC SCHOOL	69.6	69.6	69.6	67.4	67.4	67.4	64.3	64.3	64.3
N141	ST FINBAR'S PRIMARY SCHOOL	56.0	56.0	56.0	53.9	53.9	53.9	45.5	46.2	46.2
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	66.5	66.5	66.5	63.5	63.5	63.5	63.4	63.4	63.4
N143	ST JOSEPH'S PRIMARY SCHOOL	67.8	67.8	67.8	67.5	67.5	67.5	51.9	51.9	51.9
N144	ST MARY MACKILLOP PRIMARY SCHOOL	65.3	65.3	65.3	61.3	61.3	61.3	53.3	53.3	53.3
N145	ST MARYS NORTH PUBLIC SCHOOL	66.8	66.8	66.8	64.7	64.7	64.7	66.5	66.5	66.5
N146	ST MARYS PUBLIC SCHOOL	72.4	72.4	72.4	69.3	69.3	69.3	70.7	70.7	70.7
N147	ST MARYS SENIOR HIGH SCHOOL	72.0	72.0	72.0	69.1	69.1	69.1	70.2	70.2	70.2
N148	ST MARYS SOUTH PUBLIC SCHOOL	71.1	71.1	71.1	68.1	68.1	68.1	69.6	69.6	69.6
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	67.9	67.9	67.9	67.5	67.5	67.5	46.2	46.2	46.2
N150	SURVEYORS CREEK PUBLIC SCHOOL	63.9	63.9	63.9	60.0	60.0	60.0	56.3	56.3	56.3
N151	THOMAS HASSALL ANGLICAN COLLEGE	61.0	61.0	61.0	54.0	54.0	54.0	43.8	43.8	43.8
N152	TREGEAR PUBLIC SCHOOL	61.9	61.9	61.9	59.2	59.2	59.2	59.1	59.1	59.1
N153	UNITY GRAMMAR COLLEGE	58.9	58.9	58.9	56.6	56.6	56.6	42.7	42.7	42.7
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	70.0	70.0	70.0	69.5	69.5	69.5	54.9	54.9	54.9

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		S1	S3	S4	S1	S3	S4	S1	S3	S4
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	67.0	67.0	67.0	66.8	66.8	66.8	63.2	63.2	63.2
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	69.7	69.7	69.7	69.3	69.3	69.3	61.0	61.0	61.0
N157	WALTERS ROAD PUBLIC SCHOOL	64.4	64.4	64.4	60.3	60.3	60.3	60.3	60.3	60.3
N158	WARRAGAMBA PUBLIC SCHOOL	56.3	56.3	56.3	55.9	55.9	55.9	55.5	65.7	65.7
N159	WARRIMOO PUBLIC SCHOOL	63.9	63.9	63.9	63.2	63.2	63.2	57.5	57.5	57.5
N160	WERRINGTON COUNTY PUBLIC SCHOOL	65.9	65.9	65.9	63.8	63.8	63.8	63.6	63.6	63.6
N161	WERRINGTON PUBLIC SCHOOL	67.7	67.7	67.7	63.7	63.7	63.7	62.6	62.6	62.6
N162	WETHERILL PARK TAFE COLLEGE	51.8	51.8	51.8	46.0	46.0	46.0	40.0	40.0	40.0
N163	WHALAN PUBLIC SCHOOL	57.8	57.8	57.8	53.3	53.3	53.3	53.4	53.4	53.4
N164	WILLIAM DEAN PUBLIC SCHOOL	61.4	61.4	61.4	58.6	58.6	58.6	58.5	58.5	58.5
N165	WILLMOT PUBLIC SCHOOL	68.0	68.0	68.0	65.1	65.1	65.1	58.9	58.9	58.9
N166	YORK PUBLIC SCHOOL	65.1	65.1	65.1	61.0	61.0	61.0	52.3	52.3	52.3
N167	AQUINAS COURT	59.9	59.9	59.9	52.5	52.5	52.5	51.6	51.6	51.6
N168	BAPTISTCARE MORVEN GARDENS CENTRE	53.0	53.0	53.0	47.1	47.1	47.1	49.0	49.0	49.0
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	55.4	55.4	55.4	50.6	50.6	50.6	49.5	49.5	49.5
N170	BUCKLAND	60.0	60.0	60.0	52.6	52.6	52.6	49.7	49.7	49.7
N171	MARTYN CLAVER AGED CARE	52.9	52.9	52.9	46.9	46.9	46.9	49.5	49.5	49.5
N172	WINGARA HAMLET	59.4	59.4	59.4	52.9	52.9	52.9	53.7	53.7	53.7
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	59.3	59.3	59.3	58.7	58.7	58.7	59.0	59.0	59.0
N174	KATOOMBA LEURA PRE-SCHOOL	53.6	53.6	53.6	48.0	48.0	48.0	51.8	51.8	51.8
N175	KEMPS CREEK CHILDRENS COTTAGE	59.1	59.1	59.1	54.3	54.3	54.3	53.2	53.2	53.2
N176	LAPSTONE PRE-SCHOOL	54.2	54.2	54.2	51.7	51.7	51.7	48.5	48.5	48.5
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	55.9	55.9	55.9	51.3	51.3	51.3	49.4	49.4	49.4
N178	SPRINGWOOD HOSPITAL	59.8	59.8	59.8	51.0	51.0	51.0	51.5	51.5	51.5
N179	ECHO POINT LOOKOUT	49.8	49.8	49.8	43.6	43.6	43.6	55.1	55.1	55.1
N180	ANGLICAN	53.2	53.2	53.2	47.4	47.4	47.4	50.1	50.1	50.1
N181	ANGLICAN	54.1	54.1	54.1	48.7	48.7	48.7	51.3	51.3	51.3
N182	BAPTIST	53.2	53.2	53.2	47.6	47.6	47.6	52.1	52.1	52.1
N183	BAPTIST	54.1	54.1	54.1	48.7	48.7	48.7	49.6	49.6	49.6
N184	UNITING	58.7	58.7	58.7	54.5	54.5	54.5	55.2	55.2	55.2

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		S1	S3	S4	S1	S3	S4	S1	S3	S4
N185	BLUE MOUNTAINS STEINER SCHOOL	55.2	55.2	55.2	53.9	53.9	53.9	55.2	55.2	55.2
N186	ELLISON PUBLIC SCHOOL	59.8	59.8	59.8	51.9	51.9	51.9	48.7	48.7	48.7
N187	FAULCONBRIDGE PUBLIC SCHOOL	57.8	57.8	57.8	56.2	56.2	56.2	56.8	56.8	56.8
N188	HAZELBROOK PUBLIC SCHOOL	53.0	53.0	53.0	51.4	51.4	51.4	53.0	53.0	53.0
N189	KATOOMBA HIGH SCHOOL	50.7	50.7	50.7	44.5	44.5	44.5	54.0	54.0	54.0
N190	KATOOMBA NORTH PUBLIC SCHOOL	57.7	57.7	57.7	54.6	54.6	54.6	48.4	48.4	48.4
N191	KATOOMBA PUBLIC SCHOOL	52.6	52.6	52.6	46.6	46.6	46.6	52.4	52.4	52.4
N192	KINGSWOOD PARK PUBLIC SCHOOL	69.2	69.2	69.2	68.8	68.8	68.8	53.4	53.4	53.4
N193	KINGSWOOD PUBLIC SCHOOL	69.5	69.5	69.5	69.1	69.1	69.1	53.6	53.6	53.6
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	67.7	67.7	67.7	67.4	67.4	67.4	49.6	49.6	49.6
N195	LAPSTONE PUBLIC SCHOOL	54.4	54.4	54.4	52.1	52.1	52.1	47.8	47.8	47.8
N196	LAWSON PUBLIC SCHOOL	48.3	48.3	48.3	46.5	46.5	46.5	46.5	46.5	46.5
N197	LEURA PUBLIC SCHOOL	53.7	53.7	53.7	48.1	48.1	48.1	49.3	49.3	49.3
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	48.8	48.8	48.8	47.5	47.5	47.5	48.8	48.8	48.8
N199	SPRINGWOOD HIGH SCHOOL	58.1	58.1	58.1	55.1	55.1	55.1	55.6	55.6	55.6
N200	SPRINGWOOD PUBLIC SCHOOL	60.1	60.1	60.1	54.5	54.5	54.5	52.5	52.5	52.5
N201	ST CANICES PRIMARY SCHOOL	53.6	53.6	53.6	48.0	48.0	48.0	51.8	51.8	51.8
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	59.5	59.5	59.5	51.0	51.0	51.0	47.9	47.9	47.9
N203	WENTWORTH FALLS PUBLIC SCHOOL	51.9	51.9	51.9	45.6	45.6	45.6	46.5	46.9	46.9

A6 Noise Sensitive Areas – Proportion of Respite – 2033

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	0%	0%	0%	0%	0%	0%	0%	0%	0%
M02	North East Departure	0%	0%	32%	0%	0%	58%	0%	0%	56%
M03	North East Runway	24%	38%	61%	7%	13%	98%	34%	75%	98%
M04	Twin Creeks	-	-	25%	-	-	88%	-	-	90%
M06	Mount Vernon	24%	39%	-	6%	14%	-	35%	81%	-
M07	Kemps Creek Nature Reserve	20%	57%	-	42%	77%	-	0%	3%	-
M08	Luddenham	0%	0%	26%	0%	0%	92%	0%	0%	93%
M09	Penrith	24%	38%	-	7%	13%	4%	35%	78%	4%
M10	Glenmore Park	0%	54%	-	0%	69%	-	0%	1%	-
M11	Oxley Park	-	-	-	-	-	-	-	-	-
M12	St. Marys	24%	39%	31%	7%	14%	91%	34%	75%	93%
M13	Rooty Hill	5%	54%	32%	11%	69%	58%	0%	1%	56%
M14	St. Clair	24%	38%	31%	7%	13%	91%	34%	75%	93%
M15	Erskine Park	24%	39%	-	7%	14%	-	34%	75%	-
M16	Sydney International Equestrian Centre	-	-	-	-	-	-	-	-	-
M17	Wallacia	26%	-	-	61%	-	40%	2%	-	40%
M18	Warragamba	-	-	-	-	-	-	-	-	-
M19	Greendale	0%	0%	0%	0%	0%	0%	0%	0%	0%
M20	Bringelly	45%	-	-	72%	-	-	29%	-	-
M21	Bents Basin	0%	0%	0%	0%	0%	0%	0%	0%	0%
M22	Silverdale	0%	0%	0%	0%	0%	0%	0%	0%	0%
M23	Werombi	45%	-	-	72%	-	-	29%	-	-
M24	Blaxland	24%	38%	-	7%	13%	-	35%	78%	-
M25	Linden	20%	54%	0%	38%	70%	54%	0%	1%	55%
M26	North Richmond	-	-	-	-	-	-	-	-	-
M27	Kurrajong	-	-	-	-	-	-	-	-	-
M28	The Oaks	-	-	-	-	-	-	-	-	-
M29	Lake Burragorang (Natai, Brownlow Hill)	33%	-	37%	66%	-	94%	9%	-	96%
M30	Tahmoor	-	-	-	-	-	-	-	-	-
R1	Bringelly	-	-	-	-	-	-	-	-	-
R2	Luddenham	-	-	-	-	-	-	-	-	-
R3	Greendale, Greendale Road	-	-	-	-	-	7%	-	-	7%
R6	Kemps Creek	24%	39%	25%	6%	14%	92%	35%	81%	92%
R7	Wallacia	26%	-	-	61%	-	40%	2%	-	40%

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	-	-	25%	-	-	88%	-	-	90%
R14	Lawson Road, Badgerys Creek	-	-	-	-	-	-	-	-	-
R15	Mersey Rd, Greendale	45%	-	-	72%	-	-	29%	-	-
R17	Luddenham Road	24%	39%	26%	6%	14%	92%	35%	81%	93%
R18	Cnr Adams & Elizabeth Drive	20%	57%	-	43%	77%	-	0%	3%	-
R19	Cnr Adams & Anton Road	0%	0%	0%	0%	0%	0%	0%	0%	0%
R21	Cnr Willowdene Ave and Vicar Park Lane	0%	0%	0%	0%	0%	0%	0%	0%	0%
R22	Rossmore, Victor Ave	45%	-	-	72%	-	-	29%	-	-
R23	Wallacia, Greendale Road	-	-	-	-	-	40%	-	-	40%
R24	Badgerys Creek 1 NE	20%	57%	-	43%	77%	-	0%	3%	-
R25	Badgerys Creek 2 SW	-	-	-	-	-	7%	-	-	7%
R27	Greendale, Dwyer Rd	45%	-	-	72%	-	-	29%	-	-
R30	Rossmore residential	-	-	-	-	-	-	-	-	-
R31	Mt Vernon residential	24%	39%	-	6%	14%	-	35%	81%	-
R34	Emmaus Residential Aged Care	24%	38%	-	7%	13%	-	34%	75%	-
R35	Mamre After School and Vacation Care	24%	38%	-	7%	13%	-	34%	75%	-
R37	Schoolies at Mulgoa	-	-	-	-	-	-	-	-	-
R38	Do-re-mi Day Care Centre	24%	39%	-	6%	14%	-	35%	81%	-
R39	Little Amigos Austral Early Learning Centre	-	-	-	-	-	-	-	-	-
R40	Little Smarties Childcare Centre	24%	38%	-	7%	13%	-	34%	75%	-
R41	The Grove Academy	20%	57%	-	42%	77%	-	0%	3%	-
R42	Horsley Kids	24%	39%	-	6%	14%	-	35%	81%	-
R44	Bringelly Child Care Centre	45%	-	-	72%	-	-	29%	-	-
R46	Chementson Drive Early Educational Centre	45%	-	-	72%	-	-	29%	-	-
R48	Kids Korner West Hoxton Early Learning Centre	32%	-	-	13%	-	-	71%	-	-
R49	Luddenham Child Care Centre	-	-	-	-	-	-	-	-	-
R52	The Frogs Lodge	-	-	-	-	-	-	-	-	-
R54	Mulgoa Preschool	24%	39%	25%	6%	14%	89%	35%	81%	91%
R55	Jillys Educational Childcare Centre	-	-	-	-	-	-	-	-	-
R59	Bringelly Community Centre	-	-	-	-	-	-	-	-	-
R63	Luddenham Progress Hall	-	-	-	-	-	-	-	-	-
R64	Mulgoa Hall	24%	39%	25%	6%	14%	89%	35%	81%	91%
R65	Emmaus Catholic College	24%	38%	-	7%	13%	-	34%	75%	-
R66	University of Sydney Farms	45%	-	-	72%	-	7%	29%	-	7%

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R68	Christadelphian Heritage College Sydney	20%	57%	-	43%	77%	-	0%	3%	-
R69	Mamre Anglican School	24%	38%	-	7%	13%	-	34%	75%	-
R72	Irfan College	7%	41%	-	3%	18%	-	11%	91%	-
R73	Luddenham Public School	-	-	-	-	-	-	-	-	-
R74	Kemps Creek Public School	20%	57%	-	43%	77%	-	0%	3%	-
R75	Trinity Catholic Primary School	24%	38%	-	7%	13%	-	34%	75%	-
R76	Bringelly Public School	-	-	-	-	-	-	-	-	-
R78	Mulgoa Public School	24%	39%	25%	6%	14%	89%	35%	81%	91%
R79	Rossmore Public School	-	-	-	-	-	-	-	-	-
R80	Wallacia Public School	26%	-	-	61%	-	40%	2%	-	40%
R82	Bellfield College - Junior Campus	-	-	-	-	-	-	-	-	-
R84	Bringelly Park	-	-	-	-	-	-	-	-	-
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	-	-	-	-	-	-	-	-	-
R86	Blaxland Crossing Reserve	26%	-	-	61%	-	40%	2%	-	40%
R87	Bill Anderson Reserve	20%	57%	-	43%	77%	-	0%	3%	-
R91	Western Sydney Parklands	20%	54%	32%	38%	69%	58%	0%	1%	56%
R93	Rossmore Grange	-	-	-	-	-	-	-	-	-
R94	Freeburn Park	-	-	-	-	-	-	-	-	-
R95	Overett Reserve	20%	57%	-	43%	77%	-	0%	3%	-
R97	Mulgoa Park	24%	39%	25%	6%	14%	89%	35%	81%	91%
R98	Wallacia Bowling and Recreation Club	26%	-	-	61%	-	40%	2%	-	40%
R99	Hubertus Country Club	0%	0%	0%	0%	0%	0%	0%	0%	0%
R100	Sugarloaf Cobbitty Equestrian Club	-	-	-	-	-	7%	-	-	7%
R102	Panthers Wallacia (country club)	26%	-	-	61%	-	40%	2%	-	40%
R103	Twin Creeks Gold and Country Club	-	-	25%	-	-	88%	-	-	90%
R104	Sydney International Shooting Centre	0%	57%	-	0%	77%	-	0%	3%	-
R108	Luddenham Showground	-	-	-	-	-	-	-	-	-
R109	Kemps Creek Sporting and Bowling Club	0%	0%	-	0%	0%	-	0%	0%	-
R110	St James Luddenham	-	-	-	-	-	-	-	-	-
R111	Lin Ying Temple	45%	-	-	72%	-	-	29%	-	-
R112	Vat Ketanak Khmer Kampuchea Krom	-	-	-	-	-	-	-	-	-
R114	Anglican Church Sydney Diocese	-	-	-	-	-	-	-	-	-
R115	Anglican Parish of Mulgoa	-	-	25%	-	-	89%	-	-	91%
R117	Bringelly Vineyard Church	-	-	-	-	-	-	-	-	-
R120	Our Lady Queen of Peace	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R122	St Anthony	-	-	-	-	-	-	-	-	-
R123	St Marys Church	24%	39%	26%	6%	14%	92%	35%	81%	93%
R124	Wallacia Christian Church	26%	-	-	61%	-	40%	2%	-	40%
R126	St Francis Xavier Church	0%	0%	0%	0%	0%	0%	0%	0%	0%
R127	Luddenham Uniting Church	-	-	-	-	-	-	-	-	-
R131	Science of the Soul Study Centre	0%	0%	-	0%	0%	-	0%	0%	-
R132	Bringelly shops	-	-	-	-	-	-	-	-	-
R134	Kemps Creek shops	20%	57%	-	43%	77%	-	0%	3%	-
R135	Luddenham shops	0%	0%	0%	0%	0%	0%	0%	0%	0%
R136	Mulgoa shops	24%	39%	25%	6%	14%	92%	35%	81%	92%
R137	Rossmore shops	-	-	-	-	-	-	-	-	-
R138	Wallacia Shops	26%	-	-	61%	-	40%	2%	-	40%
R140	Holy Family Catholic Primary and Church	-	-	-	-	-	-	-	-	-
R141	Edmund Rice Retreat and Conference Centre	-	-	-	-	-	-	-	-	-
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	24%	38%	-	7%	13%	-	34%	75%	-
N2	JOHN EDMONDSON VC GARDENS	-	-	-	-	-	-	-	-	-
N3	REGAL OAKS VILLAGE	26%	-	-	61%	-	40%	2%	-	40%
N4	SCALABRINI VILLAGE AUSTRAL	-	-	-	-	-	-	-	-	-
N5	TOBRUK VILLAGE	-	-	-	-	-	-	-	-	-
N6	BLAXLAND PRE-SCHOOL	39%	-	-	14%	-	-	74%	-	-
N7	GLENBROOK PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N8	KEMPS CREEK CHILDRENS COTTAGE	20%	57%	-	42%	77%	-	0%	3%	-
N9	LAPSTONE PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N10	MindChamps Early Learning & Preschool Kemps Creek	20%	57%	-	42%	77%	-	0%	3%	-
N11	MY FIRST SCHOOL CHILDCARE CENTRE	24%	39%	31%	7%	14%	91%	34%	75%	93%
N12	SILVERDALE CHILD CARE CENTRE	-	-	-	-	-	-	-	-	-
N13	WARRAGAMBA PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N14	MINCHINBURY COMMUNITY HOSPITAL	-	-	-	-	-	-	-	-	-
N15	MOUNT DRUITT HOSPITAL	-	-	-	-	-	-	-	-	-
N16	NEPEAN HOSPITAL	0%	0%	-	0%	0%	-	0%	0%	-
N17	NEPEAN PRIVATE HOSPITAL	0%	0%	-	0%	0%	-	0%	0%	-
N18	AUSTRAL CHURCH OF CHRIST	-	-	-	-	-	-	-	-	-
N19	GOOD SHEPHERD CATHOLIC CHURCH	-	-	-	-	-	-	-	-	-
N20	Grace West Anglican Church - Glenmore Park	0%	54%	-	0%	69%	-	0%	1%	-
N21	Holy Family Church	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N22	HOLY SPIRIT CATHOLIC CHURCH	-	-	-	-	-	-	-	-	-
N23	Holy Spirit Parish	24%	39%	-	7%	14%	-	34%	75%	-
N24	HOXTON PARK ANGLICAN CHURCH	-	-	-	-	-	-	-	-	-
N25	Imagine Nations Church	-	-	-	-	-	-	-	-	-
N26	INSPIRE CHURCH	-	-	-	-	-	-	-	-	-
N27	Mt Hope Uniting Church Orchard Hills	-	-	-	-	-	-	-	-	-
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	-	-	-	-	-	-	-	-	-
N29	Samoan Methodist Church	0%	0%	-	0%	0%	-	0%	0%	-
N30	SIKH MISSION CENTRE	-	-	-	-	-	-	-	-	-
N31	St Clair Anglican Church	-	-	-	-	-	-	-	-	-
N32	St Mary Mother of the Church	-	-	-	-	-	-	-	-	-
N33	ST ZAIA CATHEDRAL	-	-	-	-	-	-	-	-	-
N34	Uniting Church St Clair	-	-	-	-	-	-	-	-	-
N35	WEST HOXTON COMMUNITY CHURCH	32%	-	-	13%	-	-	71%	-	-
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	-	-	-	-	-	-	-	-	-
N37	AUSTRAL PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	-	-	-	-	-	-	-	-	-
N39	BANKS PUBLIC SCHOOL	24%	39%	31%	7%	14%	91%	34%	75%	93%
N40	BENNETT ROAD PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N41	BETHANY CATHOLIC PRIMARY SCHOOL	0%	54%	-	0%	69%	-	0%	1%	-
N42	BIDWILL PUBLIC SCHOOL	20%	54%	32%	38%	69%	58%	0%	1%	56%
N43	BLACKETT PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N44	BLACKTOWN NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N46	BLACKTOWN TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N47	BLACKTOWN WEST PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N48	BLACKWELL PUBLIC SCHOOL	24%	39%	-	7%	14%	-	34%	75%	-
N49	BLAXLAND EAST PUBLIC SCHOOL	39%	-	-	14%	-	-	74%	-	-
N50	BLAXLAND HIGH SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N51	BLAXLAND PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N53	CAMBRIDGE PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N54	CATHWEST INNOVATION COLLEGE MCCARTHY CAMPUS	24%	38%	-	7%	13%	-	35%	78%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N55	CECIL HILLS PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	20%	54%	32%	38%	69%	58%	0%	1%	56%
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	-	-	-	-	-	-	-	-	-
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	-	-	-	-	-	-	-	-	-
N59	CHIFLEY COLLEGE SENIOR CAMPUS	-	-	-	-	-	-	-	-	-
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	20%	54%	-	38%	69%	-	0%	1%	-
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	20%	57%	-	43%	77%	-	0%	3%	-
N62	CLAIRGATE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N64	COLYTON HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N65	COLYTON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N66	DAWSON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N67	EASTERN CREEK PUBLIC SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N69	EMERTON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N70	EMU HEIGHTS PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N71	EMU PLAINS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N72	ERSKINE PARK HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N73	GLENBROOK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N74	GLENDENNING PUBLIC SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N75	GLENMORE PARK PUBLIC SCHOOL	0%	54%	-	0%	69%	-	0%	1%	-
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N77	GOOD SHEPHERD PRIMARY SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N78	GREENWAY PARK PUBLIC SCHOOL	32%	-	-	13%	-	-	71%	-	-
N79	HASSALL GROVE PUBLIC SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N80	HEBERSHAM PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N81	HOLY FAMILY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N82	HOLY SPIRIT PRIMARY SCHOOL	24%	39%	-	7%	14%	-	34%	75%	-
N83	HOLY SPIRIT PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N84	HORSLEY PARK PUBLIC SCHOOL	24%	39%	-	6%	14%	-	35%	81%	-
N85	HOXTON PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N86	JAMES ERSKINE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N87	JAMISON HIGH SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N88	JAMISONTOWN PUBLIC SCHOOL	20%	54%	-	38%	69%	4%	0%	1%	4%
N89	JORDAN SPRINGS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N90	KINGSWOOD PARK PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N91	KINGSWOOD PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N93	LAPSTONE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N94	LEONAY PUBLIC SCHOOL	39%	-	-	14%	-	-	74%	-	-
N95	LEPPINGTON PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N96	LETHBRIDGE PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N97	LLANDILO PUBLIC SCHOOL	24%	39%	0%	7%	14%	54%	34%	75%	54%
N98	LYNWOOD PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	-	-	-	-	-	-	-	-	-
N100	MACQUARIE FIELDS TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N101	MADANG AVENUE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	-	-	-	-	-	-	-	-	-
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N104	MARAYONG PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N105	MIDDLETON GRANGE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N106	MINCHINBURY PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N107	MONTGROVE COLLEGE	20%	54%	-	38%	69%	-	0%	1%	-
N108	MOUNT DRUITT PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	-	-	-	-	-	-	-	-	-
N110	MOUNT DRUITT TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N112	NEPEAN CHRISTIAN SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	24%	38%	-	7%	13%	4%	35%	78%	4%
N116	NOUMEA PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N117	ORCHARD HILLS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	24%	39%	31%	7%	14%	91%	34%	75%	93%
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N120	OXLEY PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	24%	38%	-	7%	13%	-	35%	78%	-
N122	PENRITH ANGLICAN COLLEGE	-	-	-	-	-	-	-	-	-
N123	PENRITH CHRISTIAN SCHOOL	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N124	PENRITH HIGH SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N125	PENRITH PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	78%	-
N126	PENRITH SOUTH PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N127	PLUMPTON HIGH SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N128	PLUMPTON PUBLIC SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N129	REGENTVILLE PUBLIC SCHOOL	39%	-	-	14%	-	4%	74%	-	4%
N130	ROOTY HILL HIGH SCHOOL	49%	-	-	35%	-	-	79%	-	-
N131	ROOTY HILL PUBLIC SCHOOL	49%	-	-	35%	-	-	79%	-	-
N132	ROPES CROSSING PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N133	SACRED HEART PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N134	SHALVEY PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N135	SHELLEY PUBLIC SCHOOL	24%	39%	-	6%	14%	-	35%	81%	-
N136	ST AIDAN'S PRIMARY SCHOOL	49%	-	-	35%	-	-	79%	-	-
N137	ST ANDREWS PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	-	-	-	-	-	-	-	-	-
N139	ST CLAIR HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N140	ST CLAIR PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N141	ST FINBAR'S PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	5%	54%	32%	11%	69%	58%	0%	1%	56%
N143	ST JOSEPH'S PRIMARY SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N144	ST MARY MACKILLOP PRIMARY SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N145	ST MARYS NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N146	ST MARYS PUBLIC SCHOOL	24%	39%	31%	7%	14%	91%	34%	75%	93%
N147	ST MARYS SENIOR HIGH SCHOOL	24%	39%	31%	7%	14%	91%	34%	75%	93%
N148	ST MARYS SOUTH PUBLIC SCHOOL	24%	39%	31%	7%	14%	91%	34%	75%	93%
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	24%	38%	-	7%	13%	4%	35%	78%	4%
N150	SURVEYORS CREEK PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N151	THOMAS HASSALL ANGLICAN COLLEGE	-	-	-	-	-	-	-	-	-
N152	TREGEAR PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N153	UNITY GRAMMAR COLLEGE	-	-	-	-	-	-	-	-	-
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N157	WALTERS ROAD PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N158	WARRAGAMBA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N159	WARRIMOO PUBLIC SCHOOL	24%	38%	33%	7%	13%	60%	35%	78%	58%
N160	WERRINGTON COUNTY PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N161	WERRINGTON PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N162	WETHERILL PARK TAFE COLLEGE	45%	-	-	72%	-	-	29%	-	-
N163	WHALAN PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N164	WILLIAM DEAN PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N165	WILLMOT PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N166	YORK PUBLIC SCHOOL	20%	54%	-	38%	69%	-	0%	1%	-
N167	AQUINAS COURT	0%	-	-	0%	-	-	0%	-	-
N168	BAPTISTCARE MORVEN GARDENS CENTRE	-	-	-	-	-	-	-	-	-
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	-	-	-	-	-	-	-	-	-
N170	BUCKLAND	26%	-	-	61%	-	-	2%	-	-
N171	MARTYN CLAVER AGED CARE	-	-	-	-	-	-	-	-	-
N172	WINGARA HAMLET	39%	-	-	14%	-	-	74%	-	-
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	-	-	-	-	-	-	-	-	-
N174	KATOOMBA LEURA PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N175	KEMPS CREEK CHILDRENS COTTAGE	20%	57%	-	42%	77%	-	0%	3%	-
N176	LAPSTONE PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	-	-	-	-	-	-	-	-	-
N178	SPRINGWOOD HOSPITAL	0%	-	-	0%	-	-	0%	-	-
N179	ECHO POINT LOOKOUT	-	-	-	-	-	-	-	-	-
N180	ANGLICAN	-	-	-	-	-	-	-	-	-
N181	ANGLICAN	-	-	-	-	-	-	-	-	-
N182	BAPTIST	-	-	-	-	-	-	-	-	-
N183	BAPTIST	-	-	-	-	-	-	-	-	-
N184	UNITING	39%	-	-	14%	-	-	74%	-	-
N185	BLUE MOUNTAINS STEINER SCHOOL	-	-	-	-	-	-	-	-	-
N186	ELLISON PUBLIC SCHOOL	26%	-	-	61%	-	-	2%	-	-
N187	FAULCONBRIDGE PUBLIC SCHOOL	39%	-	-	14%	-	-	74%	-	-
N188	HAZELBROOK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N189	KATOOMBA HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N190	KATOOMBA NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N191	KATOOMBA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N192	KINGSWOOD PARK PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N193	KINGSWOOD PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N195	LAPSTONE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N196	LAWSON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N197	LEURA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N199	SPRINGWOOD HIGH SCHOOL	39%	-	-	14%	-	-	74%	-	-
N200	SPRINGWOOD PUBLIC SCHOOL	0%	-	-	0%	-	-	0%	-	-
N201	ST CANICES PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	26%	-	-	61%	-	-	2%	-	-
N203	WENTWORTH FALLS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

A7 Noise Sensitive Areas – Proportion of Respite – 2040

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	0%	0%	0%	0%	0%	0%	0%	0%	0%
M02	North East Departure	0%	0%	32%	0%	0%	56%	0%	0%	55%
M03	North East Runway	24%	38%	45%	6%	13%	95%	34%	75%	96%
M04	Twin Creeks	-	-	25%	-	-	87%	-	-	89%
M06	Mount Vernon	24%	39%	-	6%	14%	-	35%	81%	-
M07	Kemps Creek Nature Reserve	20%	56%	-	41%	76%	-	0%	2%	-
M08	Luddenham	0%	0%	26%	0%	0%	93%	0%	0%	93%
M09	Penrith	24%	38%	-	7%	13%	4%	35%	77%	4%
M10	Glenmore Park	0%	54%	-	0%	68%	-	0%	1%	-
M11	Oxley Park	-	-	-	-	-	-	-	-	-
M12	St. Marys	24%	39%	27%	6%	14%	89%	34%	79%	91%
M13	Rooty Hill	5%	54%	32%	11%	68%	56%	0%	1%	55%
M14	St. Clair	24%	38%	27%	6%	13%	89%	34%	75%	91%
M15	Erskine Park	24%	39%	-	6%	14%	-	34%	79%	-
M16	Sydney International Equestrian Centre	-	-	-	-	-	-	-	-	-
M17	Wallacia	23%	-	-	52%	-	32%	1%	-	32%
M18	Warragamba	-	-	-	-	-	-	-	-	-
M19	Greendale	0%	0%	0%	0%	0%	0%	0%	0%	0%
M20	Bringelly	45%	-	-	72%	-	-	29%	-	-
M21	Bents Basin	0%	0%	0%	0%	0%	0%	0%	0%	0%
M22	Silverdale	0%	0%	0%	0%	0%	0%	0%	0%	0%
M23	Werombi	45%	-	-	72%	-	-	29%	-	-
M24	Blaxland	24%	38%	-	7%	13%	-	35%	77%	-
M25	Linden	20%	54%	0%	38%	71%	57%	0%	2%	57%
M26	North Richmond	-	-	-	-	-	-	-	-	-
M27	Kurrajong	-	-	-	-	-	-	-	-	-
M28	The Oaks	-	-	-	-	-	-	-	-	-
M29	Lake Burragorang (Natai, Brownlow Hill)	33%	-	25%	66%	-	91%	9%	-	92%
M30	Tahmoor	-	-	-	-	-	-	-	-	-
R1	Bringelly	-	-	-	-	-	-	-	-	-
R2	Luddenham	-	-	-	-	-	-	-	-	-
R3	Greendale, Greendale Road	-	-	-	-	-	7%	-	-	7%
R6	Kemps Creek	24%	39%	25%	6%	14%	91%	35%	81%	92%
R7	Wallacia	23%	-	-	52%	-	32%	1%	-	32%

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	-	-	25%	-	-	87%	-	-	89%
R14	Lawson Road, Badgerys Creek	-	-	-	-	-	-	-	-	-
R15	Mersey Rd, Greendale	45%	-	-	72%	-	-	29%	-	-
R17	Luddenham Road	24%	39%	26%	6%	14%	93%	35%	81%	93%
R18	Cnr Adams & Elizabeth Drive	20%	56%	-	41%	76%	-	0%	2%	-
R19	Cnr Adams & Anton Road	0%	0%	0%	0%	0%	0%	0%	0%	0%
R21	Cnr Willowdene Ave and Vicar Park Lane	0%	0%	0%	0%	0%	0%	0%	0%	0%
R22	Rossmore, Victor Ave	45%	-	-	72%	-	-	29%	-	-
R23	Wallacia, Greendale Road	-	-	-	-	-	32%	-	-	32%
R24	Badgerys Creek 1 NE	20%	56%	-	41%	76%	-	0%	2%	-
R25	Badgerys Creek 2 SW	-	-	-	-	-	7%	-	-	7%
R27	Greendale, Dwyer Rd	45%	-	-	72%	-	-	29%	-	-
R30	Rossmore residential	-	-	-	-	-	-	-	-	-
R31	Mt Vernon residential	24%	39%	-	6%	14%	-	35%	81%	-
R34	Emmaus Residential Aged Care	24%	38%	-	6%	13%	-	34%	75%	-
R35	Mamre After School and Vacation Care	24%	38%	-	6%	13%	-	34%	75%	-
R37	Schoolies at Mulgoa	-	-	-	-	-	-	-	-	-
R38	Do-re-mi Day Care Centre	24%	39%	-	6%	14%	-	35%	81%	-
R39	Little Amigos Austral Early Learning Centre	-	-	-	-	-	-	-	-	-
R40	Little Smarties Childcare Centre	24%	38%	-	6%	13%	-	34%	75%	-
R41	The Grove Academy	20%	56%	-	41%	76%	-	0%	2%	-
R42	Horsley Kids	24%	39%	-	6%	14%	-	35%	81%	-
R44	Bringelly Child Care Centre	45%	-	-	72%	-	-	29%	-	-
R46	Chementson Drive Early Educational Centre	45%	-	-	72%	-	-	29%	-	-
R48	Kids Korner West Hoxton Early Learning Centre	32%	-	-	13%	-	-	71%	-	-
R49	Luddenham Child Care Centre	-	-	-	-	-	-	-	-	-
R52	The Frogs Lodge	-	-	-	-	-	-	-	-	-
R54	Mulgoa Preschool	24%	39%	25%	6%	14%	88%	35%	81%	91%
R55	Jillys Educational Childcare Centre	-	-	-	-	-	-	-	-	-
R59	Bringelly Community Centre	-	-	-	-	-	-	-	-	-
R63	Luddenham Progress Hall	-	-	-	-	-	-	-	-	-
R64	Mulgoa Hall	24%	39%	25%	6%	14%	88%	35%	81%	91%
R65	Emmaus Catholic College	24%	38%	-	6%	13%	-	34%	75%	-
R66	University of Sydney Farms	45%	-	-	72%	-	7%	29%	-	7%

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R68	Christadelphian Heritage College Sydney	20%	56%	-	41%	76%	-	0%	2%	-
R69	Mamre Anglican School	24%	38%	-	6%	13%	-	34%	75%	-
R72	Irfan College	7%	40%	-	2%	17%	-	11%	86%	-
R73	Luddenham Public School	-	-	-	-	-	-	-	-	-
R74	Kemps Creek Public School	20%	56%	-	41%	76%	-	0%	2%	-
R75	Trinity Catholic Primary School	24%	38%	-	6%	13%	-	34%	75%	-
R76	Bringelly Public School	-	-	-	-	-	-	-	-	-
R78	Mulgoa Public School	24%	39%	25%	6%	14%	88%	35%	81%	91%
R79	Rossmore Public School	-	-	-	-	-	-	-	-	-
R80	Wallacia Public School	23%	-	-	52%	-	32%	1%	-	32%
R82	Bellfield College - Junior Campus	-	-	-	-	-	-	-	-	-
R84	Bringelly Park	-	-	-	-	-	-	-	-	-
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	-	-	-	-	-	-	-	-	-
R86	Blaxland Crossing Reserve	23%	-	-	52%	-	32%	1%	-	32%
R87	Bill Anderson Reserve	20%	56%	-	41%	76%	-	0%	2%	-
R91	Western Sydney Parklands	20%	54%	32%	38%	68%	56%	0%	1%	55%
R93	Rossmore Grange	-	-	-	-	-	-	-	-	-
R94	Freeburn Park	-	-	-	-	-	-	-	-	-
R95	Overett Reserve	20%	56%	-	41%	76%	-	0%	2%	-
R97	Mulgoa Park	24%	39%	25%	6%	14%	88%	35%	81%	91%
R98	Wallacia Bowling and Recreation Club	23%	-	-	52%	-	32%	1%	-	32%
R99	Hubertus Country Club	0%	0%	0%	0%	0%	0%	0%	0%	0%
R100	Sugarloaf Cobbitty Equestrian Club	-	-	-	-	-	7%	-	-	7%
R102	Panthers Wallacia (country club)	23%	-	-	52%	-	32%	1%	-	32%
R103	Twin Creeks Gold and Country Club	-	-	25%	-	-	87%	-	-	89%
R104	Sydney International Shooting Centre	0%	56%	-	0%	76%	-	0%	2%	-
R108	Luddenham Showground	-	-	-	-	-	-	-	-	-
R109	Kemps Creek Sporting and Bowling Club	0%	0%	-	0%	0%	-	0%	0%	-
R110	St James Luddenham	-	-	-	-	-	-	-	-	-
R111	Lin Ying Temple	45%	-	-	72%	-	-	29%	-	-
R112	Vat Ketanak Khmer Kampuchea Krom	-	-	-	-	-	-	-	-	-
R114	Anglican Church Sydney Diocese	-	-	-	-	-	-	-	-	-
R115	Anglican Parish of Mulgoa	-	-	25%	-	-	88%	-	-	91%
R117	Bringelly Vineyard Church	-	-	-	-	-	-	-	-	-
R120	Our Lady Queen of Peace	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R122	St Anthony	-	-	-	-	-	-	-	-	-
R123	St Marys Church	24%	39%	26%	6%	14%	93%	35%	81%	93%
R124	Wallacia Christian Church	23%	-	-	52%	-	32%	1%	-	32%
R126	St Francis Xavier Church	0%	0%	0%	0%	0%	0%	0%	0%	0%
R127	Luddenham Uniting Church	-	-	-	-	-	-	-	-	-
R131	Science of the Soul Study Centre	0%	0%	-	0%	0%	-	0%	0%	-
R132	Bringelly shops	-	-	-	-	-	-	-	-	-
R134	Kemps Creek shops	20%	56%	-	41%	76%	-	0%	2%	-
R135	Luddenham shops	0%	0%	0%	0%	0%	0%	0%	0%	0%
R136	Mulgoa shops	24%	39%	25%	6%	14%	91%	35%	81%	92%
R137	Rossmore shops	-	-	-	-	-	-	-	-	-
R138	Wallacia Shops	23%	-	-	52%	-	32%	1%	-	32%
R140	Holy Family Catholic Primary and Church	-	-	-	-	-	-	-	-	-
R141	Edmund Rice Retreat and Conference Centre	-	-	-	-	-	-	-	-	-
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	24%	38%	-	6%	13%	-	34%	75%	-
N2	JOHN EDMONDSON VC GARDENS	-	-	-	-	-	-	-	-	-
N3	REGAL OAKS VILLAGE	23%	-	-	52%	-	32%	1%	-	32%
N4	SCALABRINI VILLAGE AUSTRAL	-	-	-	-	-	-	-	-	-
N5	TOBRUK VILLAGE	-	-	-	-	-	-	-	-	-
N6	BLAXLAND PRE-SCHOOL	29%	-	-	9%	-	-	62%	-	-
N7	GLENBROOK PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N8	KEMPS CREEK CHILDRENS COTTAGE	20%	56%	-	41%	76%	-	0%	2%	-
N9	LAPSTONE PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N10	MindChamps Early Learning & Preschool Kemps Creek	20%	56%	-	41%	76%	-	0%	2%	-
N11	MY FIRST SCHOOL CHILDCARE CENTRE	24%	39%	27%	6%	14%	89%	34%	79%	91%
N12	SILVERDALE CHILD CARE CENTRE	-	-	-	-	-	-	-	-	-
N13	WARRAGAMBA PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N14	MINCHINBURY COMMUNITY HOSPITAL	-	-	-	-	-	-	-	-	-
N15	MOUNT DRUITT HOSPITAL	-	-	-	-	-	-	-	-	-
N16	NEPEAN HOSPITAL	0%	0%	-	0%	0%	-	0%	0%	-
N17	NEPEAN PRIVATE HOSPITAL	0%	0%	-	0%	0%	-	0%	0%	-
N18	AUSTRAL CHURCH OF CHRIST	-	-	-	-	-	-	-	-	-
N19	GOOD SHEPHERD CATHOLIC CHURCH	-	-	-	-	-	-	-	-	-
N20	Grace West Anglican Church - Glenmore Park	0%	54%	-	0%	68%	-	0%	1%	-
N21	Holy Family Church	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N22	HOLY SPIRIT CATHOLIC CHURCH	-	-	-	-	-	-	-	-	-
N23	Holy Spirit Parish	24%	39%	-	6%	14%	-	34%	79%	-
N24	HOXTON PARK ANGLICAN CHURCH	-	-	-	-	-	-	-	-	-
N25	Imagine Nations Church	-	-	-	-	-	-	-	-	-
N26	INSPIRE CHURCH	-	-	-	-	-	-	-	-	-
N27	Mt Hope Uniting Church Orchard Hills	-	-	-	-	-	-	-	-	-
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	-	-	-	-	-	-	-	-	-
N29	Samoan Methodist Church	0%	0%	-	0%	0%	-	0%	0%	-
N30	SIKH MISSION CENTRE	-	-	-	-	-	-	-	-	-
N31	St Clair Anglican Church	-	-	-	-	-	-	-	-	-
N32	St Mary Mother of the Church	-	-	-	-	-	-	-	-	-
N33	ST ZAIA CATHEDRAL	-	-	-	-	-	-	-	-	-
N34	Uniting Church St Clair	-	-	-	-	-	-	-	-	-
N35	WEST HOXTON COMMUNITY CHURCH	32%	-	-	13%	-	-	71%	-	-
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	-	-	-	-	-	-	-	-	-
N37	AUSTRAL PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	-	-	-	-	-	-	-	-	-
N39	BANKS PUBLIC SCHOOL	24%	39%	27%	6%	14%	89%	34%	79%	91%
N40	BENNETT ROAD PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N41	BETHANY CATHOLIC PRIMARY SCHOOL	0%	54%	-	0%	68%	-	0%	1%	-
N42	BIDWILL PUBLIC SCHOOL	20%	54%	32%	38%	68%	56%	0%	1%	55%
N43	BLACKETT PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N44	BLACKTOWN NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N46	BLACKTOWN TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N47	BLACKTOWN WEST PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N48	BLACKWELL PUBLIC SCHOOL	24%	39%	-	6%	14%	-	34%	79%	-
N49	BLAXLAND EAST PUBLIC SCHOOL	29%	-	-	9%	-	-	62%	-	-
N50	BLAXLAND HIGH SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N51	BLAXLAND PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N53	CAMBRIDGE PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N54	CATHWEST INNOVATION COLLEGE MCCARTHY CAMPUS	24%	38%	-	7%	13%	-	35%	77%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N55	CECIL HILLS PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	20%	54%	32%	38%	68%	56%	0%	1%	55%
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	-	-	-	-	-	-	-	-	-
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	-	-	-	-	-	-	-	-	-
N59	CHIFLEY COLLEGE SENIOR CAMPUS	-	-	-	-	-	-	-	-	-
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	20%	54%	-	39%	68%	-	0%	1%	-
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	20%	56%	-	41%	76%	-	0%	2%	-
N62	CLAIRGATE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N64	COLYTON HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N65	COLYTON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N66	DAWSON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N67	EASTERN CREEK PUBLIC SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N69	EMERTON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N70	EMU HEIGHTS PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N71	EMU PLAINS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N72	ERSKINE PARK HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N73	GLENBROOK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N74	GLENDENNING PUBLIC SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N75	GLENMORE PARK PUBLIC SCHOOL	0%	54%	-	0%	68%	-	0%	1%	-
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N77	GOOD SHEPHERD PRIMARY SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N78	GREENWAY PARK PUBLIC SCHOOL	32%	-	-	13%	-	-	71%	-	-
N79	HASSALL GROVE PUBLIC SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N80	HEBERSHAM PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N81	HOLY FAMILY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N82	HOLY SPIRIT PRIMARY SCHOOL	24%	39%	-	6%	14%	-	34%	79%	-
N83	HOLY SPIRIT PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N84	HORSLEY PARK PUBLIC SCHOOL	24%	39%	-	6%	14%	-	35%	81%	-
N85	HOXTON PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N86	JAMES ERSKINE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N87	JAMISON HIGH SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N88	JAMISONTOWN PUBLIC SCHOOL	20%	54%	-	39%	68%	4%	0%	1%	4%
N89	JORDAN SPRINGS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N90	KINGSWOOD PARK PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N91	KINGSWOOD PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N93	LAPSTONE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N94	LEONAY PUBLIC SCHOOL	29%	-	-	9%	-	-	62%	-	-
N95	LEPPINGTON PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N96	LETHBRIDGE PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N97	LLANDILO PUBLIC SCHOOL	24%	39%	0%	6%	14%	50%	34%	79%	51%
N98	LYNWOOD PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	-	-	-	-	-	-	-	-	-
N100	MACQUARIE FIELDS TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N101	MADANG AVENUE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	-	-	-	-	-	-	-	-	-
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N104	MARAYONG PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N105	MIDDLETON GRANGE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N106	MINCHINBURY PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N107	MONTGROVE COLLEGE	20%	54%	-	39%	68%	-	0%	1%	-
N108	MOUNT DRUITT PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	-	-	-	-	-	-	-	-	-
N110	MOUNT DRUITT TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N112	NEPEAN CHRISTIAN SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	24%	38%	-	7%	13%	4%	35%	77%	4%
N116	NOUMEA PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N117	ORCHARD HILLS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	24%	39%	27%	6%	14%	89%	34%	79%	91%
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N120	OXLEY PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	24%	38%	-	7%	13%	-	35%	77%	-
N122	PENRITH ANGLICAN COLLEGE	-	-	-	-	-	-	-	-	-
N123	PENRITH CHRISTIAN SCHOOL	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N124	PENRITH HIGH SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N125	PENRITH PUBLIC SCHOOL	24%	38%	-	7%	13%	-	35%	77%	-
N126	PENRITH SOUTH PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N127	PLUMPTON HIGH SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N128	PLUMPTON PUBLIC SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N129	REGENTVILLE PUBLIC SCHOOL	29%	-	-	9%	-	4%	62%	-	4%
N130	ROOTY HILL HIGH SCHOOL	49%	-	-	35%	-	-	79%	-	-
N131	ROOTY HILL PUBLIC SCHOOL	49%	-	-	35%	-	-	79%	-	-
N132	ROPES CROSSING PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N133	SACRED HEART PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N134	SHALVEY PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N135	SHELLEY PUBLIC SCHOOL	24%	39%	-	6%	14%	-	35%	81%	-
N136	ST AIDAN'S PRIMARY SCHOOL	49%	-	-	35%	-	-	79%	-	-
N137	ST ANDREWS PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	-	-	-	-	-	-	-	-	-
N139	ST CLAIR HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N140	ST CLAIR PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N141	ST FINBAR'S PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	5%	54%	32%	11%	68%	56%	0%	1%	55%
N143	ST JOSEPH'S PRIMARY SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N144	ST MARY MACKILLOP PRIMARY SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N145	ST MARYS NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N146	ST MARYS PUBLIC SCHOOL	24%	39%	27%	6%	14%	89%	34%	79%	91%
N147	ST MARYS SENIOR HIGH SCHOOL	24%	39%	27%	6%	14%	89%	34%	79%	91%
N148	ST MARYS SOUTH PUBLIC SCHOOL	24%	39%	27%	6%	14%	89%	34%	79%	91%
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	24%	38%	-	7%	13%	4%	35%	77%	4%
N150	SURVEYORS CREEK PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N151	THOMAS HASSALL ANGLICAN COLLEGE	-	-	-	-	-	-	-	-	-
N152	TREGEAR PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N153	UNITY GRAMMAR COLLEGE	-	-	-	-	-	-	-	-	-
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	0%	0%	-	0%	0%	-	0%	0%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N157	WALTERS ROAD PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N158	WARRAGAMBA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N159	WARRIMOO PUBLIC SCHOOL	24%	38%	32%	7%	13%	58%	35%	77%	56%
N160	WERRINGTON COUNTY PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N161	WERRINGTON PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N162	WETHERILL PARK TAFE COLLEGE	45%	-	-	72%	-	-	29%	-	-
N163	WHALAN PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N164	WILLIAM DEAN PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N165	WILLMOT PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N166	YORK PUBLIC SCHOOL	20%	54%	-	39%	68%	-	0%	1%	-
N167	AQUINAS COURT	0%	-	-	0%	-	-	0%	-	-
N168	BAPTISTCARE MORVEN GARDENS CENTRE	-	-	-	-	-	-	-	-	-
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	-	-	-	-	-	-	-	-	-
N170	BUCKLAND	23%	-	-	52%	-	-	1%	-	-
N171	MARTYN CLAVER AGED CARE	-	-	-	-	-	-	-	-	-
N172	WINGARA HAMLET	29%	-	-	9%	-	-	62%	-	-
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	-	-	-	-	-	-	-	-	-
N174	KATOOMBA LEURA PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N175	KEMPS CREEK CHILDRENS COTTAGE	20%	56%	-	41%	76%	-	0%	2%	-
N176	LAPSTONE PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	-	-	-	-	-	-	-	-	-
N178	SPRINGWOOD HOSPITAL	0%	-	-	0%	-	-	0%	-	-
N179	ECHO POINT LOOKOUT	-	-	-	-	-	-	-	-	-
N180	ANGLICAN	-	-	-	-	-	-	-	-	-
N181	ANGLICAN	-	-	-	-	-	-	-	-	-
N182	BAPTIST	-	-	-	-	-	-	-	-	-
N183	BAPTIST	-	-	-	-	-	-	-	-	-
N184	UNITING	29%	-	-	9%	-	-	62%	-	-
N185	BLUE MOUNTAINS STEINER SCHOOL	-	-	-	-	-	-	-	-	-
N186	ELLISON PUBLIC SCHOOL	23%	-	-	52%	-	-	1%	-	-
N187	FAULCONBRIDGE PUBLIC SCHOOL	29%	-	-	9%	-	-	62%	-	-
N188	HAZELBROOK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N189	KATOOMBA HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N190	KATOOMBA NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N191	KATOOMBA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N192	KINGSWOOD PARK PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N193	KINGSWOOD PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	0%	0%	-	0%	0%	-	0%	0%	-
N195	LAPSTONE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N196	LAWSON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N197	LEURA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N199	SPRINGWOOD HIGH SCHOOL	29%	-	-	9%	-	-	62%	-	-
N200	SPRINGWOOD PUBLIC SCHOOL	0%	-	-	0%	-	-	0%	-	-
N201	ST CANICES PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	23%	-	-	52%	-	-	1%	-	-
N203	WENTWORTH FALLS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

A8 Noise Sensitive Areas – Proportion of Respite – 2055

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
M01	South West Departure (Wallacia)	0%	0%	0%	0%	0%	0%	0%	0%	0%
M02	North East Departure	0%	0%	32%	0%	0%	56%	0%	0%	55%
M03	North East Runway	24%	38%	25%	6%	13%	89%	34%	75%	91%
M04	Twin Creeks	-	94%	24%	-	90%	85%	-	99%	88%
M06	Mount Vernon	24%	45%	-	6%	24%	-	34%	80%	-
M07	Kemps Creek Nature Reserve	20%	61%	-	39%	76%	-	0%	13%	-
M08	Luddenham	0%	5%	26%	0%	2%	92%	0%	11%	92%
M09	Penrith	24%	45%	-	6%	23%	4%	34%	76%	4%
M10	Glenmore Park	0%	60%	-	0%	72%	-	0%	13%	-
M11	Oxley Park	-	-	-	-	-	-	-	-	-
M12	St. Marys	24%	38%	25%	7%	13%	88%	34%	75%	90%
M13	Rooty Hill	5%	54%	32%	11%	69%	57%	0%	1%	56%
M14	St. Clair	24%	38%	25%	6%	13%	88%	34%	75%	90%
M15	Erskine Park	24%	38%	-	7%	13%	-	34%	75%	-
M16	Sydney International Equestrian Centre	-	-	-	-	-	-	-	-	-
M17	Wallacia	21%	-	-	45%	-	21%	1%	-	21%
M18	Warragamba	-	-	-	-	-	-	-	-	-
M19	Greendale	0%	0%	0%	0%	0%	0%	0%	0%	0%
M20	Bringelly	45%	-	-	72%	-	-	29%	-	-
M21	Bents Basin	0%	0%	0%	0%	0%	0%	0%	0%	0%
M22	Silverdale	0%	0%	0%	0%	0%	0%	0%	0%	0%
M23	Werombi	45%	-	-	72%	-	-	29%	-	-
M24	Blaxland	24%	45%	-	6%	23%	-	34%	76%	-
M25	Linden	20%	48%	0%	38%	61%	53%	0%	1%	53%
M26	North Richmond	-	-	-	-	-	-	-	-	-
M27	Kurrajong	-	-	-	-	-	-	-	-	-
M28	The Oaks	-	-	-	-	-	-	-	-	-
M29	Lake Burragorang (Natai, Brownlow Hill)	33%	94%	25%	66%	90%	88%	9%	99%	90%
M30	Tahmoor	-	-	-	-	-	-	-	-	-
R1	Bringelly	-	-	-	-	-	-	-	-	-
R2	Luddenham	-	-	-	-	-	-	-	-	-
R3	Greendale, Greendale Road	-	-	-	-	-	5%	-	-	5%
R6	Kemps Creek	24%	39%	24%	6%	14%	88%	34%	78%	89%
R7	Wallacia	21%	-	-	45%	-	21%	1%	-	21%

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R8	Twin Creeks, Cnr Twin Ck Drie & Humewood Place	-	94%	24%	-	90%	85%	-	99%	88%
R14	Lawson Road, Badgerys Creek	-	-	-	-	-	-	-	-	-
R15	Mersey Rd, Greendale	45%	-	-	72%	-	-	29%	-	-
R17	Luddenham Road	24%	39%	26%	6%	14%	92%	34%	79%	92%
R18	Cnr Adams & Elizabeth Drive	20%	61%	-	39%	76%	-	0%	13%	-
R19	Cnr Adams & Anton Road	0%	0%	0%	0%	0%	0%	0%	0%	0%
R21	Cnr Willowdene Ave and Vicar Park Lane	0%	0%	0%	0%	0%	0%	0%	0%	0%
R22	Rossmore, Victor Ave	45%	-	-	72%	-	-	29%	-	-
R23	Wallacia, Greendale Road	-	-	-	-	-	21%	-	-	21%
R24	Badgerys Creek 1 NE	20%	61%	-	39%	76%	-	0%	13%	-
R25	Badgerys Creek 2 SW	-	-	-	-	-	10%	-	-	10%
R27	Greendale, Dwyer Rd	45%	-	-	72%	-	-	29%	-	-
R30	Rossmore residential	-	-	-	-	-	-	-	-	-
R31	Mt Vernon residential	24%	45%	-	6%	24%	-	34%	80%	-
R34	Emmaus Residential Aged Care	24%	38%	-	6%	13%	-	34%	75%	-
R35	Mamre After School and Vacation Care	24%	38%	-	6%	13%	-	34%	75%	-
R37	Schoolies at Mulgoa	-	-	-	-	-	-	-	-	-
R38	Do-re-mi Day Care Centre	24%	45%	-	6%	24%	-	34%	80%	-
R39	Little Amigos Austral Early Learning Centre	-	-	-	-	-	-	-	-	-
R40	Little Smarties Childcare Centre	24%	38%	-	6%	13%	-	34%	75%	-
R41	The Grove Academy	20%	61%	-	39%	76%	-	0%	13%	-
R42	Horsley Kids	24%	45%	-	6%	24%	-	34%	80%	-
R44	Bringelly Child Care Centre	45%	-	-	72%	-	-	29%	-	-
R46	Chementson Drive Early Educational Centre	45%	-	-	72%	-	-	29%	-	-
R48	Kids Korner West Hoxton Early Learning Centre	32%	-	-	13%	-	-	71%	-	-
R49	Luddenham Child Care Centre	-	-	-	-	-	-	-	-	-
R52	The Frogs Lodge	-	-	-	-	-	-	-	-	-
R54	Mulgoa Preschool	24%	39%	24%	6%	14%	86%	34%	78%	89%
R55	Jillys Educational Childcare Centre	-	-	-	-	-	-	-	-	-
R59	Bringelly Community Centre	-	-	-	-	-	-	-	-	-
R63	Luddenham Progress Hall	-	-	-	-	-	-	-	-	-
R64	Mulgoa Hall	24%	39%	24%	6%	14%	86%	34%	78%	89%
R65	Emmaus Catholic College	24%	38%	-	6%	13%	-	34%	75%	-
R66	University of Sydney Farms	45%	-	-	72%	-	5%	29%	-	5%
R68	Christadelphian Heritage College Sydney	20%	61%	-	39%	76%	-	0%	13%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R69	Mamre Anglican School	24%	38%	-	6%	13%	-	34%	75%	-
R72	Irfan College	7%	46%	-	2%	25%	-	10%	81%	-
R73	Luddenham Public School	-	-	-	-	-	-	-	-	-
R74	Kemps Creek Public School	20%	61%	-	39%	76%	-	0%	13%	-
R75	Trinity Catholic Primary School	24%	38%	-	6%	13%	-	34%	75%	-
R76	Bringelly Public School	-	-	-	-	-	-	-	-	-
R78	Mulgoa Public School	24%	39%	24%	6%	14%	86%	34%	78%	89%
R79	Rossmore Public School	-	-	-	-	-	-	-	-	-
R80	Wallacia Public School	21%	-	-	45%	-	21%	1%	-	21%
R82	Bellfield College - Junior Campus	-	-	-	-	-	-	-	-	-
R84	Bringelly Park	-	-	-	-	-	-	-	-	-
R85	Bents Basin State Conservation Reserve and Gulguer Nature Reserve	-	-	-	-	-	-	-	-	-
R86	Blaxland Crossing Reserve	21%	-	-	45%	-	21%	1%	-	21%
R87	Bill Anderson Reserve	20%	61%	-	39%	76%	-	0%	13%	-
R91	Western Sydney Parklands	20%	53%	32%	38%	68%	56%	0%	1%	55%
R93	Rossmore Grange	-	-	-	-	-	-	-	-	-
R94	Freeburn Park	-	-	-	-	-	-	-	-	-
R95	Overett Reserve	20%	61%	-	39%	76%	-	0%	13%	-
R97	Mulgoa Park	24%	39%	24%	6%	14%	86%	34%	78%	89%
R98	Wallacia Bowling and Recreation Club	21%	-	-	45%	-	21%	1%	-	21%
R99	Hubertus Country Club	0%	0%	0%	0%	0%	0%	0%	0%	0%
R100	Sugarloaf Cobbitty Equestrian Club	-	-	-	-	-	5%	-	-	5%
R102	Panthers Wallacia (country club)	21%	-	-	45%	-	21%	1%	-	21%
R103	Twin Creeks Gold and Country Club	-	94%	24%	-	90%	85%	-	99%	88%
R104	Sydney International Shooting Centre	0%	61%	-	0%	76%	-	0%	13%	-
R108	Luddenham Showground	-	-	-	-	-	-	-	-	-
R109	Kemps Creek Sporting and Bowling Club	0%	12%	-	0%	12%	-	0%	12%	-
R110	St James Luddenham	-	-	-	-	-	-	-	-	-
R111	Lin Ying Temple	45%	-	-	72%	-	-	29%	-	-
R112	Vat Ketanak Khmer Kampuchea Krom	-	-	-	-	-	-	-	-	-
R114	Anglican Church Sydney Diocese	-	-	-	-	-	-	-	-	-
R115	Anglican Parish of Mulgoa	-	94%	24%	-	90%	86%	-	99%	89%
R117	Bringelly Vineyard Church	-	-	-	-	-	-	-	-	-
R120	Our Lady Queen of Peace	-	-	-	-	-	-	-	-	-
R122	St Anthony	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
R123	St Marys Church	24%	39%	26%	6%	14%	92%	34%	79%	92%
R124	Wallacia Christian Church	21%	-	-	45%	-	21%	1%	-	21%
R126	St Francis Xavier Church	0%	0%	0%	0%	0%	0%	0%	0%	0%
R127	Luddenham Uniting Church	-	-	-	-	-	-	-	-	-
R131	Science of the Soul Study Centre	0%	12%	-	0%	12%	-	0%	12%	-
R132	Bringelly shops	-	-	-	-	-	-	-	-	-
R134	Kemps Creek shops	20%	61%	-	39%	76%	-	0%	13%	-
R135	Luddenham shops	0%	0%	0%	0%	0%	0%	0%	0%	0%
R136	Mulgoa shops	24%	39%	24%	6%	14%	88%	34%	78%	89%
R137	Rossmore shops	-	-	-	-	-	-	-	-	-
R138	Wallacia Shops	21%	-	-	45%	-	21%	1%	-	21%
R140	Holy Family Catholic Primary and Church	-	-	-	-	-	-	-	-	-
R141	Edmund Rice Retreat and Conference Centre	-	-	-	-	-	-	-	-	-
N1	CATHOLIC HEALTHCARE EMMAUS VILLAGE	24%	38%	-	6%	13%	-	34%	75%	-
N2	JOHN EDMONDSON VC GARDENS	-	-	-	-	-	-	-	-	-
N3	REGAL OAKS VILLAGE	21%	-	-	45%	-	21%	1%	-	21%
N4	SCALABRINI VILLAGE AUSTRAL	-	-	-	-	-	-	-	-	-
N5	TOBRUK VILLAGE	-	-	-	-	-	-	-	-	-
N6	BLAXLAND PRE-SCHOOL	27%	-	-	9%	-	-	43%	-	-
N7	GLENBROOK PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N8	KEMPS CREEK CHILDRENS COTTAGE	20%	61%	-	39%	76%	-	0%	13%	-
N9	LAPSTONE PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N10	MindChamps Early Learning & Preschool Kemps Creek	20%	61%	-	39%	76%	-	0%	13%	-
N11	MY FIRST SCHOOL CHILDCARE CENTRE	24%	38%	25%	7%	13%	88%	34%	75%	90%
N12	SILVERDALE CHILD CARE CENTRE	-	-	-	-	-	-	-	-	-
N13	WARRAGAMBA PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N14	MINCHINBURY COMMUNITY HOSPITAL	-	-	-	-	-	-	-	-	-
N15	MOUNT DRUITT HOSPITAL	-	-	-	-	-	-	-	-	-
N16	NEPEAN HOSPITAL	0%	12%	-	0%	12%	-	0%	12%	-
N17	NEPEAN PRIVATE HOSPITAL	0%	12%	-	0%	12%	-	0%	12%	-
N18	AUSTRAL CHURCH OF CHRIST	-	-	-	-	-	-	-	-	-
N19	GOOD SHEPHERD CATHOLIC CHURCH	-	-	-	-	-	-	-	-	-
N20	Grace West Anglican Church - Glenmore Park	0%	60%	-	0%	72%	-	0%	13%	-
N21	Holy Family Church	-	-	-	-	-	-	-	-	-
N22	HOLY SPIRIT CATHOLIC CHURCH	-	-	-	-	-	-	-	-	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N23	Holy Spirit Parish	24%	38%	-	7%	13%	-	34%	75%	-
N24	HOXTON PARK ANGLICAN CHURCH	-	-	-	-	-	-	-	-	-
N25	Imagine Nations Church	-	-	-	-	-	-	-	-	-
N26	INSPIRE CHURCH	-	-	-	-	-	-	-	-	-
N27	Mt Hope Uniting Church Orchard Hills	-	-	-	-	-	-	-	-	-
N28	Orchard Hills Kingdom Hall of Jehovah's Witnesses	-	-	-	-	-	-	-	-	-
N29	Samoan Methodist Church	0%	12%	-	0%	12%	-	0%	12%	-
N30	SIKH MISSION CENTRE	-	-	-	-	-	-	-	-	-
N31	St Clair Anglican Church	-	-	-	-	-	-	-	-	-
N32	St Mary Mother of the Church	-	-	-	-	-	-	-	-	-
N33	ST ZAIA CATHEDRAL	-	-	-	-	-	-	-	-	-
N34	Uniting Church St Clair	-	-	-	-	-	-	-	-	-
N35	WEST HOXTON COMMUNITY CHURCH	32%	-	-	13%	-	-	71%	-	-
N36	AL-FAISAL COLLEGE LIVERPOOL CAMPUS	-	-	-	-	-	-	-	-	-
N37	AUSTRAL PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N38	AUSTRALIAN ISLAMIC COLLEGE OF SYDNEY SENIOR SCHOOL	-	-	-	-	-	-	-	-	-
N39	BANKS PUBLIC SCHOOL	24%	38%	25%	7%	13%	88%	34%	75%	90%
N40	BENNETT ROAD PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N41	BETHANY CATHOLIC PRIMARY SCHOOL	0%	60%	-	0%	72%	-	0%	13%	-
N42	BIDWILL PUBLIC SCHOOL	20%	53%	32%	38%	68%	56%	0%	1%	55%
N43	BLACKETT PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N44	BLACKTOWN NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N45	BLACKTOWN SOUTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N46	BLACKTOWN TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N47	BLACKTOWN WEST PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N48	BLACKWELL PUBLIC SCHOOL	24%	38%	-	7%	13%	-	34%	75%	-
N49	BLAXLAND EAST PUBLIC SCHOOL	27%	-	-	9%	-	-	43%	-	-
N50	BLAXLAND HIGH SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N51	BLAXLAND PUBLIC SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N52	CAMBRIDGE GARDENS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N53	CAMBRIDGE PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N54	CATHWEST INNOVATION COLLEGE MCCARTHY CAMPUS	24%	45%	-	6%	23%	-	34%	76%	-
N55	CECIL HILLS PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N56	CHIFLEY COLLEGE BIDWILL CAMPUS	20%	53%	32%	38%	68%	56%	0%	1%	55%
N57	CHIFLEY COLLEGE DUNHEVED CAMPUS	-	-	-	-	-	-	-	-	-
N58	CHIFLEY COLLEGE MOUNT DRUITT CAMPUS	-	-	-	-	-	-	-	-	-
N59	CHIFLEY COLLEGE SENIOR CAMPUS	-	-	-	-	-	-	-	-	-
N60	CHIFLEY COLLEGE SHALVEY CAMPUS	20%	60%	-	38%	72%	-	0%	13%	-
N61	CHRISTADELPHIAN HERITAGE COLLEGE SYDNEY	20%	61%	-	39%	76%	-	0%	13%	-
N62	CLAIRGATE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N63	CLAREMONT MEADOWS PUBLIC SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N64	COLYTON HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N65	COLYTON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N66	DAWSON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N67	EASTERN CREEK PUBLIC SCHOOL	5%	54%	32%	11%	69%	57%	0%	1%	56%
N68	EASTERN CREEK PUBLIC SCHOOL PRESCHOOL	5%	54%	32%	11%	69%	57%	0%	1%	56%
N69	EMERTON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N70	EMU HEIGHTS PUBLIC SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N71	EMU PLAINS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N72	ERSKINE PARK HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N73	GLENBROOK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N74	GLENDENNING PUBLIC SCHOOL	5%	53%	32%	11%	68%	56%	0%	1%	55%
N75	GLENMORE PARK PUBLIC SCHOOL	0%	60%	-	0%	72%	-	0%	13%	-
N76	GOOD SHEPHERD CATHOLIC PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N77	GOOD SHEPHERD PRIMARY SCHOOL	5%	53%	32%	11%	68%	56%	0%	1%	55%
N78	GREENWAY PARK PUBLIC SCHOOL	32%	-	-	13%	-	-	71%	-	-
N79	HASSALL GROVE PUBLIC SCHOOL	5%	53%	32%	11%	68%	56%	0%	1%	55%
N80	HEBERSHAM PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N81	HOLY FAMILY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N82	HOLY SPIRIT PRIMARY SCHOOL	24%	38%	-	7%	13%	-	34%	75%	-
N83	HOLY SPIRIT PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N84	HORSLEY PARK PUBLIC SCHOOL	24%	45%	-	6%	24%	-	34%	80%	-
N85	HOXTON PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N86	JAMES ERSKINE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N87	JAMISON HIGH SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N88	JAMISONTOWN PUBLIC SCHOOL	20%	60%	-	38%	72%	4%	0%	13%	4%
N89	JORDAN SPRINGS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N90	KINGSWOOD PARK PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N91	KINGSWOOD PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N92	KINGSWOOD SOUTH PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N93	LAPSTONE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N94	LEONAY PUBLIC SCHOOL	27%	-	-	9%	-	-	43%	-	-
N95	LEPPINGTON PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N96	LETHBRIDGE PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N97	LLANDILO PUBLIC SCHOOL	24%	33%	0%	7%	11%	50%	34%	65%	50%
N98	LYNWOOD PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N99	MACARTHUR BUILDING INDUSTRY SKILLS CENTRE	-	-	-	-	-	-	-	-	-
N100	MACQUARIE FIELDS TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N101	MADANG AVENUE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N102	MALEK FAHD ISLAMIC SCHOOL HOXTON PARK	-	-	-	-	-	-	-	-	-
N103	MARAYONG HEIGHTS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N104	MARAYONG PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N105	MIDDLETON GRANGE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N106	MINCHINBURY PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N107	MONTGROVE COLLEGE	20%	60%	-	38%	72%	-	0%	13%	-
N108	MOUNT DRUITT PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N109	MOUNT DRUITT PUBLIC SCHOOL PRESCHOOL	-	-	-	-	-	-	-	-	-
N110	MOUNT DRUITT TAFE COLLEGE	-	-	-	-	-	-	-	-	-
N111	MOUNT RIVERVIEW PUBLIC SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N112	NEPEAN CHRISTIAN SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N113	NEPEAN CREATIVE AND PERFORMING ARTS HIGH SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N114	NEPEAN TAFE COLLEGE KINGSWOOD CAMPUS	0%	12%	-	0%	12%	-	0%	12%	-
N115	NEPEAN TAFE COLLEGE PENRITH CAMPUS	24%	45%	-	6%	23%	4%	34%	76%	4%
N116	NOUMEA PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N117	ORCHARD HILLS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N118	OUR LADY OF THE ROSARY PRIMARY SCHOOL	24%	38%	25%	7%	13%	88%	34%	75%	90%
N119	OUR LADY OF THE WAY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N120	OXLEY PARK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N121	PENOLA CATHOLIC COLLEGE EMU PLAINS	24%	45%	-	6%	23%	-	34%	76%	-
N122	PENRITH ANGLICAN COLLEGE	-	-	-	-	-	-	-	-	-
N123	PENRITH CHRISTIAN SCHOOL	-	-	-	-	-	-	-	-	-
N124	PENRITH HIGH SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-

ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N125	PENRITH PUBLIC SCHOOL	24%	45%	-	6%	23%	-	34%	76%	-
N126	PENRITH SOUTH PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N127	PLUMPTON HIGH SCHOOL	5%	53%	32%	11%	68%	56%	0%	1%	55%
N128	PLUMPTON PUBLIC SCHOOL	5%	53%	32%	11%	68%	56%	0%	1%	55%
N129	REGENTVILLE PUBLIC SCHOOL	27%	-	-	9%	-	4%	43%	-	4%
N130	ROOTY HILL HIGH SCHOOL	49%	-	-	35%	-	-	79%	-	-
N131	ROOTY HILL PUBLIC SCHOOL	49%	-	-	35%	-	-	79%	-	-
N132	ROPES CROSSING PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N133	SACRED HEART PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N134	SHALVEY PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N135	SHELLEY PUBLIC SCHOOL	24%	45%	-	6%	24%	-	34%	80%	-
N136	ST AIDAN'S PRIMARY SCHOOL	49%	-	-	35%	-	-	79%	-	-
N137	ST ANDREWS PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N138	ST ANTHONY OF PADUA CATHOLIC COLLEGE	-	-	-	-	-	-	-	-	-
N139	ST CLAIR HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N140	ST CLAIR PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N141	ST FINBAR'S PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N142	ST FRANCIS OF ASSISI PRIMARY SCHOOL	5%	53%	32%	11%	68%	56%	0%	1%	55%
N143	ST JOSEPH'S PRIMARY SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N144	ST MARY MACKILLOP PRIMARY SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N145	ST MARYS NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N146	ST MARYS PUBLIC SCHOOL	24%	38%	25%	7%	13%	88%	34%	75%	90%
N147	ST MARYS SENIOR HIGH SCHOOL	24%	38%	25%	7%	13%	88%	34%	75%	90%
N148	ST MARYS SOUTH PUBLIC SCHOOL	24%	38%	25%	7%	13%	88%	34%	75%	90%
N149	ST NICHOLAS OF MYRA PRIMARY SCHOOL	24%	45%	-	6%	23%	4%	34%	76%	4%
N150	SURVEYORS CREEK PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N151	THOMAS HASSALL ANGLICAN COLLEGE	-	-	-	-	-	-	-	-	-
N152	TREGEAR PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N153	UNITY GRAMMAR COLLEGE	-	-	-	-	-	-	-	-	-
N154	UNIVERSITY OF WESTERN SYDNEY PENRITH CAMPUS	0%	12%	-	0%	12%	-	0%	12%	-
N155	UNIVERSITY OF WESTERN SYDNEY WERRINGTON NTH CAMPUS	0%	12%	-	0%	12%	-	0%	12%	-
N156	UNIVERSITY OF WESTERN SYDNEY WERRINGTON STH CAMPUS	0%	12%	-	0%	12%	-	0%	12%	-
N157	WALTERS ROAD PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

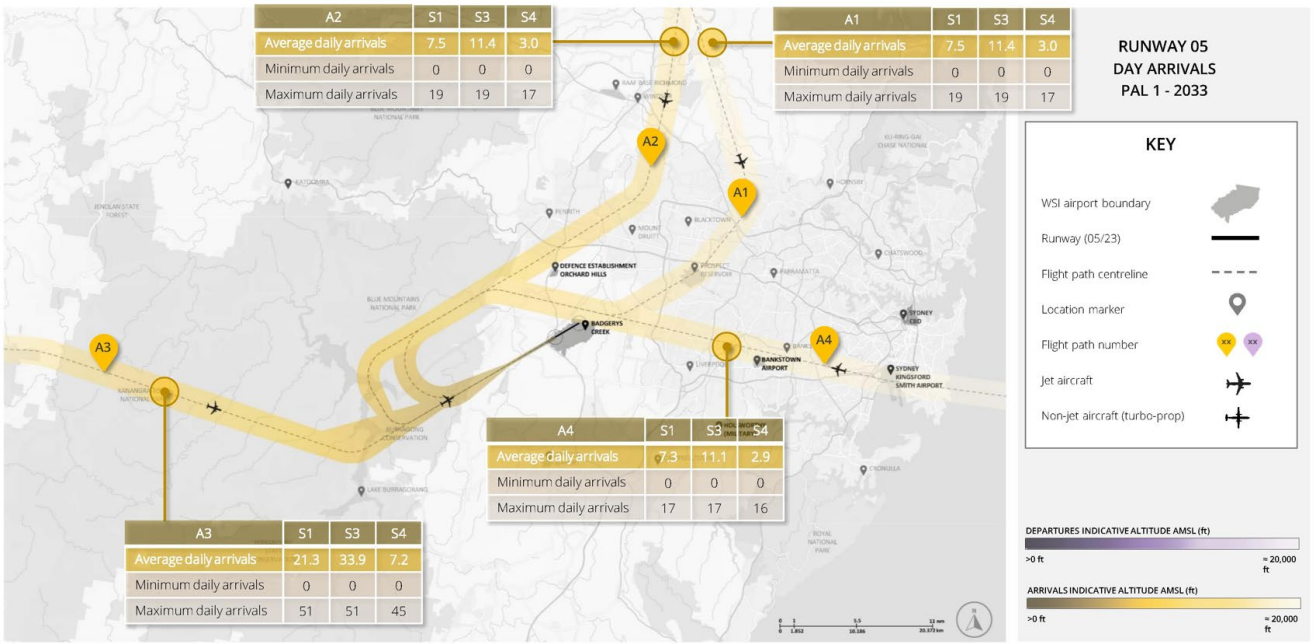
ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N158	WARRAGAMBA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N159	WARRIMOO PUBLIC SCHOOL	24%	38%	32%	6%	19%	57%	34%	65%	56%
N160	WERRINGTON COUNTY PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N161	WERRINGTON PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N162	WETHERILL PARK TAFE COLLEGE	45%	-	-	72%	-	-	29%	-	-
N163	WHALAN PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N164	WILLIAM DEAN PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N165	WILLMOT PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N166	YORK PUBLIC SCHOOL	20%	60%	-	38%	72%	-	0%	13%	-
N167	AQUINAS COURT	0%	-	-	0%	-	-	0%	-	-
N168	BAPTISTCARE MORVEN GARDENS CENTRE	-	-	-	-	-	-	-	-	-
N169	BLUE MOUNTAINS RETIREMENT VILLAGE	-	-	-	-	-	-	-	-	-
N170	BUCKLAND	21%	-	-	45%	-	-	1%	-	-
N171	MARTYN CLAVER AGED CARE	-	-	-	-	-	-	-	-	-
N172	WINGARA HAMLET	27%	-	-	9%	-	-	43%	-	-
N173	CHILDRENS HOUSE MONTESSORI CHILD CARE	-	-	-	-	-	-	-	-	-
N174	KATOOMBA LEURA PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N175	KEMPS CREEK CHILDRENS COTTAGE	20%	61%	-	39%	76%	-	0%	13%	-
N176	LAPSTONE PRE-SCHOOL	-	-	-	-	-	-	-	-	-
N177	BLUE MOUNTAINS DISTRICT ANZAC MEMORIAL HOSPITAL	-	-	-	-	-	-	-	-	-
N178	SPRINGWOOD HOSPITAL	0%	-	-	0%	-	-	0%	-	-
N179	ECHO POINT LOOKOUT	-	-	-	-	-	-	-	-	-
N180	ANGLICAN	-	-	-	-	-	-	-	-	-
N181	ANGLICAN	-	-	-	-	-	-	-	-	-
N182	BAPTIST	-	-	-	-	-	-	-	-	-
N183	BAPTIST	-	-	-	-	-	-	-	-	-
N184	UNITING	27%	-	-	9%	-	-	43%	-	-
N185	BLUE MOUNTAINS STEINER SCHOOL	-	-	-	-	-	-	-	-	-
N186	ELLISON PUBLIC SCHOOL	21%	-	-	45%	-	-	1%	-	-
N187	FAULCONBRIDGE PUBLIC SCHOOL	27%	-	-	9%	-	-	43%	-	-
N188	HAZELBROOK PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N189	KATOOMBA HIGH SCHOOL	-	-	-	-	-	-	-	-	-
N190	KATOOMBA NORTH PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N191	KATOOMBA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N192	KINGSWOOD PARK PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-

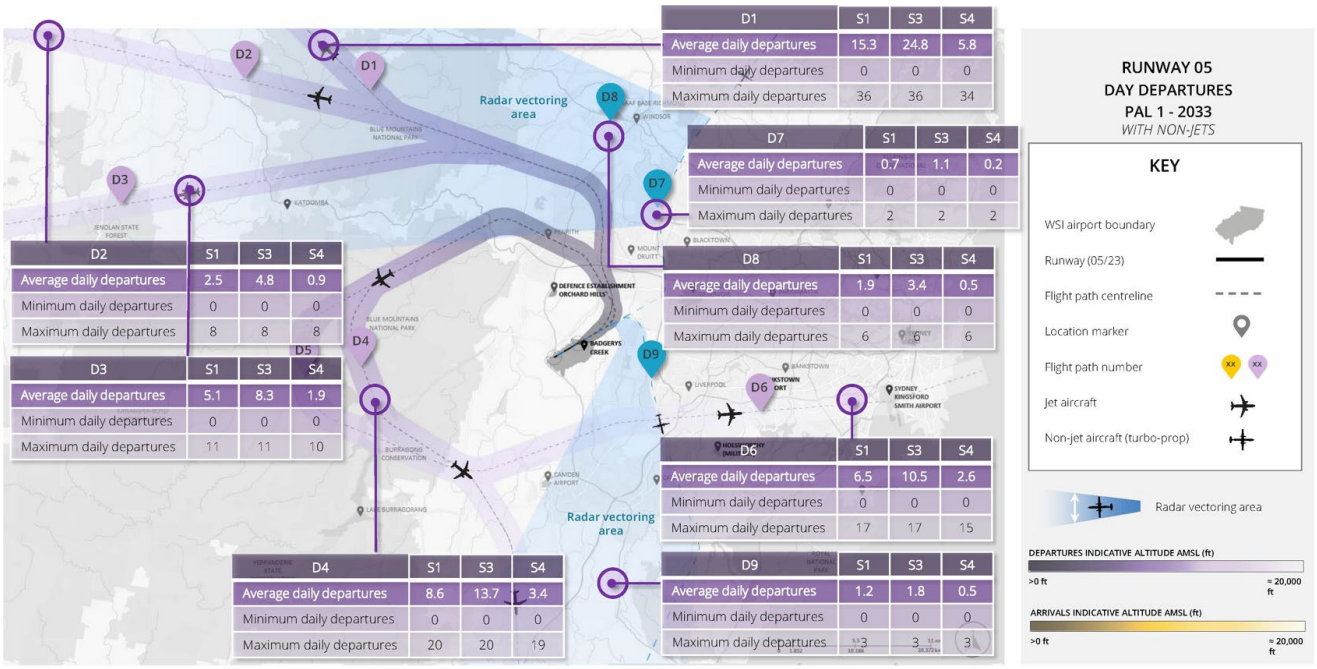
ID	Area / Site	Day			Evening			Night		
		S1	S3	S4	S1	S3	S4	S1	S3	S4
N193	KINGSWOOD PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N194	KINGSWOOD SOUTH PUBLIC SCHOOL	0%	12%	-	0%	12%	-	0%	12%	-
N195	LAPSTONE PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N196	LAWSON PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N197	LEURA PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-
N198	OUR LADY OF THE NATIVITY PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N199	SPRINGWOOD HIGH SCHOOL	27%	-	-	9%	-	-	43%	-	-
N200	SPRINGWOOD PUBLIC SCHOOL	0%	-	-	0%	-	-	0%	-	-
N201	ST CANICES PRIMARY SCHOOL	-	-	-	-	-	-	-	-	-
N202	ST THOMAS AQUINAS PRIMARY SCHOOL	21%	-	-	45%	-	-	1%	-	-
N203	WENTWORTH FALLS PUBLIC SCHOOL	-	-	-	-	-	-	-	-	-

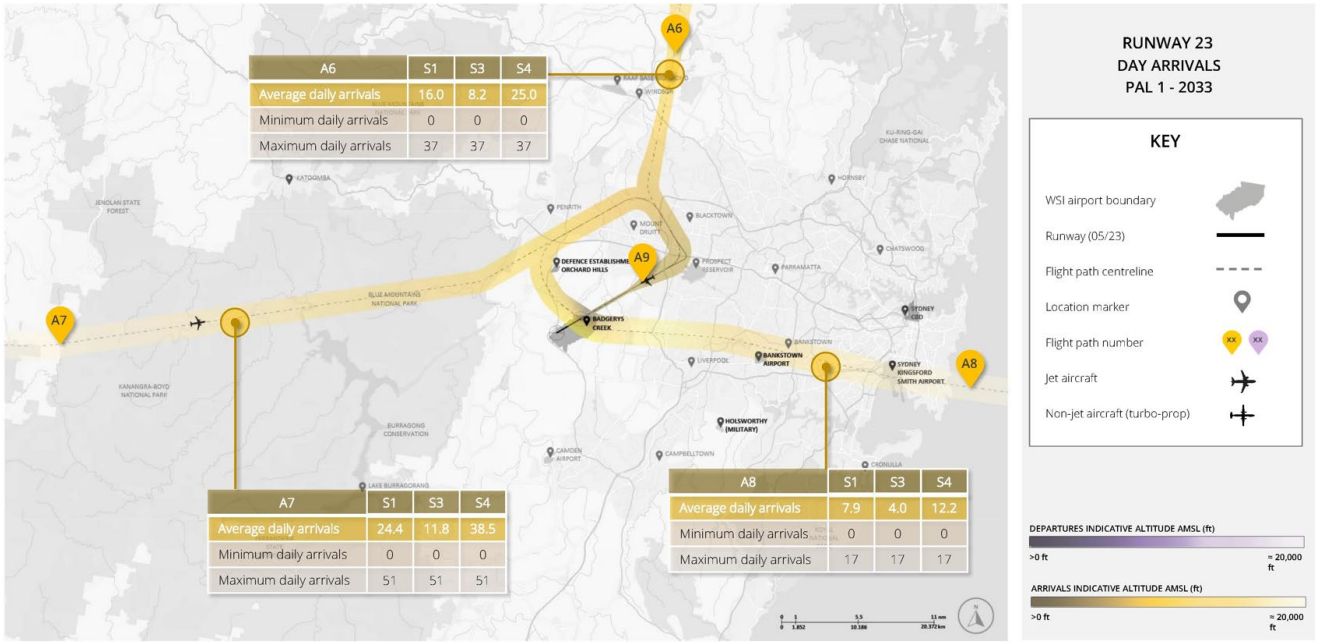
Appendix B

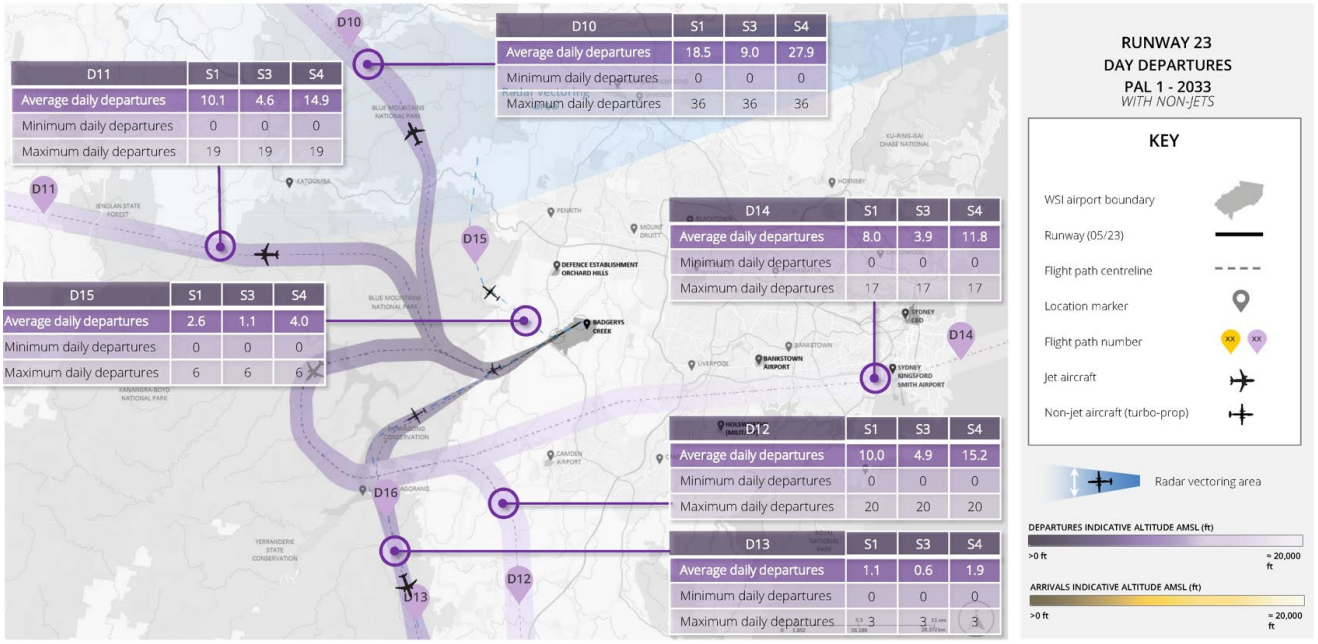
Flight path movement and respite charts

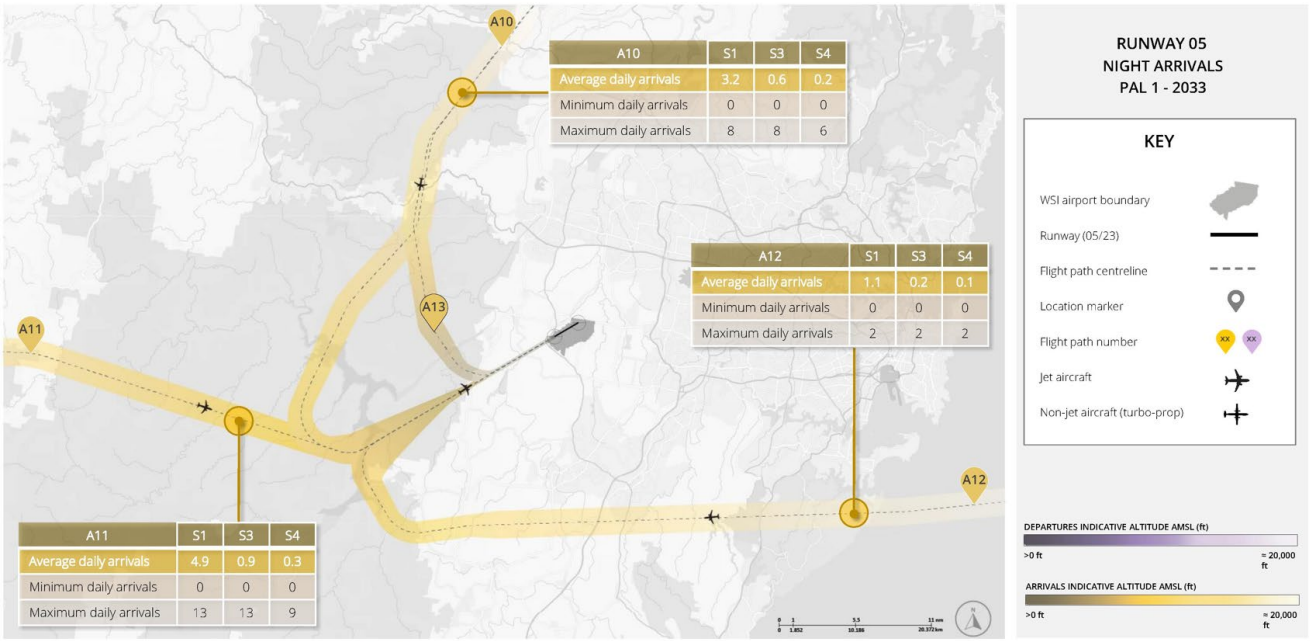
B1 Flight Path Movement charts

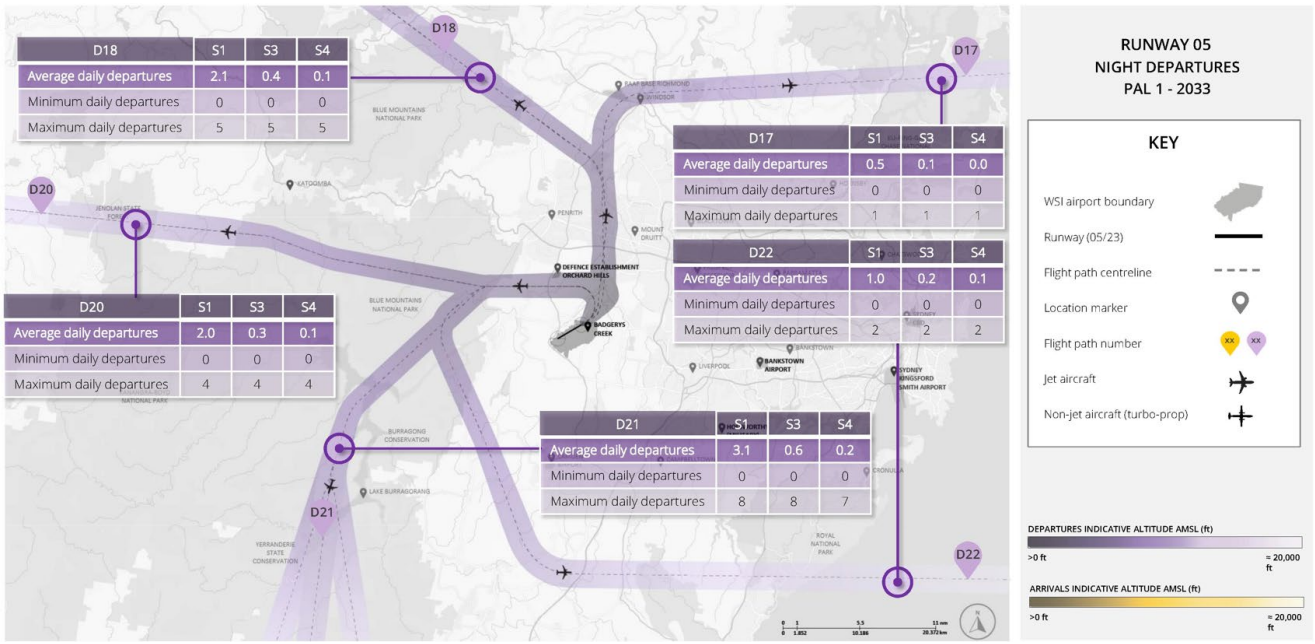


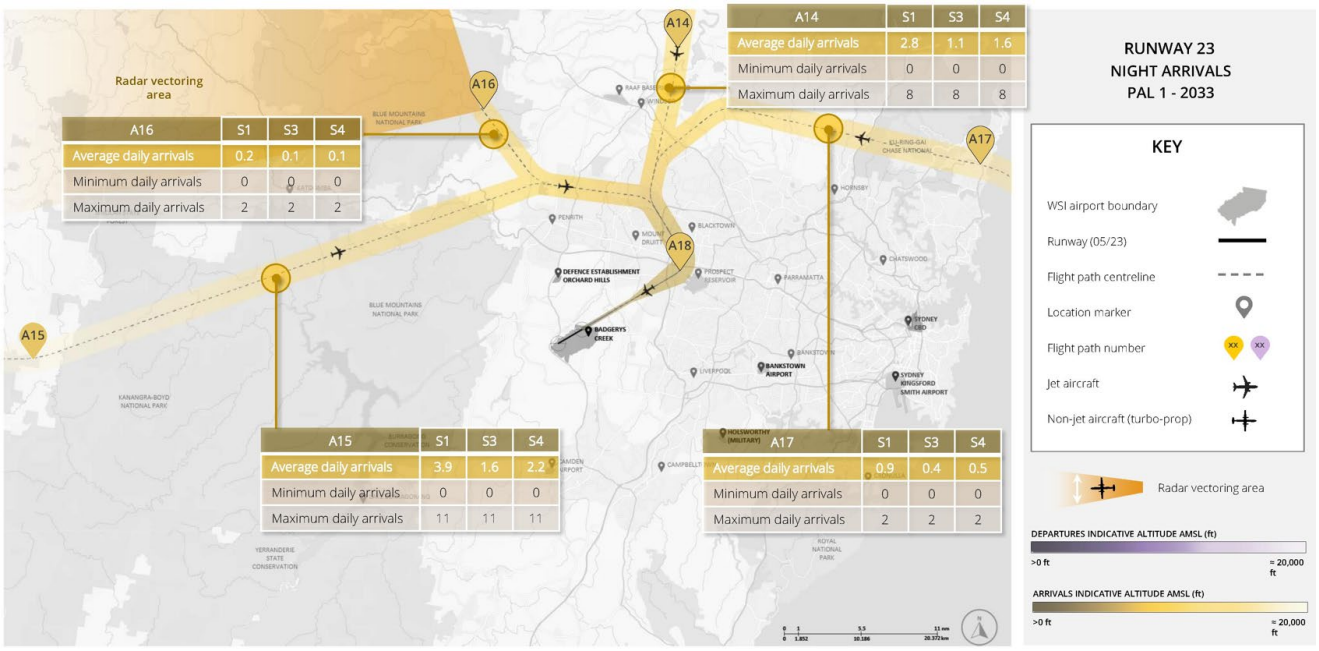


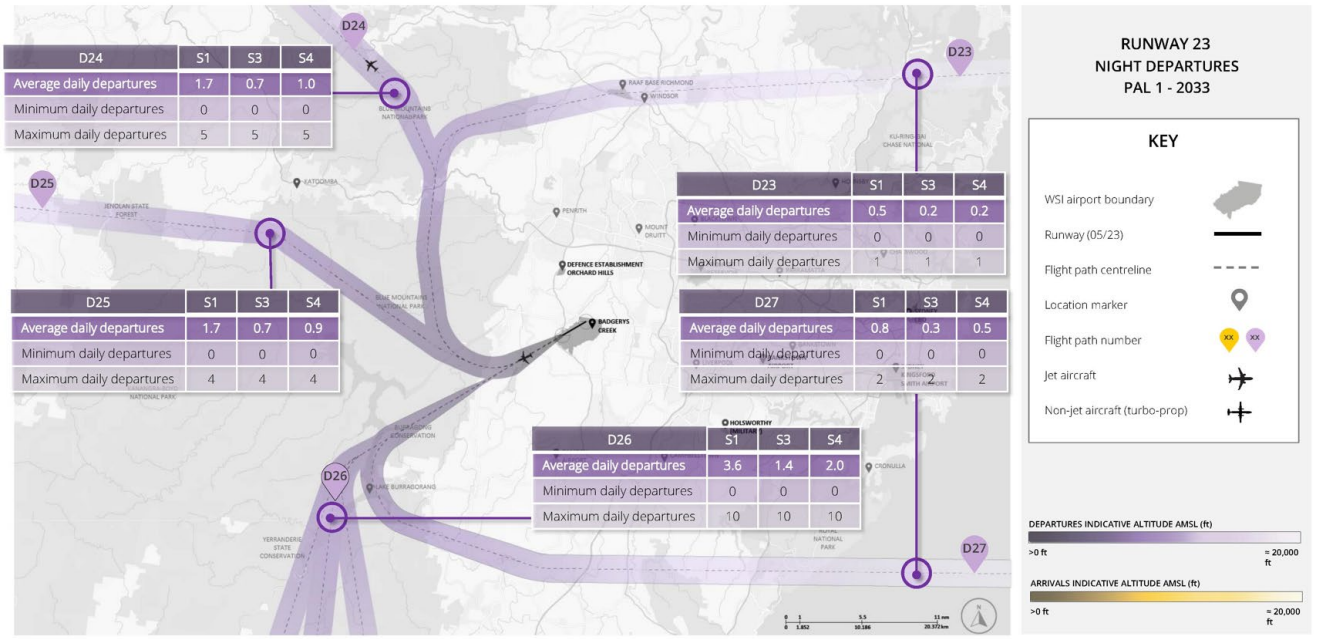

A6
A7
A8
A9
A6 S1 S3 S4
Average daily arrivals 16.0 8.2 25.0
Minimum daily arrivals 0 0 0
Maximum daily arrivals 37 37 37
A7 S1 S3 S4
Average daily arrivals 24.4 11.8 38.5
Minimum daily arrivals 0 0 0
Maximum daily arrivals 51 51 51
A8 S1 S3 S4
Average daily arrivals 7.9 4.0 12.2
Minimum daily arrivals 0 0 0
Maximum daily arrivals 17 17 17
RUNWAY 23
DAY ARRIVALS
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

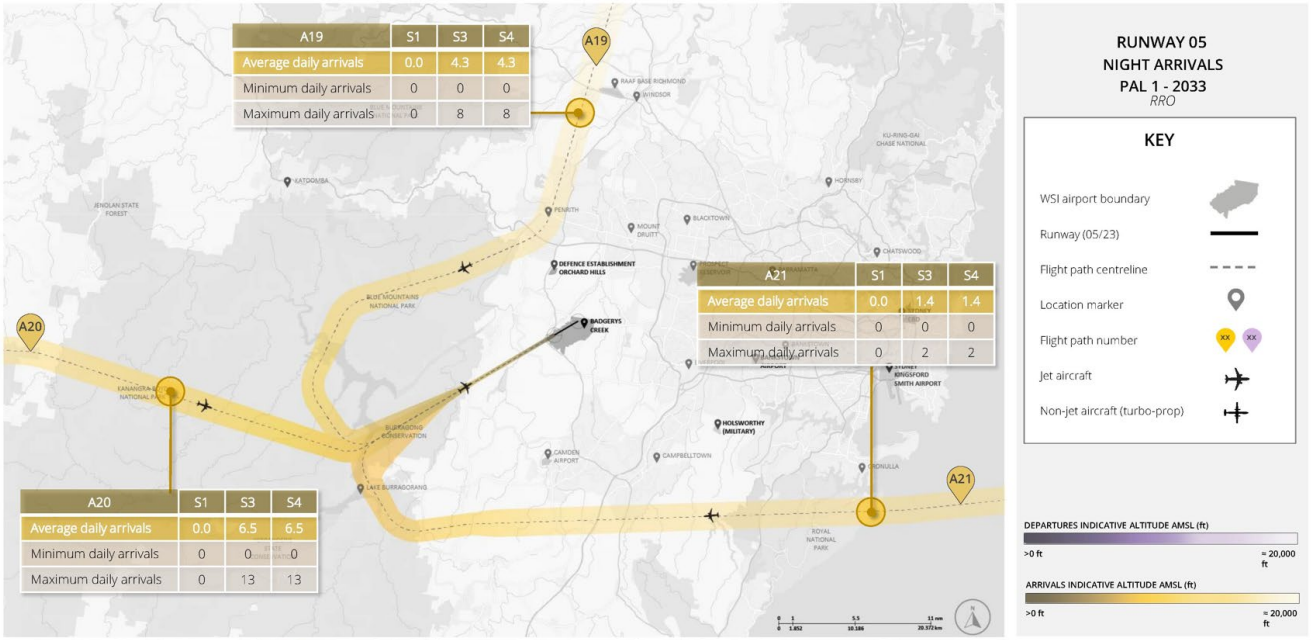

D10
D11
D12
D13
D14
D15
D16
D10 S1 S3 S4
Average daily departures 18.5 9.0 27.9
Minimum daily departures 0 0 0
Maximum daily departures 36 36 36
D11 S1 S3 S4
Average daily departures 10.1 4.6 14.9
Minimum daily departures 0 0 0
Maximum daily departures 19 19 19
D14 S1 S3 S4
Average daily departures 8.0 3.9 11.8
Minimum daily departures 0 0 0
Maximum daily departures 17 17 17
D15 S1 S3 S4
Average daily departures 2.6 1.1 4.0
Minimum daily departures 0 0 0
Maximum daily departures 6 6 6
D12 S1 S3 S4
Average daily departures 10.0 4.9 15.2
Minimum daily departures 0 0 0
Maximum daily departures 20 20 20
D13 S1 S3 S4
Average daily departures 1.1 0.6 1.9
Minimum daily departures 0 0 0
Maximum daily departures 3 3 3
RUNWAY 23
DAY DEPARTURES
PAL 1 - 2033
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A10
A11
A12
A13
A10 | S1 | S3 | S4
Average daily arrivals | 3.2 | 0.6 | 0.2
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 8 | 8 | 6
A12 | S1 | S3 | S4
Average daily arrivals | 1.1 | 0.2 | 0.1
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 2 | 2 | 2
A11 | S1 | S3 | S4
Average daily arrivals | 4.9 | 0.9 | 0.3
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 13 | 13 | 9
RUNWAY 05
NIGHT ARRIVALS
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D17
D18
D20
D21
D22
D18 | S1 | S3 | S4
Average daily departures | 2.1 | 0.4 | 0.1
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 5 | 5 | 5
D17 | S1 | S3 | S4
Average daily departures | 0.5 | 0.1 | 0.0
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 1 | 1 | 1
D22 | S1 | S3 | S4
Average daily departures | 1.0 | 0.2 | 0.1
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 2 | 2 | 2
D20 | S1 | S3 | S4
Average daily departures | 2.0 | 0.3 | 0.1
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 4 | 4 | 4
D21 | S1 | S3 | S4
Average daily departures | 3.1 | 0.6 | 0.2
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 8 | 8 | 7
RUNWAY 05
NIGHT DEPARTURES
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


RUNWAY 23
NIGHT ARRIVALS
PAL 1 - 2033
Radar vectoring area
A14 | S1 | S3 | S4
Average daily arrivals | 2.8 | 1.1 | 1.6
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 8 | 8 | 8
A16 | S1 | S3 | S4
Average daily arrivals | 0.2 | 0.1 | 0.1
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 2 | 2 | 2
A15 | S1 | S3 | S4
Average daily arrivals | 3.9 | 1.6 | 2.2
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 11 | 11 | 11
A17 | S1 | S3 | S4
Average daily arrivals | 0.9 | 0.4 | 0.5
Minimum daily arrivals | 0 | 0 | 0
Maximum daily arrivals | 2 | 2 | 2
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

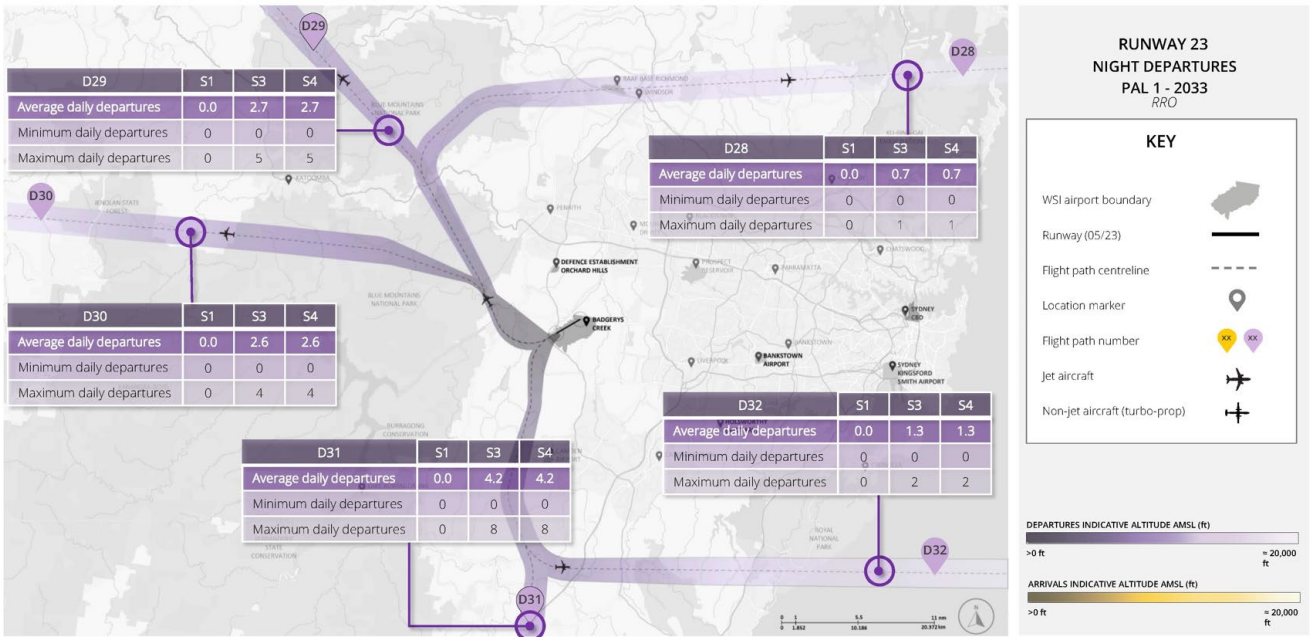

RUNWAY 23
NIGHT DEPARTURES
PAL 1 - 2033
D24 | S1 | S3 | S4
Average daily departures | 1.7 | 0.7 | 1.0
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 5 | 5 | 5
D23 | S1 | S3 | S4
Average daily departures | 0.5 | 0.2 | 0.2
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 1 | 1 | 1
D25 | S1 | S3 | S4
Average daily departures | 1.7 | 0.7 | 0.9
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 4 | 4 | 4
D27 | S1 | S3 | S4
Average daily departures | 0.8 | 0.3 | 0.5
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 2 | 2 | 2
D26 | S1 | S3 | S4
Average daily departures | 3.6 | 1.4 | 2.0
Minimum daily departures | 0 | 0 | 0
Maximum daily departures | 10 | 10 | 10
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft



A19	S1	S3	S4
Average daily arrivals	0.0	4.3	4.3
Minimum daily arrivals	0	0	0
Maximum daily arrivals	0	8	8

A21	S1	S3	S4
Average daily arrivals	0.0	1.4	1.4
Minimum daily arrivals	0	0	0
Maximum daily arrivals	0	2	2

A20	S1	S3	S4
Average daily arrivals	0.0	6.5	6.5
Minimum daily arrivals	0	0	0
Maximum daily arrivals	0	13	13



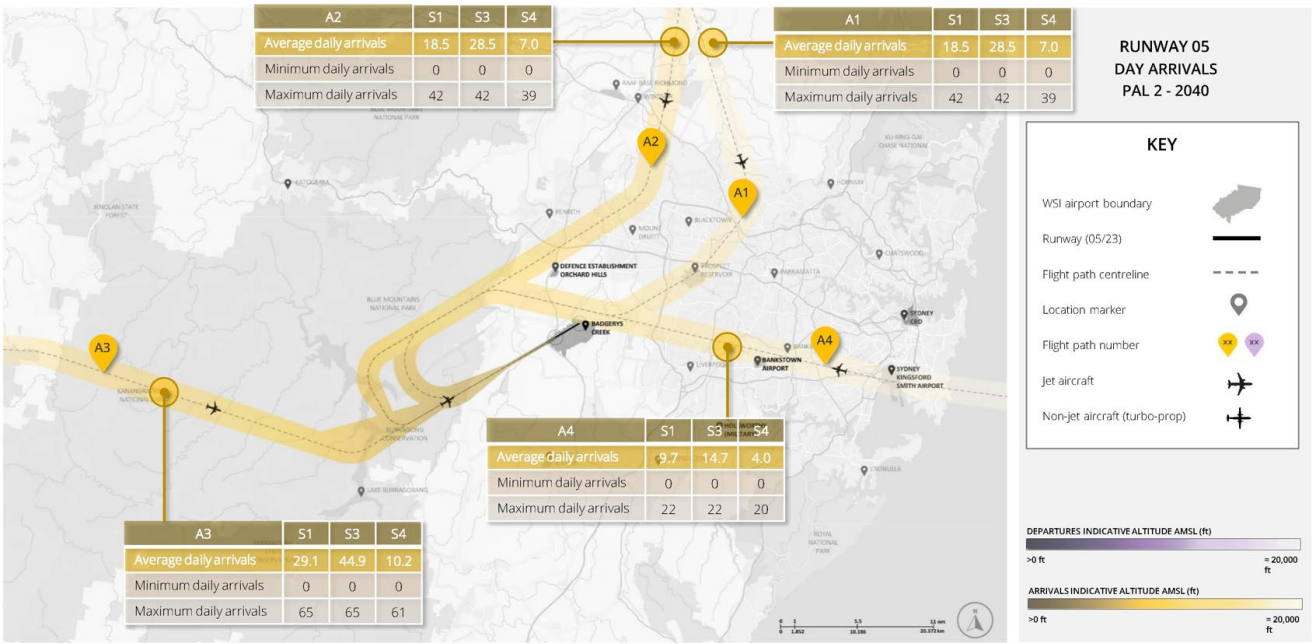
D29	S1	S3	S4
Average daily departures	0.0	2.7	2.7
Minimum daily departures	0	0	0
Maximum daily departures	0	5	5

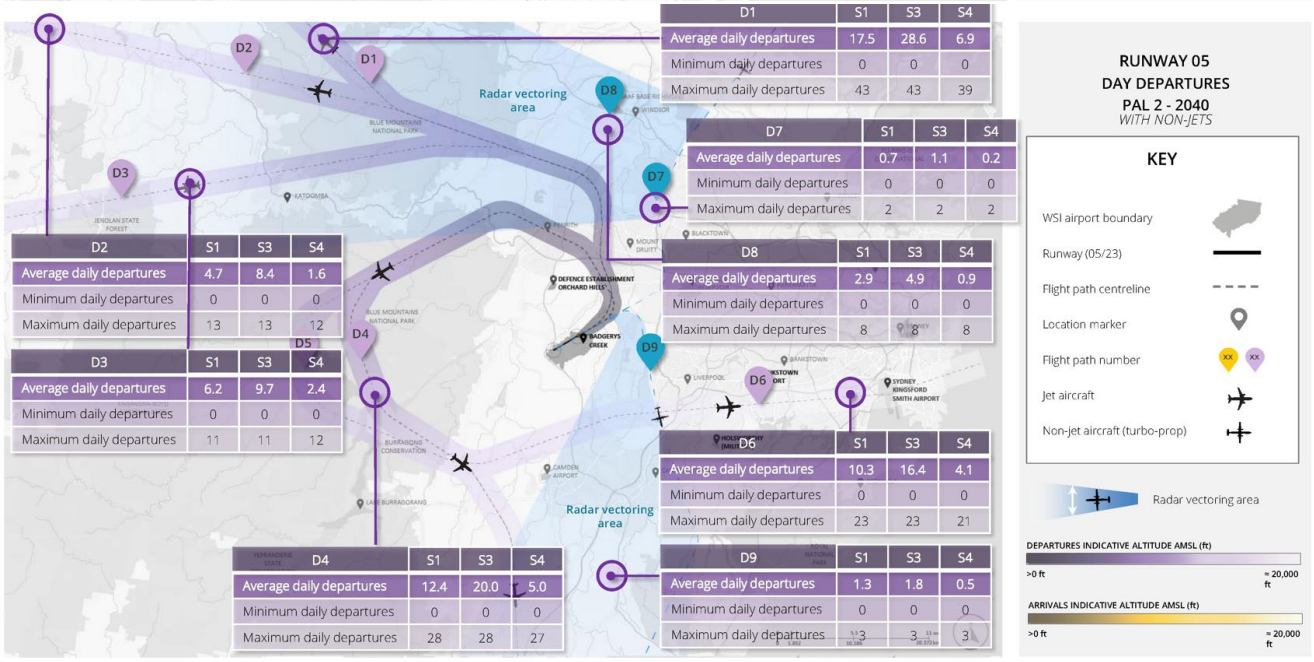
D28	S1	S3	S4
Average daily departures	0.0	0.7	0.7
Minimum daily departures	0	0	0
Maximum daily departures	0	1	1

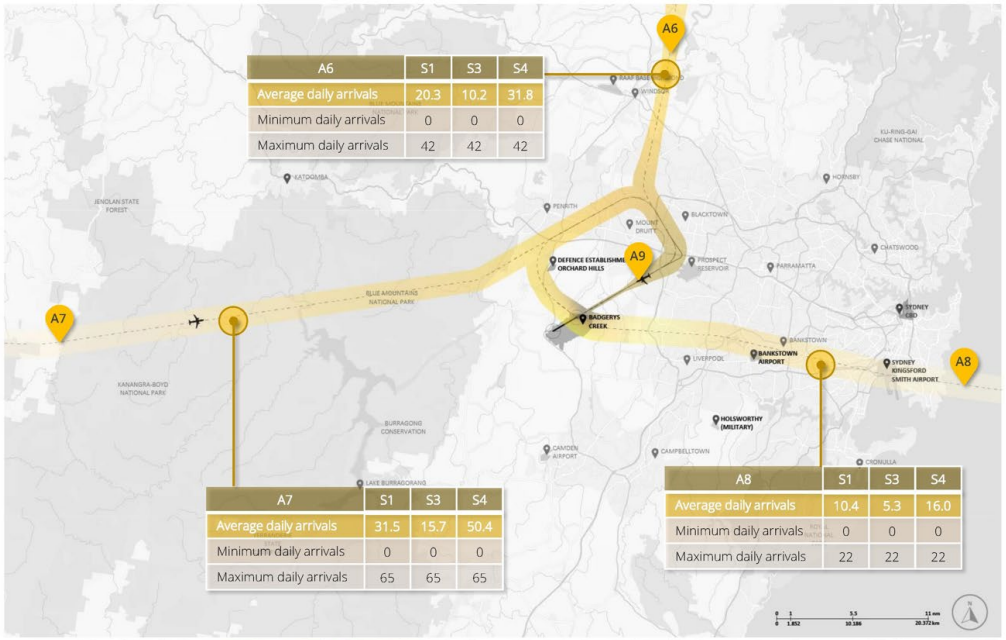
D30	S1	S3	S4
Average daily departures	0.0	2.6	2.6
Minimum daily departures	0	0	0
Maximum daily departures	0	4	4

D32	S1	S3	S4
Average daily departures	0.0	1.3	1.3
Minimum daily departures	0	0	0
Maximum daily departures	0	2	2

D31	S1	S3	S4
Average daily departures	0.0	4.2	4.2
Minimum daily departures	0	0	0
Maximum daily departures	0	8	8


A2
S1 S3 S4
Average daily arrivals 18.5 28.5 7.0
Minimum daily arrivals 0 0 0
Maximum daily arrivals 42 42 39
A1
S1 S3 S4
Average daily arrivals 18.5 28.5 7.0
Minimum daily arrivals 0 0 0
Maximum daily arrivals 42 42 39
RUNWAY 05
DAY ARRIVALS
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
A4
S1 S3 S4
Average daily arrivals 9.7 14.7 4.0
Minimum daily arrivals 0 0 0
Maximum daily arrivals 22 22 20
A3
S1 S3 S4
Average daily arrivals 29.1 44.9 10.2
Minimum daily arrivals 0 0 0
Maximum daily arrivals 65 65 61
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

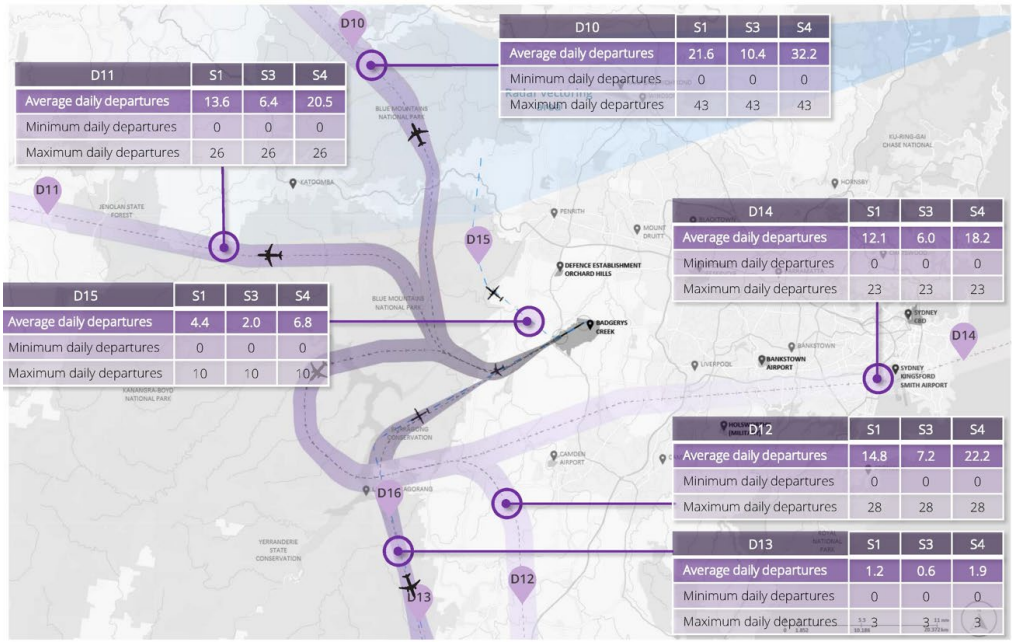

D1
S1 S3 S4
Average daily departures 17.5 28.6 6.9
Minimum daily departures 0 0 0
Maximum daily departures 43 43 39
Radar vectoring area
D7
S1 S3 S4
Average daily departures 0.7 1.1 0.2
Minimum daily departures 0 0 0
Maximum daily departures 2 2 2
D2
S1 S3 S4
Average daily departures 4.7 8.4 1.6
Minimum daily departures 0 0 0
Maximum daily departures 13 13 12
D8
S1 S3 S4
Average daily departures 2.9 4.9 0.9
Minimum daily departures 0 0 0
Maximum daily departures 8 8 8
D3
S1 S3 S4
Average daily departures 6.2 9.7 2.4
Minimum daily departures 0 0 0
Maximum daily departures 11 11 12
D6
S1 S3 S4
Average daily departures 10.3 16.4 4.1
Minimum daily departures 0 0 0
Maximum daily departures 23 23 21
Radar vectoring area
D4
S1 S3 S4
Average daily departures 12.4 20.0 5.0
Minimum daily departures 0 0 0
Maximum daily departures 28 28 27
D9
S1 S3 S4
Average daily departures 1.3 1.8 0.5
Minimum daily departures 0 0 0
Maximum daily departures 3 3 3
RUNWAY 05
DAY DEPARTURES
PAL 2 - 2040
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft



A6	S1	S3	S4
Average daily arrivals	20.3	10.2	31.8
Minimum daily arrivals	0	0	0
Maximum daily arrivals	42	42	42

A7	S1	S3	S4
Average daily arrivals	31.5	15.7	50.4
Minimum daily arrivals	0	0	0
Maximum daily arrivals	65	65	65

A8	S1	S3	S4
Average daily arrivals	10.4	5.3	16.0
Minimum daily arrivals	0	0	0
Maximum daily arrivals	22	22	22



D10	S1	S3	S4
Average daily departures	21.6	10.4	32.2
Minimum daily departures	0	0	0
Maximum daily departures	43	43	43

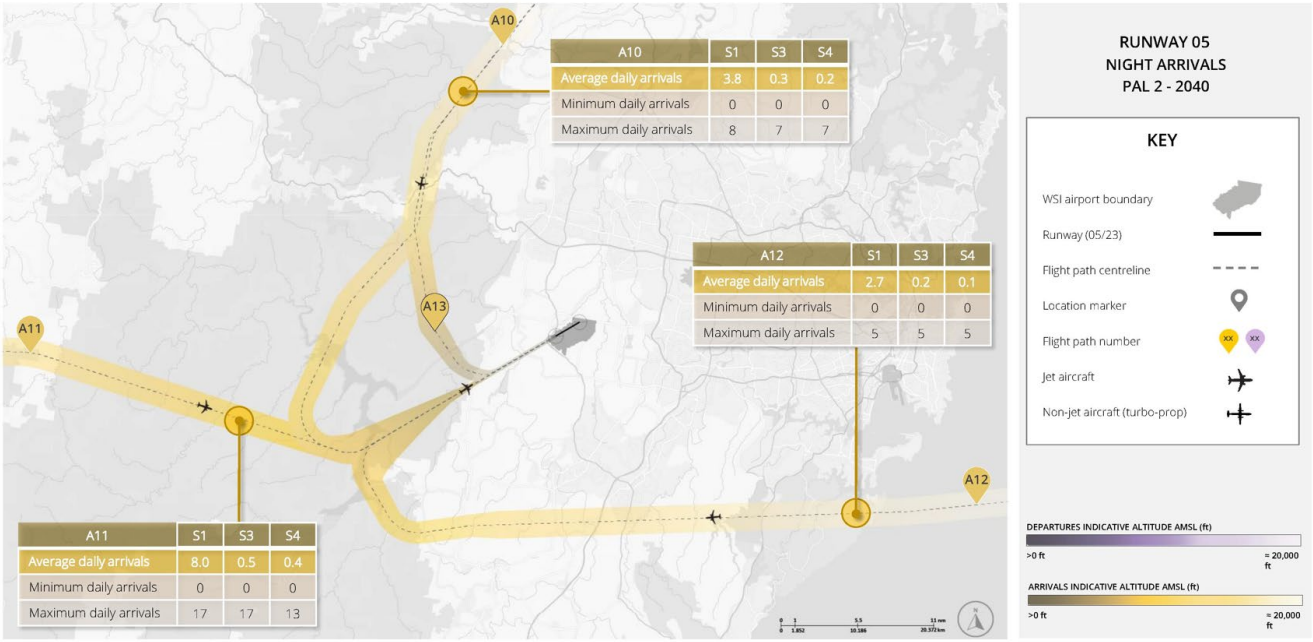
D11	S1	S3	S4
Average daily departures	13.6	6.4	20.5
Minimum daily departures	0	0	0
Maximum daily departures	26	26	26

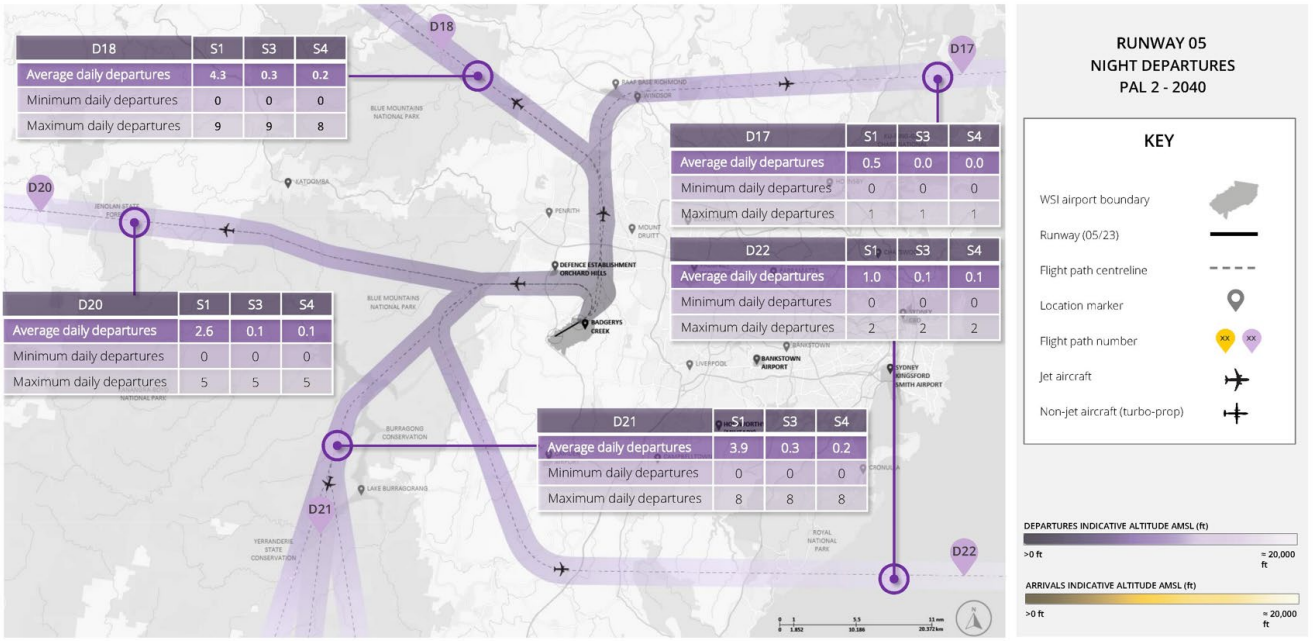
D14	S1	S3	S4
Average daily departures	12.1	6.0	18.2
Minimum daily departures	0	0	0
Maximum daily departures	23	23	23

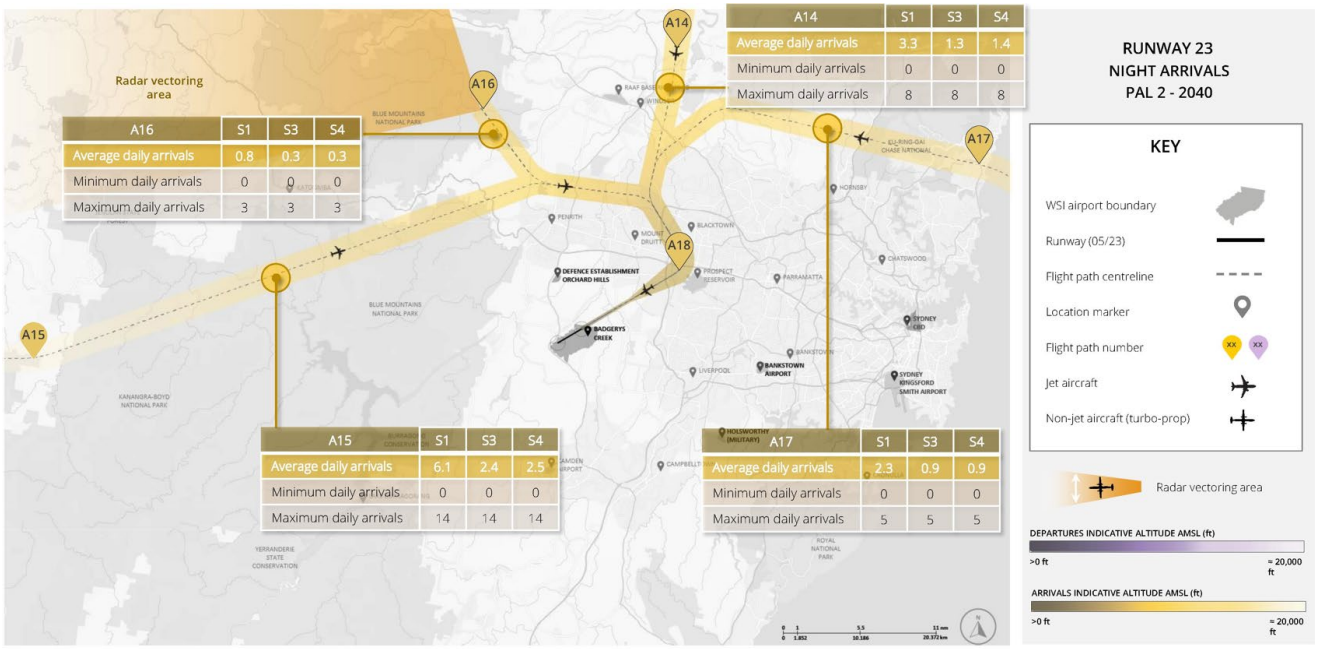
D15	S1	S3	S4
Average daily departures	4.4	2.0	6.8
Minimum daily departures	0	0	0
Maximum daily departures	10	10	10

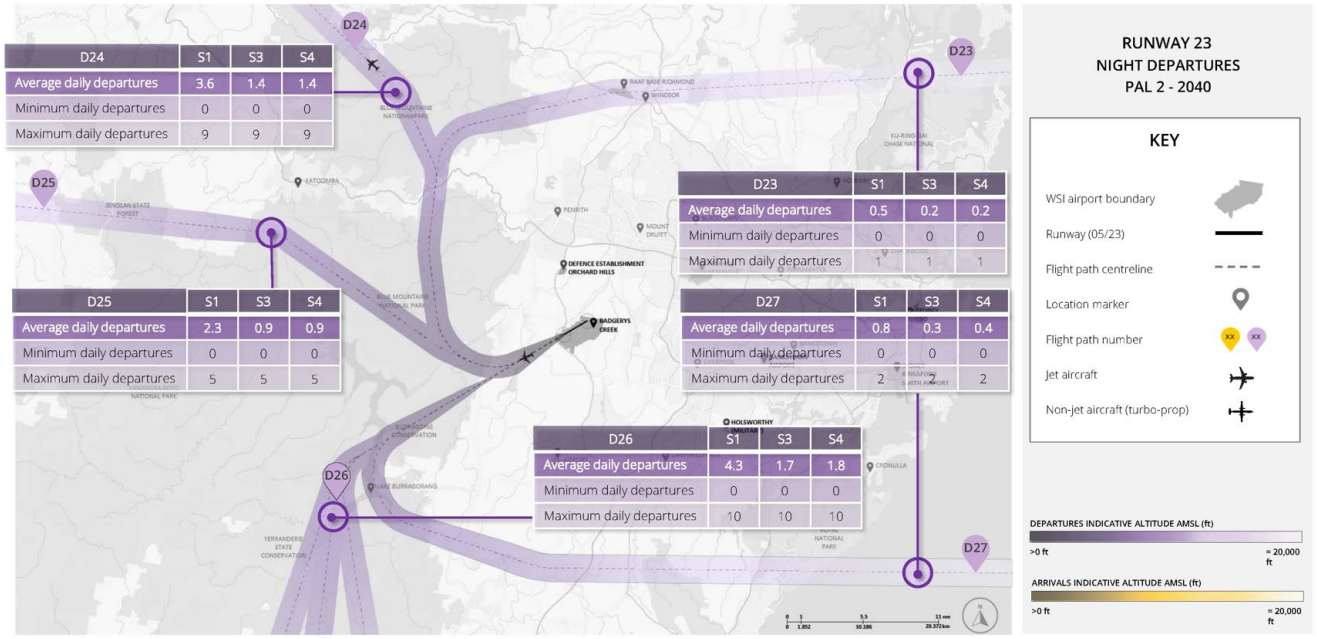
D12	S1	S3	S4
Average daily departures	14.8	7.2	22.2
Minimum daily departures	0	0	0
Maximum daily departures	28	28	28

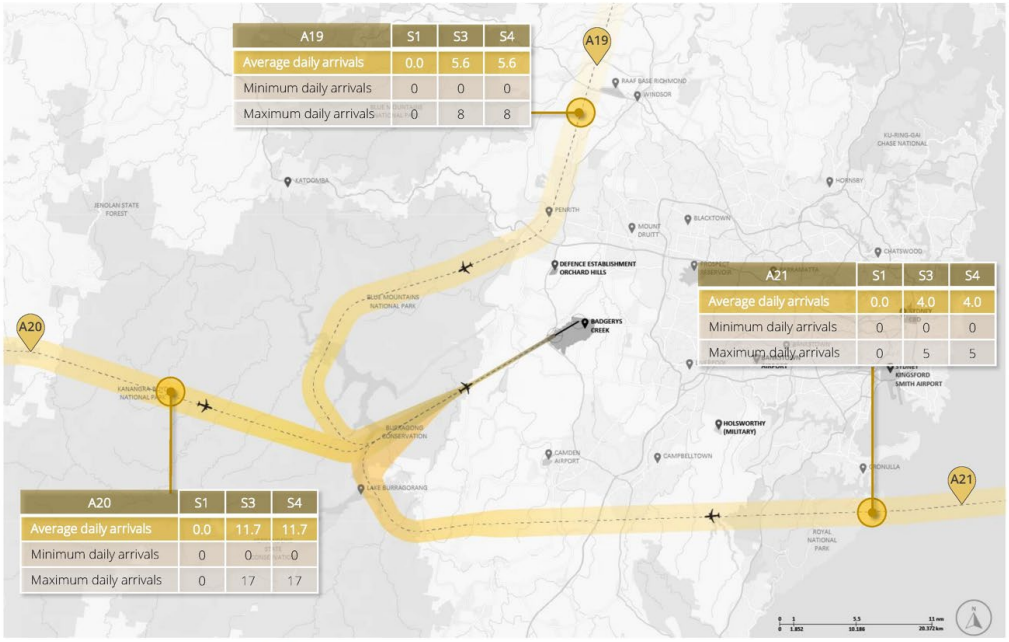
D13	S1	S3	S4
Average daily departures	1.2	0.6	1.9
Minimum daily departures	0	0	0
Maximum daily departures	3	3	3

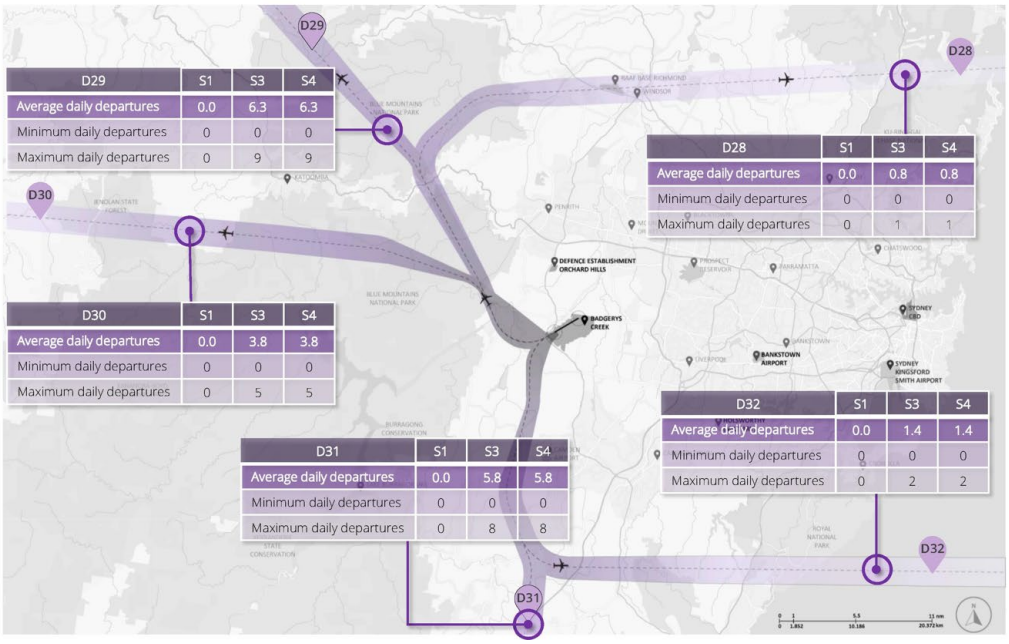

A10
A11
A12
A13
A10 S1 S3 S4
Average daily arrivals 3.8 0.3 0.2
Minimum daily arrivals 0 0 0
Maximum daily arrivals 8 7 7
A12 S1 S3 S4
Average daily arrivals 2.7 0.2 0.1
Minimum daily arrivals 0 0 0
Maximum daily arrivals 5 5 5
A11 S1 S3 S4
Average daily arrivals 8.0 0.5 0.4
Minimum daily arrivals 0 0 0
Maximum daily arrivals 17 17 13
RUNWAY 05
NIGHT ARRIVALS
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

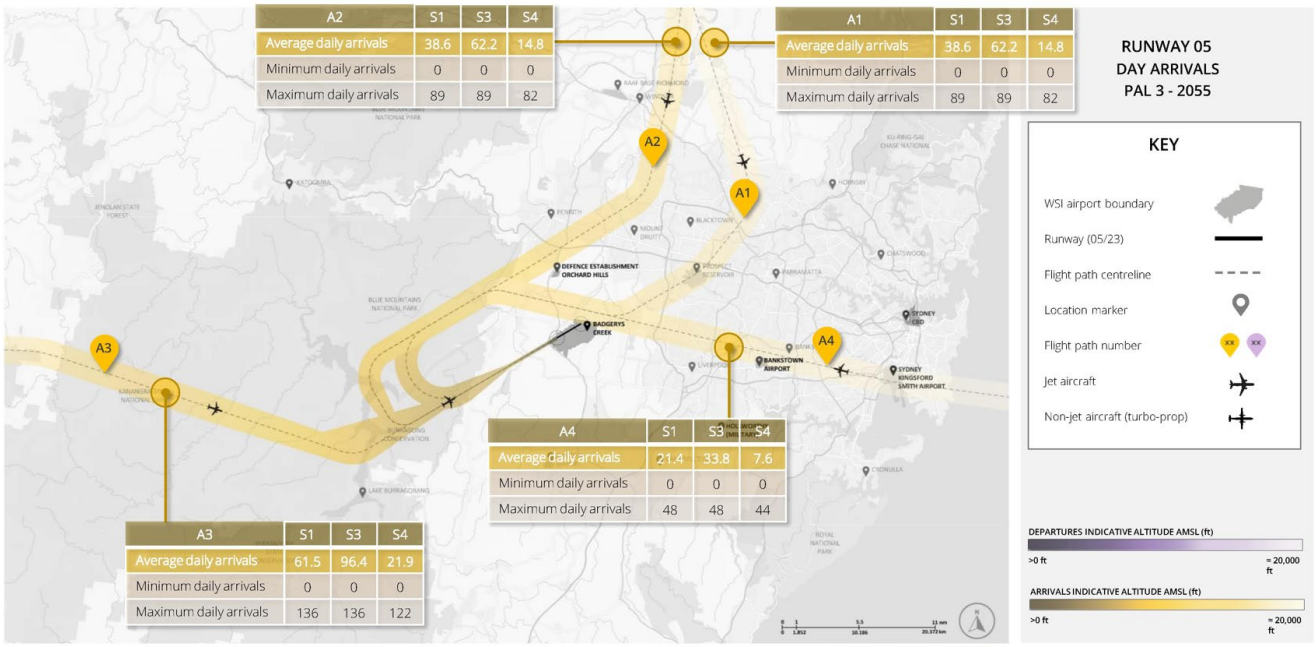

D18
D17
D20
D21
D22
D18 S1 S3 S4
Average daily departures 4.3 0.3 0.2
Minimum daily departures 0 0 0
Maximum daily departures 9 9 8
D17 S1 S3 S4
Average daily departures 0.5 0.0 0.0
Minimum daily departures 0 0 0
Maximum daily departures 1 1 1
D22 S1 S3 S4
Average daily departures 1.0 0.1 0.1
Minimum daily departures 0 0 0
Maximum daily departures 2 2 2
D20 S1 S3 S4
Average daily departures 2.6 0.1 0.1
Minimum daily departures 0 0 0
Maximum daily departures 5 5 5
D21 S1 S3 S4
Average daily departures 3.9 0.3 0.2
Minimum daily departures 0 0 0
Maximum daily departures 8 8 8
RUNWAY 05
NIGHT DEPARTURES
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

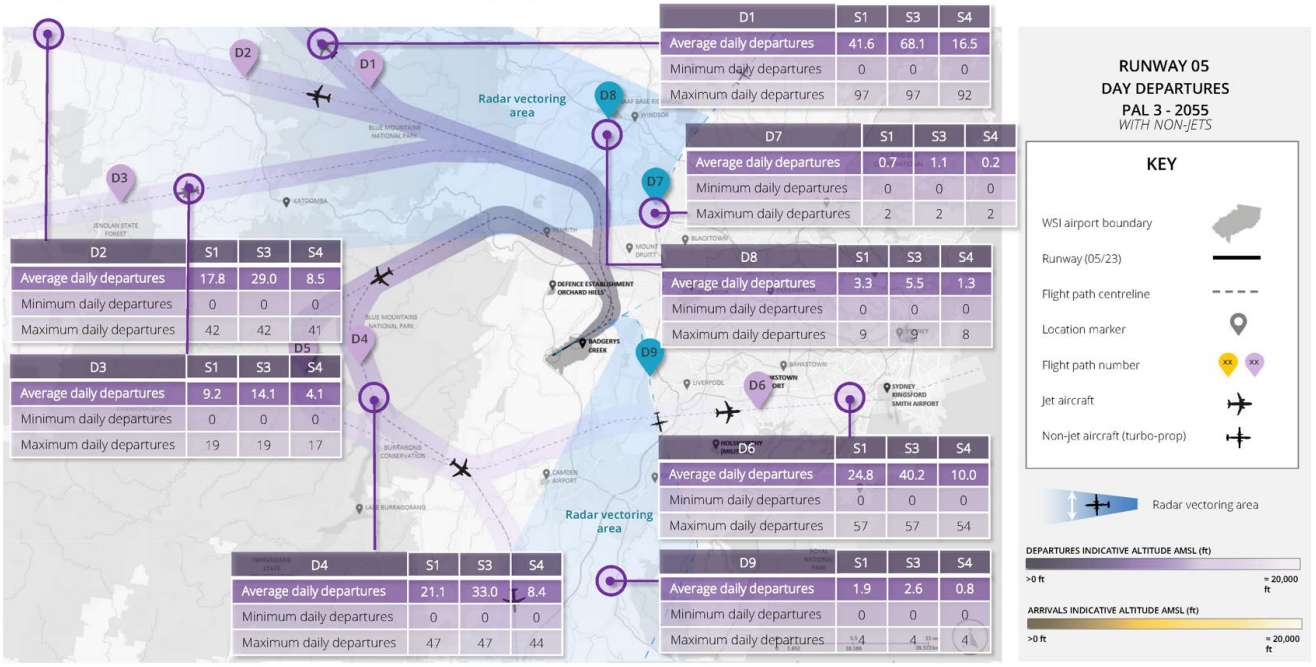

Radar vectoring area
A14
A16
A17
A18
A15
A14 S1 S3 S4
Average daily arrivals 3.3 1.3 1.4
Minimum daily arrivals 0 0 0
Maximum daily arrivals 8 8 8
A16 S1 S3 S4
Average daily arrivals 0.8 0.3 0.3
Minimum daily arrivals 0 0 0
Maximum daily arrivals 3 3 3
A15 S1 S3 S4
Average daily arrivals 6.1 2.4 2.5
Minimum daily arrivals 0 0 0
Maximum daily arrivals 14 14 14
A17 S1 S3 S4
Average daily arrivals 2.3 0.9 0.9
Minimum daily arrivals 0 0 0
Maximum daily arrivals 5 5 5
RUNWAY 23
NIGHT ARRIVALS
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

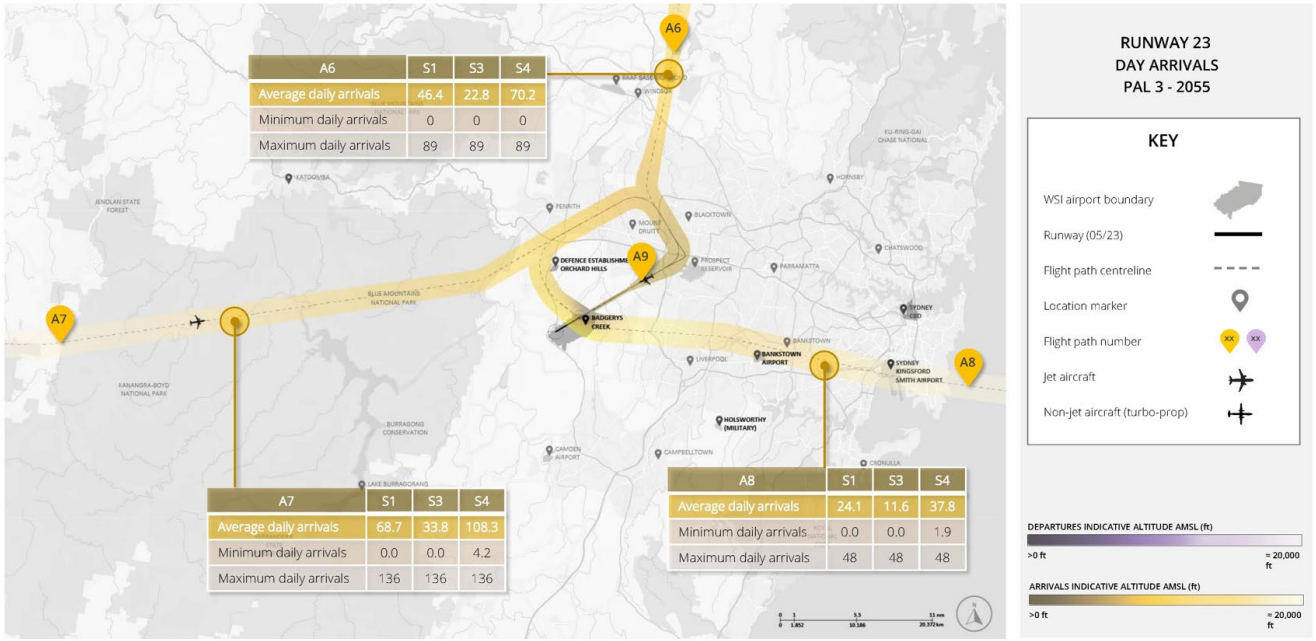

D24
D23
D25
D26
D27
D24 S1 S3 S4
Average daily departures 3.6 1.4 1.4
Minimum daily departures 0 0 0
Maximum daily departures 9 9 9
D23 S1 S3 S4
Average daily departures 0.5 0.2 0.2
Minimum daily departures 0 0 0
Maximum daily departures 1 1 1
D25 S1 S3 S4
Average daily departures 2.3 0.9 0.9
Minimum daily departures 0 0 0
Maximum daily departures 5 5 5
D27 S1 S3 S4
Average daily departures 0.8 0.3 0.4
Minimum daily departures 0 0 0
Maximum daily departures 2 2 2
D26 S1 S3 S4
Average daily departures 4.3 1.7 1.8
Minimum daily departures 0 0 0
Maximum daily departures 10 10 10
RUNWAY 23
NIGHT DEPARTURES
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

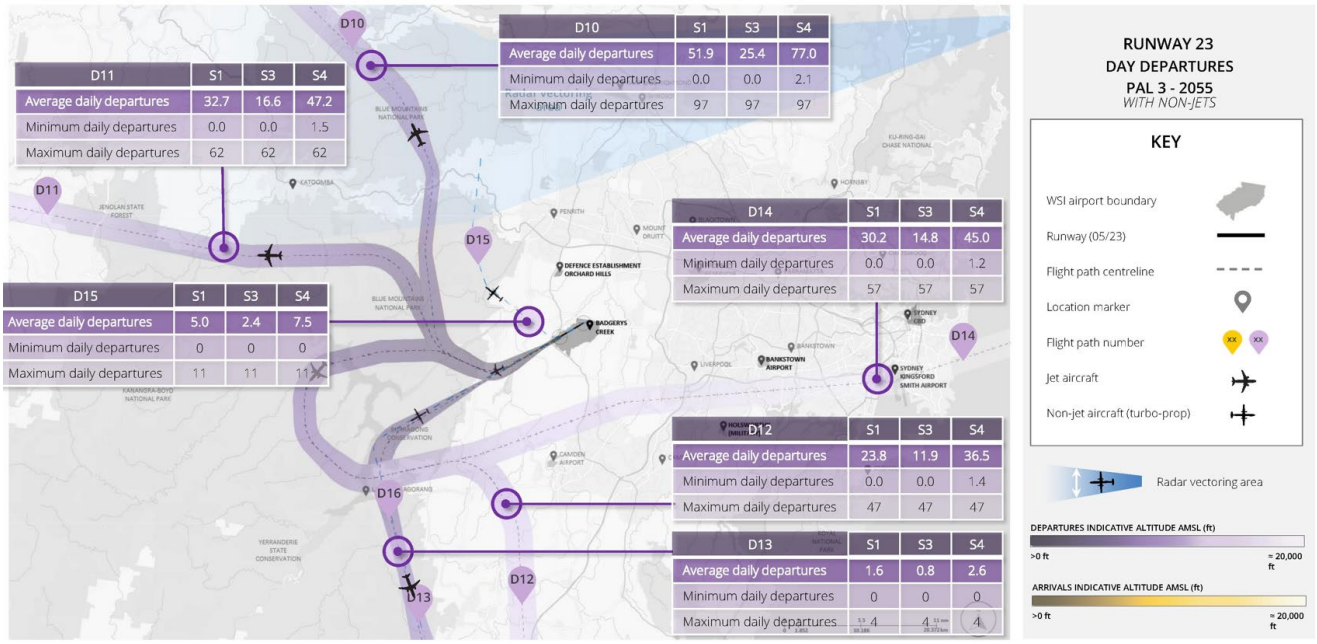

A19
Average daily arrivals 0.0 5.6 5.6
Minimum daily arrivals 0 0 0
Maximum daily arrivals 0 8 8
A21
Average daily arrivals 0.0 4.0 4.0
Minimum daily arrivals 0 0 0
Maximum daily arrivals 0 5 5
A20
Average daily arrivals 0.0 11.7 11.7
Minimum daily arrivals 0 0 0
Maximum daily arrivals 0 17 17
RUNWAY 05
NIGHT ARRIVALS
PAL 2 - 2040
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

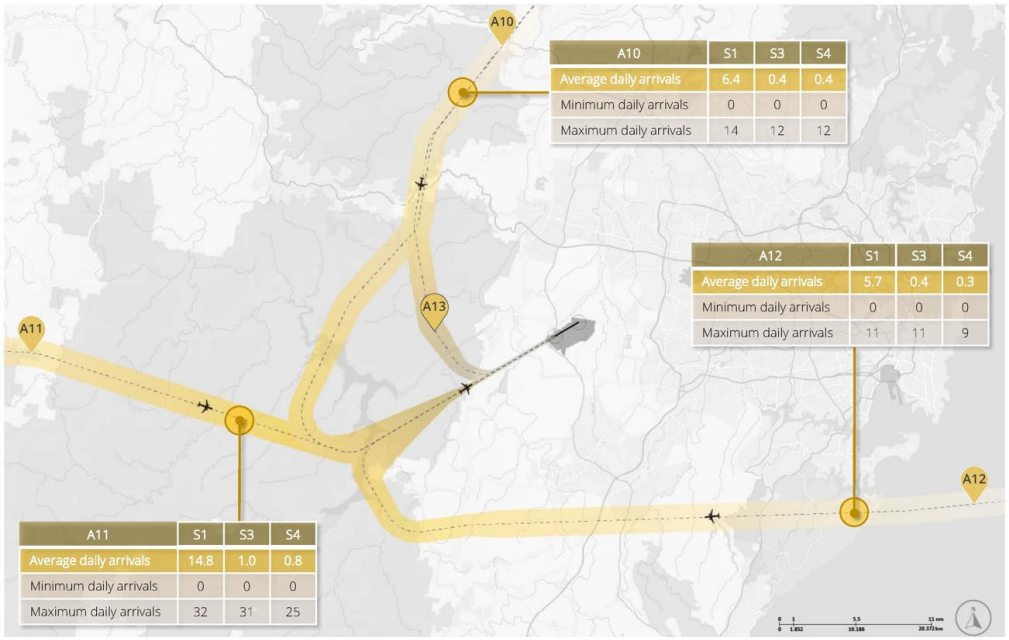

D29
Average daily departures 0.0 6.3 6.3
Minimum daily departures 0 0 0
Maximum daily departures 0 9 9
D28
Average daily departures 0.0 0.8 0.8
Minimum daily departures 0 0 0
Maximum daily departures 0 1 1
D30
Average daily departures 0.0 3.8 3.8
Minimum daily departures 0 0 0
Maximum daily departures 0 5 5
D32
Average daily departures 0.0 1.4 1.4
Minimum daily departures 0 0 0
Maximum daily departures 0 2 2
D31
Average daily departures 0.0 5.8 5.8
Minimum daily departures 0 0 0
Maximum daily departures 0 8 8
RUNWAY 23
NIGHT DEPARTURES
PAL 2 - 2040
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

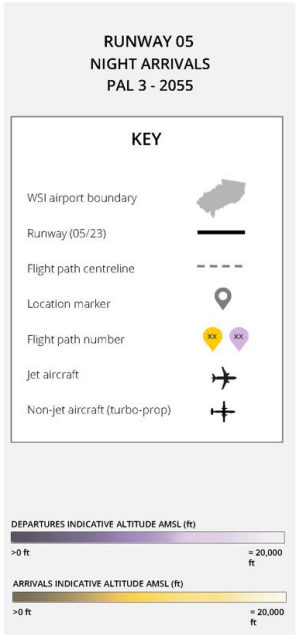

A2
S1 S3 S4
Average daily arrivals 38.6 62.2 14.8
Minimum daily arrivals 0 0 0
Maximum daily arrivals 89 89 82
A1
S1 S3 S4
Average daily arrivals 38.6 62.2 14.8
Minimum daily arrivals 0 0 0
Maximum daily arrivals 89 89 82
RUNWAY 05
DAY ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
A4
S1 S3 S4
Average daily arrivals 21.4 33.8 7.6
Minimum daily arrivals 0 0 0
Maximum daily arrivals 48 48 44
A3
S1 S3 S4
Average daily arrivals 61.5 96.4 21.9
Minimum daily arrivals 0 0 0
Maximum daily arrivals 136 136 122
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

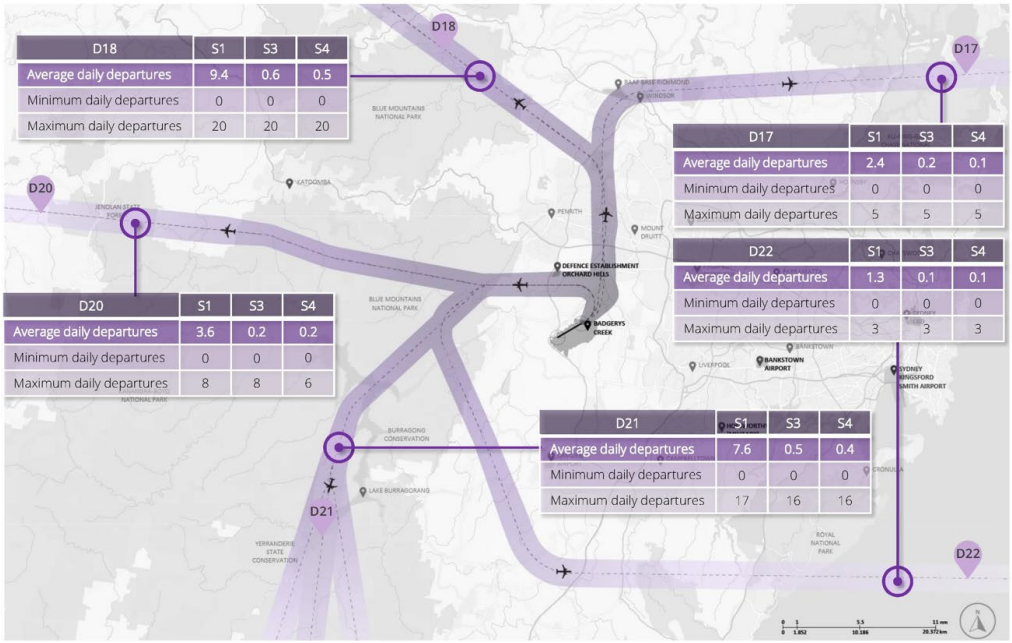

D1
S1 S3 S4
Average daily departures 41.6 68.1 16.5
Minimum daily departures 0 0 0
Maximum daily departures 97 97 92
Radar vectoring area
D7
S1 S3 S4
Average daily departures 0.7 1.1 0.2
Minimum daily departures 0 0 0
Maximum daily departures 2 2 2
D2
S1 S3 S4
Average daily departures 17.8 29.0 8.5
Minimum daily departures 0 0 0
Maximum daily departures 42 42 41
D8
S1 S3 S4
Average daily departures 3.3 5.5 1.3
Minimum daily departures 0 0 0
Maximum daily departures 9 9 8
D3
S1 S3 S4
Average daily departures 9.2 14.1 4.1
Minimum daily departures 0 0 0
Maximum daily departures 19 19 17
D6
S1 S3 S4
Average daily departures 24.8 40.2 10.0
Minimum daily departures 0 0 0
Maximum daily departures 57 57 54
Radar vectoring area
D4
S1 S3 S4
Average daily departures 21.1 33.0 8.4
Minimum daily departures 0 0 0
Maximum daily departures 47 47 44
D9
S1 S3 S4
Average daily departures 1.9 2.6 0.8
Minimum daily departures 0 0 0
Maximum daily departures 4 4 4
RUNWAY 05
DAY DEPARTURES
PAL 3 - 2055
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

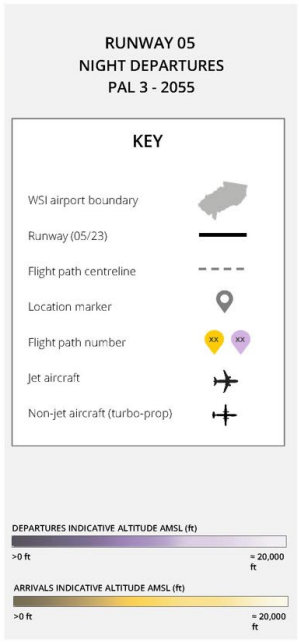

A6
A7
A8
A9
A6 S1 S3 S4
Average daily arrivals 46.4 22.8 70.2
Minimum daily arrivals 0 0 0
Maximum daily arrivals 89 89 89
A7 S1 S3 S4
Average daily arrivals 68.7 33.8 108.3
Minimum daily arrivals 0.0 0.0 4.2
Maximum daily arrivals 136 136 136
A8 S1 S3 S4
Average daily arrivals 24.1 11.6 37.8
Minimum daily arrivals 0.0 0.0 1.9
Maximum daily arrivals 48 48 48
RUNWAY 23
DAY ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

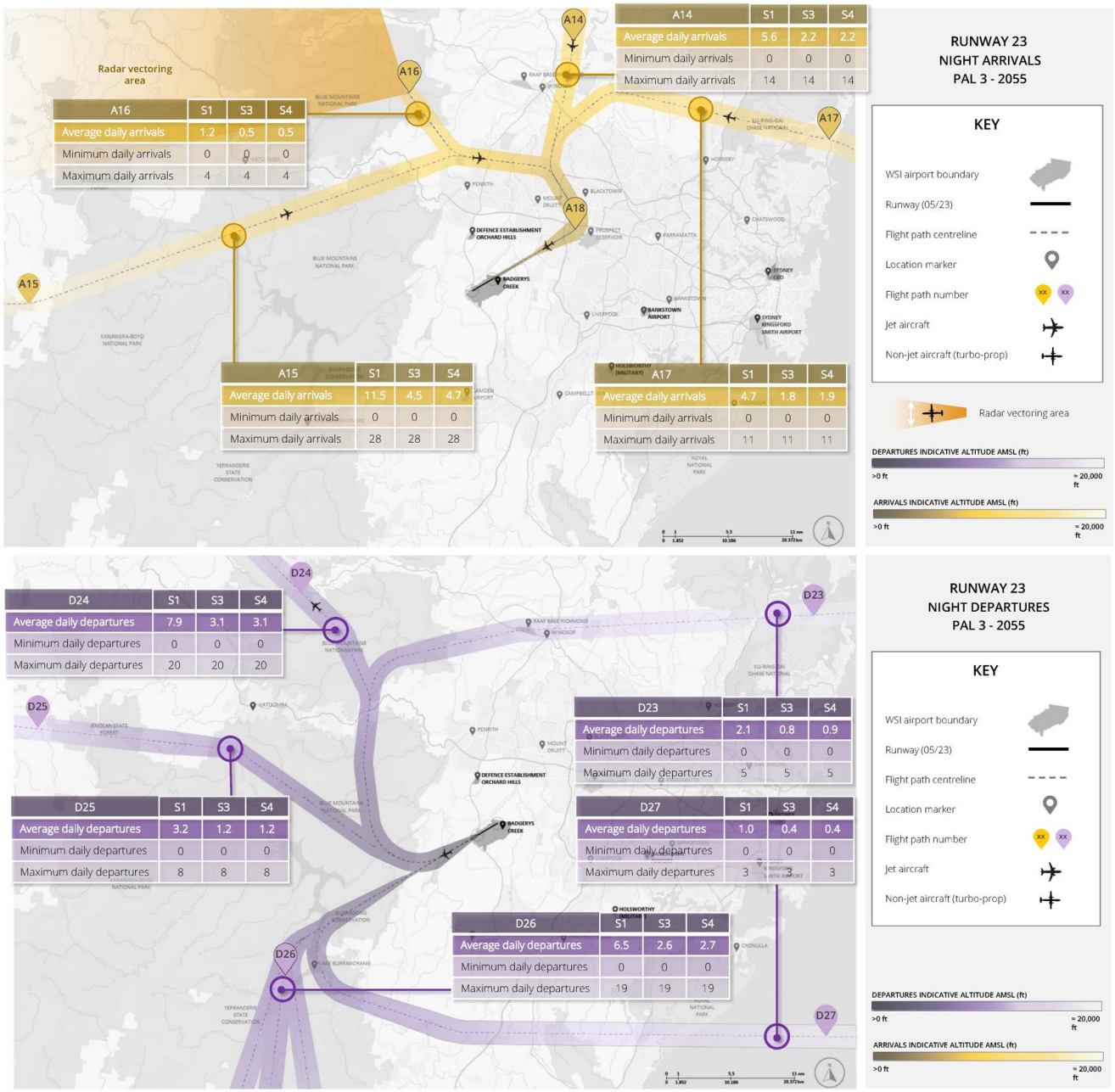

D10
D11
D12
D13
D14
D15
D16
D10 S1 S3 S4
Average daily departures 51.9 25.4 77.0
Minimum daily departures 0.0 0.0 2.1
Maximum daily departures 97 97 97
D11 S1 S3 S4
Average daily departures 32.7 16.6 47.2
Minimum daily departures 0.0 0.0 1.5
Maximum daily departures 62 62 62
D14 S1 S3 S4
Average daily departures 30.2 14.8 45.0
Minimum daily departures 0.0 0.0 1.2
Maximum daily departures 57 57 57
D15 S1 S3 S4
Average daily departures 5.0 2.4 7.5
Minimum daily departures 0 0 0
Maximum daily departures 11 11 11
D12 S1 S3 S4
Average daily departures 23.8 11.9 36.5
Minimum daily departures 0.0 0.0 1.4
Maximum daily departures 47 47 47
D13 S1 S3 S4
Average daily departures 1.6 0.8 2.6
Minimum daily departures 0 0 0
Maximum daily departures 4 4 4
RUNWAY 23
DAY DEPARTURES
PAL 3 - 2055
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A10
A11
A12
A13
A10 S1 S3 S4
Average daily arrivals 6.4 0.4 0.4
Minimum daily arrivals 0 0 0
Maximum daily arrivals 14 12 12
A12 S1 S3 S4
Average daily arrivals 5.7 0.4 0.3
Minimum daily arrivals 0 0 0
Maximum daily arrivals 11 11 9
A11 S1 S3 S4
Average daily arrivals 14.8 1.0 0.8
Minimum daily arrivals 0 0 0
Maximum daily arrivals 32 31 25

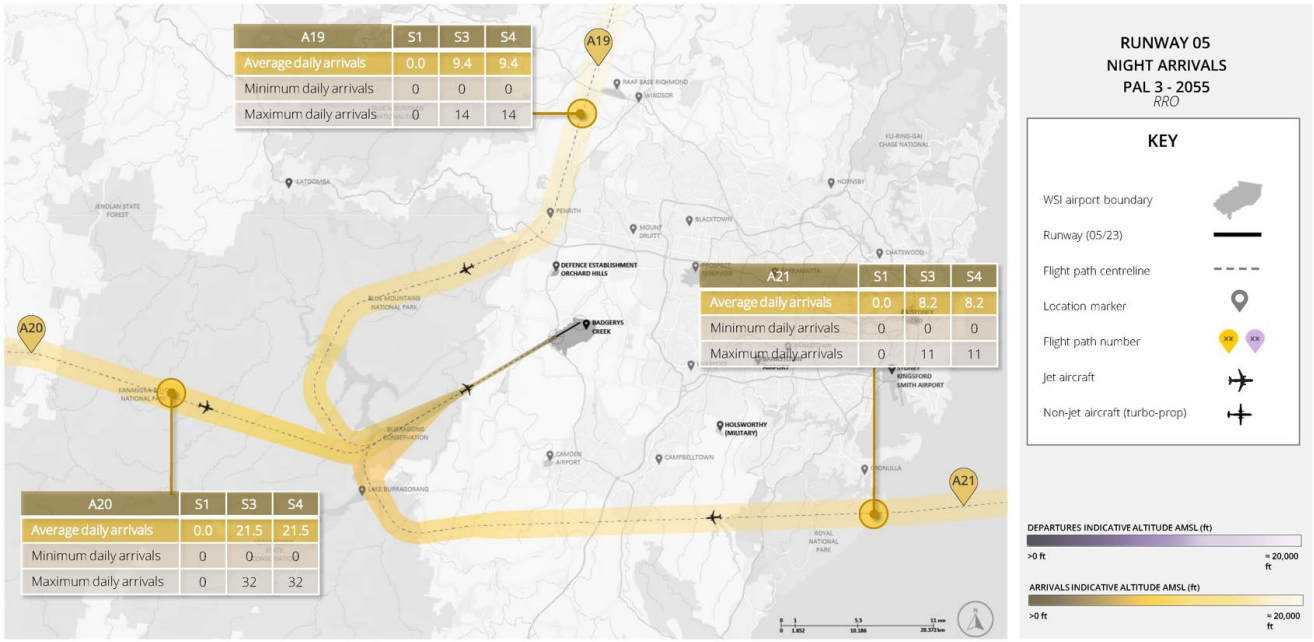

RUNWAY 05
NIGHT ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

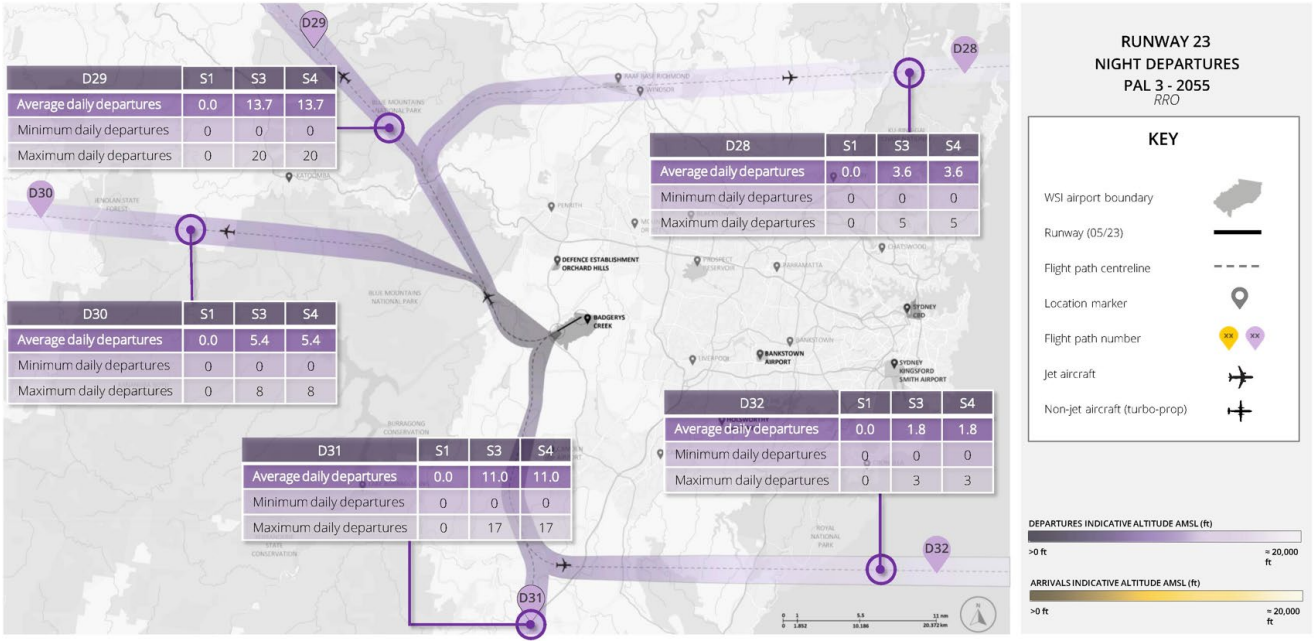

D17
D18
D20
D21
D22
D18 S1 S3 S4
Average daily departures 9.4 0.6 0.5
Minimum daily departures 0 0 0
Maximum daily departures 20 20 20
D17 S1 S3 S4
Average daily departures 2.4 0.2 0.1
Minimum daily departures 0 0 0
Maximum daily departures 5 5 5
D22 S1 S3 S4
Average daily departures 1.3 0.1 0.1
Minimum daily departures 0 0 0
Maximum daily departures 3 3 3
D20 S1 S3 S4
Average daily departures 3.6 0.2 0.2
Minimum daily departures 0 0 0
Maximum daily departures 8 8 6
D21 S1 S3 S4
Average daily departures 7.6 0.5 0.4
Minimum daily departures 0 0 0
Maximum daily departures 17 16 16


RUNWAY 05
NIGHT DEPARTURES
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

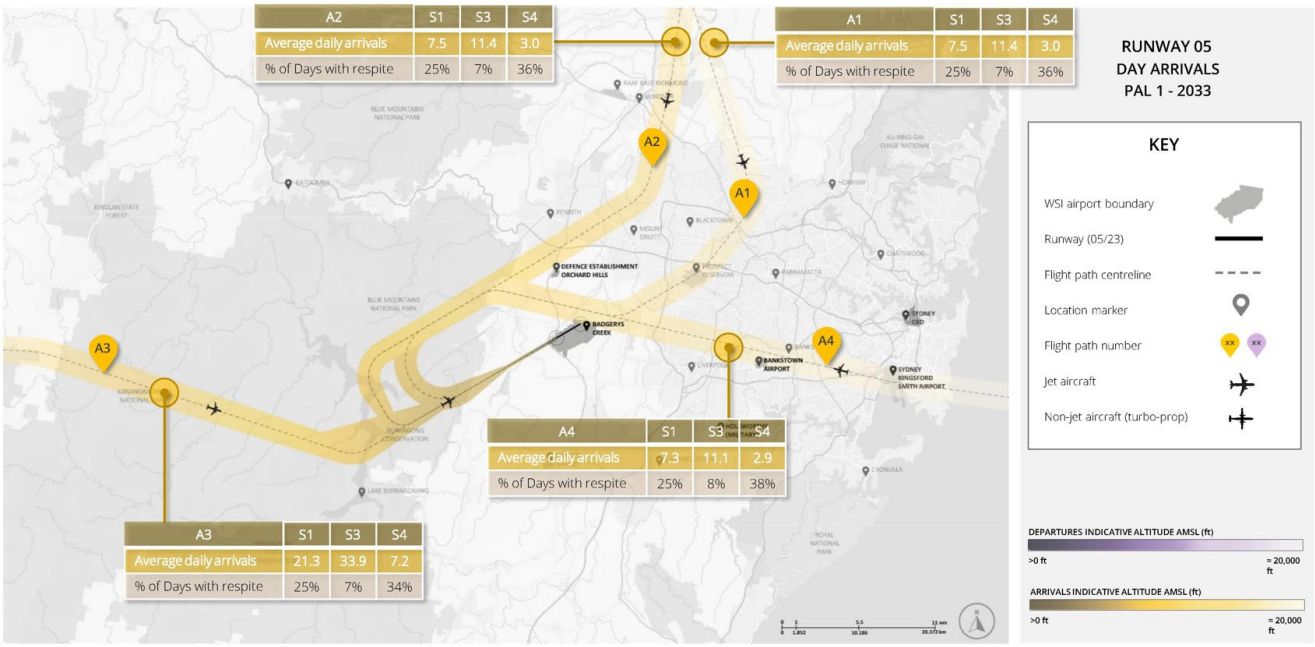

Radar vectoring area
A14
A16
A17
A18
A15
A14 S1 S3 S4
Average daily arrivals 5.6 2.2 2.2
Minimum daily arrivals 0 0 0
Maximum daily arrivals 14 14 14
A16 S1 S3 S4
Average daily arrivals 1.2 0.5 0.5
Minimum daily arrivals 0 0 0
Maximum daily arrivals 4 4 4
A15 S1 S3 S4
Average daily arrivals 11.5 4.5 4.7
Minimum daily arrivals 0 0 0
Maximum daily arrivals 28 28 28
A17 S1 S3 S4
Average daily arrivals 4.7 1.8 1.9
Minimum daily arrivals 0 0 0
Maximum daily arrivals 11 11 11
RUNWAY 23
NIGHT ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

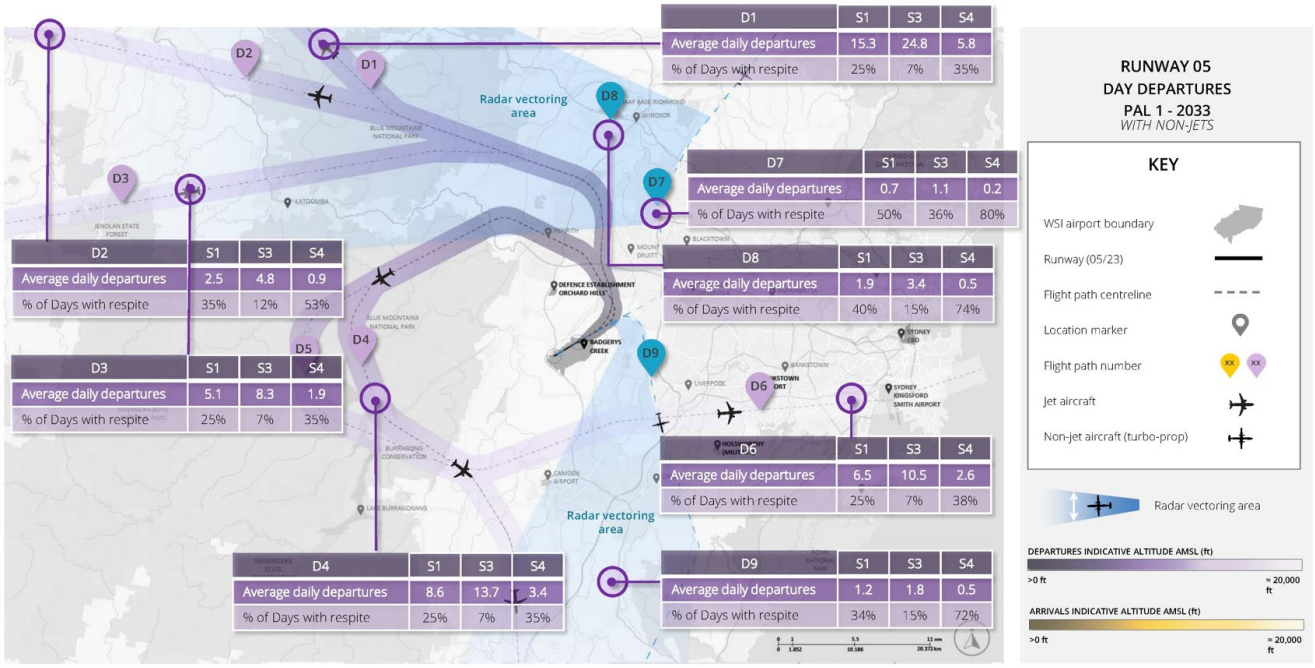
D24
D25
D23
D27
D26
D24 S1 S3 S4
Average daily departures 7.9 3.1 3.1
Minimum daily departures 0 0 0
Maximum daily departures 20 20 20
D25 S1 S3 S4
Average daily departures 3.2 1.2 1.2
Minimum daily departures 0 0 0
Maximum daily departures 8 8 8
D23 S1 S3 S4
Average daily departures 2.1 0.8 0.9
Minimum daily departures 0 0 0
Maximum daily departures 5 5 5
D27 S1 S3 S4
Average daily departures 1.0 0.4 0.4
Minimum daily departures 0 0 0
Maximum daily departures 3 3 3
D26 S1 S3 S4
Average daily departures 6.5 2.6 2.7
Minimum daily departures 0 0 0
Maximum daily departures 19 19 19
RUNWAY 23
NIGHT DEPARTURES
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

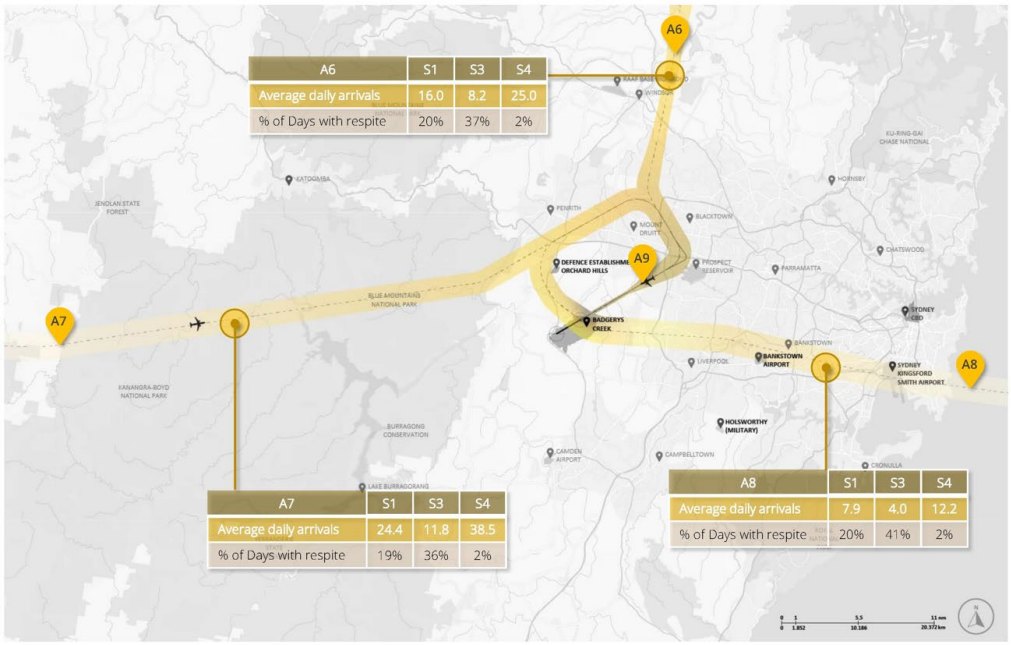

A19
A20
A21
A19 S1 S3 S4
Average daily arrivals 0.0 9.4 9.4
Minimum daily arrivals 0 0 0
Maximum daily arrivals 0 14 14
A21 S1 S3 S4
Average daily arrivals 0.0 8.2 8.2
Minimum daily arrivals 0 0 0
Maximum daily arrivals 0 11 11
A20 S1 S3 S4
Average daily arrivals 0.0 21.5 21.5
Minimum daily arrivals 0 0 0
Maximum daily arrivals 0 32 32
RUNWAY 05
NIGHT ARRIVALS
PAL 3 - 2055
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D28
D29
D30
D31
D32
D29 S1 S3 S4
Average daily departures 0.0 13.7 13.7
Minimum daily departures 0 0 0
Maximum daily departures 0 20 20
D28 S1 S3 S4
Average daily departures 0.0 3.6 3.6
Minimum daily departures 0 0 0
Maximum daily departures 0 5 5
D30 S1 S3 S4
Average daily departures 0.0 5.4 5.4
Minimum daily departures 0 0 0
Maximum daily departures 0 8 8
D31 S1 S3 S4
Average daily departures 0.0 11.0 11.0
Minimum daily departures 0 0 0
Maximum daily departures 0 17 17
D32 S1 S3 S4
Average daily departures 0.0 1.8 1.8
Minimum daily departures 0 0 0
Maximum daily departures 0 3 3
RUNWAY 23
NIGHT DEPARTURES
PAL 3 - 2055
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

B2 Respite charts







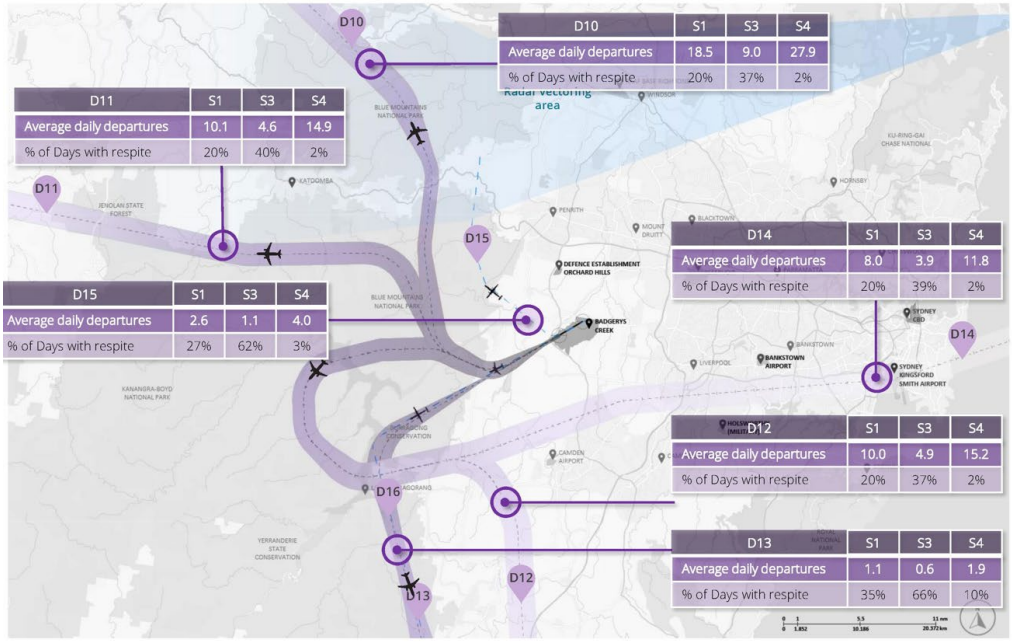
RUNWAY 23
DAY ARRIVALS
PAL 1 - 2033

KEY

- WSI airport boundary
- Runway (05/23)
- Flight path centreline
- Location marker
- Flight path number
- Jet aircraft
- Non-jet aircraft (turbo-prop)

DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft ≈ 20,000 ft

ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft ≈ 20,000 ft



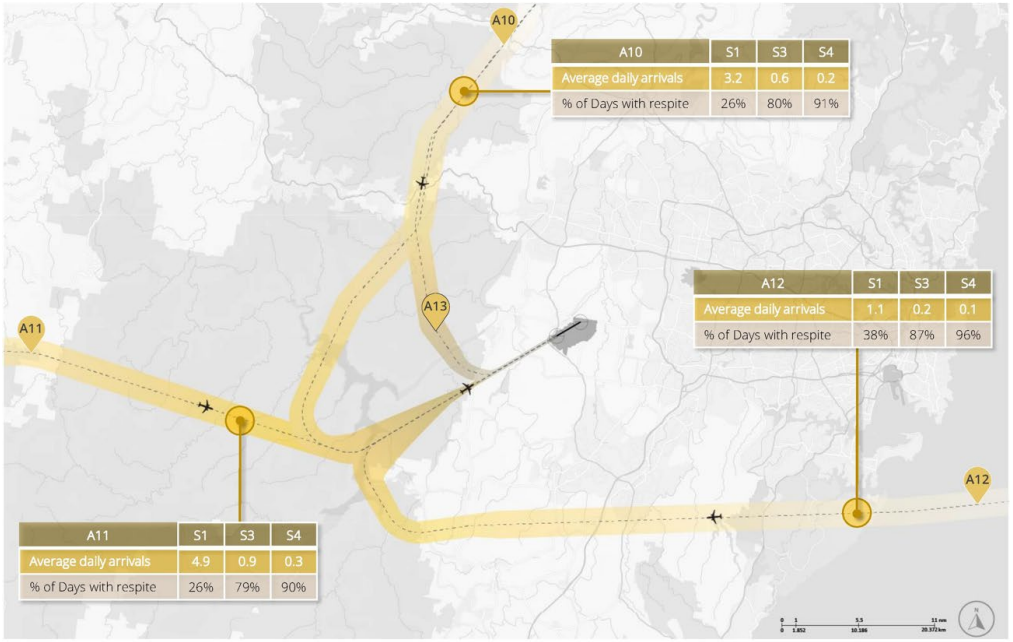
RUNWAY 23
DAY DEPARTURES
PAL 1 - 2033
WITH NON-JETS

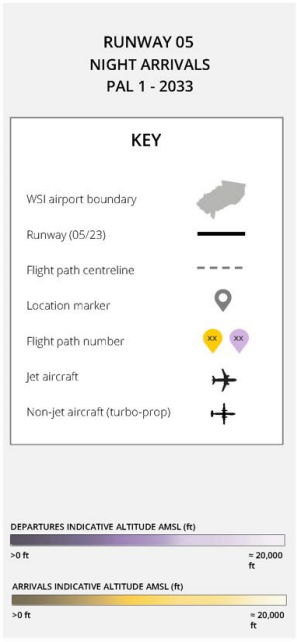
KEY

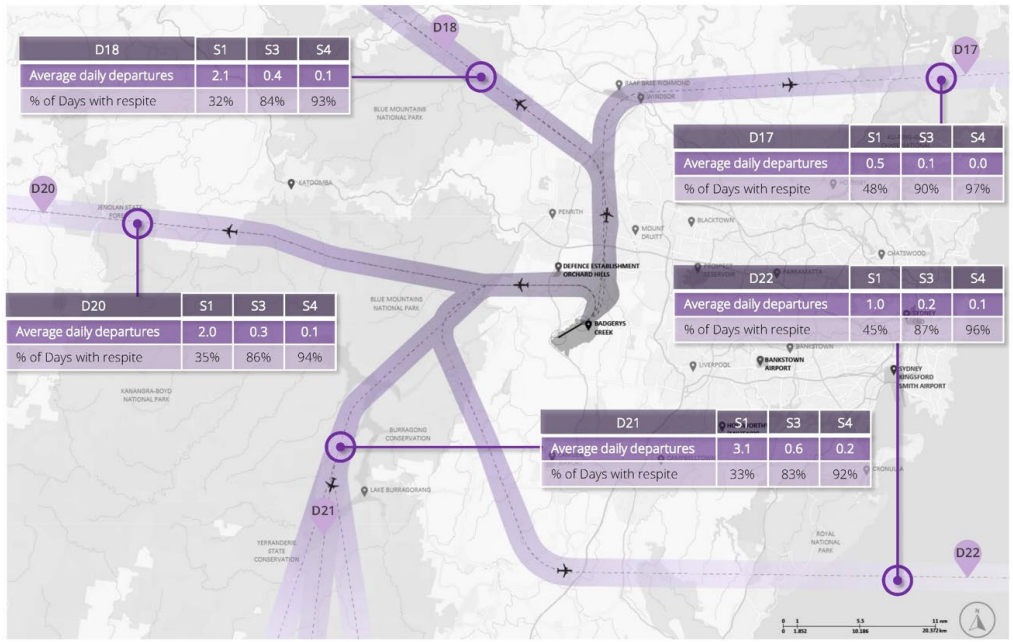
- WSI airport boundary
- Runway (05/23)
- Flight path centreline
- Location marker
- Flight path number
- Jet aircraft
- Non-jet aircraft (turbo-prop)
- Radar vectoring area

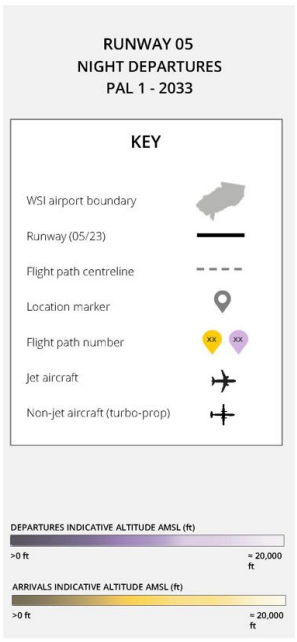
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft ≈ 20,000 ft

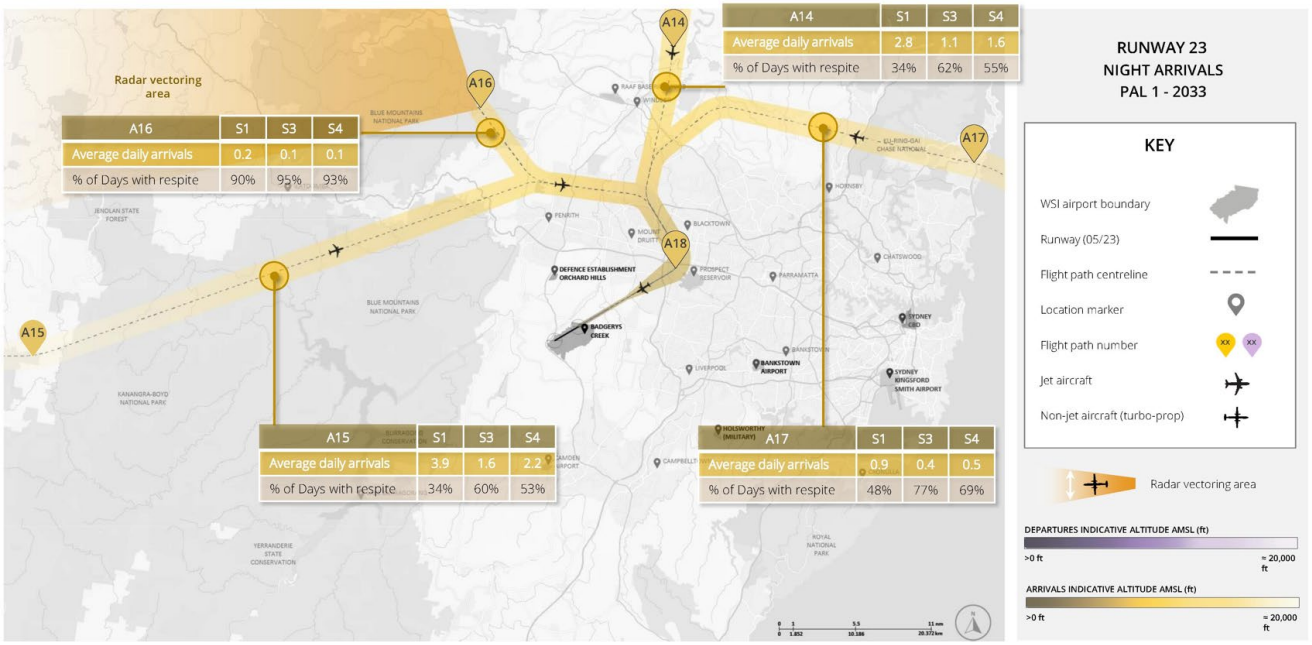
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft ≈ 20,000 ft

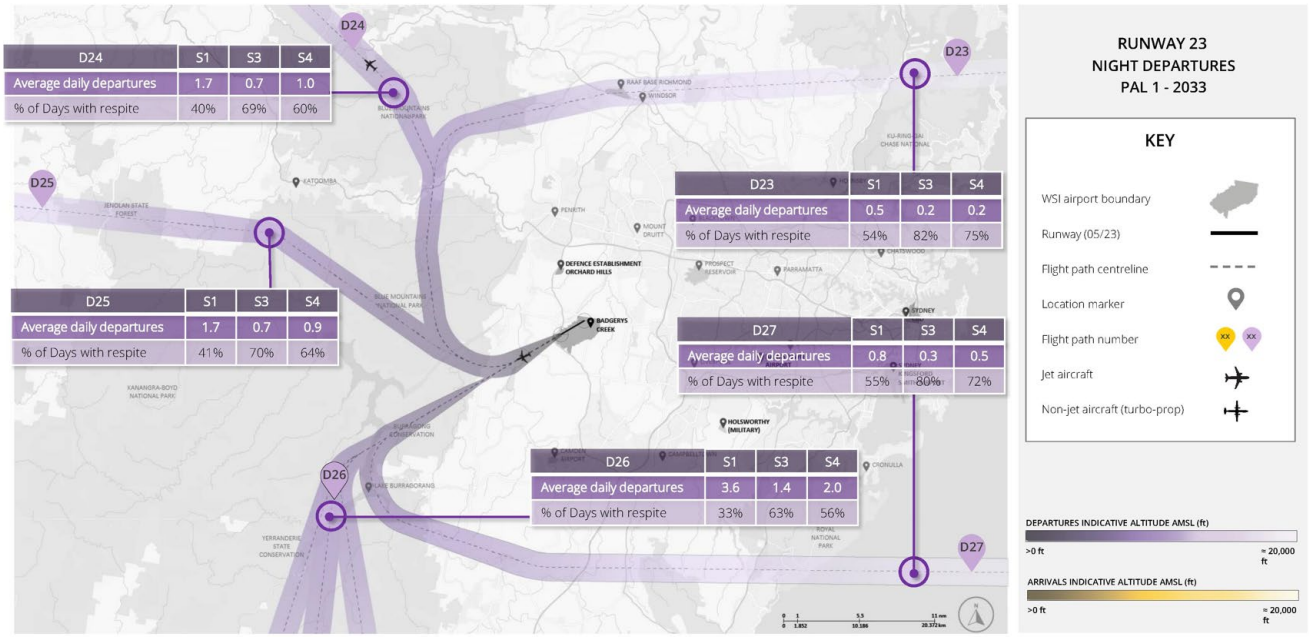

A10
A11
A12
A13
A10 | S1 | S3 | S4
Average daily arrivals | 3.2 | 0.6 | 0.2
% of Days with respite | 26% | 80% | 91%
A12 | S1 | S3 | S4
Average daily arrivals | 1.1 | 0.2 | 0.1
% of Days with respite | 38% | 87% | 96%
A11 | S1 | S3 | S4
Average daily arrivals | 4.9 | 0.9 | 0.3
% of Days with respite | 26% | 79% | 90%

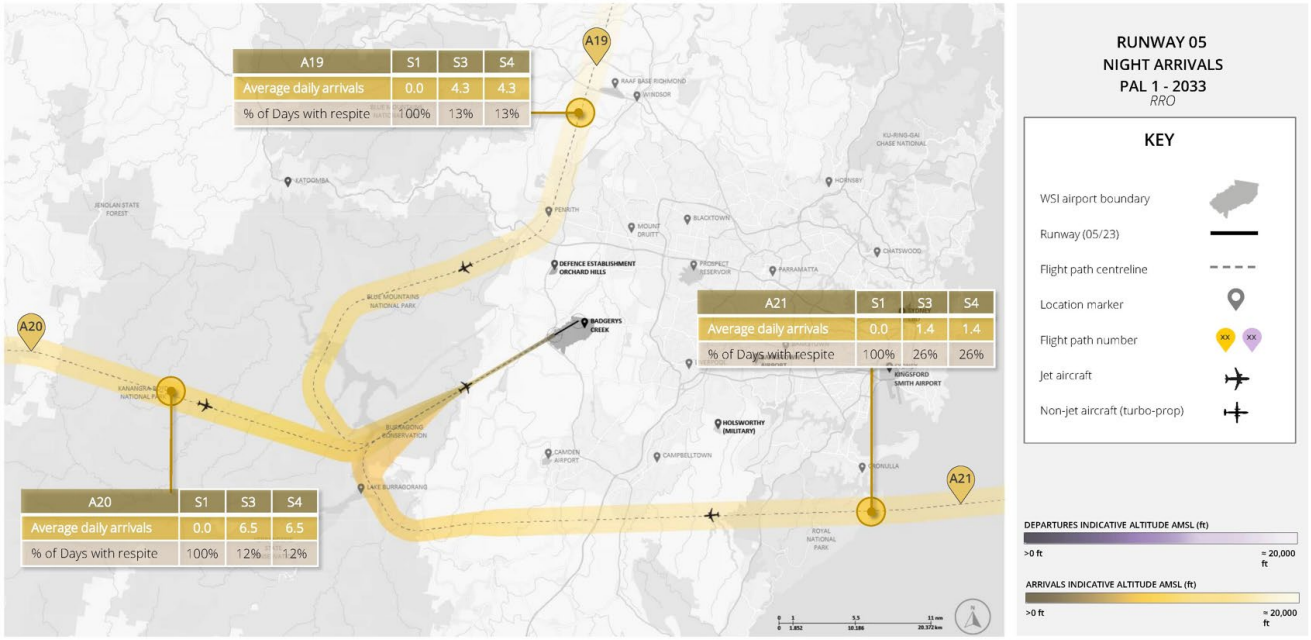

RUNWAY 05
NIGHT ARRIVALS
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

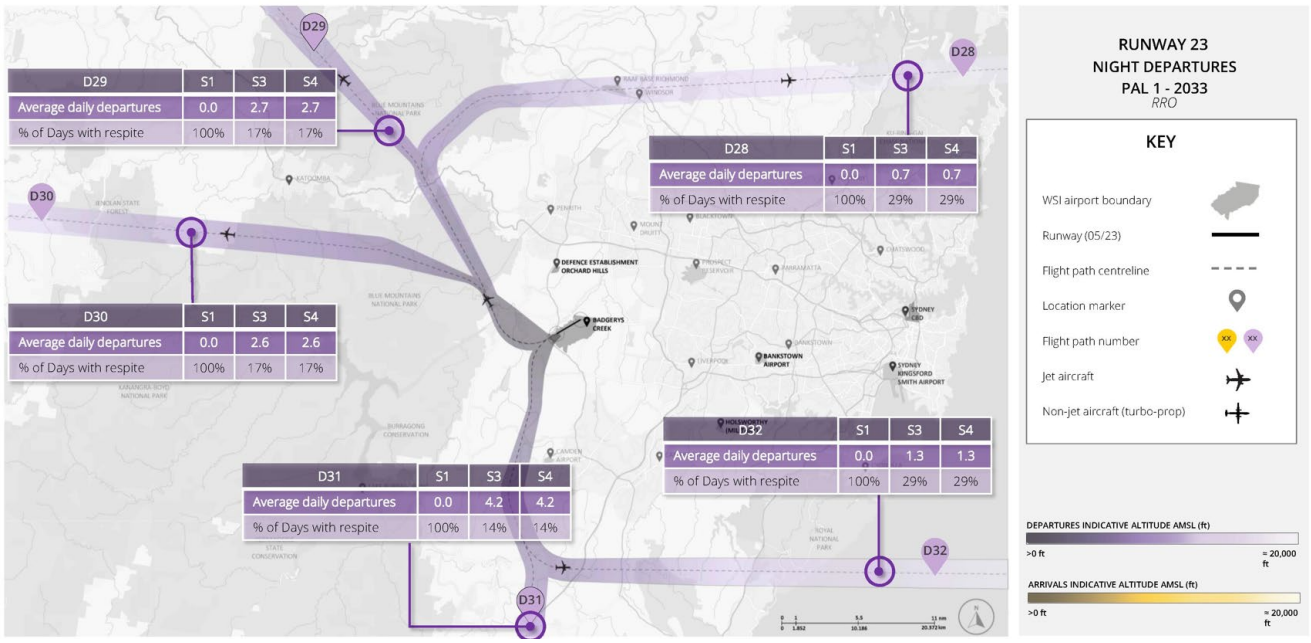

D17
D18
D20
D21
D22
D18 | S1 | S3 | S4
Average daily departures | 2.1 | 0.4 | 0.1
% of Days with respite | 32% | 84% | 93%
D17 | S1 | S3 | S4
Average daily departures | 0.5 | 0.1 | 0.0
% of Days with respite | 48% | 90% | 97%
D20 | S1 | S3 | S4
Average daily departures | 2.0 | 0.3 | 0.1
% of Days with respite | 35% | 86% | 94%
D22 | S1 | S3 | S4
Average daily departures | 1.0 | 0.2 | 0.1
% of Days with respite | 45% | 87% | 96%
D21 | S1 | S3 | S4
Average daily departures | 3.1 | 0.6 | 0.2
% of Days with respite | 33% | 83% | 92%

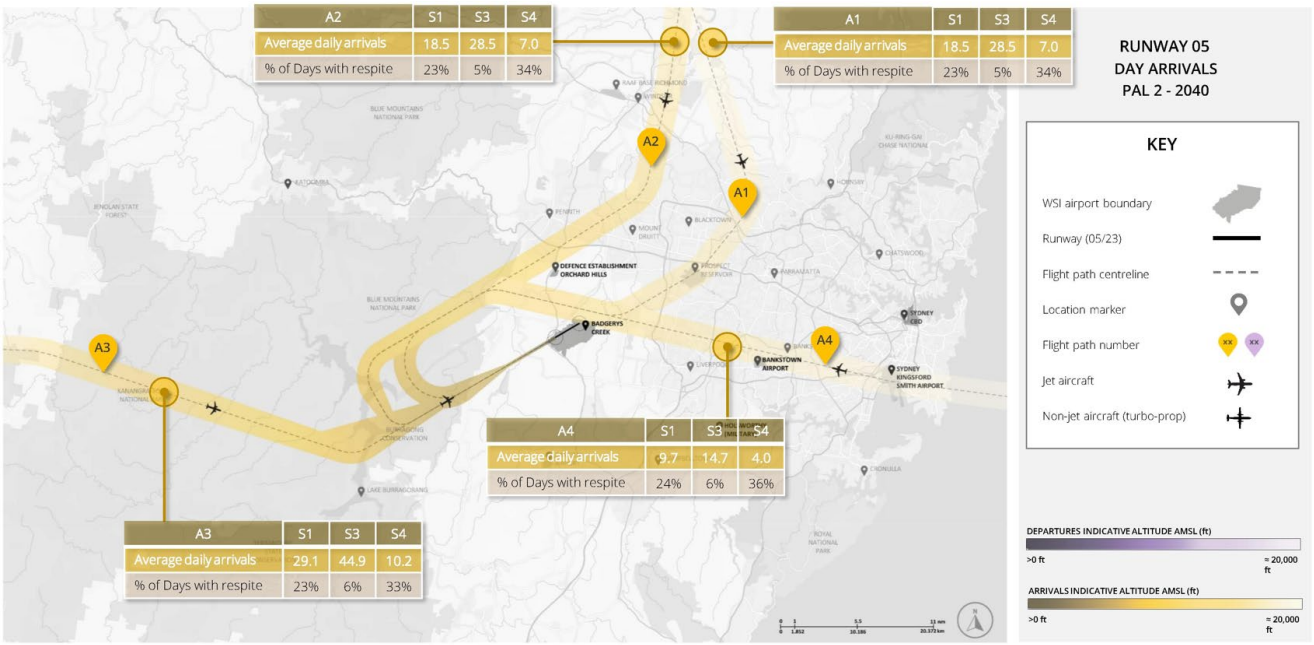

RUNWAY 05
NIGHT DEPARTURES
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

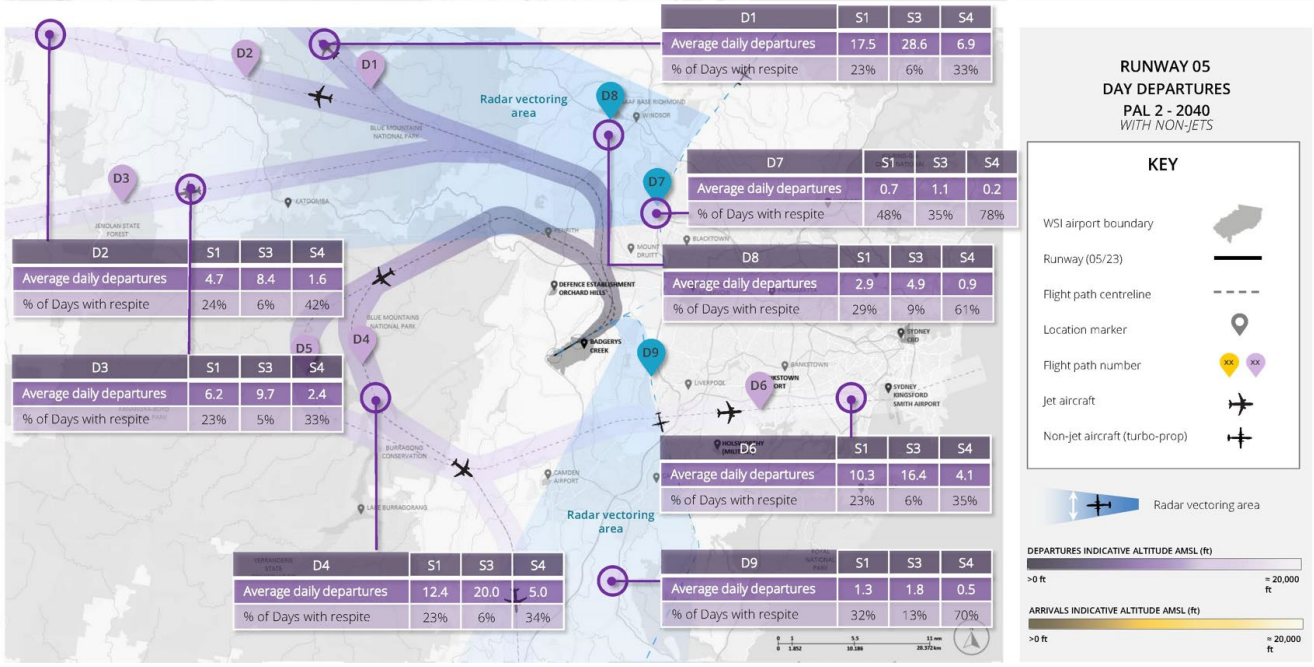

Radar vectoring area
A14
A16
A17
A18
A15
A14 S1 S3 S4
Average daily arrivals 2.8 1.1 1.6
% of Days with respite 34% 62% 55%
A16 S1 S3 S4
Average daily arrivals 0.2 0.1 0.1
% of Days with respite 90% 95% 93%
A15 S1 S3 S4
Average daily arrivals 3.9 1.6 2.2
% of Days with respite 34% 60% 53%
A17 S1 S3 S4
Average daily arrivals 0.9 0.4 0.5
% of Days with respite 48% 77% 69%
RUNWAY 23
NIGHT ARRIVALS
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

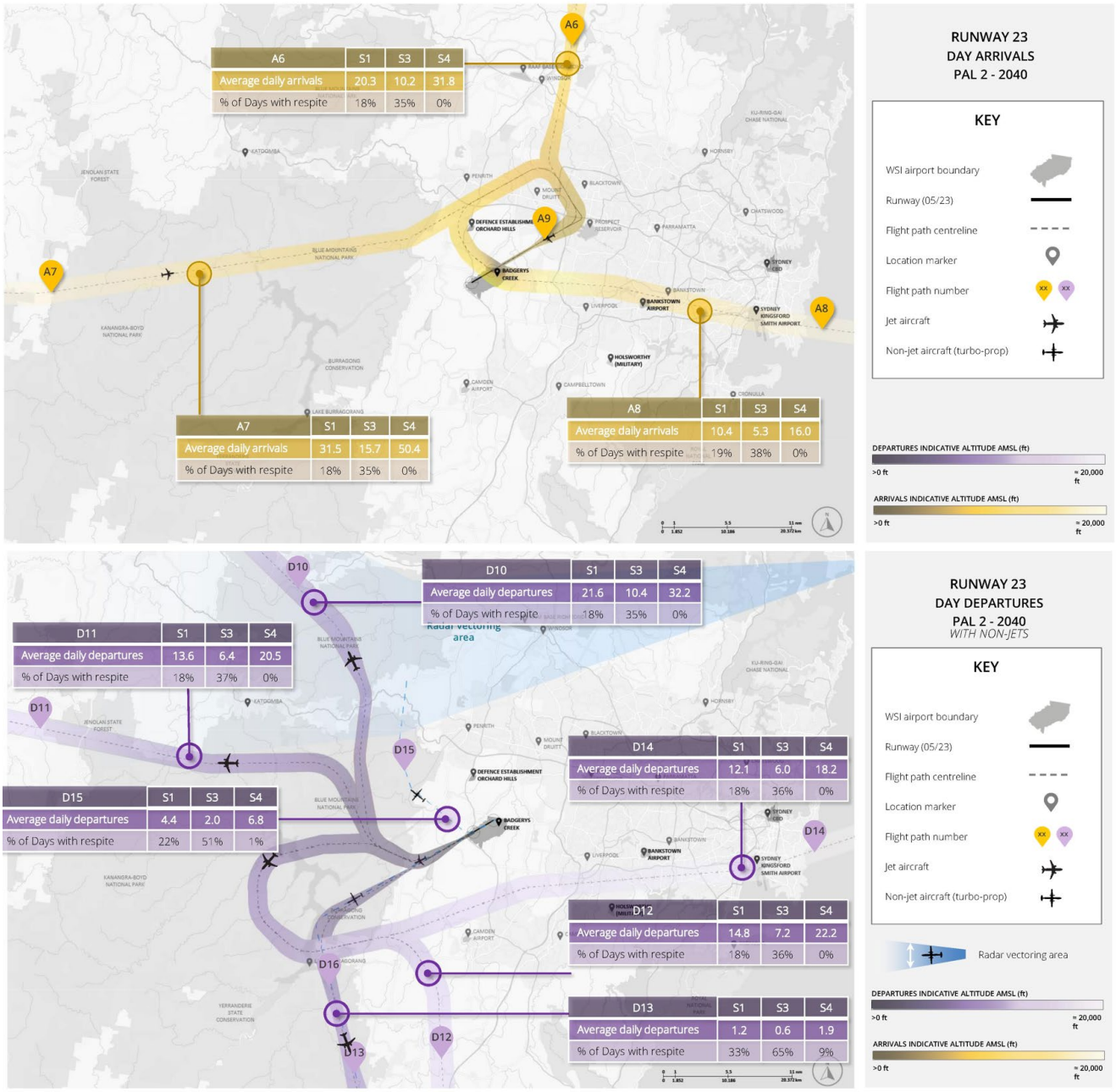

D24
D25
D23
D26
D27
D24 S1 S3 S4
Average daily departures 1.7 0.7 1.0
% of Days with respite 40% 69% 60%
D25 S1 S3 S4
Average daily departures 1.7 0.7 0.9
% of Days with respite 41% 70% 64%
D23 S1 S3 S4
Average daily departures 0.5 0.2 0.2
% of Days with respite 54% 82% 75%
D27 S1 S3 S4
Average daily departures 0.8 0.3 0.5
% of Days with respite 55% 80% 72%
D26 S1 S3 S4
Average daily departures 3.6 1.4 2.0
% of Days with respite 33% 63% 56%
RUNWAY 23
NIGHT DEPARTURES
PAL 1 - 2033
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A19
A19 | S1 | S3 | S4
Average daily arrivals | 0.0 | 4.3 | 4.3
% of Days with respite | 100% | 13% | 13%
A20
A20 | S1 | S3 | S4
Average daily arrivals | 0.0 | 6.5 | 6.5
% of Days with respite | 100% | 12% | 12%
A21
A21 | S1 | S3 | S4
Average daily arrivals | 0.0 | 1.4 | 1.4
% of Days with respite | 100% | 26% | 26%
RUNWAY 05
NIGHT ARRIVALS
PAL 1 - 2033
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

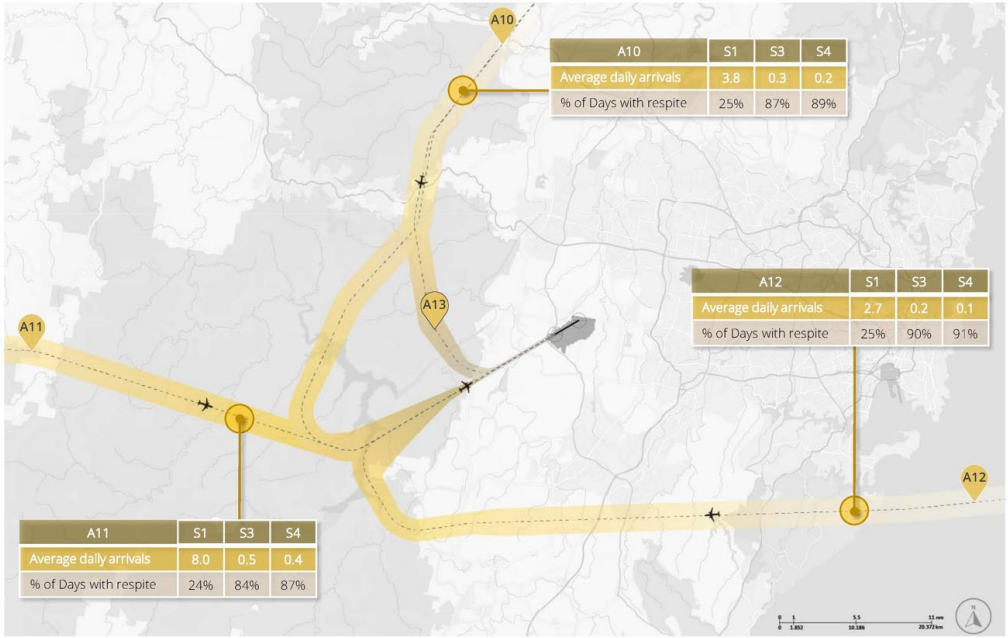

D29
D29 | S1 | S3 | S4
Average daily departures | 0.0 | 2.7 | 2.7
% of Days with respite | 100% | 17% | 17%
D30
D30 | S1 | S3 | S4
Average daily departures | 0.0 | 2.6 | 2.6
% of Days with respite | 100% | 17% | 17%
D28
D28 | S1 | S3 | S4
Average daily departures | 0.0 | 0.7 | 0.7
% of Days with respite | 100% | 29% | 29%
D31
D31 | S1 | S3 | S4
Average daily departures | 0.0 | 4.2 | 4.2
% of Days with respite | 100% | 14% | 14%
D32
D32 | S1 | S3 | S4
Average daily departures | 0.0 | 1.3 | 1.3
% of Days with respite | 100% | 29% | 29%
RUNWAY 23
NIGHT DEPARTURES
PAL 1 - 2033
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A2 S1 S3 S4
Average daily arrivals 18.5 28.5 7.0
% of Days with respite 23% 5% 34%
A1 S1 S3 S4
Average daily arrivals 18.5 28.5 7.0
% of Days with respite 23% 5% 34%
A4 S1 S3 S4
Average daily arrivals 9.7 14.7 4.0
% of Days with respite 24% 6% 36%
A3 S1 S3 S4
Average daily arrivals 29.1 44.9 10.2
% of Days with respite 23% 6% 33%
RUNWAY 05
DAY ARRIVALS
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D1 S1 S3 S4
Average daily departures 17.5 28.6 6.9
% of Days with respite 23% 6% 33%
D7 S1 S3 S4
Average daily departures 0.7 1.1 0.2
% of Days with respite 48% 35% 78%
D8 S1 S3 S4
Average daily departures 2.9 4.9 0.9
% of Days with respite 29% 9% 61%
D2 S1 S3 S4
Average daily departures 4.7 8.4 1.6
% of Days with respite 24% 6% 42%
D3 S1 S3 S4
Average daily departures 6.2 9.7 2.4
% of Days with respite 23% 5% 33%
D6 S1 S3 S4
Average daily departures 10.3 16.4 4.1
% of Days with respite 23% 6% 35%
D4 S1 S3 S4
Average daily departures 12.4 20.0 5.0
% of Days with respite 23% 6% 34%
D9 S1 S3 S4
Average daily departures 1.3 1.8 0.5
% of Days with respite 32% 13% 70%
Radar vectoring area
Radar vectoring area
RUNWAY 05
DAY DEPARTURES
PAL 2 - 2040
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A6
A7
A8
A9
A6 S1 S3 S4
Average daily arrivals 20.3 10.2 31.8
% of Days with respite 18% 35% 0%
A7 S1 S3 S4
Average daily arrivals 31.5 15.7 50.4
% of Days with respite 18% 35% 0%
A8 S1 S3 S4
Average daily arrivals 10.4 5.3 16.0
% of Days with respite 19% 38% 0%
RUNWAY 23
DAY ARRIVALS
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

D10
D11
D12
D13
D14
D15
D16
D10 S1 S3 S4
Average daily departures 21.6 10.4 32.2
% of Days with respite 18% 35% 0%
D11 S1 S3 S4
Average daily departures 13.6 6.4 20.5
% of Days with respite 18% 37% 0%
D14 S1 S3 S4
Average daily departures 12.1 6.0 18.2
% of Days with respite 18% 36% 0%
D15 S1 S3 S4
Average daily departures 4.4 2.0 6.8
% of Days with respite 22% 51% 1%
D12 S1 S3 S4
Average daily departures 14.8 7.2 22.2
% of Days with respite 18% 36% 0%
D13 S1 S3 S4
Average daily departures 1.2 0.6 1.9
% of Days with respite 33% 65% 9%
RUNWAY 23
DAY DEPARTURES
PAL 2 - 2040
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft



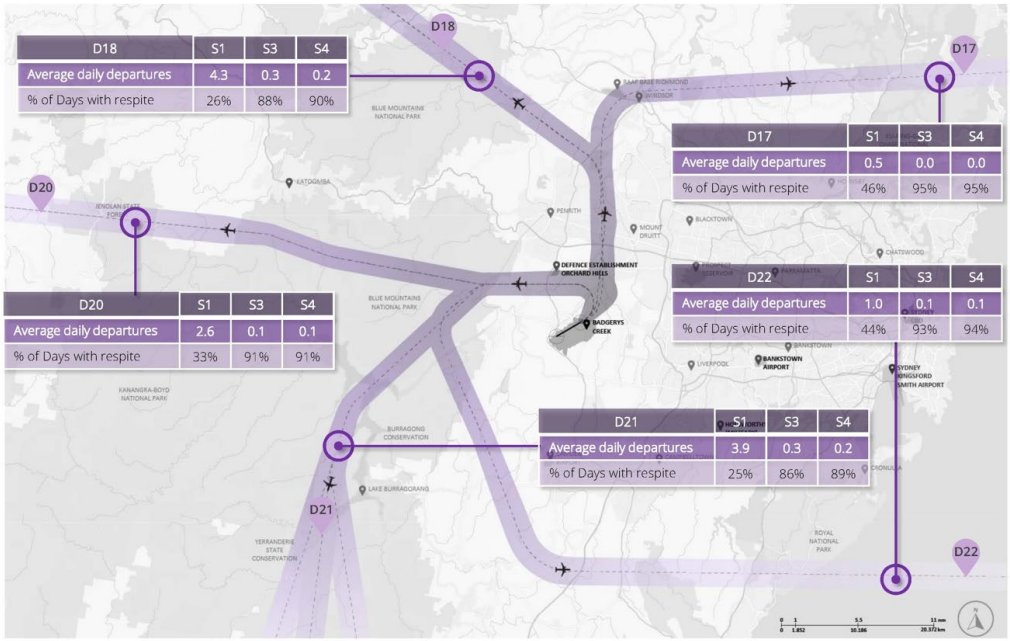
RUNWAY 05
NIGHT ARRIVALS
PAL 2 - 2040

KEY

- WSI airport boundary
- Runway (05/23)
- Flight path centreline
- Location marker
- Flight path number
- Jet aircraft
- Non-jet aircraft (turbo-prop)

DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft

ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft



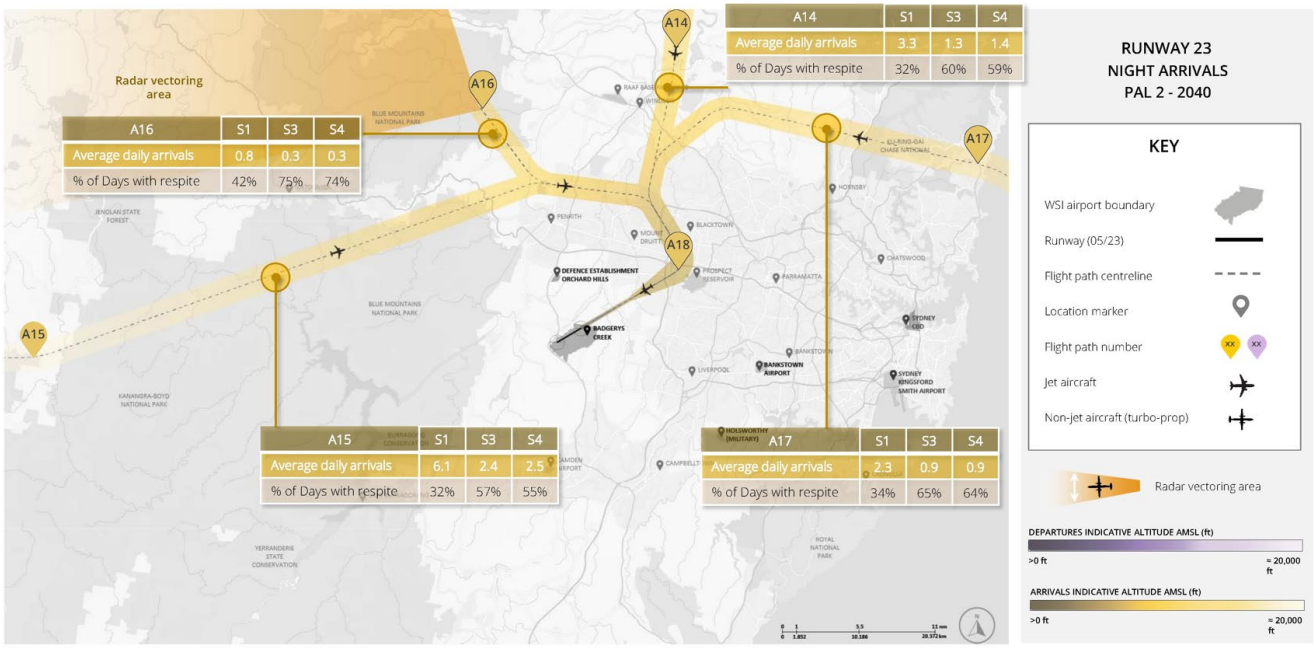
RUNWAY 05
NIGHT DEPARTURES
PAL 2 - 2040

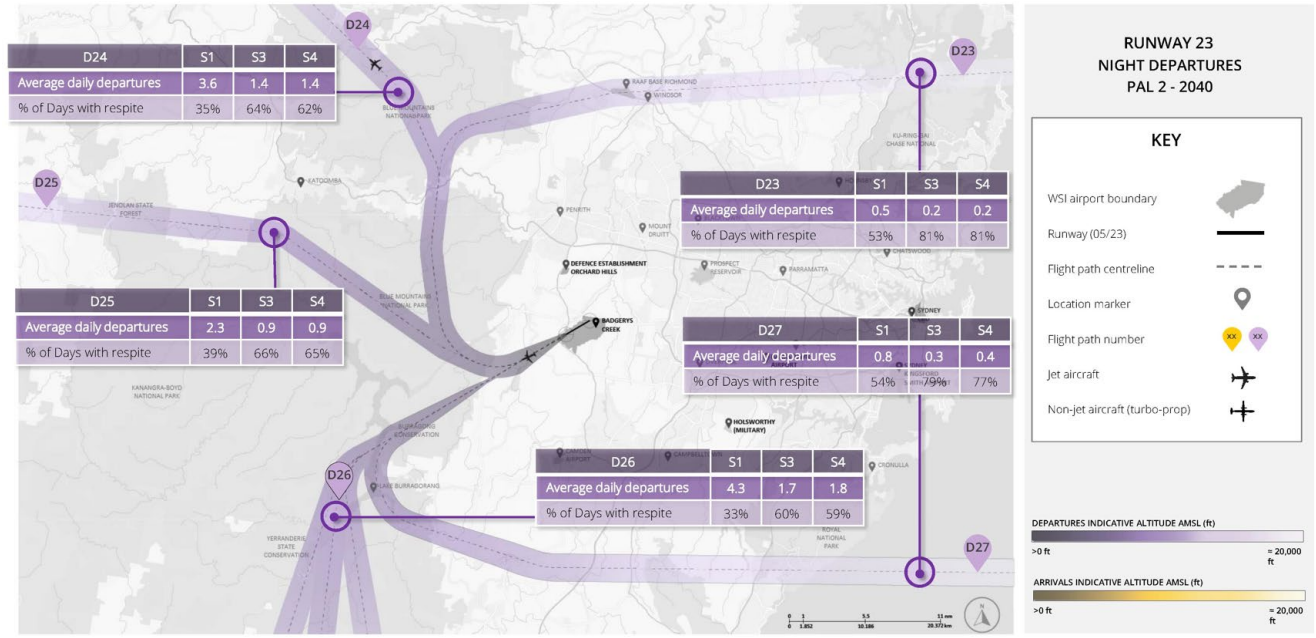
KEY

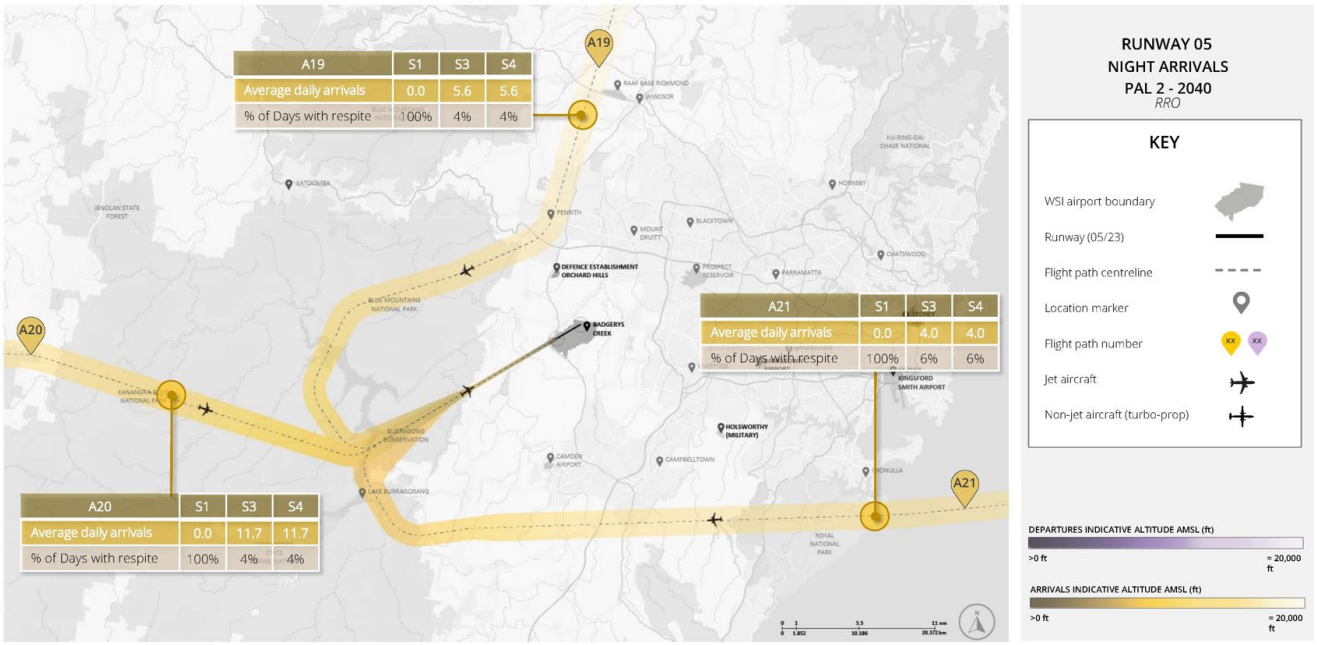
- WSI airport boundary
- Runway (05/23)
- Flight path centreline
- Location marker
- Flight path number
- Jet aircraft
- Non-jet aircraft (turbo-prop)

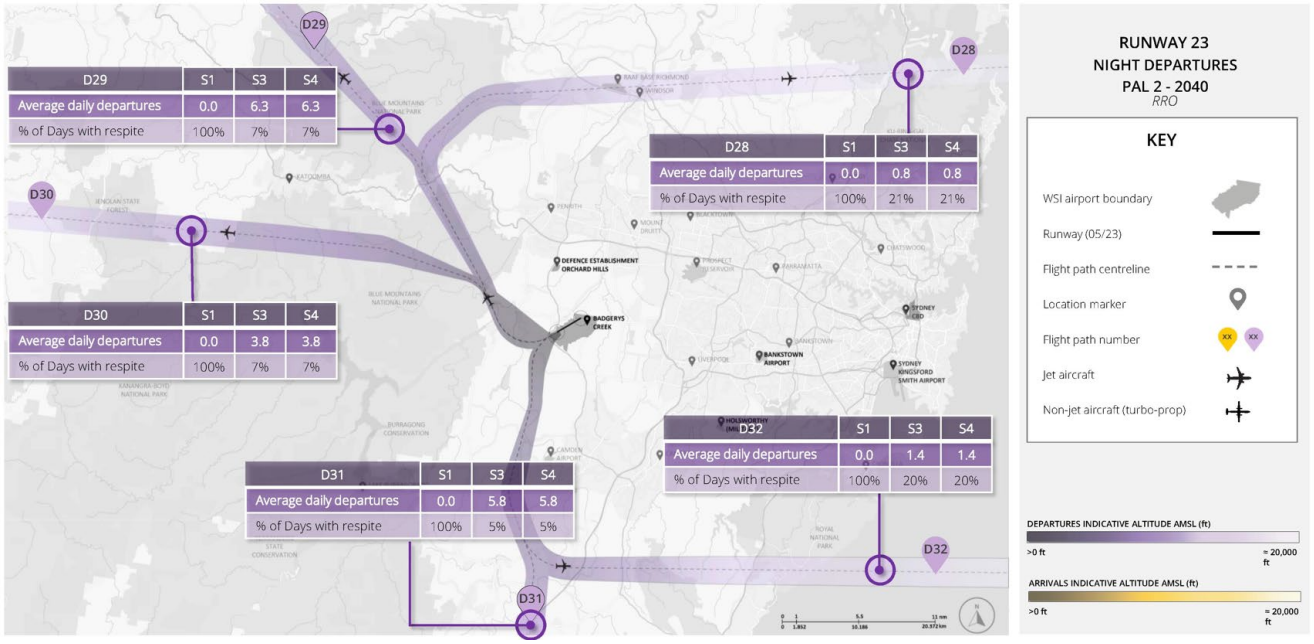
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft

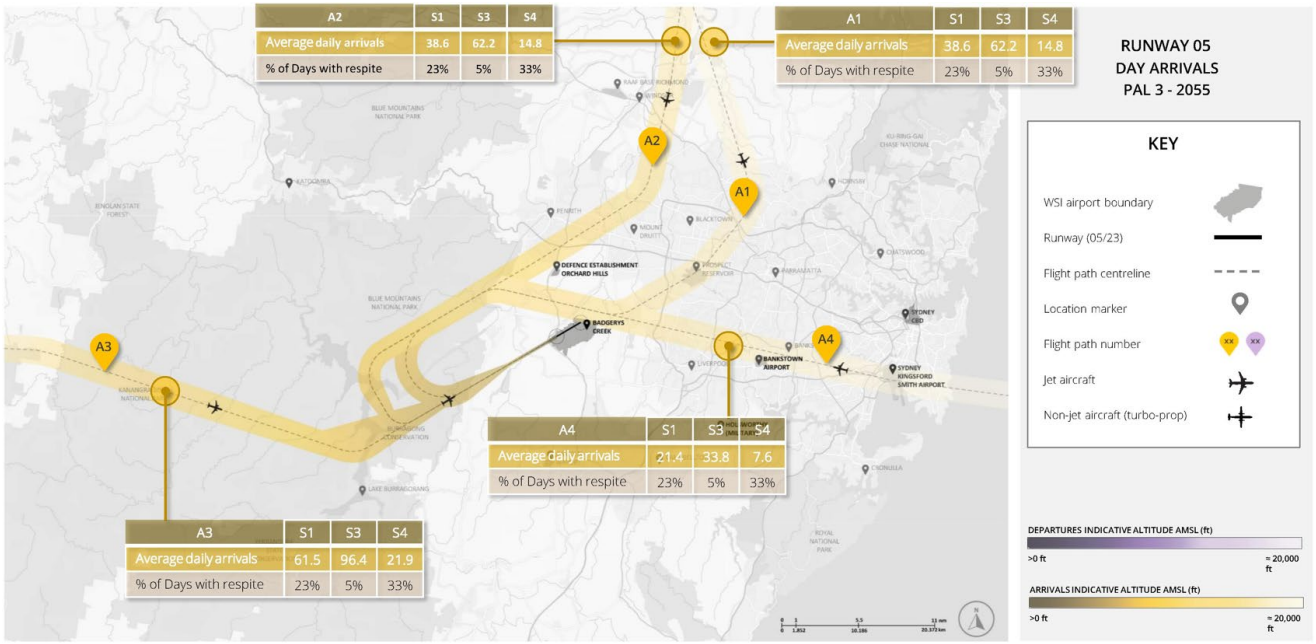
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft

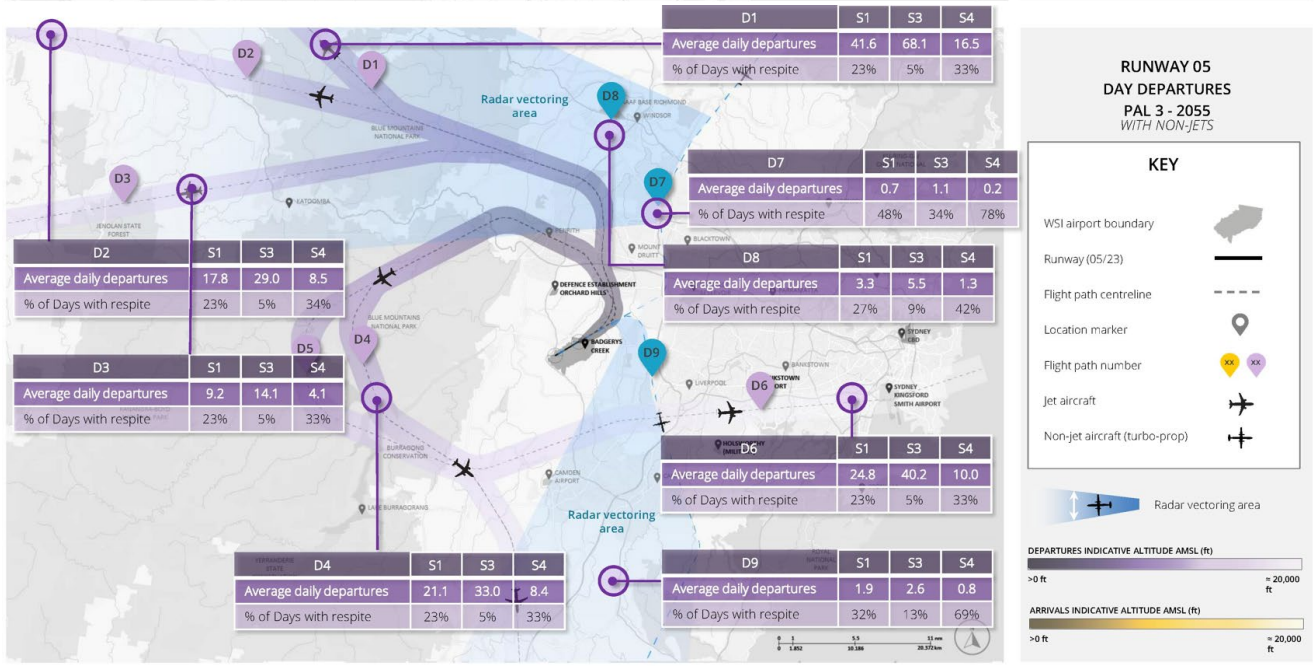

Radar vectoring area
A14
S1 S3 S4
Average daily arrivals 3.3 1.3 1.4
% of Days with respite 32% 60% 59%
A16
S1 S3 S4
Average daily arrivals 0.8 0.3 0.3
% of Days with respite 42% 75% 74%
A15
S1 S3 S4
Average daily arrivals 6.1 2.4 2.5
% of Days with respite 32% 57% 55%
A17
S1 S3 S4
Average daily arrivals 2.3 0.9 0.9
% of Days with respite 34% 65% 64%
A18
RUNWAY 23
NIGHT ARRIVALS
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

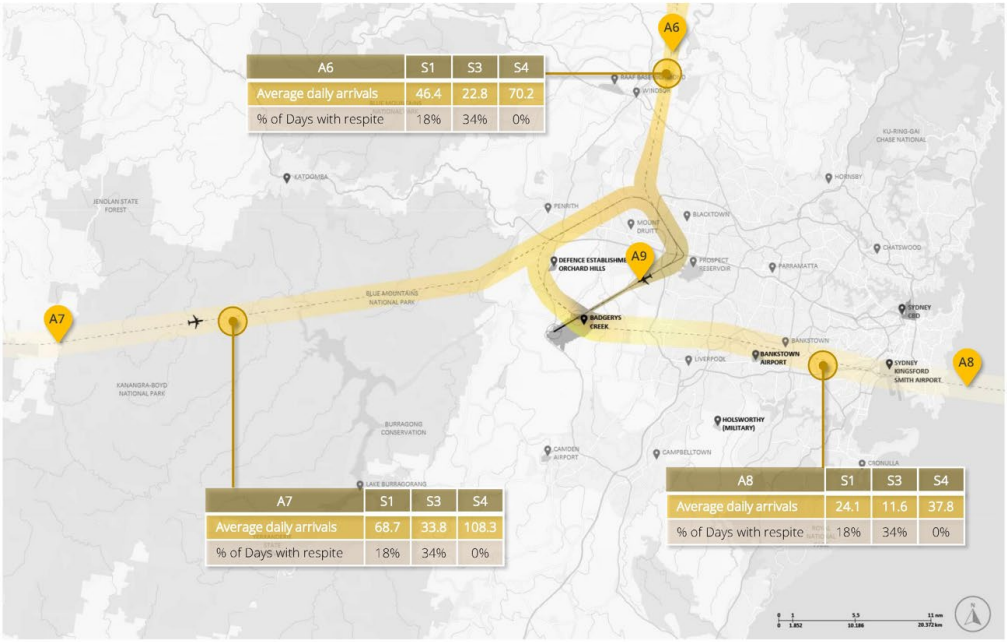

D24
S1 S3 S4
Average daily departures 3.6 1.4 1.4
% of Days with respite 35% 64% 62%
D25
S1 S3 S4
Average daily departures 2.3 0.9 0.9
% of Days with respite 39% 66% 65%
D23
S1 S3 S4
Average daily departures 0.5 0.2 0.2
% of Days with respite 53% 81% 81%
D27
S1 S3 S4
Average daily departures 0.8 0.3 0.4
% of Days with respite 54% 79% 77%
D26
S1 S3 S4
Average daily departures 4.3 1.7 1.8
% of Days with respite 33% 60% 59%
RUNWAY 23
NIGHT DEPARTURES
PAL 2 - 2040
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A19
A20
A21
A19 S1 S3 S4
Average daily arrivals 0.0 5.6 5.6
% of Days with respite 100% 4% 4%
A21 S1 S3 S4
Average daily arrivals 0.0 4.0 4.0
% of Days with respite 100% 6% 6%
A20 S1 S3 S4
Average daily arrivals 0.0 11.7 11.7
% of Days with respite 100% 4% 4%
RUNWAY 05
NIGHT ARRIVALS
PAL 2 - 2040
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D29
D28
D30
D31
D32
D29 S1 S3 S4
Average daily departures 0.0 6.3 6.3
% of Days with respite 100% 7% 7%
D28 S1 S3 S4
Average daily departures 0.0 0.8 0.8
% of Days with respite 100% 21% 21%
D30 S1 S3 S4
Average daily departures 0.0 3.8 3.8
% of Days with respite 100% 7% 7%
D31 S1 S3 S4
Average daily departures 0.0 5.8 5.8
% of Days with respite 100% 5% 5%
D32 S1 S3 S4
Average daily departures 0.0 1.4 1.4
% of Days with respite 100% 20% 20%
RUNWAY 23
NIGHT DEPARTURES
PAL 2 - 2040
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


A2 S1 S3 S4
Average daily arrivals 38.6 62.2 14.8
% of Days with respite 23% 5% 33%
A1 S1 S3 S4
Average daily arrivals 38.6 62.2 14.8
% of Days with respite 23% 5% 33%
A4 S1 S3 S4
Average daily arrivals 21.4 33.8 7.6
% of Days with respite 23% 5% 33%
A3 S1 S3 S4
Average daily arrivals 61.5 96.4 21.9
% of Days with respite 23% 5% 33%
RUNWAY 05
DAY ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D1 S1 S3 S4
Average daily departures 41.6 68.1 16.5
% of Days with respite 23% 5% 33%
D7 S1 S3 S4
Average daily departures 0.7 1.1 0.2
% of Days with respite 48% 34% 78%
D8 S1 S3 S4
Average daily departures 3.3 5.5 1.3
% of Days with respite 27% 9% 42%
D2 S1 S3 S4
Average daily departures 17.8 29.0 8.5
% of Days with respite 23% 5% 34%
D3 S1 S3 S4
Average daily departures 9.2 14.1 4.1
% of Days with respite 23% 5% 33%
D6 S1 S3 S4
Average daily departures 24.8 40.2 10.0
% of Days with respite 23% 5% 33%
D4 S1 S3 S4
Average daily departures 21.1 33.0 8.4
% of Days with respite 23% 5% 33%
D9 S1 S3 S4
Average daily departures 1.9 2.6 0.8
% of Days with respite 32% 13% 69%
Radar vectoring area
Radar vectoring area
RUNWAY 05
DAY DEPARTURES
PAL 3 - 2055
WITH NON-JETS
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft



A6	S1	S3	S4
Average daily arrivals	46.4	22.8	70.2
% of Days with respite	18%	34%	0%

A7	S1	S3	S4
Average daily arrivals	68.7	33.8	108.3
% of Days with respite	18%	34%	0%

A8	S1	S3	S4
Average daily arrivals	24.1	11.6	37.8
% of Days with respite	18%	34%	0%

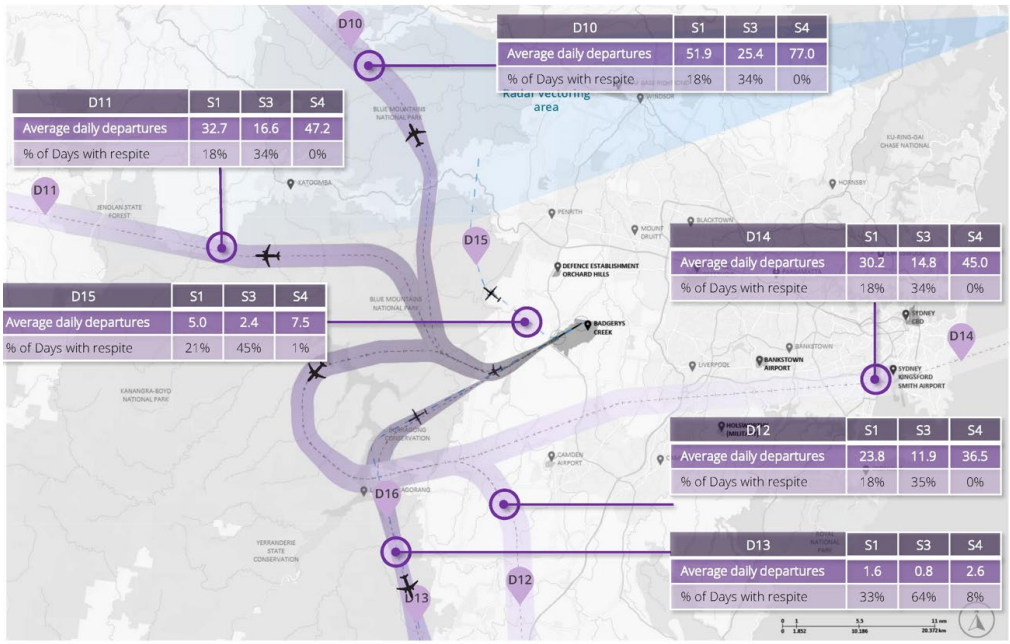
RUNWAY 23
DAY ARRIVALS
PAL 3 - 2055

KEY

- WSI airport boundary
- Runway (05/23)
- Flight path centreline
- Location marker
- Flight path number
- Jet aircraft
- Non-jet aircraft (turbo-prop)

DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft

ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft



D10	S1	S3	S4
Average daily departures	51.9	25.4	77.0
% of Days with respite	18%	34%	0%

D11	S1	S3	S4
Average daily departures	32.7	16.6	47.2
% of Days with respite	18%	34%	0%

D14	S1	S3	S4
Average daily departures	30.2	14.8	45.0
% of Days with respite	18%	34%	0%

D15	S1	S3	S4
Average daily departures	5.0	2.4	7.5
% of Days with respite	21%	45%	1%

D12	S1	S3	S4
Average daily departures	23.8	11.9	36.5
% of Days with respite	18%	35%	0%

D13	S1	S3	S4
Average daily departures	1.6	0.8	2.6
% of Days with respite	33%	64%	8%

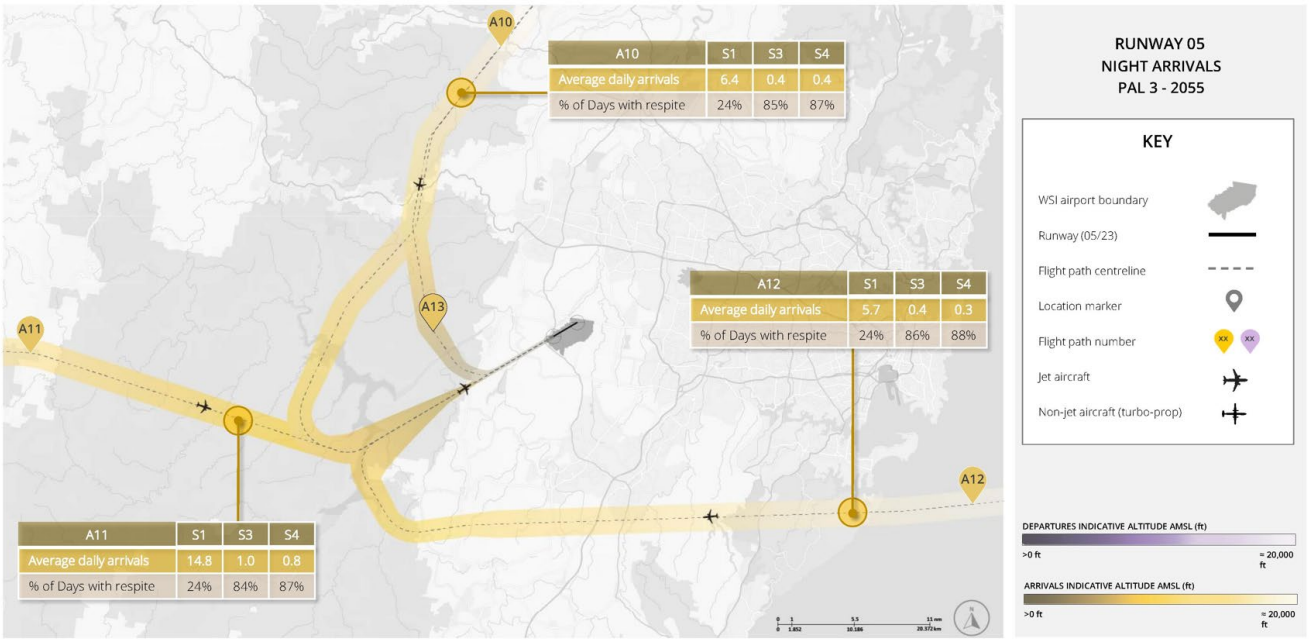
RUNWAY 23
DAY DEPARTURES
PAL 3 - 2055
WITH NON-JETS

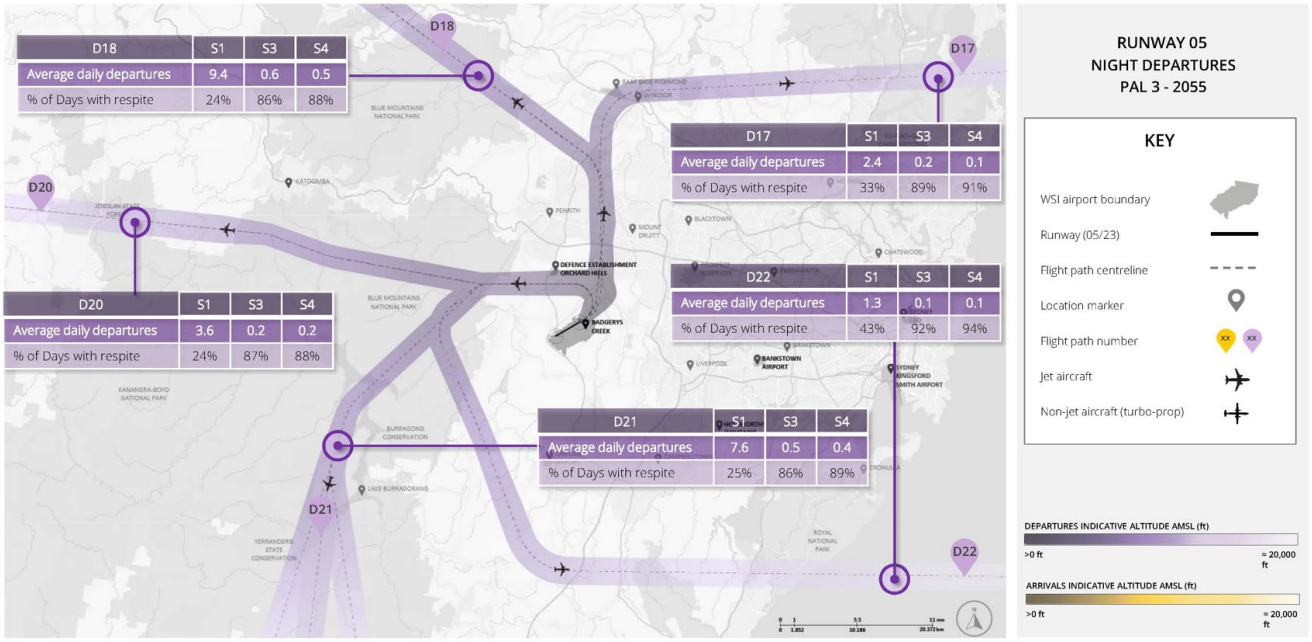
KEY

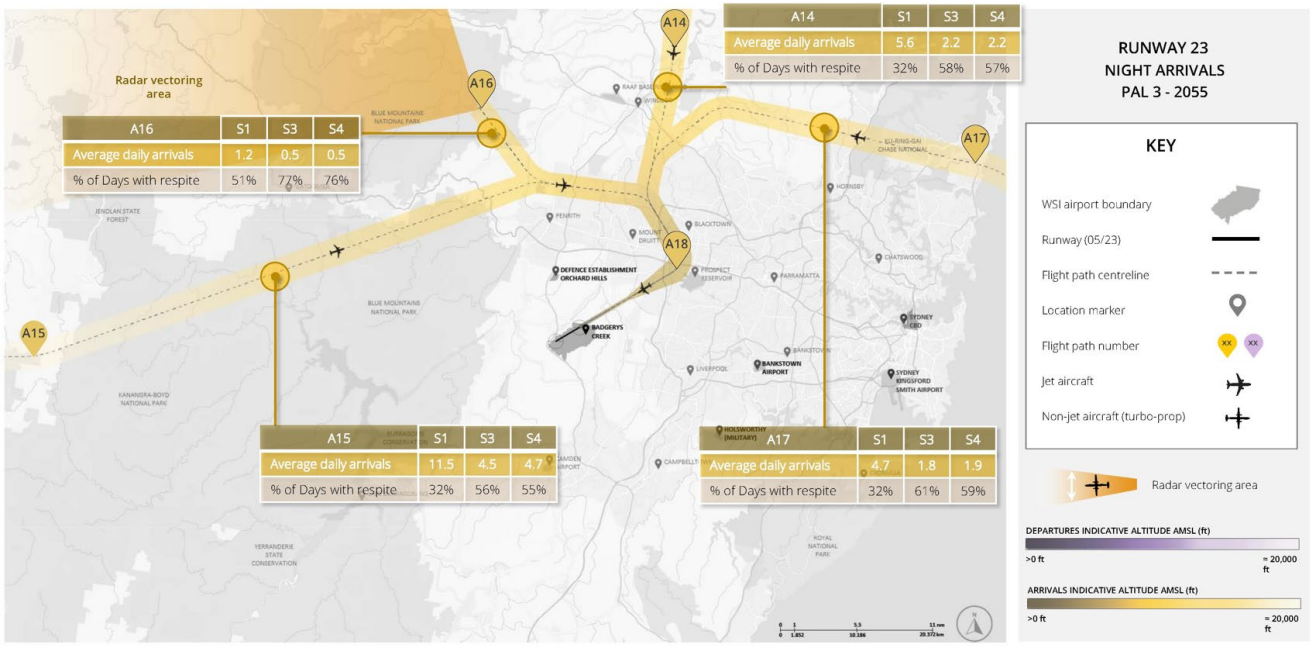
- WSI airport boundary
- Runway (05/23)
- Flight path centreline
- Location marker
- Flight path number
- Jet aircraft
- Non-jet aircraft (turbo-prop)
- Radar vectoring area

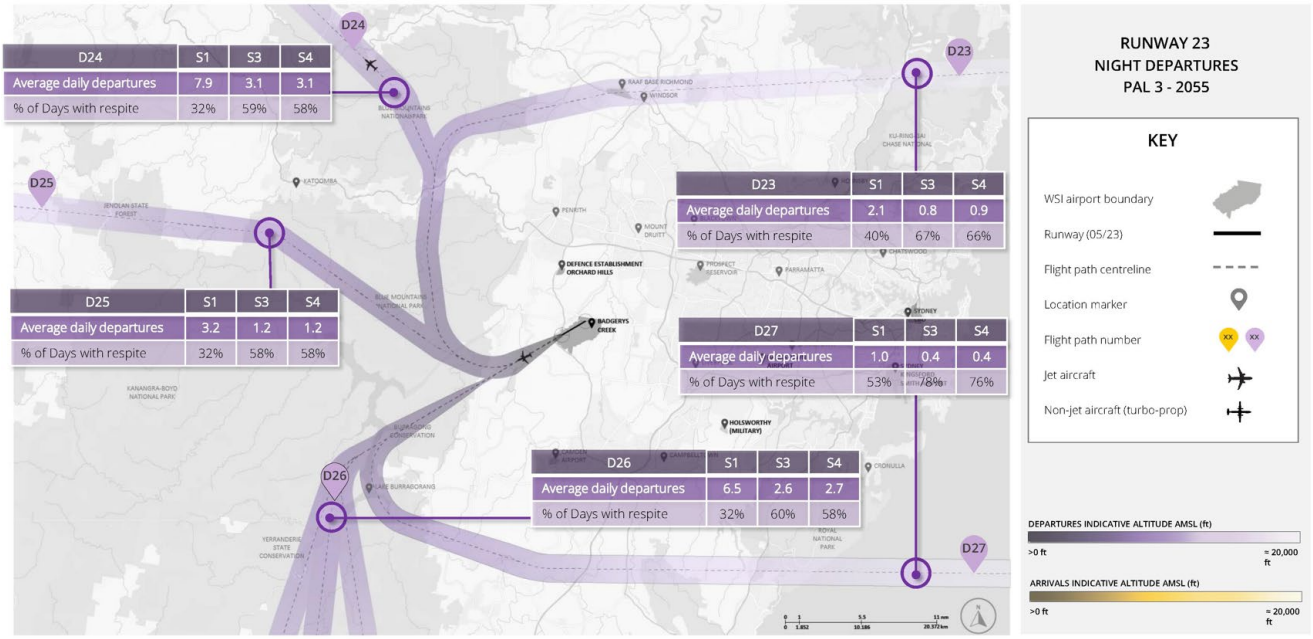
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft

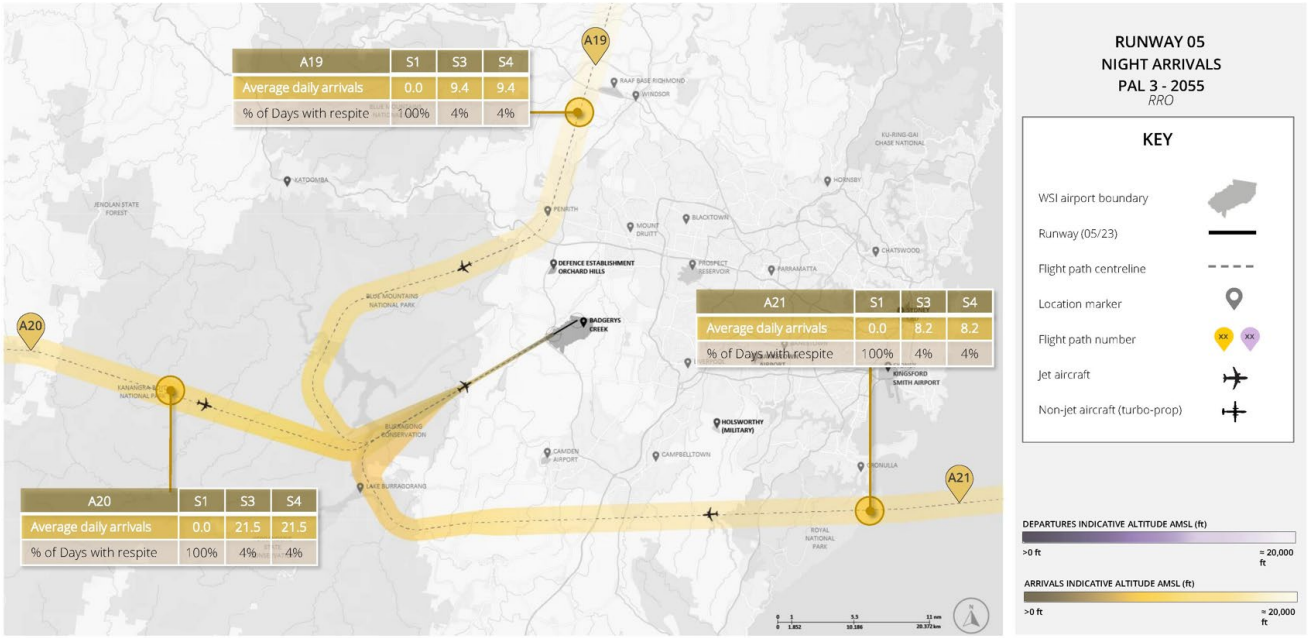
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft — ≈ 20,000 ft

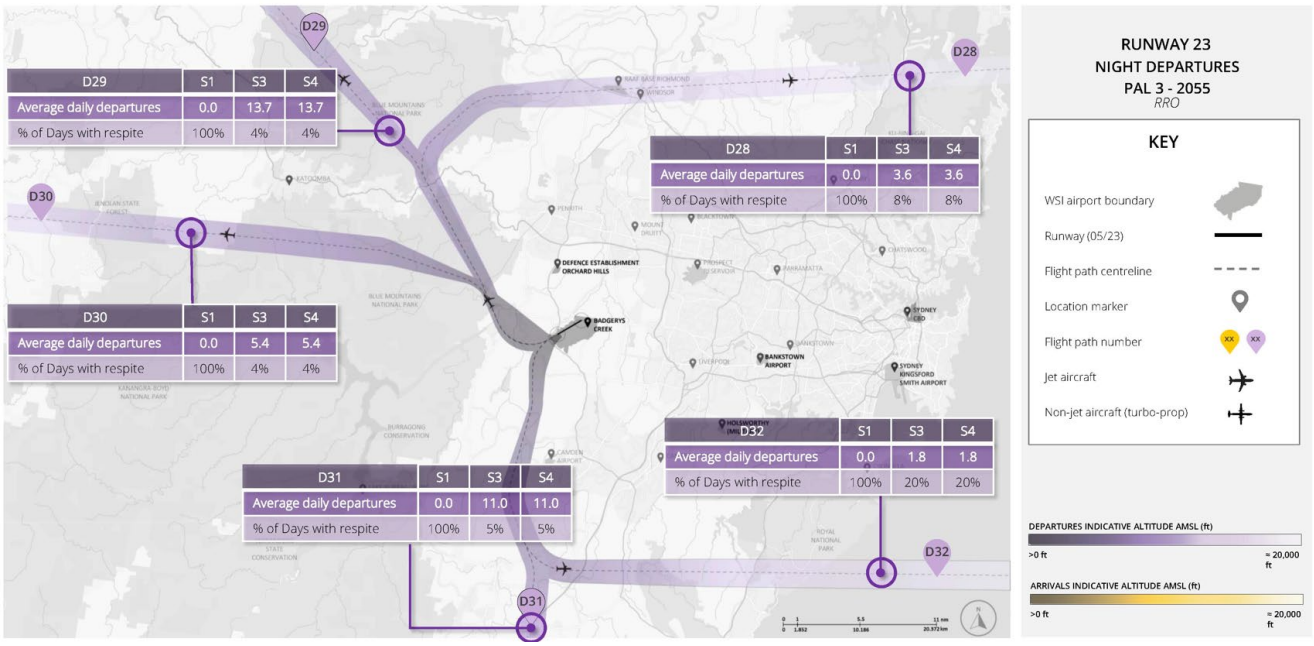

A10
A11
A12
A13
A10 S1 S3 S4
Average daily arrivals 6.4 0.4 0.4
% of Days with respite 24% 85% 87%
A12 S1 S3 S4
Average daily arrivals 5.7 0.4 0.3
% of Days with respite 24% 86% 88%
A11 S1 S3 S4
Average daily arrivals 14.8 1.0 0.8
% of Days with respite 24% 84% 87%
RUNWAY 05
NIGHT ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D17
D18
D20
D21
D22
D18 S1 S3 S4
Average daily departures 9.4 0.6 0.5
% of Days with respite 24% 86% 88%
D17 S1 S3 S4
Average daily departures 2.4 0.2 0.1
% of Days with respite 33% 89% 91%
D20 S1 S3 S4
Average daily departures 3.6 0.2 0.2
% of Days with respite 24% 87% 88%
D22 S1 S3 S4
Average daily departures 1.3 0.1 0.1
% of Days with respite 43% 92% 94%
D21 S1 S3 S4
Average daily departures 7.6 0.5 0.4
% of Days with respite 25% 86% 89%
RUNWAY 05
NIGHT DEPARTURES
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


Radar vectoring area
A14
A16
A17
A18
A15
A14 S1 S3 S4
Average daily arrivals 5.6 2.2 2.2
% of Days with respite 32% 58% 57%
A16 S1 S3 S4
Average daily arrivals 1.2 0.5 0.5
% of Days with respite 51% 77% 76%
A15 S1 S3 S4
Average daily arrivals 11.5 4.5 4.7
% of Days with respite 32% 56% 55%
A17 S1 S3 S4
Average daily arrivals 4.7 1.8 1.9
% of Days with respite 32% 61% 59%
RUNWAY 23
NIGHT ARRIVALS
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
Radar vectoring area
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D24
D25
D23
D27
D26
D24 S1 S3 S4
Average daily departures 7.9 3.1 3.1
% of Days with respite 32% 59% 58%
D25 S1 S3 S4
Average daily departures 3.2 1.2 1.2
% of Days with respite 32% 58% 58%
D23 S1 S3 S4
Average daily departures 2.1 0.8 0.9
% of Days with respite 40% 67% 66%
D27 S1 S3 S4
Average daily departures 1.0 0.4 0.4
% of Days with respite 53% 78% 76%
D26 S1 S3 S4
Average daily departures 6.5 2.6 2.7
% of Days with respite 32% 60% 58%
RUNWAY 23
NIGHT DEPARTURES
PAL 3 - 2055
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

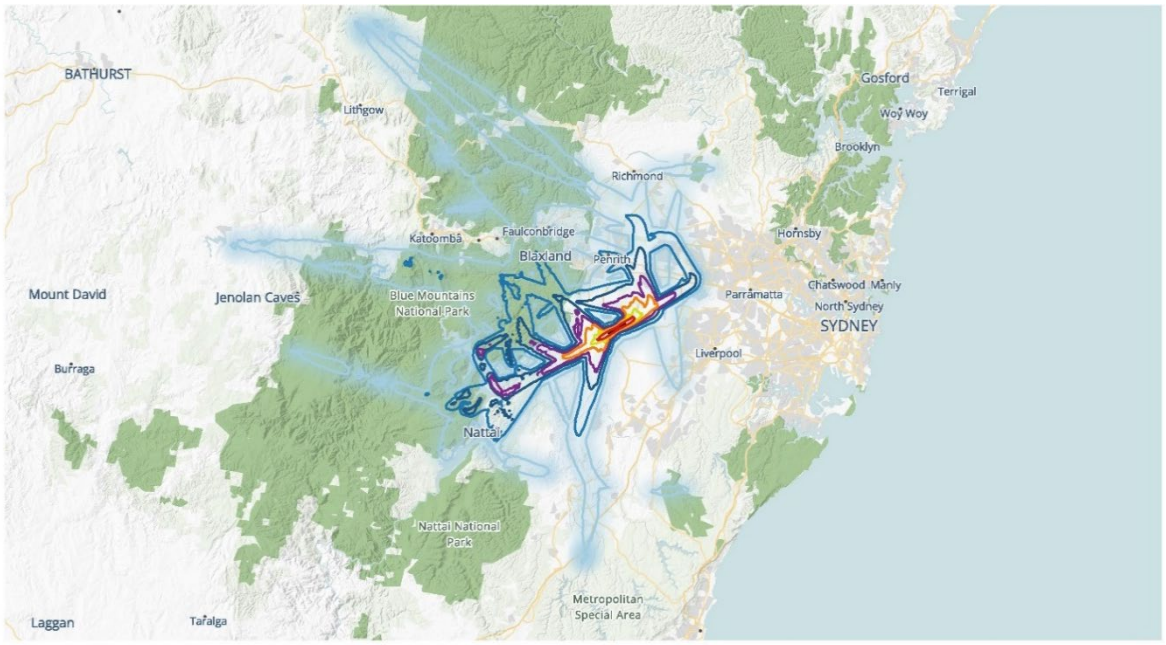

A19
A19 | S1 | S3 | S4
Average daily arrivals | 0.0 | 9.4 | 9.4
% of Days with respite | 100% | 4% | 4%
A20
A20 | S1 | S3 | S4
Average daily arrivals | 0.0 | 21.5 | 21.5
% of Days with respite | 100% | 4% | 4%
A21
A21 | S1 | S3 | S4
Average daily arrivals | 0.0 | 8.2 | 8.2
% of Days with respite | 100% | 4% | 4%
RUNWAY 05
NIGHT ARRIVALS
PAL 3 - 2055
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft


D29
D29 | S1 | S3 | S4
Average daily departures | 0.0 | 13.7 | 13.7
% of Days with respite | 100% | 4% | 4%
D30
D30 | S1 | S3 | S4
Average daily departures | 0.0 | 5.4 | 5.4
% of Days with respite | 100% | 4% | 4%
D28
D28 | S1 | S3 | S4
Average daily departures | 0.0 | 3.6 | 3.6
% of Days with respite | 100% | 8% | 8%
D31
D31 | S1 | S3 | S4
Average daily departures | 0.0 | 11.0 | 11.0
% of Days with respite | 100% | 5% | 5%
D32
D32 | S1 | S3 | S4
Average daily departures | 0.0 | 1.8 | 1.8
% of Days with respite | 100% | 20% | 20%
RUNWAY 23
NIGHT DEPARTURES
PAL 3 - 2055
RRO
KEY
WSI airport boundary
Runway (05/23)
Flight path centreline
Location marker
Flight path number
Jet aircraft
Non-jet aircraft (turbo-prop)
DEPARTURES INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft
ARRIVALS INDICATIVE ALTITUDE AMSL (ft)
>0 ft
≈ 20,000 ft

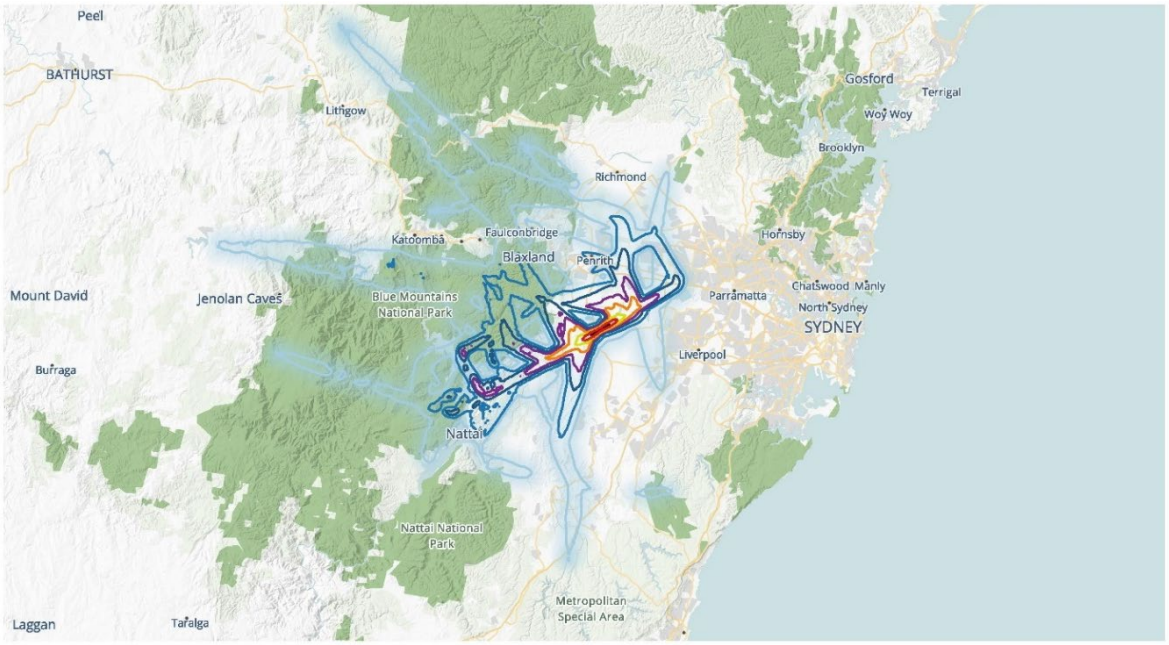
Appendix C

Noise contours

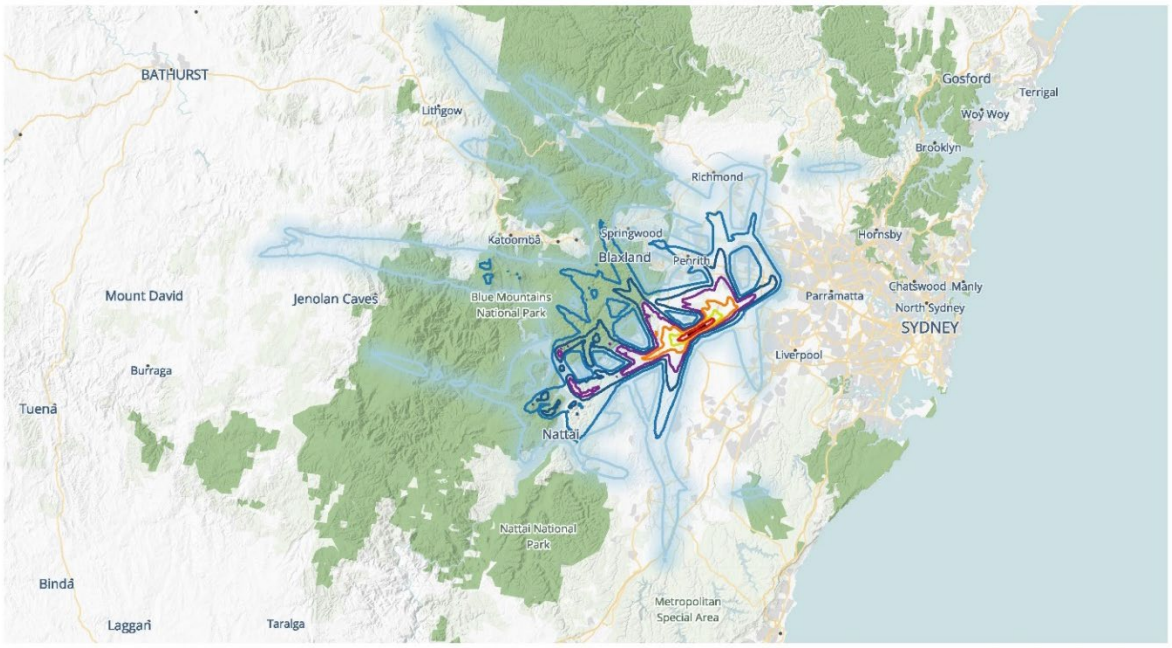
C1 Maximum sound level contours – Cumulative



Maximum Sound Level (LAmax)
24 Hours
PAL 1 (2033)



Maximum Sound Level (LAmax)
24 Hours
PAL 2 (2040)

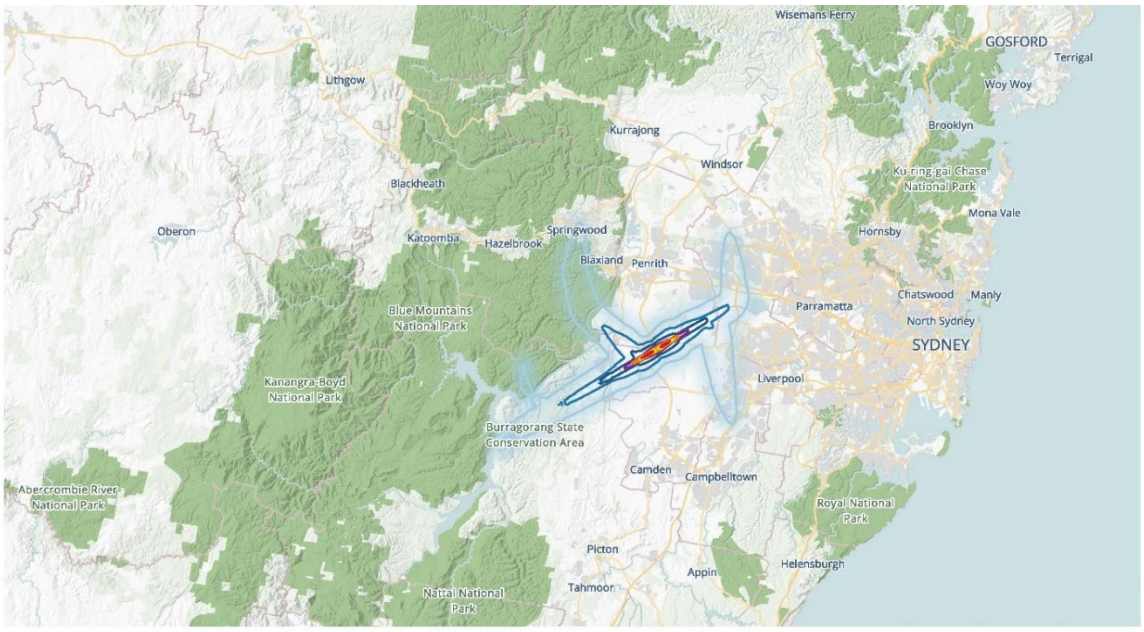


Maximum Sound Level (LAmax)
24 Hours
PAL3 (2055)

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

N 0 8 16 24 32 km

C2 Maximum sound level contours – Single Event Contours



Dash8-Q400
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05/23

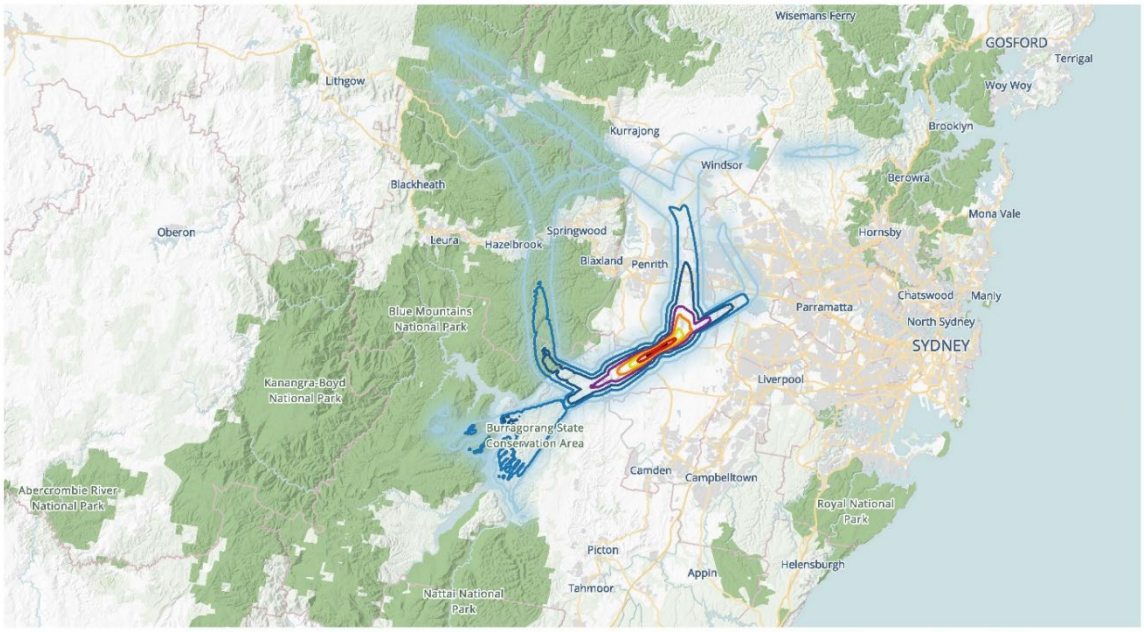
N 0 7 14 21 28 km



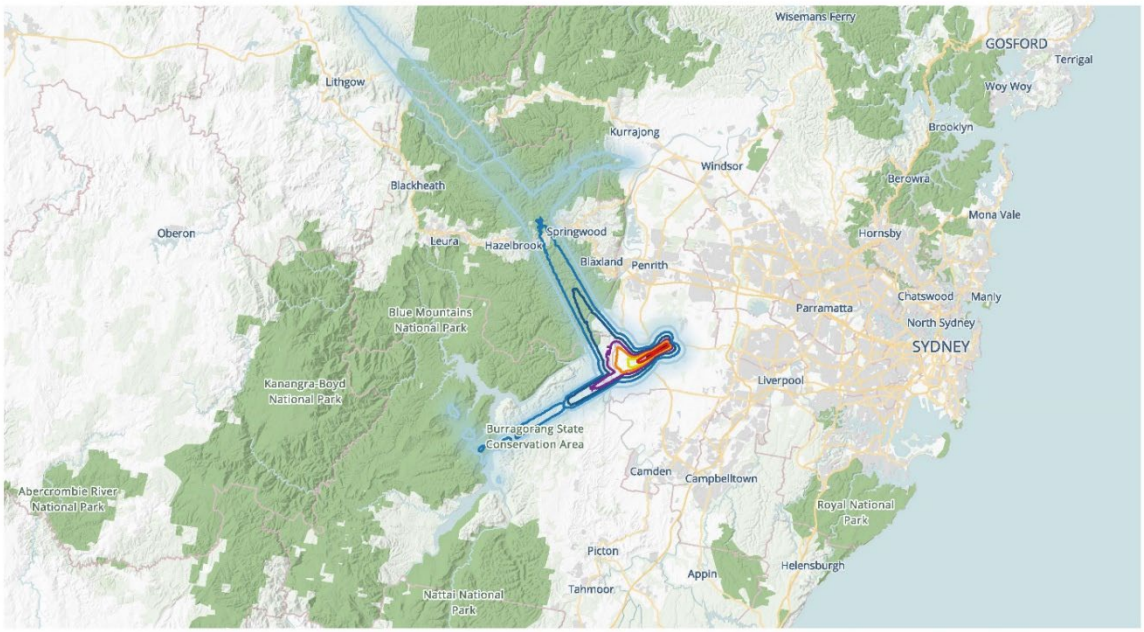
B777-300
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

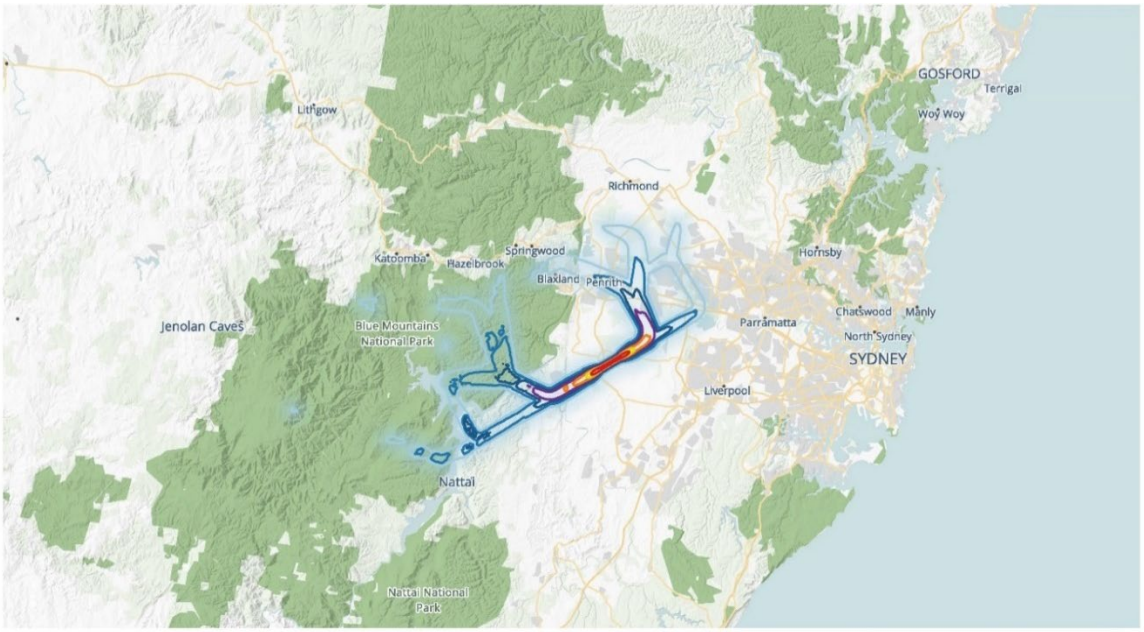
N 0 7 14 21 28 km



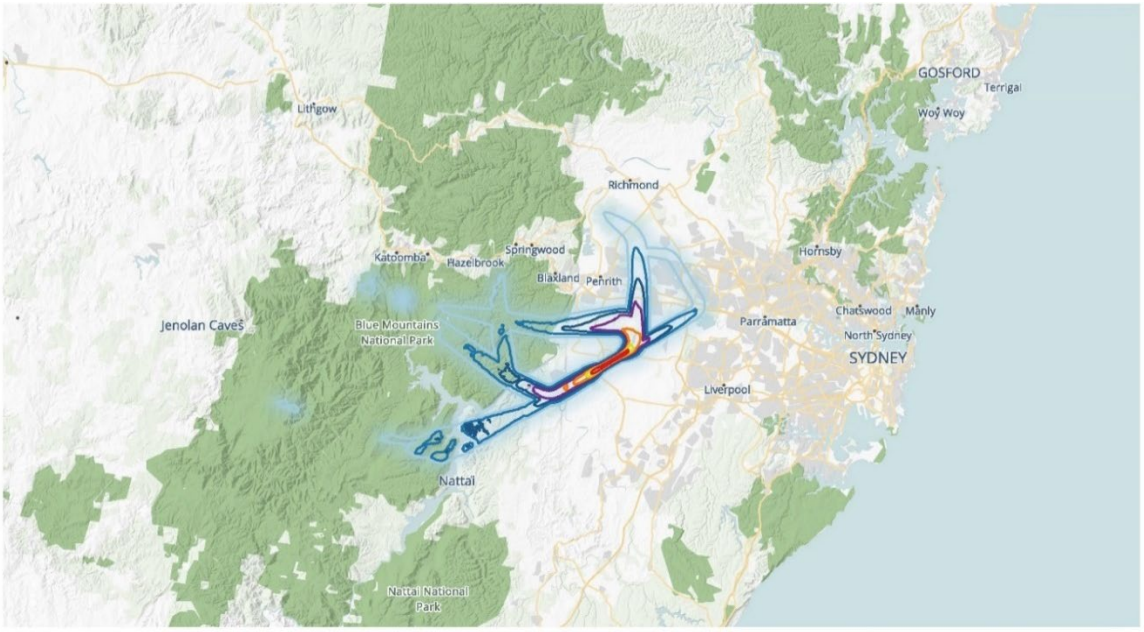
B777-300
Maximum Sound Level (LAmax)
Night Tracks



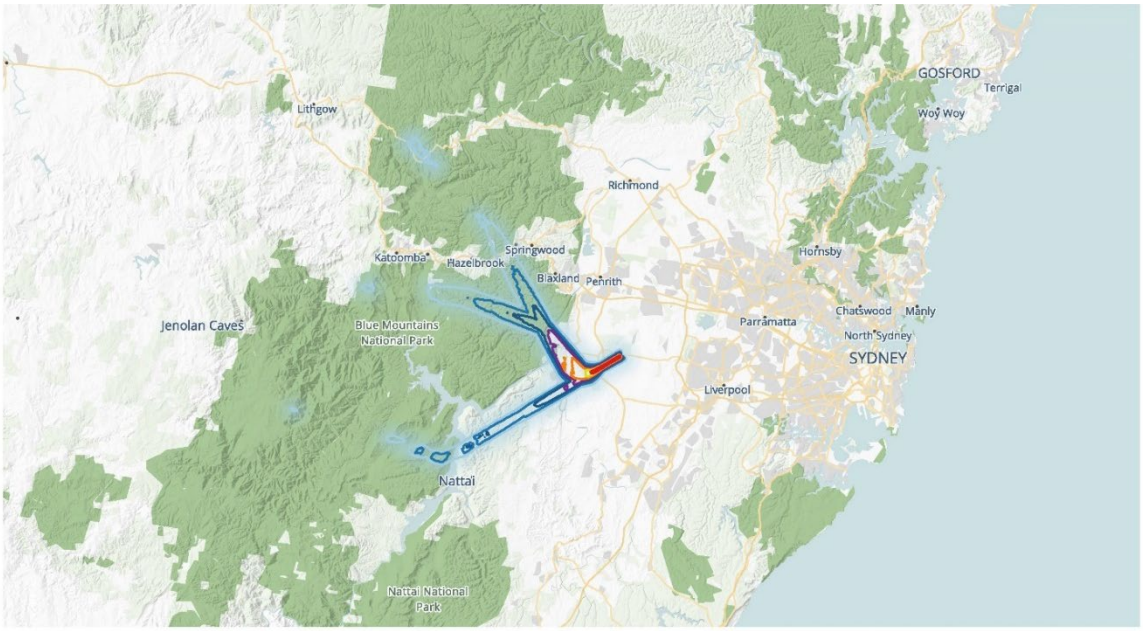
B777-300
Maximum Sound Level (LAmax)
Night Tracks (RRO)



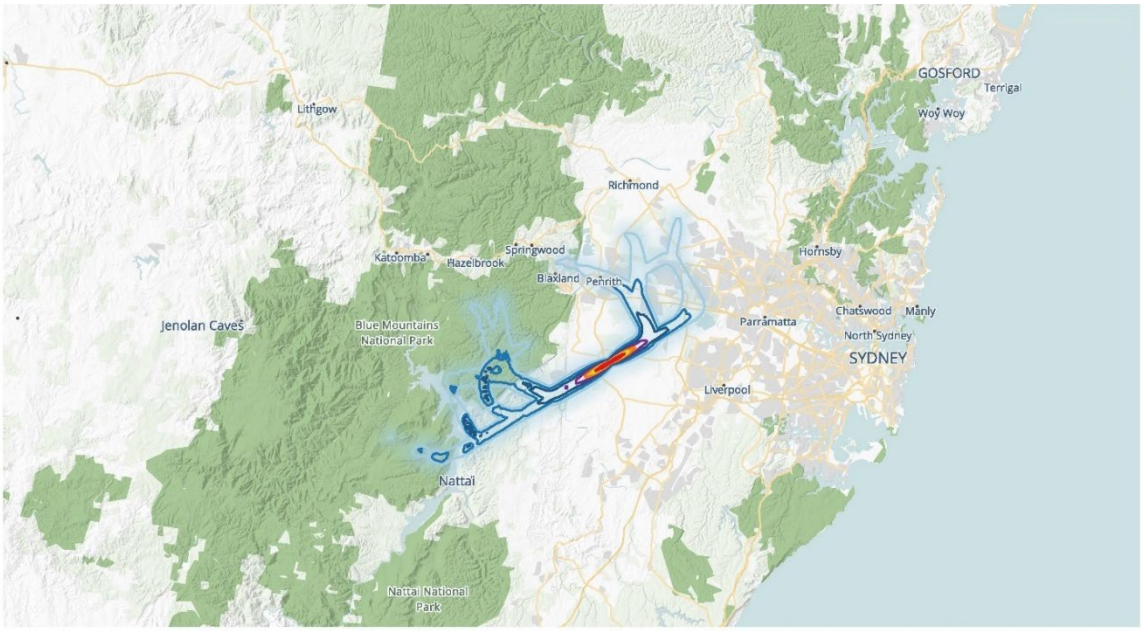
B787-9
Maximum Sound Level (LAmax)
Day Tracks



B787-9
Maximum Sound Level (LAmax)
Night Tracks



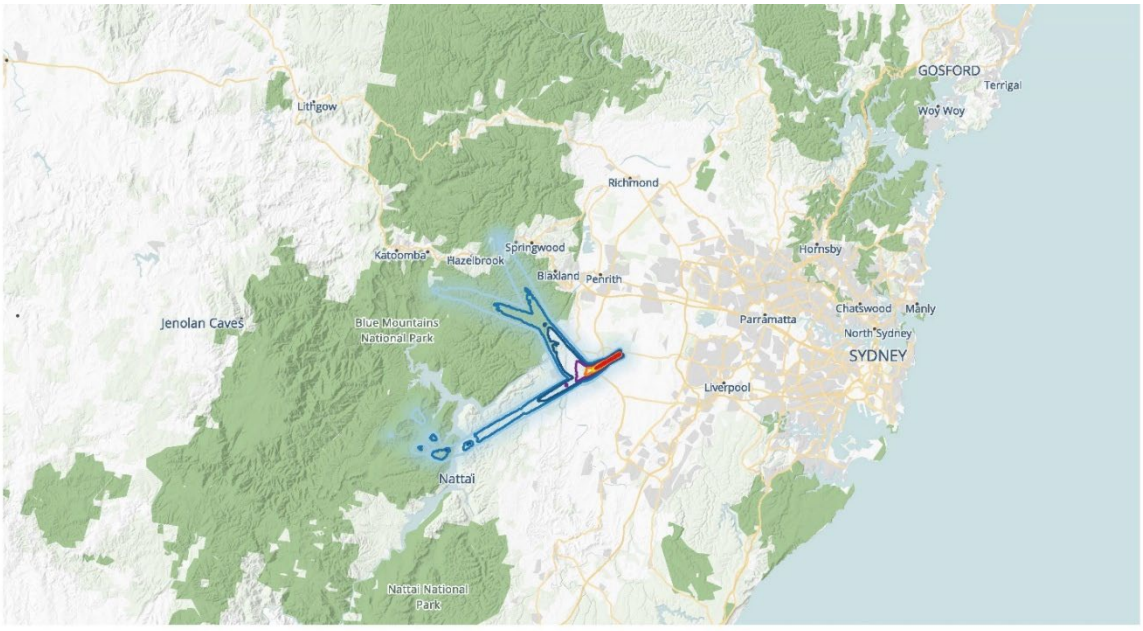
B787-9
Maximum Sound Level (LAmax)
Night Tracks (RRO)



B787-8
Maximum Sound Level (LAmax)
Day Tracks



B787-8
Maximum Sound Level (LAmax)
Night Tracks



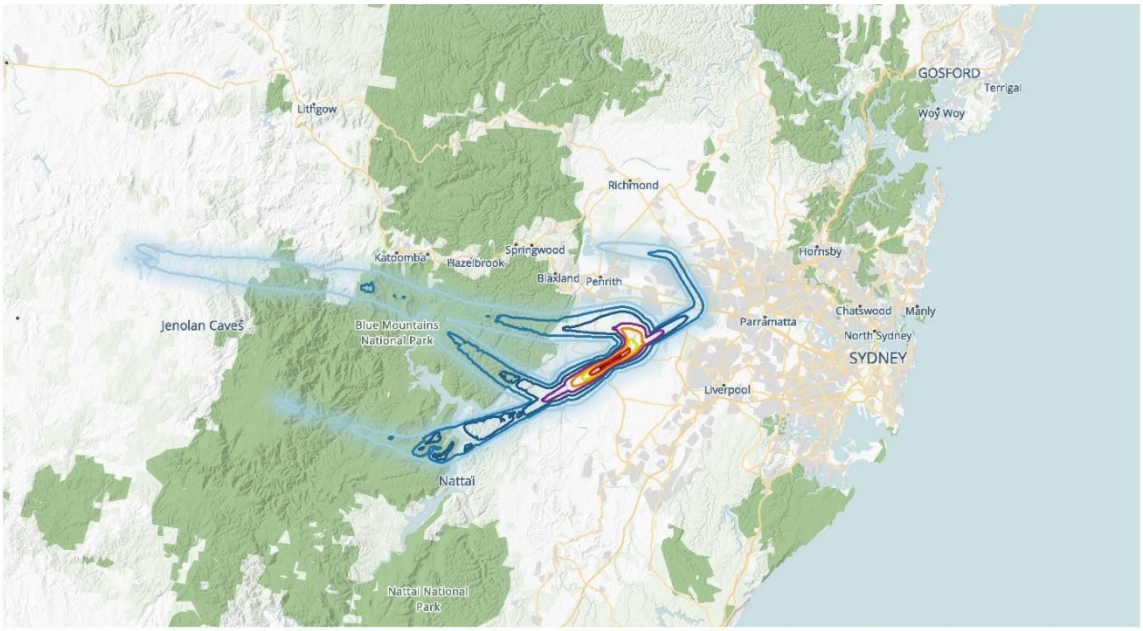
B787-8
Maximum Sound Level (LAmax)
Night Tracks (RRO)



B777-300ER
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90 65
85 60
80 Runway 05-23
75
70

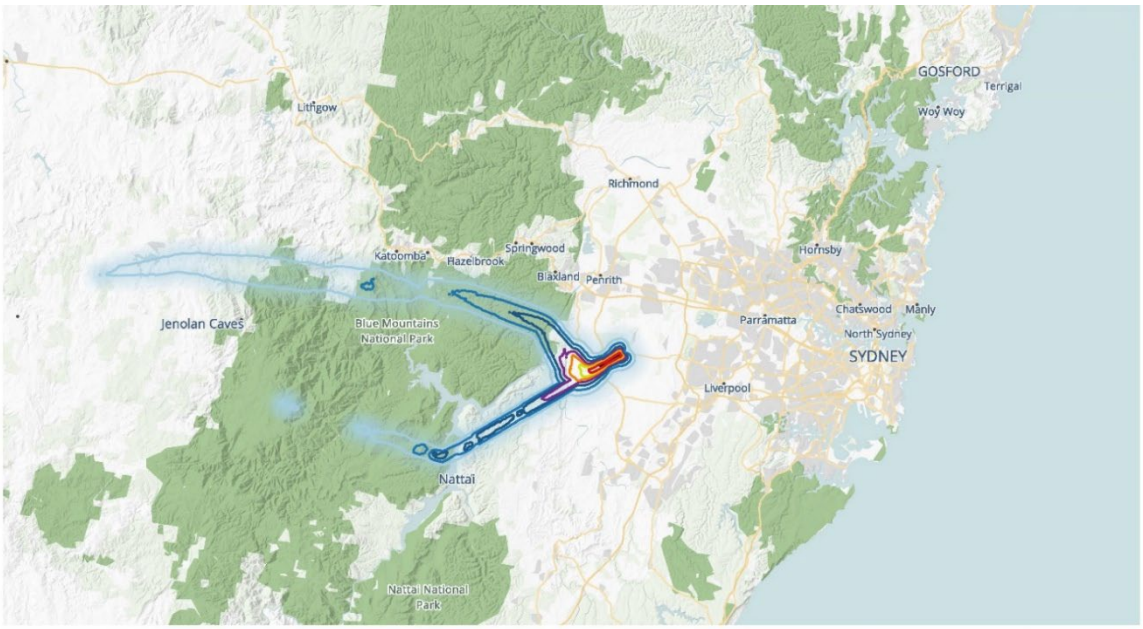
N 0 7 14 21 28 km



B777-300ER
Maximum Sound Level (LAmax)
Night Tracks

LEGEND (dB(A))
90 65
85 60
80 Runway 05-23
75
70

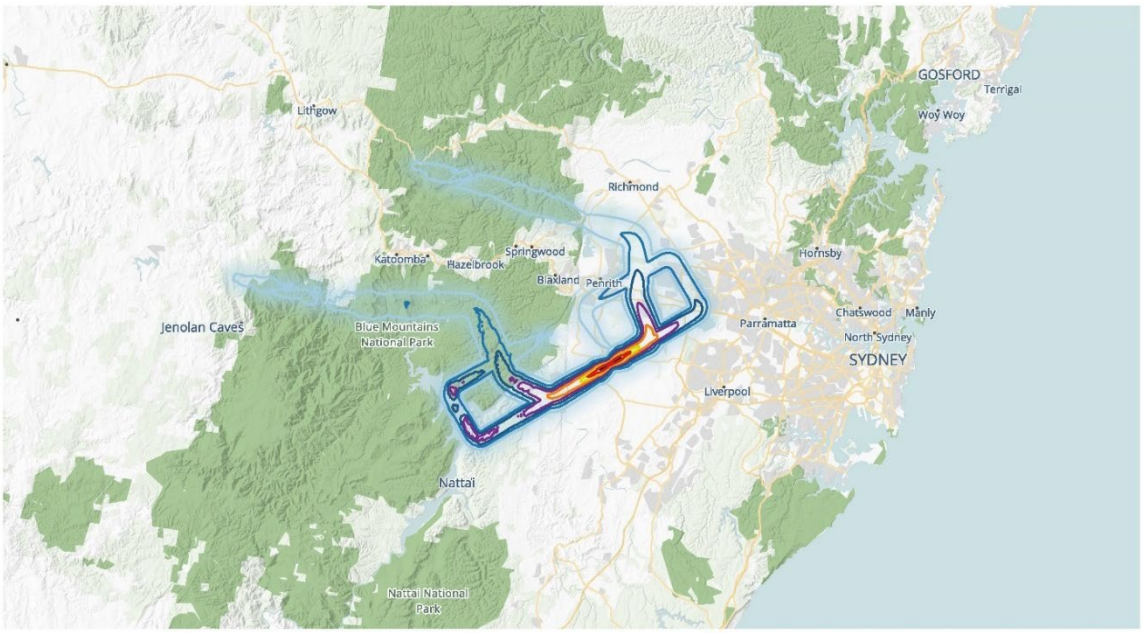
N 0 7 14 21 28 km



B777-300ER
Maximum Sound Level (LAmax)
Night Tracks (RRO)

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

N 0 7 14 21 28 km



B747-8F
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

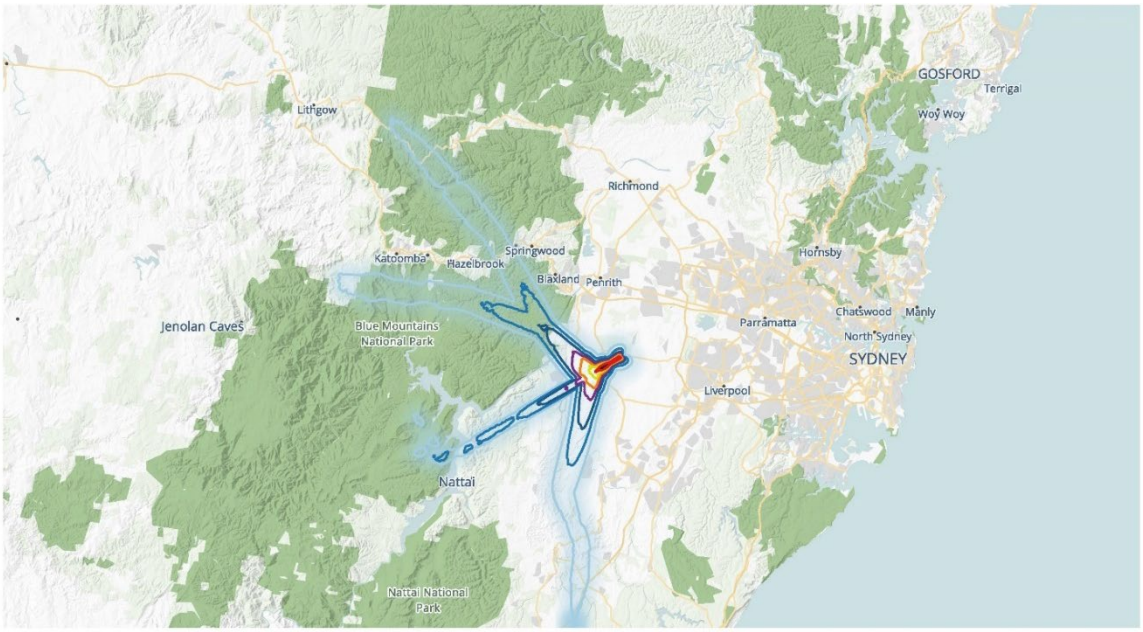
N 0 7 14 21 28 km



B737-800
Maximum Sound Level (LAmax)
Day Tracks



B737-800
Maximum Sound Level (LAmax)
Night Tracks



B737-800
Maximum Sound Level (LAmax)
Night Tracks (RRO)

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

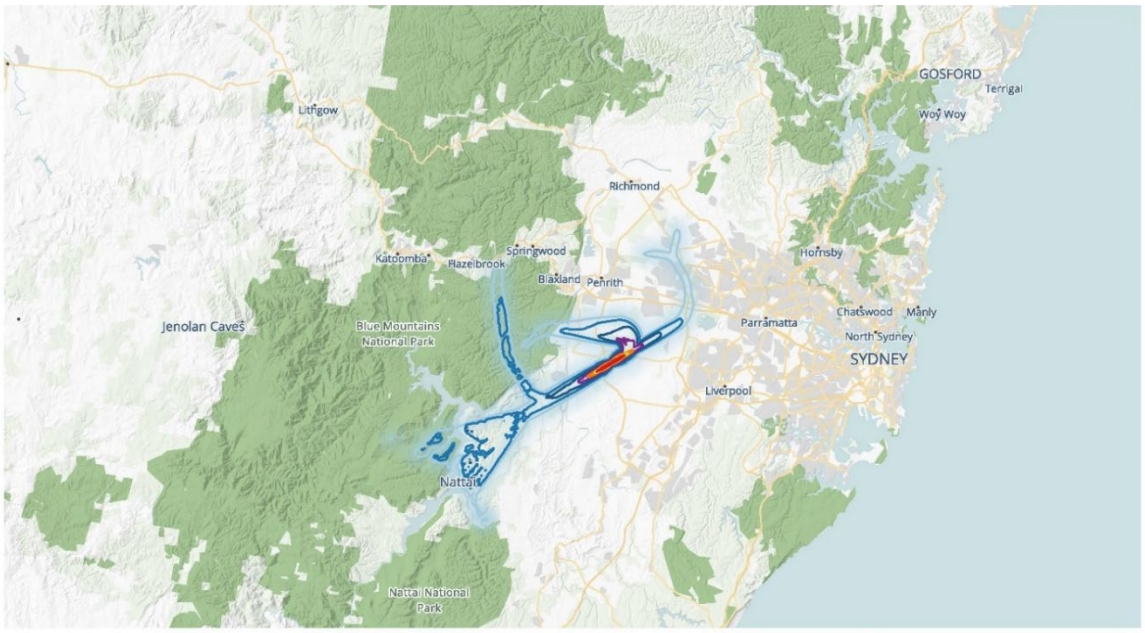
N 0 7 14 21 28 km



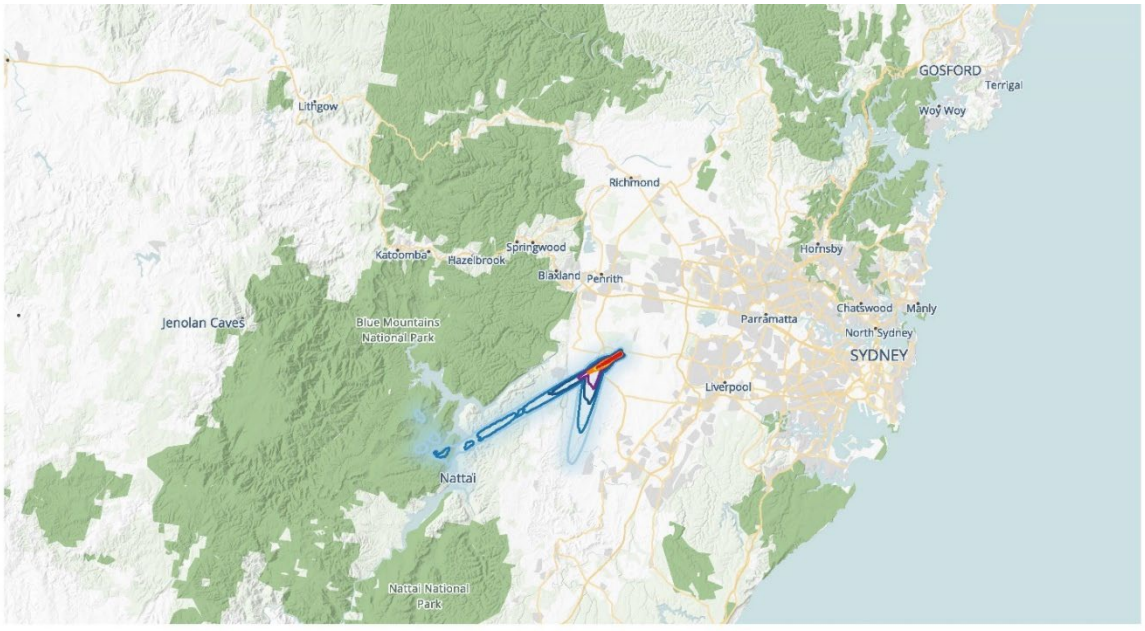
B737MAX8
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

N 0 7 14 21 28 km



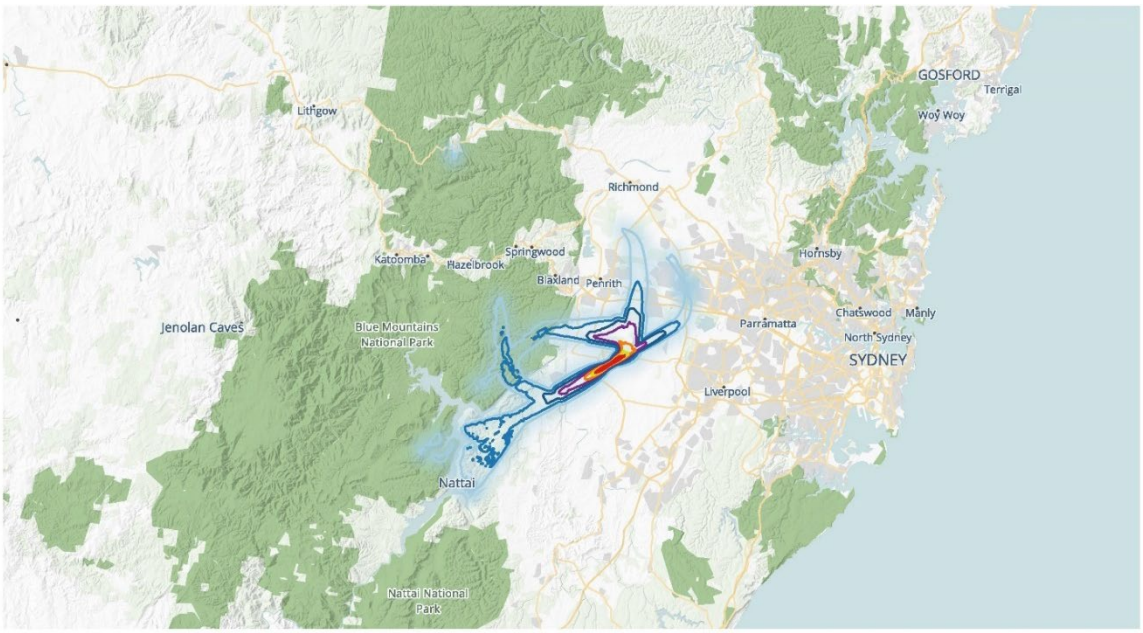
B737MAX8
Maximum Sound Level (LAmax)
Night Tracks



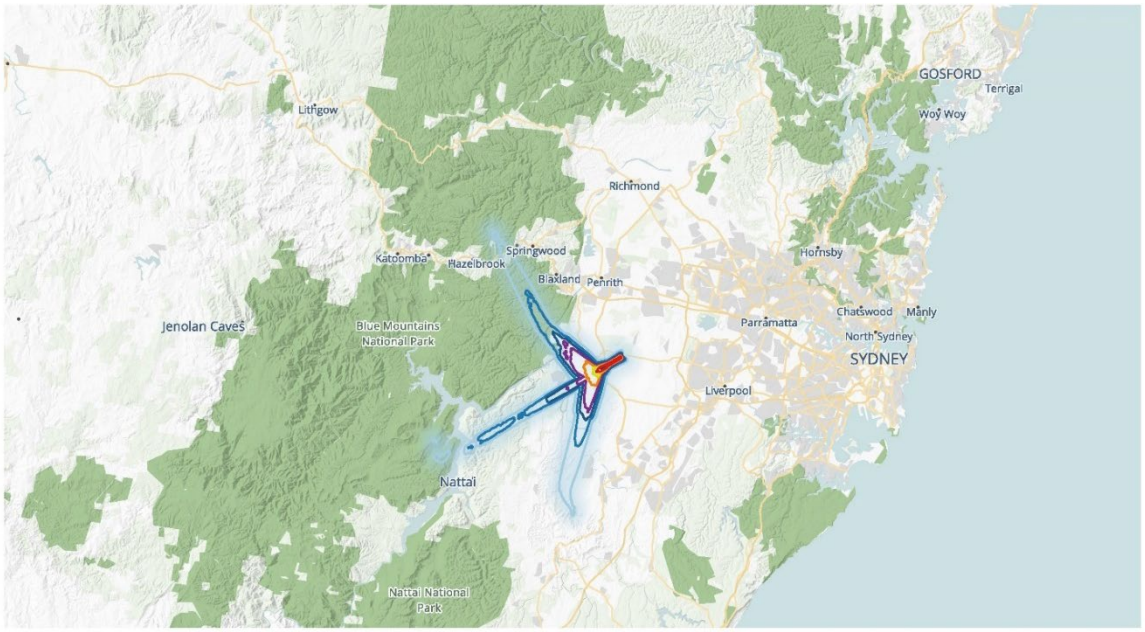
B737MAX8
Maximum Sound Level (LAmax)
Night Tracks (RRO)



A321
Maximum Sound Level (LAmax)
Day Tracks



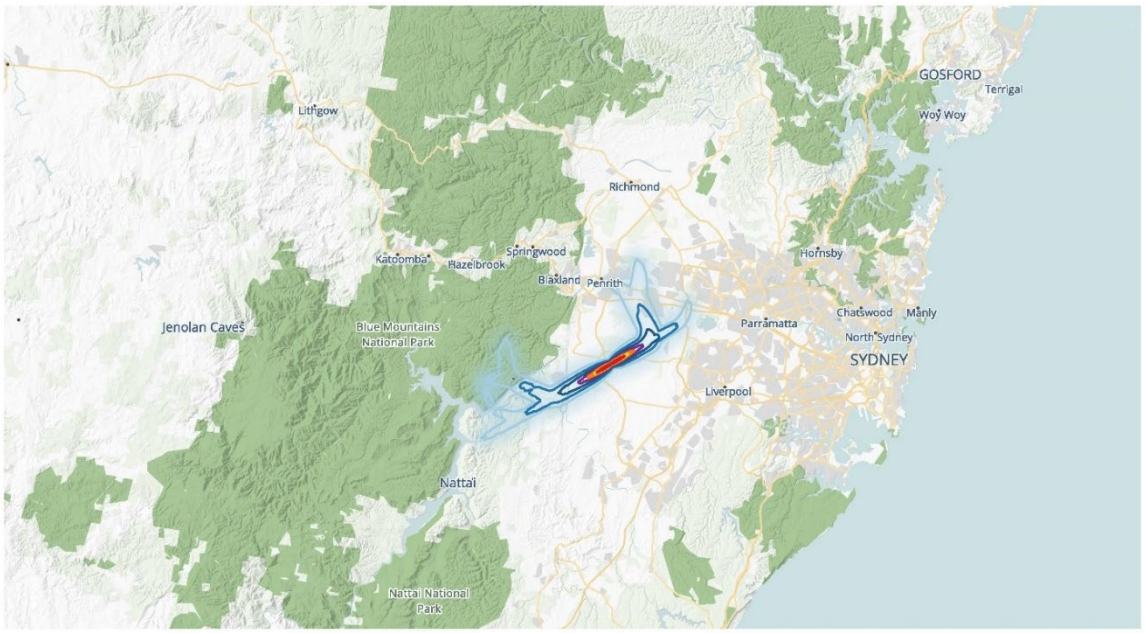
A321
Maximum Sound Level (LAmax)
Night Tracks



A321
Maximum Sound Level (LAmax)
Night Tracks (RRO)

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

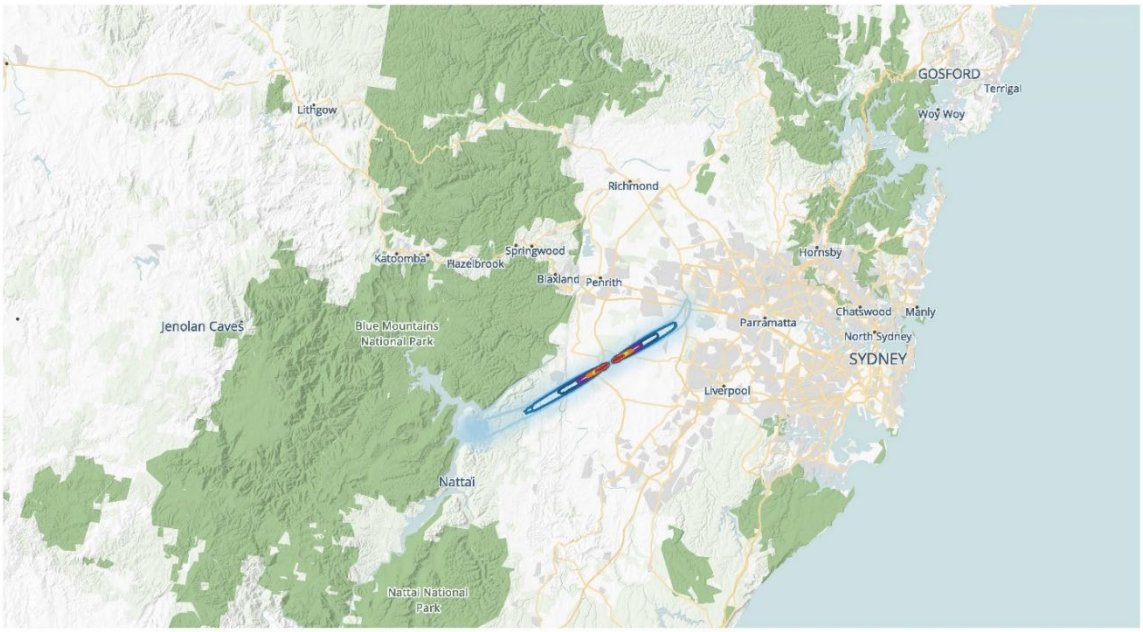
N 0 7 14 21 28 km



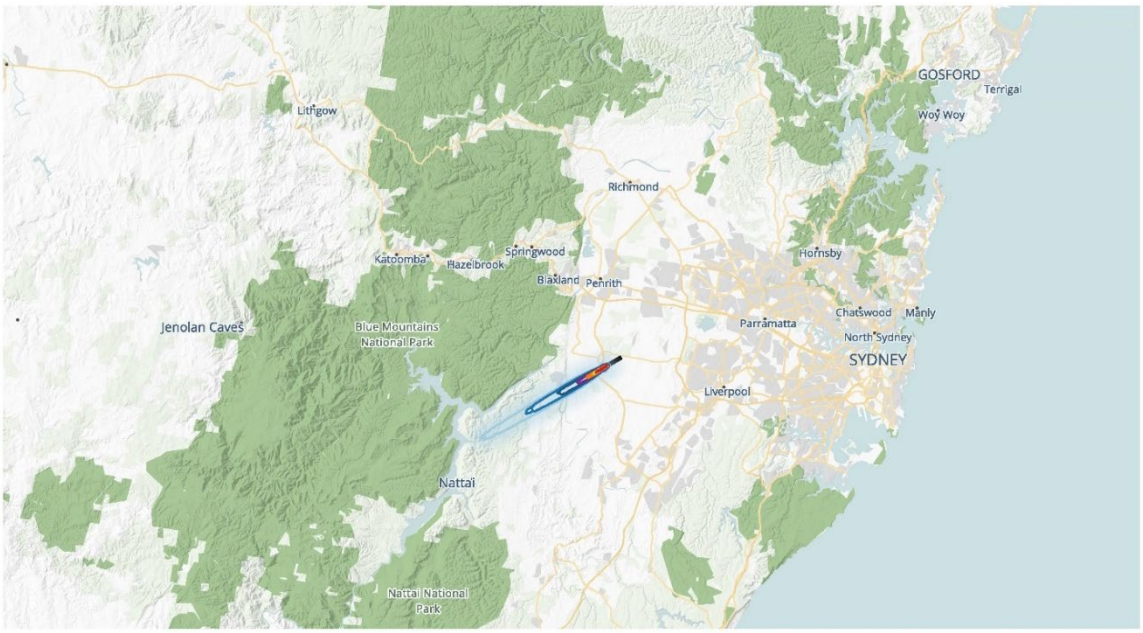
A220-100
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

N 0 7 14 21 28 km



A220-100
Maximum Sound Level (LAmax)
Night Tracks



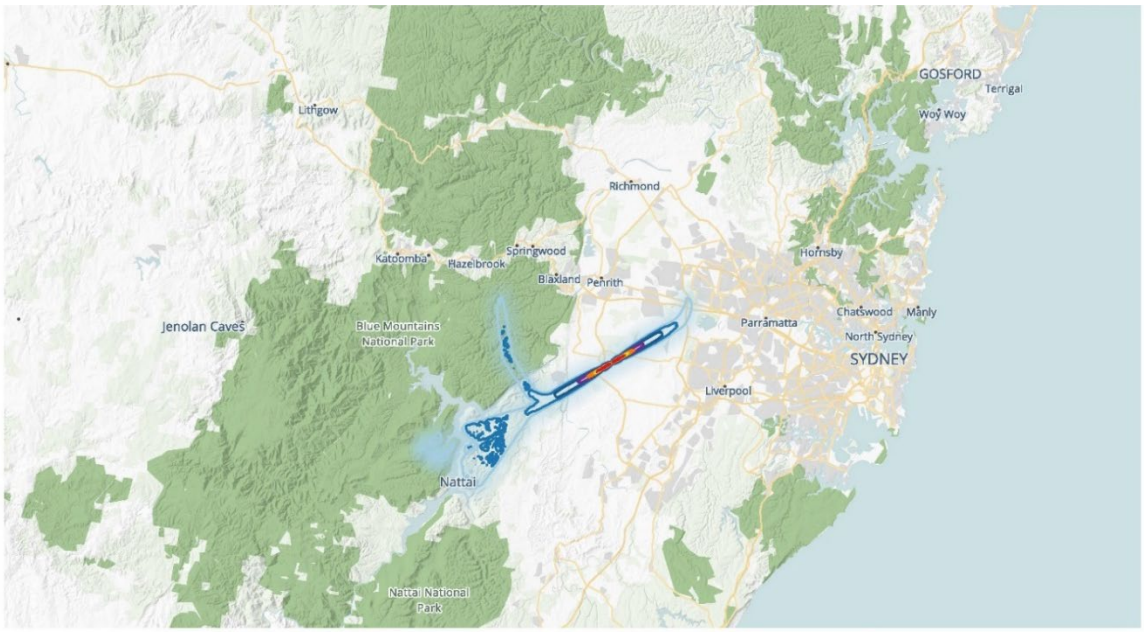
A220-100
Maximum Sound Level (LAmax)
Night Tracks (RRO)



A320neo
Maximum Sound Level (LAmax)
Day Tracks

LEGEND (dB(A))
90 65
85 60
80 Runway 05-23
75
70

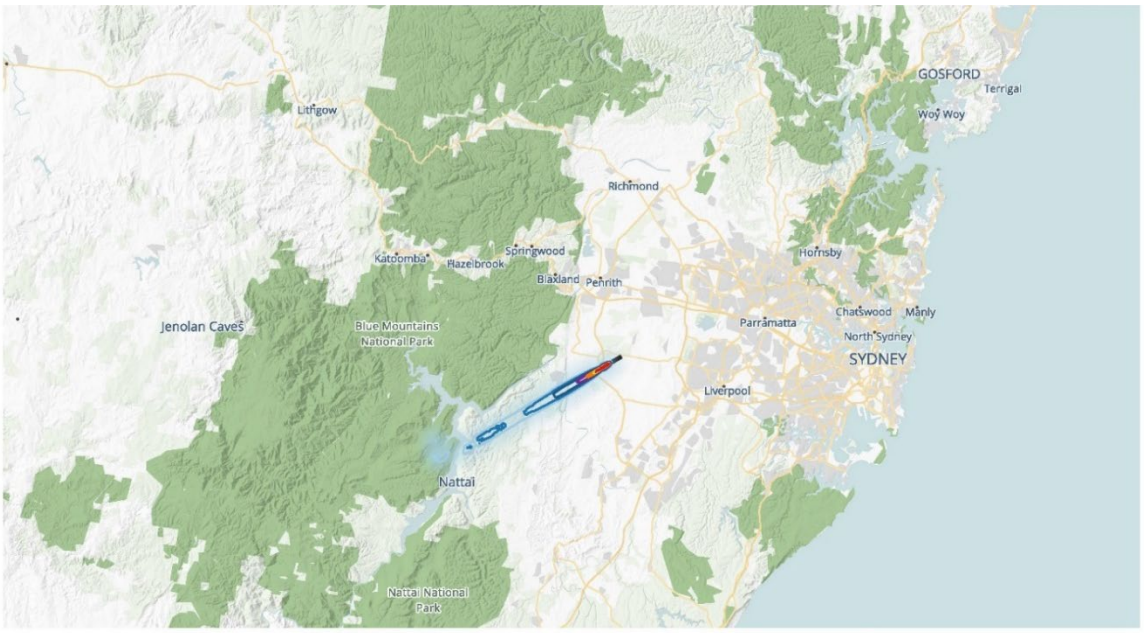
N 0 7 14 21 28 km



A320neo
Maximum Sound Level (LAmax)
Night Tracks

LEGEND (dB(A))
90 65
85 60
80 Runway 05-23
75
70

N 0 7 14 21 28 km

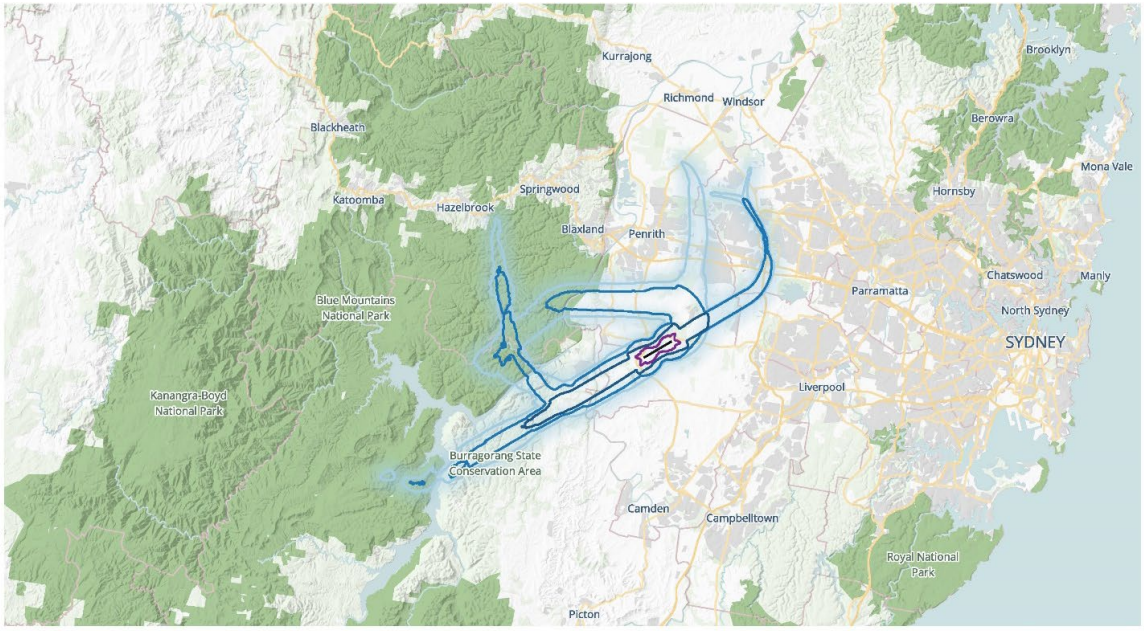


A320neo
Maximum Sound Level (LAmax)
Night Tracks (RRO)

LEGEND (dB(A))
90
85
80
75
70
65
60
Runway 05-23

N 0 7 14 21 28 km

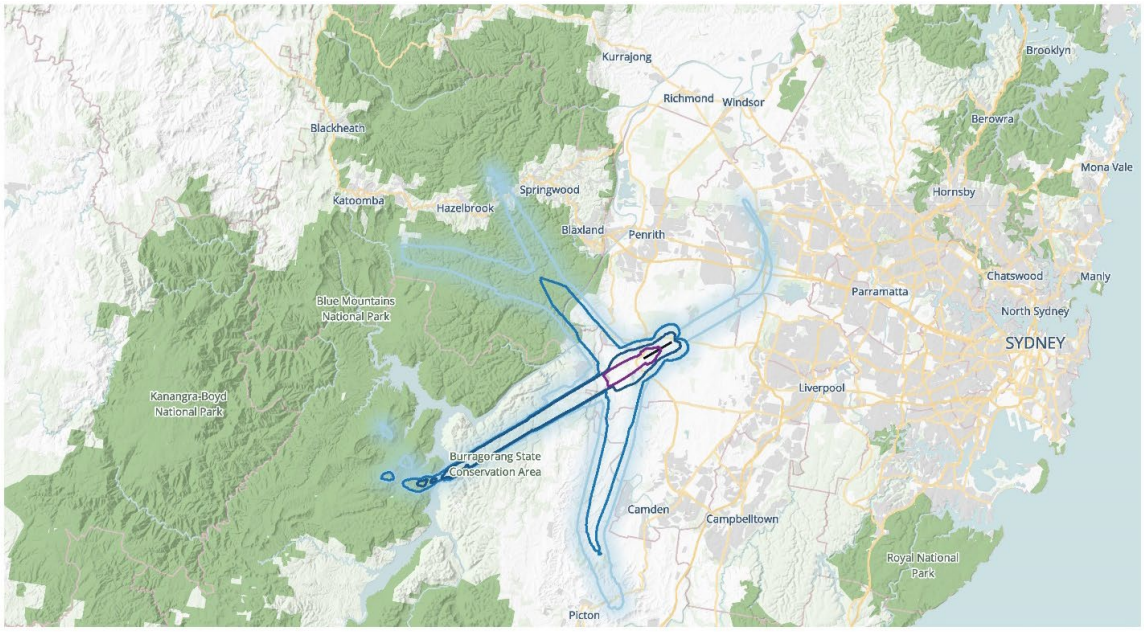
C3 N60 Contours – Night (11 pm to 5.30 am)



PAL 1 (2033)
N60 - Night (11pm-5:30am)
Scenario 1

LEGEND
20+ Movements
10-19 Movements
5-9 Movements
2-4 Movements
Runway 05-23

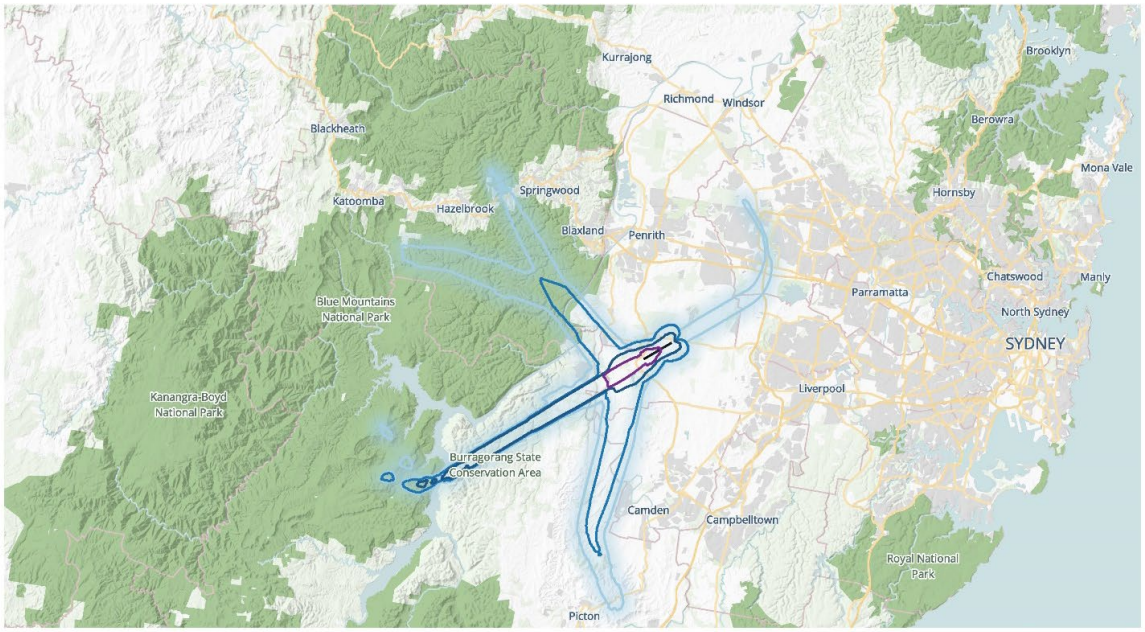
N 0 9 18 km



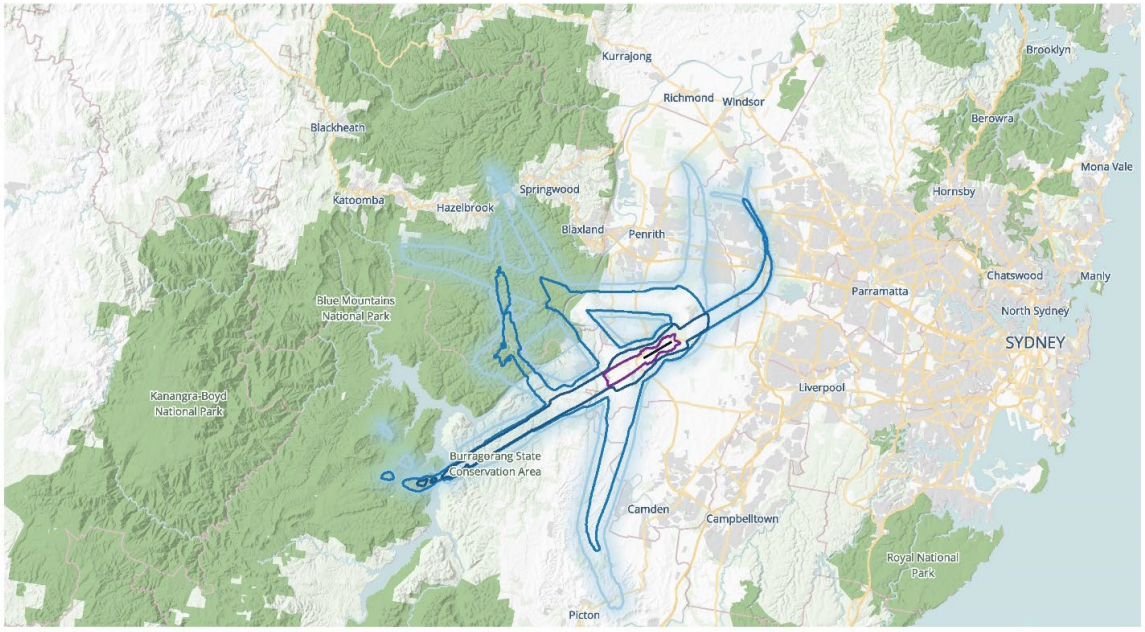
PAL 1 (2033)
N60 - Night (11pm-5:30am)
Scenario 3

LEGEND
20+ Movements
10-19 Movements
5-9 Movements
2-4 Movements
Runway 05-23

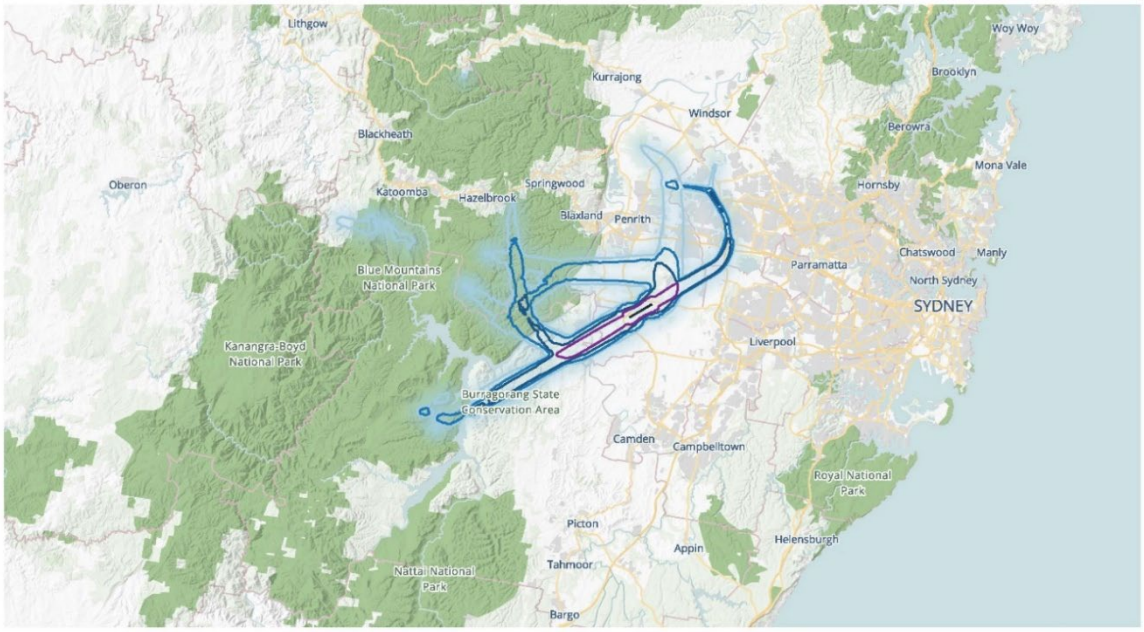
N 0 9 18 km



PAL 1 (2033)
N60 - Night (11pm-5:30am)
Scenario 4



PAL 1 (2033)
N60 - Night (11pm-5:30am)
Composite Scenario



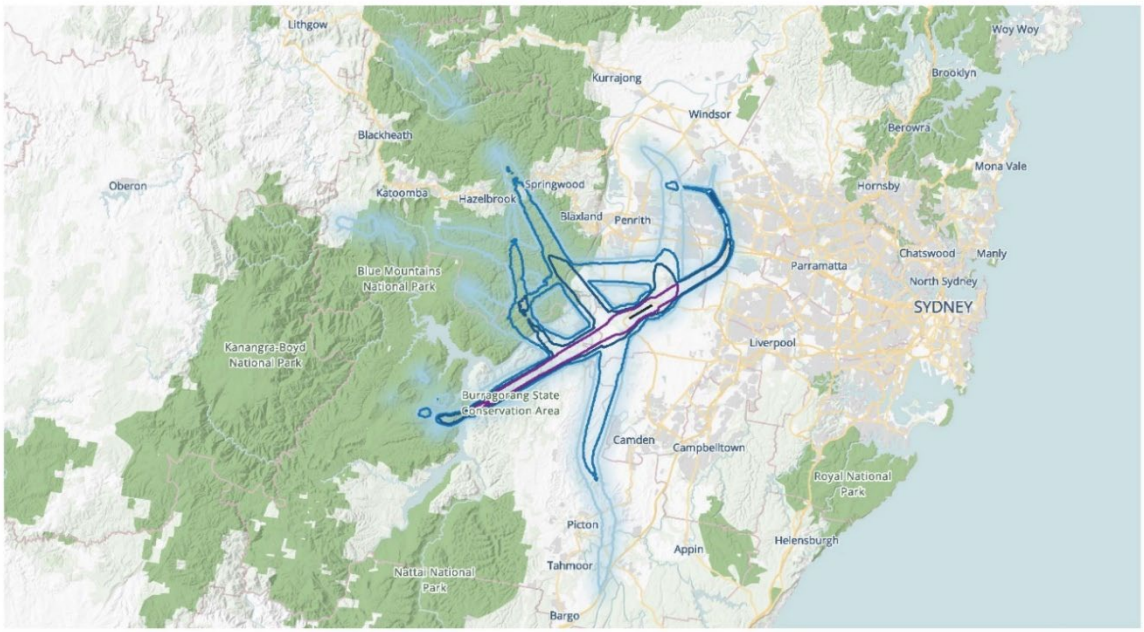
PAL 2 (2040)
N60 - Night (11pm-5:30am)
Scenario 1



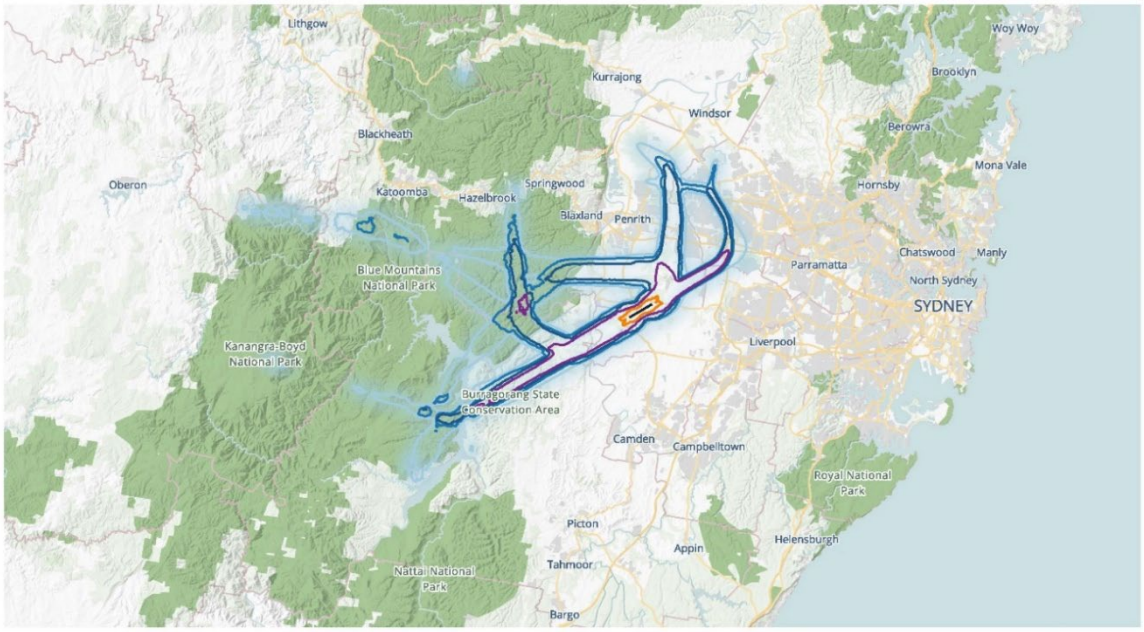
PAL 2 (2040)
N60 - Night (11pm-5:30am)
Scenario 3



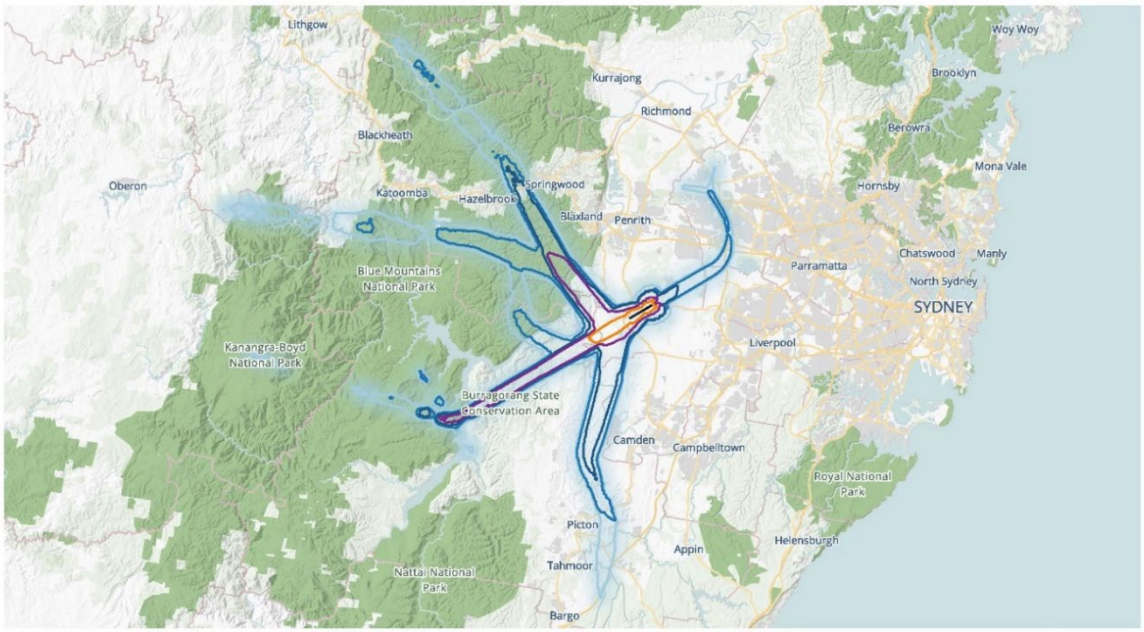
PAL 2 (2040)
N60 - Night (11pm-5:30am)
Scenario 4



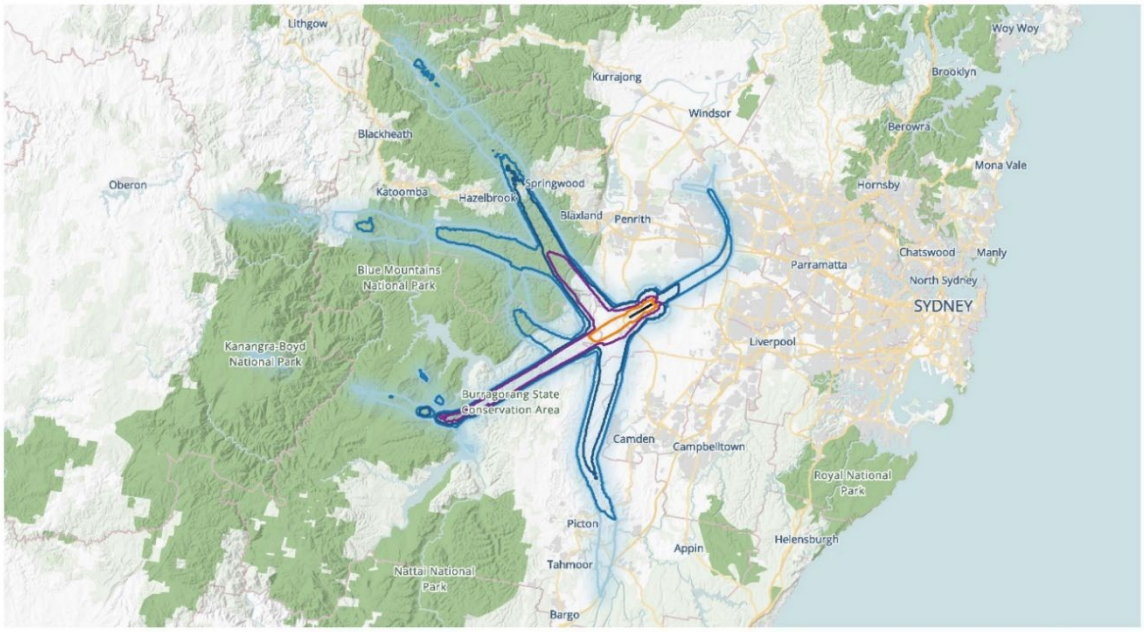
PAL 2 (2040)
N60 - Night (11pm-5:30am)
Composite Scenario



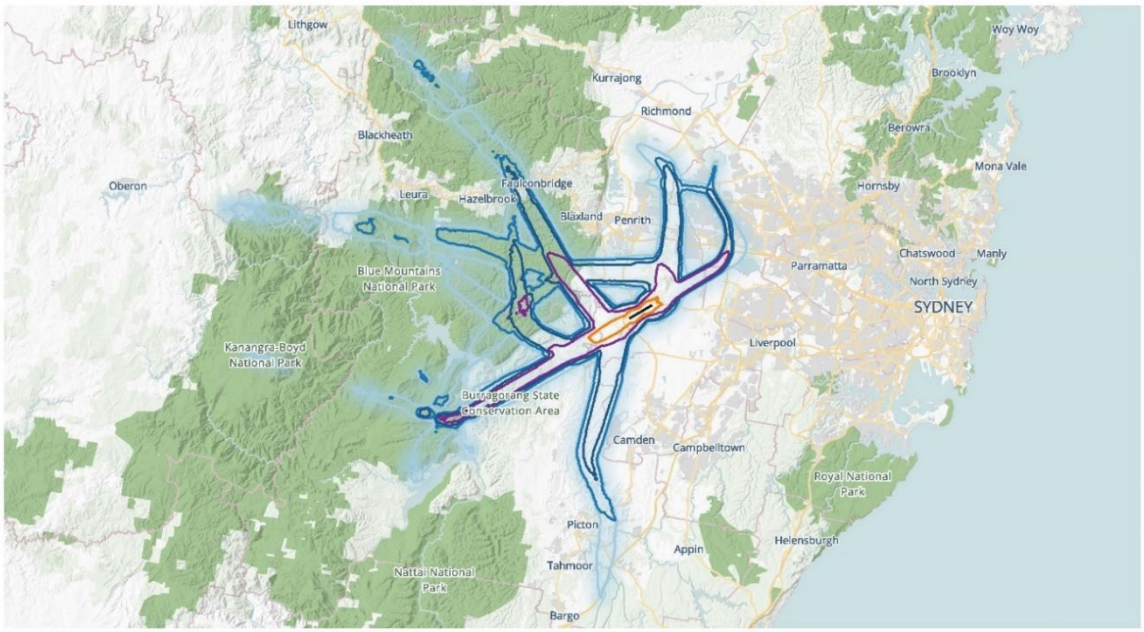
PAL 3 (2055)
N60 - Night (11pm-5:30am)
Scenario 1



PAL 3 (2055)
N60 - Night (11pm-5:30am)
Scenario 3

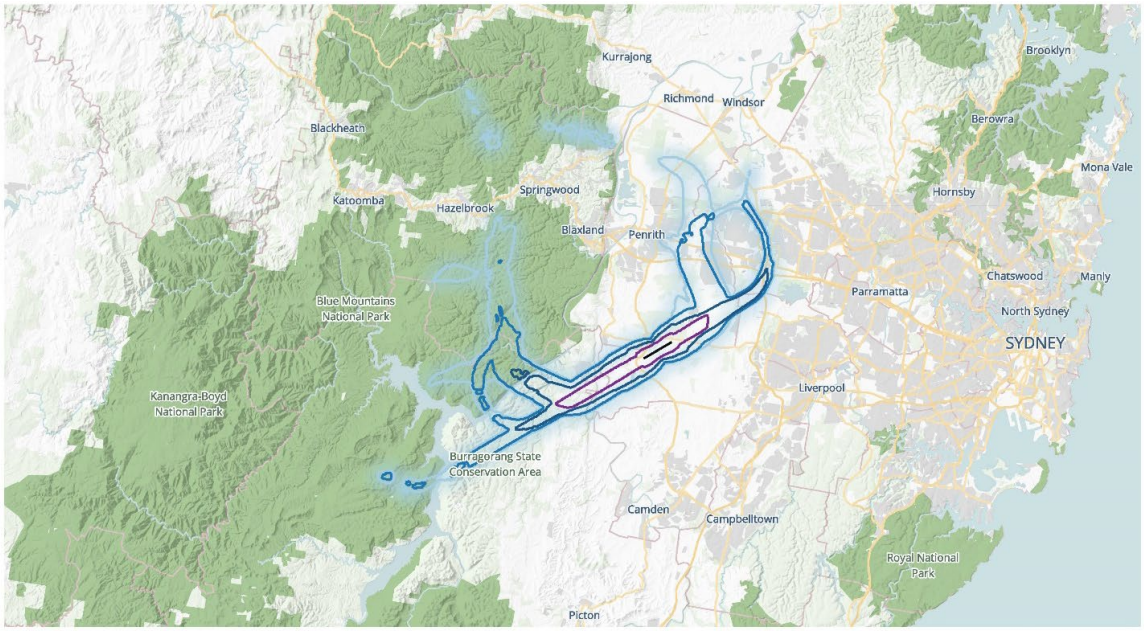


PAL 3 (2055)
N60 - Night (11pm-5:30am)
Scenario 4



PAL 3 (2055)
N60 - Night (11pm-5:30am)
Composite Scenario

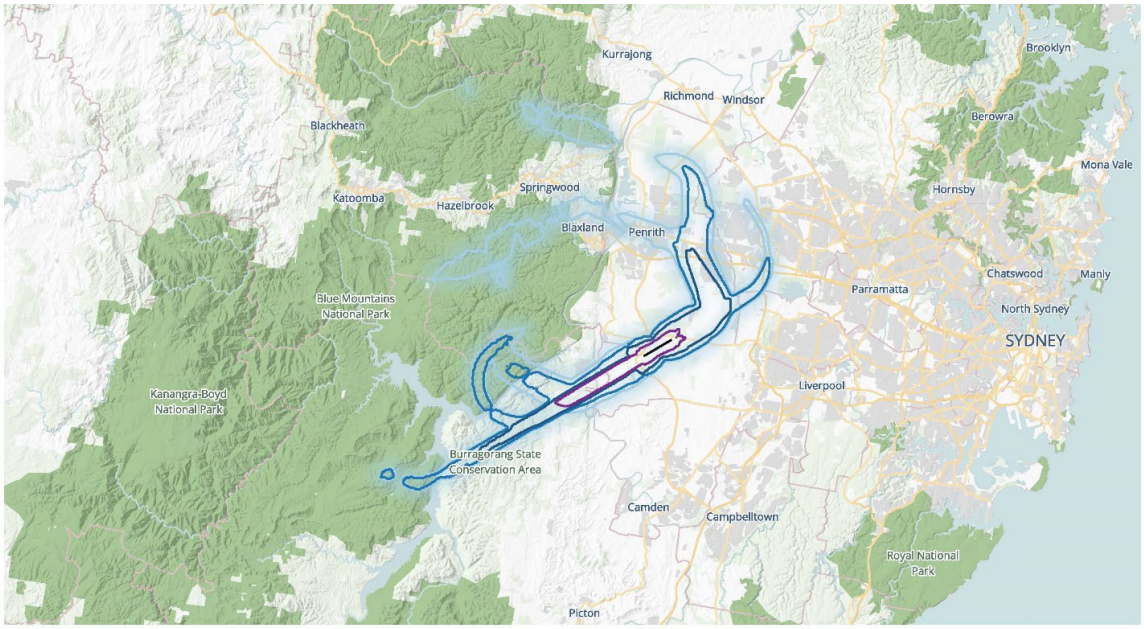
C4 N60 Contours – 24-Hours



PAL 1 (2033)
N60 - 24 Hours
Scenario 1

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
Runway 05-23

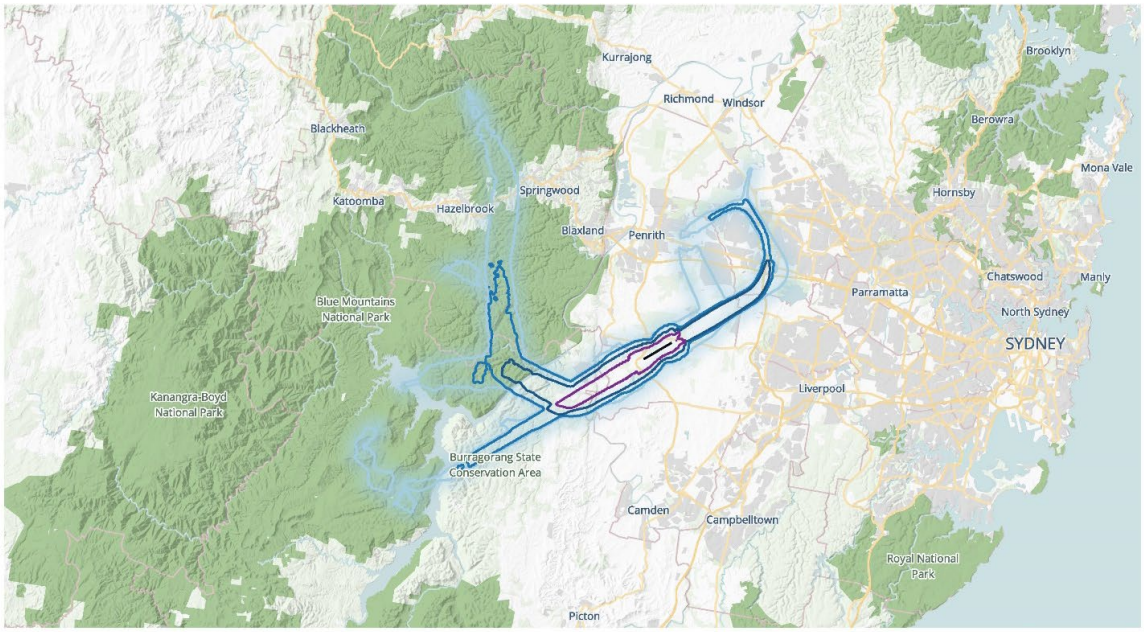
N 0 9 18 km



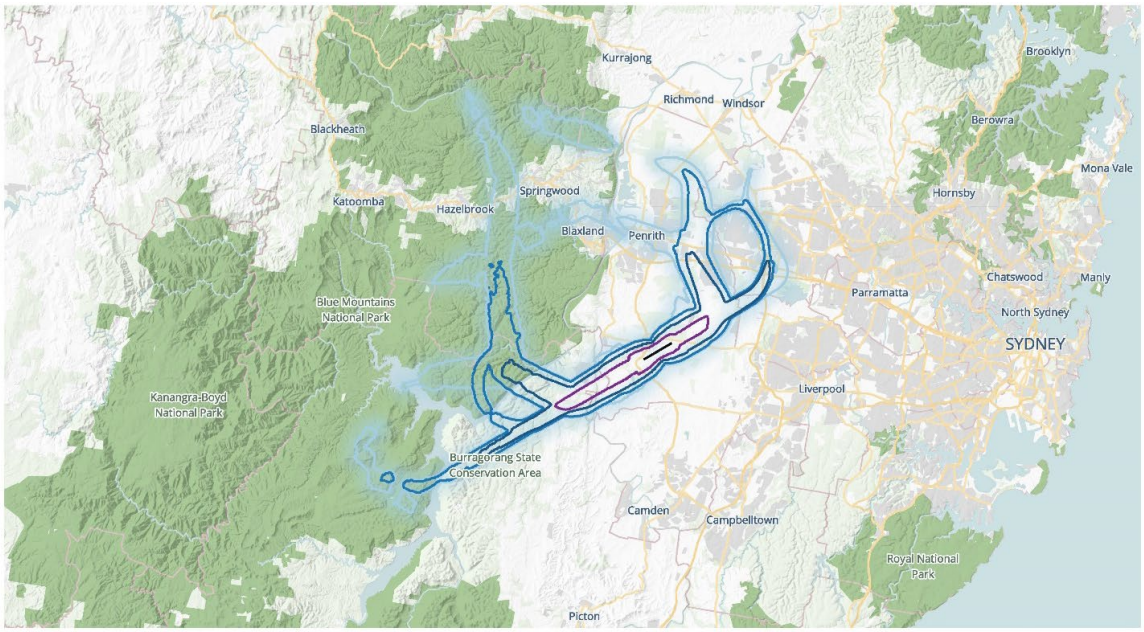
PAL 1 (2033)
N60 - 24 Hours
Scenario 3

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
Runway 05-23

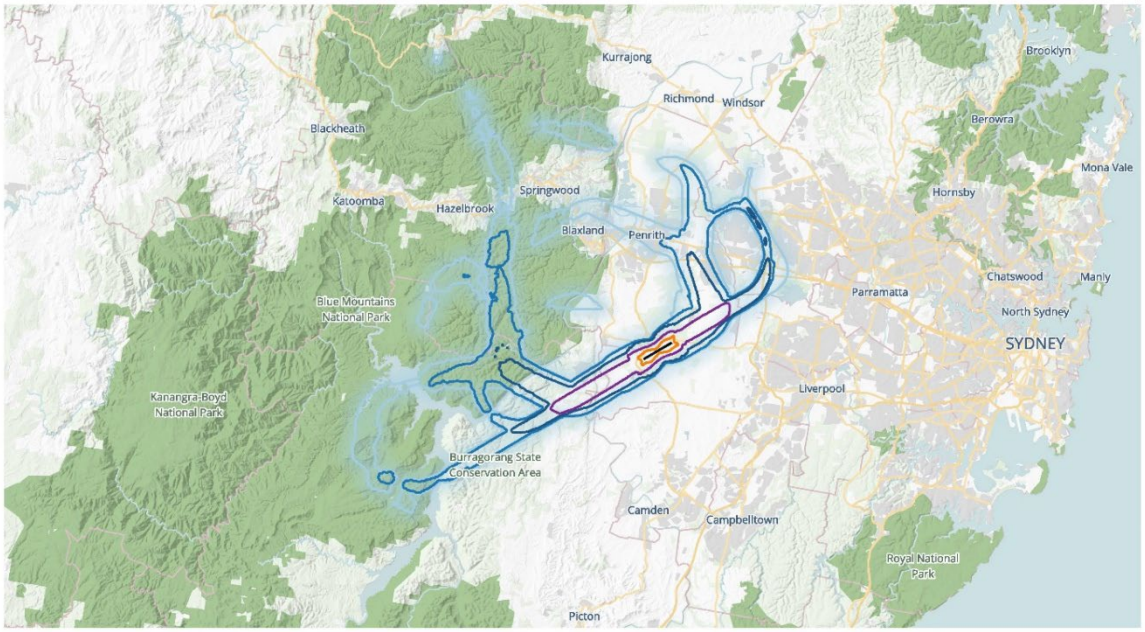
N 0 9 18 km



PAL 1 (2033)
N60 - 24 Hours
Scenario 4



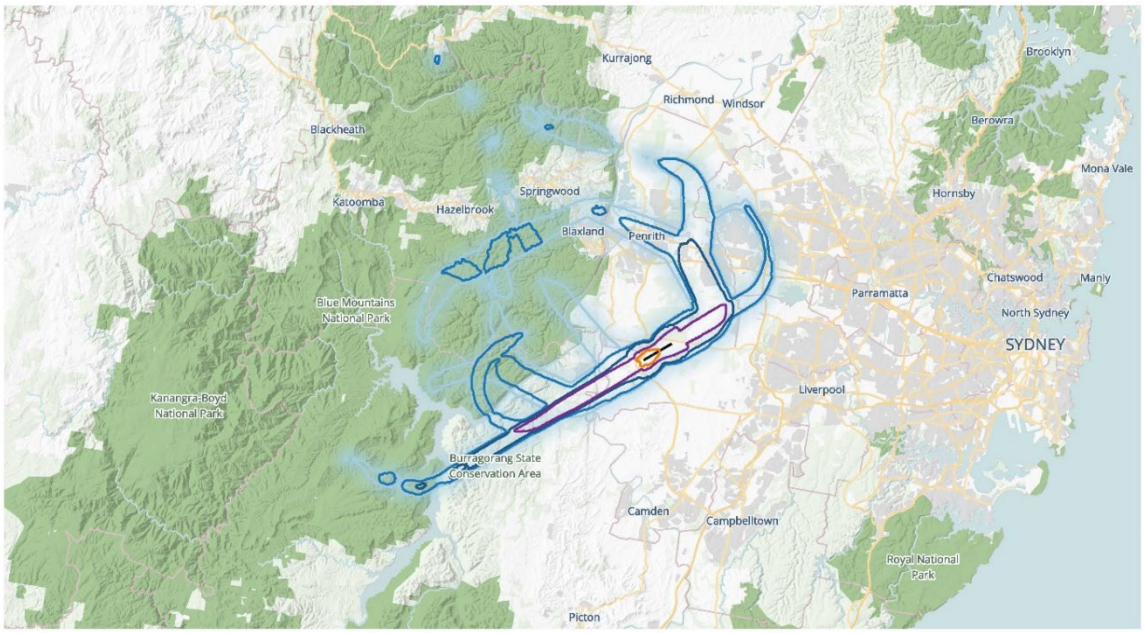
PAL 1 (2033)
N60 - 24 Hours
Composite Scenario



PAL 2 (2040)
N60 - 24 Hours
Scenario 1

LEGEND
200+ Movements
100-199 Movements
50-99 Movements
20-49 Movements
10-19 Movements
Runway 05-23

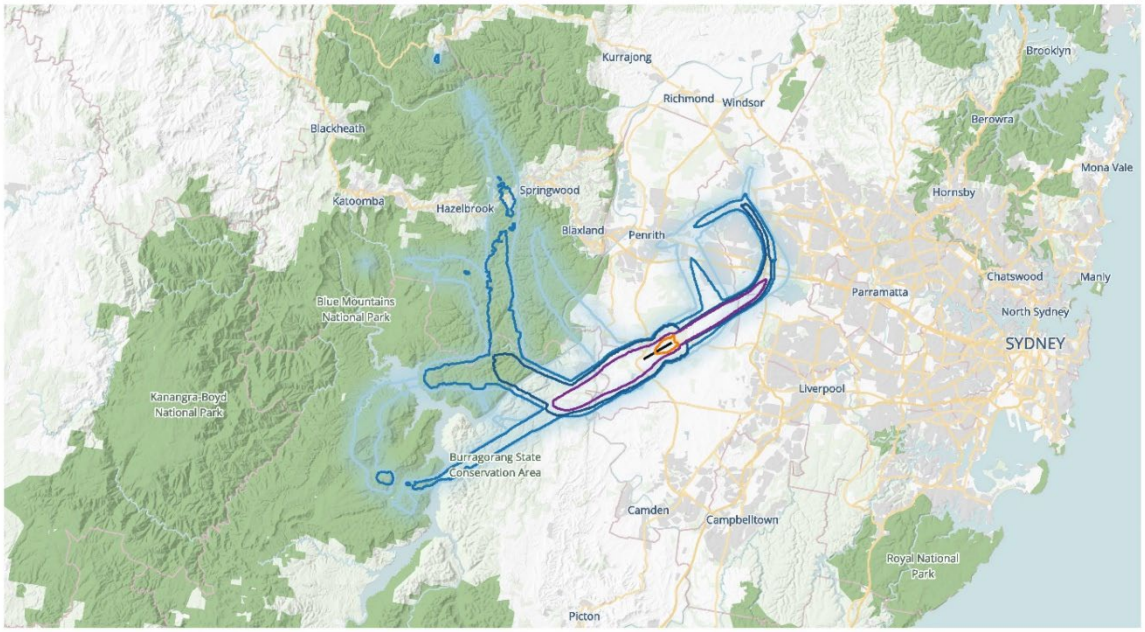
N 0 9 18 km



PAL 2 (2040)
N60 - 24 Hours
Scenario 3

LEGEND
200+ Movements
100-199 Movements
50-99 Movements
20-49 Movements
10-19 Movements
Runway 05-23

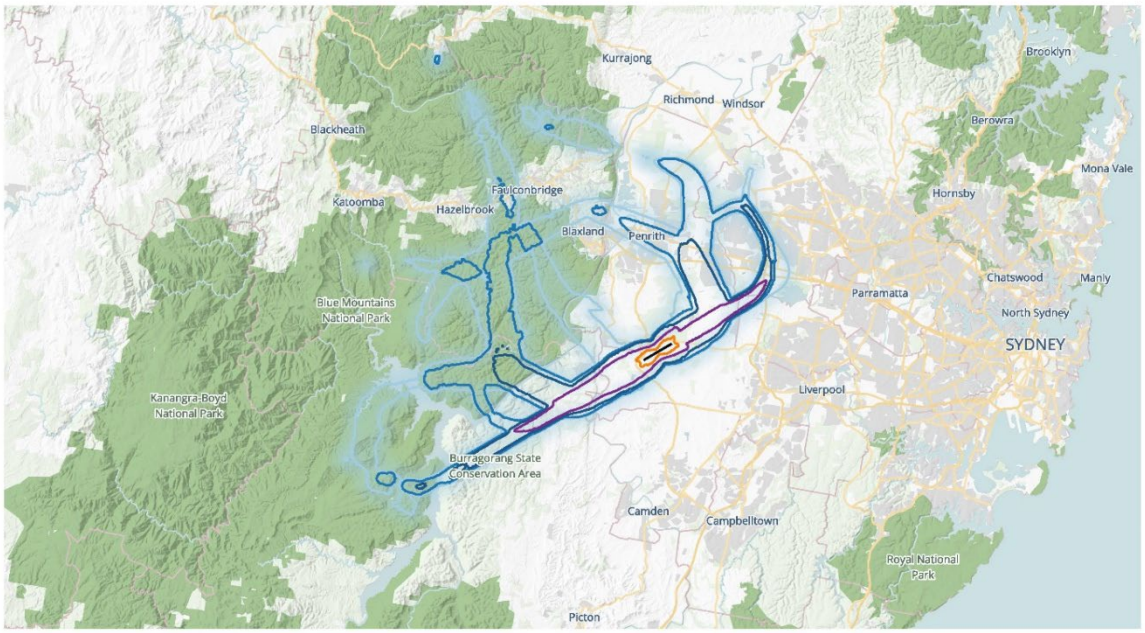
N 0 9 18 km



PAL 2 (2040)
N60 - 24 Hours
Scenario 4

LEGEND
200+ Movements
100-199 Movements
50-99 Movements
20-49 Movements
10-19 Movements
Runway 05-23

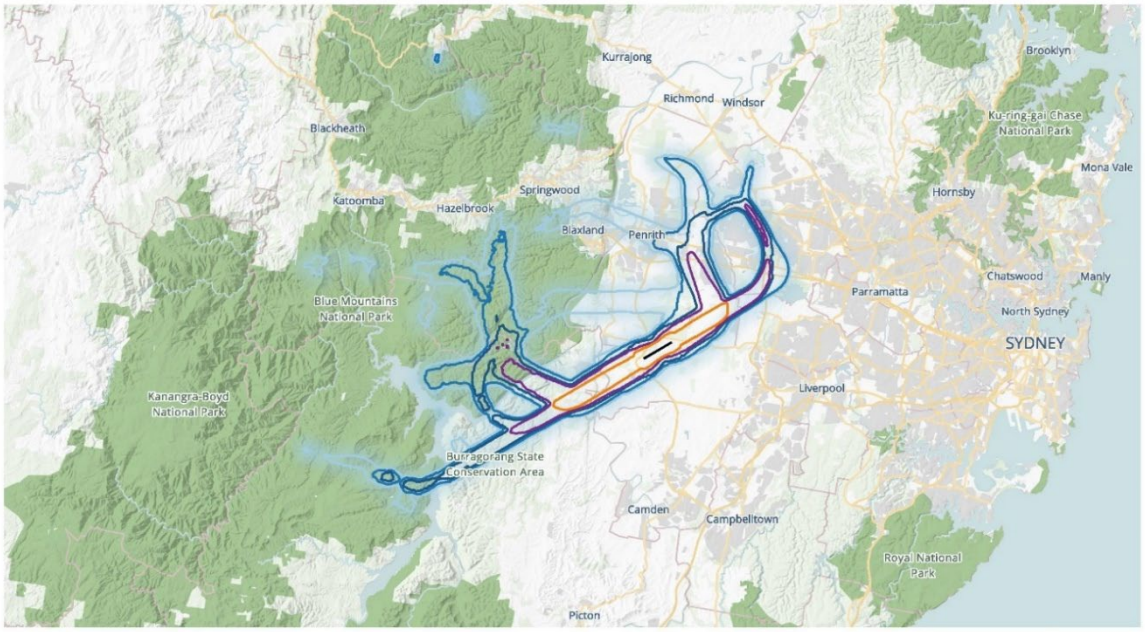
N 0 9 18 km



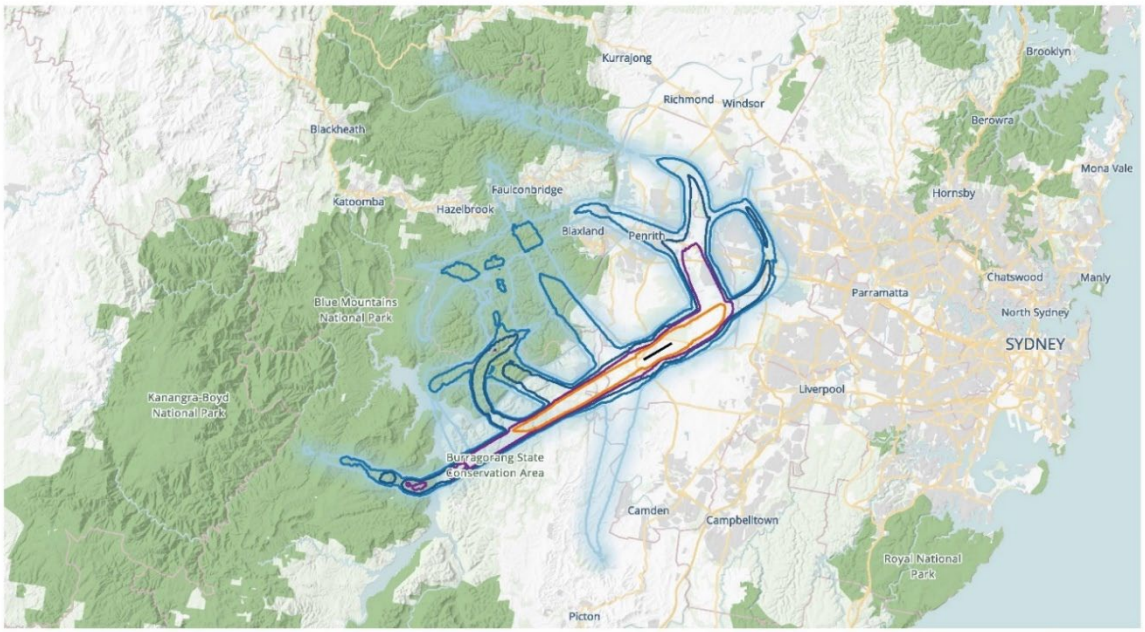
PAL 2 (2040)
N60 - 24 Hours
Composite Scenario

LEGEND
200+ Movements
100-199 Movements
50-99 Movements
20-49 Movements
10-19 Movements
Runway 05-23

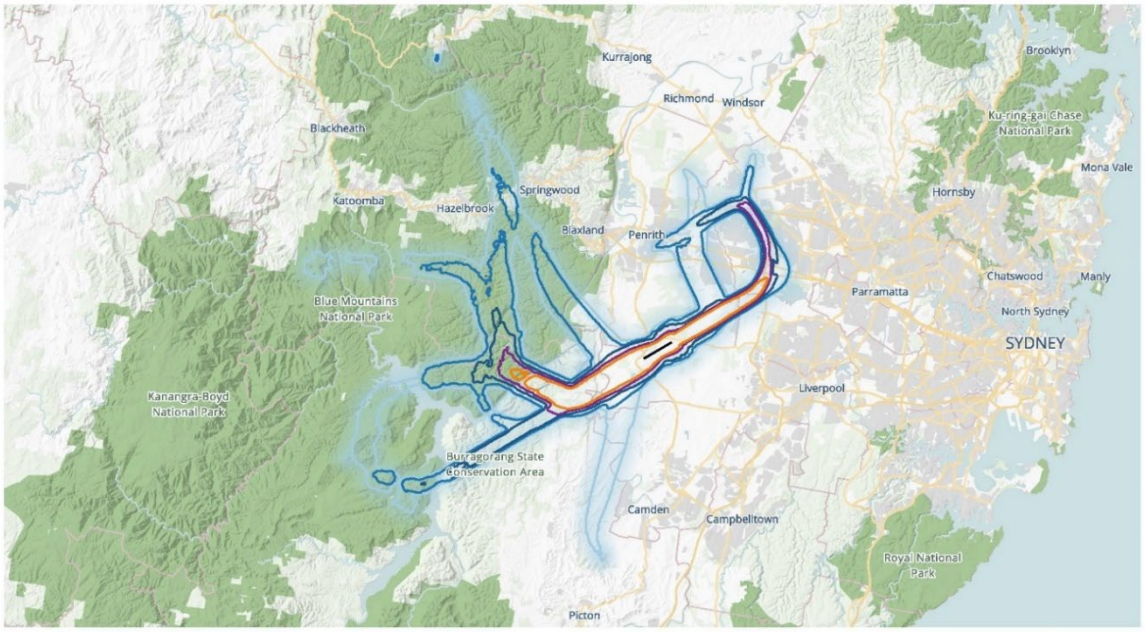
N 0 9 18 km



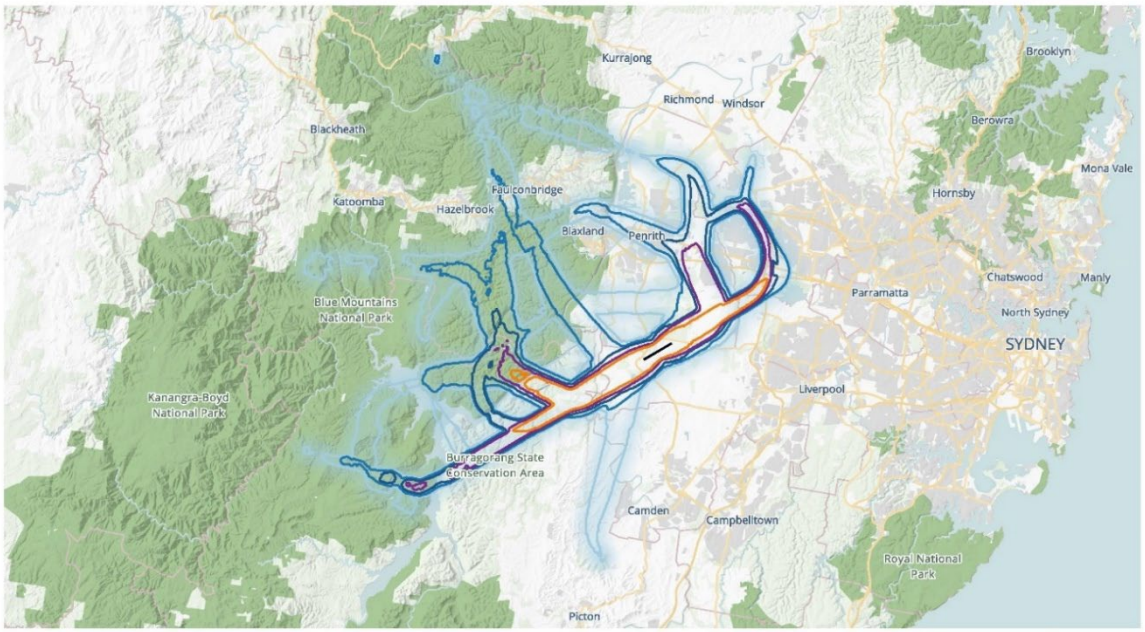
PAL 3 (2055)
N60 - 24 Hours
Scenario 1



PAL 3 (2055)
N60 - 24 Hours
Scenario 3

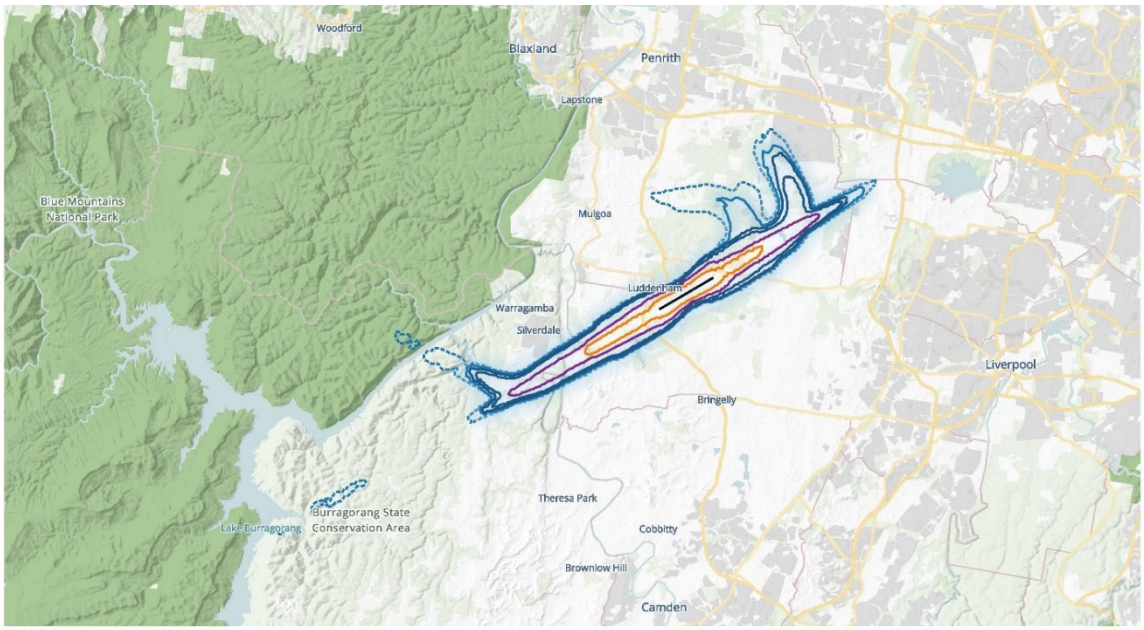


PAL 3 (2055)
N60 - 24 Hours
Scenario 4



PAL 3 (2055)
N60 - 24 Hours
Composite Scenario

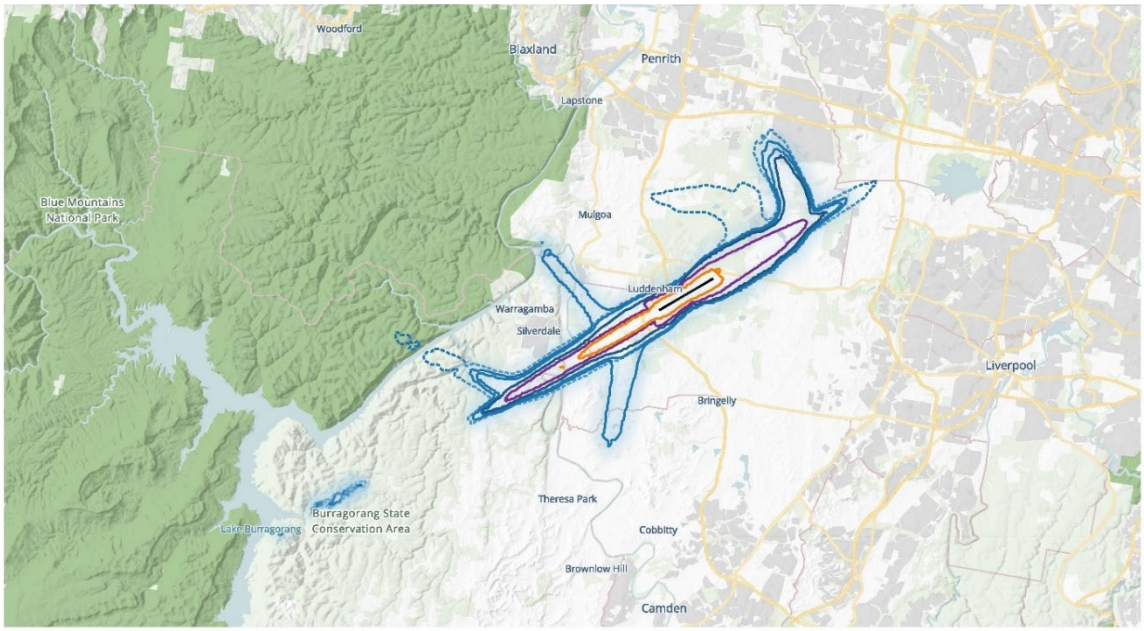
C5 N70 contours – 24-Hours



PAL 1 (2033)
N70 - 24 Hours
Scenario 1

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

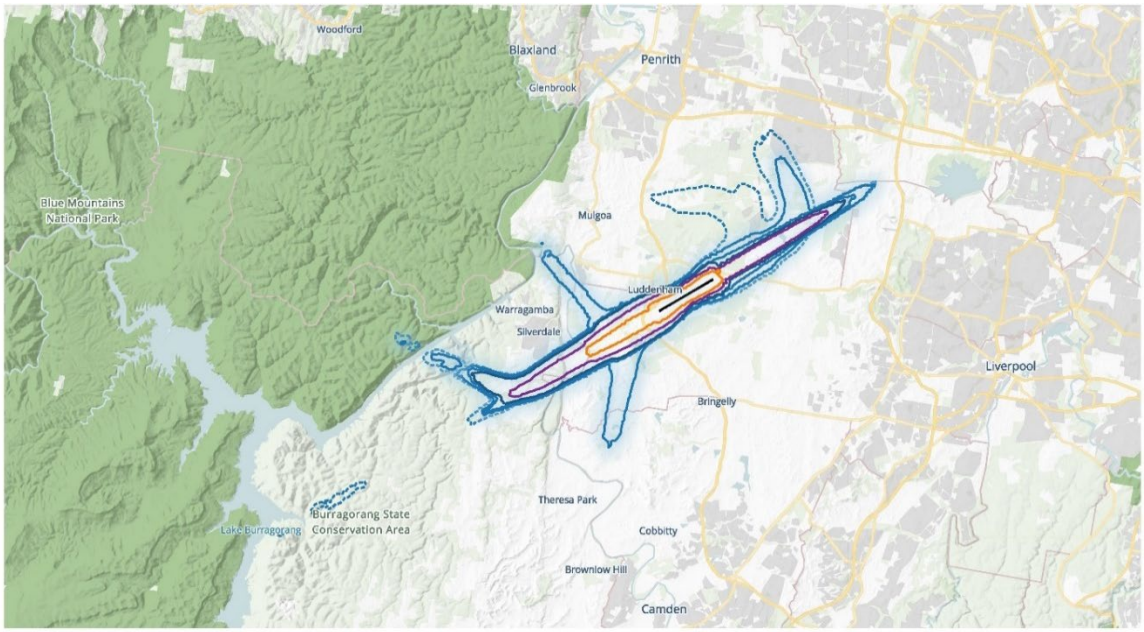
N 0 5 10 km



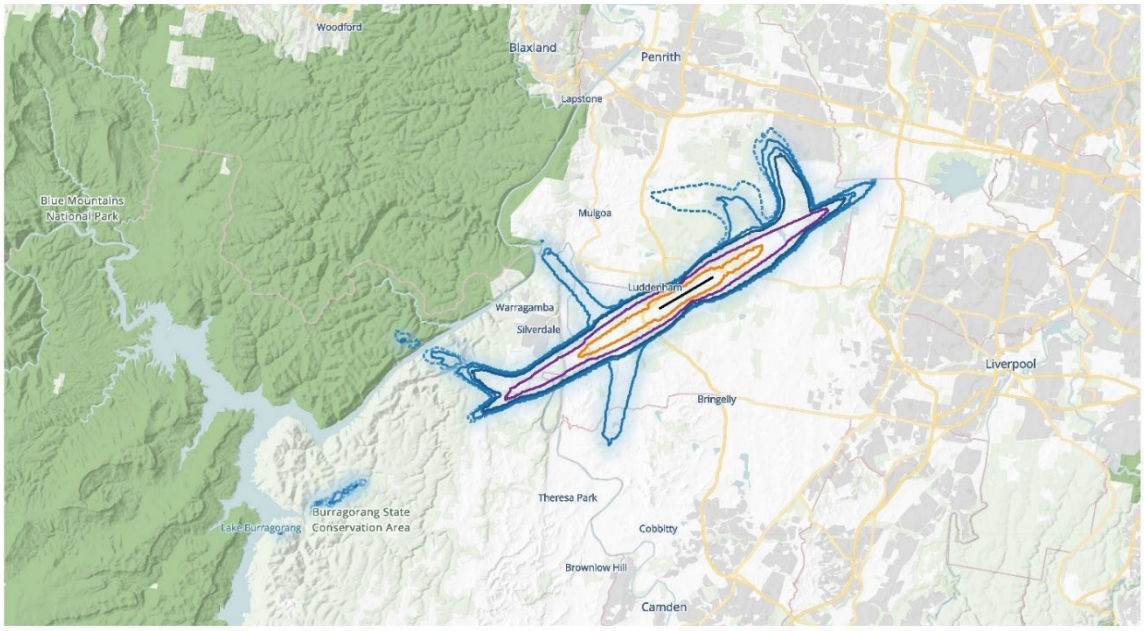
PAL 1 (2033)
N70 - 24 Hours
Scenario 3

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

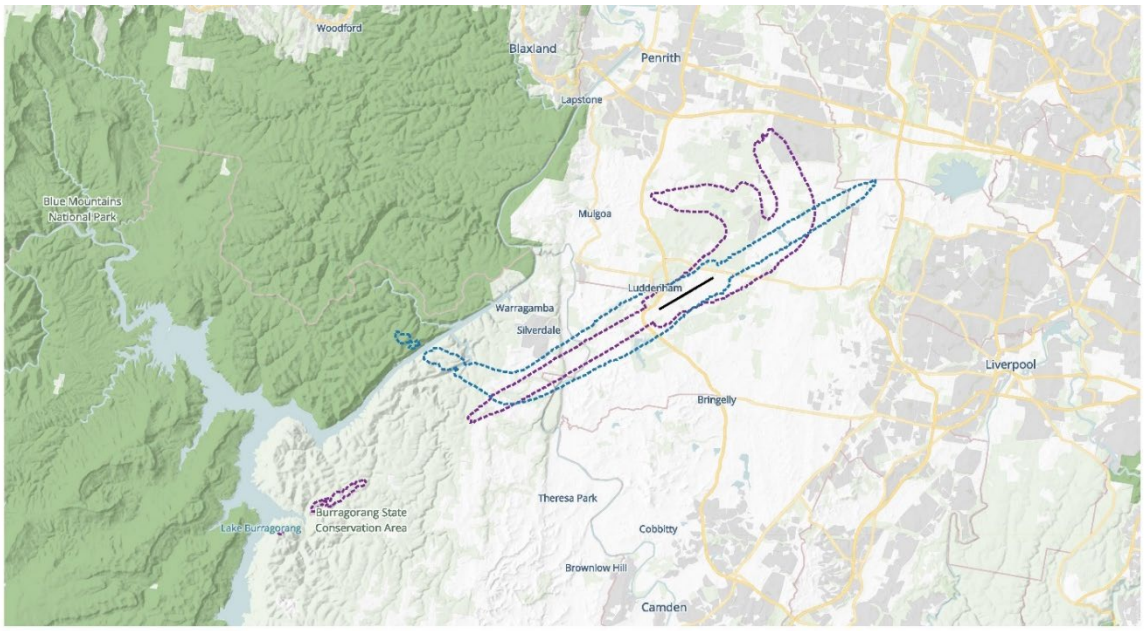
N 0 5 10 km



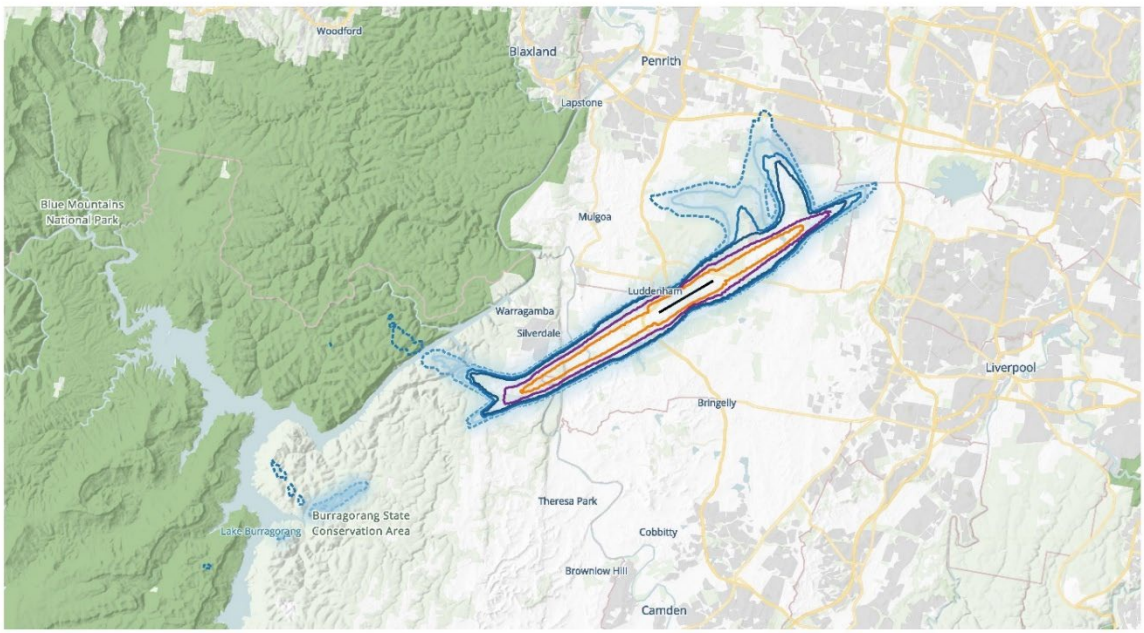
PAL 1 (2033)
N70 - 24 Hours
Scenario 4



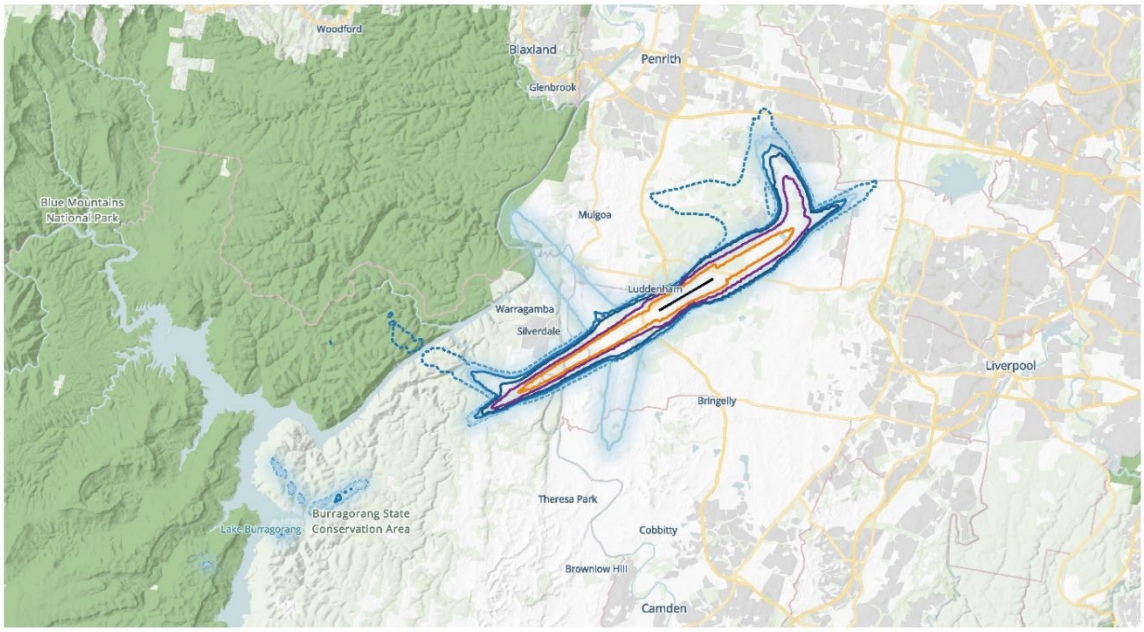
PAL 1 (2033)
N70 - 24 Hours
Composite Scenario



PAL 1 (2033)
N70 - 24 Hours
Unidirectional Flows



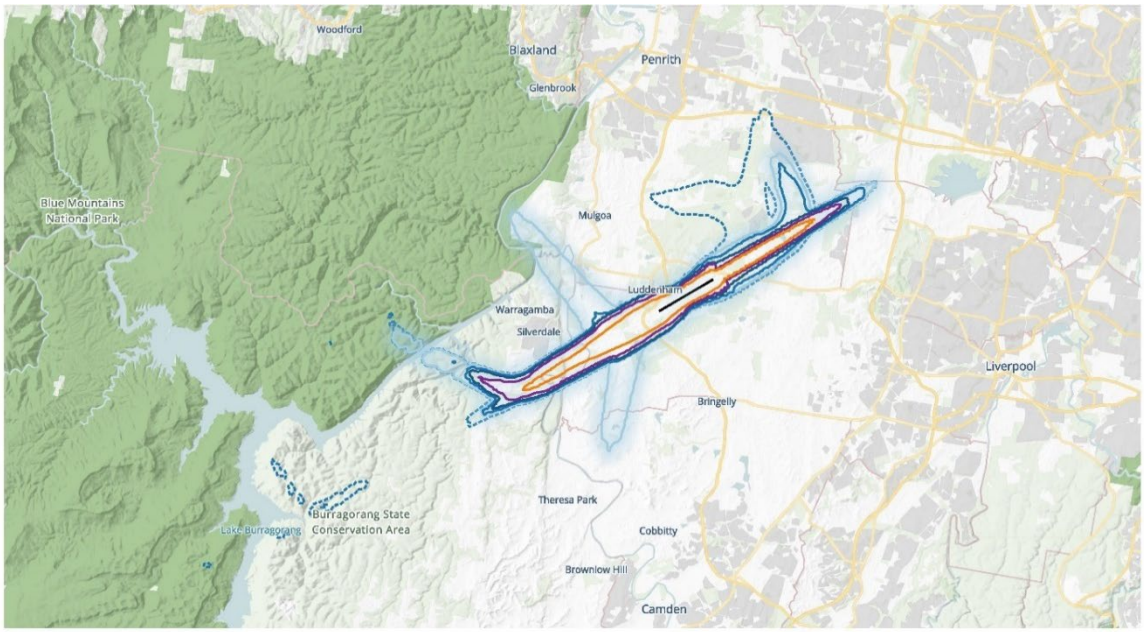
PAL 2 (2040)
N70 - 24 Hours
Scenario 1



PAL 2 (2040)
N70 - 24 Hours
Scenario 3

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

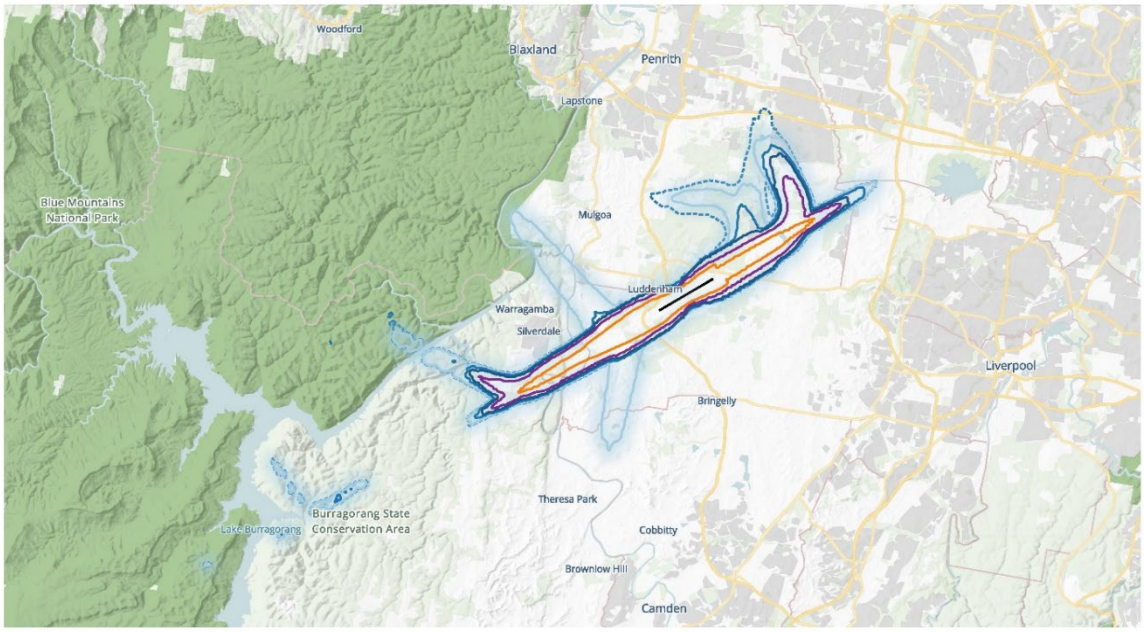
N 0 5 10 km



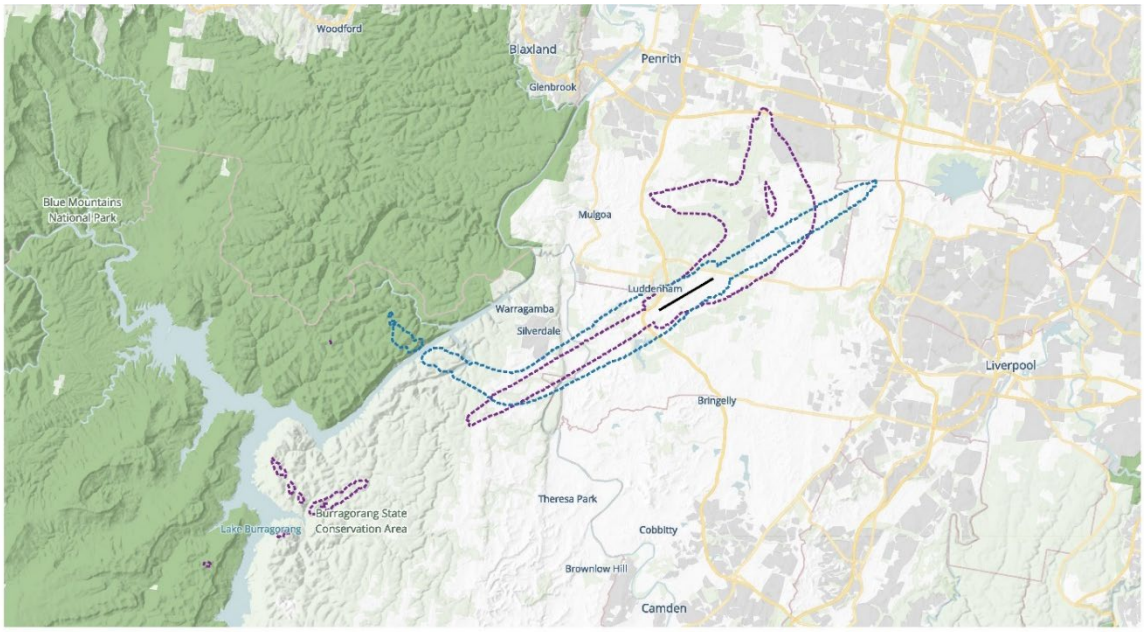
PAL 2 (2040)
N70 - 24 Hours
Scenario 4

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

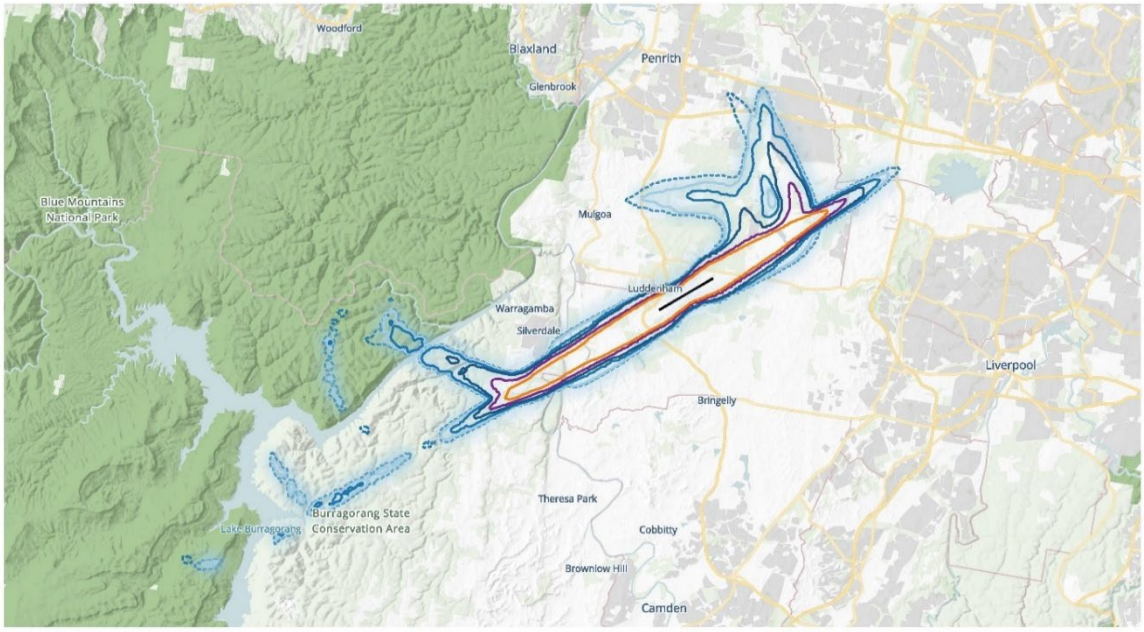
N 0 5 10 km



PAL 2 (2040)
N70 - 24 Hours
Composite Scenario



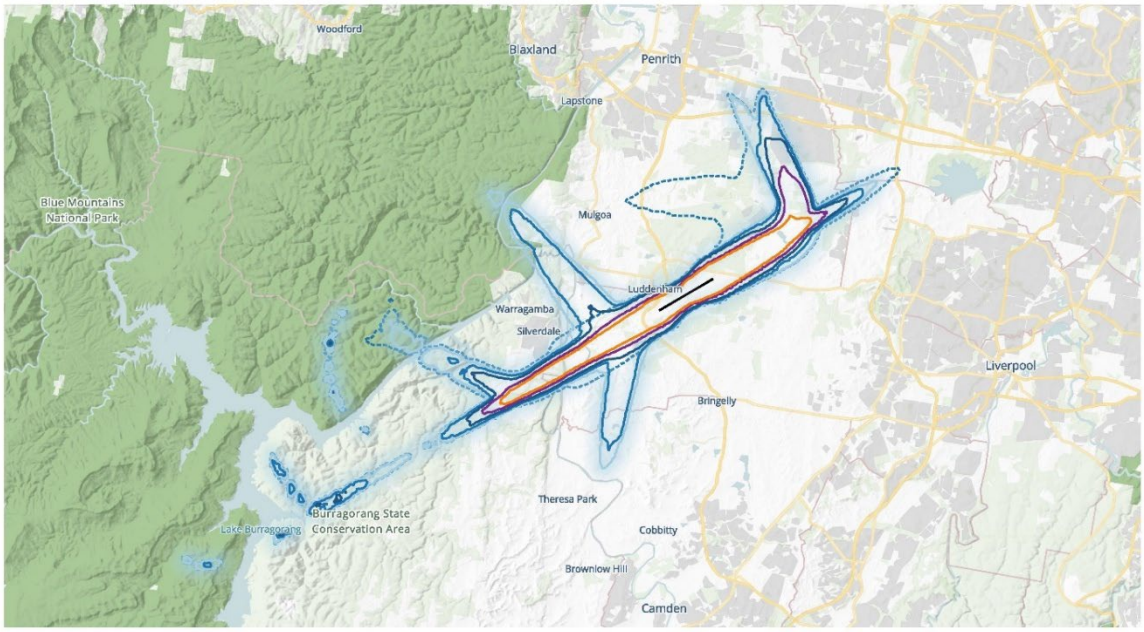
PAL 2 (2040)
N70 - 24 Hours
Unidirectional Flows



PAL 3 (2055)
N70 - 24 Hours
Scenario 1

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

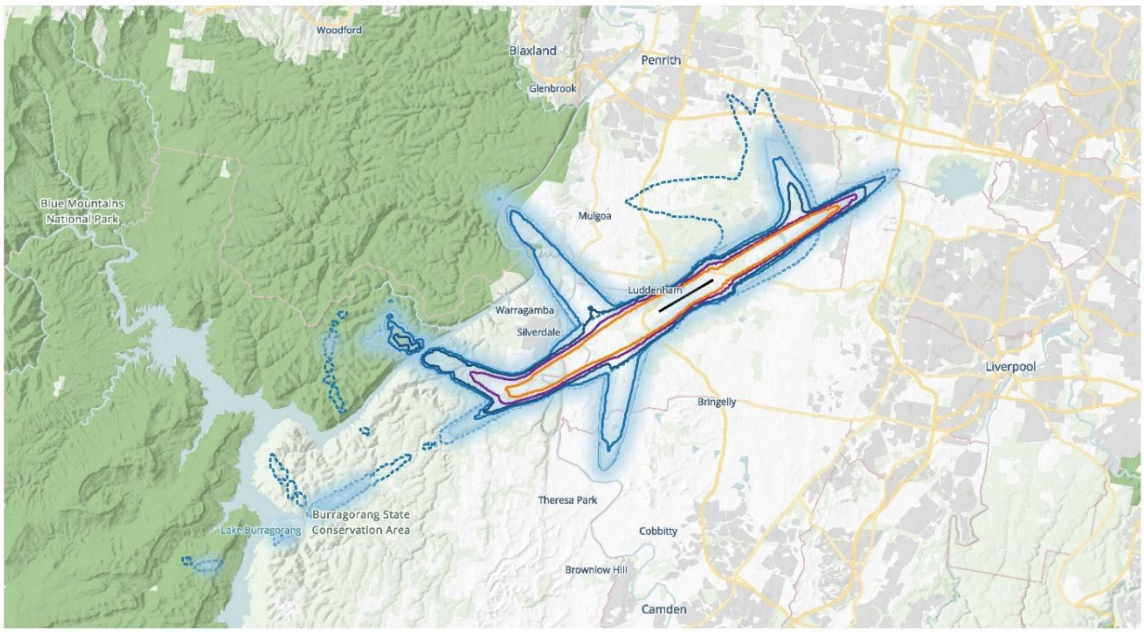
N 0 5 10 km



PAL 3 (2055)
N70 - 24 Hours
Scenario 3

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

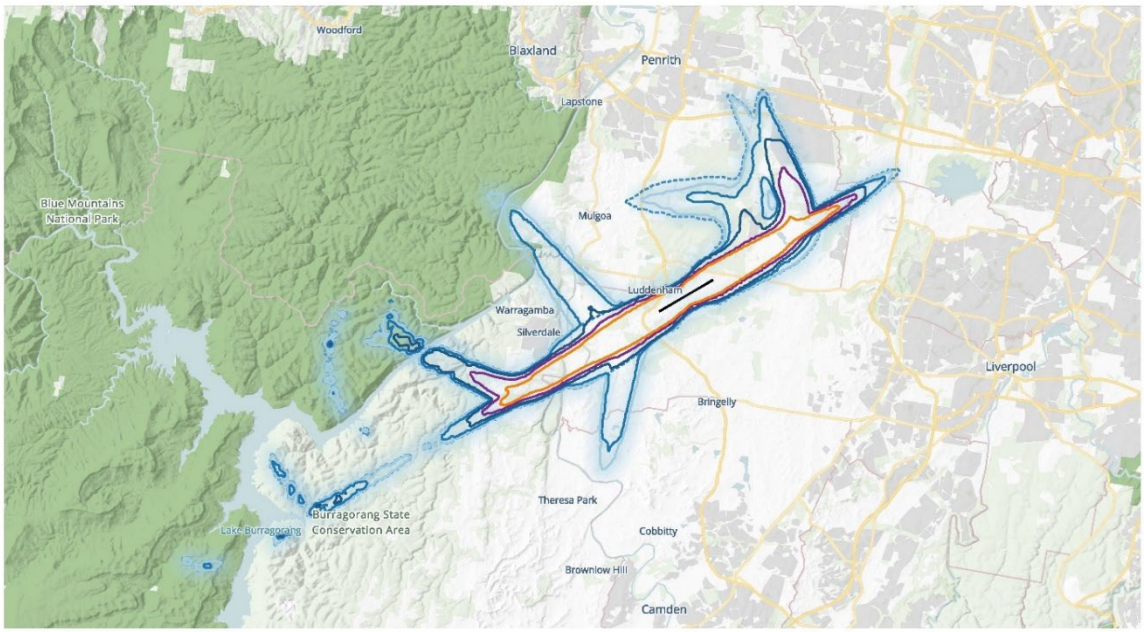
N 0 5 10 km



PAL 3 (2055)
N70 - 24 Hours
Scenario 4

LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

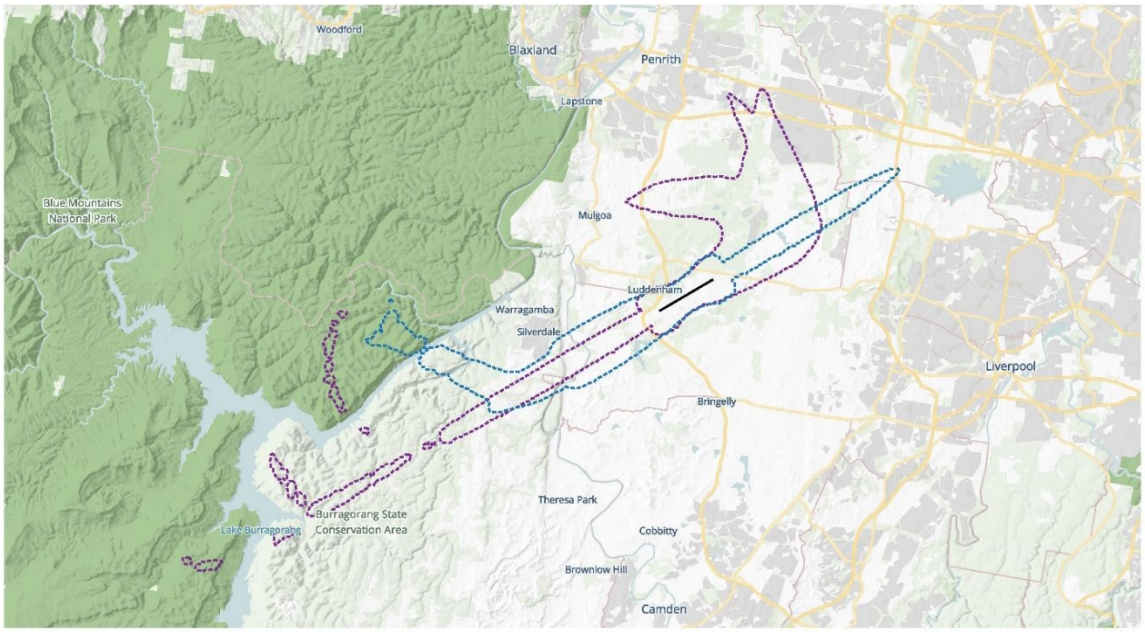
N 0 5 10 km



PAL 3 (2055)
N70 - 24 Hours
Composite Scenario

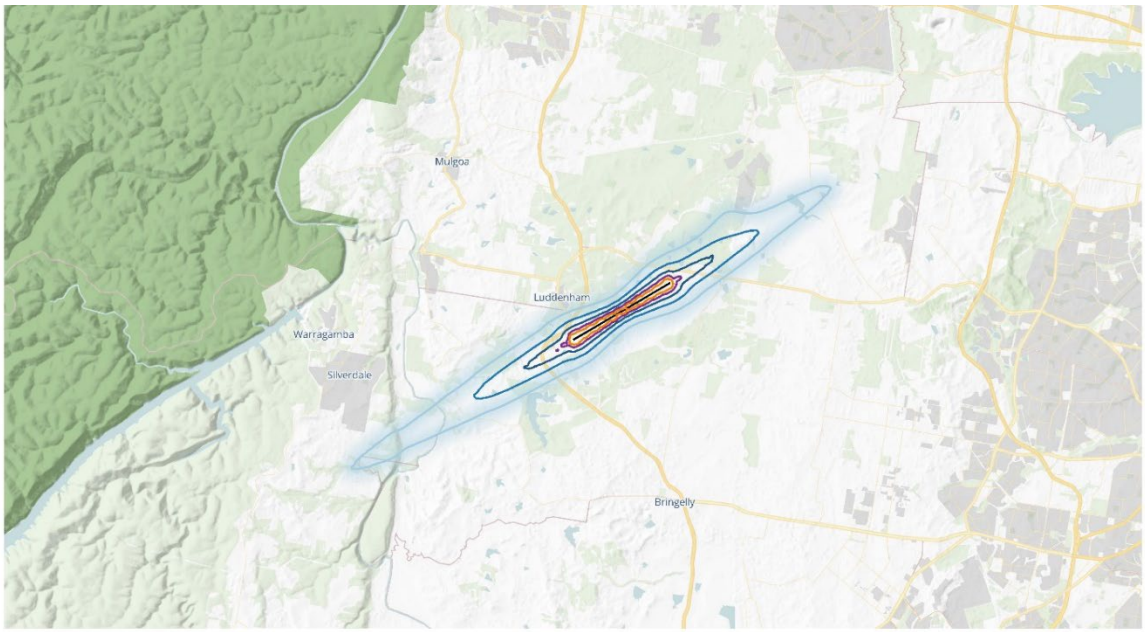
LEGEND
100+ Movements
50-99 Movements
20-49 Movements
10-19 Movements
5-9 Movements
5-9 Movements
5 Movements (Unidirectional)
Runway 05-23

N 0 5 10 km



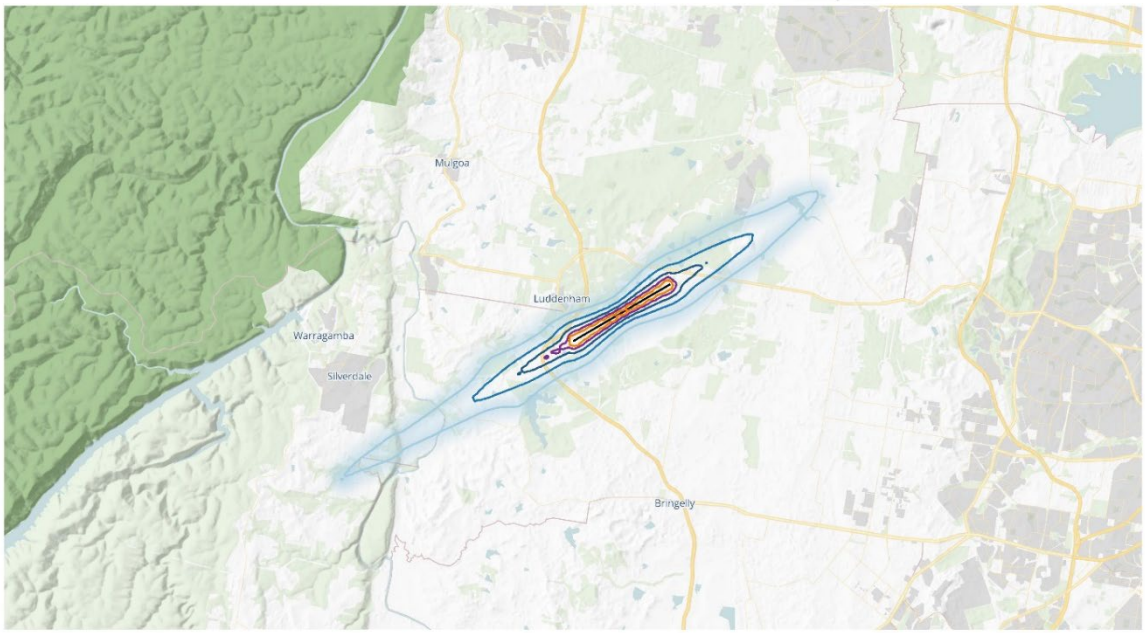
PAL 3 (2055)
N70 - 24 Hours
Unidirectional Flows

C6 ANEC contours



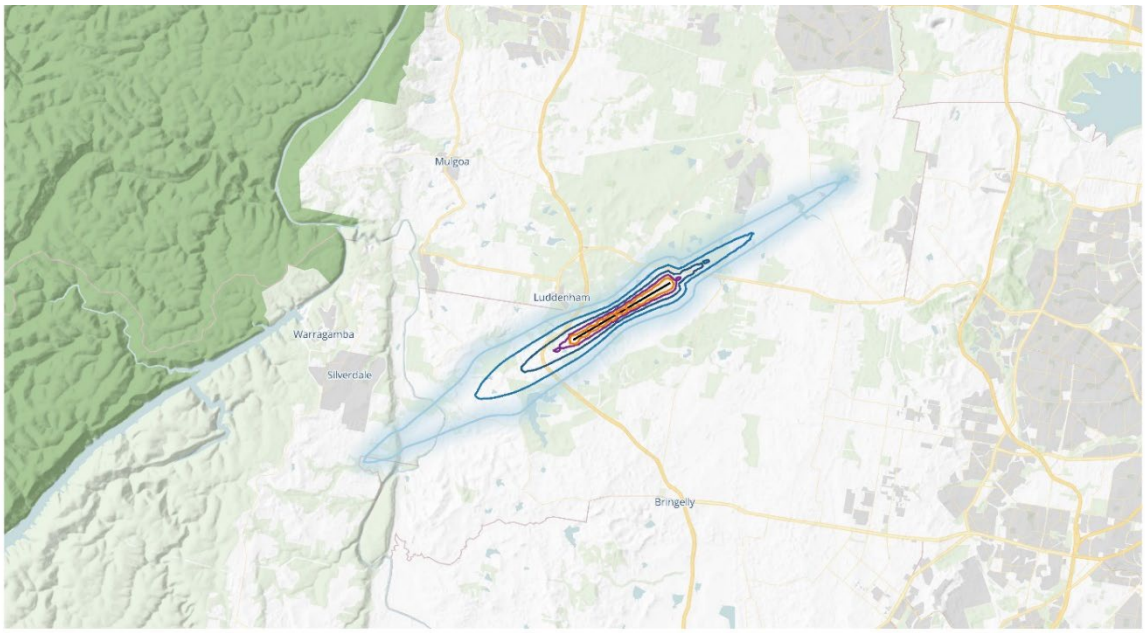
PAL 1 (2033)
ANEC
Scenario 1

LEGEND
40
35
30
25
20
Runway 05-23
N
0 3 6 km

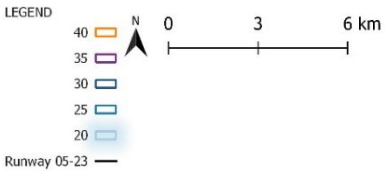


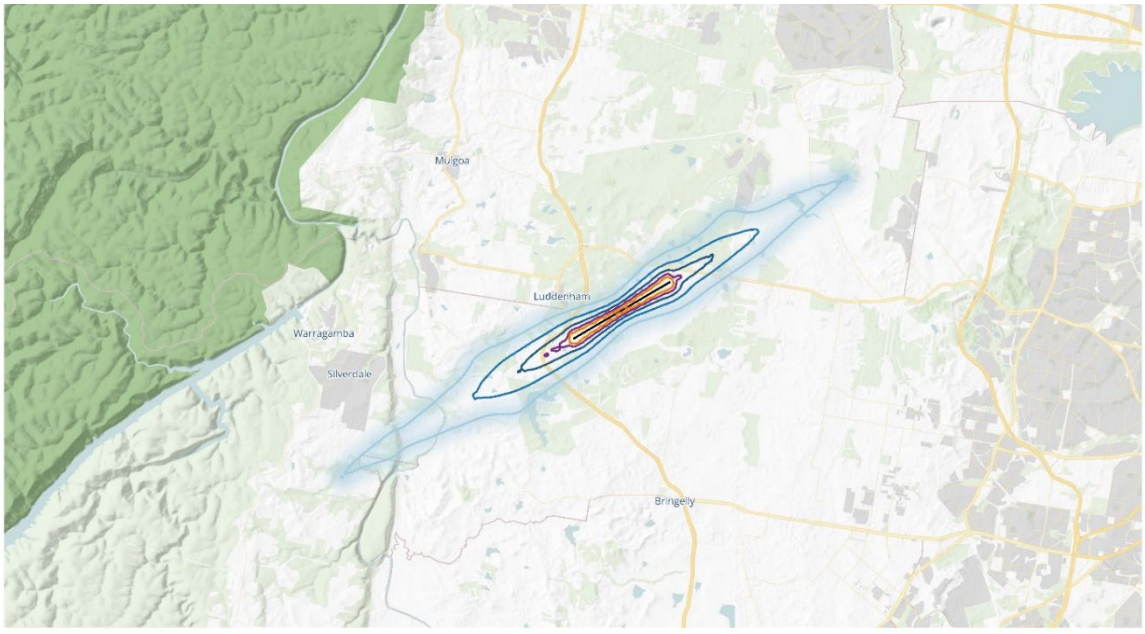
PAL 1 (2033)
ANEC
Scenario 3

LEGEND
40
35
30
25
20
Runway 05-23
N
0 3 6 km

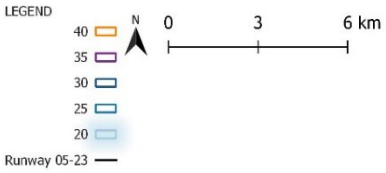


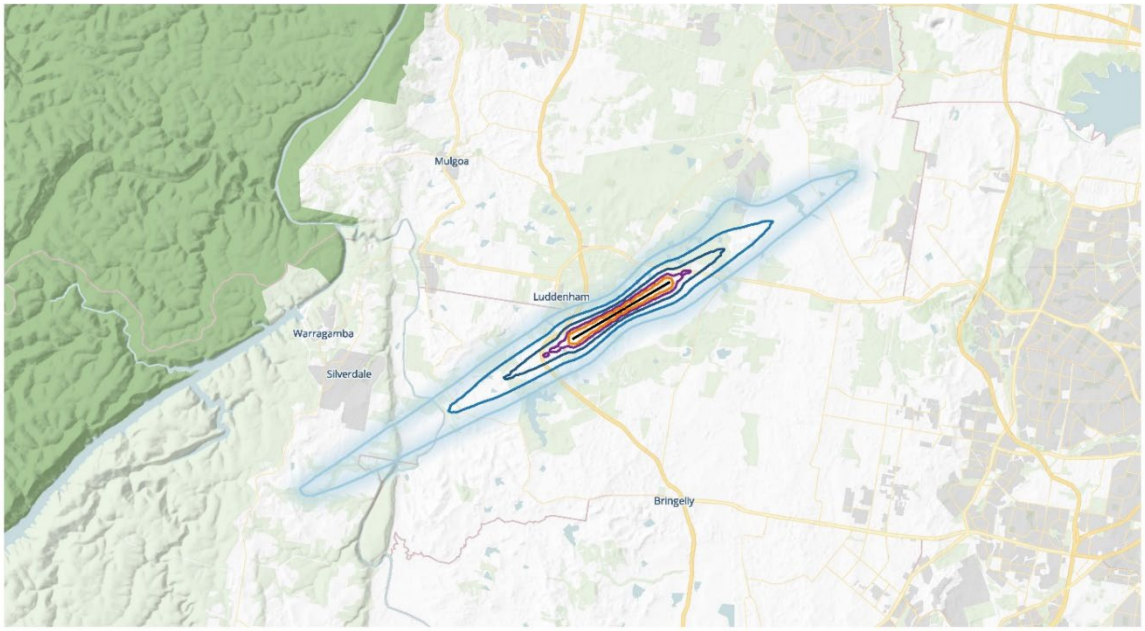
PAL 1 (2033)
ANEC
Scenario 4



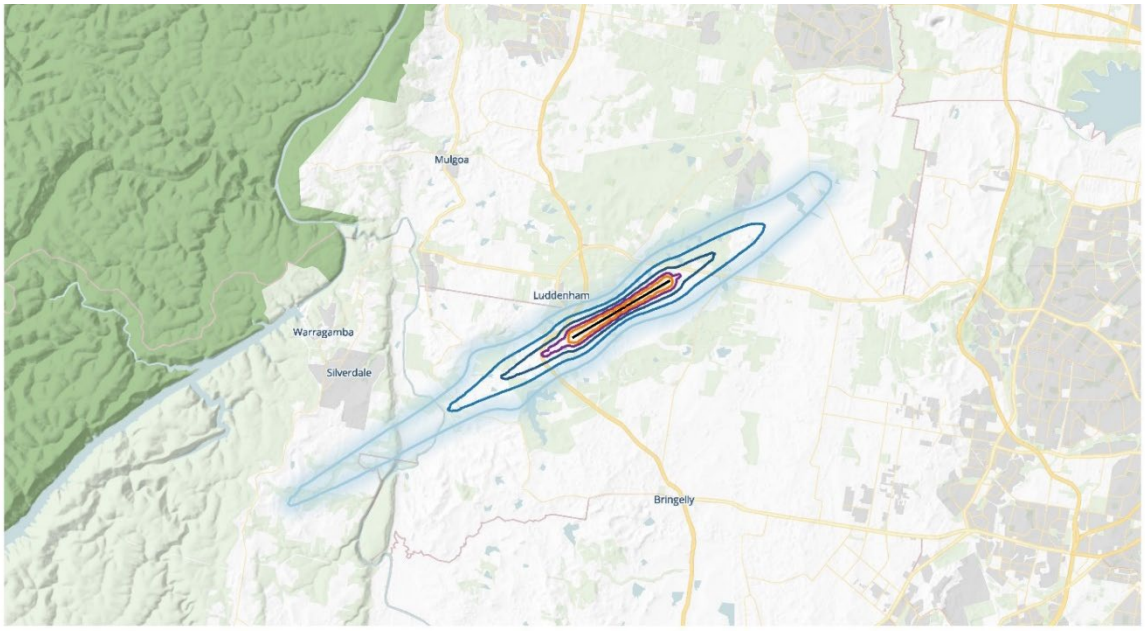


PAL 1 (2033)
ANEC
Composite Scenario

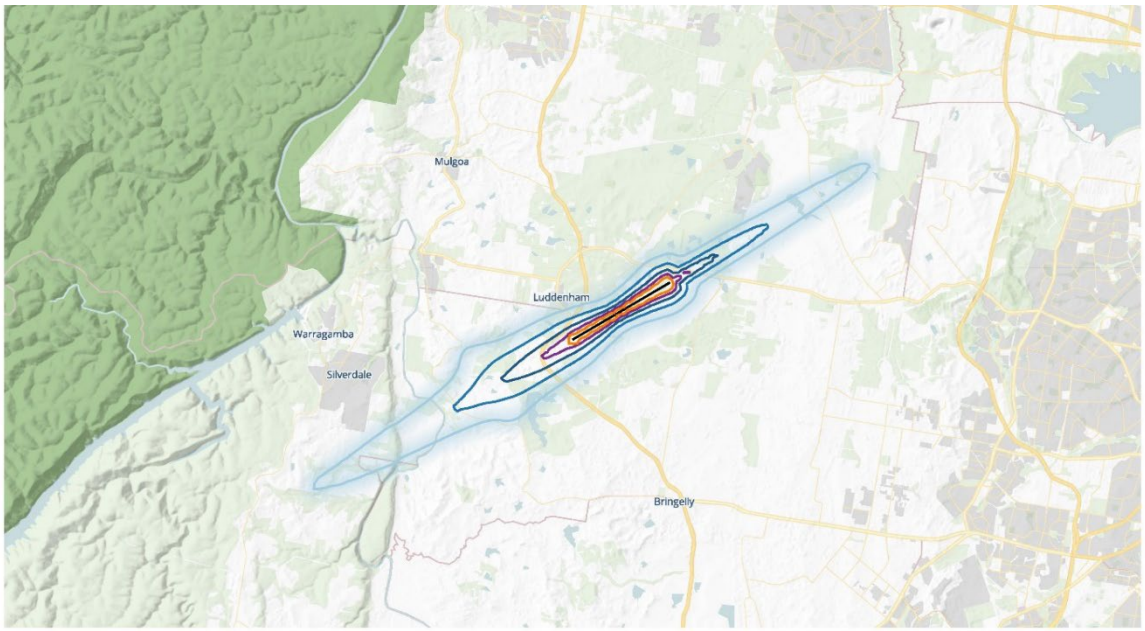




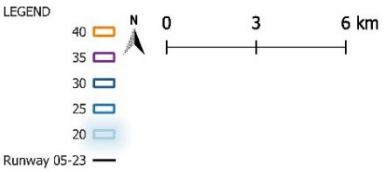
PAL 2 (2040)
ANEC
Scenario 1

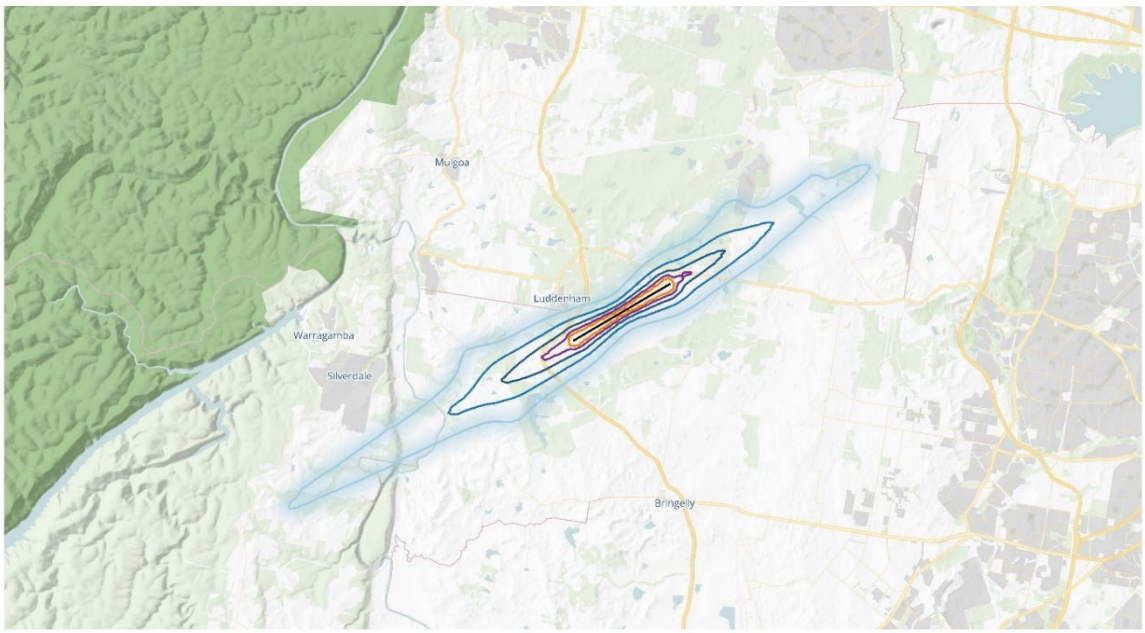


PAL 2 (2040)
ANEC
Scenario 3

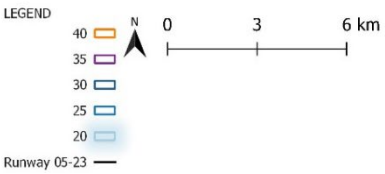


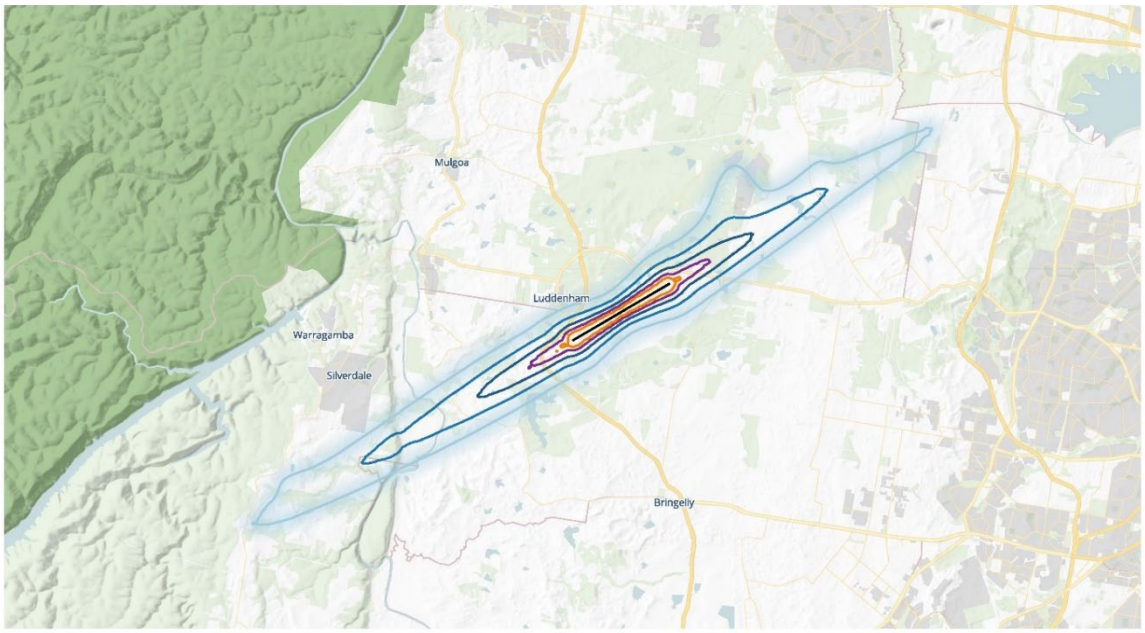
PAL 2 (2040)
ANEC
Scenario 4



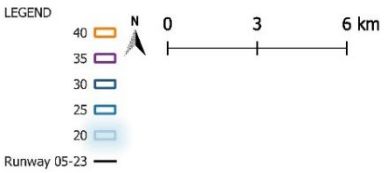


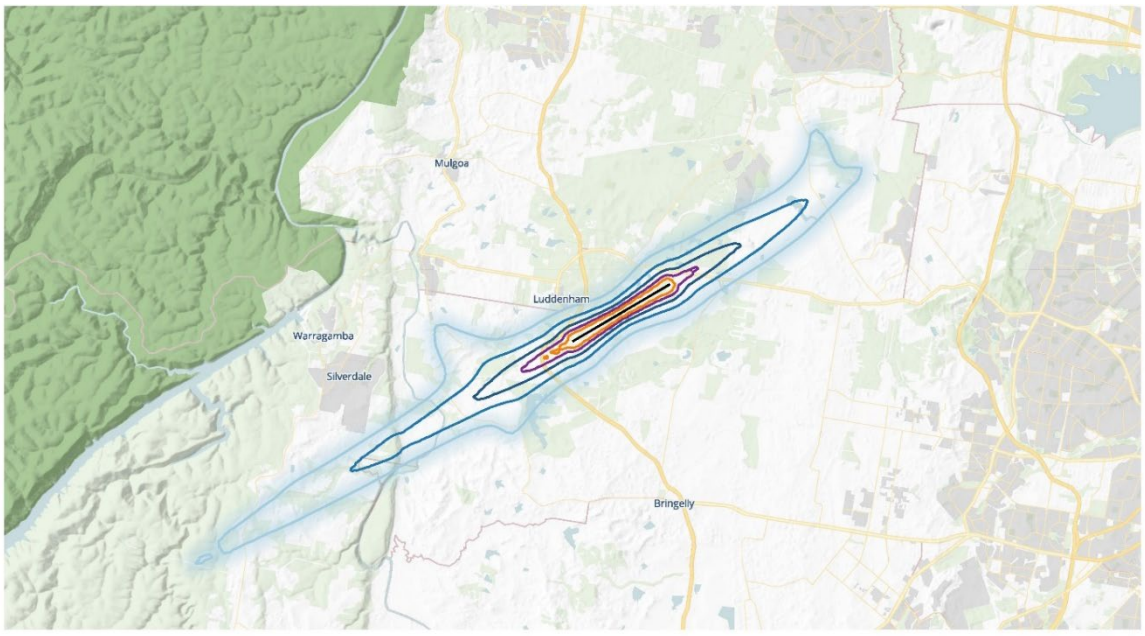
PAL 2 (2040)
ANEC
Composite Scenario



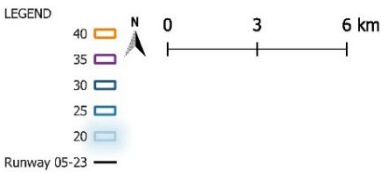


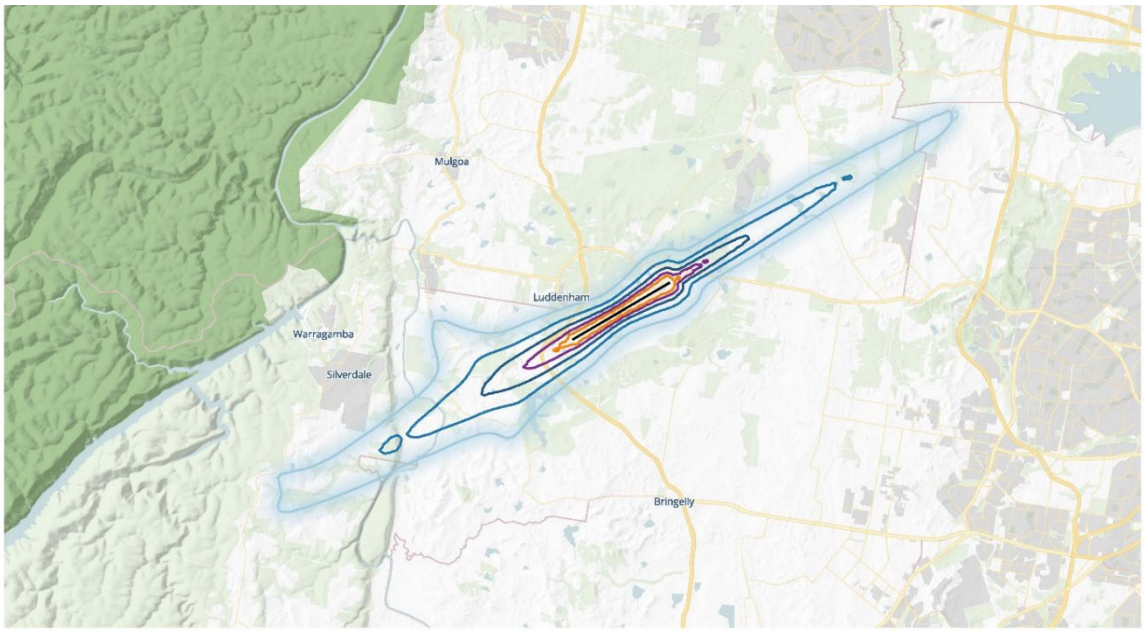
PAL 3 (2055)
ANEC
Scenario 1



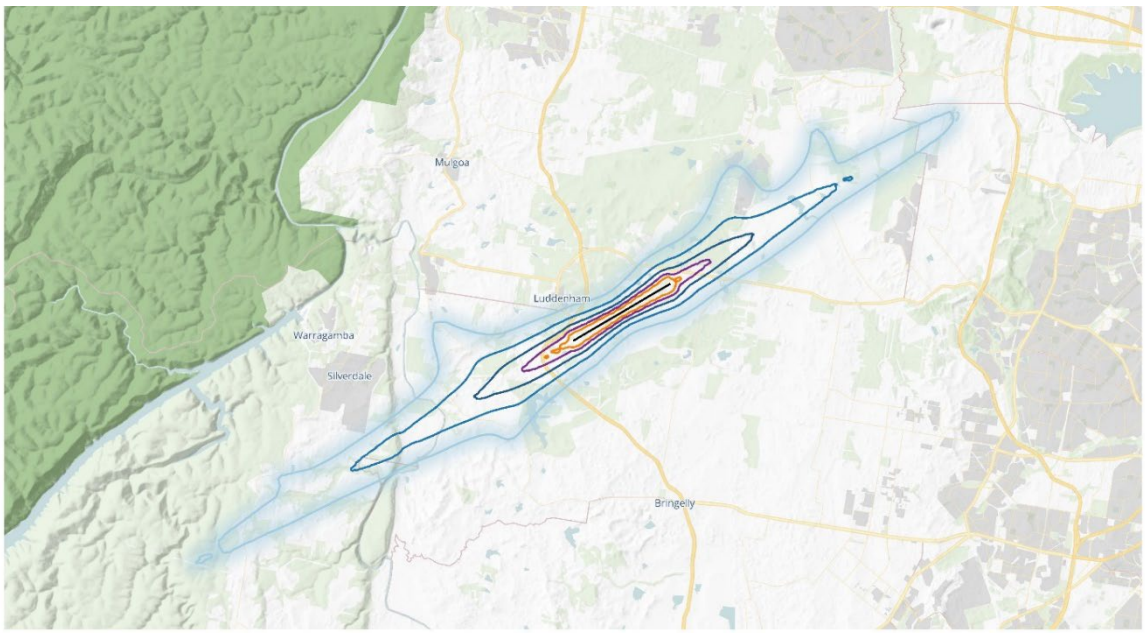


PAL 3 (2055)
ANEC
Scenario 3





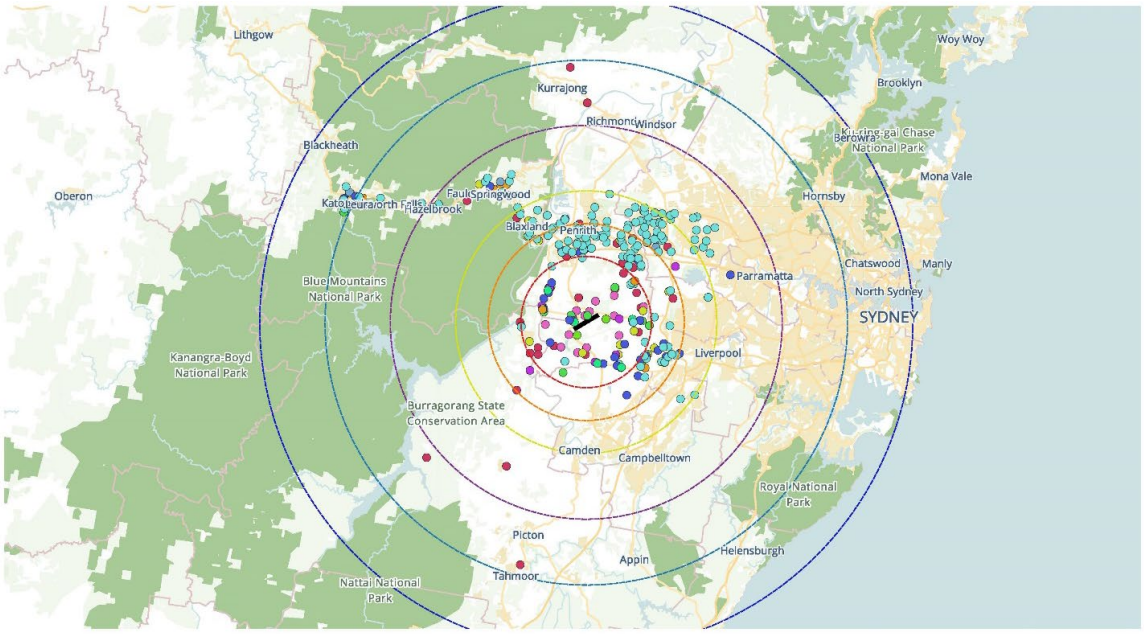
PAL 3 (2055)
ANEC
Scenario 4



PAL 3 (2055)
ANEC
Composite Scenario

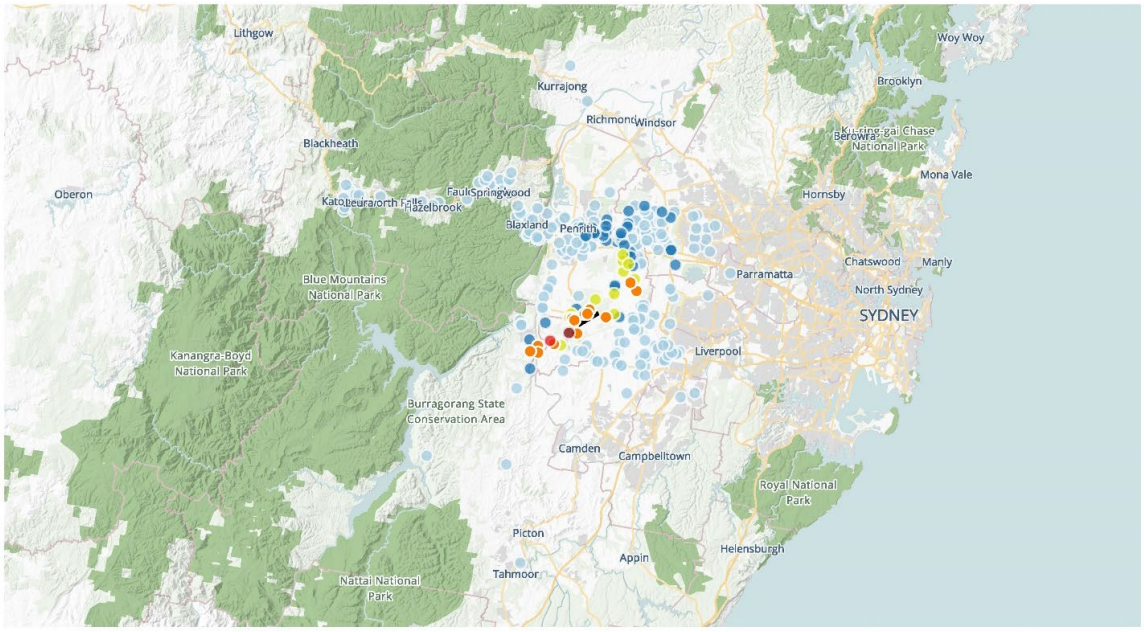
Appendix D

Noise sensitive receptors

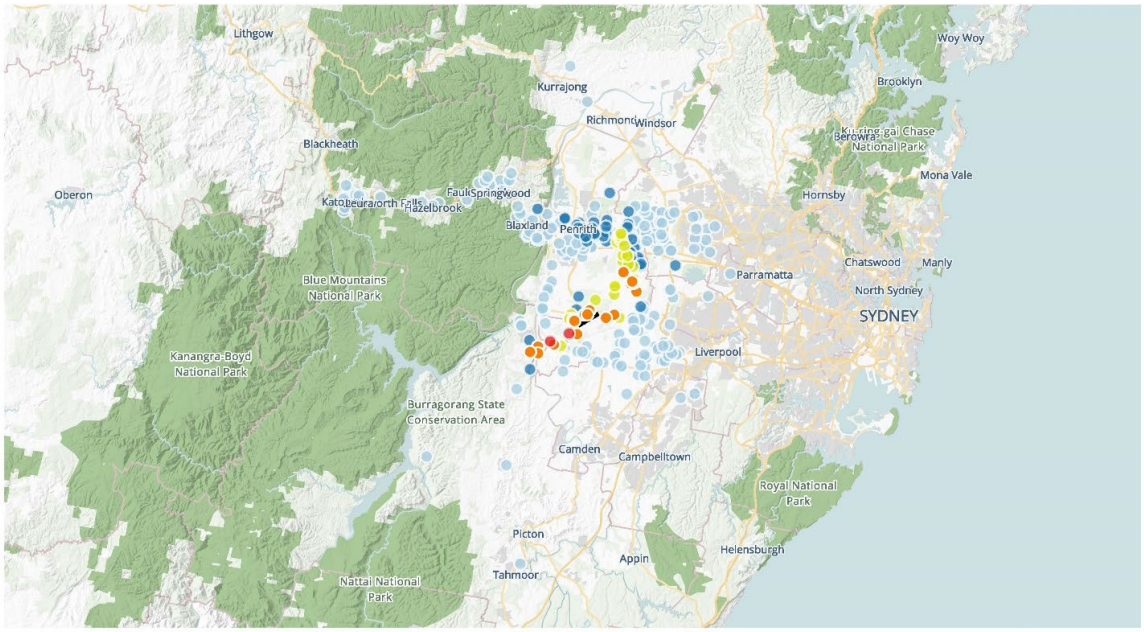


Noise Sensitive Receptors and
Noise Monitoring Terminals

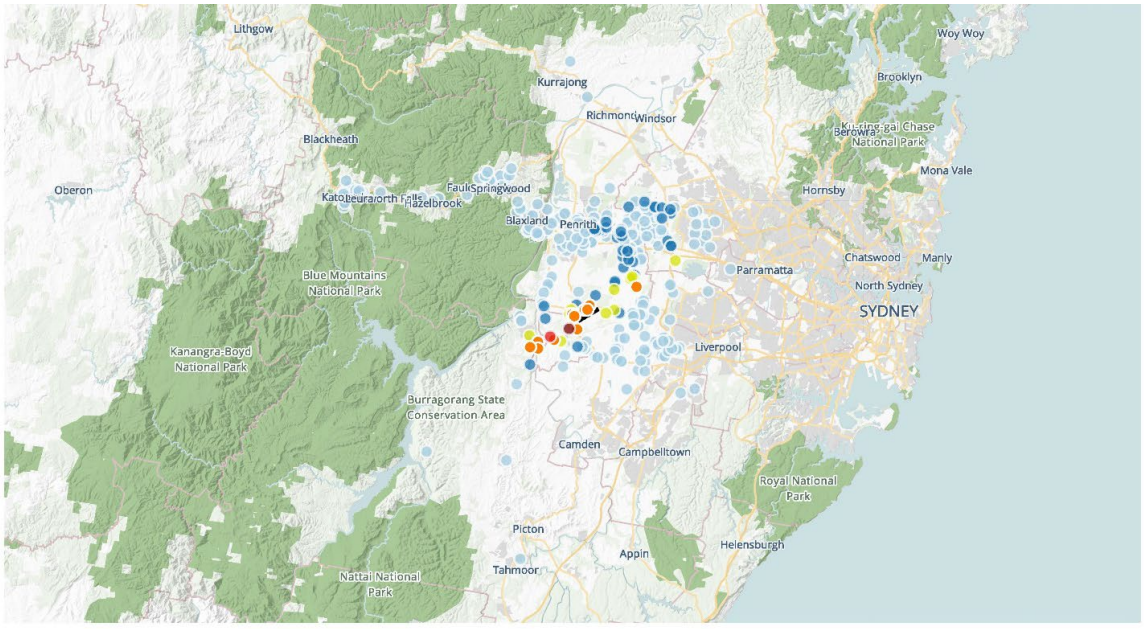
D1 Average Sound Level



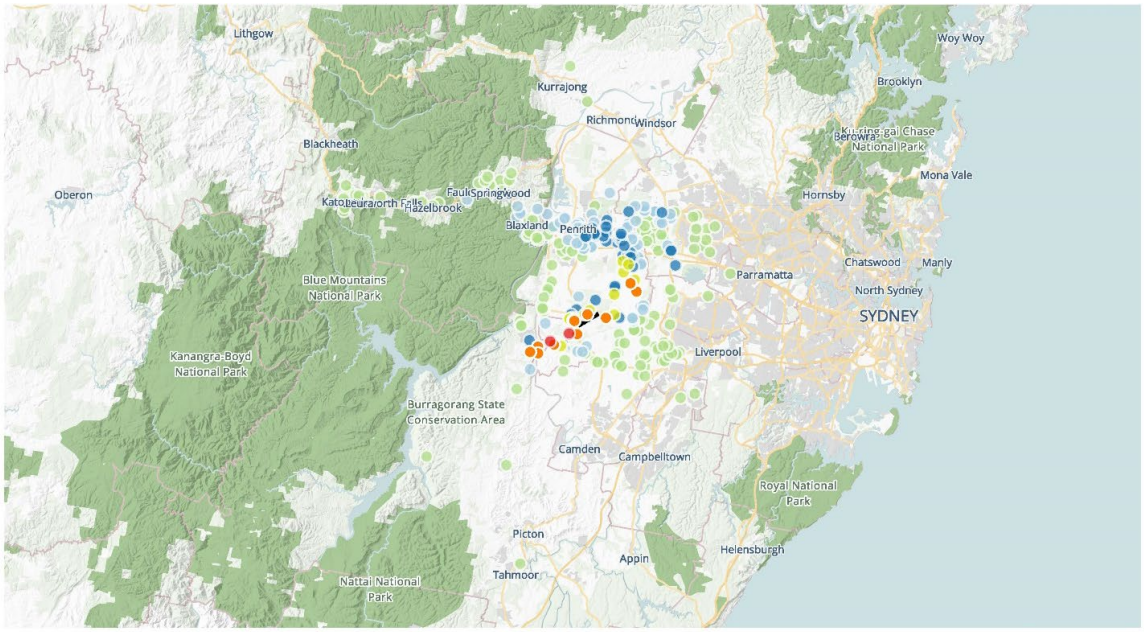
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 1 - PAL 1 (2033)



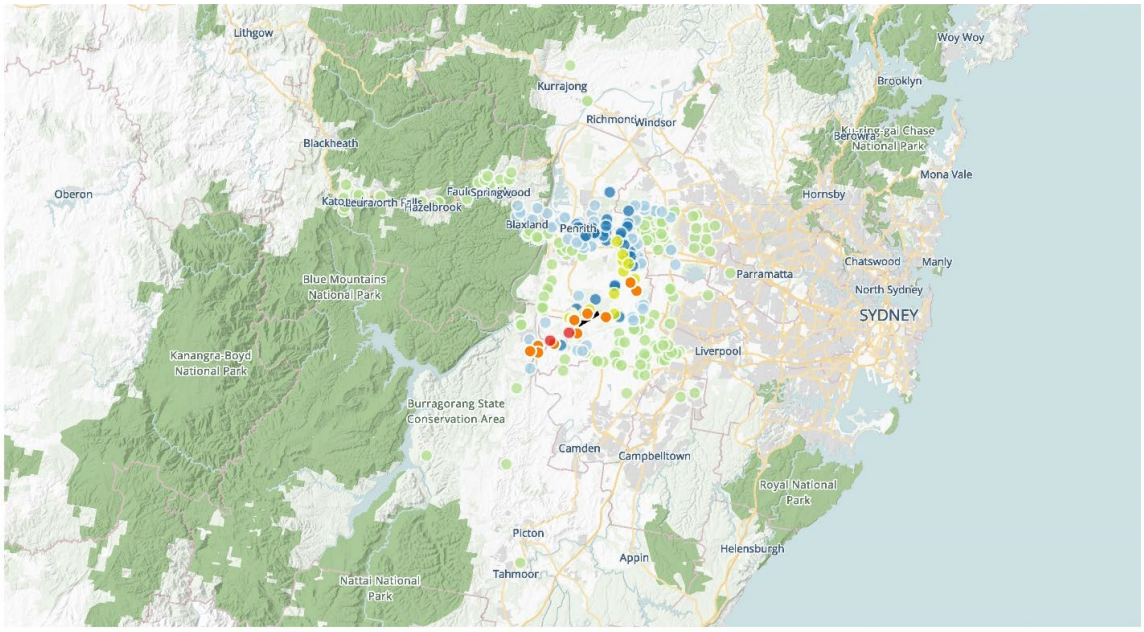
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 3 - PAL 1 (2033)



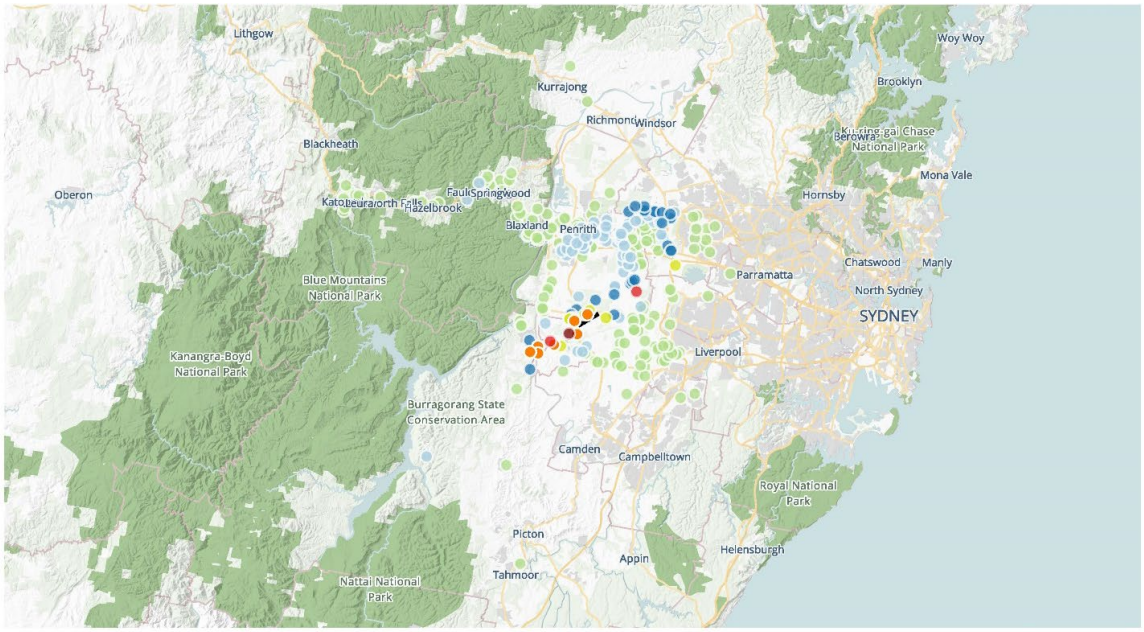
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 4 - PAL 1 (2033)



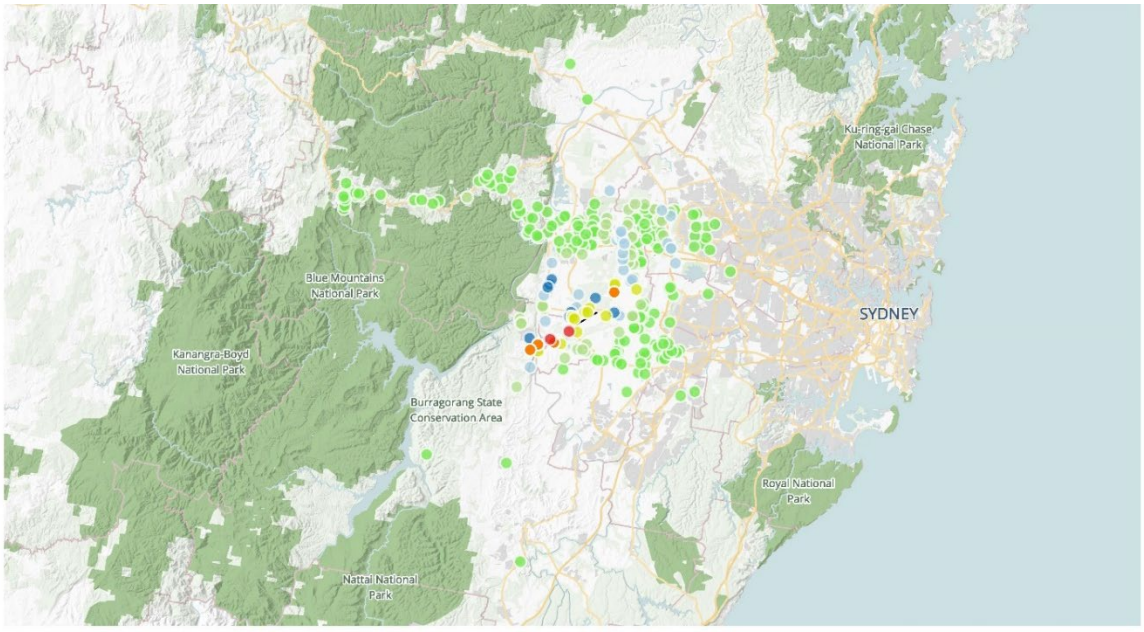
Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 1 - PAL 1 (2033)



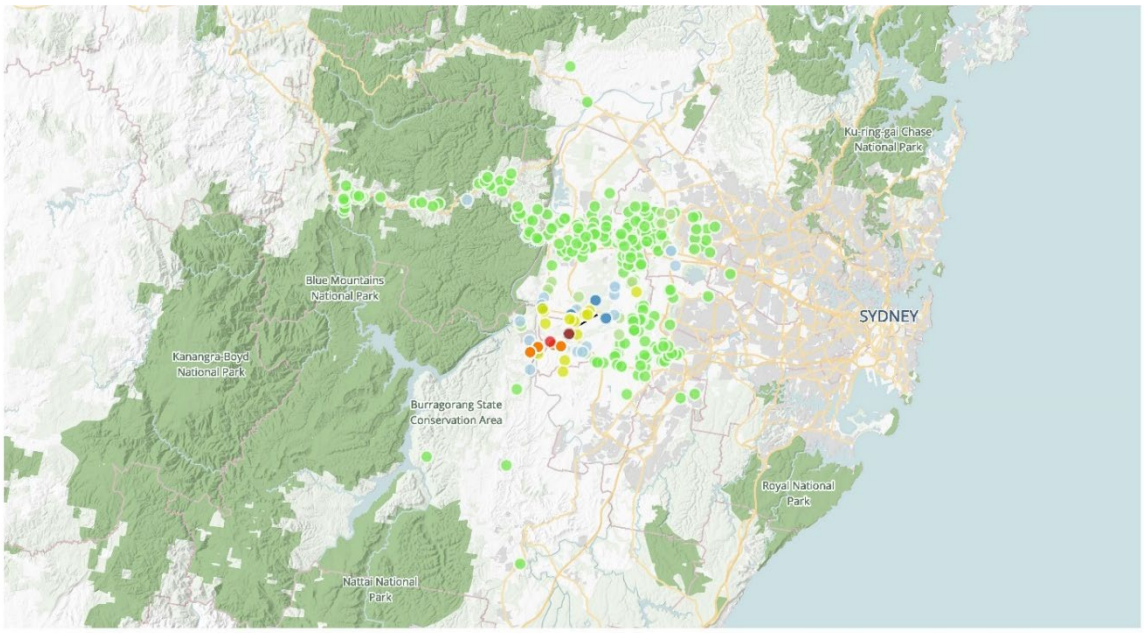
Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 3 - PAL 1 (2033)



Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 4 - PAL 1 (2033)



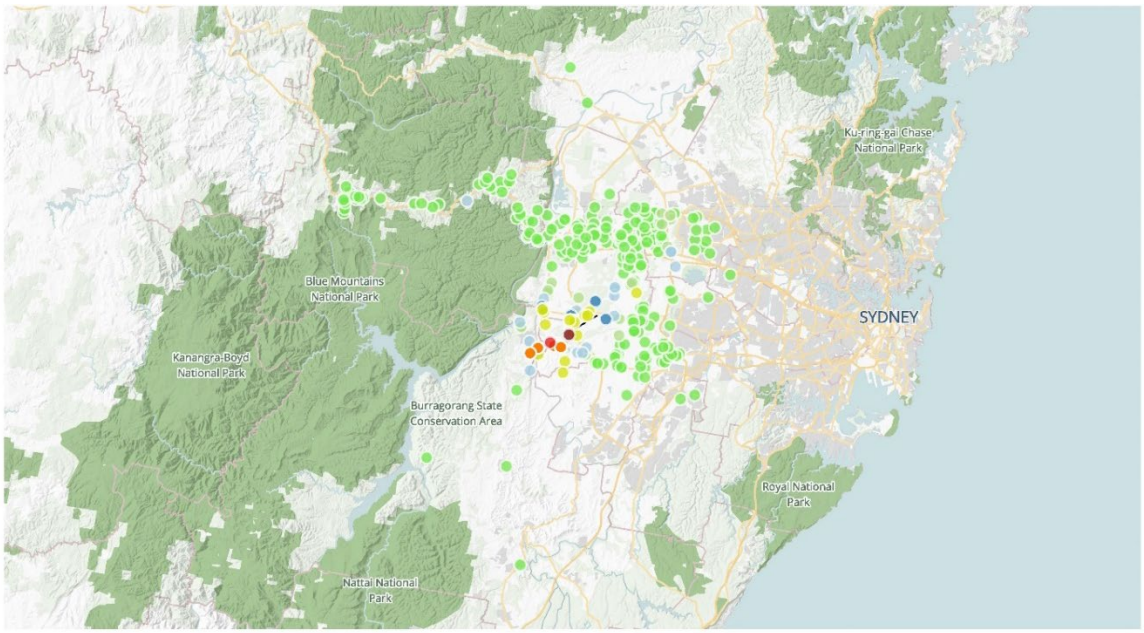
Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 1 - PAL1 (2033)



Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 3 - PAL1 (2033)

LEGEND (dB(A))
0 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05/23

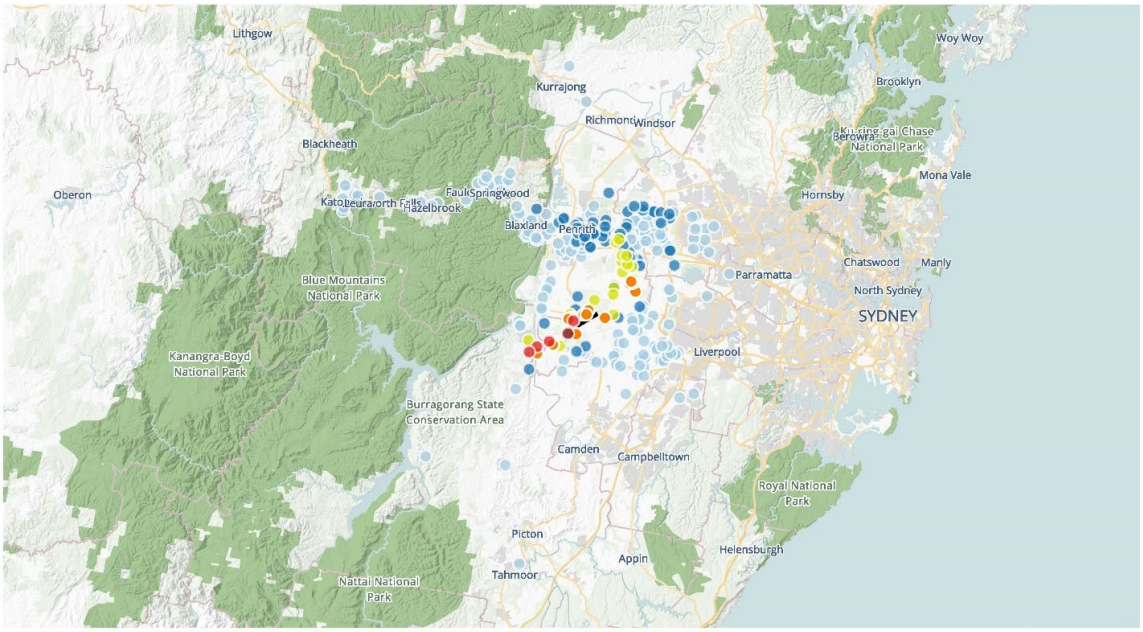
N 0 10 20 km



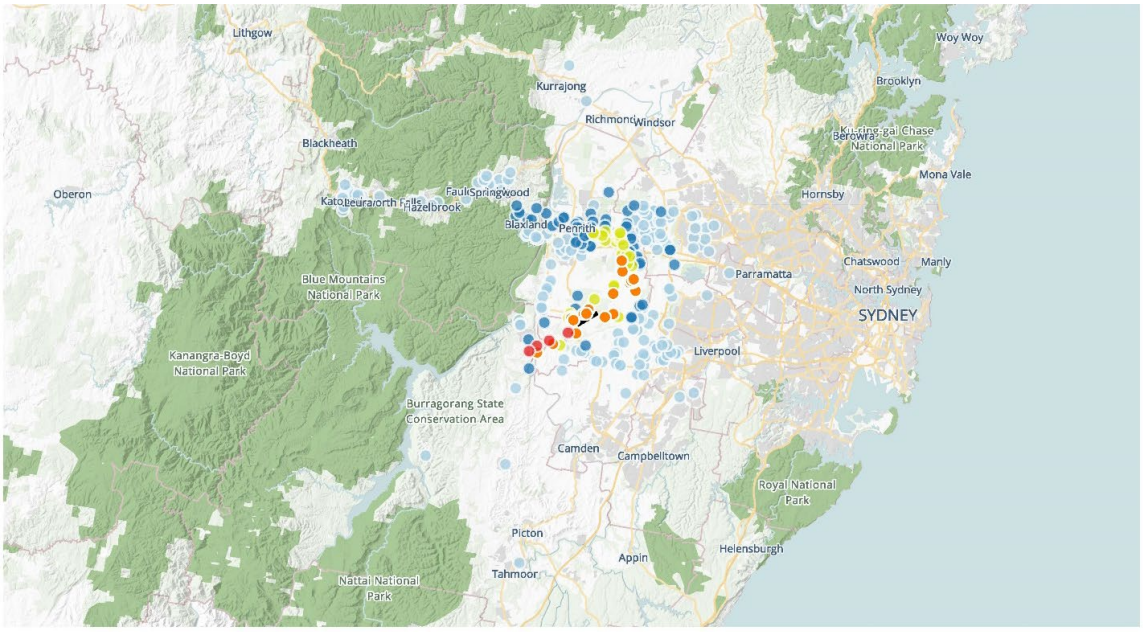
Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 4 - PAL1 (2033)

LEGEND (dB(A))
0 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05/23

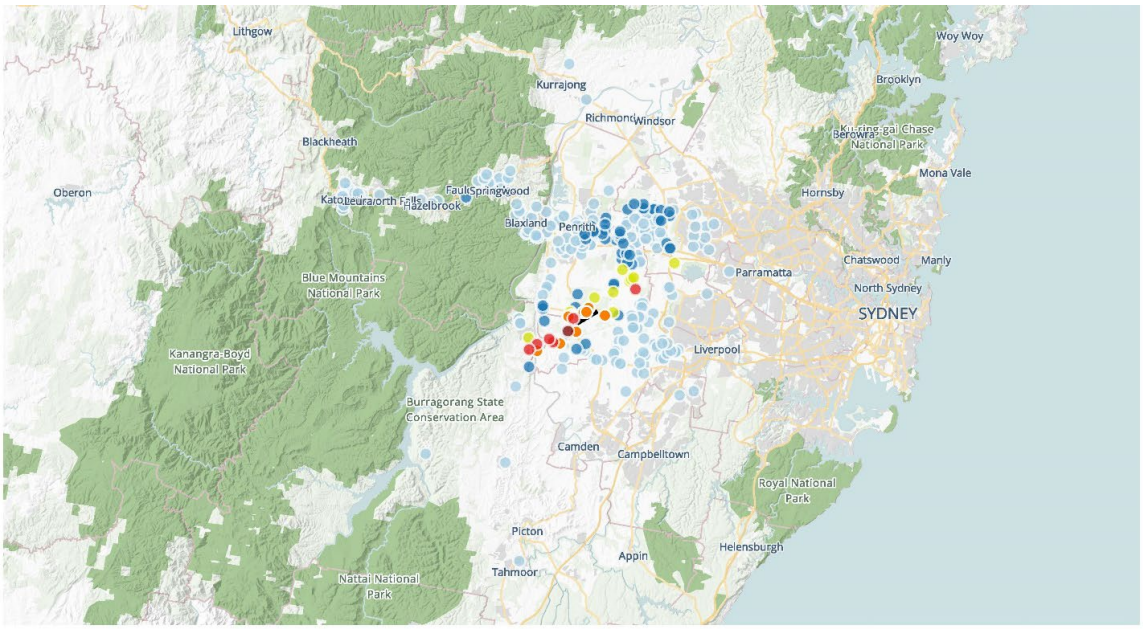
N 0 10 20 km



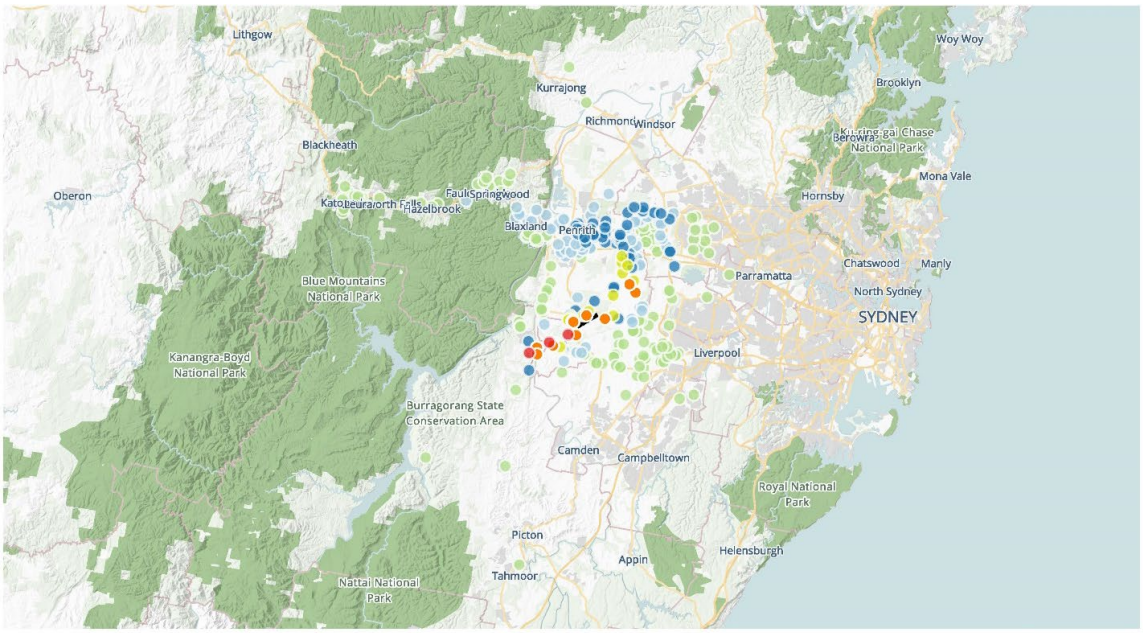
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 1 - PAL 2 (2040)



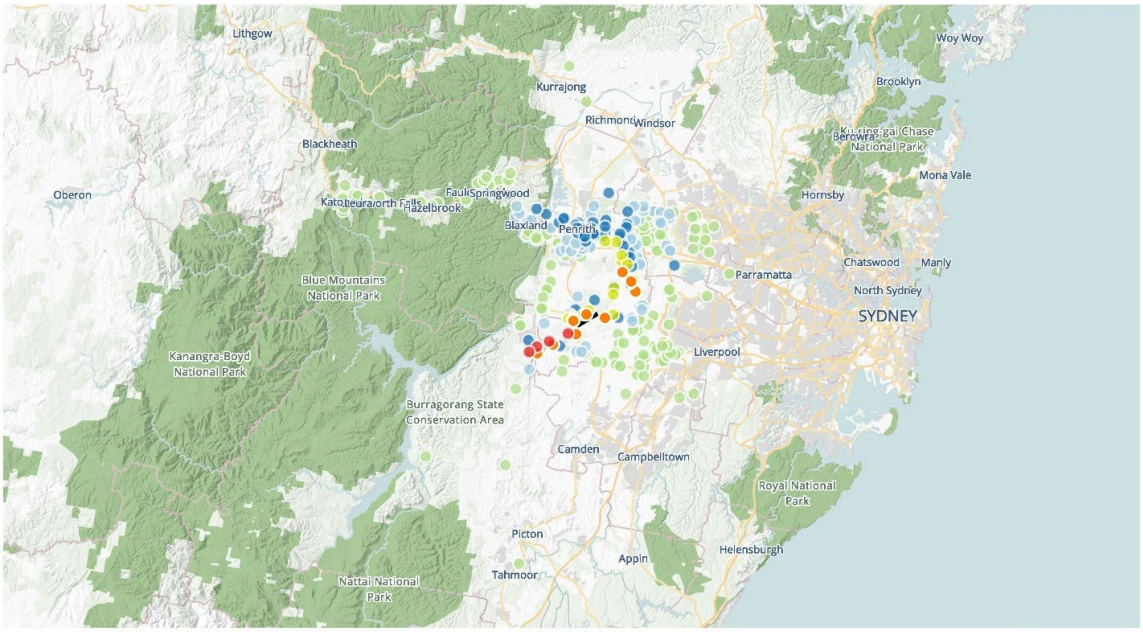
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 3 - PAL 2 (2040)



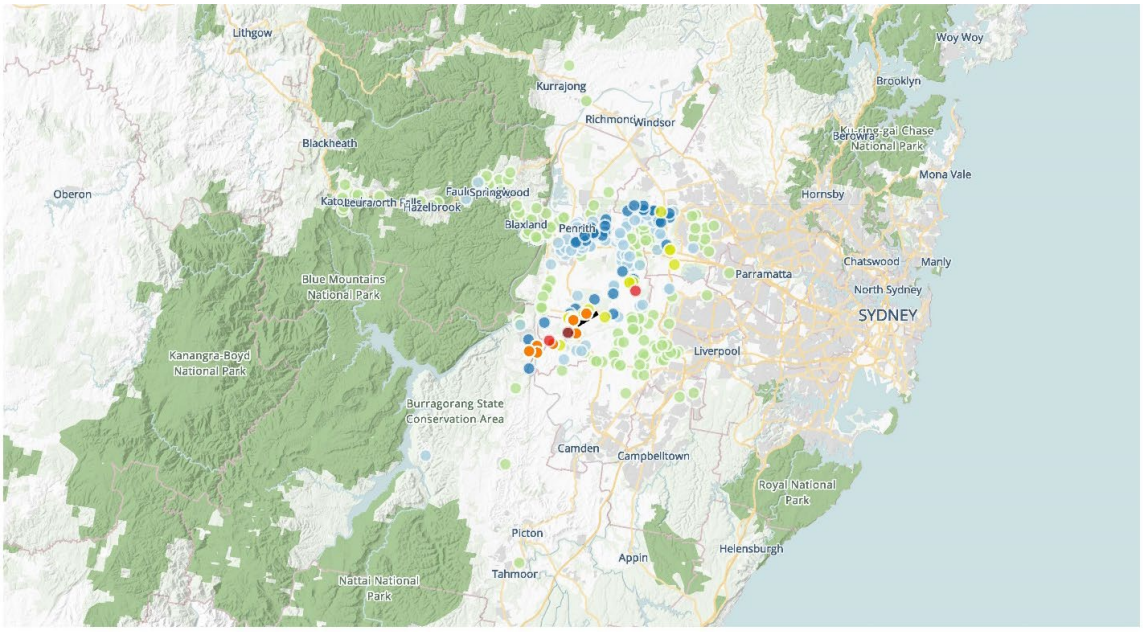
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 4 - PAL 2 (2040)



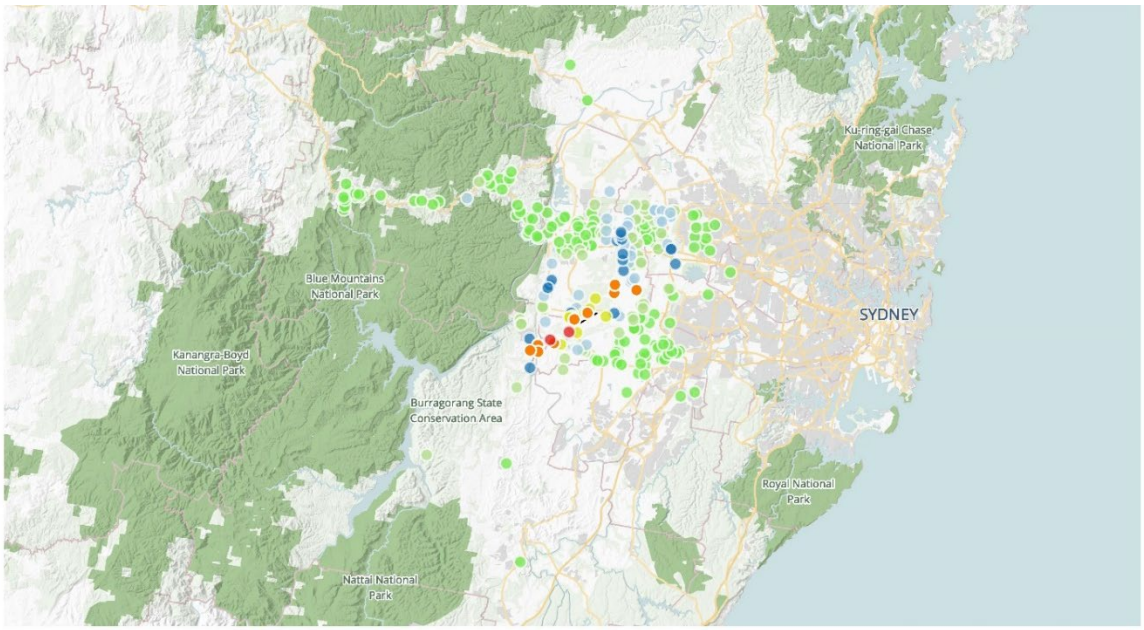
Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 1 - PAL 2 (2040)



Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 3 - PAL 2 (2040)



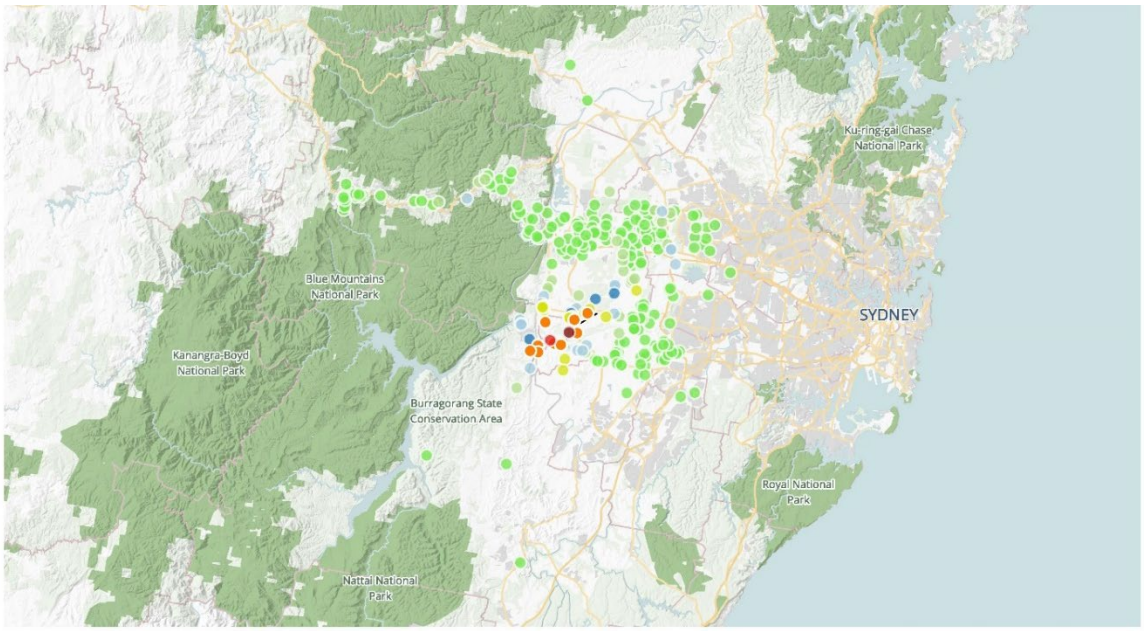
Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 4 - PAL 2 (2040)



Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 1 - PAL2 (2040)

LEGEND (dB(A))
0 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
Runway 05/23

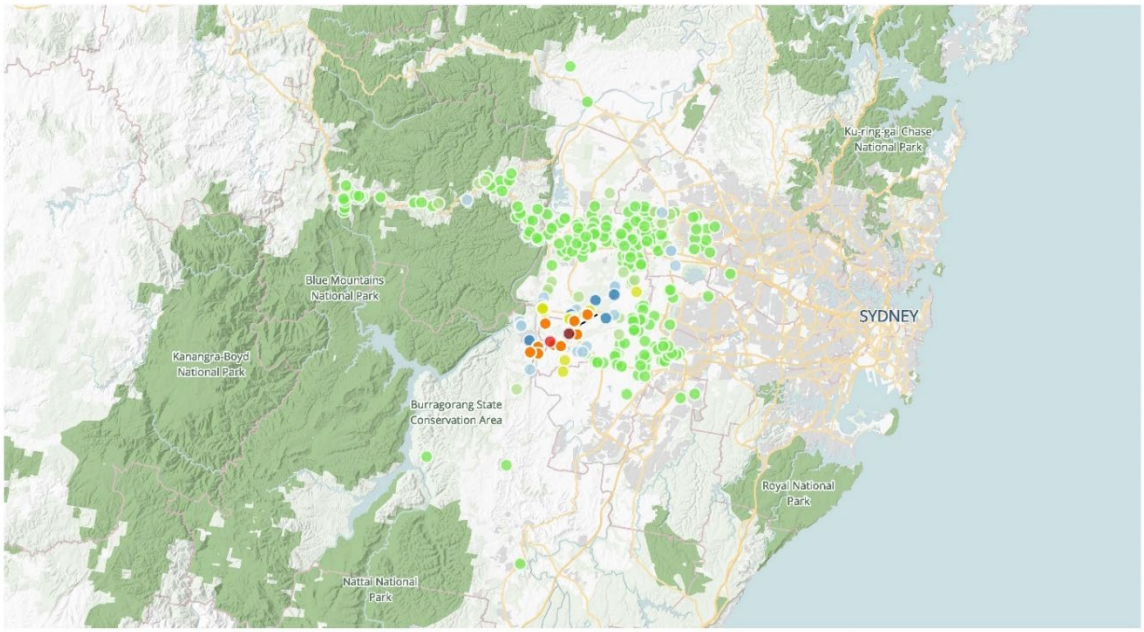
N 0 10 20 km



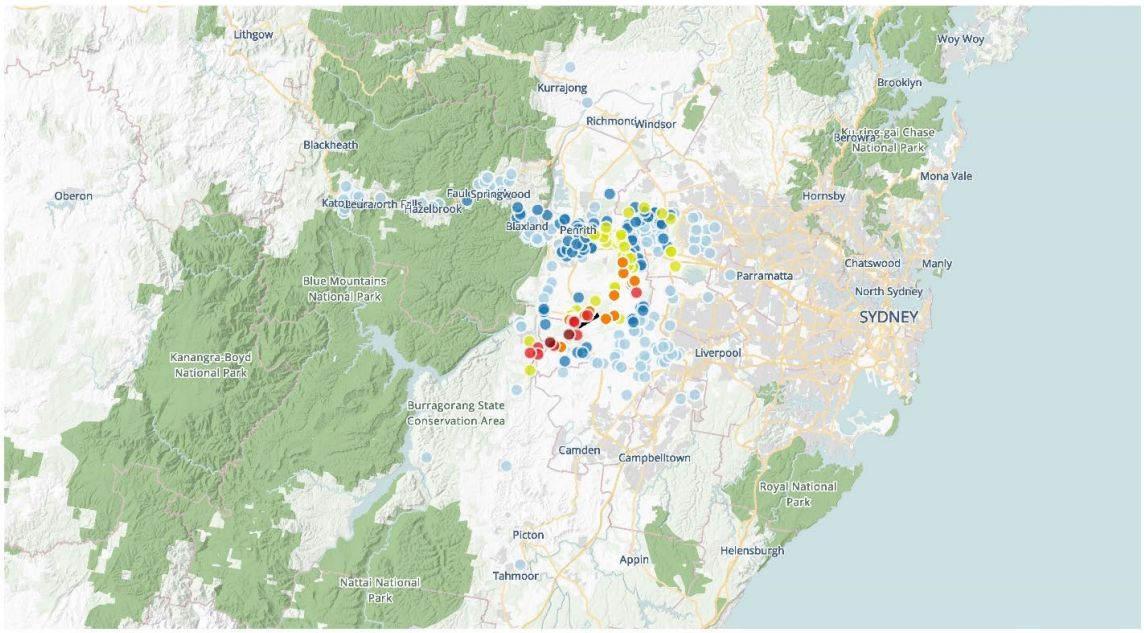
Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 3 - PAL2 (2040)

LEGEND (dB(A))
0 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05/23

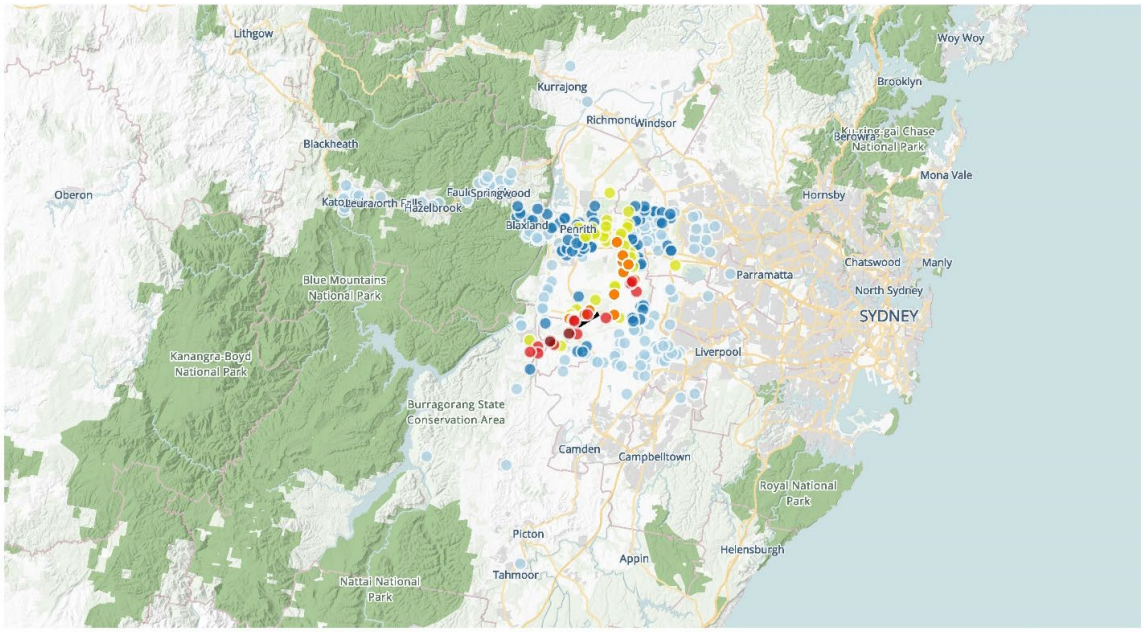
N 0 10 20 km



Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 4 - PAL2 (2040)



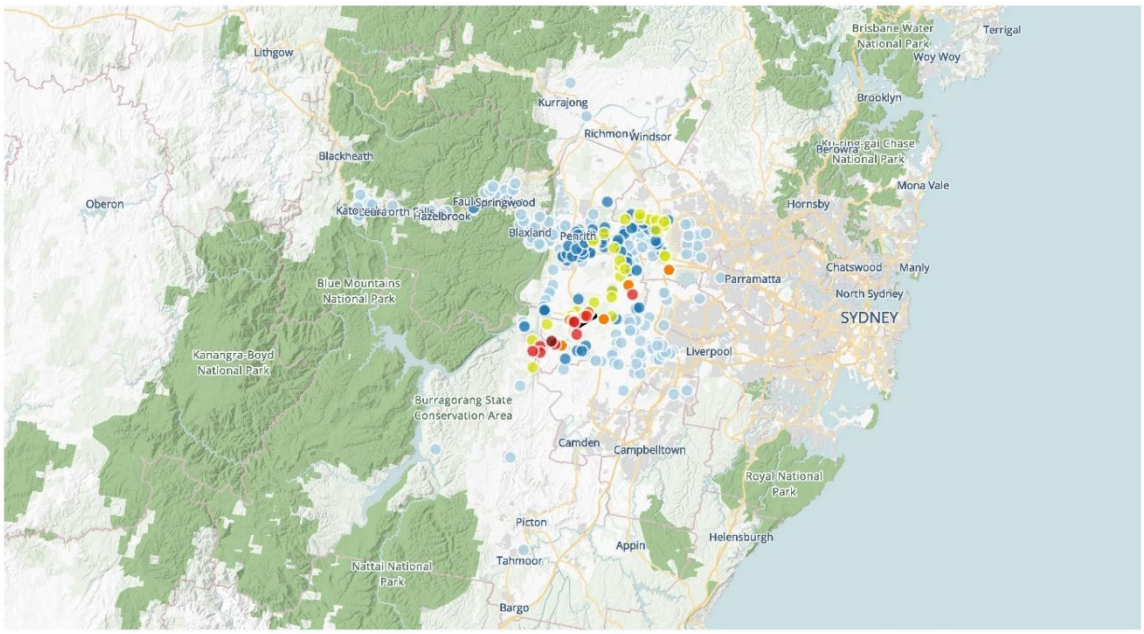
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 1 - PAL 3 (2055)



Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 3 - PAL 3 (2055)

LEGEND (dB(A))
0 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05-23

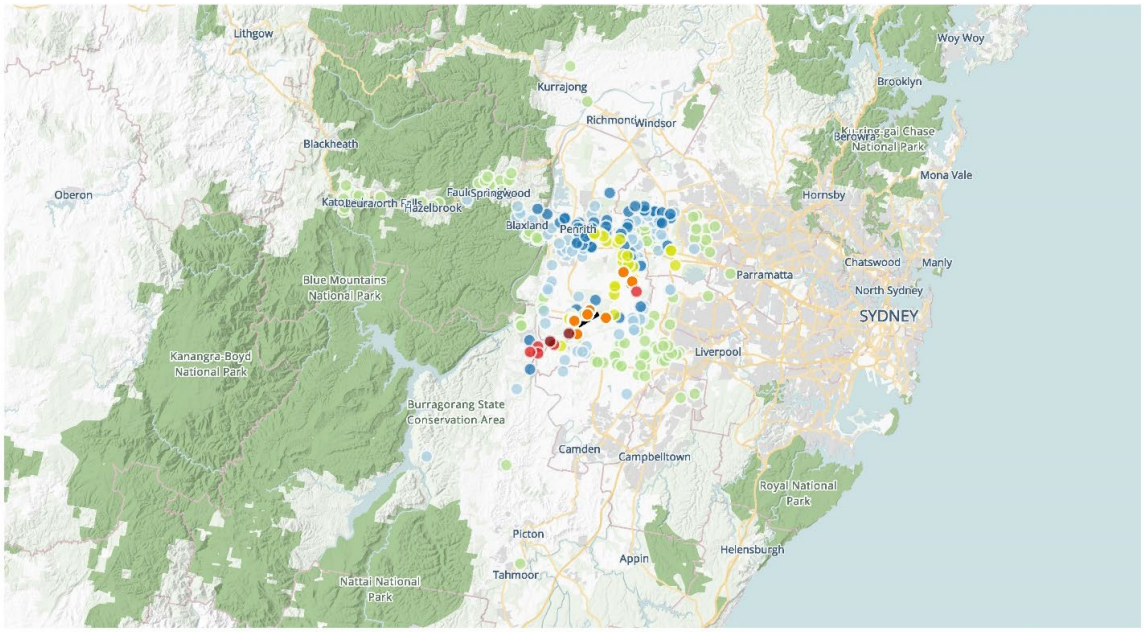
N 0 10 20 km



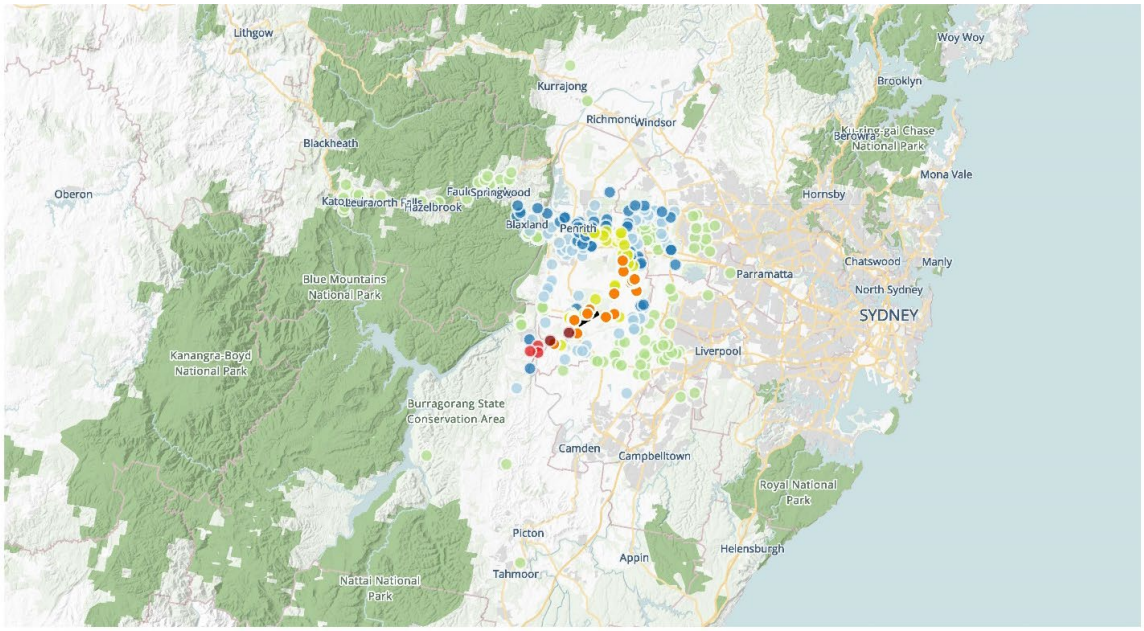
Noise Sensitive Receptors
LAeq - Day (05:30-19:00)
Scenario 4 - PAL 3 (2055)

LEGEND
0 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05-23

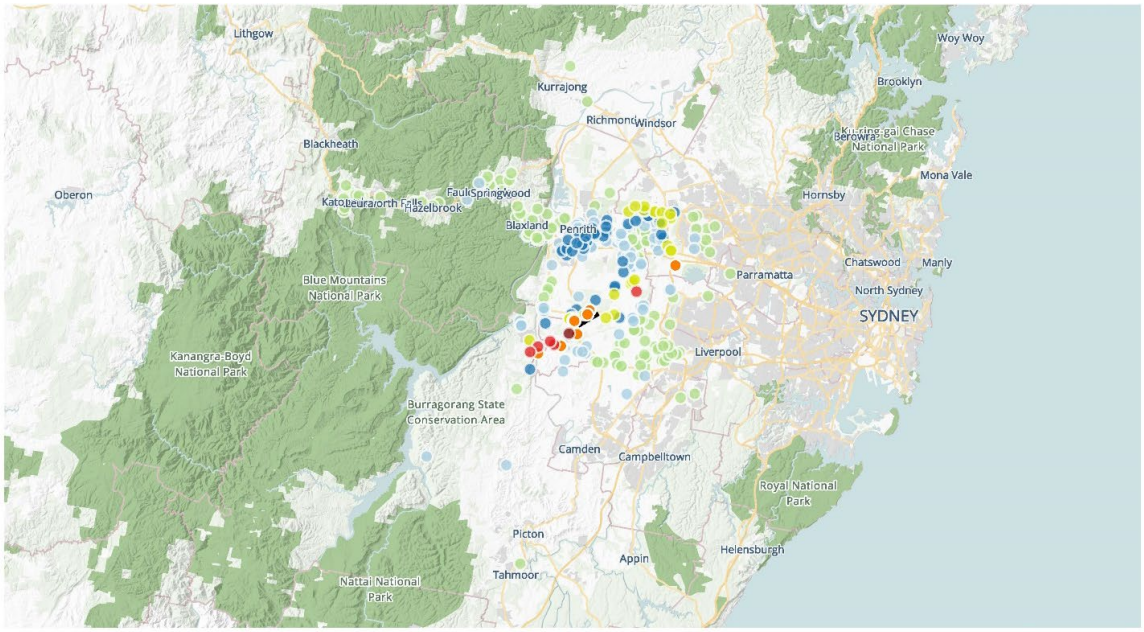
N 0 10 20 km



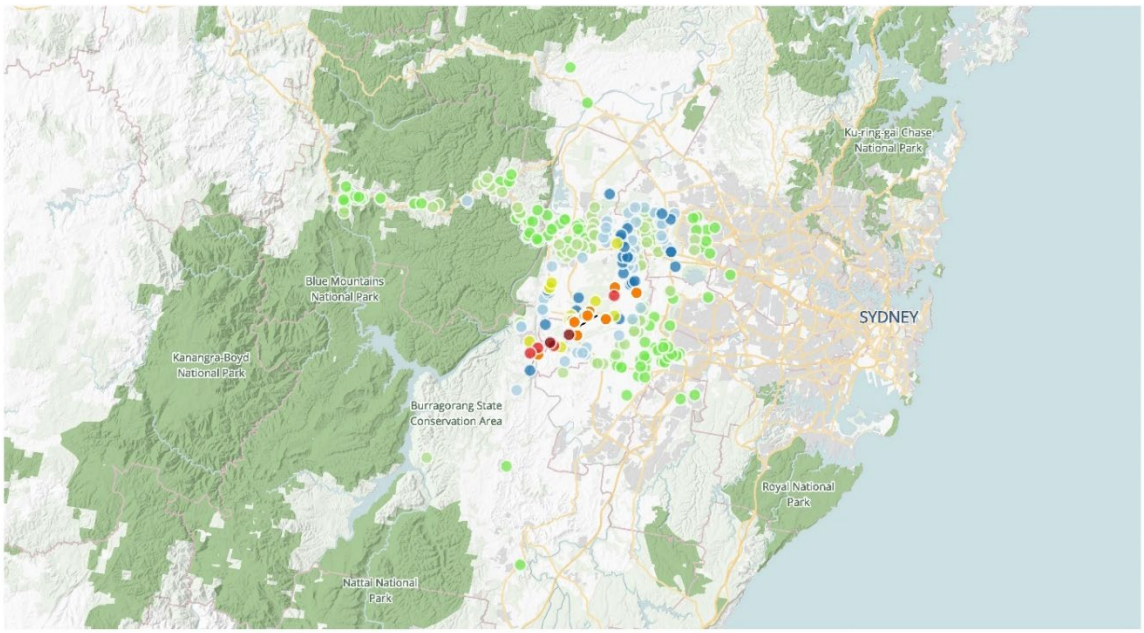
Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 1 - PAL 3 (2055)



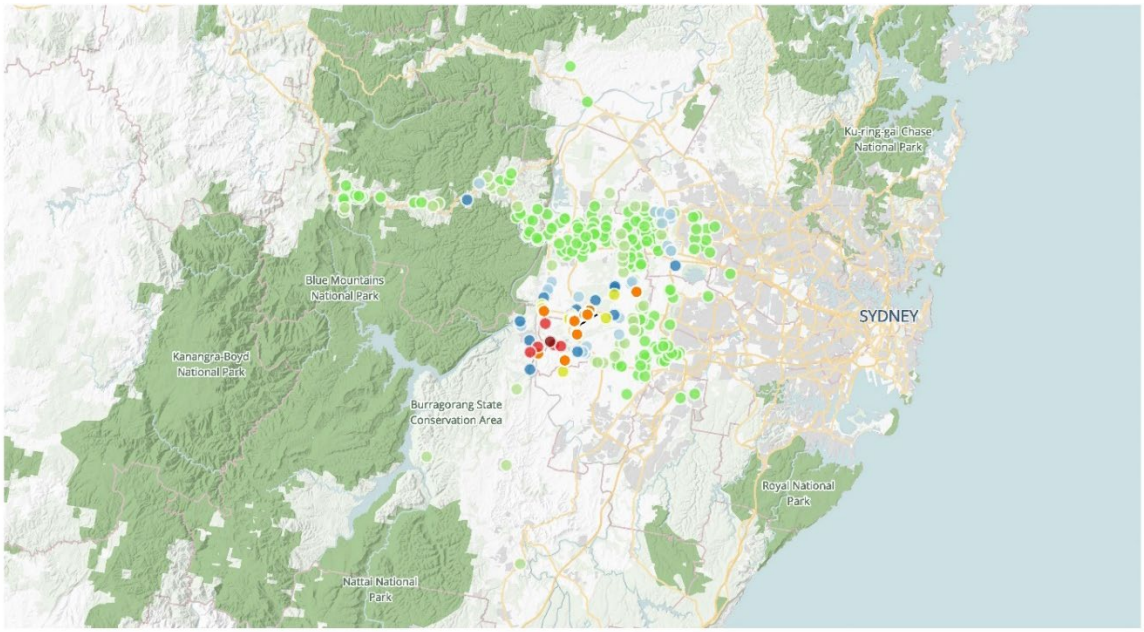
Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 3 - PAL 3 (2055)



Noise Sensitive Receptors
LAeq - Evening (19:00-23:00)
Scenario 4 - PAL 3 (2055)



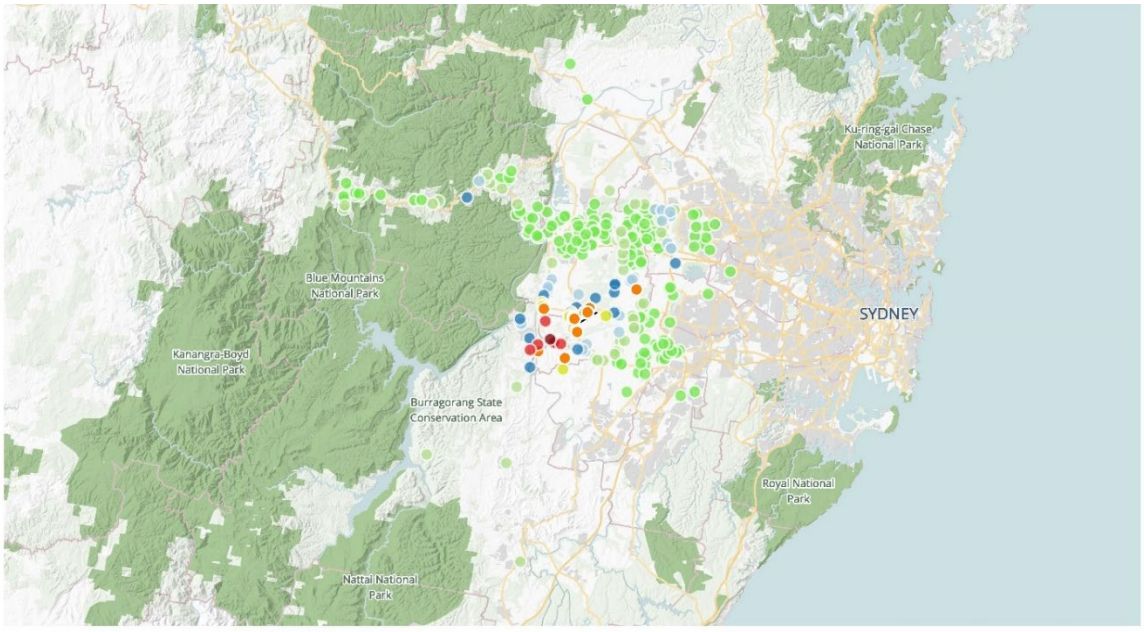
Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 1 - PAL3 (2055)



Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 3 - PAL3 (2055)

LEGEND (dB(A))
0 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05/23

N 0 10 20 km

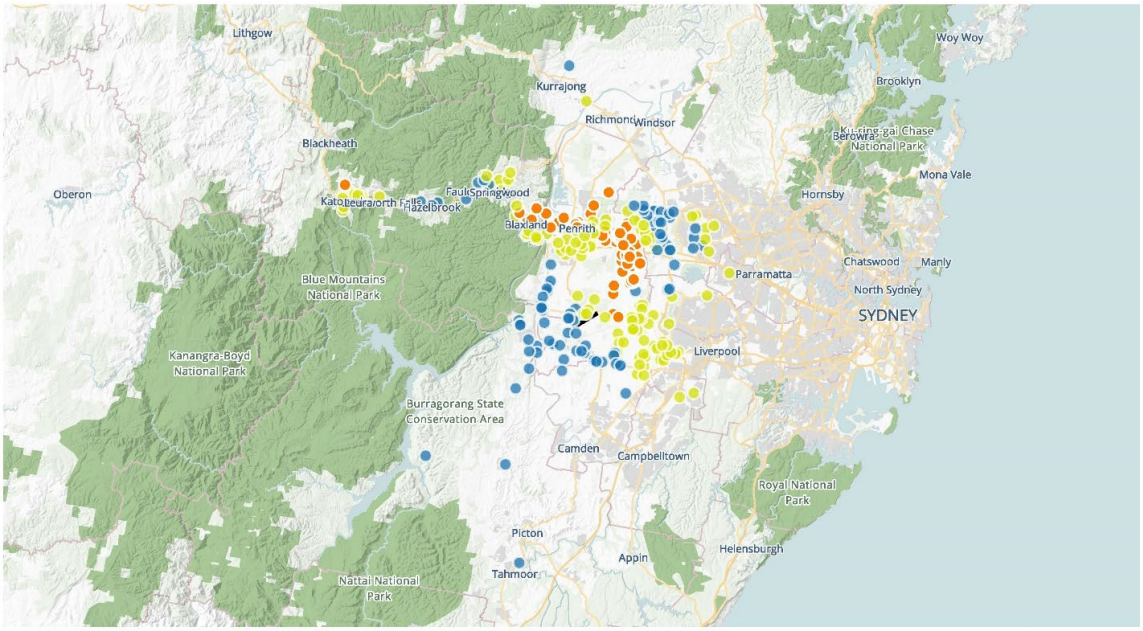


Noise Sensitive Receptors
Average Sound Level (LAeq) - Night (23:00-05:30)
Scenario 4 - PAL3 (2055)

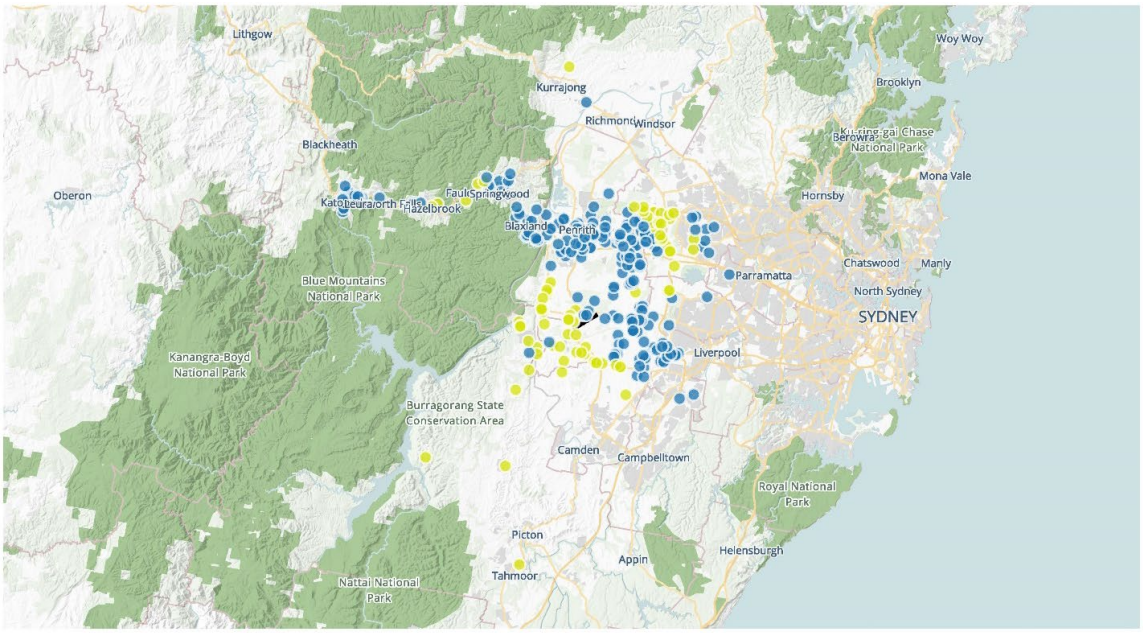
LEGEND (dB(A))
0 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Runway 05/23

N 0 10 20 km

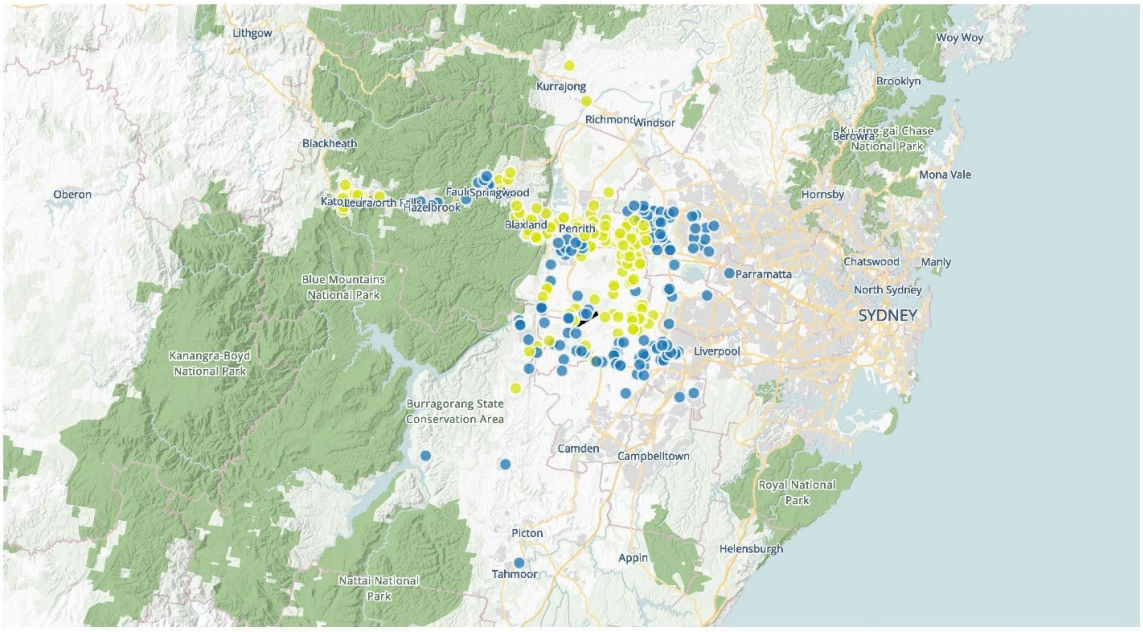
D2 Average Sound Level – Projected Scenario Variations



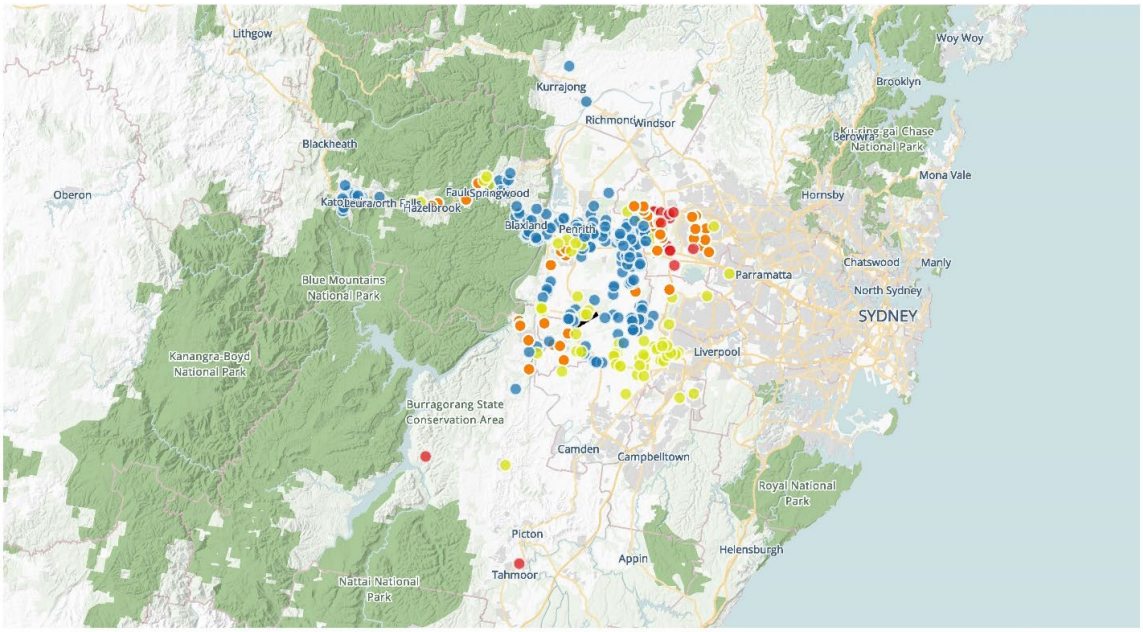
Noise Sensitive Receptors
LAeq Variation - Day (05:30-19:00)
Scenario 3 vs 1 - PAL 1 (2033)



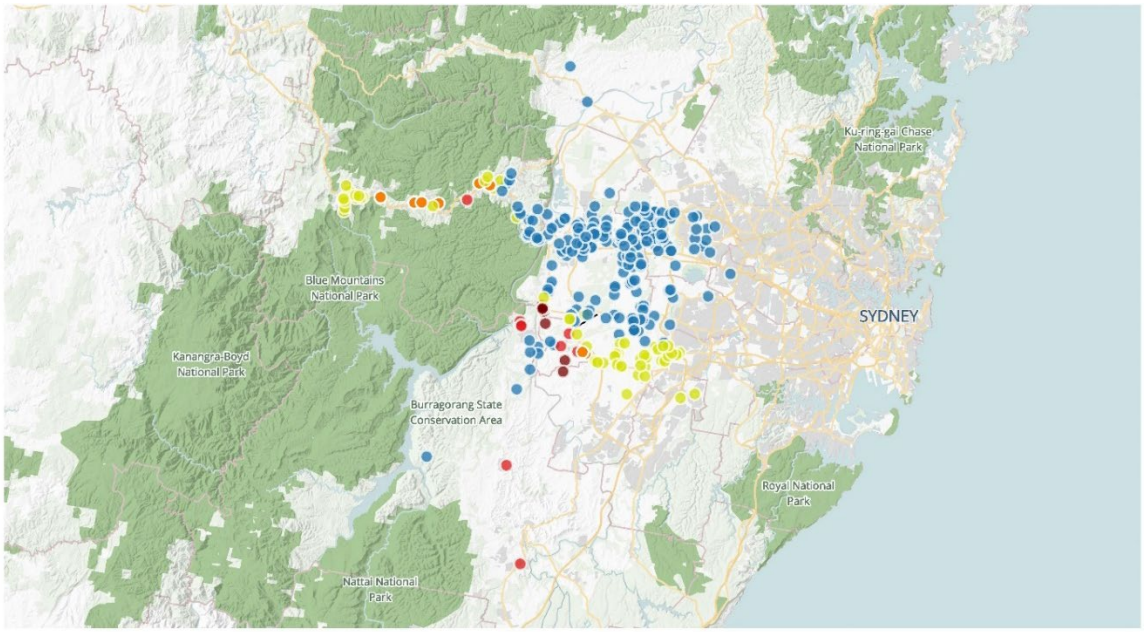
Noise Sensitive Receptors
LAeq Variation - Day (05:30-19:00)
Scenario 4 vs 1 - PAL 1 (2033)



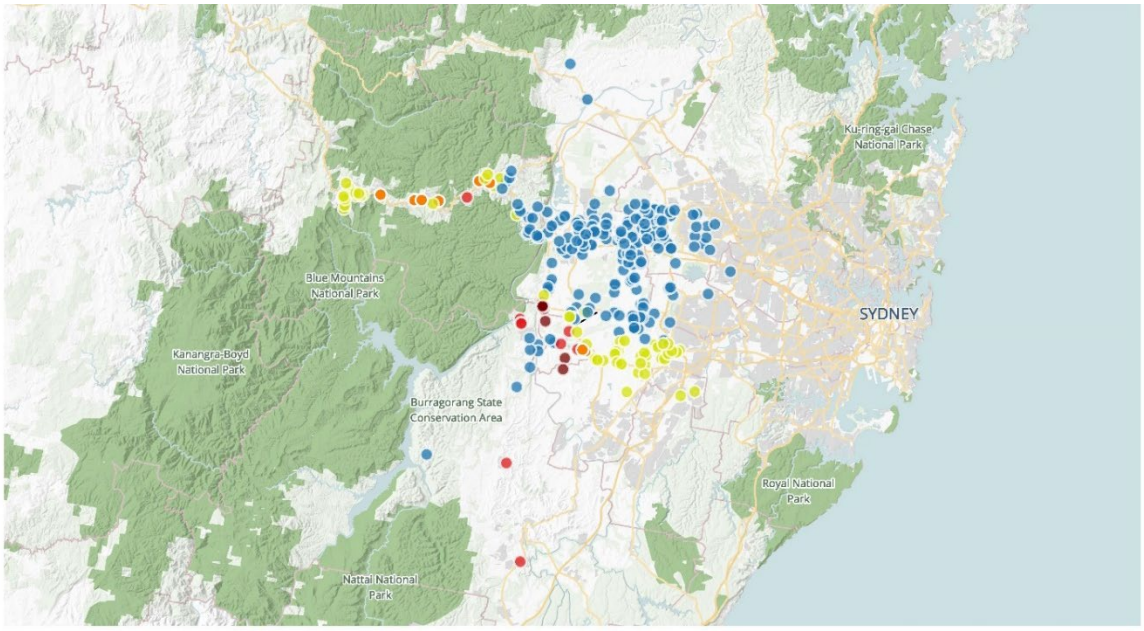
Noise Sensitive Receptors
LAeq Variation - Evening (19:00-23:00)
Scenario 3 vs 1 - PAL 1 (2033)



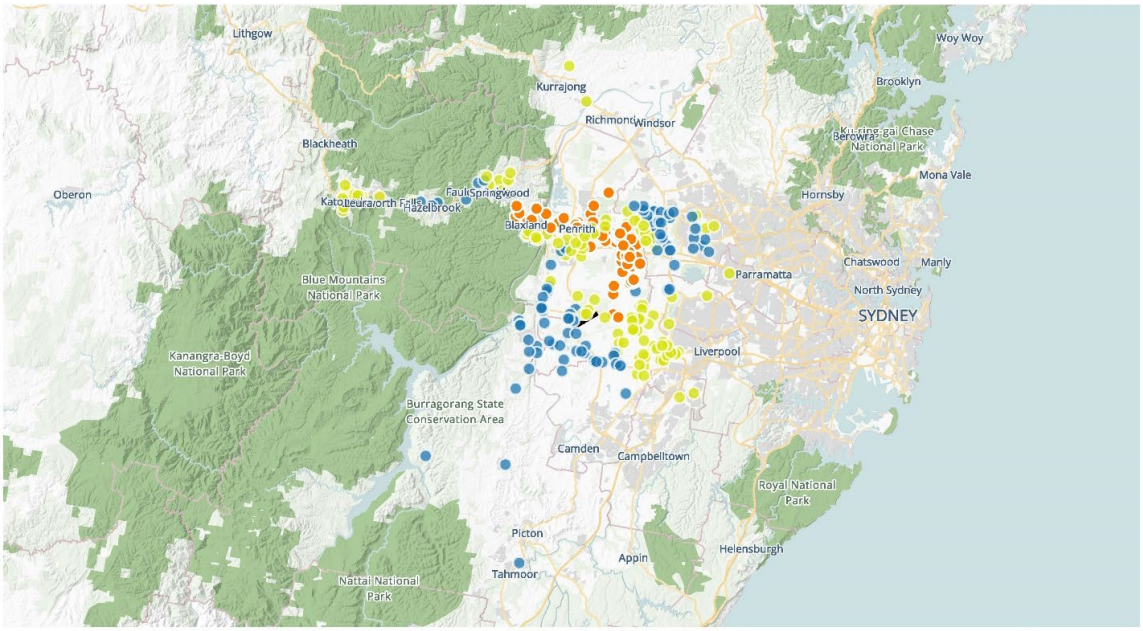
Noise Sensitive Receptors
LAeq Variation - Evening (19:00-23:00)
Scenario 4 vs 1 - PAL 1 (2033)



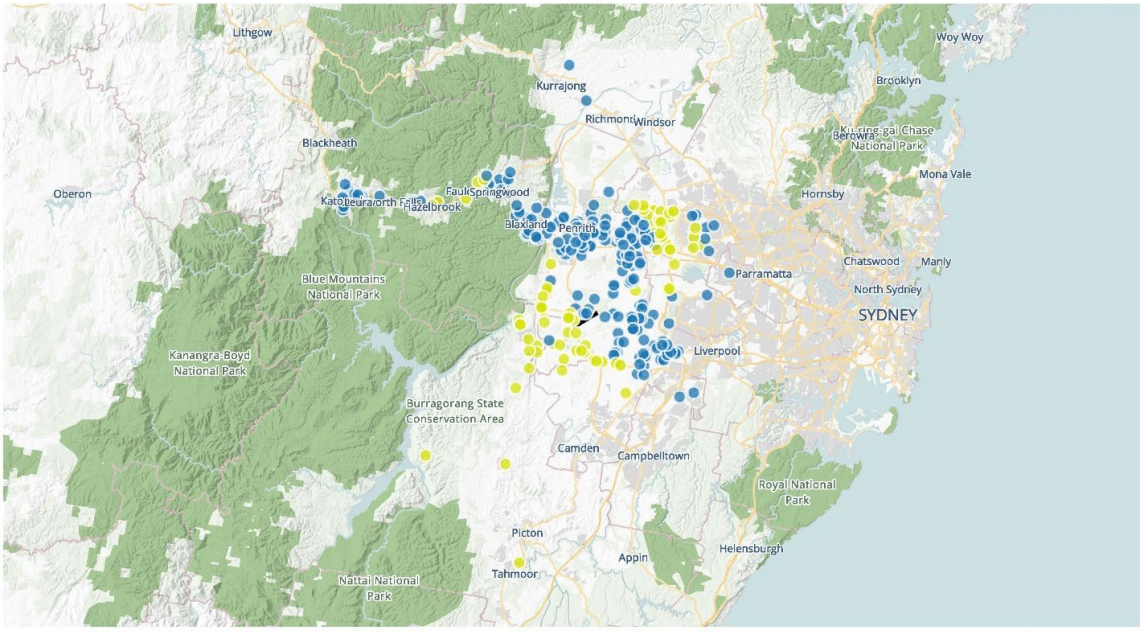
Noise Sensitive Receptors
LAeq Variation - Night (23:00-05:30)
Scenario 3 vs 1 - PAL 1 (2033)



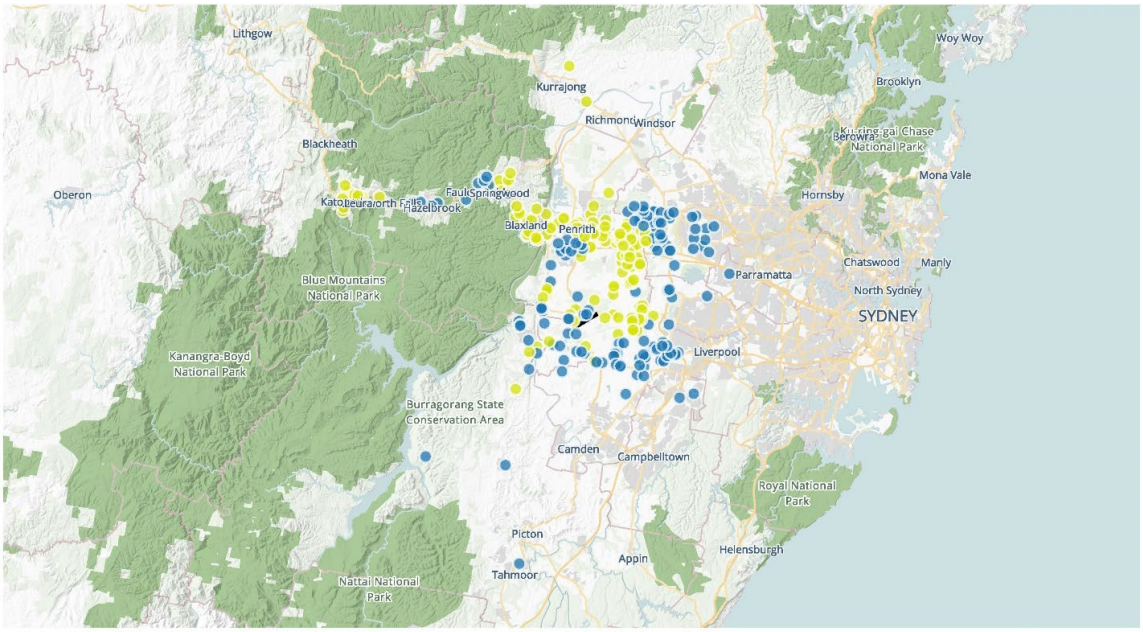
Noise Sensitive Receptors
LAeq Variation - Night (23:00-05:30)
Scenario 4 vs 1 - PAL 1 (2033)



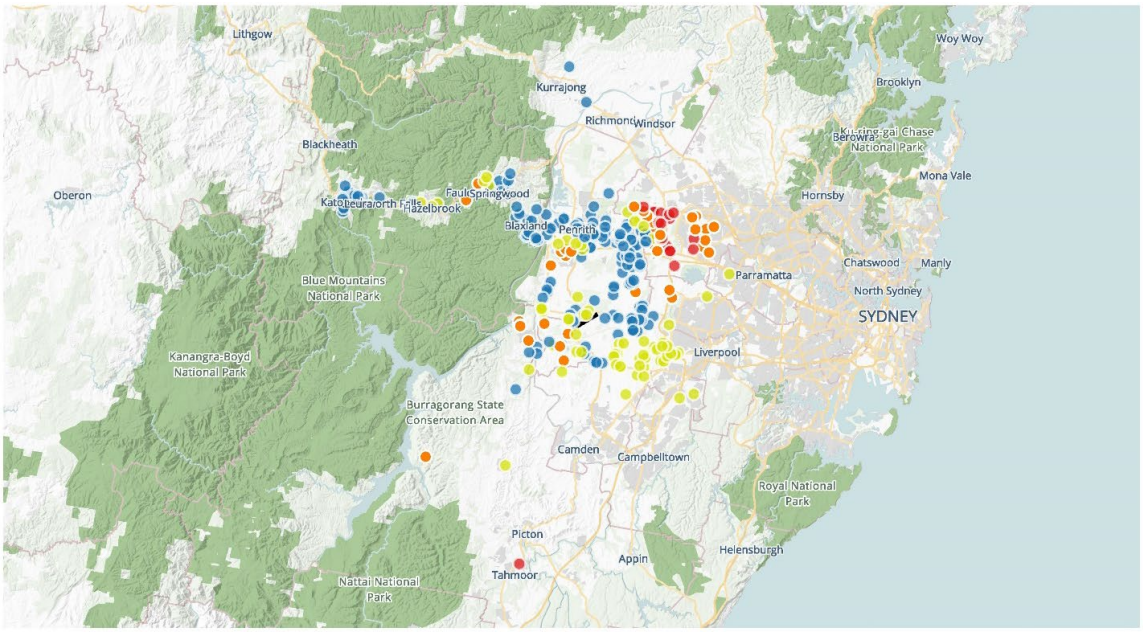
Noise Sensitive Receptors
LAeq Variation - Day (05:30-19:00)
Scenario 3 vs 1 - PAL 2 (2040)



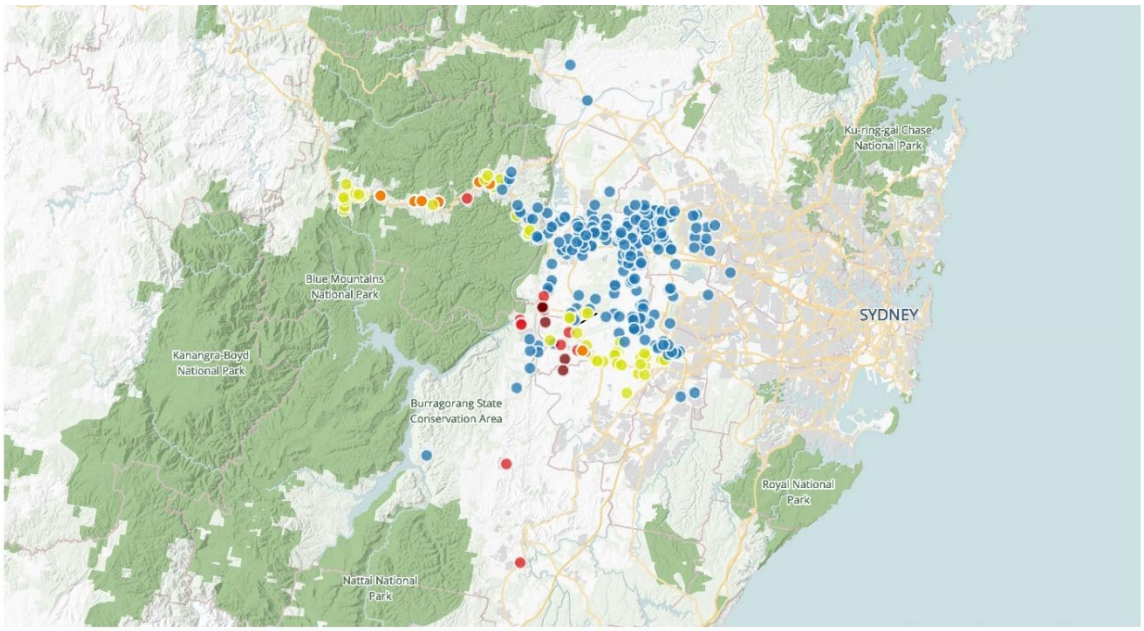
Noise Sensitive Receptors
LAeq Variation - Day (05:30-19:00)
Scenario 4 vs 1 - PAL 2 (2040)



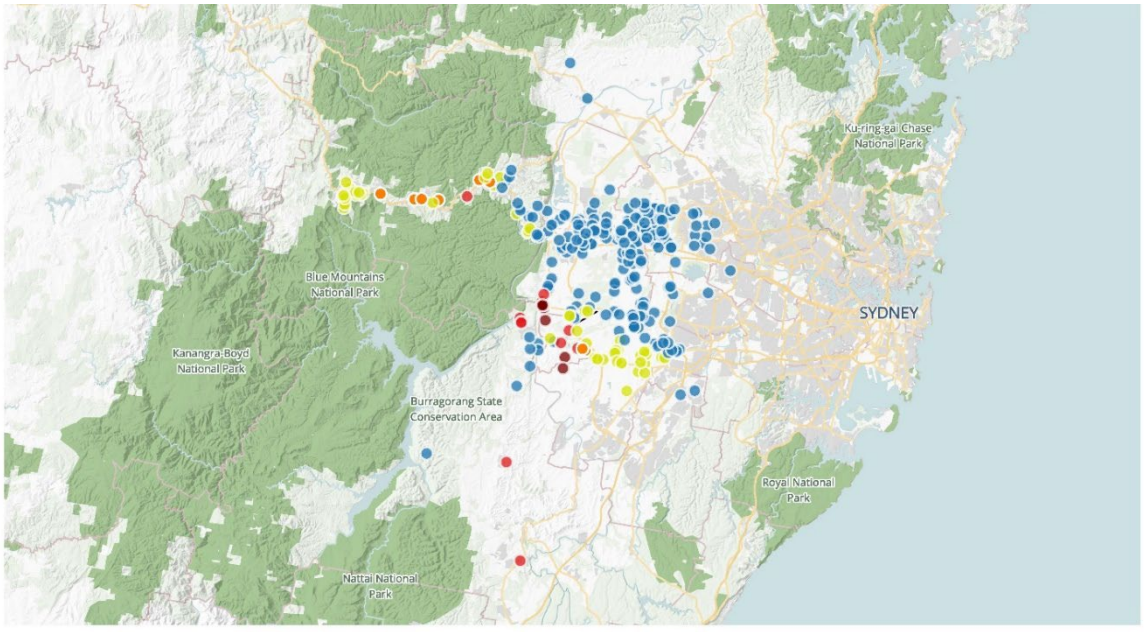
Noise Sensitive Receptors
LAeq Variation - Evening (19:00-23:00)
Scenario 3 vs 1 - PAL 2 (2040)



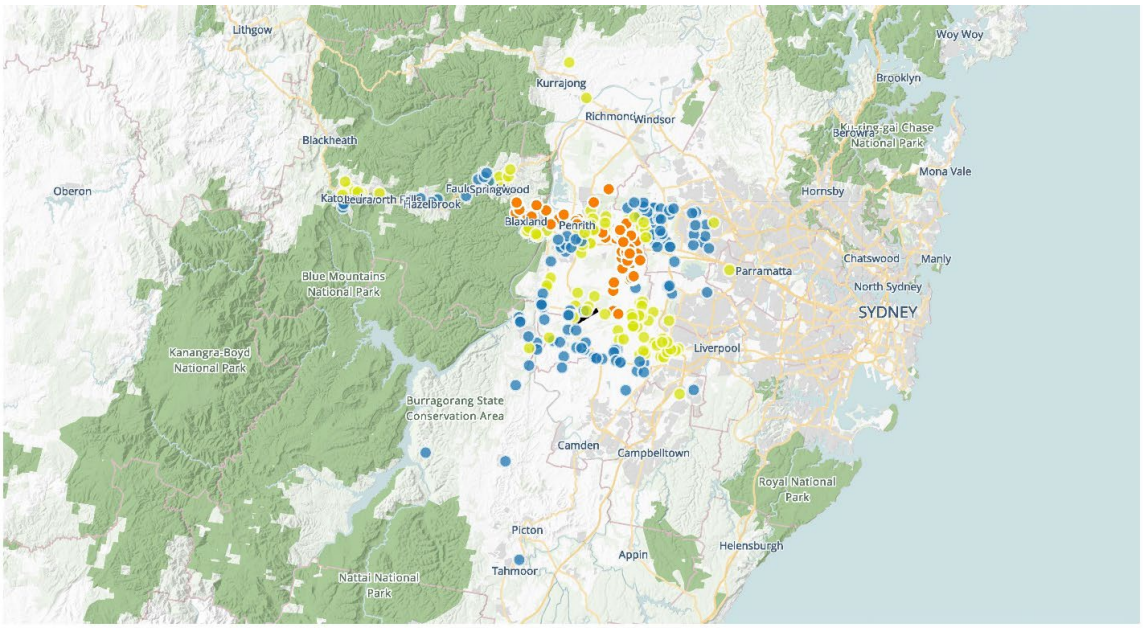
Noise Sensitive Receptors
LAeq Variation - Evening (19:00-23:00)
Scenario 4 vs 1 - PAL 2 (2040)



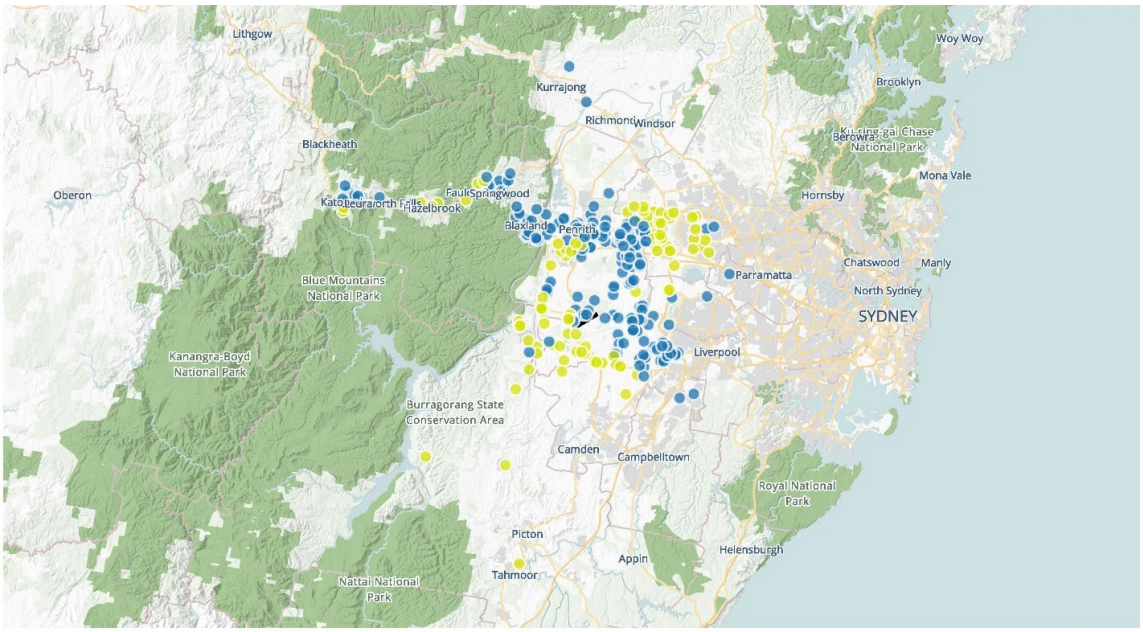
Noise Sensitive Receptors
LAeq Variation - Night (23:00-05:30)
Scenario 3 vs 1 - PAL 2 (2040)



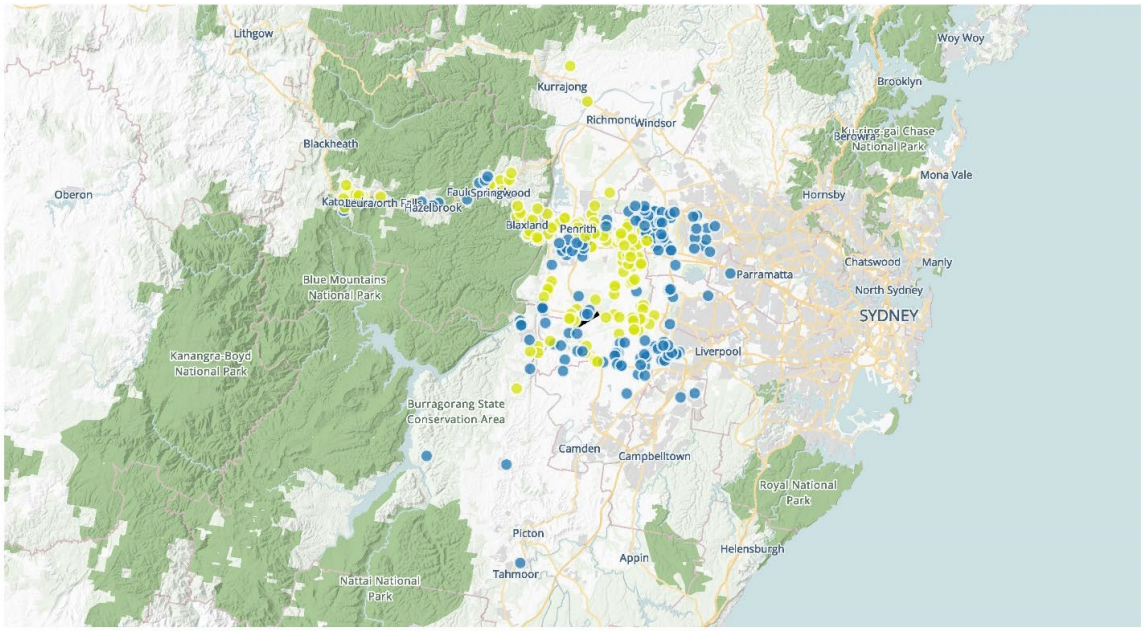
Noise Sensitive Receptors
LAeq Variation - Night (23:00-05:30)
Scenario 4 vs 1 - PAL 2 (2040)



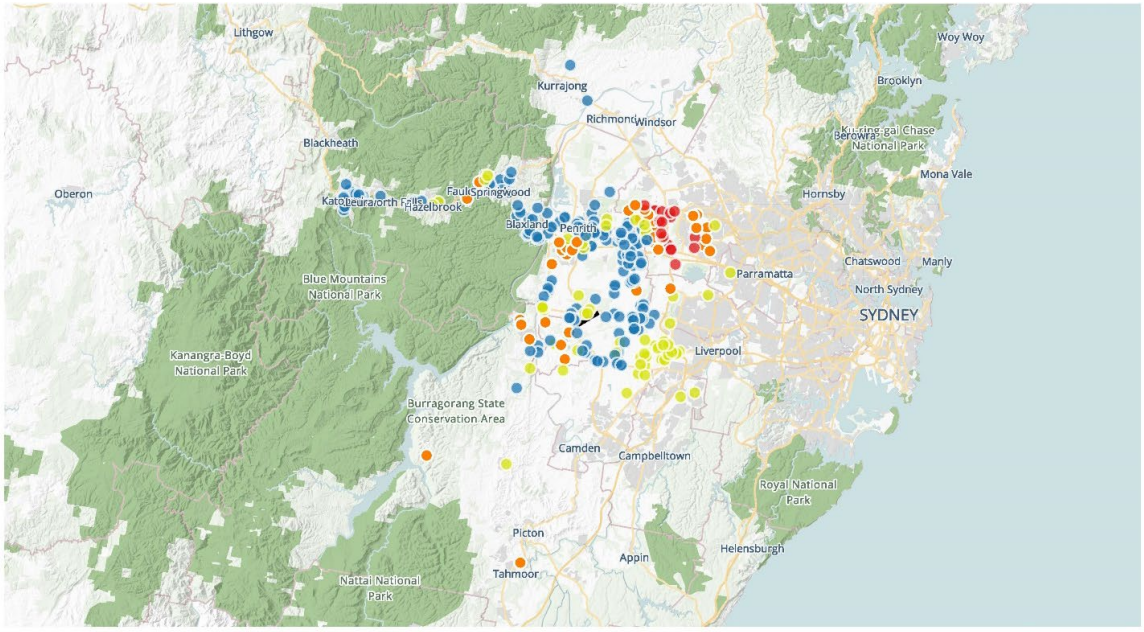
Noise Sensitive Receptors
LAeq Variation - Day (05:30-19:00)
Scenario 3 vs 1 - PAL 3 (2055)



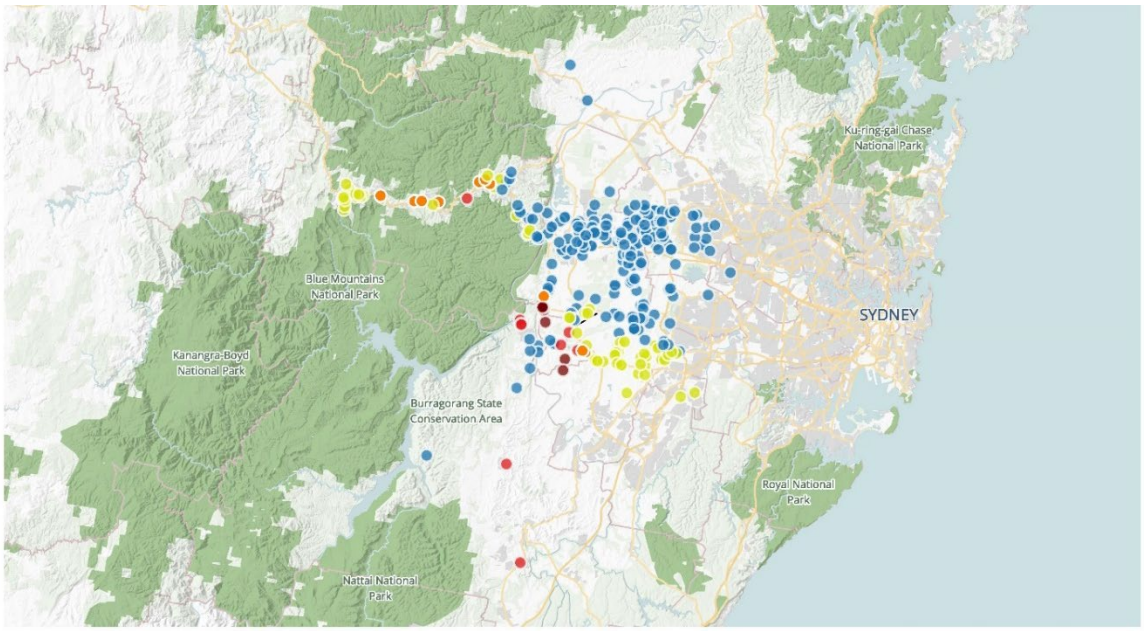
Noise Sensitive Receptors
LAeq Variation - Day (05:30-19:00)
Scenario 4 vs 1 - PAL 3 (2055)



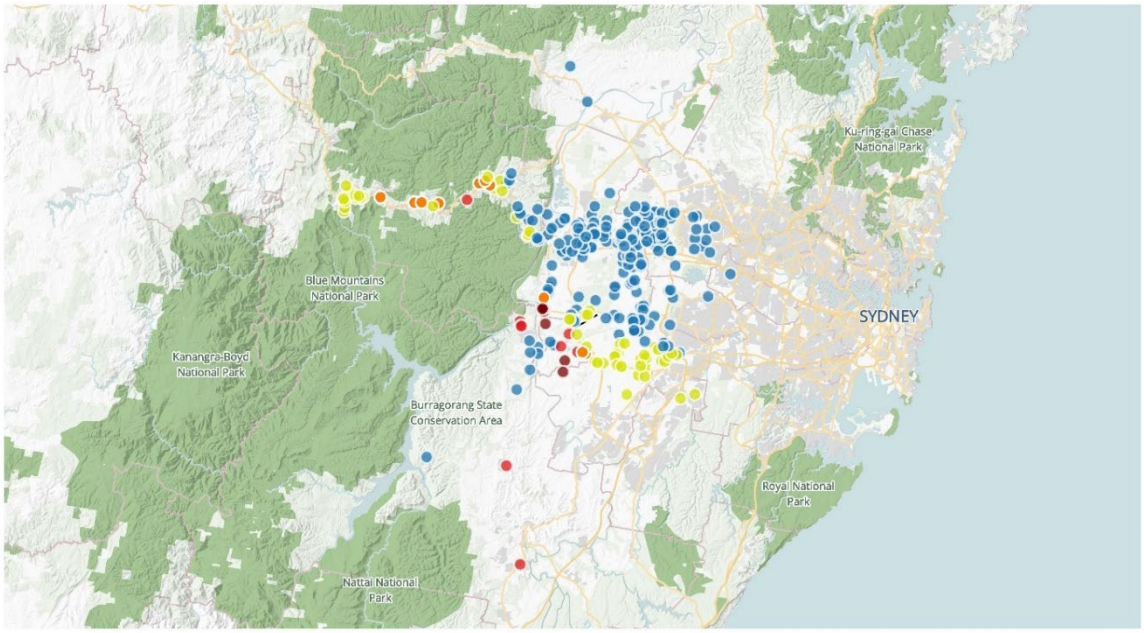
Noise Sensitive Receptors
LAeq Variation - Evening (19:00-23:00)
Scenario 3 vs 1 - PAL 3 (2055)



Noise Sensitive Receptors
LAeq Variation - Evening (19:00-23:00)
Scenario 4 vs 1 - PAL 3 (2055)

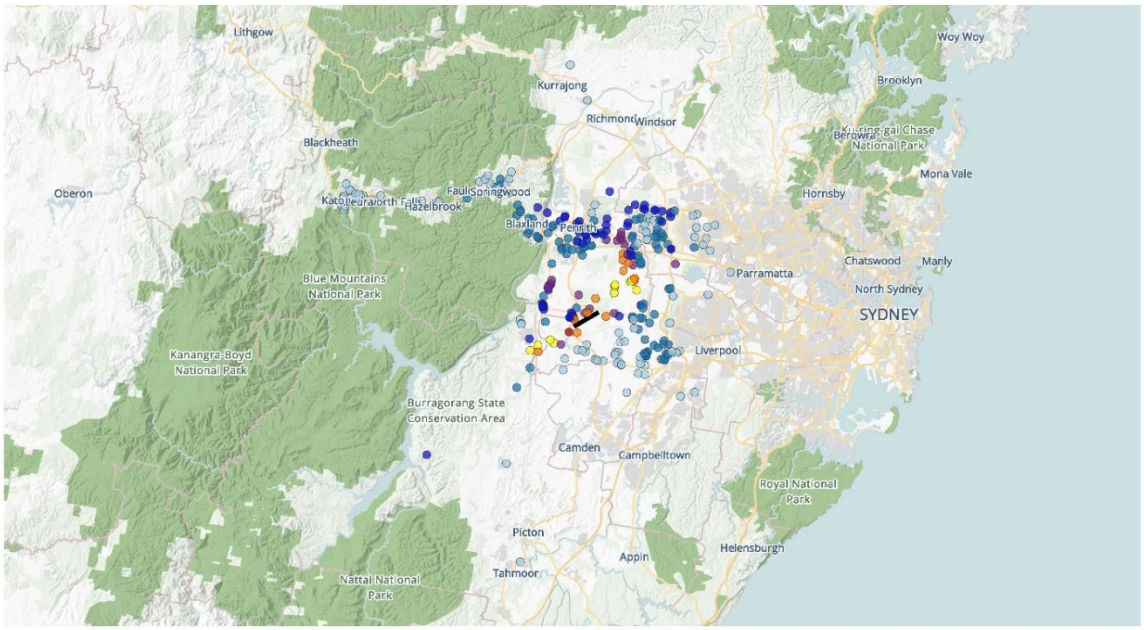


Noise Sensitive Receptors
LAeq Variation - Night (23:00-05:30)
Scenario 3 vs 1 - PAL 3 (2055)

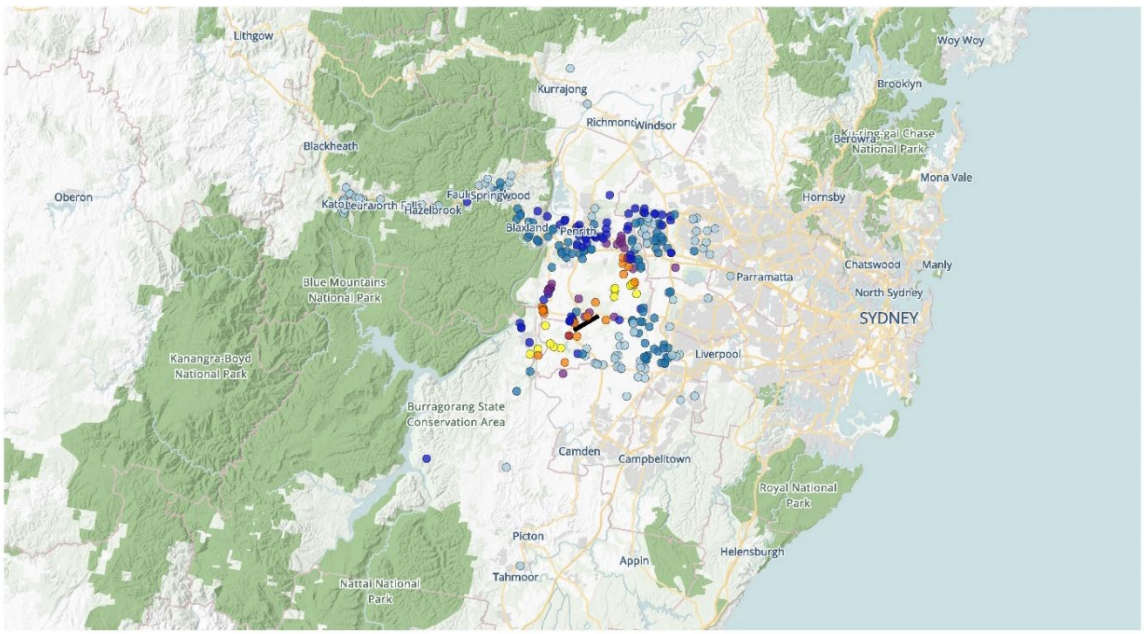


Noise Sensitive Receptors
LAeq Variation - Night (23:00-05:30)
Scenario 4 vs 1 - PAL 3 (2055)

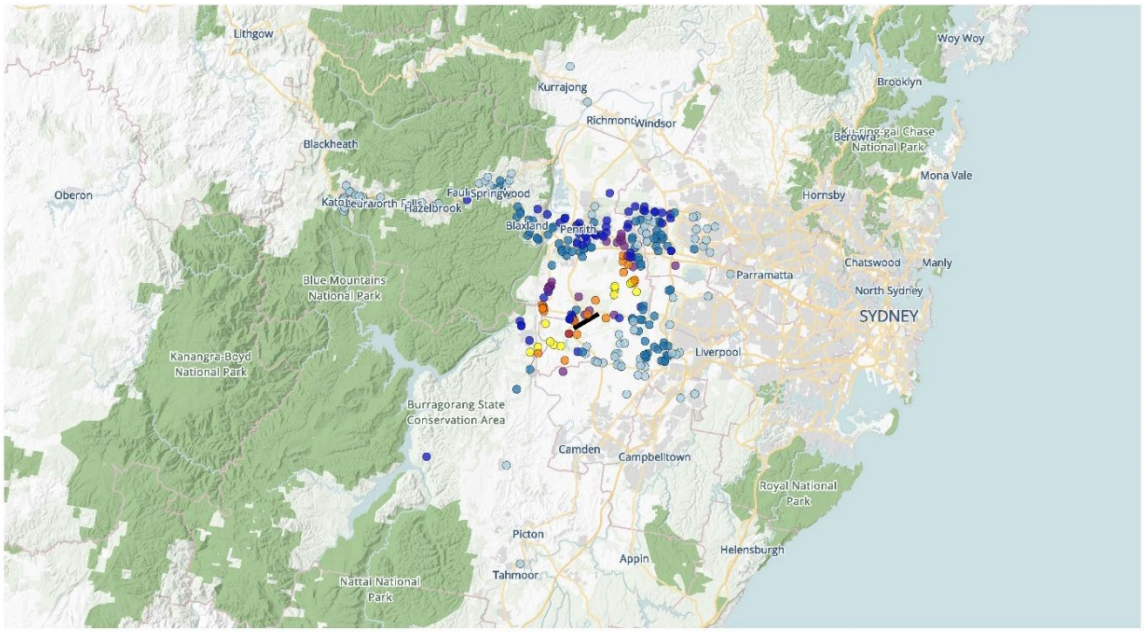
D3 Projected Maximum Sound Level



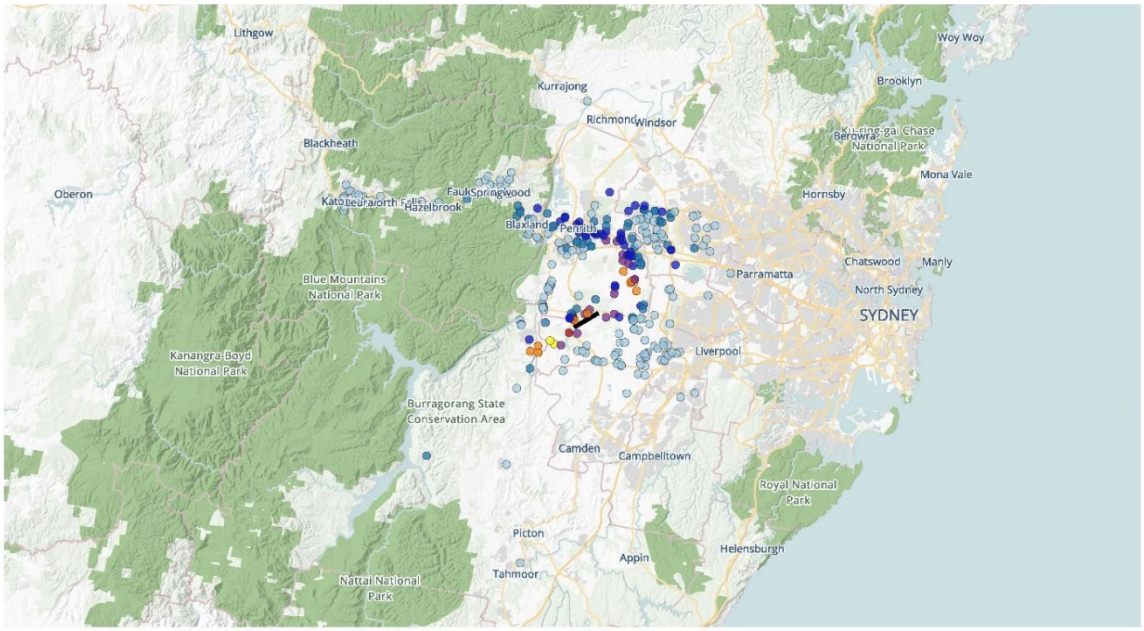
Noise Monitoring Terminals
Maximum Sound Level (LAmax) - Day (05:30-19:00)
Scenario 1 - PAL3 (2055)



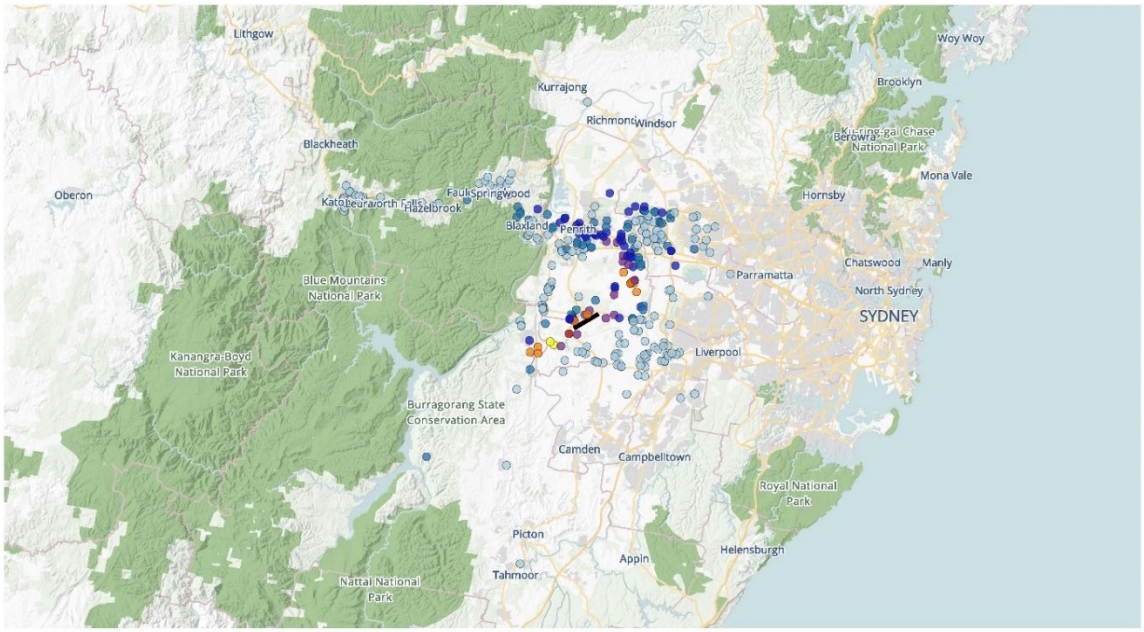
Noise Monitoring Terminals
Maximum Sound Level (LAmax) - Day (05:30-19:00)
Scenario 3 - PAL3 (2055)



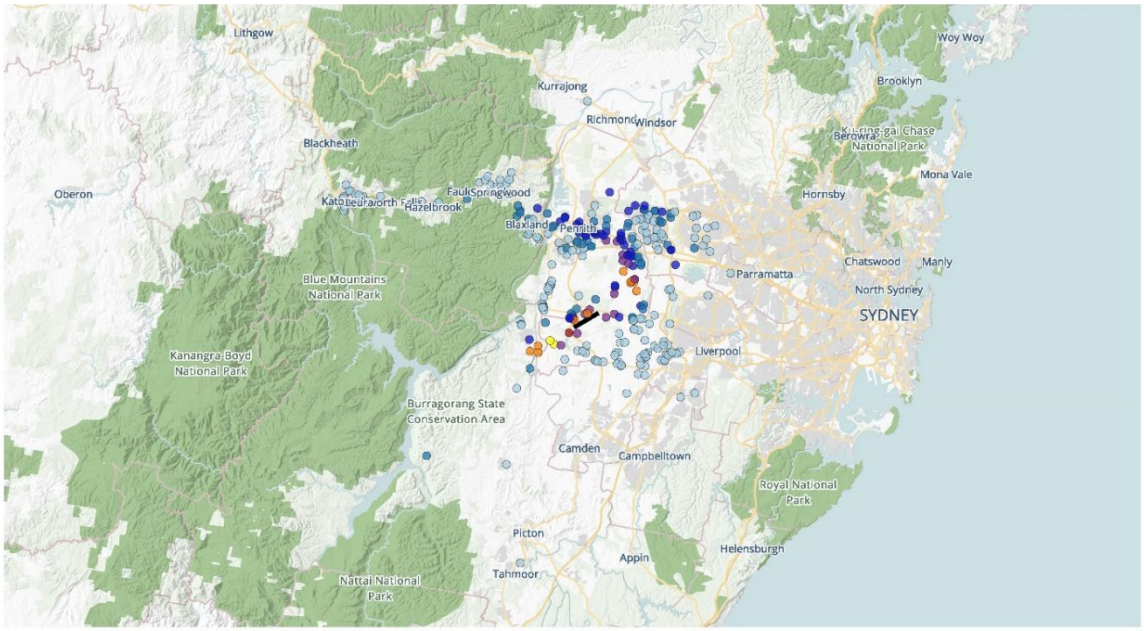
Noise Monitoring Terminals
Maximum Sound Level (LAmax) - Day (05:30-19:00)
Scenario 4 - PAL3 (2055)



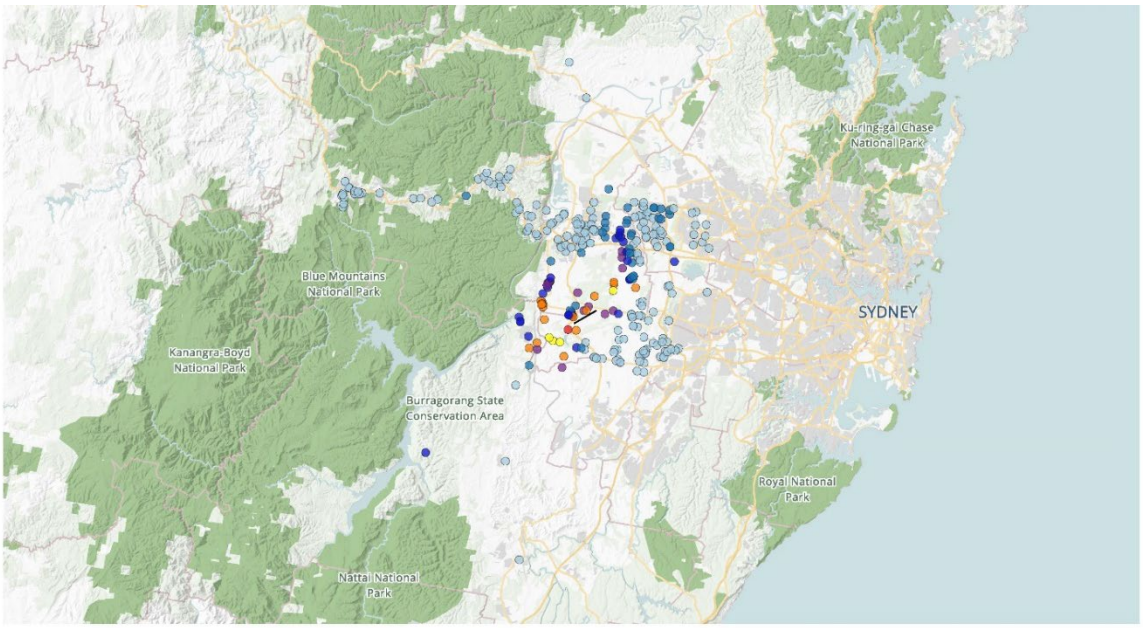
Noise Monitoring Terminals
Maximum Sound Level (LAmax) - Evening (19:00-23:00)
Scenario 1 - PAL3 (2055)



Noise Monitoring Terminals
Maximum Sound Level (LAmax) - Evening (19:00-23:00)
Scenario 3 - PAL3 (2055)



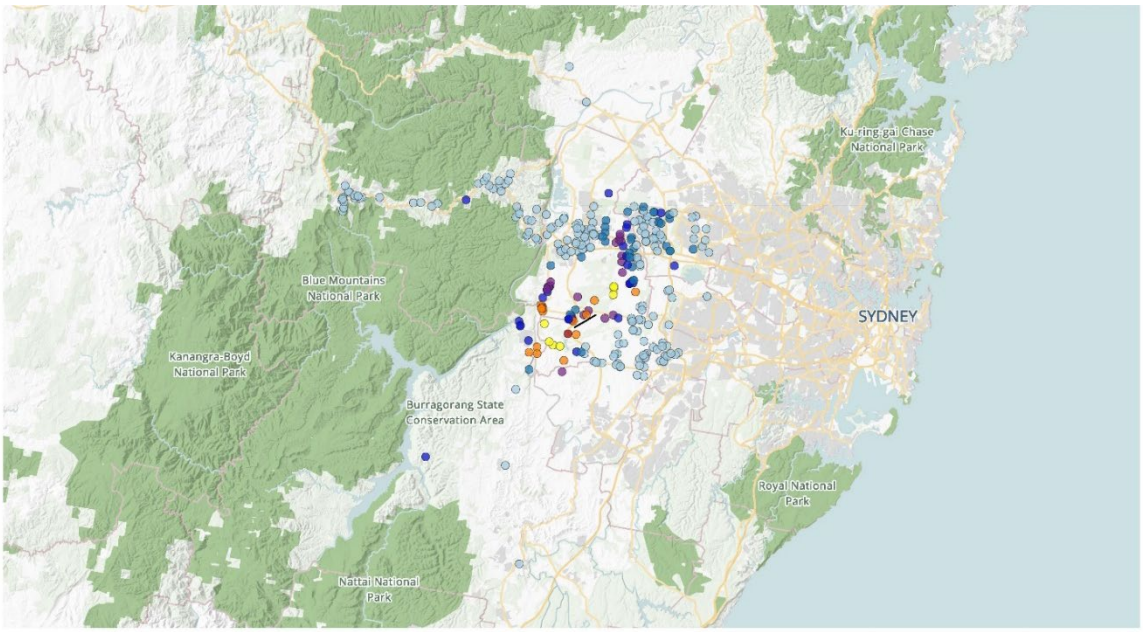
Noise Monitoring Terminals
Maximum Sound Level (LAmax) - Evening (19:00-23:00)
Scenario 4 - PAL3 (2055)



Noise Sensitive Receptors
Maximum Sound Level (LAmax) - Night (23:00-05:30)
Scenario 3 - PAL1 (2033)

LEGEND (dB(A))
<60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
85 - 90
Runway 05/23

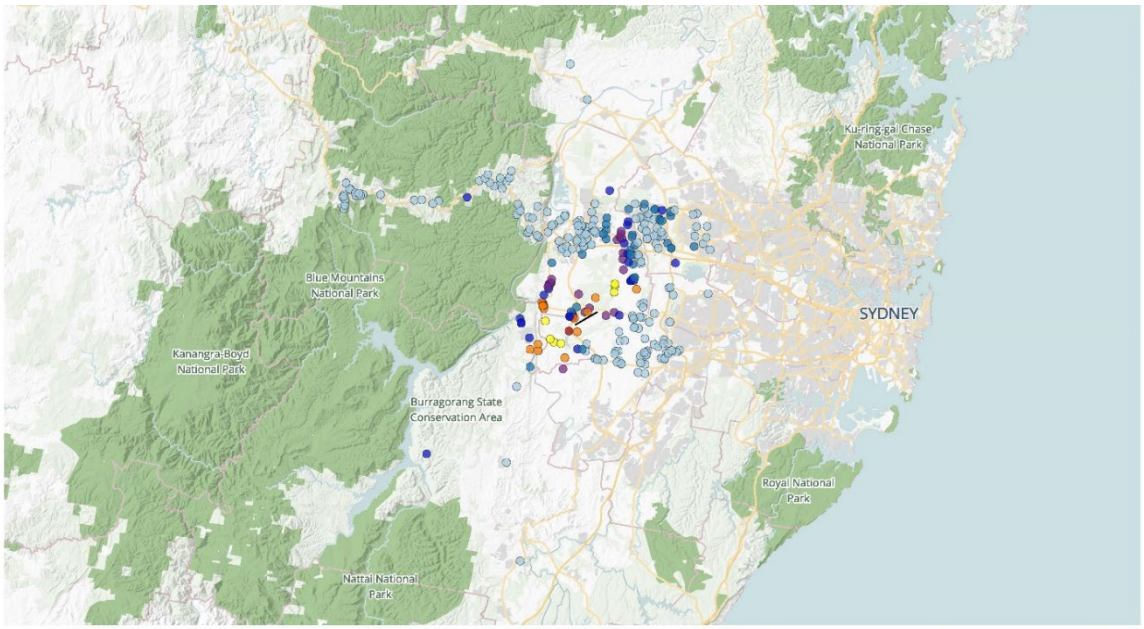
N 0 10 20 km



Noise Sensitive Receptors
Maximum Sound Level (LAmax) - Night (23:00-05:30)
Scenario 3 - PAL3 (2055)

LEGEND (dB(A))
<60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
>90
Runway 05/23

N 0 10 20 km



Noise Sensitive Receptors
Maximum Sound Level (LAmax) - Night (23:00-05:30)
Scenario 4 - PAL3 (2055)

LEGEND (dB(A))
<60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
>90
Runway 05/23

N 0 10 20 km

D4 Assessment by Suburb – Projected Average and Maximum Sound Level

CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)

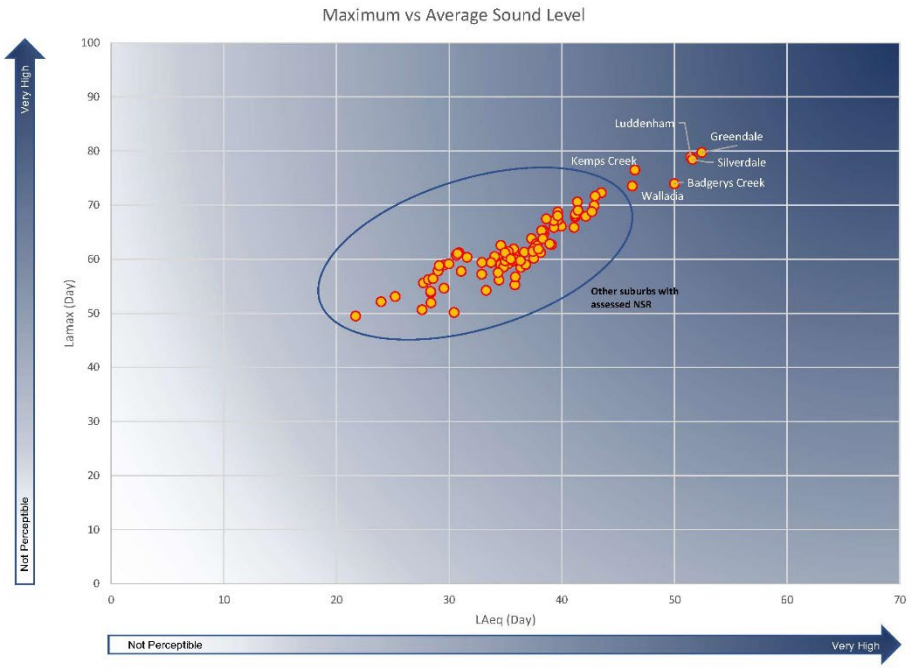


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Evening (19:00-22:59)

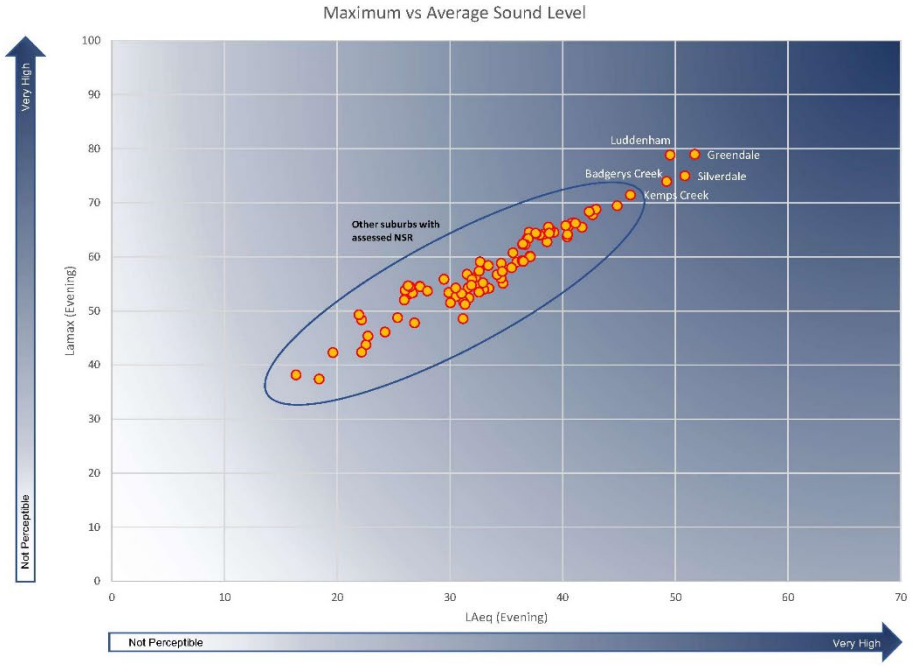


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)

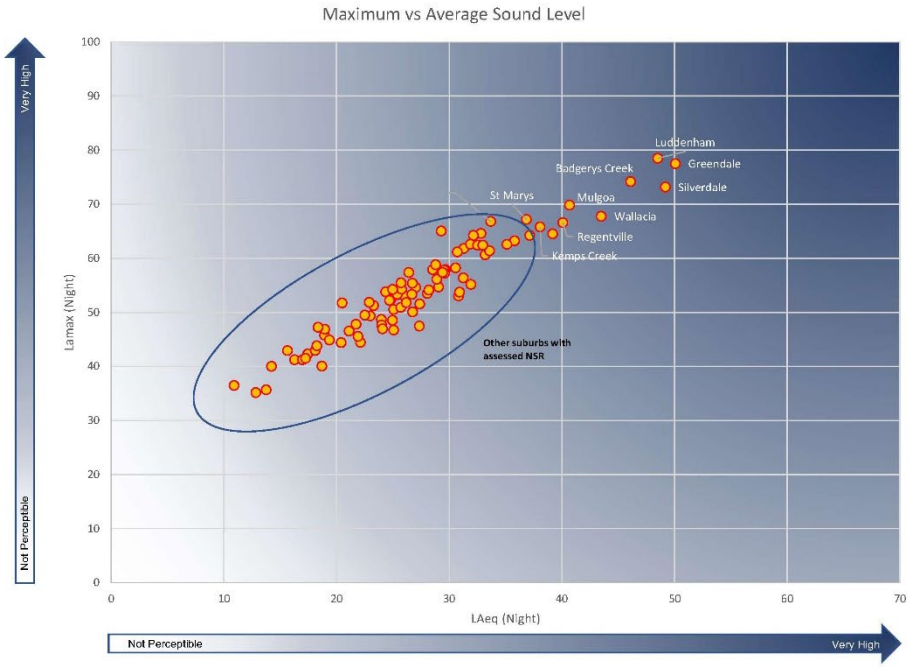


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)

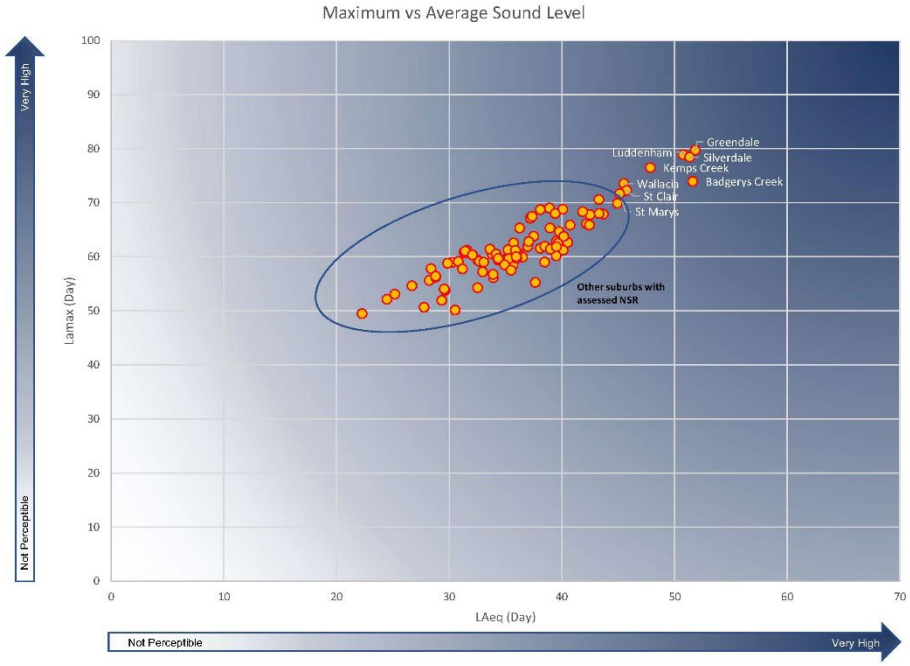


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Evening (19:00-22:59)

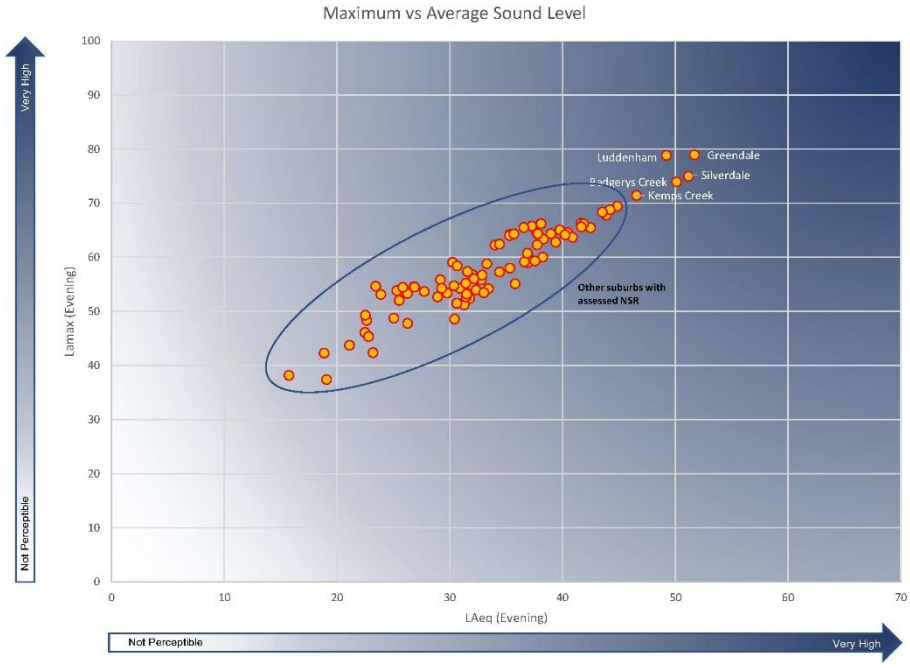


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)

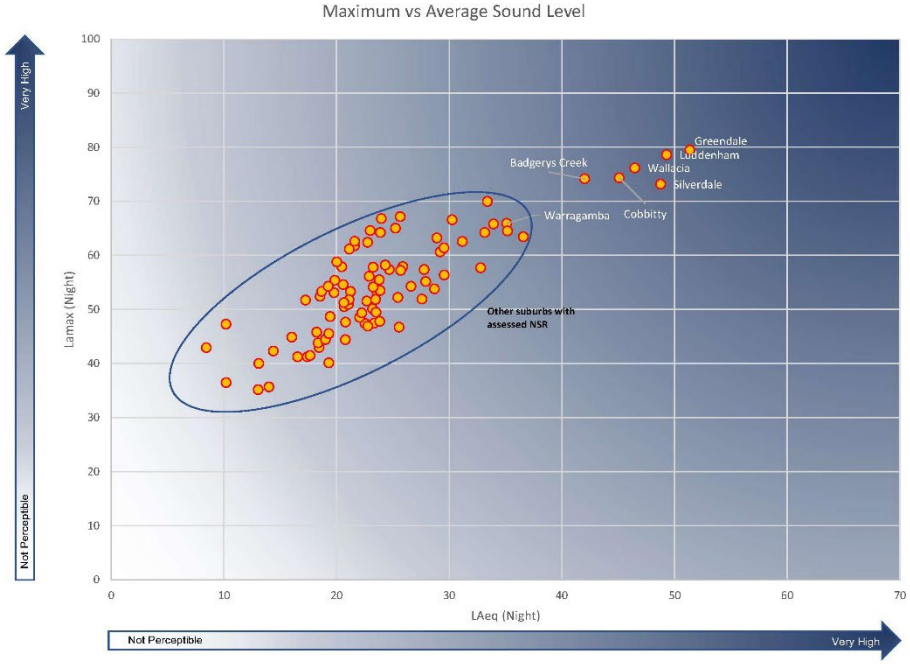


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)

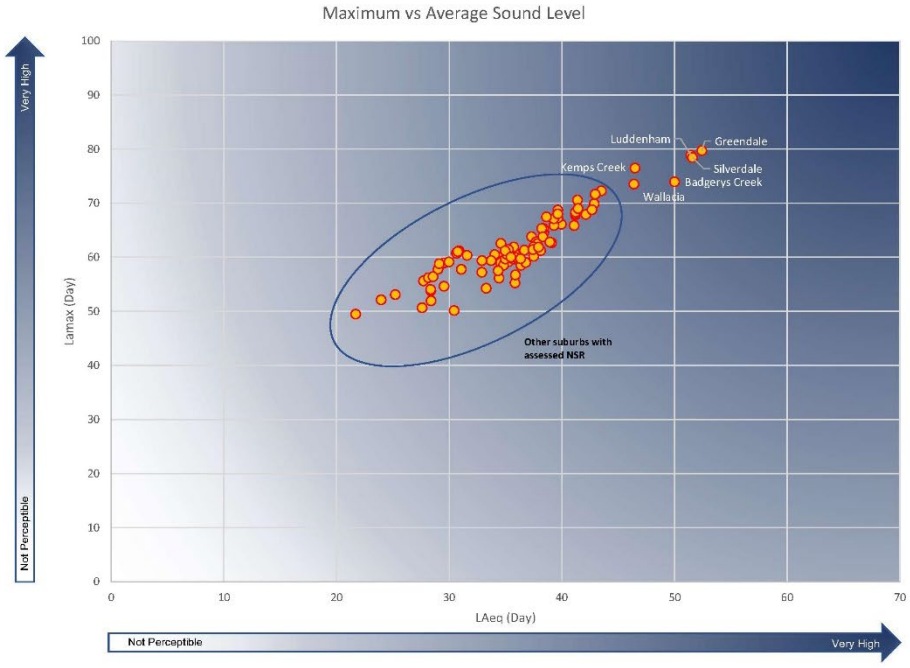


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Evening (19:00-22:59)

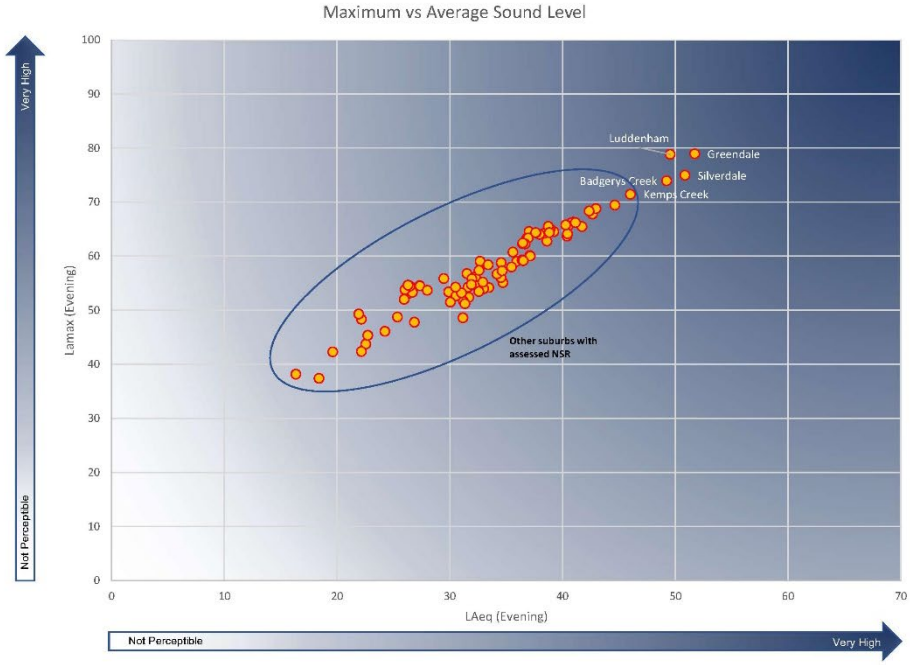


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)

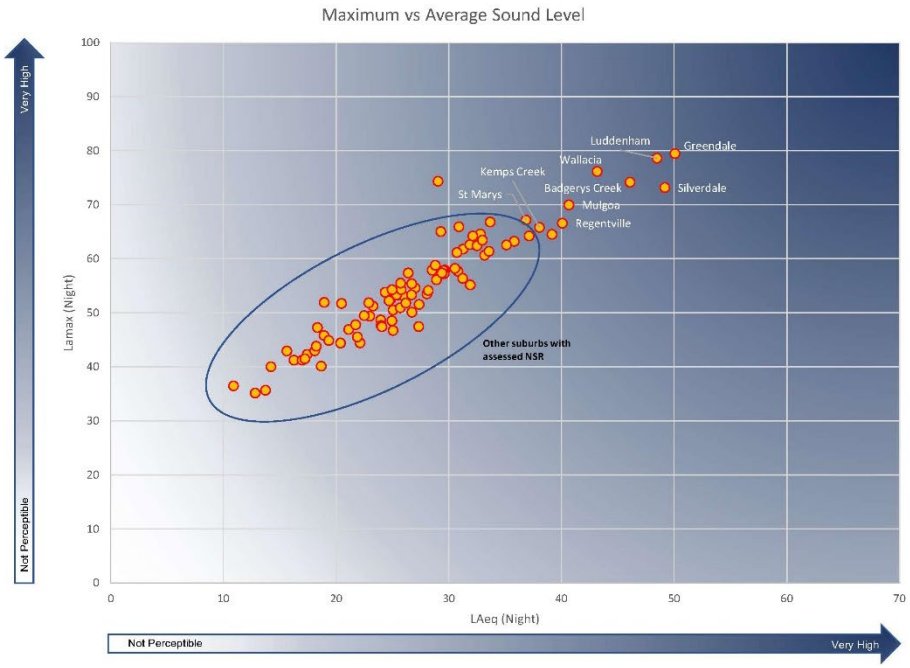


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)

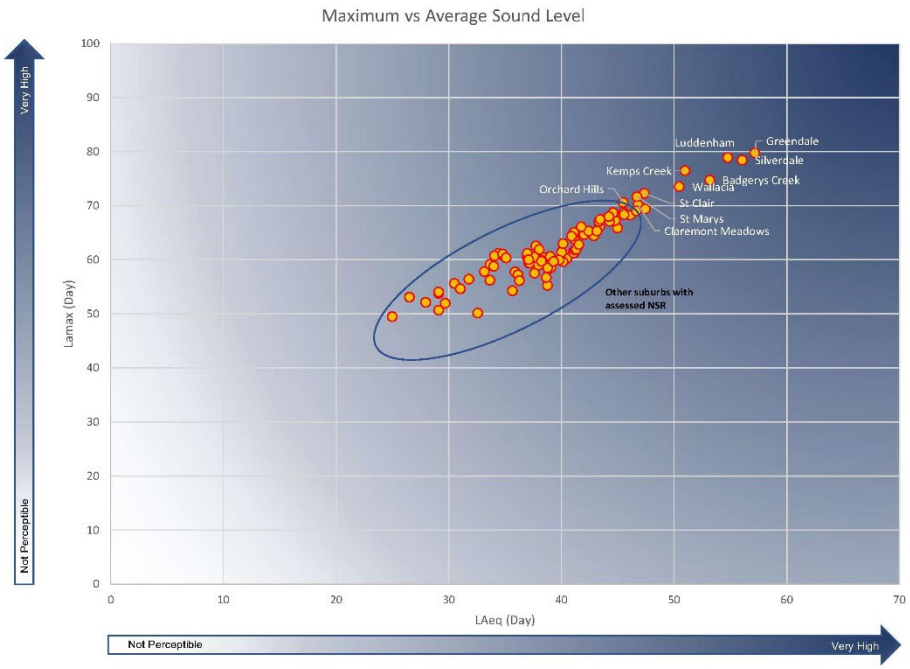


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Evening (19:00-22:59)

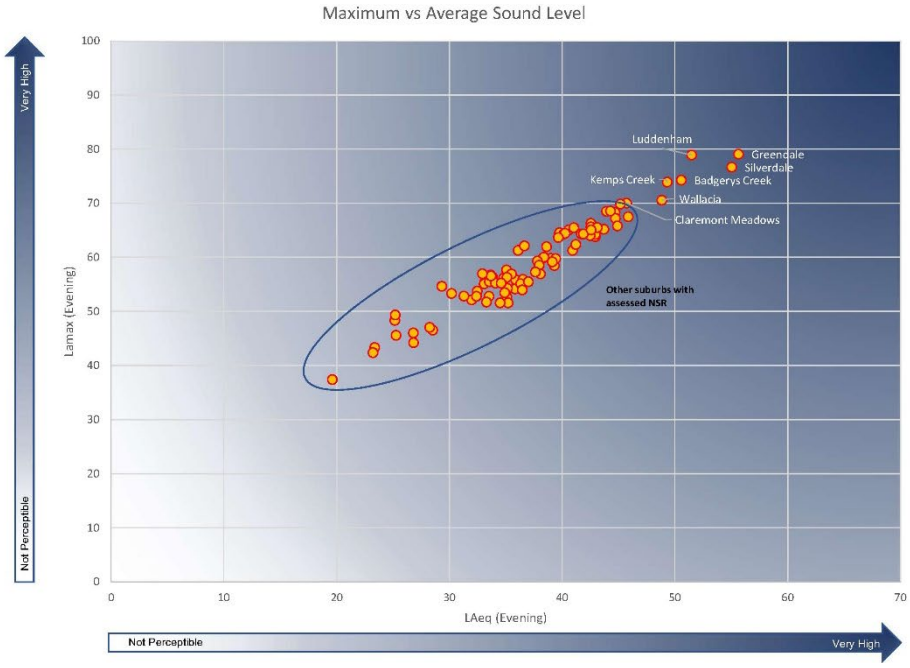


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)

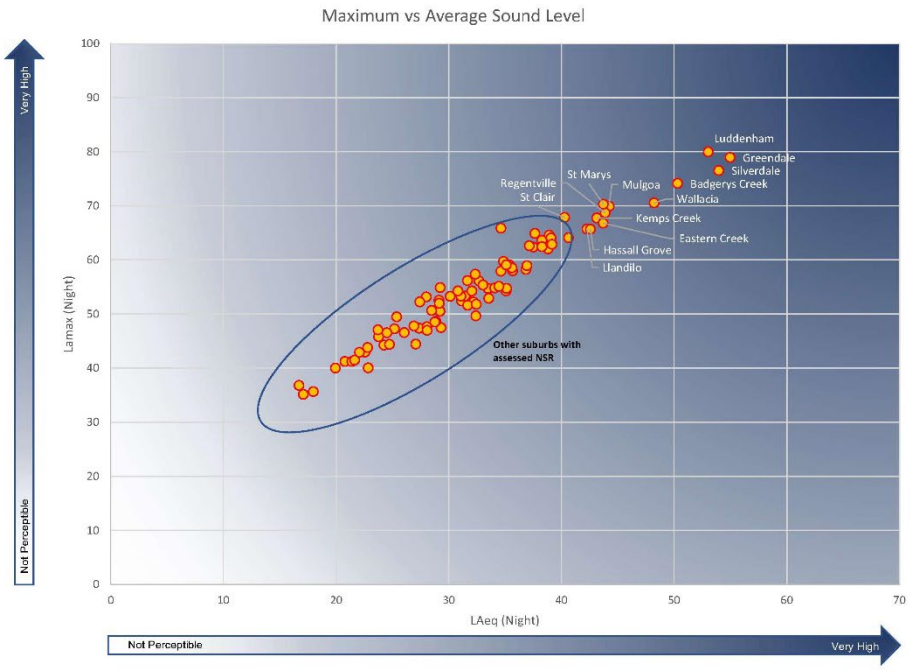


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)

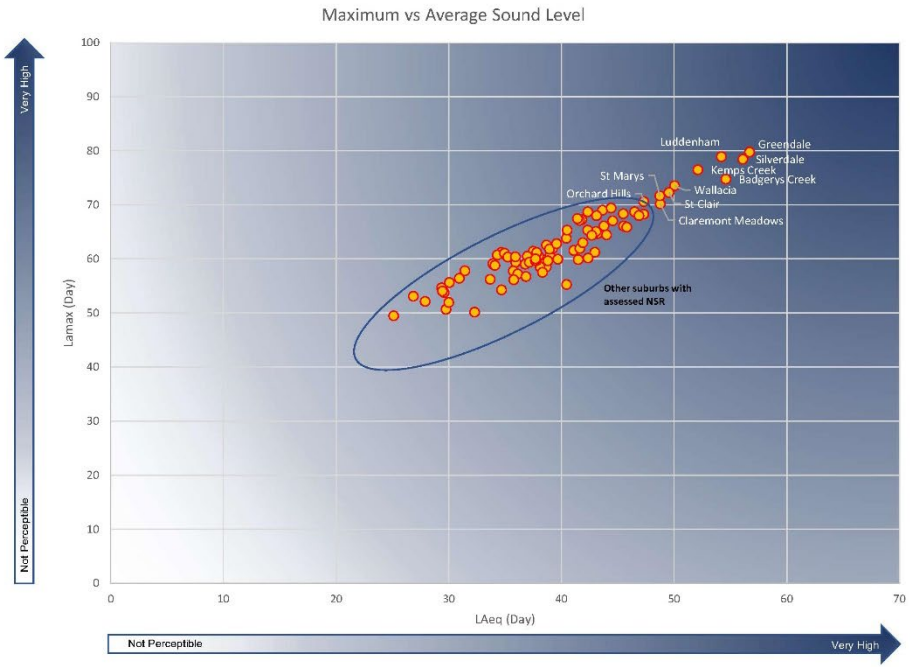


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Evening (19:00-22:59)

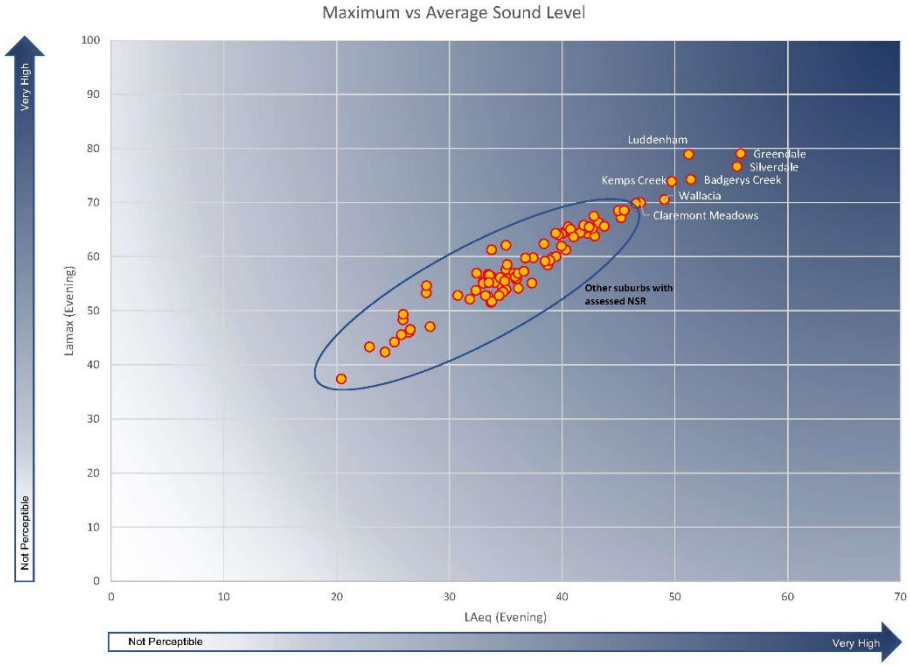


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)

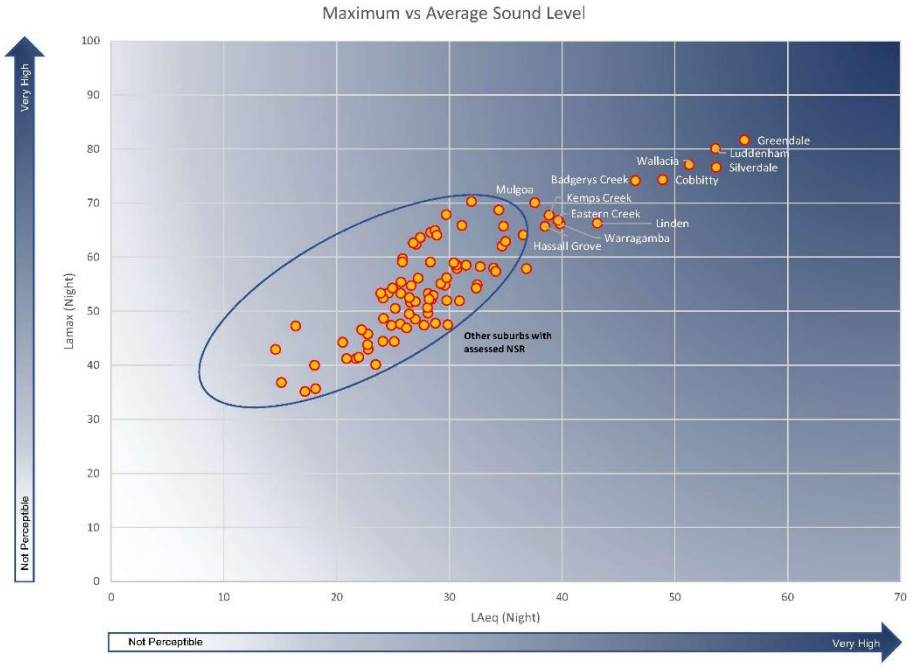


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)

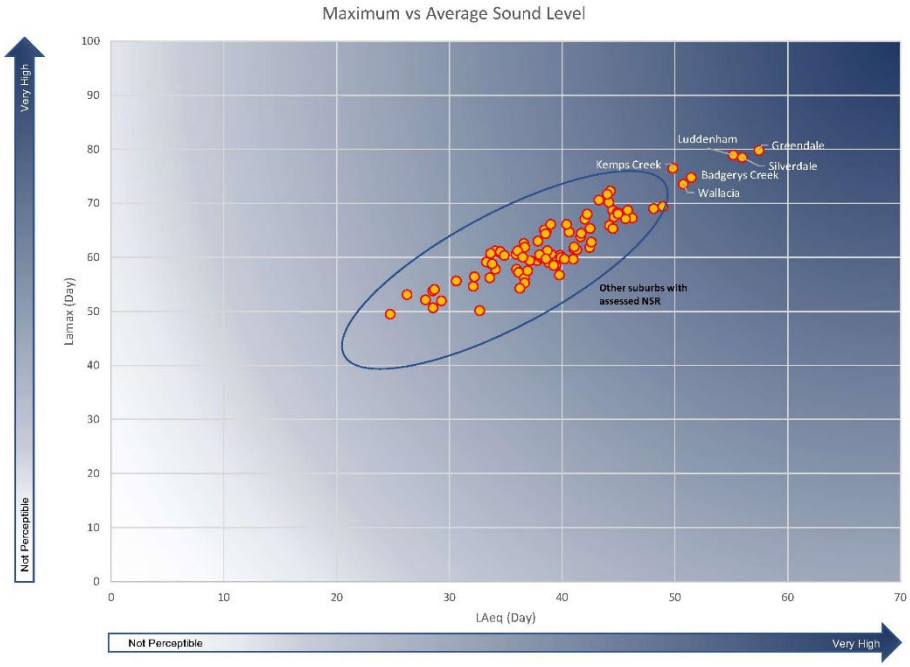


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Evening (19:00-22:59)

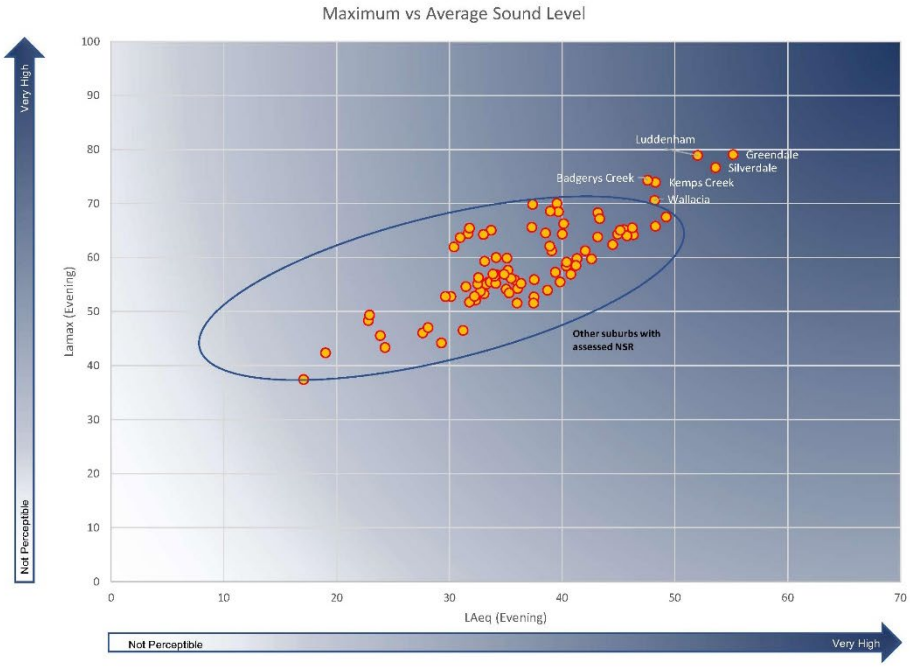
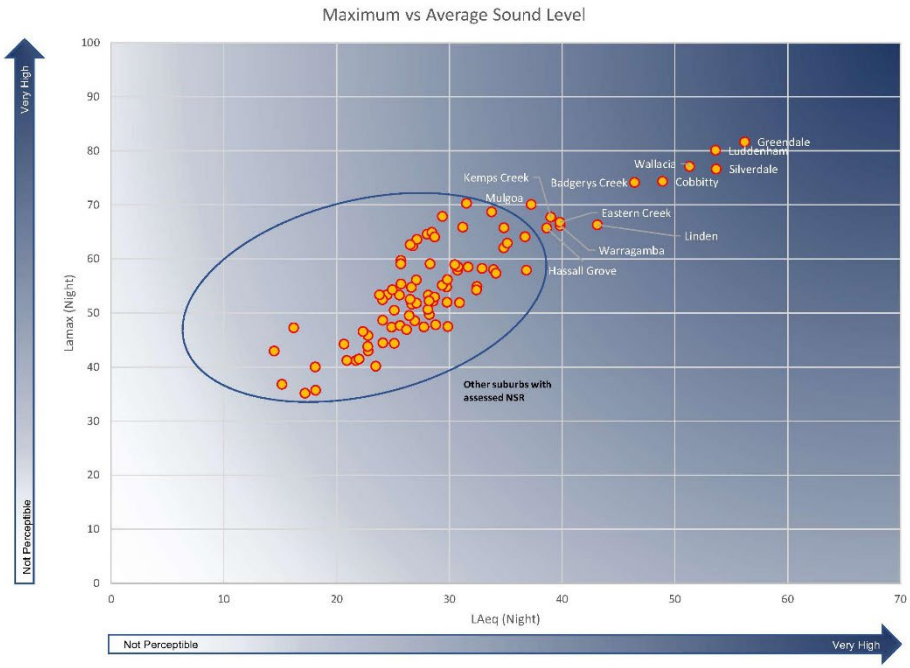


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)



D5 Assessment by School – Projected Average and Maximum Sound Level

CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Schools

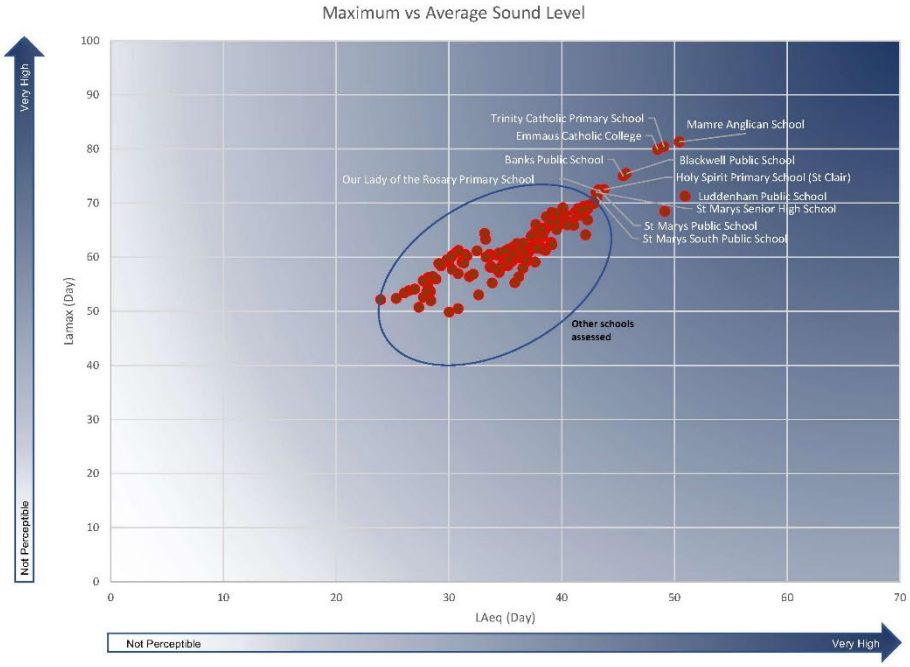


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Schools

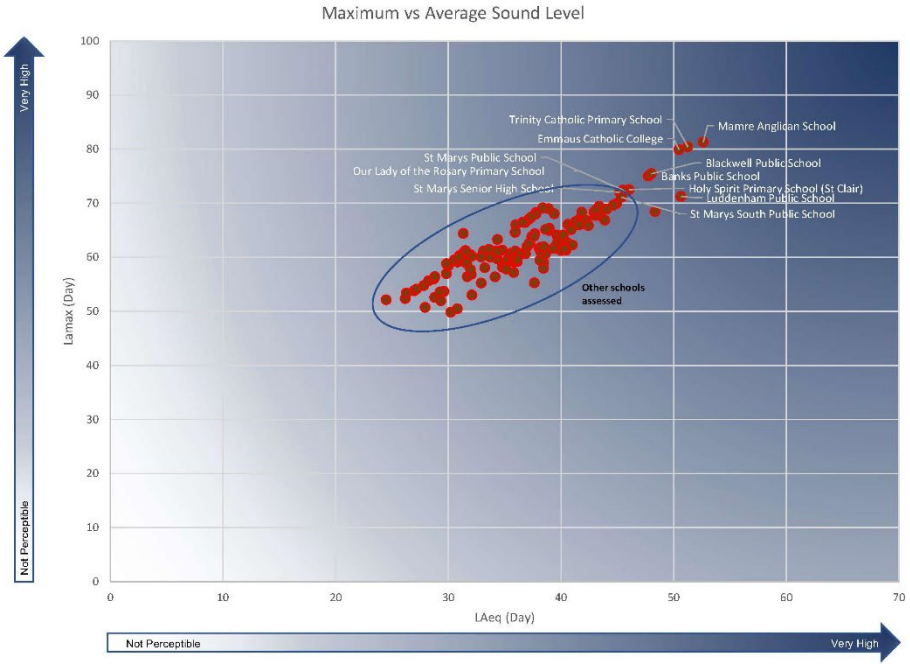


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Schools

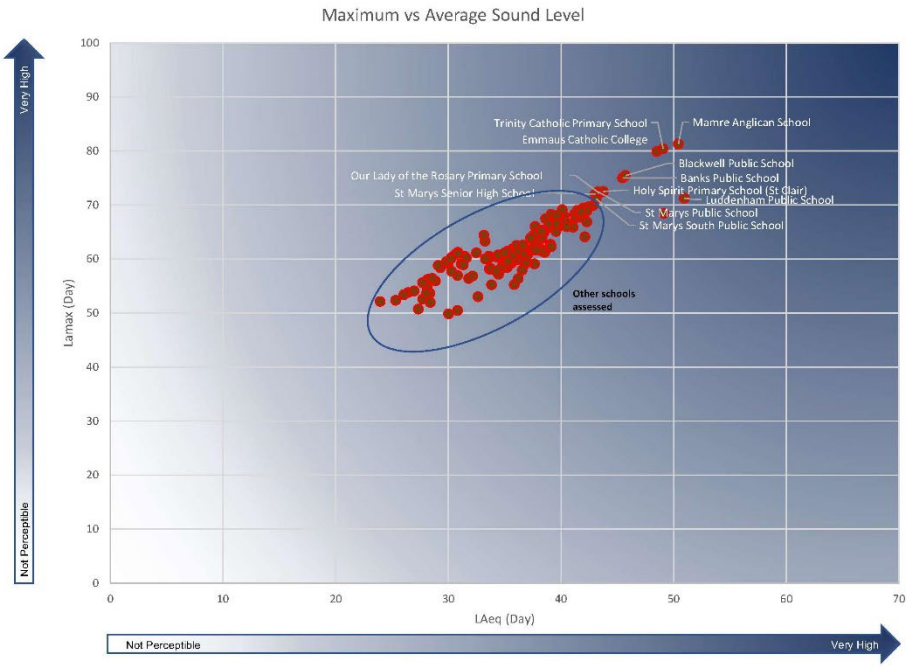


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Schools

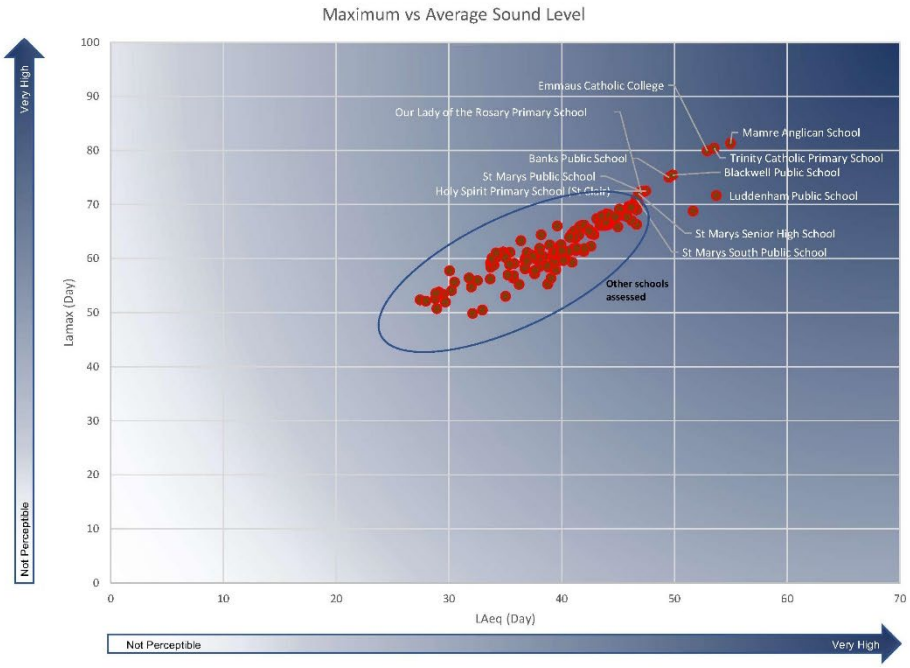


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Schools

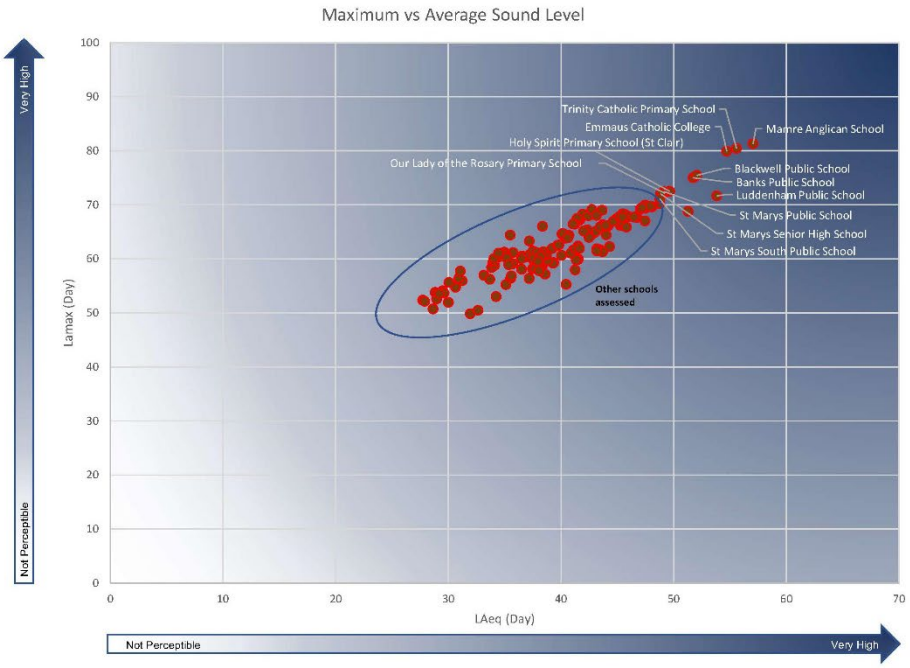
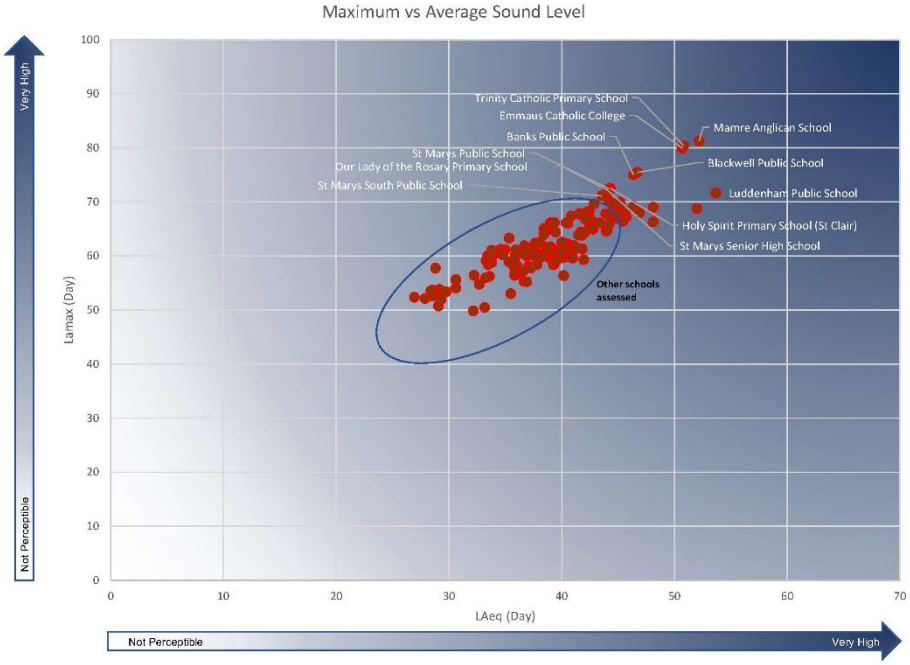


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Schools



D6 Assessment by Hospital, Aged Care and Childcare Facility – Projected Average and Maximum Sound Level

CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Hospitals, Aged Care and Childcare

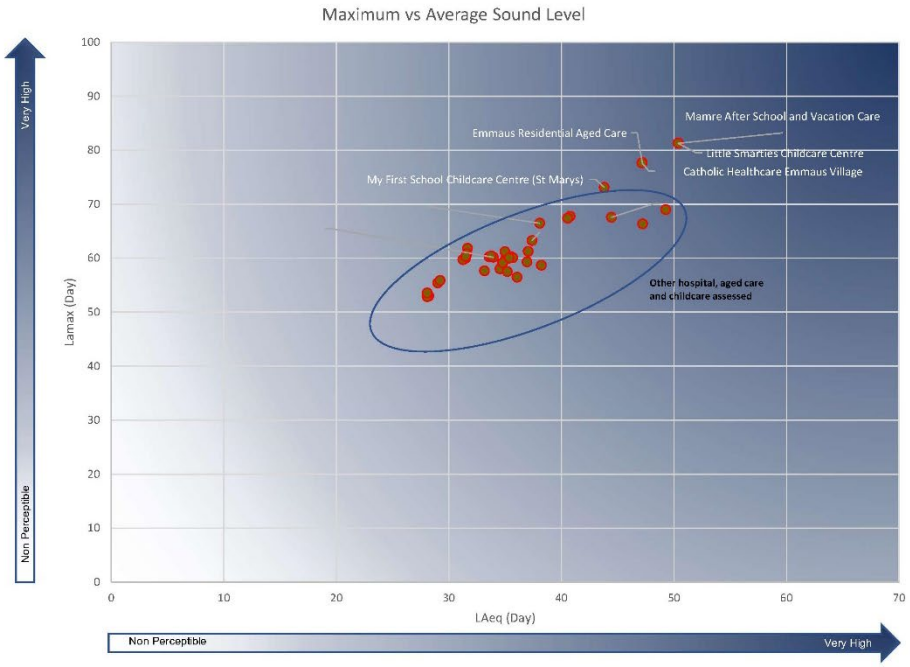


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Hospitals, Aged Care and Childcare

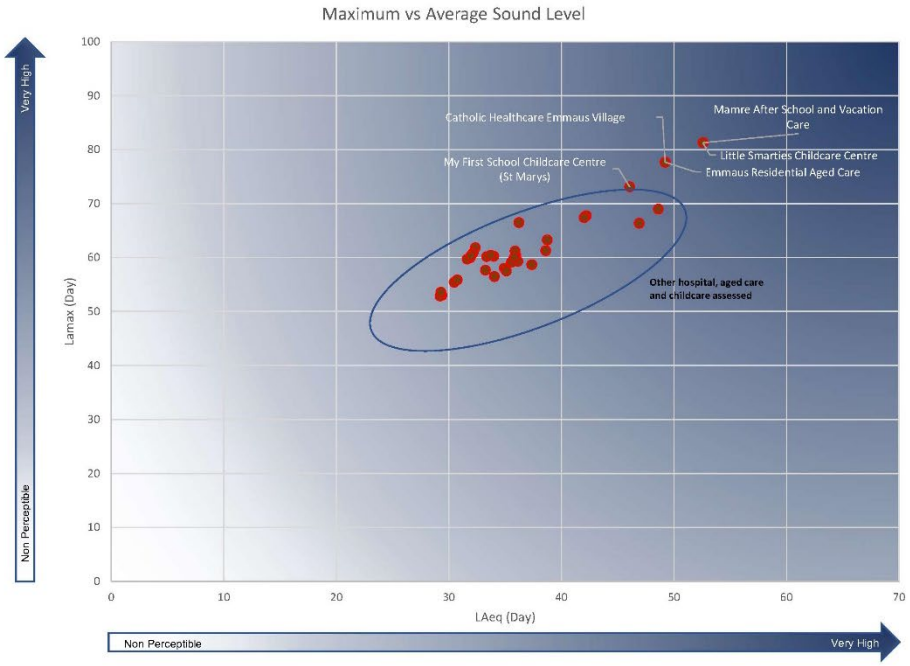


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Hospitals, Aged Care and Childcare

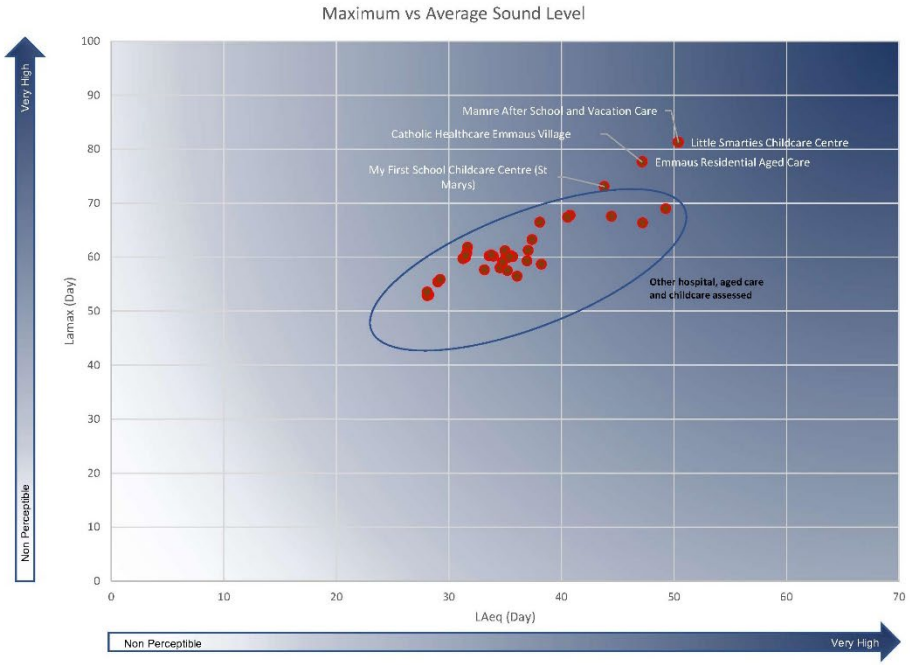


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Hospitals, Aged Care and Childcare

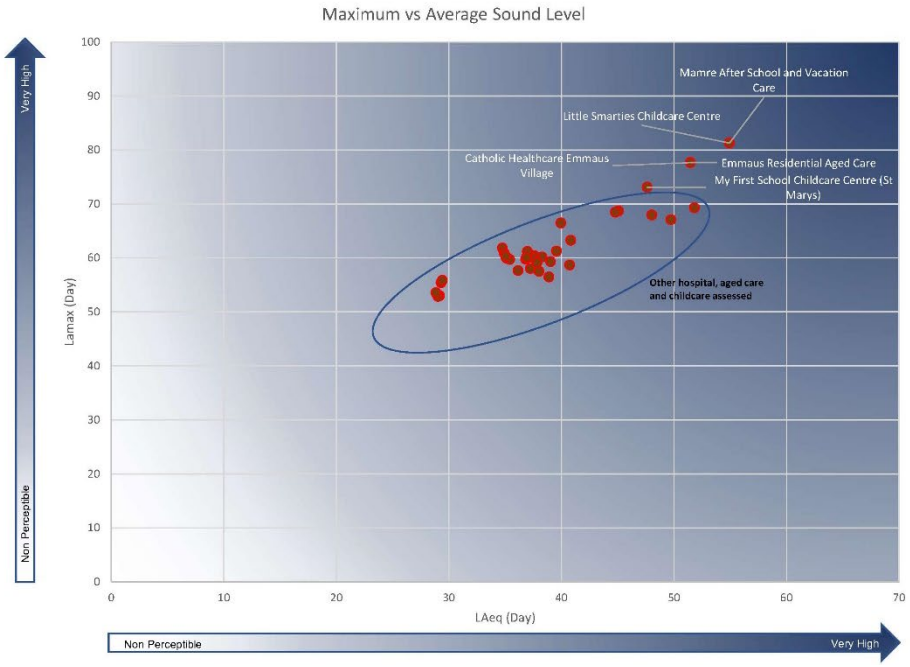


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Hospitals, Aged Care and Childcare

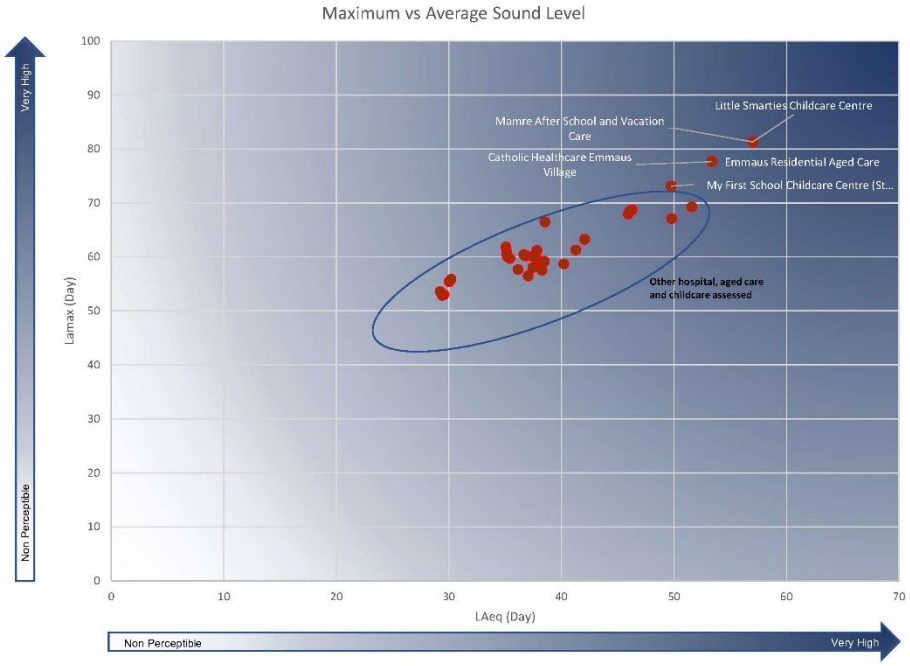


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Hospitals, Aged Care and Childcare

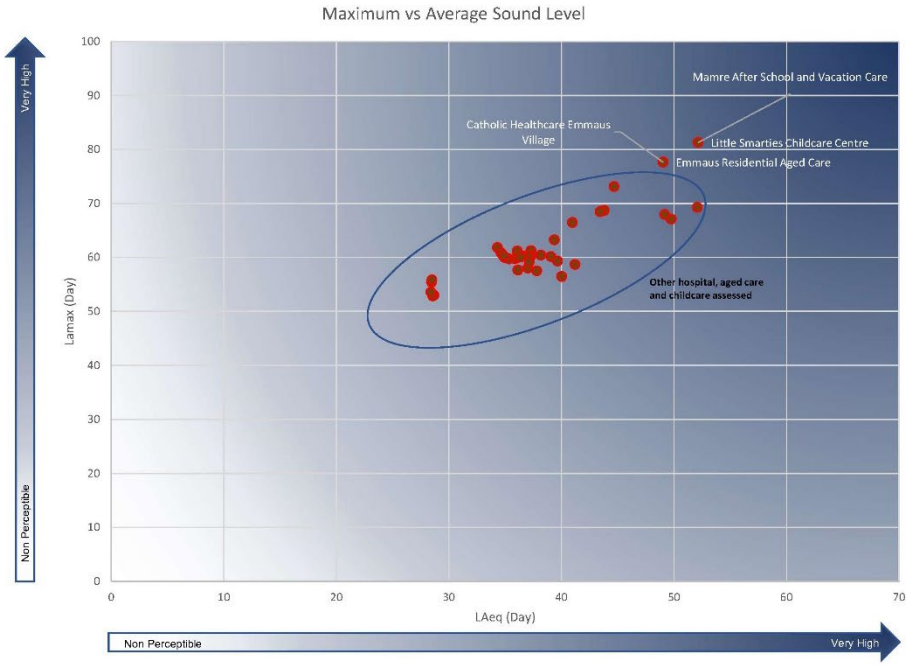


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)
NSR	Hospitals, Aged Care and Childcare

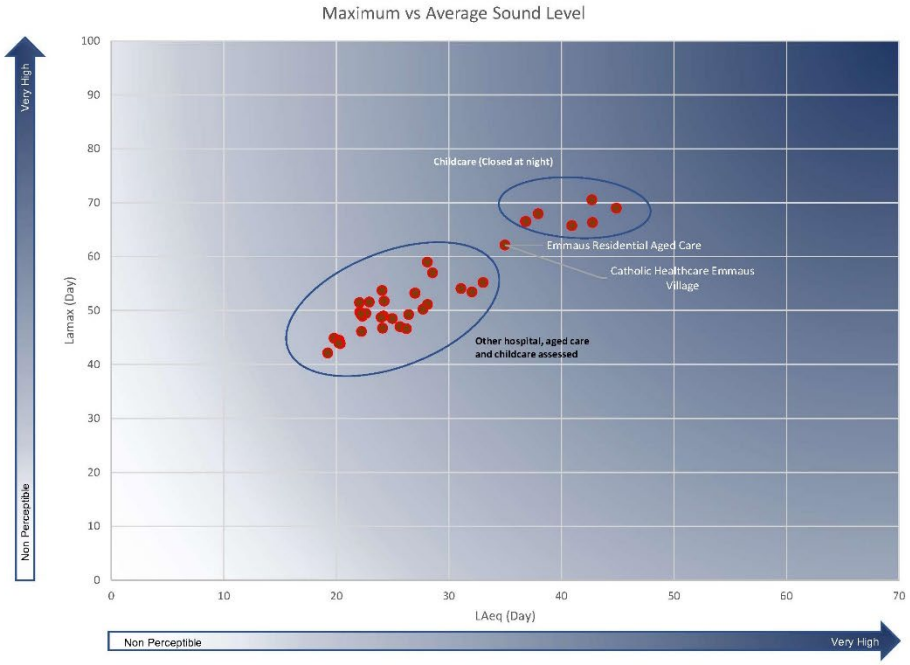


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)
NSR	Hospitals, Aged Care and Childcare

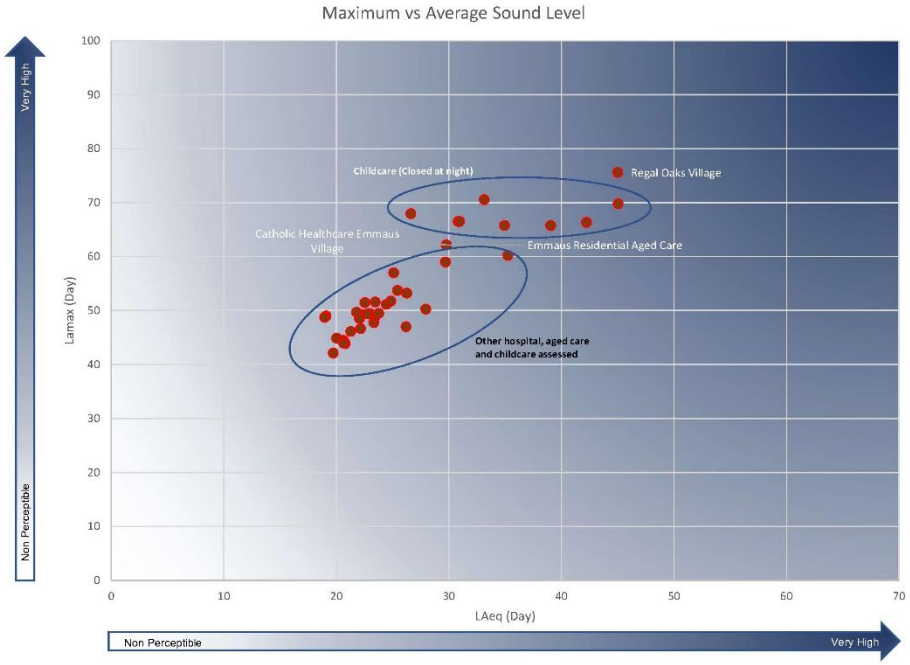


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)
NSR	Hospitals, Aged Care and Childcare

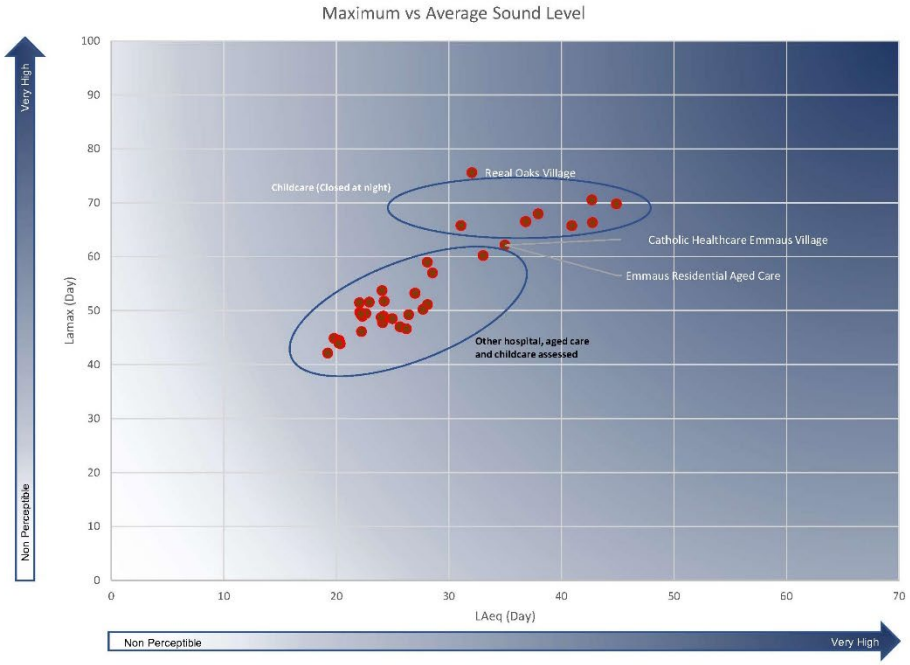


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)
NSR	Hospitals, Aged Care and Childcare

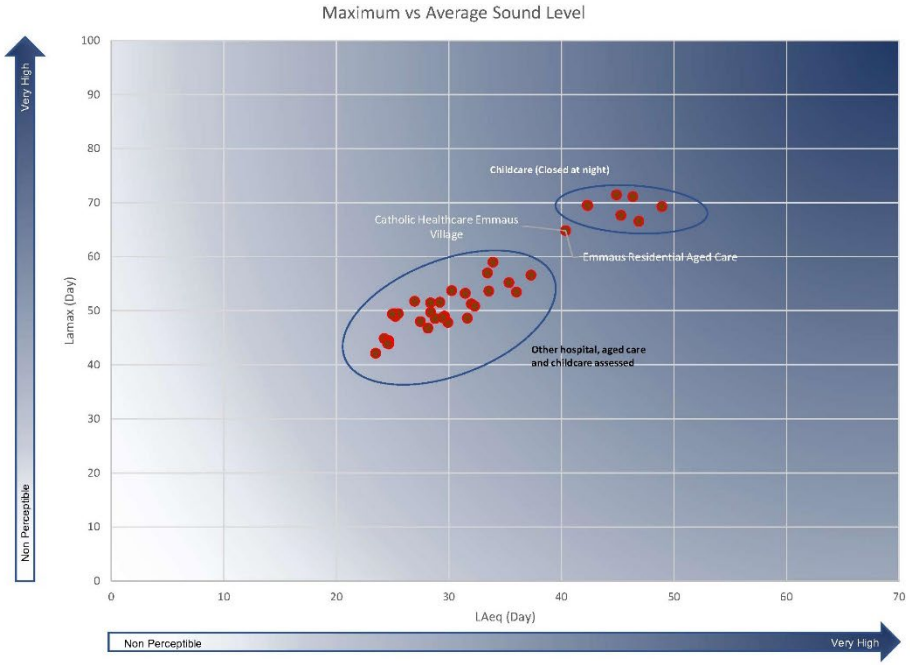


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)
NSR	Hospitals, Aged Care and Childcare

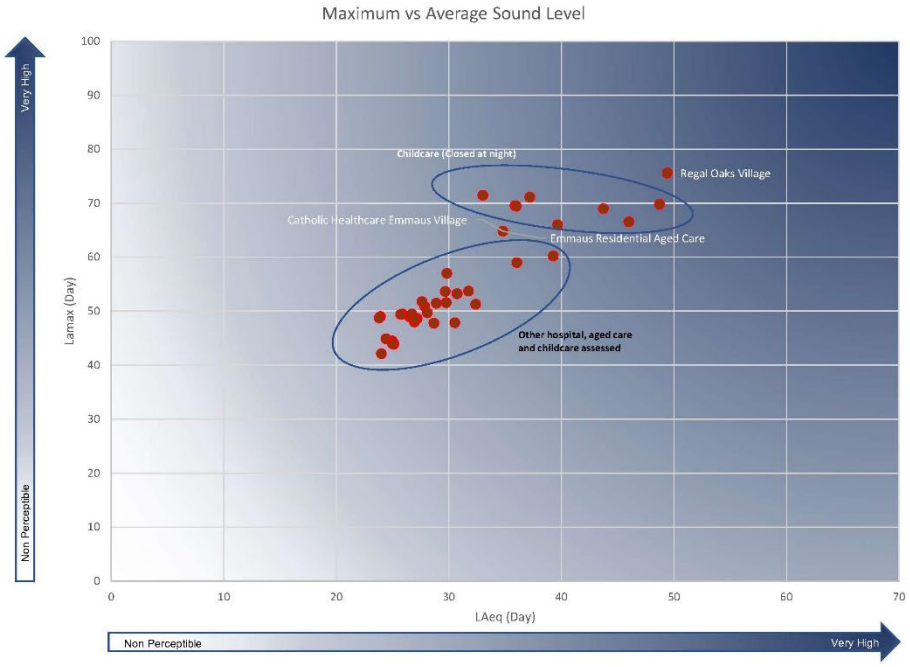
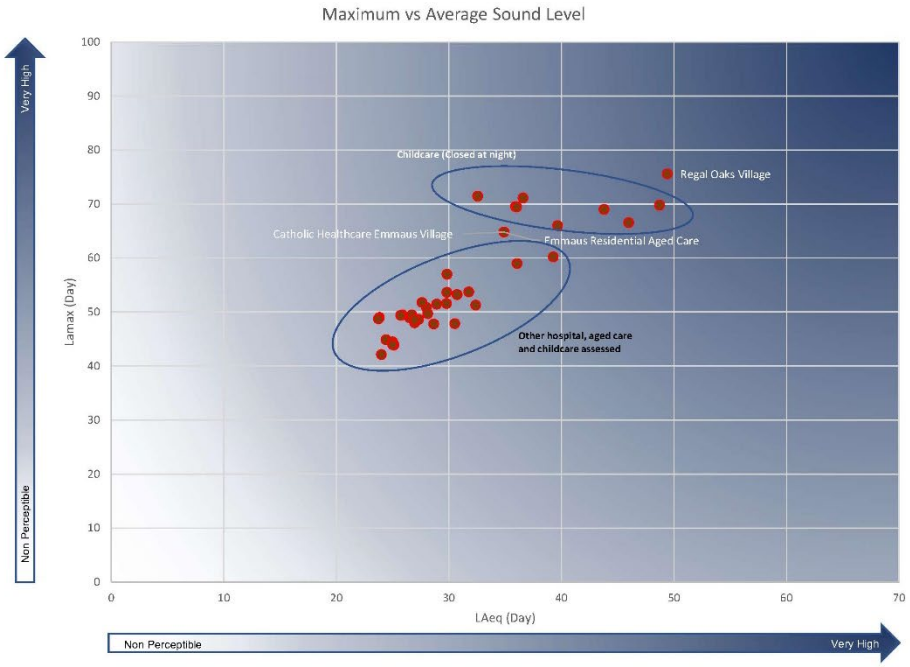


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Night (23:00-05:29)
NSR	Hospitals, Aged Care and Childcare



D7 Assessment by Religious and Community Centre Facility – Projected Average and Maximum Sound Level

CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Religious Facilities and Community Centres

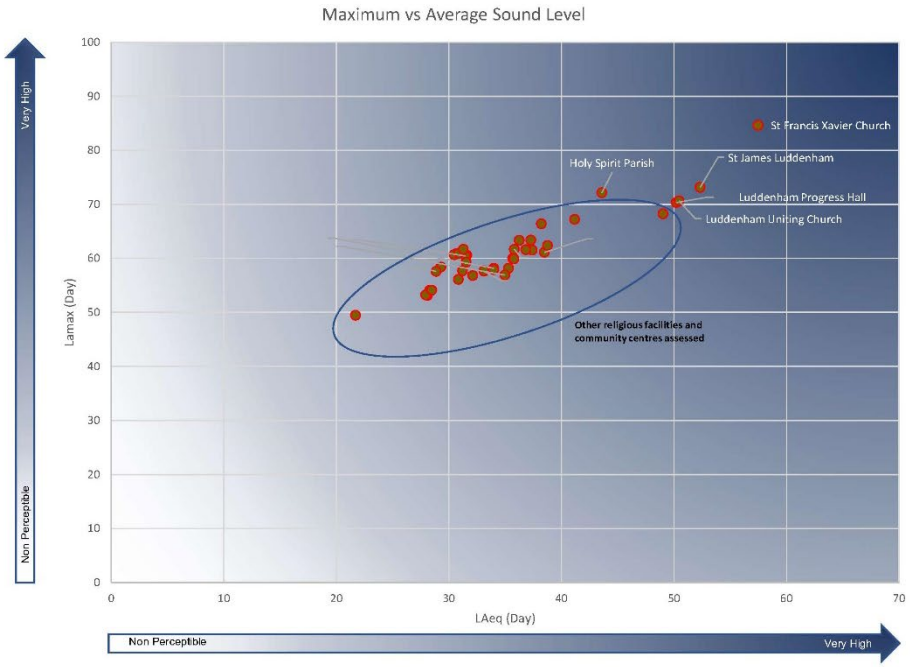


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Religious Facilities and Community Centres

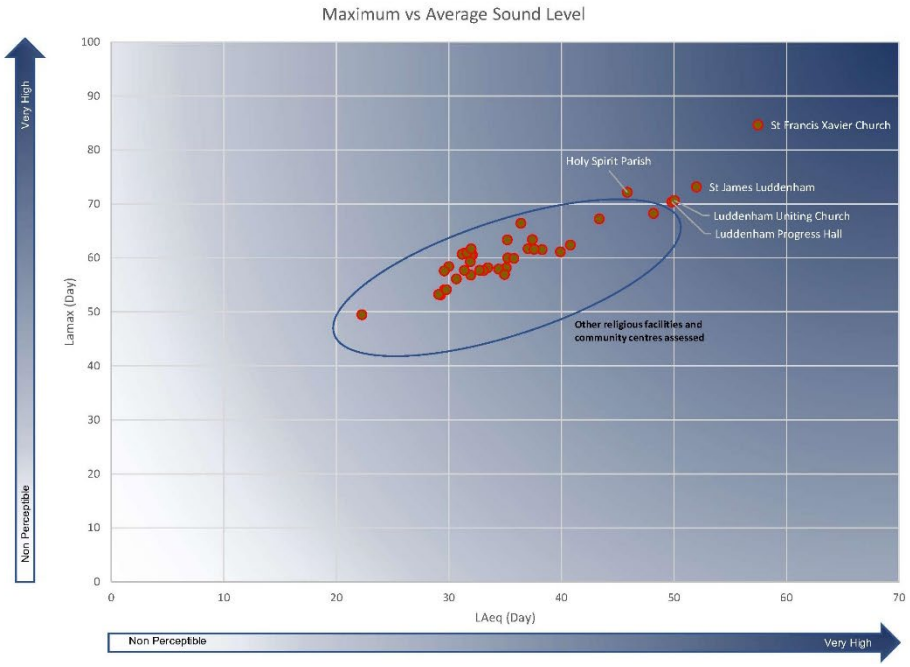


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Religious Facilities and Community Centres

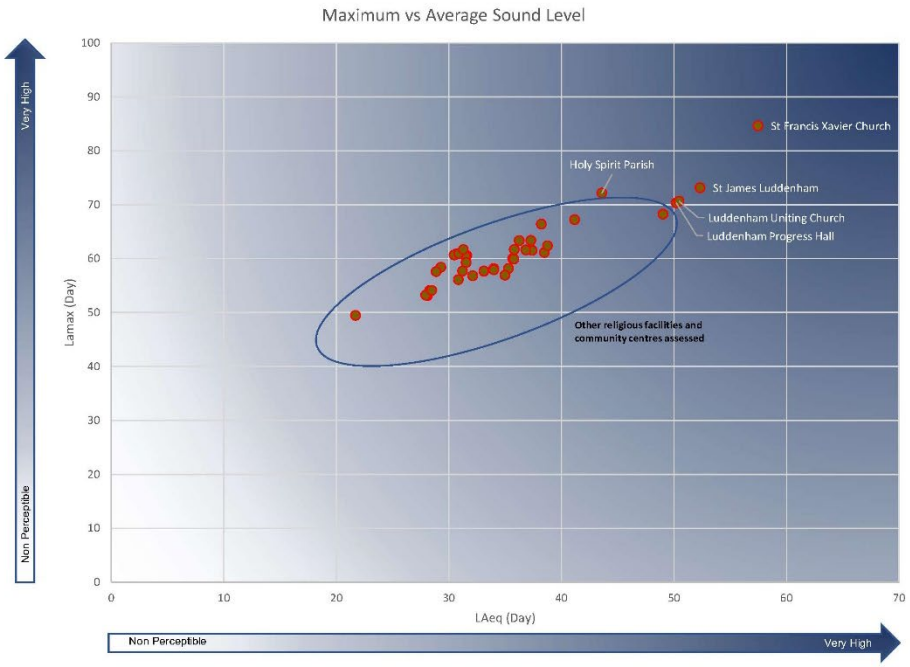


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Religious Facilities and Community Centres

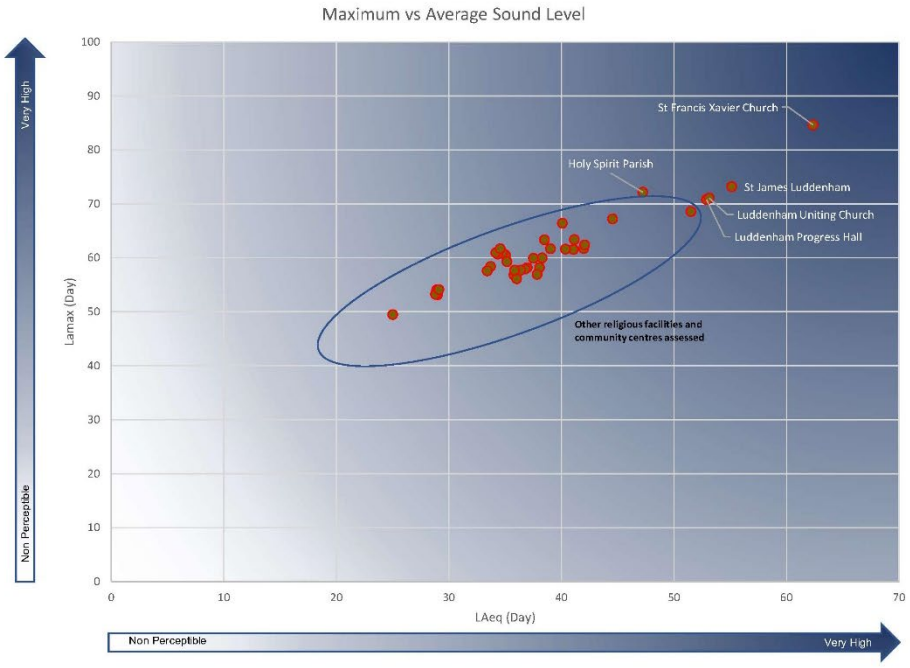


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Religious Facilities and Community Centres

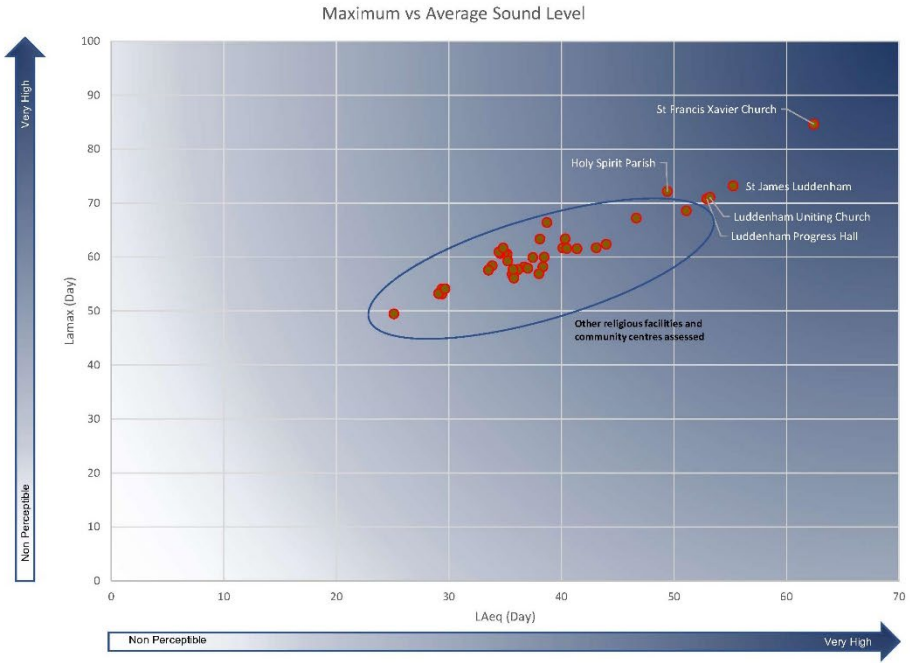
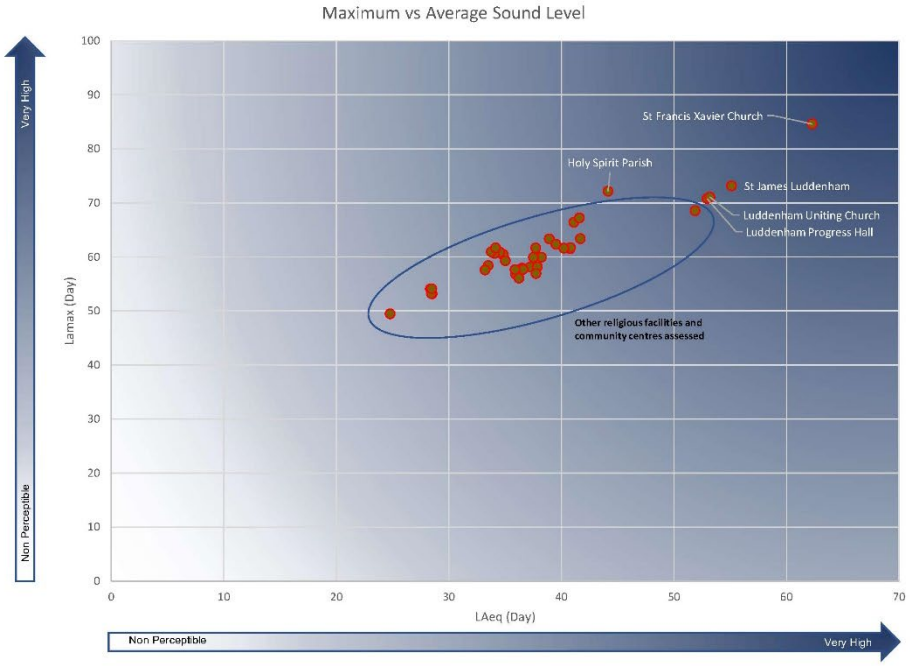


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Religious Facilities and Community Centres



D8 Assessment by Shopping Mall, Parks and Recreation – Projected Average and Maximum Sound Level

CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Shopping Malls, Parks and Recreation

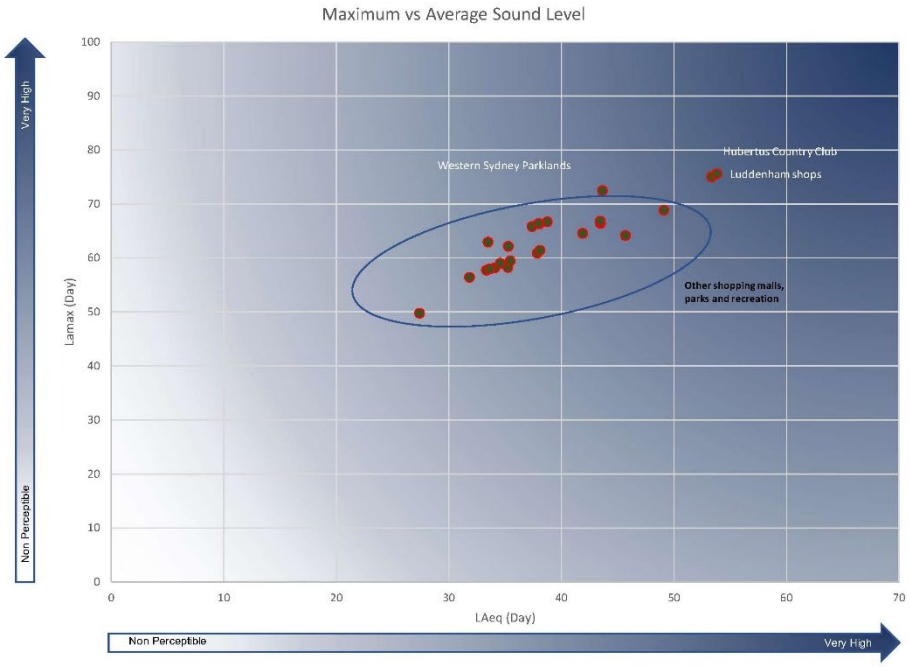


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Shopping Malls, Parks and Recreation

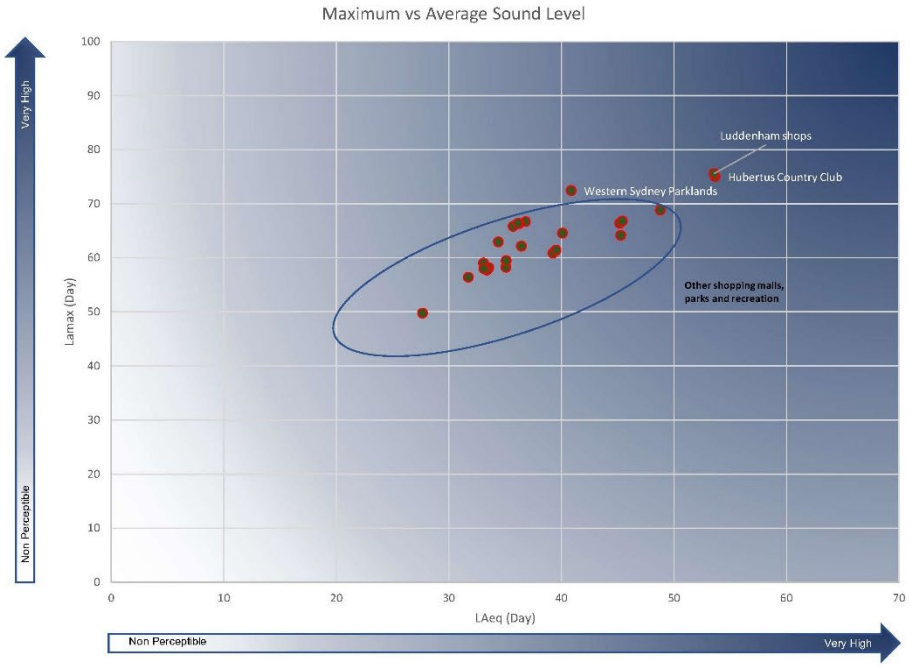


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Shopping Malls, Parks and Recreation

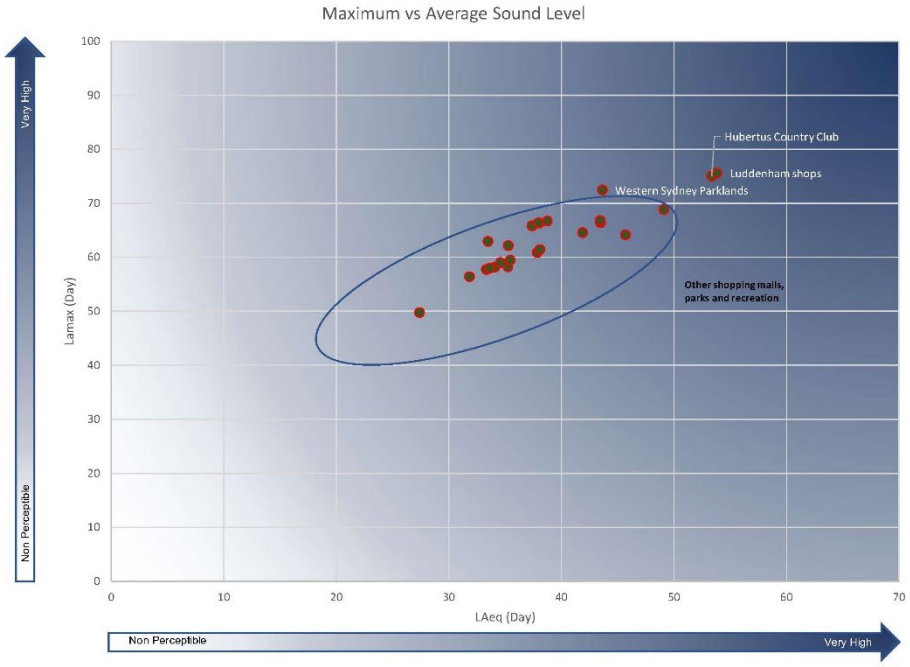


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Shopping Malls, Parks and Recreation

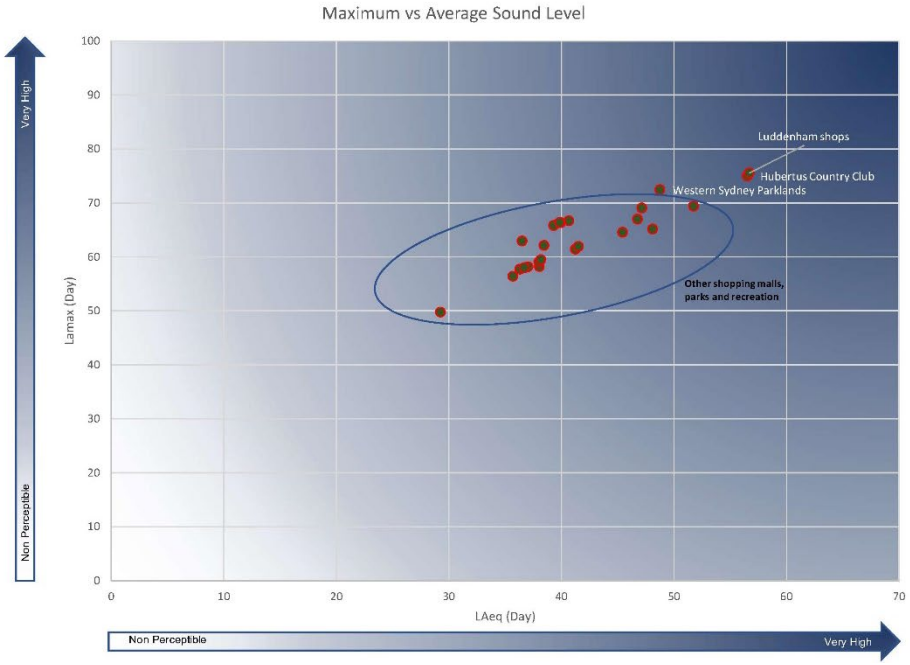


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Shopping Malls, Parks and Recreation

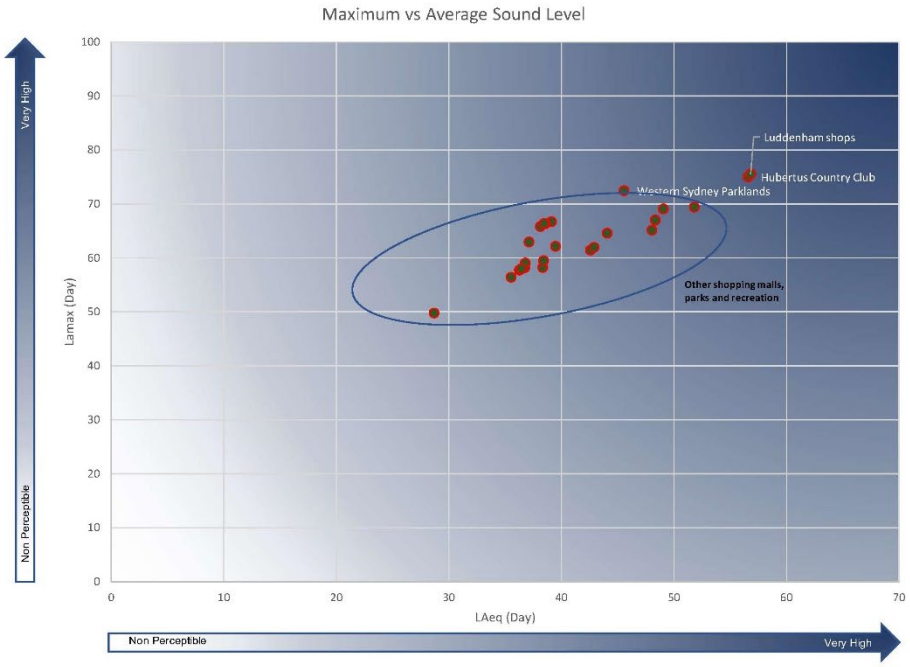
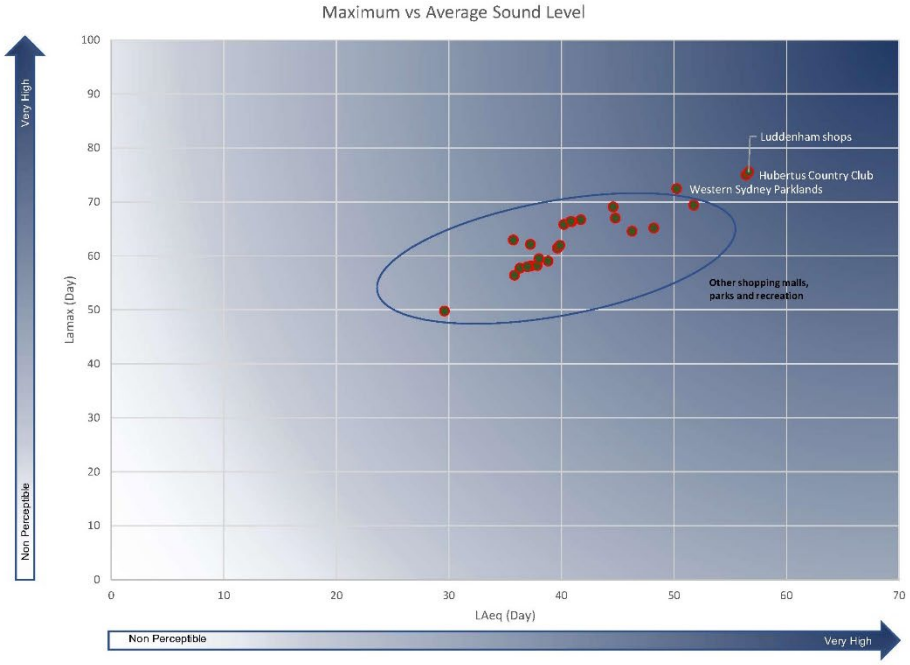
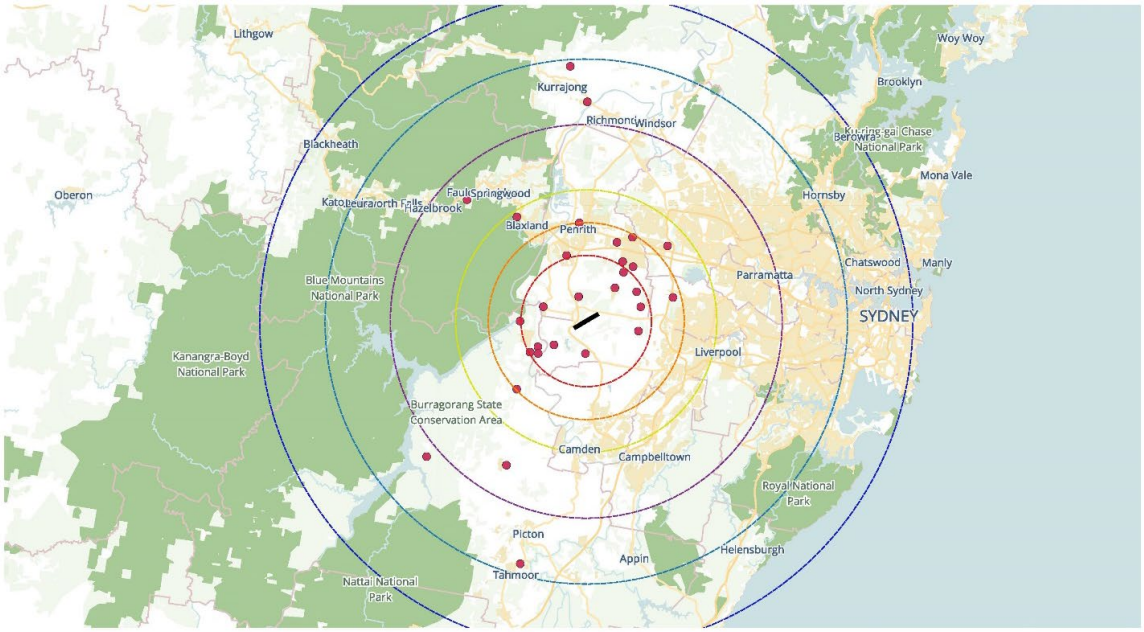
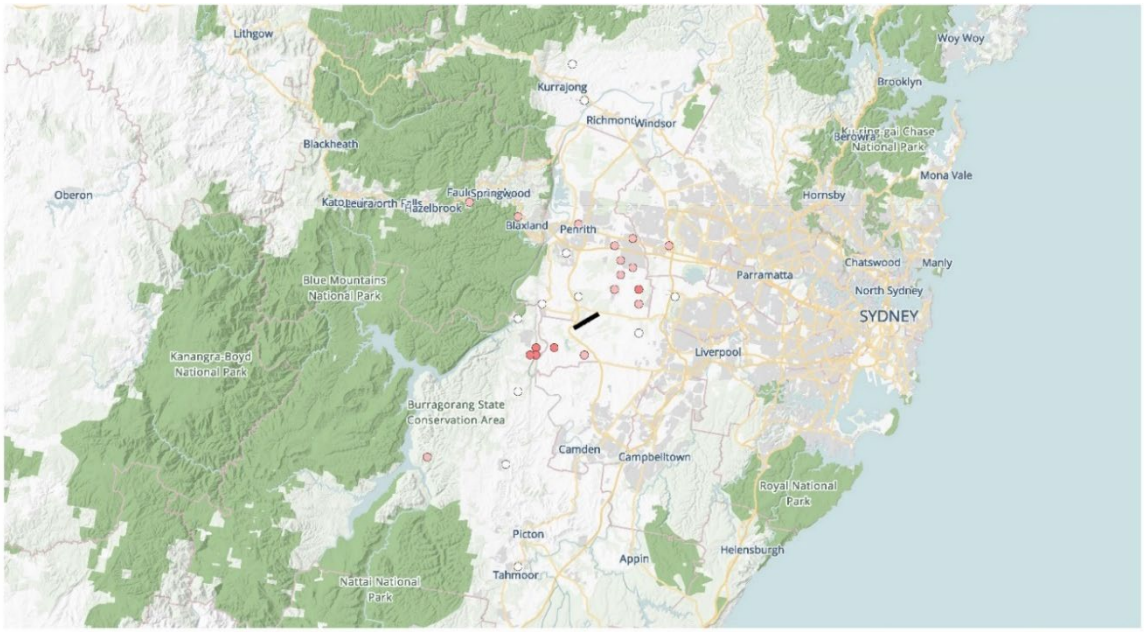


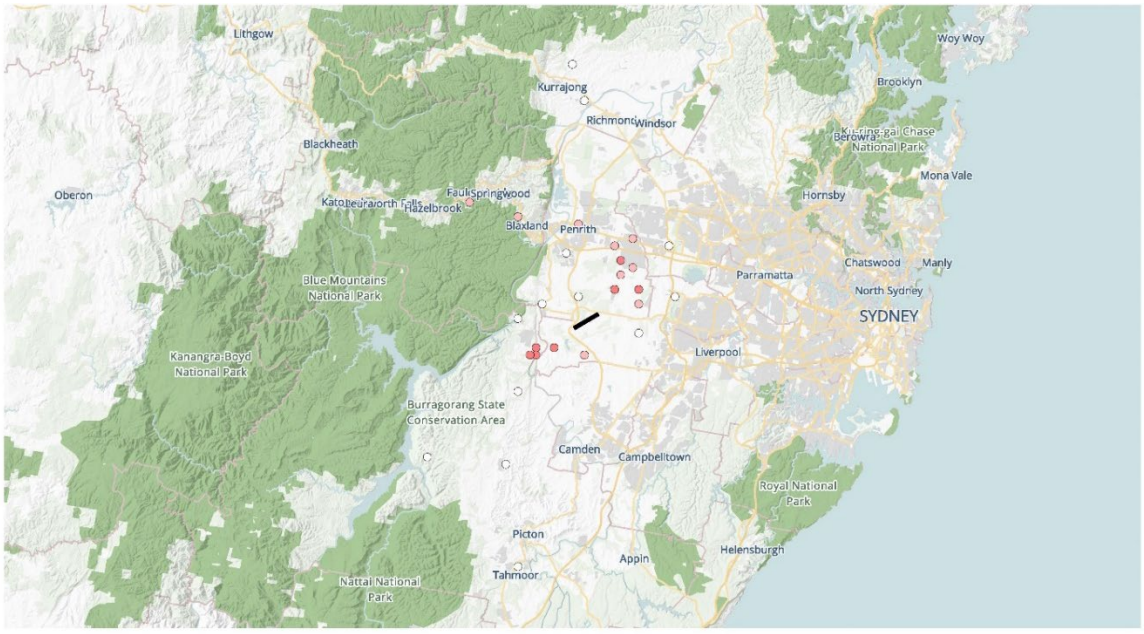
CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	LAmax vs LAeq
TIME	Day (05:30-18:59)
NSR	Shopping Malls, Parks and Recreation



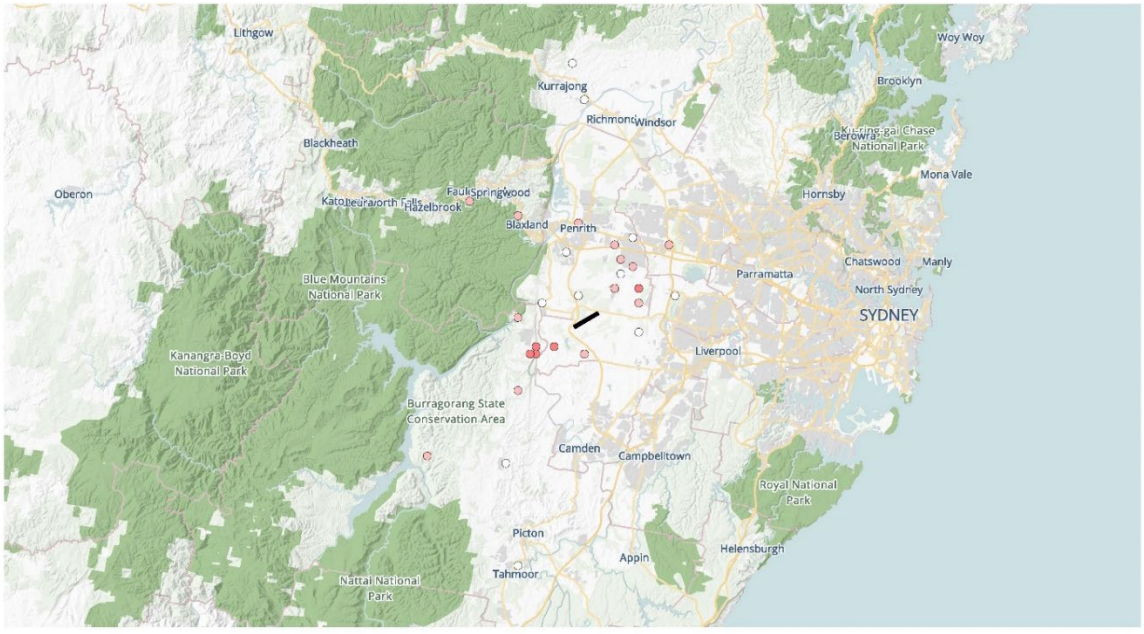
D9 Noise Monitoring – Projected Average Sound Level Variations



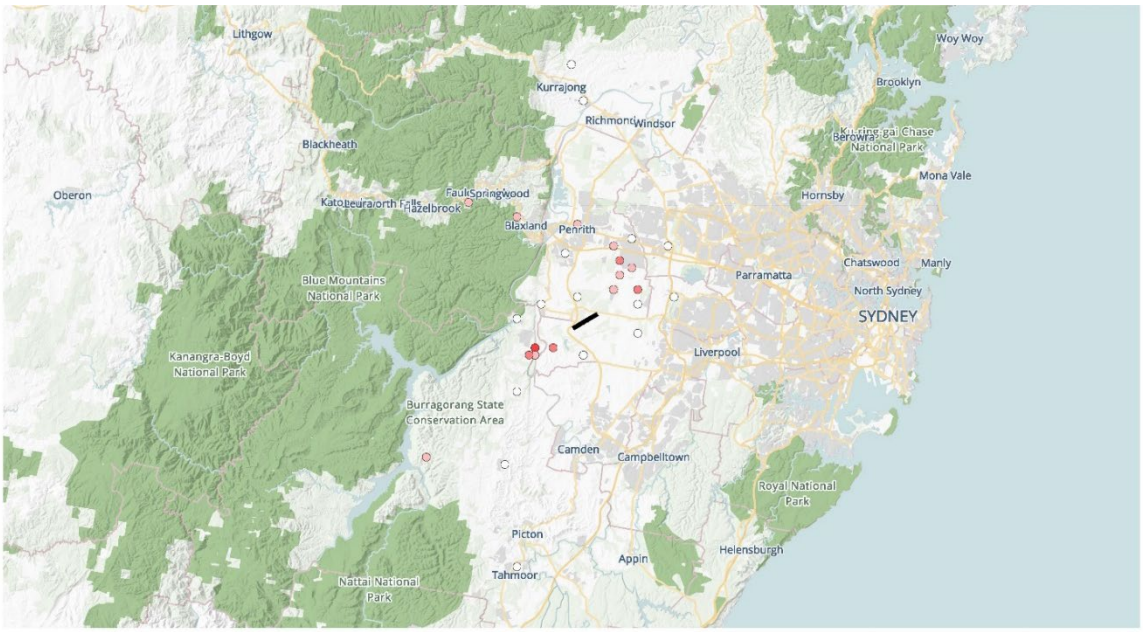




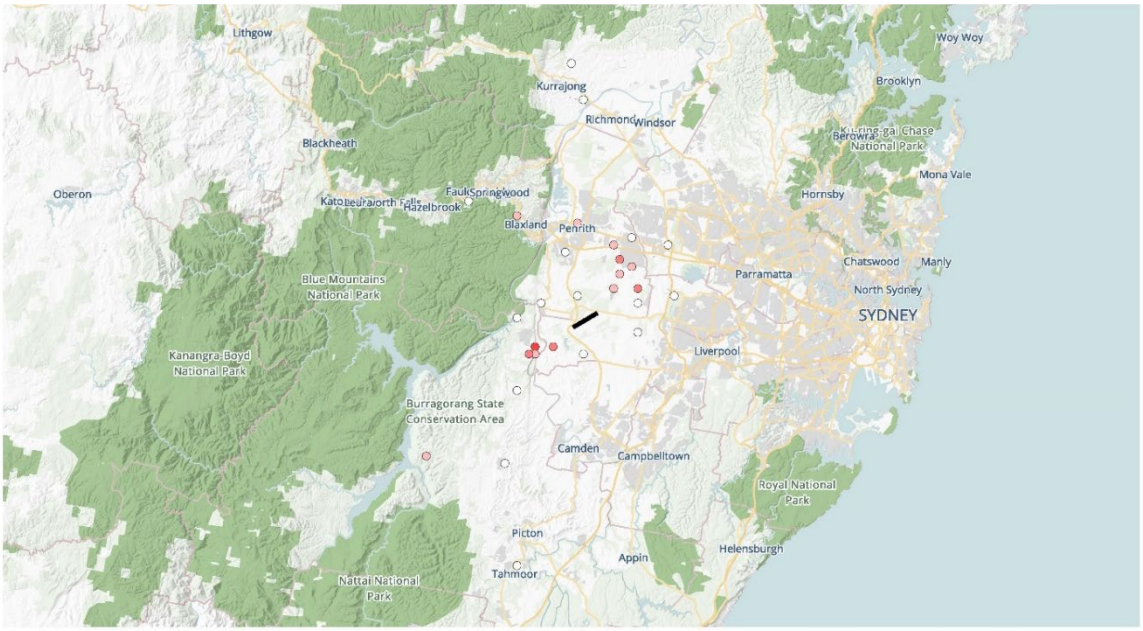
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 3 - PAL 1 (2033)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 4 - PAL 1 (2033)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 1 - PAL 1 (2033)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 3 - PAL 1 (2033)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 4 - PAL 1 (2033)



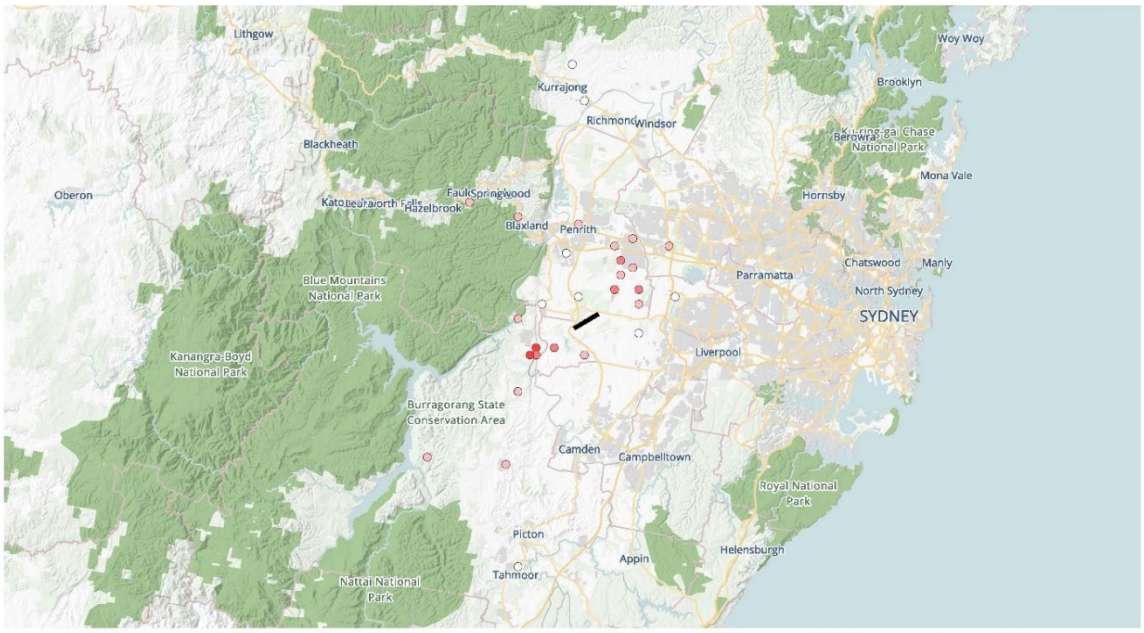
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 1 - PAL 1 (2033)



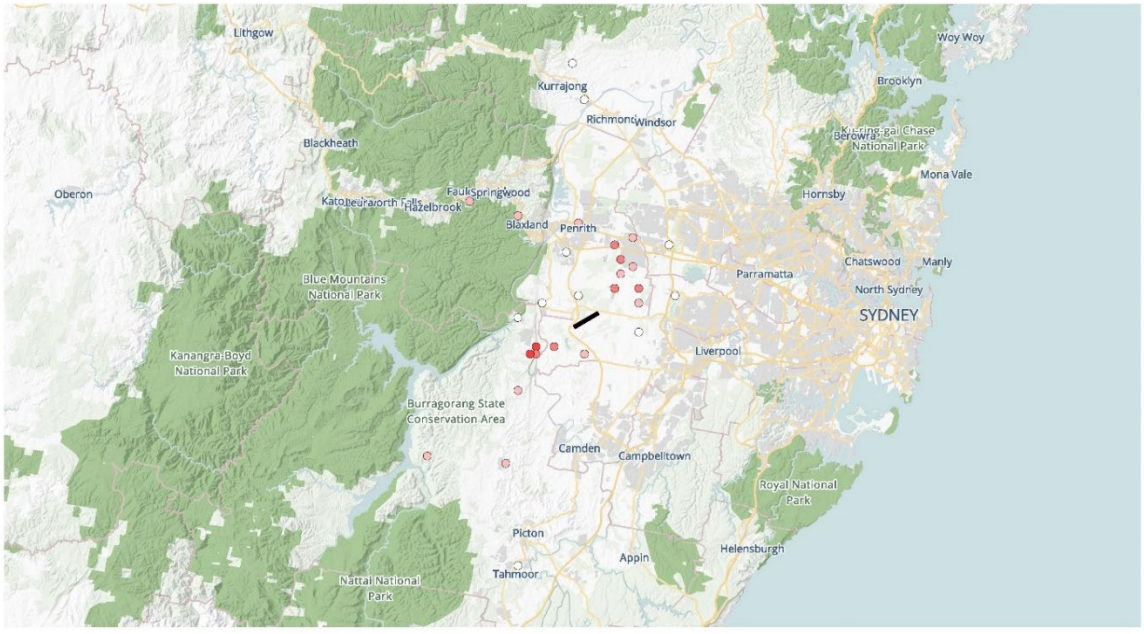
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 3 - PAL 1 (2033)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 4 - PAL 1 (2033)



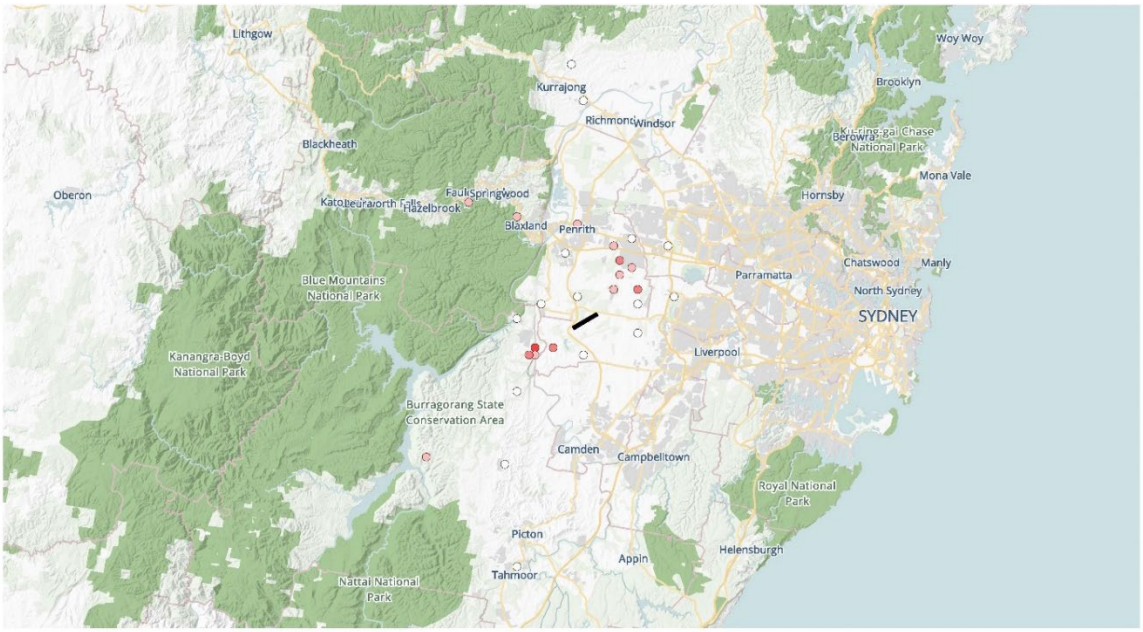
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 1 - PAL 2 (2040)



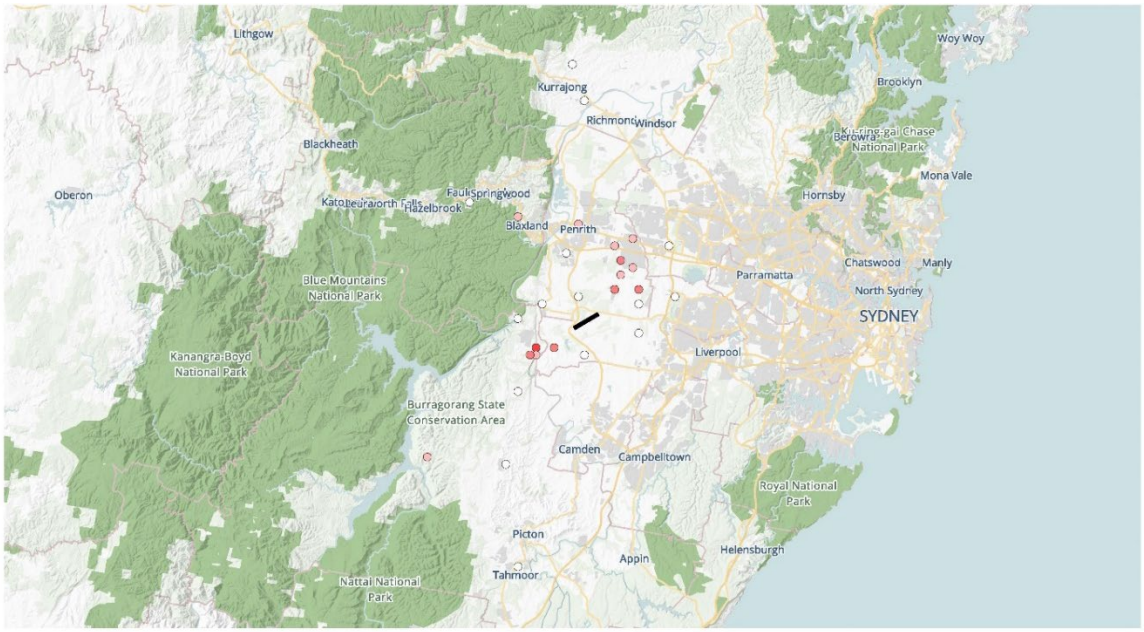
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 3 - PAL 2 (2040)



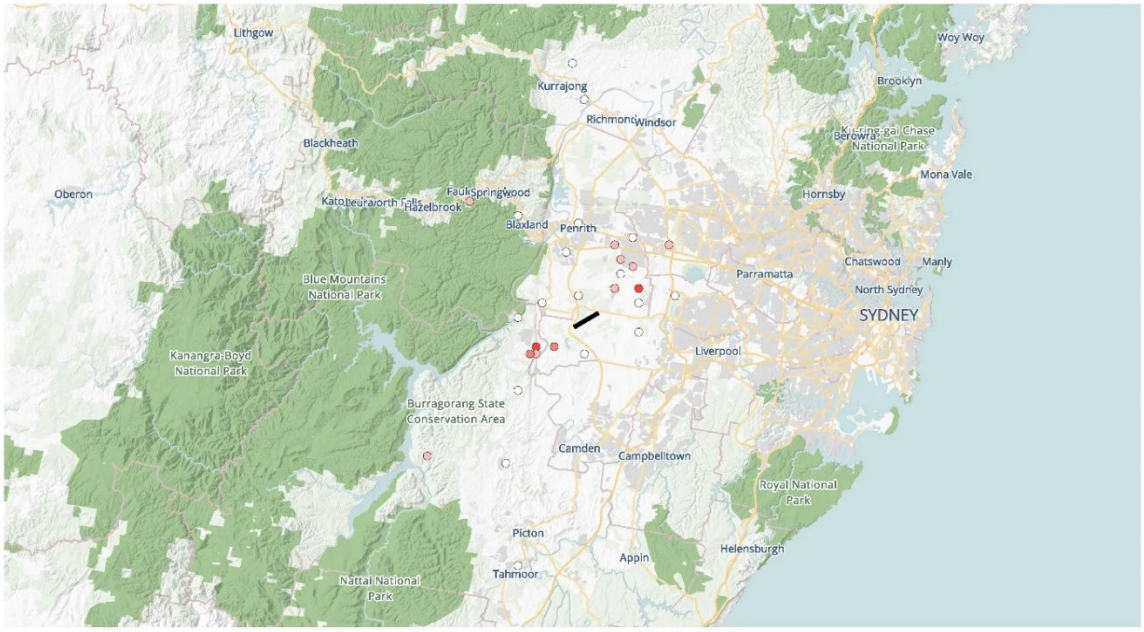
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 4 - PAL 2 (2040)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 1 - PAL 2 (2040)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 3 - PAL 2 (2040)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 4 - PAL 2 (2040)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 1 - PAL 2 (2040)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05/23

N 0 10 20 km



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 3 - PAL 2 (2040)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05/23

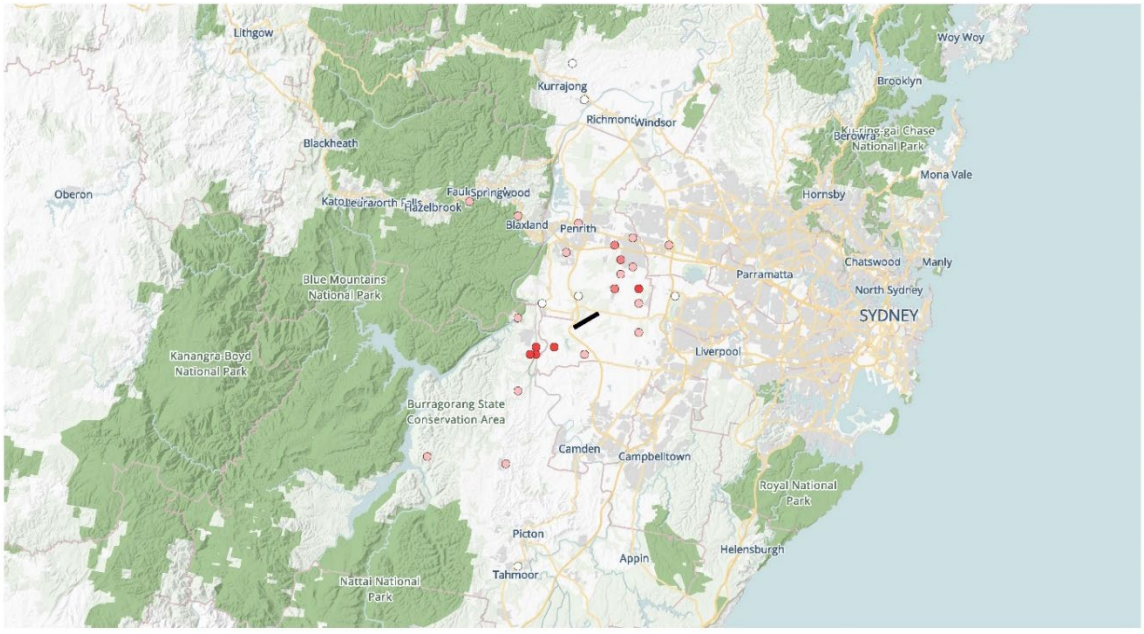
N 0 10 20 km



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 4 - PAL 2 (2040)

LEGEND (dB(A))
<0 — Runway 05/23
0 - 10
10 - 20

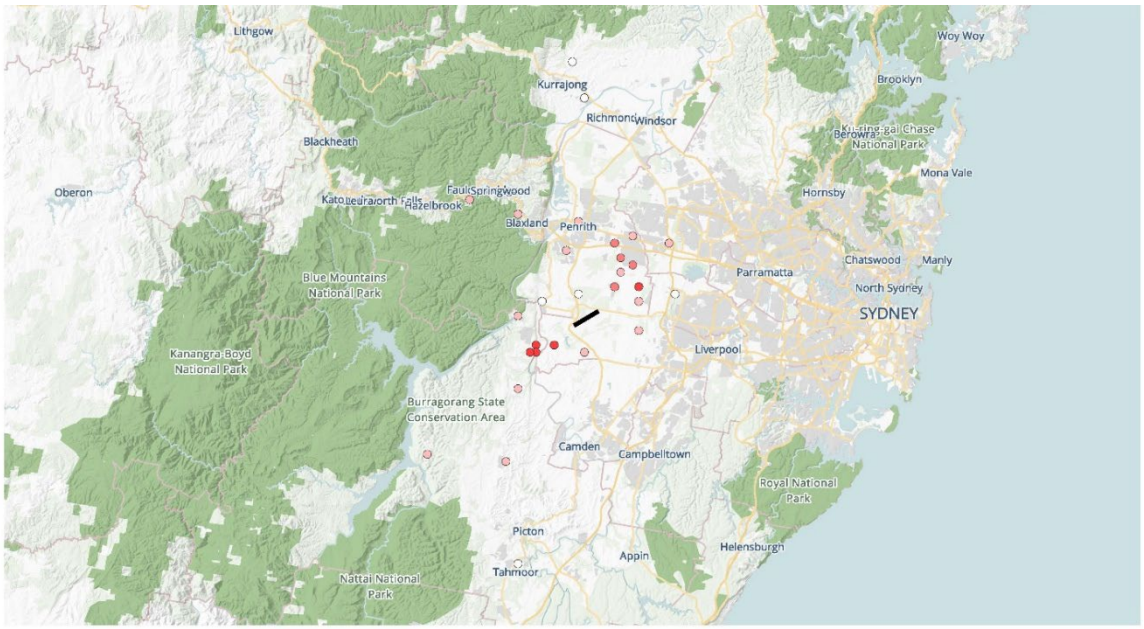
N 0 10 20 km



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 1 - PAL 3 (2055)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05-23

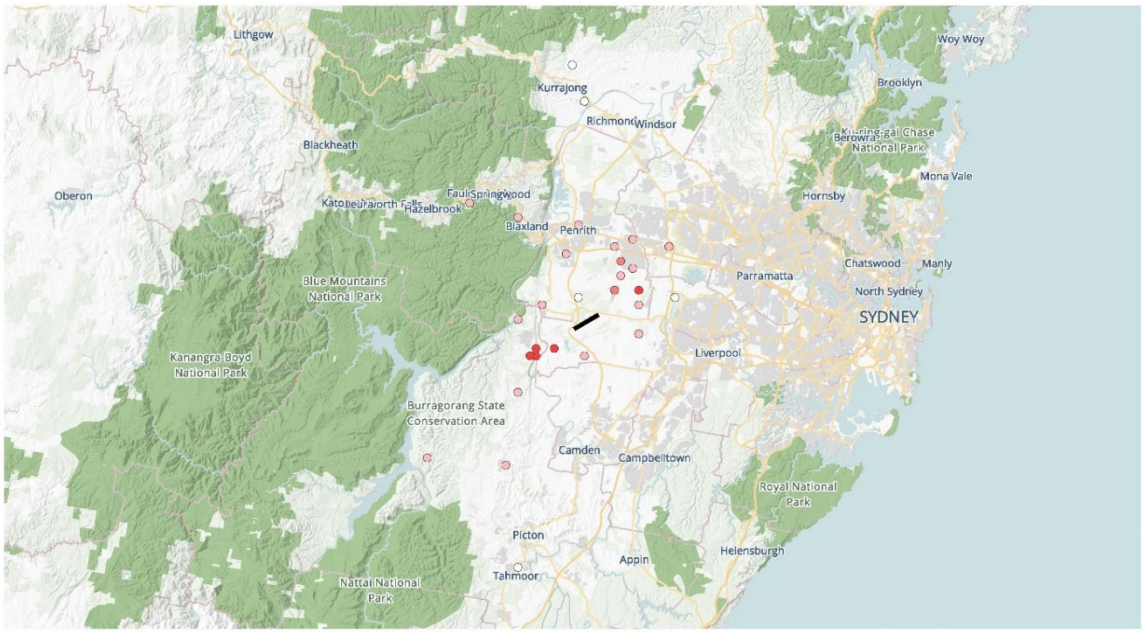
N 0 10 20 km



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 3 - PAL 3 (2055)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05-23

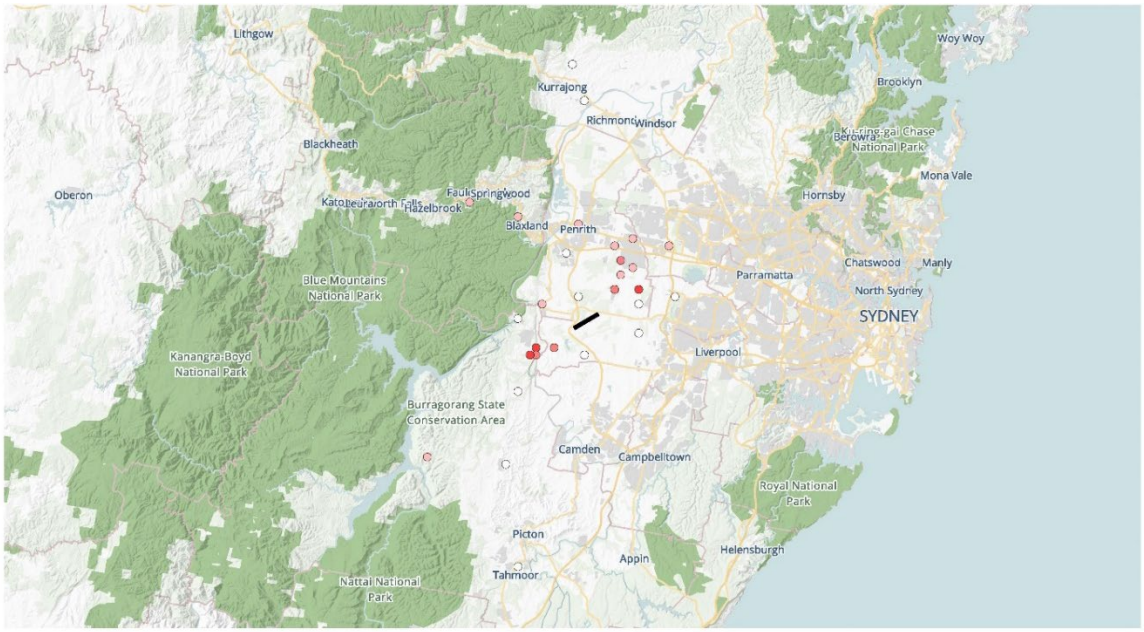
N 0 10 20 km



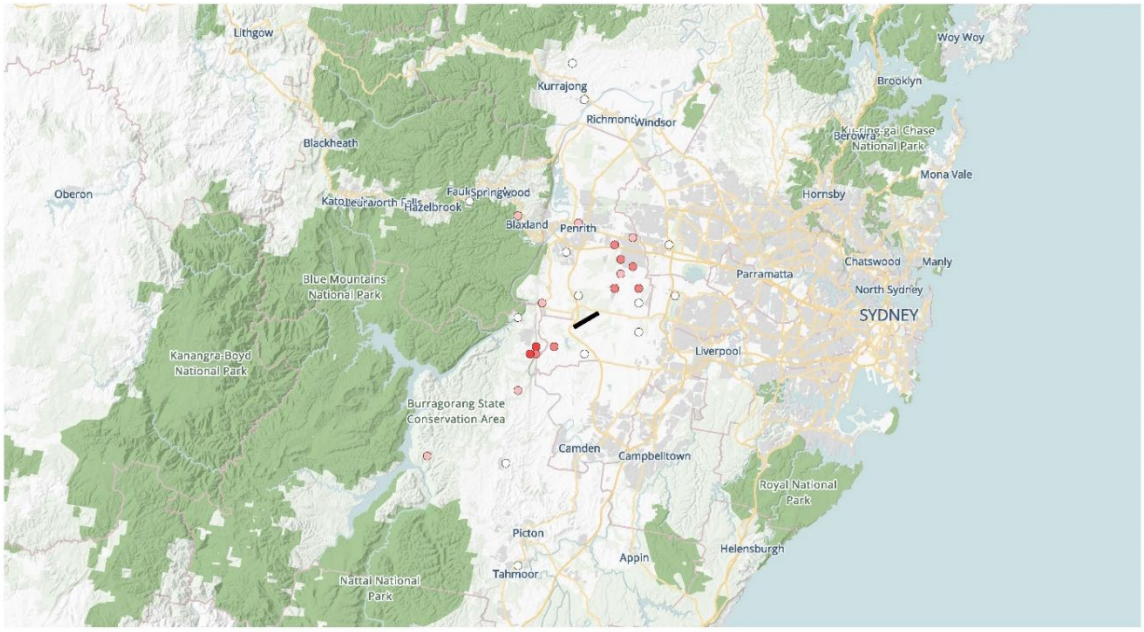
Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Day (05:30-19:00)
Scenario 4 - PAL 3 (2055)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05-23

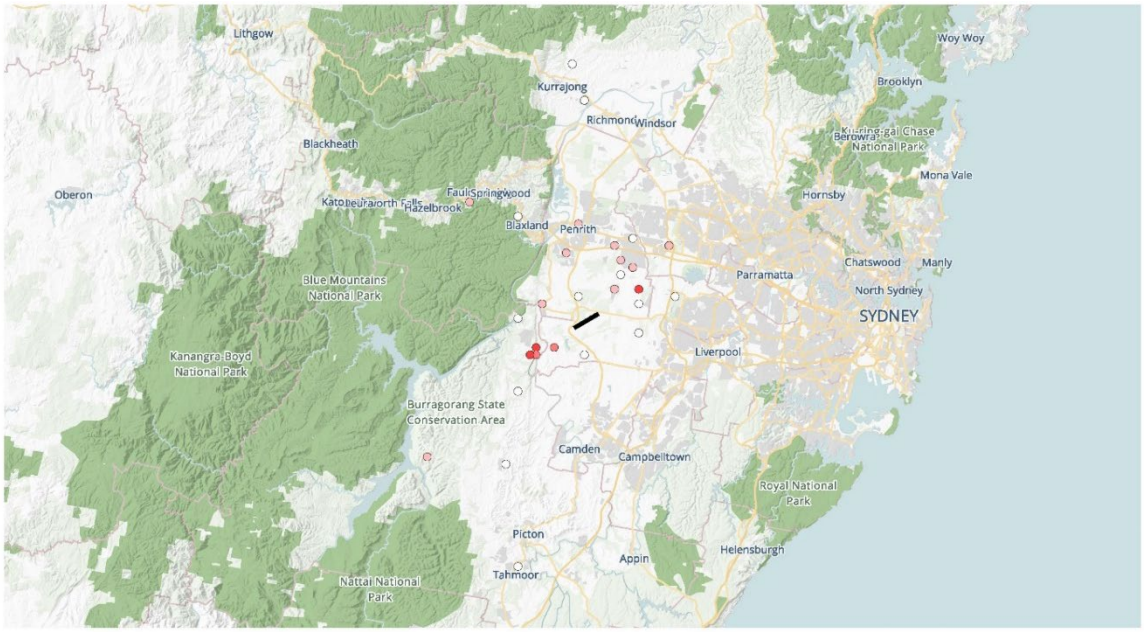
N 0 10 20 km



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 1 - PAL 3 (2055)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 3 - PAL 3 (2055)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Evening (19:00-23:00)
Scenario 4 - PAL 3 (2055)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 1 - PAL 3 (2055)



Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 3 - PAL 3 (2055)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05/23

N 0 10 20 km

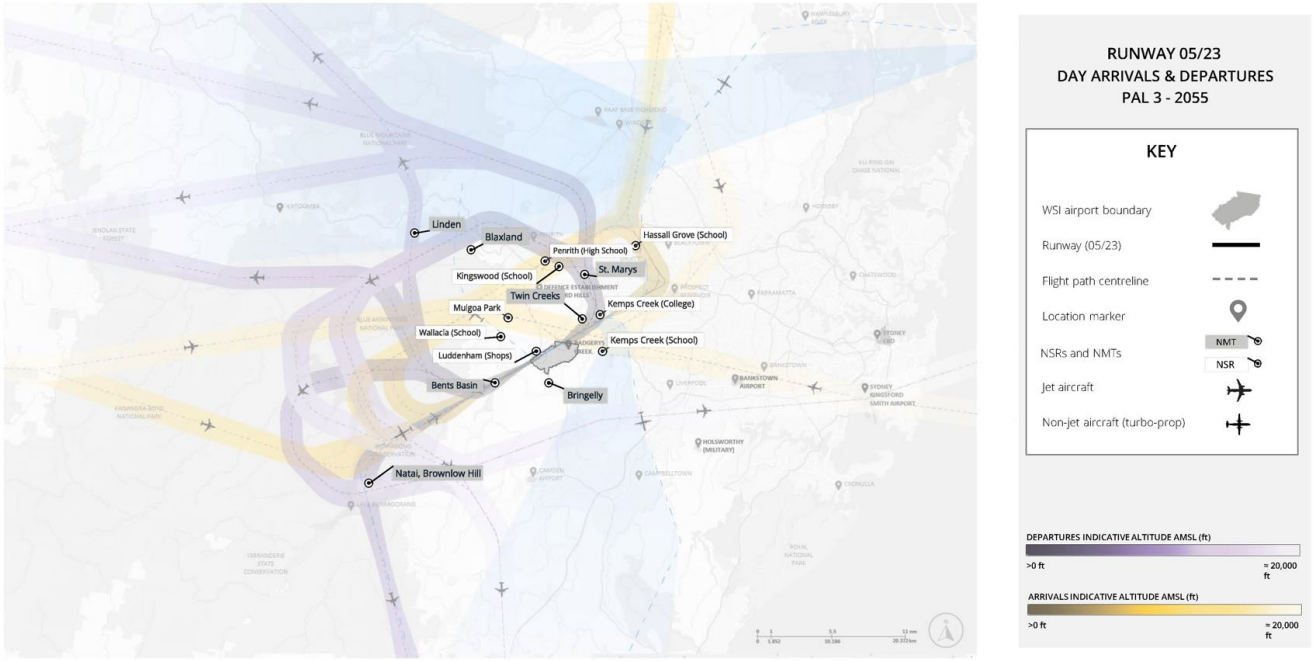


Noise Monitoring Terminals
Measured RBL vs Modelled LAeq - Night (23:00-05:30)
Scenario 4 - PAL 3 (2055)

LEGEND (dB(A))
<0
0 - 10
10 - 20
20 - 30
Runway 05/23

N 0 10 20 km

D10 Noise Sensitive Areas – Detailed Respite Assessment



Scenario 1 - Daytime (5:30 to 18:59)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	116	215.6	228.1	241	0%
Kemps Creek (College)	0	95.9	221.1	225	24%
Hassall Grove (School)	0	115.4	204.0	210	5%
Kingswood (School)	46	113.2	134.8	138	0%
St. Marys	0	57.9	134.6	137	24%
Mulgoa Park	0	46.8	108.5	112	24%
Linden	0	53.0	93.5	94	20%
Blaxland	0	38.0	87.1	88	24%
Kemps Creek (School)	0	21.8	40.5	41	20%
Twin Creeks	0	0.0	0.0	0	100%
Luddenham (Shops)	193	398.4	437.4	450	0%
Penrith (High School)	0	38.0	87.1	88	24%
Wallacia (School)	0	4.3	9.0	9	21%
Natai, Brownlow Hill	0	1.6	4.0	4	33%
Bringelly	0	0.7	2.0	2	45%

Scenario 1 - Evening (19:00 to 22:59)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	116	215.6	228.1	241	0%
Kemps Creek (College)	0	95.9	221.1	225	24%
Hassall Grove (School)	0	115.4	204.0	210	5%
Kingswood (School)	46	113.2	134.8	138	0%
St. Marys	0	57.9	134.6	137	24%
Mulgoa Park	0	46.8	108.5	112	24%
Linden	0	53.0	93.5	94	20%
Blaxland	0	38.0	87.1	88	24%
Kemps Creek (School)	0	21.8	40.5	41	20%
Twin Creeks	0	0.0	0.0	0	100%
Luddenham (Shops)	193	398.4	437.4	450	0%
Penrith (High School)	0	38.0	87.1	88	24%
Wallacia (School)	0	4.3	9.0	9	21%
Natai, Brownlow Hill	0	1.6	4.0	4	33%
Bringelly	0	0.7	2.0	2	45%

Scenario 3 - Daytime (5:30 to 18:59)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	116	210.1	226.4	245	0%
Kemps Creek (College)	0	158.7	224.5	225	6%
Hassall Grove (School)	0	57.4	163.7	210	11%
Kingswood (School)	49	99.1	123.6	138	0%
St. Marys	0	96.5	137.0	137	7%
Mulgoa Park	0	78.0	110.2	112	6%
Linden	0	26.3	79.5	94	38%
Blaxland	0	62.2	88.0	88	6%
Kemps Creek (School)	0	10.6	30.4	41	39%
Twin Creeks	0	0.0	0.0	0	100%
Luddenham (Shops)	203	374.1	421.2	450	0%
Penrith (High School)	0	62.2	88.0	88	6%
Wallacia (School)	0	2.0	5.8	9	45%
Natai, Brownlow Hill	0	0.8	3.0	4	66%
Bringelly	0	0.3	1.0	2	72%

Scenario 3 - Evening (19:00 to 22:59)

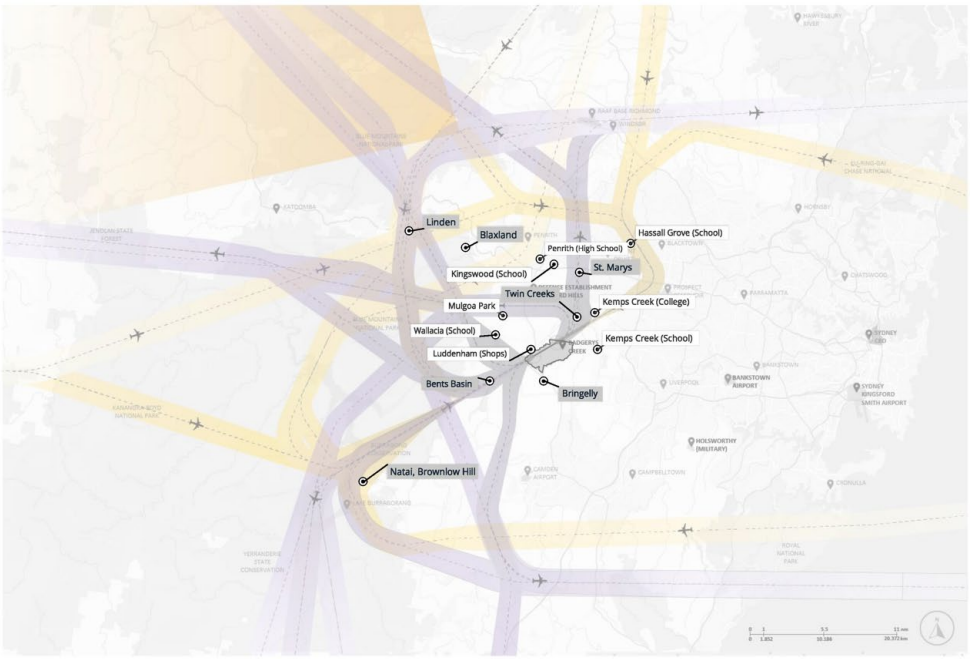
Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	0	52.6	61.0	67	0%
Kemps Creek (College)	0	24.1	35.2	37	13%
Hassall Grove (School)	0	12.0	55.5	62	68%
Kingswood (School)	0	17.2	36.3	46	12%
St. Marys	0	14.3	20.2	21	13%
Mulgoa Park	0	19.2	28.1	29	14%
Linden	0	4.2	13.6	20	61%
Blaxland	0	9.8	15.2	16	23%
Kemps Creek (School)	0	1.7	7.5	12	76%
Twin Creeks	0	1.1	2.8	15	90%
Luddenham (Shops)	0	80.0	90.2	98	0%
Penrith (High School)	0	9.8	15.2	16	23%
Wallacia (School)	0	0.0	0.0	0	100%
Natai, Brownlow Hill	0	0.7	1.8	10	90%
Bringelly	0	0.0	0.0	0	100%

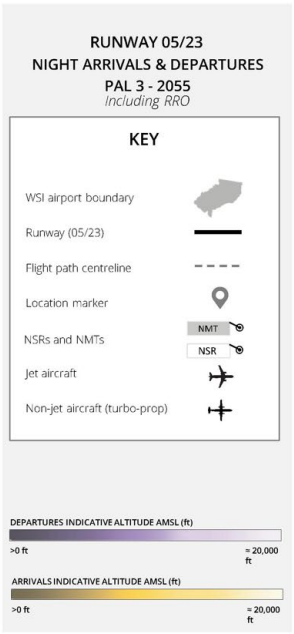
Scenario 4 - Daytime (5:30 to 18:59)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	116	219.8	230.7	244	0%
Kemps Creek (College)	0	45.1	120.6	225	34%
Hassall Grove (School)	1	163.1	206.6	210	0%
Kingswood (School)	46	125.3	136.0	140	0%
St. Marys	0	27.6	73.5	137	34%
Mulgoa Park	0	21.3	56.0	110	34%
Linden	0	73.6	94.0	94	0%
Blaxland	0	17.6	47.4	88	34%
Kemps Creek (School)	0	31.7	41.0	41	0%
Twin Creeks	0	0.0	0.0	0	100%
Luddenham (Shops)	193	418.8	443.1	450	0%
Penrith (High School)	0	17.6	47.4	88	34%
Wallacia (School)	0	6.2	9.0	9	1%
Natai, Brownlow Hill	0	2.6	4.0	4	9%
Bringelly	0	1.2	2.0	2	29%

Scenario 4 - Evening (19:00 to 22:59)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	0	34.2	38.7	63	0%
Kemps Creek (College)	0	2.4	9.0	37	75%
Hassall Grove (School)	0	53.7	61.0	62	1%
Kingswood (School)	0	34.5	43.2	46	12%
St. Marys	0	1.5	5.8	21	75%
Mulgoa Park	0	1.8	7.0	29	78%
Linden	0	12.4	15.0	18	1%
Blaxland	0	0.8	2.4	16	76%
Kemps Creek (School)	0	7.5	11.0	12	13%
Twin Creeks	0	0.1	0.0	13	99%
Luddenham (Shops)	0	89.5	98.0	98	0%
Penrith (High School)	0	0.8	2.4	16	76%
Wallacia (School)	0	0.0	0.0	0	100%
Natai, Brownlow Hill	0	0.0	0.0	10	99%
Bringelly	0	0.0	0.0	0	100%





Scenario 1 - Night (23:00 to 5:29)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	12	47.7	54.2	67	0%
Kemps Creek (College)	0	0.0	0.0	0	100%
Hassall Grove (School)	0	23.0	51.2	56	32%
Kingswood (School)	0	0.0	0.0	0	100%
St. Marys	0	9.5	18.7	20	25%
Mulgoa Park	0	7.3	14.0	15	24%
Linden	4	14.3	18.0	23	0%
Blaxland	0	0.0	0.0	0	100%
Kemps Creek (School)	0	0.0	0.0	0	100%
Twin Creeks	0	16.8	32.5	35	24%
Luddenham (Shops)	34	87.5	98.0	105	0%
Penrith (High School)	0	0.0	0.0	0	100%
Wallacia (School)	0	0.0	0.0	0	100%
Natai, Brownlow Hill	0	5.7	11.0	11	25%
Bringelly	0	0.0	0.0	0	100%

* Under scenario 1, no movements are assigned to RRO flight paths.

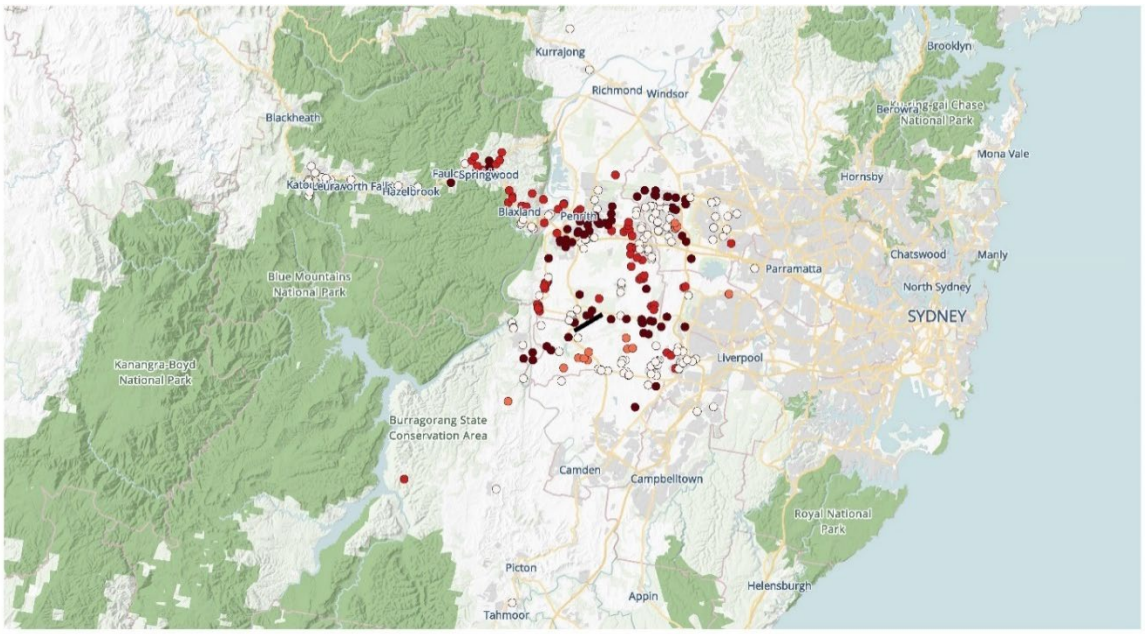
Scenario 3 - Night (23:00 to 5:29)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	22	49.1	54.8	68	0%
Kemps Creek (College)	0	0.0	0.0	0	100%
Hassall Grove (School)	0	9.0	28.4	56	56%
Kingswood (School)	0	0.0	0.0	0	100%
St. Marys	0	0.6	1.4	20	88%
Mulgoa Park	0	0.5	2.2	15	86%
Linden	0	3.5	11.6	21	53%
Blaxland	0	0.0	0.0	0	100%
Kemps Creek (School)	0	0.0	0.0	0	100%
Twin Creeks	0	1.0	3.3	35	85%
Luddenham (Shops)	24	65.8	81.6	105	0%
Penrith (High School)	0	0.0	0.0	0	100%
Wallacia (School)	0	1.4	2.0	2	21%
Natai, Brownlow Hill	0	0.4	0.9	11	88%
Bringelly	0	0.0	0.0	0	100%

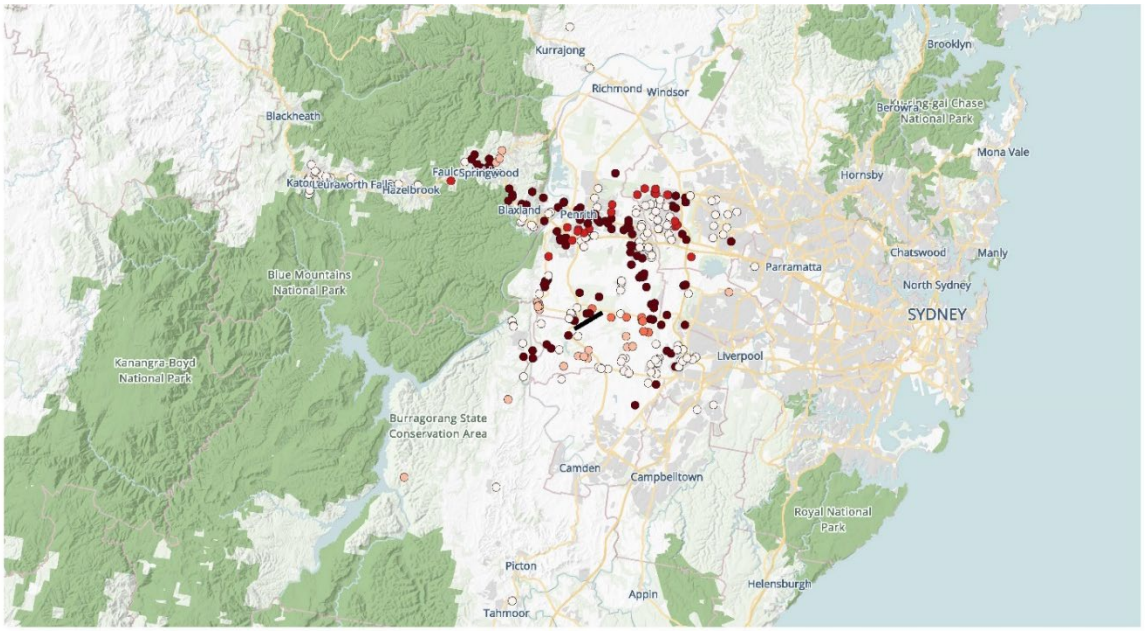
Scenario 4 - Night (23:00 to 5:29)

Location	Minimum Movements	Average Movements	90th Percentile Movements	Maximum Movements	% of Days with Respite
Bents Basin	22	49.0	54.6	68	0%
Kemps Creek (College)	0	0.0	0.0	0	100%
Hassall Grove (School)	0	9.4	28.5	56	55%
Kingswood (School)	0	0.0	0.0	0	100%
St. Marys	0	0.5	0.8	20	90%
Mulgoa Park	0	0.4	1.0	13	89%
Linden	0	3.5	11.4	20	53%
Blaxland	0	0.0	0.0	0	100%
Kemps Creek (School)	0	0.0	0.0	0	100%
Twin Creeks	0	0.9	1.9	31	88%
Luddenham (Shops)	24	65.9	81.6	105	0%
Penrith (High School)	0	0.0	0.0	0	100%
Wallacia (School)	0	1.4	2.0	2	21%
Natai, Brownlow Hill	0	0.3	0.6	9	90%
Bringelly	0	0.0	0.0	0	100%

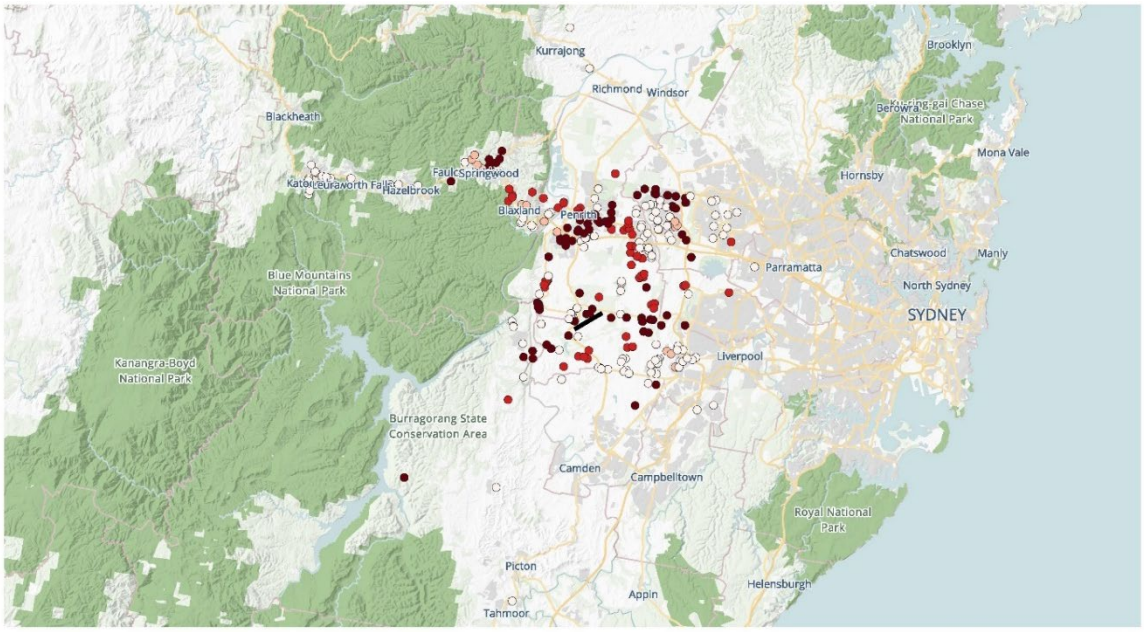
D11 Noise Sensitive Areas – Proportion of Respite Days



Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 1 - PAL 1 (2033)



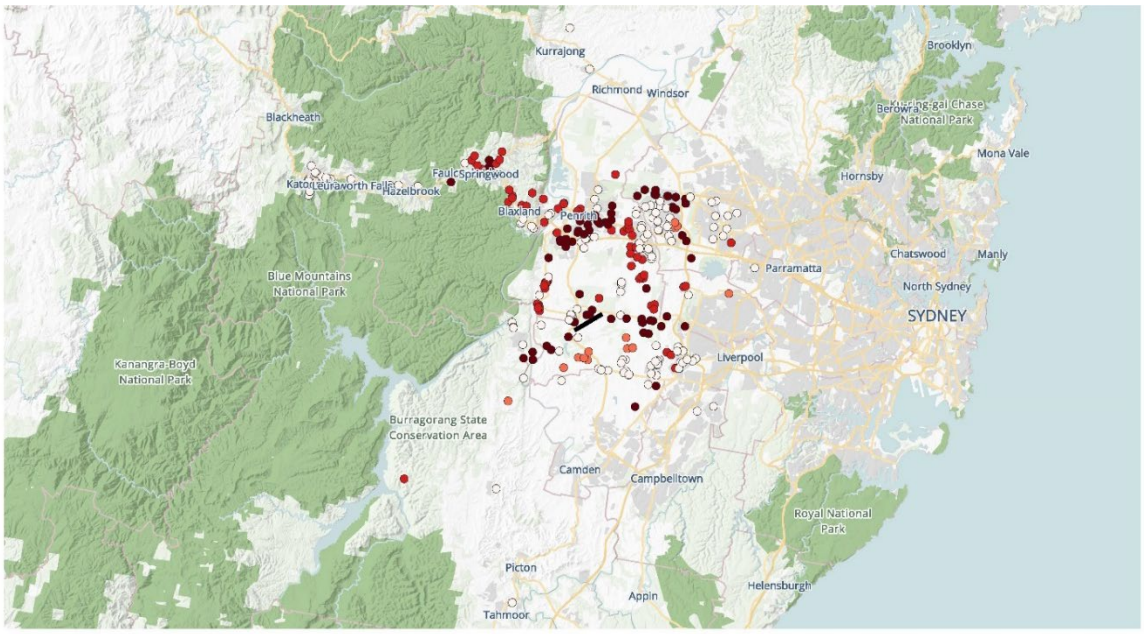
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 3 - PAL 1 (2033)



Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 4 - PAL 1 (2033)

LEGEND (Proportion)
0 - 0.2
0.2 - 0.4
0.6 - 0.8
0.8 - 1
Runway 05-23

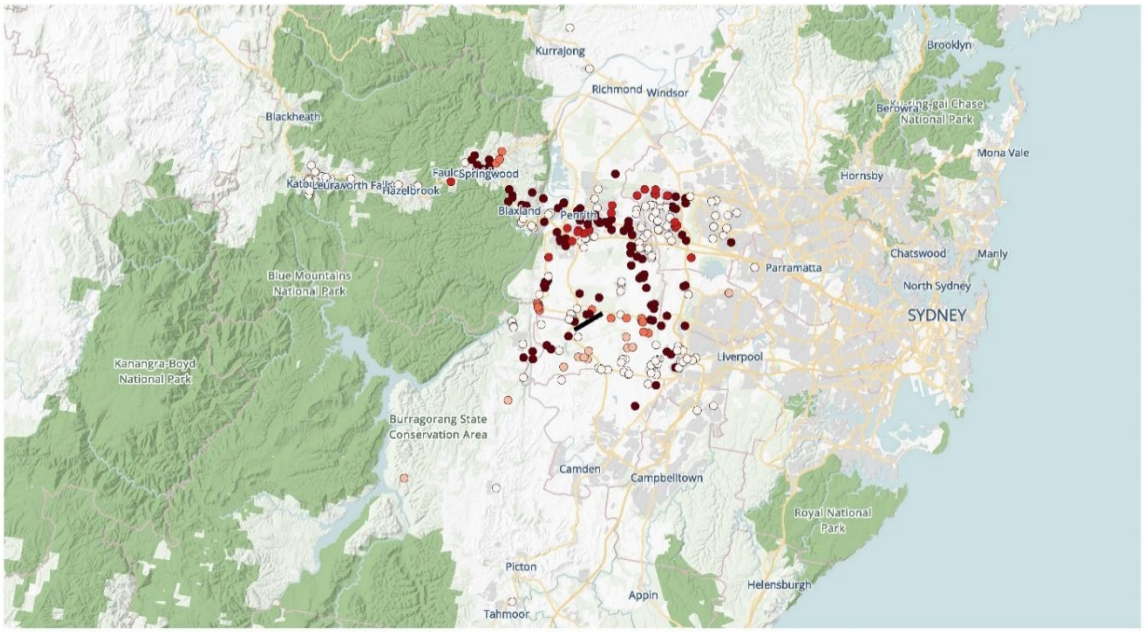
N 0 10 20 km



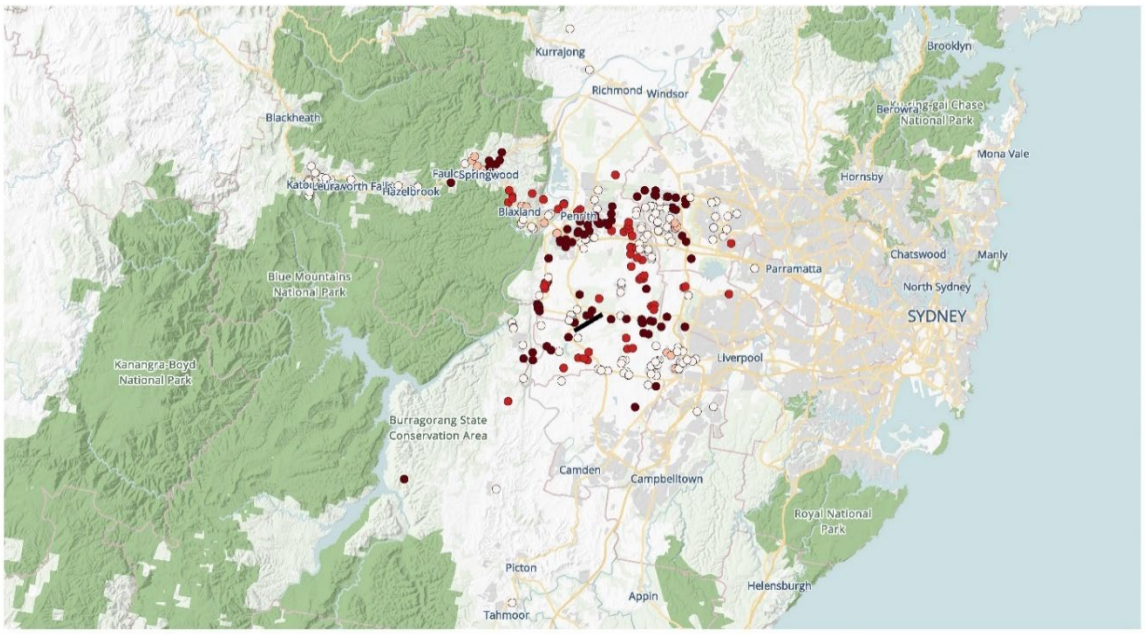
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 1 - PAL 2 (2040)

LEGEND (Proportion)
0 - 0.2
0.2 - 0.4
0.4 - 0.6
0.8 - 1
Runway 05-23

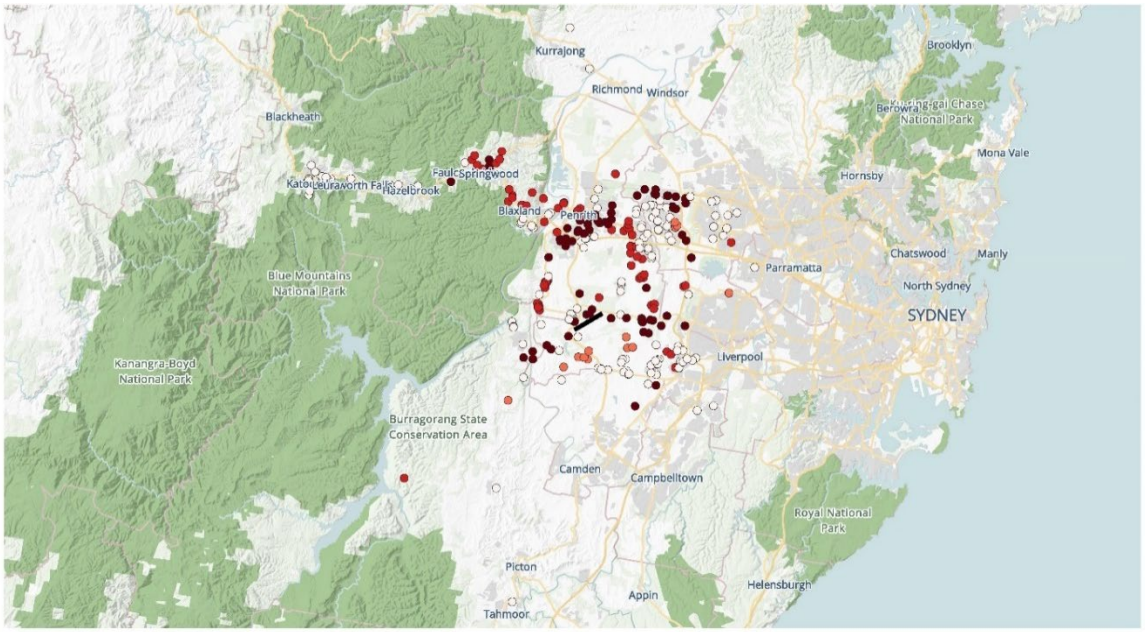
N 0 10 20 km



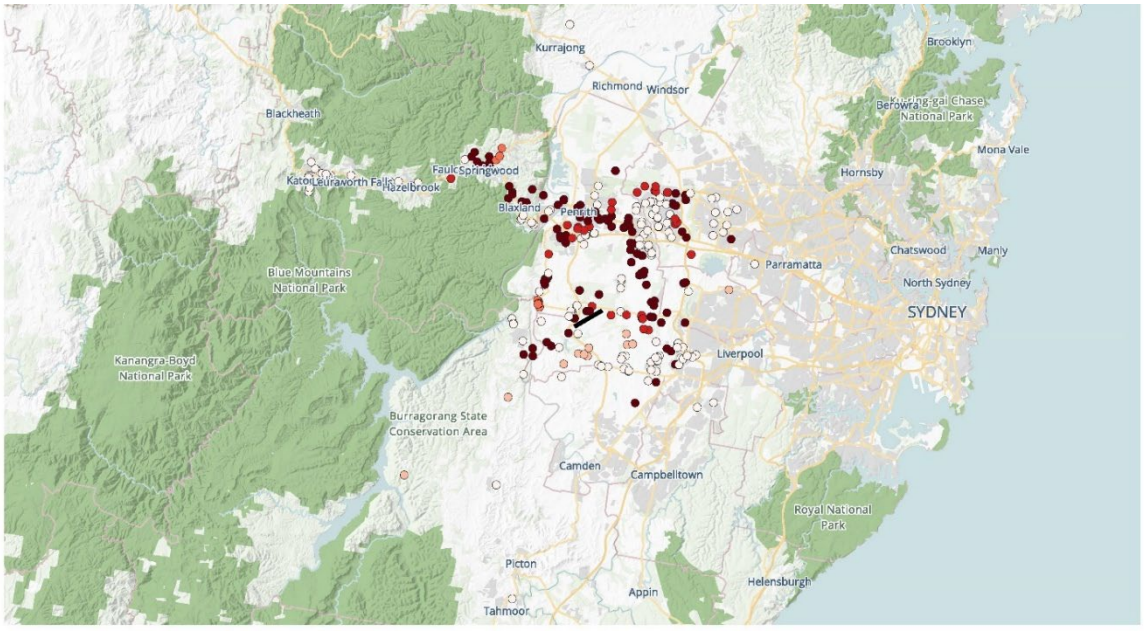
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 3 - PAL 2 (2040)



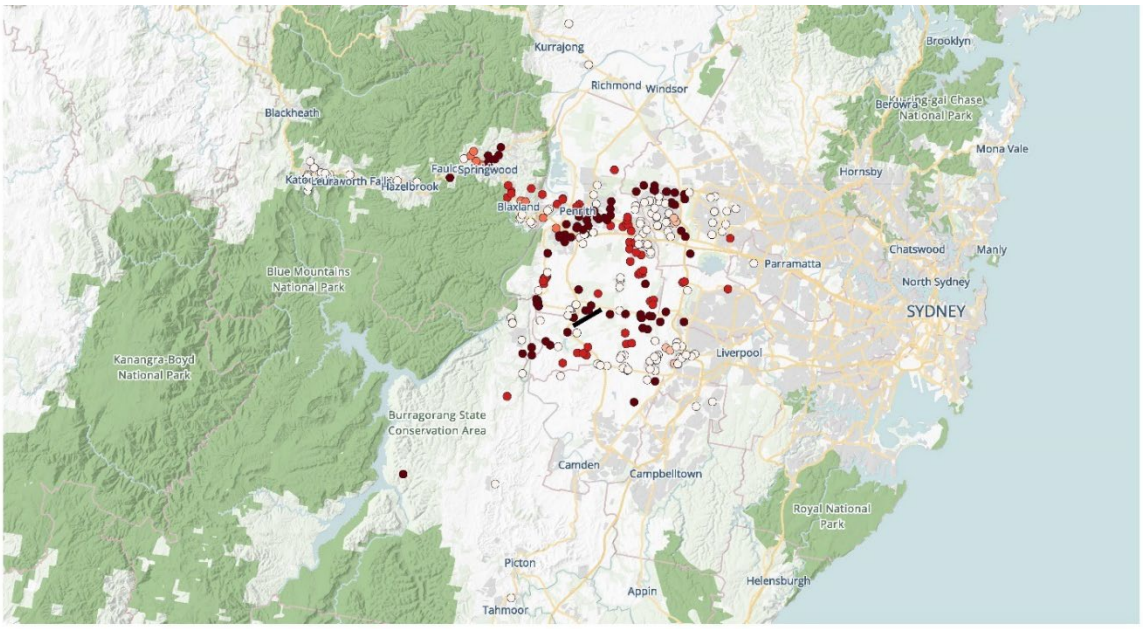
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 4 - PAL 2 (2040)



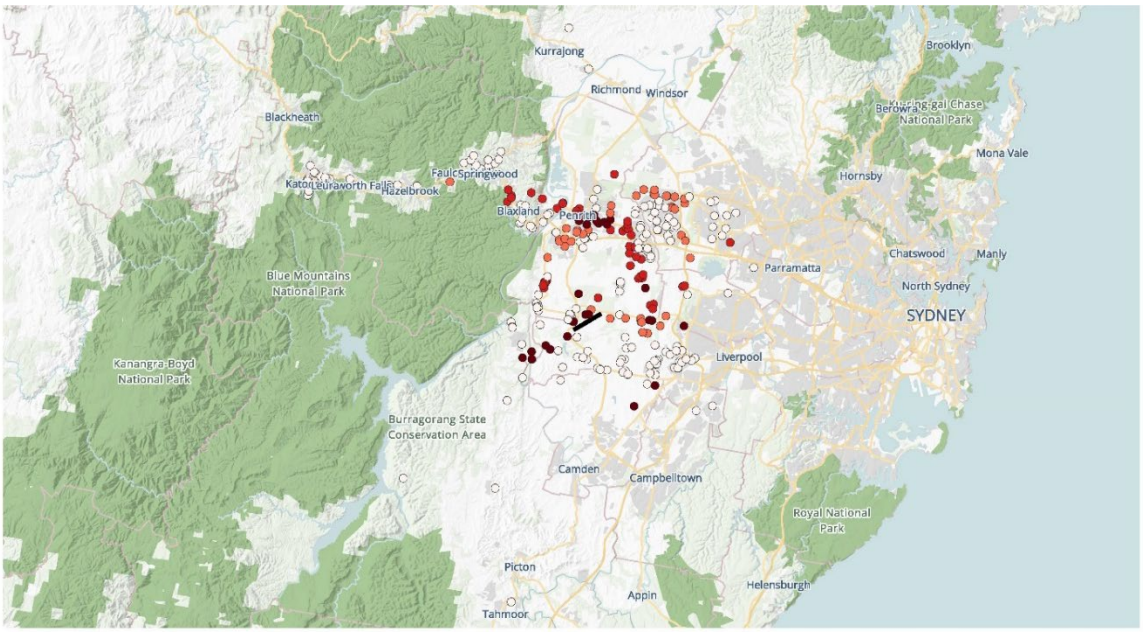
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 1 - PAL 3 (2055)



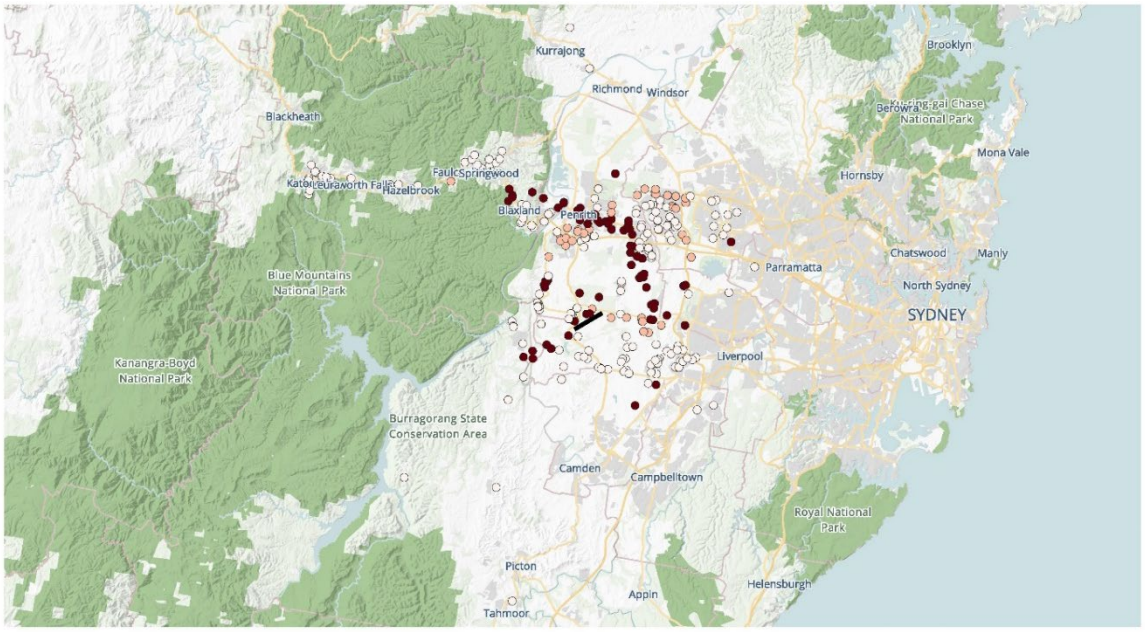
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 3 - PAL 3 (2055)



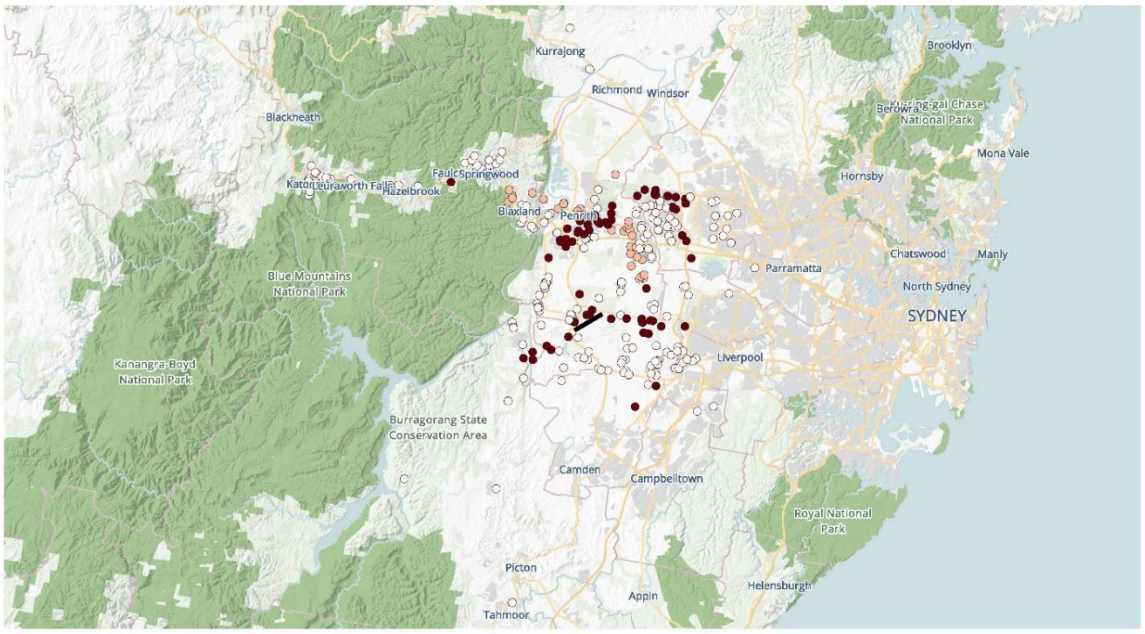
Noise Sensitive Areas
Respite (Proportion of days without overflights - Day (05:30-19:00)
Scenario 4 - PAL 3 (2055)



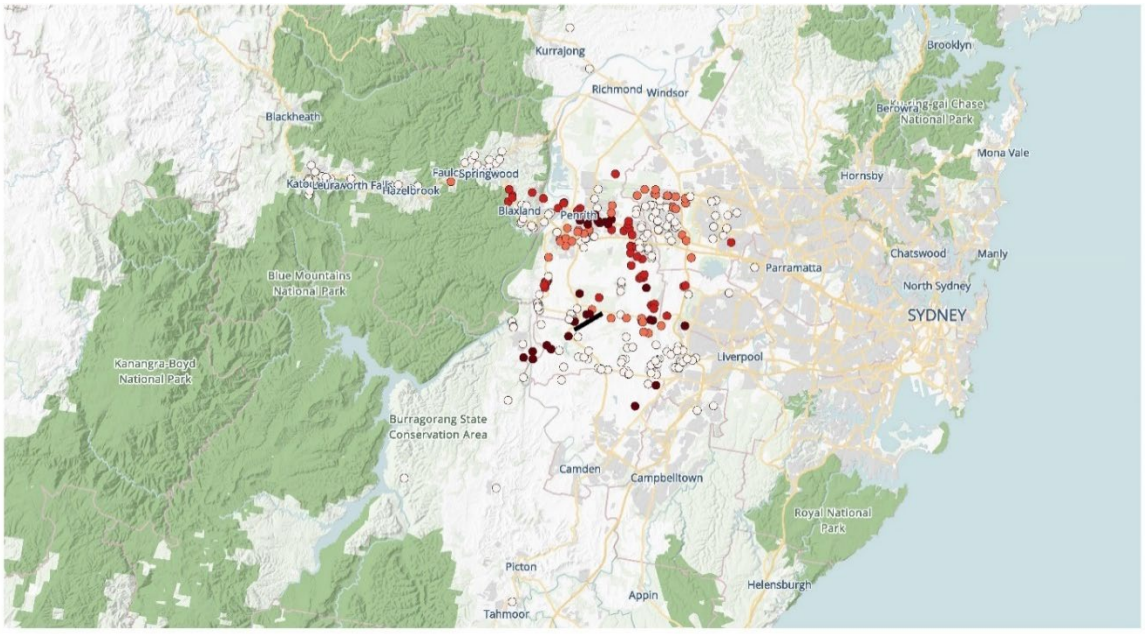
Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 1 - PAL 1 (2033)



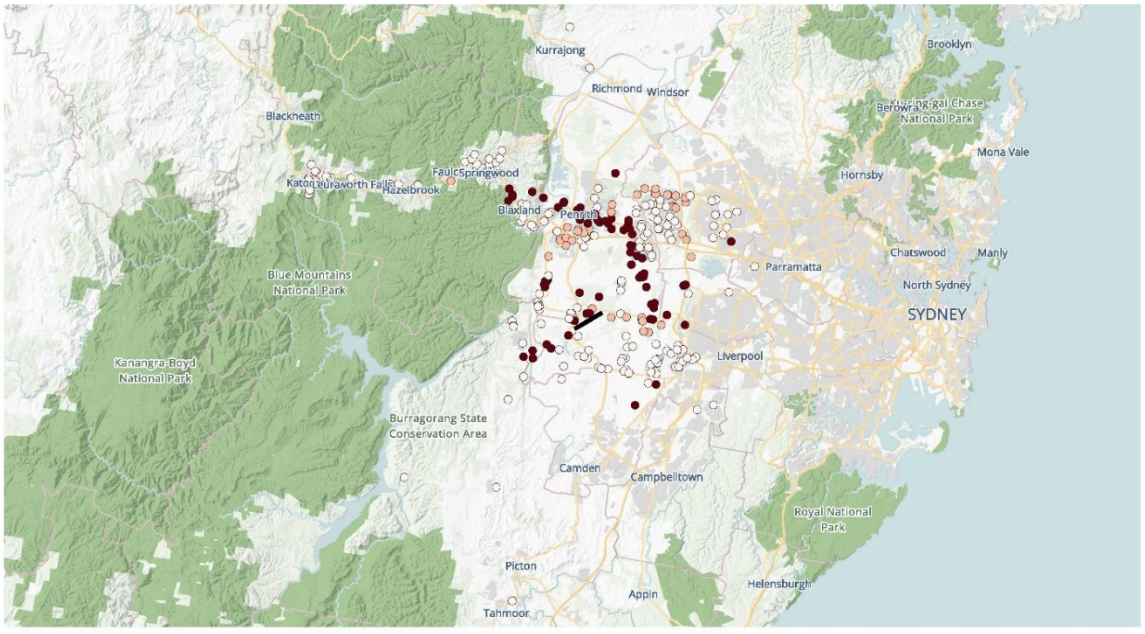
Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 3 - PAL 1 (2033)



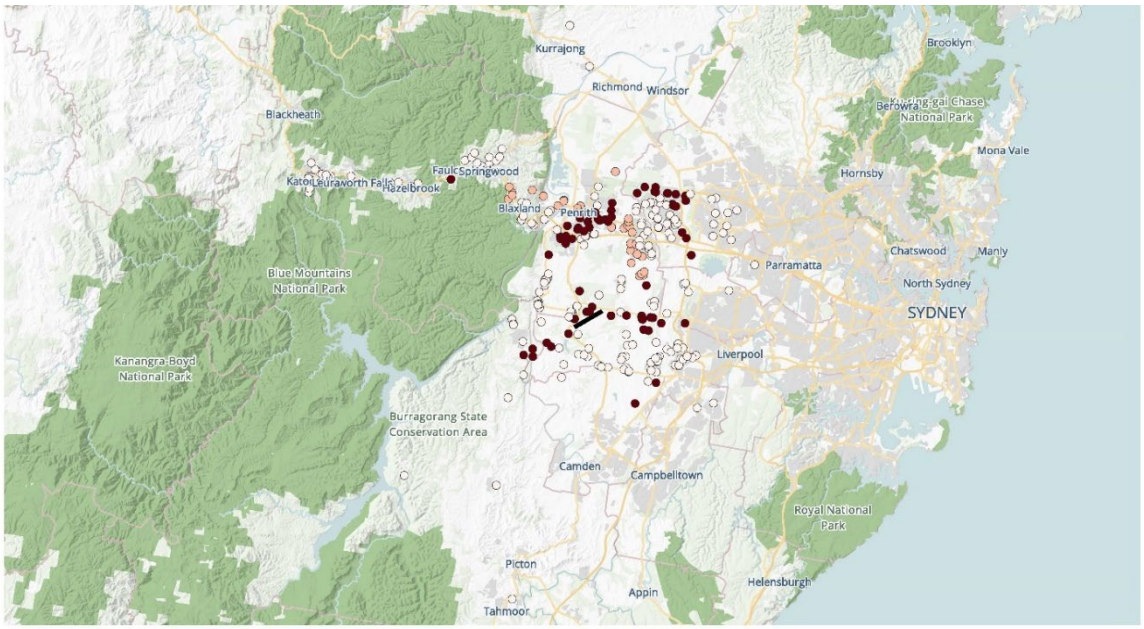
Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 4 - PAL 1 (2033)



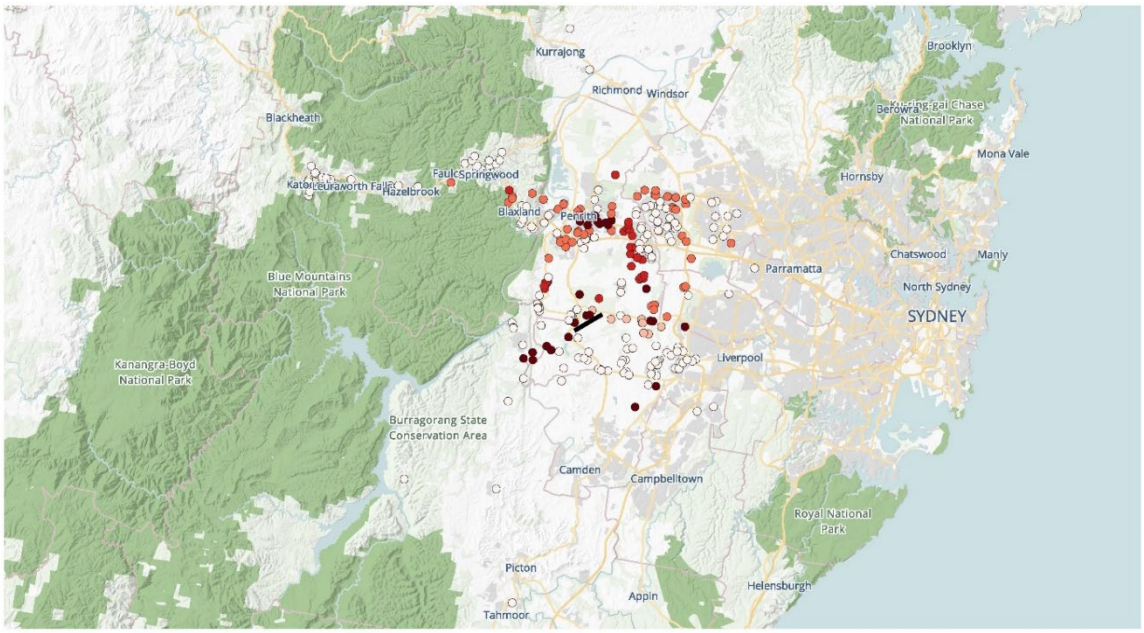
Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 1 - PAL 2 (2040)



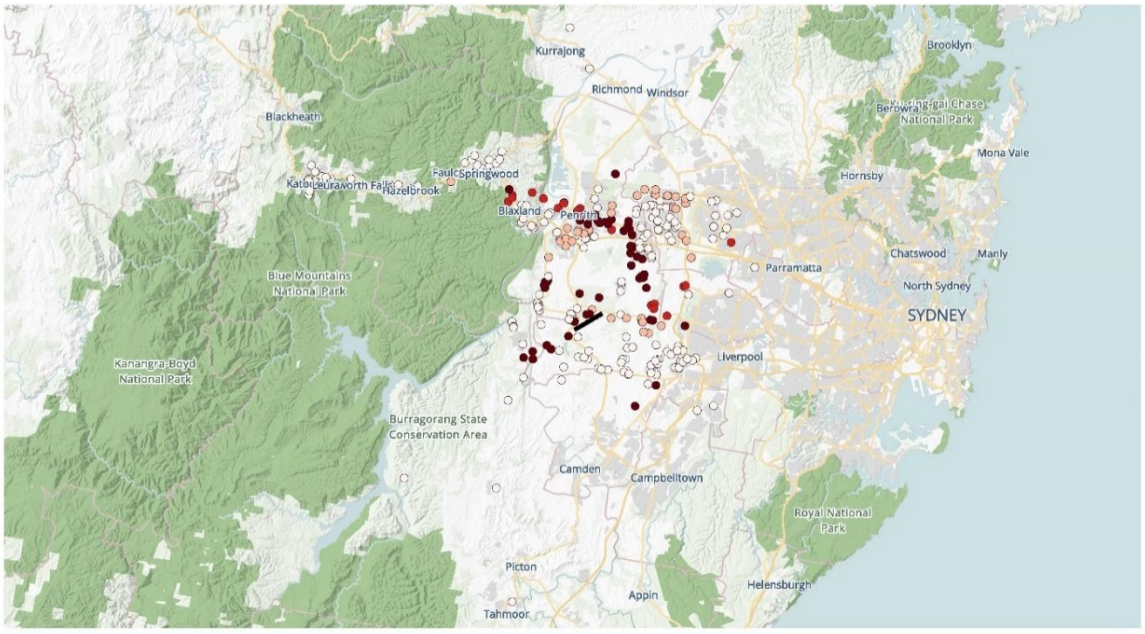
Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 3 - PAL 2 (2040)



Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 4 - PAL 2 (2040)



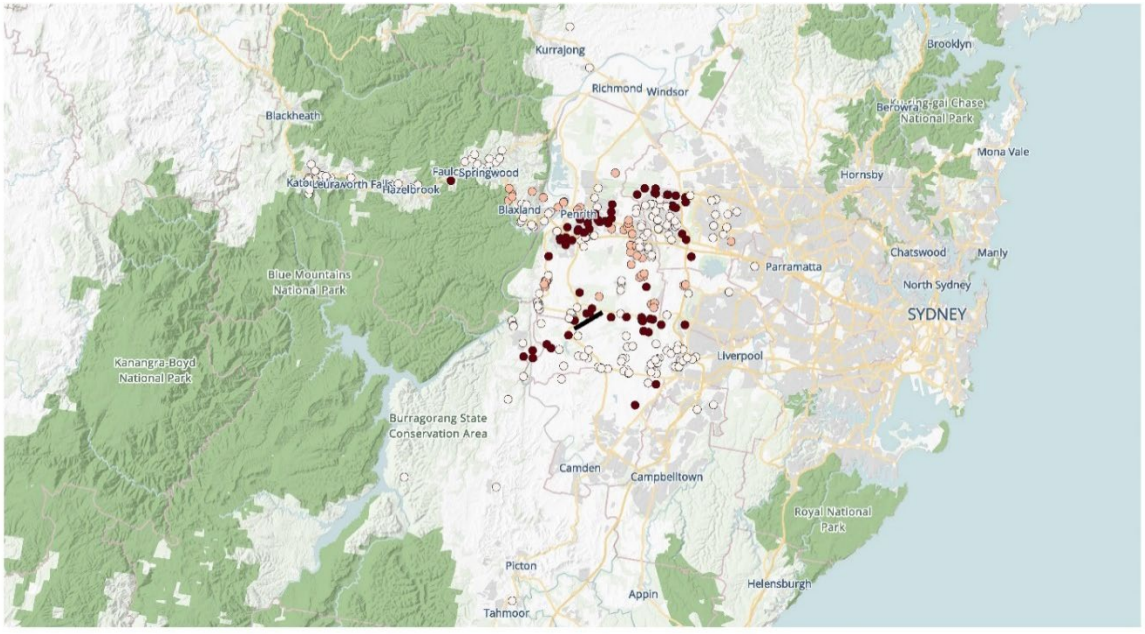
Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 1 - PAL 3 (2055)



Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 3 - PAL 3 (2055)

LEGEND (Proportion)
0 - 0.2
0.2 - 0.4
0.6 - 0.8
0.8 - 1
Runway 05-23

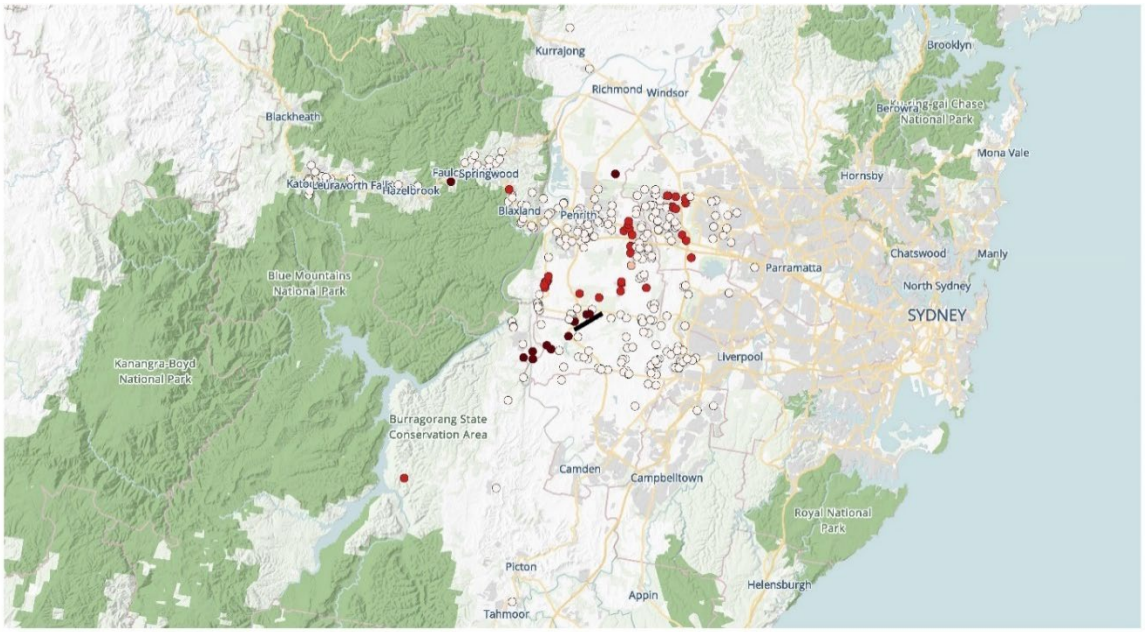
N 0 10 20 km



Noise Sensitive Areas
Respite (Proportion of days without overflights - Evening (19:00-23:00)
Scenario 4 - PAL 3 (2055)

LEGEND (Proportion)
0 - 0.2
0.6 - 0.8
0.8 - 1
Runway 05-23

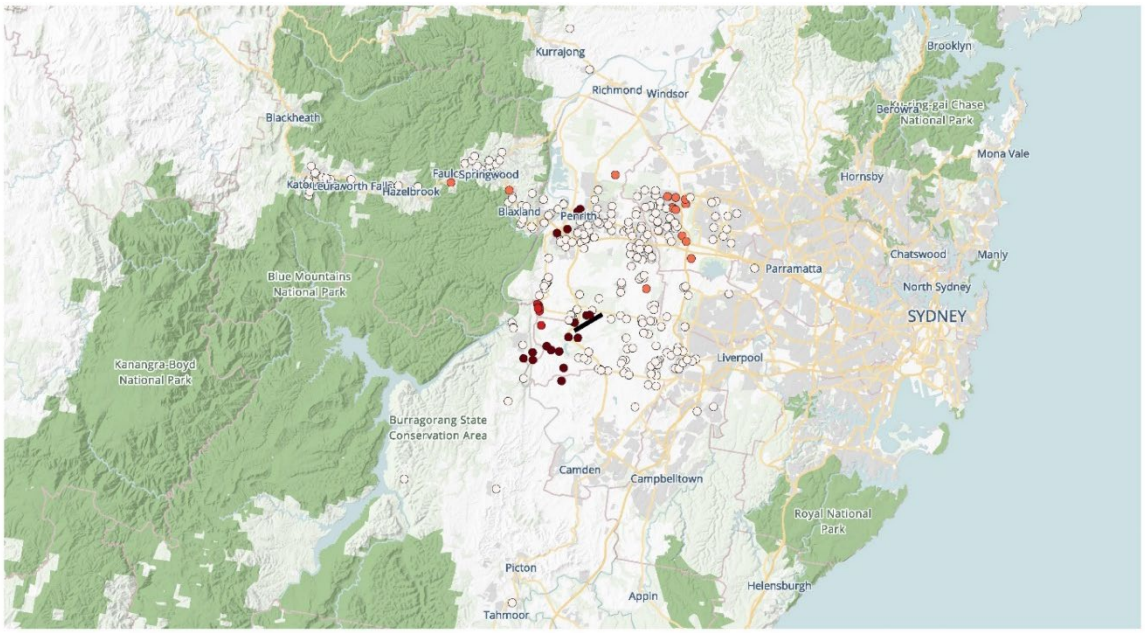
N 0 10 20 km



Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 1 - PAL 1 (2033)

LEGEND (Proportion)
- 0 - 0.2
- 0.2 - 0.4
- 0.6 - 0.8
- 0.8 - 1
- Runway 05-23

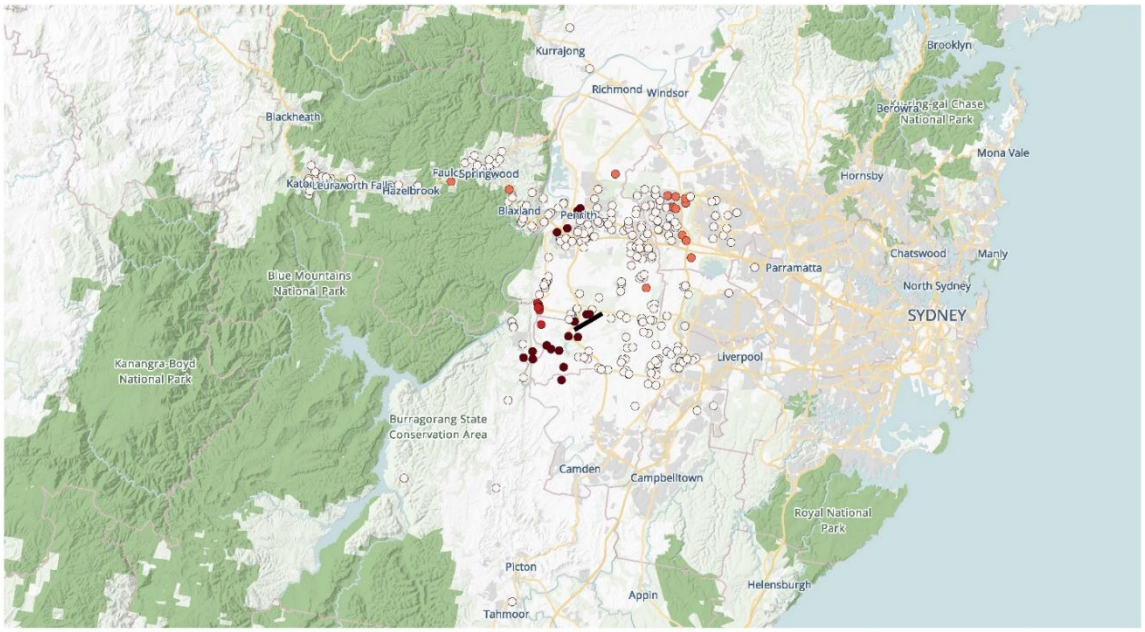
N 0 10 20 km



Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 3 - PAL 1 (2033)

LEGEND (Proportion)
- 0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.8 - 1
- Runway 05-23

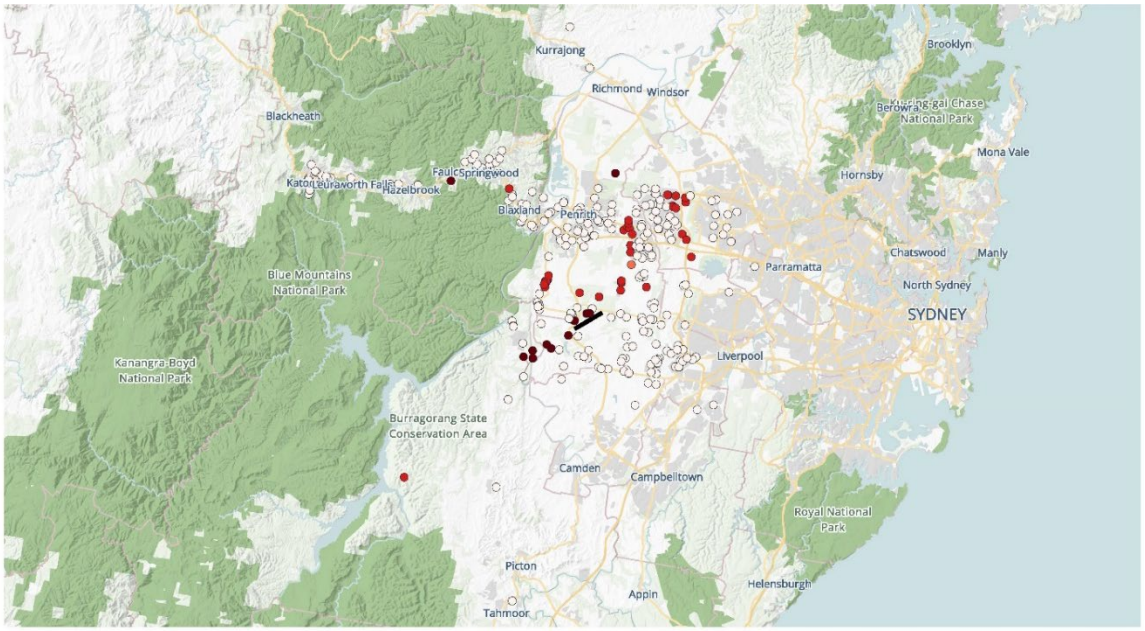
N 0 10 20 km



Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 4 - PAL 1 (2033)

LEGEND (Proportion)
0 - 0.2
0.2 - 0.4
0.4 - 0.6
0.8 - 1
Runway 05-23

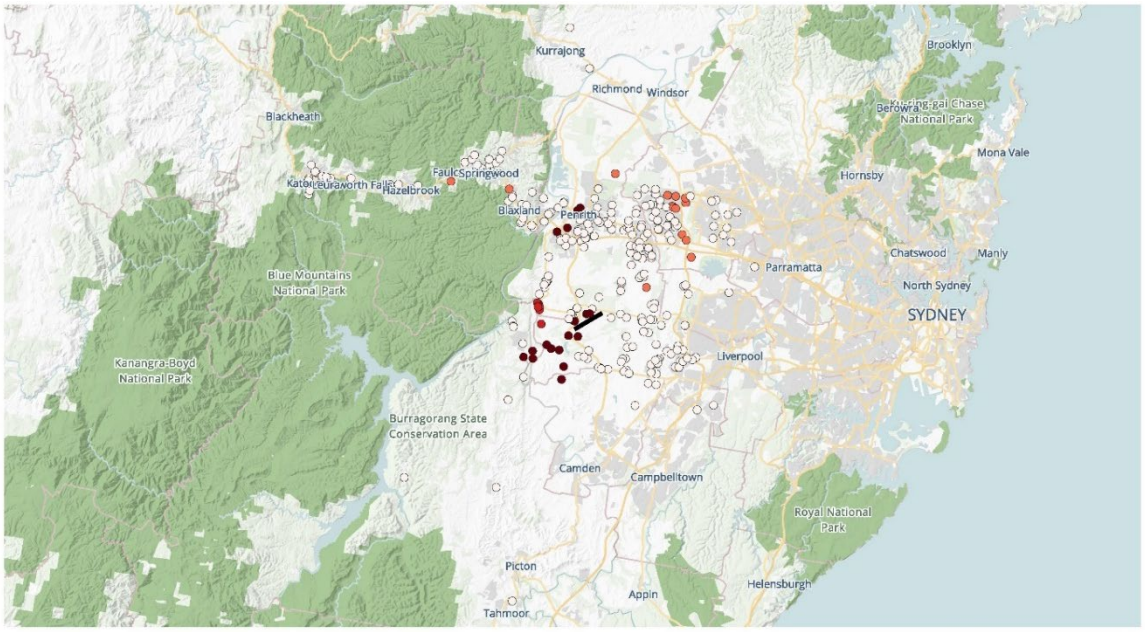
N 0 10 20 km



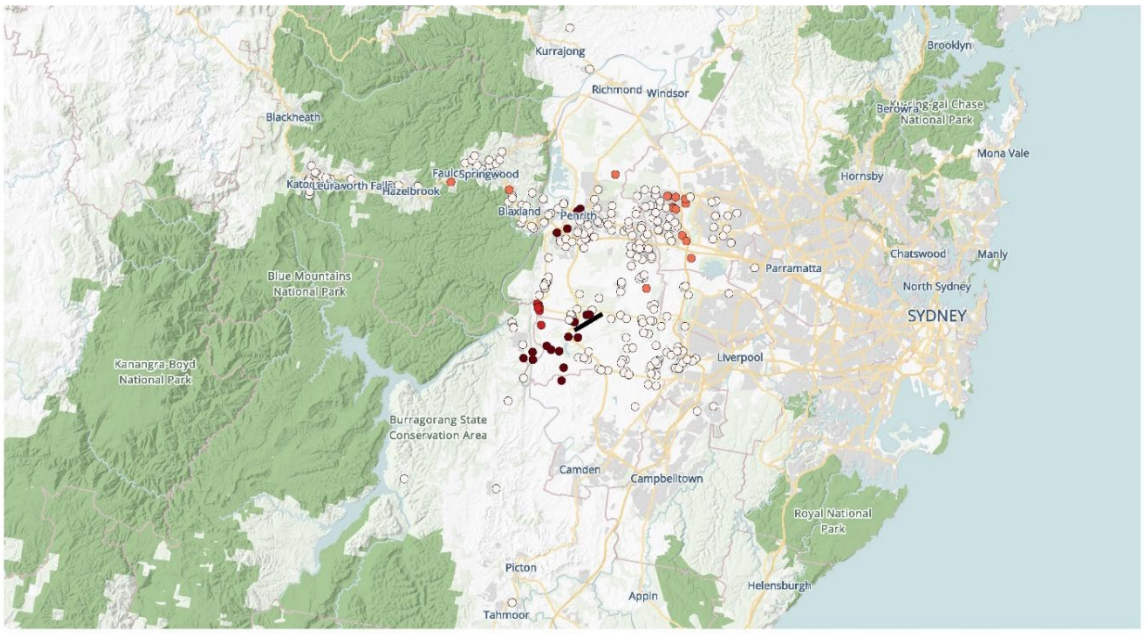
Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 1 - PAL 2 (2040)

LEGEND (Proportion)
0 - 0.2
0.2 - 0.4
0.4 - 0.6
0.8 - 1
Runway 05-23

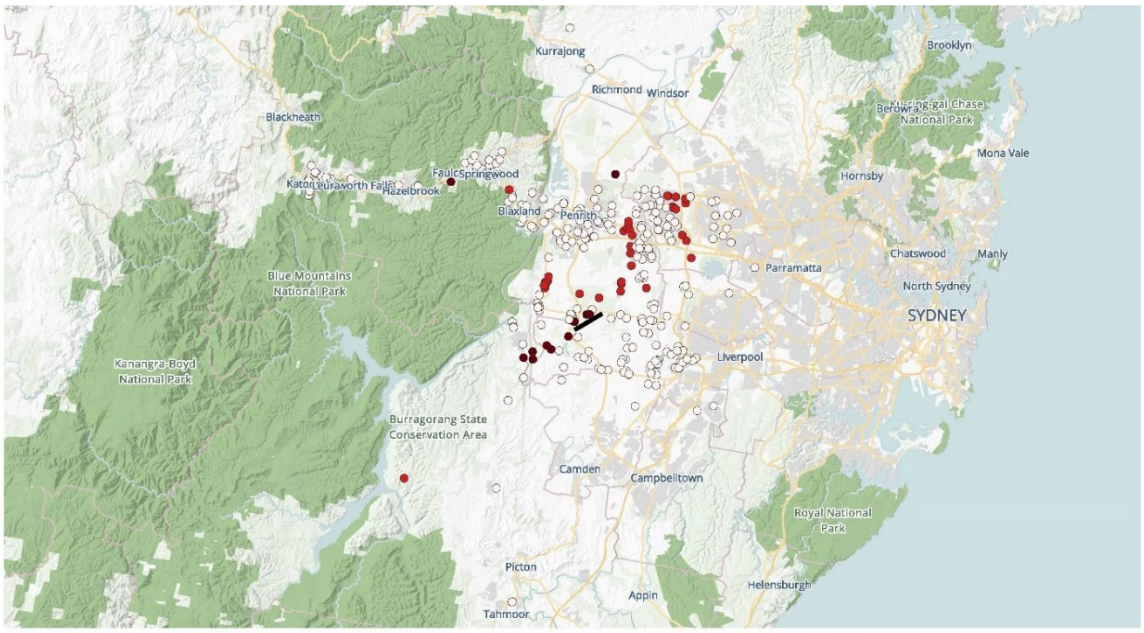
N 0 10 20 km



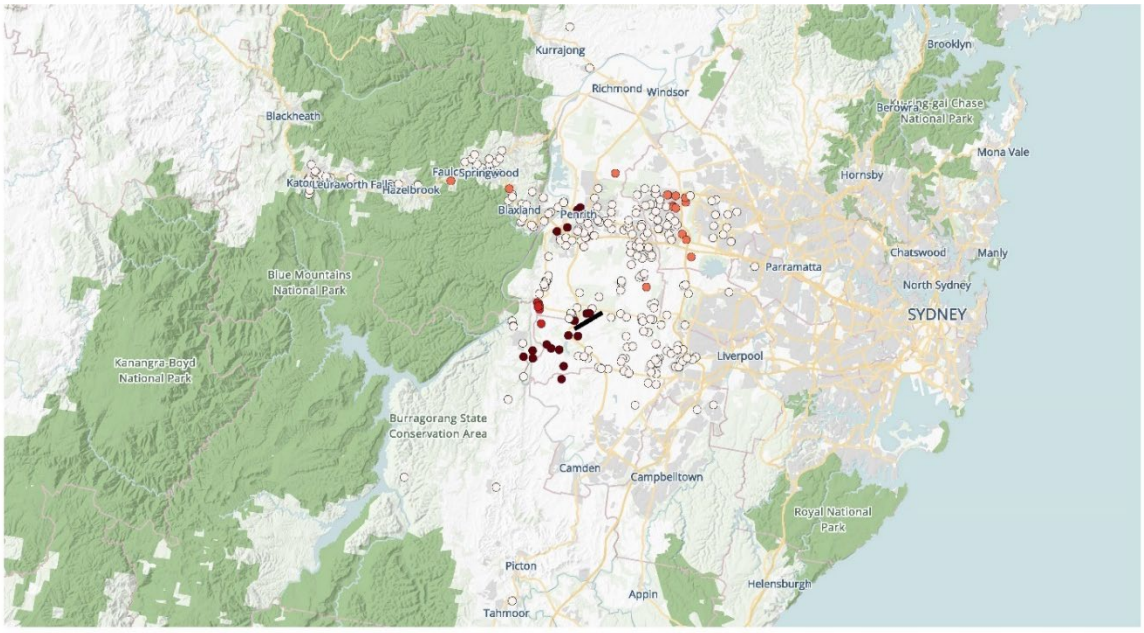
Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 3 - PAL 2 (2040)



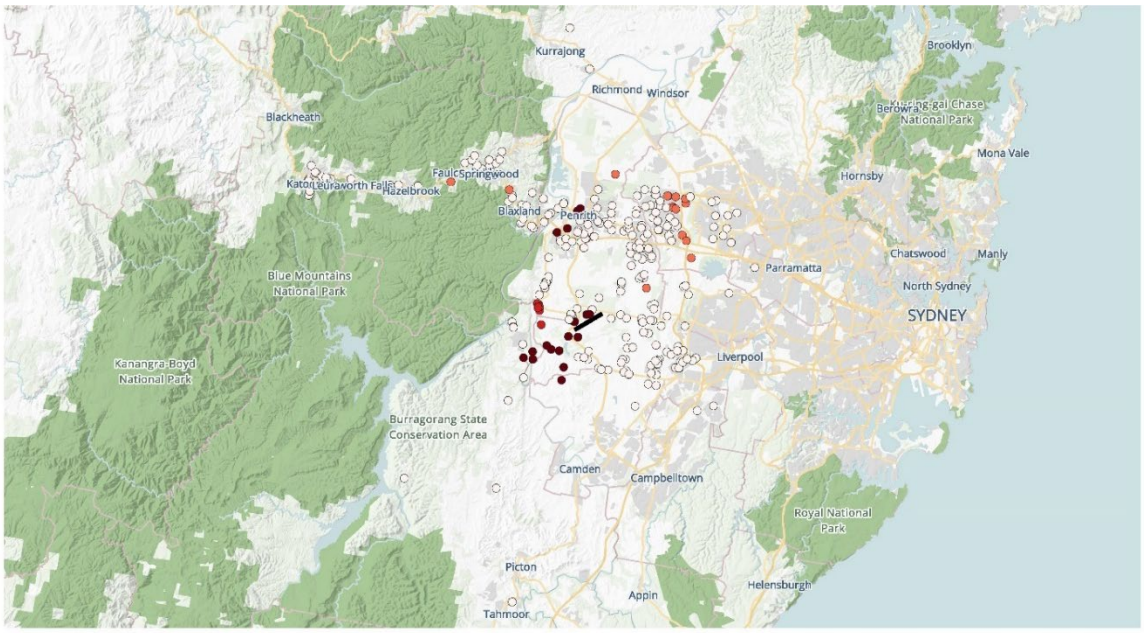
Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 4 - PAL 2 (2040)



Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 1 - PAL 3 (2055)



Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 3 - PAL 3 (2055)



Noise Sensitive Areas
Respite (Proportion of days without overflights - Night (23:00-05:30)
Scenario 4 - PAL 3 (2055)

D12 Assessment by Noise Sensitive Receptor – Projected Average Frequency and Proportion of Respite

CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

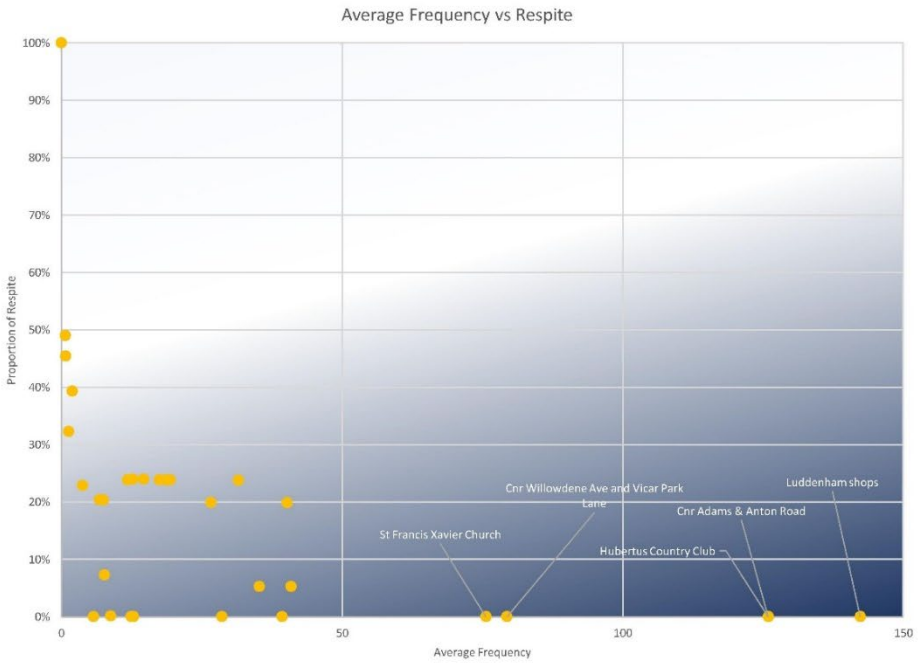


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

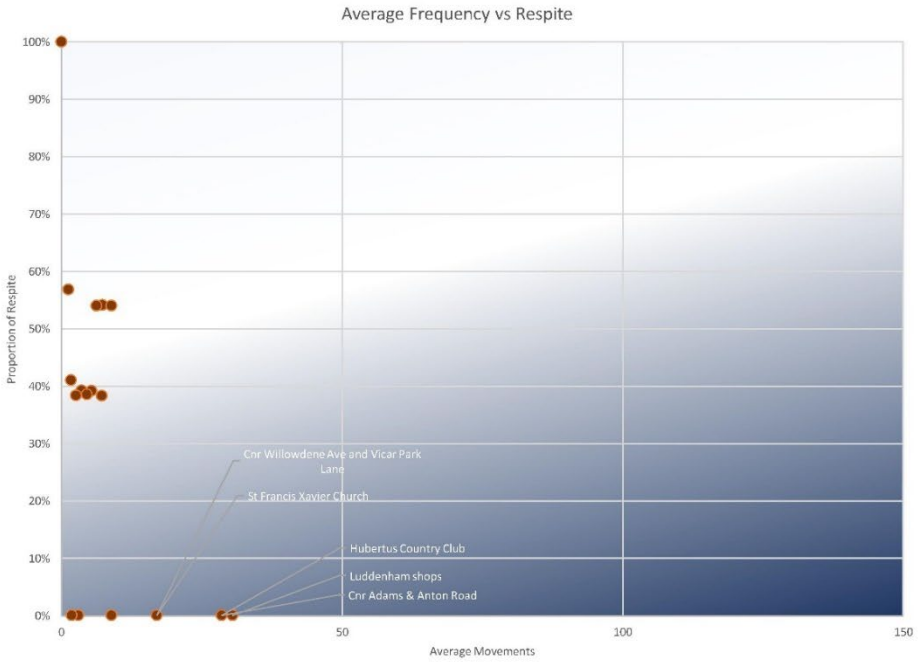


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

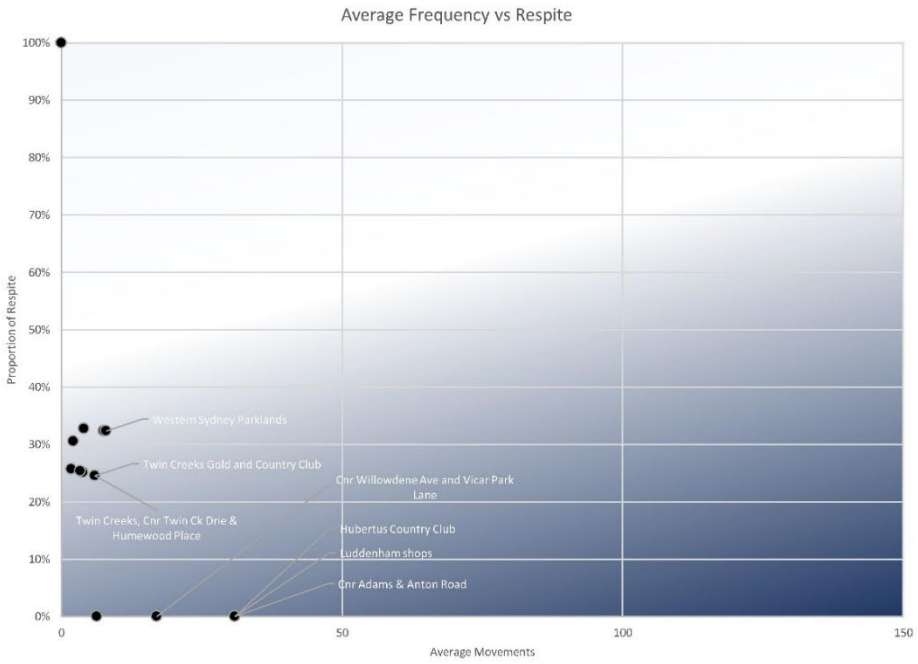


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

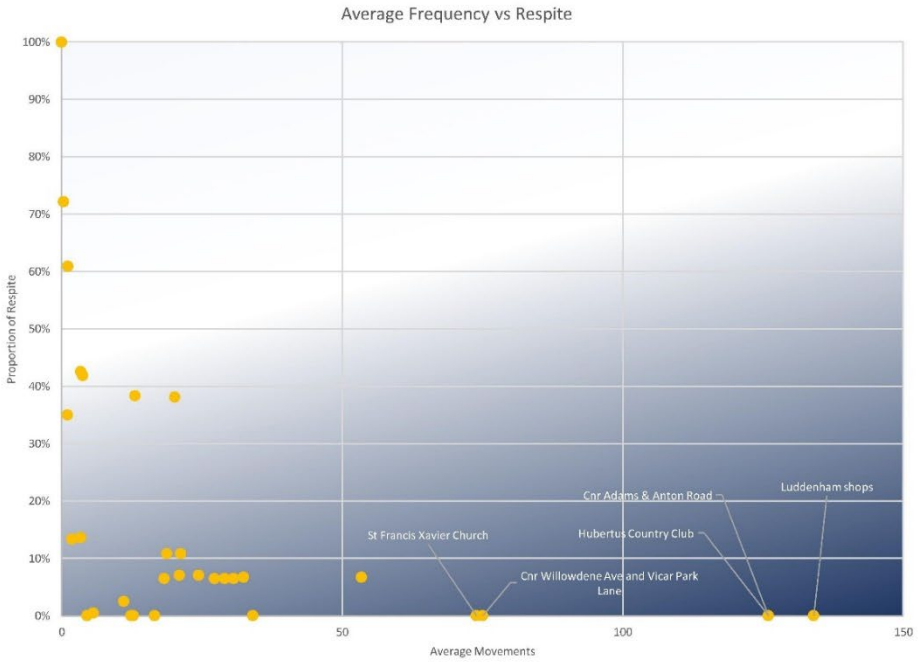


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

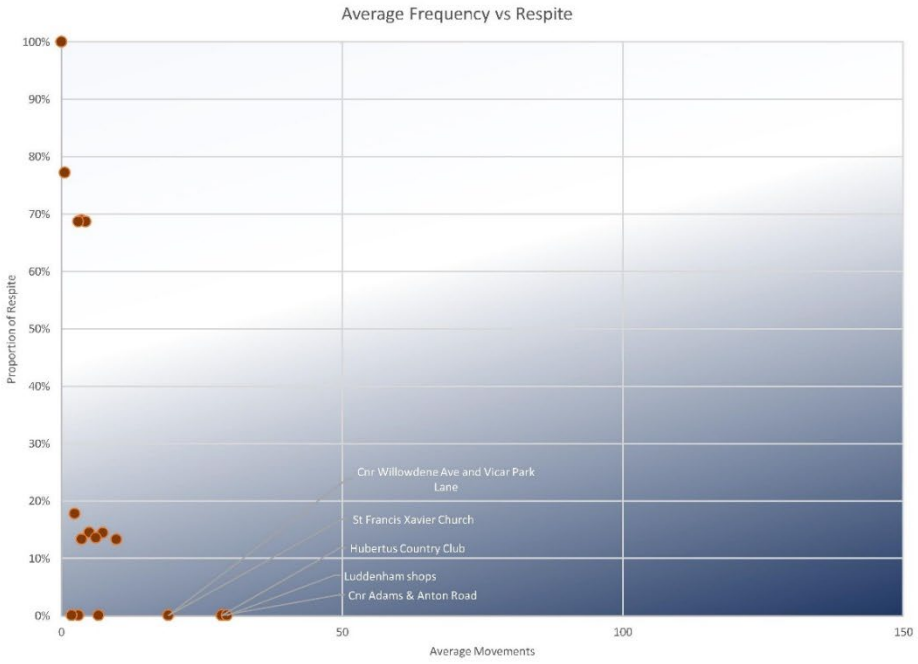


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

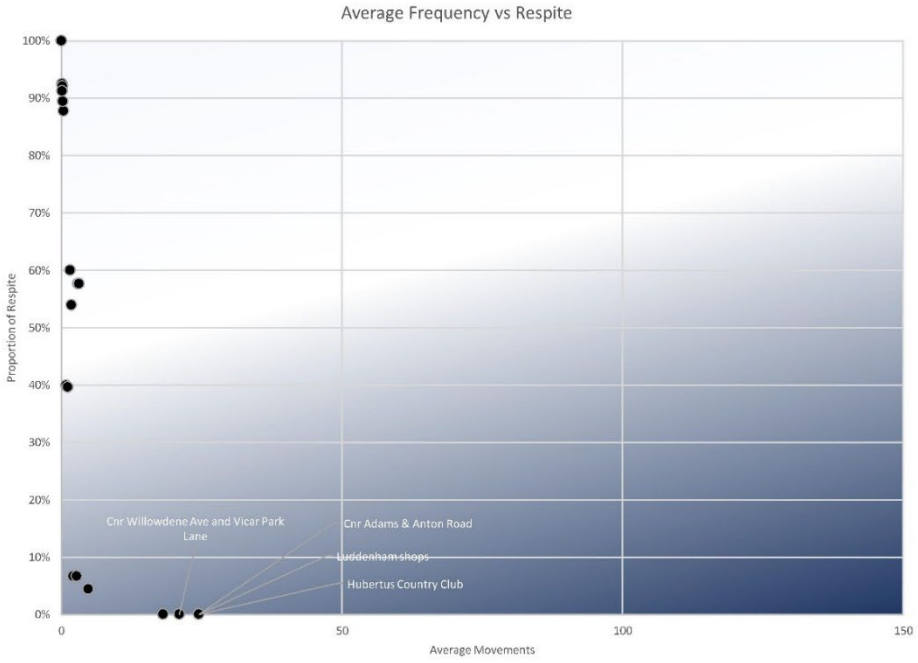


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

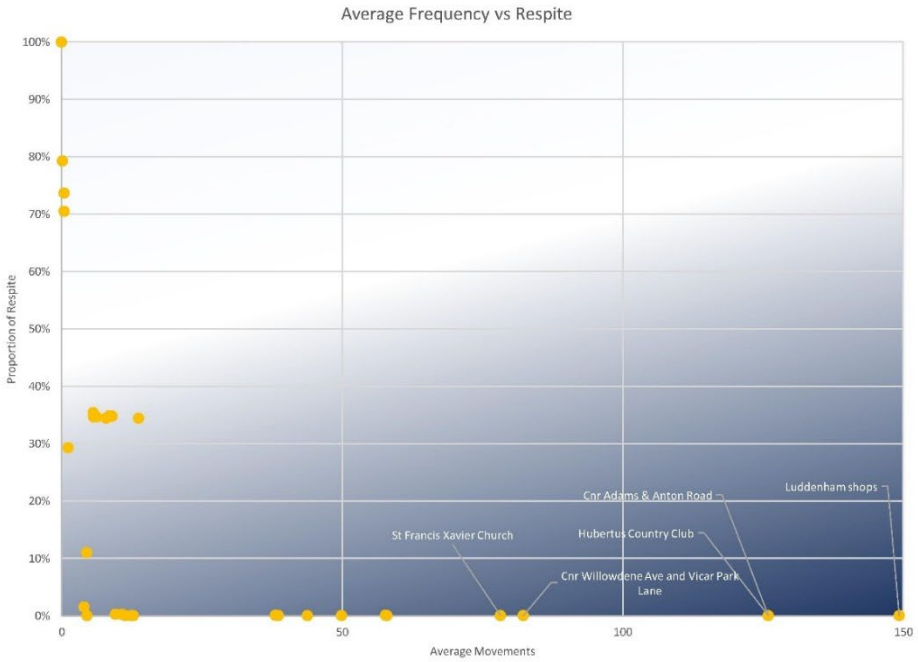


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

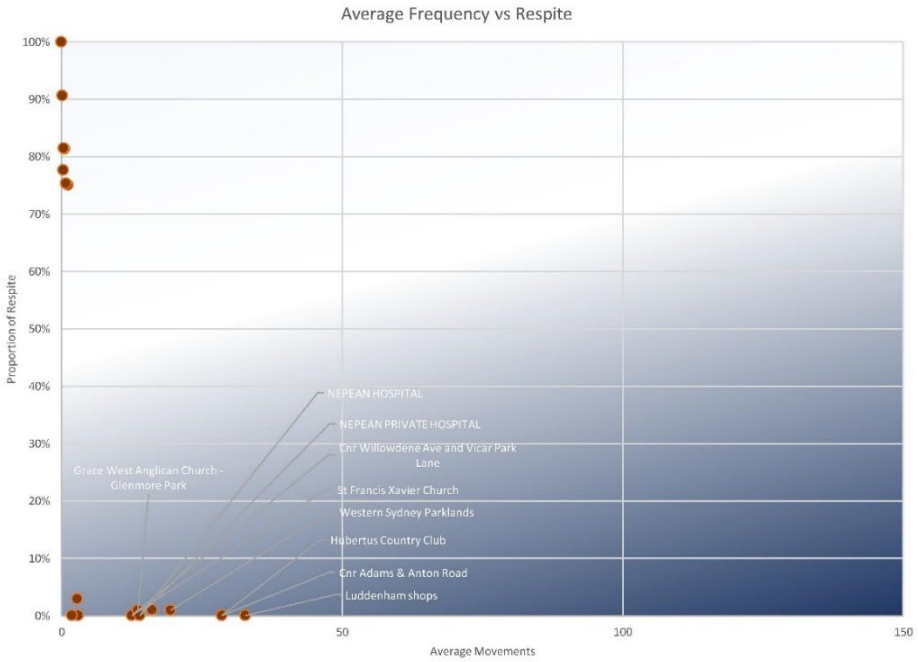


CHART	Flight Path Movement
PAL	1
YEAR	2033
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

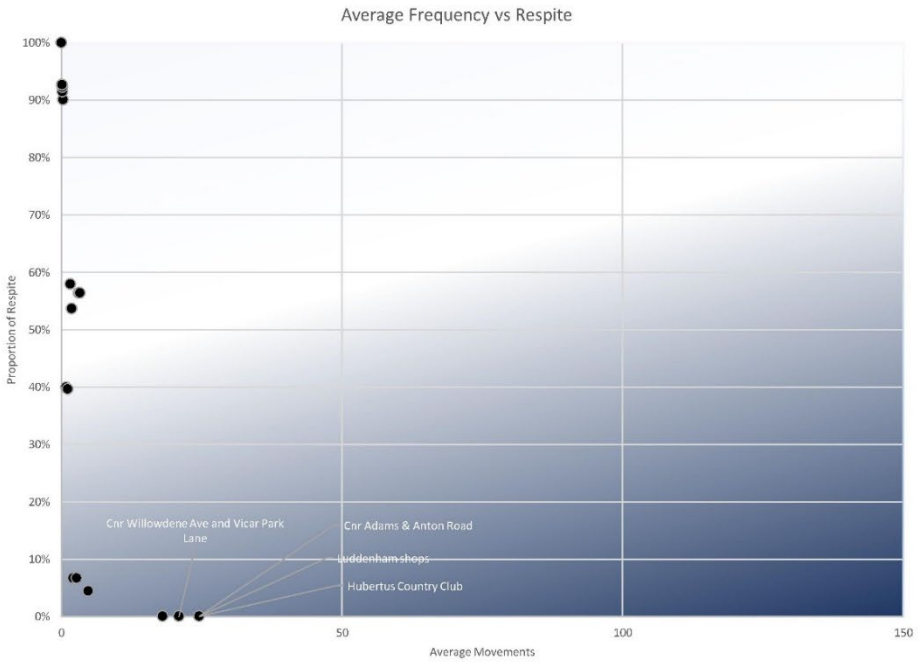


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

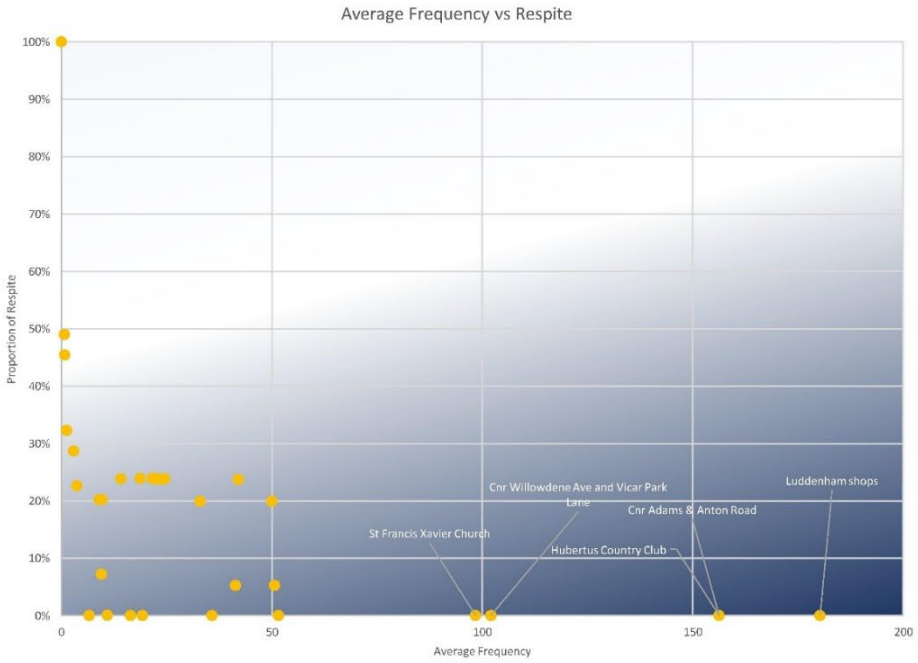


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

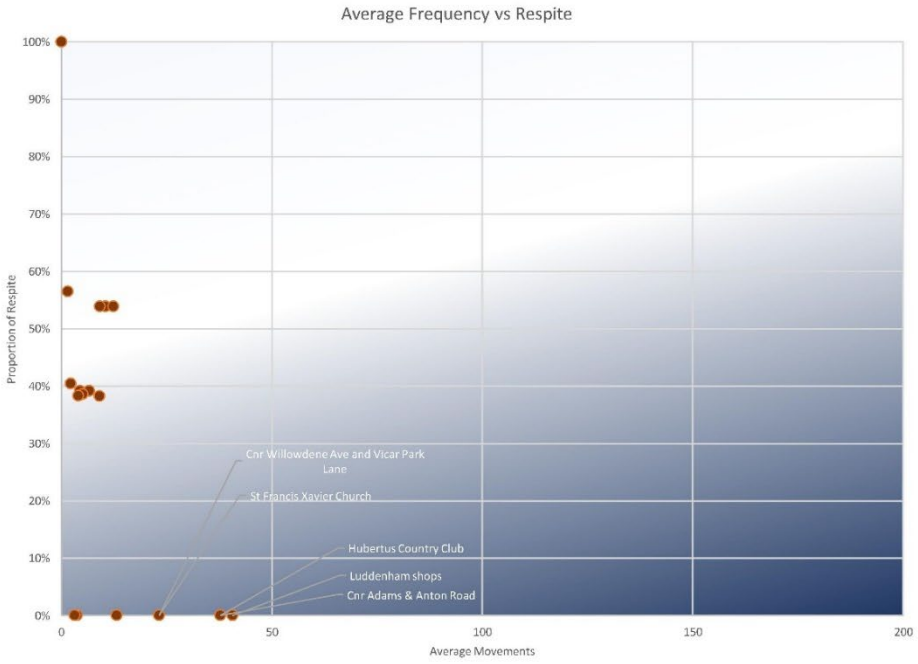


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

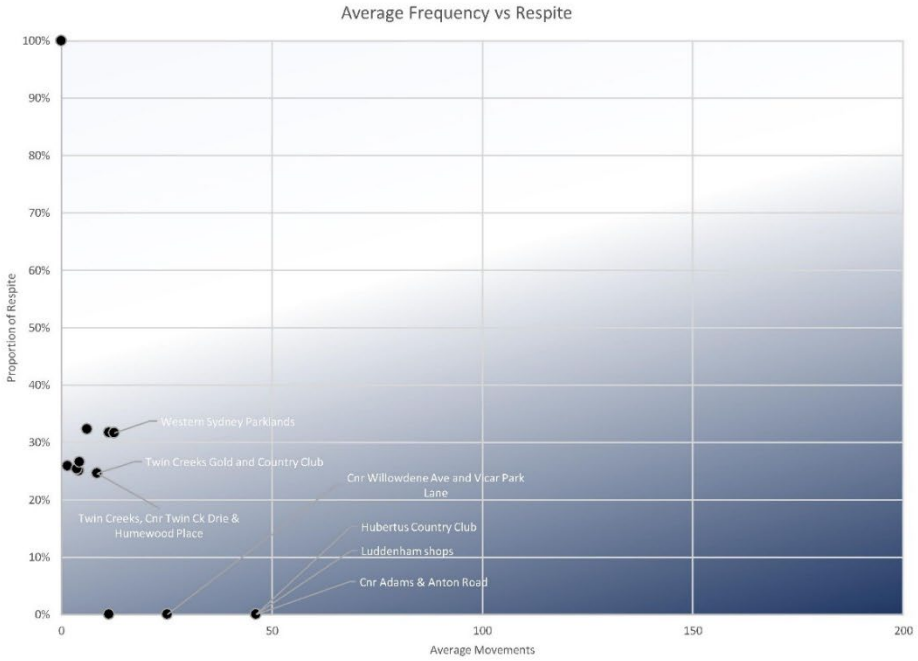


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

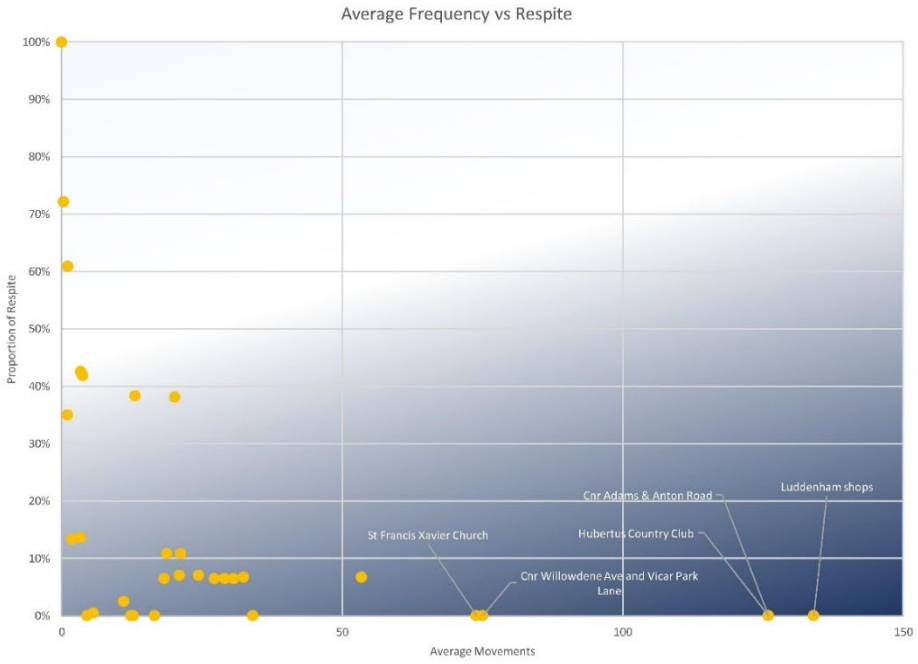


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

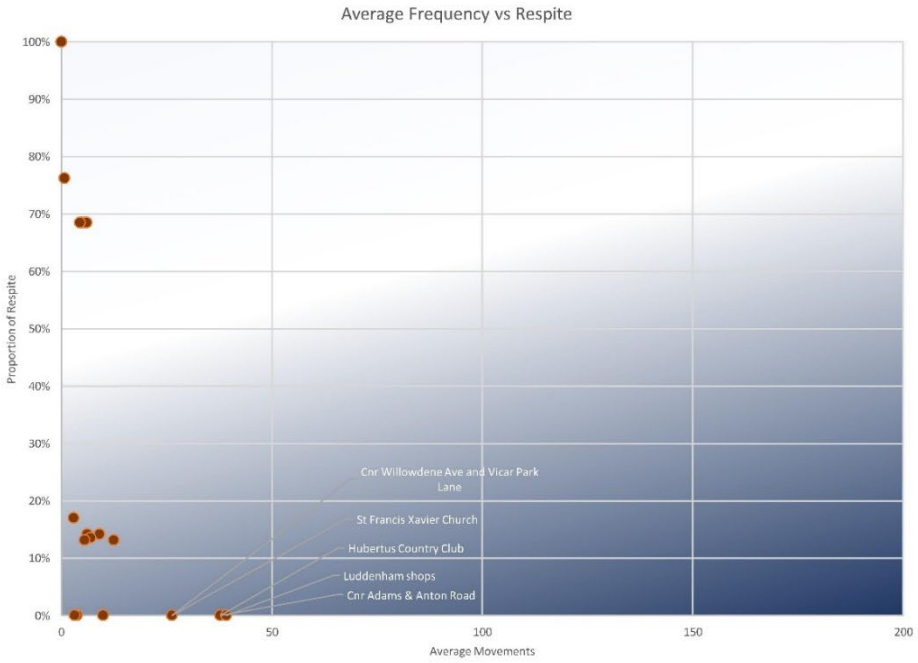


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

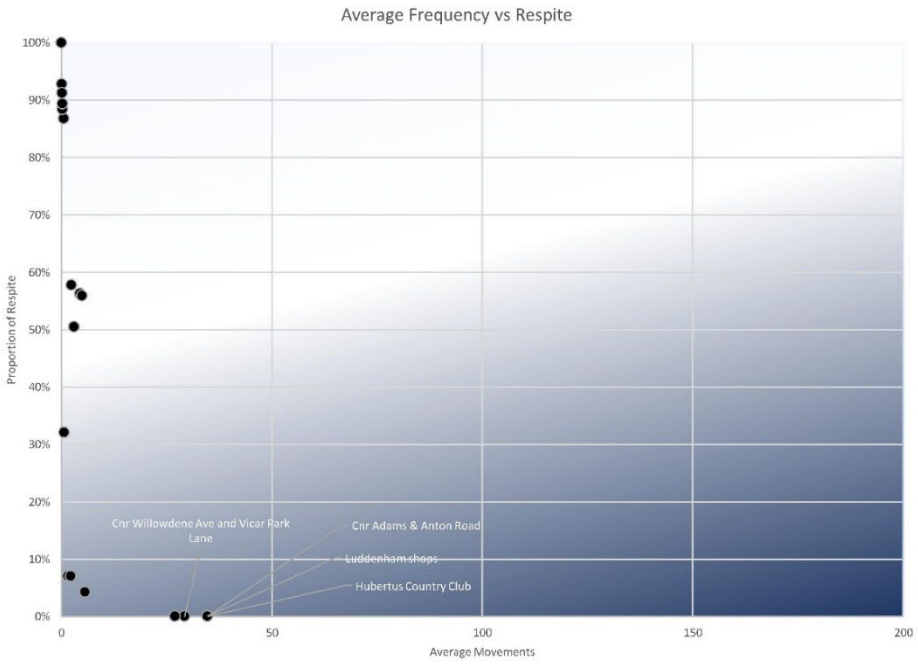


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

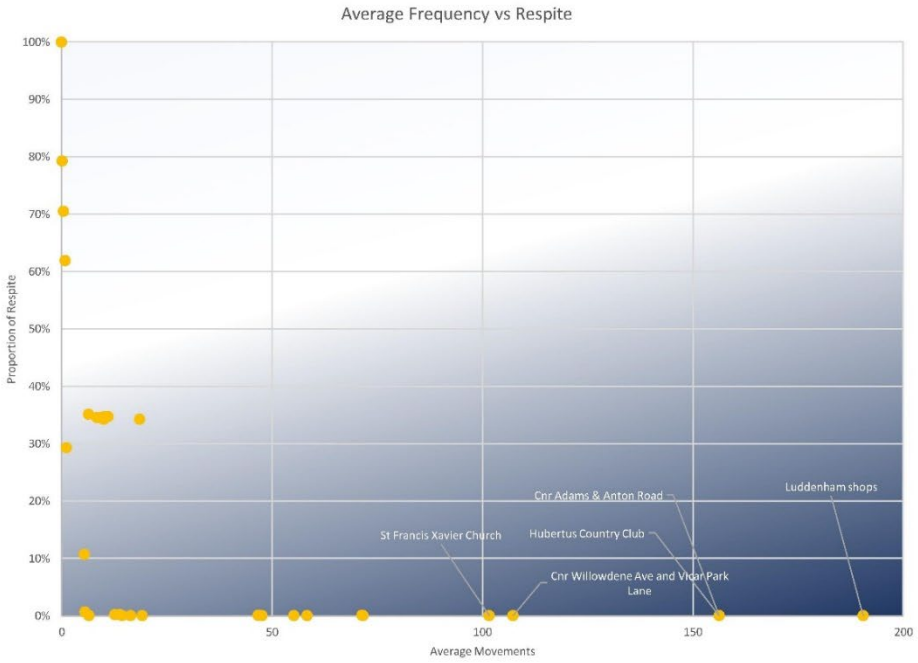


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

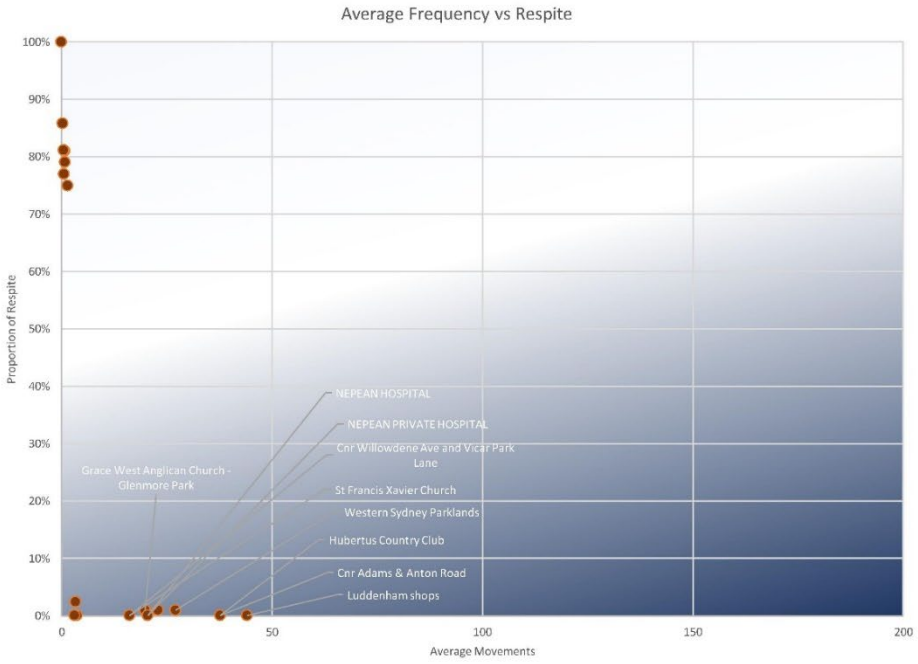


CHART	Flight Path Movement
PAL	2
YEAR	2040
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

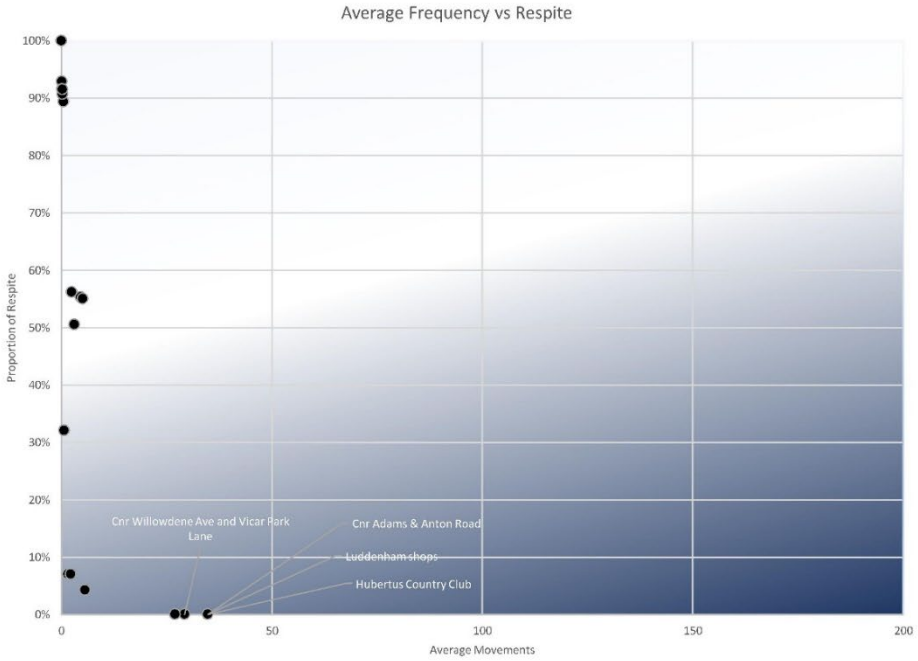


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

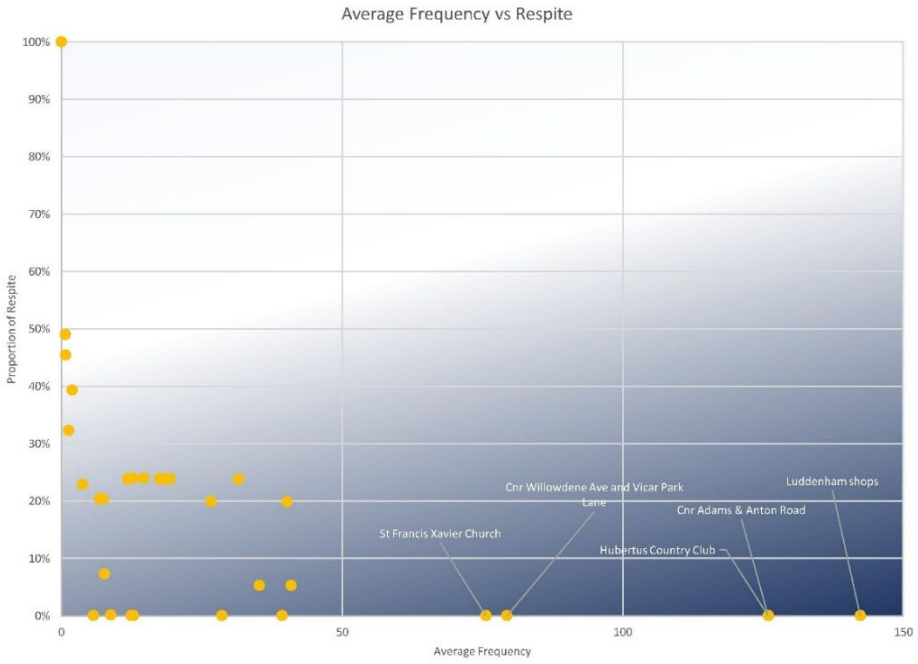


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

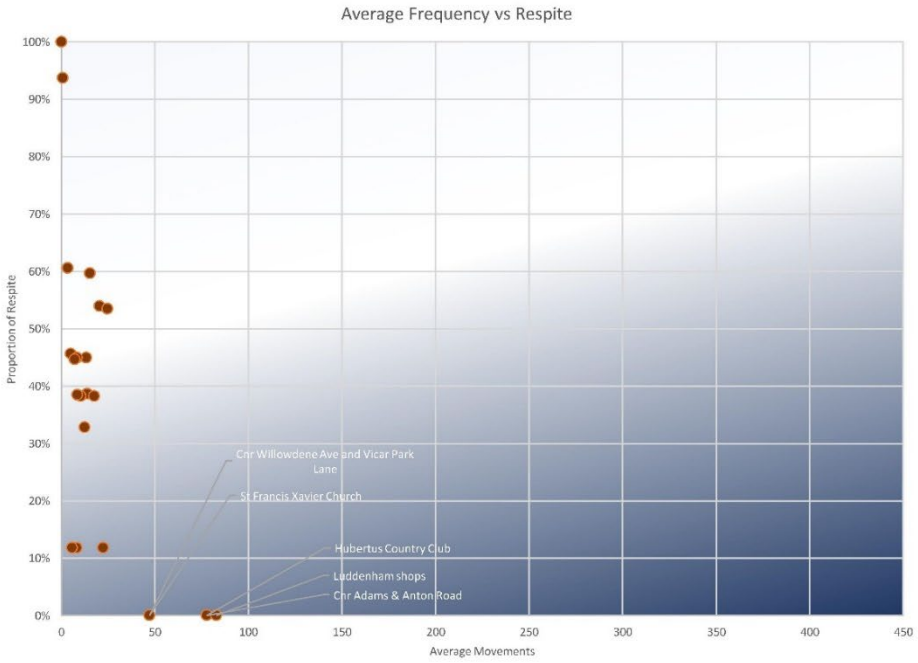


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	1
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

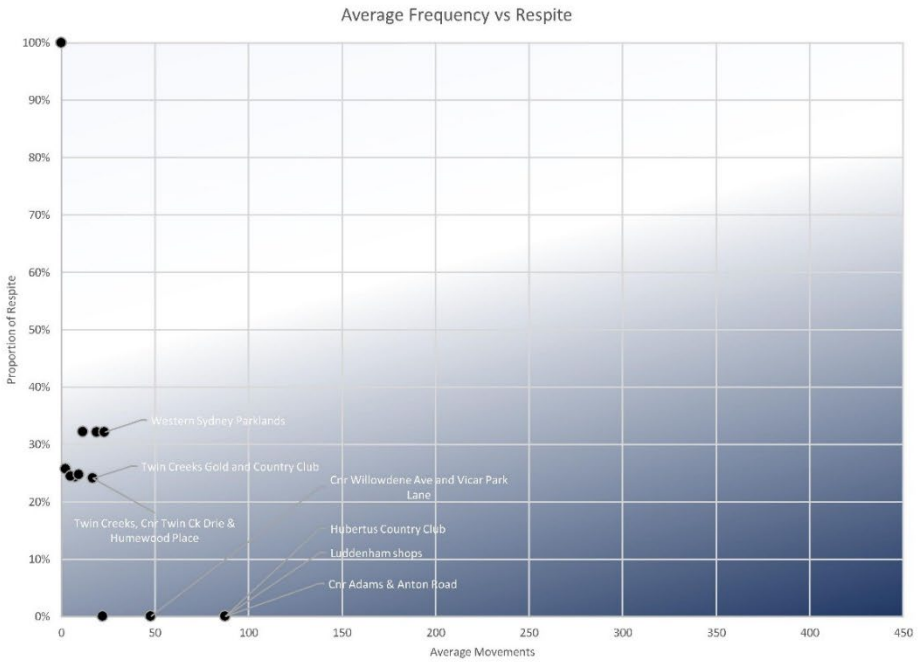


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

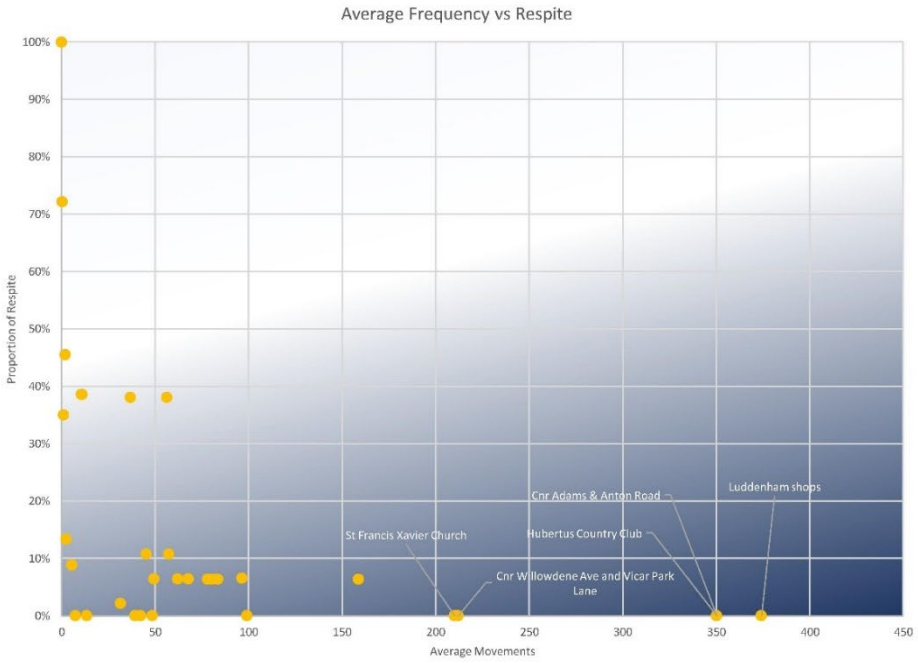


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

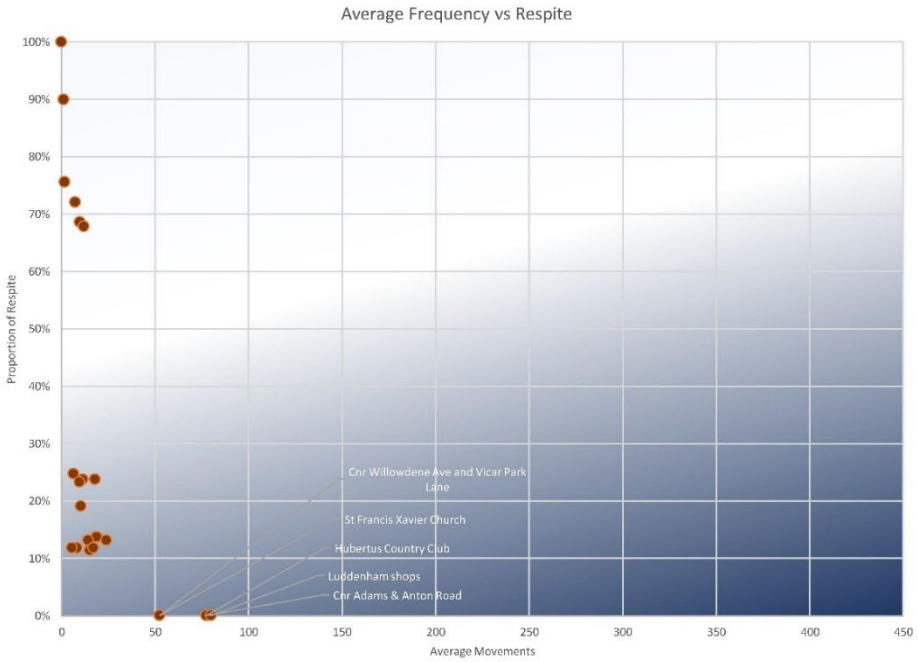


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	3
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All

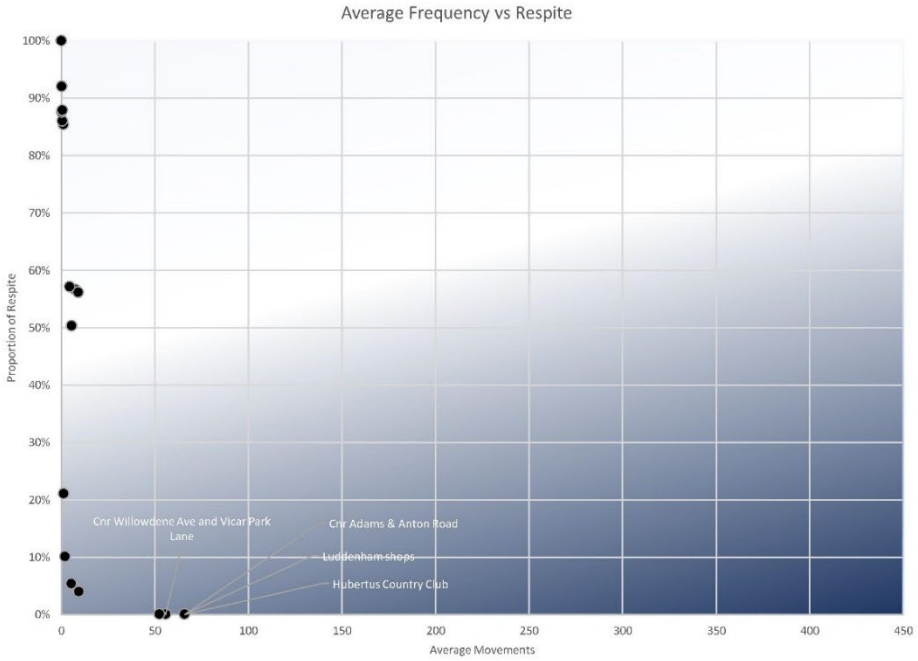


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Day (05:30-18:59)
NSR	All

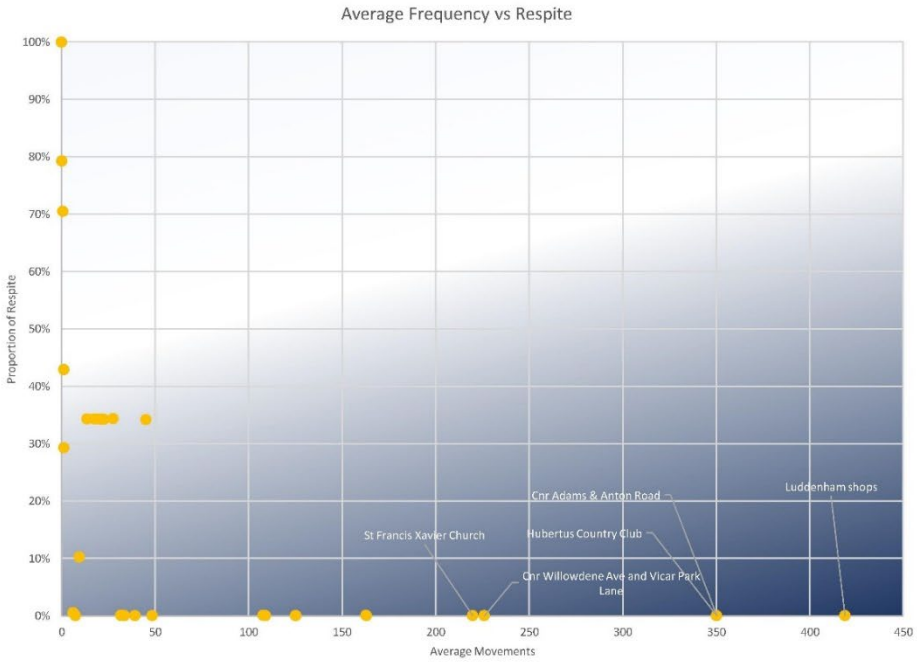


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Evening (19:00-22:59)
NSR	All

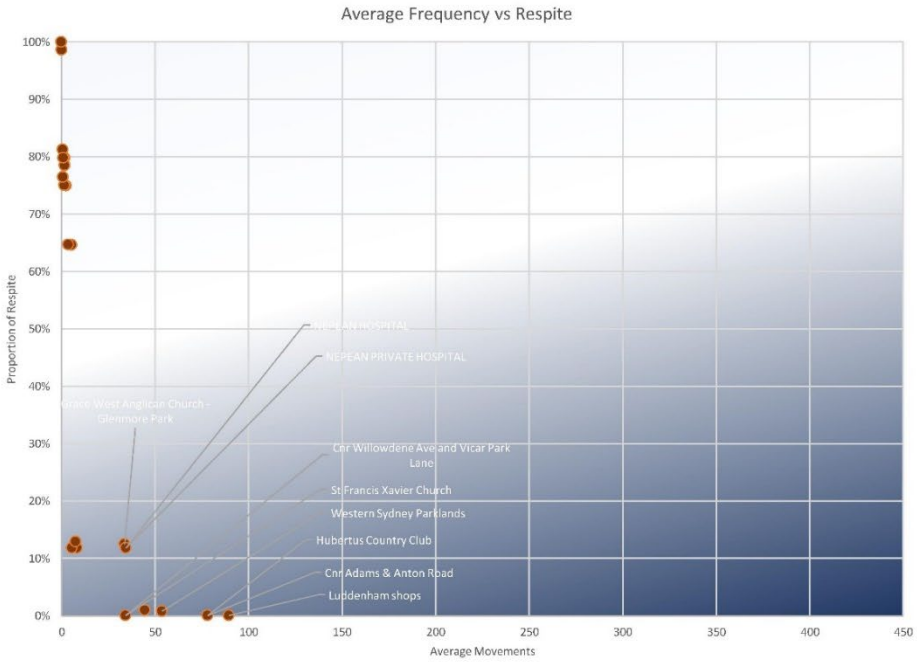
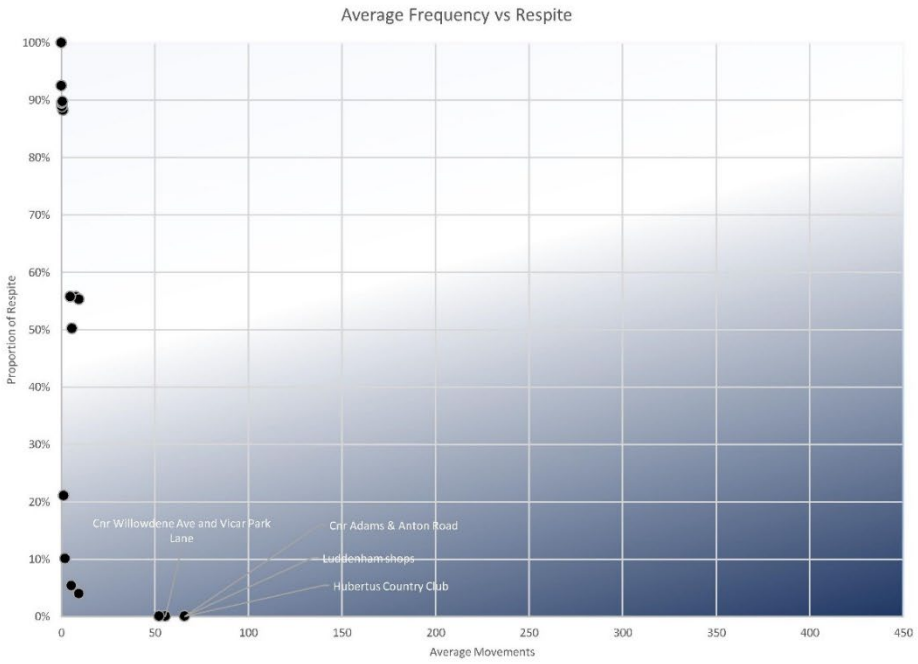


CHART	Flight Path Movement
PAL	3
YEAR	2055
WIND	2012-2021
SCENARIO	4
METRICS	Frequency vs Respite
TIME	Night (23:00-05:29)
NSR	All



Appendix E

Noise monitoring report

Background Noise Monitoring

Location	M01 South West Departure (Wallacia) - 620 Bents Basin Road	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	8781CB	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	93.9 dBA	**Post:**	94.1 dBA	**Calibration**	**Pre:**	93.9 dBA	**Post:**	93.8 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Wednesday, 12 Oct 2022
No. of days	19
No. of nights	17

* Monitoring period not continuous

Weather	
Station	BoM
Station Info	Badgery Creeks AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger is placed at the southeast corner of the property, on the left side of the entrance way and placed off the grass upon request from resident.

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	13/09/2022	4:00:44 PM	4:15:53 PM	79	56	49	35	
2	Day	13/09/2022	4:18:08 PM	4:33:08 PM	67	44	46	36	
3	Day	13/09/2022	4:35:06 PM	4:50:06 PM	73	47	46	34	
4	Day	13/09/2022	4:52:12 PM	5:07:12 PM	68	47	45	36	
5	Evening	25/09/2022	6:00:00 PM	6:15:00 PM	60	48	49	45	
6	Evening	25/09/2022	7:30:00 PM	7:45:00 PM	50	46	48	45	*
7	Evening	25/09/2022	8:30:00 PM	8:45:00 PM	59	42	42	38	*
8	Evening	25/09/2022	9:15:00 PM	9:30:00 PM	54	35	34	30	*
9	Night	26/09/2022	12:30:00 AM	12:45:00 AM	41	30	31	28	*
10	Night	26/09/2022	2:15:00 AM	2:30:00 AM	52	31	34	26	*
11	Night	26/09/2022	4:15:00 AM	4:30:00 AM	41	31	34	27	*
12	Night	26/09/2022	6:30:00 AM	6:45:00 AM	58	42	45	37	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Mechanical noise from tractor working on the adjacent land east of property. Intermittent bird calls from nearby trees. Occasional HV and LV vehicle passbys on Bents Basin Road. Residents using lawn mower on the other side of the property (>50 metres away). Several aircraft flying overhead with approx. durations of 30 sec to 1 min with maximum sound levels in the range of 35 to 58 dBA.
Background noise	Constant bird chirping from nearby trees. Constant tractor noise of varying intensity from adjacent property. Movement of vegetation induced by wind (e.g. grass and trees rustling).
Evening	
Ambient noise	Constant noise from insects, along with intermittent impulsive animal noises (e.g. frog/toads, birds, dogs). Occasional vehicle passbys on Bents Basin Road. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 41 to 57 dBA.
Background noise	Constant insect noise. Movement of vegetation induced by wind (e.g. grass and trees rustling).
Night	
Ambient noise	Constant bird noise, varying in intensity. Intermittent dog barking from adjacent property. Occasional vehicles passing. In the early morning (around 4 AM), the intermittent rooster crowing dominant. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 50 to 58 dBA.
Background noise	Movement in vegetation due to wind (e.g. grass and trees rustling).

Site Details	M01 South West Departure (Wallacia) - 620 Bents Basin Road
Start Date	Tue 13 September 2022
End Date	Wed 12 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	58
$L_{eq, Evening}$ dBA	49
$L_{eq, Night}$ dBA	43
RBL, $_{Day}$ dBA	33
RBL, $_{Evening}$ dBA	32
RBL, $_{Night}$ dBA	27

Daily Summary

Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA	45	56	45	50	53	52	50	63
$L_{eq, Evening}$ dBA	41	39	39	45	38	42	40	41
$L_{eq, Night}$ dBA	39	38	38	38	38	39	38	39
ABL, $_{Day}$ dBA	35	33	33	33	34	33	33	35
ABL, $_{Evening}$ dBA	25	26	31	35	27	27	24	27
ABL, $_{Night}$ dBA	24	26	23	25	24	23	24	26

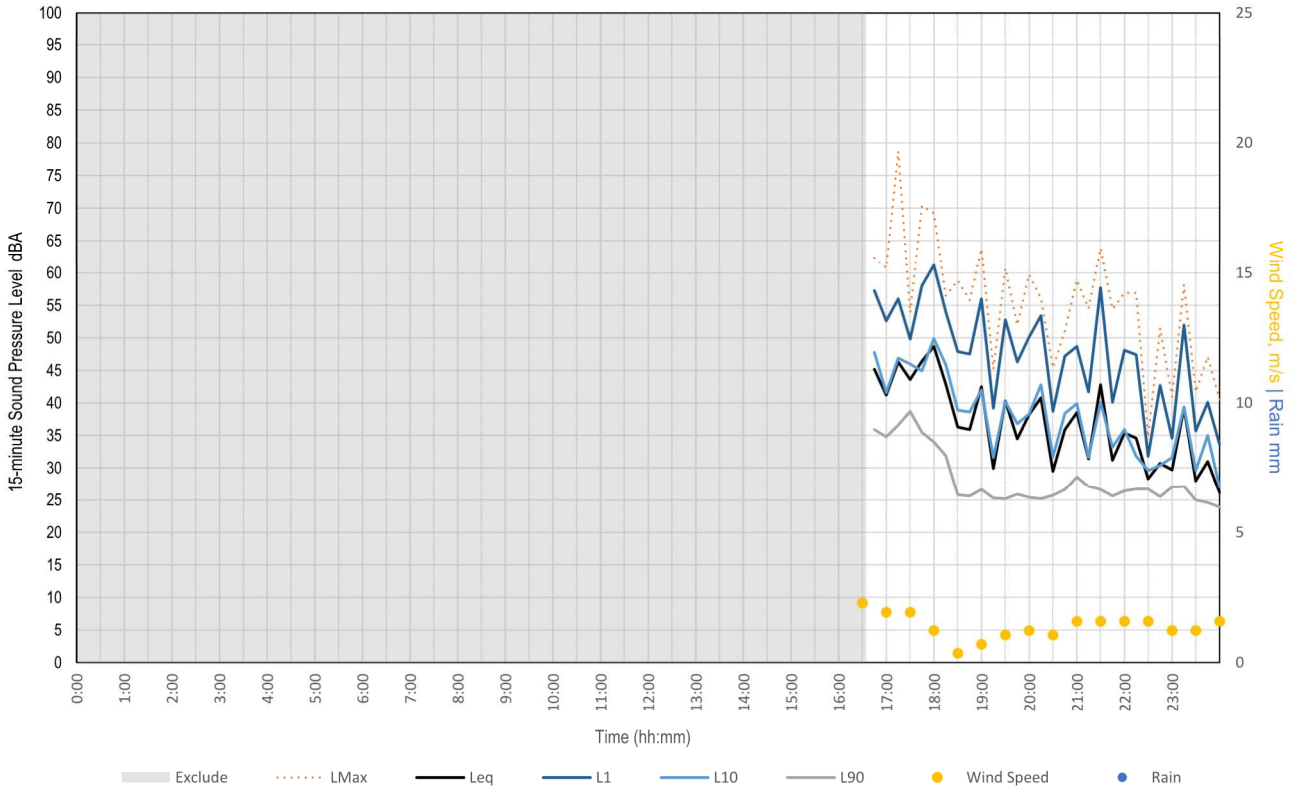
Date	21/09	22/09	23/09	24/09	25/09	26/09
$L_{eq, Day}$ dBA	48	45	44	47	52	63
$L_{eq, Evening}$ dBA	38	43	49	50	45	52
$L_{eq, Night}$ dBA	38	39	42	39	38	34
ABL, $_{Day}$ dBA	34	33	33	33	33	34
ABL, $_{Evening}$ dBA	29	33	42	36	31	29
ABL, $_{Night}$ dBA	27	28	30	28	26	26

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	69	49	48	54	51	48	49	43
$L_{eq, Evening}$ dBA	41	43	38	46	48	56	41	50
$L_{eq, Night}$ dBA	39	38	38	37	52	39	45	38
ABL, $_{Day}$ dBA	37	36	33	32	31	34	38	34
ABL, $_{Evening}$ dBA	33	33	32	28	26	29	35	37
ABL, $_{Night}$ dBA	31	30	27	25	25	29	36	32

Date	07/10	08/10	09/10	10/10	11/10
$L_{eq, Day}$ dBA	47	63	45	51	55
$L_{eq, Evening}$ dBA	49	60	48	46	45
$L_{eq, Night}$ dBA	43	44	51	40	44
ABL, $_{Day}$ dBA	32	32	32	34	34
ABL, $_{Evening}$ dBA	40	57	35	34	34
ABL, $_{Night}$ dBA	33	37	31	32	29

Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

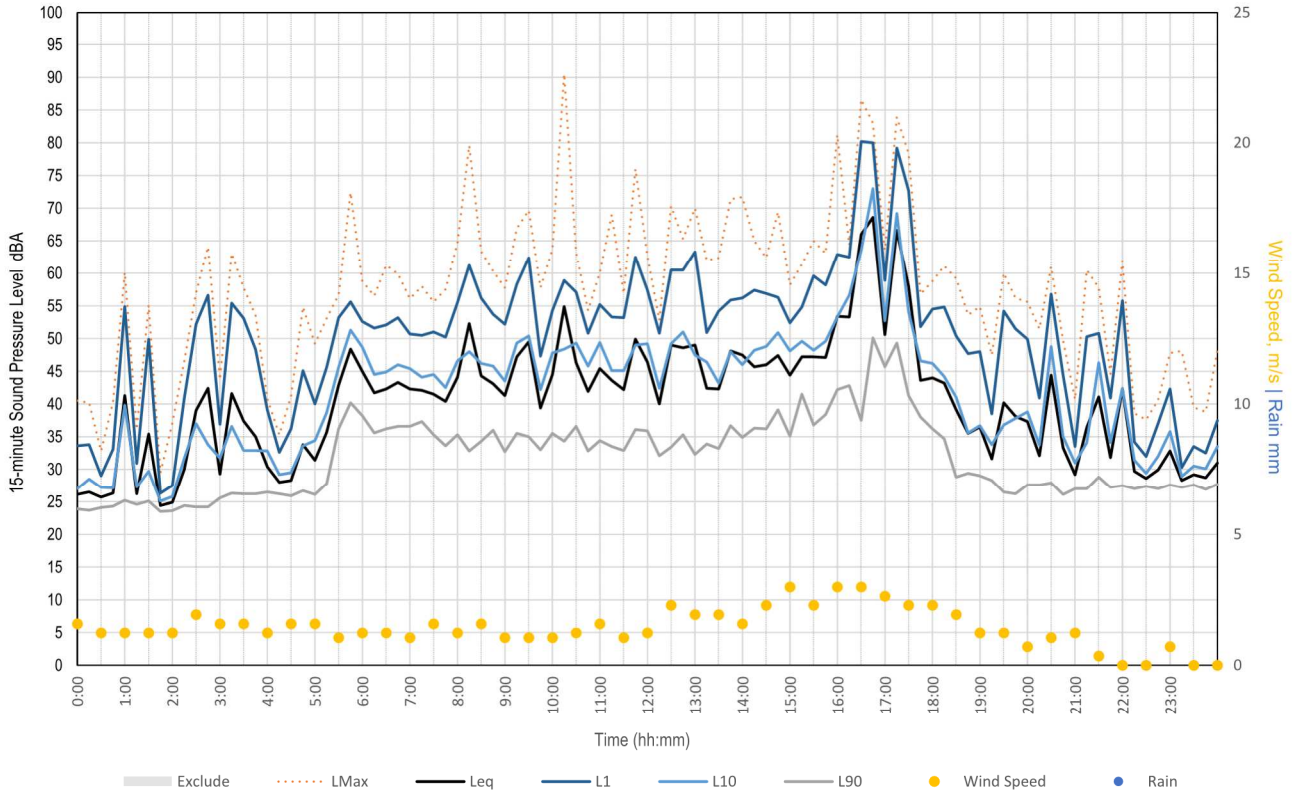
Tuesday, 13 September 2022



Noise Logger Results

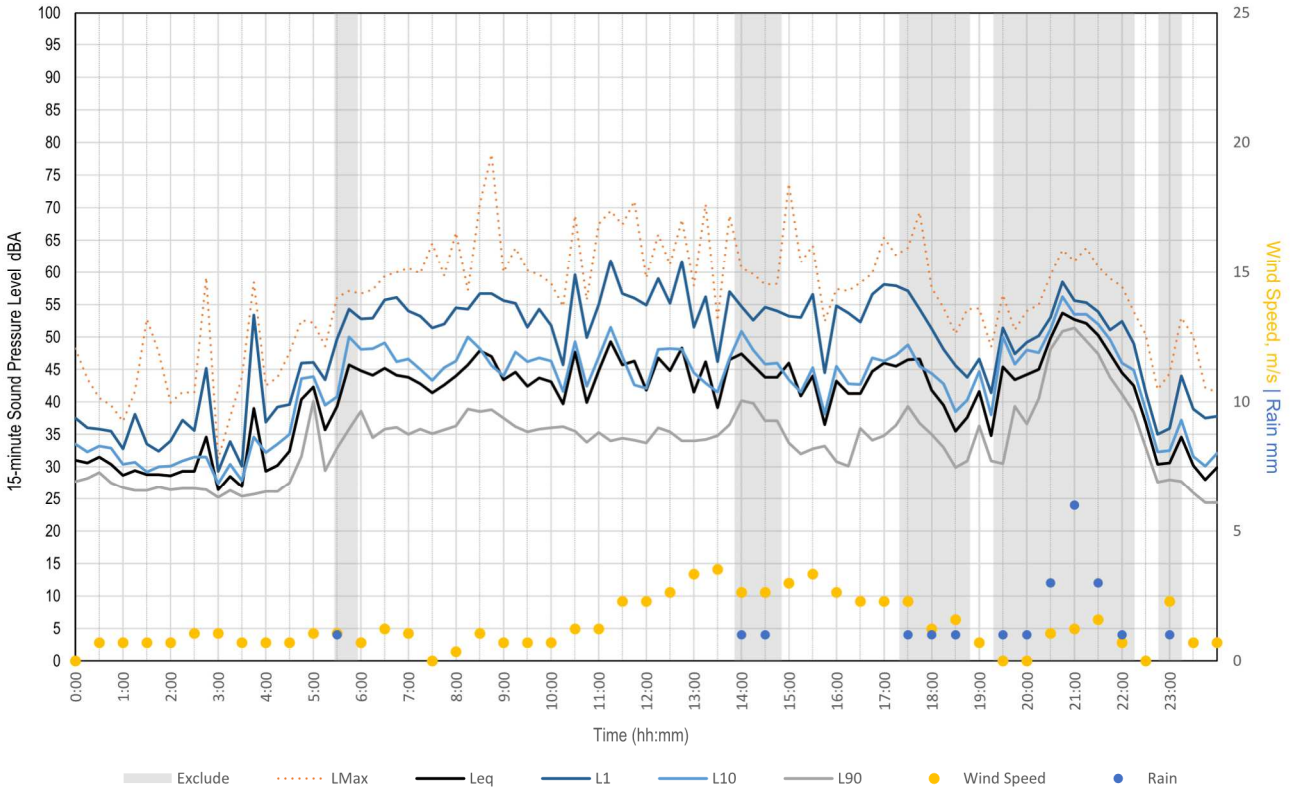
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Wednesday, 14 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

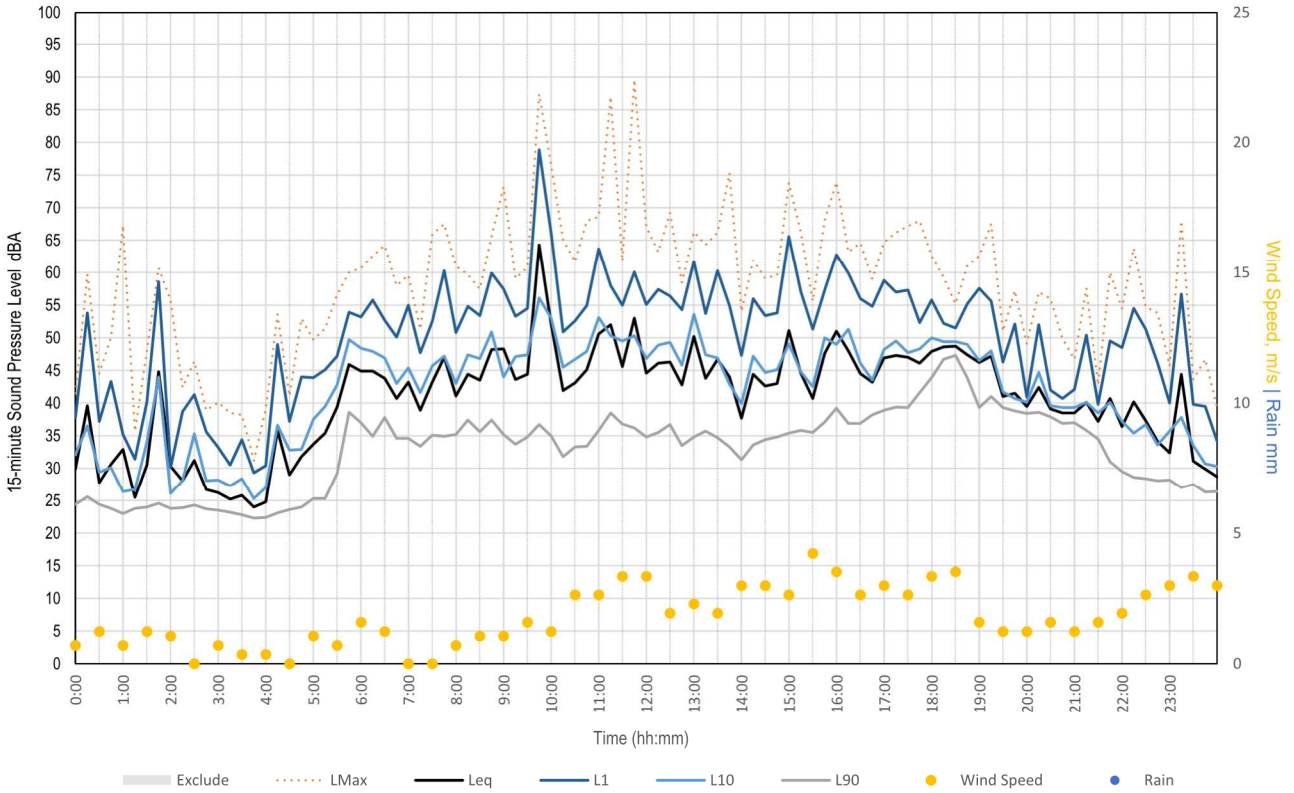
Thursday, 15 September 2022



Noise Logger Results

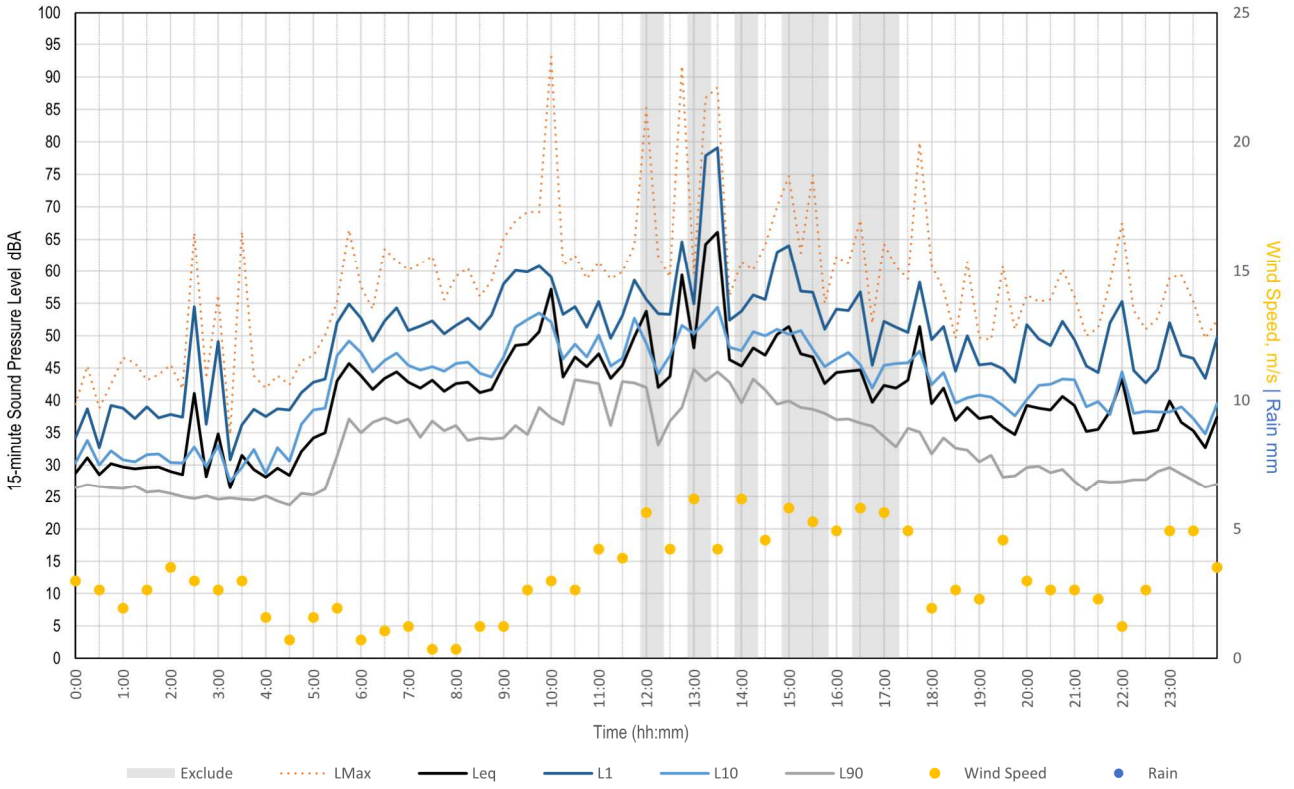
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Friday, 16 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

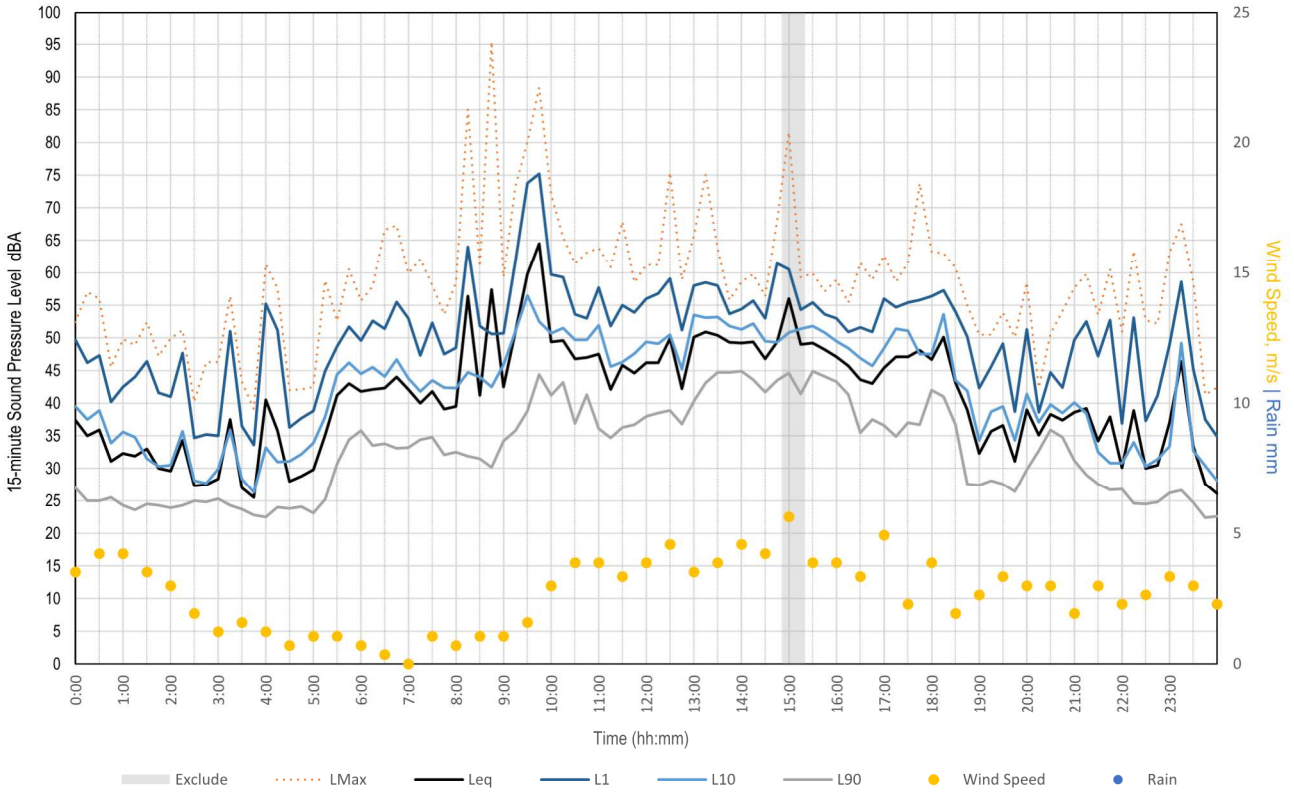
Saturday, 17 September 2022



Noise Logger Results

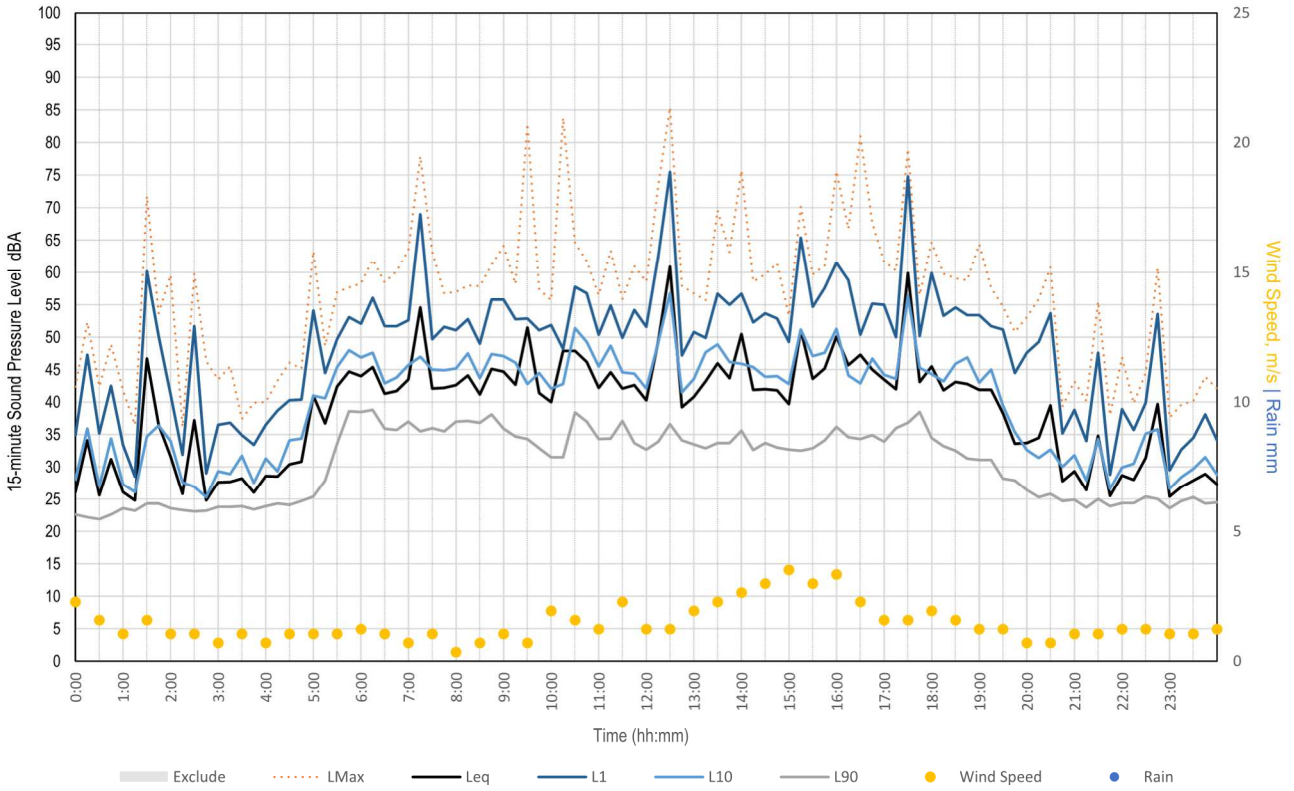
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Sunday, 18 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

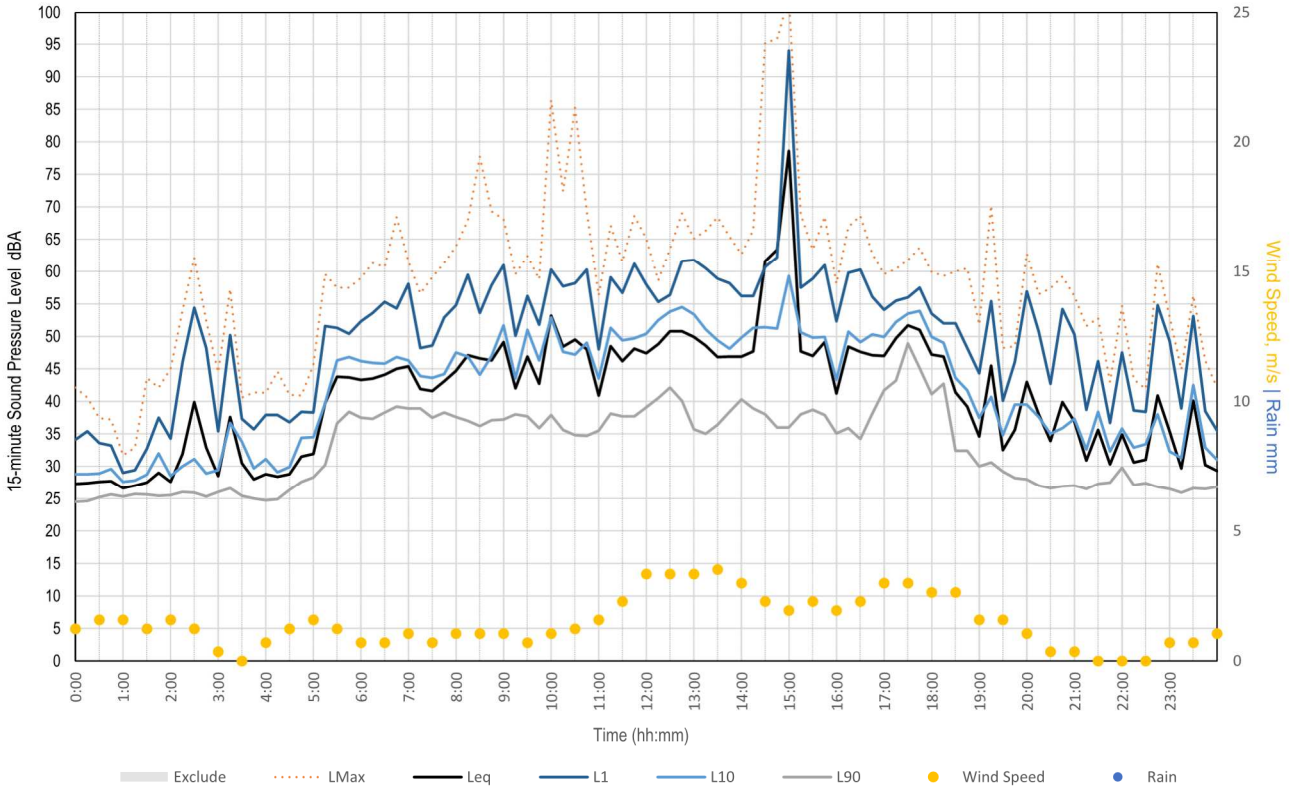
Monday, 19 September 2022



Noise Logger Results

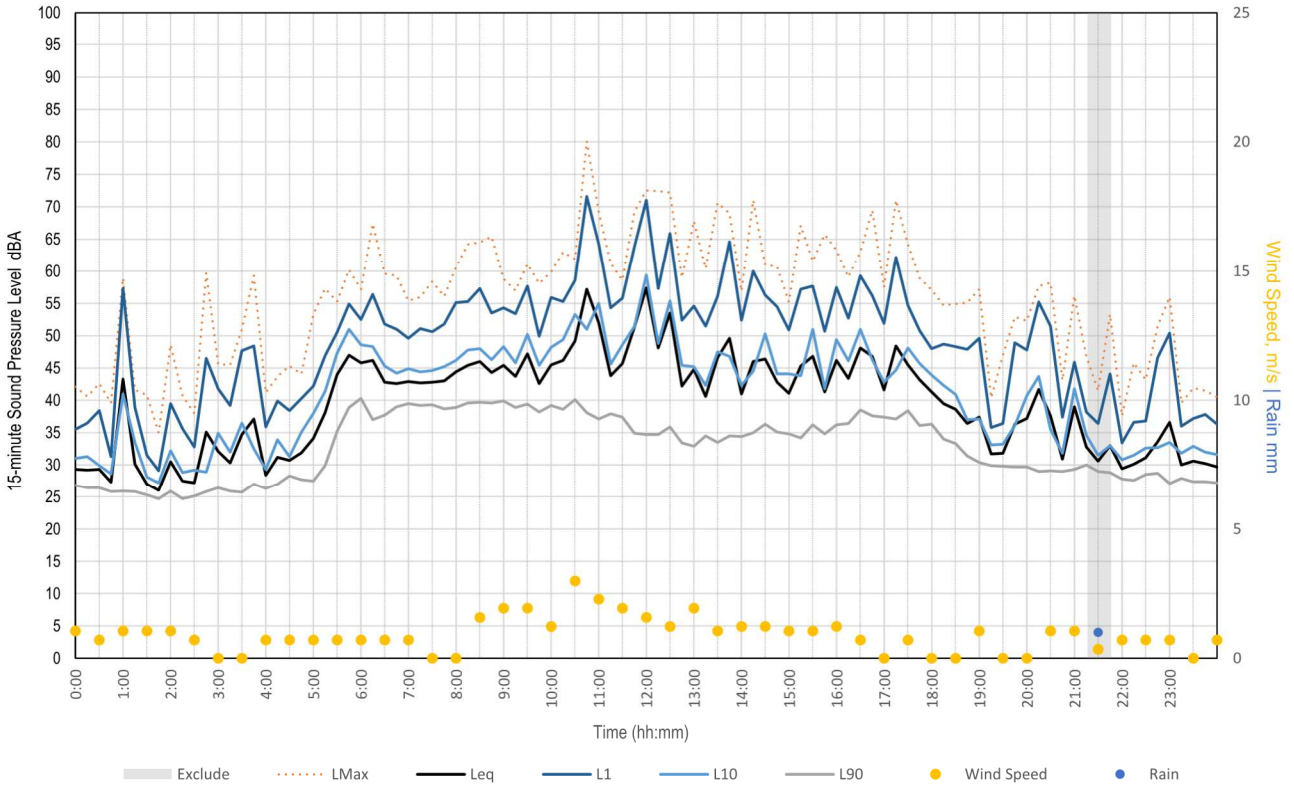
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Tuesday, 20 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

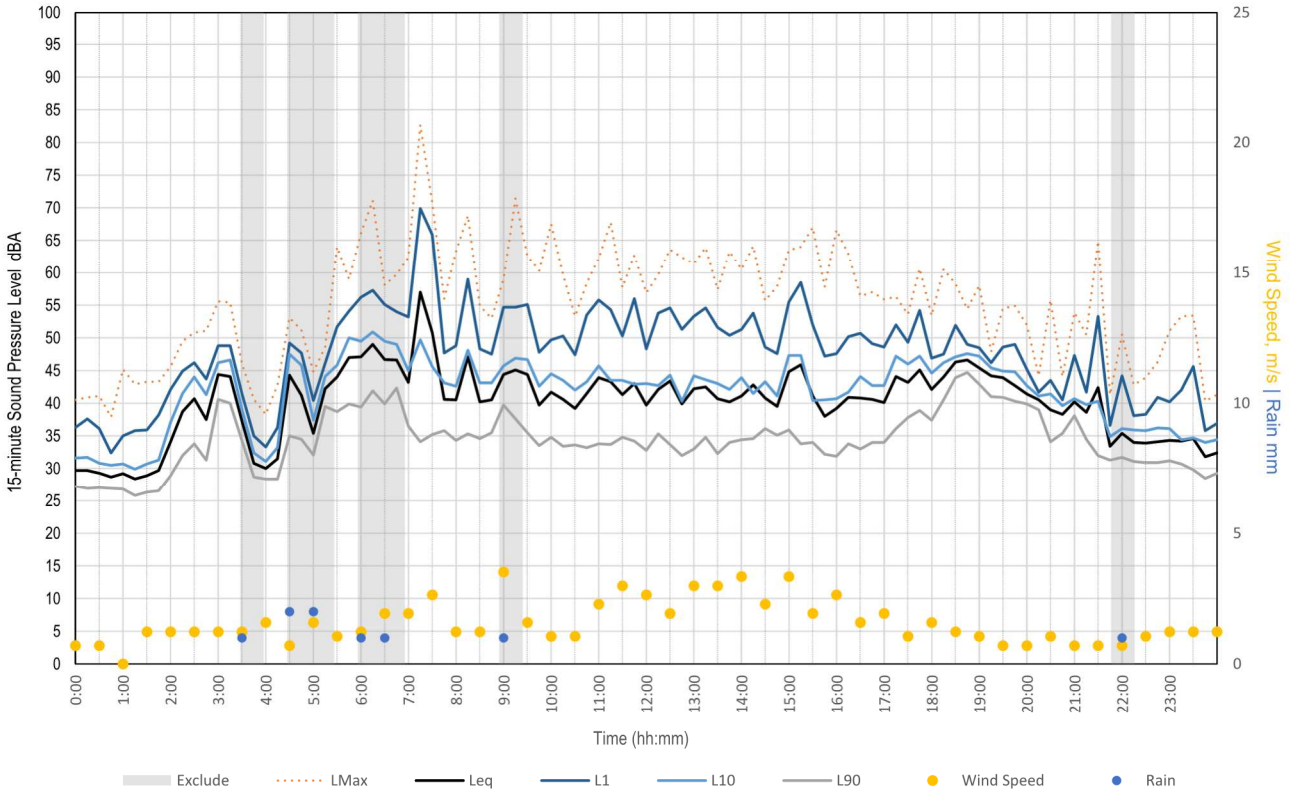
Wednesday, 21 September 2022



Noise Logger Results

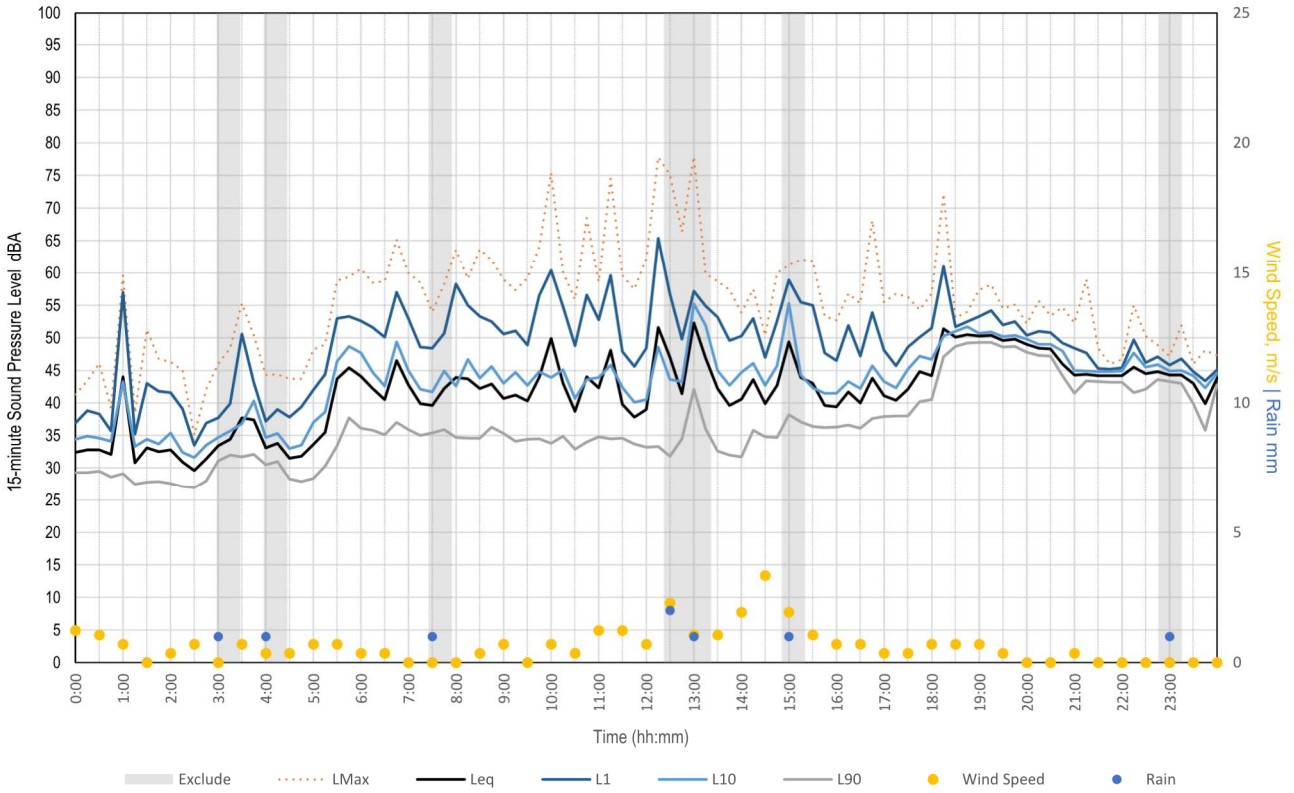
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Thursday, 22 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

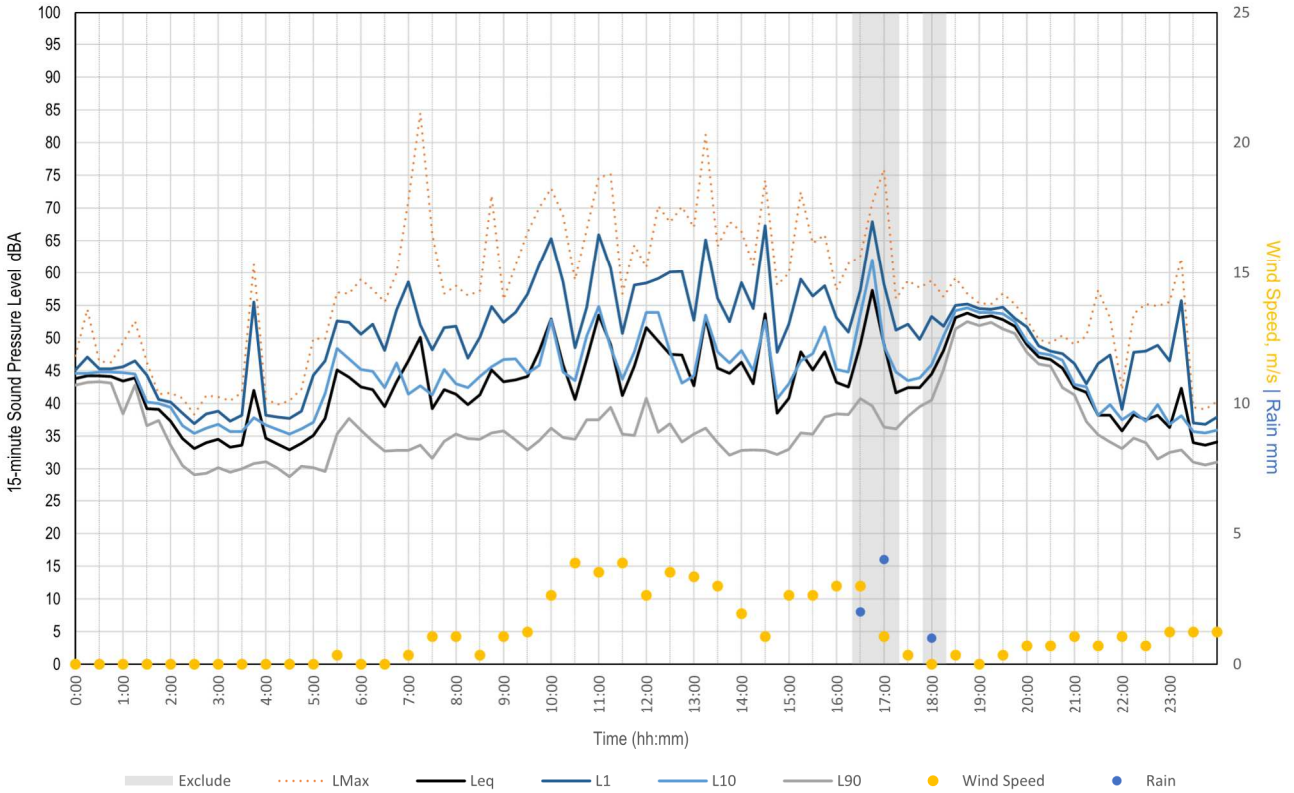
Friday, 23 September 2022



Noise Logger Results

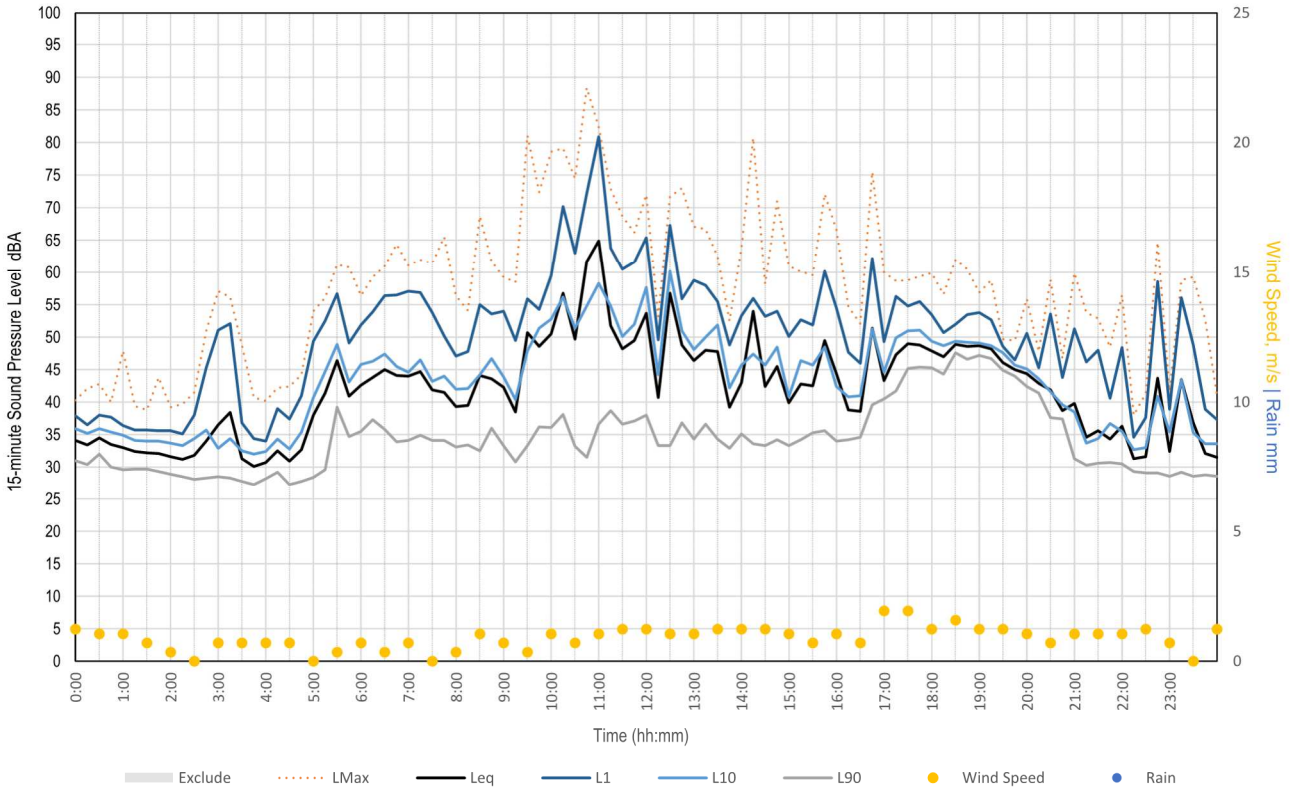
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Saturday, 24 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

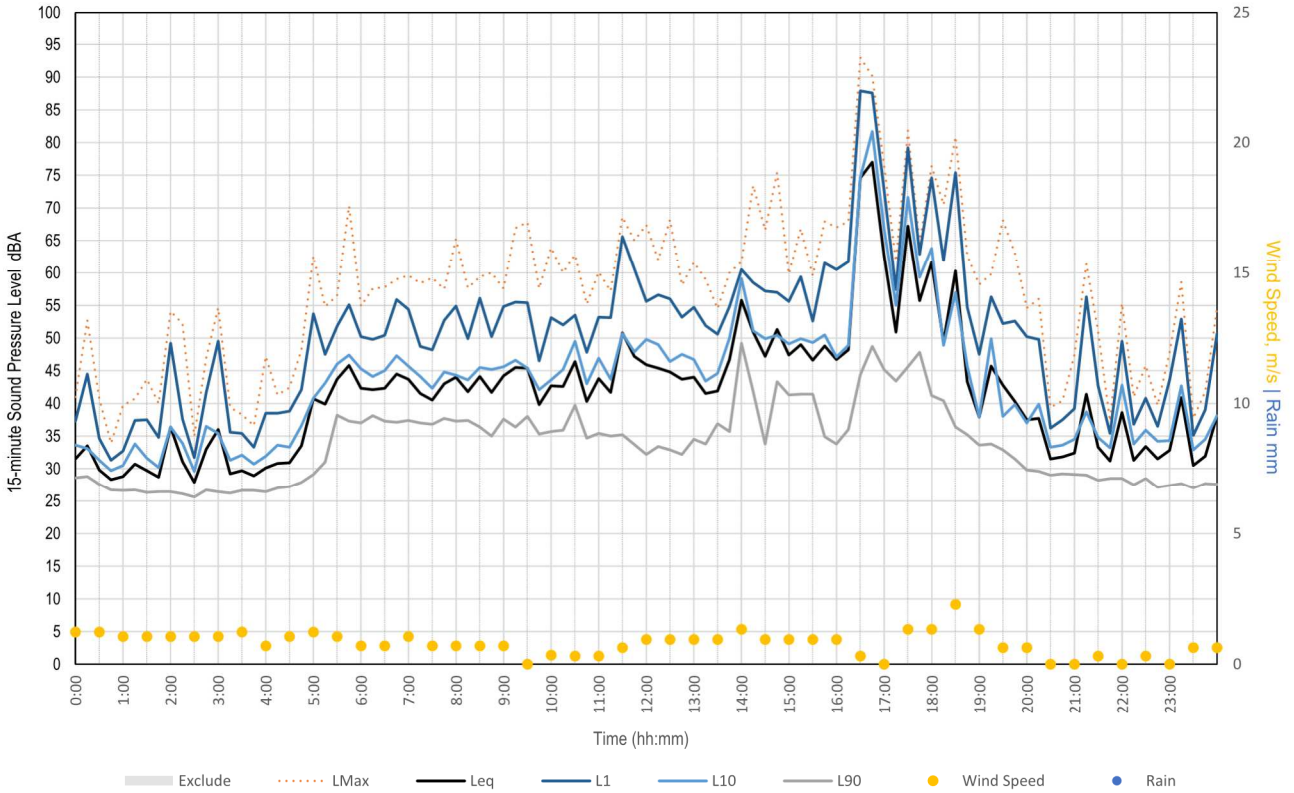
Sunday, 25 September 2022



Noise Logger Results

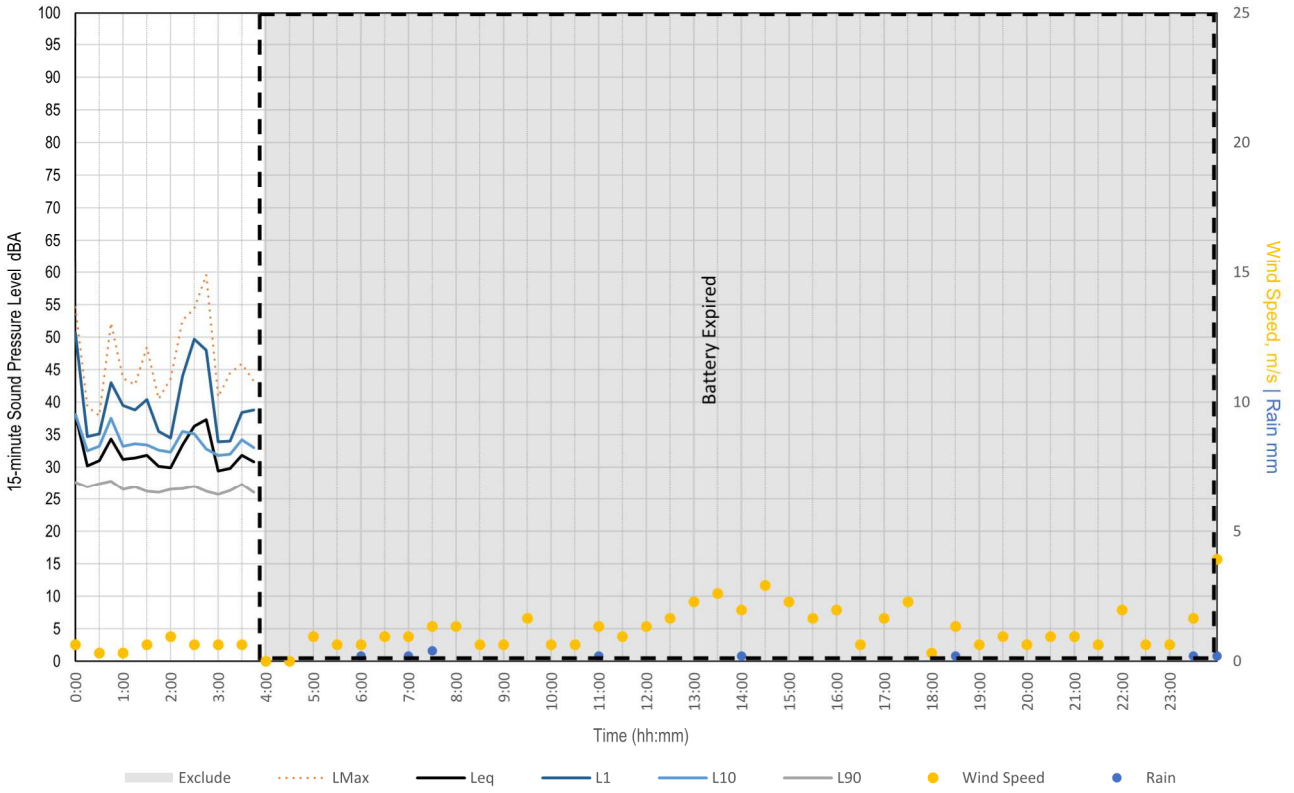
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Monday, 26 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

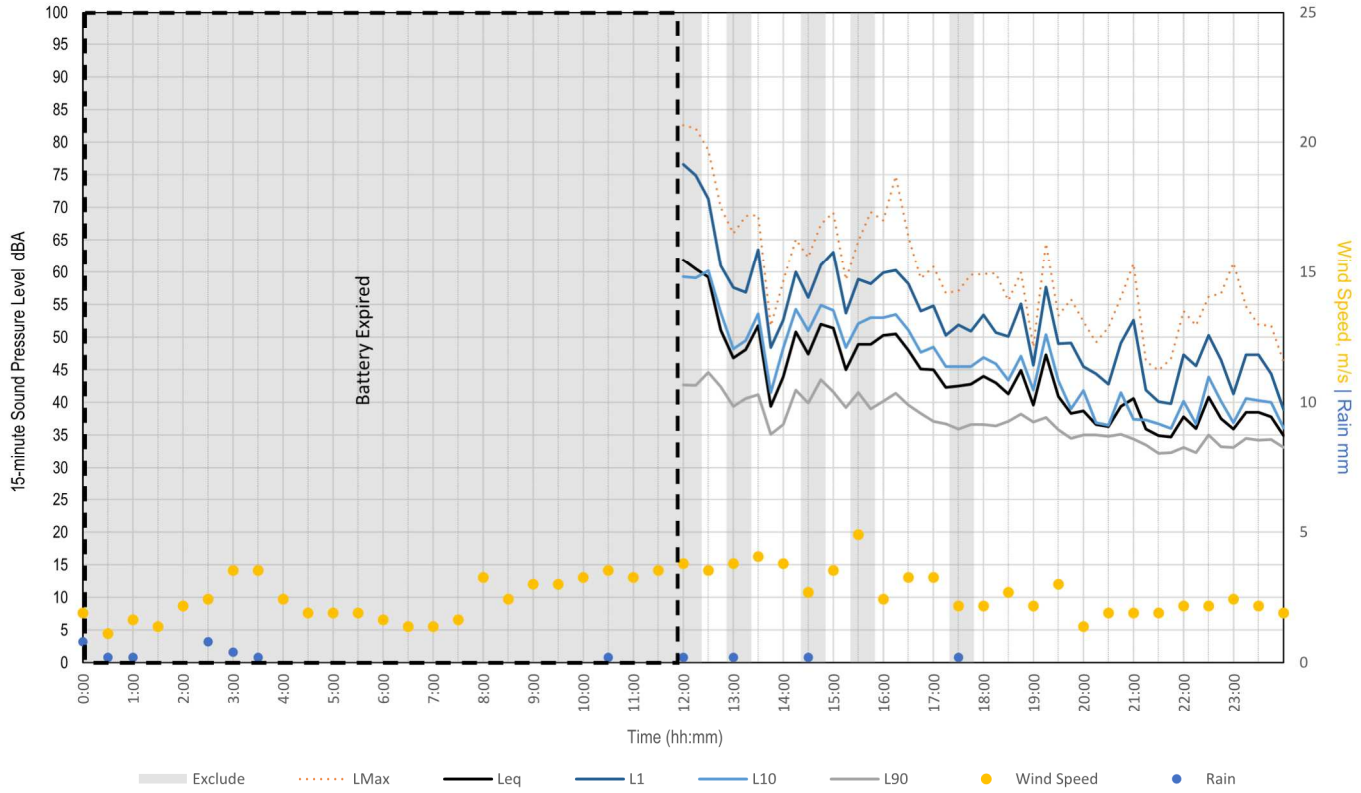
Tuesday, 27 September 2022



Noise Logger Results

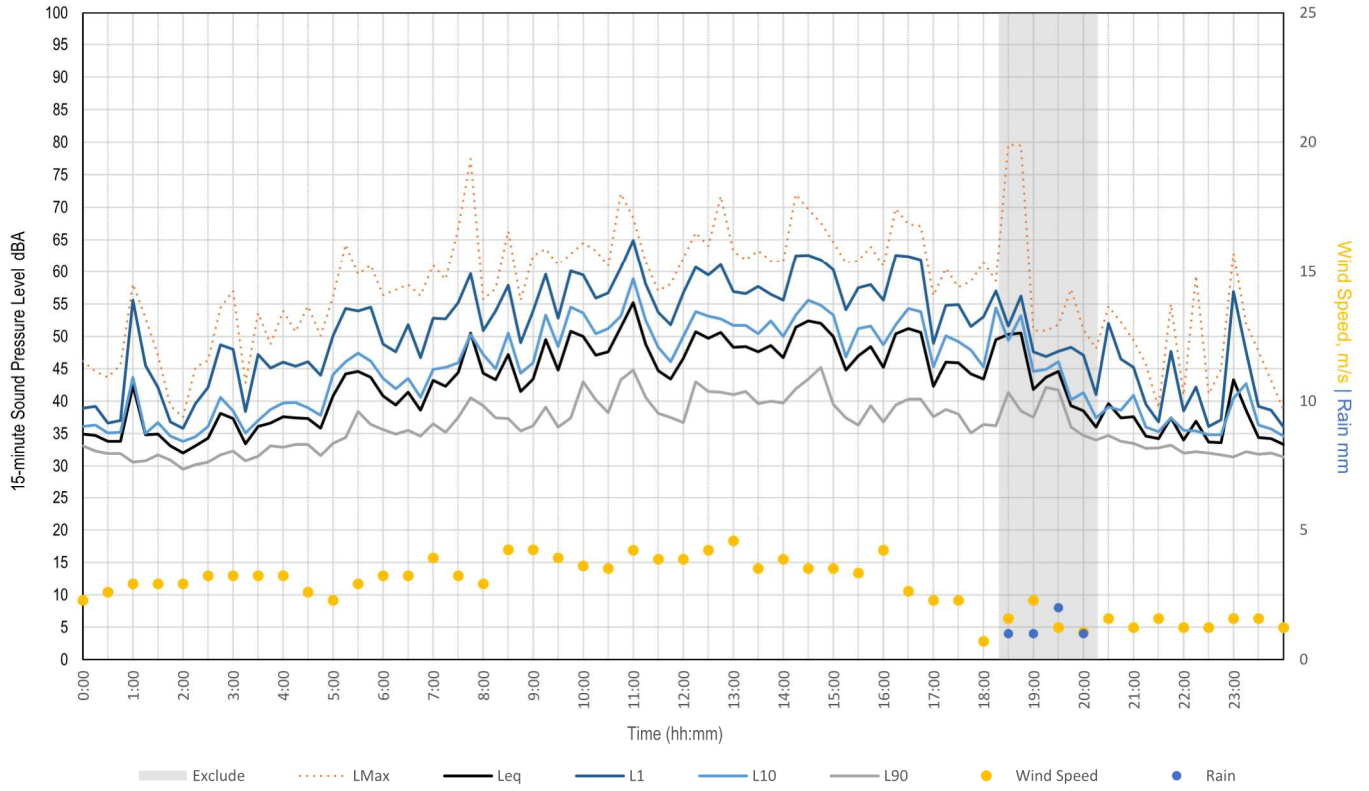
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Thursday, 29 September 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

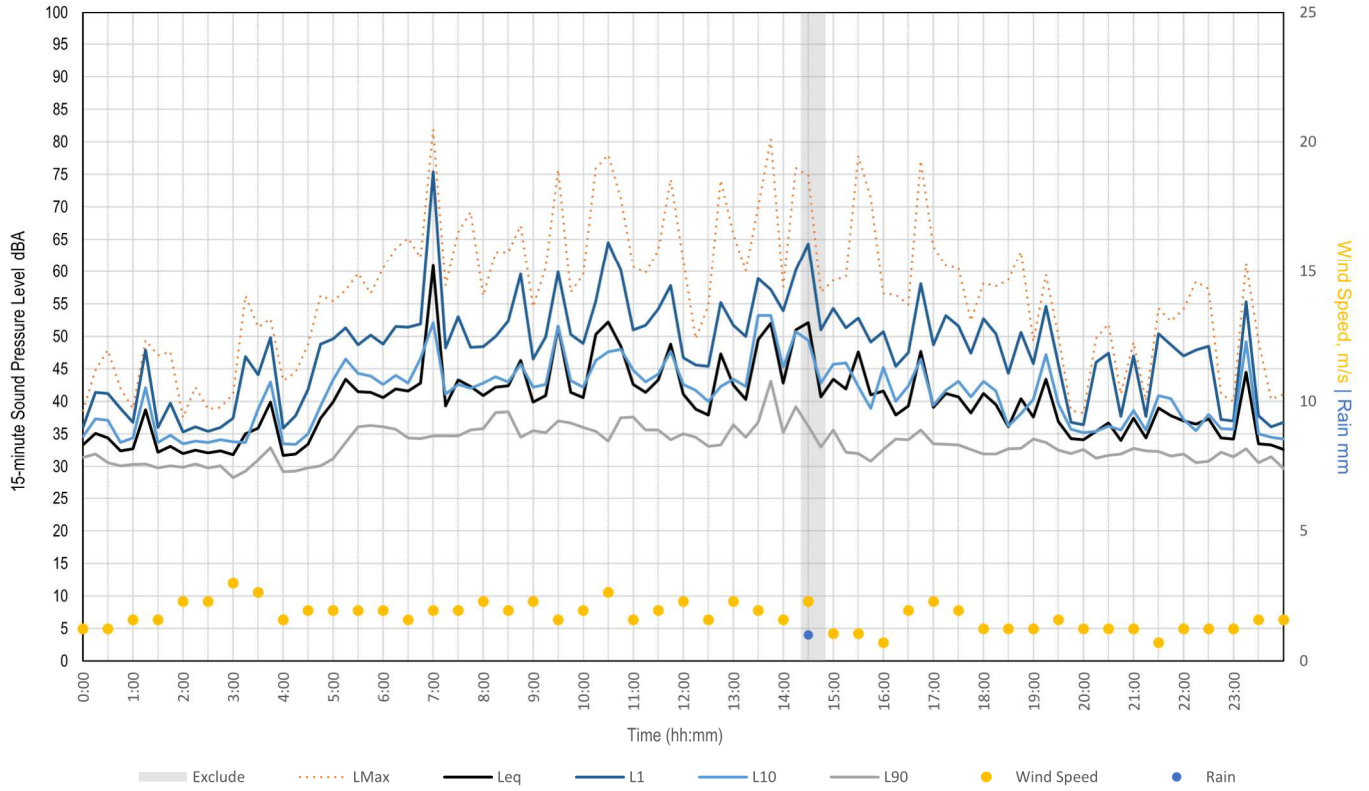
Friday, 30 September 2022



Noise Logger Results

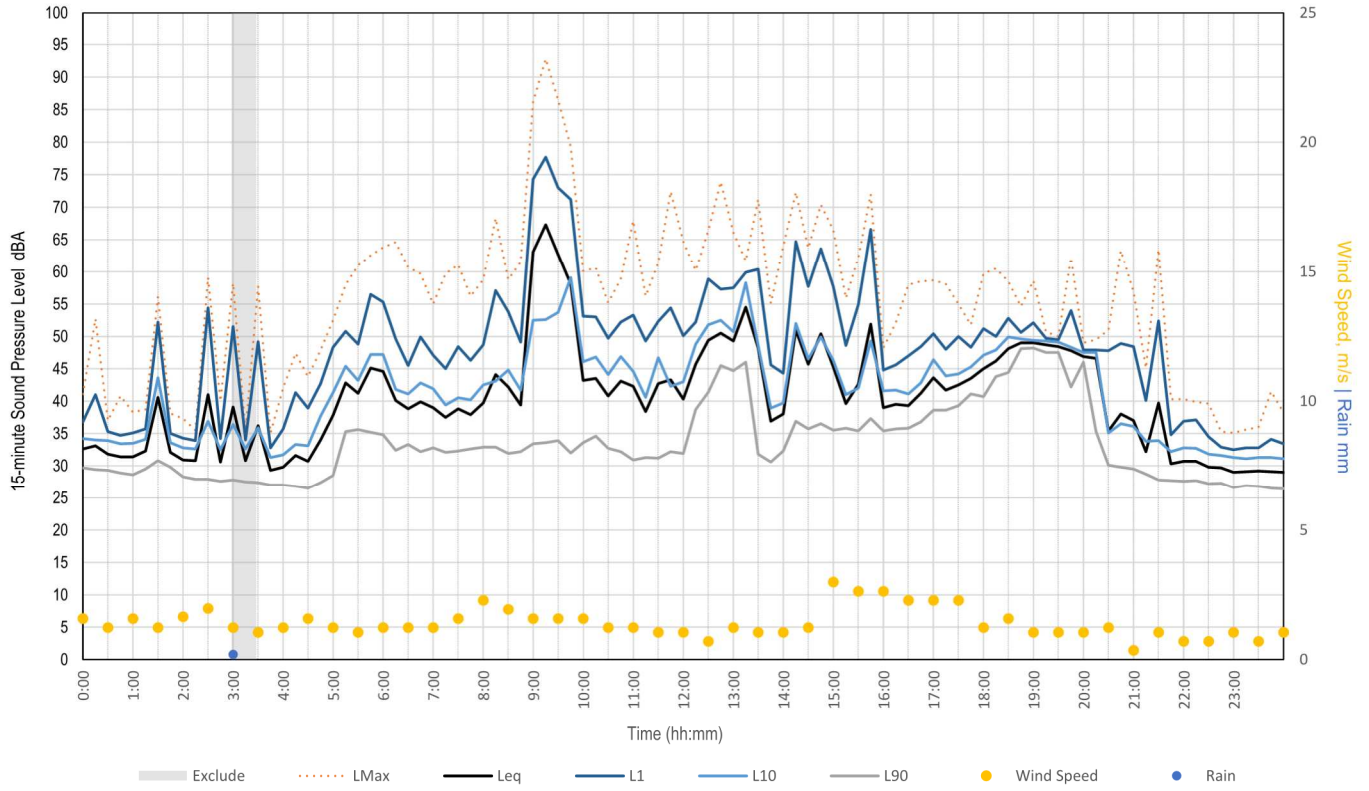
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Saturday, 01 October 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

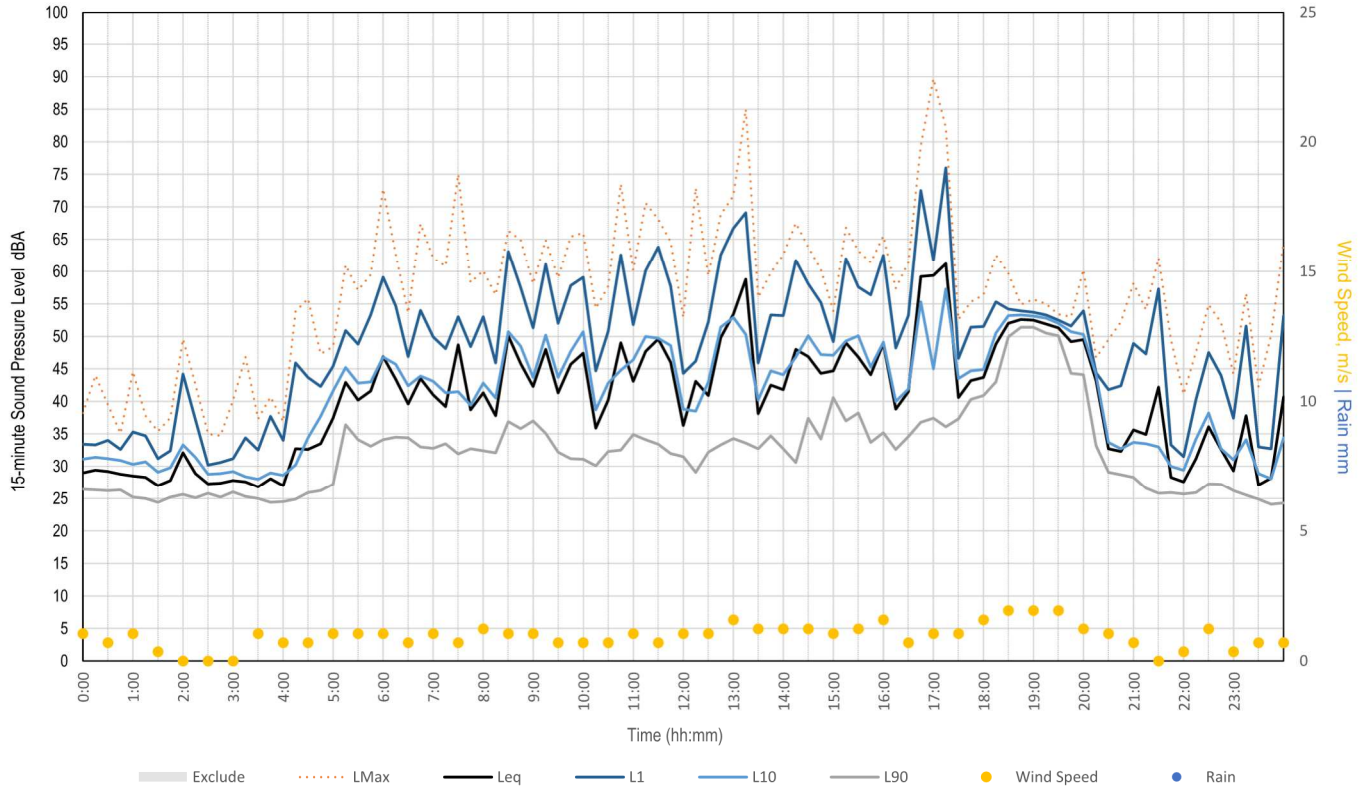
Sunday, 02 October 2022



Noise Logger Results

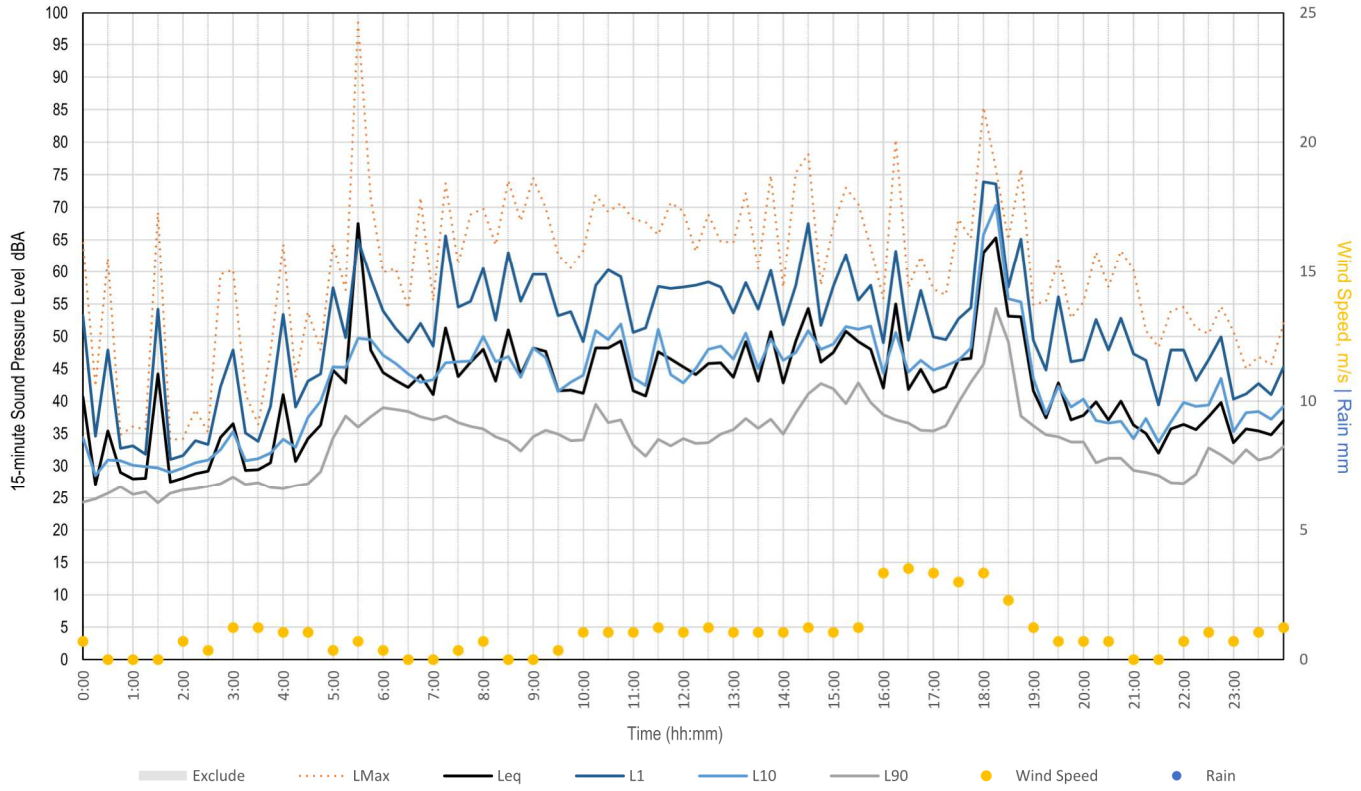
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Monday, 03 October 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

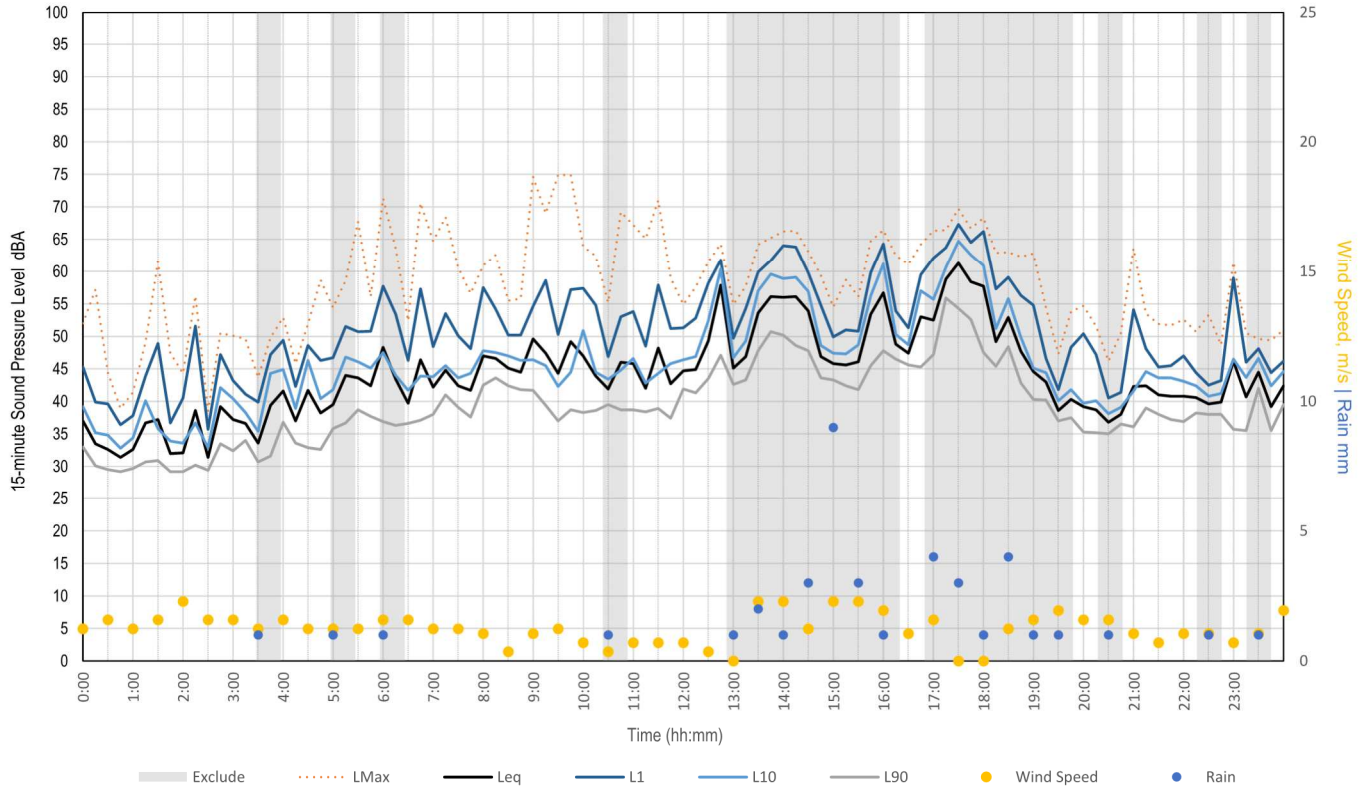
Tuesday, 04 October 2022



Noise Logger Results

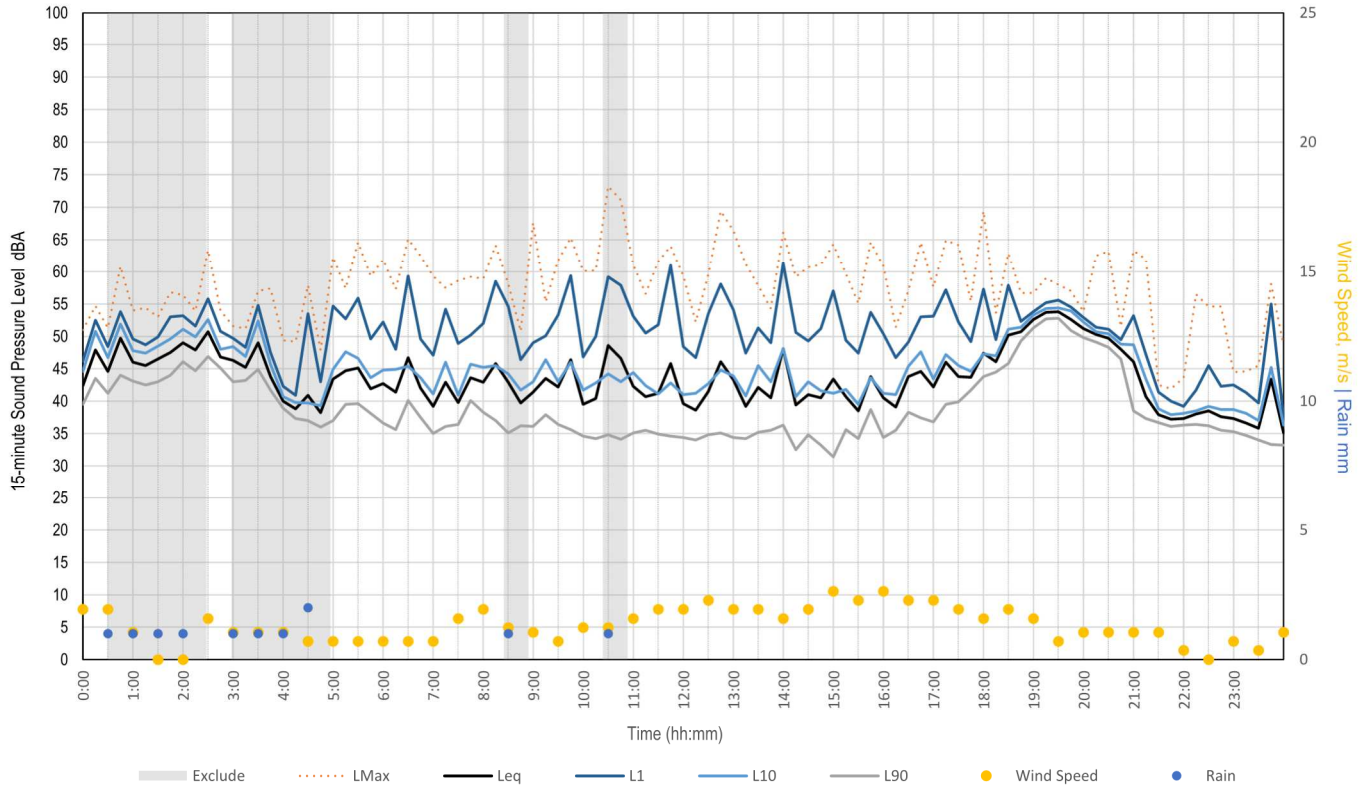
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Wednesday, 05 October 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

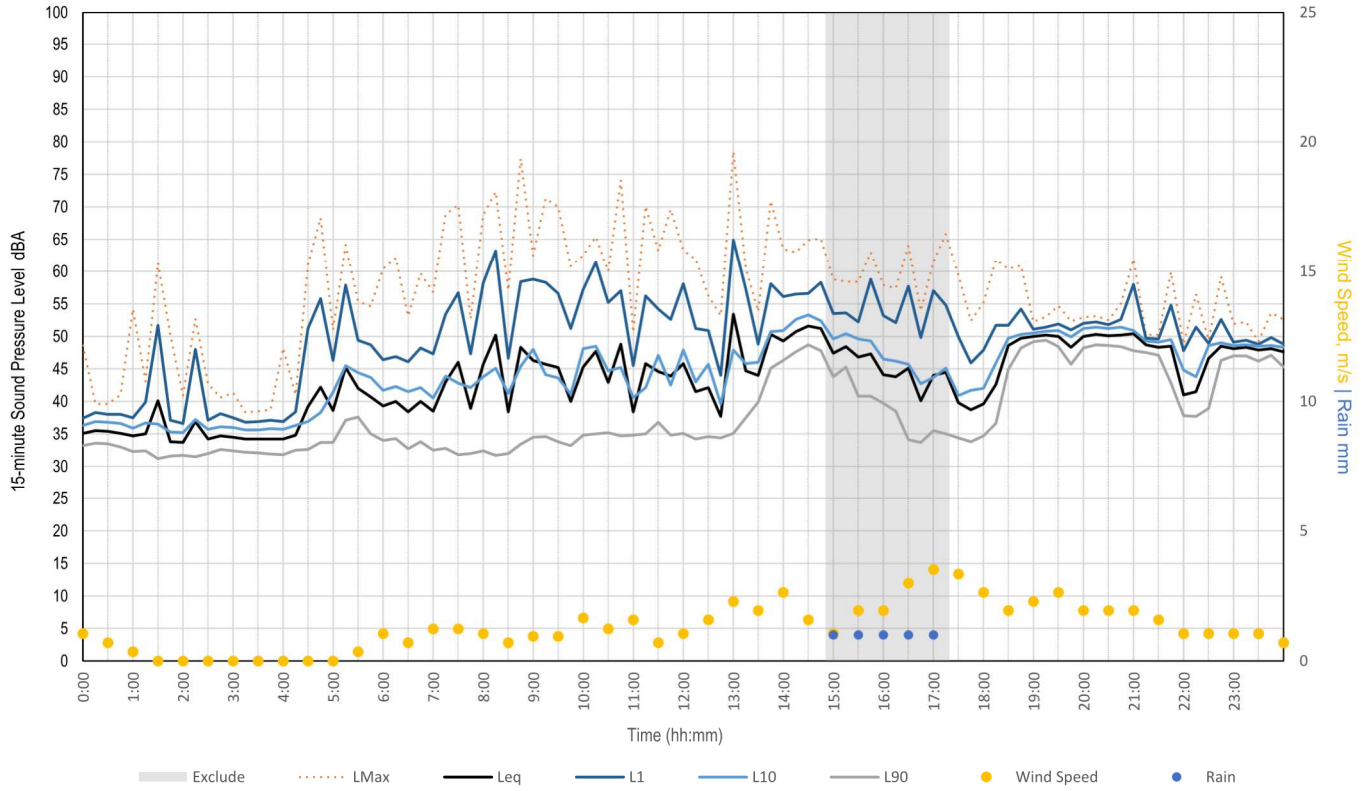
Thursday, 06 October 2022



Noise Logger Results

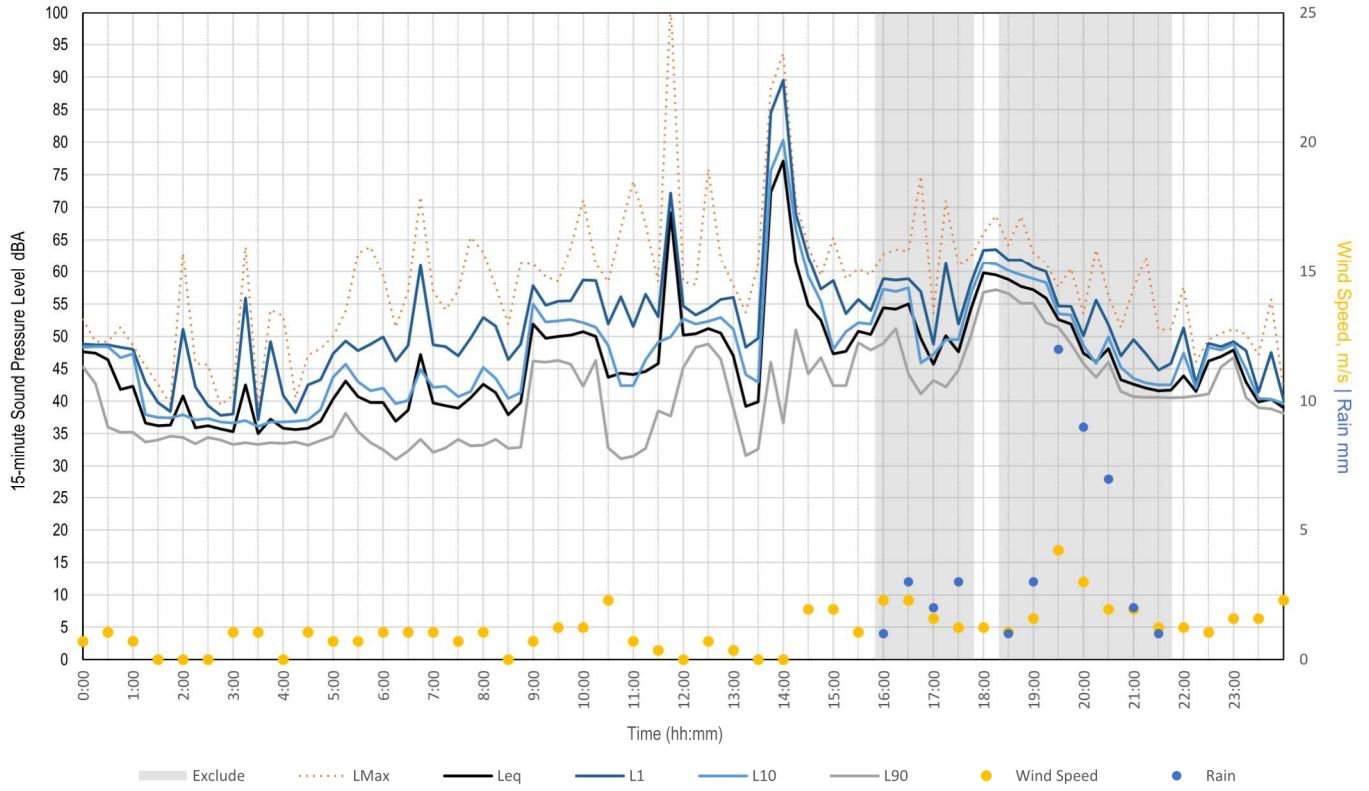
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Friday, 07 October 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

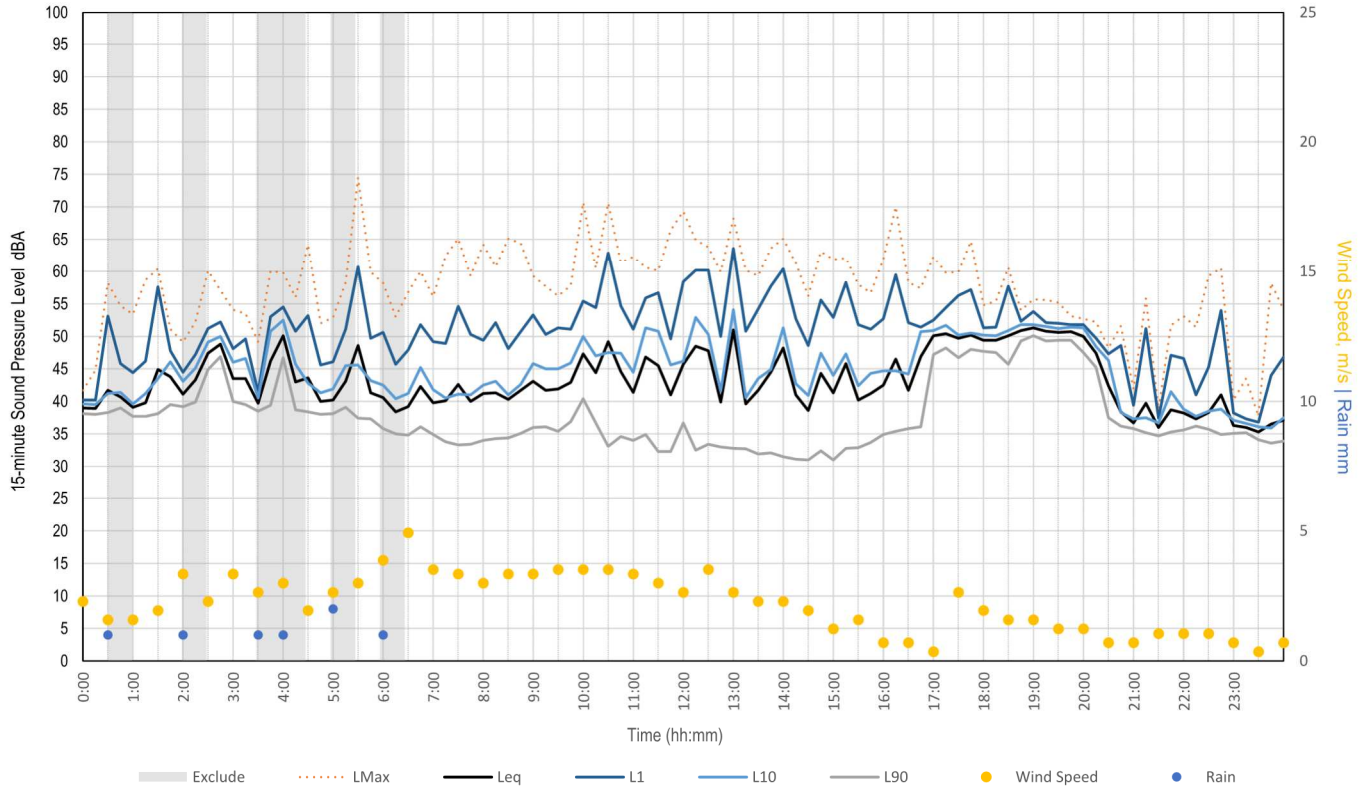
Saturday, 08 October 2022



Noise Logger Results

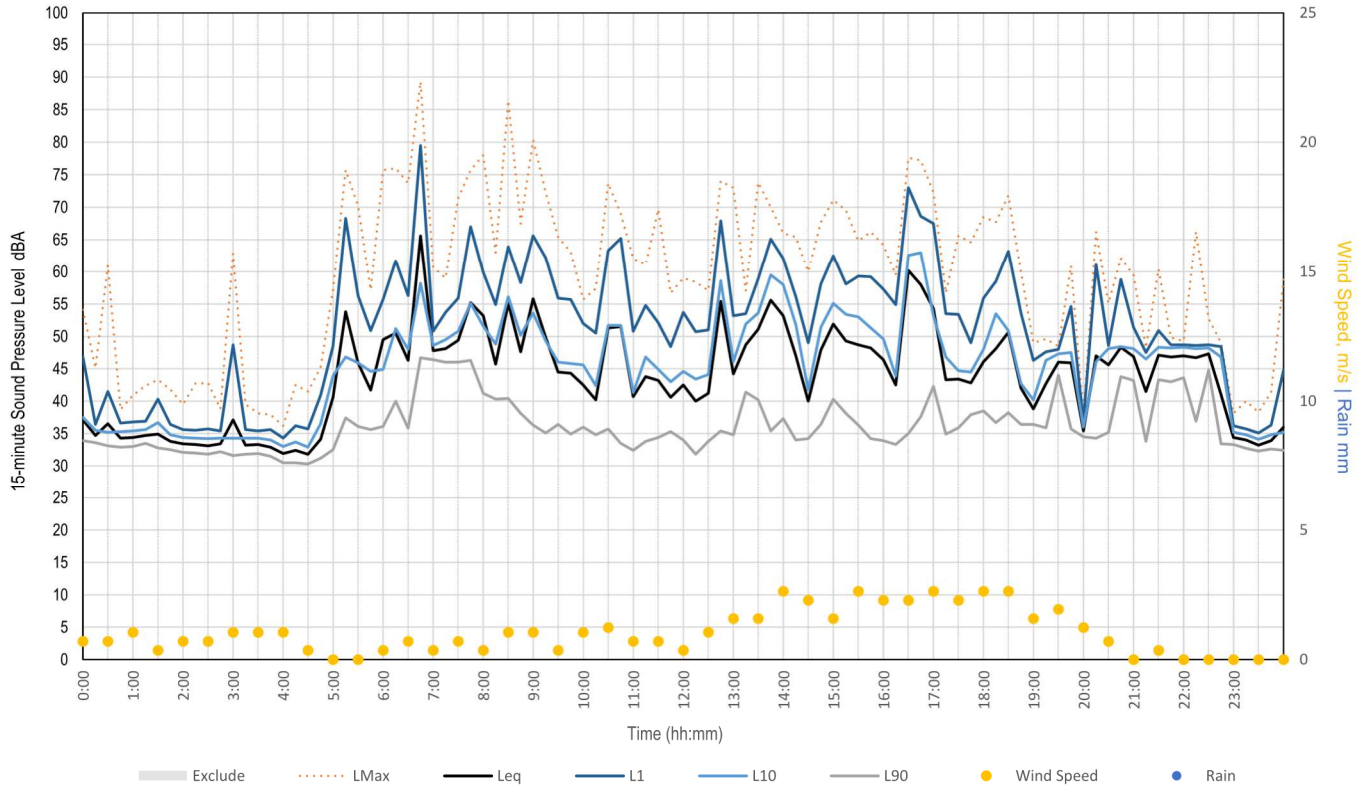
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Sunday, 09 October 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

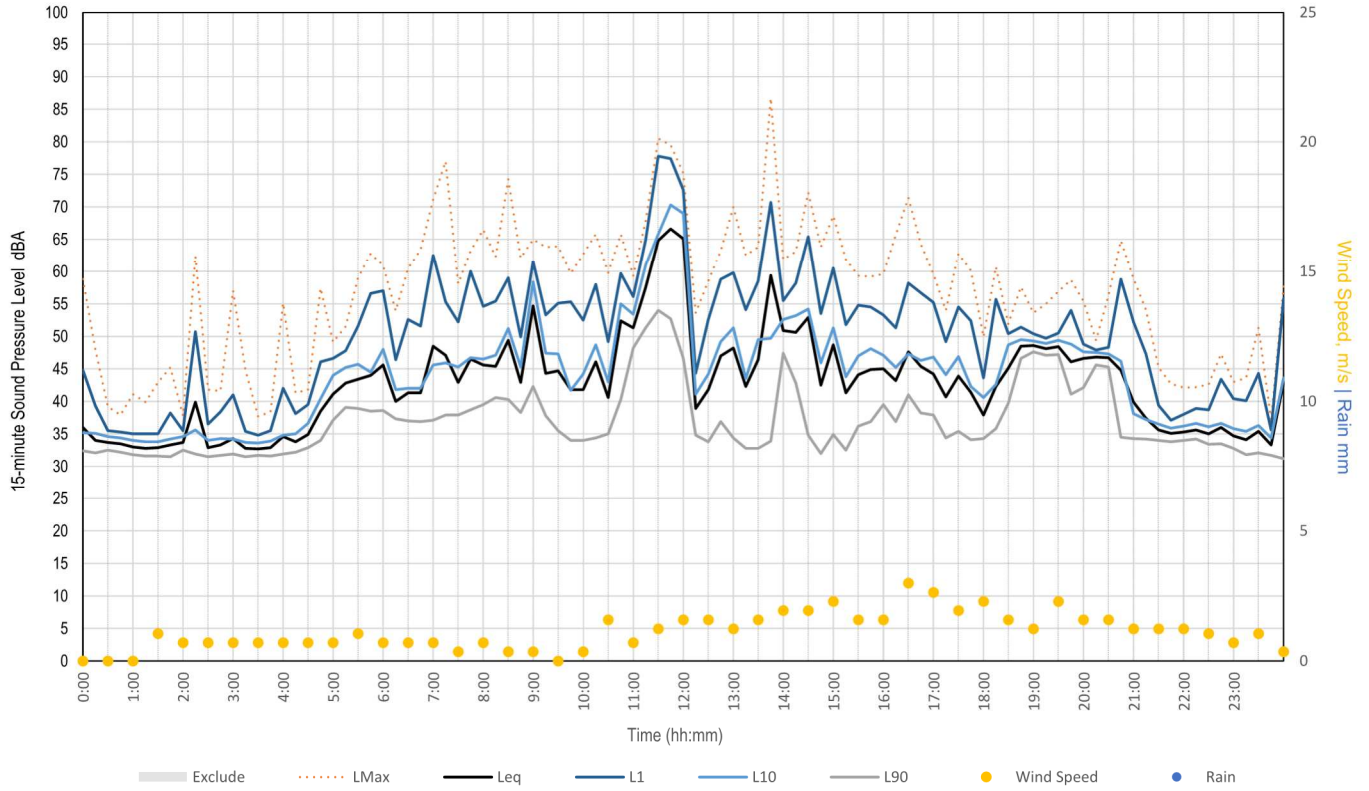
Monday, 10 October 2022



Noise Logger Results

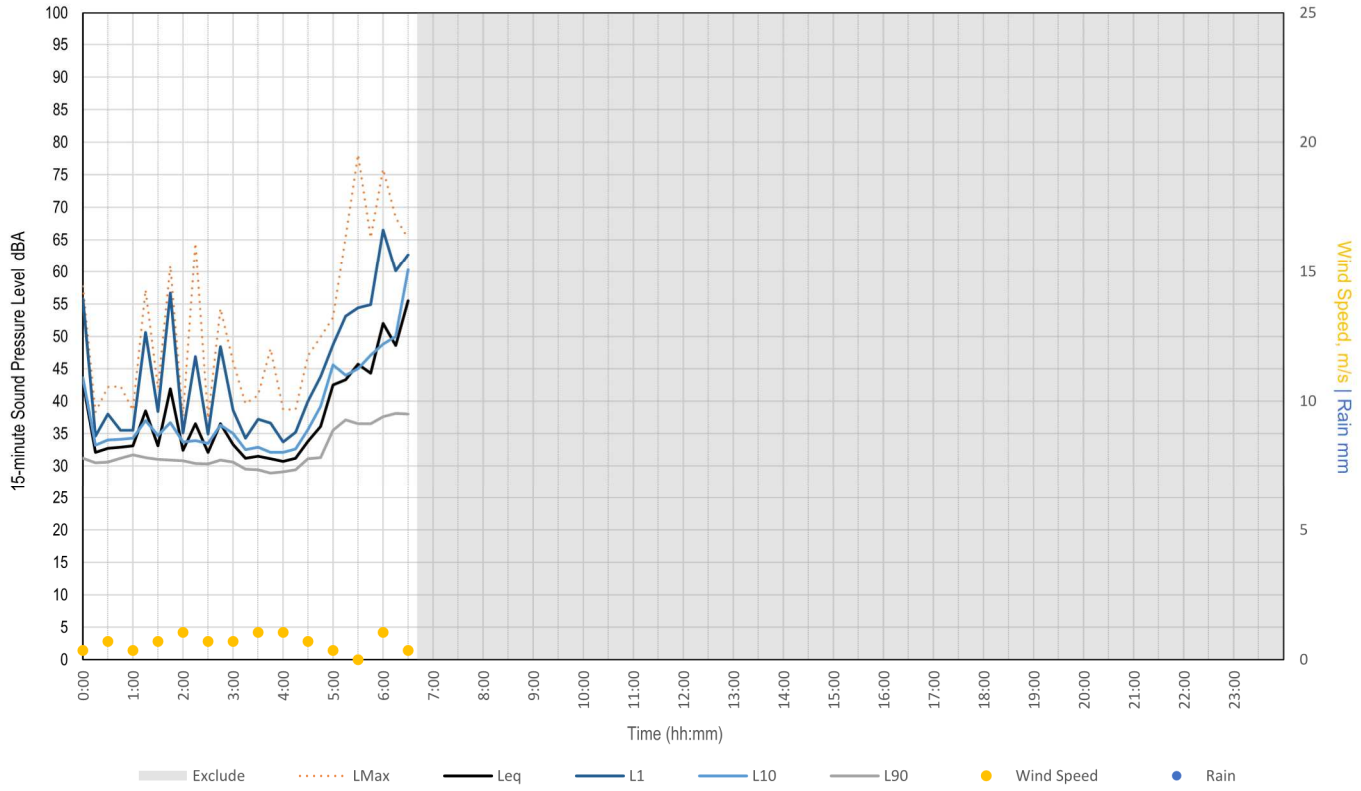
Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Tuesday, 11 October 2022



Measured Noise Levels - M01 South West Departure (Wallacia) - 620 Bents Basin Road

Wednesday, 12 October 2022



Background Noise Monitoring

Location	M02 North East Departure - 141 Aldington Road (Kemps Creek)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878238
Calibration	**Pre:**	94.0 dBA	**Post:**	94.3 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	93.7 dBA	**Post:**	93.6 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Wednesday, 12 Oct 2022
No. of days	30
No. of nights	29

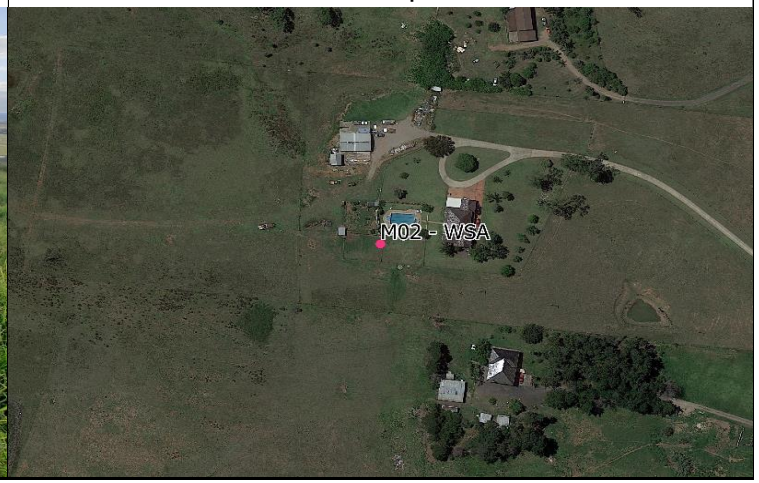
Weather	
Station	BoM
Station Info	Horsley Park Equestrian
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed at fence line of property backing onto rural property.

Located ≥ 3 metres away from any reflective structures other than the ground (e.g. house facade). Fence will not have a notable reflective effect due to it being a wire fence with large gaps.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	28/09/2022	1:41:30 PM	1:56:30 PM	68	46	47	39	
2	Day	28/09/2022	1:56:30 PM	2:11:30 PM	66	48	51	40	
3	Day	28/09/2022	2:11:30 PM	2:26:30 PM	81	48	47	39	
4	Day	28/09/2022	2:26:30 PM	2:41:30 PM	67	46	48	40	
5	Evening	13/10/2022	7:21:52 PM	7:36:52 PM	60	47	49	40	
6	Evening	20/09/2022	6:30:00 PM	6:45:00 PM	57	45	48	37	*
7	Evening	20/09/2022	7:15:00 PM	7:30:00 PM	57	42	43	37	*
8	Evening	20/09/2022	8:00:00 PM	8:15:00 PM	46	37	38	34	*
9	Night	19/09/2022	12:15:00 AM	12:30:00 AM	56	39	40	34	*
10	Night	19/09/2022	2:15:00 AM	2:30:00 AM	47	37	39	34	*
11	Night	19/09/2022	4:30:00 AM	4:45:00 AM	54	40	43	37	*
12	Night	19/09/2022	6:30:00 AM	6:45:00 AM	63	49	50	46	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent flow of traffic on Aldington Road. Intermittent birds in nearby trees. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in range of 42 to 52 dBA.
Background noise	Traffic at distance.
Evening	
Ambient noise	Intermittent bird noise in nearby trees. Noise from occasional strong wind gusts. Occasional vehicle passbys on local street. Movement in vegetation induced by wind (e.g. grass rustling). Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 48 to 57 dBA.
Background noise	Constant insect noise. Traffic at distance.
Night	
Ambient noise	Constant bird chirping in nearby trees, varying in intensity. Occasional vehicles passing by on nearby street. Several aircraft flying overhead with an approx. duration of 30 sec to 2 min with maximum sound levels in the range of 42 to 70 dBA.
Background noise	Constant insect noise. Constant bird noise from nearby trees. Traffic at distance.

Site Details	M02 North East Departure - 141 Aldington Road (Kemps Creek)
Start Date	Tue 13 September 2022
End Date	Wed 12 October 2022

Unattended noise logging with attended on-site monitoring

Summary	Average (dBA)
$L_{eq, Day}$ dBA	63
$L_{eq, Evening}$ dBA	47
$L_{eq, Night}$ dBA	44
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	37
RBL, $_{Night}$ dBA	36

Daily Summary

Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA	49	48	48	48	50	46	49	65
$L_{eq, Evening}$ dBA	42	41	40	43	42	39	41	42
$L_{eq, Night}$ dBA	45	43	42	40	40	43	47	43
ABL, $_{Day}$ dBA	41	35	35	38	38	36	38	37
ABL, $_{Evening}$ dBA	36	34	34	36	36	33	33	34
ABL, $_{Night}$ dBA	35	35	34	36	33	32	33	36

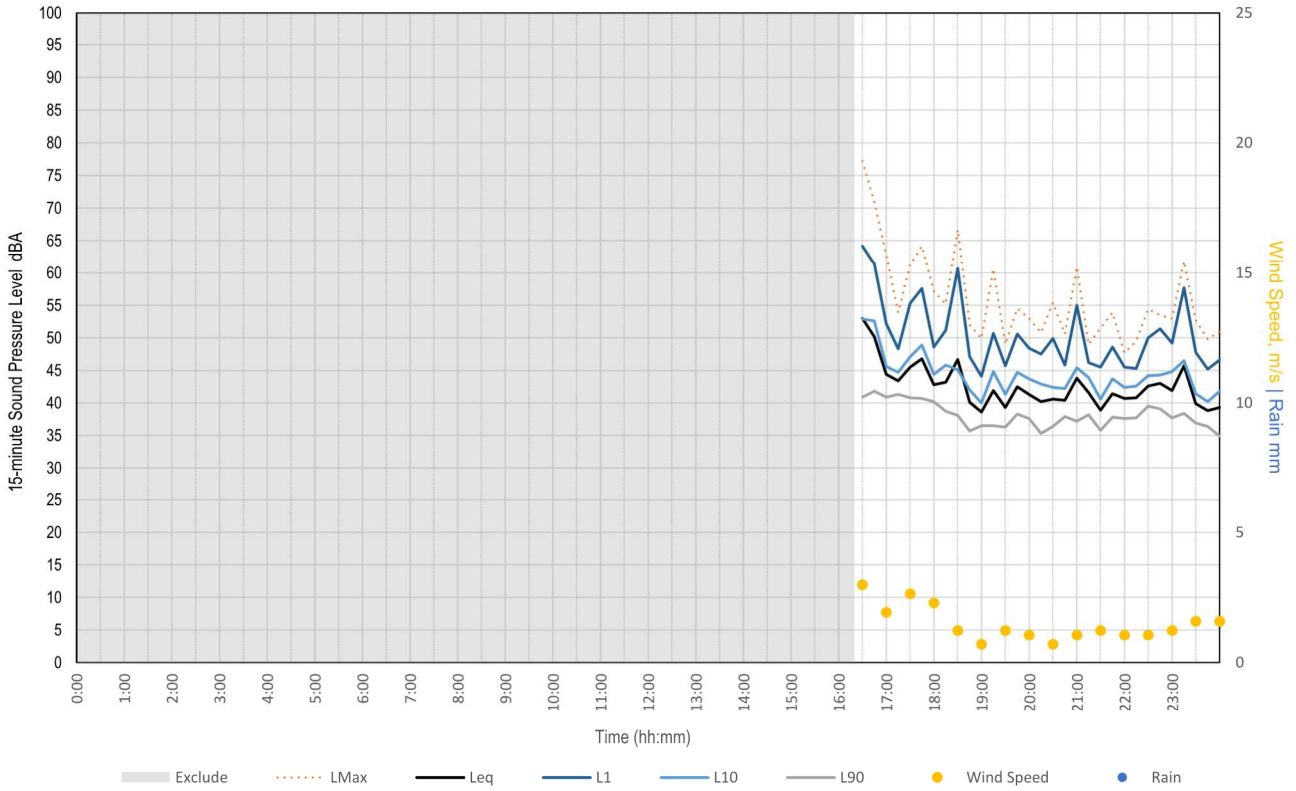
Date	21/09	22/09	23/09	24/09	25/09	26/09	27/09	28/09
$L_{eq, Day}$ dBA	46	43	46	47	47	47	47	77
$L_{eq, Evening}$ dBA	43	44	44	44	55	41	45	46
$L_{eq, Night}$ dBA	41	41	39	42	45	44	51	47
ABL, $_{Day}$ dBA	36	32	35	36	32	35	35	39
ABL, $_{Evening}$ dBA	35	37	38	42	41	35	37	43
ABL, $_{Night}$ dBA	36	35	31	35	36	36	36	39

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	52	49	46	45	48	64	49	44
$L_{eq, Evening}$ dBA	46	45	43	46	56	46	41	43
$L_{eq, Night}$ dBA	45	43	42	40	46	44	45	42
ABL, $_{Day}$ dBA	46	42	37	33	32	37	39	33
ABL, $_{Evening}$ dBA	43	41	39	36	35	39	38	37
ABL, $_{Night}$ dBA	39	37	36	32	33	35	37	34

Date	07/10	08/10	09/10	10/10	11/10	12/10
$L_{eq, Day}$ dBA	46	47	46	47	48	49
$L_{eq, Evening}$ dBA	42		43	40	41	45
$L_{eq, Night}$ dBA	42	46	44	45	46	39
ABL, $_{Day}$ dBA	35	32	36	37	35	36
ABL, $_{Evening}$ dBA	37		38	34	35	37
ABL, $_{Night}$ dBA	37	41	37	37	36	37

Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

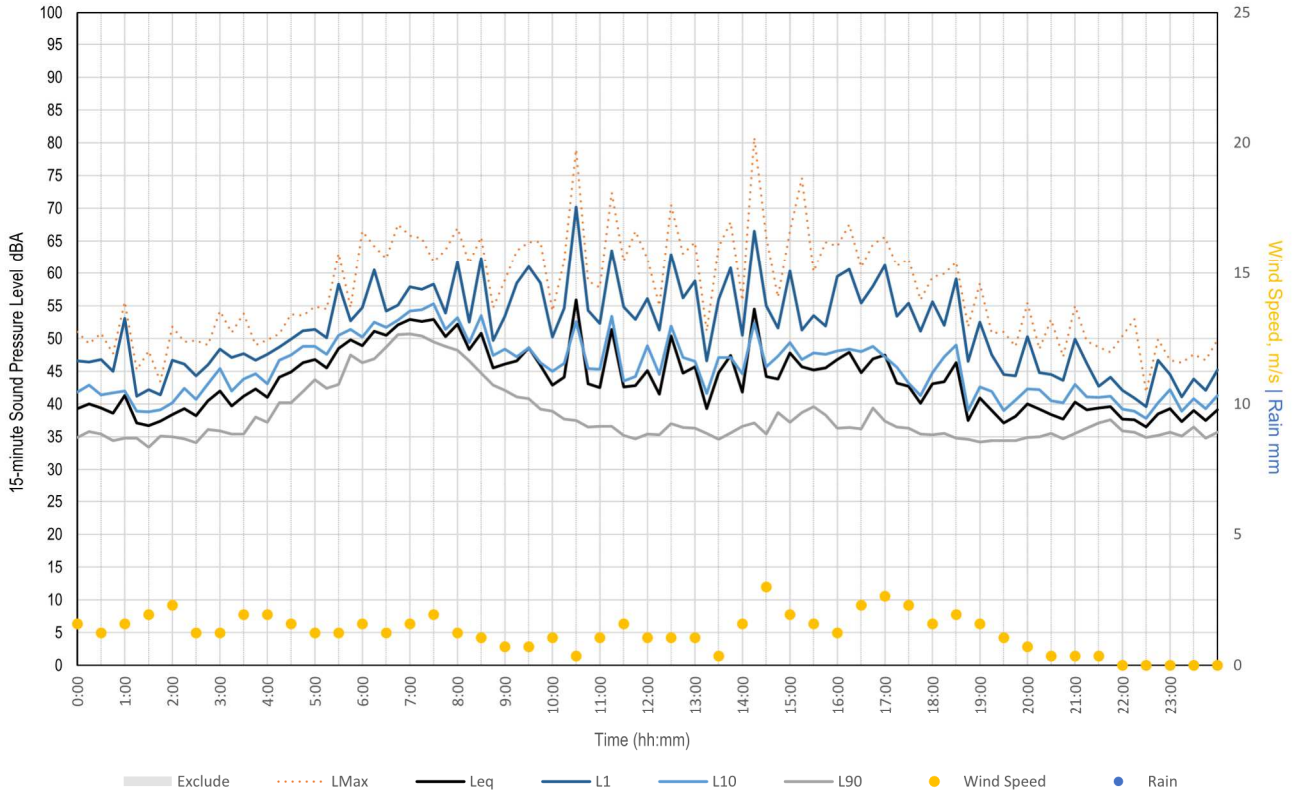
Tuesday, 13 September 2022



Noise Logger Results

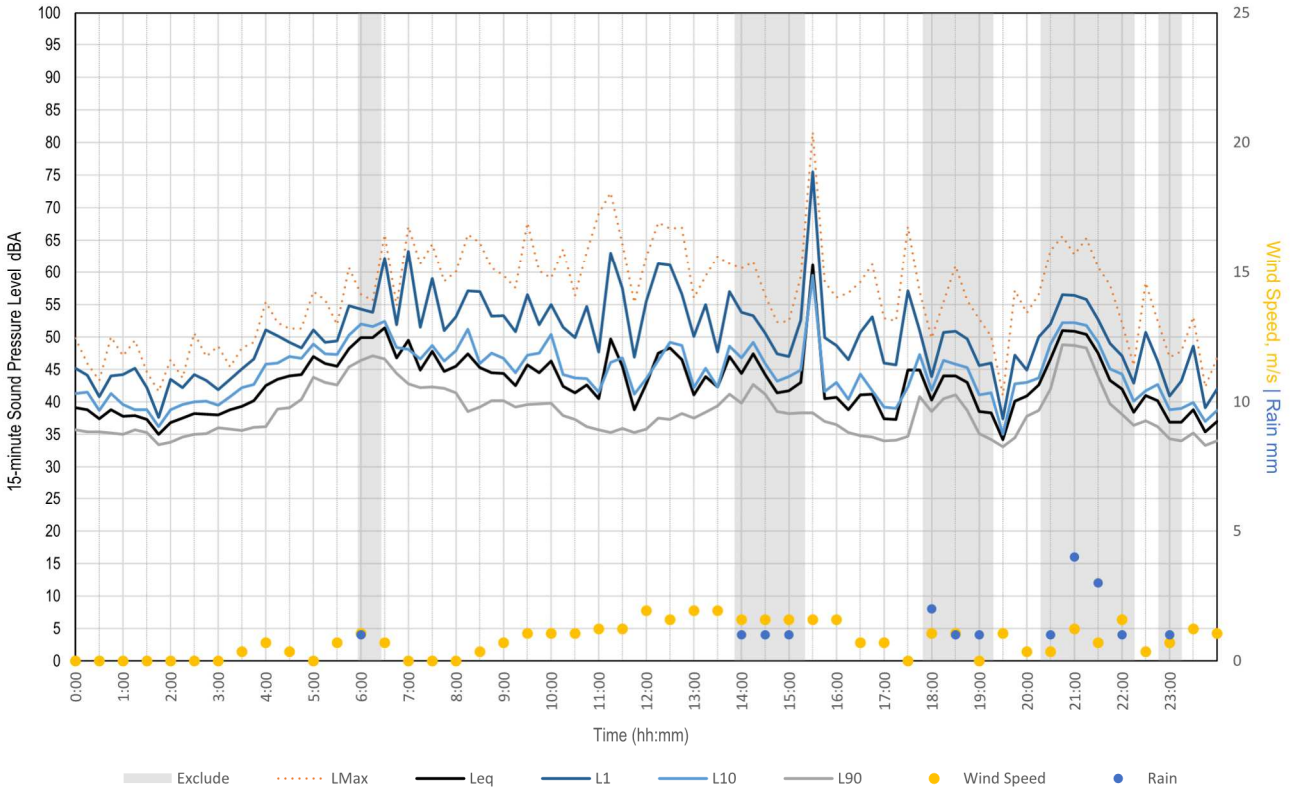
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Wednesday, 14 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

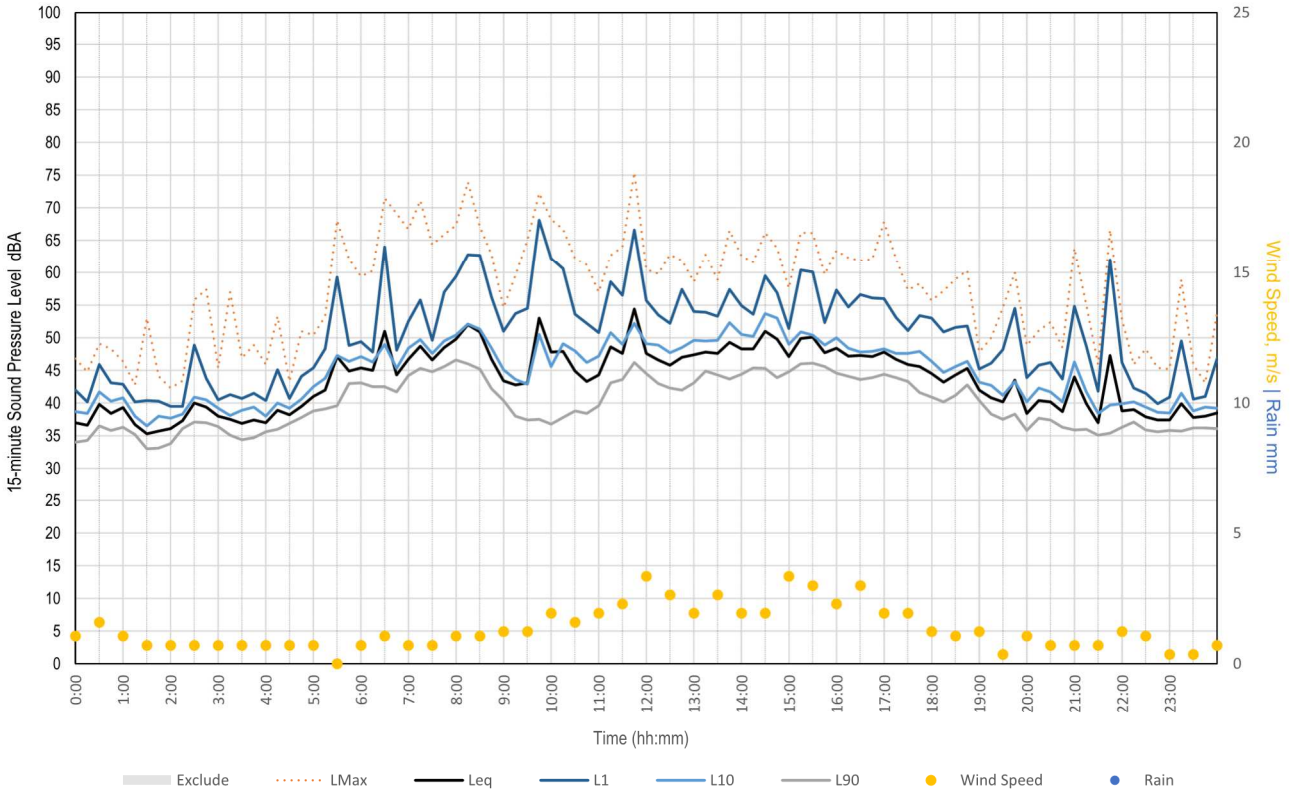
Thursday, 15 September 2022



Noise Logger Results

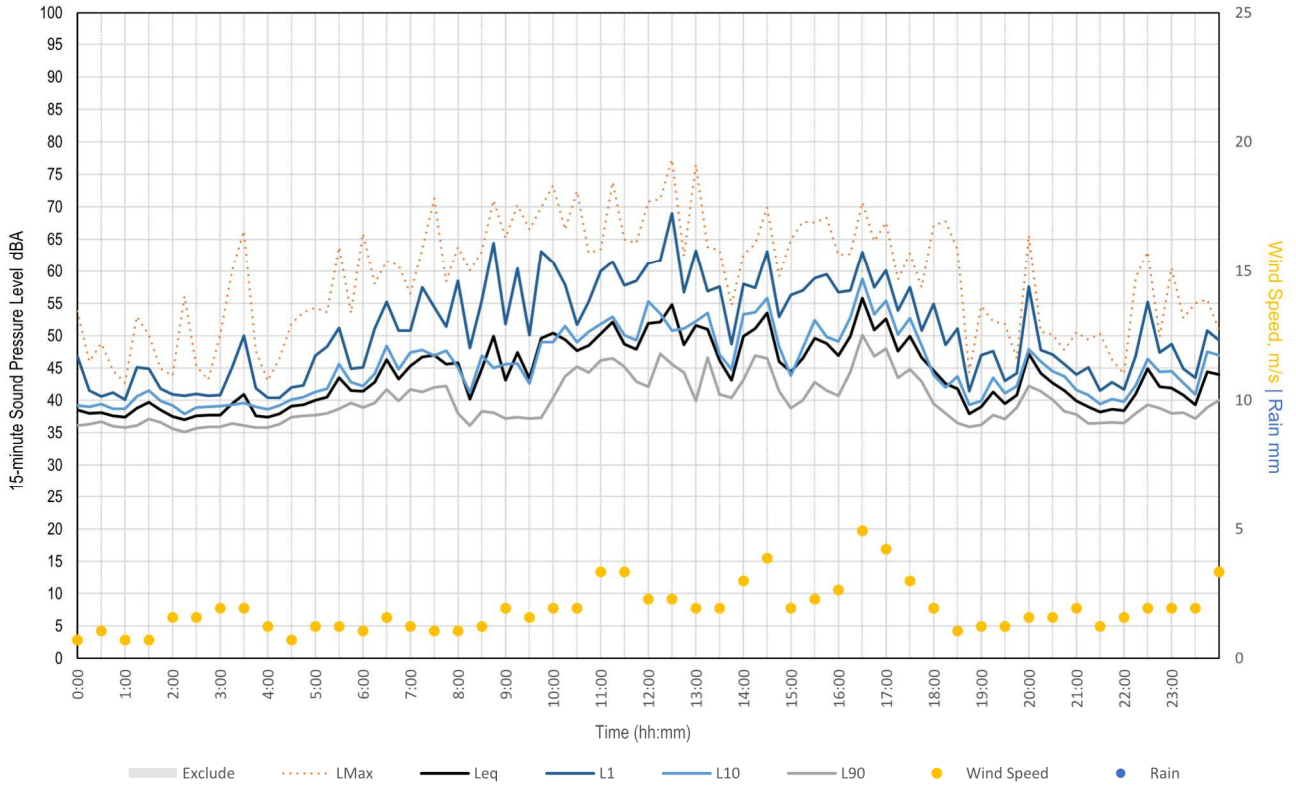
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Friday, 16 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

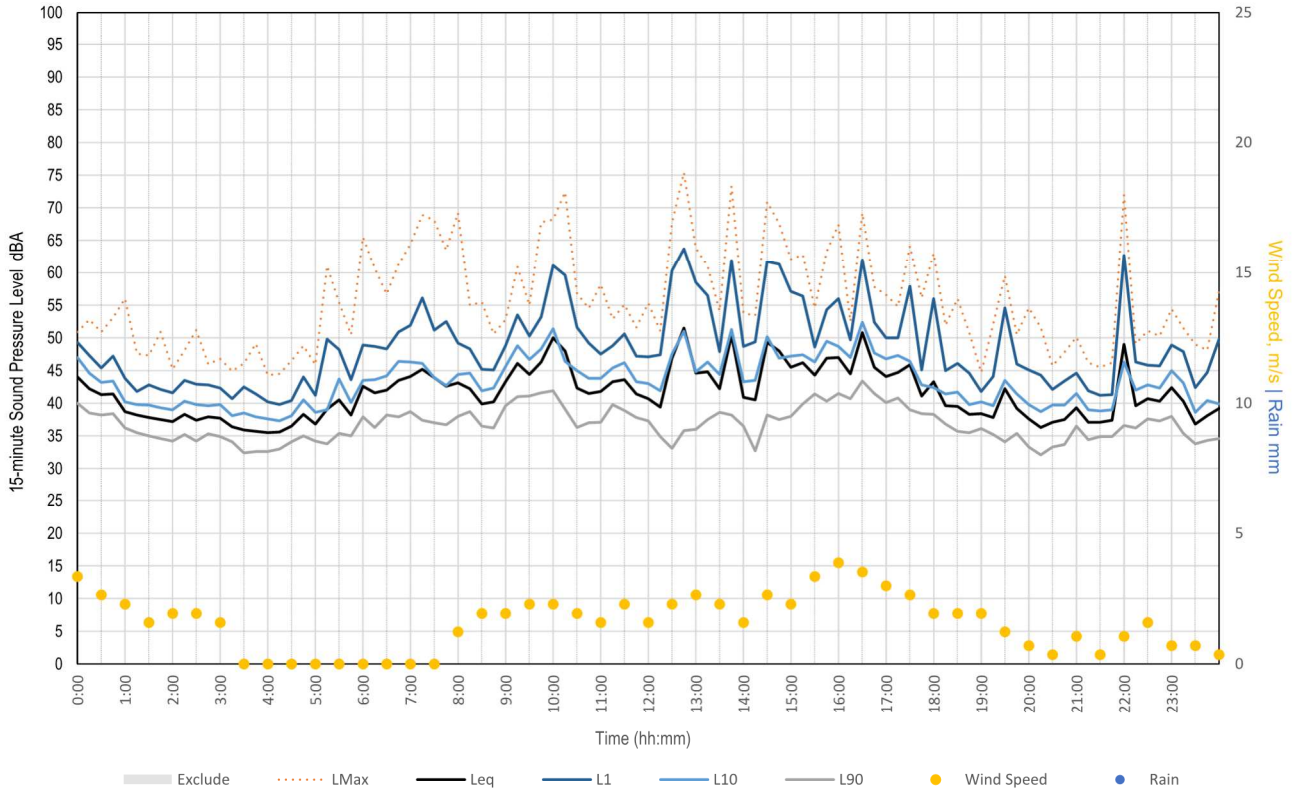
Saturday, 17 September 2022



Noise Logger Results

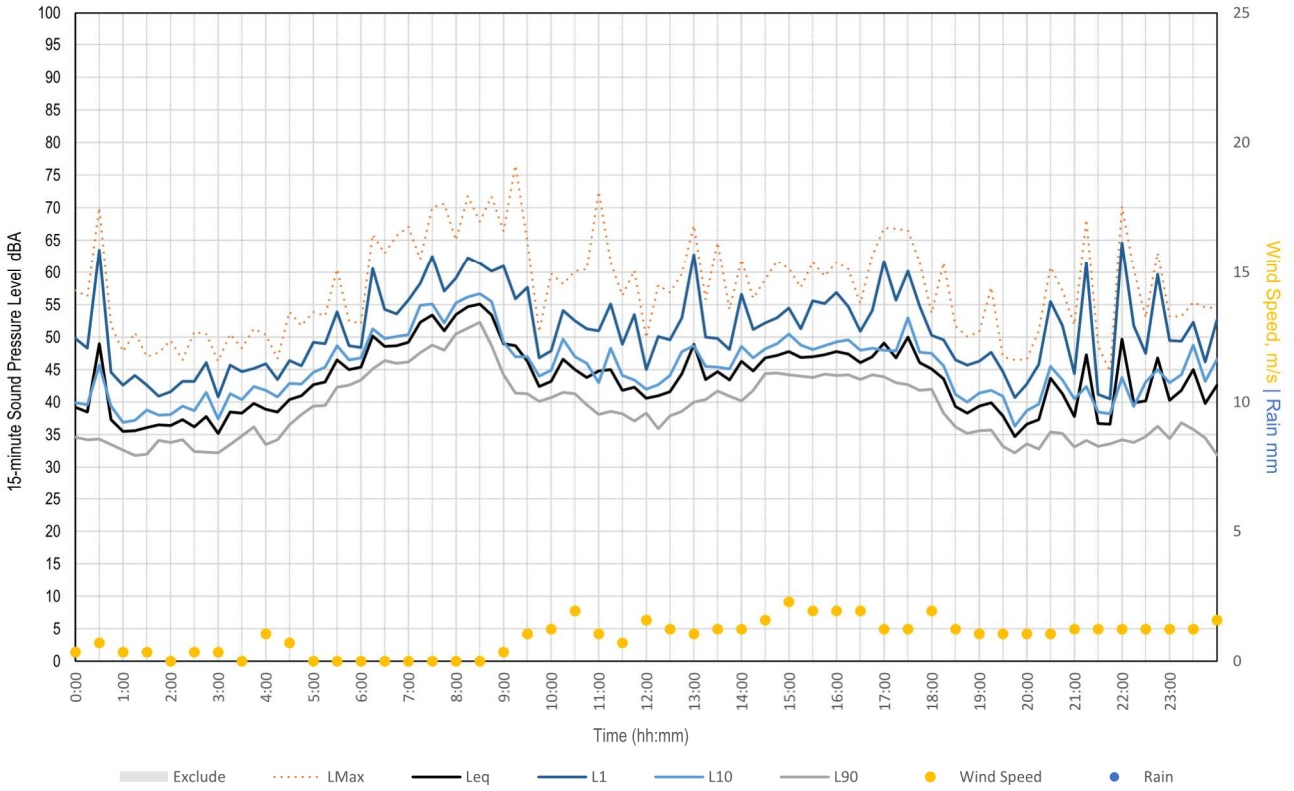
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Sunday, 18 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

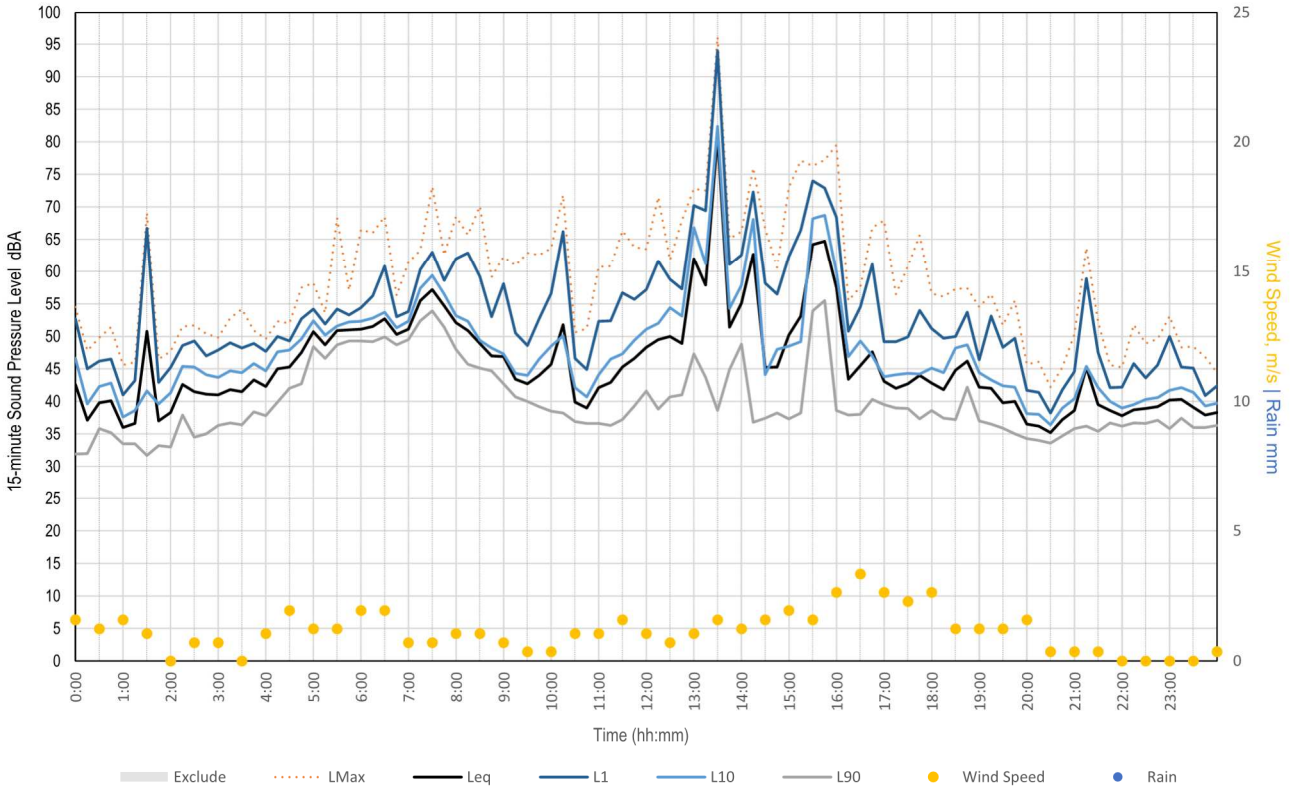
Monday, 19 September 2022



Noise Logger Results

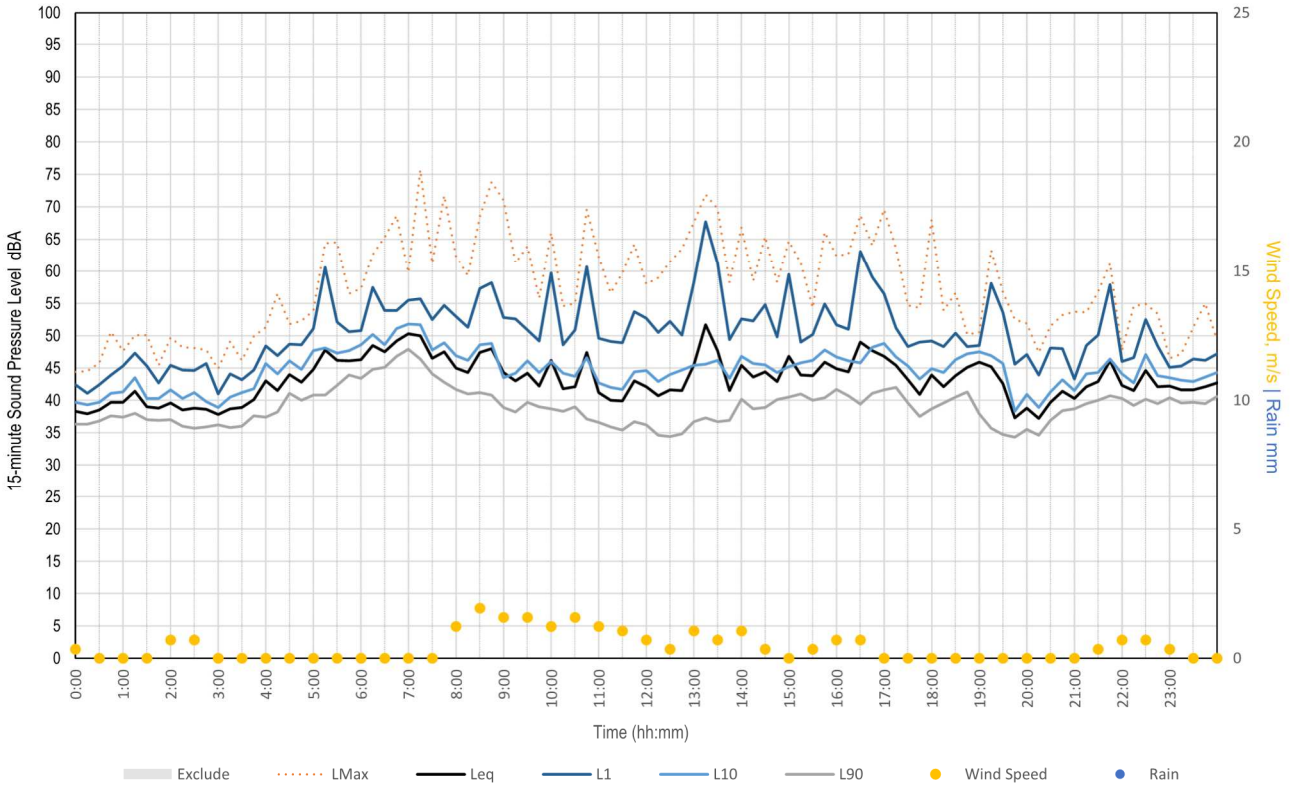
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Tuesday, 20 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

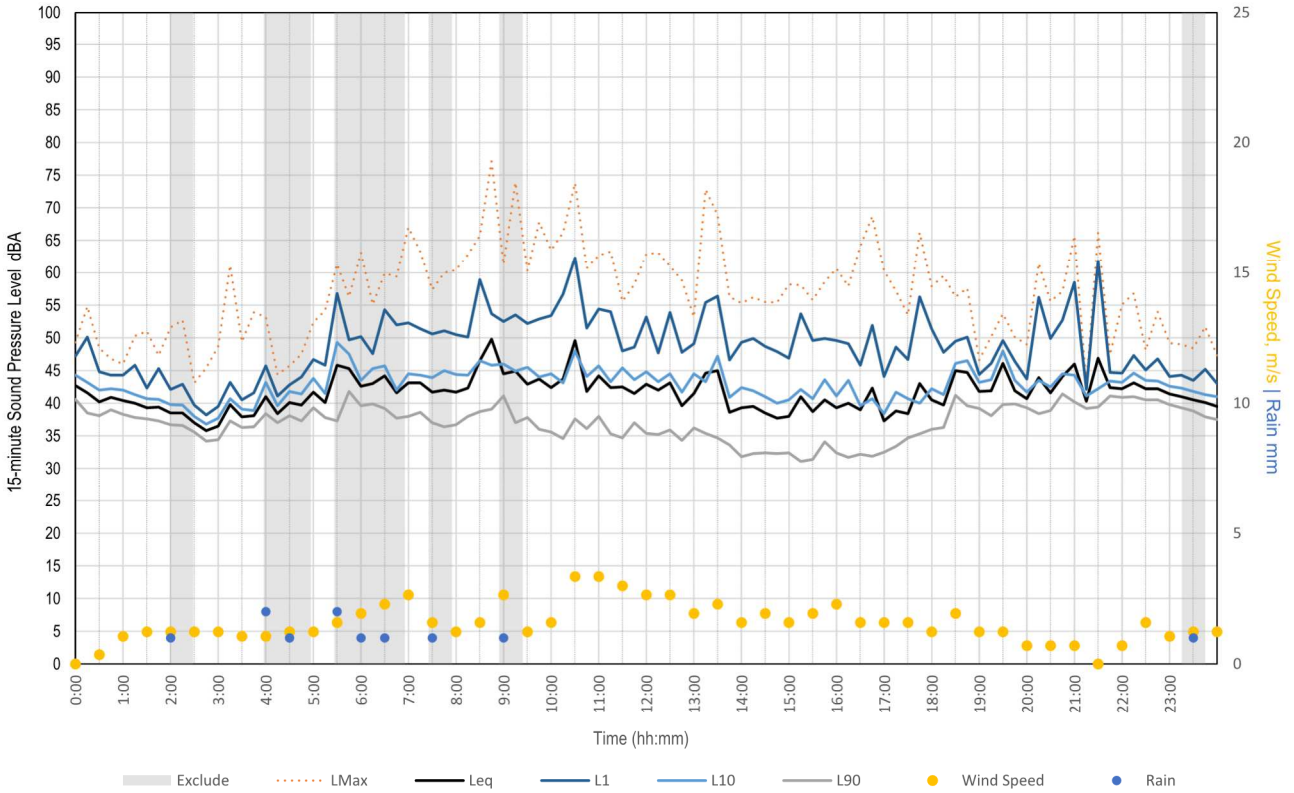
Wednesday, 21 September 2022



Noise Logger Results

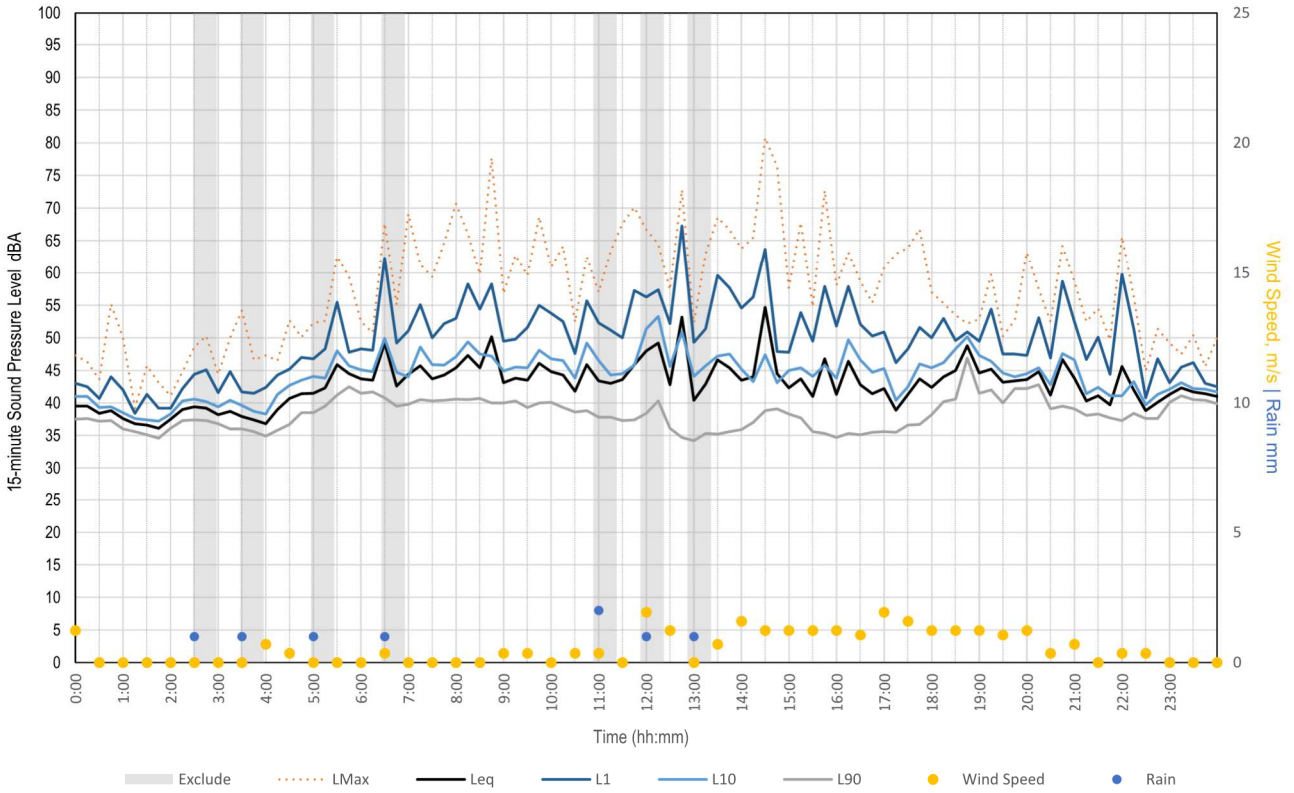
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Thursday, 22 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

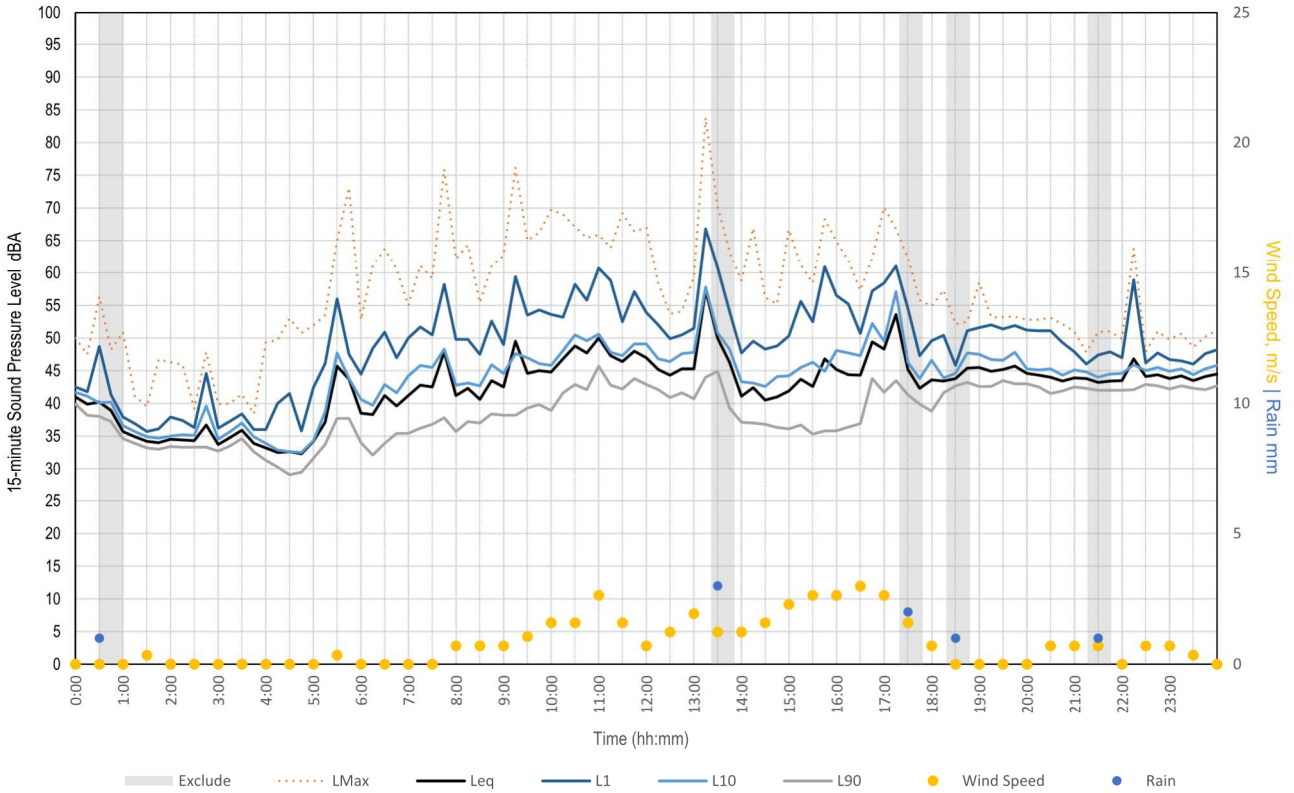
Friday, 23 September 2022



Noise Logger Results

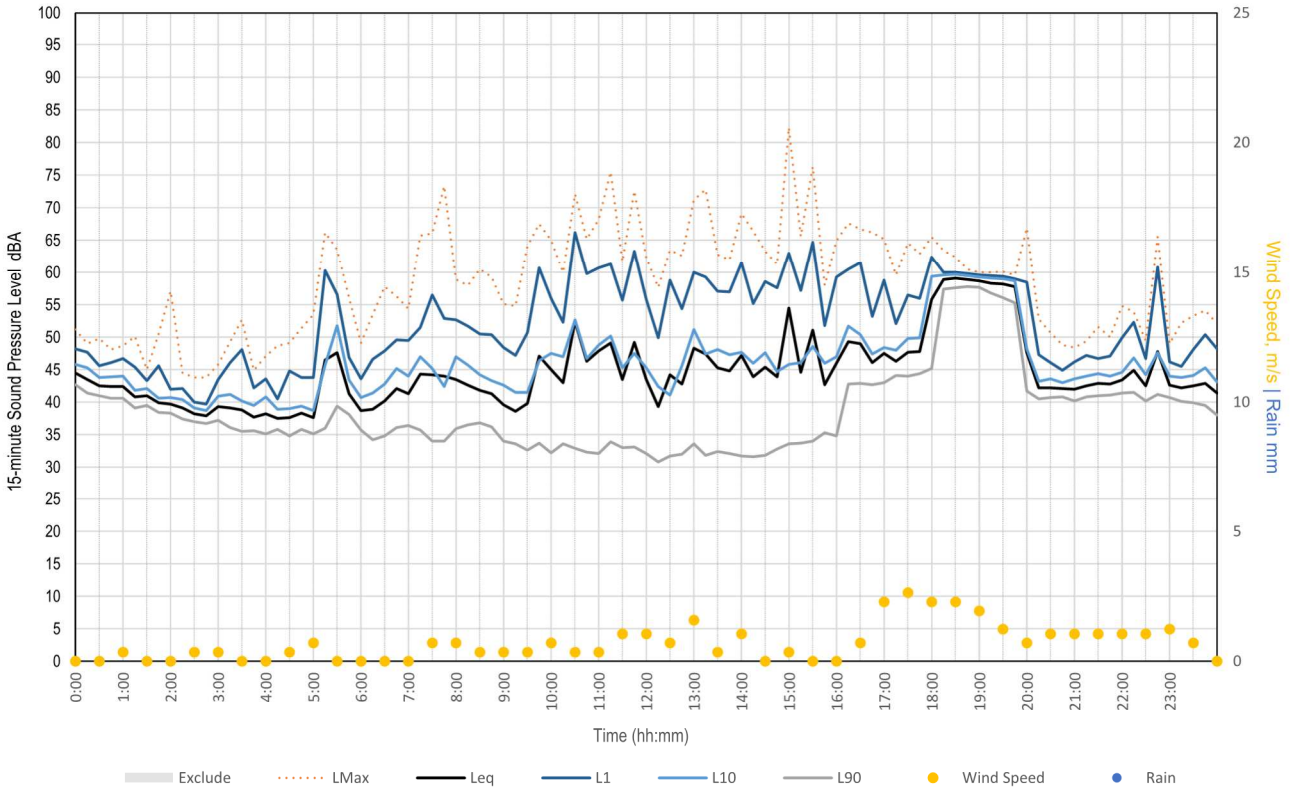
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Saturday, 24 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

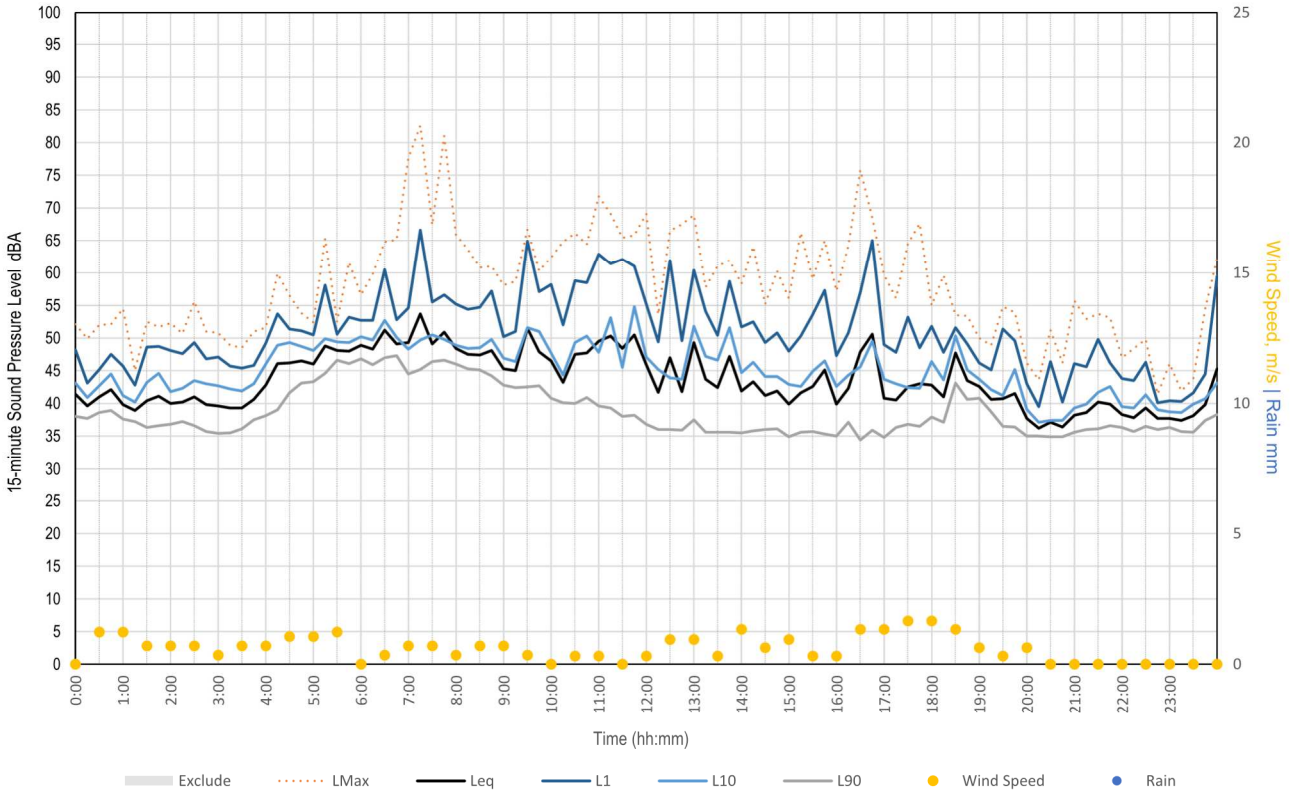
Sunday, 25 September 2022



Noise Logger Results

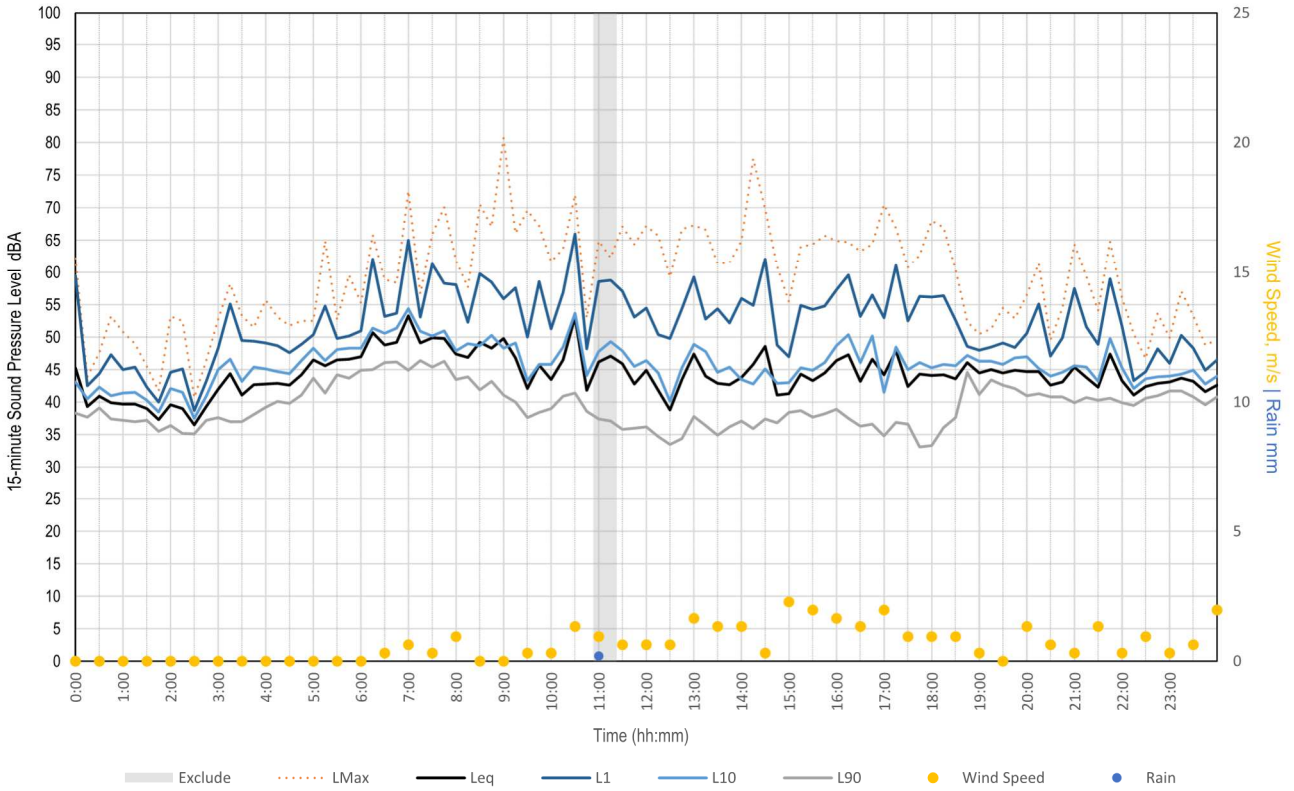
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Monday, 26 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

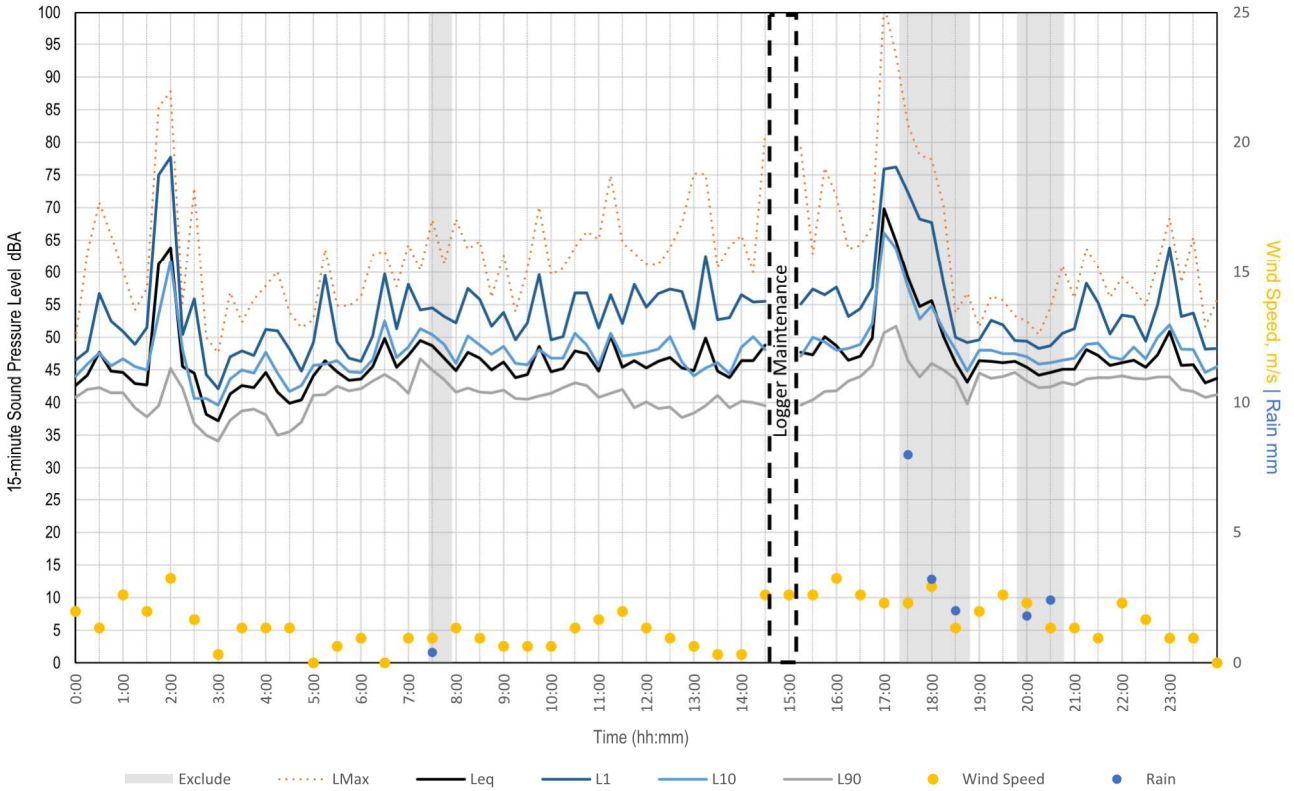
Tuesday, 27 September 2022



Noise Logger Results

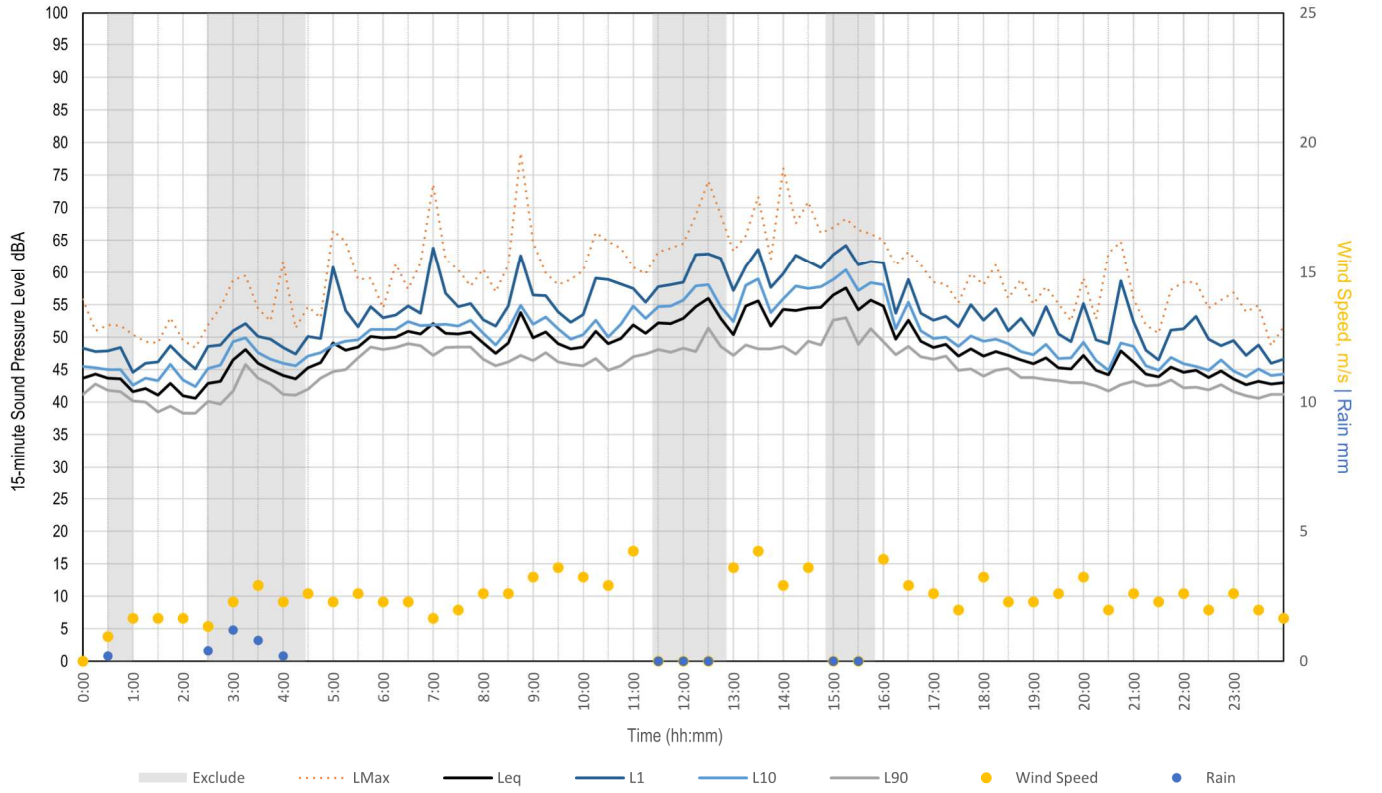
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Wednesday, 28 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

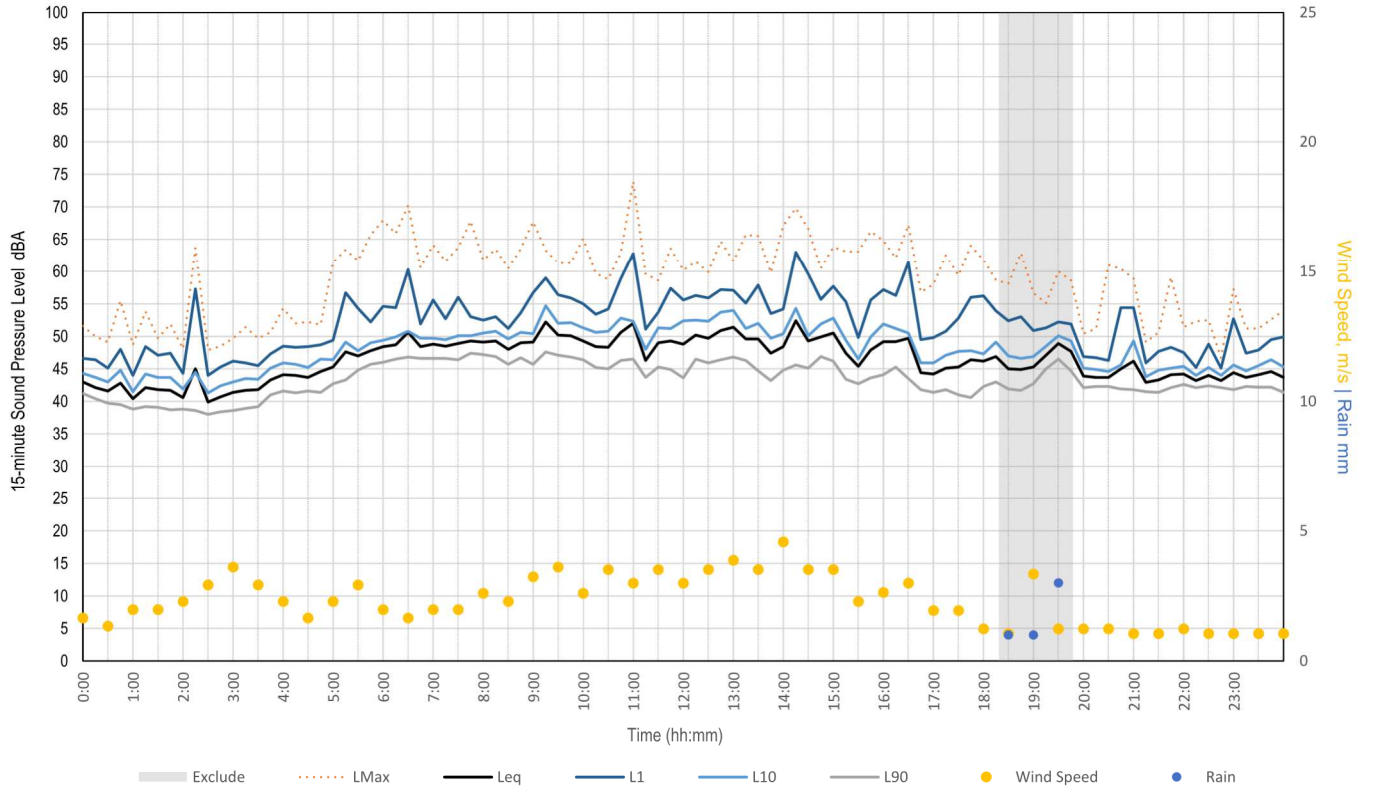
Thursday, 29 September 2022



Noise Logger Results

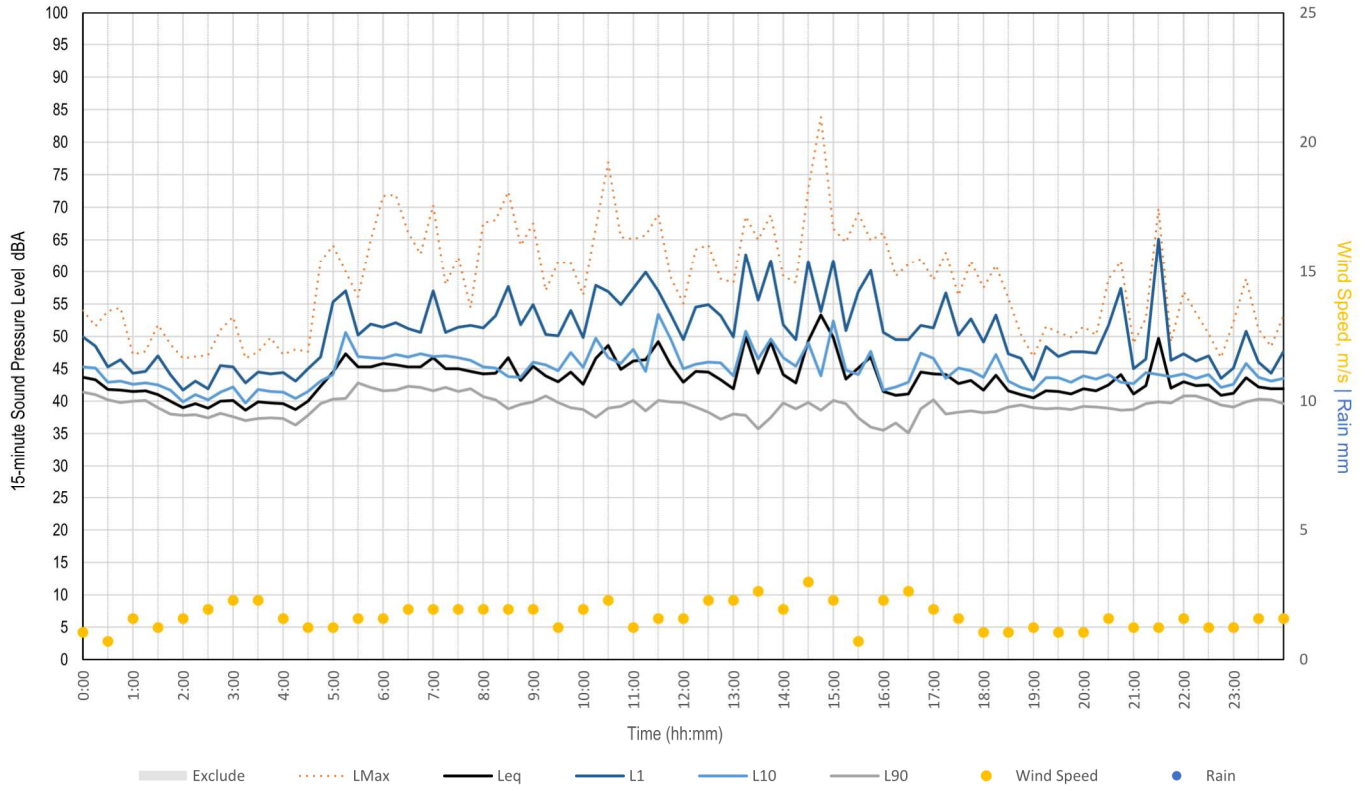
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Friday, 30 September 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

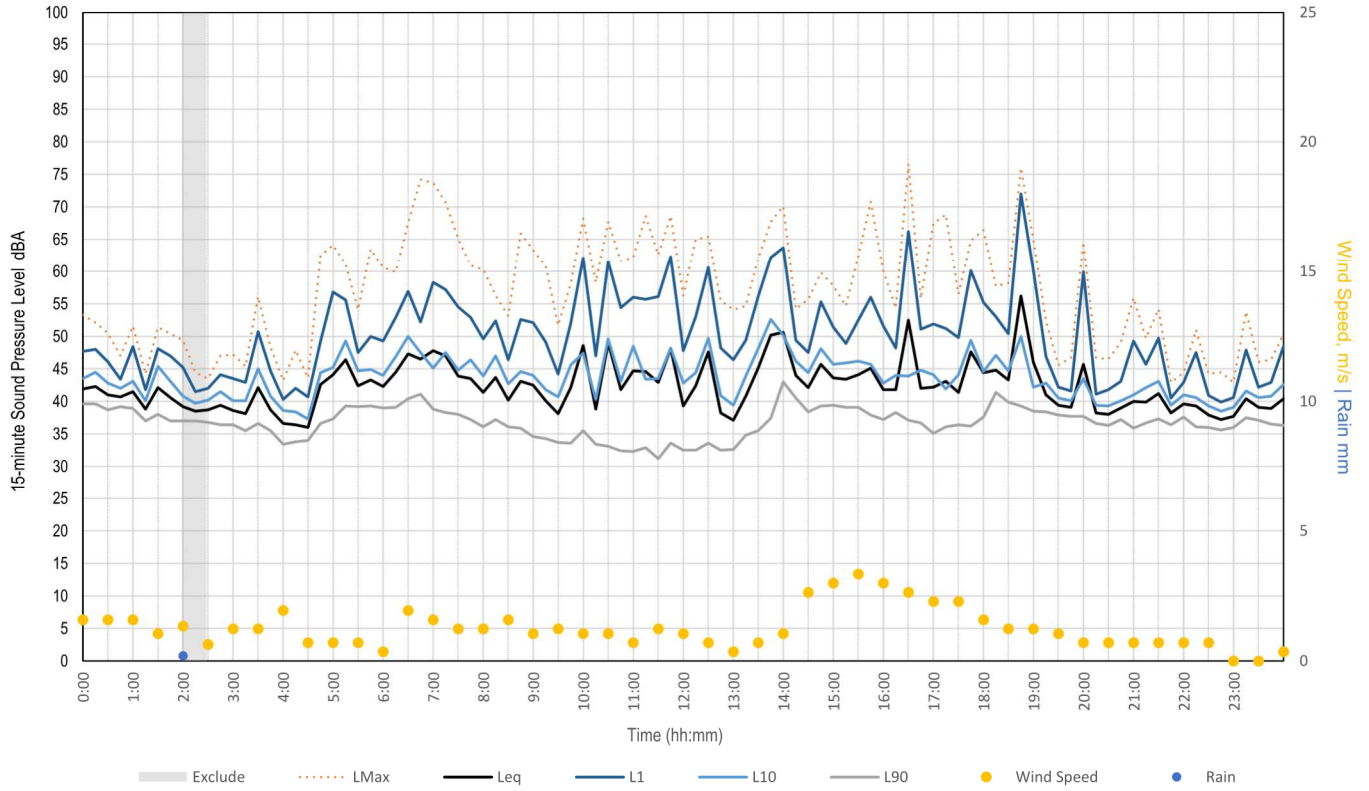
Saturday, 01 October 2022



Noise Logger Results

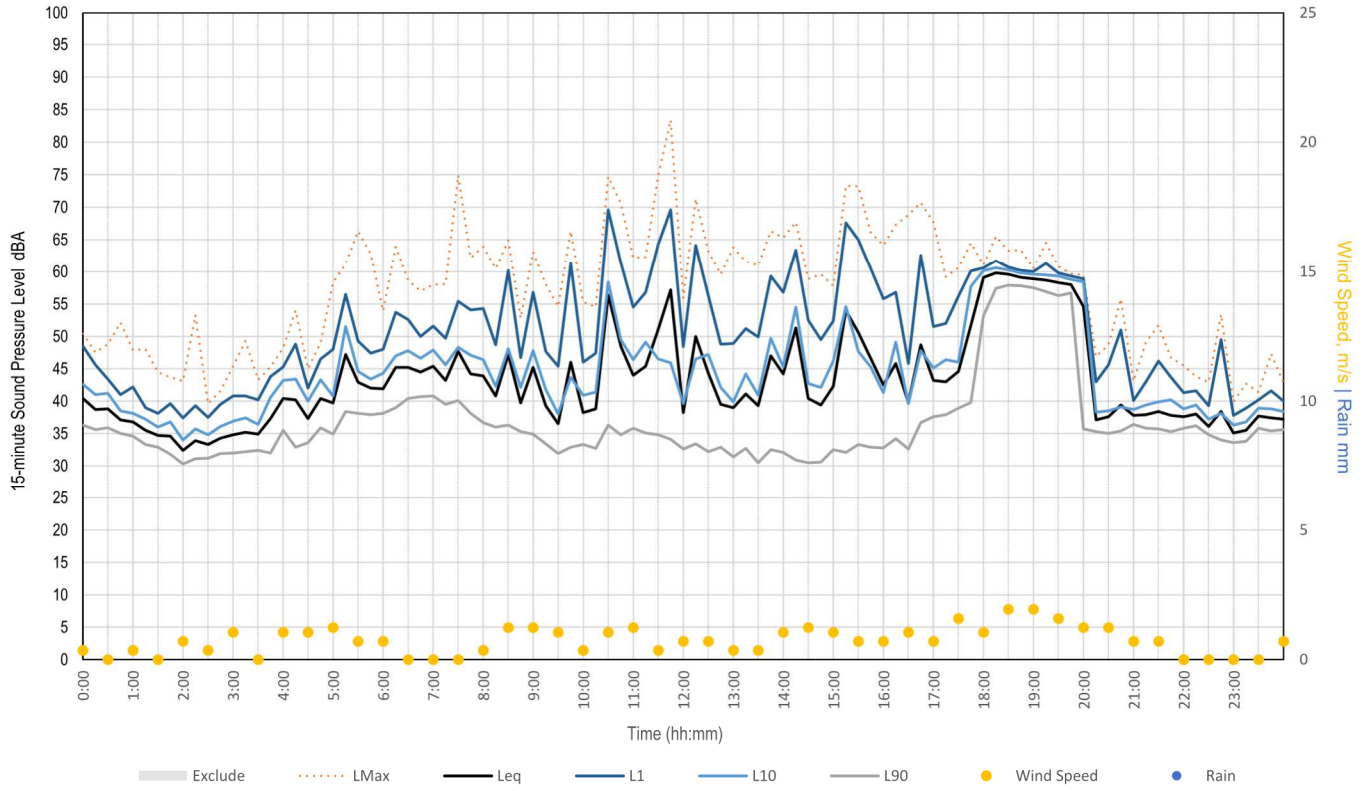
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Sunday, 02 October 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

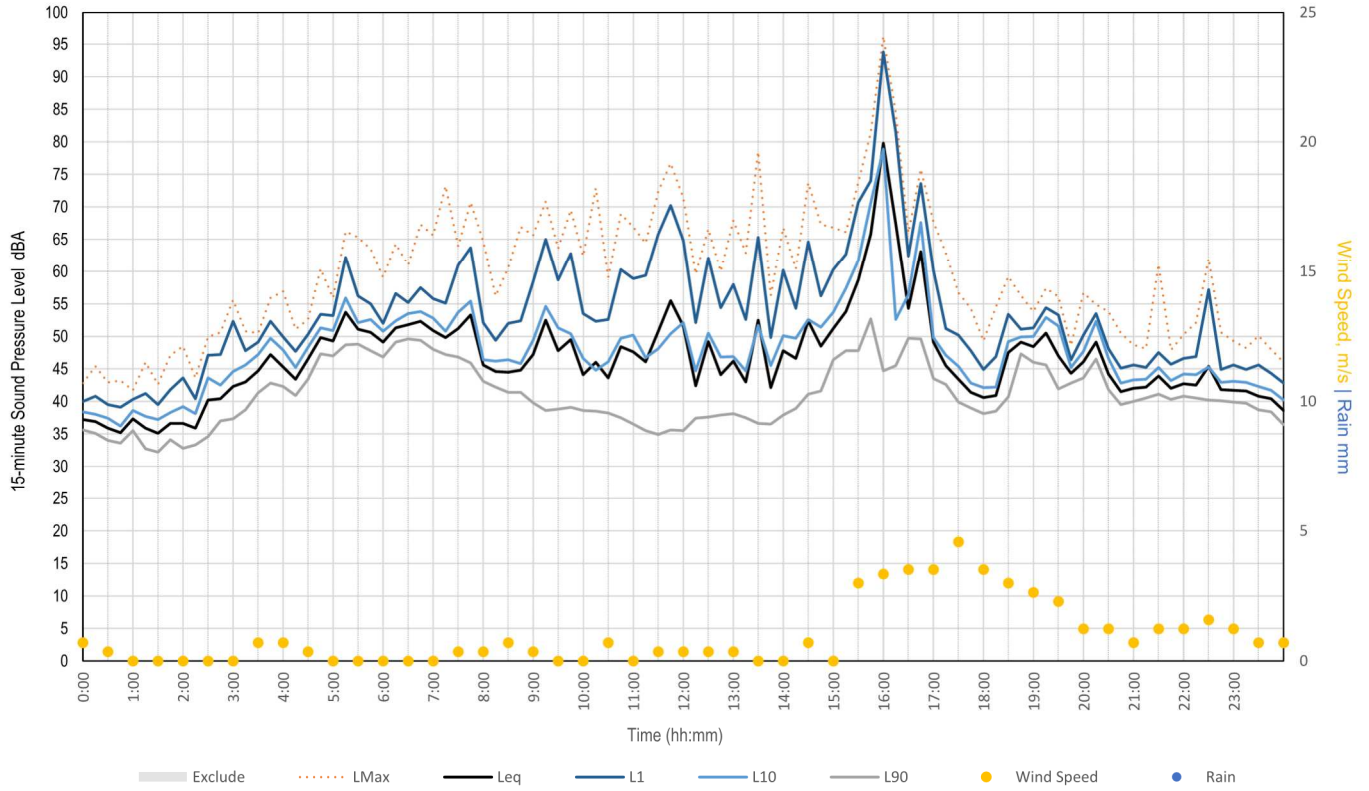
Monday, 03 October 2022



Noise Logger Results

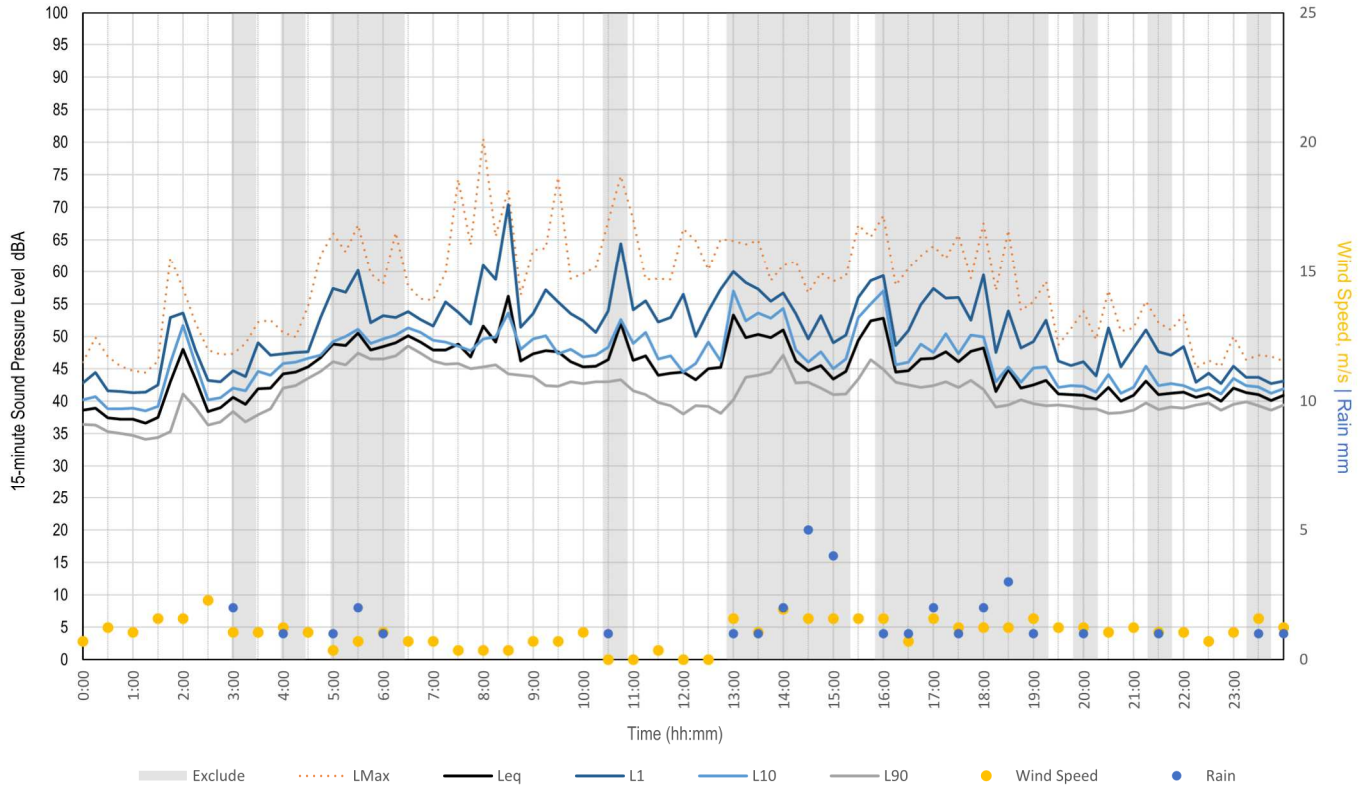
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Tuesday, 04 October 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

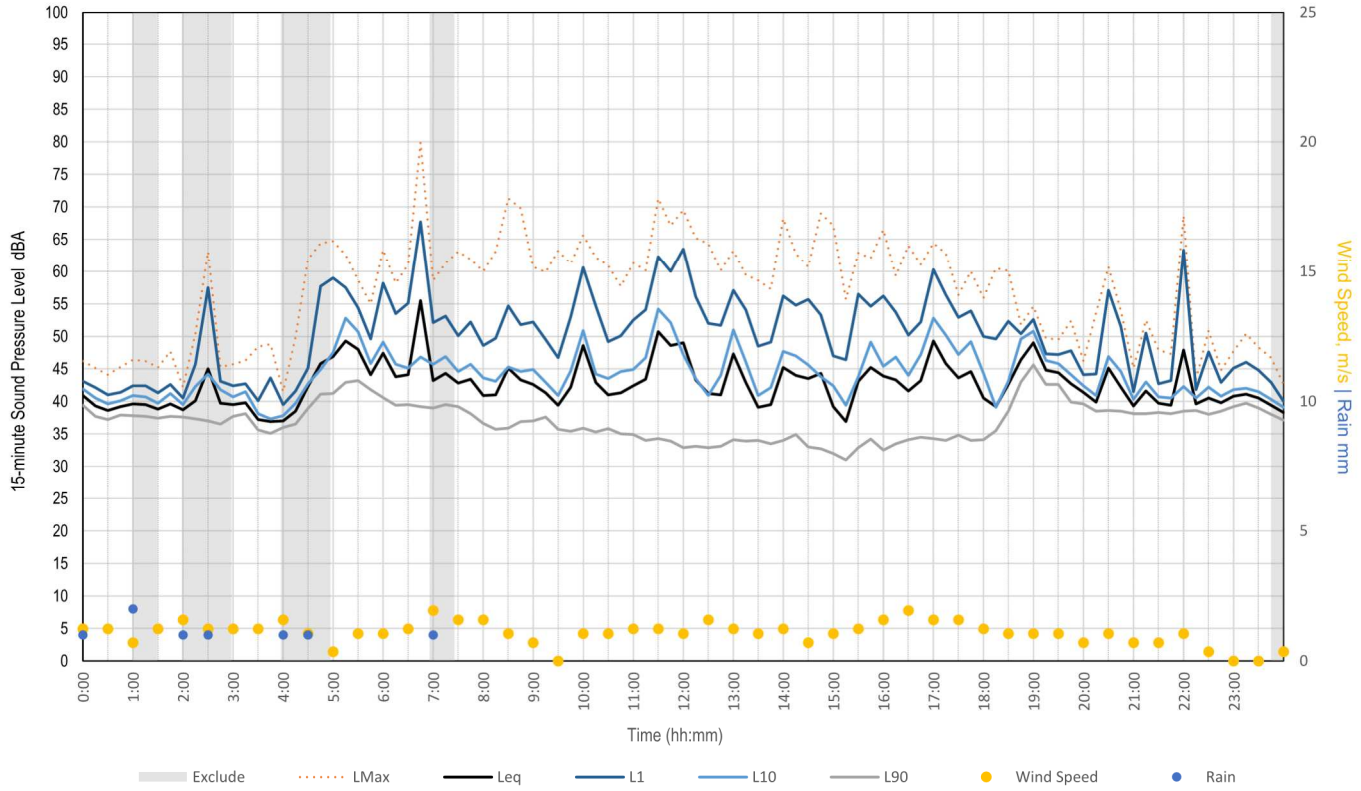
Wednesday, 05 October 2022



Noise Logger Results

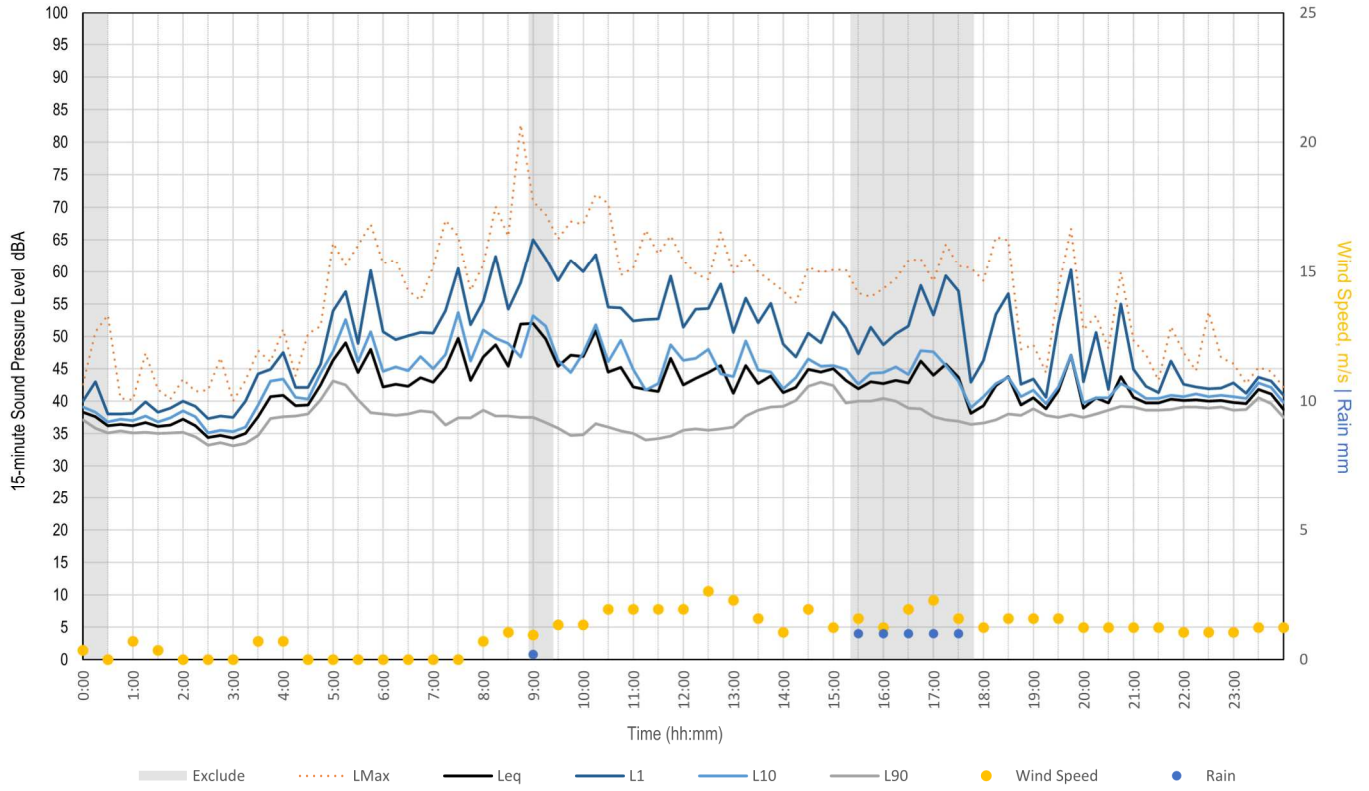
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Thursday, 06 October 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

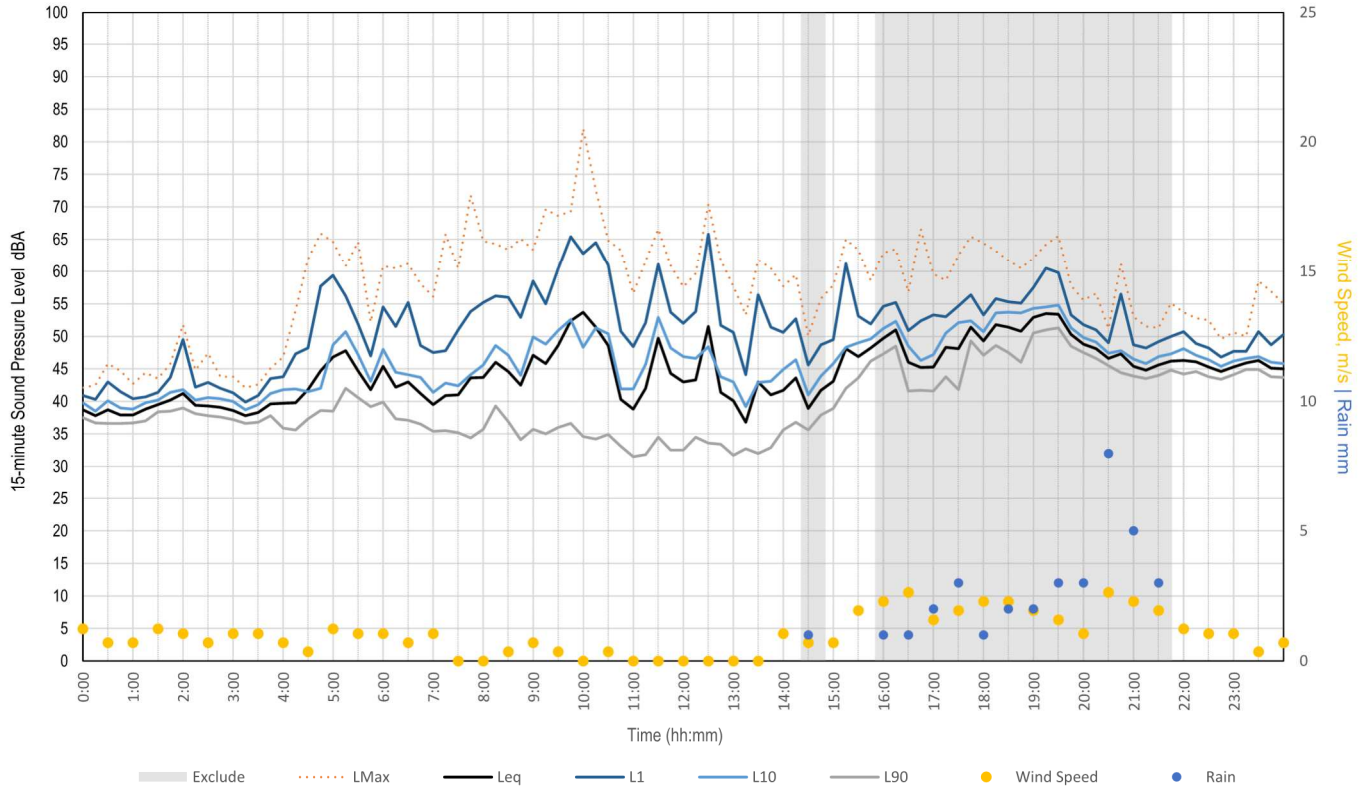
Friday, 07 October 2022



Noise Logger Results

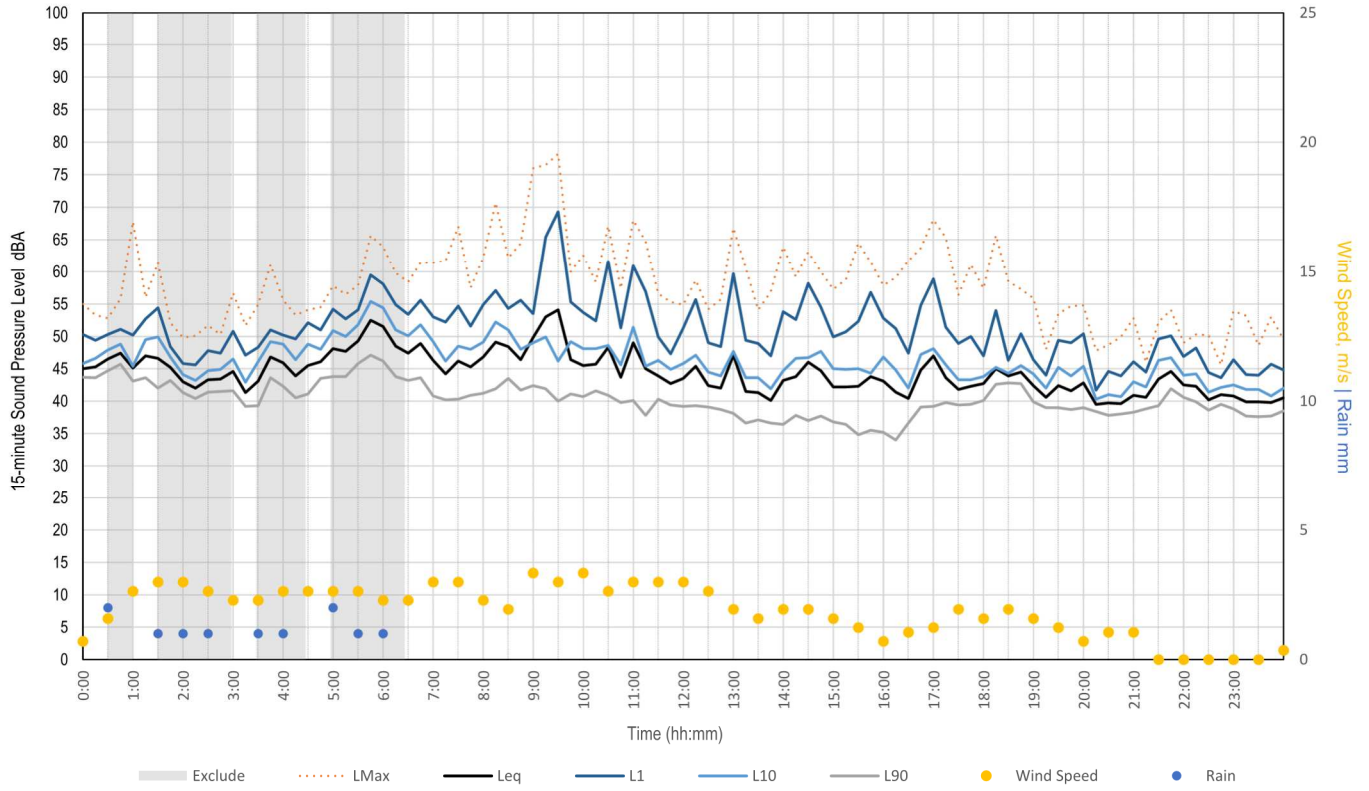
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Saturday, 08 October 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

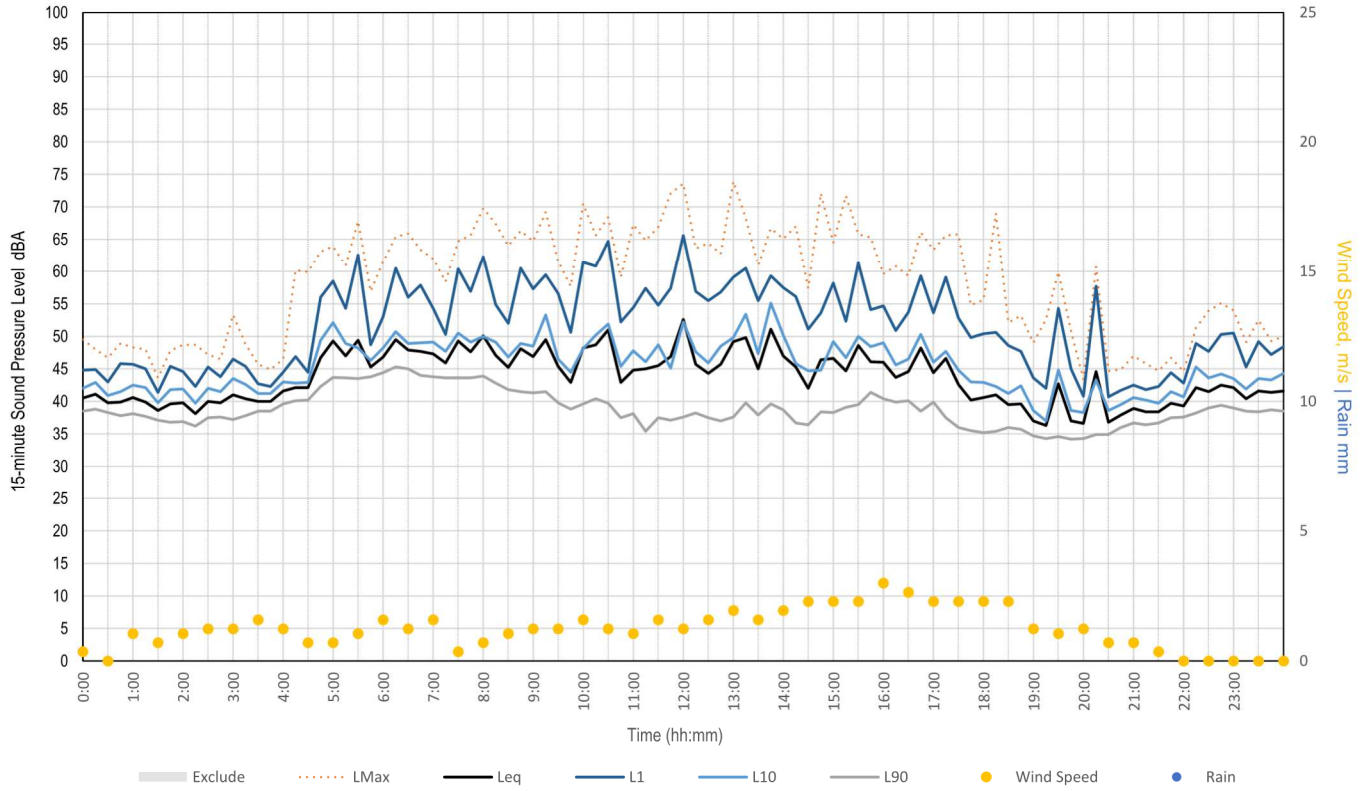
Sunday, 09 October 2022



Noise Logger Results

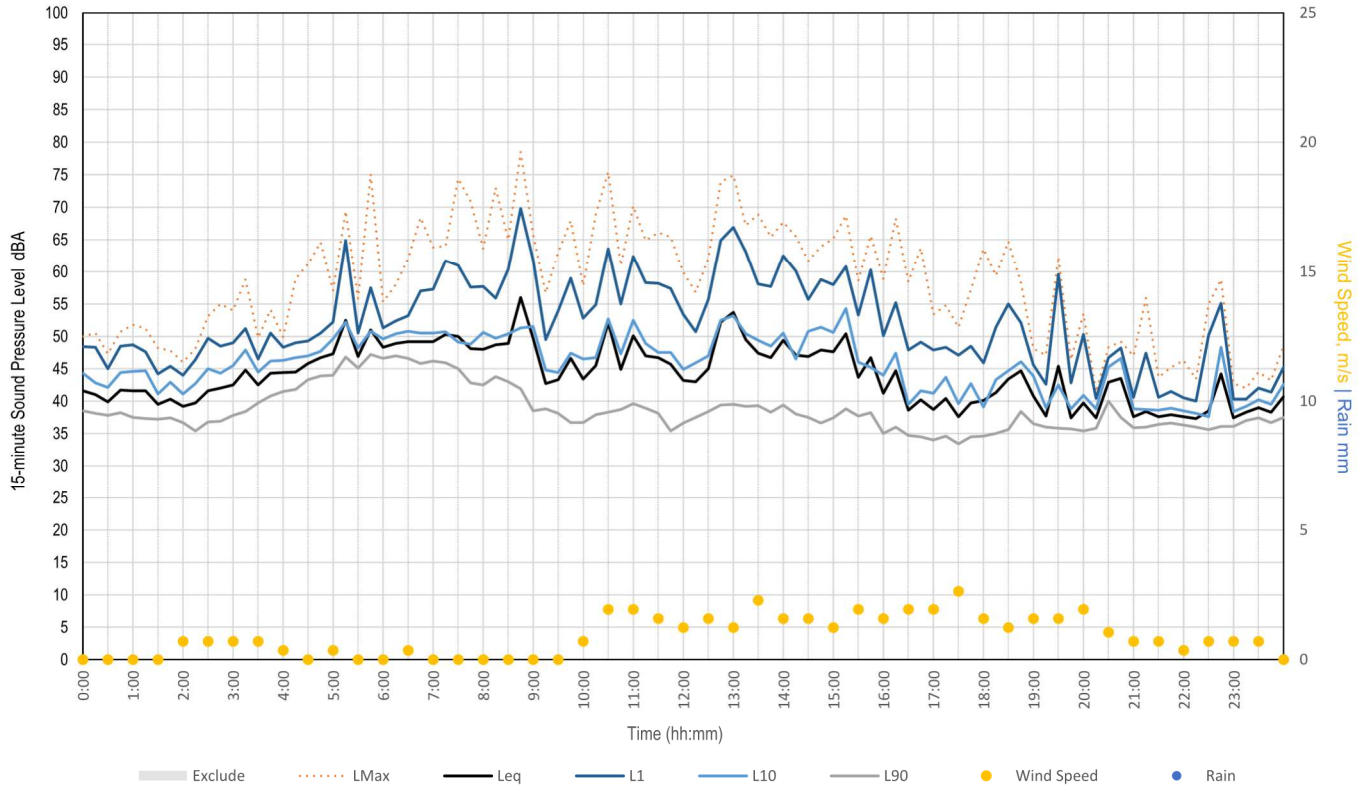
Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Monday, 10 October 2022



Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

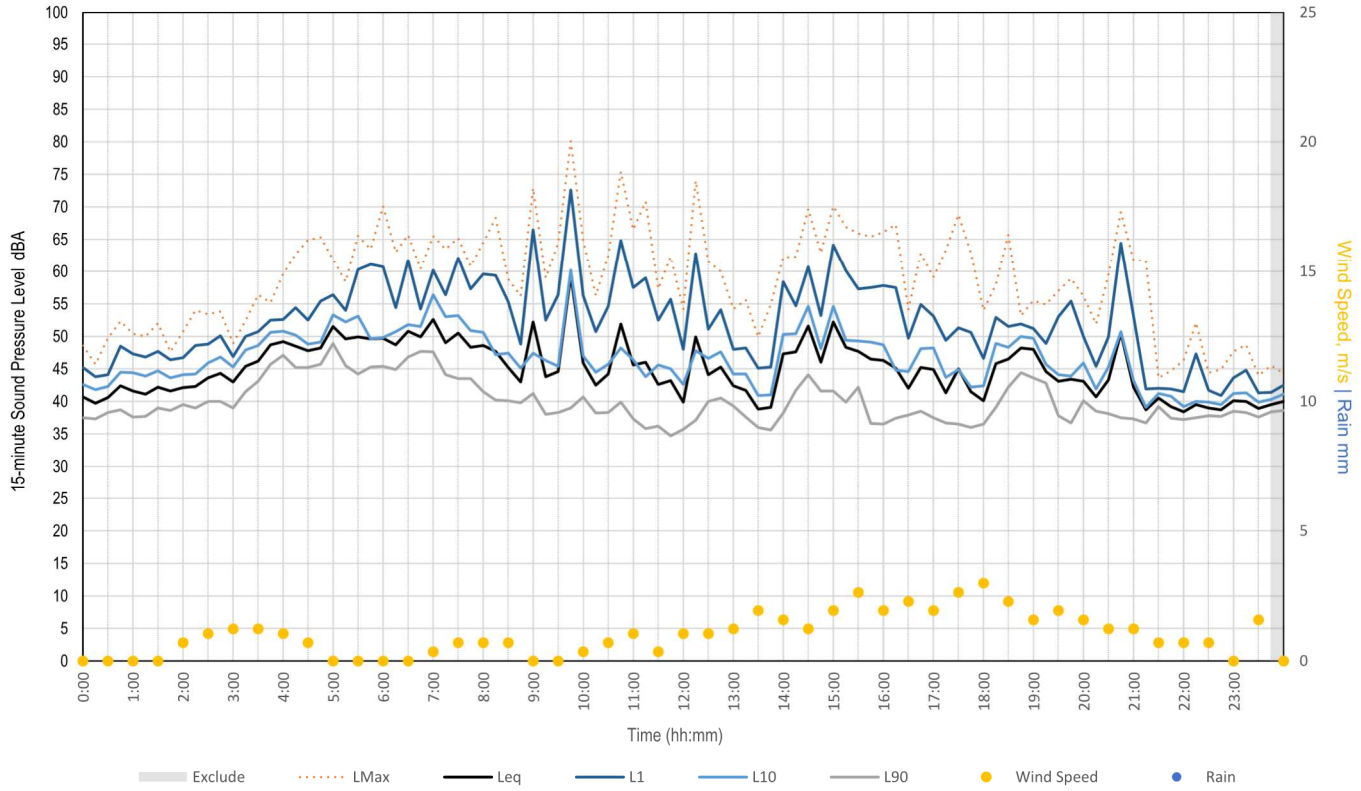
Tuesday, 11 October 2022



Noise Logger Results

Measured Noise Levels - M02 North East Departure - 141 Aldington Road (Kemps Creek)

Wednesday, 12 October 2022



Background Noise Monitoring

Location	M03 North East Runway - 19 Mandalong Close (Orchard Hills)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & JF

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	87821F
Calibration	**Pre:**	94.0 dBA	**Post:**	94.2 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Wednesday, 12 Oct 2022
No. of days	29
No. of nights	28

Weather	
Station	BoM
Station Info	Horsley Park Equestrian AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within block.

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	28/09/2022	3:49:18 PM	4:04:18 PM	76	58	59	54	
2	Day	28/09/2022	4:04:18 PM	4:19:18 PM	67	57	59	55	
3	Day	28/09/2022	4:19:18 PM	4:34:18 PM	68	58	60	55	
4	Day	13/10/2022	5:40:40 PM	5:55:40 PM	75	59	60	55	
5	Evening	13/10/2022	6:10:40 PM	6:25:40 PM	68	56	58	54	
6	Evening	21/09/2022	6:15:00 PM	6:30:00 PM	63	55	57	52	*
7	Evening	21/09/2022	7:15:00 PM	7:30:00 PM	67	54	56	51	*
8	Evening	21/09/2022	8:45:00 PM	9:00:00 PM	63	51	53	47	*
9	Night	19/09/2022	12:45:00 AM	1:00:00 AM	64	50	53	45	*
10	Night	19/09/2022	2:45:00 AM	3:00:00 AM	64	49	52	40	*
11	Night	19/09/2022	4:30:00 AM	4:45:00 AM	66	54	56	51	*
12	Night	19/09/2022	6:15:00 AM	6:30:00 AM	66	59	61	57	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Constant traffic on Mamre Road, with a combination of light and heavy vehicles, and other traffic related sound e.g. police sirens. Occasional bird noise in nearby trees. An aircraft flying overhead was observed with an approx. duration of 30 sec with a maximum sound level around 61 dBA.
Background noise	Traffic on Mamre Road.
Evening	
Ambient noise	Constant traffic on Mamre Road, with a combination of light and heavy vehicles. Intermittent bird noise in nearby trees. Occasional motorcycle passbys inducing loud impulsive noise. An aircraft flying overhead with approx. duration of 30 sec to 1 min with maximum sound levels in the range of 55 to 62 dBA.
Background noise	Traffic on Mamre Road.
Night	
Ambient noise	Occasional vehicles passing by on Mamre Road. Heavy moving vehicle passbys. Other traffic related noise e.g. sirens. Intermittent bird noise from the nearby trees, dominant in early morning (around 4 AM).
Background noise	Traffic on Mamre Road.

Site Details	M03 North East Runway - 19 Mandalong Close (Orchard Hills)
Start Date	Tue 13 September 2022
End Date	Wed 12 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	67
$L_{eq, Evening}$ dBA	53
$L_{eq, Night}$ dBA	53
RBL, $_{Day}$ dBA	47
RBL, $_{Evening}$ dBA	45
RBL, $_{Night}$ dBA	39

Daily Summary

Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA		55	55	52	54	54	54	55
$L_{eq, Evening}$ dBA	53	54	50	52	49	50	54	54
$L_{eq, Night}$ dBA	55	51	53	52	46	54	54	51
ABL, $_{Day}$ dBA		46	49	45	43	39	45	47
ABL, $_{Evening}$ dBA	44	48	44	45	40	40	48	46
ABL, $_{Night}$ dBA	36	42	38	37	31	35	41	40

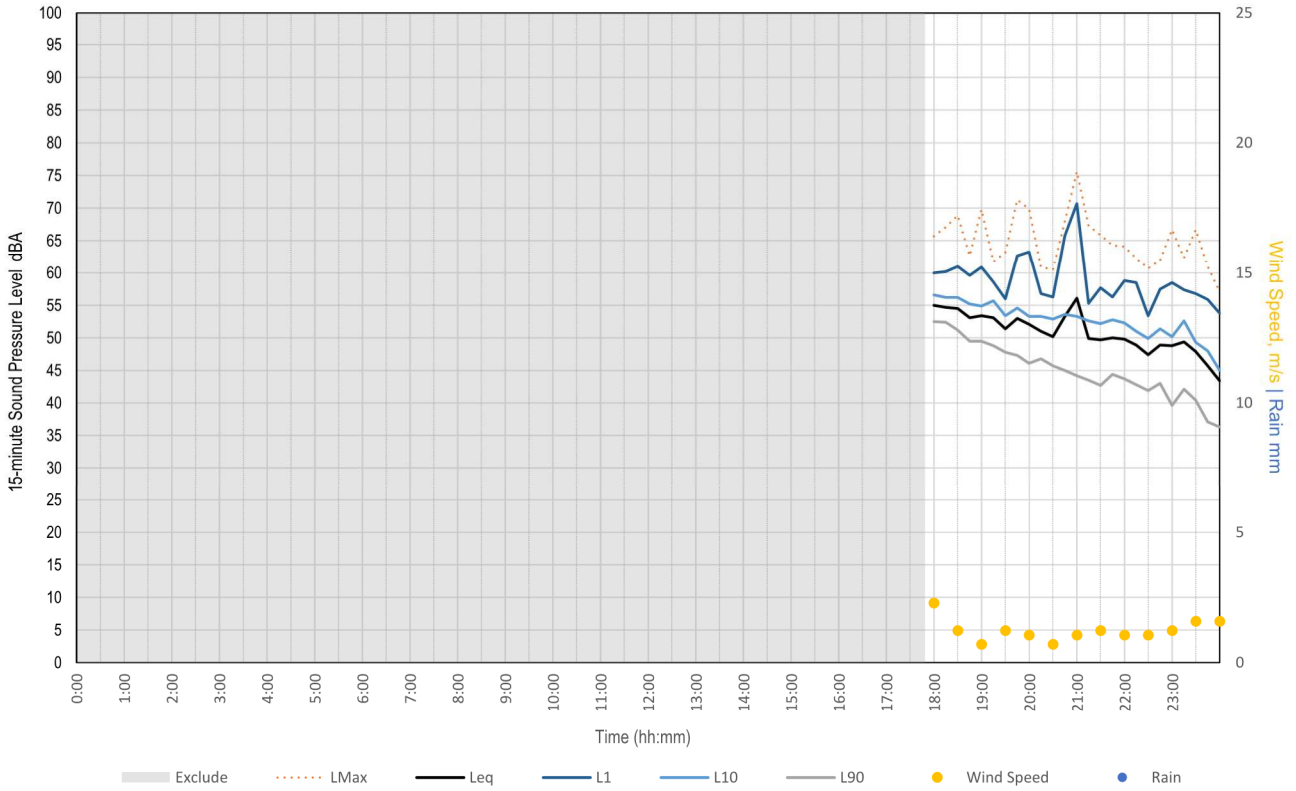
Date	21/09	22/09	23/09	24/09	25/09	26/09	27/09	28/09
$L_{eq, Day}$ dBA	55	54	55	53	51	54	55	82
$L_{eq, Evening}$ dBA	53	50	54	50	52	53	53	52
$L_{eq, Night}$ dBA	49	50	48	47	51	51	50	57
ABL, $_{Day}$ dBA	47	47	46	43	39	47	47	54
ABL, $_{Evening}$ dBA	44	44	46	46	45	46	47	45
ABL, $_{Night}$ dBA	40	38	36	38	39	40	42	41

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	59	58	53	51	50	60	55	58
$L_{eq, Evening}$ dBA	53	54	51	51	53	51	53	53
$L_{eq, Night}$ dBA	52	59	50	49	54	52	54	53
ABL, $_{Day}$ dBA	51	52	46	40	40	47	48	49
ABL, $_{Evening}$ dBA	46	46	44	43	45	44	49	48
ABL, $_{Night}$ dBA	40	40	38	38	39	39	41	42

Date	07/10	08/10	09/10	10/10	11/10
$L_{eq, Day}$ dBA	56	52	52	57	56
$L_{eq, Evening}$ dBA	53	0	51	52	53
$L_{eq, Night}$ dBA	50	49	53	53	50
ABL, $_{Day}$ dBA	49	43	42	48	49
ABL, $_{Evening}$ dBA	46		42	44	45
ABL, $_{Night}$ dBA	40	42	38	39	42

Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

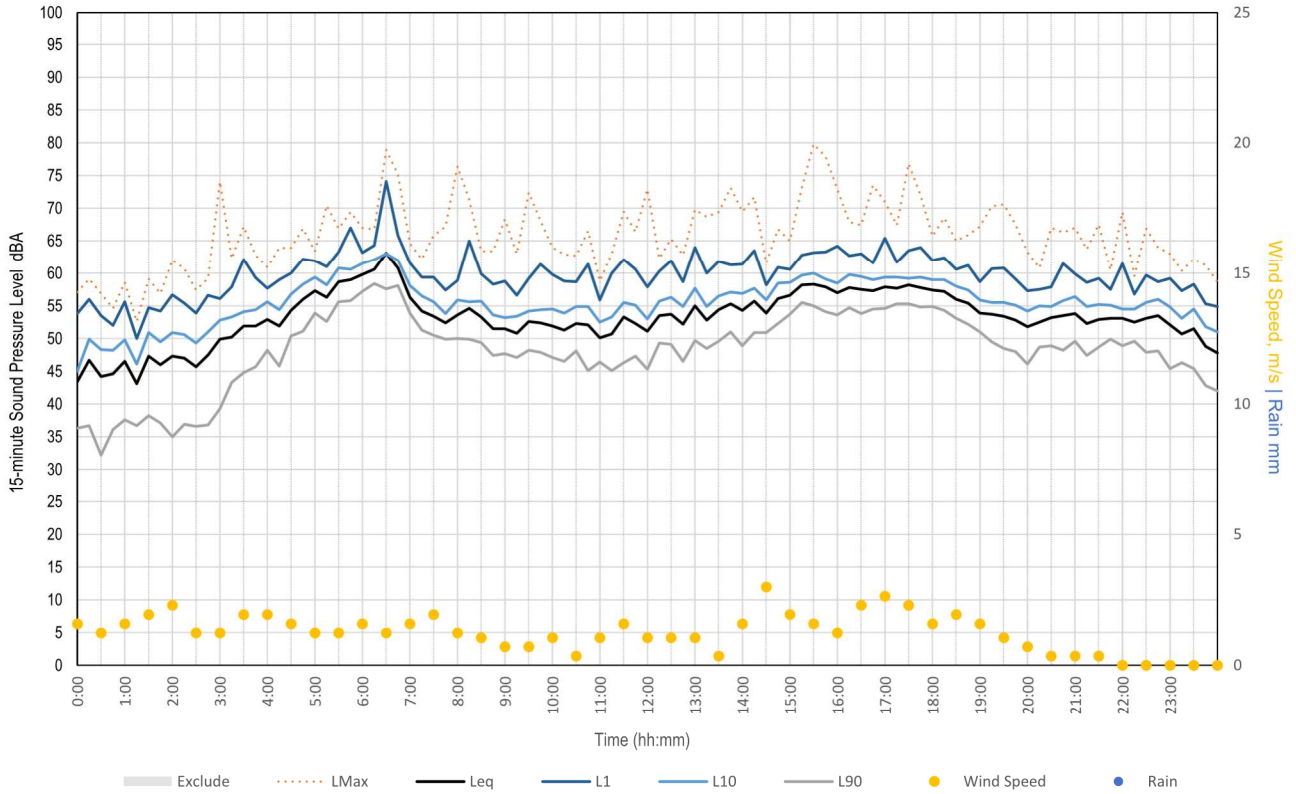
Tuesday, 13 September 2022



Noise Logger Results

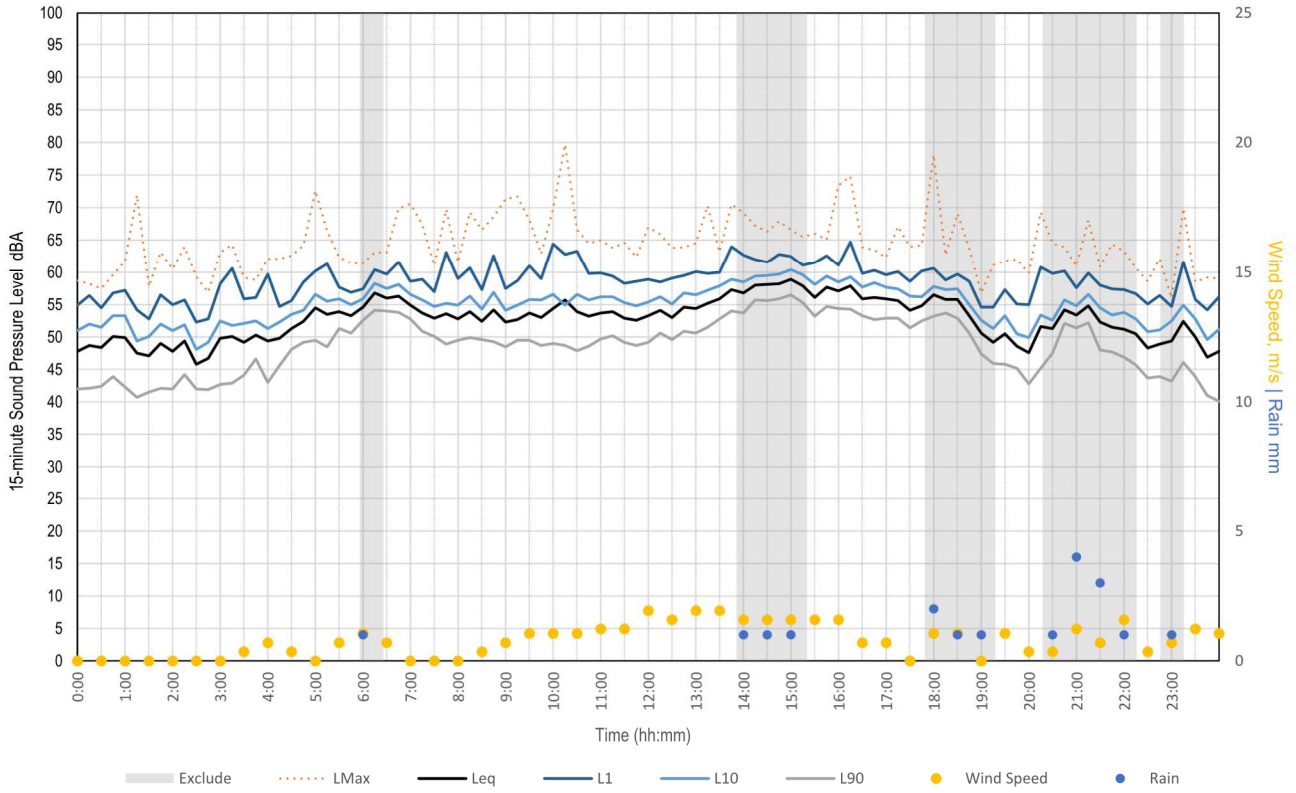
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Wednesday, 14 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

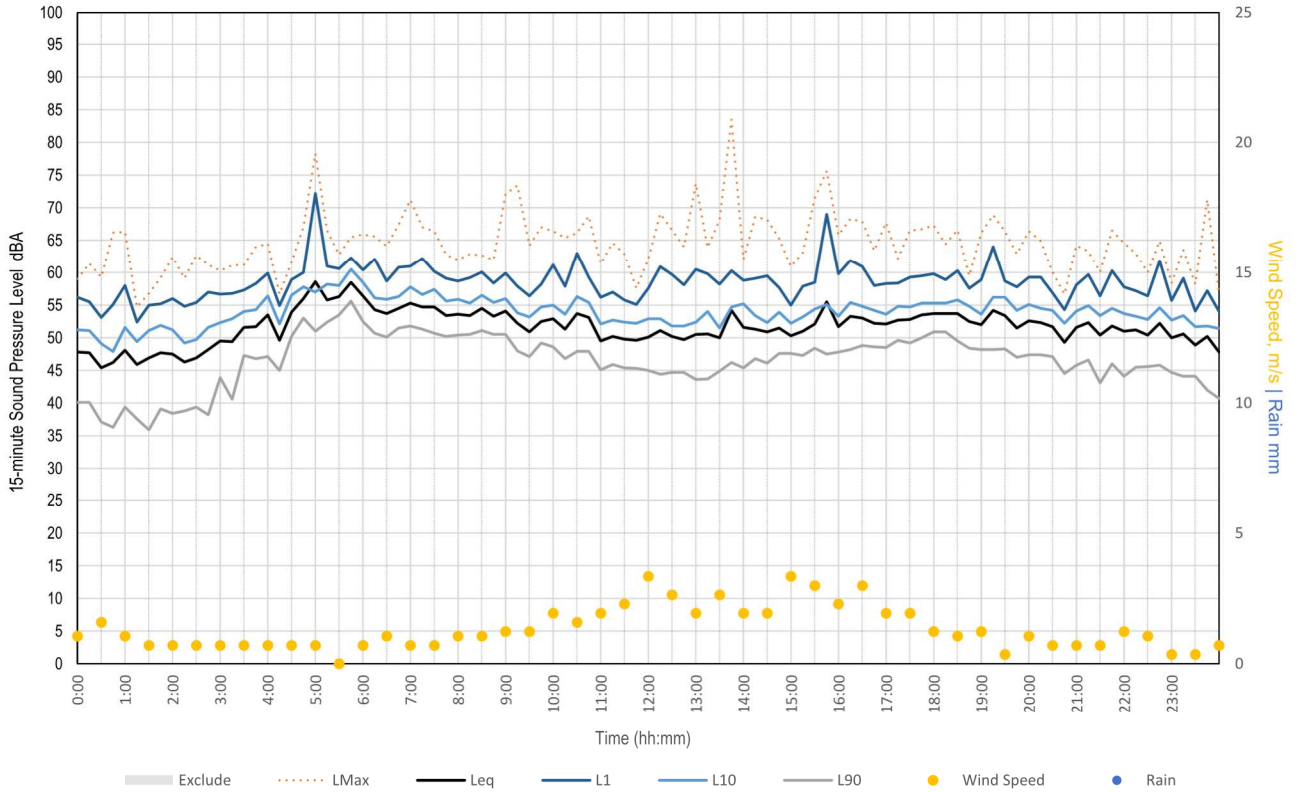
Thursday, 15 September 2022



Noise Logger Results

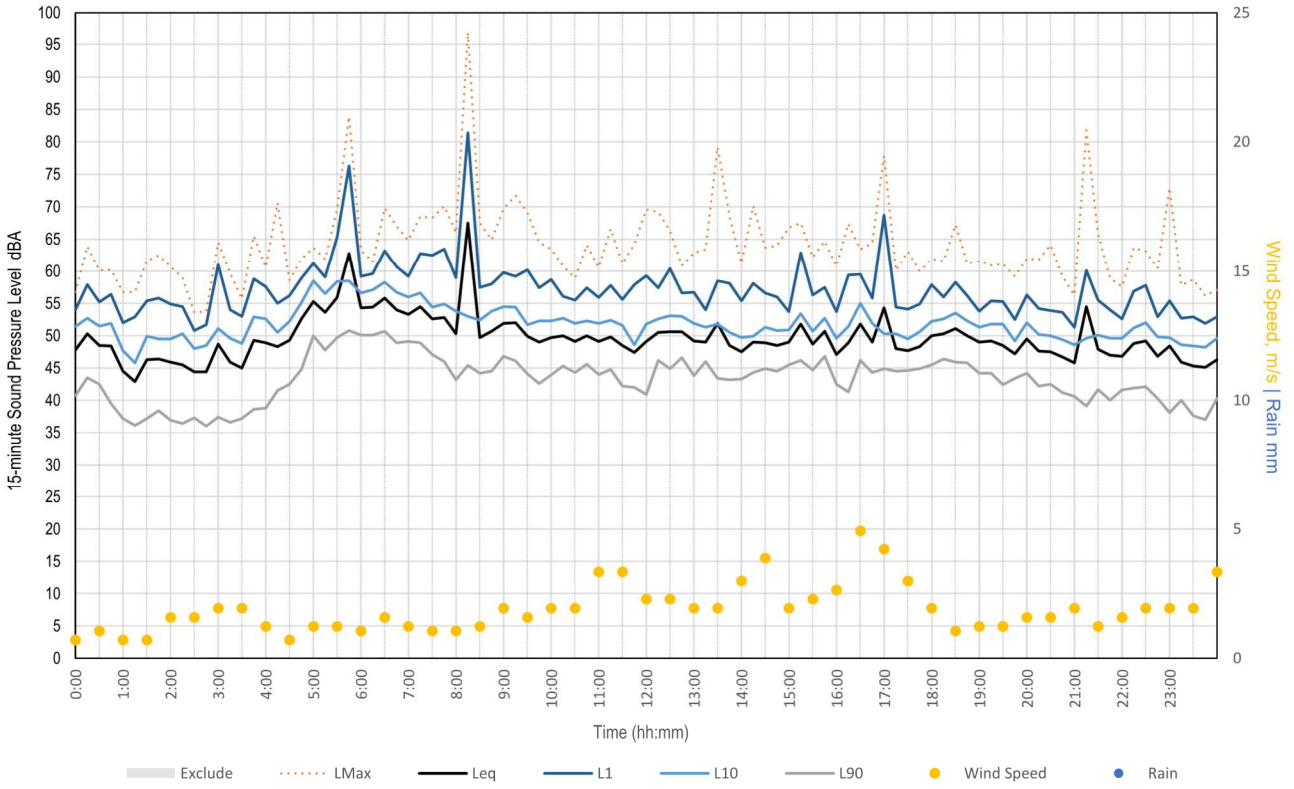
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Friday, 16 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

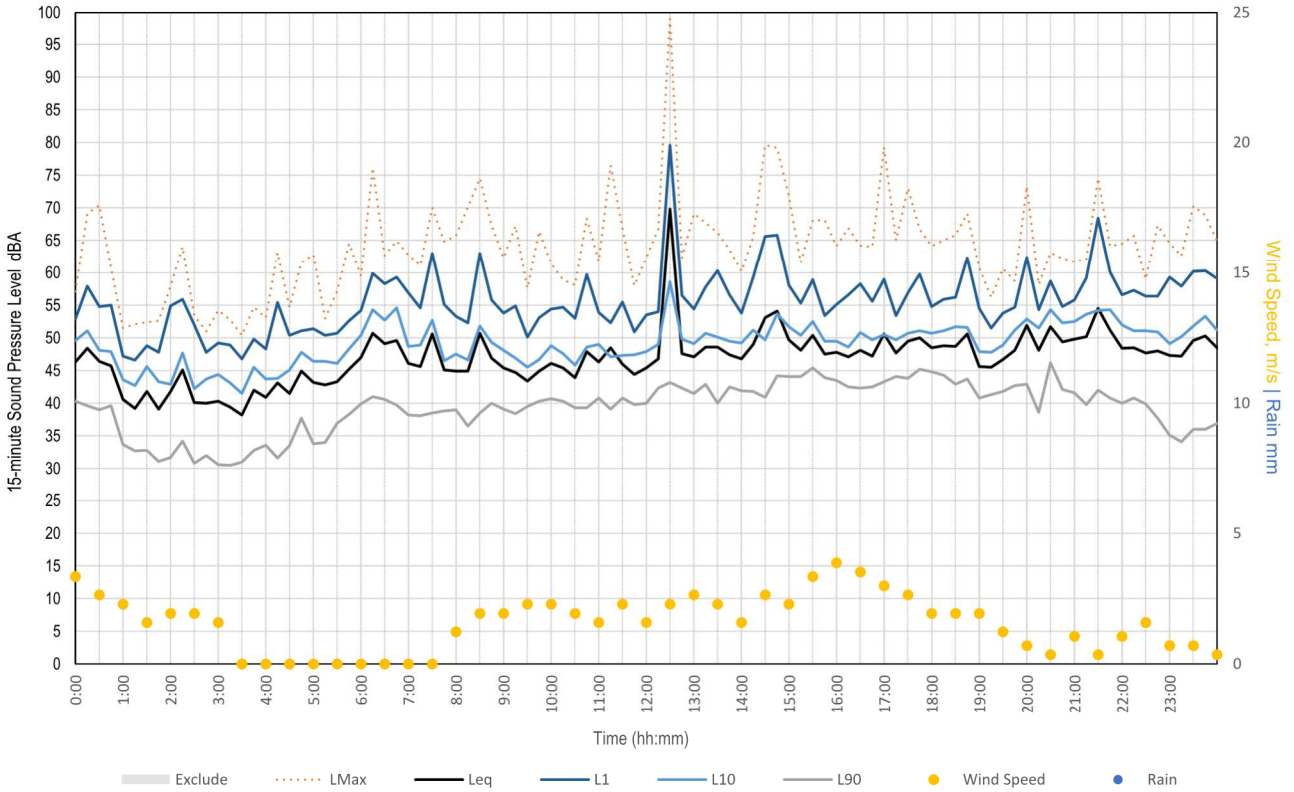
Saturday, 17 September 2022



Noise Logger Results

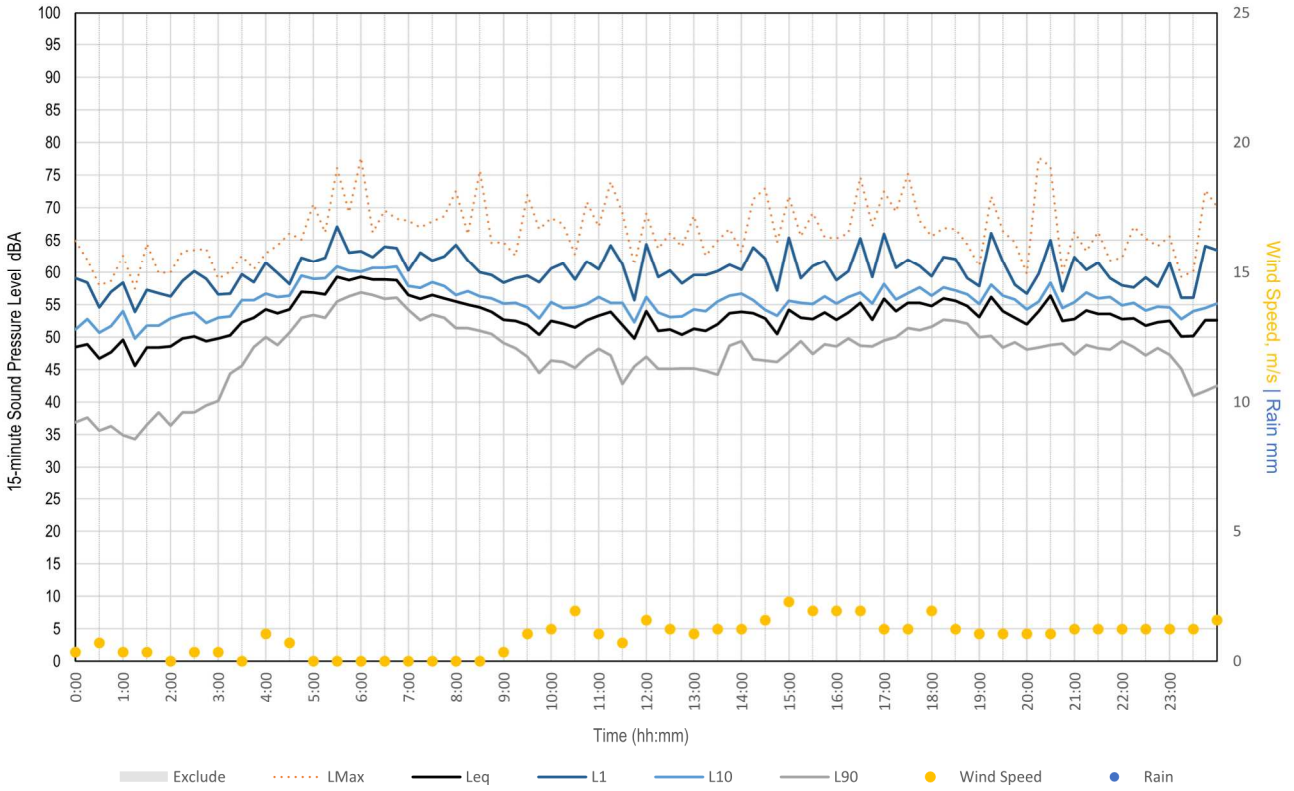
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Sunday, 18 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

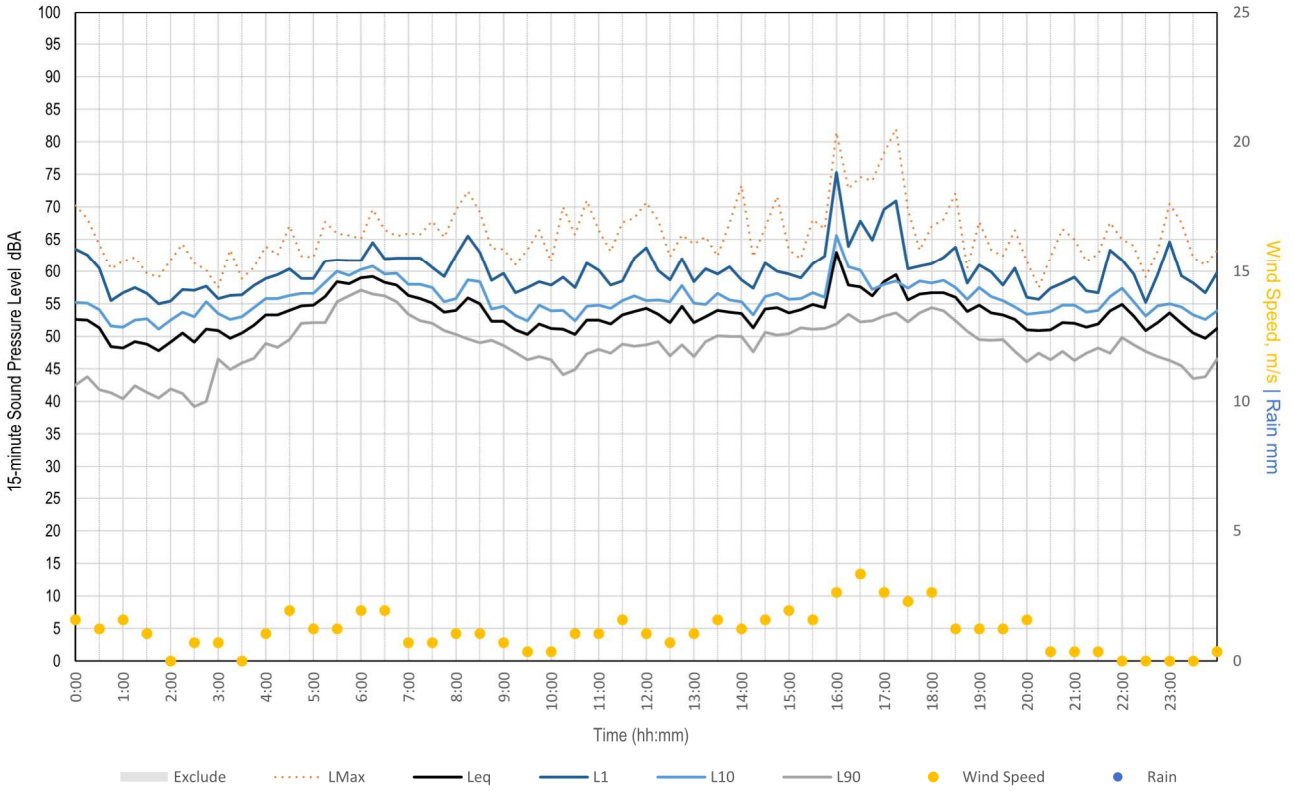
Monday, 19 September 2022



Noise Logger Results

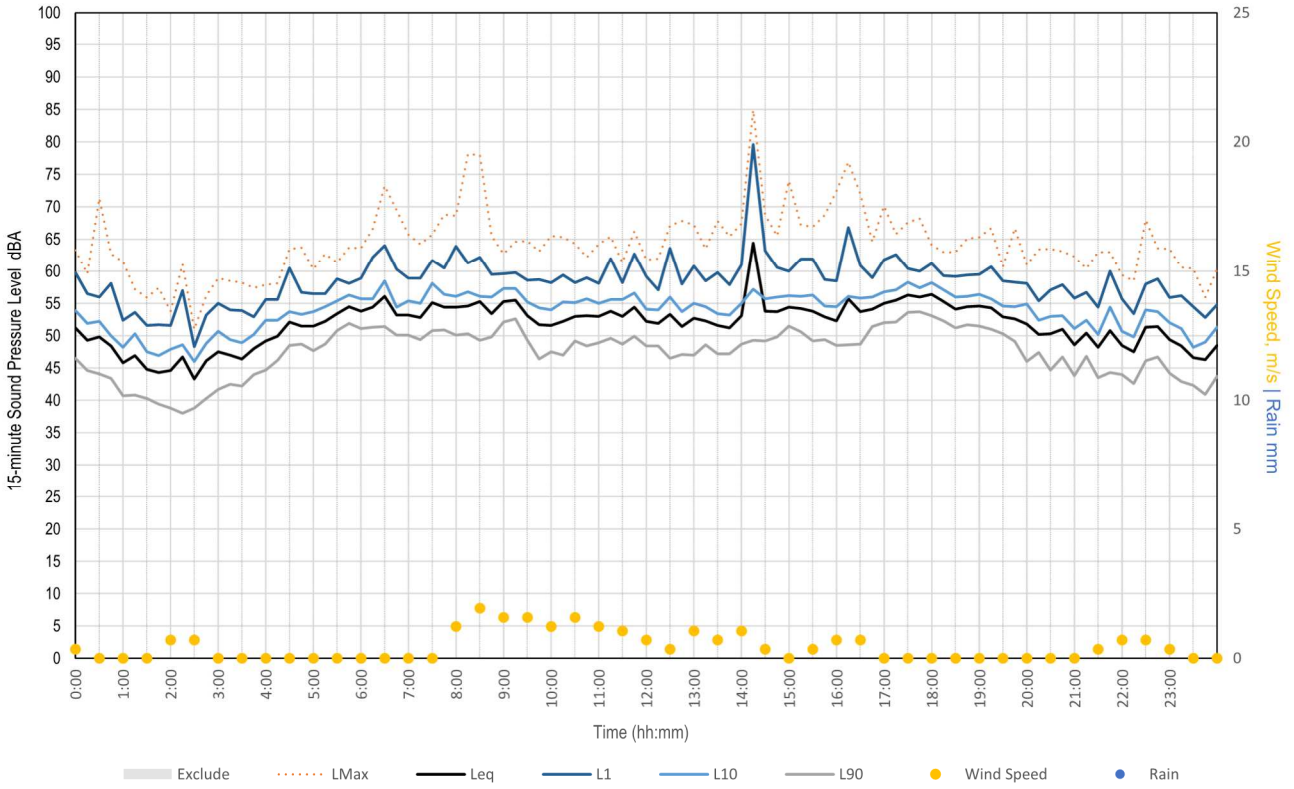
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Tuesday, 20 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

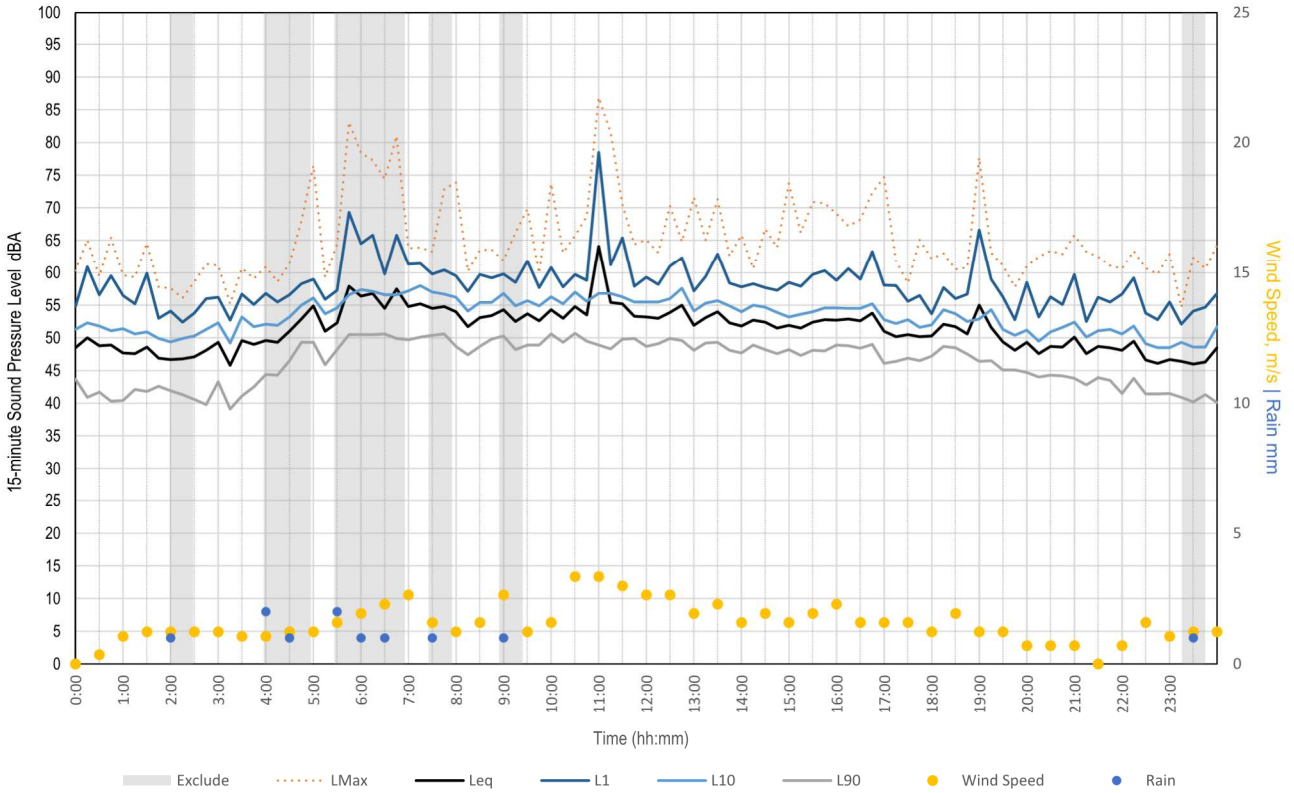
Wednesday, 21 September 2022



Noise Logger Results

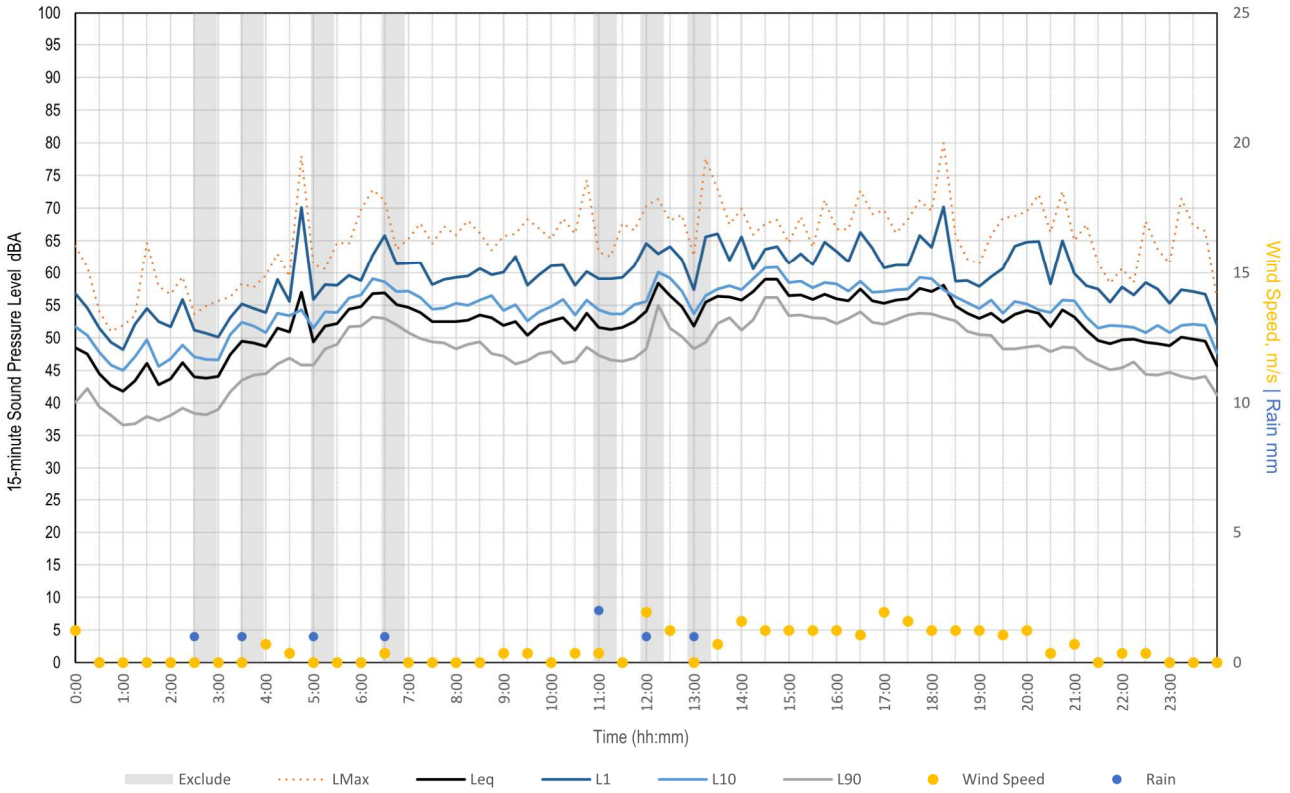
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Thursday, 22 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

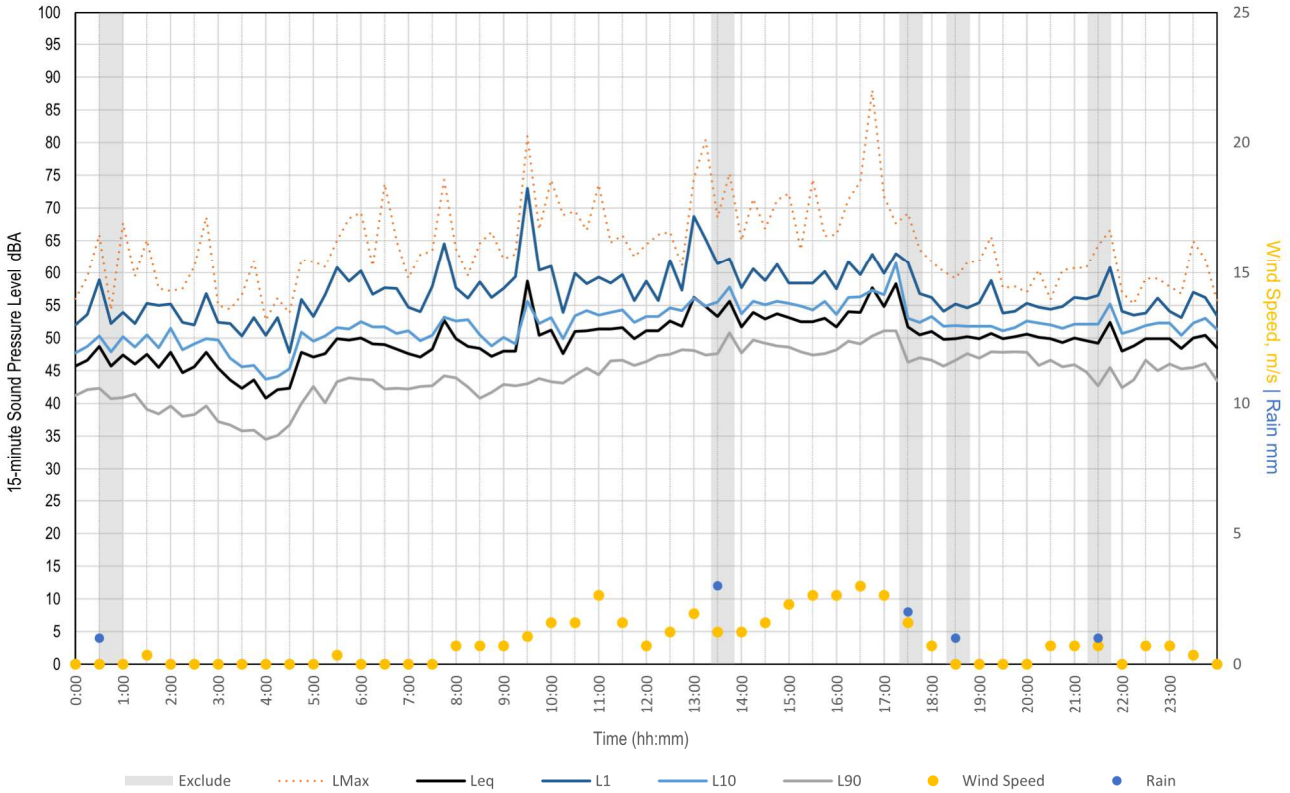
Friday, 23 September 2022



Noise Logger Results

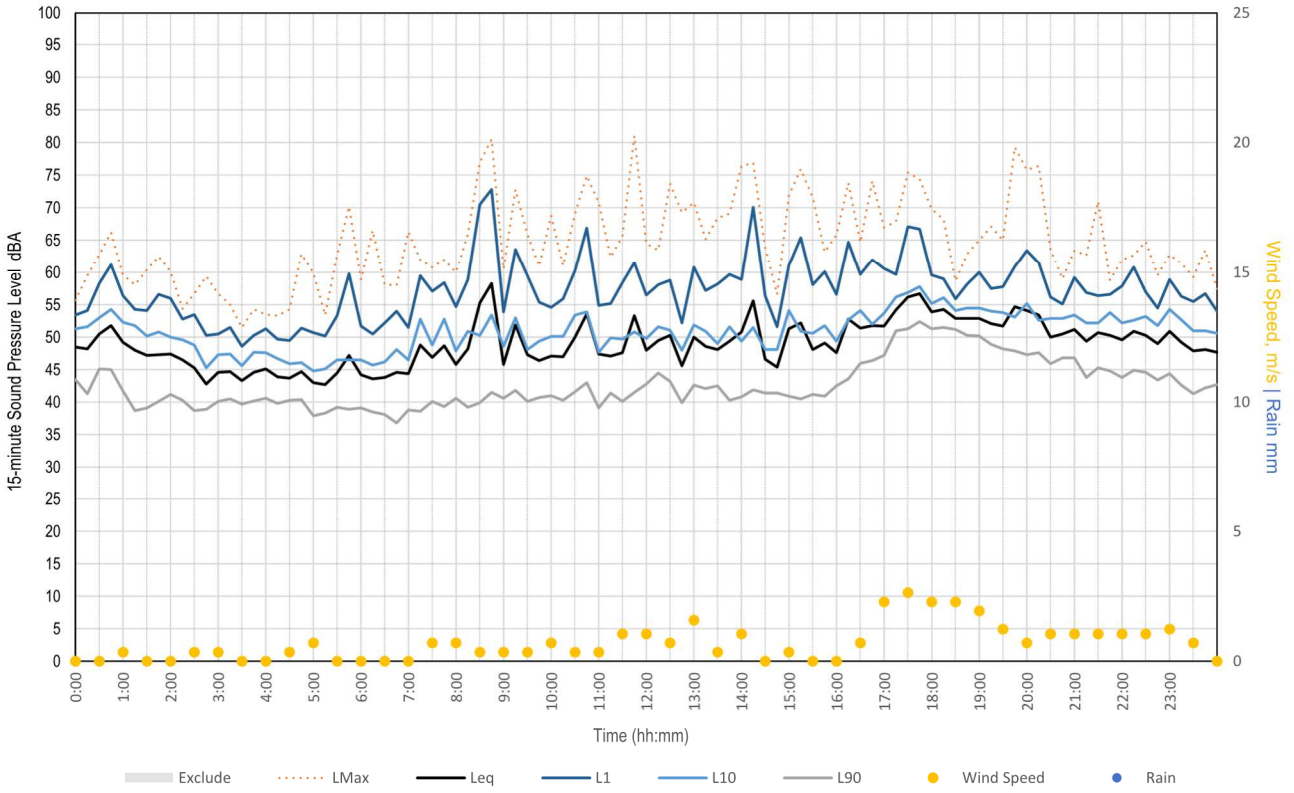
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Saturday, 24 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

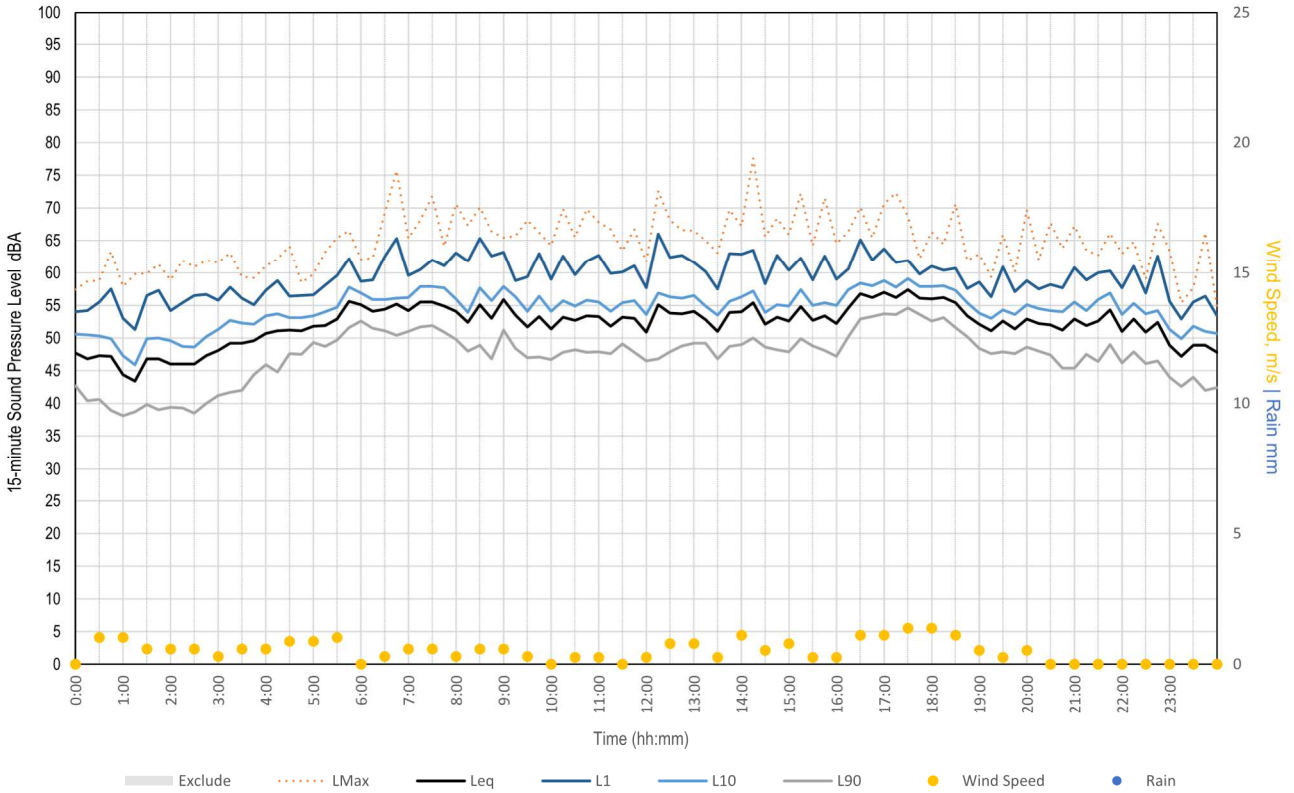
Sunday, 25 September 2022



Noise Logger Results

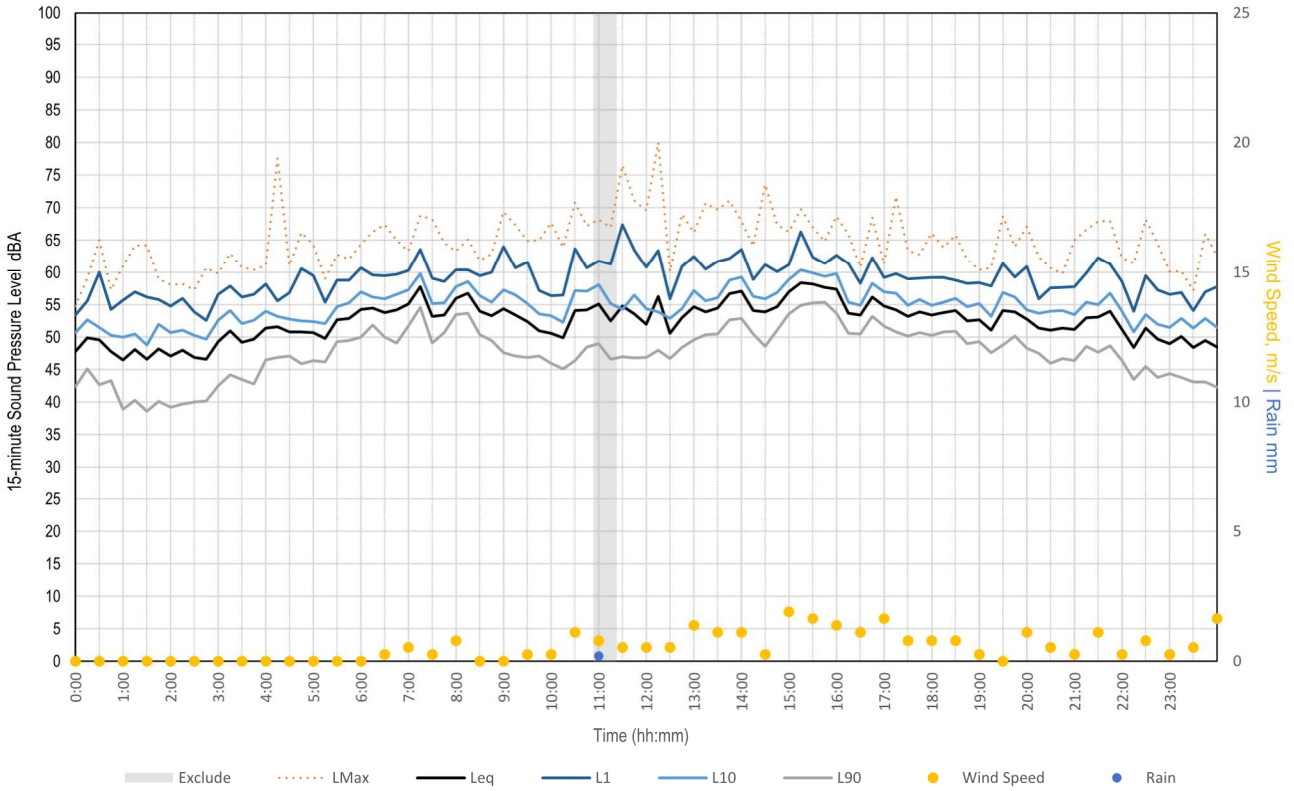
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Monday, 26 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

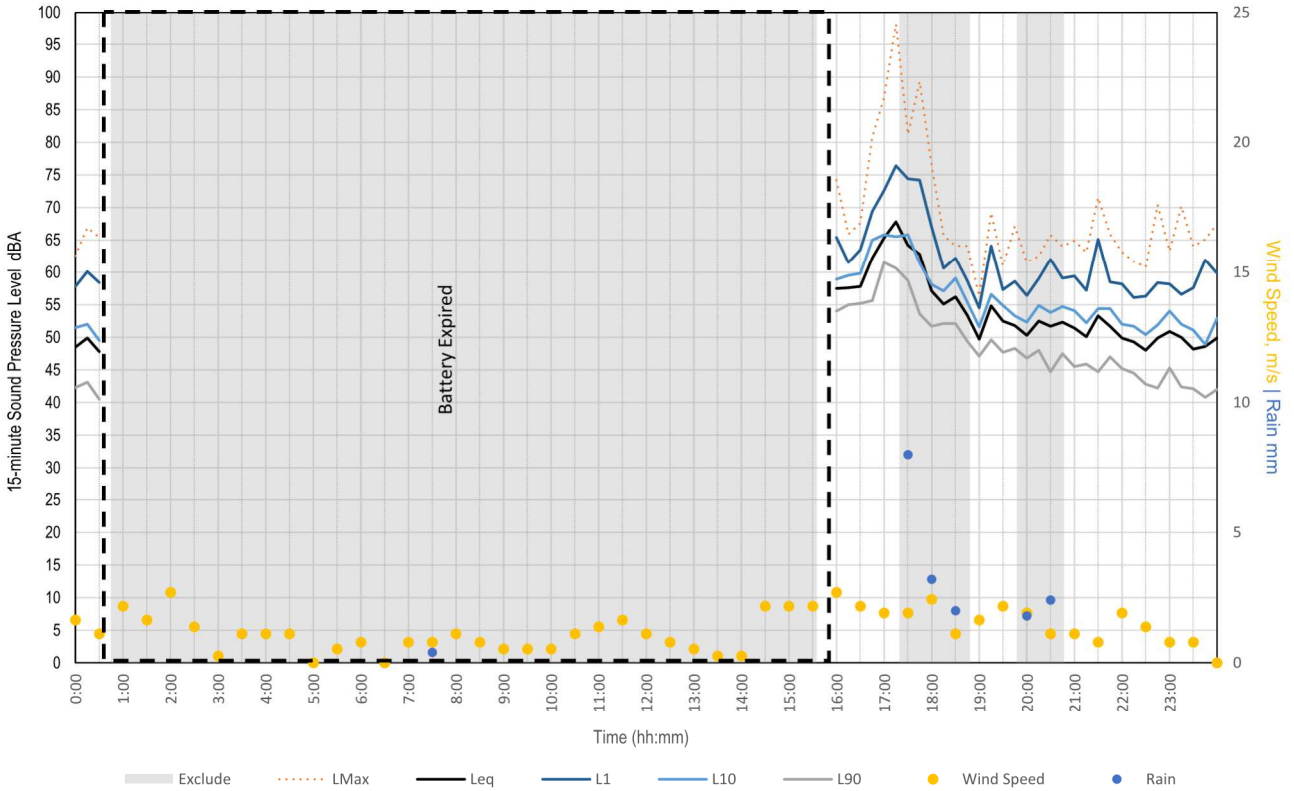
Tuesday, 27 September 2022



Noise Logger Results

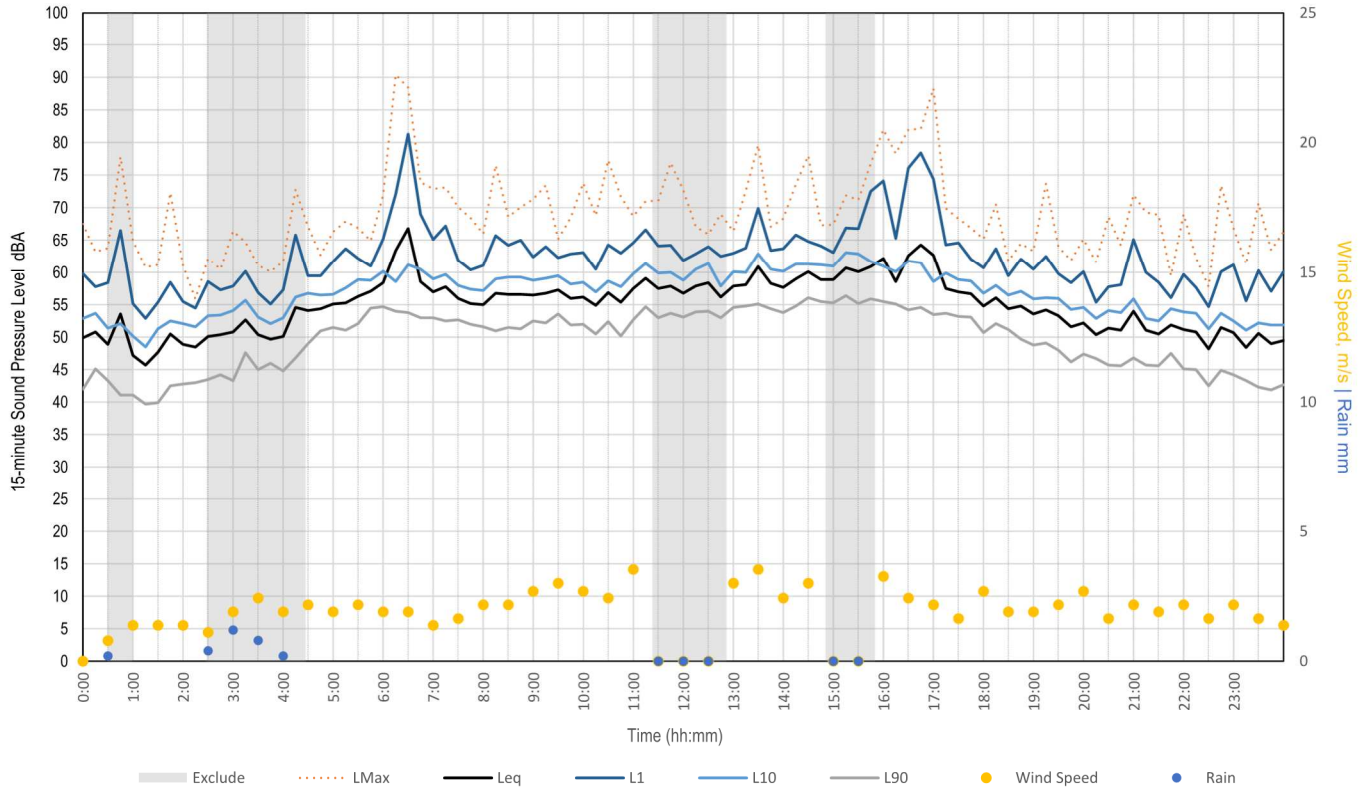
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Wednesday, 28 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

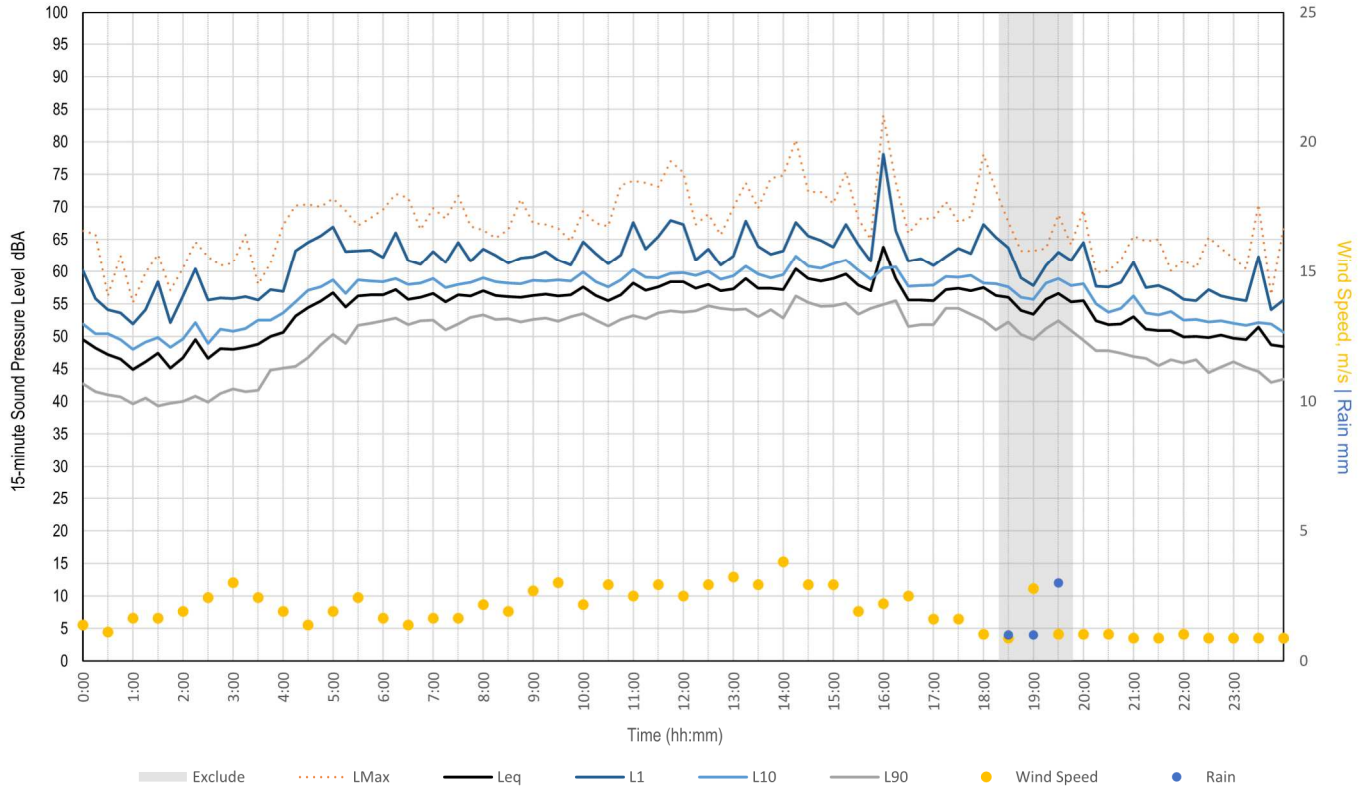
Thursday, 29 September 2022



Noise Logger Results

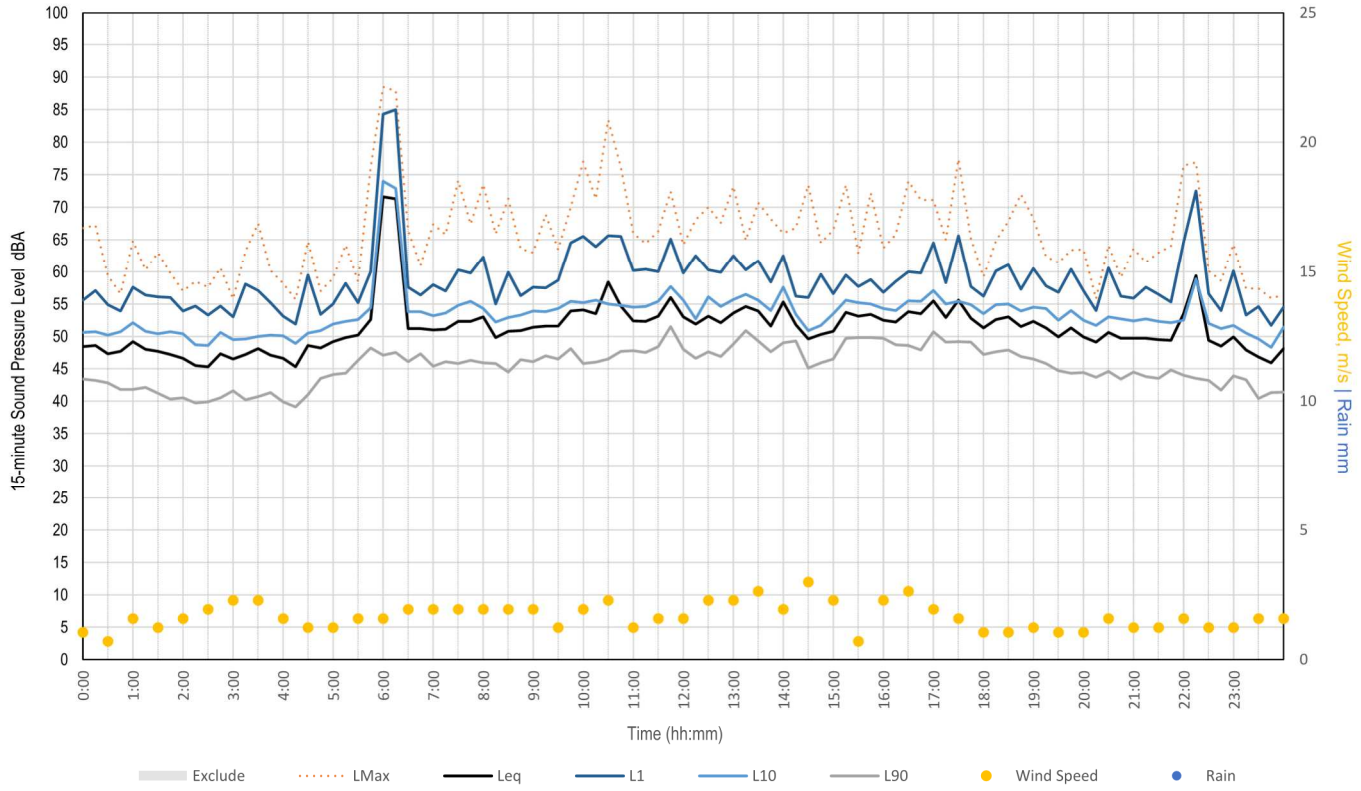
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Friday, 30 September 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

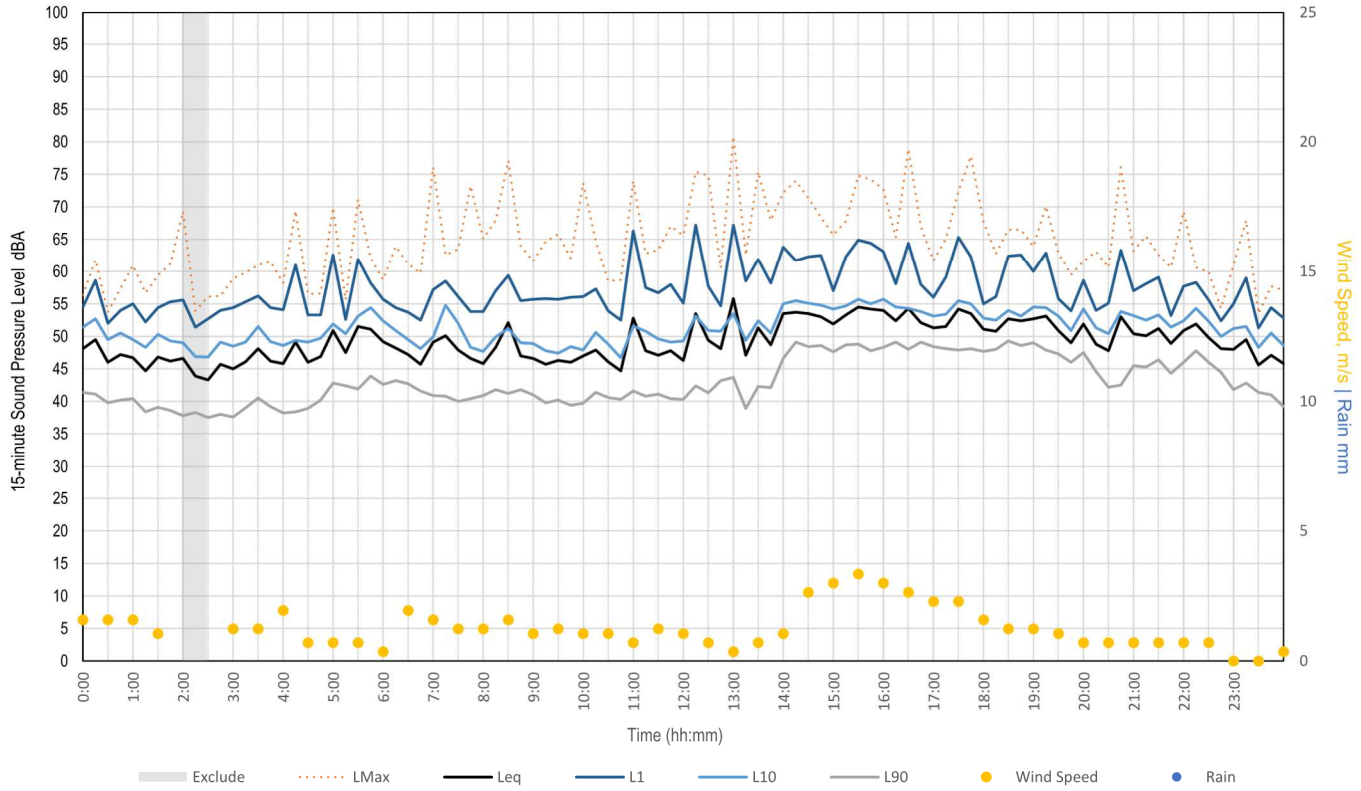
Saturday, 01 October 2022



Noise Logger Results

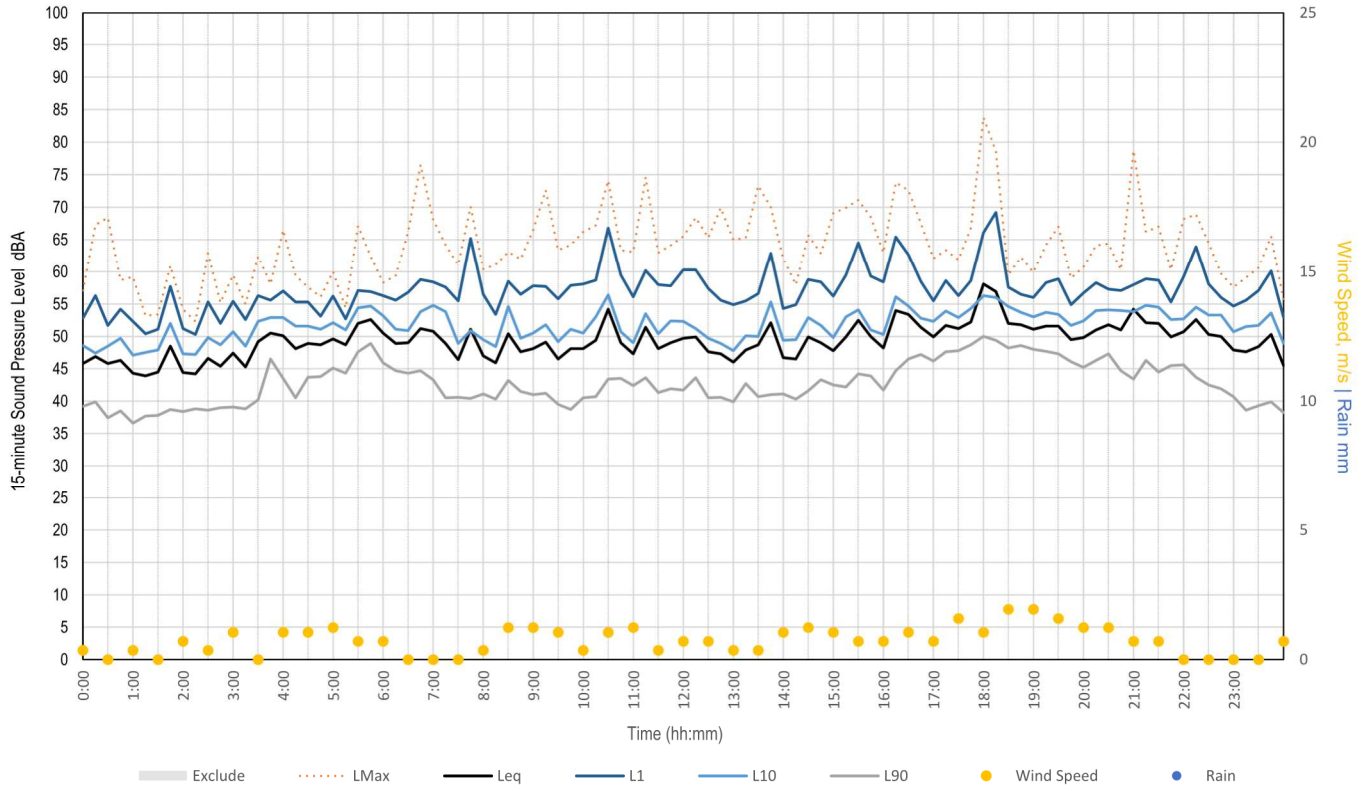
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Sunday, 02 October 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

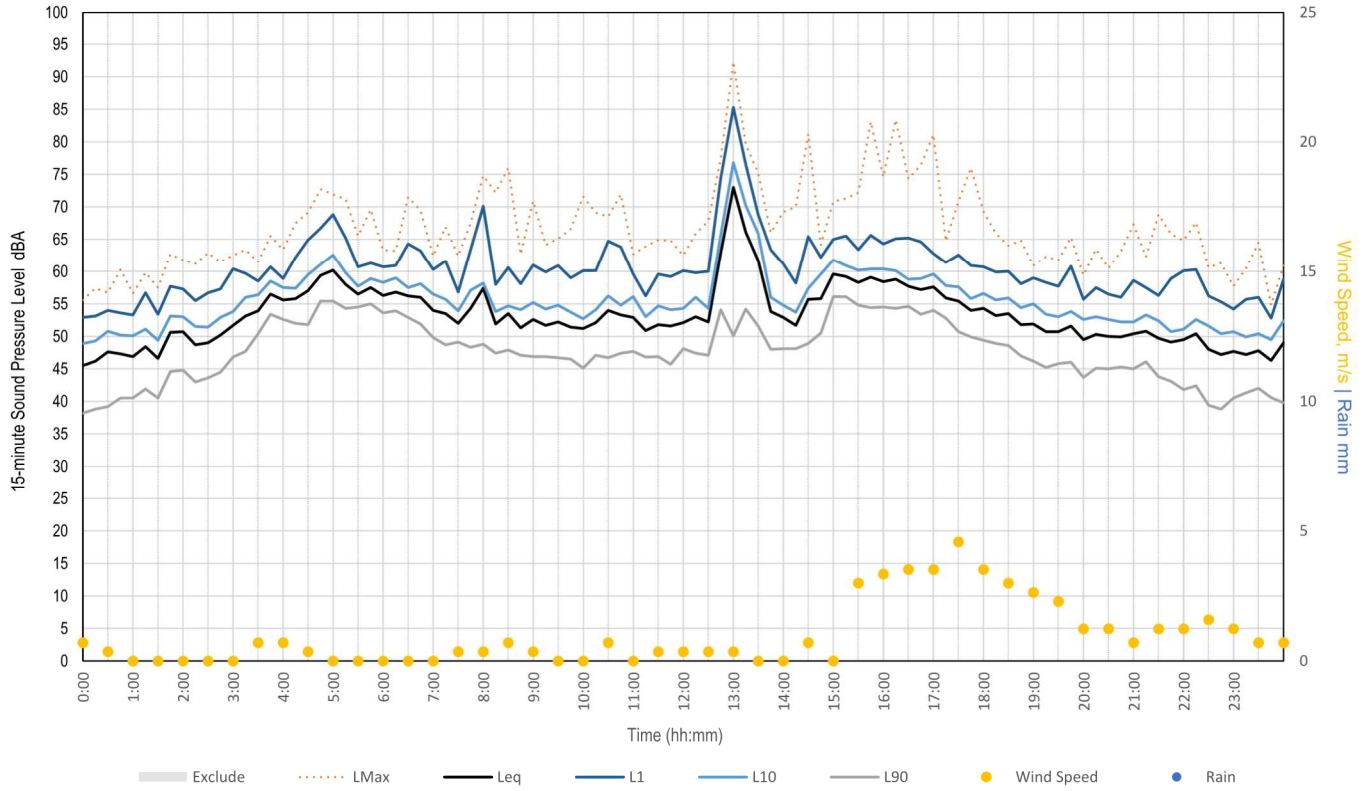
Monday, 03 October 2022



Noise Logger Results

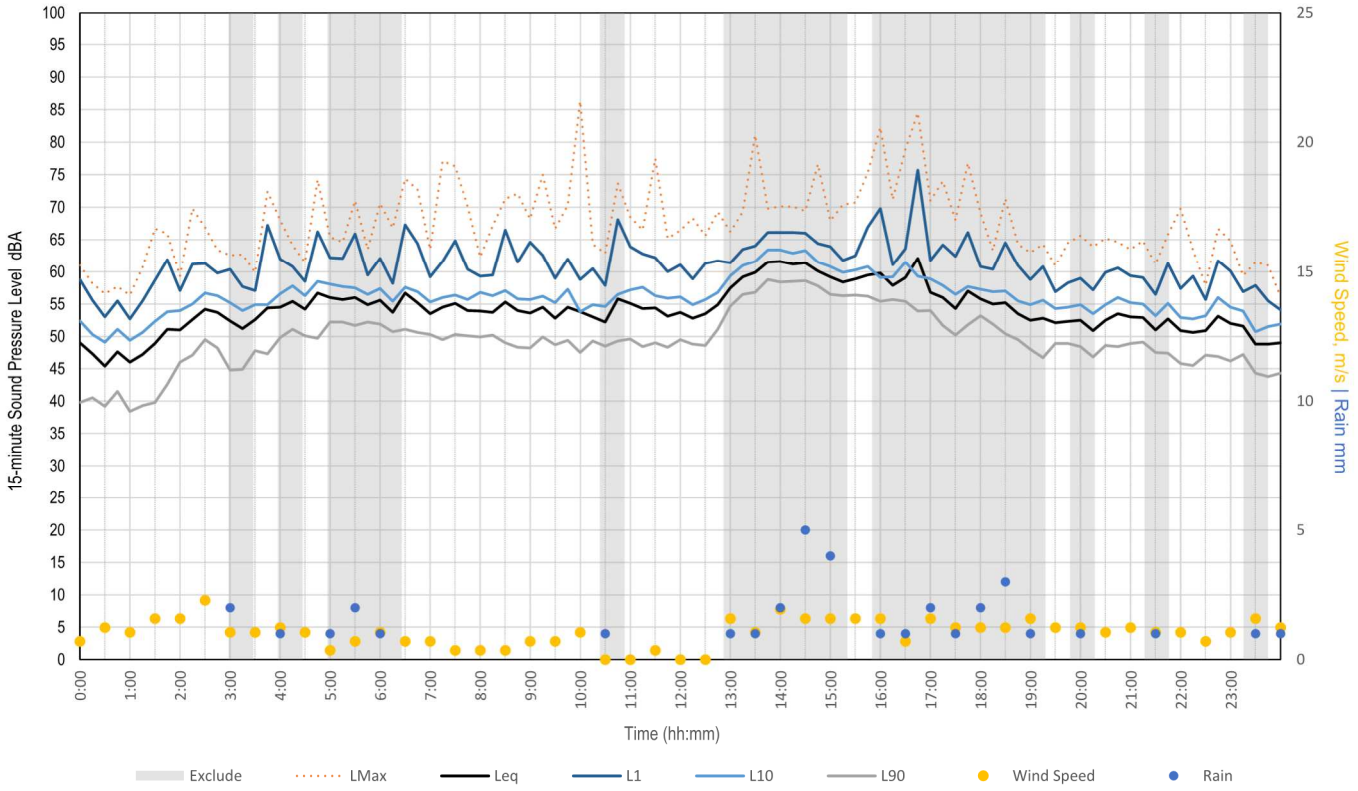
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Tuesday, 04 October 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

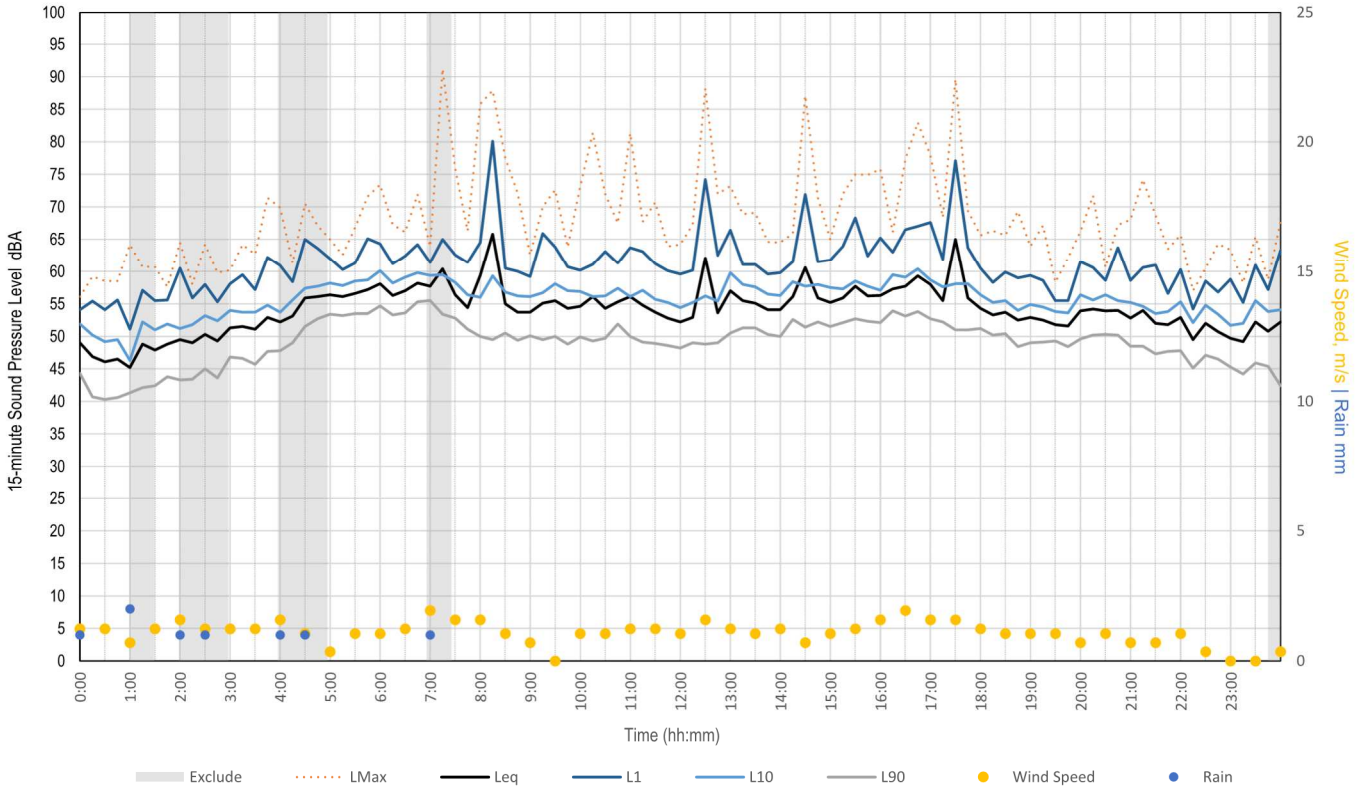
Wednesday, 05 October 2022



Noise Logger Results

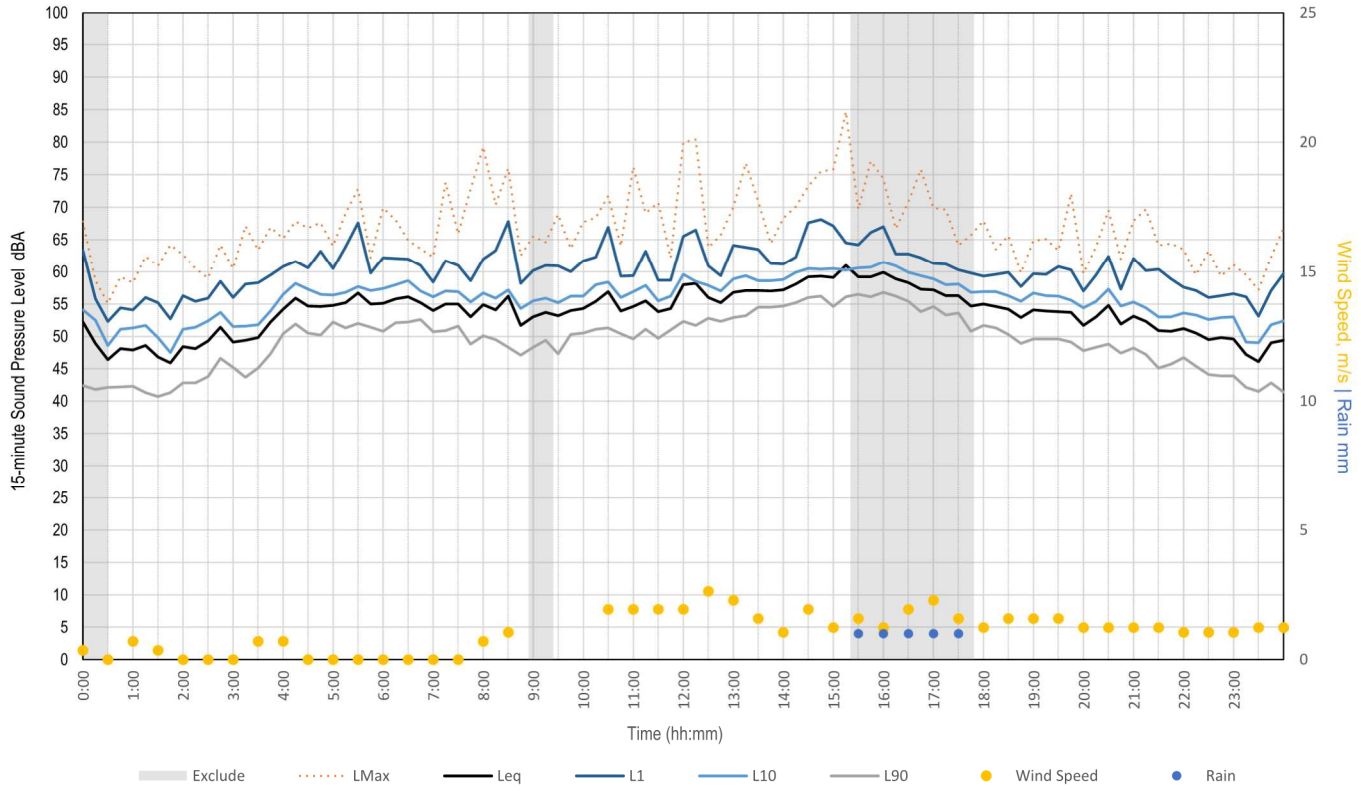
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Thursday, 06 October 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

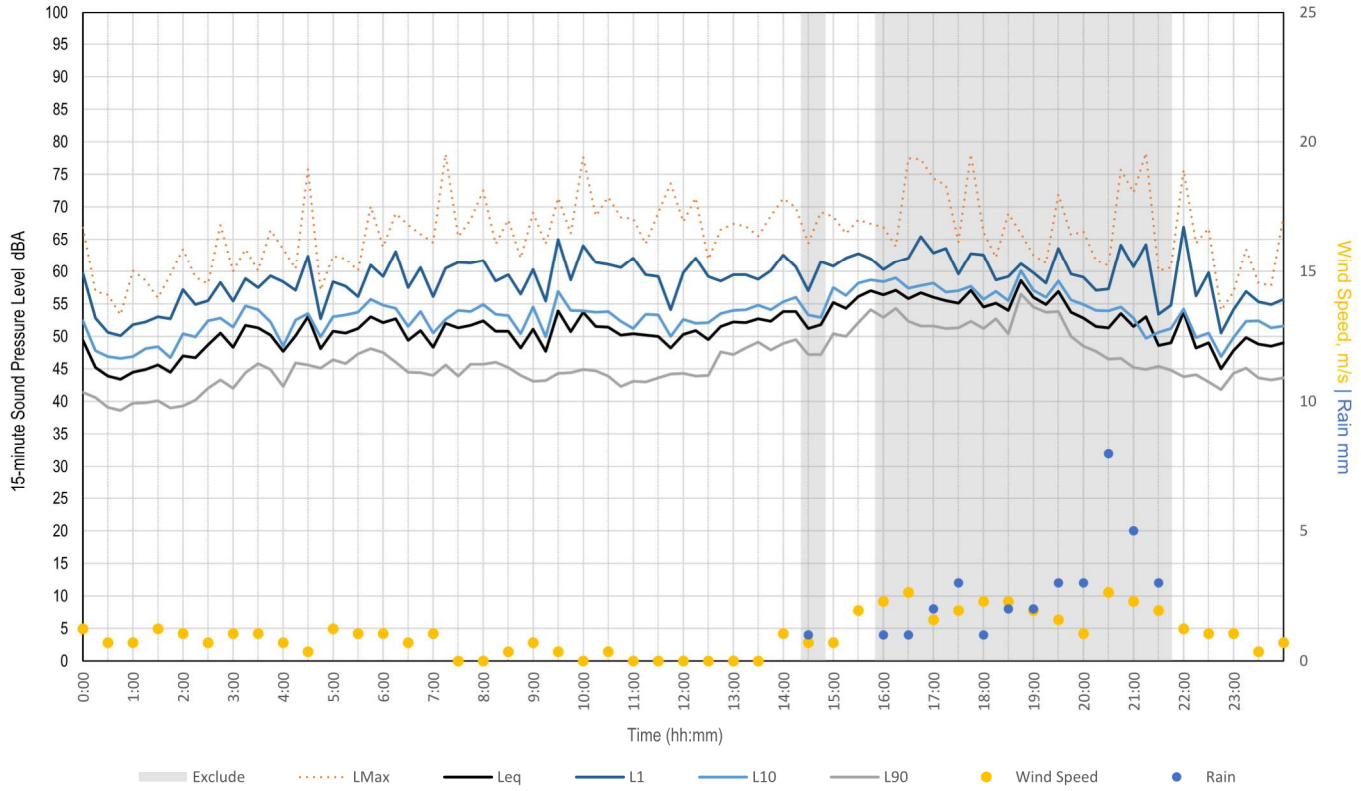
Friday, 07 October 2022



Noise Logger Results

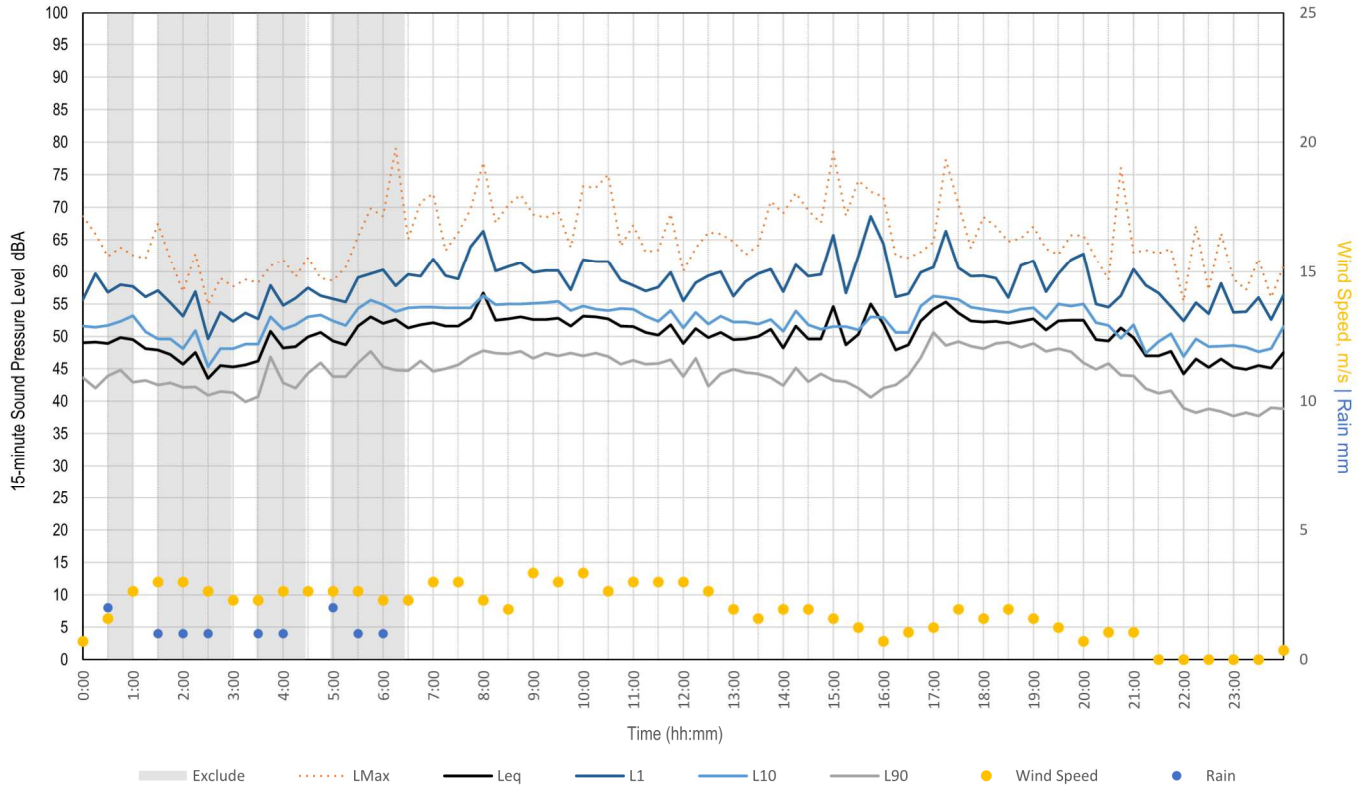
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Saturday, 08 October 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

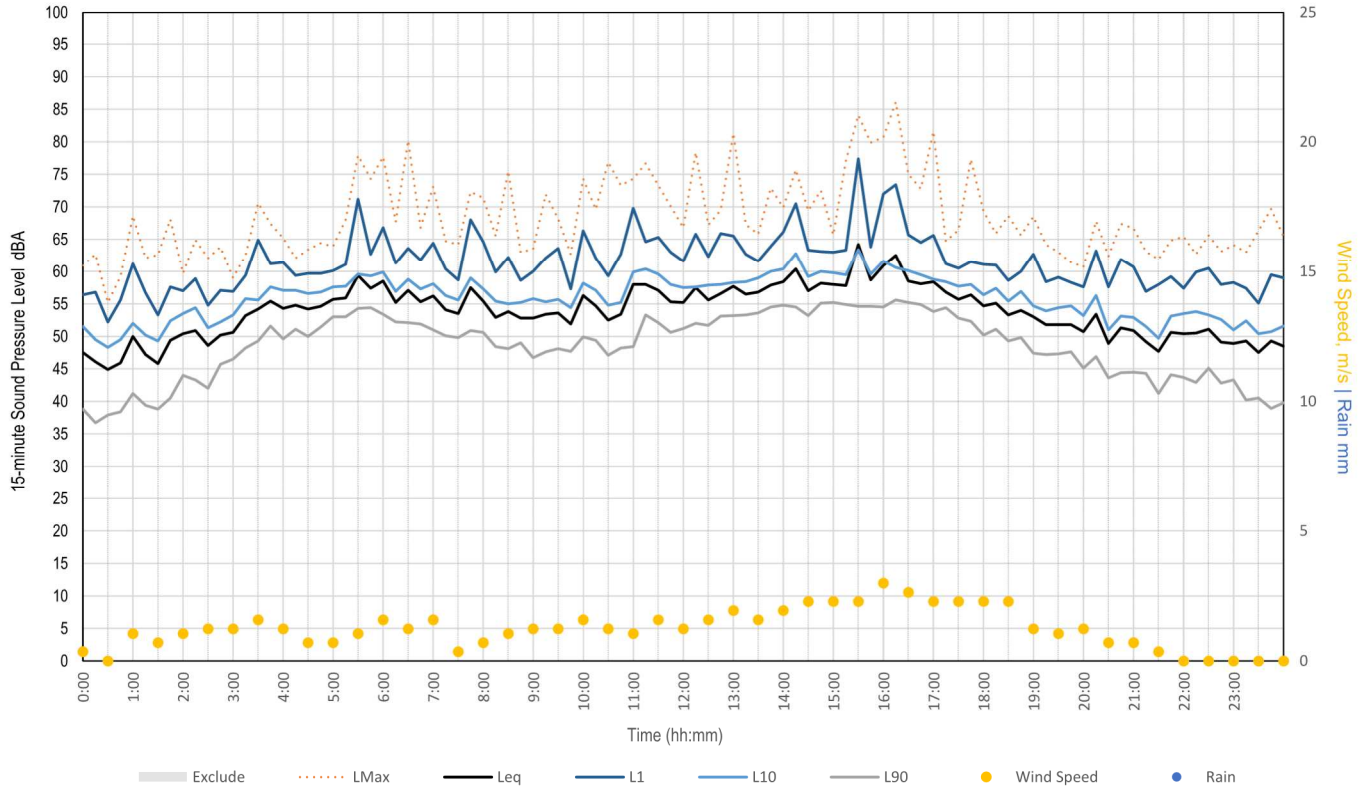
Sunday, 09 October 2022



Noise Logger Results

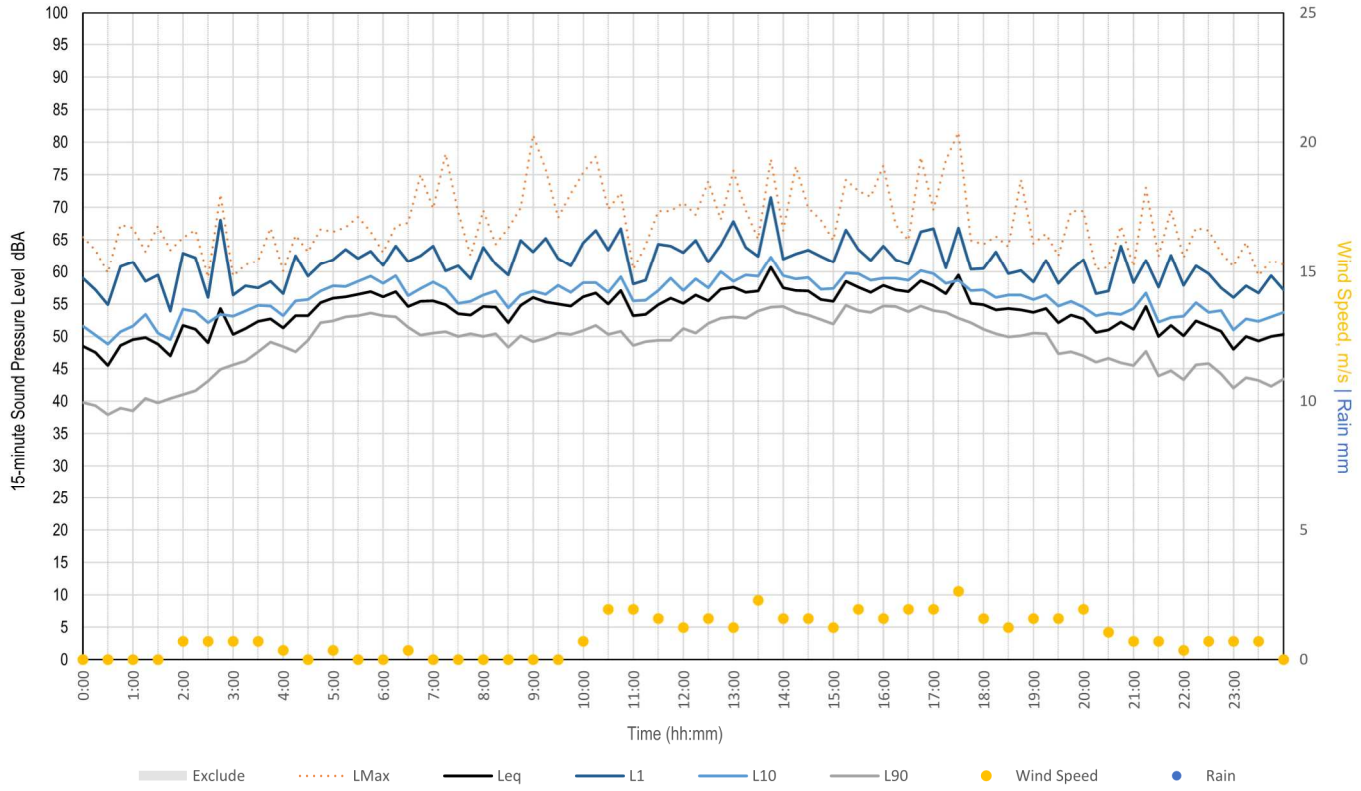
Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Monday, 10 October 2022



Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

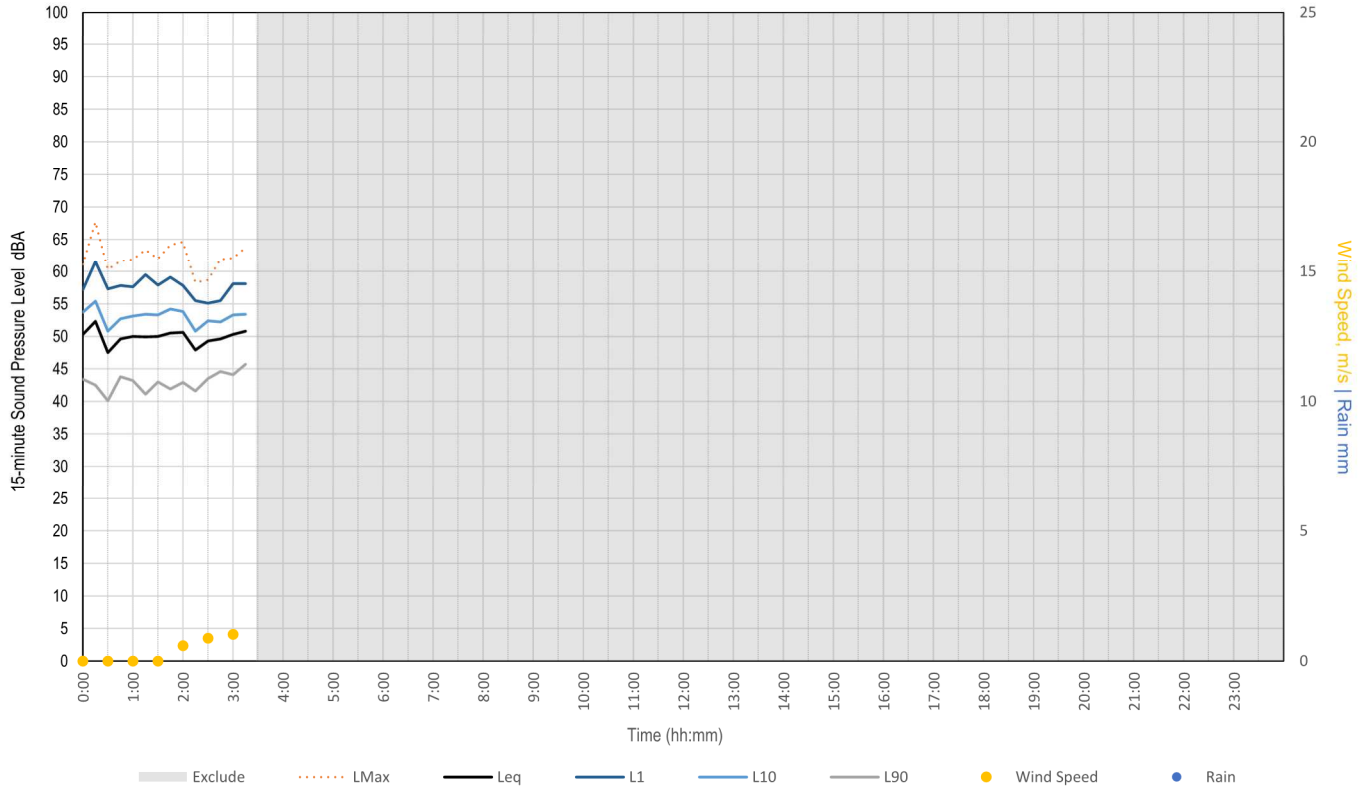
Tuesday, 11 October 2022



Noise Logger Results

Measured Noise Levels - M03 North East Runway - 19 Mandalong Close (Orchard Hills)

Wednesday, 12 October 2022



Background Noise Monitoring

Location	M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & MUA

Unattended Equipment				
Equipment	**Evening**	ARL Ngara	**Serial No. :**	878235
Calibration	**Pre:**	94.0 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	94.0 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Wednesday, 07 Sep 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placement at free field location in a field with short grass.

Located at fence line towards row of residential structures (approx. 50m away from closest building).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	9/08/2022	10:50:00 AM	11:05:00 AM	67	47	49	39	
2	Day	9/08/2022	11:05:00 AM	11:20:00 AM	77	54	54	40	
3	Day	9/08/2022	11:23:00 AM	11:34:00 AM	62	48	53	40	
4	Day	9/08/2022	11:35:00 AM	11:50:00 AM	76	50	51	40	
5	Evening	14/08/2022	6:30:00 PM	6:45:00 PM	61	40	41	36	*
6	Evening	14/08/2022	7:15:00 PM	7:30:00 PM	57	38	40	35	*
7	Evening	14/08/2022	8:30:00 PM	8:45:00 PM	56	41	45	34	*
8	Evening	14/08/2022	9:15:00 PM	9:30:00 PM	89	56	43	34	*
9	Night	13/08/2022	12:00:00 AM	12:15:00 AM	89	57	42	35	*
10	Night	13/08/2022	3:00:00 AM	3:15:00 AM	48	37	41	33	*
11	Night	13/08/2022	10:45:00 PM	11:00:00 PM	76	54	46	38	*
12	Night	13/08/2022	11:30:00 PM	11:45:00 PM	66	45	45	39	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird calls in adjacent trees. Occasional sounds of vehicles passing on local street (Twin Creeks Drive). Lawn mower on golf course (≥ 20 metres away) influenced noise level while in operation depending on distance. Several flight passbys were noted, duration of approx. 30 sec and with maximum levels between 43 and 54 dBA.
Background noise	Movement in vegetation due to wind (e.g. grass and tree leaves rustling).
Evening	
Ambient noise	Constant insect noise of varying intensity. Occasional sound of vehicles passing on street. Various impulsive animal noises (e.g. frog/toads, birds, dog barks). Several aircraft flyovers were observed.
Background noise	Movement in vegetation due to wind (e.g. grass and tree leaves rustling). Constant insect noise.
Night	
Ambient noise	Constant insect noise of varying intensity. Various impulsive animal noises (e.g. frog/toads, birds, dog barks). Animal movement in vegetation (e.g. branches snapping, trees rustling).
Background noise	Movement in vegetation due to wind (e.g. grass and tree leaves rustling

Site Details	M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)
Start Date	Tue 09 August 2022
End Date	Wed 07 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	49
$L_{eq, Evening}$ dBA	47
$L_{eq, Night}$ dBA	45
RBL, $_{Day}$ dBA	34
RBL, $_{Evening}$ dBA	35
RBL, $_{Night}$ dBA	33

Daily Summary

Date	09/08	10/08	11/08	12/08	13/08	14/08	15/08	16/08
$L_{eq, Day}$ dBA	47	46	47	46	46	48	48	47
$L_{eq, Evening}$ dBA	56	51	45	54	47	46	47	46
$L_{eq, Night}$ dBA	40	42	43	45	51	47	42	43
ABL, $_{Day}$ dBA	35	31	37	38	33	35	37	35
ABL, $_{Evening}$ dBA	31	35	36	35	37	34	33	30
ABL, $_{Night}$ dBA	29	34	35	32	34	31	32	32

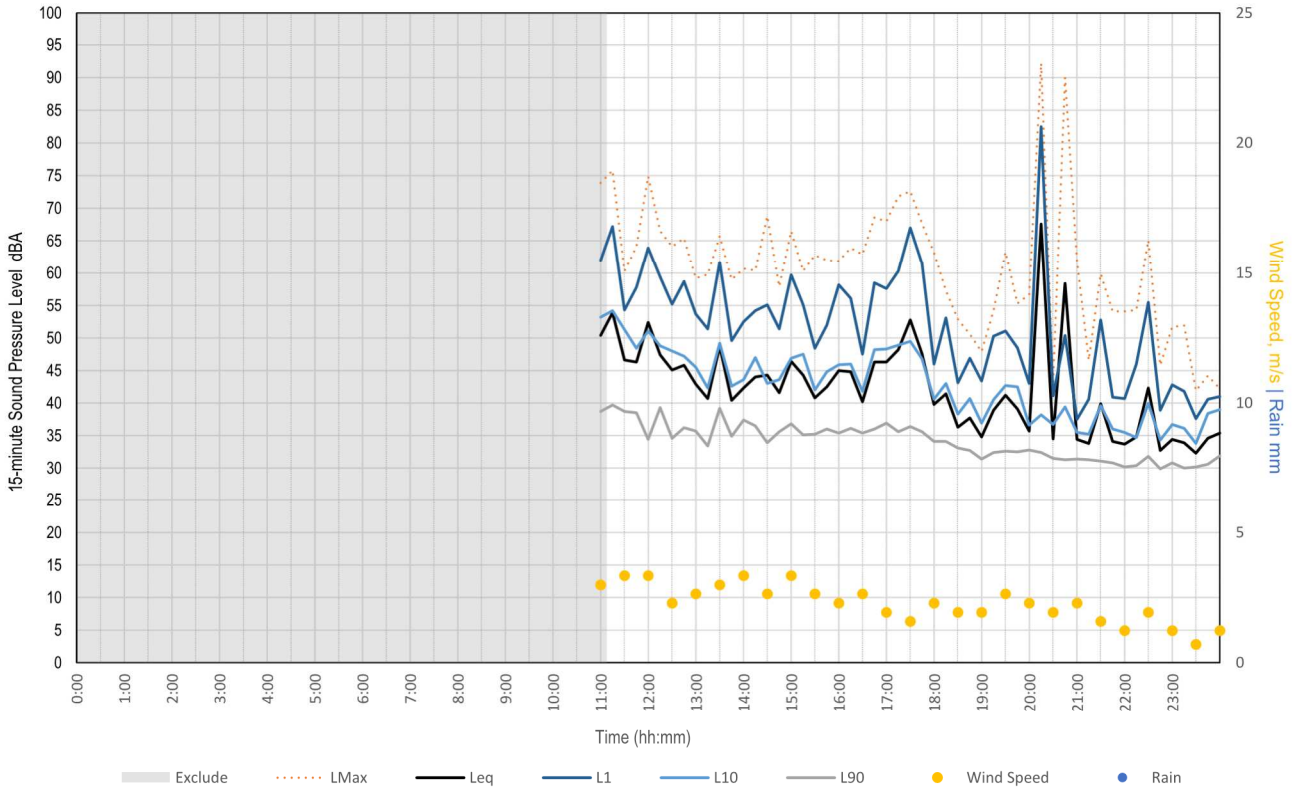
Date	17/08	18/08	19/08	20/08	21/08	22/08	23/08	24/08
$L_{eq, Day}$ dBA	47	47	46	51	56	47	49	51
$L_{eq, Evening}$ dBA	43	48	41	43	43	42	42	40
$L_{eq, Night}$ dBA	43	41	41	37	42	47	42	42
ABL, $_{Day}$ dBA	31	34	33	33	31	35	37	34
ABL, $_{Evening}$ dBA	36	36	33	32	37	33	37	32
ABL, $_{Night}$ dBA	33	33	33	27	35	34	29	33

Date	25/08	26/08	27/08	28/08	29/08	30/08	31/08	01/09
$L_{eq, Day}$ dBA	48	47	55	47	46	49	47	48
$L_{eq, Evening}$ dBA	54	45	43	43	42	44	41	44
$L_{eq, Night}$ dBA		49	45	47	44	43	47	42
ABL, $_{Day}$ dBA	33	33	32	35	33	38	34	35
ABL, $_{Evening}$ dBA	32	35	35	36	38	36	35	38
ABL, $_{Night}$ dBA	31	32	32	33	36	35	34	34

Date	02/09	03/09	04/09	05/09	06/09	07/09
$L_{eq, Day}$ dBA	47	48	45	48	49	46
$L_{eq, Evening}$ dBA	41	41	41	40	39	
$L_{eq, Night}$ dBA	48	48	43	41	42	
ABL, $_{Day}$ dBA	34	37	33	32	32	34
ABL, $_{Evening}$ dBA	33	36	35	34	32	
ABL, $_{Night}$ dBA	33	34	34	31	30	

Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

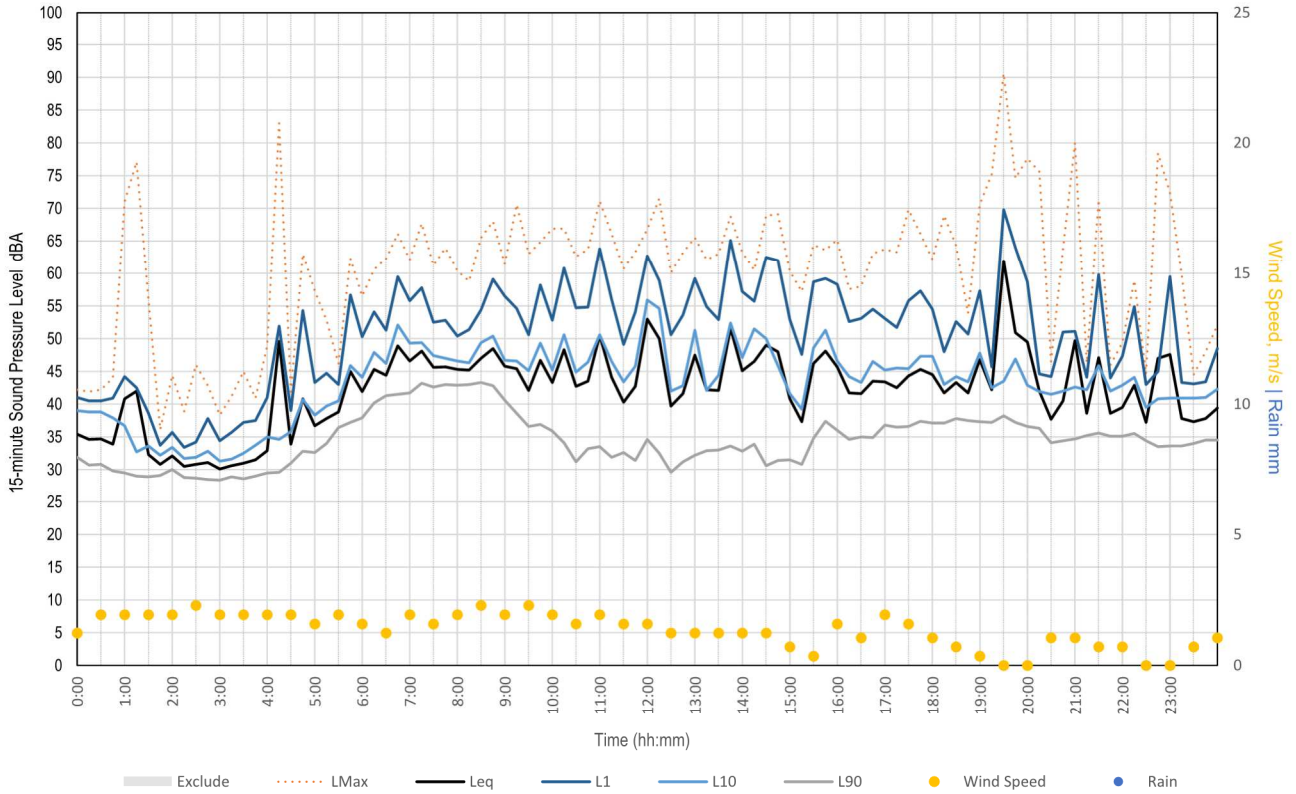
Tuesday, 09 August 2022



Noise Logger Results

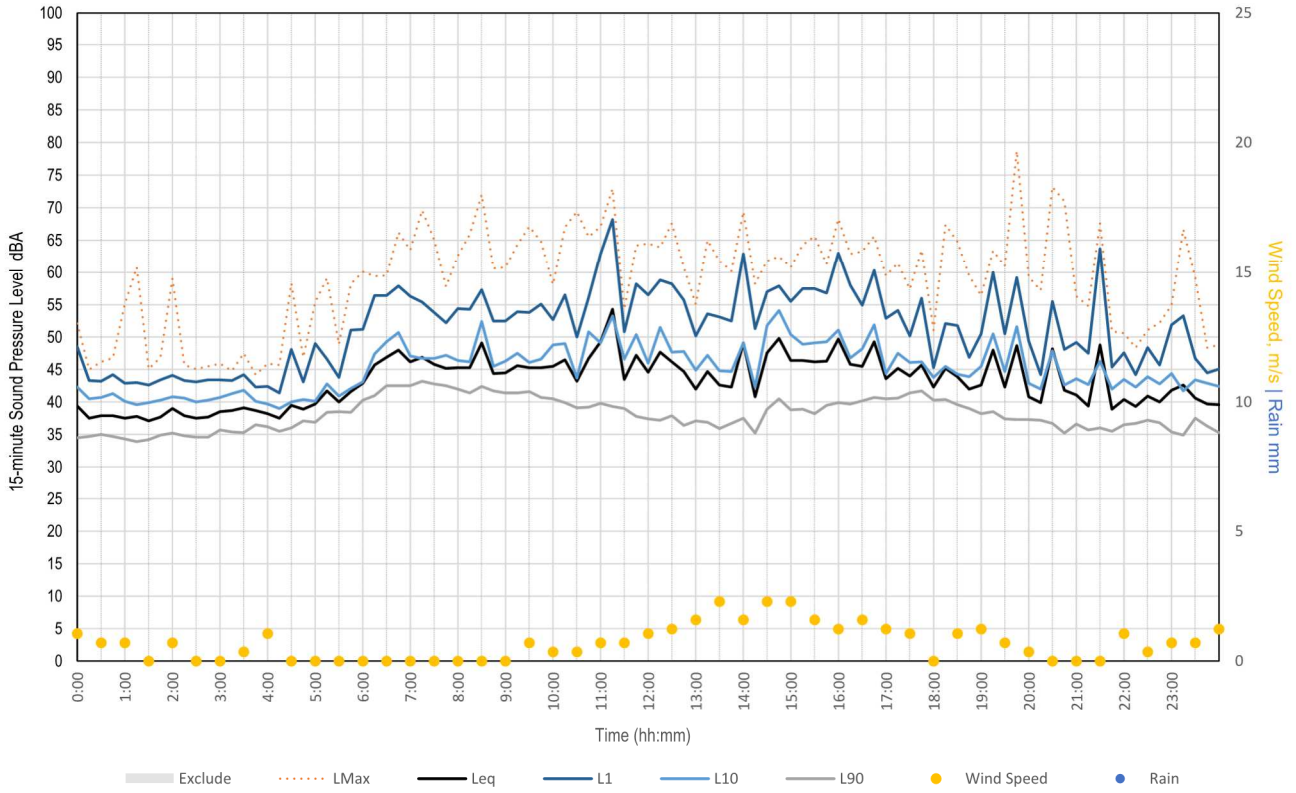
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Wednesday, 10 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

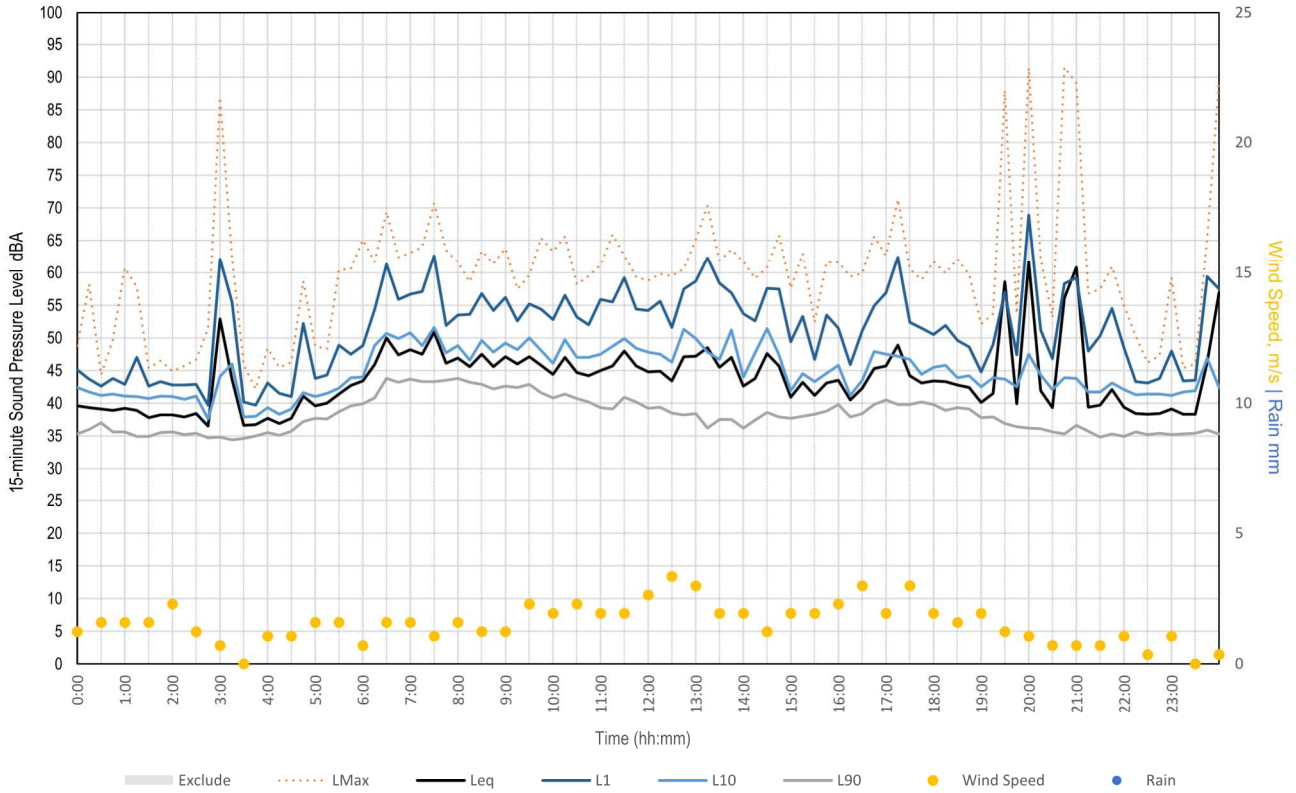
Thursday, 11 August 2022



Noise Logger Results

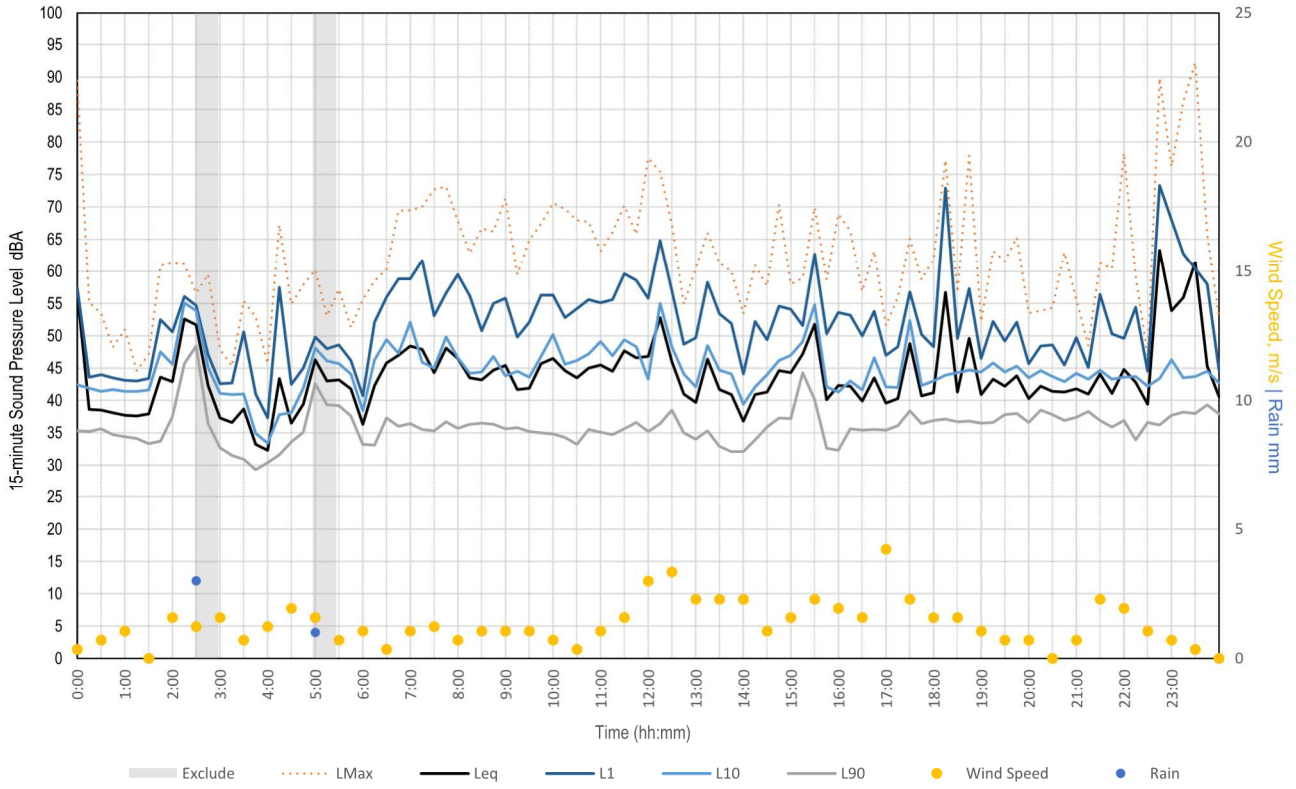
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Friday, 12 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

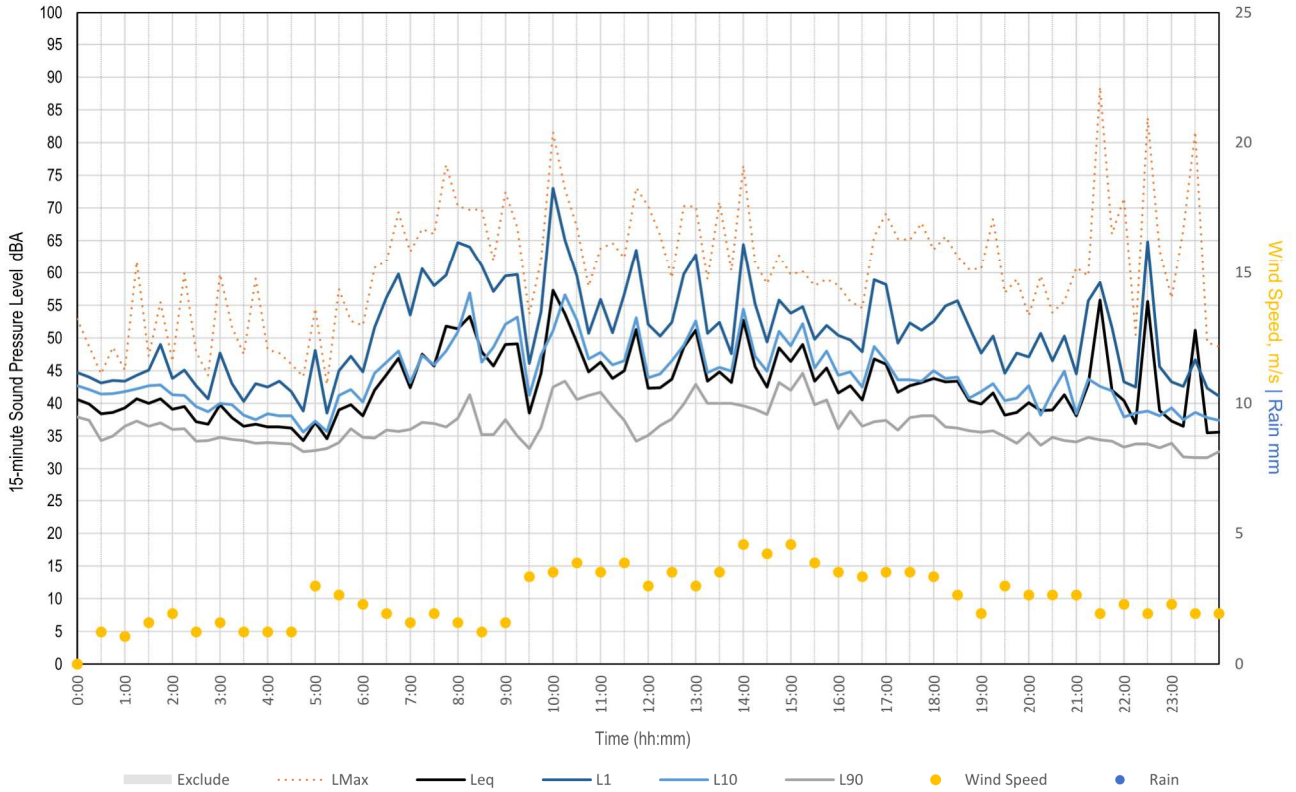
Saturday, 13 August 2022



Noise Logger Results

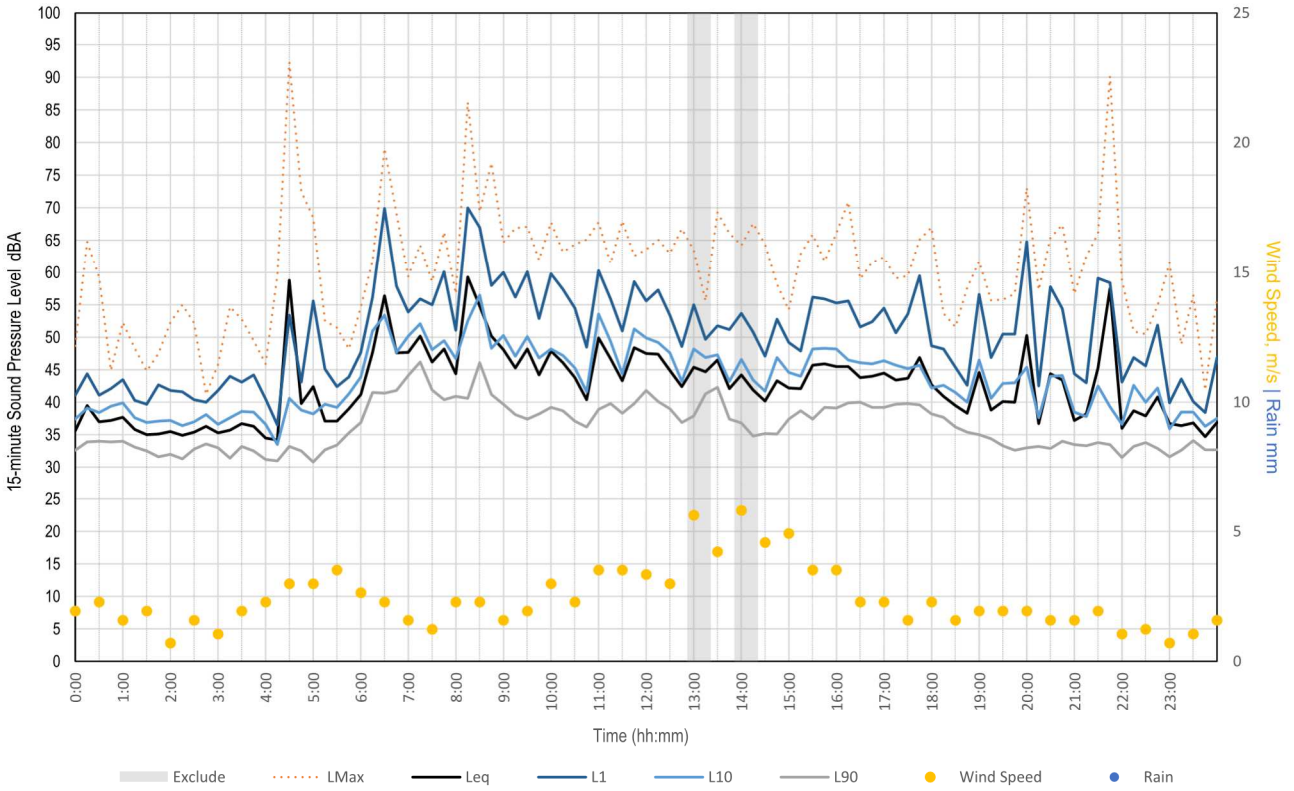
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Sunday, 14 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

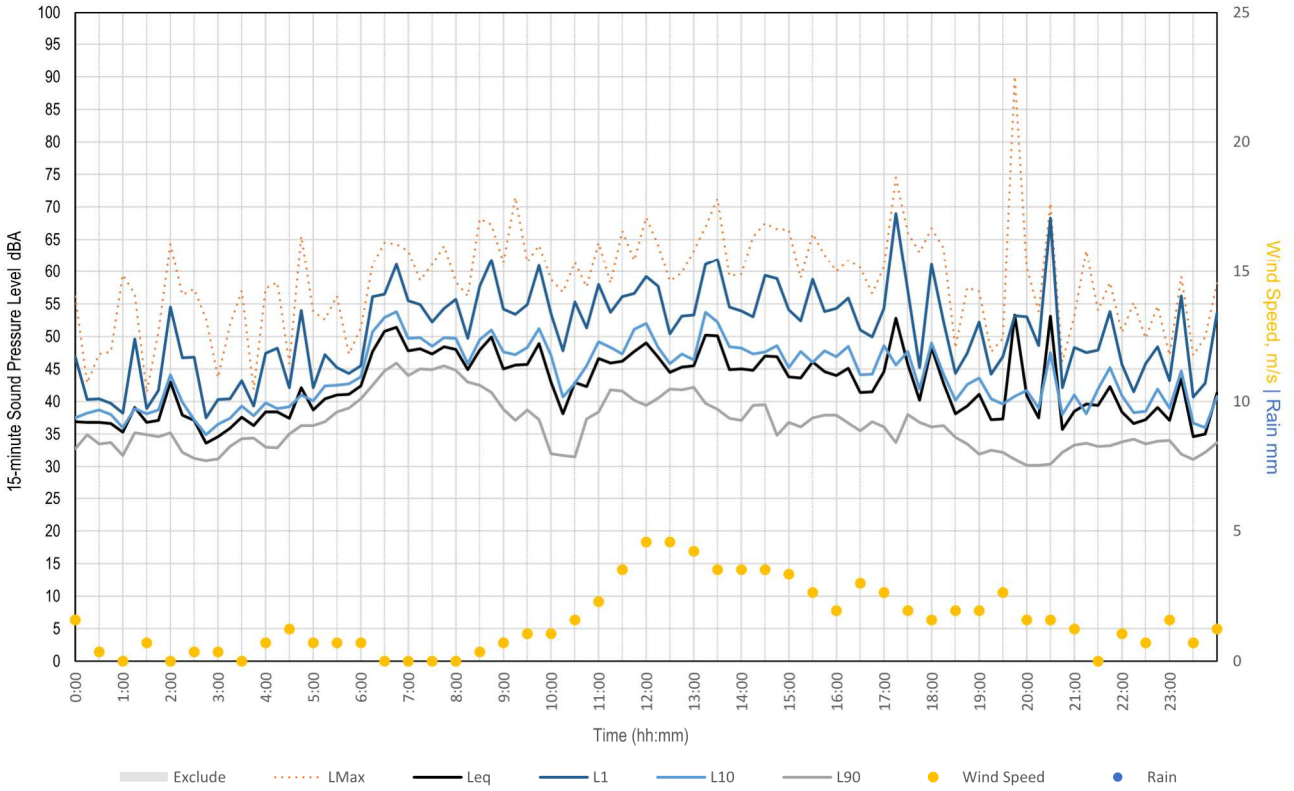
Monday, 15 August 2022



Noise Logger Results

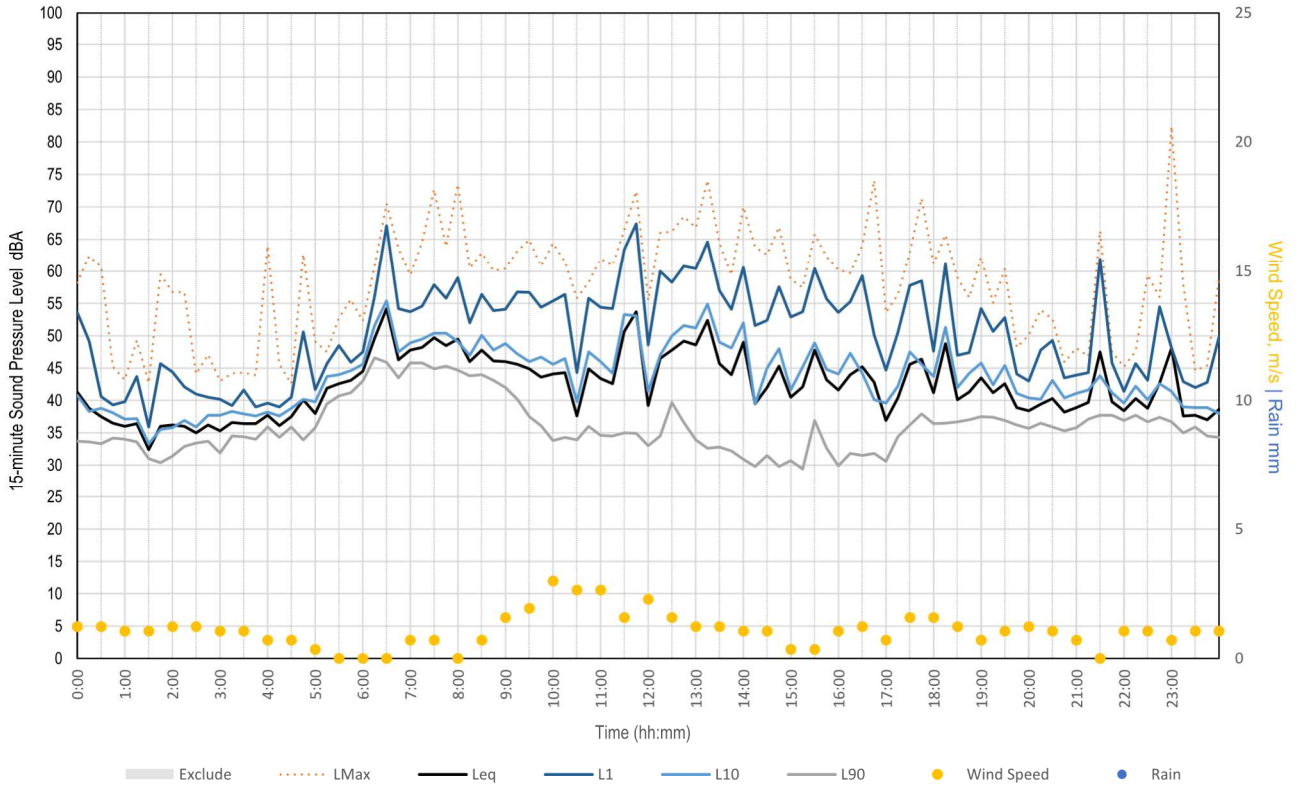
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Tuesday, 16 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

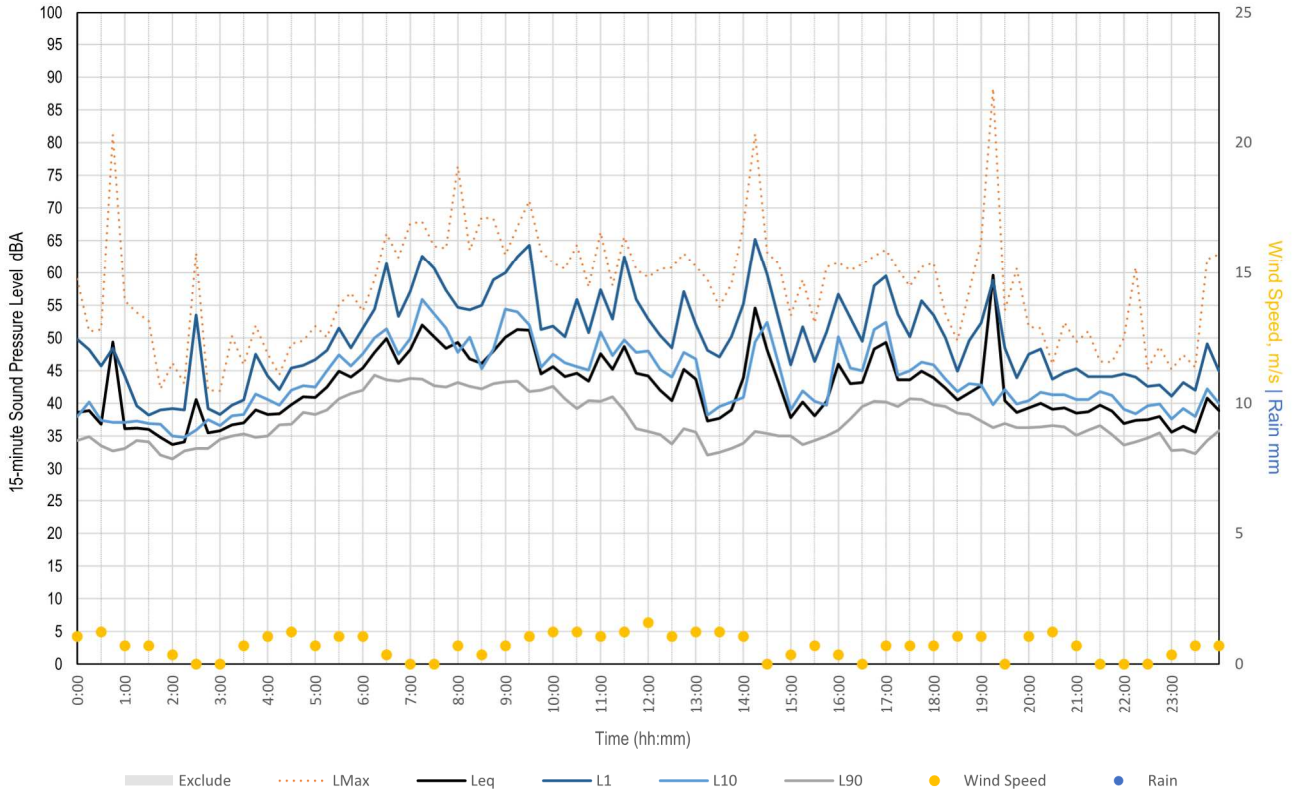
Wednesday, 17 August 2022



Noise Logger Results

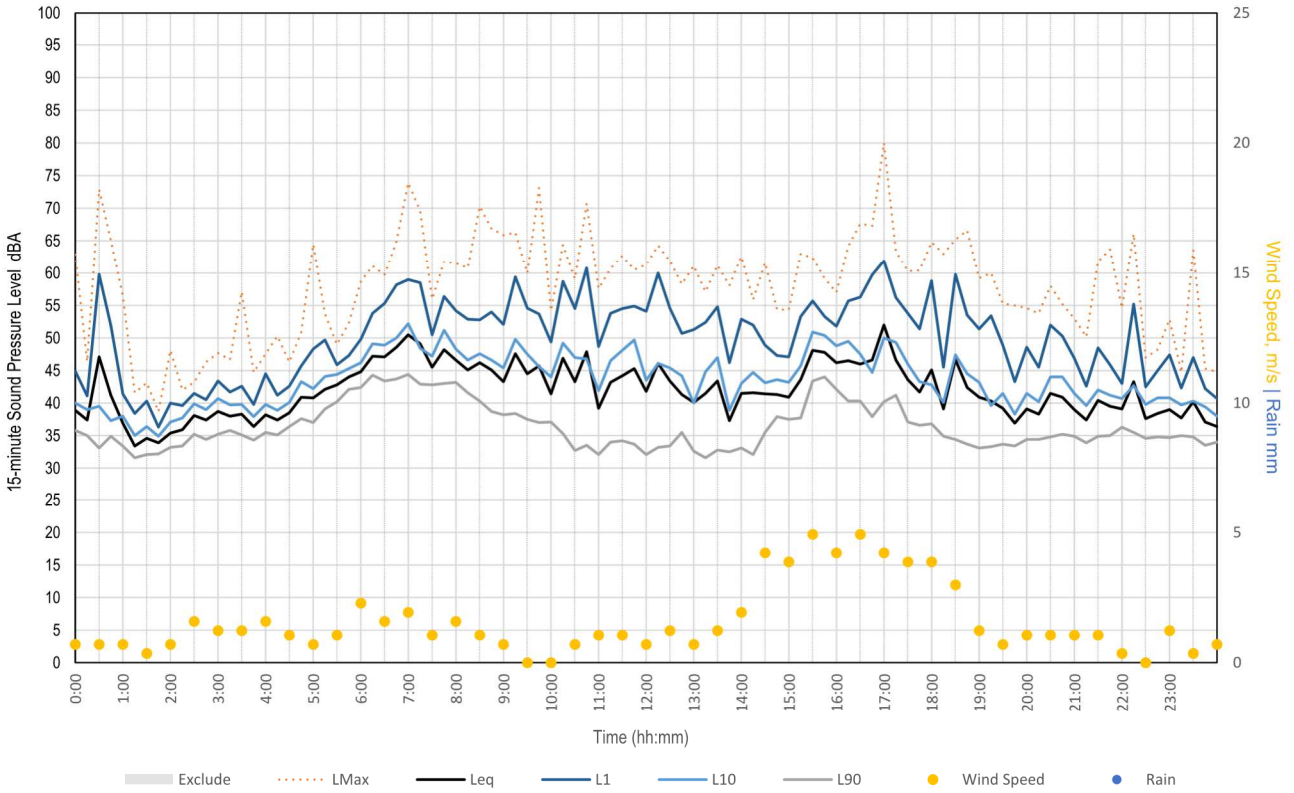
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Thursday, 18 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

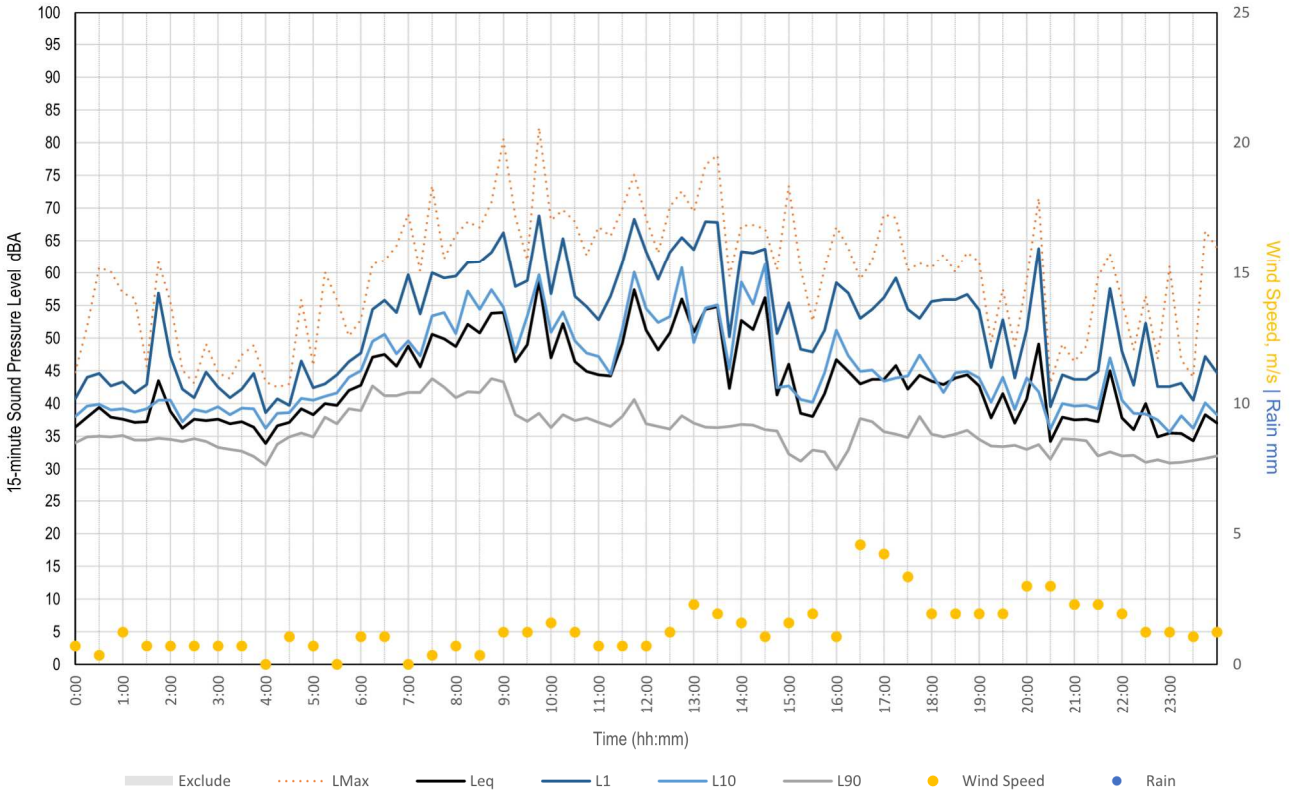
Friday, 19 August 2022



Noise Logger Results

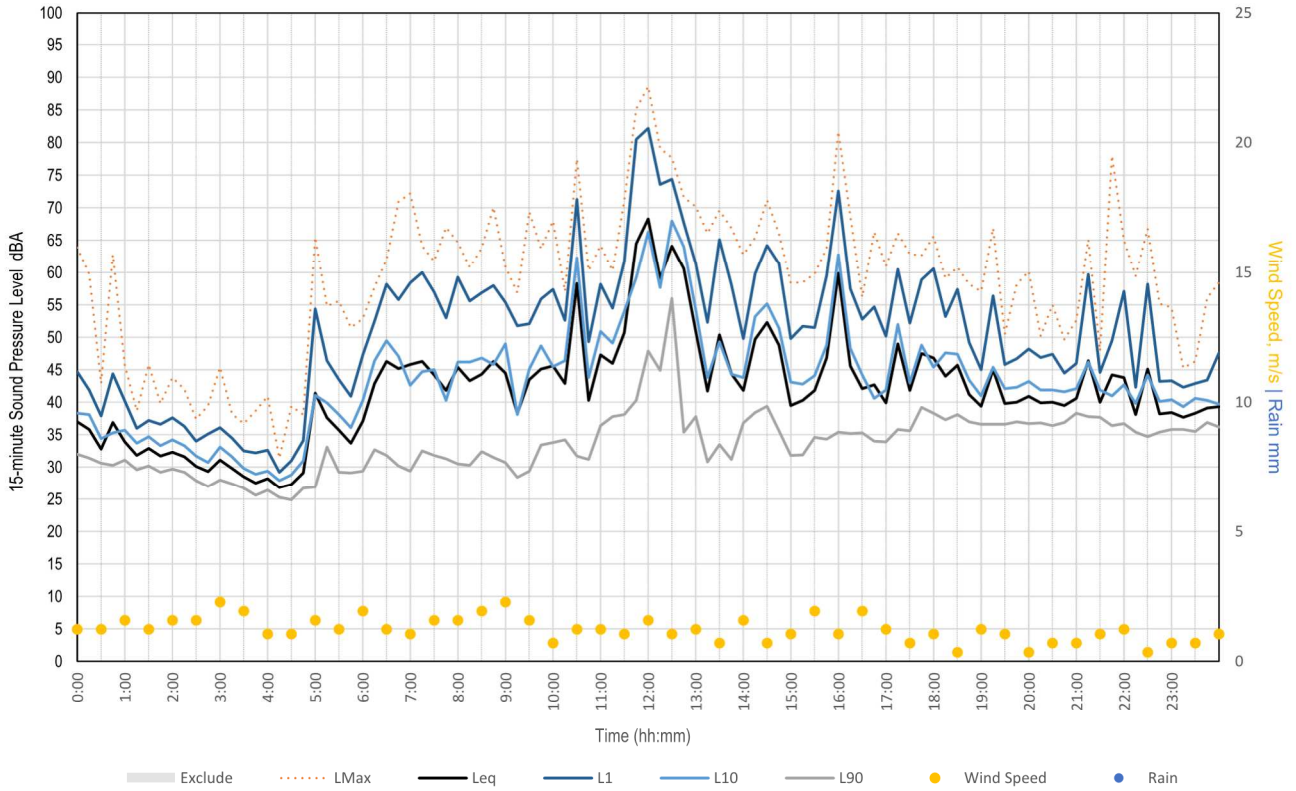
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Saturday, 20 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

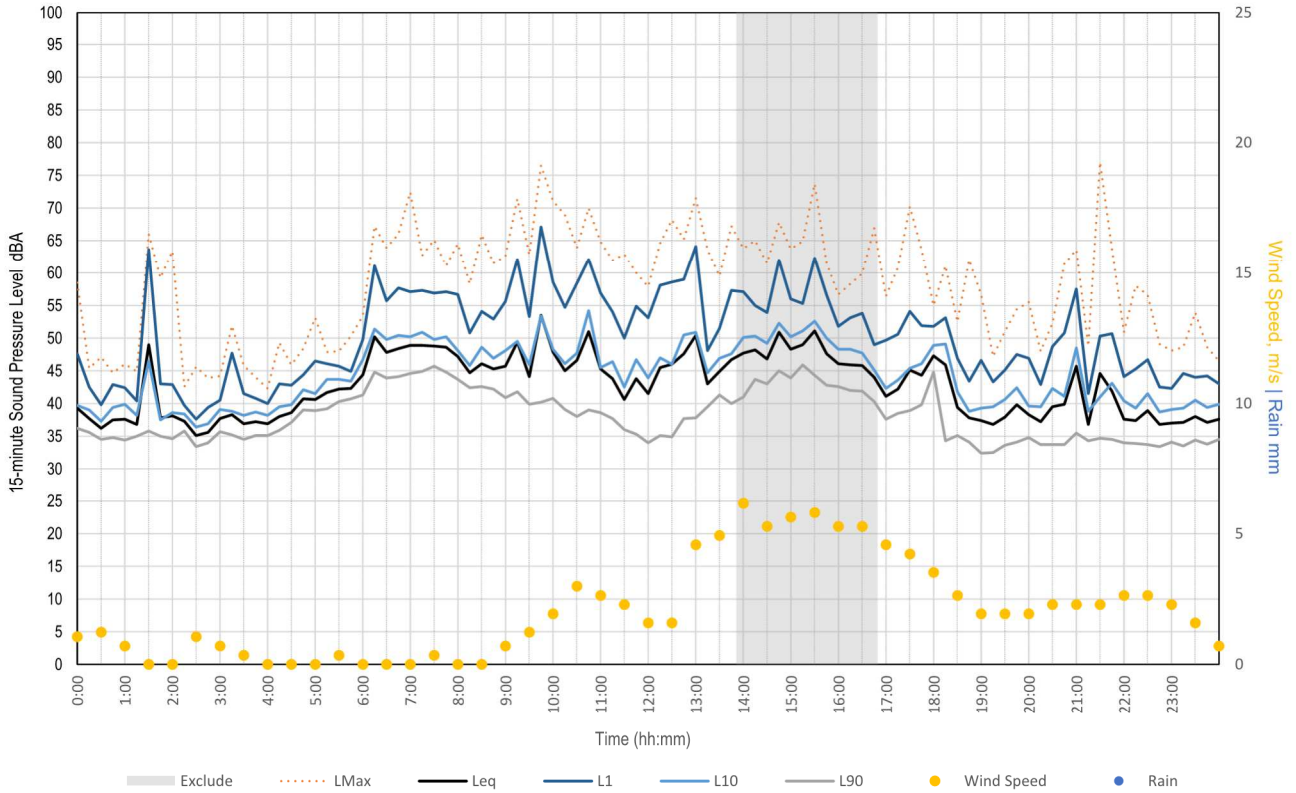
Sunday, 21 August 2022



Noise Logger Results

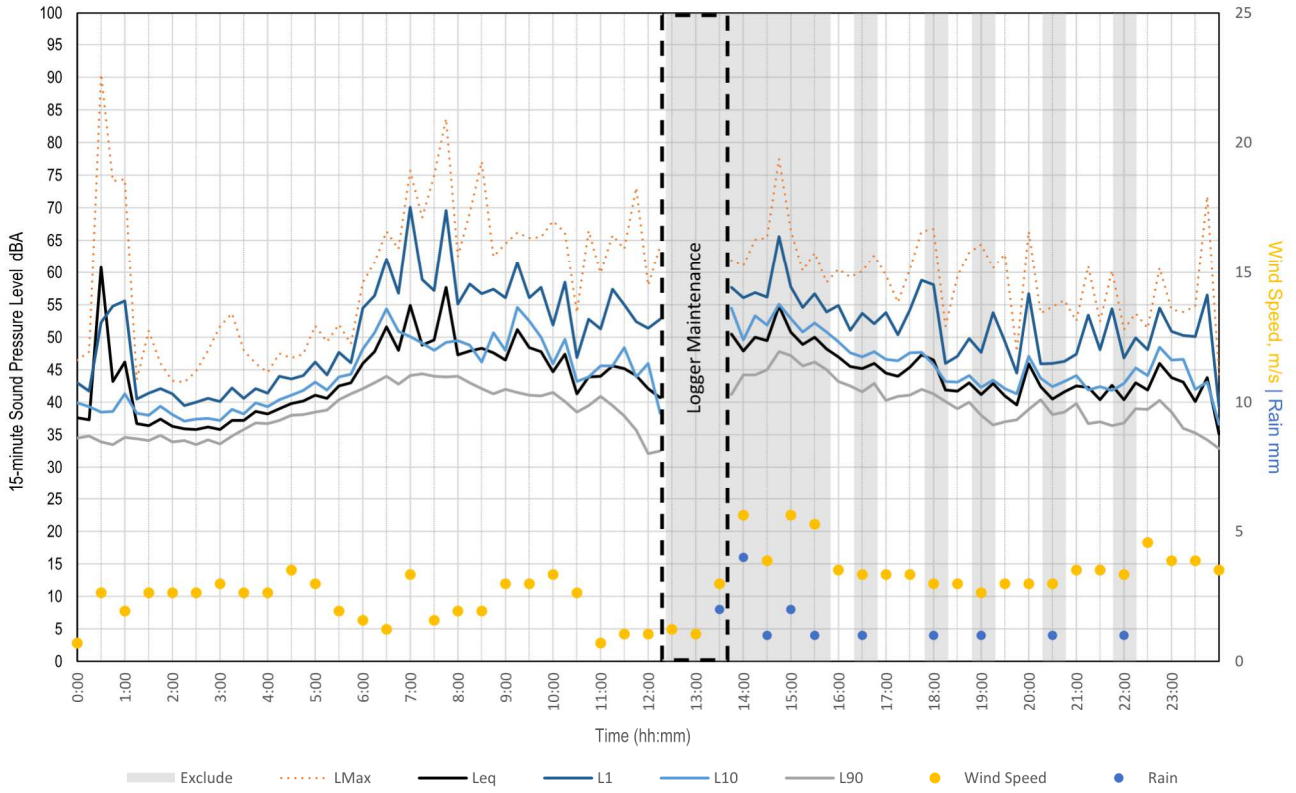
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Monday, 22 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

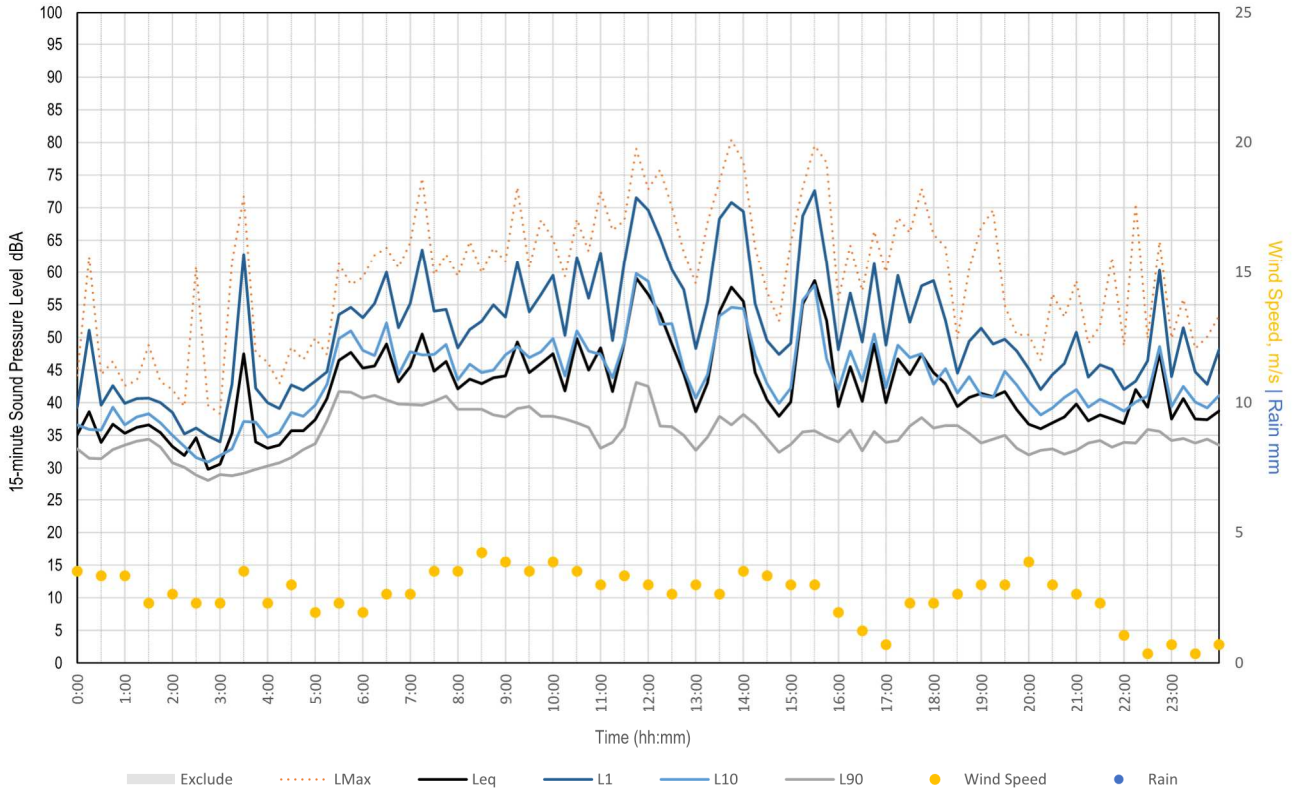
Tuesday, 23 August 2022



Noise Logger Results

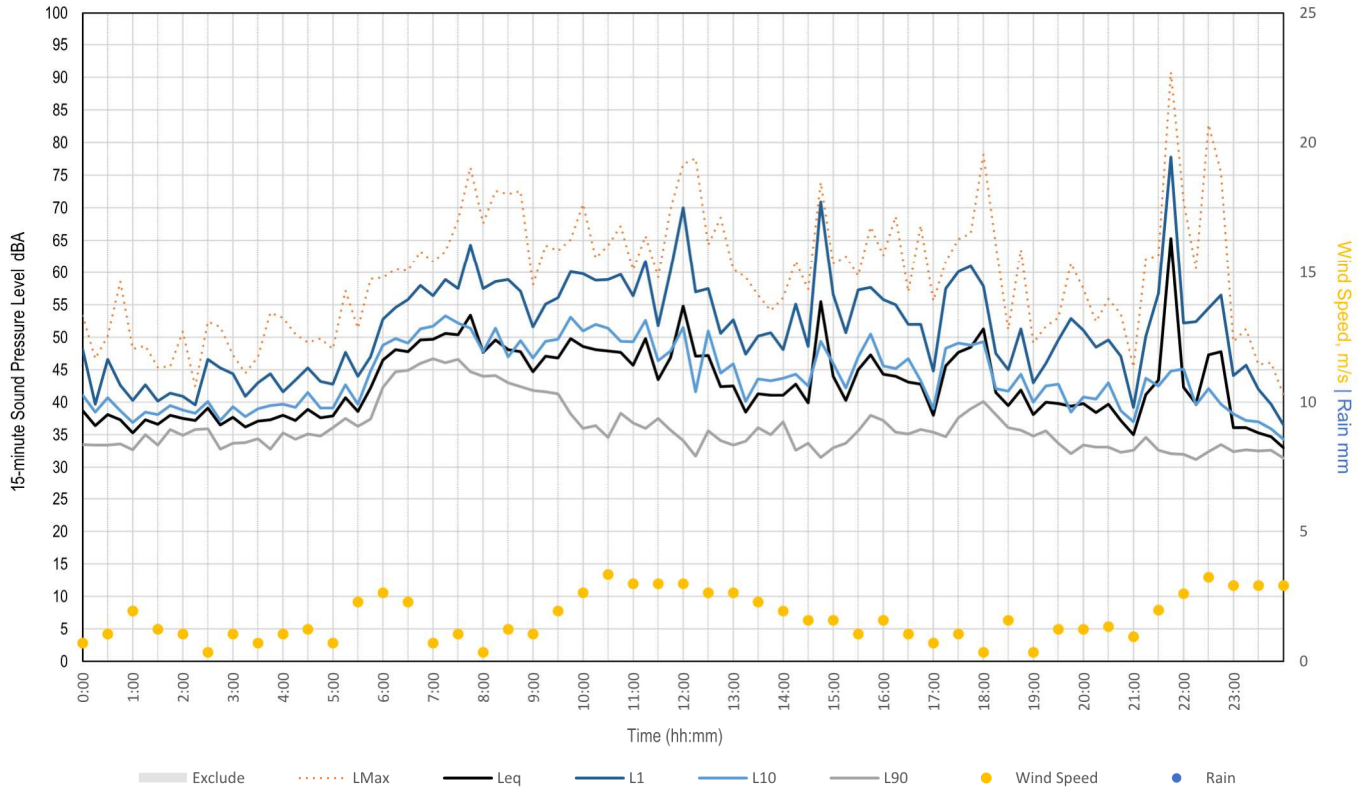
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Wednesday, 24 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

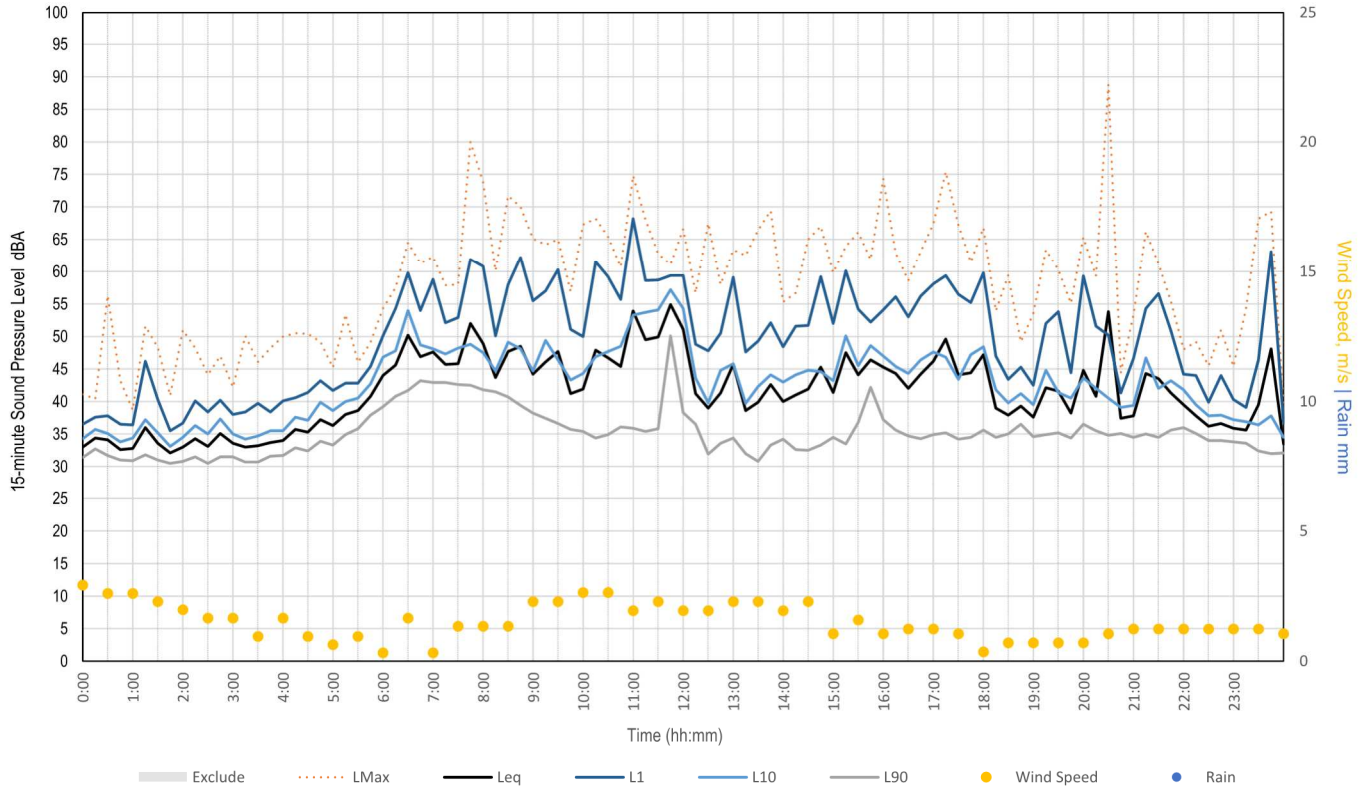
Thursday, 25 August 2022



Noise Logger Results

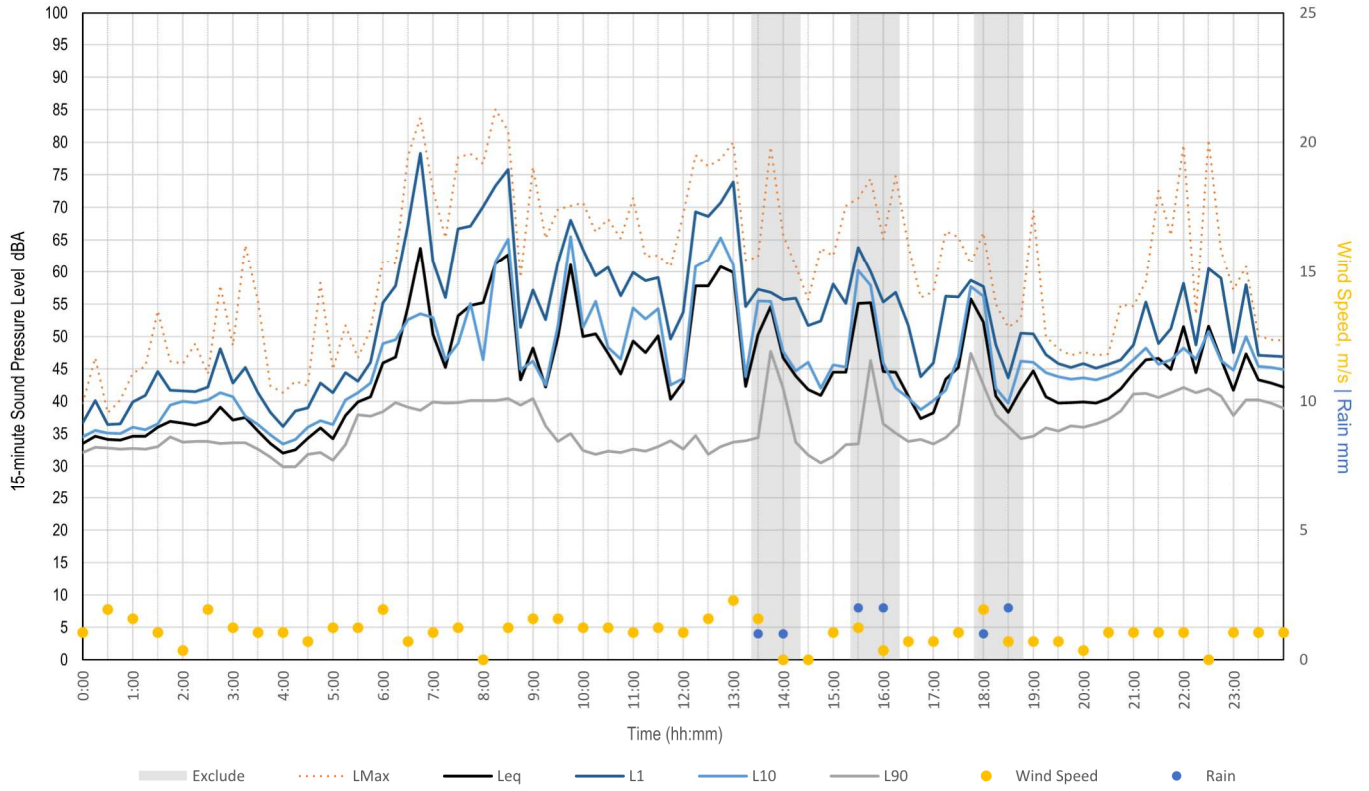
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Friday, 26 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

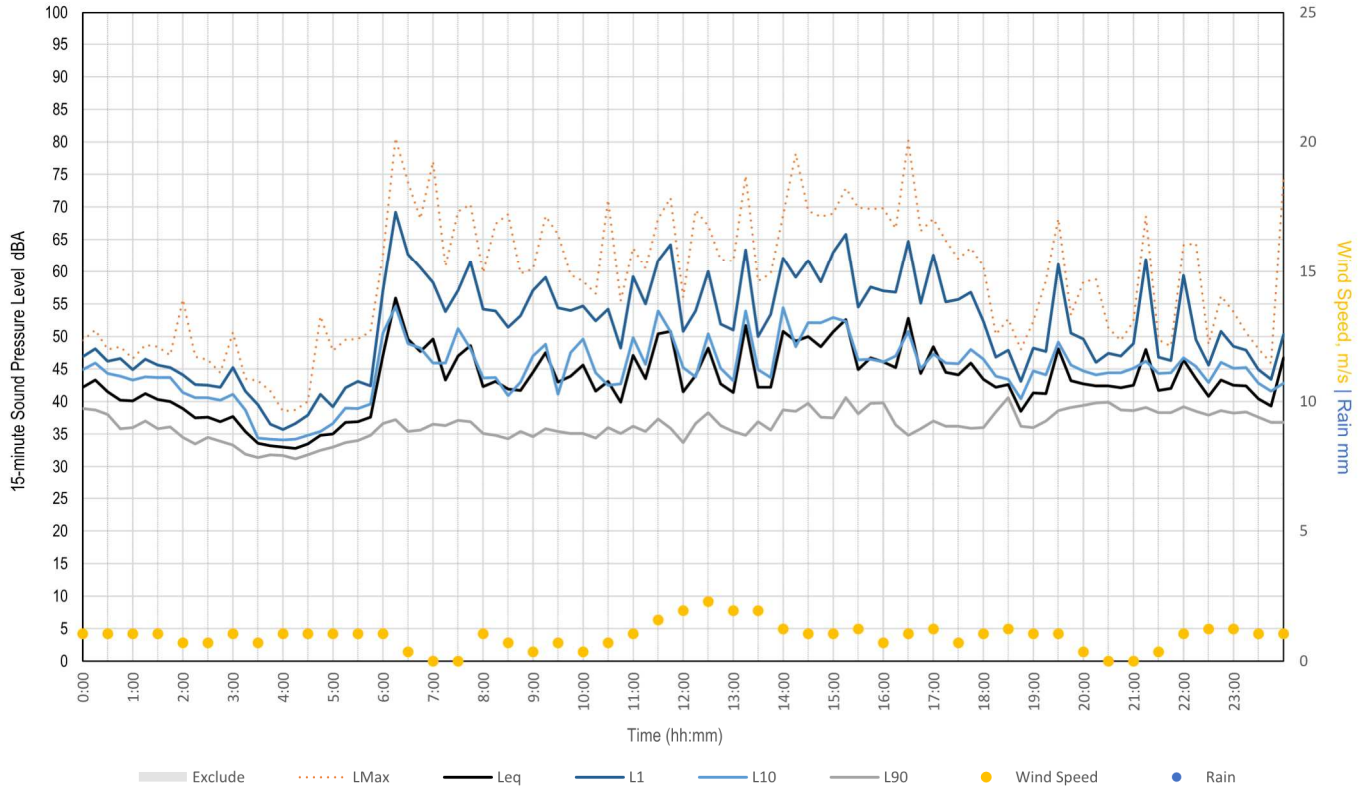
Saturday, 27 August 2022



Noise Logger Results

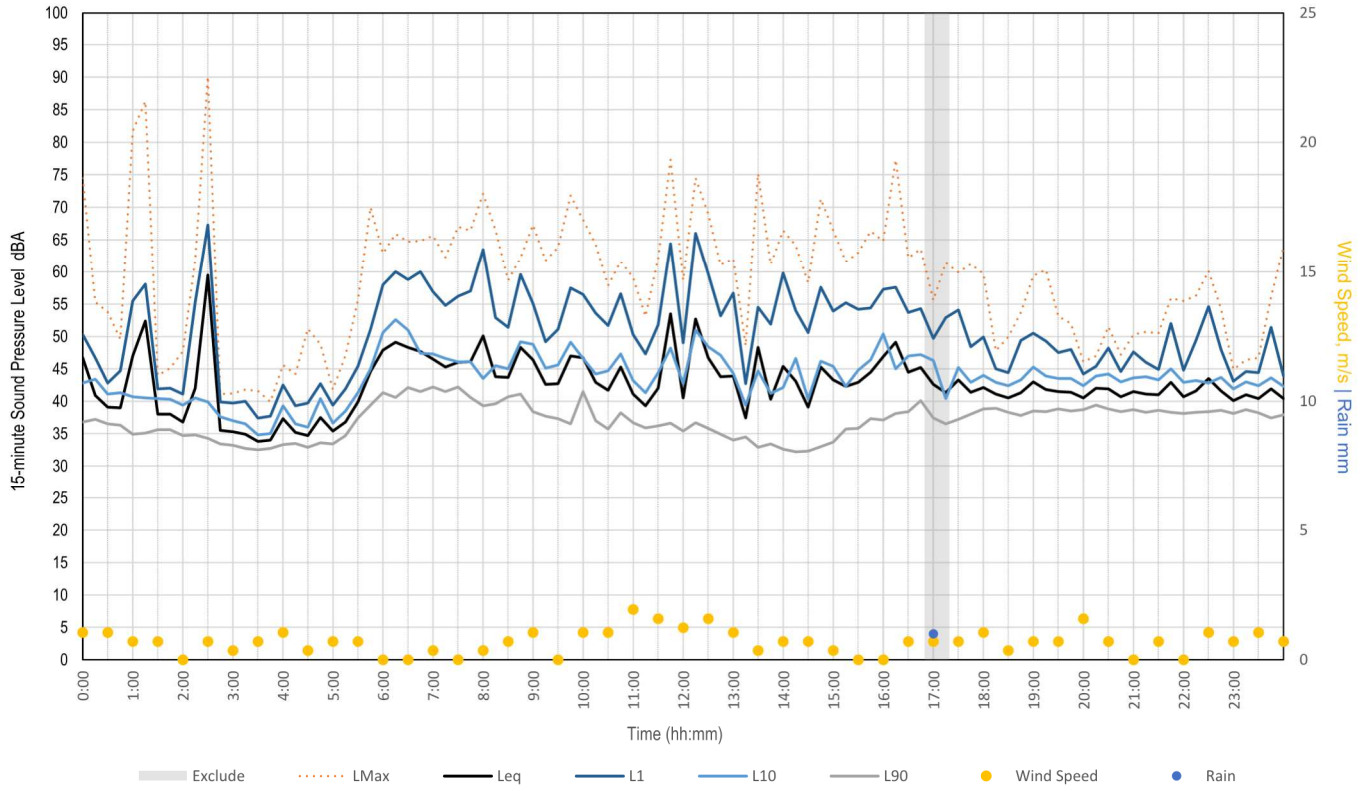
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Sunday, 28 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

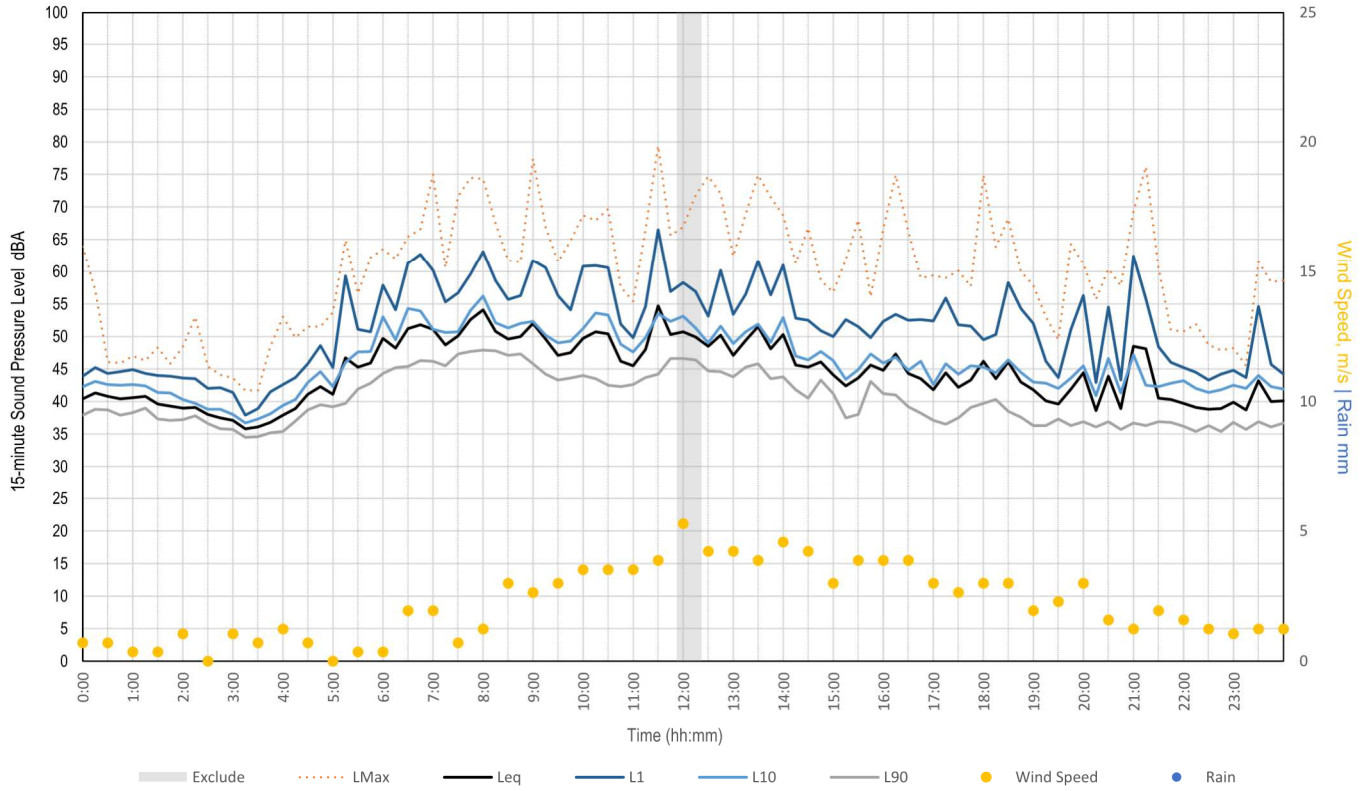
Monday, 29 August 2022



Noise Logger Results

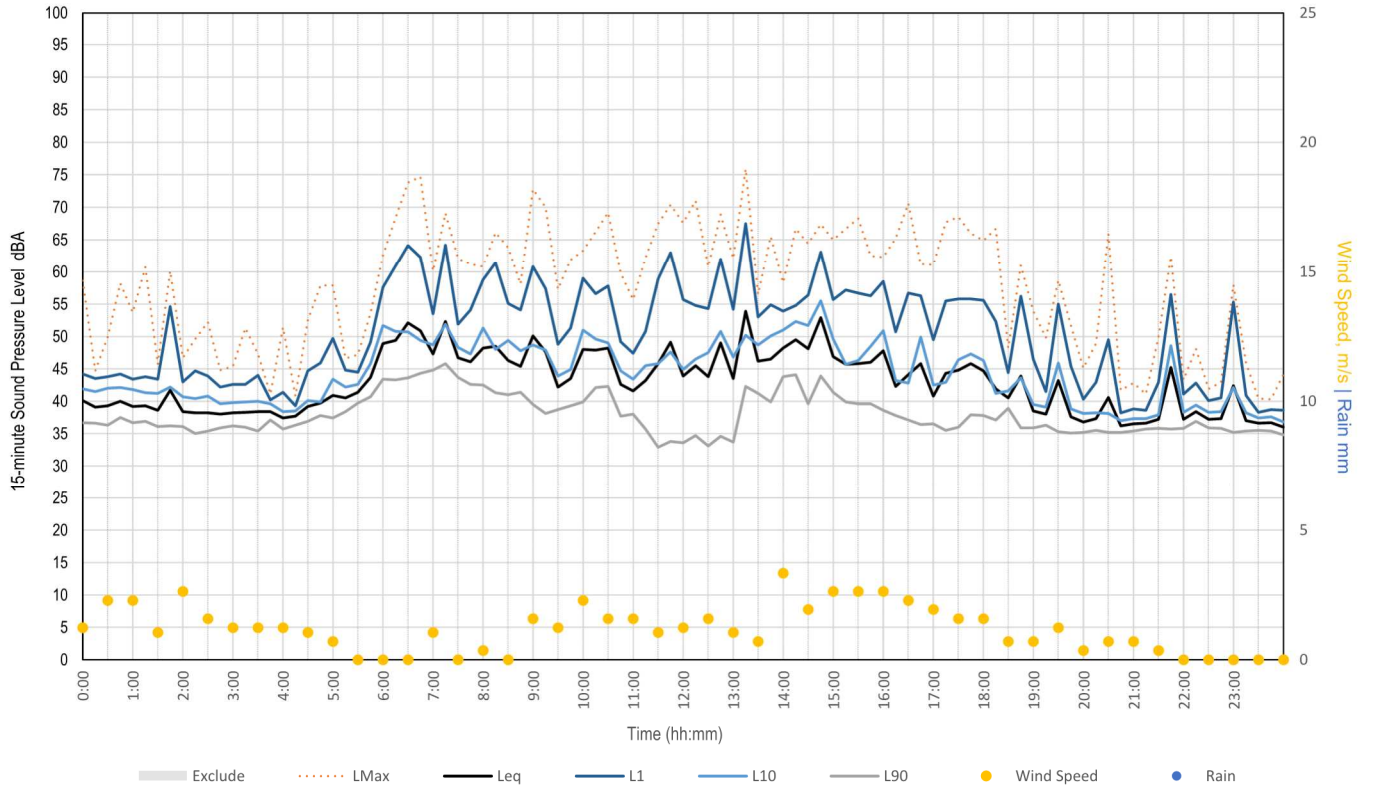
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Tuesday, 30 August 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

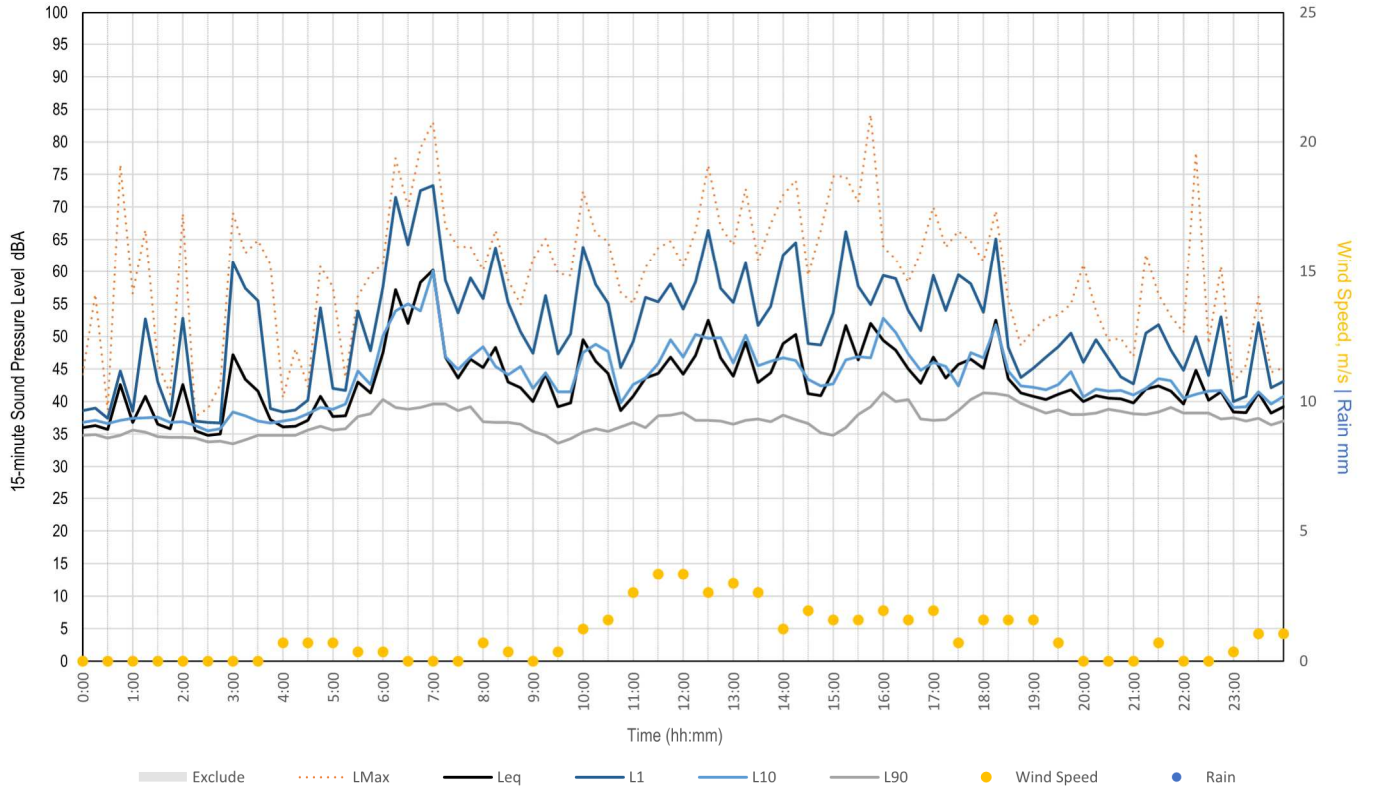
Wednesday, 31 August 2022



Noise Logger Results

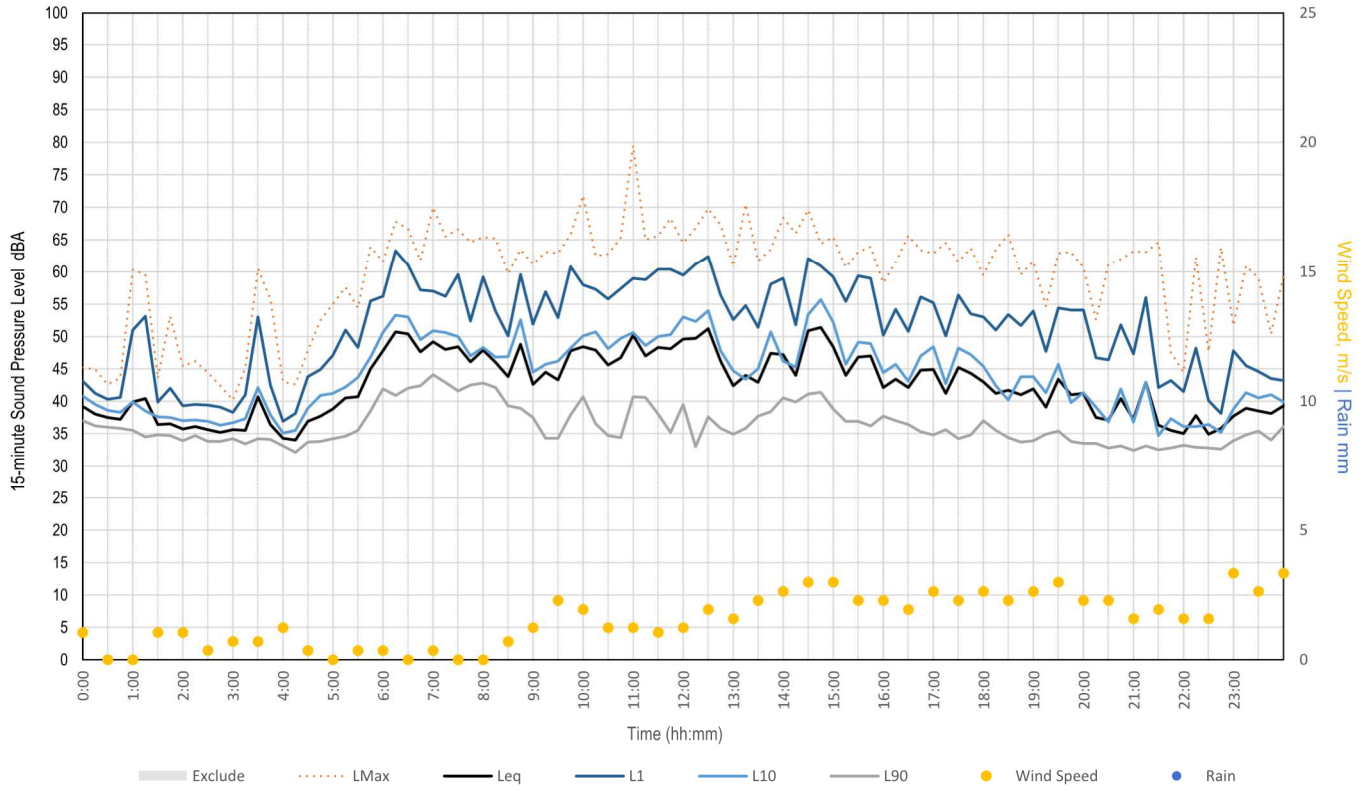
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Thursday, 01 September 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

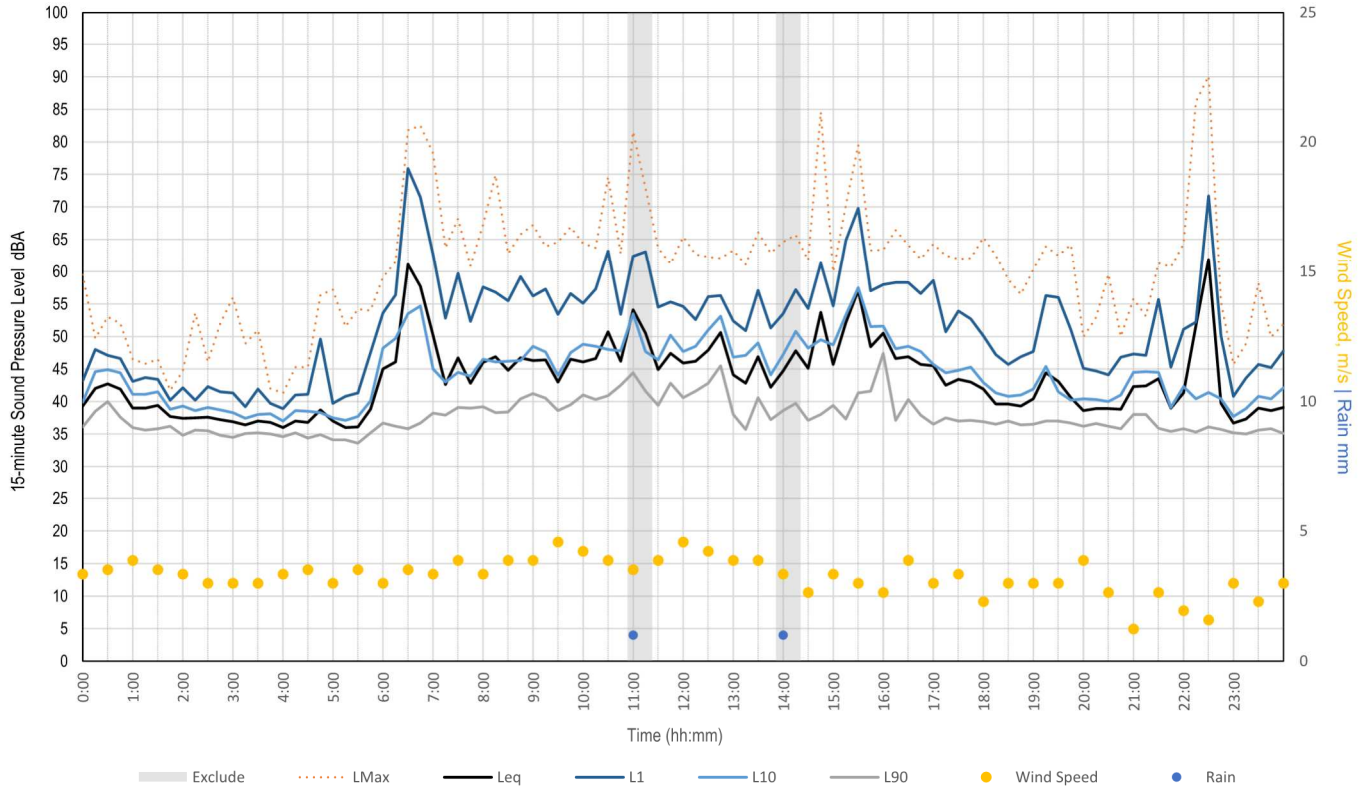
Friday, 02 September 2022



Noise Logger Results

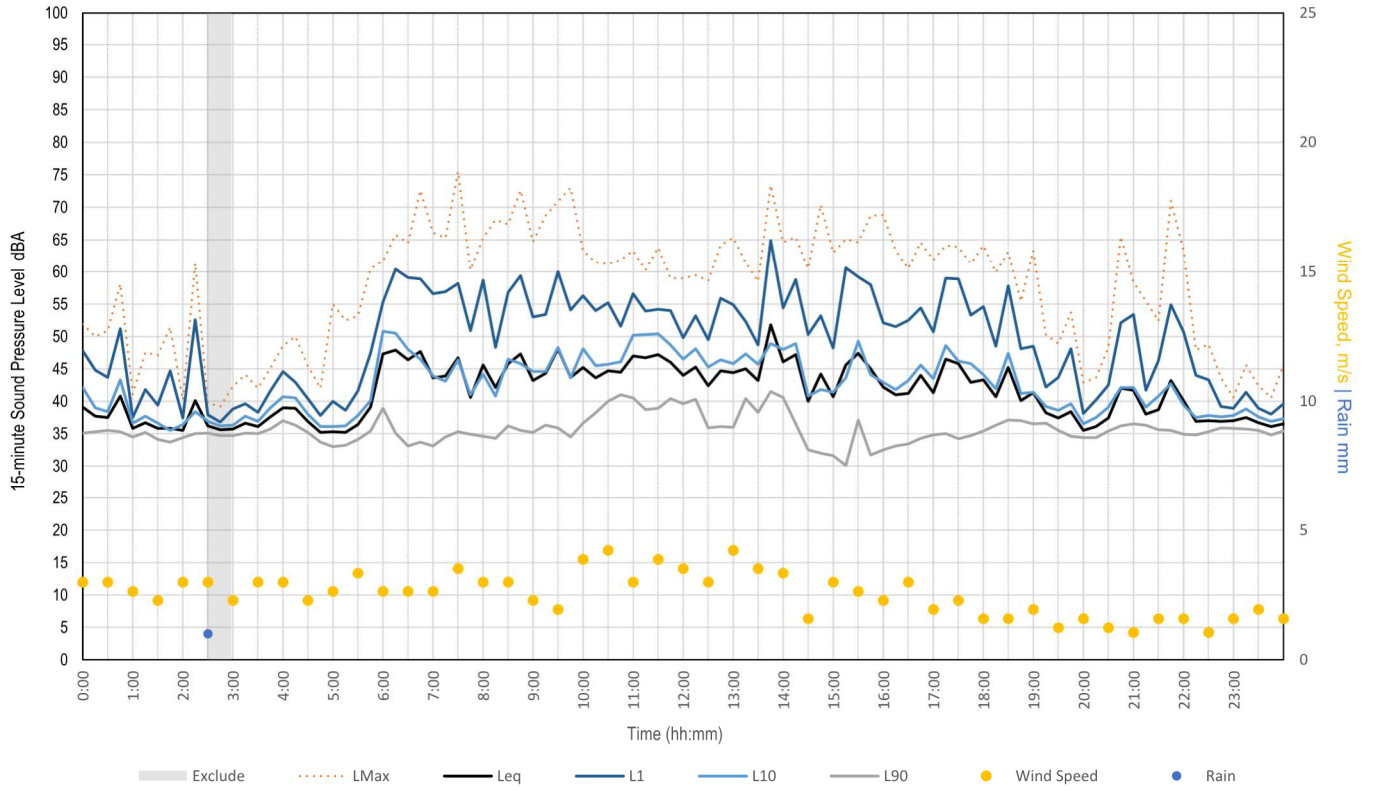
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Saturday, 03 September 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

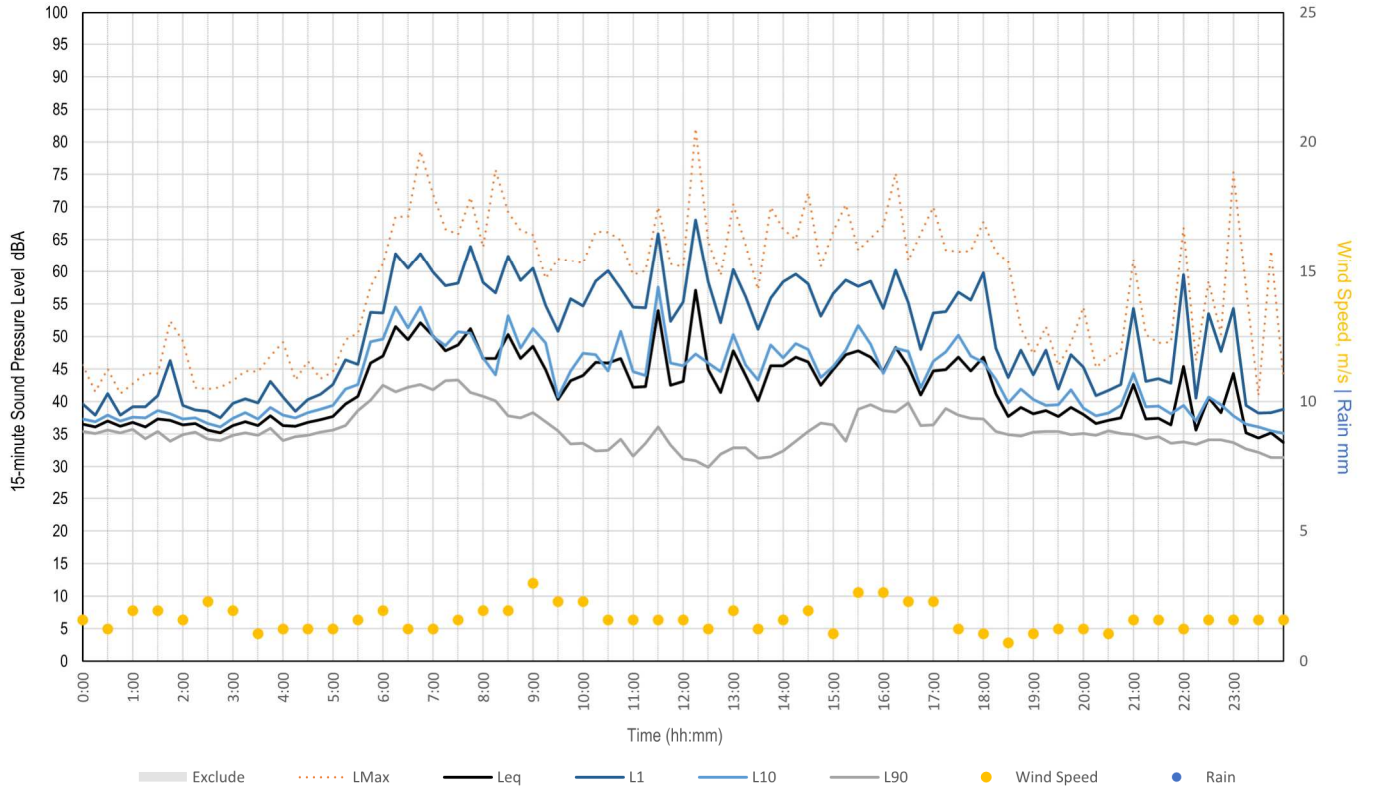
Sunday, 04 September 2022



Noise Logger Results

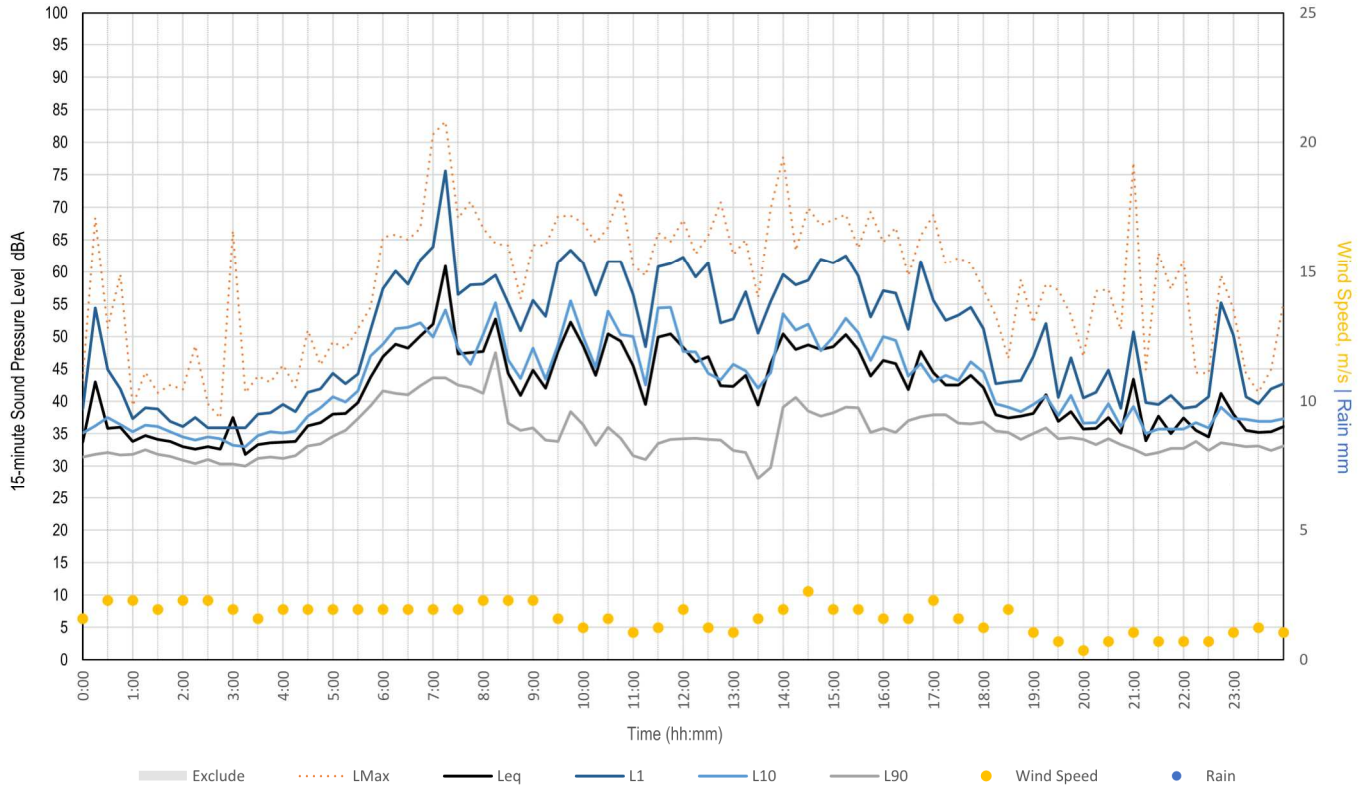
Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Monday, 05 September 2022



Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

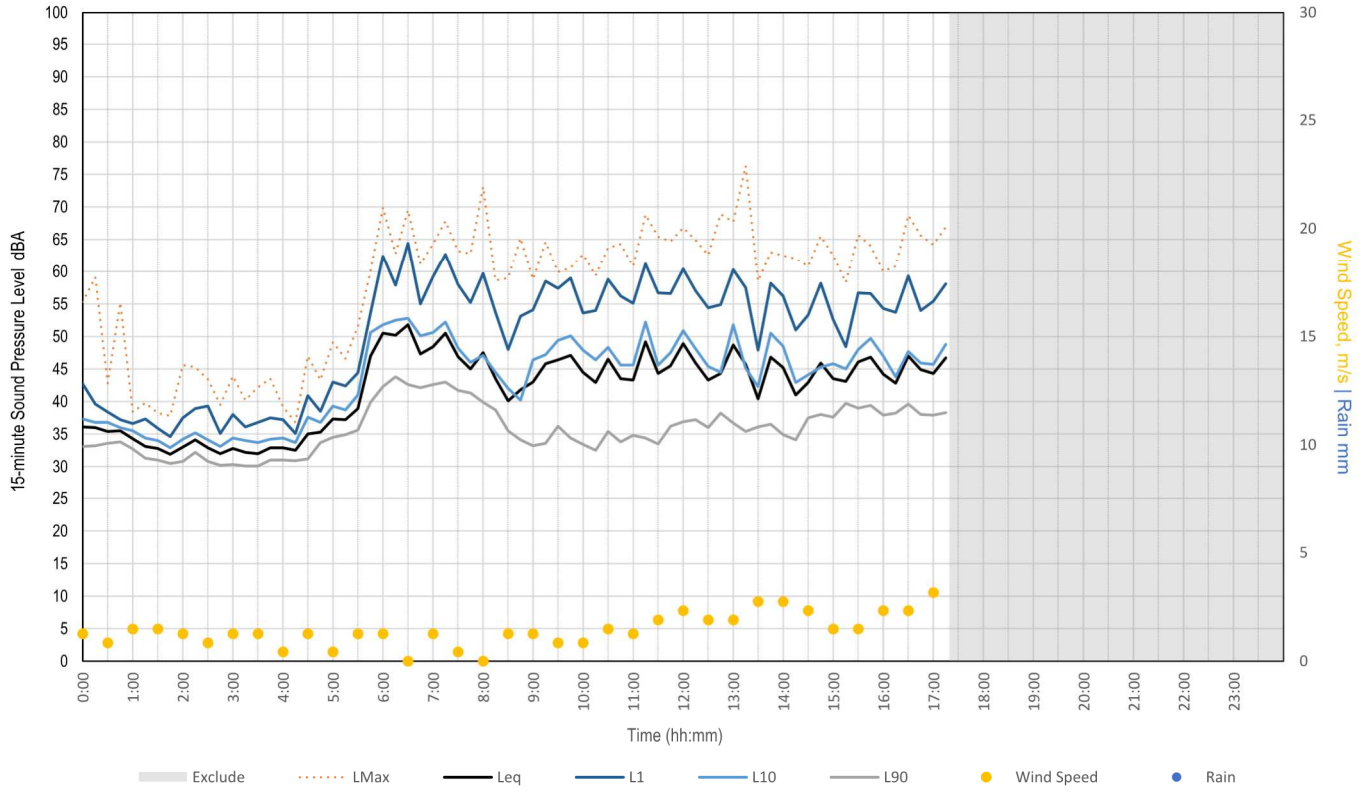
Tuesday, 06 September 2022



Noise Logger Results

Measured Noise Levels - M04 Twin Creeks - Twin Creeks Golf Course (Luddenham)

Wednesday, 07 September 2022



Background Noise Monitoring

Location	M06 - 22 Mount Vernon Road, Mount Vernon	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & JF

Unattended Equipment					Attended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	87809A	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-17705-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	94.0 dBA	**Calibration**	**Pre:**	94.2 dBA	**Post:**	94.3 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Thursday, 29 Sep 2022
Date End	Thursday, 13 Oct 2022
No. of days	15
No. of nights	14

Weather	
Station	BoM
Station Info	Horsley Park Equestrian AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placement at free field location in a field with short grass.

Located near a fence line (approx. 150m away from closest building).

Post processing indicated several periods where noise levels were artificially affected by nearby mechanical plant noise; these were not observed during installation or site visits.

Logger installation was delayed due to delayed access to the site.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	13/10/2022	4:58:54 PM	5:13:54 PM	68	48	48	42	
2	Day	13/10/2022	5:16:22 PM	5:31:22 PM	62	44	47	41	
3	Day	13/10/2022	5:31:22 PM	5:46:22 PM	59	45	47	41	
4	Day	13/10/2022	5:46:22 PM	6:01:22 PM	64	48	49	42	
5	Evening	13/10/2022	6:01:22 PM	6:16:22 PM	70	48	49	44	
6	Evening	1/10/2022	6:15:00 PM	6:30:00 PM	60	52	54	50	*
7	Evening	1/10/2022	7:15:00 PM	7:30:00 PM	57	53	54	52	*
8	Evening	1/10/2022	8:45:00 PM	9:00:00 PM	55	52	53	50	*
9	Night	3/10/2022	12:45:00 AM	1:00:00 AM	51	46	48	43	*
10	Night	3/10/2022	2:30:00 AM	2:45:00 AM	50	44	46	40	*
11	Night	3/10/2022	4:45:00 AM	5:00:00 AM	55	43	46	39	*
12	Night	3/10/2022	6:15:00 AM	6:30:00 AM	67	50	54	42	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird noise in nearby trees, varying in intensity. Tractors/mowers at adjacent property, varying in intensity. Several aircraft flying overhead with approx. duration of 30 sec to 1 min with maximum sound level in the range of 56 to 67 dBA.
Background noise	Traffic at a distance. Movement in vegetation induced by wind (e.g. trees and grass rustling). Constant insect noise.
Evening	
Ambient noise	Intermittent bird noise in nearby trees. Tractors/mowers at adjacent property, varying in intensity. Noise from animal enclosure on property and occasional dog barks. Several aircraft flying overhead with approx. duration of 1 to 2 min with maximum sound level in the range of 54 to 59 dBA.
Background noise	Traffic at a distance. Movement in vegetation induced by wind (e.g. trees and grass rustling). Constant insect noise.
Night	
Ambient noise	Intermittent bird noise in trees. Intermittent noise from roosters and dogs at nearby farm (after 6AM). Tractors/mowers at adjacent property. Occasional vehicle passbys by on local streets. Several aircraft flying overhead with approx. duration of 30 sec to 1 min with maximum sound level of 48 dBA to 50 dBA.
Background noise	Traffic at a distance. Movement in vegetation induced by wind (e.g. trees and grass rustling). Constant insect noise.

Site Details	M06 - 22 Mount Vernon Road, Mount Vernon
Start Date	Thu 29 September 2022
End Date	Thu 13 October 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	51
$L_{eq, Evening}$ dBA	53
$L_{eq, Night}$ dBA	50
RBL, $_{Day}$ dBA	37
RBL, $_{Evening}$ dBA	49
RBL, $_{Night}$ dBA	42

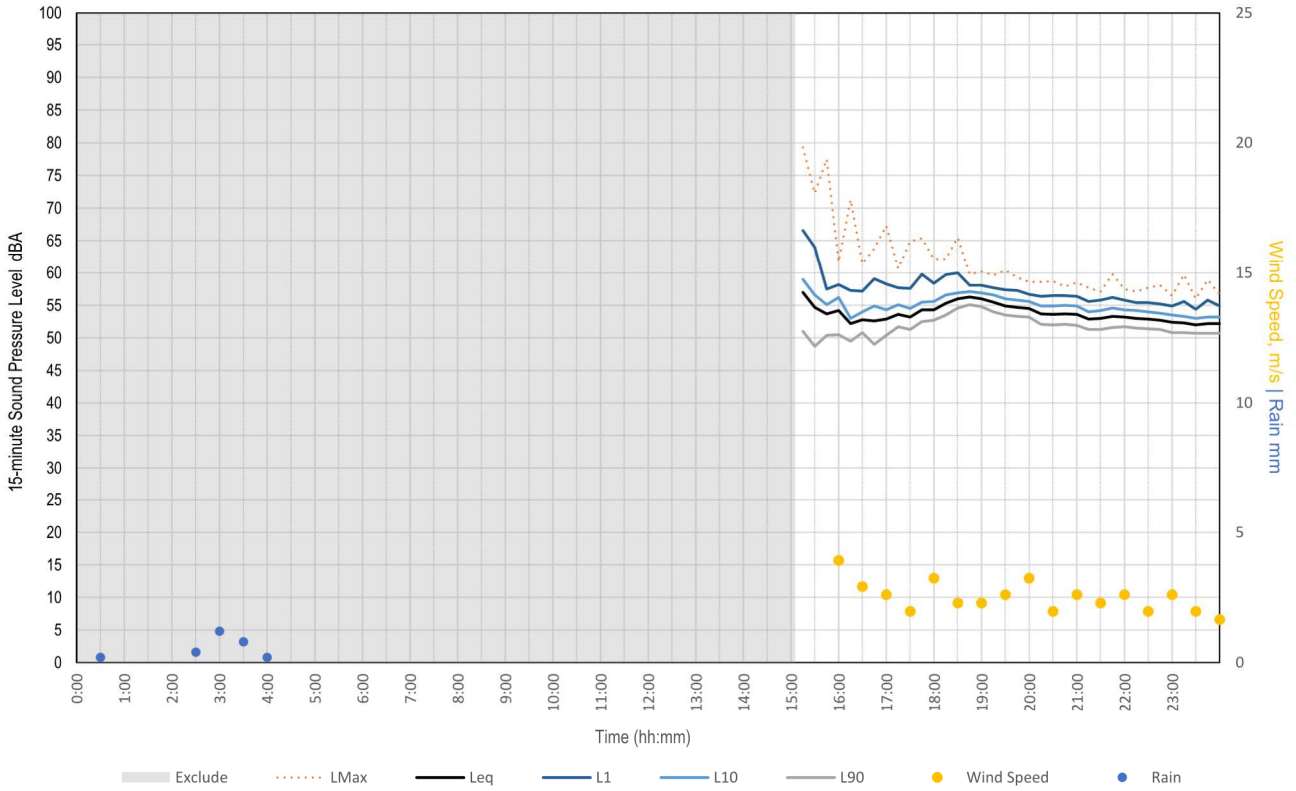
Daily Summary

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	54	50	48	47	50	50	49	49
$L_{eq, Evening}$ dBA	55	53	52	50	50	51	54	56
$L_{eq, Night}$ dBA	51	50	50	47	46	46	53	51
ABL, $_{Day}$ dBA	49	45	38	35	35	37	38	37
ABL, $_{Evening}$ dBA	51	51	49	44	43	45	52	53
ABL, $_{Night}$ dBA	46	43	42	38	37	39	45	42

Date	07/10	08/10	09/10	10/10	11/10	12/10	13/10
$L_{eq, Day}$ dBA	48	48	50	56	48	49	56
$L_{eq, Evening}$ dBA	55		55	44	50	51	
$L_{eq, Night}$ dBA	52	54	50	44	48	47	
ABL, $_{Day}$ dBA	37	35	39	36	34	37	39
ABL, $_{Evening}$ dBA	50		50	37	44	43	
ABL, $_{Night}$ dBA	43	47	44	36	41	39	

Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

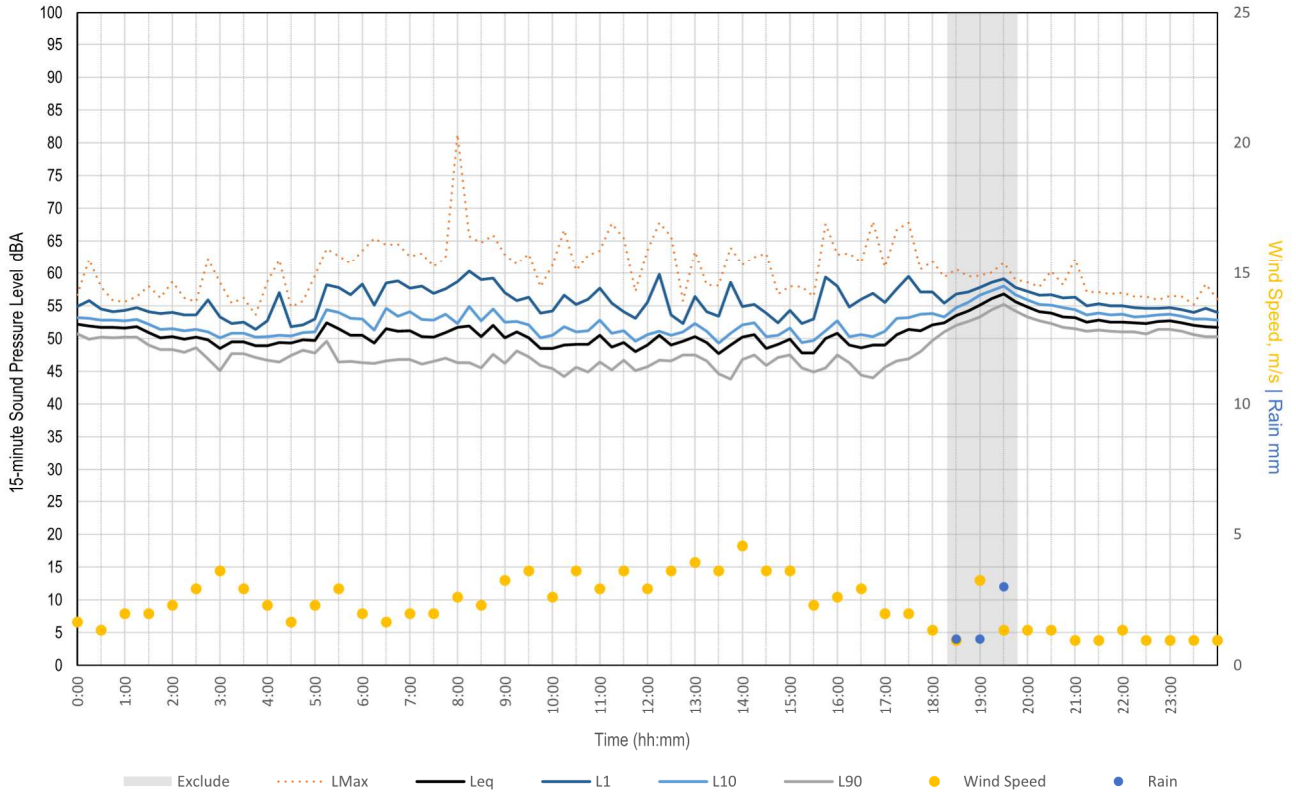
Thursday, 29 September 2022



Noise Logger Results

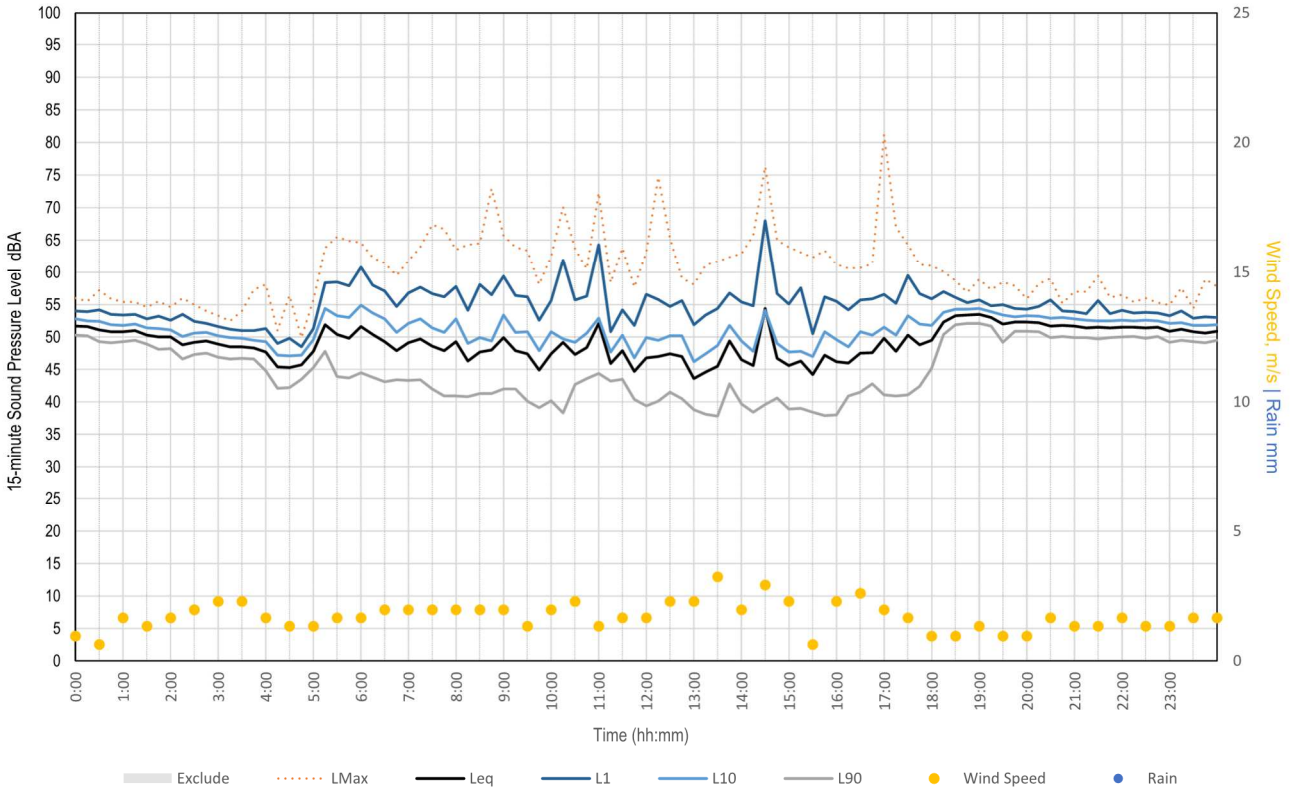
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Friday, 30 September 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

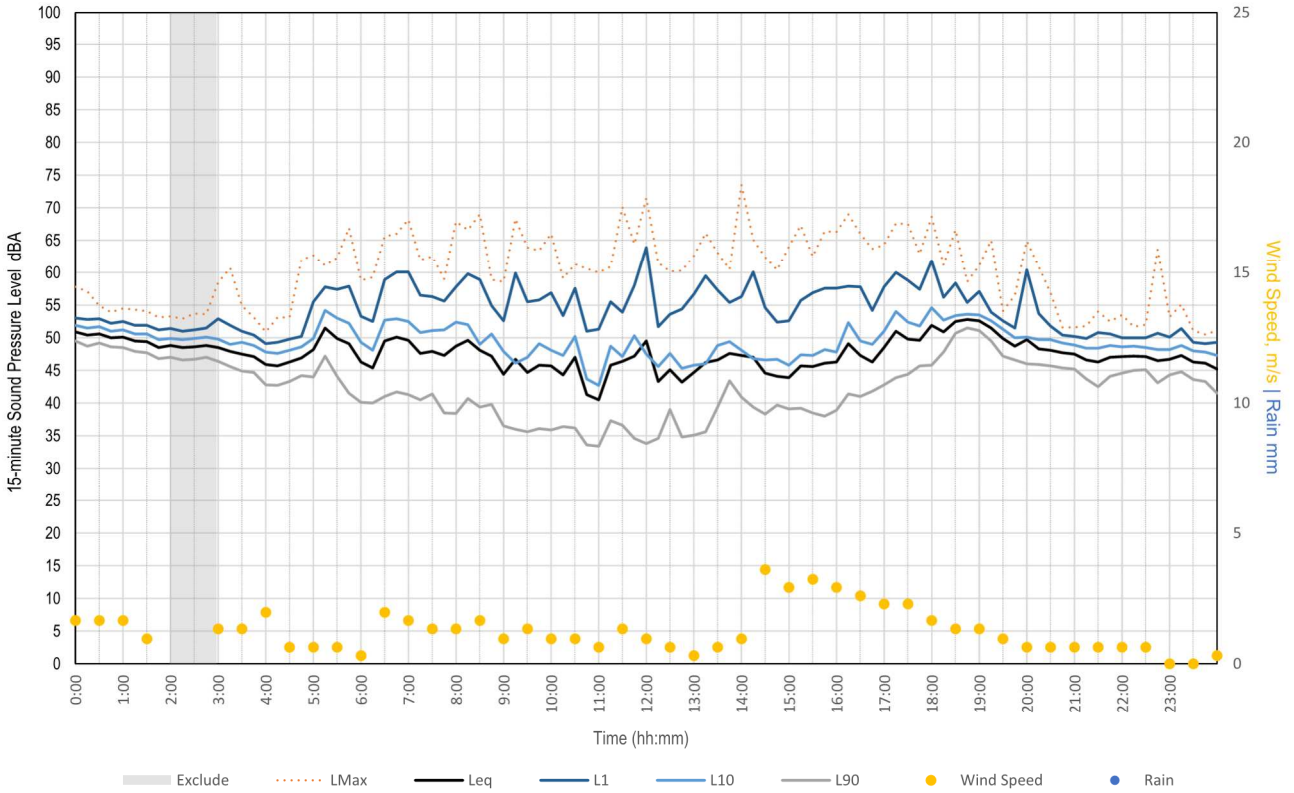
Saturday, 01 October 2022



Noise Logger Results

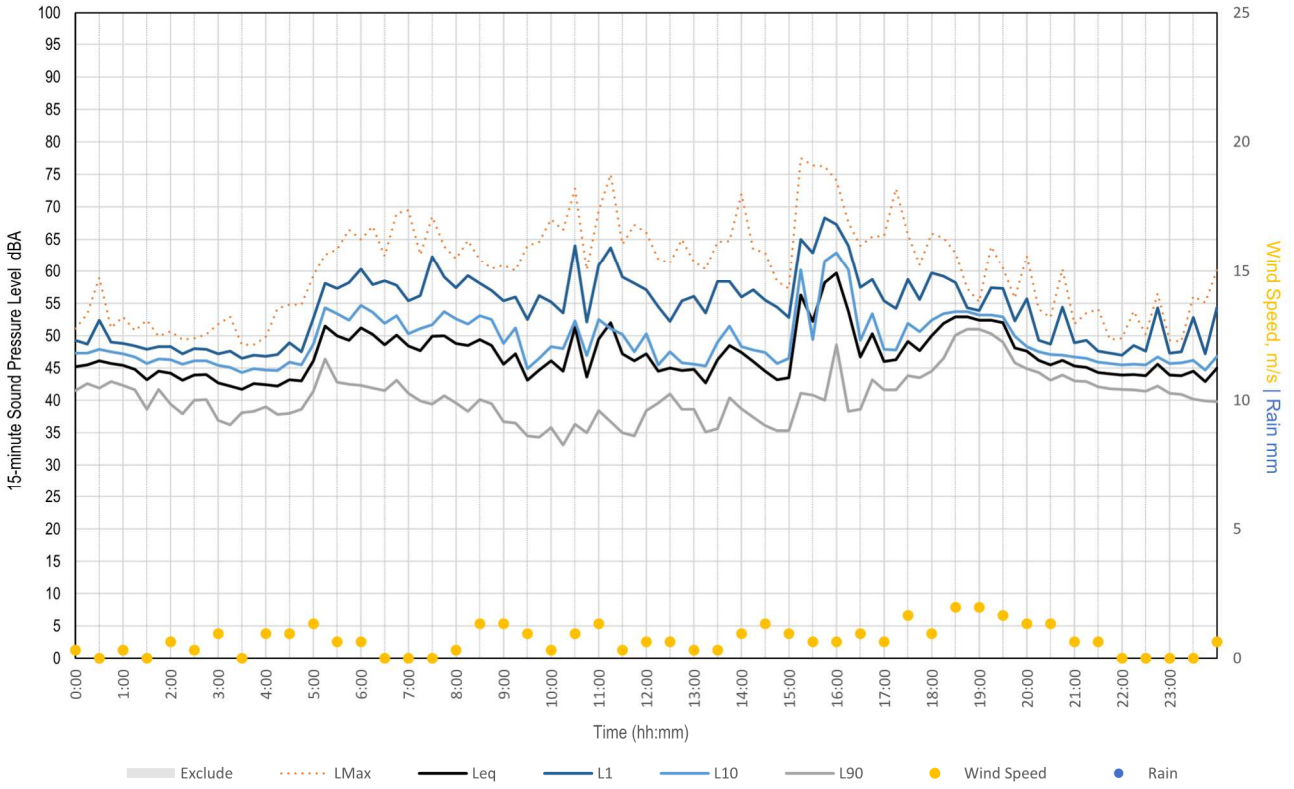
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Sunday, 02 October 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

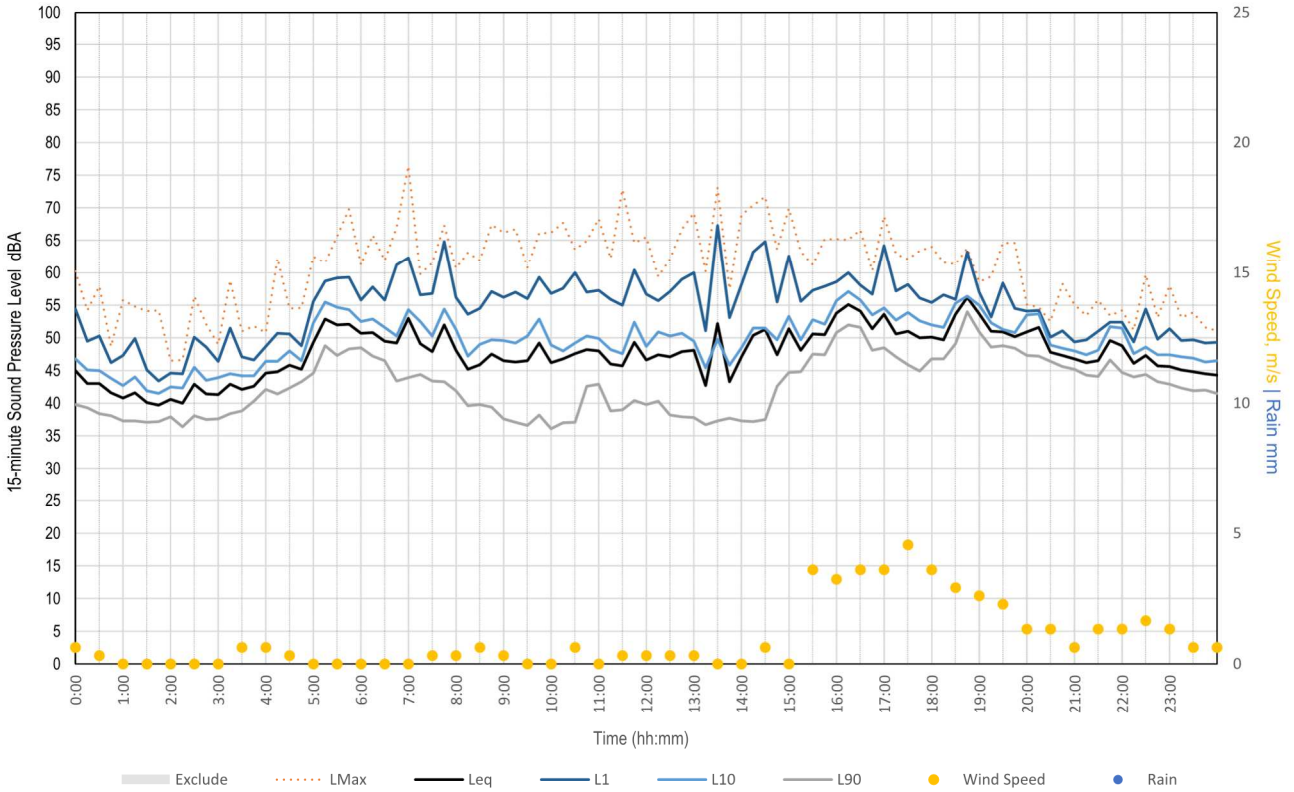
Monday, 03 October 2022



Noise Logger Results

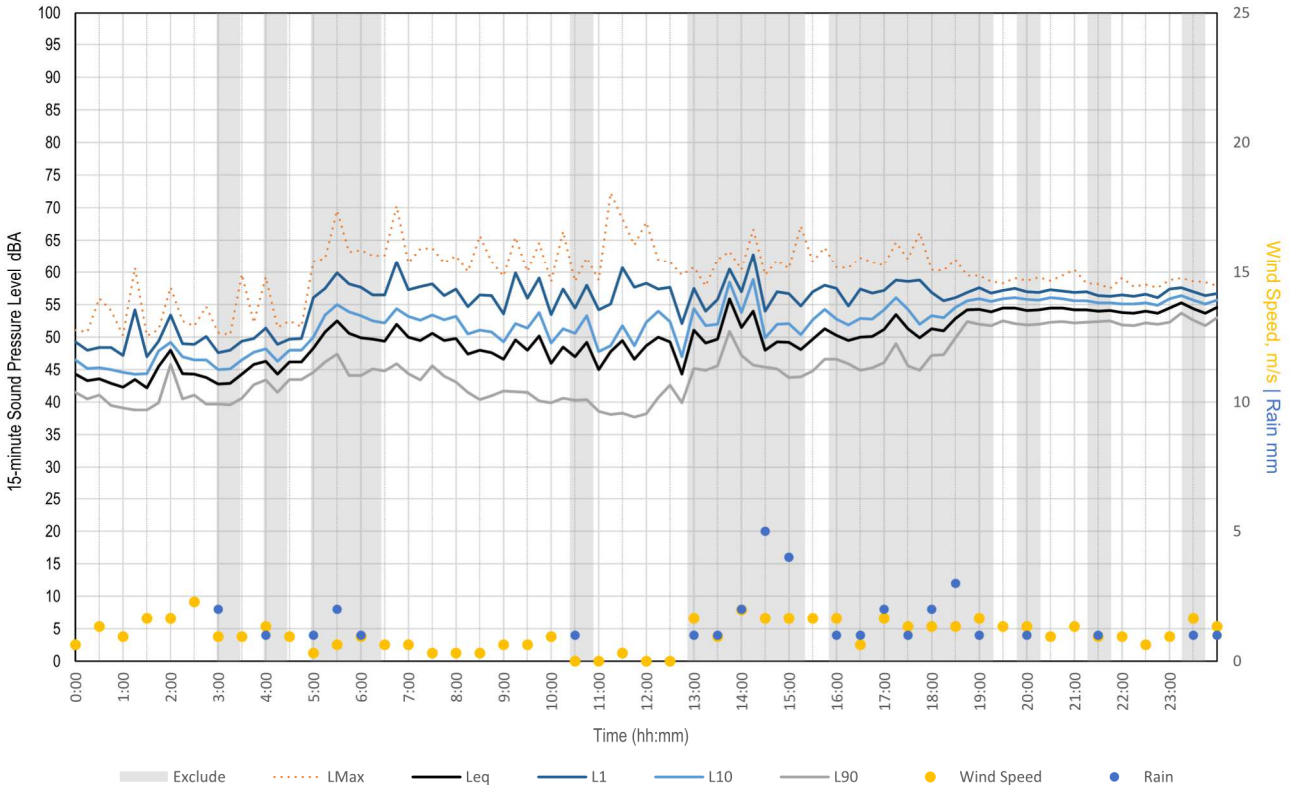
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Tuesday, 04 October 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

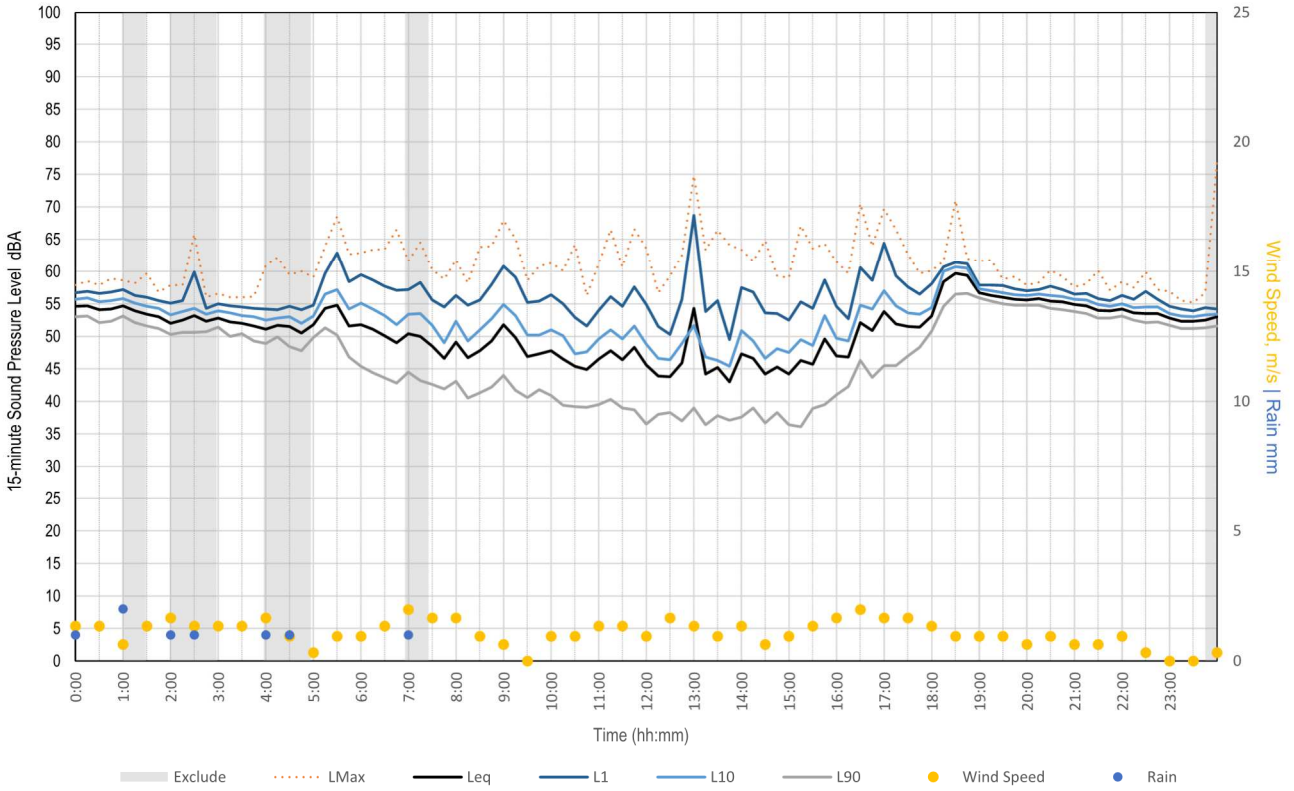
Wednesday, 05 October 2022



Noise Logger Results

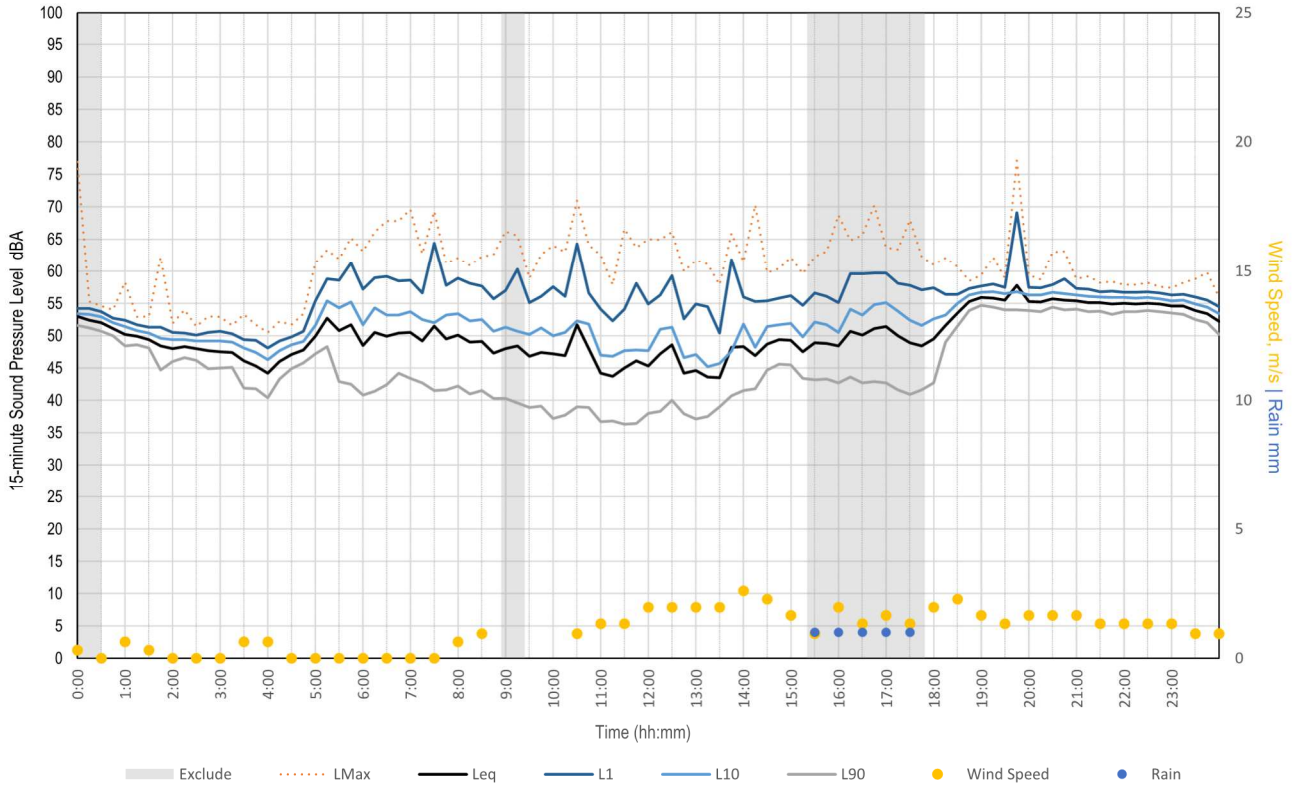
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Thursday, 06 October 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

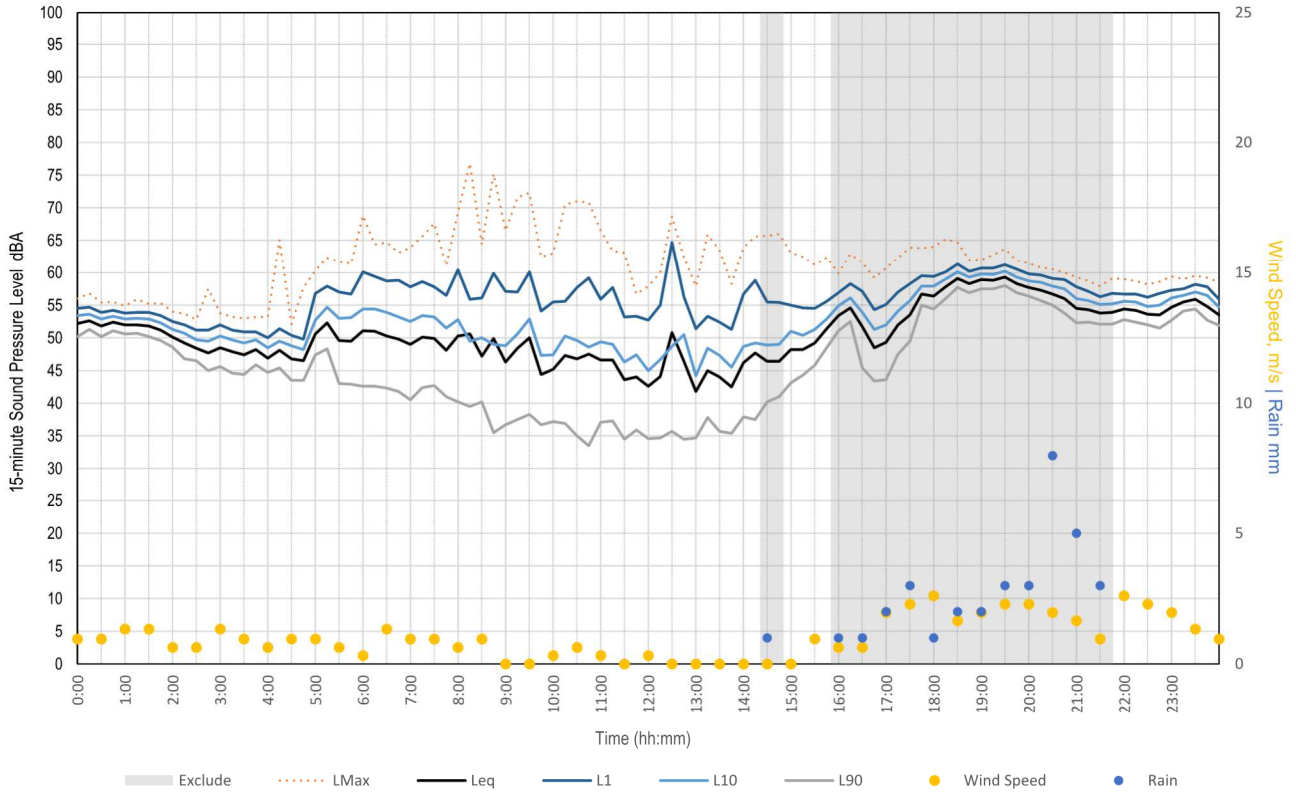
Friday, 07 October 2022



Noise Logger Results

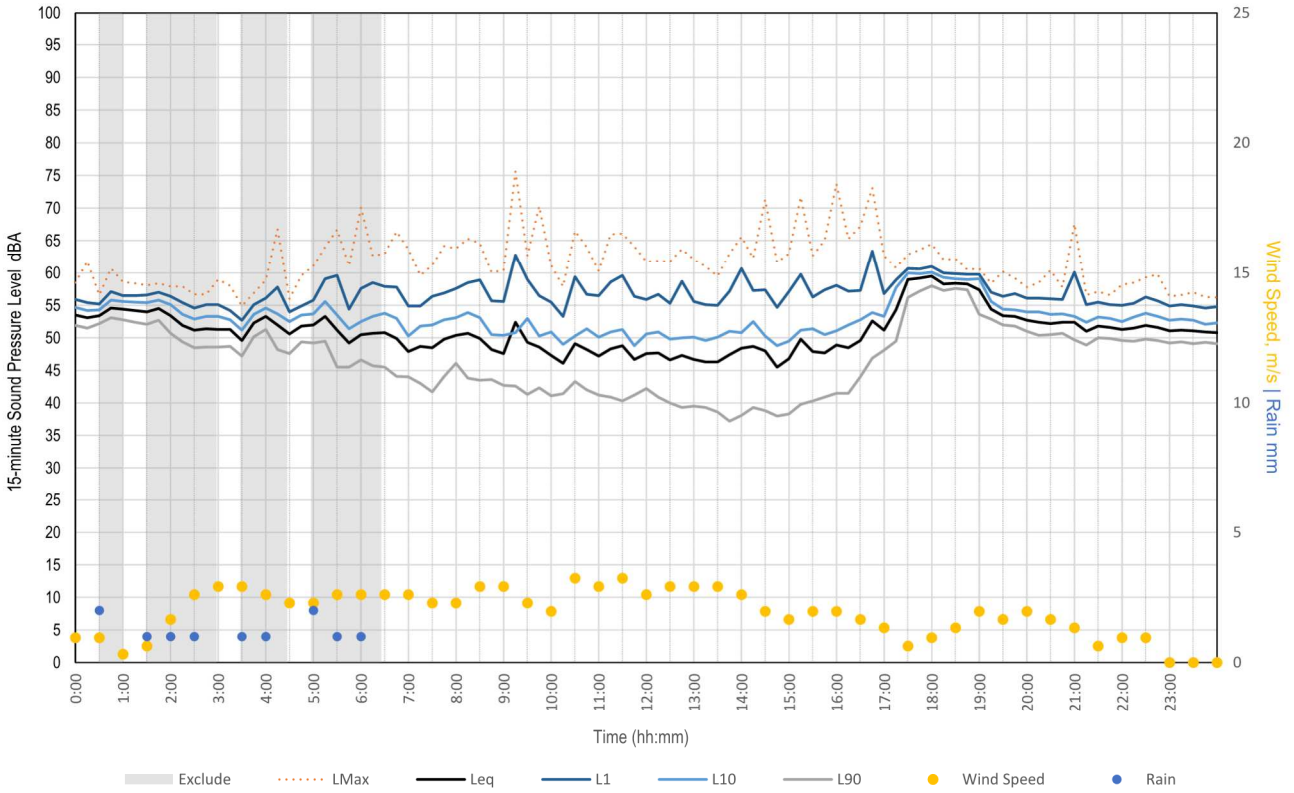
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Saturday, 08 October 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

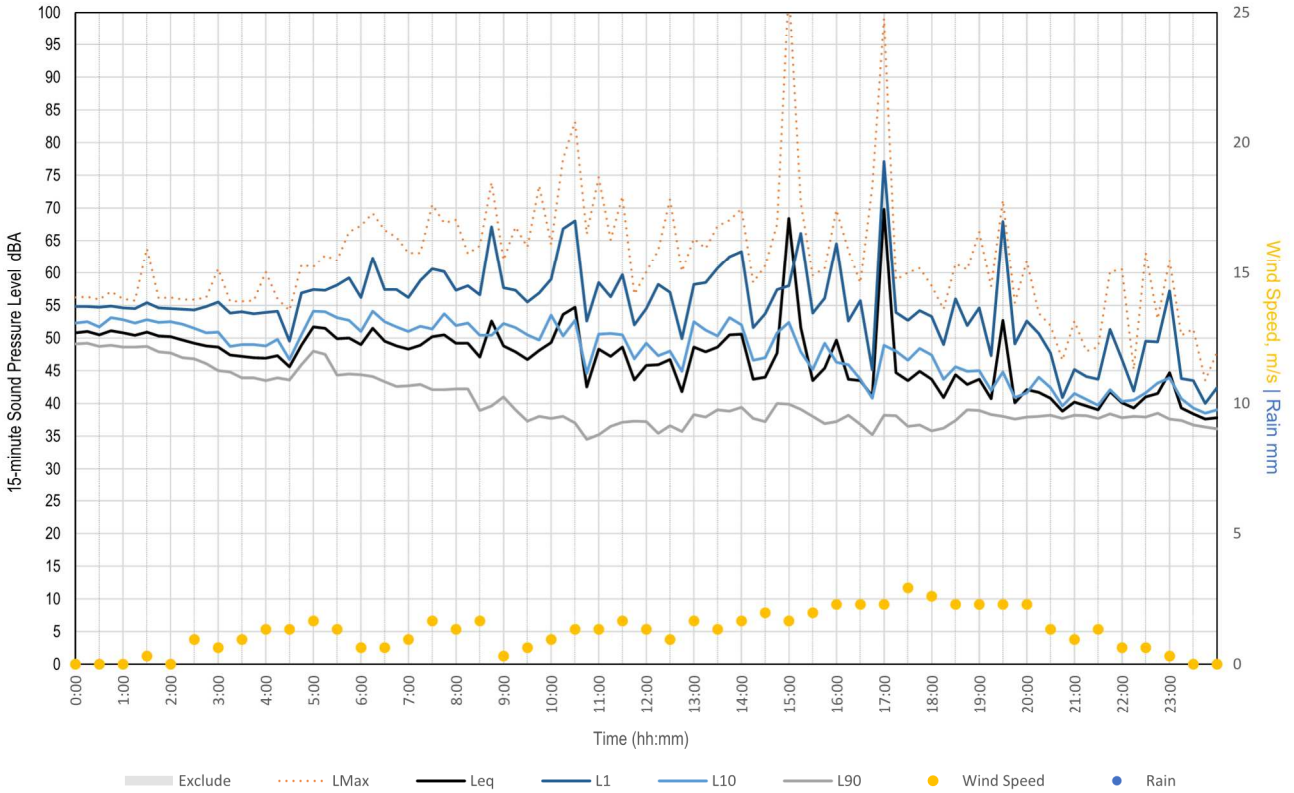
Sunday, 09 October 2022



Noise Logger Results

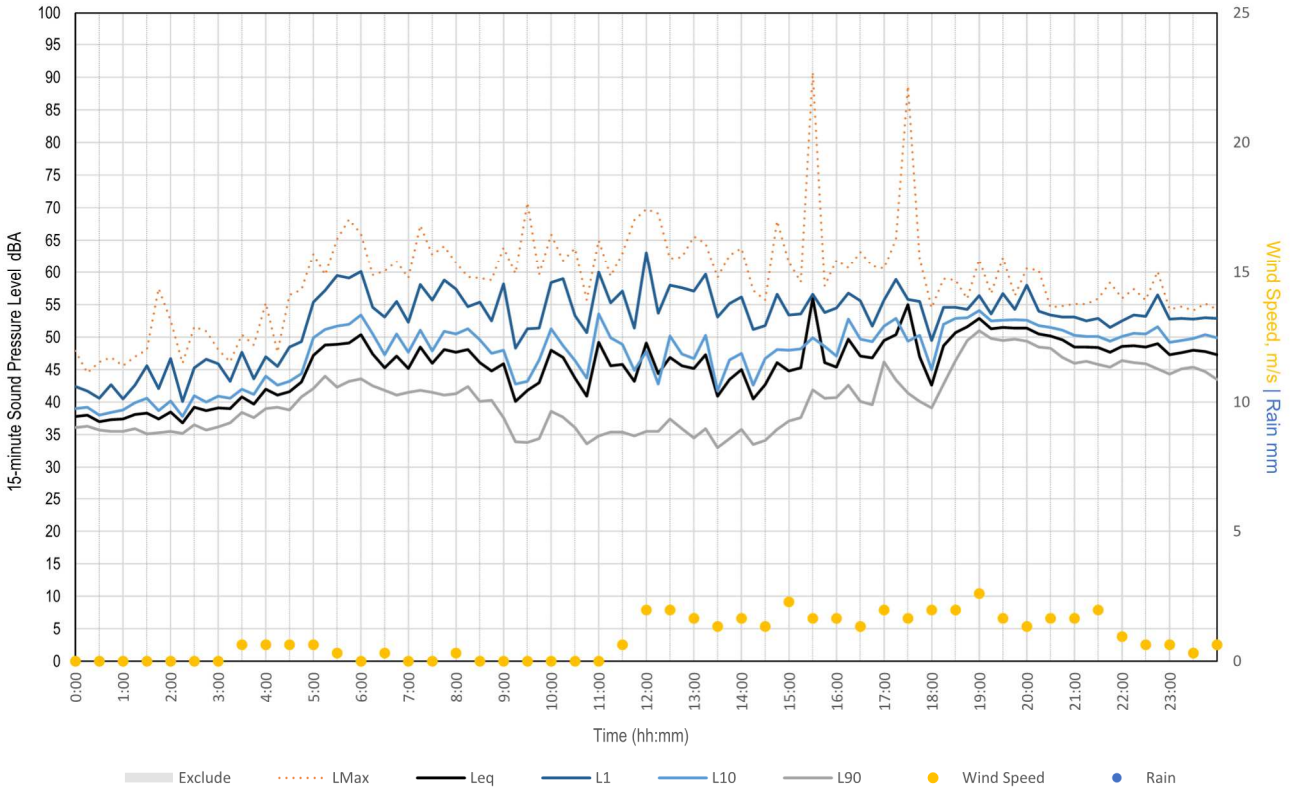
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Monday, 10 October 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

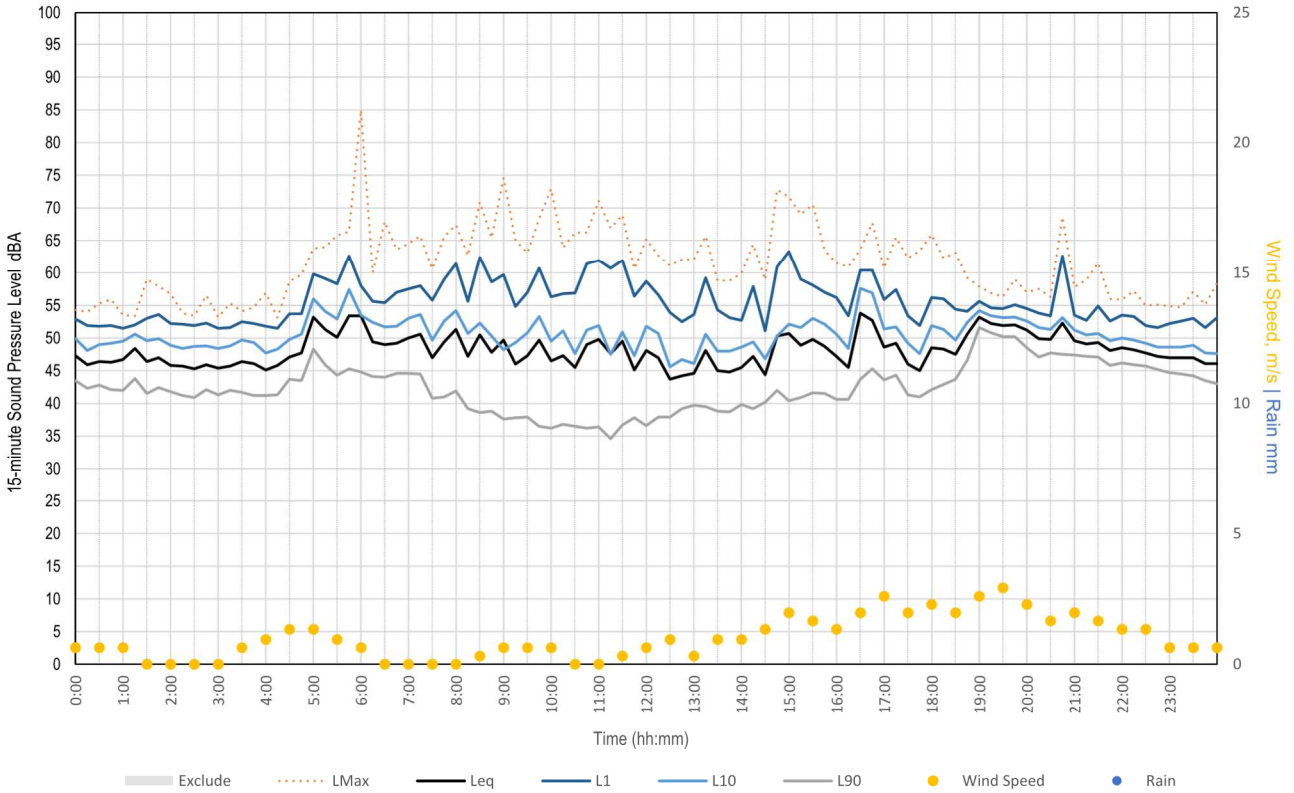
Tuesday, 11 October 2022



Noise Logger Results

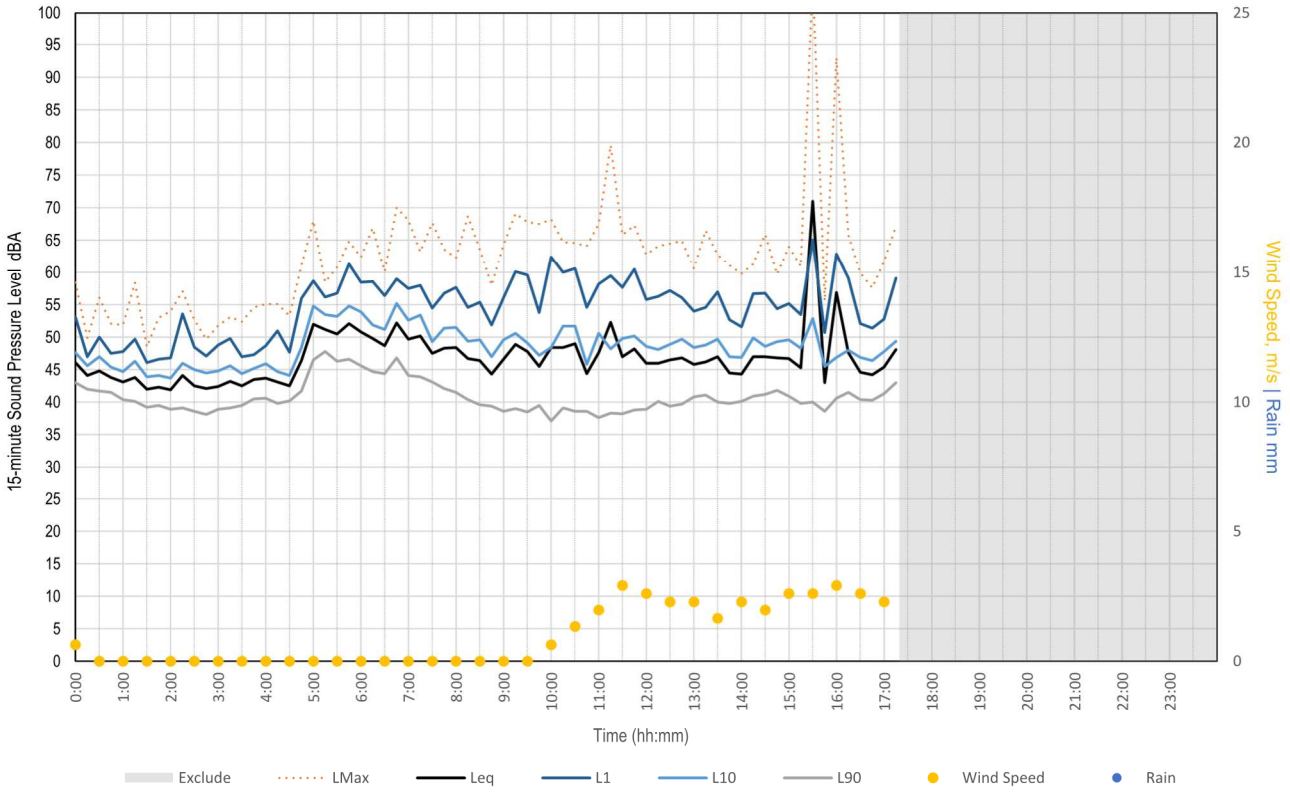
Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Wednesday, 12 October 2022



Measured Noise Levels - M06 - 22 Mount Vernon Road, Mount Vernon

Thursday, 13 October 2022



Background Noise Monitoring

Location	M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878179	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-17705-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	94.0 dBA	**Calibration**	**Pre:**	94.0 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Saturday, 08 Oct 2022
No. of days	26
No. of nights	25

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger is placed centrally on the front yard. Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Placement in backyard was not possible as measurements would be affected by condensers situated at neighbouring house.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	13/09/2022	11:04:16 AM	11:19:16 AM	70	47	48	39	
2	Day	28/09/2022	10:42:32 AM	10:57:32 AM	68	47	49	36	
3	Day	28/09/2022	11:05:36 AM	11:20:36 AM	65	43	44	37	
4	Day	2/10/2022	10:00:00 AM	10:15:00 AM	64	43	43	33	*
5	Evening	16/09/2022	6:30:00 PM	6:45:00 PM	61	47	48	43	*
6	Evening	16/09/2022	7:15:00 PM	7:30:00 PM	52	42	44	40	*
7	Evening	16/09/2022	8:00:00 PM	8:15:00 PM	65	44	45	38	*
8	Evening	16/09/2022	9:30:00 PM	9:45:00 PM	67	41	43	38	*
9	Night	20/09/2022	12:00:00 AM	12:15:00 AM	53	37	38	32	*
10	Night	20/09/2022	2:15:00 AM	2:30:00 AM	51	36	39	30	*
11	Night	20/09/2022	4:00:00 AM	4:15:00 AM	56	40	41	33	*
12	Night	20/09/2022	6:30:00 AM	6:45:00 AM	62	47	48	44	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird noise in nearby trees. Occasional dogs barking at a distance. Occasional vehicle passbys on local street. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min and maximum sound levels in the range of 40 to 65 dBA.
Background noise	Movement in vegetation induced by wind (e.g. grass and trees rustling). Some insect noise.
Evening	
Ambient noise	Constant bird noise in trees, varying in intensity. Intermittent dogs barking at a distance. Occasional residential noise (e.g. walking and talking at nearby property). Occasional vehicles (including trucks) passing by on local street. From 7 PM, insect noise dominated the noise environment. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min and maximum sound levels in the range of 45 to 50 dBA.
Background noise	Movement in vegetation induced by wind (e.g. grass and trees rustling). Traffic at distance.
Night	
Ambient noise	Occasional impulsive animal sounds (e.g. birds, dogs at a distance). Occasional vehicle passbys on local street. Insect noise dominated the noise environment during night period (around midnight and 2AM). One aircraft flying overhead observed with an approx. duration of 30 sec and maximum sound level of 46 dBA.
Background noise	Movement in vegetation induced by wind (e.g. grass and trees rustling). Traffic at distance.

Site Details	M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)
Start Date	Tue 13 September 2022
End Date	Sat 08 October 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	58
$L_{eq, Evening}$ dBA	45
$L_{eq, Night}$ dBA	45
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	37
RBL, $_{Night}$ dBA	32

Daily Summary

Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA	49	50	49	49	49	51	50	49
$L_{eq, Evening}$ dBA	43	44	46	45	44	43	42	43
$L_{eq, Night}$ dBA	46	42	43	43	42	43	42	43
ABL, $_{Day}$ dBA	36	34	39	38	39	35	36	36
ABL, $_{Evening}$ dBA	31	35	39	37	36	35	33	35
ABL, $_{Night}$ dBA	29	32	32	32	31	30	31	32

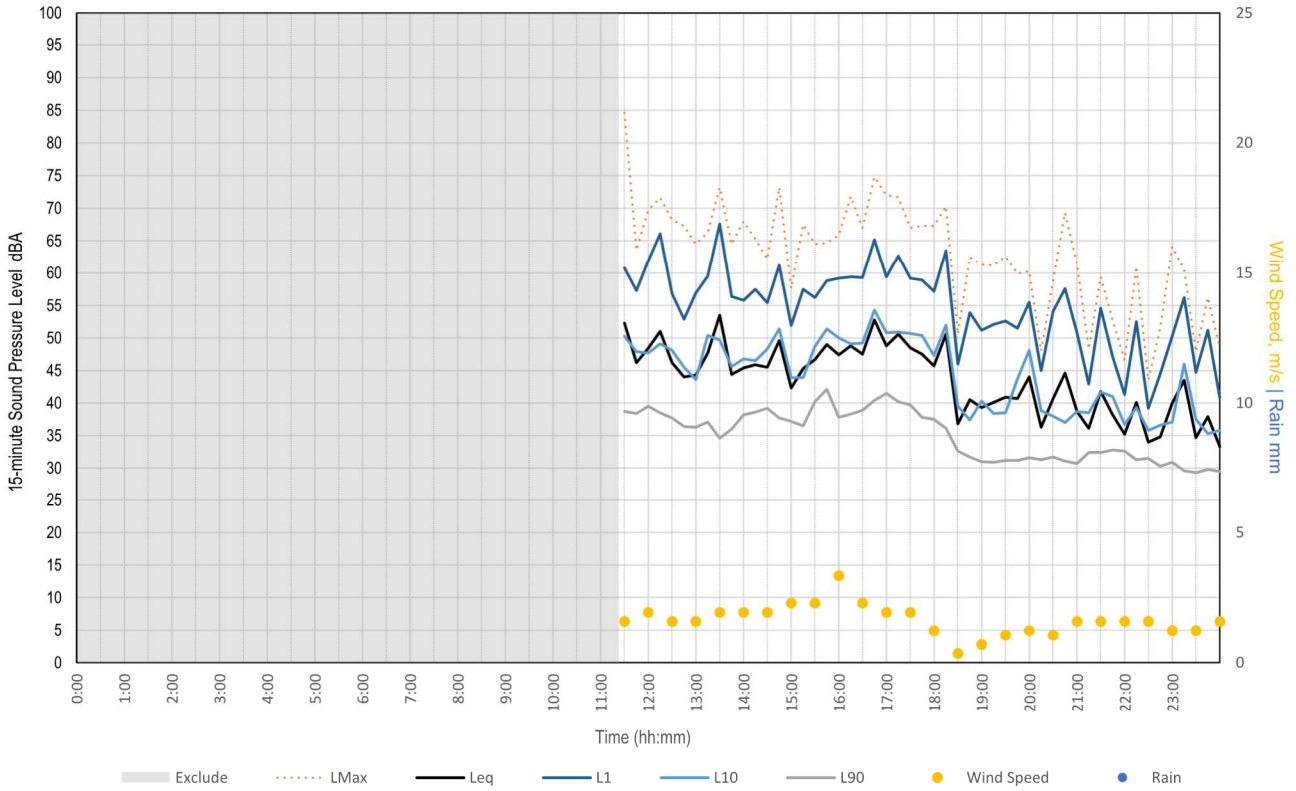
Date	21/09	22/09	23/09	24/09	25/09	26/09	27/09	28/09
$L_{eq, Day}$ dBA	48	46	49	48	48	48	49	70
$L_{eq, Evening}$ dBA	45	44	44	49	43	44	45	44
$L_{eq, Night}$ dBA	44	44	46	41	44	44	54	47
ABL, $_{Day}$ dBA	35	33	35	34	32	34	37	34
ABL, $_{Evening}$ dBA	34	35	38	39	38	37	37	38
ABL, $_{Night}$ dBA	33	32	32	34	33	33	35	36

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	59	52	46	48	62	60	53	50
$L_{eq, Evening}$ dBA	46	47	45	43	43	43	46	45
$L_{eq, Night}$ dBA	45	43	43	42	45	46	48	45
ABL, $_{Day}$ dBA	41	39	34	33	32	38	40	39
ABL, $_{Evening}$ dBA	40	41	39	37	35	34	42	41
ABL, $_{Night}$ dBA	38	36	35	31	32	32	41	37

Date	07/10
$L_{eq, Day}$ dBA	50
$L_{eq, Evening}$ dBA	46
$L_{eq, Night}$ dBA	41
ABL, $_{Day}$ dBA	39
ABL, $_{Evening}$ dBA	41
ABL, $_{Night}$ dBA	36

Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

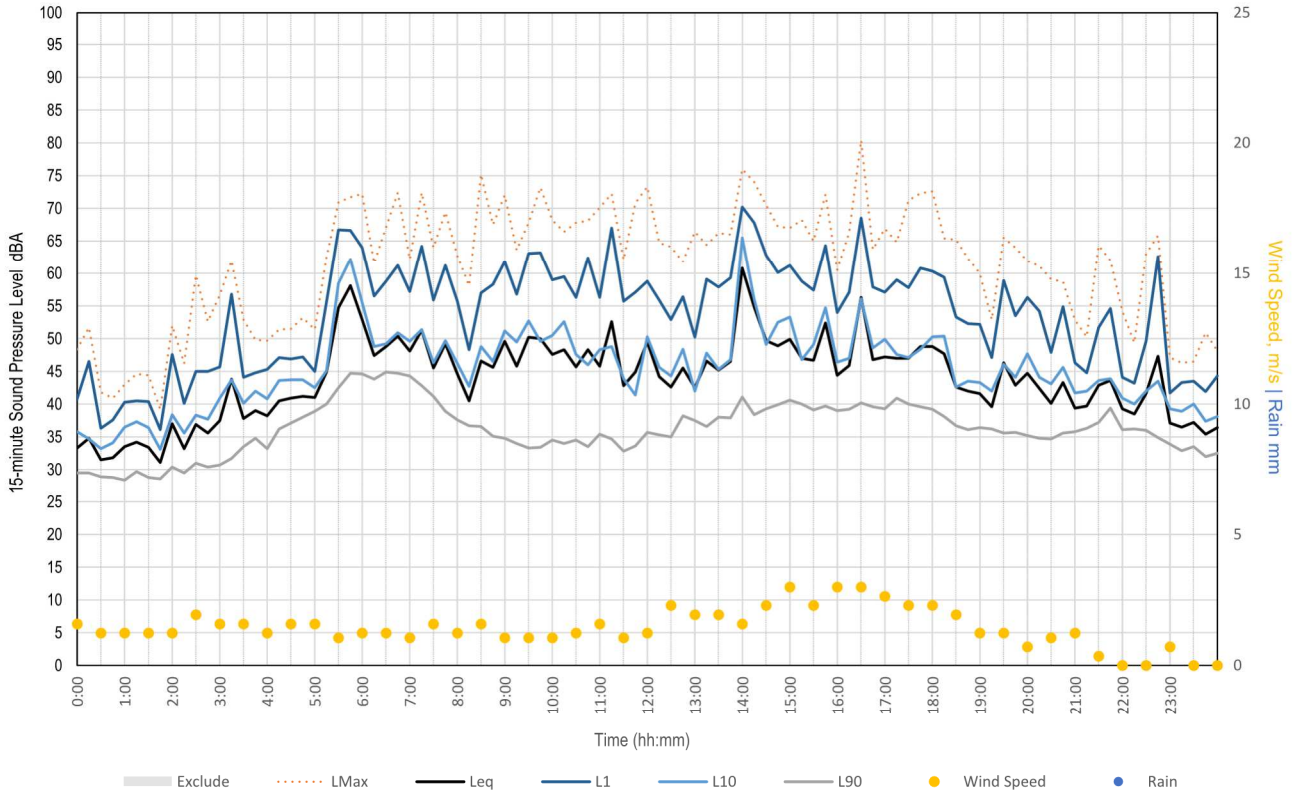
Tuesday, 13 September 2022



Noise Logger Results

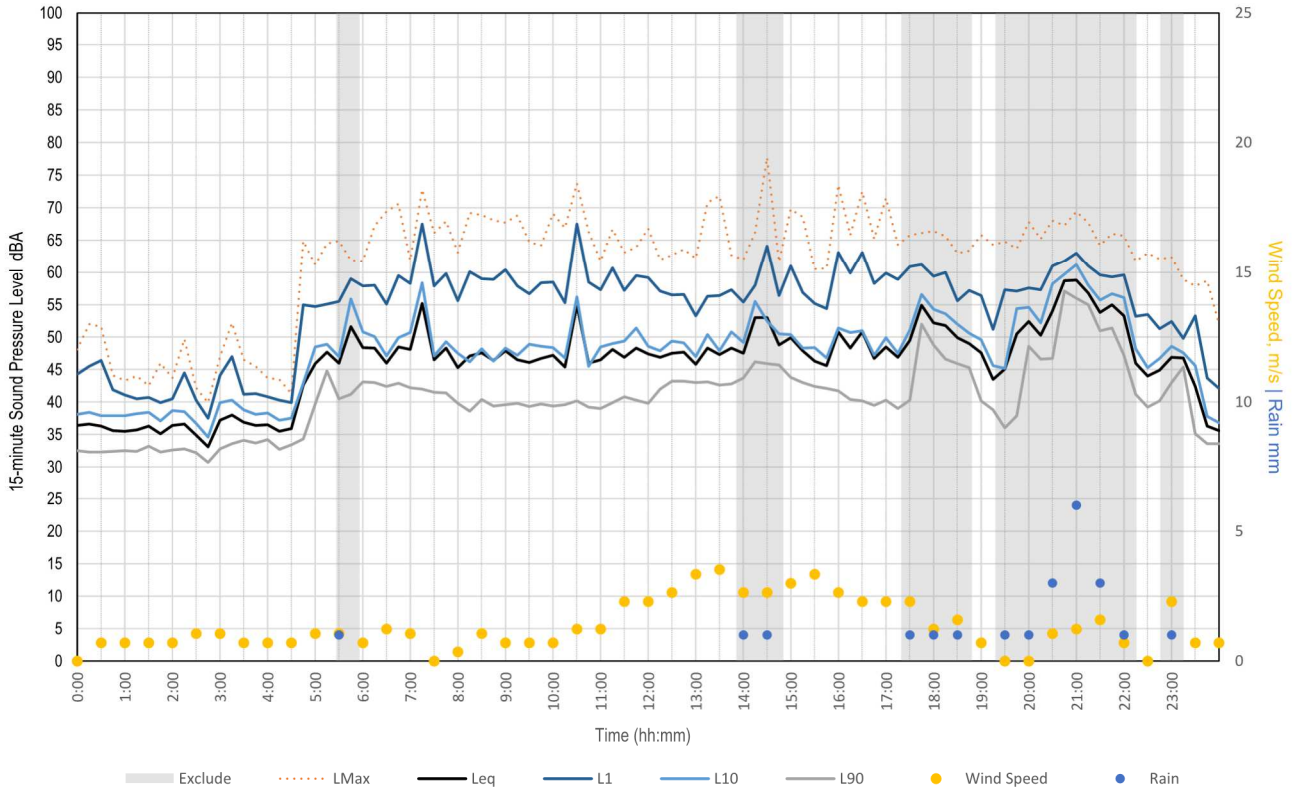
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Wednesday, 14 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

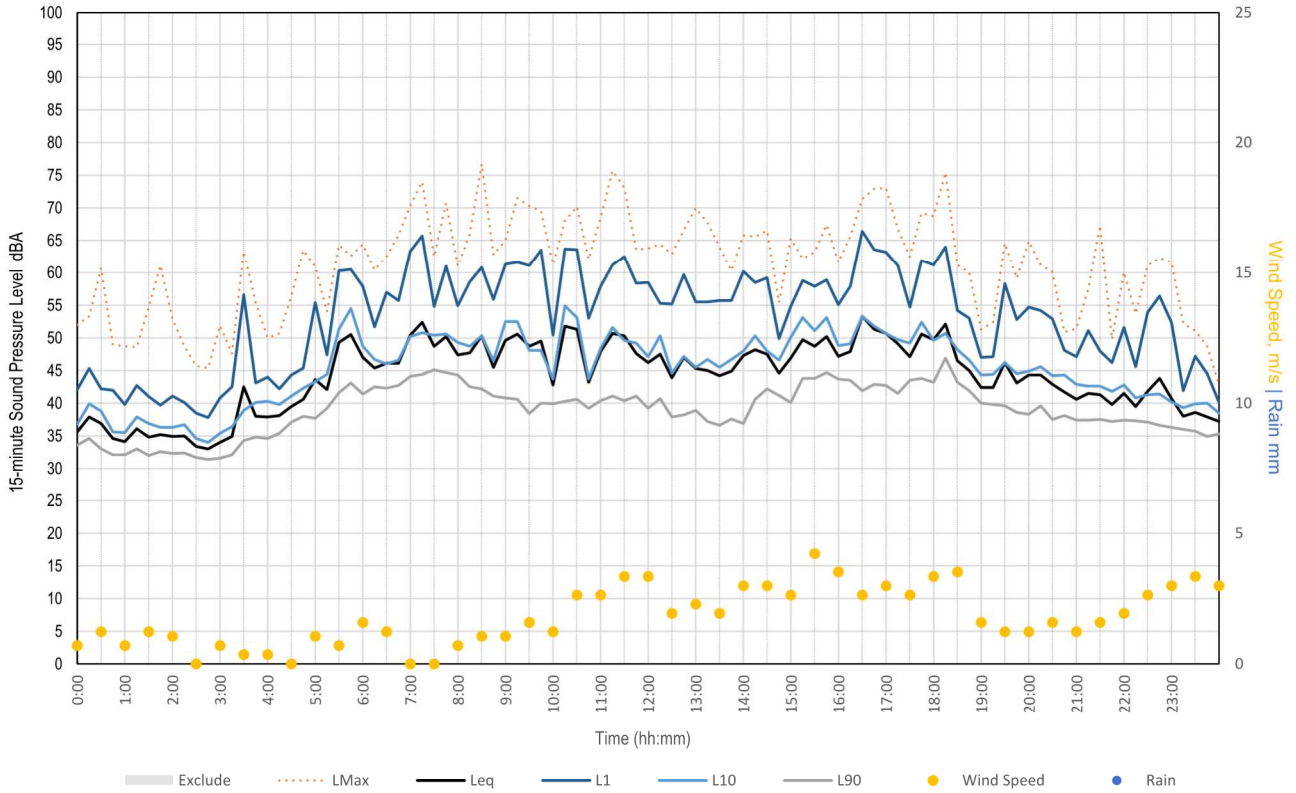
Thursday, 15 September 2022



Noise Logger Results

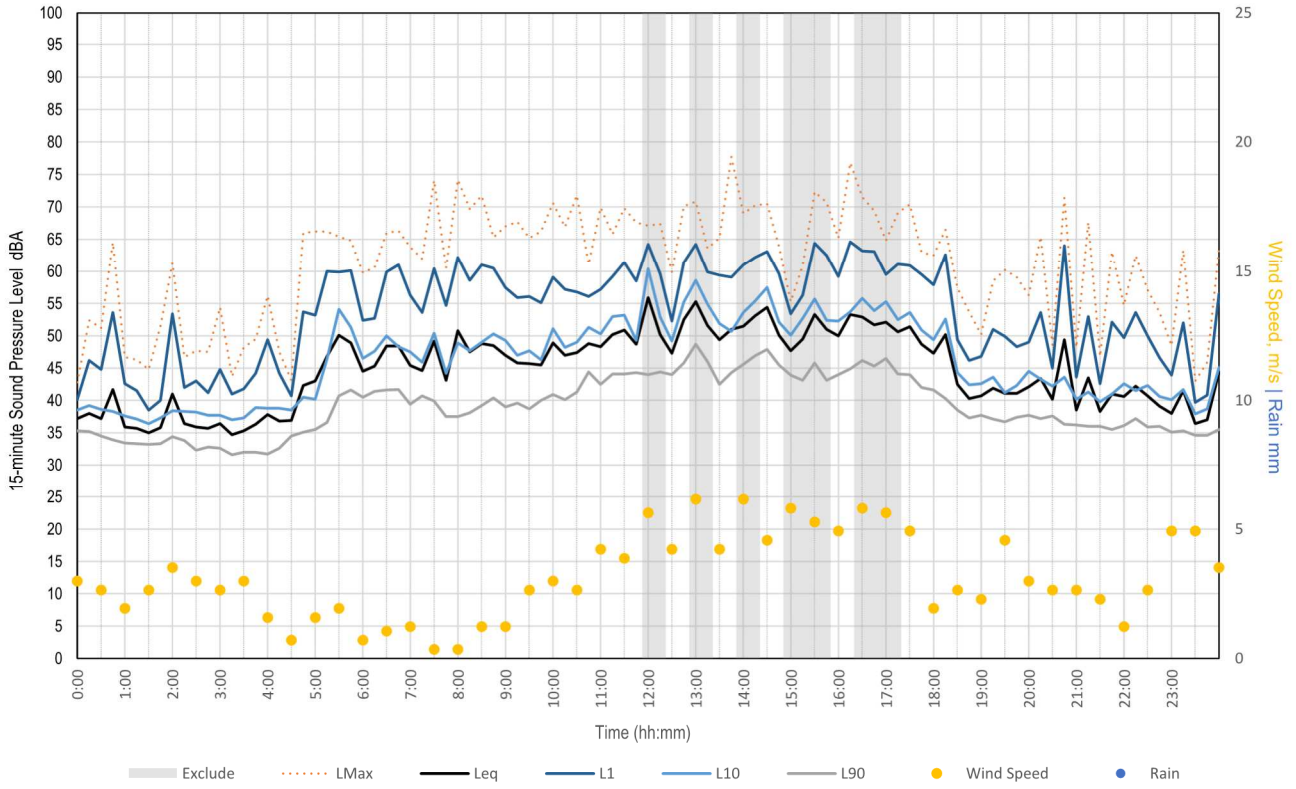
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Friday, 16 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

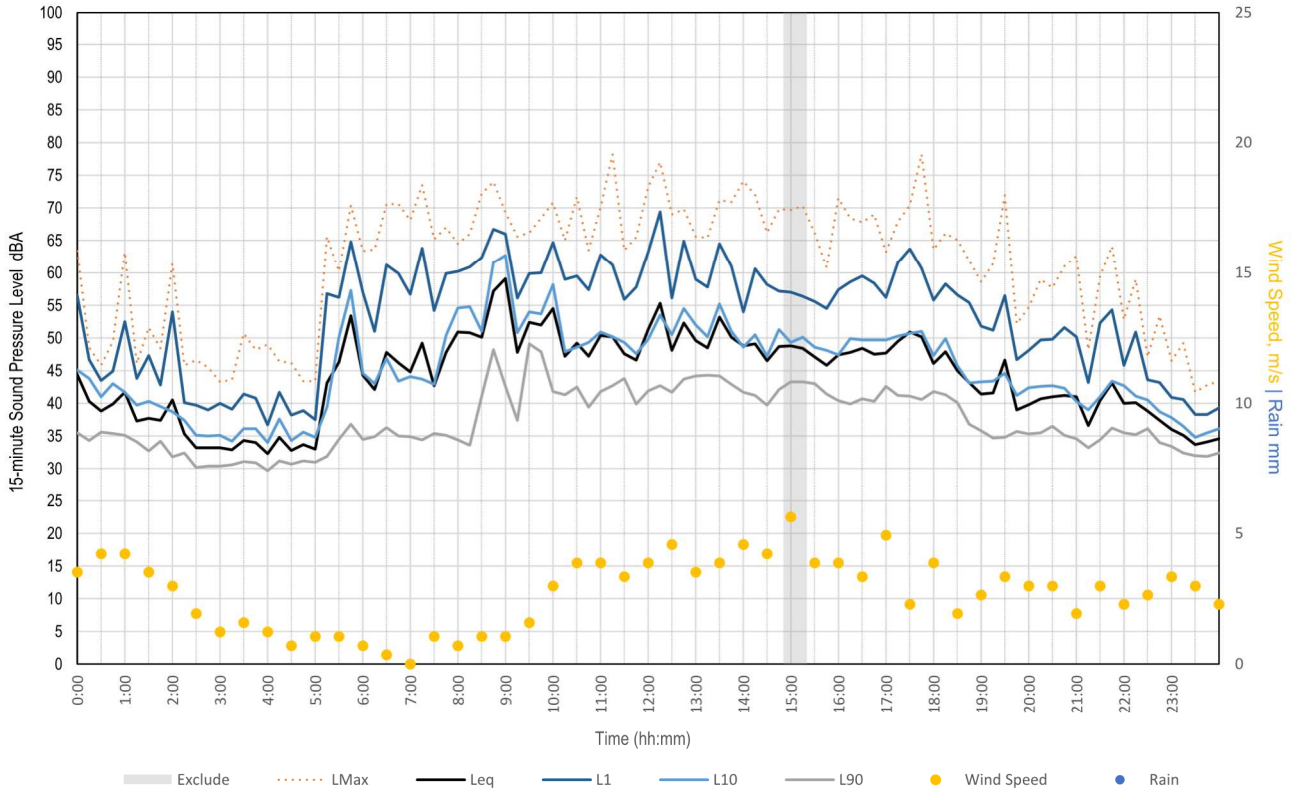
Saturday, 17 September 2022



Noise Logger Results

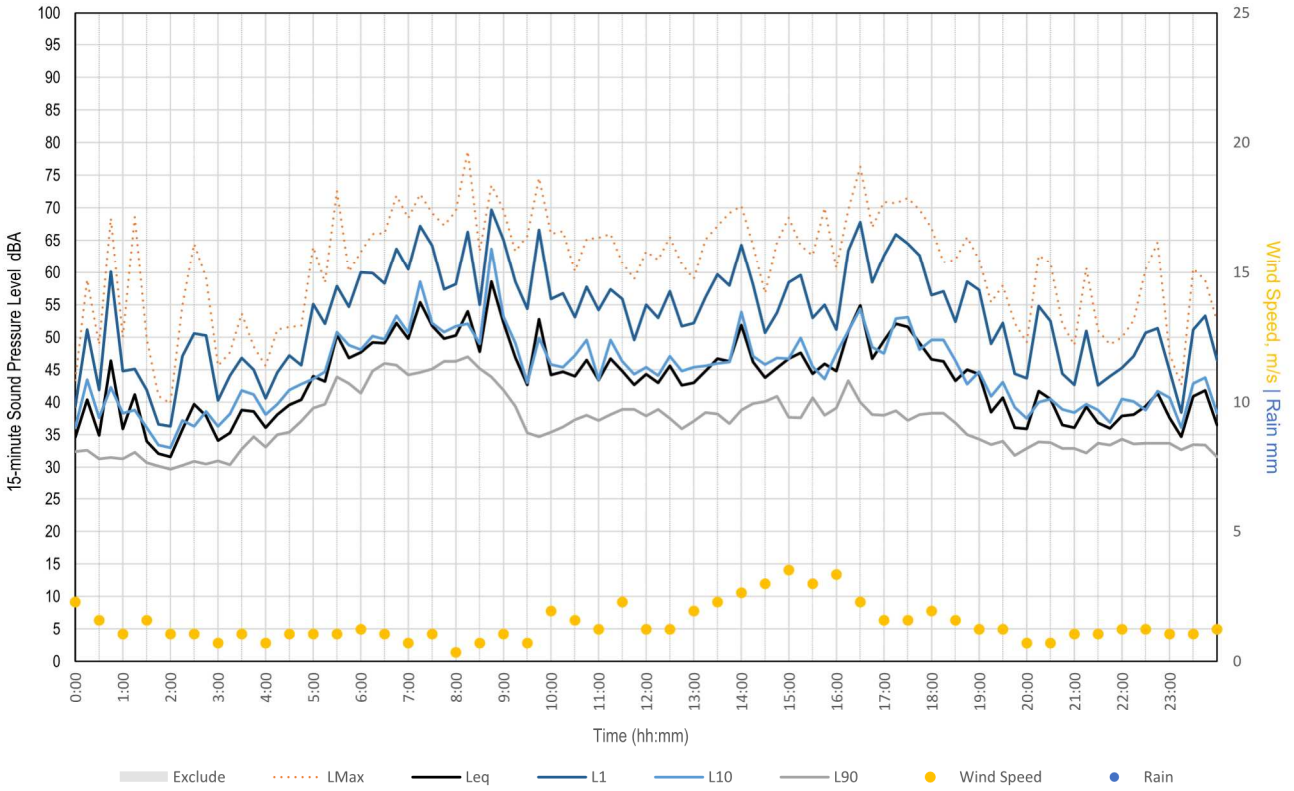
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Sunday, 18 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

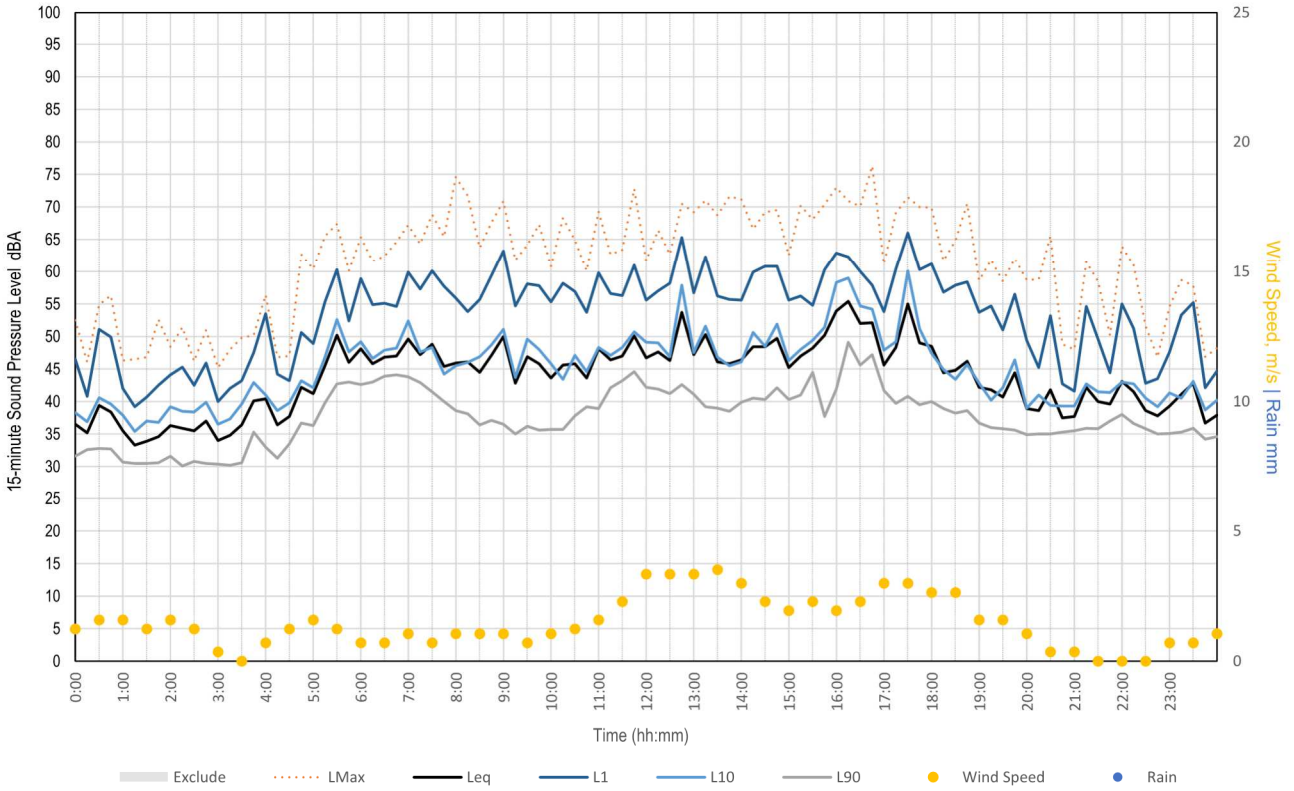
Monday, 19 September 2022



Noise Logger Results

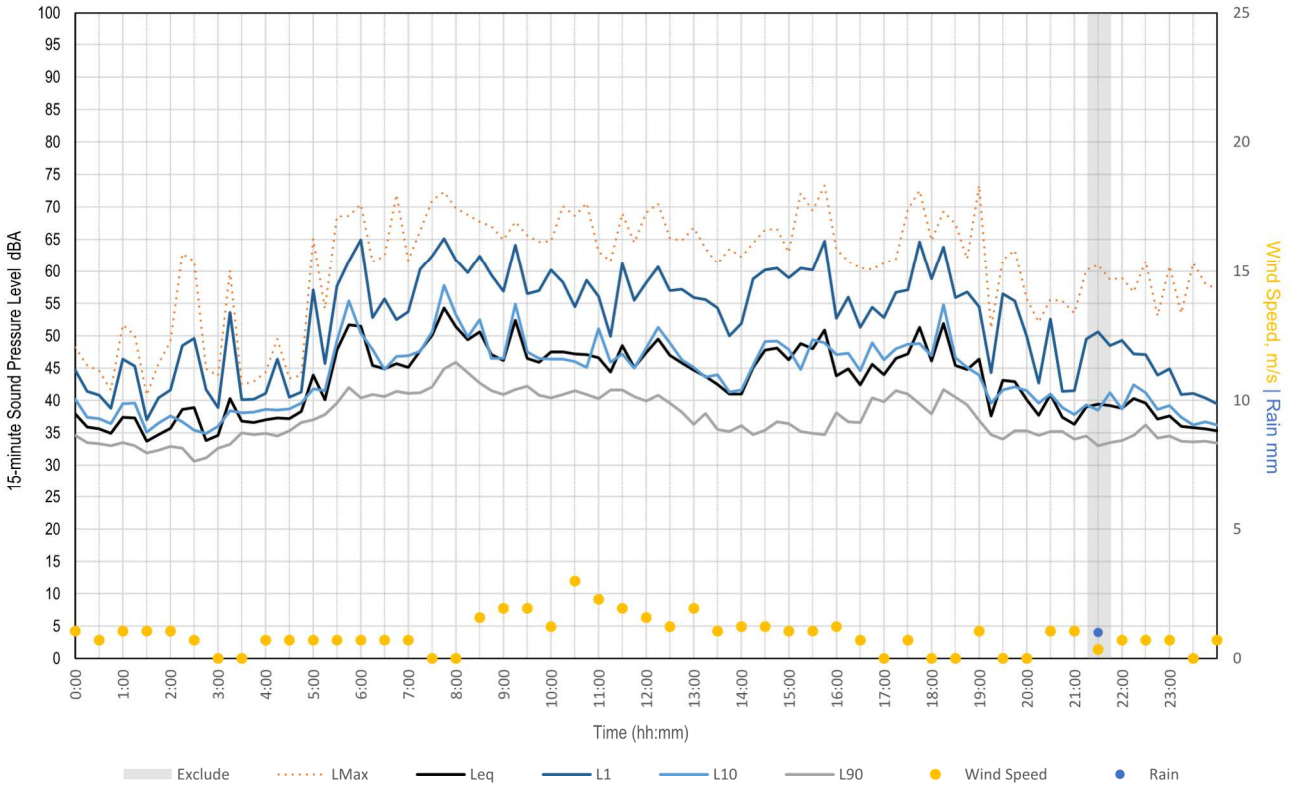
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Tuesday, 20 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

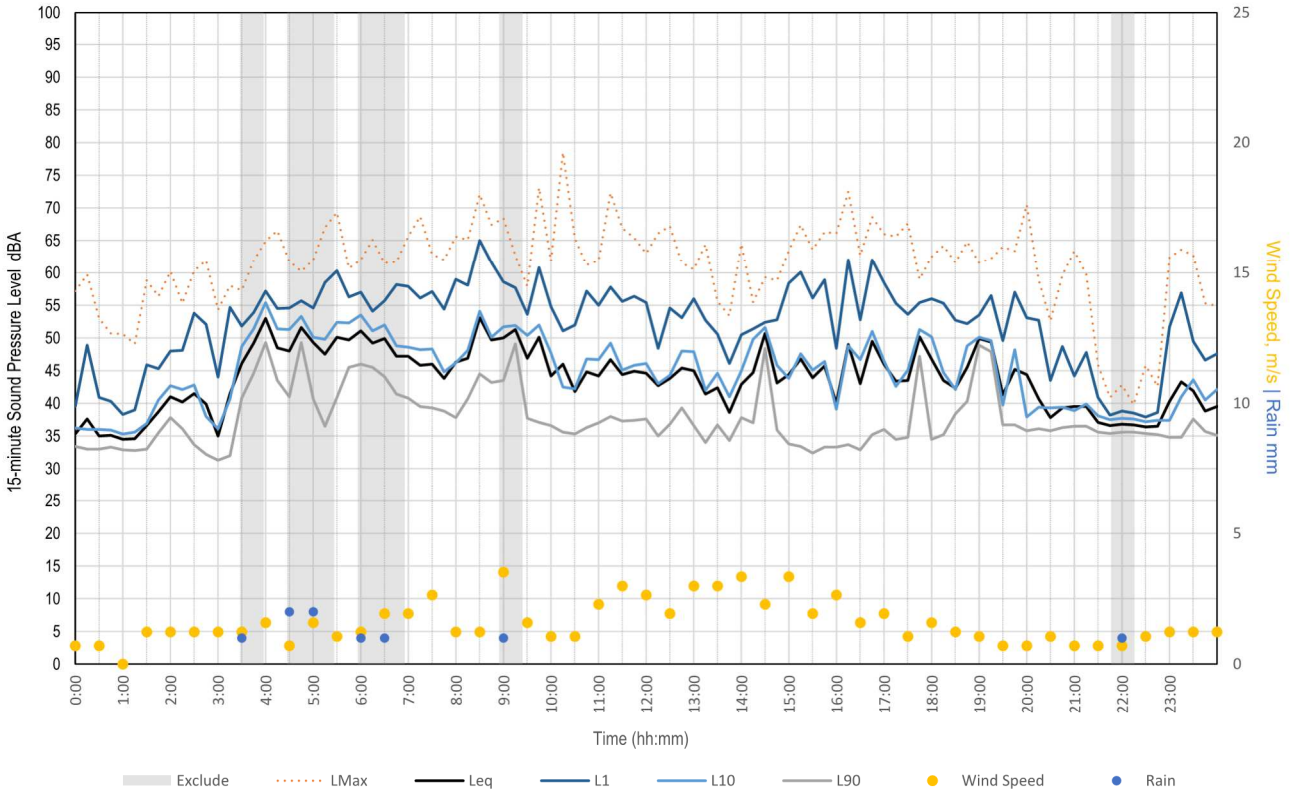
Wednesday, 21 September 2022



Noise Logger Results

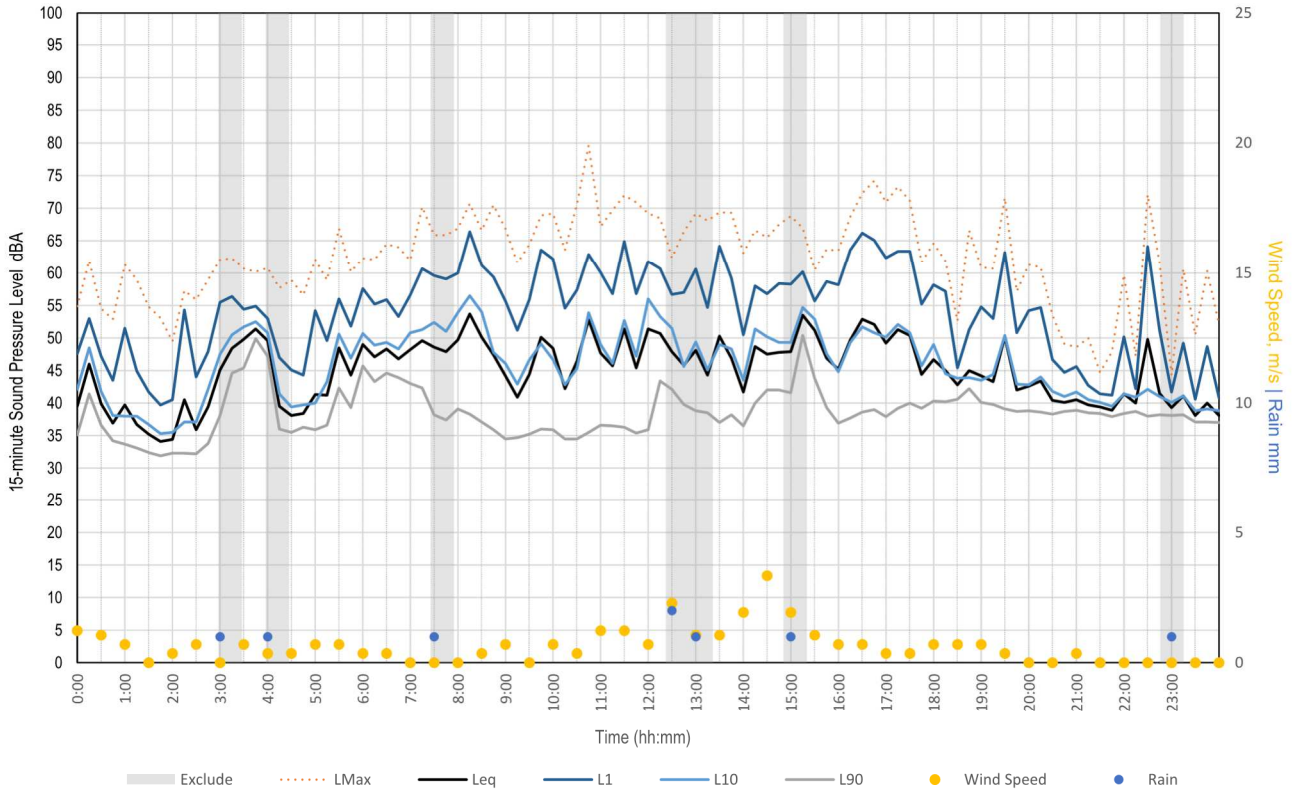
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Thursday, 22 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

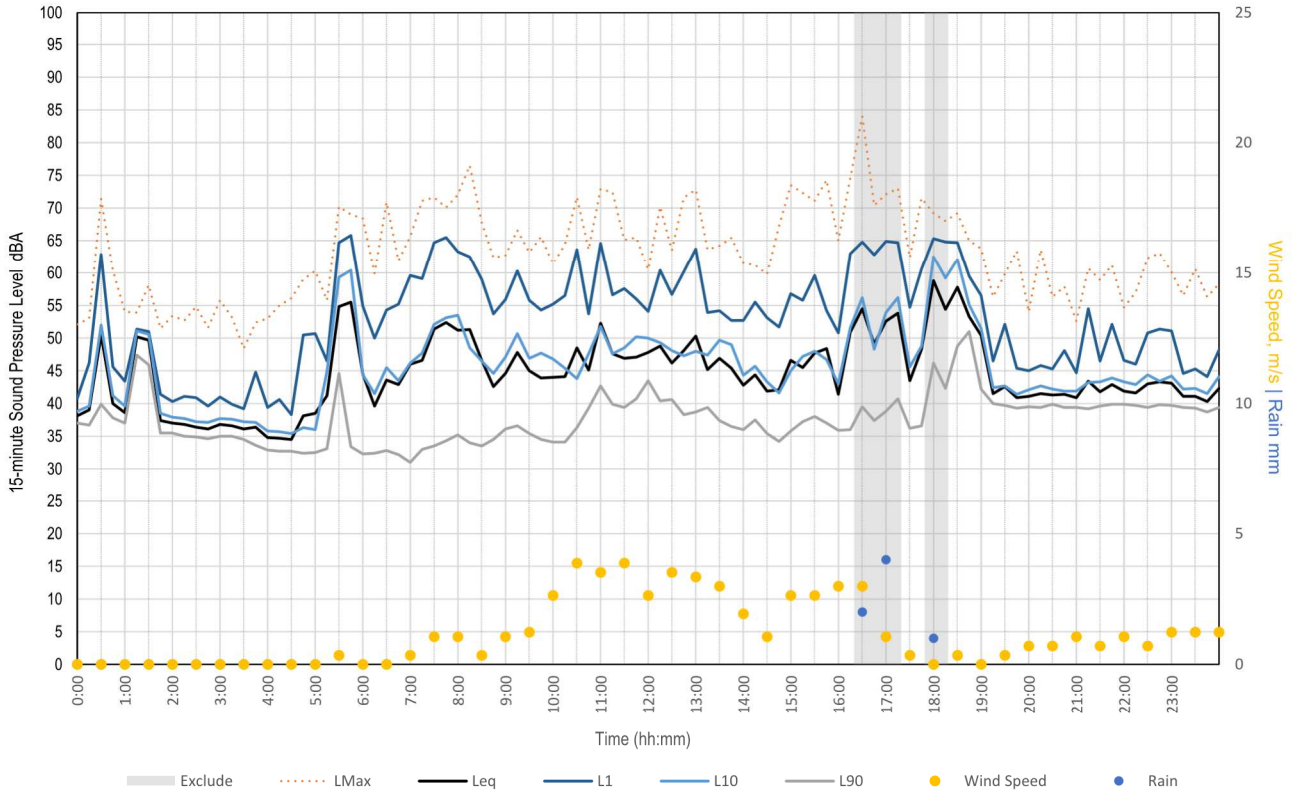
Friday, 23 September 2022



Noise Logger Results

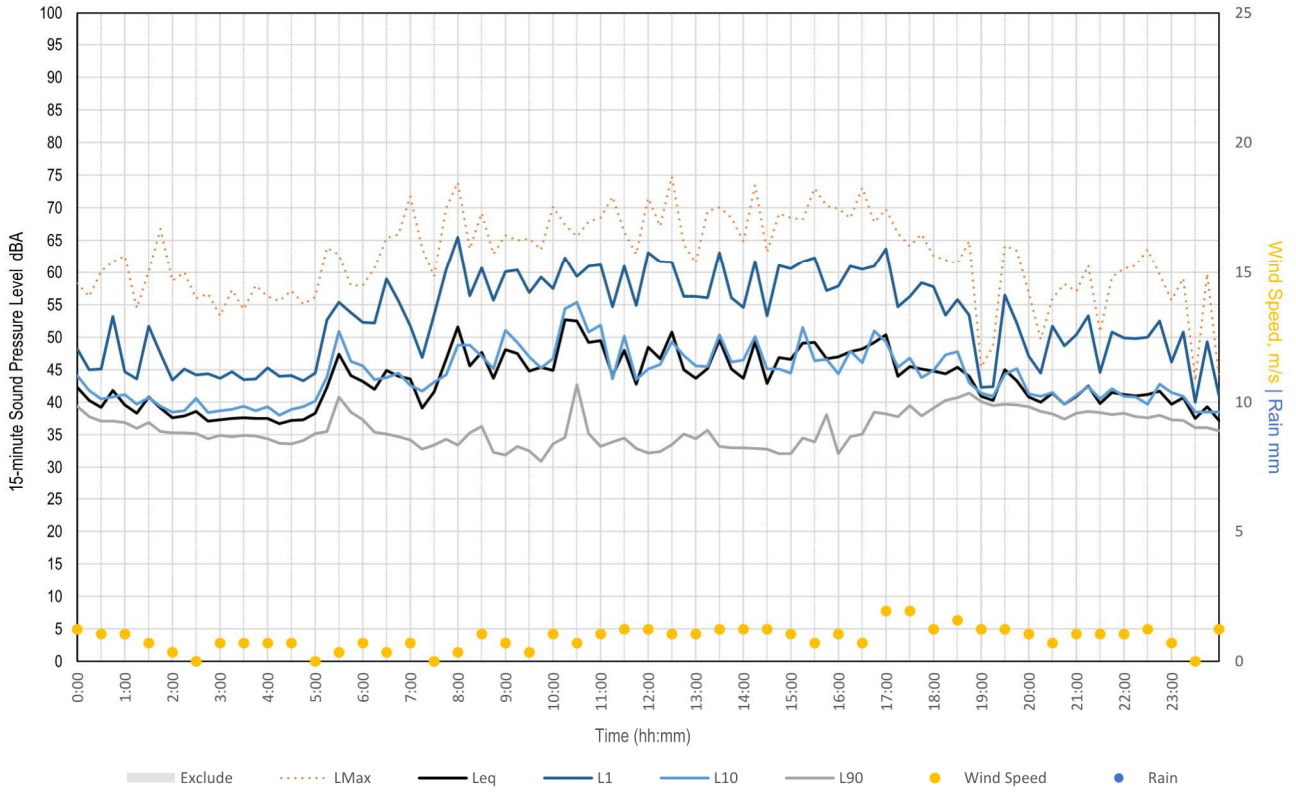
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Saturday, 24 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

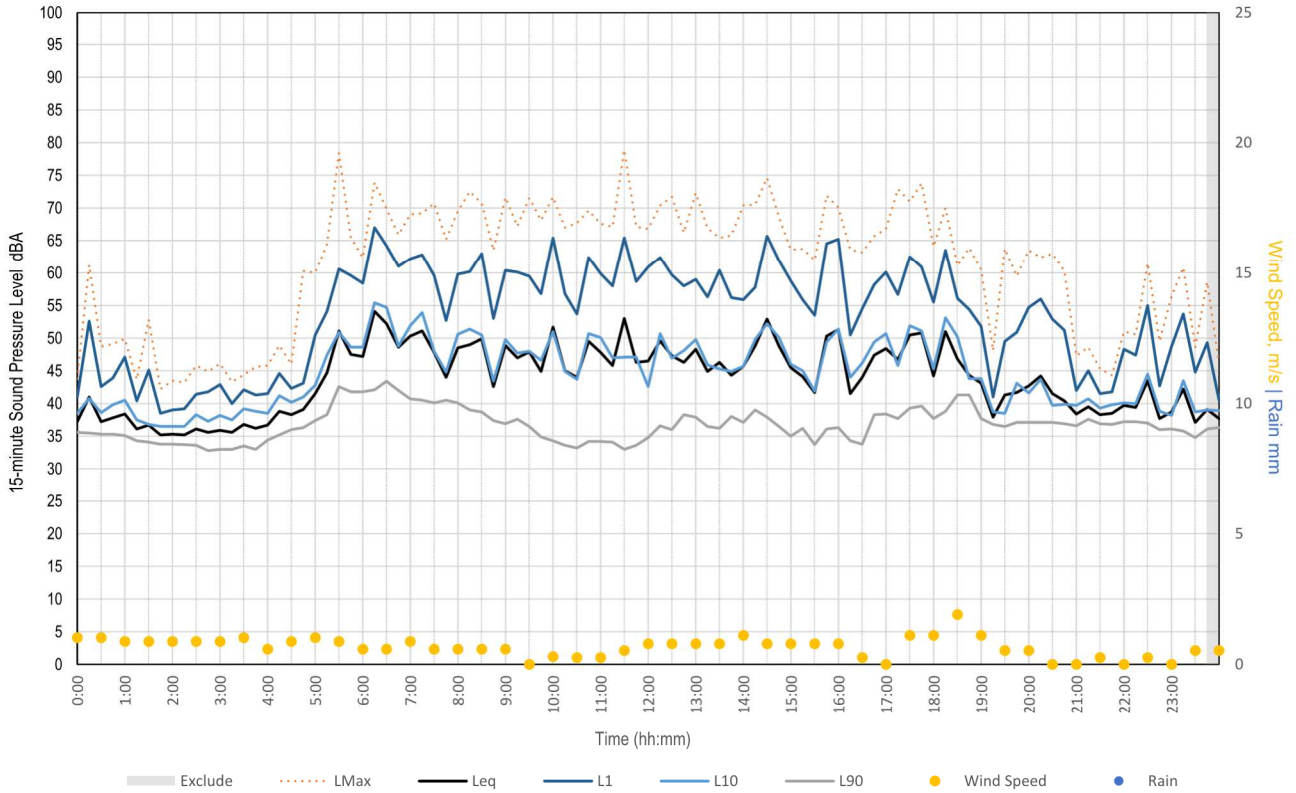
Sunday, 25 September 2022



Noise Logger Results

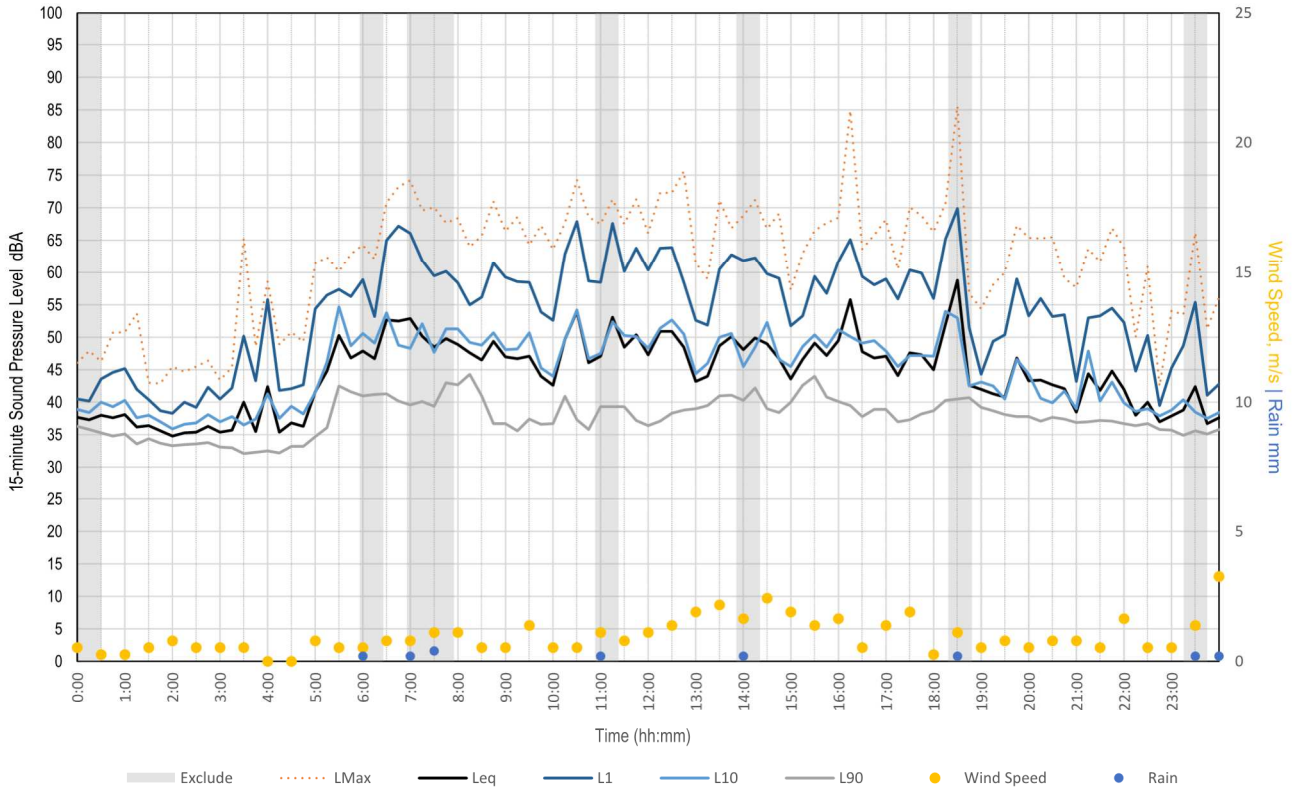
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Monday, 26 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

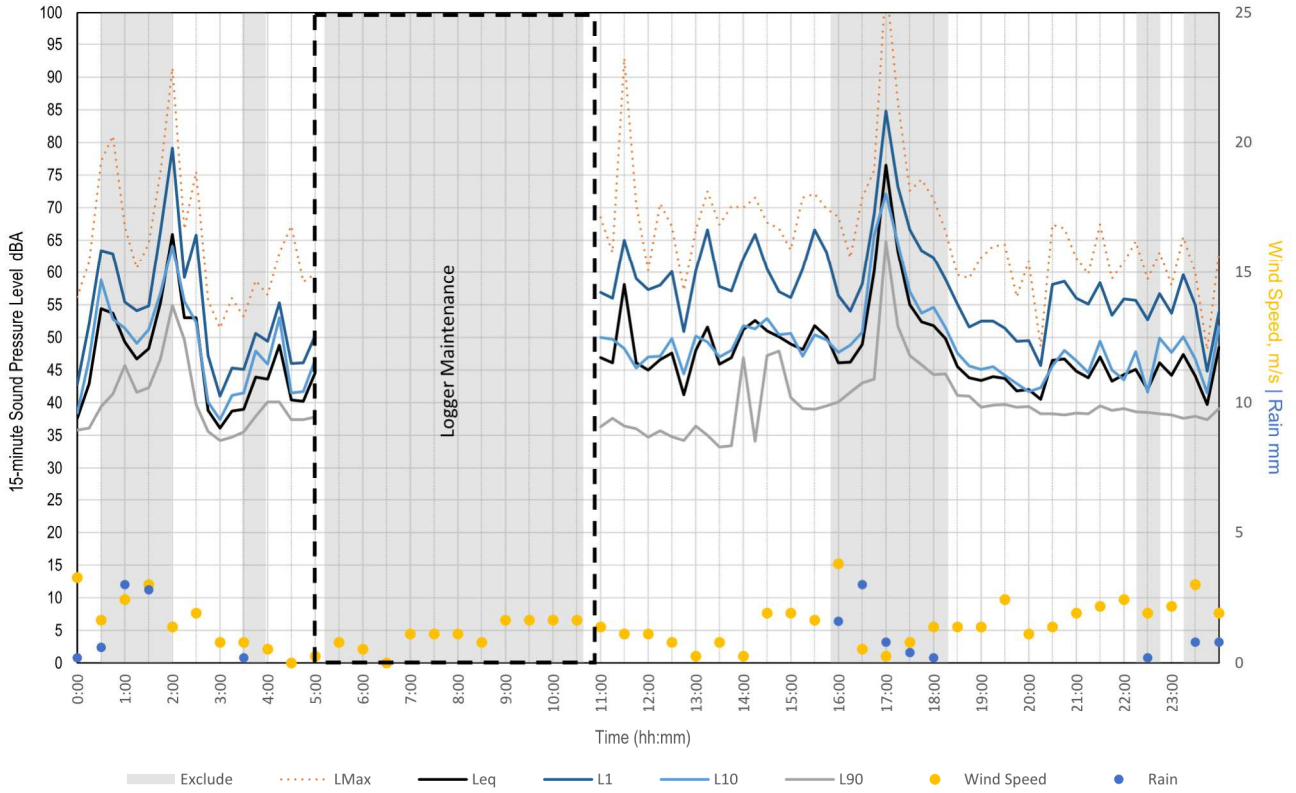
Tuesday, 27 September 2022



Noise Logger Results

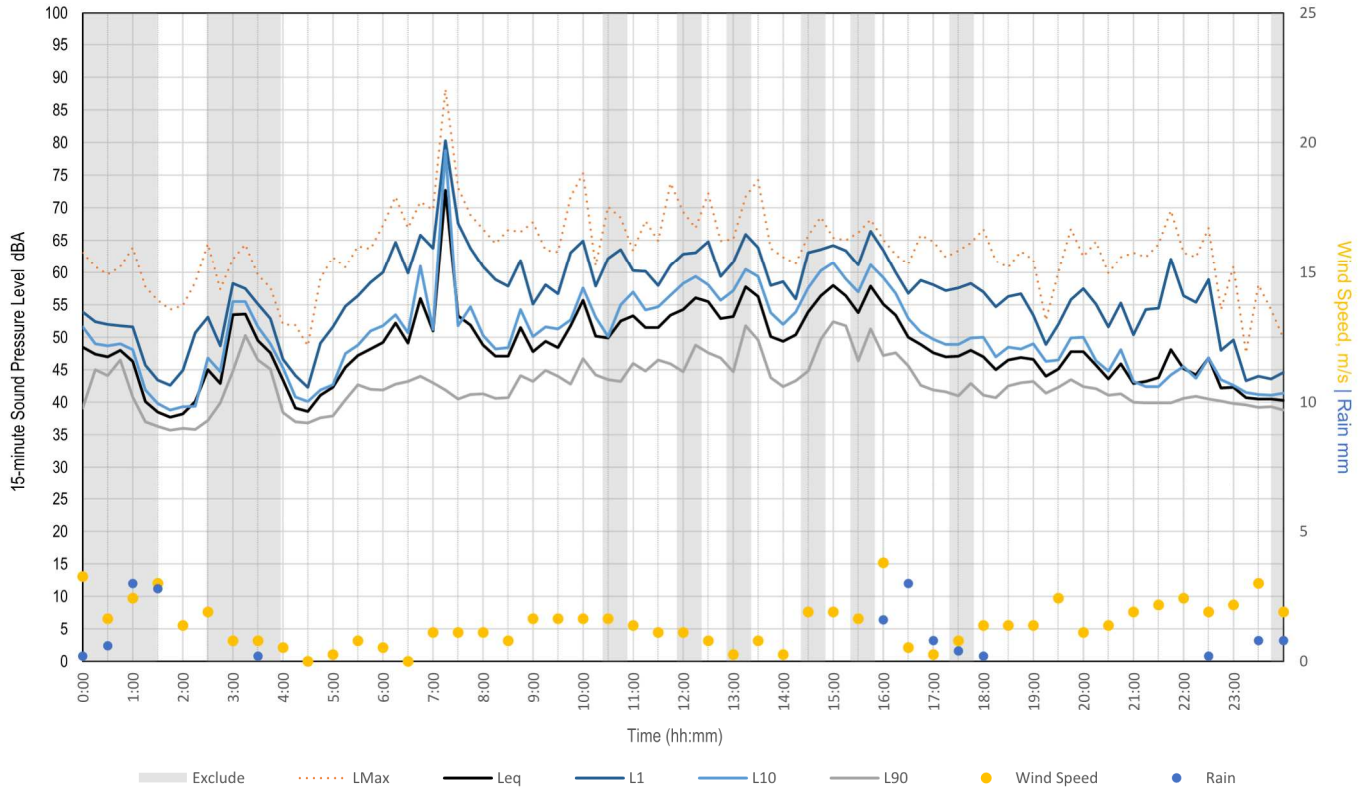
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Wednesday, 28 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

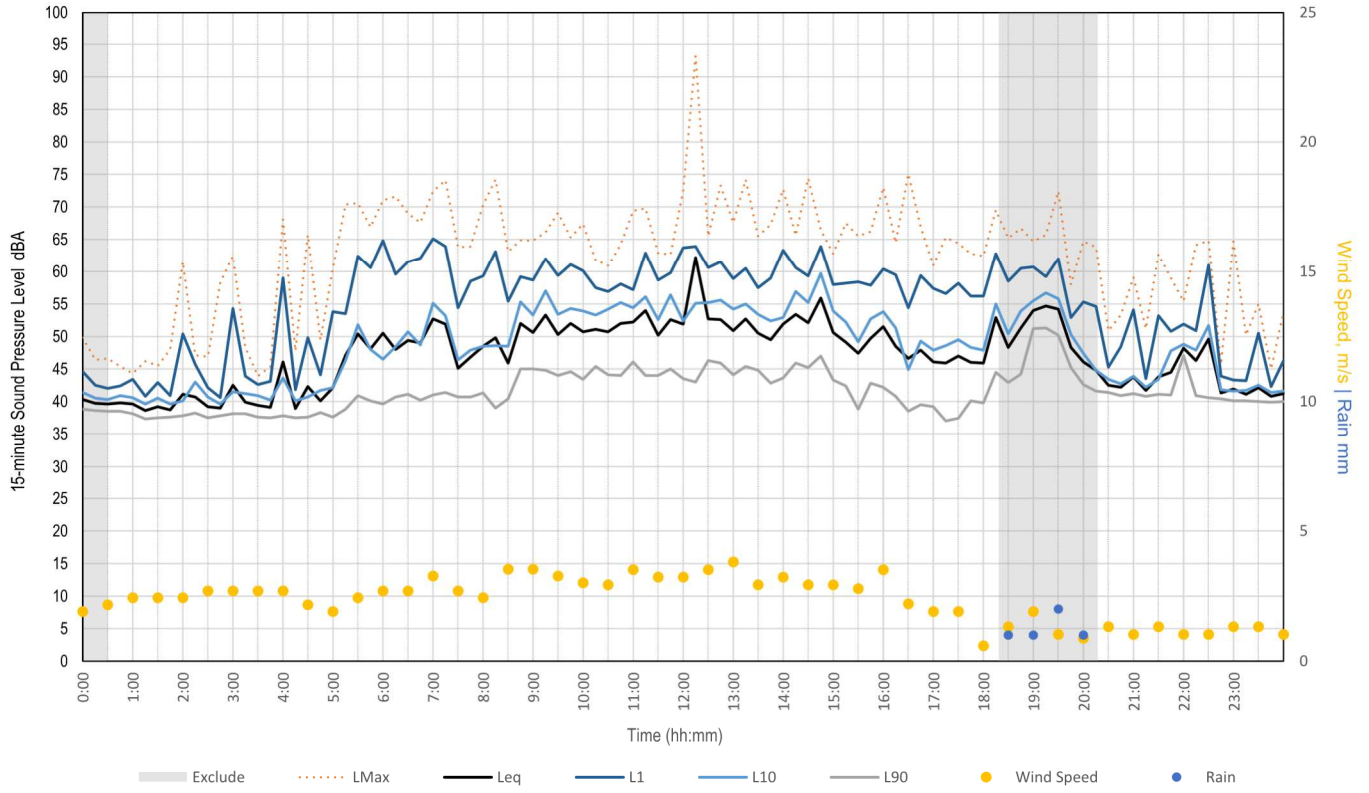
Thursday, 29 September 2022



Noise Logger Results

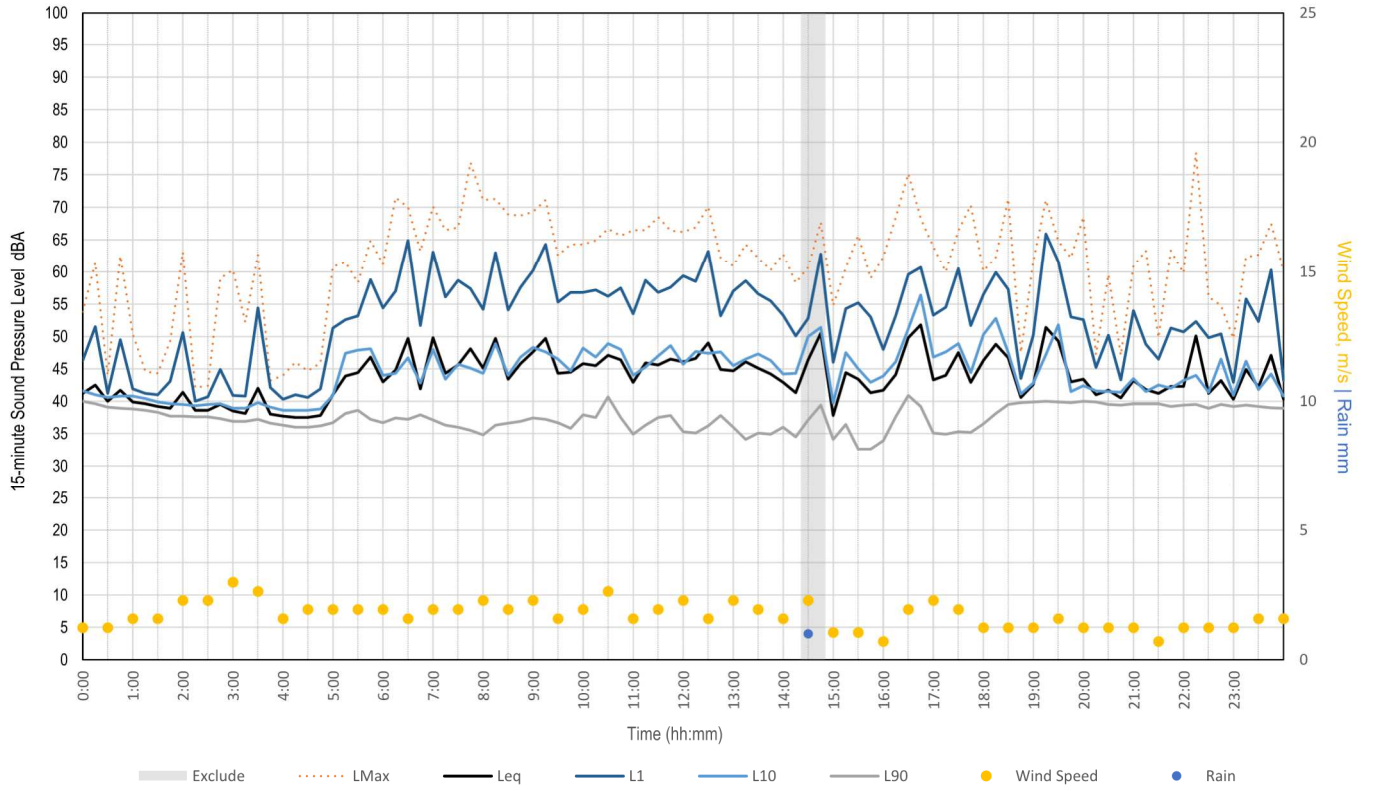
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Friday, 30 September 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

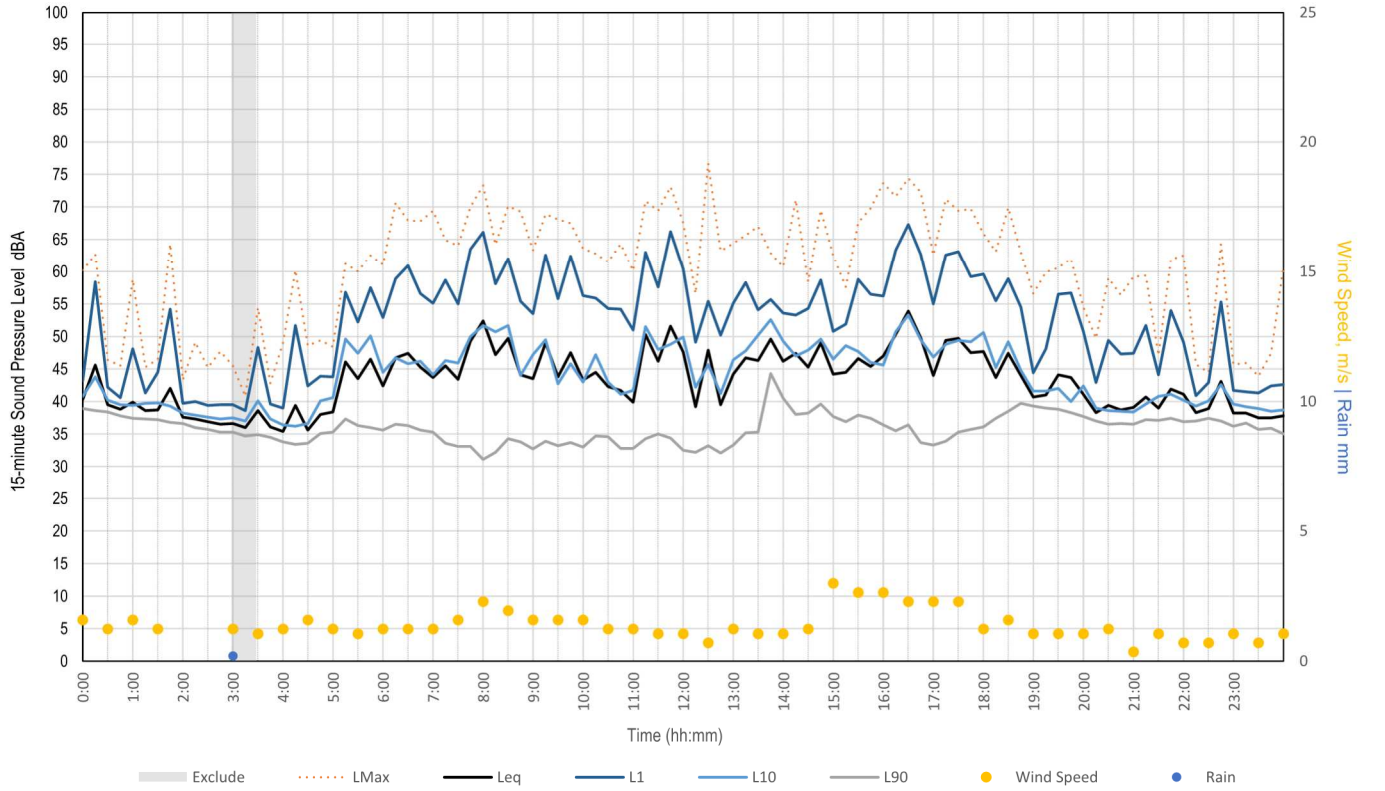
Saturday, 01 October 2022



Noise Logger Results

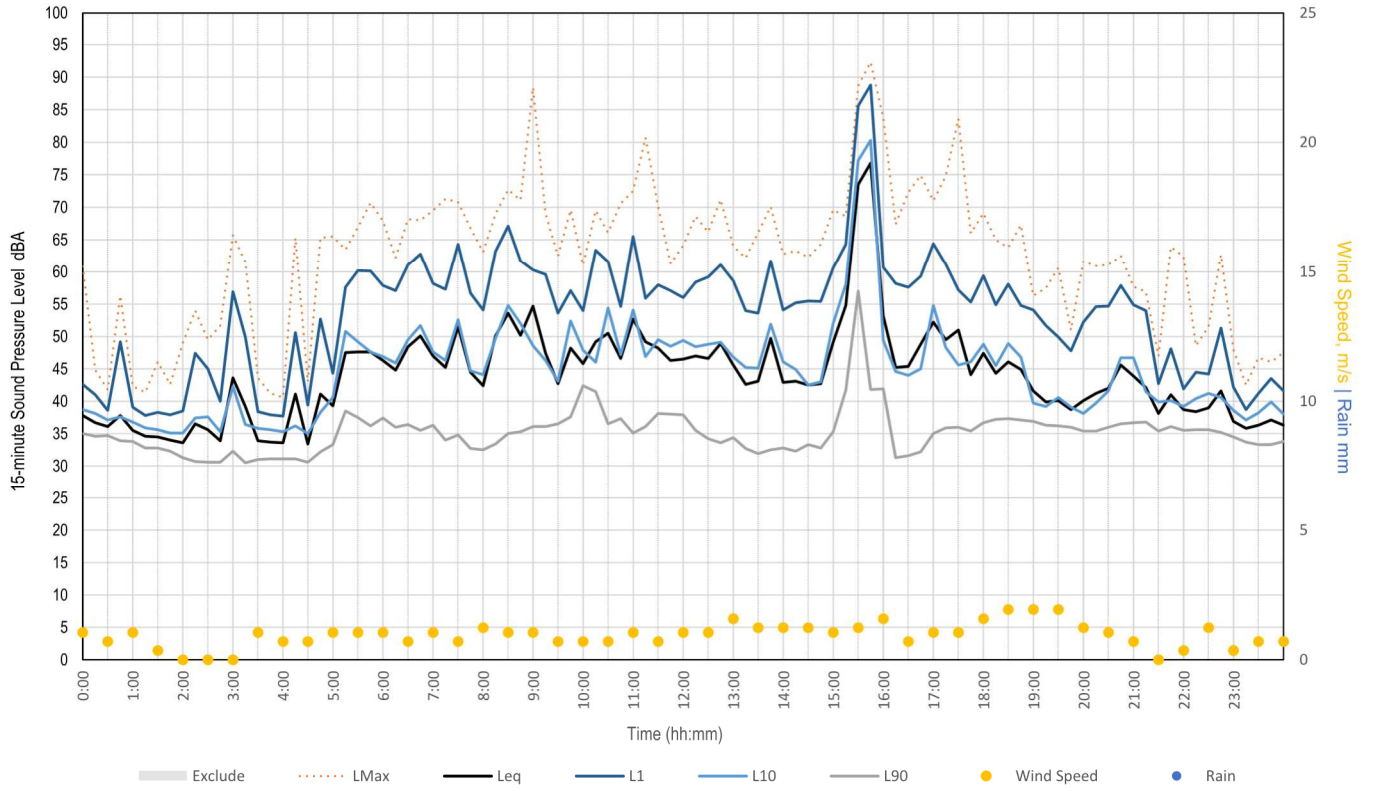
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Sunday, 02 October 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

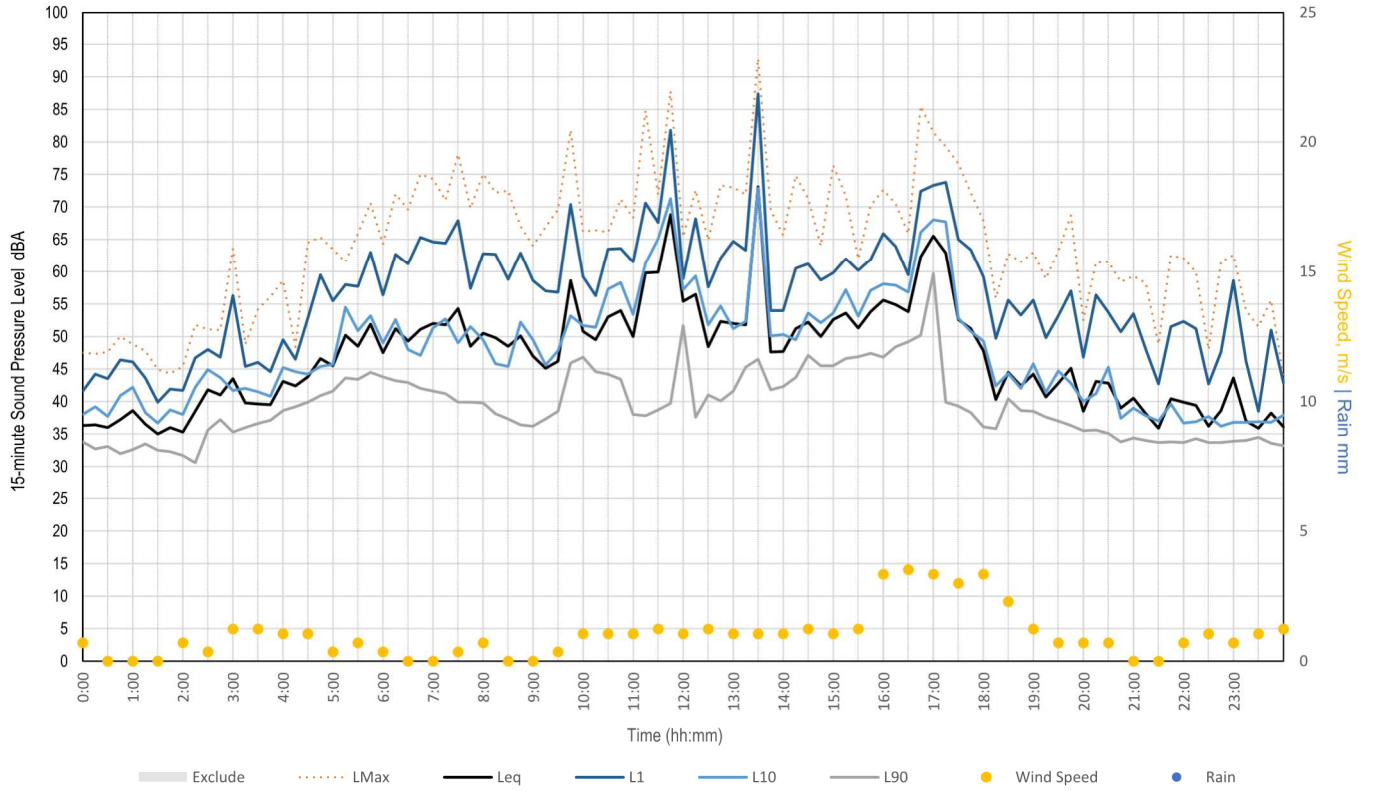
Monday, 03 October 2022



Noise Logger Results

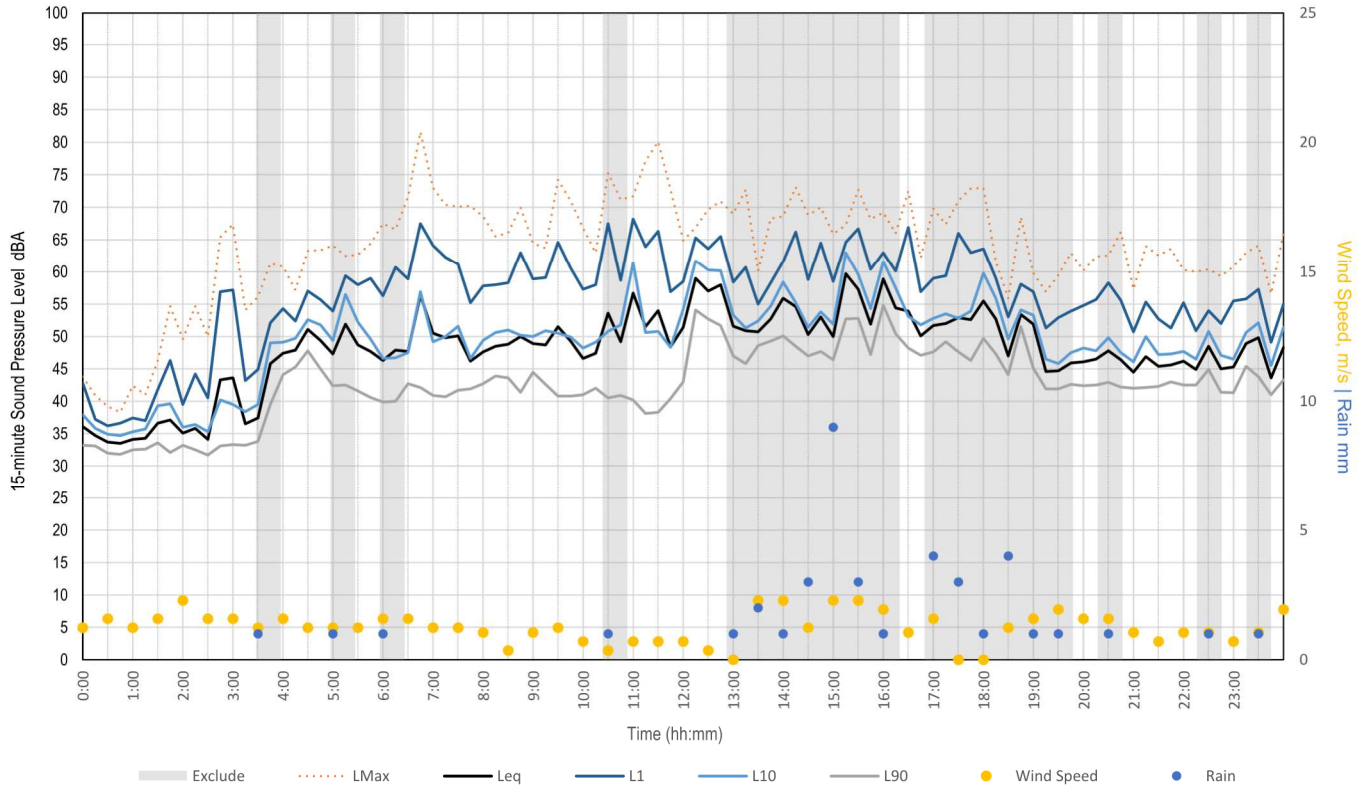
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Tuesday, 04 October 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

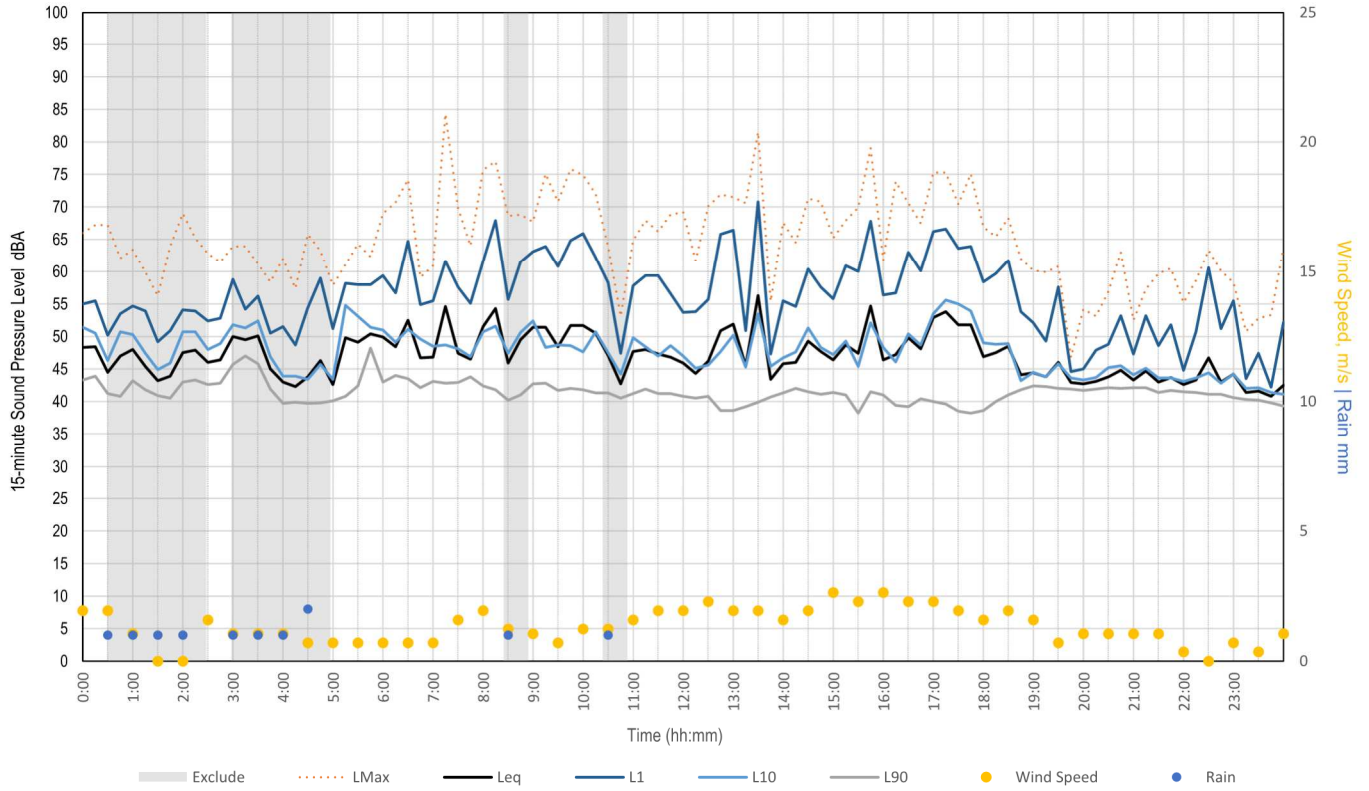
Wednesday, 05 October 2022



Noise Logger Results

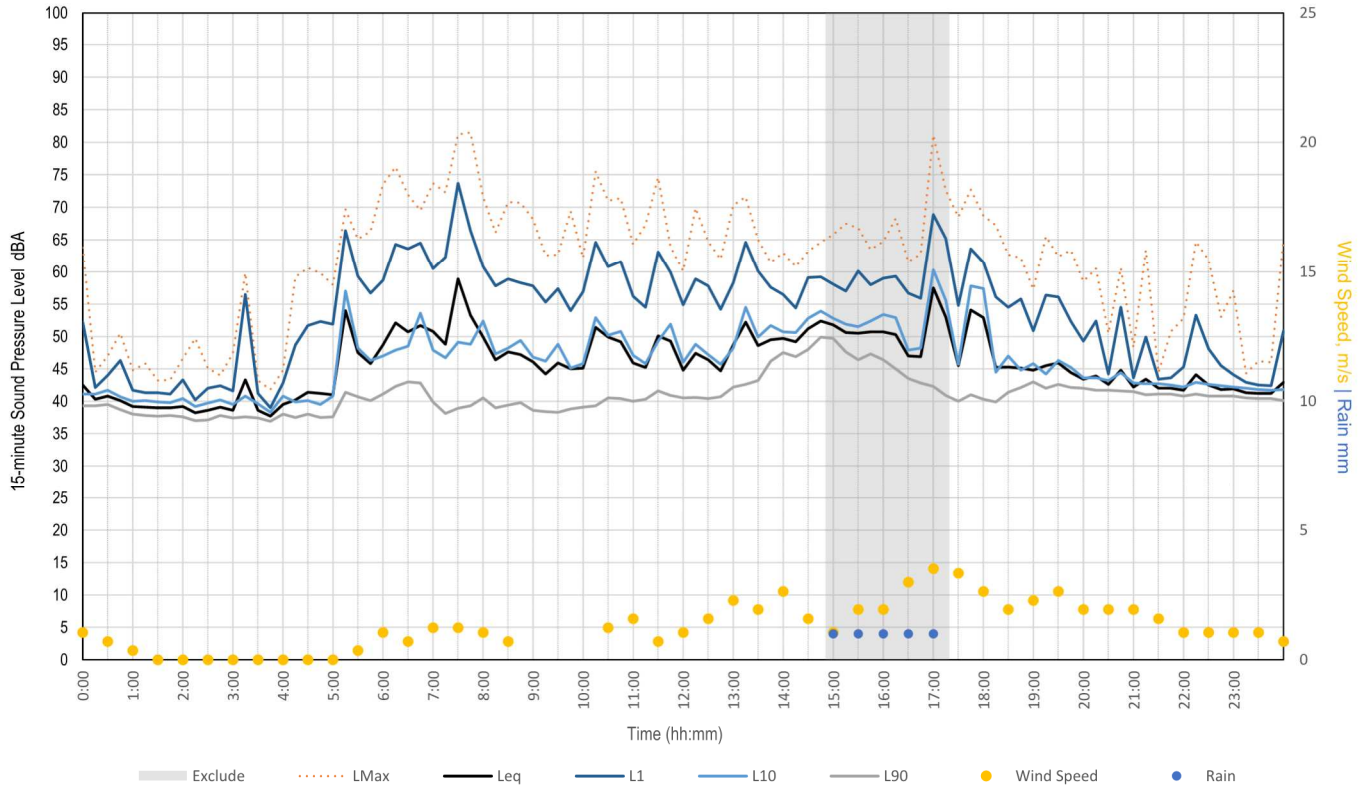
Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Thursday, 06 October 2022



Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

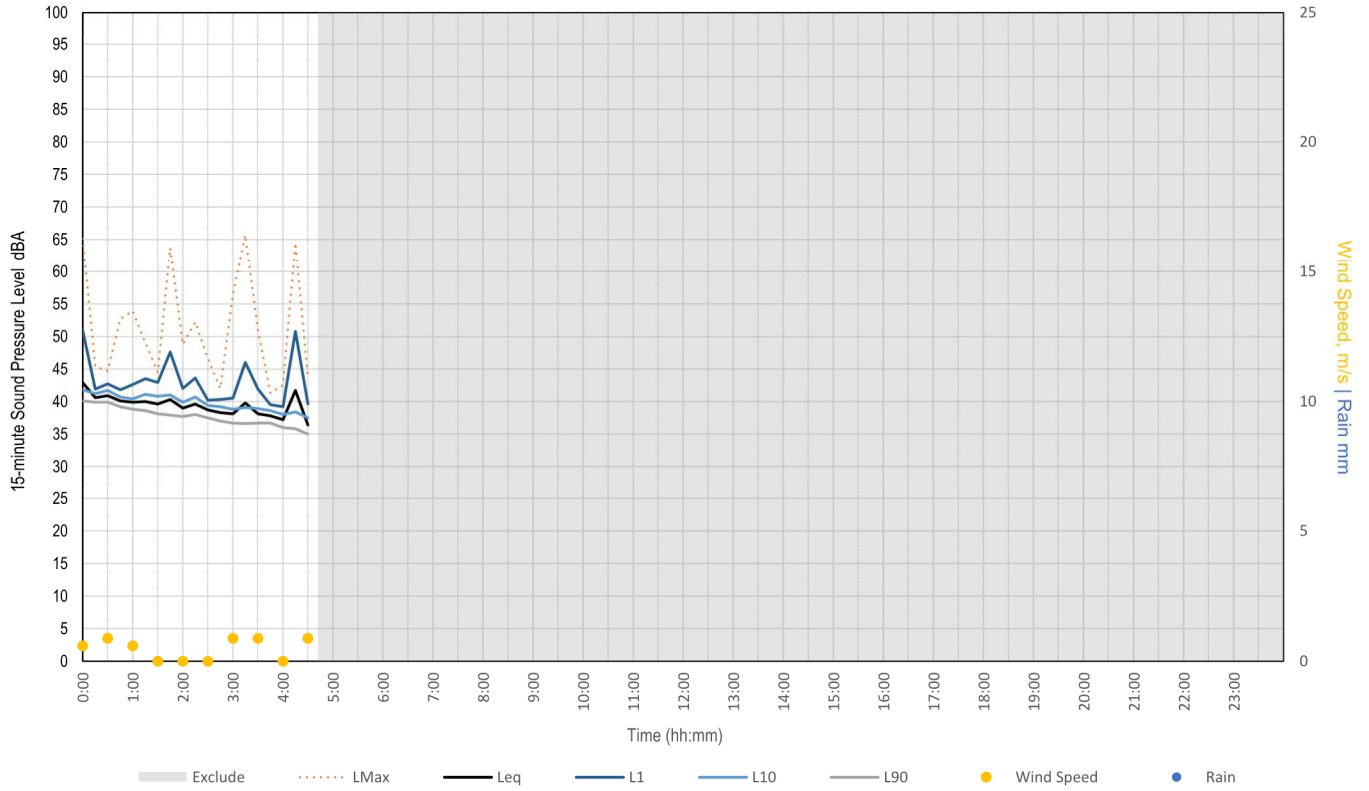
Friday, 07 October 2022



Noise Logger Results

Measured Noise Levels - M07 Kemps Creek Nature Reserve - 100 Floribunda Road (Kemps Creek)

Saturday, 08 October 2022



Background Noise Monitoring

Location	M08 - 2776 The Northern Road (Luddenham)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & MUA

Unattended Equipment				
Equipment	**Evening**	ARL Ngara	**Serial No. :**	878099
Calibration	**Pre:**	94.1 dBA	**Post:**	94.5 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	94.0 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Wednesday, 07 Sep 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placement in field away from residential structure (approx. 150m) and in front of road (approx. 50m from road centre).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	9/08/2022	1:30:26 PM	1:45:26 PM	73	62	66	51	
2	Day	9/08/2022	1:45:26 PM	2:00:26 PM	81	61	65	51	
3	Day	9/08/2022	2:00:26 PM	2:15:26 PM	74	62	65	53	
4	Day	9/08/2022	2:15:26 PM	2:30:26 PM	73	62	65	53	
5	Evening	19/08/2022	6:15:00 PM	6:30:00 PM	70	61	64	56	*
6	Evening	19/08/2022	7:15:00 PM	7:30:00 PM	70	59	62	52	*
7	Evening	19/08/2022	8:00:00 PM	8:15:00 PM	69	56	59	47	*
8	Evening	7/09/2022	6:39:08 PM	6:54:08 PM	69	56	59	49	
9	Night	11/08/2022	1:30:00 AM	1:45:00 AM	90	62	57	41	*
10	Night	11/08/2022	4:30:00 AM	4:45:00 AM	69	56	60	44	*
11	Night	11/08/2022	6:15:00 AM	6:30:00 AM	74	63	66	57	*
12	Night	11/08/2022	10:15:00 PM	10:30:00 PM	72	61	64	51	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Dominated by constant flow of traffic on The Northern Road, combination of light and heavy vehicles observed. A number of plane passbys were observed at a distance, traffic still being the dominant noise source.
Background noise	Predominantly distant traffic, but in lulls movement of vegetation induced by wind (e.g. grass rustling).
Evening	
Ambient noise	Constant insect noise. Intermittent vehicle traffic on The Northern Road. One plane and one helicopter passby were observed. A plane passby was observed to have a maximum noise level of approx. 50 dBA.
Background noise	Traffic at distance. Insect noise constant.
Night	
Ambient noise	Intermittent vehicle traffic on The Northern Road. Various occasional impulsive animal noises (e.g. frog/ toad, dogs, birds). One occasion of faint noise of a train horn. Small aircraft and helicopter flybys were observed.
Background noise	Traffic at distance.

Site Details	M08 - 2776 The Northern Road (Luddenham)
Start Date	Tue 09 August 2022
End Date	Wed 07 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	62
$L_{eq, Evening}$ dBA	59
$L_{eq, Night}$ dBA	58
RBL, $_{Day}$ dBA	47
RBL, $_{Evening}$ dBA	45
RBL, $_{Night}$ dBA	39

Daily Summary

Date	09/08	10/08	11/08	12/08	13/08	14/08	15/08	16/08
$L_{eq, Day}$ dBA	63	61	61	60	60	59	62	63
$L_{eq, Evening}$ dBA	59	58	58	56	59	56	58	59
$L_{eq, Night}$ dBA	58	57	57	57	53	58	58	58
ABL, $_{Day}$ dBA	52	46	44	45	48	44	51	49
ABL, $_{Evening}$ dBA	42	45	45	43	47	39	42	43
ABL, $_{Night}$ dBA	35	42	40	39	37	36	37	36

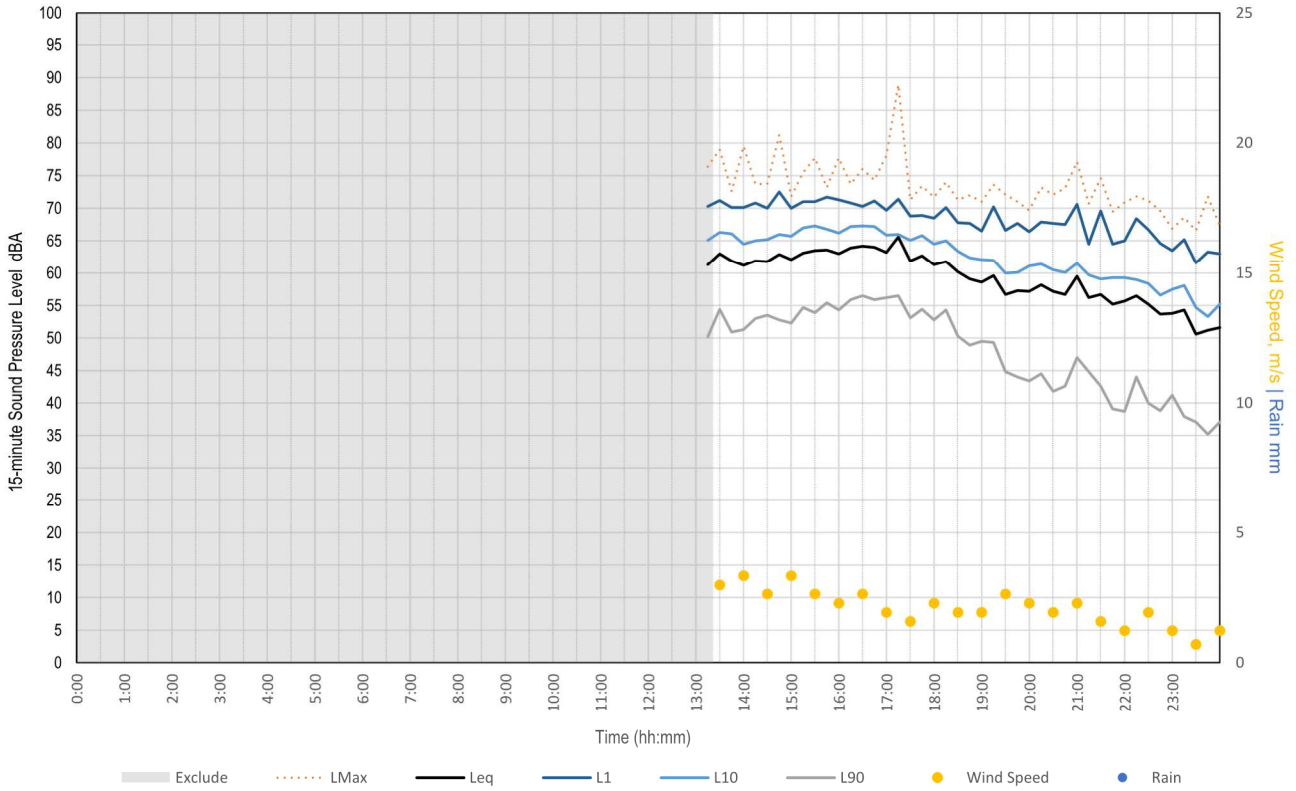
Date	17/08	18/08	19/08	20/08	21/08	22/08	23/08	24/08
$L_{eq, Day}$ dBA	61	61	62	58	57	61	65	63
$L_{eq, Evening}$ dBA	59	59	60	58	57	57	64	62
$L_{eq, Night}$ dBA	58	58	56	52	58	57	62	
ABL, $_{Day}$ dBA	47	44	49	42	42	44	46	50
ABL, $_{Evening}$ dBA	47	45	45	44	44	41	48	
ABL, $_{Night}$ dBA	37	40	37	33	39	34	36	

Date	25/08	26/08	27/08	28/08	29/08	30/08	31/08	01/09
$L_{eq, Day}$ dBA	62	62	62	59	61	62	61	60
$L_{eq, Evening}$ dBA	59	59	62	58	60	61	57	58
$L_{eq, Night}$ dBA		59	58	58	59	59	58	58
ABL, $_{Day}$ dBA		49	48	43	44	50	46	44
ABL, $_{Evening}$ dBA	47	50	53	47	48	47	42	47
ABL, $_{Night}$ dBA	41	43	43	40	42	41	39	42

Date	02/09	03/09	04/09	05/09	06/09	07/09
$L_{eq, Day}$ dBA	64	64	61	61	61	60
$L_{eq, Evening}$ dBA	60	62	59	59	57	59
$L_{eq, Night}$ dBA	57	57	60	59	59	
ABL, $_{Day}$ dBA	49	52	49	47	47	43
ABL, $_{Evening}$ dBA	45	50	49	46	41	49
ABL, $_{Night}$ dBA	40	39	41	39	38	

Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

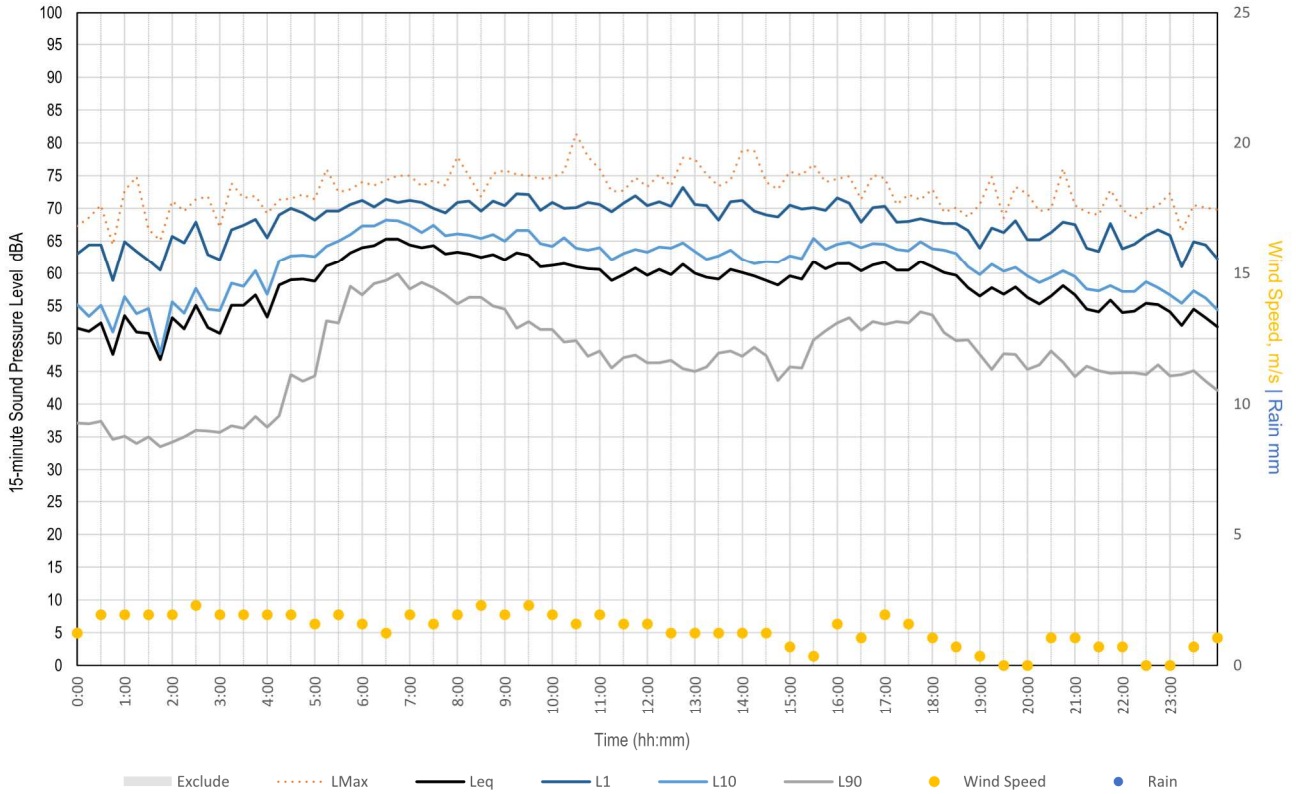
Tuesday, 09 August 2022



Noise Logger Results

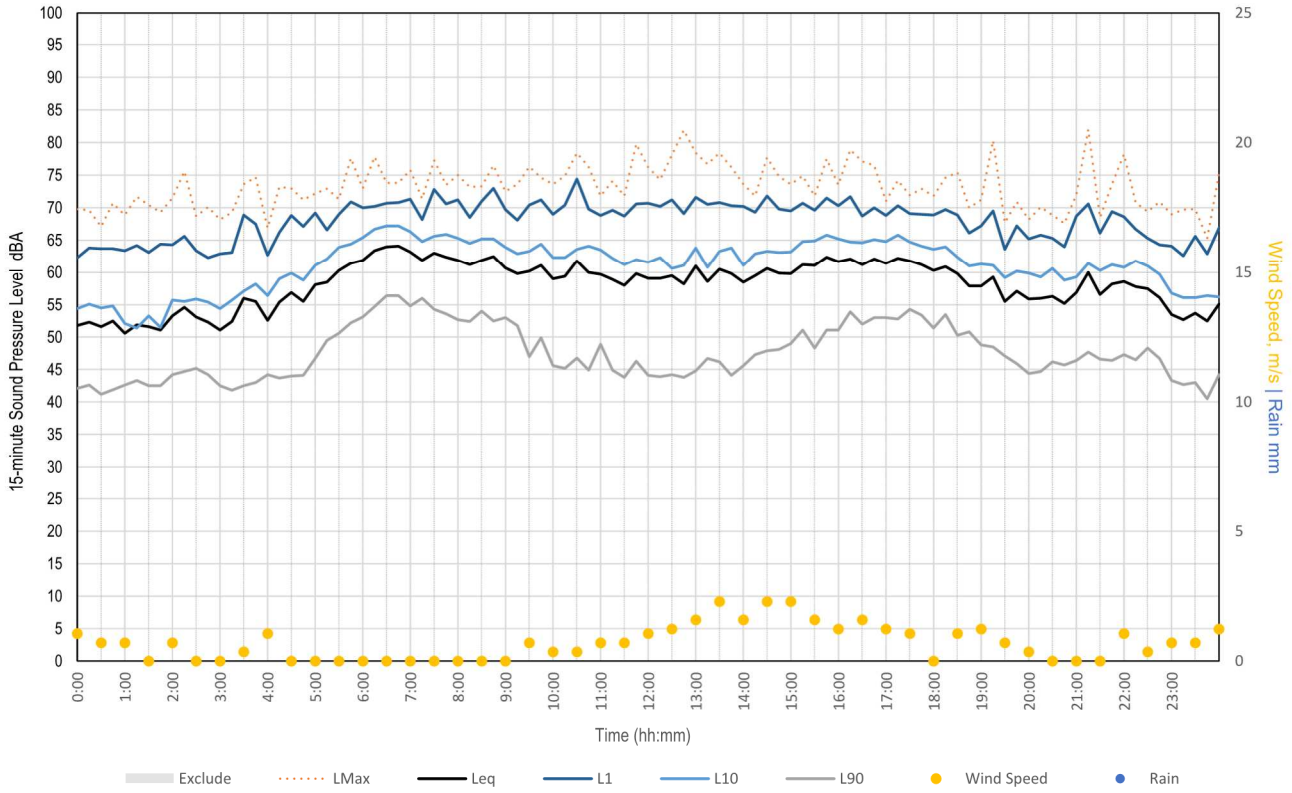
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Wednesday, 10 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

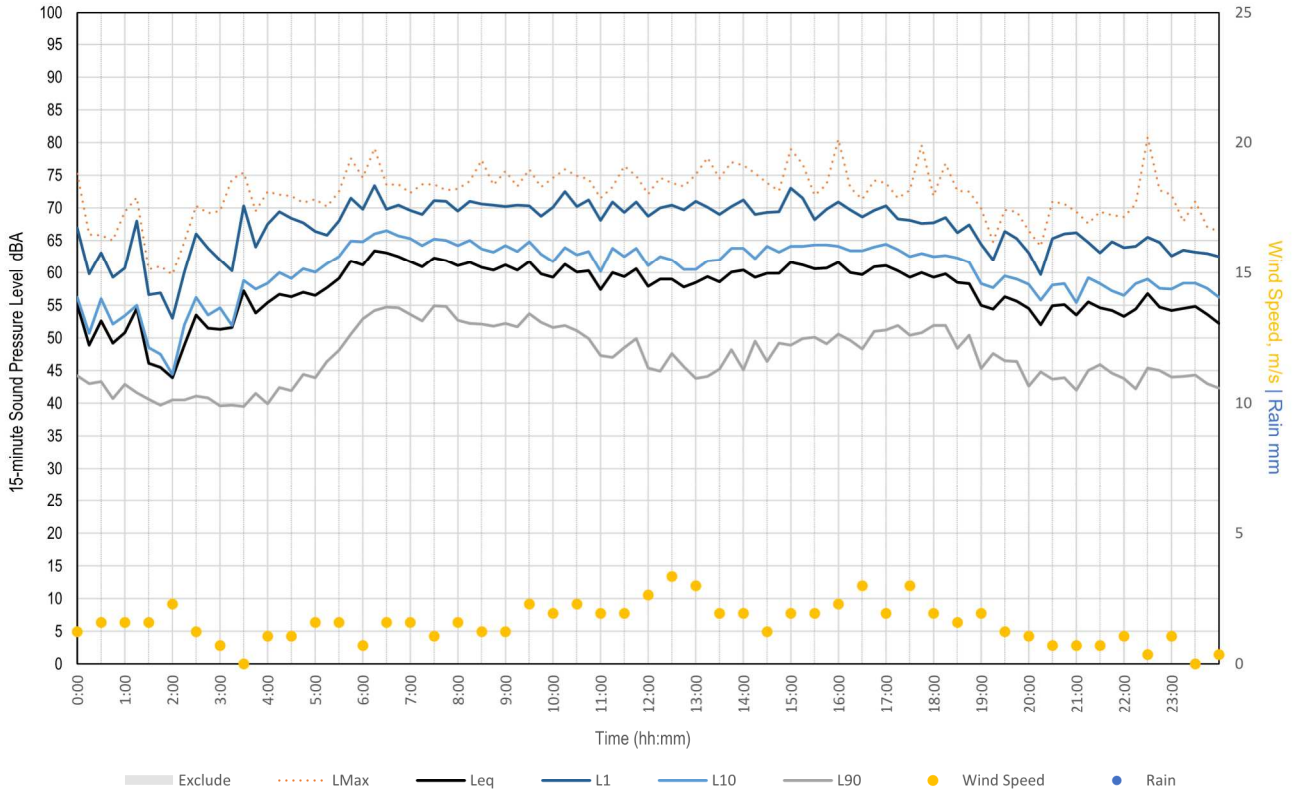
Thursday, 11 August 2022



Noise Logger Results

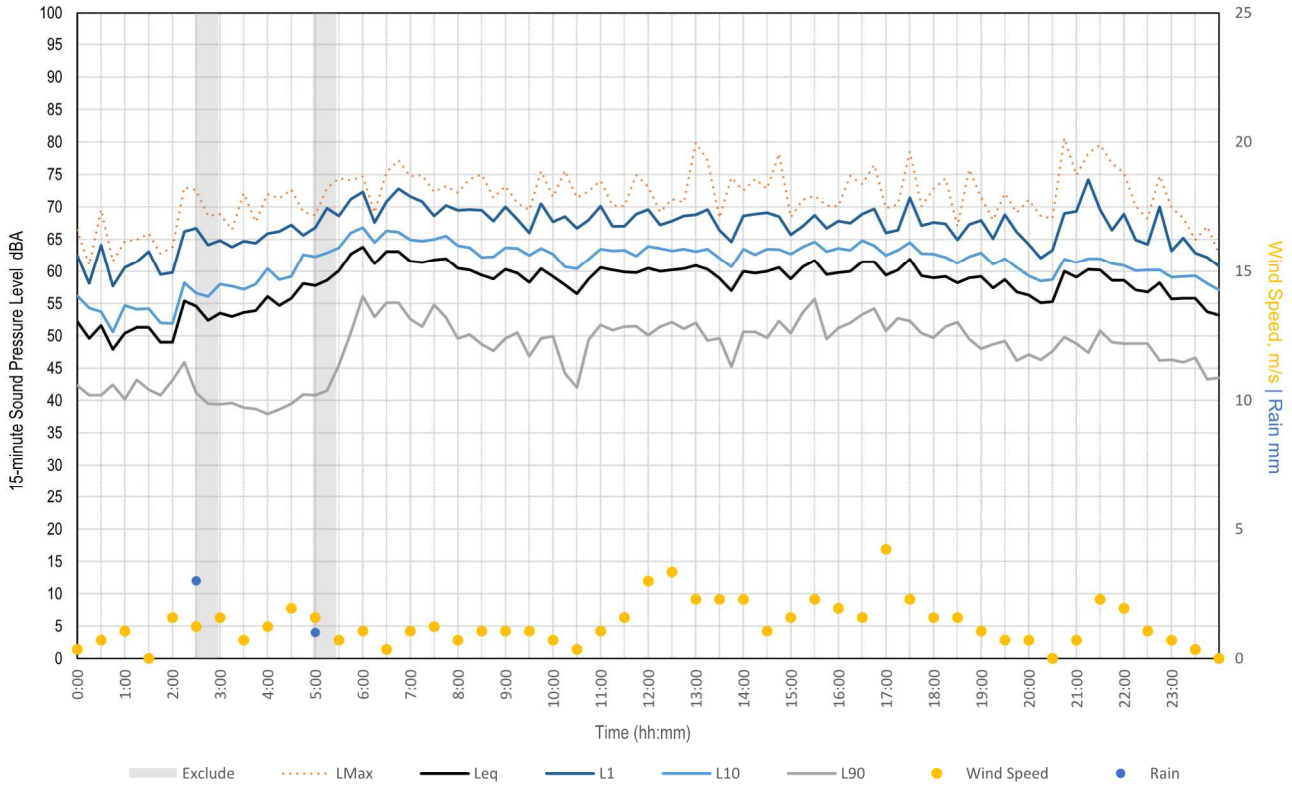
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Friday, 12 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

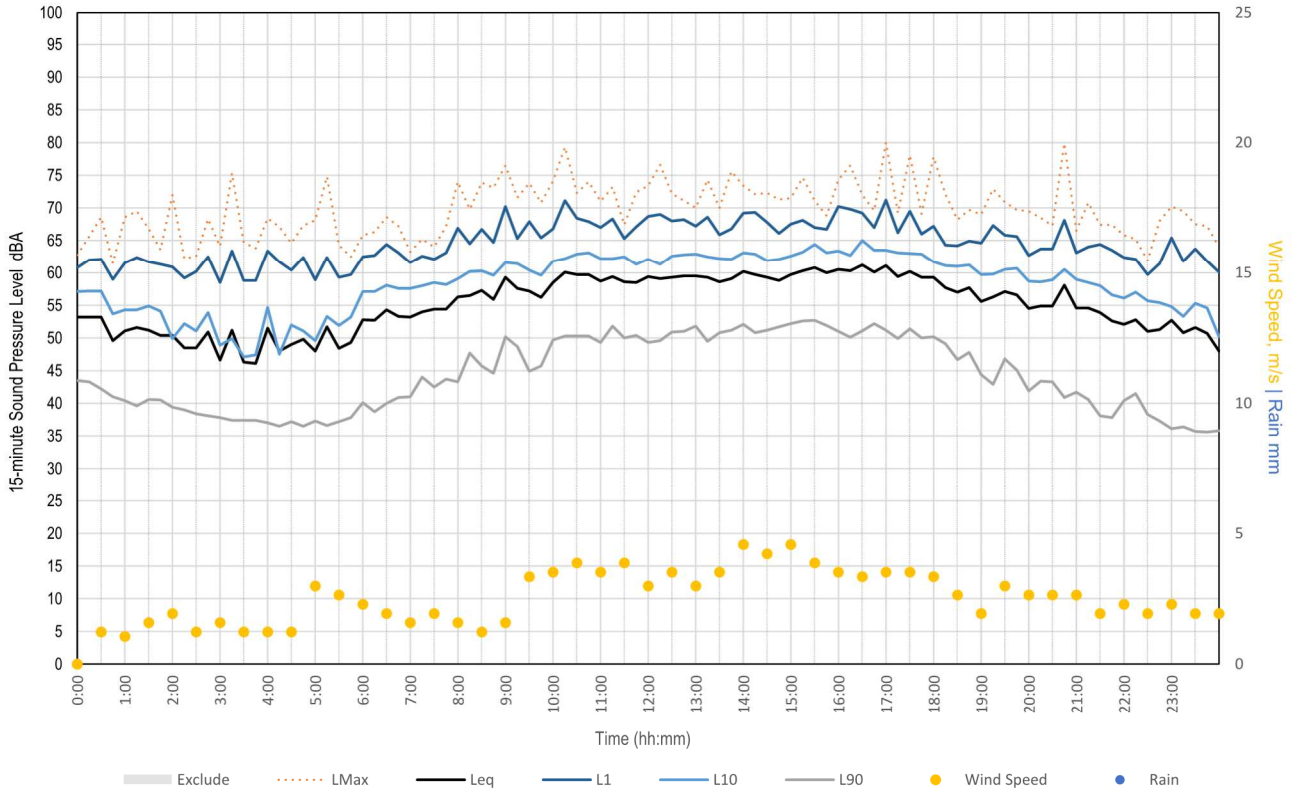
Saturday, 13 August 2022



Noise Logger Results

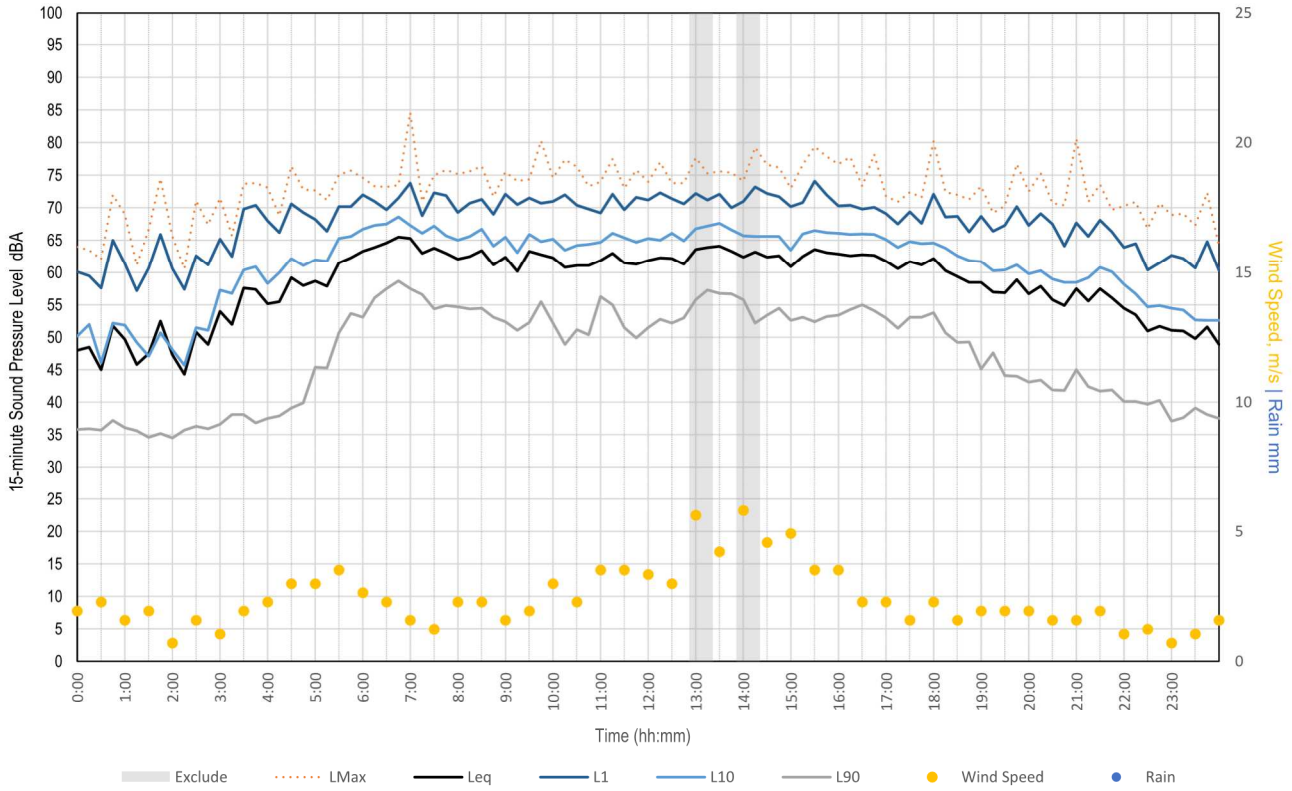
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Sunday, 14 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

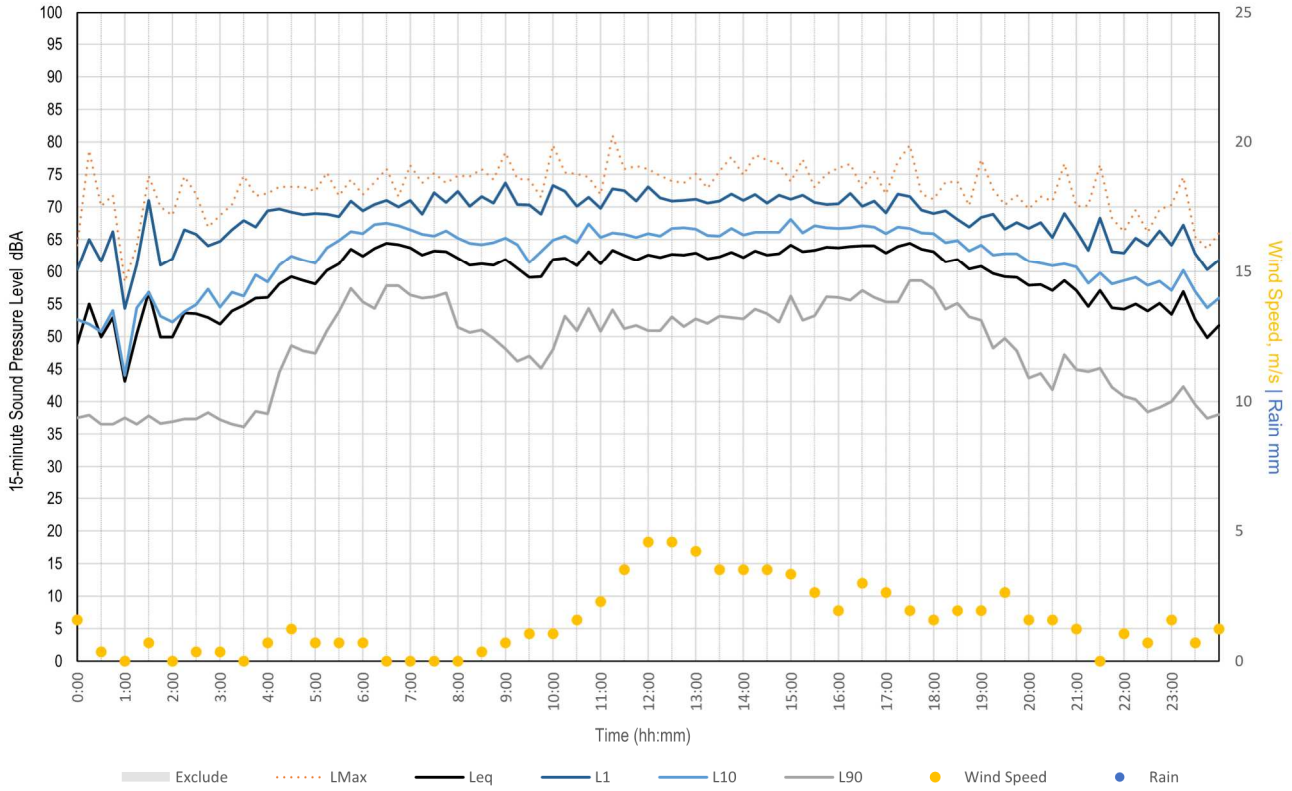
Monday, 15 August 2022



Noise Logger Results

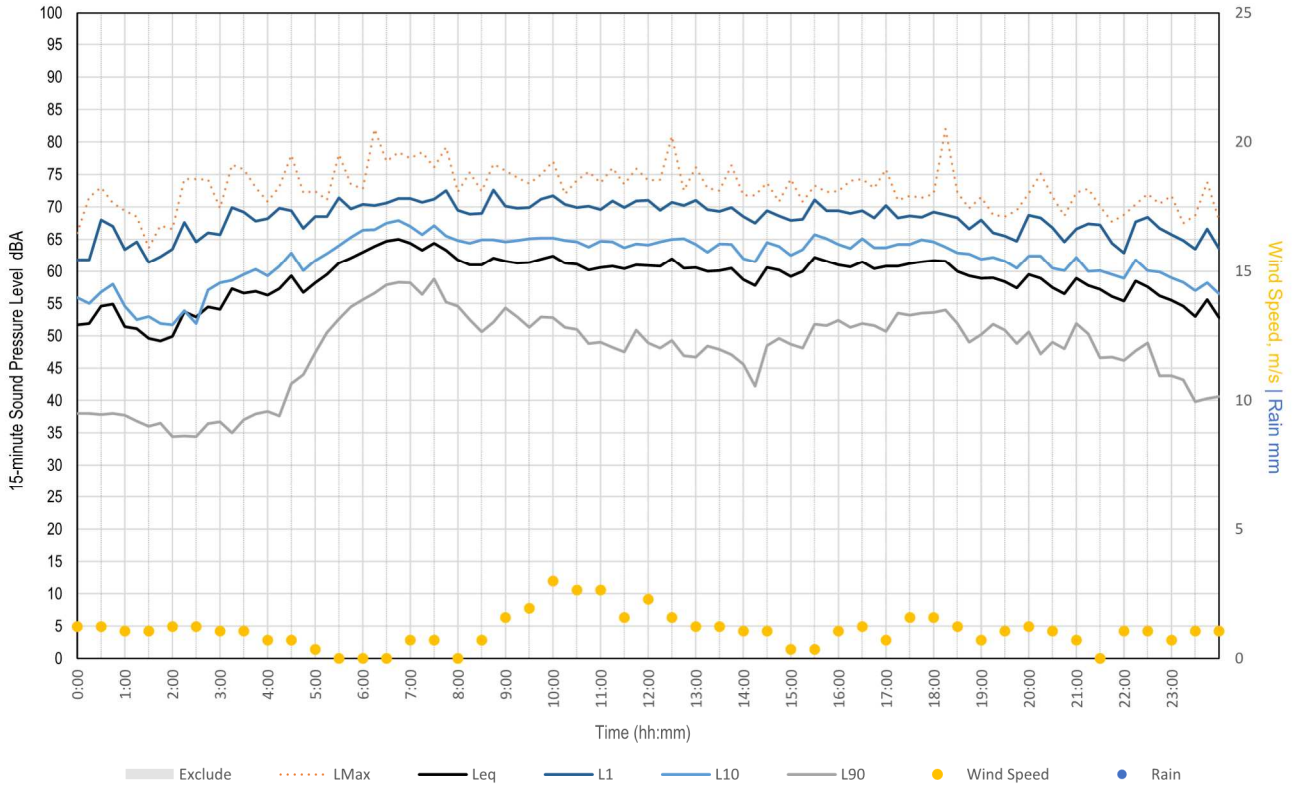
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Tuesday, 16 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

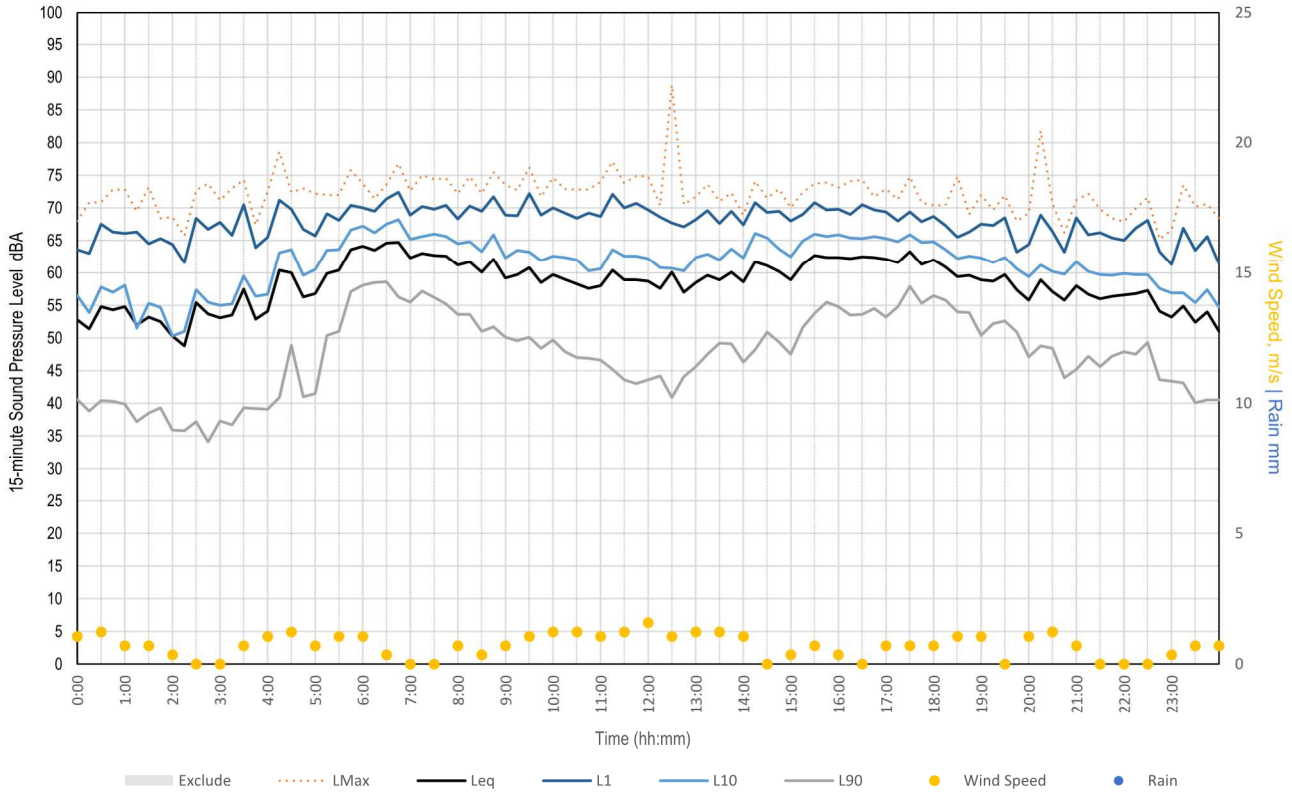
Wednesday, 17 August 2022



Noise Logger Results

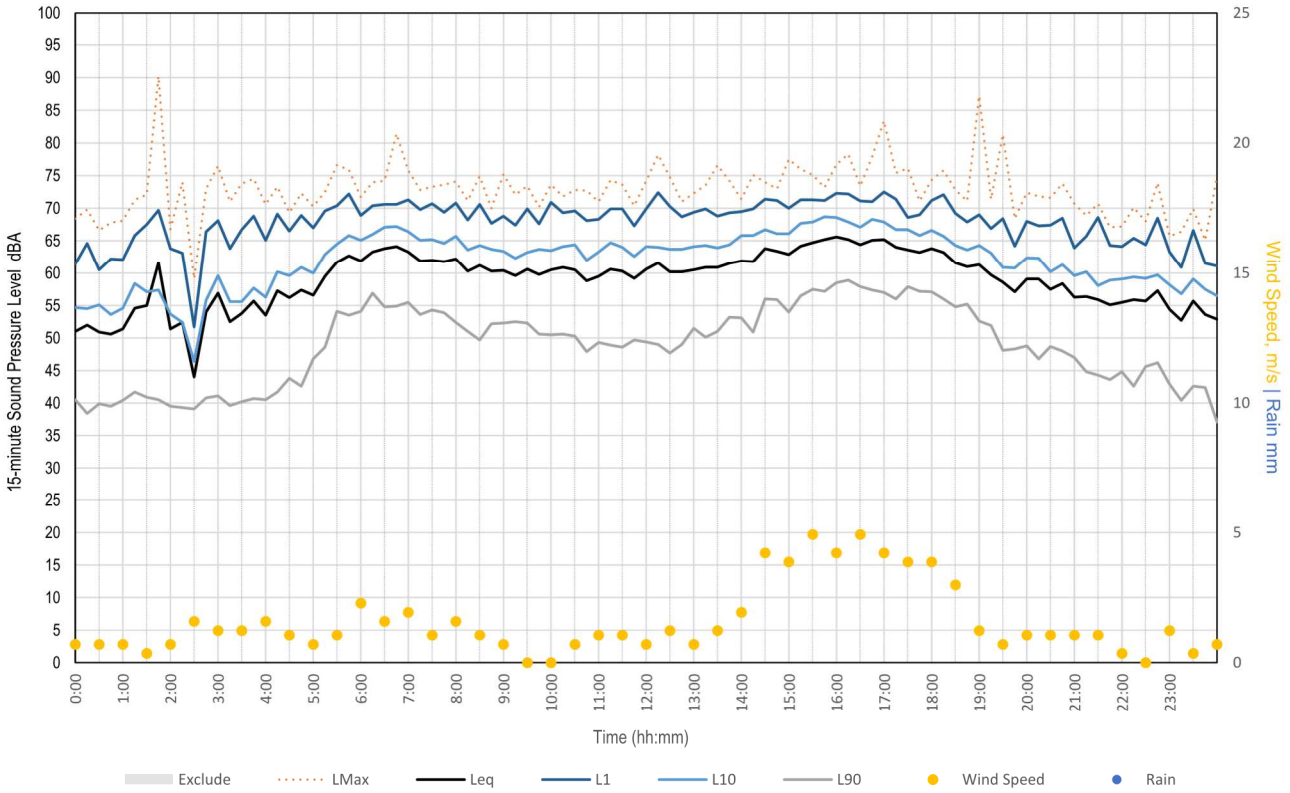
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Thursday, 18 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

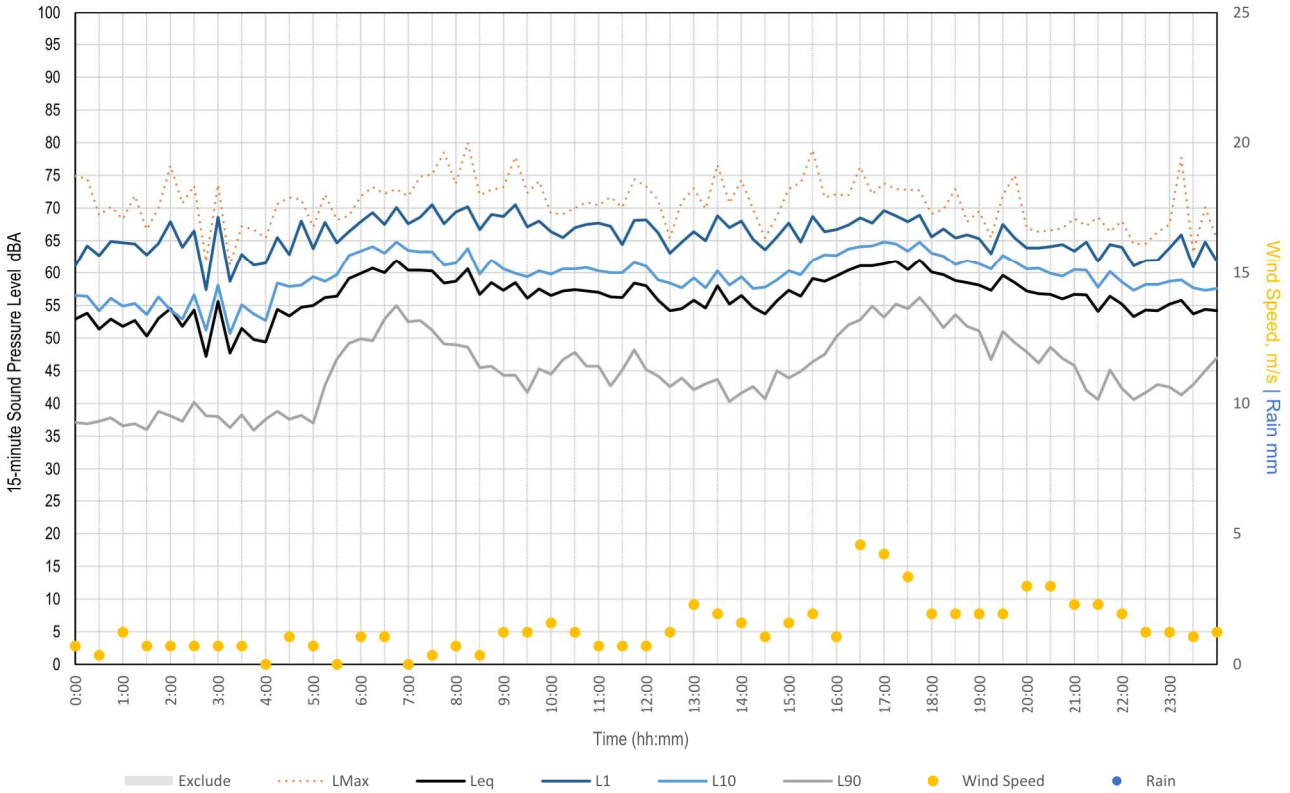
Friday, 19 August 2022



Noise Logger Results

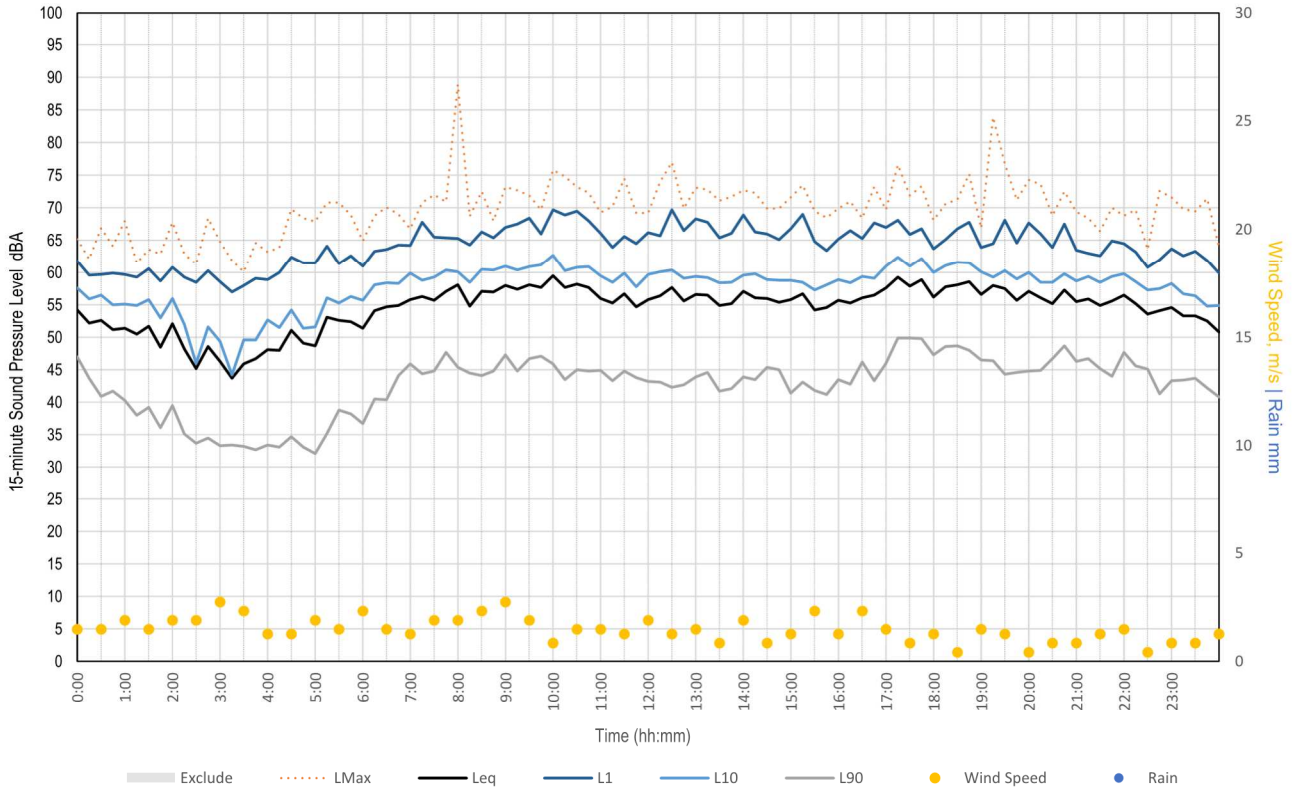
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Saturday, 20 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

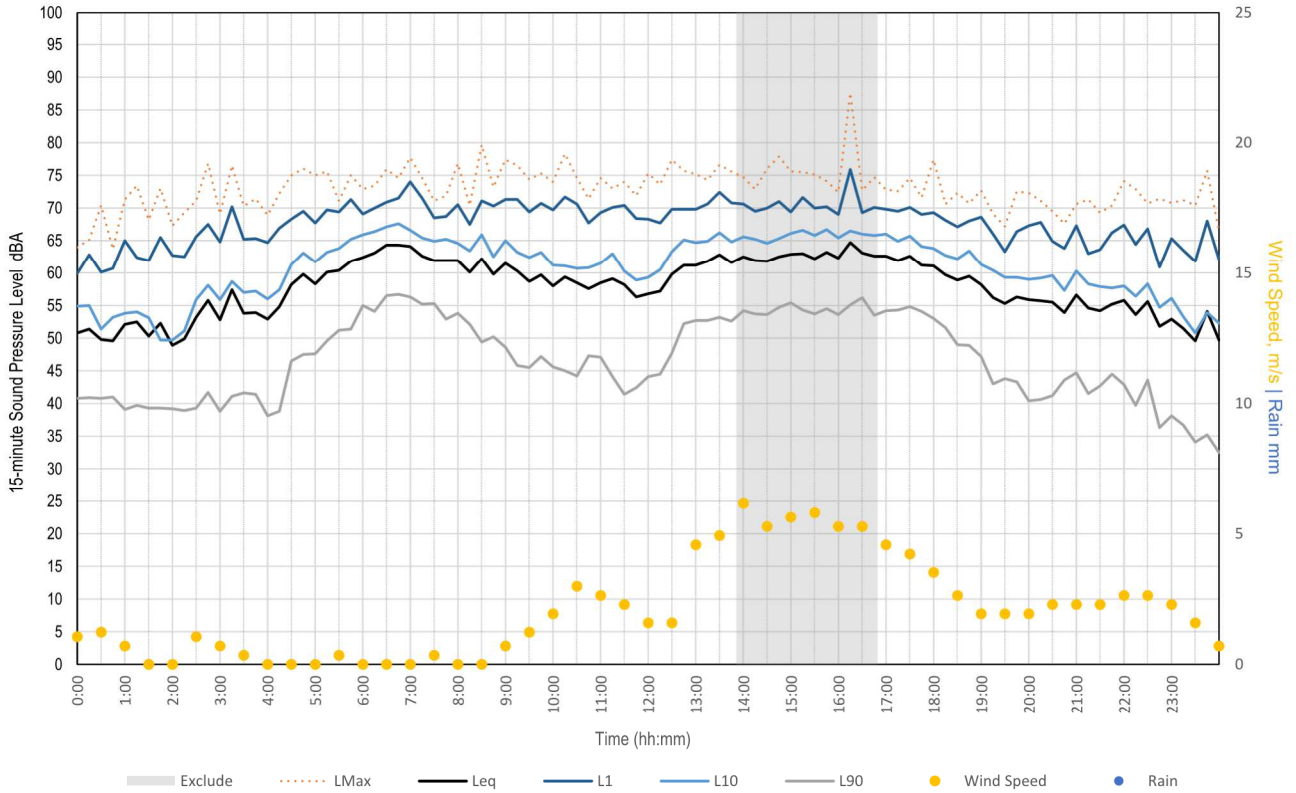
Sunday, 21 August 2022



Noise Logger Results

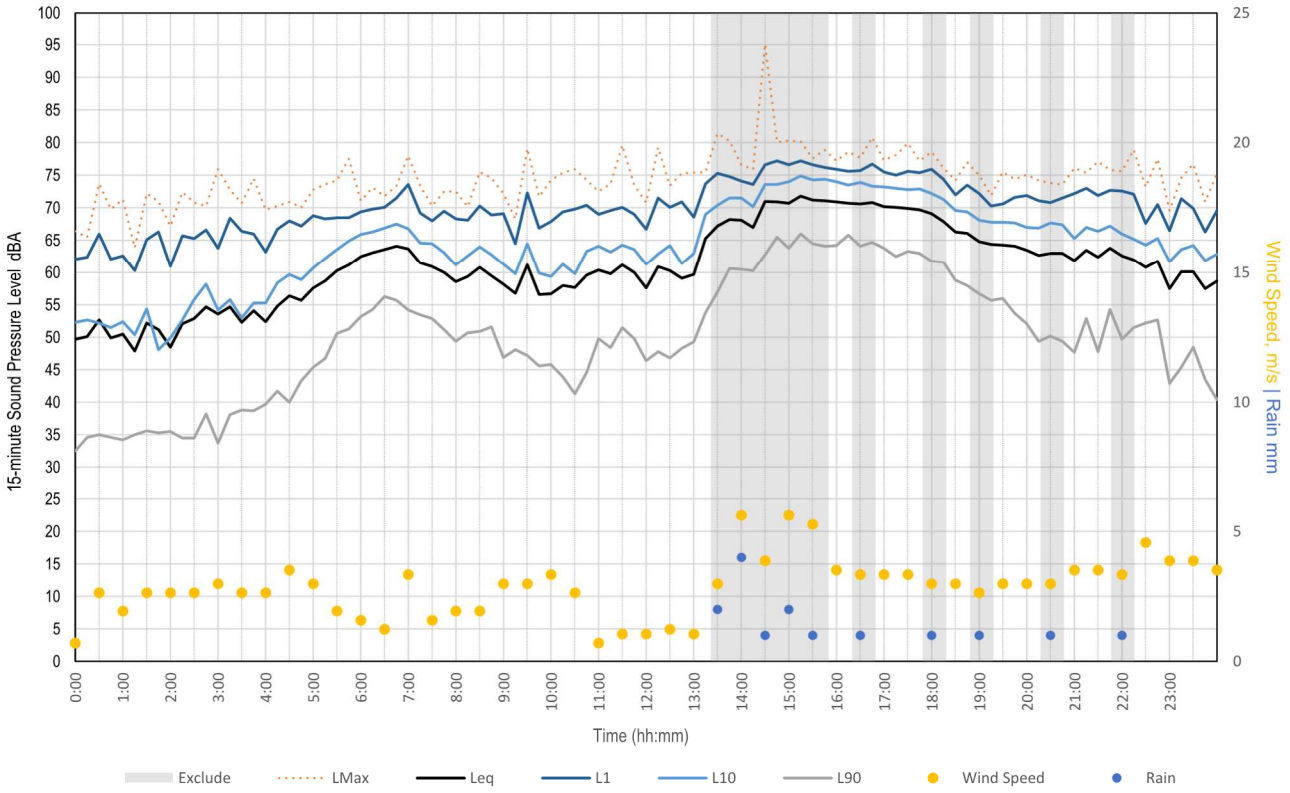
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Monday, 22 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

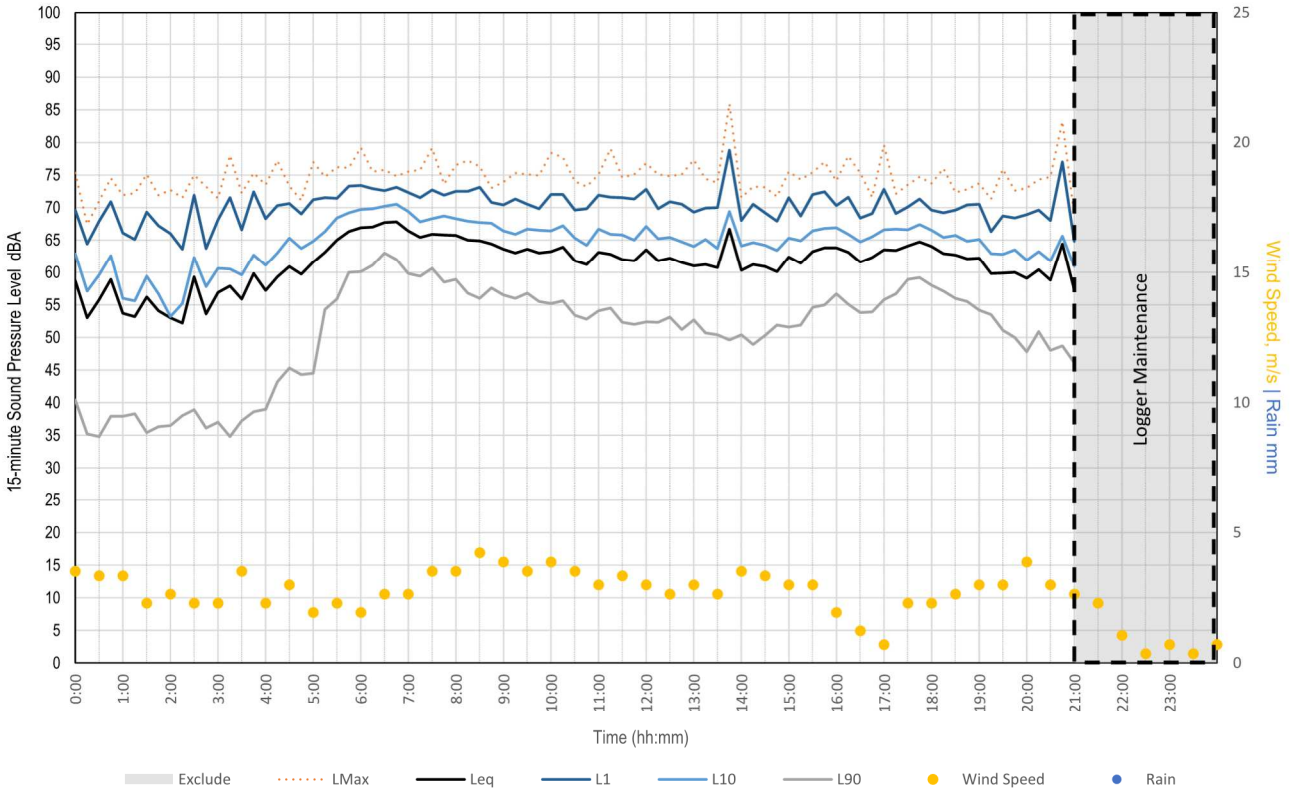
Tuesday, 23 August 2022



Noise Logger Results

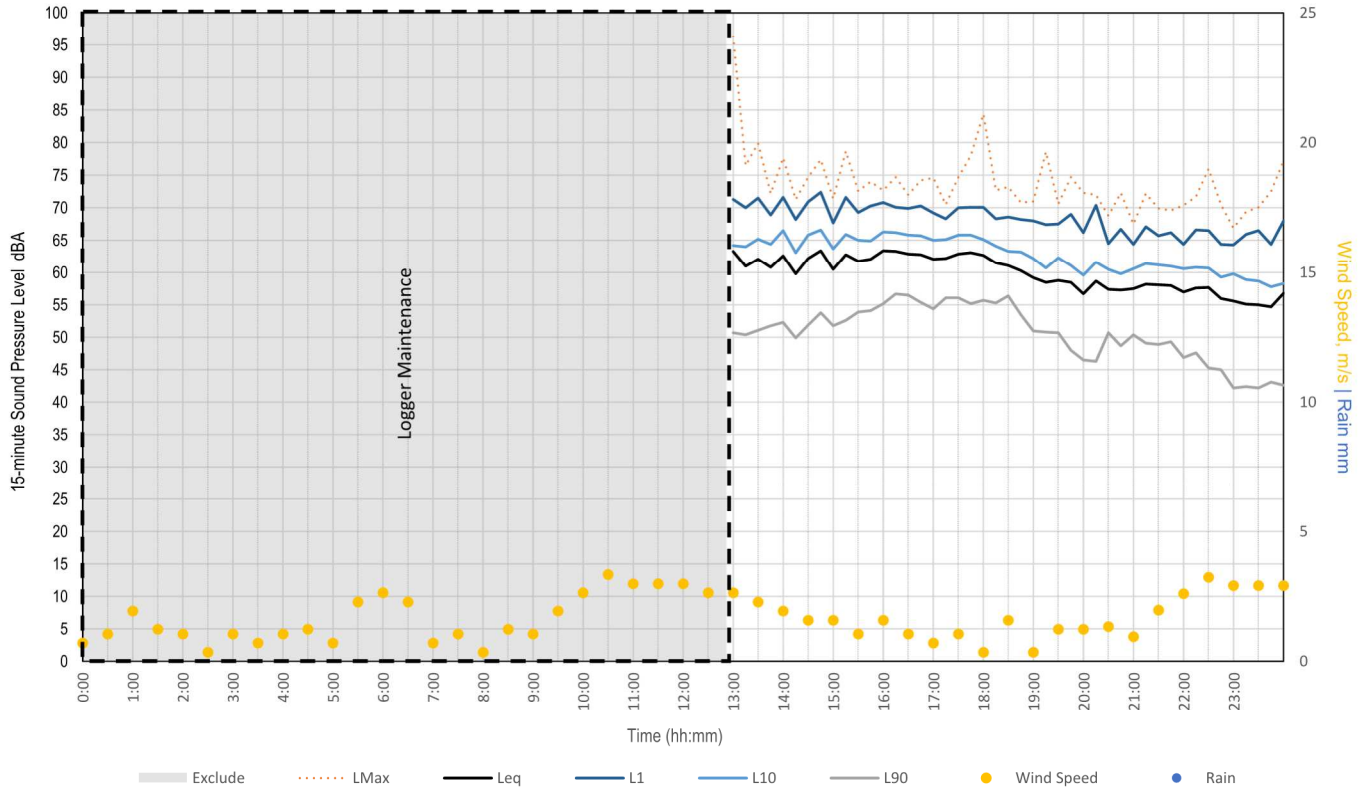
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Wednesday, 24 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

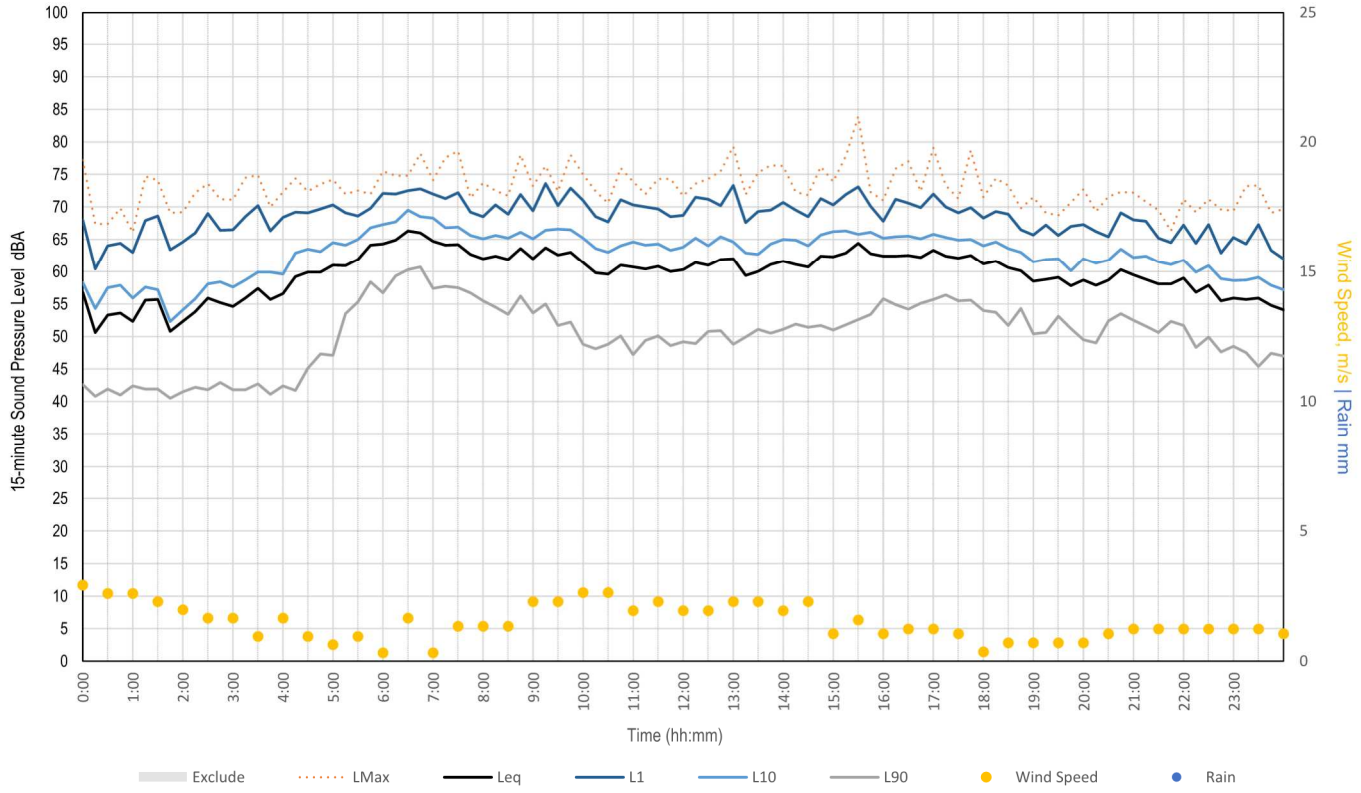
Thursday, 25 August 2022



Noise Logger Results

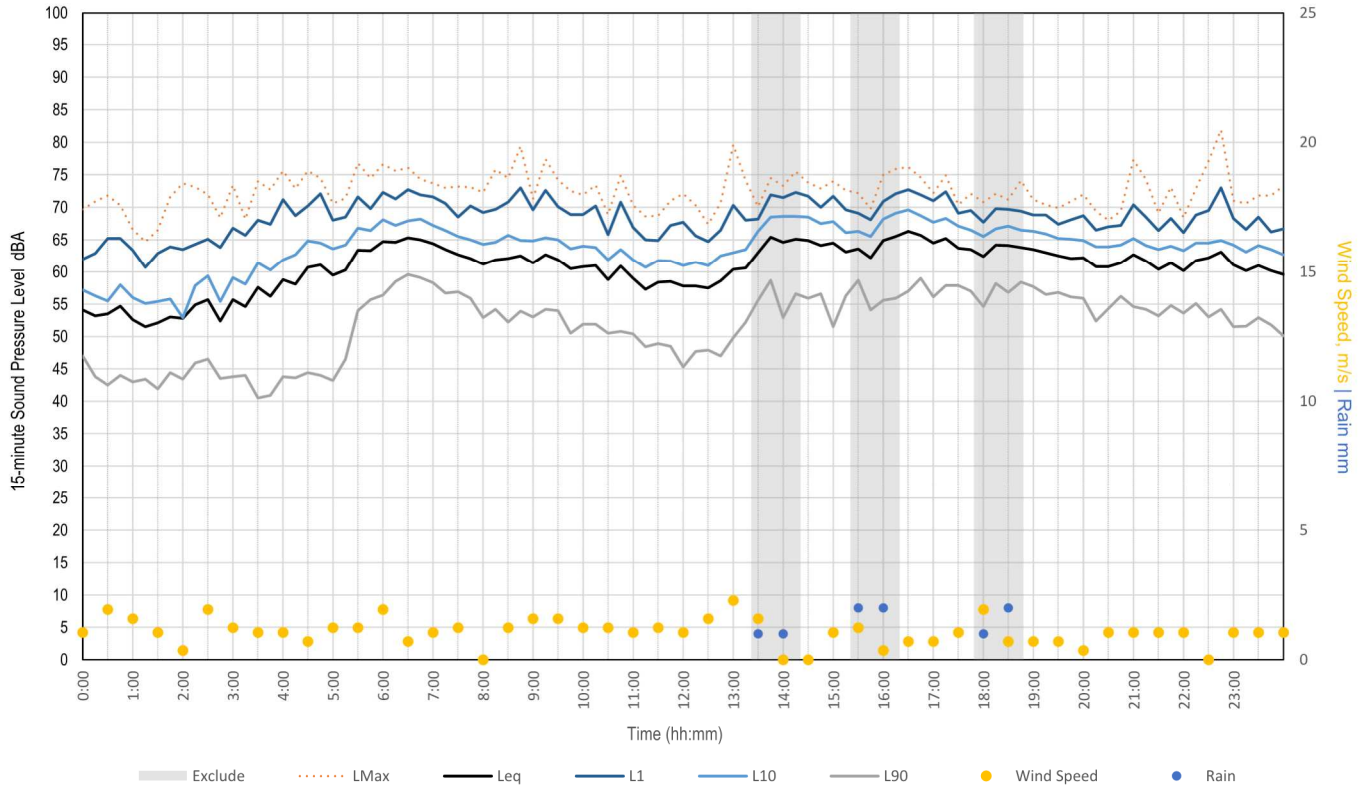
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Friday, 26 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

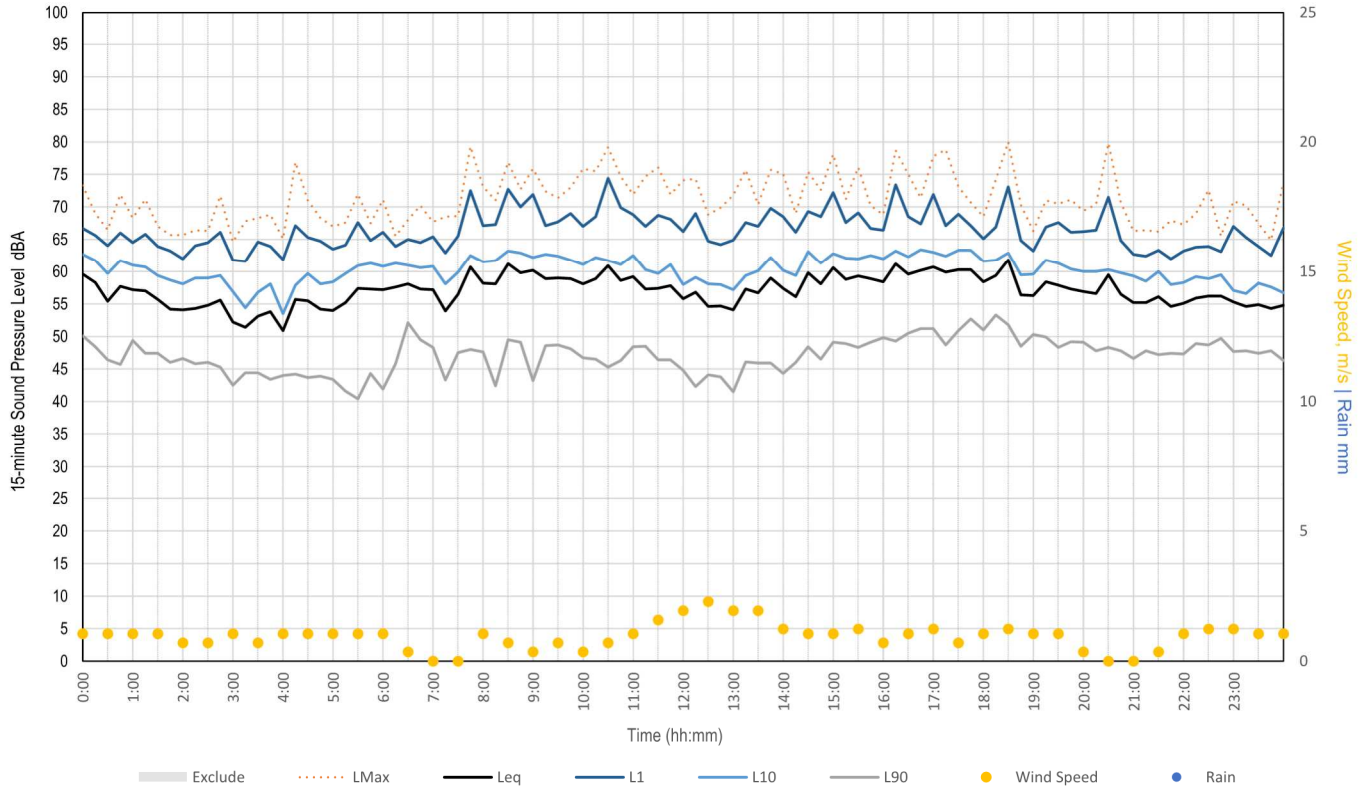
Saturday, 27 August 2022



Noise Logger Results

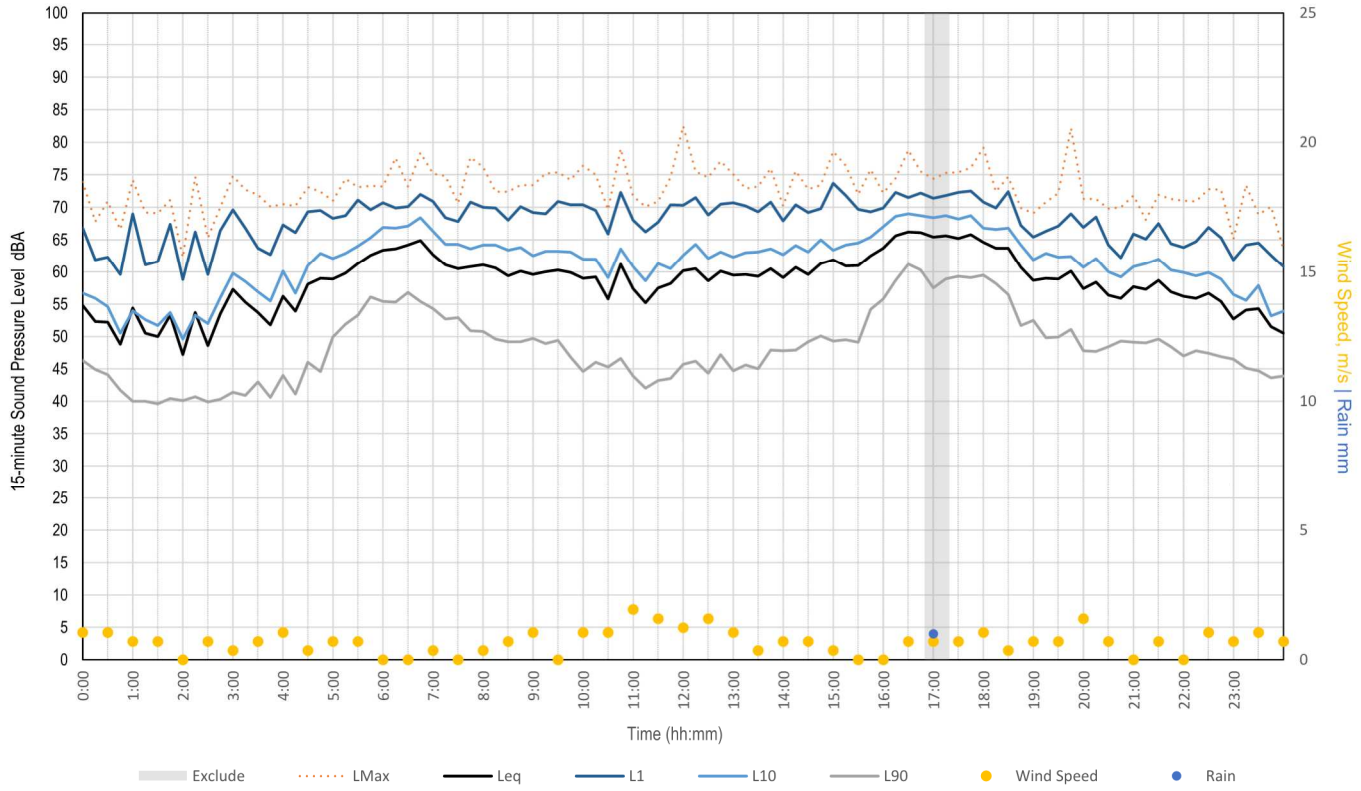
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Sunday, 28 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

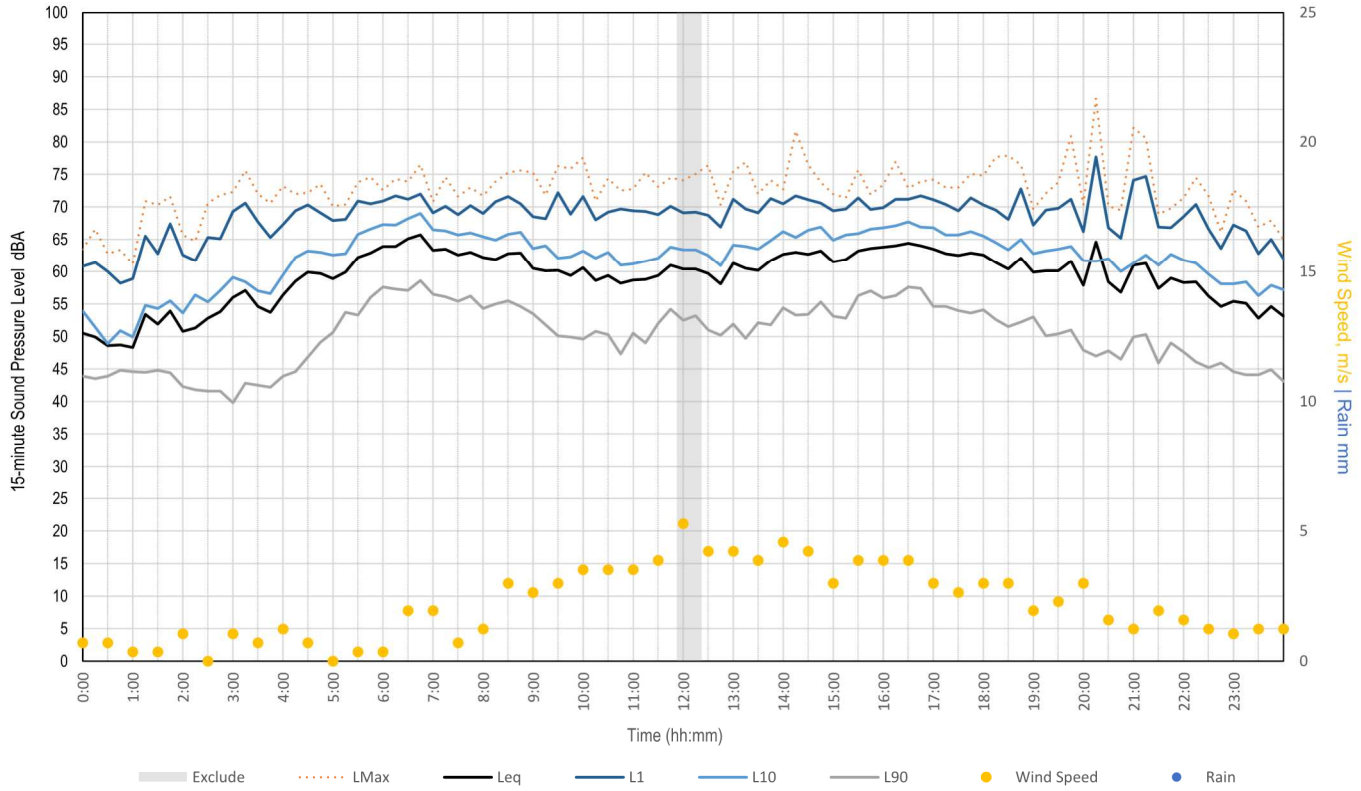
Monday, 29 August 2022



Noise Logger Results

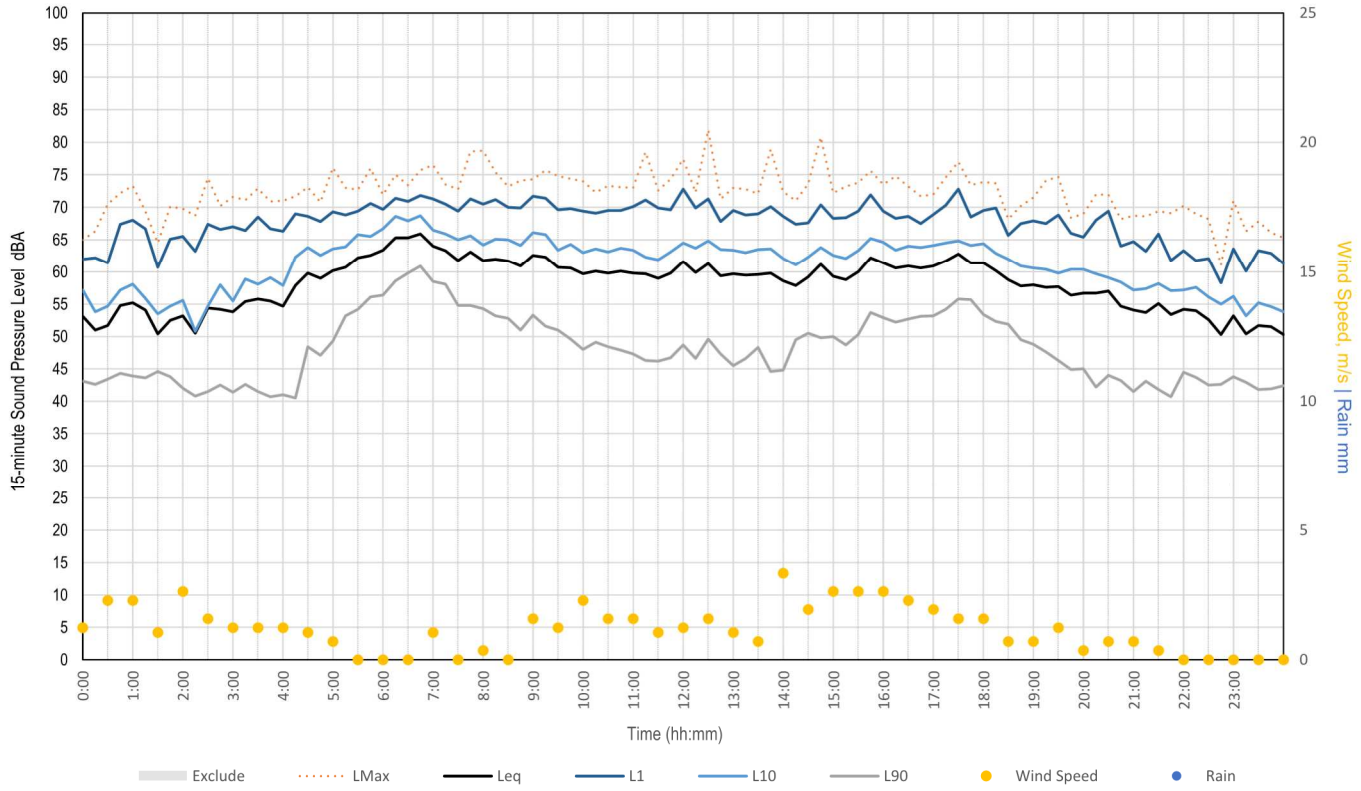
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Tuesday, 30 August 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

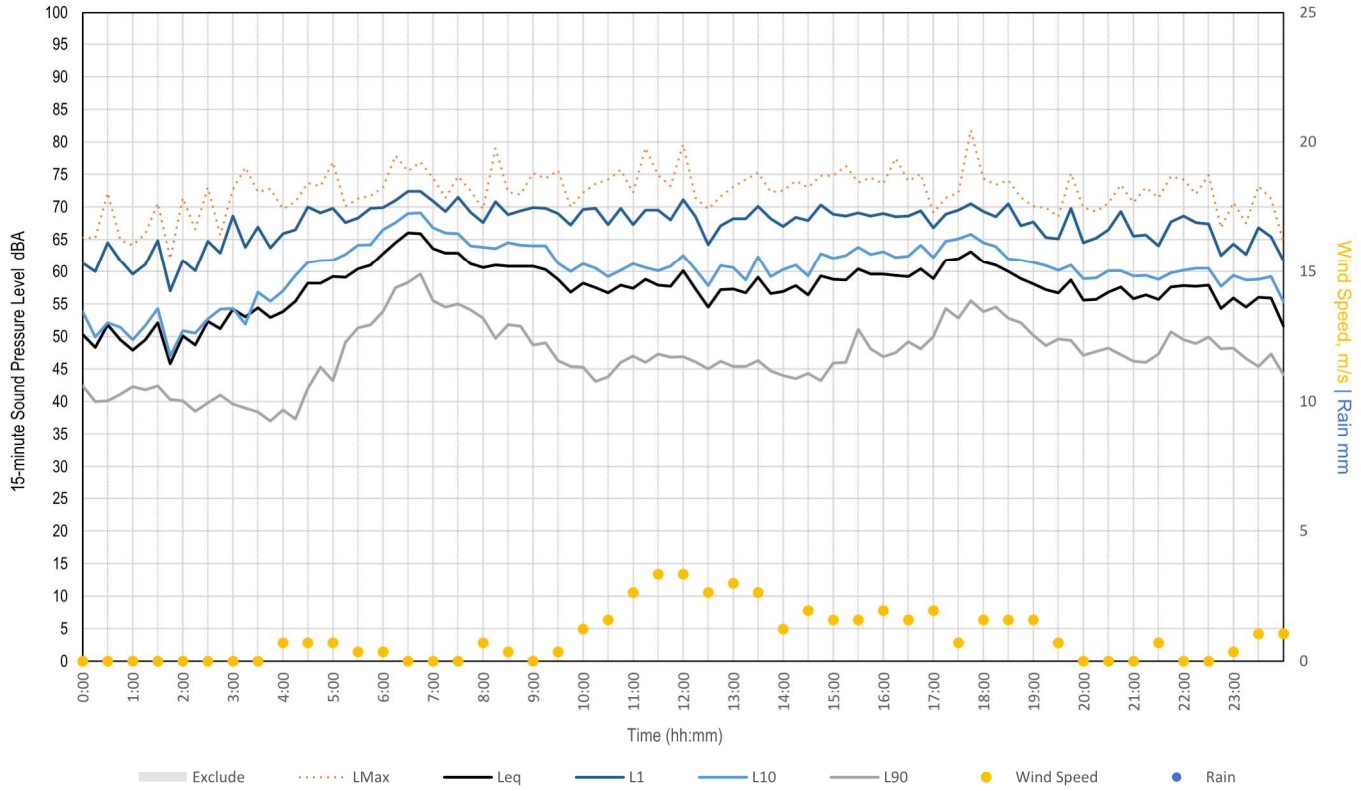
Wednesday, 31 August 2022



Noise Logger Results

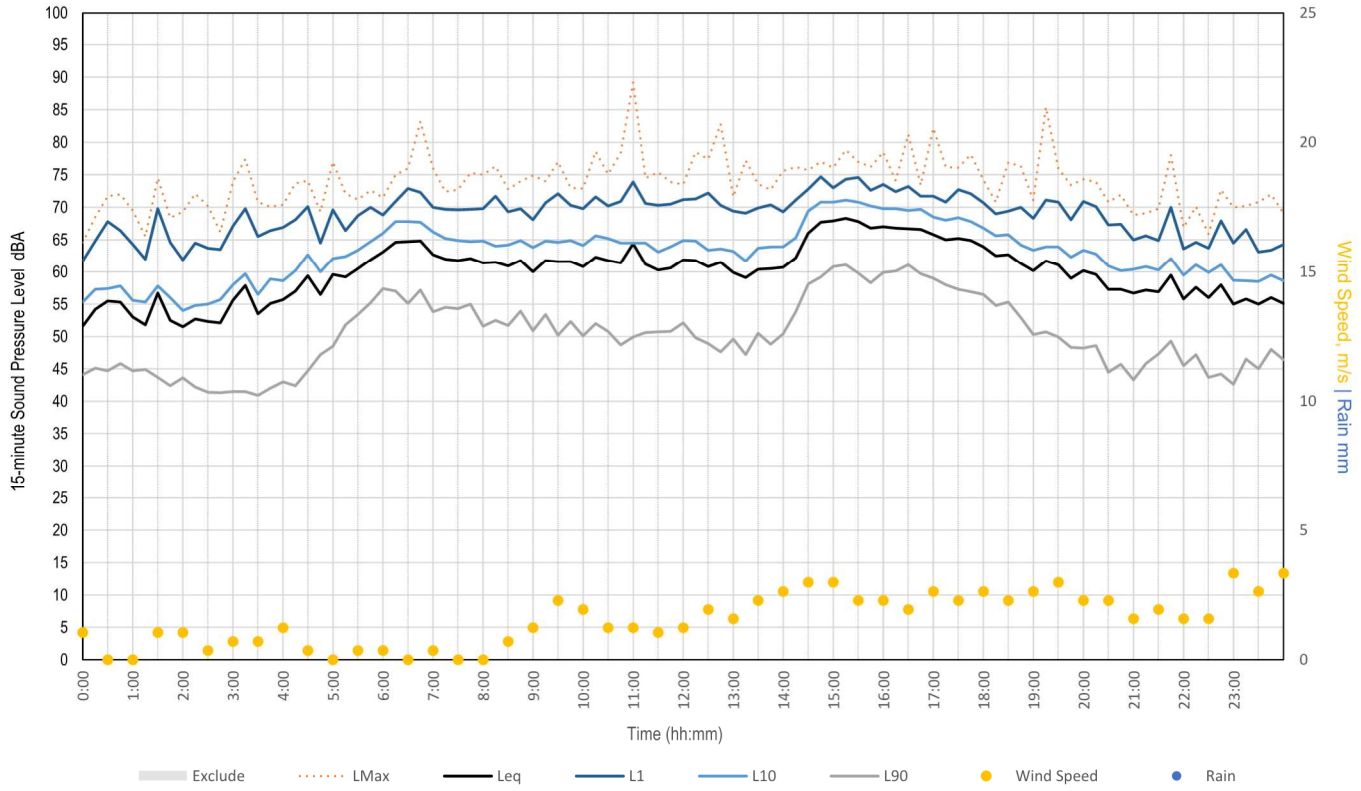
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Thursday, 01 September 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

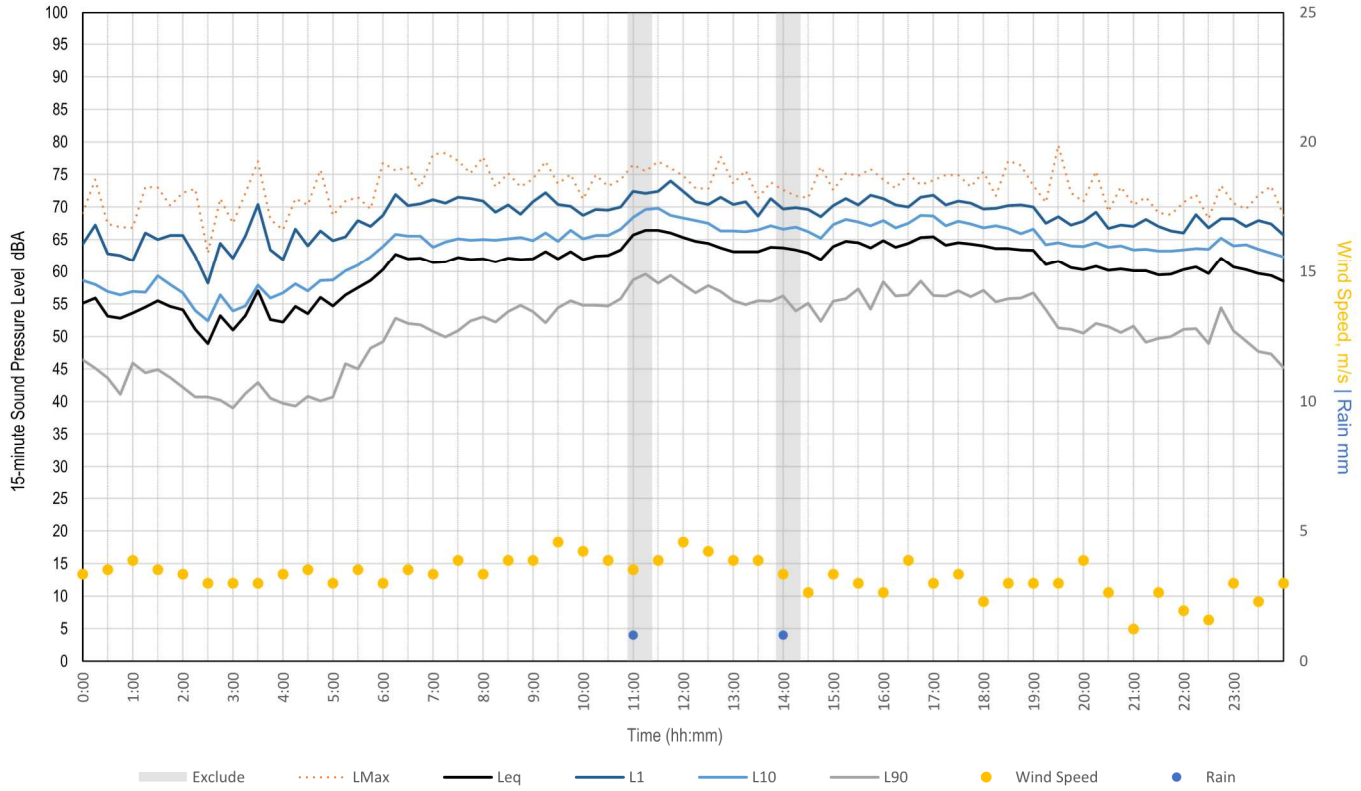
Friday, 02 September 2022



Noise Logger Results

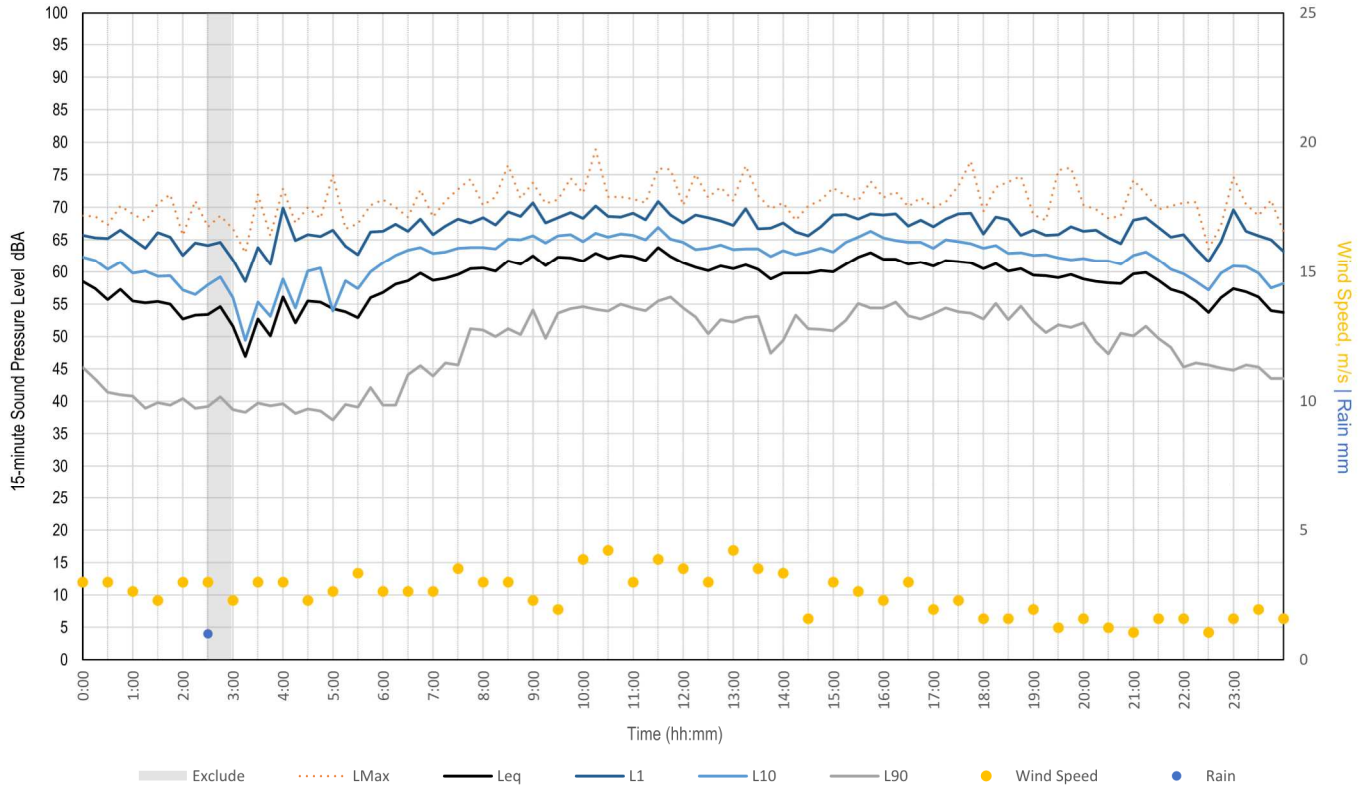
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Saturday, 03 September 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

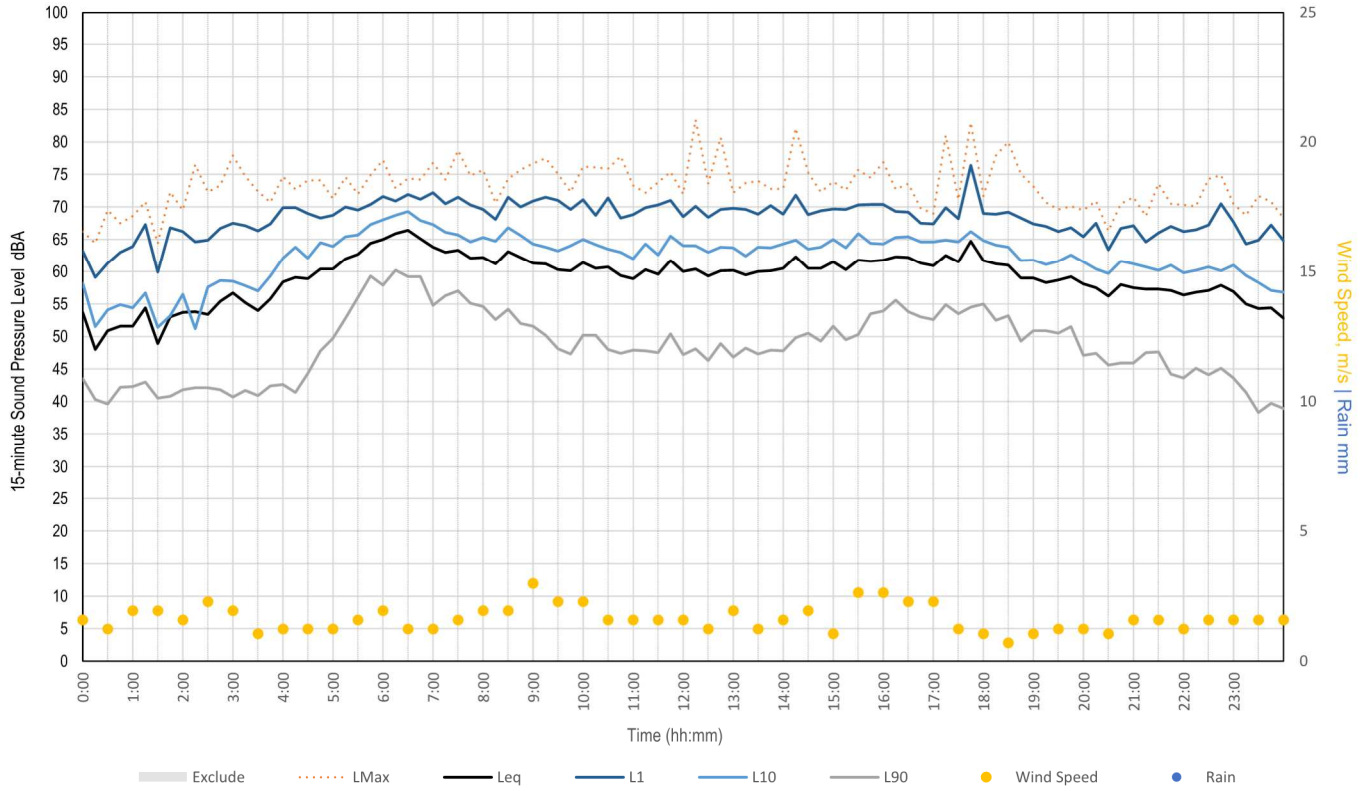
Sunday, 04 September 2022



Noise Logger Results

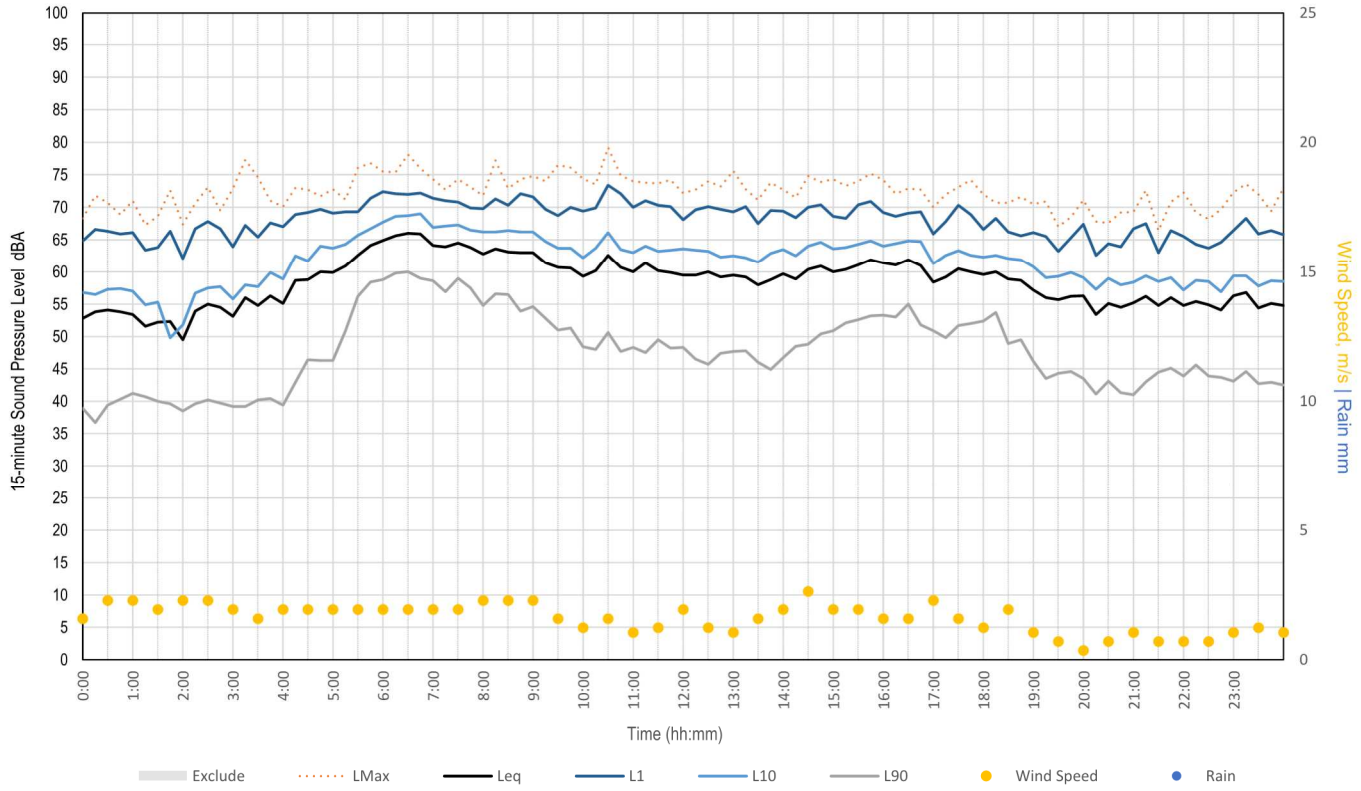
Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Monday, 05 September 2022



Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

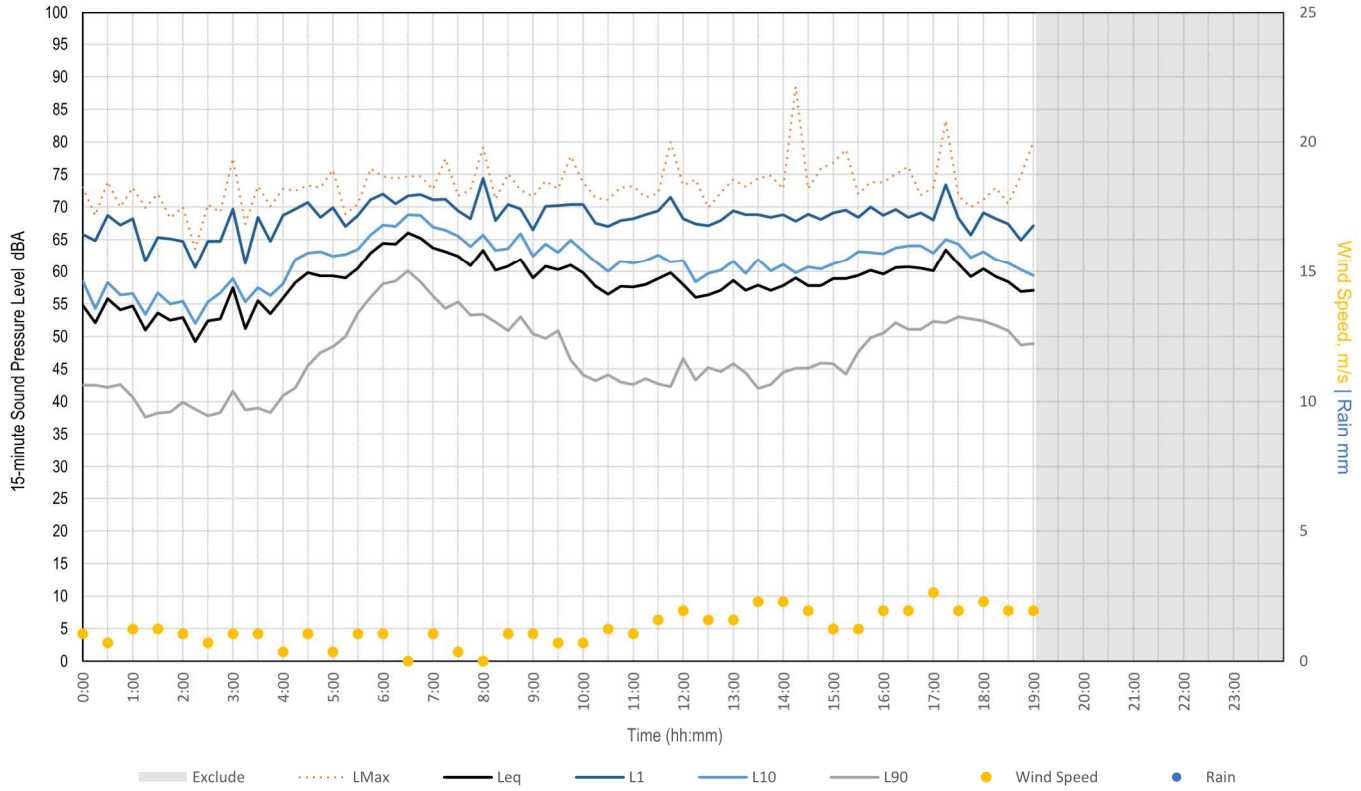
Tuesday, 06 September 2022



Noise Logger Results

Measured Noise Levels - M08 - 2776 The Northern Road (Luddenham)

Wednesday, 07 September 2022



Background Noise Monitoring

Location	M09 - 8 Cricketer's Avenue (Penrith)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878179
Calibration	**Pre:**	93.8 dBA	**Post:**	94.2 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

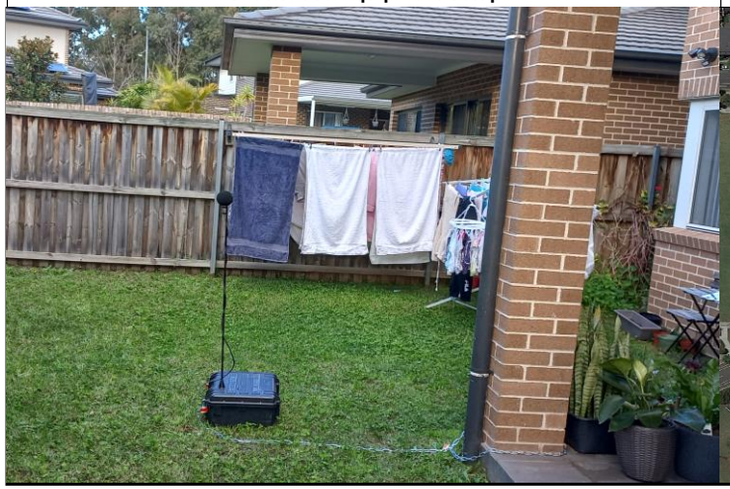
Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-05718-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.4 m
Interval:	15 minutes			

Date Start	Monday, 08 Aug 2022
Date End	Tuesday, 30 Aug 2022
No. of days	23
No. of nights	22

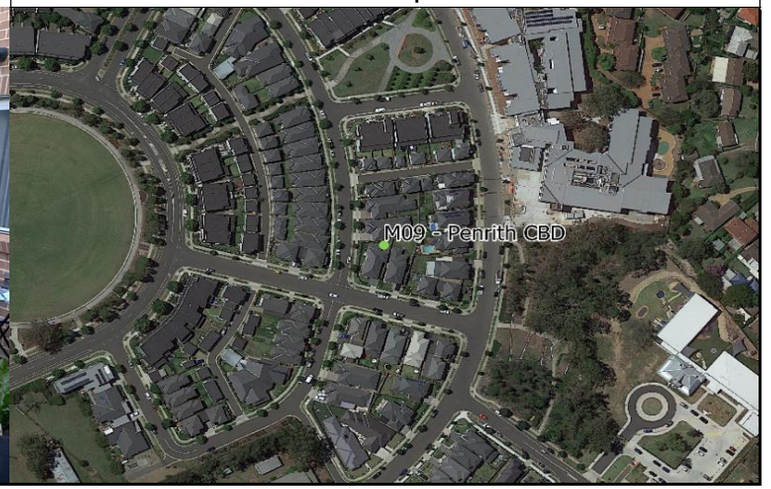
Weather	
Station	BoM
Station Info	Penrith Lakes AWS
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	8/08/2022	2:57:34 PM	3:12:34 PM	82	59	59	36	
2	Day	8/08/2022	3:17:36 PM	3:32:36 PM	74	55	48	36	
3	Day	8/08/2022	3:32:36 PM	3:47:36 PM	69	48	48	38	
4	Day	8/08/2022	3:47:36 PM	4:02:36 PM	75	48	49	37	
5	Evening	16/08/2022	6:30:00 PM	6:45:00 PM	68	47	49	41	*
6	Evening	16/08/2022	7:15:00 PM	7:30:00 PM	66	45	46	39	*
7	Evening	16/08/2022	8:15:00 PM	8:30:00 PM	51	41	45	36	*
8	Evening	16/08/2022	9:15:00 PM	9:30:00 PM	60	42	44	38	*
9	Night	14/08/2022	1:15:00 AM	1:30:00 AM	65	42	38	35	*
10	Night	14/08/2022	3:30:00 AM	3:45:00 AM	49	37	38	35	*
11	Night	14/08/2022	5:30:00 AM	5:45:00 AM	54	38	39	36	*
12	Night	14/08/2022	11:30:00 PM	11:45:00 PM	51	37	38	35	*

* Performed remotely due to personal safety and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Occasional vehicle passbys and nearby traffic. A police helicopter looping overhead with sound levels ranging from of 56 to 72 dBA. Several aircraft recorded flying directly overhead, with an approx. duration of 30 sec to 1 min with maximum levels of 38 to 59 dBA.
Background noise	Constant birds at distance. Distant traffic.
Evening	
Ambient noise	Occasional vehicle passbys. Constant noise from residential activity at adjacent properties (e.g. TV noise, people talking, hammering). Occasional dog barks.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling).
Night	
Ambient noise	Occasional vehicle passbys. Intermittent bird noises in adjacent trees. Occasional noise of a train horn at distance.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling).

Site Details	M09 - 8 Cricketer's Avenue (Penrith)
Start Date	Mon 08 August 2022
End Date	Tue 30 August 2022

Summary	**Average (dBA)**
$L_{eq,\ Day}$ dBA	52
$L_{eq,\ Evening}$ dBA	46
$L_{eq,\ Night}$ dBA	42
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	36
RBL, $_{Night}$ dBA	33

Daily Summary

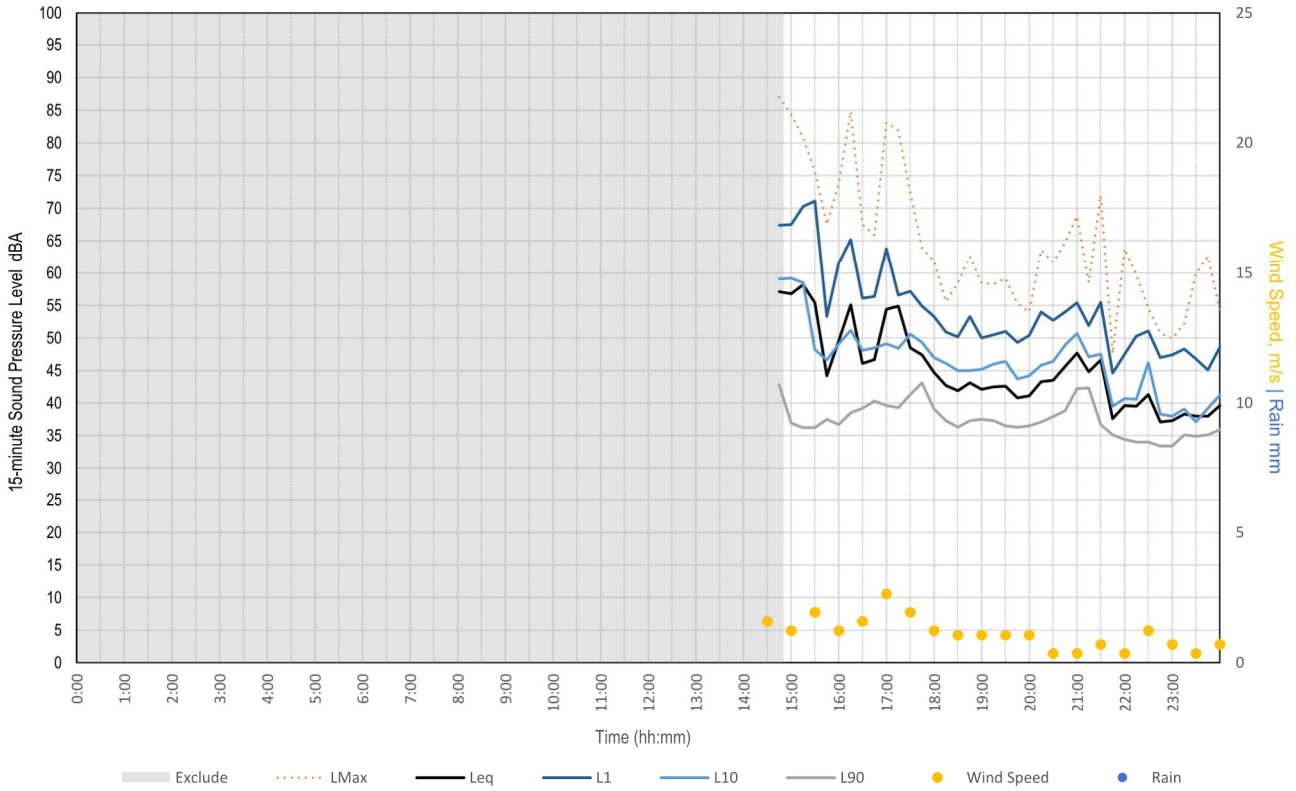
Date	08-08	09-08	10-08	11-08	12-08	13-08	14-08	15-08
$L_{eq,\ Day}$ dBA	54	54	53	52	52	51	50	51
$L_{eq,\ Evening}$ dBA	44	46	44	47	45	49	45	44
$L_{eq,\ Night}$ dBA	43	40	40	42	41	40	41	43
ABL, $_{Day}$ dBA	36	38	35	36	38	35	37	38
ABL, $_{Evening}$ dBA	36	35	34	36	34	37	37	35
ABL, $_{Night}$ dBA	34	32	33	35	33	34	34	34

Date	16-08	17-08	18-08	19-08	20-08	21-08	22-08	23-08
$L_{eq,\ Day}$ dBA	51	53	51	51	52	52	55	57
$L_{eq,\ Evening}$ dBA	45	47	46	45	46	45	48	47
$L_{eq,\ Night}$ dBA	42	41	42	42	41	41	44	42
ABL, $_{Day}$ dBA	35	36	34	36	36	33	37	36
ABL, $_{Evening}$ dBA	37	36	37	37	37	37	39	42
ABL, $_{Night}$ dBA	35	33	34	36	31	33	36	33

Date	24-08	25-08	26-08	27-08	28-08	29-08	30-08
$L_{eq,\ Day}$ dBA	53	50	52	50	49	47	48
$L_{eq,\ Evening}$ dBA	44	44	44	46	44	43	47
$L_{eq,\ Night}$ dBA	45		41	39	39	42	
ABL, $_{Day}$ dBA	36	36	36	35	33	35	40
ABL, $_{Evening}$ dBA	36	36	37	34	36	35	40
ABL, $_{Night}$ dBA	35	33	33	31	32	33	

Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

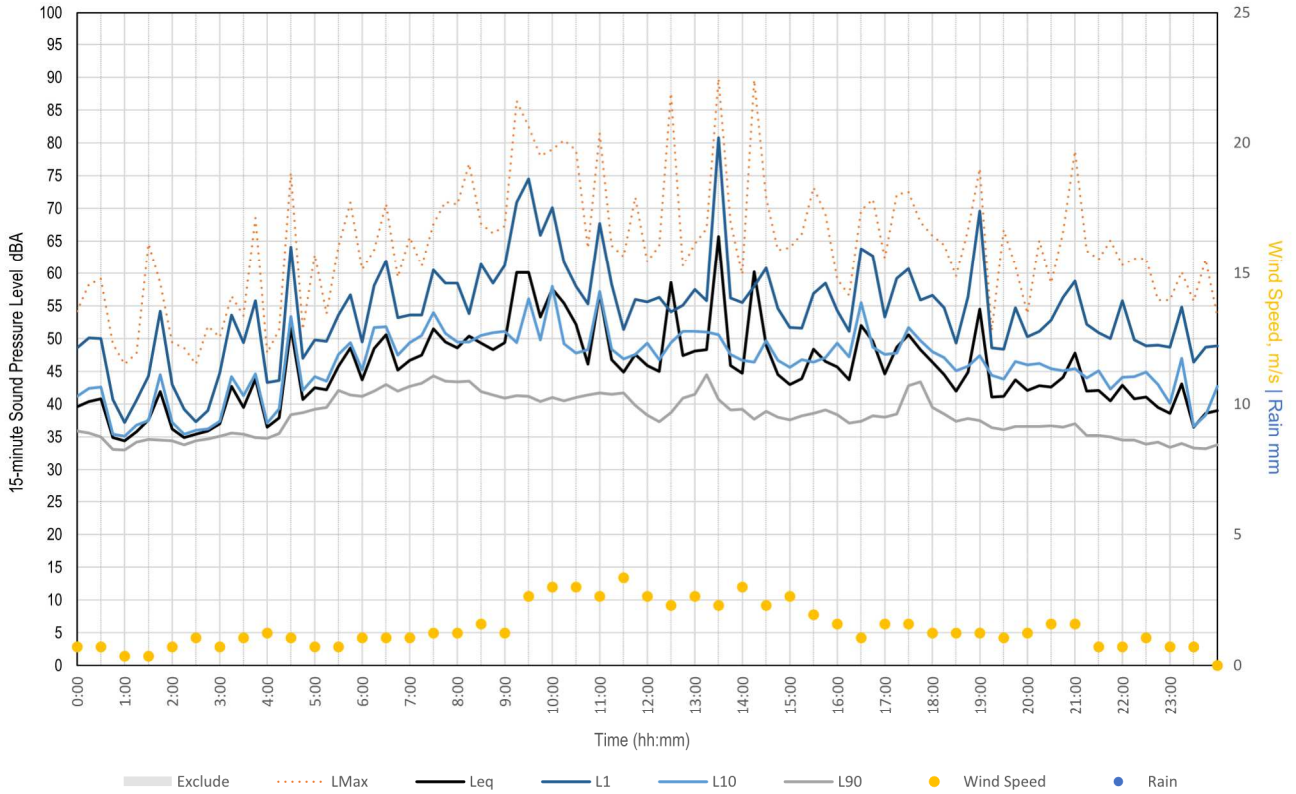
Monday, 08 August 2022



Noise Logger Results

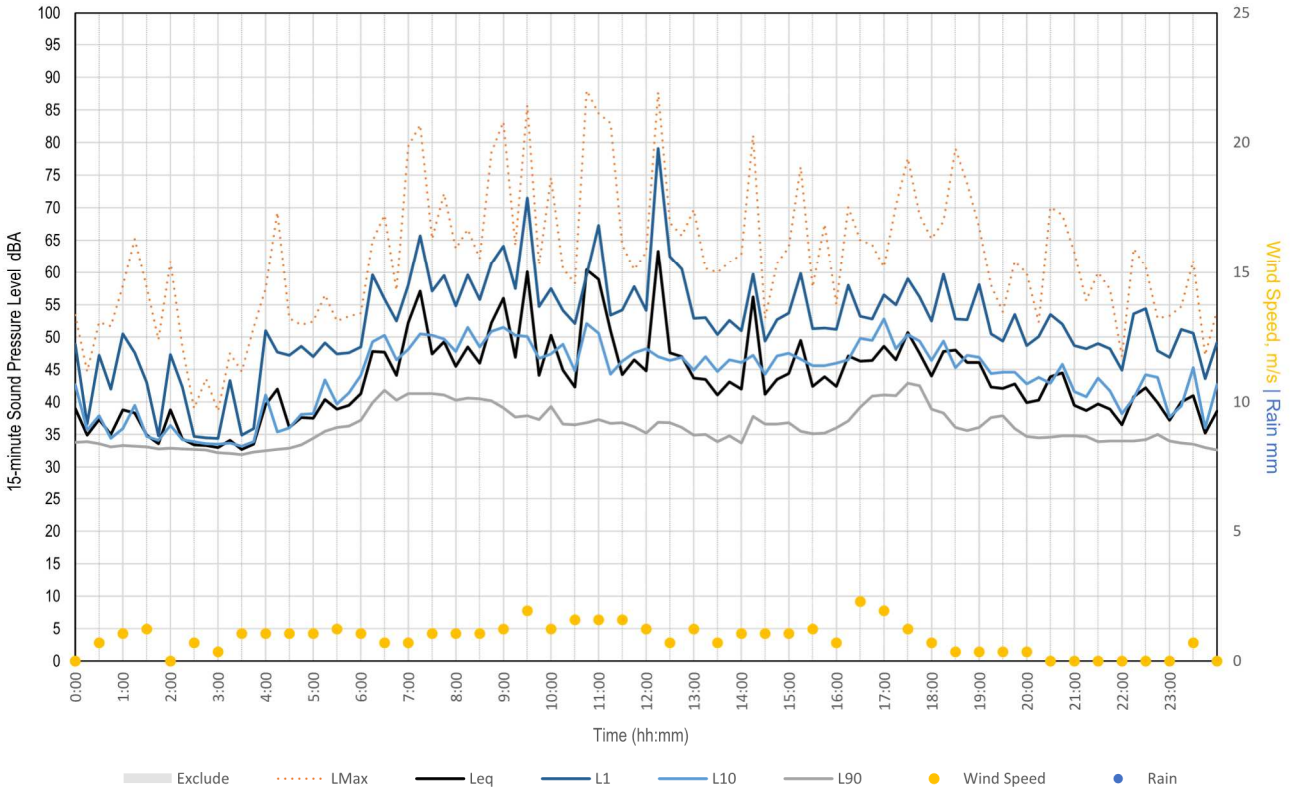
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Tuesday, 09 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

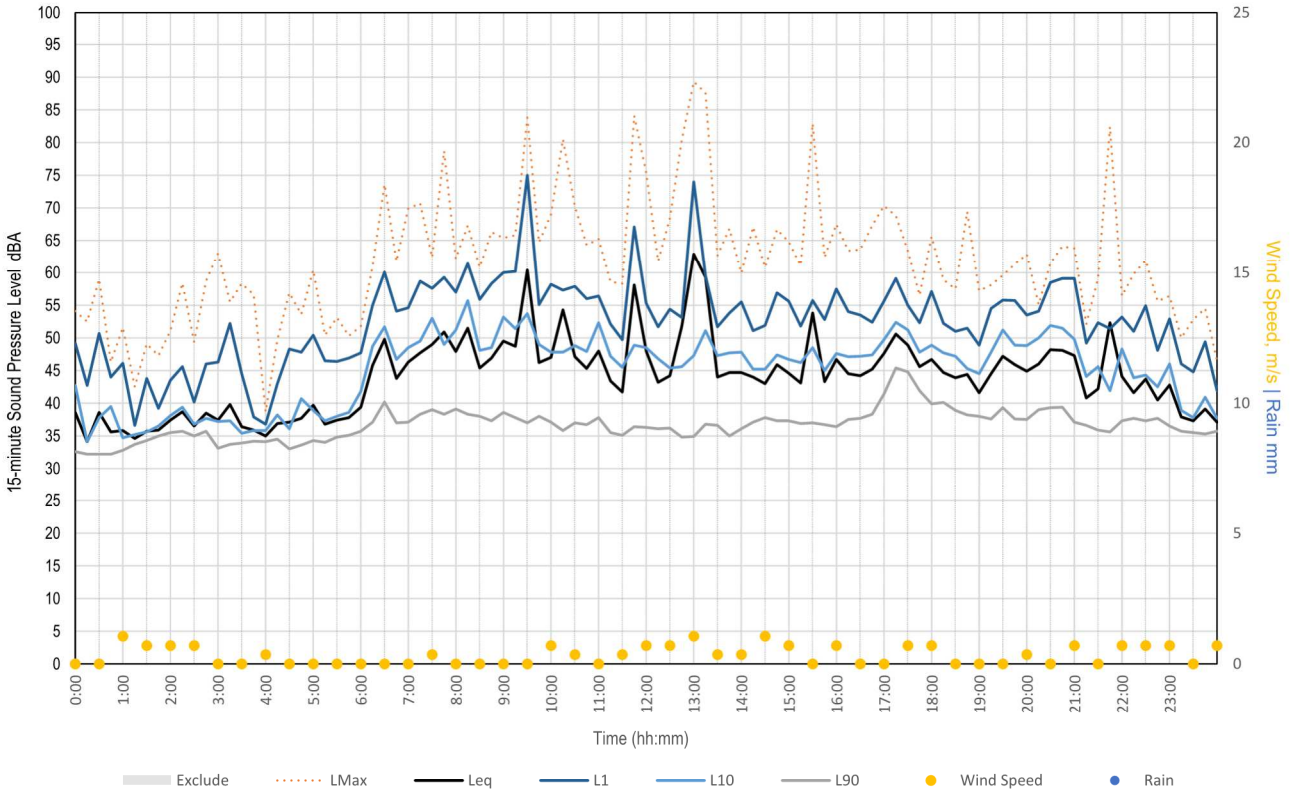
Wednesday, 10 August 2022



Noise Logger Results

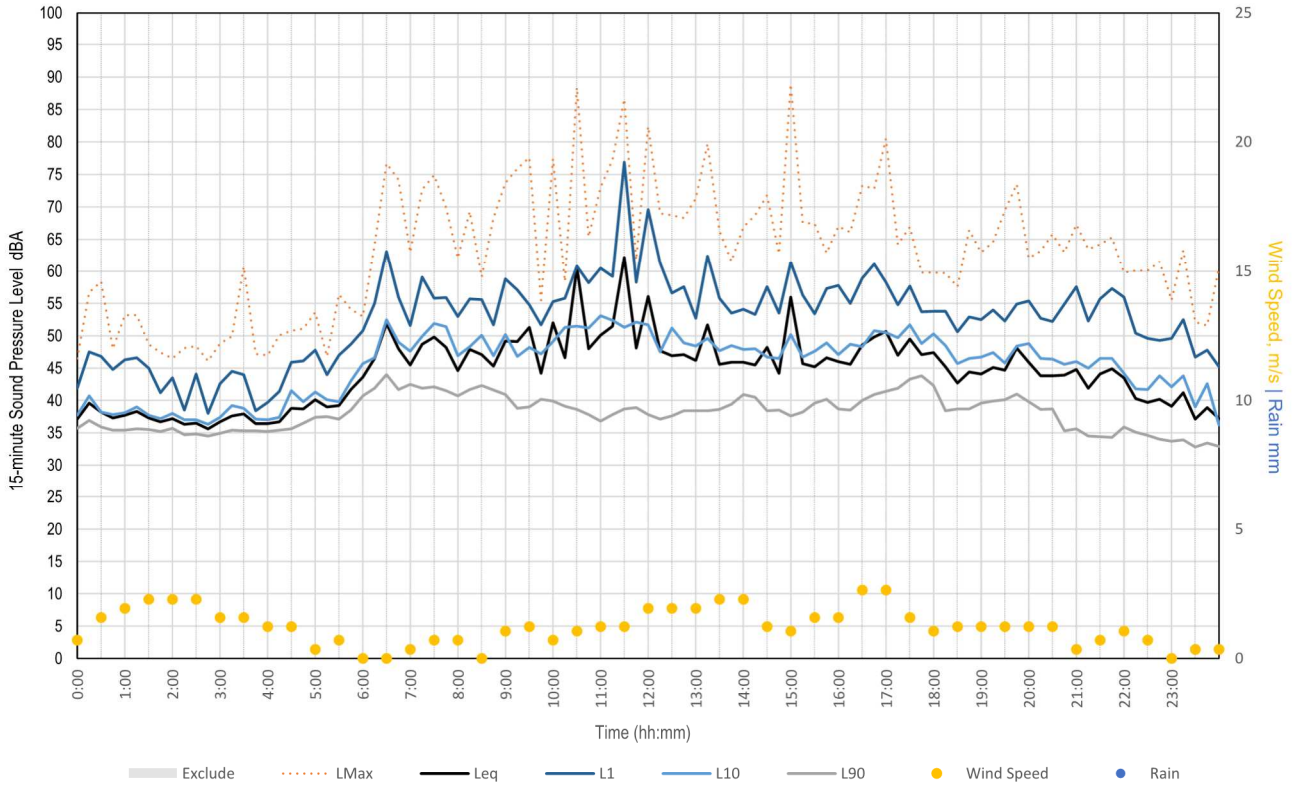
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Thursday, 11 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

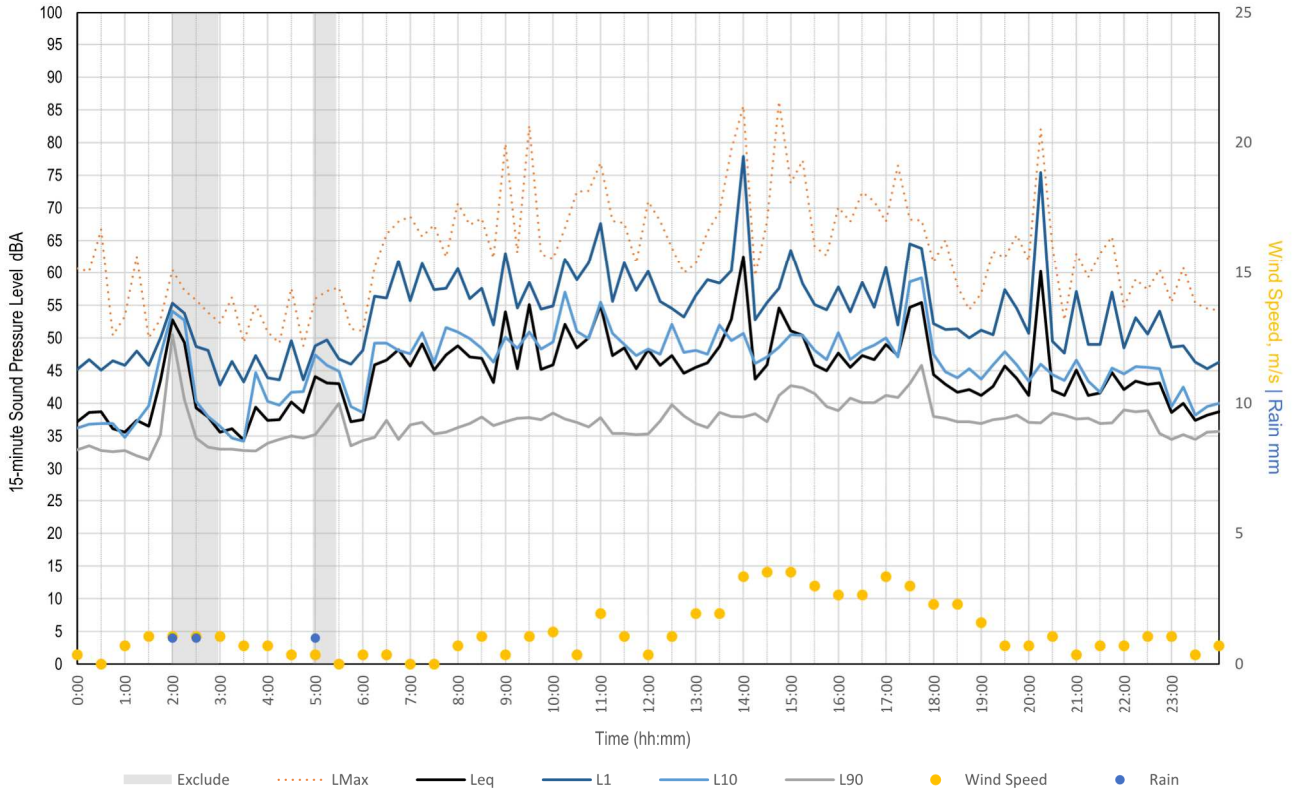
Friday, 12 August 2022



Noise Logger Results

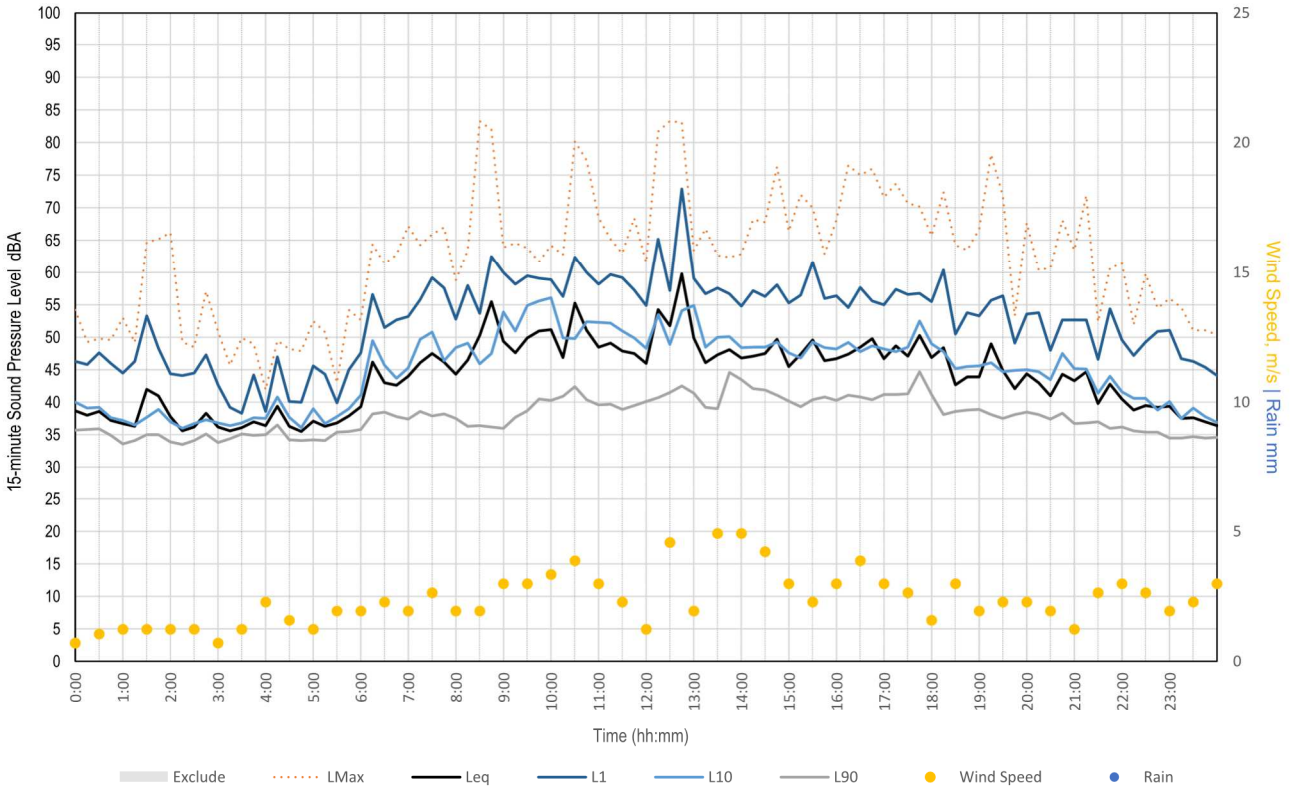
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Saturday, 13 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

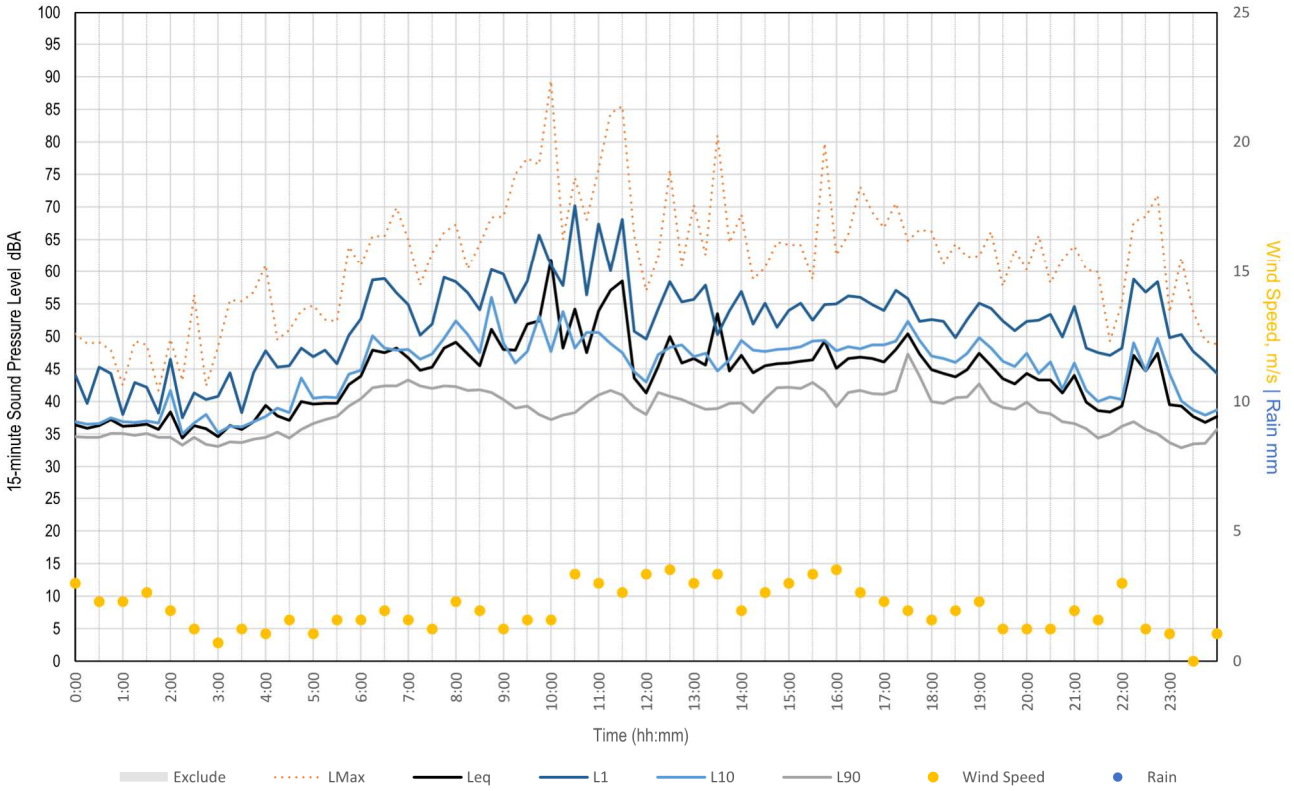
Sunday, 14 August 2022



Noise Logger Results

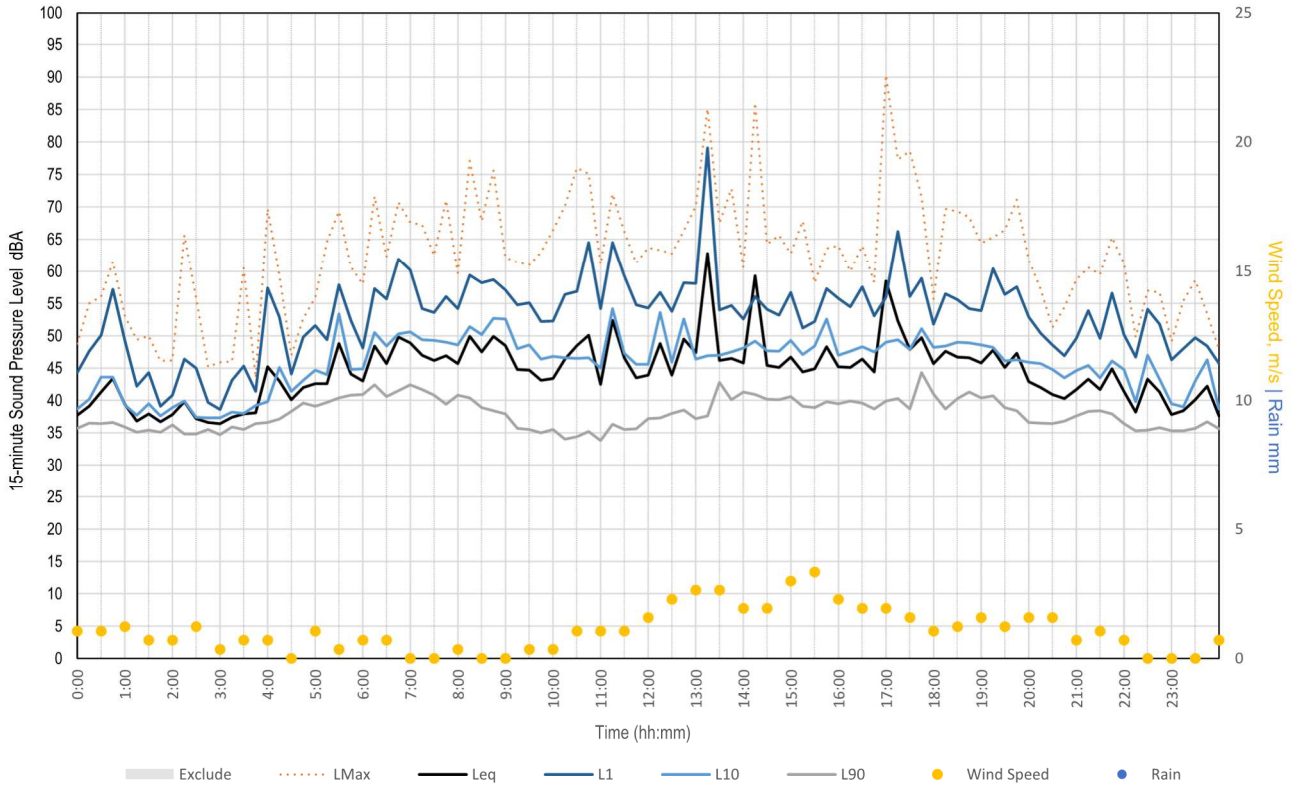
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Monday, 15 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

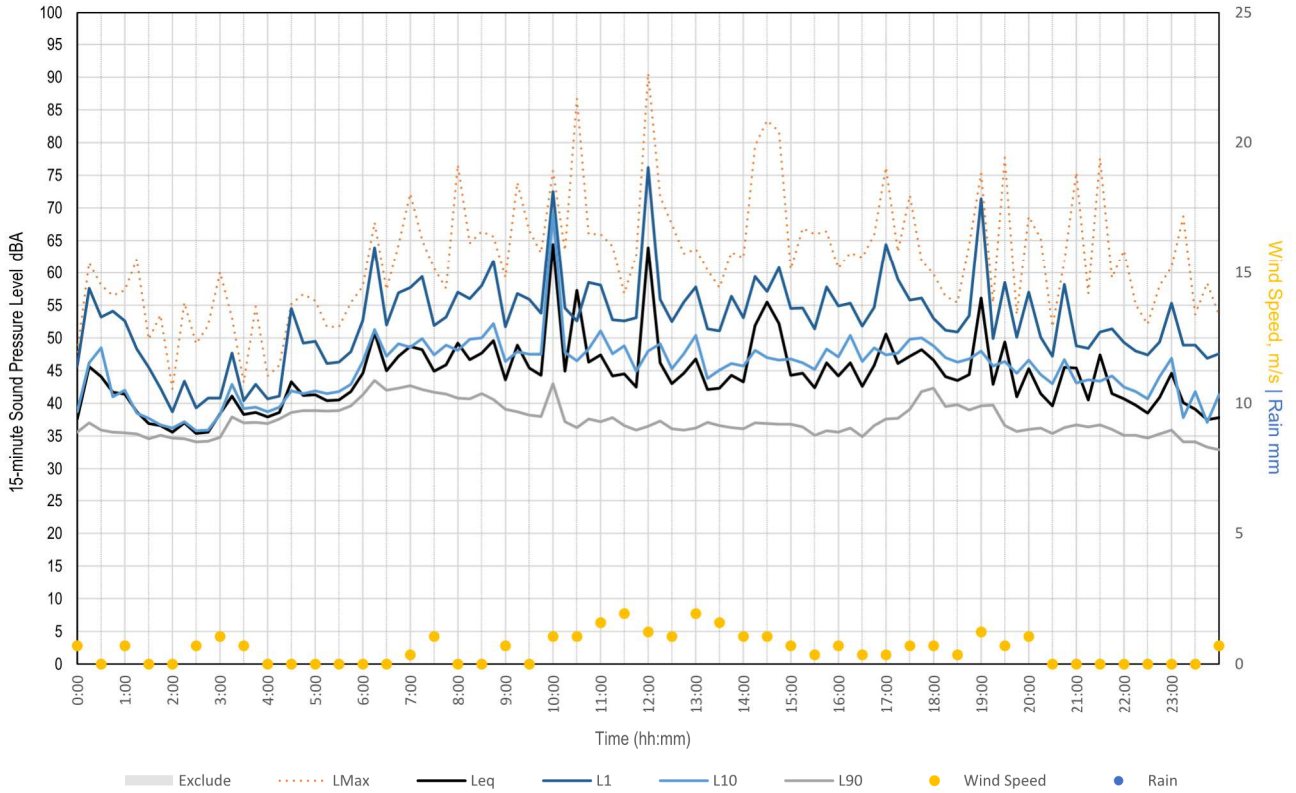
Tuesday, 16 August 2022



Noise Logger Results

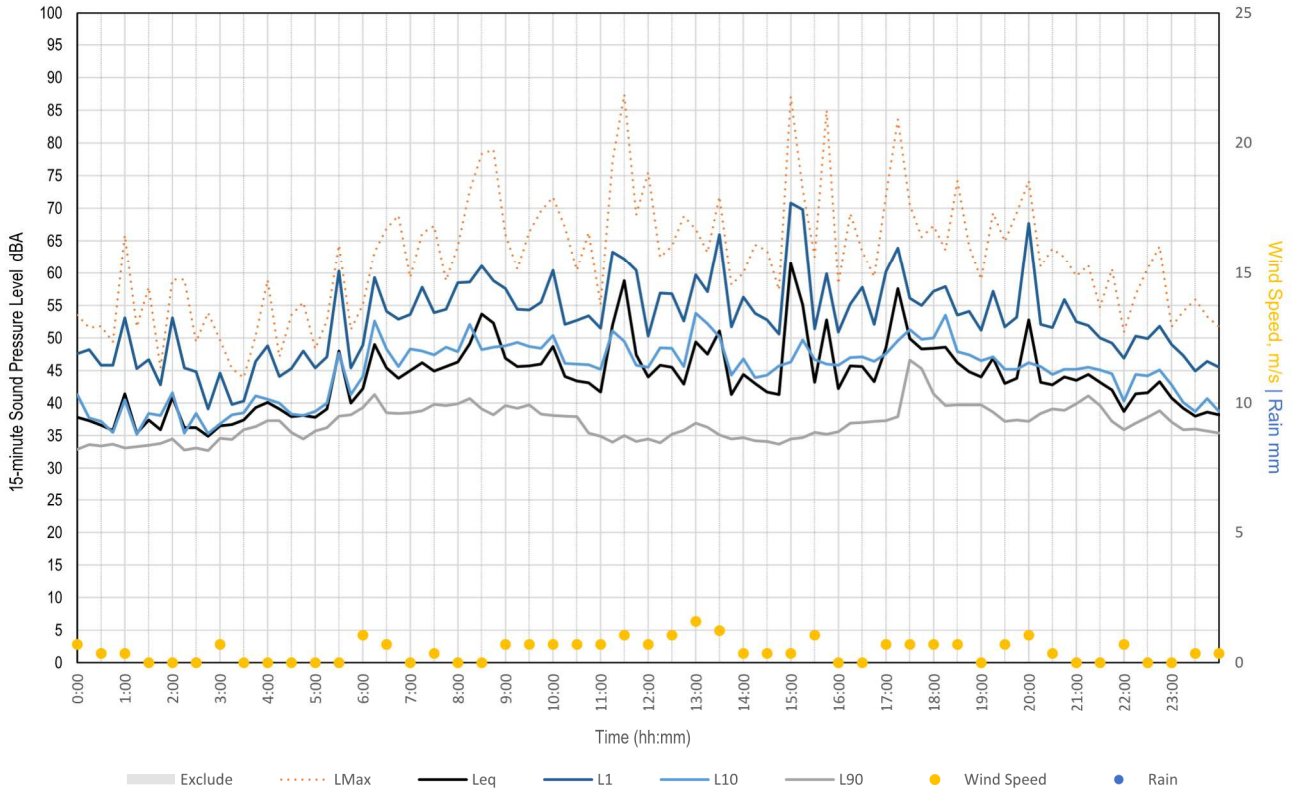
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Wednesday, 17 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

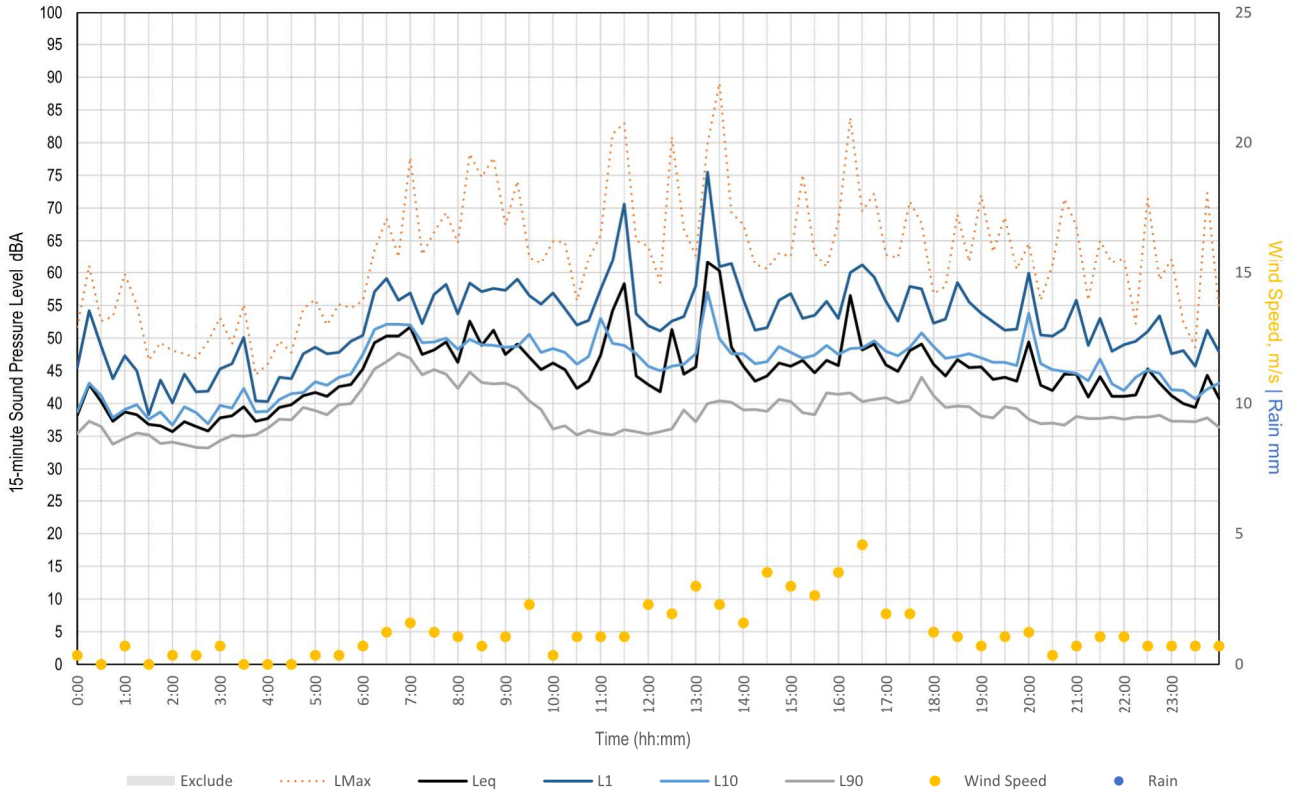
Thursday, 18 August 2022



Noise Logger Results

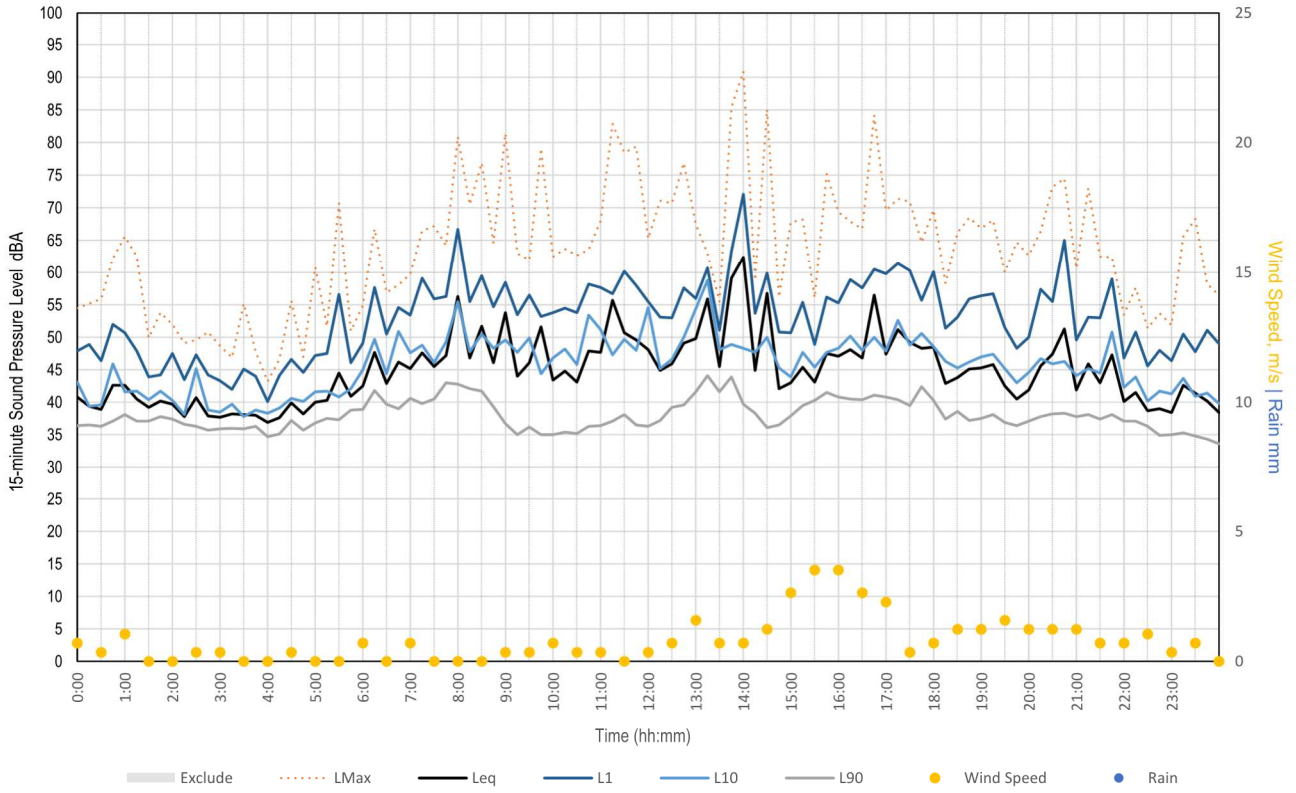
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Friday, 19 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

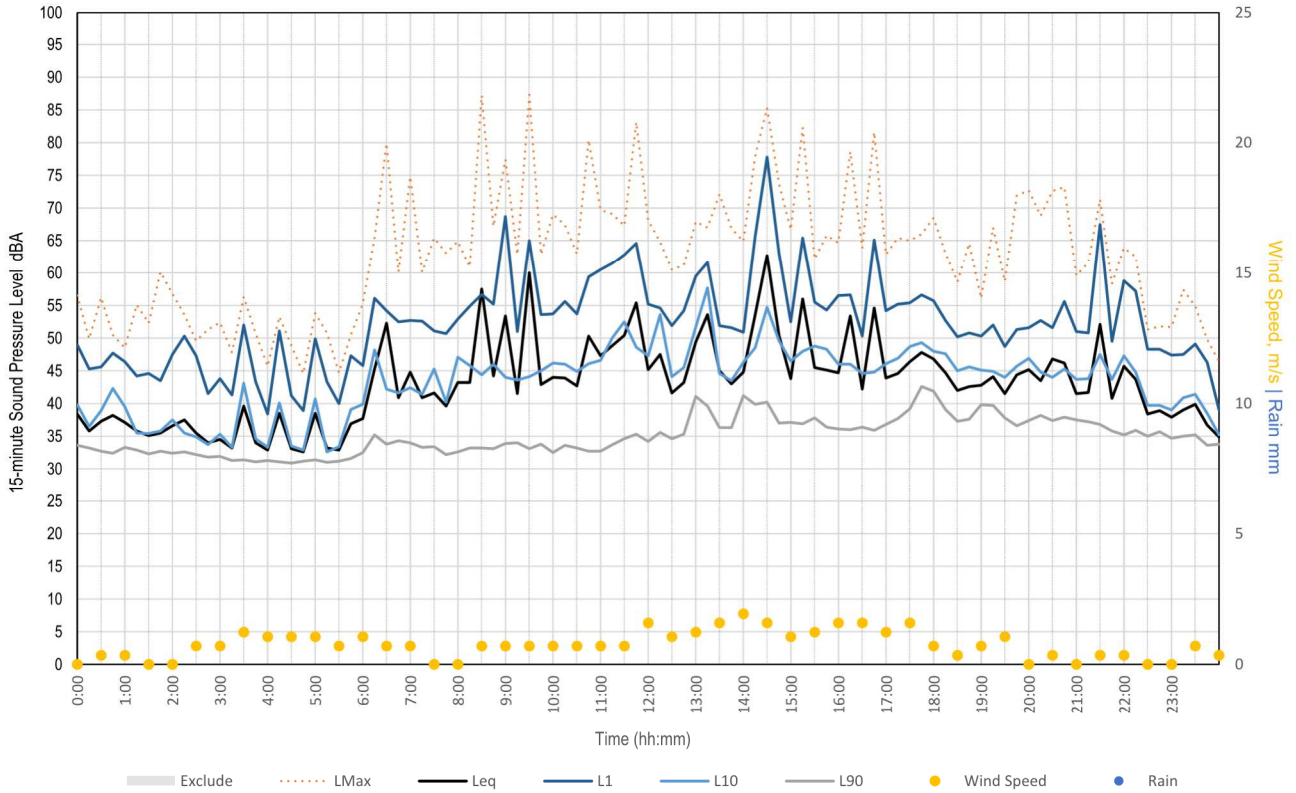
Saturday, 20 August 2022



Noise Logger Results

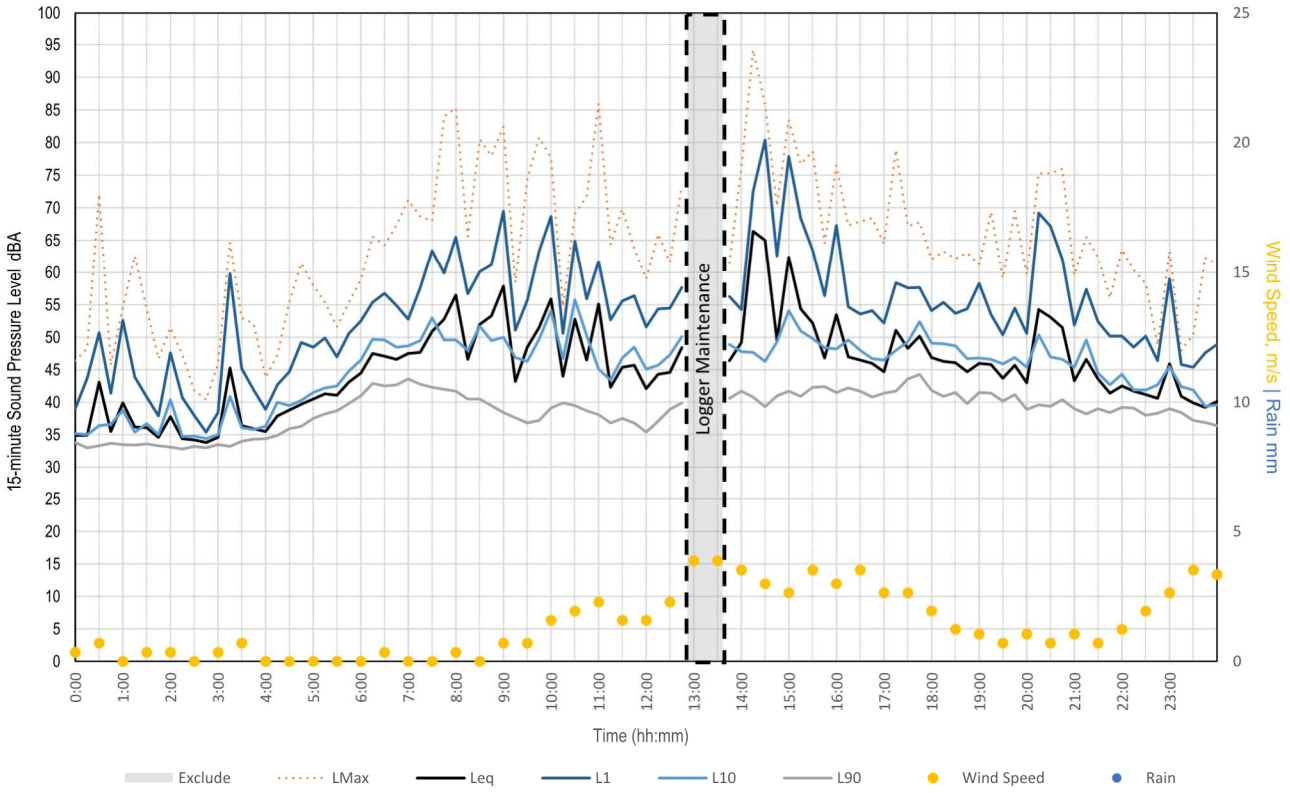
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Sunday, 21 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

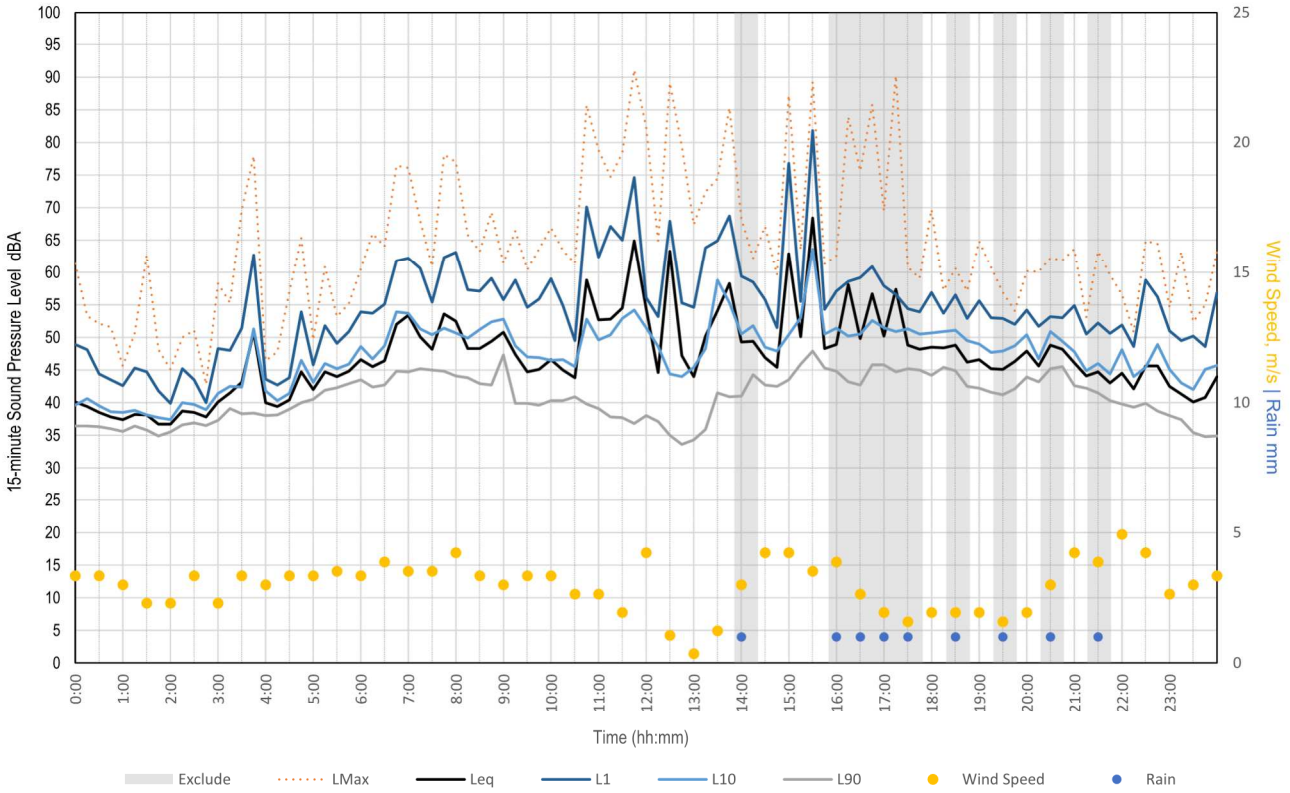
Monday, 22 August 2022



Noise Logger Results

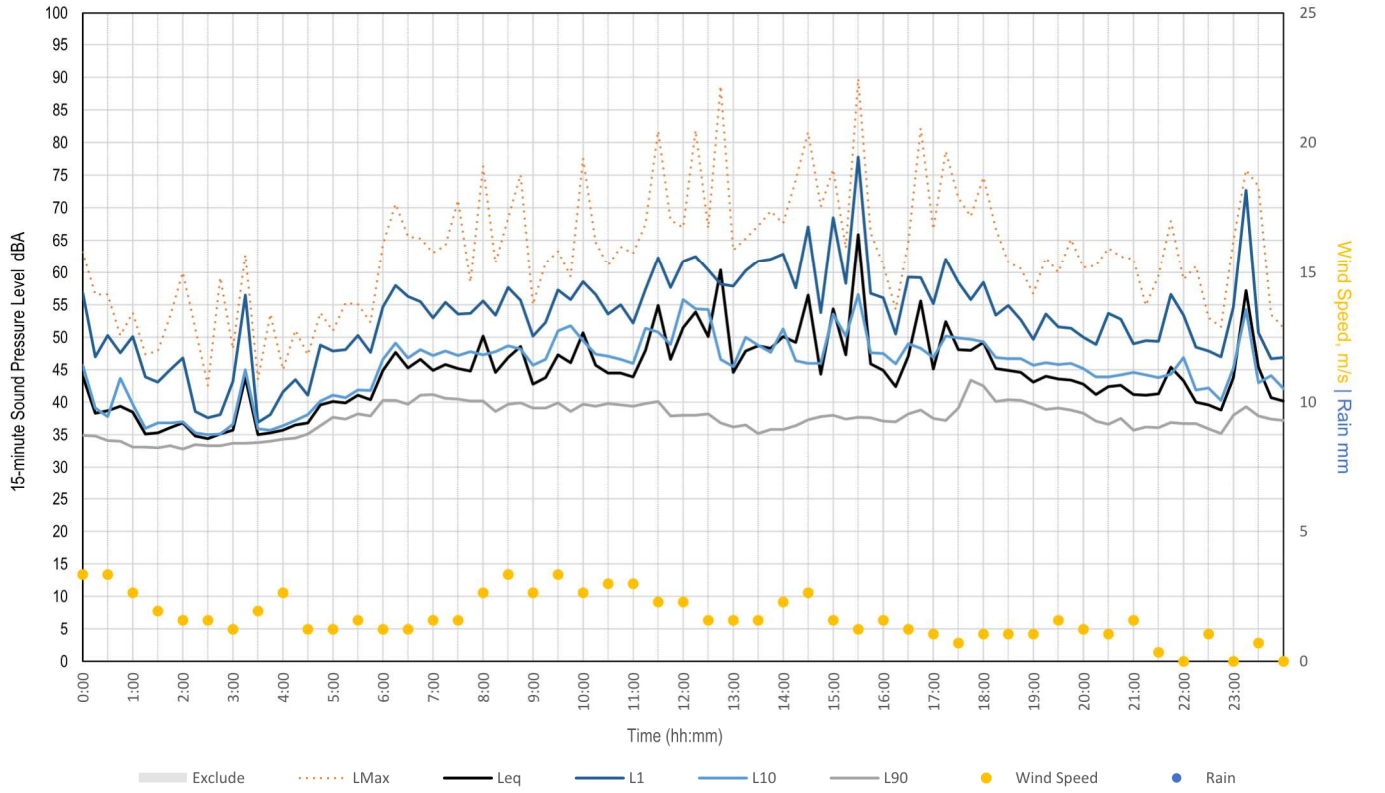
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Tuesday, 23 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

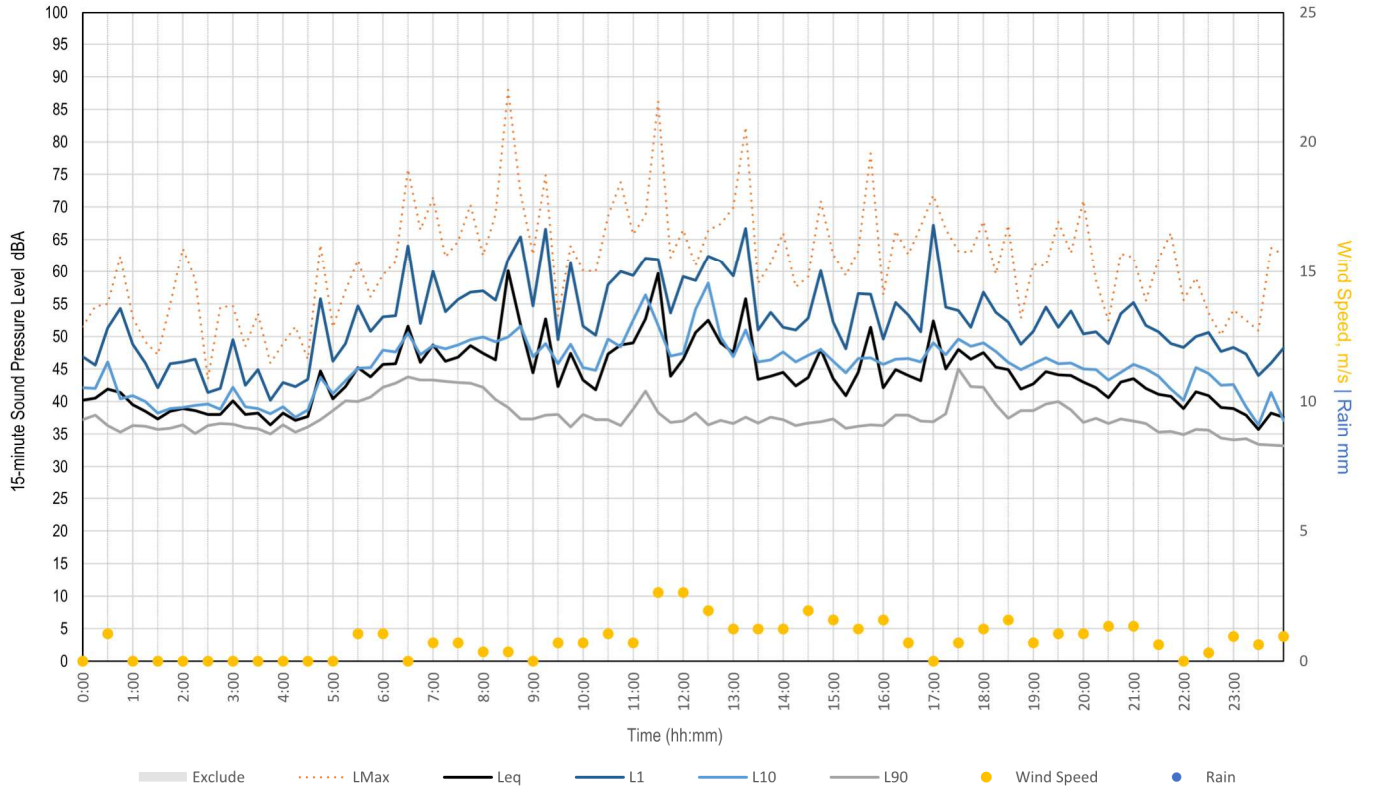
Wednesday, 24 August 2022



Noise Logger Results

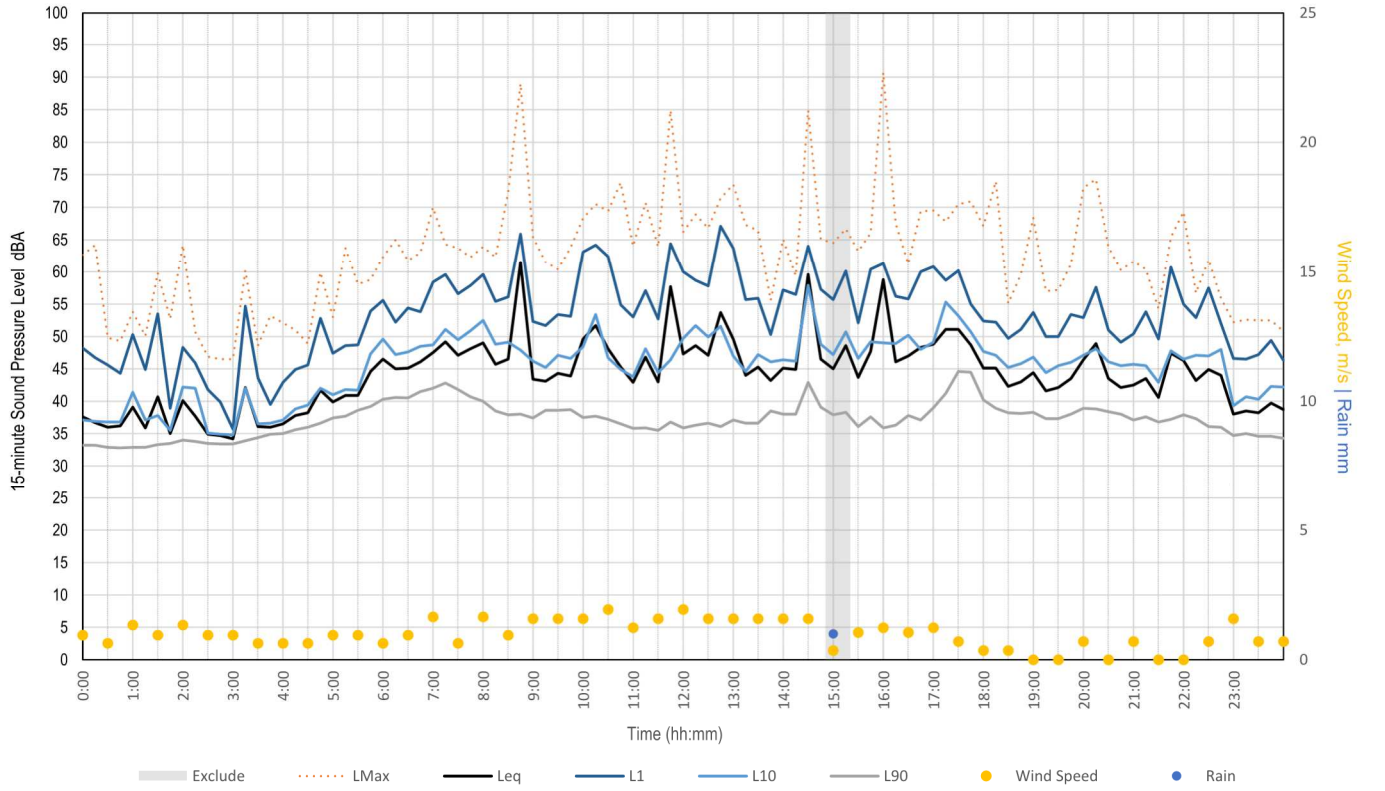
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Thursday, 25 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

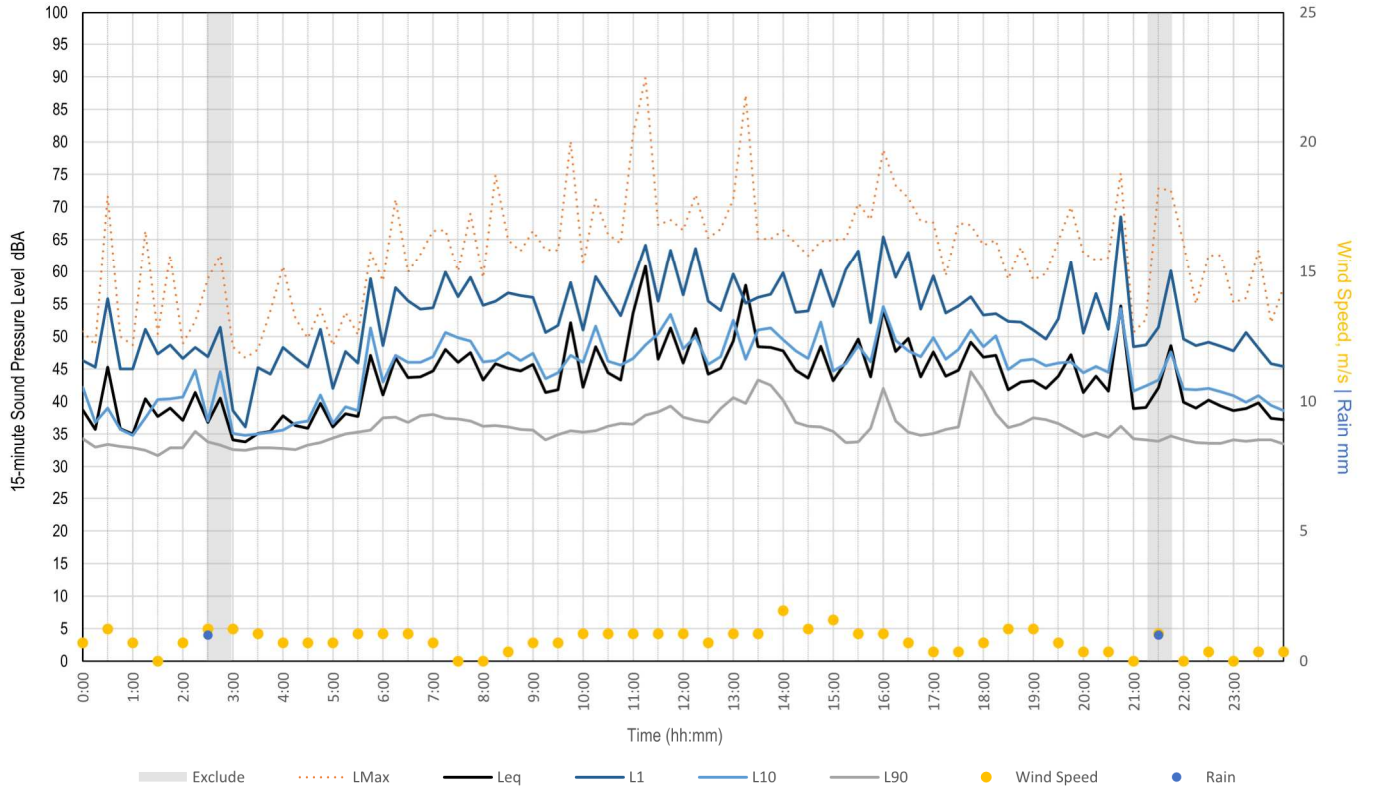
Friday, 26 August 2022



Noise Logger Results

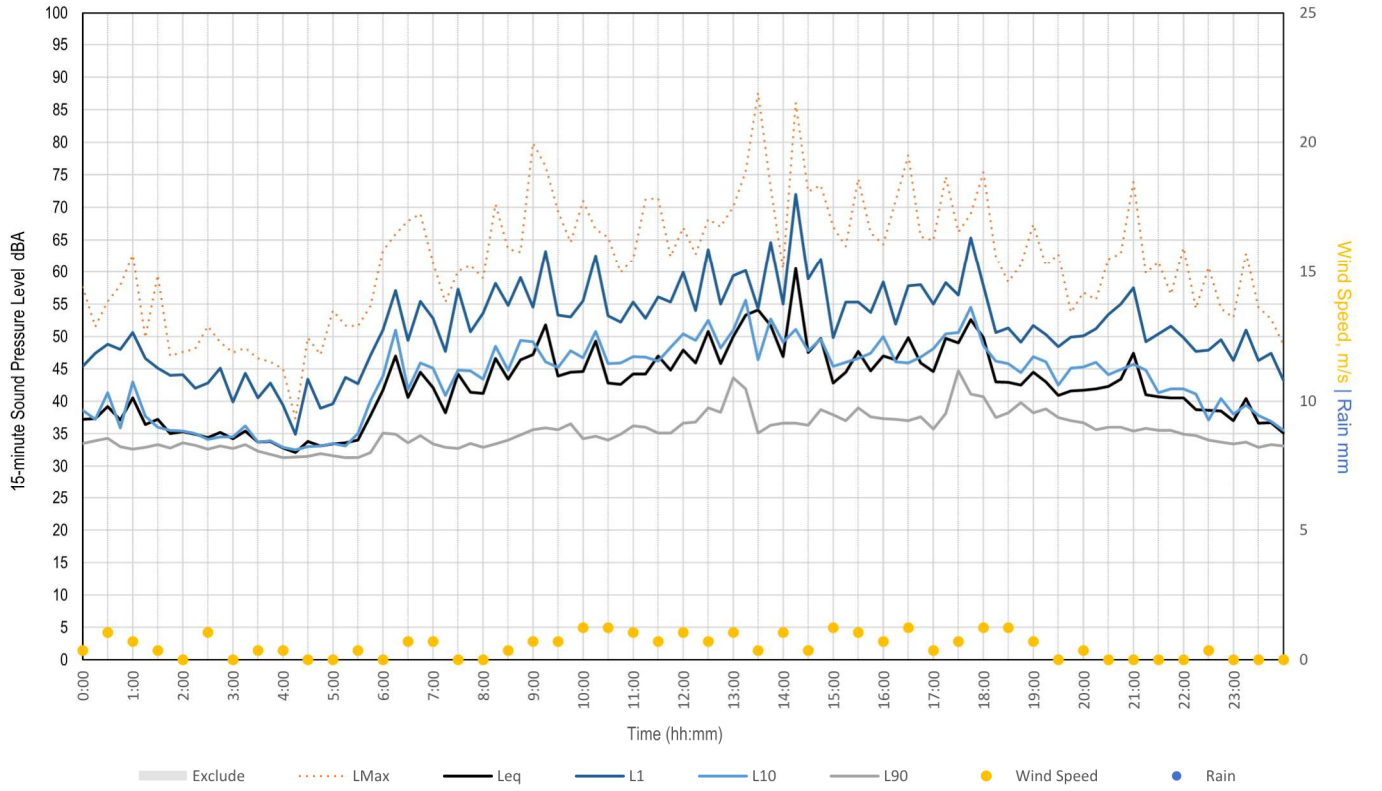
Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Saturday, 27 August 2022



Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

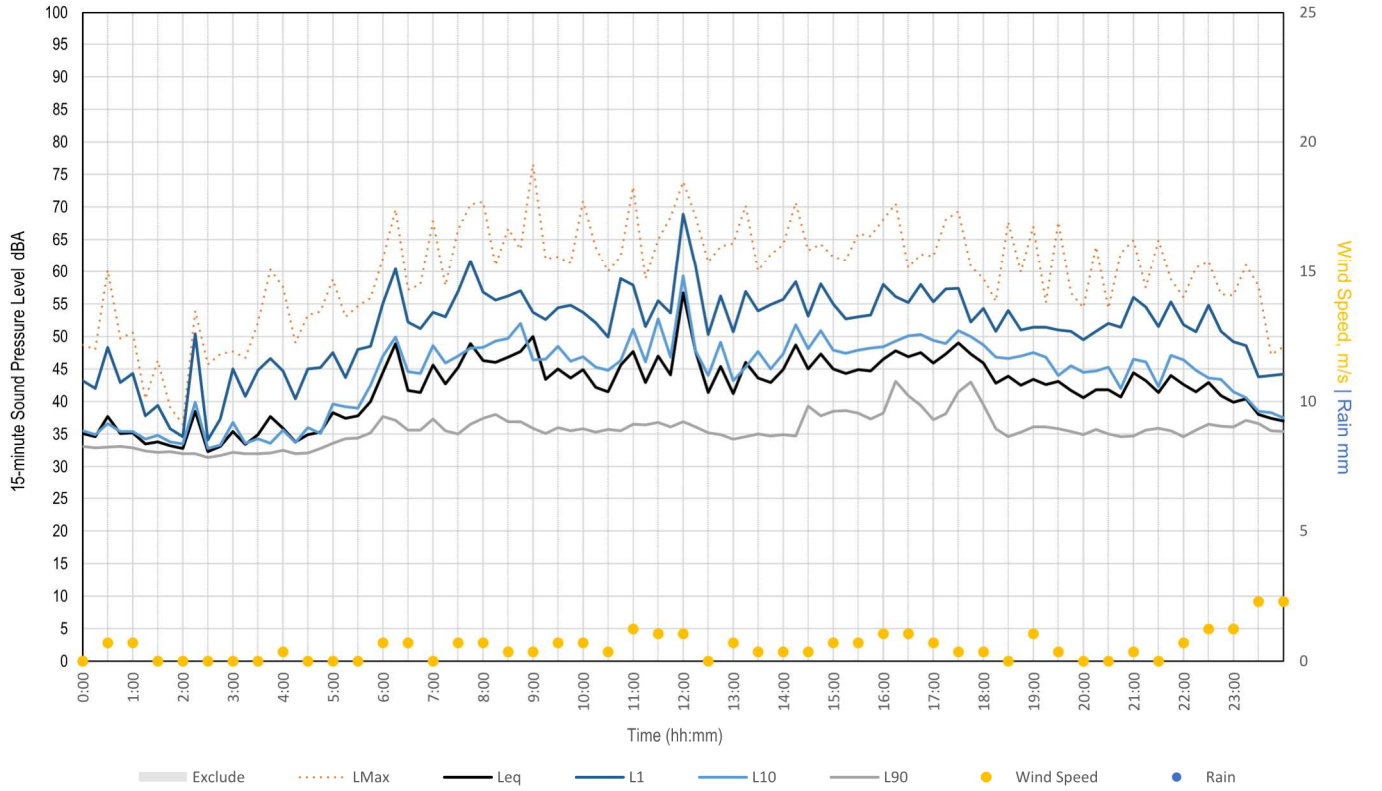
Sunday, 28 August 2022

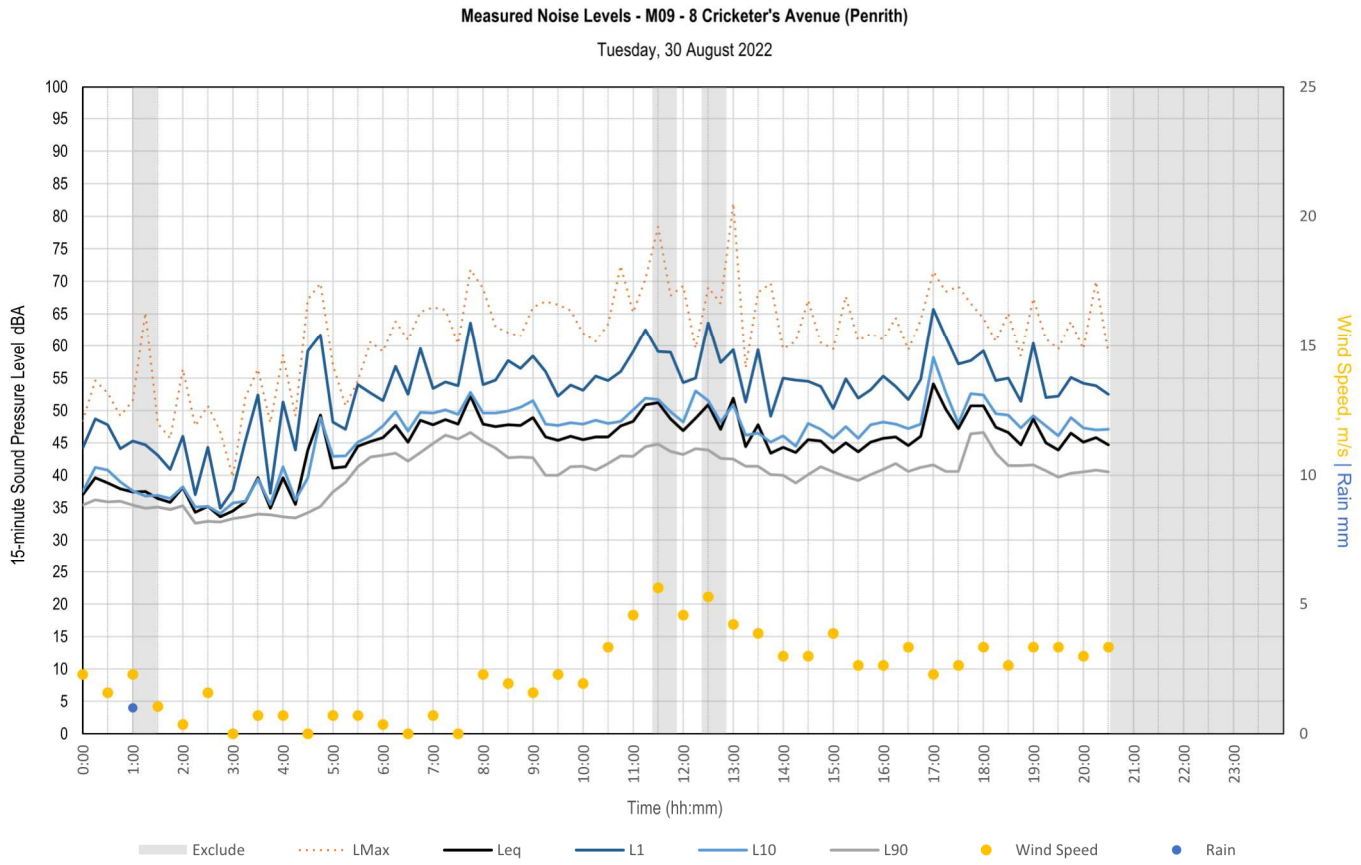


Noise Logger Results

Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)

Monday, 29 August 2022




Measured Noise Levels - M09 - 8 Cricketer's Avenue (Penrith)
Tuesday, 30 August 2022
15-minute Sound Pressure Level dBA
Wind Speed, m/s | Rain mm
Time (hh:mm)
Exclude
LMax
Leq
L1
L10
L90
Wind Speed
Rain

Background Noise Monitoring

Location	M10 - 46 Bujan Street (Glenmore Park)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	MUA & JF

Unattended Equipment					Attended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	8781CB	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-05718-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	94.0 dBA	**Calibration**	**Pre:**	94.1 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Thursday, 11 Aug 2022
Date End	Sunday, 28 Aug 2022
No. of days	14
No. of nights	13

*Monitoring period not continuous

Weather	
Station	BoM
Station Info	Penrith Lakes AWS
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard (off the grass).

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	11/08/2022	10:16:16 AM	10:31:16 AM	66	42	41	37	
2	Day	11/08/2022	10:31:16 AM	10:46:16 AM	58	41	43	37	
3	Day	11/08/2022	10:46:16 AM	11:01:16 AM	62	45	45	37	
4	Day	22/08/2022	2:02:06 PM	2:17:08 PM	60	45	48	40	
5	Evening	16/08/2022	6:00:00 PM	6:15:00 PM	65	47	49	42	*
6	Evening	16/08/2022	7:45:00 PM	8:00:00 PM	67	47	48	36	*
7	Evening	16/08/2022	8:30:00 PM	8:45:00 PM	62	48	49	46	*
8	Evening	16/08/2022	9:45:00 PM	10:00:00 PM	60	43	45	36	*
9	Night	12/08/2022	12:45:00 AM	1:00:00 AM	49	36	38	33	*
10	Night	12/08/2022	2:15:00 AM	2:30:00 AM	54	40	41	34	*
11	Night	12/08/2022	4:30:00 AM	4:45:00 AM	52	39	42	36	*
12	Night	12/08/2022	10:15:00 PM	10:30:00 PM	49	38	42	34	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Constant noise from water fountain within garden (>10 metres away). Occasional vehicle passby on local streets. Intermittent distant bird noise. Aircraft flyby dominant for duration of approx. 30 sec to 1 min with maximum levels in the range of 46 to 59 dBA.
Background noise	Constant noise from water fountain in garden. Traffic at a distance, just audible.
Evening	
Ambient noise	Occasional vehicle passby on local streets. Constant insect noise. Occasional noise of dogs barking at adjacent properties. Two aircraft flybys noted, approximately 1 min in duration.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass rustling).
Night	
Ambient noise	Occasional vehicle passby on local streets. Occasional animal sounds (e.g. birds, insect noise). Mechanical humming sound, likely a pool pump at neighbouring property.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass rustling).

Site Details	M10 - 46 Bujan Street (Glenmore Park)
Start Date	Thu 11 August 2022
End Date	Sun 28 August 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	57
$L_{eq, Evening}$ dBA	51
$L_{eq, Night}$ dBA	46
RBL, $_{Day}$ dBA	39
RBL, $_{Evening}$ dBA	39
RBL, $_{Night}$ dBA	30

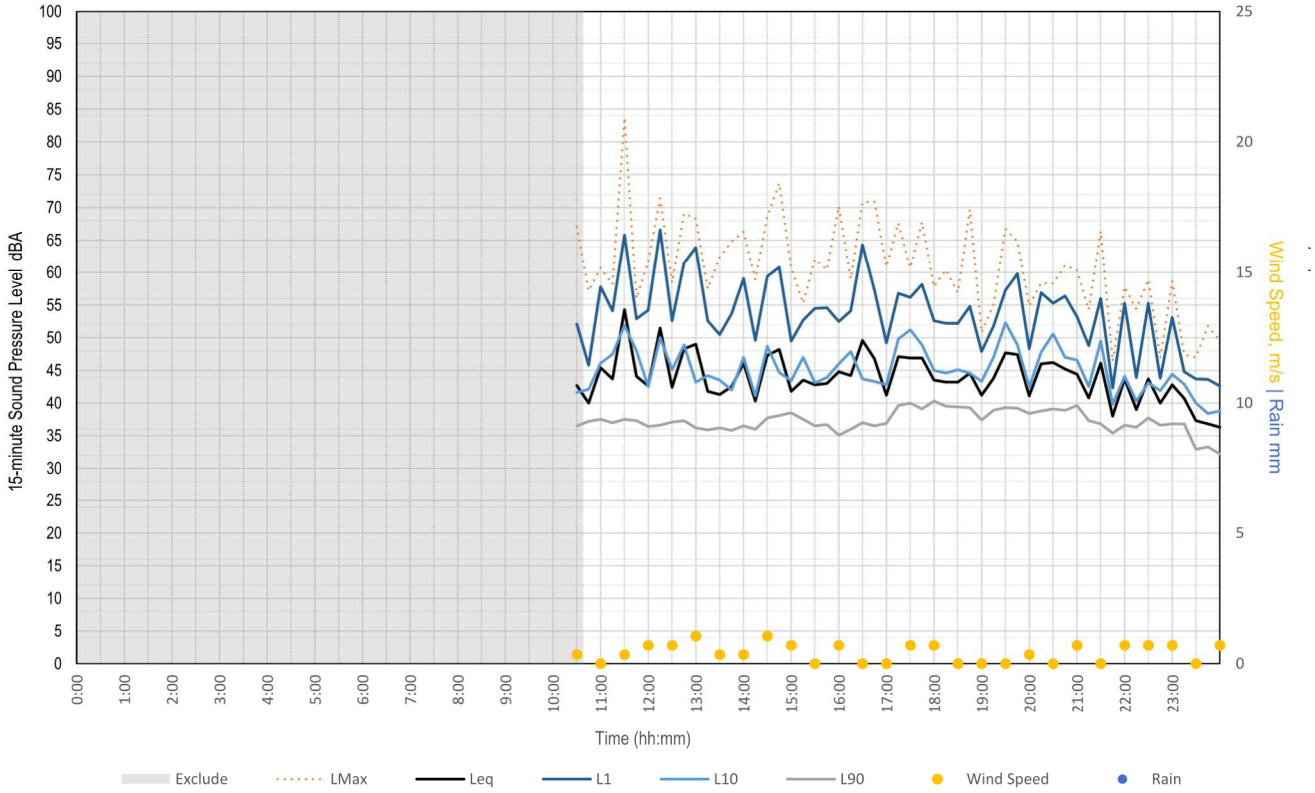
Daily Summary

Date	11-08	12-08	13-08	14-08	15-08	16-08	17-08
$L_{eq, Day}$ dBA	47	48	52	53	54	54	53
$L_{eq, Evening}$ dBA	45	49	52	51	50	49	48
$L_{eq, Night}$ dBA	45	51	43	43	47	46	44
ABL, $_{Day}$ dBA	36	40	39	42	41	37	38
ABL, $_{Evening}$ dBA	37	39	40	38	39	36	40
ABL, $_{Night}$ dBA	32	27	31	30	31	30	33

Date	22-08	23-08	24-08	25-08	26-08	27-08	28-08
$L_{eq, Day}$ dBA	52	62	52	53	51	66	49
$L_{eq, Evening}$ dBA	47	59	52	52	48	47	47
$L_{eq, Night}$ dBA	48	47	48		44	43	
ABL, $_{Day}$ dBA	40	40	39	37	37	38	36
ABL, $_{Evening}$ dBA	42	45	37	36	40	38	38
ABL, $_{Night}$ dBA	37	29	33	25	28	29	

Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

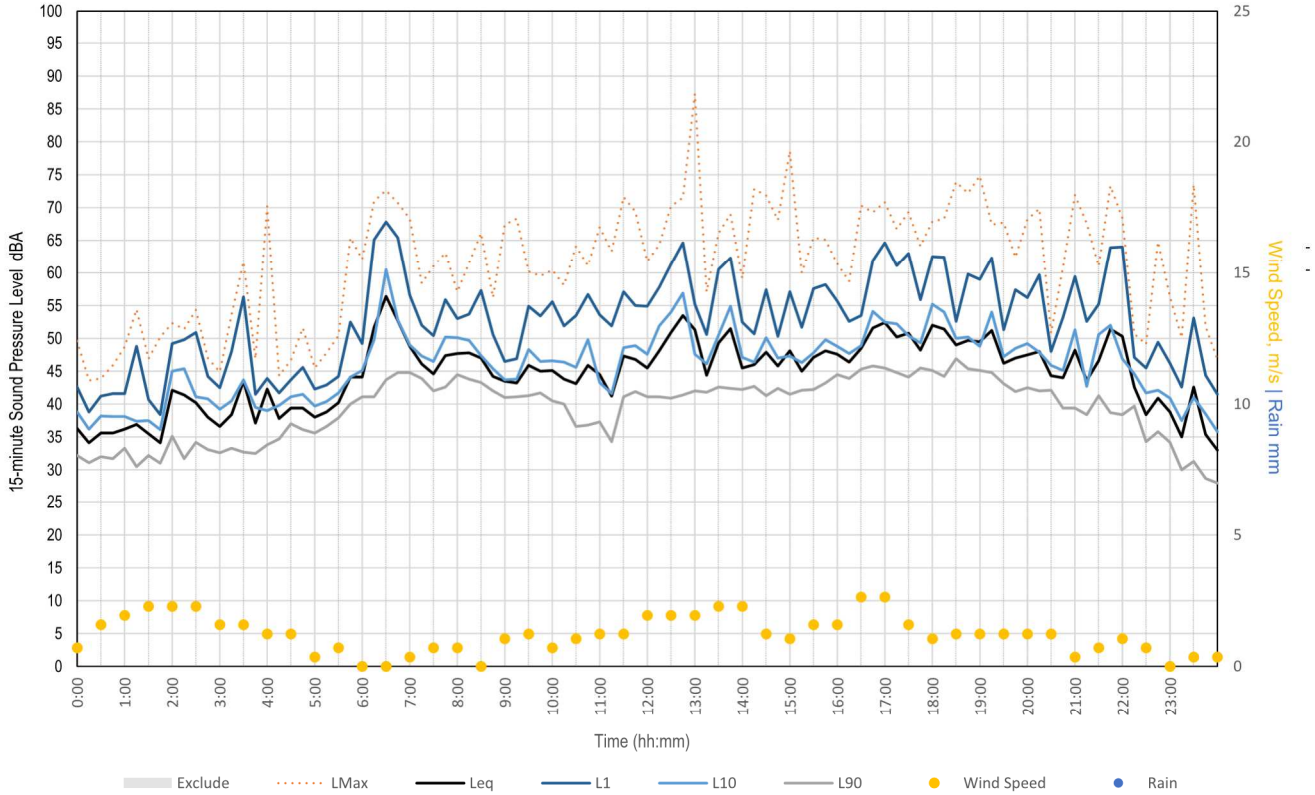
Thursday, 11 August 2022



Noise Logger Results

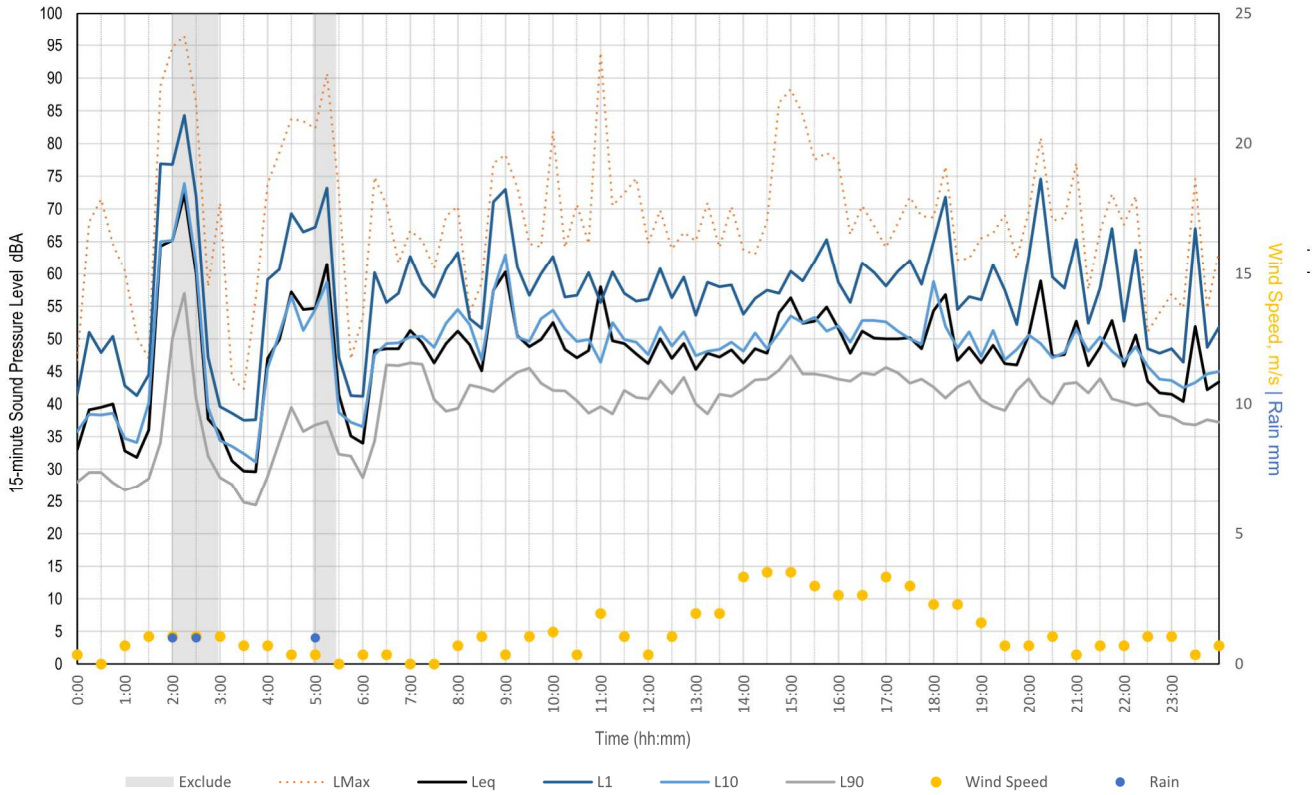
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Friday, 12 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

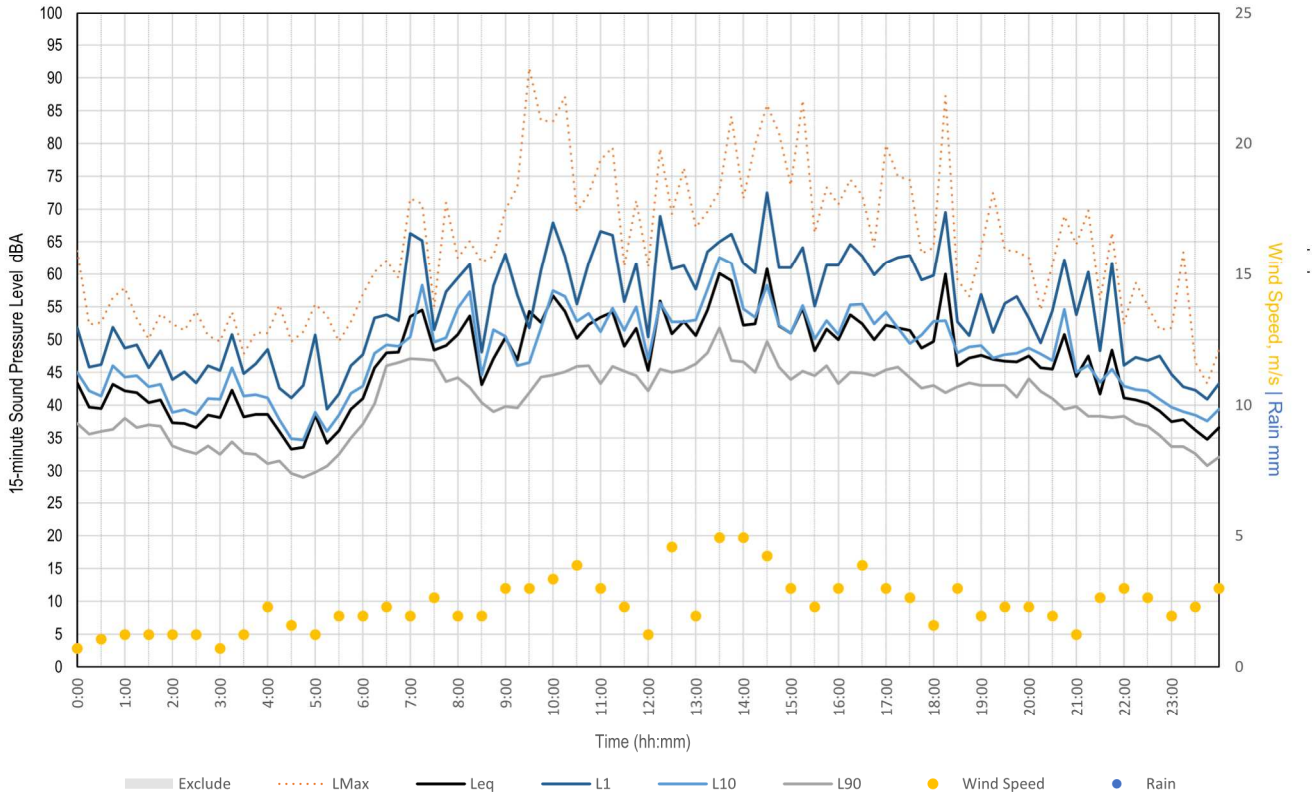
Saturday, 13 August 2022



Noise Logger Results

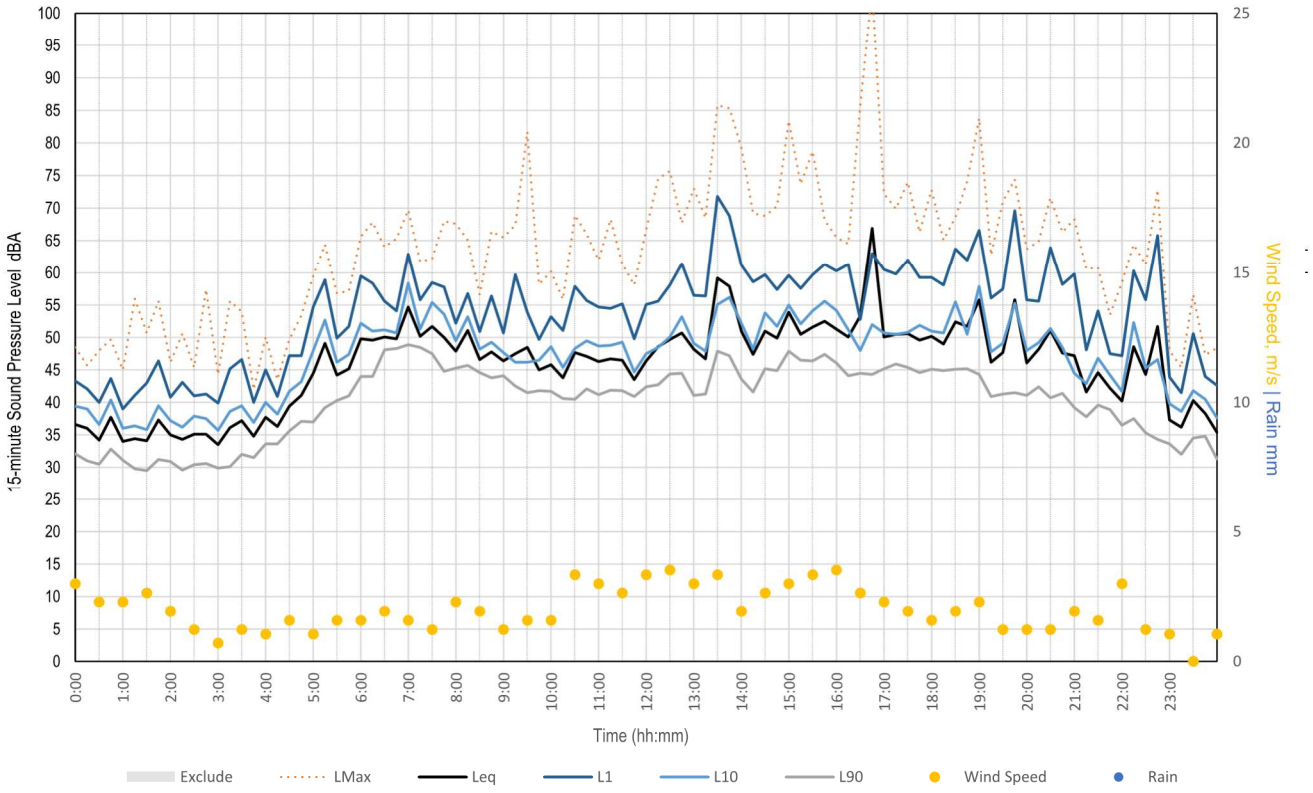
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Sunday, 14 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

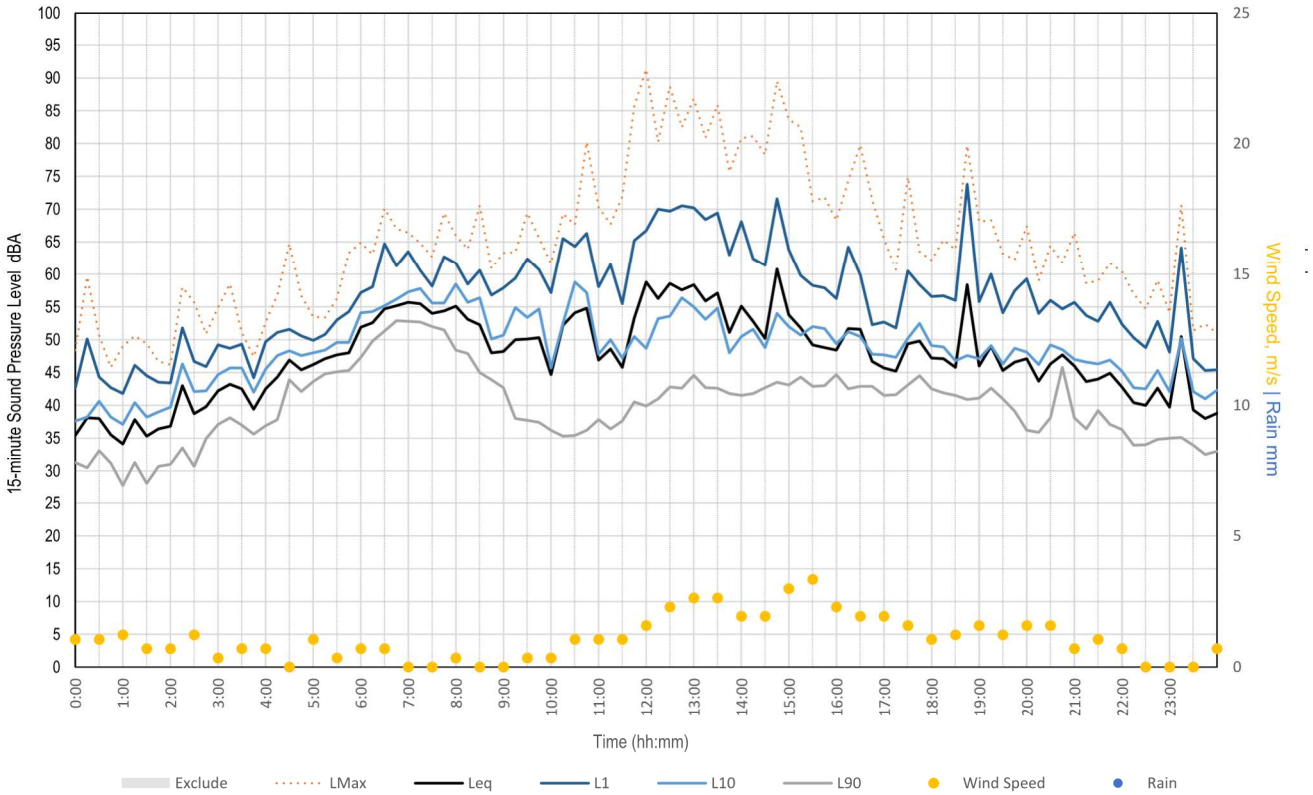
Monday, 15 August 2022



Noise Logger Results

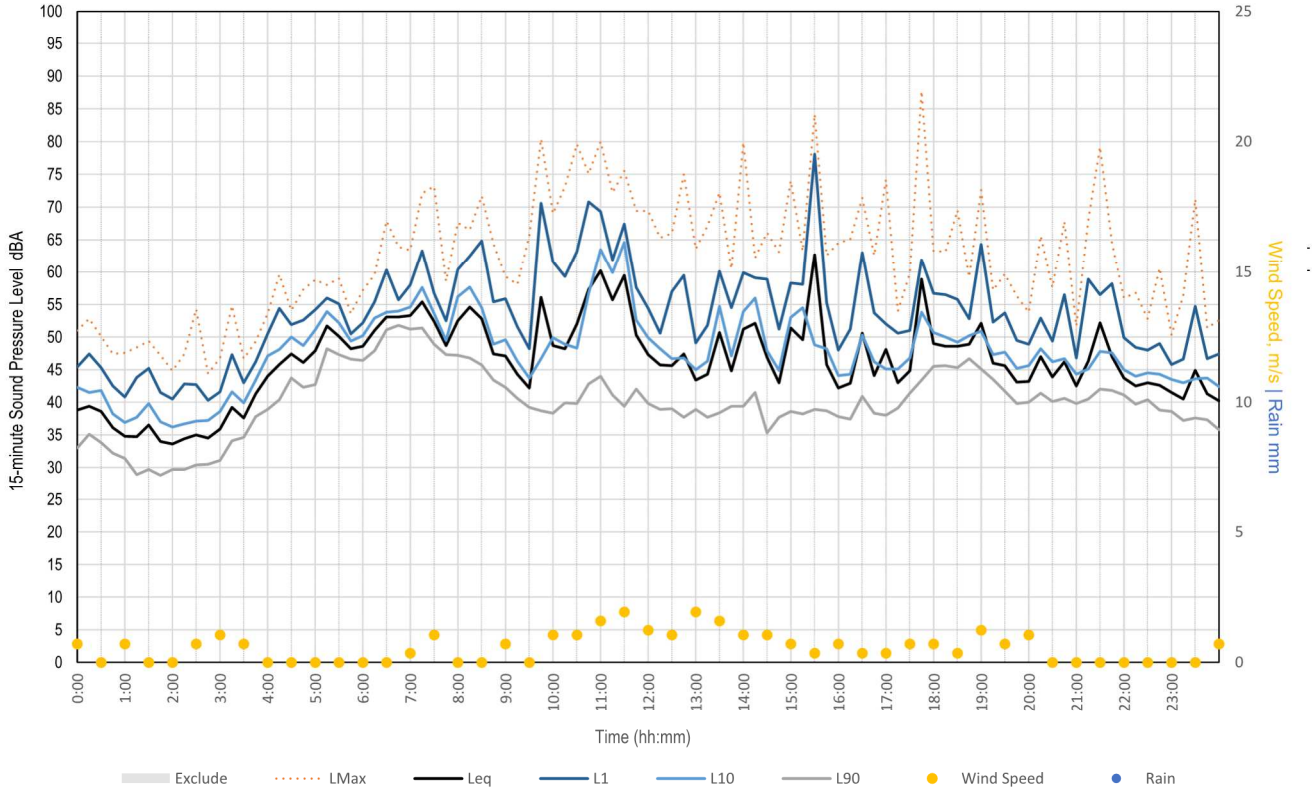
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Tuesday, 16 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

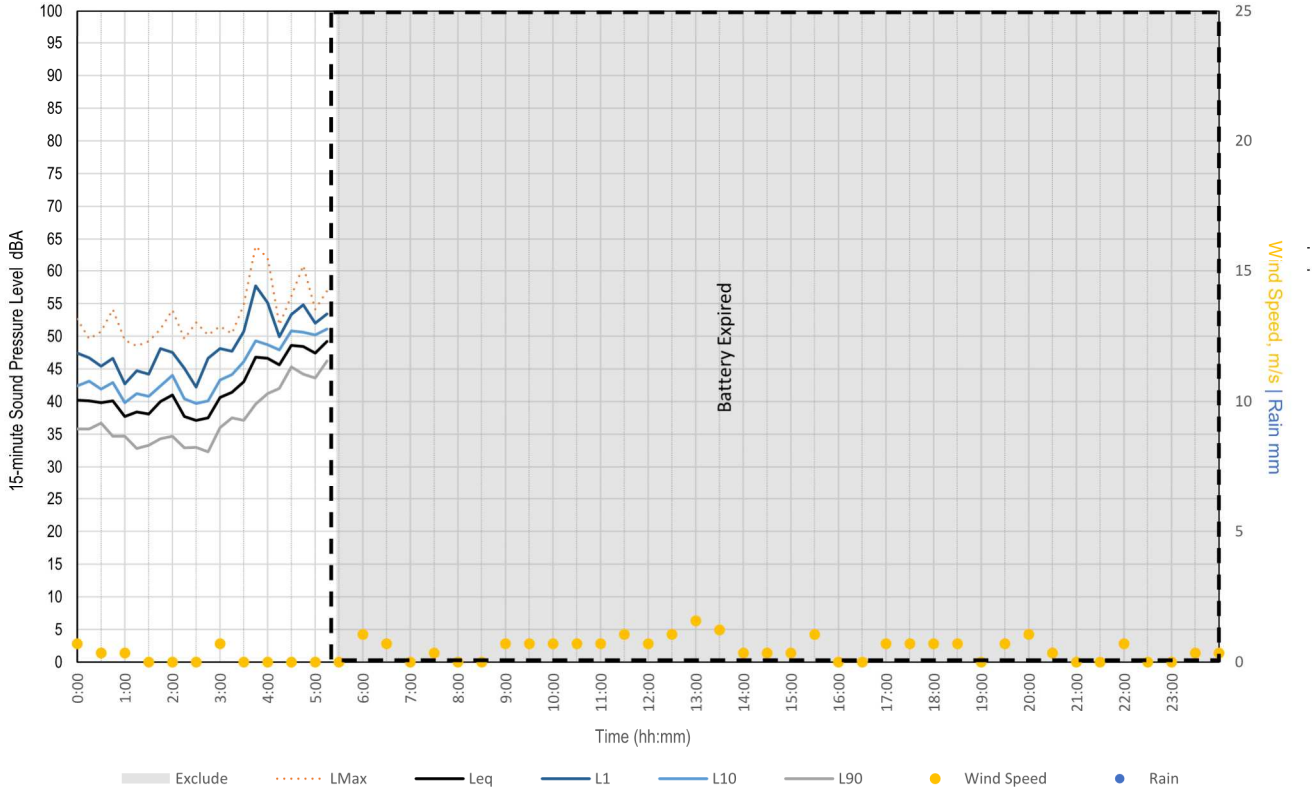
Wednesday, 17 August 2022



Noise Logger Results

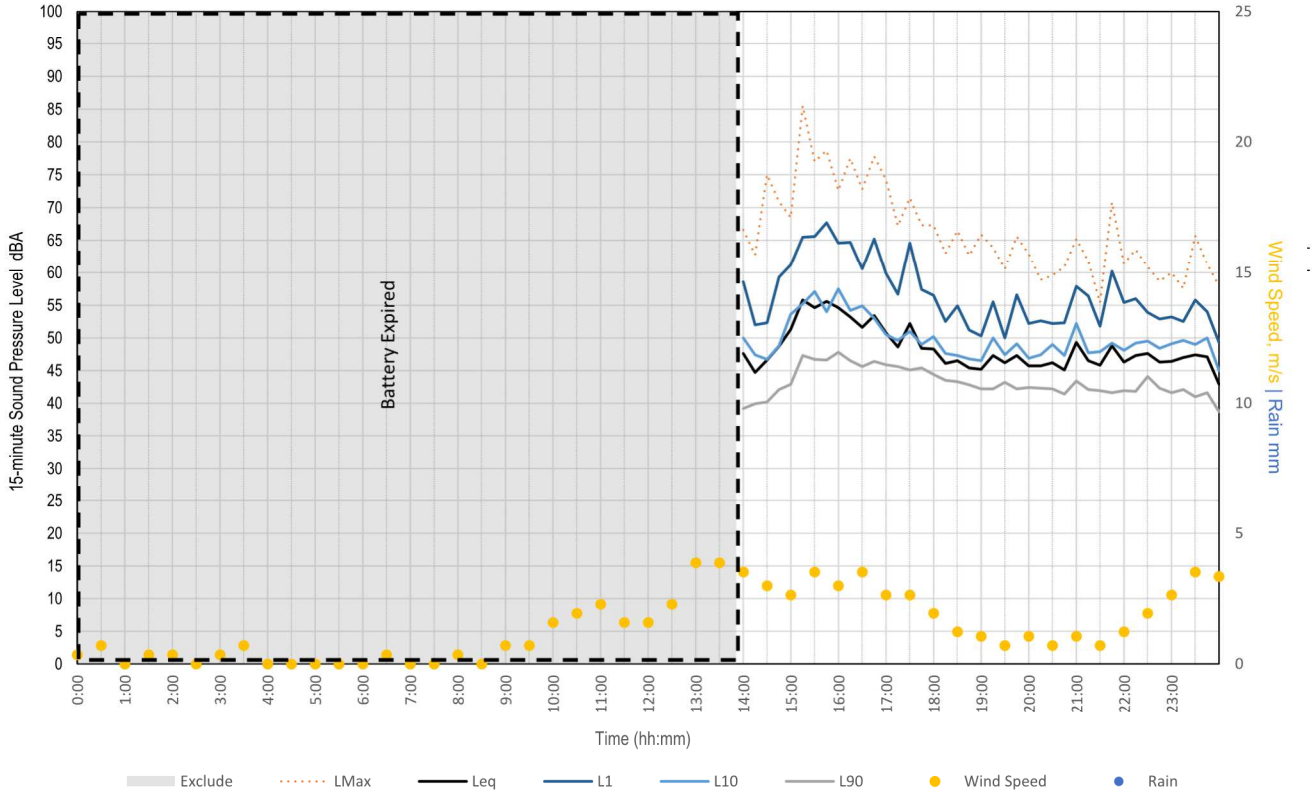
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Thursday, 18 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

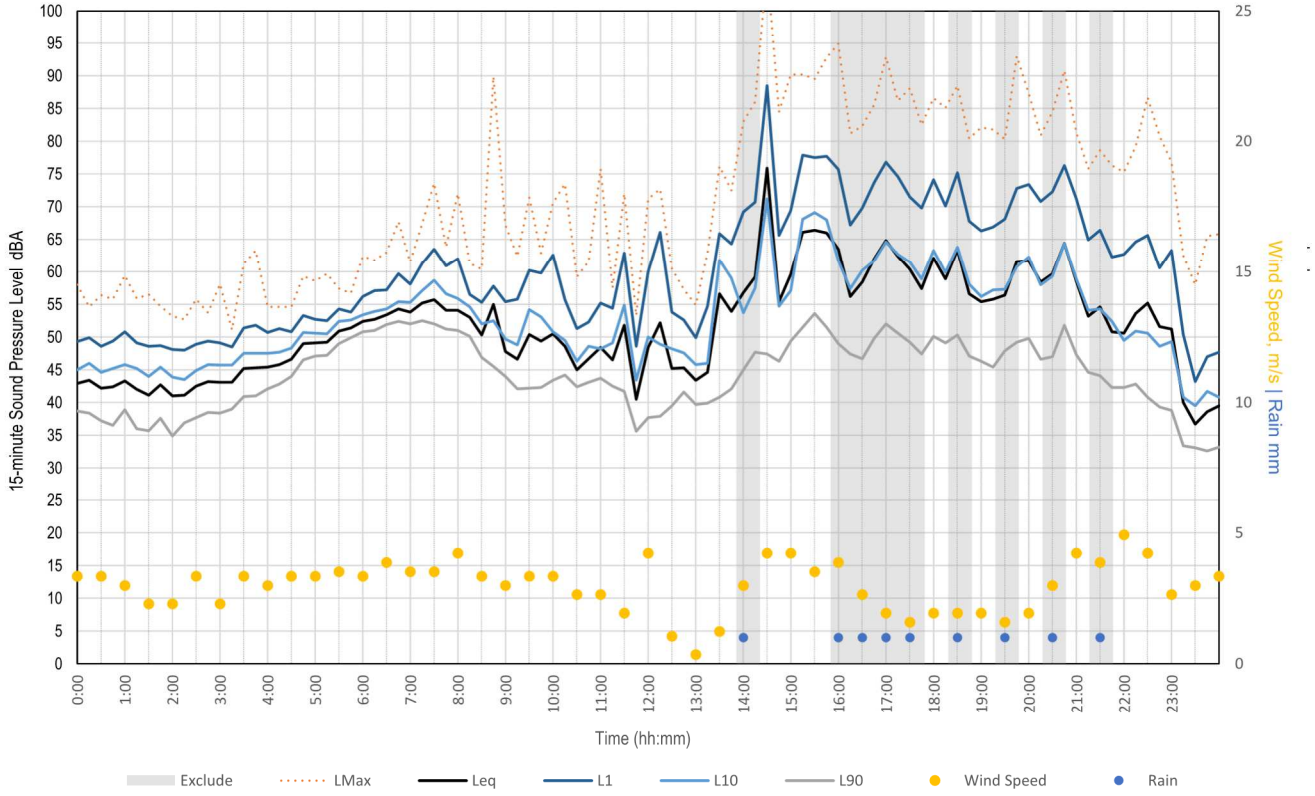
Monday, 22 August 2022



Noise Logger Results

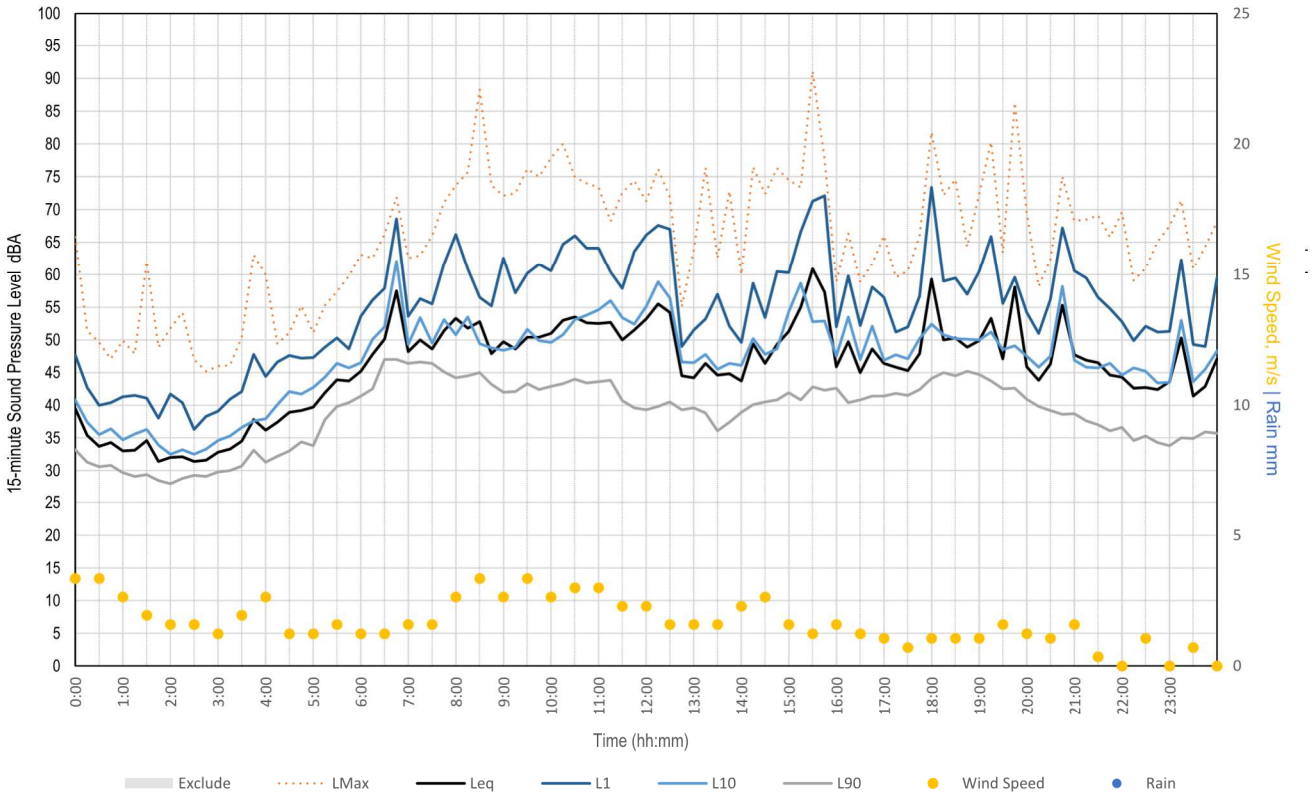
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Tuesday, 23 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

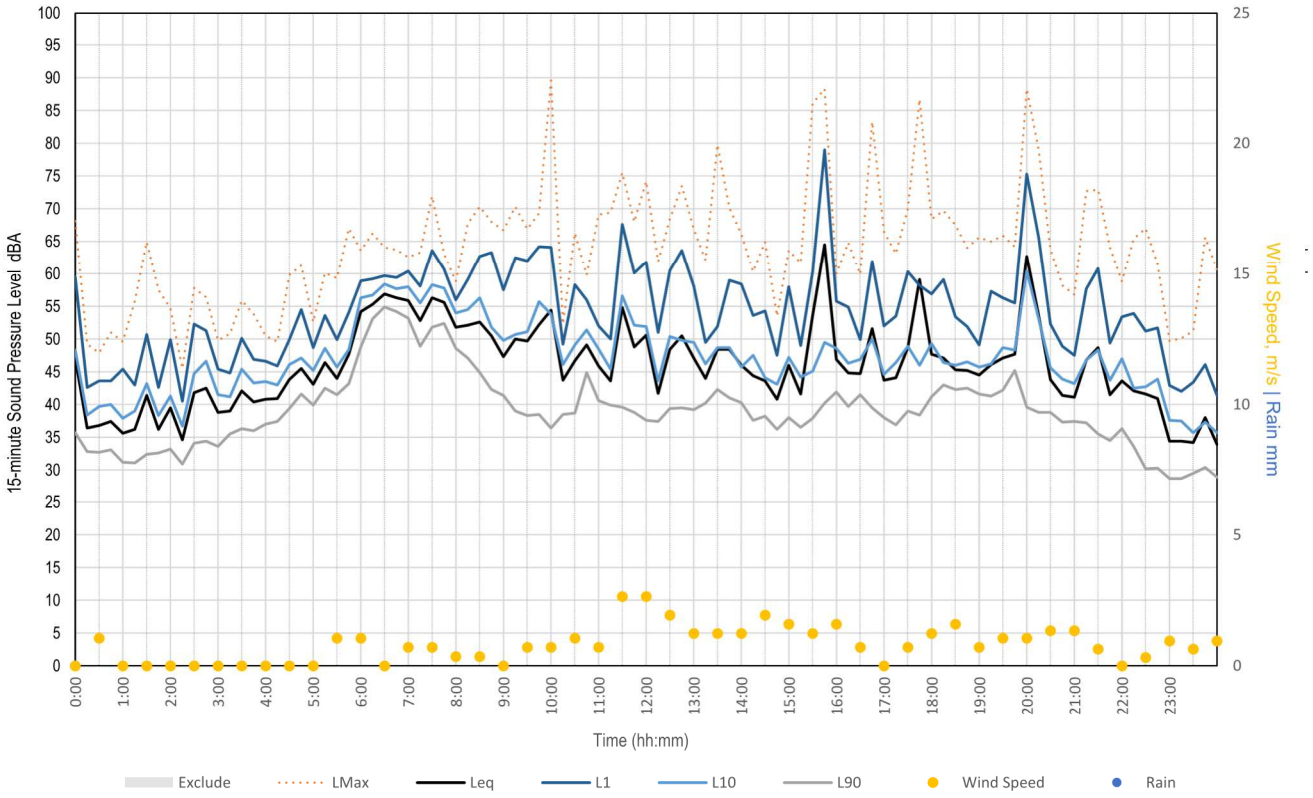
Wednesday, 24 August 2022



Noise Logger Results

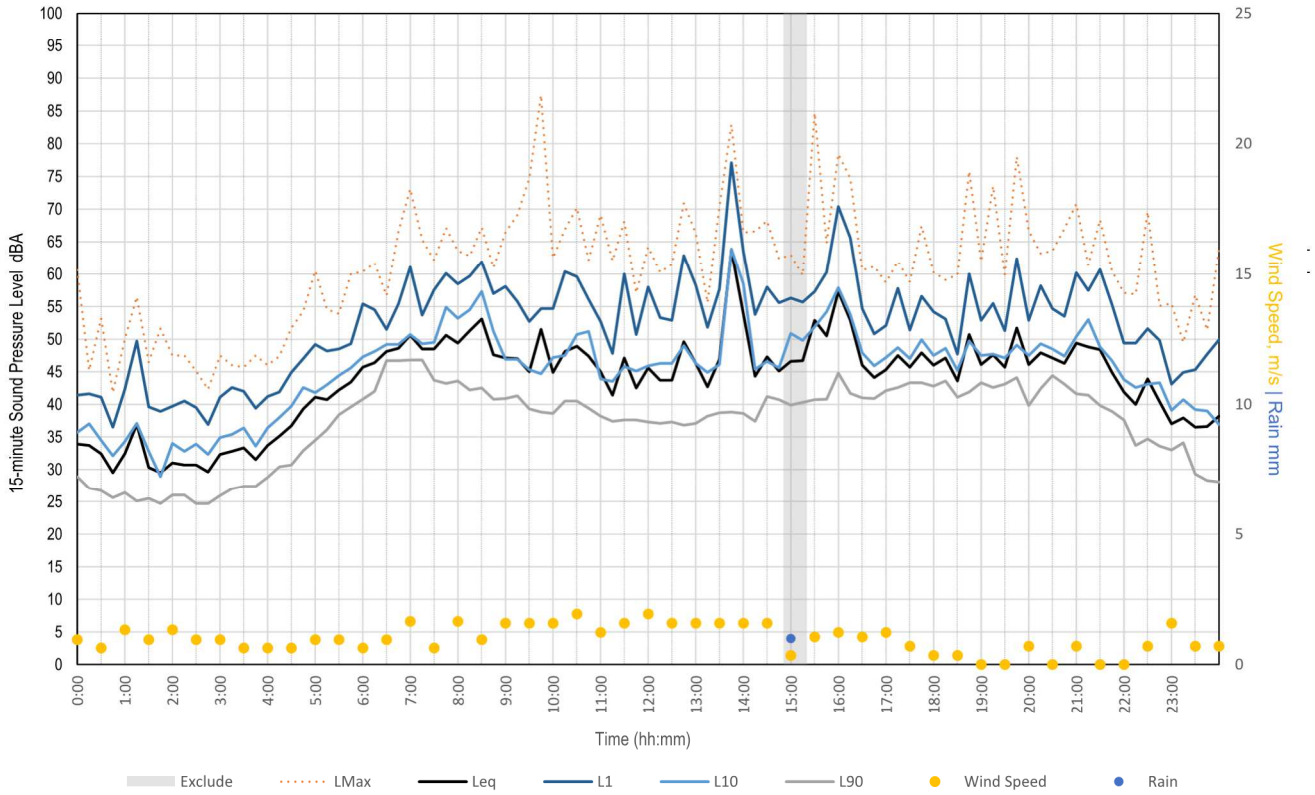
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Thursday, 25 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

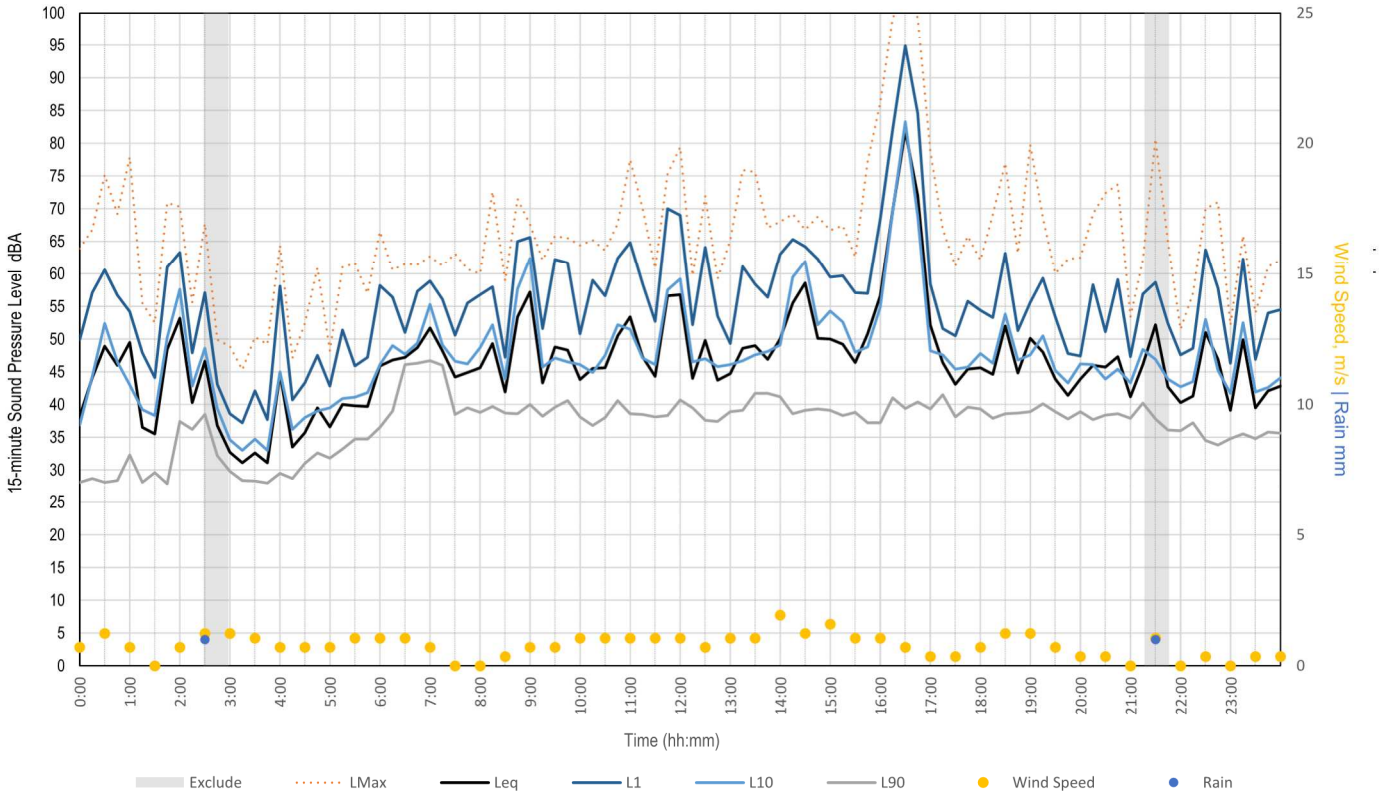
Friday, 26 August 2022



Noise Logger Results

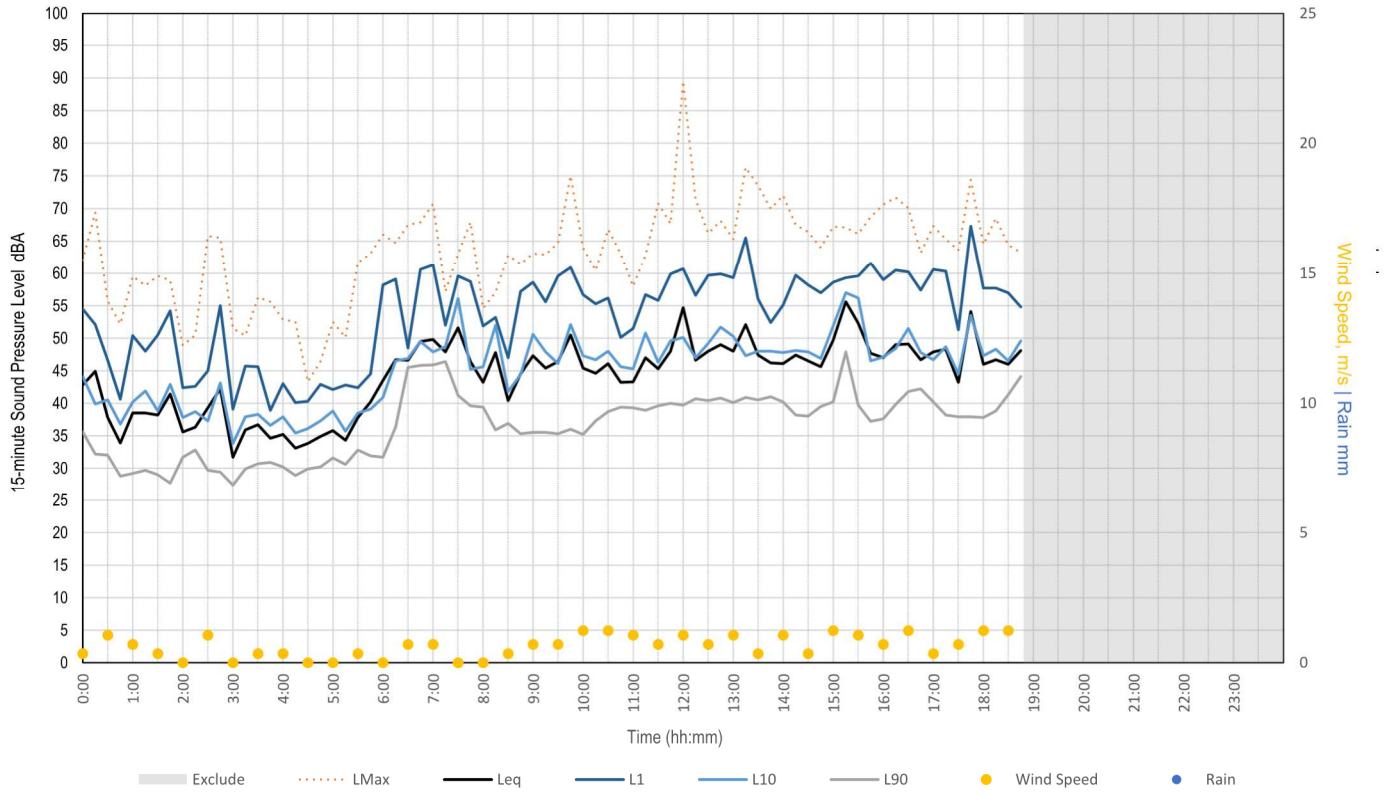
Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Saturday, 27 August 2022



Measured Noise Levels - M10 - 46 Bujan Street (Glenmore Park)

Sunday, 28 August 2022



Background Noise Monitoring

Location	M11 - 96 Brisbane Street (Oxley Park)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment				
Equipment	**Model:**	Rion NL-42	**Serial No. :**	509281
Calibration	**Pre:**	94.5 dBA	**Post:**	94.3 dBA
Microphone	**Position:**	Free field *	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-05718-E0
Calibration	**Pre:**	94.2 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

* As far as practicable

Date Start	Tuesday, 09 Aug 2022
Date End	Tuesday, 06 Sep 2022
No. of days	29
No. of nights	28

Weather	
Station	BoM
Station Info	Horsley Park Equestrian
Distance	≤ 15km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally at the northern end of the backyard; located ≥ 4 metres away from house facade and metal fence, and ≥ 1.5 metres away from roof structure. Logger could not be placed further away from roof structure due to resident requirements.
Due to the diffuse nature of the surrounding background level noise sources and distance from structure, location was deemed acceptable.
On analysis, several high periods of noises are identified which indicate short term peak events near the microphone (e.g. children playing). While the event influenced short term LAeq levels, they do not significantly influence the L90 background levels.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}
1	Day	9/08/2022	2:03:00 PM	2:17:00 PM	65	46	47	38
2	Day	9/08/2022	2:18:00 PM	2:33:00 PM	54	45	47	42
3	Day	9/08/2022	2:35:00 PM	2:49:00 PM	71	46	48	40
4	Day	9/08/2022	2:51:00 PM	3:05:00 PM	65	44	46	39

* Not possible to access site during evening/night due to personal safety and/or access issues. No audio available to perform remote attended.

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent flow of traffic on Brisbane Street. Occasional bird noise in trees. Occasional dogs barking at neighbouring property. Occasional construction noise, likely a circular saw at nearby property (around 40 to 45 dBA). Some aircraft movements overhead. Movements were noted as audible but distant with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 42 to 45 dBA.
Background noise	Distant traffic on highway.

Site Details	M11 - 96 Brisbane Street (Oxley Park)
Start Date	Tue 09 August 2022
End Date	Tue 06 September 2022

Summary	**Average (dBA)**
$L_{eq,\ Day}$ dBA	72
$L_{eq,\ Evening}$ dBA	47
$L_{eq,\ Night}$ dBA	44
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	38
RBL, $_{Night}$ dBA	32

Daily Summary

Date	09-08	10-08	11-08	12-08	13-08	14-08	15-08	16-08
$L_{eq,\ Day}$ dBA	51	72	48	47	85	79	50	58
$L_{eq,\ Evening}$ dBA	48	45	46	45	45	45	45	48
$L_{eq,\ Night}$ dBA	45	40	41	51	40	42	45	46
ABL, $_{Day}$ dBA	42	35	35	35	35	36	40	37
ABL, $_{Evening}$ dBA	40	35	34	32	38	36	35	42
ABL, $_{Night}$ dBA	33	31	29	30	30	32	30	38

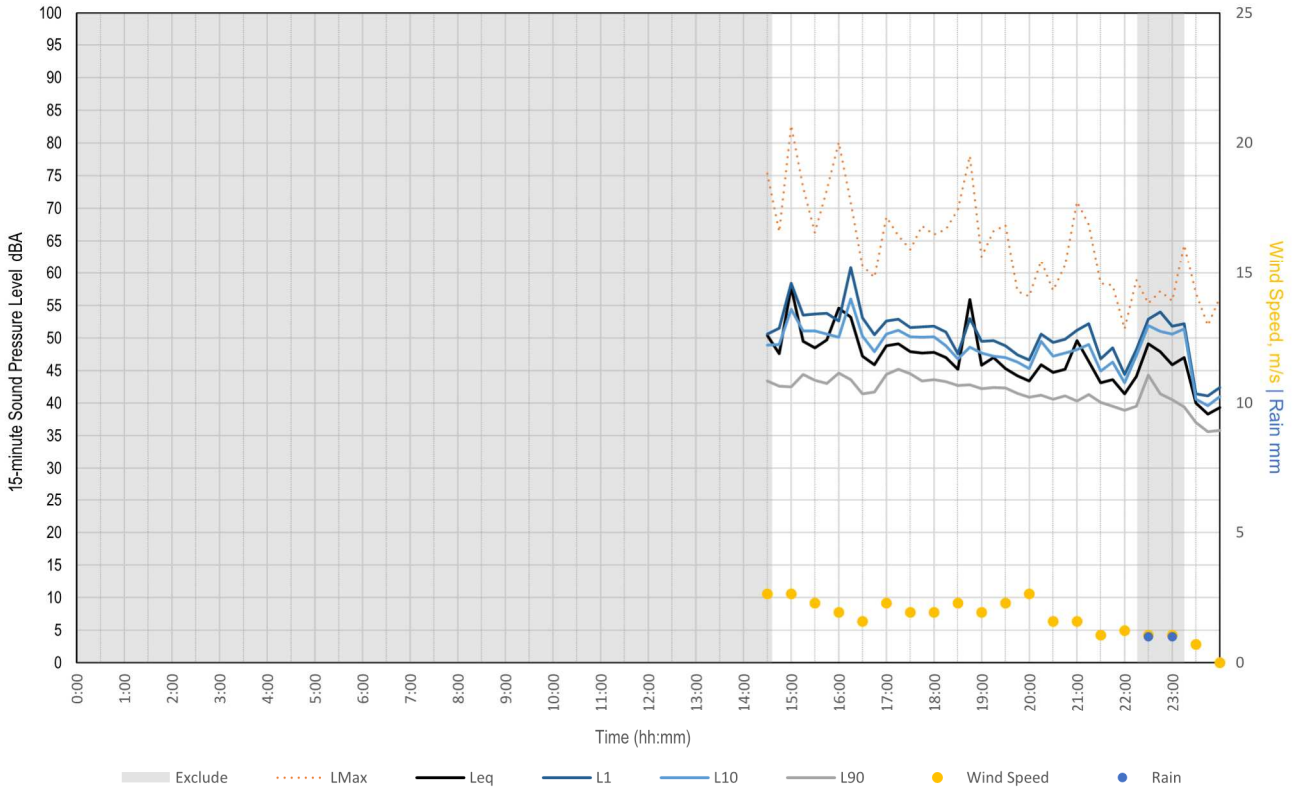
Date	17-08	18-08	19-08	20-08	21-08	22-08	23-08	24-08
$L_{eq,\ Day}$ dBA	49	49	49	56	64	49	52	51
$L_{eq,\ Evening}$ dBA	45	45	47	45	44	45	54	47
$L_{eq,\ Night}$ dBA	43	42	43	40	43	42	46	46
ABL, $_{Day}$ dBA	35	33	35	34	34	36	36	39
ABL, $_{Evening}$ dBA	37	38	40	40	33	36	47	41
ABL, $_{Night}$ dBA	34	31	34	31	31	30	37	36

Date	25-08	26-08	27-08	28-08	29-08	30-08	31-08	01-09
$L_{eq,\ Day}$ dBA	48	48	71	69	48	49	48	66
$L_{eq,\ Evening}$ dBA	46	44	45	46	45	47	43	44
$L_{eq,\ Night}$ dBA		44	43	41	42	46	39	42
ABL, $_{Day}$ dBA	36	38	35	33	32	38	35	35
ABL, $_{Evening}$ dBA	40	38	38	33	34	40	31	32
ABL, $_{Night}$ dBA	37	35	30	30	29	35	26	31

Date	02-09	03-09	04-09	05-09	06-09
$L_{eq,\ Day}$ dBA	49	56	72	49	54
$L_{eq,\ Evening}$ dBA	45	48	53	45	
$L_{eq,\ Night}$ dBA	43	44	45	46	
ABL, $_{Day}$ dBA	39	44	41	36	38
ABL, $_{Evening}$ dBA	39	44	41	39	
ABL, $_{Night}$ dBA	35	36	35	37	

Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

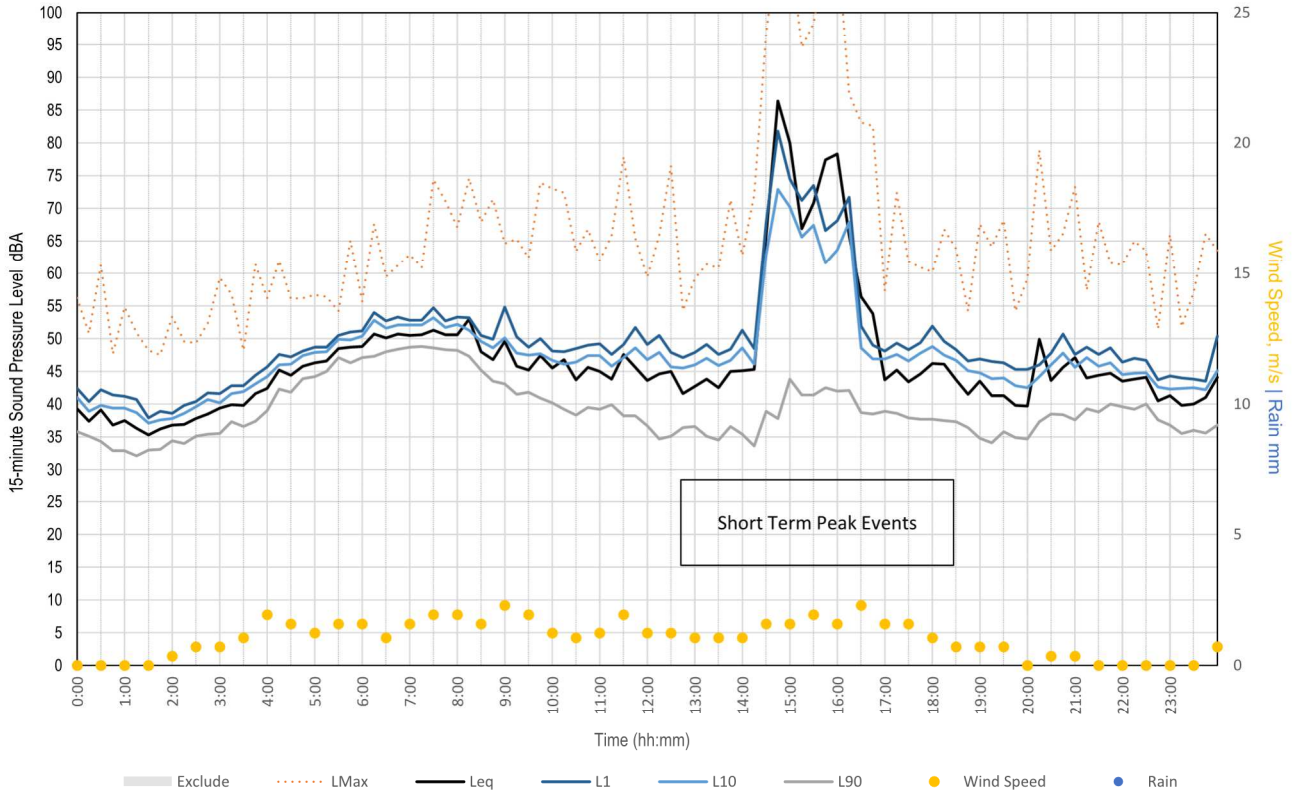
Tuesday, 09 August 2022



Noise Logger Results

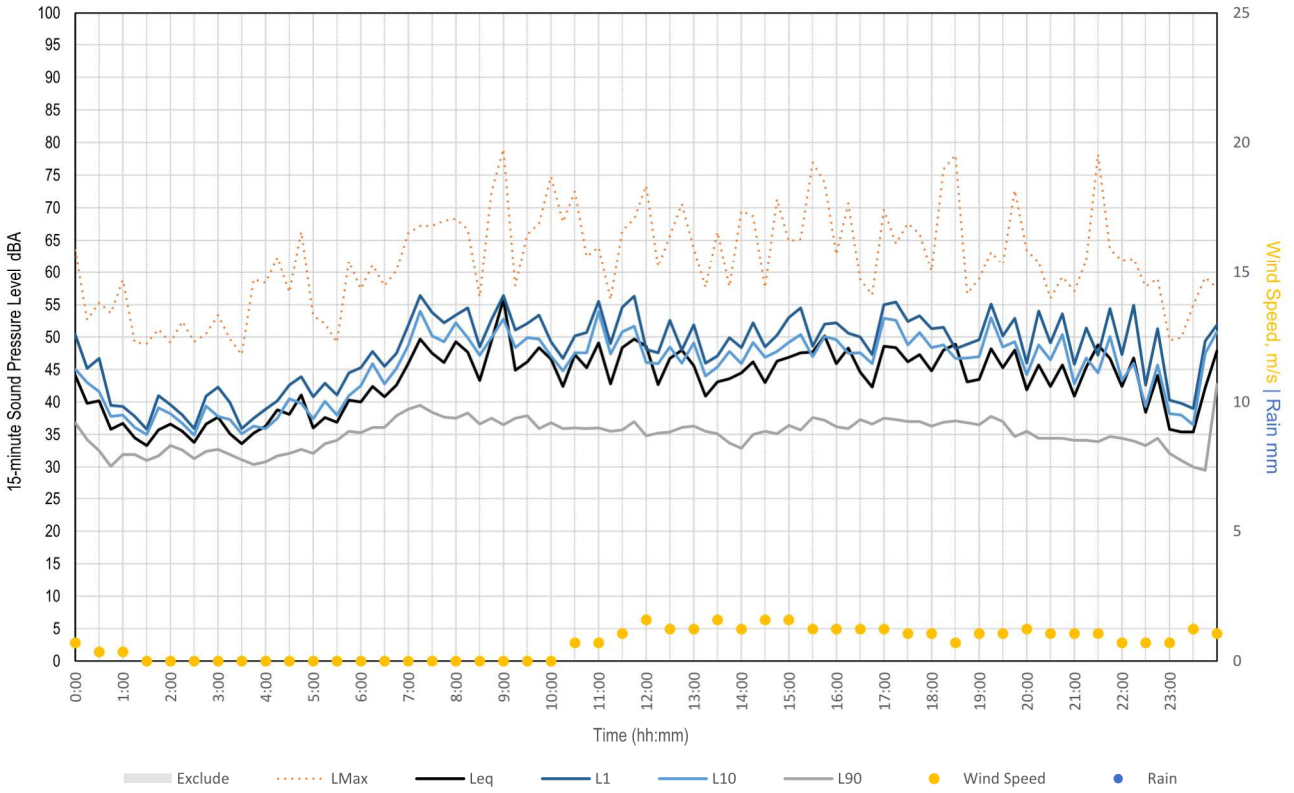
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Wednesday, 10 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

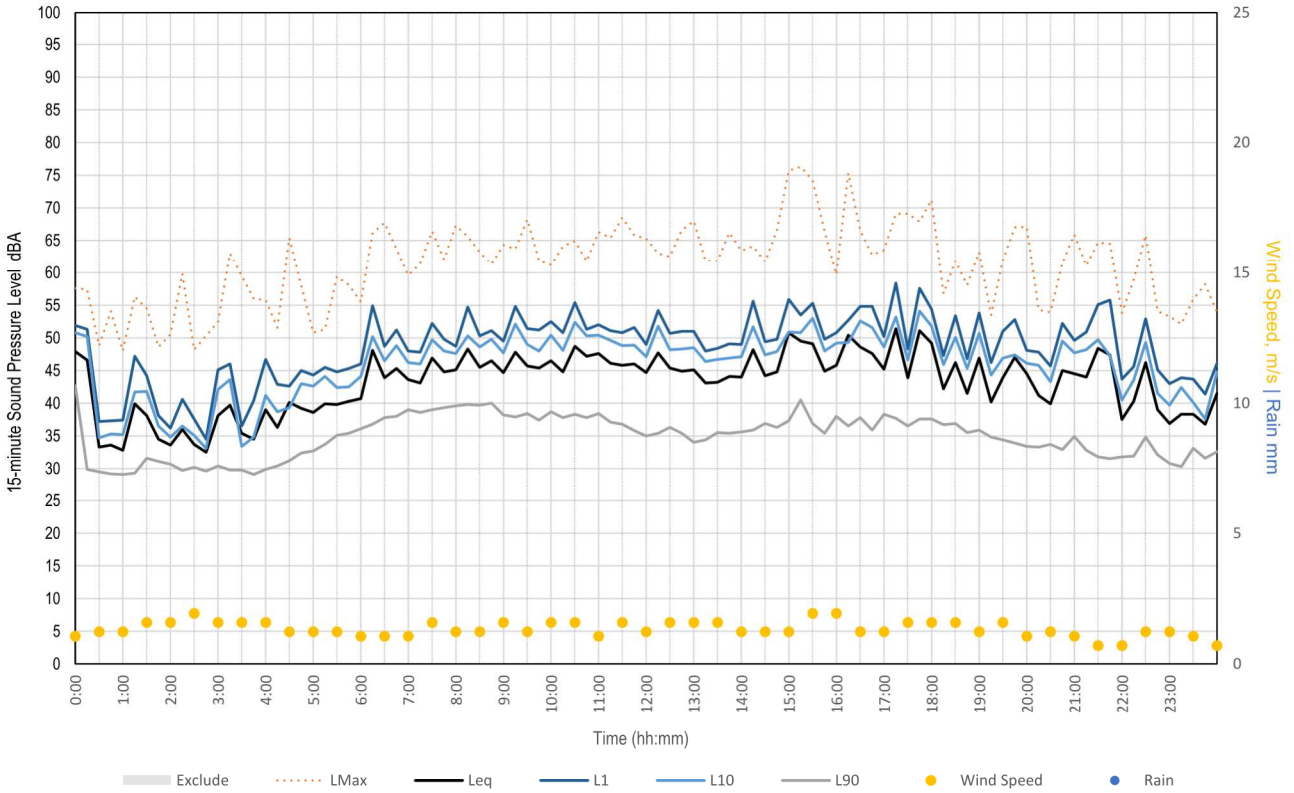
Thursday, 11 August 2022



Noise Logger Results

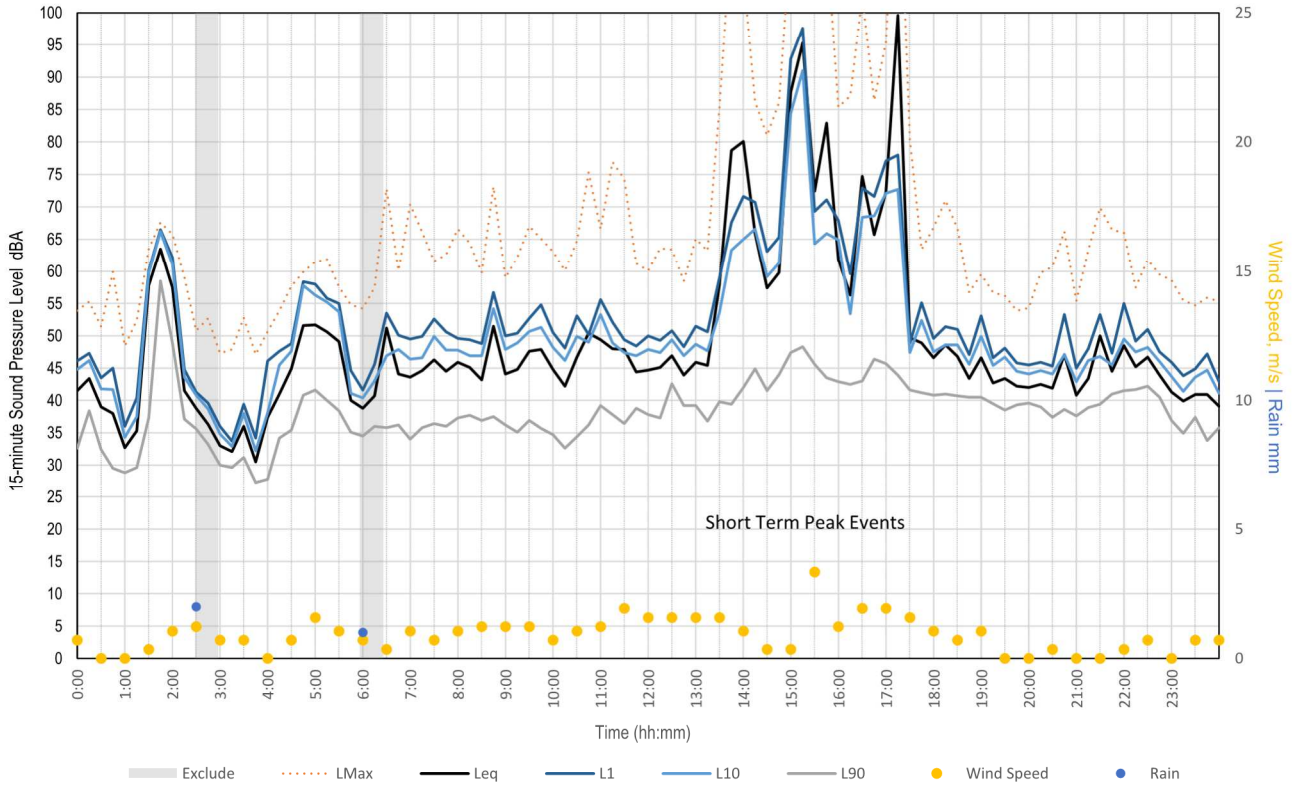
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Friday, 12 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

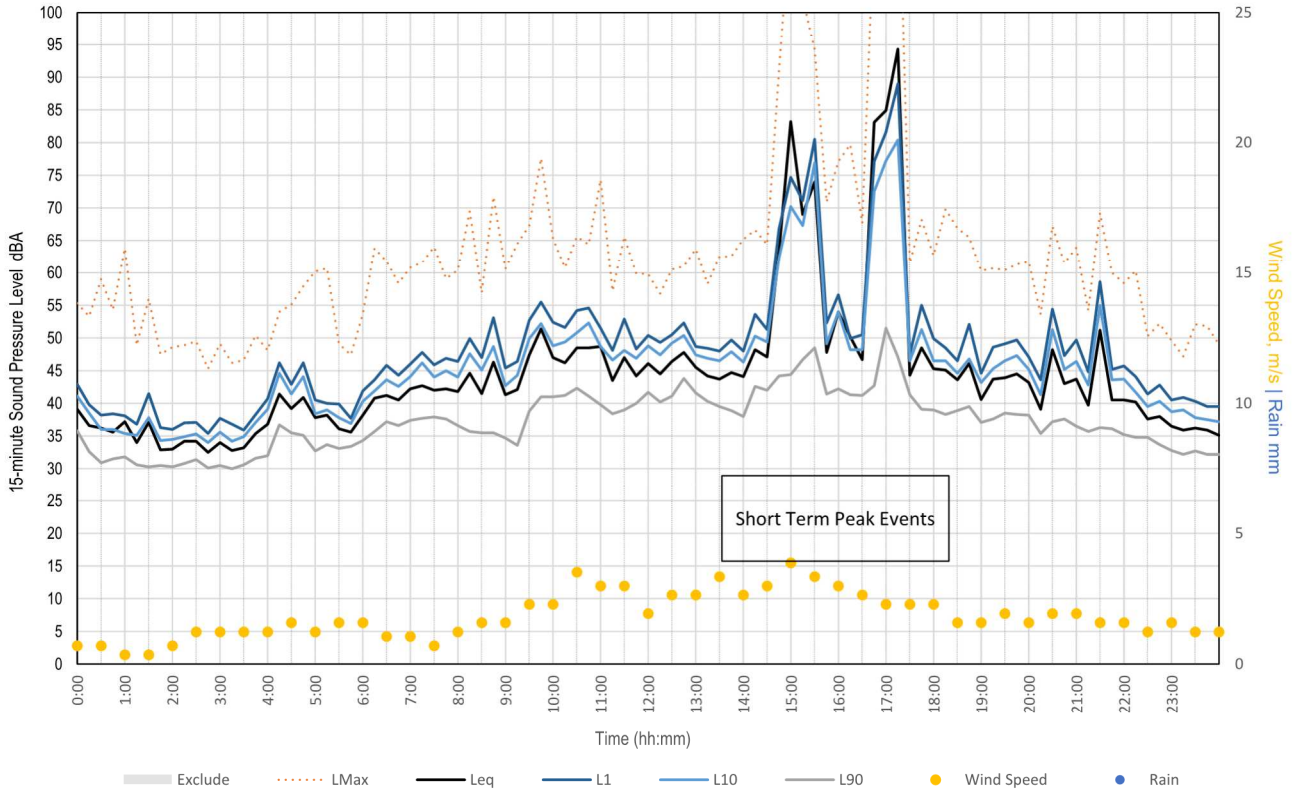
Saturday, 13 August 2022



Noise Logger Results

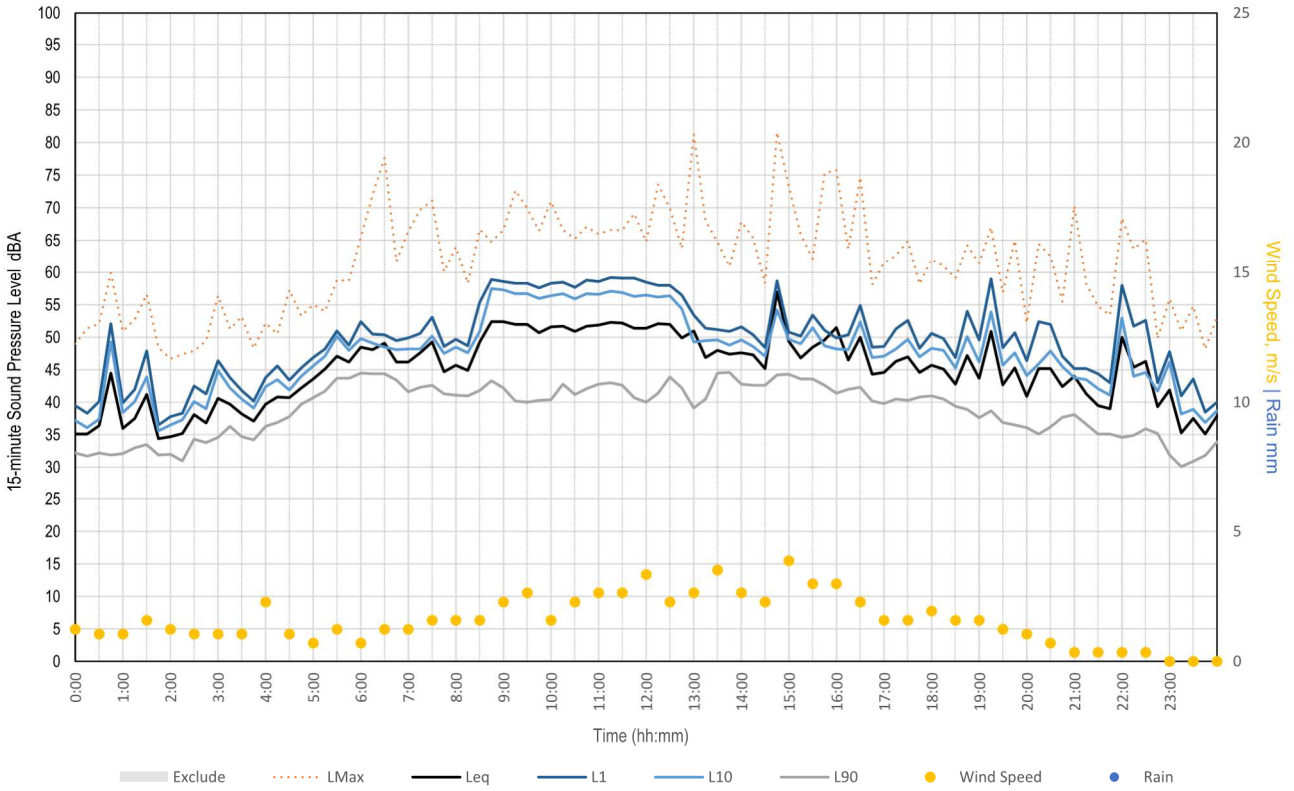
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Sunday, 14 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

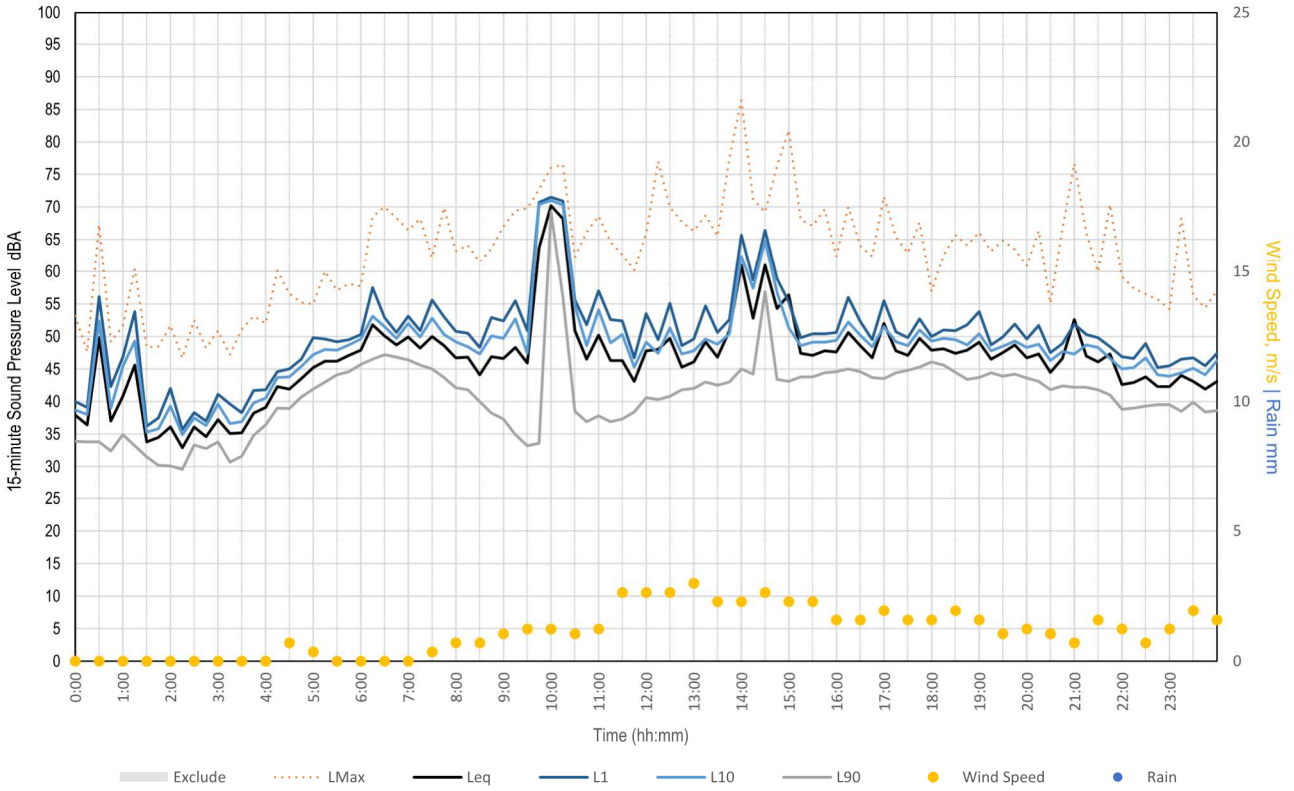
Monday, 15 August 2022



Noise Logger Results

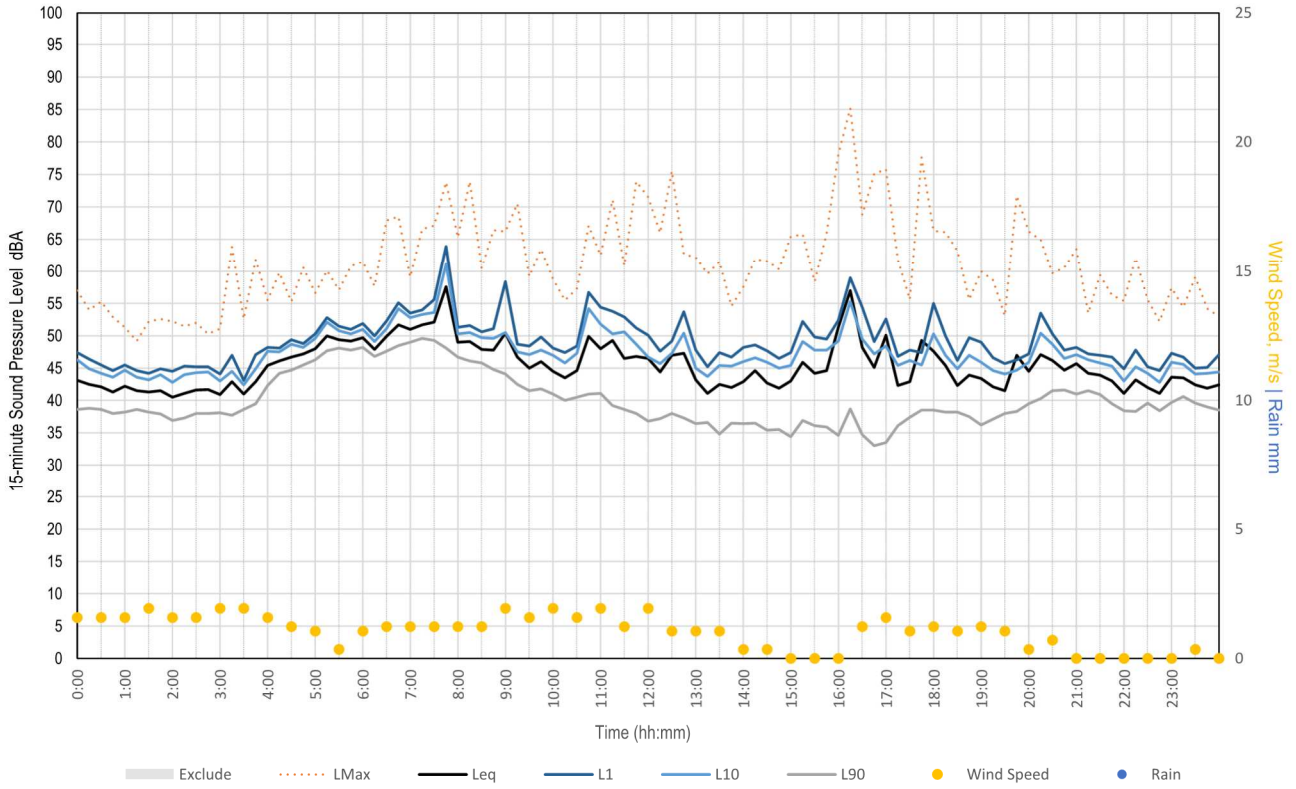
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Tuesday, 16 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

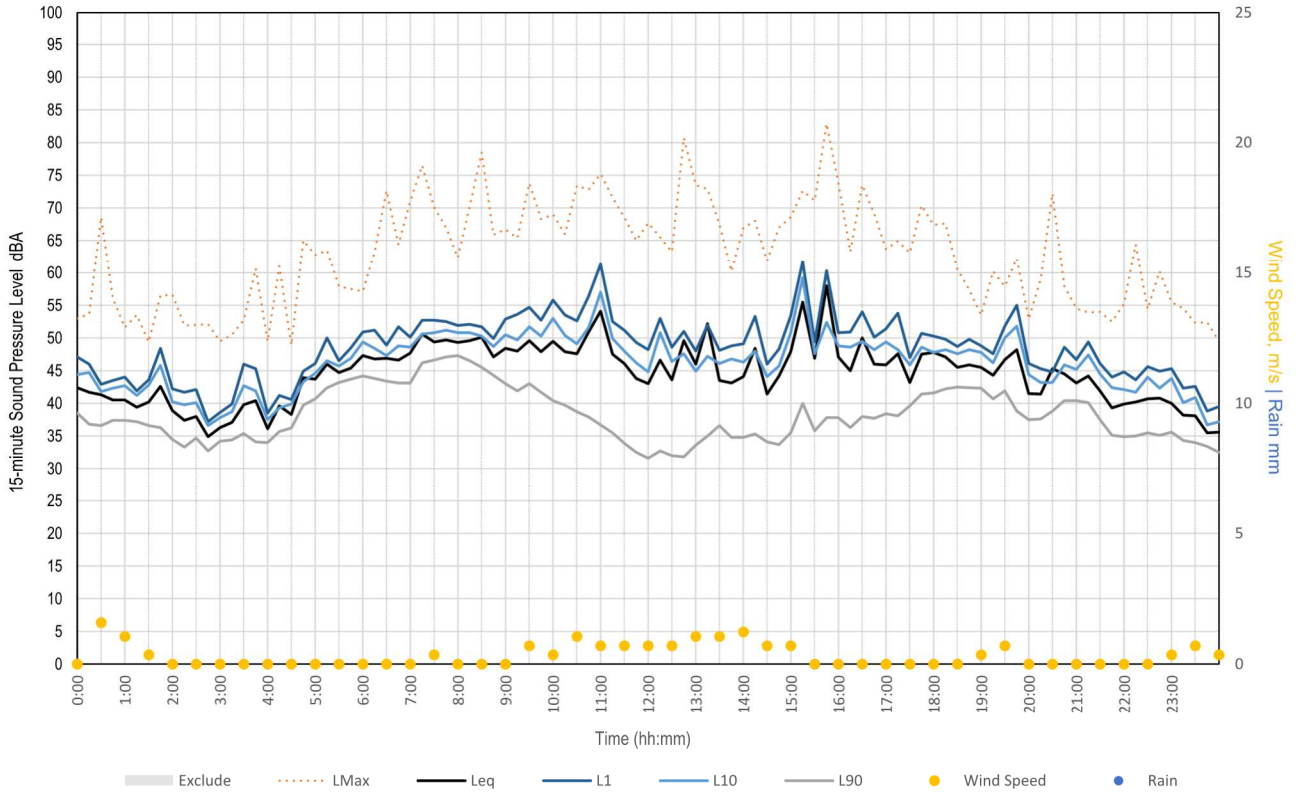
Wednesday, 17 August 2022



Noise Logger Results

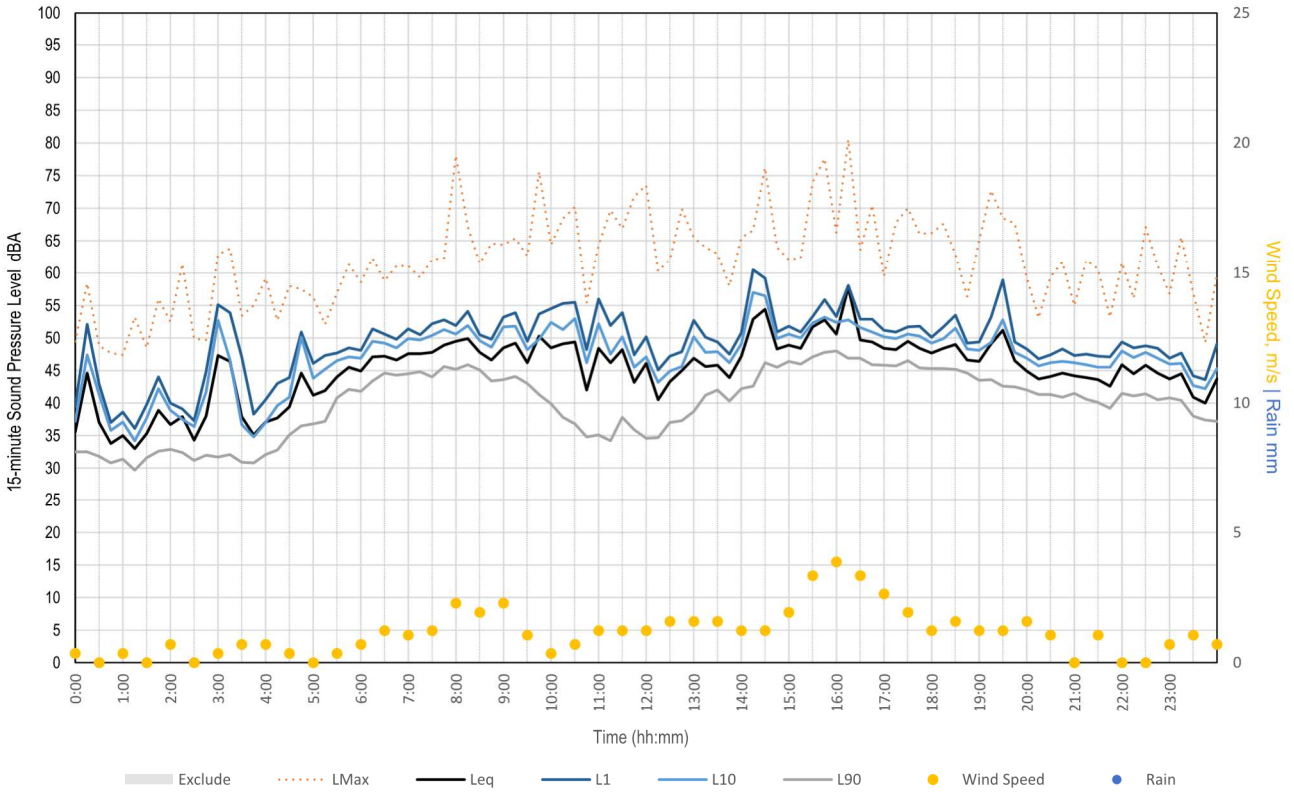
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Thursday, 18 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

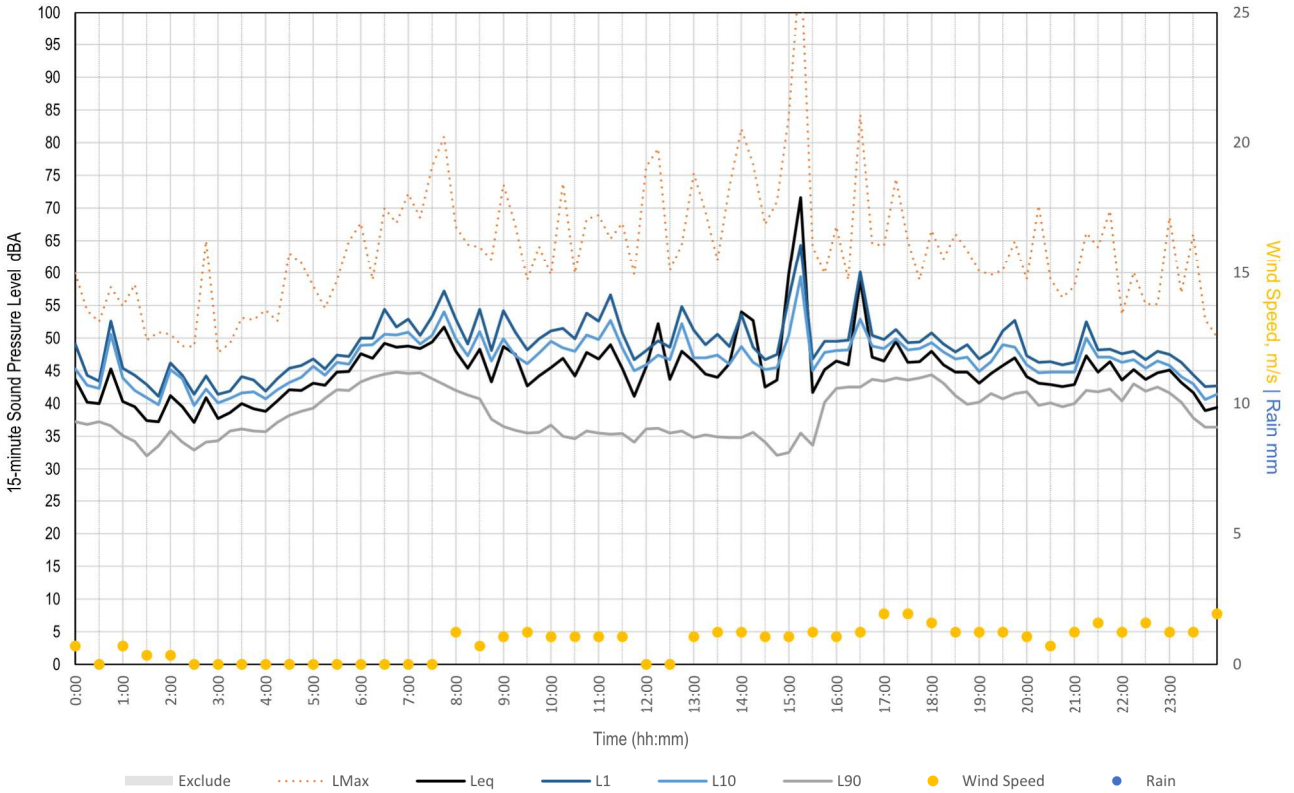
Friday, 19 August 2022



Noise Logger Results

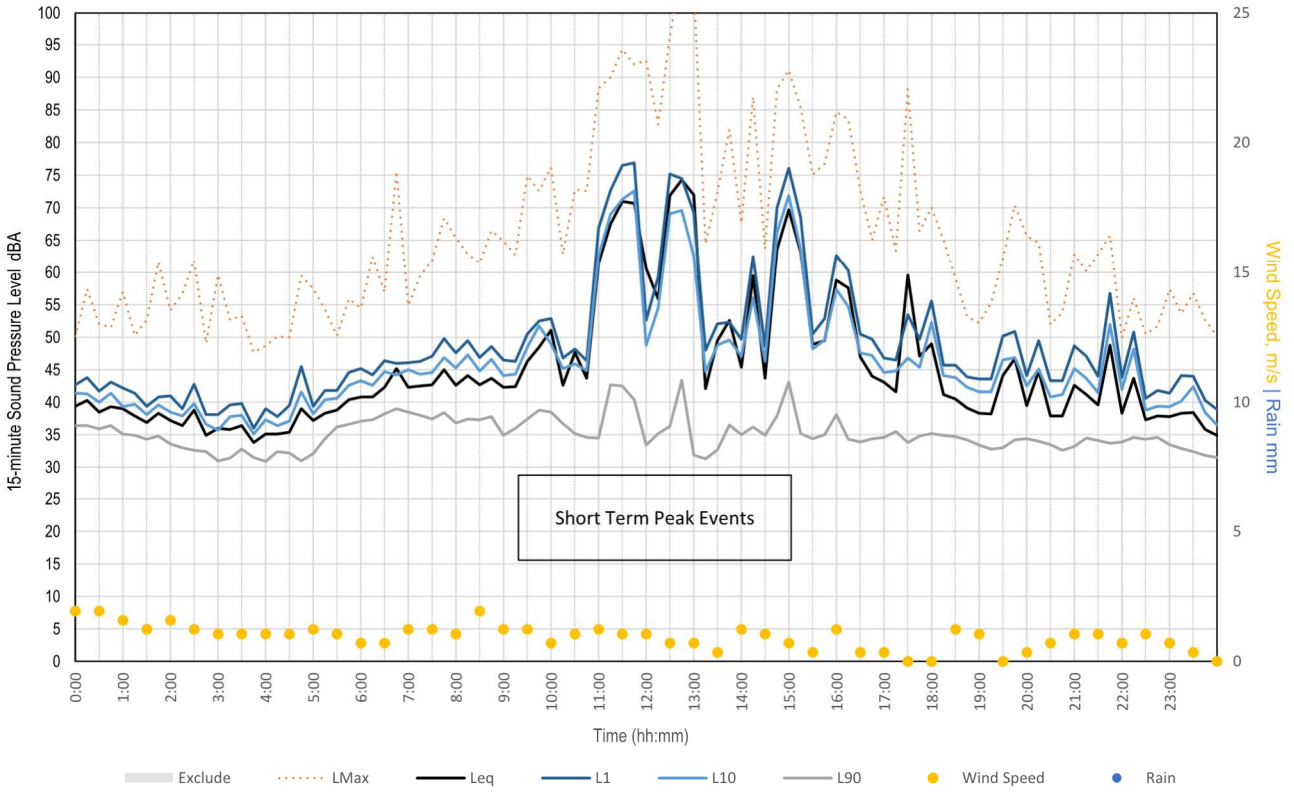
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Saturday, 20 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

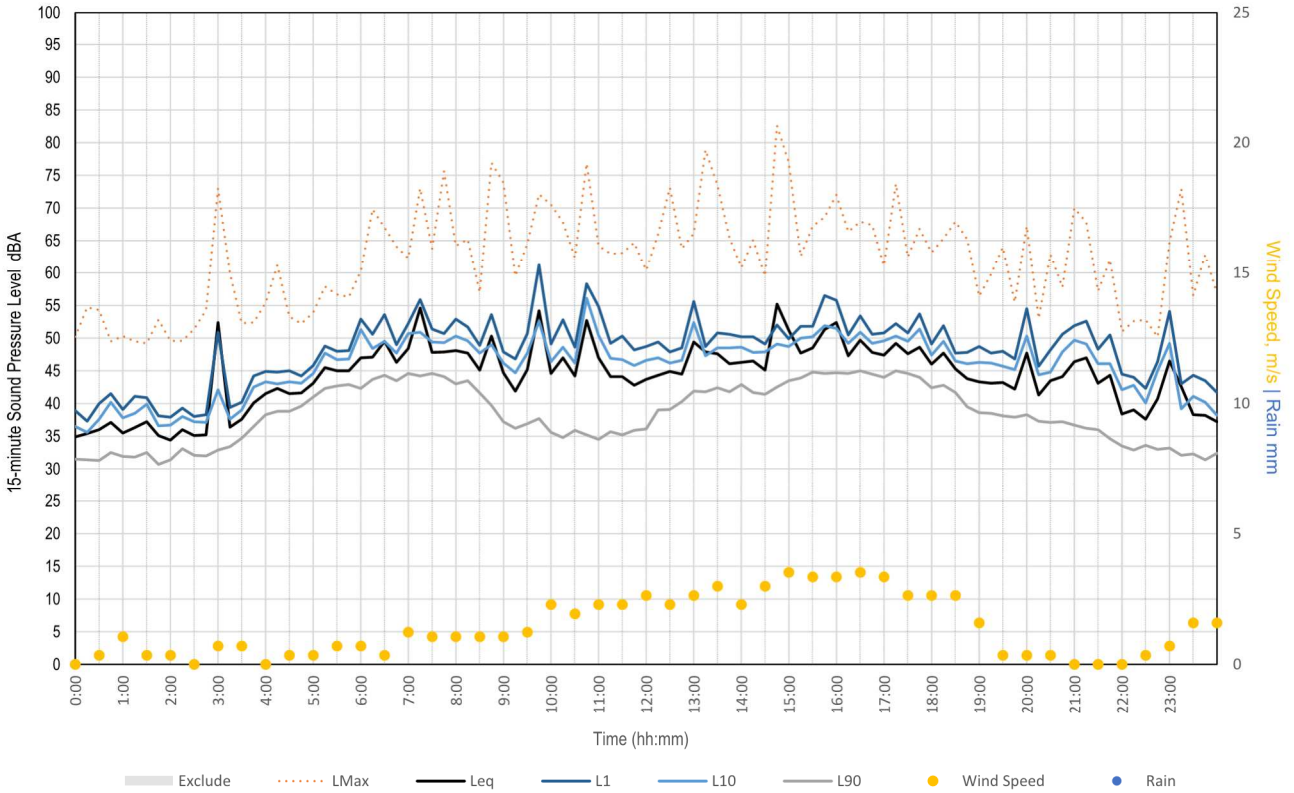
Sunday, 21 August 2022



Noise Logger Results

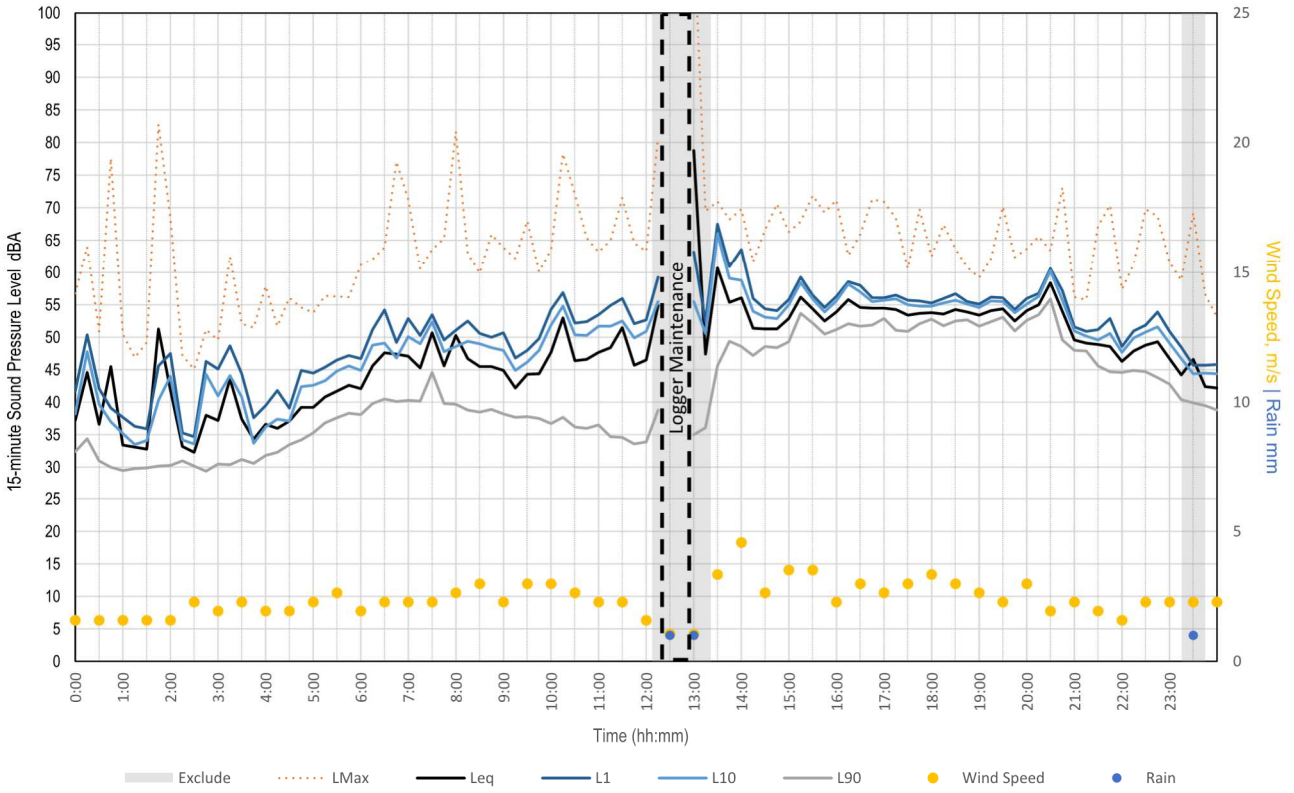
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Monday, 22 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

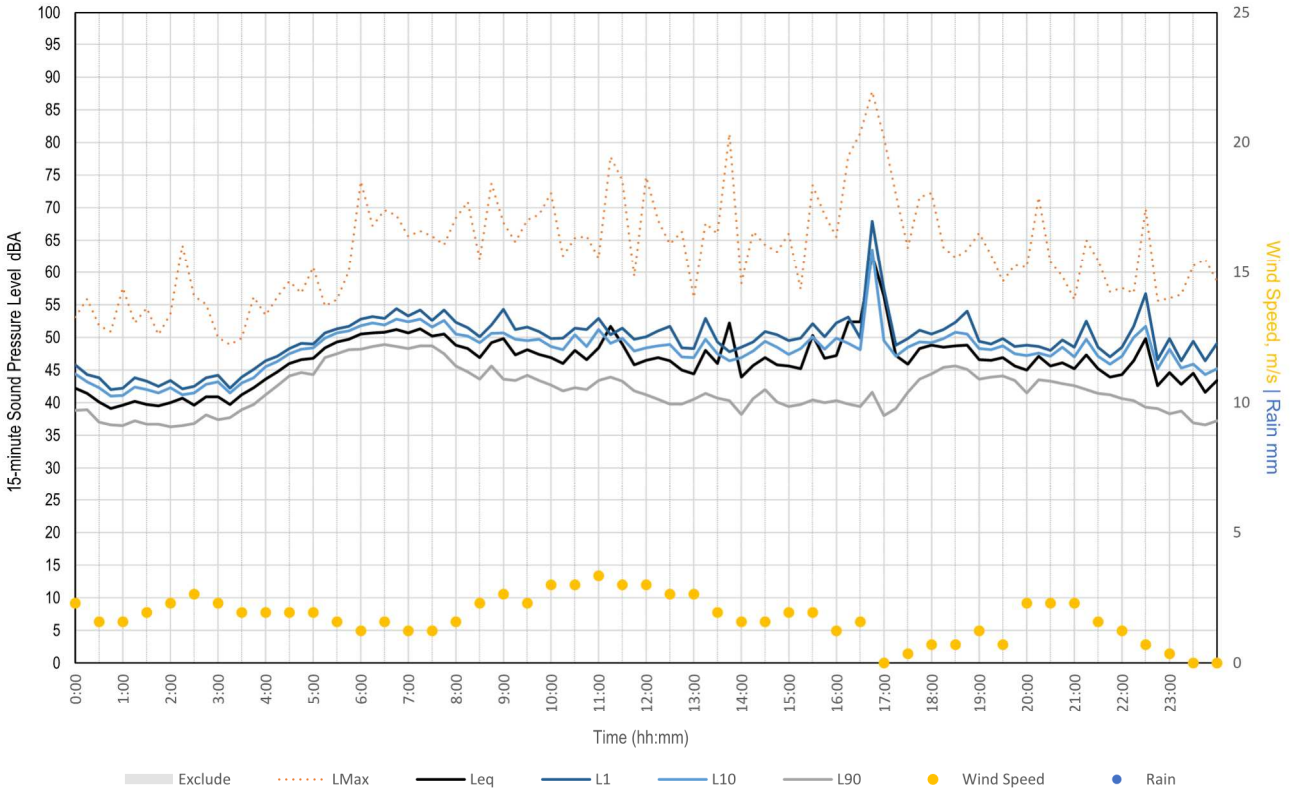
Tuesday, 23 August 2022



Noise Logger Results

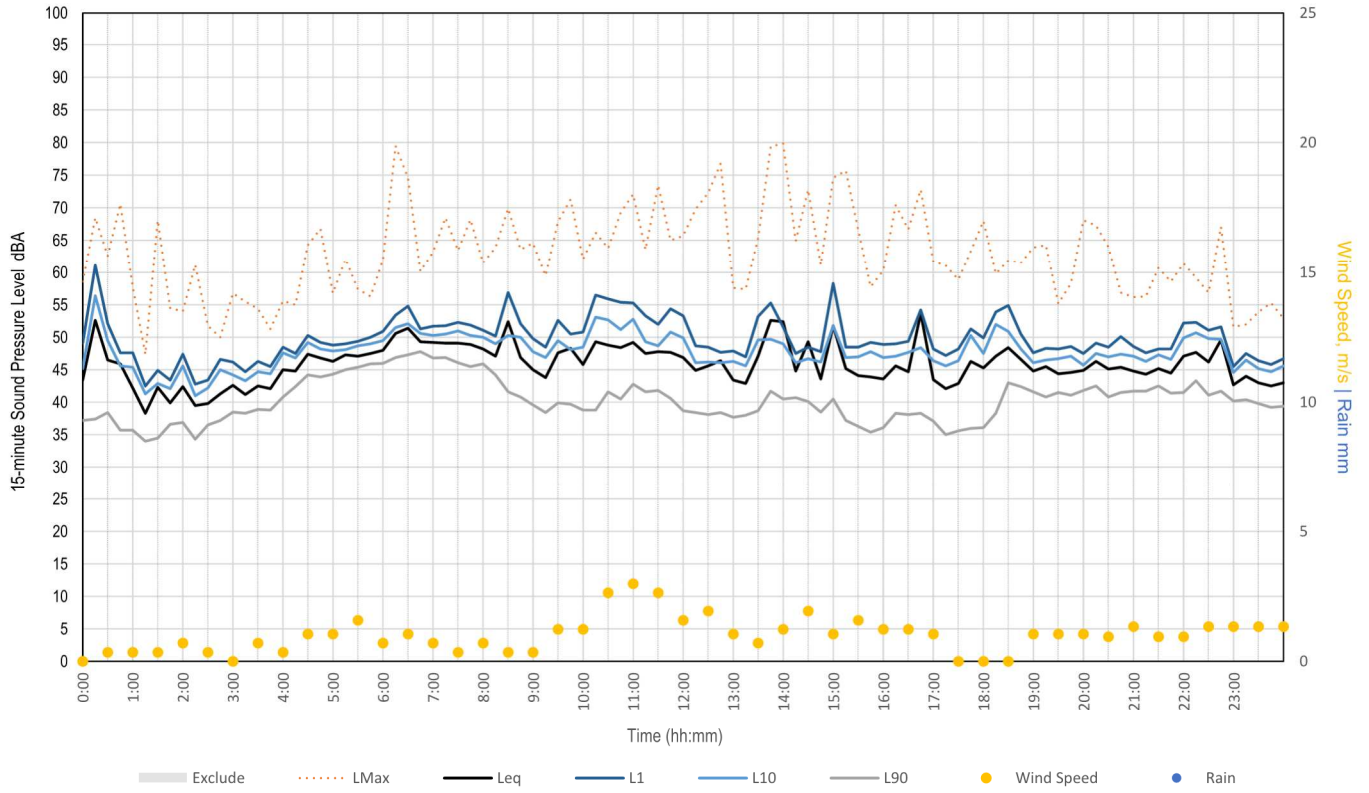
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Wednesday, 24 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

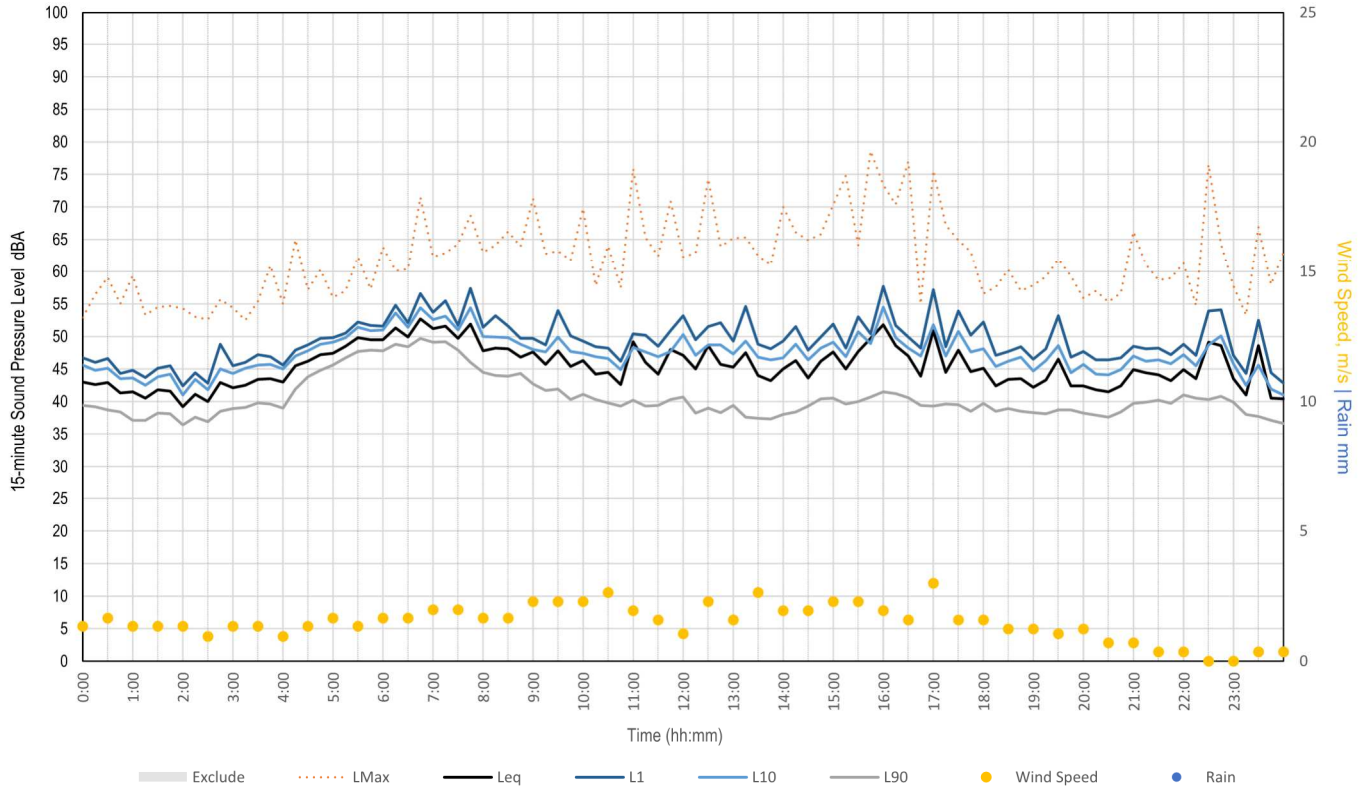
Thursday, 25 August 2022



Noise Logger Results

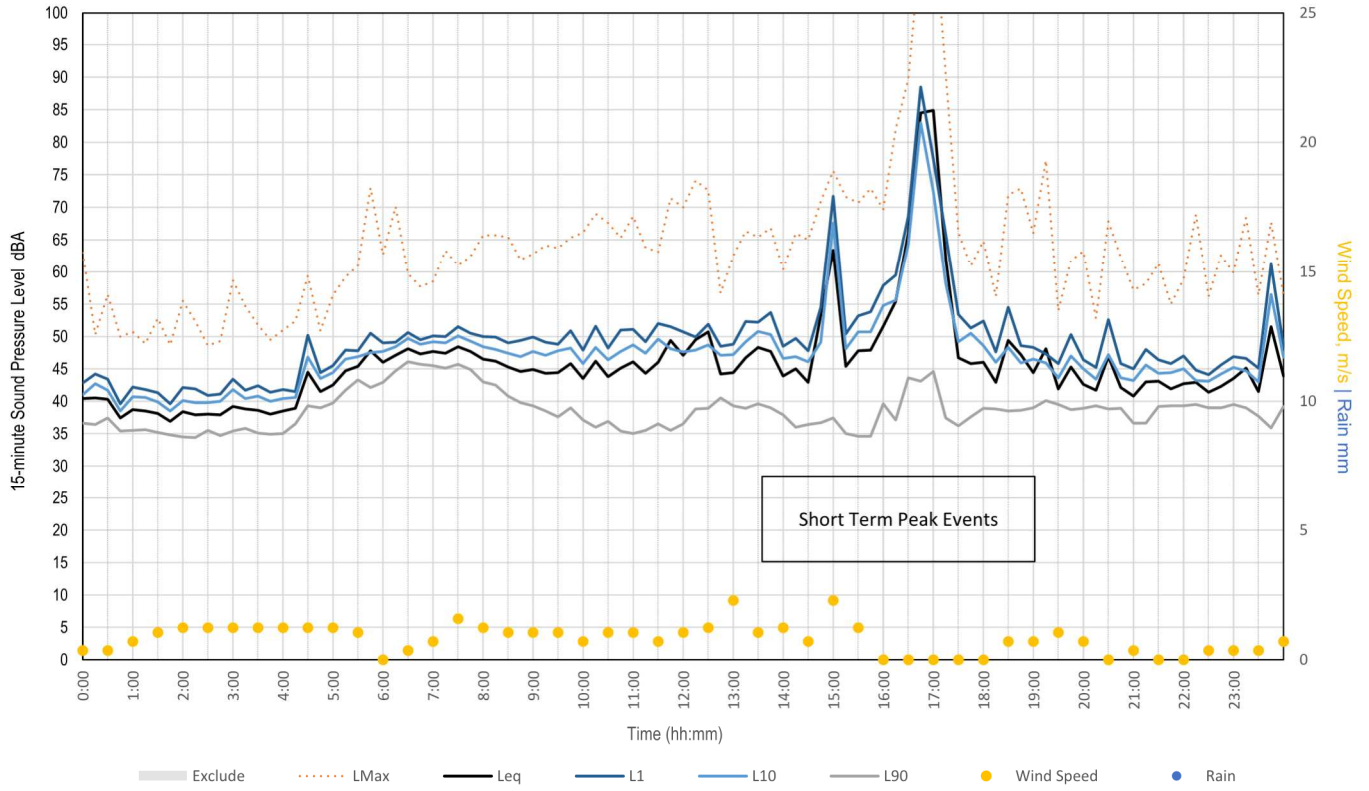
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Friday, 26 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

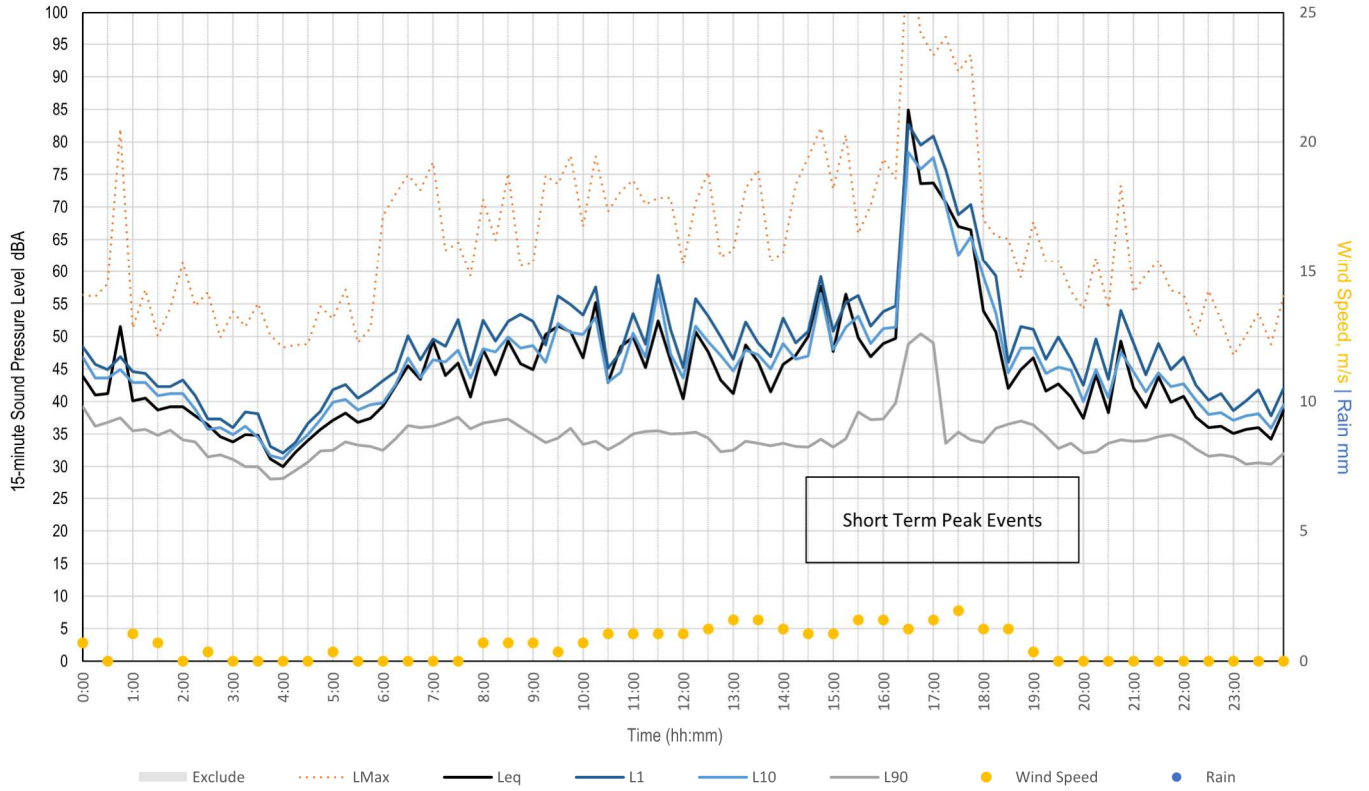
Saturday, 27 August 2022



Noise Logger Results

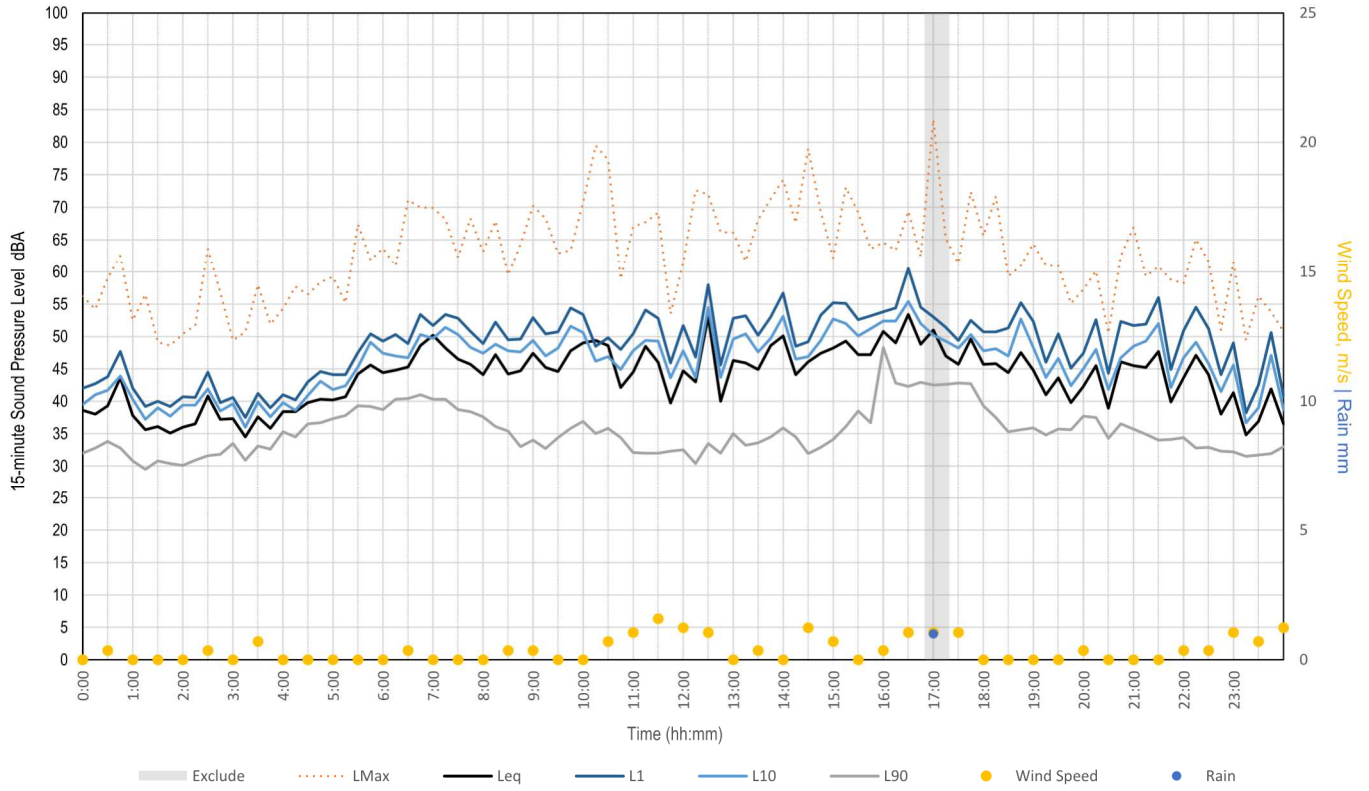
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Sunday, 28 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

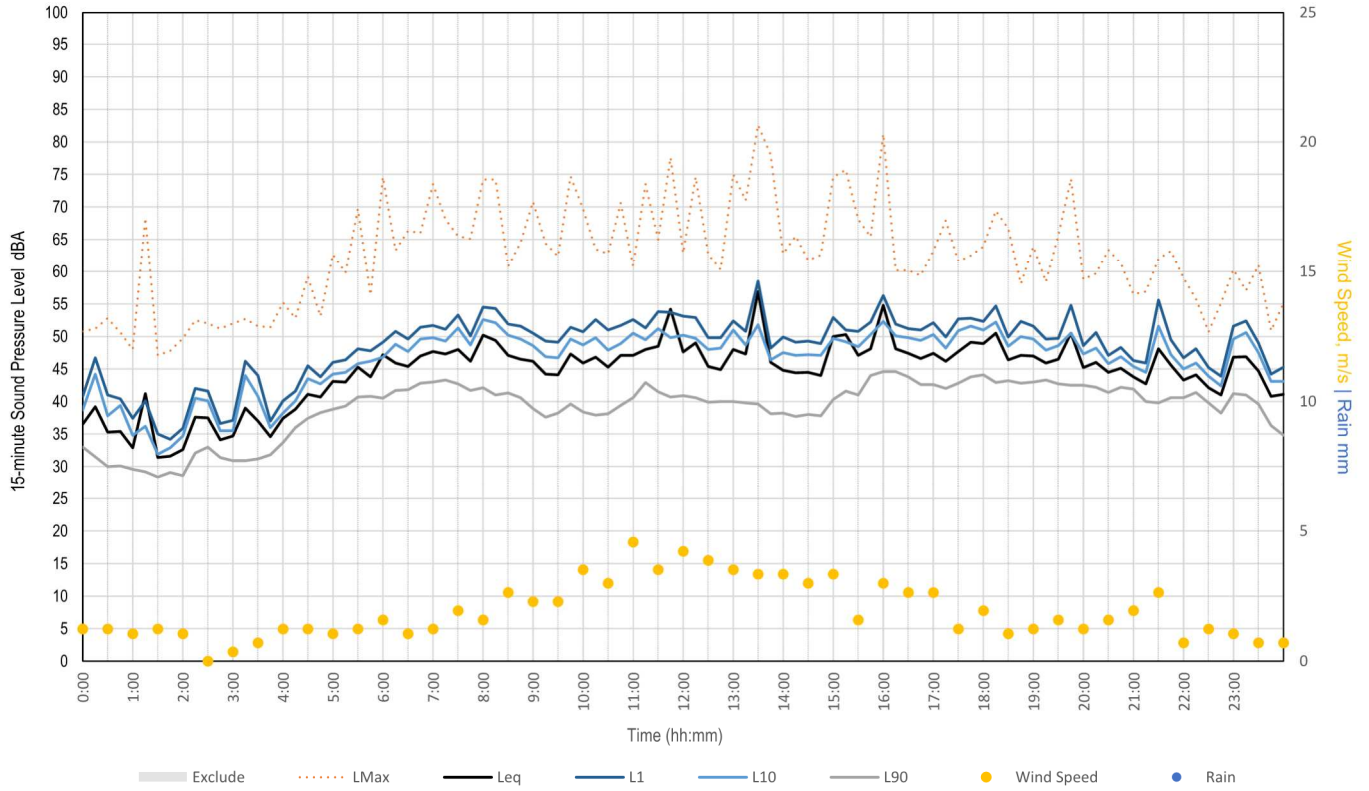
Monday, 29 August 2022



Noise Logger Results

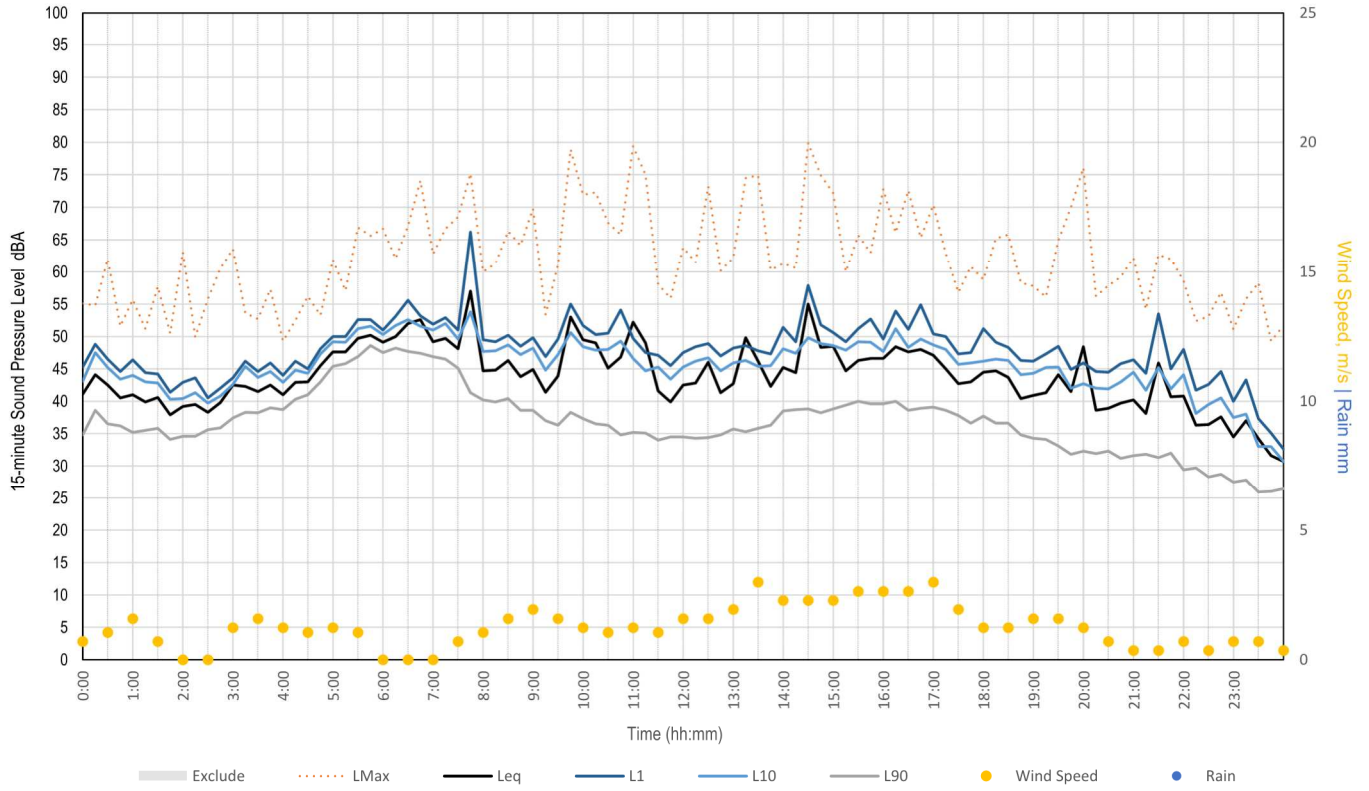
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Tuesday, 30 August 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

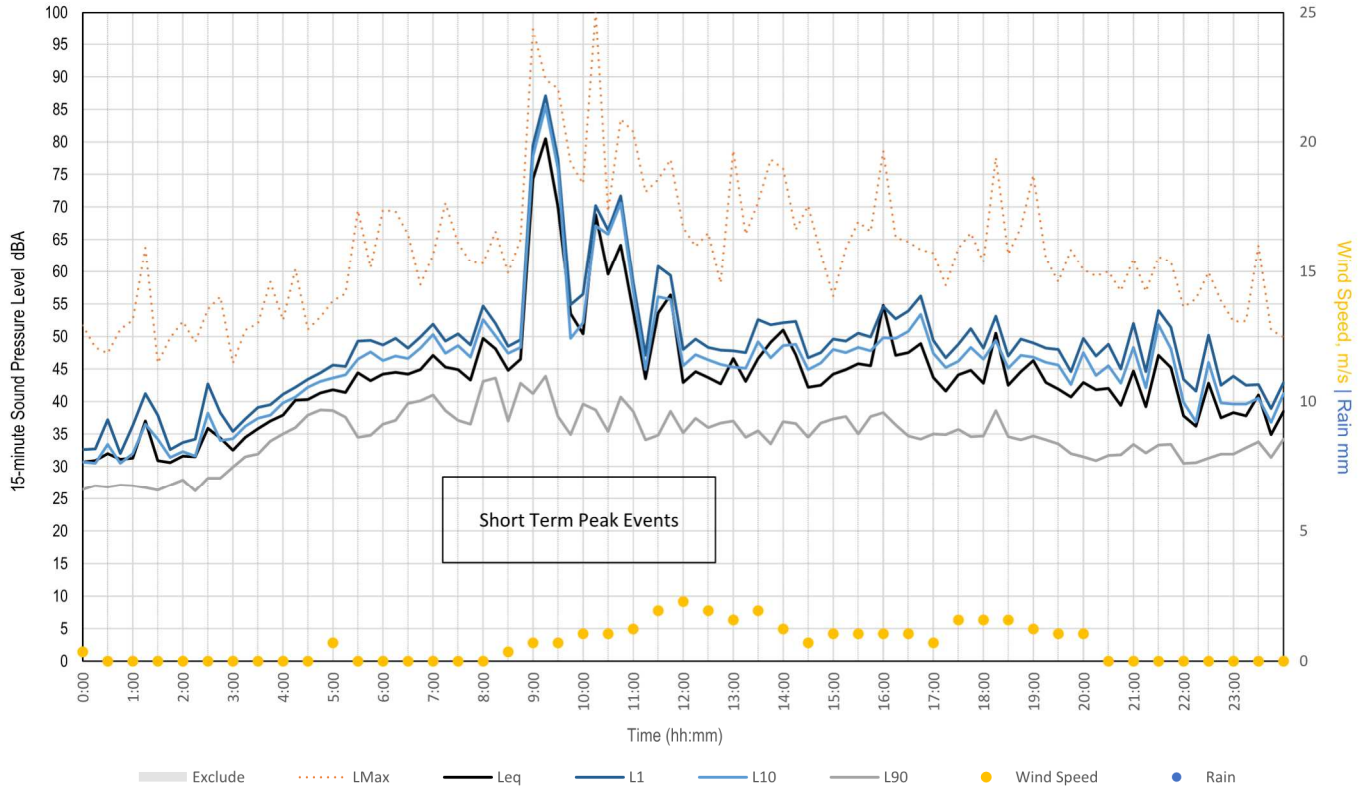
Wednesday, 31 August 2022



Noise Logger Results

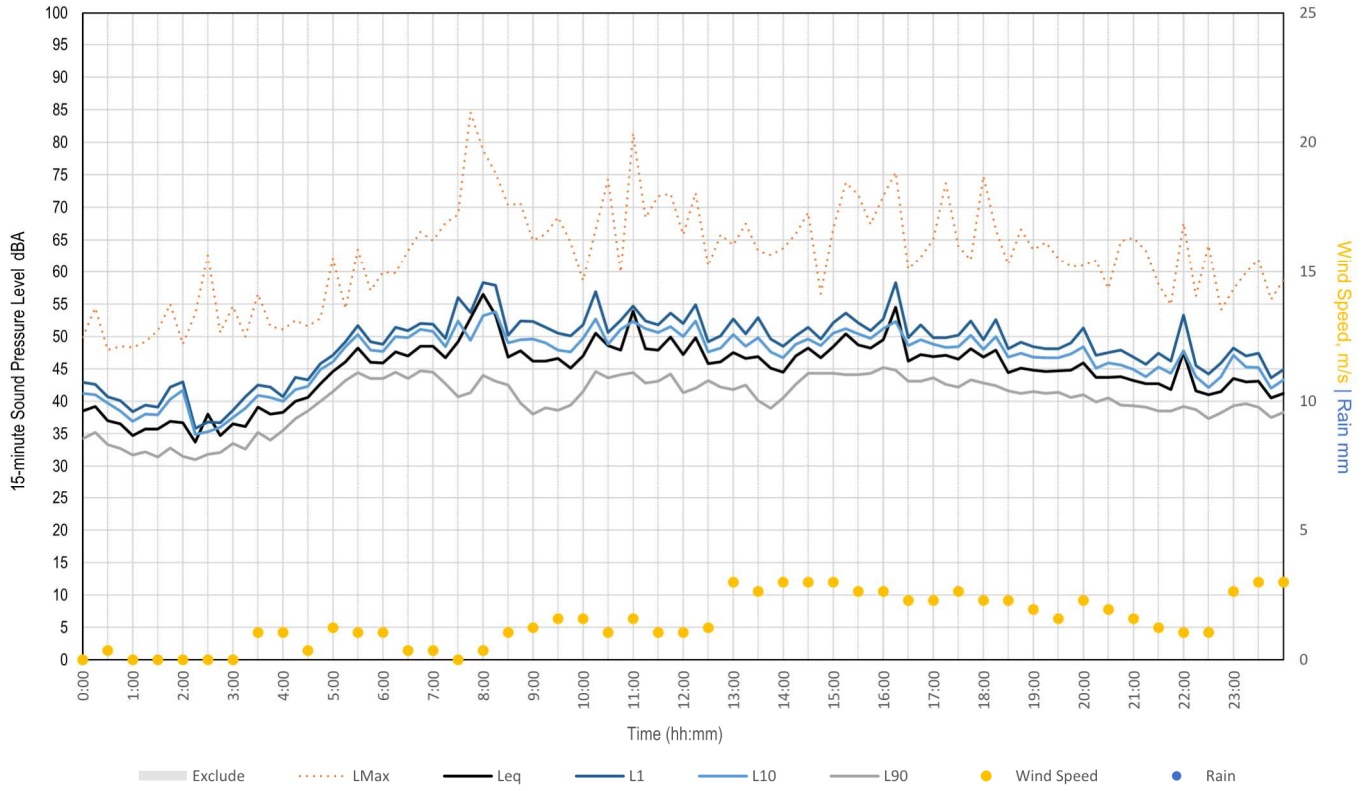
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Thursday, 01 September 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

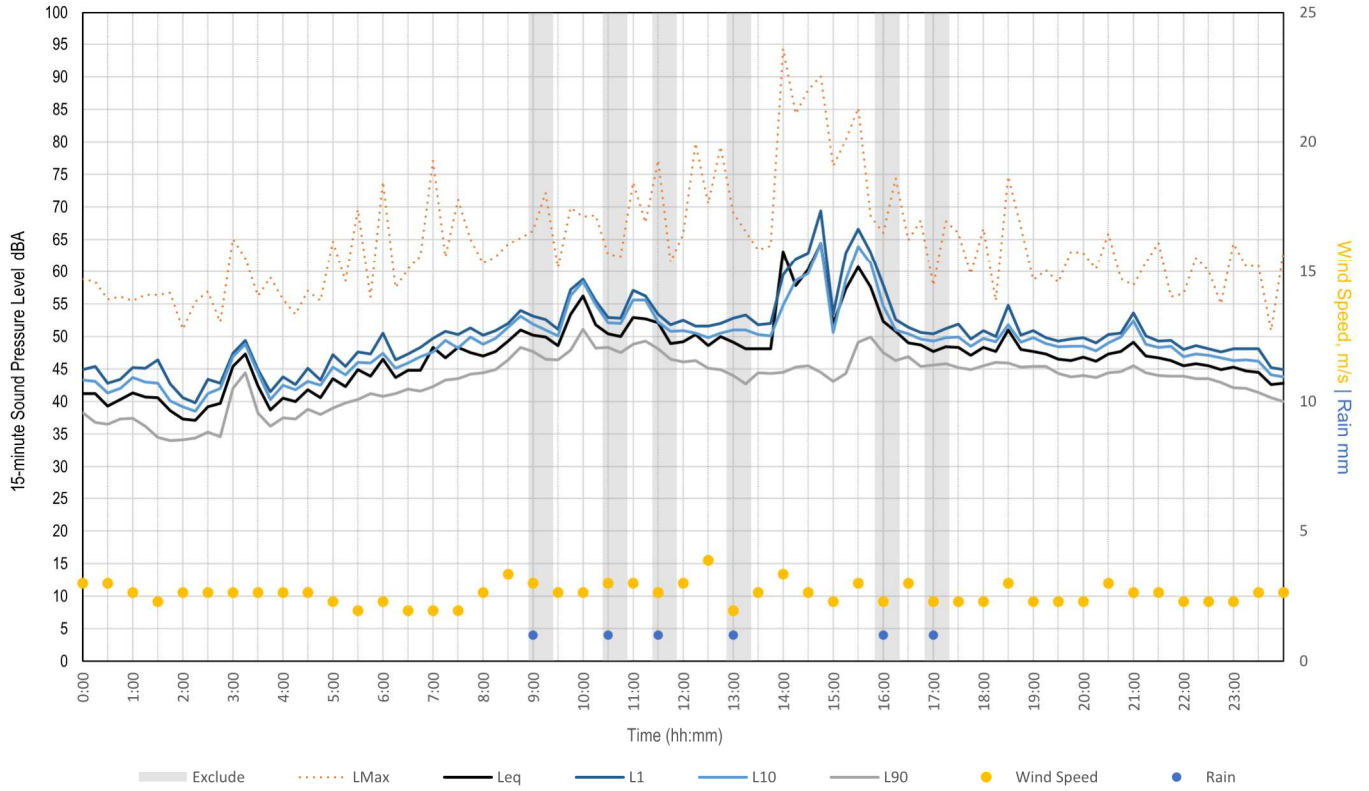
Friday, 02 September 2022



Noise Logger Results

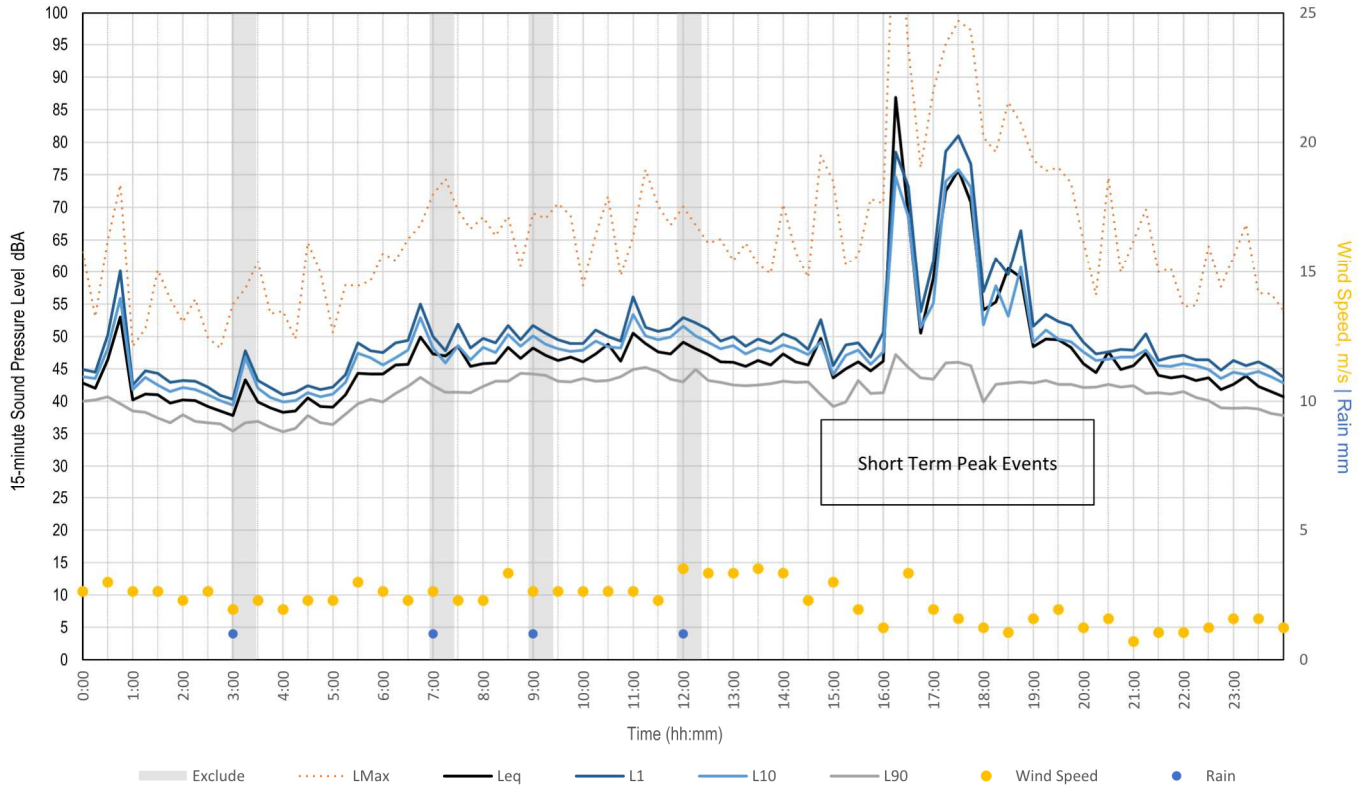
Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Saturday, 03 September 2022



Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

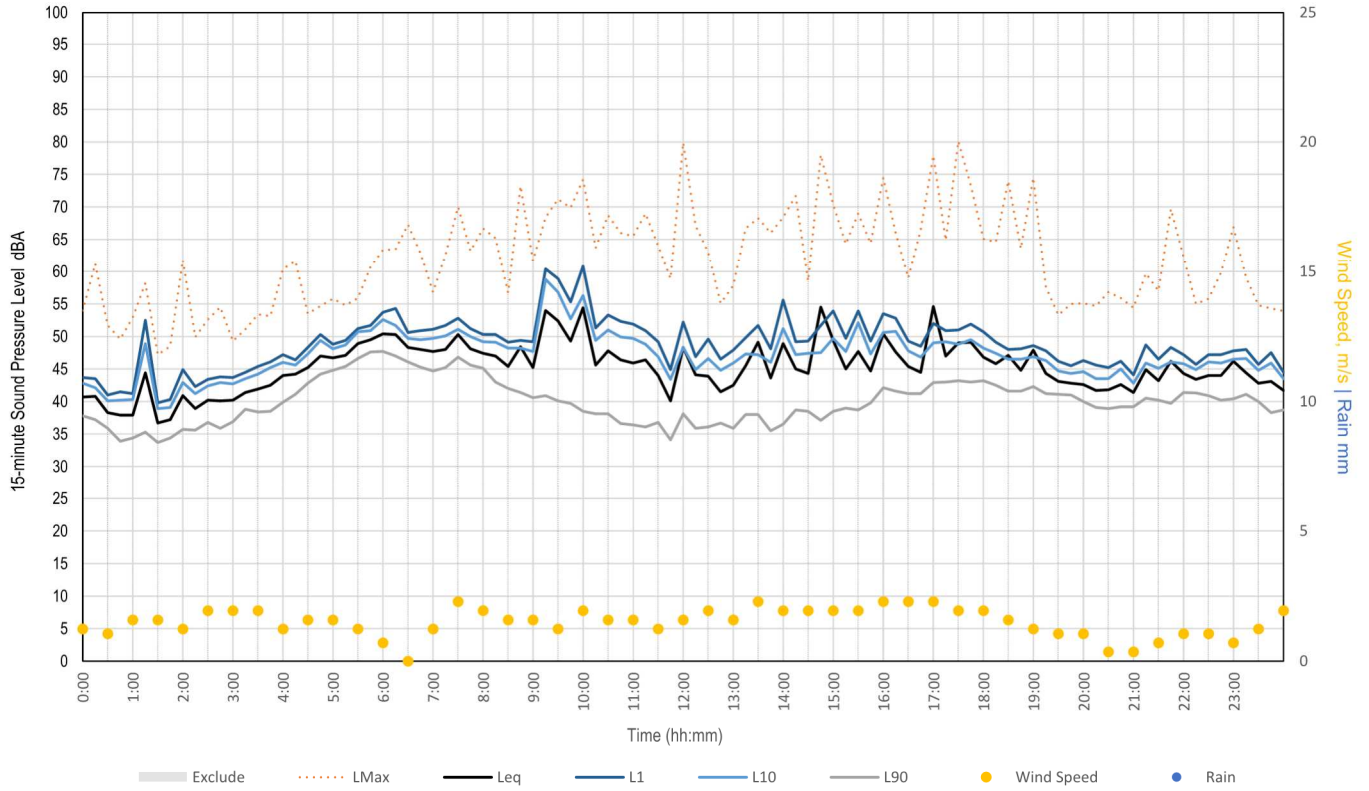
Sunday, 04 September 2022

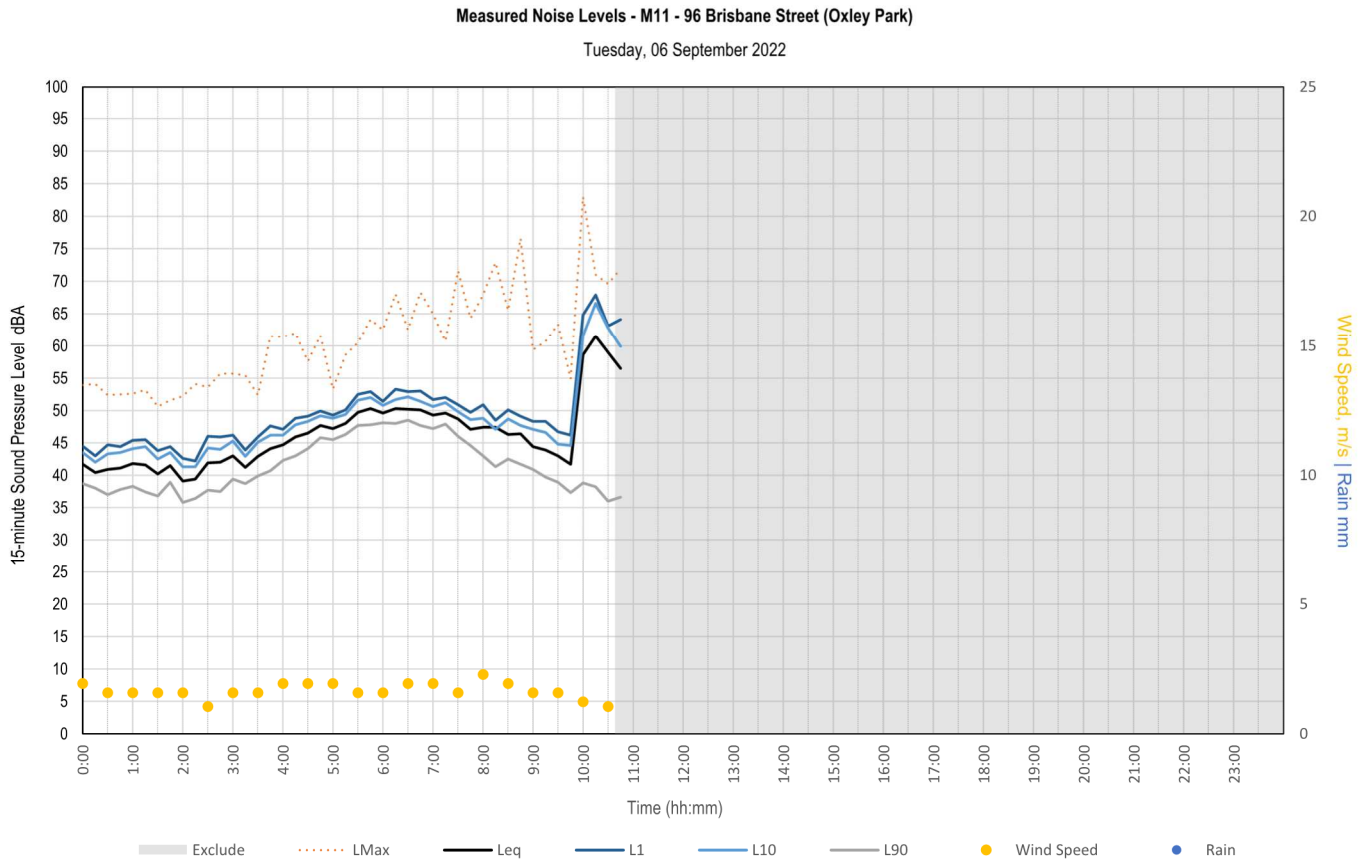


Noise Logger Results

Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)

Monday, 05 September 2022




Measured Noise Levels - M11 - 96 Brisbane Street (Oxley Park)
Tuesday, 06 September 2022
15-minute Sound Pressure Level dBA
Wind Speed, m/s | Rain mm
Time (hh:mm)
Exclude
LMax
Leq
L1
L10
L90
Wind Speed
Rain

Background Noise Monitoring

Location	M12 - 21 Player Street (St Marys)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & MUA

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878237
Calibration	**Pre:**	94.0 dBA	**Post:**	94.3 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Monday, 08 Aug 2022
Date End	Tuesday, 06 Sep 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Penrith Lakes AWS
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located >3 metres away from any reflecting structure other than ground (e.g. metal fence and house facade).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	23/08/2022	9:46:12 AM	10:01:12 AM	85	51	50	43	
2	Day	23/08/2022	10:01:12 AM	10:16:12 AM	77	52	52	42	
3	Day	23/08/2022	10:16:12 AM	10:31:12 AM	76	46	46	41	
4	Day	23/08/2022	10:31:12 AM	10:46:12 AM	69	47	48	41	
5	Evening	12/08/2022	6:15:00 PM	6:30:00 PM	59	44	46	41	*
6	Evening	12/08/2022	7:45:00 PM	8:00:00 PM	65	47	48	39	*
7	Evening	12/08/2022	8:15:00 PM	8:30:00 PM	54	40	42	37	*
8	Evening	12/08/2022	9:00:00 PM	9:15:00 PM	59	39	41	34	*
9	Night	20/08/2022	2:45:00 AM	3:00:00 AM	56	39	41	35	*
10	Night	20/08/2022	4:15:00 AM	4:30:00 AM	59	43	45	39	*
11	Night	20/08/2022	6:15:00 AM	6:30:00 AM	66	49	49	45	*
12	Night	20/08/2022	11:15:00 PM	11:30:00 PM	62	41	43	38	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Constant bird noise from adjacent properties. Occasional dog barking at neighbouring properties. Several aircrafts flying directly overhead with approx. duration of 30 sec to 1 min with maximum levels in the range of 50 to 59 dBA, around the same sound level as bird noise.
Background noise	Traffic at a distance.
Evening	
Ambient noise	Occasional vehicle passbys on local streets, and distant traffic noises (e.g. reverse alarm, faint siren). Various impulsive animal noises (e.g. dogs, frog/toads, birds). Several aircraft flying overhead with approx. duration of 1 to 3 min and with maximum sound level of approximately 59 dBA.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling). Traffic at a distance.
Night	
Ambient noise	Occasional vehicle passbys on local streets, and distant traffic associated noises (e.g. faint siren). Various impulsive animal noises (e.g. dogs, frog/toads, birds).
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling).

Site Details	M12 - 21 Player Street (St Marys)
Start Date	Mon 08 August 2022
End Date	Tue 06 September 2022

Summary	**Average (dBA)**
$L_{eq,\ Day}$ dBA	57
$L_{eq,\ Evening}$ dBA	50
$L_{eq,\ Night}$ dBA	44
RBL, $_{Day}$ dBA	37
RBL, $_{Evening}$ dBA	37
RBL, $_{Night}$ dBA	31

Daily Summary

Date	08-08	09-08	10-08	11-08	12-08	13-08	14-08	15-08
$L_{eq,\ Day}$ dBA	53	56	57	55	57	53	54	54
$L_{eq,\ Evening}$ dBA	45	42	42	49	46	45	45	44
$L_{eq,\ Night}$ dBA	42	41	43	44	44	42	46	44
ABL, $_{Day}$ dBA	37	39	36	37	41	37	38	39
ABL, $_{Evening}$ dBA	35	34	36	39	33	39	38	38
ABL, $_{Night}$ dBA	31	30	31	35	29	31	30	32

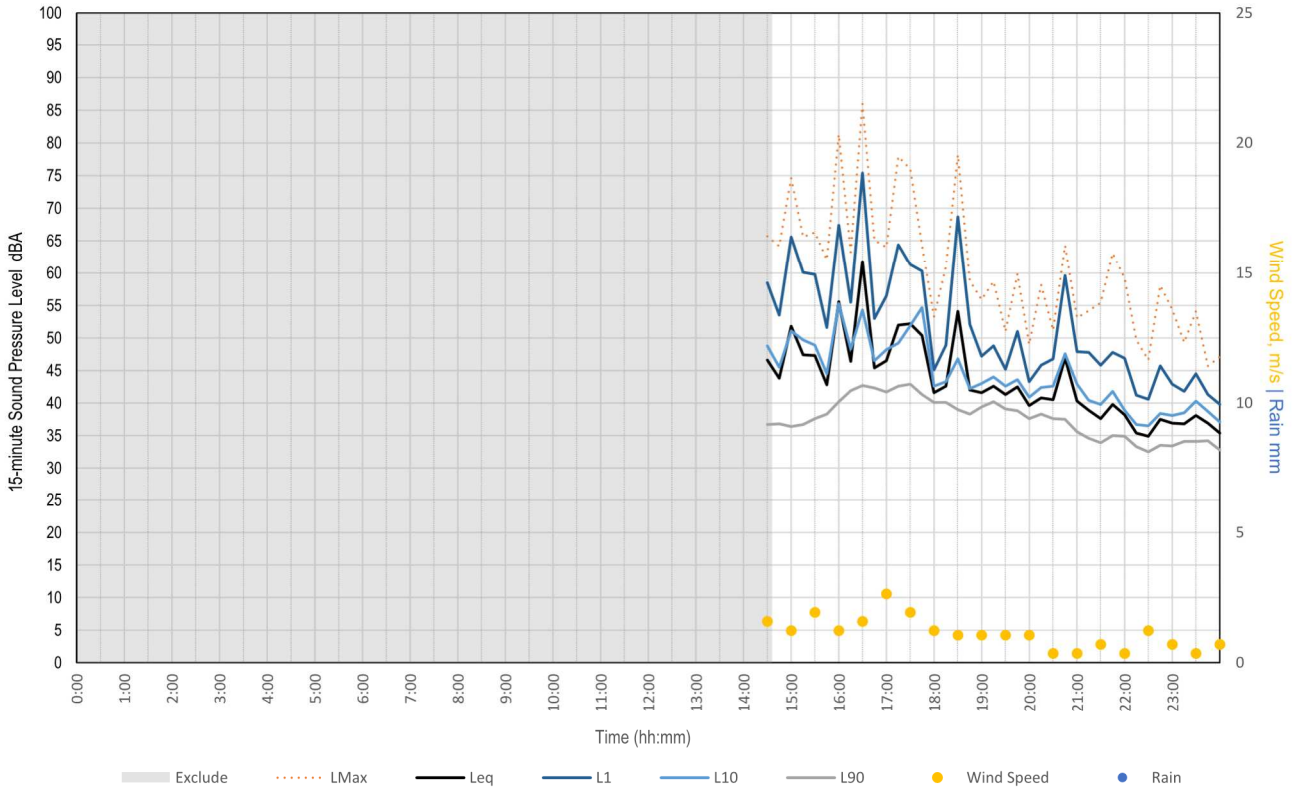
Date	16-08	17-08	18-08	19-08	20-08	21-08	22-08	23-08
$L_{eq,\ Day}$ dBA	52	51	57	65	53	56	54	56
$L_{eq,\ Evening}$ dBA	51	49	47	44	50	45	46	47
$L_{eq,\ Night}$ dBA	44	45	44	44	40	44	44	43
ABL, $_{Day}$ dBA	35	35	35	36	36	35	39	37
ABL, $_{Evening}$ dBA	38	39	40	38	36	37	39	43
ABL, $_{Night}$ dBA	35	33	34	36	27	34	34	31

Date	24-08	25-08	26-08	27-08	28-08	29-08	30-08	31-08
$L_{eq,\ Day}$ dBA	55	53	53	55	67	51	57	55
$L_{eq,\ Evening}$ dBA	43	42	61	43	44	43	46	52
$L_{eq,\ Night}$ dBA	46		44	40	43	45	46	40
ABL, $_{Day}$ dBA	38	38	38	35	33	34	41	35
ABL, $_{Evening}$ dBA	37	36	39	36	37	36	38	34
ABL, $_{Night}$ dBA	34	30	30	27	31	35	32	27

Date	01-09	02-09	03-09	04-09	05-09	06-09
$L_{eq,\ Day}$ dBA	54	55	52	51	58	55
$L_{eq,\ Evening}$ dBA	46	51	41	41	42	
$L_{eq,\ Night}$ dBA	42	44	43	44	43	
ABL, $_{Day}$ dBA	36	36	40	38	36	35
ABL, $_{Evening}$ dBA	35	35	37	36	36	
ABL, $_{Night}$ dBA	31	33	31	30	32	

Measured Noise Levels - M12 - 21 Player Street (St Marys)

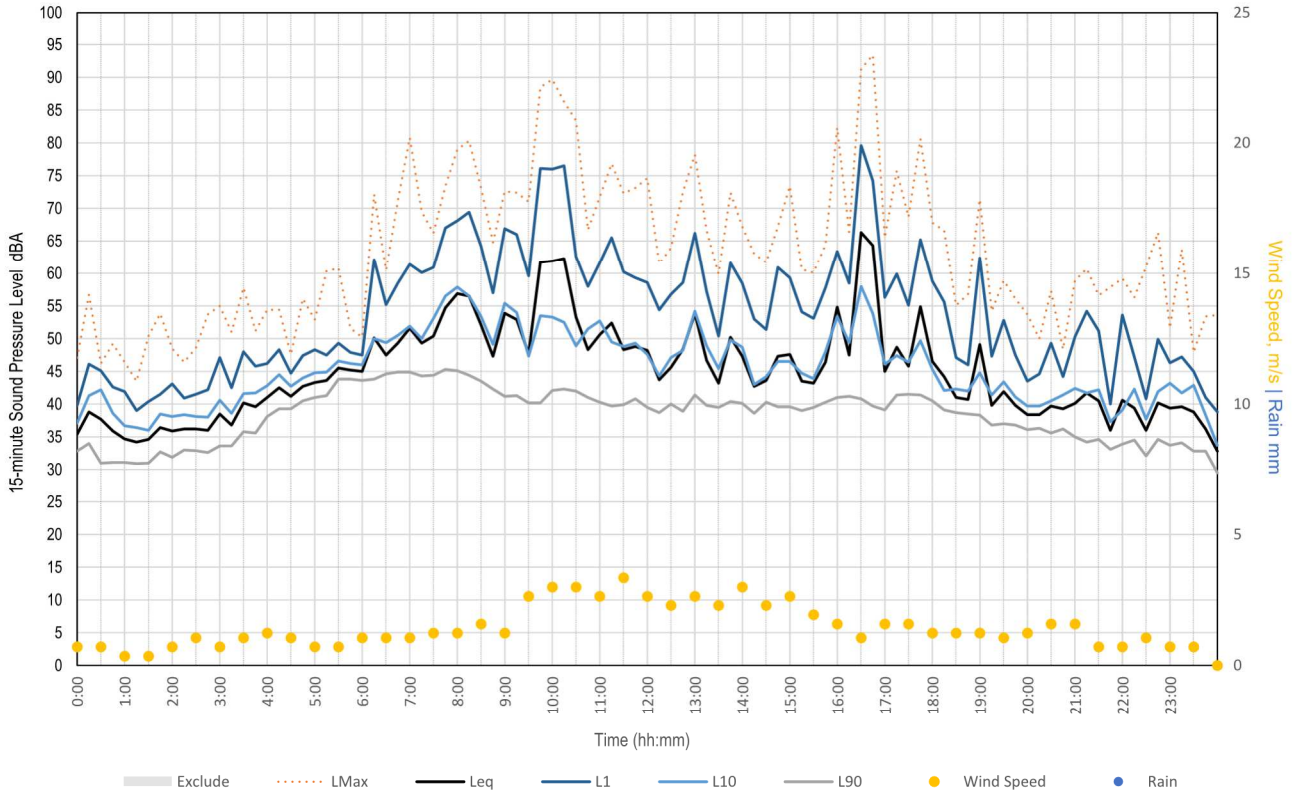
Monday, 08 August 2022



Noise Logger Results

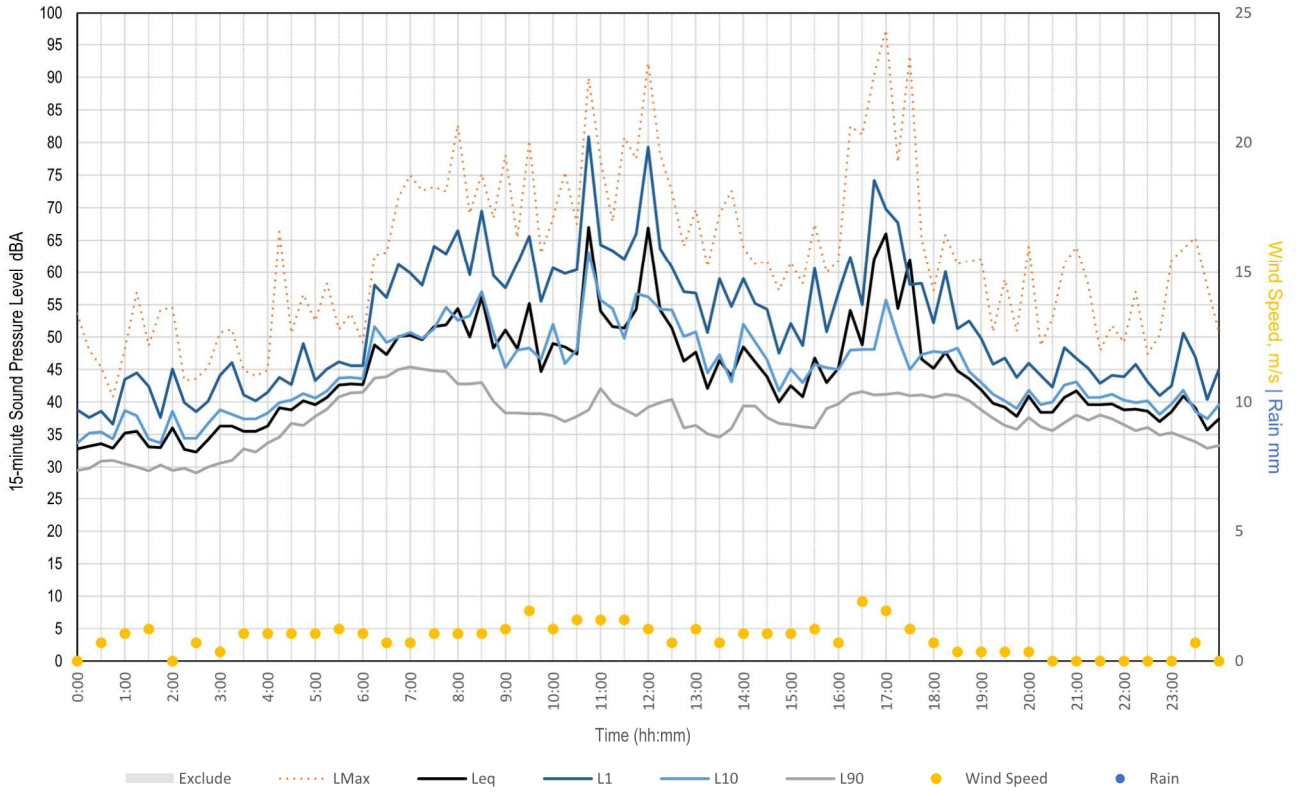
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Tuesday, 09 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

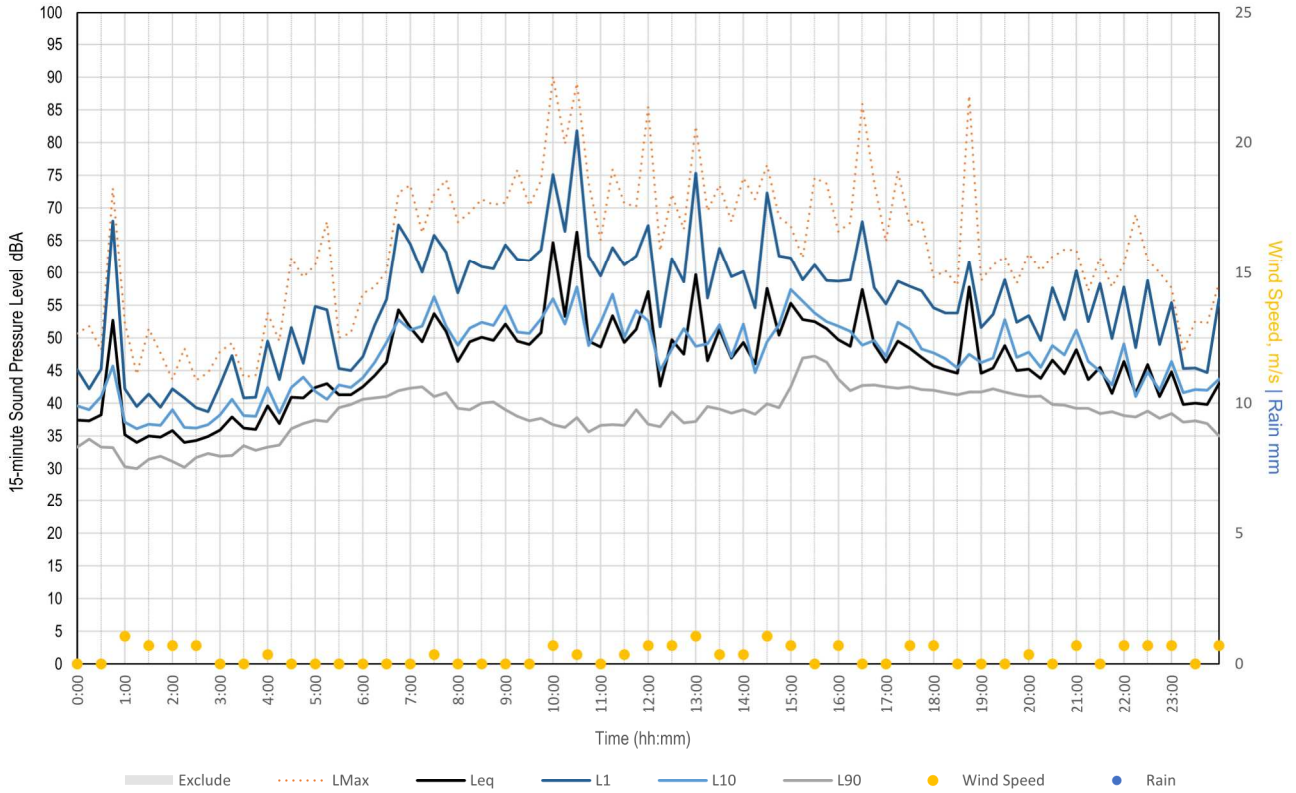
Wednesday, 10 August 2022



Noise Logger Results

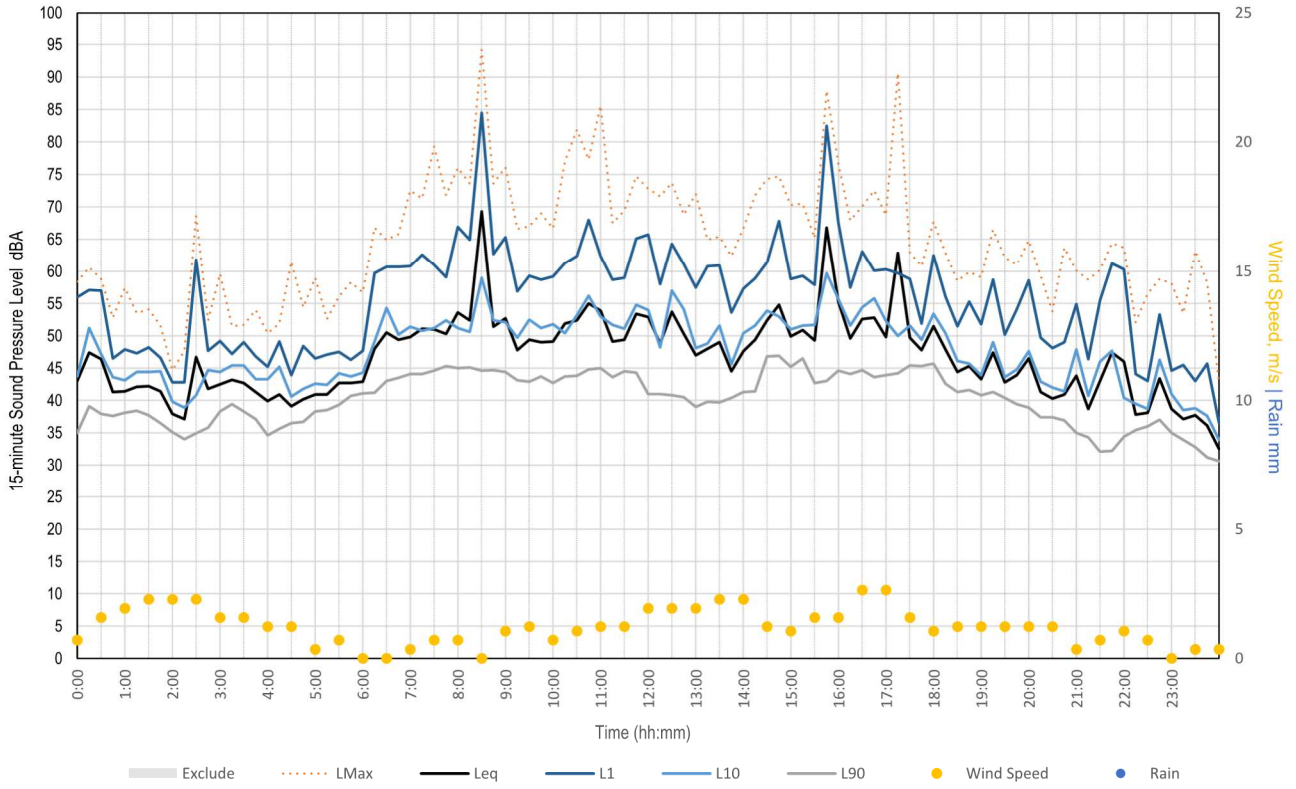
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Thursday, 11 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

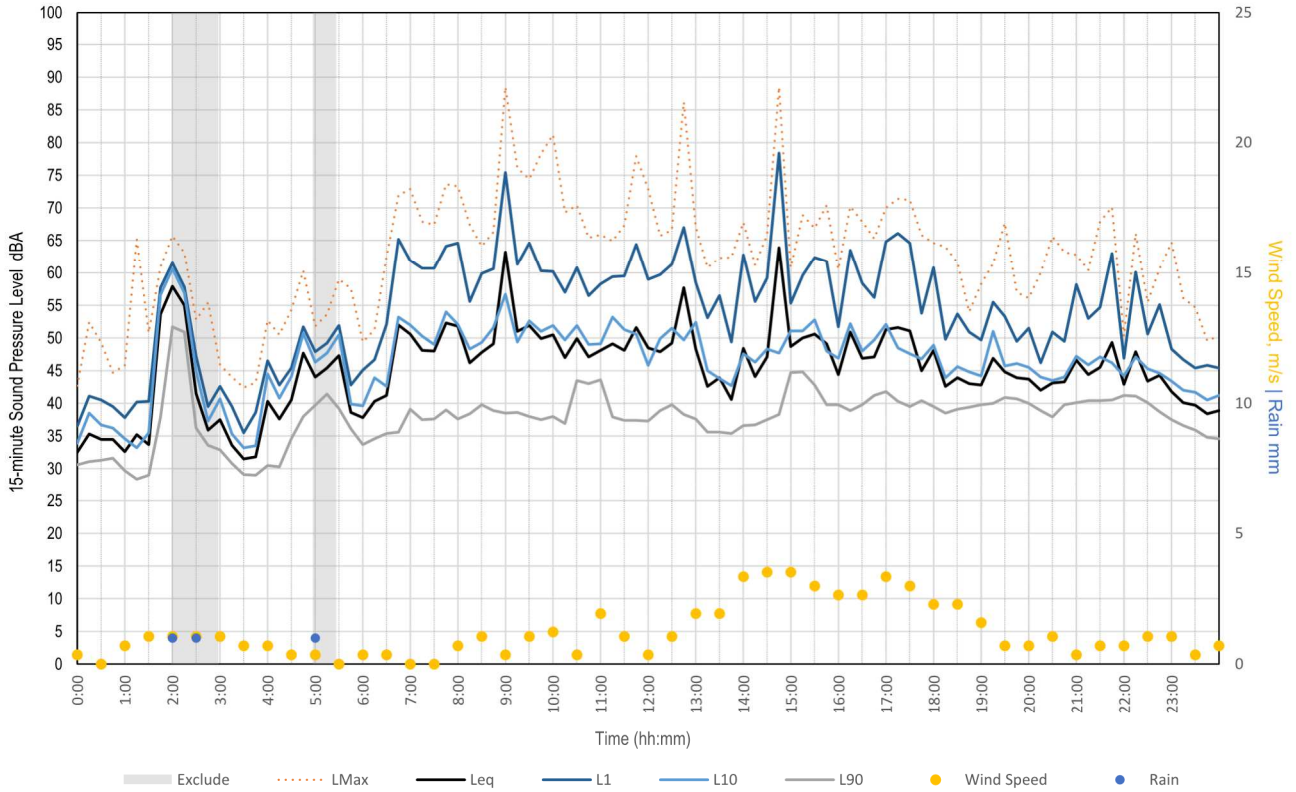
Friday, 12 August 2022



Noise Logger Results

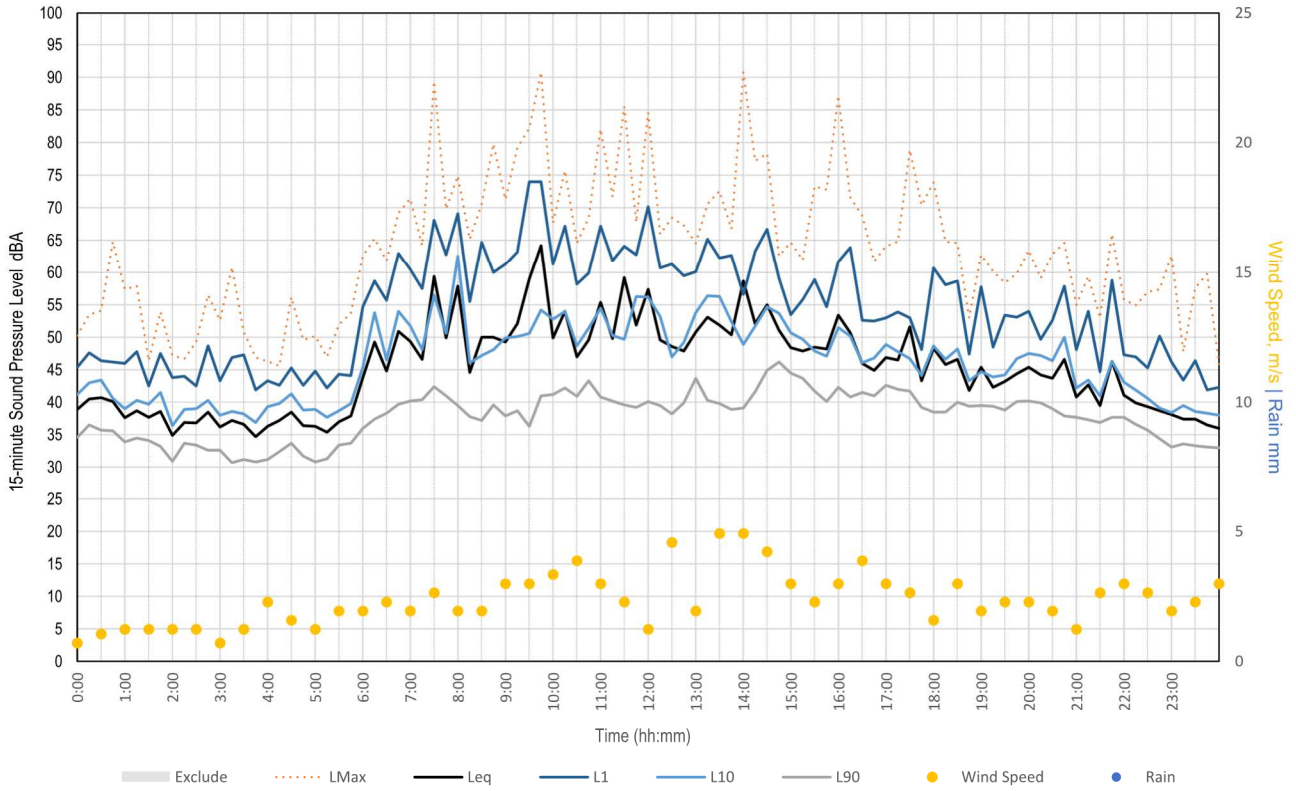
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Saturday, 13 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

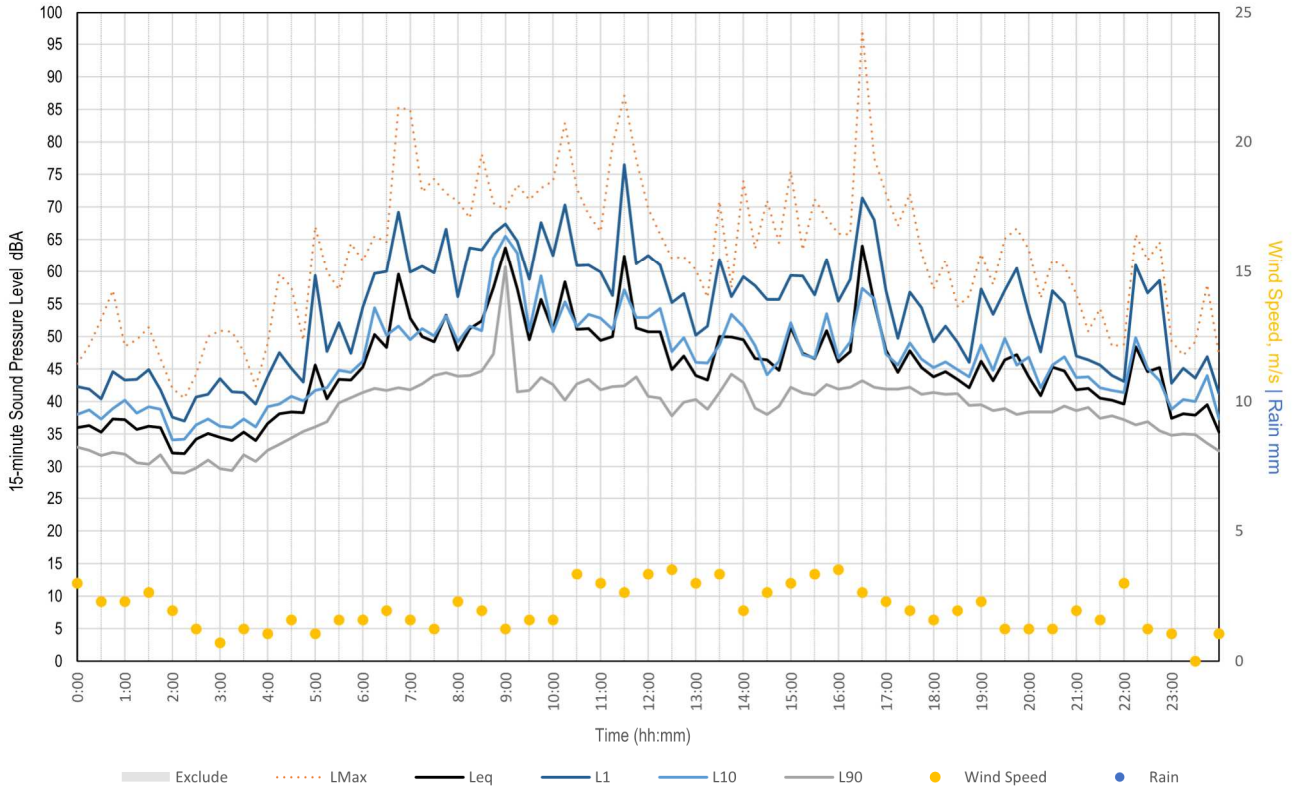
Sunday, 14 August 2022



Noise Logger Results

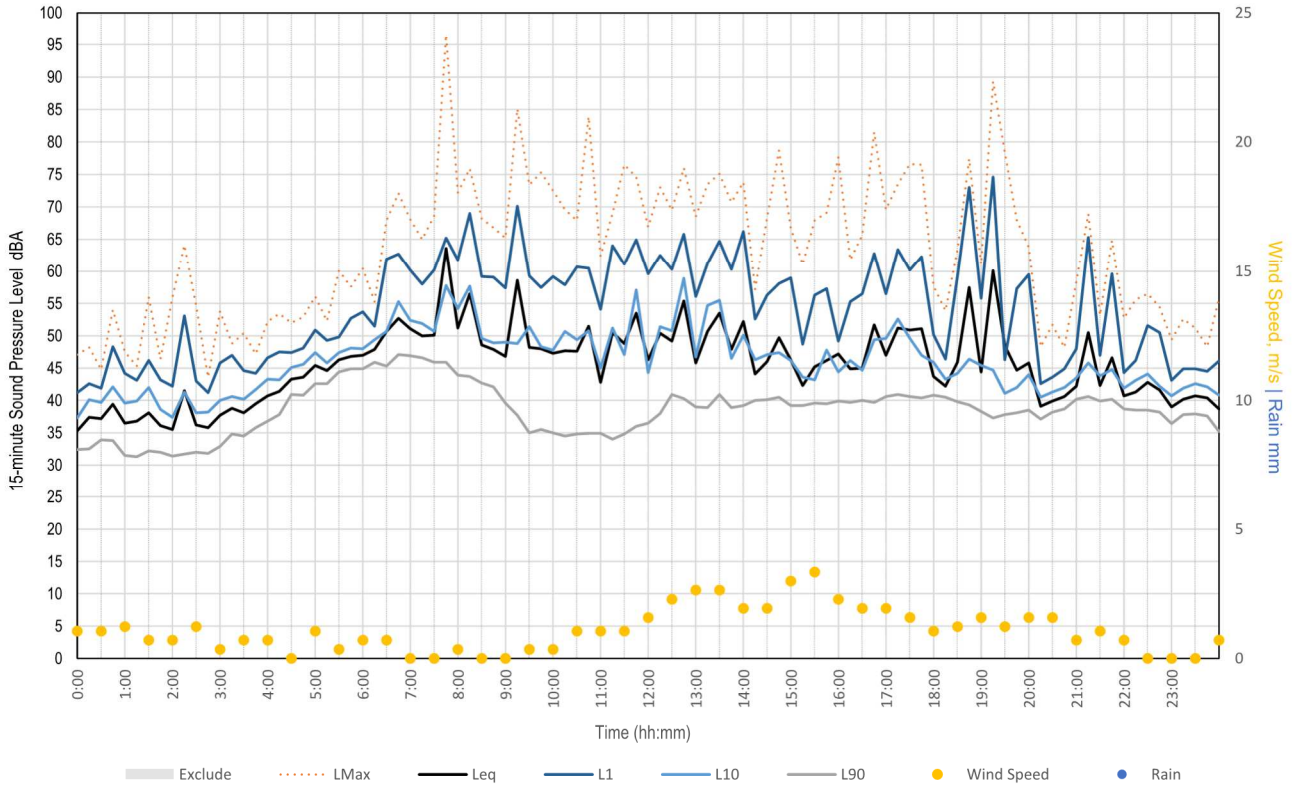
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Monday, 15 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

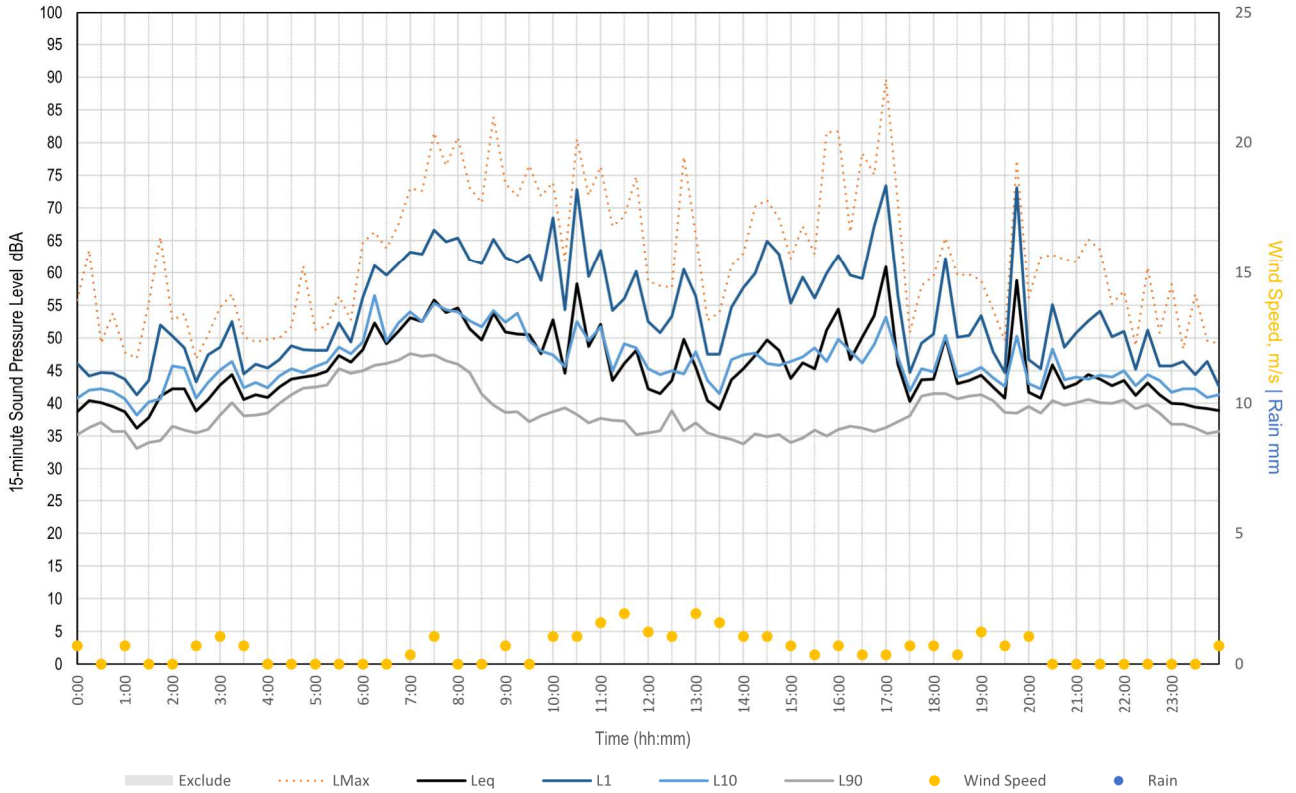
Tuesday, 16 August 2022



Noise Logger Results

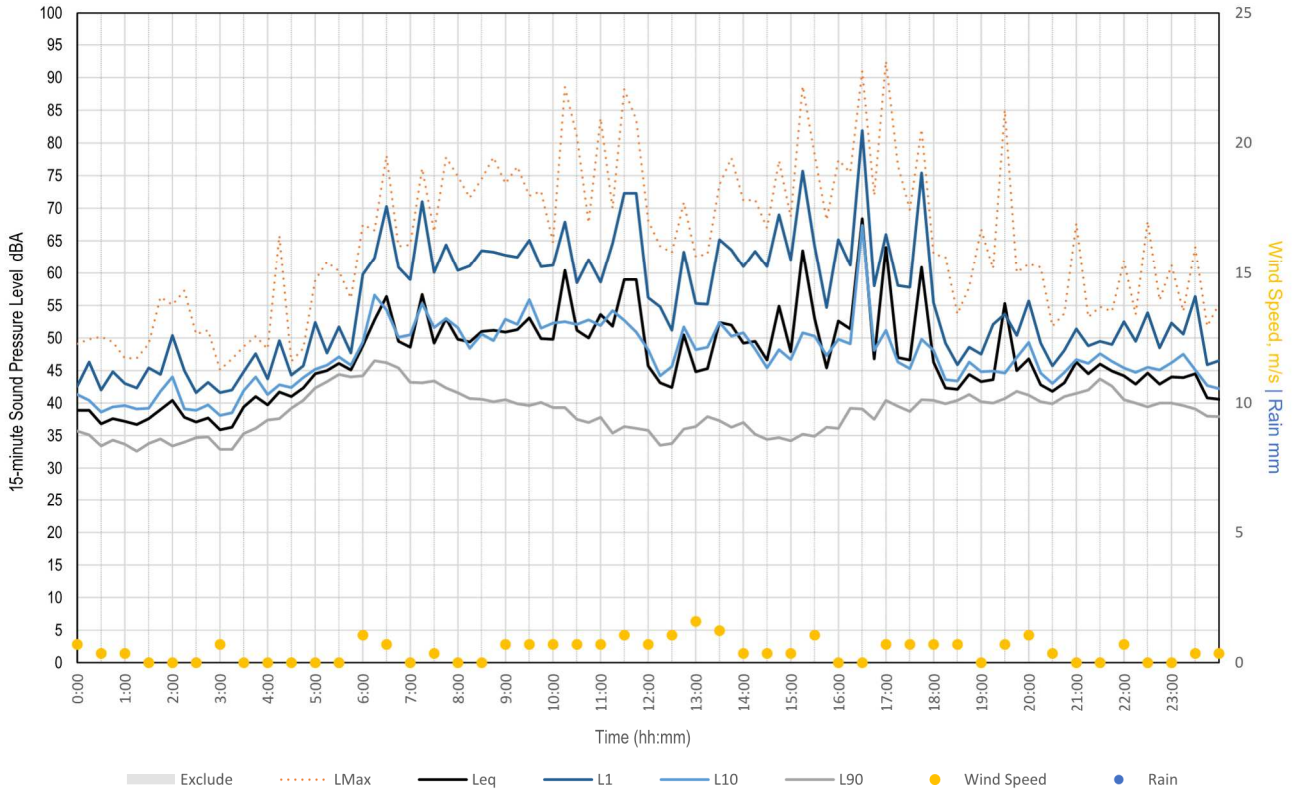
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Wednesday, 17 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

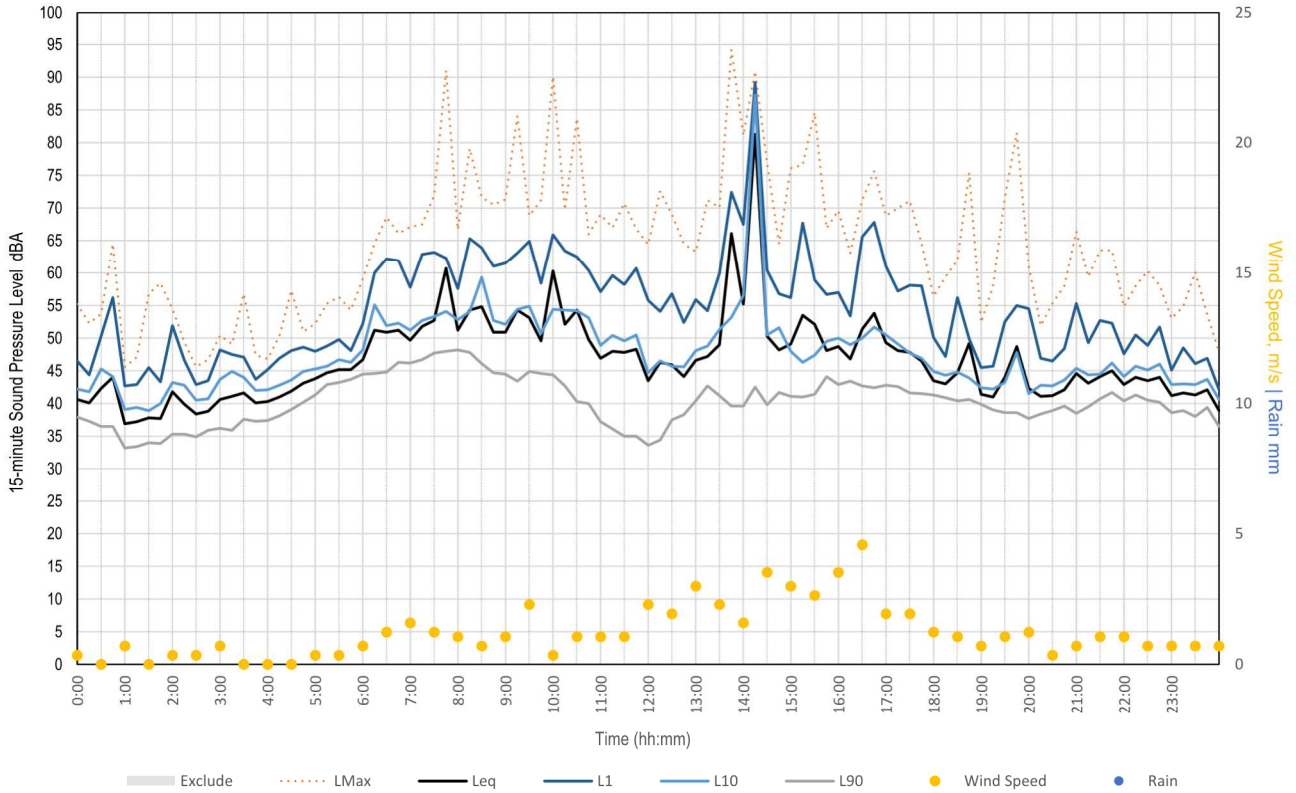
Thursday, 18 August 2022



Noise Logger Results

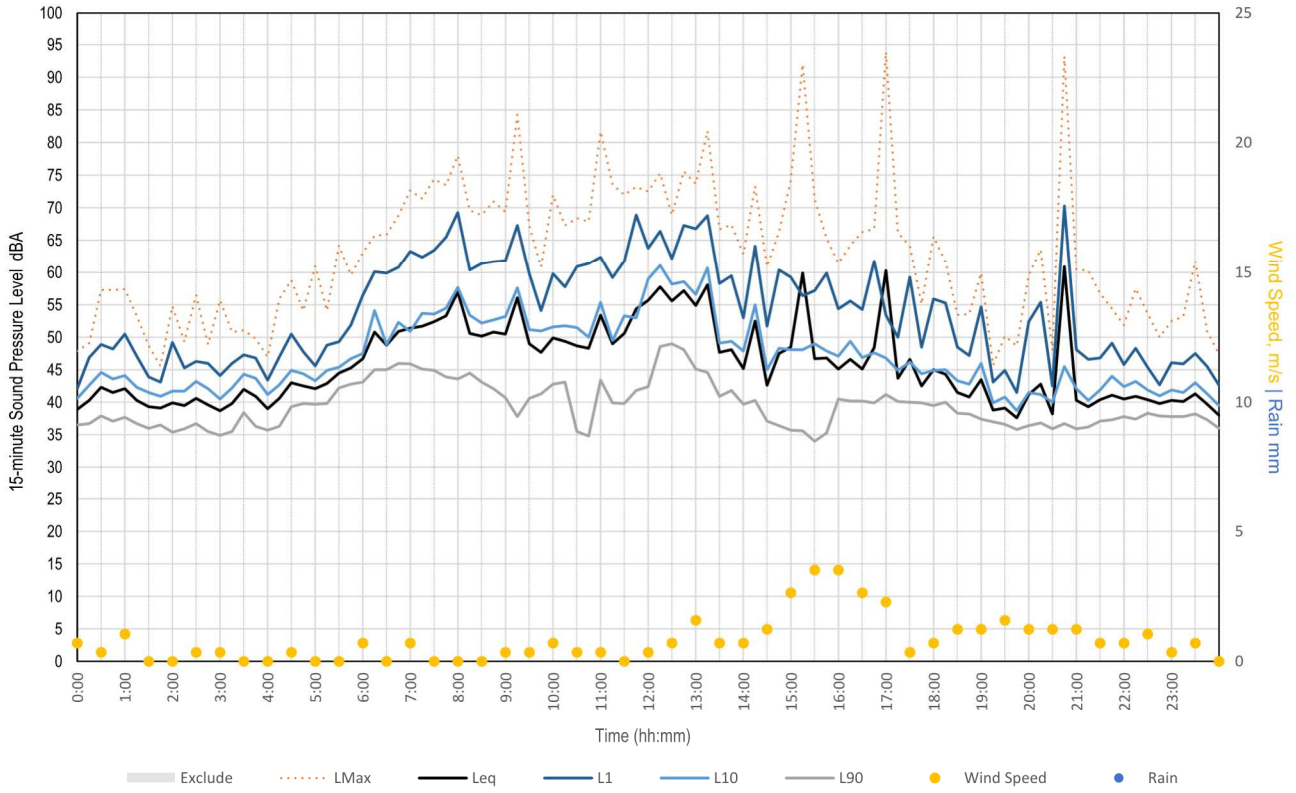
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Friday, 19 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

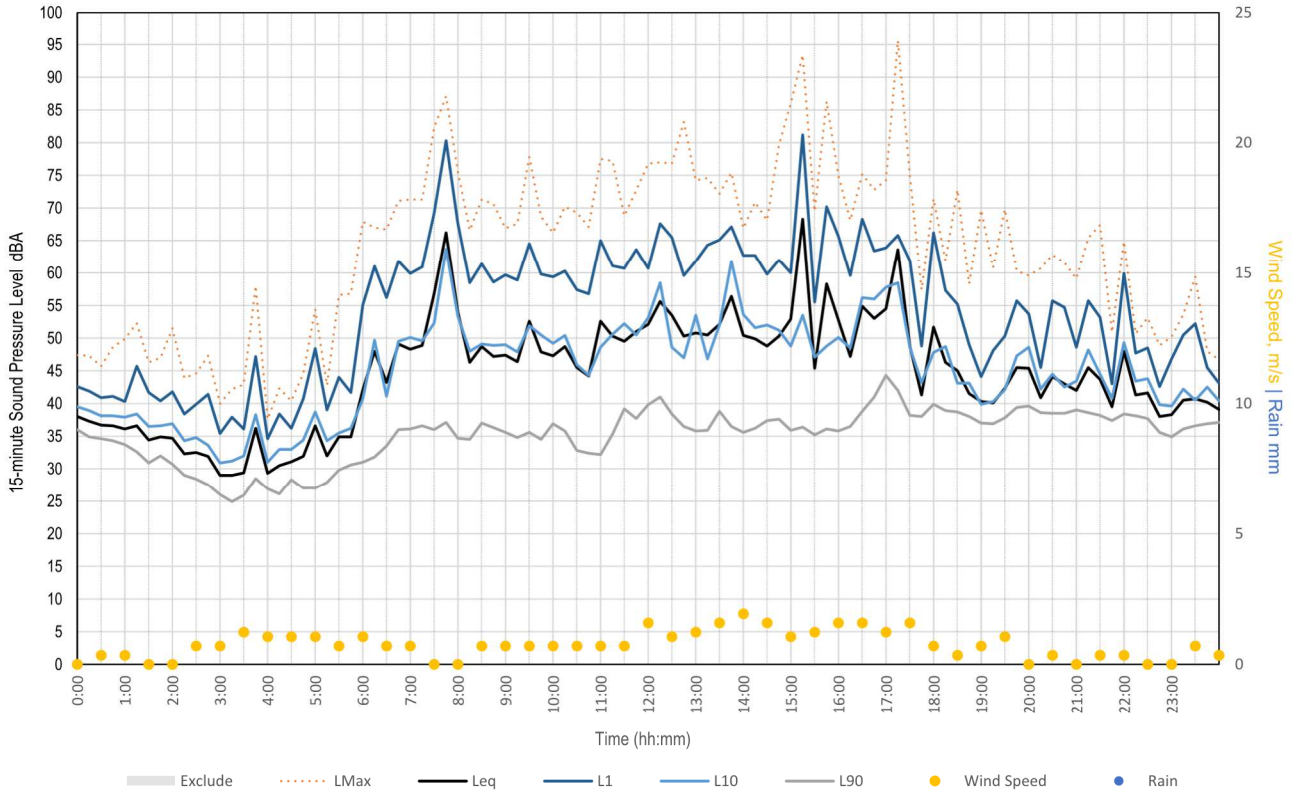
Saturday, 20 August 2022



Noise Logger Results

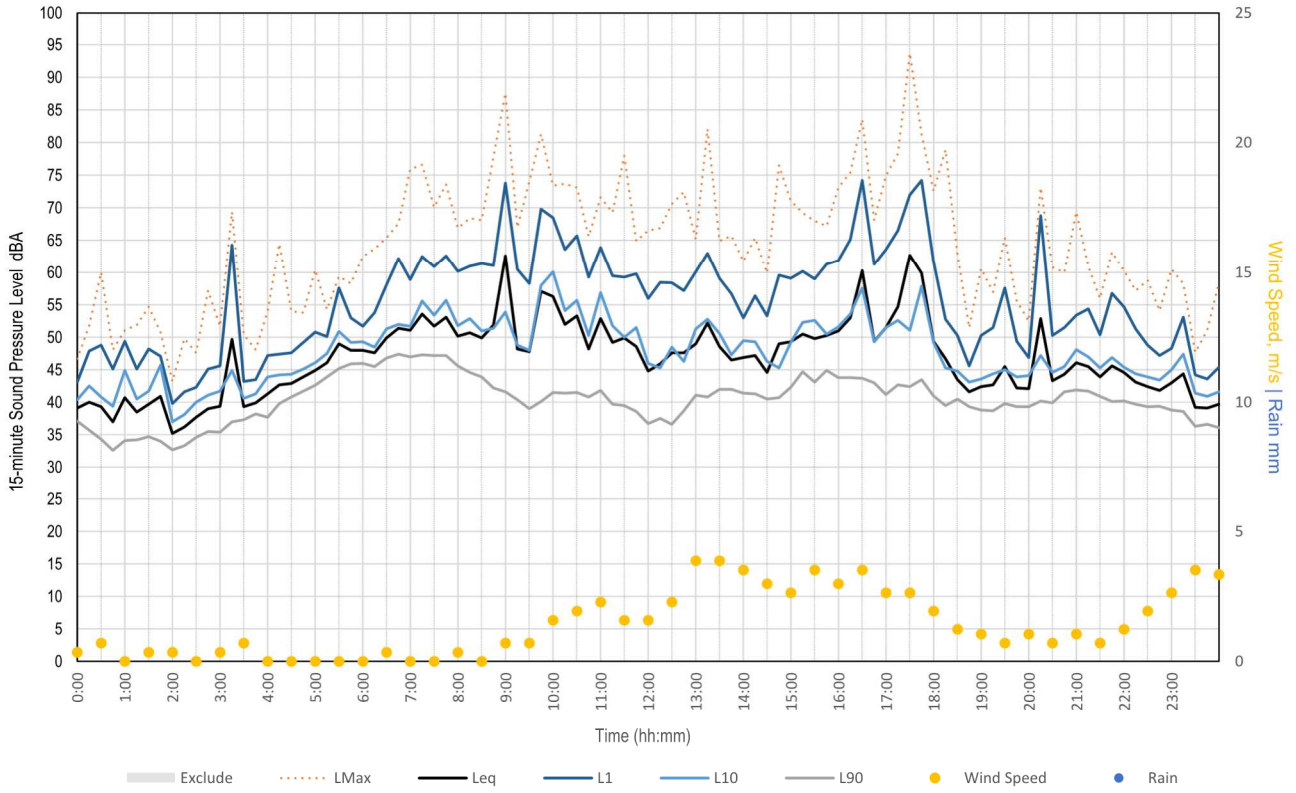
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Sunday, 21 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

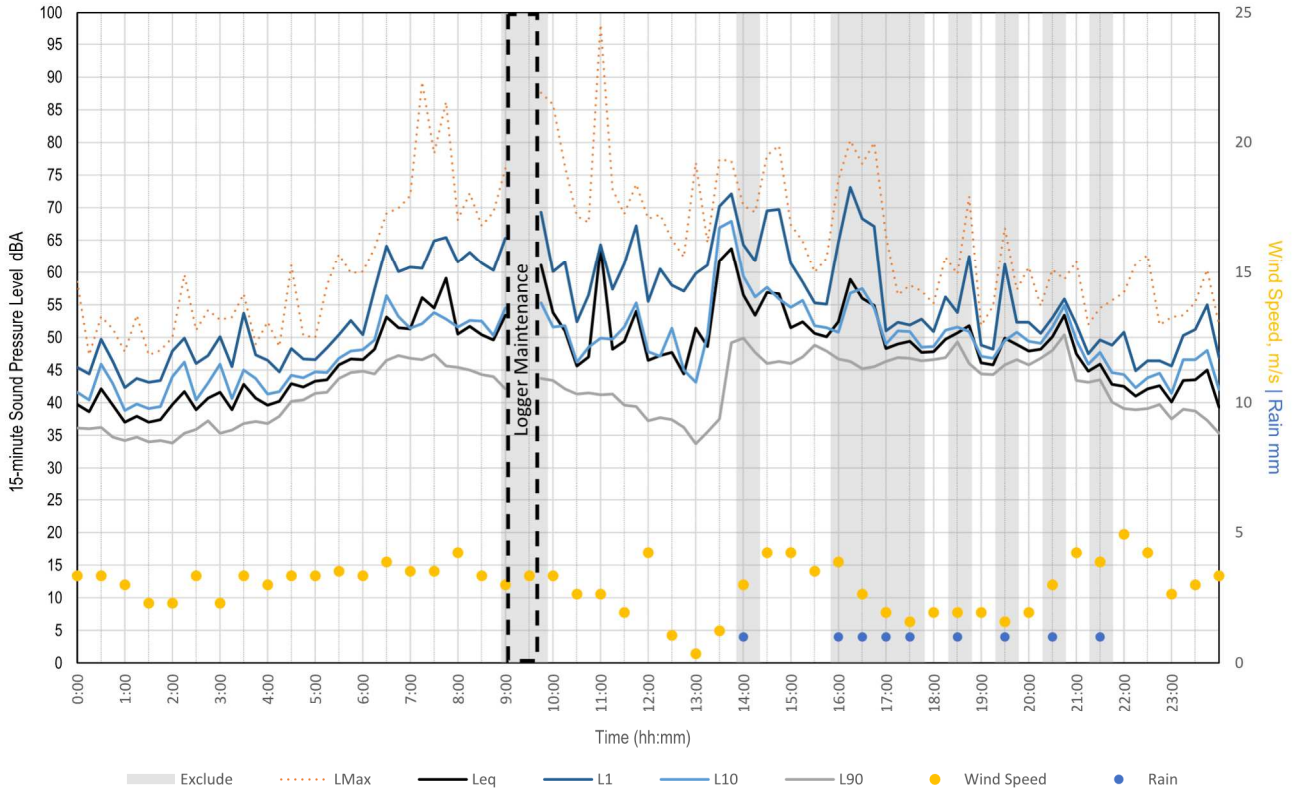
Monday, 22 August 2022



Noise Logger Results

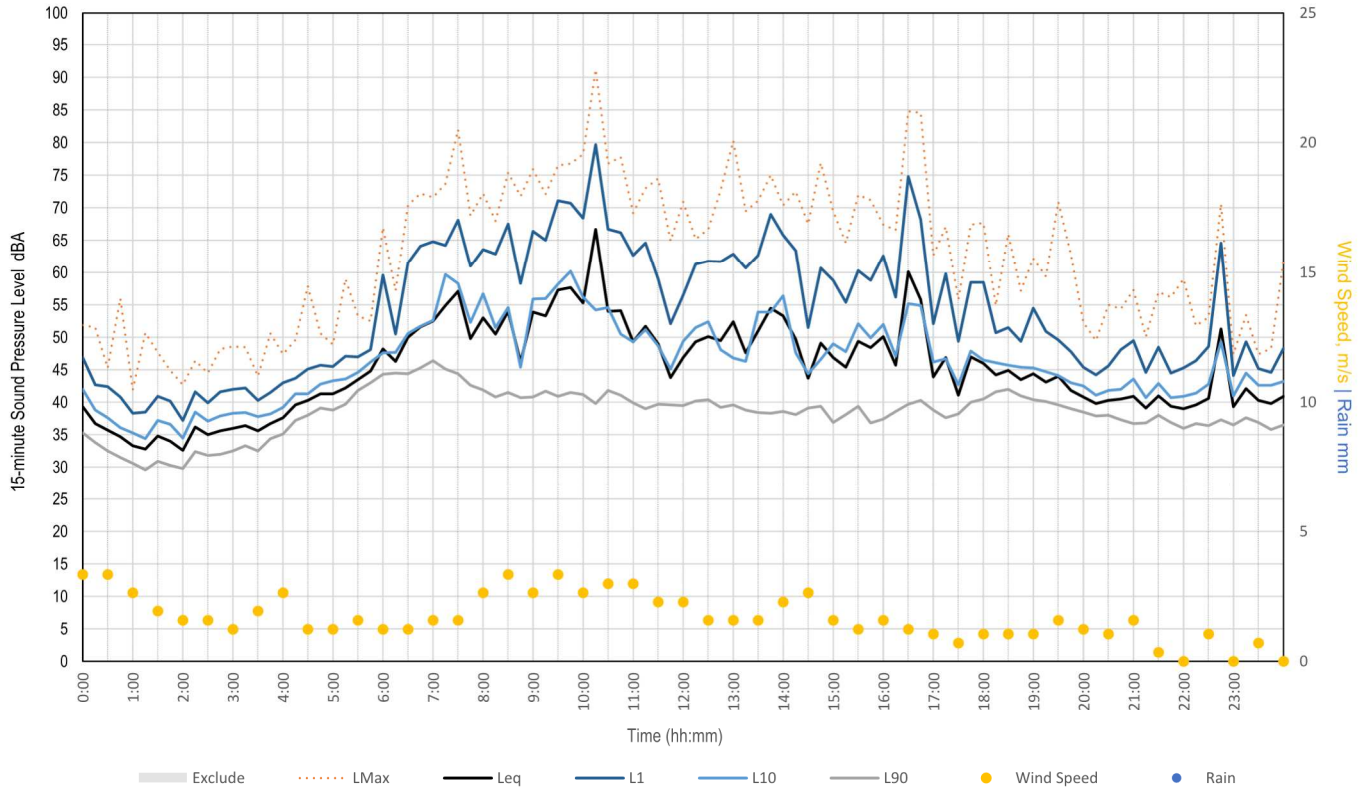
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Tuesday, 23 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

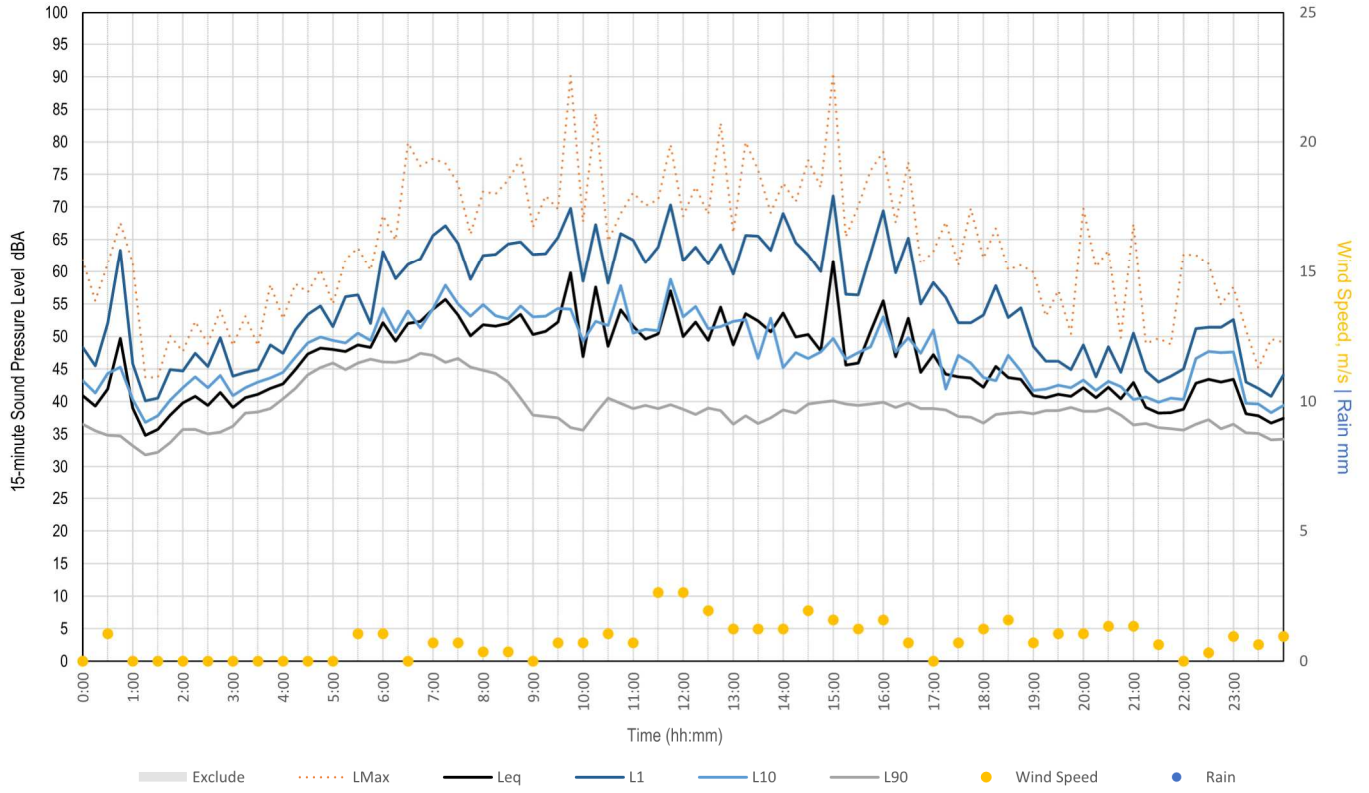
Wednesday, 24 August 2022



Noise Logger Results

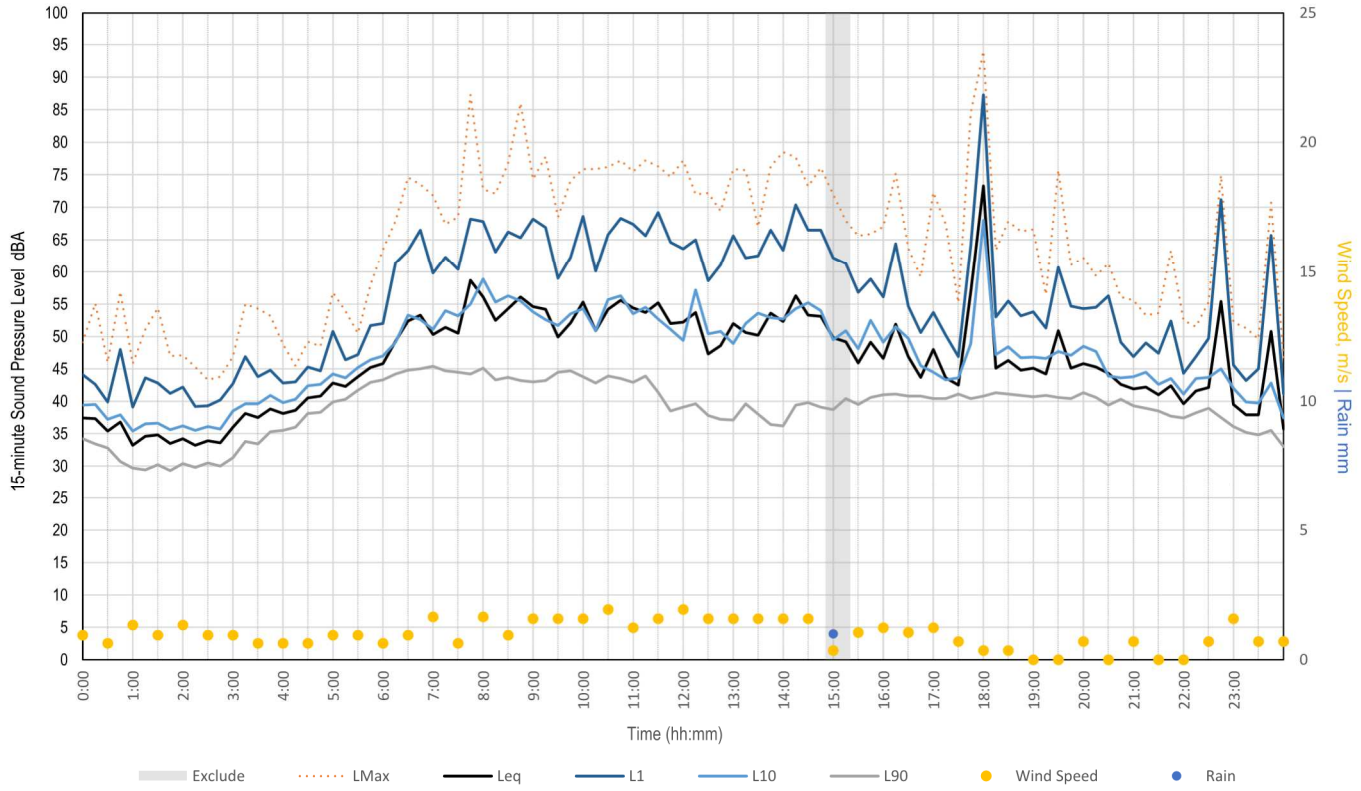
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Thursday, 25 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

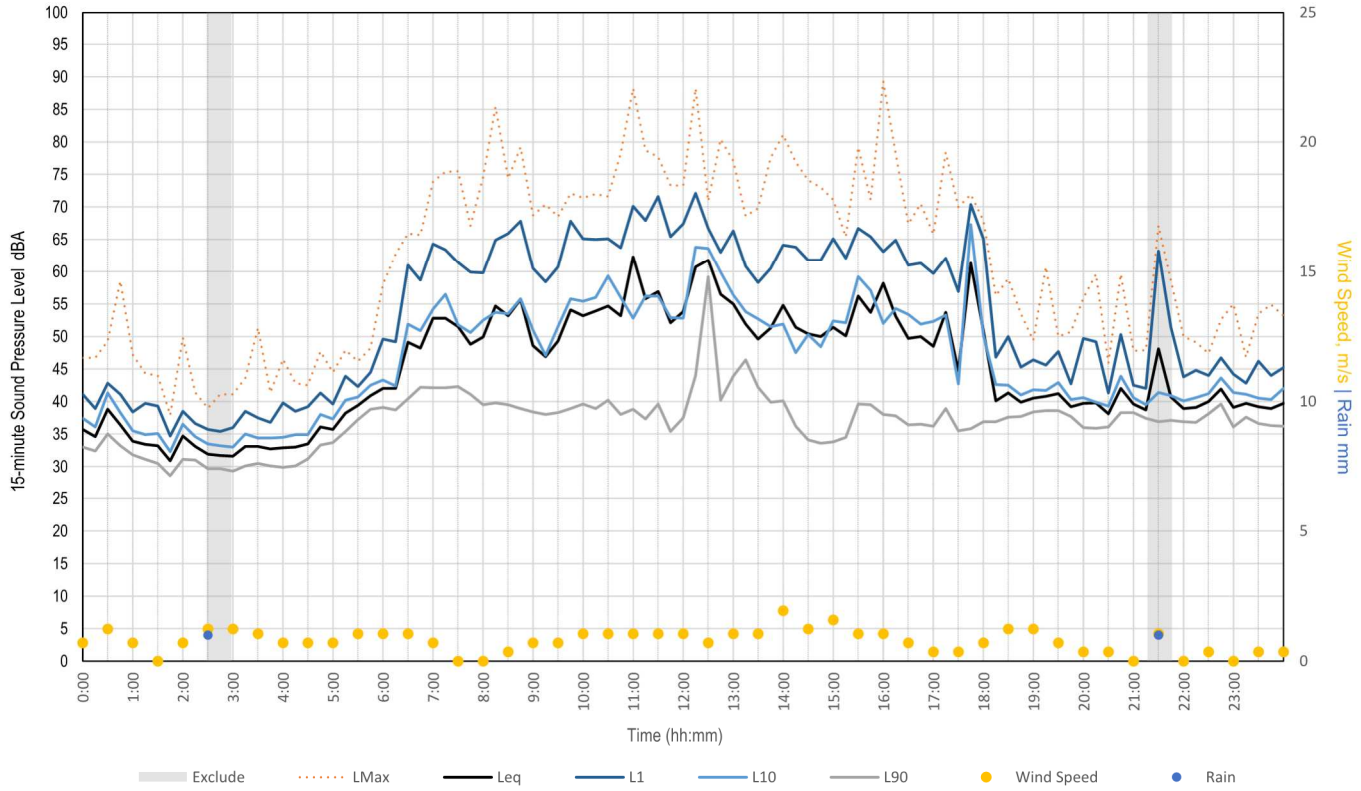
Friday, 26 August 2022



Noise Logger Results

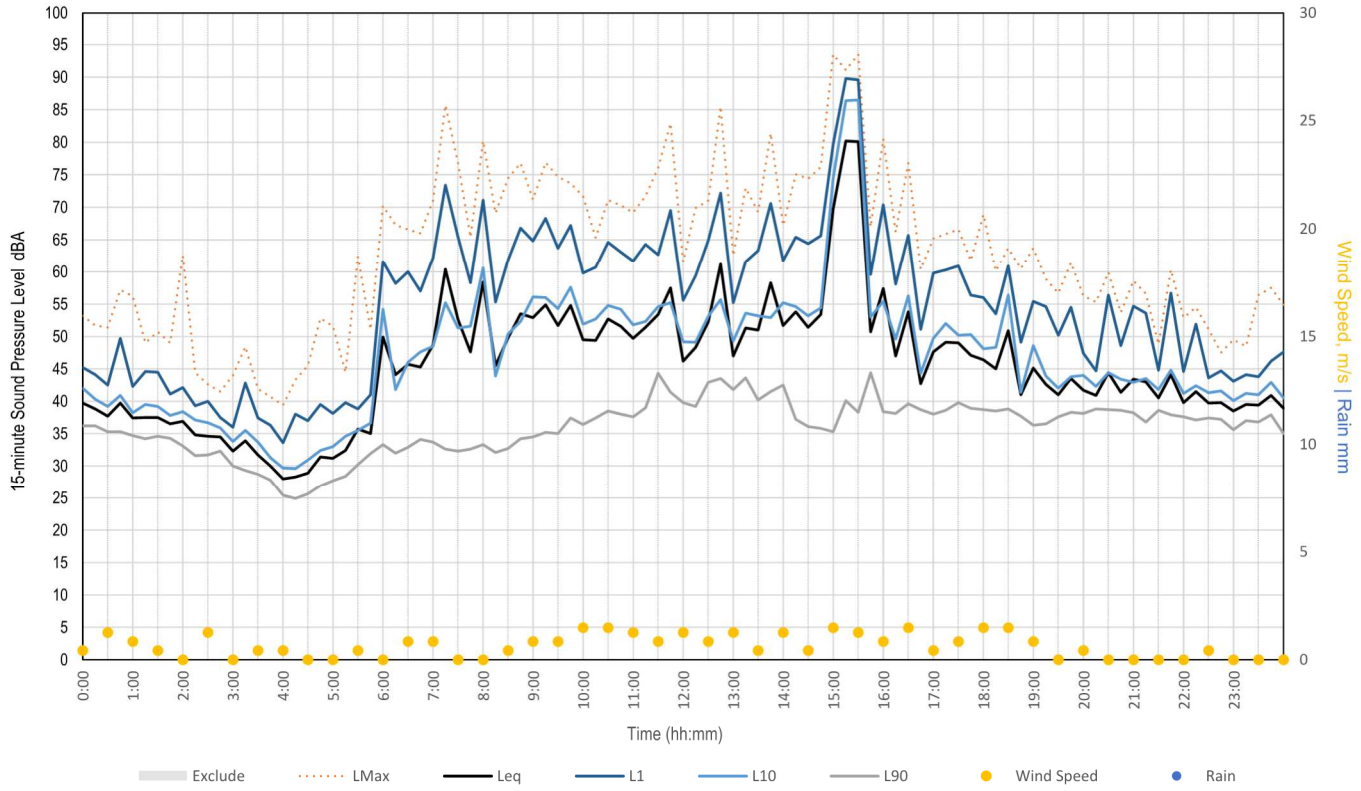
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Saturday, 27 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

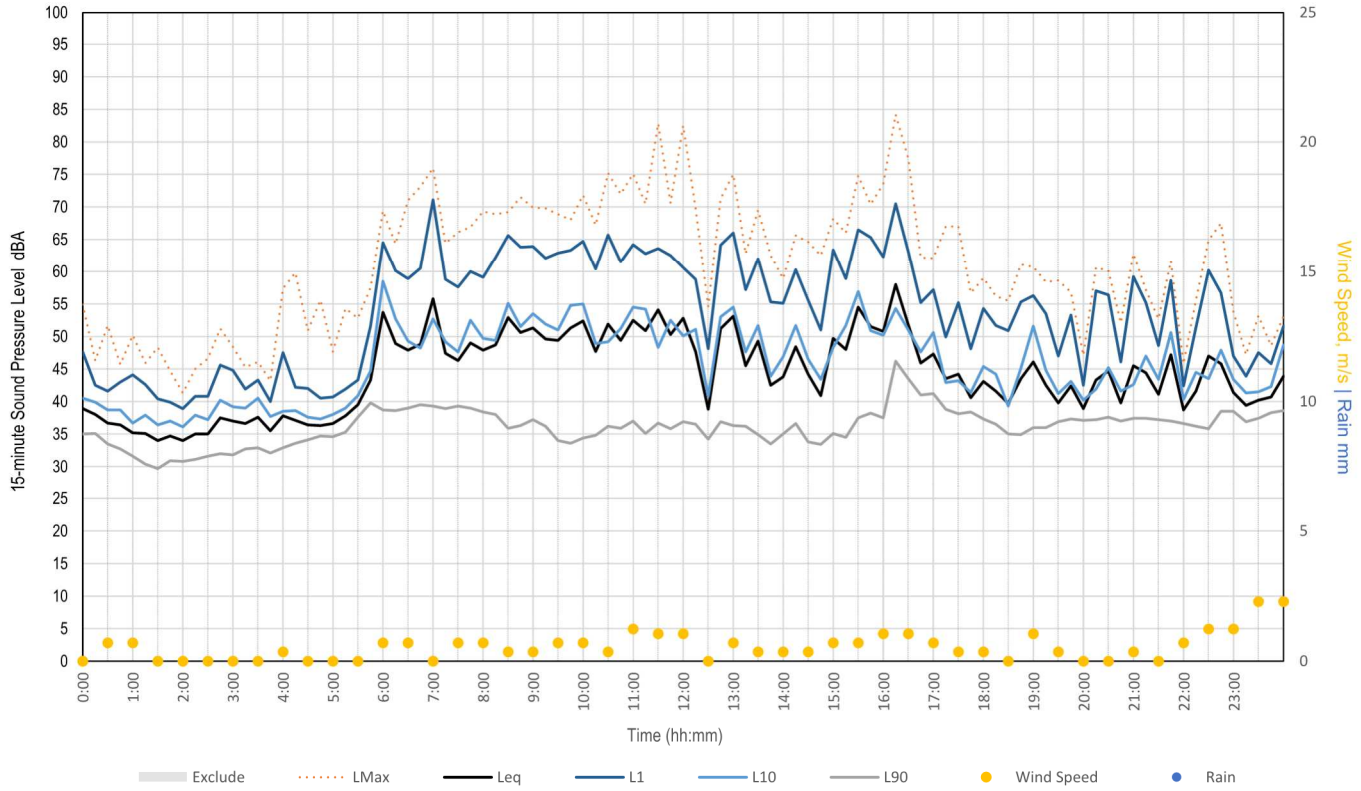
Sunday, 28 August 2022



Noise Logger Results

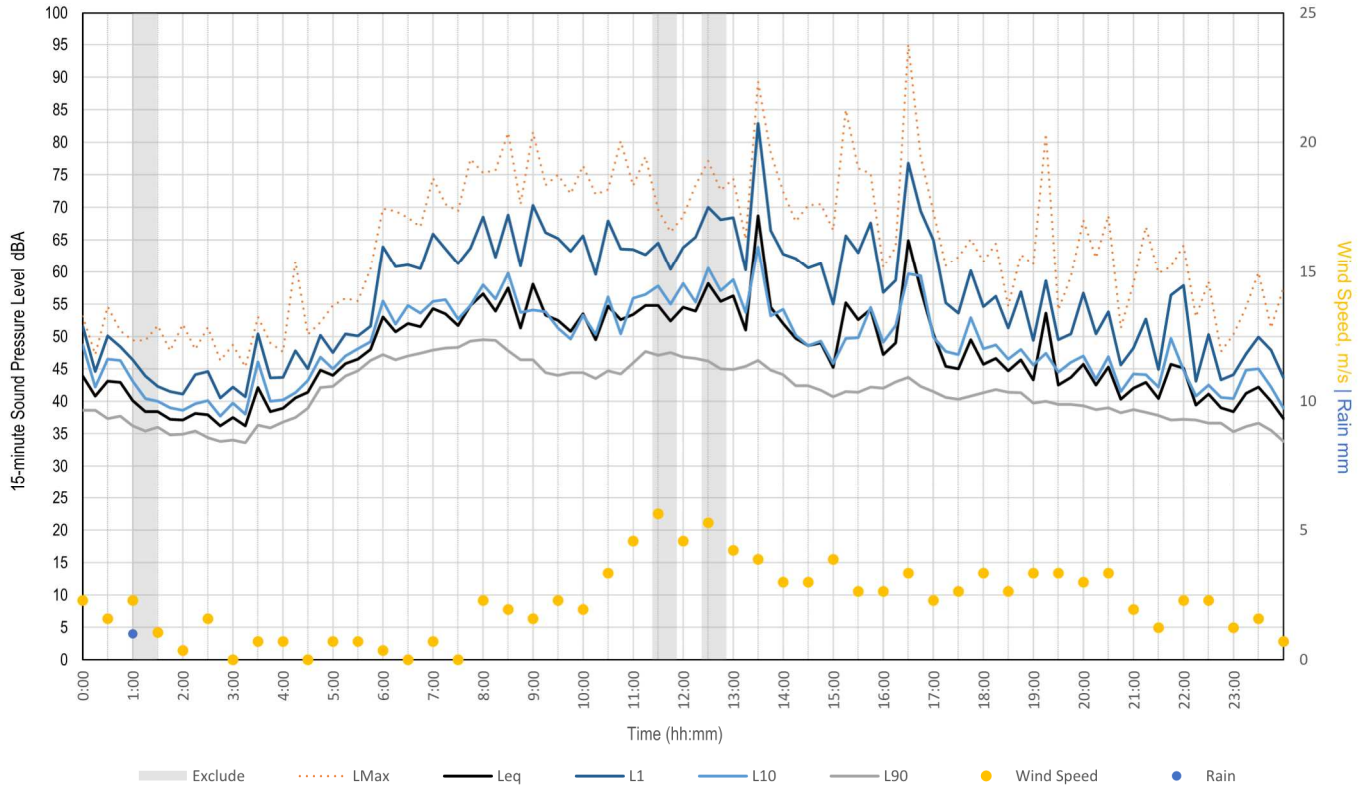
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Monday, 29 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

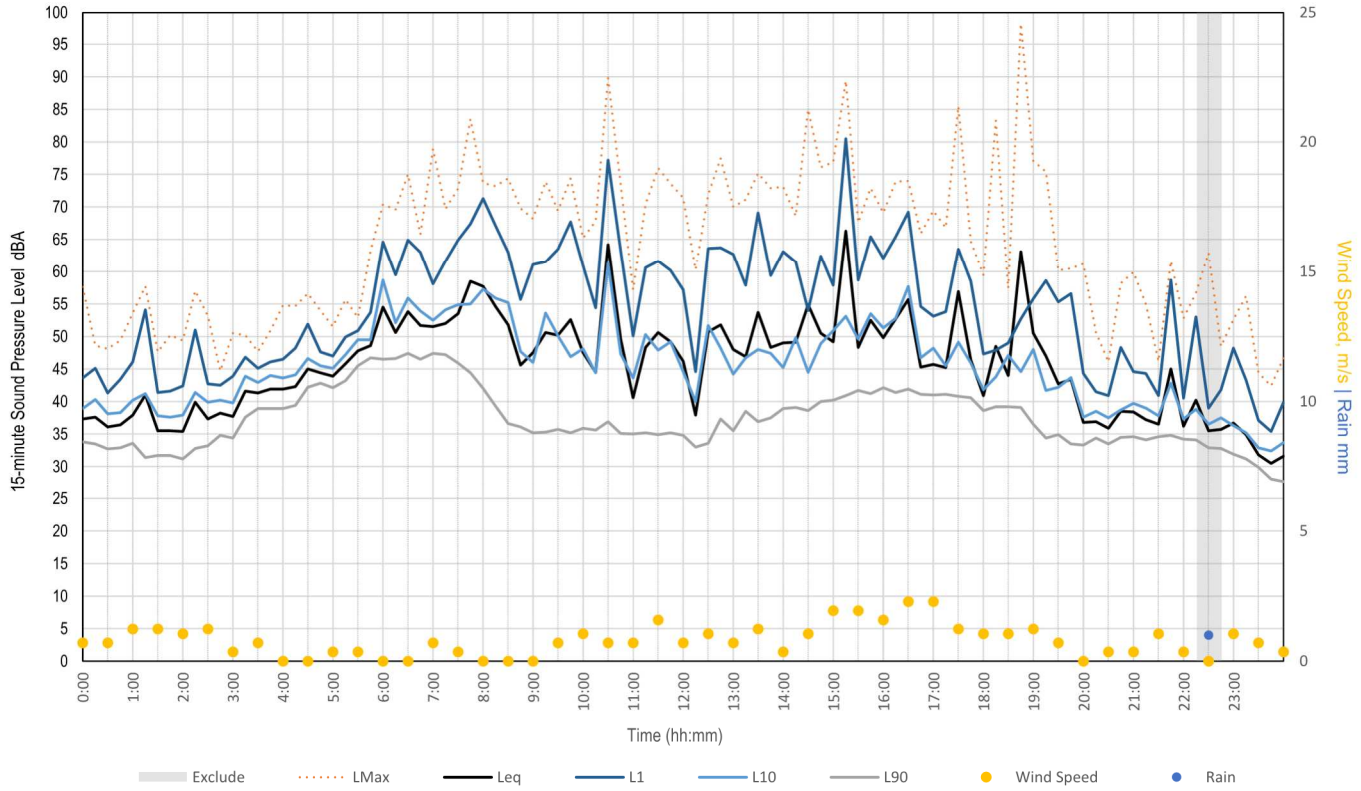
Tuesday, 30 August 2022



Noise Logger Results

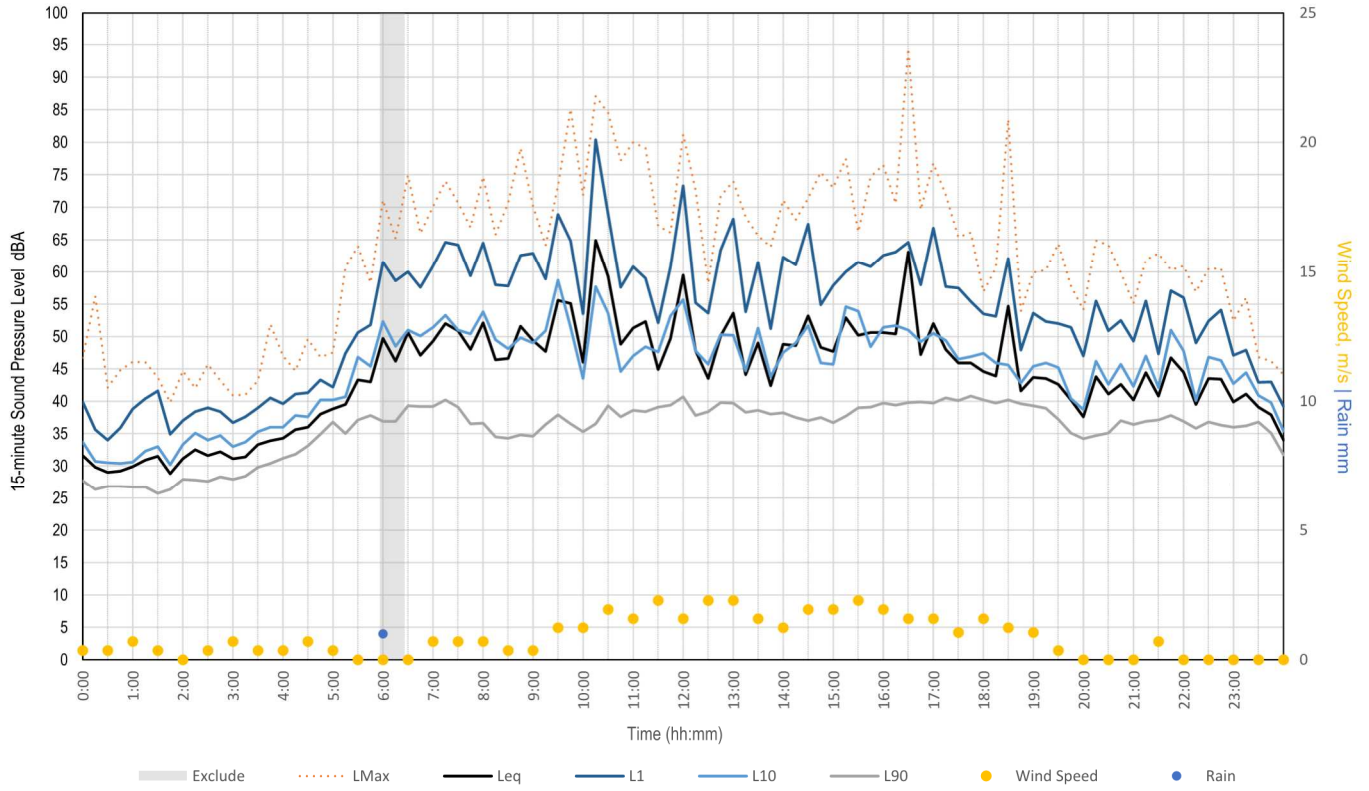
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Wednesday, 31 August 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

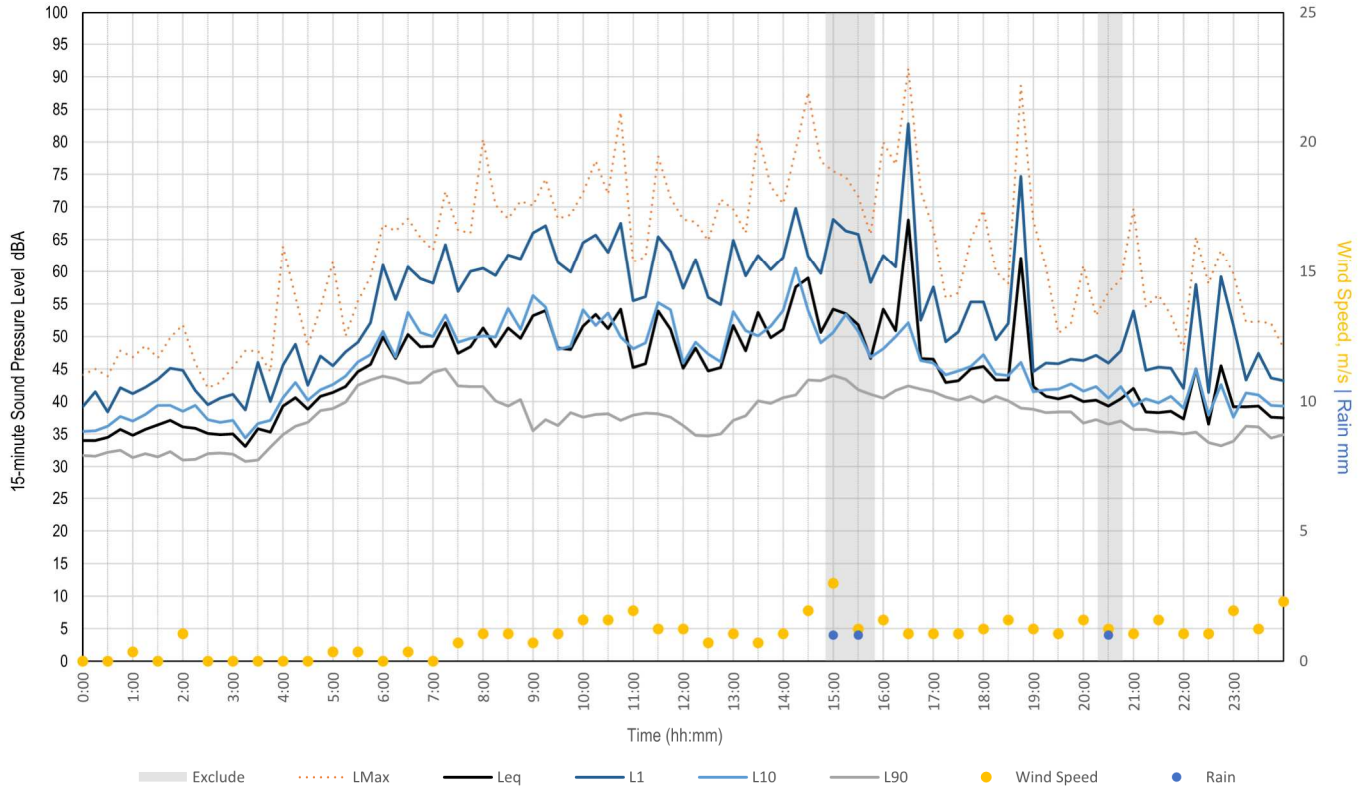
Thursday, 01 September 2022



Noise Logger Results

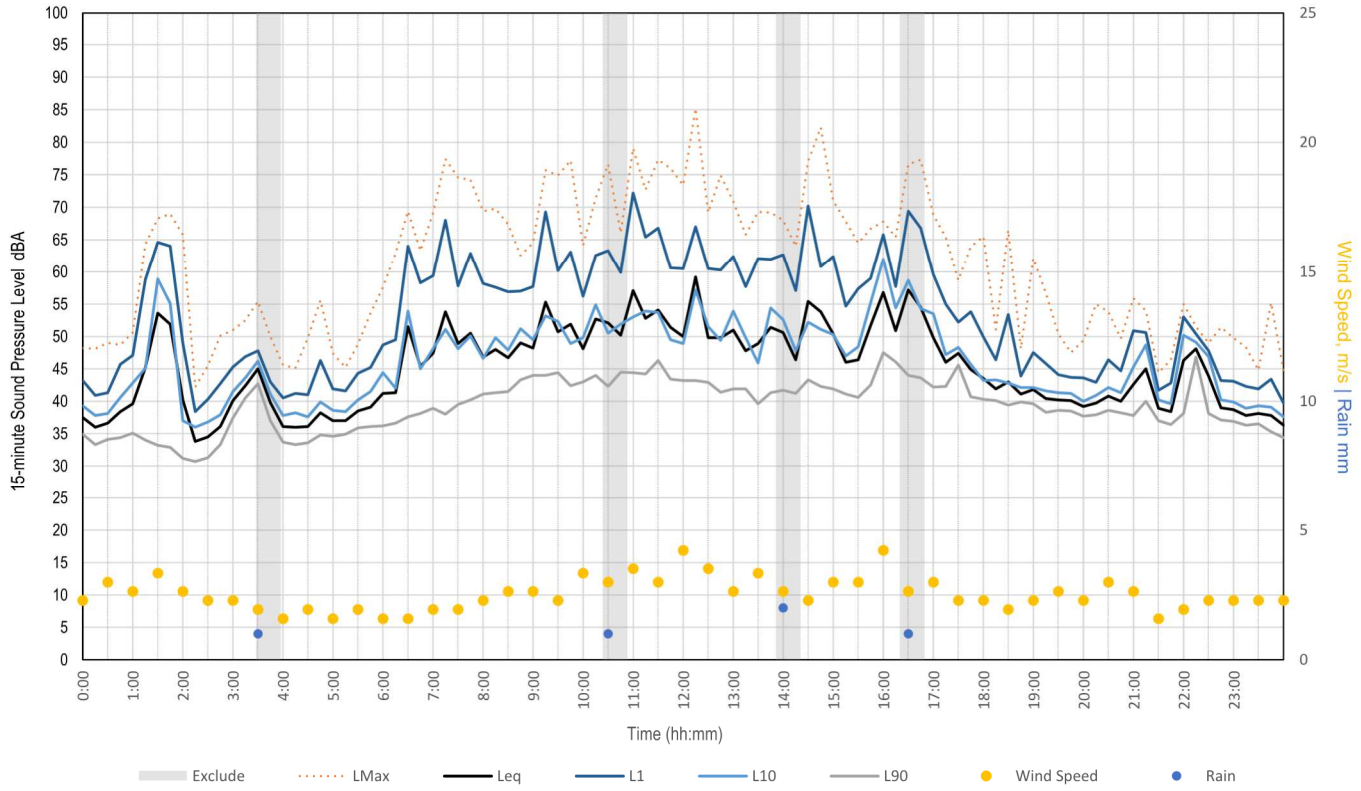
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Friday, 02 September 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

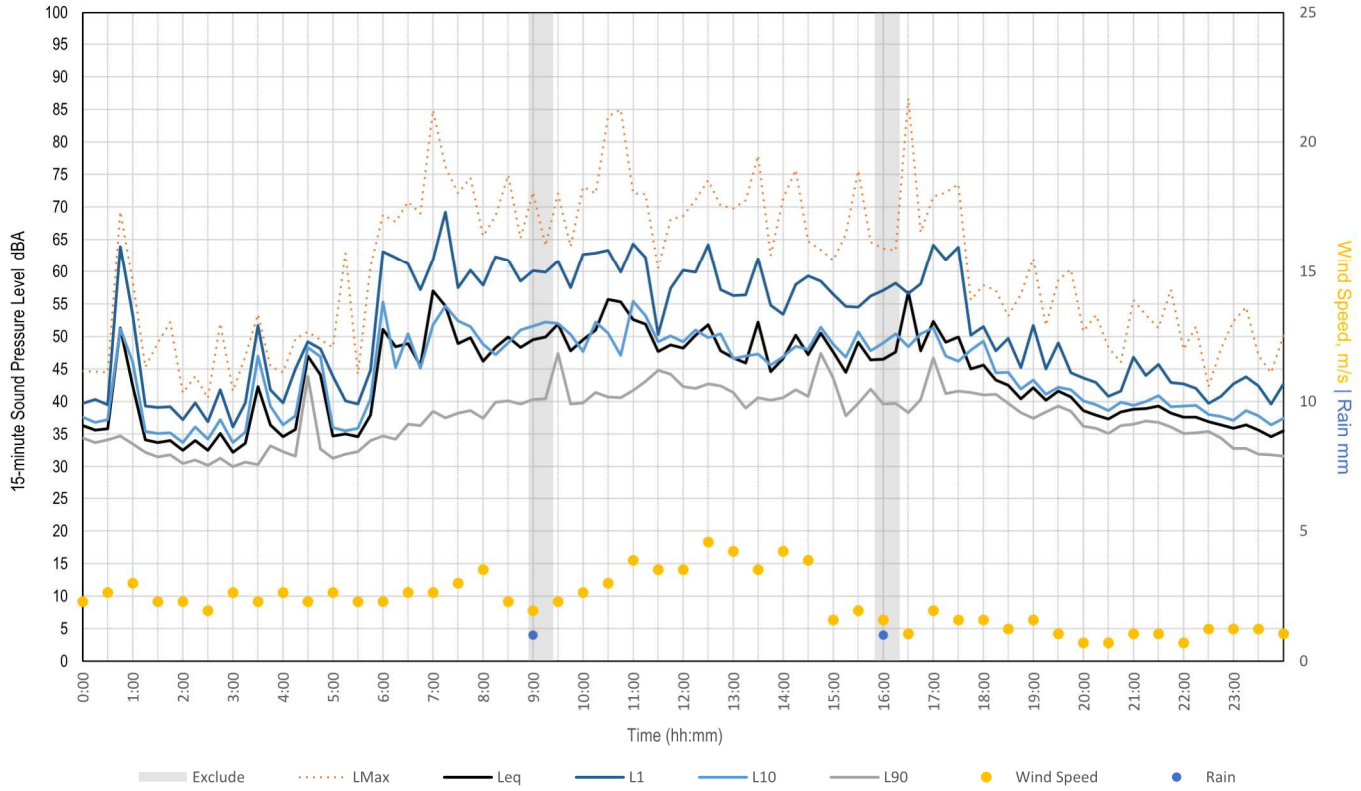
Saturday, 03 September 2022



Noise Logger Results

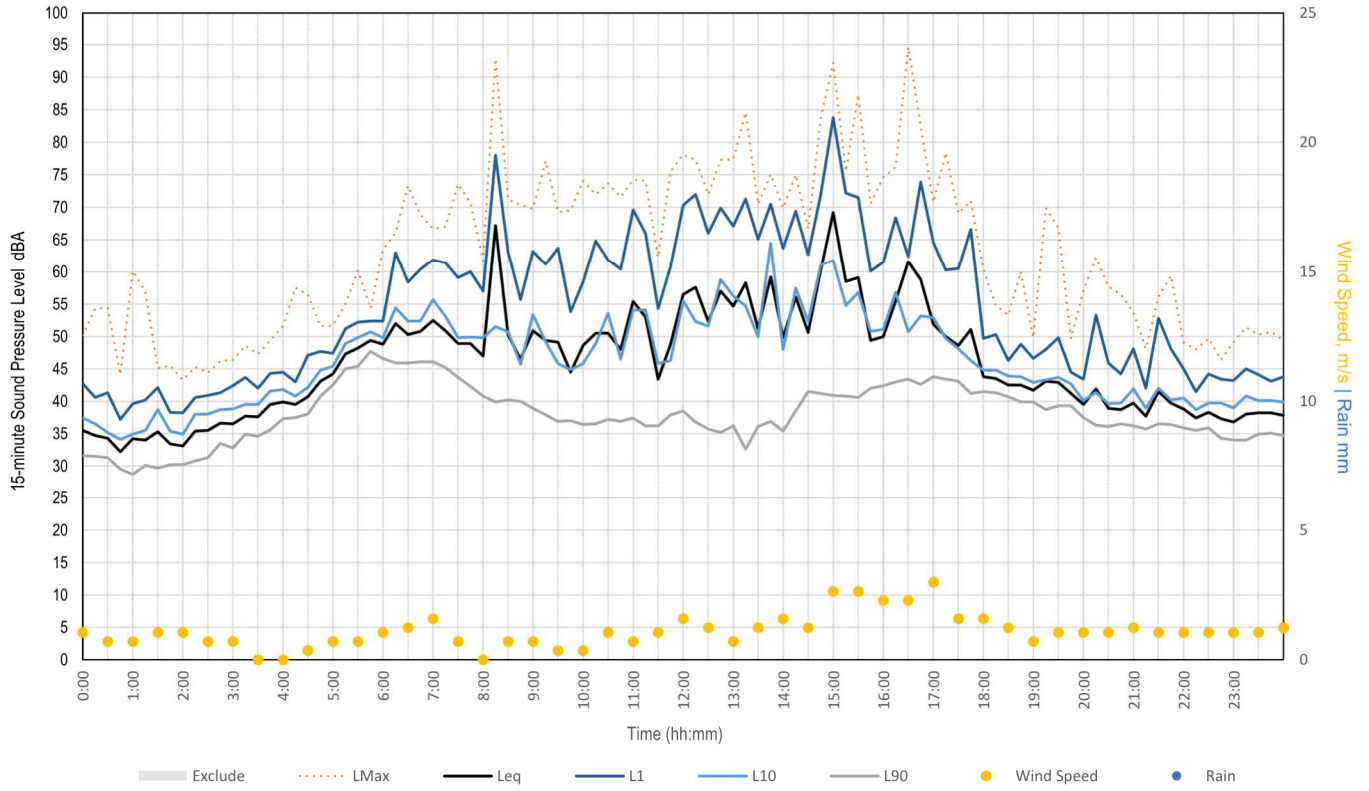
Measured Noise Levels - M12 - 21 Player Street (St Marys)

Sunday, 04 September 2022



Measured Noise Levels - M12 - 21 Player Street (St Marys)

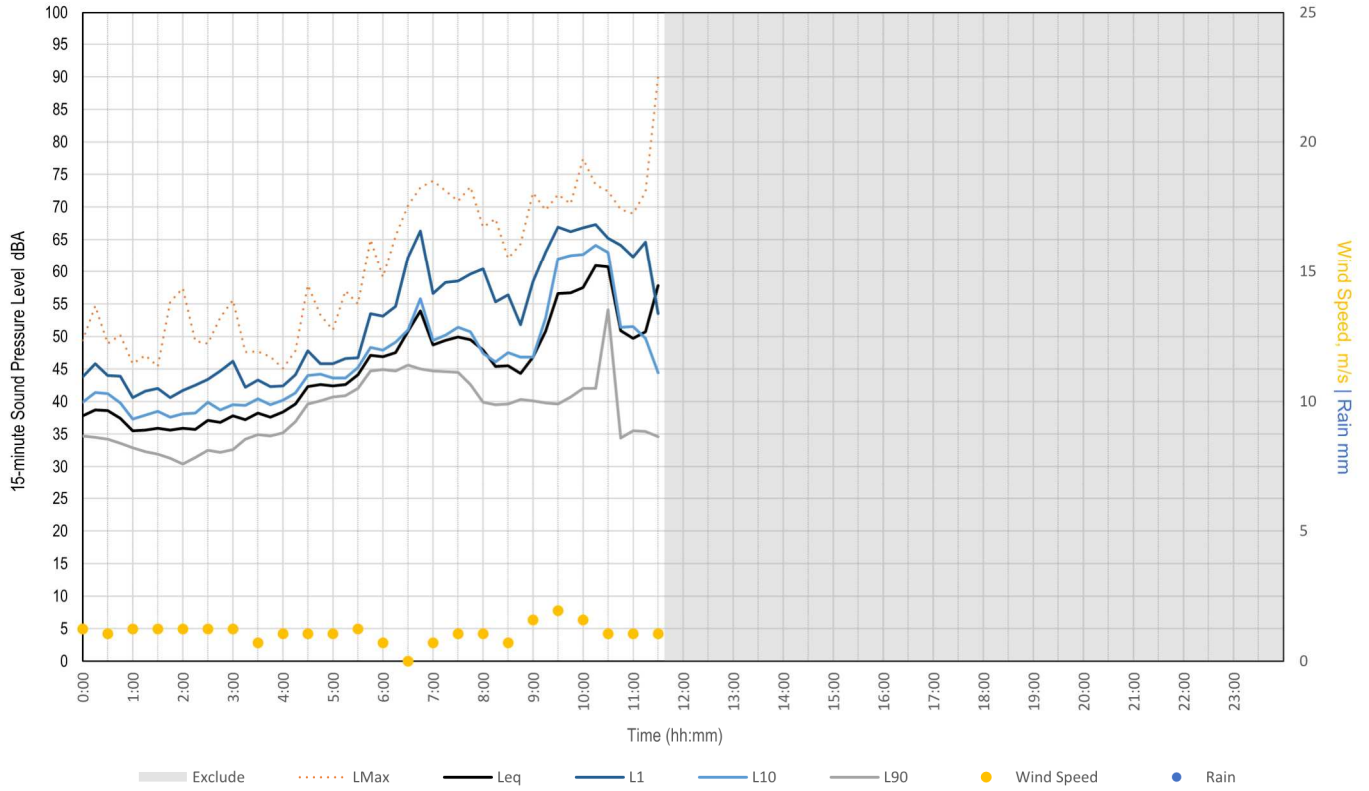
Monday, 05 September 2022



Noise Logger Results

Measured Noise Levels - M12 - 21 Player Street (St Marys)

Tuesday, 06 September 2022



Background Noise Monitoring

Location	M13 - 6 Waratah Street (Rooty Hill)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment				
Equipment	**Model:**	Rion NL-42	**Serial No. :**	785237
Calibration	**Pre:**	93.6 dBA	**Post:**	94.2 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-05718-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Tuesday, 06 Sep 2022
No. of days	29
No. of nights	28

Weather	
Station	BoM
Station Info	Horsley Park Equestrian
Distance	≤ 10km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within the backyard.

Located ≥ 3 metres away from any reflective surfaces other than the ground (e.g. house façade, and metal fence).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}
1	Day	9/08/2022	11:45:58 AM	12:00:58 PM	63	45	45	40
2	Day	9/08/2022	12:00:58 PM	12:15:58 PM	71	44	44	39
3	Day	9/08/2022	12:15:58 PM	12:30:58 PM	66	42	43	38
4	Day	9/08/2022	12:30:58 PM	12:45:58 PM	53	41	43	39

* Not possible to access site during evening and night due to personal safety and/or access issues. No audio available for remote attended.

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Various impulsive animal sounds (e.g. birds, occasional dog barks). Residential activities at adjacent properties (e.g. doors closing, people talking, and motor revving). Helicopter observed to fly directly above for less than a minute. Several aircraft movements were noted mostly at distance but some passing at closer range. Movements were of approximately 1 min duration with maximum sound level in the range of 44 to 56 dBA.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling), constant traffic at distance.

Site Details	M13 - 6 Waratah Street (Rooty Hill)
Start Date	Tue 09 August 2022
End Date	Tue 06 September 2022

Summary	**Average (dBA)**
$L_{eq,\ Day}$ dBA	54
$L_{eq,\ Evening}$ dBA	47
$L_{eq,\ Night}$ dBA	46
RBL, $_{Day}$ dBA	38
RBL, $_{Evening}$ dBA	40
RBL, $_{Night}$ dBA	36

Daily Summary

Date	09-08	10-08	11-08	12-08	13-08	14-08	15-08	16-08
$L_{eq,\ Day}$ dBA	50	46	47	49	61	53	48	46
$L_{eq,\ Evening}$ dBA	47	44	48	48	45	47	47	46
$L_{eq,\ Night}$ dBA	43	44	47	52	43	45	46	45
ABL, $_{Day}$ dBA	38	35	41	45	37	41	41	37
ABL, $_{Evening}$ dBA	38	37	43	41	40	41	42	36
ABL, $_{Night}$ dBA	36	34	39	31	36	36	36	34

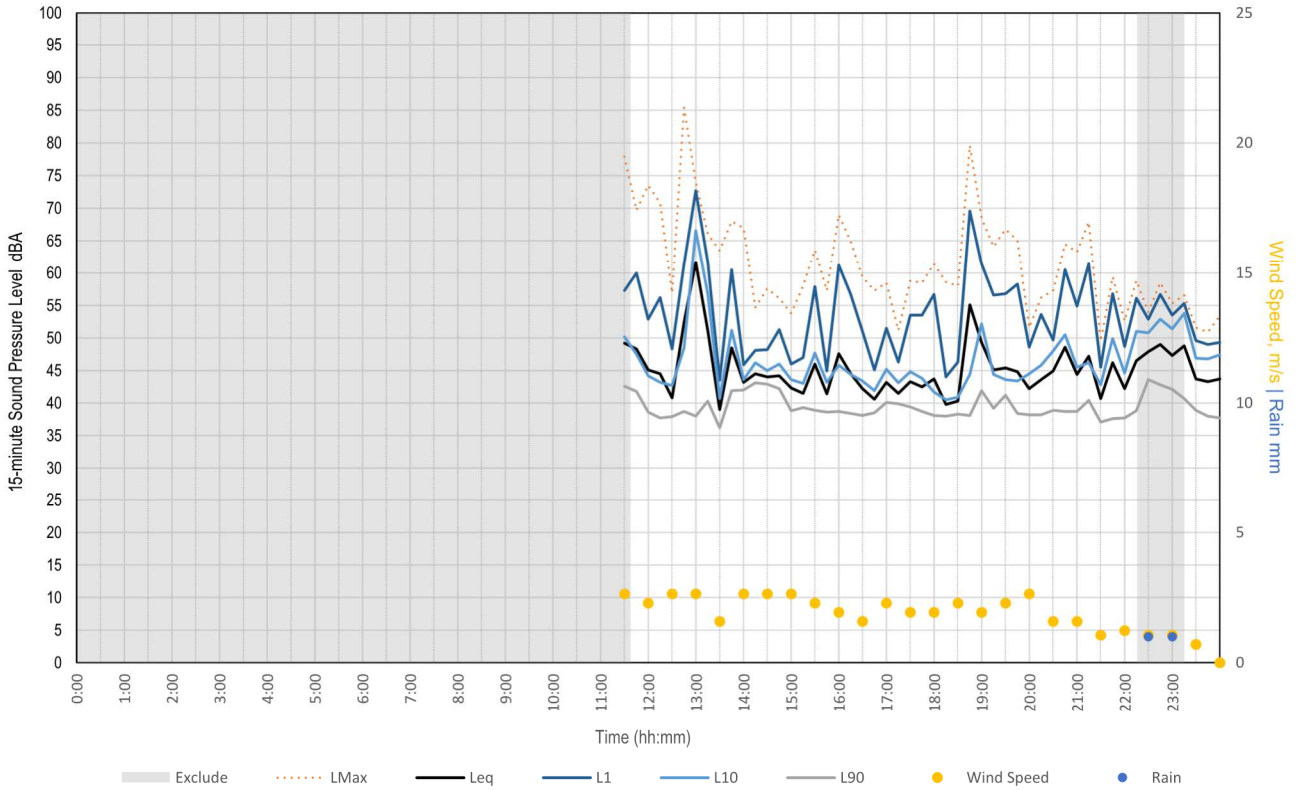
Date	17-08	18-08	19-08	20-08	21-08	22-08	23-08	24-08
$L_{eq,\ Day}$ dBA	48	45	49	46	43	52	58	46
$L_{eq,\ Evening}$ dBA	45	46	44	43	46	46	55	45
$L_{eq,\ Night}$ dBA	45	48	44	41	47	47	45	48
ABL, $_{Day}$ dBA	34	38	37	39	33	41	45	37
ABL, $_{Evening}$ dBA	38	41	38	37	42	42	48	40
ABL, $_{Night}$ dBA	35	38	36	28	37	39	36	36

Date	25-08	26-08	27-08	28-08	29-08	30-08	31-08	01-09
$L_{eq,\ Day}$ dBA	47	47	47	48	46	53	46	64
$L_{eq,\ Evening}$ dBA	44	45	45	47	46	47	46	49
$L_{eq,\ Night}$ dBA		43	43	43	48	46	41	44
ABL, $_{Day}$ dBA	37	37	35	36	38	44	37	38
ABL, $_{Evening}$ dBA	37	37	38	40	40	41	36	41
ABL, $_{Night}$ dBA	34	33	32	37	40	36	33	37

Date	02-09	03-09	04-09	05-09	06-09
$L_{eq,\ Day}$ dBA	45	55	48	48	47
$L_{eq,\ Evening}$ dBA	45	45	43	46	
$L_{eq,\ Night}$ dBA	45	45	45	43	
ABL, $_{Day}$ dBA	38	40	40	35	35
ABL, $_{Evening}$ dBA	38	41	37	38	
ABL, $_{Night}$ dBA	35	35	34	34	

Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

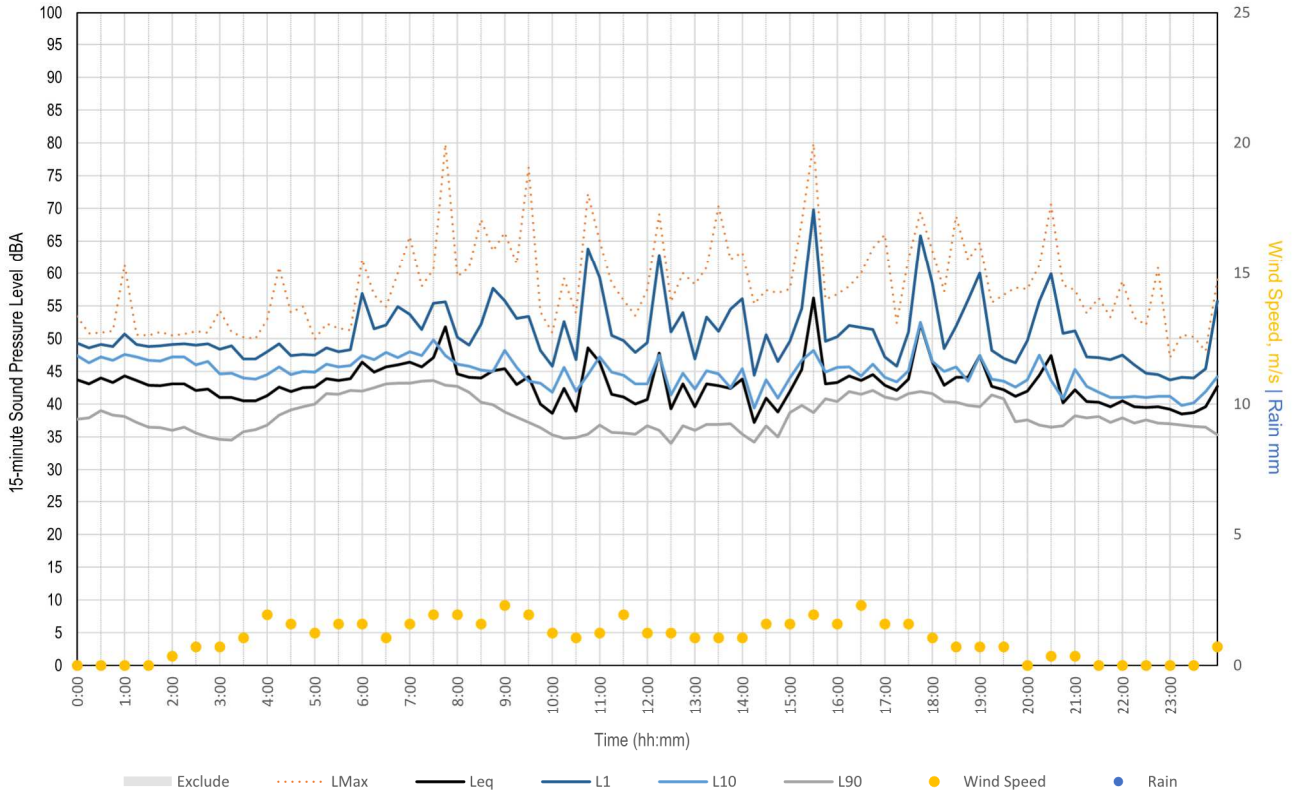
Tuesday, 09 August 2022



Noise Logger Results

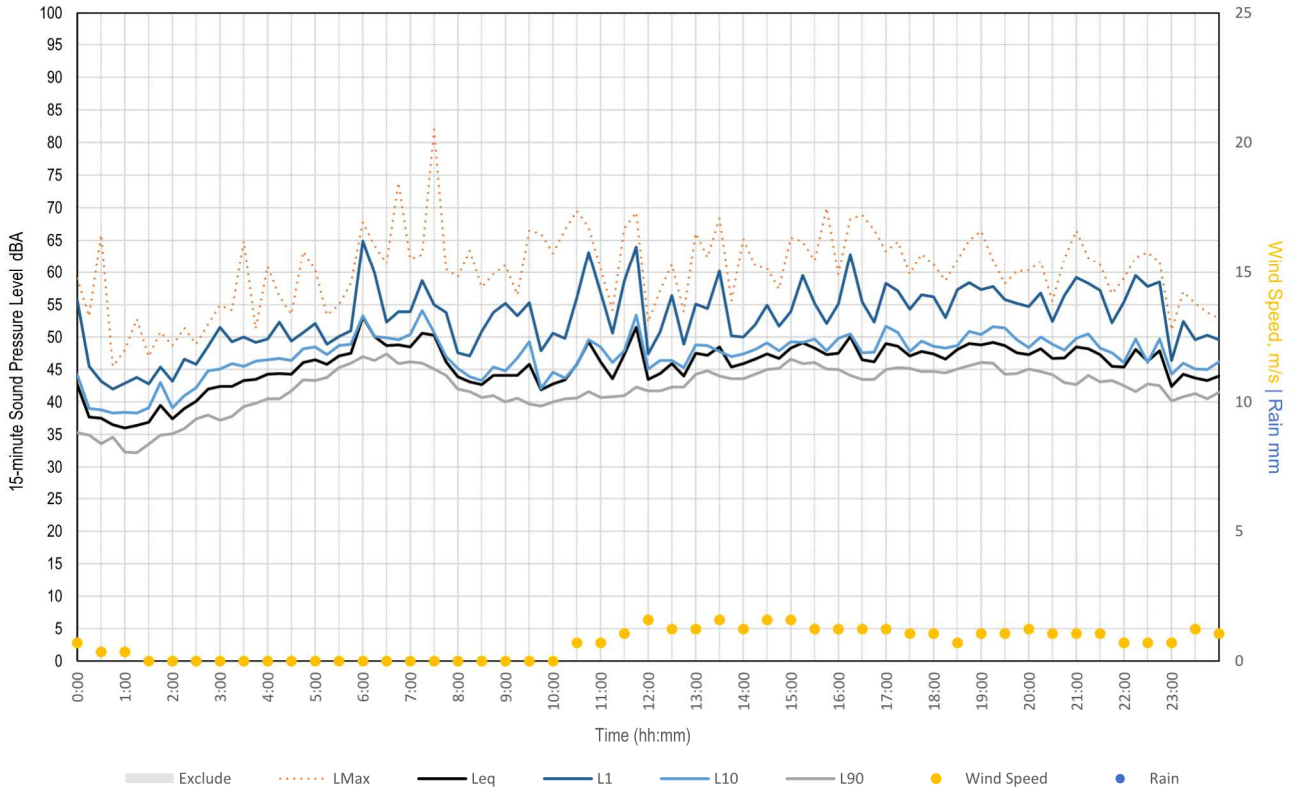
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Wednesday, 10 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

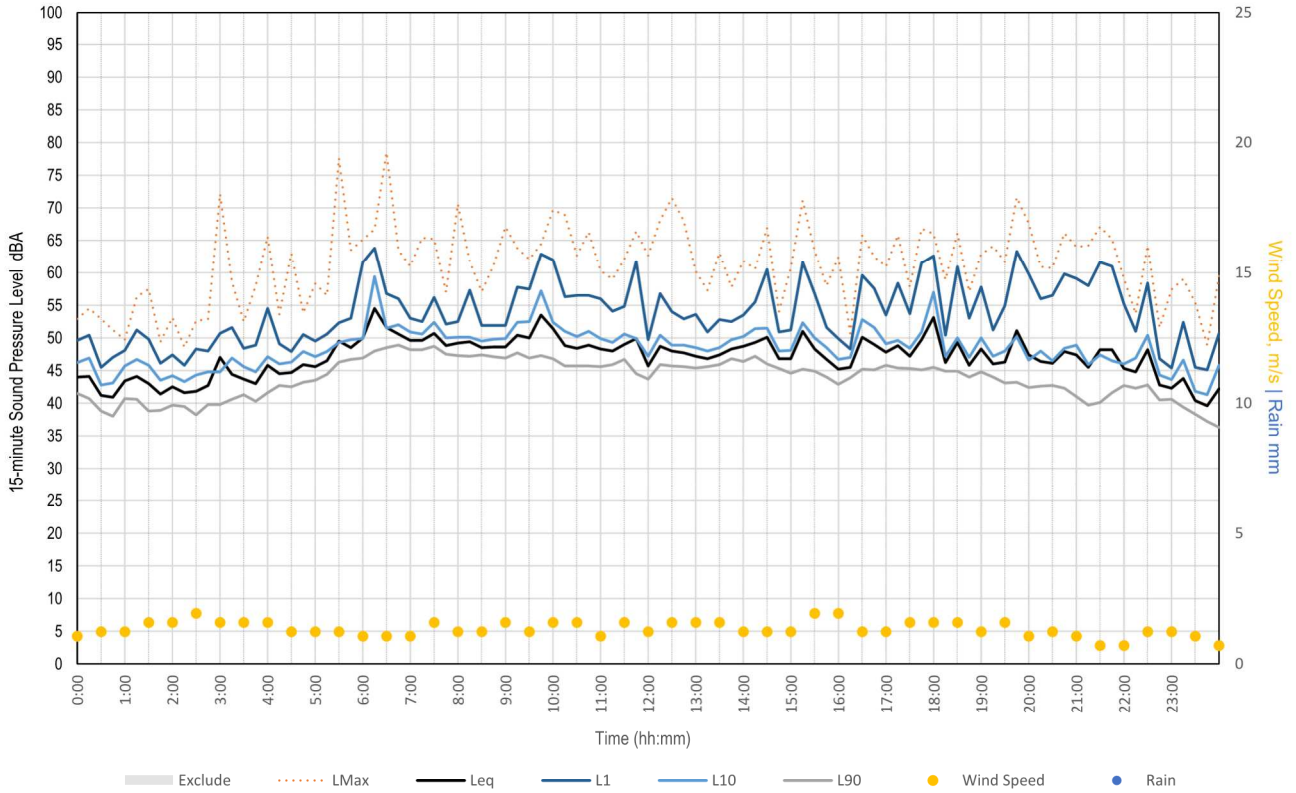
Thursday, 11 August 2022



Noise Logger Results

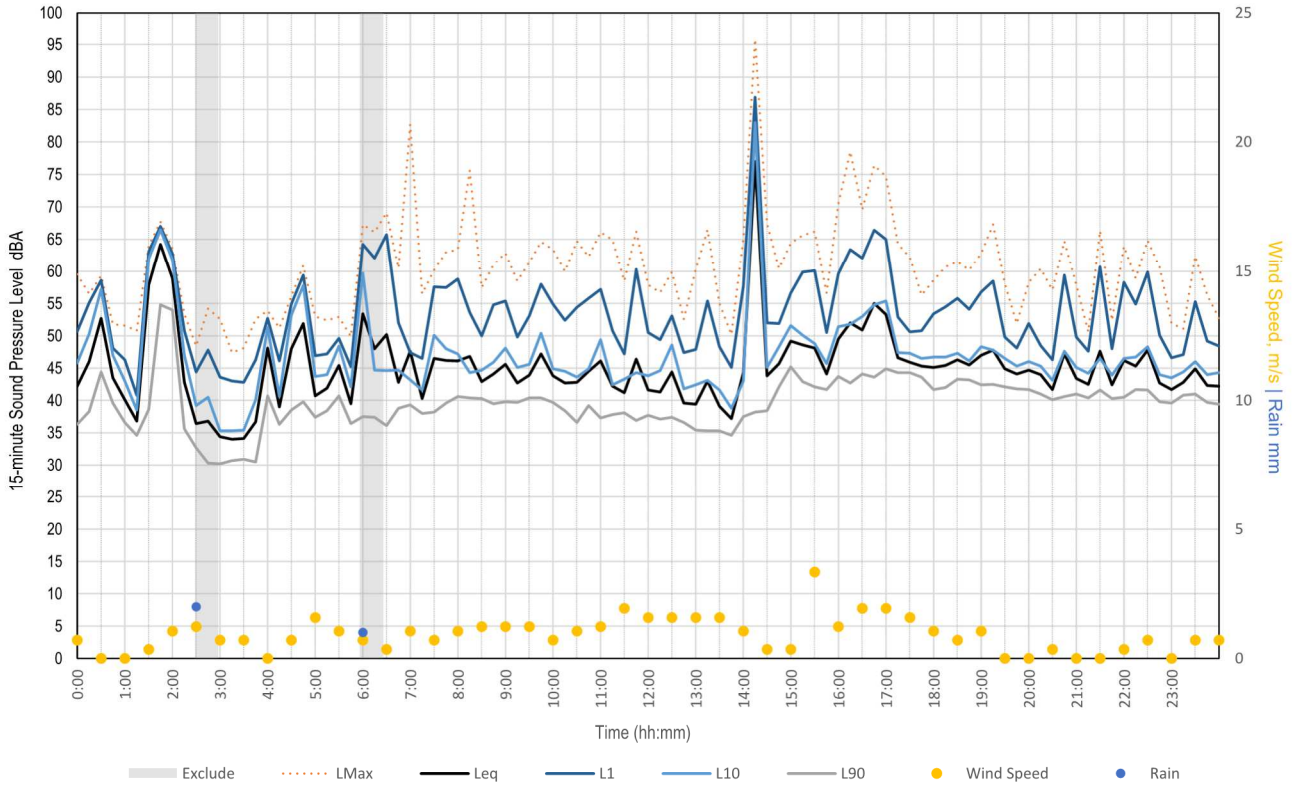
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Friday, 12 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

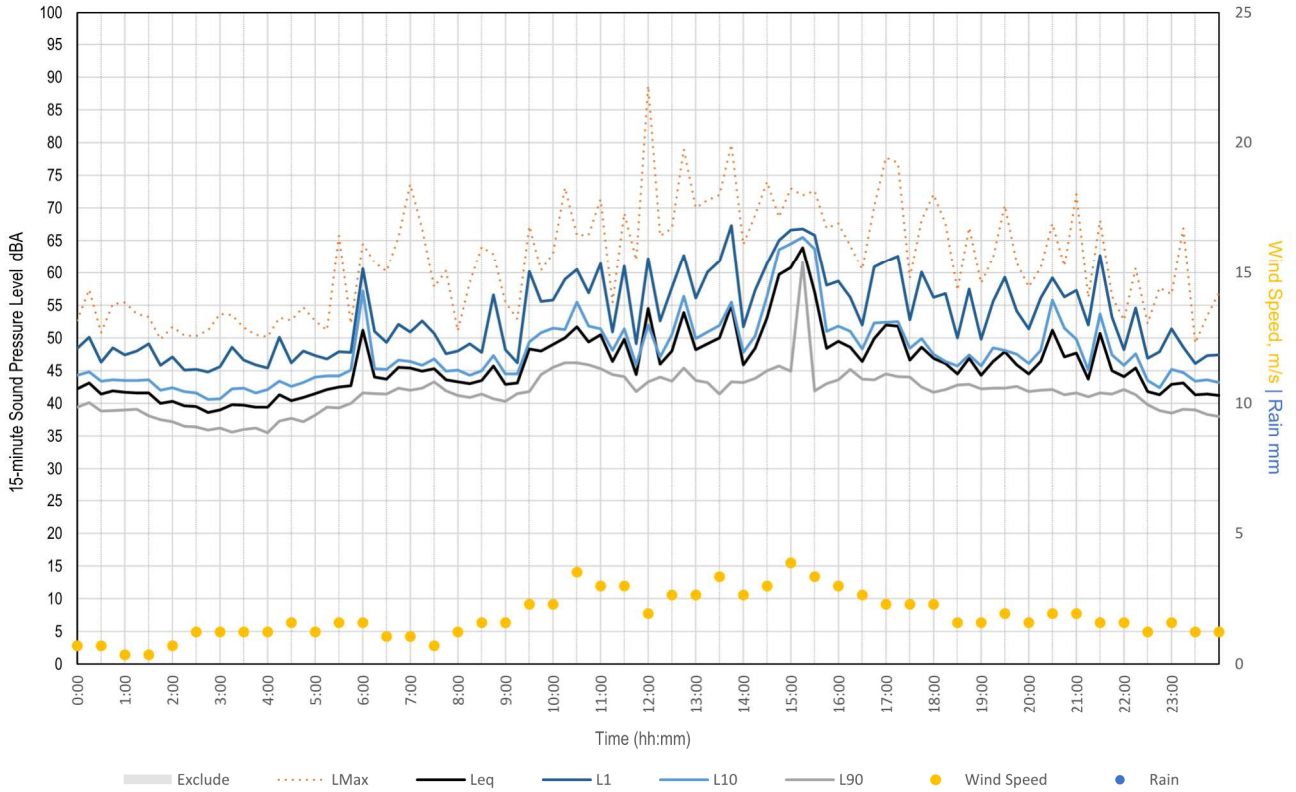
Saturday, 13 August 2022



Noise Logger Results

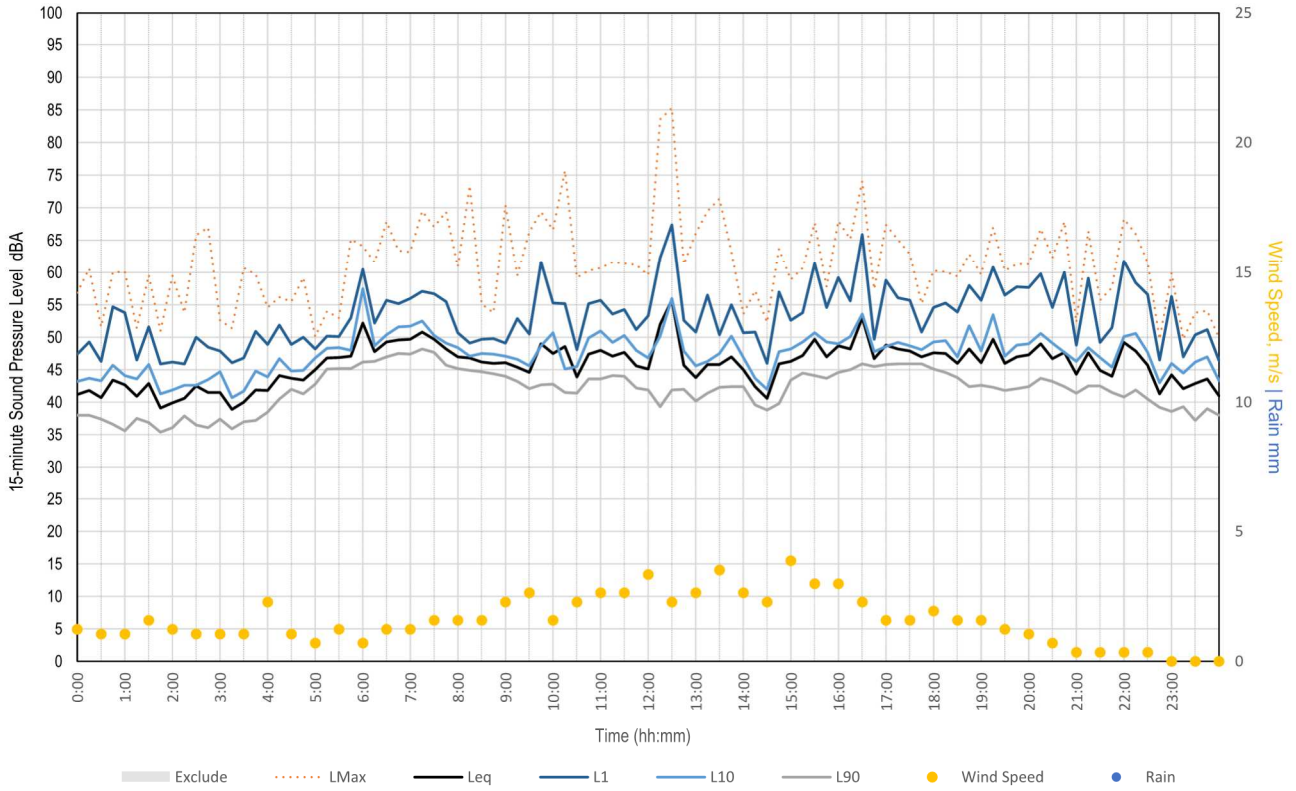
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Sunday, 14 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

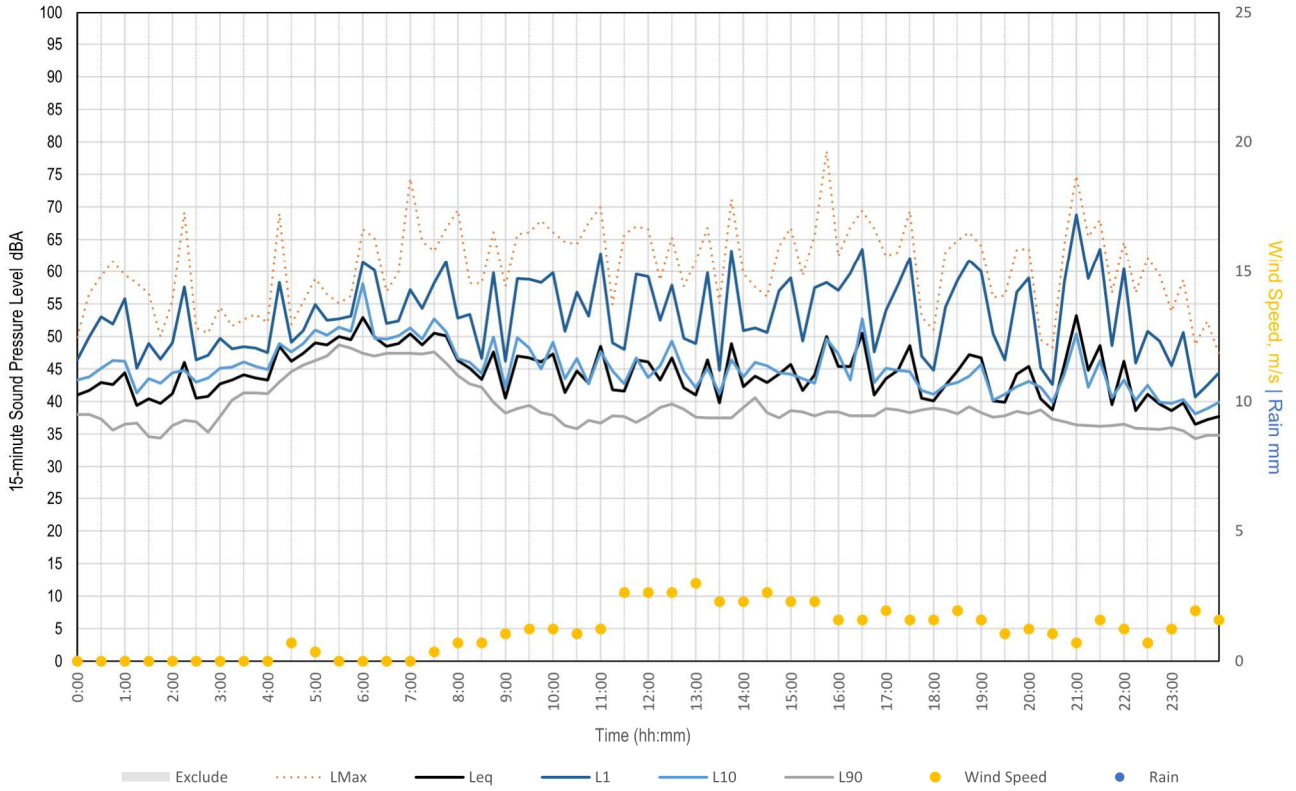
Monday, 15 August 2022



Noise Logger Results

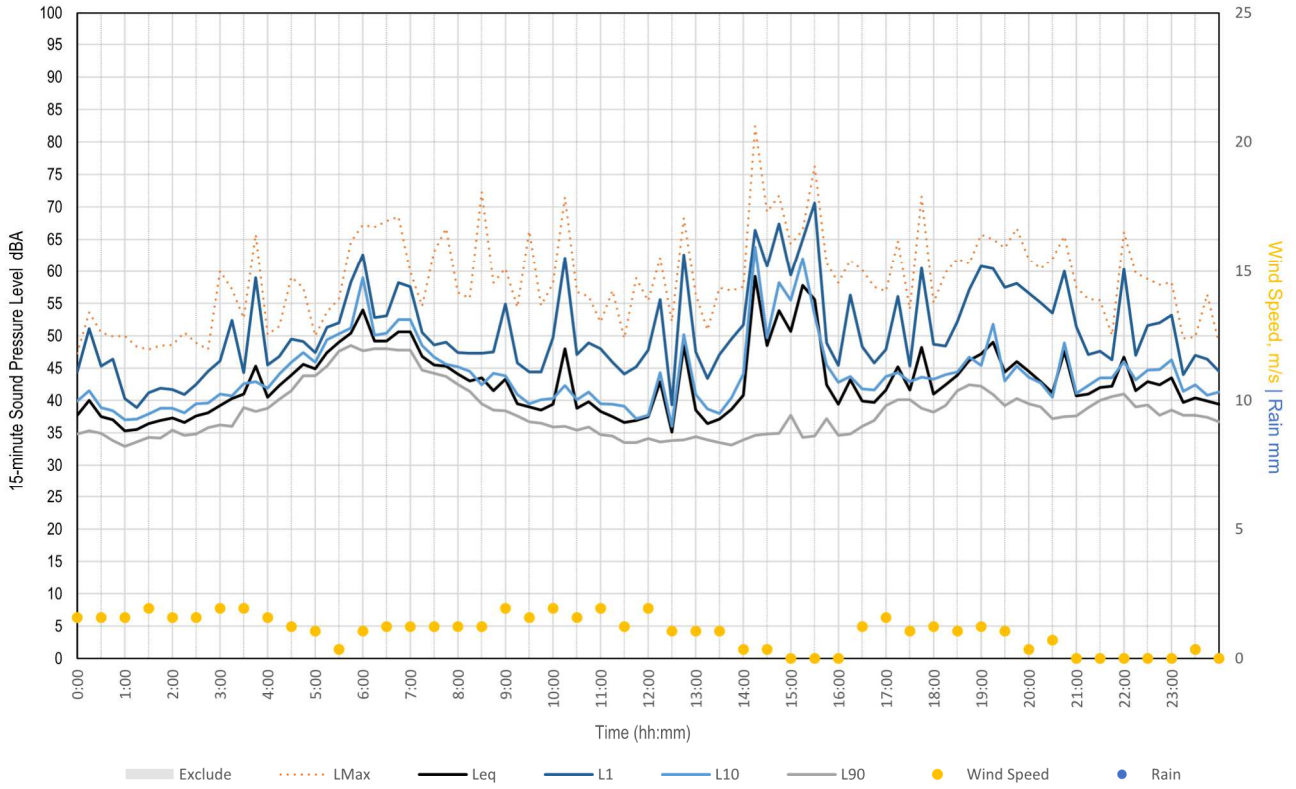
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Tuesday, 16 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

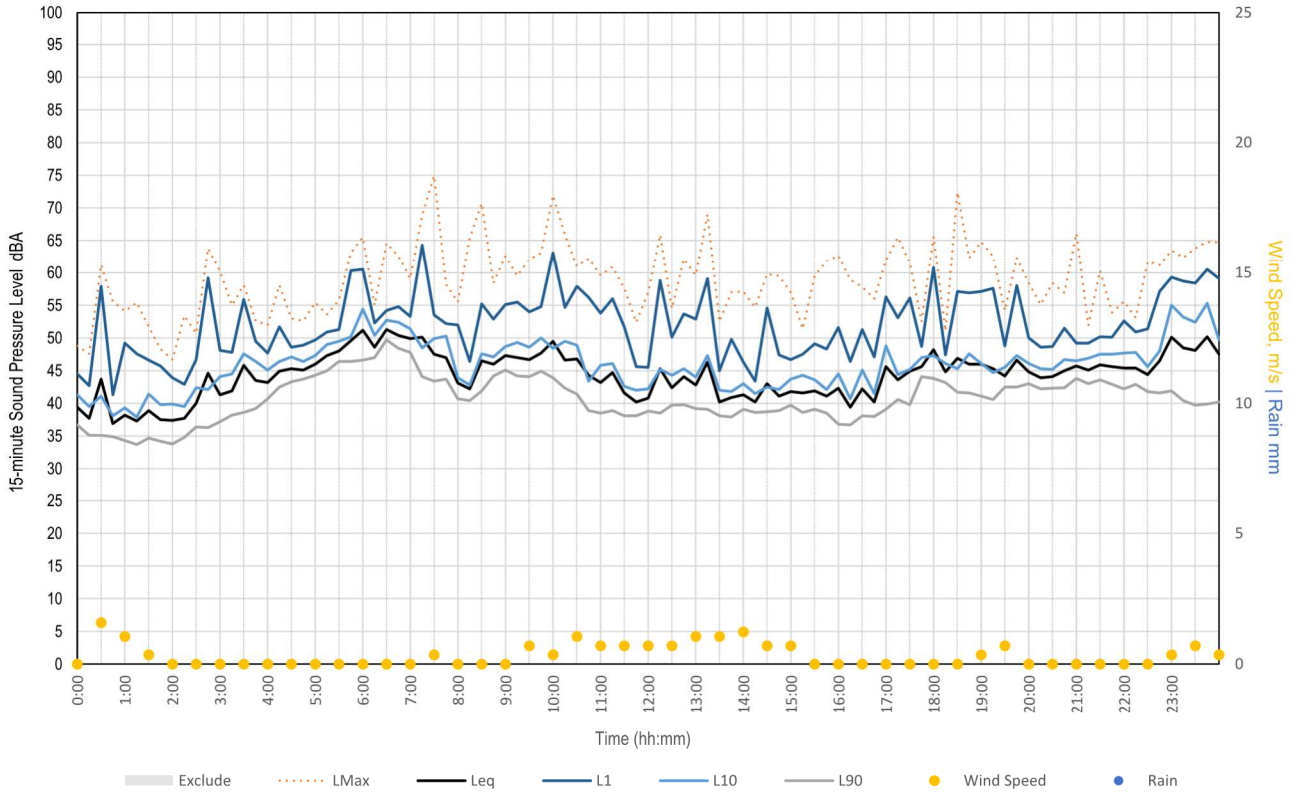
Wednesday, 17 August 2022



Noise Logger Results

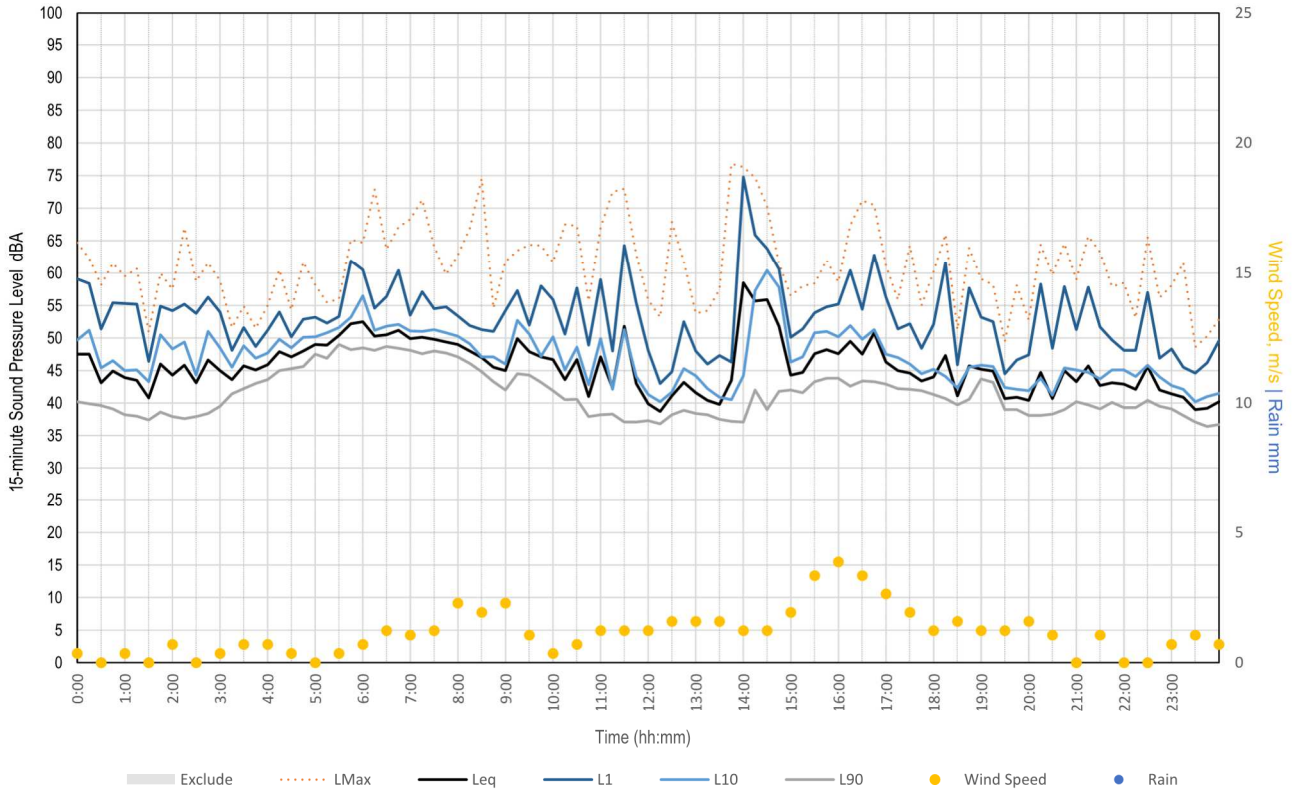
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Thursday, 18 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

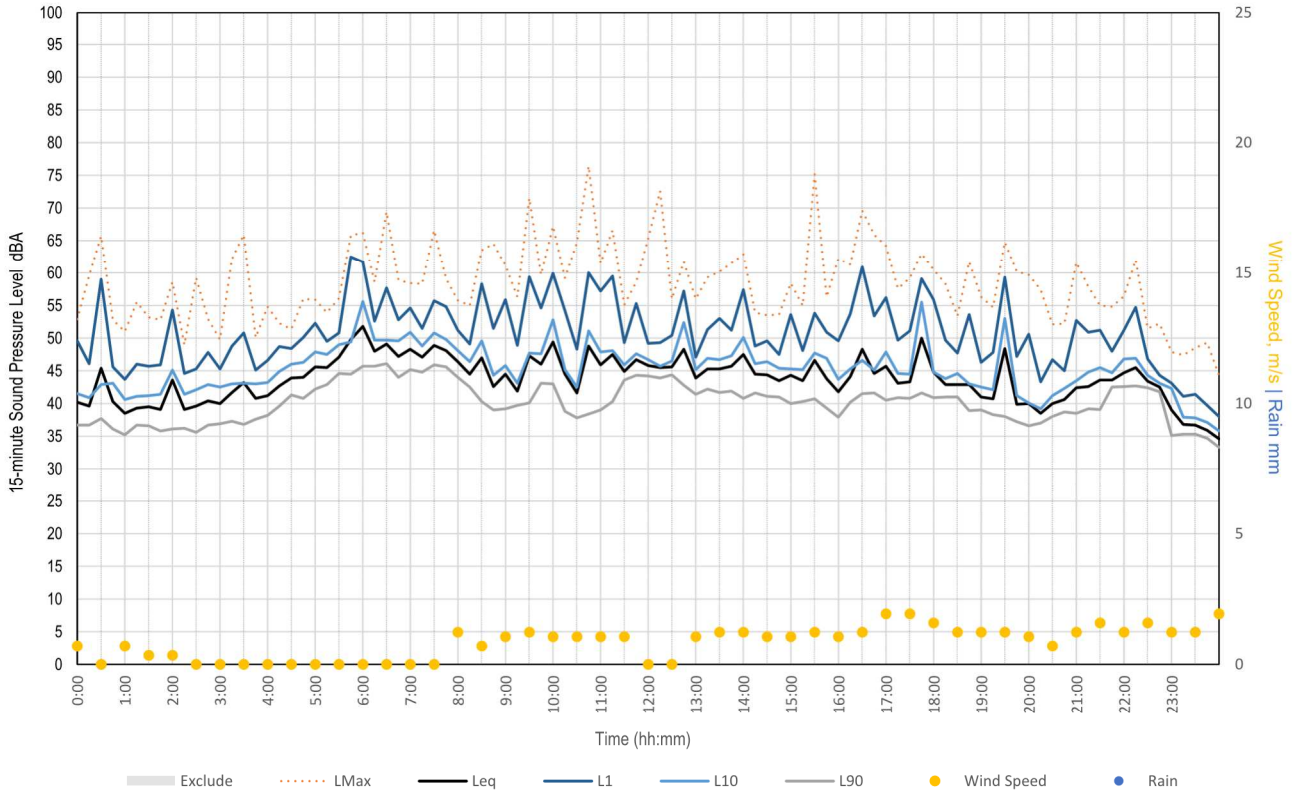
Friday, 19 August 2022



Noise Logger Results

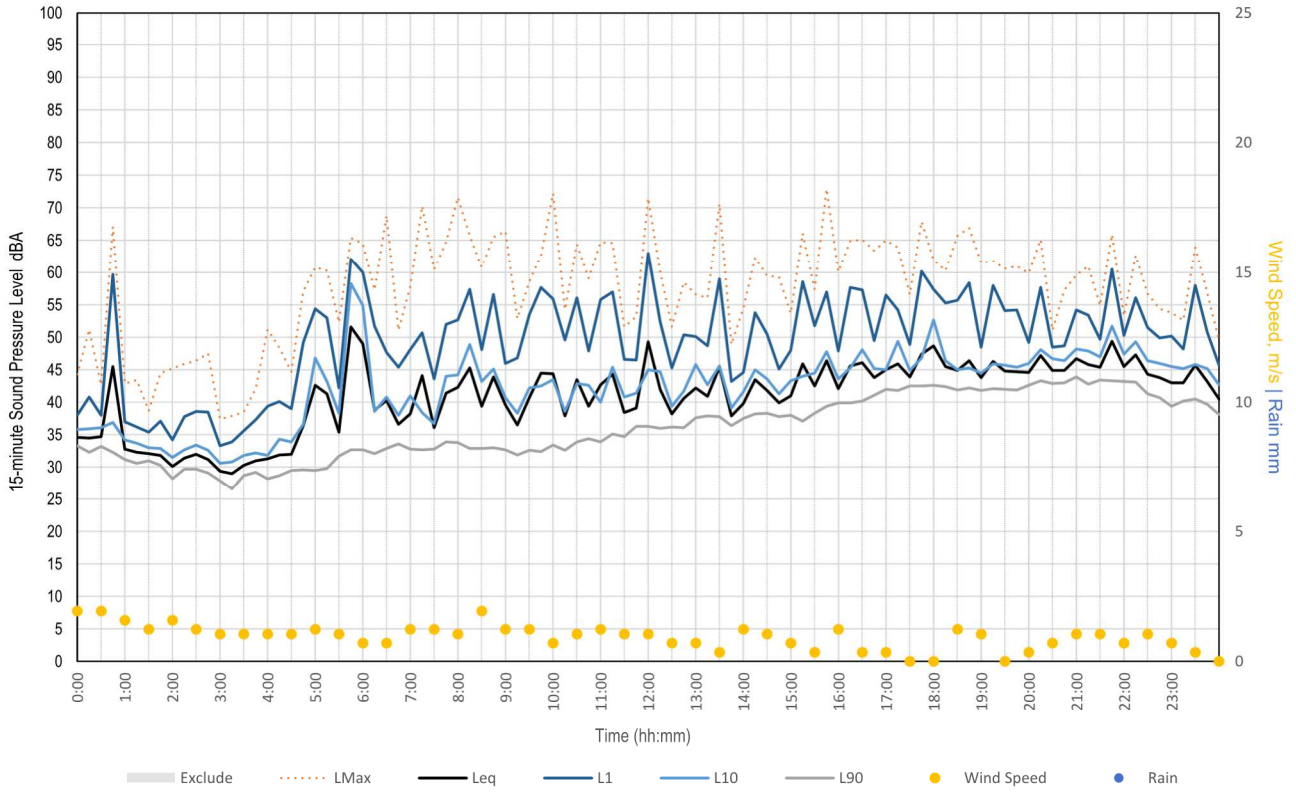
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Saturday, 20 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

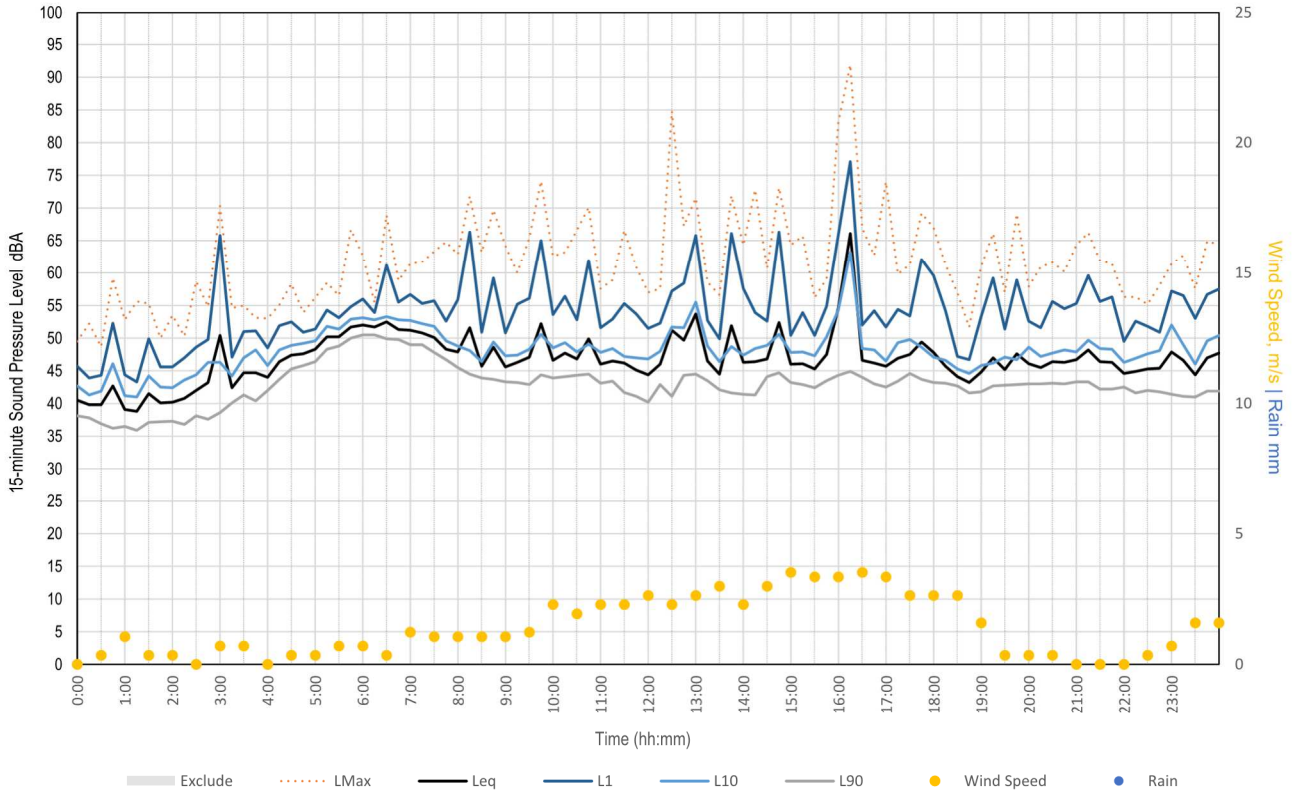
Sunday, 21 August 2022



Noise Logger Results

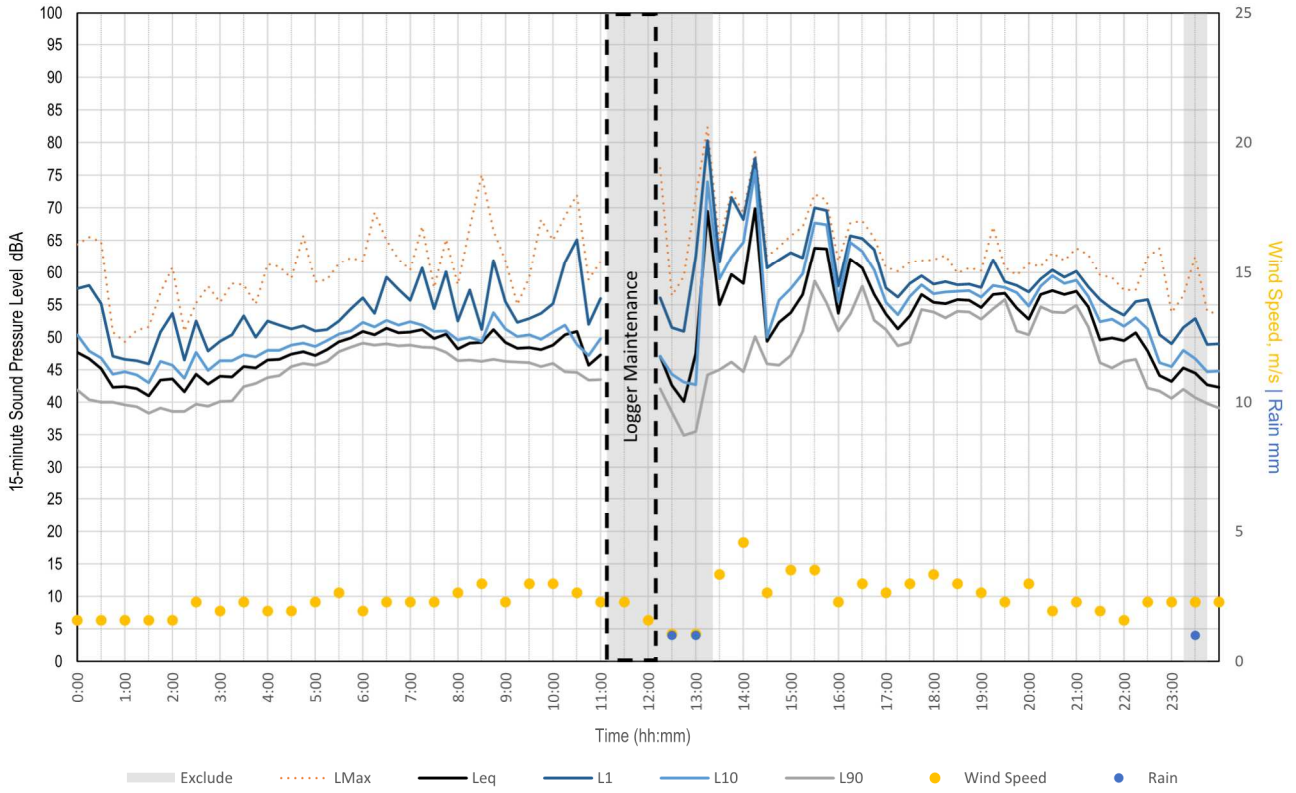
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Monday, 22 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

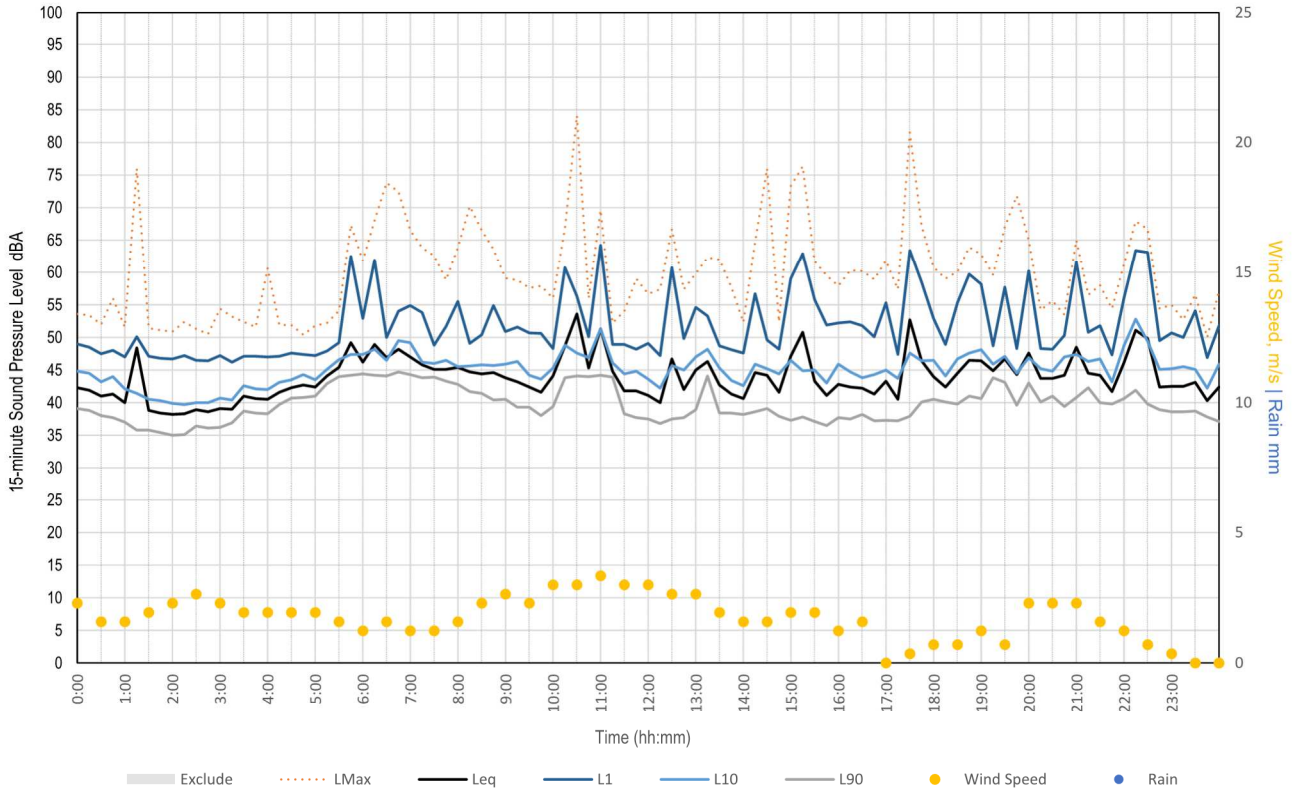
Tuesday, 23 August 2022



Noise Logger Results

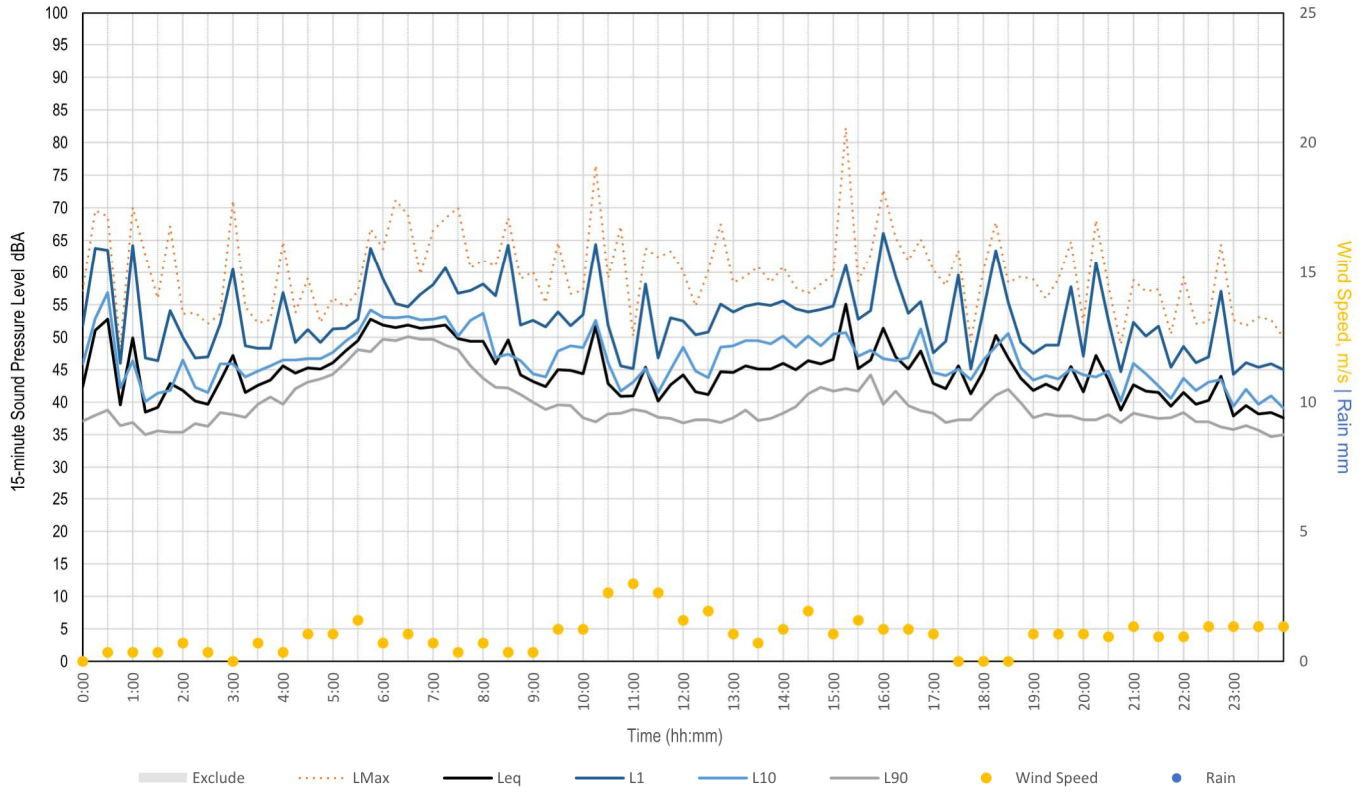
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Wednesday, 24 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

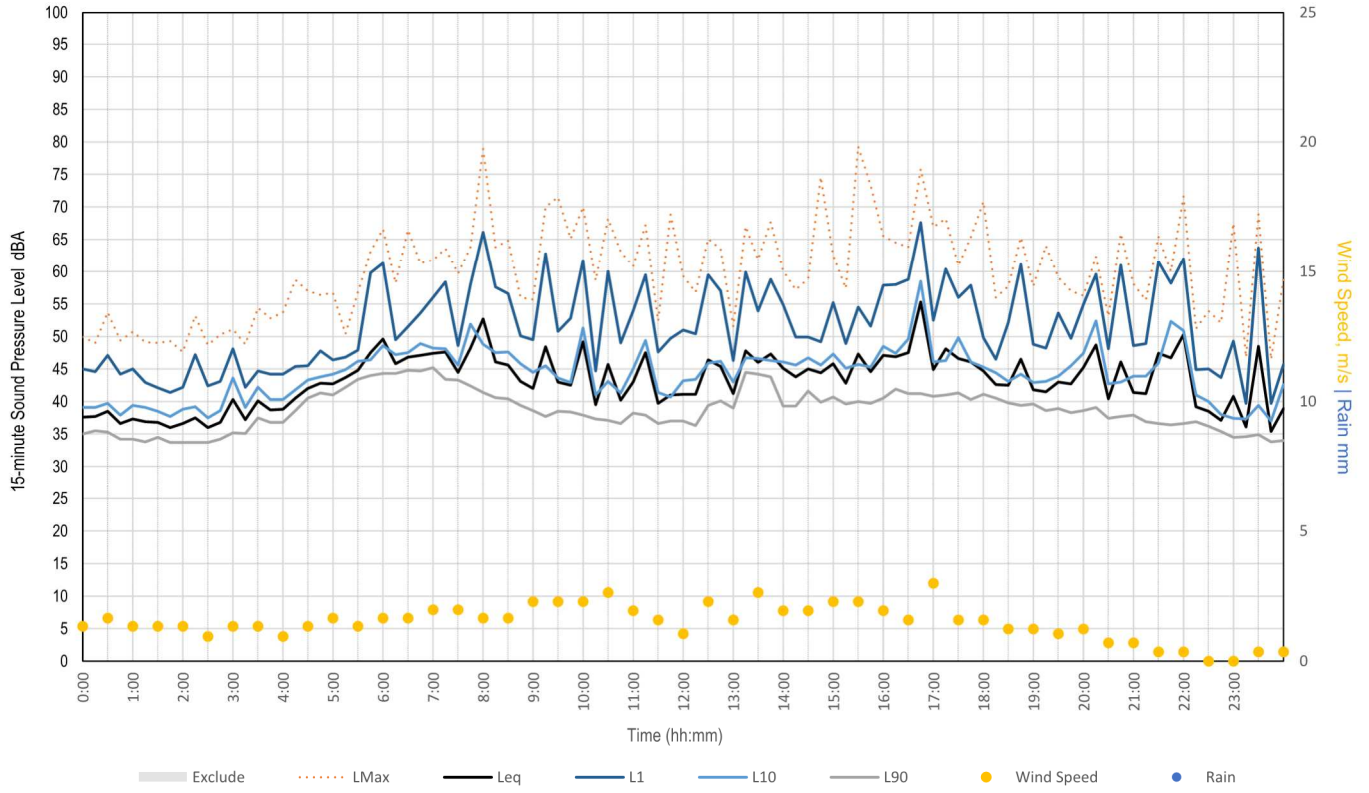
Thursday, 25 August 2022



Noise Logger Results

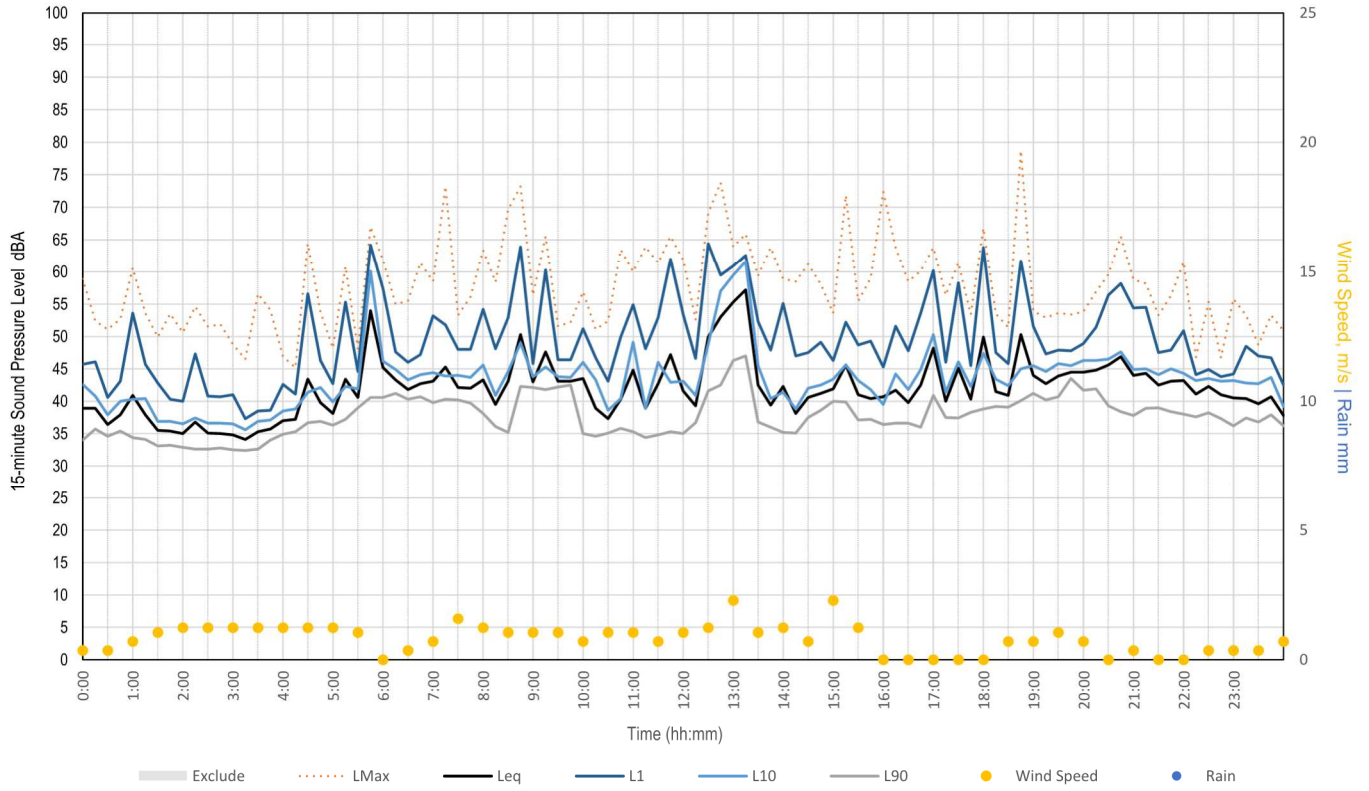
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Friday, 26 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

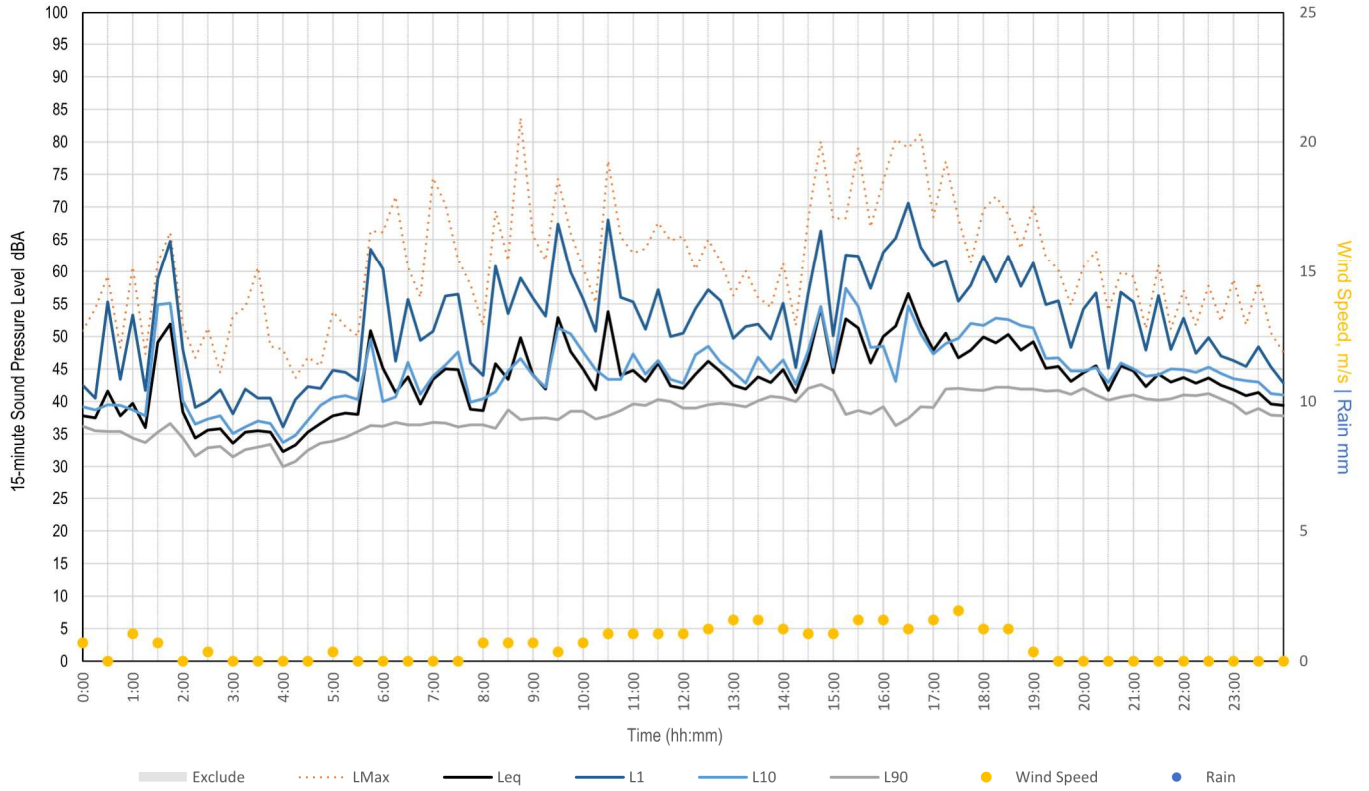
Saturday, 27 August 2022



Noise Logger Results

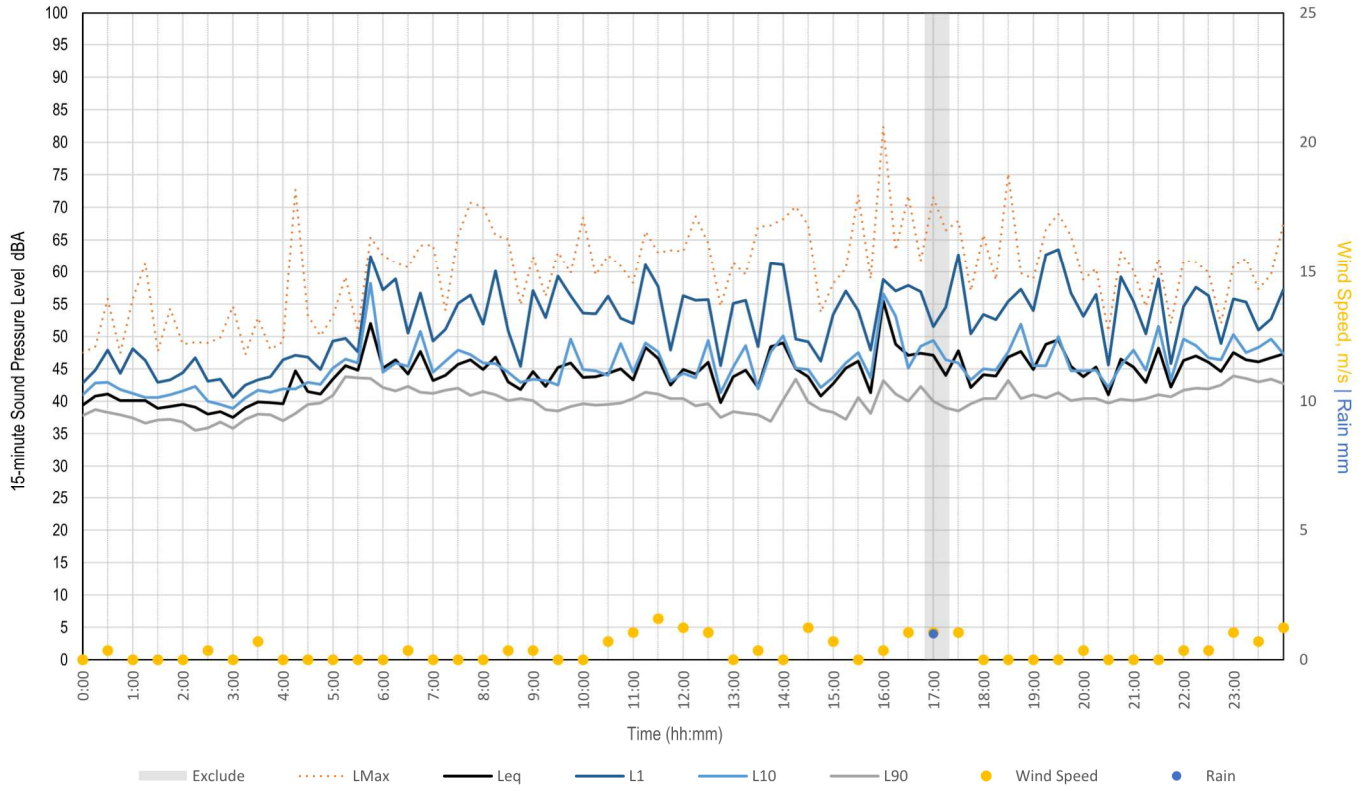
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Sunday, 28 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

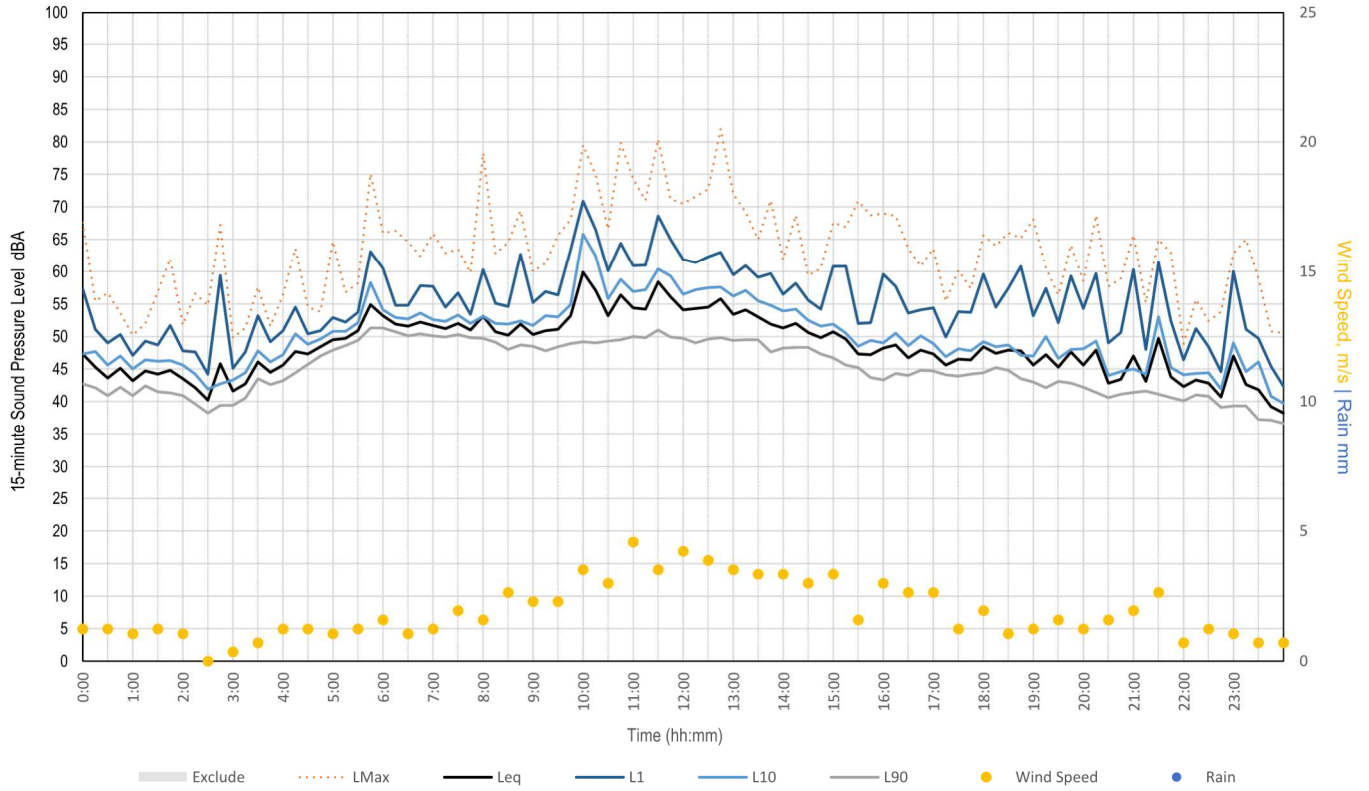
Monday, 29 August 2022



Noise Logger Results

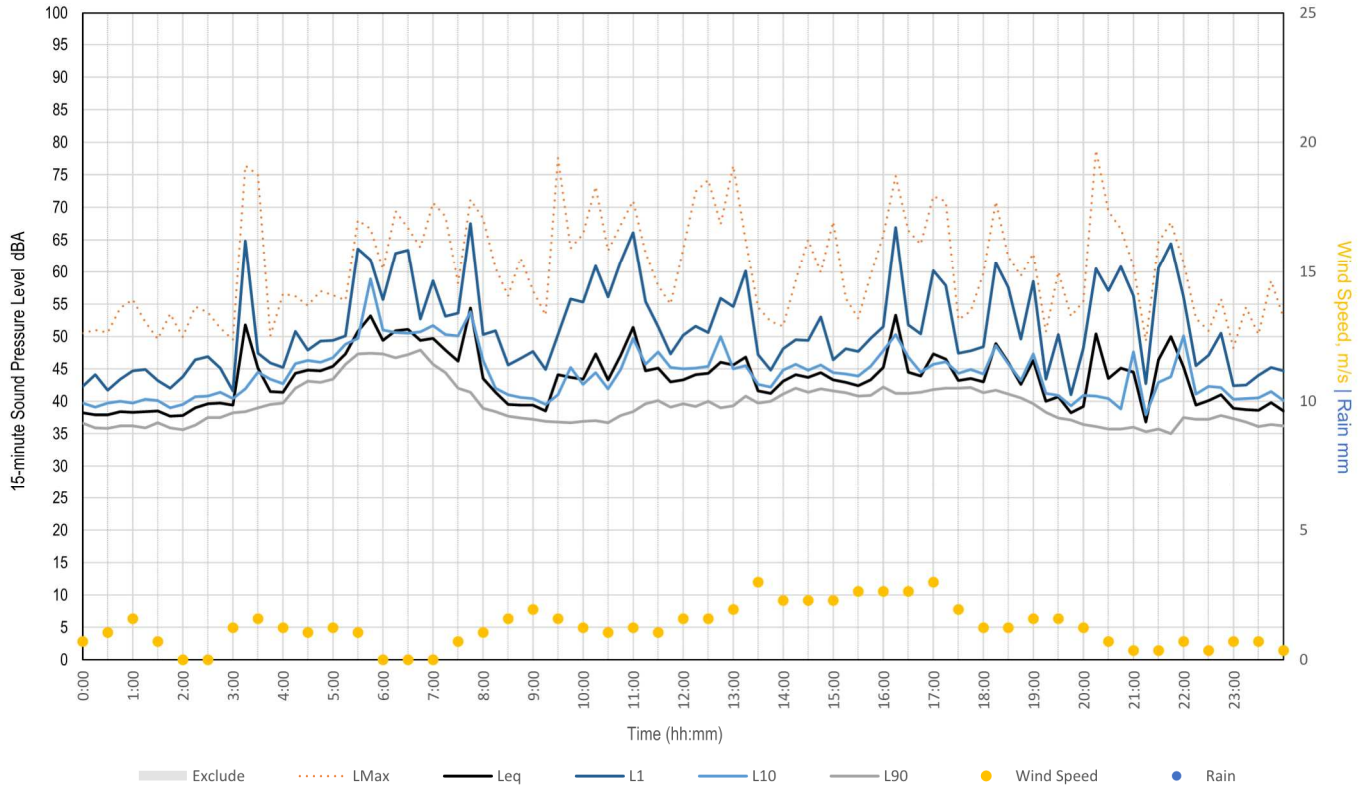
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Tuesday, 30 August 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

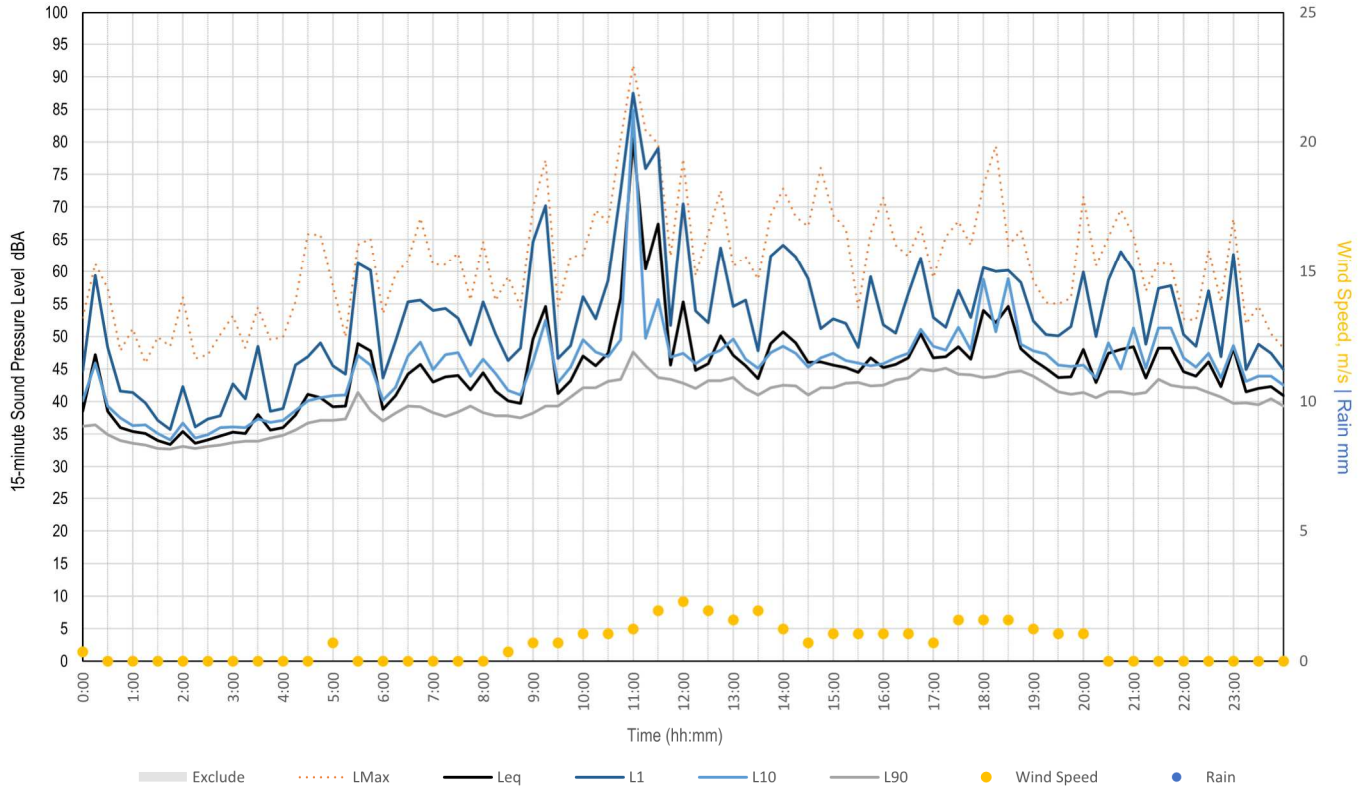
Wednesday, 31 August 2022



Noise Logger Results

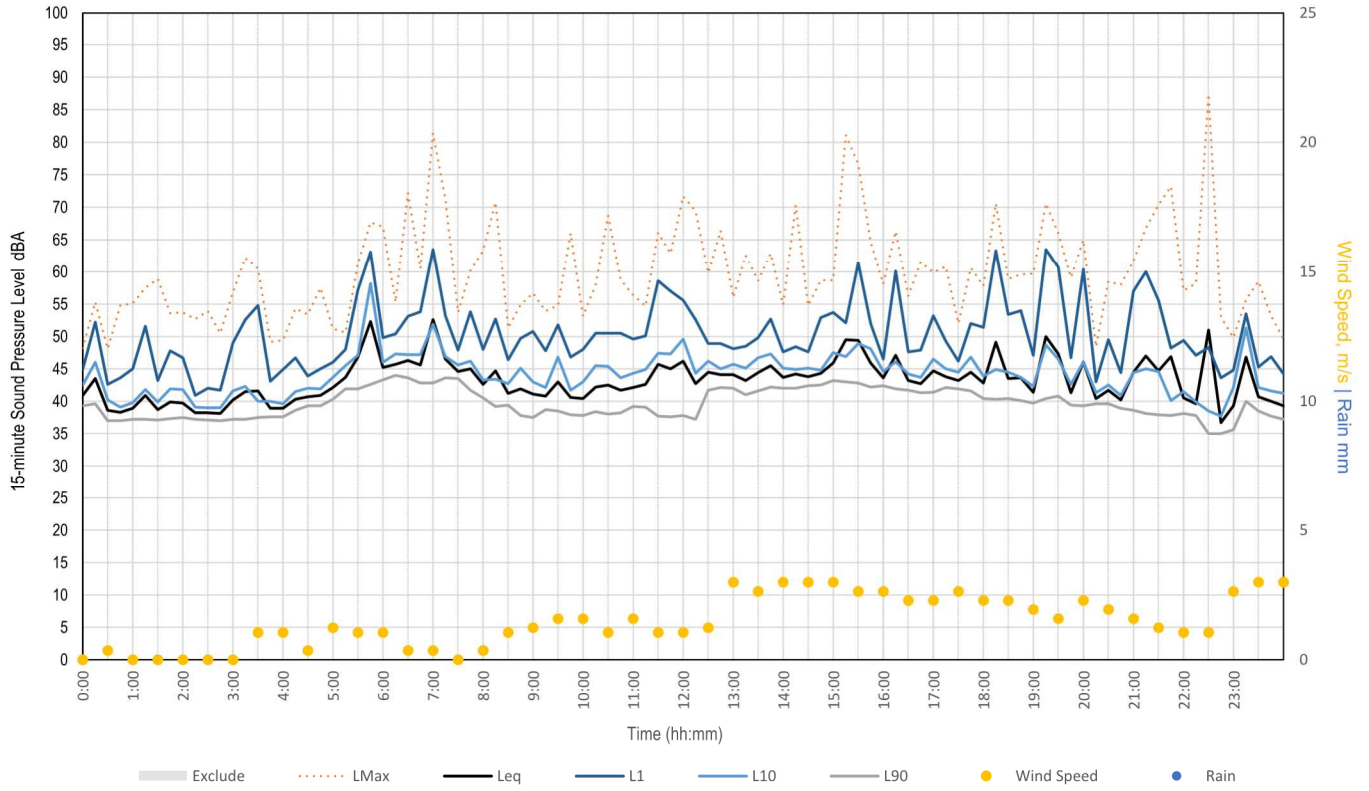
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Thursday, 01 September 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

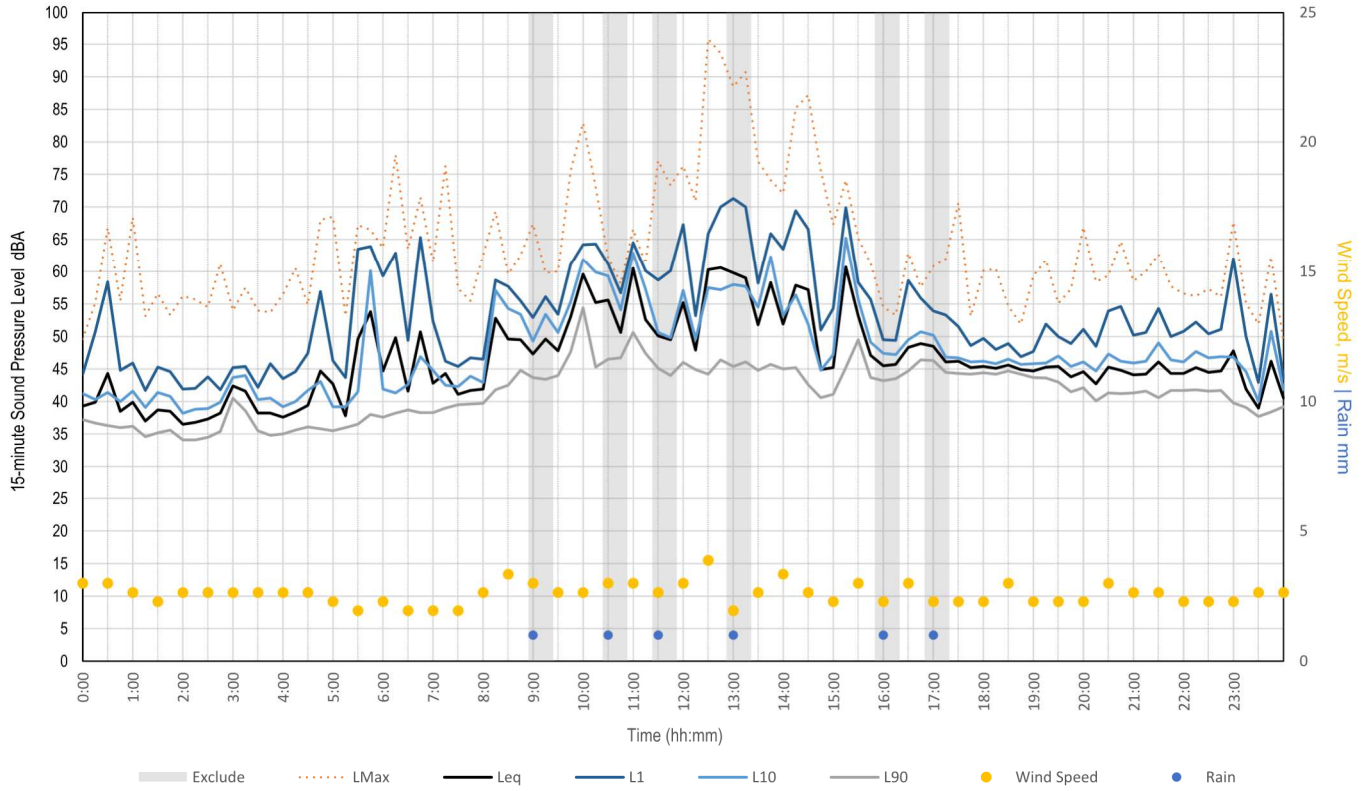
Friday, 02 September 2022



Noise Logger Results

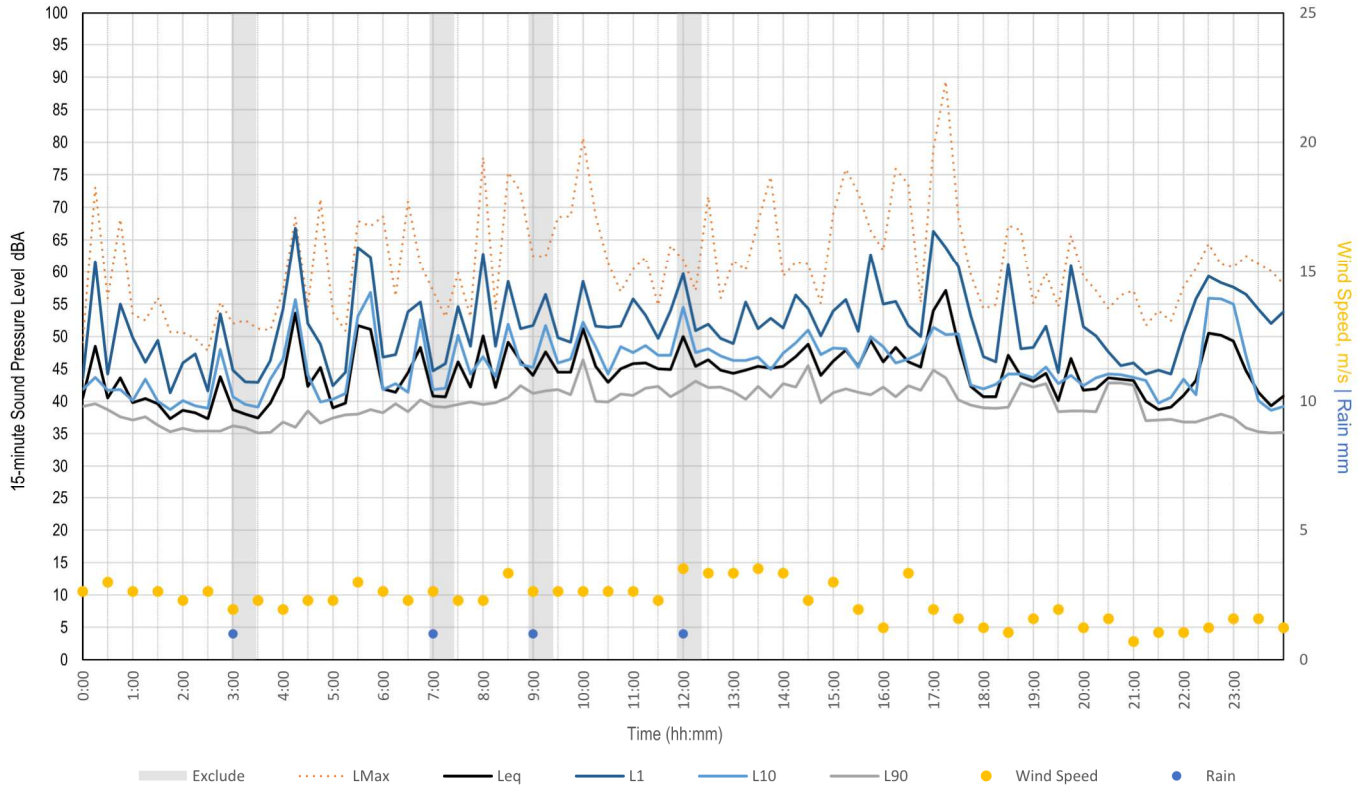
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Saturday, 03 September 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

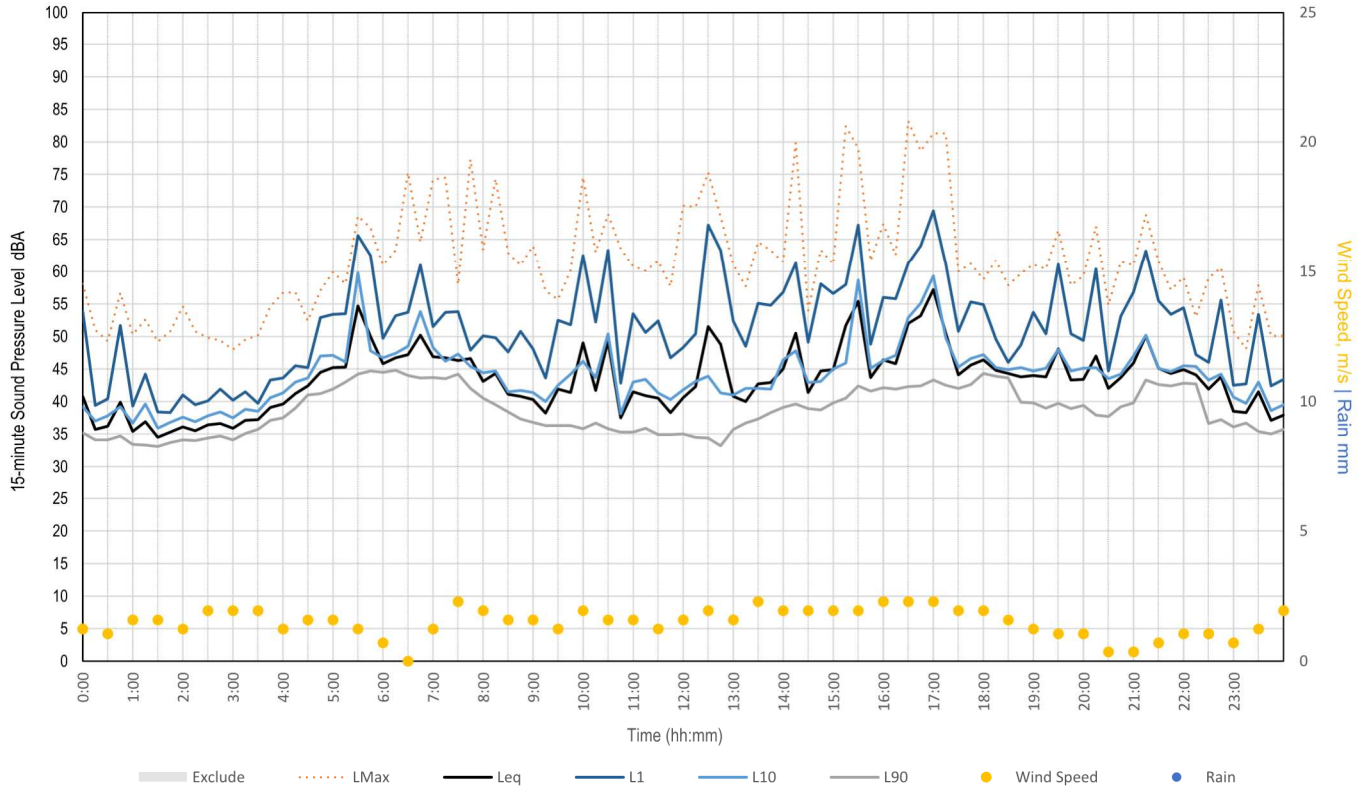
Sunday, 04 September 2022



Noise Logger Results

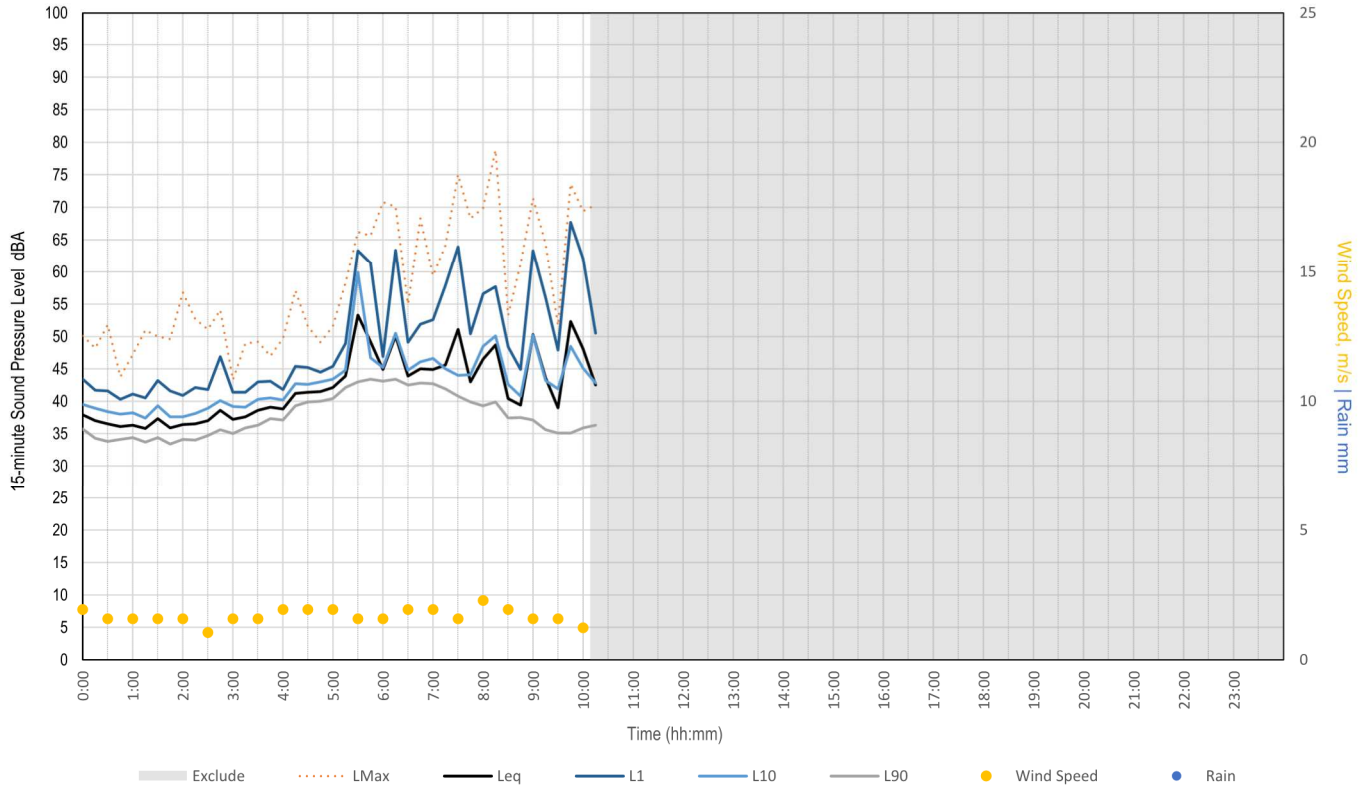
Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Monday, 05 September 2022



Measured Noise Levels - M13 - 6 Waratah Street (Rooty Hill)

Tuesday, 06 September 2022



Background Noise Monitoring

Location	M14 - 11 Lago Place (St. Clair)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment					Attended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878043	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-05718-E0
Calibration	**Pre:**	93.6 dBA	**Post:**	93.5 dBA	**Calibration**	**Pre:**	94.2 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Saturday, 03 Sep 2022
No. of days	23
No. of nights	21

*Monitoring period not continuous

Weather	
Station	BoM
Station Info	Horsley Park Equestrian
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres away from any reflecting structure other than ground (e.g. house facade, shed and metal fence).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	9/08/2022	4:09:26 PM	4:24:26 PM	71	51	53	42	
2	Day	9/08/2022	4:24:26 PM	4:39:26 PM	72	53	55	43	
3	Day	9/08/2022	4:39:26 PM	4:54:26 PM	69	50	52	42	
4	Day	9/08/2022	4:54:26 PM	5:09:26 PM	75	53	54	45	
5	Evening	18/08/2022	7:45:00 PM	8:00:00 PM	65	45	45	38	*
6	Evening	18/08/2022	8:30:00 PM	8:45:00 PM	49	39	41	38	*
7	Evening	18/08/2022	9:15:00 PM	9:30:00 PM	53	40	41	36	*
8	Evening	7/09/2022	6:01:00 PM	6:16:00 PM	68	43	44	36	
9	Night	10/08/2022	12:15:00 AM	12:30:00 AM	70	36	35	28	*
10	Night	10/08/2022	3:30:00 AM	3:45:00 AM	48	37	40	32	*
11	Night	10/08/2022	6:15:00 AM	6:30:00 AM	72	50	51	45	*
12	Night	10/08/2022	10:15:00 PM	10:30:00 PM	72	48	46	38	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird noise in nearby trees with maximum levels around 66 to 72 dBA. Occasional vehicle movements on local streets, and other vehicle related sounds (e.g. distant truck). Residential activity faintly audible (e.g. opening and closing doors). Several aircraft flying overhead with approx. durations of 30 sec to 1 min and with maximum levels in the range of 43 to 56 dBA.
Background noise	Constant traffic at distance.
Evening	
Ambient noise	Various impulsive animal noises (e.g. birds, occasional dog bark). Occasional vehicle passbys. Occasional suburban activity (e.g. hammering sound). A number of aircraft were noted to fly over at a distance with maximum levels around 40 dBA.
Background noise	Constant traffic at distance.
Night	
Ambient noise	Various impulsive animal noises (e.g. bird noise and dogs barking). Occasional faint traffic noise. Occasional suburban activity (e.g. child crying). Short period with sprinkler operating at adjacent property.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling). Constant traffic at distance.

Site Details	M14 - 11 Lago Place (St. Clair)
Start Date	Tue 09 August 2022
End Date	Sat 03 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	57
$L_{eq, Evening}$ dBA	45
$L_{eq, Night}$ dBA	49
$RBL_{, Day}$ dBA	37
$RBL_{, Evening}$ dBA	36
$RBL_{, Night}$ dBA	29

Daily Summary

Date	09-08	10-08	11-08	12-08	13-08	14-08	15-08	16-08
$L_{eq, Day}$ dBA	54	54	54	55	58	53	55	54
$L_{eq, Evening}$ dBA	43	41	43	44	44	42	42	45
$L_{eq, Night}$ dBA	54	48	49	49	47	46	50	49
$ABL_{, Day}$ dBA	42	35	36	37	37	37	39	38
$ABL_{, Evening}$ dBA	36	35	35	32	35	33	34	37
$ABL_{, Night}$ dBA	27	29	31	28	28	28	25	29

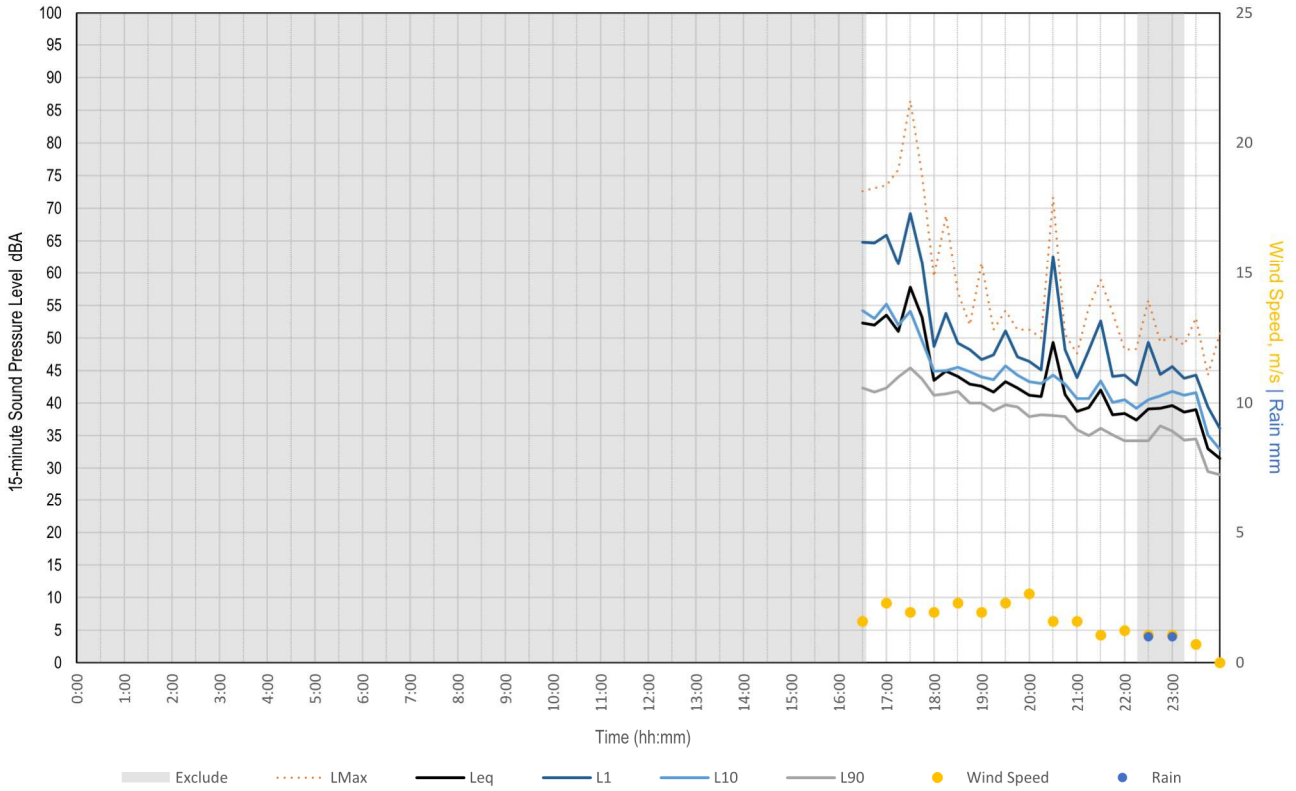
Date	17-08	18-08	19-08
$L_{eq, Day}$ dBA	52	57	64
$L_{eq, Evening}$ dBA	43	42	47
$L_{eq, Night}$ dBA	49	50	
$ABL_{, Day}$ dBA	34	34	36
$ABL_{, Evening}$ dBA	36	36	44
$ABL_{, Night}$ dBA	31	29	

Date	23-08	24-08	25-08	26-08	27-08	28-08	29-08	30-08
$L_{eq, Day}$ dBA	54	60	53	54	54	55	62	55
$L_{eq, Evening}$ dBA	50	52	43	44	41	52	42	44
$L_{eq, Night}$ dBA	50	49		48	47	47	48	47
$ABL_{, Day}$ dBA		39	38	40	34	34	33	41
$ABL_{, Evening}$ dBA	44	37	38	39	37	34	32	35
$ABL_{, Night}$ dBA	34	29	31	31	29	30	31	30

Date	31-08	01-09	02-09	03-09
$L_{eq, Day}$ dBA	52	51	51	56
$L_{eq, Evening}$ dBA	45	42	50	47
$L_{eq, Night}$ dBA	47	47	47	
$ABL_{, Day}$ dBA	35	35	37	43
$ABL_{, Evening}$ dBA	32	32	37	43
$ABL_{, Night}$ dBA	25	30	35	

Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

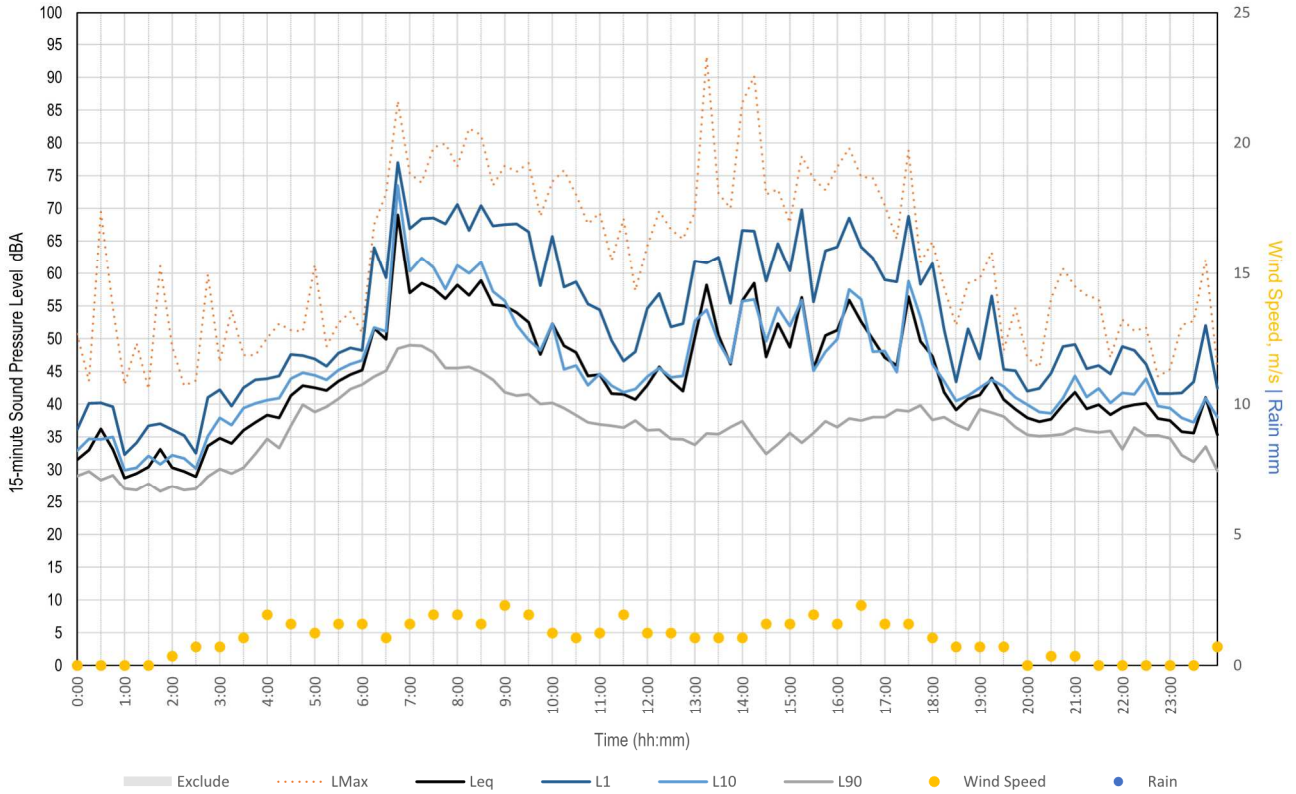
Tuesday, 09 August 2022



Noise Logger Results

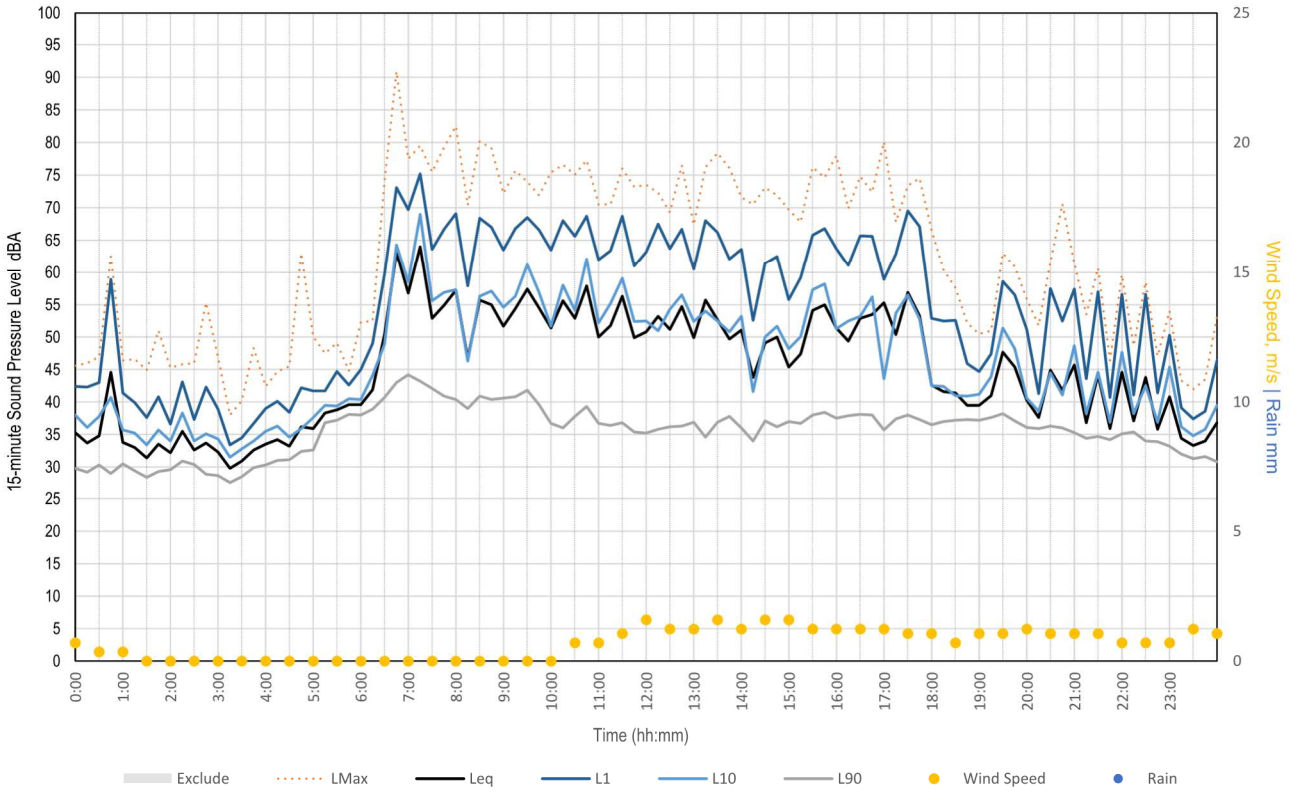
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Wednesday, 10 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

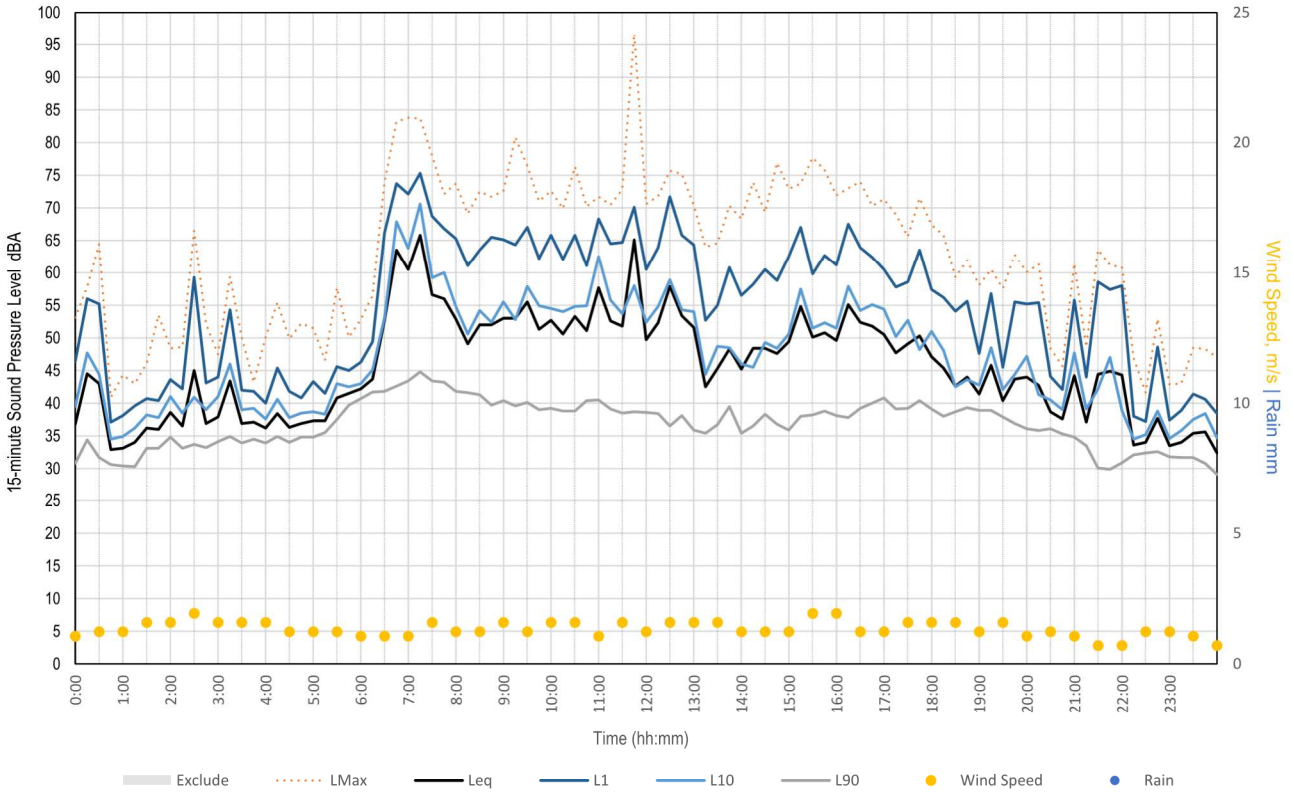
Thursday, 11 August 2022



Noise Logger Results

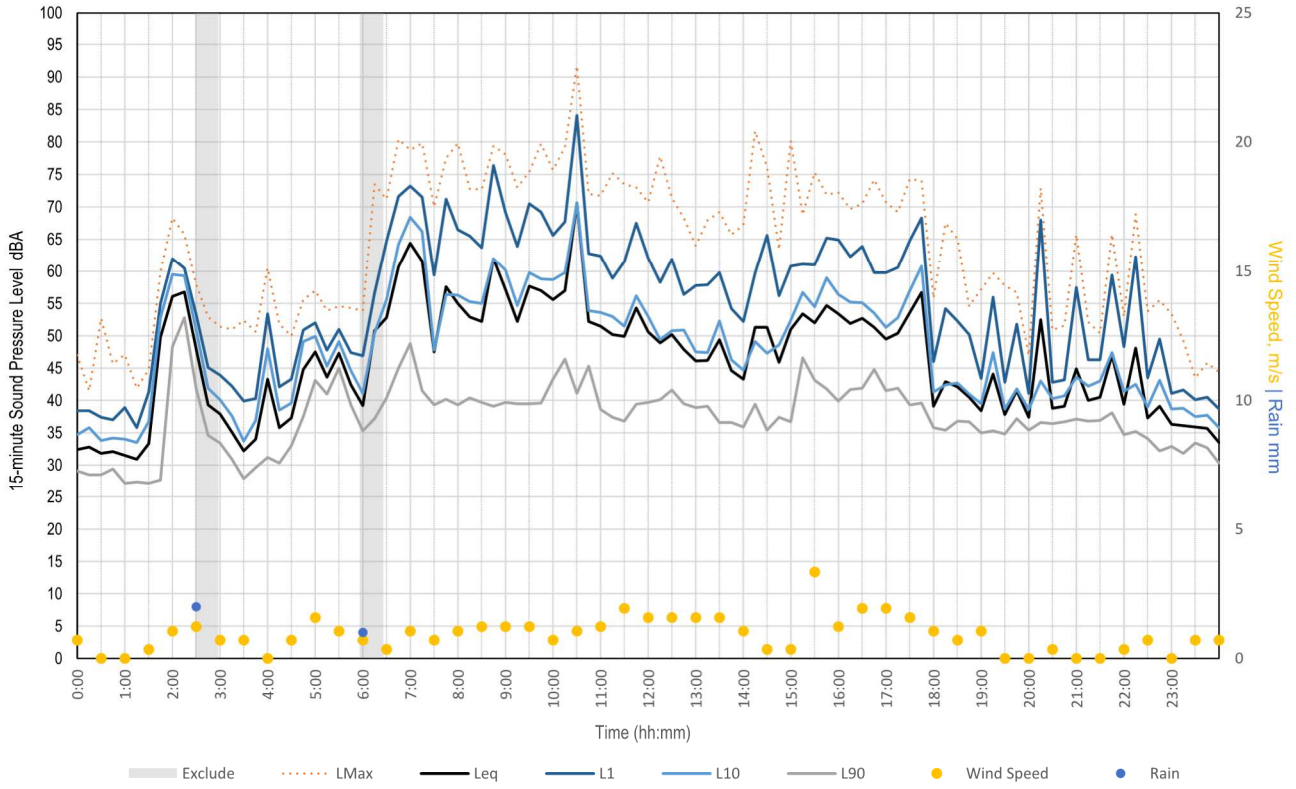
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Friday, 12 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

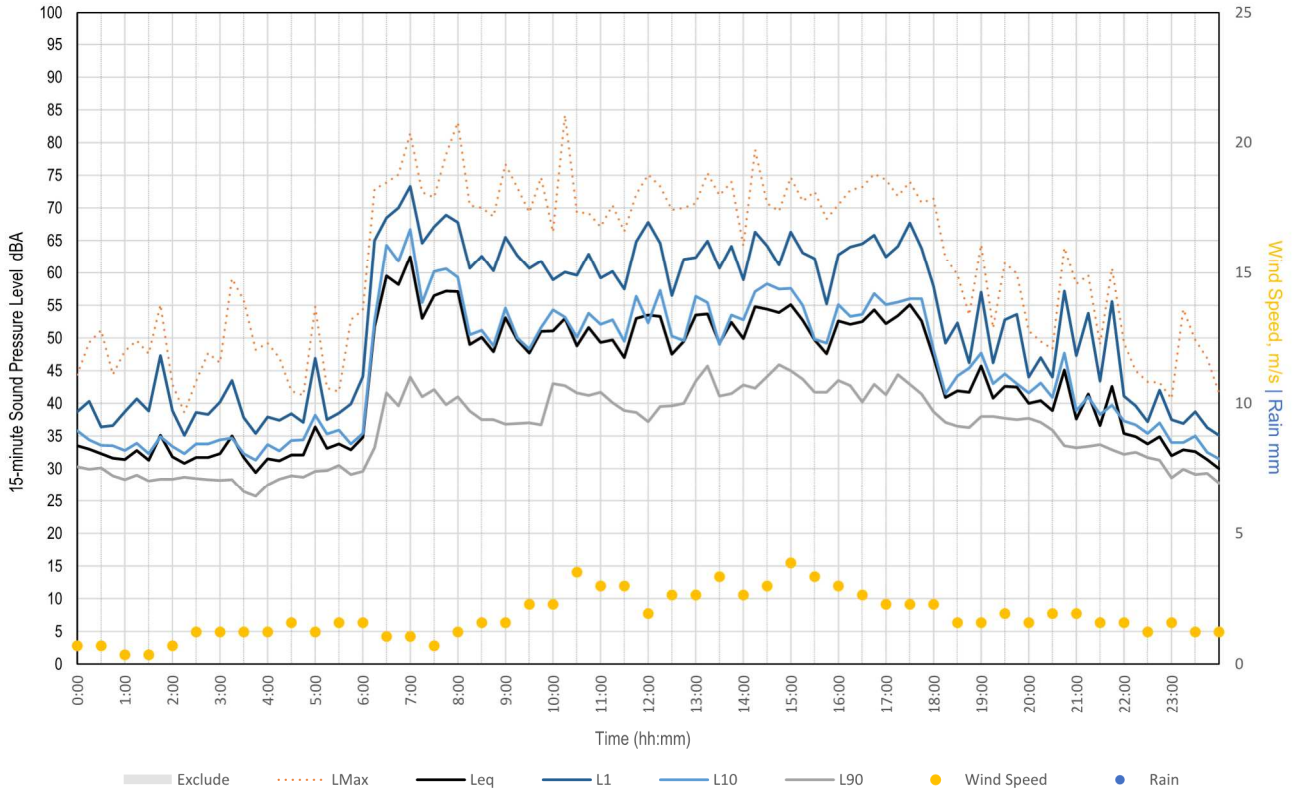
Saturday, 13 August 2022



Noise Logger Results

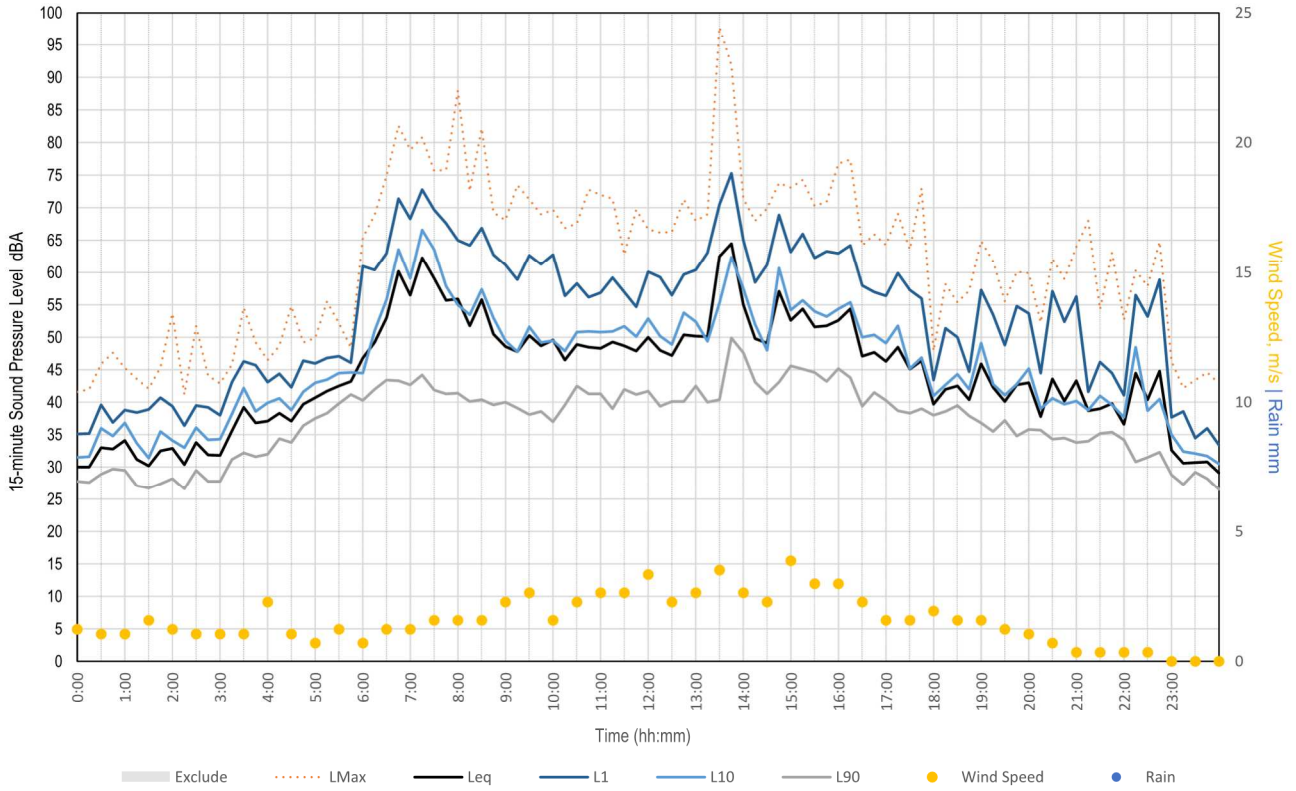
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Sunday, 14 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

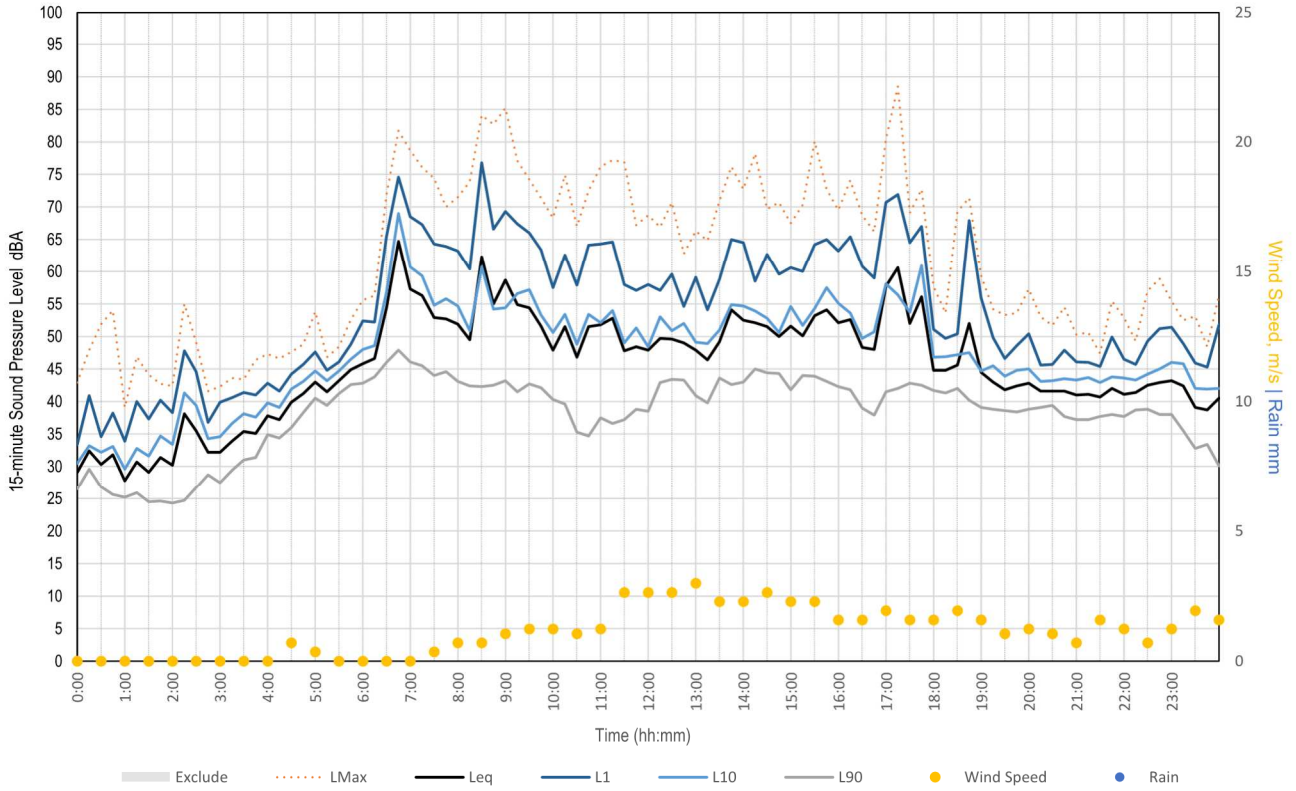
Monday, 15 August 2022



Noise Logger Results

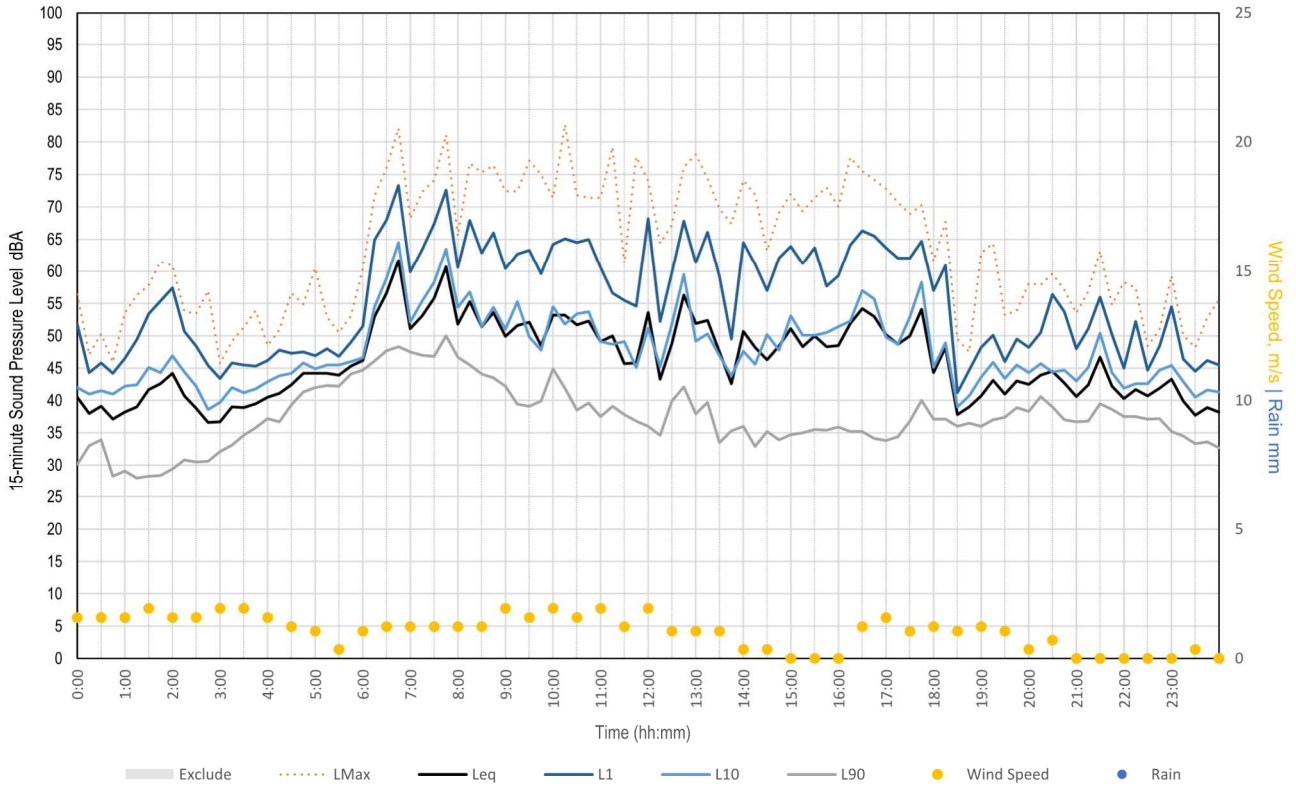
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Tuesday, 16 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

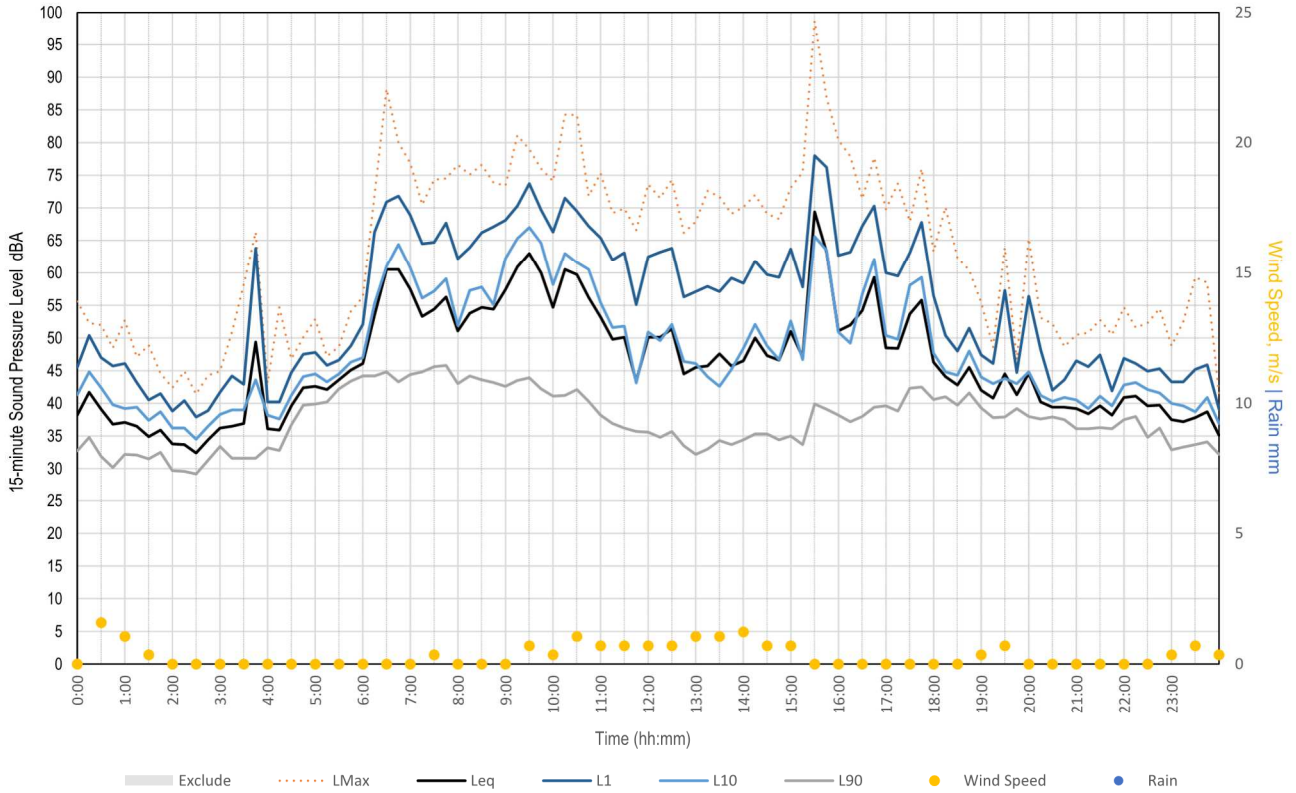
Wednesday, 17 August 2022



Noise Logger Results

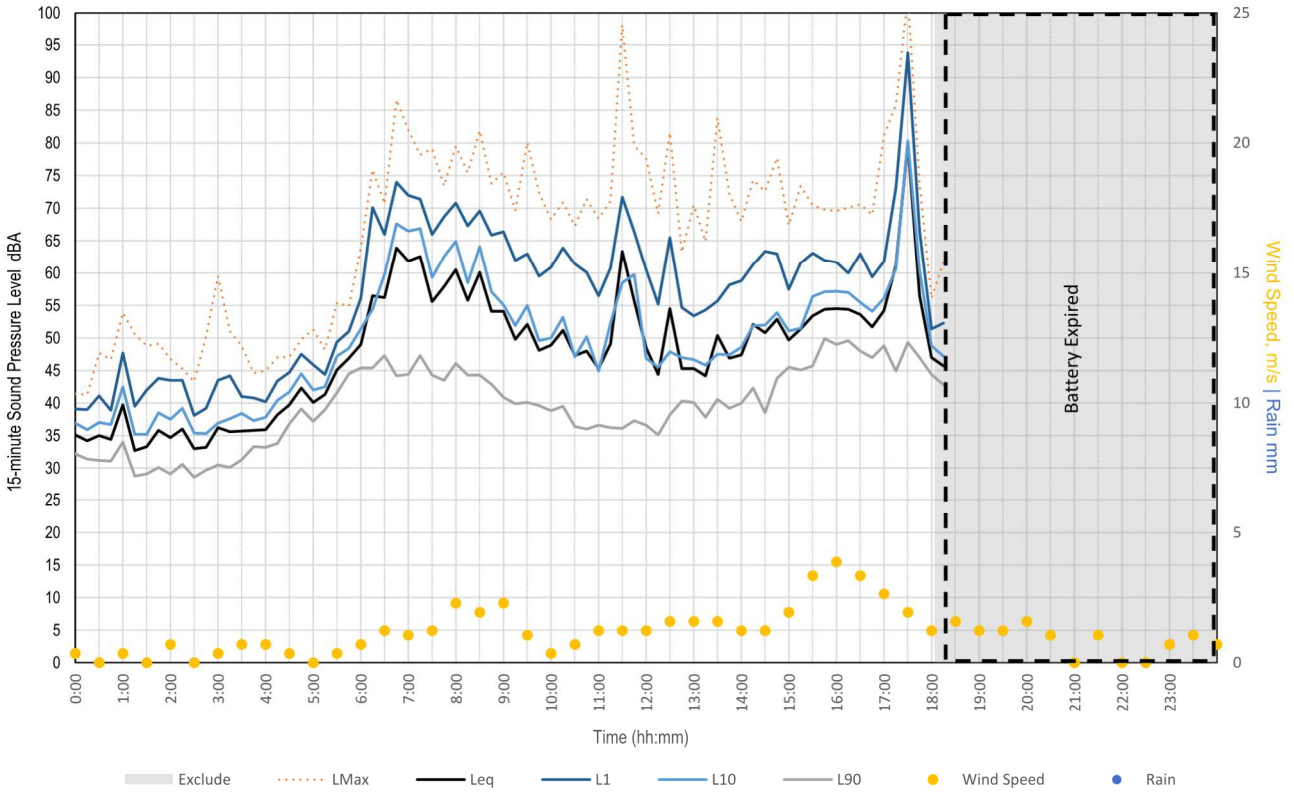
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Thursday, 18 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

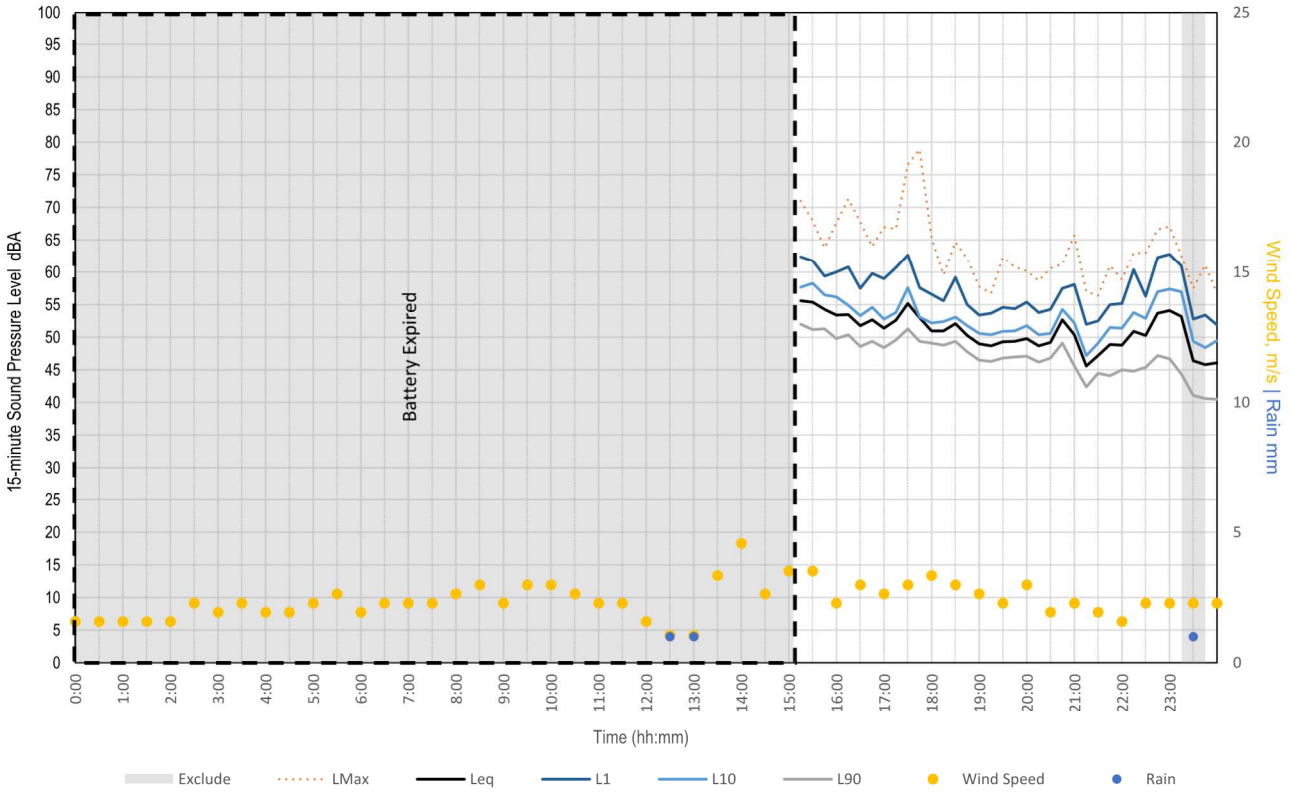
Friday, 19 August 2022



Noise Logger Results

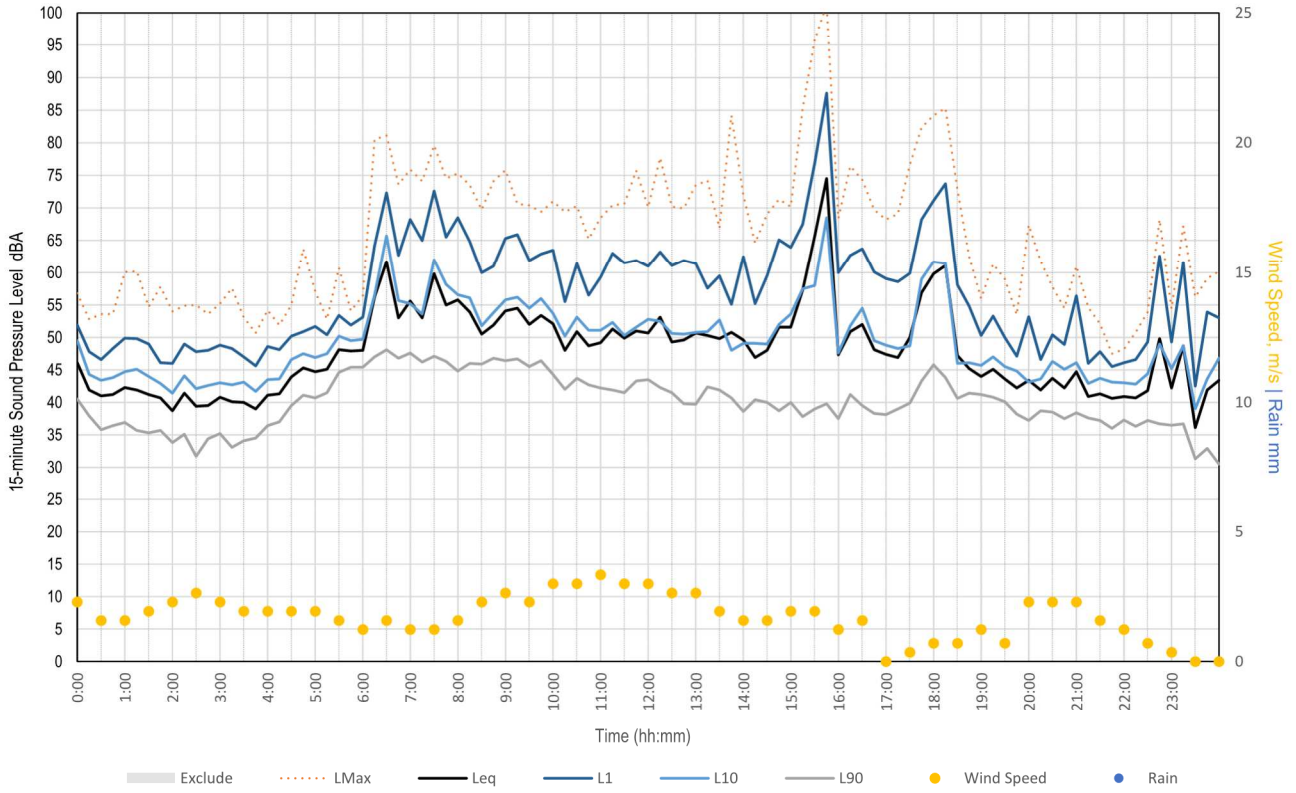
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Tuesday, 23 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

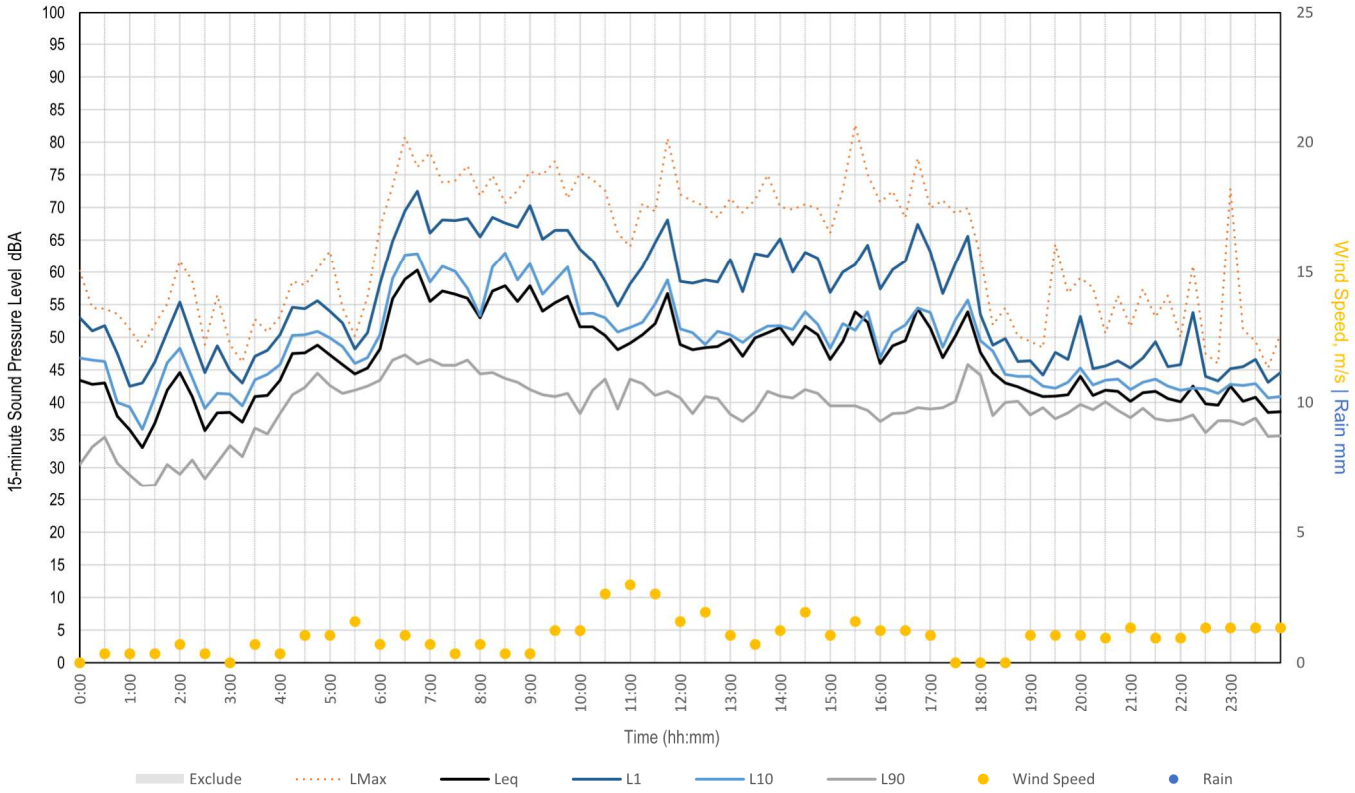
Wednesday, 24 August 2022



Noise Logger Results

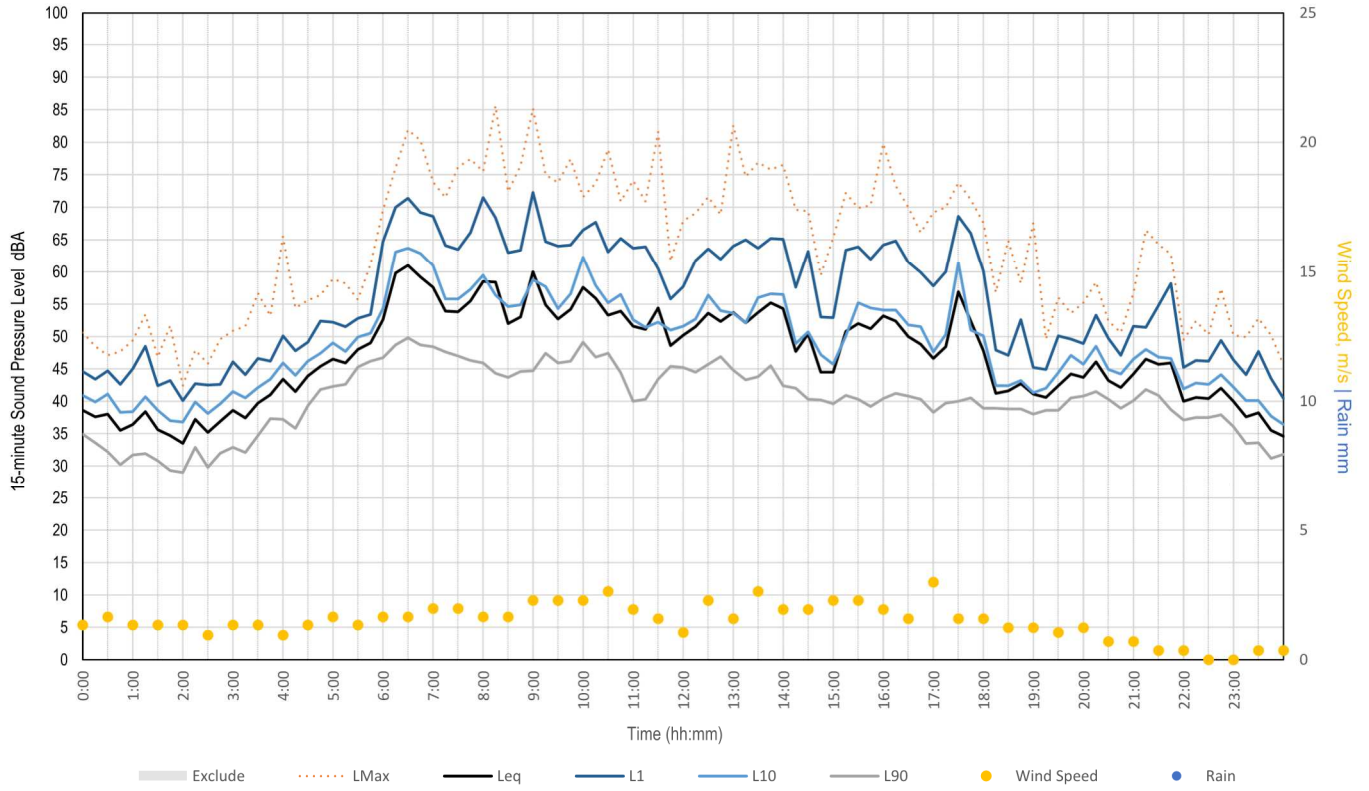
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Thursday, 25 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

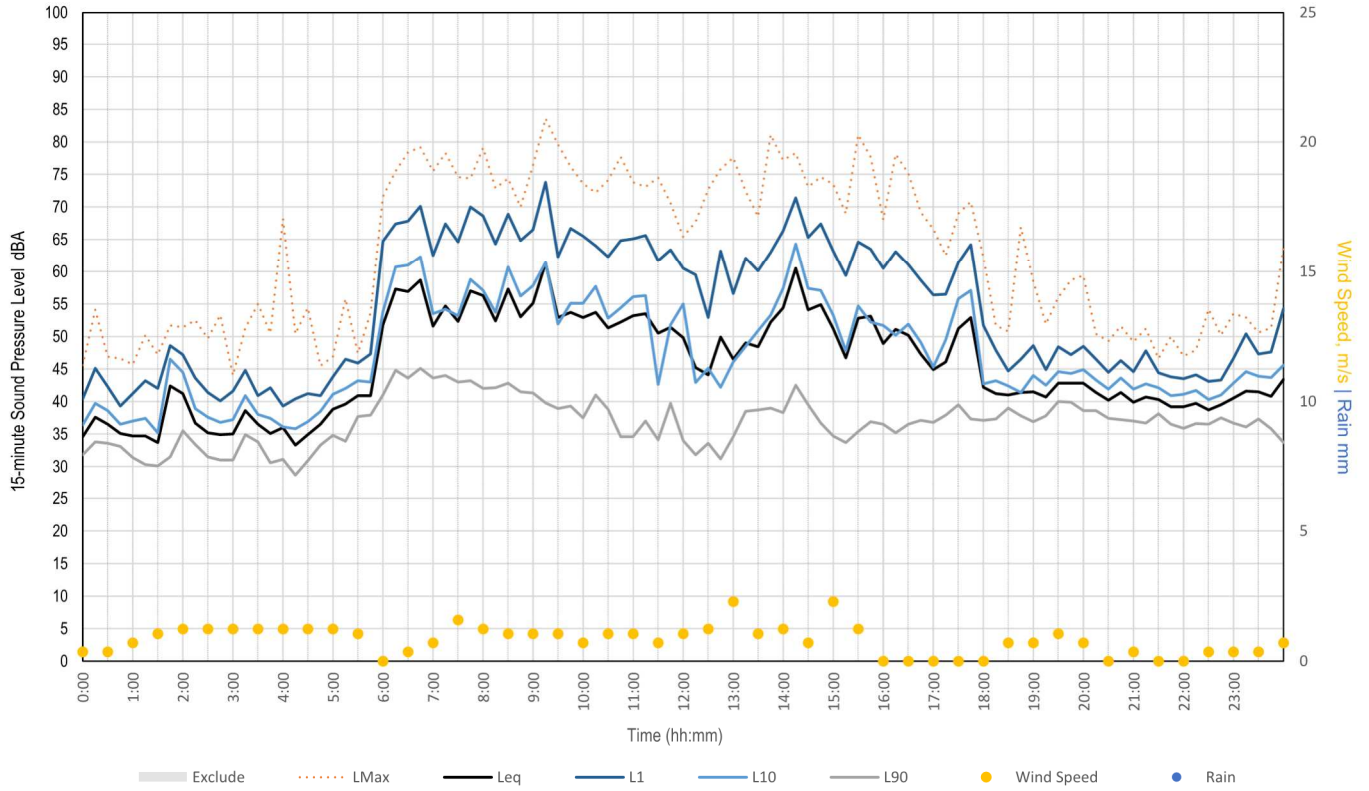
Friday, 26 August 2022



Noise Logger Results

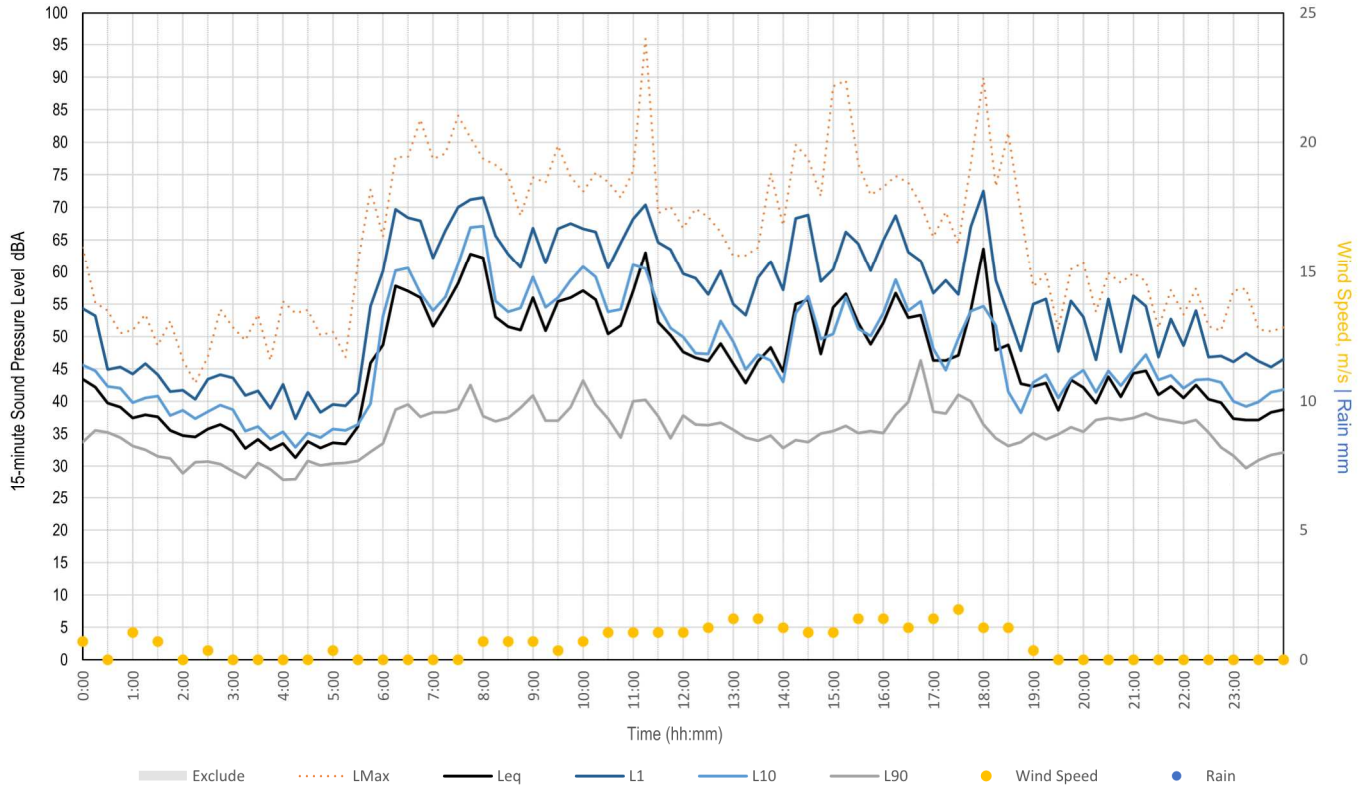
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Saturday, 27 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

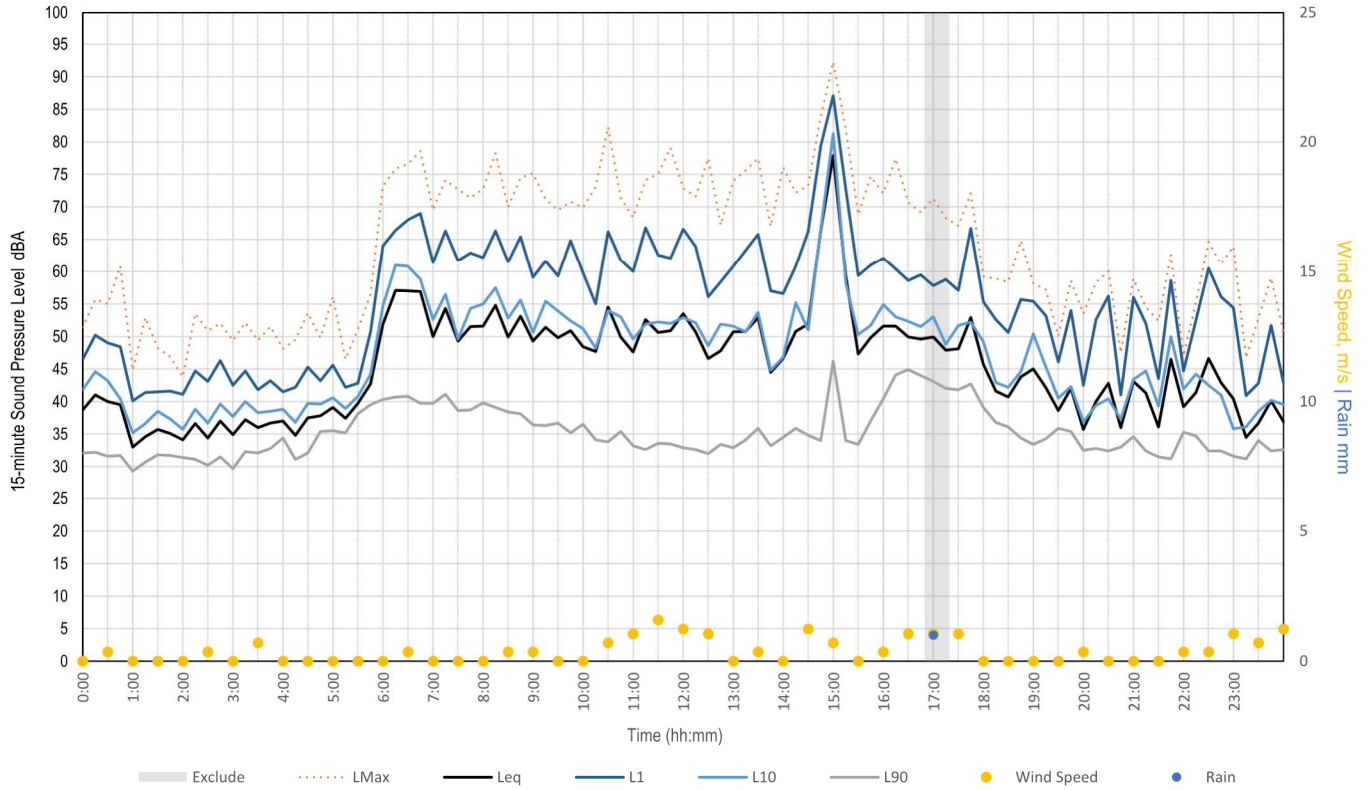
Sunday, 28 August 2022



Noise Logger Results

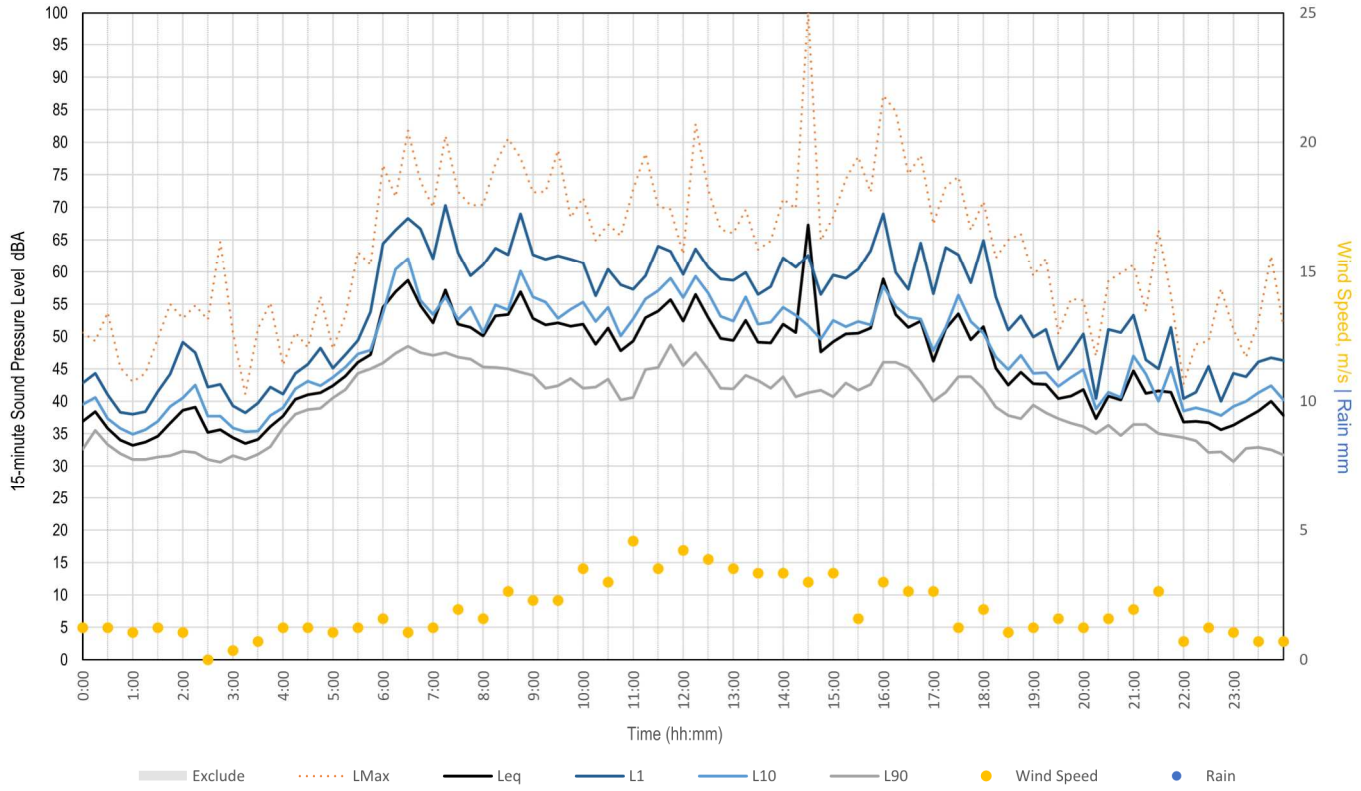
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Monday, 29 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

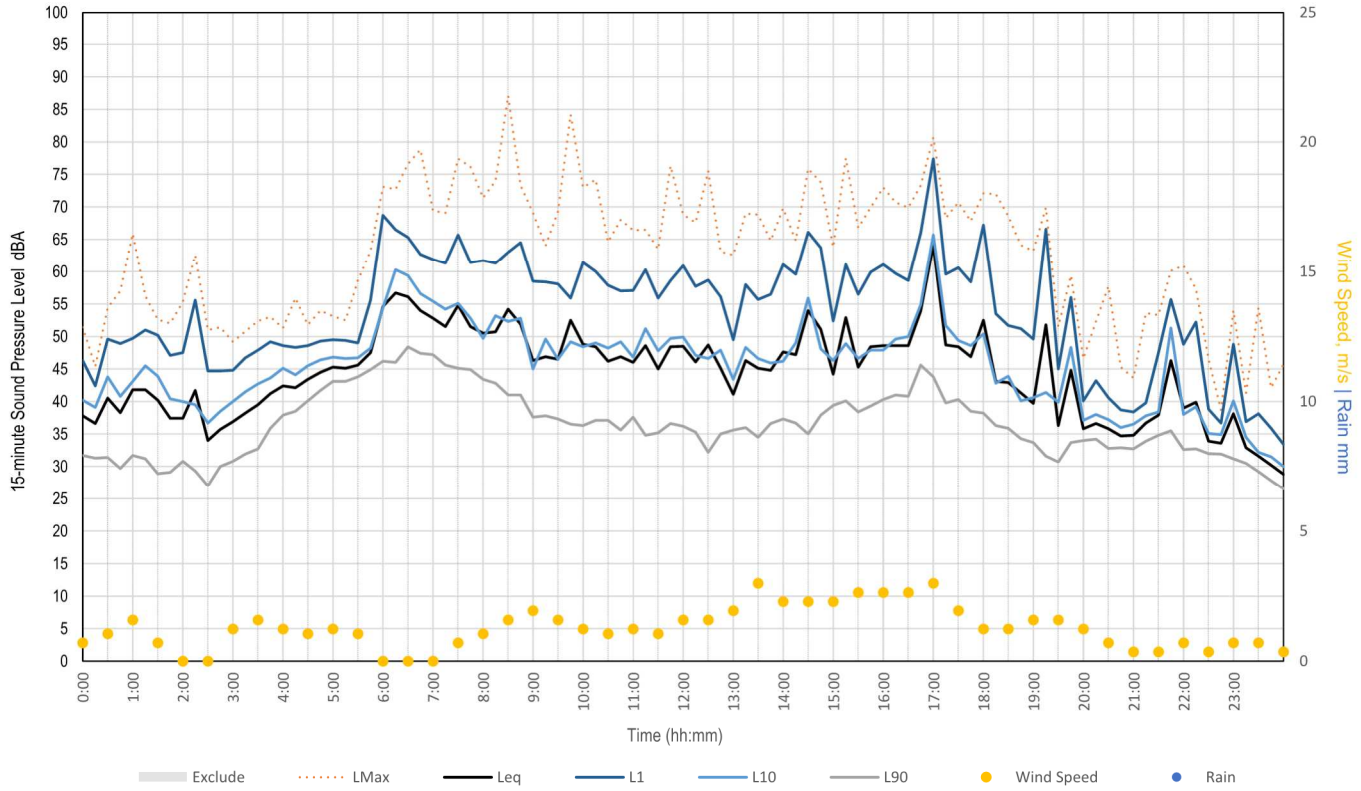
Tuesday, 30 August 2022



Noise Logger Results

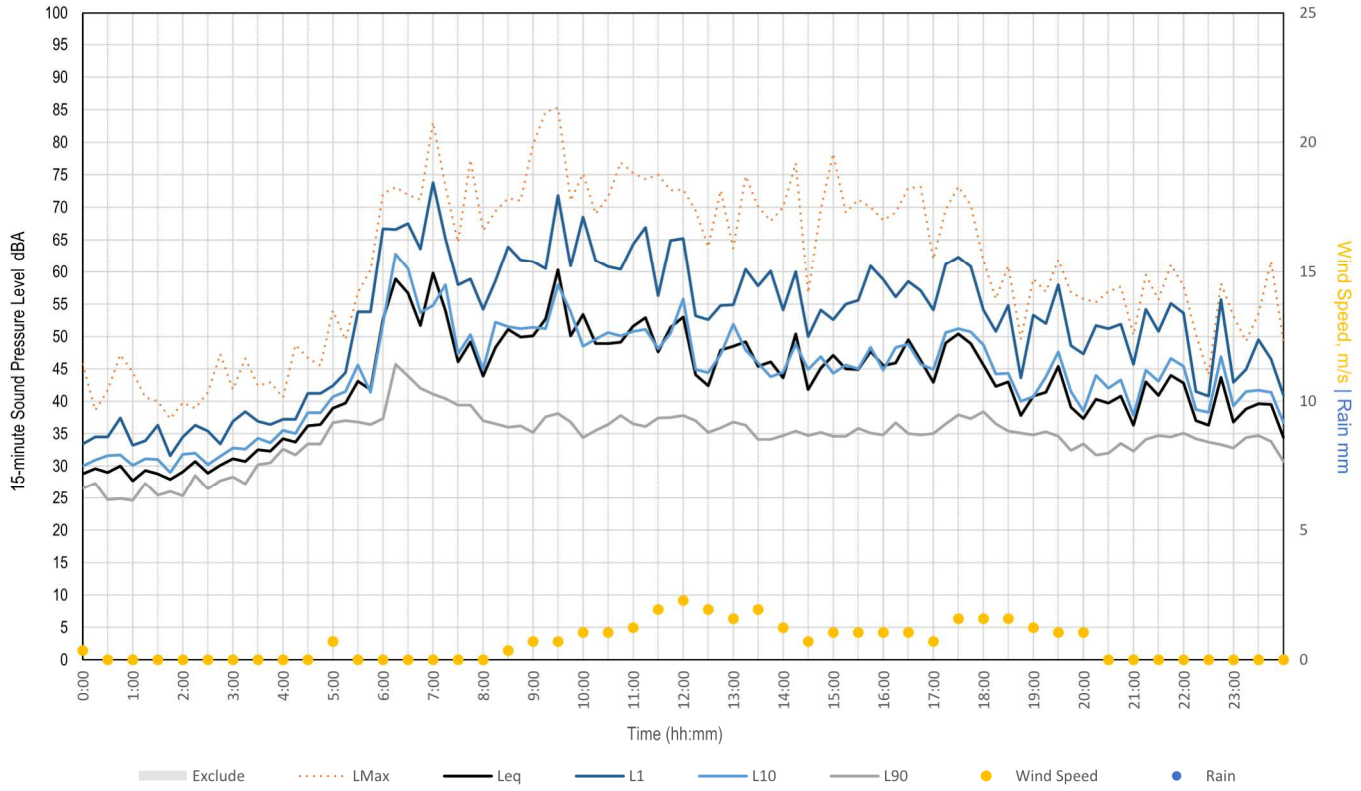
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Wednesday, 31 August 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

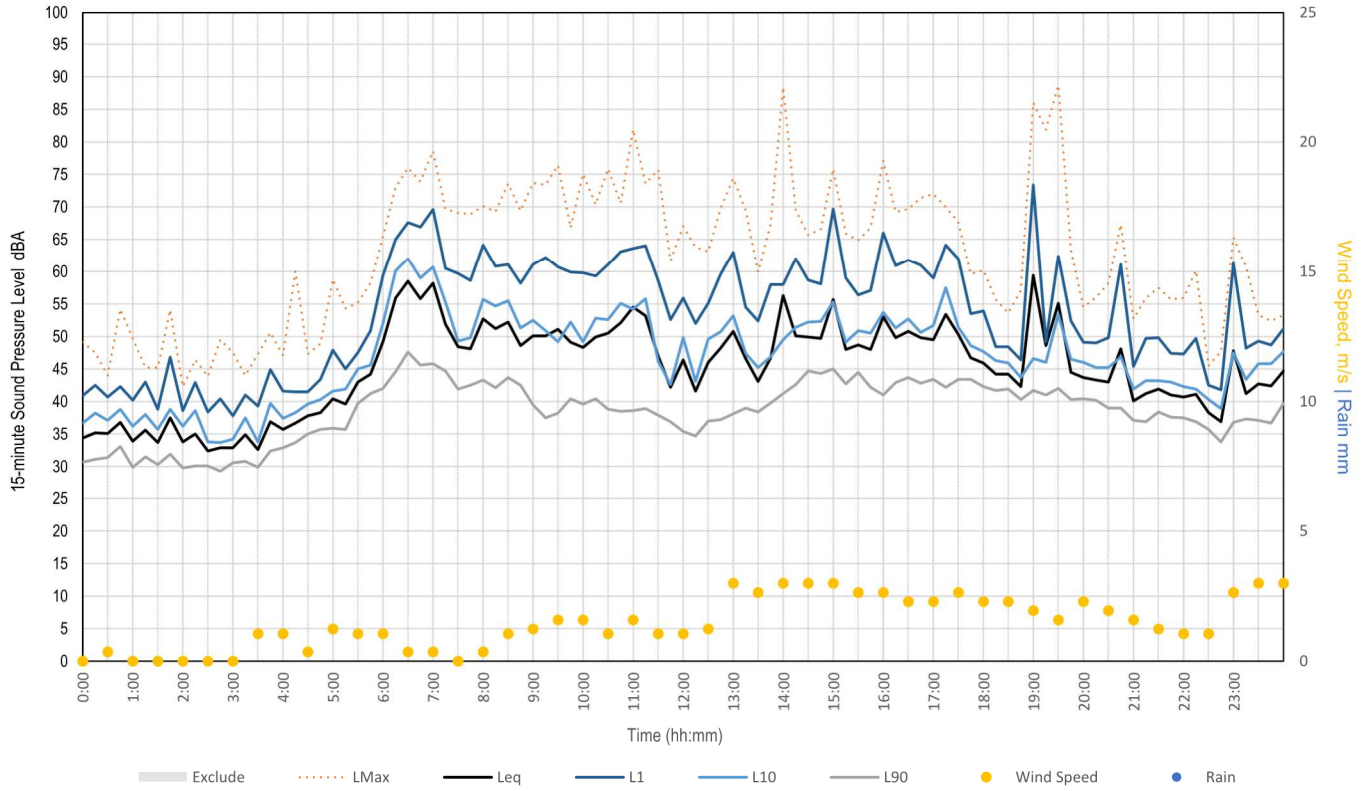
Thursday, 01 September 2022



Noise Logger Results

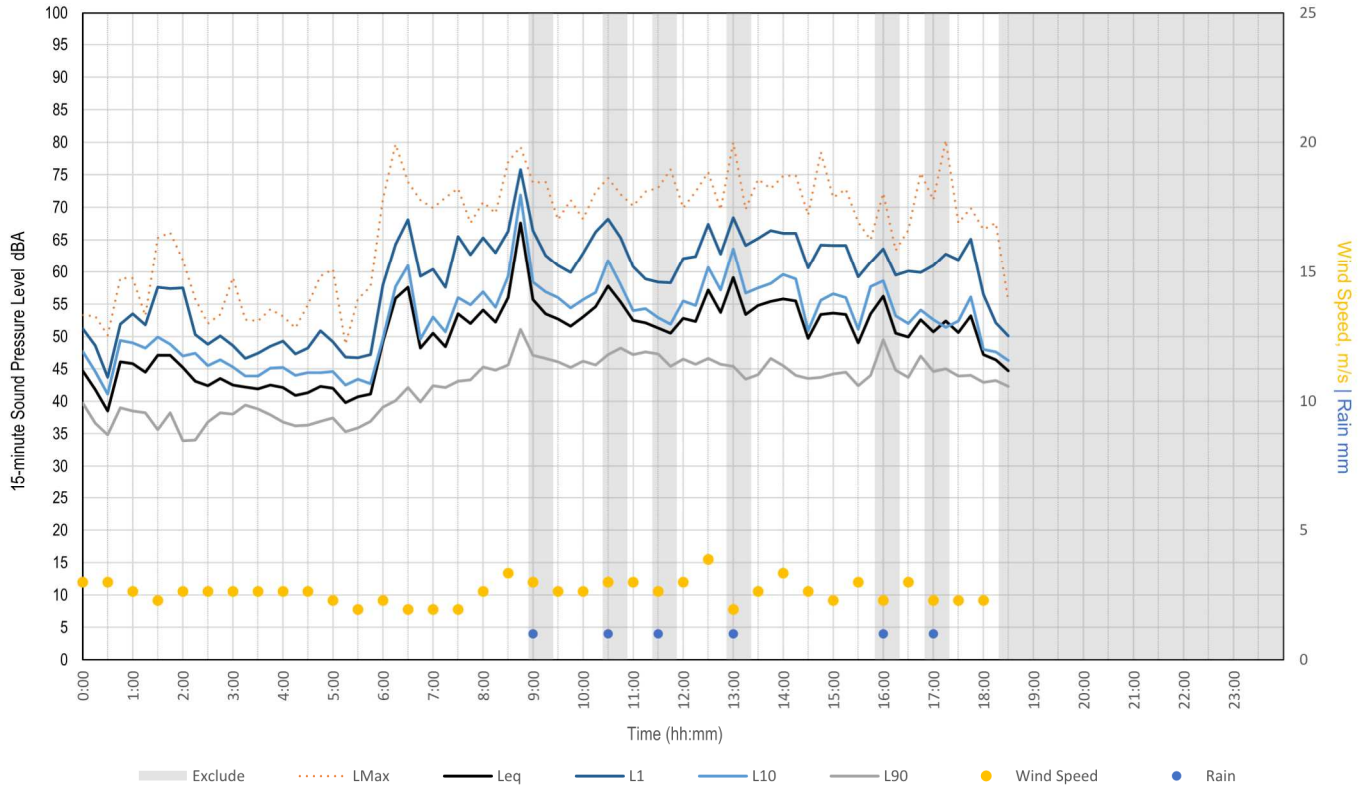
Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Friday, 02 September 2022



Measured Noise Levels - M14 - 11 Lago Place (St. Clair)

Saturday, 03 September 2022



Background Noise Monitoring

Location	M15 - 5 Bindowan Place (Erskine Park)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878097
Calibration	**Pre:**	94.0 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Tuesday, 06 Sep 2022
No. of days	29
No. of nights	28

Weather	
Station	BoM
Station Info	Horsley Park Equestrian
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within outer backyard area. Located ≥ 3 metres away from any reflecting structure other than ground (e.g. house facade and fence).

Location noted to not be ideal due to proximity to a stock feed merchant with storage silos. Resident expressed that silos are generally only filled once a month. Location deemed acceptable due to the expected low impact from proximity to merchant and it being the only available after extensive door knocking.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	6/09/2022	8:59:18 AM	9:14:18 AM	76	53	53	50	
2	Day	6/09/2022	9:14:18 AM	9:29:18 AM	60	49	51	47	
3	Day	6/09/2022	9:29:18 AM	9:44:18 AM	66	49	50	44	
4	Day	6/09/2022	9:44:18 AM	9:59:18 AM	62	46	48	43	
5	Evening	21/08/2022	6:30:00 PM	6:45:00 PM	72	44	44	42	*
6	Evening	21/08/2022	7:15:00 PM	7:30:00 PM	69	41	41	37	*
7	Evening	21/08/2022	8:15:00 PM	8:30:00 PM	64	45	45	39	*
8	Evening	21/08/2022	9:30:00 PM	9:45:00 PM	65	41	43	38	*
9	Night	22/08/2022	12:00:00 AM	12:15:00 AM	48	38	40	36	*
10	Night	22/08/2022	3:30:00 AM	3:45:00 AM	47	40	42	38	*
11	Night	22/08/2022	6:30:00 AM	6:45:00 AM	78	52	50	46	*
12	Night	22/08/2022	11:00:00 PM	11:15:00 PM	48	38	41	35	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Noise from silos being filled at the stock feed merchant site, sound level in the range of 45 to 55 dBA. Intermittent bird noise in trees. A number of aircrafts were noted and audible but not loud enough to dominate the noise environment.
Background noise	Low mechanical hum from pool pump and AC unit located in front garden.
Evening	
Ambient noise	Intermittent vehicle passbys on local streets. Intermittent dog barking. Occasional suburban noise (e.g. TV, residents talking). Constant insect noise of varying intensity after 9 PM. One aircraft passby was noted with a duration of approximately 1 min with a maximum sound level of 49 dBA.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass rustling). Low mechanical hum from pool pump and AC unit located in front garden.
Night	
Ambient noise	Occasional vehicle passbys on local streets. Intermittent bird noise. Intermittent crunching sound, potential animal movement. One aircraft passby was noted (period after 6AM).
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling). Low mechanical hum from pool pump and AC unit located in front garden.

Site Details	M15 - 5 Bindowan Place (Erskine Park)
Start Date	Tue 09 August 2022
End Date	Tue 06 September 2022

Summary	**Average (dBA)**
$L_{eq,\ Day}$ dBA	59
$L_{eq,\ Evening}$ dBA	51
$L_{eq,\ Night}$ dBA	43
RBL, $_{Day}$ dBA	39
RBL, $_{Evening}$ dBA	36
RBL, $_{Night}$ dBA	33

Daily Summary

Date	09-08	10-08	11-08	12-08	13-08	14-08	15-08	16-08
$L_{eq,\ Day}$ dBA		58	53	56	51	48	51	54
$L_{eq,\ Evening}$ dBA	49	55	47	46	46	49	45	46
$L_{eq,\ Night}$ dBA	42	41	45	47	40	42	43	44
ABL, $_{Day}$ dBA		39	41	41	36	37	41	42
ABL, $_{Evening}$ dBA	35	37	38	34	35	35	35	37
ABL, $_{Night}$ dBA	30	32	34	31	30	30	29	37

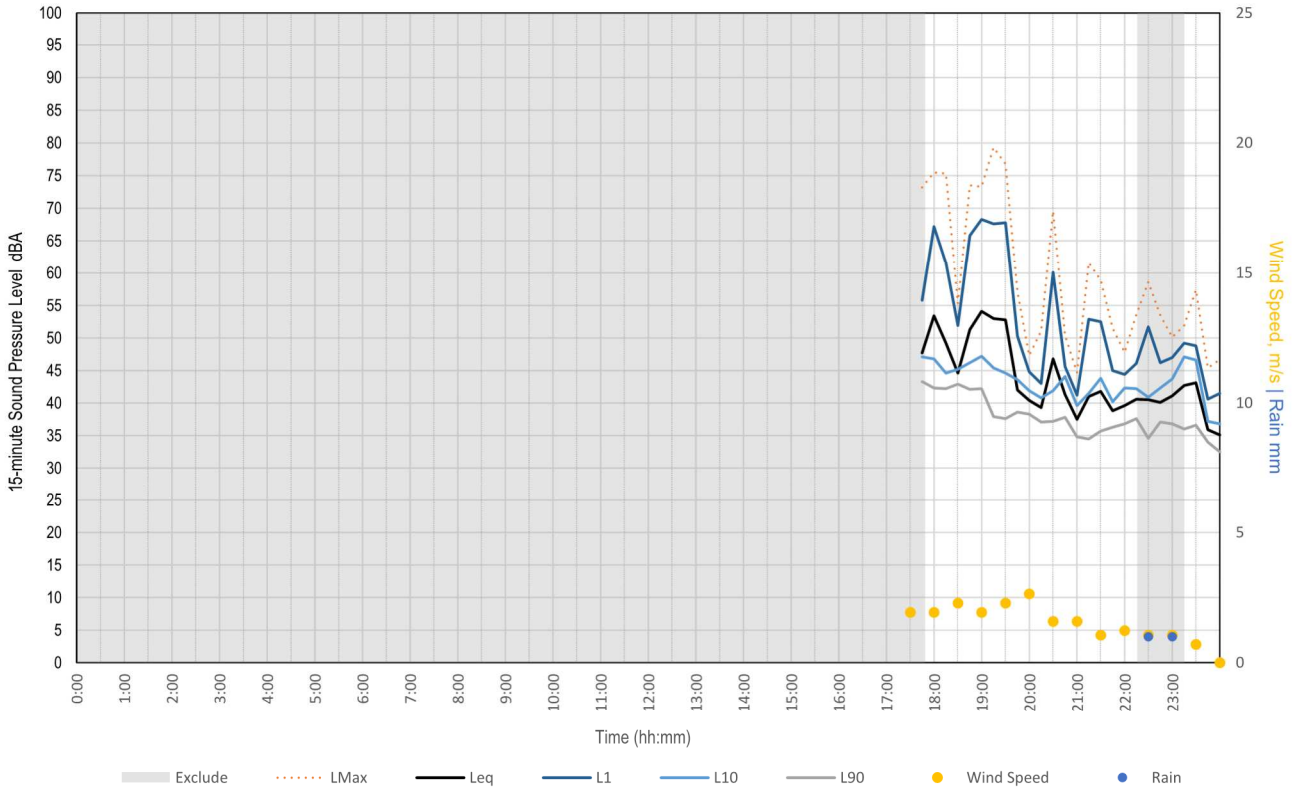
Date	17-08	18-08	19-08	20-08	21-08	22-08	23-08	24-08
$L_{eq,\ Day}$ dBA	60	58	61	61	58	59	62	64
$L_{eq,\ Evening}$ dBA	51	45	47	48	44	47	50	46
$L_{eq,\ Night}$ dBA	43	46	43	38	44	44	45	44
ABL, $_{Day}$ dBA	36	37	40	33	33	44	47	39
ABL, $_{Evening}$ dBA	40	37	38	36	38	36	44	39
ABL, $_{Night}$ dBA	36	33	31	31	34	35	36	31

Date	25-08	26-08	27-08	28-08	29-08	30-08	31-08	01-09
$L_{eq,\ Day}$ dBA	63	63	59	60	56	54	52	52
$L_{eq,\ Evening}$ dBA	43	43	43	45	45	47	63	46
$L_{eq,\ Night}$ dBA		40	41	40	45	43	42	43
ABL, $_{Day}$ dBA	38	38	33	36	42	44	41	40
ABL, $_{Evening}$ dBA	35	37	37	35	36	38	34	36
ABL, $_{Night}$ dBA	33	31	32	33	36	33	30	32

Date	02-09	03-09	04-09	05-09	06-09
$L_{eq,\ Day}$ dBA	57	49	53	64	52
$L_{eq,\ Evening}$ dBA	51	45	55	44	
$L_{eq,\ Night}$ dBA	43	43	45	43	
ABL, $_{Day}$ dBA	38	40	37	41	46
ABL, $_{Evening}$ dBA	36	37	35	37	
ABL, $_{Night}$ dBA	35	34	33	35	

Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

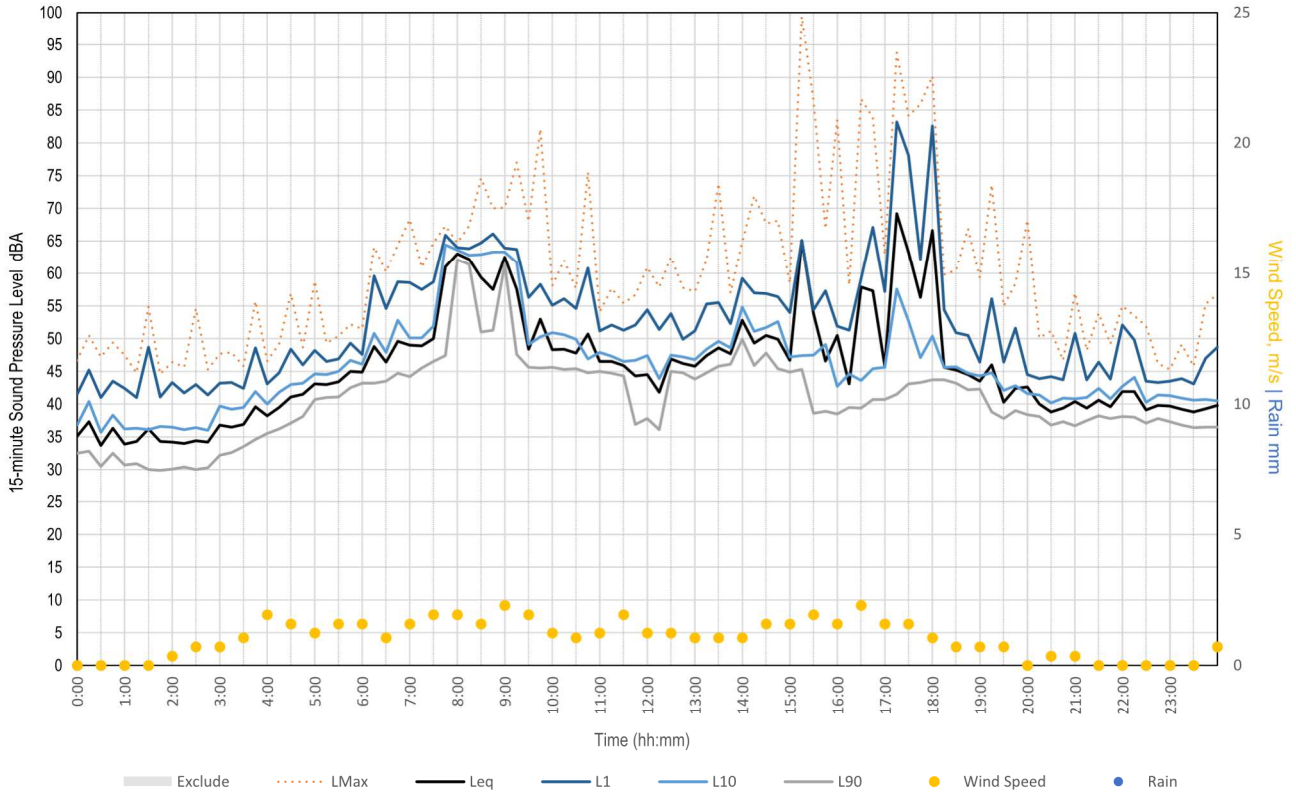
Tuesday, 09 August 2022



Noise Logger Results

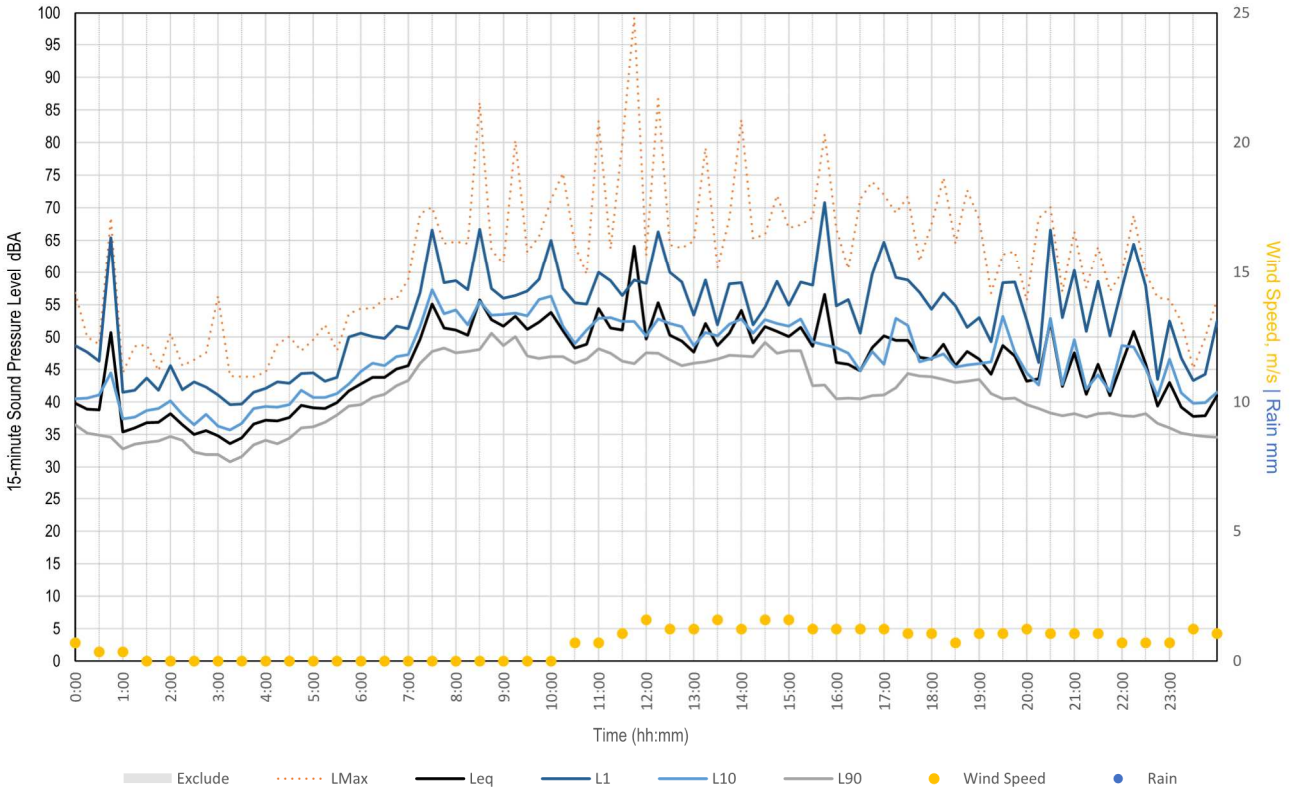
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Wednesday, 10 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

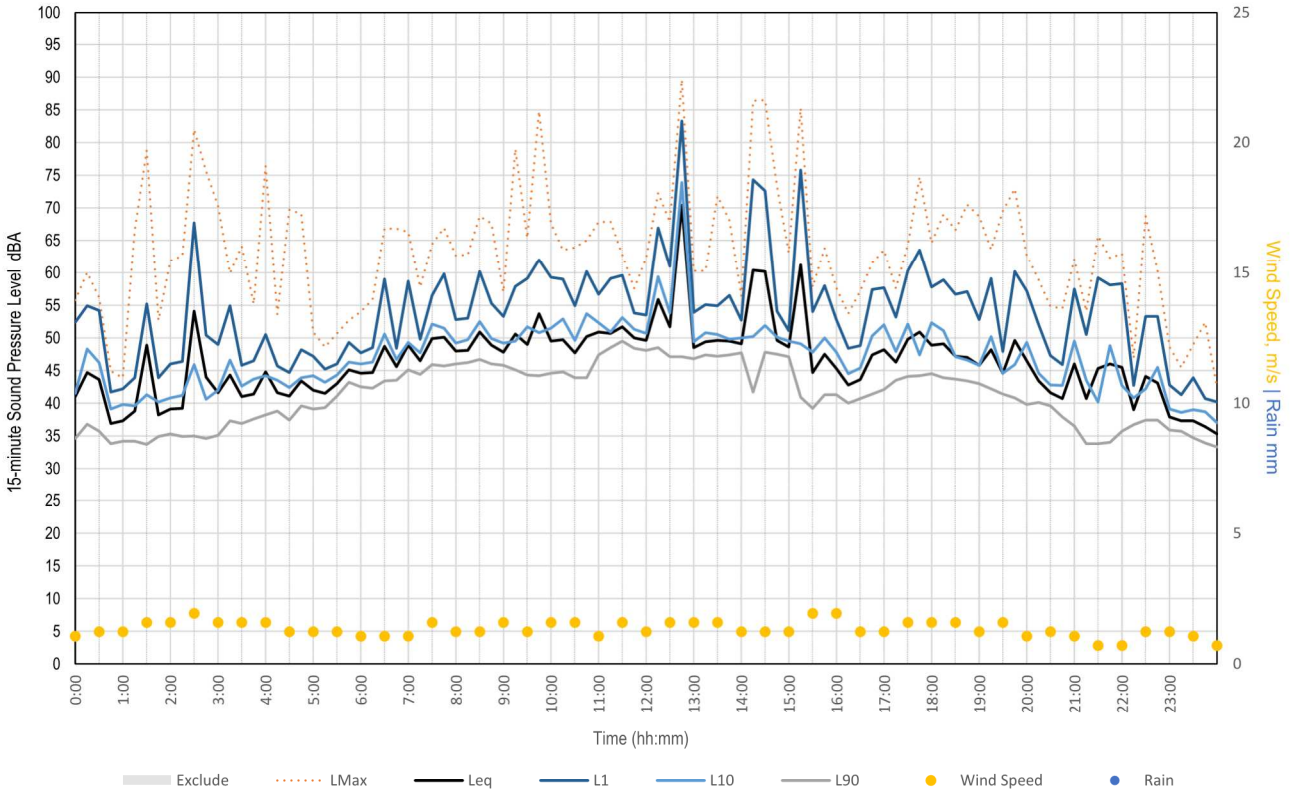
Thursday, 11 August 2022



Noise Logger Results

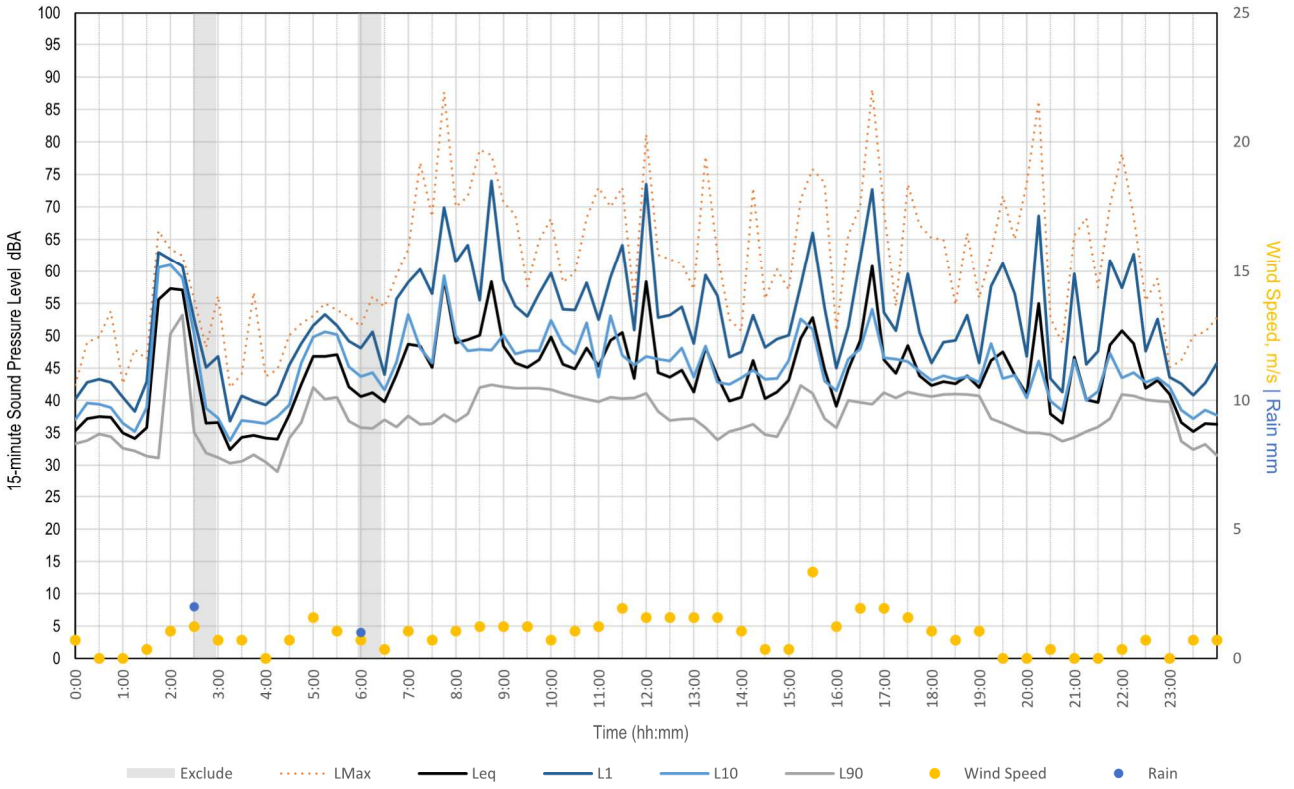
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Friday, 12 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

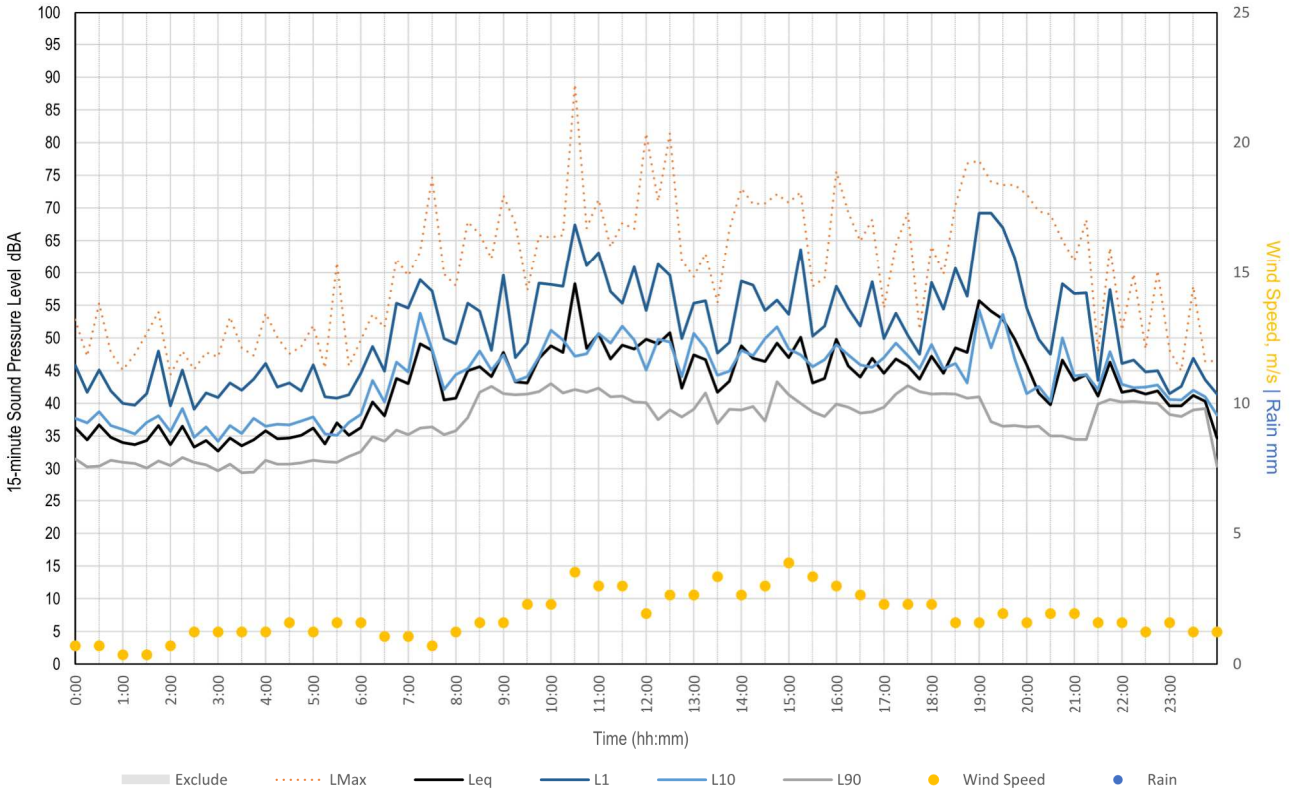
Saturday, 13 August 2022



Noise Logger Results

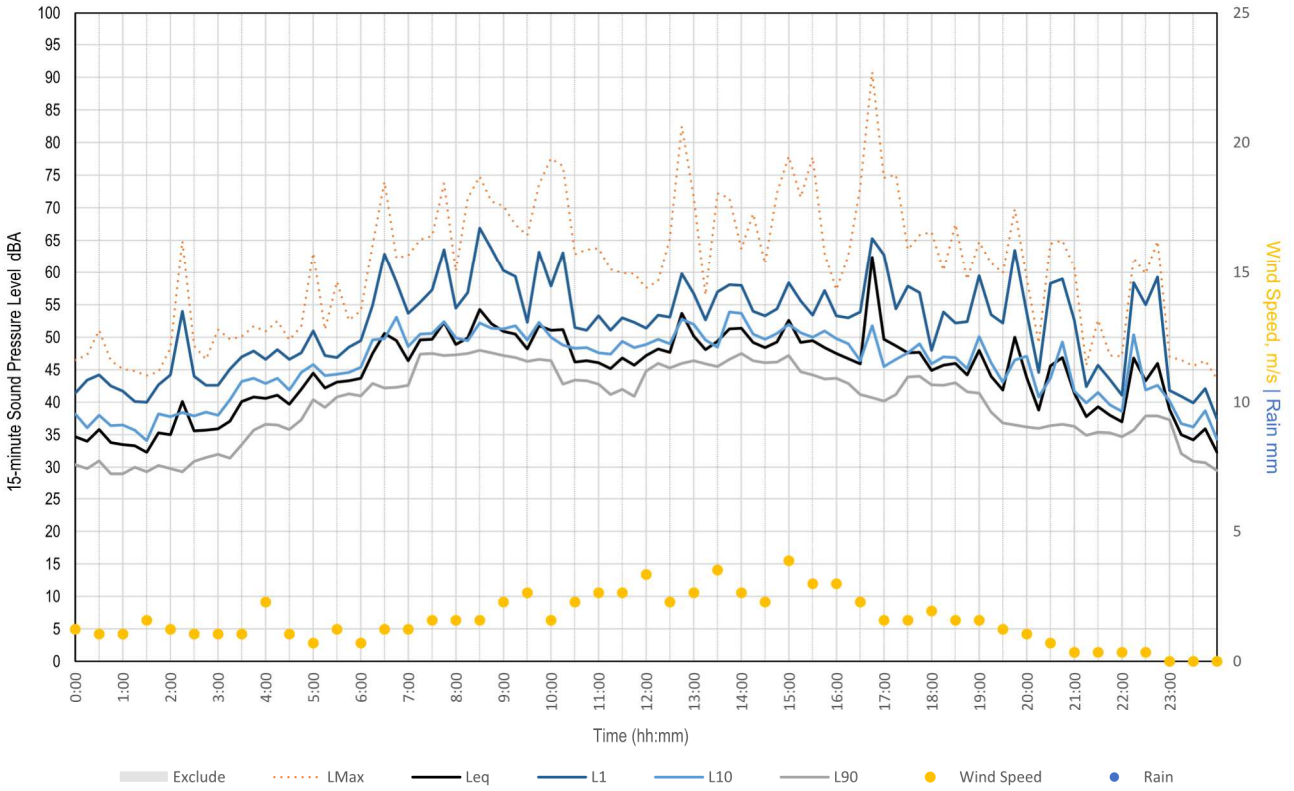
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Sunday, 14 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

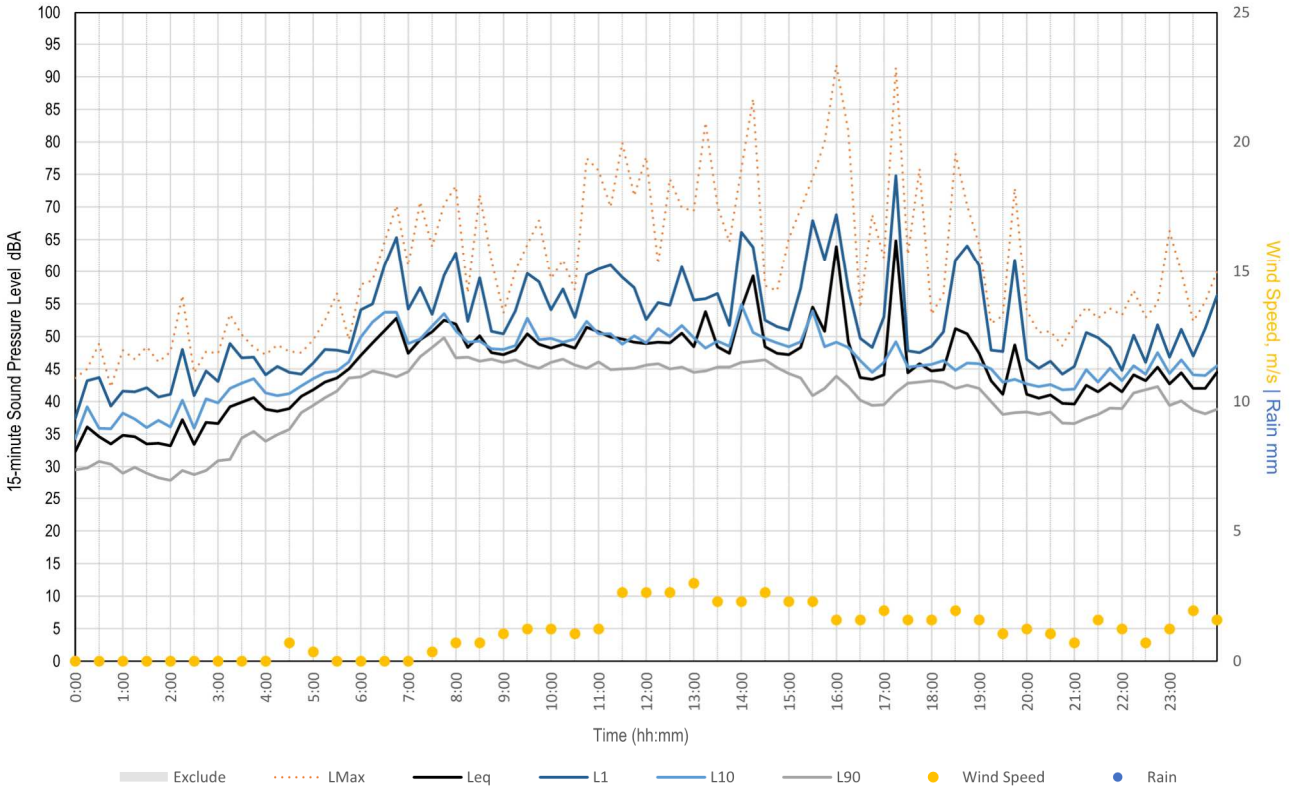
Monday, 15 August 2022



Noise Logger Results

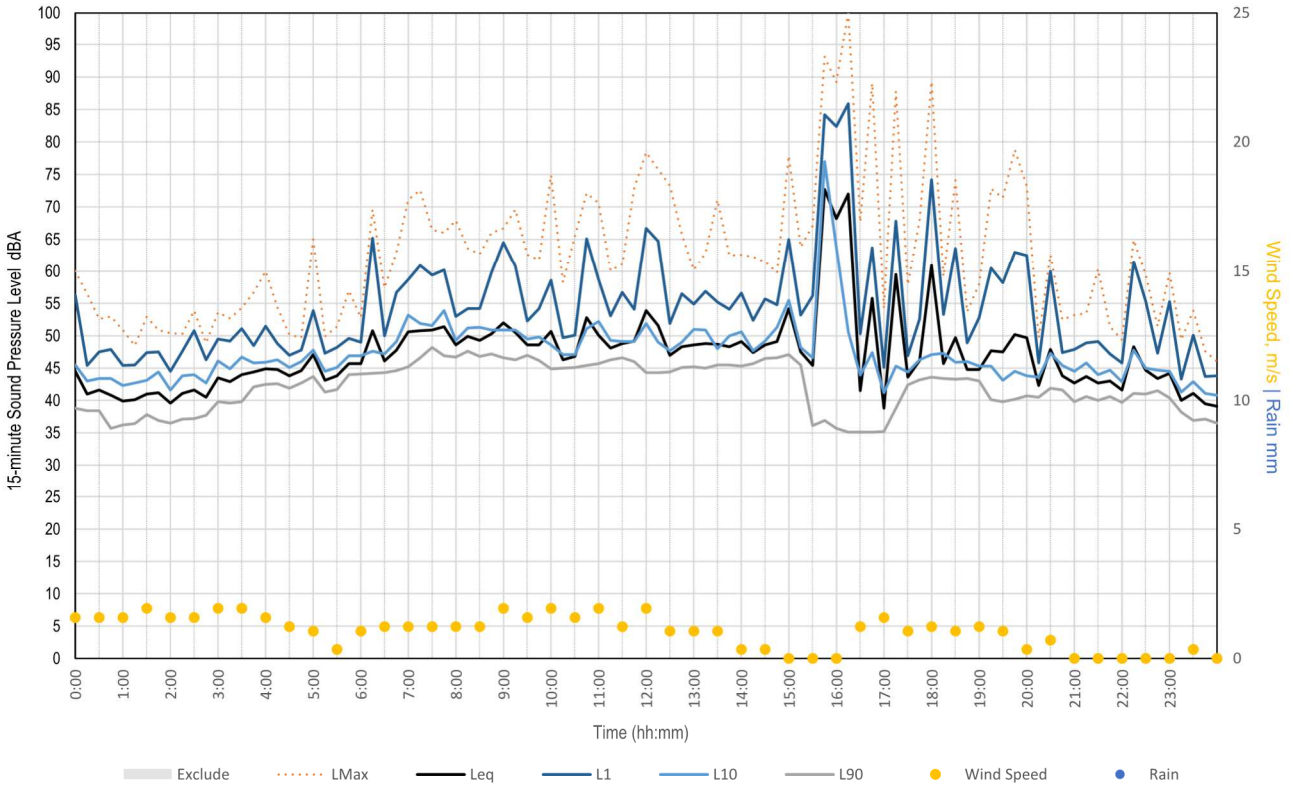
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Tuesday, 16 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

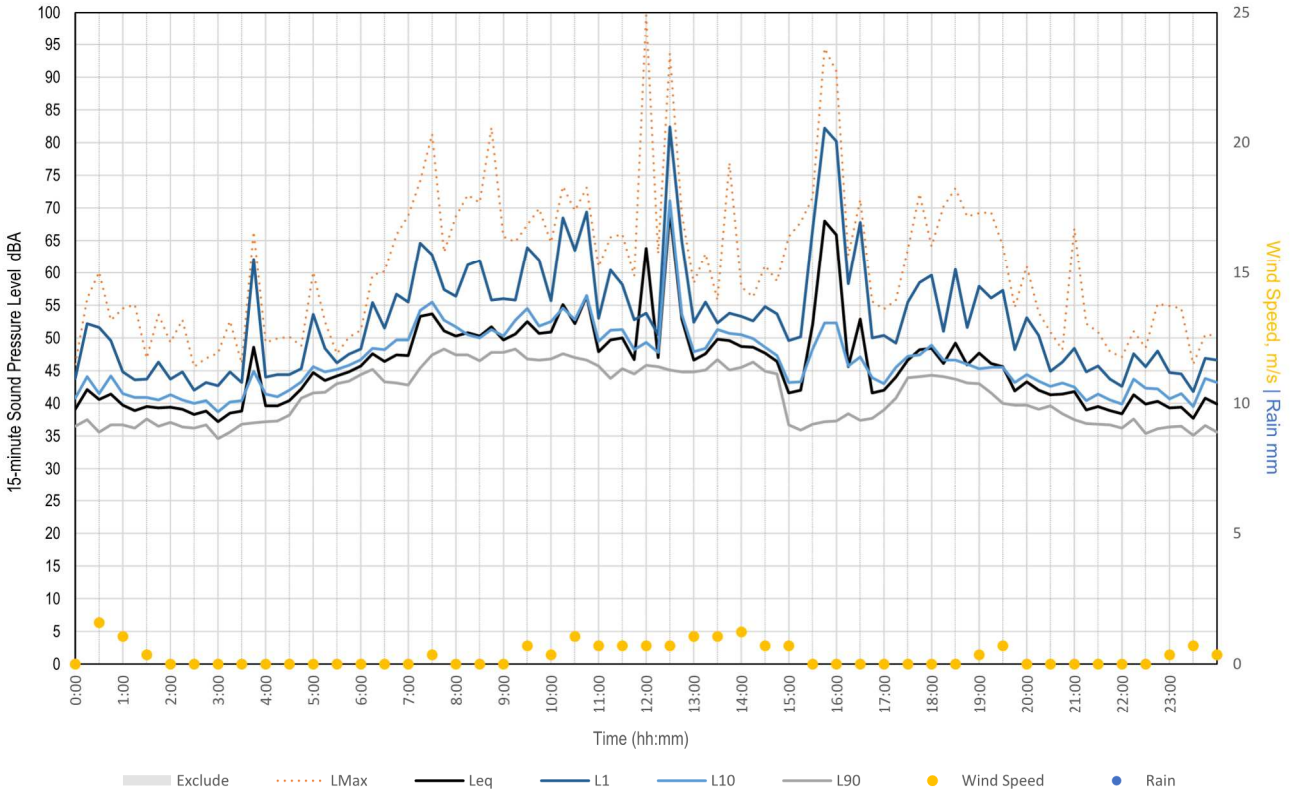
Wednesday, 17 August 2022



Noise Logger Results

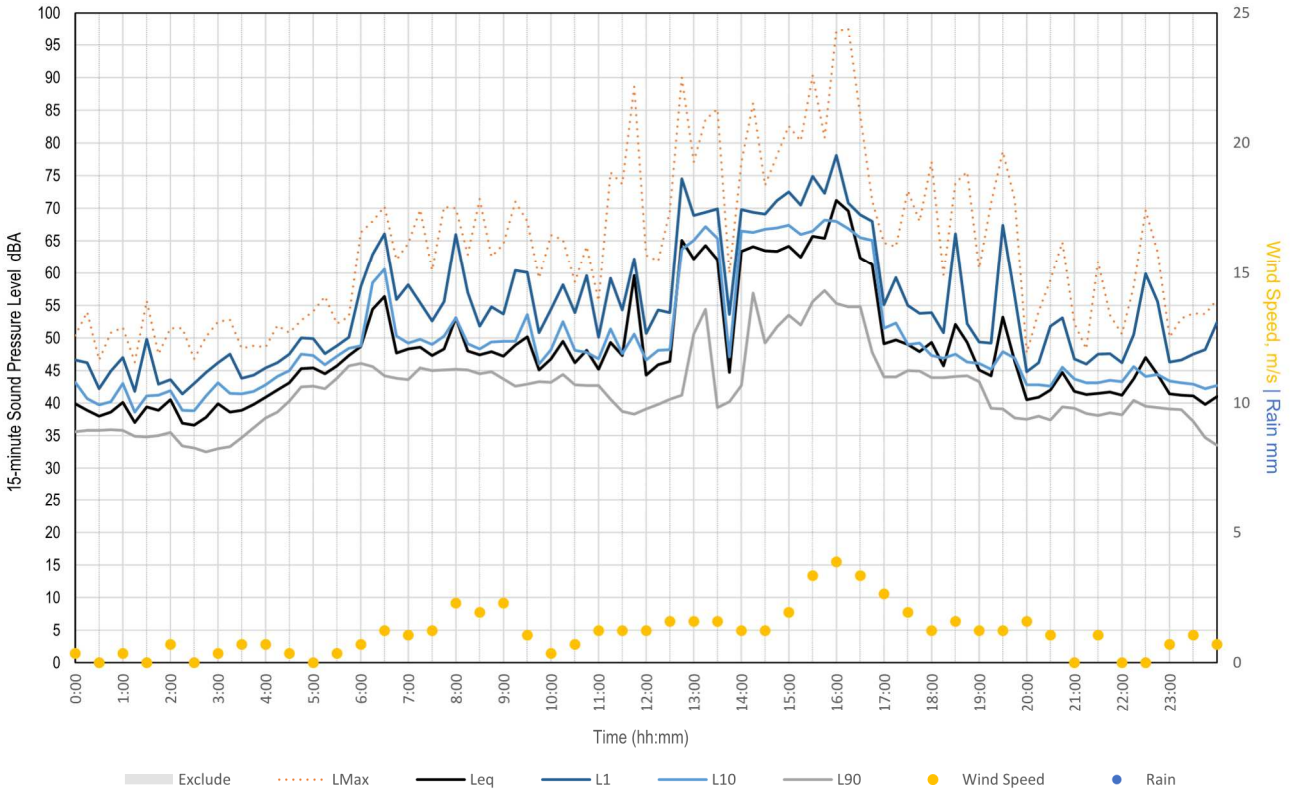
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Thursday, 18 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

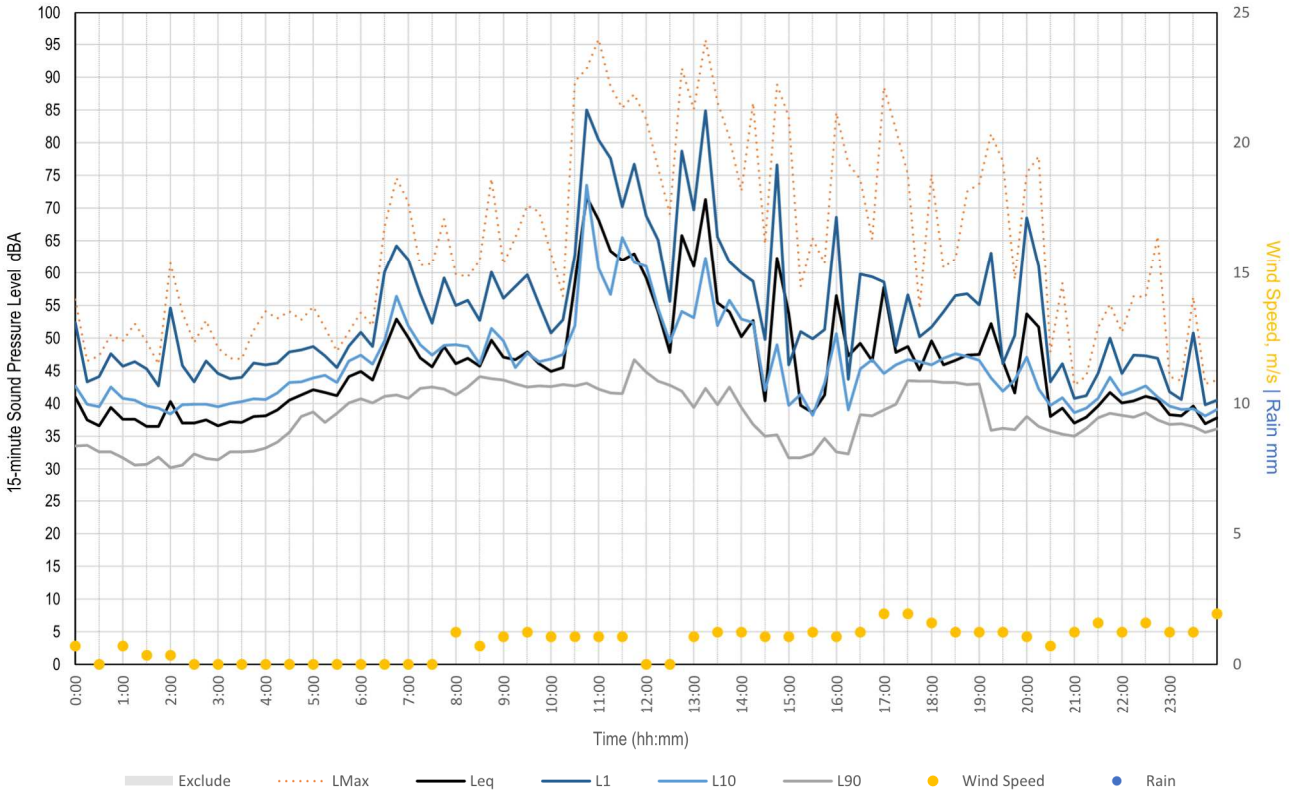
Friday, 19 August 2022



Noise Logger Results

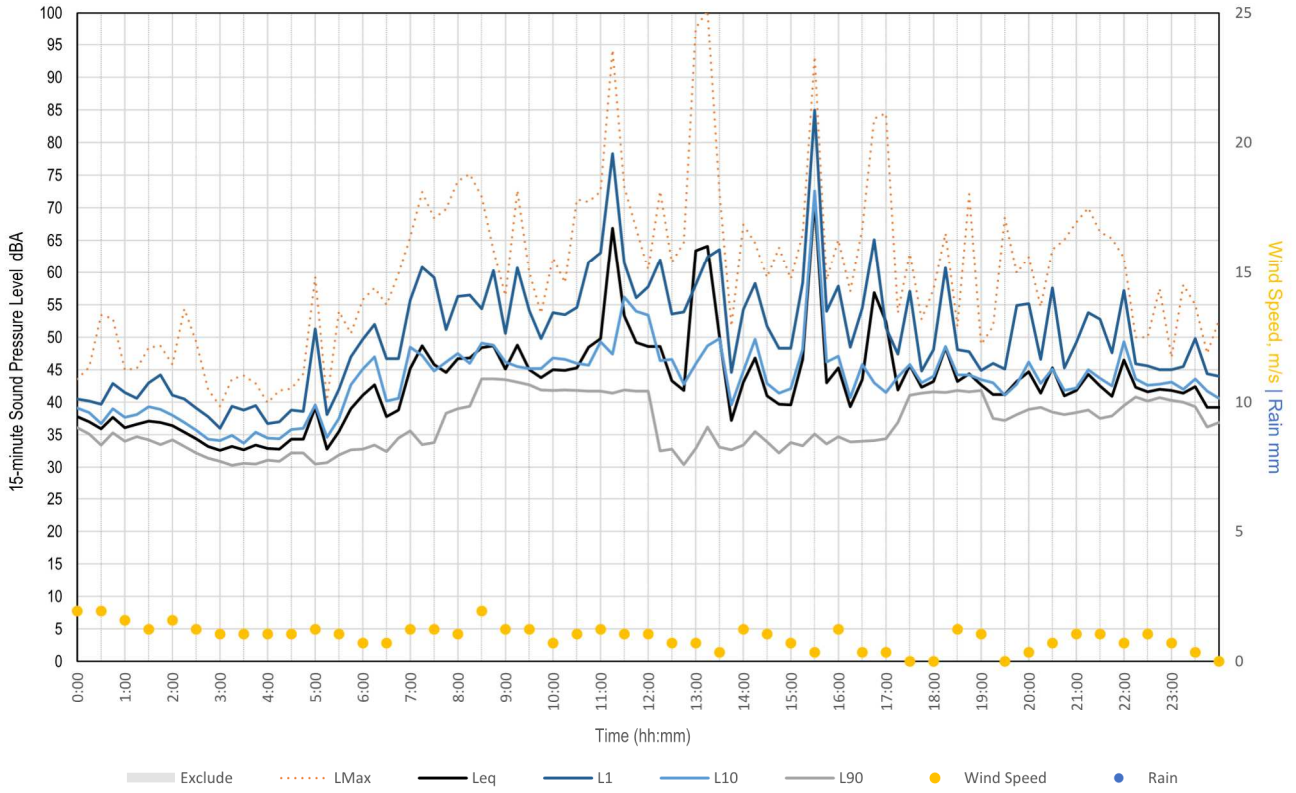
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Saturday, 20 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

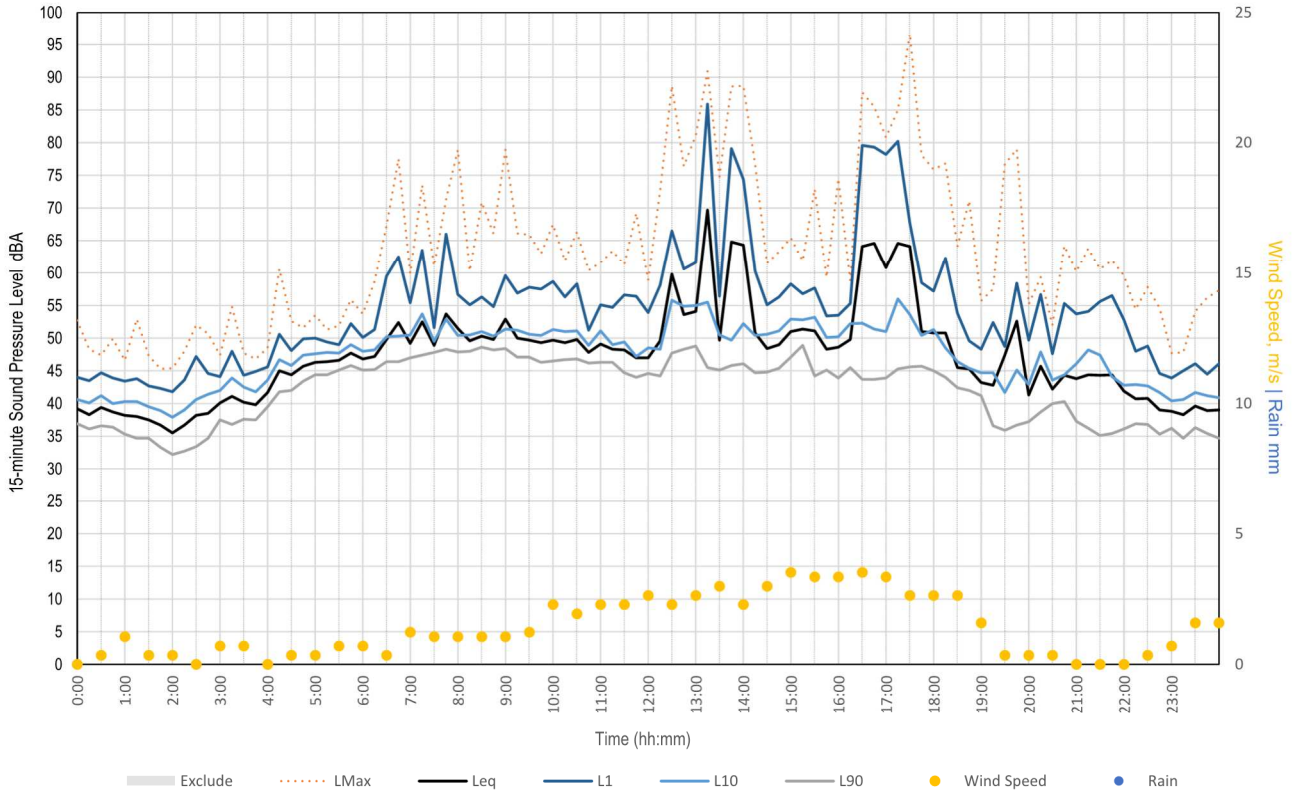
Sunday, 21 August 2022



Noise Logger Results

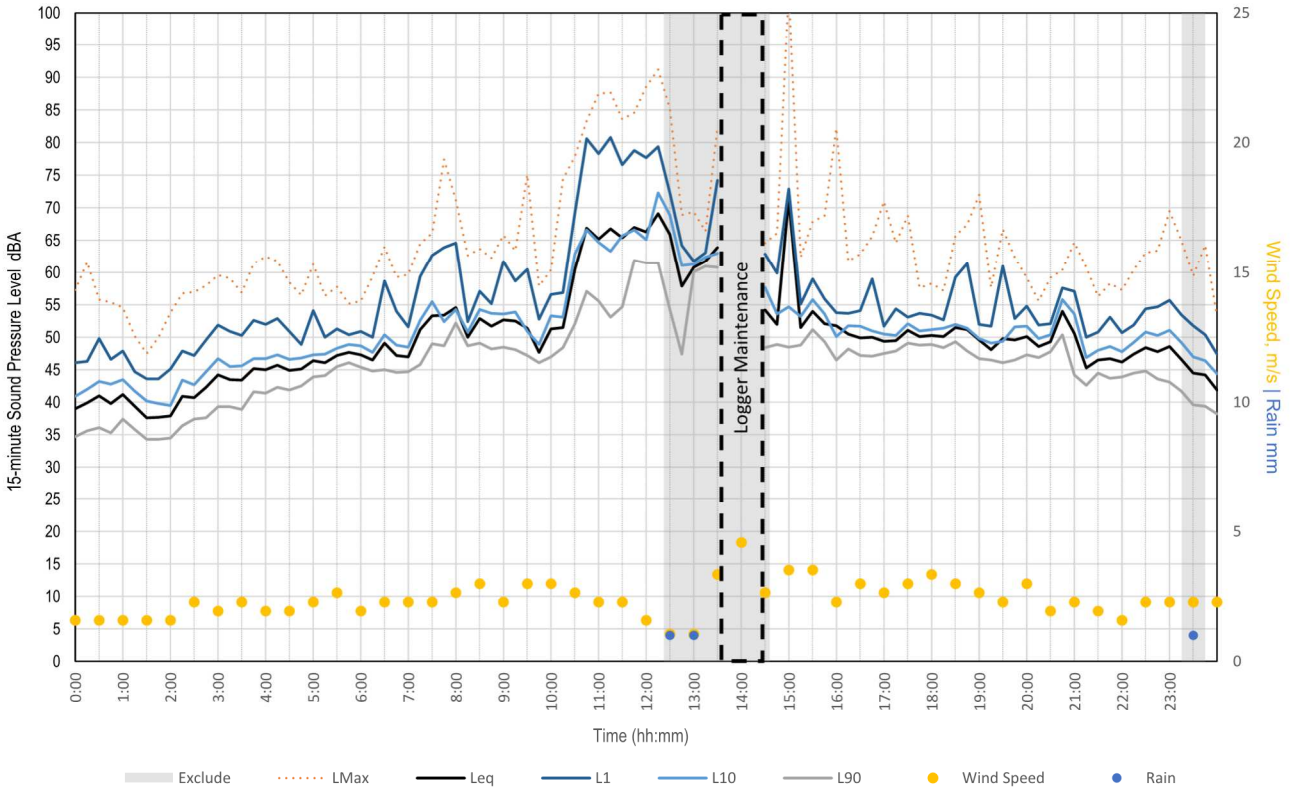
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Monday, 22 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

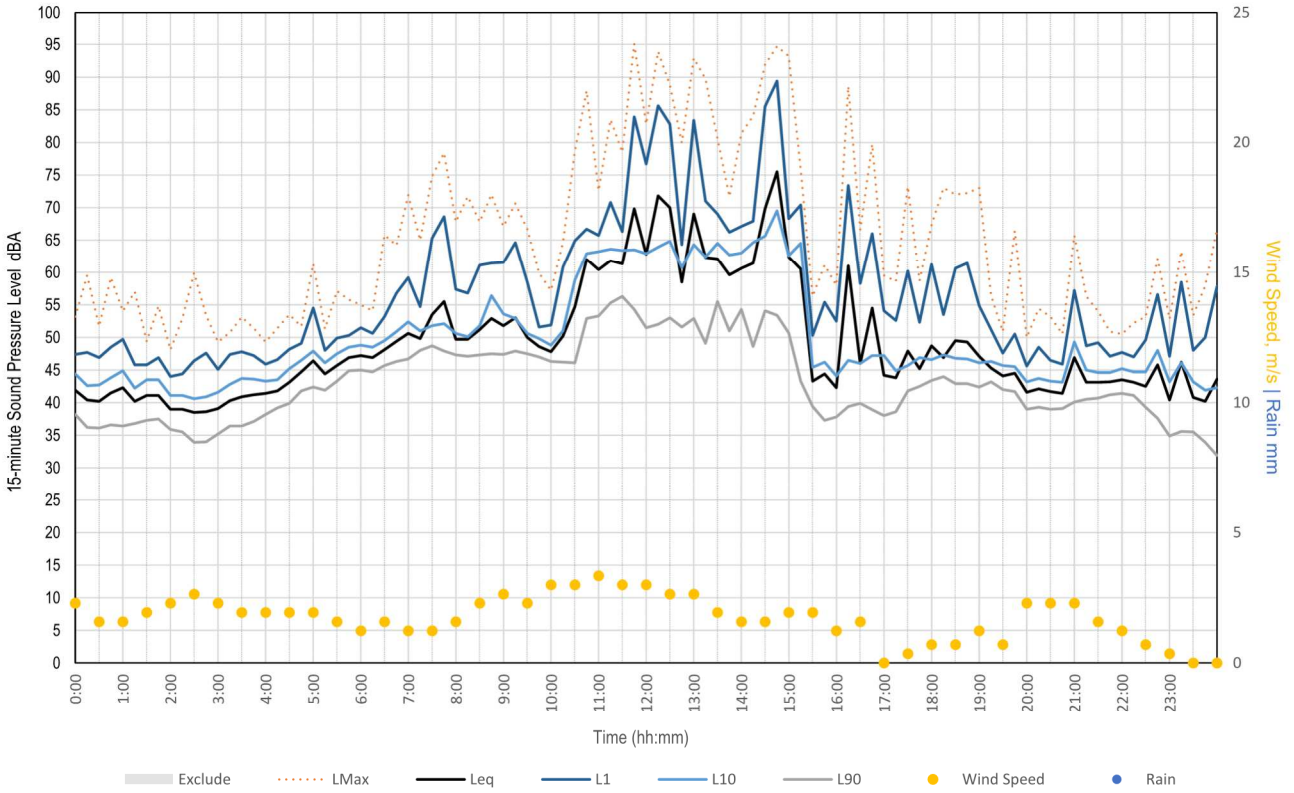
Tuesday, 23 August 2022



Noise Logger Results

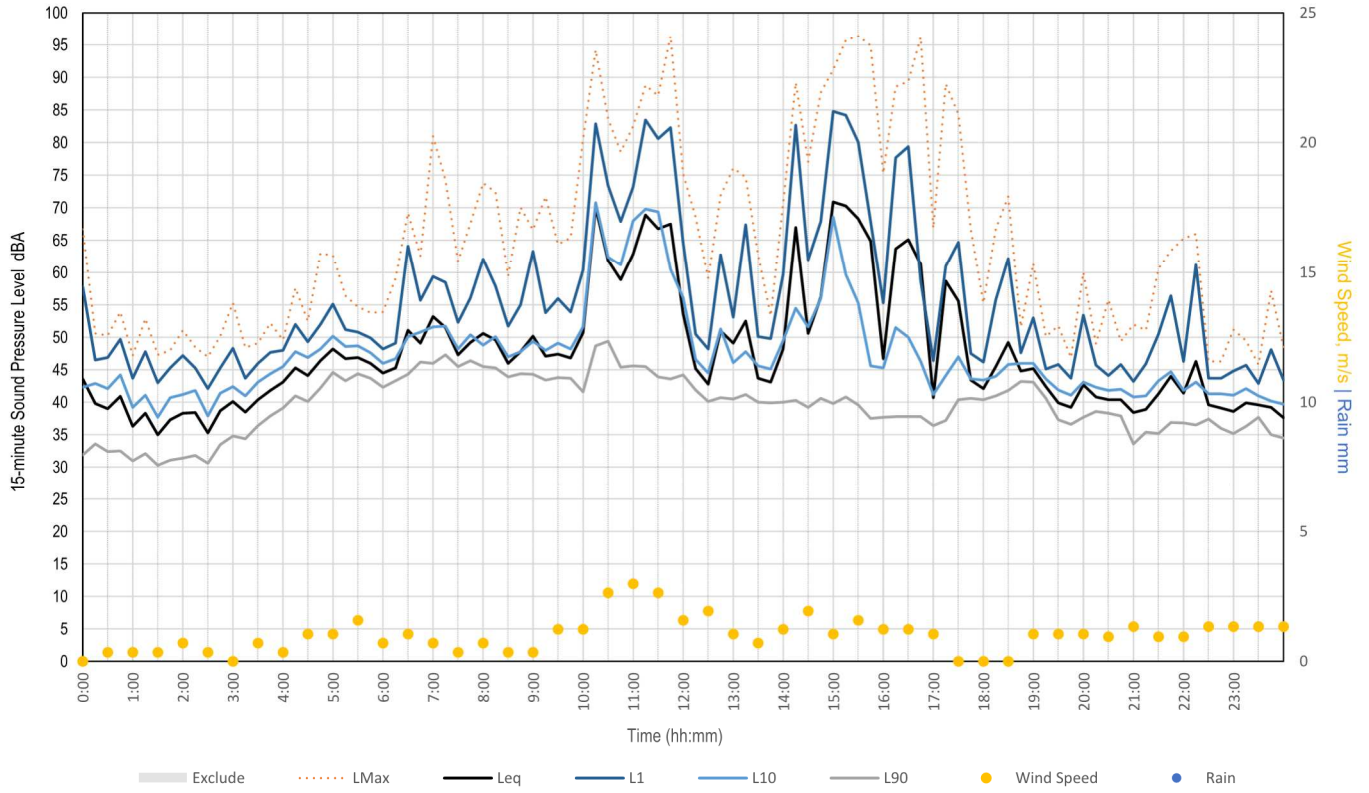
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Wednesday, 24 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

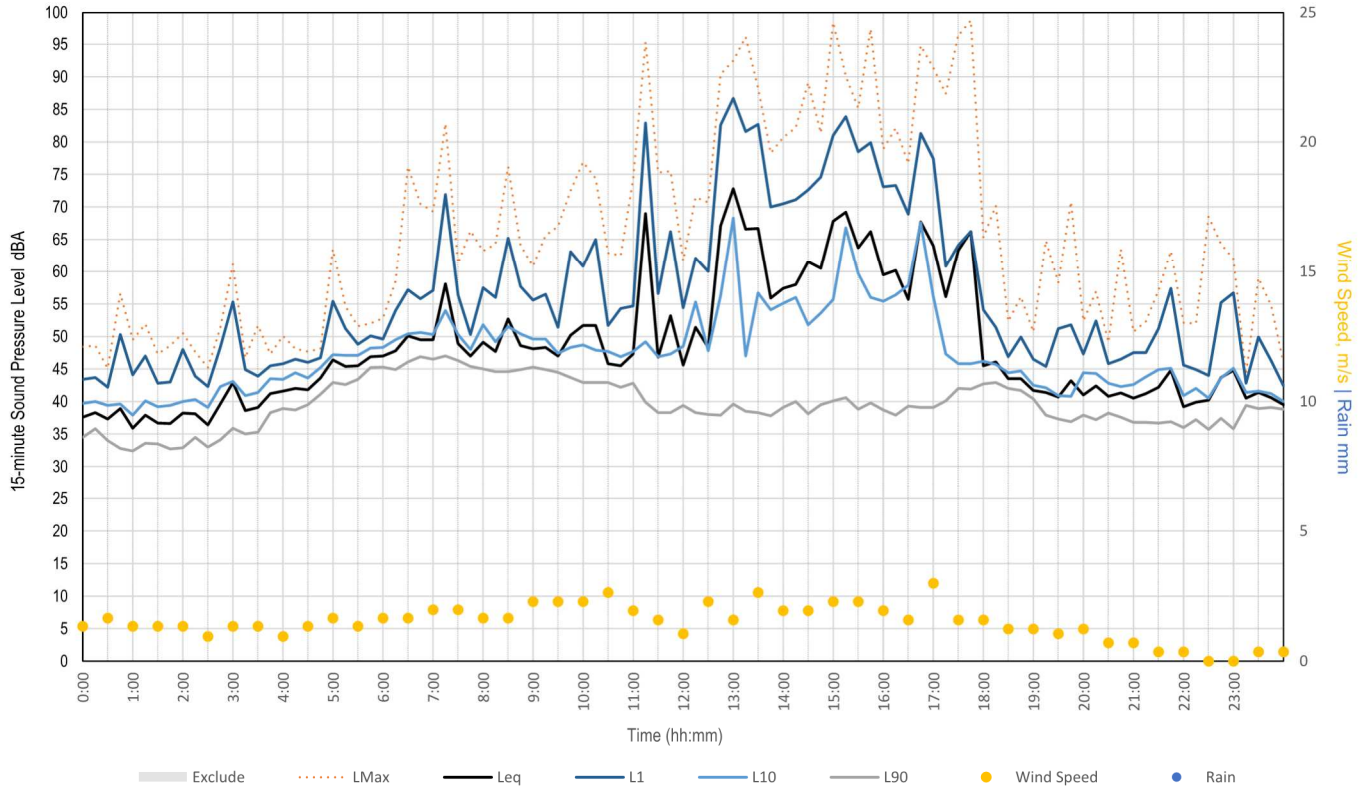
Thursday, 25 August 2022



Noise Logger Results

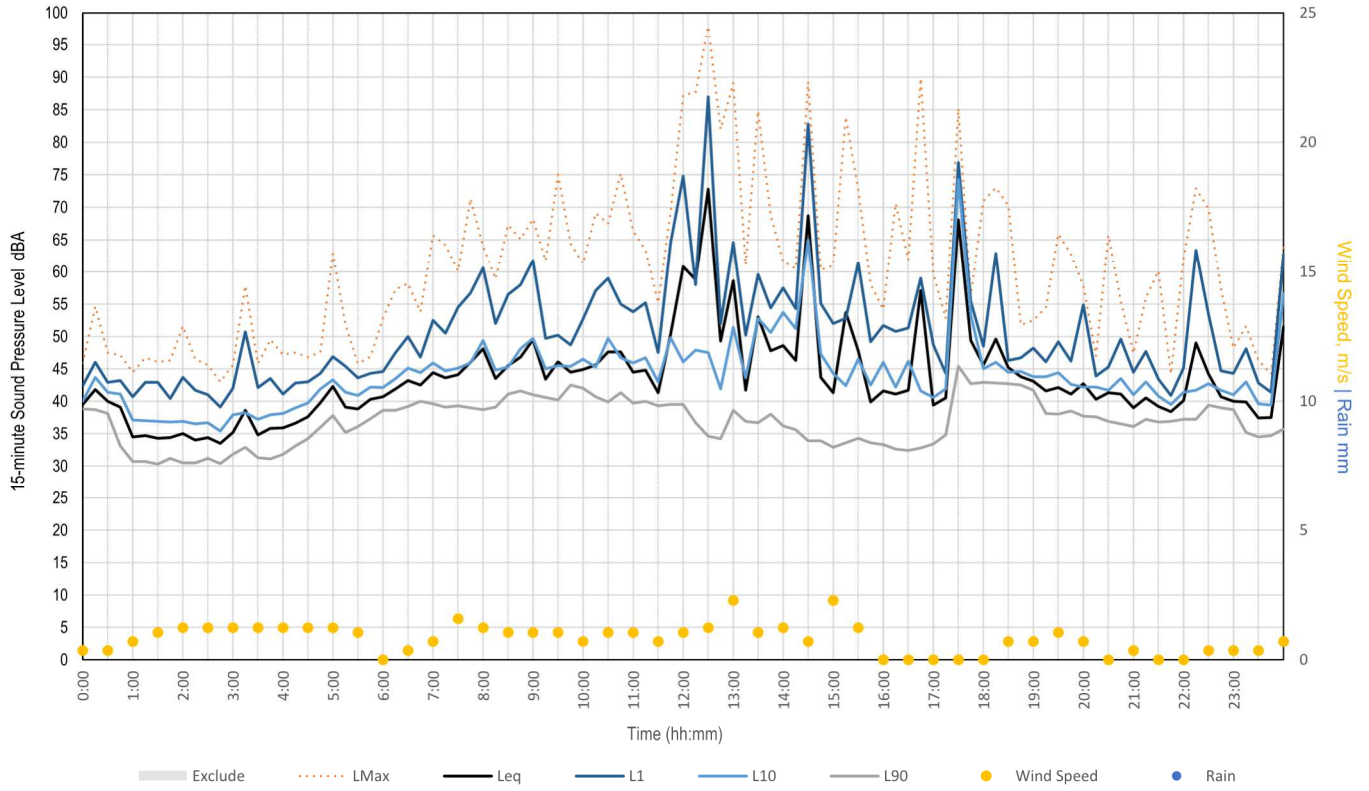
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Friday, 26 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

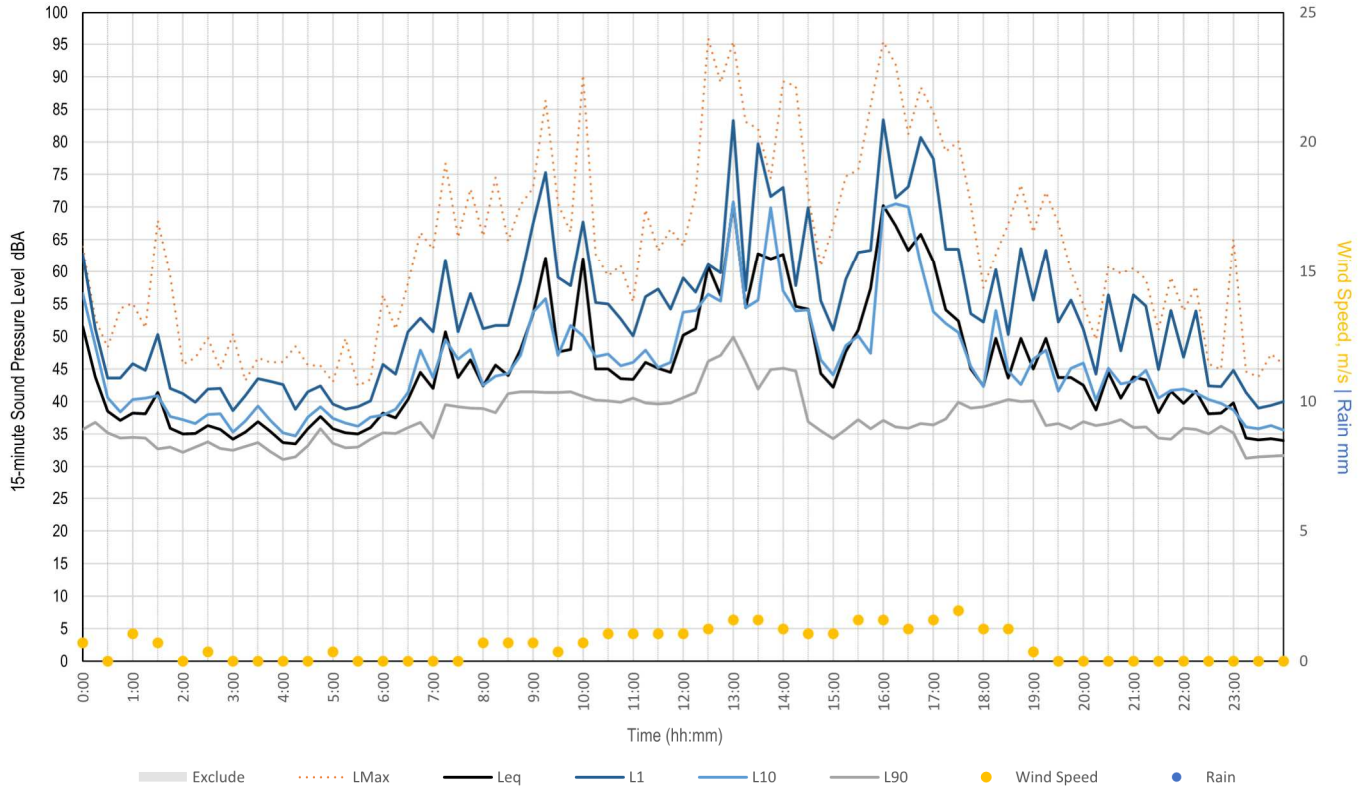
Saturday, 27 August 2022



Noise Logger Results

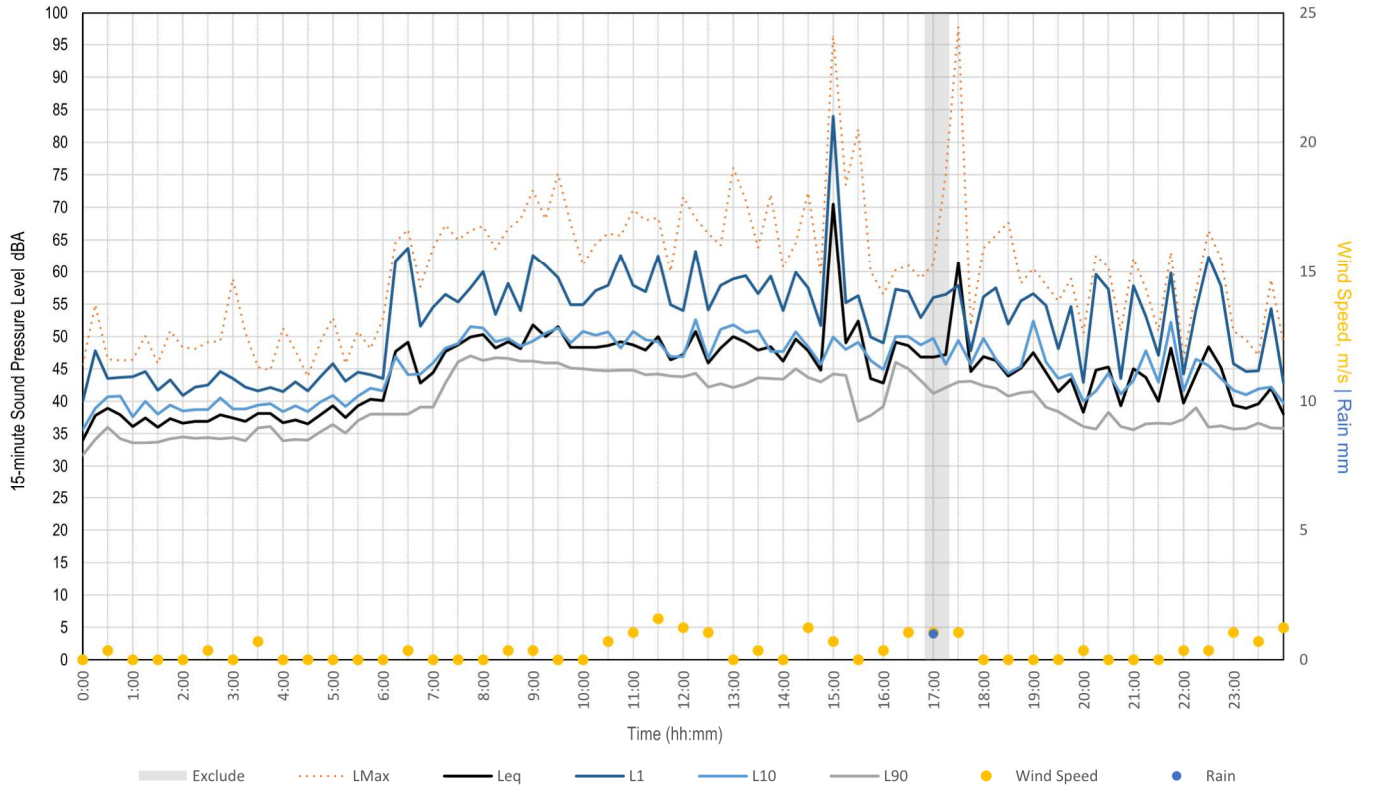
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Sunday, 28 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

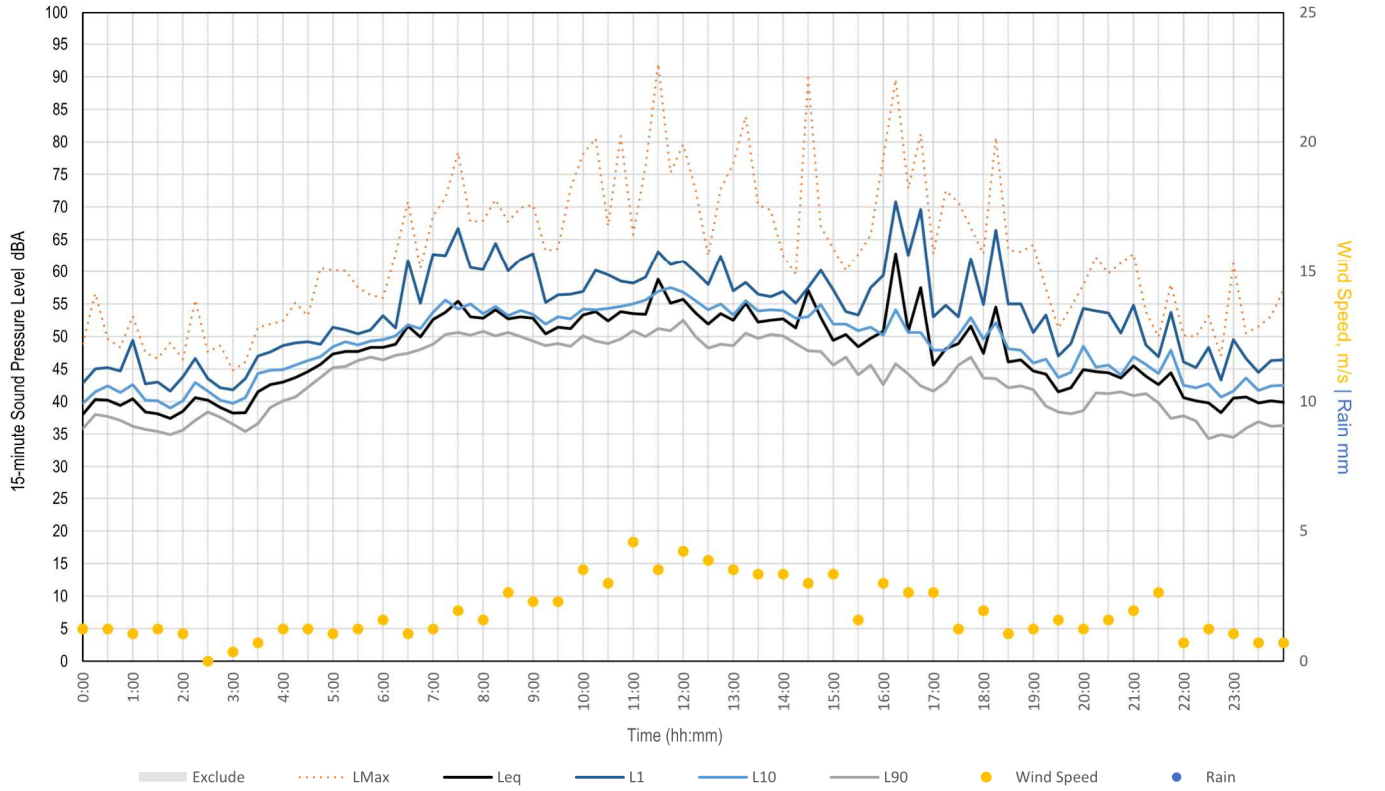
Monday, 29 August 2022



Noise Logger Results

Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Tuesday, 30 August 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

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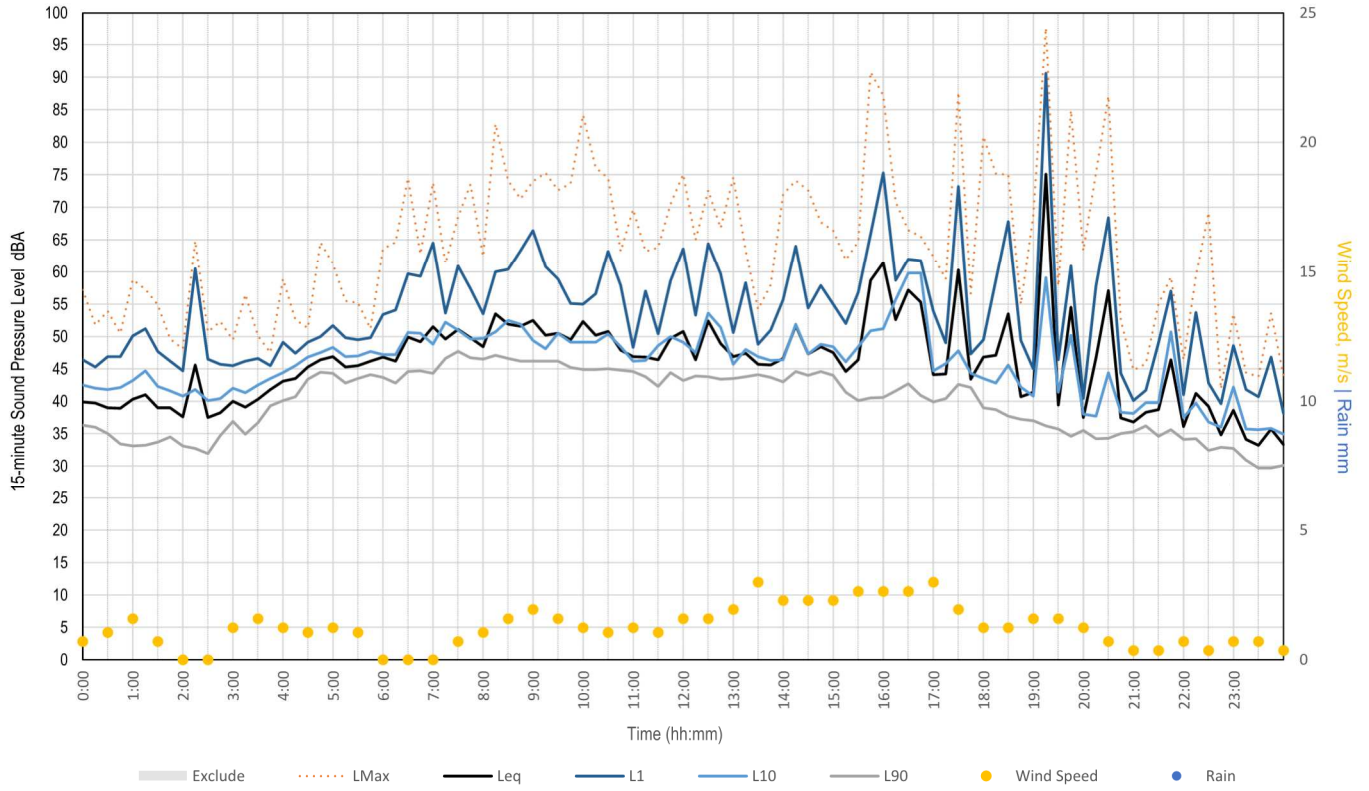
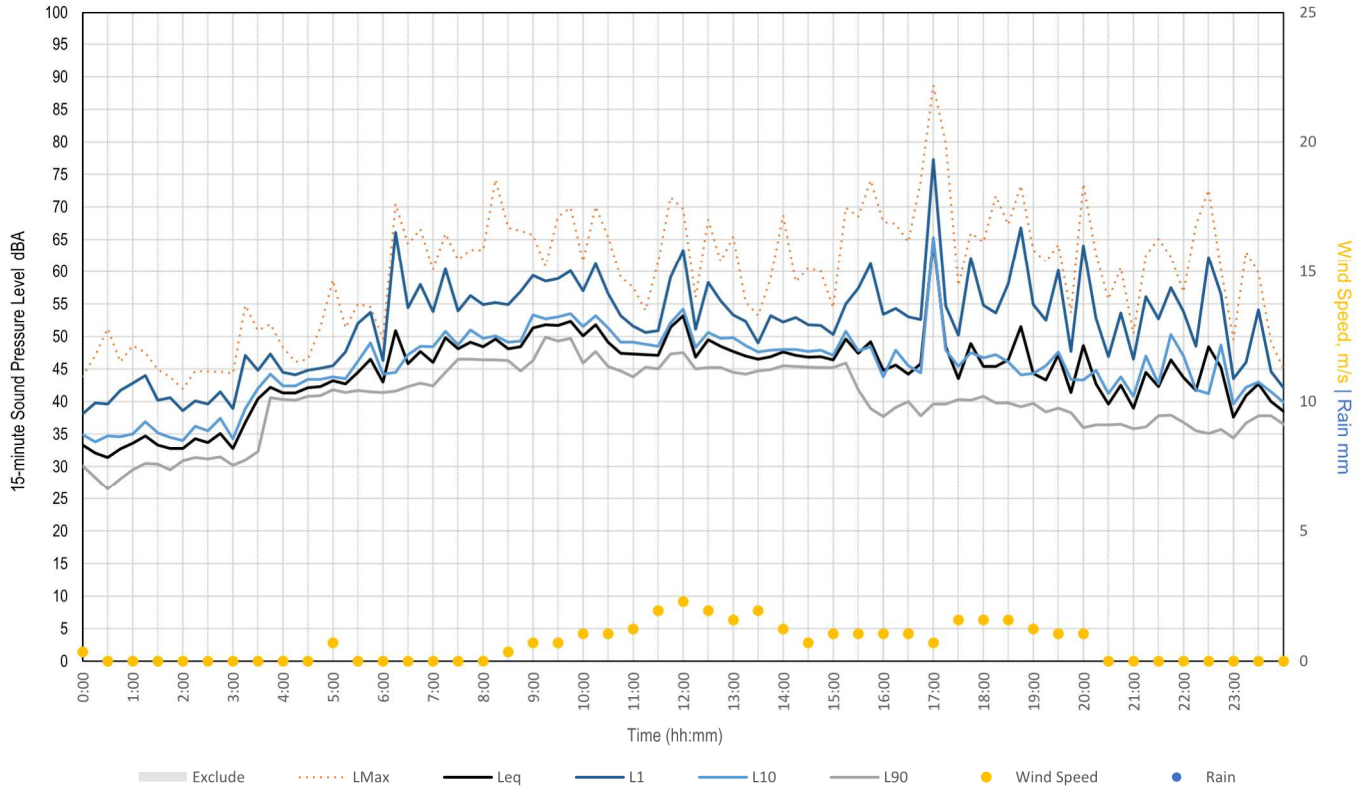


Noise Logger Results

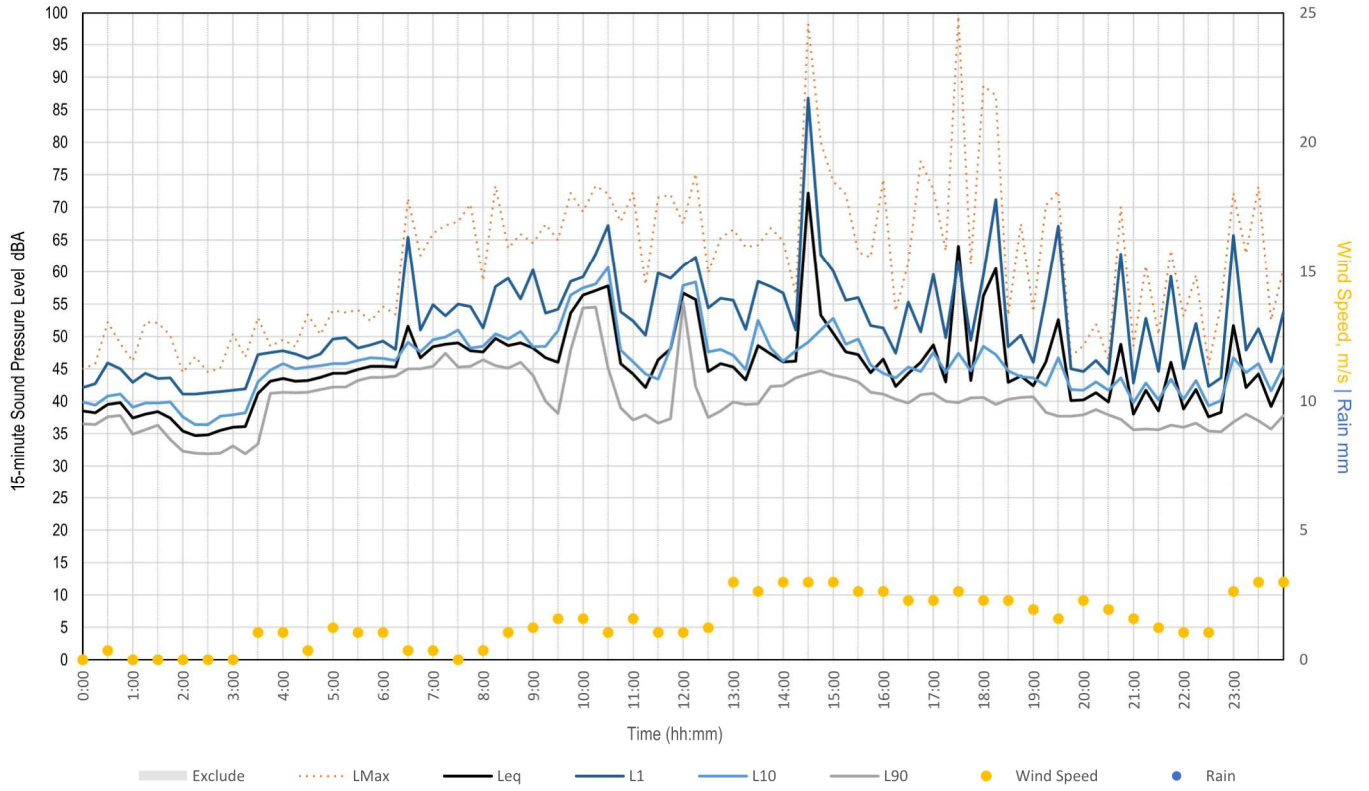
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Thursday, 01 September 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

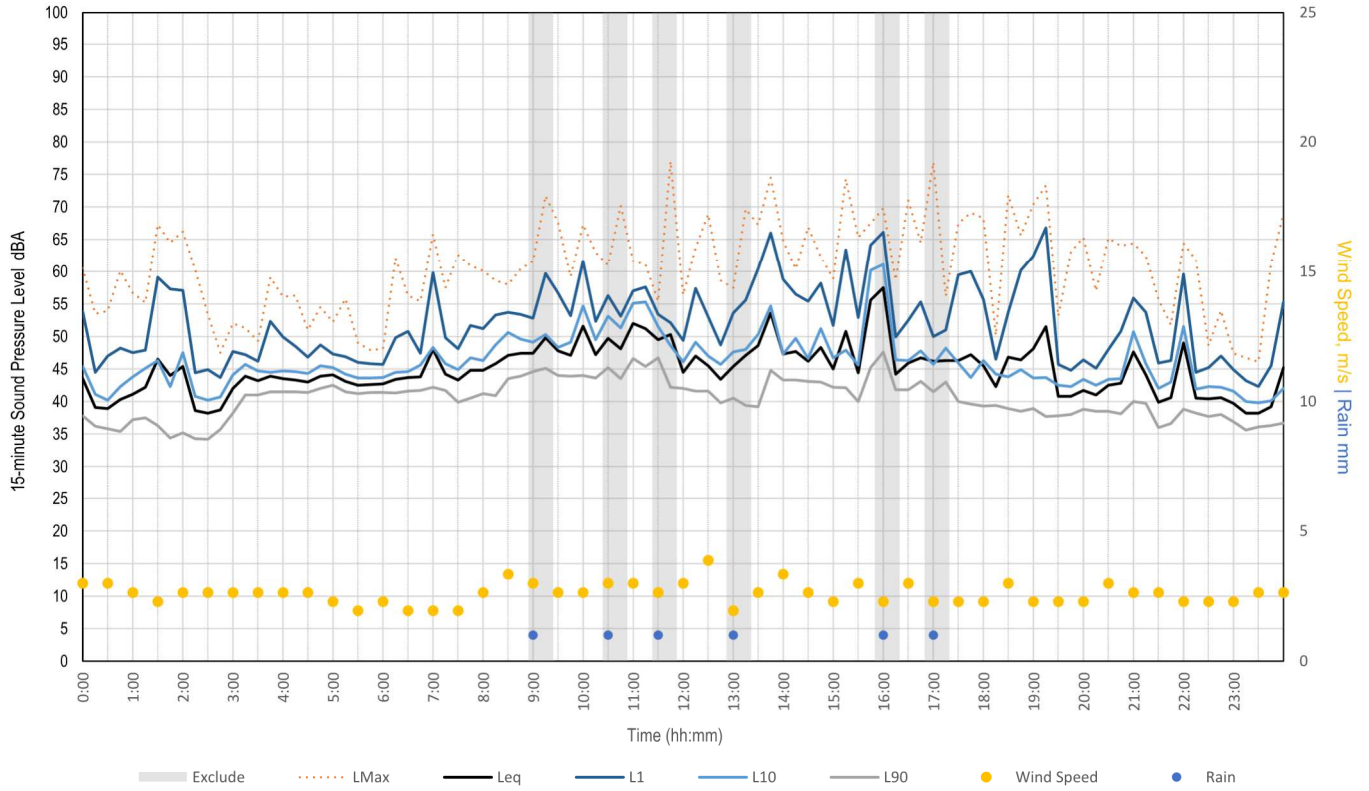
Friday, 02 September 2022



Noise Logger Results

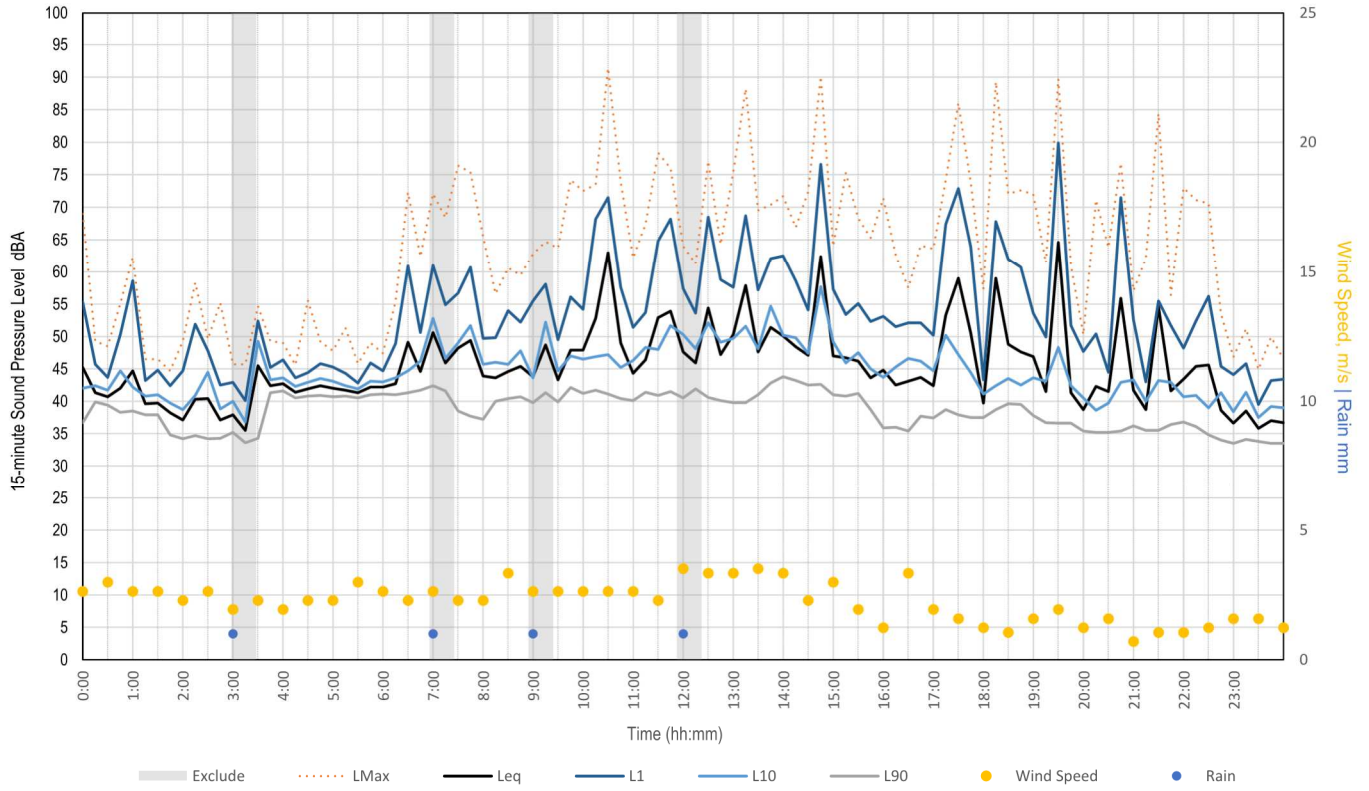
Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Saturday, 03 September 2022



Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

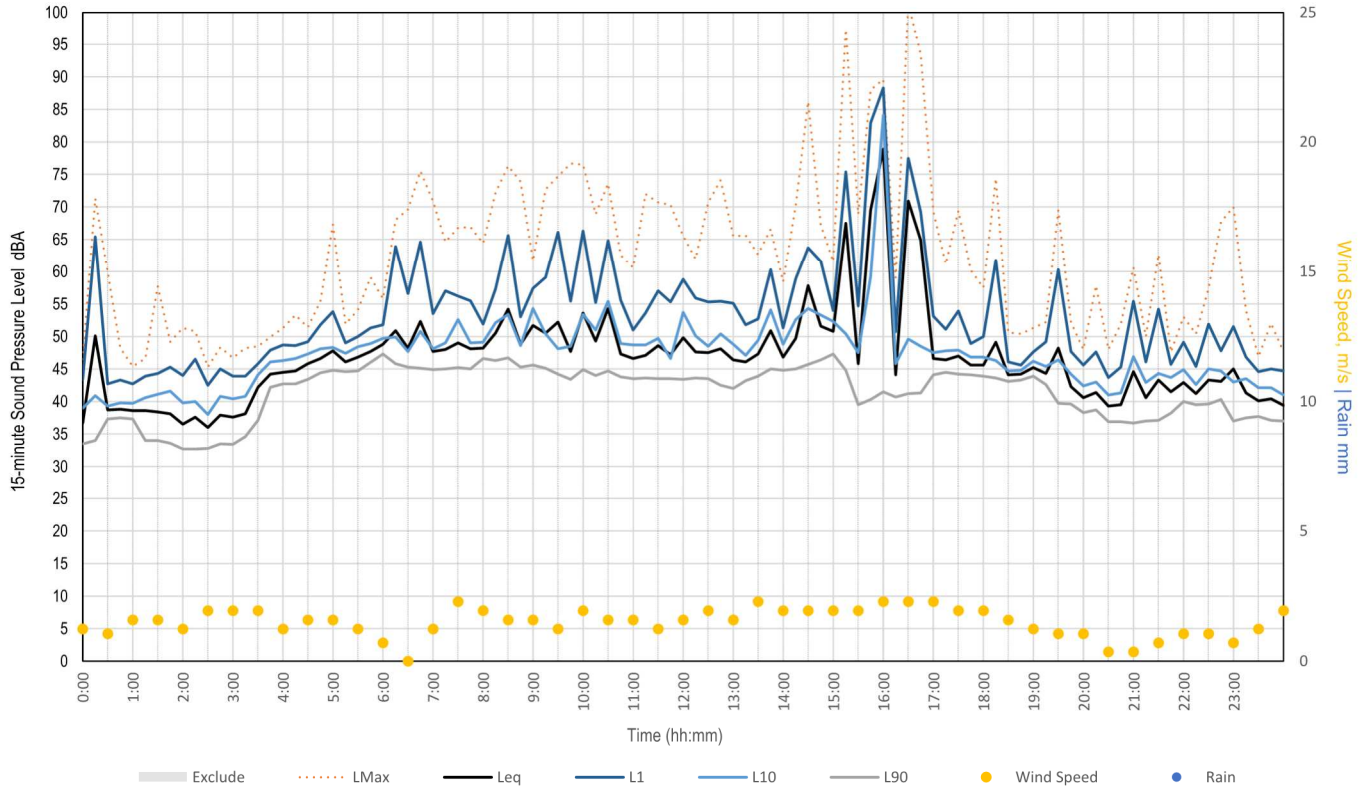
Sunday, 04 September 2022

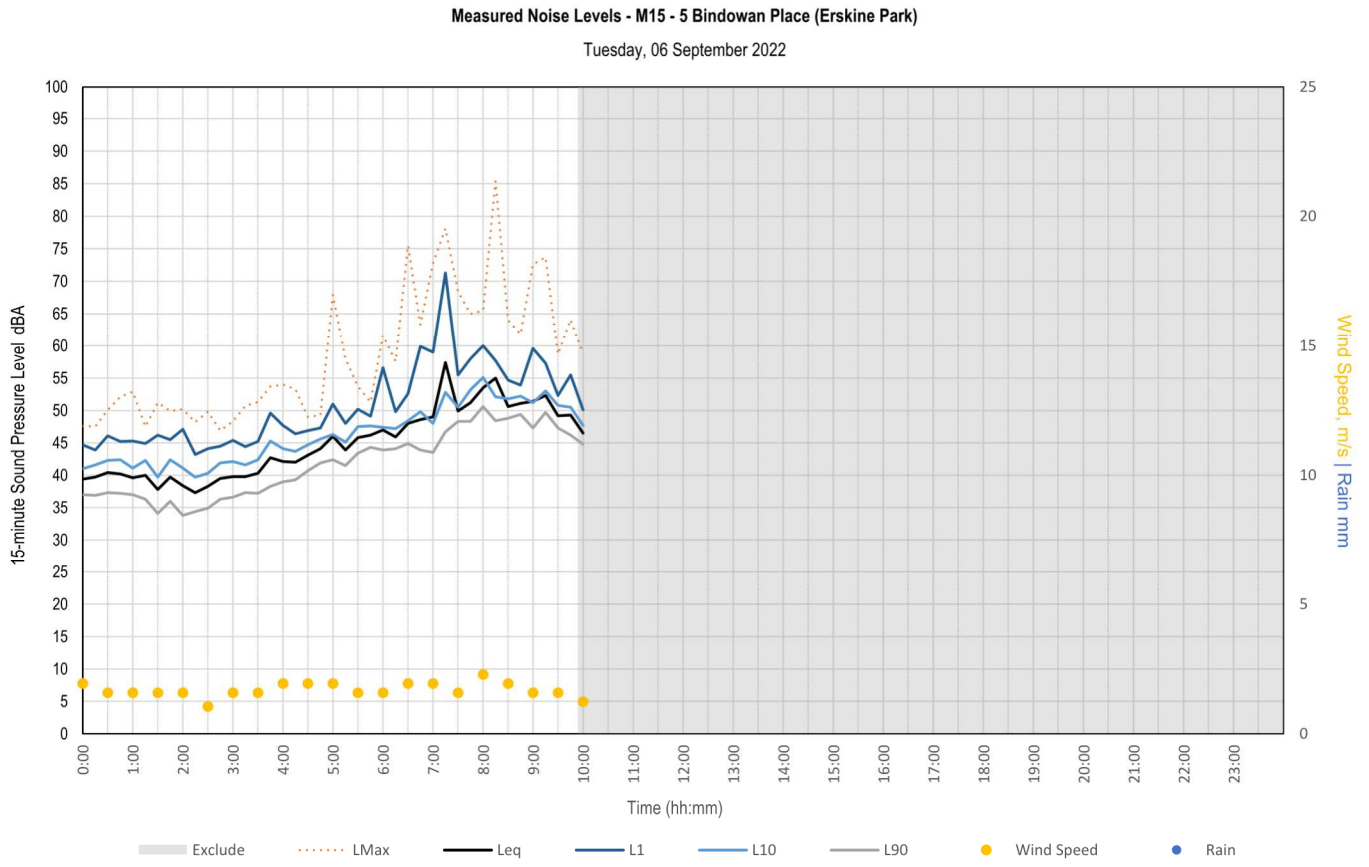


Noise Logger Results

Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)

Monday, 05 September 2022




Measured Noise Levels - M15 - 5 Bindowan Place (Erskine Park)
Tuesday, 06 September 2022
15-minute Sound Pressure Level dBA
Wind Speed, m/s | Rain mm
Time (hh:mm)
Exclude
LMax
Leq
L1
L10
L90
Wind Speed
Rain

Background Noise Monitoring

Location	M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & JF

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878097
Calibration	**Pre:**	94.0 dBA	**Post:**	94.2 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	93.6 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Wednesday, 12 Oct 2022
No. of days	30
No. of nights	29

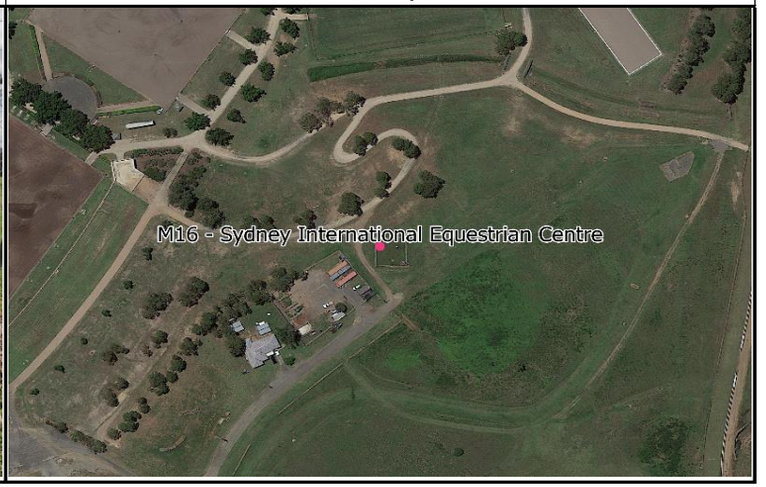
Weather	
Station	BoM
Station Info	Horsley Park Equestrian AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placement at free field location in a field with short grass.

Located at fence line towards equestrian track (approx.150m away from closest building). Fence will not have a notable reflective effect due to it being a wire fence with large gaps.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	13/09/2022	11:01:10 AM	11:16:10 AM	69	51	53	42	
2	Day	28/09/2022	11:48:50 AM	12:03:50 PM	67	52	54	47	
3	Day	28/09/2022	12:03:50 PM	12:18:50 PM	69	50	52	46	
4	Day	28/09/2022	12:18:50 PM	12:33:50 PM	67	52	54	47	
5	Evening	17/09/2022	6:45:00 PM	7:00:00 PM	64	52	54	50	*
6	Evening	17/09/2022	7:45:00 PM	8:00:00 PM	63	52	54	49	*
7	Evening	17/09/2022	8:15:00 PM	8:30:00 PM	64	52	53	49	*
8	Evening	17/09/2022	9:30:00 PM	9:45:00 PM	63	50	52	47	*
9	Night	21/09/2022	1:15:00 AM	1:30:00 AM	57	46	48	42	*
10	Night	21/09/2022	3:00:00 AM	3:15:00 AM	56	44	46	40	*
11	Night	21/09/2022	5:15:00 AM	5:30:00 AM	55	48	49	46	*
12	Night	21/09/2022	11:15:00 PM	11:30:00 PM	53	43	44	40	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Constant flow of traffic on Westlink M7. Intermittent bird noise. Staff maintenance vehicle moving around the centre (buggy). Several aircraft observed flying at a distance with an approx. duration of 1 min with a maximum sound level in the range of 47 to 54 dBA.
Background noise	Traffic noise (Westlink M7).
Evening	
Ambient noise	Occasional vehicles passing on Westlink M7. Constant insect and bird noise. Intermittent animal and insect sounds (e.g. frogs/toads, dogs). An aircraft flying overhead with an approx. duration of 1 min and with a maximum sound level of in the range of 50 to 60 dBA.
Background noise	Traffic noise (Westlink M7). Movement in vegetation induced by wind (e.g. trees rustling).
Night	
Ambient noise	Constant flow of traffic on Westlink M7, mainly cars with occasional motorbike. Constant insect and bird noise.Various animal sound (e.g. frogs/toads). Aircrafts flying overhead with an approx. duration of 30 sec to 1 min and with a maximum sound level in the range of 50 to 61 dBA.
Background noise	Traffic at a distance (Westlink M7). Movement in vegetation induced by wind (e.g. trees rustling). Constant bird noise.

Site Details	M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)
Start Date	Tue 13 September 2022
End Date	Wed 12 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	55
$L_{eq, Evening}$ dBA	51
$L_{eq, Night}$ dBA	50
RBL, $_{Day}$ dBA	45
RBL, $_{Evening}$ dBA	45
RBL, $_{Night}$ dBA	40

Daily Summary

Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA	50	52	54	56	55	53	63	51
$L_{eq, Evening}$ dBA	46	50	47	54	52	51	48	49
$L_{eq, Night}$ dBA	50	49	52	51	49	51	52	49
ABL, $_{Day}$ dBA	41	43	47	50	48	44	45	45
ABL, $_{Evening}$ dBA	41	45	44	48	47	45	41	45
ABL, $_{Night}$ dBA	40	42	43	42	37	39	40	40

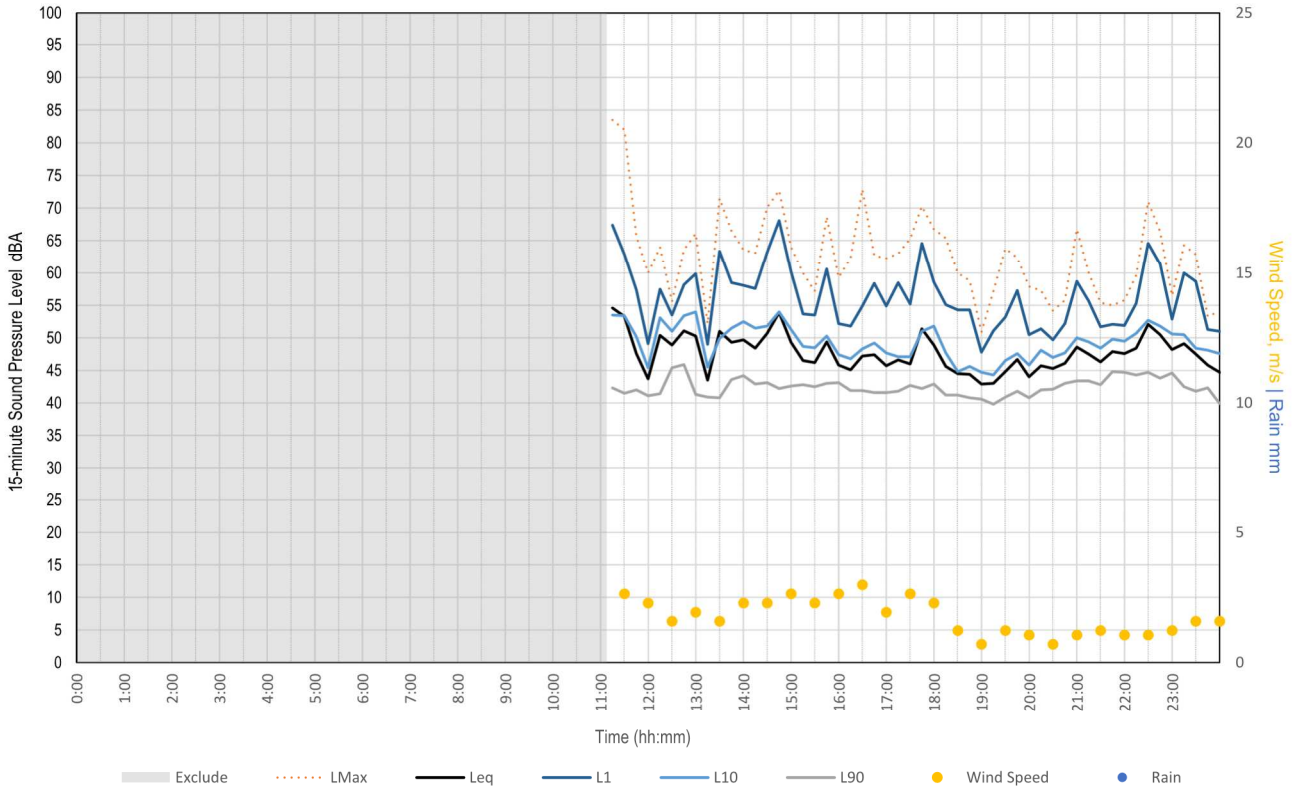
Date	21/09	22/09	23/09	24/09	25/09	26/09	27/09	28/09
$L_{eq, Day}$ dBA	52	49	52	48	51	52	52	52
$L_{eq, Evening}$ dBA	49	47	51	54	50	49	49	55
$L_{eq, Night}$ dBA	44	46	47	47	49	50	54	53
ABL, $_{Day}$ dBA	45	43	46	41	42	44	45	43
ABL, $_{Evening}$ dBA	45	41	45	48	43	46	43	49
ABL, $_{Night}$ dBA	37	39	40	39	38	41	43	41

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	54	63	48	47	48	52	54	53
$L_{eq, Evening}$ dBA	51	49	46	55	52	46	47	54
$L_{eq, Night}$ dBA	51	47	46	47	51	48	50	51
ABL, $_{Day}$ dBA	48	44	41	39	40	45	45	47
ABL, $_{Evening}$ dBA	47	45	42	40	46	39	44	48
ABL, $_{Night}$ dBA	41	39	38	37	42	35	44	44

Date	07/10	08/10	09/10	10/10	11/10	12/10
$L_{eq, Day}$ dBA	55	48	52	49	51	53
$L_{eq, Evening}$ dBA	51		52	47	49	49
$L_{eq, Night}$ dBA	49	48	48	49	51	49
ABL, $_{Day}$ dBA	50	42	40	43	45	46
ABL, $_{Evening}$ dBA	48		45	41	44	45
ABL, $_{Night}$ dBA	43	44	38	40	43	44

Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

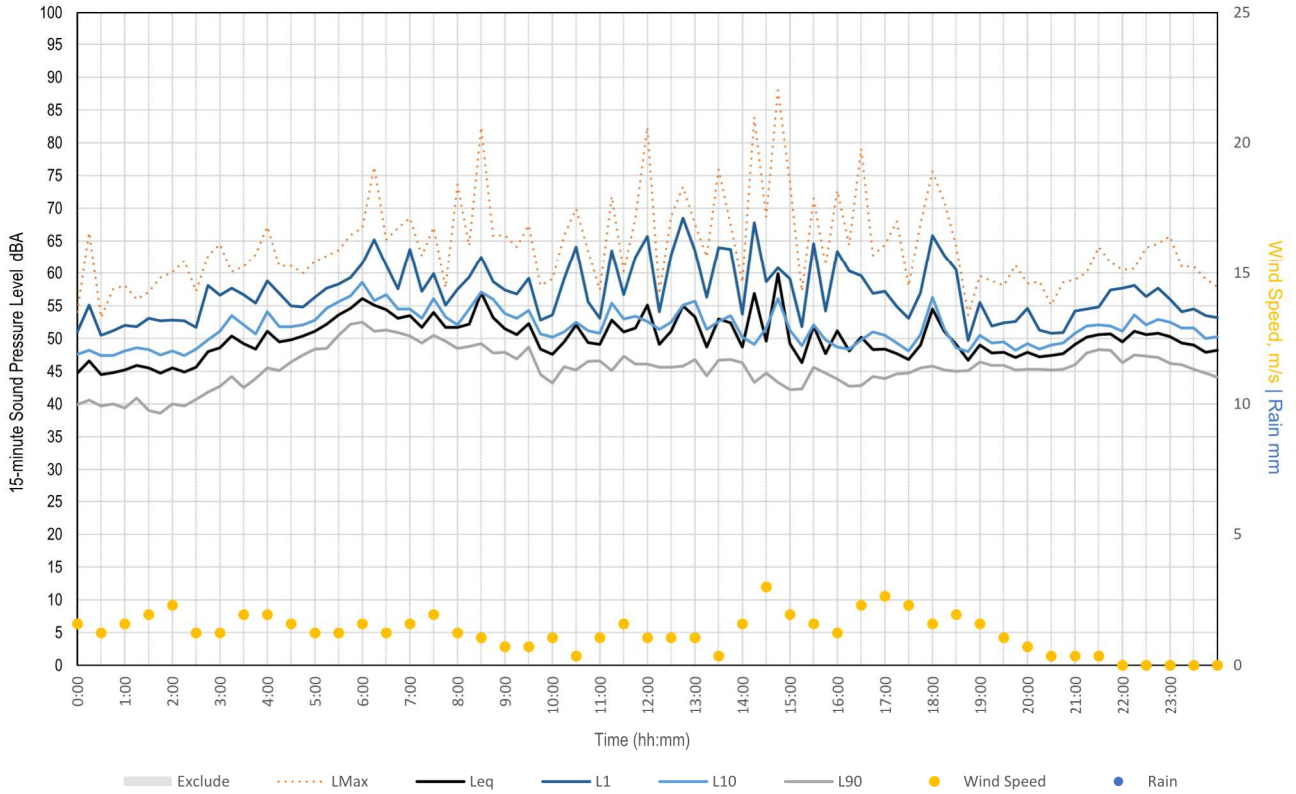
Tuesday, 13 September 2022



Noise Logger Results

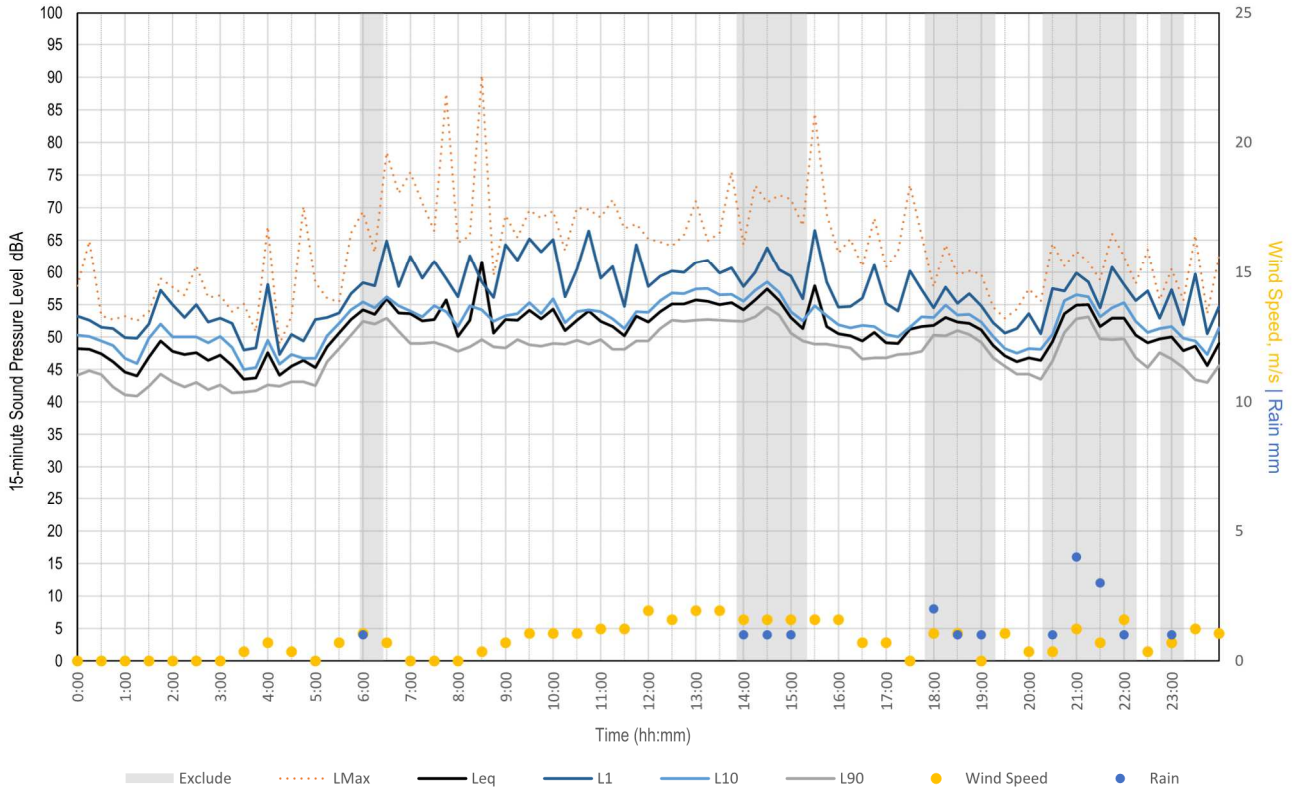
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Wednesday, 14 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

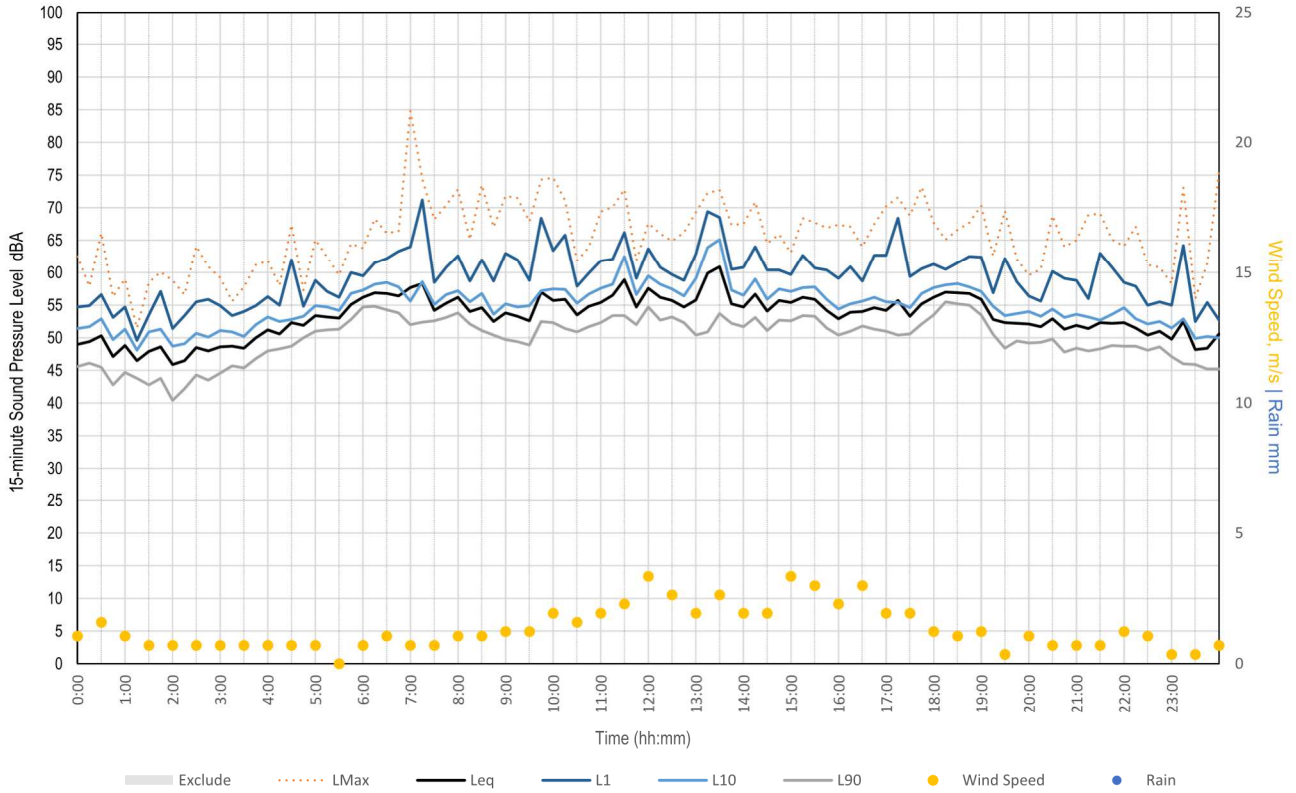
Thursday, 15 September 2022



Noise Logger Results

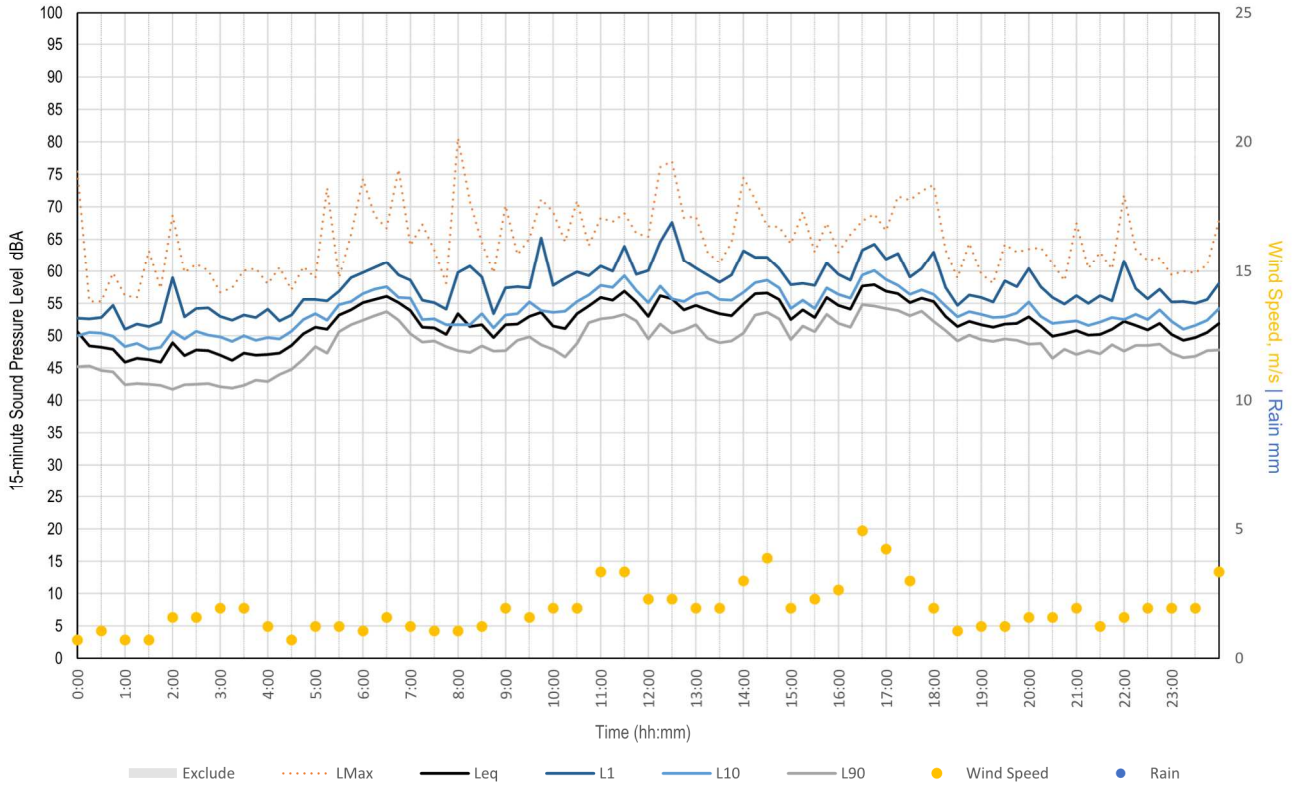
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Friday, 16 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

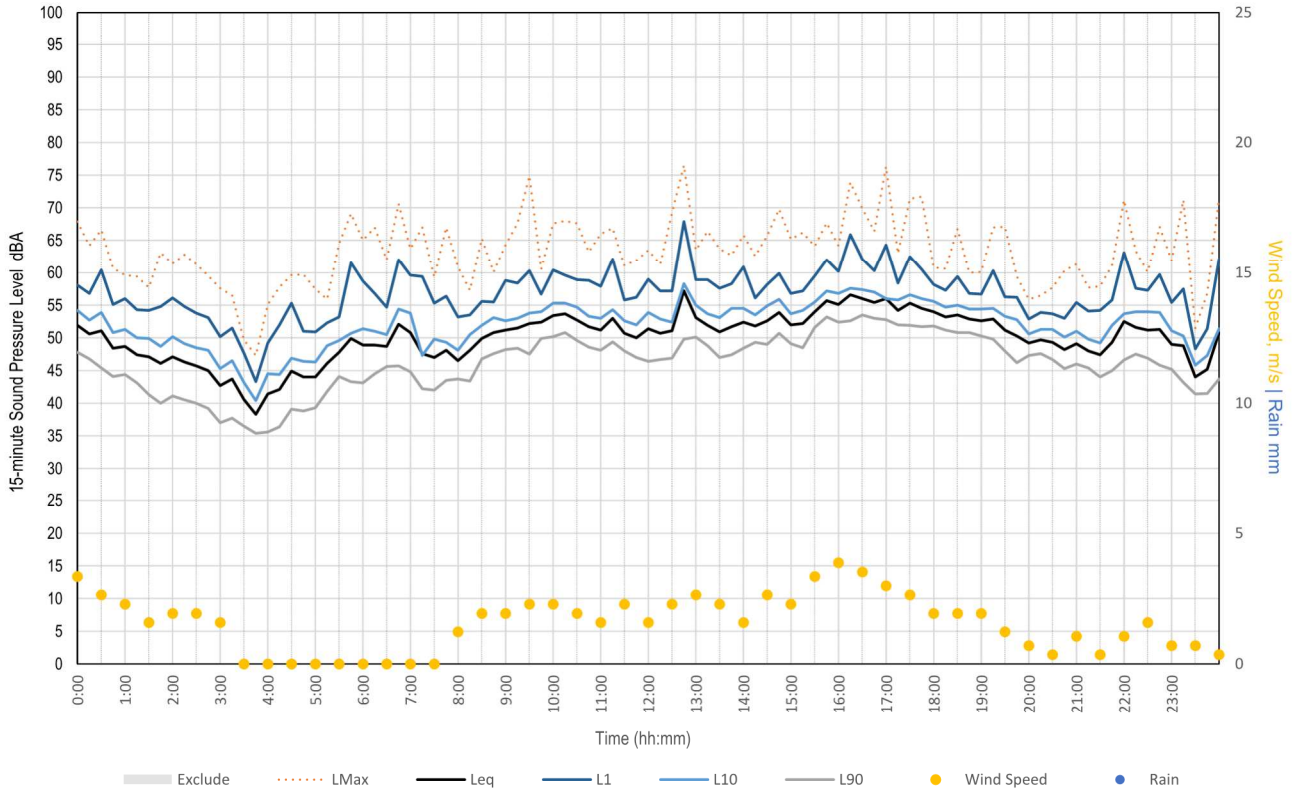
Saturday, 17 September 2022



Noise Logger Results

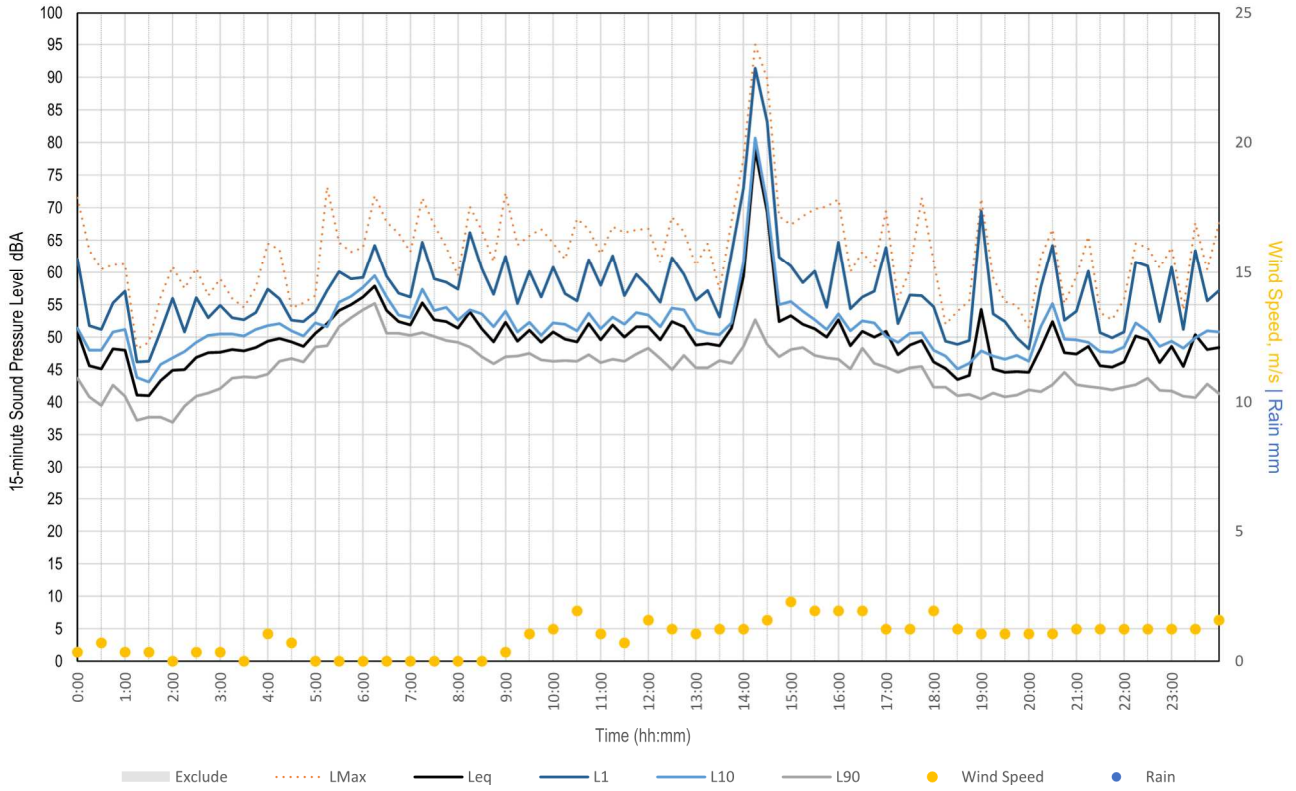
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Sunday, 18 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

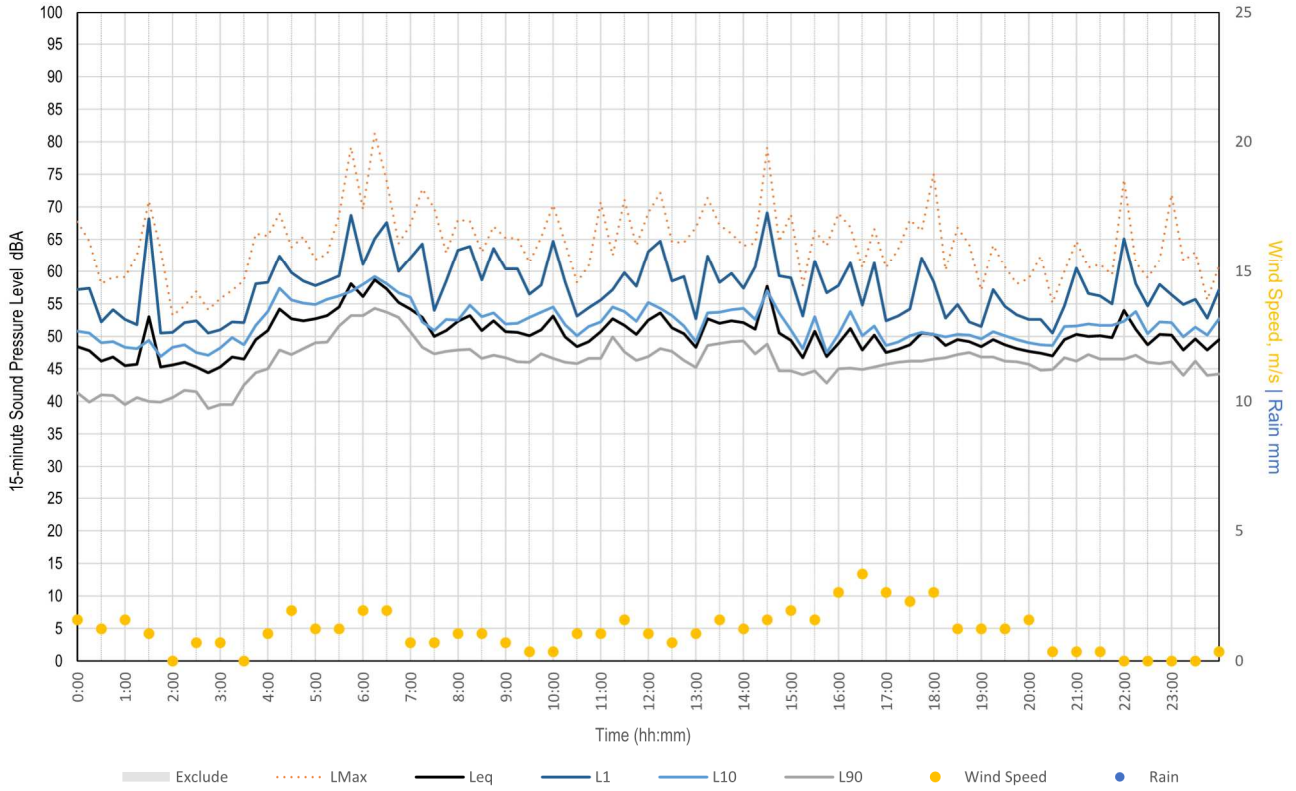
Monday, 19 September 2022



Noise Logger Results

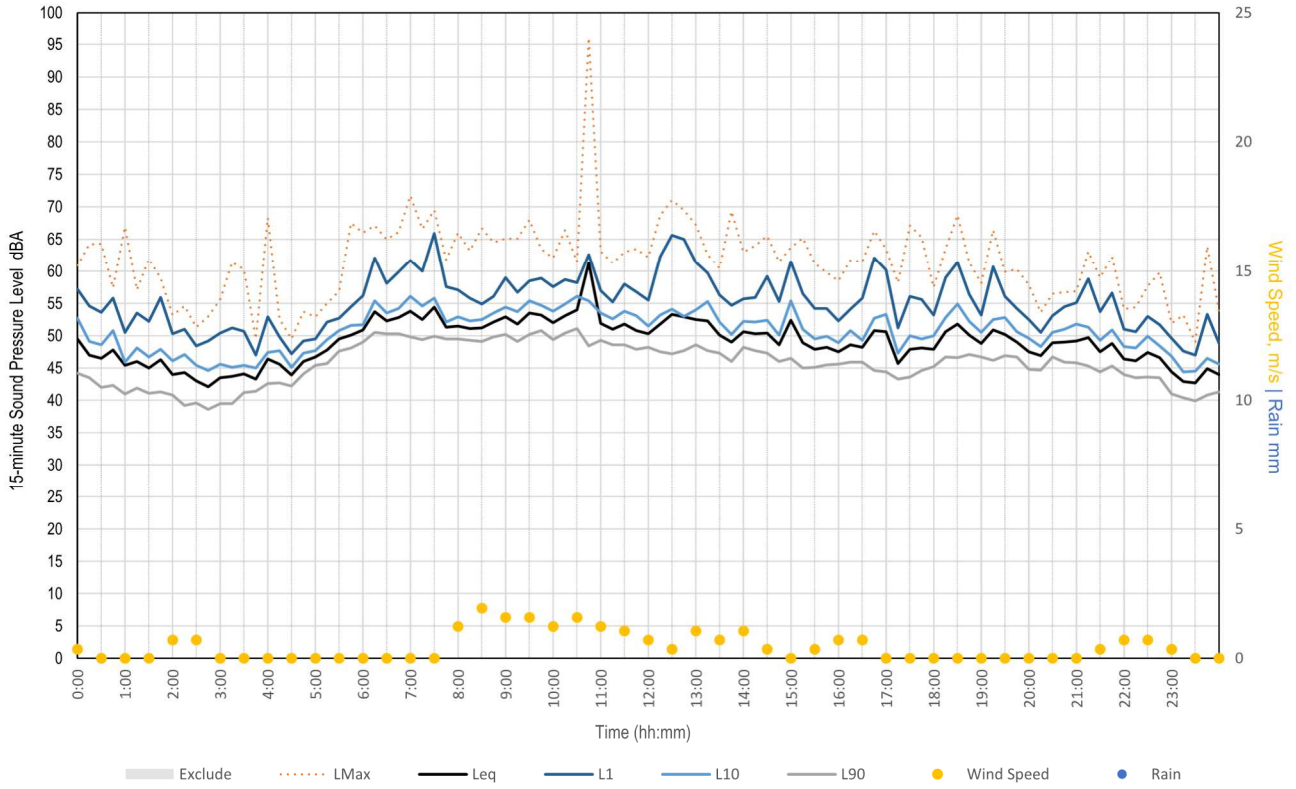
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Tuesday, 20 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

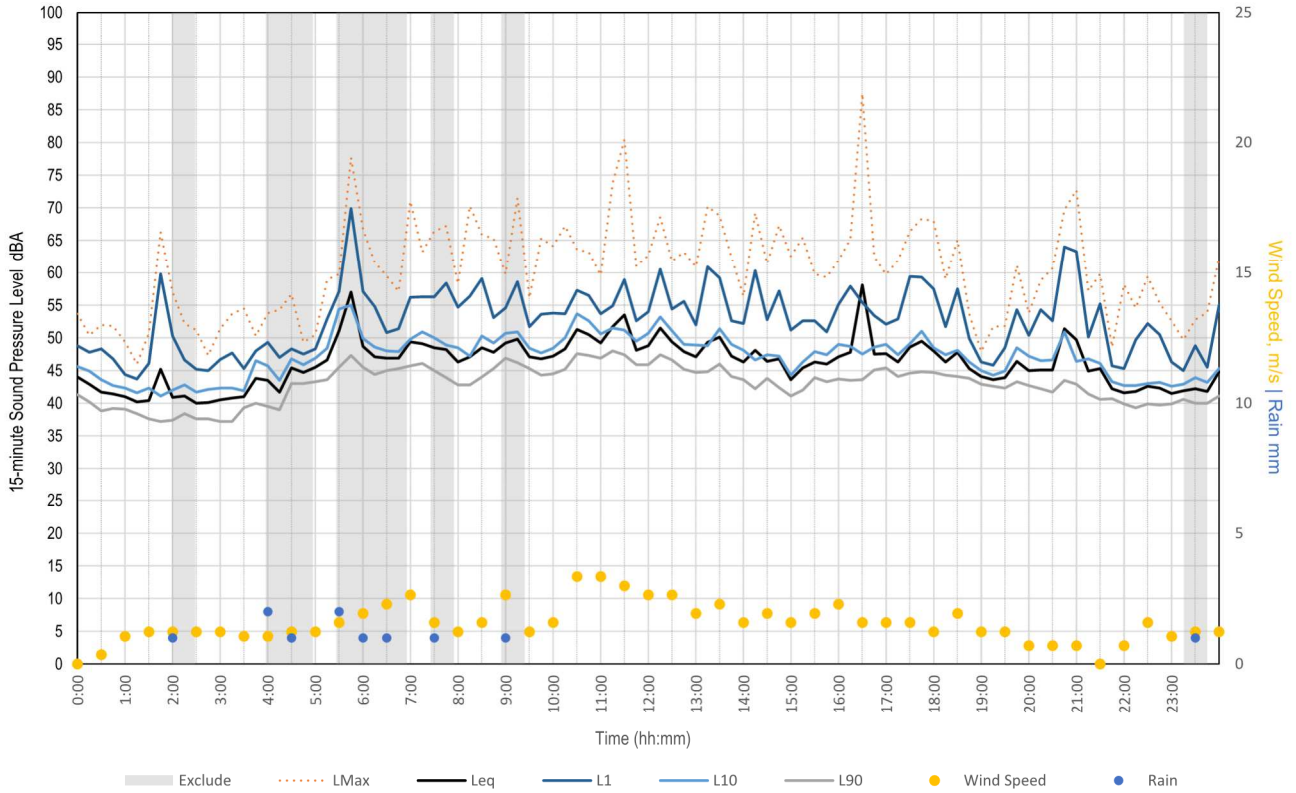
Wednesday, 21 September 2022



Noise Logger Results

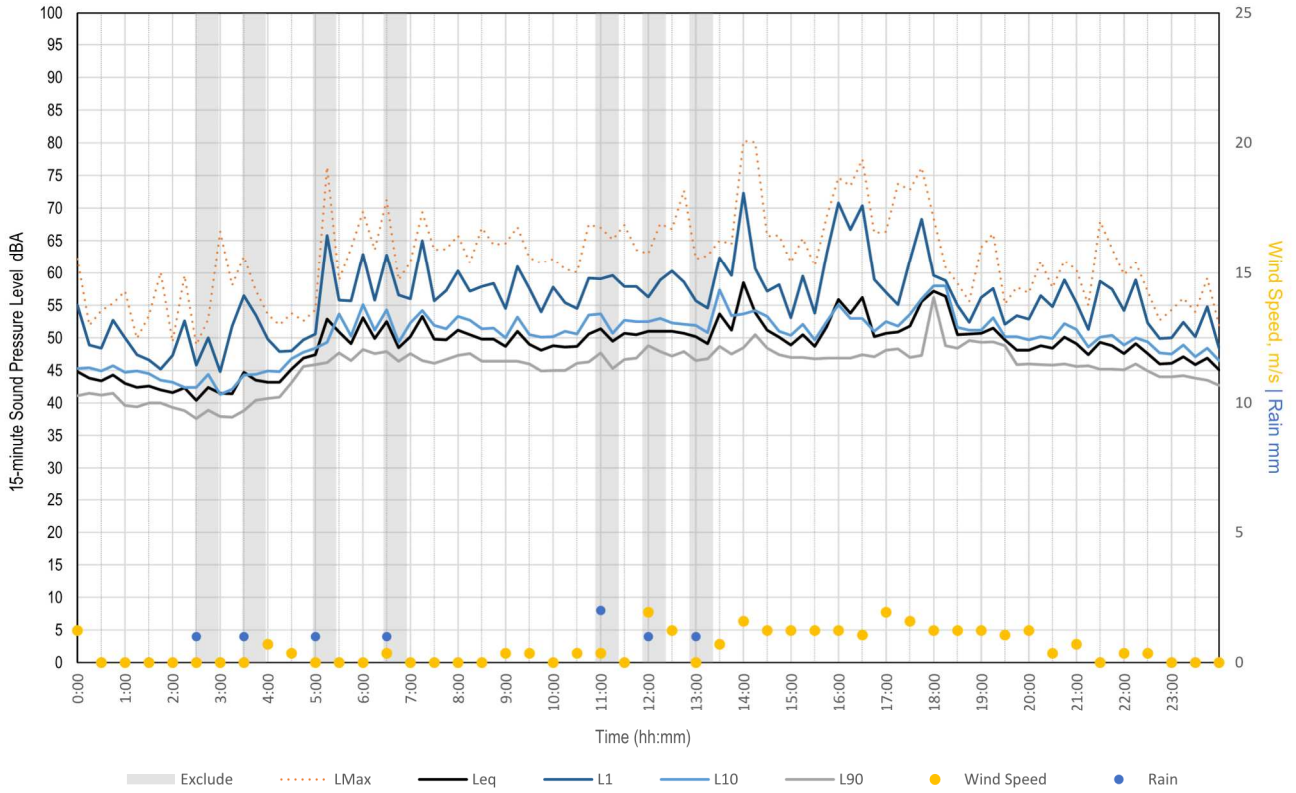
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Thursday, 22 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

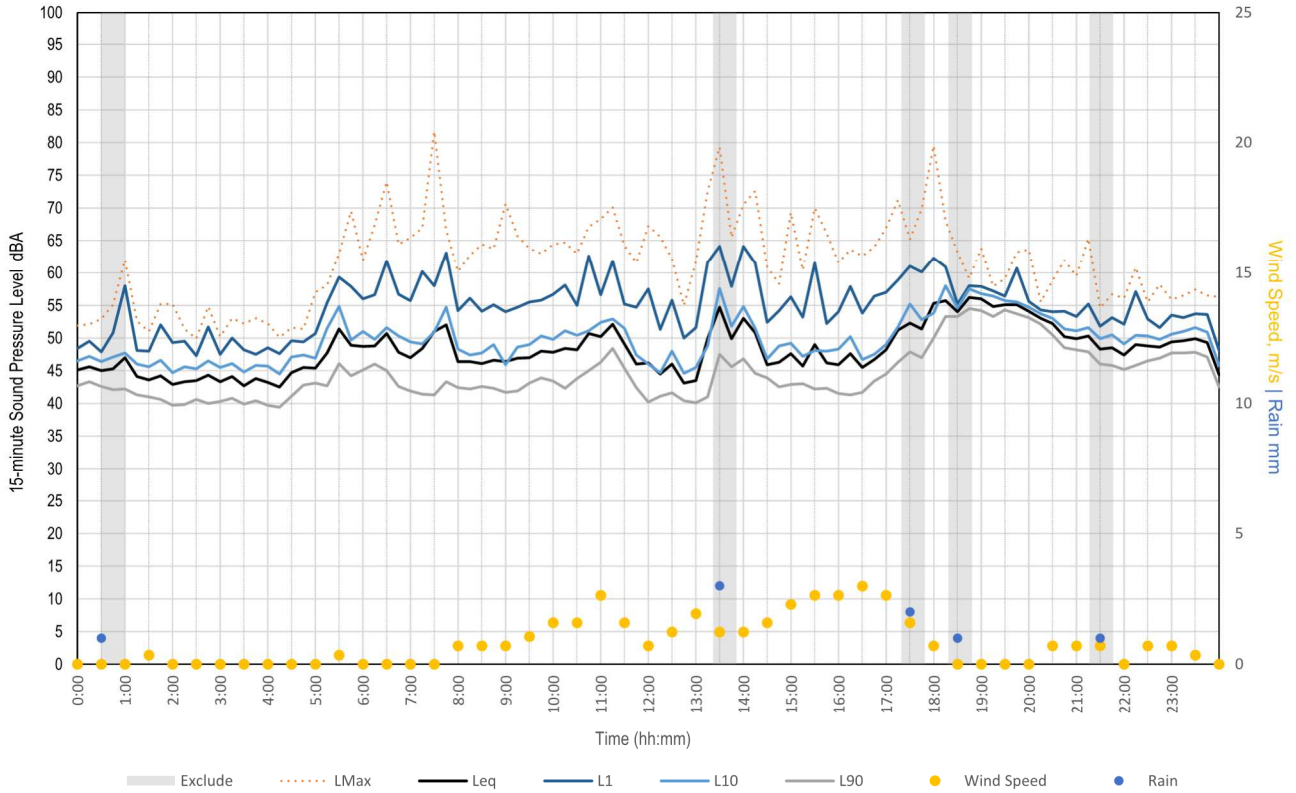
Friday, 23 September 2022



Noise Logger Results

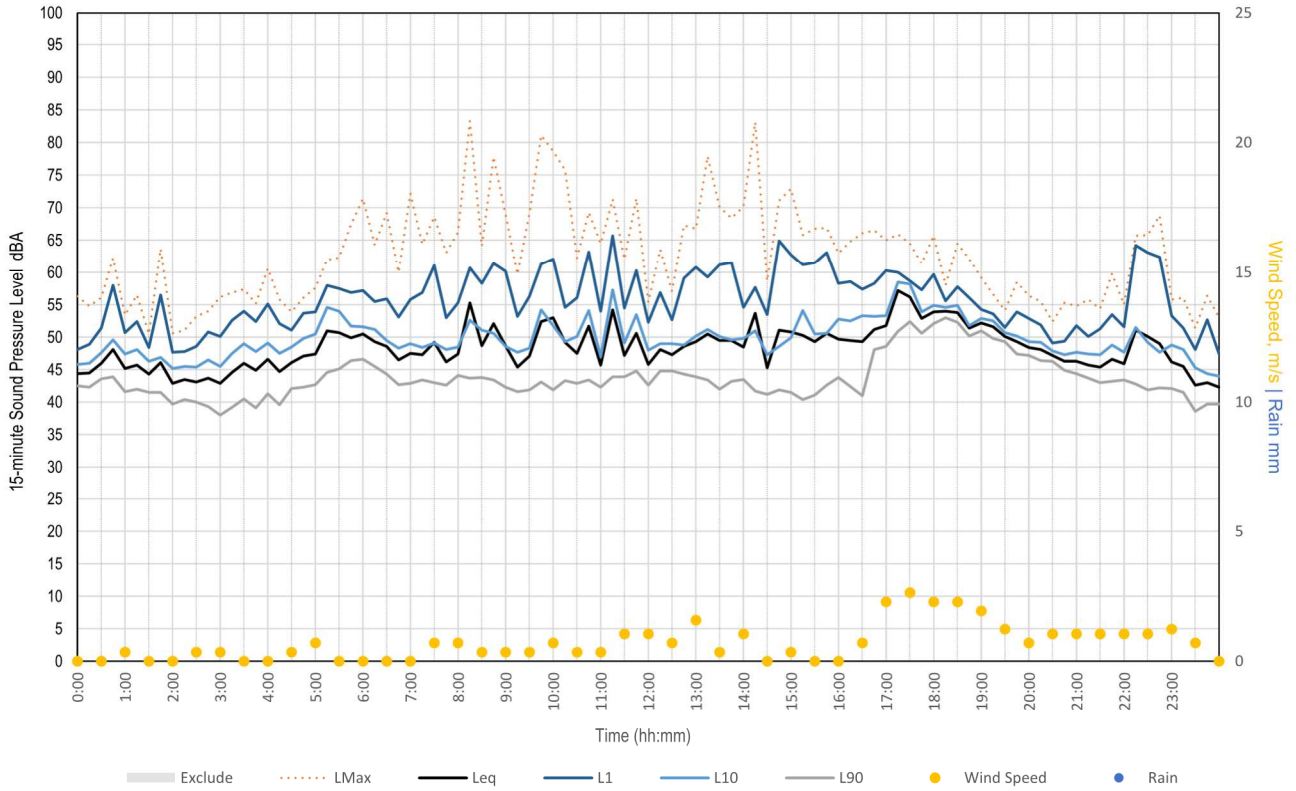
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Saturday, 24 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

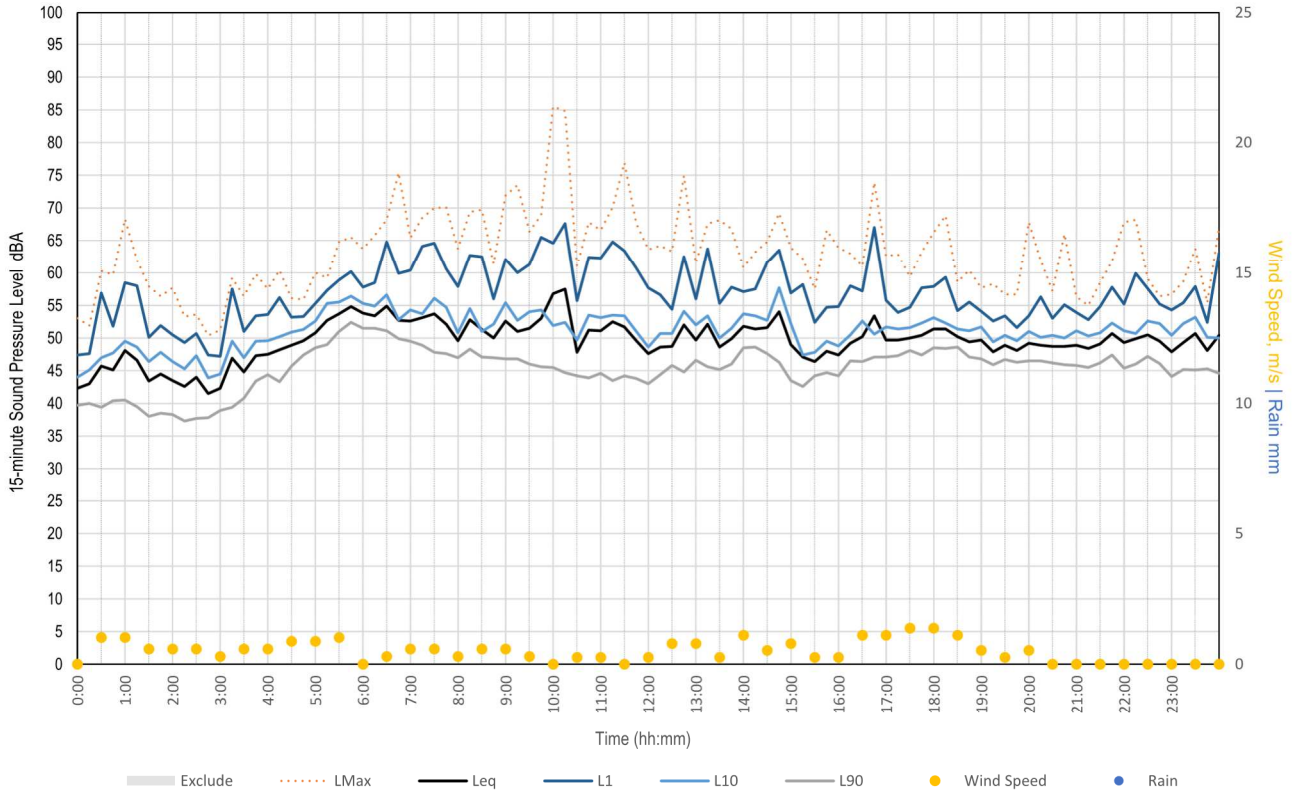
Sunday, 25 September 2022



Noise Logger Results

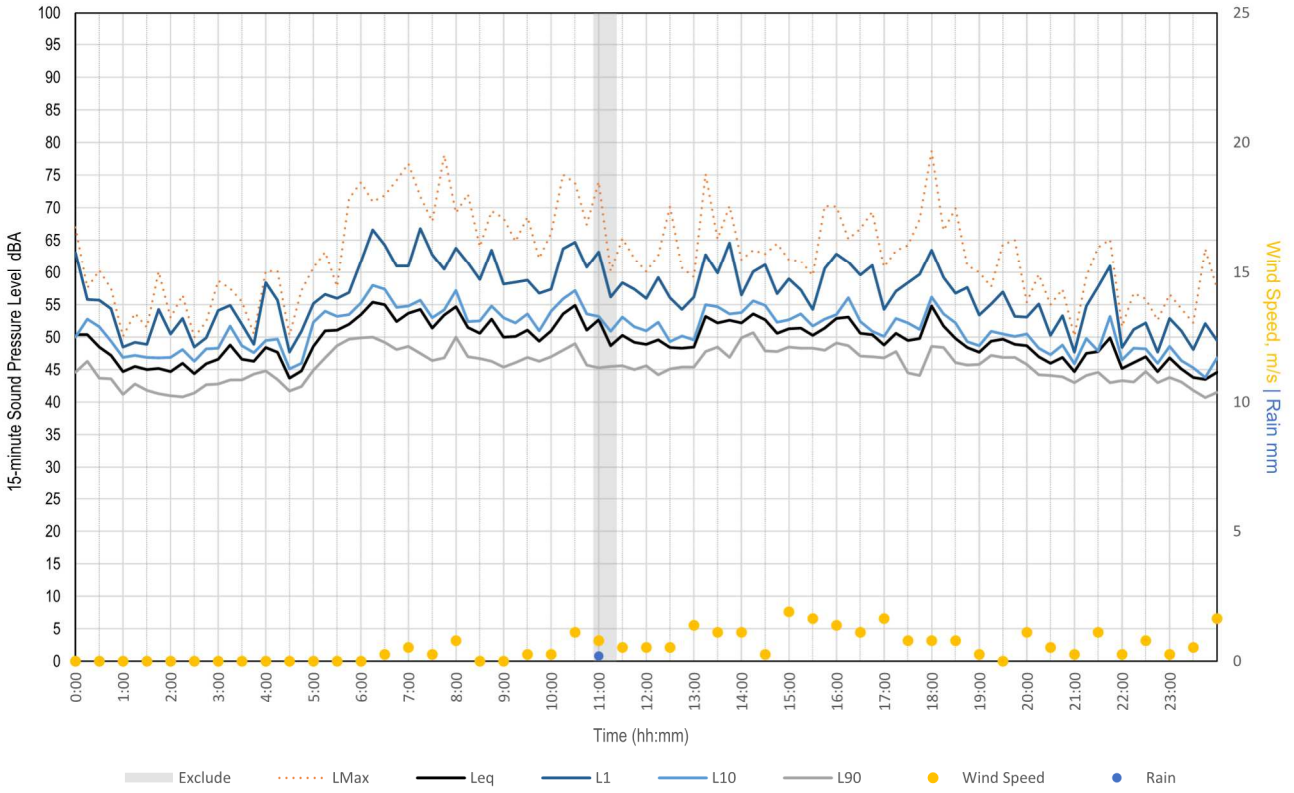
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Monday, 26 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

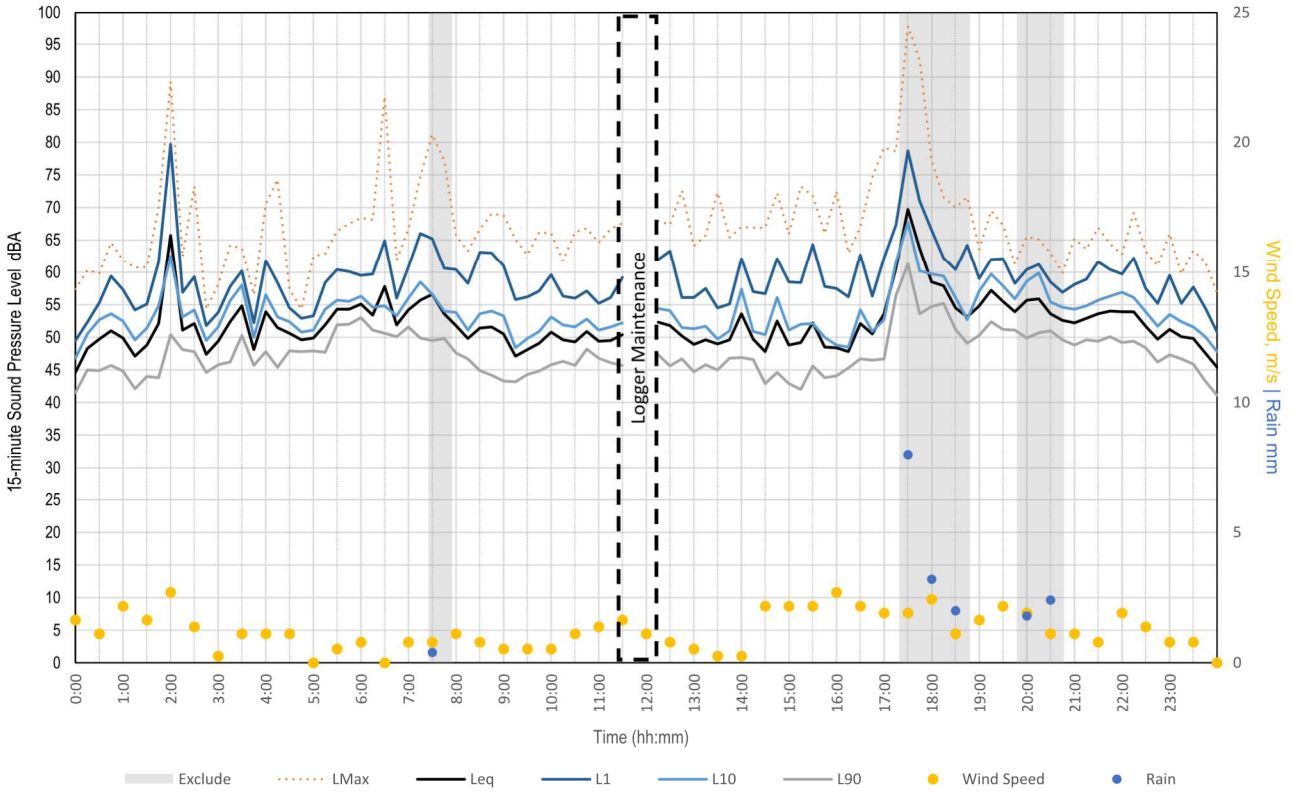
Tuesday, 27 September 2022



Noise Logger Results

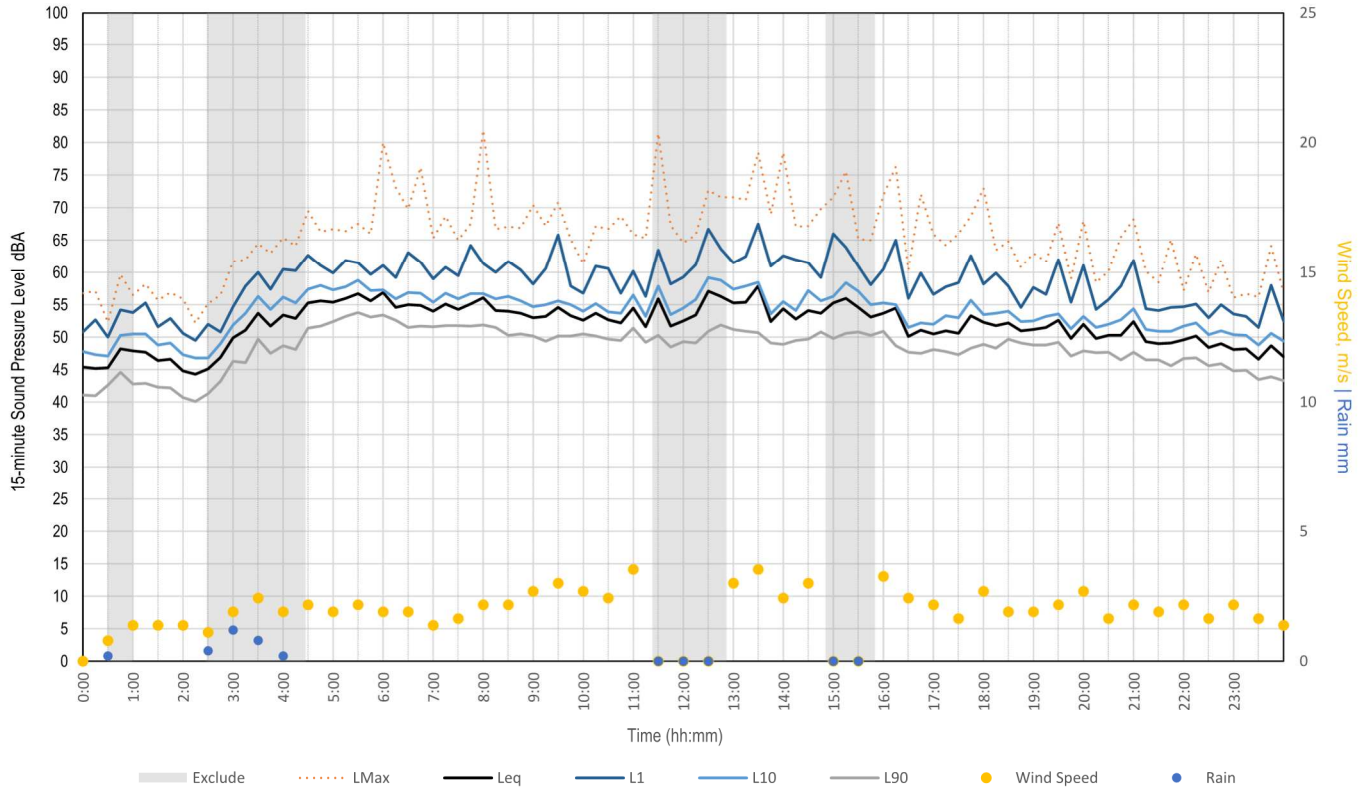
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Wednesday, 28 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

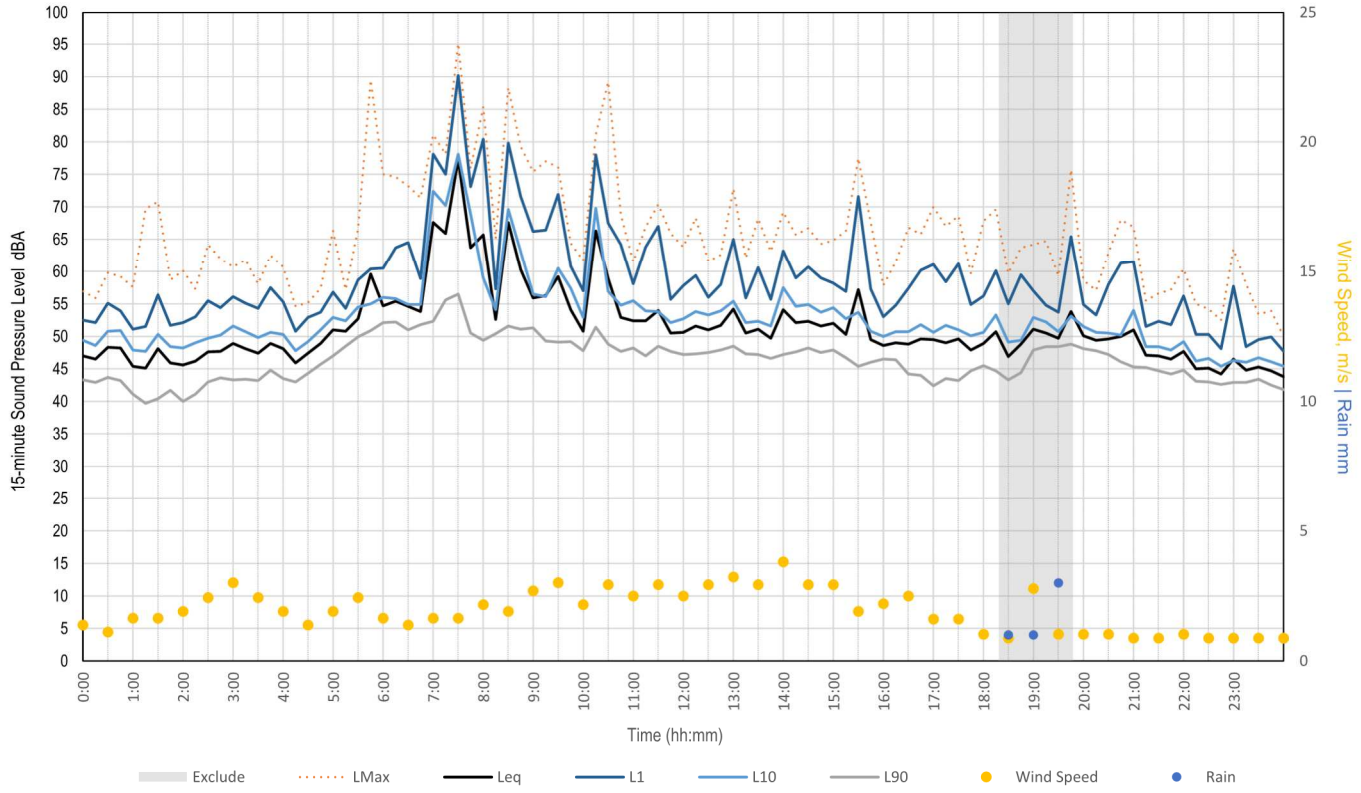
Thursday, 29 September 2022



Noise Logger Results

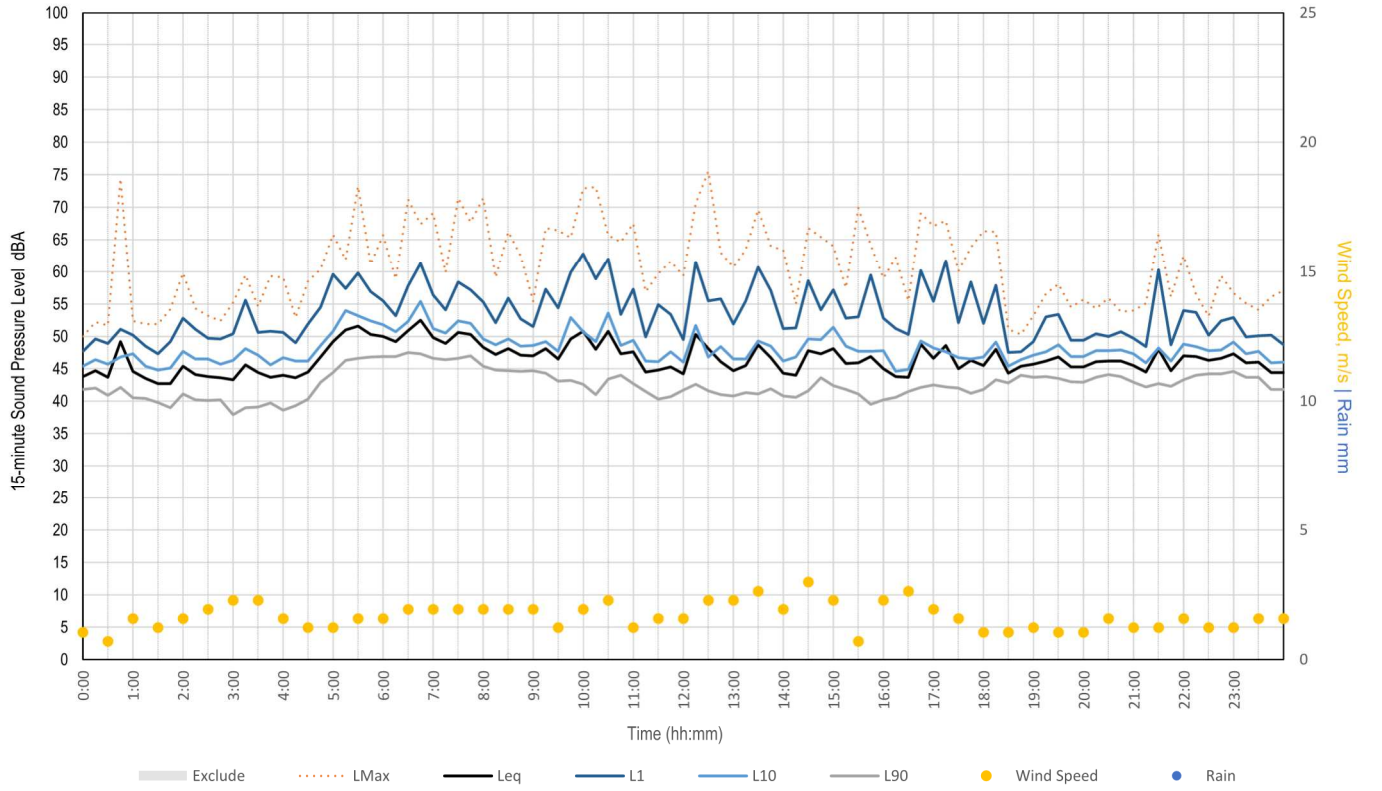
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Friday, 30 September 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

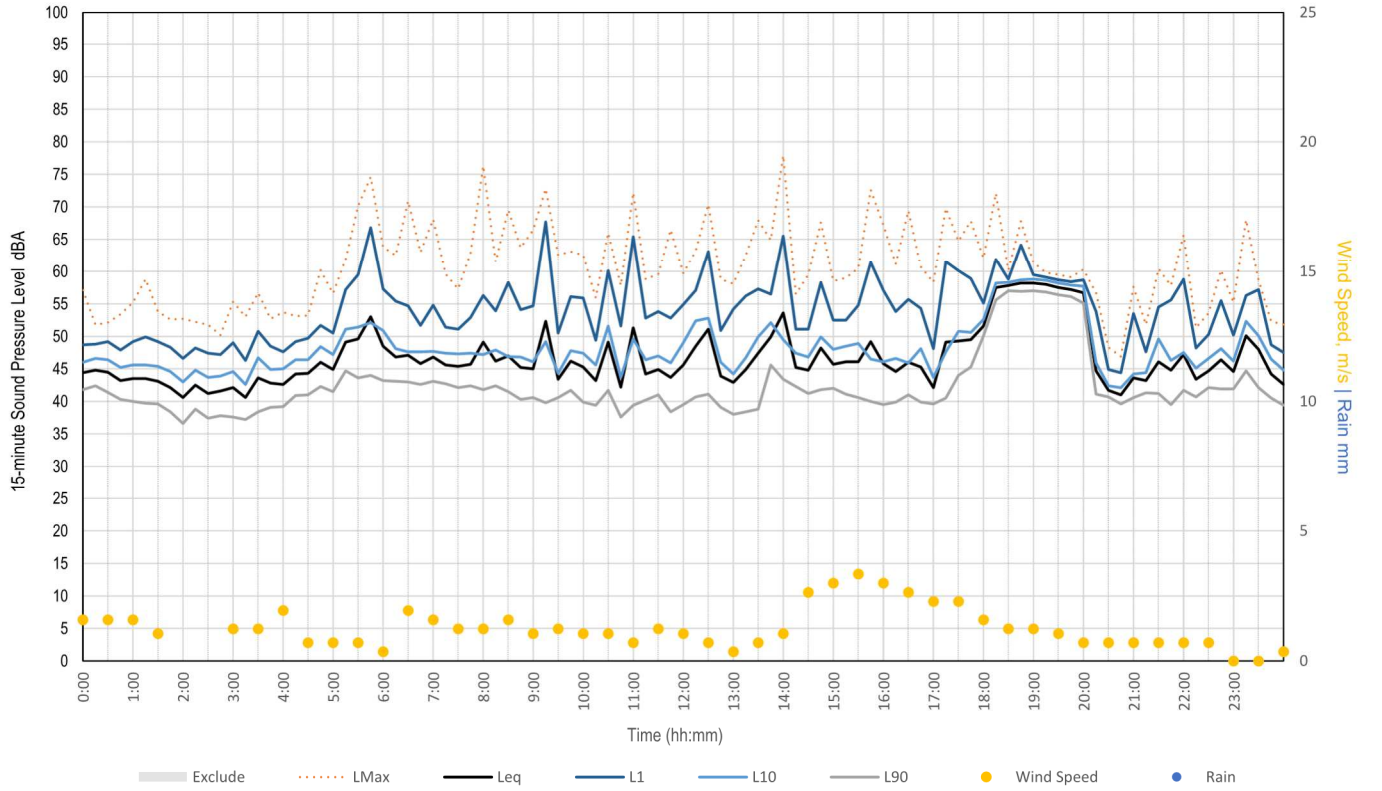
Saturday, 01 October 2022



Noise Logger Results

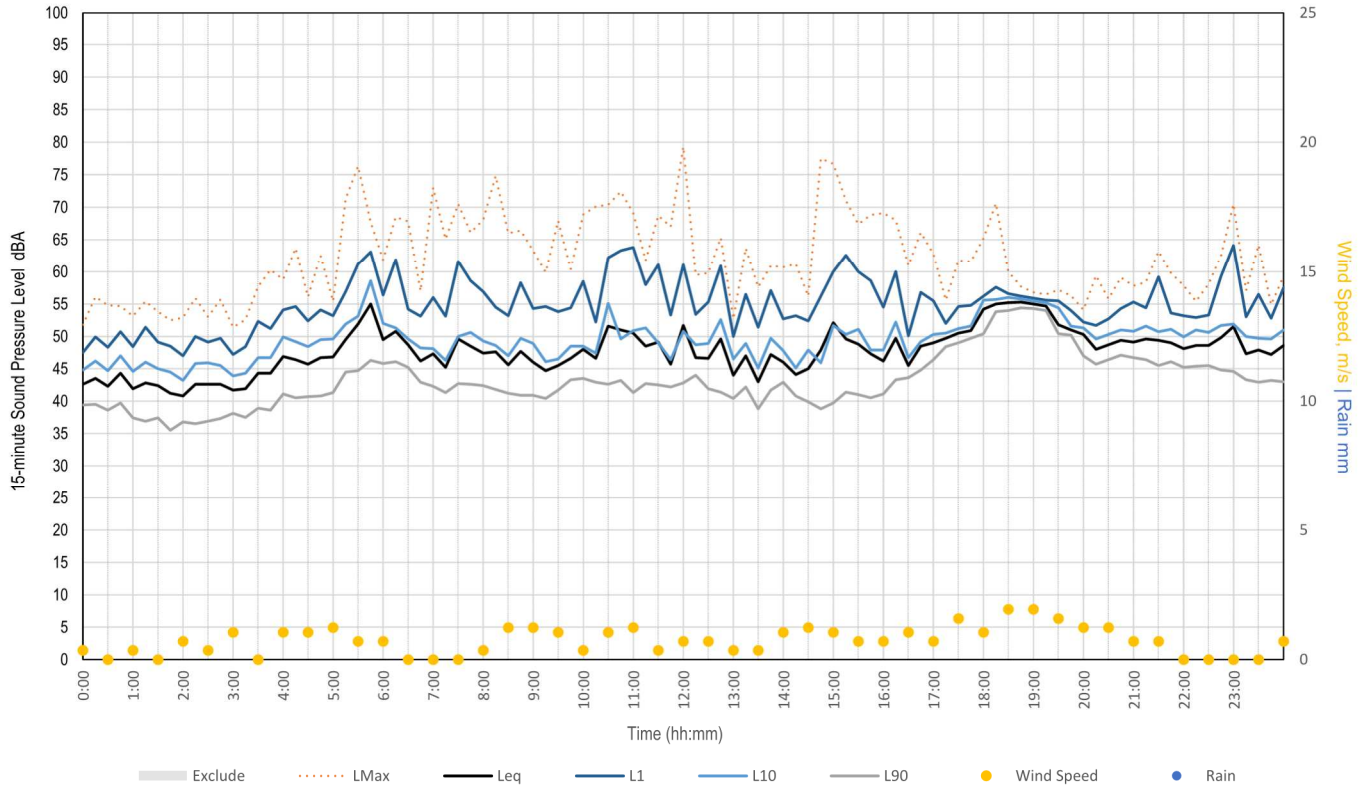
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Sunday, 02 October 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

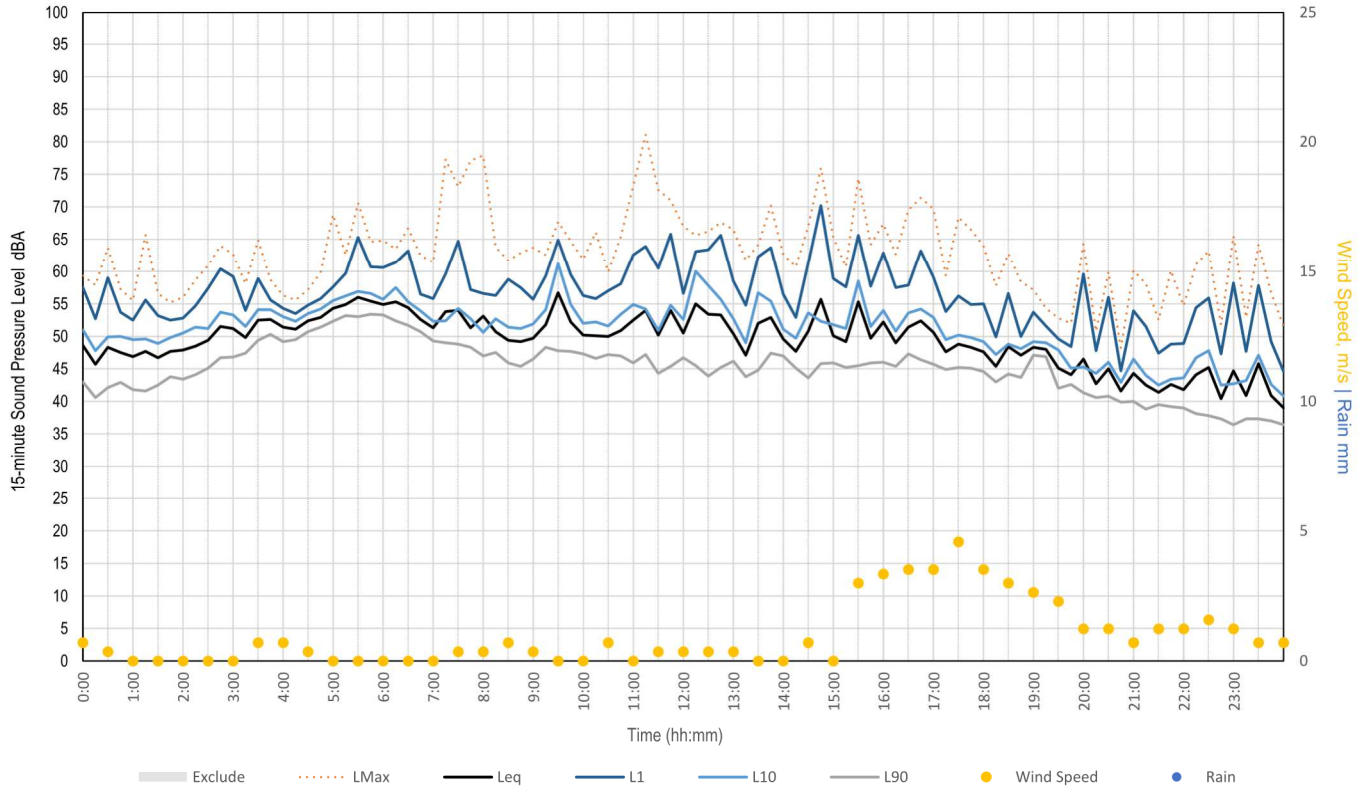
Monday, 03 October 2022



Noise Logger Results

Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Tuesday, 04 October 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

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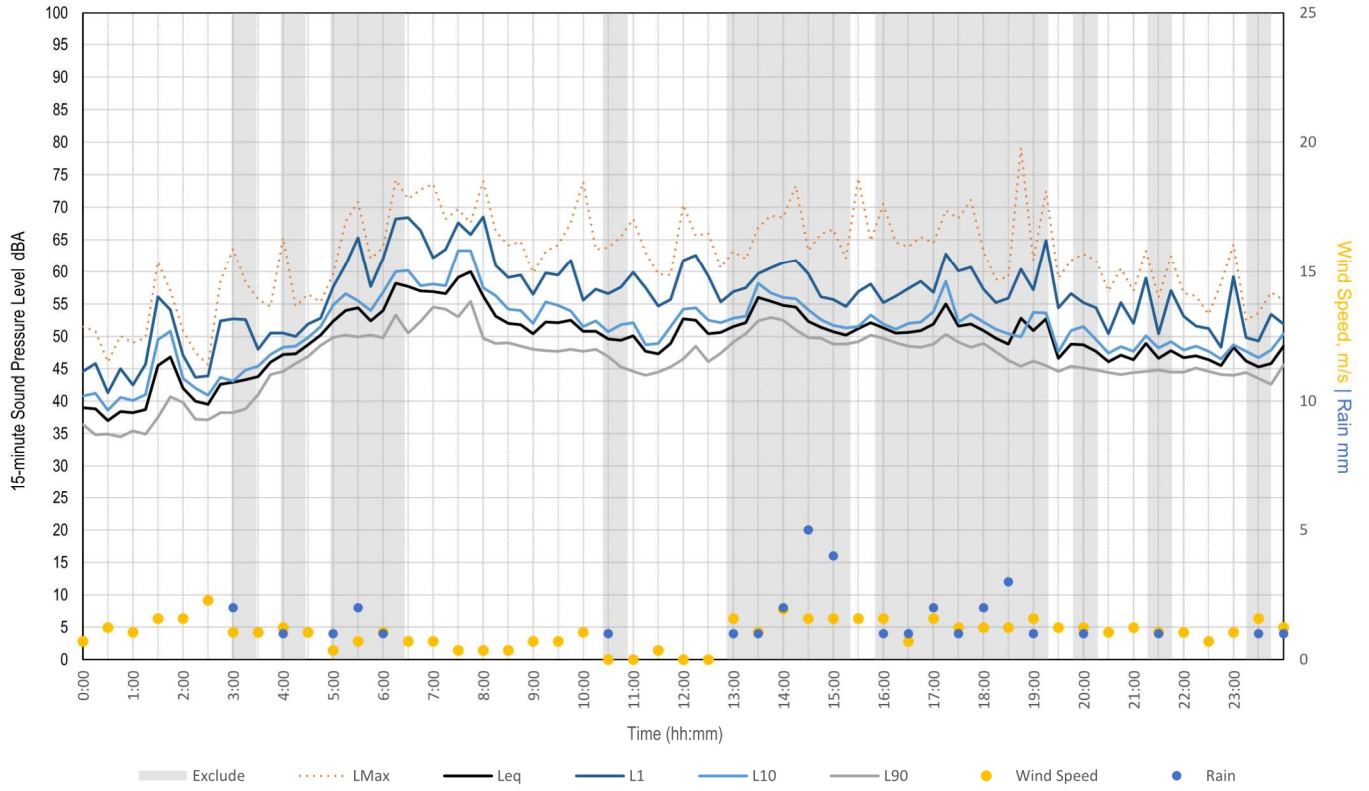
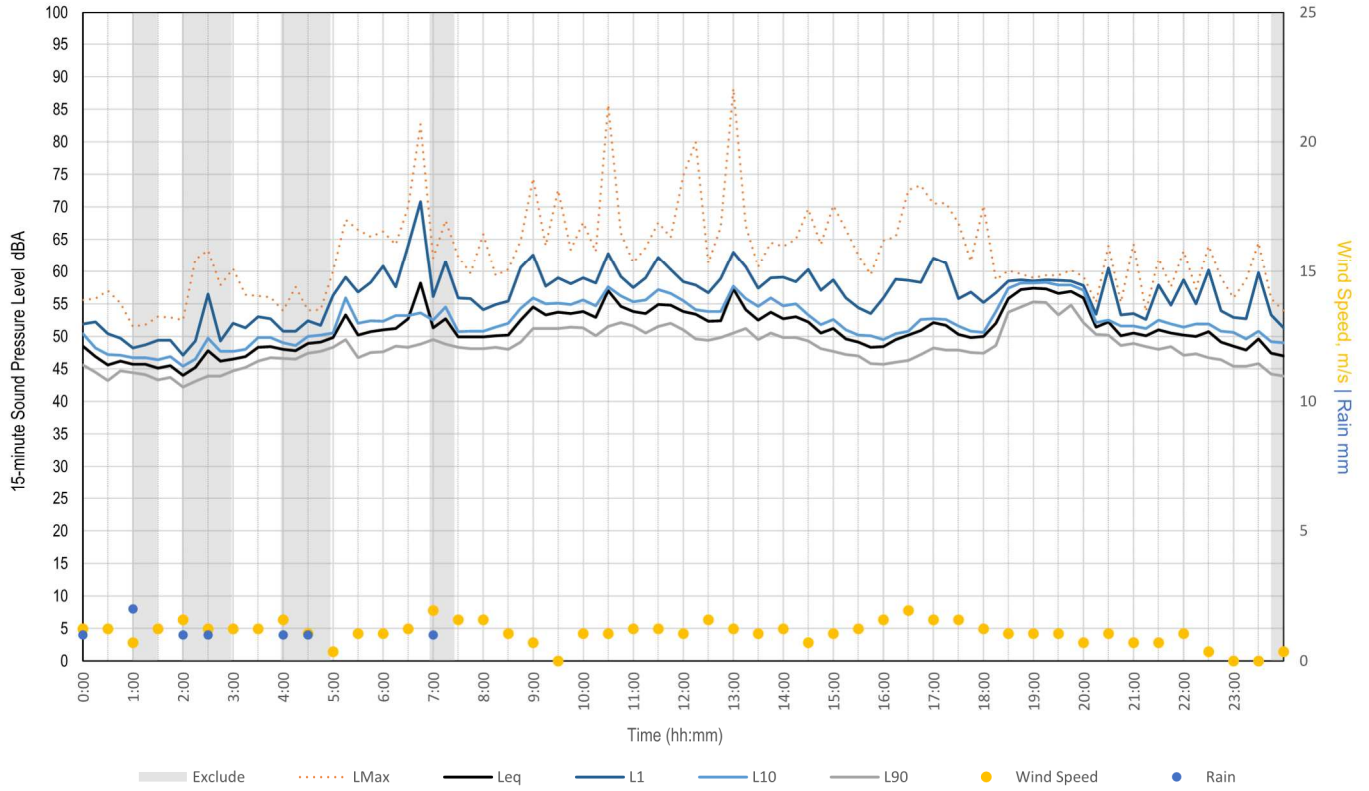


Noise Logger Results

Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Thursday, 06 October 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

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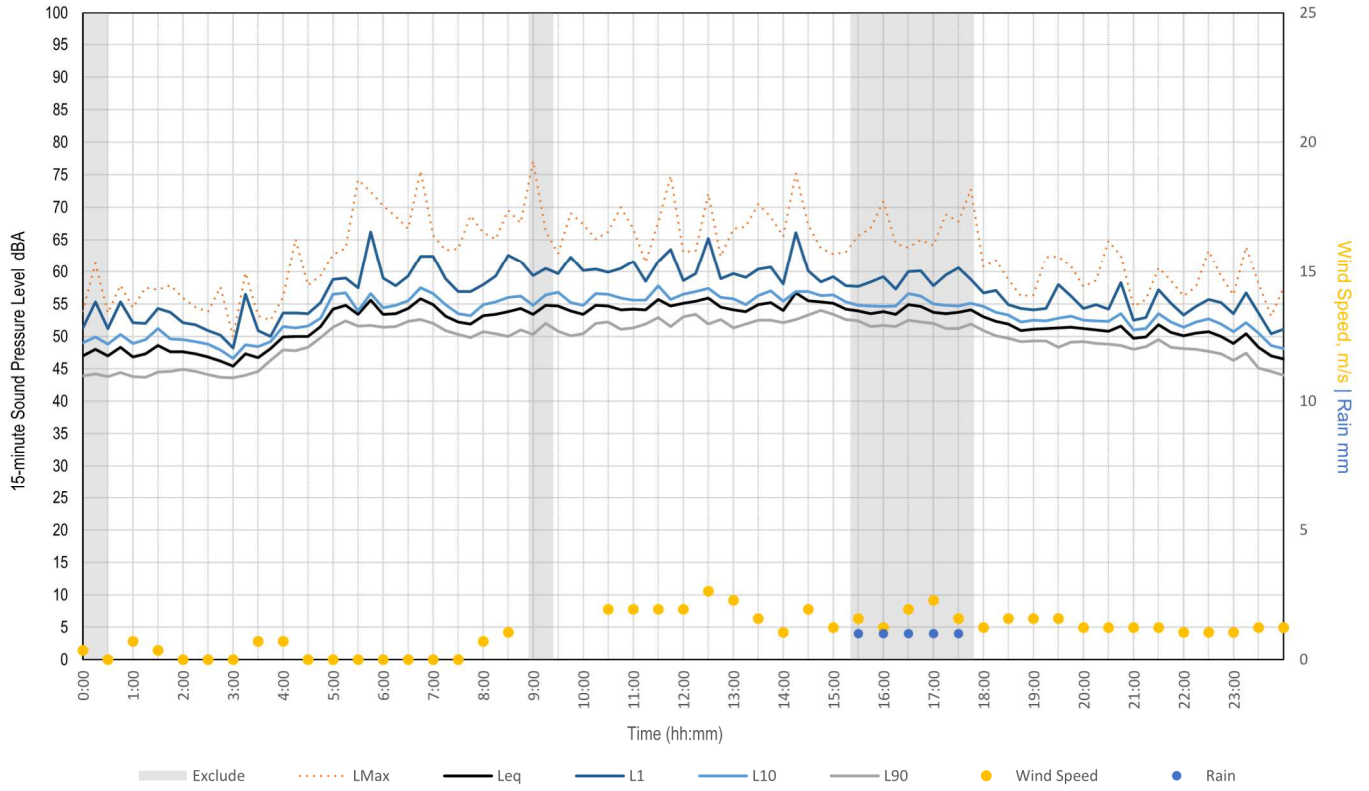
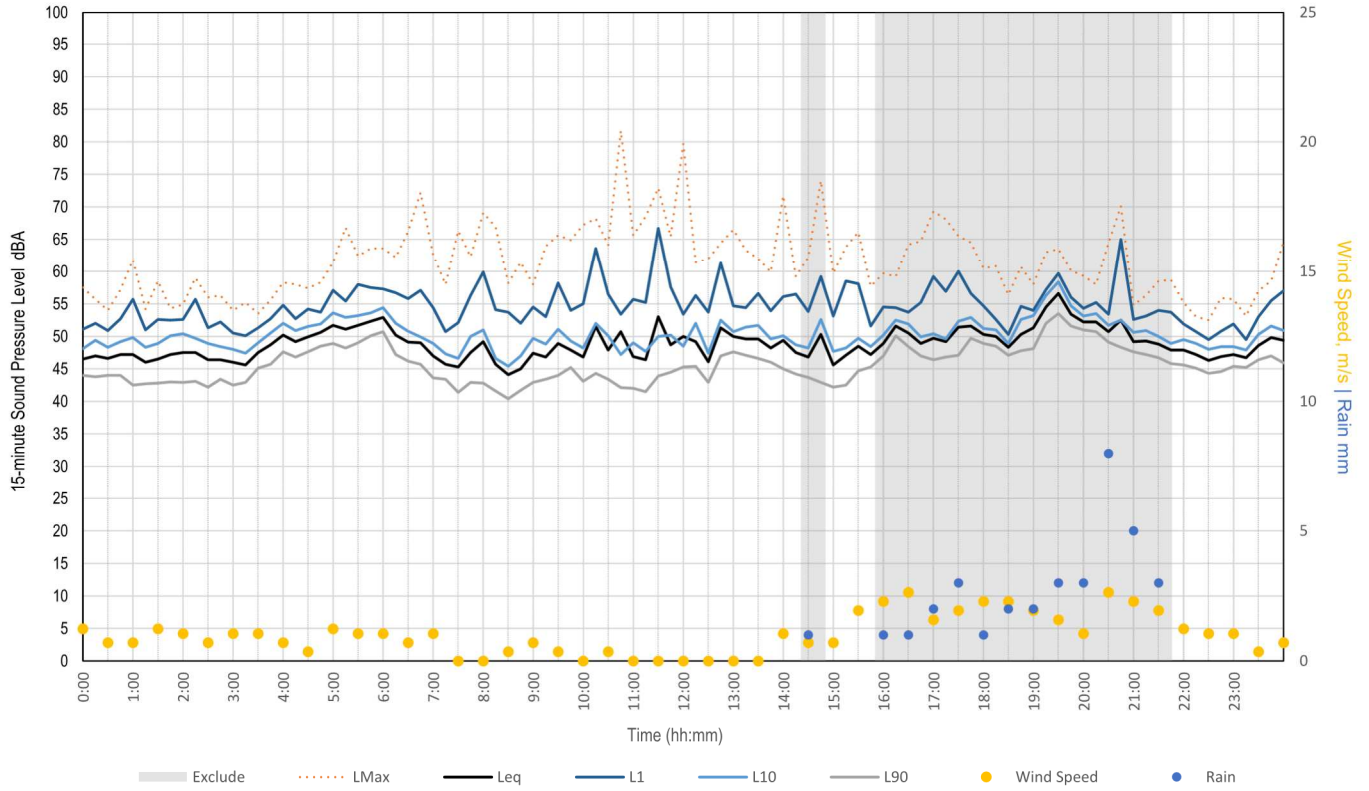


Noise Logger Results

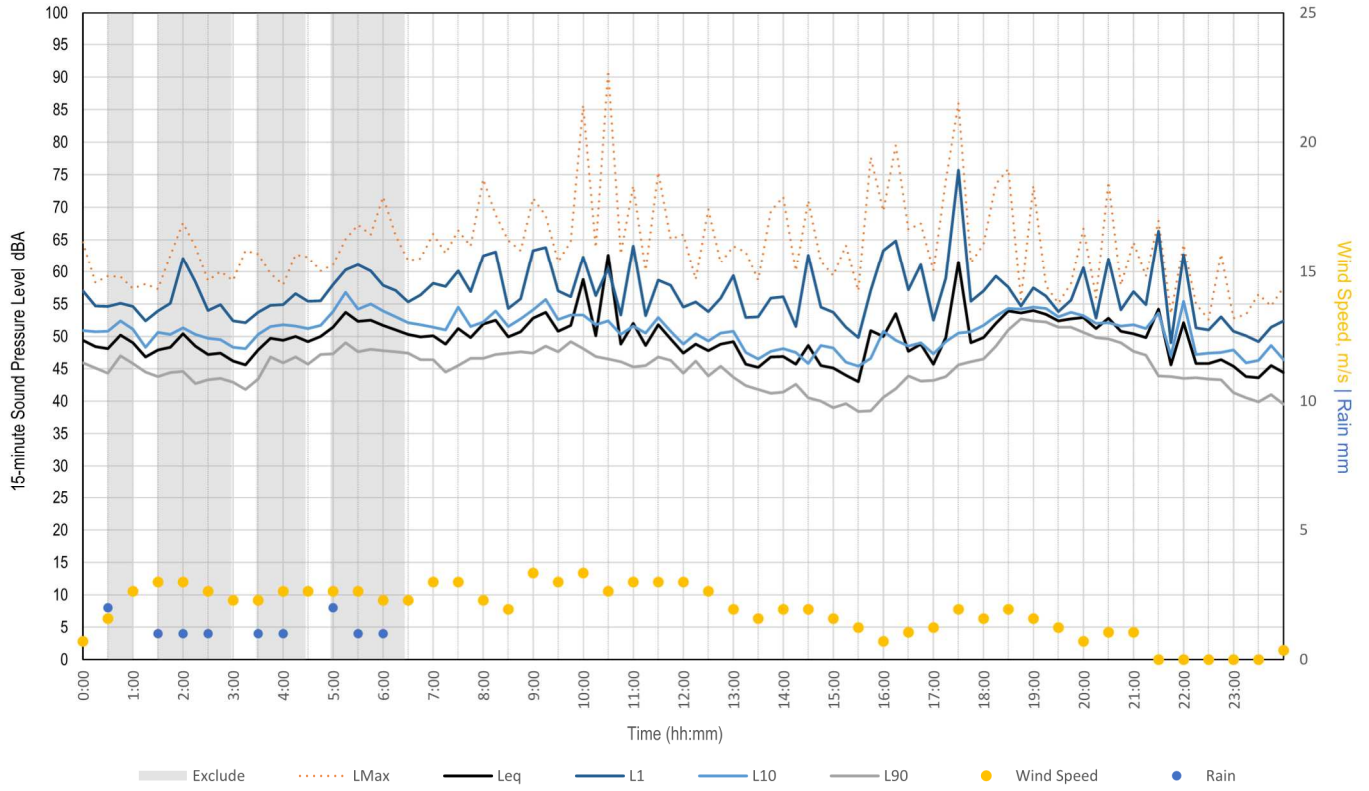
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Saturday, 08 October 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

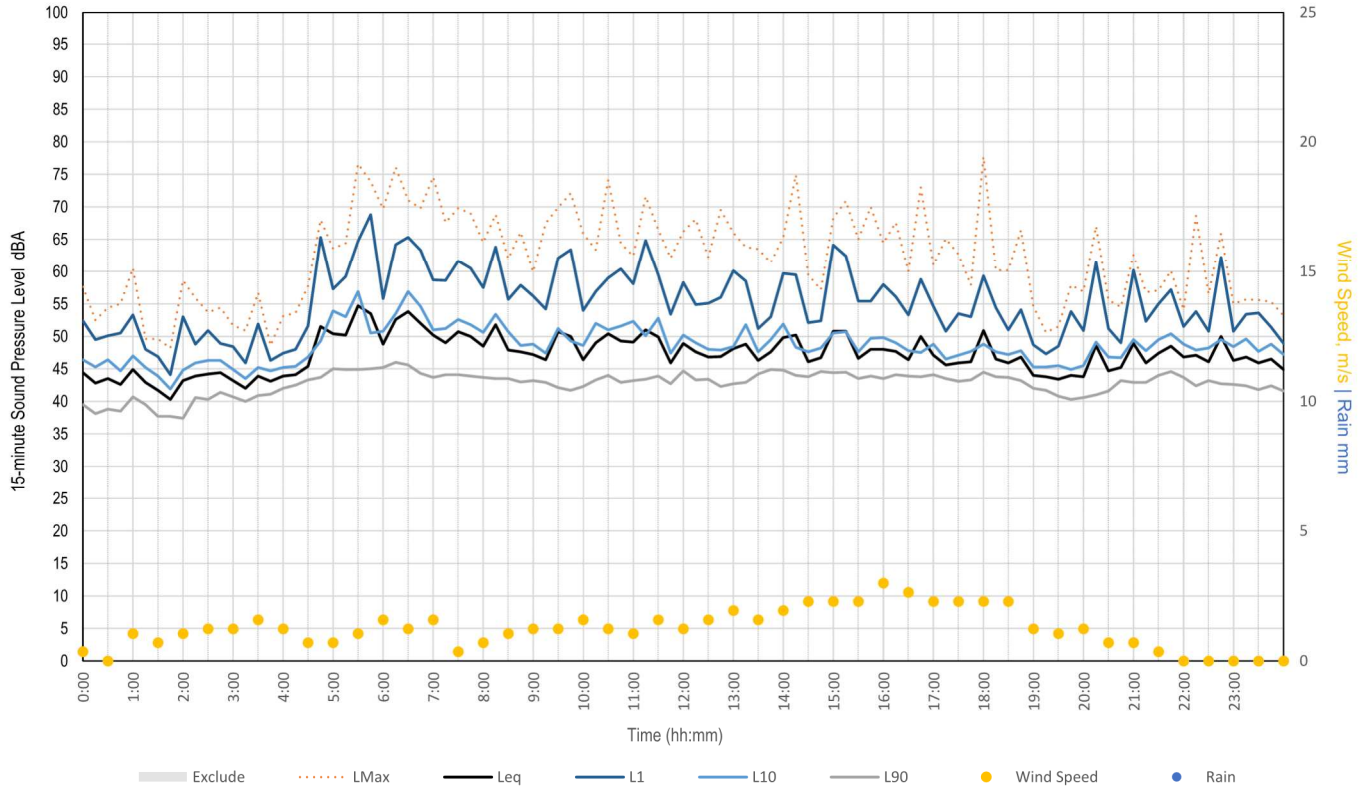
Sunday, 09 October 2022



Noise Logger Results

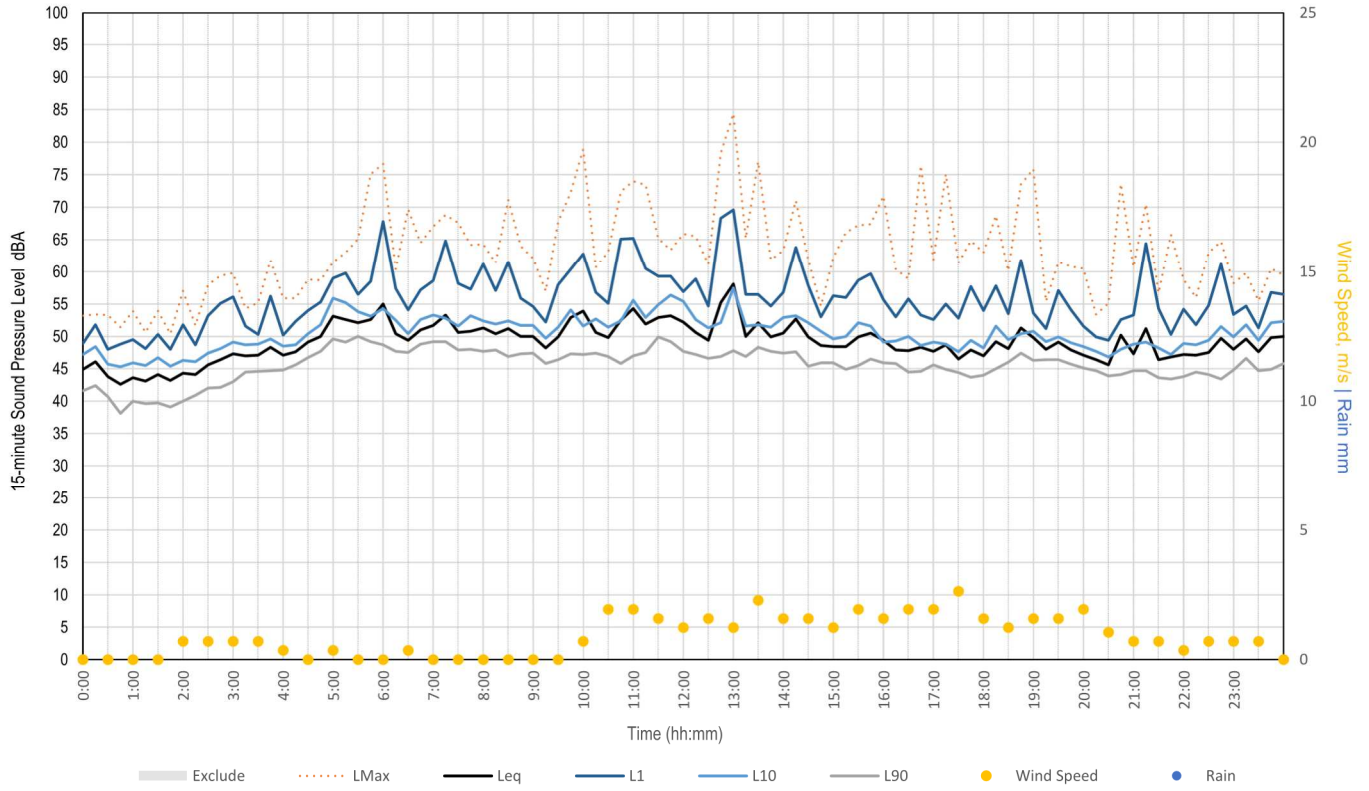
Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Monday, 10 October 2022



Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

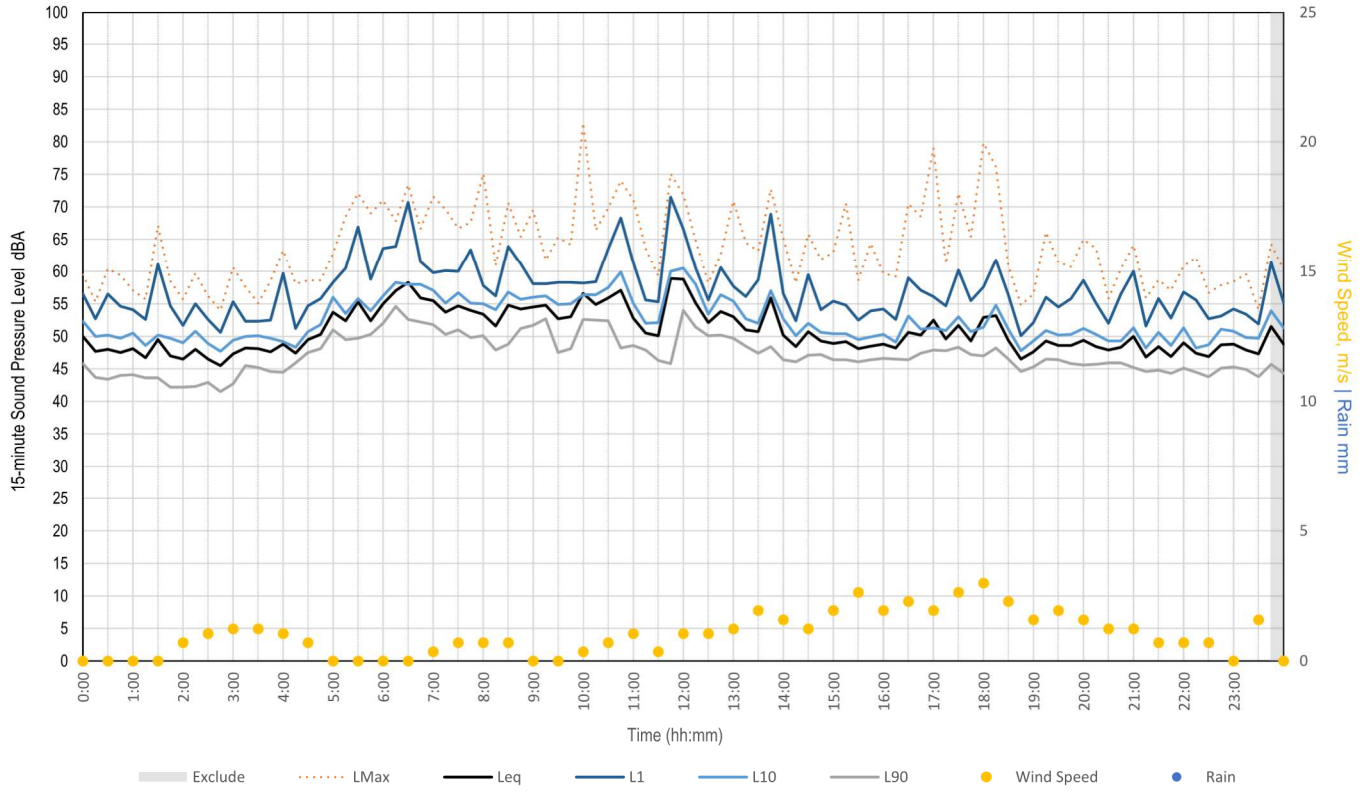
Tuesday, 11 October 2022



Noise Logger Results

Measured Noise Levels - M16 Sydney International Equestrian Centre - off Saxemy Road (Horsley Park)

Wednesday, 12 October 2022



Background Noise Monitoring

Location	M17 - 1578 Mulgoa Road (Wallacia)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & MUA

Unattended Equipment					Attended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878238	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	93.6 dBA	**Post:**	94.1 dBA	**Calibration**	**Pre:**	93.6 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Sunday, 04 Sep 2022
No. of days	22
No. of nights	20

*Monitoring period not continuous

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres away from any reflective surfaces other than the ground (e.g. house facade and fence).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{MAX}	L_{eq}	L_{10}	L_{90}	
1	Day	25/08/2022	2:07:00 PM	2:22:00 PM	67	51	53	44	
2	Day	25/08/2022	2:22:00 PM	2:37:00 PM	73	51	54	45	
3	Day	25/08/2022	2:37:00 PM	2:52:00 PM	71	50	52	42	
4	Day	25/08/2022	2:52:00 PM	3:07:00 PM	75	51	53	42	
5	Evening	16/08/2022	6:30:00 PM	6:45:00 PM	64	48	51	40	*
6	Evening	16/08/2022	8:15:00 PM	8:30:00 PM	58	46	49	37	*
7	Evening	16/08/2022	9:30:00 PM	9:45:00 PM	72	48	49	35	*
8	Evening	7/09/2022	7:53:40 PM	8:08:40 PM	66	46	49	36	
9	Night	15/08/2022	12:00:00 AM	12:15:00 AM	56	36	35	26	*
10	Night	15/08/2022	3:30:00 AM	3:45:00 AM	56	40	44	28	*
11	Night	15/08/2022	6:30:00 AM	6:45:00 AM	73	53		46	*
12	Night	15/08/2022	10:15:00 PM	10:30:00 PM	83	56	54	42	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent flow of traffic on Mulgoa Road dominant, combination of cars and heavy vehicles. Intermittent bird noise from surrounding trees. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min and with a maximum sound levels ranging from 45 to 56 dBA.
Background noise	Traffic at a distance.
Evening	
Ambient noise	Intermittent flow of traffic on Mulgoa Road, and other vehicle noise (e.g. sirens and car horn). Constant insect noise of varying intensity. Occasional aircraft flying overhead with an approx. duration of 30 sec to 1 min and with maximum sound levels ranging from 44 to 50 dBA.
Background noise	Traffic at a distance.
Night	
Ambient noise	Intermittent flow of traffic on Mulgoa Road. Constant insect noise in the early night (around 10 PM). Intermittent birds in surrounding trees with levels around 36 to 46 dBA.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass rustling). Traffic at a distance.

Site Details	M17 - 1578 Mulgoa Road (Wallacia)
Start Date	Tue 09 August 2022
End Date	Sun 04 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	53
$L_{eq, Evening}$ dBA	49
$L_{eq, Night}$ dBA	45
RBL, $_{Day}$ dBA	40
RBL, $_{Evening}$ dBA	34
RBL, $_{Night}$ dBA	26

Daily Summary

Date	09-08	10-08	11-08	12-08	13-08	14-08	15-08	16-08
$L_{eq, Day}$ dBA	52	54	51	52	53	53	56	52
$L_{eq, Evening}$ dBA	48	48	49	50	49	49	48	49
$L_{eq, Night}$ dBA	45	45	46	46	44	46	46	46
ABL, $_{Day}$ dBA	42	40	39	41	40	38	42	40
ABL, $_{Evening}$ dBA	30	32	34	36	36	33	33	36
ABL, $_{Night}$ dBA	26	25	26	25	26	26	25	27

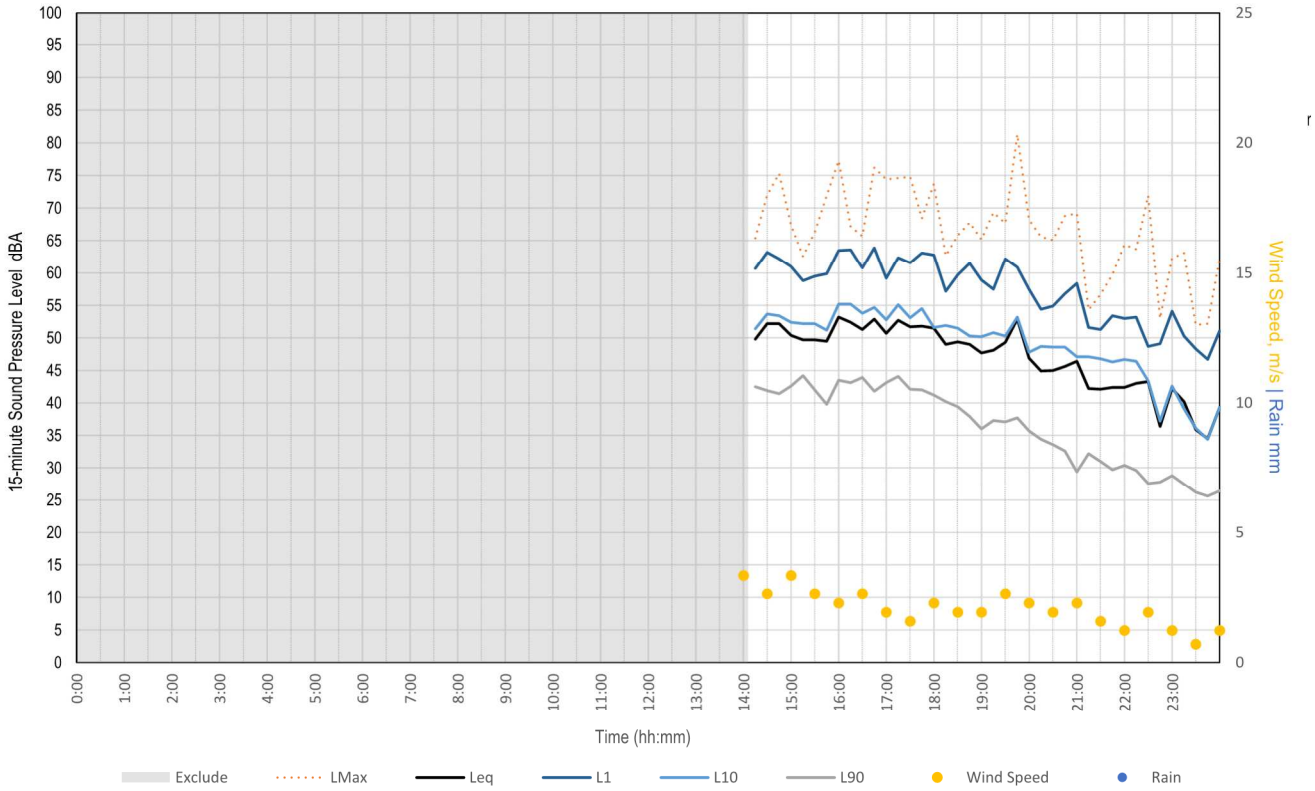
Date	17-08
$L_{eq, Day}$ dBA	53
$L_{eq, Evening}$ dBA	49
$L_{eq, Night}$ dBA	41
ABL, $_{Day}$ dBA	40
ABL, $_{Evening}$ dBA	34
ABL, $_{Night}$ dBA	24

Date	23-08	24-08	25-08	26-08	27-08	28-08	29-08	30-08
$L_{eq, Day}$ dBA	54	51	52	53	52	52	50	51
$L_{eq, Evening}$ dBA	51	48	49	49	48	47	48	48
$L_{eq, Night}$ dBA	46	47		45	42	46	45	46
ABL, $_{Day}$ dBA	47	41	42	42	40	37	39	42
ABL, $_{Evening}$ dBA	42	35	35	35	36	33	31	33
ABL, $_{Night}$ dBA	31	28	24	26	26	25	23	27

Date	31-08	01-09	02-09	03-09	04-09
$L_{eq, Day}$ dBA	54	53	53	52	47
$L_{eq, Evening}$ dBA	48	51	48	47	
$L_{eq, Night}$ dBA	46	46	45	44	
ABL, $_{Day}$ dBA	40	41	41	41	34
ABL, $_{Evening}$ dBA	31	34	33	36	
ABL, $_{Night}$ dBA	24	24	30	27	

Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

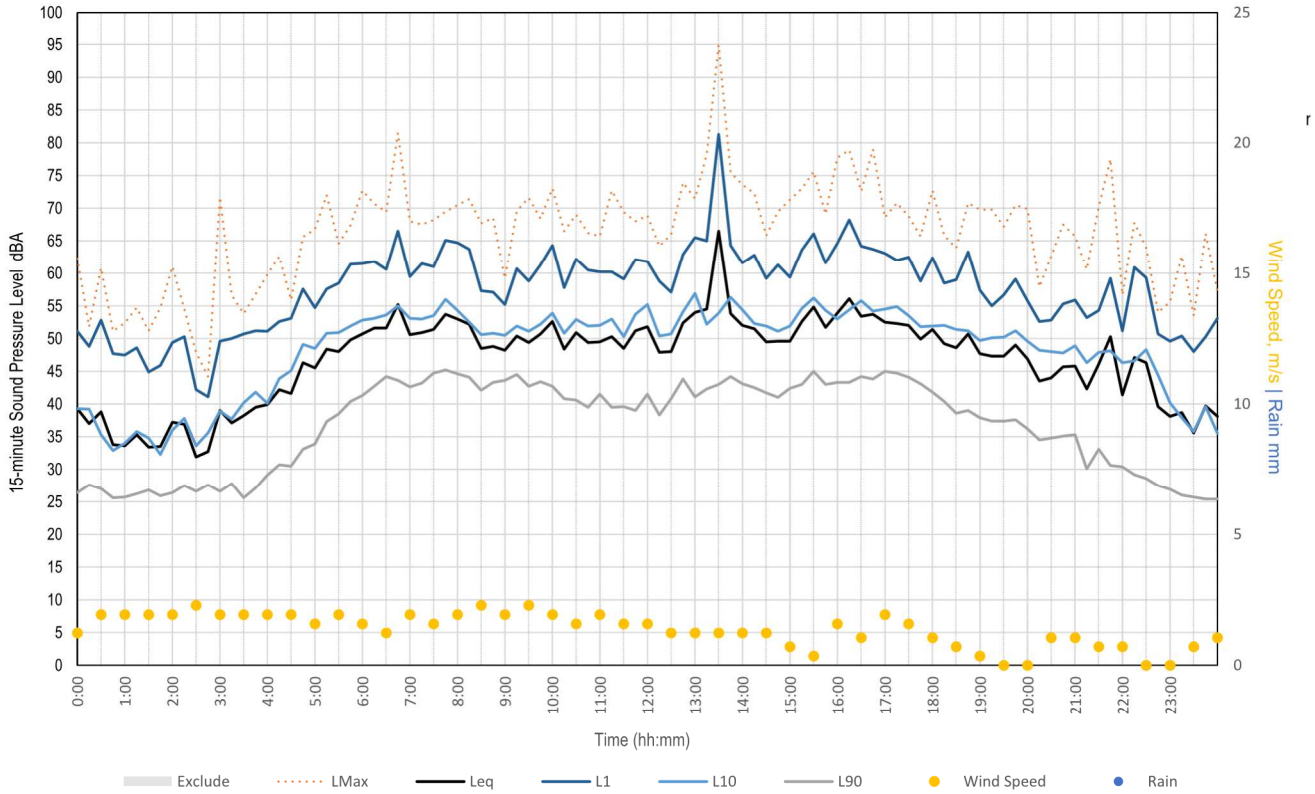
Tuesday, 09 August 2022



Noise Logger Results

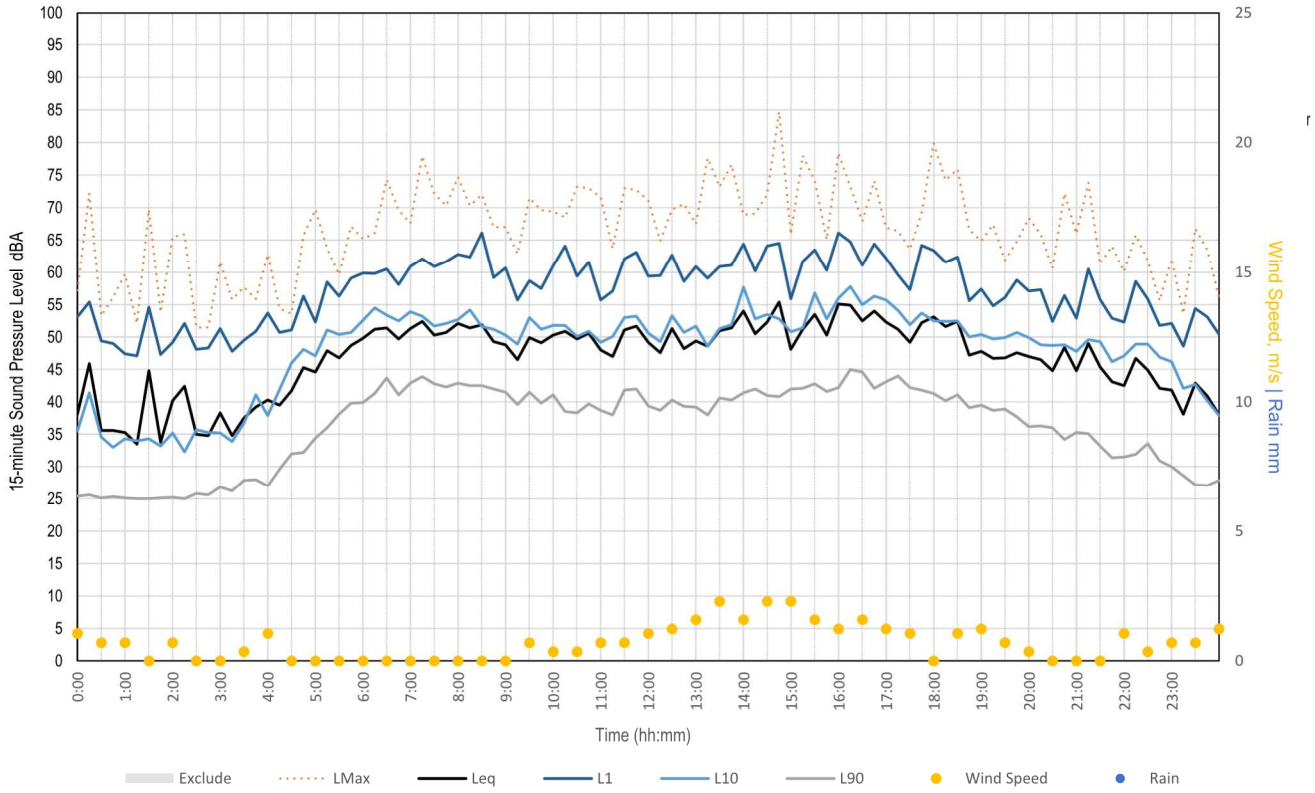
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Wednesday, 10 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

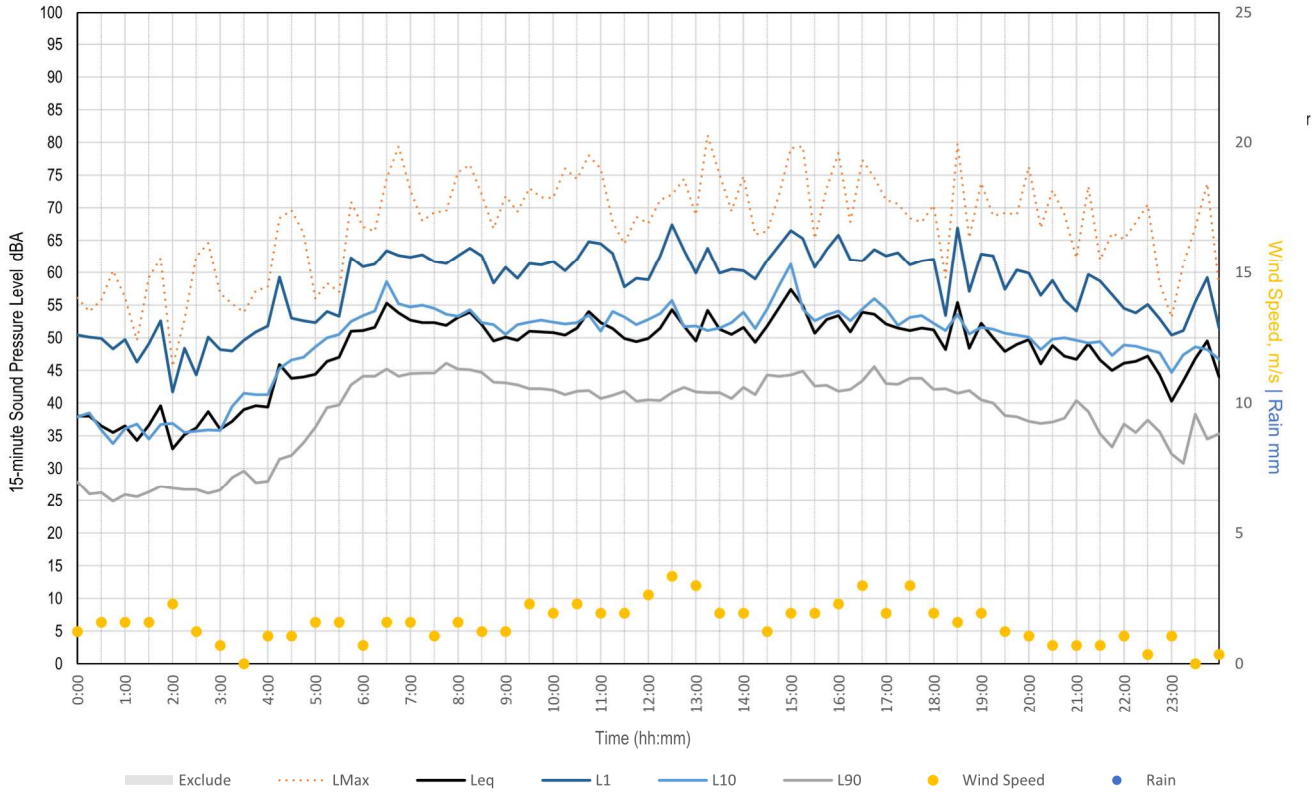
Thursday, 11 August 2022



Noise Logger Results

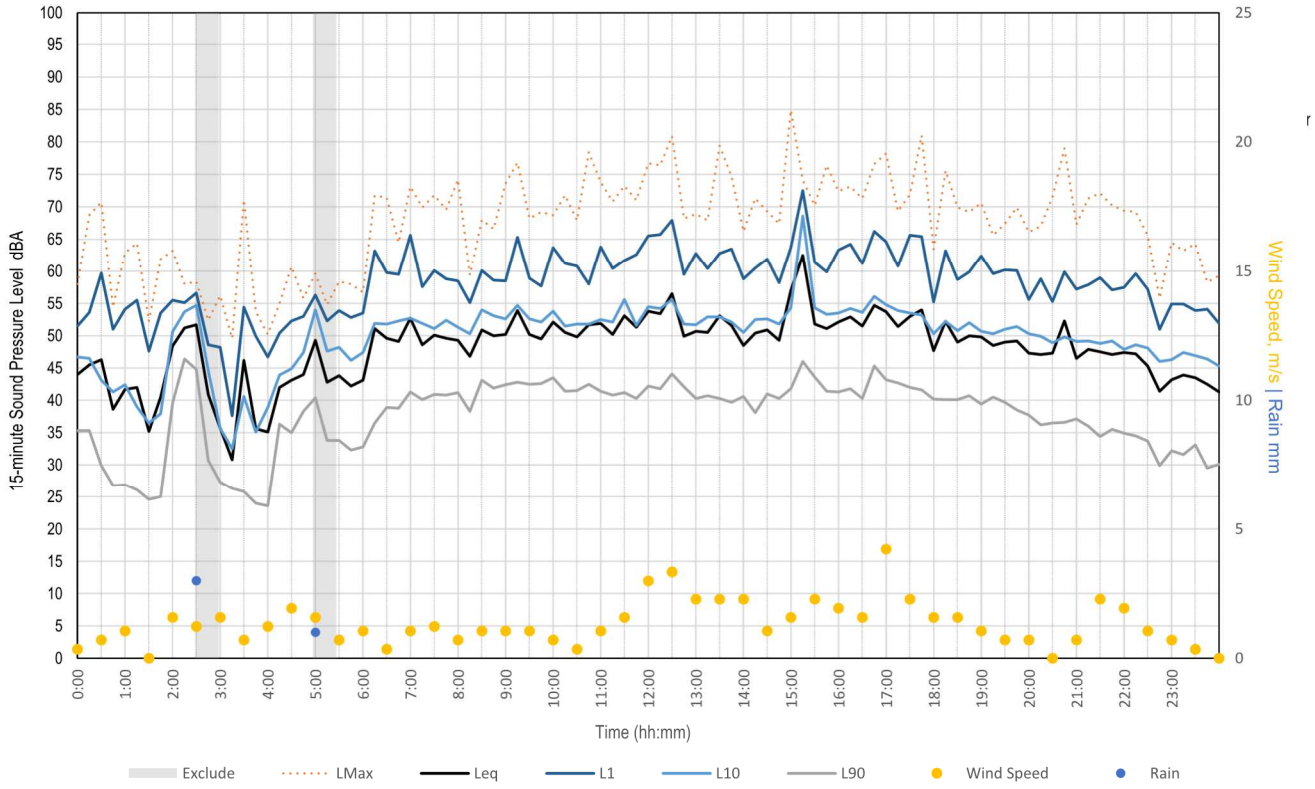
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Friday, 12 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

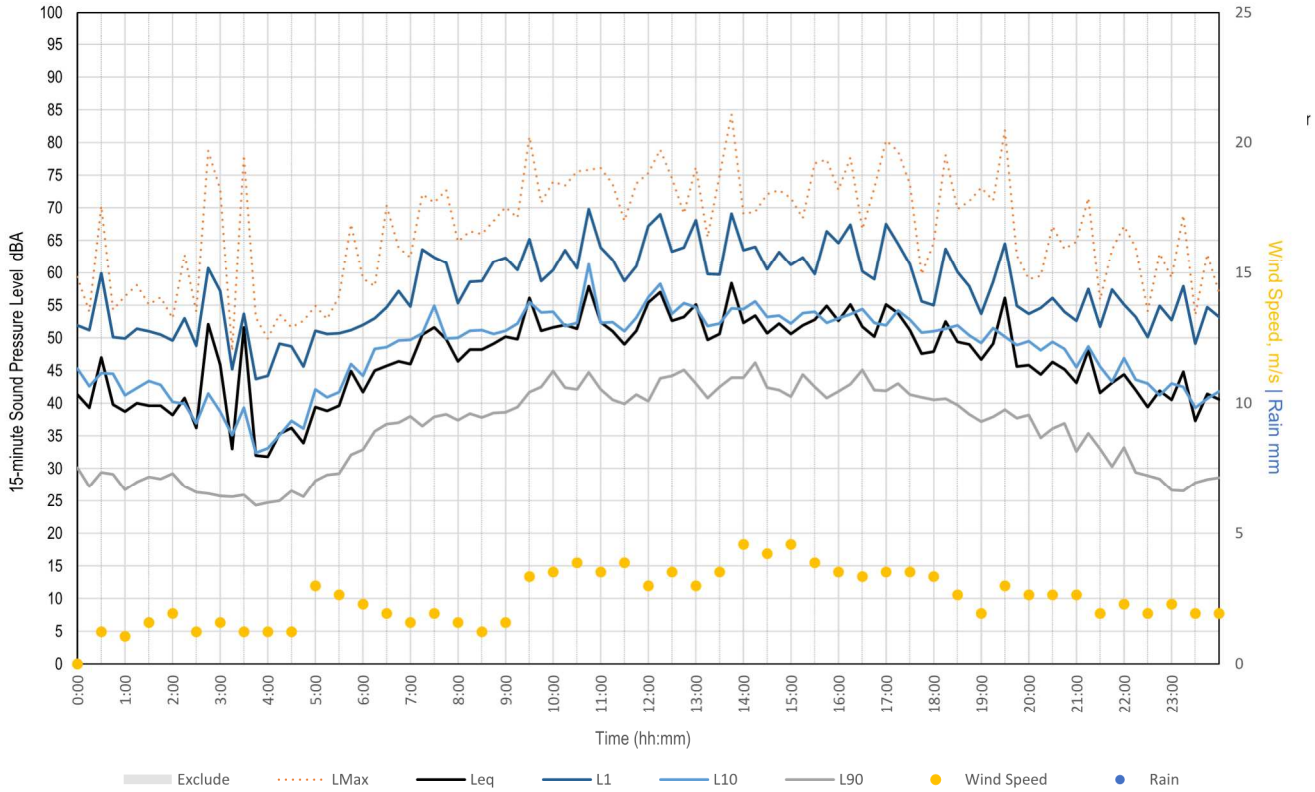
Saturday, 13 August 2022



Noise Logger Results

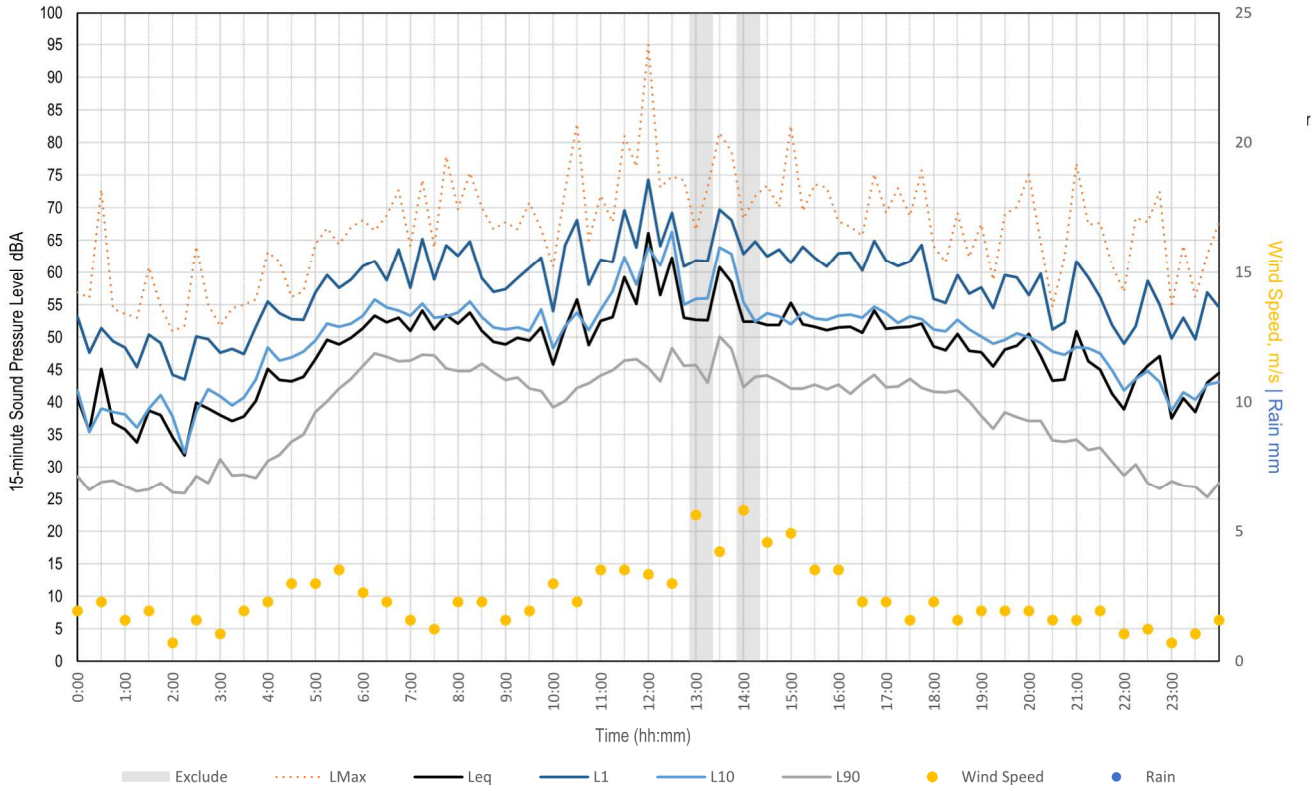
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Sunday, 14 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

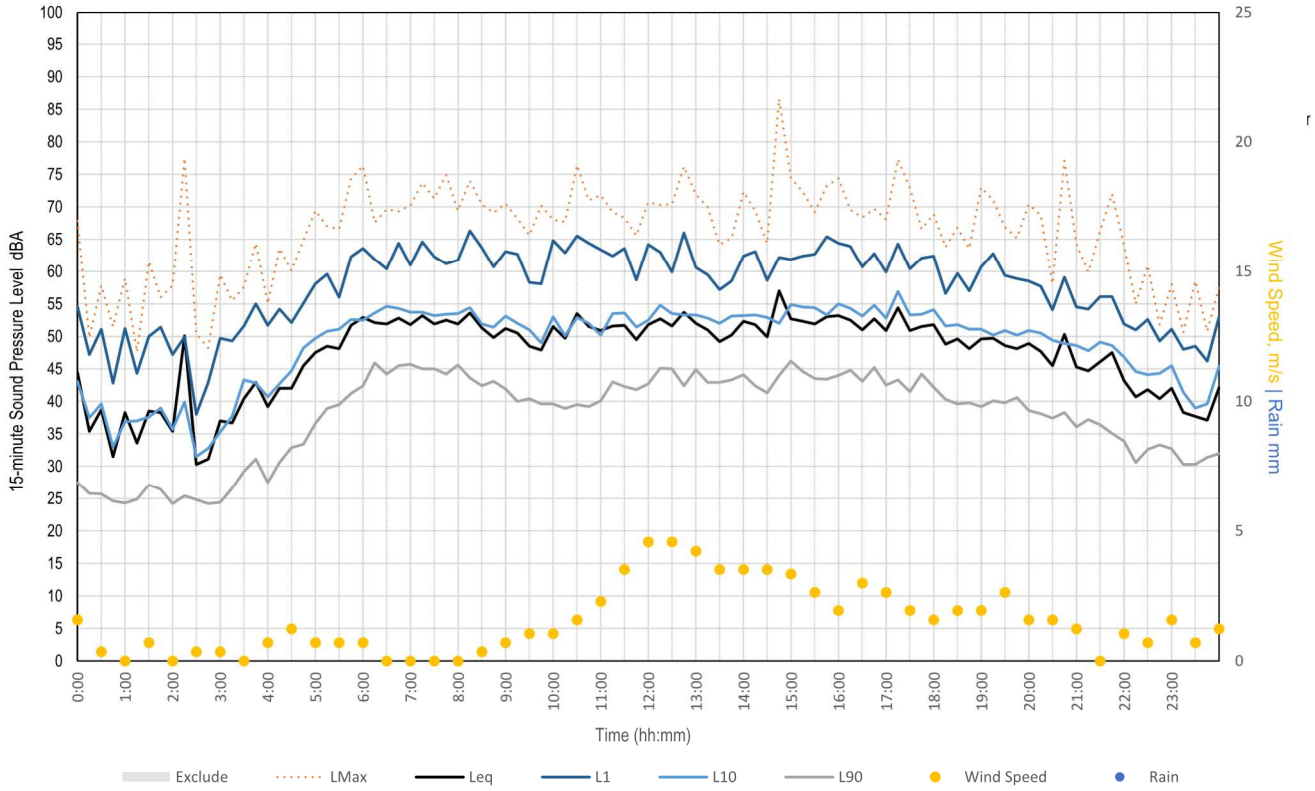
Monday, 15 August 2022



Noise Logger Results

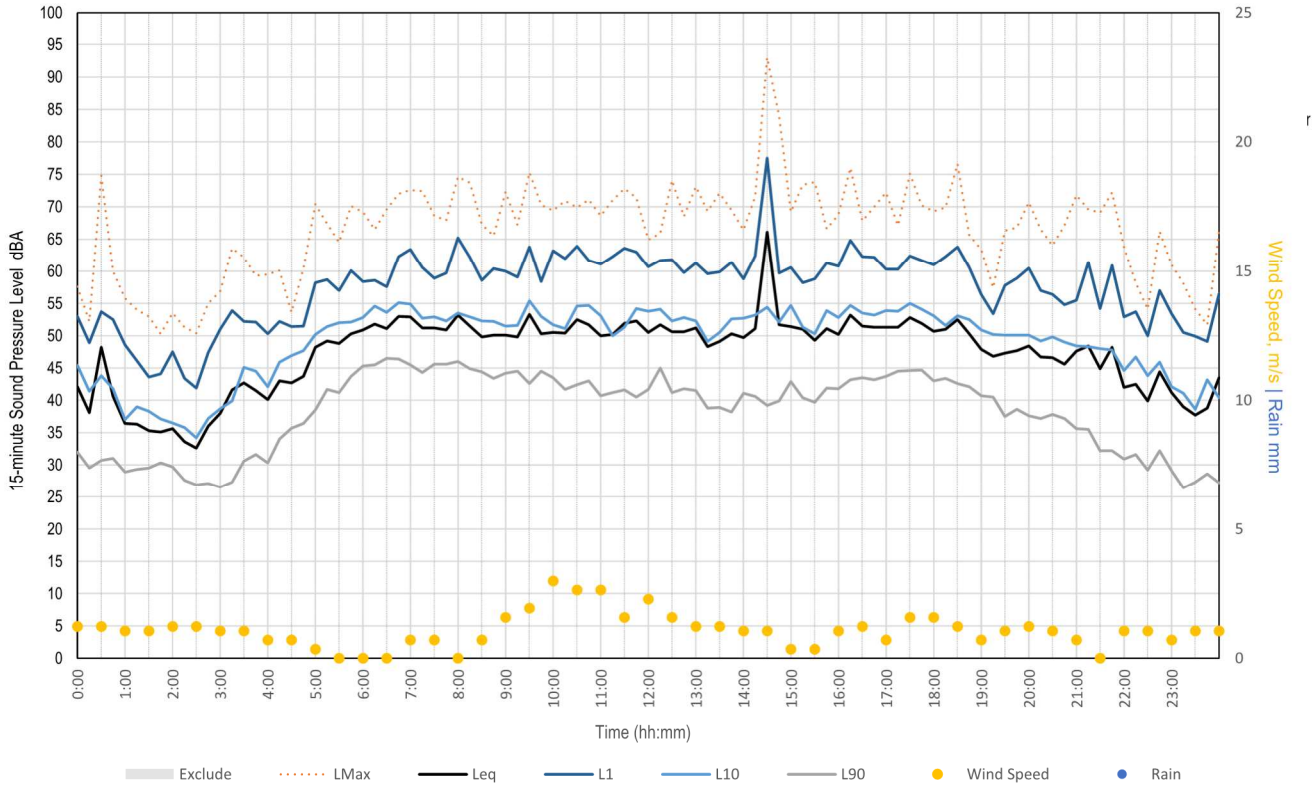
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Tuesday, 16 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

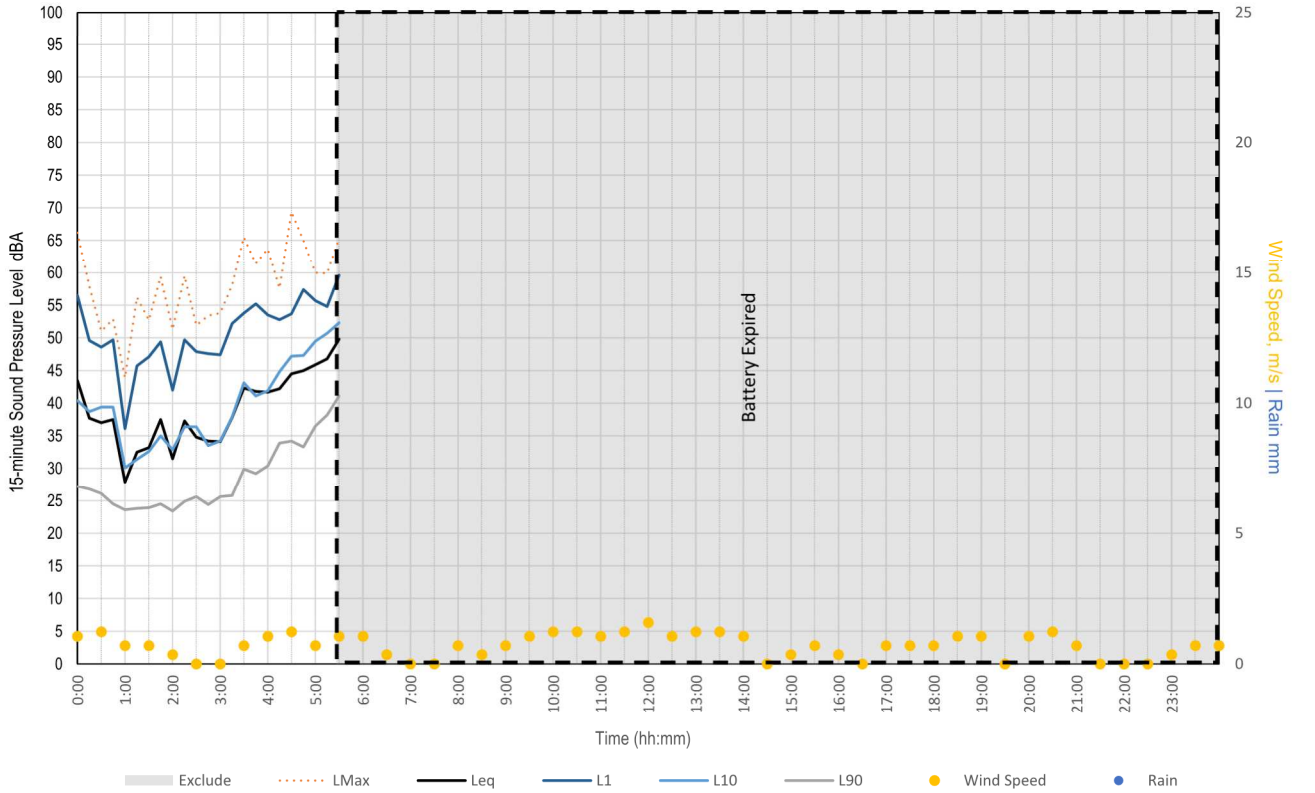
Wednesday, 17 August 2022



Noise Logger Results

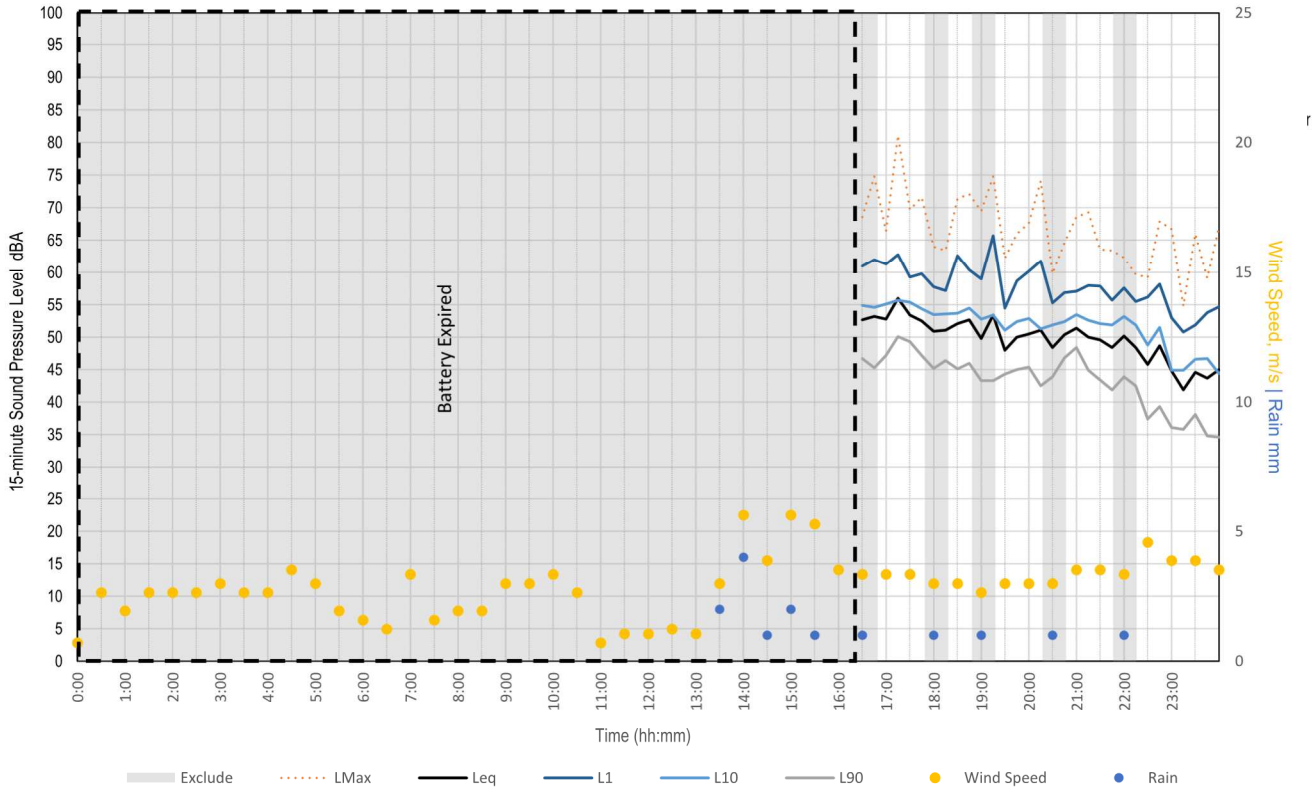
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Thursday, 18 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

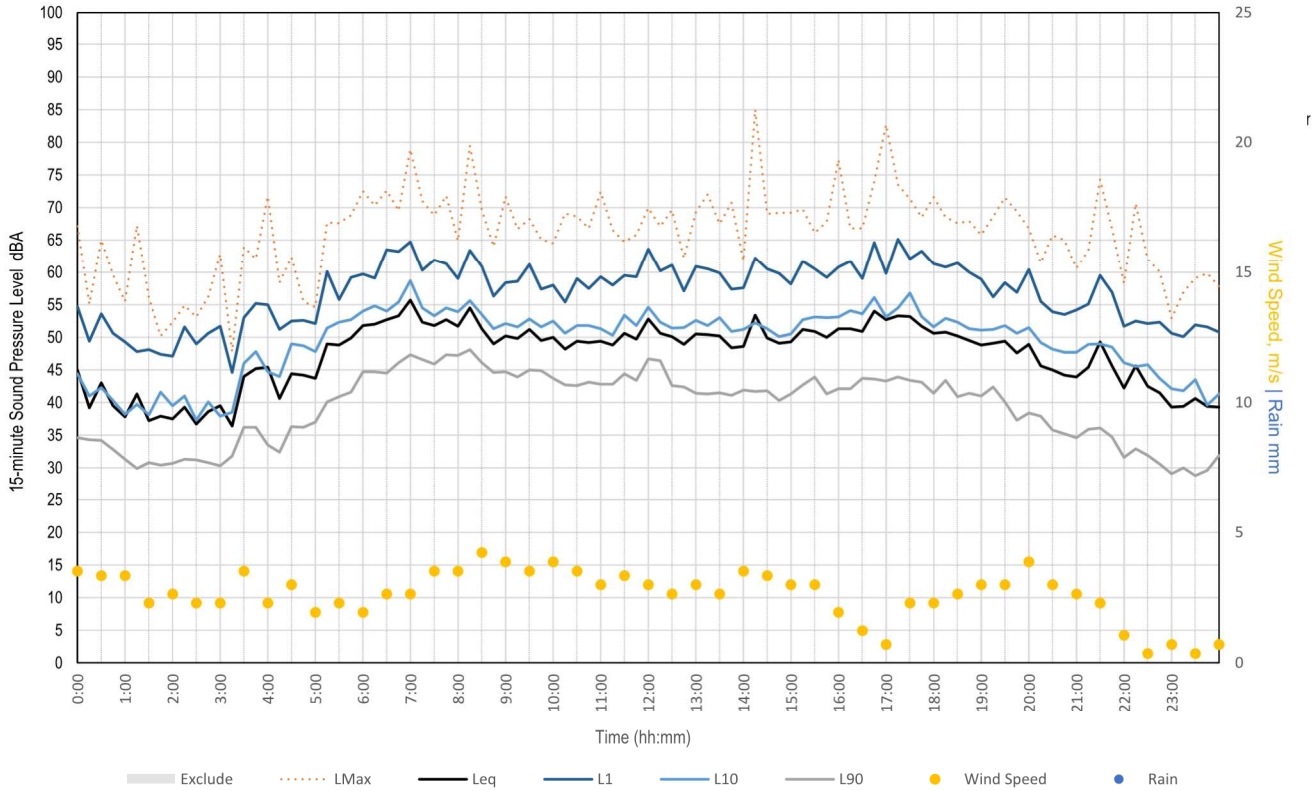
Tuesday, 23 August 2022



Noise Logger Results

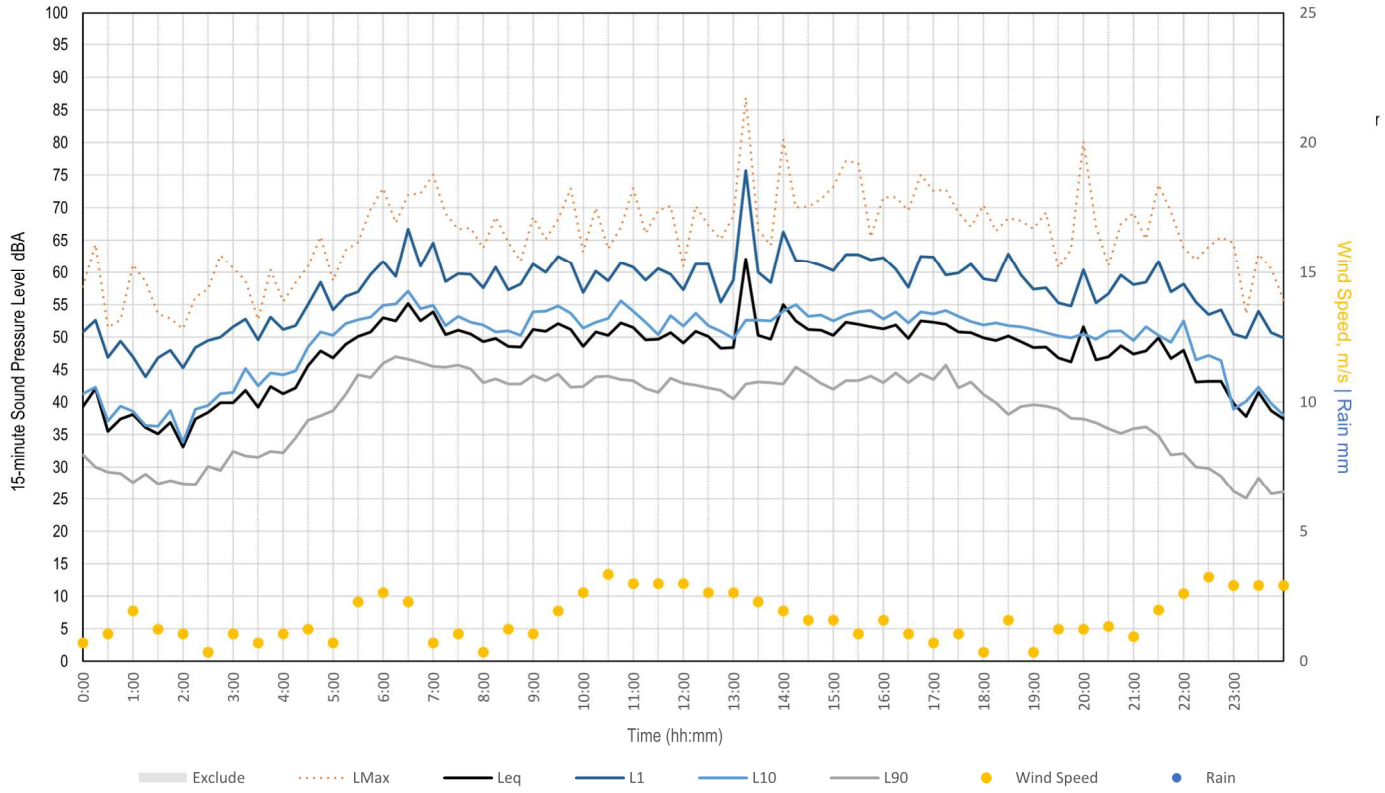
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Wednesday, 24 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

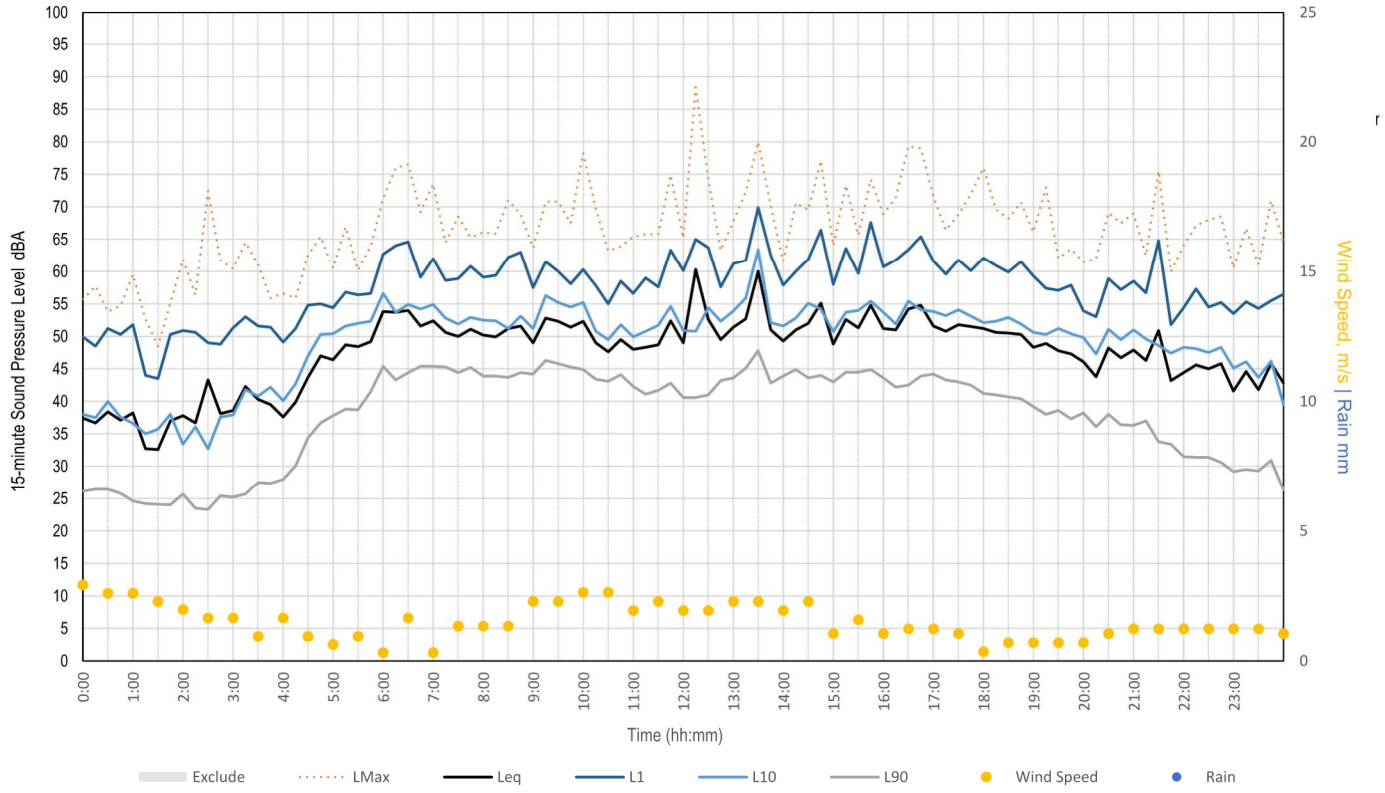
Thursday, 25 August 2022



Noise Logger Results

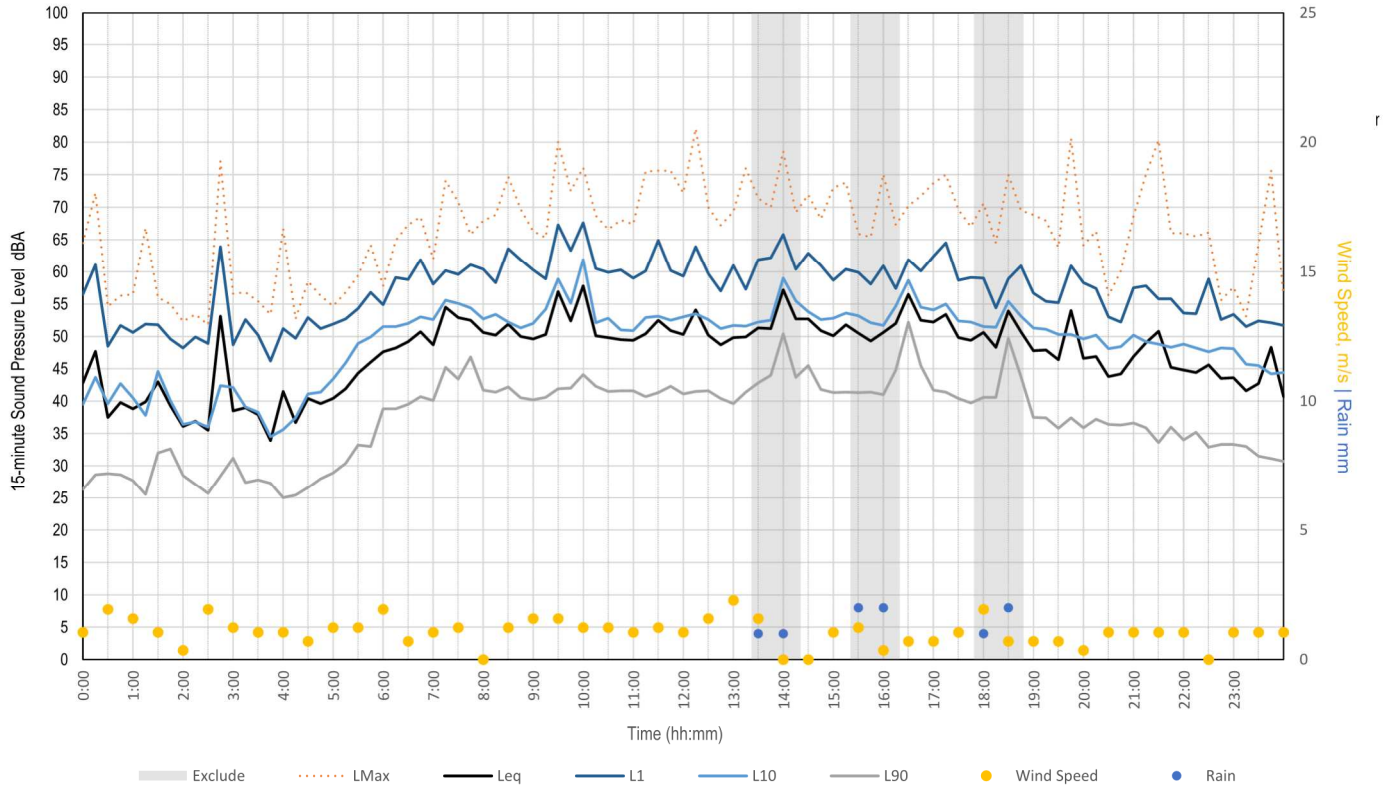
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Friday, 26 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

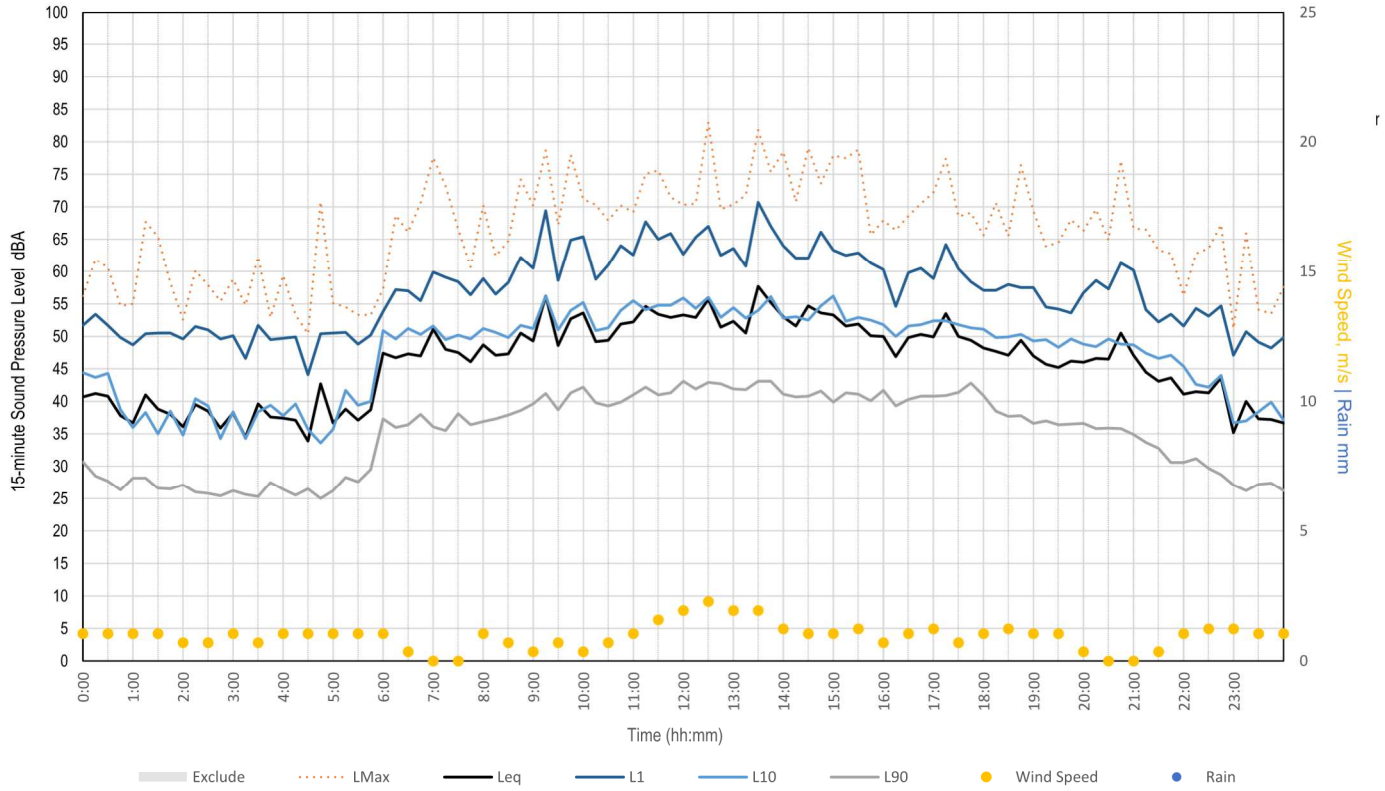
Saturday, 27 August 2022



Noise Logger Results

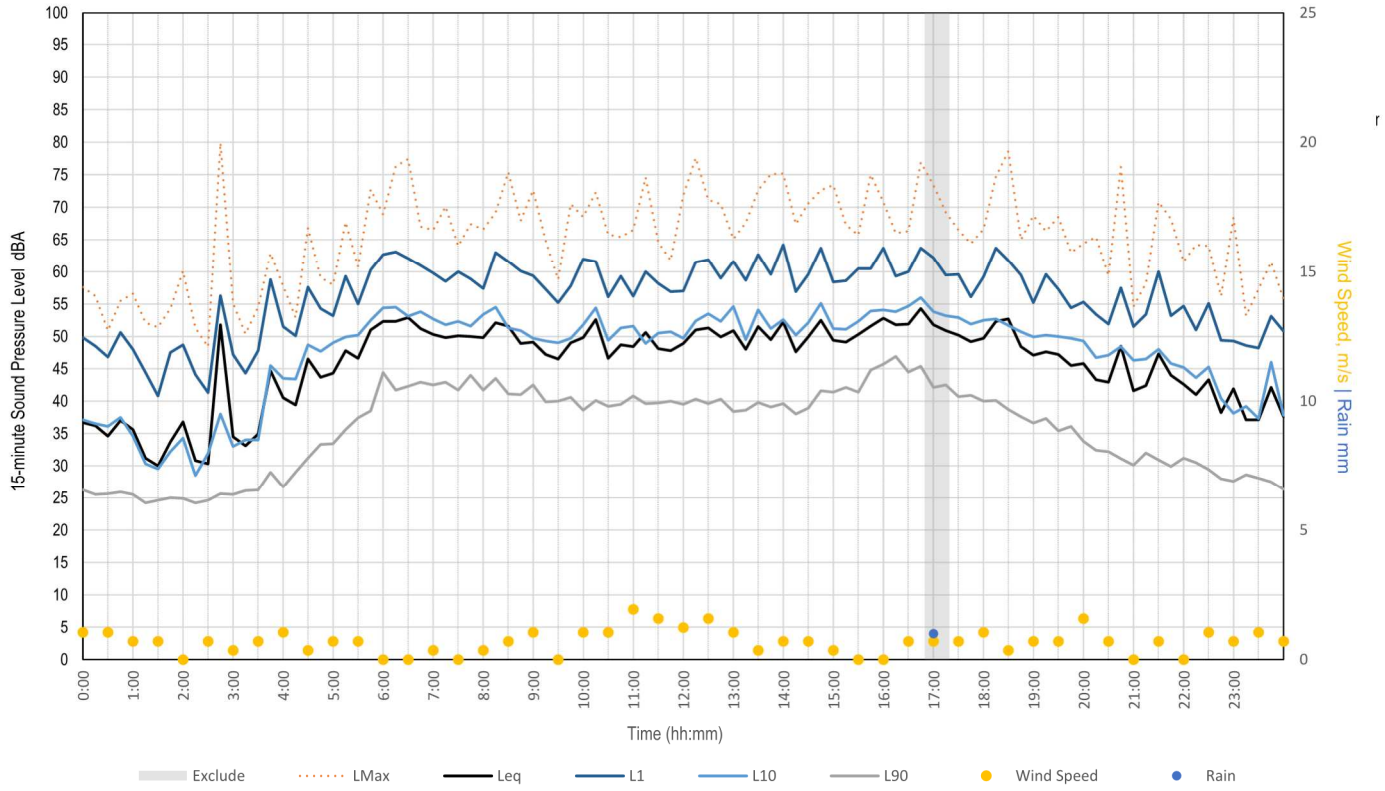
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Sunday, 28 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

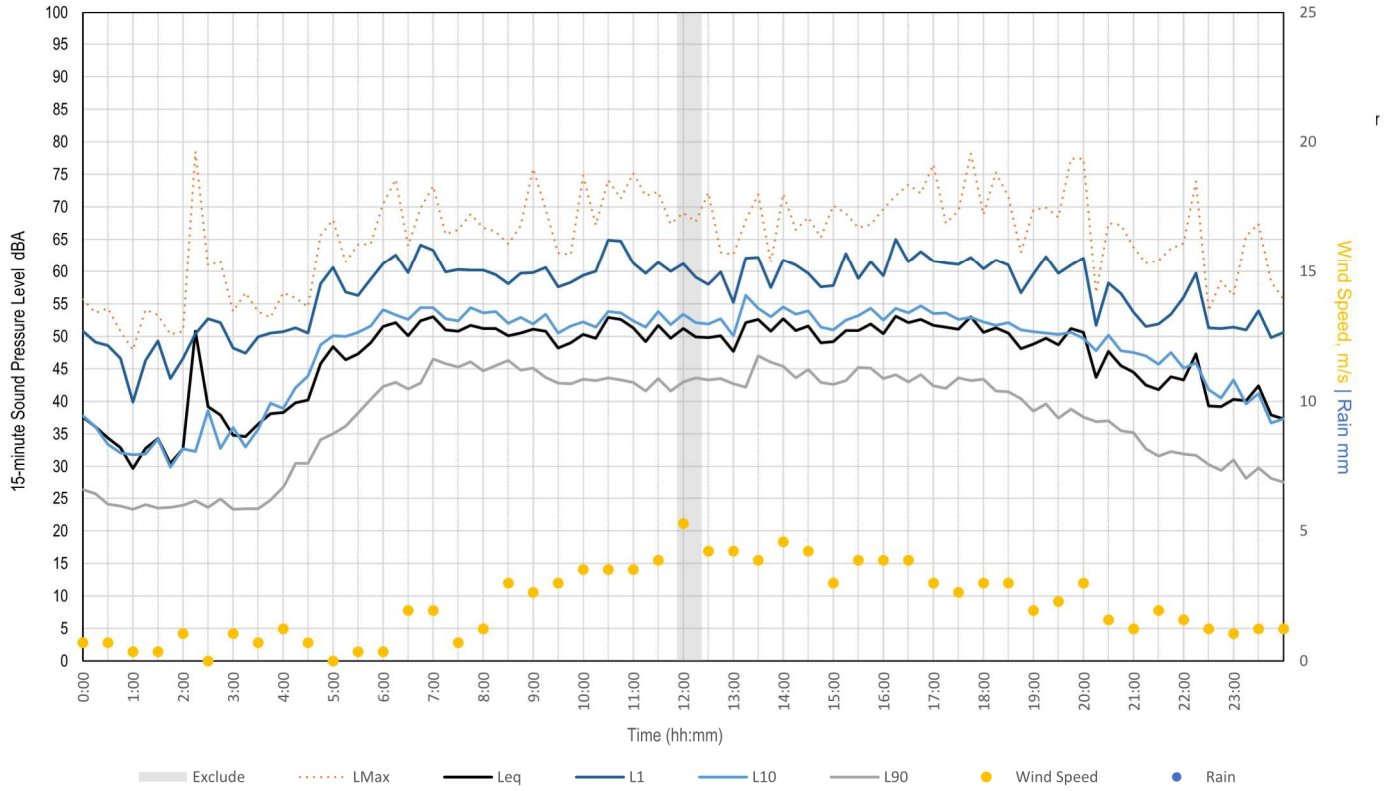
Monday, 29 August 2022



Noise Logger Results

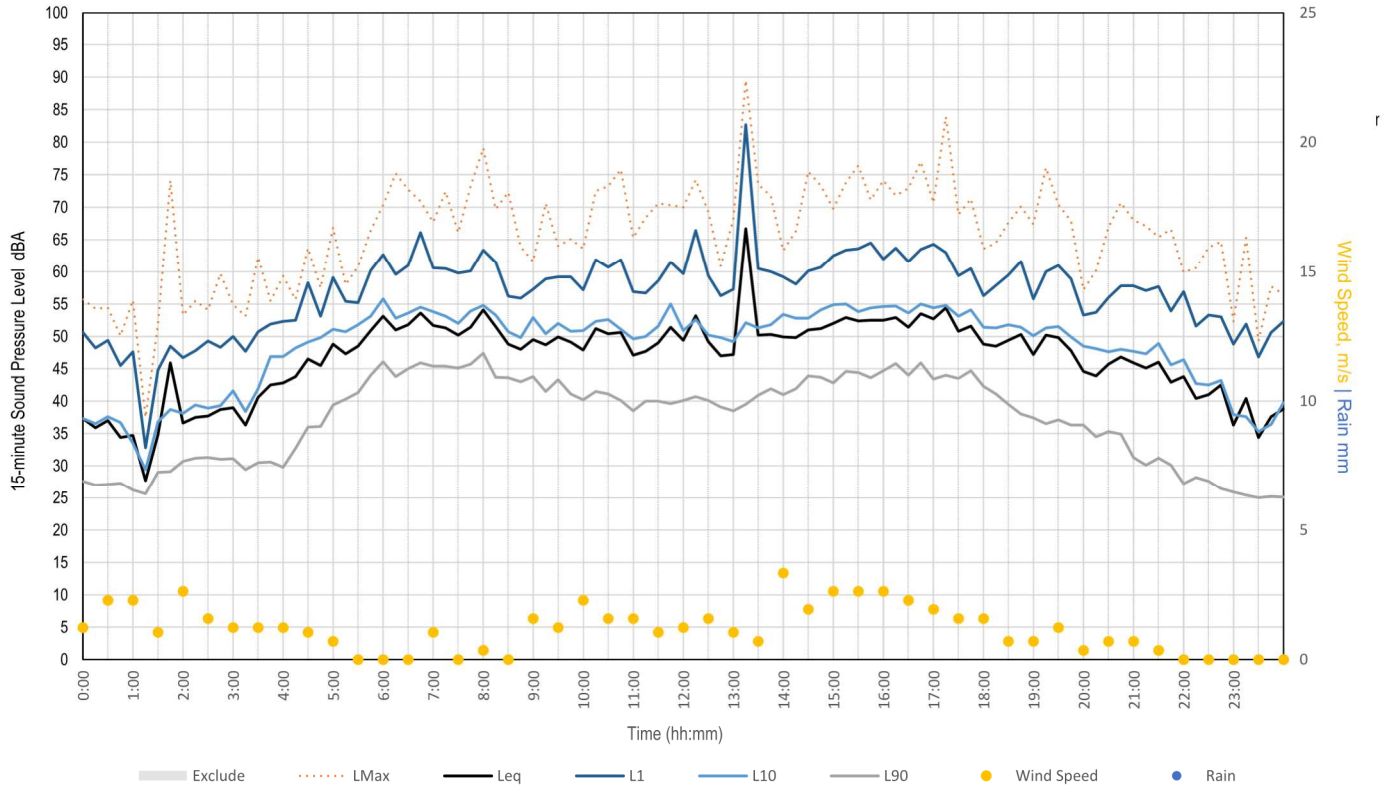
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Tuesday, 30 August 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

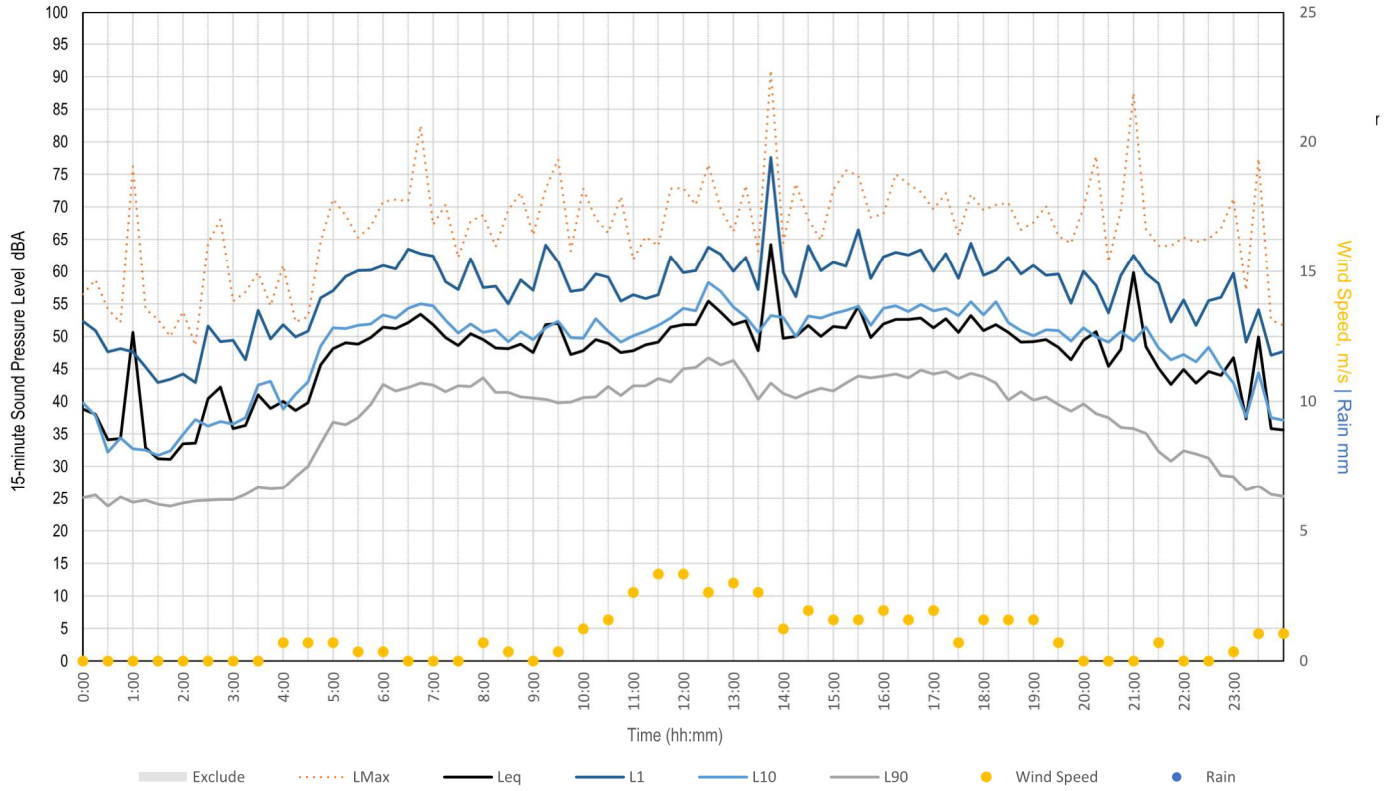
Wednesday, 31 August 2022



Noise Logger Results

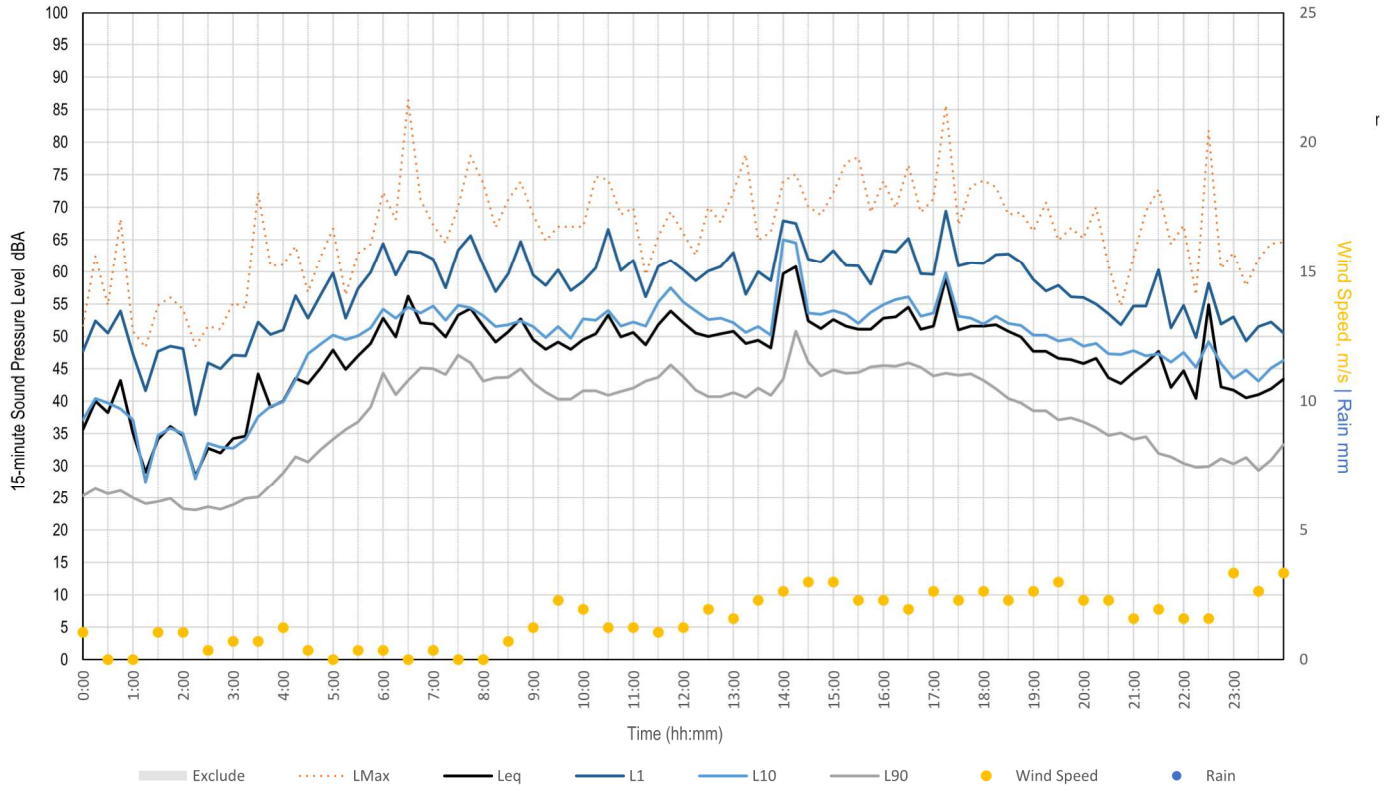
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Thursday, 01 September 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

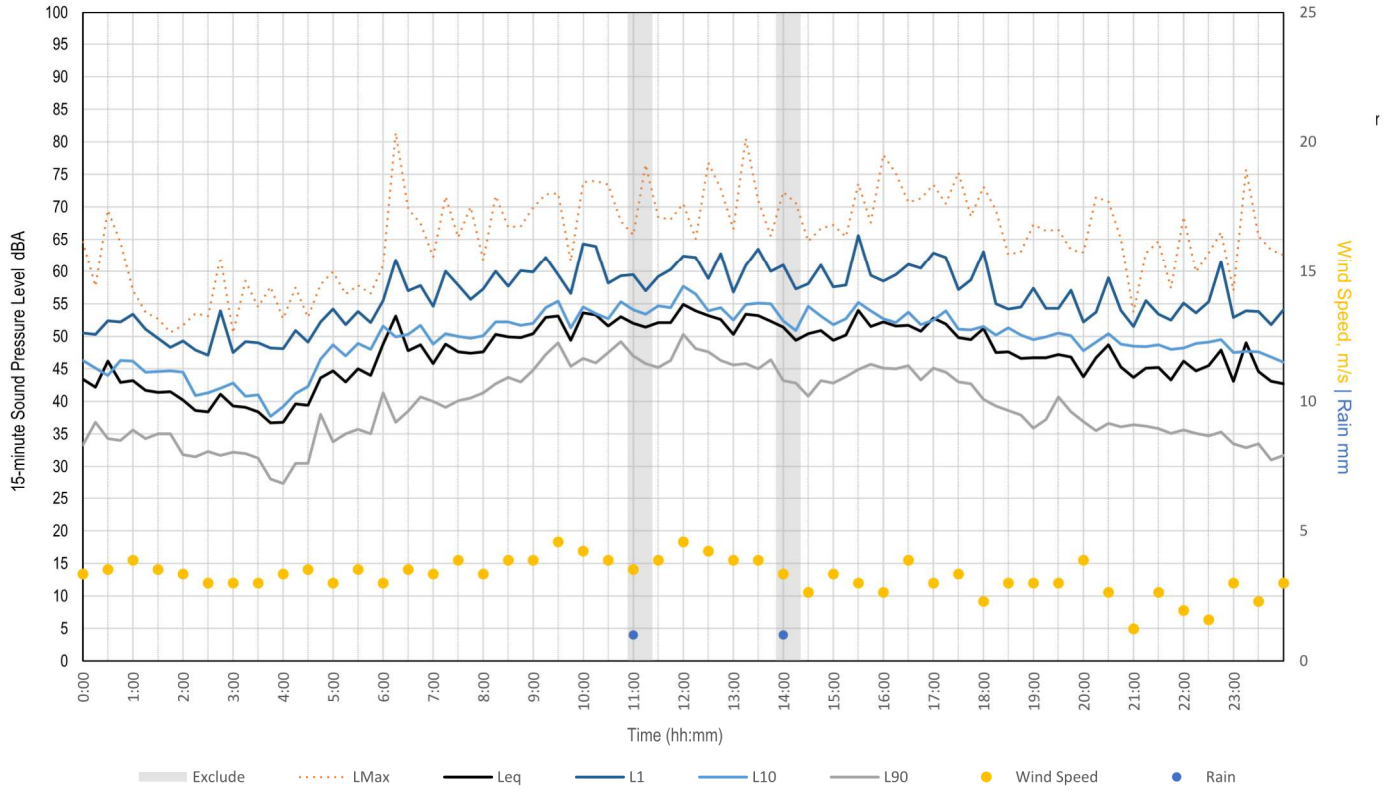
Friday, 02 September 2022



Noise Logger Results

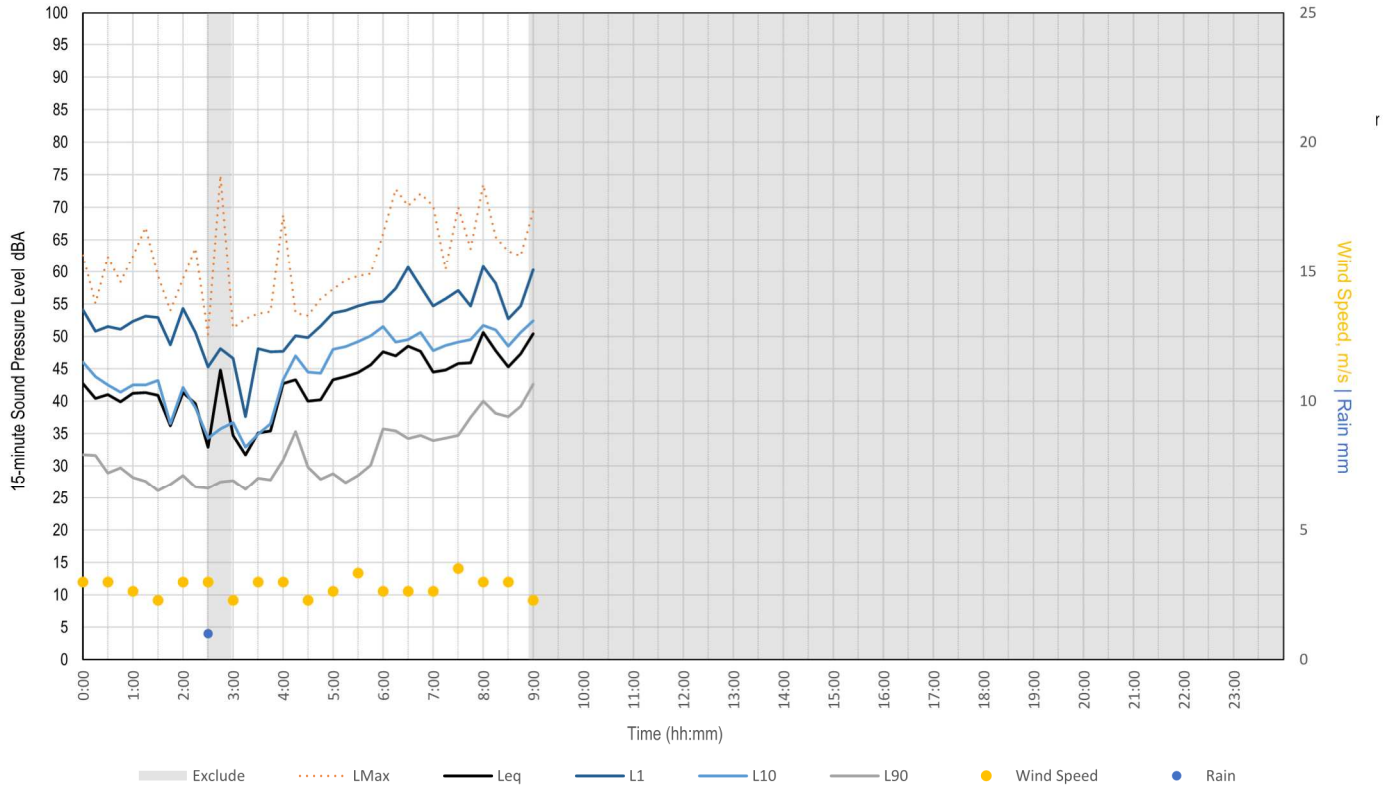
Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Saturday, 03 September 2022



Measured Noise Levels - M17 - 1578 Mulgoa Road (Wallacia)

Sunday, 04 September 2022



Background Noise Monitoring

Location	M18 - 33 Thirteenth Street (Warragamba)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & MUA

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	87809A
Calibration	**Pre:**	93.8 dBA	**Post:**	94.3 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 09 Aug 2022
Date End	Wednesday, 07 Sep 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	≤ 15 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed at fence line of property backing onto rural area.

Located ≥ 3 metres away from any reflective structures other than the ground (e.g. house facade). Fence will not have a notable reflective effect due to it being a wire fence with large gaps.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	25/08/2022	4:07:02 PM	4:22:02 PM	69	44	44	39	
2	Day	25/08/2022	4:45:18 PM	4:51:11 PM	67	49	50	45	
3	Day	25/08/2022	5:15:28 PM	5:30:28 PM	84	56	56	40	
4	Day	25/08/2022	5:30:28 PM	5:45:28 PM	68	47	48	41	
5	Evening	18/08/2022	6:15:00 PM	6:30:00 PM	56	48	50	45	*
6	Evening	18/08/2022	7:00:00 PM	7:15:00 PM	52	47	48	44	*
7	Evening	18/08/2022	8:15:00 PM	8:30:00 PM	53	46	48	44	*
8	Evening	7/09/2022	8:57:14 PM	9:12:14 PM	54	41	41	40	
9	Night	14/08/2022	1:30:00 AM	1:45:00 AM	47	44	44	43	*
10	Night	14/08/2022	3:45:00 AM	4:00:00 AM	54	49	51	46	*
11	Night	14/08/2022	5:30:00 AM	5:45:00 AM	48	44	45	42	*
12	Night	14/08/2022	11:15:00 PM	11:30:00 PM	45	42	44	40	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Constant bird noise from adjacent rural property (maximum levels around 65 to 70 dBA. Residential activity (e.g. talking and activity in neighbouring yard). Occasional motorcycle passbys on local street. Several aircraft flying overhead with and approx. duration of 1 to 2 min and with maximum sound levels ranging from 41 to 53 dBA.
Background noise	Traffic at a distance.
Evening	
Ambient noise	Constant bird noise. Constant noise from insects of varying intensity around 9 PM. Occasional vehicle passbys on street. Occasional dog barking. One aircraft flyover was observed with maximum sound level around 42 dBA for a duration of less than a minute.
Background noise	Constant insect noise. Movement in vegetation induced by wind (e.g. leaves and grass rustling). Traffic at a distance.
Night	
Ambient noise	Intermittent bird noises. Various intermittent noise, likely from animal activity. Some strong wind gusts. Aircraft flyover faintly audible with an approx. duration of 30 sec to 1 min and with a maximum sound levels ranging from 45 to 52 dBA.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass rustling).

Site Details	M18 - 33 Thirteenth Street (Warragamba)
Start Date	Tue 09 August 2022
End Date	Wed 07 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	51
$L_{eq, Evening}$ dBA	46
$L_{eq, Night}$ dBA	46
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	41
RBL, $_{Night}$ dBA	41

Daily Summary

Date	09-08	10-08	11-08	12-08	13-08	14-08	15-08	16-08
$L_{eq, Day}$ dBA	49	51	49	49	48	50	50	52
$L_{eq, Evening}$ dBA	46	42	43	42	46	47	48	47
$L_{eq, Night}$ dBA	50	42	44	46	45	48	46	50
ABL, $_{Day}$ dBA	42	35	35	35	39	40	42	40
ABL, $_{Evening}$ dBA	42	37	40	37	43	41	43	43
ABL, $_{Night}$ dBA	43	40	39	38	41	42	41	46

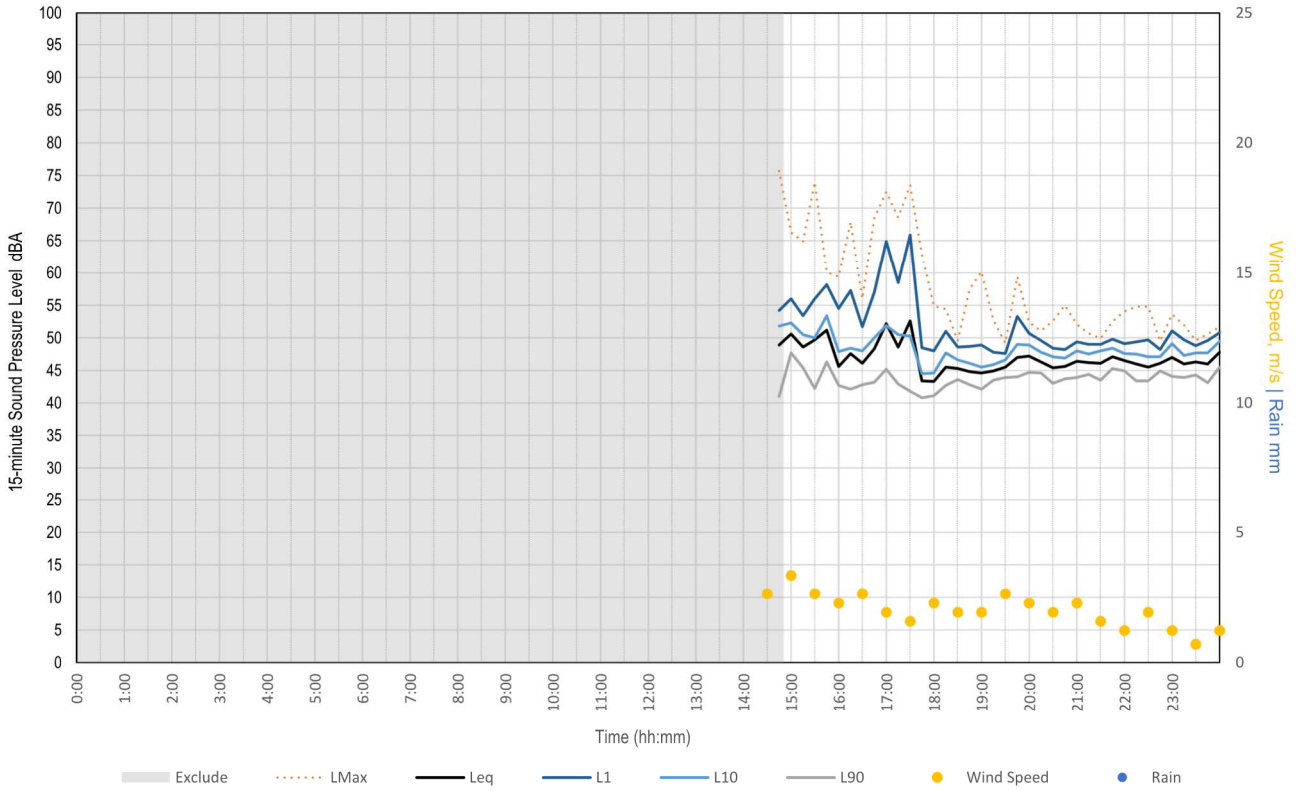
Date	17-08	18-08	19-08	20-08	21-08	22-08	23-08	24-08
$L_{eq, Day}$ dBA	52	49	48	47	46	50	51	49
$L_{eq, Evening}$ dBA	47	47	48	48	46	47	51	47
$L_{eq, Night}$ dBA	48	46	45	42	47	46	47	48
ABL, $_{Day}$ dBA	36	39	37	35	35	36	34	41
ABL, $_{Evening}$ dBA	43	44	42	38	40	41	47	42
ABL, $_{Night}$ dBA	43	41	41	39	43	40	43	41

Date	25-08	26-08	27-08	28-08	29-08	30-08	31-08	01-09
$L_{eq, Day}$ dBA	53	48	47	48	48	59	57	48
$L_{eq, Evening}$ dBA	45	45	43	43	42	47	38	48
$L_{eq, Night}$ dBA	47	46	43	44	41	48	40	46
ABL, $_{Day}$ dBA	37	36	35	35	35	37	34	35
ABL, $_{Evening}$ dBA	40	42	41	40	39	43	34	42
ABL, $_{Night}$ dBA	43	42	39	41	36	40	37	42

Date	02-09	03-09	04-09	05-09	06-09	07-09
$L_{eq, Day}$ dBA	49	48	48	48	48	46
$L_{eq, Evening}$ dBA	41	47	44	45	43	41
$L_{eq, Night}$ dBA	44	46	49	48	45	
ABL, $_{Day}$ dBA	36	40	38	35	36	35
ABL, $_{Evening}$ dBA	38	43	40	41	40	35
ABL, $_{Night}$ dBA	37	43	44	44	41	

Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

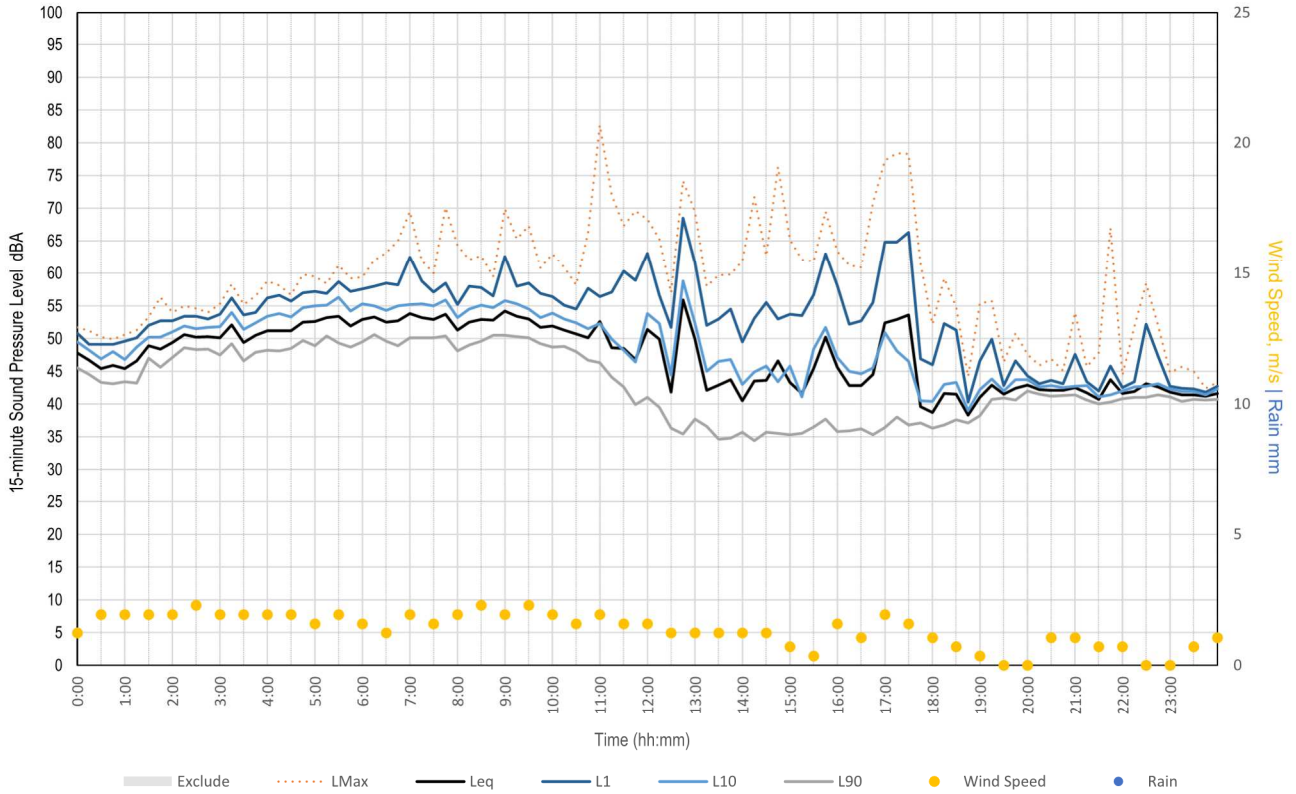
Tuesday, 09 August 2022



Noise Logger Results

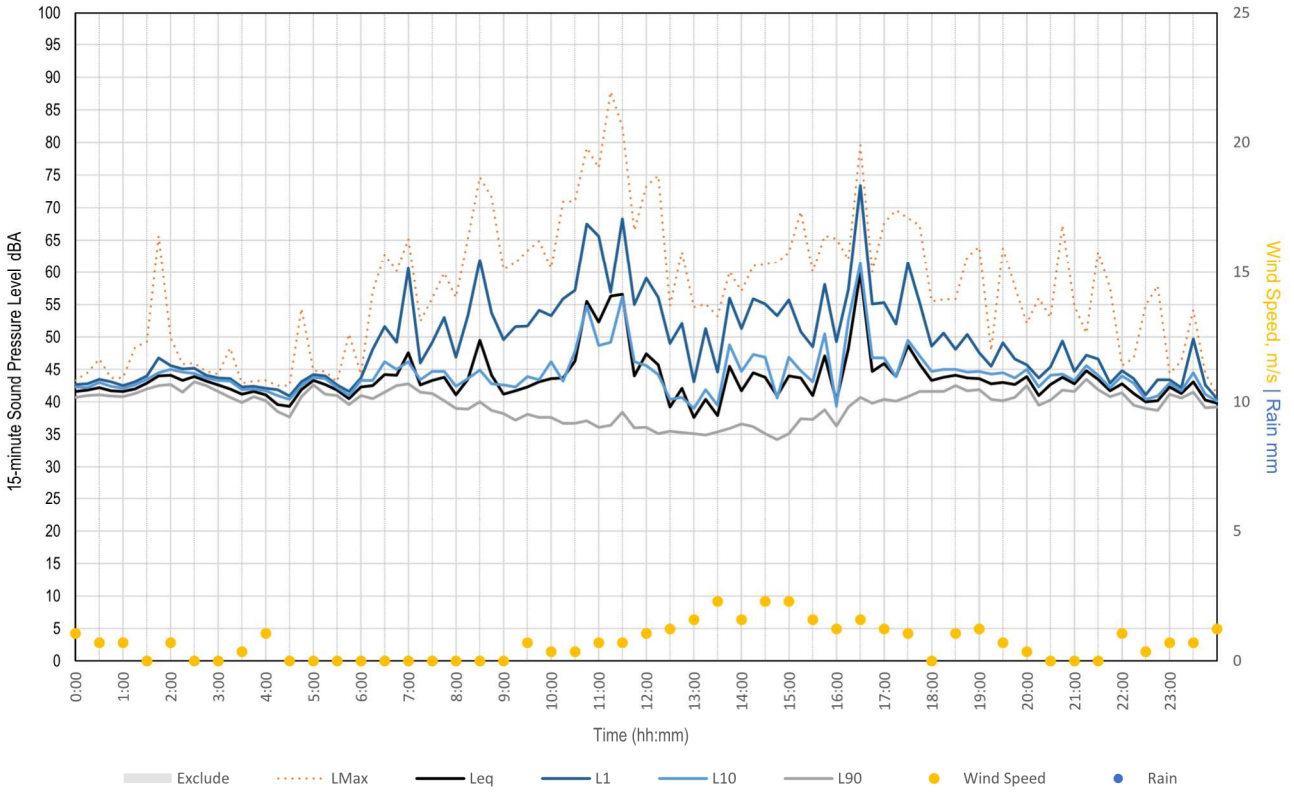
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Wednesday, 10 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

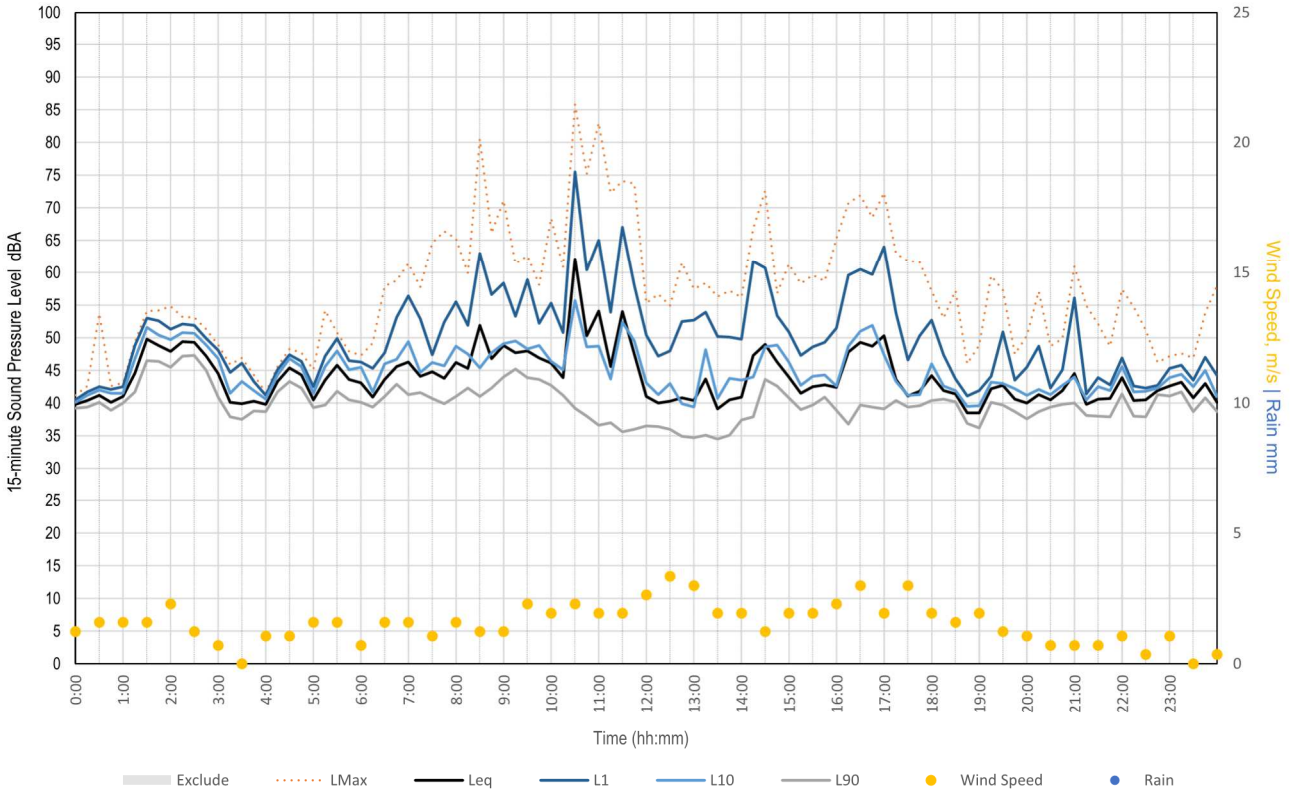
Thursday, 11 August 2022



Noise Logger Results

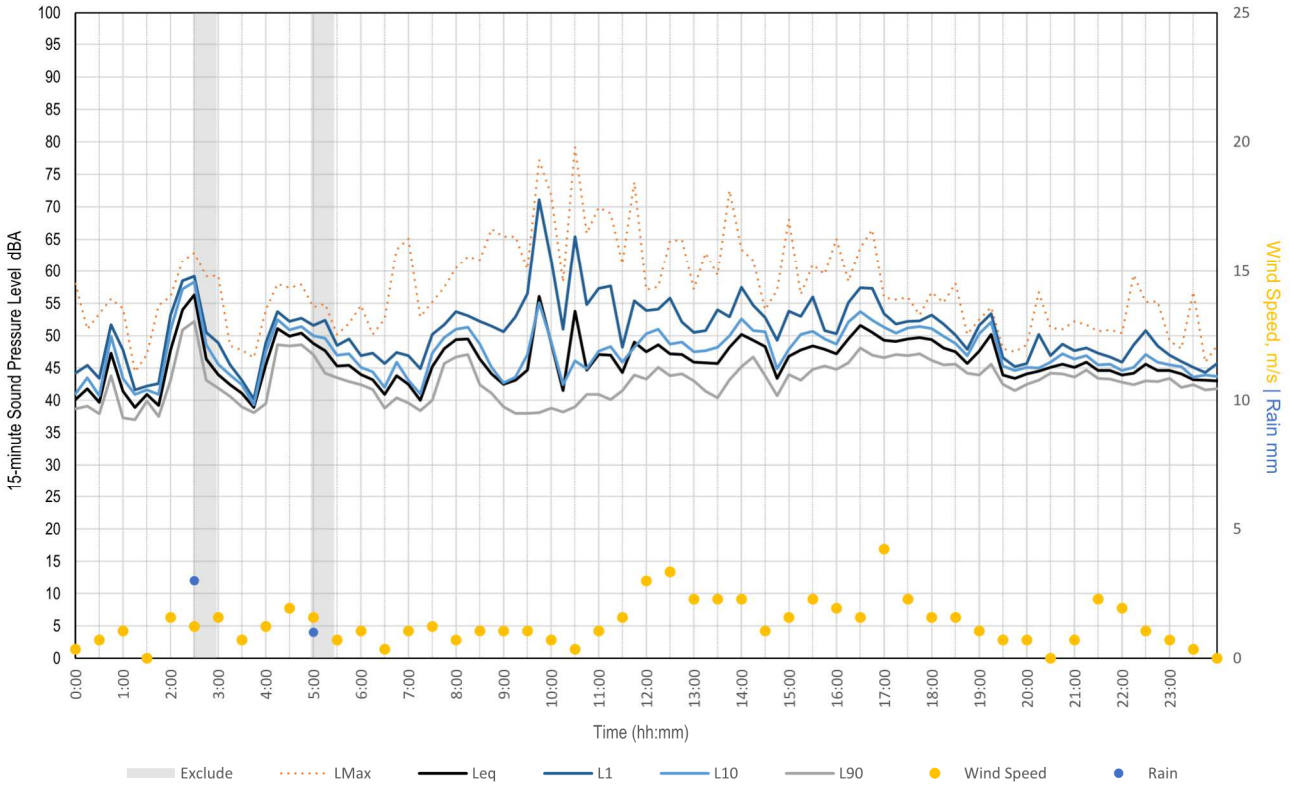
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Friday, 12 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

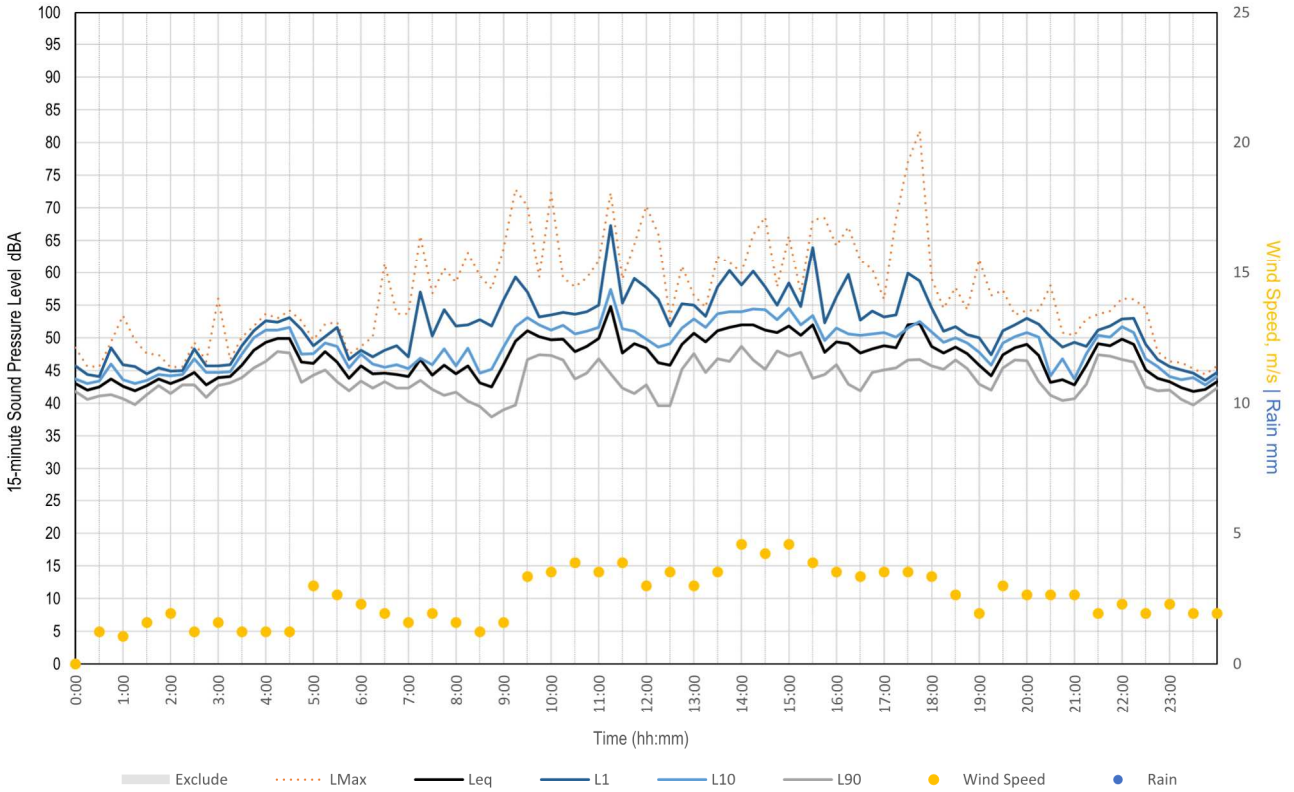
Saturday, 13 August 2022



Noise Logger Results

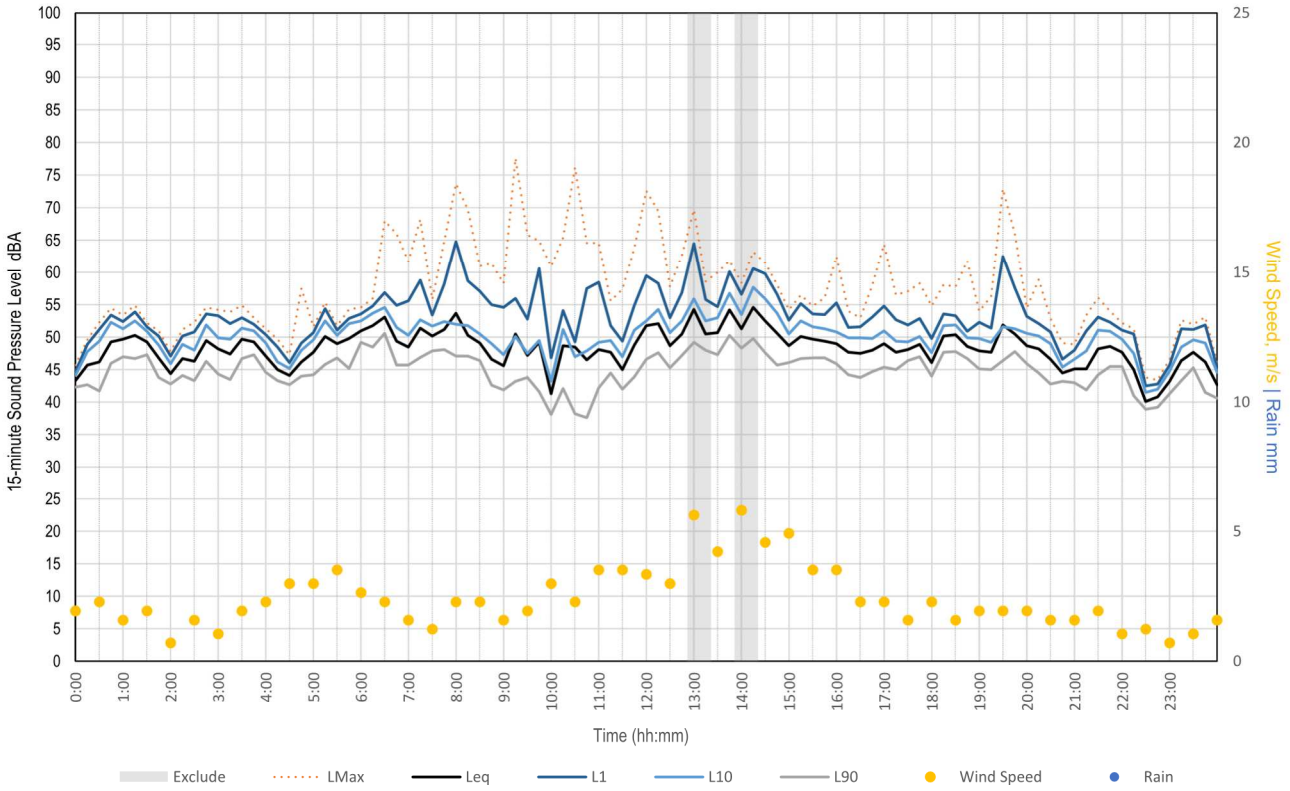
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Sunday, 14 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

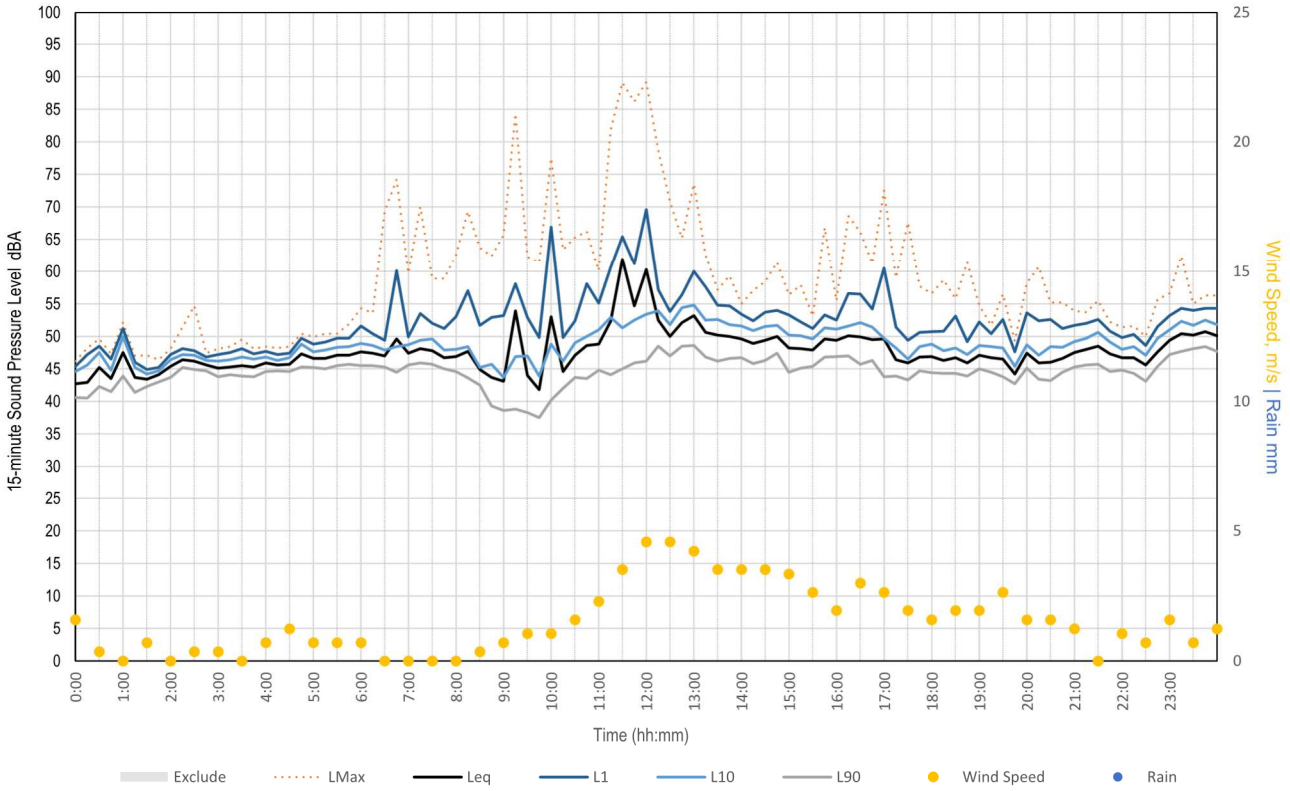
Monday, 15 August 2022



Noise Logger Results

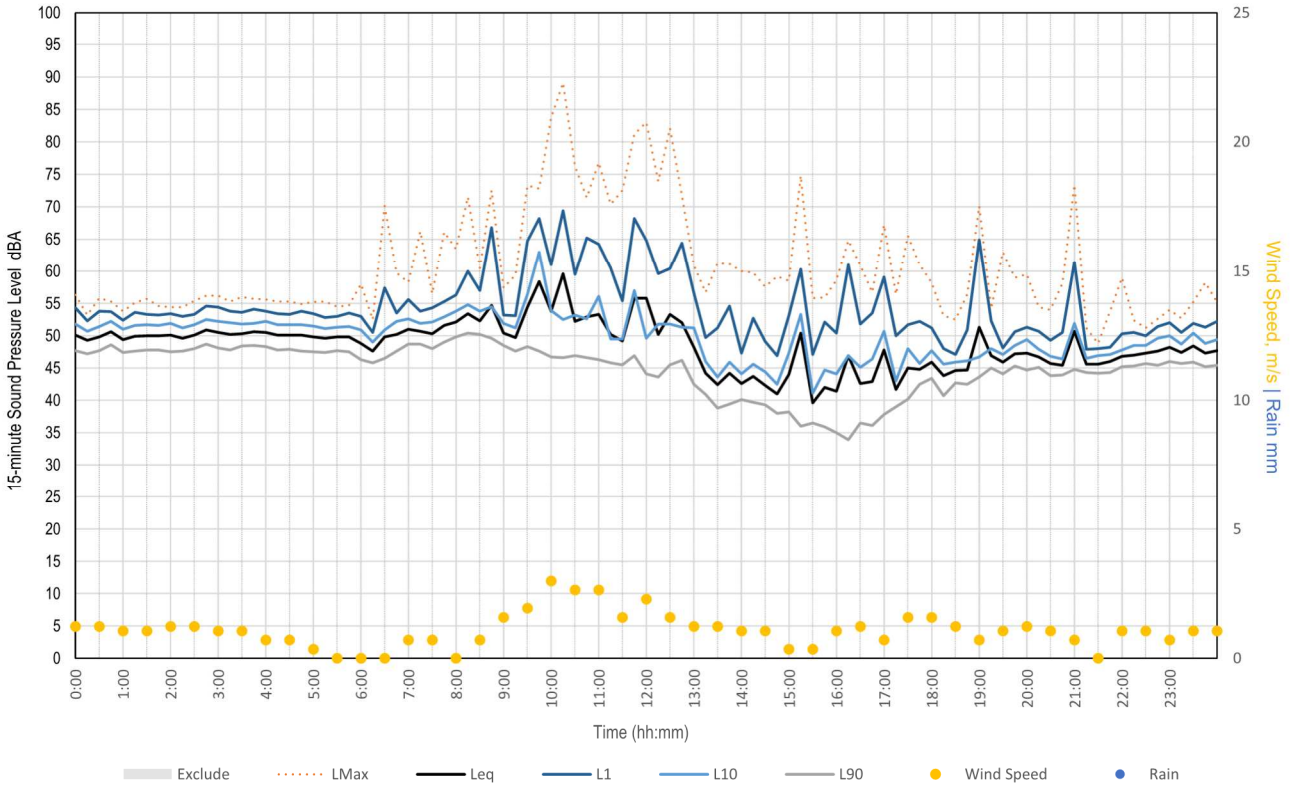
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Tuesday, 16 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

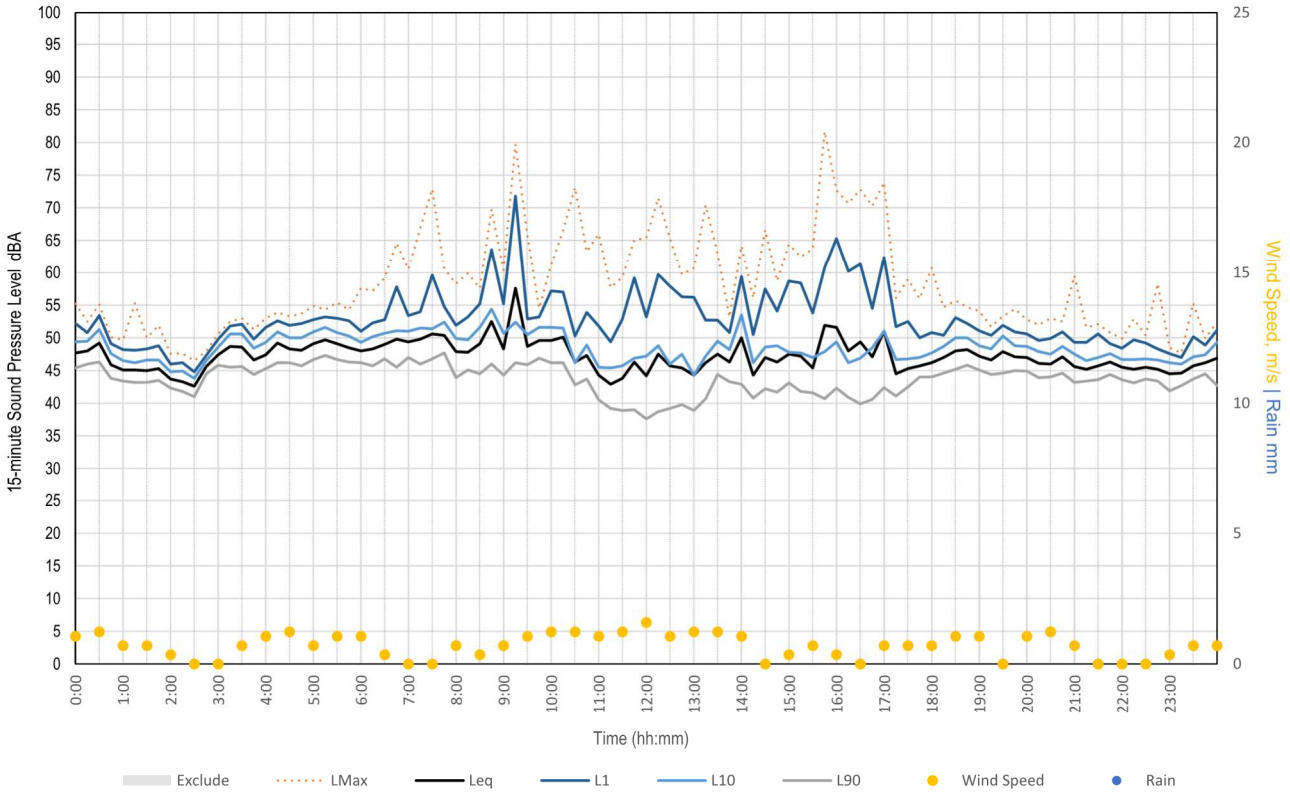
Wednesday, 17 August 2022



Noise Logger Results

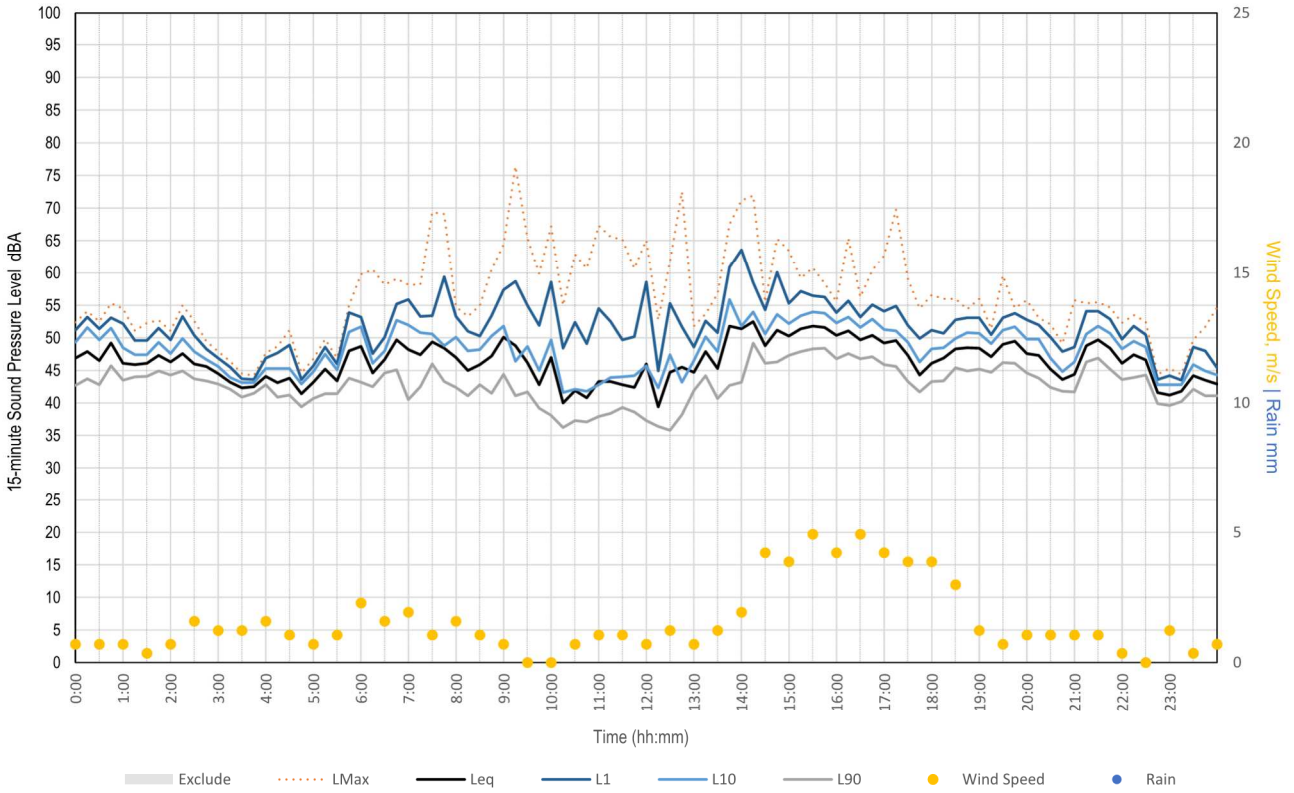
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Thursday, 18 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

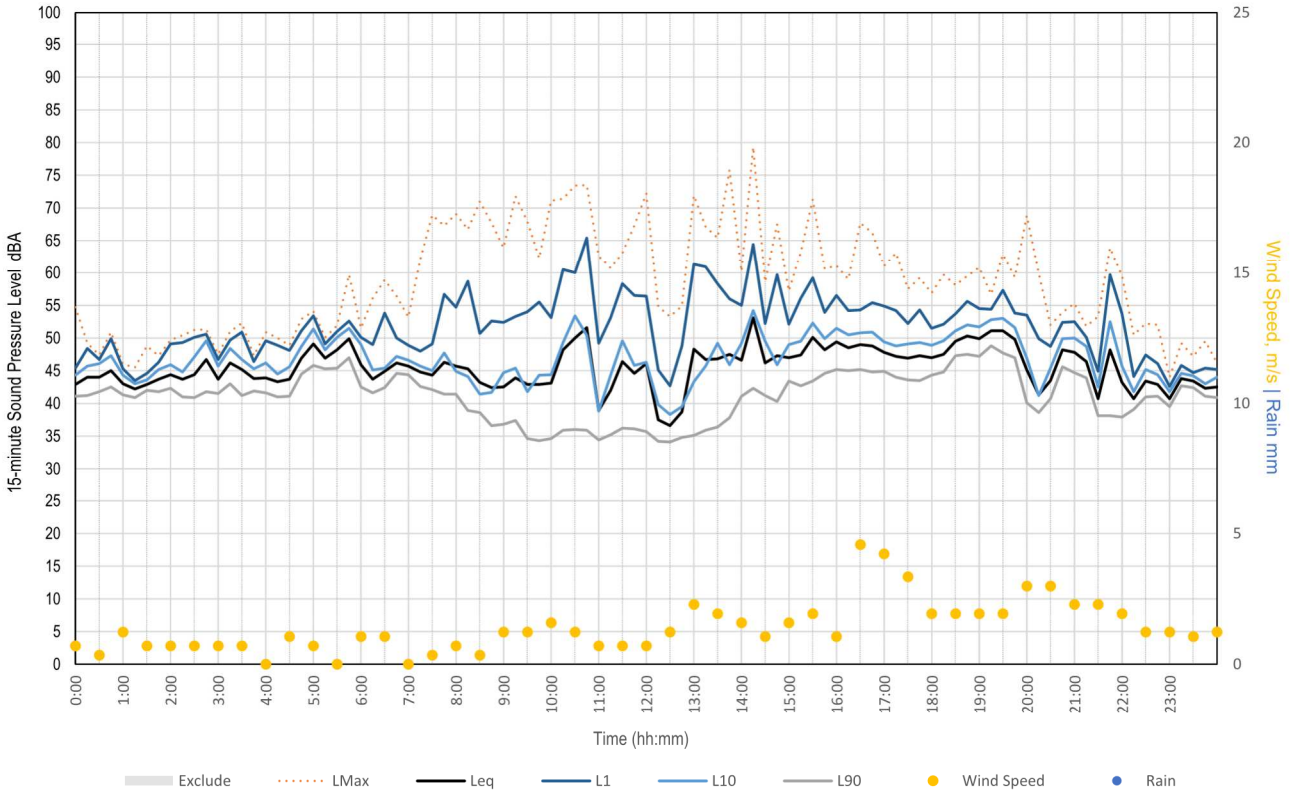
Friday, 19 August 2022



Noise Logger Results

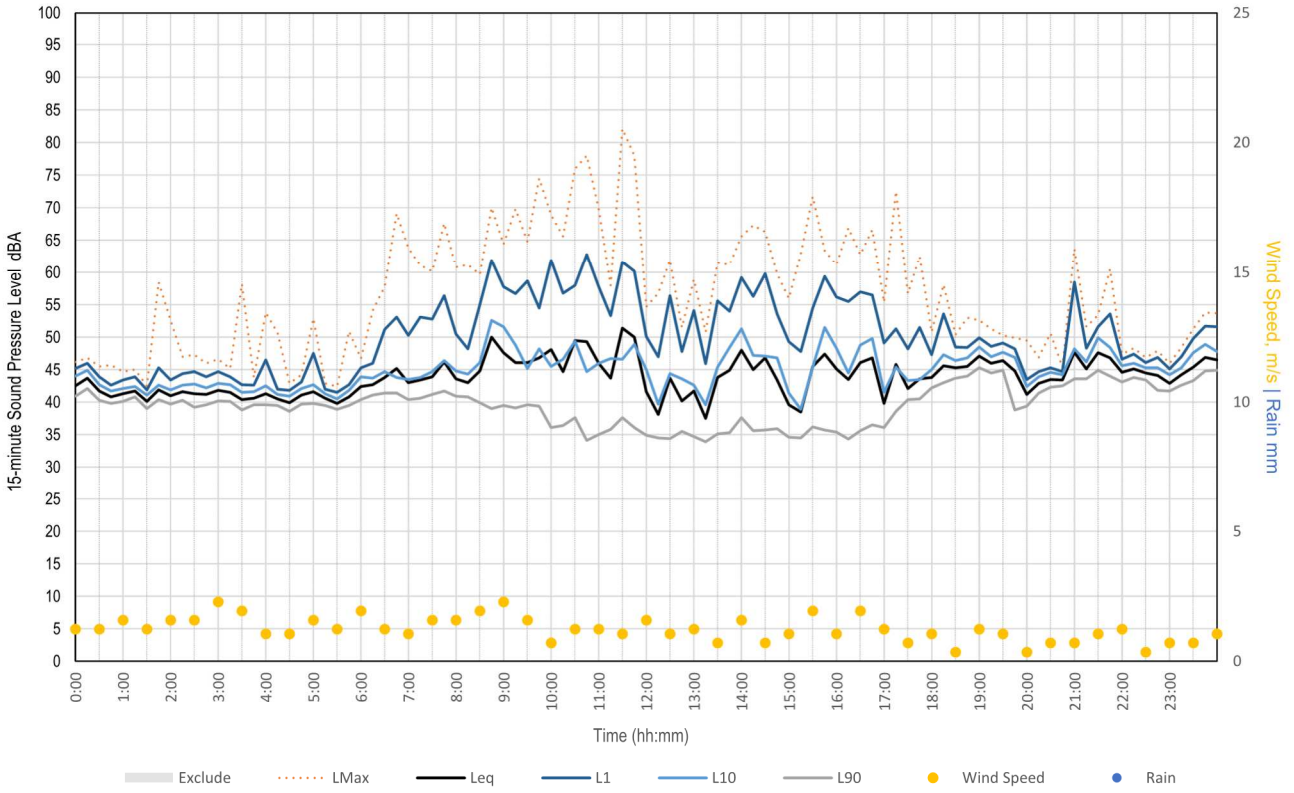
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Saturday, 20 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

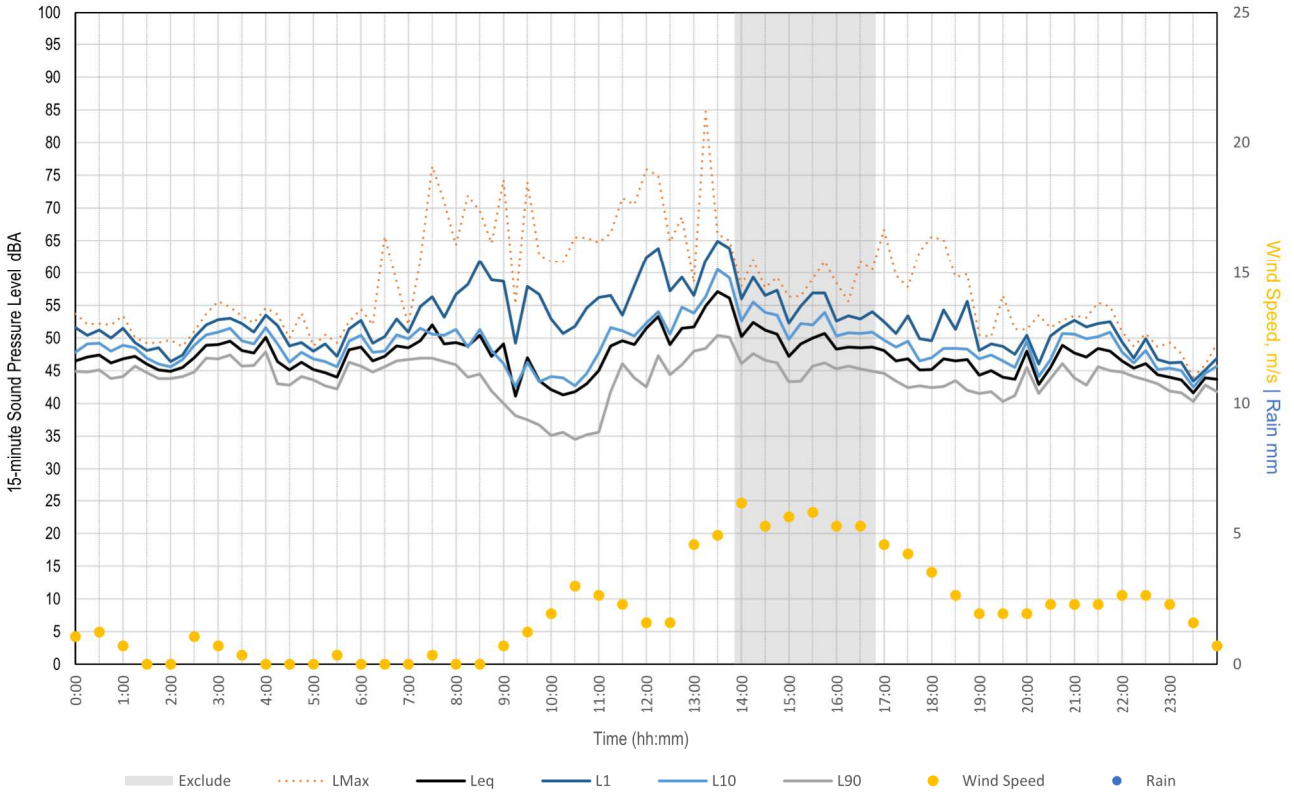
Sunday, 21 August 2022



Noise Logger Results

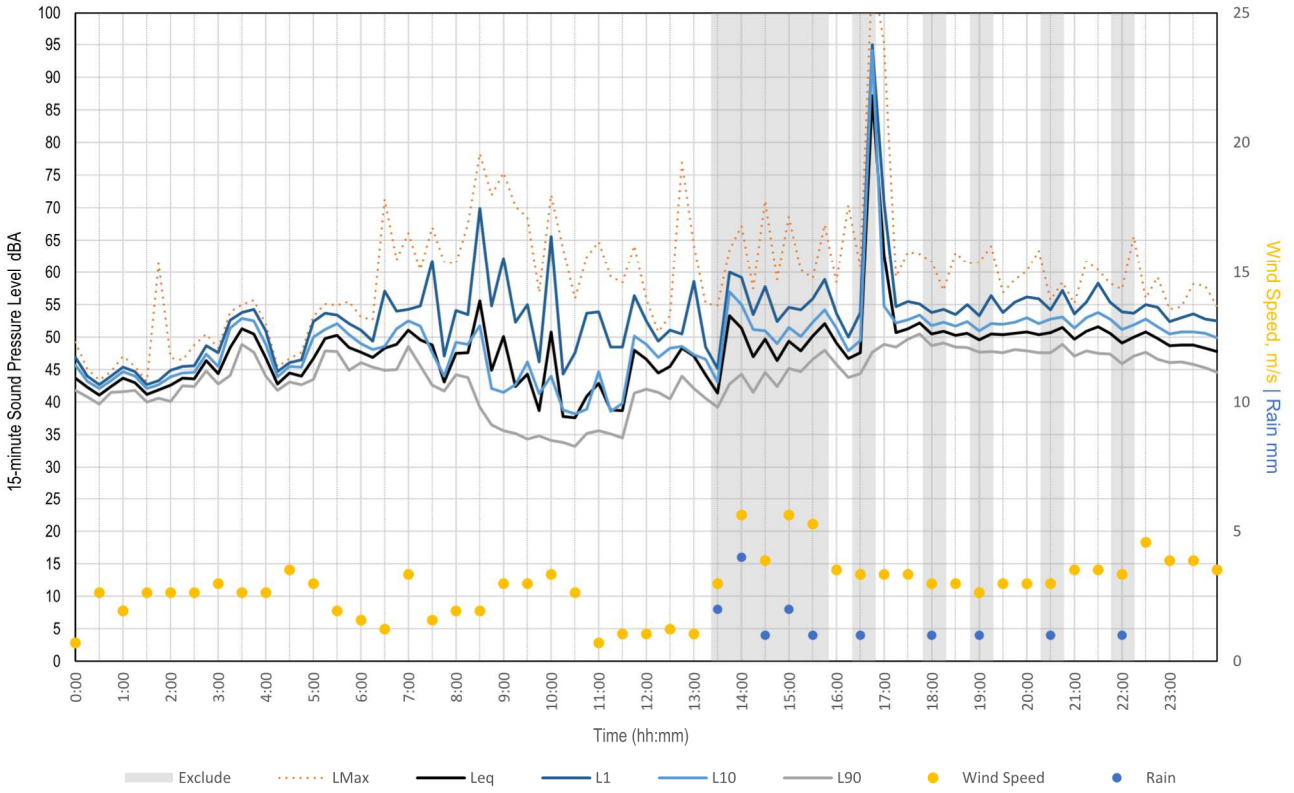
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Monday, 22 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

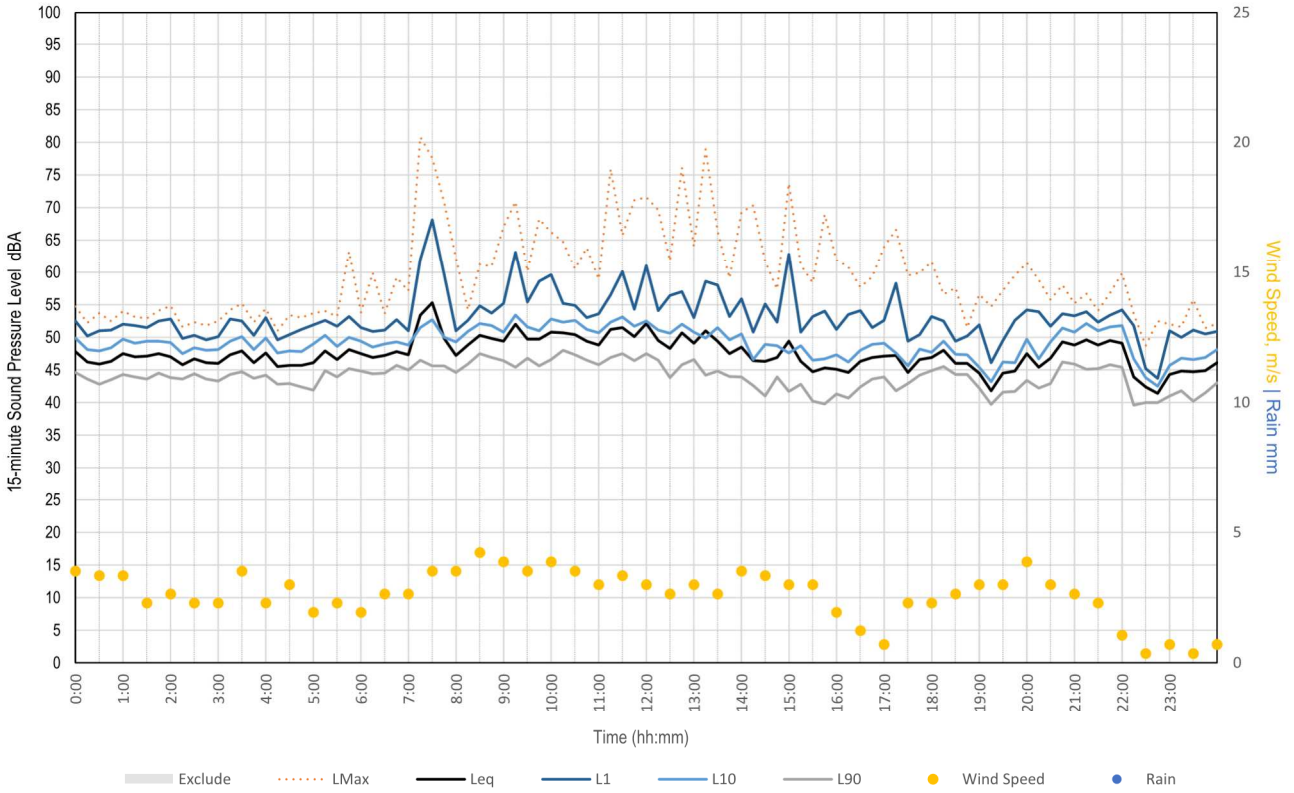
Tuesday, 23 August 2022



Noise Logger Results

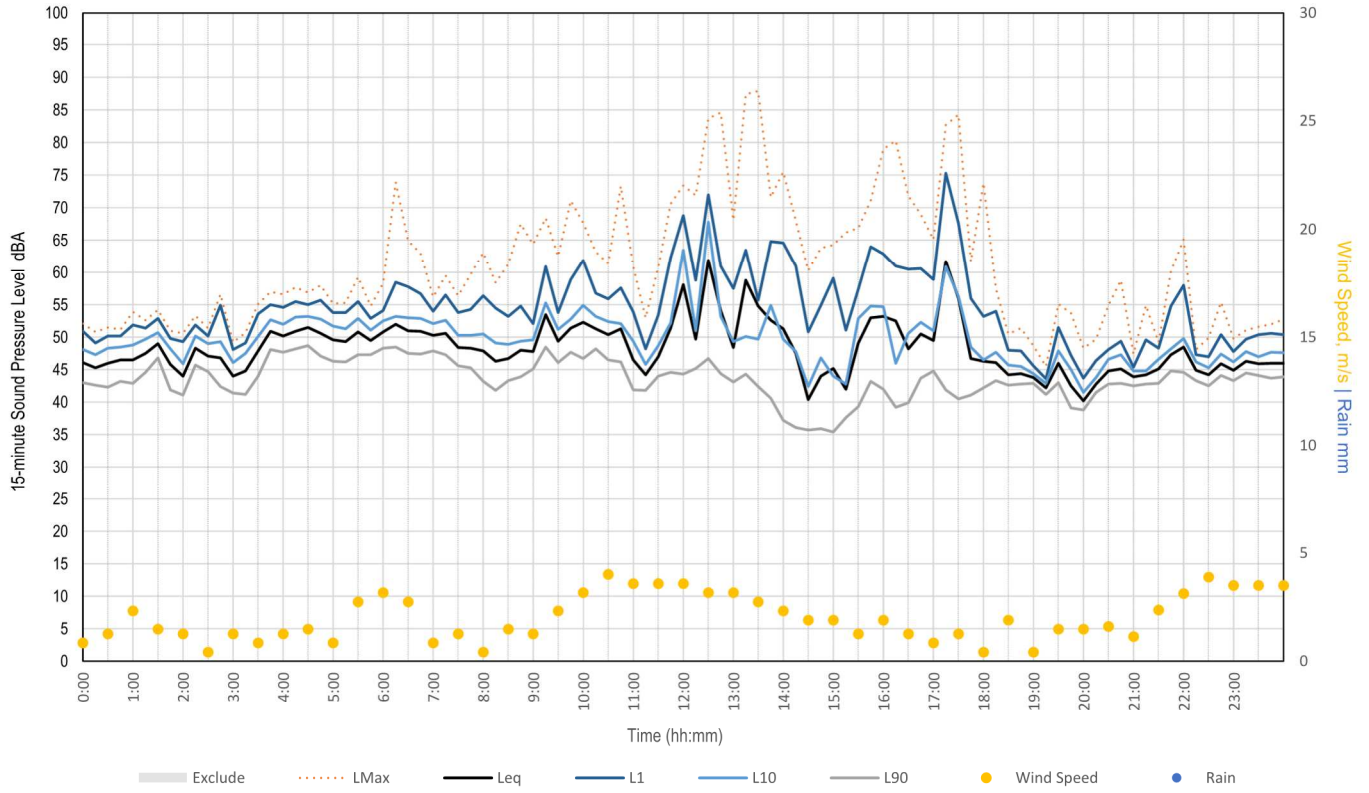
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Wednesday, 24 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

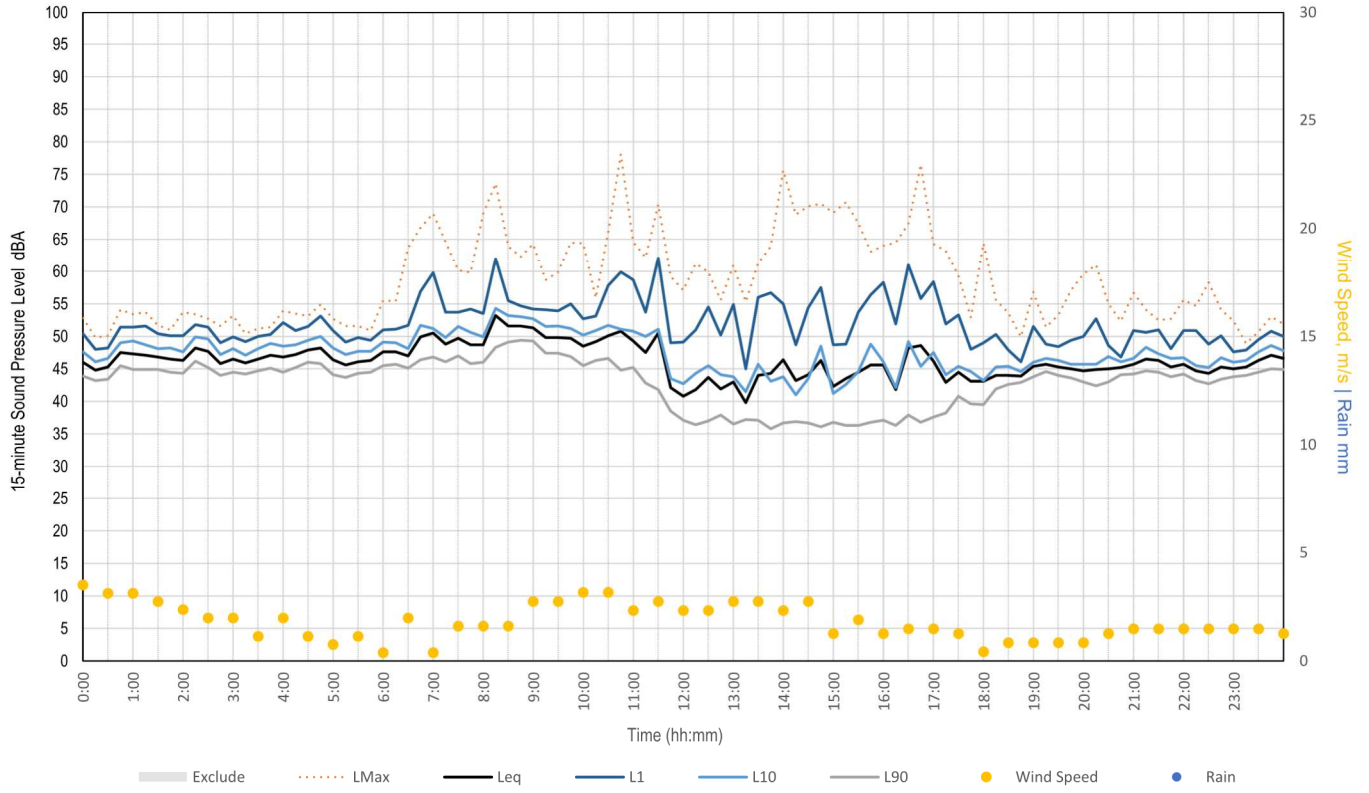
Thursday, 25 August 2022



Noise Logger Results

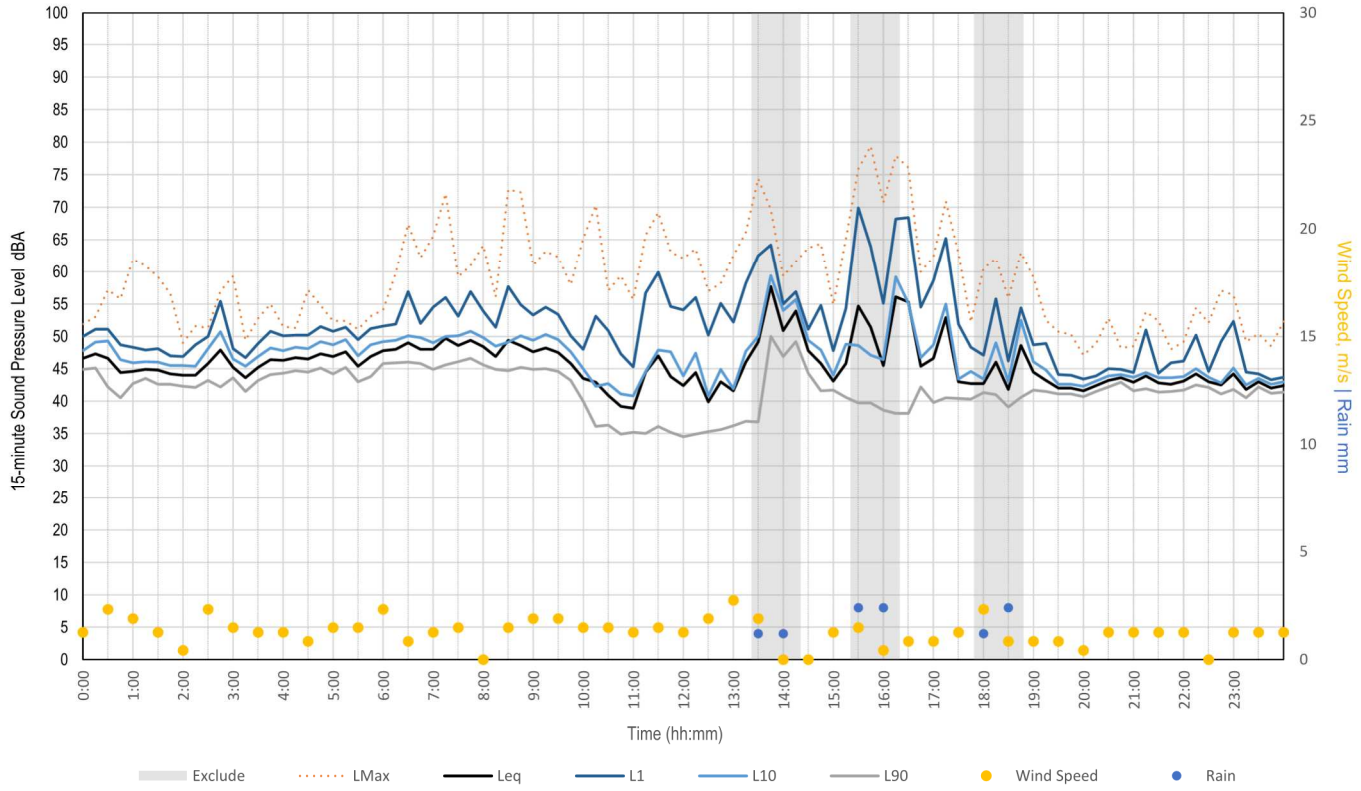
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Friday, 26 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

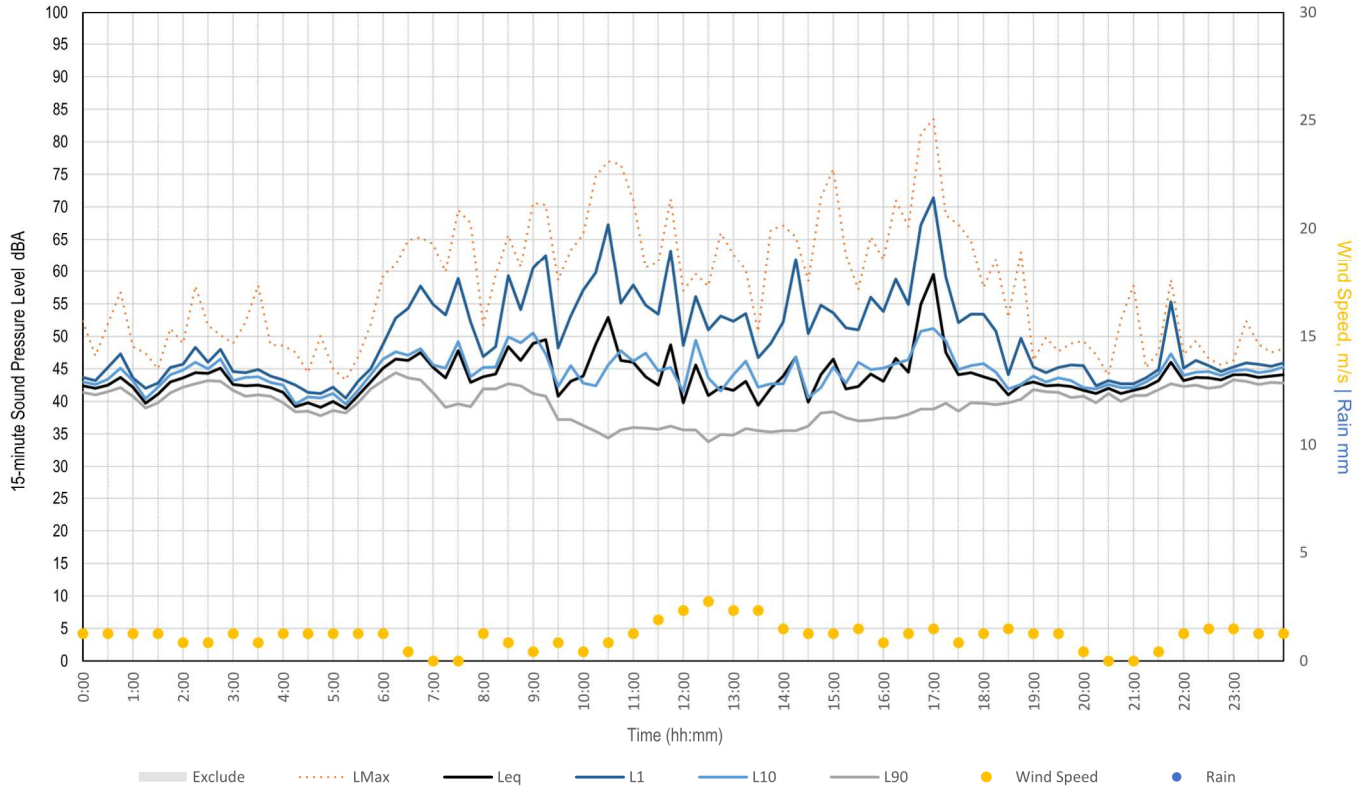
Saturday, 27 August 2022



Noise Logger Results

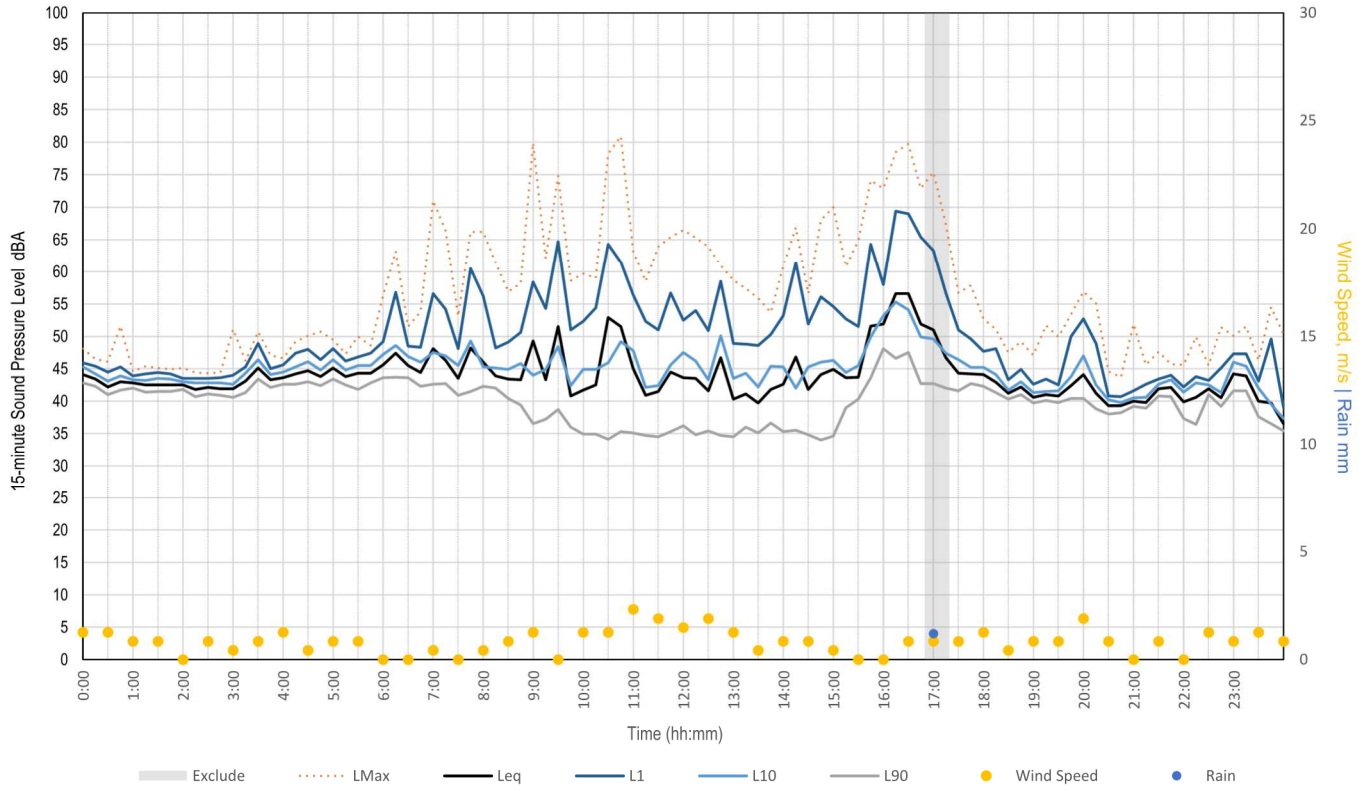
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Sunday, 28 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

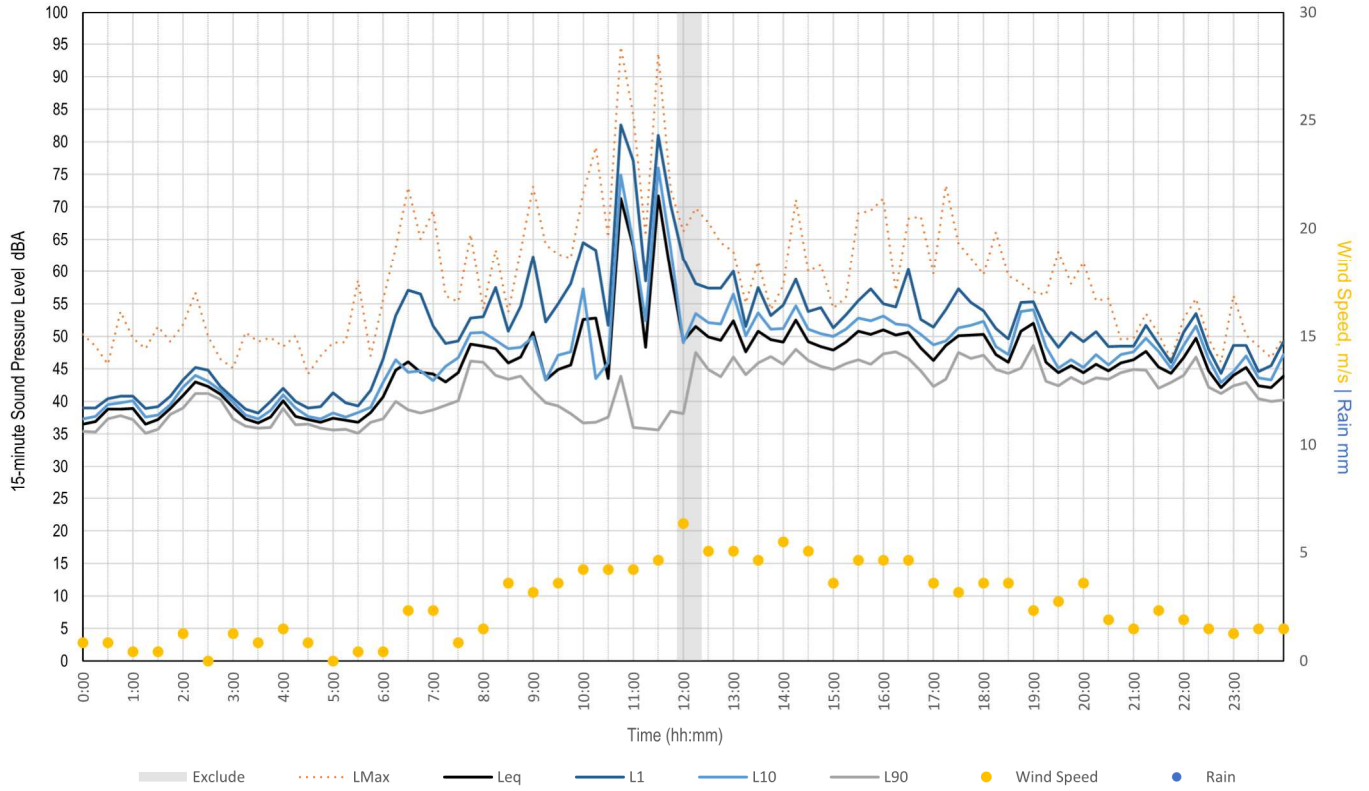
Monday, 29 August 2022



Noise Logger Results

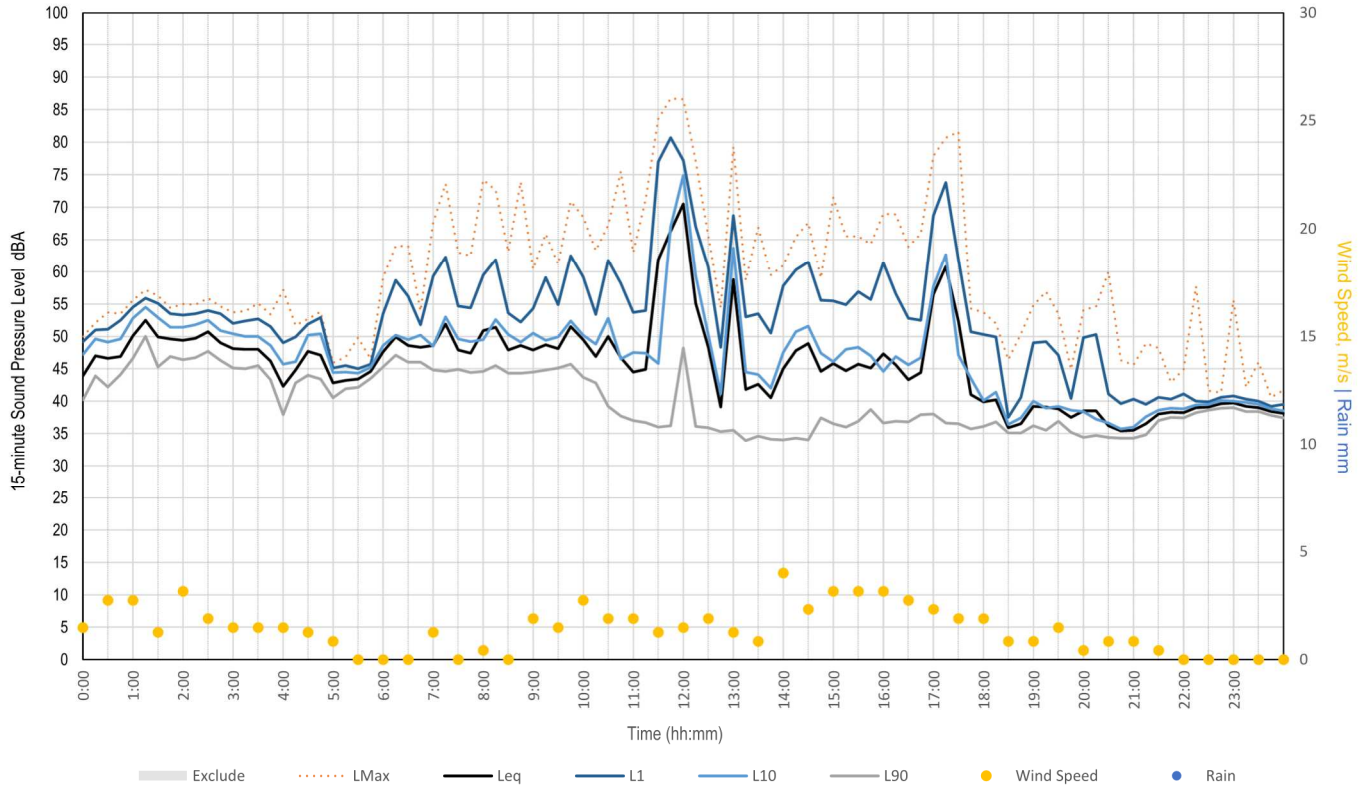
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Tuesday, 30 August 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

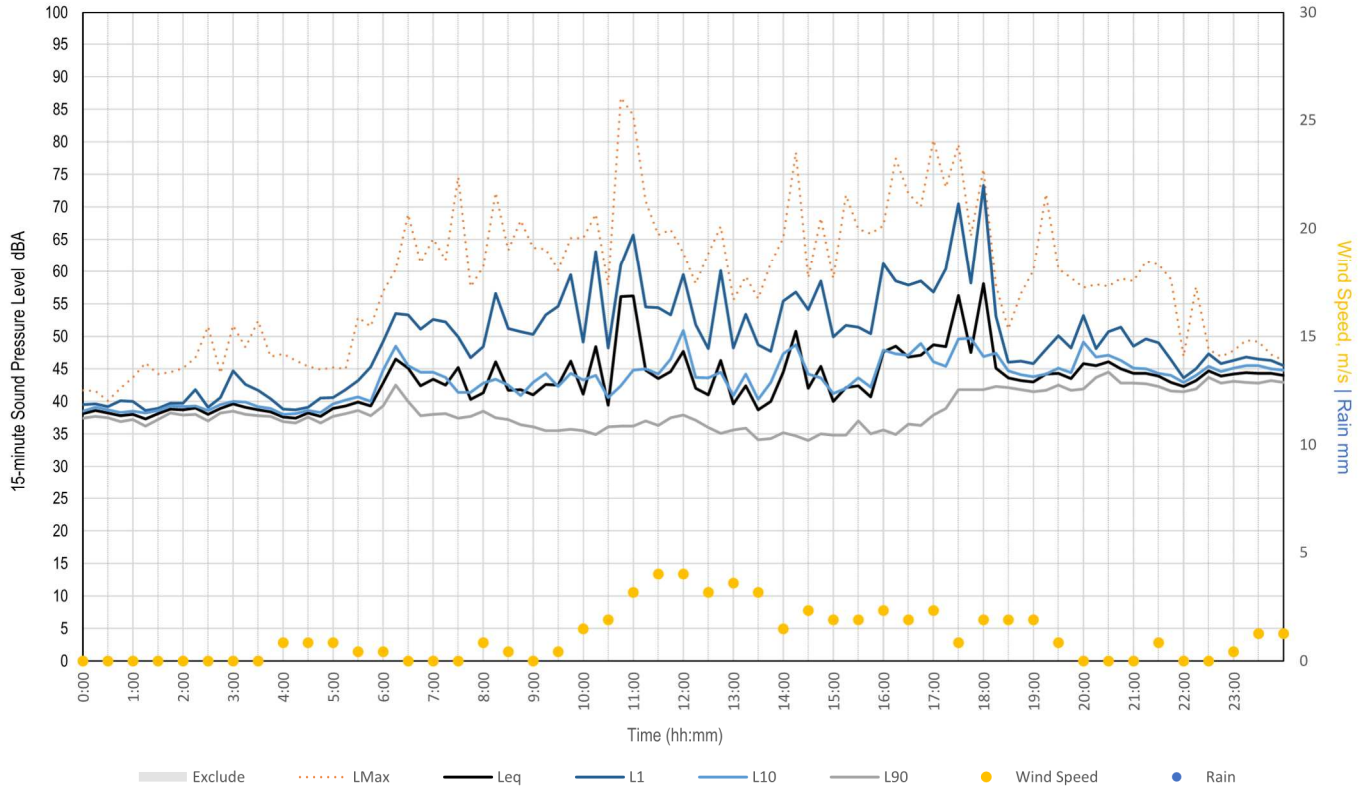
Wednesday, 31 August 2022



Noise Logger Results

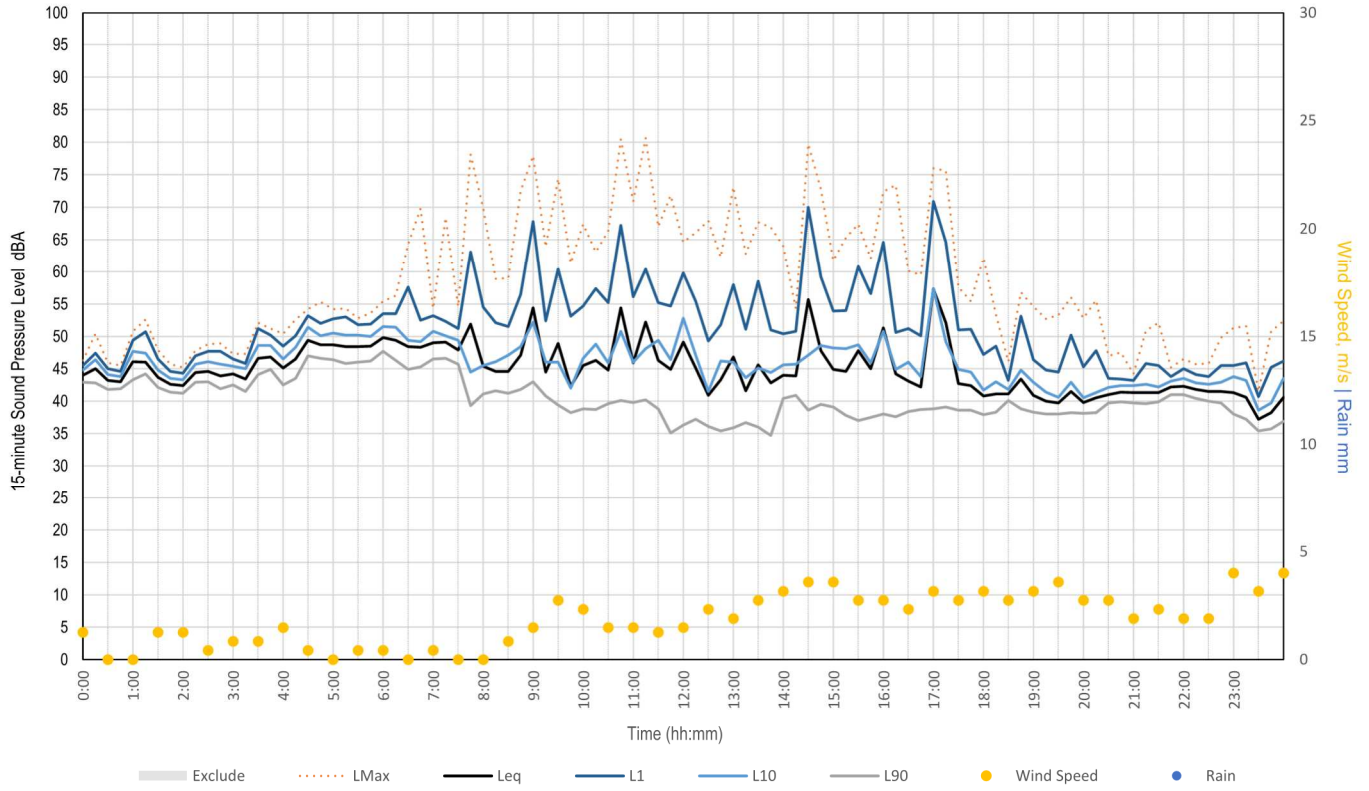
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Thursday, 01 September 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

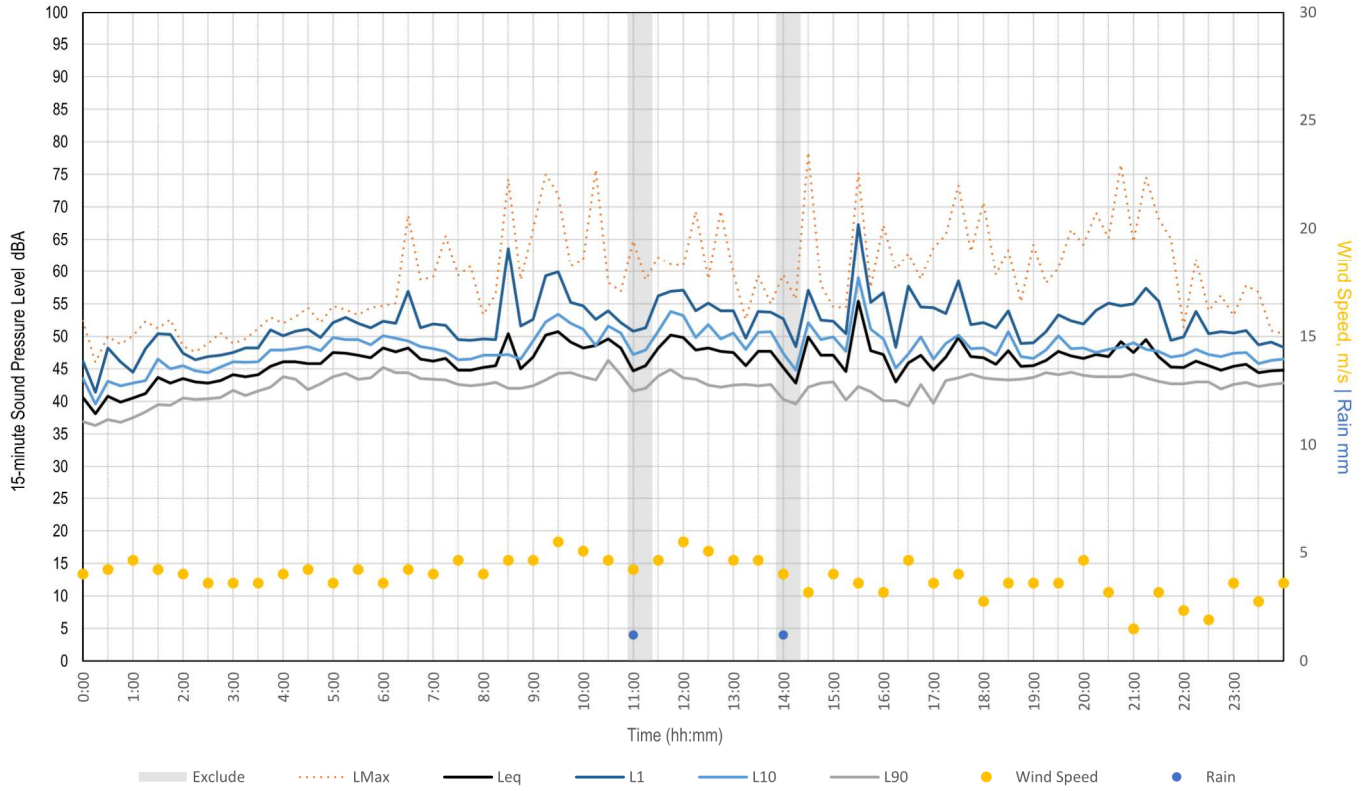
Friday, 02 September 2022



Noise Logger Results

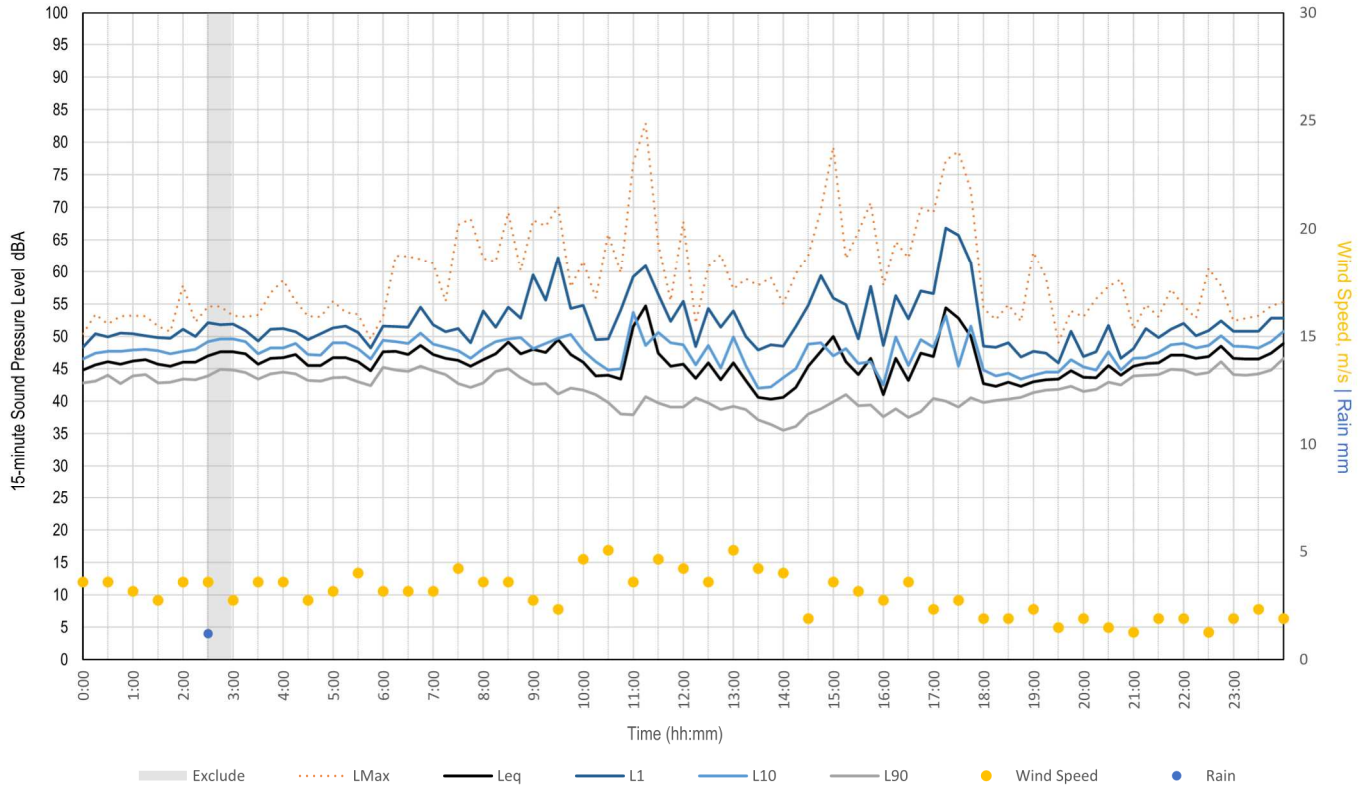
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Saturday, 03 September 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

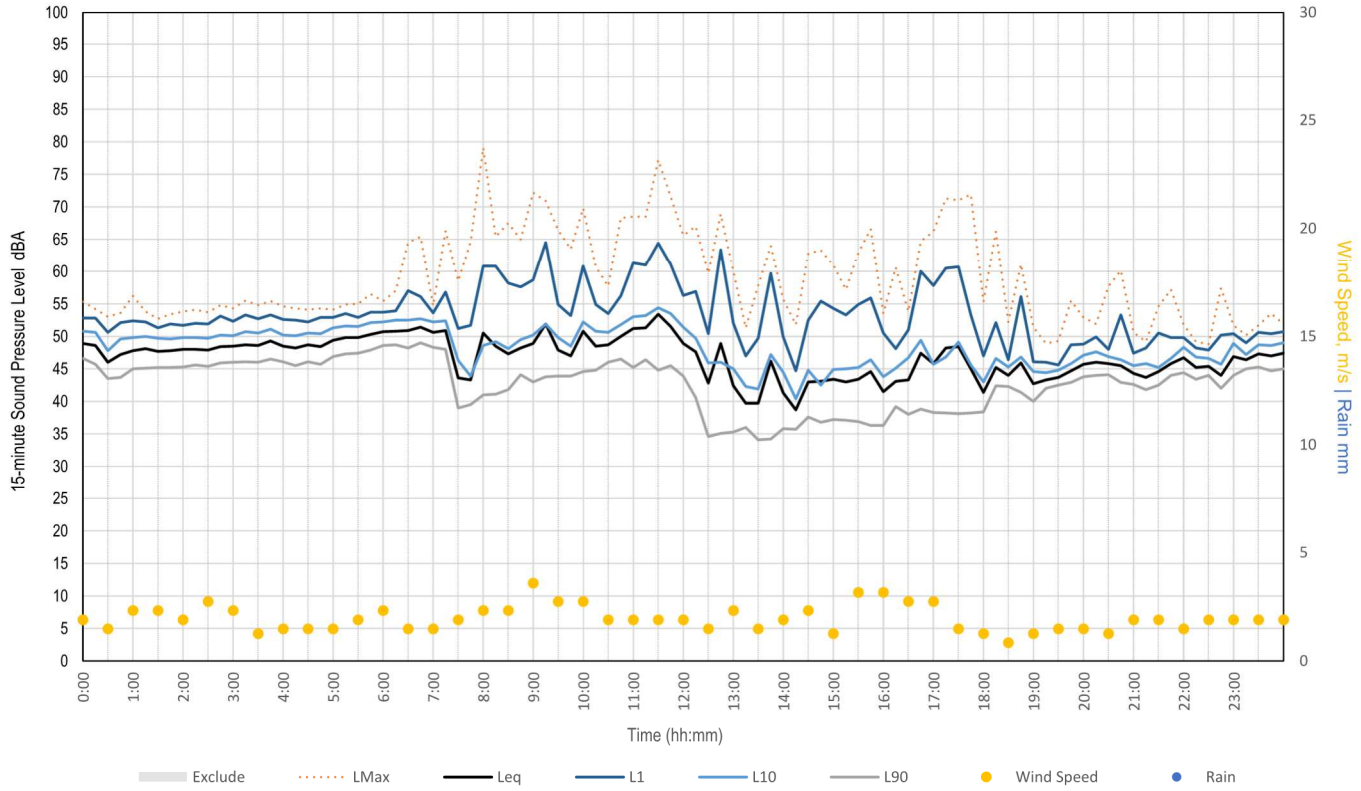
Sunday, 04 September 2022



Noise Logger Results

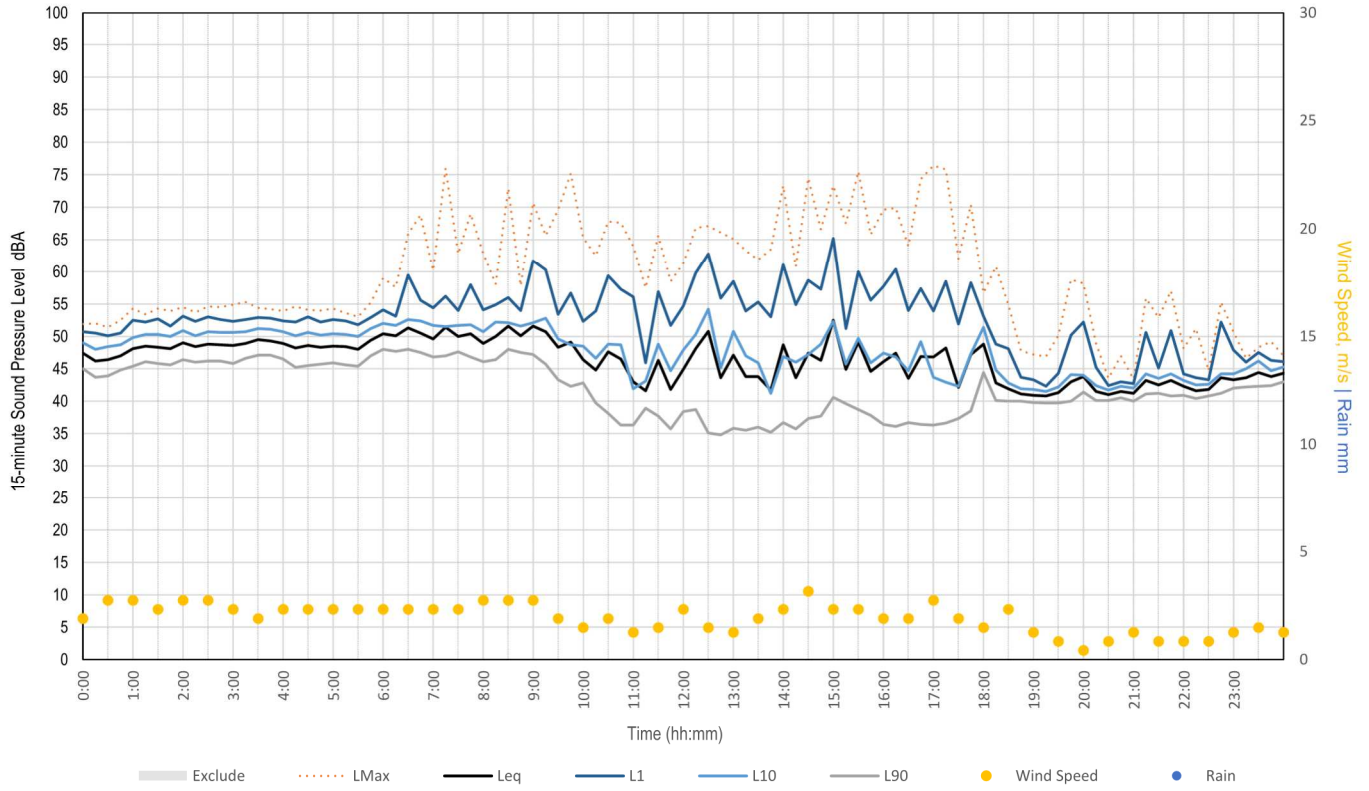
Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Monday, 05 September 2022



Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

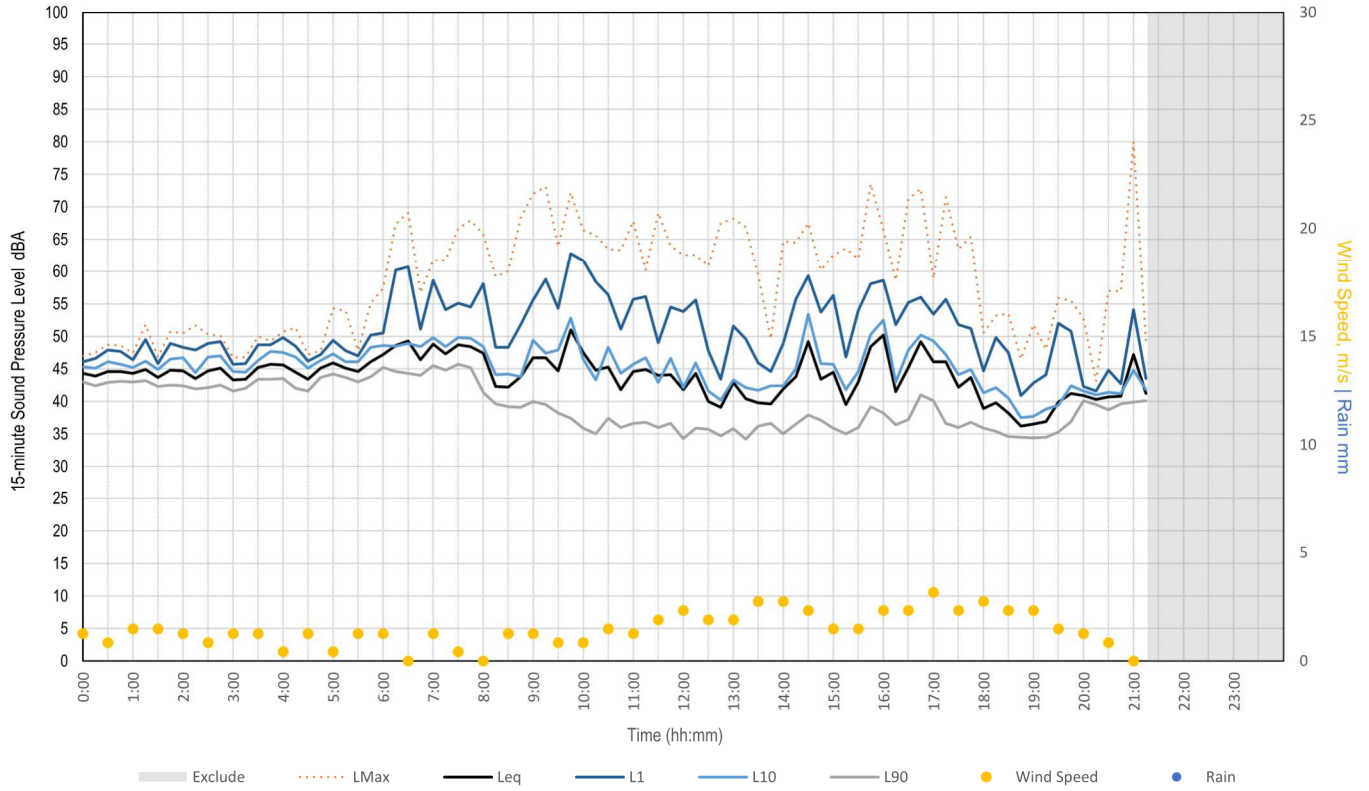
Tuesday, 06 September 2022



Noise Logger Results

Measured Noise Levels - M18 - 33 Thirteenth Street (Warragamba)

Wednesday, 07 September 2022



Background Noise Monitoring

Location	M19 - 930 Greendale Road (Greendale)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment					Attended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878099	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	93.4 dBA	**Calibration**	**Pre:**	93.9 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Friday, 07 Oct 2022
No. of days	18
No. of nights	16

*Monitoring period not continuous

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	13/09/2022	2:36:48 PM	2:51:51 PM	79	53	55	37	
2	Day	13/09/2022	2:19:58 PM	2:34:58 PM	68	50	54	37	
3	Day	28/09/2022	9:38:20 AM	9:53:20 AM	66	44	47	33	
4	Day	28/09/2022	9:53:20 AM	10:08:20 AM	73	49	52	36	
5	Evening	14/10/2022	6:35:32 PM	6:50:32 PM	70	48	50	38	
6	Evening	16/09/2022	6:45:00 PM	7:00:00 PM	56	46	48	43	*
7	Evening	16/09/2022	7:15:00 PM	7:30:00 PM	60	45	47	40	*
8	Evening	16/09/2022	8:00:00 PM	8:15:00 PM	59	44	47	39	*
9	Night	19/09/2022	12:15:00 AM	12:30:00 AM	55	39	42	29	*
10	Night	19/09/2022	2:00:00 AM	2:15:00 AM	48	38	40	34	*
11	Night	19/09/2022	4:30:00 AM	4:45:00 AM	57	38	40	35	*
12	Night	19/09/2022	6:15:00 AM	6:30:00 AM	70	50	51	36	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Occasional traffic on Greendale Road, combination of light vehicles and trucks. Constant bird noise in trees. Various impulsive animal noises from adjacent property (e.g. roosters, dogs, cows). For a period noise environment was dominated by planes flying over distant property (four low flying small agricultural planes). Occasional commercial aircrafts flying overhead with an approx. duration of 1 to 3 min with maximum sound levels in the range of 40 to 58 dBA.
Background noise	Movement in vegetation induced by wind (e.g. trees and grass rustling).
Evening	
Ambient noise	Constant insect and bird noise. Noise induced by both strong and faint winds. Several aircraft flying overhead with an approx. duration of 30 sec to 2 min and with maximum sound levels in the range of 53 to 59 dBA.
Background noise	Traffic from a distance. Movement in vegetation due to wind (e.g. grass and trees rustling).
Night	
Ambient noise	Constant noise from birds and insects. Intermittent animal noise (e.g. sheep, dogs, and roosters). Occasional vehicles passing by on Greendale Road.
Background noise	Traffic from a distance. Movement in vegetation due to wind (e.g. grass and trees rustling).

Site Details	M19 - 930 Greendale Road (Greendale)
Start Date	Tue 13 September 2022
End Date	Fri 07 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	49
$L_{eq, Evening}$ dBA	50
$L_{eq, Night}$ dBA	45
RBL, $_{Day}$ dBA	31
RBL, $_{Evening}$ dBA	38
RBL, $_{Night}$ dBA	33

Daily Summary

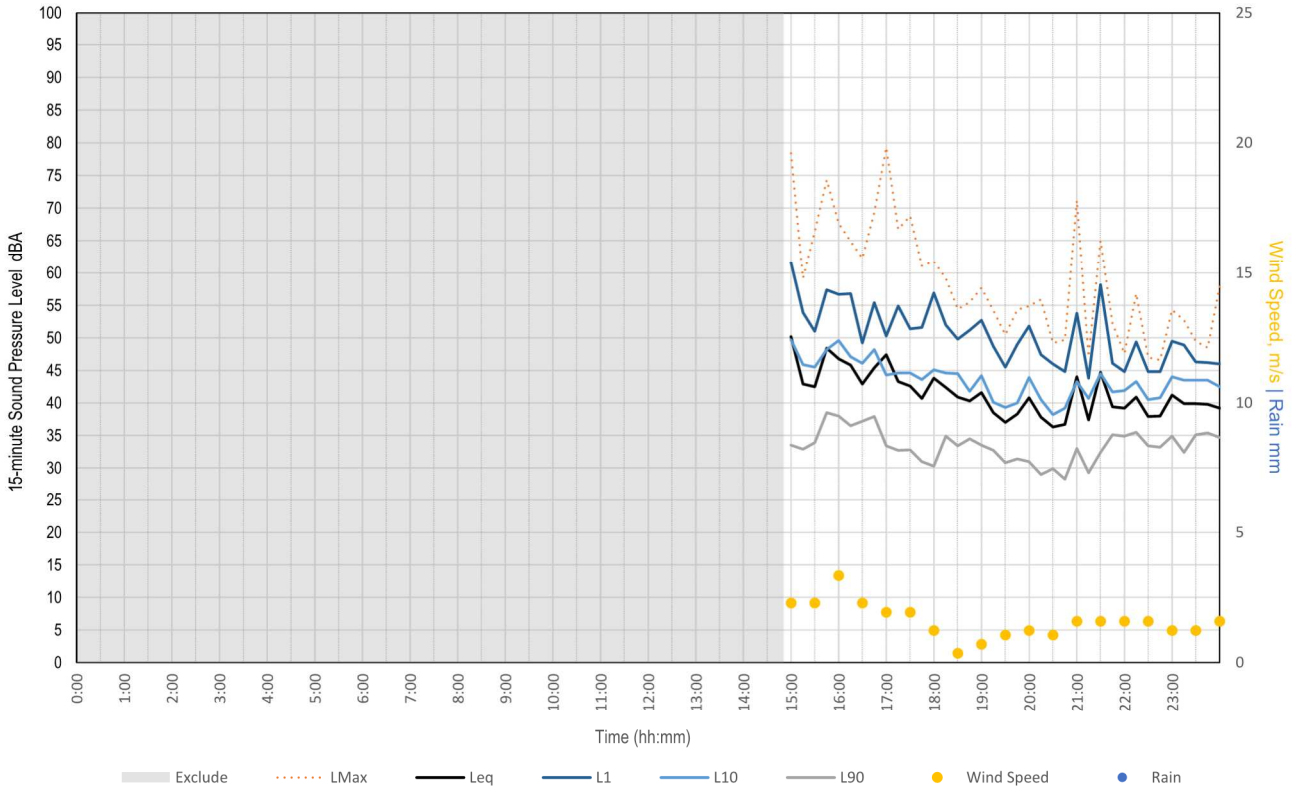
Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA	46	48	46	48	52	52	46	47
$L_{eq, Evening}$ dBA	41	46	42	46	45	47	41	44
$L_{eq, Night}$ dBA	43	44	42	45	46	46	43	43
ABL, $_{Day}$ dBA	33	31	30	32	34	29	30	33
ABL, $_{Evening}$ dBA	29	33	37	38	36	35	33	34
ABL, $_{Night}$ dBA	27	33	31	33	32	34	31	33

Date	21/09	28/09
$L_{eq, Day}$ dBA	47	49
$L_{eq, Evening}$ dBA	45	47
$L_{eq, Night}$ dBA		48
ABL, $_{Day}$ dBA	31	31
ABL, $_{Evening}$ dBA	37	43
ABL, $_{Night}$ dBA		34

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	54	51	46	51	49	48	49	48
$L_{eq, Evening}$ dBA	57	46	46	57	47	53	45	53
$L_{eq, Night}$ dBA	47	45	46	45	45	45	48	46
ABL, $_{Day}$ dBA	34	38	30	31	31	31	35	31
ABL, $_{Evening}$ dBA	39	36	38	42	40	44	40	41
ABL, $_{Night}$ dBA	38	33	33	32	33	35	36	32

Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

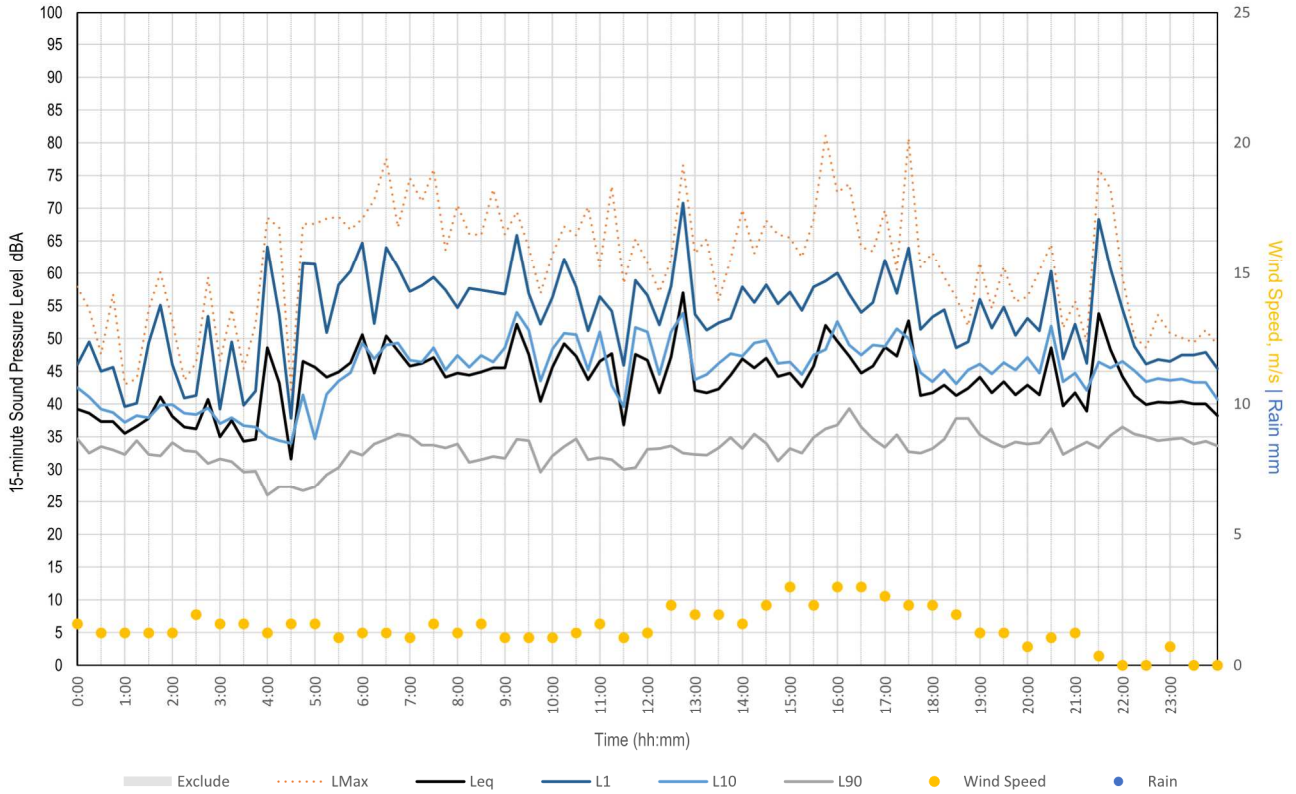
Tuesday, 13 September 2022



Noise Logger Results

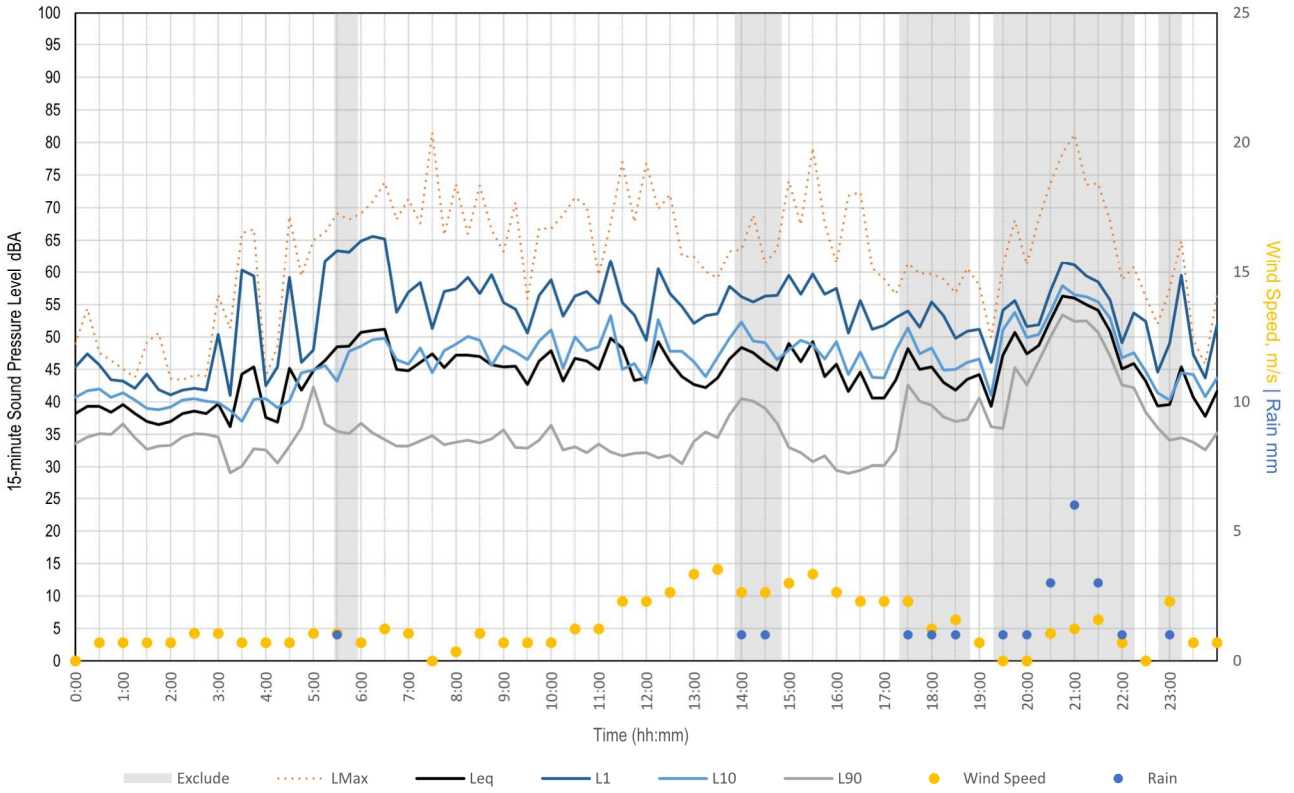
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Wednesday, 14 September 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

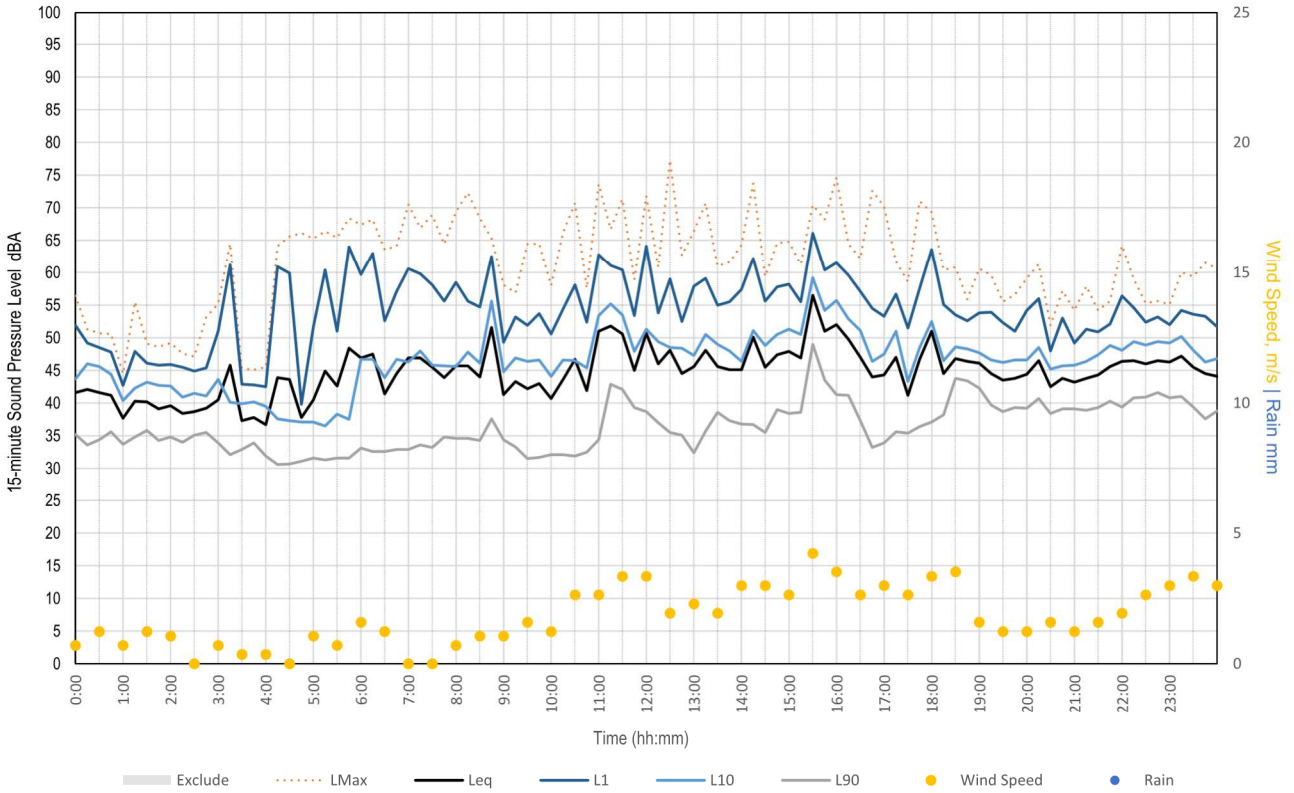
Thursday, 15 September 2022



Noise Logger Results

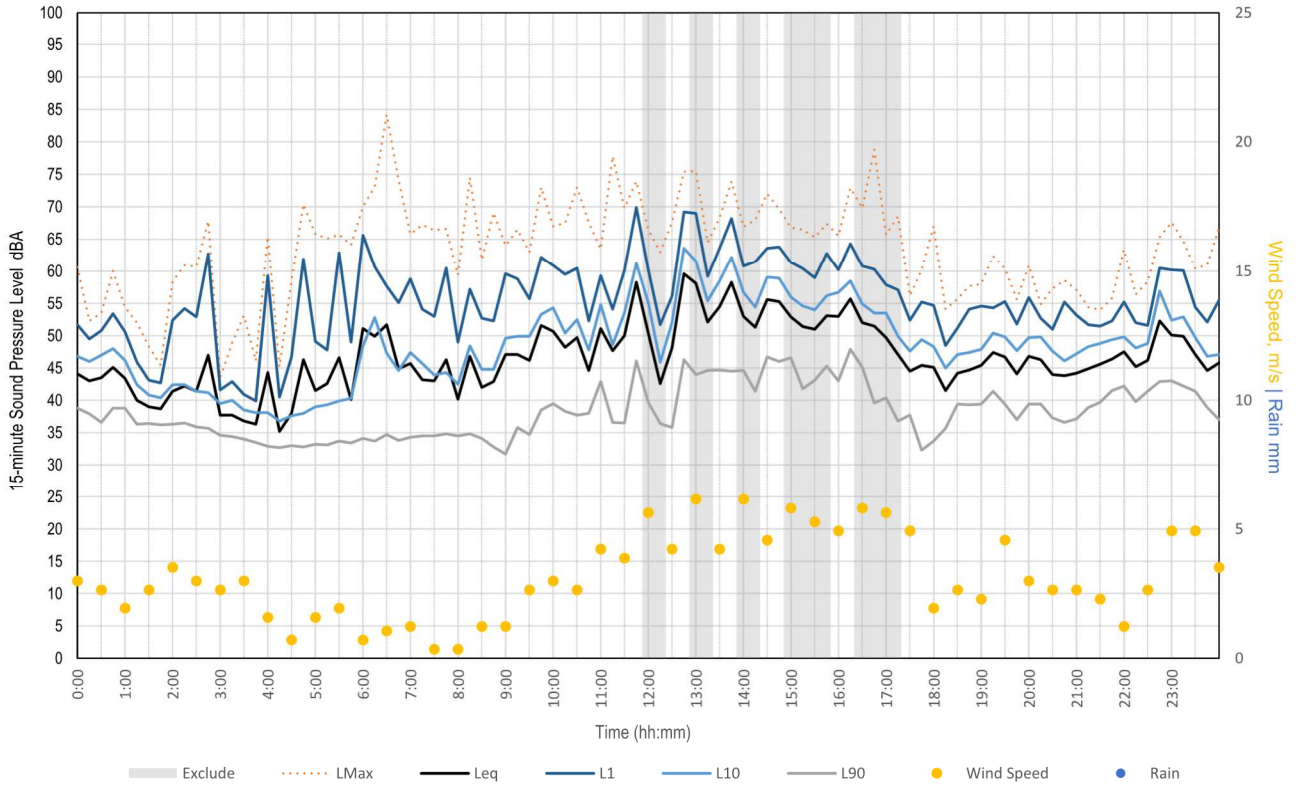
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Friday, 16 September 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

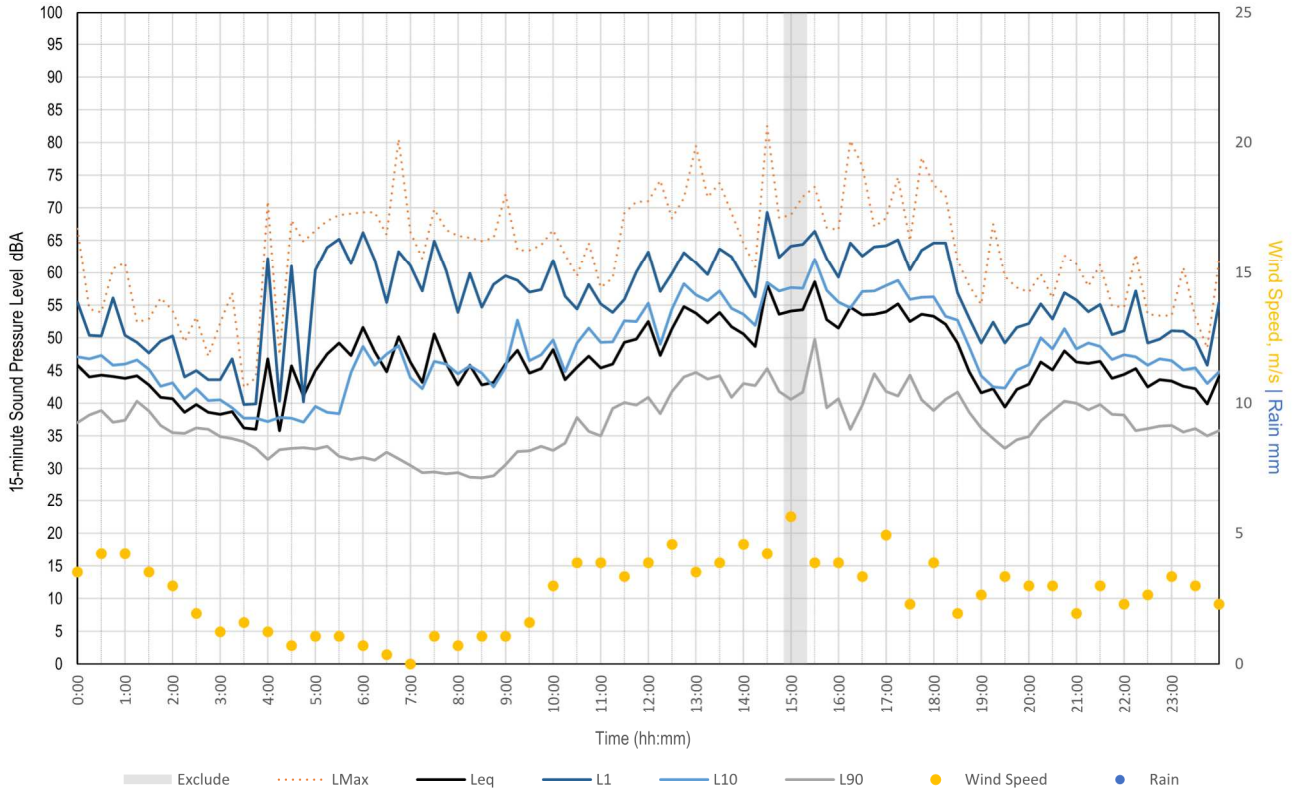
Saturday, 17 September 2022



Noise Logger Results

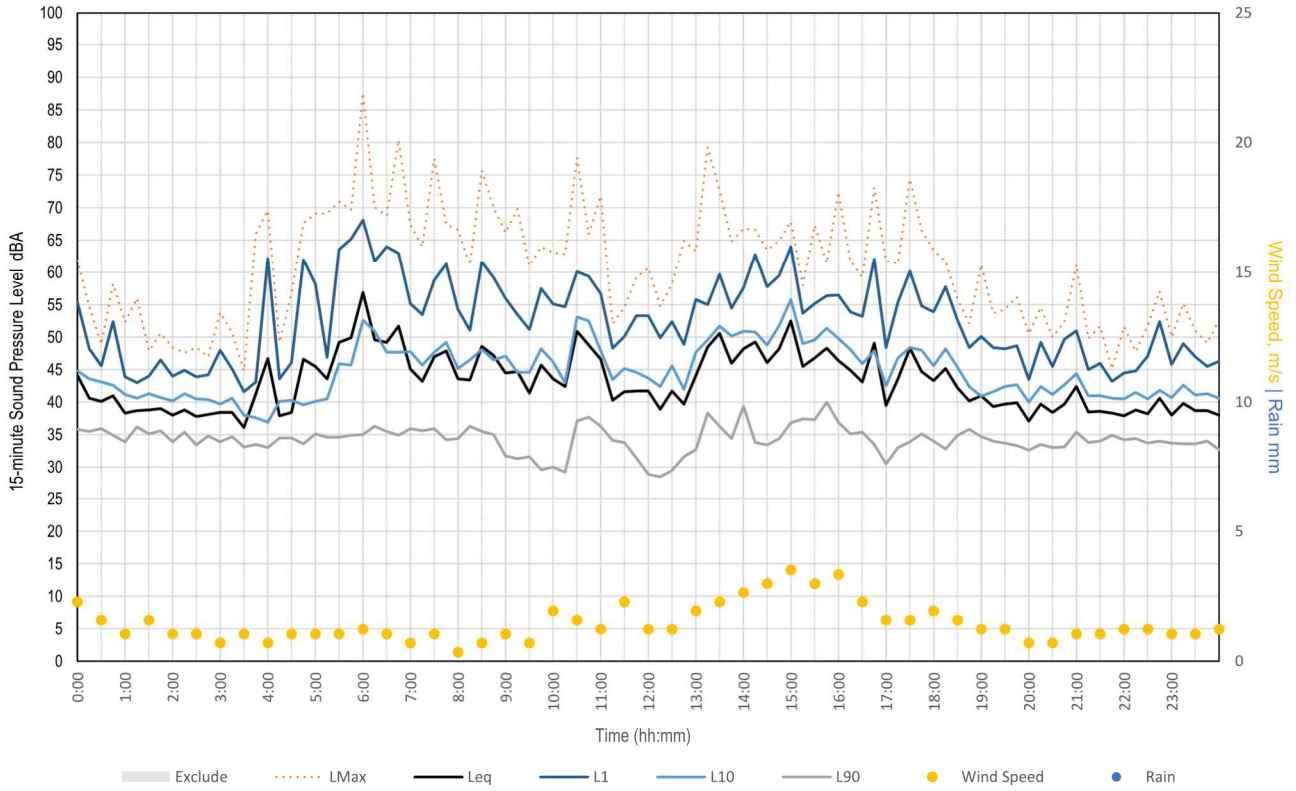
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Sunday, 18 September 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

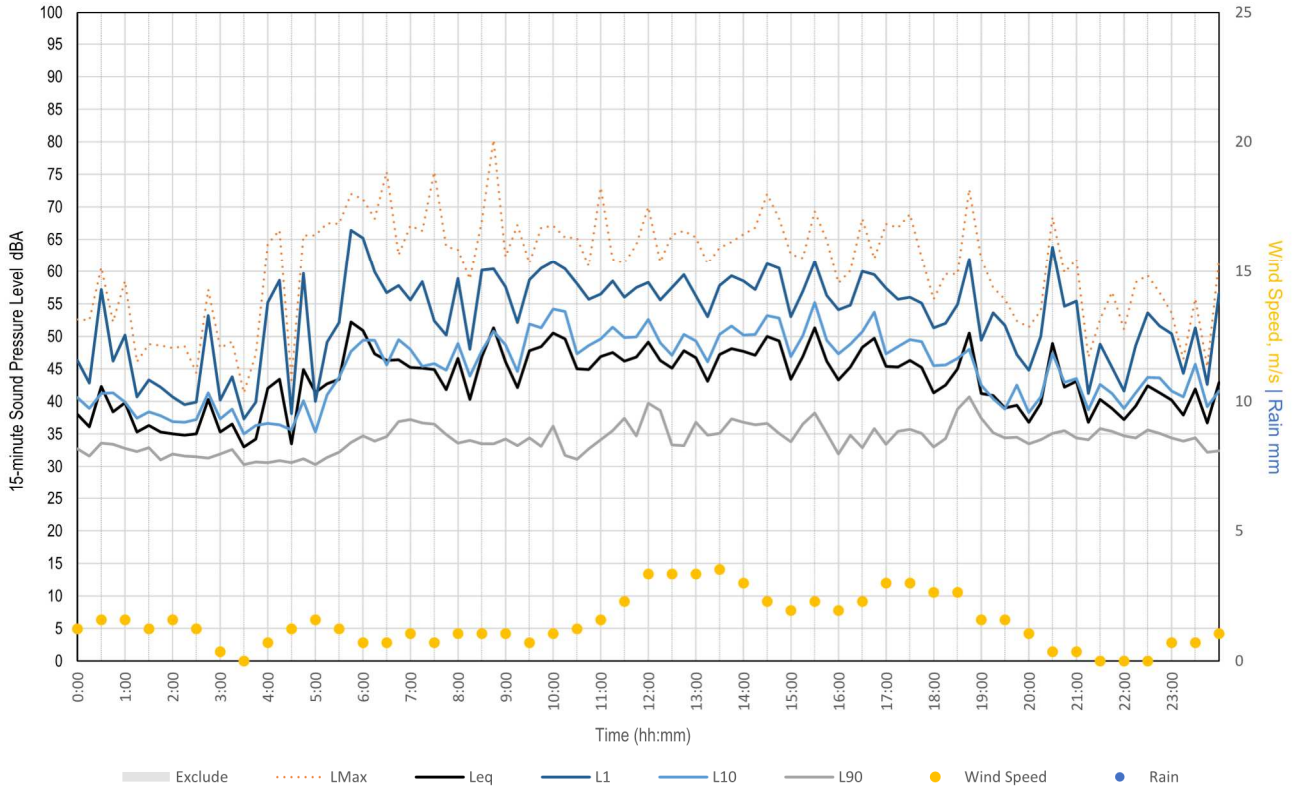
Monday, 19 September 2022



Noise Logger Results

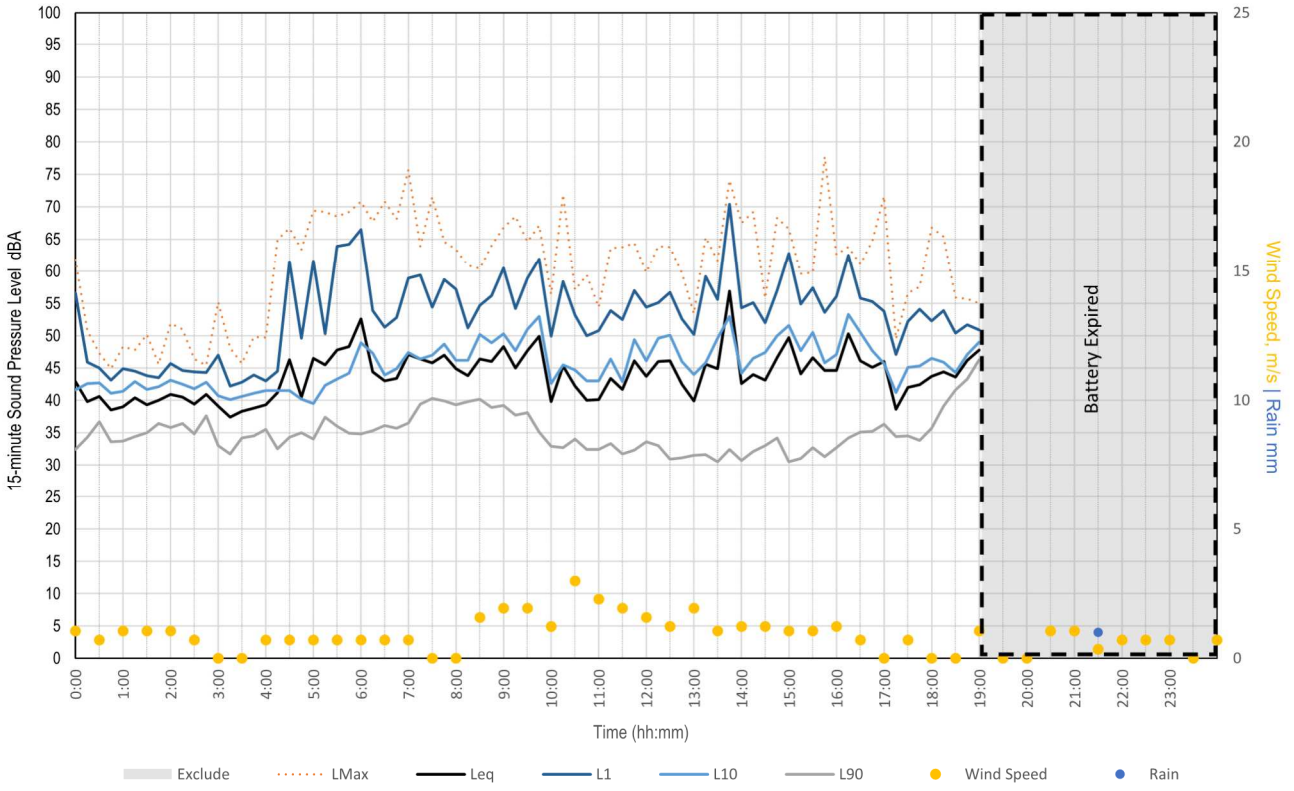
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Tuesday, 20 September 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

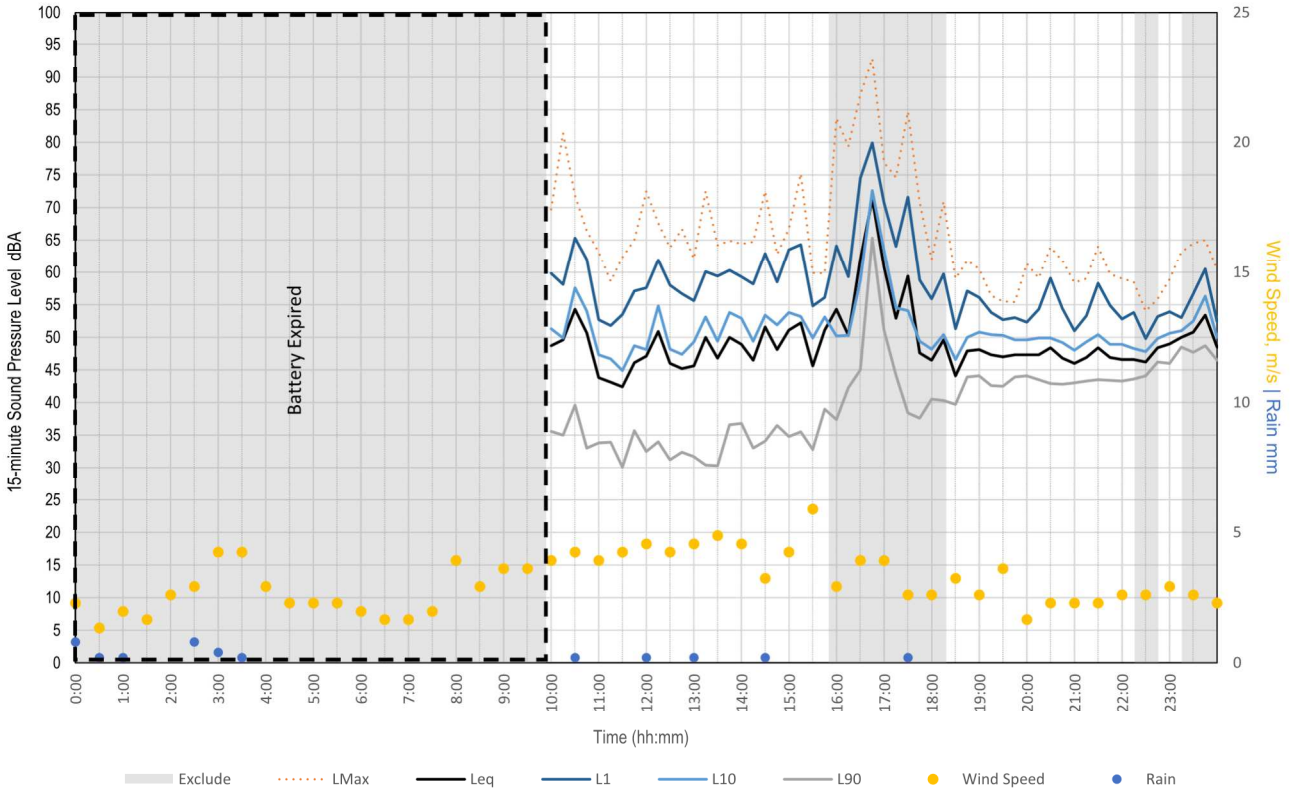
Wednesday, 21 September 2022



Noise Logger Results

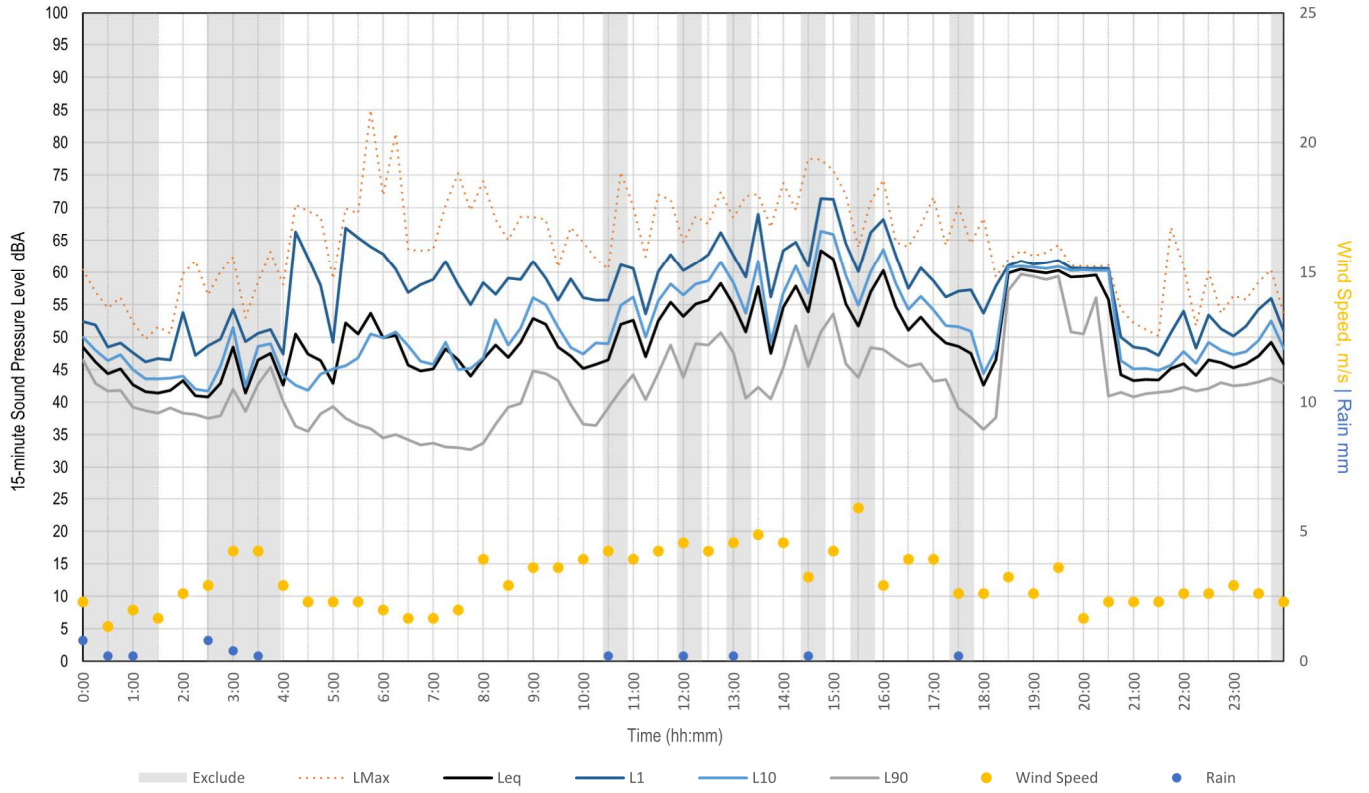
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Wednesday, 28 September 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

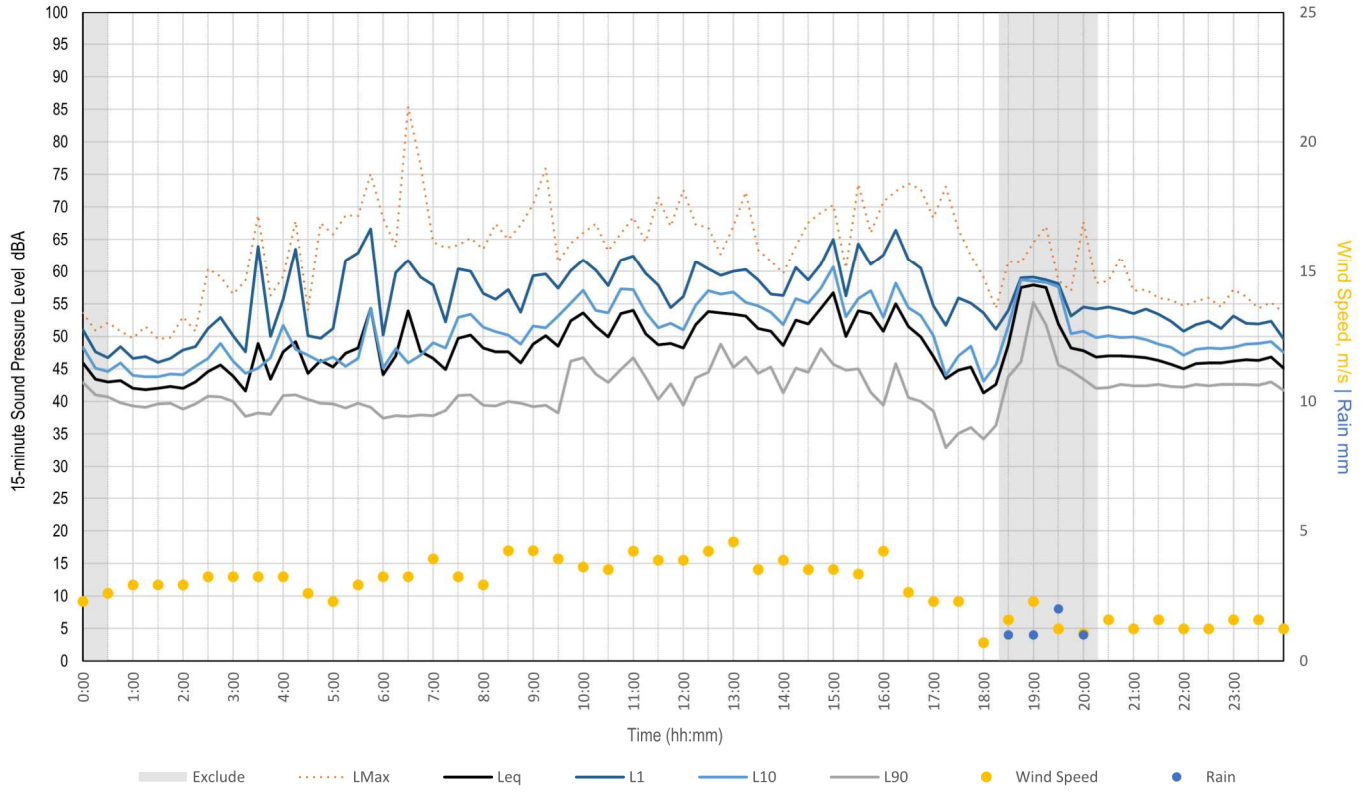
Thursday, 29 September 2022



Noise Logger Results

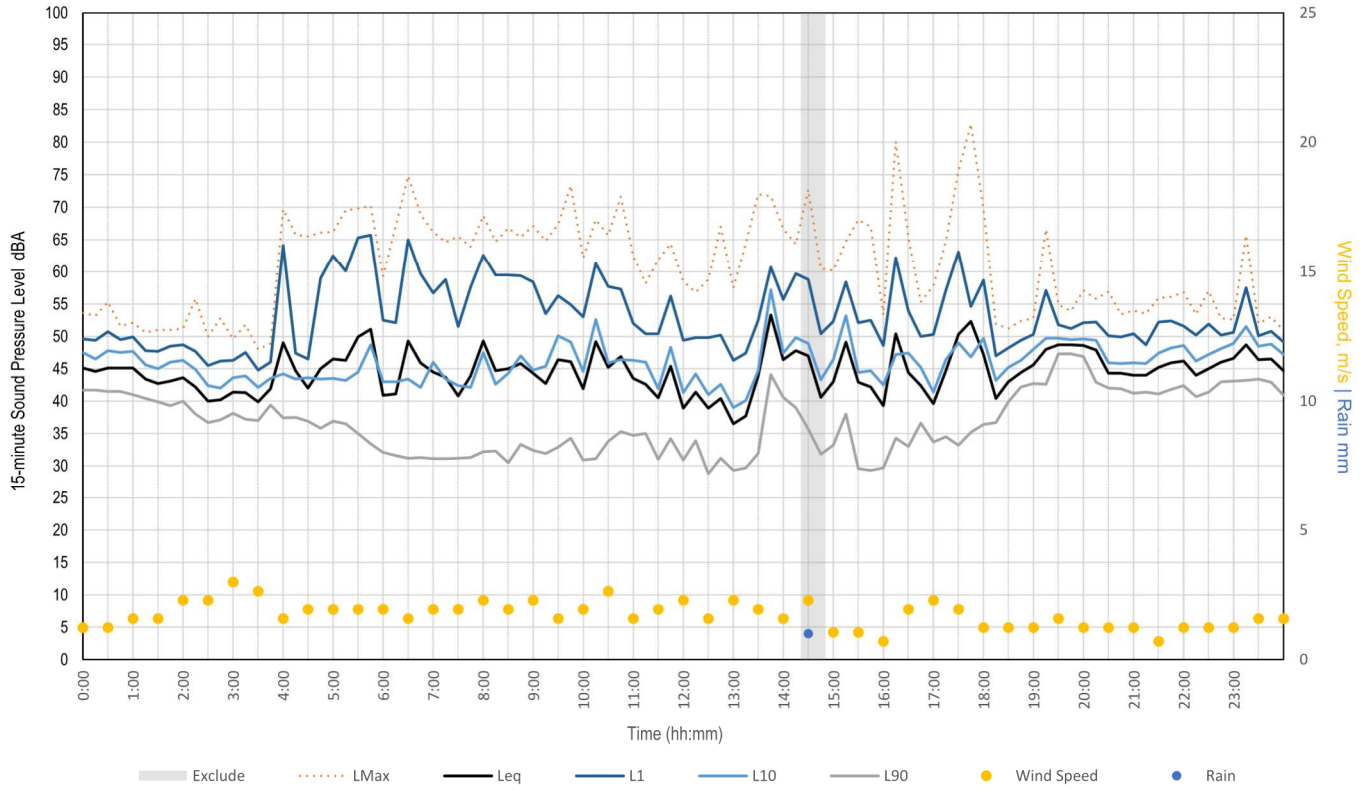
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Friday, 30 September 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

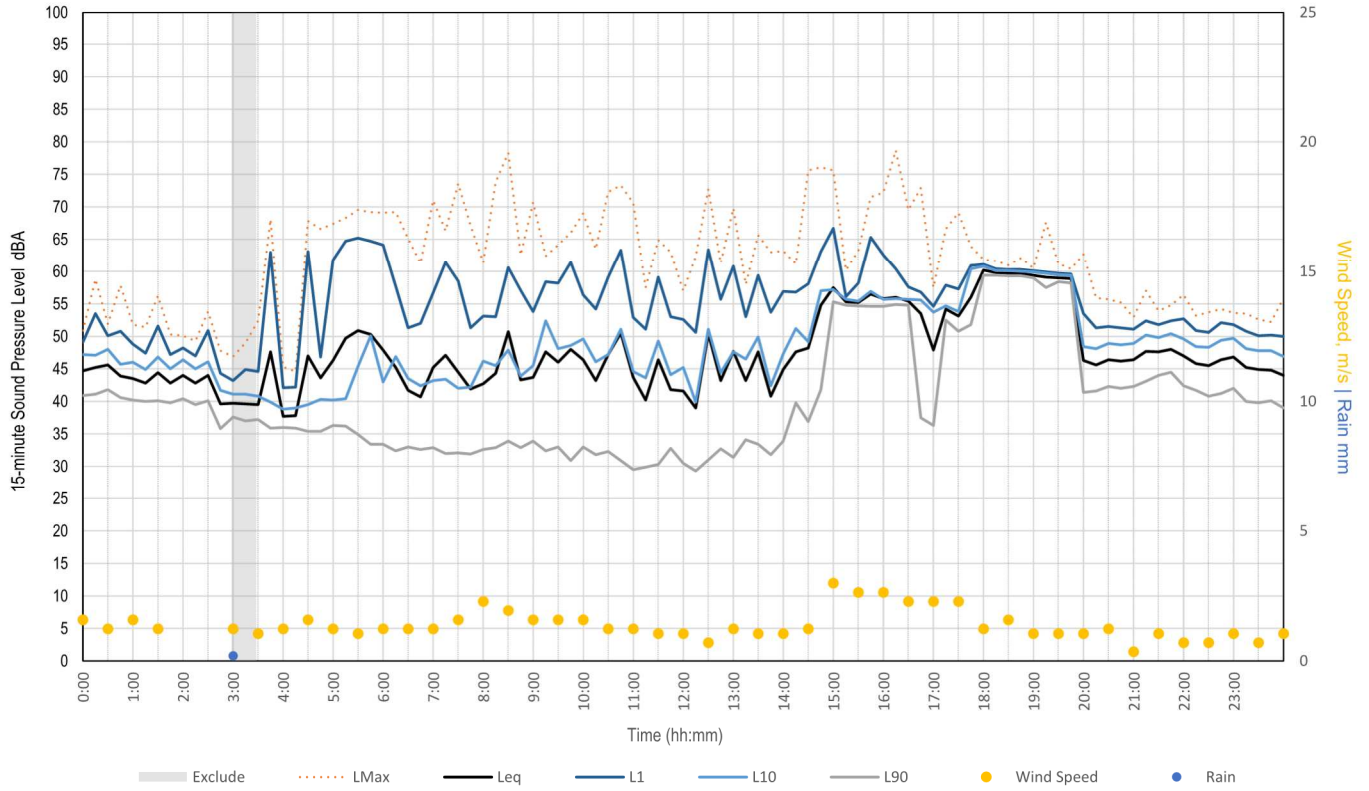
Saturday, 01 October 2022



Noise Logger Results

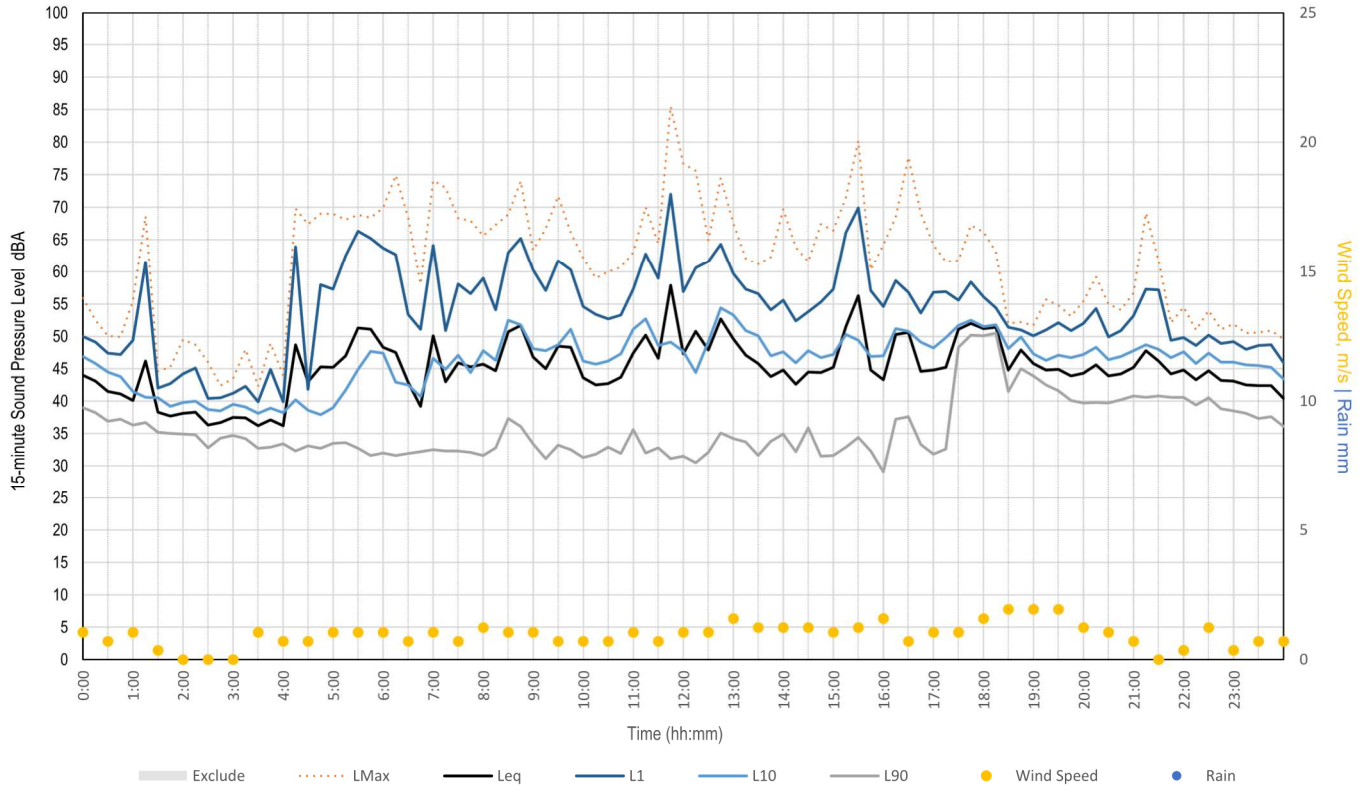
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Sunday, 02 October 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

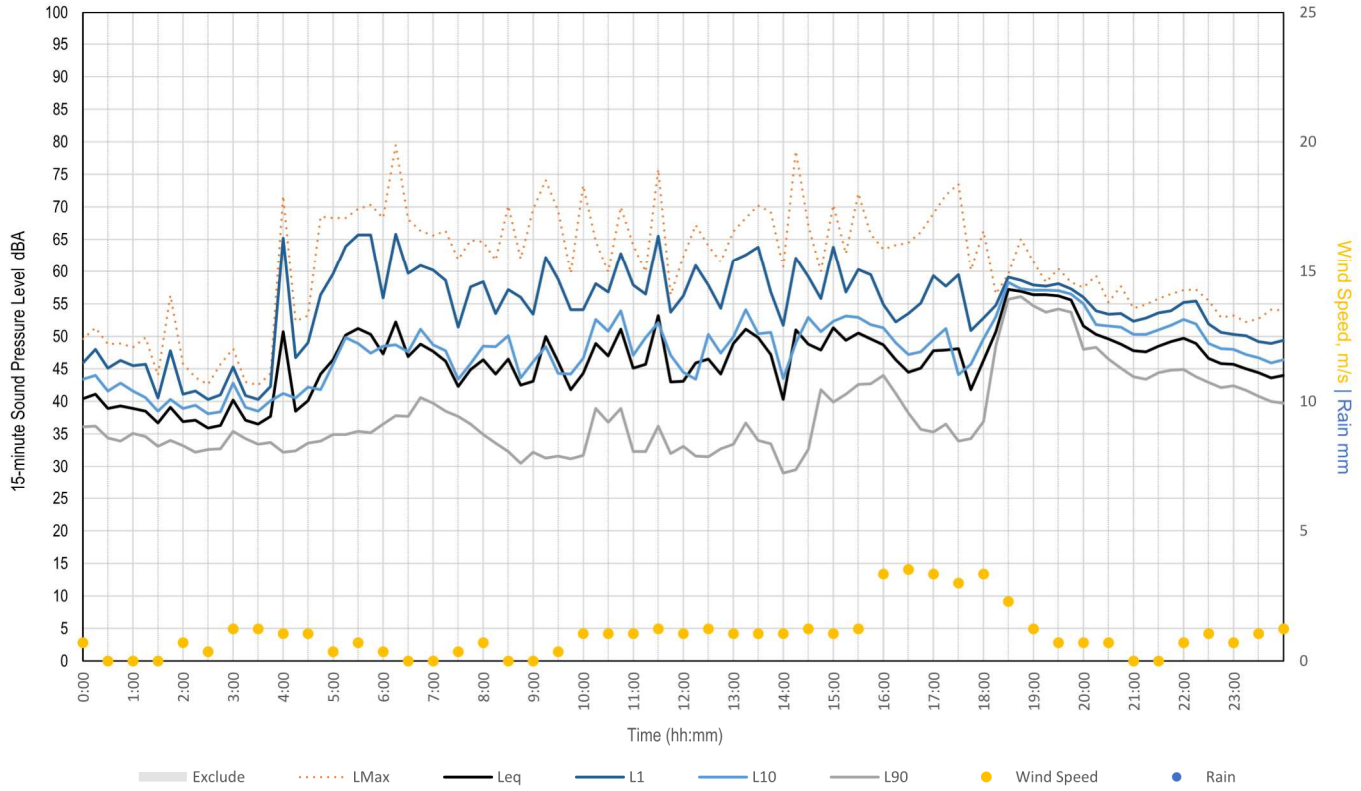
Monday, 03 October 2022



Noise Logger Results

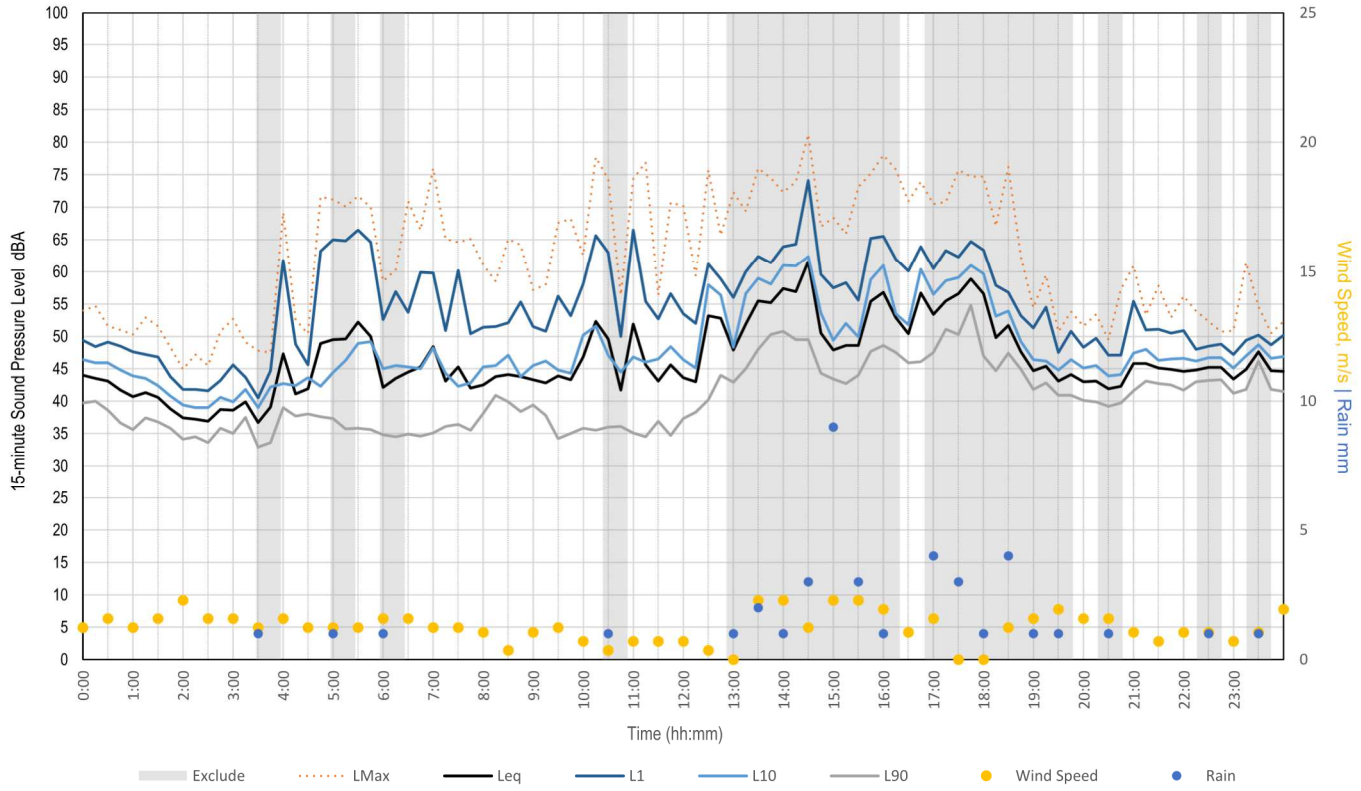
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Tuesday, 04 October 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

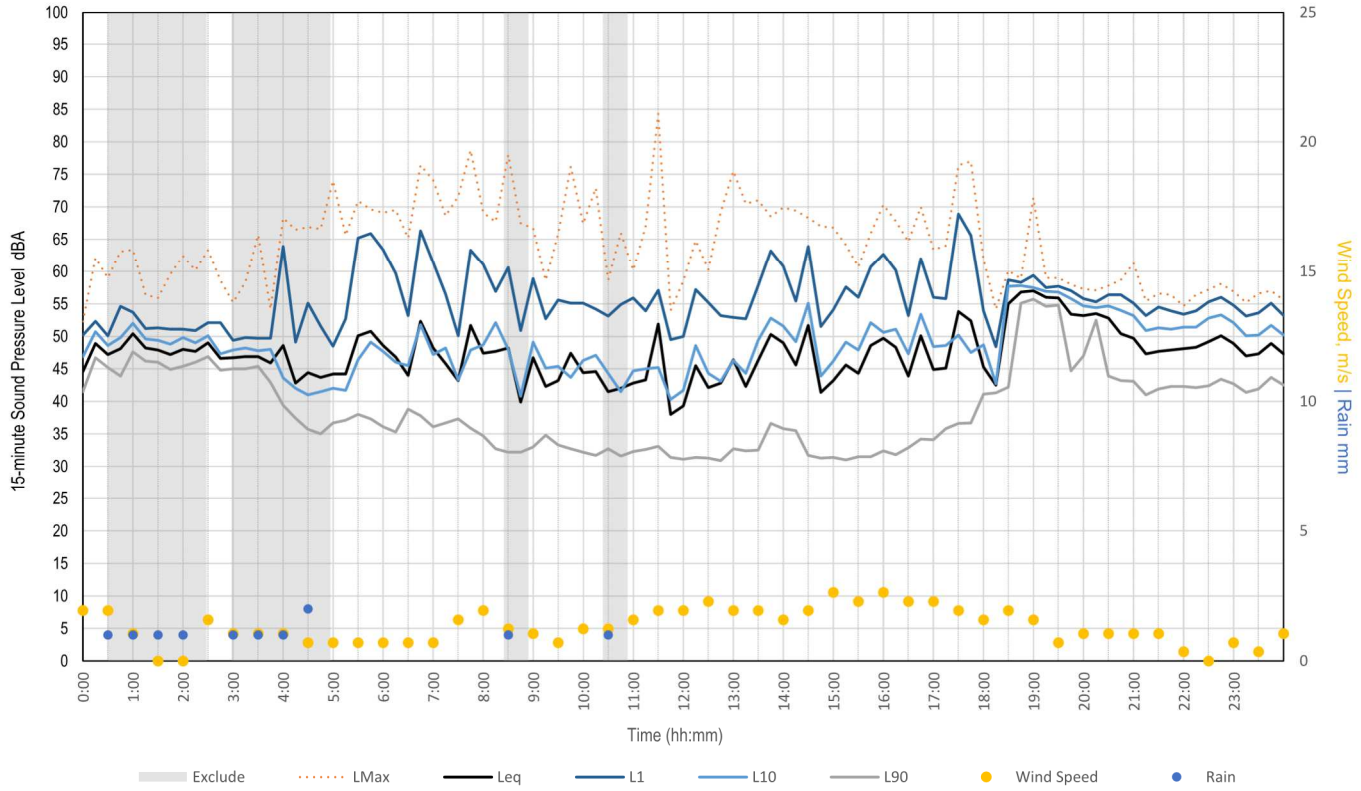
Wednesday, 05 October 2022



Noise Logger Results

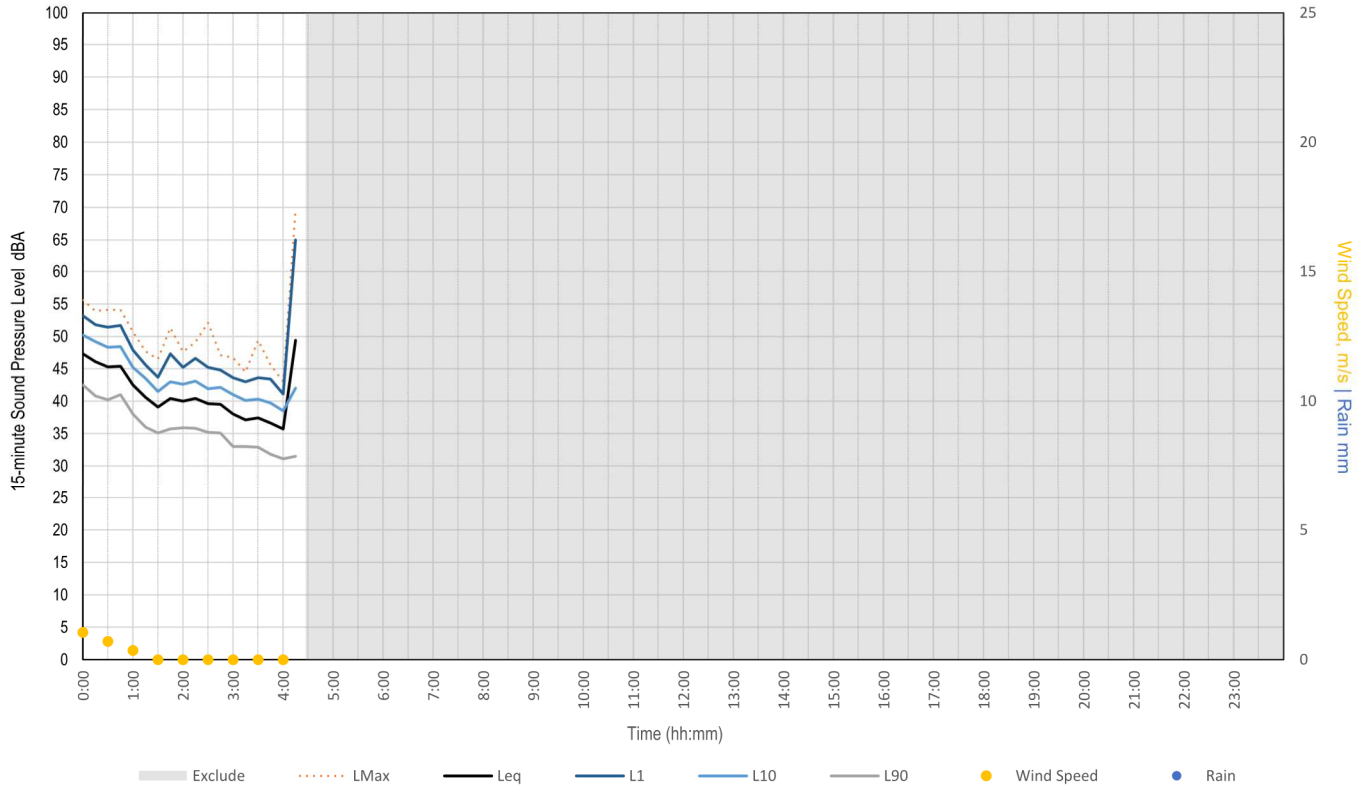
Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Thursday, 06 October 2022



Measured Noise Levels - M19 - 930 Greendale Road (Greendale)

Friday, 07 October 2022



Background Noise Monitoring

Location	M20 - 110A Carr Road (Bringelly)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878235
Calibration	**Pre:**	94.2 dBA	**Post:**	94.2 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-17705-E0
Calibration	**Pre:**	93.7 dBA	**Post:**	93.5 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Tuesday, 13 Sep 2022
Date End	Wednesday, 12 Oct 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally in front yard.

Located ≥ 3 metres away from any reflective surfaces other than ground (e.g. house facade and low stone perimeter wall).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	13/09/2022	12:49:24 PM	1:04:24 PM	63	47	51	33	
2	Day	28/09/2022	12:55:08 PM	1:10:08 PM	64	47	51	38	
3	Day	28/09/2022	1:10:08 PM	1:25:08 PM	62	49	52	35	
4	Day	28/09/2022	1:25:08 PM	1:40:08 PM	68	48	48	35	
5	Evening	14/10/2022	6:00:42 PM	6:15:42 PM	60	45	47	40	
6	Evening	25/09/2022	6:00:00 PM	6:15:00 PM	58	47	48	46	*
7	Evening	25/09/2022	7:30:00 PM	7:45:00 PM	56	46	46	45	*
8	Evening	25/09/2022	8:30:00 PM	8:45:00 PM	61	44	45	41	*
9	Night	17/09/2022	12:15:00 AM	12:30:00 AM	49	41	42	39	*
10	Night	17/09/2022	2:45:00 AM	3:00:00 AM	50	38	40	35	*
11	Night	17/09/2022	4:30:00 AM	4:45:00 AM	56	39	40	35	*
12	Night	17/09/2022	6:00:00 AM	6:15:00 AM	66	47	50	41	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird noise and dog barking from nearby house. Residential noise (e.g. neighbour walking and talking). Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 35 to 56 dBA.
Background noise	Constant bird noise. Noise from distant aircraft.
Evening	
Ambient noise	Occasional vehicle passbys on Carr Road. Intermittent dog barking. Constant insect noise at dusk. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 43 to 54 dBA.
Background noise	Distant traffic. Constant bird chirpings from trees.
Night	
Ambient noise	Occasional vehicle passbys on Carr Road. Noise from nearby machine. Intermittent rural noise (e.g roosters, dogs). Constant insect noise in the early hours of the morning. Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 38 to 49 dBA.
Background noise	Distant traffic. Movement in vegetation induced by wind (e.g. grass and trees rustling).

Site Details	M20 - 110A Carr Road (Bringelly)
Start Date	Tue 13 September 2022
End Date	Wed 12 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	52
$L_{eq, Evening}$ dBA	48
$L_{eq, Night}$ dBA	44
RBL, $_{Day}$ dBA	34
RBL, $_{Evening}$ dBA	39
RBL, $_{Night}$ dBA	34

Daily Summary

Date	13/09	14/09	15/09	16/09	17/09	18/09	19/09	20/09
$L_{eq, Day}$ dBA	51	47	50	48	51	48	51	51
$L_{eq, Evening}$ dBA	44	50	45	44	42	44	42	42
$L_{eq, Night}$ dBA	39	41	42	42	46	43	40	41
ABL, $_{Day}$ dBA	33	35	39	37	36	34	34	36
ABL, $_{Evening}$ dBA	30	34	39	39	37	35	32	36
ABL, $_{Night}$ dBA	31	32	33	34	34	35	33	33

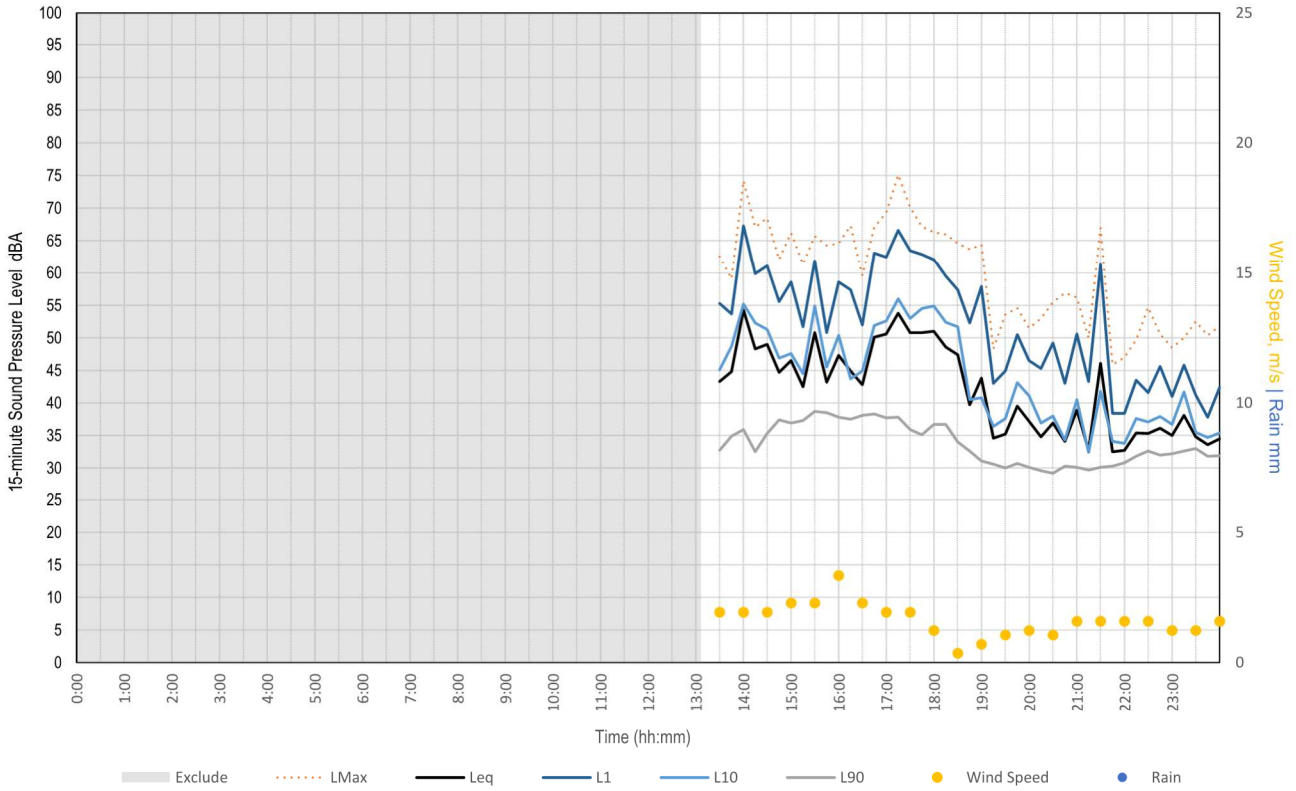
Date	21/09	22/09	23/09	24/09	25/09	26/09	27/09	28/09
$L_{eq, Day}$ dBA	51	46	46	51	49	52	46	64
$L_{eq, Evening}$ dBA	42	42	46	47	46	46	46	45
$L_{eq, Night}$ dBA	42	42	45	45	42	41	48	45
ABL, $_{Day}$ dBA	37	34	34	33	33	34	34	33
ABL, $_{Evening}$ dBA	37	38	42	43	41	38	41	39
ABL, $_{Night}$ dBA	34	33	31	34	34	33	33	37

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	51	48	44	49	47	51	51	50
$L_{eq, Evening}$ dBA	45	46	45	45	45	44	45	48
$L_{eq, Night}$ dBA	44	45	44	41	44	42	48	44
ABL, $_{Day}$ dBA	38	40	34	33	33	34	37	37
ABL, $_{Evening}$ dBA	41	43	40	38	39	39	40	43
ABL, $_{Night}$ dBA	38	35	35	32	33	33	40	35

Date	07/10	08/10	09/10	10/10	11/10	12/10
$L_{eq, Day}$ dBA	49	49	47	48	47	50
$L_{eq, Evening}$ dBA	46	60	48	45	44	45
$L_{eq, Night}$ dBA	45	48	44	43	44	42
ABL, $_{Day}$ dBA	35	32	33	36	35	36
ABL, $_{Evening}$ dBA	41	55	41	38	38	40
ABL, $_{Night}$ dBA	35	43	36	35	35	40

Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

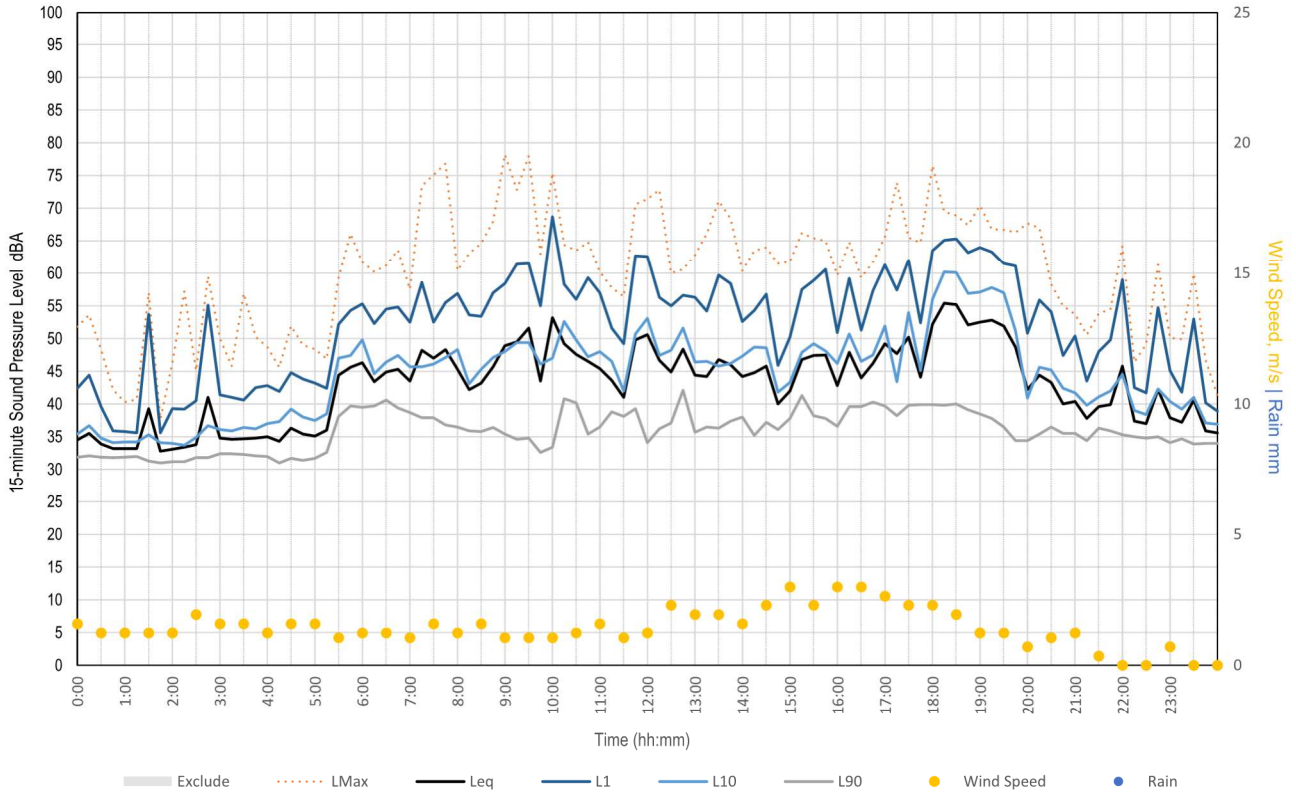
Tuesday, 13 September 2022



Noise Logger Results

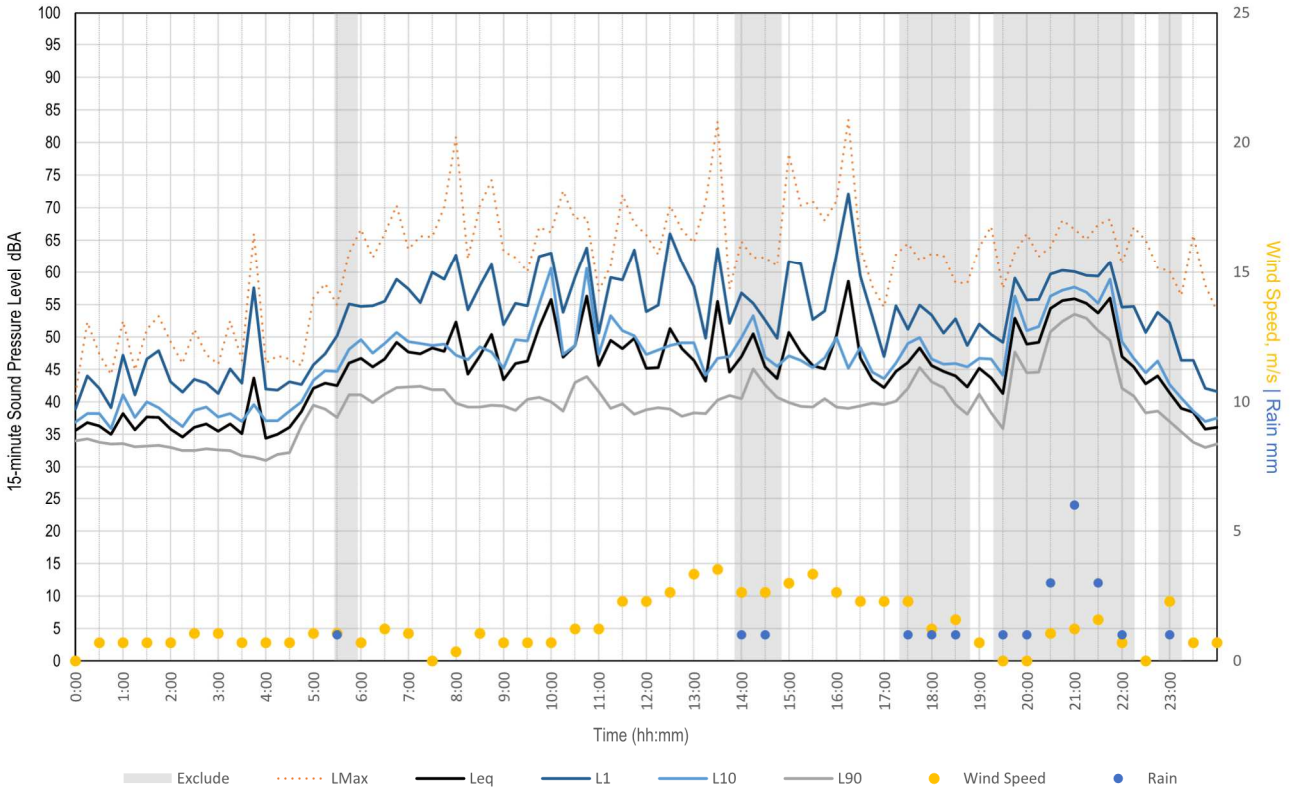
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Wednesday, 14 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

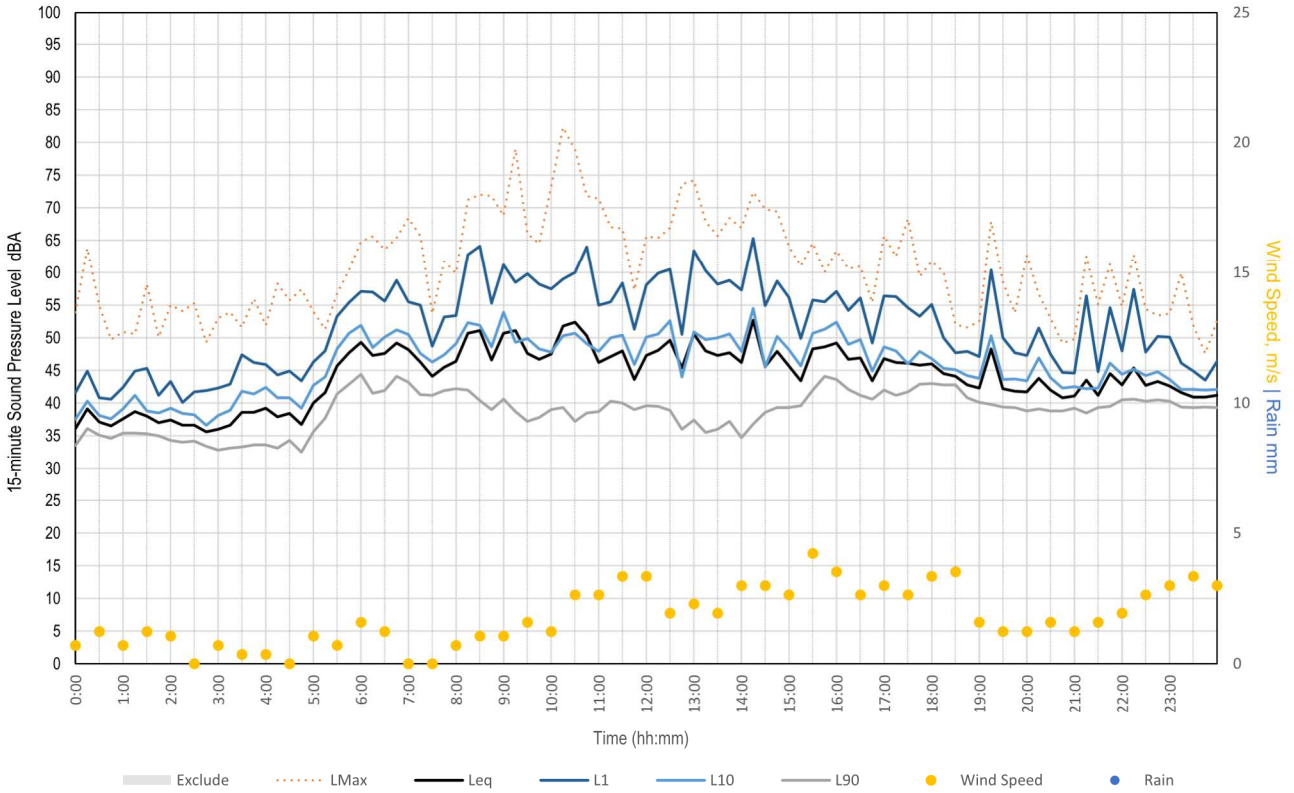
Thursday, 15 September 2022



Noise Logger Results

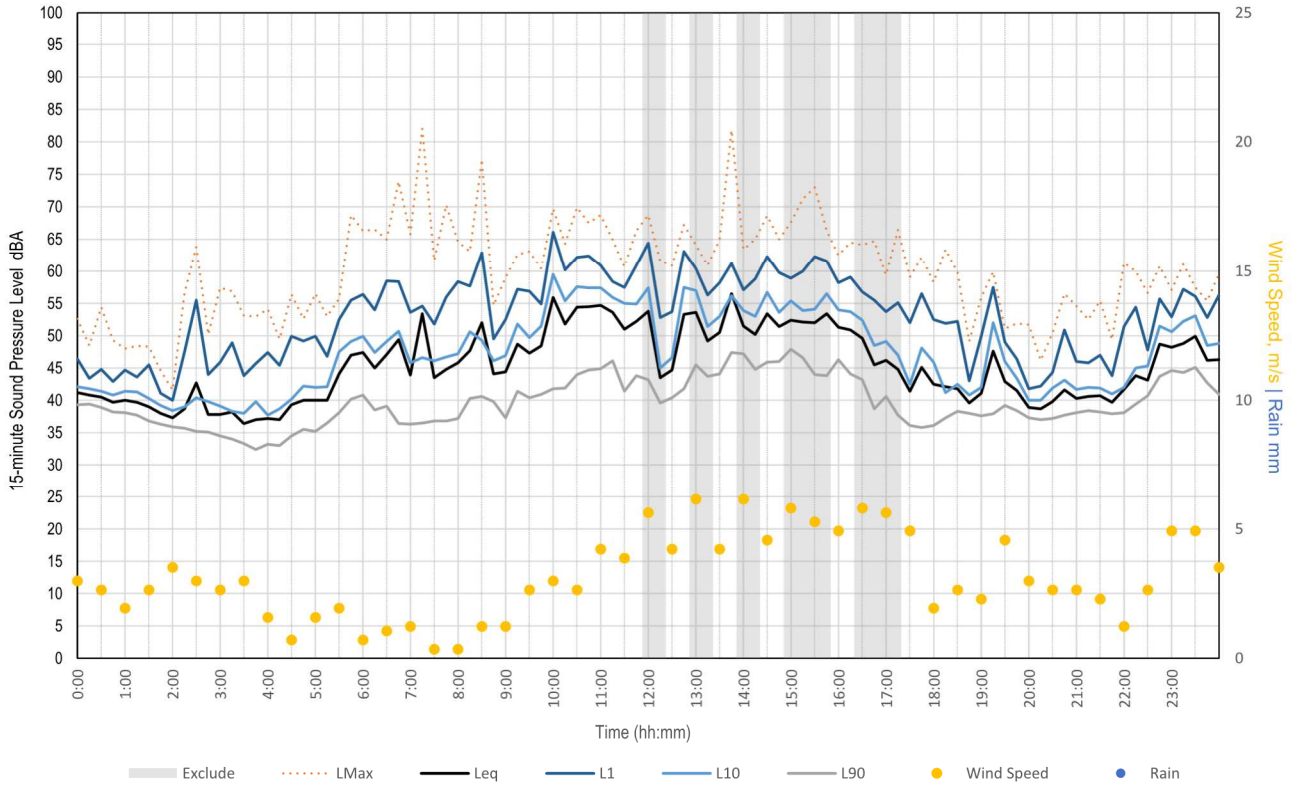
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Friday, 16 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

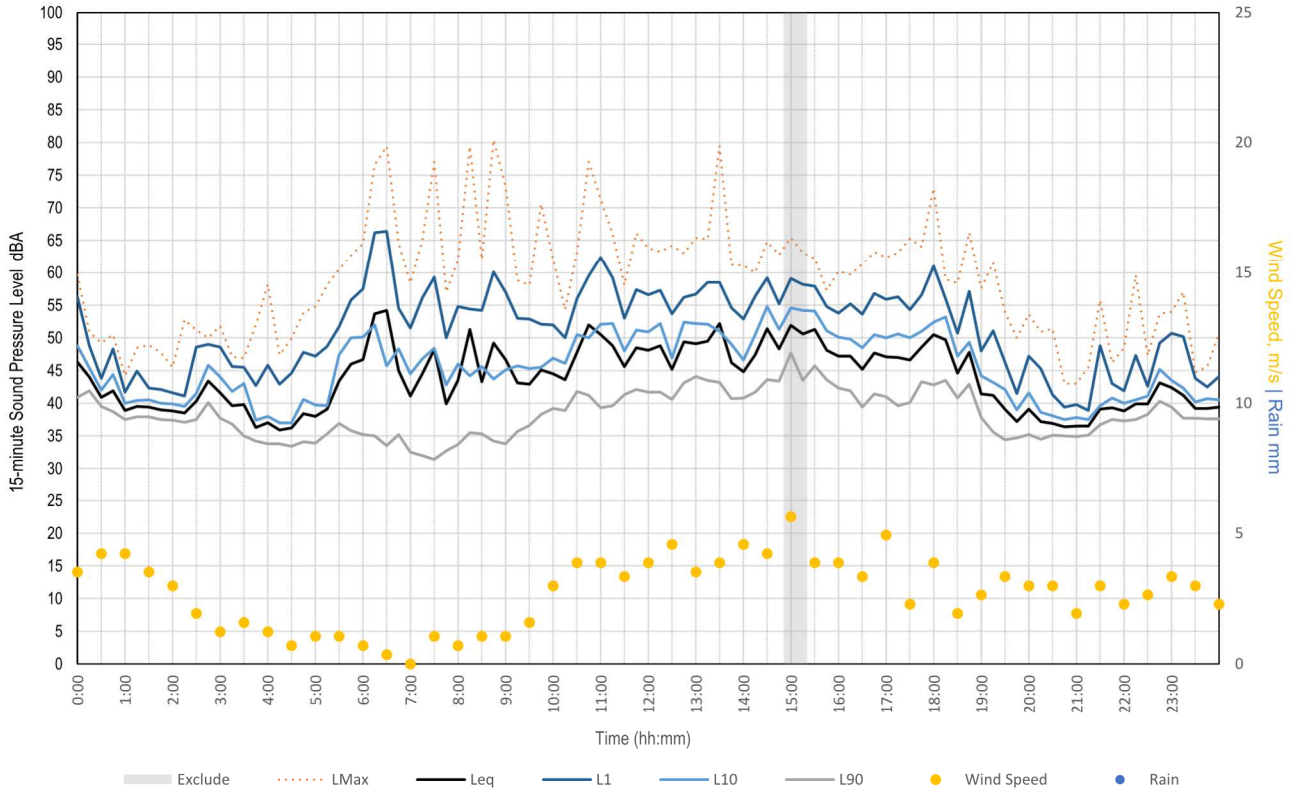
Saturday, 17 September 2022



Noise Logger Results

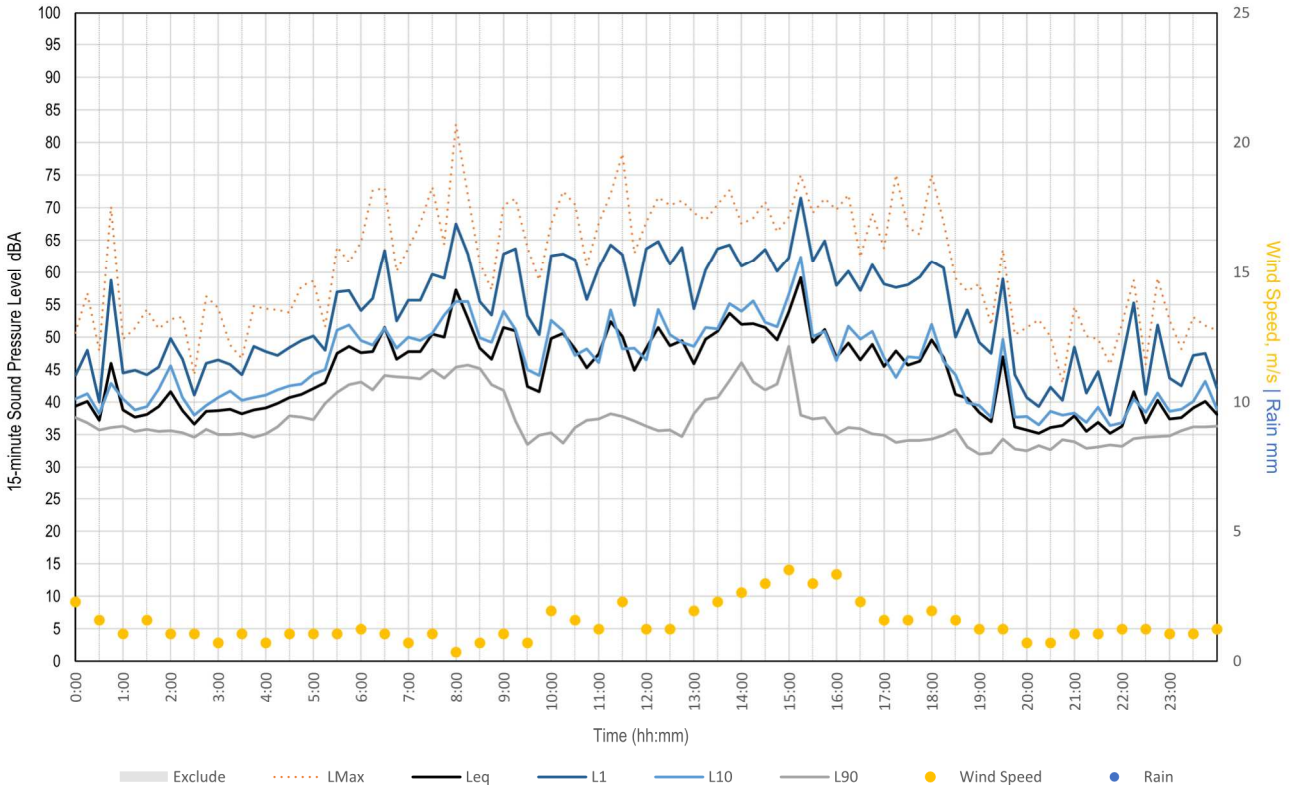
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Sunday, 18 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

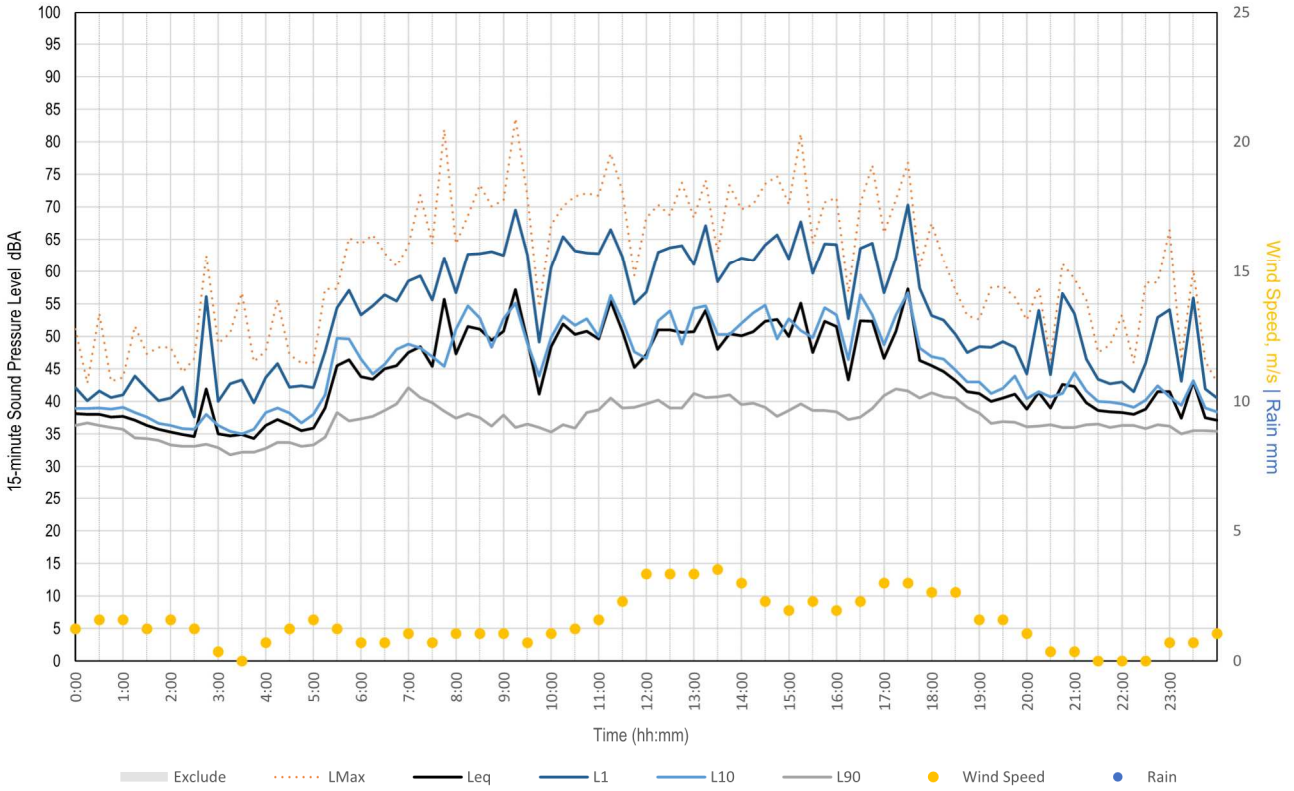
Monday, 19 September 2022



Noise Logger Results

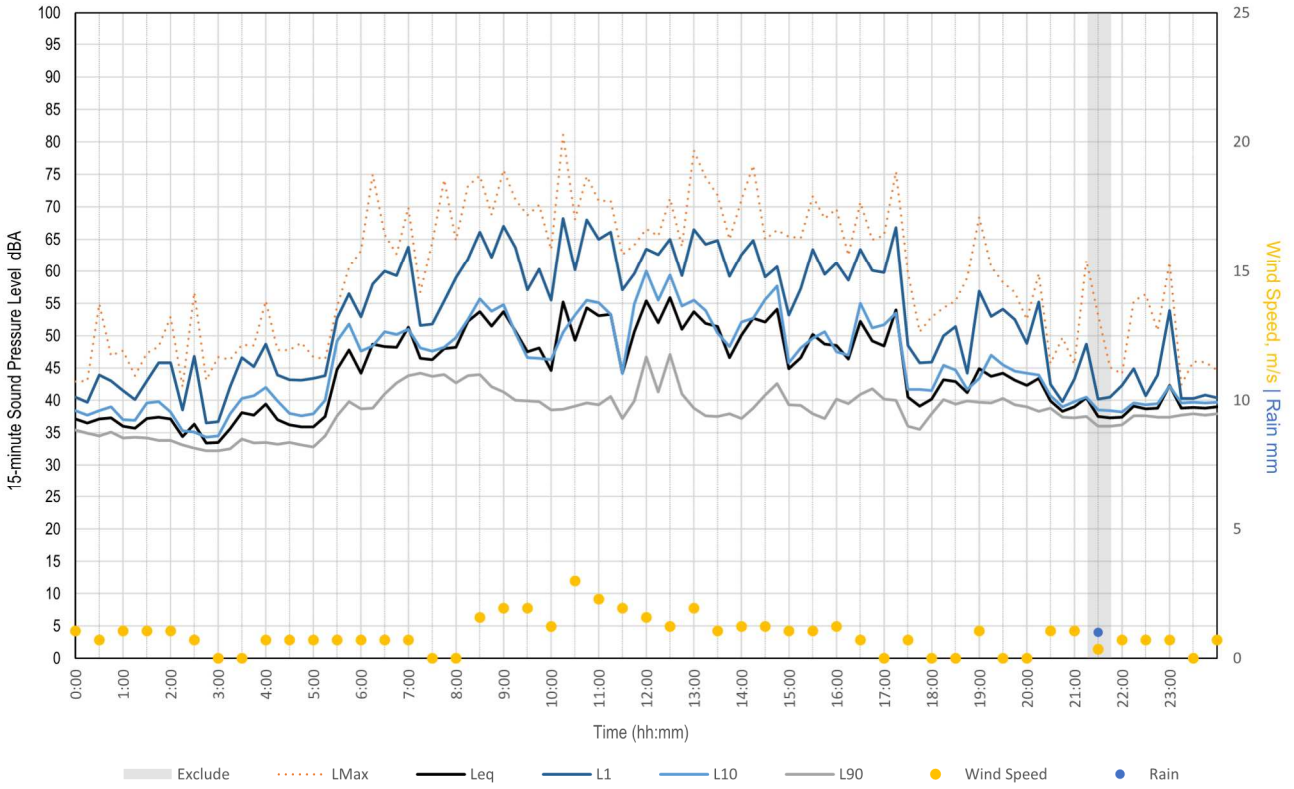
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Tuesday, 20 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

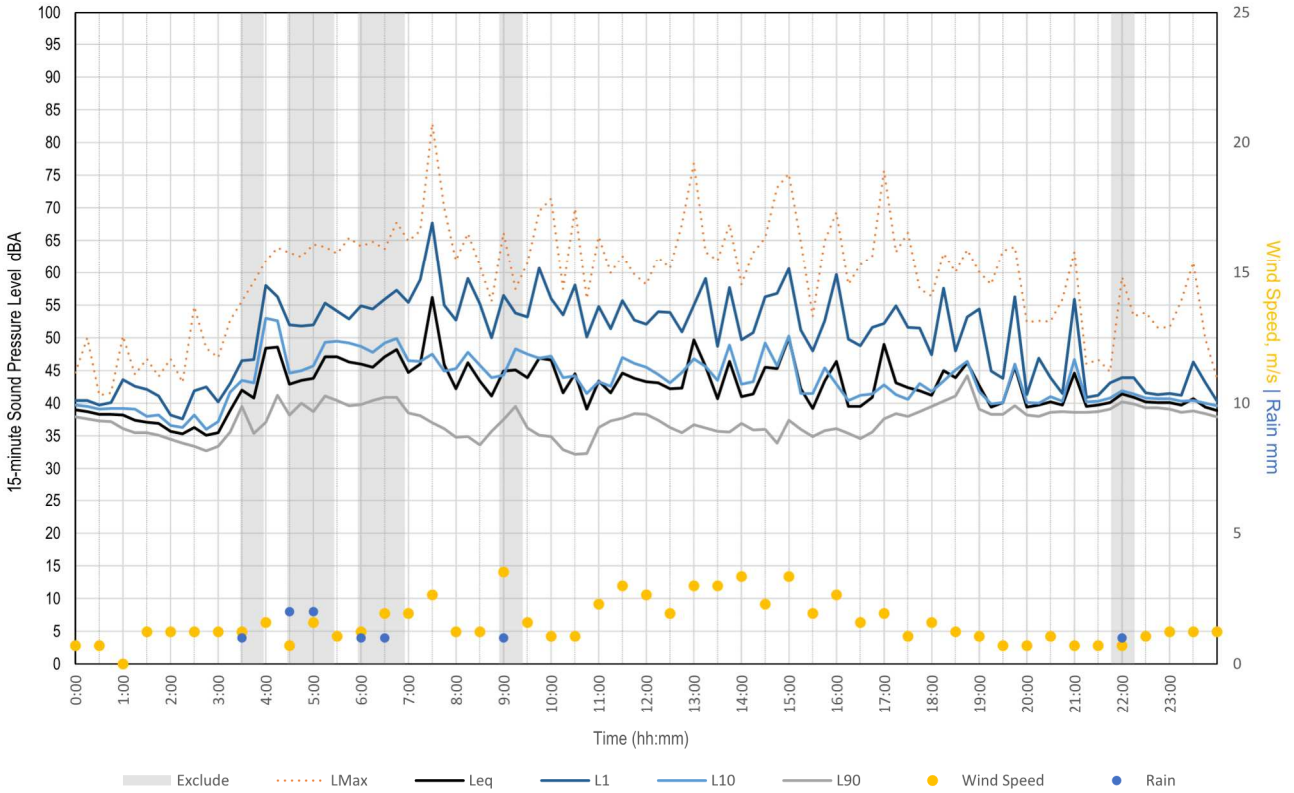
Wednesday, 21 September 2022



Noise Logger Results

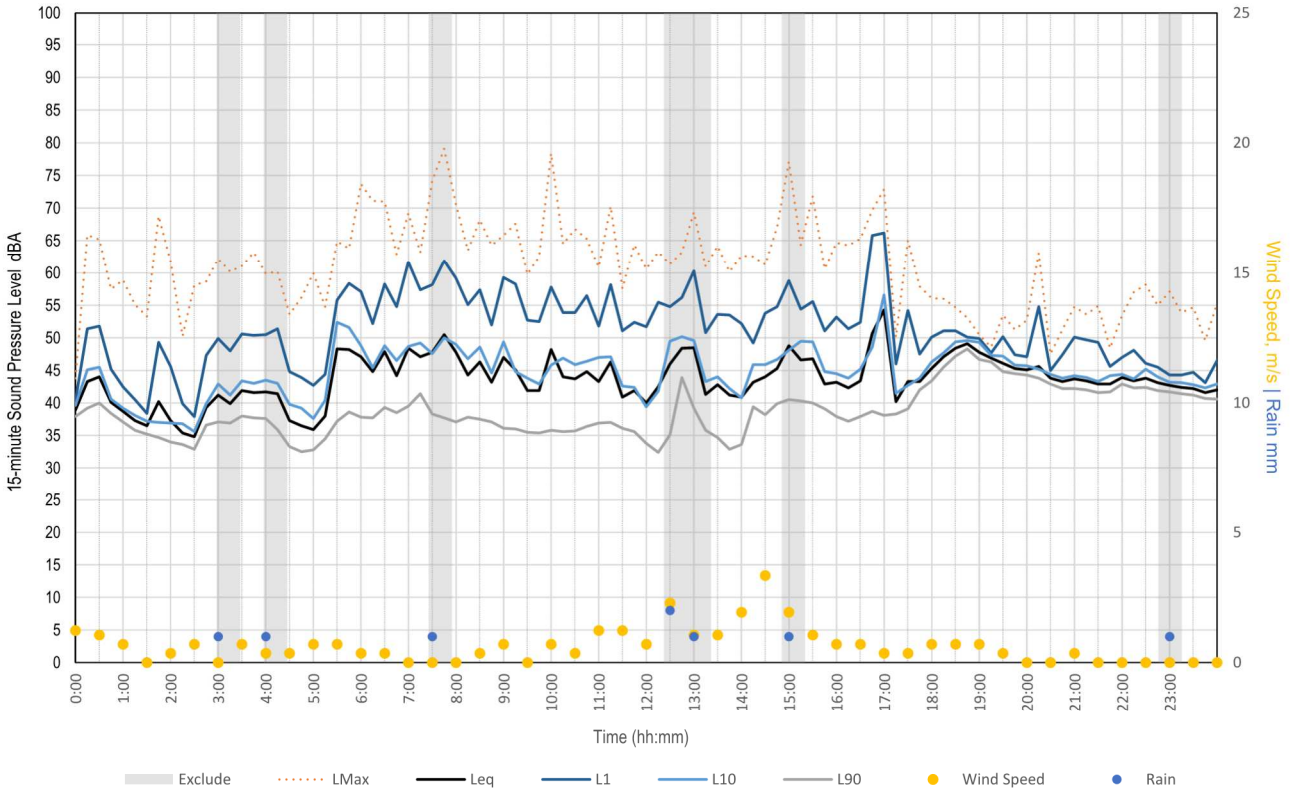
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Thursday, 22 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

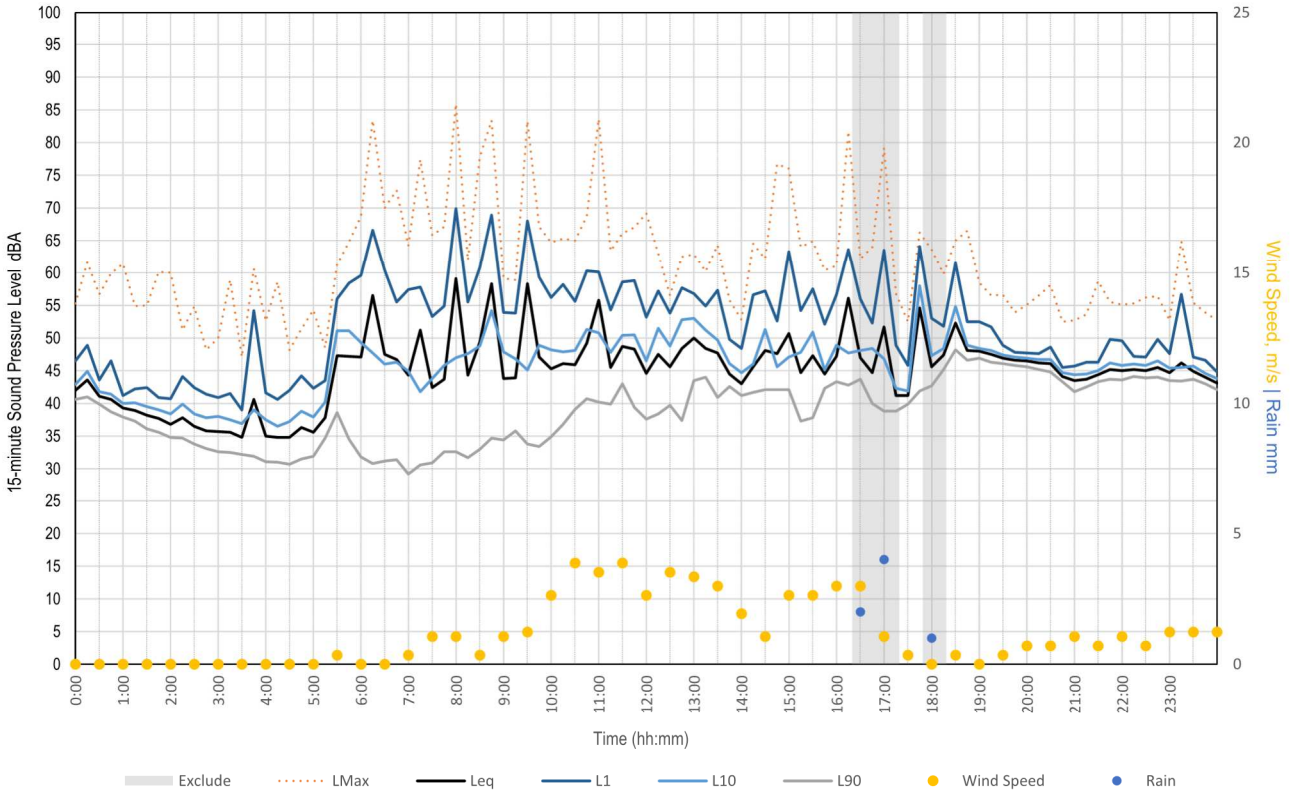
Friday, 23 September 2022



Noise Logger Results

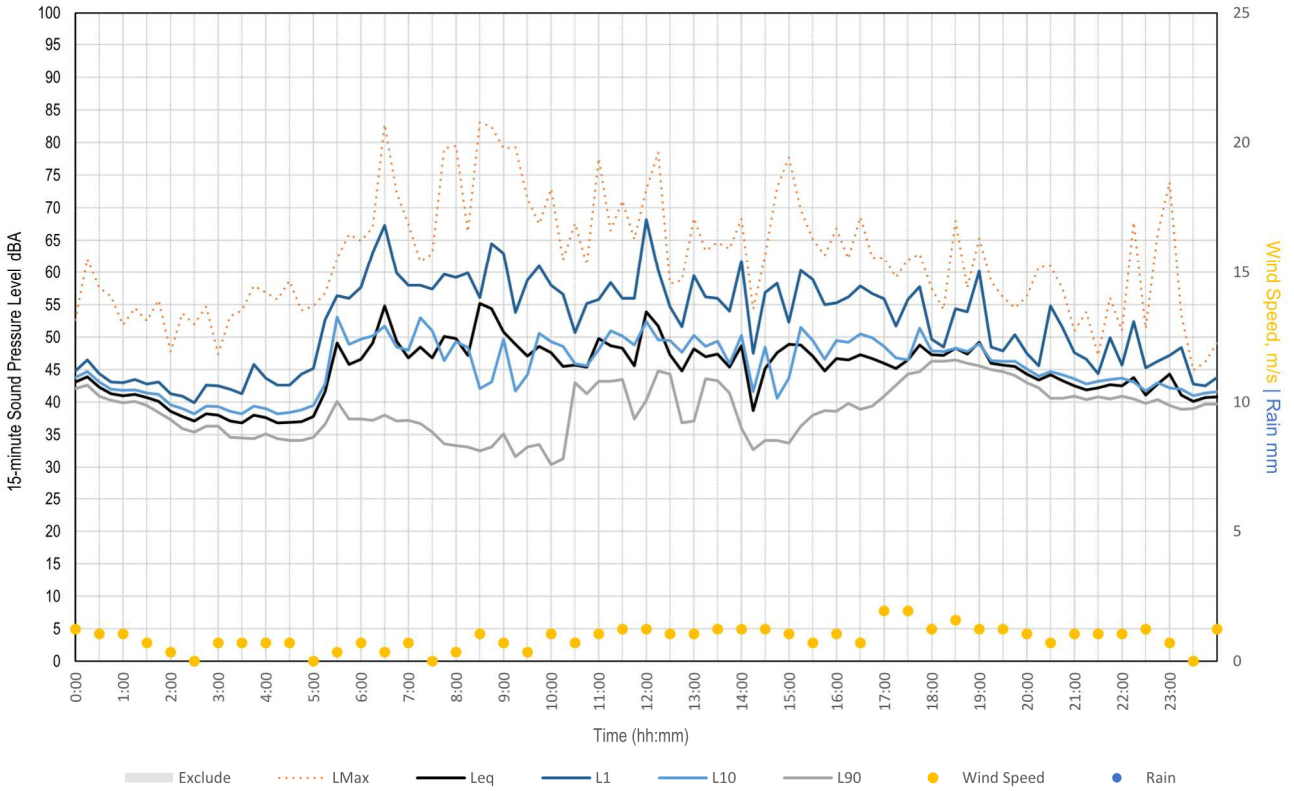
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Saturday, 24 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

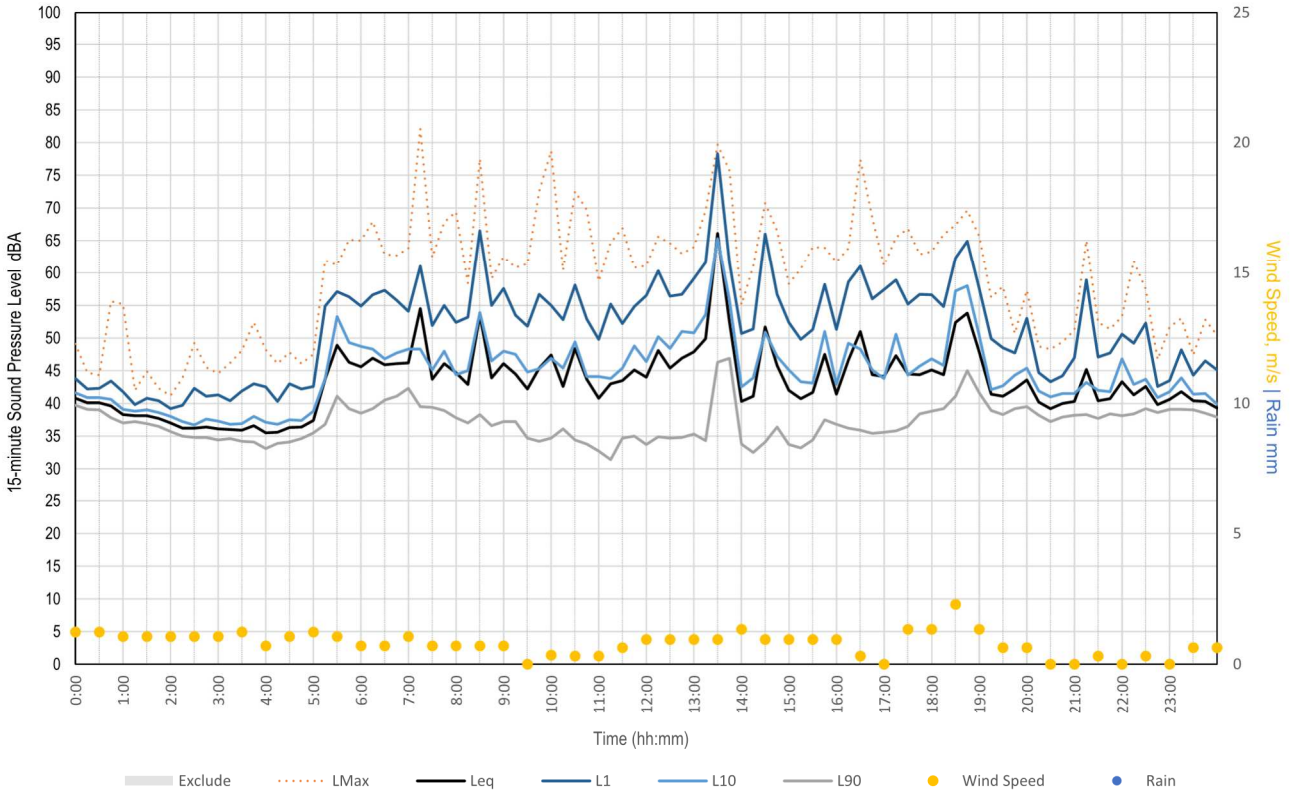
Sunday, 25 September 2022



Noise Logger Results

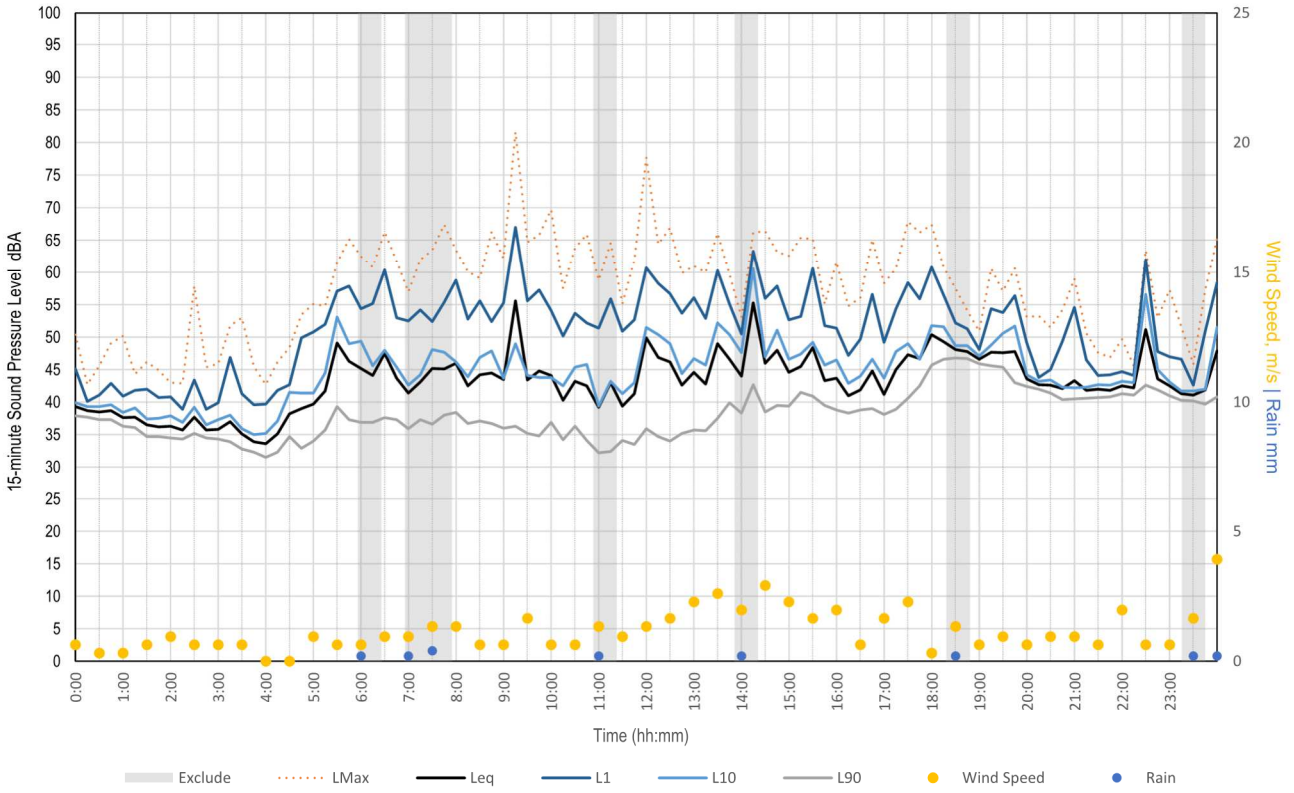
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Monday, 26 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

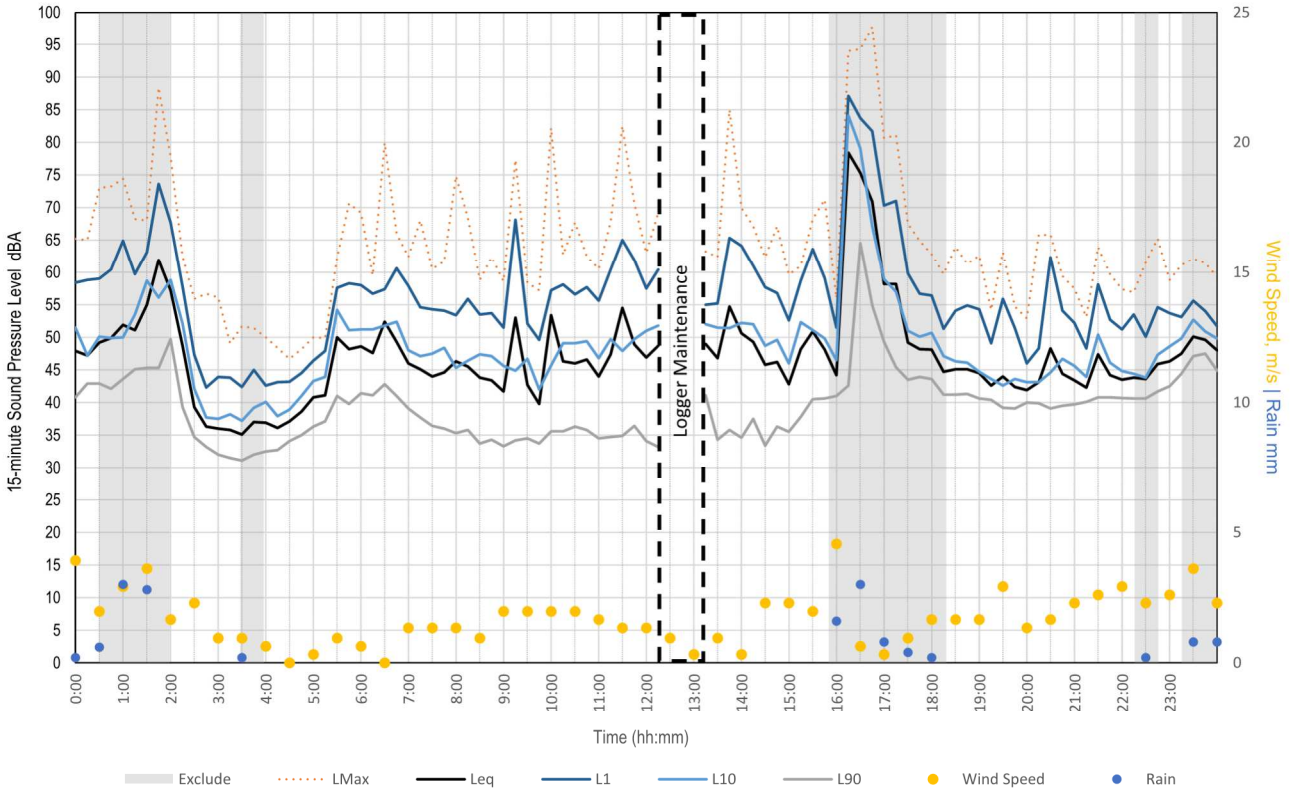
Tuesday, 27 September 2022



Noise Logger Results

Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Wednesday, 28 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

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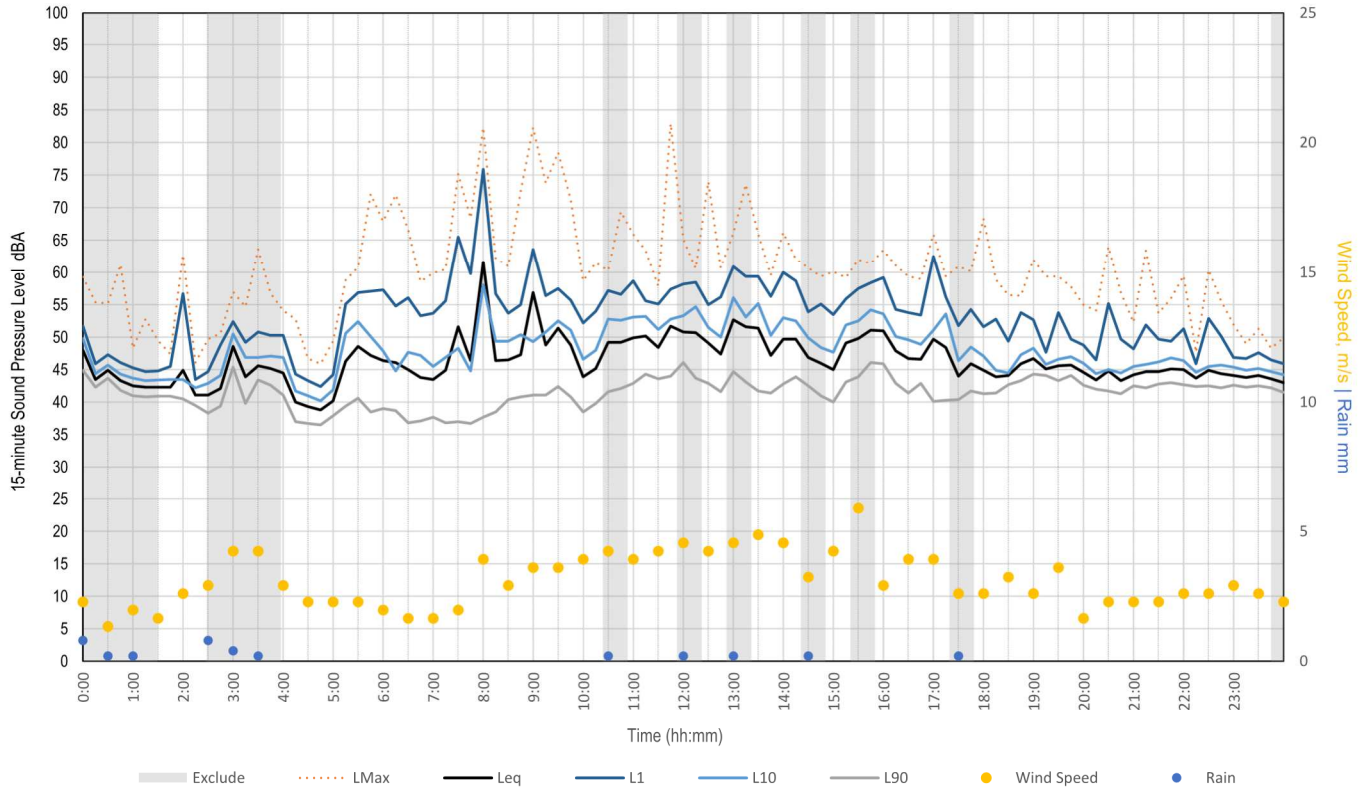
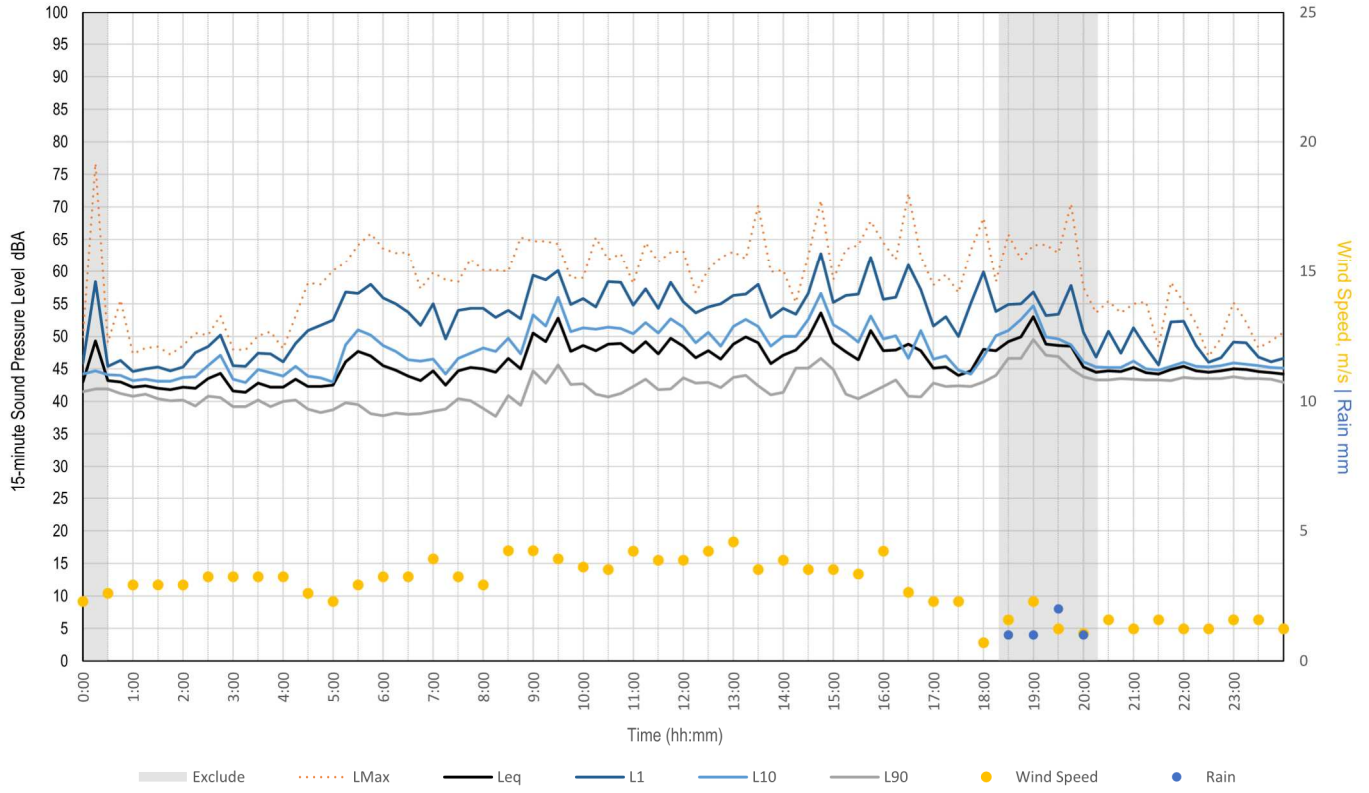


Noise Logger Results

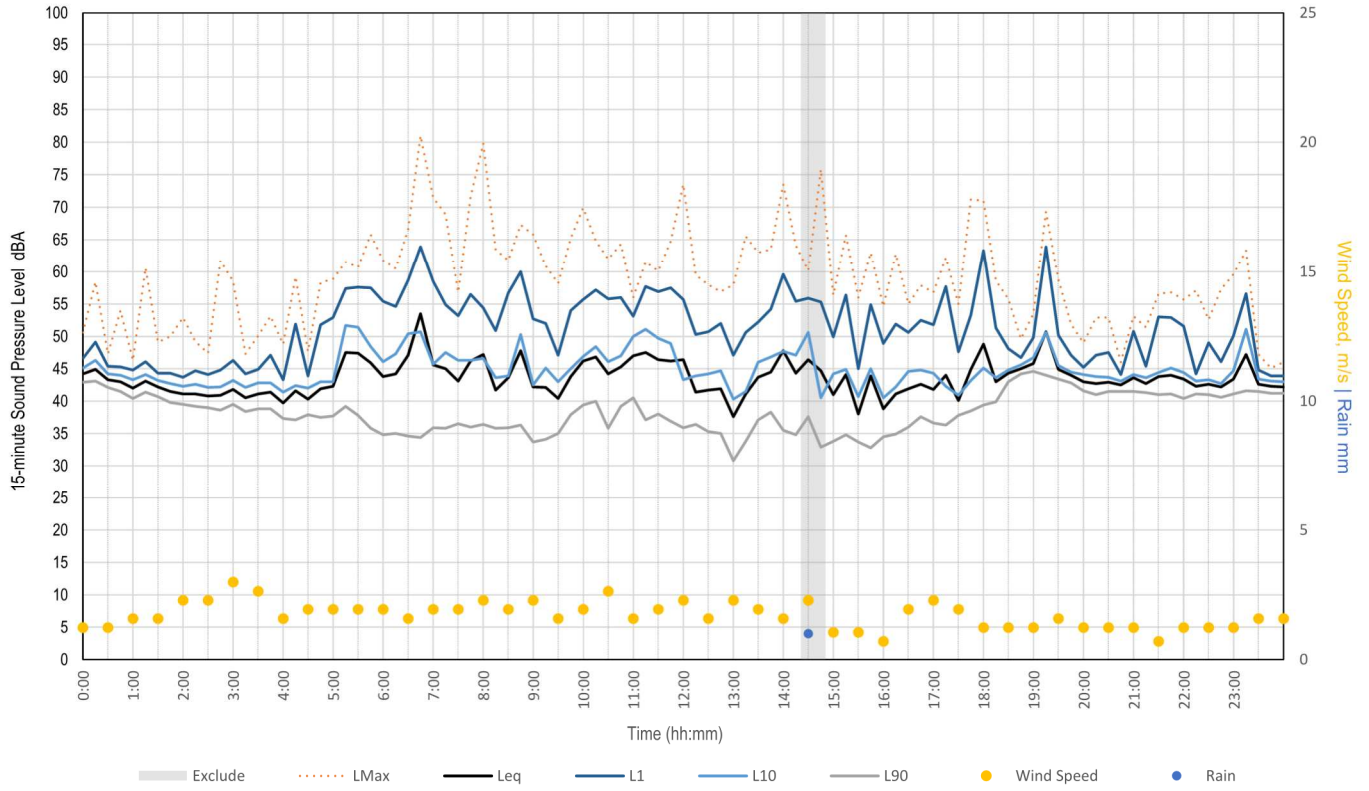
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Friday, 30 September 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

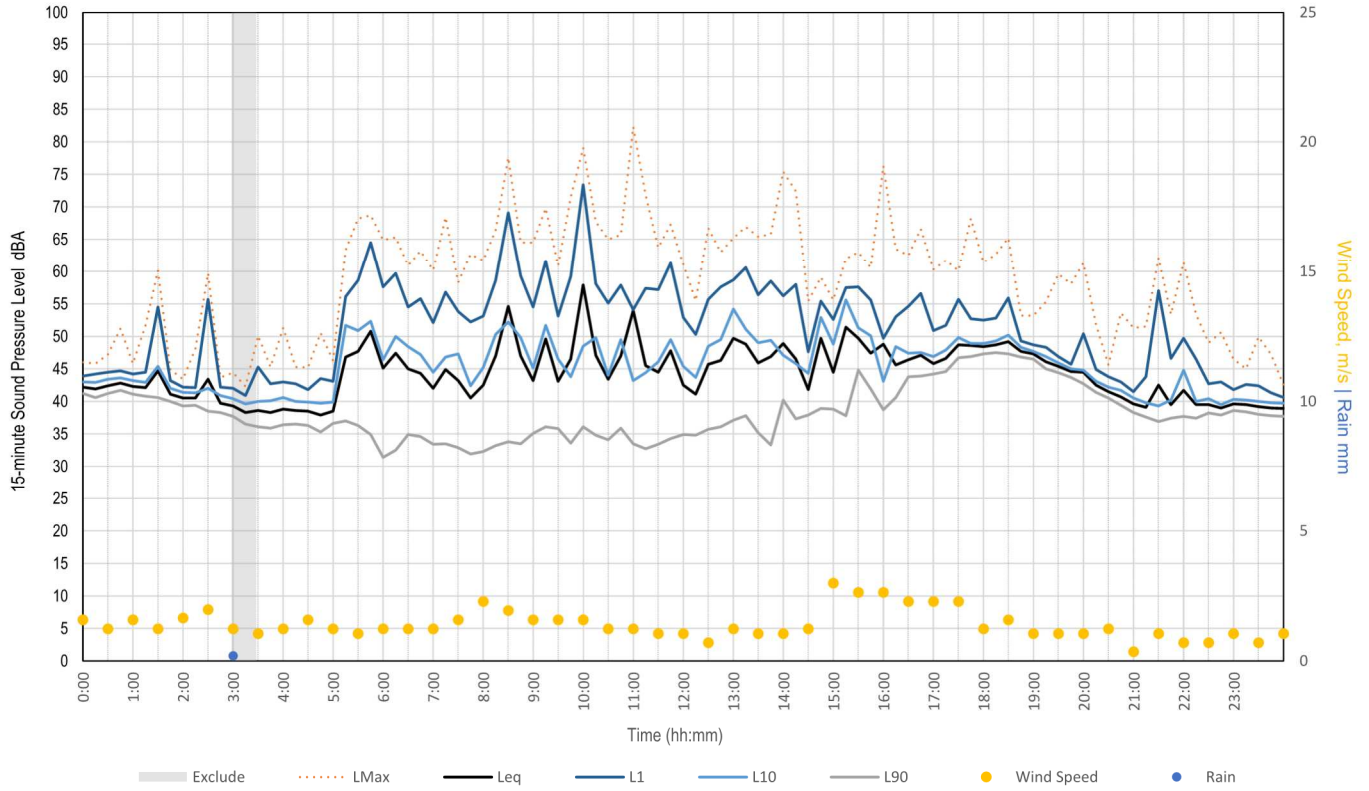
Saturday, 01 October 2022



Noise Logger Results

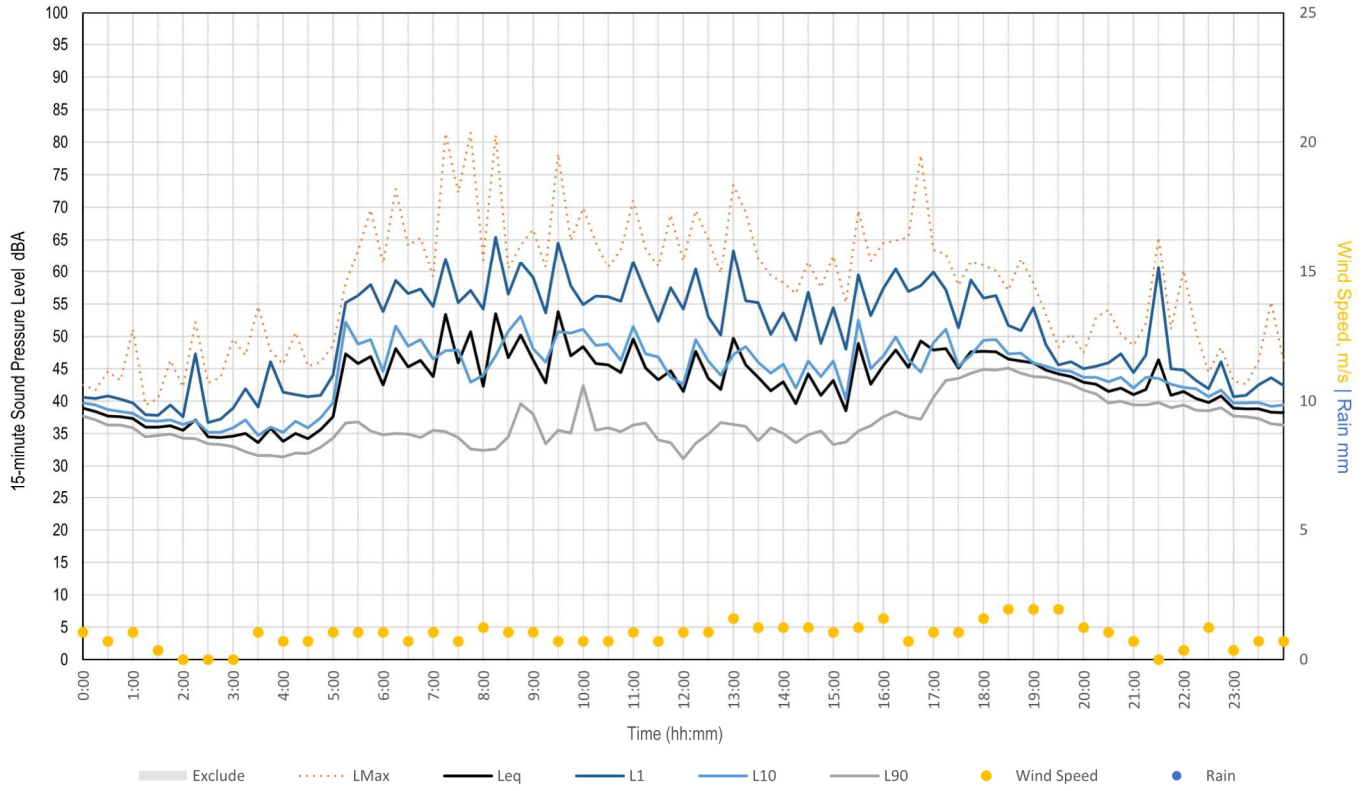
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Sunday, 02 October 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

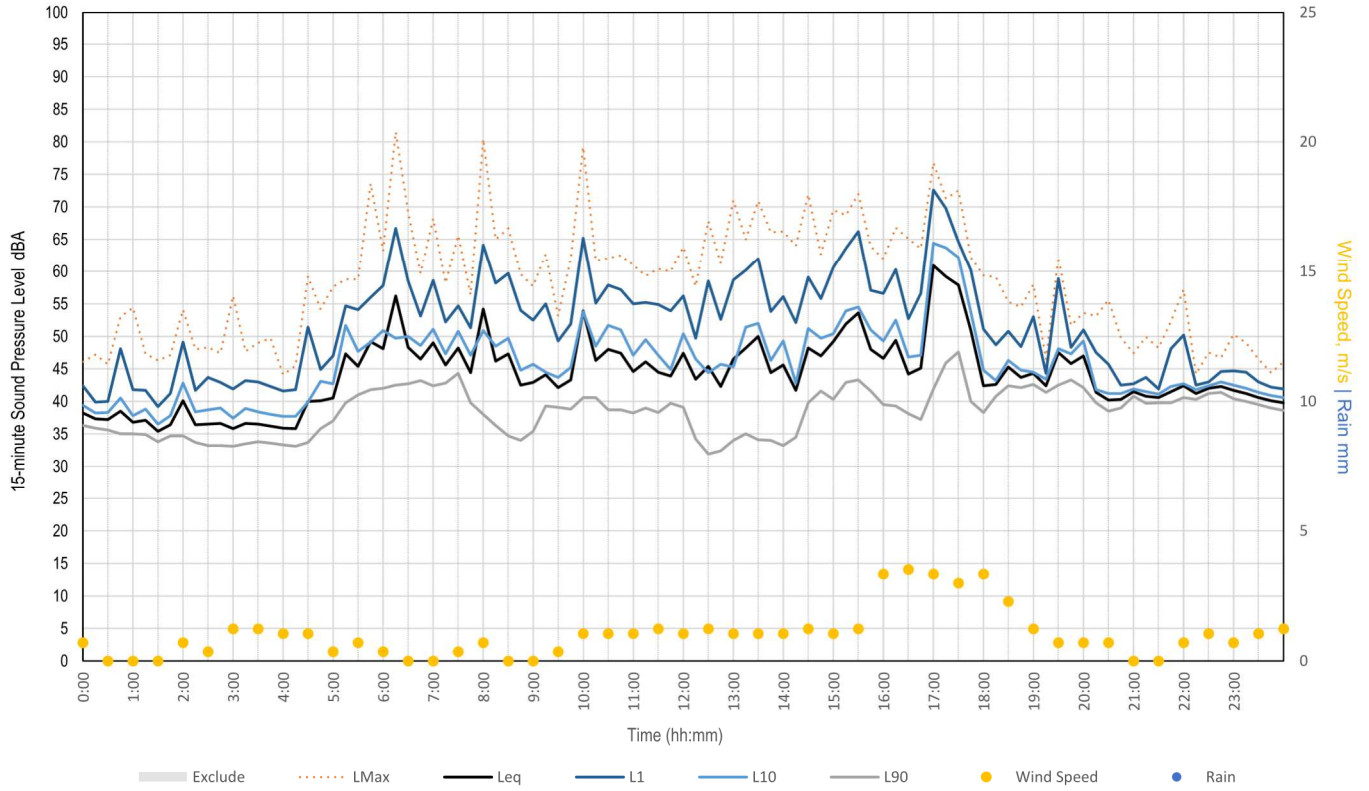
Monday, 03 October 2022



Noise Logger Results

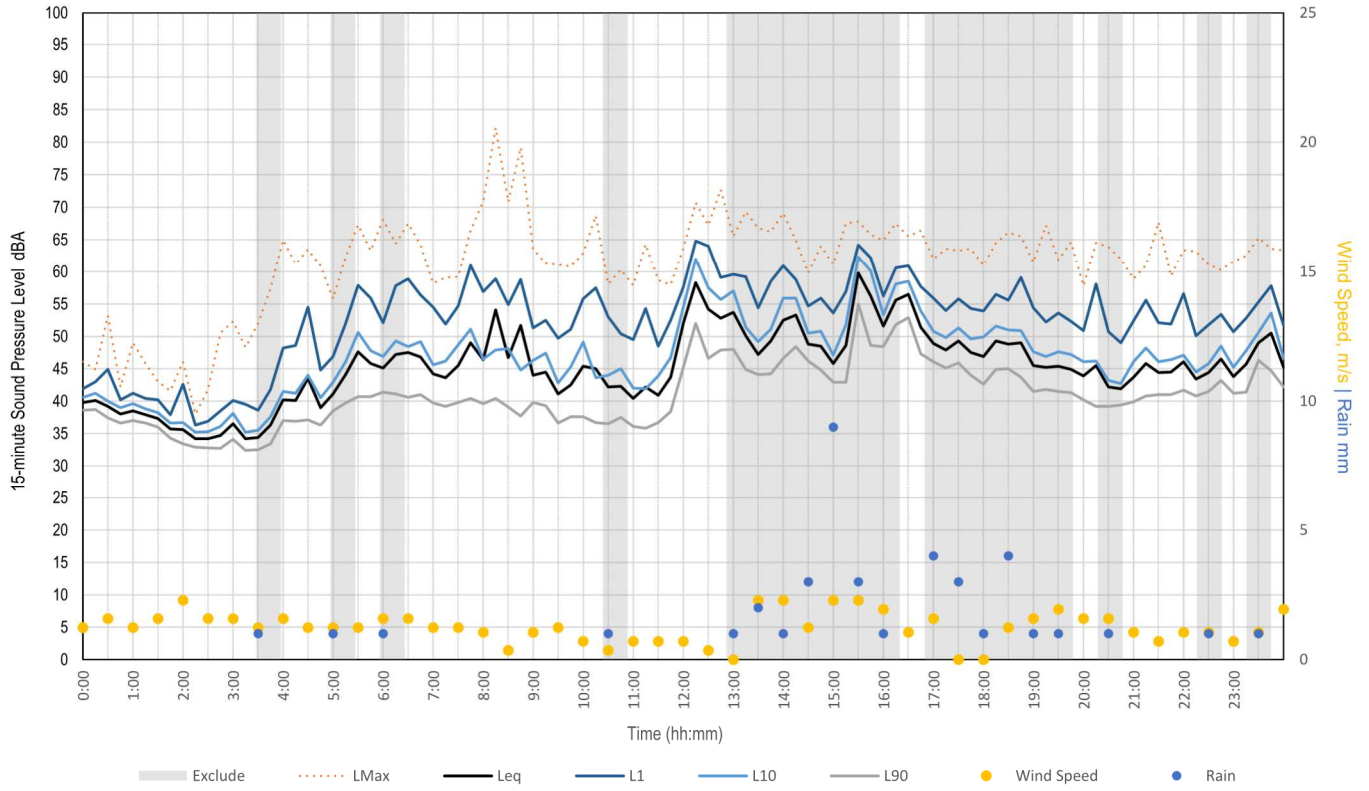
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Tuesday, 04 October 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

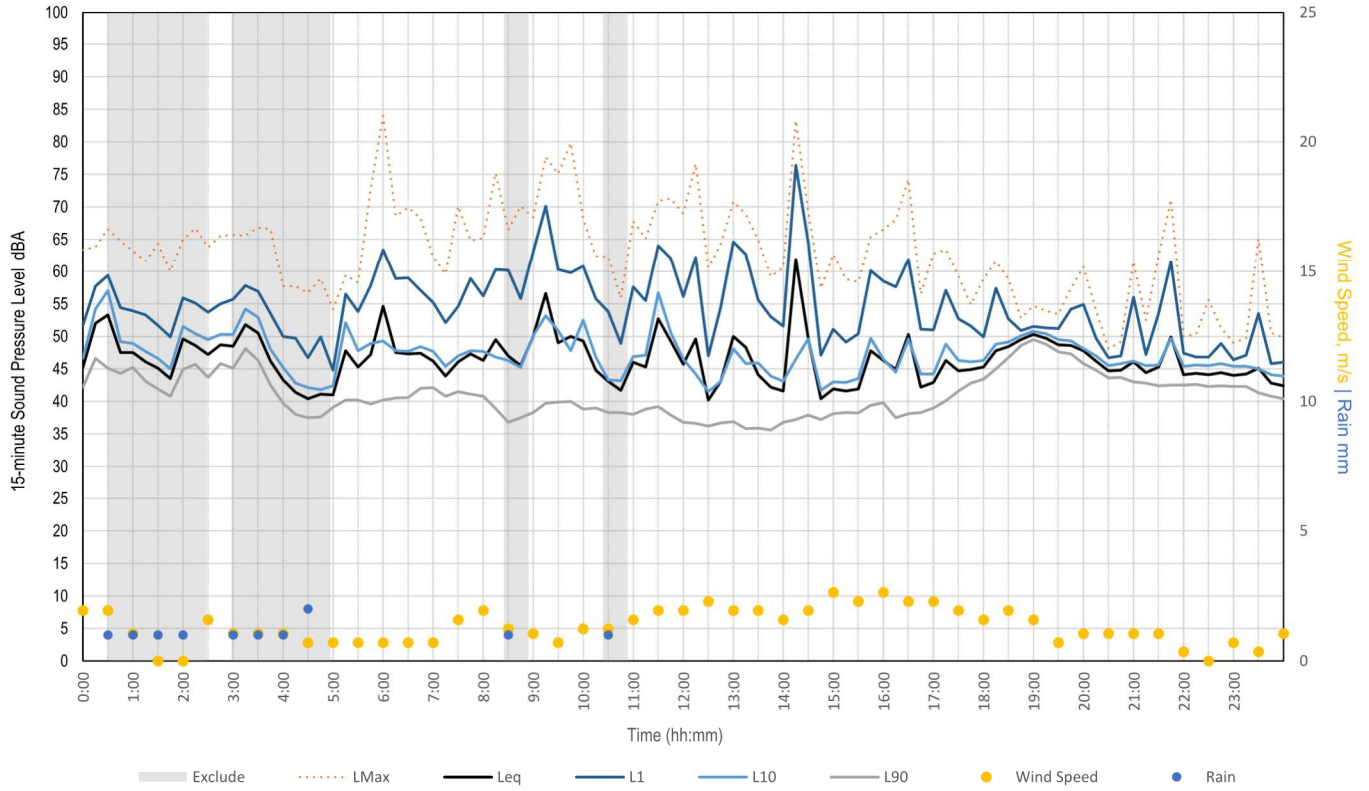
Wednesday, 05 October 2022



Noise Logger Results

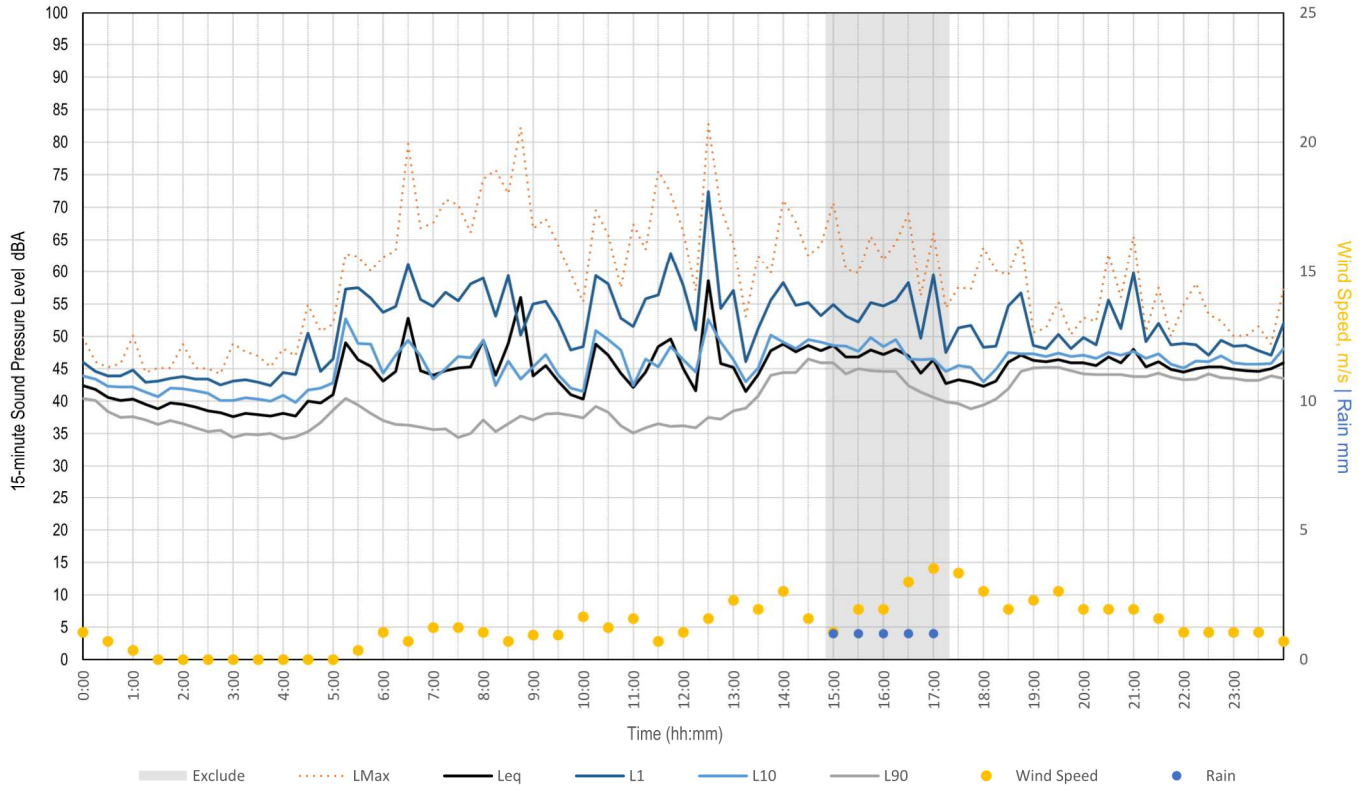
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Thursday, 06 October 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

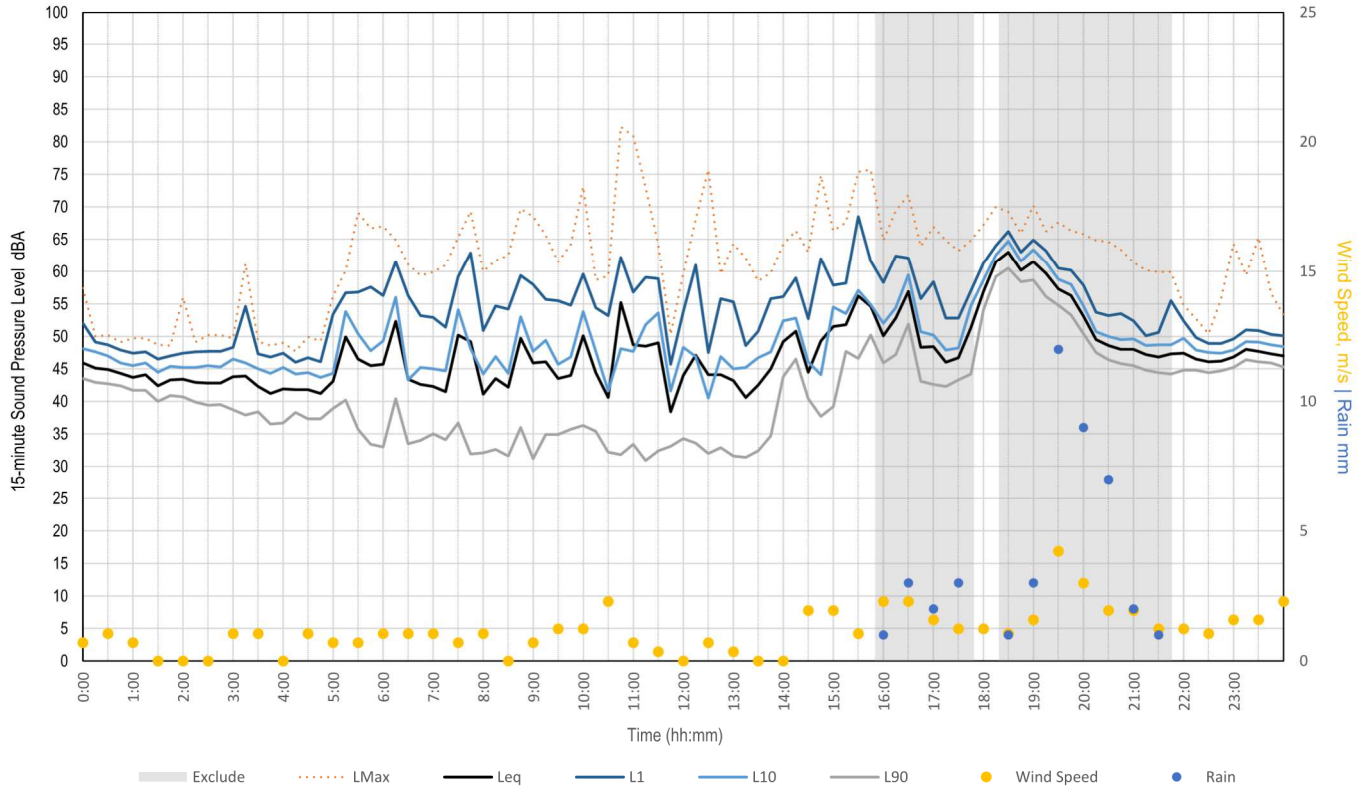
Friday, 07 October 2022



Noise Logger Results

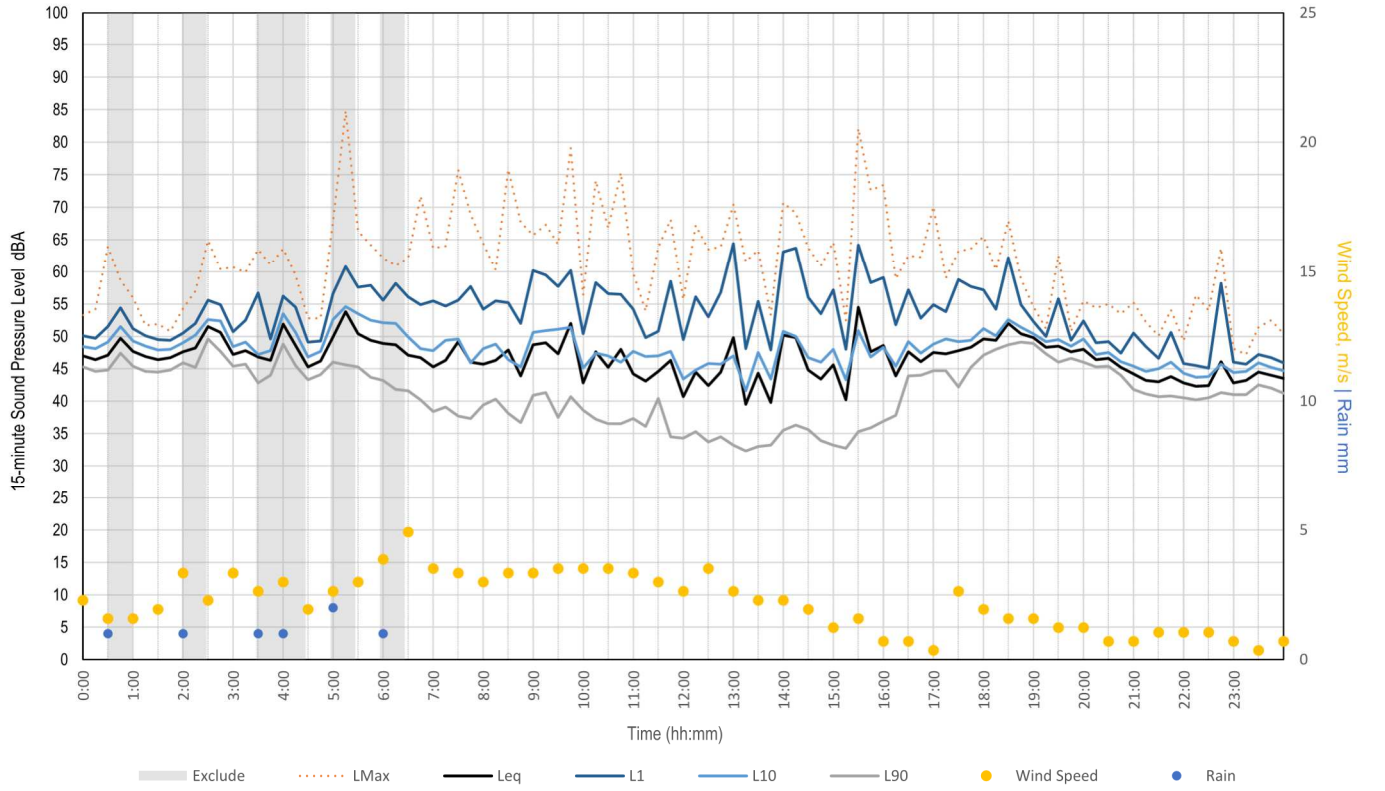
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Saturday, 08 October 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

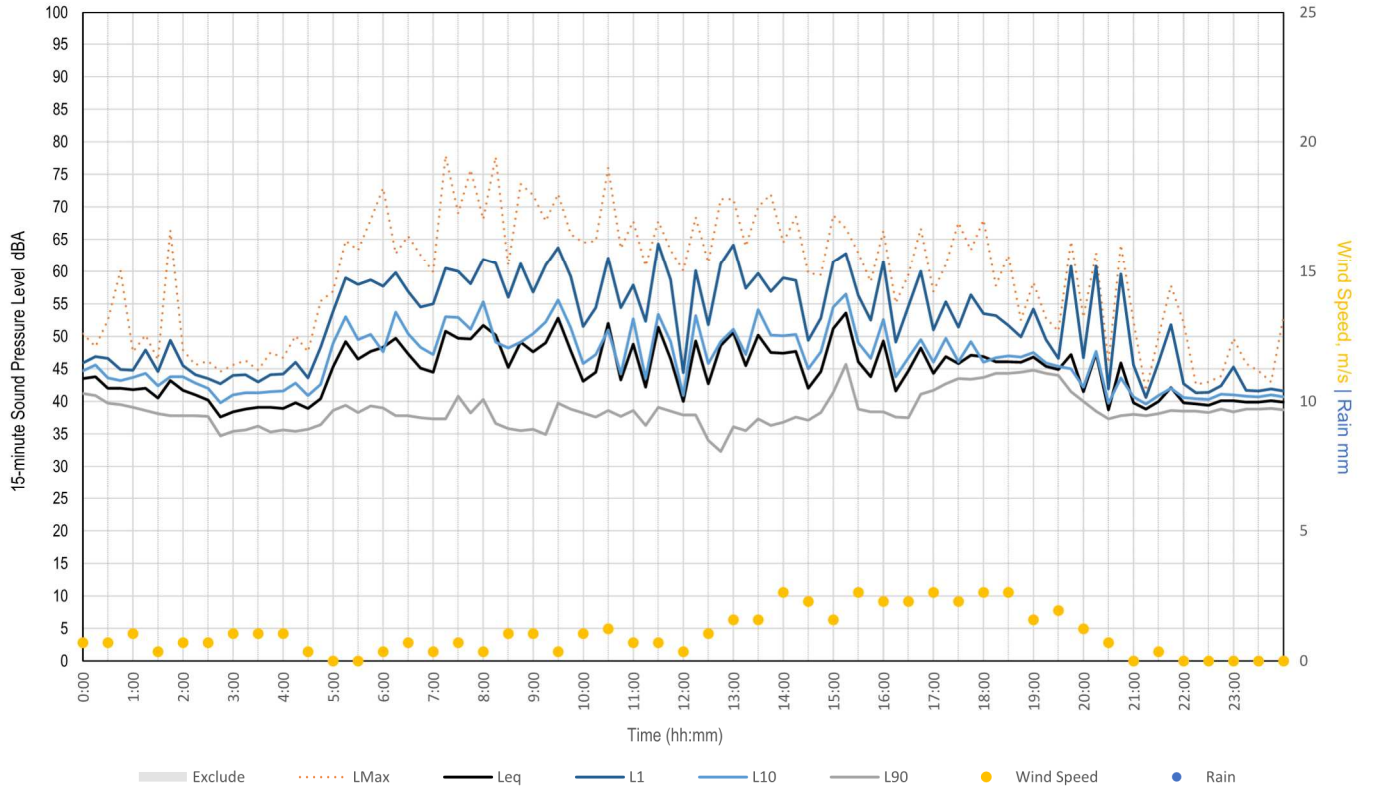
Sunday, 09 October 2022



Noise Logger Results

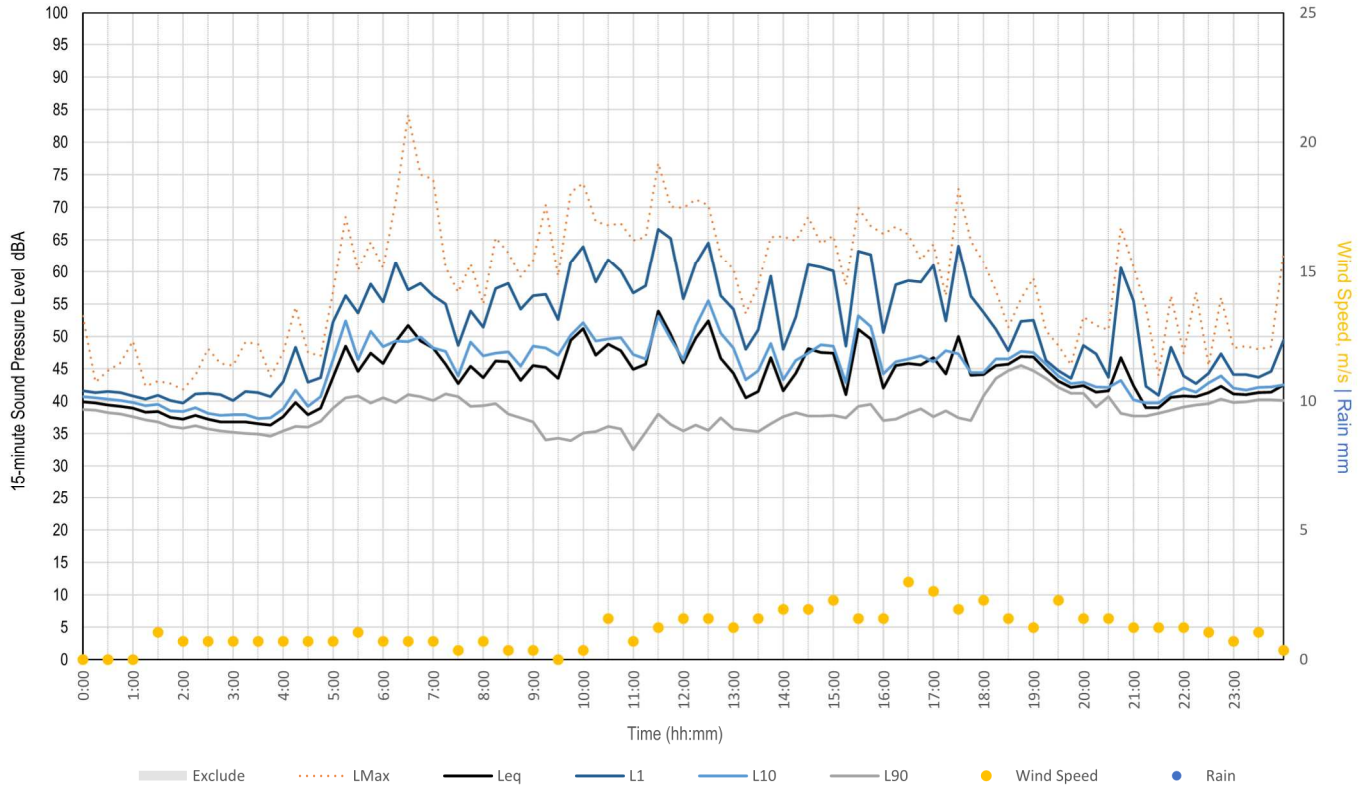
Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Monday, 10 October 2022



Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

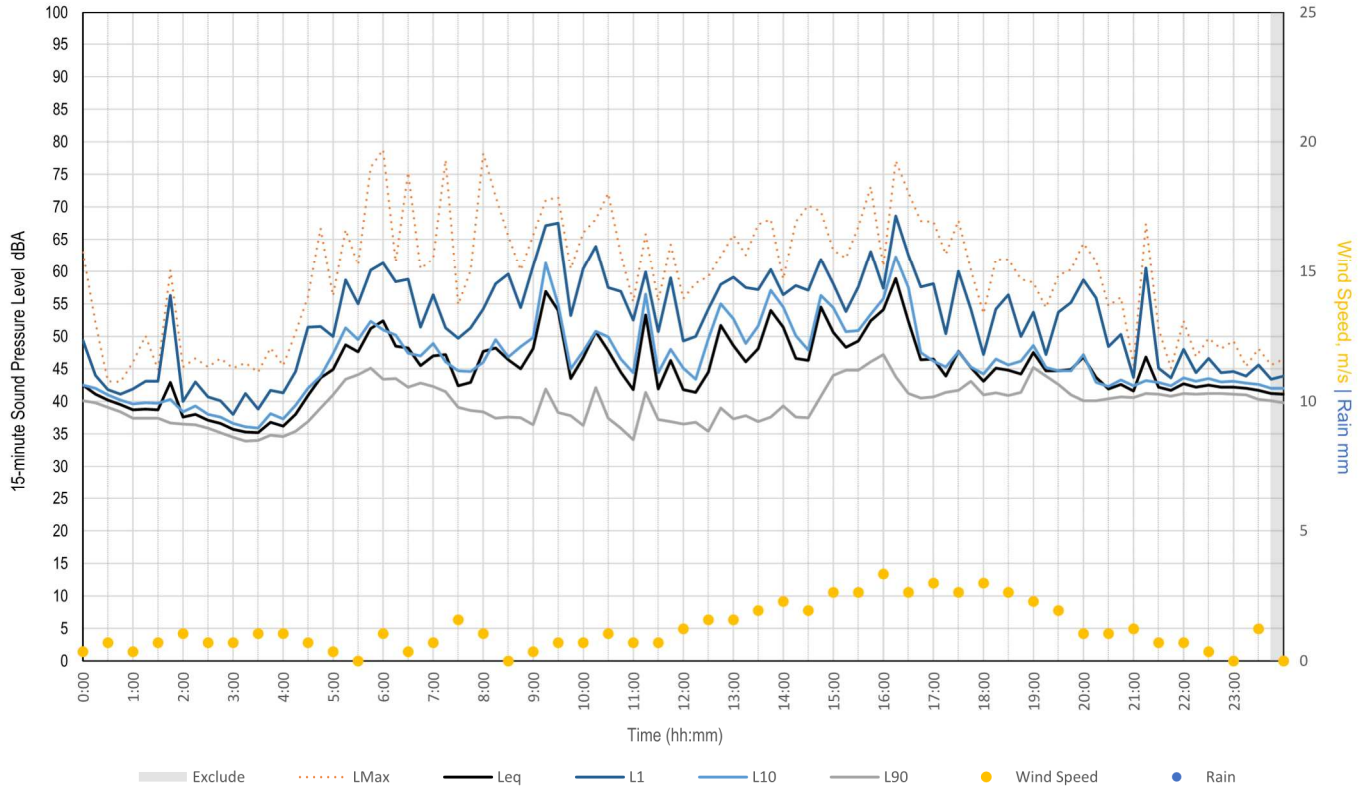
Tuesday, 11 October 2022



Noise Logger Results

Measured Noise Levels - M20 - 110A Carr Road (Bringelly)

Wednesday, 12 October 2022



Background Noise Monitoring

Location	M21 - 680 Bents Basin Road (Wallacia)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & JF

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	8781EC
Calibration	**Pre:**	94.1 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-17705-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Wednesday, 14 Sep 2022
Date End	Thursday, 13 Oct 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	< 30 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placement at free field location on a tennis court.

Located at fence line near a field (approx. 150m away from closest building).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	14/09/2022	10:57:18 AM	11:12:18 AM	62	44	46	34	
2	Day	14/09/2022	11:12:18 AM	11:27:18 AM	61	43	47	34	
3	Day	14/09/2022	11:27:18 AM	11:42:18 AM	63	43	46	34	
4	Day	14/09/2022	11:50:24 AM	12:05:24 PM	65	47	50	34	
5	Evening	19/09/2022	6:30:00 PM	6:45:00 PM	54	44	45	42	*
6	Evening	19/09/2022	7:45:00 PM	8:00:00 PM	51	40	42	37	*
7	Evening	19/09/2022	8:30:00 PM	8:45:00 PM	47	40	42	37	*
8	Evening	19/09/2022	9:15:00 PM	9:30:00 PM	47	40	42	37	*
9	Night	21/09/2022	12:00:00 AM	12:15:00 AM	46	40	42	36	*
10	Night	21/09/2022	2:15:00 AM	2:30:00 AM	44	38	40	35	*
11	Night	21/09/2022	4:30:00 AM	4:45:00 AM	45	36	39	33	*
12	Night	21/09/2022	6:30:00 AM	6:45:00 AM	65	45	47	39	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird noise. Distant mechanical noise, possibly lawn mower, observed approx. 80% of monitoring period. Constant noise of small low flying agricultural planes at distance audible for half the monitoring period. Several commercial aircraft flying overhead at an approx. duration of 30 sec to 1 min and with maximum sound levels in the range of 36 to 60 dBA.
Background noise	Distant traffic. Small low flying agricultural planes at distance present for half the monitoring period.
Evening	
Ambient noise	Various intermittent animal sounds (e.g. intermittent frogs/toads, birds, and dog barks). Several aircraft flying overhead with approximate duration of 30 sec to 1 min and with maximum sound levels of 43 to 57 dBA.
Background noise	Constant insect noise. Distant traffic. Movement in vegetation induced by wind (e.g. grass and trees rustling).
Night	
Ambient noise	Occasional vehicles passbys. Intermittent bird noise, dog barks and roosters crowing nearby.
Background noise	Constant insect and bird noise. Distant traffic. Movement in vegetation induced by wind (e.g. grass and trees rustling).

Site Details	M21 - 680 Bents Basin Road (Wallacia)
Start Date	Wed 14 September 2022
End Date	Thu 13 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	63
$L_{eq, Evening}$ dBA	51
$L_{eq, Night}$ dBA	47
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	44
RBL, $_{Night}$ dBA	38

Daily Summary

Date	14/09	15/09	16/09	17/09	18/09	19/09	20/09	21/09
$L_{eq, Day}$ dBA	48	44	47	47	51	45	47	53
$L_{eq, Evening}$ dBA	40	43	47	44	43	42	41	47
$L_{eq, Night}$ dBA	42	43	45	43	43	43	43	46
ABL, $_{Day}$ dBA	33	34	35	35	34	33	36	36
ABL, $_{Evening}$ dBA	34	40	42	41	38	36	35	43
ABL, $_{Night}$ dBA	33	34	35	38	35	33	33	38

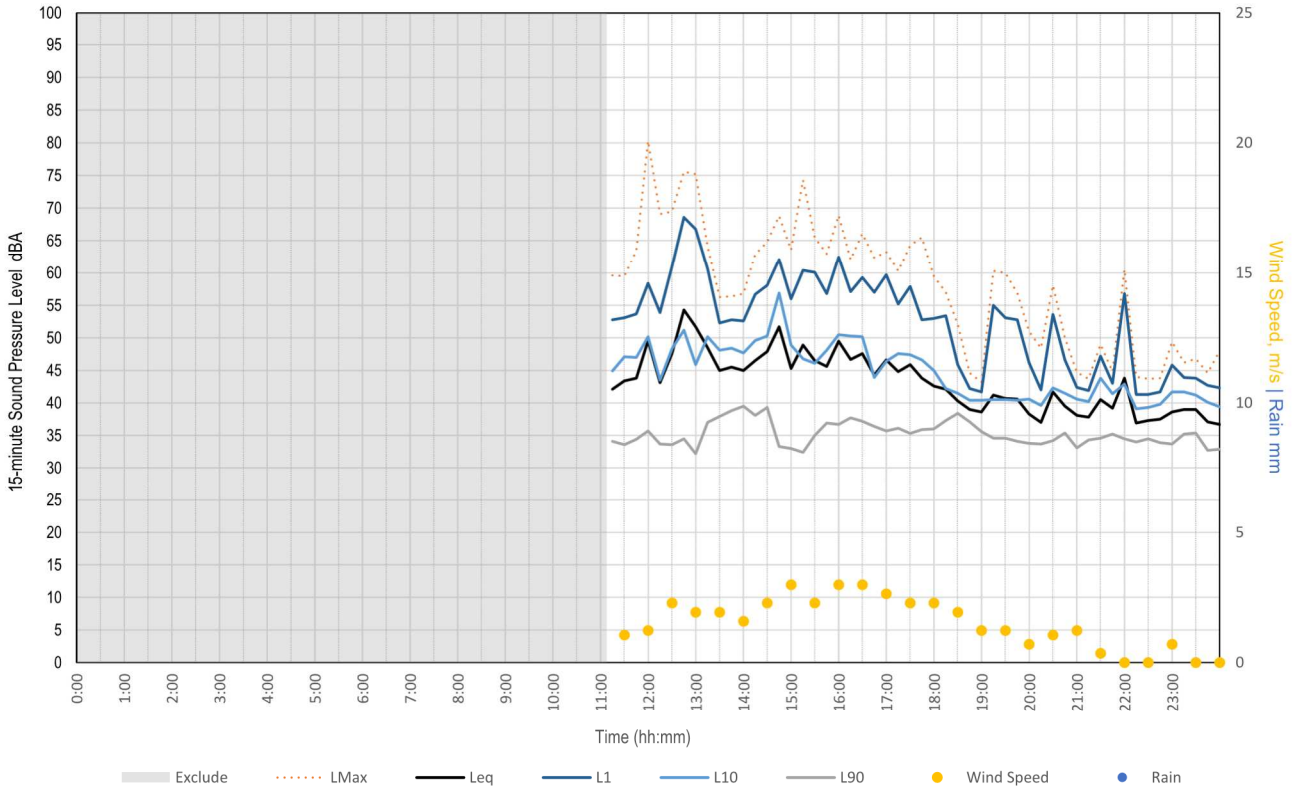
Date	22/09	23/09	24/09	25/09	26/09	27/09	28/09	29/09
$L_{eq, Day}$ dBA	44	45	48	59	46	45	47	78
$L_{eq, Evening}$ dBA	52	53	52	50	46	47	49	49
$L_{eq, Night}$ dBA	49	49	47	44	44	47	47	47
ABL, $_{Day}$ dBA	36	37	36	36	34	34	34	39
ABL, $_{Evening}$ dBA	46	50	48	40	38	41	45	46
ABL, $_{Night}$ dBA	39	40	38	35	34	34	38	41

Date	30/09	01/10	02/10	03/10	04/10	05/10	06/10	07/10
$L_{eq, Day}$ dBA	49	44	47	48	46	48	46	47
$L_{eq, Evening}$ dBA	48	48	46	45	47	49	53	55
$L_{eq, Night}$ dBA	47	46	44	42	42	48	49	51
ABL, $_{Day}$ dBA	40	36	36	34	35	38	37	38
ABL, $_{Evening}$ dBA	44	44	39	35	39	45	50	51
ABL, $_{Night}$ dBA	39	39	34	32	36	40	41	41

Date	08/10	09/10	10/10	11/10	12/10	13/10
$L_{eq, Day}$ dBA	47	45	48	46	49	46
$L_{eq, Evening}$ dBA	58	52	52	53	54	54
$L_{eq, Night}$ dBA	51	49	48	48	47	51
ABL, $_{Day}$ dBA	37	37	36	36	37	38
ABL, $_{Evening}$ dBA	56	49	48	48	48	46
ABL, $_{Night}$ dBA	43	40	40	40	39	48

Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

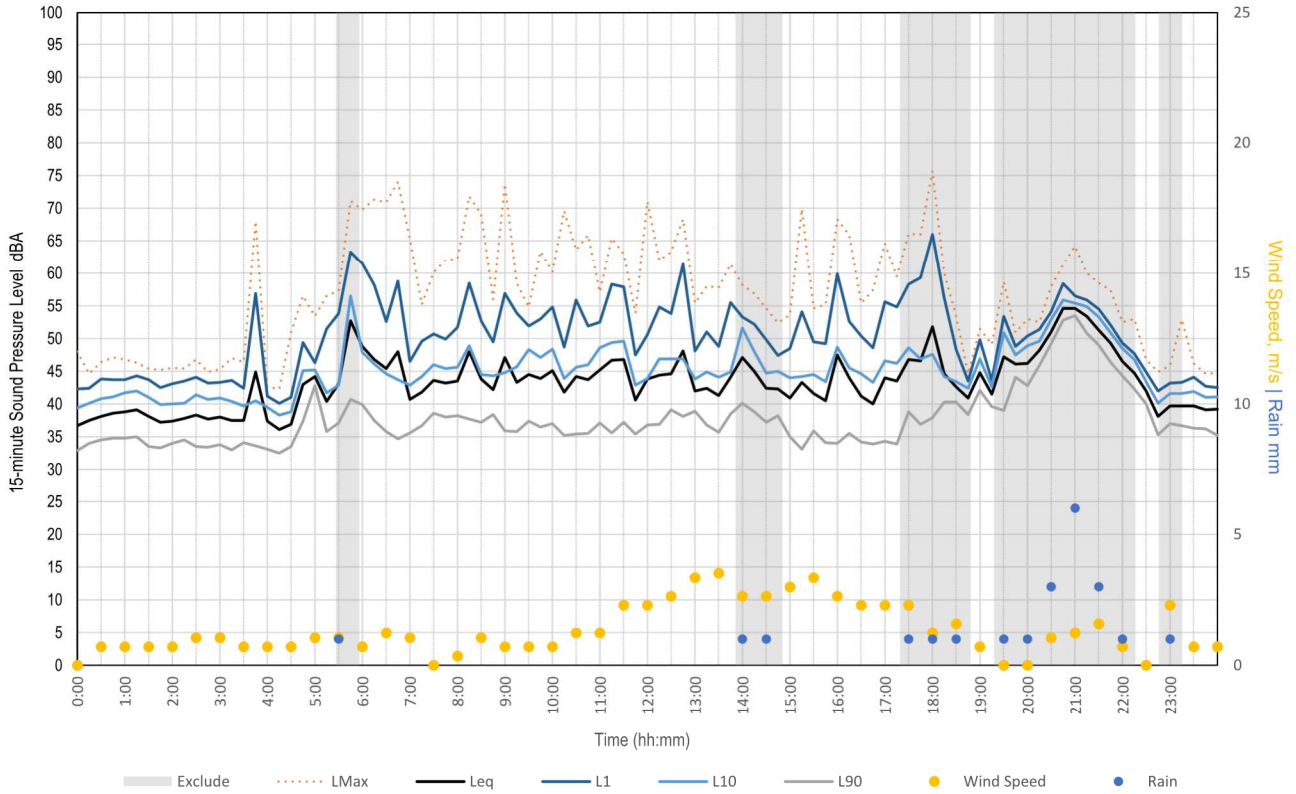
Wednesday, 14 September 2022



Noise Logger Results

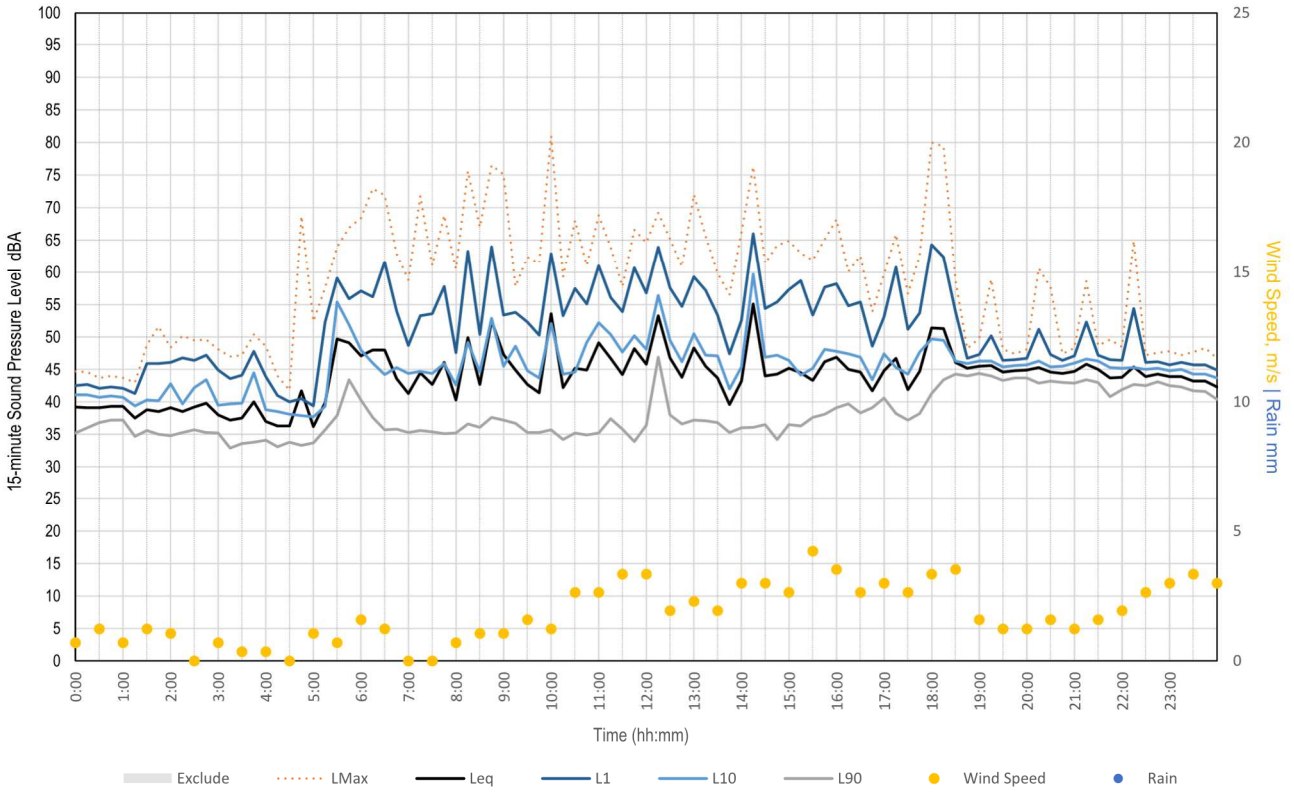
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Thursday, 15 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

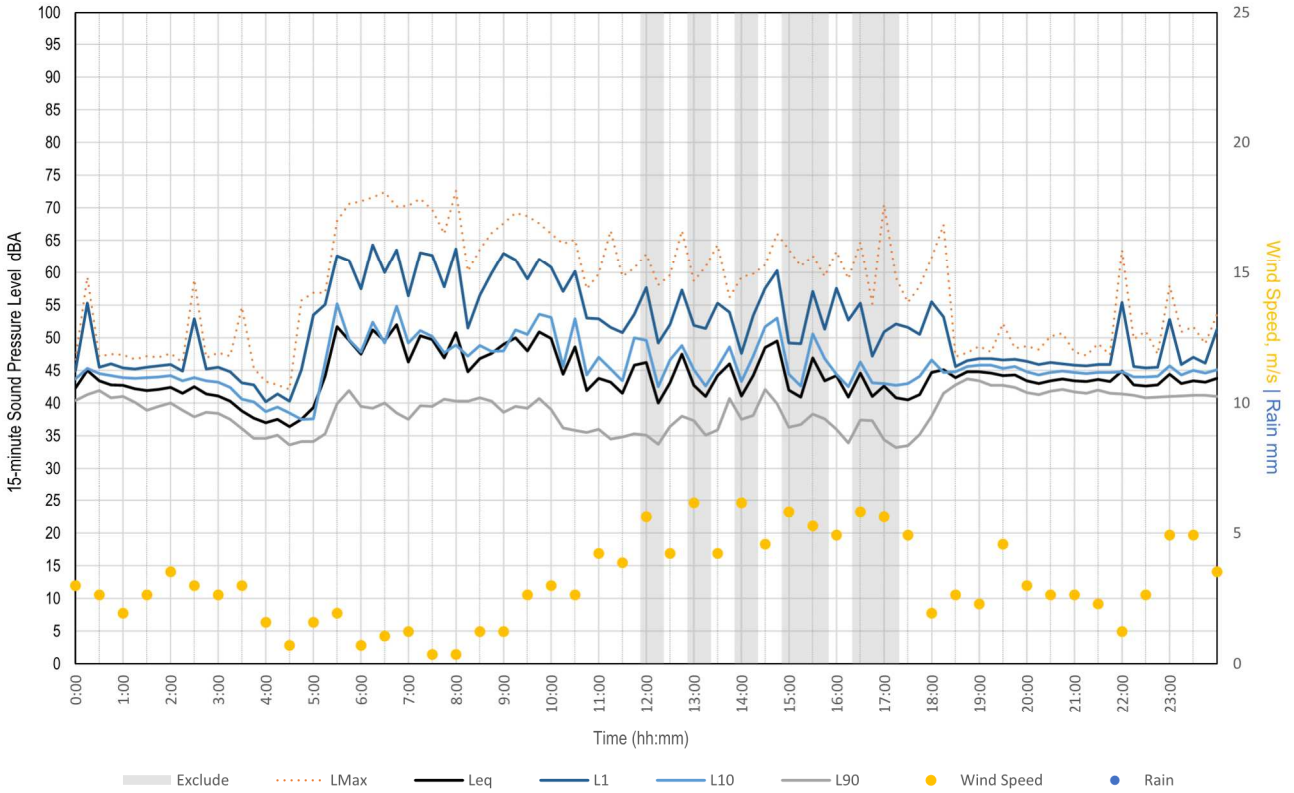
Friday, 16 September 2022



Noise Logger Results

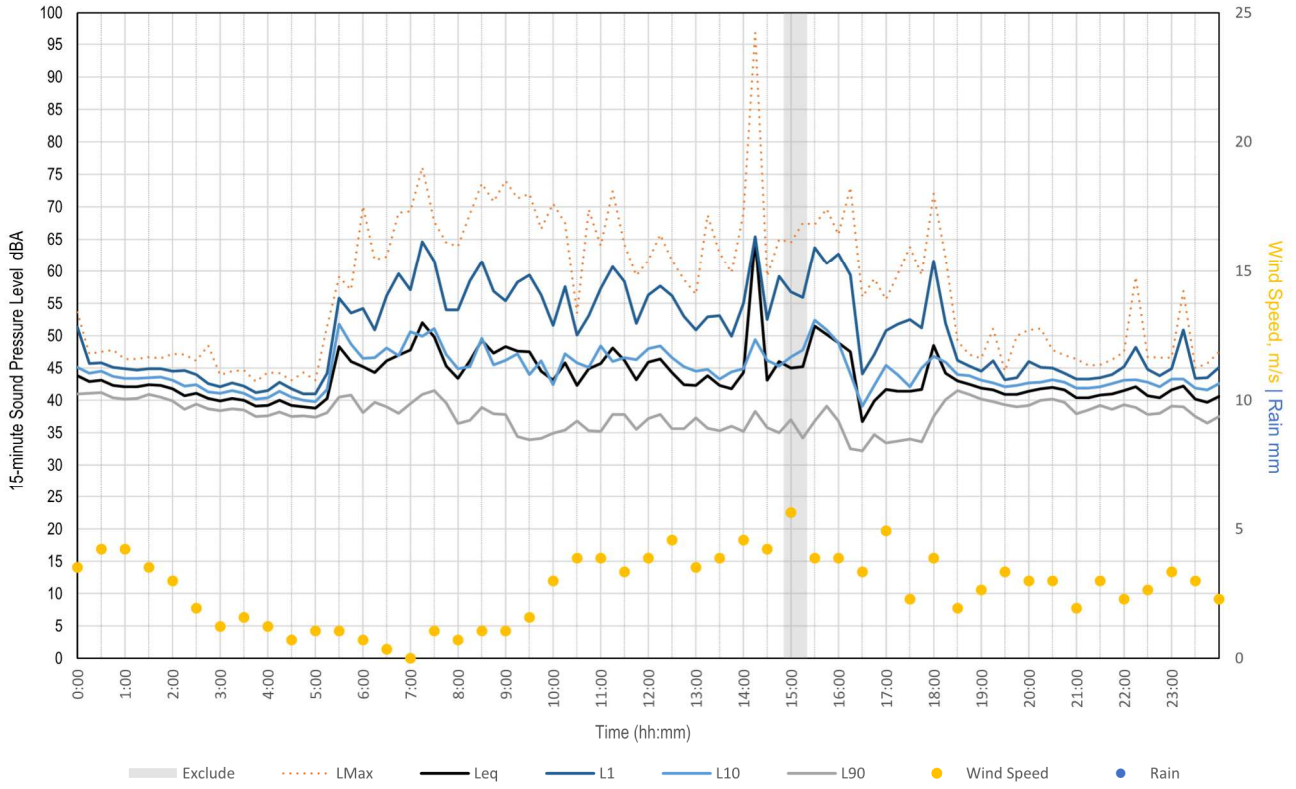
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Saturday, 17 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

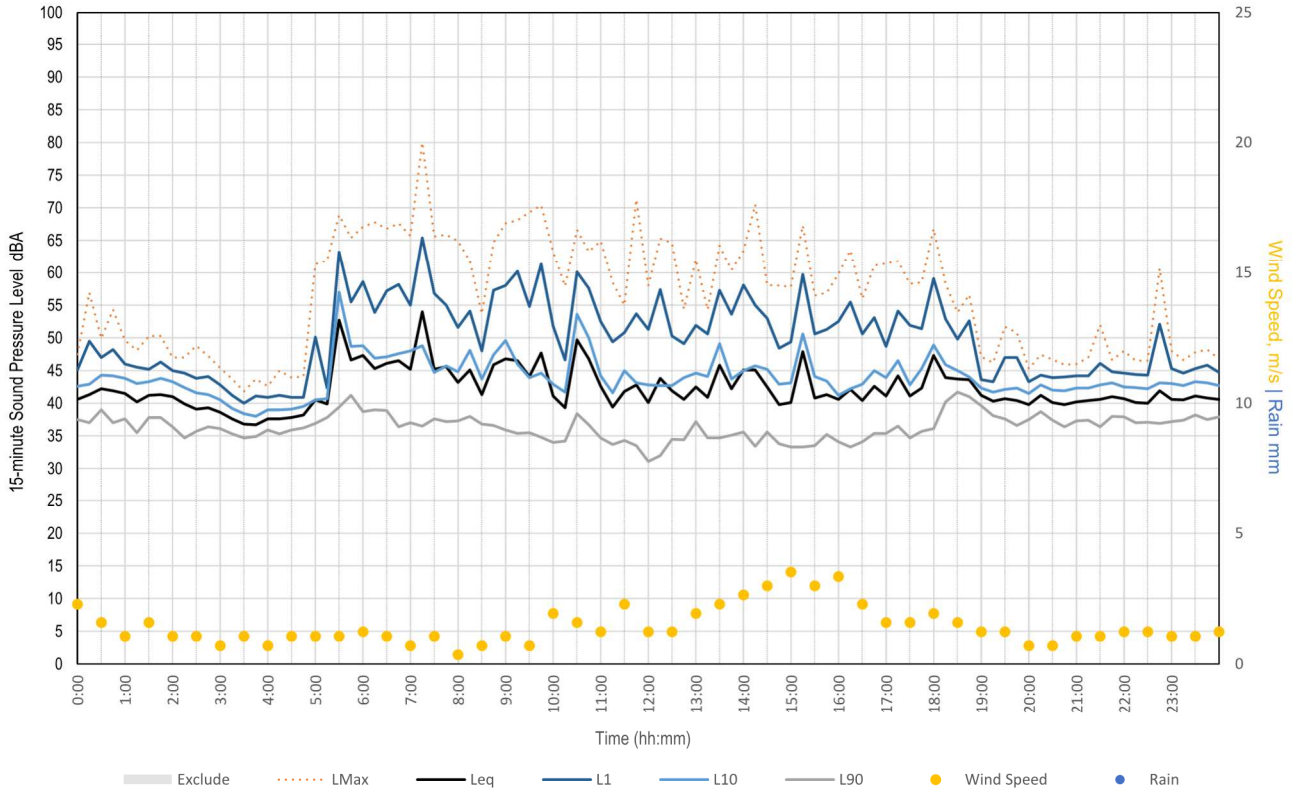
Sunday, 18 September 2022



Noise Logger Results

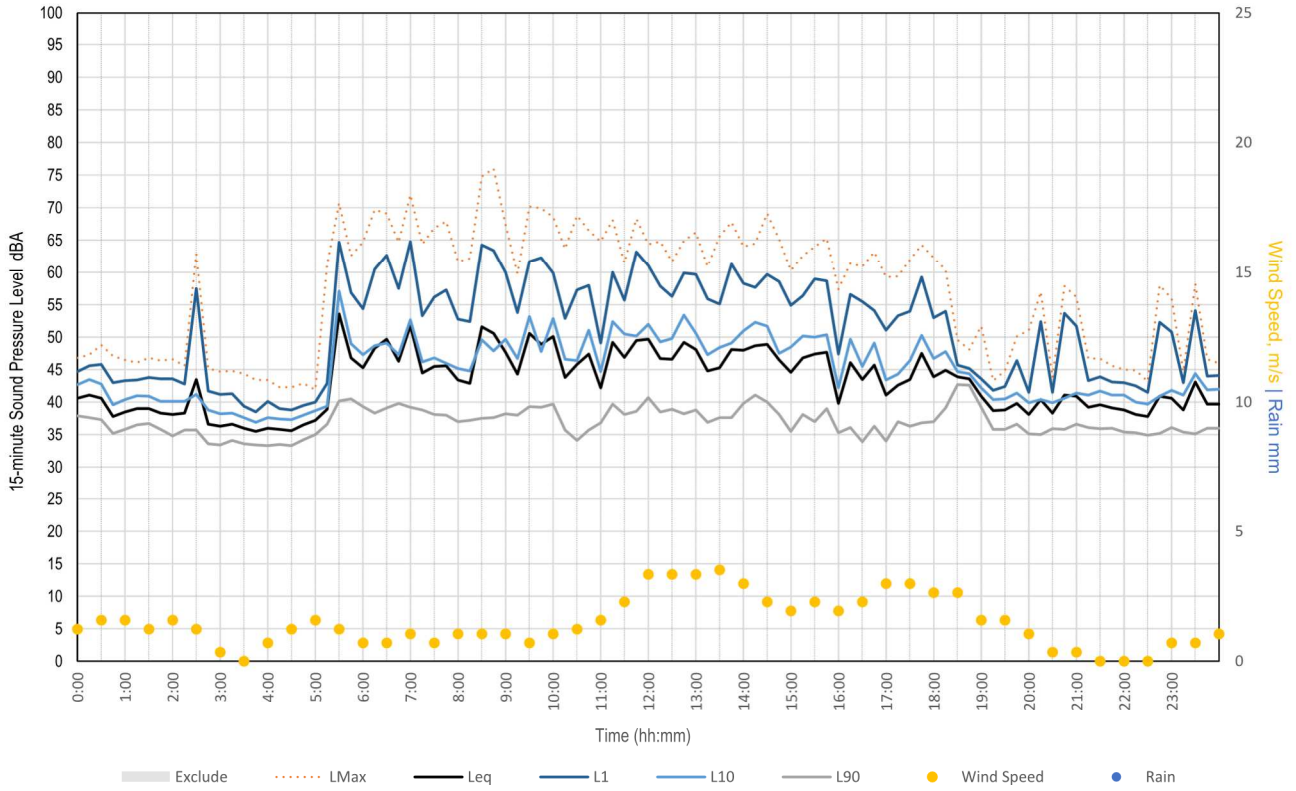
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Monday, 19 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

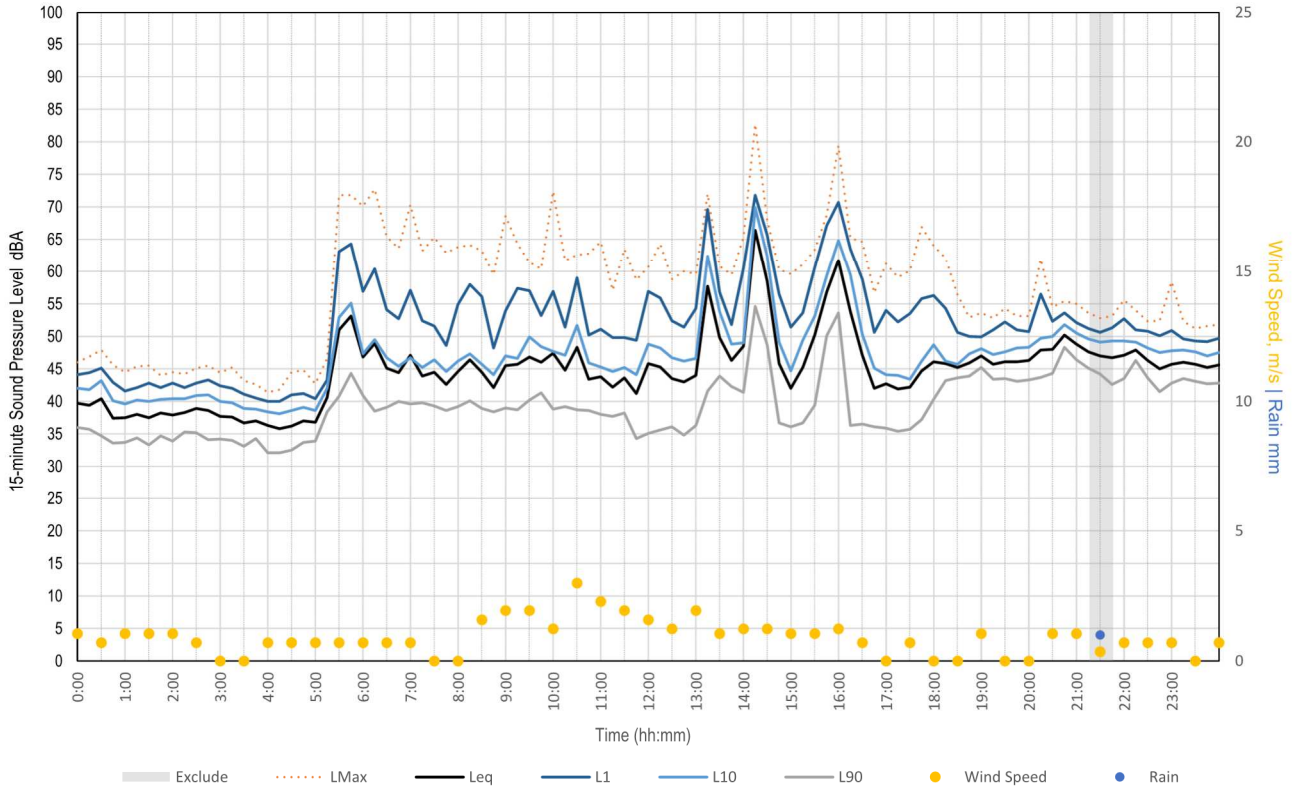
Tuesday, 20 September 2022



Noise Logger Results

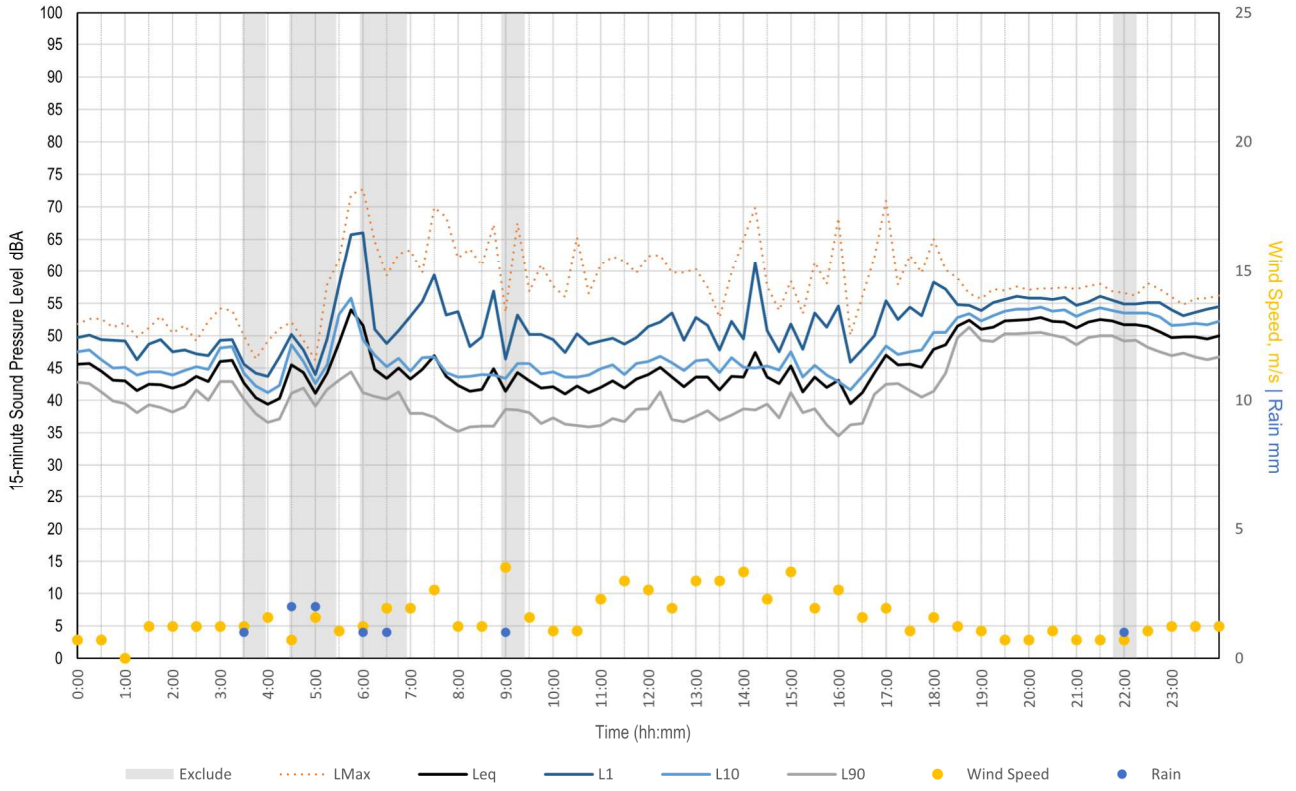
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Wednesday, 21 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

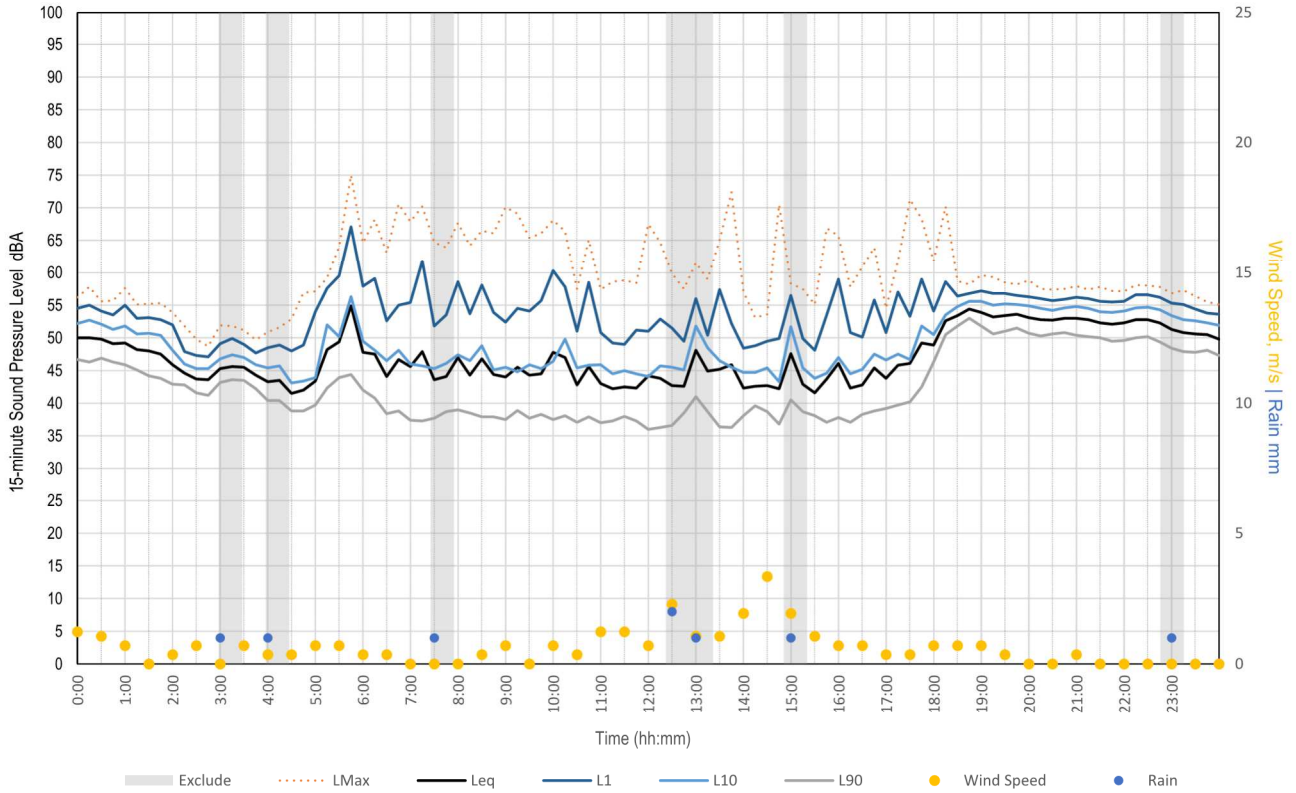
Thursday, 22 September 2022



Noise Logger Results

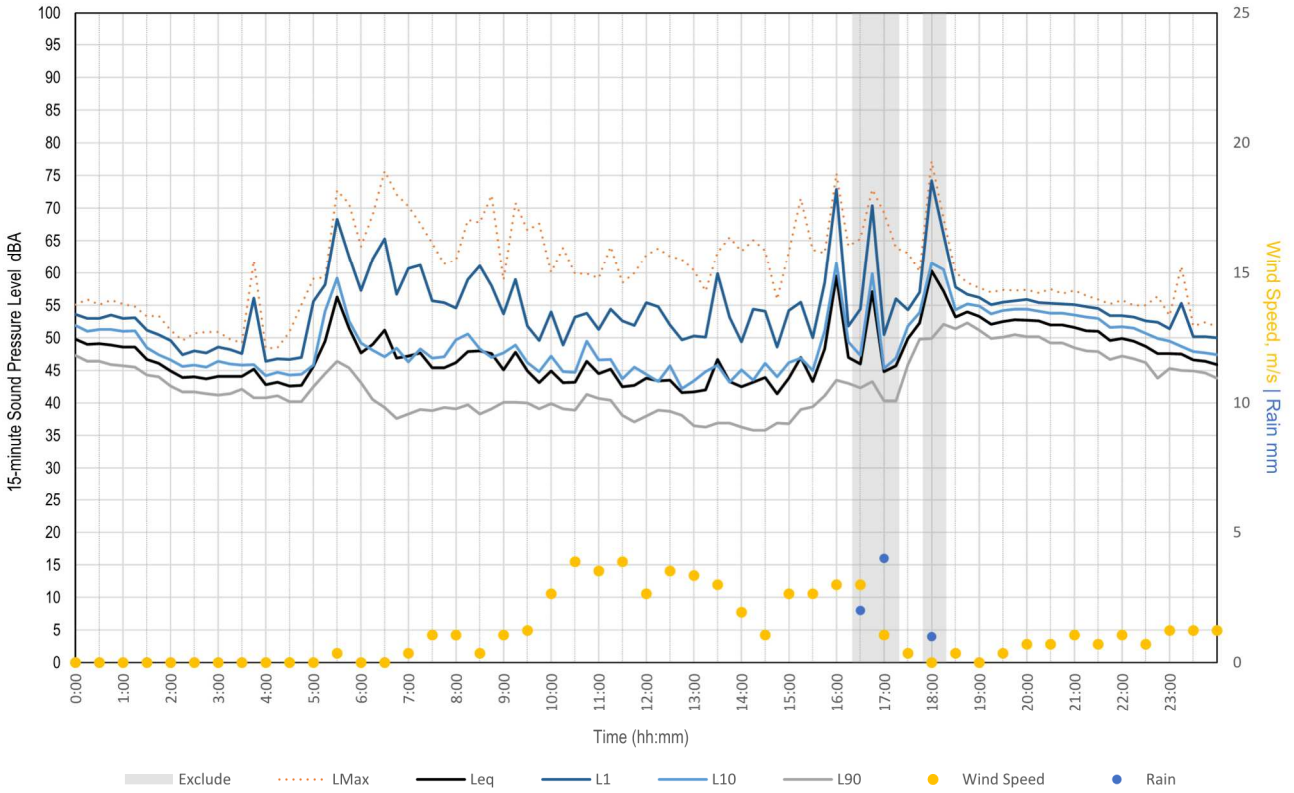
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Friday, 23 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

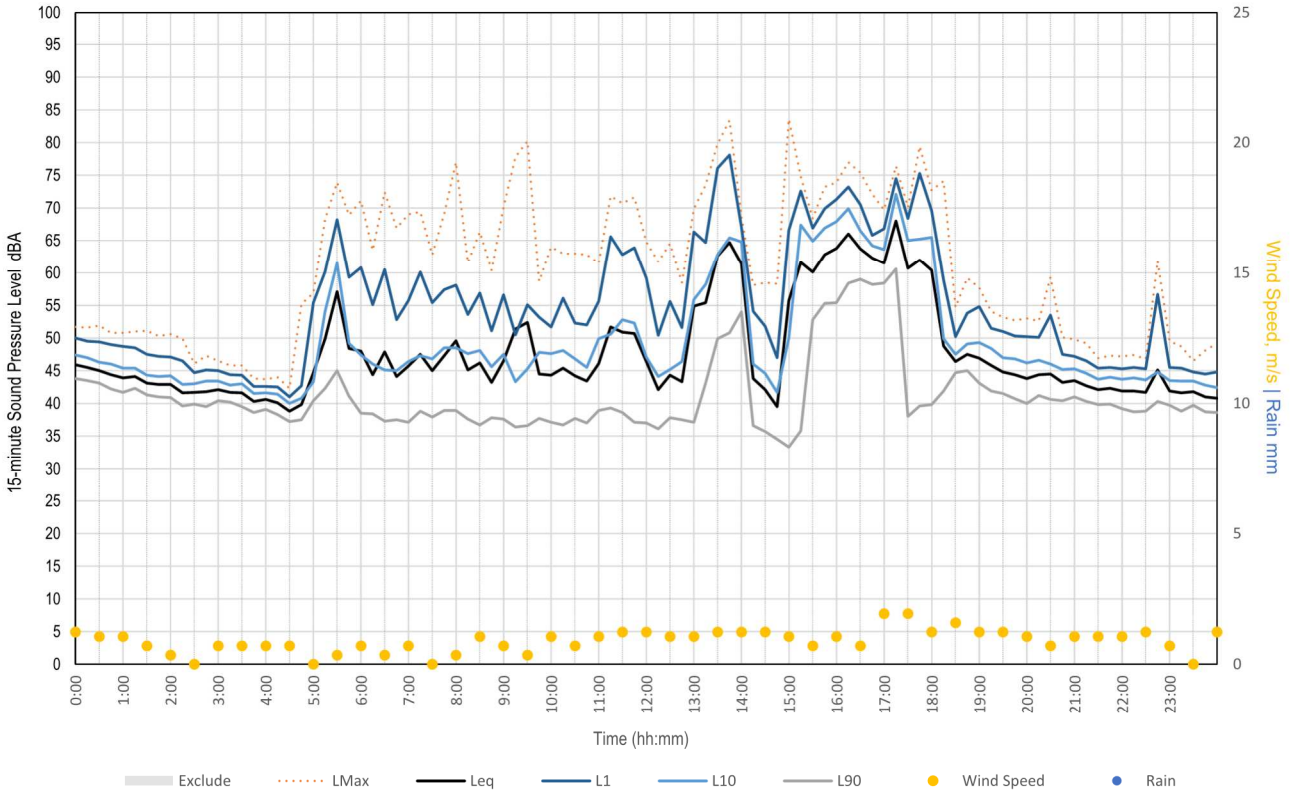
Saturday, 24 September 2022



Noise Logger Results

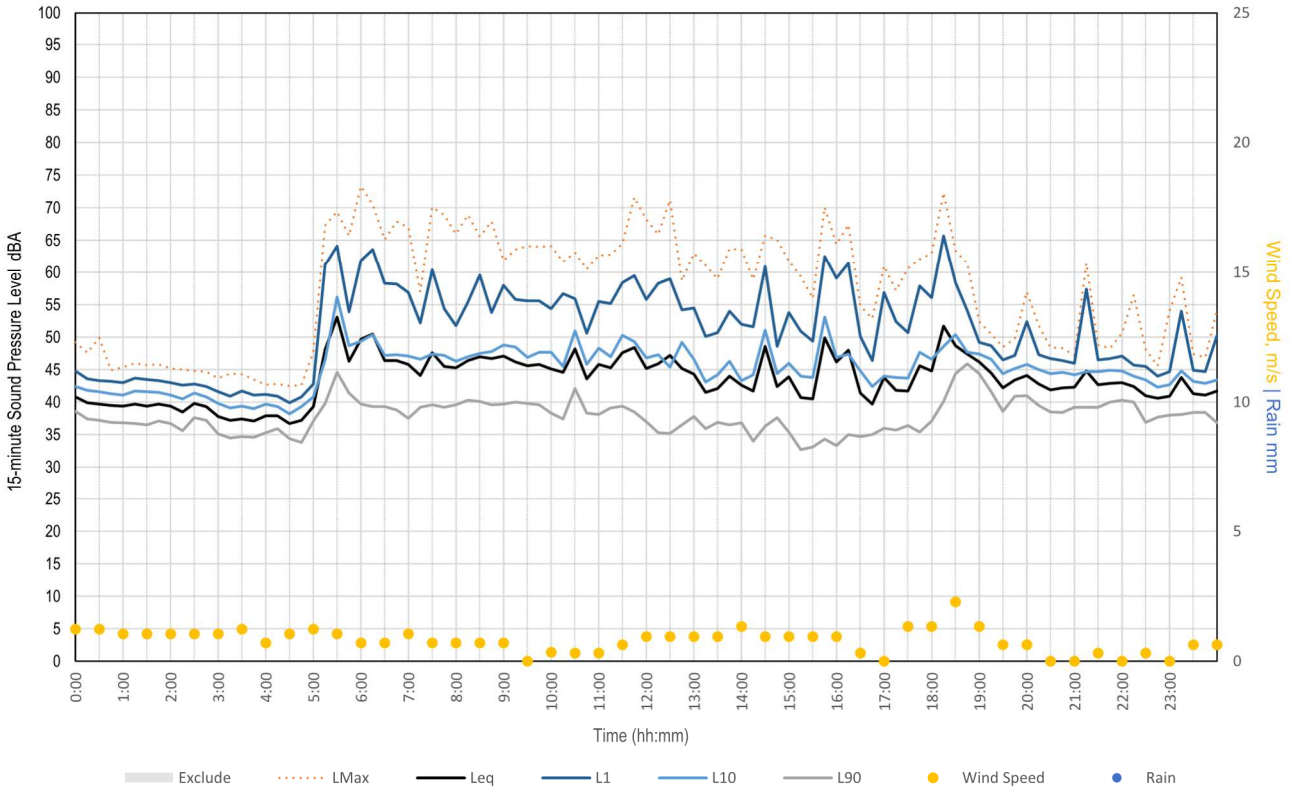
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Sunday, 25 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

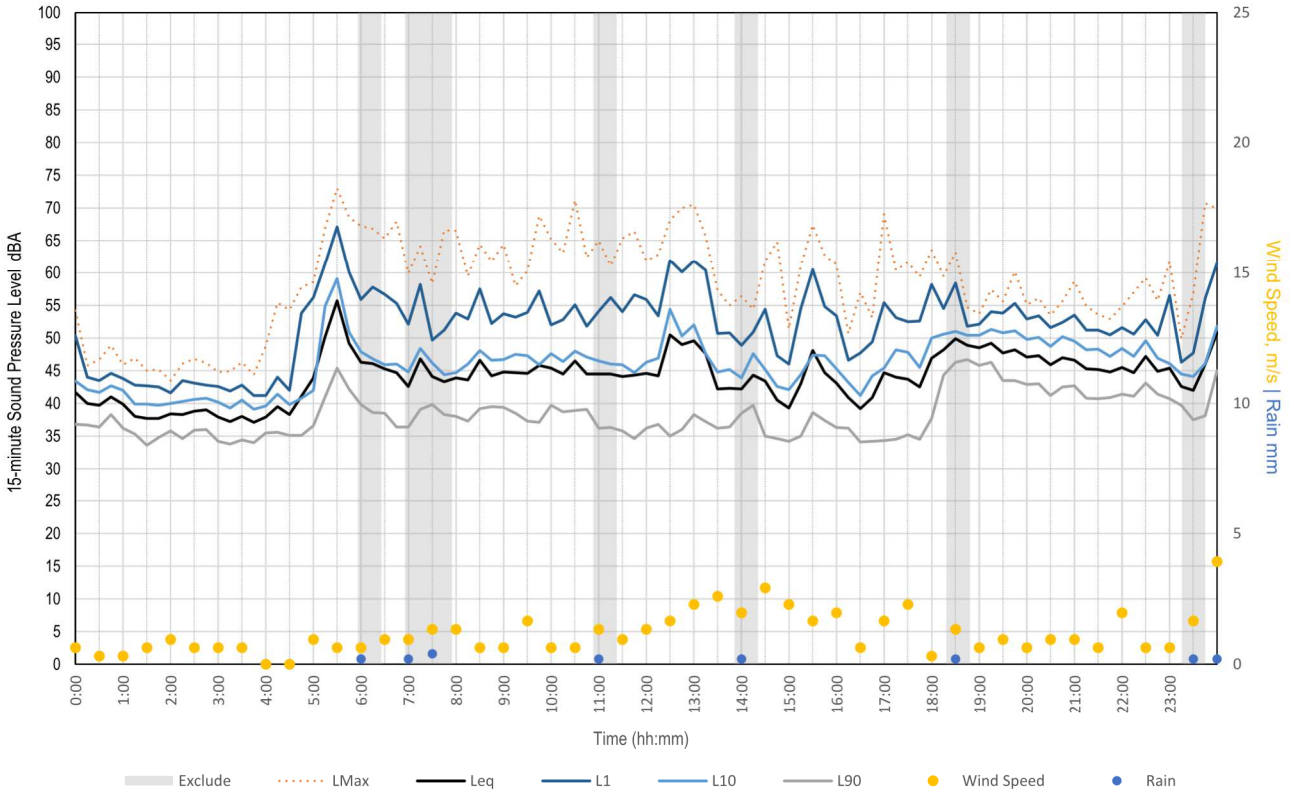
Monday, 26 September 2022



Noise Logger Results

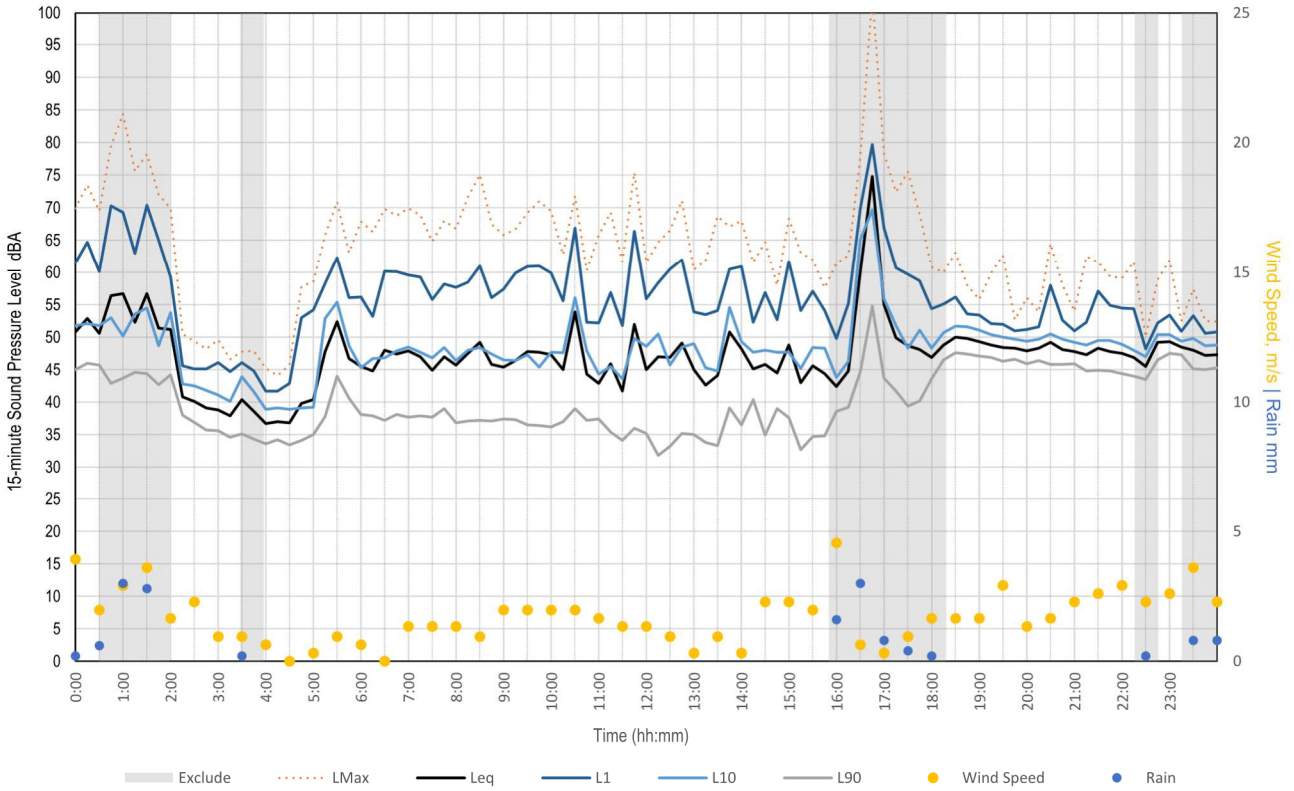
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Tuesday, 27 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

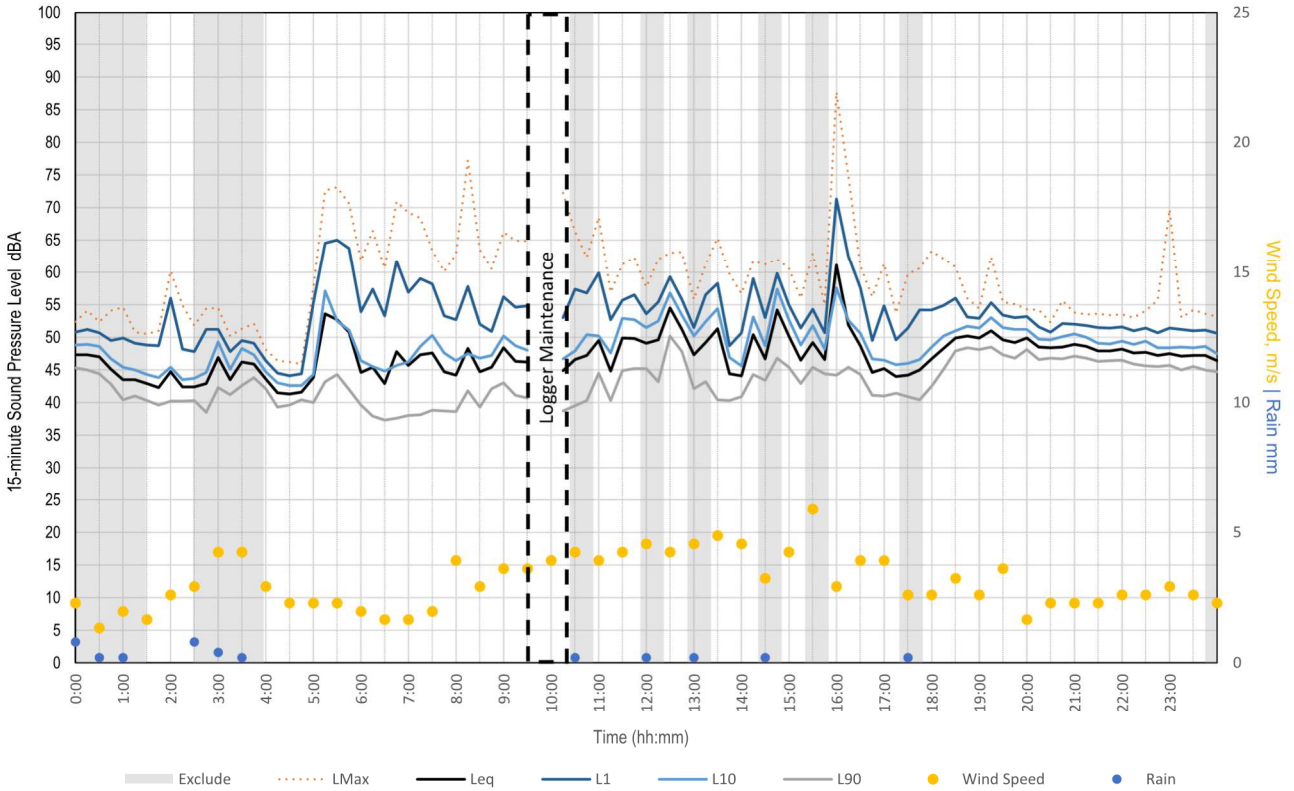
Wednesday, 28 September 2022



Noise Logger Results

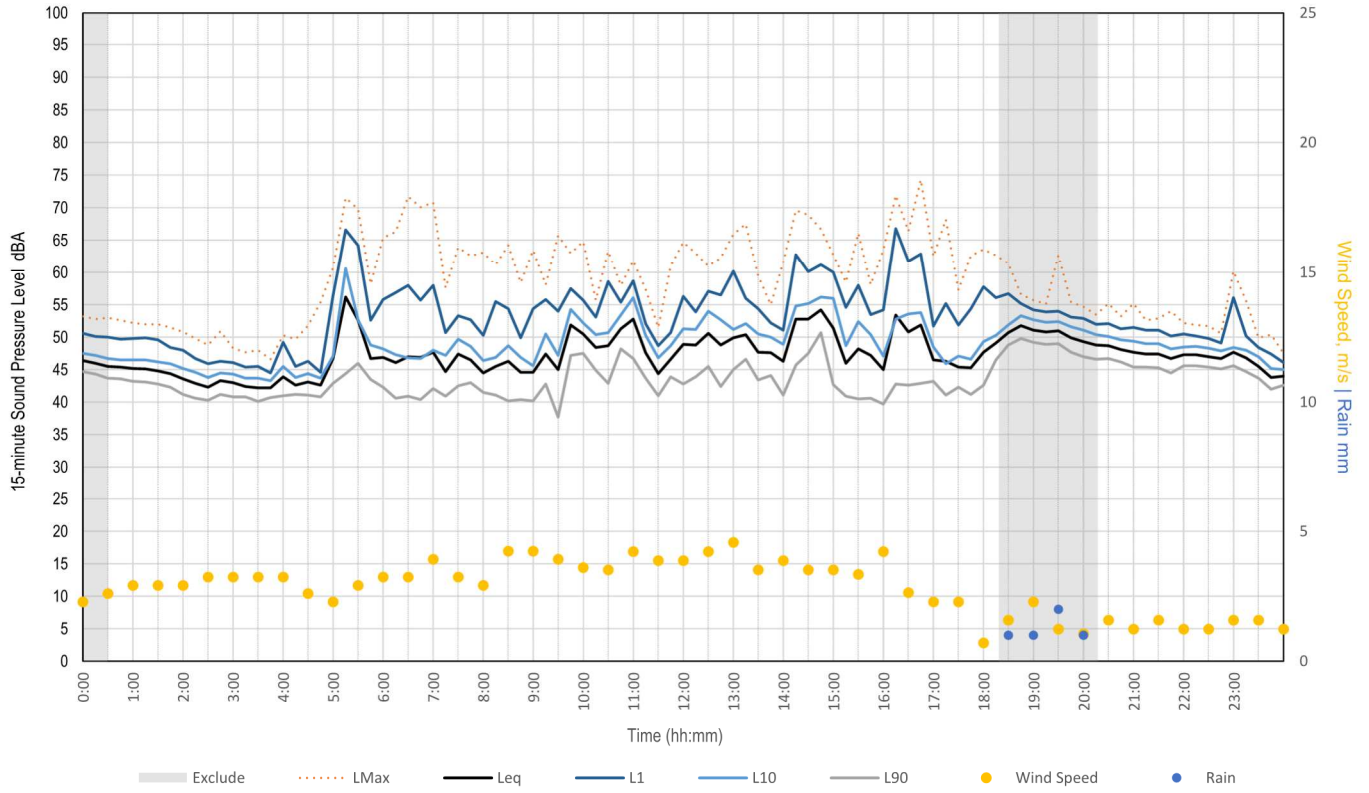
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Thursday, 29 September 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

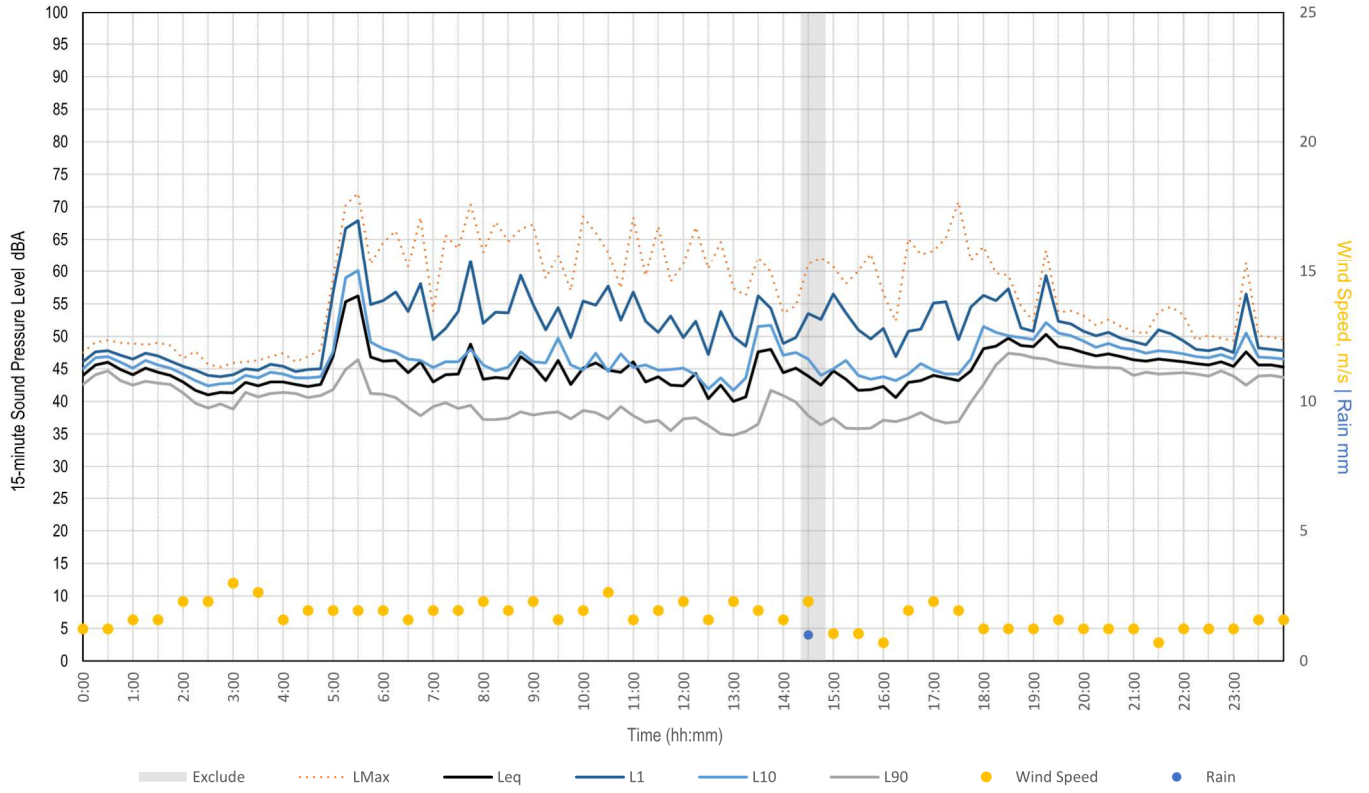
Friday, 30 September 2022



Noise Logger Results

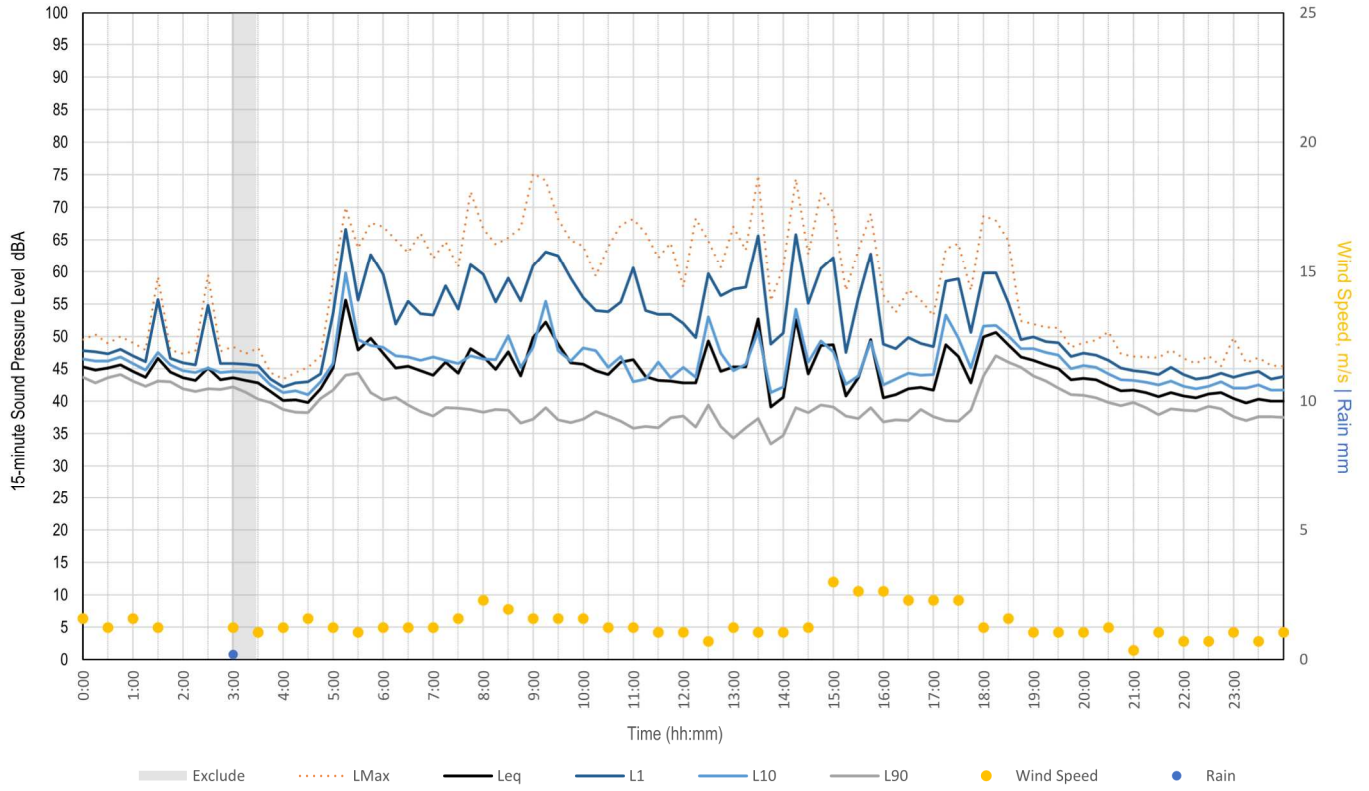
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Saturday, 01 October 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

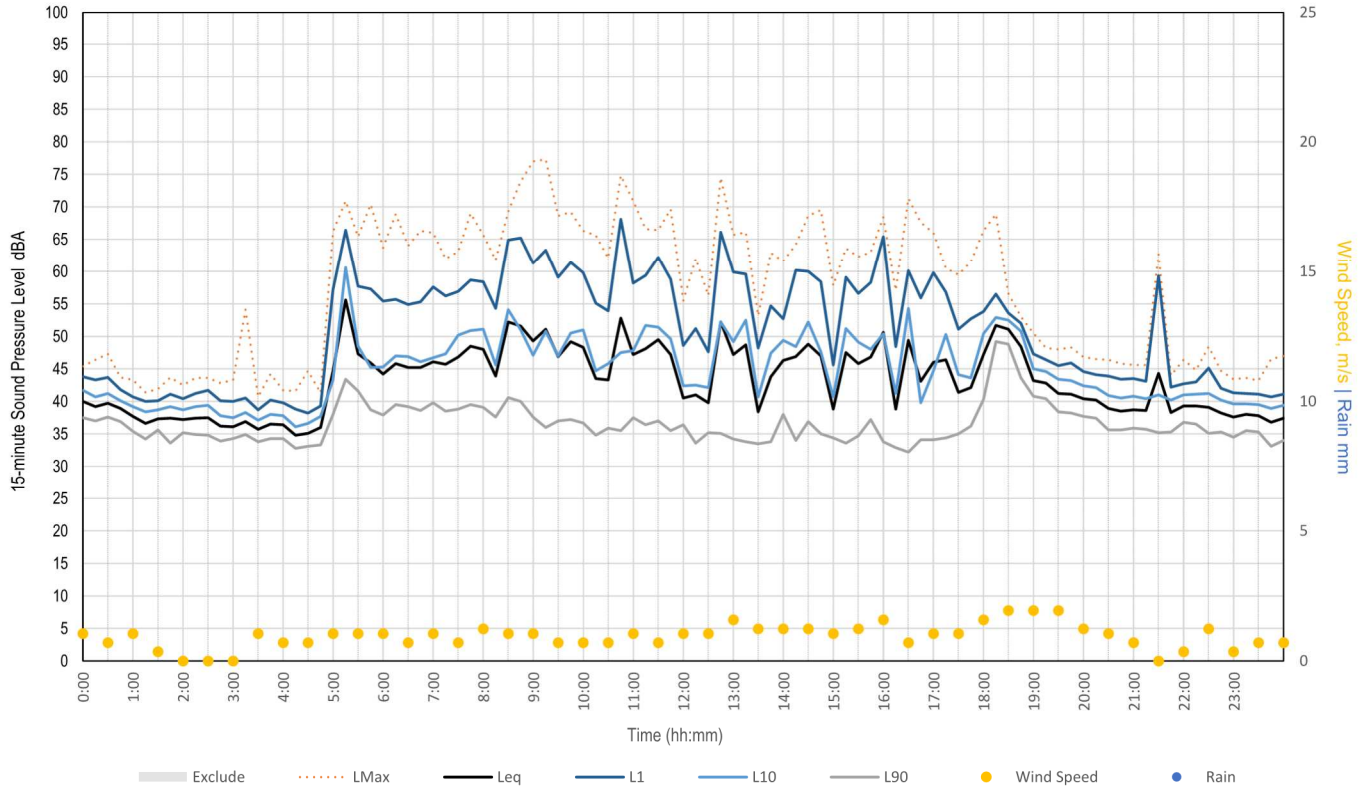
Sunday, 02 October 2022



Noise Logger Results

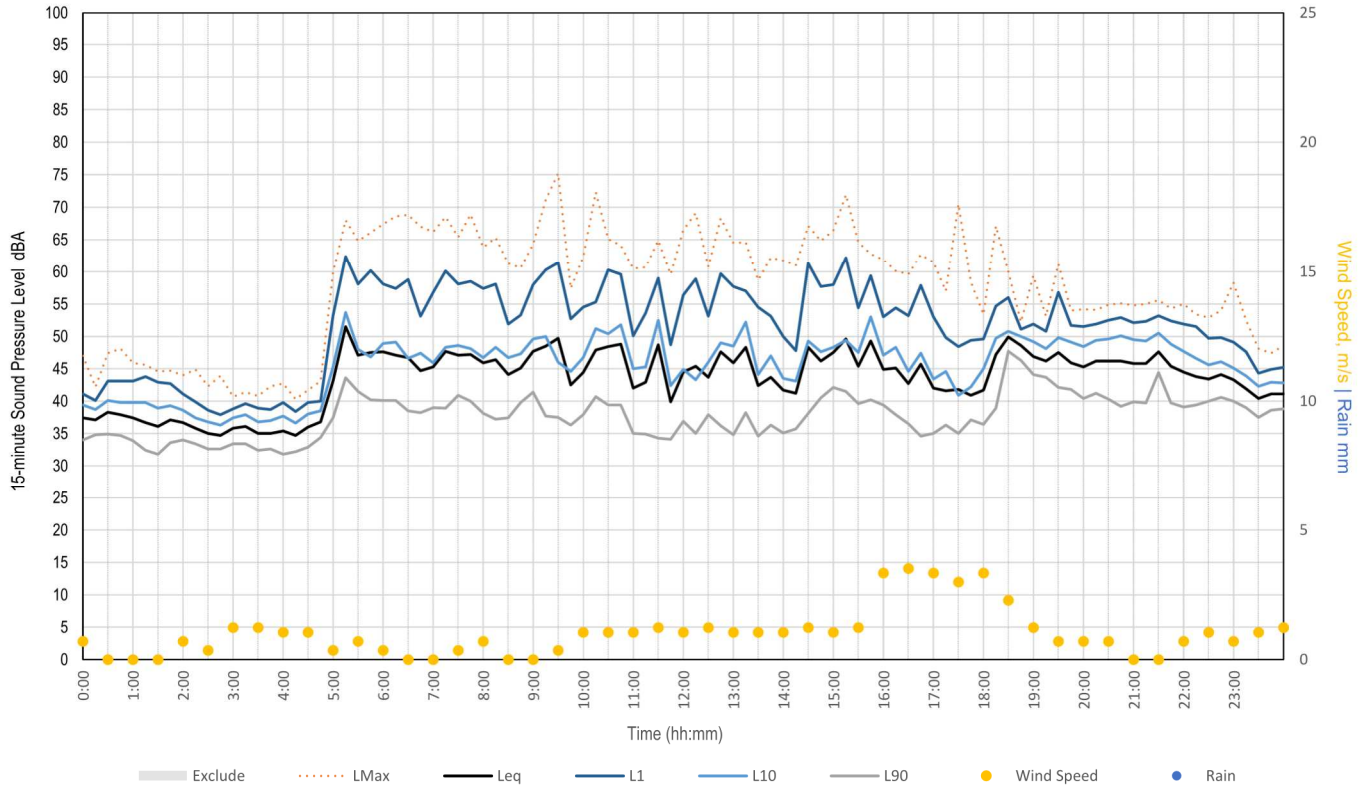
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Monday, 03 October 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

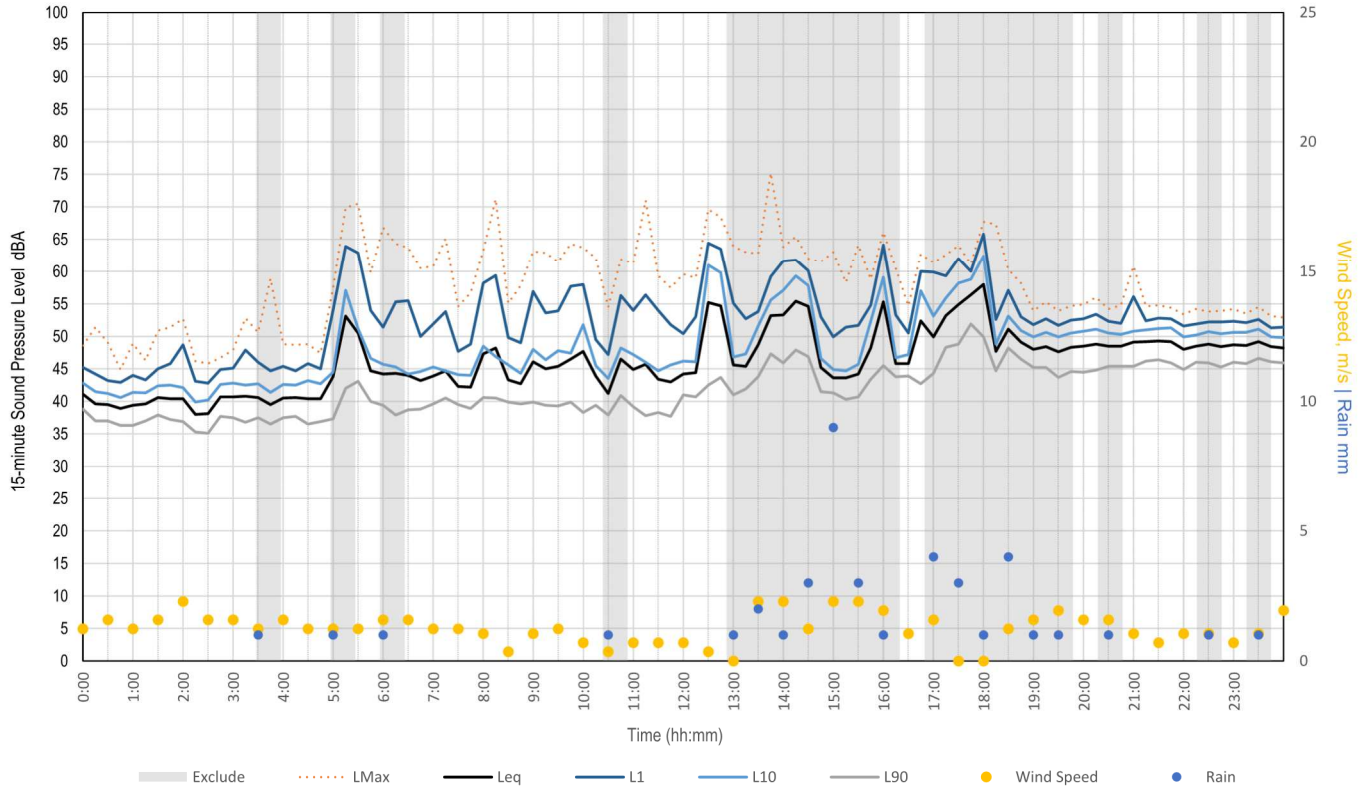
Tuesday, 04 October 2022



Noise Logger Results

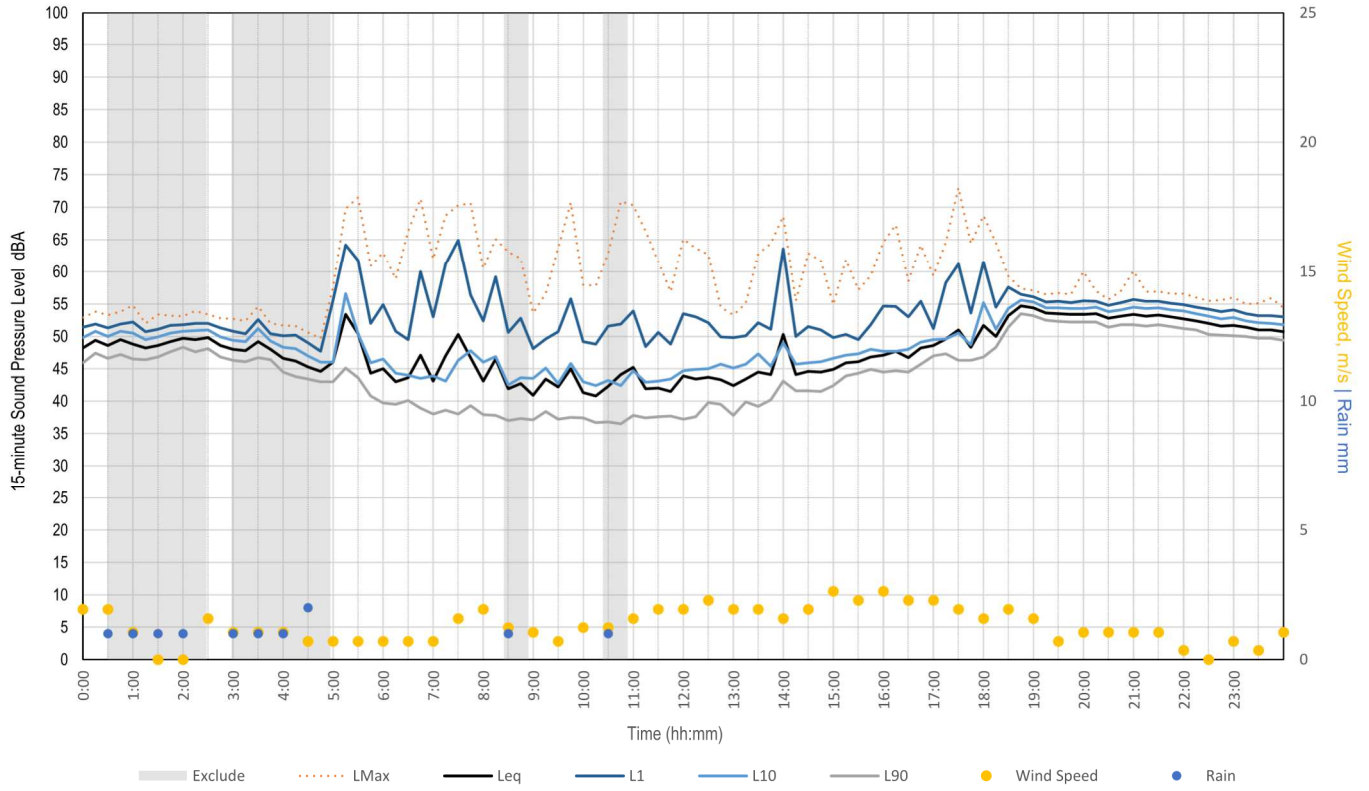
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Wednesday, 05 October 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

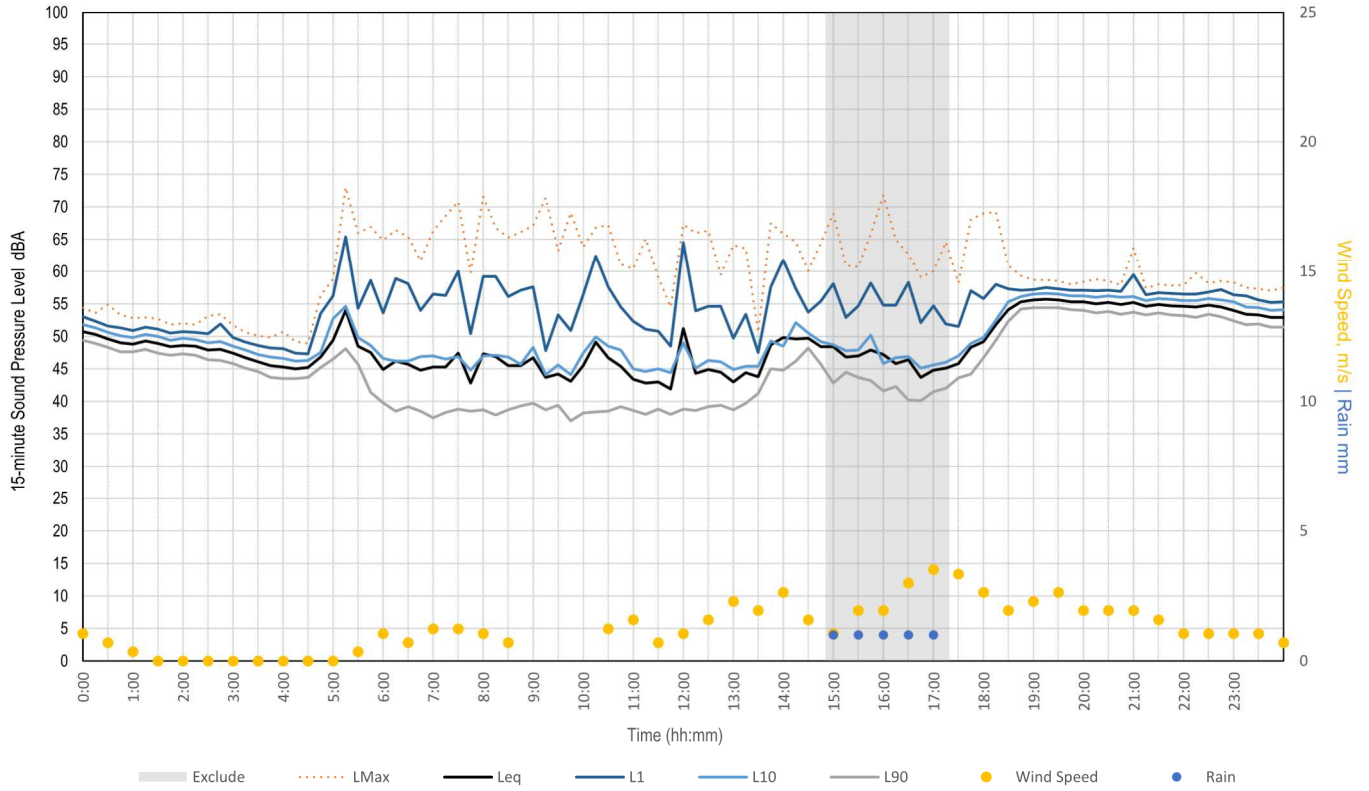
Thursday, 06 October 2022



Noise Logger Results

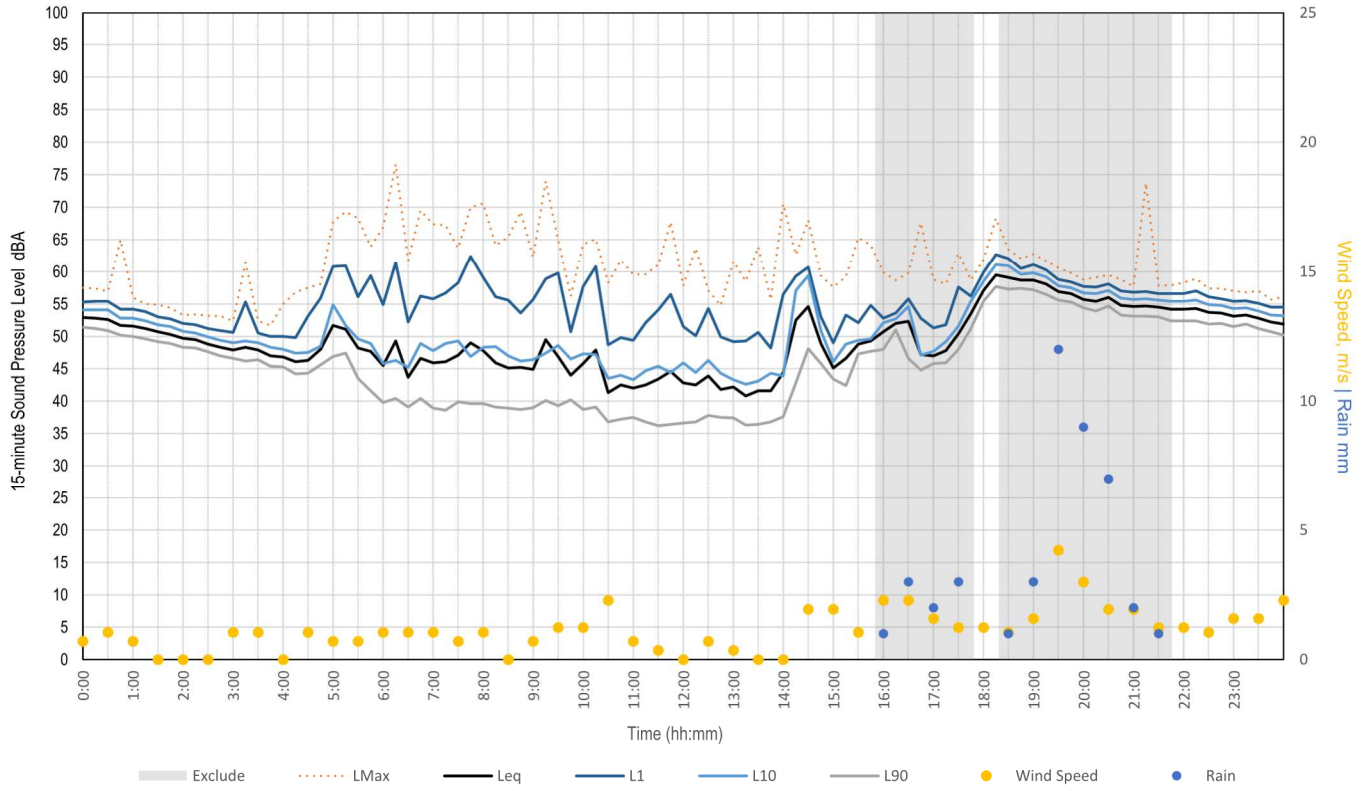
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Friday, 07 October 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

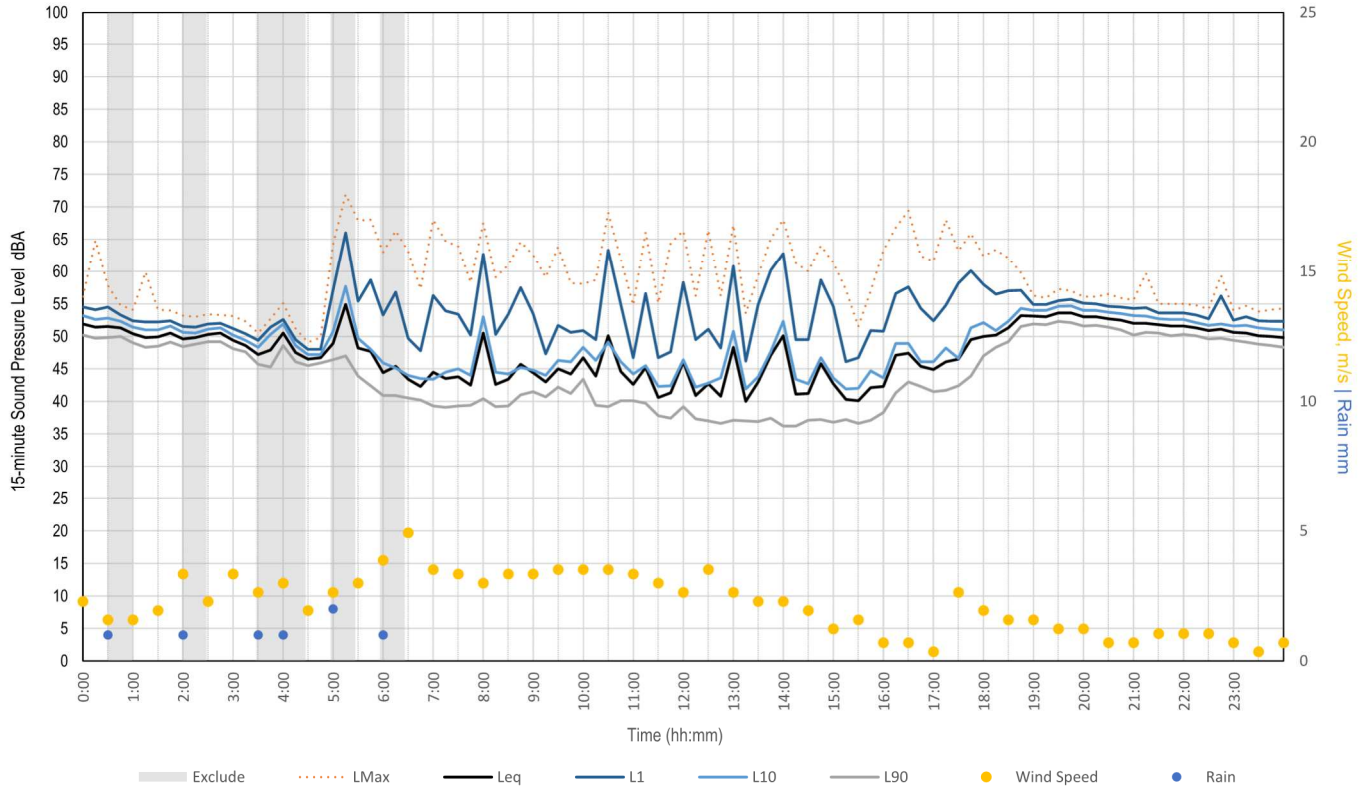
Saturday, 08 October 2022



Noise Logger Results

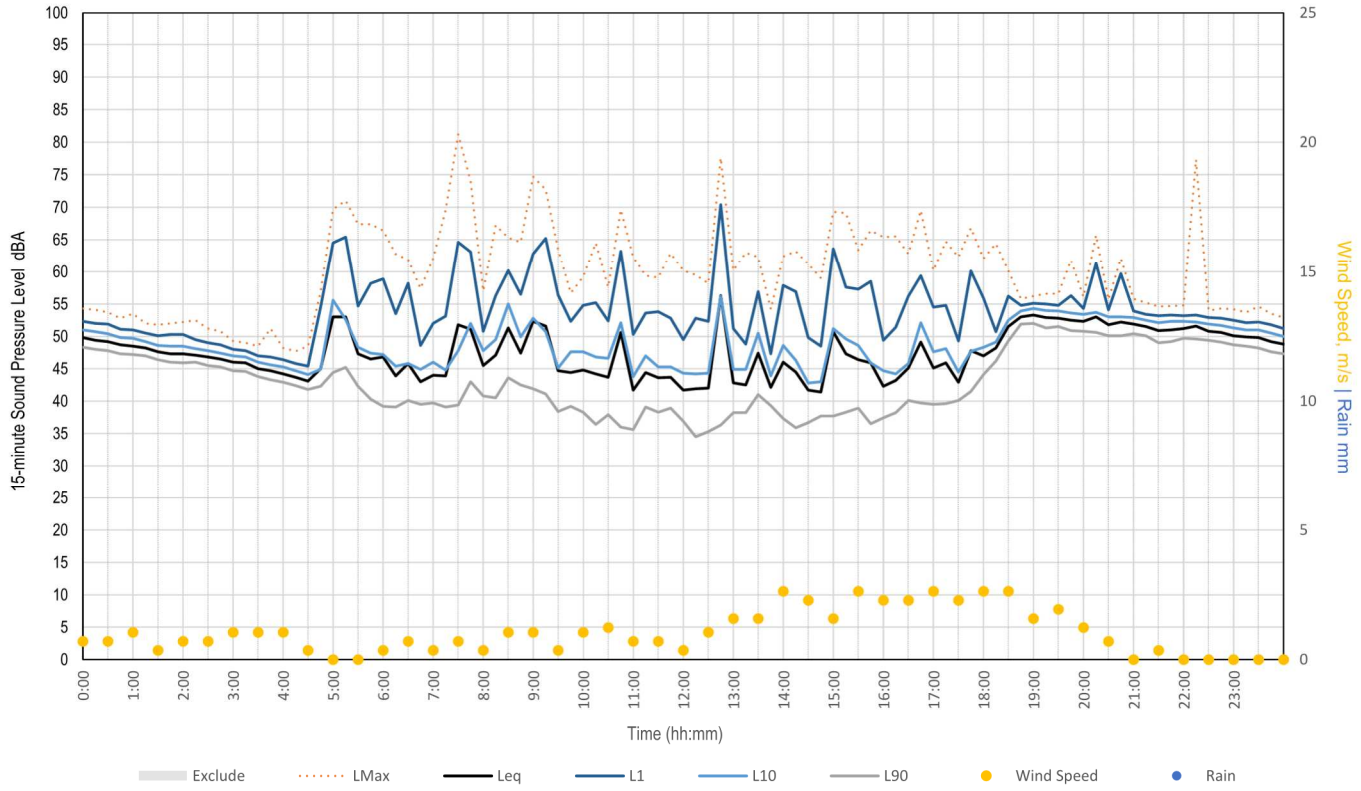
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Sunday, 09 October 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

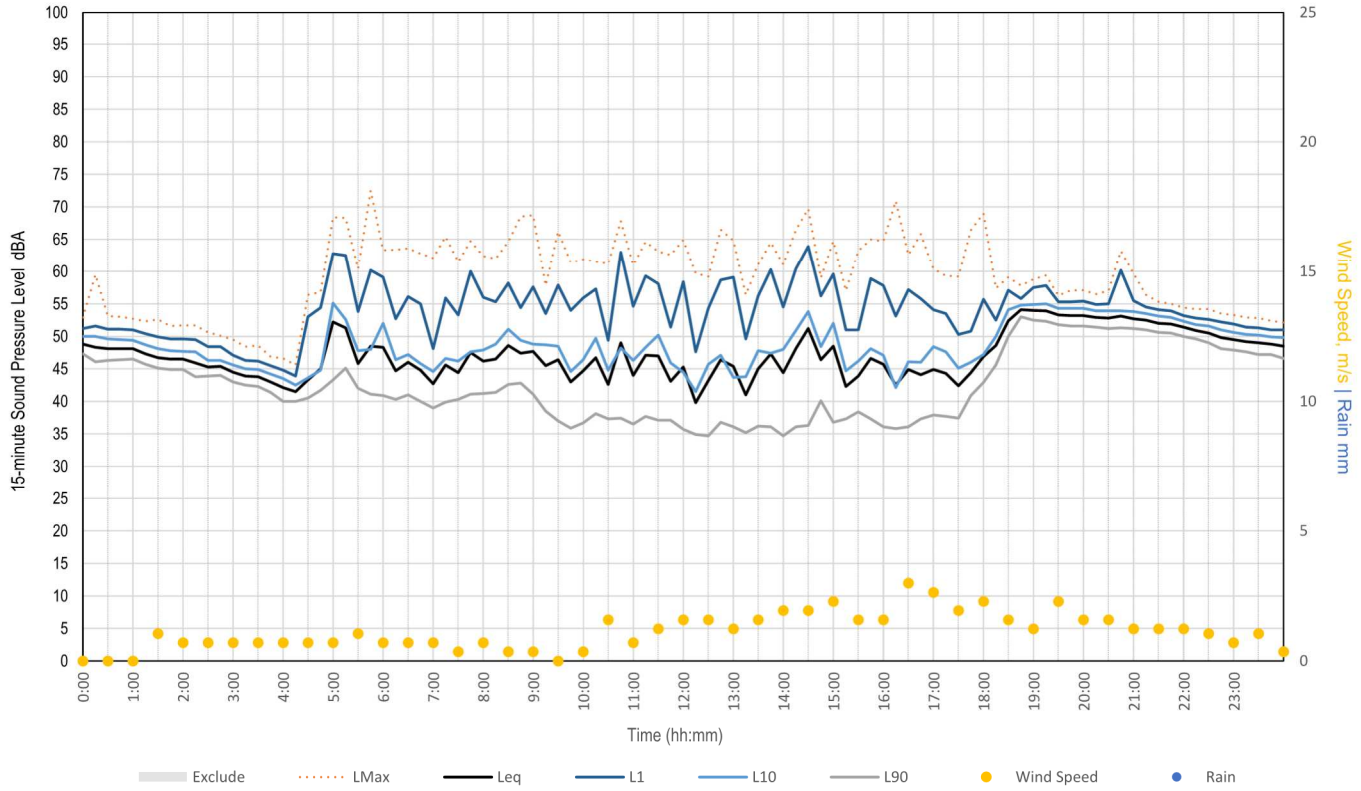
Monday, 10 October 2022



Noise Logger Results

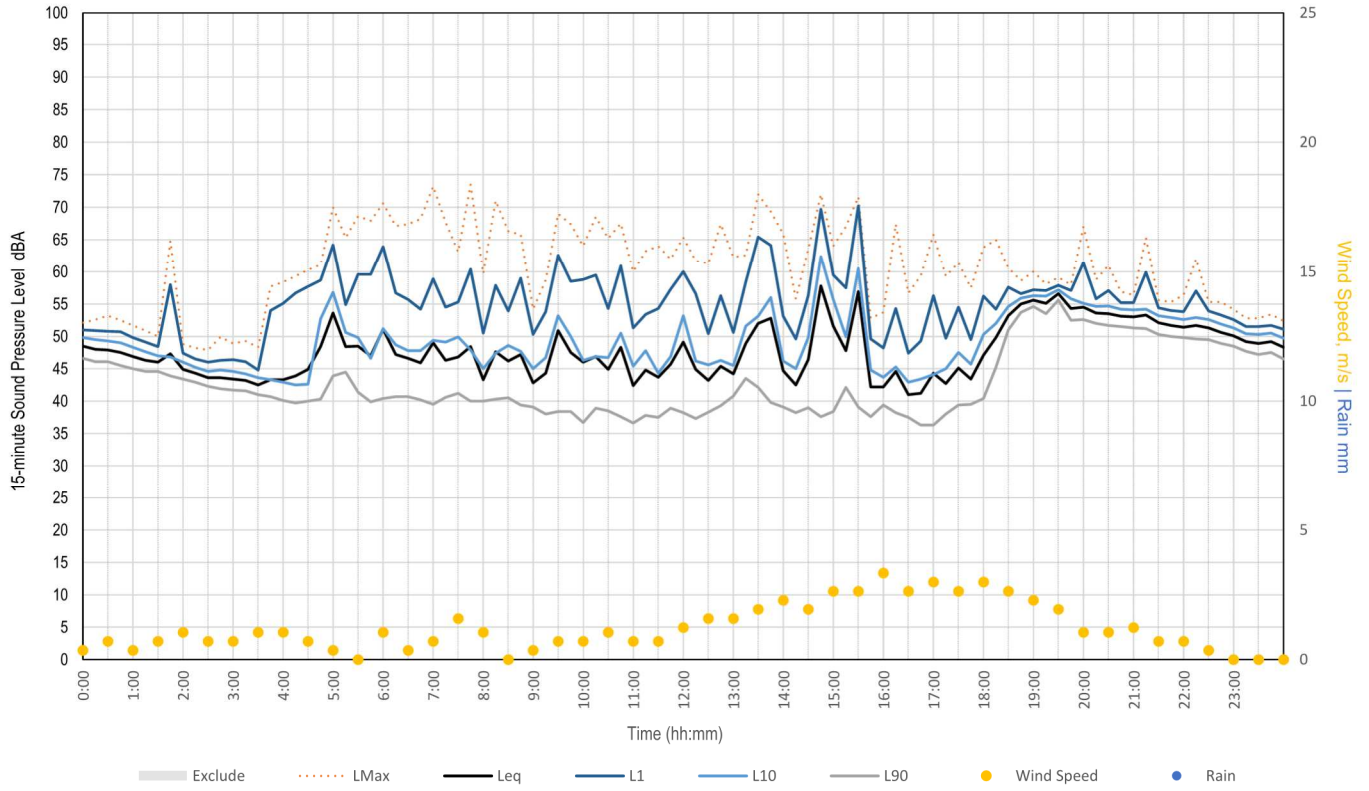
Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Tuesday, 11 October 2022



Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

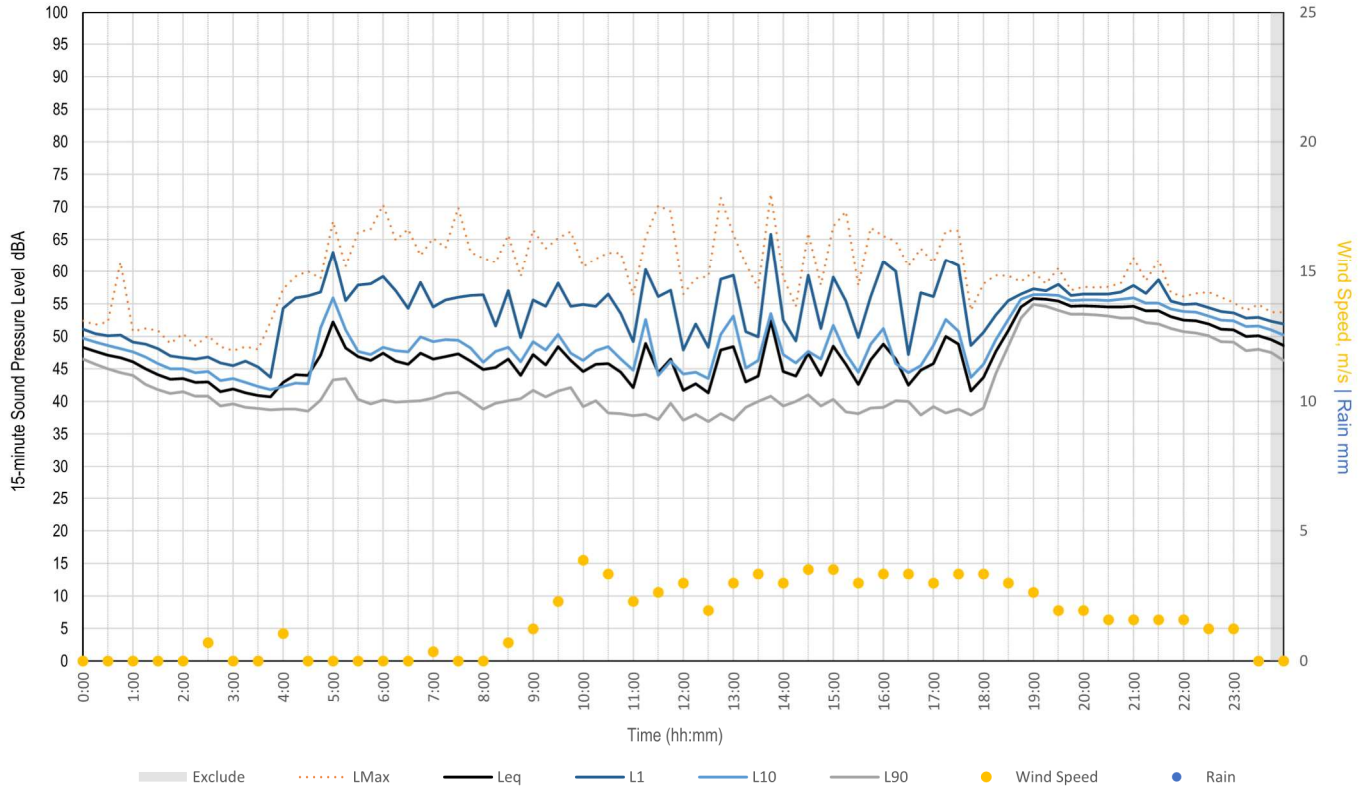
Wednesday, 12 October 2022



Noise Logger Results

Measured Noise Levels - M21 - 680 Bents Basin Road (Wallacia)

Thursday, 13 October 2022



Background Noise Monitoring

Location	M22 - 325 Taylors Road (Silverdale)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	JF & NM

Unattended Equipment				
Equipment	**Model:**	RION NL-42	**Serial No. :**	509281
Calibration	**Pre:**	93.9 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	93.8 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Wednesday, 14 Sep 2022
Date End	Thursday, 13 Oct 2022
No. of days	30
No. of nights	29

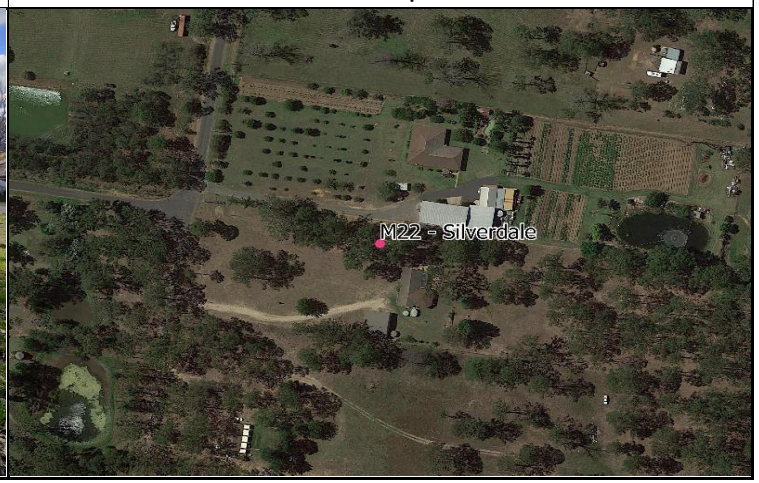
Weather	
Station	BoM
Station Info	Badgerys Creek AWS
Distance	< 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard in a field away from residential structure (approx. 150m).

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house façade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}
1	Day	14/09/2022	1:54:04 PM	2:09:04 PM	68	44	45	37
2	Day	29/09/2022	12:43:30 PM	12:58:30 PM	71	50	52	42
3	Day	29/09/2022	12:58:30 PM	1:13:30 PM	58	48	52	42
4	Day	29/09/2022	1:26:16 PM	1:41:16 PM	62	46	49	40
5	Evening	14/10/2022	7:28:32 PM	7:43:32 PM	66	47	47	44

* Not possible to access site during evening and night due to personal safety and/or access issues. No audio available for remote attended.

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent bird noise. Movement of vegetation due to wind (e.g. grass and trees rustling), varying in intensity. Occasional animal sounds (e.g. dog bark, bird noise). Occasional car passbys on local road and suburban noise (e.g. doorbell). Several aircraft flying overhead with an approx. duration of 30 sec with a maximum sound level in the range of 43 to 56 dBA.
Background noise	Bird noise, plane flyovers. Movement of vegetation due to wind (e.g. grass and trees rustling).
Evening	
Ambient noise	Intermittent bird noise, varying in intensity. Intermittent dog barks. Wind induced noise e.g. trees rustling.
Background noise	Constant animal sounds dominating the background level, insect noise and frogs/toads.

Site Details	M22 - 325 Taylors Road (Silverdale)
Start Date	Wed 14 September 2022
End Date	Thu 13 October 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	51
$L_{eq, Evening}$ dBA	48
$L_{eq, Night}$ dBA	44
RBL, $_{Day}$ dBA	34
RBL, $_{Evening}$ dBA	36
RBL, $_{Night}$ dBA	32

Daily Summary

Date	14/09	15/09	16/09	17/09	18/09	19/09	20/09	21/09
$L_{eq, Day}$ dBA	52	49	48	53	48	49	48	50
$L_{eq, Evening}$ dBA	42	50	39	40	48	39	39	41
$L_{eq, Night}$ dBA	43	45	43	42	41	40	40	45
ABL, $_{Day}$ dBA	35	34	33	37	34	34	36	36
ABL, $_{Evening}$ dBA	28	36	33	33	31	28	30	32
ABL, $_{Night}$ dBA	27	26	30	31	29	28	28	30

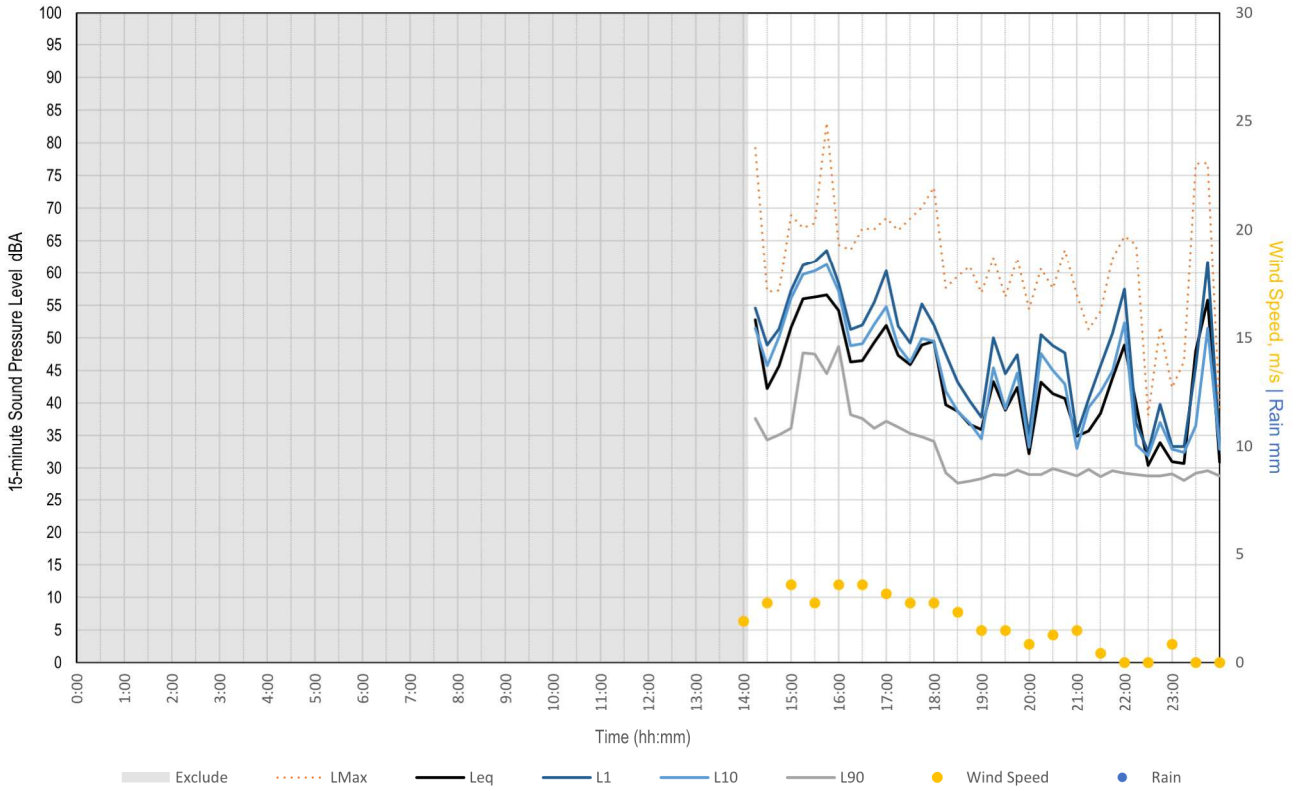
Date	22/09	23/09	24/09	25/09	26/09	27/09	28/09	29/09
$L_{eq, Day}$ dBA	46	47	47	49	59	47	50	50
$L_{eq, Evening}$ dBA	44	44	47	47	45	40	44	45
$L_{eq, Night}$ dBA	46	42	43	42	46	44	46	45
ABL, $_{Day}$ dBA	34	33	34	35	37	34	34	39
ABL, $_{Evening}$ dBA	36	39	39	34	31	34	39	40
ABL, $_{Night}$ dBA	31	32	34	31	29	28	36	37

Date	30/09	01/10	02/10	03/10	04/10	05/10	06/10	07/10
$L_{eq, Day}$ dBA	51	47	50	50	48	51	47	49
$L_{eq, Evening}$ dBA	43	43	42	45	42	45	43	47
$L_{eq, Night}$ dBA	45	43	43	43	42	49	45	45
ABL, $_{Day}$ dBA	40	34	33	35	34	39	36	35
ABL, $_{Evening}$ dBA	38	37	34	32	31	40	40	43
ABL, $_{Night}$ dBA	33	34	30	28	30	39	36	38

Date	08/10	09/10	10/10	11/10	12/10	13/10
$L_{eq, Day}$ dBA	50	49	50	50	52	49
$L_{eq, Evening}$ dBA	60	43	41	43	47	48
$L_{eq, Night}$ dBA	47	47	44	45	44	40
ABL, $_{Day}$ dBA	33	33	33	34	36	37
ABL, $_{Evening}$ dBA	58	39	36	37	38	38
ABL, $_{Night}$ dBA	40	35	34	34	33	38

Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

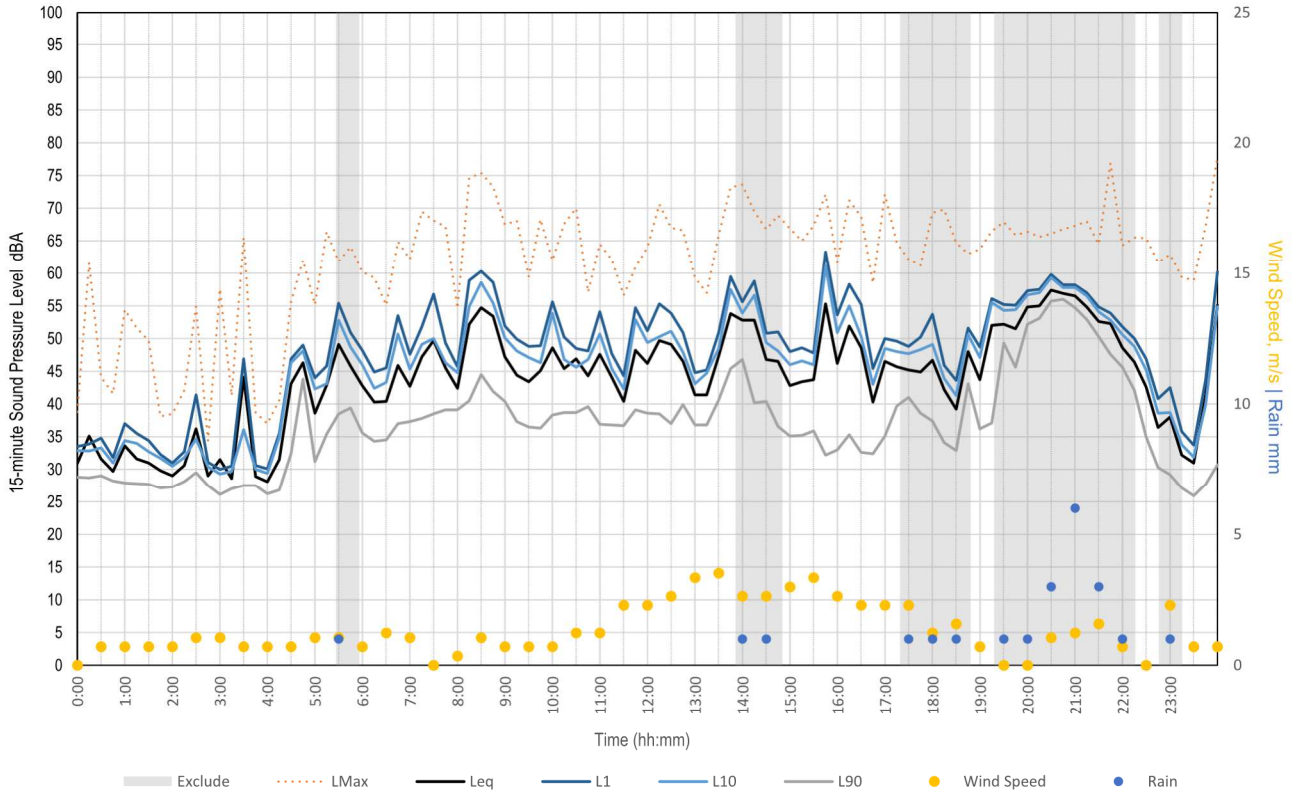
Wednesday, 14 September 2022



Noise Logger Results

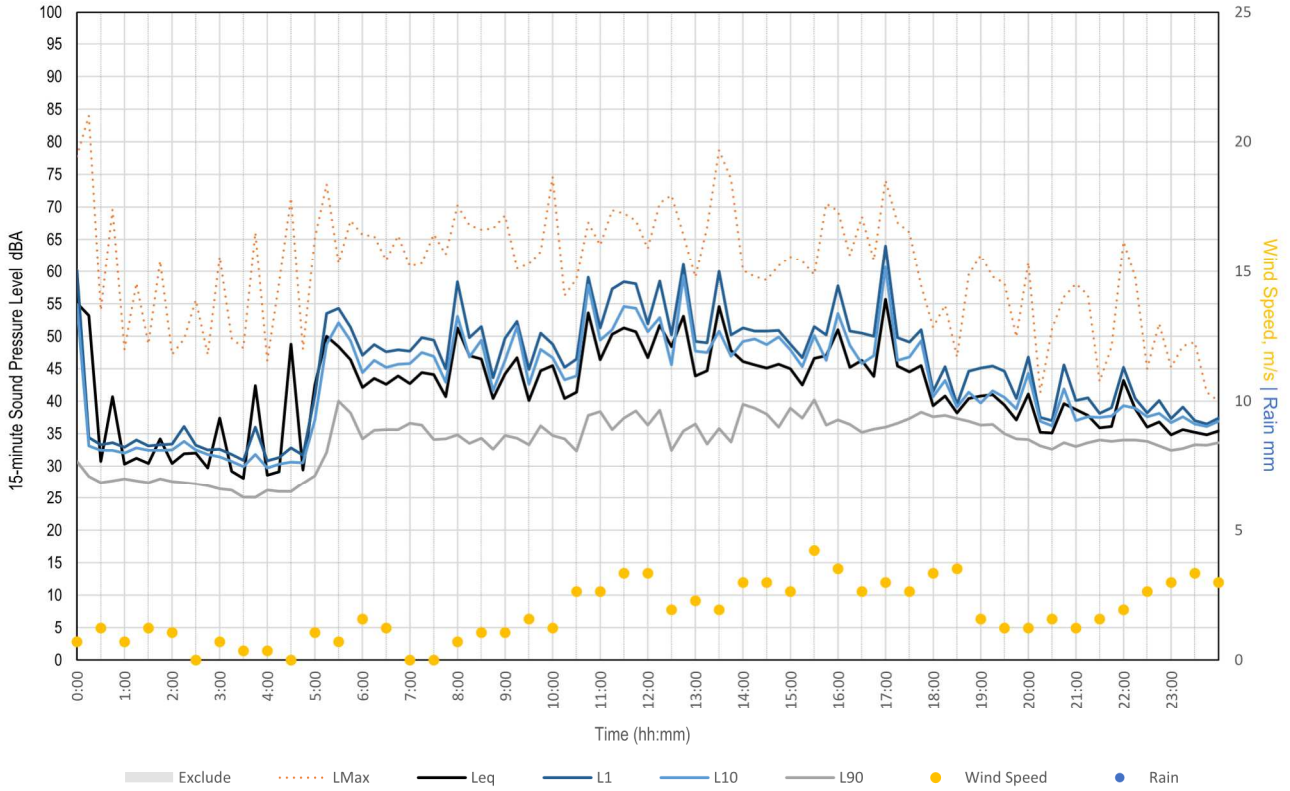
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Thursday, 15 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

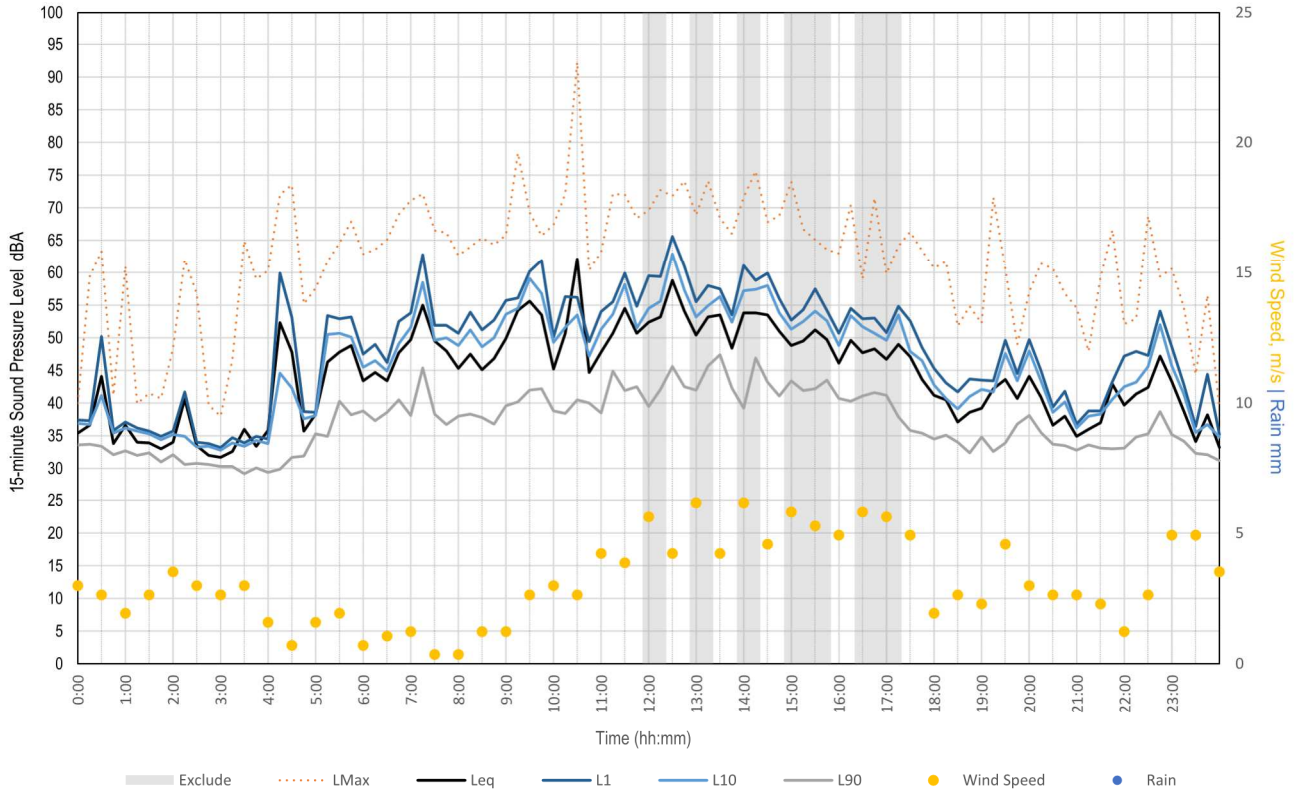
Friday, 16 September 2022



Noise Logger Results

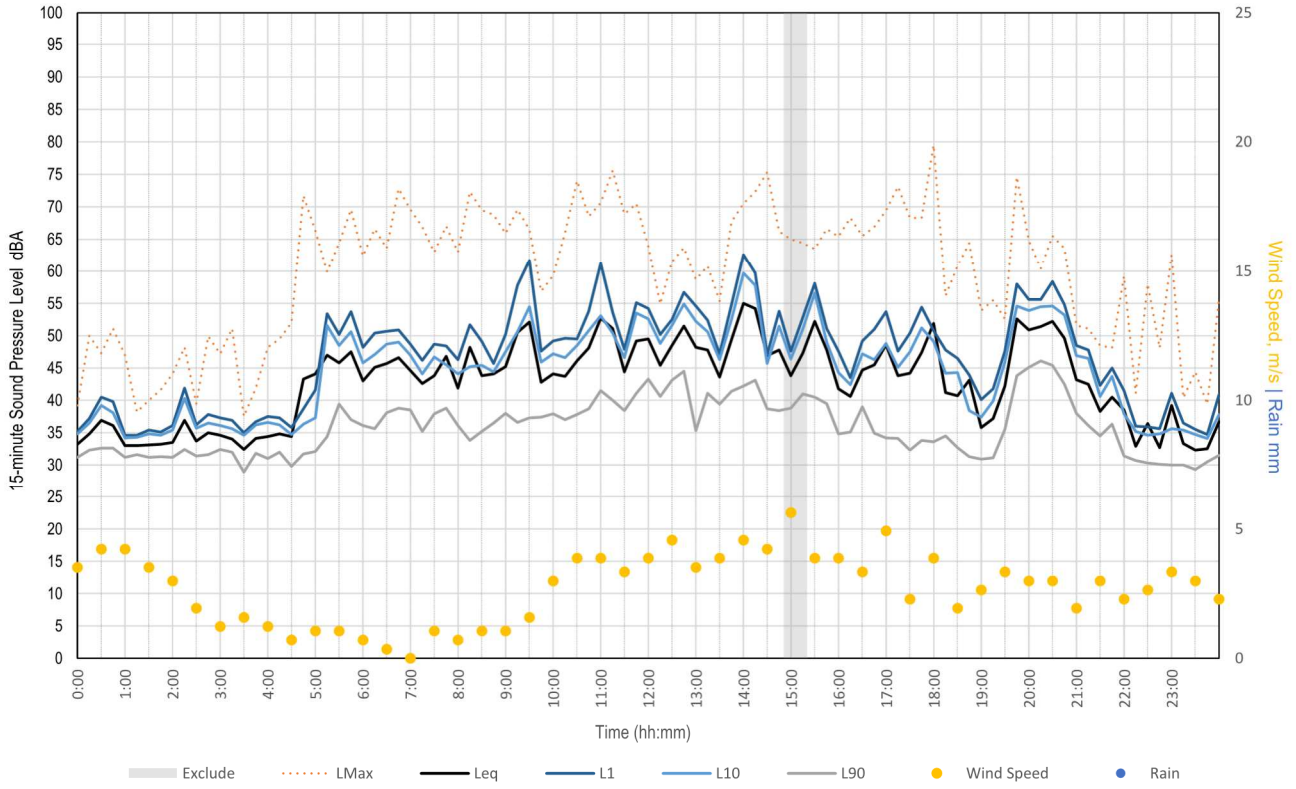
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Saturday, 17 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

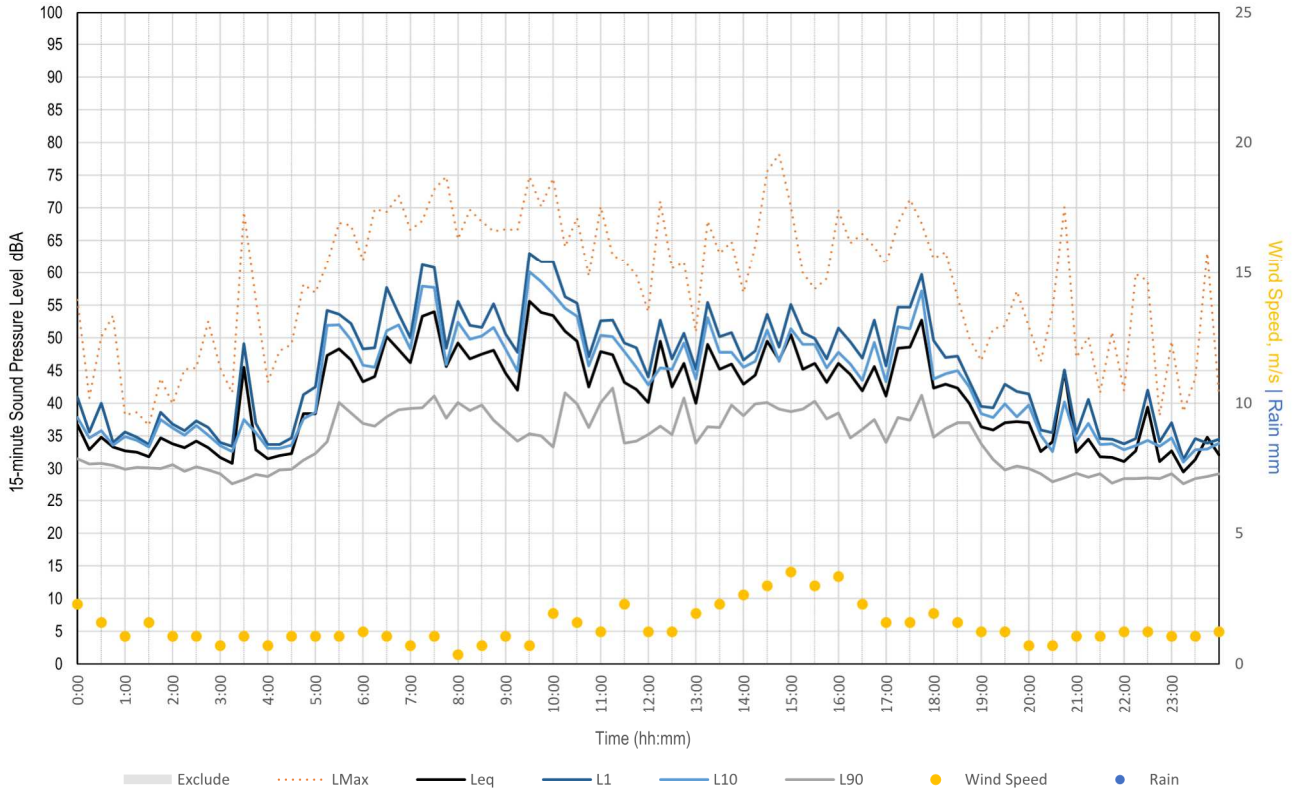
Sunday, 18 September 2022



Noise Logger Results

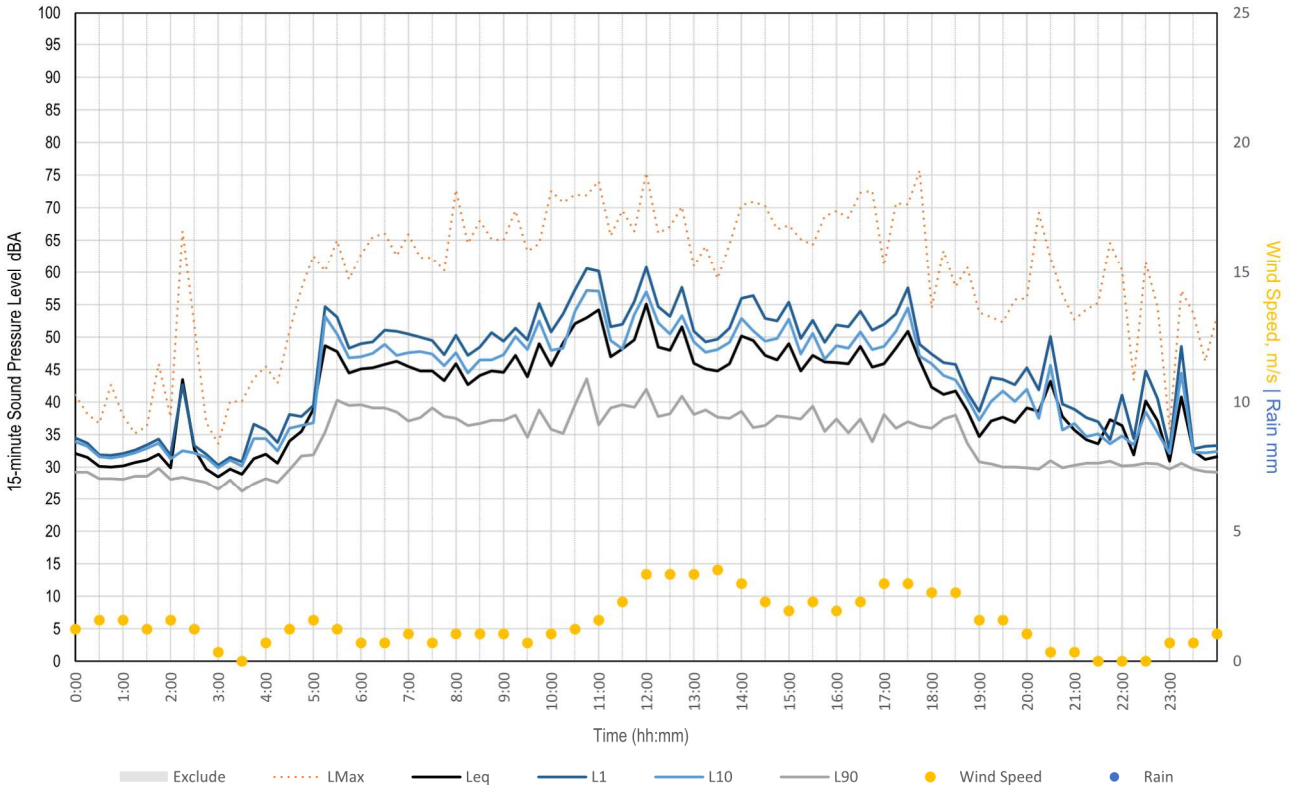
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Monday, 19 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

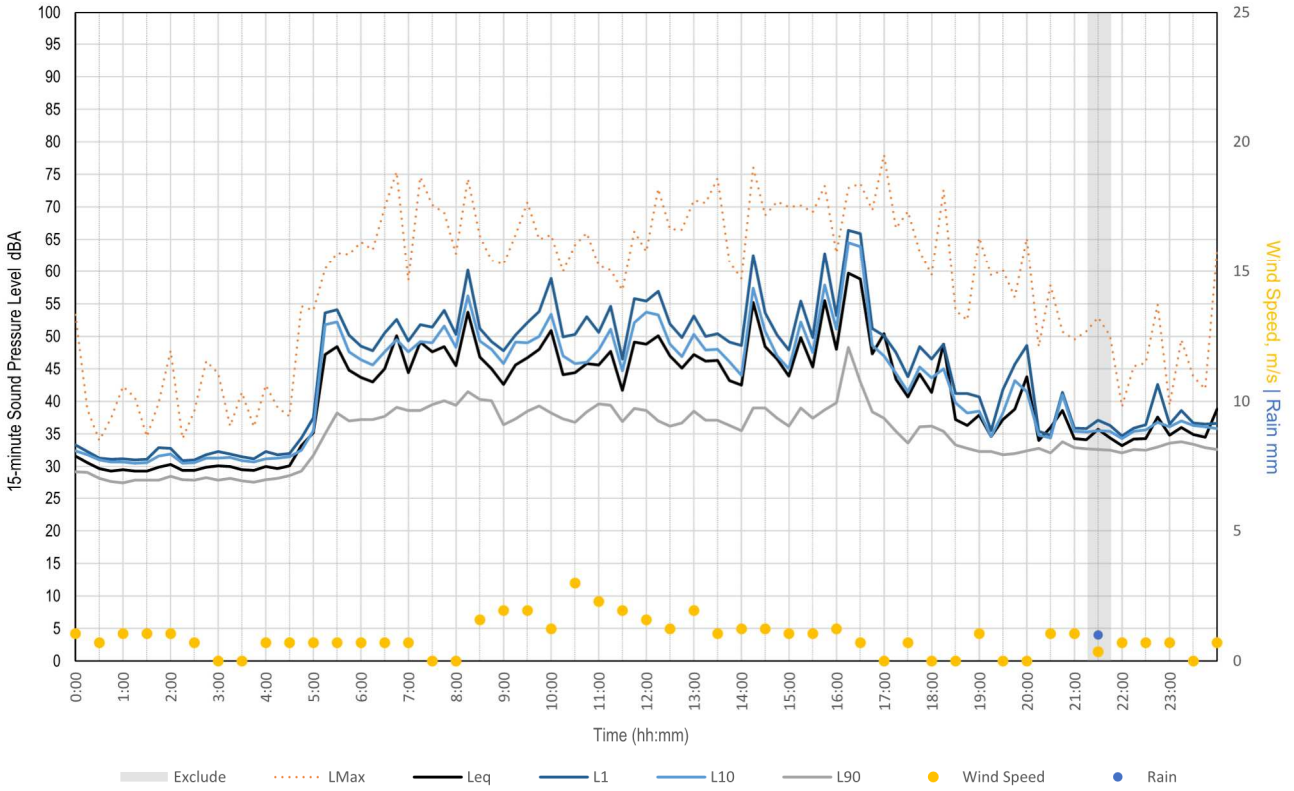
Tuesday, 20 September 2022



Noise Logger Results

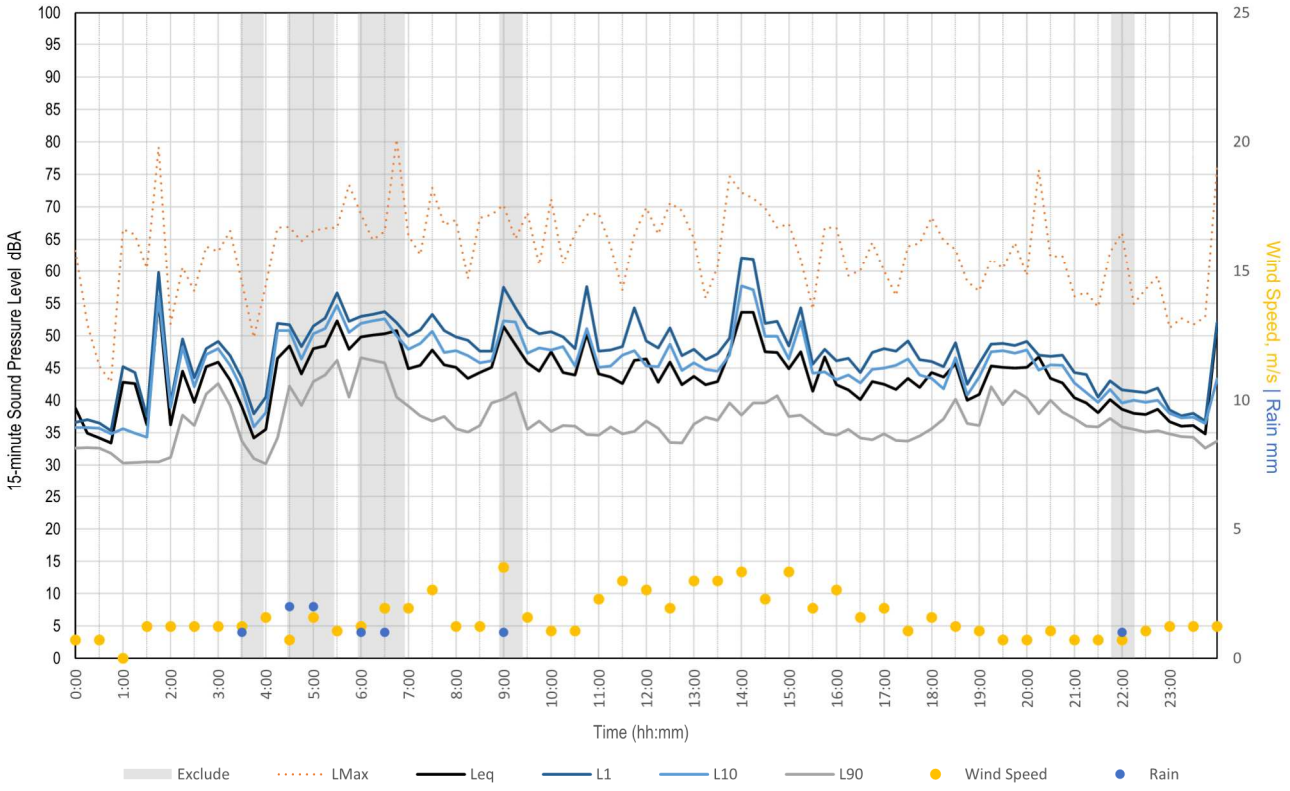
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Wednesday, 21 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

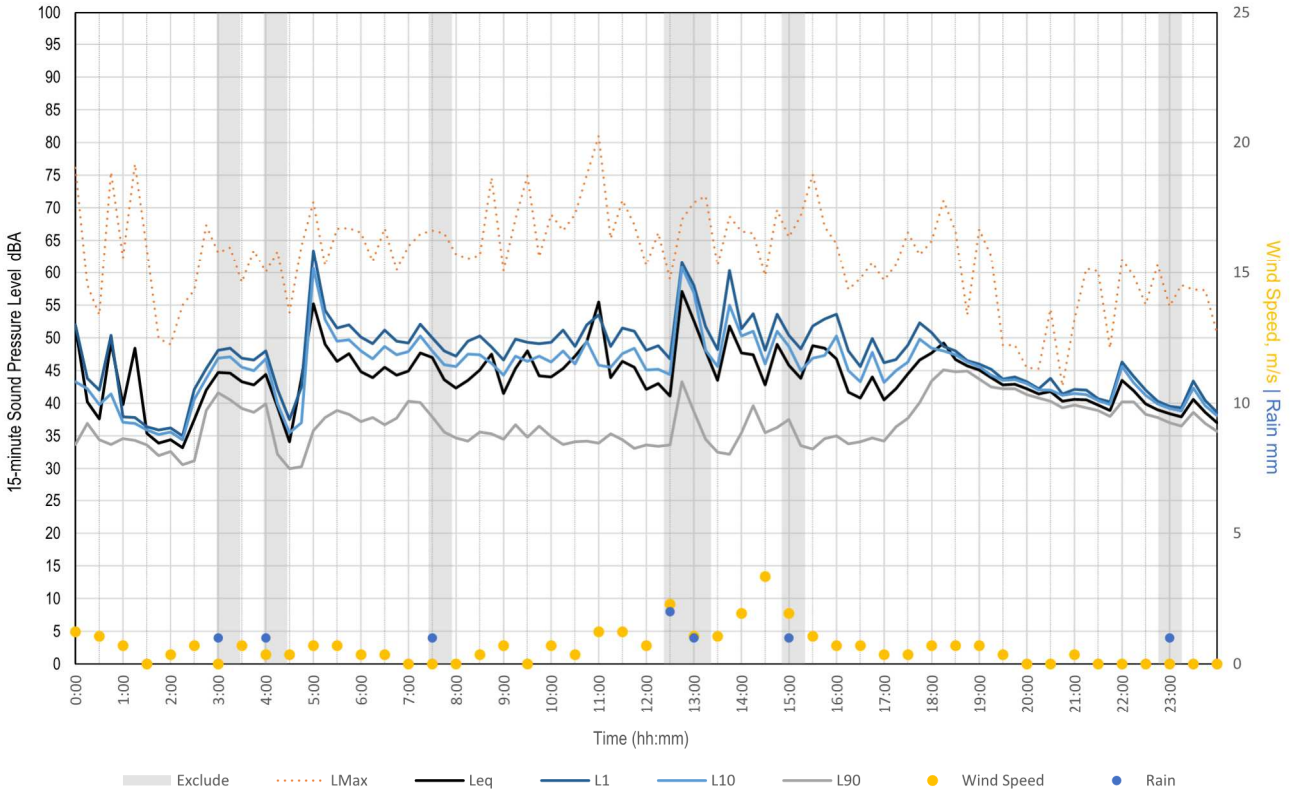
Thursday, 22 September 2022



Noise Logger Results

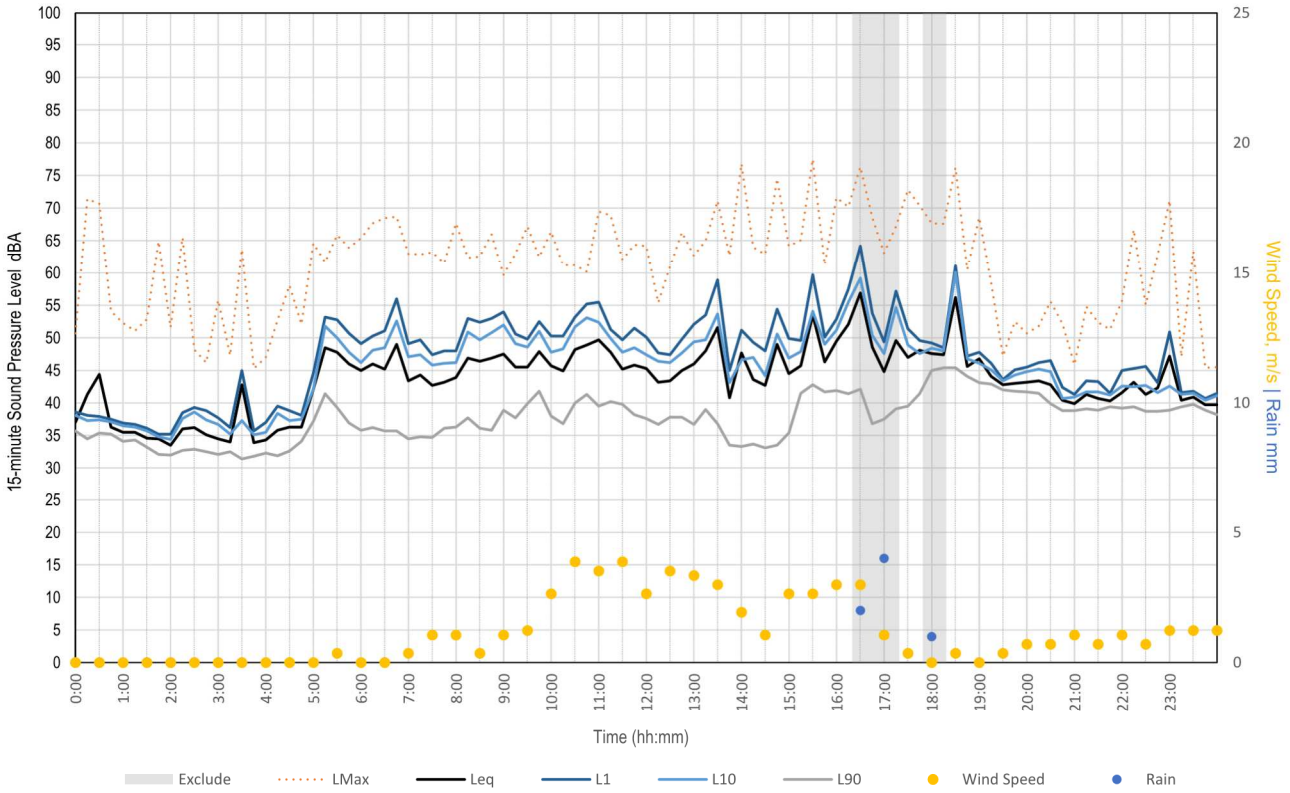
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Friday, 23 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

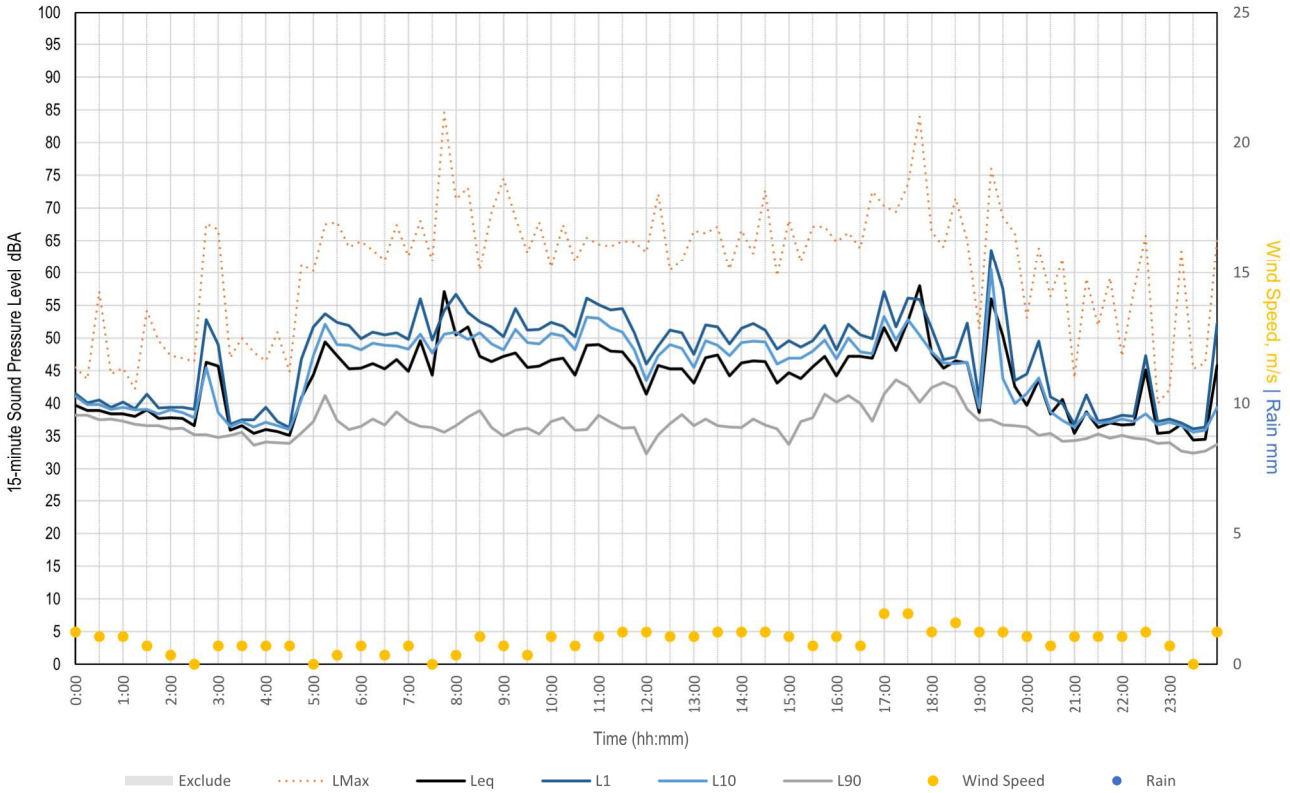
Saturday, 24 September 2022



Noise Logger Results

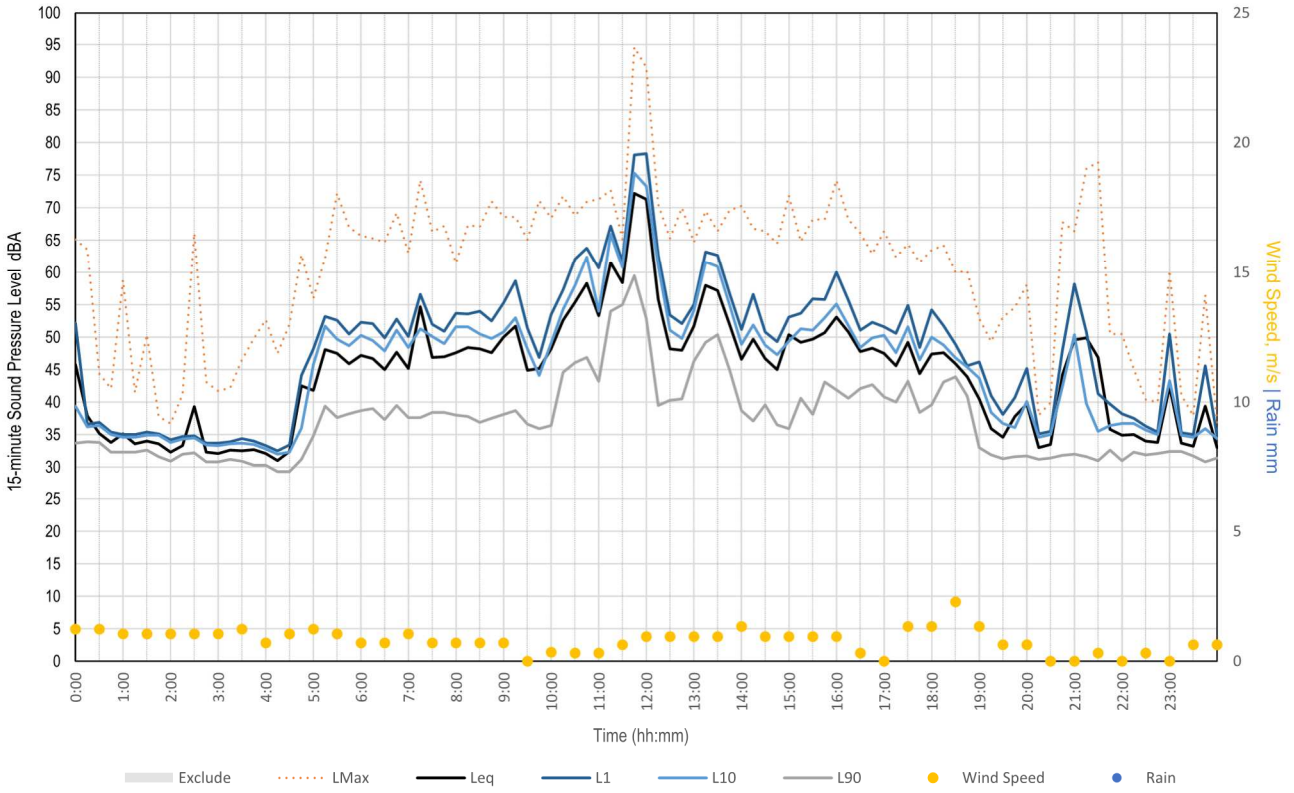
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Sunday, 25 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

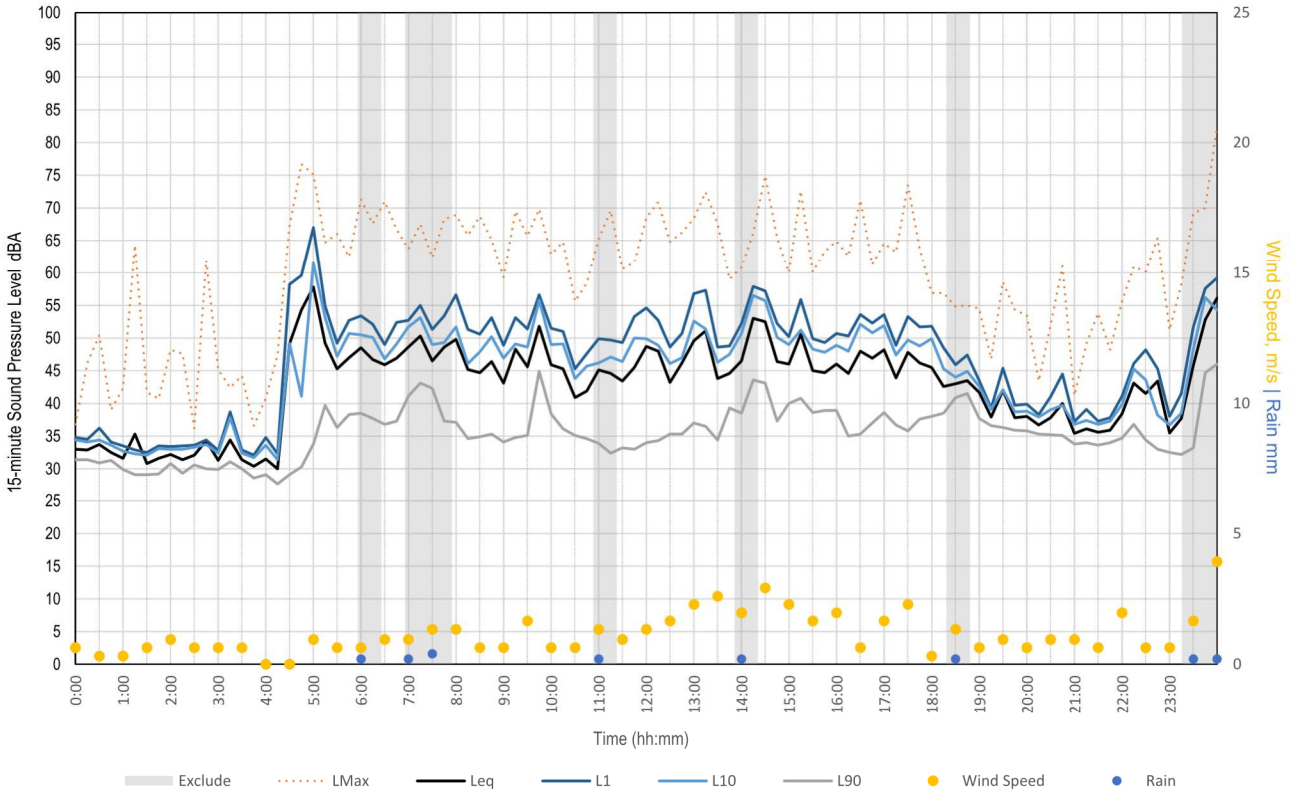
Monday, 26 September 2022



Noise Logger Results

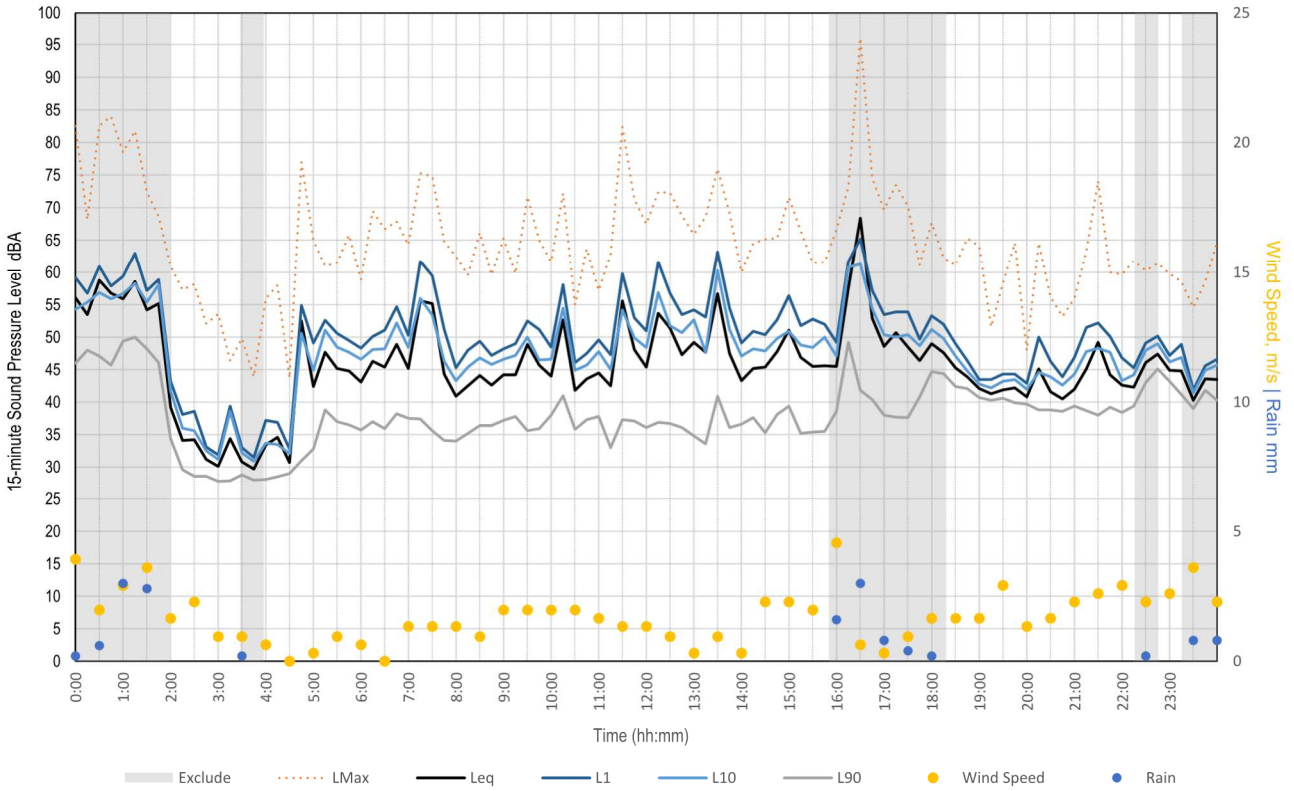
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Tuesday, 27 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

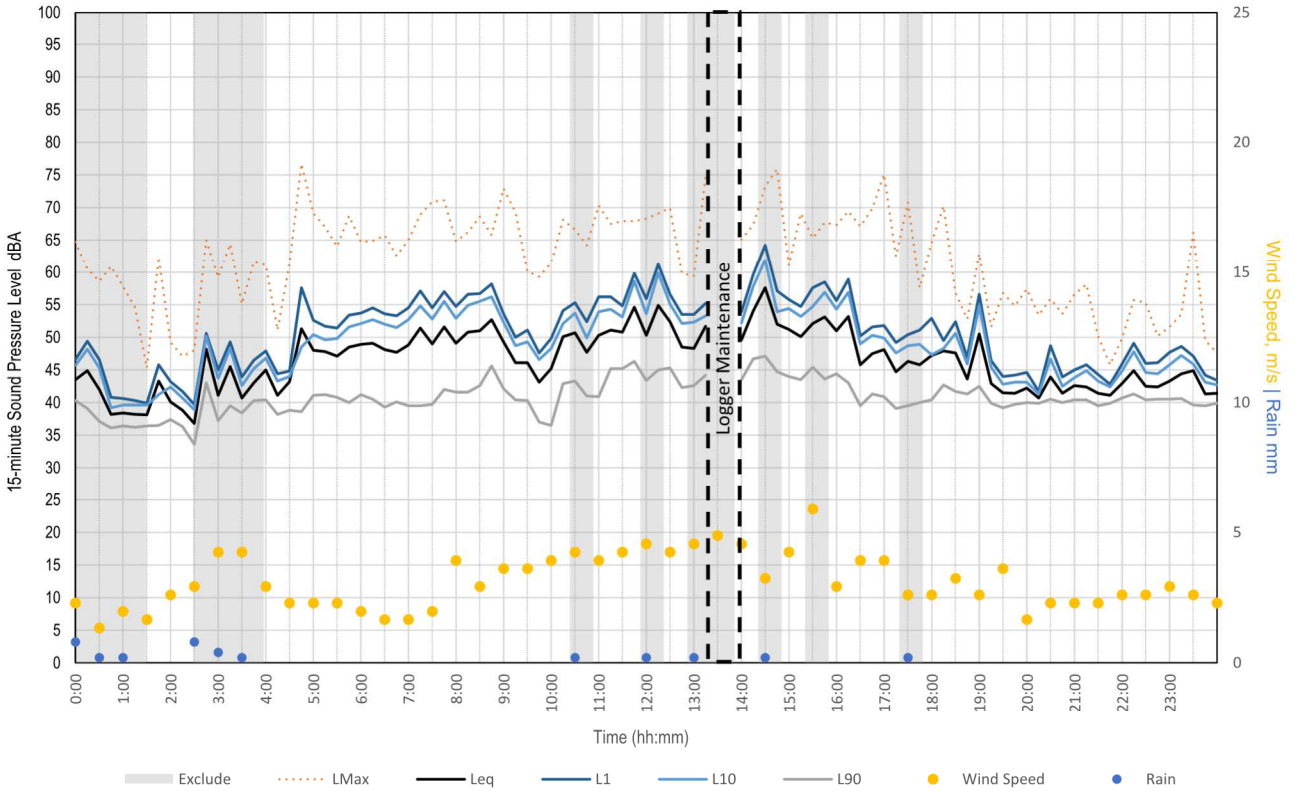
Wednesday, 28 September 2022



Noise Logger Results

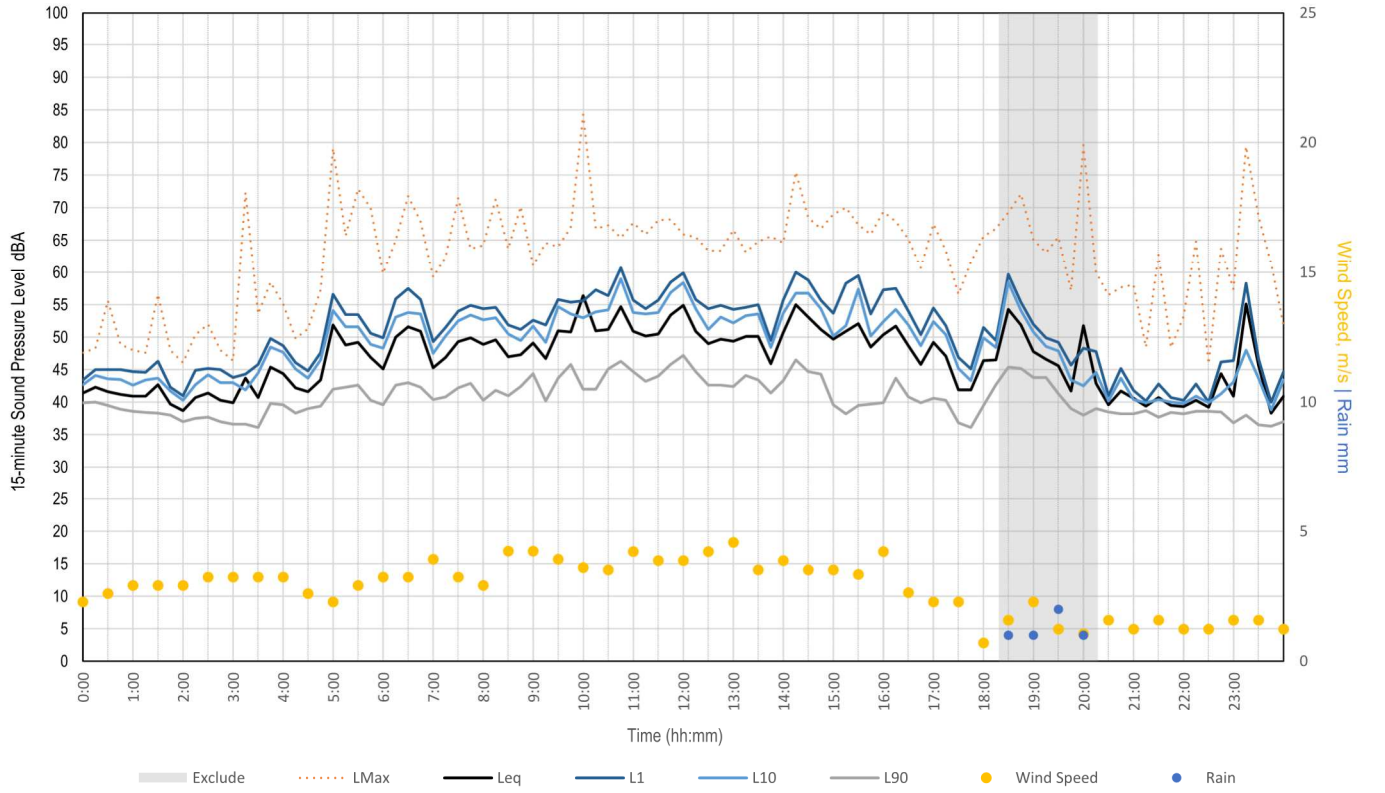
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Thursday, 29 September 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

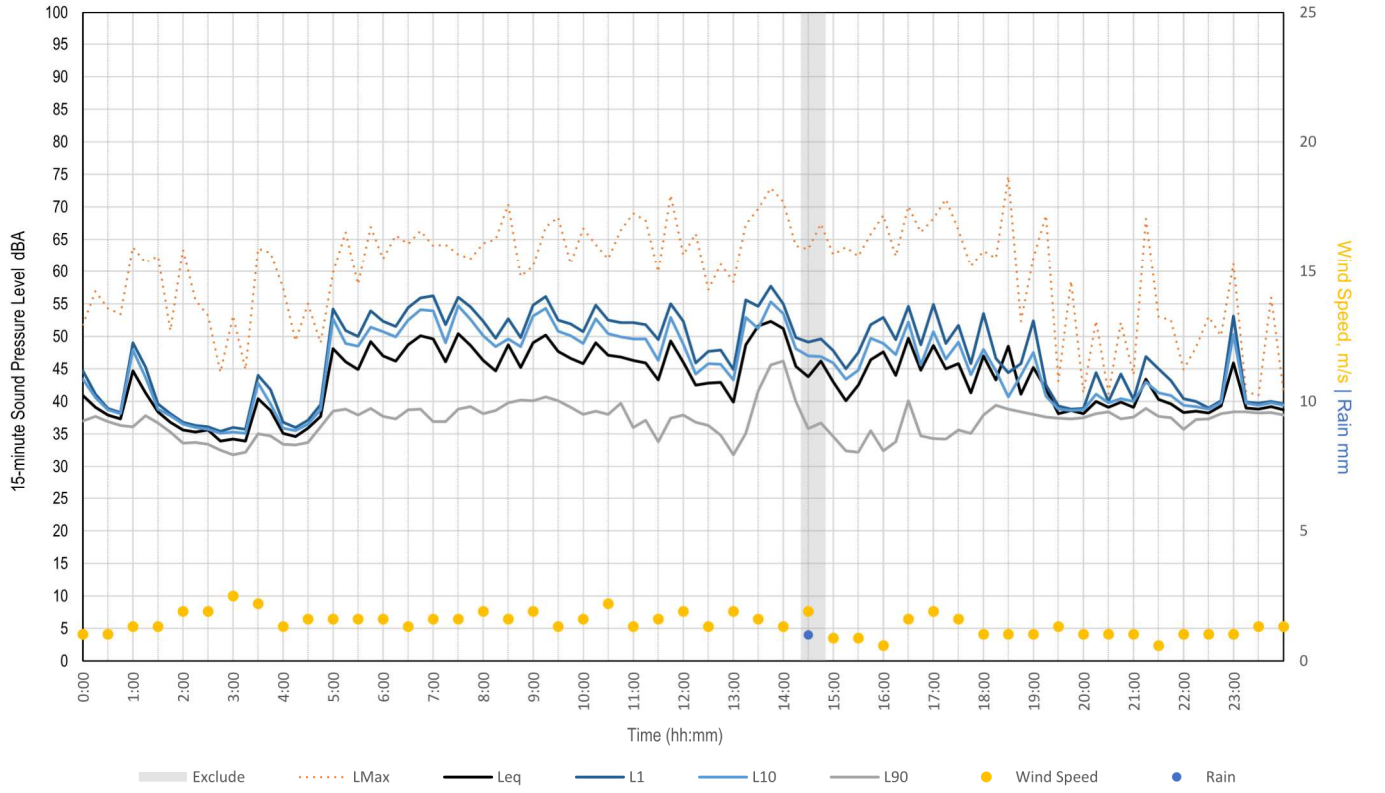
Friday, 30 September 2022



Noise Logger Results

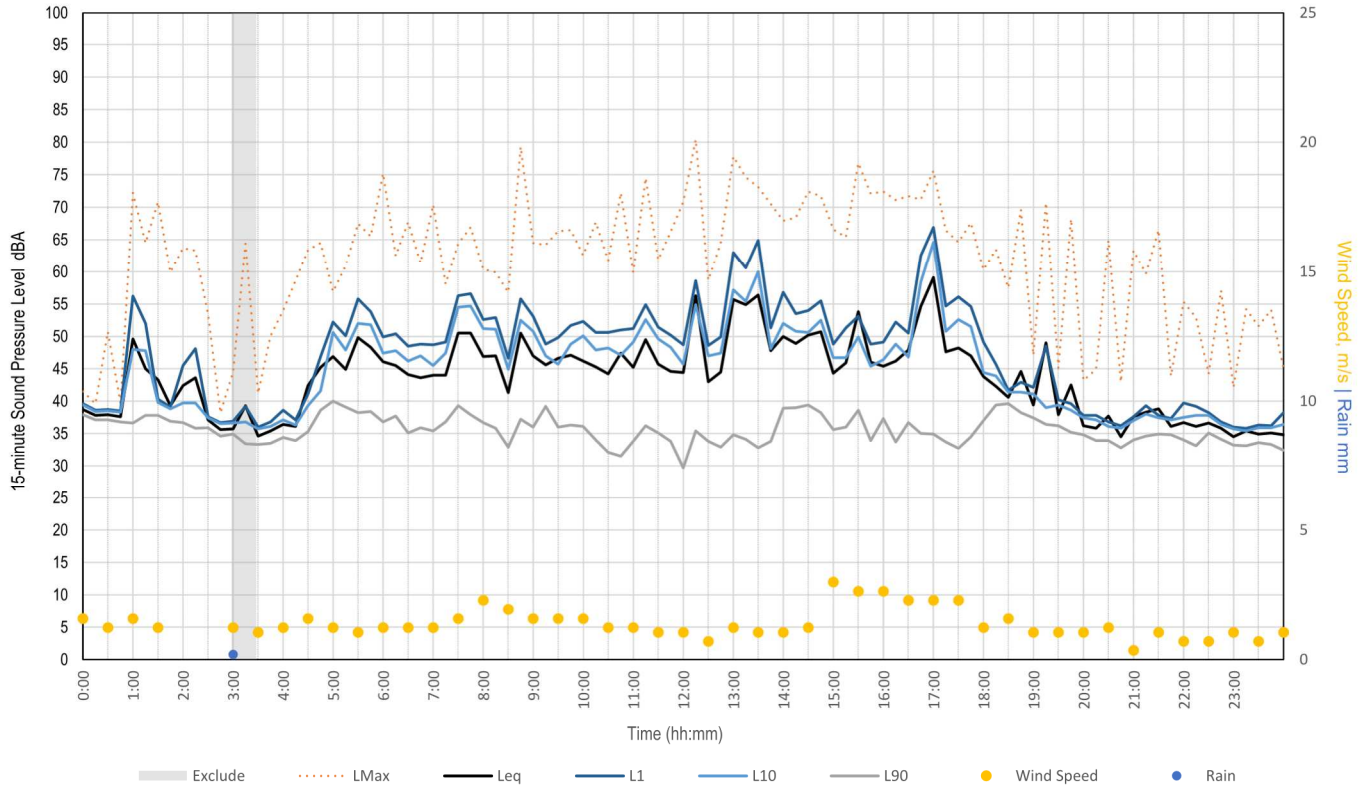
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Saturday, 01 October 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

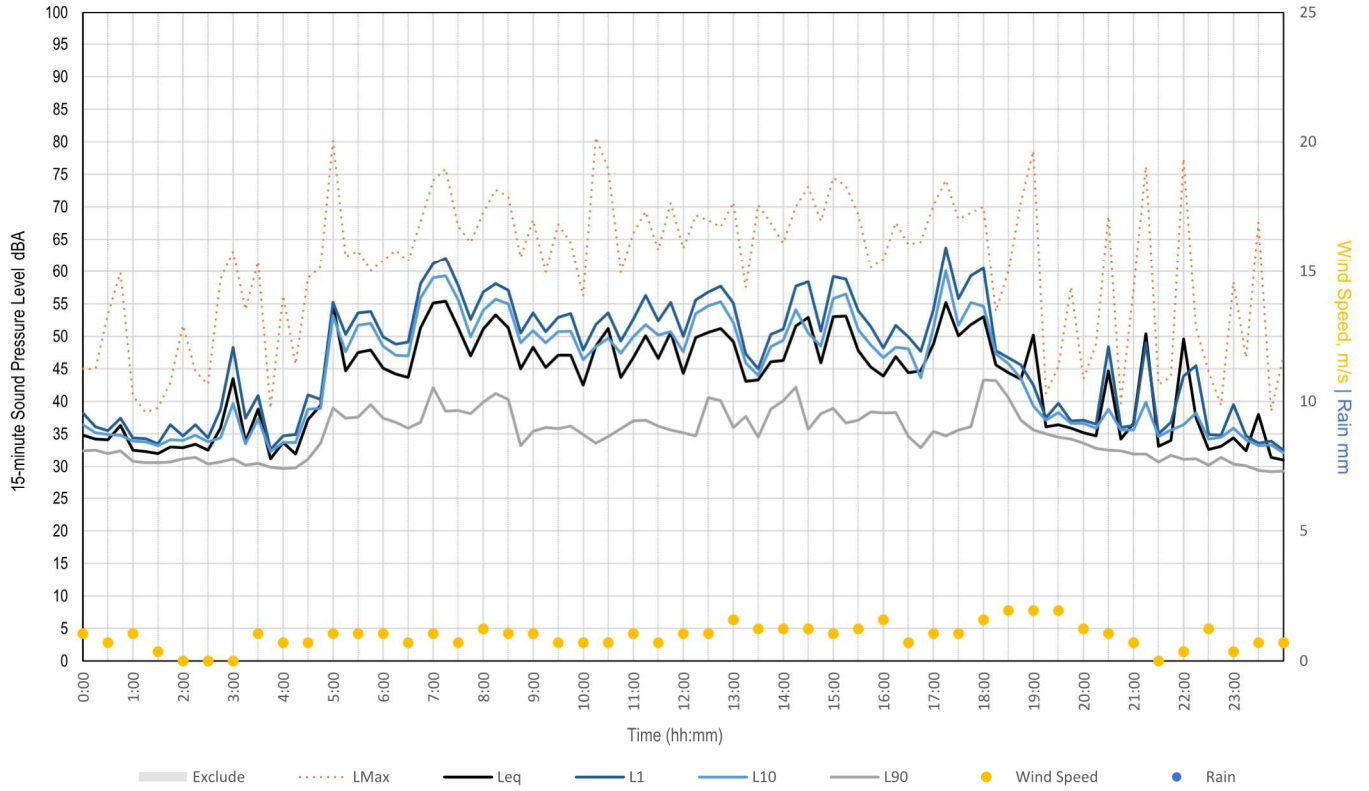
Sunday, 02 October 2022



Noise Logger Results

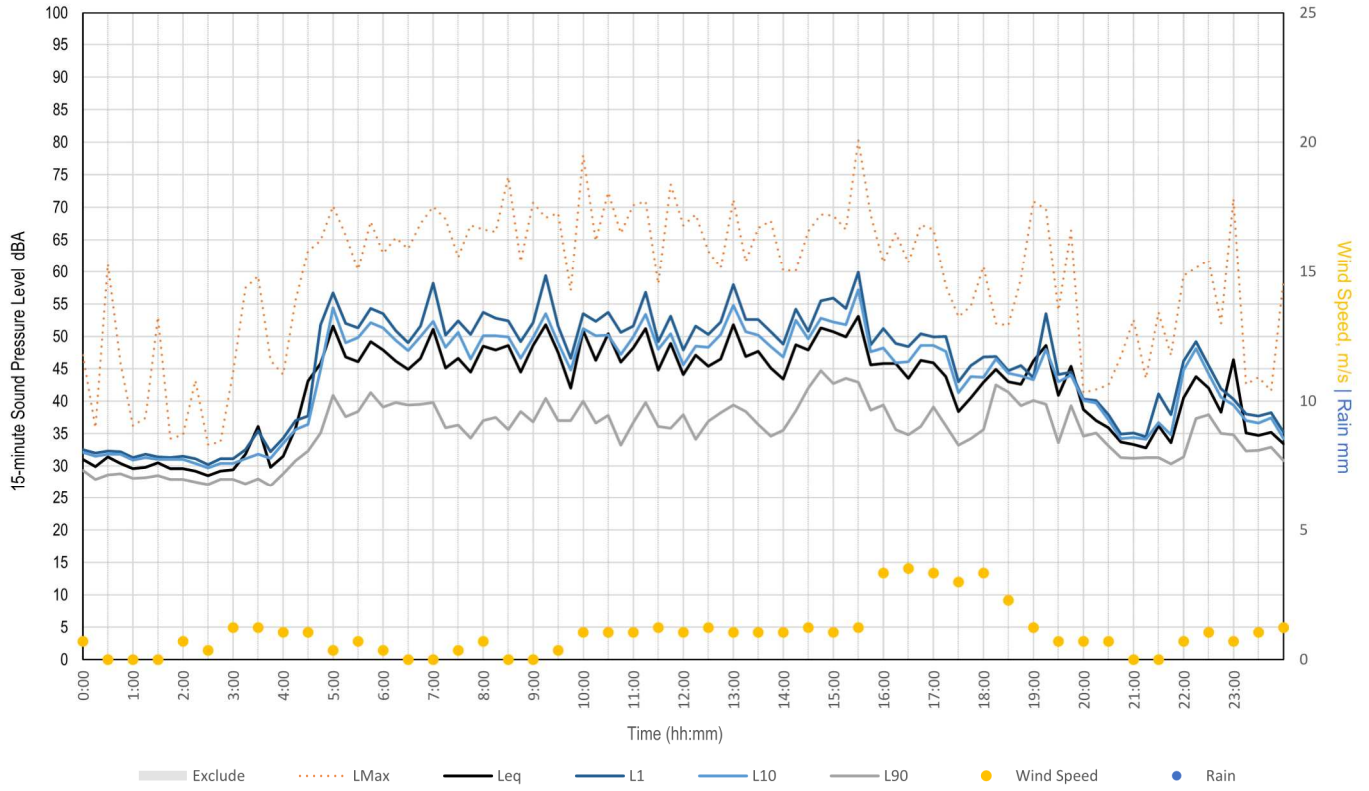
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Monday, 03 October 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

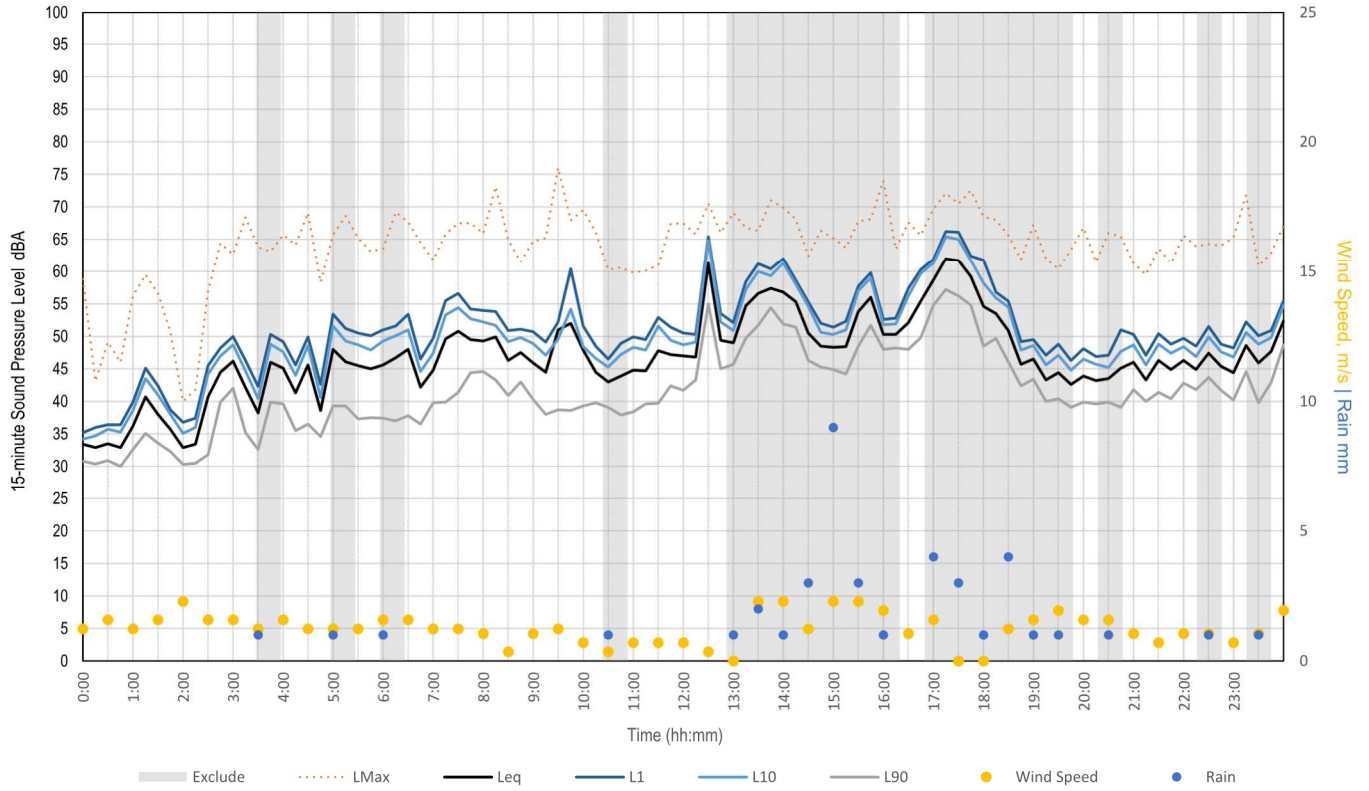
Tuesday, 04 October 2022



Noise Logger Results

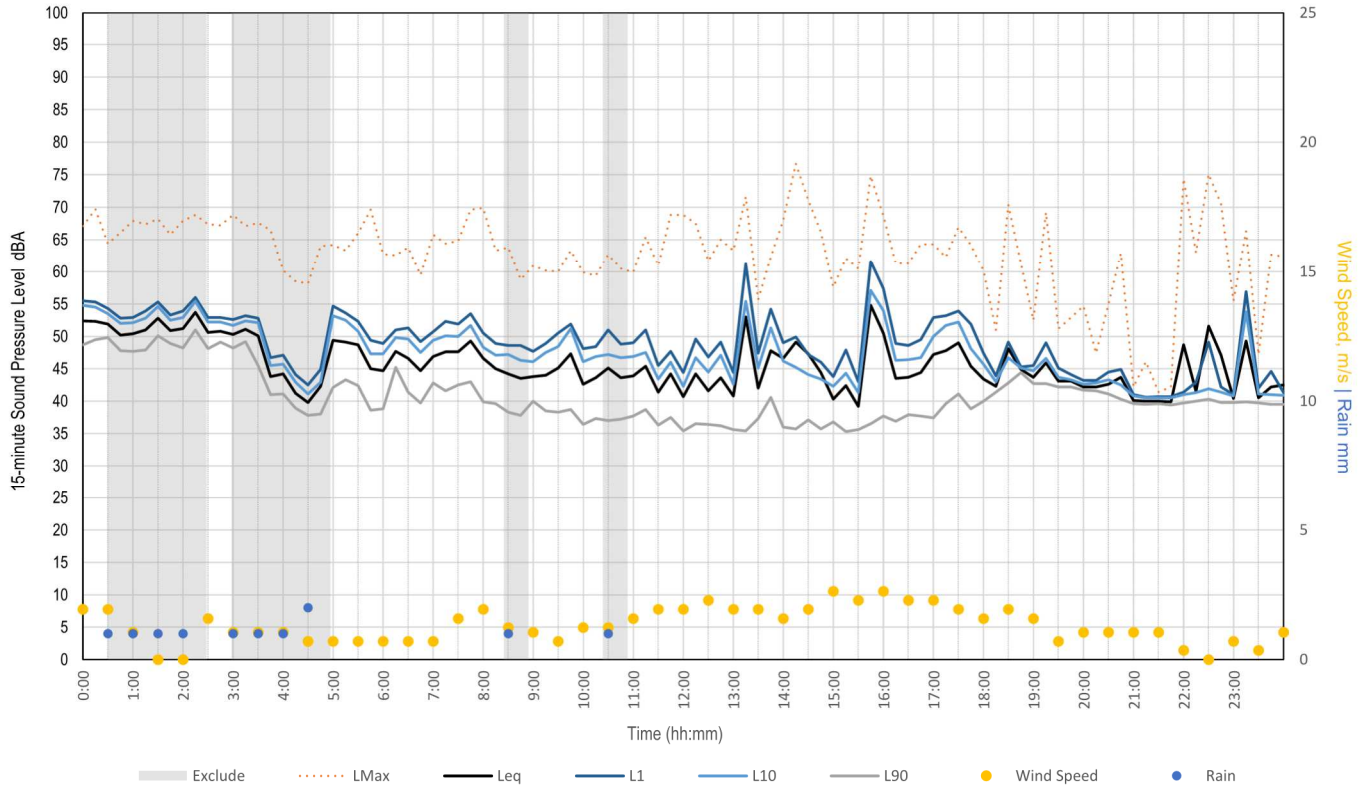
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Wednesday, 05 October 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

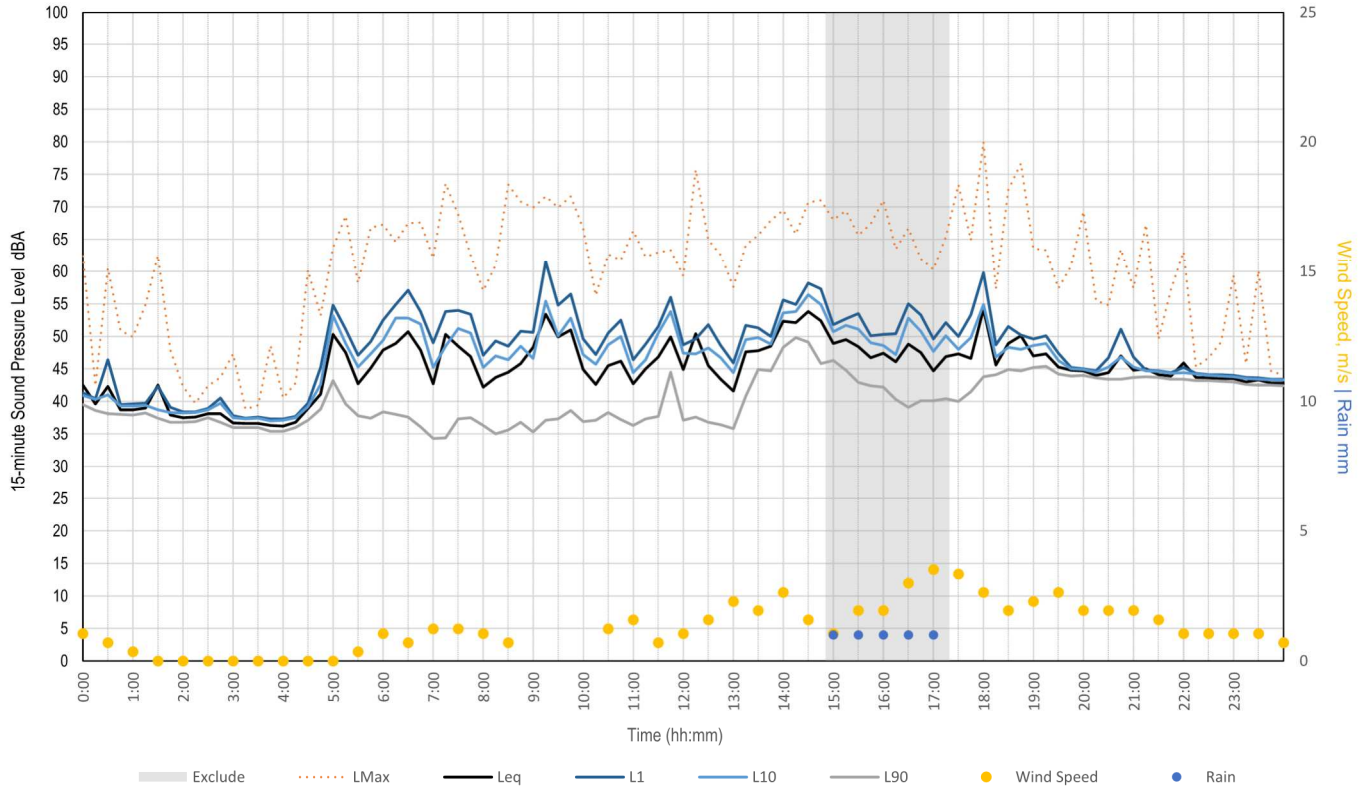
Thursday, 06 October 2022



Noise Logger Results

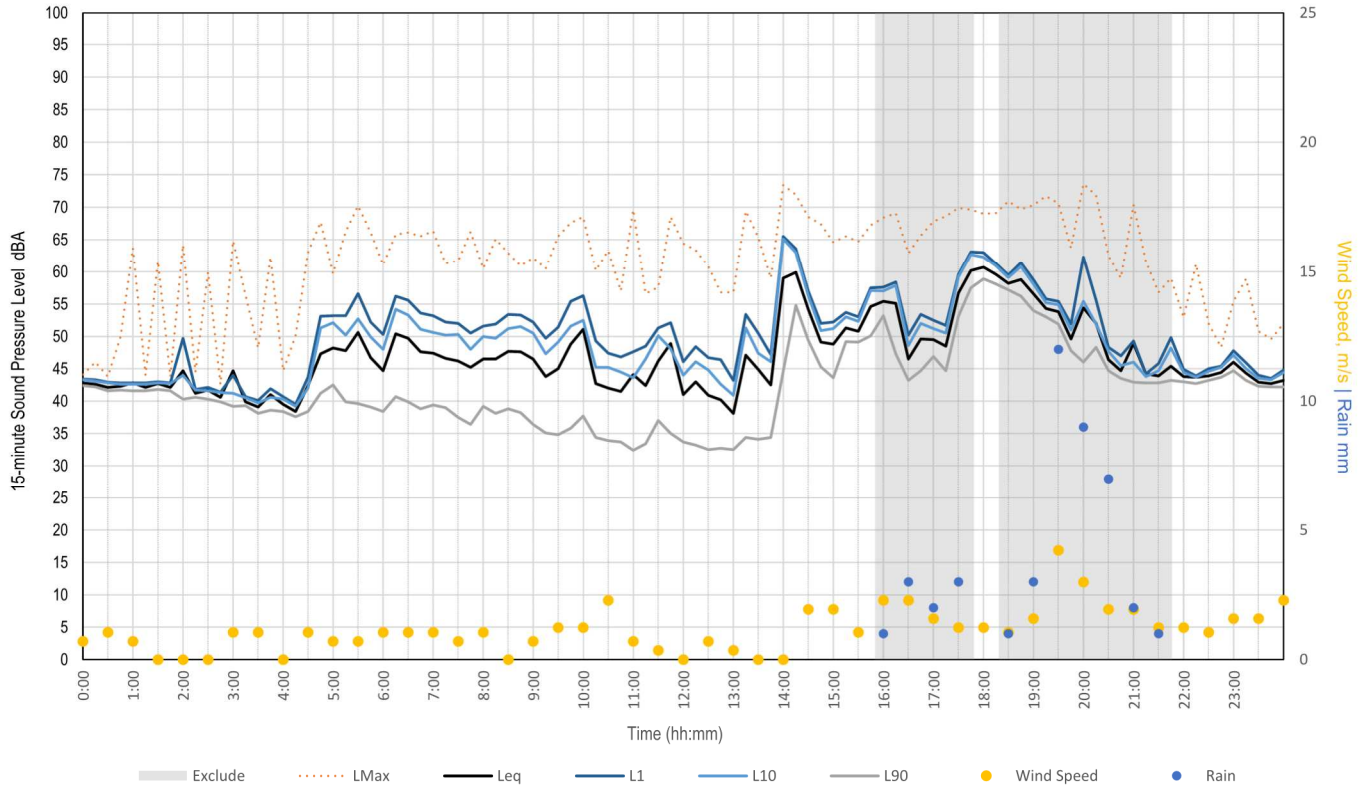
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Friday, 07 October 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

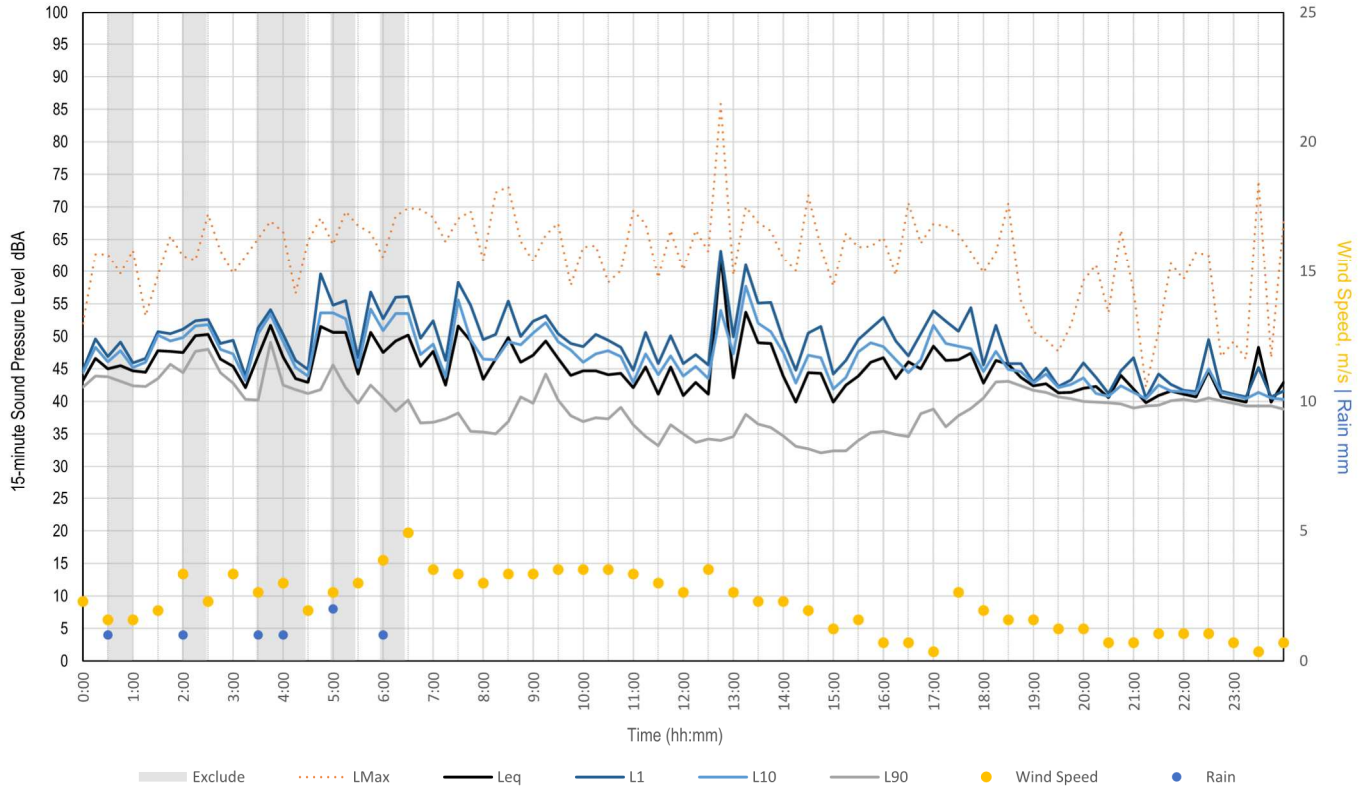
Saturday, 08 October 2022



Noise Logger Results

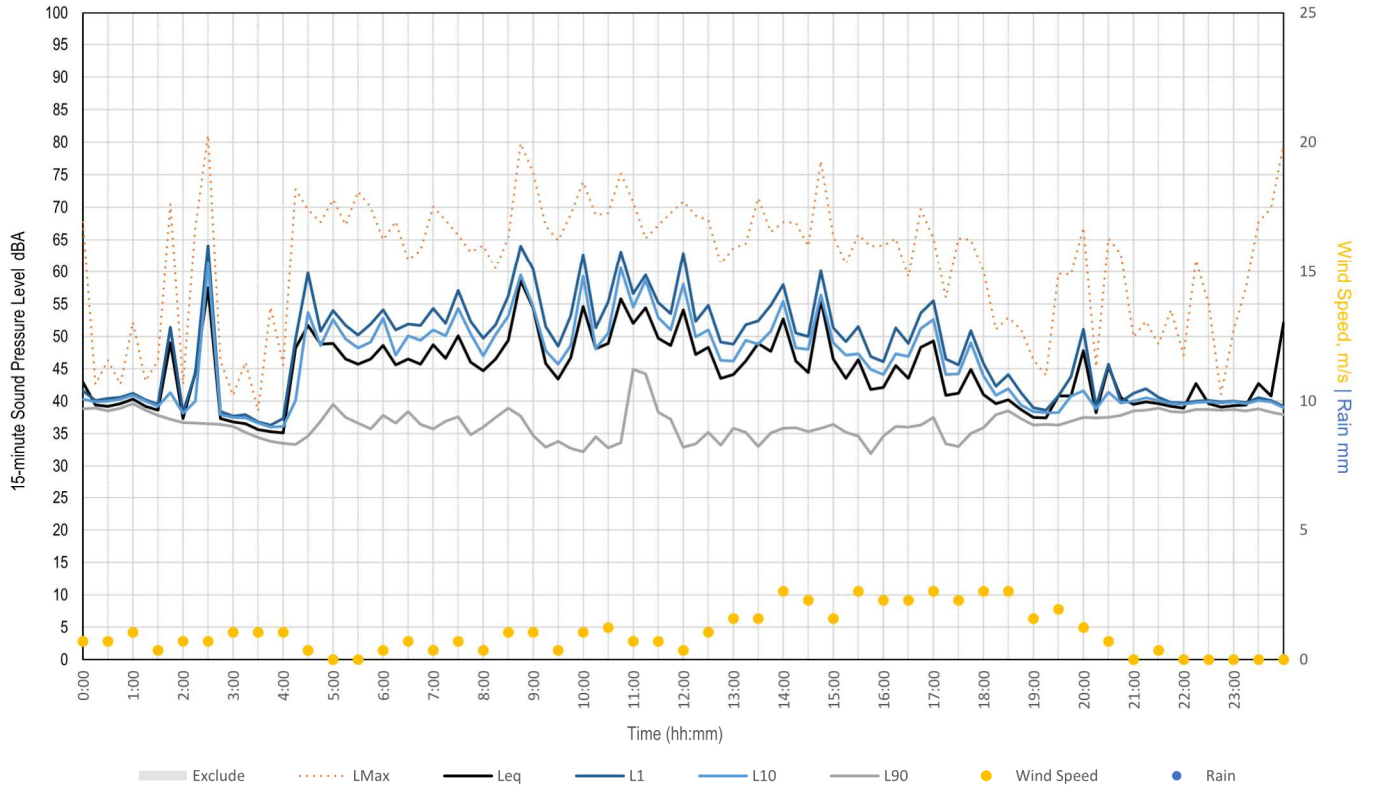
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Sunday, 09 October 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

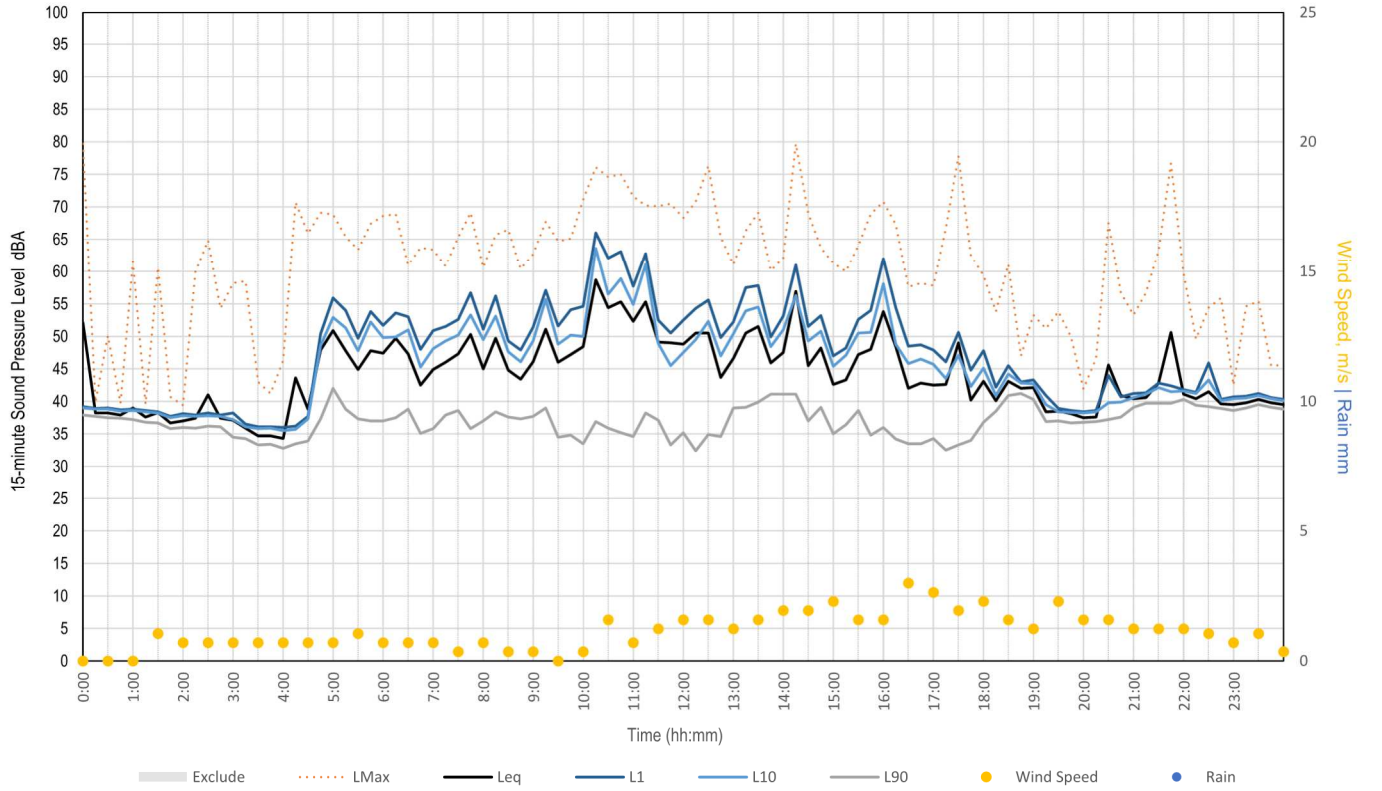
Monday, 10 October 2022



Noise Logger Results

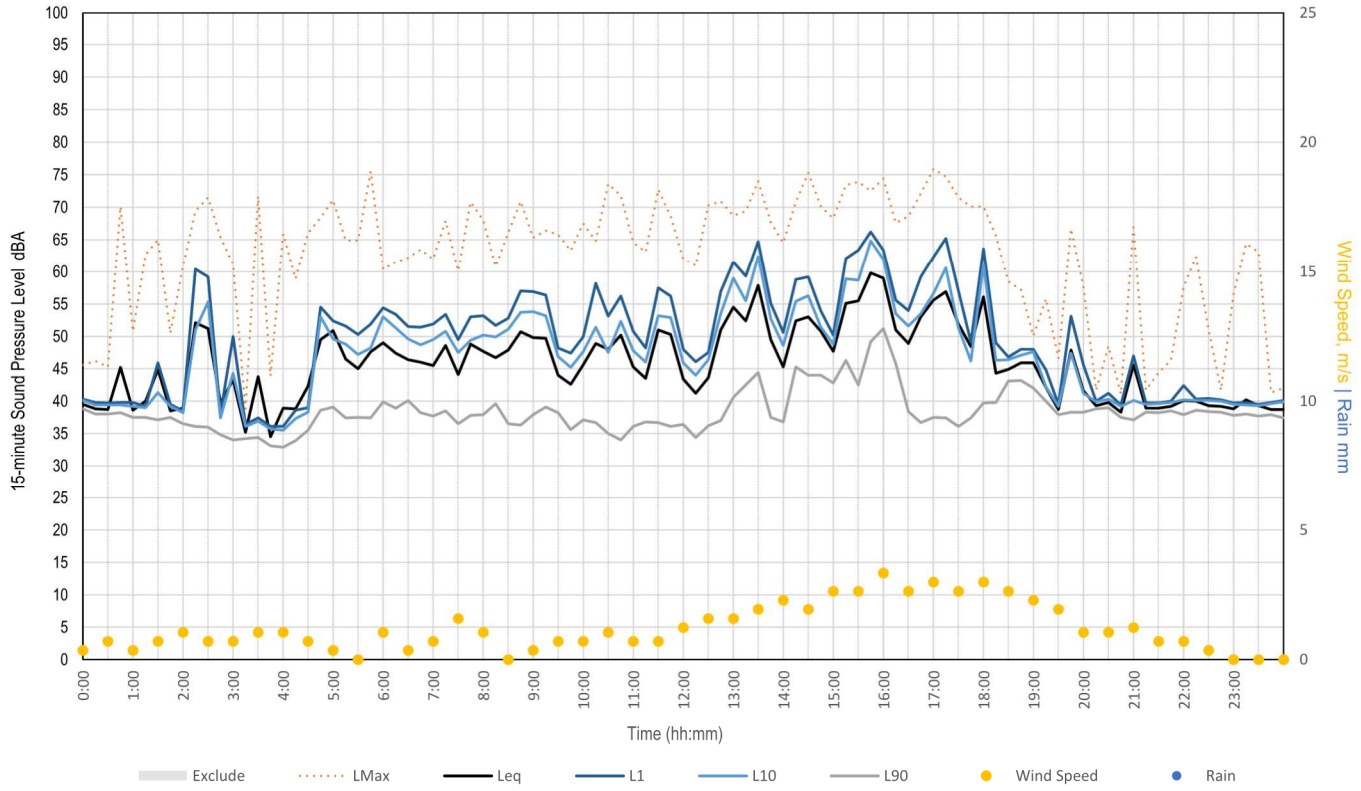
Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Tuesday, 11 October 2022



Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

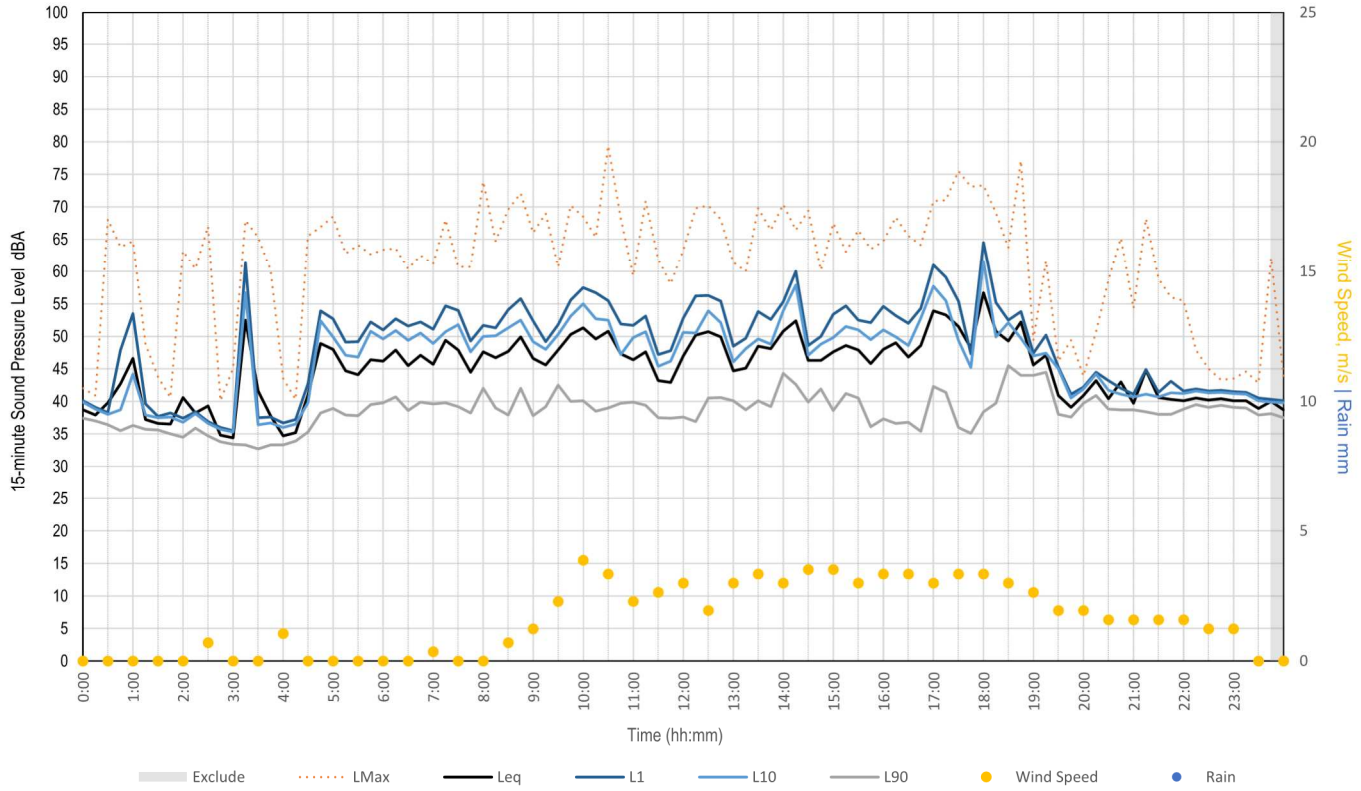
Wednesday, 12 October 2022



Noise Logger Results

Measured Noise Levels - M22 - 325 Taylors Road (Silverdale)

Thursday, 13 October 2022



Background Noise Monitoring

Location	M23 - 310 Rapleys Loop Road (Werombi)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878236	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.1 dBA	**Post:**	94.0 dBA	**Calibration**	**Pre:**	94.1 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Wednesday, 14 Sep 2022
Date End	Thursday, 13 Oct 2022
No. of days	30
No. of nights	29

Weather	
Station	BoM
Station Info	Camden Airport AWS
Distance	< 30 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placement in field away from residential structure (approx. 50m) and in front of road (approx. 50m from road centre).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	14/09/2022	3:21:00 PM	3:36:00 PM	61	43	46	32	
2	Day	29/09/2022	7:58:26 AM	8:13:26 AM	68	45	46	37	
3	Day	29/09/2022	8:14:38 AM	8:29:38 AM	62	48	51	41	
4	Day	29/09/2022	8:29:38 AM	8:44:38 AM	64	48	51	41	
5	Evening	13/10/2022	7:33:24 PM	7:48:24 PM	64	58	60	54	
6	Evening	25/09/2022	6:45:00 PM	7:00:00 PM	50	44	45	43	*
7	Evening	25/09/2022	7:30:00 PM	7:45:00 PM	59	43	44	42	*
8	Evening	25/09/2022	8:15:00 PM	8:30:00 PM	52	40	41	37	*
9	Night	16/09/2022	12:30:00 AM	12:45:00 AM	56	34	34	26	*
10	Night	16/09/2022	2:15:00 AM	2:30:00 AM	51	30	31	25	*
11	Night	16/09/2022	4:15:00 AM	4:30:00 AM	48	31	34	26	*
12	Night	16/09/2022	6:15:00 AM	6:30:00 AM	65	46	49	37	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Constant mechanical noise from tractor at neighbouring property. Intermittent bird noise. Occasional wind gusts causing movement in vegetation (e.g. grass and trees rustling). Intermittent animal sounds (e.g. frog/toads, dogs). Possible mechanical plant at adjacent property influencing the background noise environment when active (observed around 8 AM). Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 38 to 60 dBA.
Background noise	Distant traffic, likely Werombi Road.
Evening	
Ambient noise	Constant insect and animal noise. Intermittent animal sounds (e.g. birds noise and dog barking). Several aircraft flying overhead with an approx. duration of 30 sec to 1 min and with maximum sound levels in the range of 44 to 52 dBA.
Background noise	Insect noise.
Night	
Ambient noise	Constant insect noise. Intermittent animal sounds (e.g. bird noise, dog barks, farm animals). Occasional vehicle passby on local roads. Several aircraft flying distant with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 35 to 37 dBA.
Background noise	Constant bird and insect noise. Movement in vegetation due to wind (e.g. grass and trees rustling).

Site Details	M23 - 310 Rapleys Loop Road (Werombi)
Start Date	Wed 14 September 2022
End Date	Thu 13 October 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	58
$L_{eq, Evening}$ dBA	47
$L_{eq, Night}$ dBA	45
RBL, $_{Day}$ dBA	30
RBL, $_{Evening}$ dBA	36
RBL, $_{Night}$ dBA	30

Daily Summary

Date	14/09	15/09	16/09	17/09	18/09	19/09	20/09	21/09
$L_{eq, Day}$ dBA	47	44	46	49	51	61	45	44
$L_{eq, Evening}$ dBA	41	42	41	40	44	37	38	43
$L_{eq, Night}$ dBA	37	39	39	49	40	39	37	41
ABL, $_{Day}$ dBA	28	28	33	32	29	32	30	31
ABL, $_{Evening}$ dBA	24	27	34	35	35	27	26	30
ABL, $_{Night}$ dBA	24	24	28	30	27	25	24	27

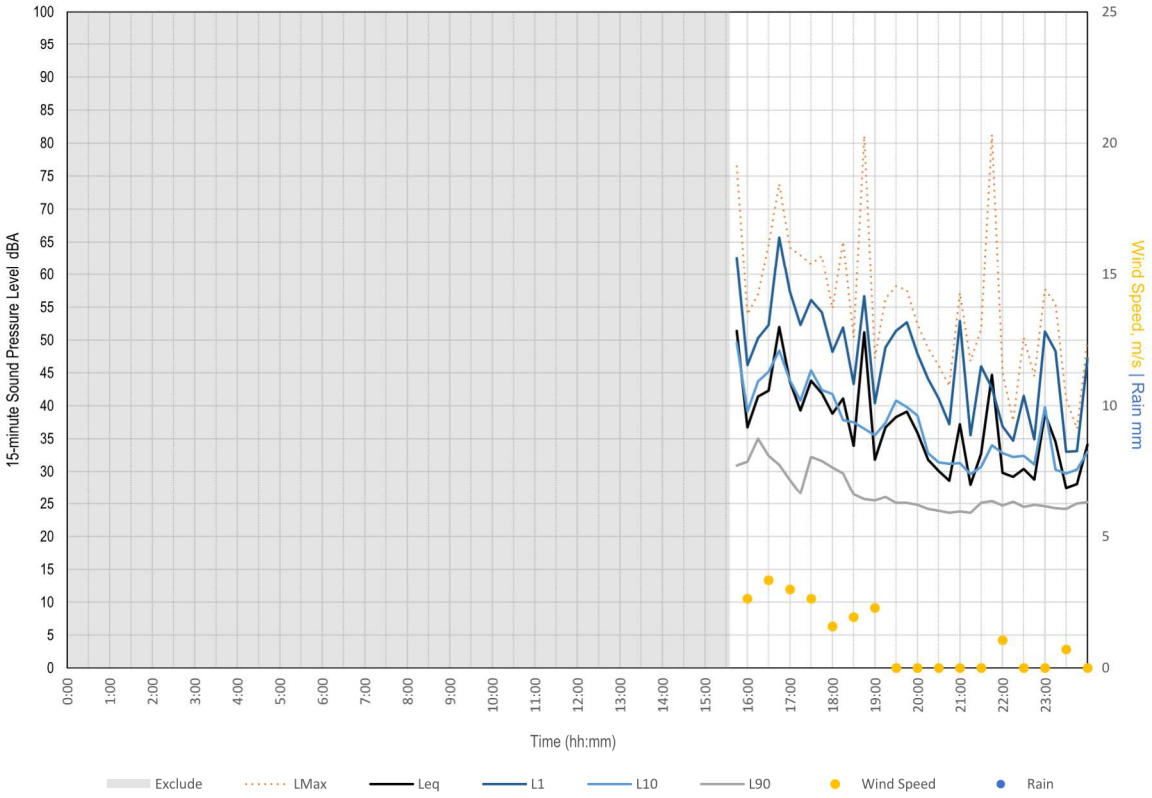
Date	22/09	23/09	24/09	25/09	26/09	27/09	28/09	29/09
$L_{eq, Day}$ dBA	45	46	45	43	66	46	48	71
$L_{eq, Evening}$ dBA	45	48	44	42	42	44	46	46
$L_{eq, Night}$ dBA	39	43	42	40	40	48	43	43
ABL, $_{Day}$ dBA	28	29	31	30	29	30	32	35
ABL, $_{Evening}$ dBA	35	41	40	36	32	36	41	40
ABL, $_{Night}$ dBA	31	34	32	30	28	32	34	36

Date	30/09	01/10	02/10	03/10	04/10	05/10	06/10	07/10
$L_{eq, Day}$ dBA	46	44	49	48	63	49	44	45
$L_{eq, Evening}$ dBA	43	43	42	38	48	46	46	52
$L_{eq, Night}$ dBA	44	42	41	42	42	50	45	49
ABL, $_{Day}$ dBA	32	29	30	30	32	36	32	30
ABL, $_{Evening}$ dBA	39	36	35	31	33	42	37	39
ABL, $_{Night}$ dBA	33	33	29	27	30	39	30	36

Date	08/10	09/10	10/10	11/10	12/10	13/10
$L_{eq, Day}$ dBA	46	45	48	47	46	46
$L_{eq, Evening}$ dBA		52	53	49	50	50
$L_{eq, Night}$ dBA	52	50	49	45	41	
ABL, $_{Day}$ dBA	30	30	29	29	31	32
ABL, $_{Evening}$ dBA		39	41	37	39	47
ABL, $_{Night}$ dBA	43	32	32	31	29	

Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

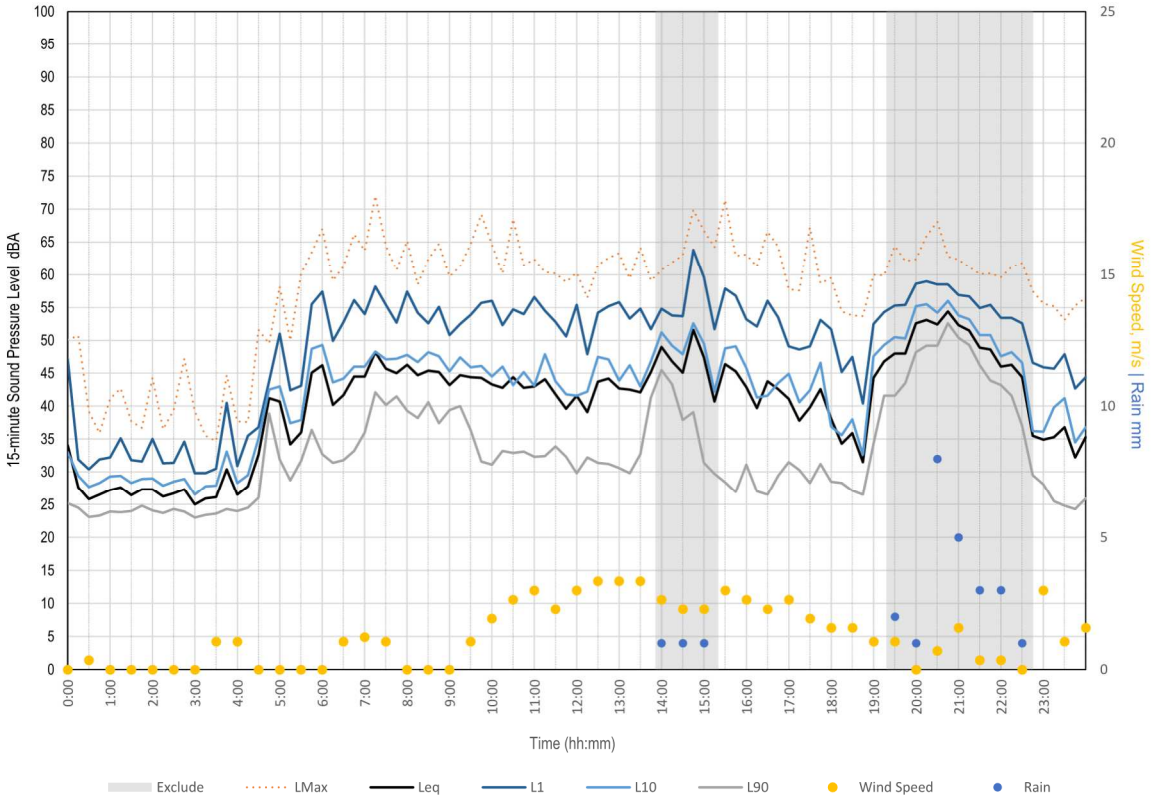
Wednesday, 14 September 2022



Noise Logger Results

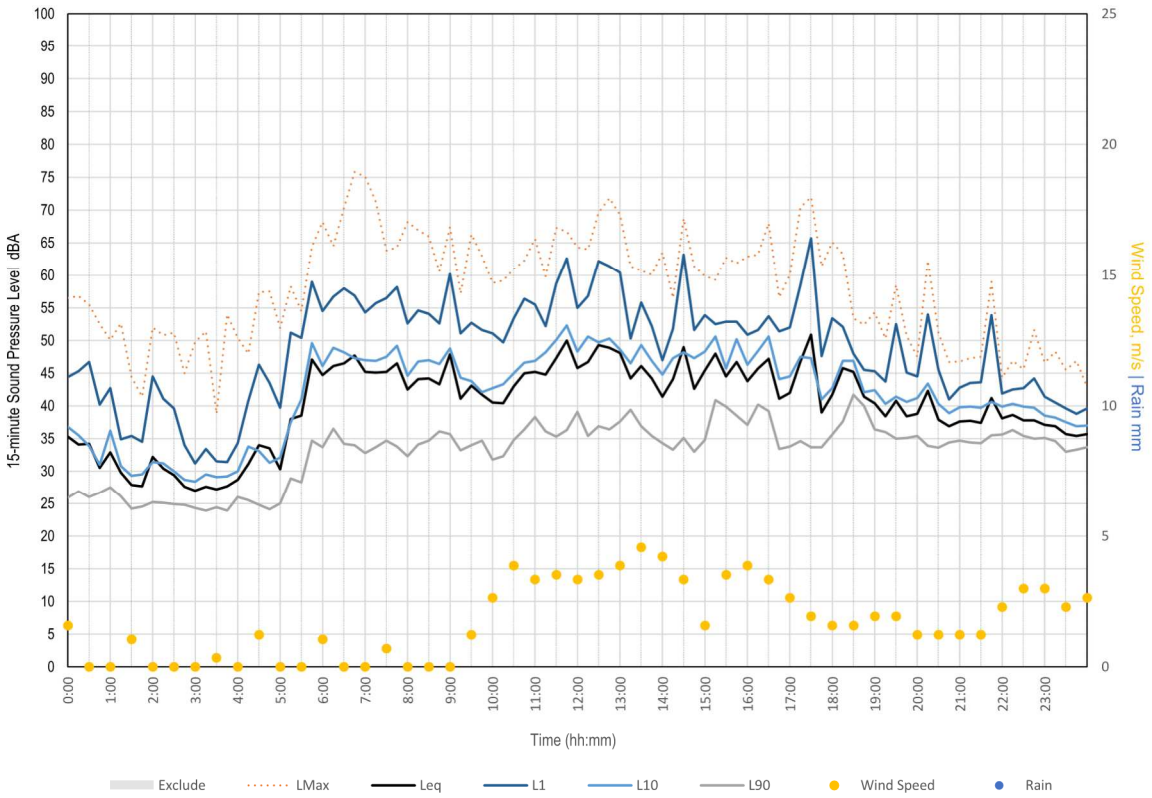
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Thursday, 15 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

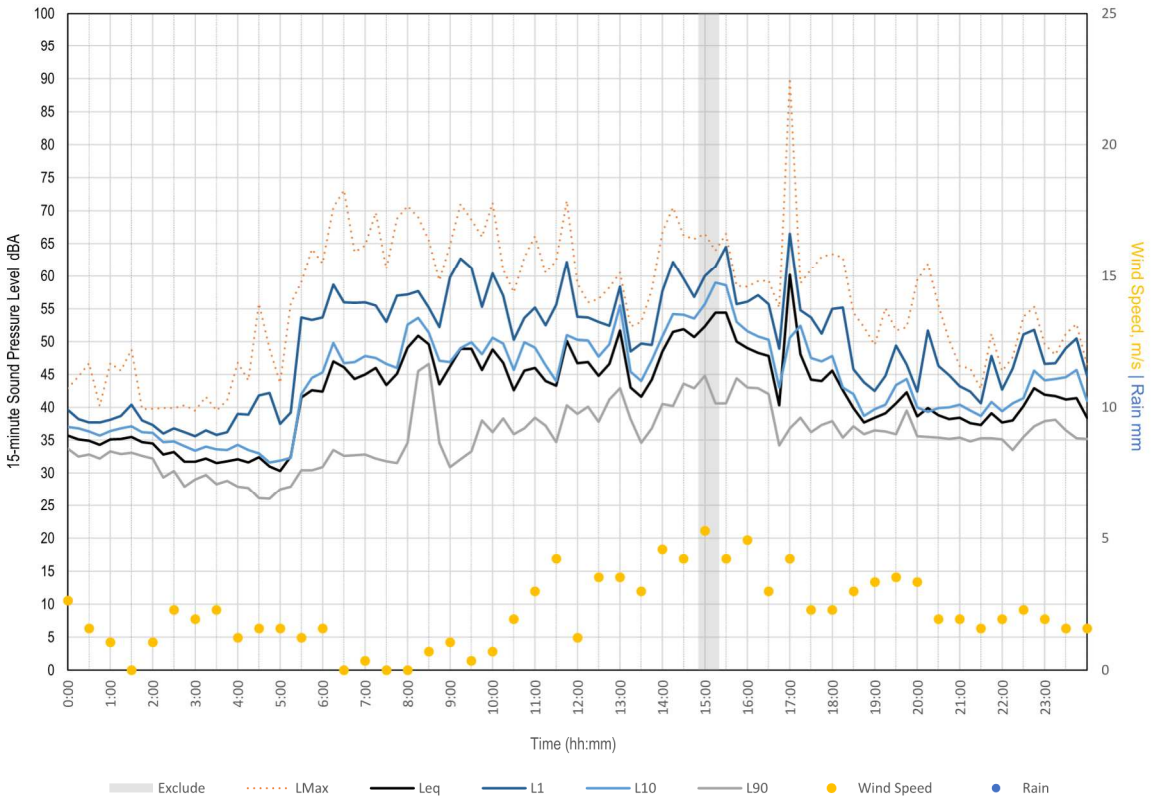
Friday, 16 September 2022



Noise Logger Results

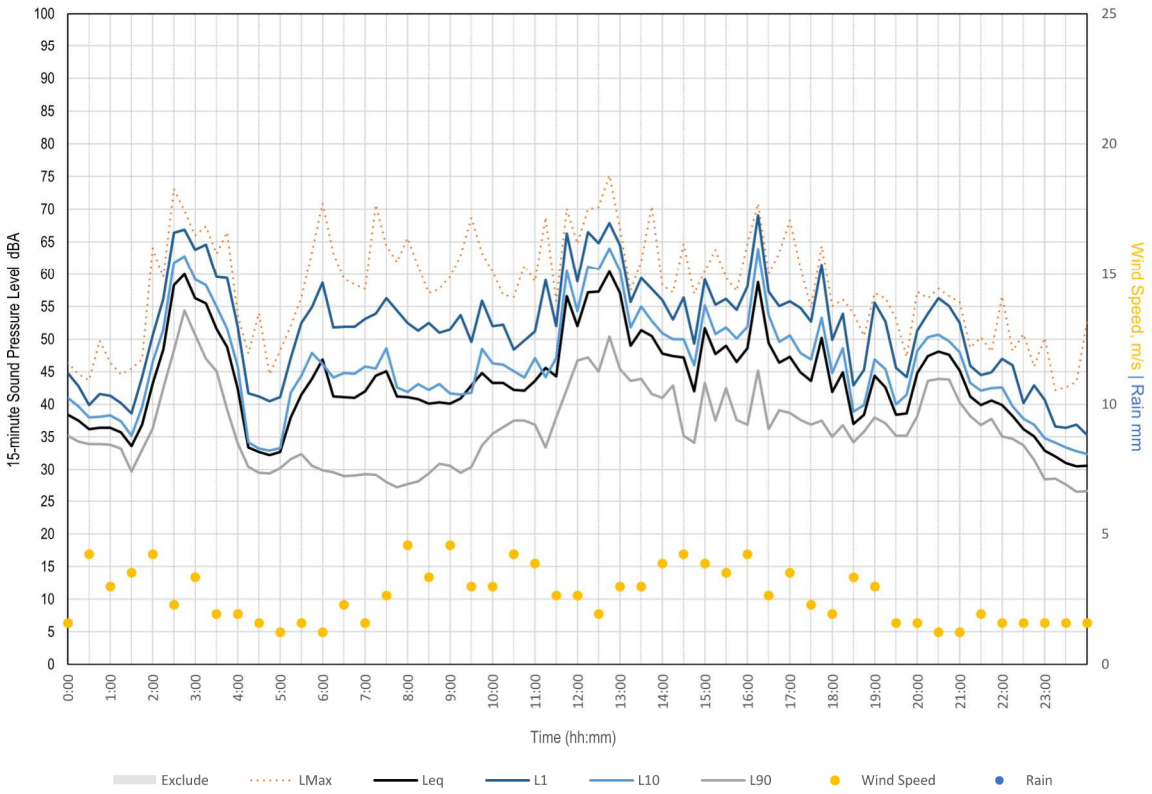
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Saturday, 17 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

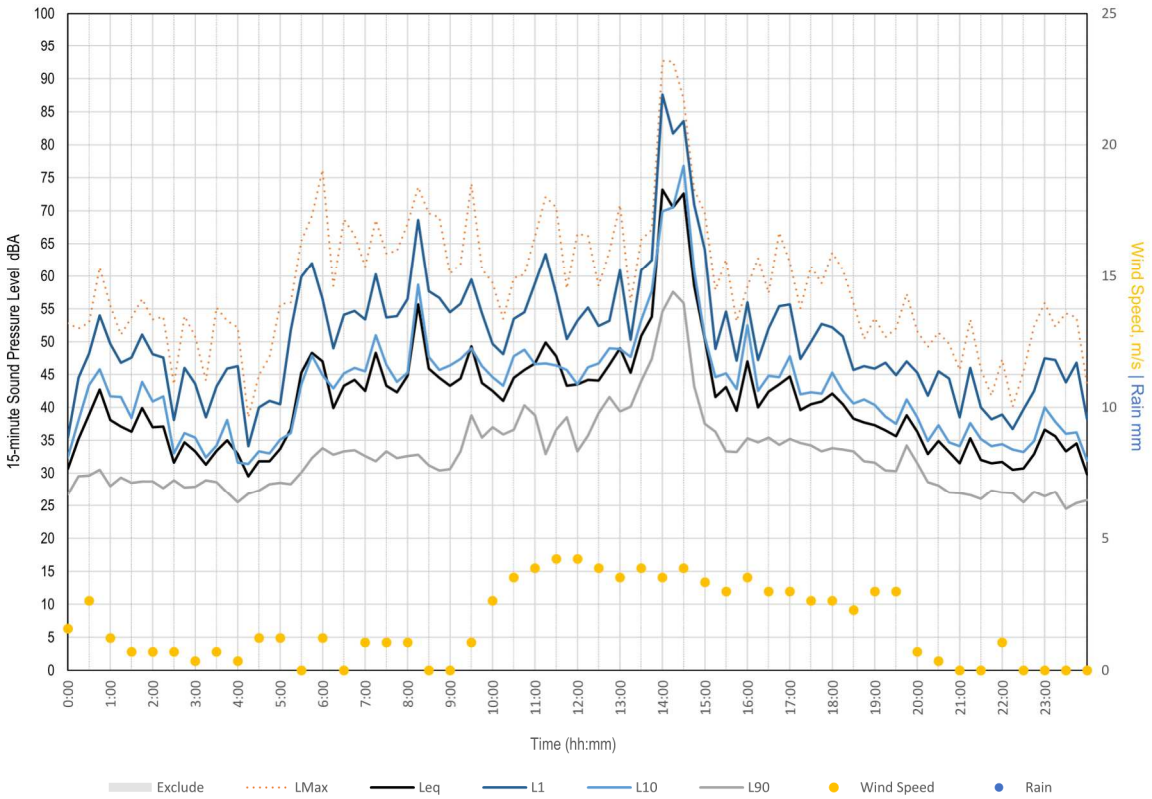
Sunday, 18 September 2022



Noise Logger Results

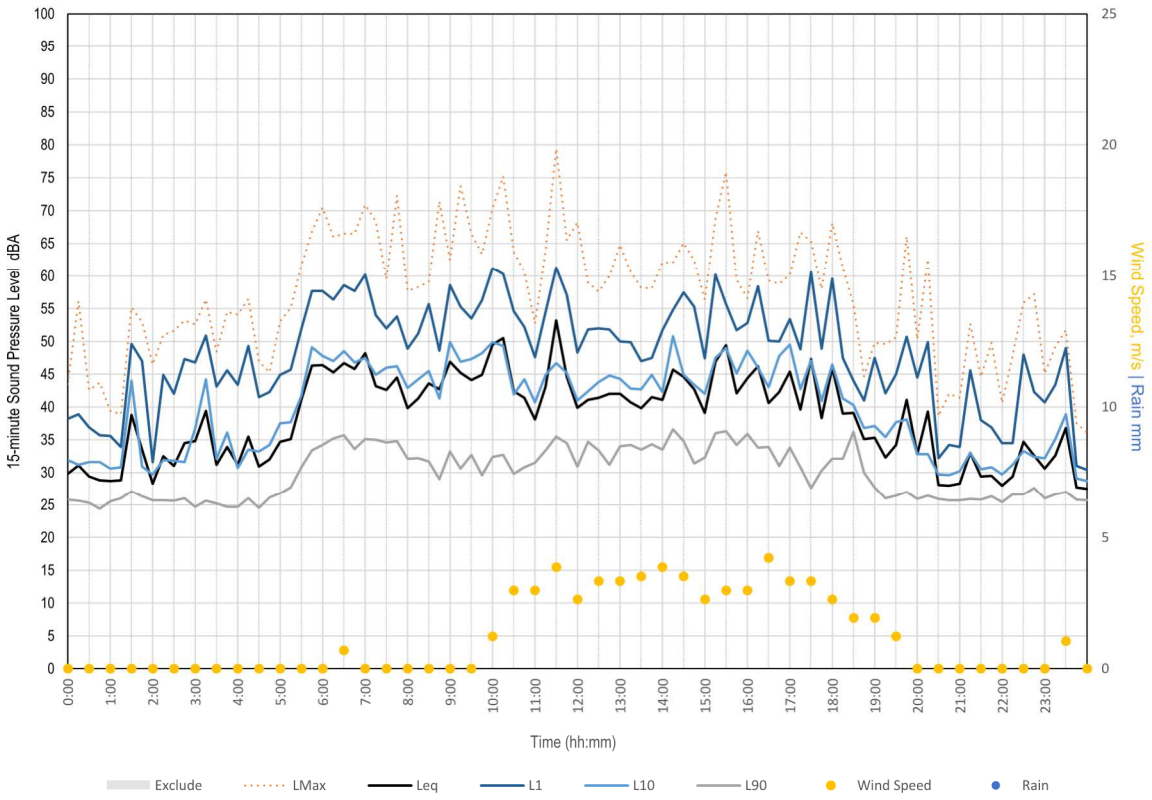
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Monday, 19 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

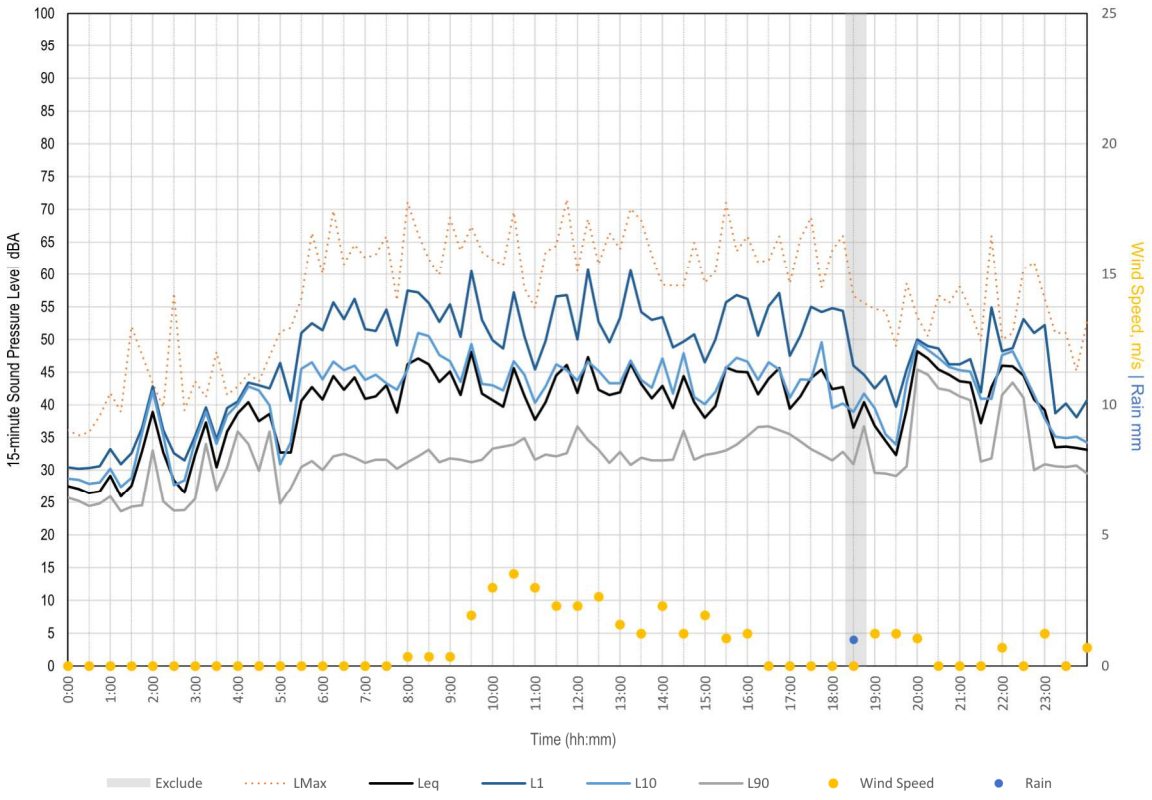
Tuesday, 20 September 2022



Noise Logger Results

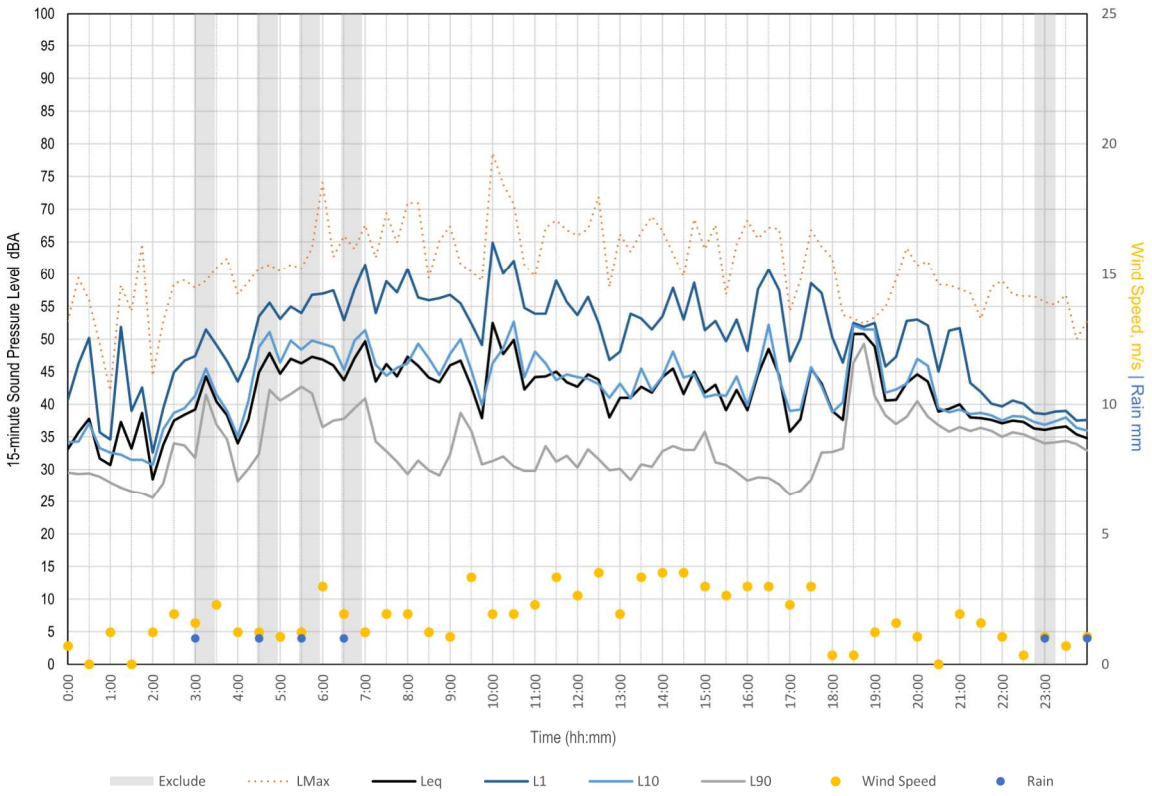
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Wednesday, 21 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

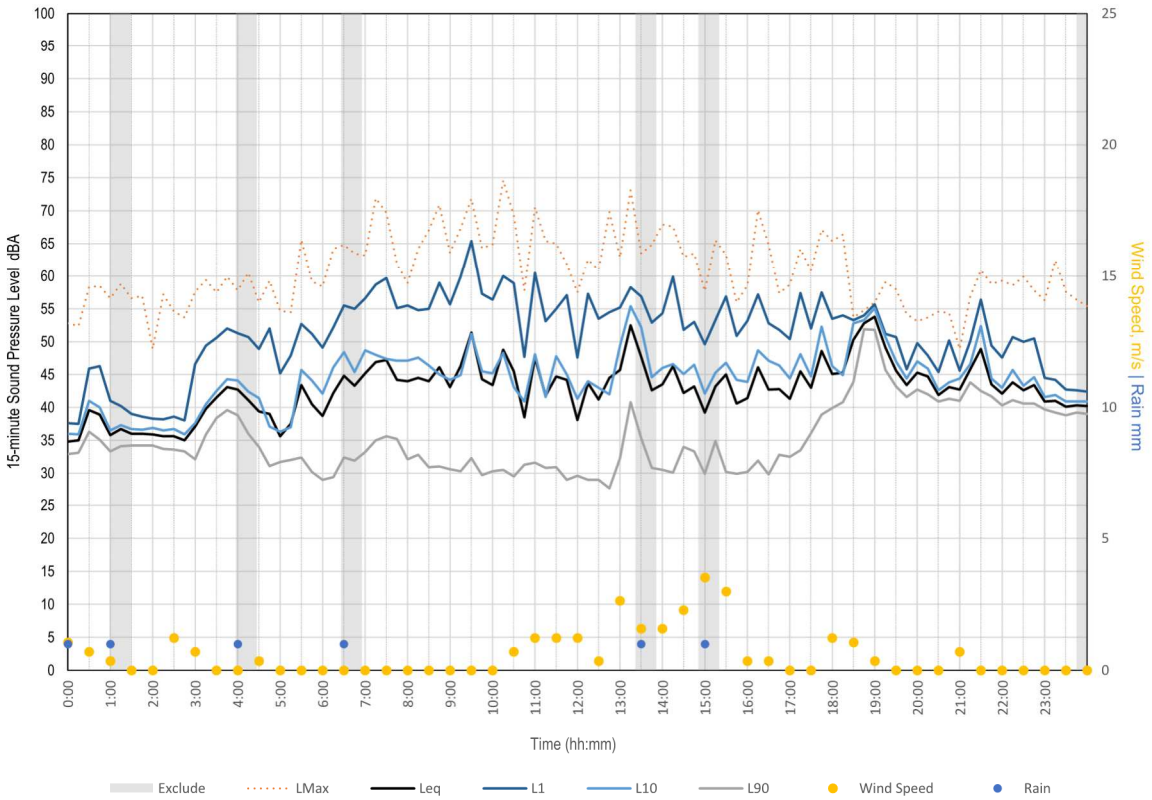
Thursday, 22 September 2022



Noise Logger Results

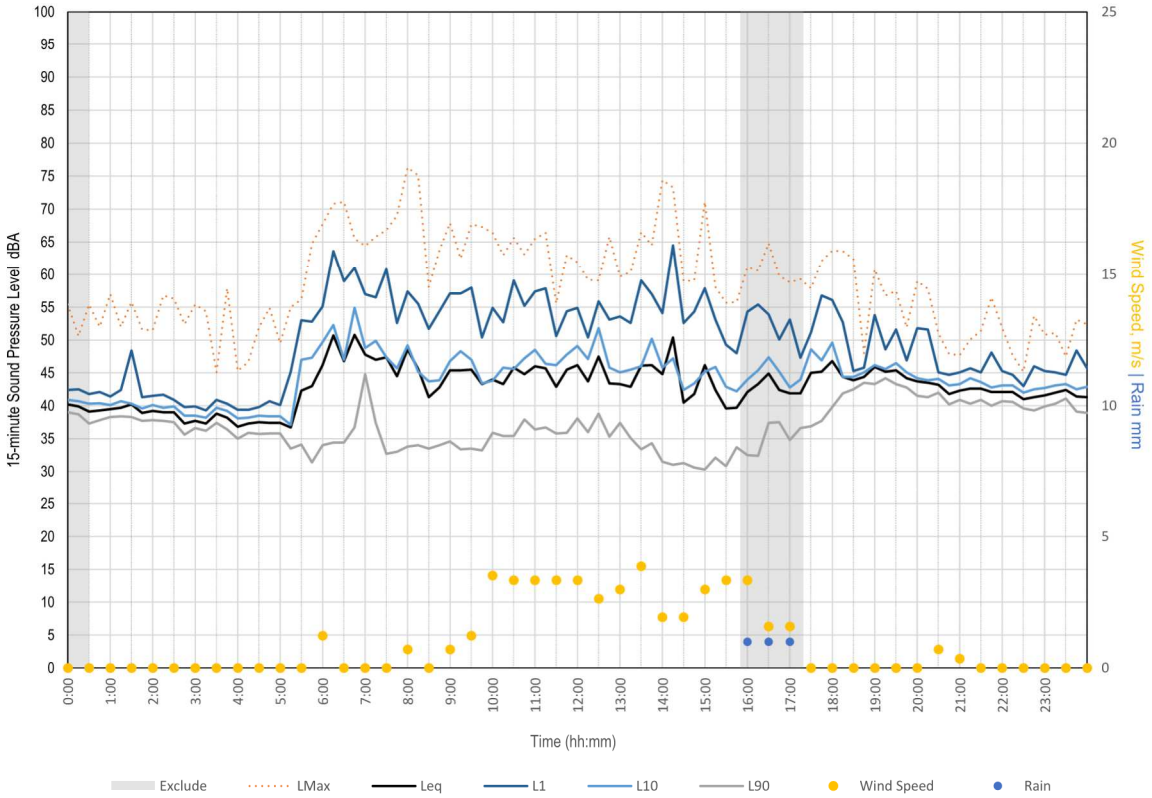
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Friday, 23 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

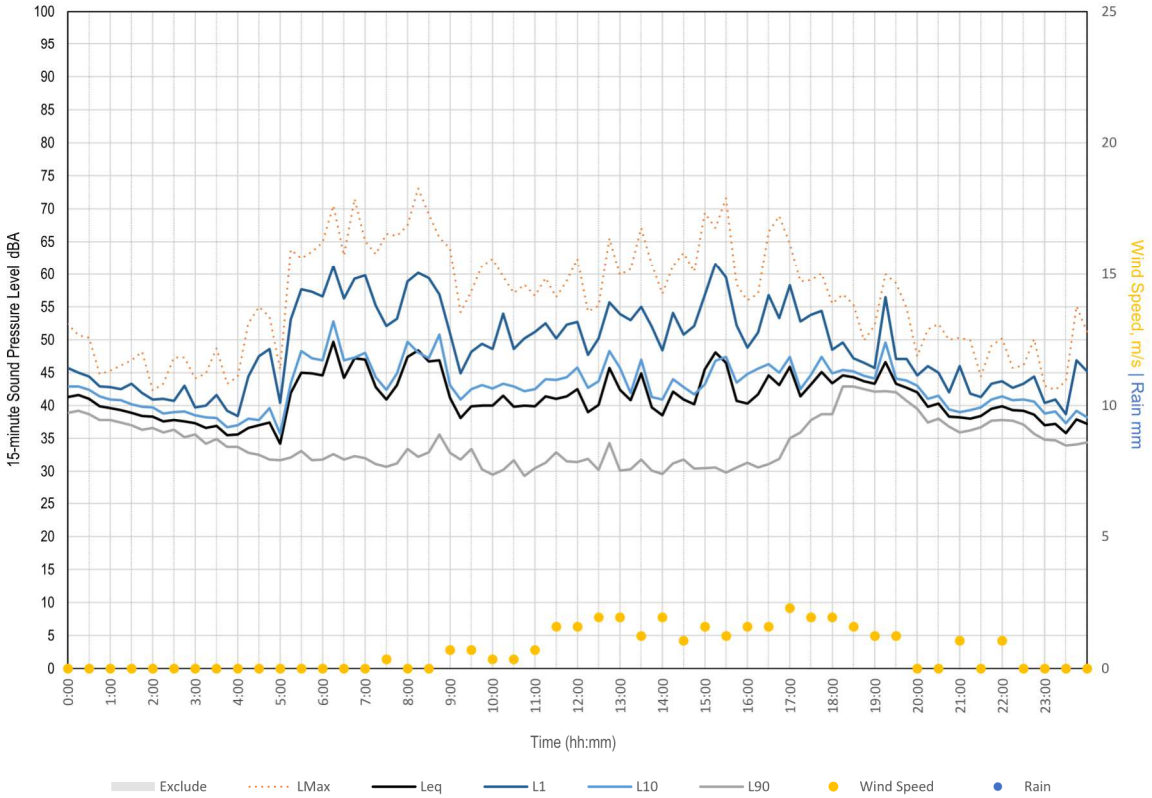
Saturday, 24 September 2022



Noise Logger Results

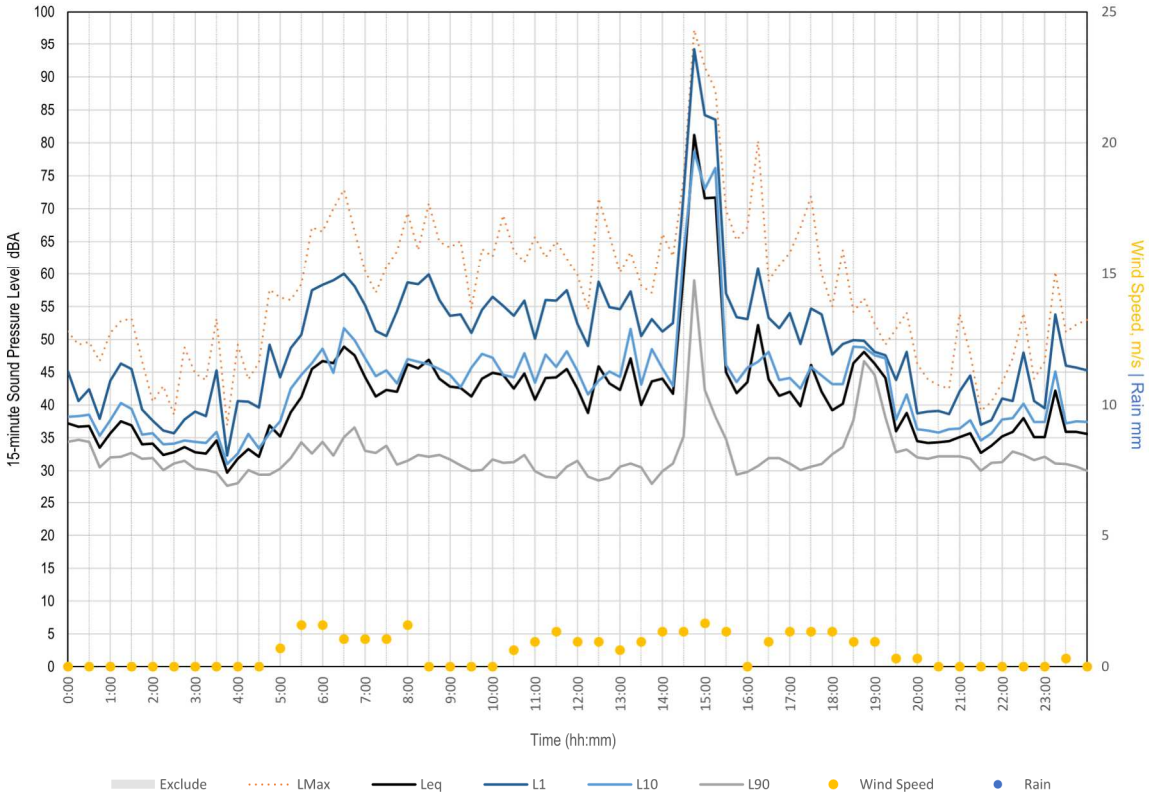
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Sunday, 25 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

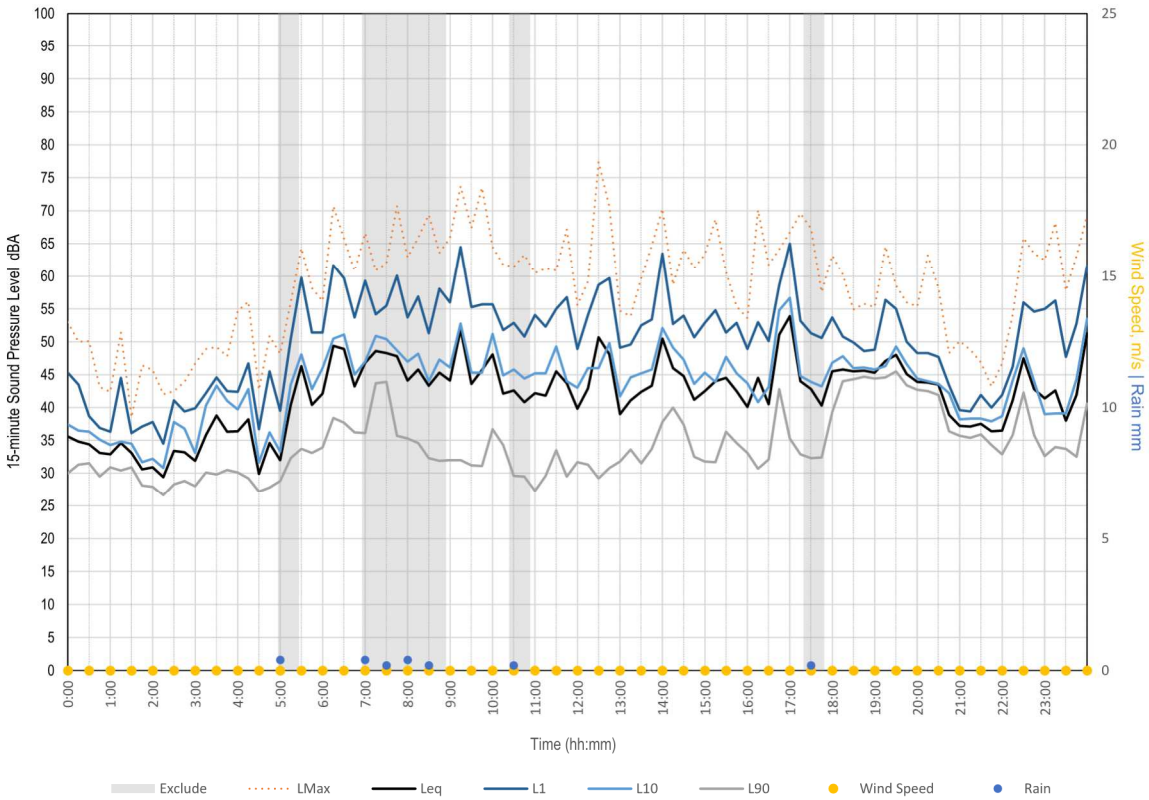
Monday, 26 September 2022



Noise Logger Results

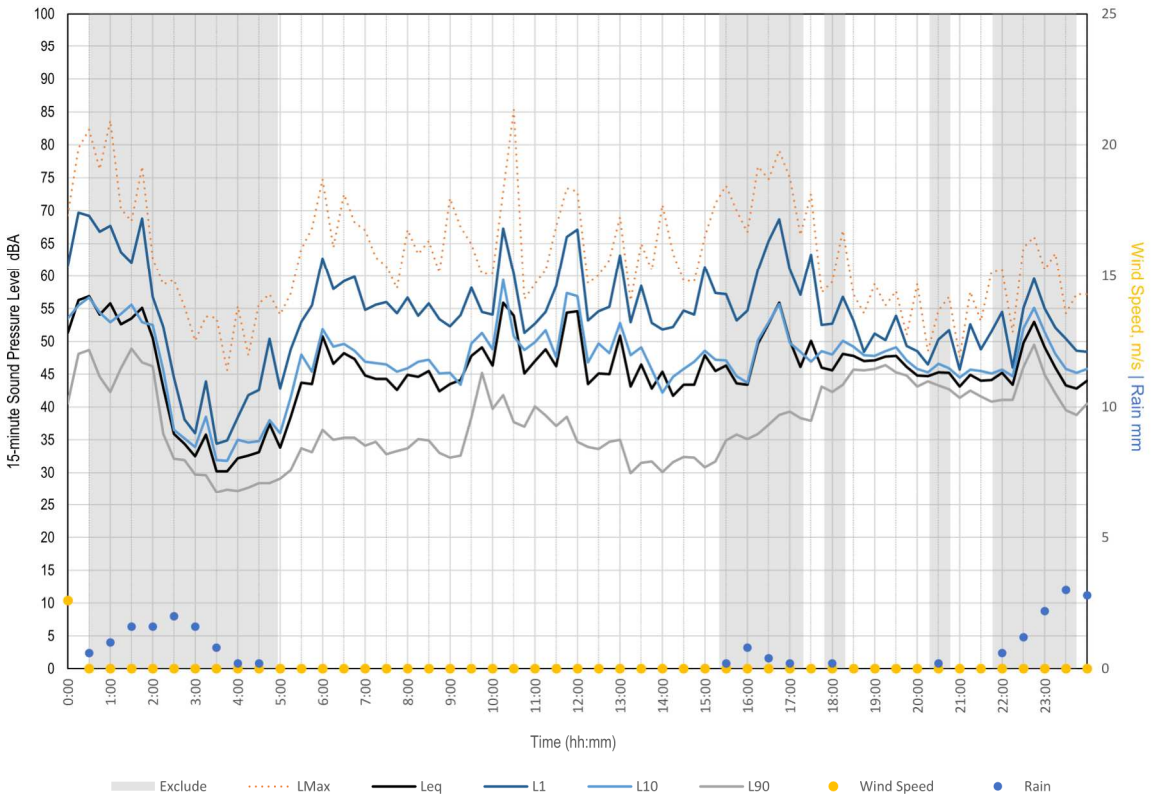
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Tuesday, 27 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

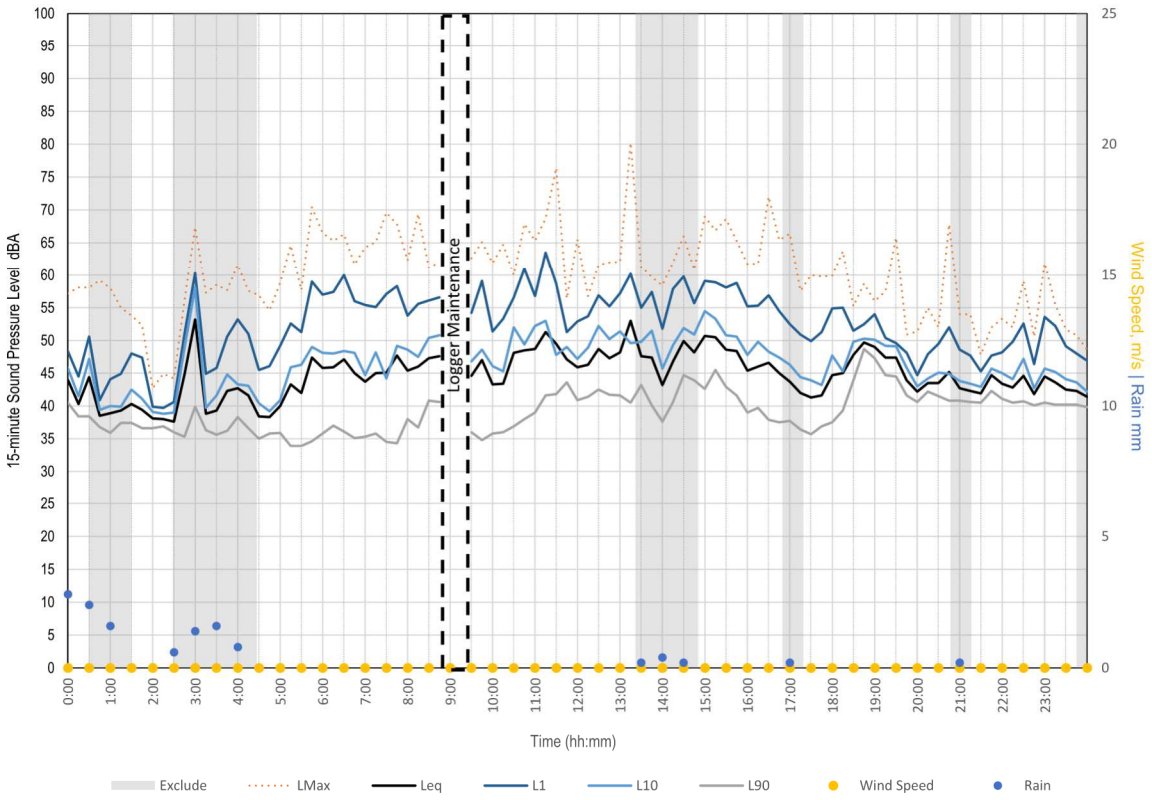
Wednesday, 28 September 2022



Noise Logger Results

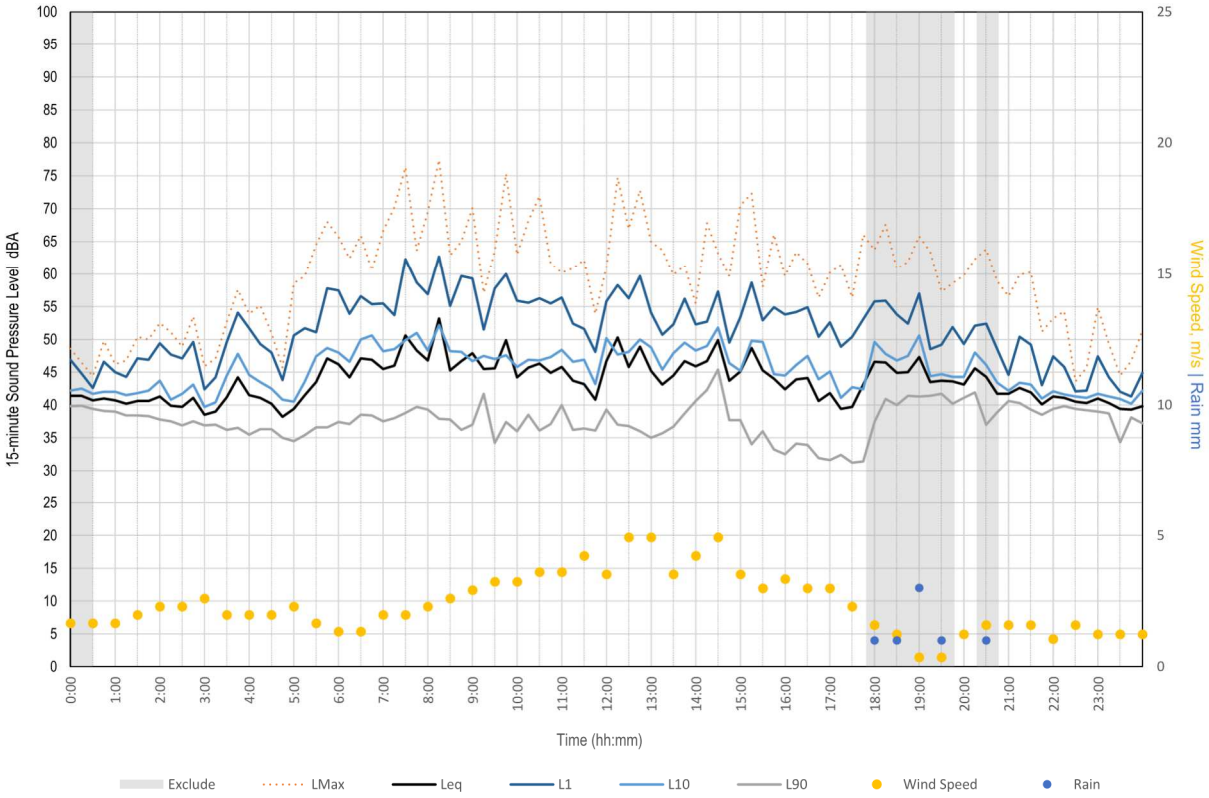
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Thursday, 29 September 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

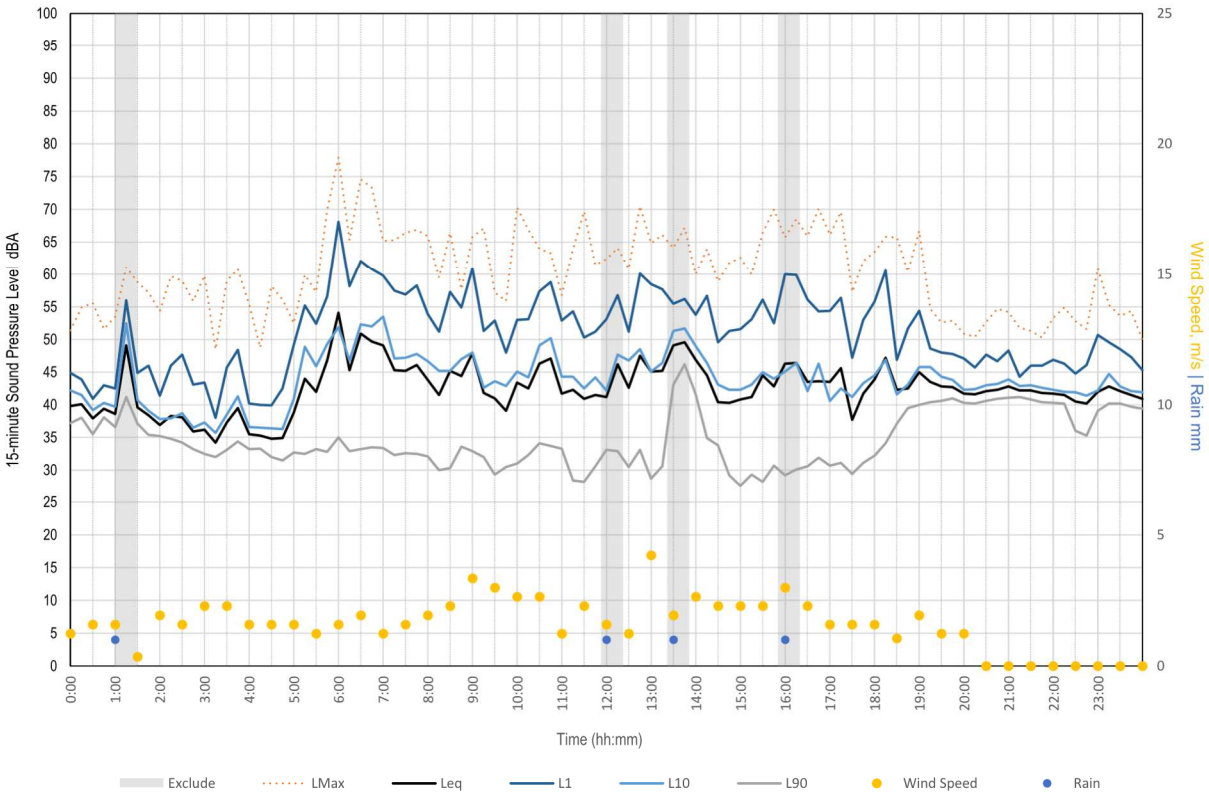
Friday, 30 September 2022



Noise Logger Results

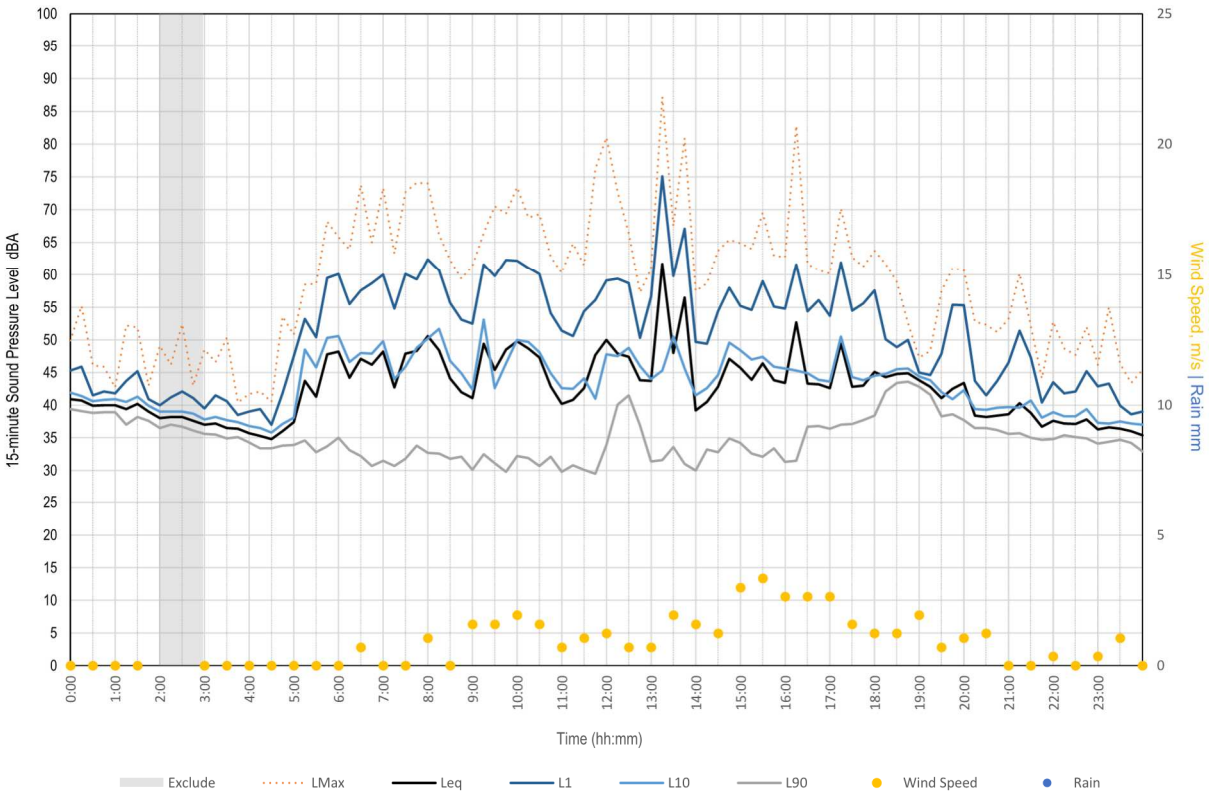
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Saturday, 01 October 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

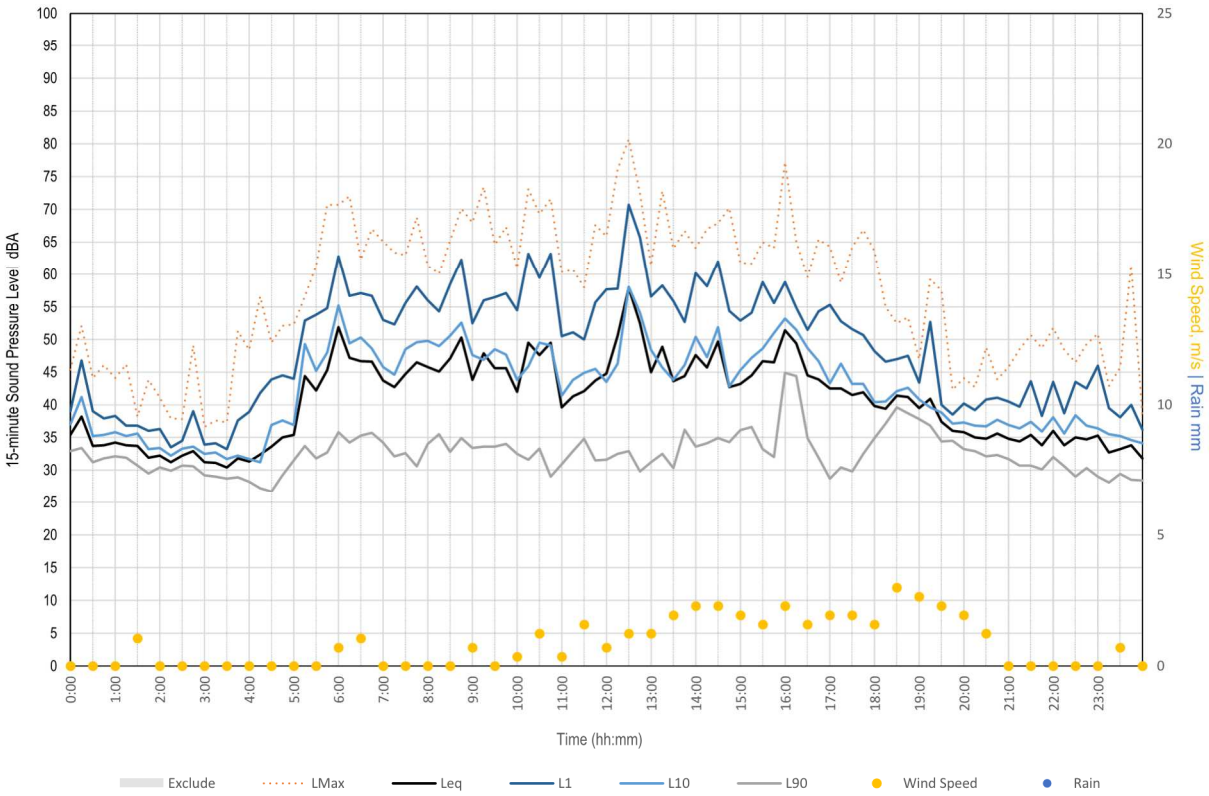
Sunday, 02 October 2022



Noise Logger Results

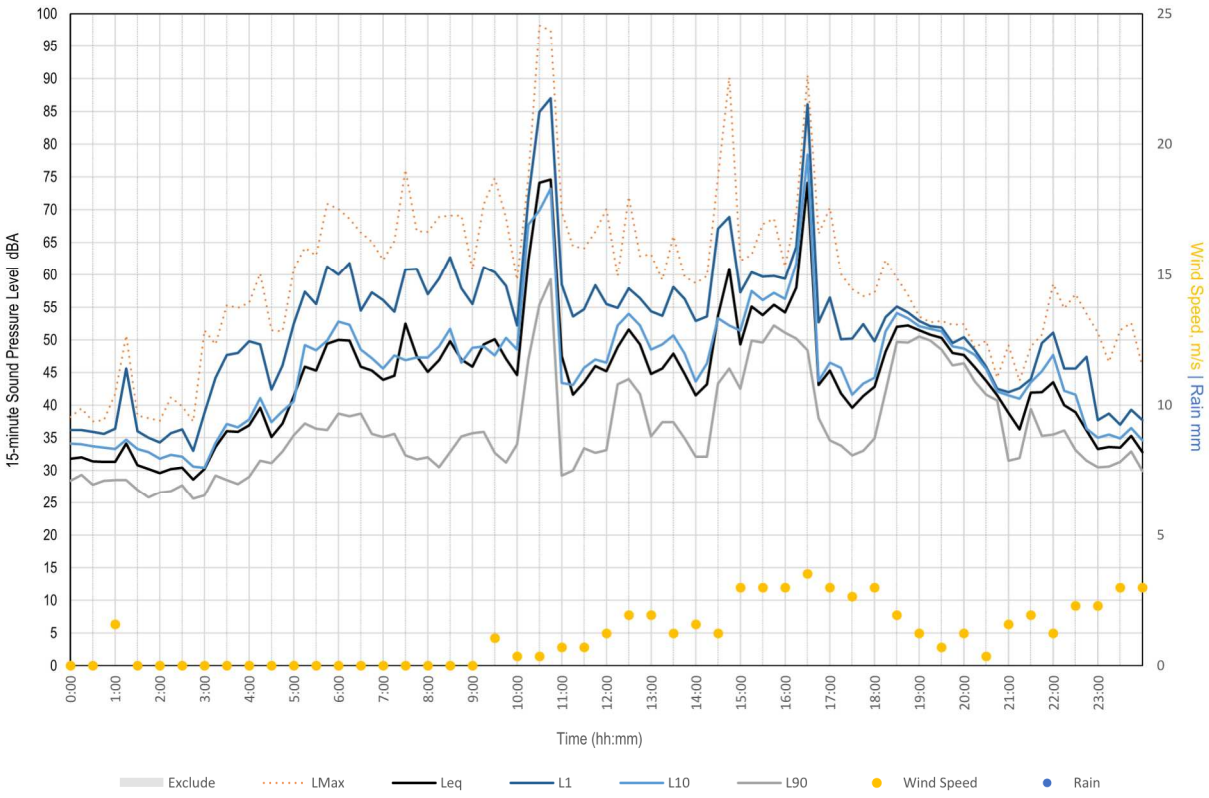
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Monday, 03 October 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

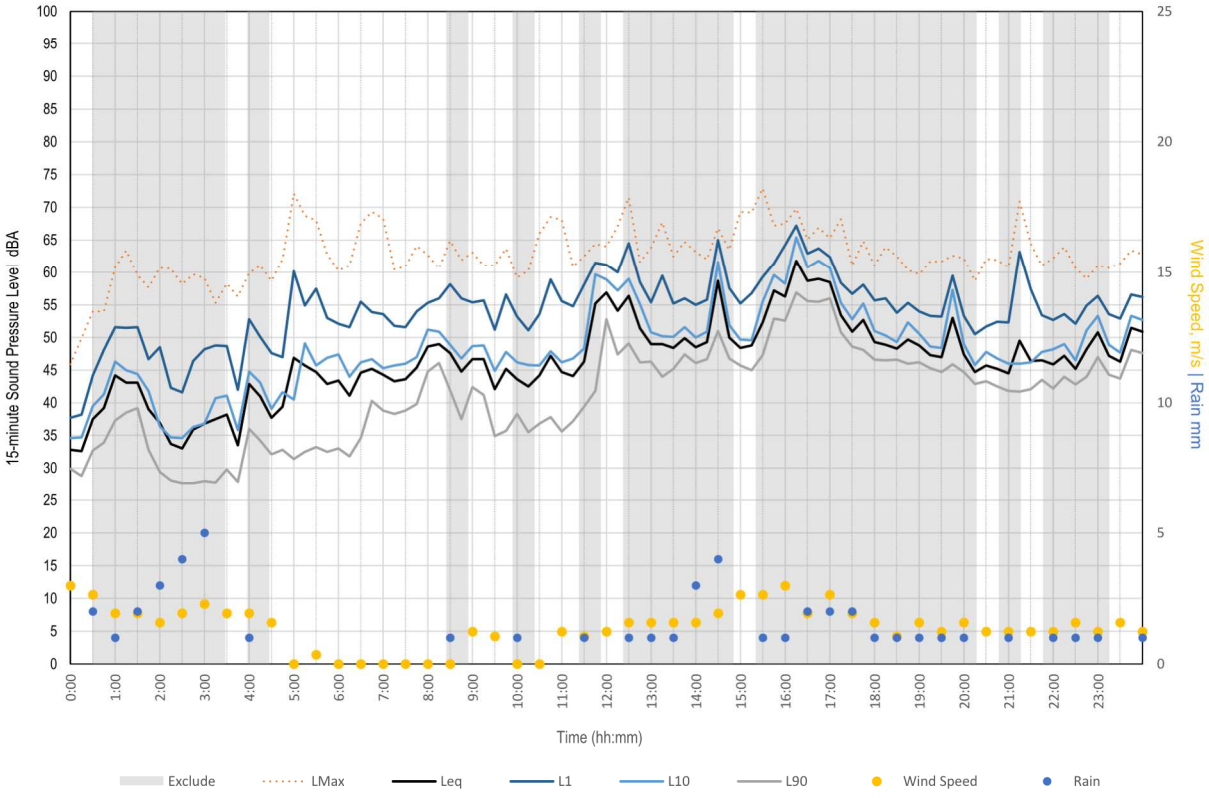
Tuesday, 04 October 2022



Noise Logger Results

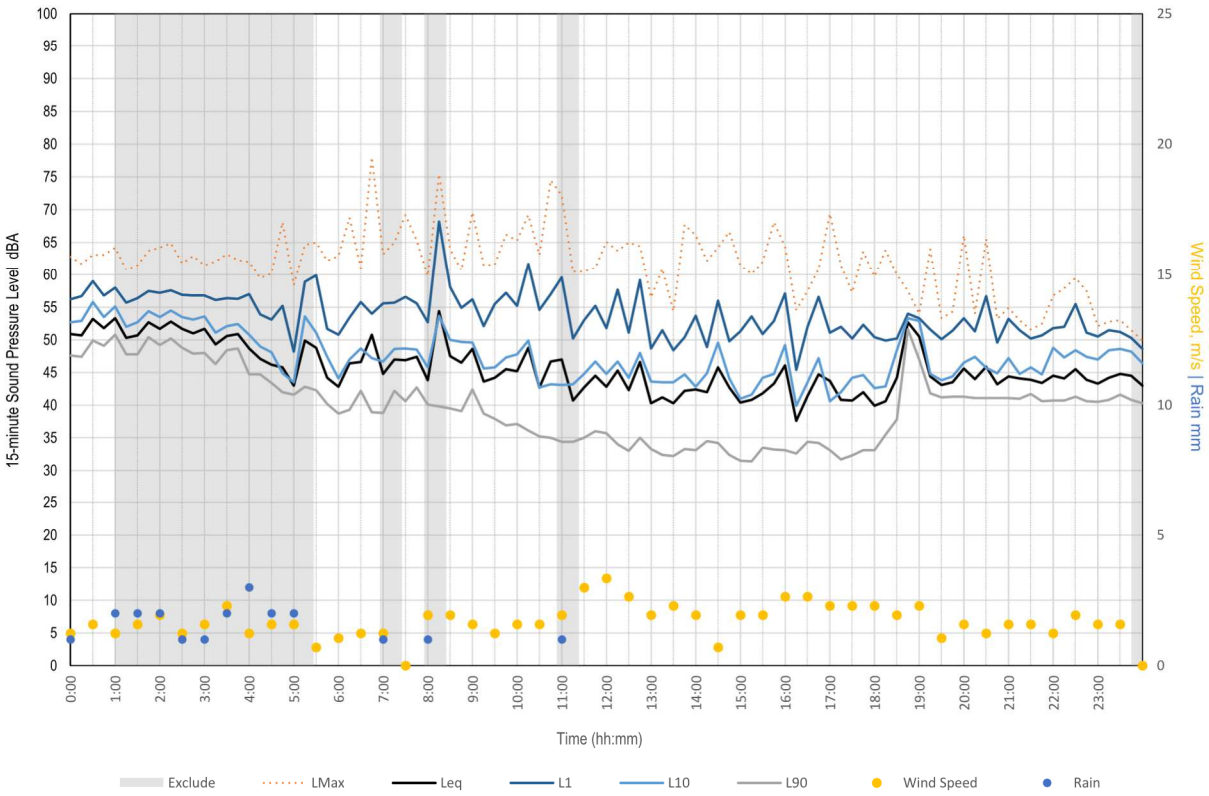
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Wednesday, 05 October 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

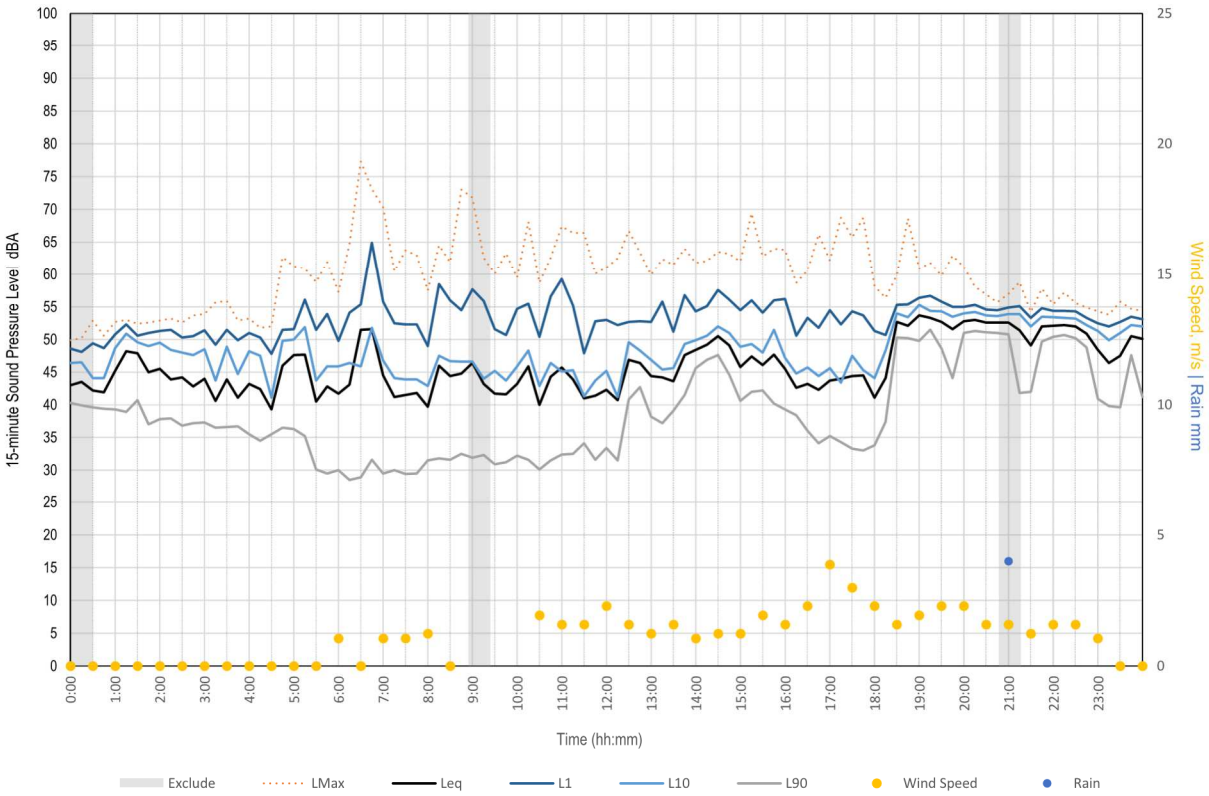
Thursday, 06 October 2022



Noise Logger Results

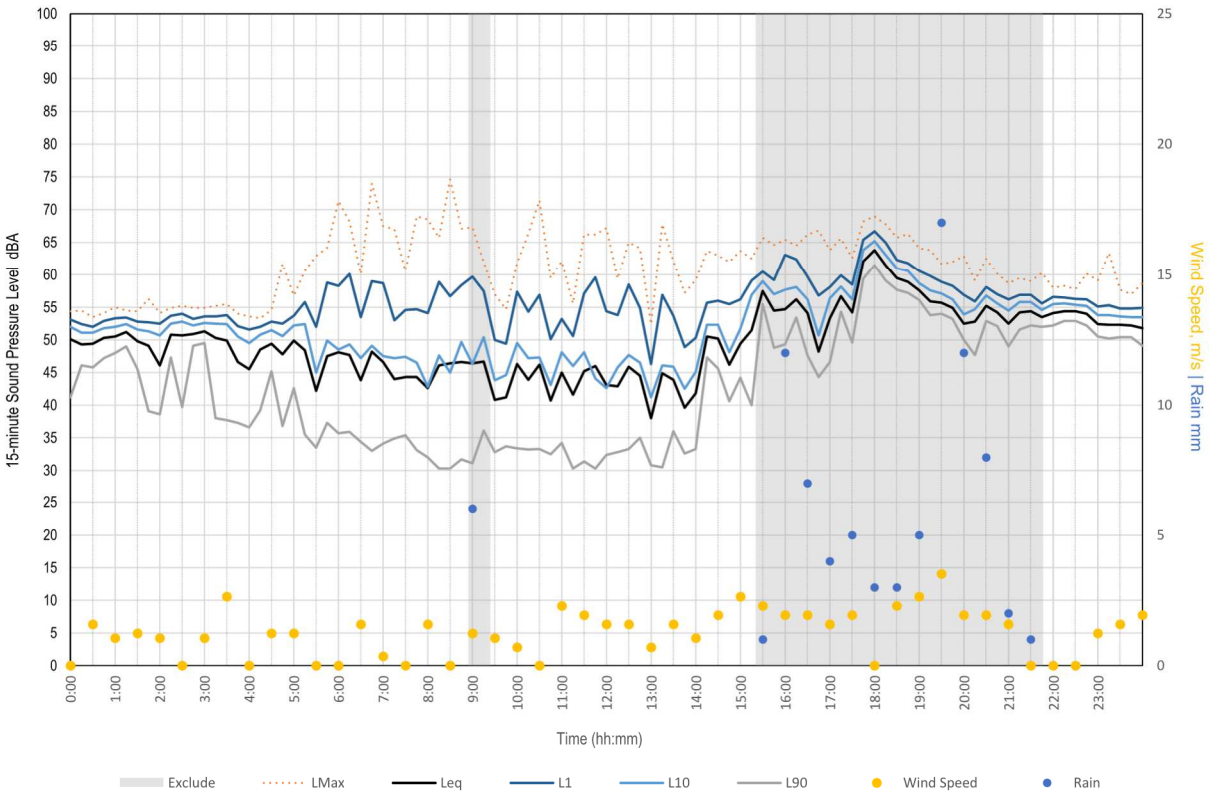
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Friday, 07 October 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

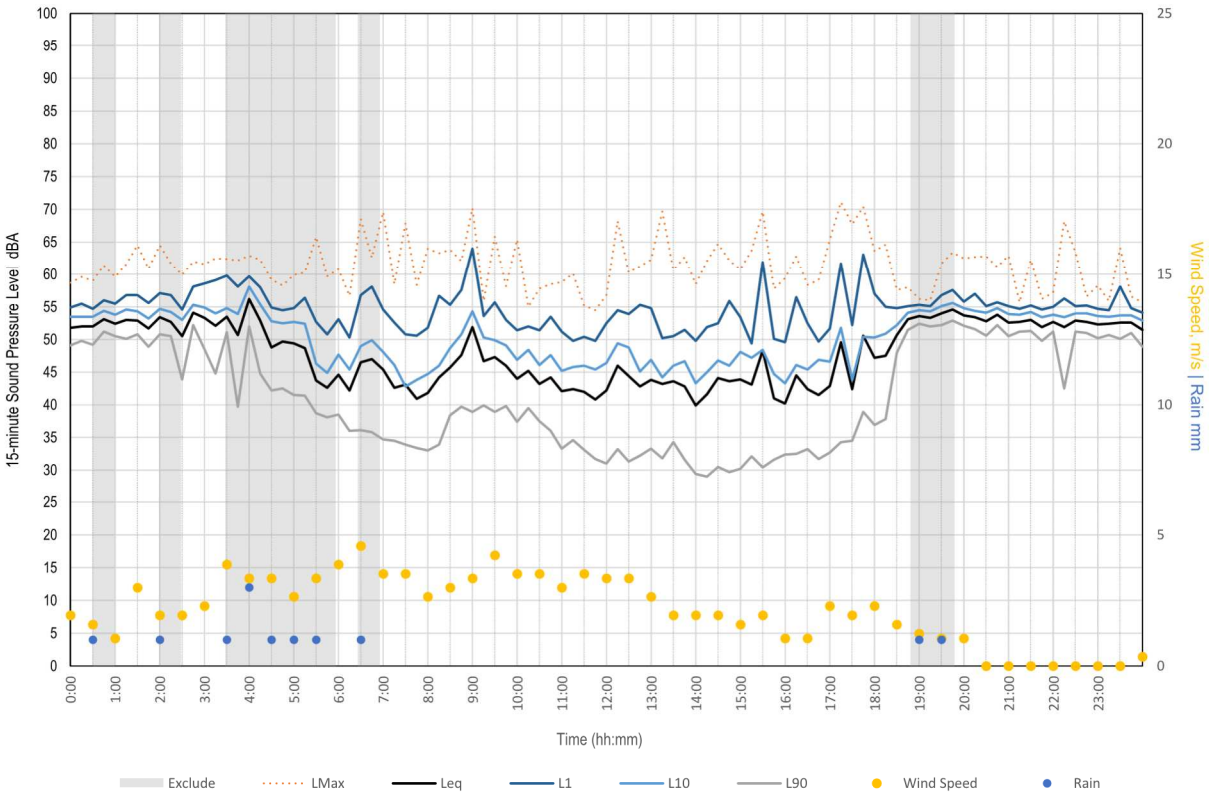
Saturday, 08 October 2022



Noise Logger Results

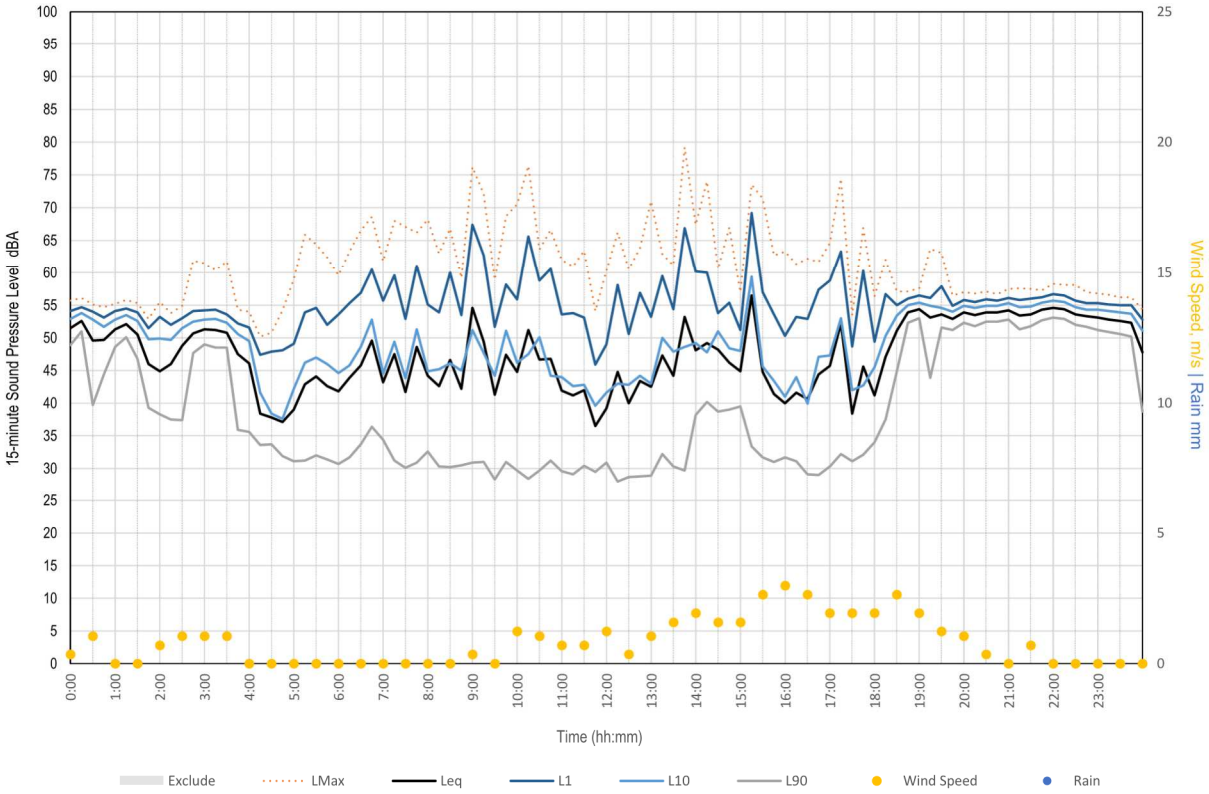
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Sunday, 09 October 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

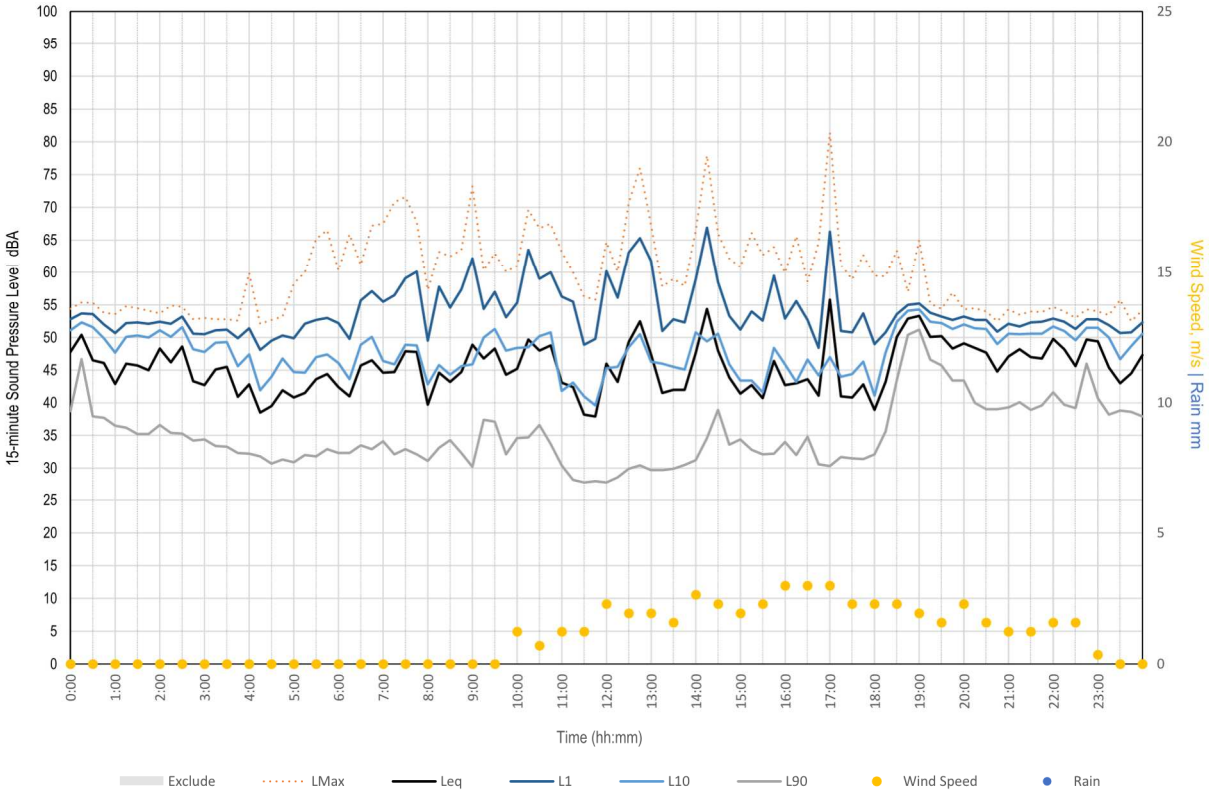
Monday, 10 October 2022



Noise Logger Results

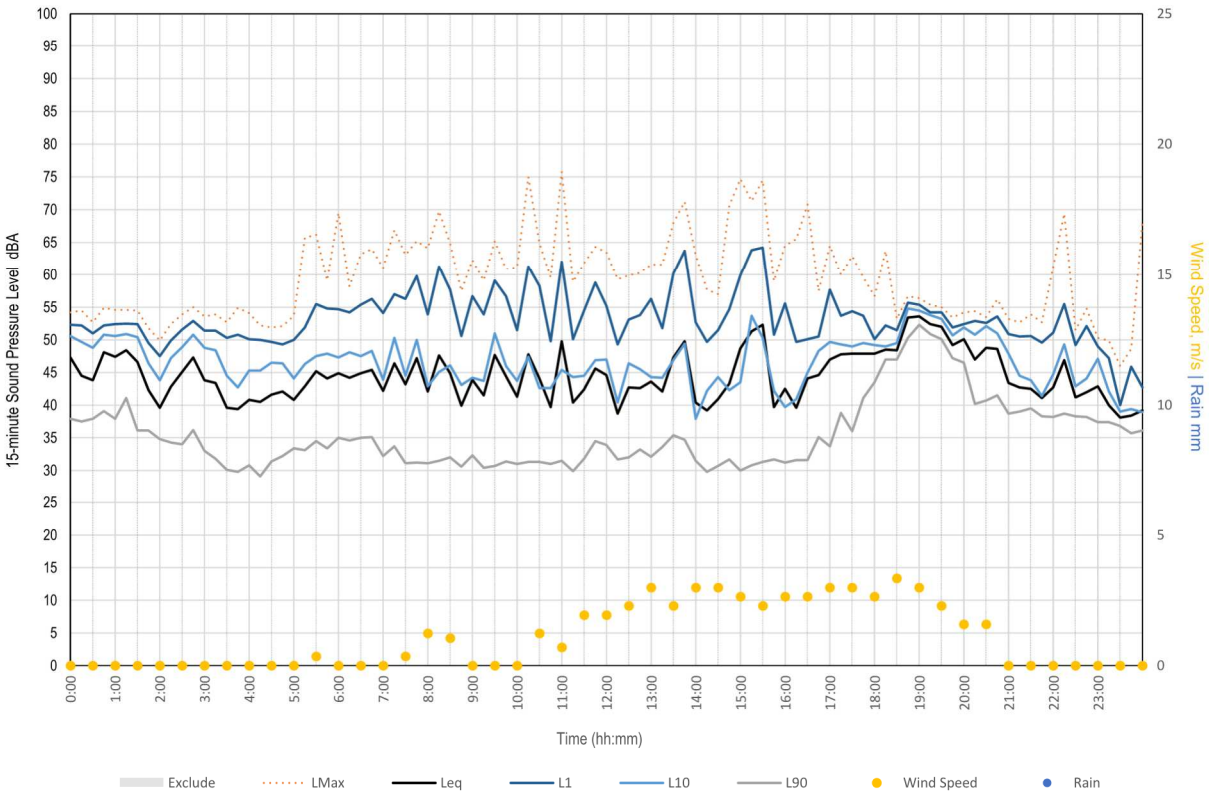
Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Tuesday, 11 October 2022



Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

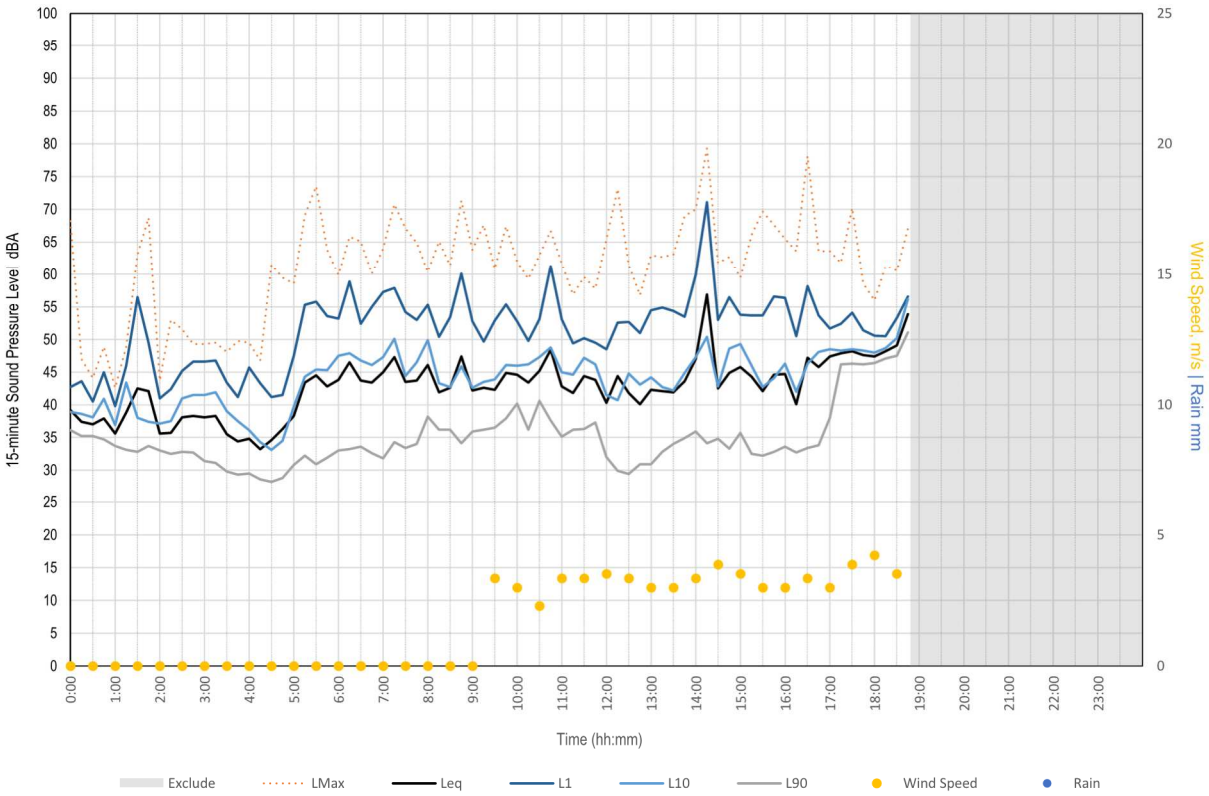
Wednesday, 12 October 2022



Noise Logger Results

Measured Noise Levels - M23 - 310 Rapleys Loop Road (Werombi)

Thursday, 13 October 2022



Background Noise Monitoring

Location	M24 Blaxland - 51 Bridge Road	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & MUA

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878236	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	93.7 dBA	**Post:**	93.9 dBA	**Calibration**	**Pre:**	94.1 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Monday, 08 Aug 2022
Date End	Friday, 02 Sep 2022
No. of days	22
No. of nights	20

*Monitoring period not continuous

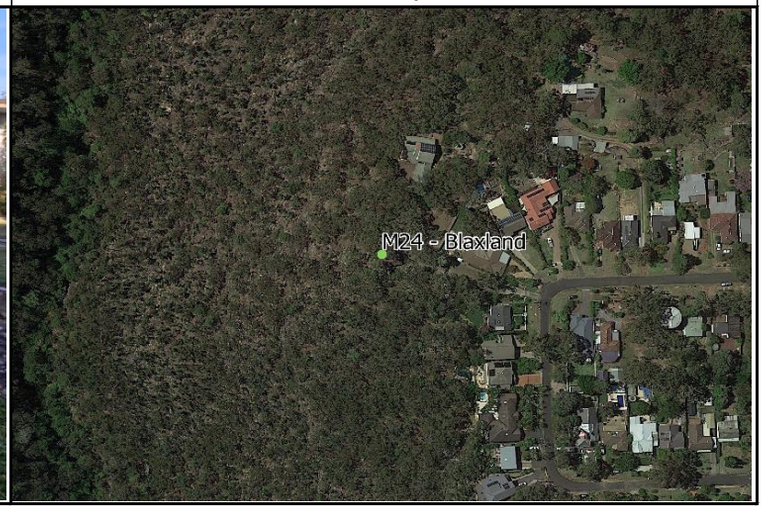
Weather	
Station	BoM
Station Info	Penrith Lakes AWS
Distance	≤ 15 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed at east end of property backing onto rural area.

Located > 3 metres away from reflective surfaces other than ground (e.g. house facade and shed).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	22/08/2022	3:11:28 PM	3:26:28 PM	66	50	53	45	
2	Day	22/08/2022	3:26:28 PM	3:41:28 PM	69	49	53	39	
3	Day	22/08/2022	3:41:28 PM	3:56:28 PM	68	47	50	40	
4	Day	22/08/2022	3:56:28 PM	4:11:28 PM	69	51	53	39	
5	Evening	14/08/2022	7:00:00 PM	7:15:00 PM	46	39	41	37	*
6	Evening	14/08/2022	8:30:00 PM	8:45:00 PM	62	43	46	34	*
7	Evening	14/08/2022	9:15:00 PM	9:30:00 PM	54	37	40	32	*
8	Evening	7/09/2022	6:52:54 PM	7:07:54 PM	61	45	48	42	
9	Night	11/08/2022	12:00:00 AM	12:15:00 AM	44	31	34	27	*
10	Night	11/08/2022	2:45:00 AM	3:00:00 AM	46	35	38	25	*
11	Night	11/08/2022	4:15:00 AM	4:30:00 AM	55	44	47	39	*
12	Night	11/08/2022	11:15:00 PM	11:30:00 PM	55	37	40	33	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Strong wind gusts causing trees to rustle. Occasional animal noise (e.g. dog barking and bird noise). Occasional loud truck on the Great Western Highway (GWH). One aircraft (helicopter) flying overhead with maximum noise level in the range of 57 to 60 dBA, audible for a duration of 10 min.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling and grass moving). Distant traffic noise from GWH.
Evening	
Ambient noise	Various animal noises (e.g. frog/toad, birds, dogs). Occasional vehicle passby. Occasional strong wind gusts. Several aircraft flying overhead with an approx. duration of less than a 1 min and a maximum sound levels ranging from 49 to 52 dBA.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling and grass moving). Distant traffic noise from GWH.
Night	
Ambient noise	Intermittent bird noise. Occasional vehicle passby. Occasional strong wind gusts. A few aircraft movements noted at a distance in the early morning hours.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass rustling).

Site Details	M24 Blaxland - 51 Bridge Road
Start Date	Mon 08 August 2022
End Date	Fri 02 September 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	50
$L_{eq, Evening}$ dBA	42
$L_{eq, Night}$ dBA	42
$RBL_{, Day}$ dBA	33
$RBL_{, Evening}$ dBA	32
$RBL_{, Night}$ dBA	26

Daily Summary

Date	08-08	09-08	10-08	11-08	12-08	13-08	14-08	15-08
$L_{eq, Day}$ dBA		49	49	51	48	51	51	50
$L_{eq, Evening}$ dBA	37	40	40	45	43	41	41	42
$L_{eq, Night}$ dBA	37	41	42	43	41	38	39	41
$ABL_{, Day}$ dBA		32	31	37	34	32	34	35
$ABL_{, Evening}$ dBA	30	27	32	37	29	34	33	33
$ABL_{, Night}$ dBA	24	24	27	31	24	25	27	25

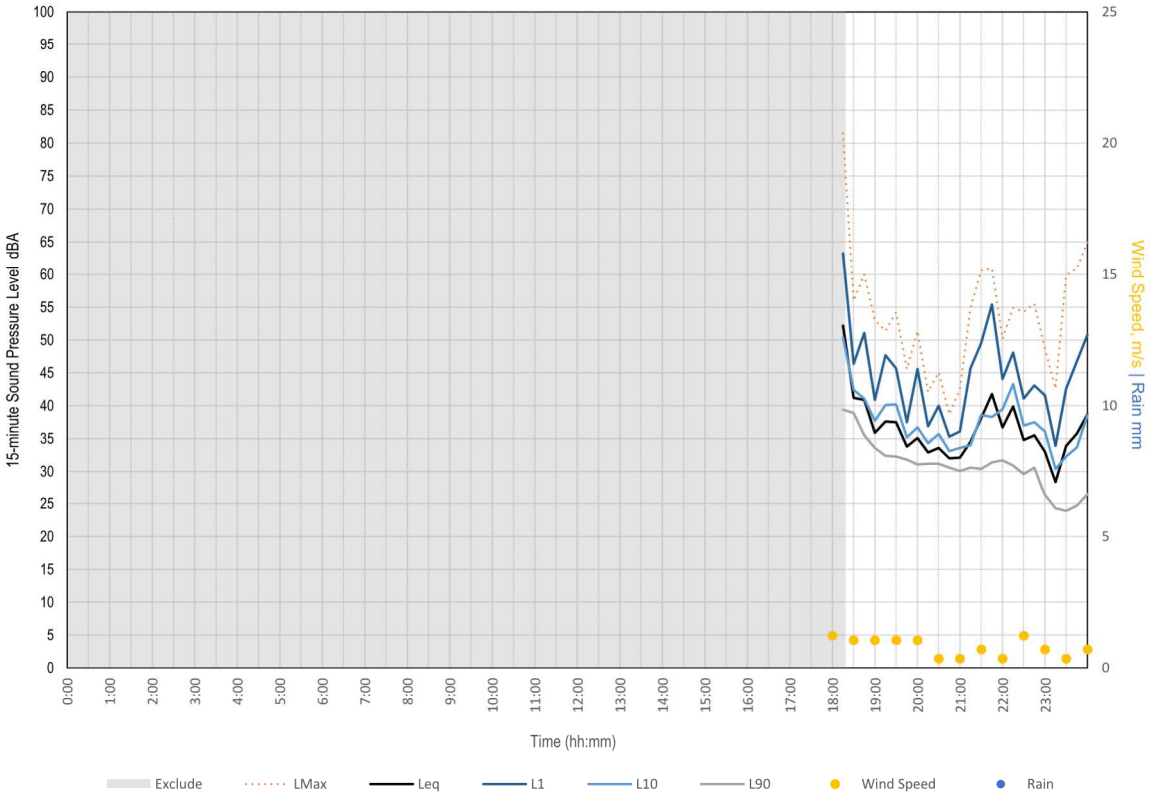
Date	16-08	17-08
$L_{eq, Day}$ dBA	51	50
$L_{eq, Evening}$ dBA	41	45
$L_{eq, Night}$ dBA	42	
$ABL_{, Day}$ dBA	33	30
$ABL_{, Evening}$ dBA	27	40
$ABL_{, Night}$ dBA	25	

Date	22-08	23-08	24-08	25-08	26-08	27-08	28-08	29-08
$L_{eq, Day}$ dBA	52	49	49	48	47	46	51	48
$L_{eq, Evening}$ dBA	43	46	36	38	41	35	43	42
$L_{eq, Night}$ dBA	46	46	39		37	43	39	45
$ABL_{, Day}$ dBA	38	34	30	30	32	30	34	34
$ABL_{, Evening}$ dBA	34	41	29	28	32	29	35	35
$ABL_{, Night}$ dBA	30	32	24	23	27	27	25	30

Date	30-08	31-08	01-09	02-09
$L_{eq, Day}$ dBA	48	52	51	44
$L_{eq, Evening}$ dBA	41	40	45	40
$L_{eq, Night}$ dBA	42	43	40	
$ABL_{, Day}$ dBA	36	32	38	31
$ABL_{, Evening}$ dBA	30	29	36	30
$ABL_{, Night}$ dBA	25	30	28	

Measured Noise Levels - M24 Blaxland - 51 Bridge Road

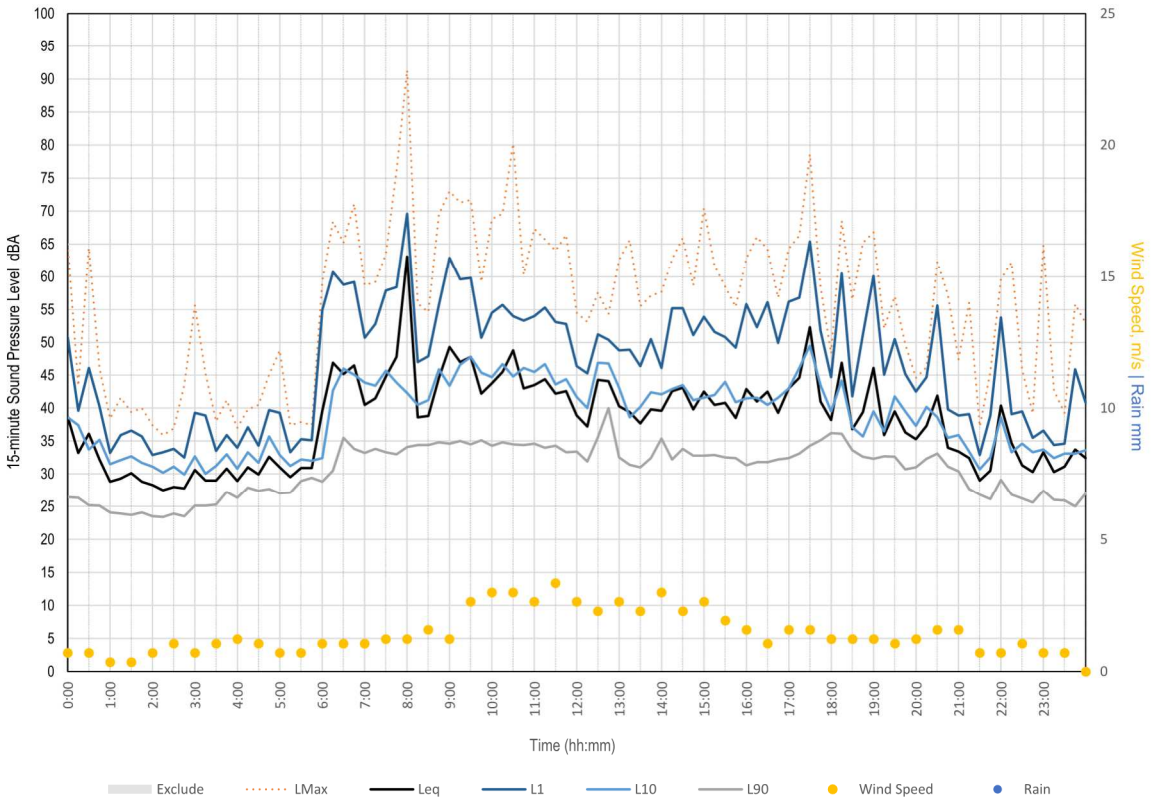
Monday, 08 August 2022



Noise Logger Results

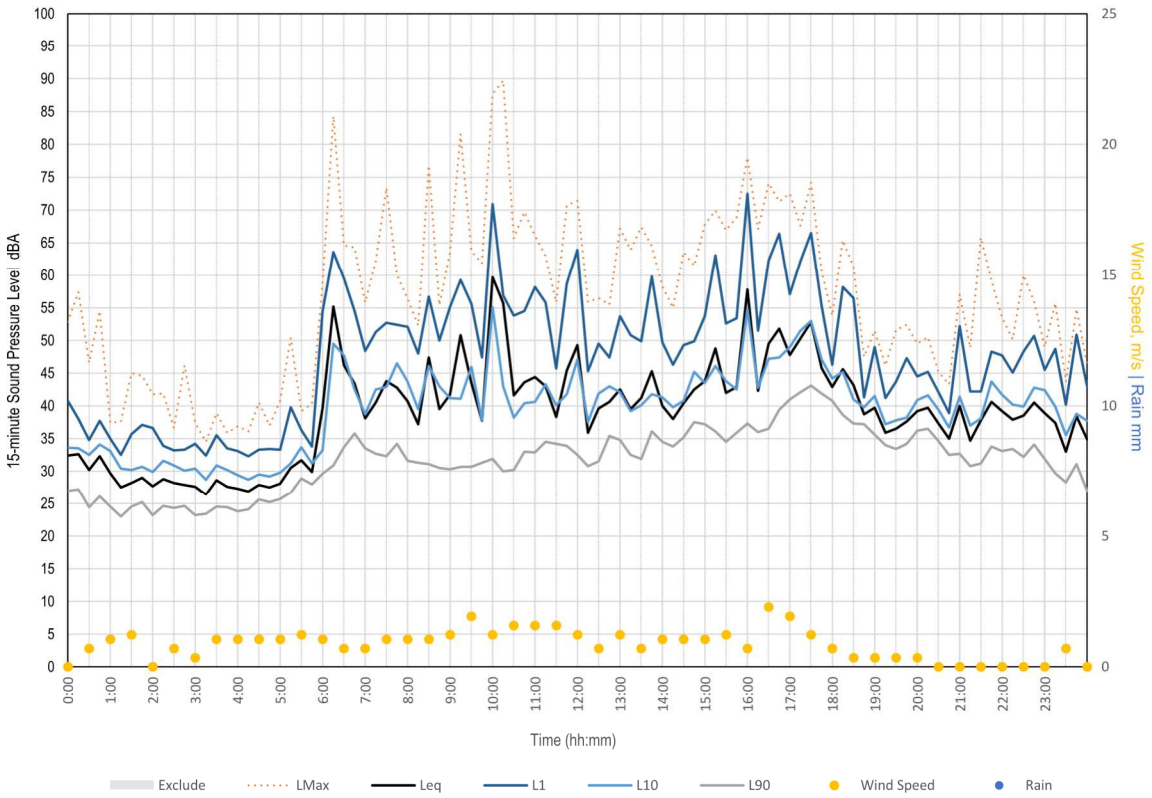
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Tuesday, 09 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

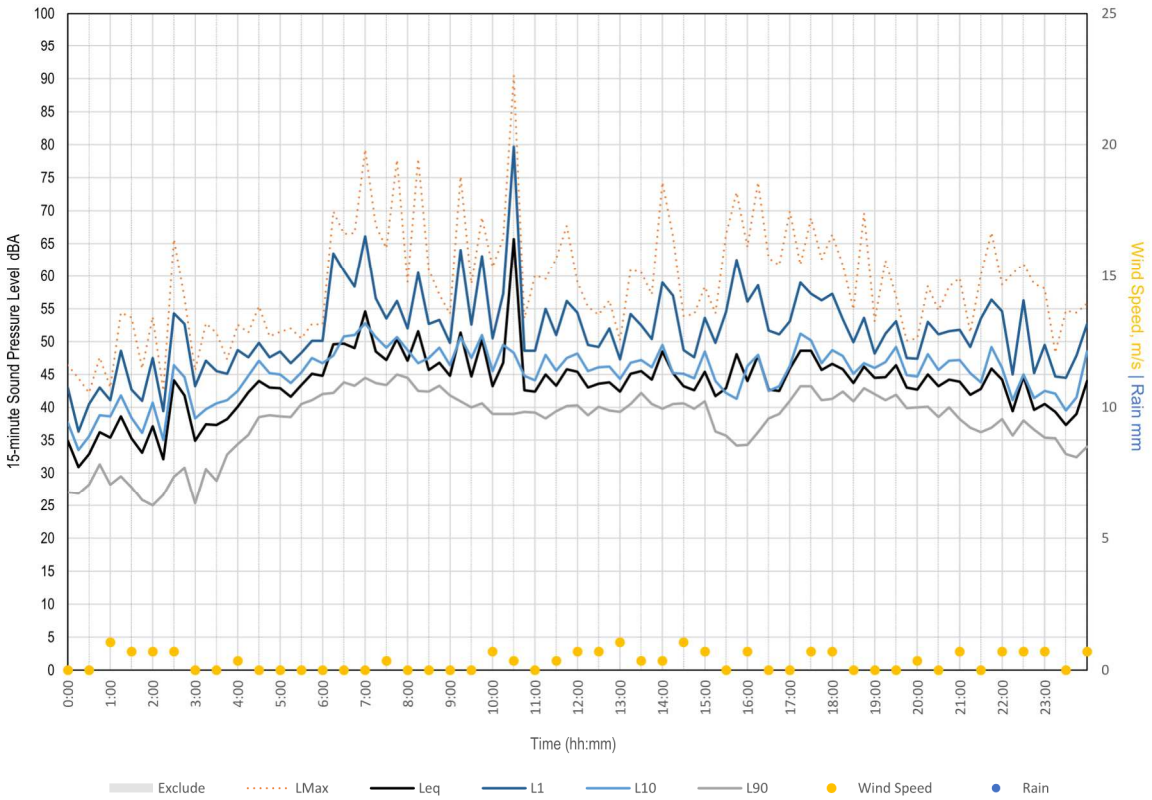
Wednesday, 10 August 2022



Noise Logger Results

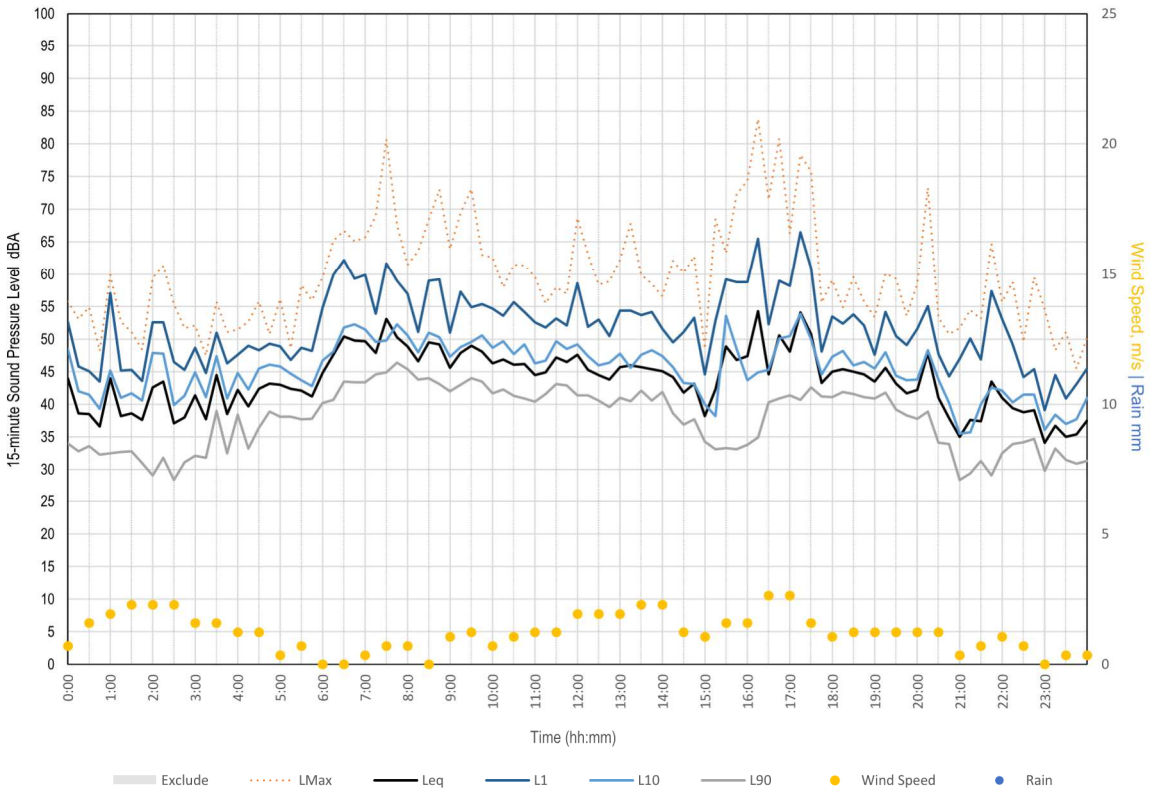
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Thursday, 11 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

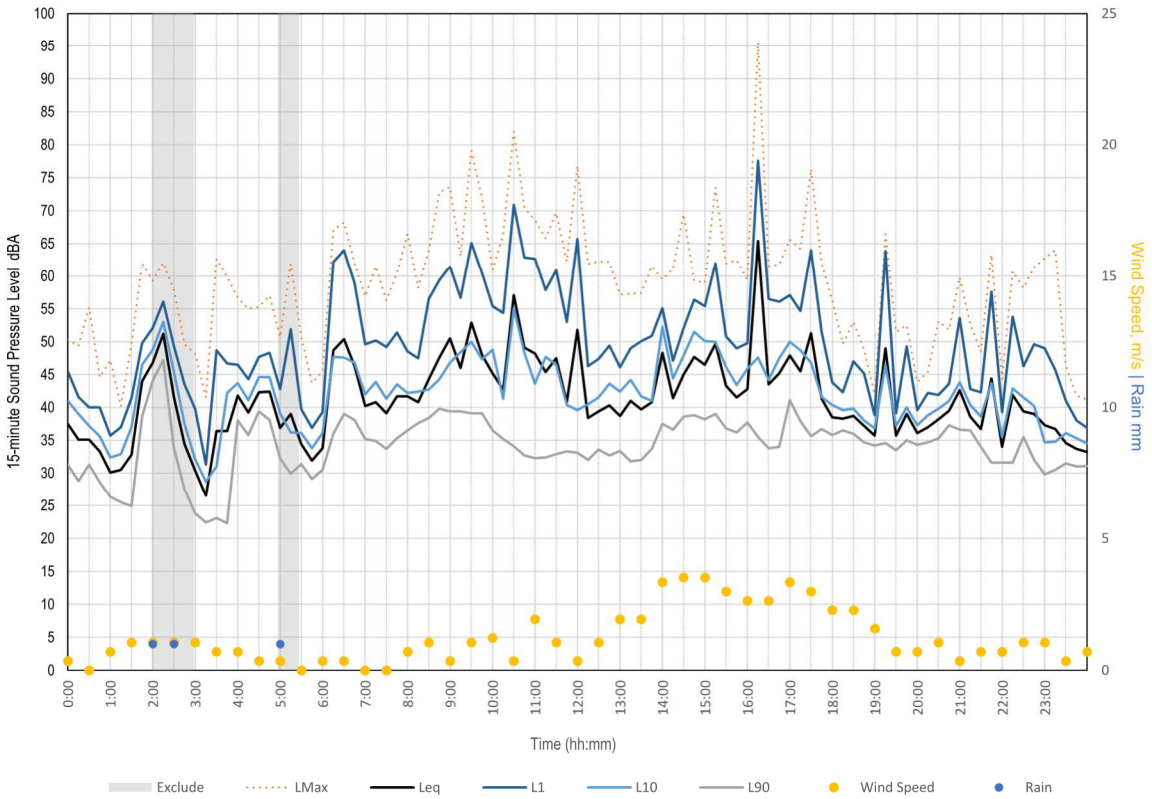
Friday, 12 August 2022



Noise Logger Results

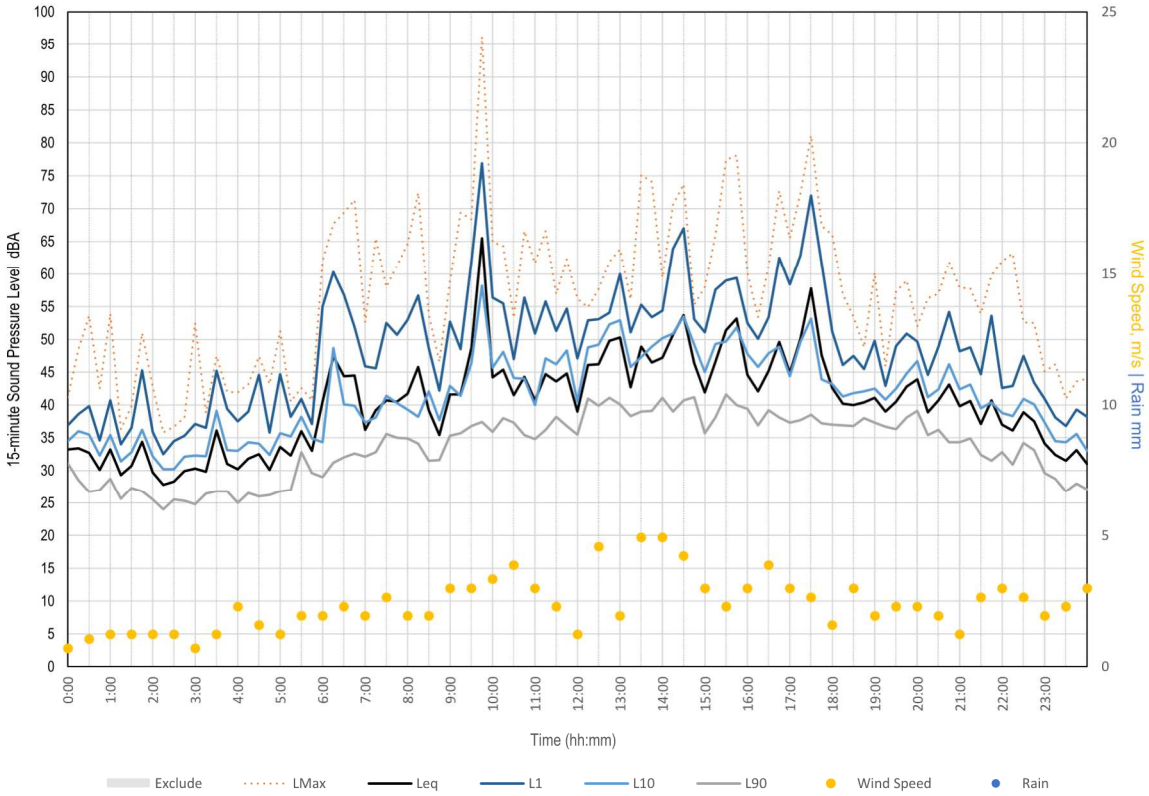
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Saturday, 13 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

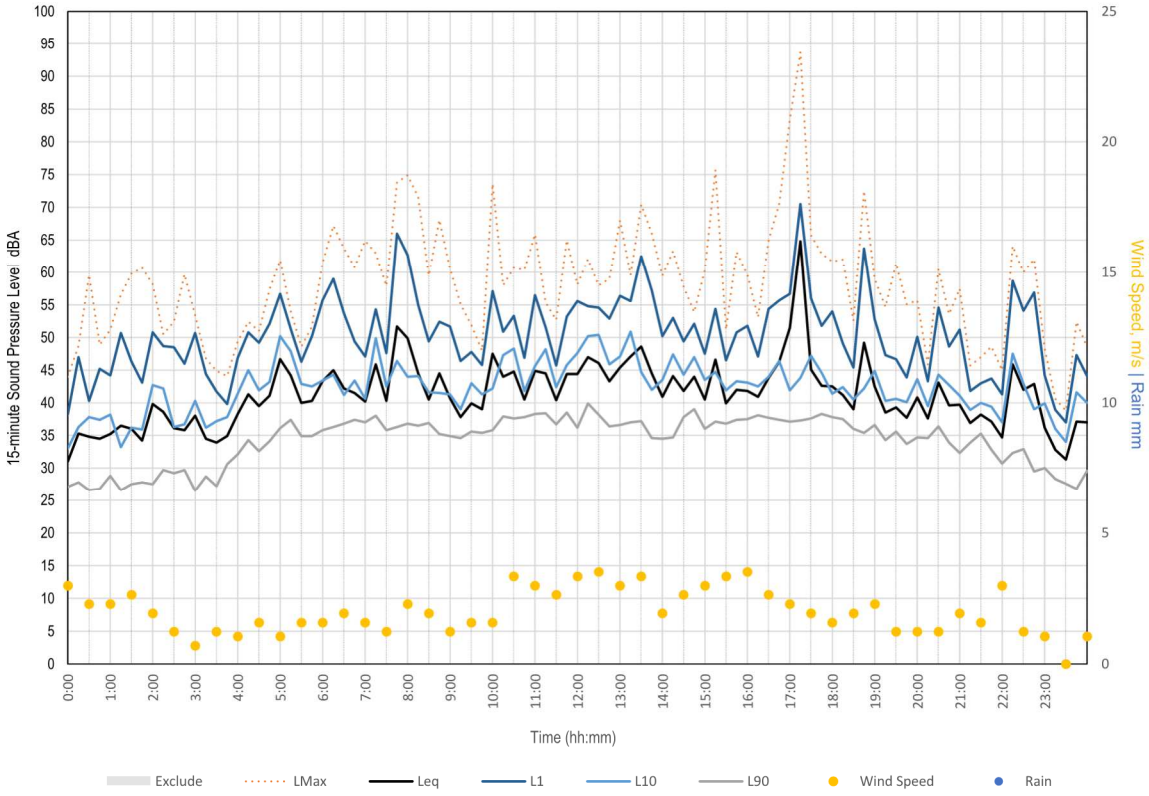
Sunday, 14 August 2022



Noise Logger Results

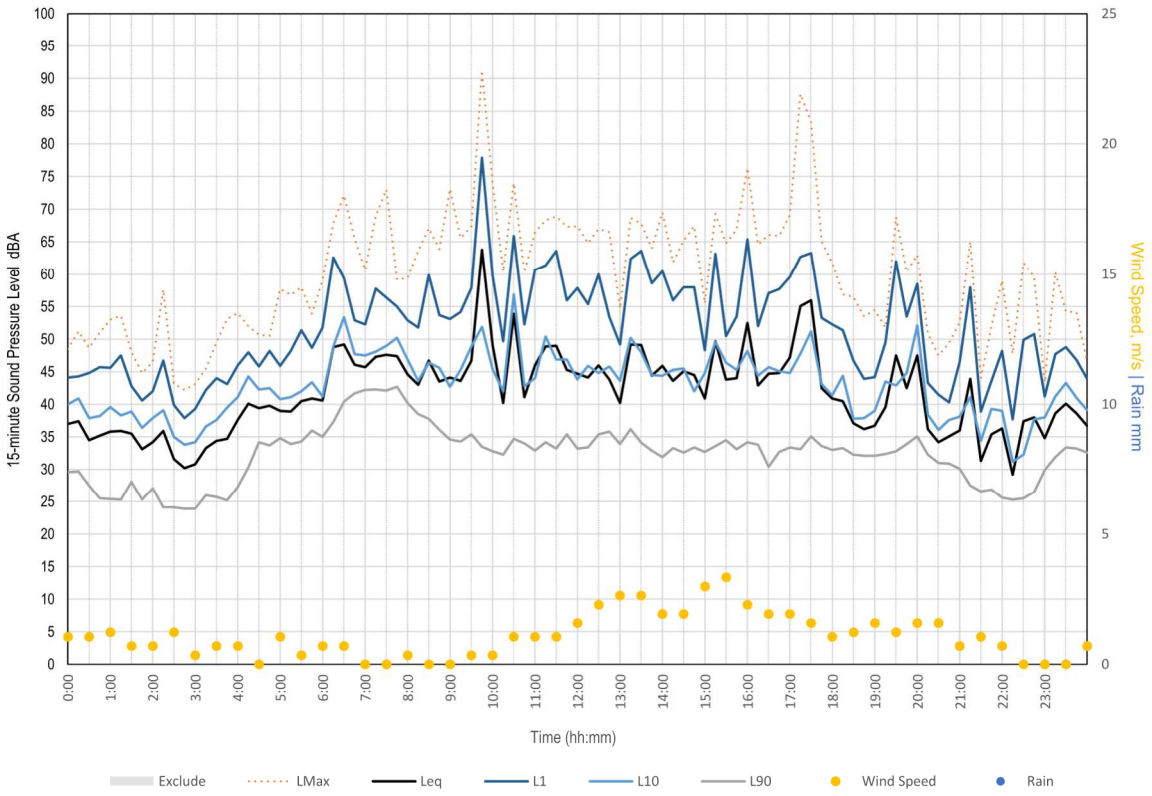
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Monday, 15 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

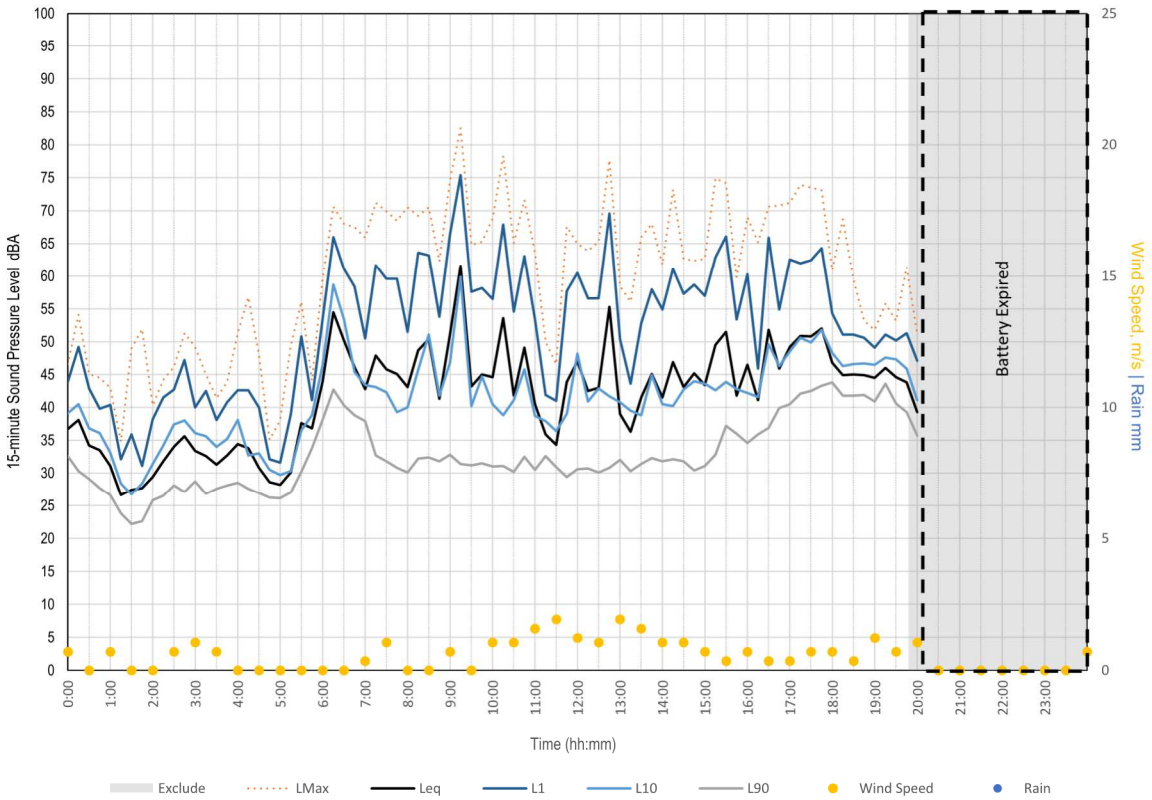
Tuesday, 16 August 2022



Noise Logger Results

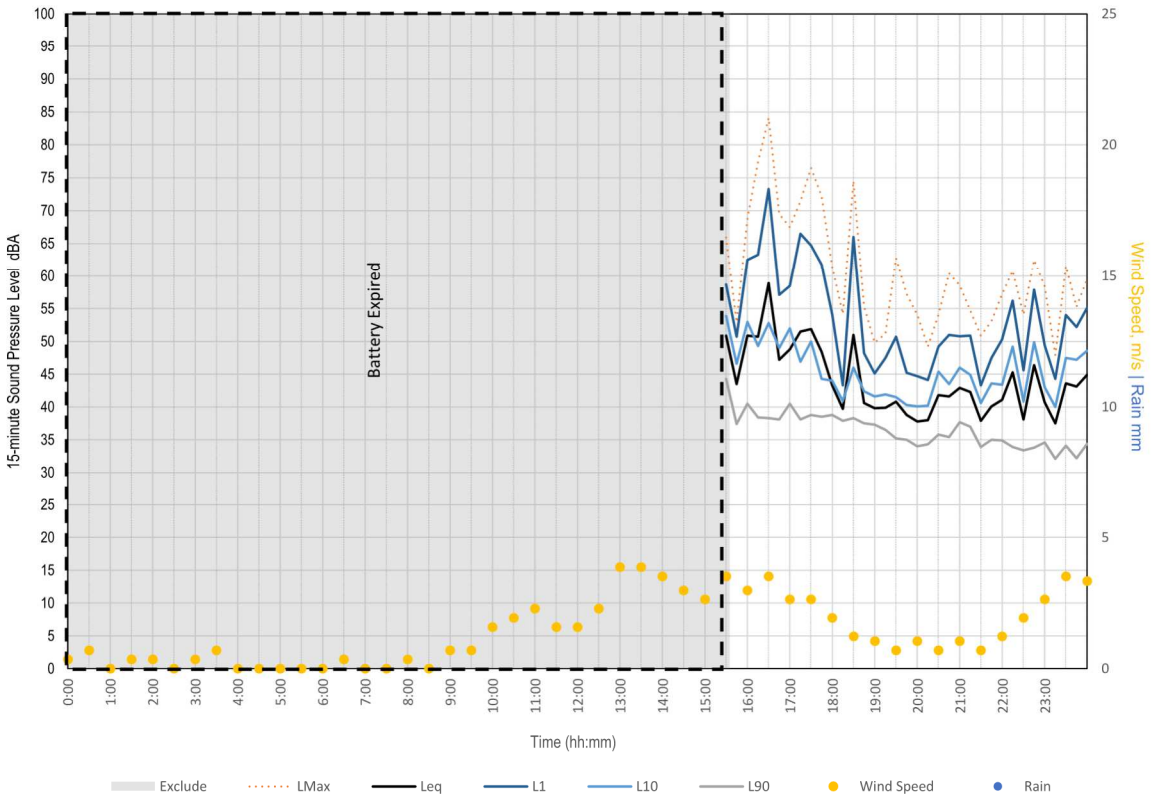
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Wednesday, 17 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

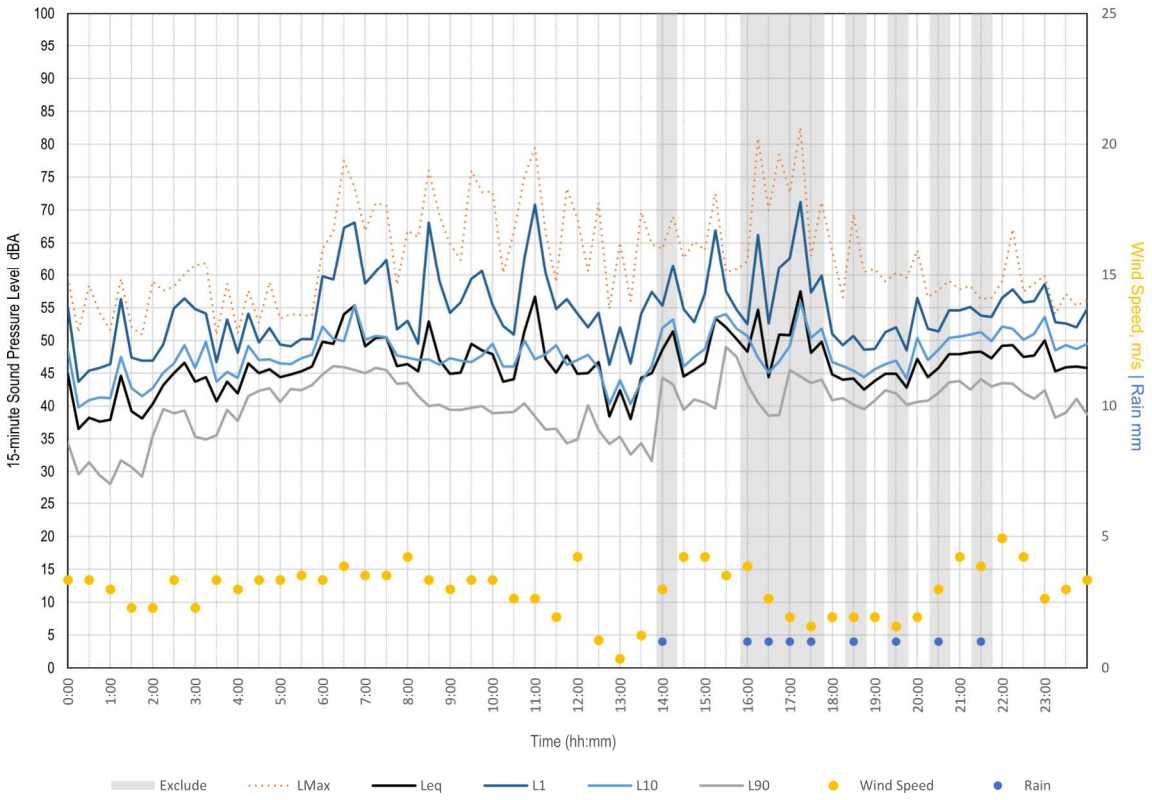
Monday, 22 August 2022



Noise Logger Results

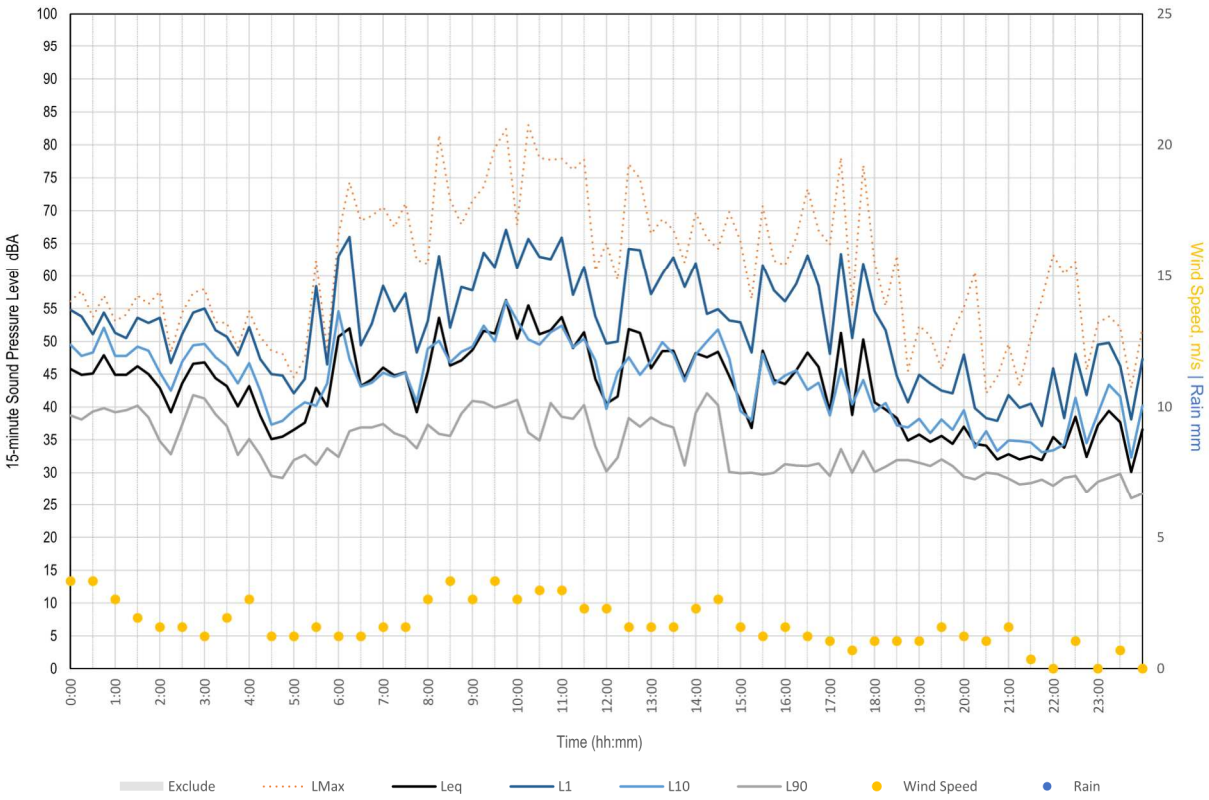
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Tuesday, 23 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

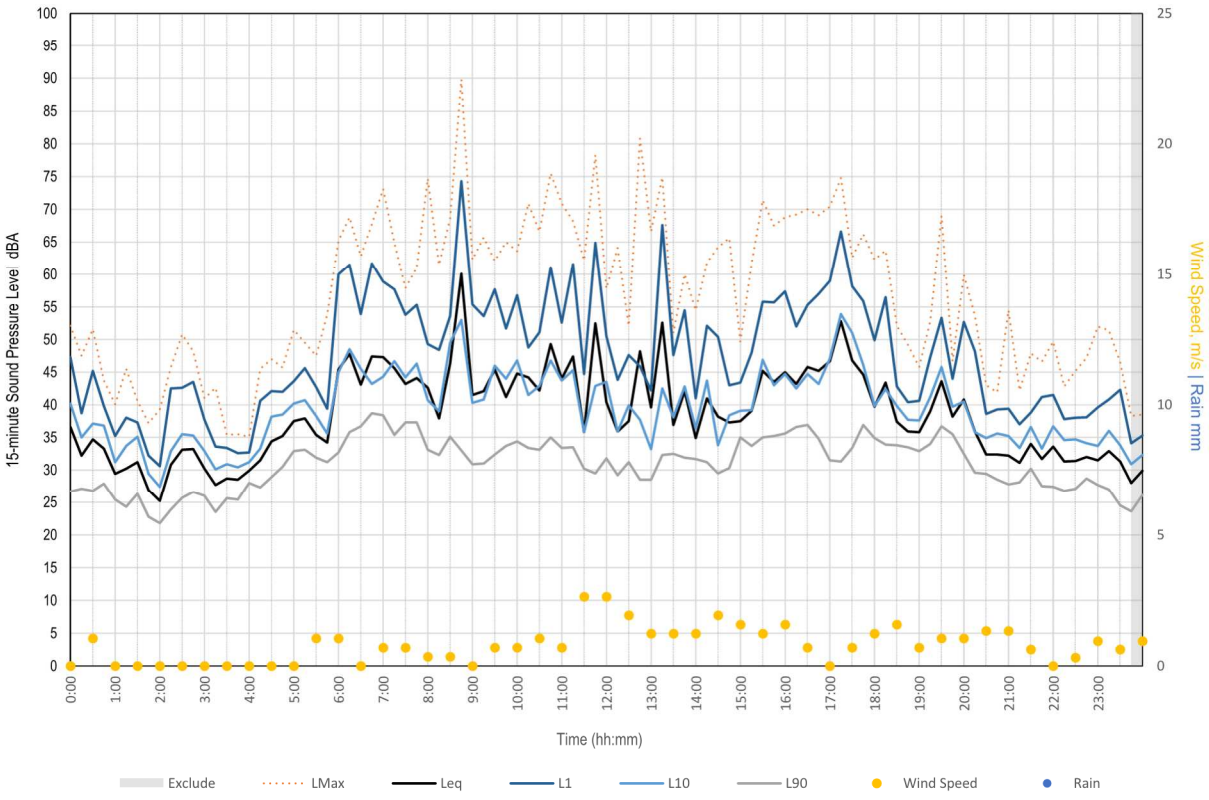
Wednesday, 24 August 2022



Noise Logger Results

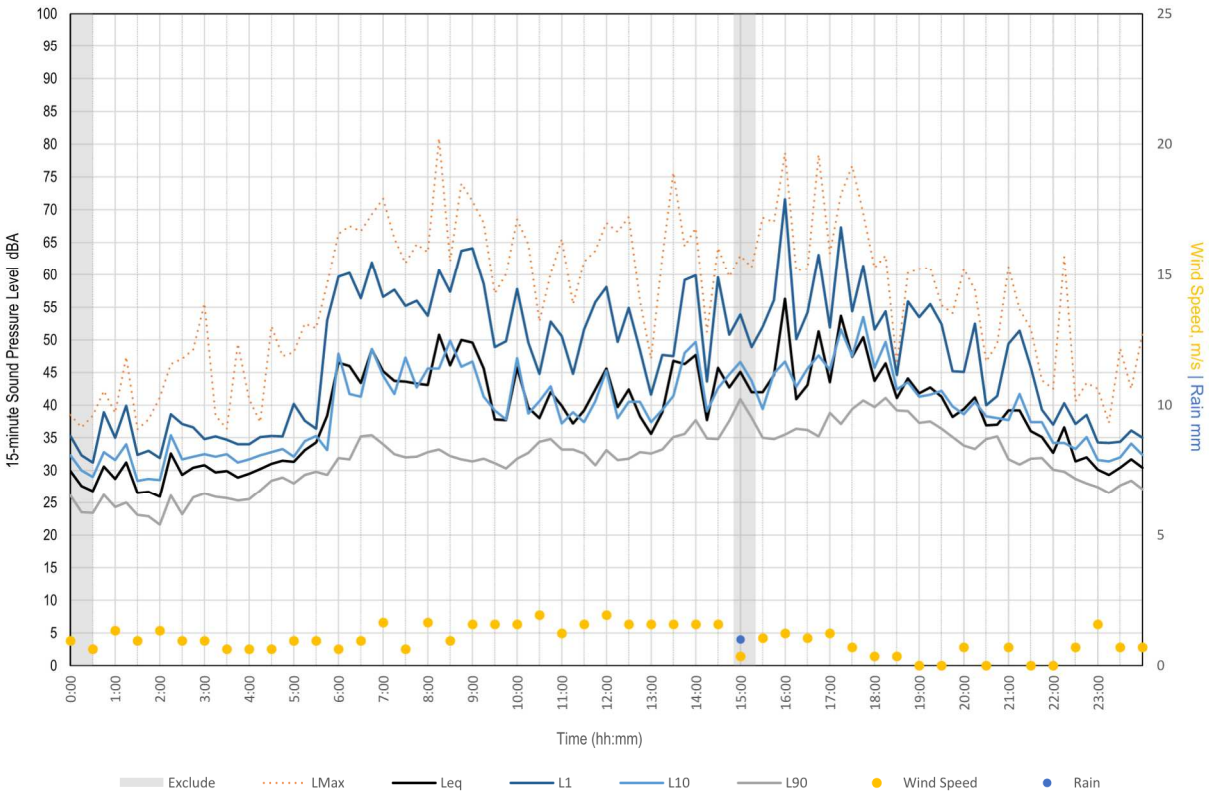
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Thursday, 25 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

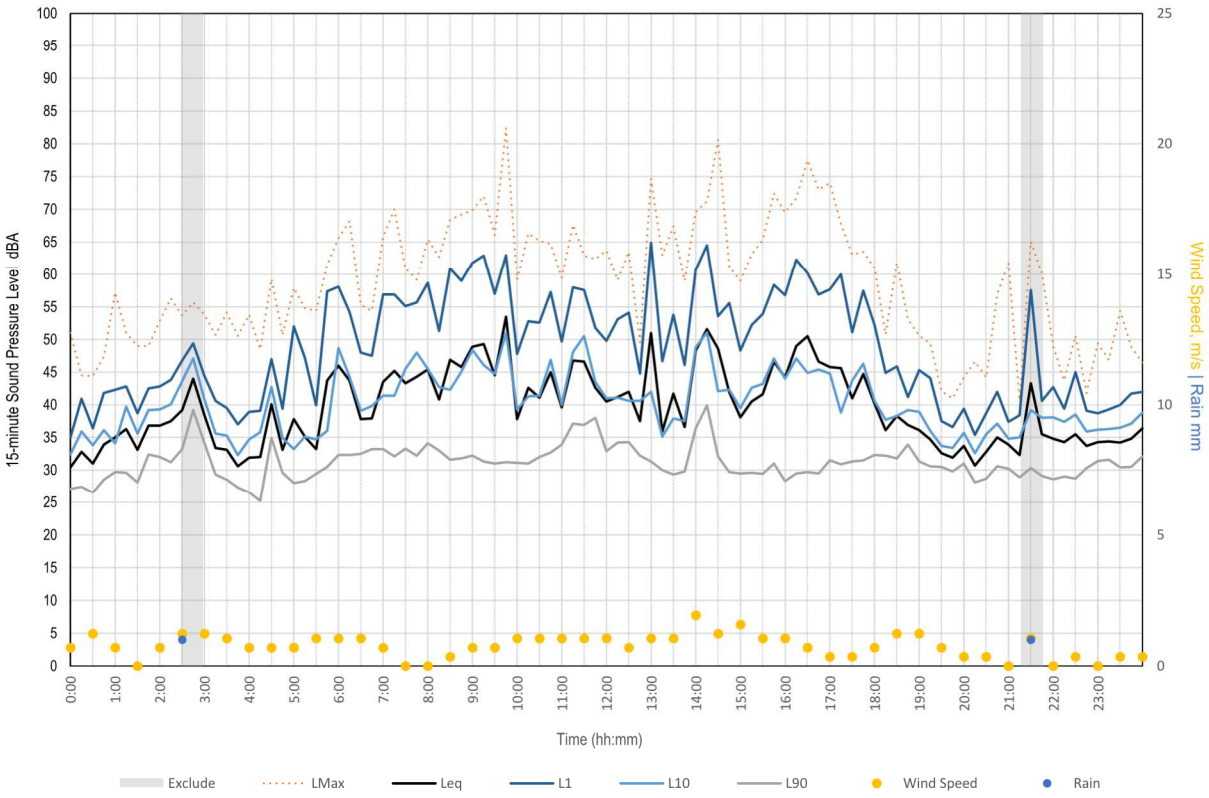
Friday, 26 August 2022



Noise Logger Results

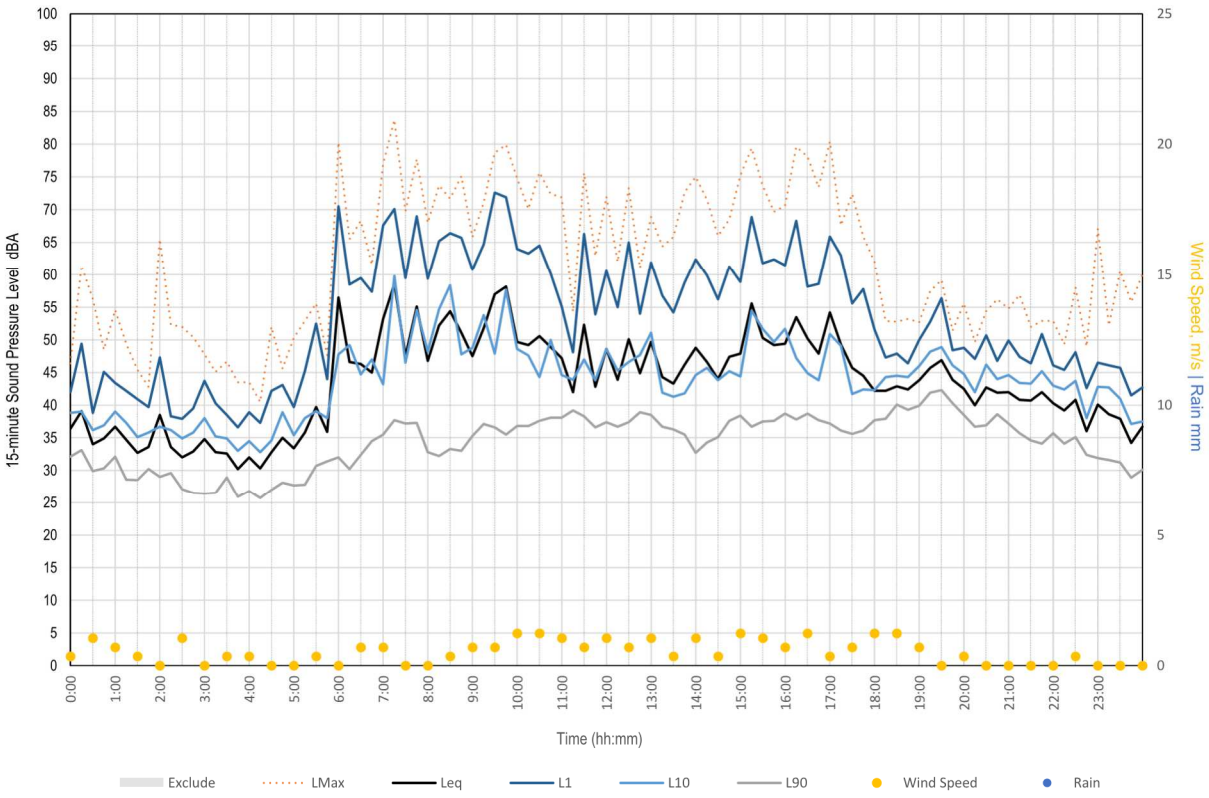
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Saturday, 27 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

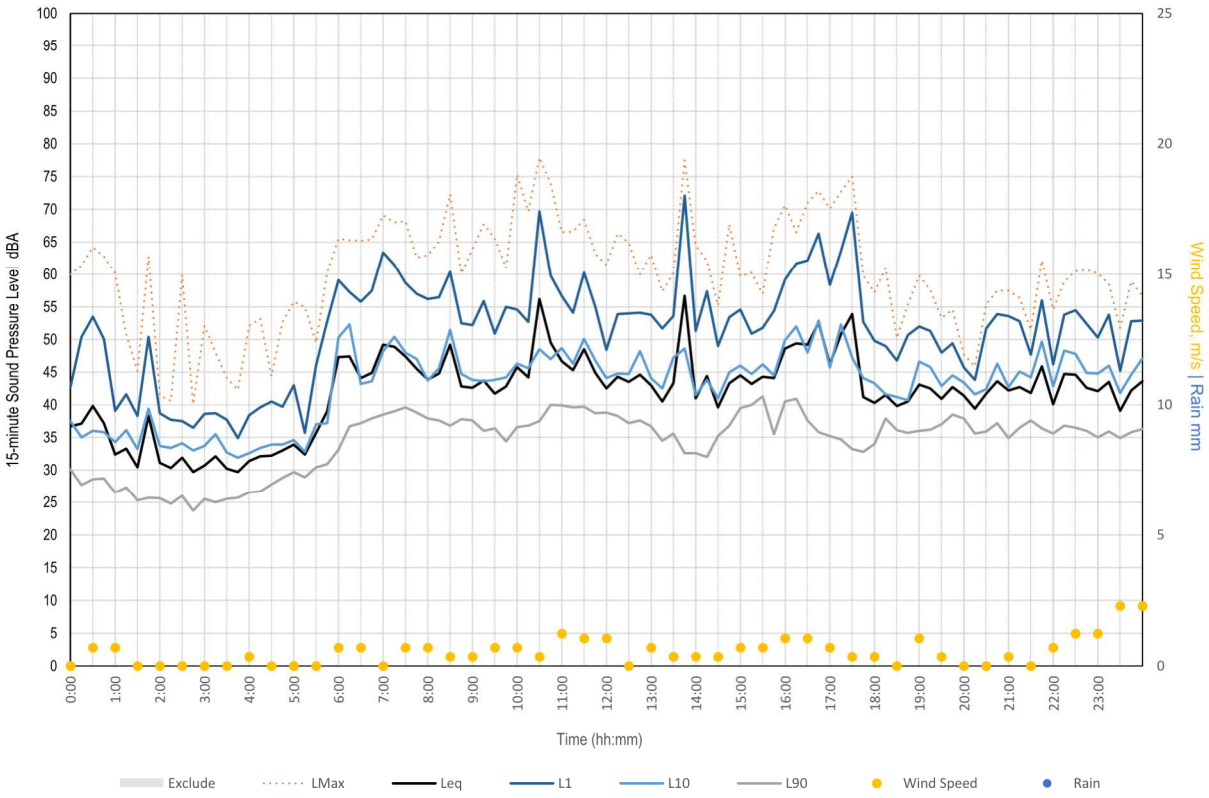
Sunday, 28 August 2022



Noise Logger Results

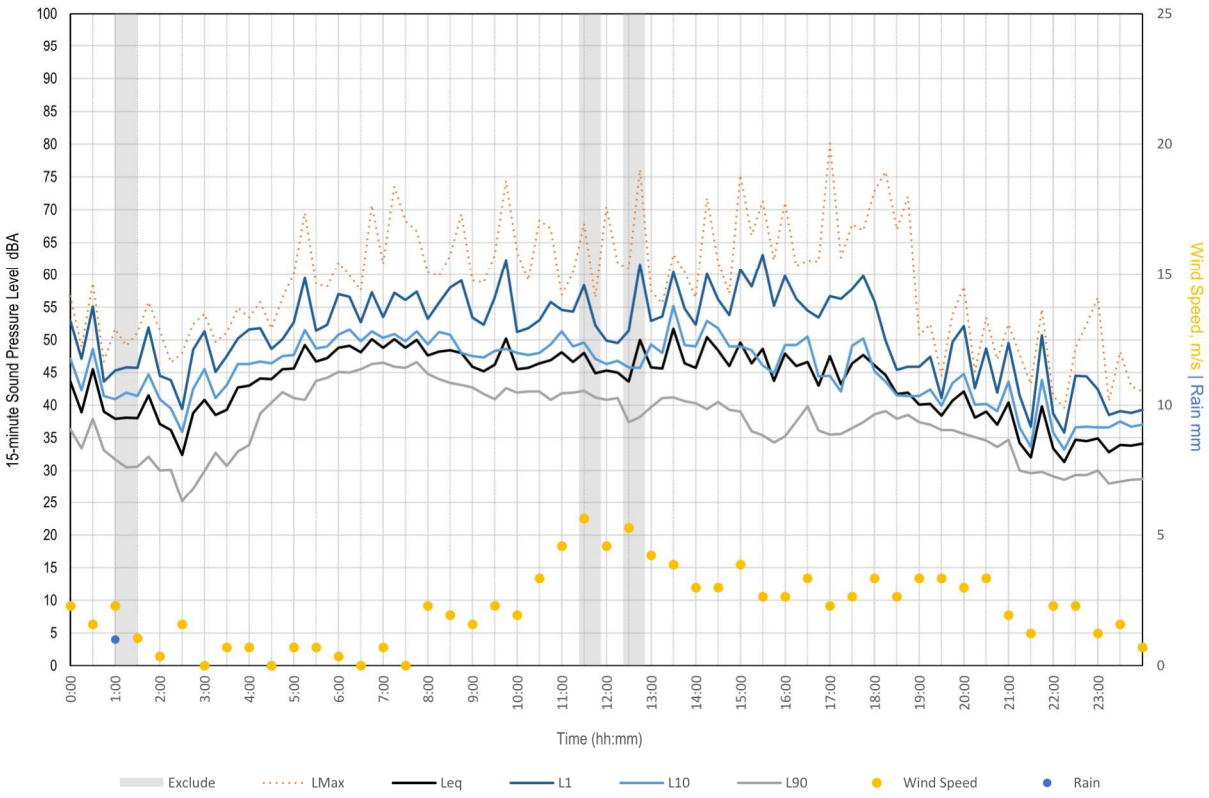
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Monday, 29 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

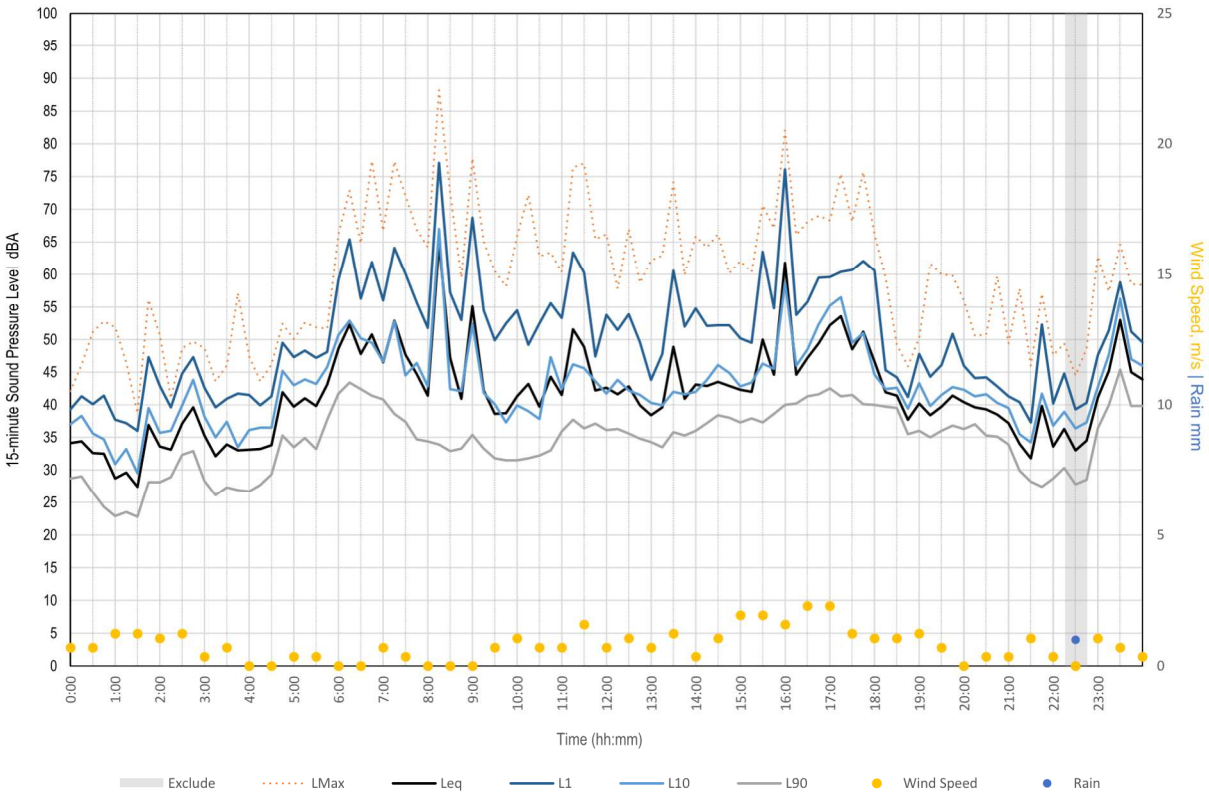
Tuesday, 30 August 2022



Noise Logger Results

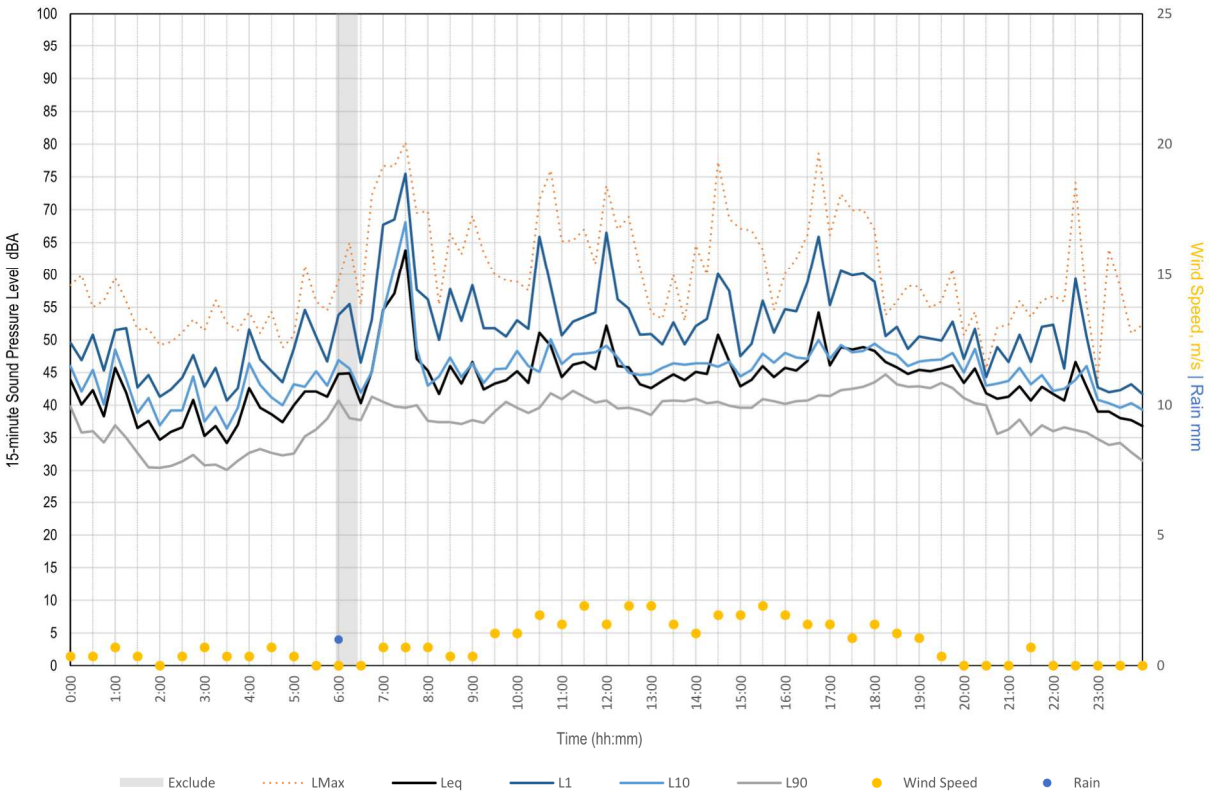
Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Wednesday, 31 August 2022



Measured Noise Levels - M24 Blaxland - 51 Bridge Road

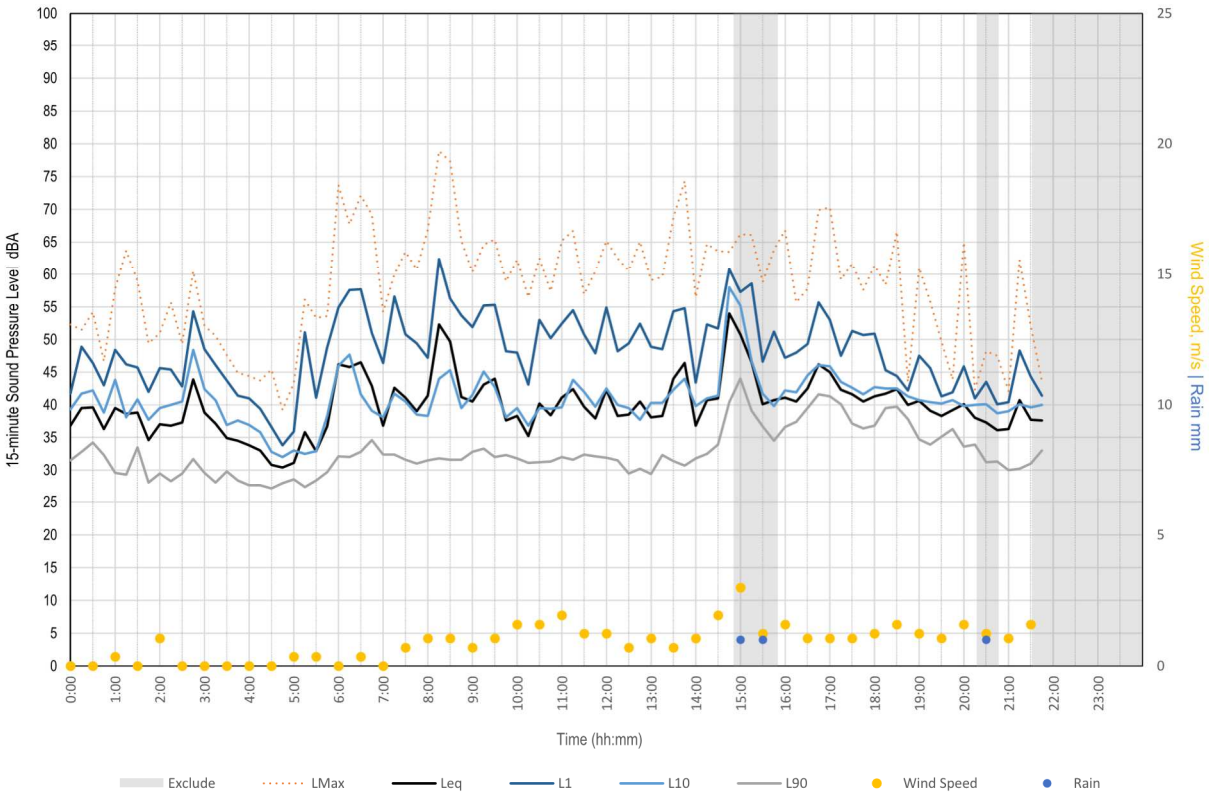
Thursday, 01 September 2022



Noise Logger Results

Measured Noise Levels - M24 Blaxland - 51 Bridge Road

Friday, 02 September 2022



Background Noise Monitoring

Location	M25 - 52 Martin Place (Linden)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	87802C
Calibration	**Pre:**	93.9 dBA	**Post:**	93.8 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

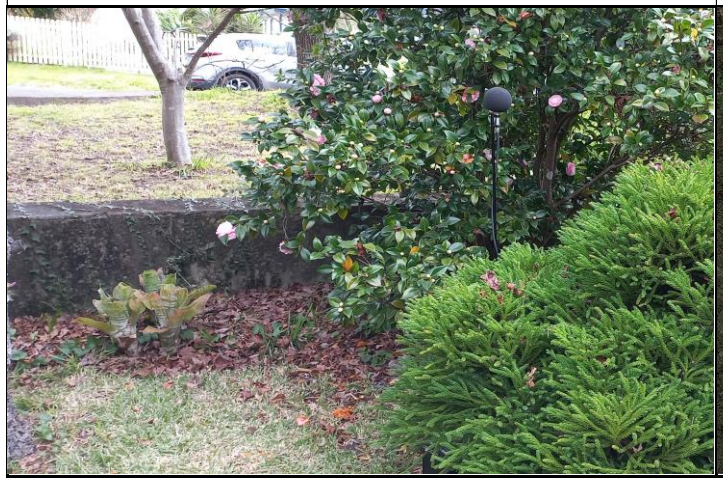
Attended Equipment				
Equipment	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	94.3 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Thursday, 11 Aug 2022
Date End	Wednesday, 07 Sep 2022
No. of days	28
No. of nights	27

Weather	
Station	BoM
Station Info	Penrith Lakes AWS
Distance	≤ 15 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally in front yard.

Located ≥ 3 metres away from any reflective surfaces other than ground (e.g. house façade and low stone perimeter wall).

Placed in close proximity to vegetation for security purposes.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	11/08/2022	12:45:00 PM	1:00:00 PM	55	39	40	35	
2	Day	11/08/2022	1:00:00 PM	1:15:00 PM	58	43	46	36	
3	Day	11/08/2022	1:15:00 PM	1:30:00 PM	73	49	52	39	
4	Day	11/08/2022	1:30:00 PM	1:45:00 PM	77	48	45	38	
5	Evening	19/08/2022	6:30:00 PM	6:45:00 PM	60	47	49	43	*
6	Evening	19/08/2022	8:15:00 PM	8:30:00 PM	66	49	50	41	*
7	Evening	19/08/2022	9:30:00 PM	9:45:00 PM	53	45	47	41	*
8	Evening	7/09/2022	7:37:26 PM	7:52:26 PM	63	42	44	37	
9	Night	17/08/2022	12:30:00 AM	12:45:00 AM	52	38	41	33	*
10	Night	17/08/2022	2:45:00 AM	3:00:00 AM	55	39	41	29	*
11	Night	17/08/2022	5:30:00 AM	5:45:00 AM	53	42	45	38	*
12	Night	17/08/2022	11:15:00 PM	11:30:00 PM	60	45	47	31	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Intermittent bird noise from nearby trees with maximum levels around 55 dBA. Intermittent activity at neighbouring properties (e.g. dog barking and closing doors). Occasional car passby on local street. Train movement audible in distance. Several aircrafts flyovers noted, mainly at a distance with some passing overhead. Approximate durations of aircraft 30 sec to 1 min and with maximum levels in the range of 39 to 55 dBA.
Background noise	Distant traffic
Evening	
Ambient noise	Occasional vehicle passbys. Occasional strong wind gusts. Intermittent activity at neighbouring properties (e.g. talking, gate opening/closing). Distant sound of a train horn. Several aircraft flyovers with approx. durations of 30 sec to 1 min and with maximum levels in the range of 45 to 51 dBA.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass moving). Distant traffic.
Night	
Ambient noise	Occasional strong wind gusts. Various natural noises (e.g. frogs/toads, birds, dog barks). Occasional vehicle noise, and mechanical noise (e.g. vacuum). Several aircraft flyovers noted, mainly at a distance with some passing overhead. Approximate durations of aircraft 30 sec to 1 min and with maximum levels in the range of 33 to 54 dBA.
Background noise	Movement in vegetation induced by wind (e.g. leaves and grass moving).

Site Details	M25 - 52 Martin Place (Linden)
Start Date	Thu 11 August 2022
End Date	Wed 07 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	51
$L_{eq, Evening}$ dBA	45
$L_{eq, Night}$ dBA	43
RBL, $_{Day}$ dBA	35
RBL, $_{Evening}$ dBA	36
RBL, $_{Night}$ dBA	28

Daily Summary

Date	11-08	12-08	13-08	14-08	15-08	16-08	17-08	18-08
$L_{eq, Day}$ dBA	50	49	50	53	53	48	46	50
$L_{eq, Evening}$ dBA	46	44	45	45	50	44	43	45
$L_{eq, Night}$ dBA	43	43	43	50	44	42	41	44
ABL, $_{Day}$ dBA	37	34	40	39	43	37	32	37
ABL, $_{Evening}$ dBA	39	35	38	38	41	37	33	38
ABL, $_{Night}$ dBA	29	29	28	36	25	30	25	27

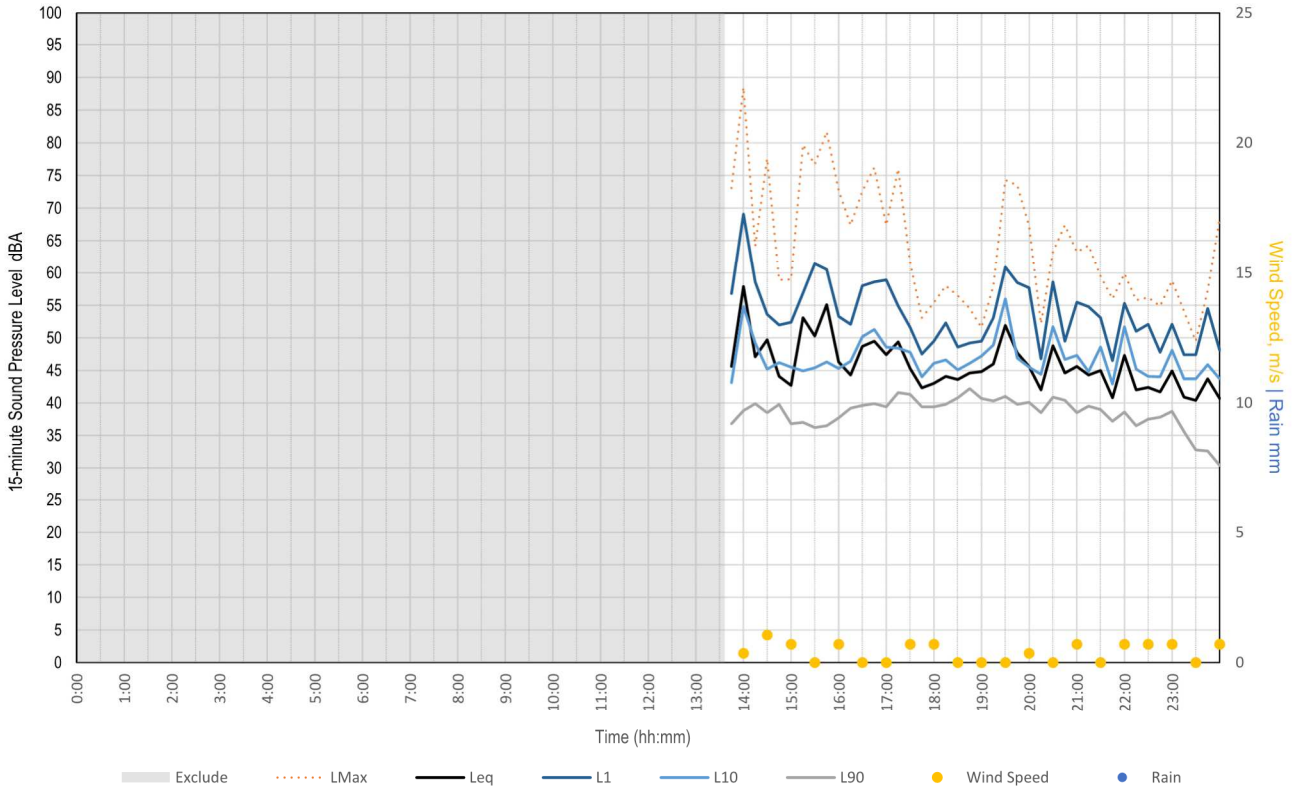
Date	19-08	20-08	21-08	22-08	23-08	24-08	25-08	26-08
$L_{eq, Day}$ dBA	51	49	45	61	48	48	48	49
$L_{eq, Evening}$ dBA	46	46	44	45	51	44	42	42
$L_{eq, Night}$ dBA	43	36	44	46	45	46		41
ABL, $_{Day}$ dBA	40	37	30	43	37	35	33	33
ABL, $_{Evening}$ dBA	38	38	37	36	45	35	30	29
ABL, $_{Night}$ dBA	25	20	24	29	37	35	24	25

Date	27-08	28-08	29-08	30-08	31-08	01-09	02-09	03-09
$L_{eq, Day}$ dBA	42	44	45	51	46	51	49	47
$L_{eq, Evening}$ dBA	38	44	45	45	39	46	46	40
$L_{eq, Night}$ dBA	40	39	46	43	44	44	38	38
ABL, $_{Day}$ dBA	33	34	36	43	34	39	33	35
ABL, $_{Evening}$ dBA	30	35	36	36	32	37	31	33
ABL, $_{Night}$ dBA	25	22	32	32	29	28	28	29

Date	04-09	05-09	06-09
$L_{eq, Day}$ dBA	44	45	50
$L_{eq, Evening}$ dBA	37	41	39
$L_{eq, Night}$ dBA	41	38	38
ABL, $_{Day}$ dBA	33	32	32
ABL, $_{Evening}$ dBA	29	27	28
ABL, $_{Night}$ dBA	24	23	24

Measured Noise Levels - M25 - 52 Martin Place (Linden)

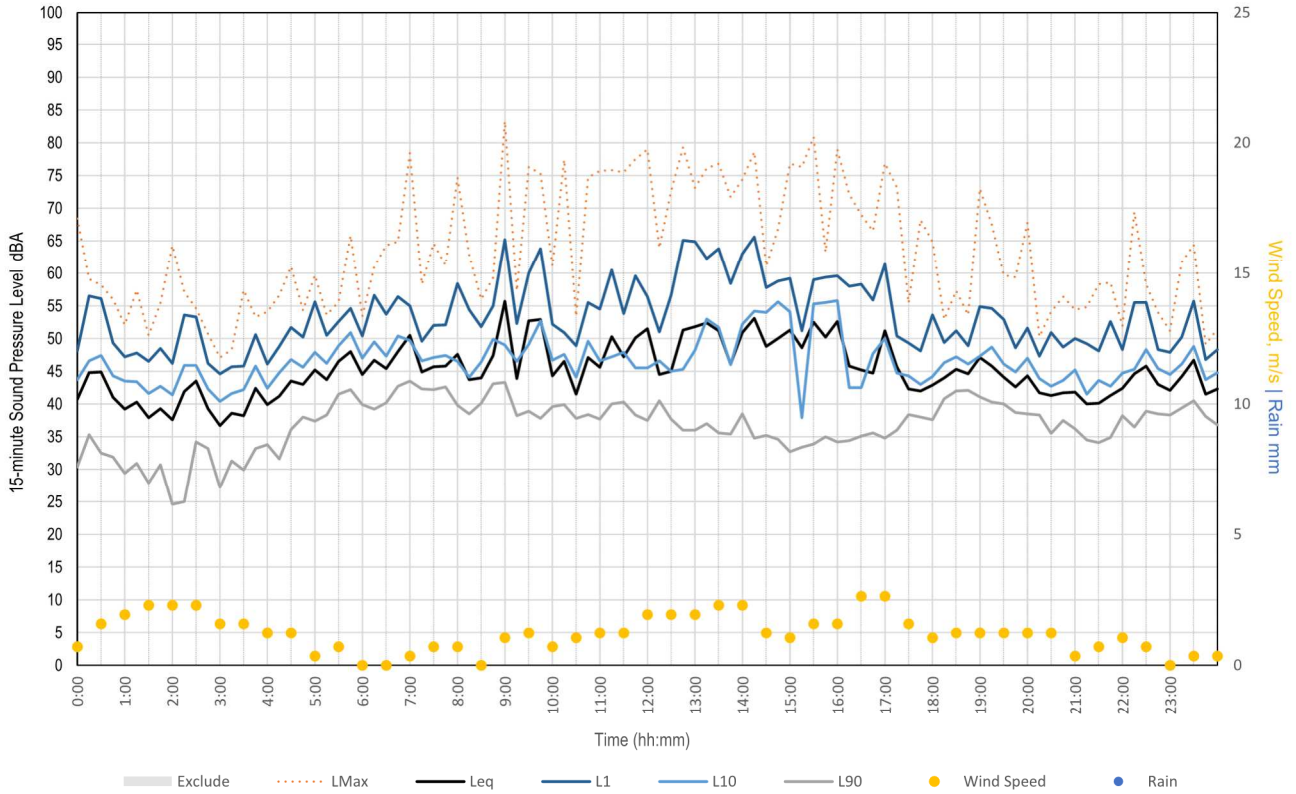
Thursday, 11 August 2022



Noise Logger Results

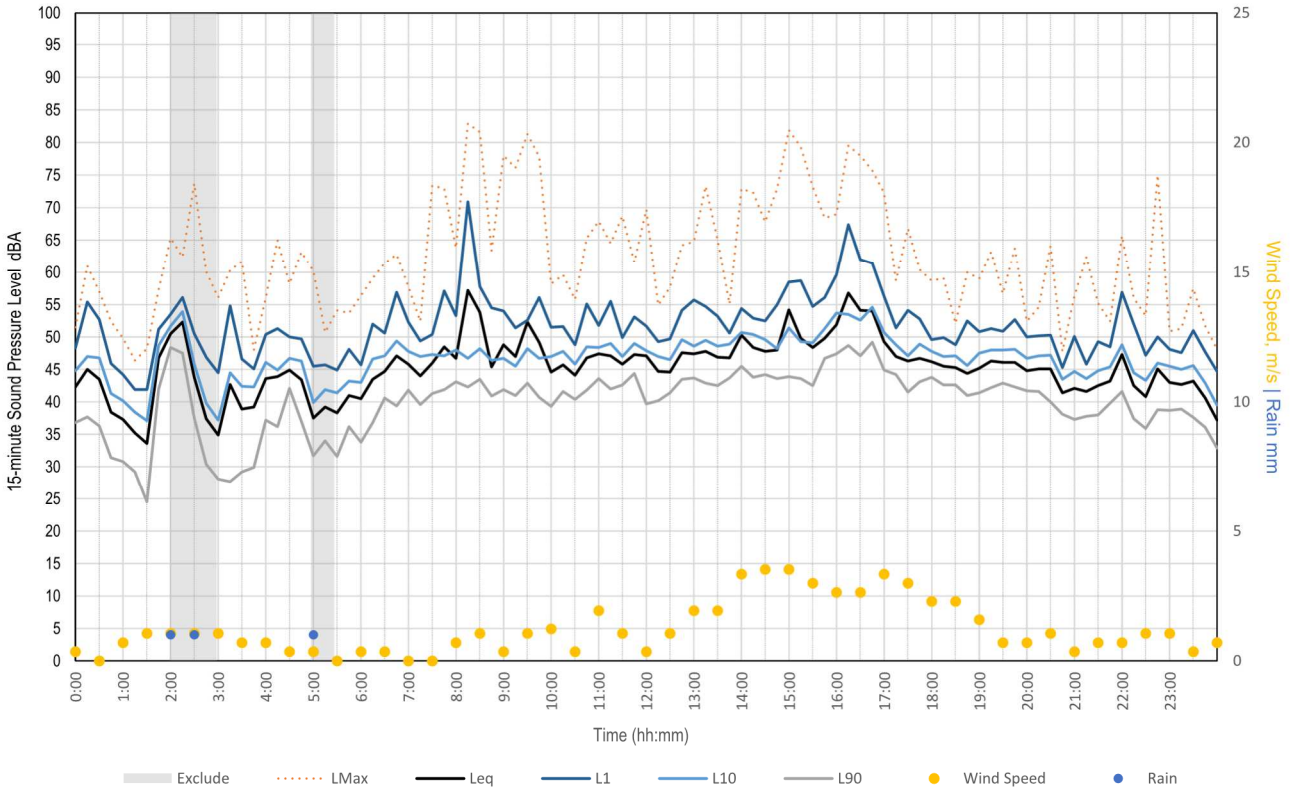
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Friday, 12 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

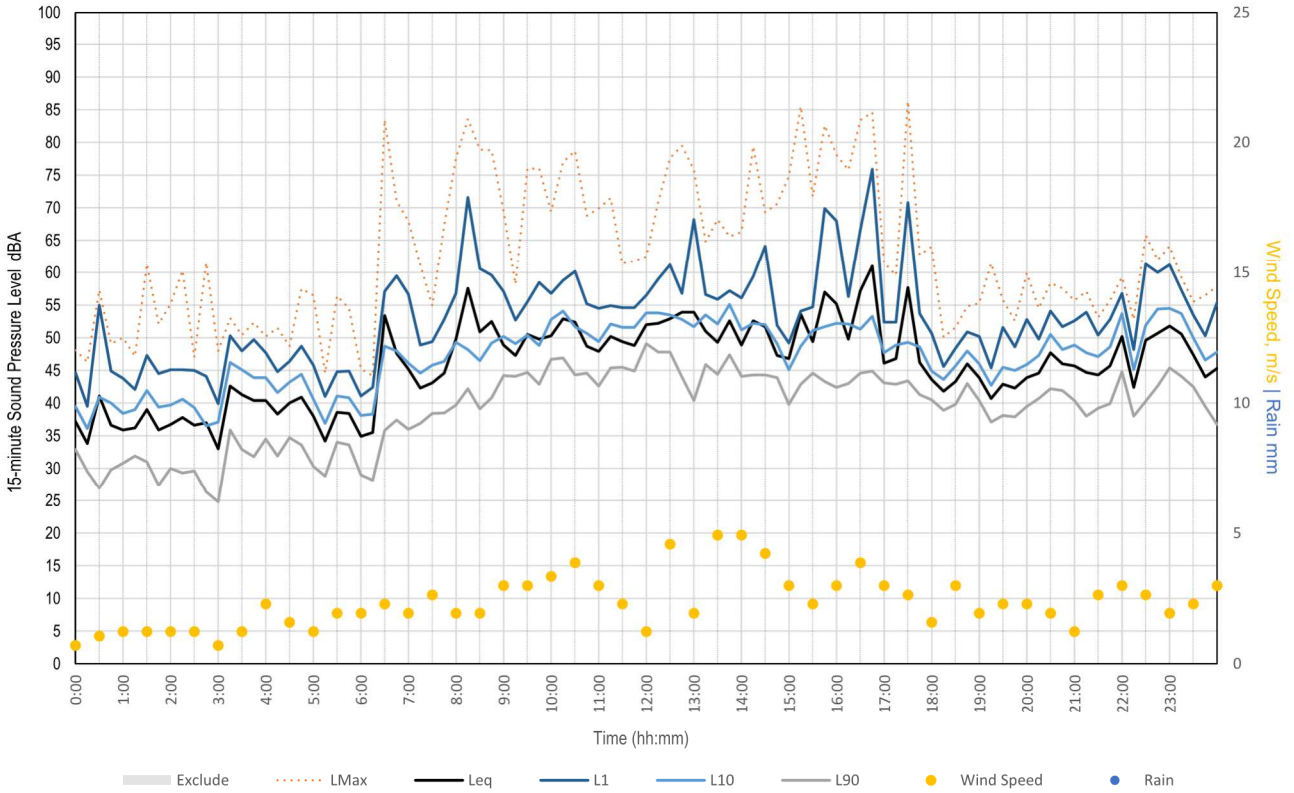
Saturday, 13 August 2022



Noise Logger Results

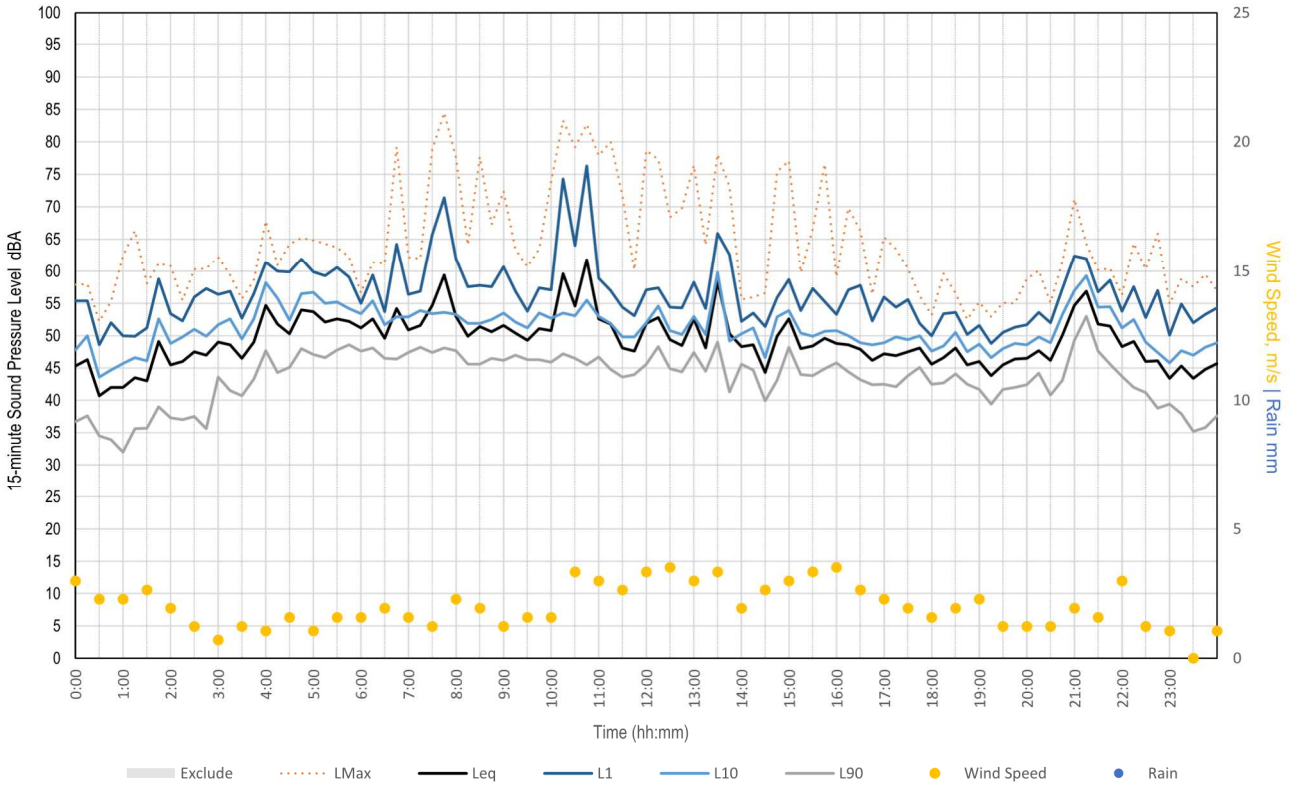
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Sunday, 14 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

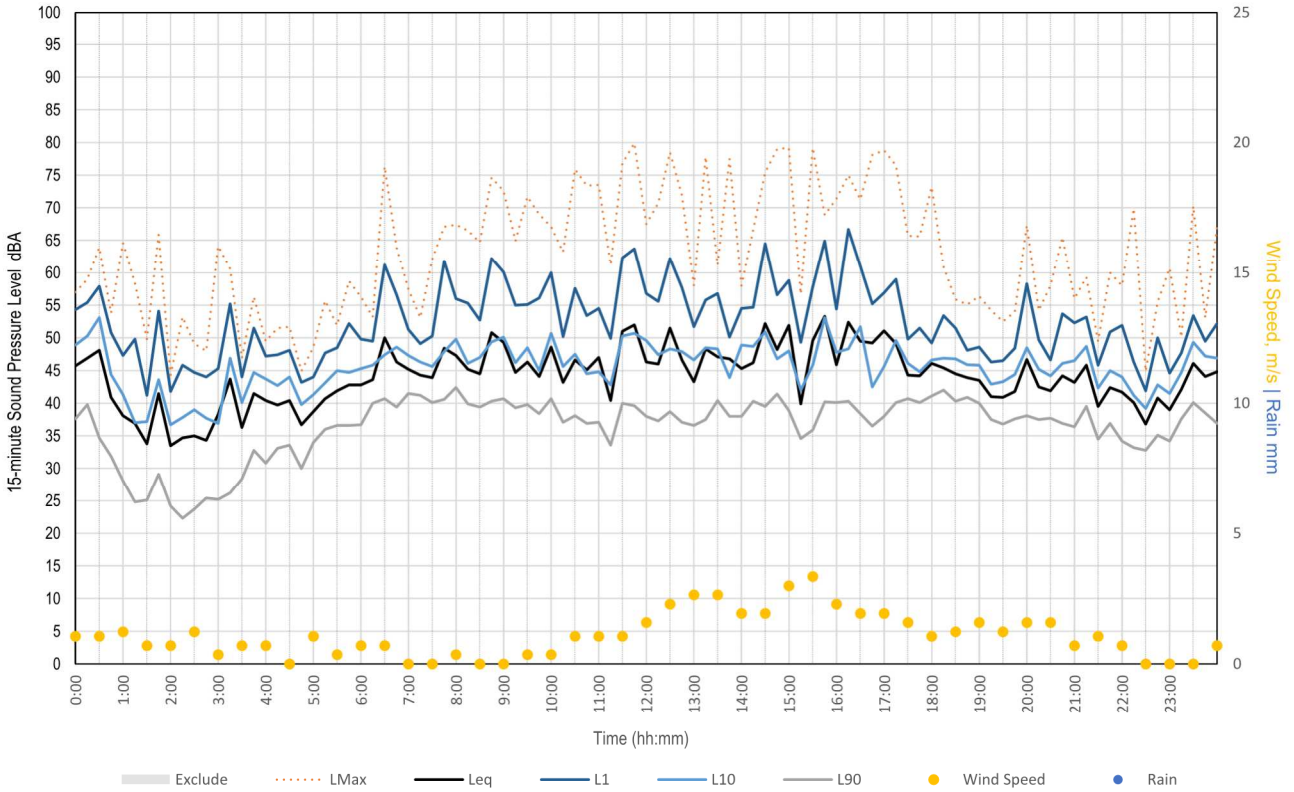
Monday, 15 August 2022



Noise Logger Results

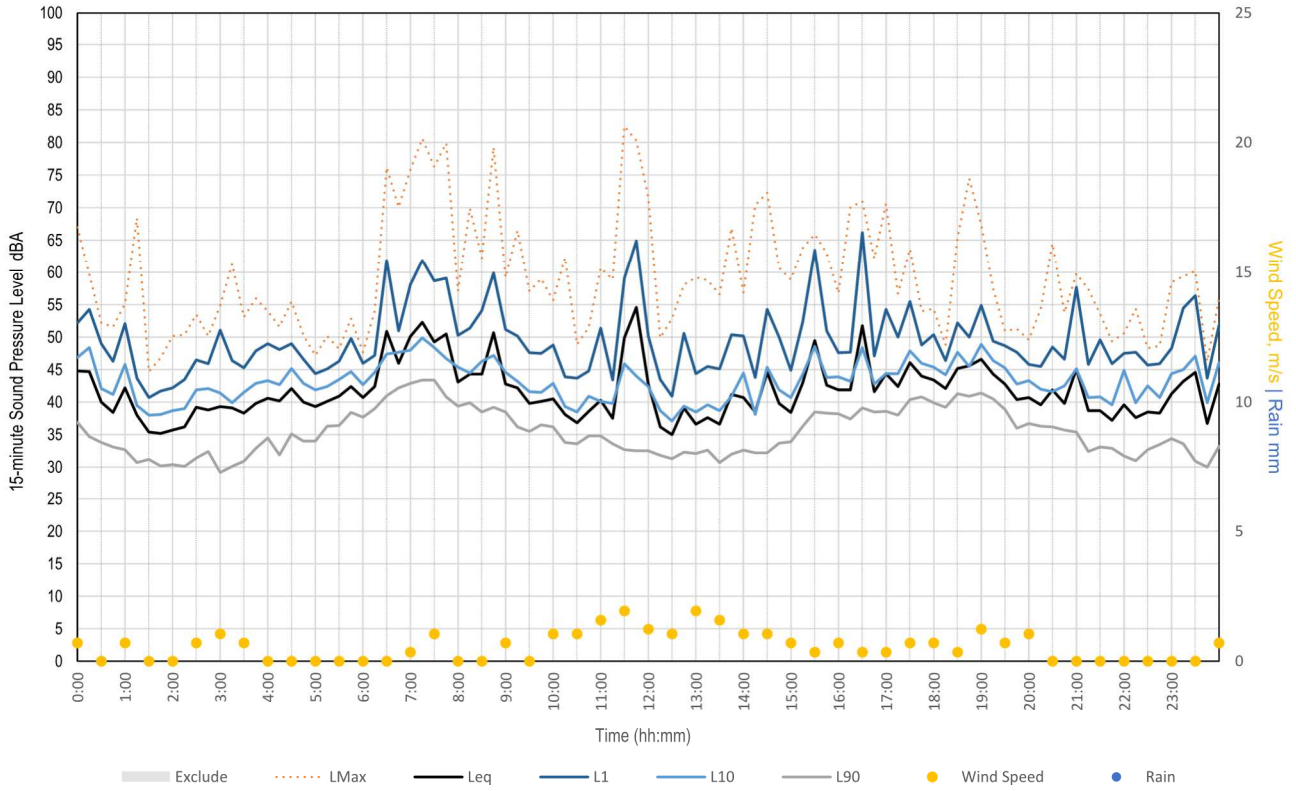
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Tuesday, 16 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

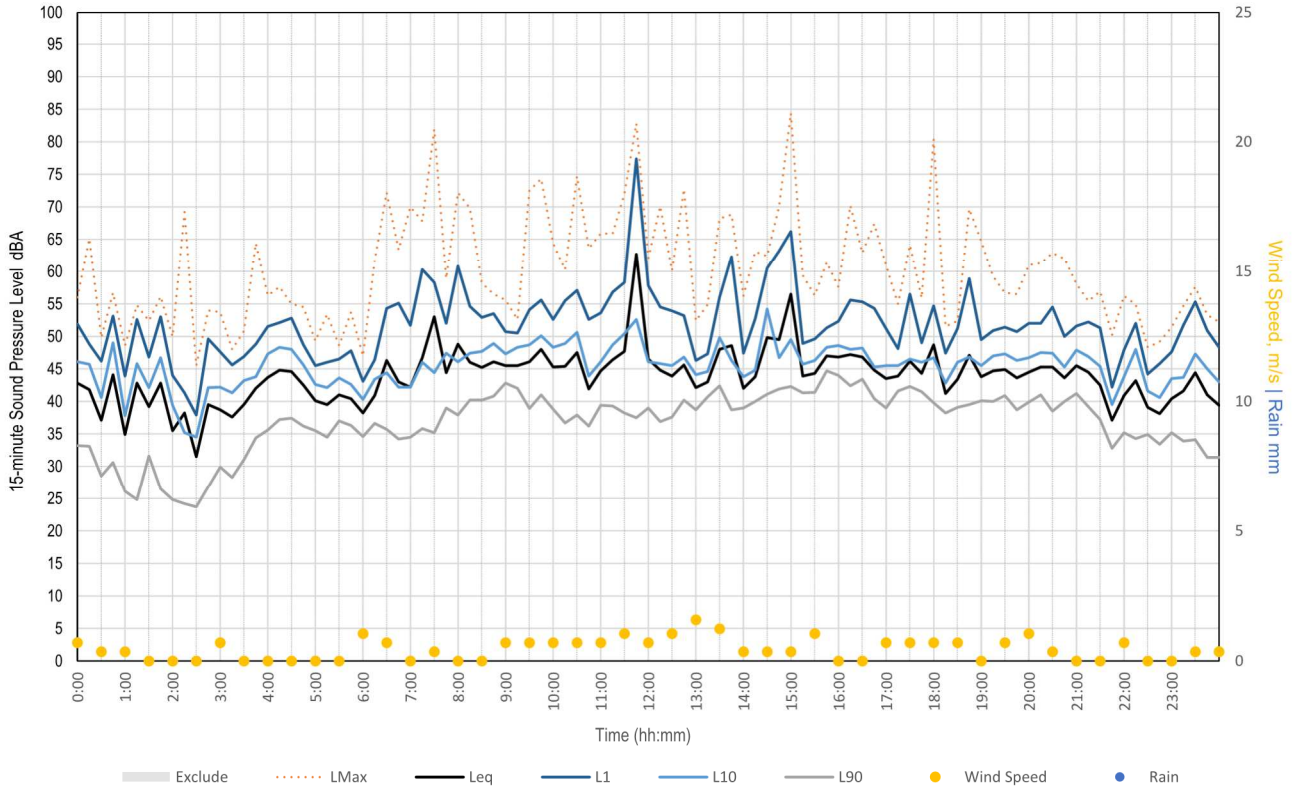
Wednesday, 17 August 2022



Noise Logger Results

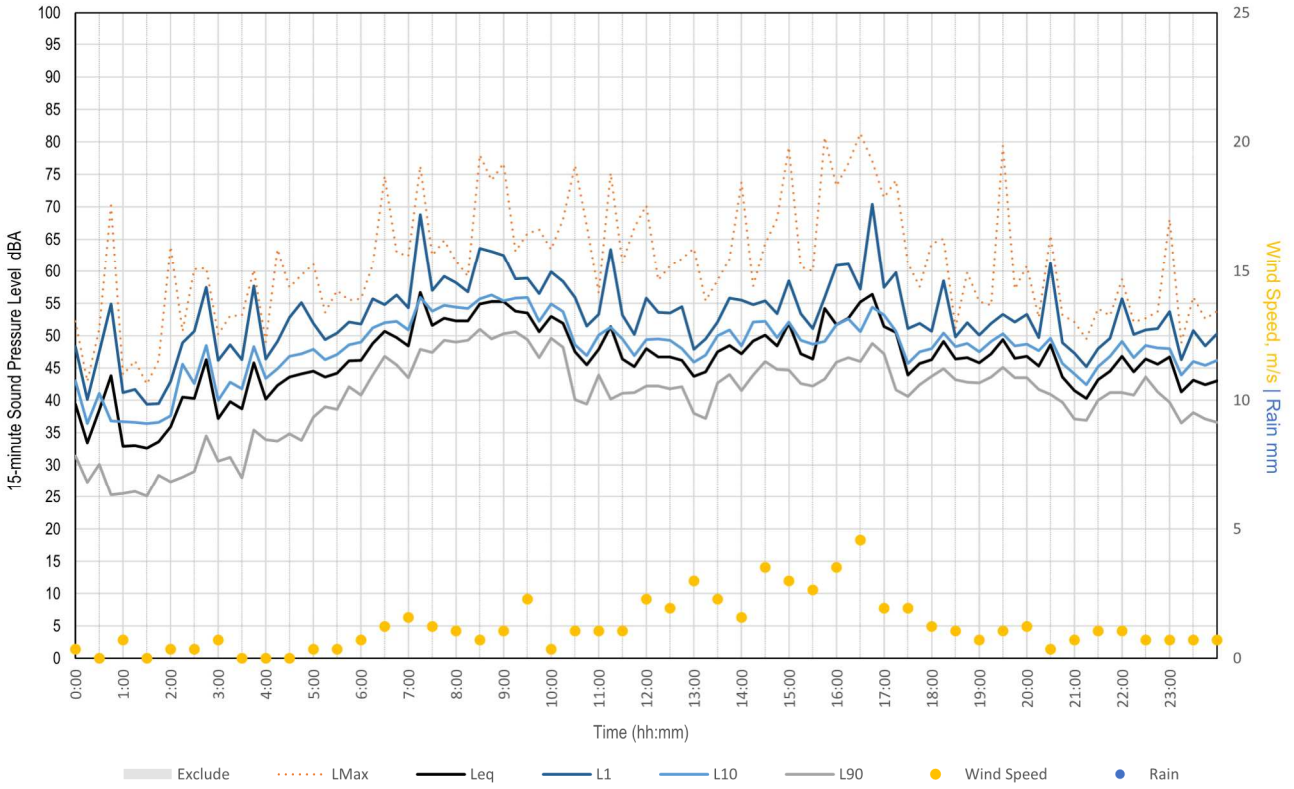
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Thursday, 18 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

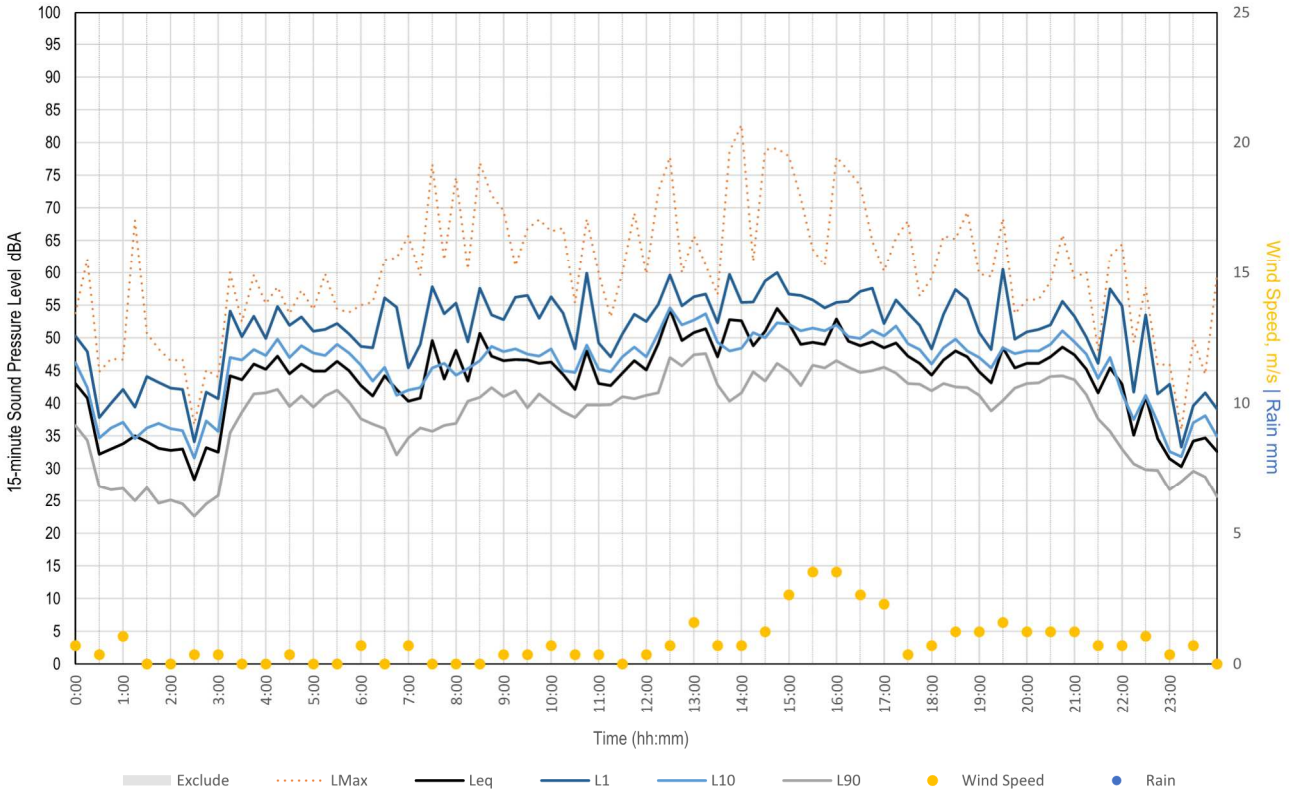
Friday, 19 August 2022



Noise Logger Results

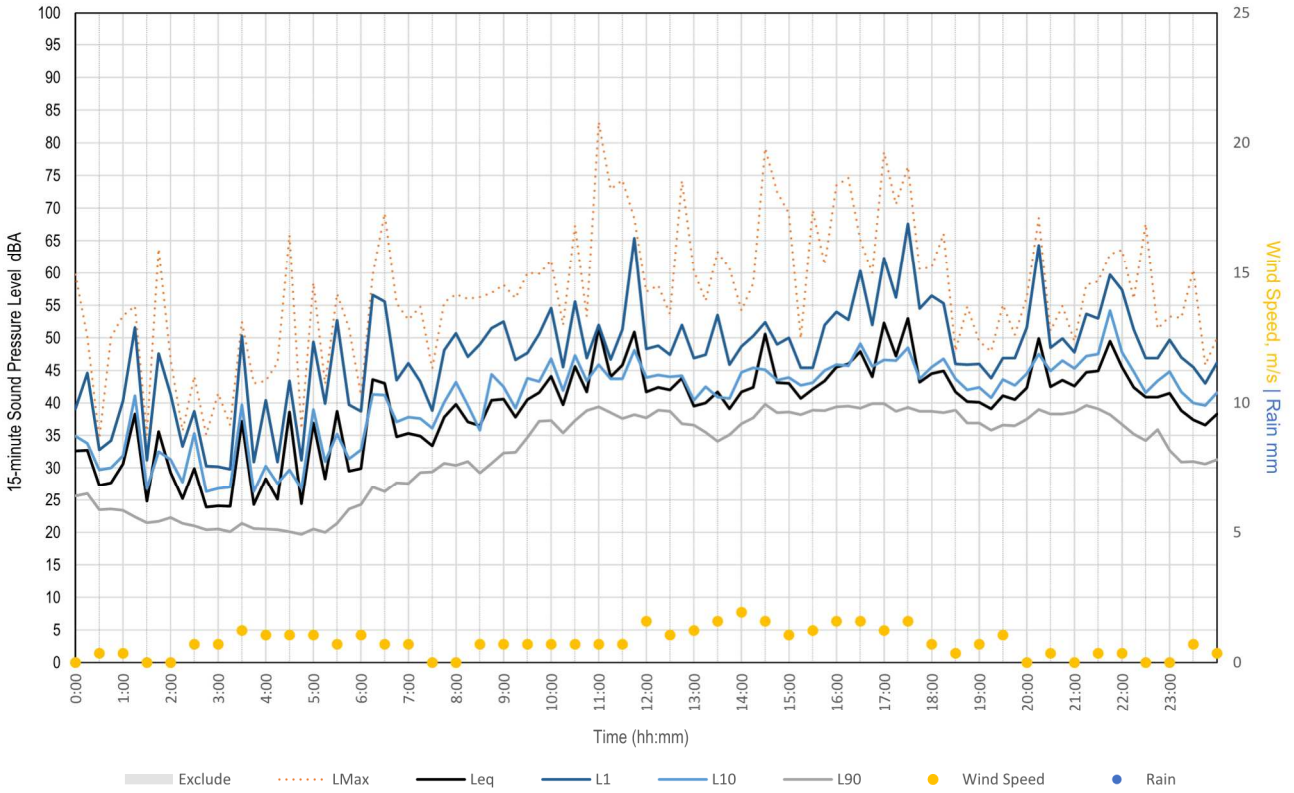
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Saturday, 20 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

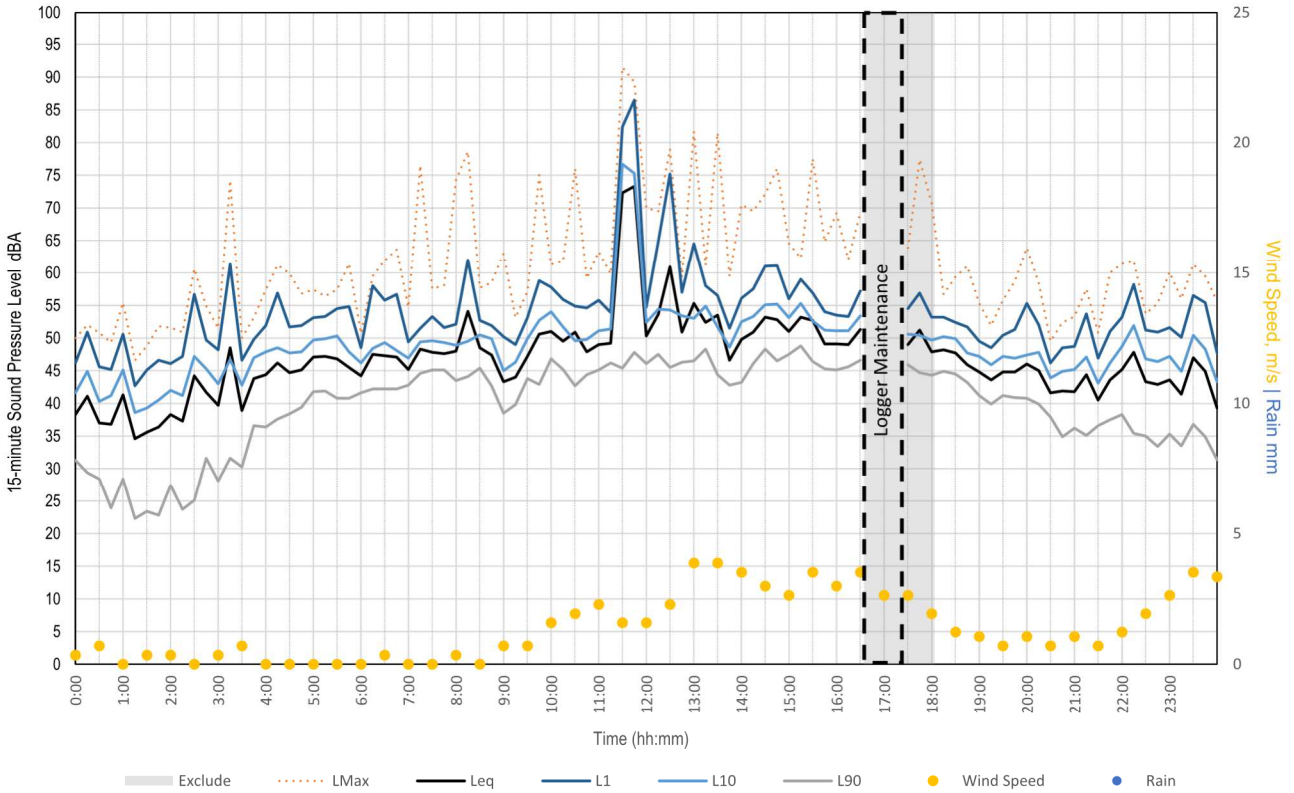
Sunday, 21 August 2022



Noise Logger Results

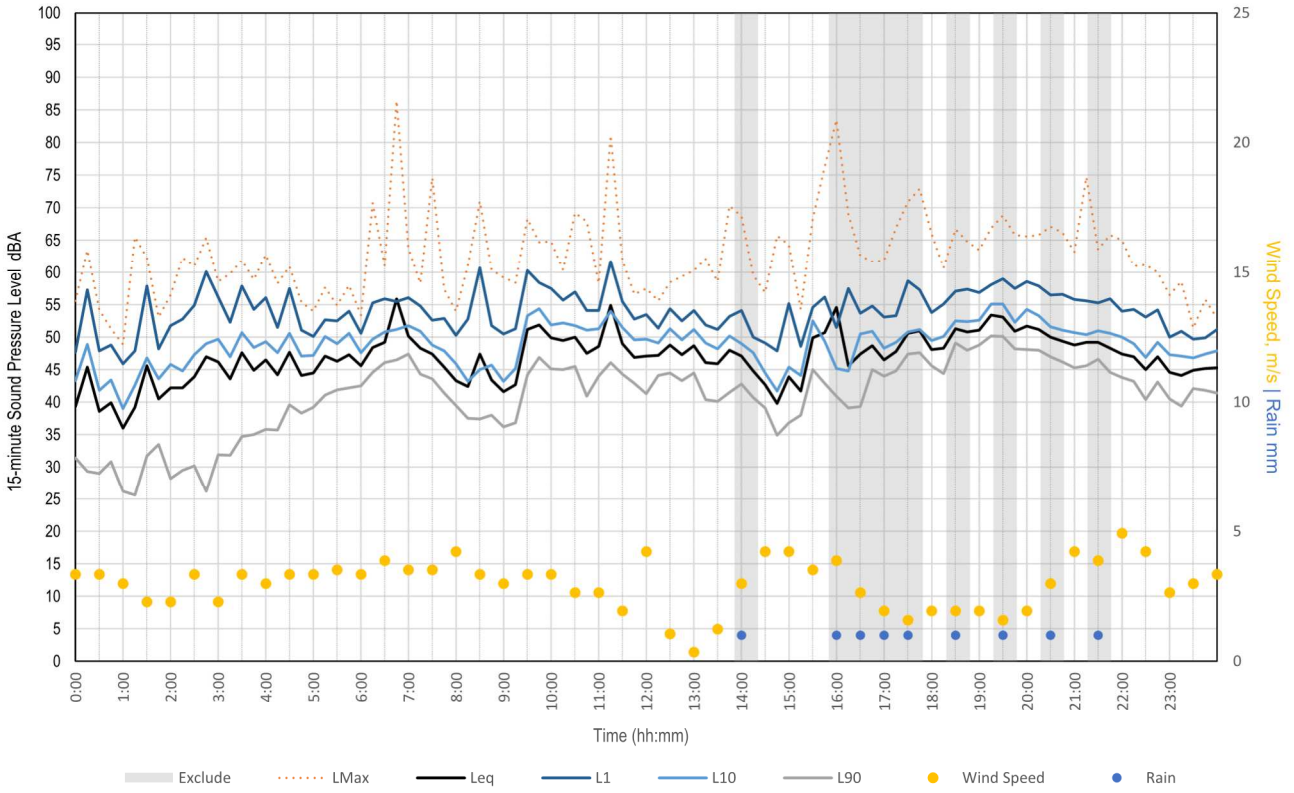
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Monday, 22 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

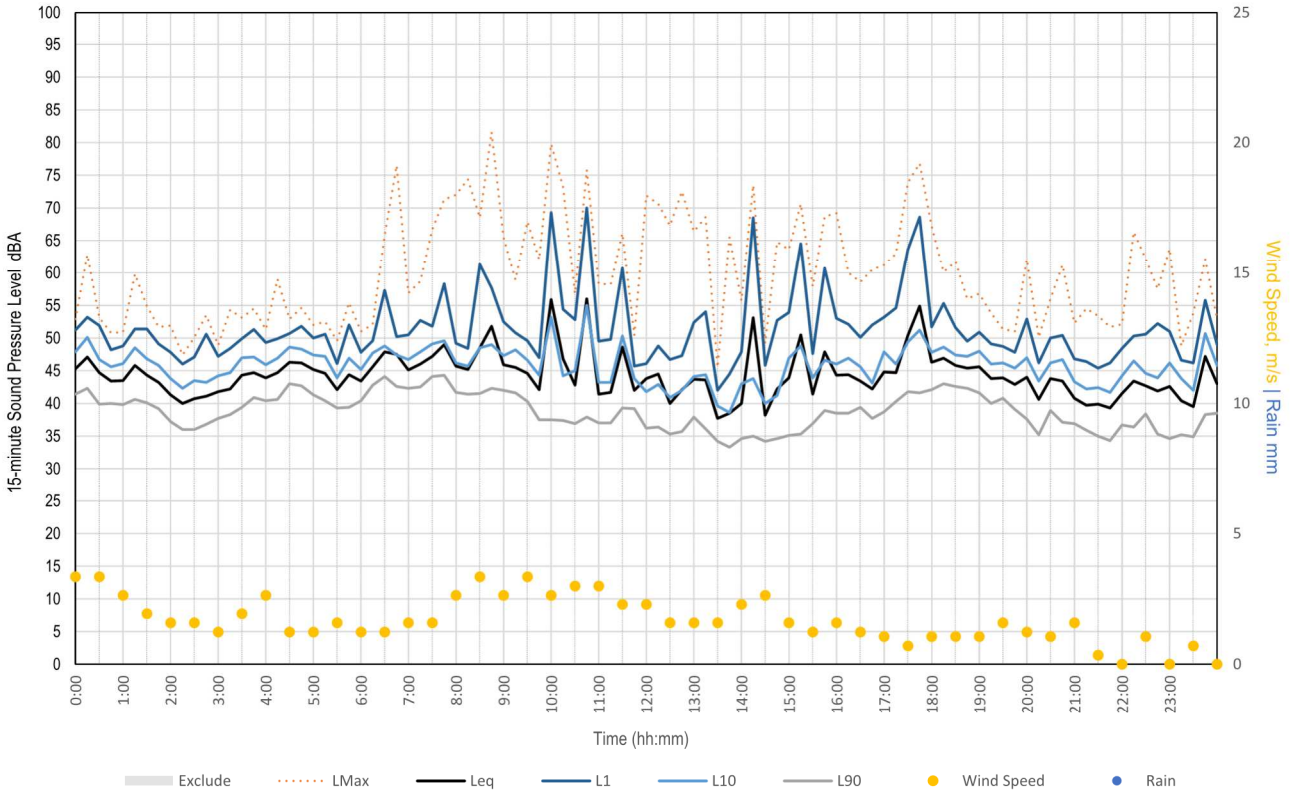
Tuesday, 23 August 2022



Noise Logger Results

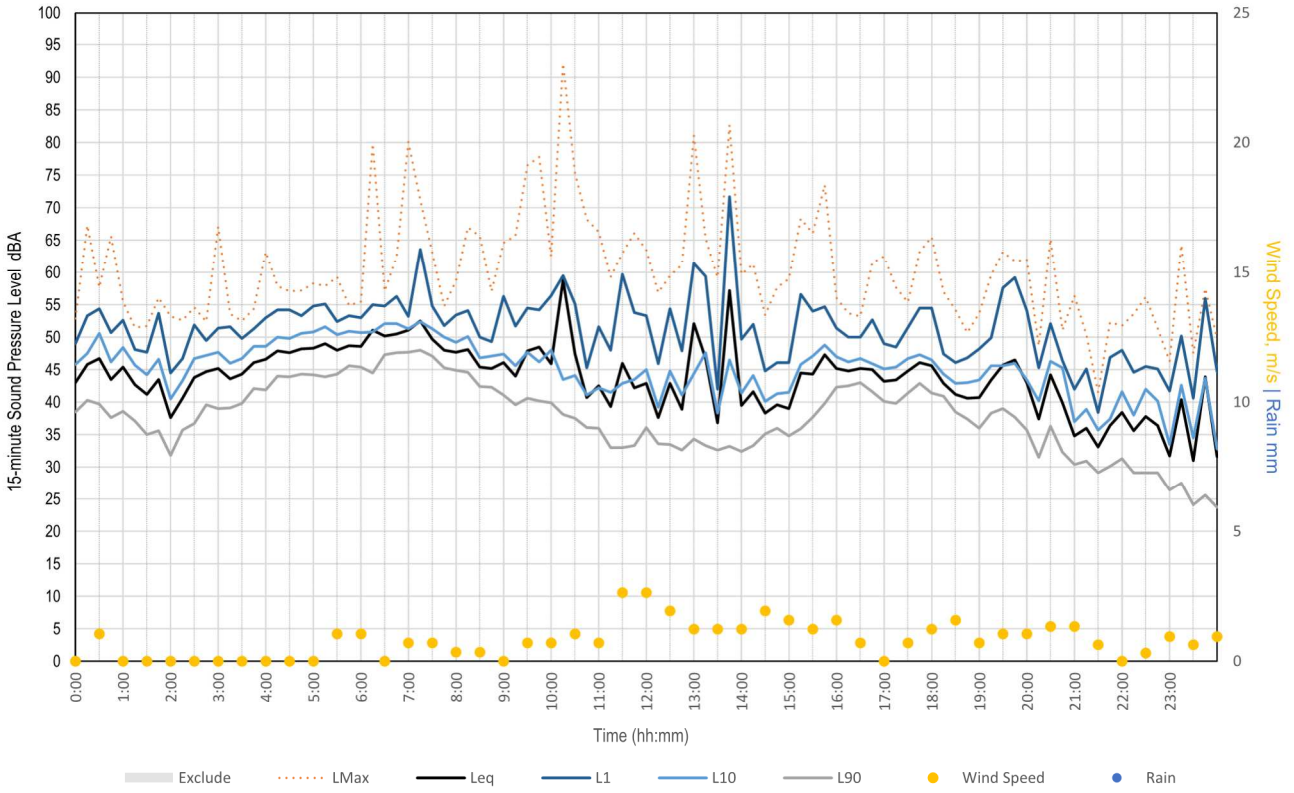
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Wednesday, 24 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

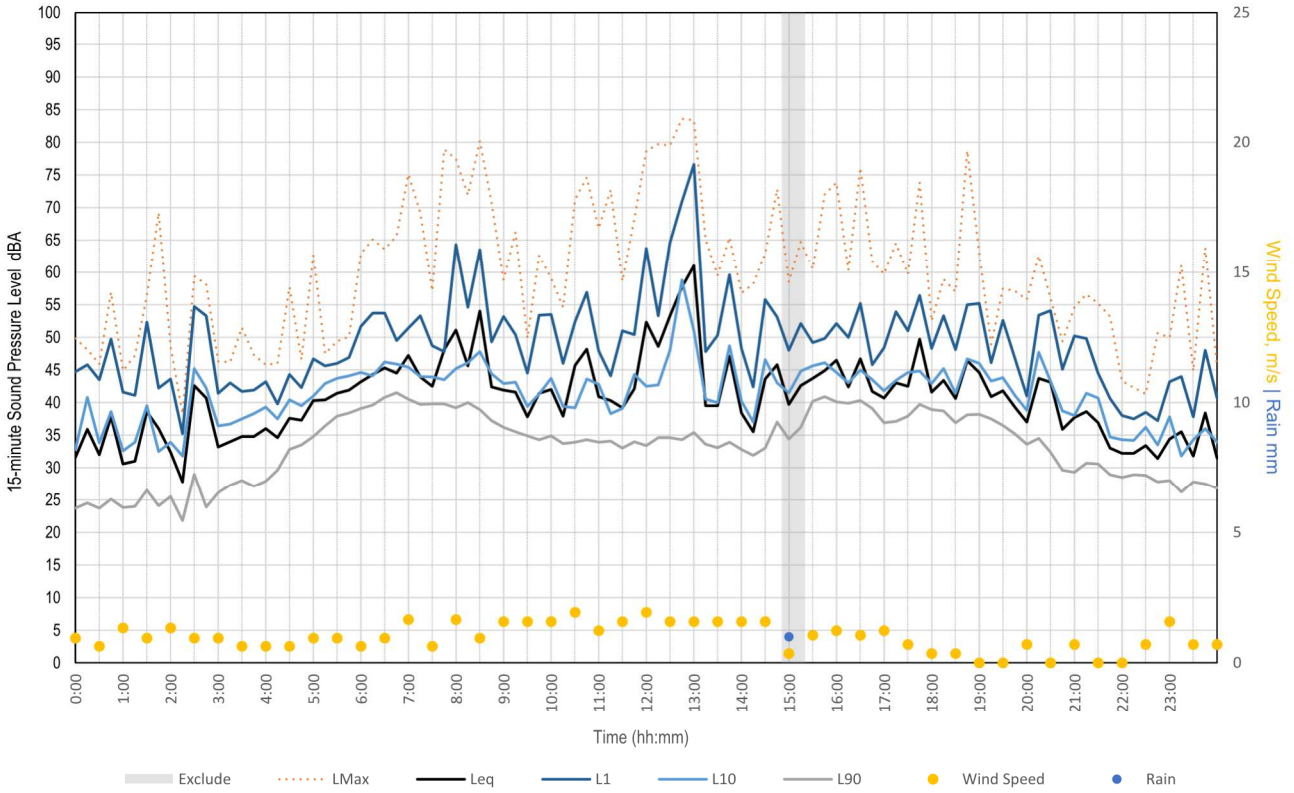
Thursday, 25 August 2022



Noise Logger Results

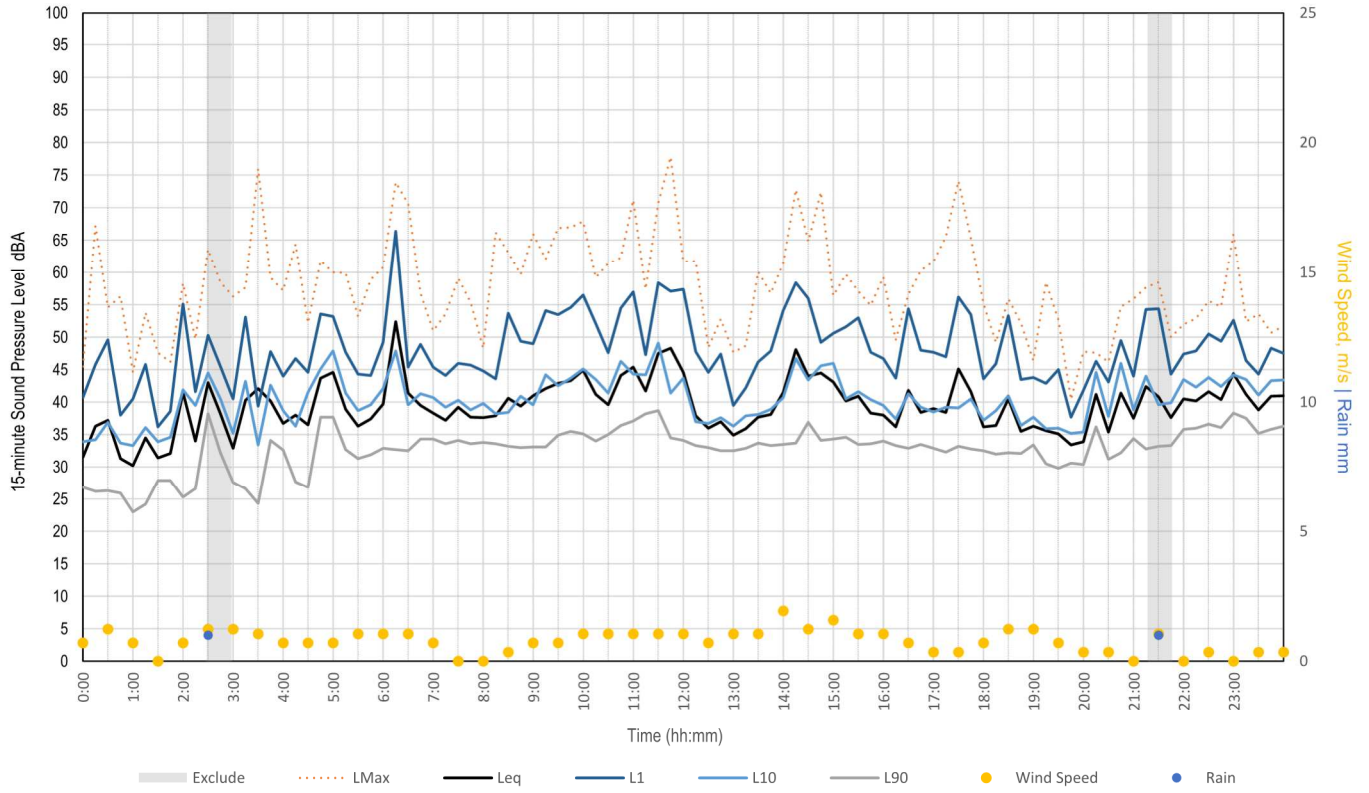
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Friday, 26 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

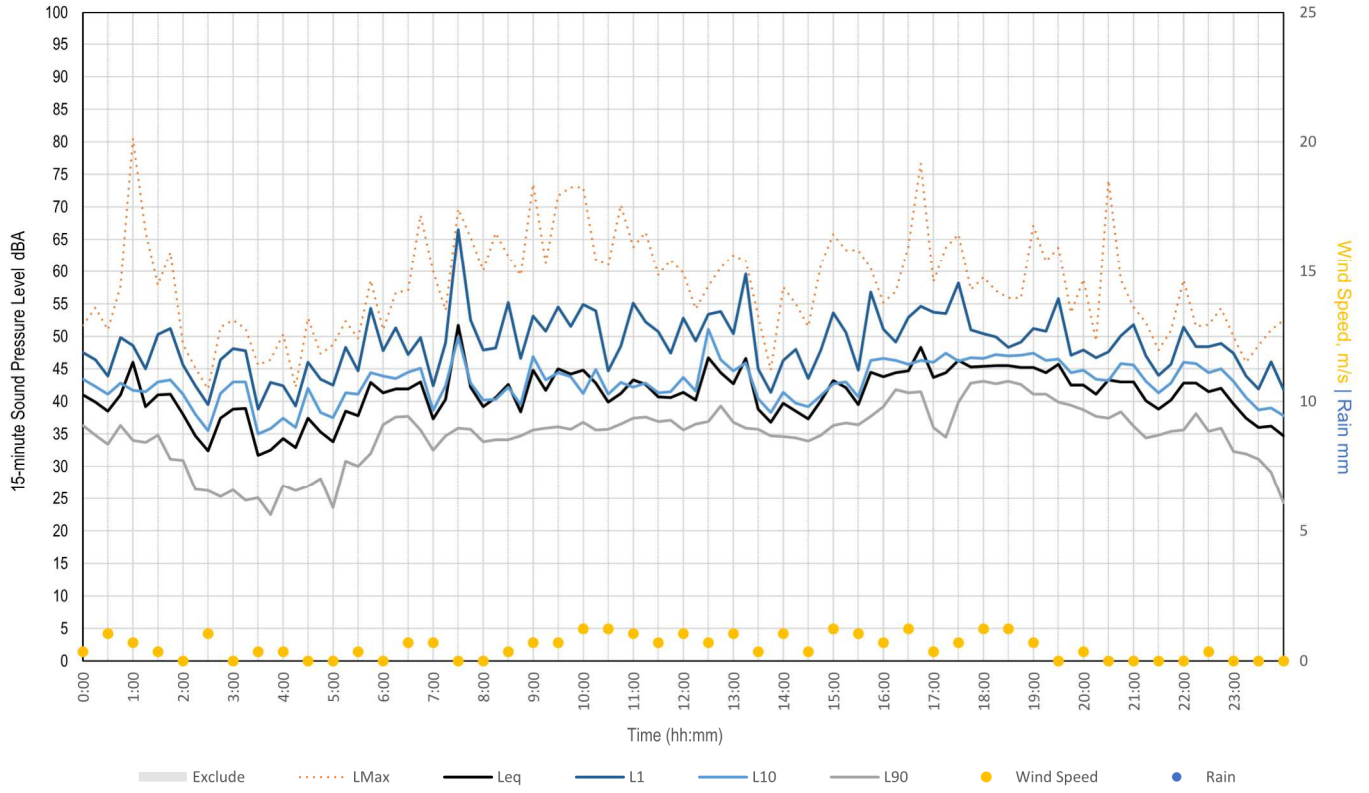
Saturday, 27 August 2022



Noise Logger Results

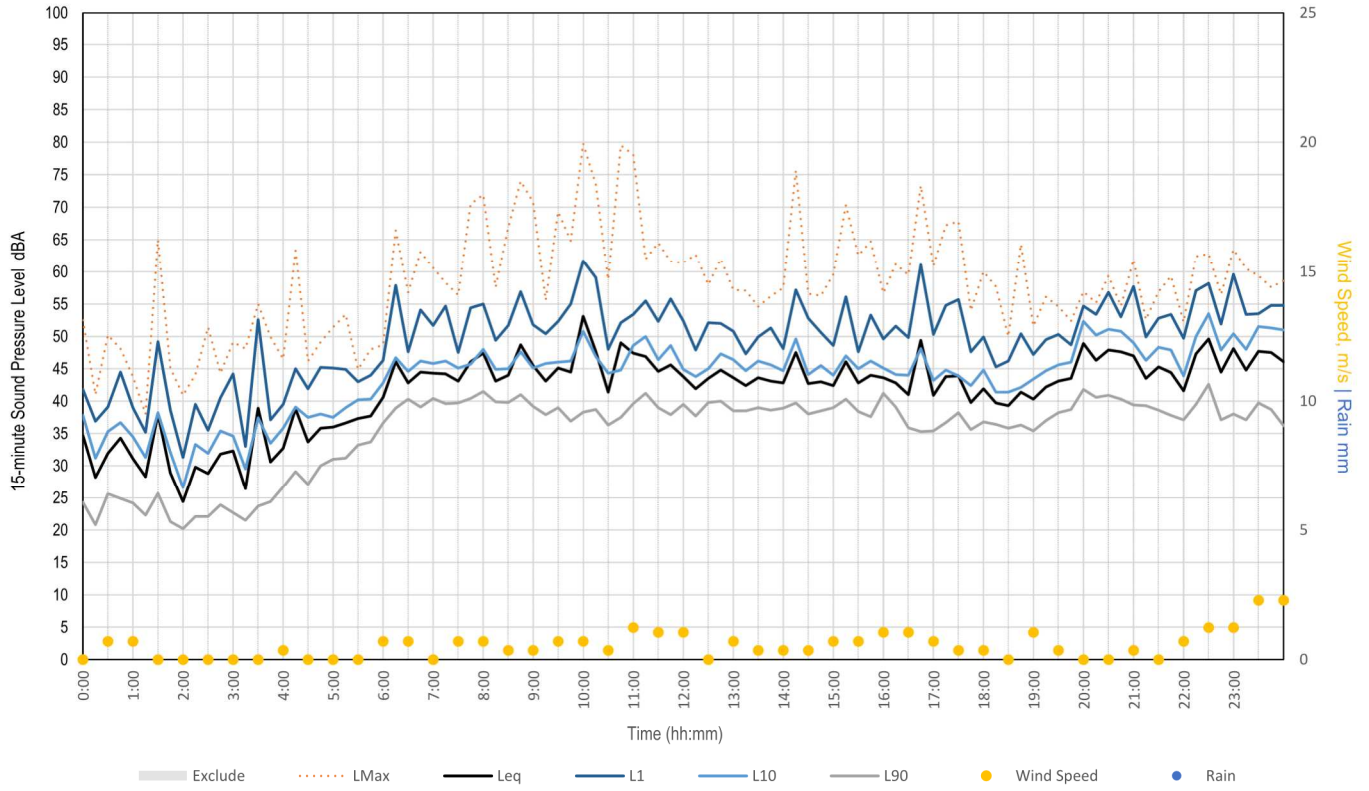
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Sunday, 28 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

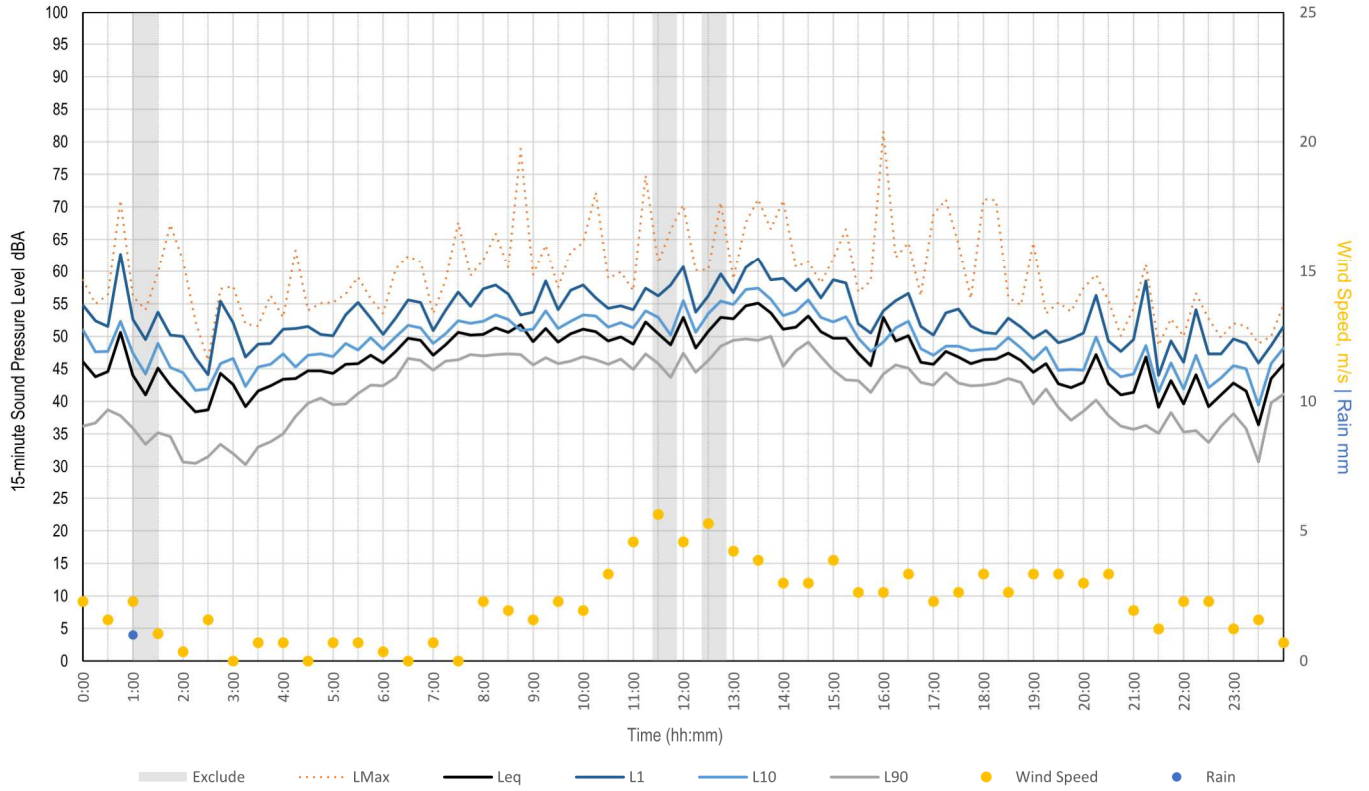
Monday, 29 August 2022



Noise Logger Results

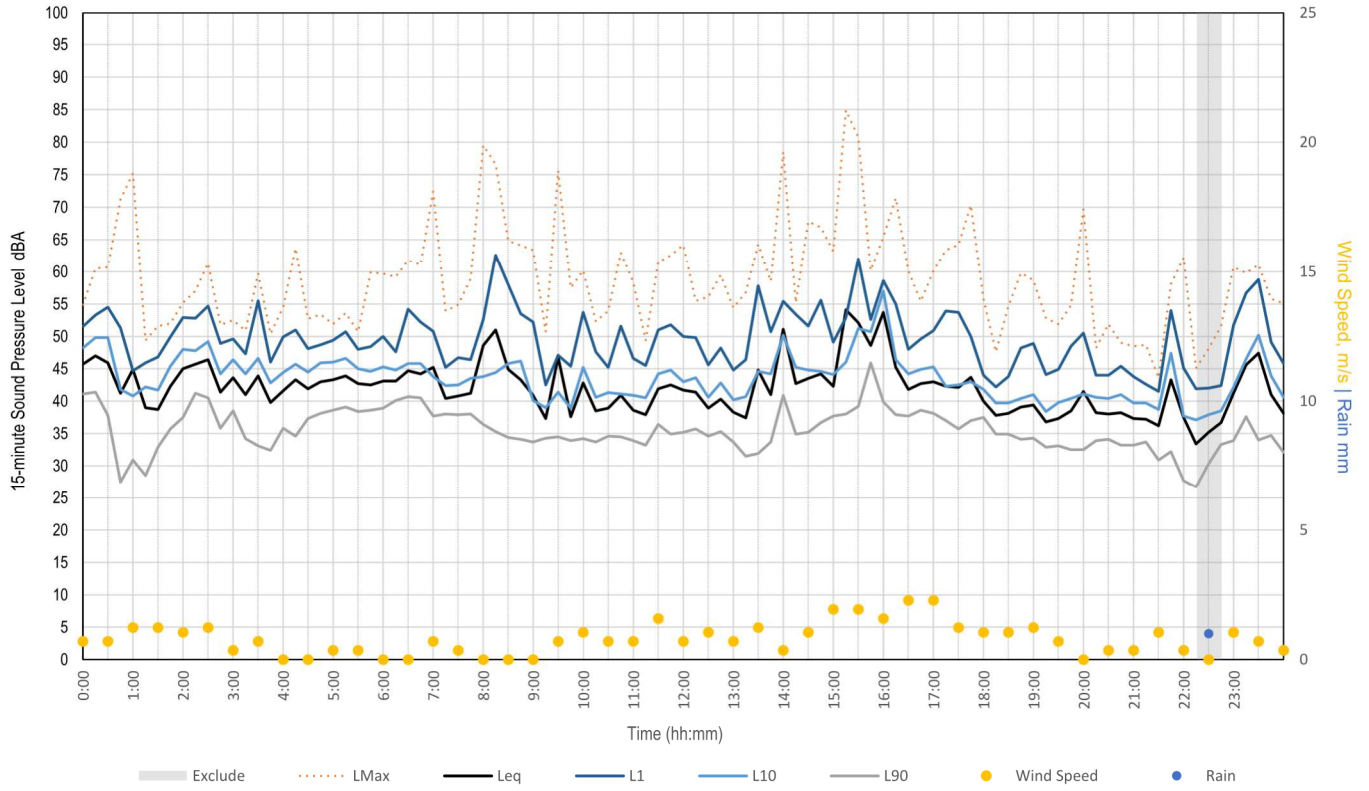
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Tuesday, 30 August 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

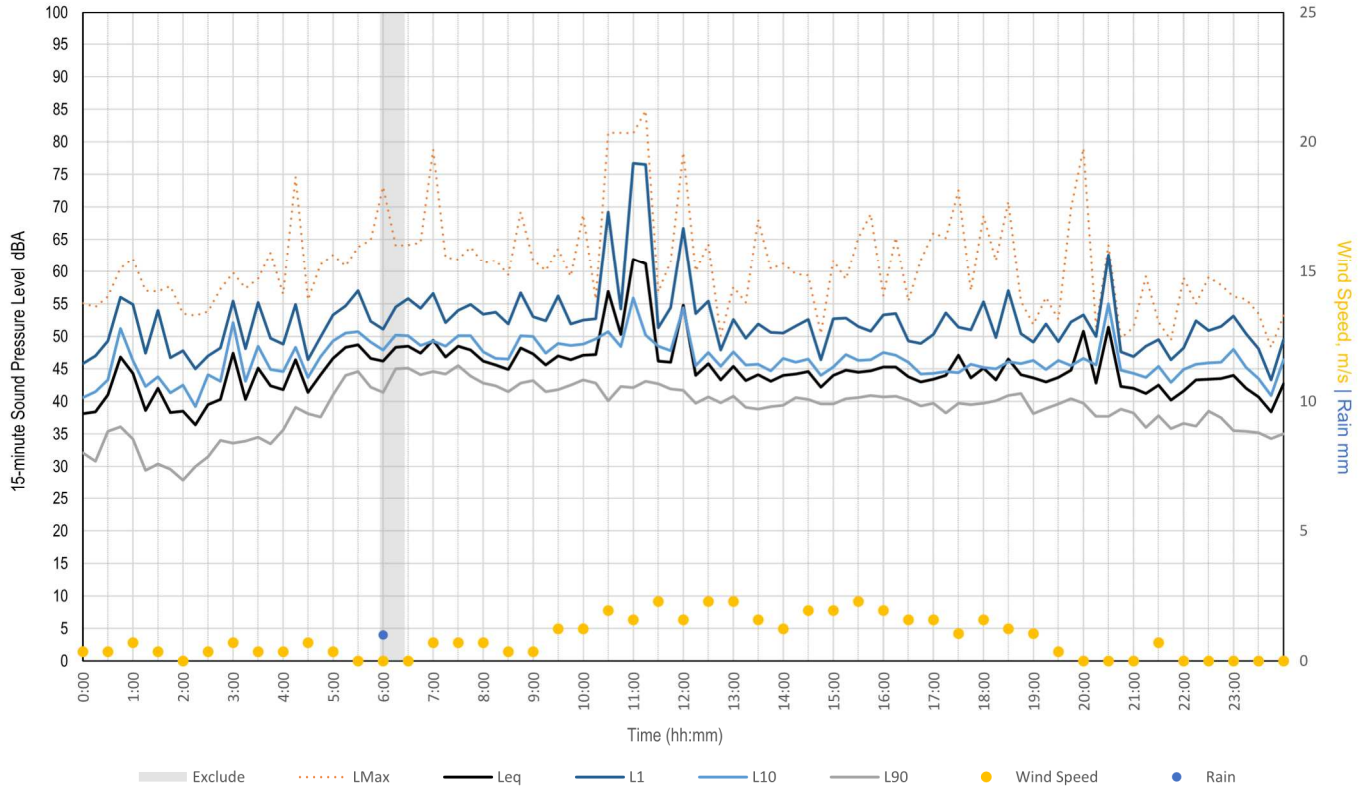
Wednesday, 31 August 2022



Noise Logger Results

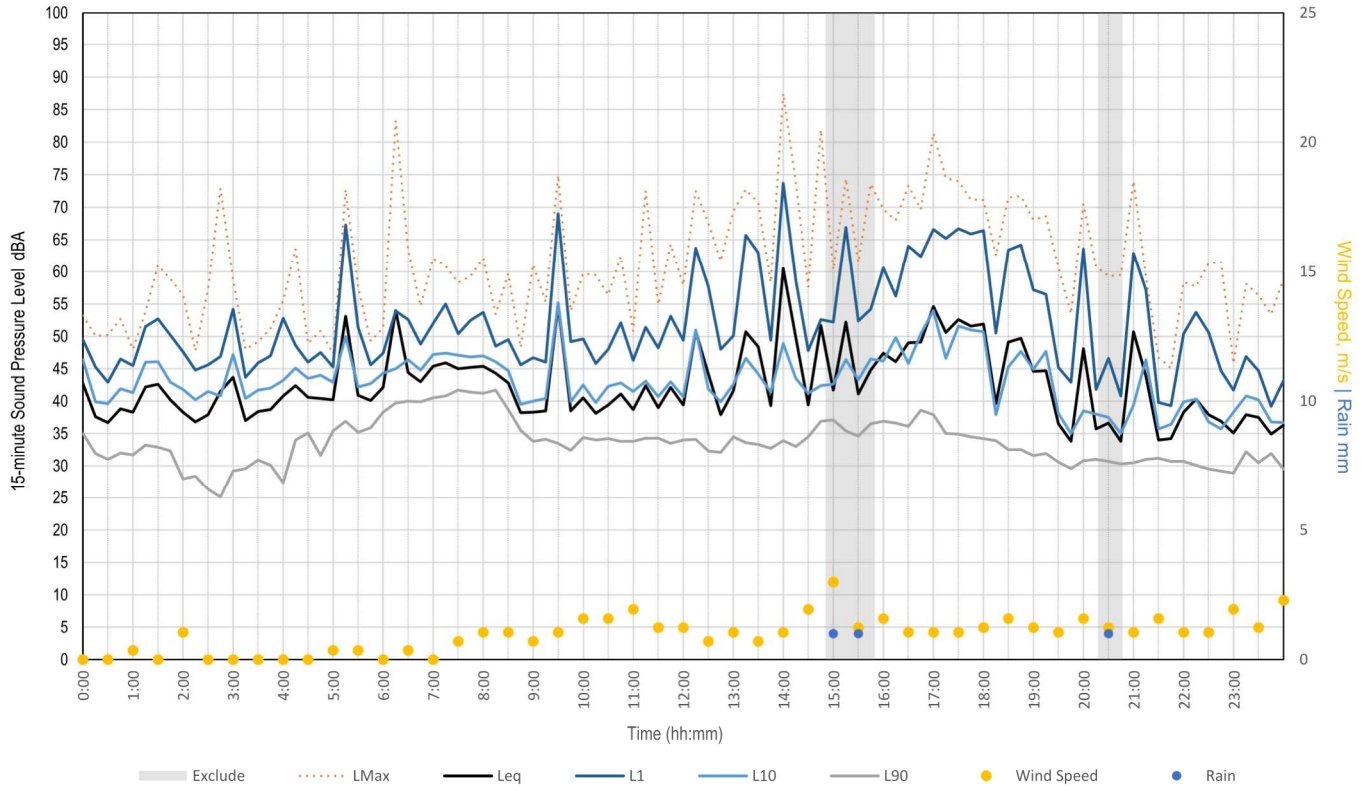
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Thursday, 01 September 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

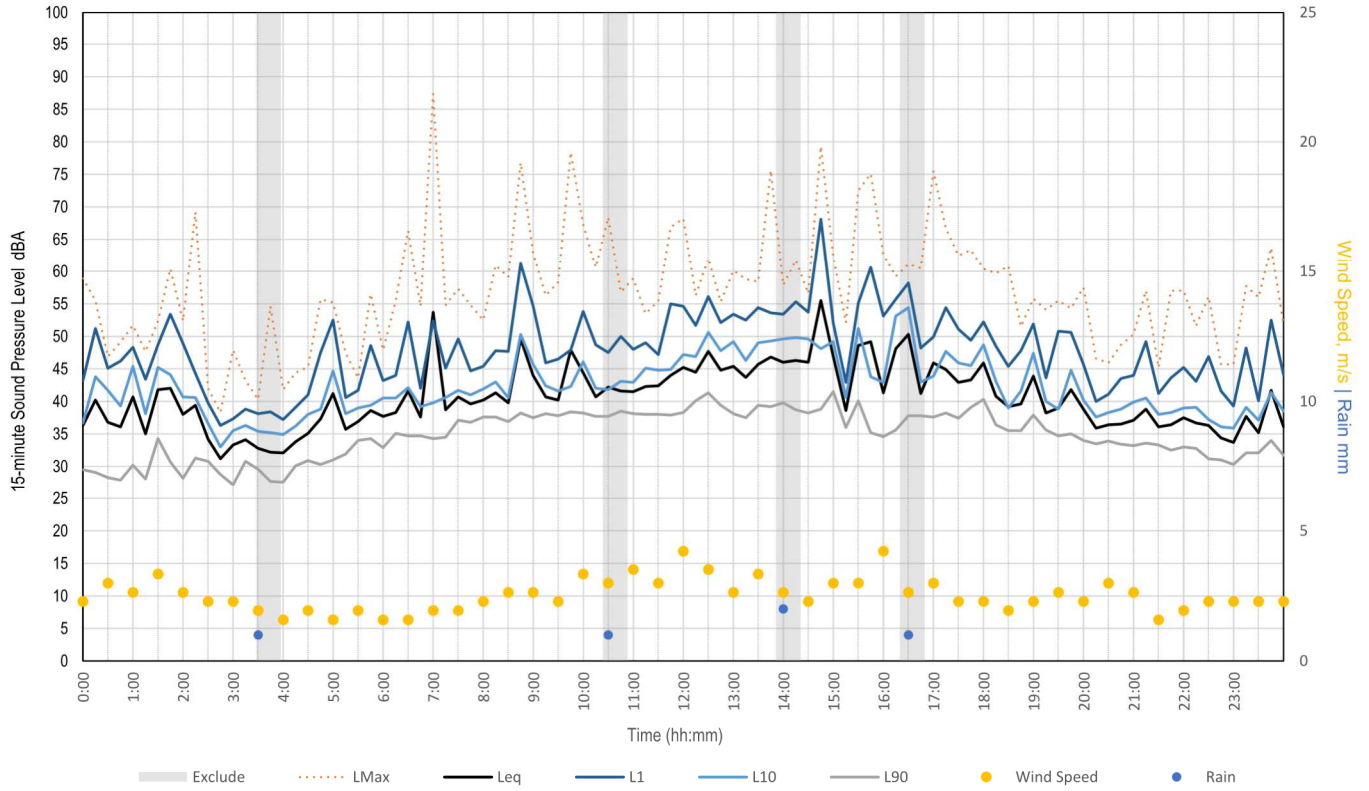
Friday, 02 September 2022



Noise Logger Results

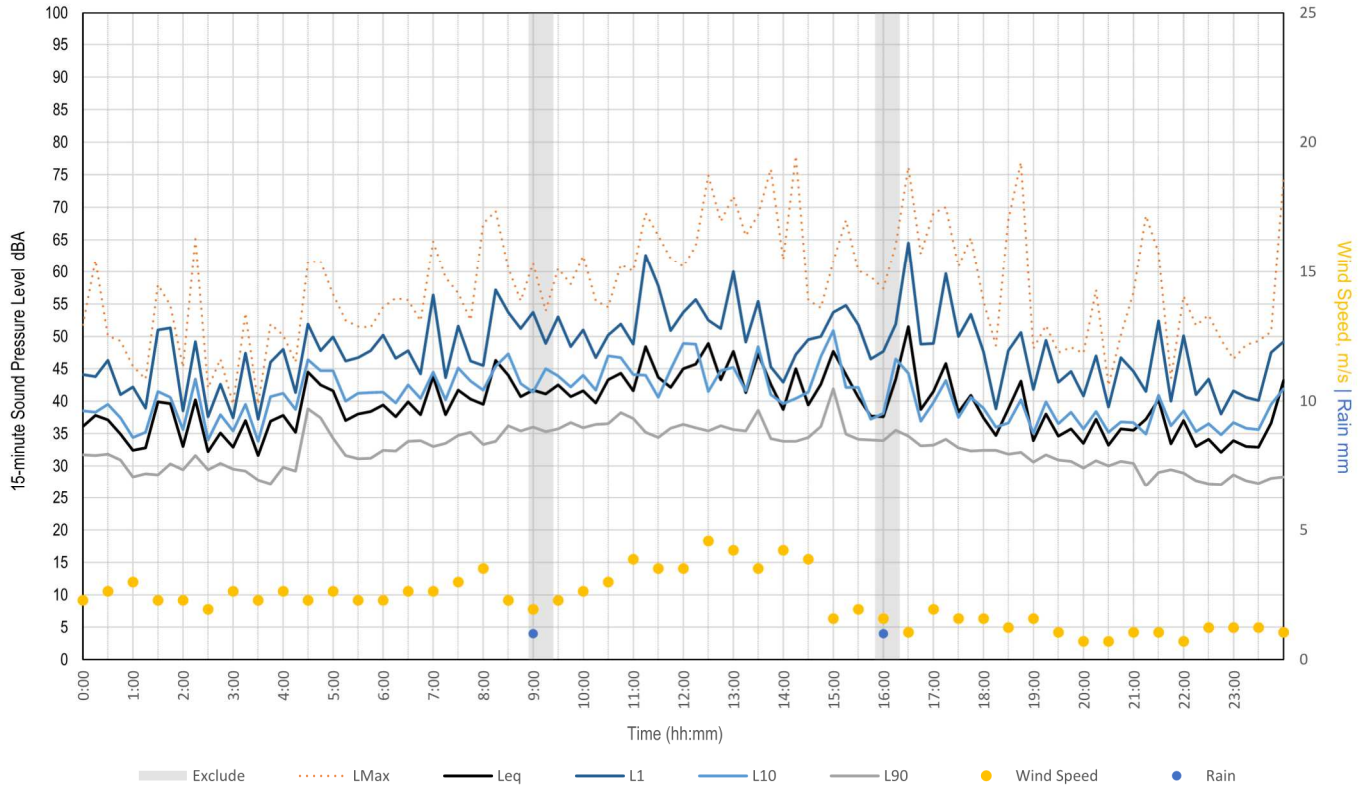
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Saturday, 03 September 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

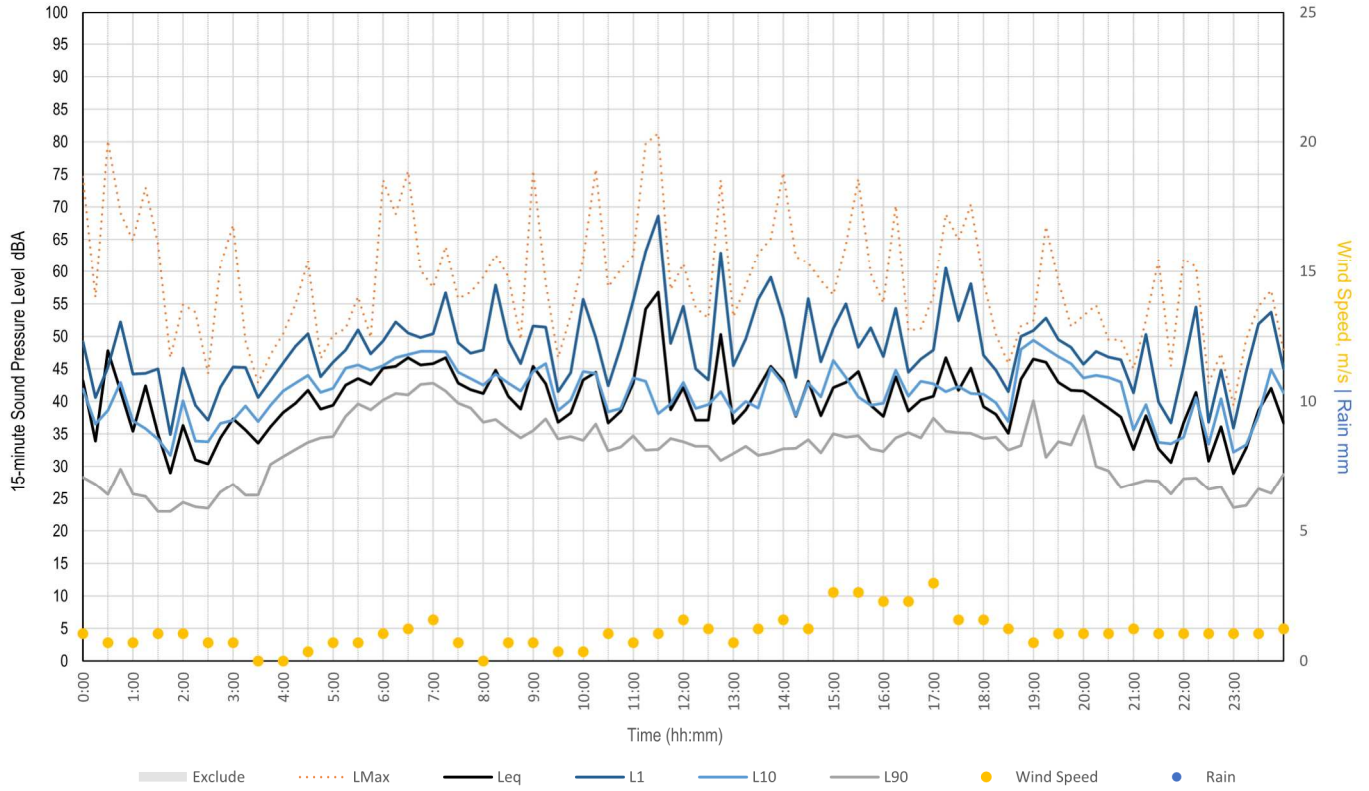
Sunday, 04 September 2022



Noise Logger Results

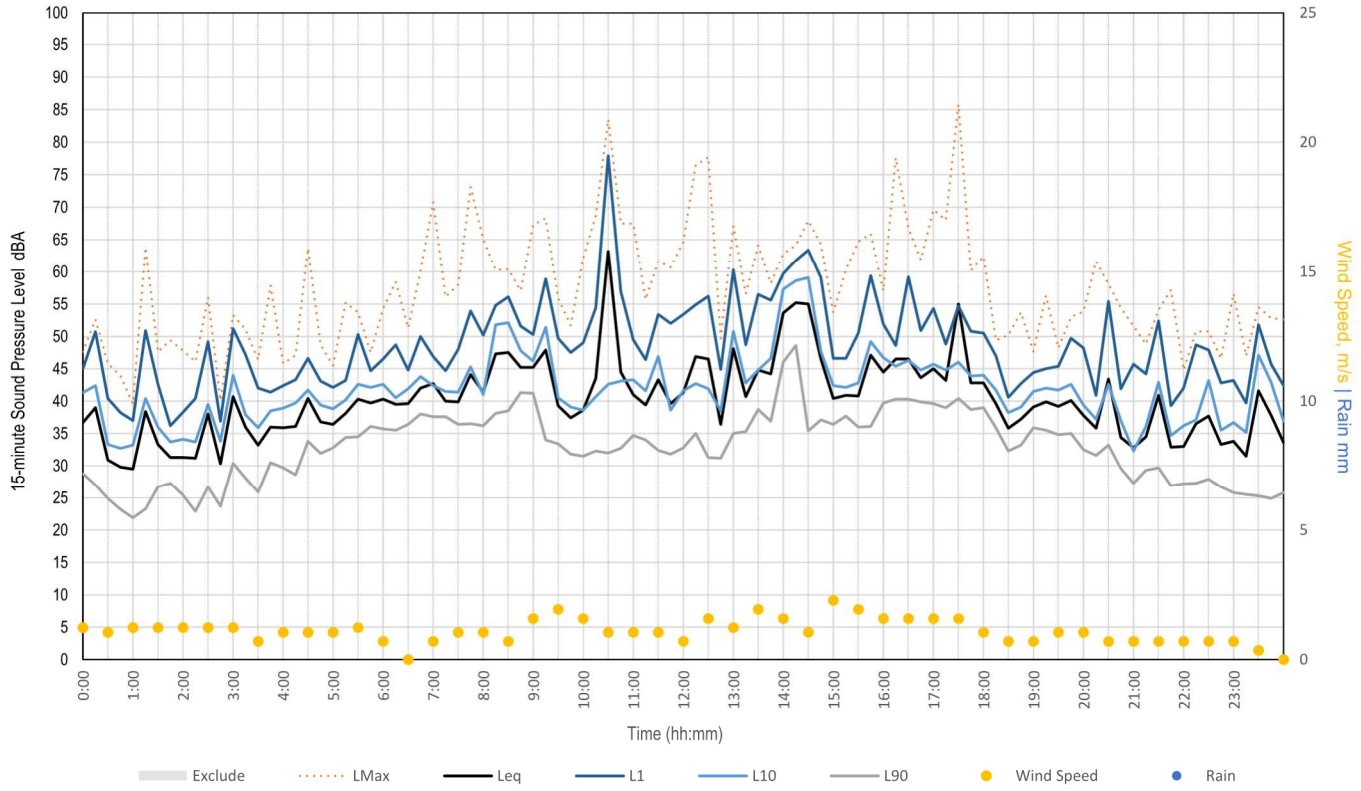
Measured Noise Levels - M25 - 52 Martin Place (Linden)

Monday, 05 September 2022



Measured Noise Levels - M25 - 52 Martin Place (Linden)

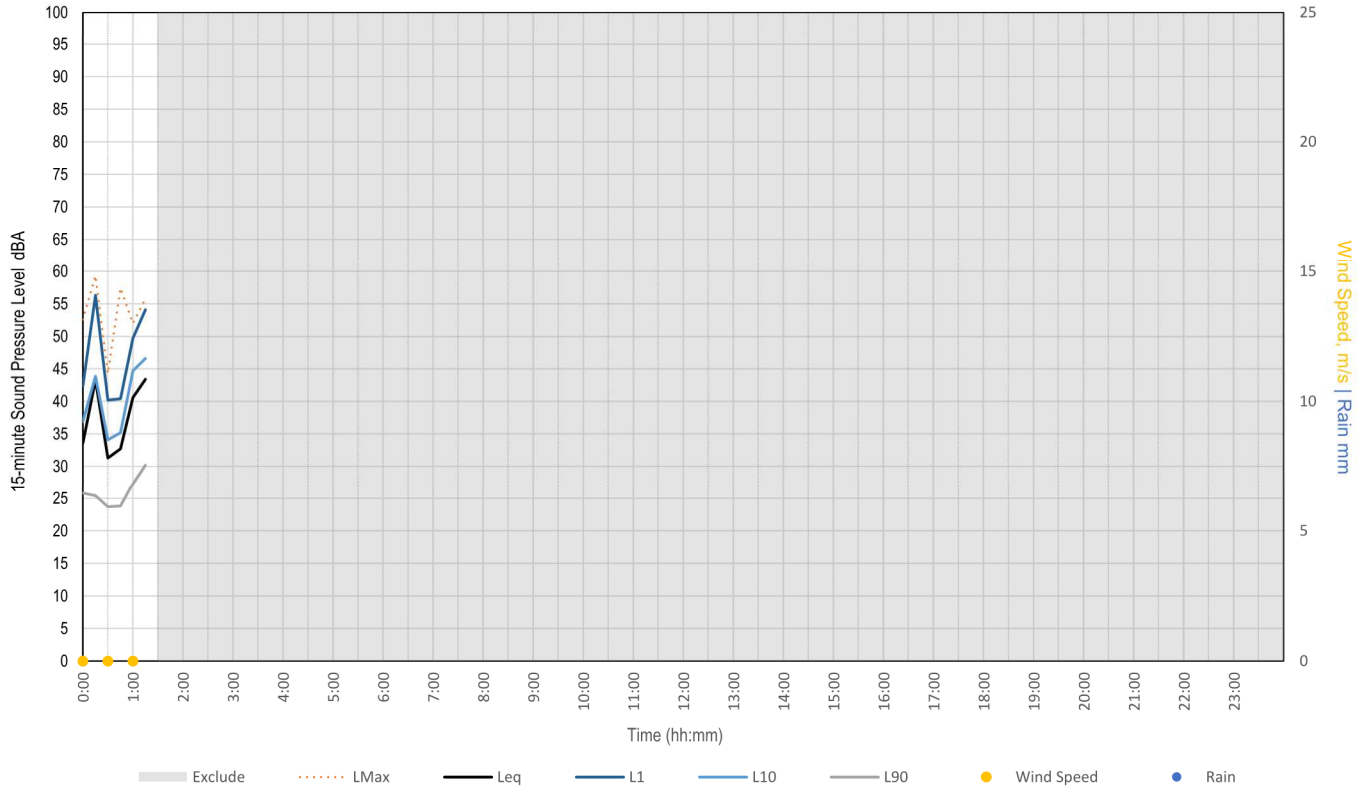
Tuesday, 06 September 2022



Noise Logger Results

Measured Noise Levels - M25 - 52 Martin Place (Linden)

Wednesday, 07 September 2022



Background Noise Monitoring

Location	M26 - 4 Momti Place (North Richmond)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & JF

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	87821F	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-05718-E0
Calibration	**Pre:**	94.0 dBA	**Post:**	94.1 dBA	**Calibration**	**Pre:**	93.9 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Monday, 08 Aug 2022
Date End	Monday, 29 Aug 2022
No. of days	14
No. of nights	12

*Monitoring period not continuous

Weather	
Station	BoM
Station Info	Richmond
Distance	≤ 10 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres away from any reflective structures other than ground (e.g. house facade and fence).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	8/08/2022	5:28:30 PM	5:43:30 PM	70	50	50	45	
2	Day	8/08/2022	5:43:30 PM	5:58:30 PM	57	45	47	42	
3	Day	22/08/2022	3:00:59 PM	3:15:23 PM	68	51	53	46	
4	Day	22/08/2022	3:19:24 PM	3:33:48 PM	71	51	52	43	
5	Evening	8/08/2022	5:58:30 PM	6:13:30 PM	56	42	44	39	
6	Evening	8/08/2022	6:13:30 PM	6:28:30 PM	60	41	43	38	
7	Evening	9/08/2022	8:30:00 PM	8:45:00 PM	47	39	42	36	*
8	Evening	9/08/2022	9:30:00 PM	9:45:00 PM	53	39	43	34	*
9	Night	11/08/2022	1:15:00 AM	1:30:00 AM	46	30	34	24	*
10	Night	11/08/2022	3:30:00 AM	3:45:00 AM	56	32	34	24	*
11	Night	11/08/2022	6:30:00 AM	6:45:00 AM	68	47	49	41	*
12	Night	11/08/2022	10:15:00 PM	10:30:00 PM	58	36	39	32	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Wind induced noise with gusts up to 4 m/s (e.g. tree leaves rustling). Intermittent bird noise. Occasional vehicle passbys, and other vehicle related noise e.g. siren. Suburban noise at neighbouring properties (e.g. doors opening/closing, dogs barking), and mechanical plant (likely a circular saw). Some aircraft flybys noted (plane and helicopter) at a distance with maximum sound levels in the range of 41 to 49 dBA.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling). Distant traffic.
Evening	
Ambient noise	Intermittent birds. Occasional vehicle passbys. Suburban noise at neighbouring properties (e.g. doors opening/closing), and mechanical plant (likely a circular saw). Movement in vegetation induced by wind (e.g. tree leaves rustling).
Background noise	Distant traffic.
Night	
Ambient noise	Intermittent dog barking nearby. Various impulsive noises (e.g. footsteps, and objects falling). Occasional vehicle passbys. Noise induced by strong wind gusts. Intermittent bird and insect noise.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling).

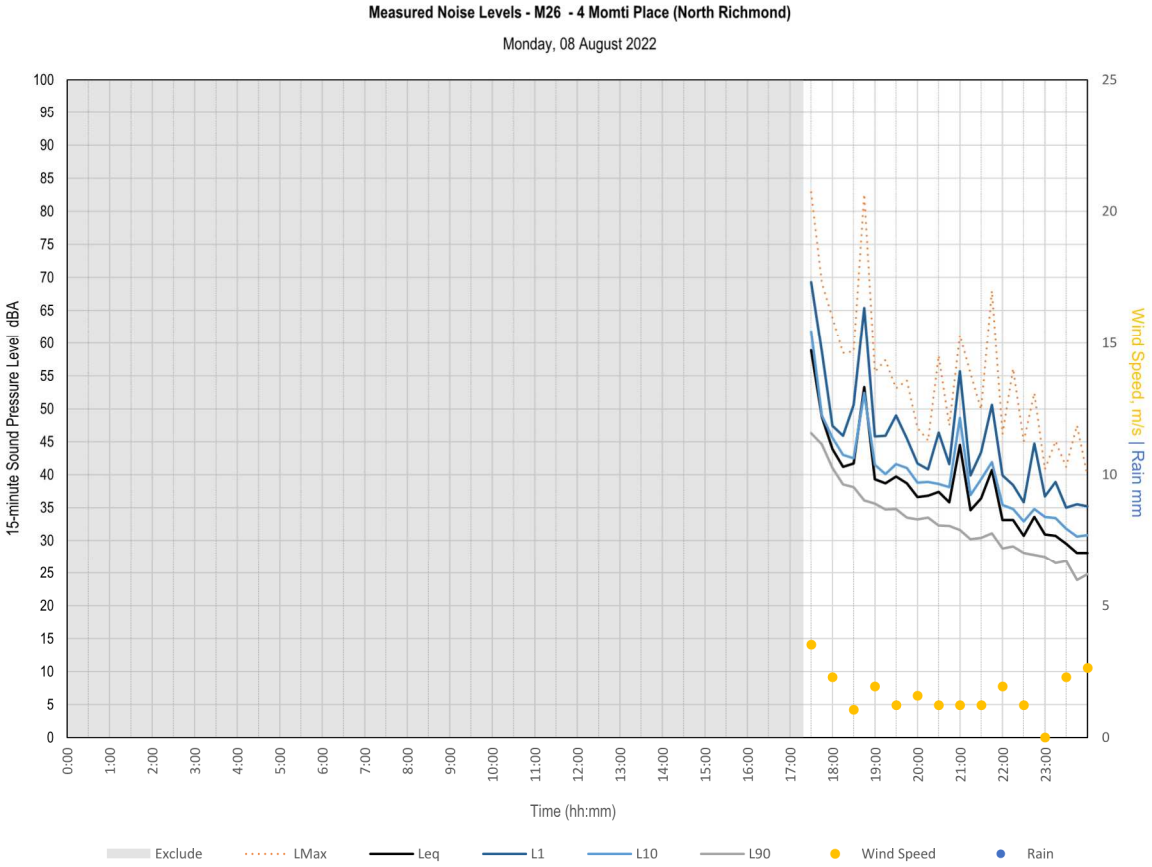
Site Details	M26 - 4 Momti Place (North Richmond)
Start Date	Mon 08 August 2022
End Date	Mon 29 August 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	53
$L_{eq, Evening}$ dBA	47
$L_{eq, Night}$ dBA	41
RBL, $_{Day}$ dBA	40
RBL, $_{Evening}$ dBA	35
RBL, $_{Night}$ dBA	26

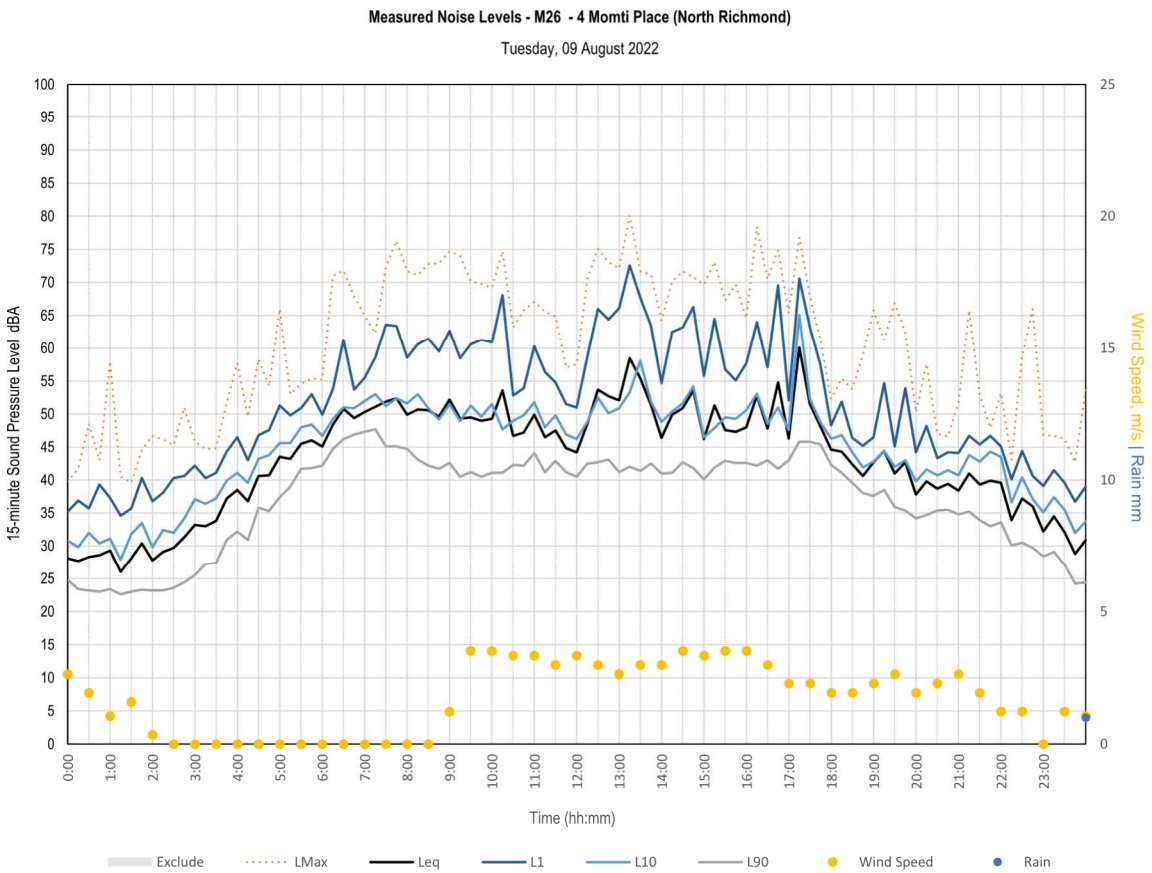
Daily Summary

Date	08-08	09-08	10-08	11-08	12-08	13-08
$L_{eq, Day}$ dBA	56	52	55	52	52	51
$L_{eq, Evening}$ dBA	44	42	46	43	43	46
$L_{eq, Night}$ dBA	41	39	38	40	42	39
ABL, $_{Day}$ dBA	45	41	39	41	43	40
ABL, $_{Evening}$ dBA	31	34	32	36	35	37
ABL, $_{Night}$ dBA	23	24	23	27	24	27

Date	22-08	23-08	24-08	25-08	26-08	27-08	28-08
$L_{eq, Day}$ dBA	53	54	56	51	54	51	52
$L_{eq, Evening}$ dBA	52	50	47	45	46	43	45
$L_{eq, Night}$ dBA	41	46	42	35	41	40	39
ABL, $_{Day}$ dBA	42	41	40	39	40	40	39
ABL, $_{Evening}$ dBA	37	45	34	35	36	35	34
ABL, $_{Night}$ dBA	27	25	29	26	26	24	27

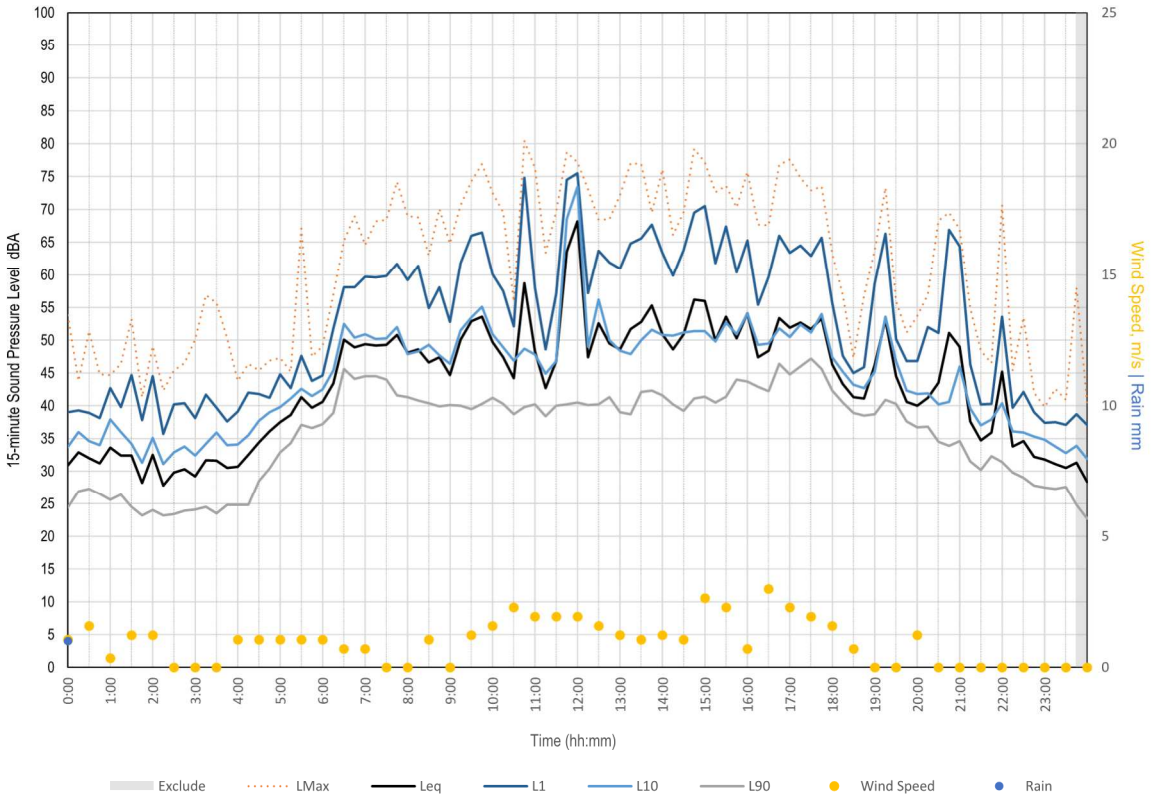


Noise Logger Results



Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

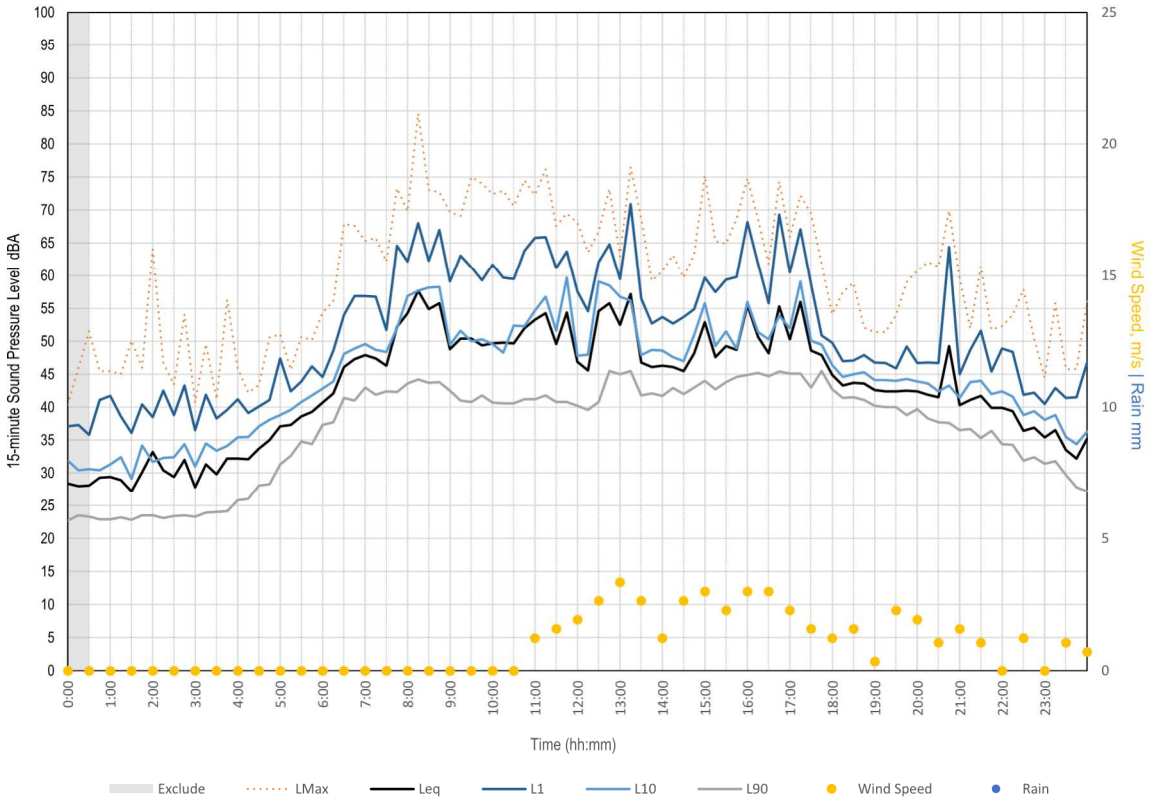
Wednesday, 10 August 2022



Noise Logger Results

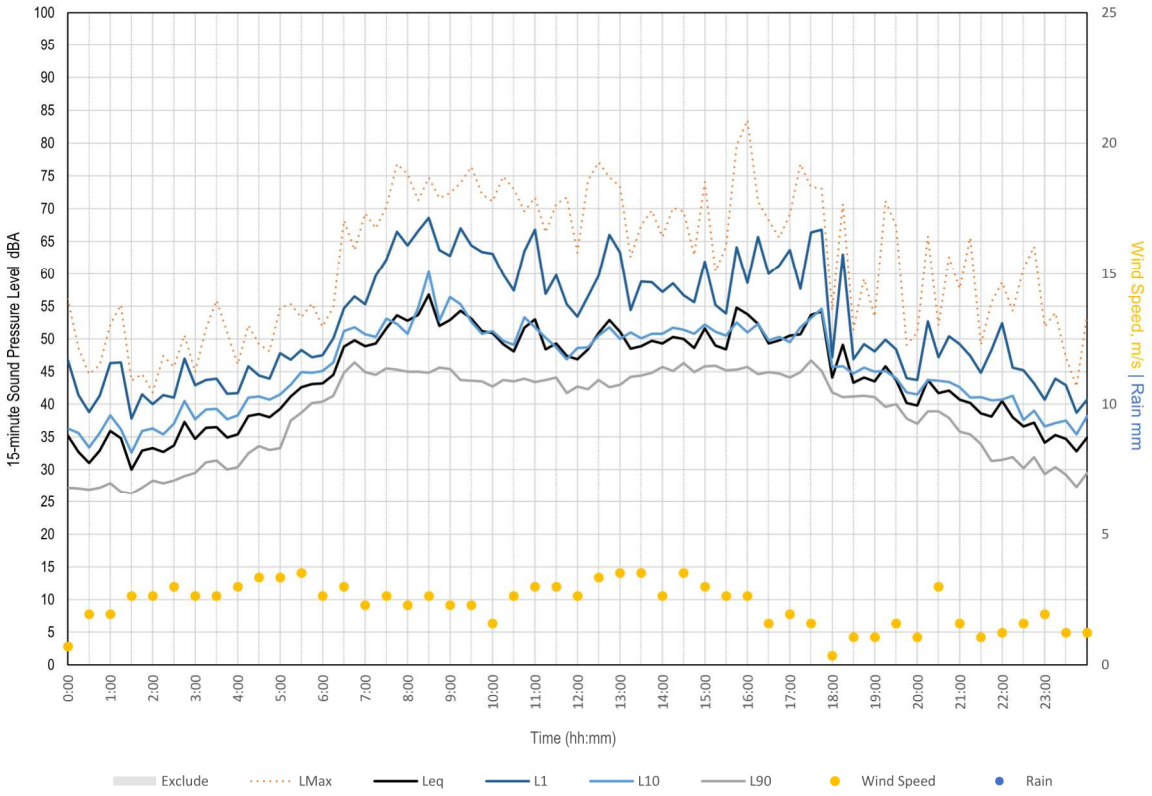
Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

Thursday, 11 August 2022



Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

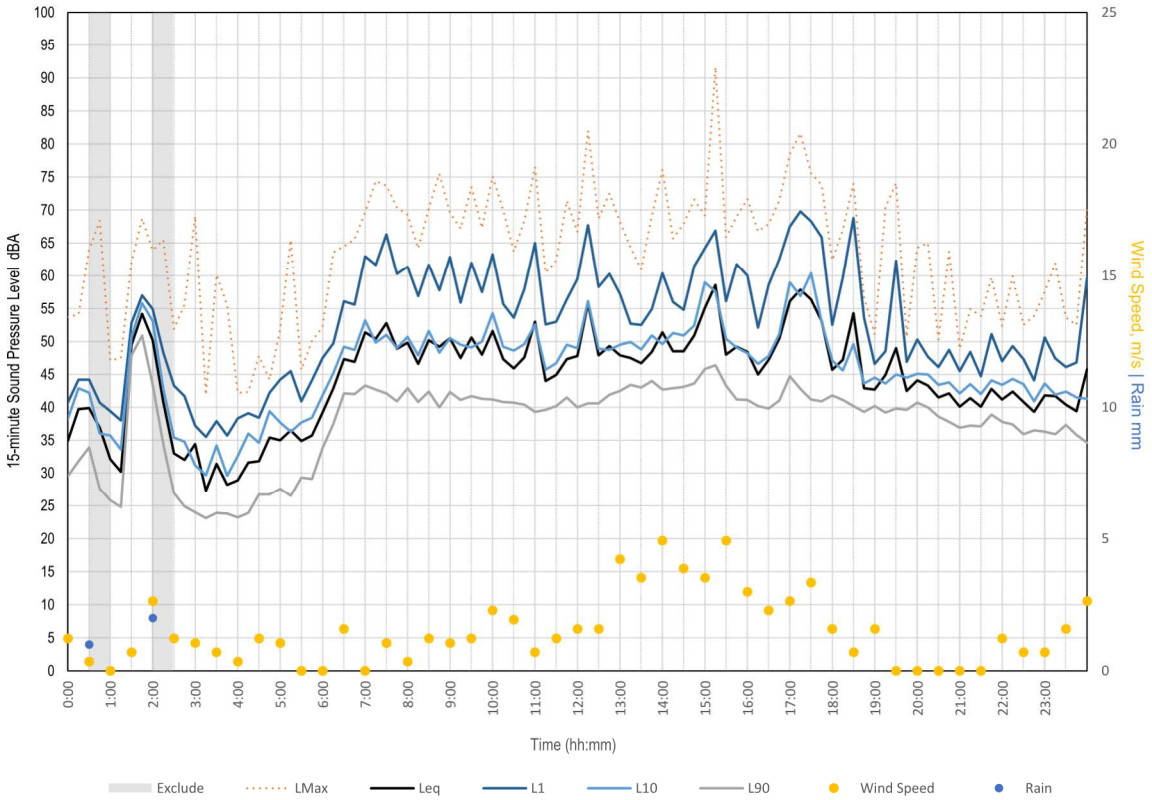
Friday, 12 August 2022

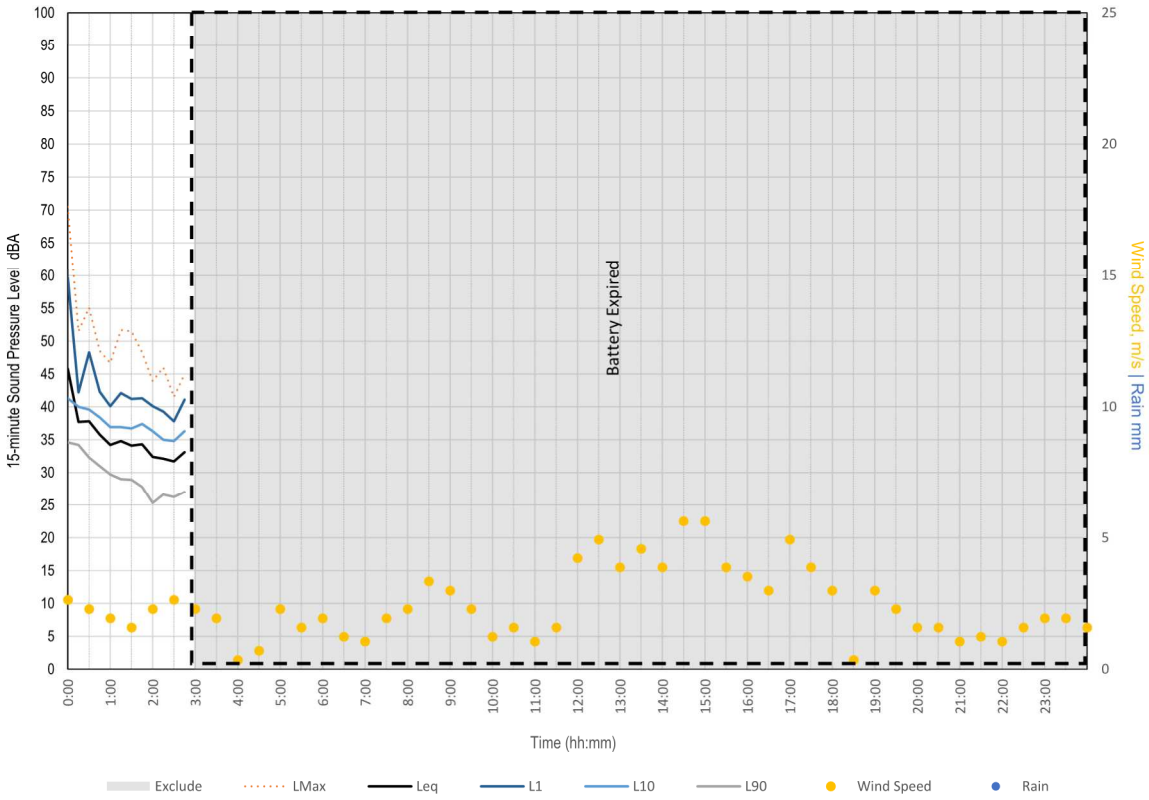


Noise Logger Results

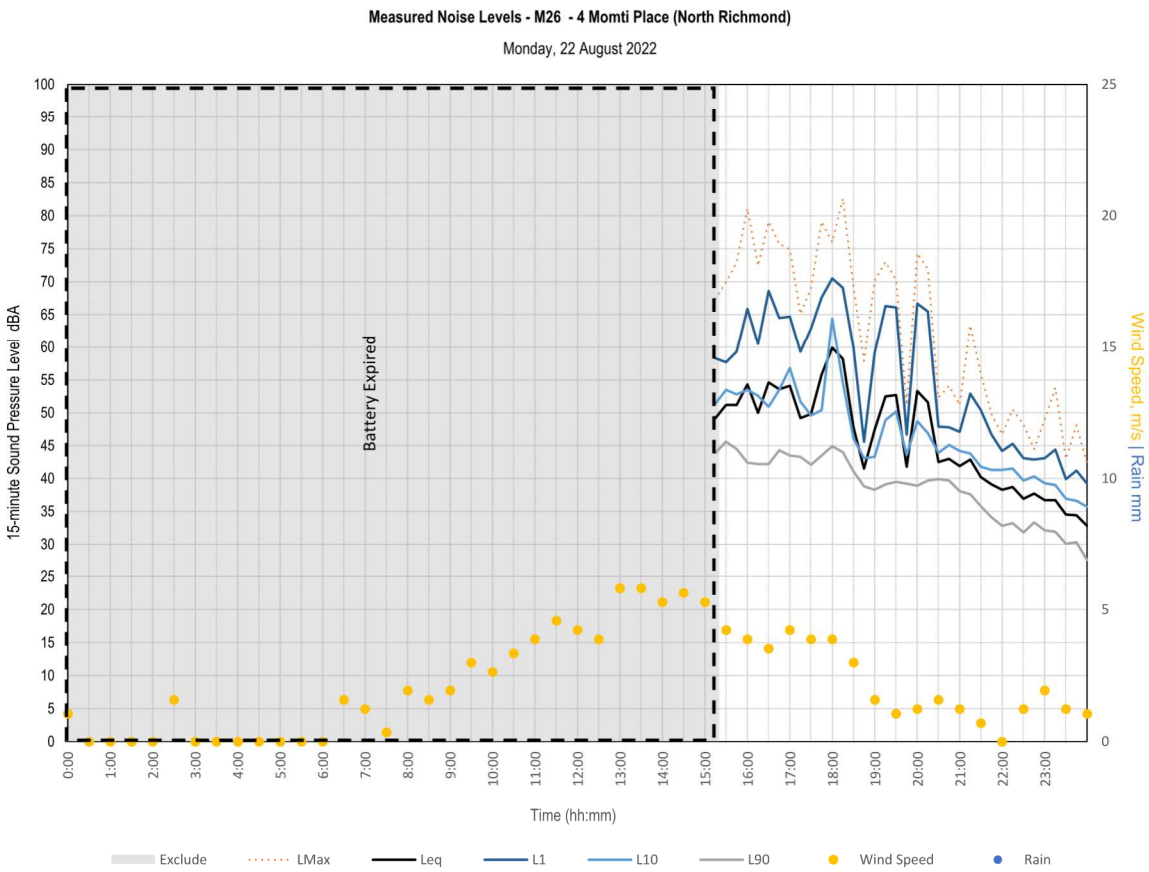
Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

Saturday, 13 August 2022



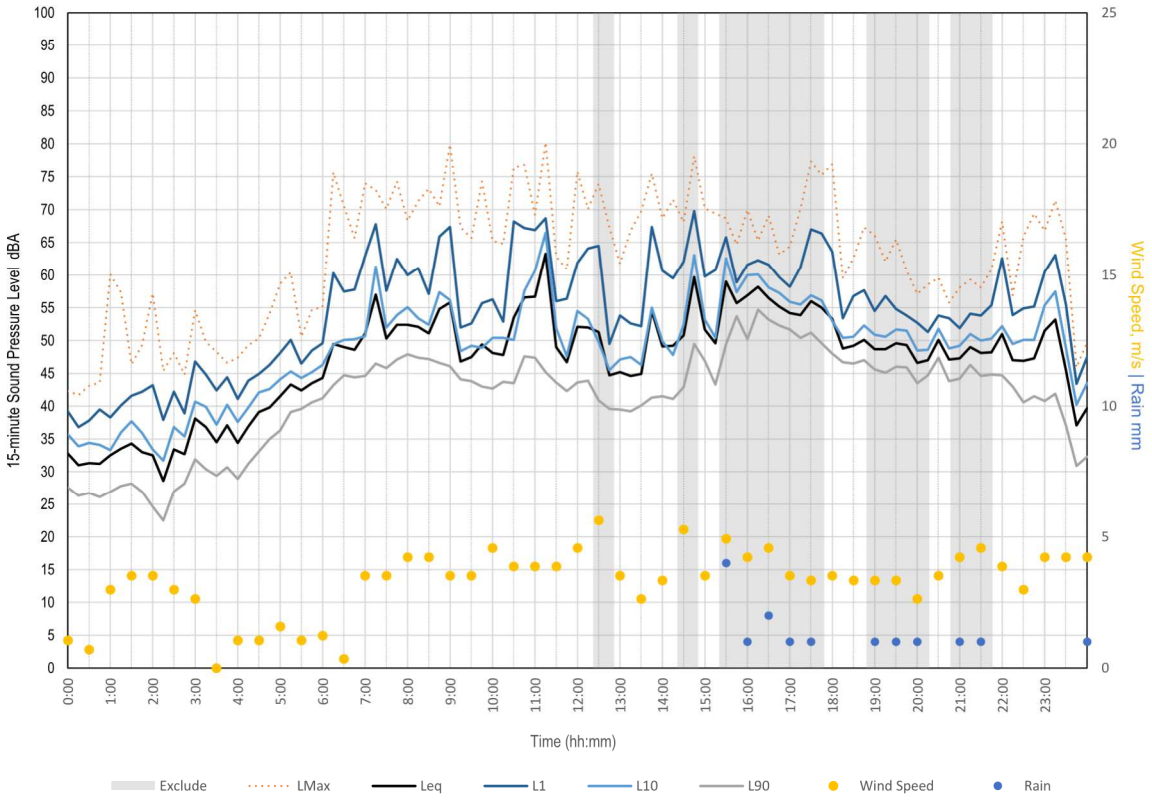


Noise Logger Results



Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

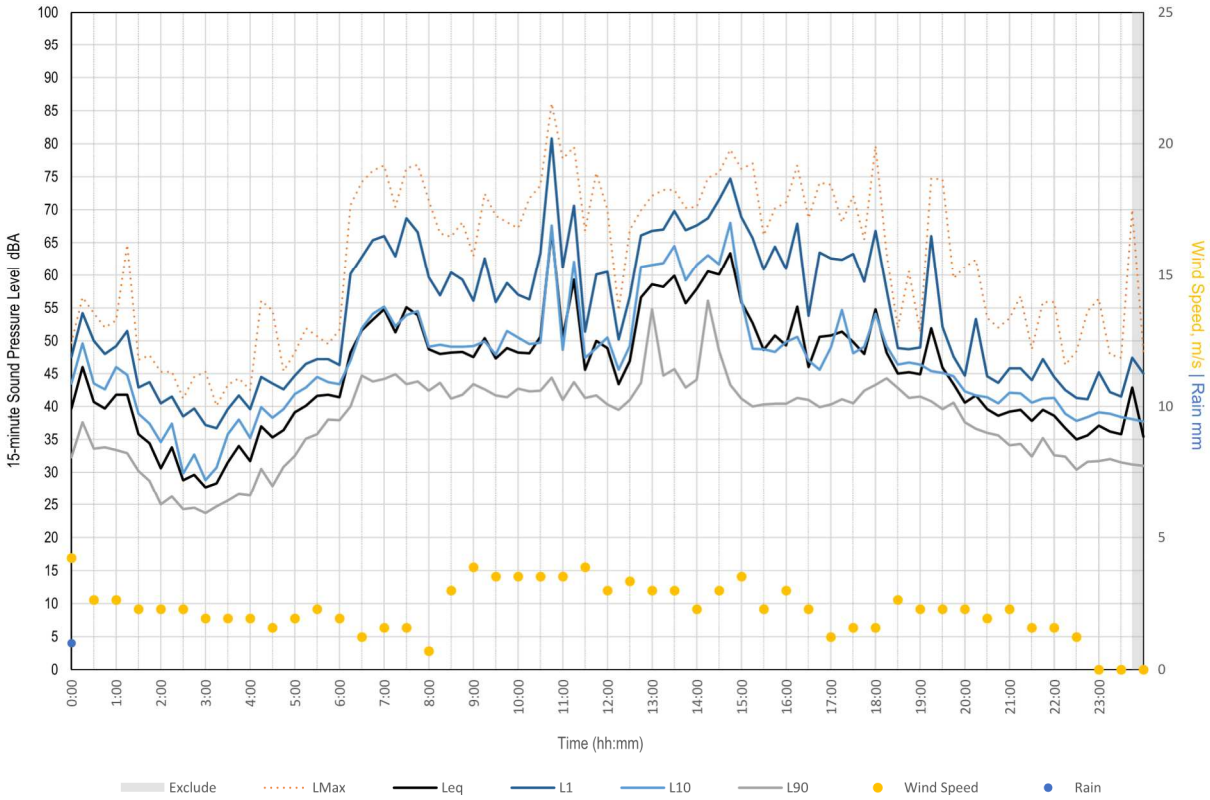
Tuesday, 23 August 2022



Noise Logger Results

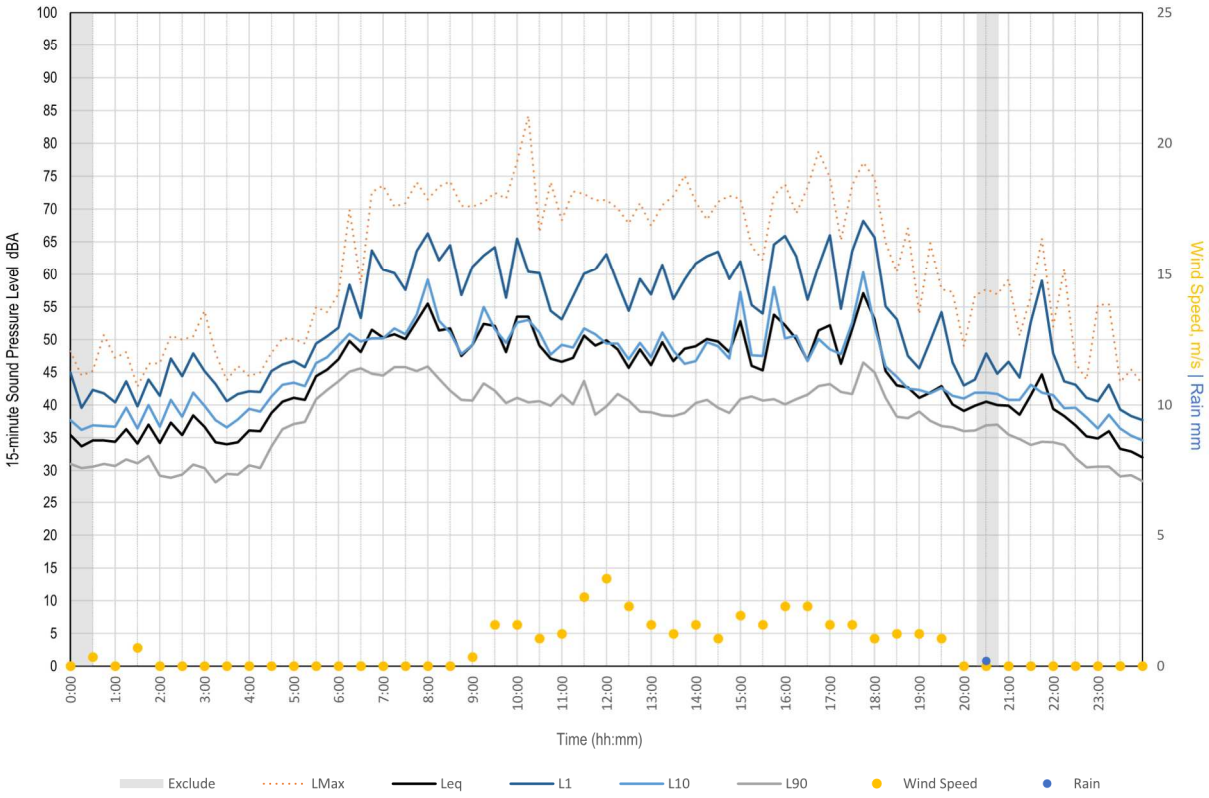
Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

Wednesday, 24 August 2022



Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

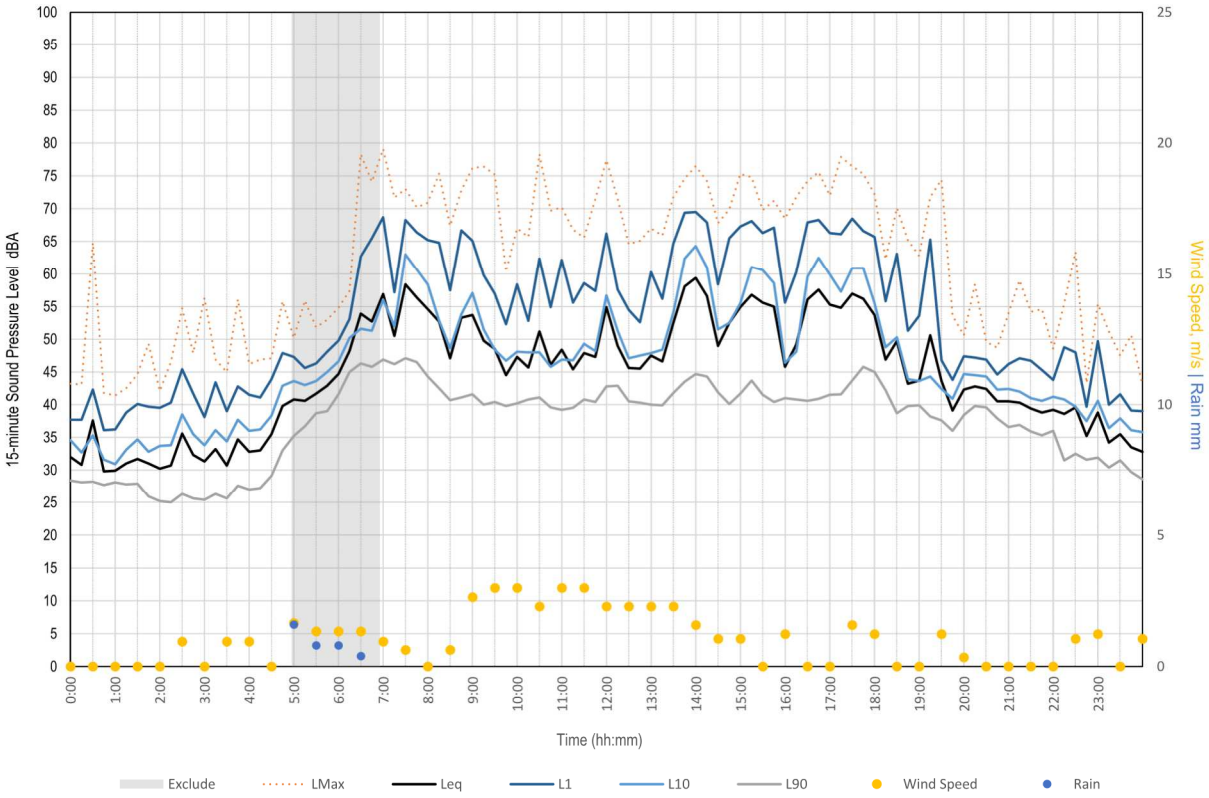
Thursday, 25 August 2022



Noise Logger Results

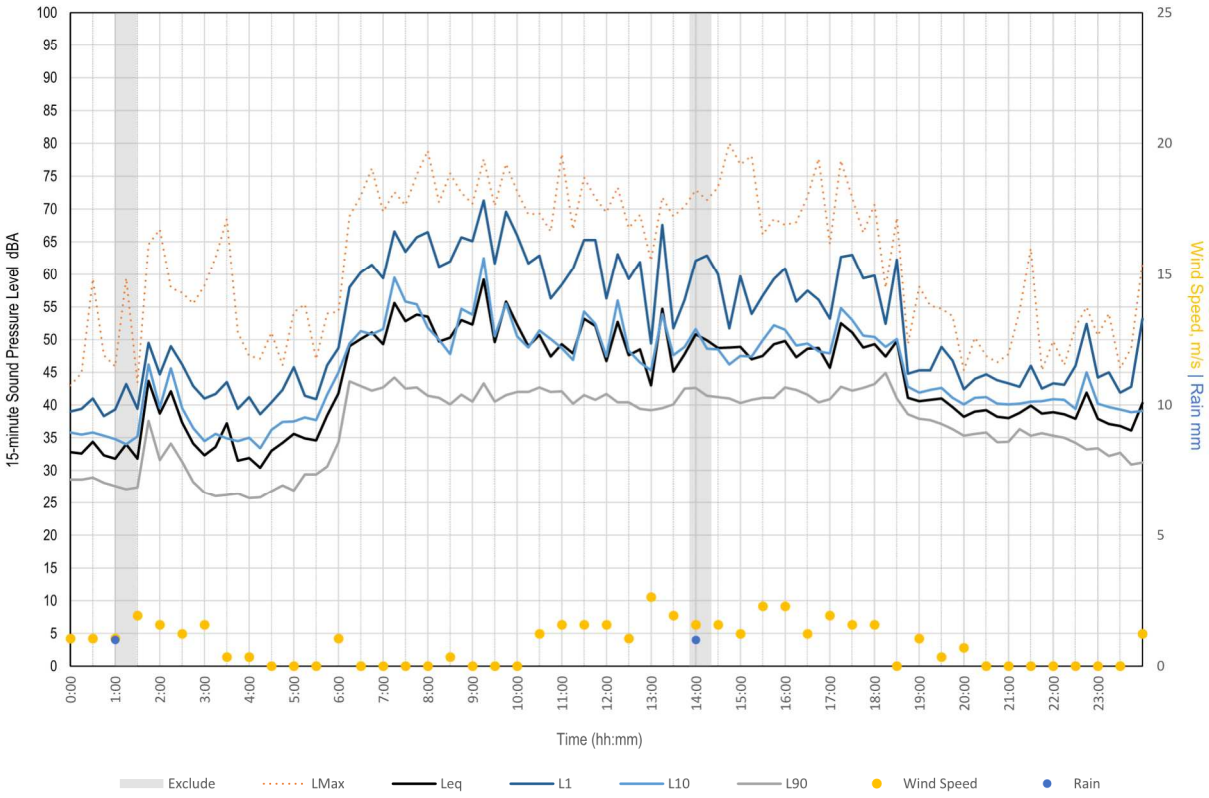
Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

Friday, 26 August 2022



Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

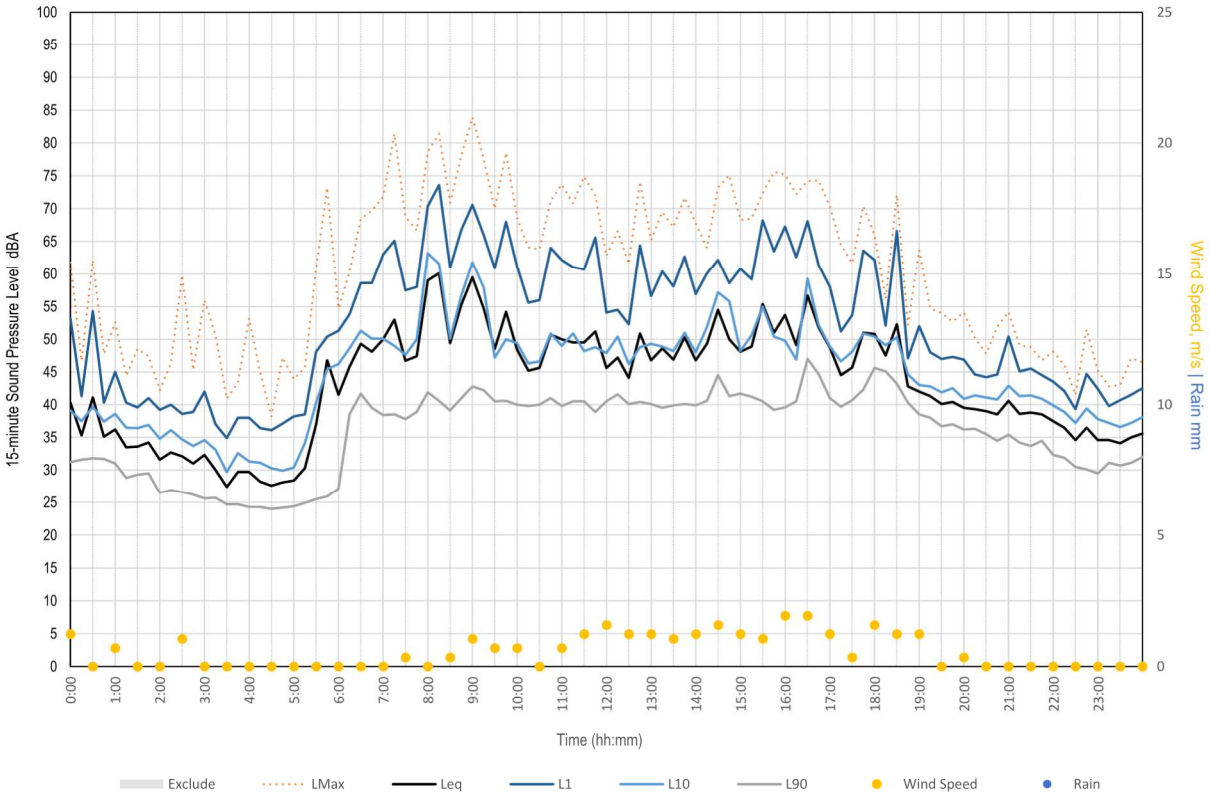
Saturday, 27 August 2022



Noise Logger Results

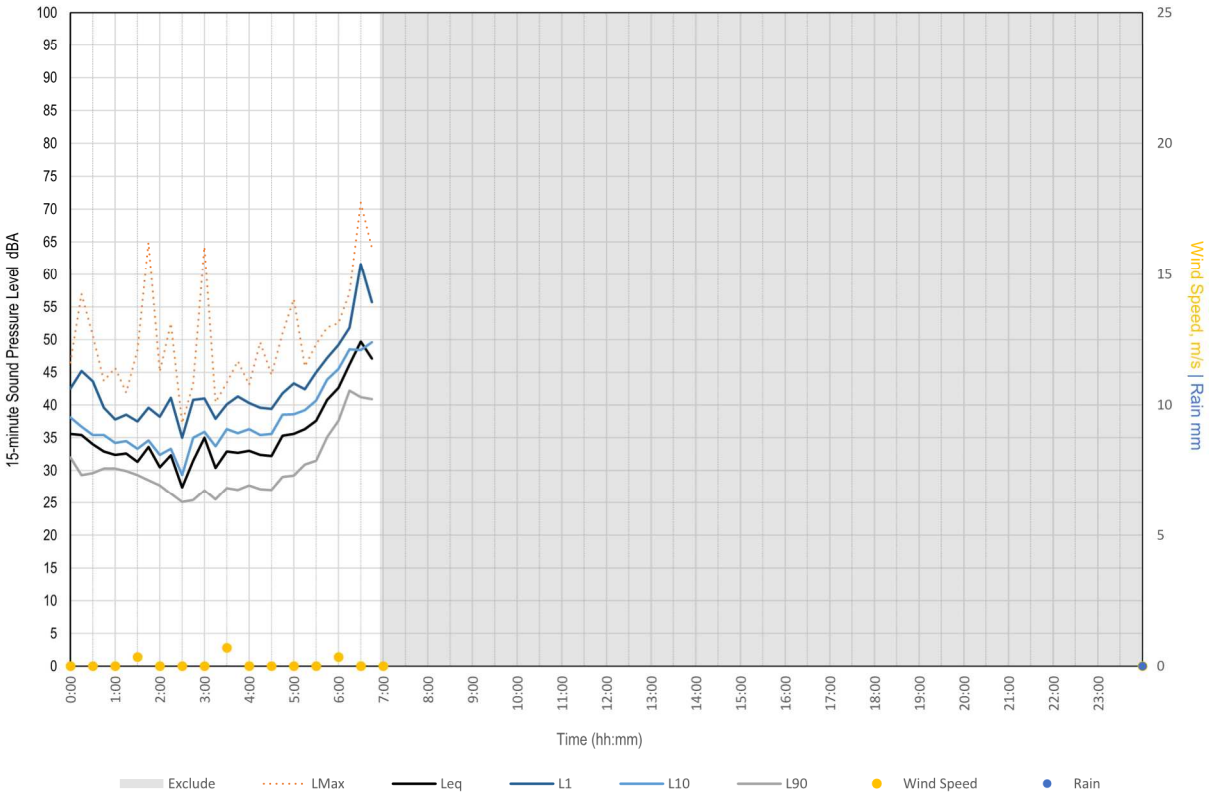
Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

Sunday, 28 August 2022



Measured Noise Levels - M26 - 4 Momti Place (North Richmond)

Monday, 29 August 2022



Background Noise Monitoring

Location	M27 Kurrajong - 53 Peel Parade	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	8781EC
Calibration	**Pre:**	94.0 dBA	**Post:**	94.1 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m
Interval:	15 min			

Attended Equipment				
Equipment	**Model:**	Norsonic	**Serial No. :**	1406503
Calibration	**Pre:**	94.0 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 minutes			

Date Start	Friday, 12 Aug 2022
Date End	Tuesday, 06 Sep 2022
No. of days	26
No. of nights	25

Weather	
Station	BoM
Station Info	Richmond
Distance	≤ 15 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed in backyard with plenty of open area surrounding.

≥3 metres away from any reflective surfaces other than ground (e.g. house façade and sheds).

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	22/08/2022	4:54:00 PM	5:08:00 PM	45	33	43	36	
2	Day	22/08/2022	5:11:00 PM	5:26:00 PM	44	33	44	36	
3	Day	22/08/2022	5:28:00 PM	5:42:00 PM	40	31	41	35	
4	Day	22/08/2022	5:43:00 PM	5:57:00 PM	38	30	39	34	
5	Evening	20/08/2022	7:15:00 PM	7:30:00 PM	53	44	46	40	*
6	Evening	20/08/2022	8:00:00 PM	8:15:00 PM	54	43	46	38	*
7	Evening	20/08/2022	9:45:00 PM	10:00:00 PM	51	41	44	35	*
8	Evening	6/09/2022	6:26:34 PM	6:41:34 PM	65	40	40	34	
9	Night	16/08/2022	12:00:00 AM	12:15:00 AM	37	48	40	32	*
10	Night	16/08/2022	3:15:00 AM	3:30:00 AM	36	50	39	32	*
11	Night	16/08/2022	5:45:00 AM	6:00:00 AM	45	67	47	37	*
12	Night	16/08/2022	11:45:00 PM	12:00:00 AM	36	48	39	32	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of Noise Environment	
Day	
Ambient noise	Intermittent bird song from adjacent trees. Occasional vehicles on local street, as well as sound from a dirt bike at adjacent property. Noise induced from gusts of wind (e.g. leaves rustling). A couple of aricraft flybys noted at a distance with maximum sound levels in the range of 41 to 47 dBA.
Background noise	Traffic at distance (intermittent).
Evening	
Ambient noise	Intermittent bird song,occasional vehicle passbys on local street. Activity at neighbouring properties (e.g. doors opening/closing), and mechanical plant used (likely a circular saw). Movement in vegetation induced by wind (e.g. tree leaves rustling).
Background noise	Traffic at distance. Insects audible at dusk.
Night	
Ambient noise	Constant bird song of varying intensity, maximum noise level in the range of 40 to 45 dBA. Occasional vehicle passbys on local streets. Constant insect noise of varying strength at dusk.
Background noise	Movement in vegetation induced by wind (e.g. tree leaves rustling). Intermittent traffic at distance. Insect noise at dusk.

Site Details	M27 Kurrajong - 53 Peel Parade
Start Date	Thu 11 August 2022
End Date	Tue 06 September 2022

Summary	Average (dBA)
$L_{eq, Day}$ dBA	51
$L_{eq, Evening}$ dBA	44
$L_{eq, Night}$ dBA	44
RBL, $_{Day}$ dBA	36
RBL, $_{Evening}$ dBA	37
RBL, $_{Night}$ dBA	34

Daily Summary

Date	11/08	12/08	13/08	14/08	15/08	16/08	17/08	18/08
$L_{eq, Day}$ dBA			50	49	47	47	50	51
$L_{eq, Evening}$ dBA			43	42	41	42	43	42
$L_{eq, Night}$ dBA		46	44	42	41	42	43	41
ABL, $_{Day}$ dBA			36	34	35	36	36	33
ABL, $_{Evening}$ dBA		40	38	35	33	32	33	33
ABL, $_{Night}$ dBA		35	36	33	31	31	28	31

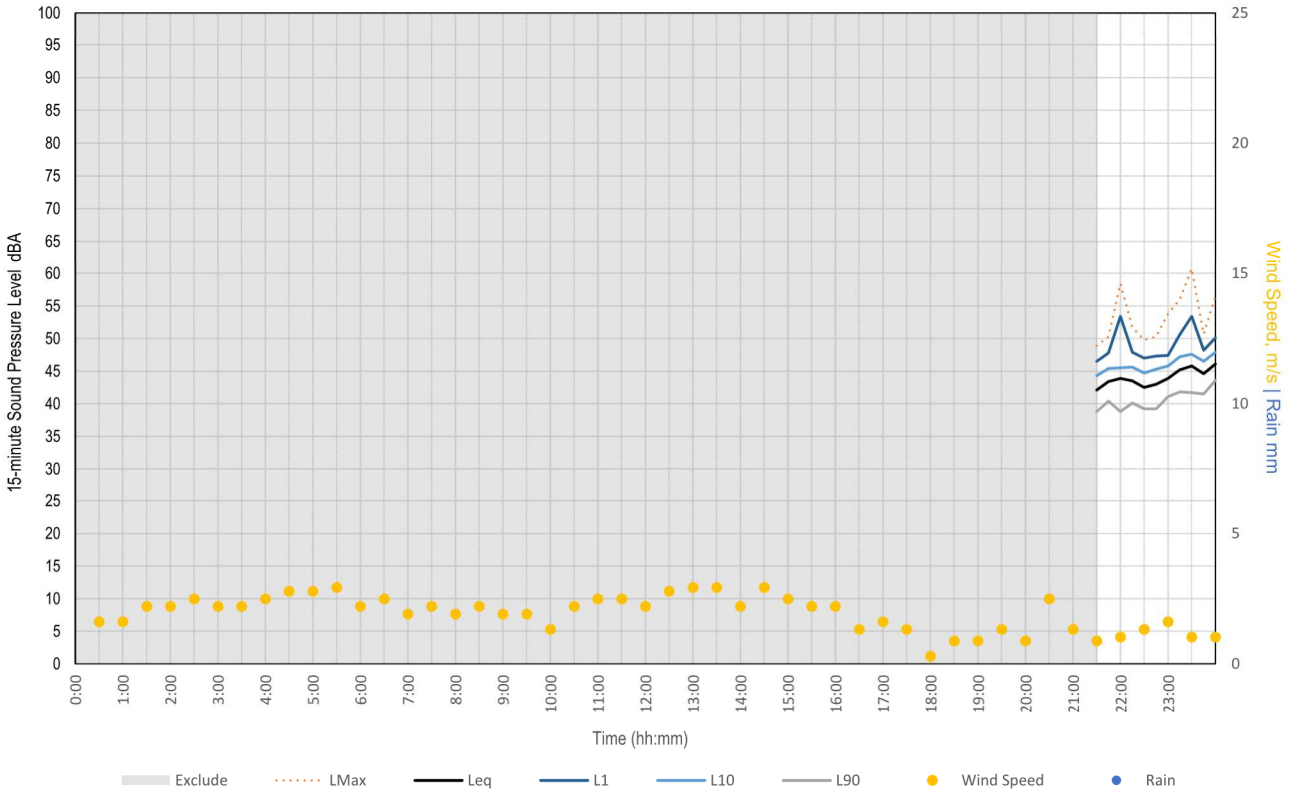
Date	19/08	20/08	21/08	22/08	23/08	24/08	25/08	26/08
$L_{eq, Day}$ dBA	52	47	48	50	49	50	50	46
$L_{eq, Evening}$ dBA	49	44	43	43	48	45	43	44
$L_{eq, Night}$ dBA	45	43	42	44	46	43	41	45
ABL, $_{Day}$ dBA	37	36	34	37	36	36	36	37
ABL, $_{Evening}$ dBA	36	36	35	36	43	37	37	39
ABL, $_{Night}$ dBA	33	32	33	31	37	30	34	37

Date	27/08	28/08	29/08	30/08	31/08	01/09	02/09	03/09
$L_{eq, Day}$ dBA	50	46	45	47	47	45	50	48
$L_{eq, Evening}$ dBA	44	44	43	44	42	46	46	45
$L_{eq, Night}$ dBA	46	45	45	45	44	46	46	45
ABL, $_{Day}$ dBA	36	34	34	37	35	33	37	39
ABL, $_{Evening}$ dBA	39	39	37	39	35	42	40	41
ABL, $_{Night}$ dBA	36	36	37	34	33	37	39	40

Date	04/09	05/09	06/09
$L_{eq, Day}$ dBA	62	47	49
$L_{eq, Evening}$ dBA	45	44	43
$L_{eq, Night}$ dBA	45	46	
ABL, $_{Day}$ dBA	41	35	35
ABL, $_{Evening}$ dBA	40	38	37
ABL, $_{Night}$ dBA	34	35	

Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

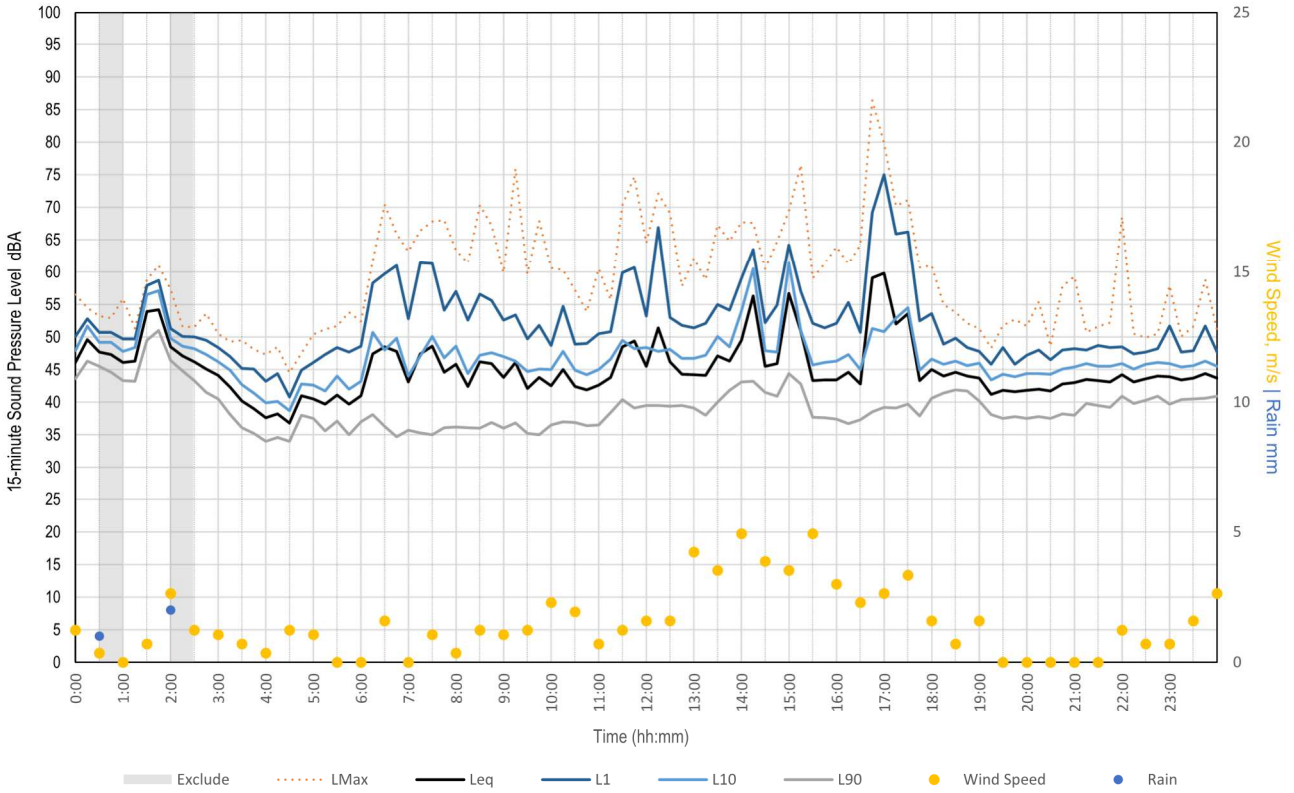
Friday, 12 August 2022



Noise Logger Results

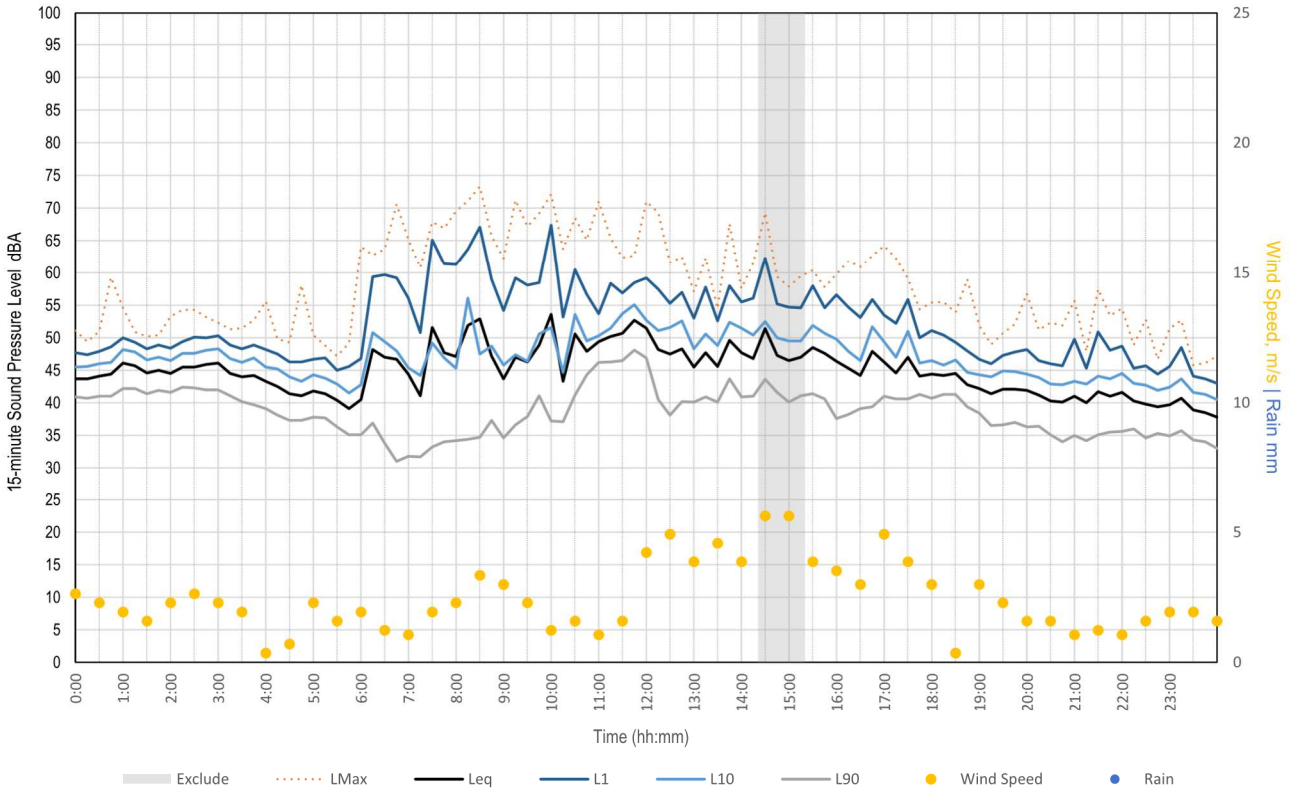
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Saturday, 13 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

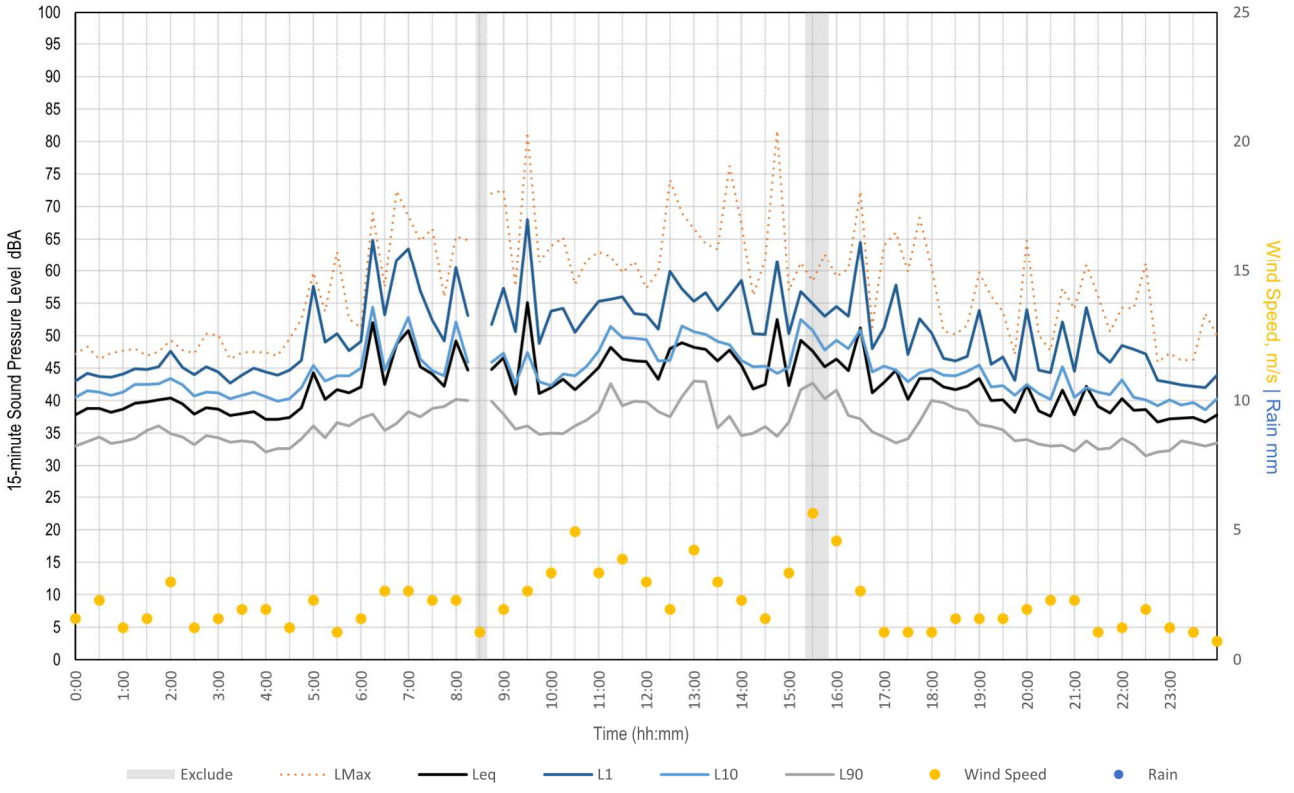
Sunday, 14 August 2022



Noise Logger Results

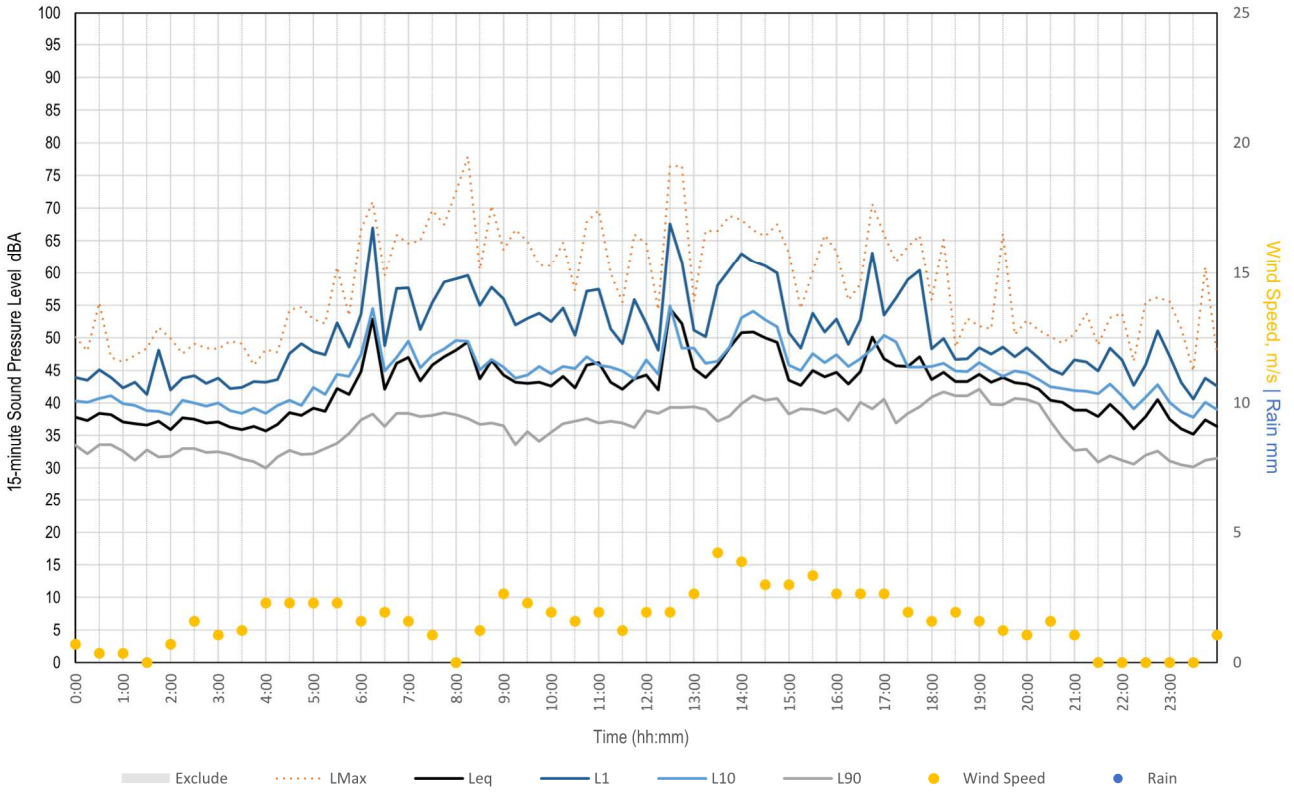
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Monday, 15 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

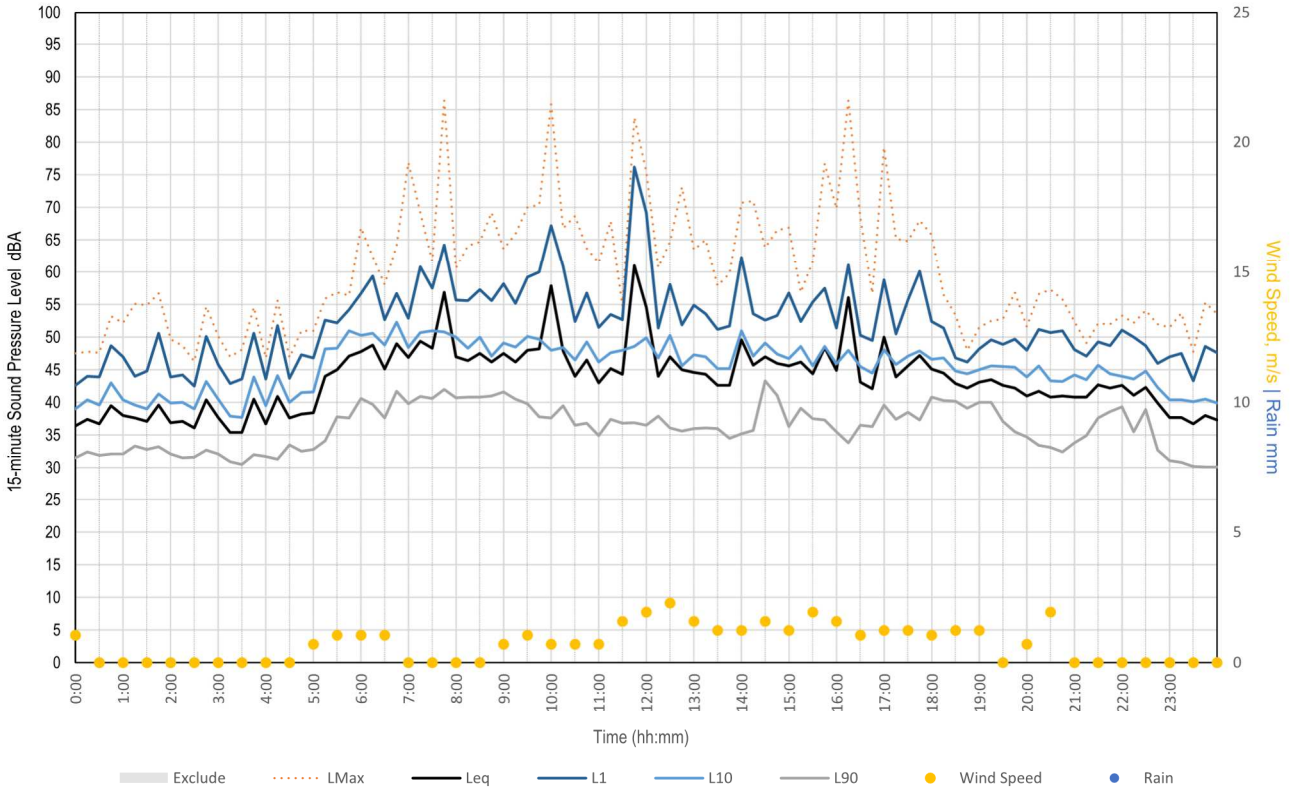
Tuesday, 16 August 2022



Noise Logger Results

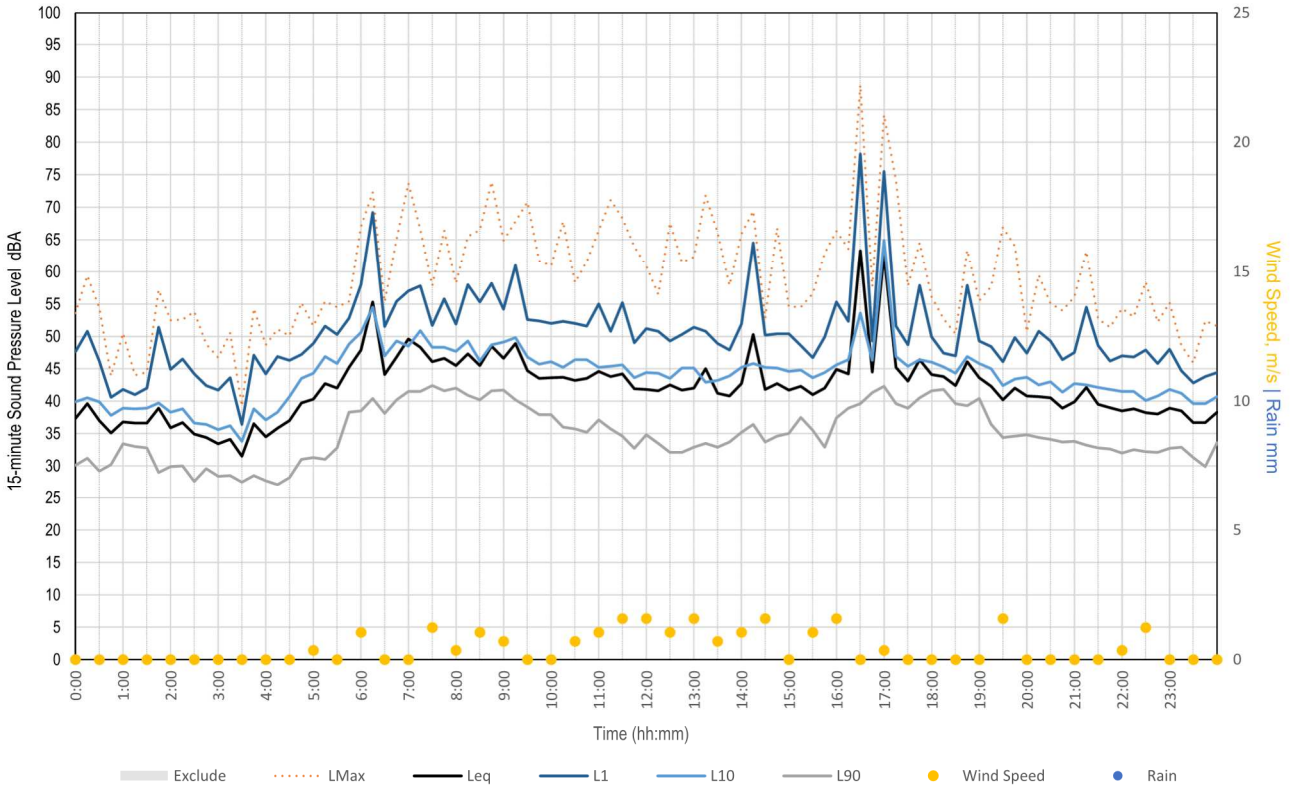
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Wednesday, 17 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

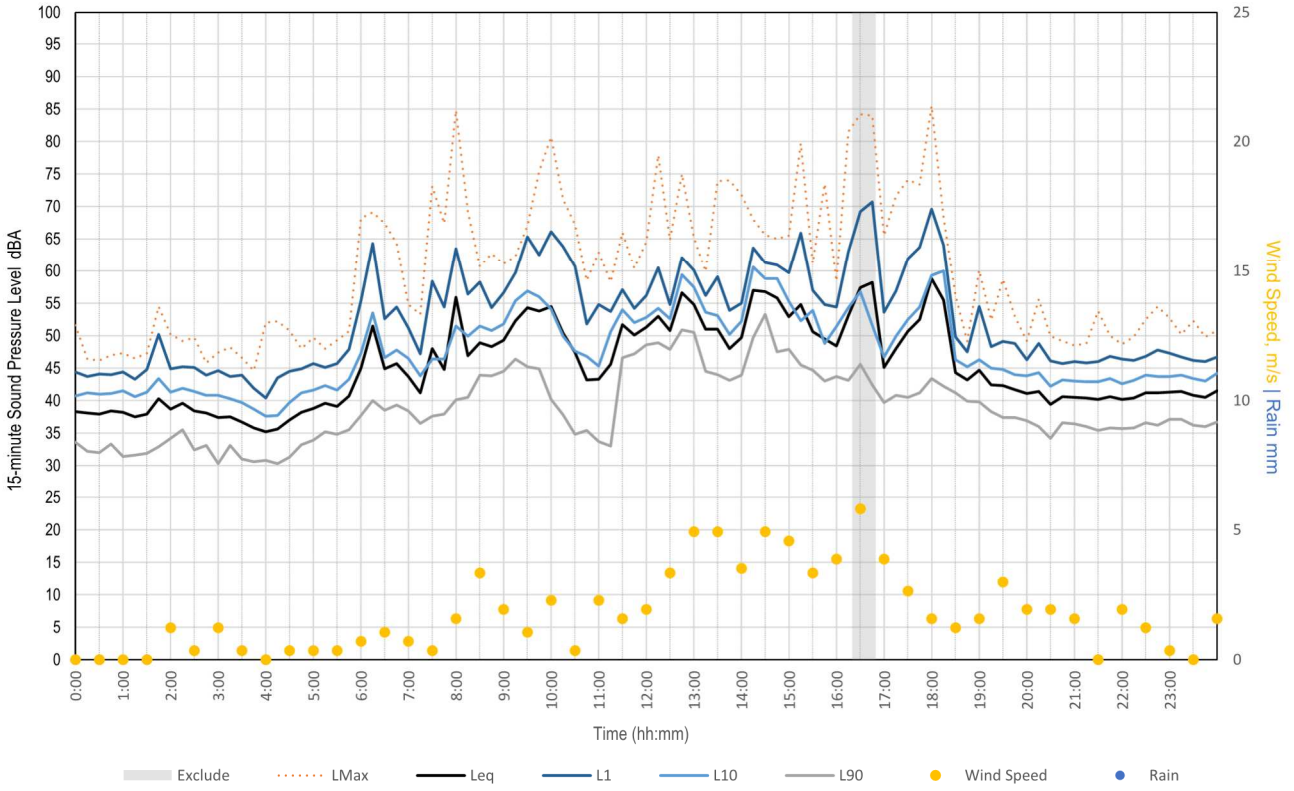
Thursday, 18 August 2022



Noise Logger Results

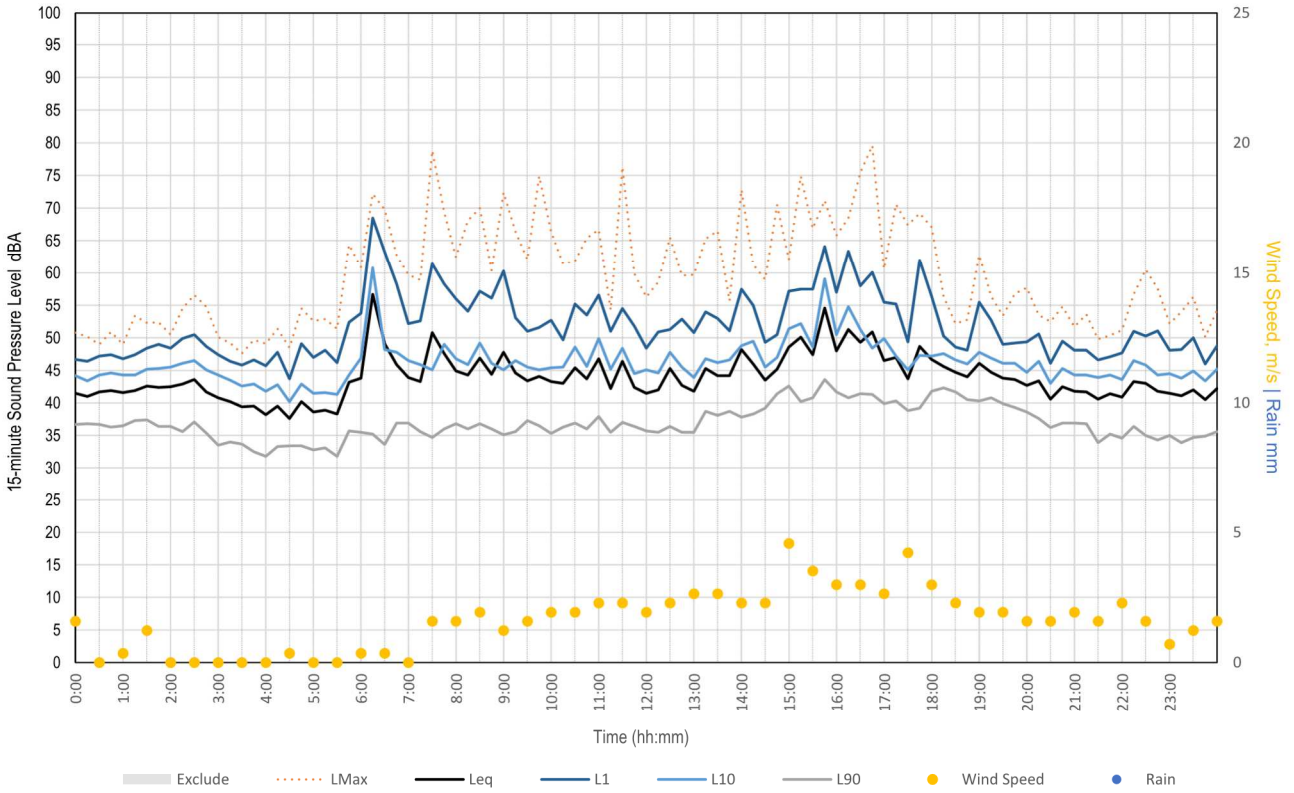
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Friday, 19 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

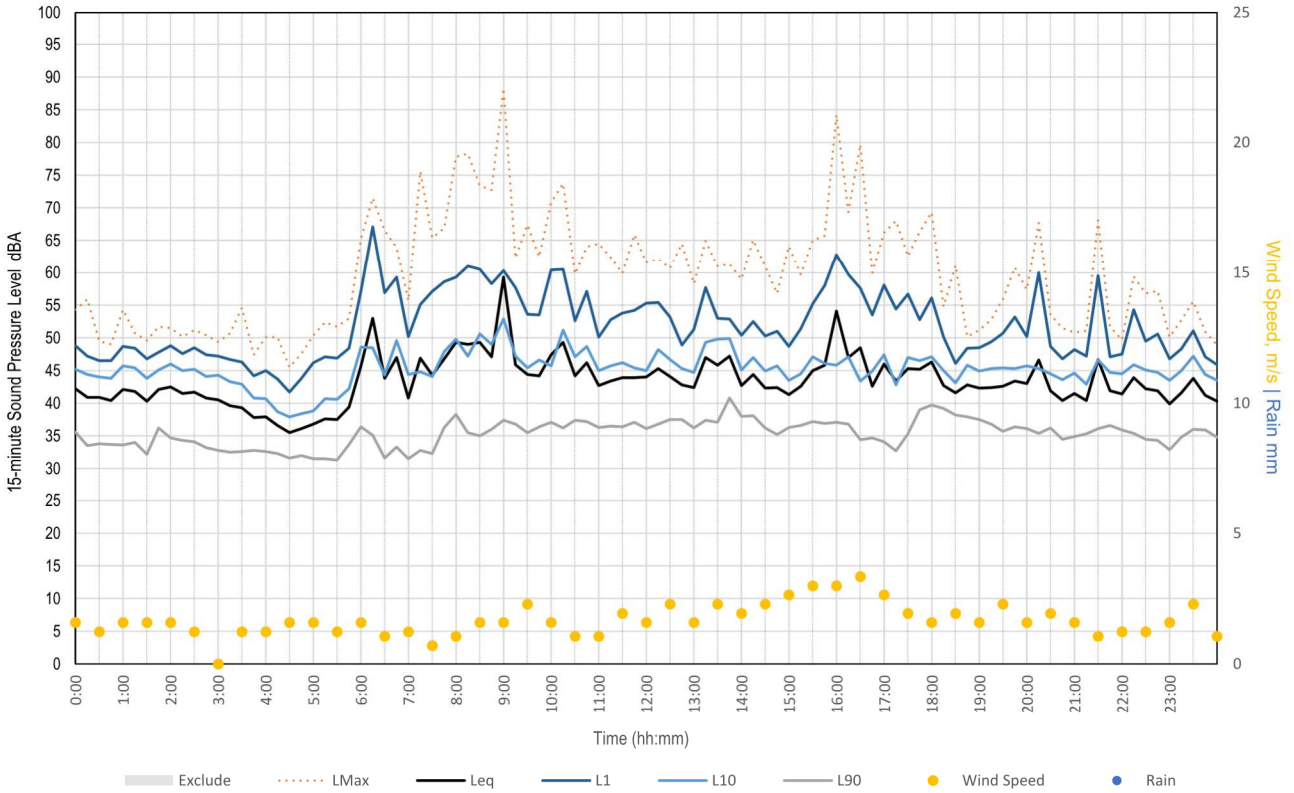
Saturday, 20 August 2022



Noise Logger Results

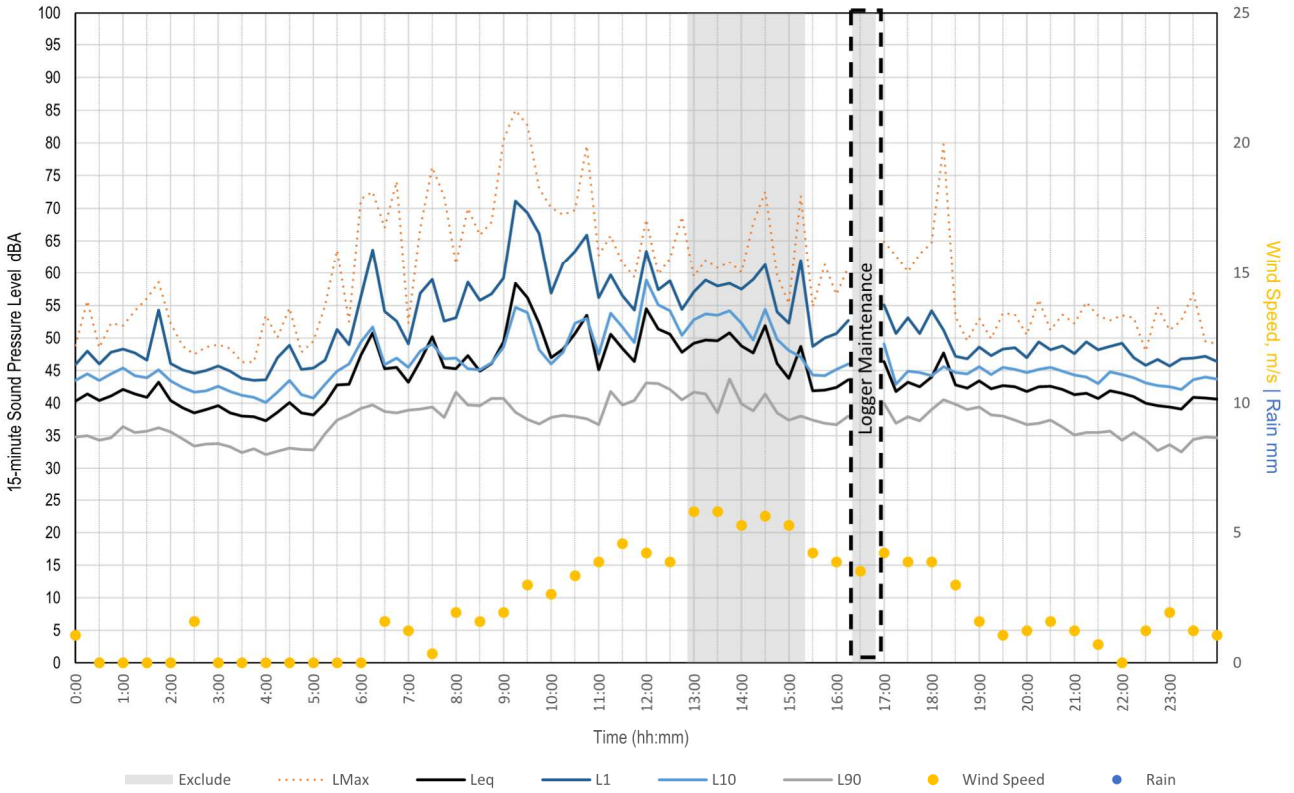
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Sunday, 21 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

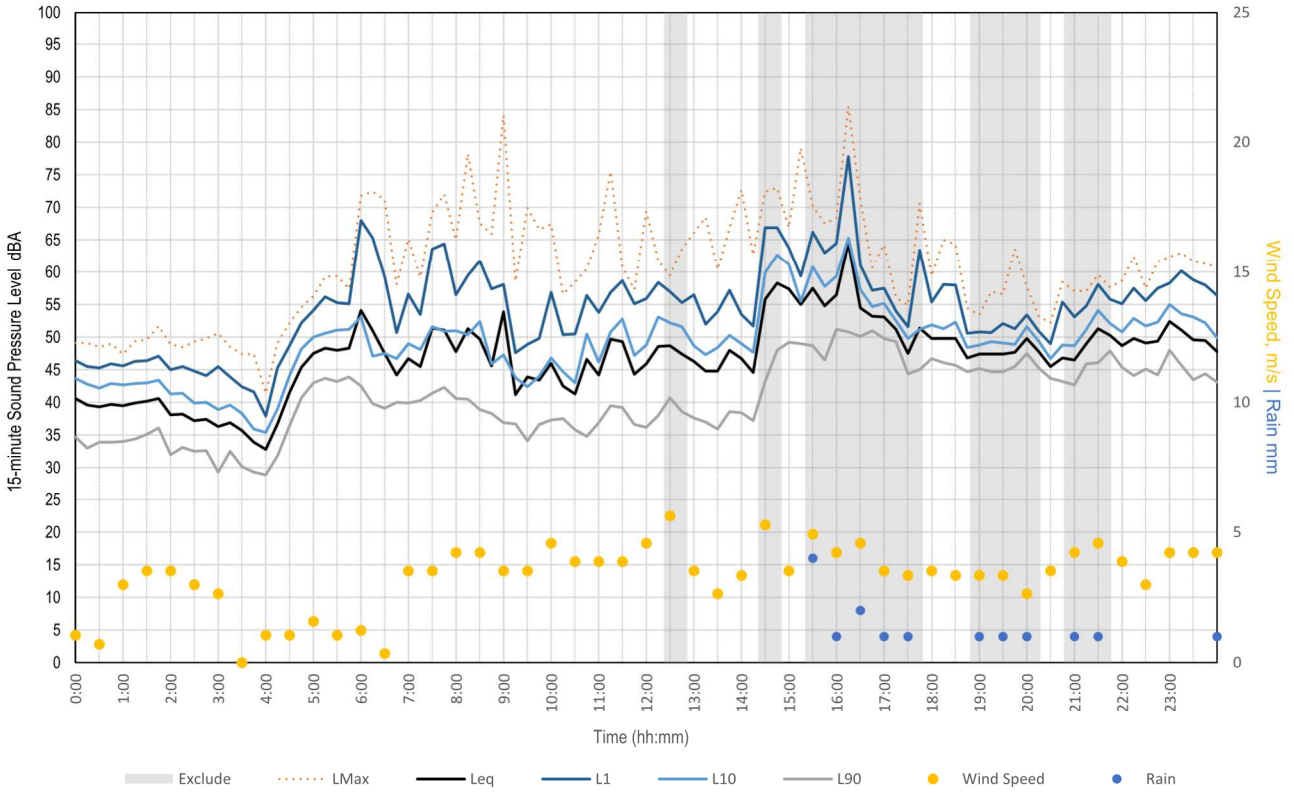
Monday, 22 August 2022



Noise Logger Results

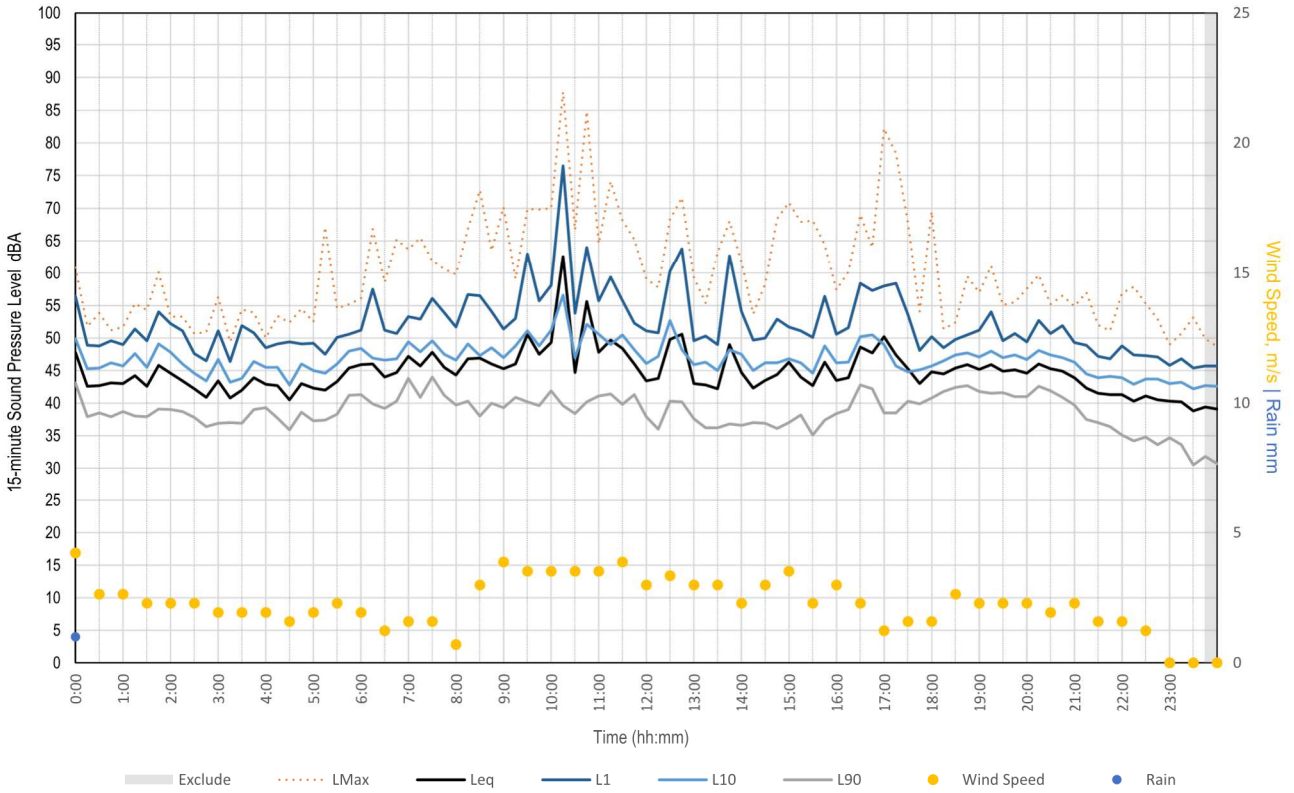
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Tuesday, 23 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

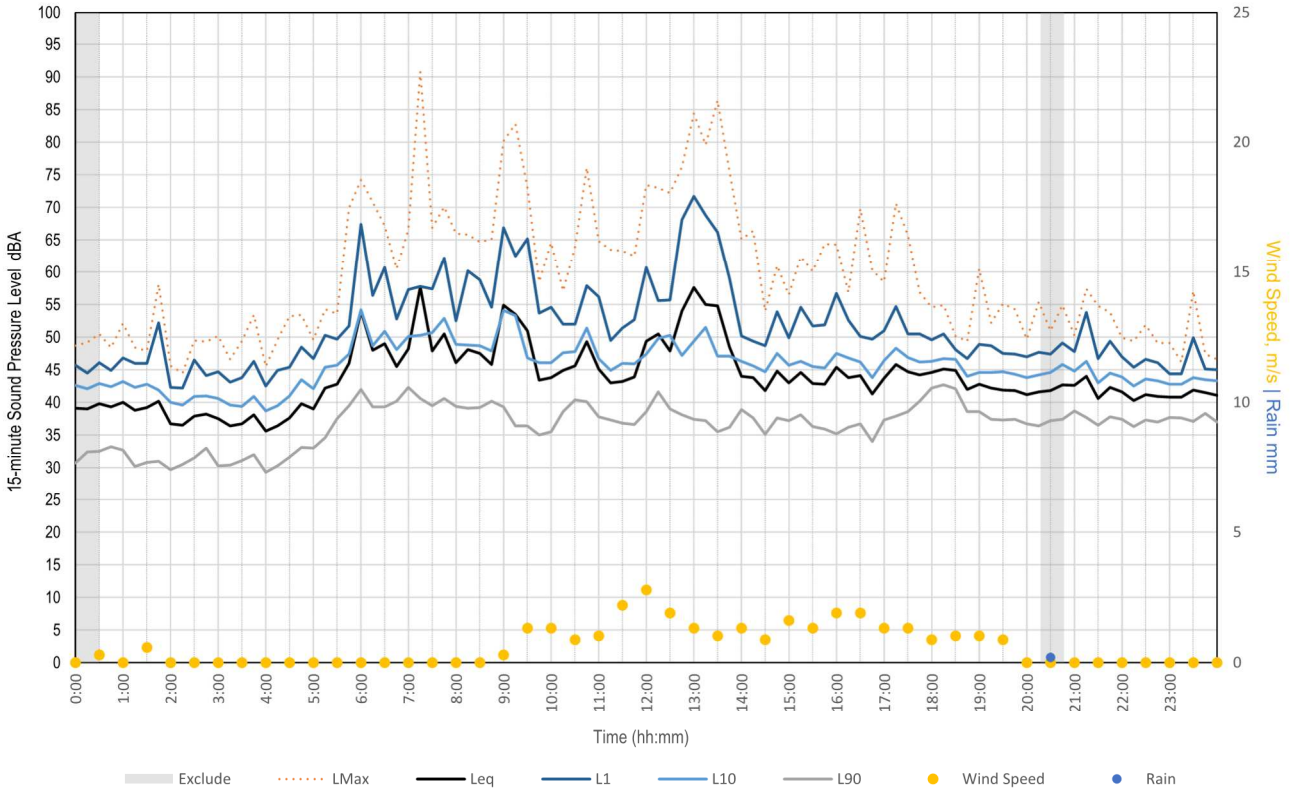
Wednesday, 24 August 2022



Noise Logger Results

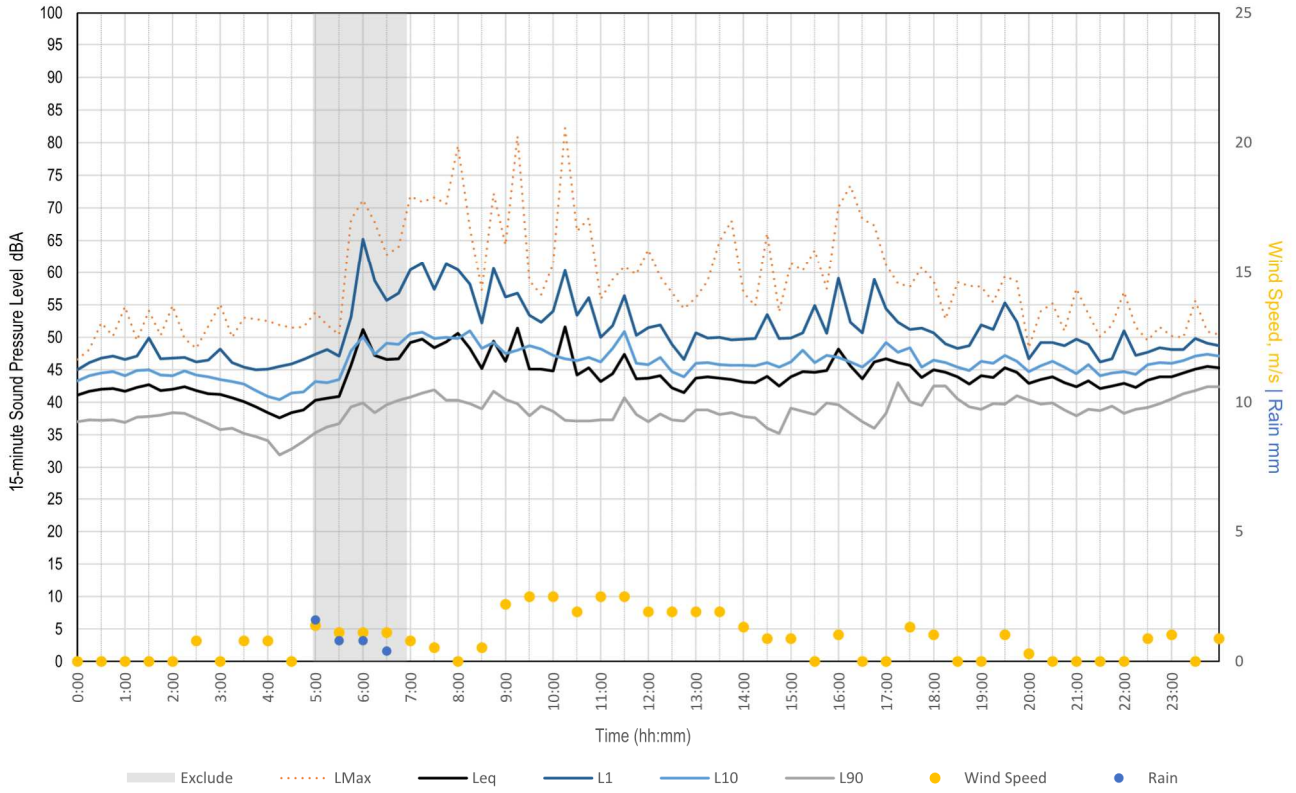
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Thursday, 25 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

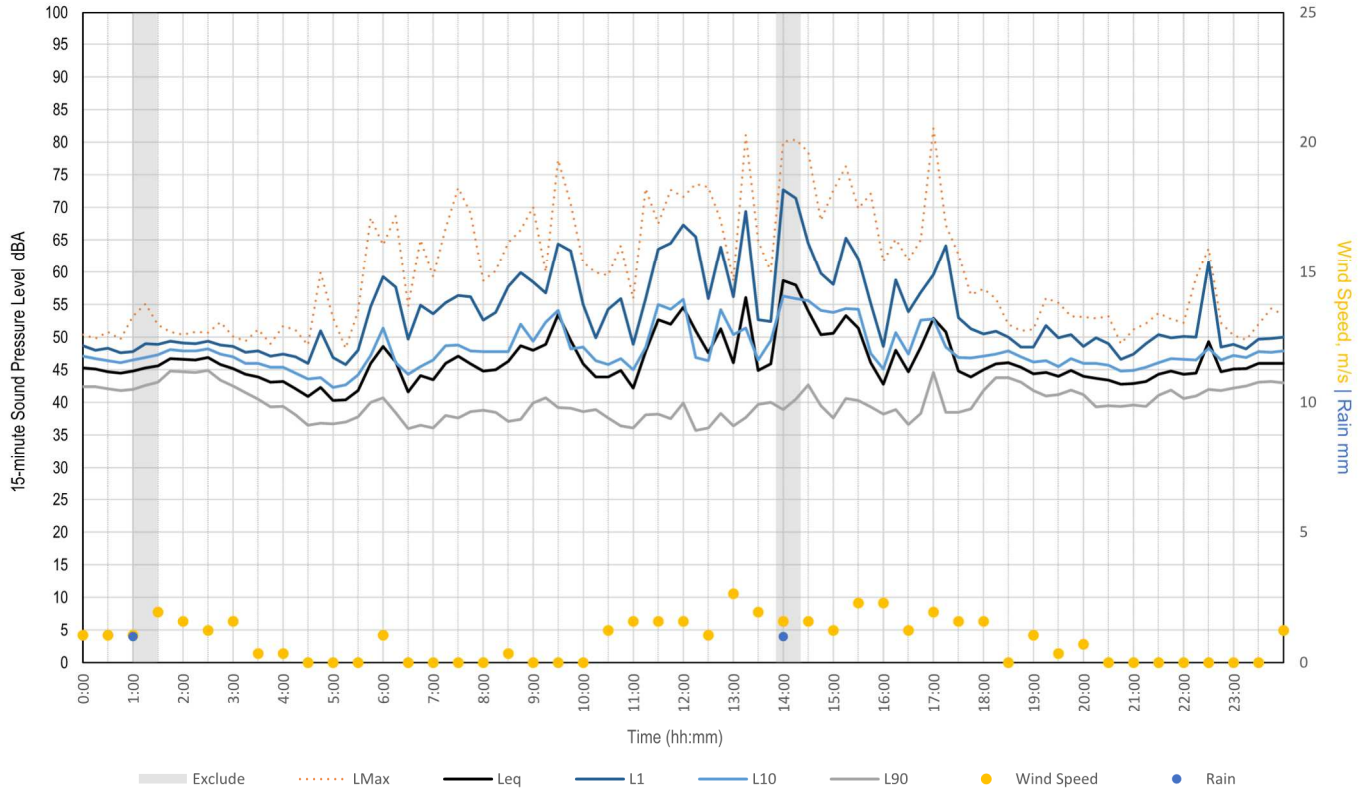
Friday, 26 August 2022



Noise Logger Results

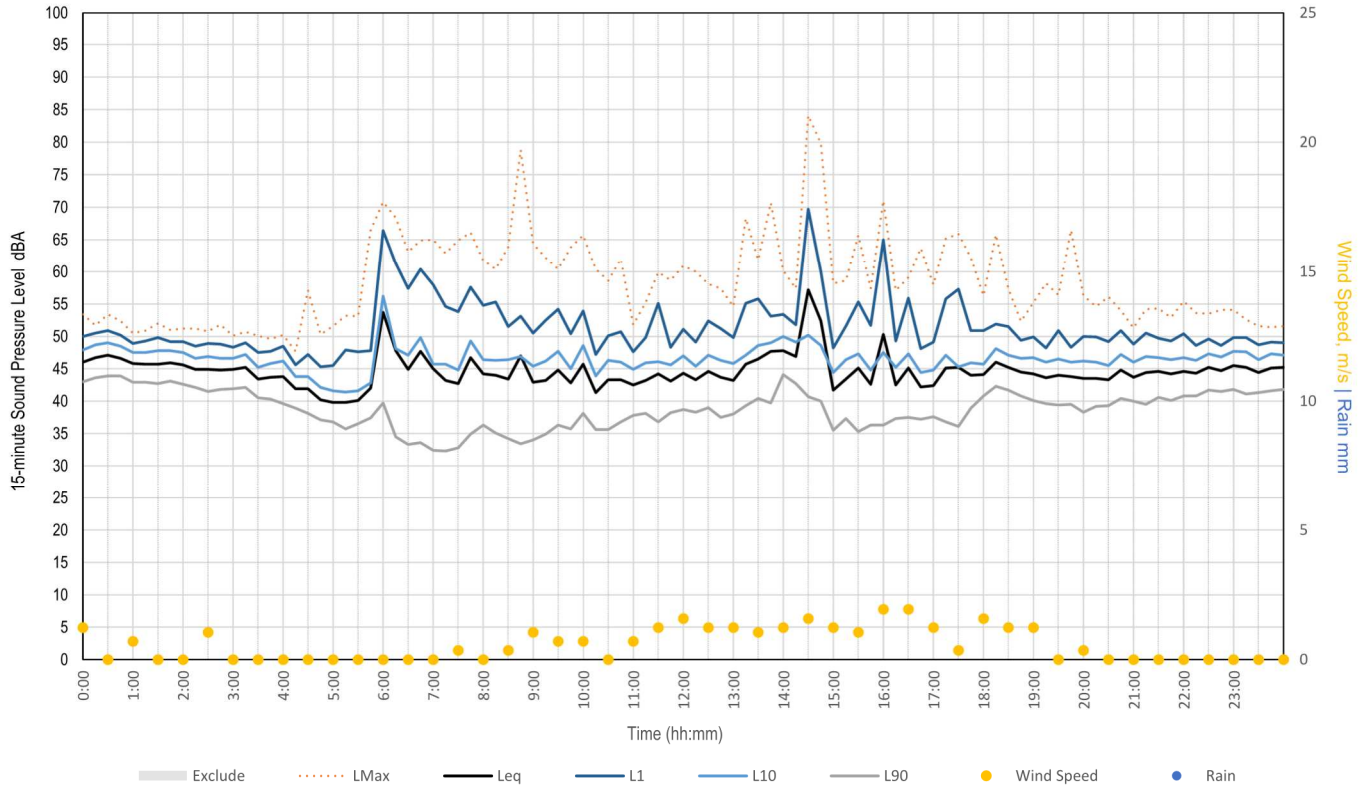
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Saturday, 27 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

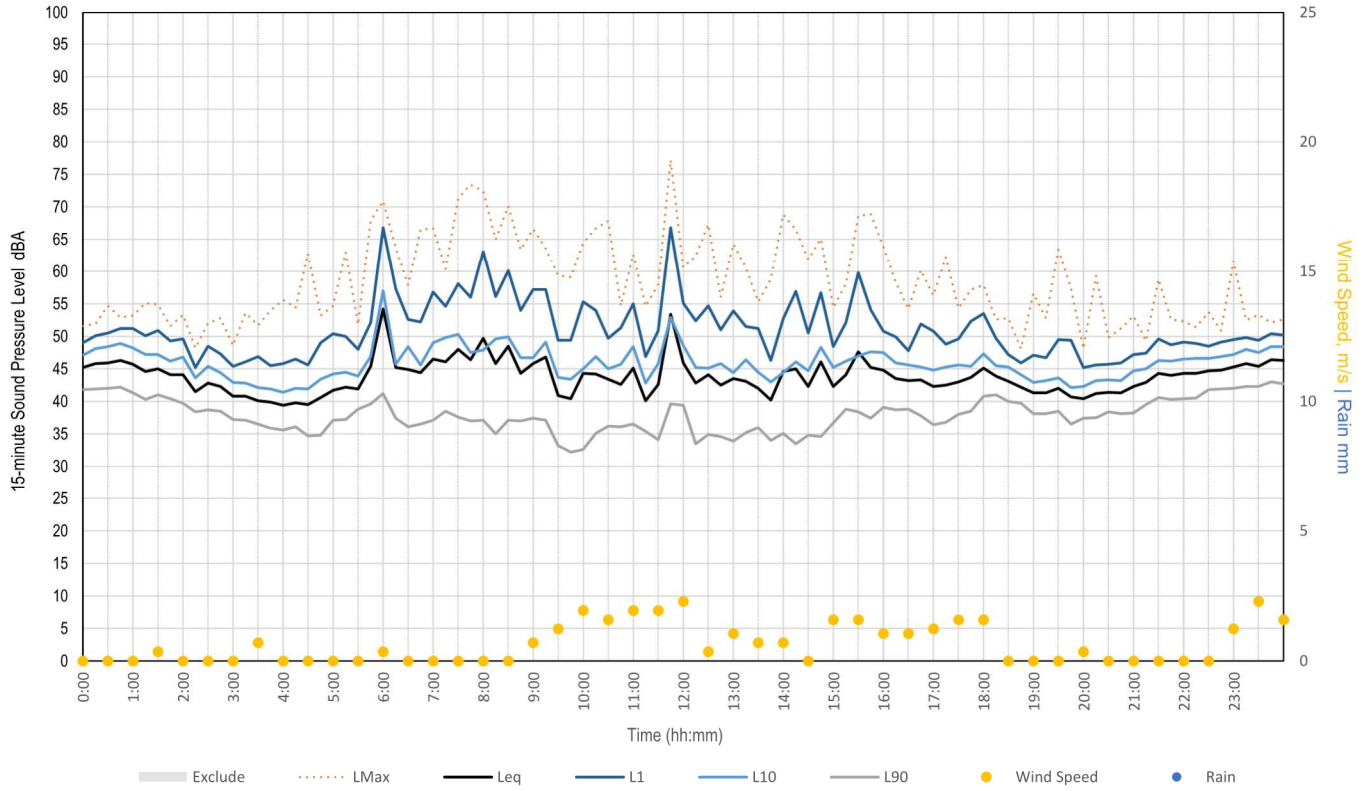
Sunday, 28 August 2022



Noise Logger Results

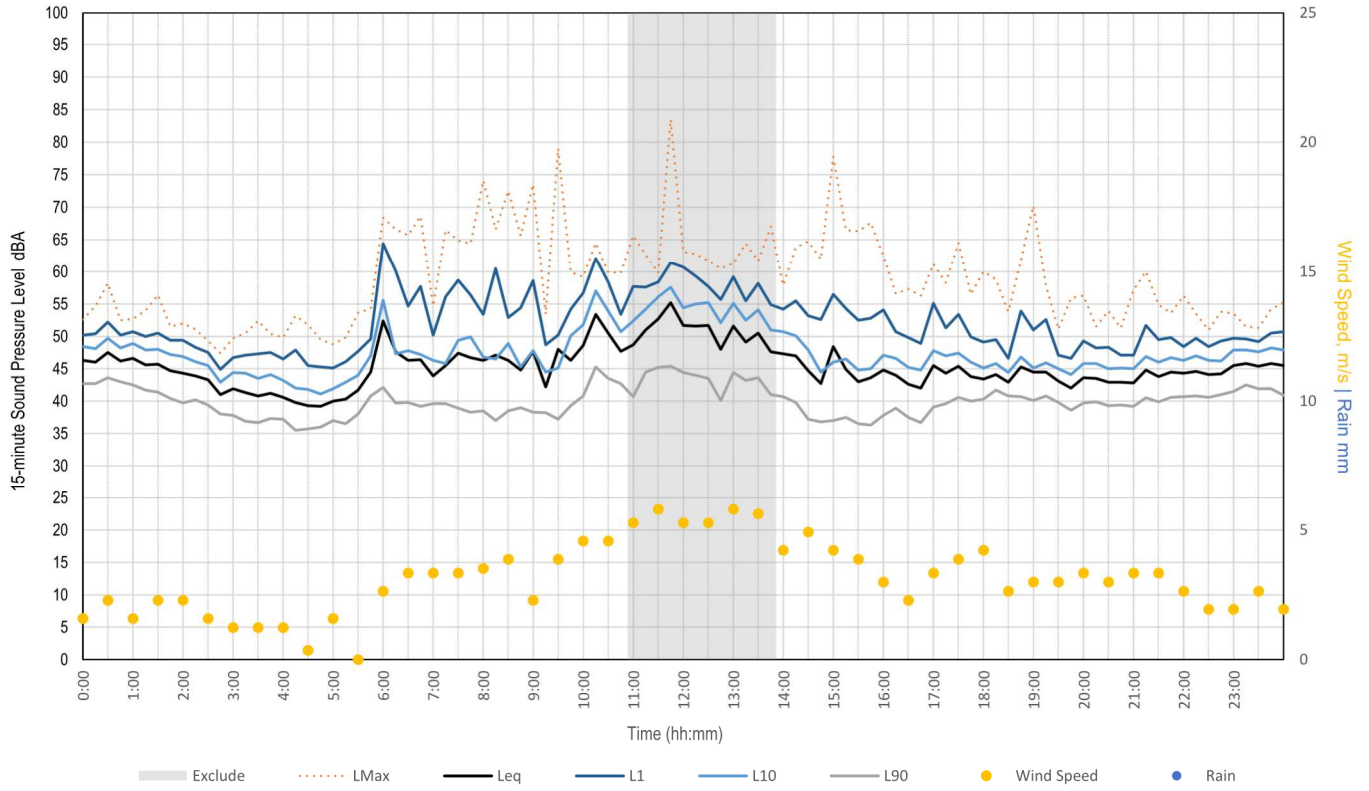
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Monday, 29 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

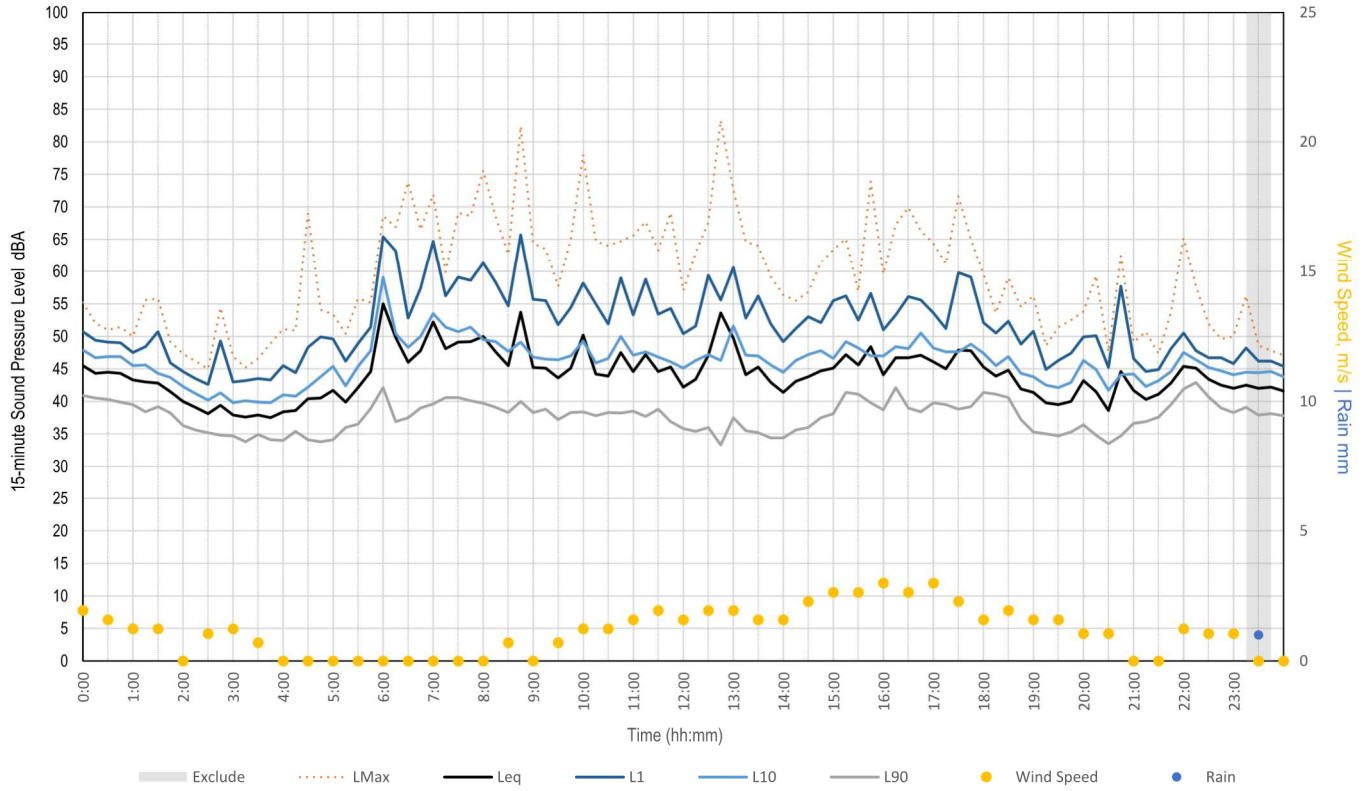
Tuesday, 30 August 2022



Noise Logger Results

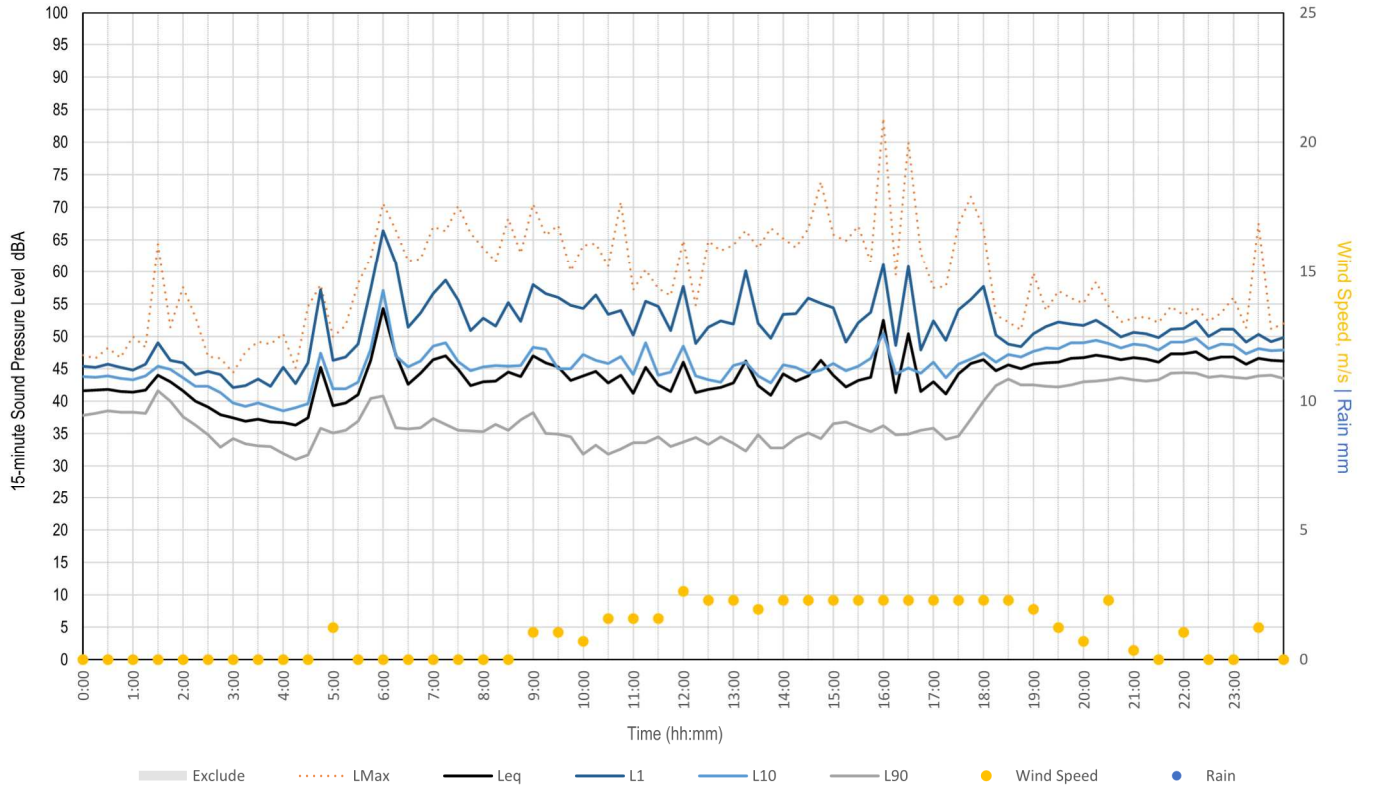
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Wednesday, 31 August 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

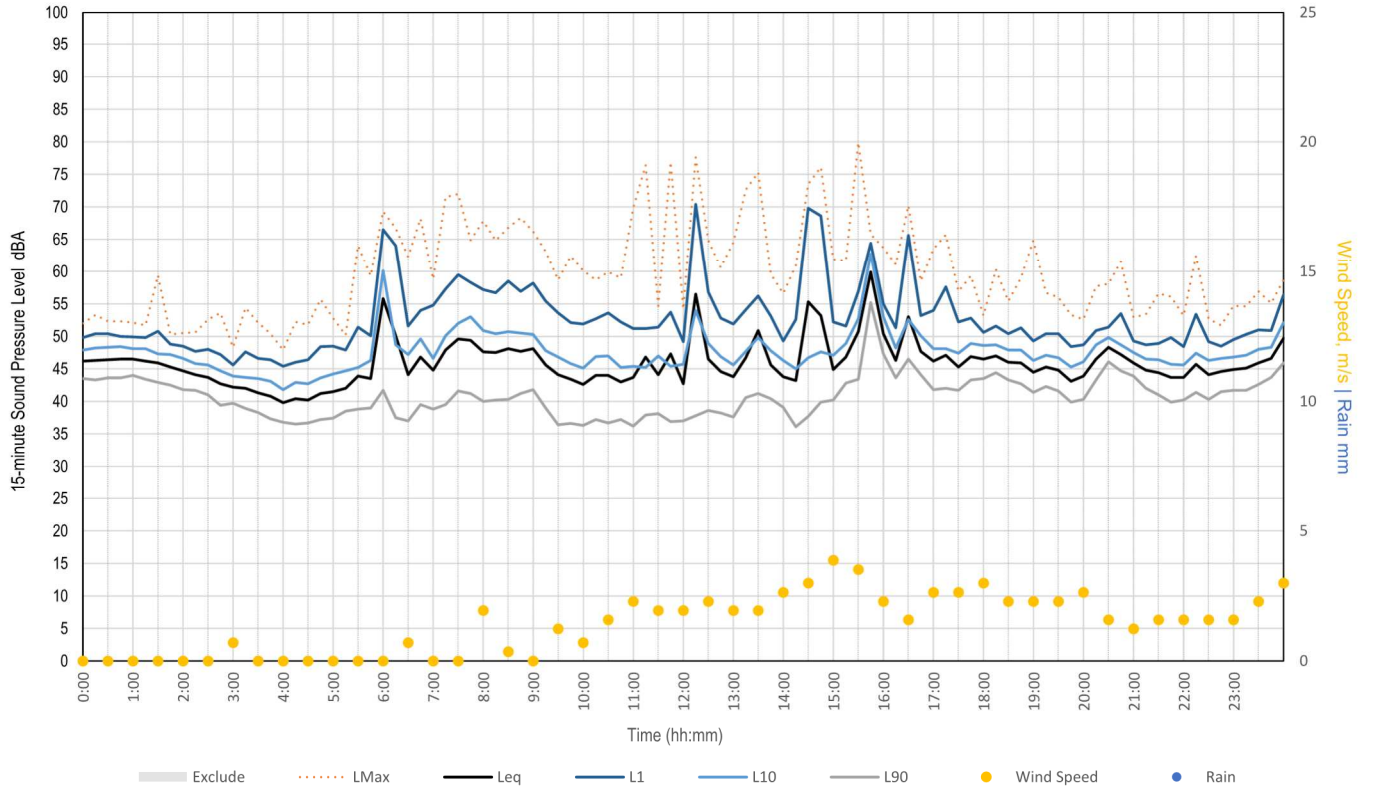
Thursday, 01 September 2022



Noise Logger Results

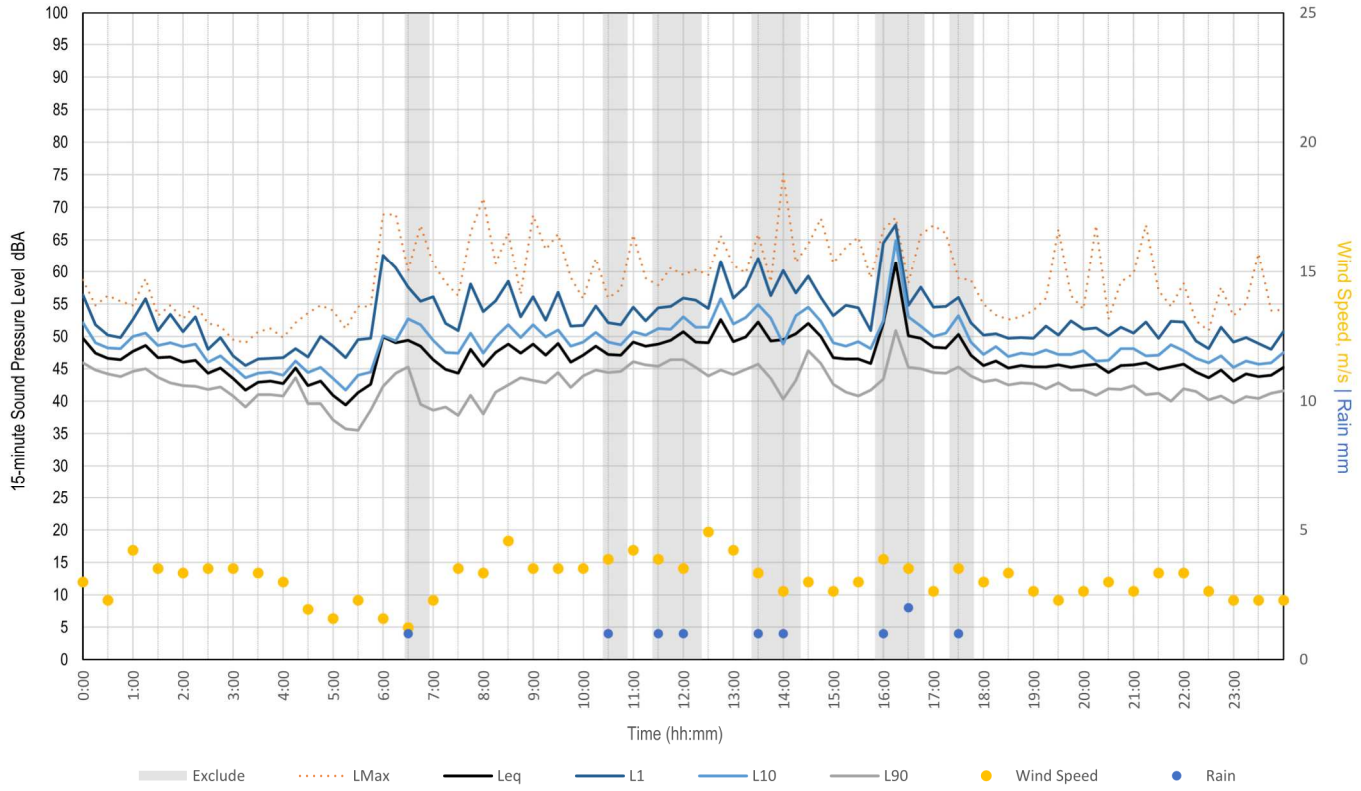
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Friday, 02 September 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

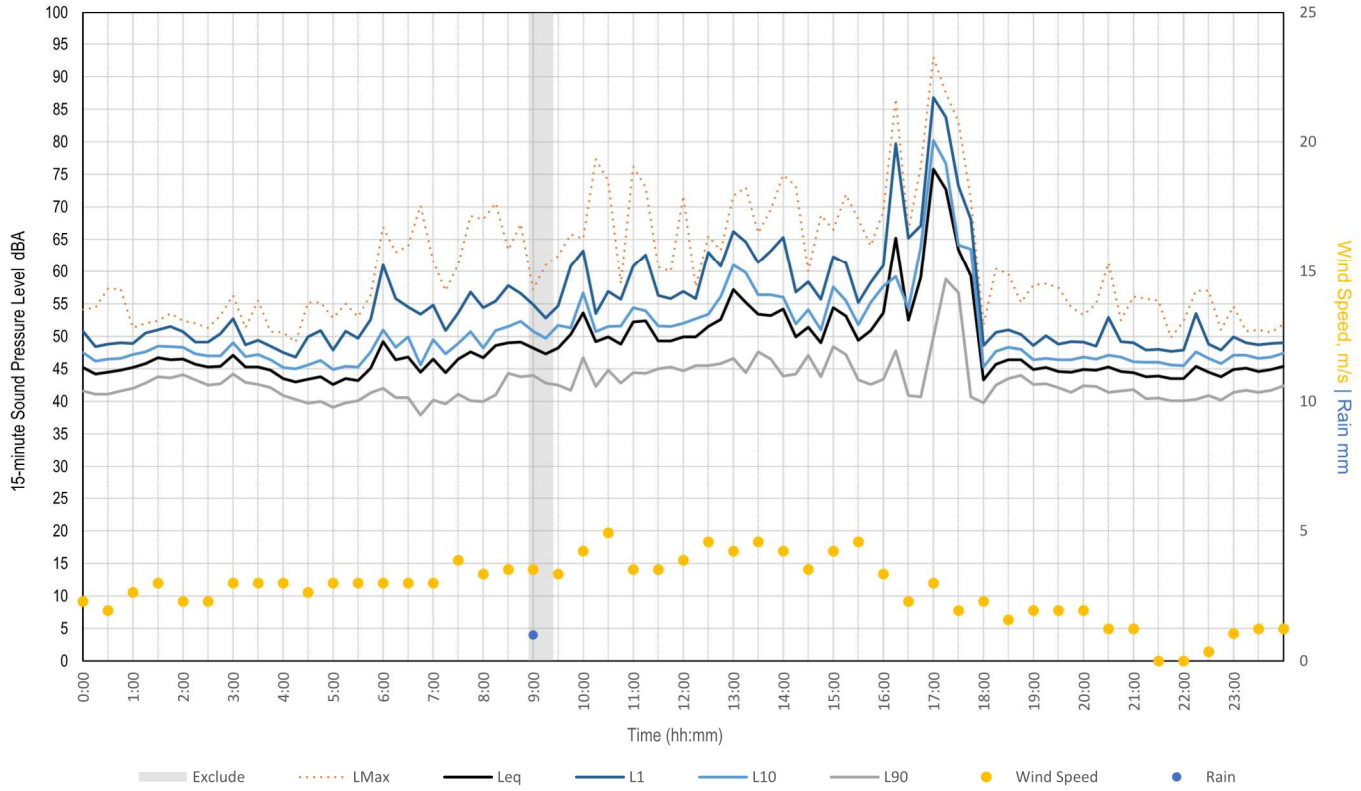
Saturday, 03 September 2022



Noise Logger Results

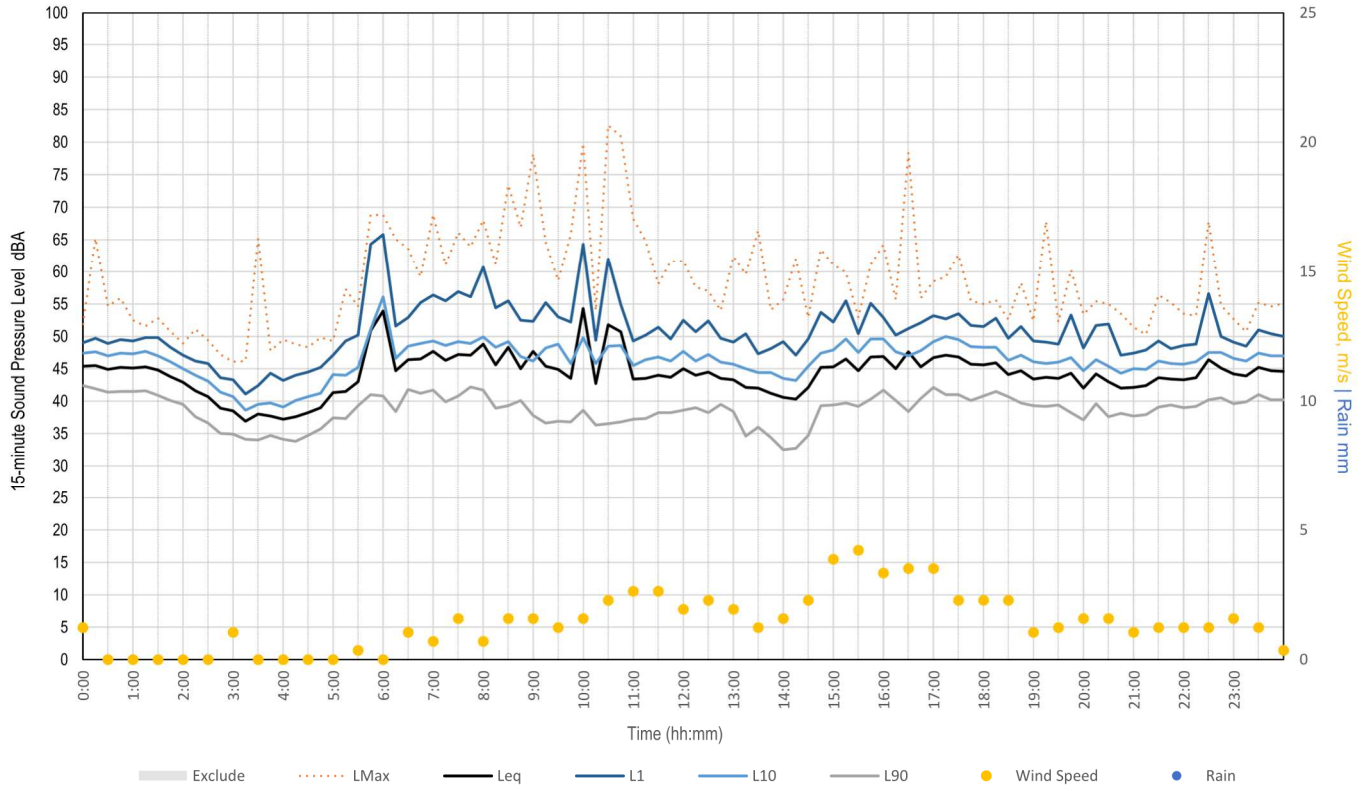
Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Sunday, 04 September 2022



Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

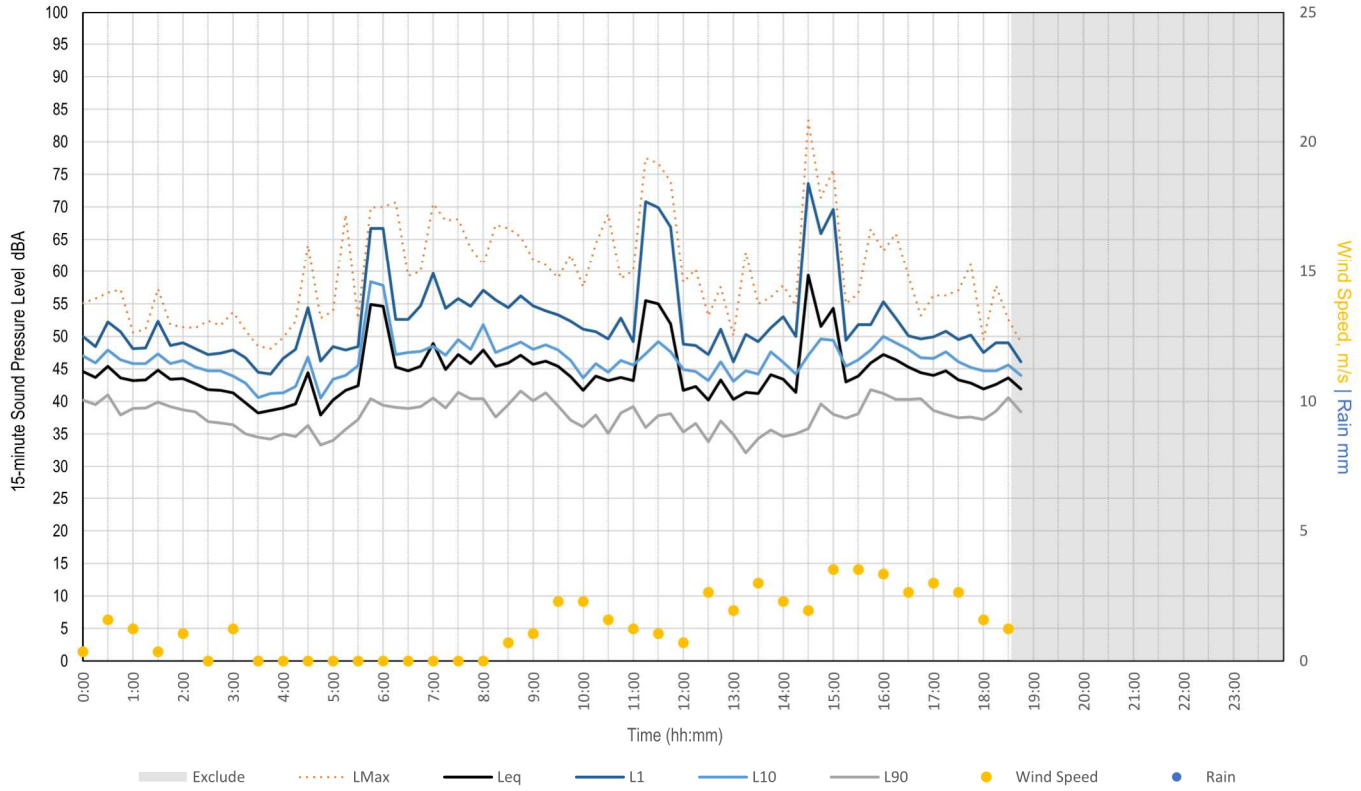
Monday, 05 September 2022



Noise Logger Results

Measured Noise Levels - M27 Kurrajong - 53 Peel Parade

Tuesday, 06 September 2022



Background Noise Monitoring

Location	M28 - 110 Glendiver Road (The Oaks)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	NM & JF

Unattended Equipment					Attended Equipment				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878237	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-17705-E0
Calibration	**Pre:**	93.9 dBA	**Post:**	93.9 dBA	**Calibration**	**Pre:**	94.0 dBA	**Post:**	94.0 dBA
Microphone	**Position:**	Free field	**Height:**	1.2 m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Wednesday, 14 Sep 2022
Date End	Tuesday, 11 Oct 2022
No. of days	28
No. of nights	27

Weather	
Station	BoM
Station Info	Camden Airport AWS
Distance	< 30 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	14/09/2022	5:12:00 PM	5:27:00 PM	62	44	47	30	
2	Day	11/10/2022	5:15:42 PM	5:31:15 PM	76	55	52	31	
3	Day	11/10/2022	5:37:28 PM	5:52:28 PM	51	36	37	30	
4	Day	11/10/2022	5:52:28 PM	6:07:28 PM	56	41	44	32	
5	Evening	11/10/2022	6:10:04 PM	6:25:04 PM	61	42	42	31	
6	Evening	25/09/2022	6:00:00 PM	6:15:00 PM	59	43	48	32	*
7	Evening	25/09/2022	7:15:00 PM	7:30:00 PM	53	41	41	39	*
8	Evening	25/09/2022	8:30:00 PM	8:45:00 PM	60	39	39	37	*
9	Night	19/09/2022	12:15:00 AM	12:30:00 AM	62	42	45	32	*
10	Night	19/09/2022	2:15:00 AM	2:30:00 AM	47	35	36	33	*
11	Night	19/09/2022	4:30:00 AM	4:45:00 AM	43	34	35	33	*
12	Night	19/09/2022	6:15:00 AM	6:30:00 AM	62	40	42	32	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent animal noise (e.g. birds, dogs). Occasional car passbys on local road. Several aircraft passing overhead with an approx. duration of 30 sec to 1 min with maximum sound levels in the range of 35 to 61 dBA.
Background noise	Traffic in distance. Movement in vegetation due to wind (e.g. trees and grass rustling). Insect noise dominated the noise environment at dusk.
Evening	
Ambient noise	Intermittent animal sounds (e.g. birds, dogs). Occasional suburban activity at neighbouring houses (e.g. talking). Occasional car passbys on local road. Several aircraft flying overhead with approx. duration of 30 sec to 1 min with maximum sound levels in the range of 48 to 55 dBA.
Background noise	Movement in vegetation due to wind (e.g. trees and grass rustling). Insects dominating the noise environment at dusk.
Night	
Ambient noise	Constant insect and bird noise. Intermittent animal sounds (e.g. crows and dogs). Faint wind gust induced noise. Occasional vehicles passing by on local road.
Background noise	Traffic in distance. Insect noise dominating the noise environment except after 6 AM.

Site Details	M28 - 110 Glendiver Road (The Oaks)
Start Date	Wed 14 September 2022
End Date	Tue 11 October 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	56
$L_{eq, Evening}$ dBA	48
$L_{eq, Night}$ dBA	44
RBL, $_{Day}$ dBA	29
RBL, $_{Evening}$ dBA	36
RBL, $_{Night}$ dBA	32

Daily Summary

Date	14/09	15/09	16/09	17/09	18/09	19/09	20/09	21/09
$L_{eq, Day}$ dBA	49	54	54	46	43	43	48	61
$L_{eq, Evening}$ dBA	39	39	45	39	44	44	39	41
$L_{eq, Night}$ dBA	37	37	42	45	39	38	36	40
ABL, $_{Day}$ dBA	30	29	31	29	31	29	30	29
ABL, $_{Evening}$ dBA	30	31	37	35	35	33	31	36
ABL, $_{Night}$ dBA	29	28	32	36	32	29	29	34

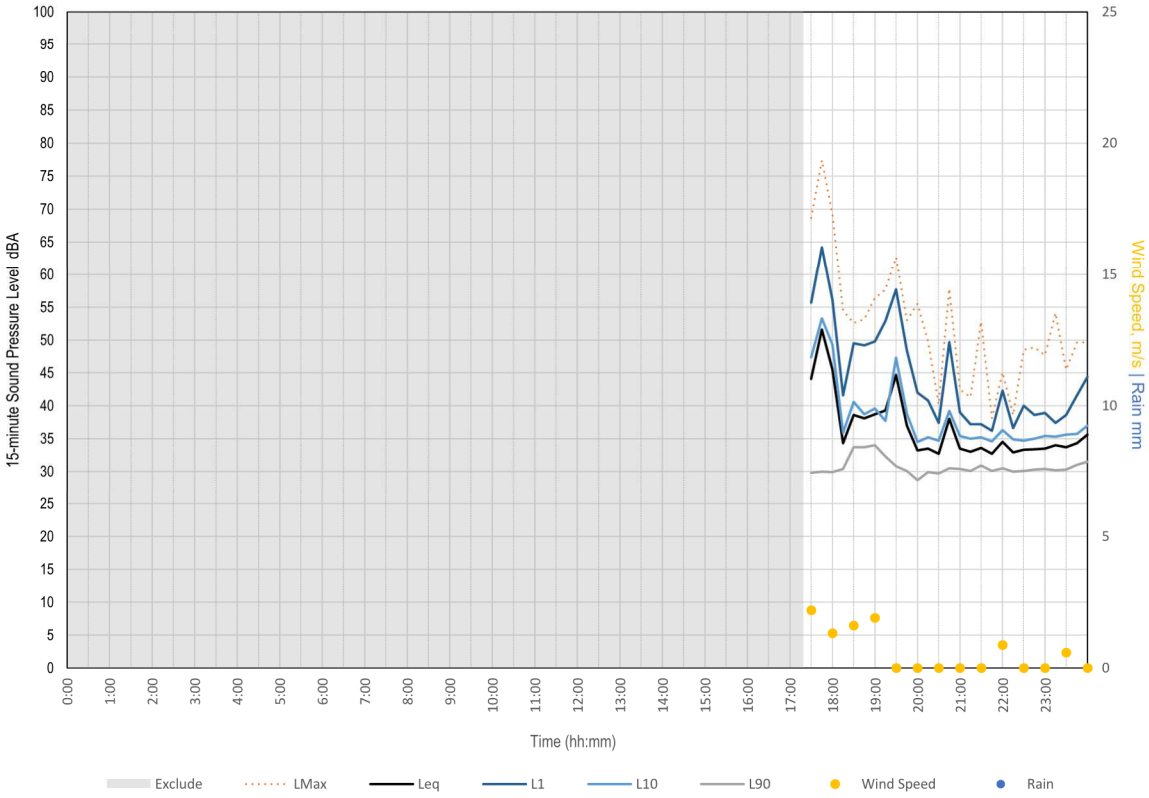
Date	22/09	23/09	24/09	25/09	26/09	27/09	28/09	29/09
$L_{eq, Day}$ dBA	43	44	44	61	66	45	45	46
$L_{eq, Evening}$ dBA	48	48	49	41	43	43	56	46
$L_{eq, Night}$ dBA	40	40	40	39	40	47	42	40
ABL, $_{Day}$ dBA	29	29	30	29	30	29	28	33
ABL, $_{Evening}$ dBA	38	42	39	35	34	37	49	39
ABL, $_{Night}$ dBA	33	32	32	32	32	33	33	34

Date	30/09	01/10	02/10	03/10	04/10	05/10	06/10	07/10
$L_{eq, Day}$ dBA	46	45	52	48	64	48	41	44
$L_{eq, Evening}$ dBA	43	45	53	50	48	43	43	46
$L_{eq, Night}$ dBA	41	41	39	38	41	47	40	44
ABL, $_{Day}$ dBA	32	30	29	29	29	34	31	30
ABL, $_{Evening}$ dBA	41	37	37	36	36	39	33	40
ABL, $_{Night}$ dBA	34	32	32	31	31	37	31	35

Date	08/10	09/10	10/10	11/10
$L_{eq, Day}$ dBA	46	43	47	48
$L_{eq, Evening}$ dBA		54	52	
$L_{eq, Night}$ dBA	52	50	41	
ABL, $_{Day}$ dBA	31	29	29	28
ABL, $_{Evening}$ dBA		36	39	
ABL, $_{Night}$ dBA	39	32	33	

Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

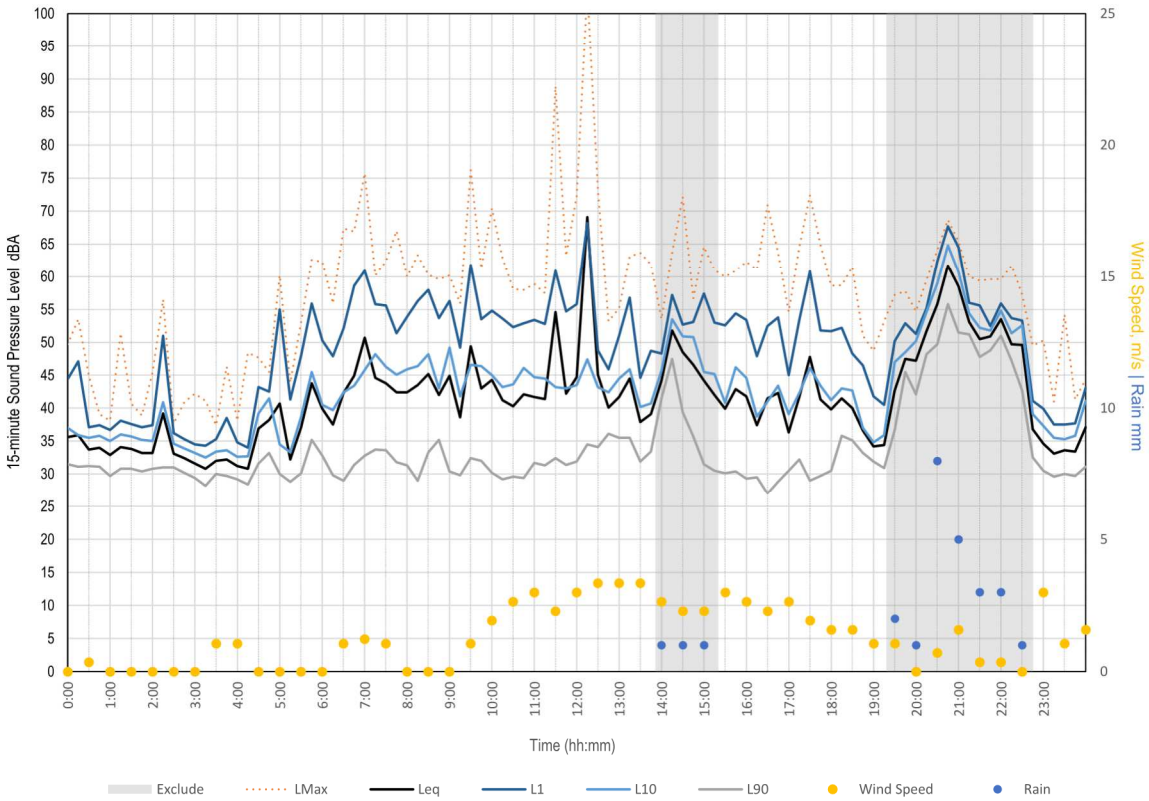
Wednesday, 14 September 2022



Noise Logger Results

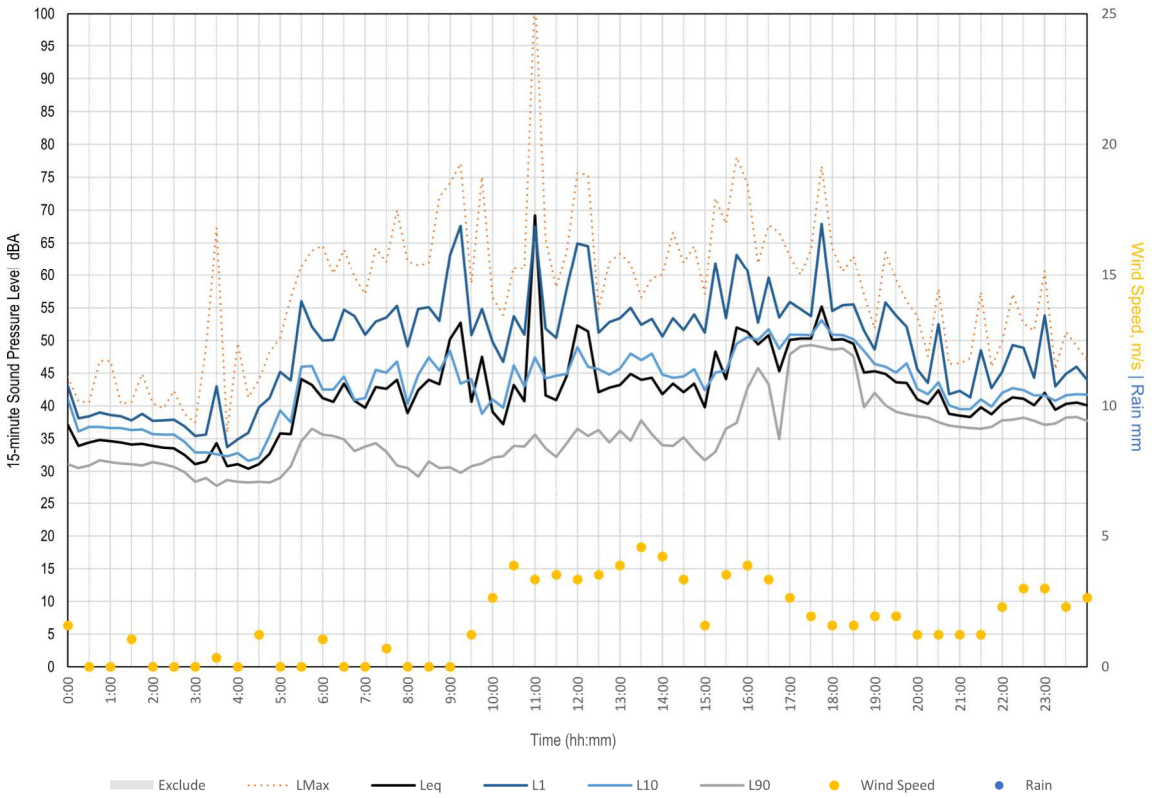
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Thursday, 15 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

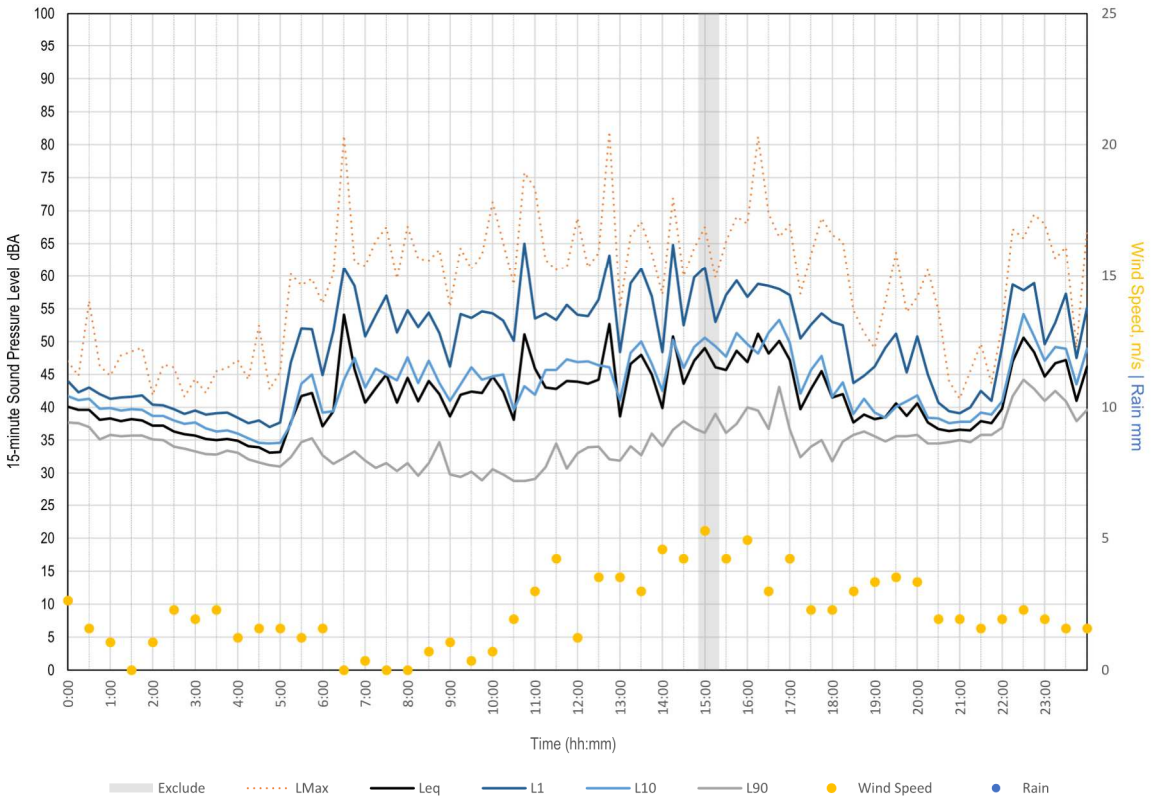
Friday, 16 September 2022



Noise Logger Results

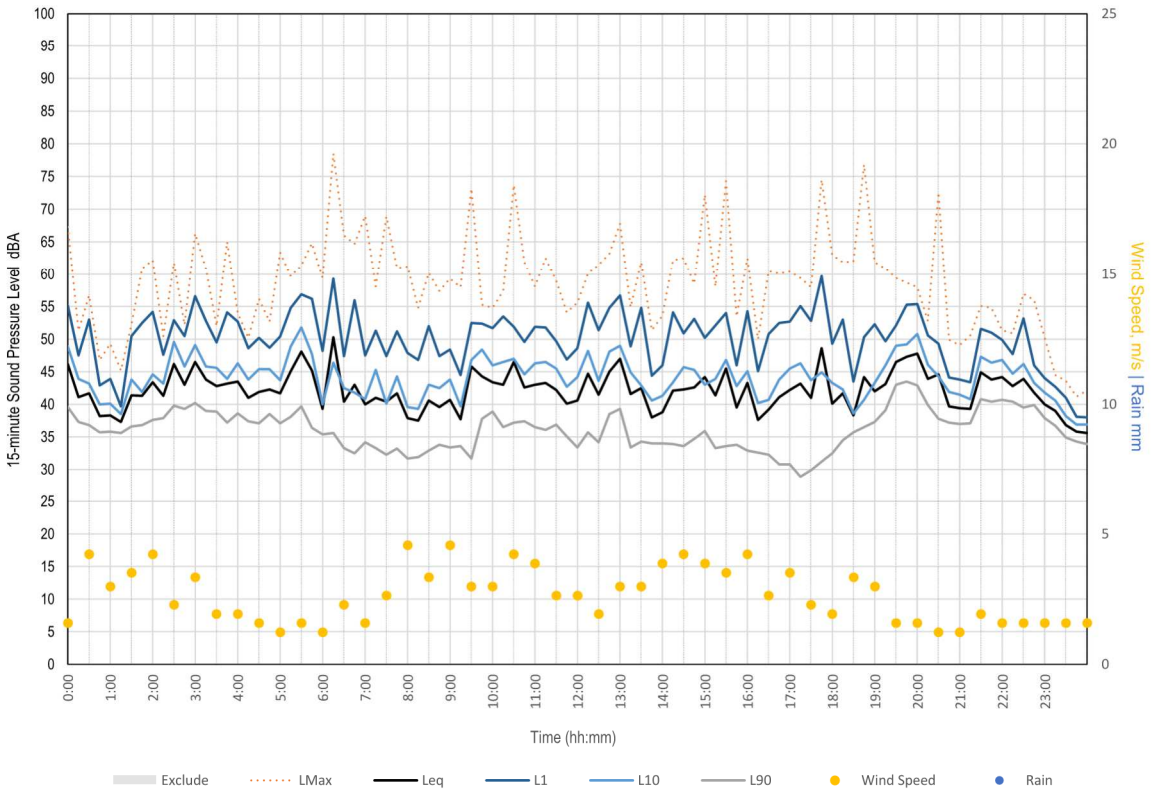
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Saturday, 17 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

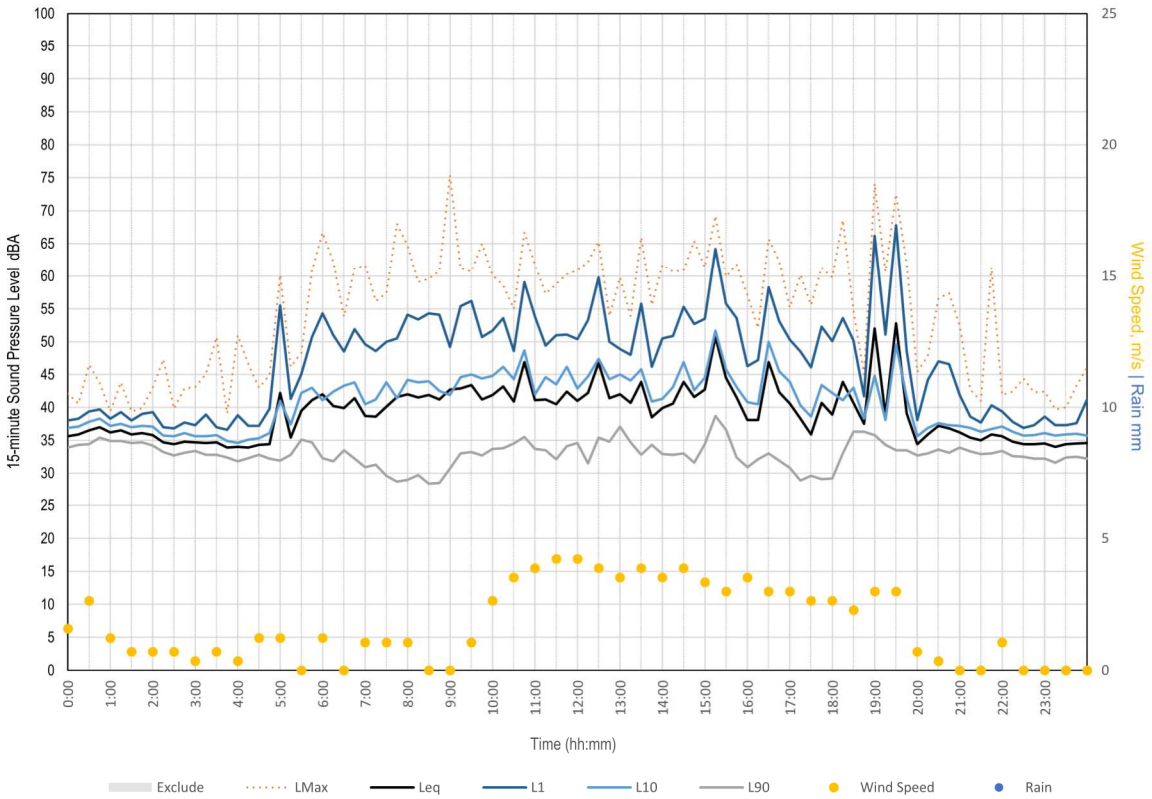
Sunday, 18 September 2022



Noise Logger Results

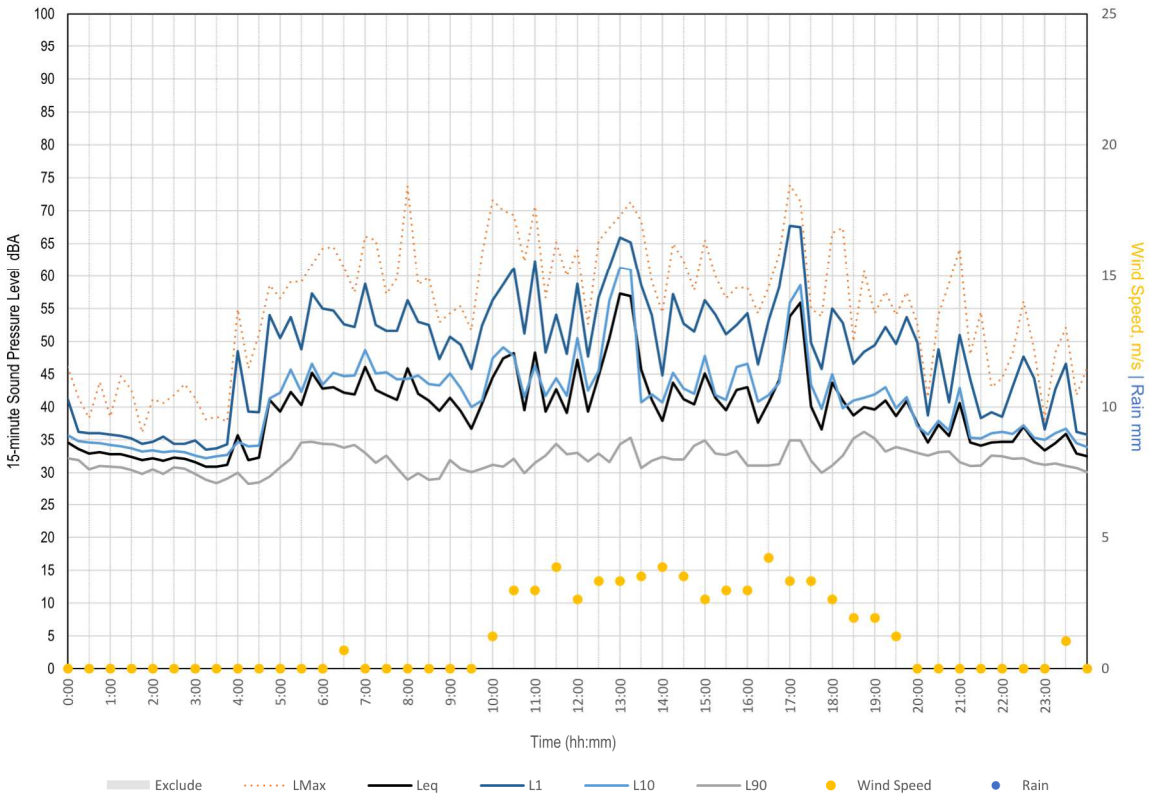
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Monday, 19 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

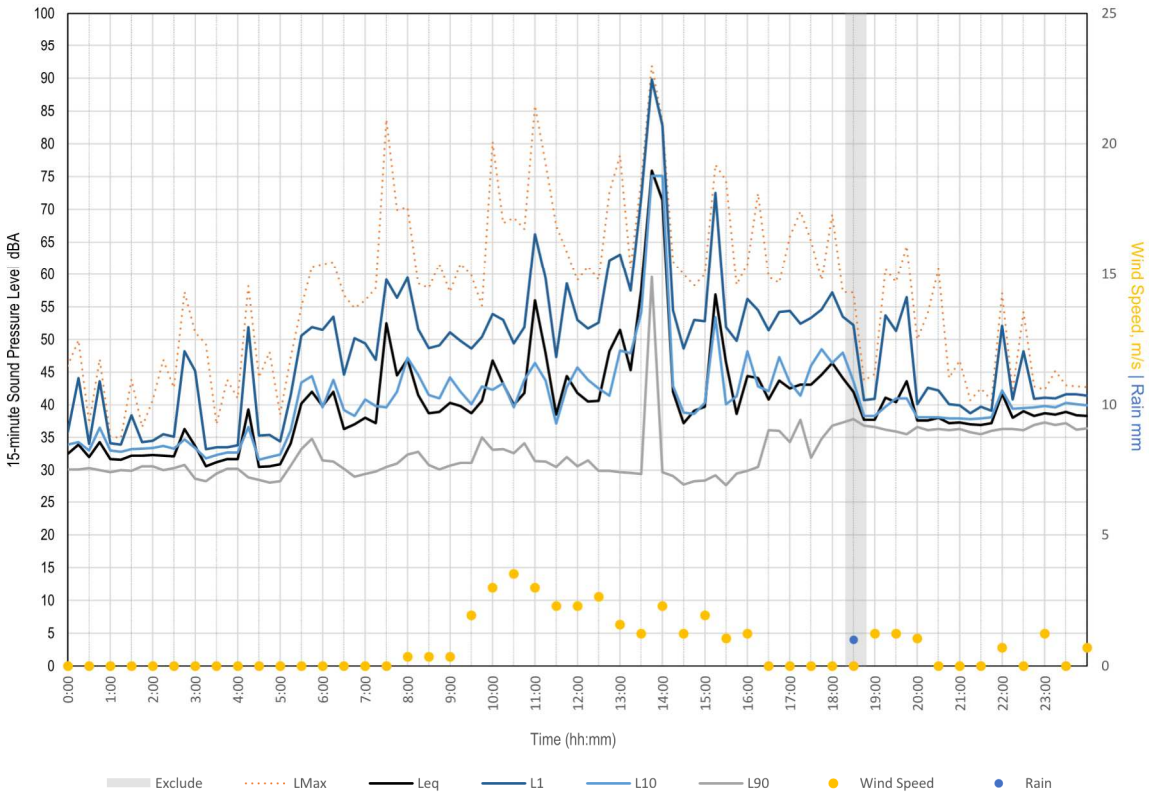
Tuesday, 20 September 2022



Noise Logger Results

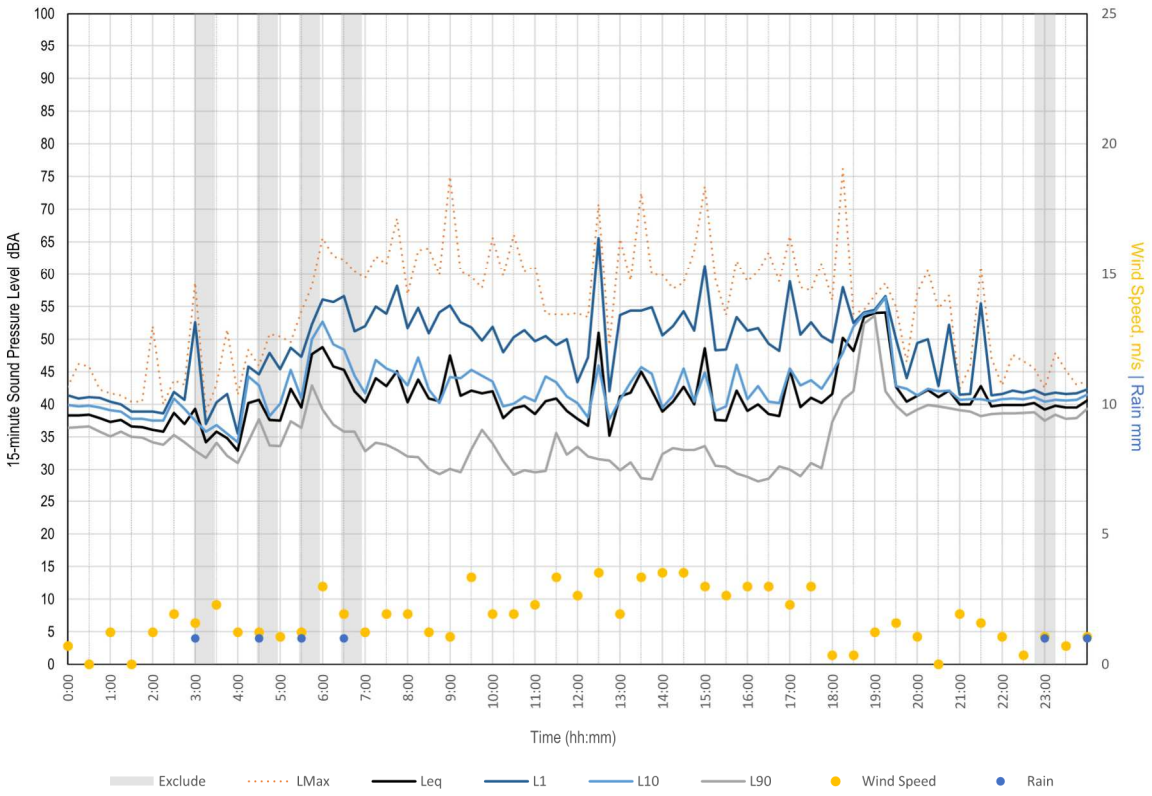
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Wednesday, 21 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

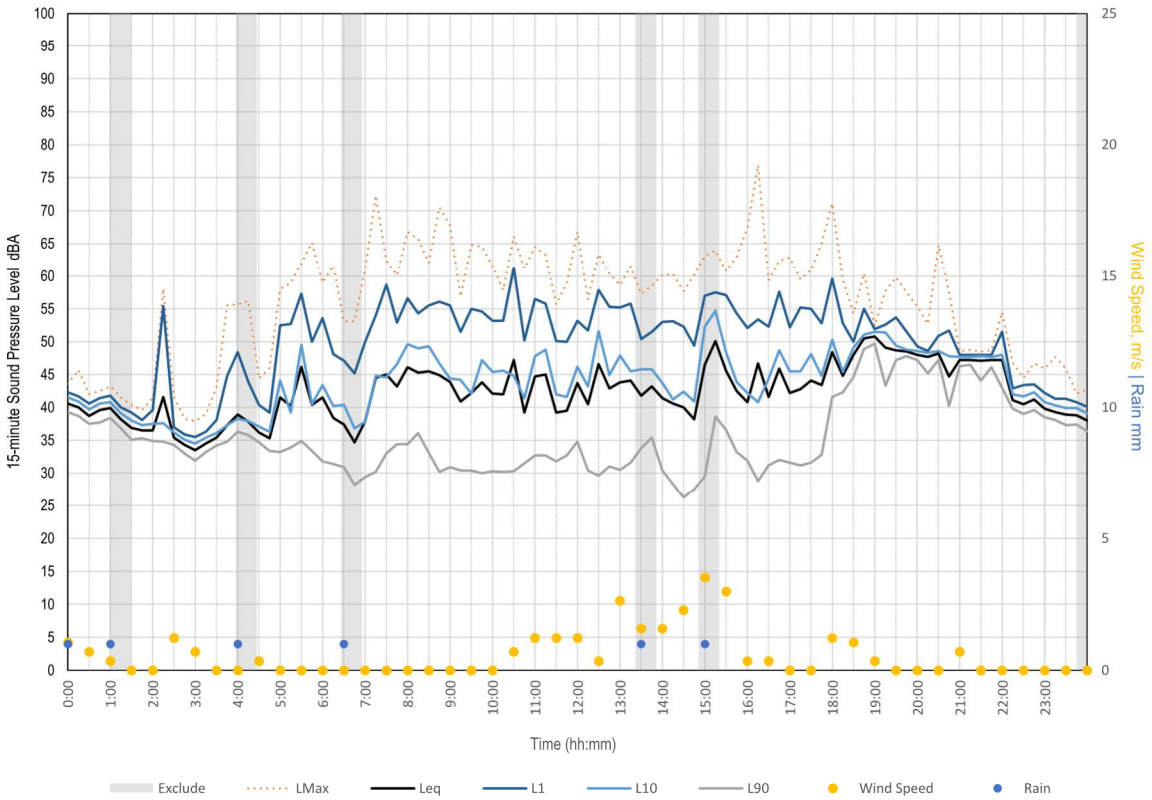
Thursday, 22 September 2022



Noise Logger Results

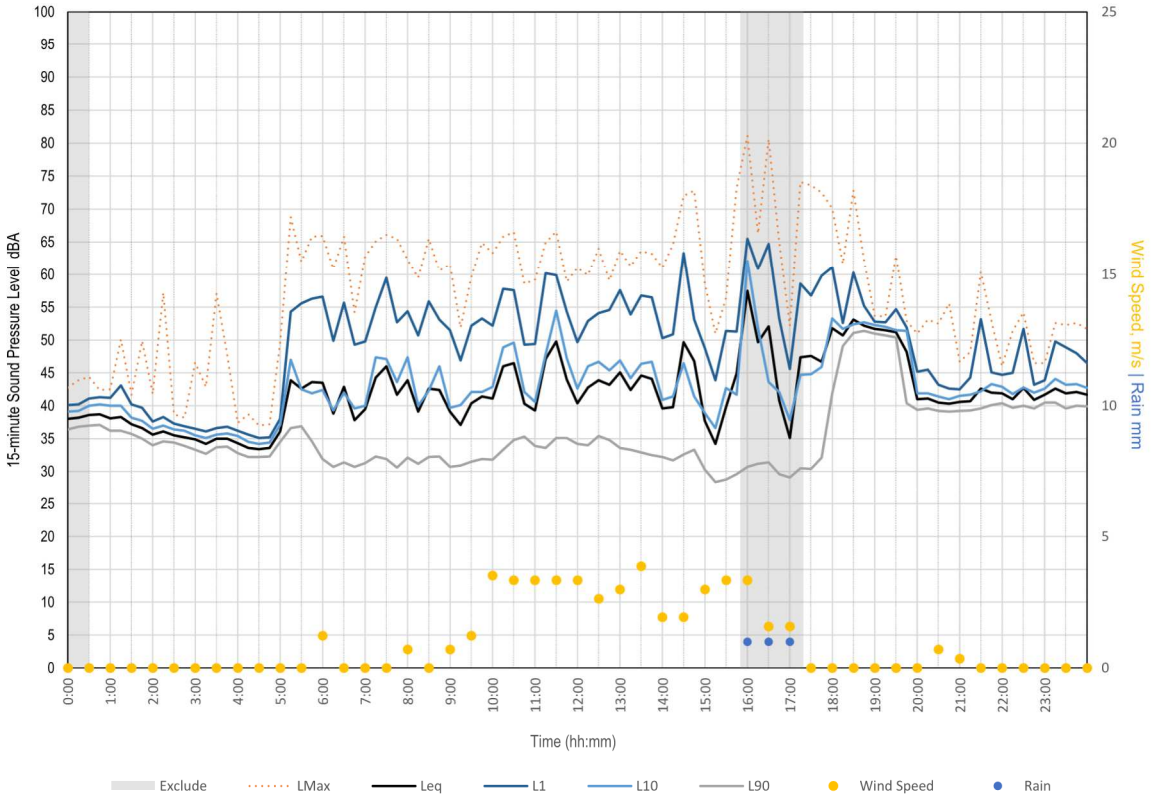
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Friday, 23 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

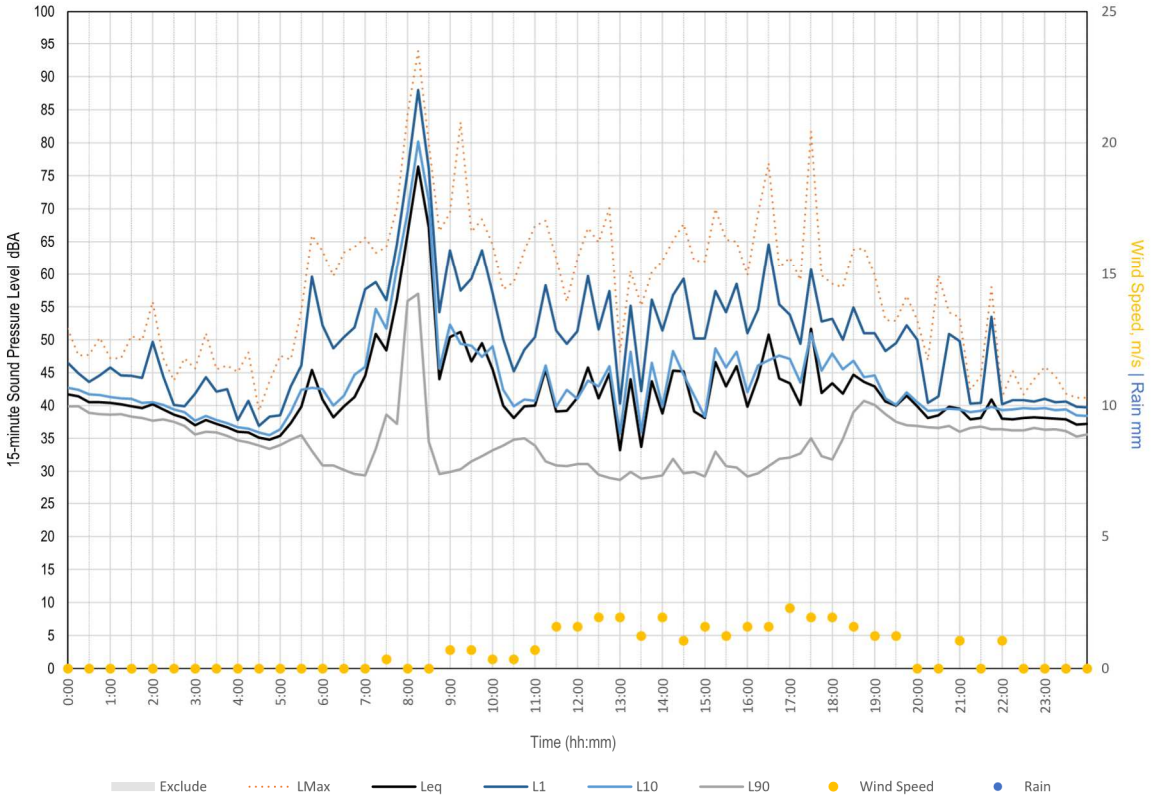
Saturday, 24 September 2022



Noise Logger Results

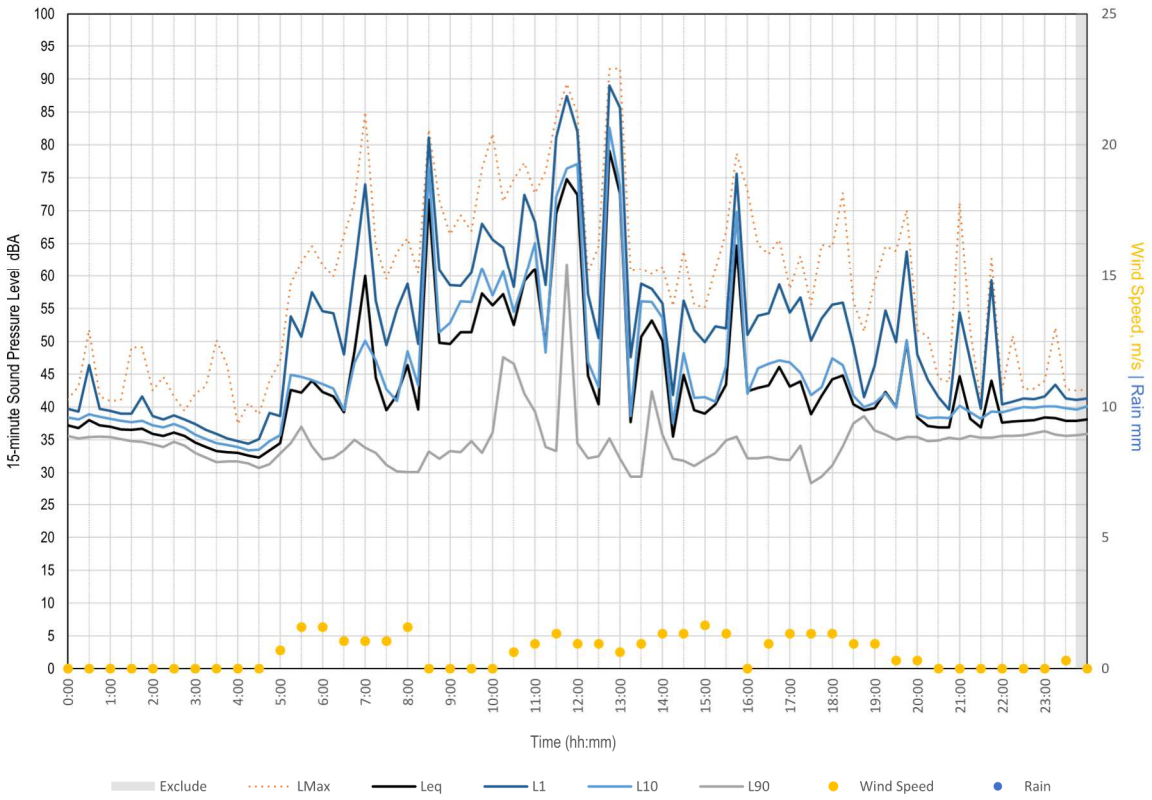
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Sunday, 25 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

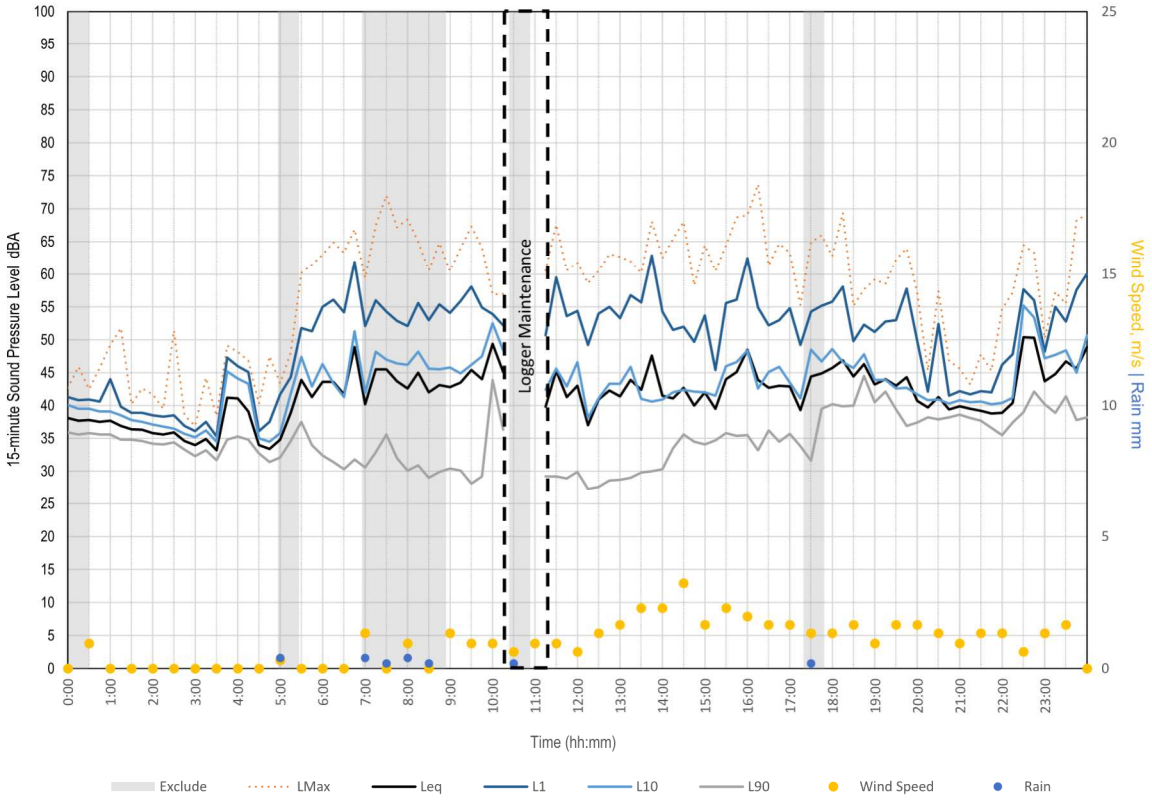
Monday, 26 September 2022



Noise Logger Results

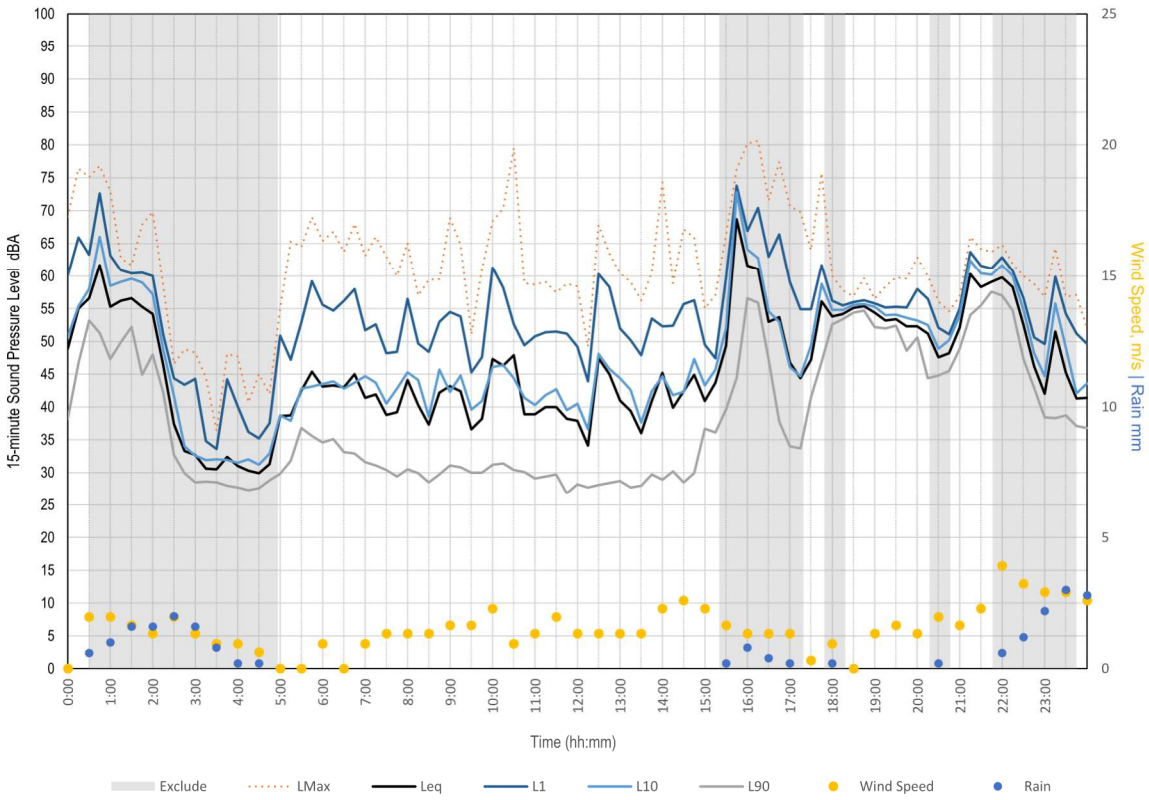
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Tuesday, 27 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

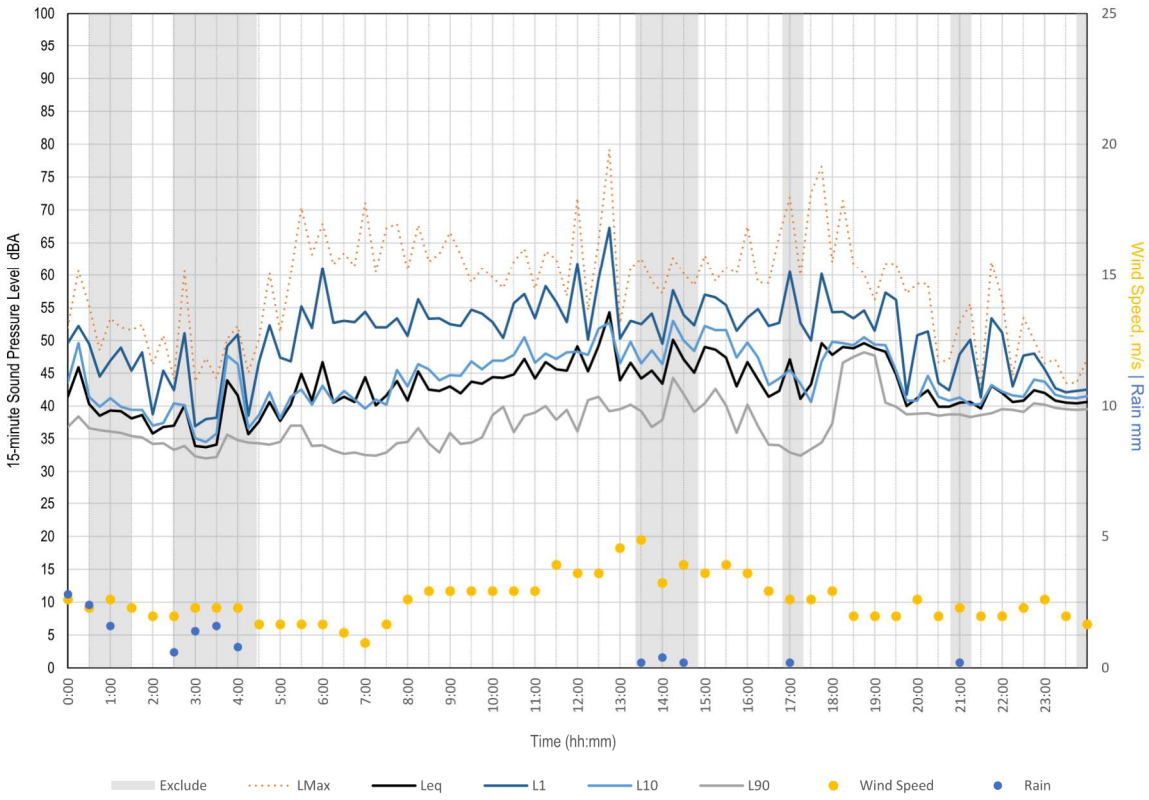
Wednesday, 28 September 2022



Noise Logger Results

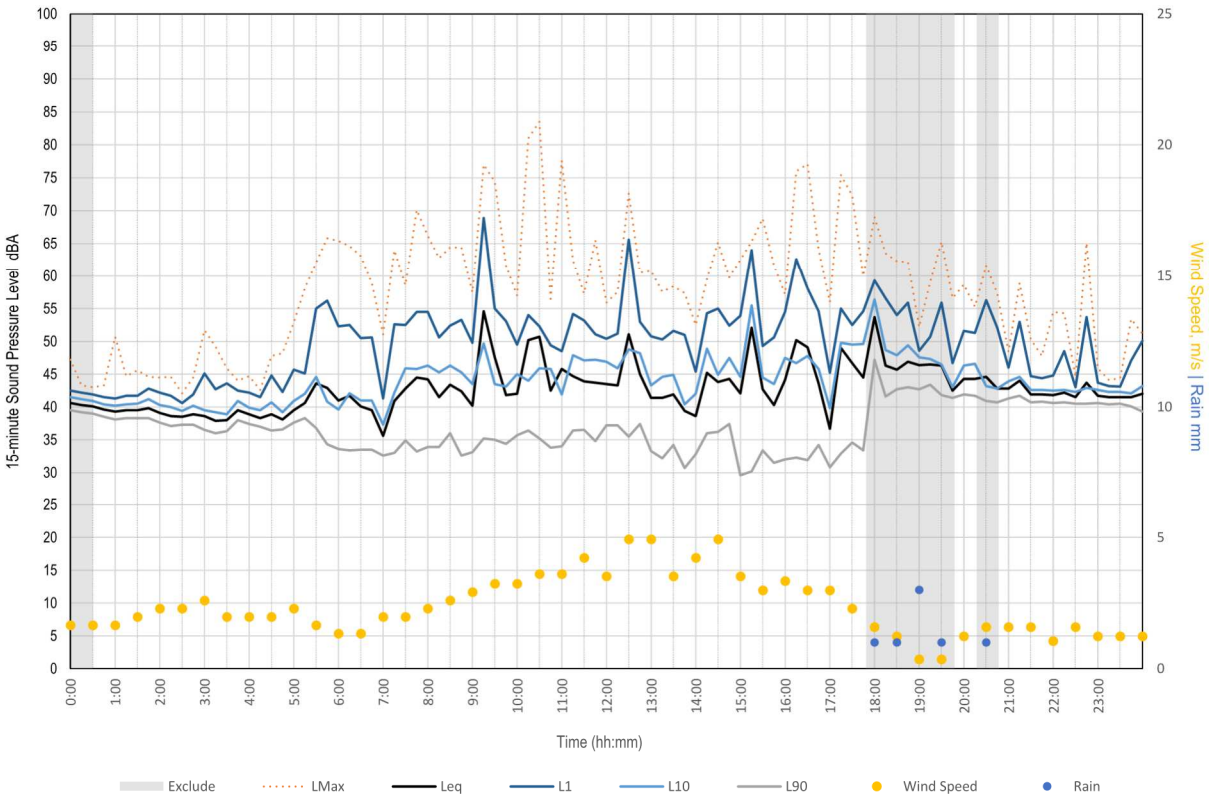
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Thursday, 29 September 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

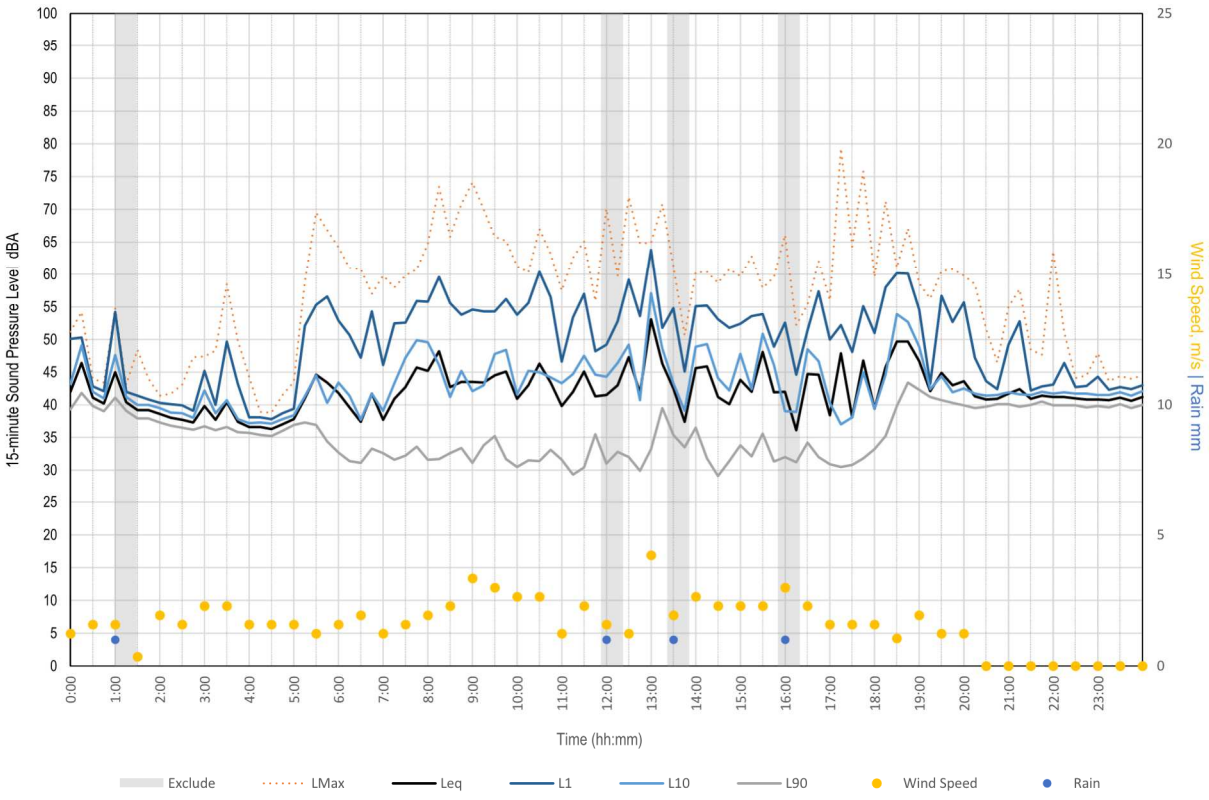
Friday, 30 September 2022



Noise Logger Results

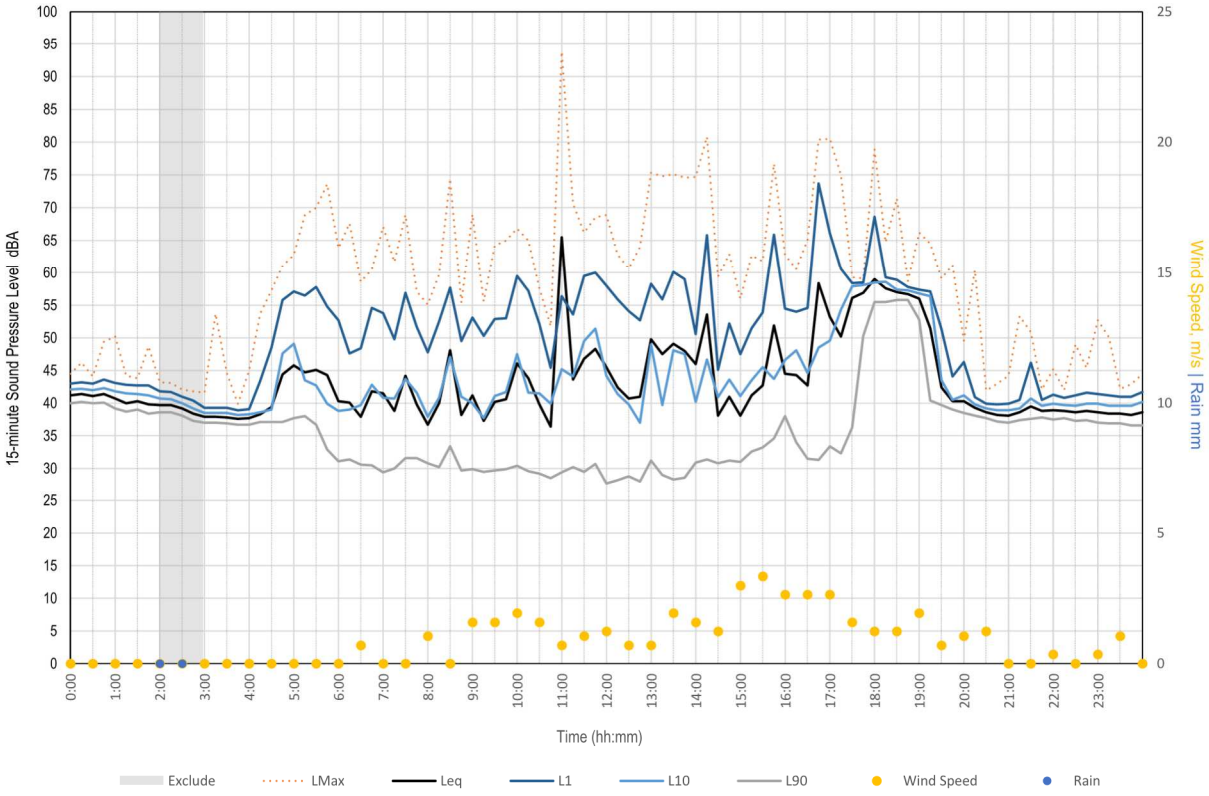
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Saturday, 01 October 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

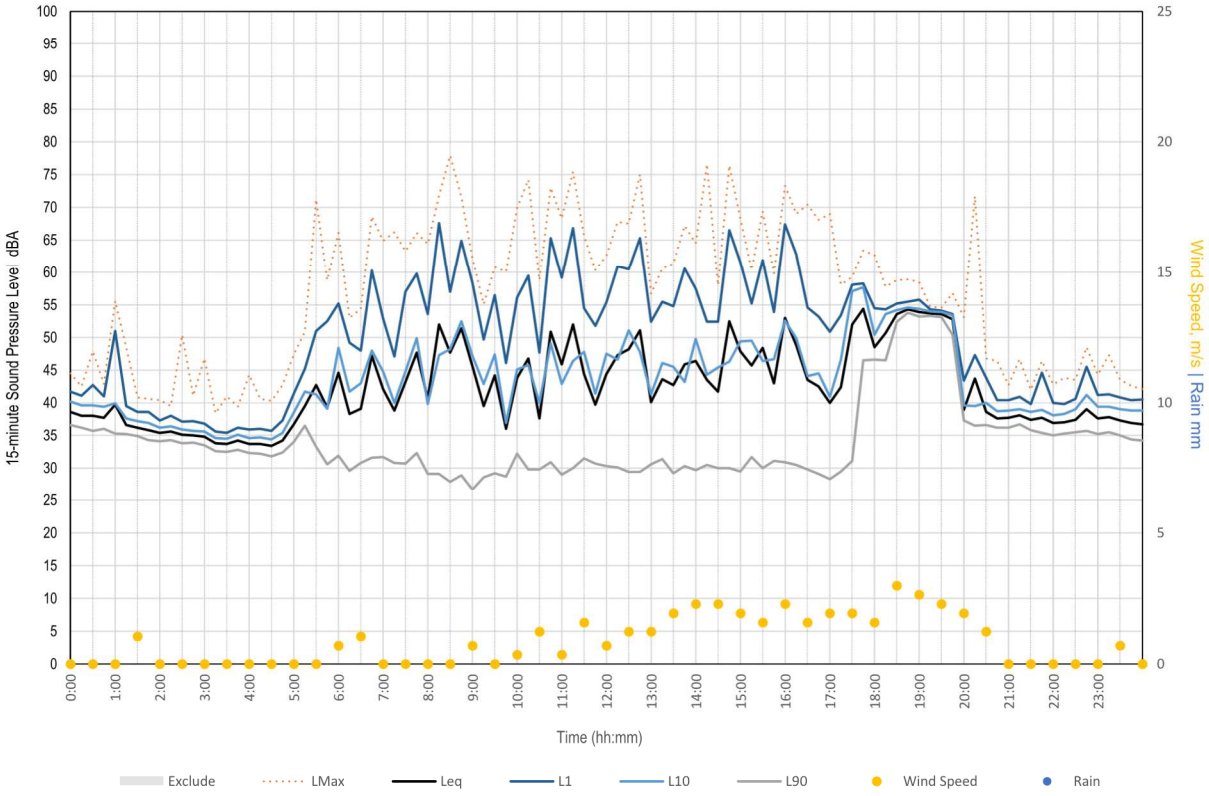
Sunday, 02 October 2022



Noise Logger Results

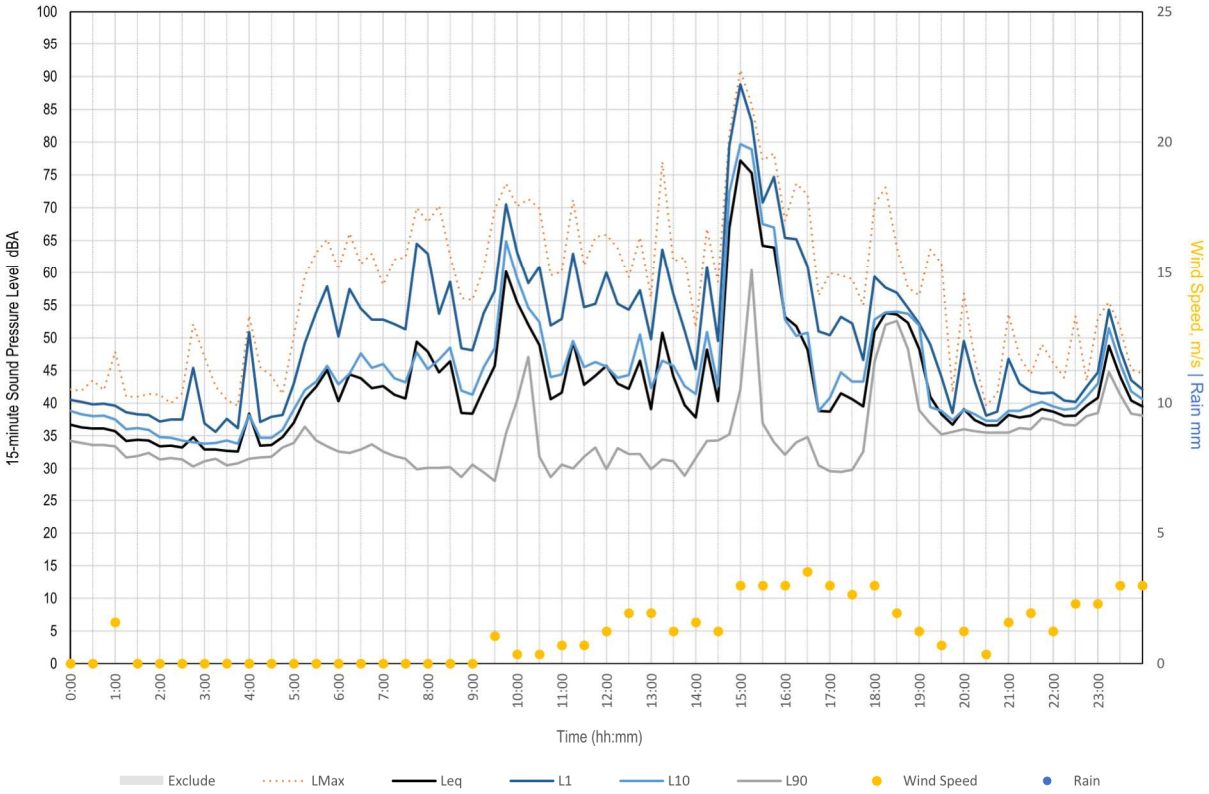
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Monday, 03 October 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

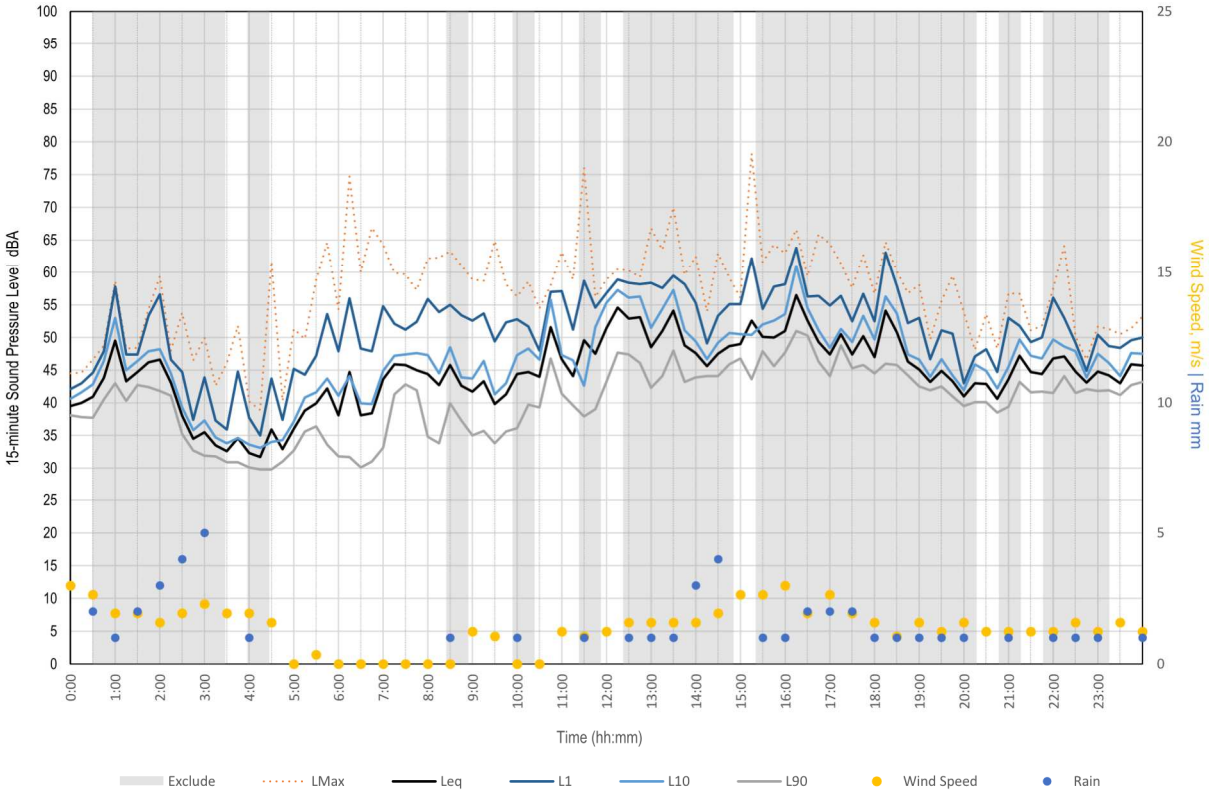
Tuesday, 04 October 2022



Noise Logger Results

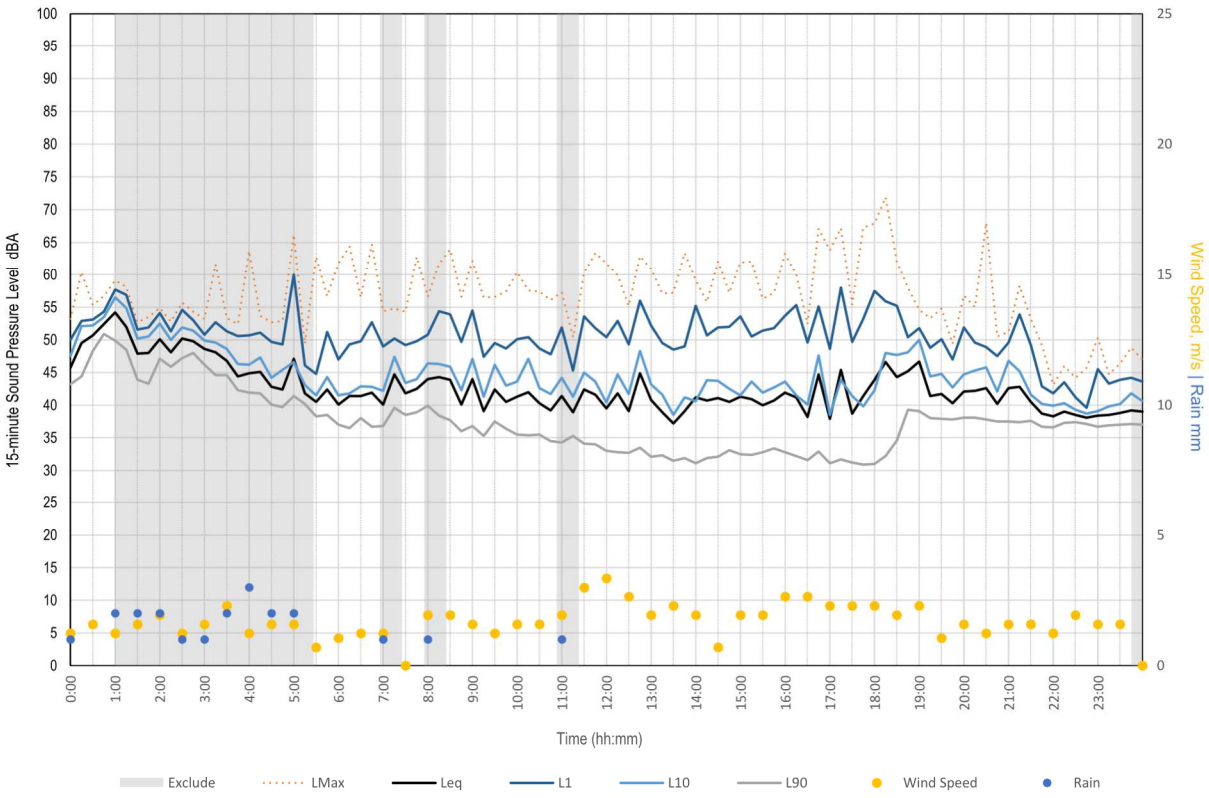
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Wednesday, 05 October 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

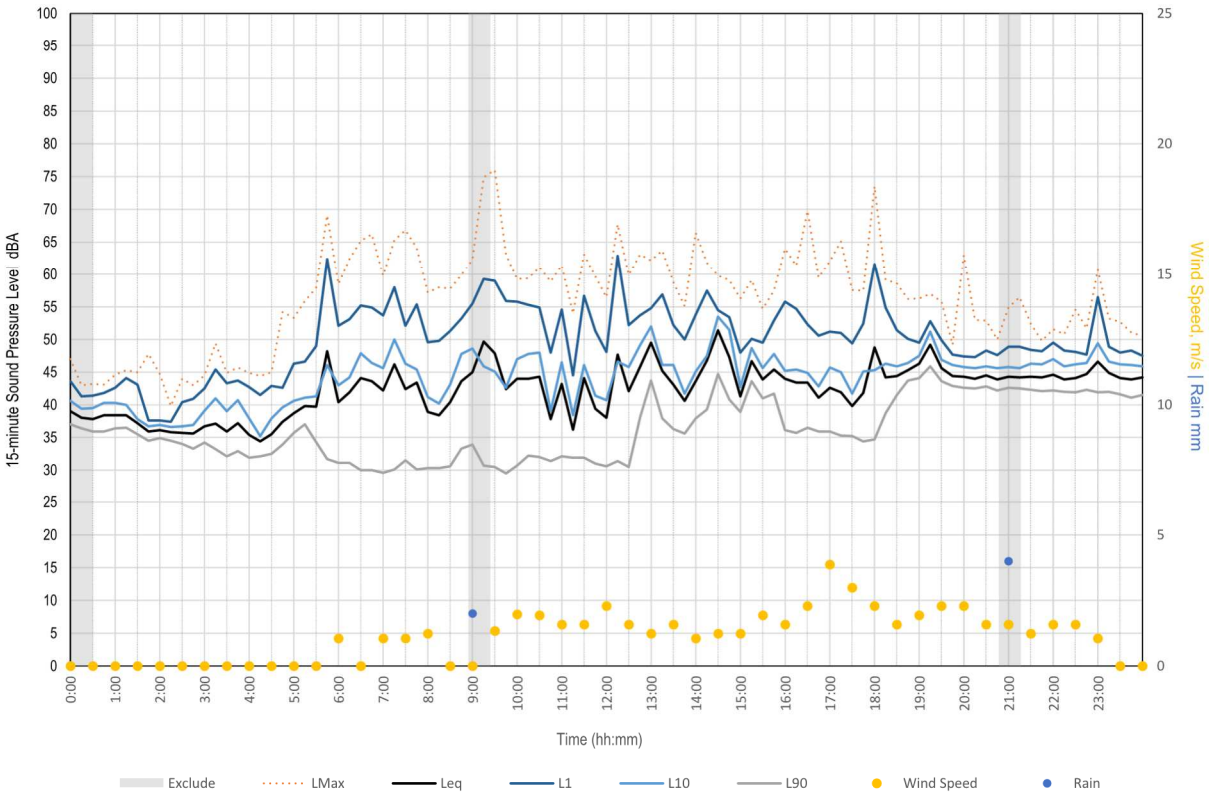
Thursday, 06 October 2022



Noise Logger Results

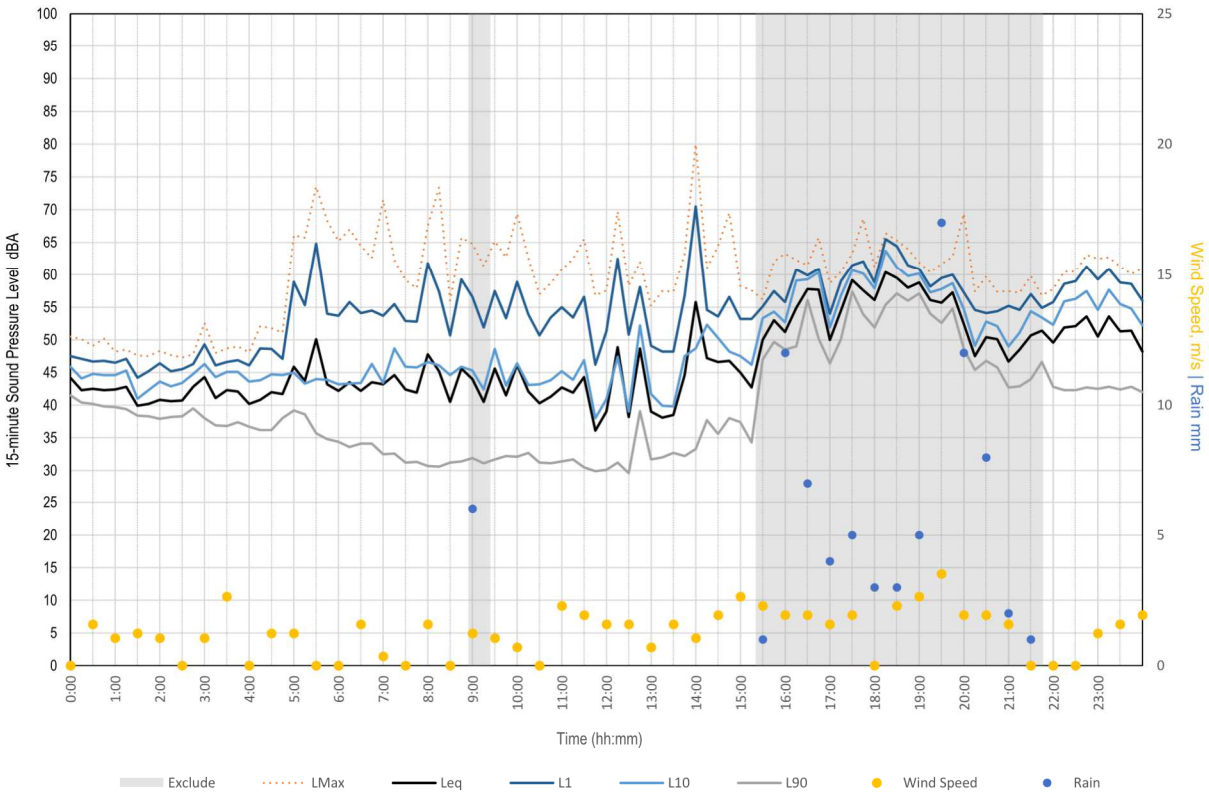
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Friday, 07 October 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

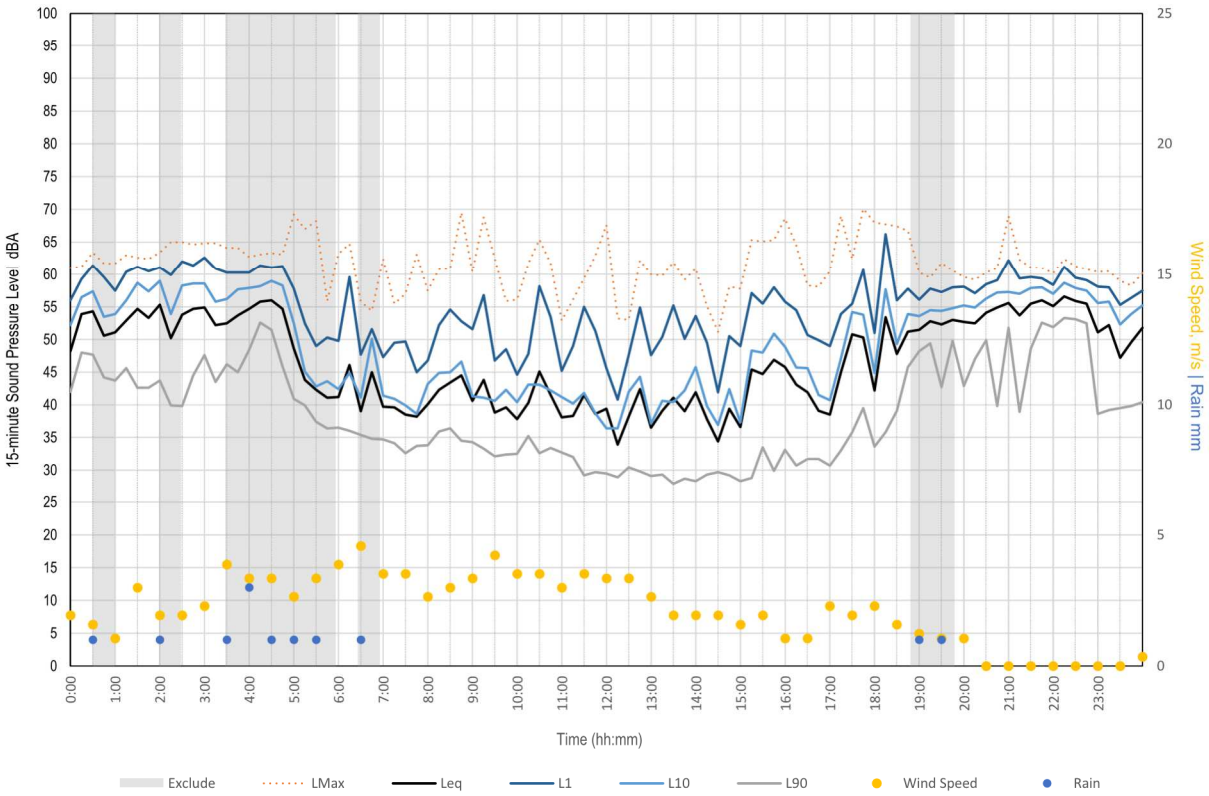
Saturday, 08 October 2022



Noise Logger Results

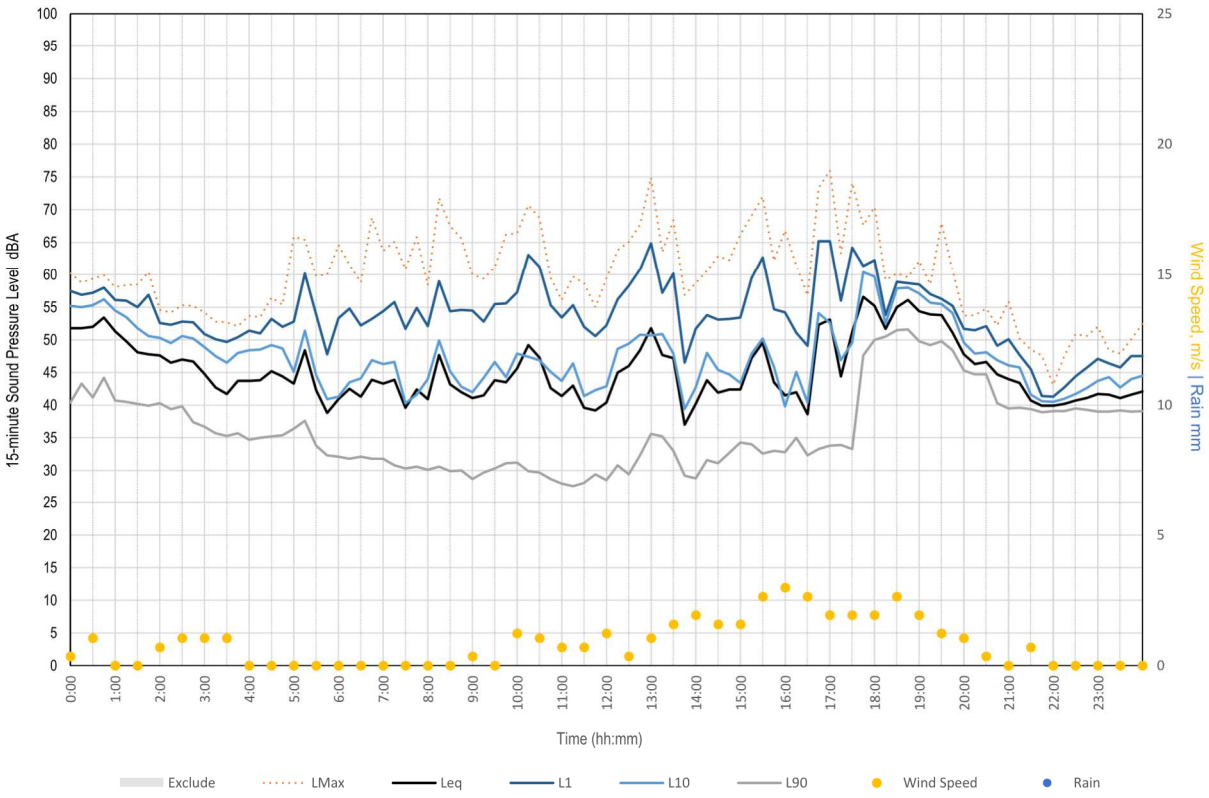
Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Sunday, 09 October 2022



Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

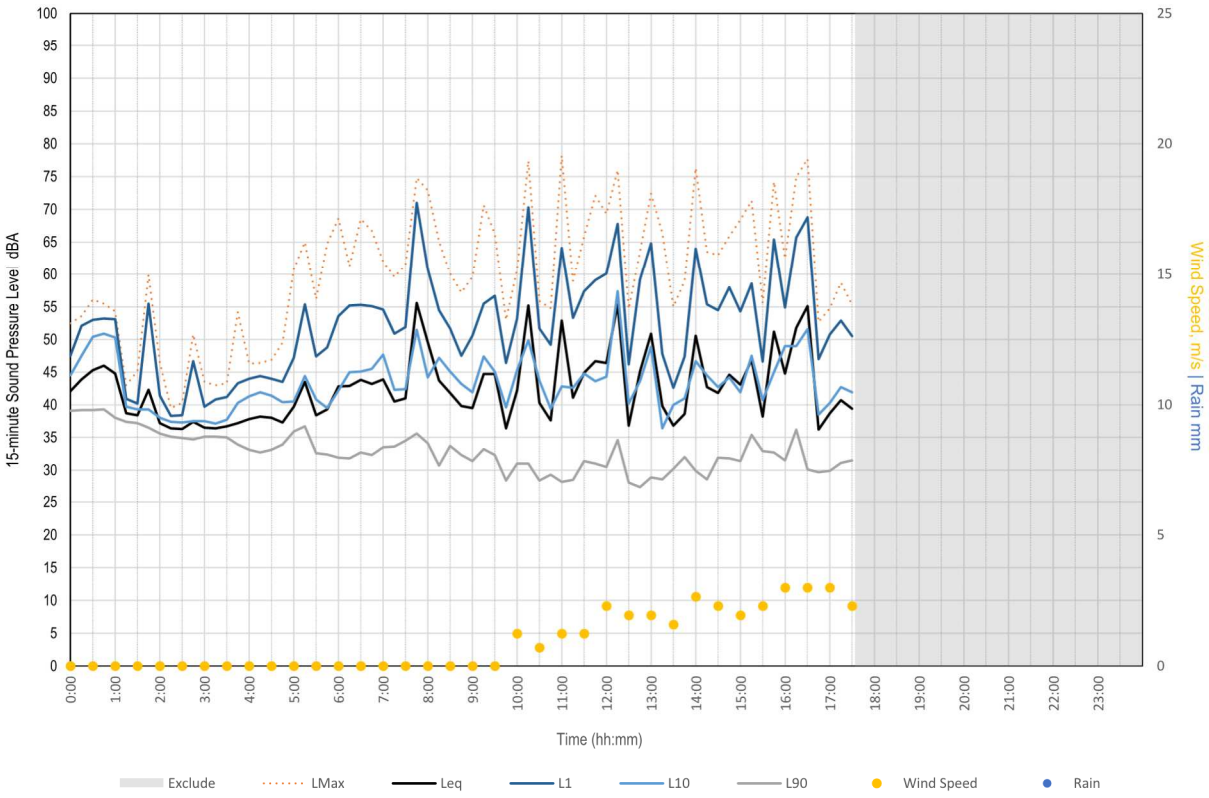
Monday, 10 October 2022



Noise Logger Results

Measured Noise Levels - M28 - 110 Glendiver Road (The Oaks)

Tuesday, 11 October 2022



Background Noise Monitoring

Location	M29 Lake Burragorang - 57 Burragorang Road (Nattai)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	87802C	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	93.7 dBA	**Post:**	93.8 dBA	**Calibration**	**Pre:**	93.8 dBA	**Post:**	93.9 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Wednesday, 14 Sep 2022
Date End	Monday, 10 Oct 2022
No. of days	25
No. of nights	23

*Monitoring period not continuous

Weather	
Station	BoM
Station Info	Camden Airport AWS
Distance	< 30 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed centrally within backyard.

Located ≥ 3 metres away from reflective surfaces other than ground e.g. house facade and fence.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	14/09/2022	11:27:30 AM	11:42:30 AM	66	43	45	30	
2	Day	14/09/2022	11:43:56 AM	11:58:56 AM	65	44	46	29	
3	Day	14/09/2022	12:02:04 PM	12:17:53 PM	72	45	47	30	
4	Day	14/09/2022	12:21:04 PM	12:40:39 PM	85	57	47	30	
5	Evening	11/10/2022	7:22:54 PM	7:37:54 PM	66	44	43	34	
6	Evening	18/09/2022	6:00:00 PM	6:15:00 PM	61	47	50	42	*
7	Evening	18/09/2022	7:00:00 PM	7:15:00 PM	53	45	47	40	*
8	Evening	18/09/2022	8:15:00 PM	8:30:00 PM	50	39	42	35	*
9	Night	20/09/2022	12:30:00 AM	12:45:00 AM	37	27	29	24	*
10	Night	20/09/2022	2:15:00 AM	2:30:00 AM	33	24	25	22	*
11	Night	20/09/2022	4:15:00 AM	4:30:00 AM	32	24	26	22	*
12	Night	20/09/2022	6:30:00 AM	6:45:00 AM	72	44	40	26	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Intermittent loud bird calls from surrounding trees. Intermittent noise lawn mower on adjacent property. Occasional vehicle passbys on local road, combination of cars and motorcycles. Intermittent dog barking from adjacent house. Several planes flying overhead with approx. duration of 30 sec to 1 min with maximum sound levels in the range of 35 to 50 dBA.
Background noise	Distant traffic. Mechanical noise (possibly from a pool pump) from adjacent property (<30 dBA).
Evening	
Ambient noise	Intermittent loud bird calls. Periods with intermittent insect noise. Occasional vehicle passbys on local street. Movement in vegetation due to gusts of wind (e.g. grass and trees rustling). Several planes flying overhead with approx. duration of 30 sec to 1 min with maximum sound levels in the range of 42 to 47 dBA.
Background noise	Movement in vegetation due to wind (e.g. grass and trees rustling).
Night	
Ambient noise	Intermittent loud bird calls from a distance. Dog barking from neighbouring house. Movement in vegetation due to strong wind gusts (e.g. grass and trees rustling).
Background noise	Mechanical noise (possibly from a pool pump) from adjacent property (<30 dBA). Movement in vegetation due to wind (e.g. grass and trees rustling).

Site Details	M29 Lake Burragorang - 57 Burragorang Road (Nattai)
Start Date	Wed 14 September 2022
End Date	Mon 10 October 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	46
$L_{eq, Evening}$ dBA	42
$L_{eq, Night}$ dBA	44
RBL, $_{Day}$ dBA	25
RBL, $_{Evening}$ dBA	27
RBL, $_{Night}$ dBA	24

Daily Summary

Date	14/09	15/09	16/09	17/09	18/09	19/09	20/09	21/09
$L_{eq, Day}$ dBA	51	43	46	46	52	48	42	41
$L_{eq, Evening}$ dBA	36	36	35	47	46	40	37	34
$L_{eq, Night}$ dBA	32	33	36	55	45	36	33	40
ABL, $_{Day}$ dBA	27	23	25	25	41	29	23	25
ABL, $_{Evening}$ dBA	27	28	24	30	34	28	26	20
ABL, $_{Night}$ dBA	20	20	22	41	28	21	22	20

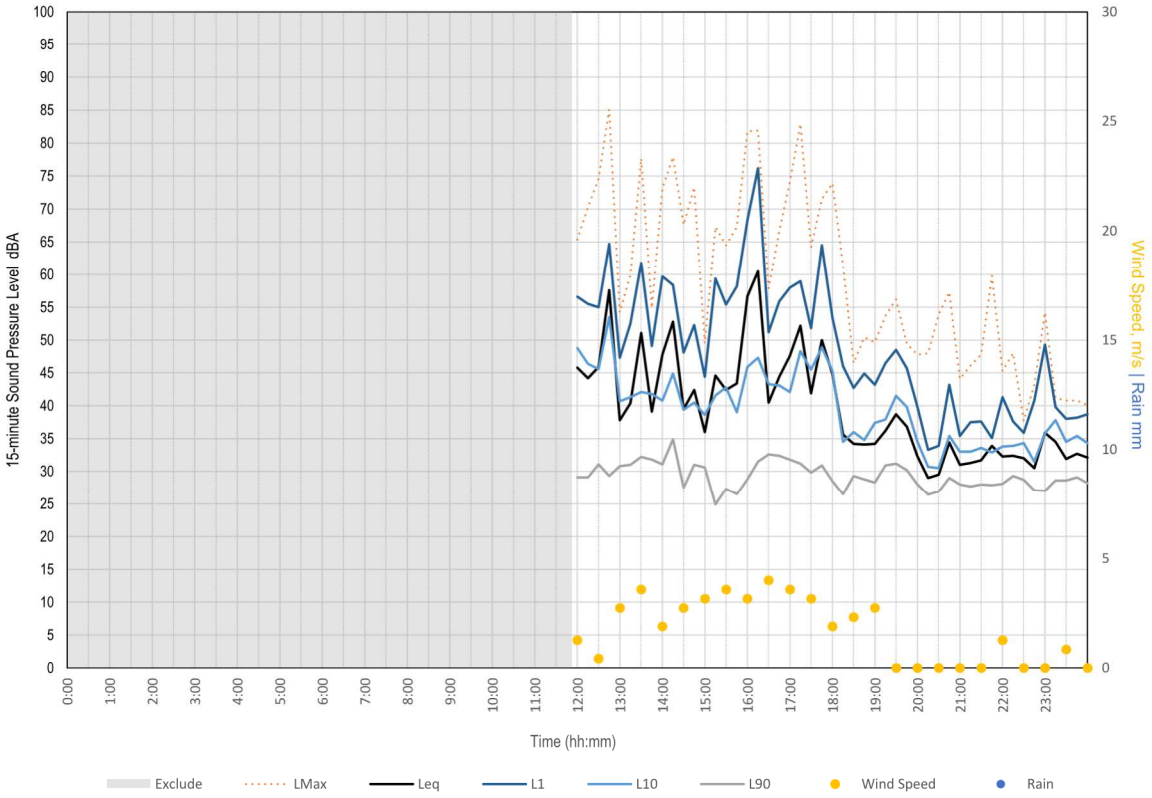
Date	22/09	23/09	24/09	25/09	26/09	27/09
$L_{eq, Day}$ dBA	45	42	42	47	43	41
$L_{eq, Evening}$ dBA	39	37	37	33	41	
$L_{eq, Night}$ dBA	34	36	38	32	37	
ABL, $_{Day}$ dBA	25	25	26	26	23	24
ABL, $_{Evening}$ dBA	30	27	26	20	21	
ABL, $_{Night}$ dBA	26	25	26	20	19	

Date	29/09	30/09	01/10	02/10	03/10	04/10	05/10	06/10
$L_{eq, Day}$ dBA	48	44	43	44	47	44	52	45
$L_{eq, Evening}$ dBA	48	45	39	37	34	37	49	40
$L_{eq, Night}$ dBA	43	39	36	32	36	38	48	39
ABL, $_{Day}$ dBA	30	27	24	25	23	24	37	28
ABL, $_{Evening}$ dBA	37	35	24	26	25	25	41	32
ABL, $_{Night}$ dBA	31	24	27	21	20	26	37	27

Date	07/10	08/10	09/10
$L_{eq, Day}$ dBA	49	41	46
$L_{eq, Evening}$ dBA	41		41
$L_{eq, Night}$ dBA	39	46	36
ABL, $_{Day}$ dBA	27	25	25
ABL, $_{Evening}$ dBA	33		27
ABL, $_{Night}$ dBA	28	40	26

Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

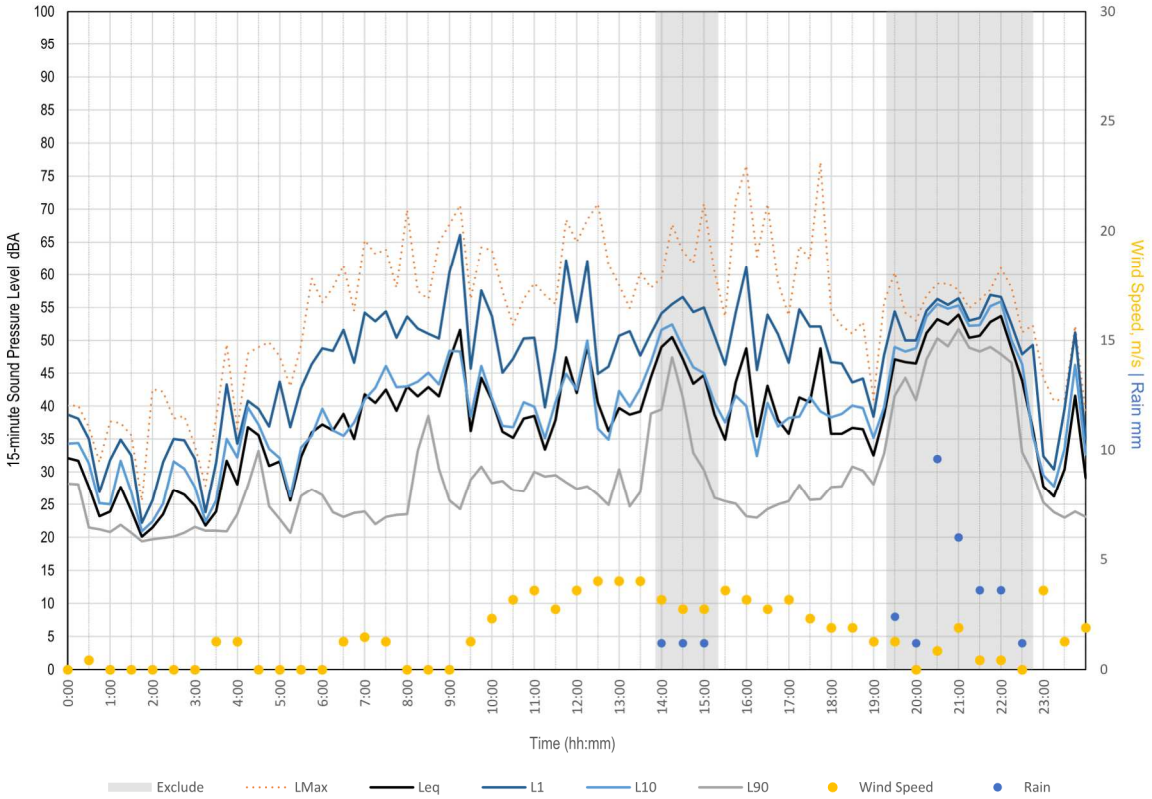
Wednesday, 14 September 2022



Noise Logger Results

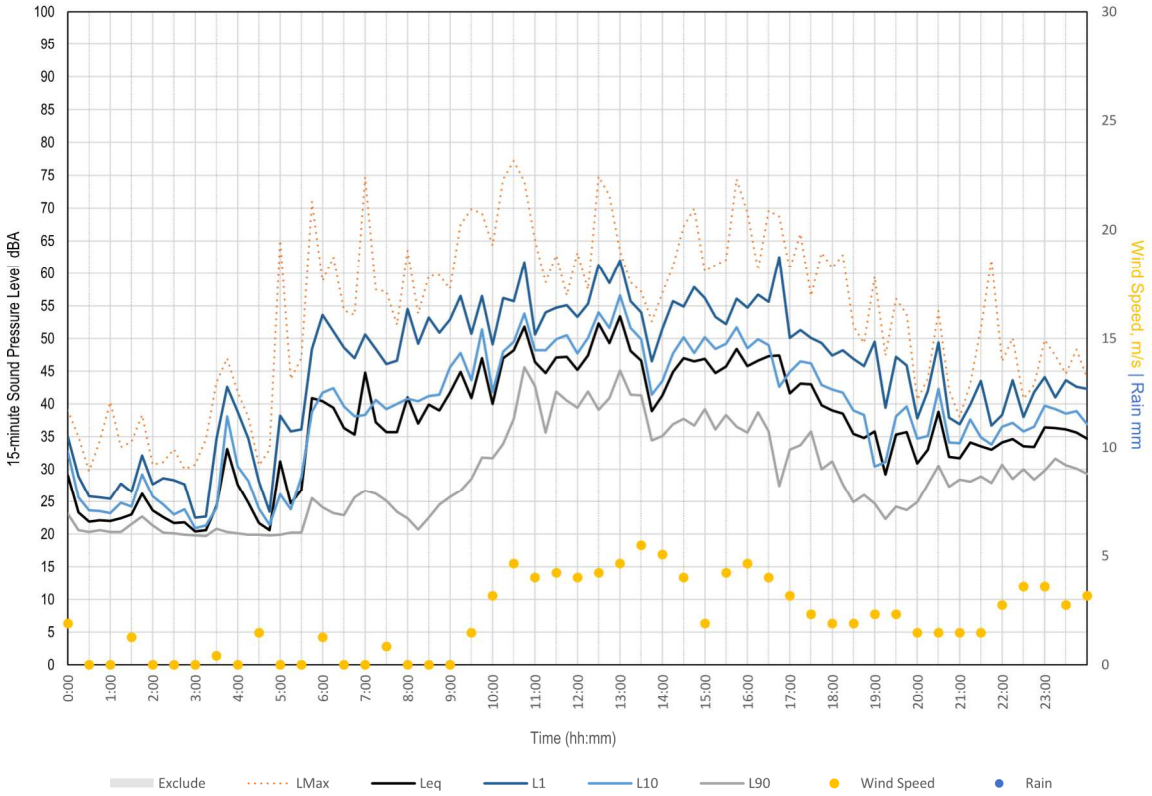
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Thursday, 15 September 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

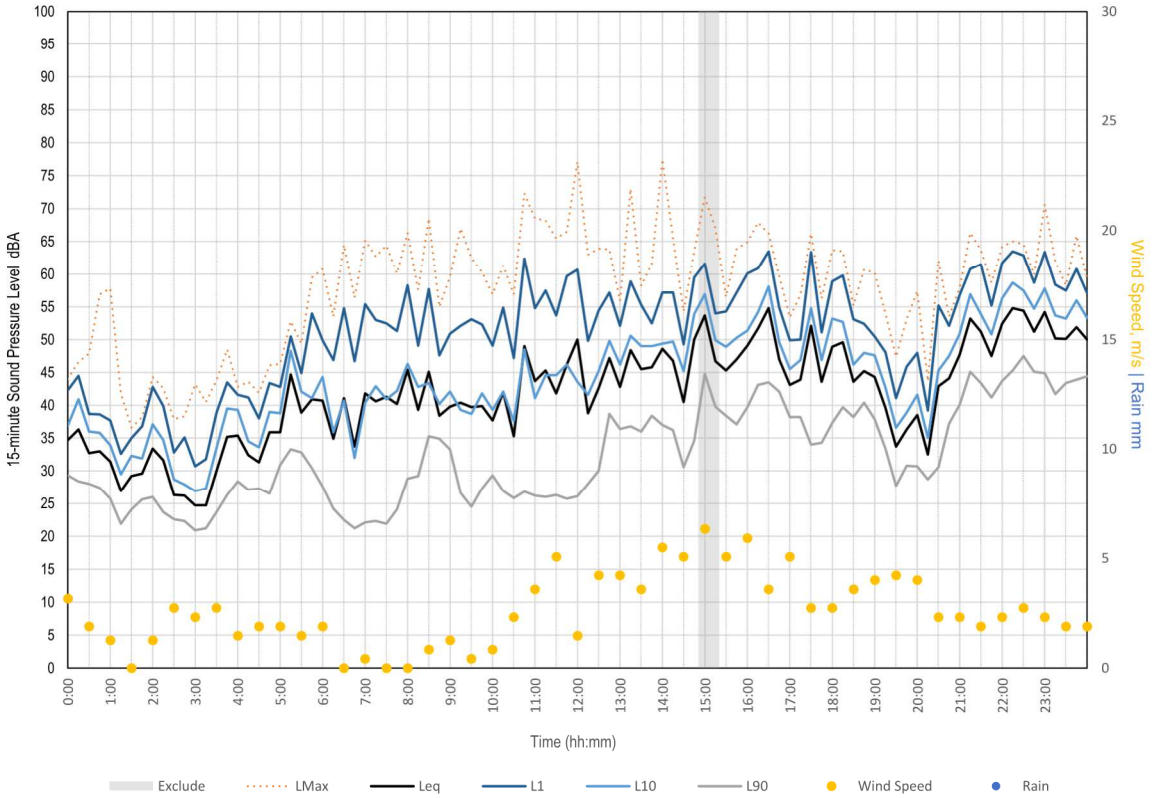
Friday, 16 September 2022



Noise Logger Results

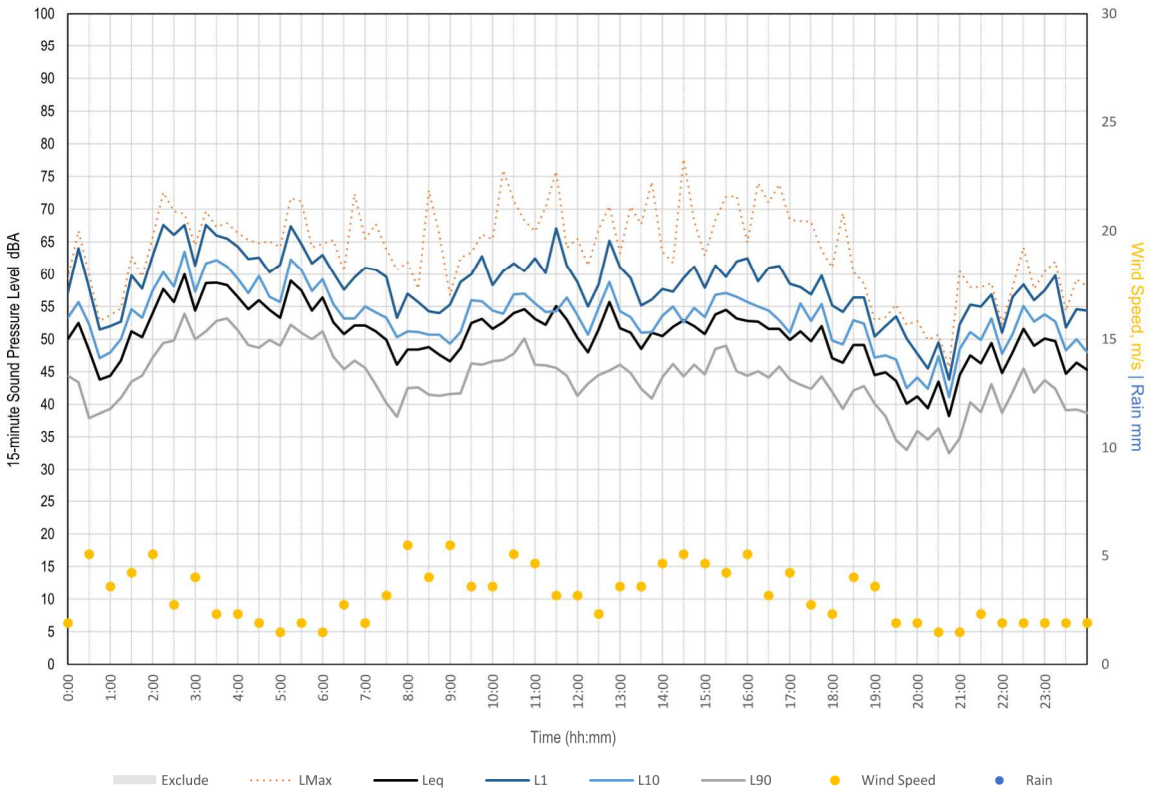
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Saturday, 17 September 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

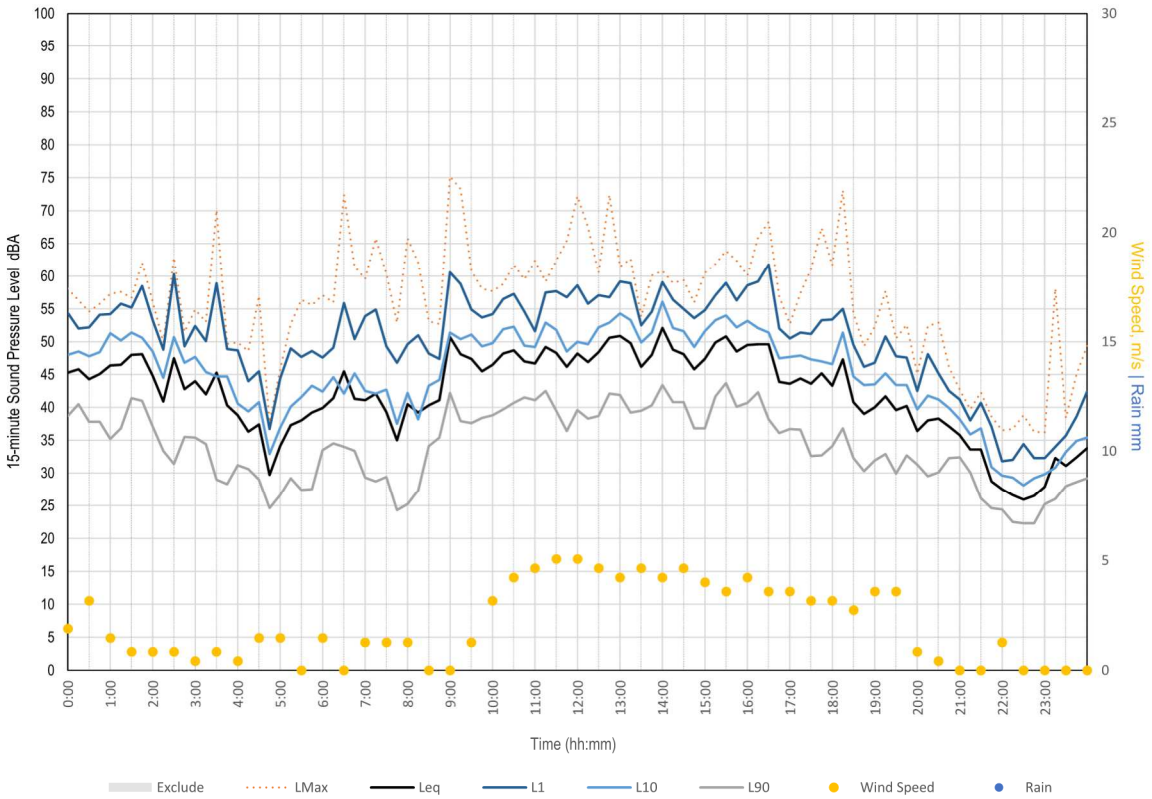
Sunday, 18 September 2022



Noise Logger Results

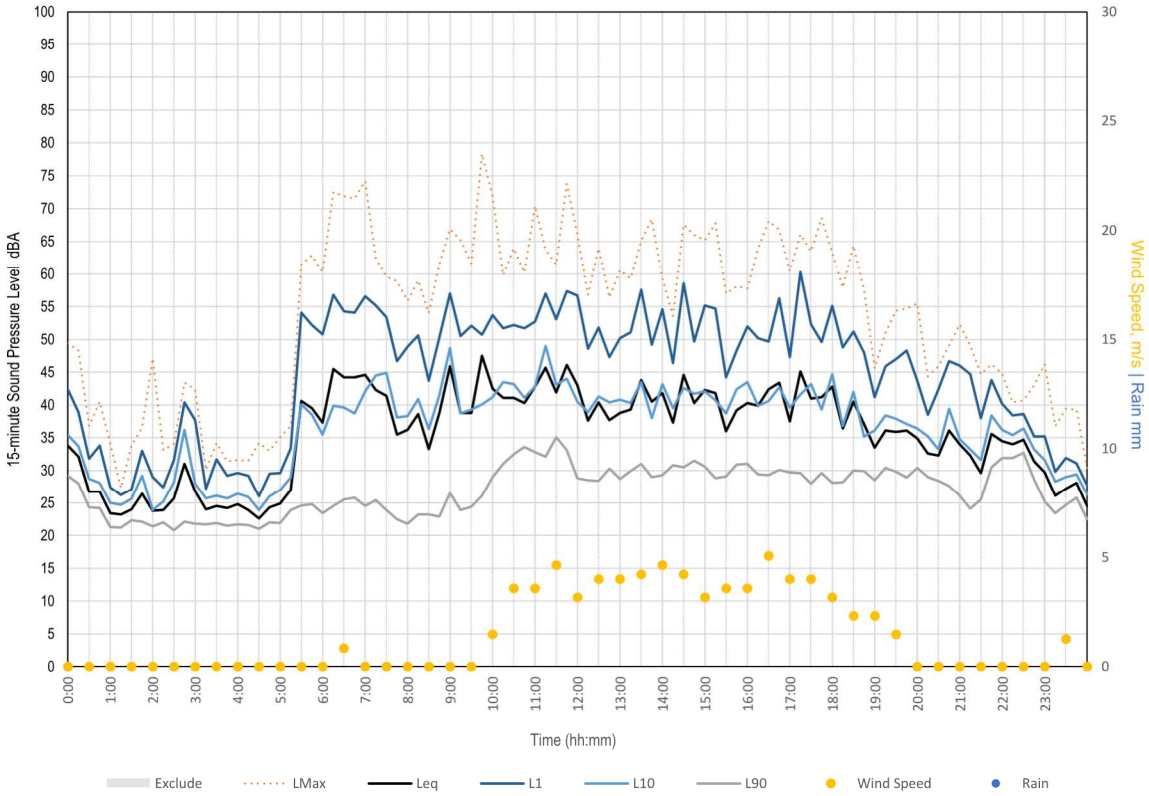
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Monday, 19 September 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

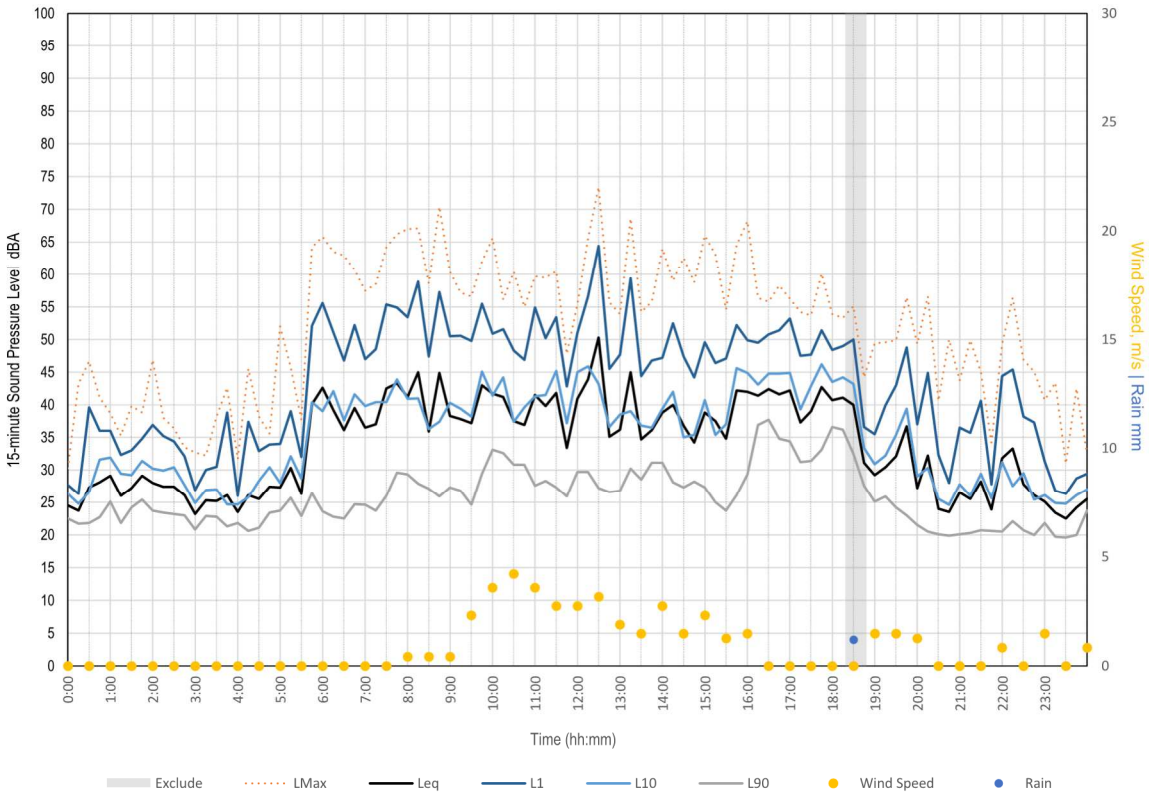
Tuesday, 20 September 2022



Noise Logger Results

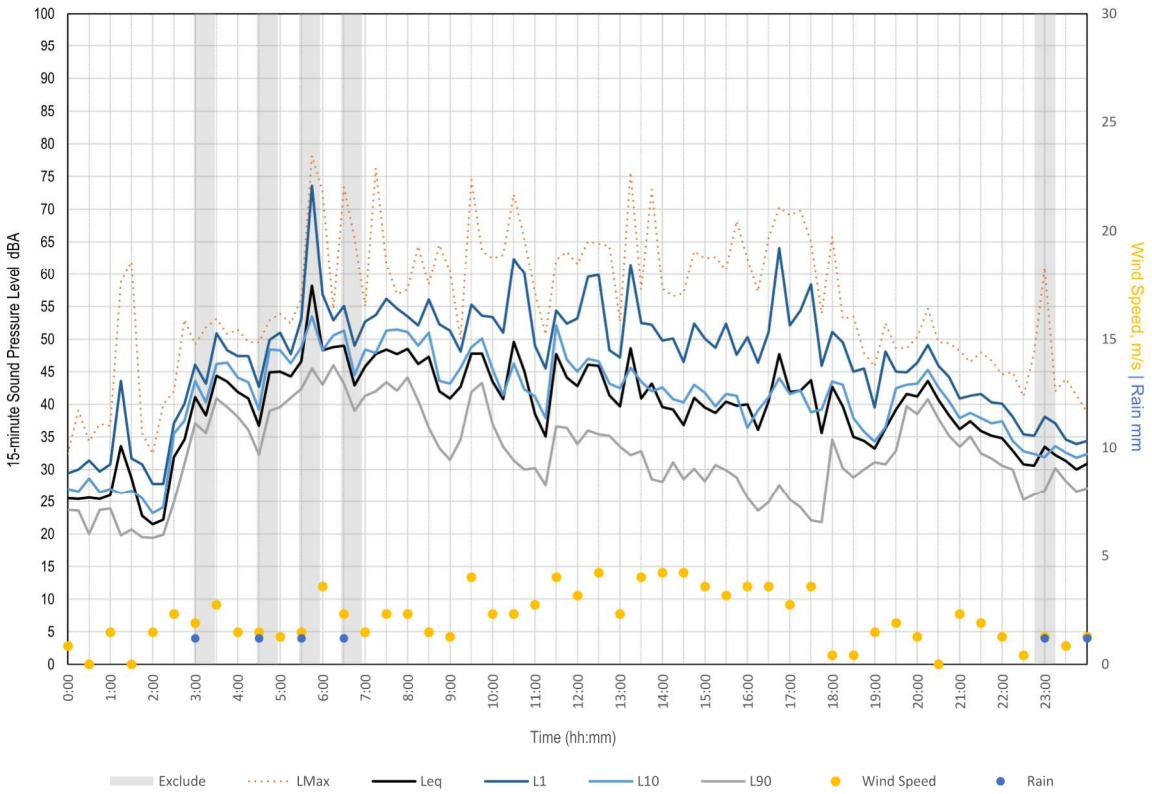
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Wednesday, 21 September 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

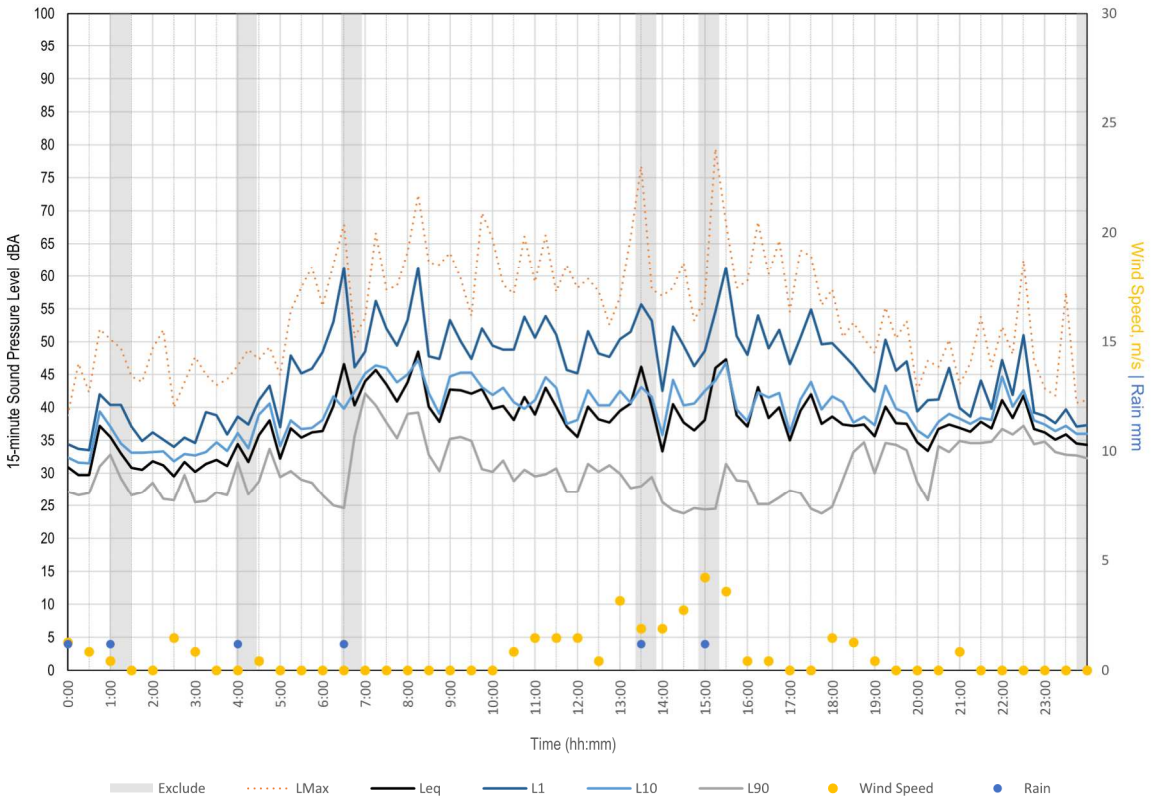
Thursday, 22 September 2022



Noise Logger Results

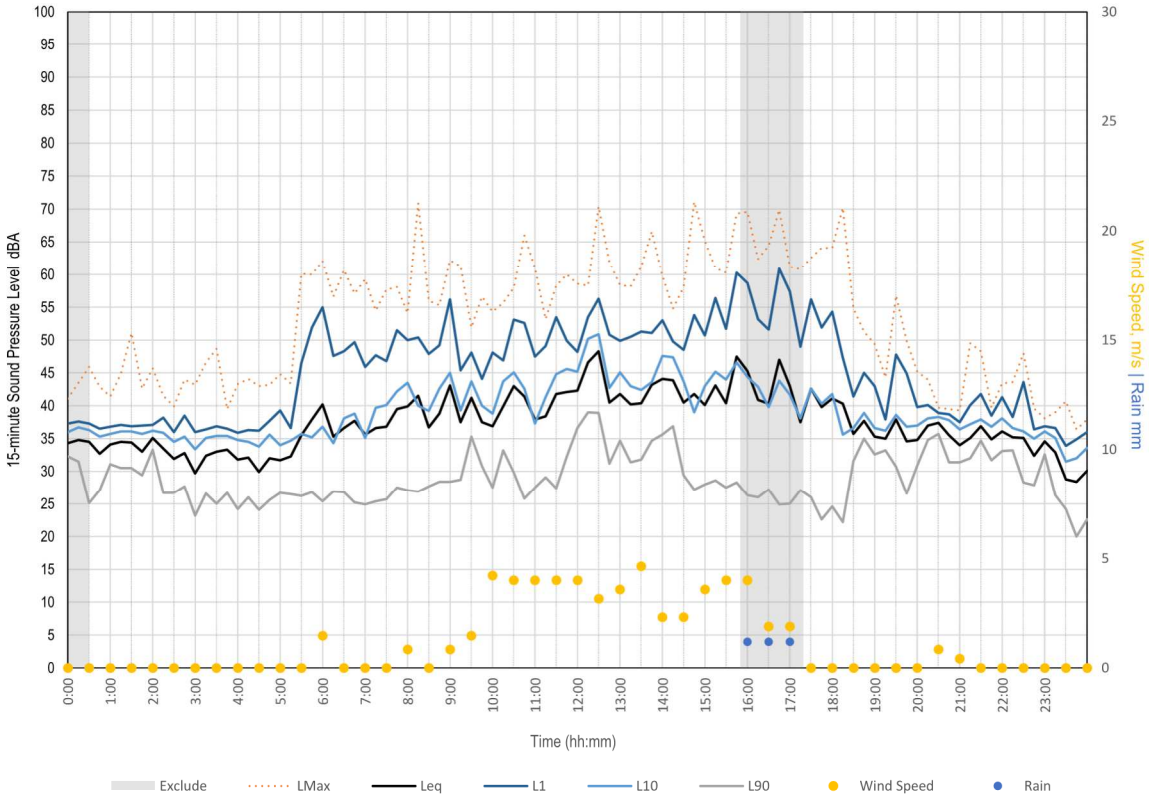
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Friday, 23 September 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Saturday, 24 September 2022



Noise Logger Results

Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

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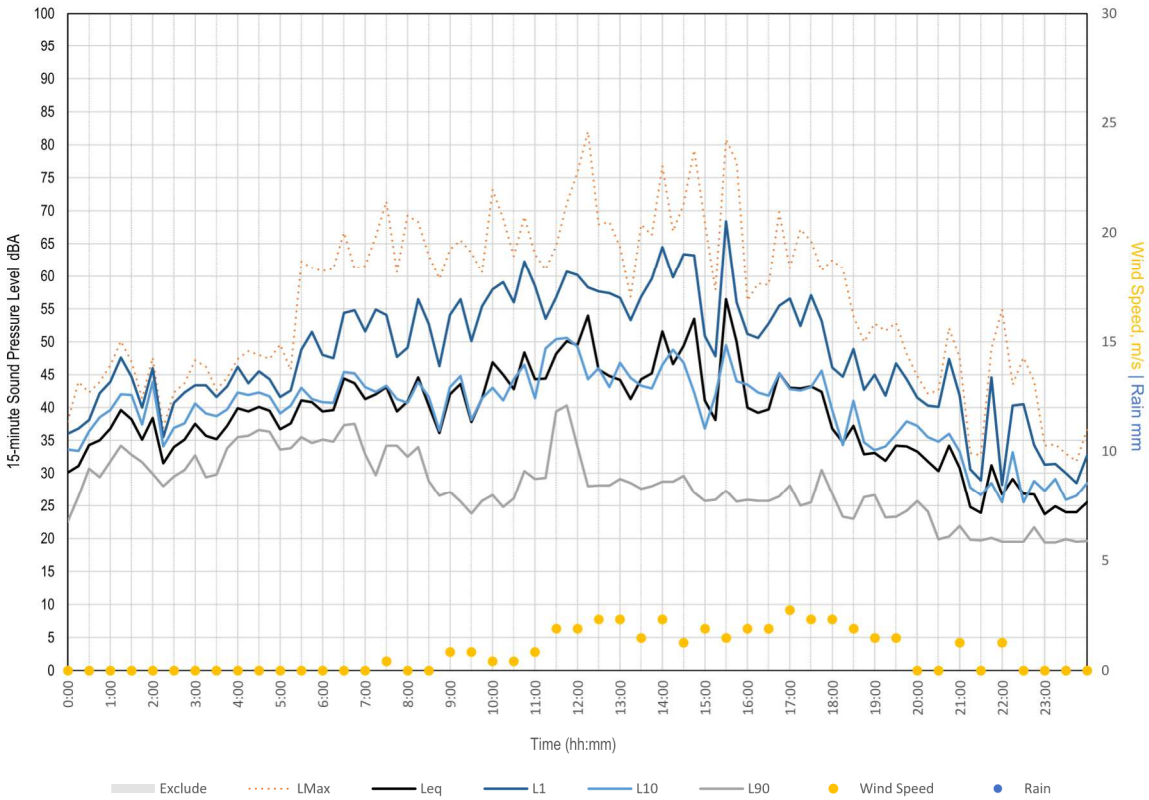

Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

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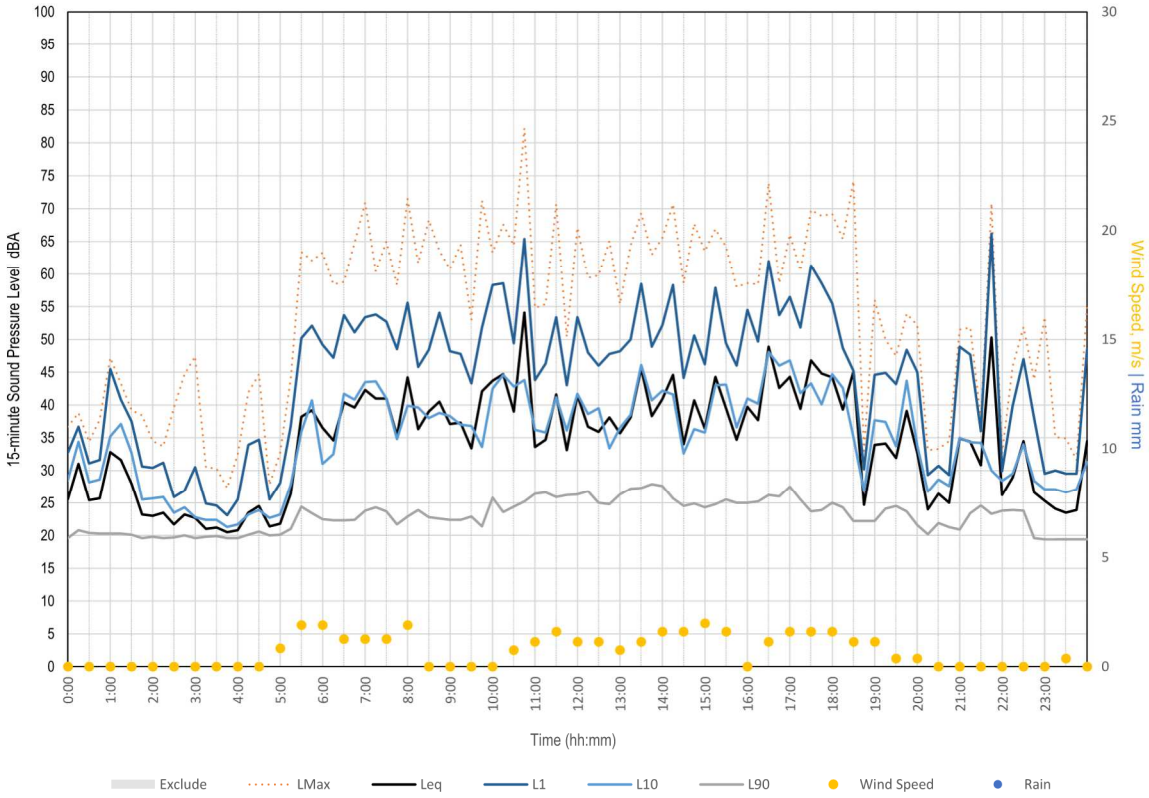

Noise Logger Results

Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

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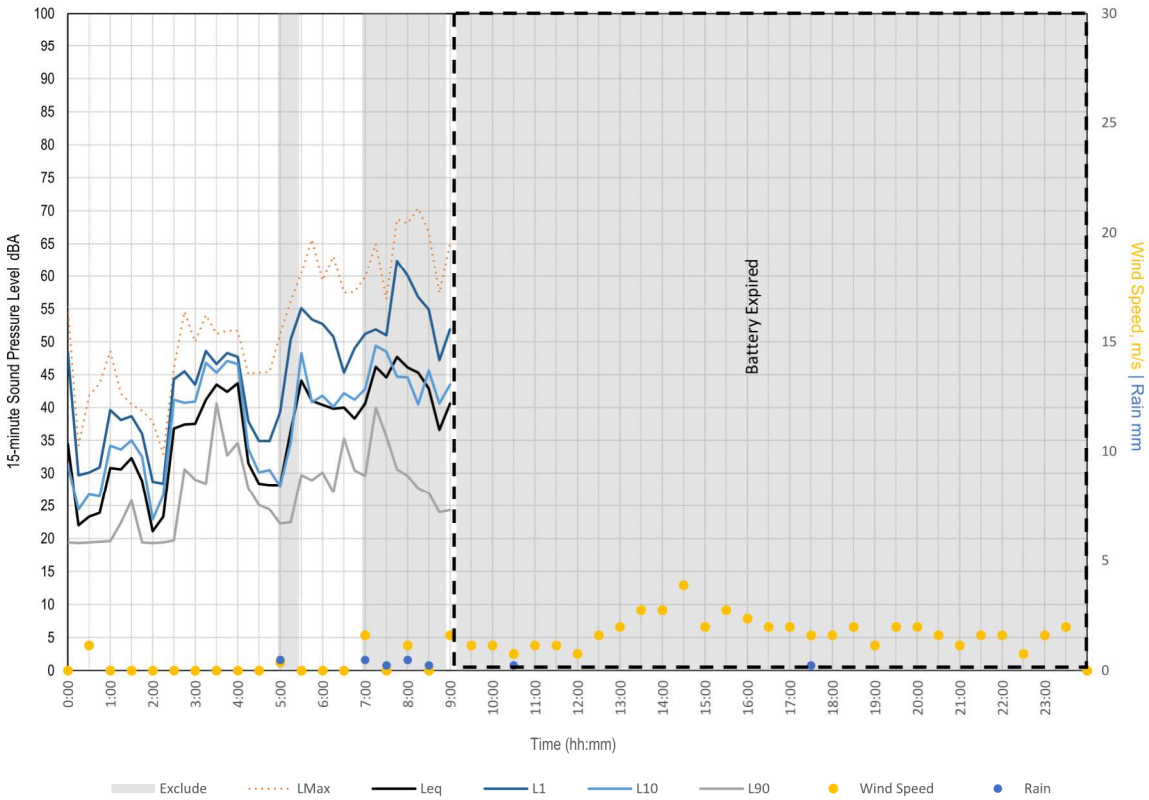
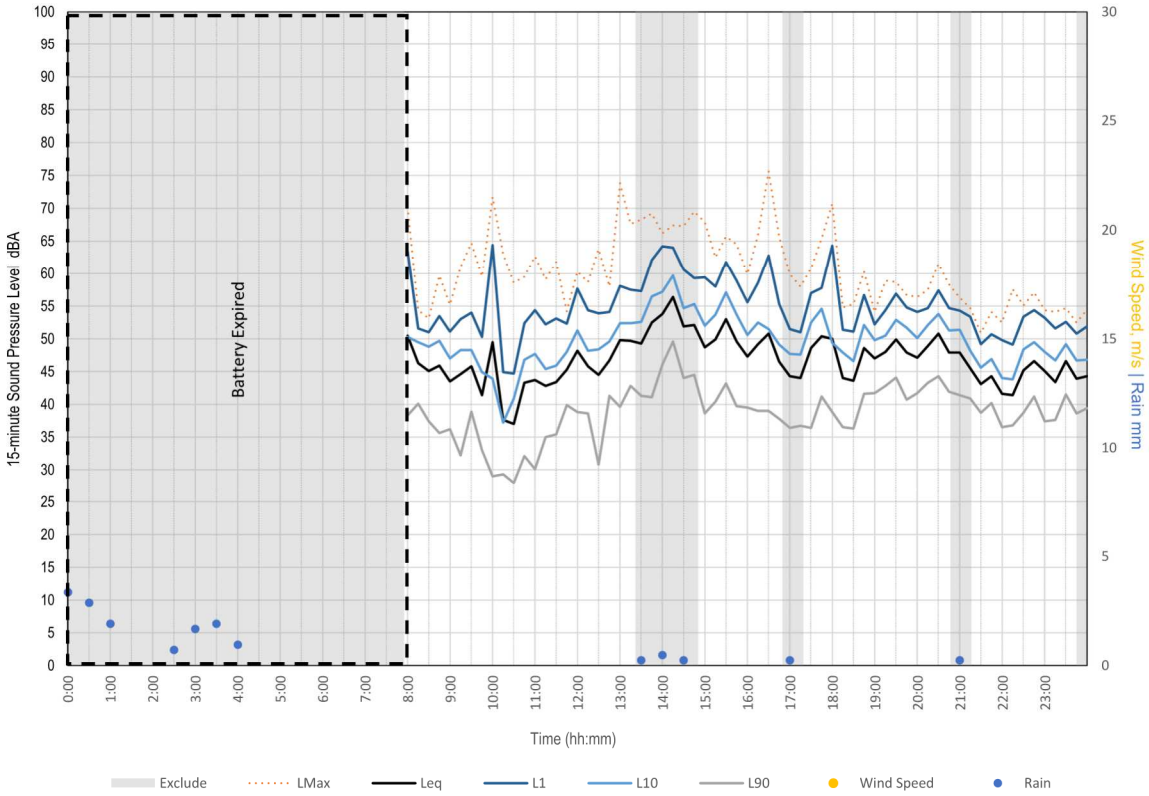


Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

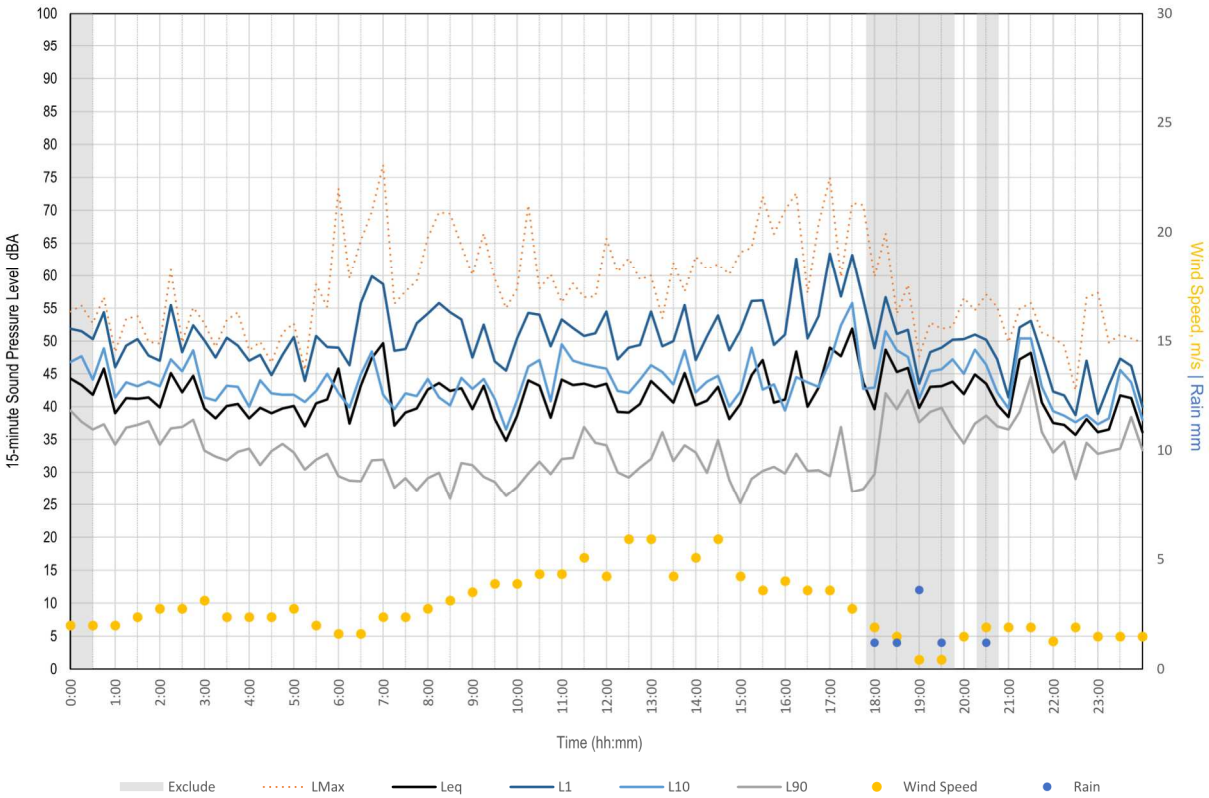
Thursday, 29 September 2022



Noise Logger Results

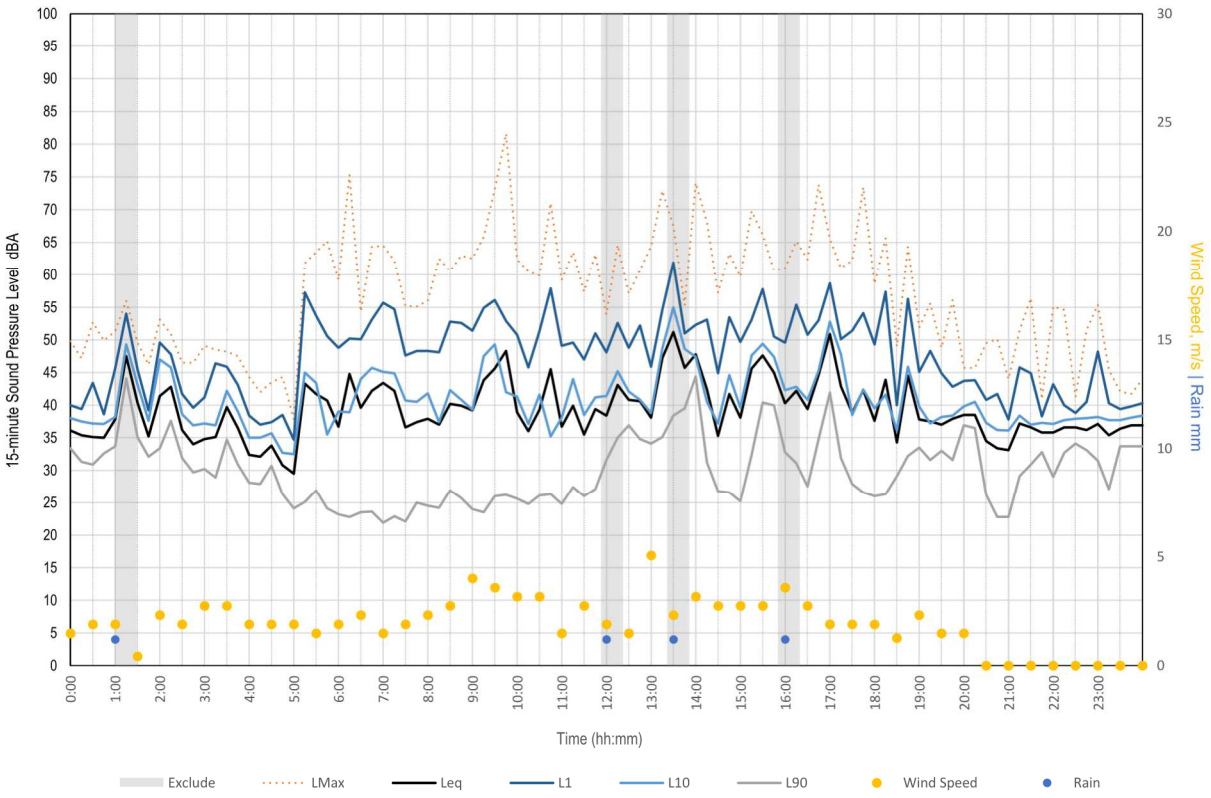
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Friday, 30 September 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

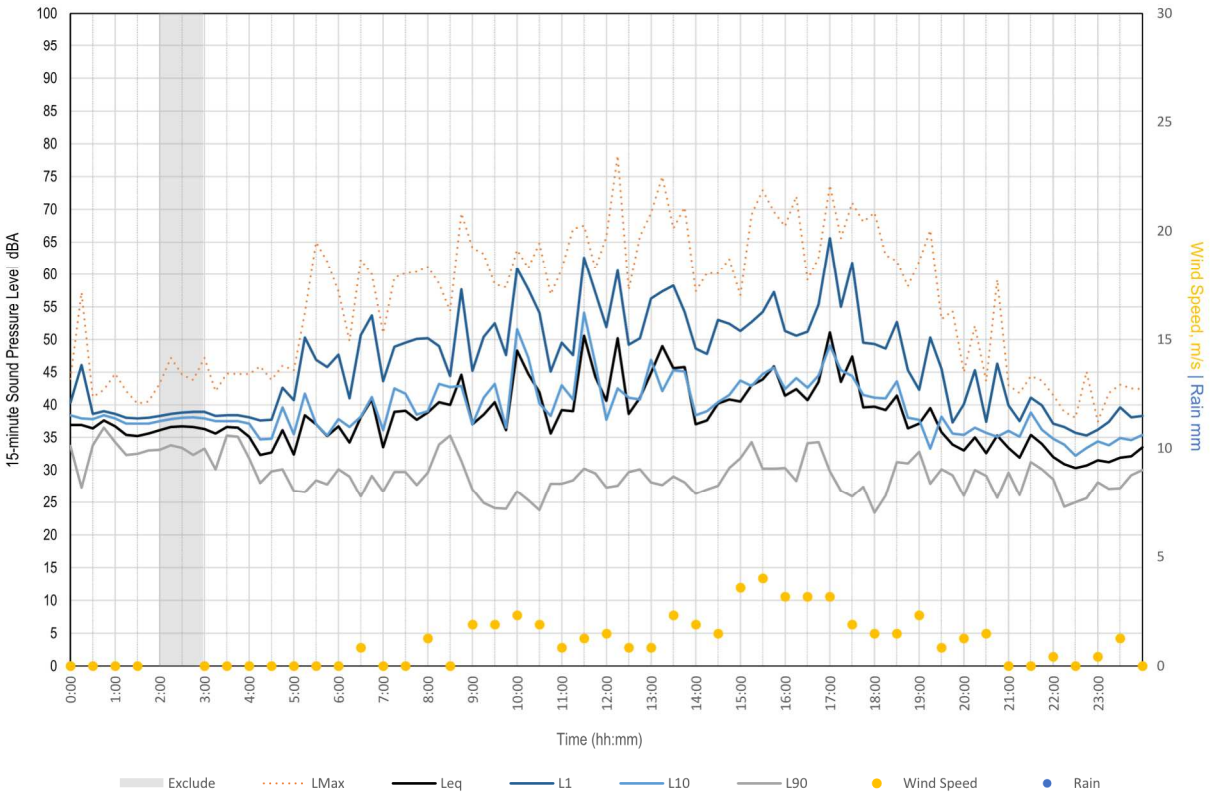
Saturday, 01 October 2022



Noise Logger Results

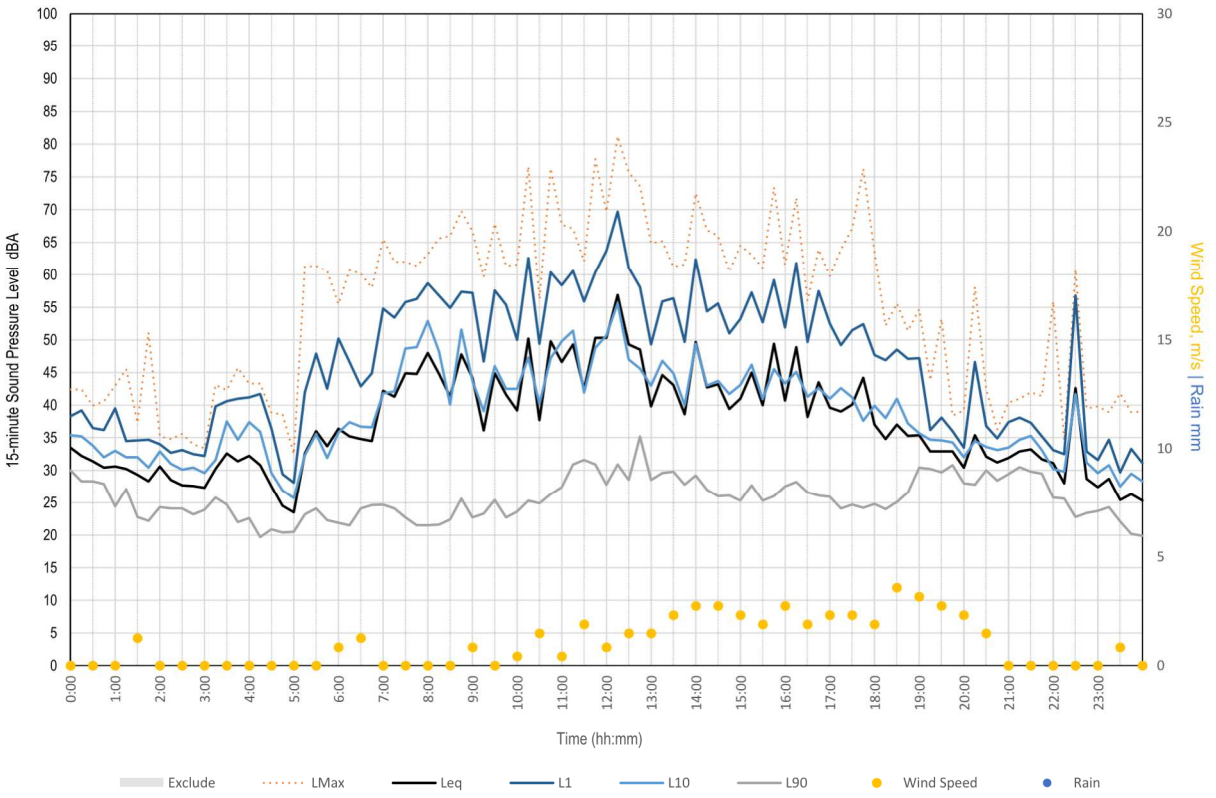
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Sunday, 02 October 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

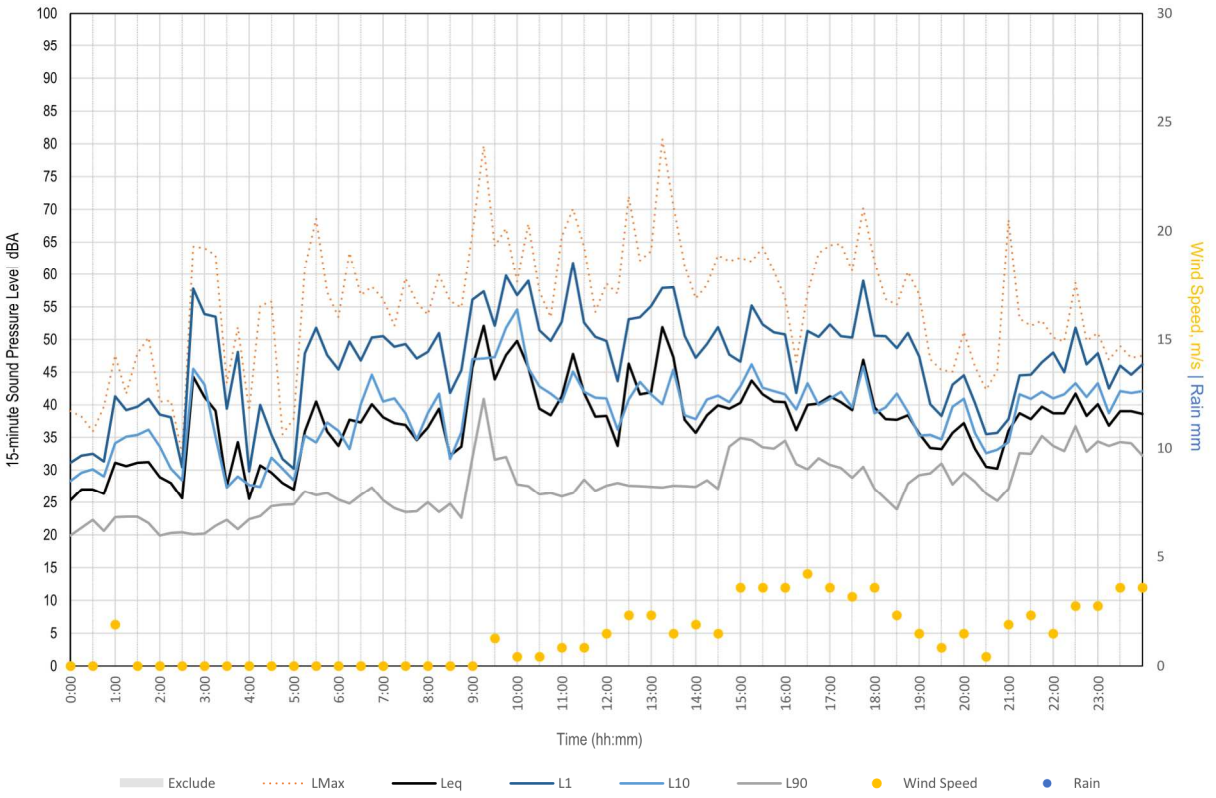
Monday, 03 October 2022



Noise Logger Results

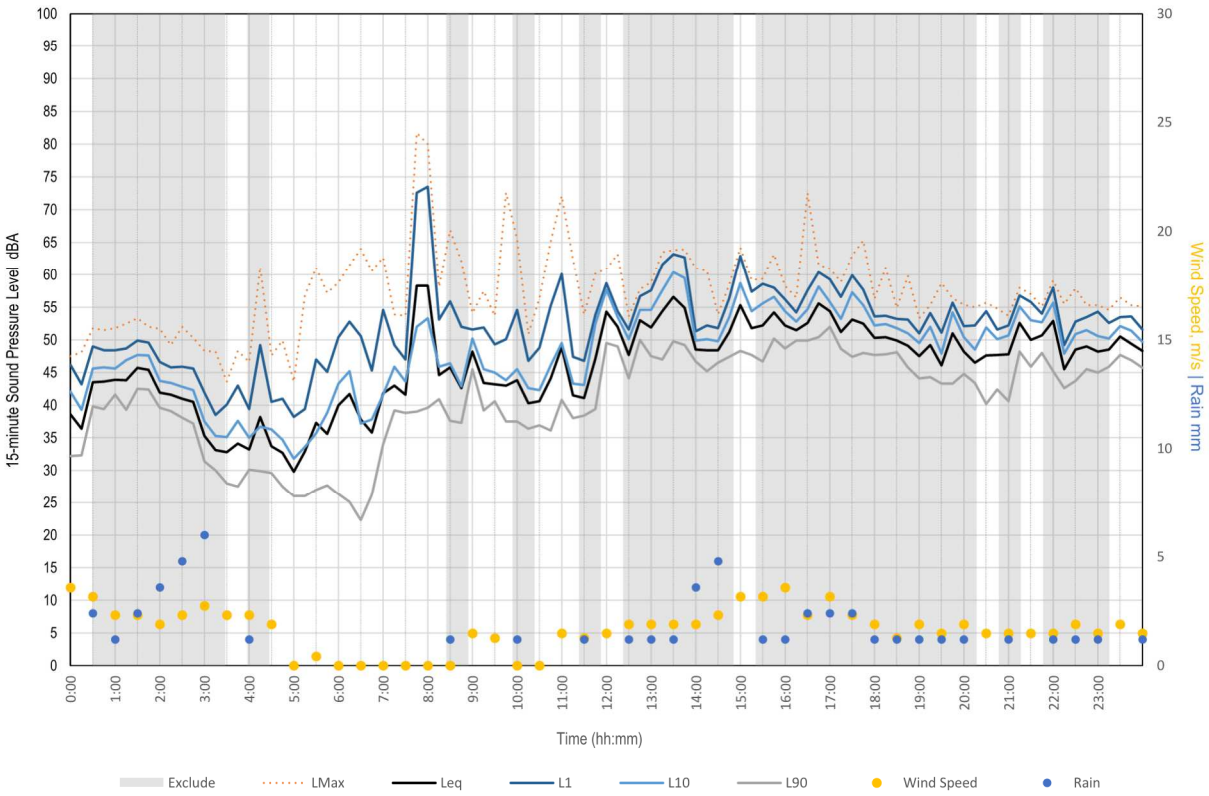
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Tuesday, 04 October 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

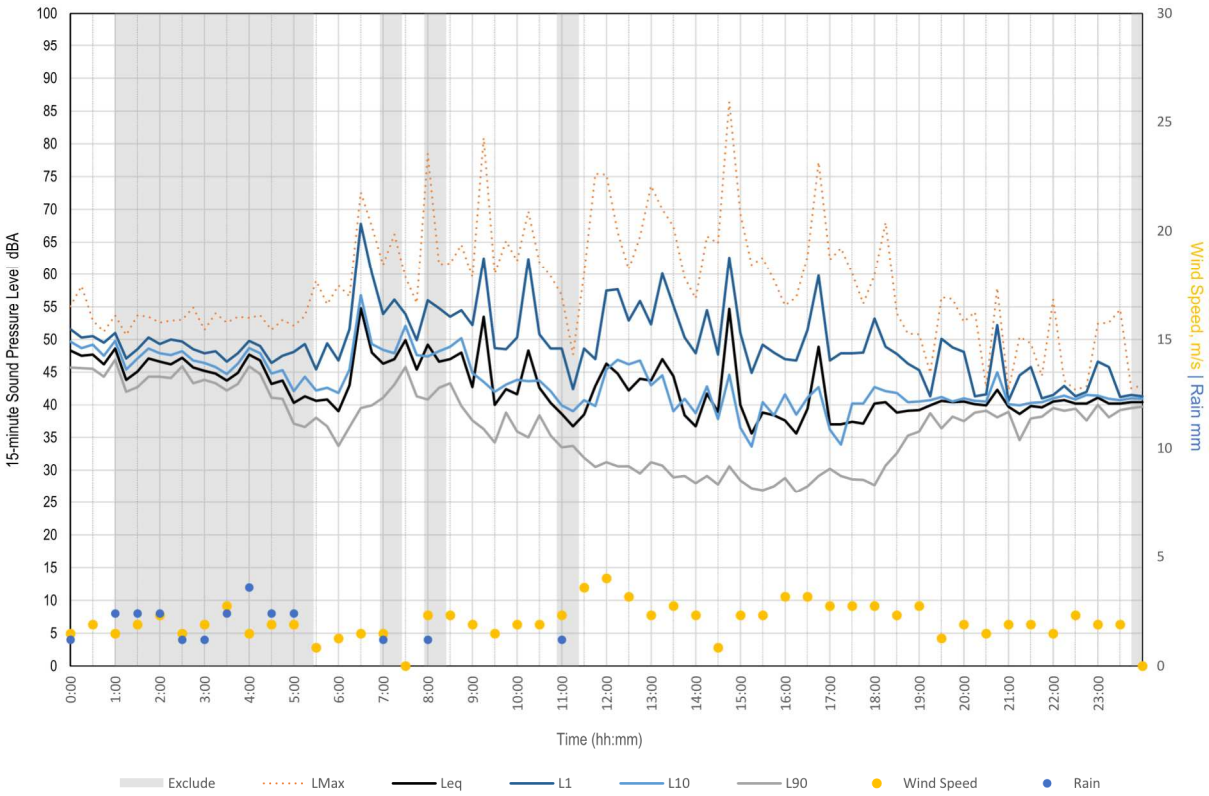
Wednesday, 05 October 2022



Noise Logger Results

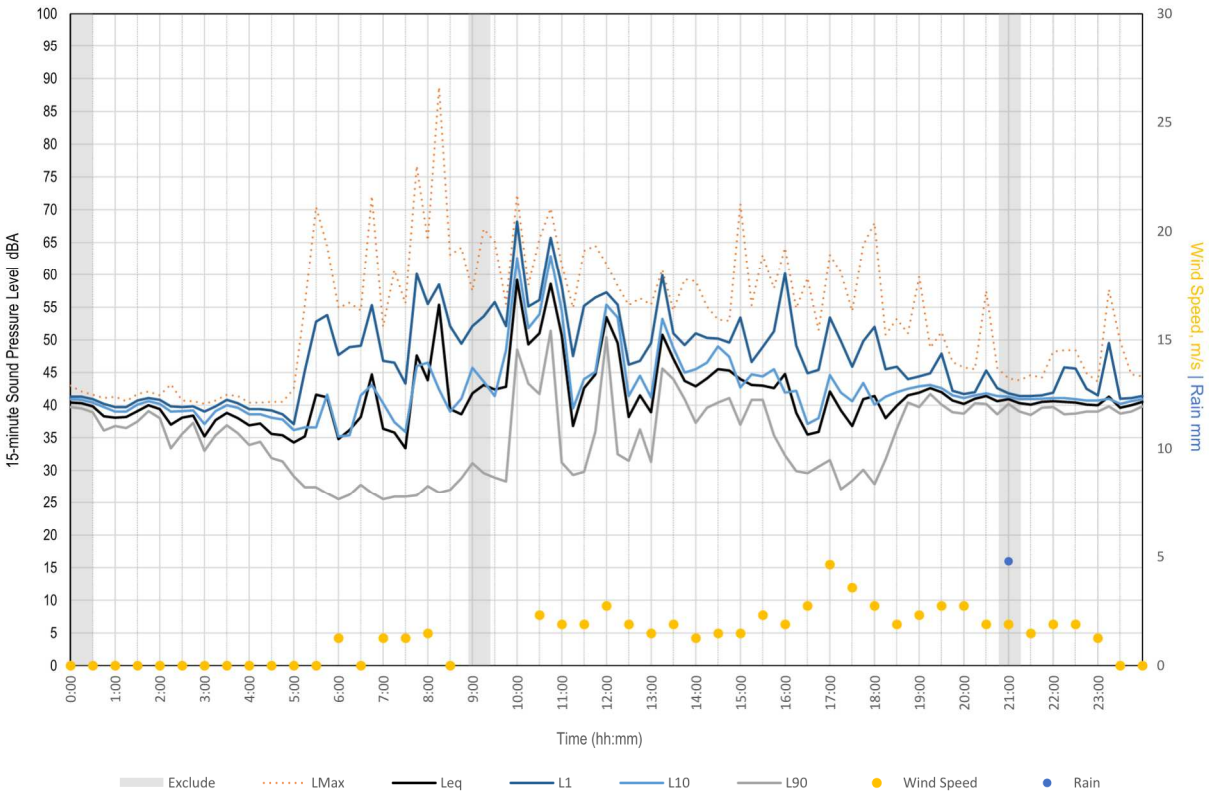
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Thursday, 06 October 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

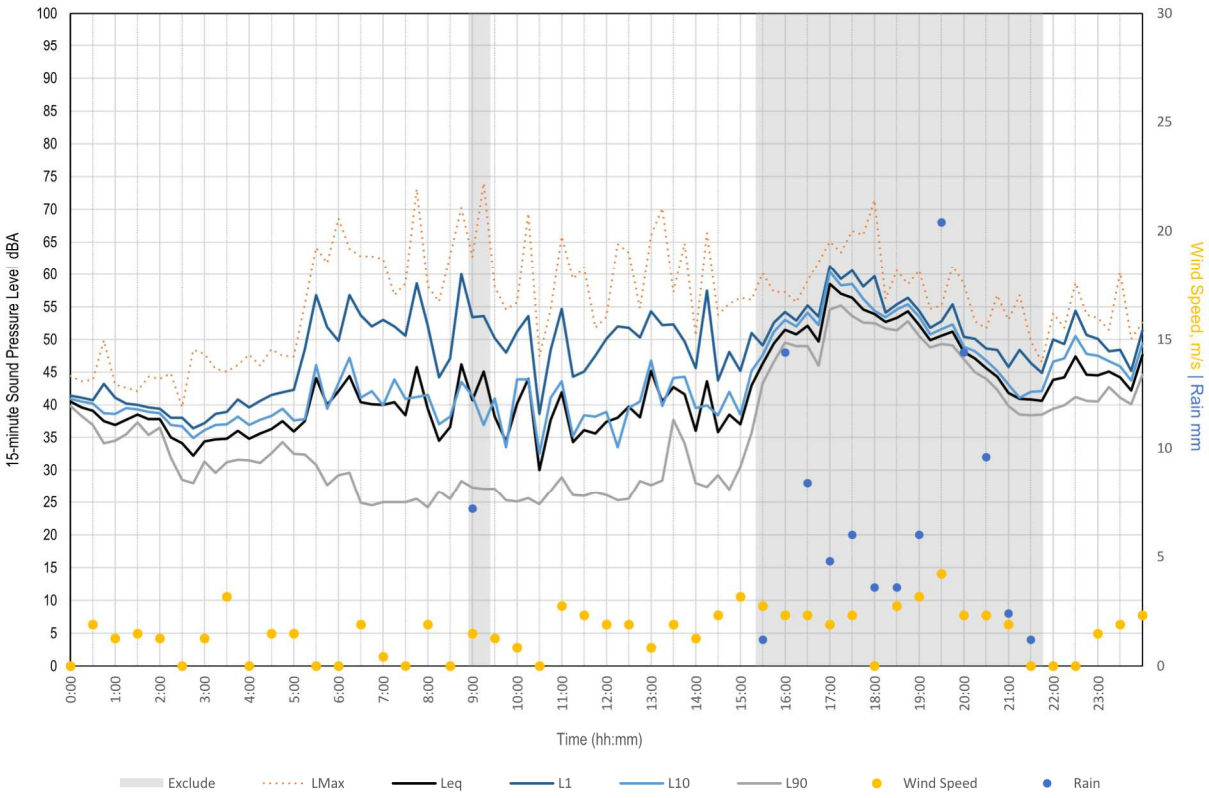
Friday, 07 October 2022



Noise Logger Results

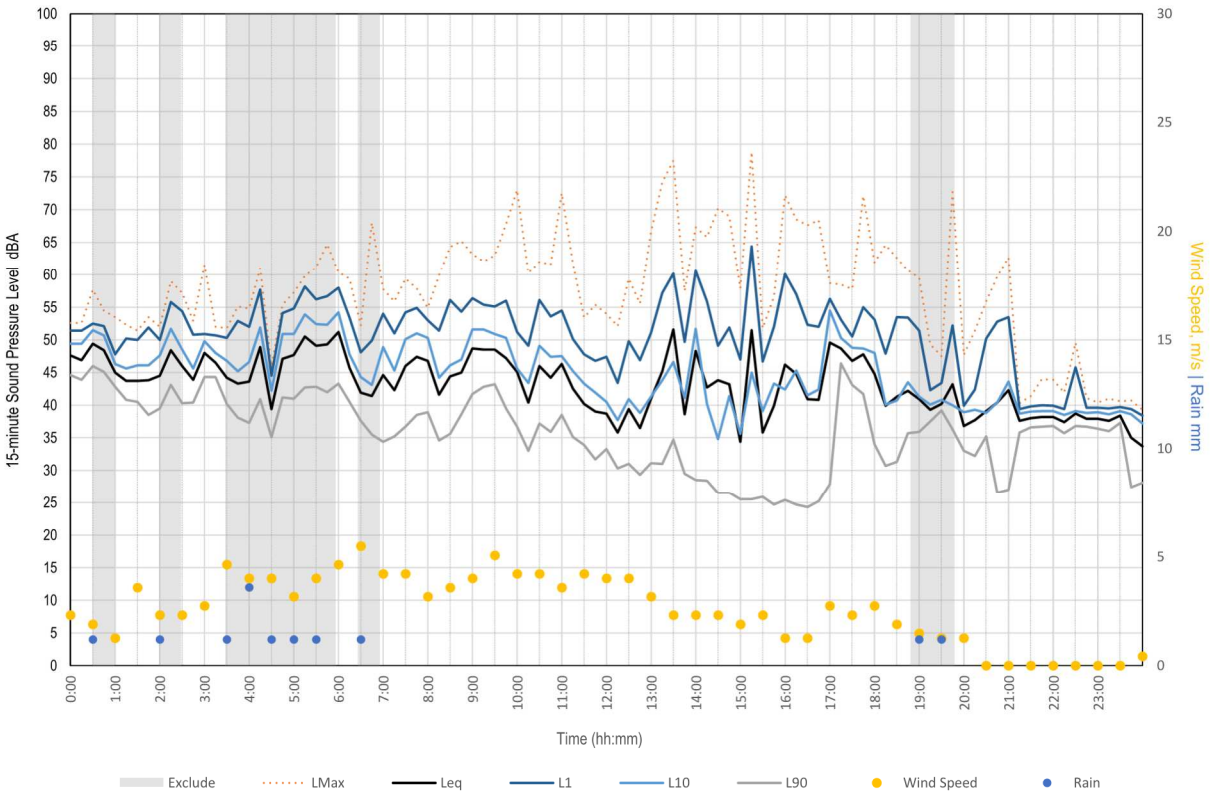
Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Saturday, 08 October 2022



Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

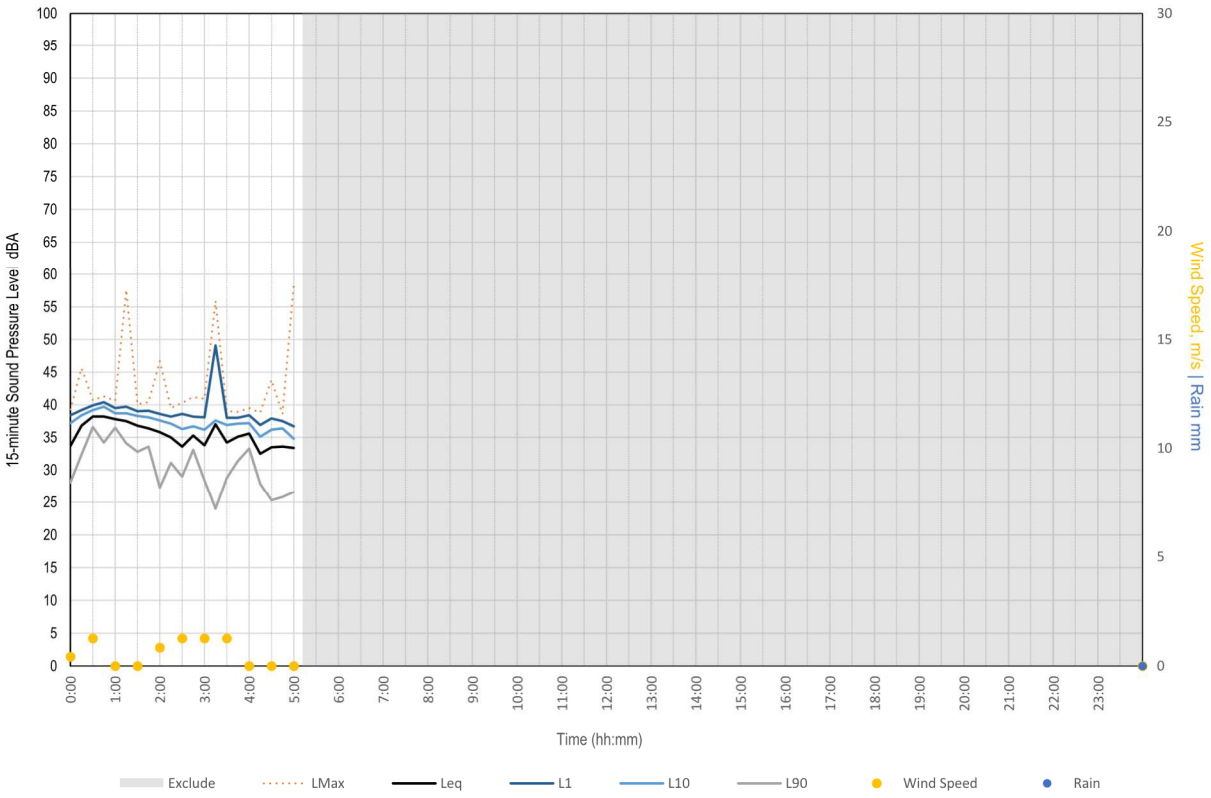
Sunday, 09 October 2022



Noise Logger Results

Measured Noise Levels - M29 Lake Burragorang - 57 Burragorang Road (Nattai)

Monday, 10 October 2022



Background Noise Monitoring

Location	M30 - 8 Chivers Place (Tahmoor)	**Project**	Western Sydney International Airport (WSI)
Test Type	Unattended noise logging with attended on-site monitoring	**Engineer**	LE & MUA

Unattended Equipment					**Attended Equipment**				
Equipment	**Model:**	ARL Ngara	**Serial No. :**	878043	**Equipment**	**Model:**	NTi XL2	**Serial No. :**	A2A-18160-E0
Calibration	**Pre:**	93.6 dBA	**Post:**	93.6 dBA	**Calibration**	**Pre:**	93.8 dBA	**Post:**	93.5 dBA
Microphone	**Position:**	Free field	**Height:**	1.35m	**Microphone**	**Position:**	Free field	**Height:**	1.5 m
Interval:	15 min				**Interval:**	15 minutes			

Date Start	Wednesday, 14 Sep 2022
Date End	Tuesday, 11 Oct 2022
No. of days	28
No. of nights	27

Weather	
Station	BoM
Station Info	Campbell Town
Distance	< 30 km
Threshold*	Wind 5 m/s, Rain 0mm /hr

*for exclusion of dataset

Unattended Equipment Setup



Site Map



Site Notes

Logger placed at northern end of backyard; ≥ 4 metres away from house and fence and ≥ 1.5 metres away from roof. Logger could not be placed further from roof due to resident and other site constraints.
Post processing indicated a mechanical unit was active during most of monitoring period, affecting data from Day 4 onwards. This unit was not active during deployment or battery change nor mentioned by resident and was not considered at site selection. It is recommended that data from Days 1 to 4 be used for the purpose of background noise investigations at this location.

Attended Measurement Results (dBA)

No.	Period	Date	Start Time	Stop Time	L_{FMAX}	L_{eq}	L_{10}	L_{90}	
1	Day	14/09/2022	2:26:34 PM	2:41:34 PM	75	49	50	37	
2	Day	14/09/2022	2:44:02 PM	2:59:29 PM	75	45	48	37	
3	Day	14/09/2022	3:07:40 PM	3:23:30 PM	72	51	54	40	
4	Day	14/09/2022	3:26:22 PM	3:41:22 PM	65	50	54	37	
5	Evening	11/10/2022	9:03:12 PM	9:18:12 PM	58	43	45	40	
6	Evening	16/09/2022	6:30:00 PM	6:45:00 PM	60	46	47	43	*
7	Evening	16/09/2022	7:30:00 PM	7:45:00 PM	57	43	45	40	*
8	Evening	16/09/2022	8:30:00 PM	8:45:00 PM	54	43	46	40	*
9	Night	20/09/2022	12:15:00 AM	12:30:00 AM	46	40	41	39	*
10	Night	20/09/2022	2:30:00 AM	2:45:00 AM	50	40	41	39	*
11	Night	20/09/2022	4:30:00 AM	4:45:00 AM	54	42	45	40	*
12	Night	20/09/2022	6:00:00 AM	6:15:00 AM	80	52	52	43	*

* Performed remotely due to personal safety concerns and/or access restrictions

General comments on attended monitoring / Characteristics of noise environment	
Day	
Ambient noise	Occasional vehicle passbys. Intermittent loud bird calls from surrounding trees. Suburban noise (e.g. neighbours talking). Intermittent dog barks. Movement in vegetation due to gusts of wind (e.g. trees rustling). Several aircraft flying overhead with approx. duration of 30 sec to 1 min with maximum sound levels in the range of 38 to 53 dBA.
Background noise	Constant bird noise. Traffic in distance, likely Old Hume Highway, combination of light and heavy vehicles.
Evening	
Ambient noise	Suburban noise (e.g. music playing, objects being moved). Intermittent vehicle related noise (e.g. sirens). Several aircraft flying overhead with an approx. duration of 30 sec to 1 min with a maximum sound level in the range of 46 to 58 dBA.
Background noise	Constant mechanical noise from outdoor condenser unit within garden (approx. 40 dBA).
Night	
Ambient noise	Dominated by bird noise from surrounding trees. Movement in vegetation due to gusts of wind (e.g. trees rustling). Occasional vehicle passbys on local street. Several aircraft flying overhead with an approximate duration of 30 sec to 1 min with a maximum sound level in the range of 48 to 64 dBA.
Background noise	Constant bird noise. Constant mechanical noise from outdoor condenser unit (approx. 40 dBA).

Site Details	M30 - 8 Chivers Place (Tahmoor)
Start Date	Wed 14 September 2022
End Date	Tue 11 October 2022

Summary	**Average (dBA)**
$L_{eq, Day}$ dBA	56
$L_{eq, Evening}$ dBA	46
$L_{eq, Night}$ dBA	48
RBL, $_{Day}$ dBA	40
RBL, $_{Evening}$ dBA	39
RBL, $_{Night}$ dBA	38

Daily Summary

Date	14/09	15/09	16/09	17/09	18/09	19/09	20/09	21/09
$L_{eq, Day}$ dBA	53	53	48	54	53	55	55	54
$L_{eq, Evening}$ dBA	42	43	44	44	45	44	46	46
$L_{eq, Night}$ dBA	45	49	47	47	45	47	46	44
ABL, $_{Day}$ dBA	37	36	36	40	39	40	40	40
ABL, $_{Evening}$ dBA	32	36	39	38	40	39	40	39
ABL, $_{Night}$ dBA	25	24	38	38	38	39	39	39

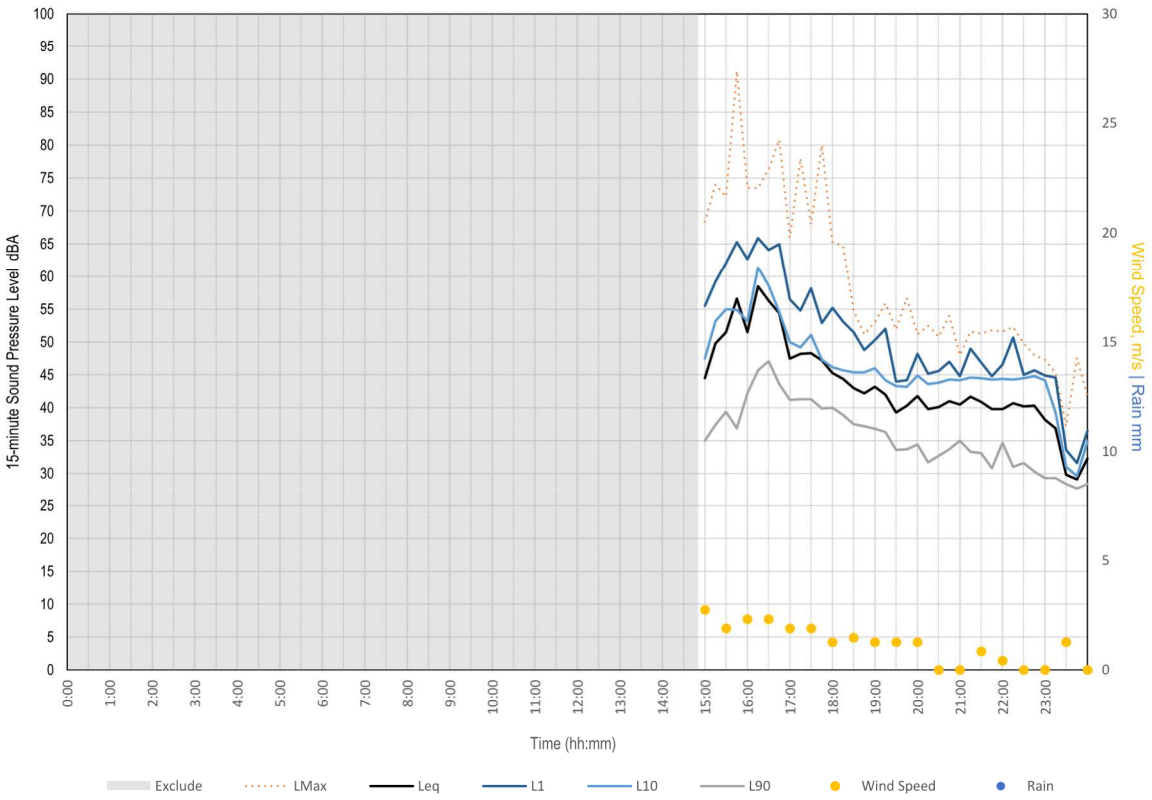
Date	22/09	23/09	24/09	25/09	26/09	27/09	28/09	29/09
$L_{eq, Day}$ dBA	57	53	64	54	59	50	52	53
$L_{eq, Evening}$ dBA	47	46	43	43	44	42	55	43
$L_{eq, Night}$ dBA	48	48	48	48	49	50	51	47
ABL, $_{Day}$ dBA	41	41	40	39	39	40	38	42
ABL, $_{Evening}$ dBA	45	40	39	39	38	38	40	39
ABL, $_{Night}$ dBA	39	39	38	38	37	39	38	38

Date	30/09	01/10	02/10	03/10	04/10	05/10	06/10	07/10
$L_{eq, Day}$ dBA	52	55	53	63	54	55	55	55
$L_{eq, Evening}$ dBA	46	45	44	43	44		47	46
$L_{eq, Night}$ dBA	48	46	47	49	51	47	48	51
ABL, $_{Day}$ dBA	39	40	39	40	39	40	41	40
ABL, $_{Evening}$ dBA	45	38	38	37	38		37	40
ABL, $_{Night}$ dBA	38	37	37	37	37	39	37	37

Date	08/10	09/10	10/10	11/10
$L_{eq, Day}$ dBA	55	53	54	55
$L_{eq, Evening}$ dBA		44	44	48
$L_{eq, Night}$ dBA	51	49	50	
ABL, $_{Day}$ dBA	41	41	38	39
ABL, $_{Evening}$ dBA		37	37	37

Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

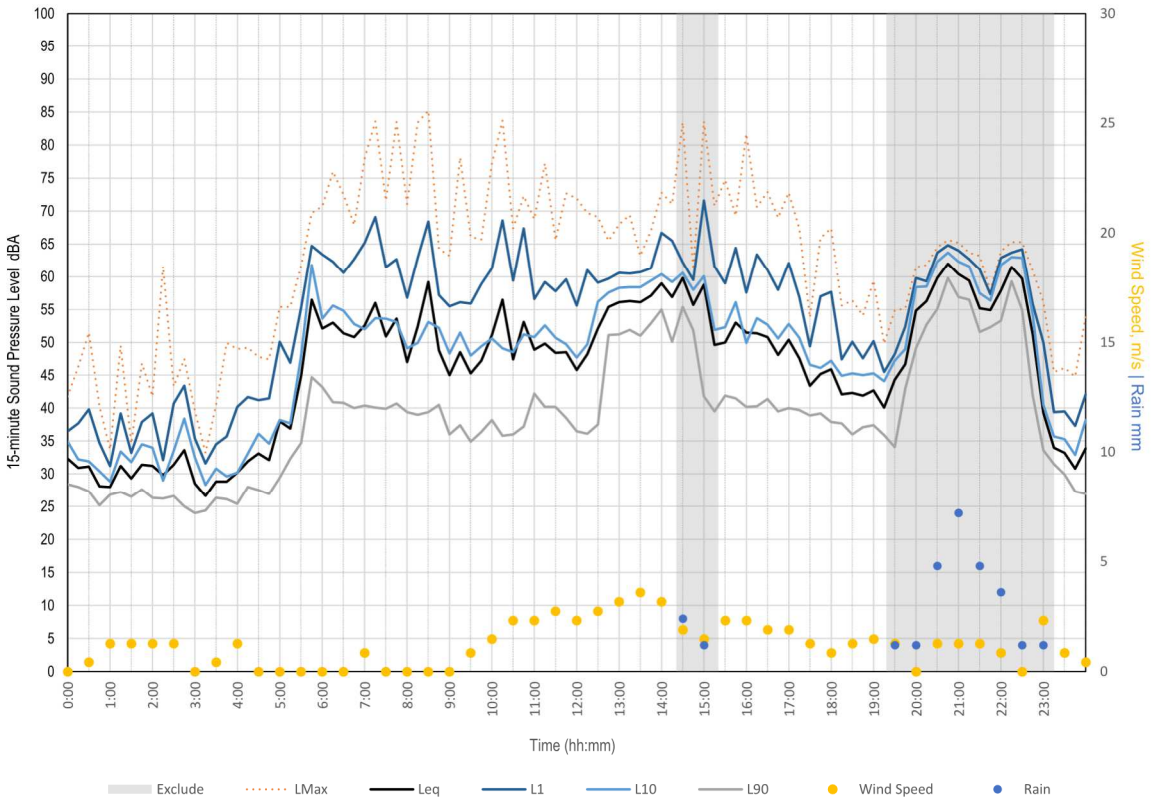
Wednesday, 14 September 2022



Noise Logger Results

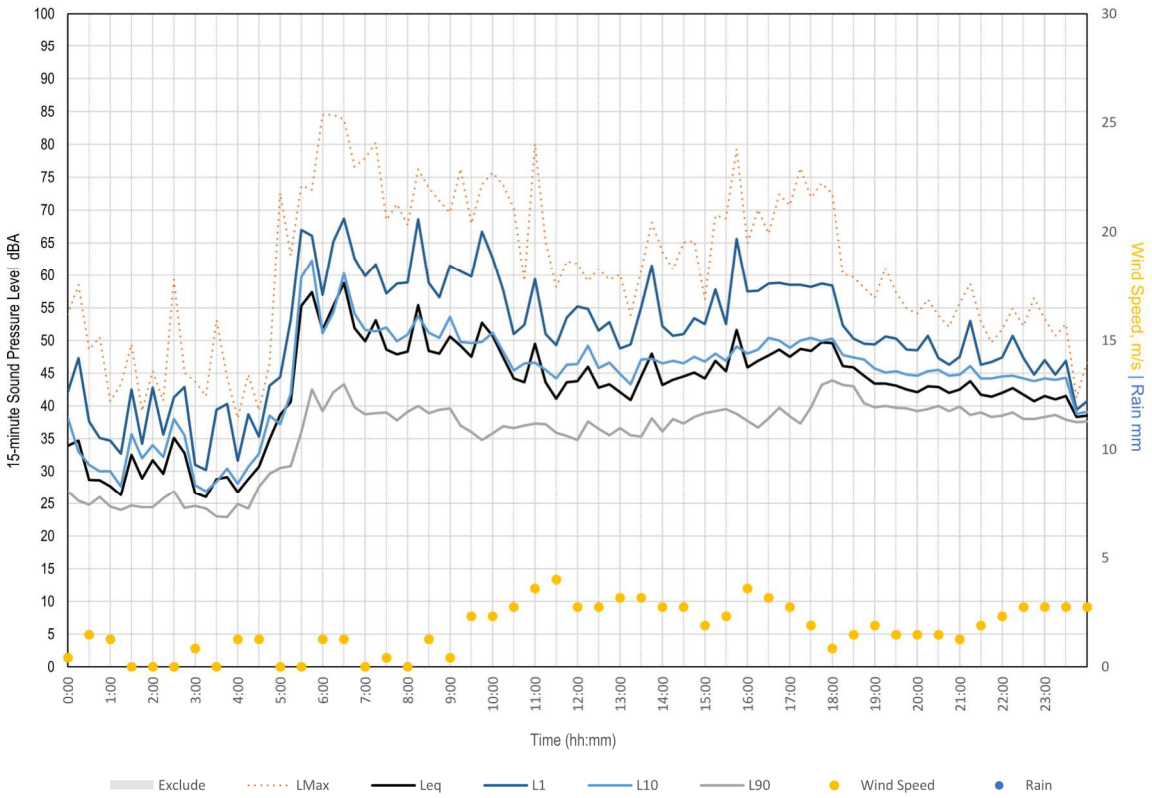
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Thursday, 15 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

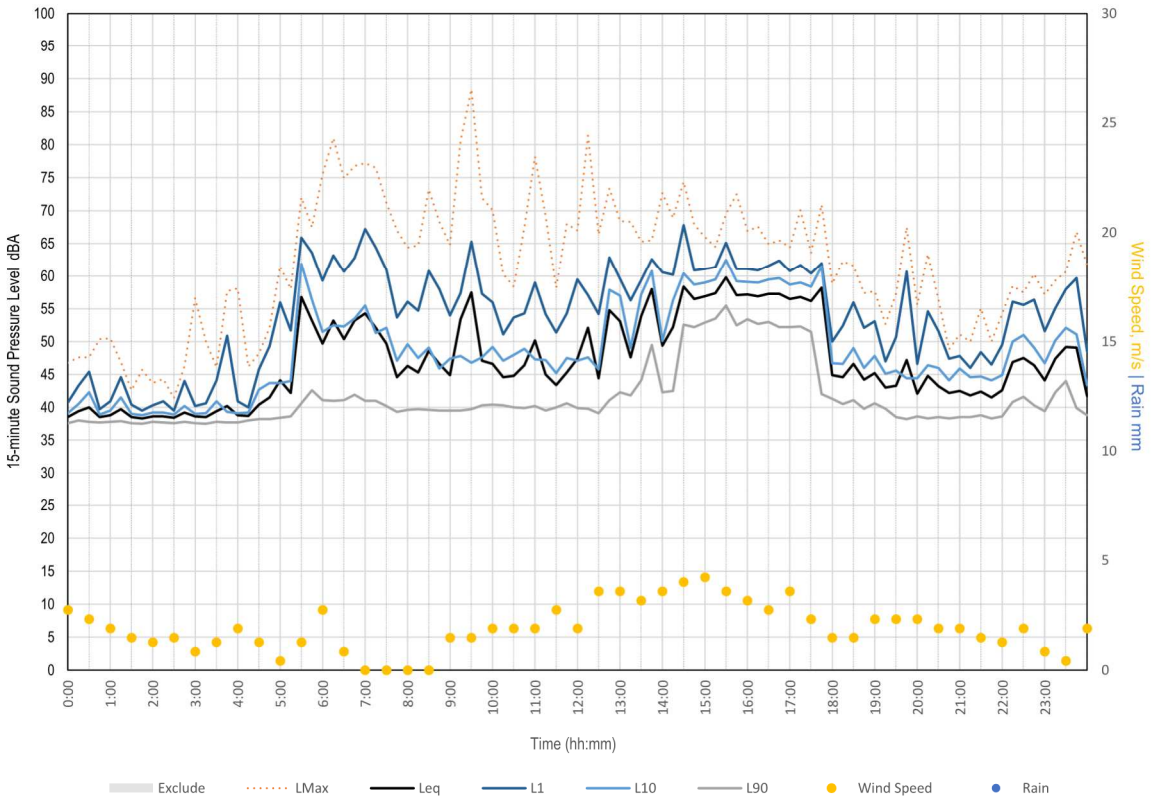
Friday, 16 September 2022



Noise Logger Results

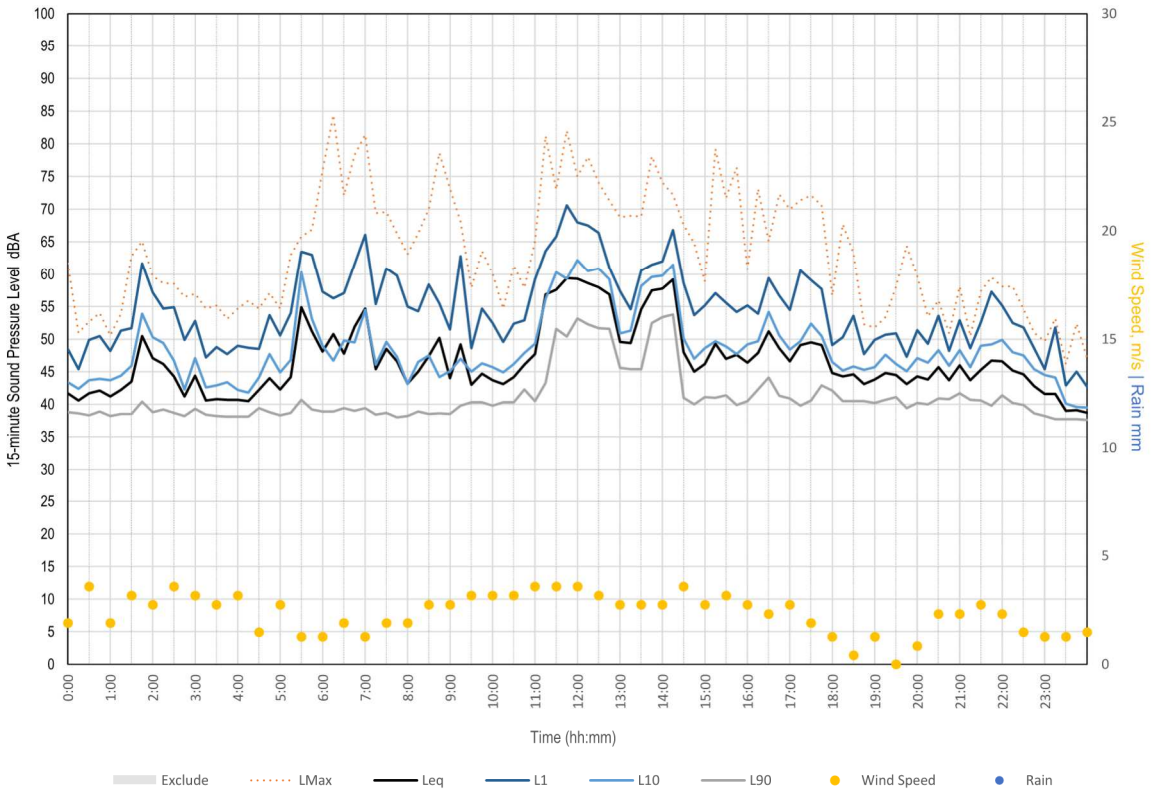
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Saturday, 17 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

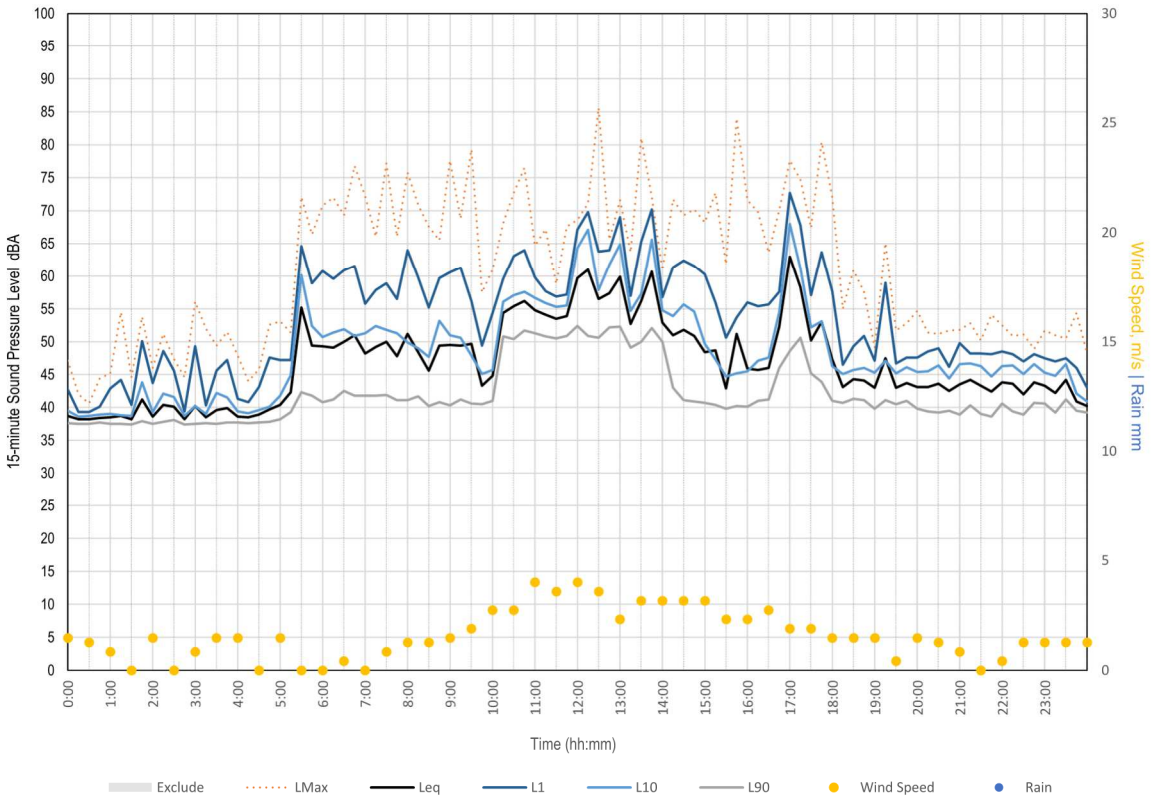
Sunday, 18 September 2022



Noise Logger Results

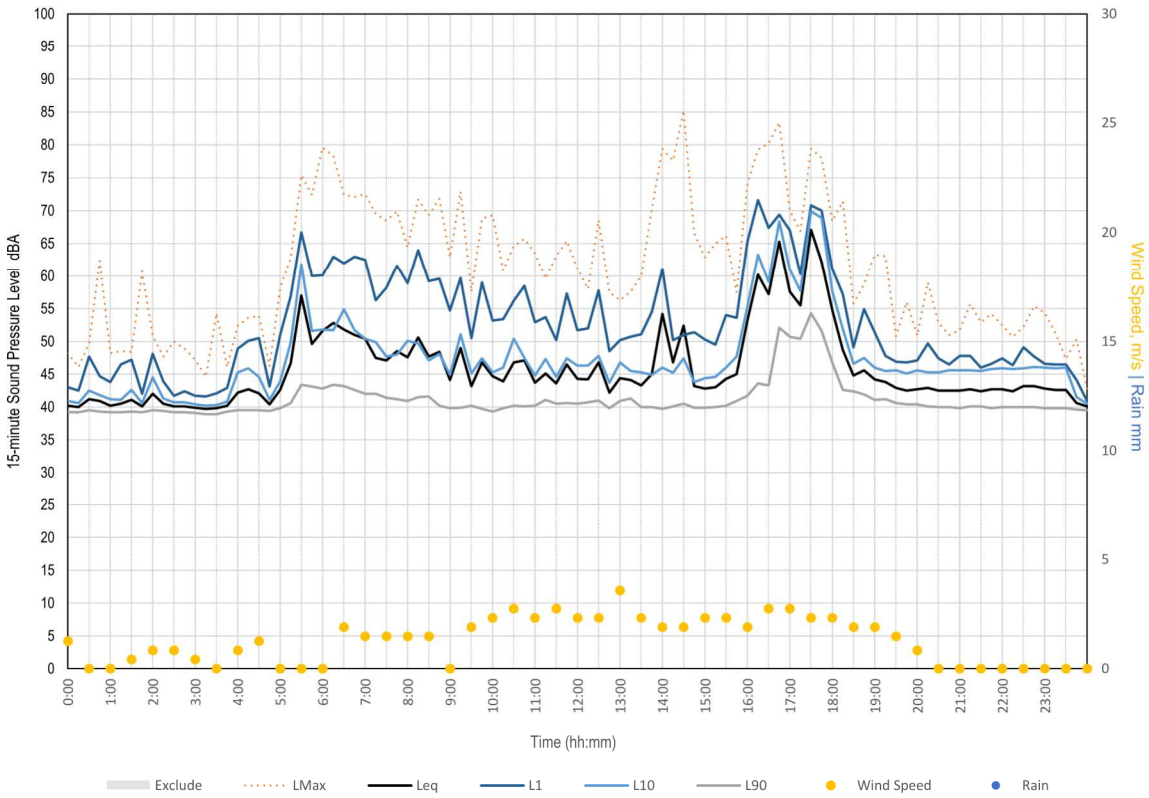
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Monday, 19 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

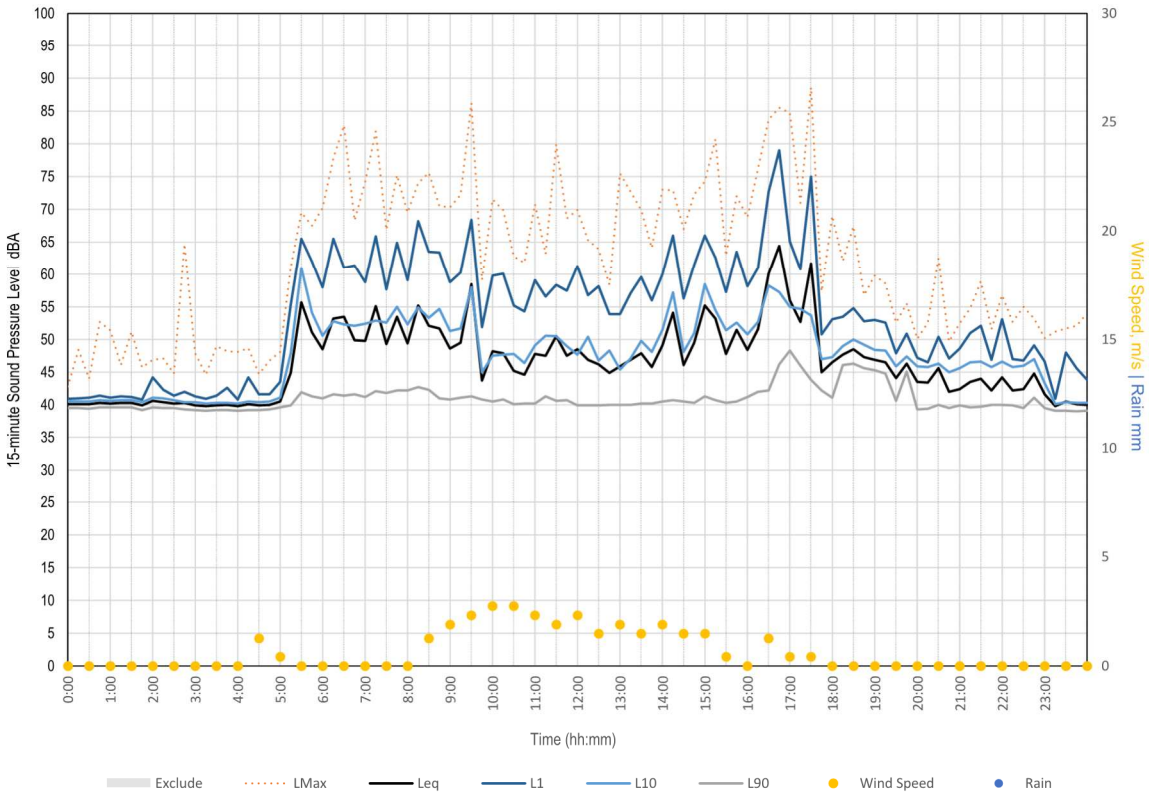
Tuesday, 20 September 2022



Noise Logger Results

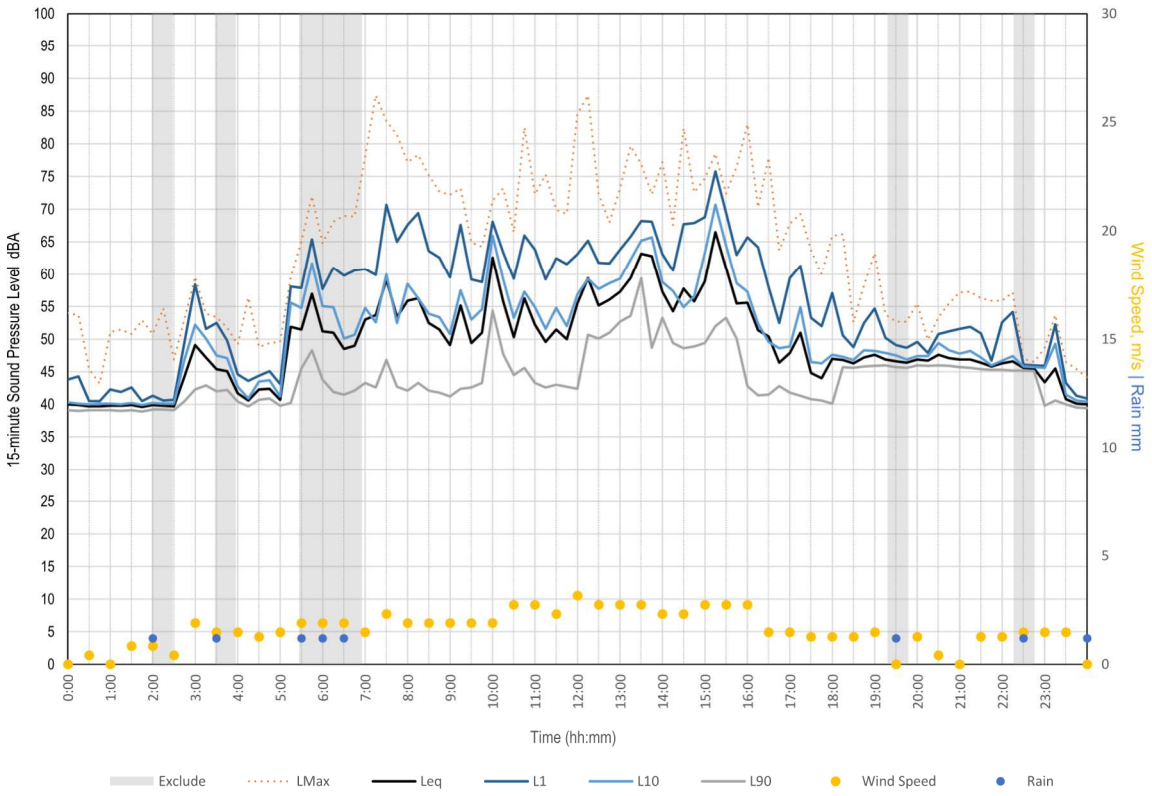
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Wednesday, 21 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

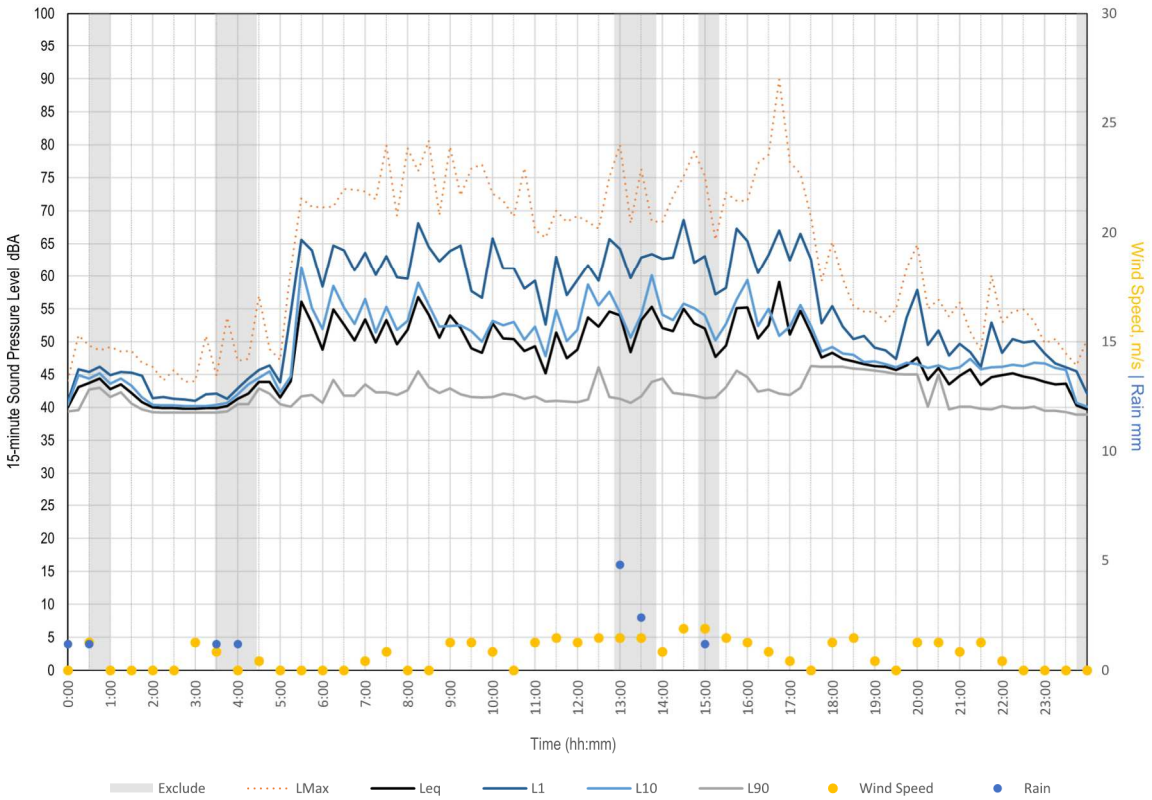
Thursday, 22 September 2022



Noise Logger Results

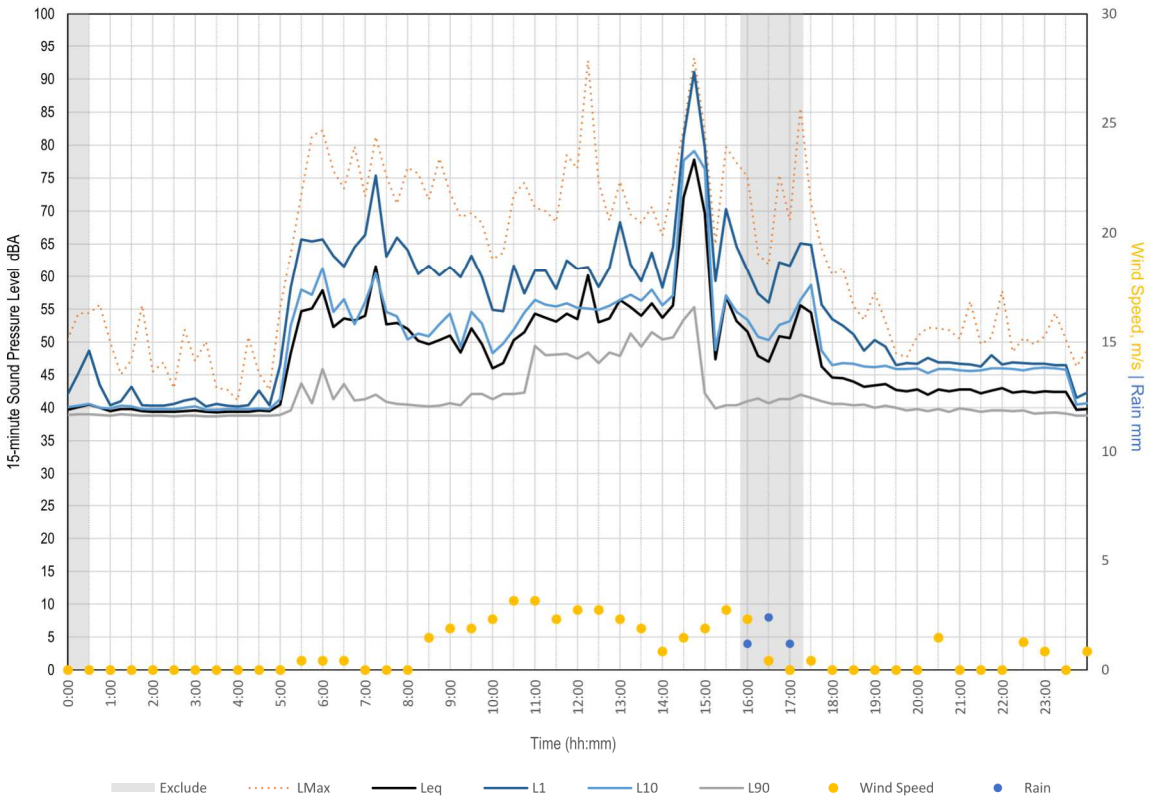
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Friday, 23 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

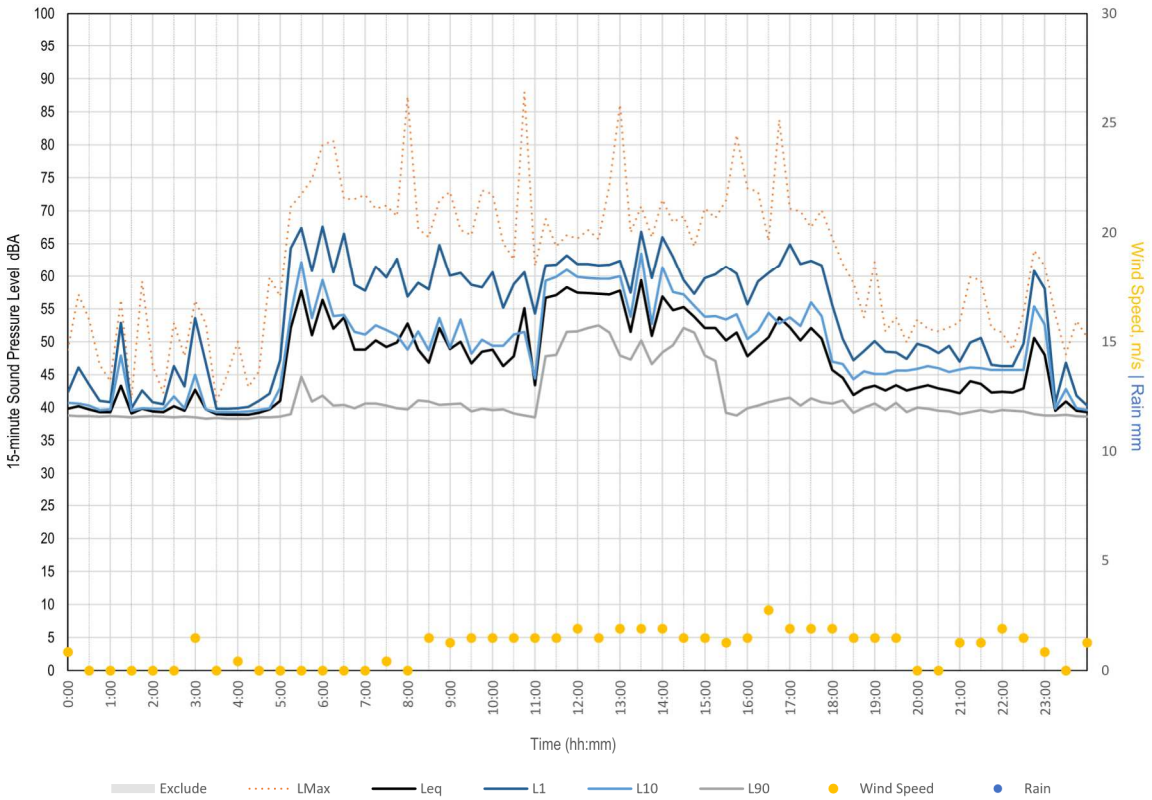
Saturday, 24 September 2022



Noise Logger Results

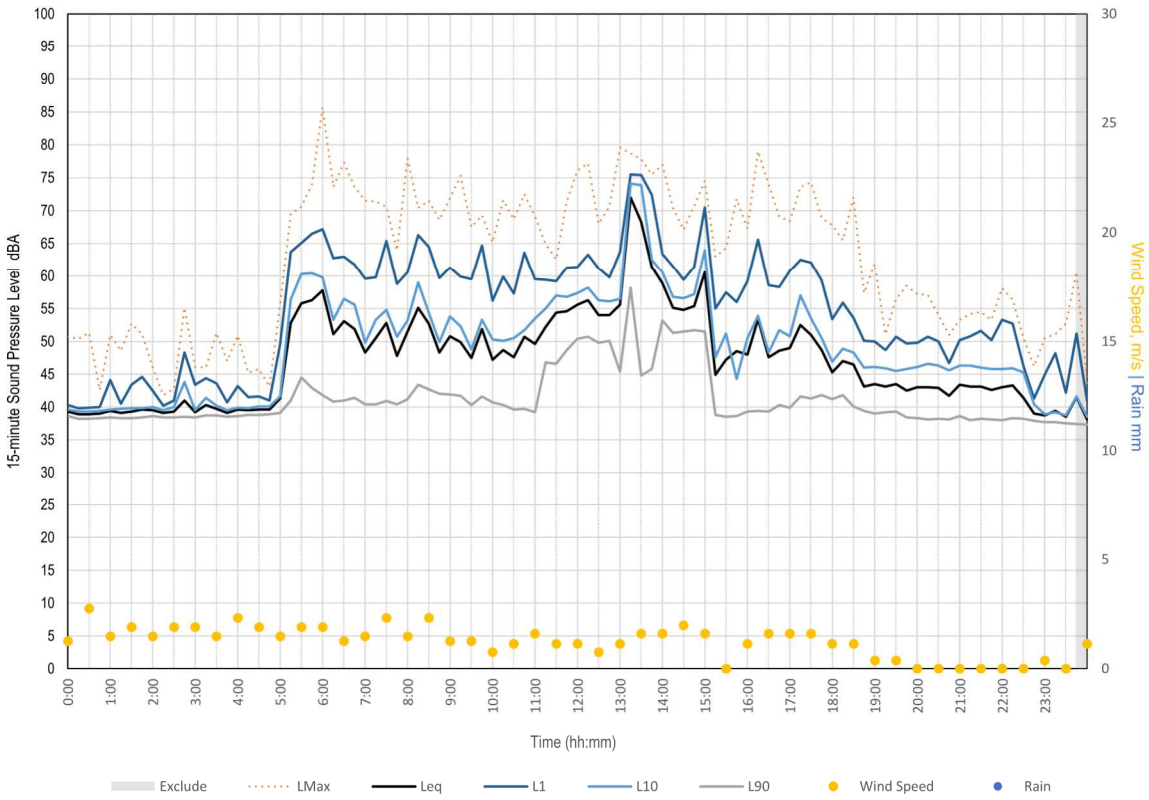
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Sunday, 25 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

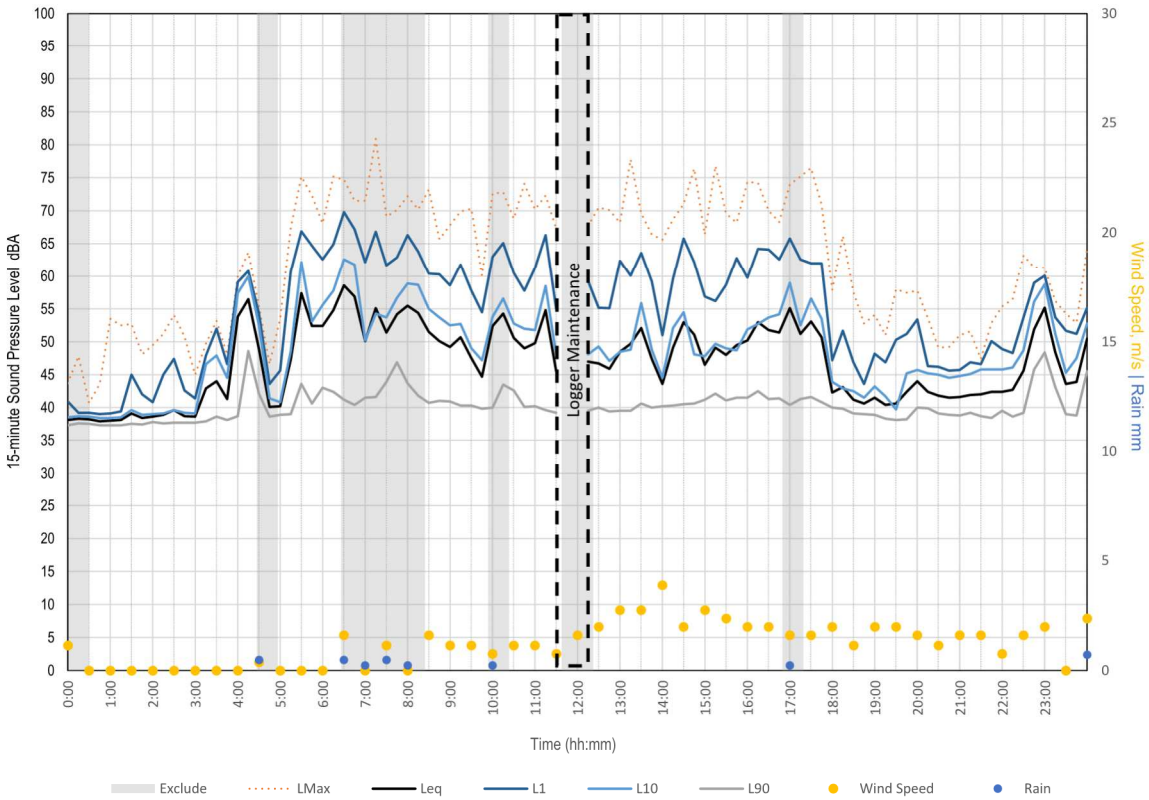
Monday, 26 September 2022



Noise Logger Results

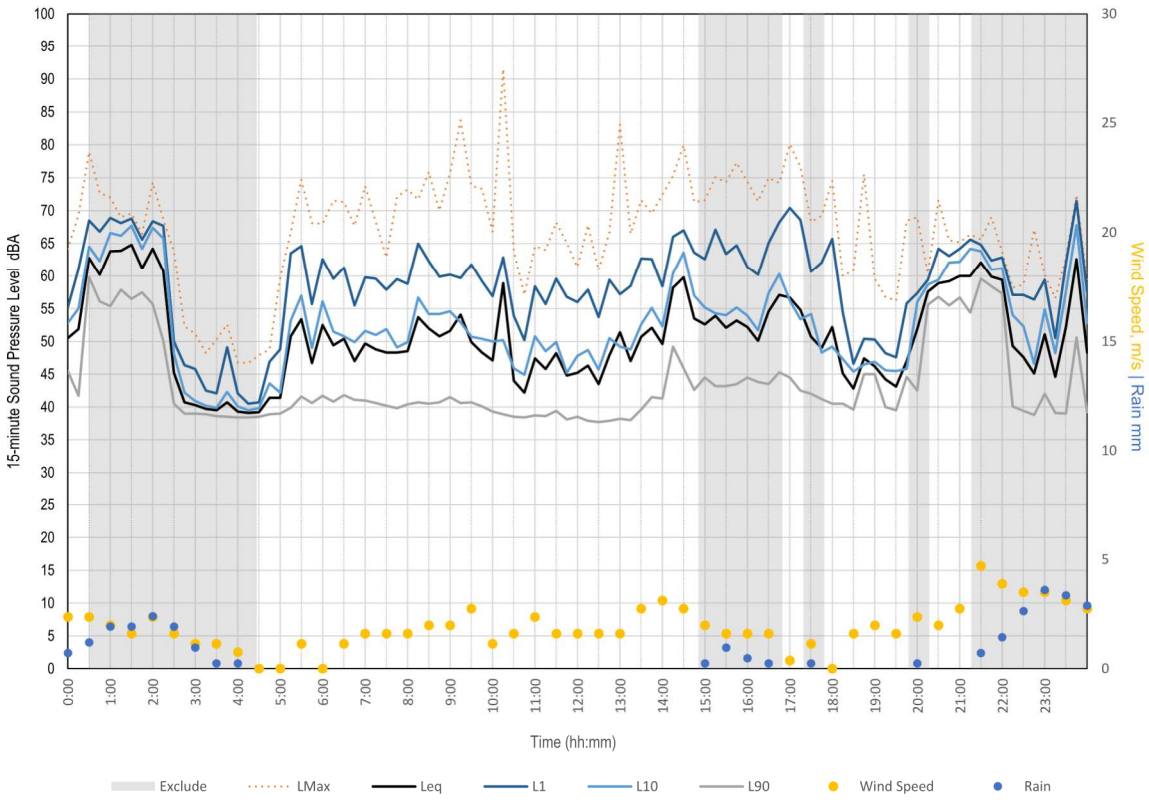
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Tuesday, 27 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

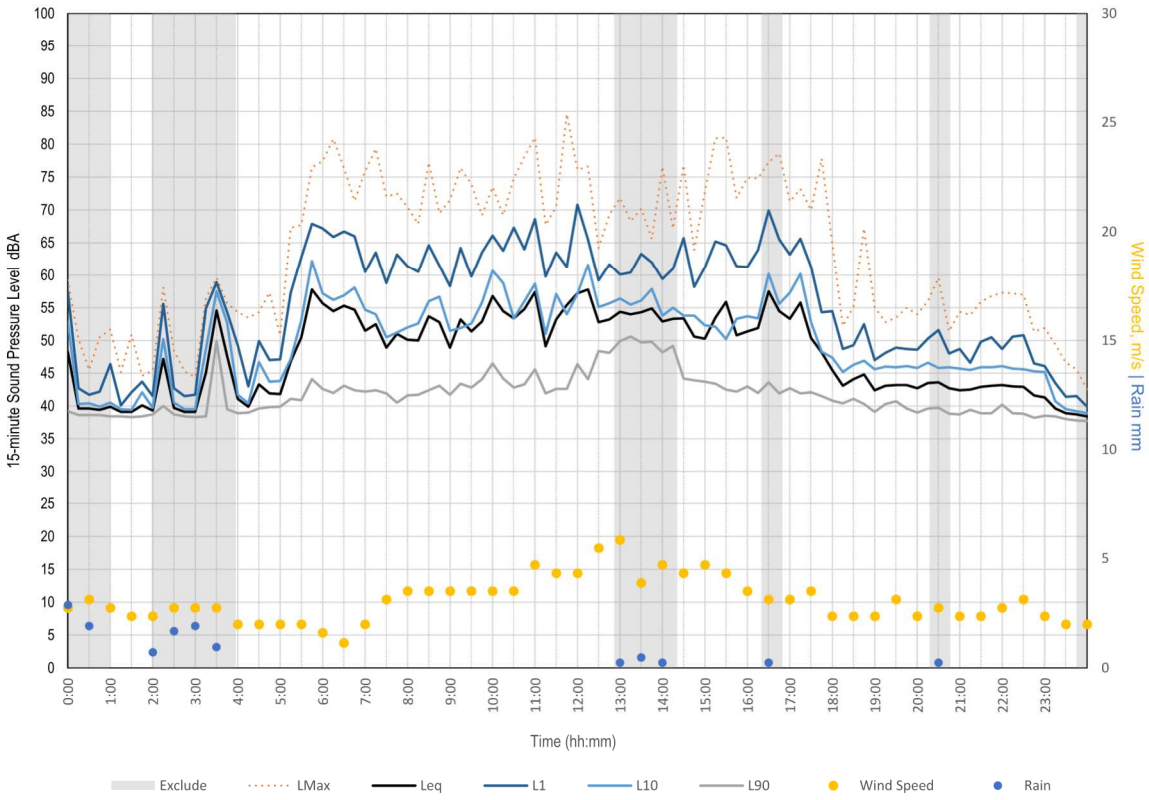
Wednesday, 28 September 2022



Noise Logger Results

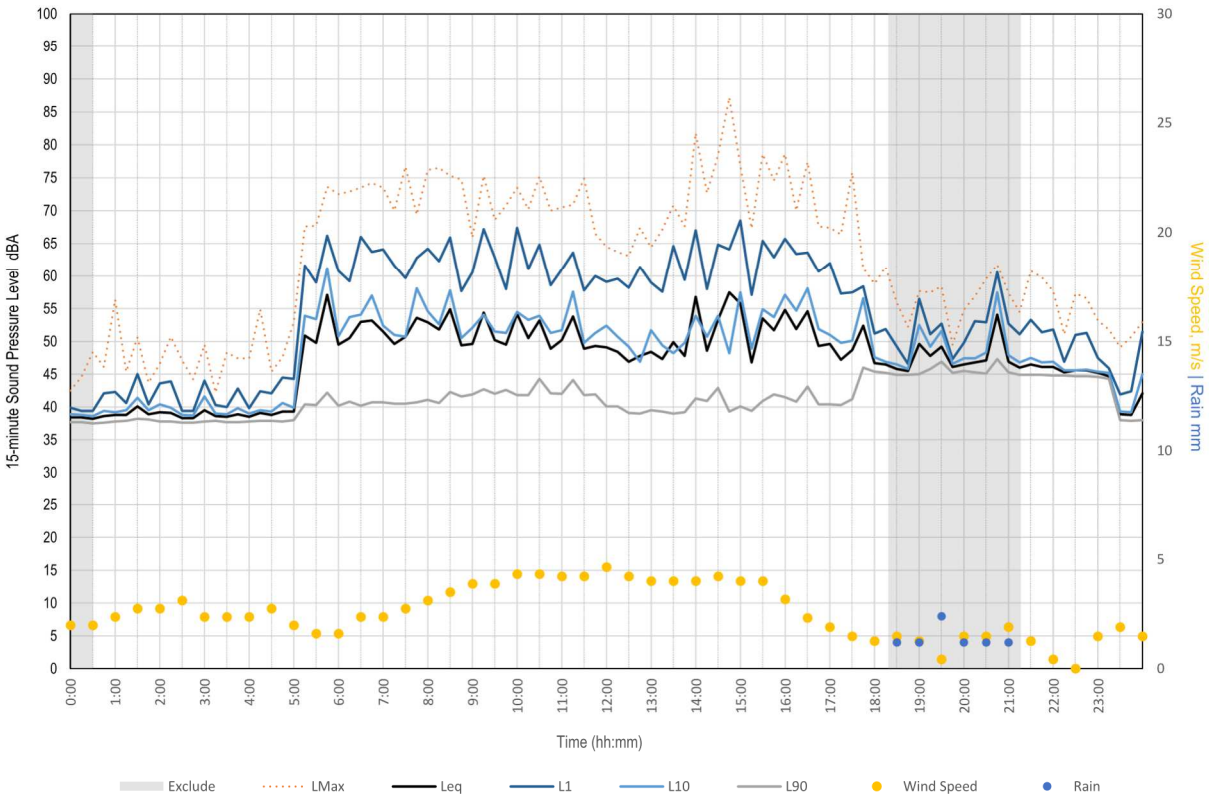
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Thursday, 29 September 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

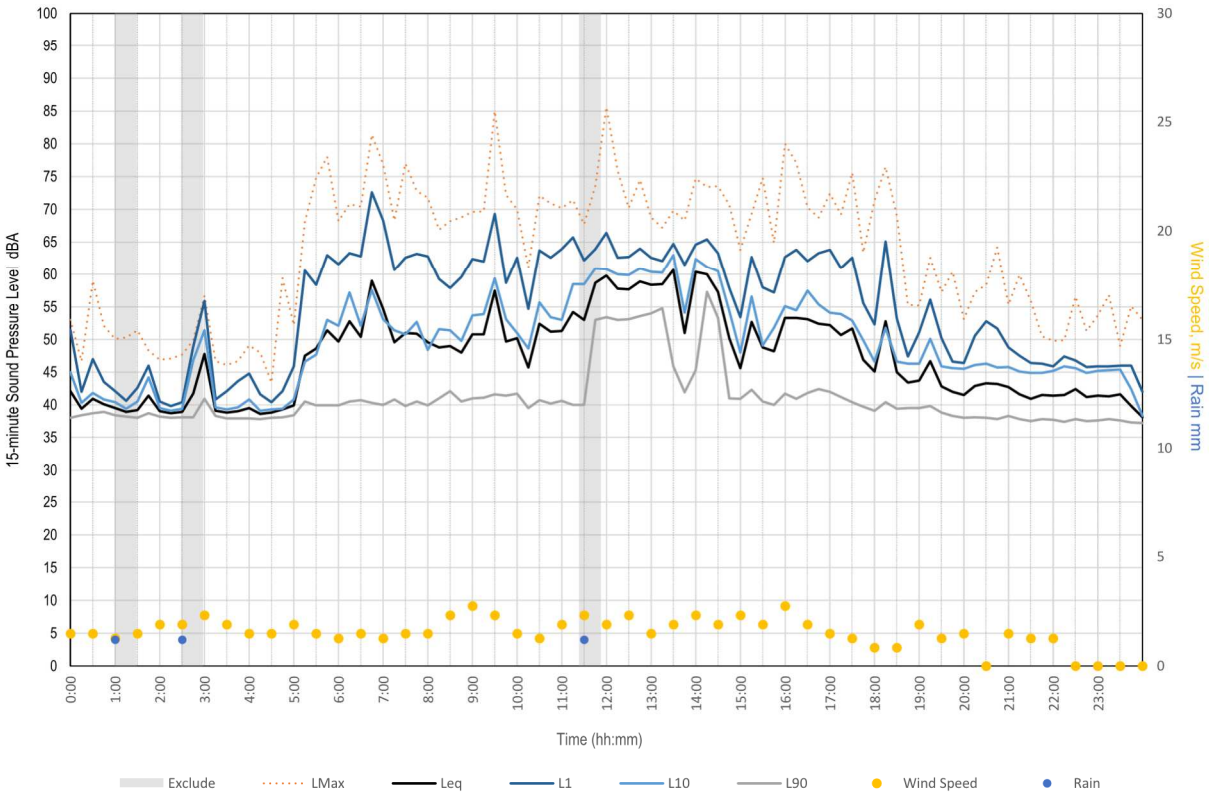
Friday, 30 September 2022



Noise Logger Results

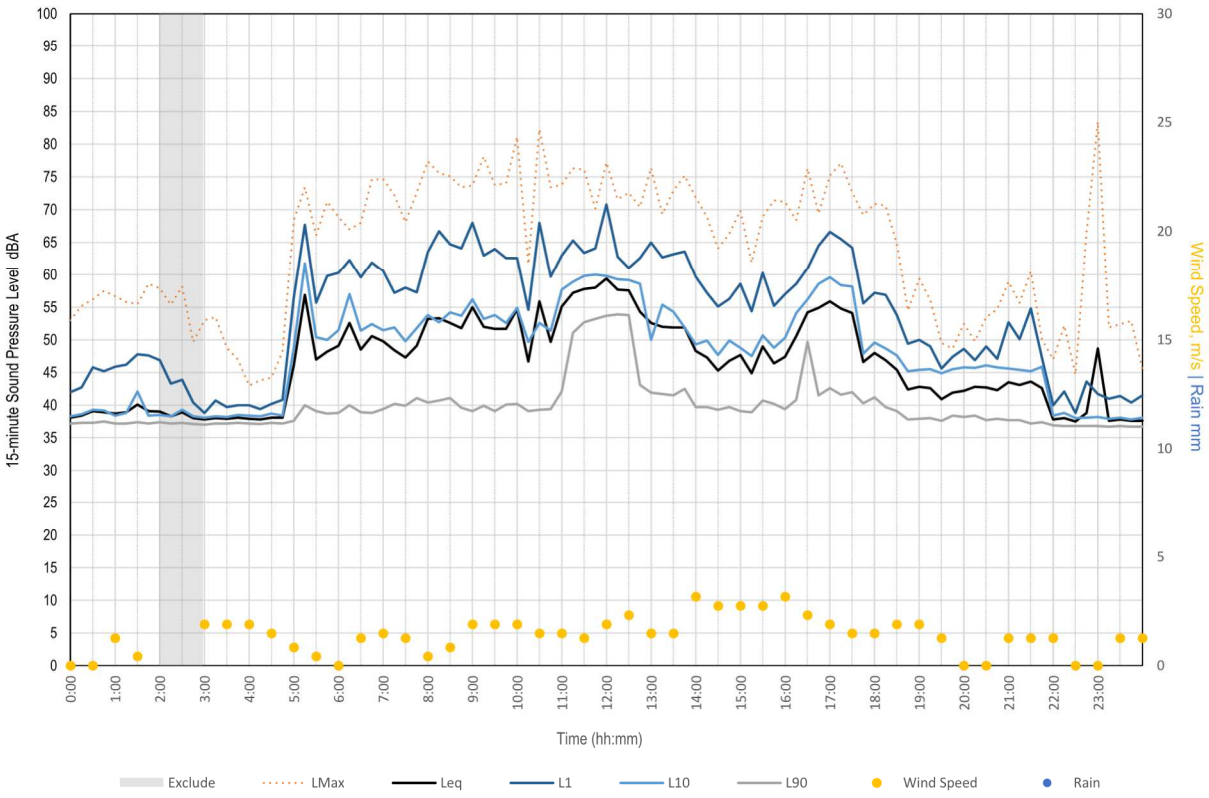
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Saturday, 01 October 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

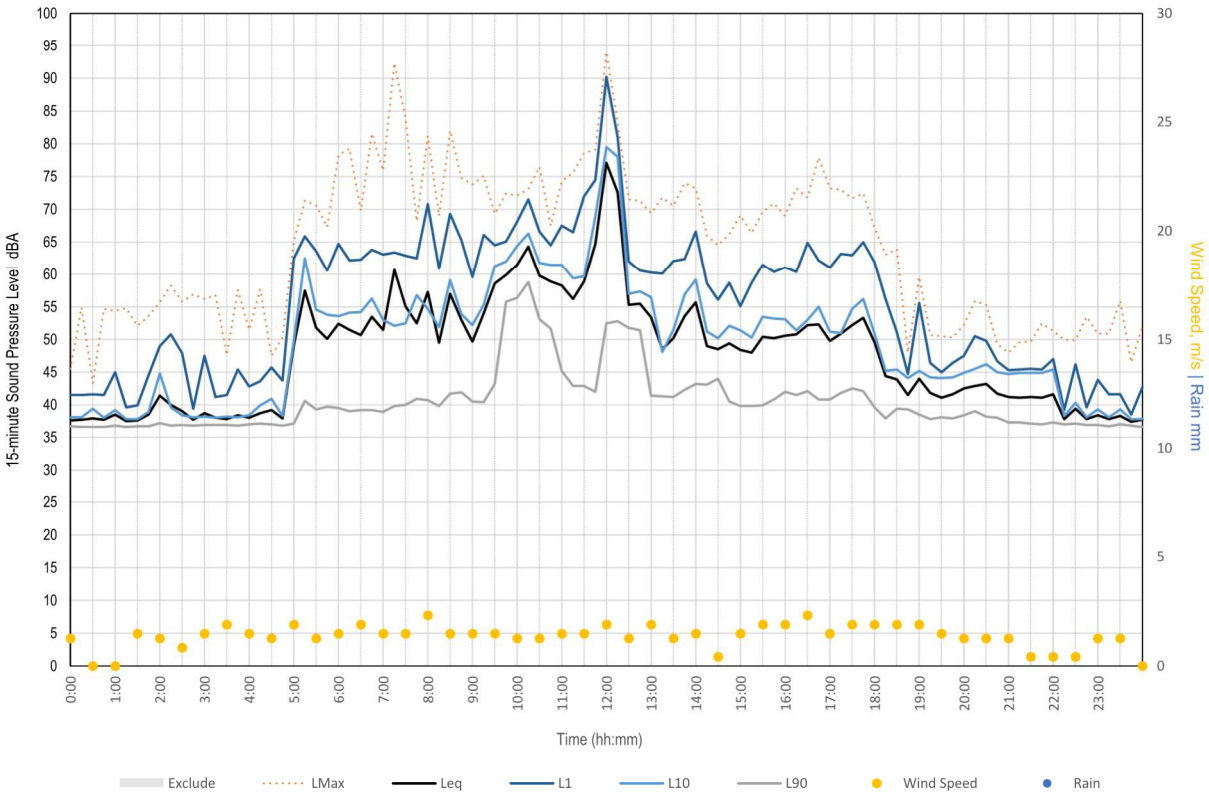
Sunday, 02 October 2022



Noise Logger Results

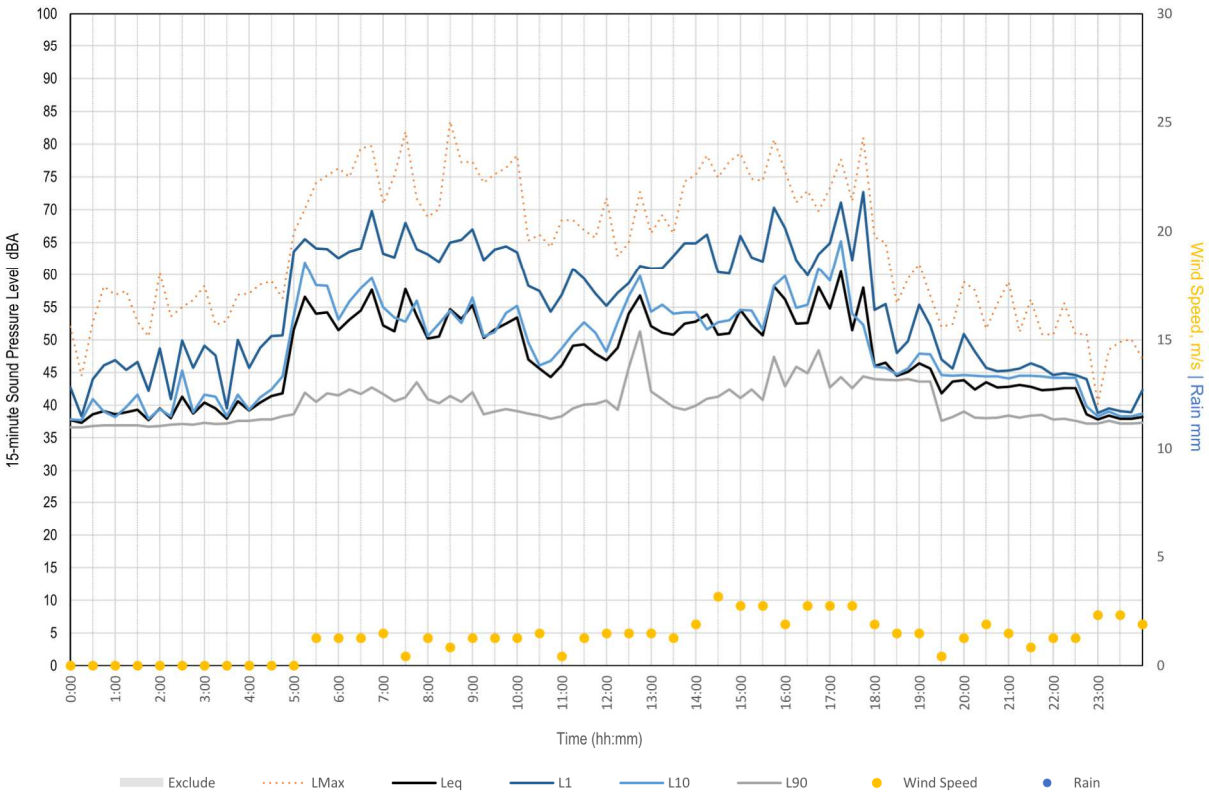
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Monday, 03 October 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

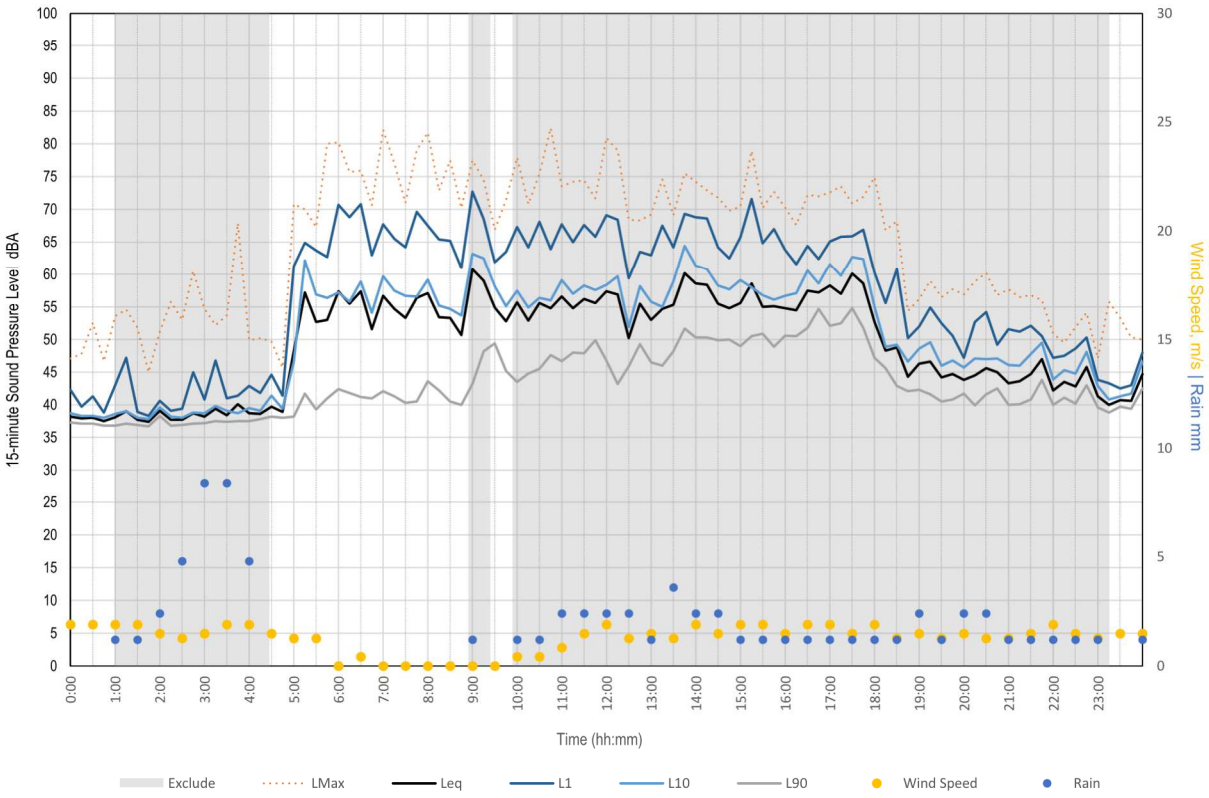
Tuesday, 04 October 2022



Noise Logger Results

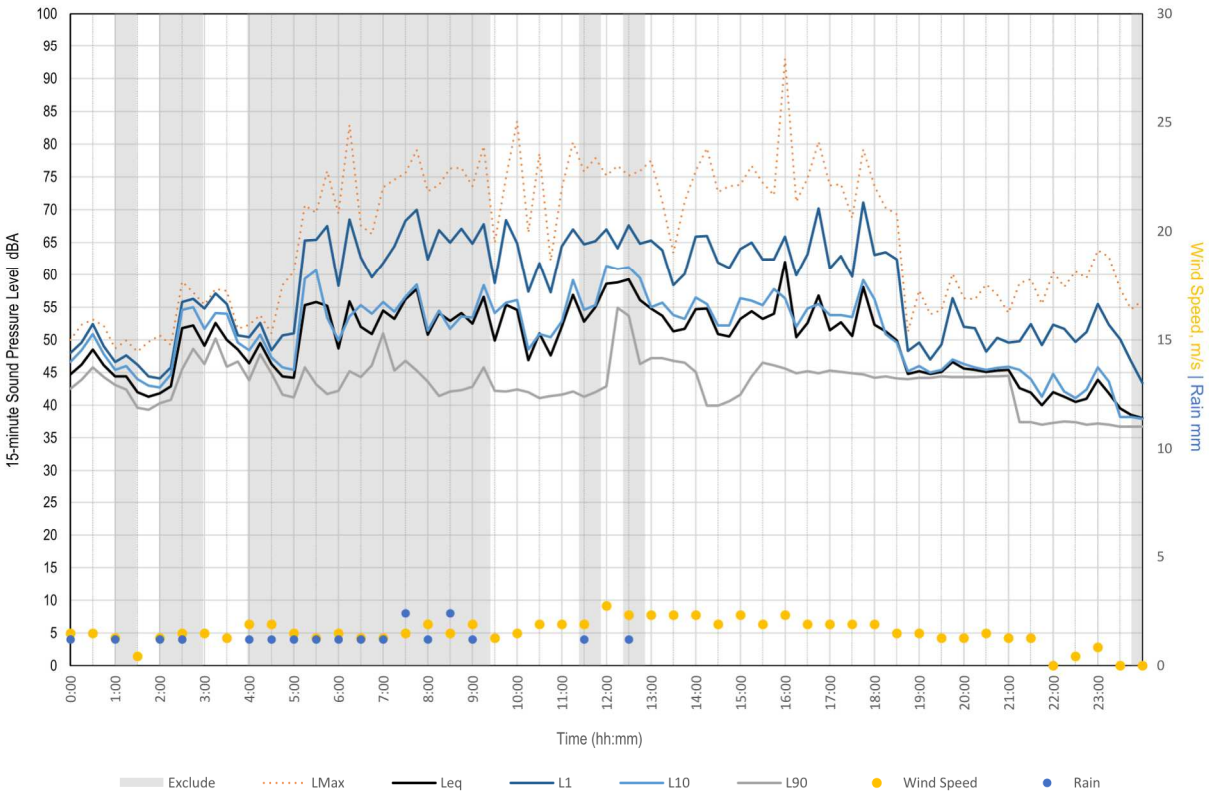
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Wednesday, 05 October 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

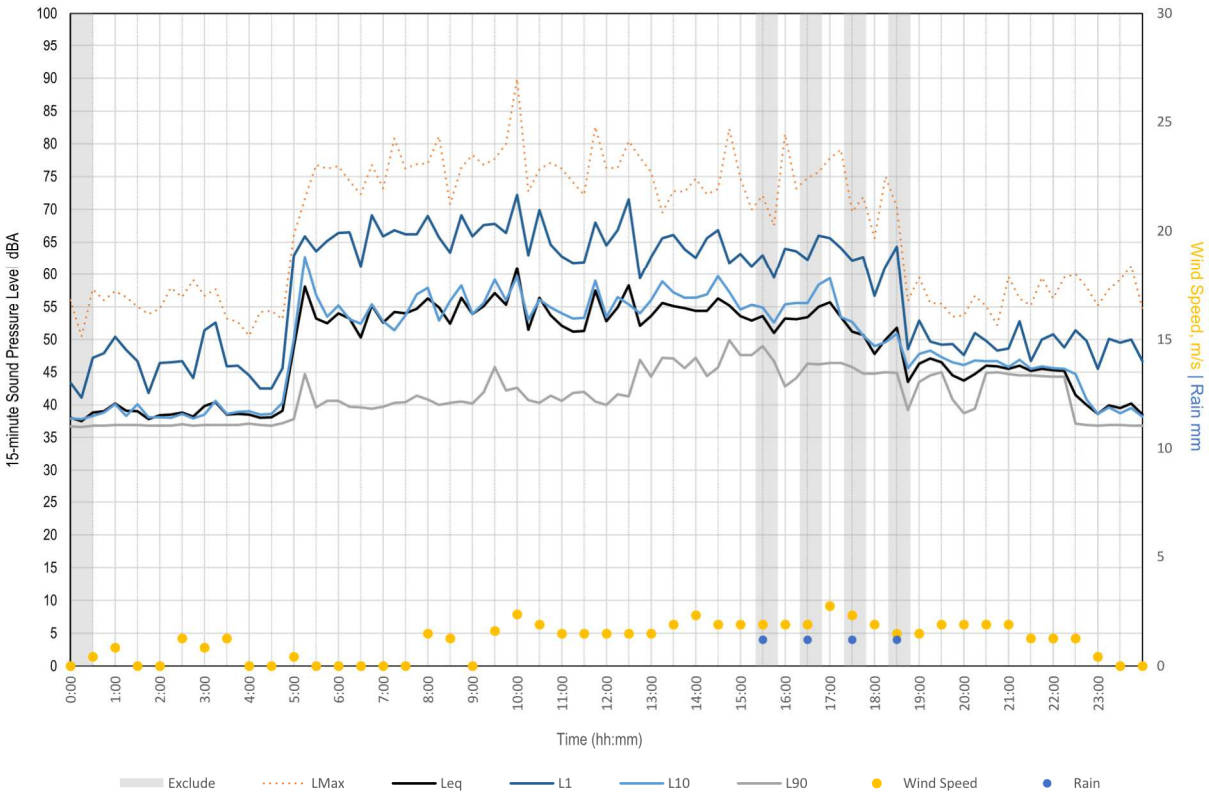
Thursday, 06 October 2022



Noise Logger Results

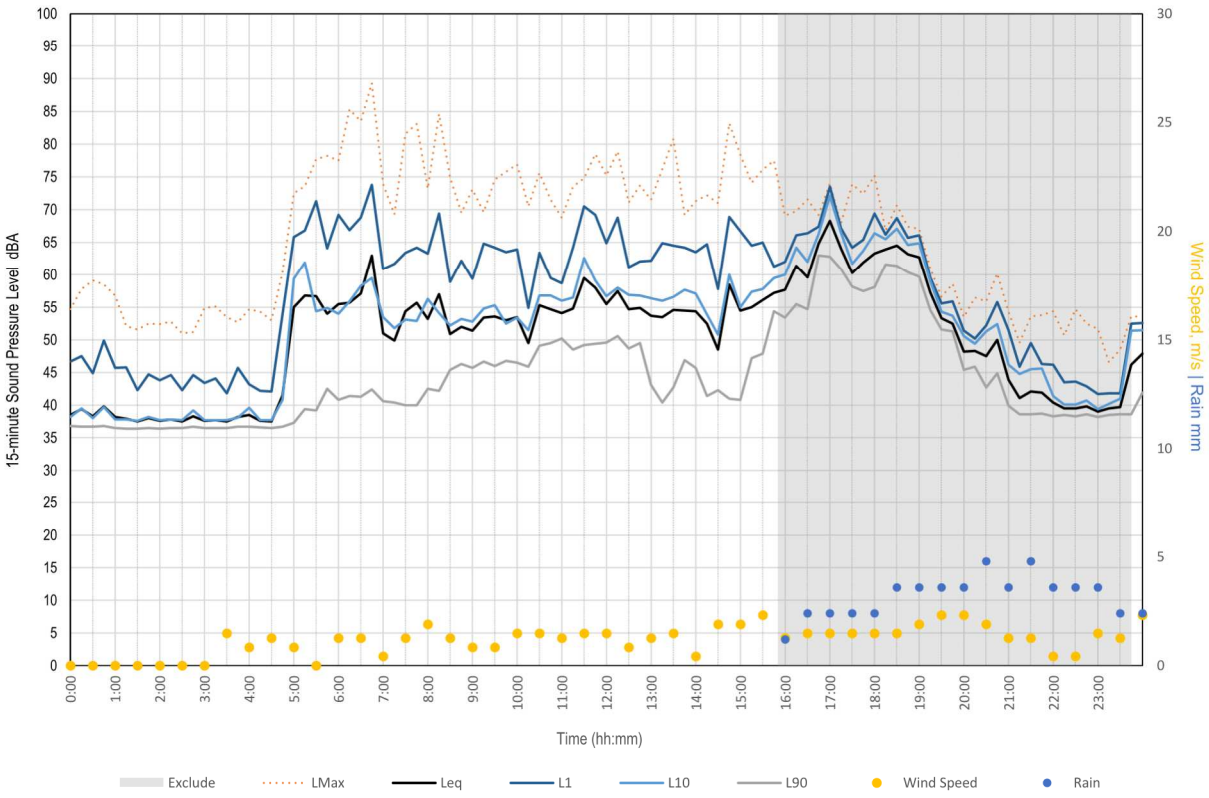
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Friday, 07 October 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

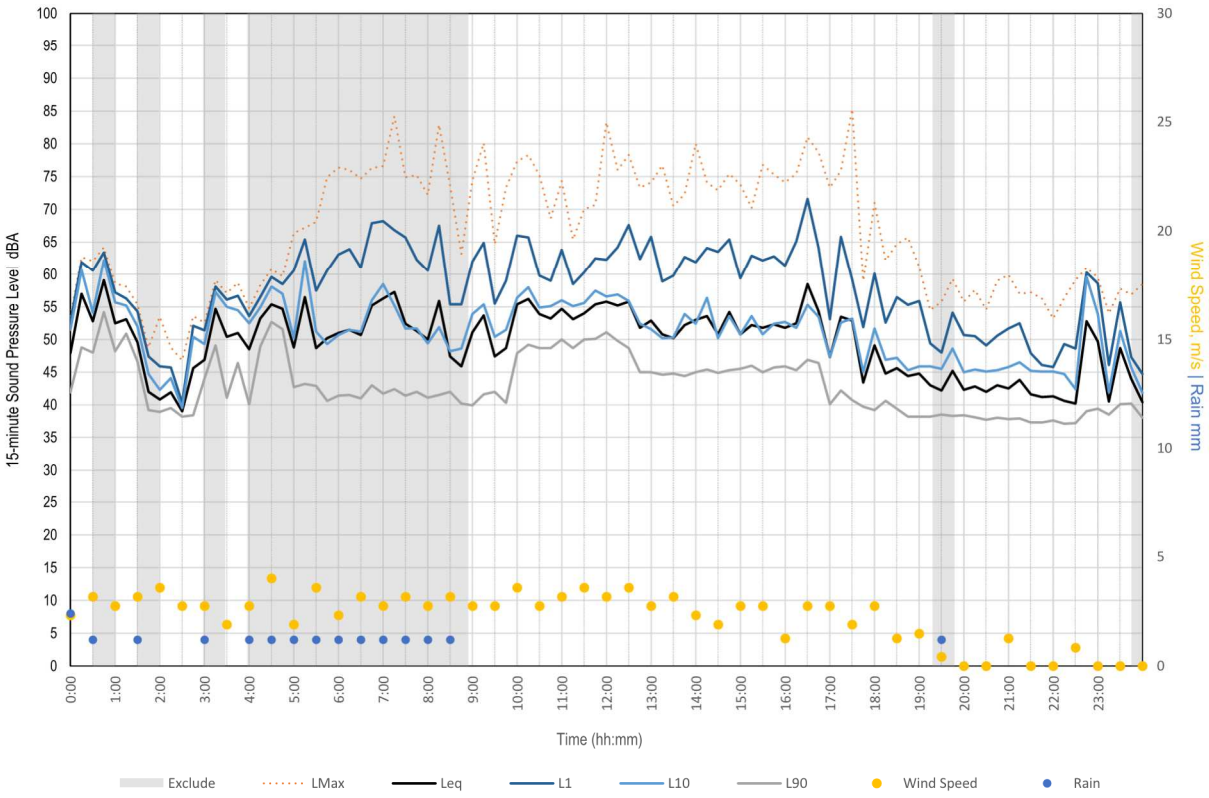
Saturday, 08 October 2022



Noise Logger Results

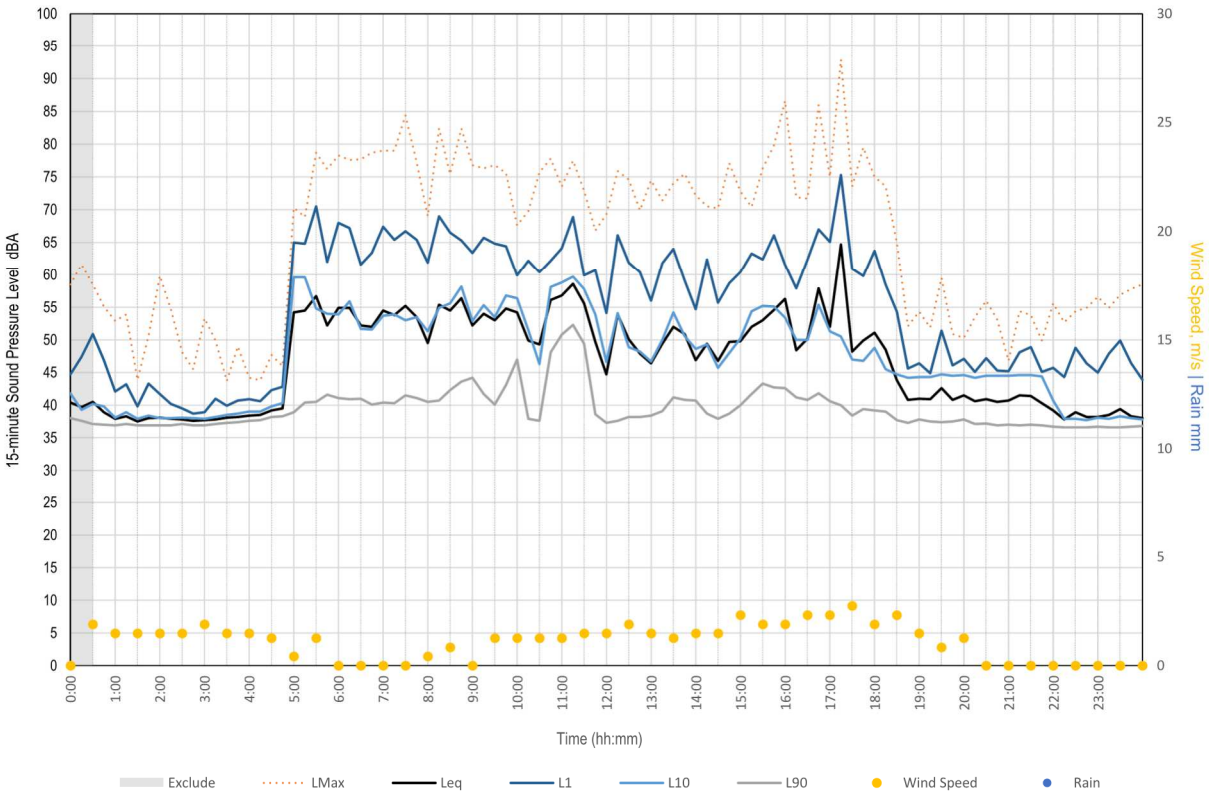
Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Sunday, 09 October 2022



Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

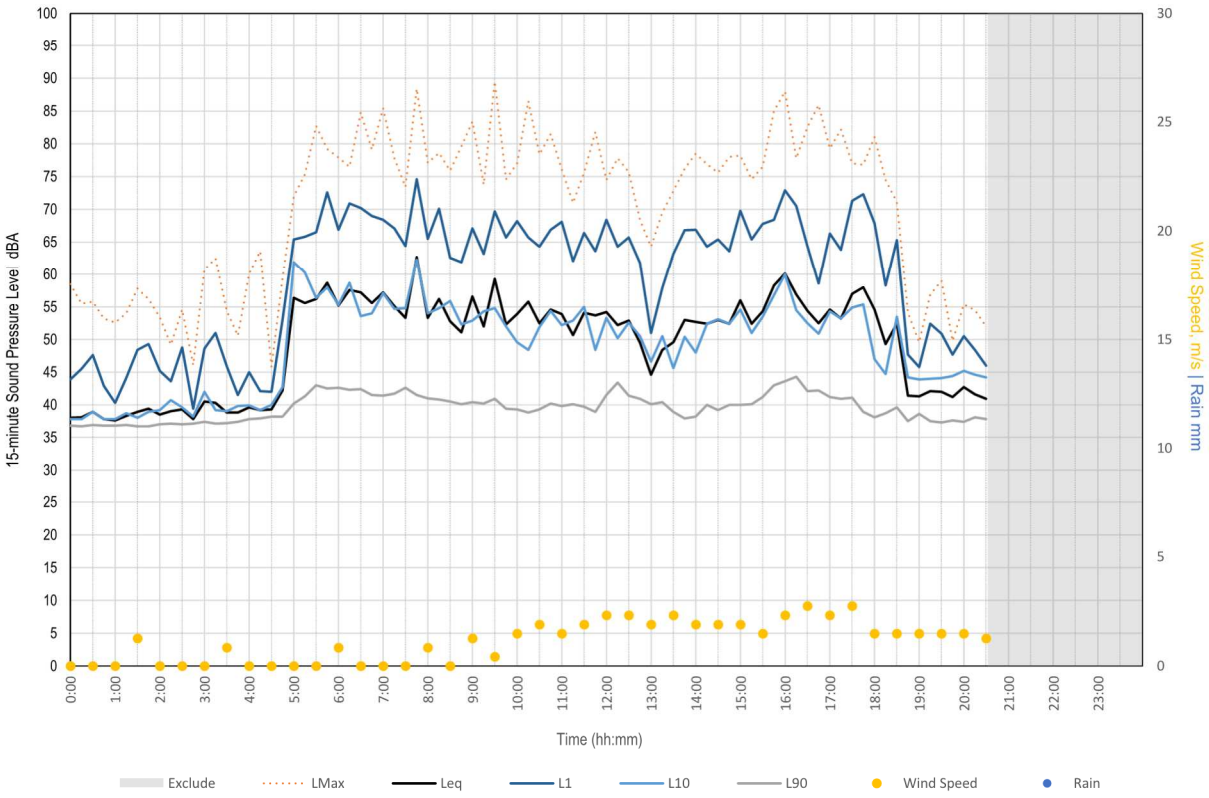
Monday, 10 October 2022



Noise Logger Results

Measured Noise Levels - M30 - 8 Chivers Place (Tahmoor)

Tuesday, 11 October 2022





Australian Government

Department of Infrastructure, Transport,
Regional Development, Communications and the Arts

