ACOUSTICS AND AIR

STAGE 3 FACILITIES - SYDNEY BUSINESS PARK (MARSDEN PARK)

SSD NOISE & VIBRATION IMPACT ASSESSMENT

REPORT NO. 20232
VERSION B

JULY 2020

PREPARED FOR

SYDNEY BUSINESS PARK
15 HOLLINSWORTH ROAD
MARSDEN PARK NSW 2765

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

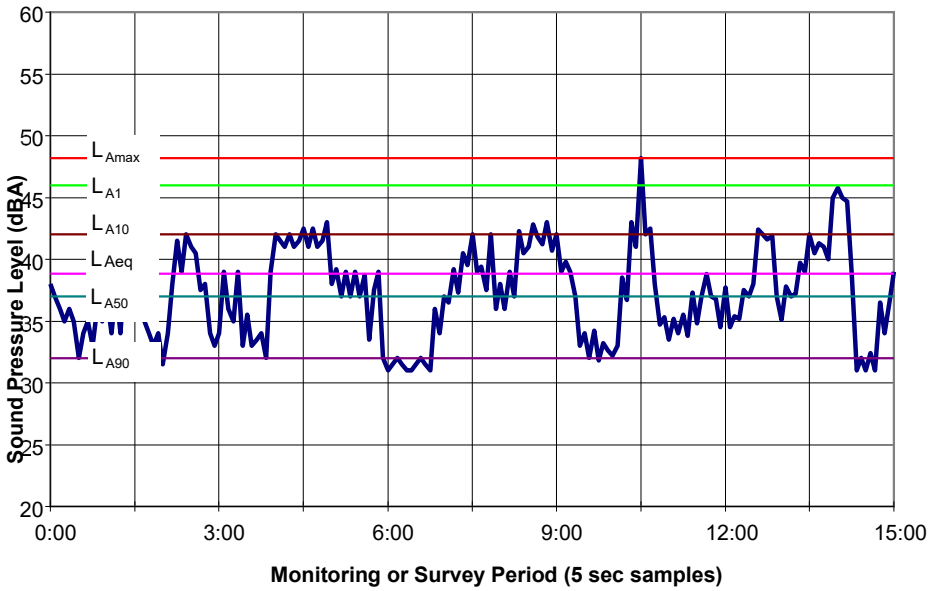
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Wilkinson Murray has been engaged by Sydney Business Park to provide a noise and vibration impact assessment of four proposed warehouse and distribution facilities in the area known as 'Stage 3' (site). The proposed site is in the south-western area of the Sydney Business Park, Marsden Park.

Two of the proposed warehouses would be developed for known end-users. TJX Australia will occupy Warehouse 1 and Australia Pharmaceutical Industries (API) will occupy Warehouse 4. The other two warehouses are located between warehouses 1 and 4 and are proposed to be developed for pending/unidentified end users. The facilities are proposed to operate up to 24 hours a day, 7 days a week.

At this stage, we have been advised that this development is likely to be operational during 2021 and that the Marsden Park Precinct will likely be completed in 2036 and will include several road upgrade projects currently proposed by Transport for NSW.

Figure 1-1 presents the design layout of the proposed warehouse.

This assessment report provides details of the identified nearby receivers and their relevant noise criteria, the noise impact calculation and assumptions used in the assessment, and recommendations to minimise the noise impact on the affected receivers, if required and is suitable for submission to the NSW Department of Planning, Industry and Environment (DPIE) as part of a State Significant Development (SSD) application.

It directly addresses Section 7 – Noise and Vibration (reproduced below) of the Secretary's Environmental Assessment Requirements (SEARS) issued on 24 July, 2020 for SSD-10477.

> *7. Noise and Vibration – including:*
>
> - *a description of all potential noise and vibration sources during the construction and operational phases of the development, including on and off-site traffic noise*
> - *a cumulative noise impact assessment of all potential noise sources in accordance with relevant Environmental Protection Authority guidelines*
> - *details of noise mitigation, management and monitoring measures.*

A review of the construction and operation activities confirms that there are no vibration intensive activities proposed. Furthermore, there is sufficient distance between the site and the nearest receiver to mitigate any low-level vibration activities that may arise to a level that would unlikely be perceptible. On this basis a detailed vibration assessment is not deemed necessary and this report will focus on impacts associated with construction noise and operational noise only.

On this basis, and as required by the SEARS, Environmental Protection Authority (EPA) guideline documents have been considered in preparing this assessment as per below:

- *Interim Construction Noise Guideline* (ICNG);
- *Road Noise Policy* (RNP)*;* and
- *Noise Policy for Industry* (NPfI).

This assessment report provides details of the identified nearby receivers and their relevant noise criteria, the noise impact calculation and assumptions used in the assessment, and recommendations as required to minimise the noise impact on the affected receivers. This report is suitable for submission to the NSW Department of Planning, Industry and Environment (DPIE) as part of a State Significant Development (SSD) application.

Figure 1-1 Stage 3 facilities – site layout

Source: Reid Campbell – Stage 3 Master Plan, Sheet Number 1200045_A0003, Issue J.

2 SITE DESCRIPTION

The site is currently vacant, predominately cleared and awaiting redevelopment for employment purposes. The overall area of the site is approximately 159,048m^2, and is in the Blacktown local government area. The site has a relatively flat topography, sloping gently to the north-west.

According to the Blacktown City Council (BCC) Growth Centre Precinct Development Control Plan (DCP), the proposed site and immediate surrounding area are located within an industrial zone. The industrial area consists of industrial buildings (some under construction) and vacant land.

Residential receivers are located approximately 120m to the south from the site (suburb: Bidwill) and approximately 550m north-west from the site (suburb: Marsden Park).

Table 2-1 presents the nearby surrounding receivers from the site and **Figure 2-1** presents the location of the proposed warehouse, the surrounding receivers and the noise monitoring locations.

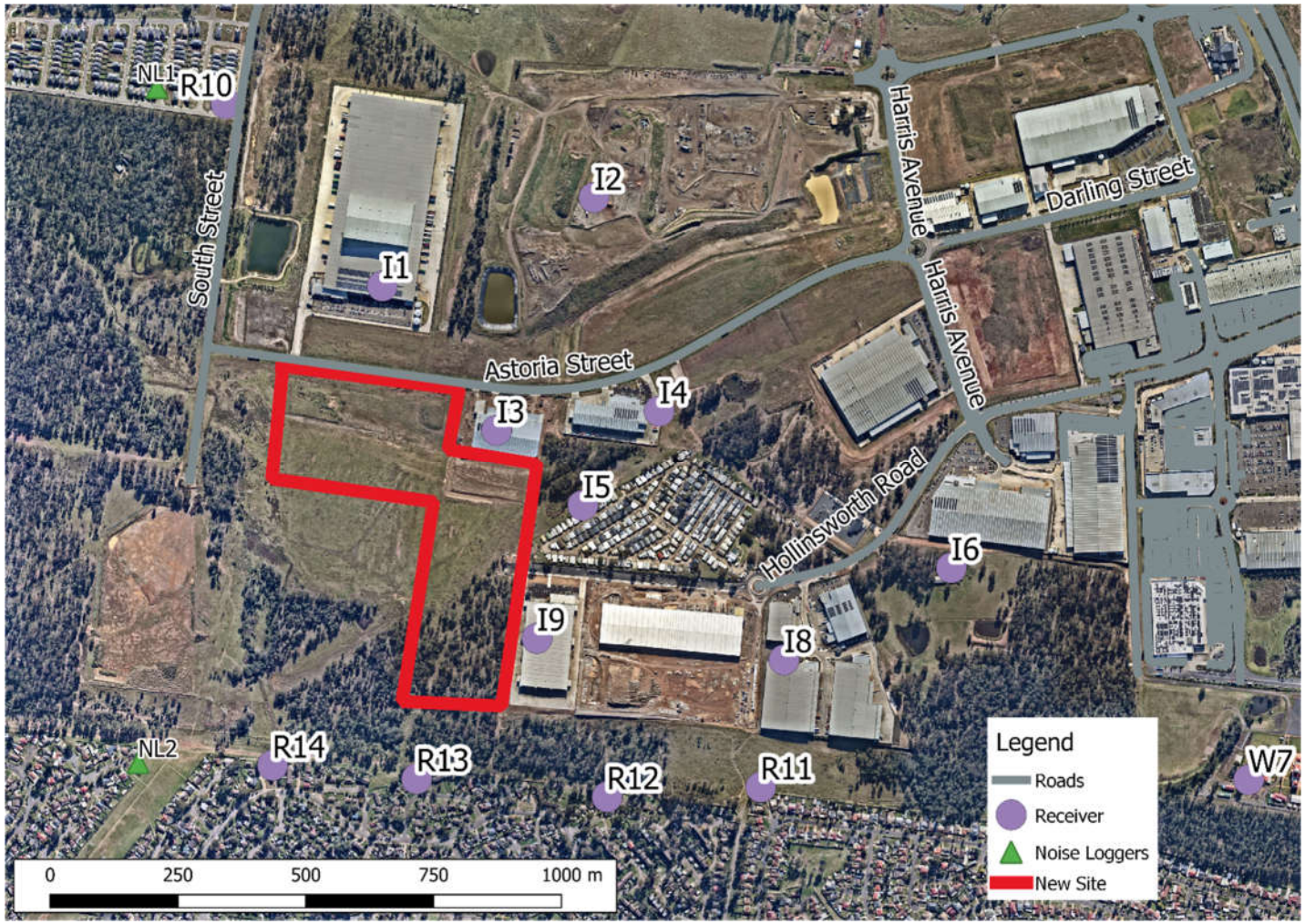
Table 2-1 Surrounding receivers

Receiver ID	Receiver site	Address	Orientation
I1	Ikea Distribution Centre	376 South St, Marsden Park	North
I2	Blacktown Waste Service	25 Harris Ave, Marsden Park	North-East
I3	Tigerpak Packaging	22 Astoria St, Marsden Park	East
I4	Proposed Bucher Municipal	19 Astoria St, Marsden Park	East
I5	Caravan Park	140 Hollinsworth Rd, Marsden Park	East
I6	Isolated Resident	105 Hollinsworth Rd, Marsden Park	East
W7	Baitul Huda Mosque	45 Hollinsworth Rd, Marsden Park	South-East
I8	Industrial Warehouses	23 Hollinsworth Rd, Marsden Park	East
I9	Warehouses in construction	24 Hollinsworth Rd, Marsden Park	East
R10	Resident	372 Dortmund Crescent, Marsden Park	North-West
R11	Resident	67B Amelia Way Bidwill	South-East
R12	Resident	11 Pine Cres, Bidwill	South-East
R13	Resident	15 Loranthus Cres, Bidwill	South
R14	Resident	8 Amaryllis Way, Bidwill	South-West

Note: I=Industrial, W=Place of Worship and R=Residential

The caravan park (I5) and isolated resident (I6) are located within the industrial zone as per the BCC's Growth Centre Precinct DCP. This location is assessed as 'isolated residences' within an industrial zone as per the *NPfI*. This approach is consistent with other assessments within Sydney Business Park and in particular the recently approved modification assessment for Marsden Park Warehousing Estate (SSD-8606-MOD-3). Refer to Receiver ID I8 and I9 in **Table 2-1.**

Figure 2-1 Aerial view of the site location, surrounding receivers and noise monitoring locations



3 BACKGROUND NOISE MEASUREMENT

3.1 Background Noise Levels

To establish the existing ambient noise environment of the nearest residential area from the site, unattended environmental noise monitoring was conducted. Noise loggers were installed at 18 Aubusson Street, Marsden Park (NL1) located approximately 500m north-west of the site boundary and at 15 Roche Grove, Shalvey (NL2), located approximately 500m south-west of the site boundary.

The instrumentation used for the survey consisted of Acoustic Research Laboratories (ARL) NGARA noise loggers, each with a microphone windshield. Calibration of the loggers was checked prior to and after the measurement. Drift in calibration did not exceed ±0.5 dBA. Both loggers hold current NATA calibration certificates.

The measured data was processed according to the *NPfI* requirements. **Table 3-1** details the L_{A90} presented as Rating Background Level (RBL) and L_{Aeq} noise levels logged during the daytime, evening and night time periods. RBL data affected by adverse meteorological conditions or extraneous noise was removed from the data prior to processing.

Table 3-1 Unattended ambient noise measurement

Logger location	Noise level – dBA					
	Daytime		Evening		Night time	
	RBL	L_{Aeq}	RBL	L_{Aeq}	RBL	L_{Aeq}
NL1 – 18 Aubusson St, Marsden Park	29	50	30	44	27	41
NL2 – 15 Roche Gr, Shalvey	33	54	36	46	28	45

Note: Day: 7am - 6pm except that Sundays and Public Holidays it begins at 8am
Note: Evening: 6pm - 10pm
Note: Day: Night 10pm - 7am except that Sundays and Public Holidays it ends at 8am

Review of the background noise data indicate that some noise levels need to be amended based on the *NPfI* requirements. The *NPfI* states *'where the rating background noise level is found to be less than 30dB(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 35dB(A).'*

In addition to this, evening RBL at 15 Roche Grove, Shalvey is noted to be higher than the daytime RBL. Evening period is expected to be more stringent than daytime. Therefore, evening RBL is reduced to equate to the daytime RBL as measured.

Table 3-2 presents the revised RBL at each location in accordance with the *NPfI* requirements.

Table 3-2 Revised rating background level

Logger location	Noise Level – dBA		
	Daytime	Evening	Night time
	RBL	RBL	RBL
NL1 – 18 Aubusson St, Marsden Park	35	30	30
NL2 – 15 Roche Gr, Shalvey	35	33	30

4 NOISE CRITERIA

4.1 Blacktown City Growth Centre Precincts Development Control Plan

Schedule 3 of the BCC Growth Centre Precinct DCP provides a general noise requirement for developments surrounding the existing caravan park. Section 5.1.4 of Schedule 3 provides the following objective and control measures to be implemented:

Objectives

- To minimise impacts from industrial development on the existing caravan park.
- To provide for a landscaped buffer between industrial development and the existing caravan park.
- To ensure the boundary between industrial development and the caravan park is not dominated by over-shadowing or noise generating activities.

Control

In addition to other provisions that may apply to development contained in this DCP, the following provisions apply to all development adjacent to the existing caravan park:

- A minimum 20 metre buffer zone is to be provided between the caravan park boundary and any industrial development.
- The buffer zone is to include high quality landscaping.
- Employee car parking, storage and other non-intrusive uses are permitted within the buffer zone. Noise generating activities are not permitted within the buffer zone.
- If the caravan park ceases to continue operating as a business, Clause 5.1.4 will no longer apply.

4.2 NSW *Noise Policy for Industry*

The *NPfI* provides a framework and process for deriving noise criteria for consents and licences that enable the EPA and others to regulate premises that are scheduled under the Protection of the Environment Operations Act 1997. Whilst specifically aimed at assessment and control of noise from industrial premises regulated by the EPA, the Policy is also appropriate for use by the DPI&E and local councils when assessing development proposals.

The *NPfI* documents a procedure for assessment and management of industrial noise which involves the following steps:

- Determining the project noise trigger levels for a development. The project noise trigger level is a benchmark level above which noise management measured are required to be considered. They are derived by considering short-term intrusiveness due to changes in the existing noise environment (applicable to residential receivers only). The noise trigger levels are derived from ambient noise monitoring;
- Predicting or measuring noise produced by the development (having regard to any associated annoying characteristics and prevailing meteorological effects);

- Comparing the predicted or measured noise level with the project noise trigger level and assessing impacts and the need for noise mitigation and management measures;
- Considering any residual noise impacts following the application of feasible and reasonable noise mitigation measures;
- Setting statutory compliance levels that reflect the best achievable and agreed noise limits for development; and
- Monitoring and reporting environmental noise levels from the development.

The project noise trigger level represents the level that, if exceeded, may indicate a potential noise impact upon a community. It is a benchmark or objective and is not intended for use as a mandatory requirement.

4.2.1 Intrusiveness Noise Level

For assessing intrusiveness, the background noise level (L_{A90}) is measured and the RBL is determined. The intrusiveness of an industrial noise source may generally be considered acceptable if the equivalent continuous noise level (L_{Aeq}) of the source (measured over a 15-minute period) does not exceed the background noise level (RBL) by more than 5dBA.

The intrusiveness noise level for the surrounding residential receiver area are presented in **Table 4-1**.

Table 4-1 Intrusiveness noise level

Receiver	Time of day	Intrusiveness noise level $L_{Aeq,15min}$ dBA
R10	Day	40
	Evening	35
	Night	35
R11 – R14	Day	40
	Evening	38
	Night	35

4.2.2 Amenity Noise Level

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise (when on public transport corridors), noise from motor sport, construction noise, community noise, blasting, shooting ranges, occupational workplace noise, wind farms, amplified music/patron noise.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5dBA below the recommended amenity noise level.

It should be noted, the noise emissions from this site may vary at times due to the number of trucks entering/exiting the site and the operation of the forklifts. The amenity noise criteria, as prescribed by *NPfI*, derived from an average noise level of the whole time period and is more suitable for constant noise sources.

The *NPfI*, project trigger noise levels and limits are assessed on a 15-minute assessment period. The *NPfI* provides the following guidance on adjusting the $L_{Aeq,period}$ level to a representative $L_{Aeq,15minute}$ level to standardise the time periods.

$$L_{Aeq,15minute} = L_{Aeq,period} + 3dBA$$

An extract from the *NPfI* that relates to the amenity noise levels for surrounding receivers is given in **Table 4-2** and considers that in accordance with the *NPfI,* the residential locality is considered to be classified as a "suburban" area.

Table 4-2 Amenity noise levels

Noise amenity area	Time of day	Recommended amenity noise level $L_{Aeq,period}$ dBA
Residence (Suburban)	Day	55
	Evening	45
	Night	40
Industrial	All times in use	68 (70 – 5 +3)
Place of Worship	All times in use	38 (40 – 5 +3)

4.2.3 Maximum Noise Level Events

Noise sources of short duration and high level that may cause disturbance to sleep if occurring during the night time need to be considered.

The approach recommended by the *NPfI* is to apply the following initial screening noise levels:

- $L_{Aeq,15min}$ 40dBA or the prevailing RBL + 5dB, whichever is the greater; and/or
- L_{AFmax} 52dBA or the prevailing RBL + 15dB, whichever is the greater.

The sleep disturbance screening noise levels apply outside bedroom windows during the night time period. It should be noted, the sleep disturbance criteria do not apply to receivers within an industrial zone.

Where the screening noise levels cannot be met, a detailed maximum noise level event assessment should be undertaken. It may also be appropriate to consider other guidelines including the NSW *Road Noise Policy* (RNP) which contains additional guidance relating to potential sleep disturbance impacts.

4.2.4 Project Trigger Levels

The amenity and intrusiveness noise levels and resulting project trigger levels are shown in **Table 4-3** and include the sleep disturbance (screening) levels.

Table 4-3 Project noise trigger levels

Noise amenity area	Time of day	Project noise trigger level	Noise descriptor
Industrial	Day	68	$L_{Aeq,15min}$
	Evening	68	$L_{Aeq,15min}$
	Night	68	$L_{Aeq,15min}$
Place of Worship	Day	38	$L_{Aeq,15min}$
	Evening	38	$L_{Aeq,15min}$
	Night	38	$L_{Aeq,15min}$
Residence R10	Day	40	$L_{Aeq,15min}$
	Evening	35	$L_{Aeq,15min}$
	Night	35	$L_{Aeq,15min}$
	Night	52	L_{AFmax}
Residences R11 – R14	Day	40	$L_{Aeq,15min}$
	Evening	38	$L_{Aeq,15min}$
	Night	35	$L_{Aeq,15min}$
	Night	52	L_{AFmax}

4.3 Construction Noise Criteria

4.3.1 *Interim Construction Noise Guideline*

The *ICNG* provides the noise goals for construction noise to be achieved for this project.

All construction works will be carried out during the daytime period only and it is expected that the approval will typically condition standard construction hours. Standard construction hours are typically Monday to Friday 7.00am – 6.00pm, and Saturday 8.00am – 1.00pm.

On this basis and specifically for residences, the construction Noise Management Level (NML) is that the noise should not exceed the RBL by more than 10dBA.

It should be noted, the NML are considered as guidelines and not necessarily numeric noise levels to be complied with. The *ICNG* also prescribes a noise limit of 75 dBA. This limit represents the likelihood of a strong reaction from surrounding receivers. **Table 4-4** presents the application of the NML.

Table 4-4 Construction noise goals at residences for a quantitative assessment

Time of day	Management level $L_{Aeq(15min)}$	How to apply
Recommended Standard Hours: Monday to Friday 7am to 6pm Saturday & Sunday 8am to 5pm. No work on Sundays or Public Holidays	Noise affected RBL + 10 dBA	• The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	• The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level. • If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.

Table 4-5 presents the construction NMLs $L_{Aeq,15min}$ for other non-residential receivers relevant in this assessment.

Table 4-5 Construction noise management levels for non-residential receivers

Land use	NML L_{Aeq} (dBA)
Office, retail outlets	70dBA External
Places of Worship	45 dBA Internal
	55dBA (outside of building assuming windows are open)

Based on the recommended NML, **Table 4-6** and **Table 4-7** present the applicable NML for construction activities.

Table 4-6 Construction NML for non-residential receivers

Receiver ID	Receiver	Address	Day NML L_{Aeq} (dBA)
I1	Ikea Distribution Centre	376 South St, Marsden Park	70
I2	Blacktown Waste Service	25 Harris Ave, Marsden Park	70
I3	Tigerpak Packaging	22 Astoria St, Marsden Park	70
I4	Proposed Bucher Municipal	19 Astoria St, Marsden Park	70
I5	Caravan Park	140 Hollinsworth Rd, Marsden Park	70
I6	Isolated Resident	105 Hollinsworth Rd, Marsden Park	70
W7	Baitul Huda Mosque	45 Hollinsworth Rd, Marsden Park	55
I8	Industrial Warehouses	23 Hollinsworth Rd, Marsden Park	70
I9	Warehouses in construction	24 Hollinsworth Rd, Marsden Park	70

Table 4-7 Construction NML for residential receivers

Receiver ID	Receiver	Address	Day NML L_{Aeq} (dBA)
R10	Resident	372 Dortmund Cres, Marsden Park	45
R11	Resident	67B Amelia Way Bidwill	45
R12	Resident	11 Pine Cres, Bidwill	45
R13	Resident	15 Loranthus Cres, Bidwill	45
R14	Resident	8 Amaryllis Way, Bidwill	45

4.4 Traffic Noise Criteria

Additional traffic movements will result from both the construction and the operational phases of this project.

The *RNP* is considered by WMPL to be the most suitable guideline to assess potential impacts at residences from both construction and operation.

It is noted that the *RNP* is normally applied to developments which result in indefinite increases in road traffic noise rather than temporary increases associated with construction projects, however the *ICNG* does not include criteria to assess off-site construction traffic noise.

It has been assumed that during construction and following opening of all four warehouses that all traffic from the site will use the existing upgraded roads along Astoria Avenue via either Hawthorne Avenue or Hollinsworth Road to get to/from Richmond Road. Based on this approach, the impact of the traffic generated by this proposal will potentially impact residential receivers located along some sections of Richmond Road.

Considering all the variety of development categories within the *RNP*, the relevant criteria are summarised in **Table 4-8** and apply to all traffic along Richmond Road.

Table 4-8 Road traffic noise criteria – residences

Type of development	Criteria (external)	
	Daytime	Night-time
Existing residences affected by additional traffic on existing freeways / arterial / sub-arterial roads generated by land use developments	60 ($L_{Aeq.\ 15hr}$)	55 ($L_{Aeq.\ 9hr}$)

In addition, for existing residences and other sensitive land uses affected by additional traffic on existing roads and where the criterion is exceeded, any increase in the total traffic noise level should preferably be limited to 2dB. The *RNP* considers that a 2dB increase is typically not noticeable.

It is worthy to note that the EPA defines periods for on-site noise differently to that defined for road traffic (along the road network). For road traffic noise along the road network, the day time period is defined as the time between 7:00am and 10:00pm and night-time is between 10:00pm and 7:00am.

5 OPERATIONAL NOISE ASSESSMENT

5.1 Noise Modelling

Site related noise emissions were modelled using the CadnaA Ver2020 noise prediction software. To complete this, a representative 3-D model within the software was constructed of the site and surrounding receivers.

Factors that are addressed in the modelling are:

- equipment sound level emissions (in octave bands) and locations;
- screening effects from buildings and barriers;
- receiver locations;
- ground topography;
- noise attenuation due to geometric spreading; and
- ground absorption and atmospheric absorption.

5.2 Scenarios & Noise Sources

Considering further information within the *NPfI* regarding the time of day definitions, the following operational scenarios have been developed as outlined in **Table 5-1**, **Table 5-2** and **Table 5-3**.

Based on the client's proposed truck movement the maximum hourly vehicles movements likely to occur for each operational scenario is presented. It is critical to note that such movements are unlikely to be sustained at such levels during each of these periods and for each warehouse.

- Day Worst-case hour between 7.00am and 6.00pm
- Evening Worst-case hour between 6.00pm and 10.00am
- Night Worst-case hour between 10.00pm and 7.00am

For general continuous or semi-continuous use, the noise predictions assume the Sound Power Level of a heavy vehicle to be 102dBA and for light vehicles to be 90dBA. Both heavy and light vehicles are assumed to travel 20km/h on-site. Forklifts are assumed to have a Sound Power Level of 95dBA and travel 10km/h on-site.

It should be noted, no mechanical data was provided, and a Sound Power Level for each AC Unit is assumed to be 80dBA.

Regarding sleep disturbance, the use of a truck engine brake has been identified as the possible short-term noise event that could lead to sleep disturbance. A Sound Power Level (maximum) of 115dBA has been assigned to this event.

Table 5-1 Operational noise prediction scenarios – worst case during the day

Warehouse	Source	Amount per hour
1	Heavy Vehicles	5 at east loading and 5 at west loading dock
	Light Vehicle	86 vehicles arriving or departing
	Forklifts	5 at east loading and 5 at west loading dock
	A/C units	14 operating on the roof
2	Heavy Vehicles	8 at loading dock
	Light Vehicle	64 vehicles arriving or departing
	Forklifts	8 at loading dock
	A/C units	8 operating on the roof
3	Heavy Vehicles	3 at loading dock
	Light Vehicle	18 vehicles arriving or departing
	Forklifts	3 at loading dock
	A/C units	4 operating on the roof
4	Heavy Vehicles	5 at loading dock
	Van Couriers	10 at loading dock
	Light Vehicle	80 vehicles arriving or departing
	Forklifts	5 at loading dock
	A/C units	10 operating on the roof

Table 5-2 Operational noise prediction scenarios – worst case during the evening

Warehouse	Source	Amount per hour
1	Heavy Vehicles	3 at east loading and 3 at west loading dock
	Light Vehicle	86 vehicles arriving or departing
	Forklifts	3 at east loading and 3 at west loading dock
	A/C units	14 operating on the roof
2	Heavy Vehicles	4 at loading dock
	Light Vehicle	64 vehicles arriving or departing
	Forklifts	4 at loading dock
	A/C units	8 operating on the roof
3	Heavy Vehicles	3 at loading dock
	Light Vehicle	18 vehicles arriving or departing
	Forklifts	3 at loading dock
	A/C units	4 operating on the roof
4	Heavy Vehicles	4 at loading dock
	Van Couriers	6 at loading dock
	Light Vehicle	80 vehicles arriving or departing
	Forklifts	4 at loading dock
	A/C units	10 operating on the roof

Table 5-3 Operational noise prediction scenarios – worst case during the night

Warehouse	Source	Amount per hour
1	Heavy Vehicles	2 at east loading and 2 at west loading dock
	Light Vehicle	43 vehicles arriving or departing
	Forklifts	2 at east loading and 2 at west loading dock
	A/C units	14 operating on the roof
2	Heavy Vehicles	2 at loading dock
	Light Vehicle	32 vehicles arriving or departing
	Forklifts	2 at loading dock
	A/C units	8 operating on the roof
3	Heavy Vehicles	2 at loading dock
	Light Vehicle	9 vehicles arriving or departing
	Forklifts	2 at loading dock
	A/C units	4 operating on the roof
4	Heavy Vehicles	2 at loading dock
	Van Couriers	4 at loading dock
	Light Vehicle	40 vehicles arriving or departing
	Forklifts	2 at loading dock
	A/C units	10 operating on the roof
Any	Truck Engine Brake	Worst-case noise event occurring at any loading dock area (sleep disturbance)

The noise modelling also assumed the following items:

- A 15-minute period will occur during each time period (day, evening and night) where all four warehouses will be operating as outlined in **Table 5-1**, **Table 5-2** and **Table 5-3**.
- Buildings at receiver locations I2 and I9 are still in construction at this stage. However, the model assumes the buildings associated with I9 to be complete and a height (conservative) of 10m. The site layout of I9 was collected from noise assessment reports for Lot 23 & 24 Hollinsworth Road, Marsden Park prepared by EMM Consulting Pty Ltd (ref: J17164RP1).
- A 2.4m high noise barrier is proposed to be located on the eastern boundary between Warehouse 2 and the caravan park in order to further reduce noise levels to this receiver. Previous discussions between SBP and this receiver for other approved developments have resulted in a commitment by SBP to further reduce impacts to this receiver by the installation of noise barriers.
- The rooftop mechanical units are located evenly across the roof of Warehouse 1 and 4, however are grouped towards the north-western quarter of the roof for Warehouse 2 and 3. This will be subject to a final detailed design.
- A 2.7m high noise barrier is proposed to be located on part of the south-western boundary corner to minimise loading dock noise associated with Warehouse 4 impacting the residential receivers directly to the south of the loading docks.

5.3 Meteorological Conditions

The meteorological effects on noise propagation such as temperature inversion and wind are considered in the noise prediction model. Two meteorological scenarios are considered, one is under neutral conditions where temperature inversion and wind have minimal effect on the noise. The second is a worst-case scenario, where temperature inversion and wind affect the noise emissions.

The standardised neutral and worst-case weather conditions outlined in Section D of the NSW *NPfI* are used in the noise prediction model. A summary of the meteorological conditions is outlined in **Table 5-4**.

Table 5-4 Meteorological conditions adopted for the noise modelling

Assessment period	Meteorological condition	Wind speed (m/s)	Wind direction (°)	Stability category (A to G)
Day/Evening	Standard	0	N/A	D Class
	Noise Enhancing (wind)	3	Worst-Case	D Class
Night	Standard	0	N/A	D Class
	Noise Enhancing (wind)	3	Worst-Case	D Class
	Noise Enhancing (temperature inversion with drainage flow wind)	2	Worst-Case	F Class

5.4 Predicted Noise Levels at Receivers

Operational noise levels have been predicted at the nearest receivers surrounding the site using CadnaA Ver2020 noise modelling software implementing the CONCAWE predication algorithm.

Table 5-5, Table 5-6 and **Table 5-7** present predicted noise levels at surrounding receivers with all equipment and vehicles operating.

Table 5-8 presents the predictions associated with sleep disturbance.

For completeness, the noise levels associated with standard metrological and noise enhancing have been presented. It is important to reinforce that this report assumes a worst case period where each warehouses operates during a noise enhancing metrological condition.

Table 5-5 Operational noise predictions – day ($L_{Aeq,15min}$ dBA)

ID	Address	Predicted level		Project noise trigger level	Compliance
		Standard metrological	Weather enhanced		
I1	376 South St, Marsden Park	38	42	68	Compliant
I2	25 Harris Ave, Marsden Park	<30	<30	68	Compliant
I3	22 Astoria St, Marsden Park	53	54	68	Compliant
I4	19 Astoria St, Marsden Park	33	37	68	Compliant
I5	140 Hollinsworth Rd, Marsden Park	43	46	68	Compliant
I6	105 Hollinsworth Rd, Marsden Park	<30	<30	68	Compliant
W7	45 Hollinsworth Rd, Marsden Park	<30	<30	48	Compliant
I8	23 Hollinsworth Rd, Marsden Park	<30	31	68	Compliant
I9	24 Hollinsworth Rd, Marsden Park	49	50	68	Compliant
R10	372 Dortmund Cres, Marsden Park	<30	<30	40	Compliant
R11	67B Amelia Way Bidwill	<30	<30	40	Compliant
R12	11 Pine Cres, Bidwill	<30	<30	40	Compliant
R13	15 Loranthus Cres, Bidwill	30	35	40	Compliant
R14	8 Amaryllis Way, Bidwill	<30	32	40	Compliant

Table 5-6 Operational noise predictions – evening ($L_{Aeq,15min}$ dBA)

ID	Address	Predicted level		Project noise trigger level	Compliance
		Standard metrological	Weather enhanced		
I1	376 South St, Marsden Park	36	40	68	Compliant
I2	25 Harris Ave, Marsden Park	<30	<30	68	Compliant
I3	22 Astoria St, Marsden Park	52	53	68	Compliant
I4	19 Astoria St, Marsden Park	32	36	68	Compliant
I5	140 Hollinsworth Rd, Marsden Park	43	46	68	Compliant
I6	105 Hollinsworth Rd, Marsden Park	<30	<30	68	Compliant
W7	45 Hollinsworth Rd, Marsden Park	<30	<30	48	Compliant
I8	23 Hollinsworth Rd, Marsden Park	<30	<30	68	Compliant
I9	24 Hollinsworth Rd, Marsden Park	49	50	68	Compliant
R10	372 Dortmund Cres, Marsden Park	<30	<30	35	Compliant
R11	67B Amelia Way Bidwill	<30	<30	38	Compliant
R12	11 Pine Cres, Bidwill	<30	32	38	Compliant
R13	15 Loranthus Cres, Bidwill	31	35	38	Compliant
R14	8 Amaryllis Way, Bidwill	<30	33	38	Compliant

Table 5-7 Operational noise predictions – night ($L_{Aeq,15min}$ dBA)

ID	Address	Predicted level		Project noise trigger level	Compliance
		Standard metrological	Weather enhanced		
I1	376 South St, Marsden Park	35	39	68	Compliant
I2	25 Harris Ave, Marsden Park	<30	<30	68	Compliant
I3	22 Astoria St, Marsden Park	49	51	68	Compliant
I4	19 Astoria St, Marsden Park	30	34	68	Compliant
I5	140 Hollinsworth Rd, Marsden Park	41	43	68	Compliant
I6	105 Hollinsworth Rd, Marsden Park	<30	<30	68	Compliant
W7	45 Hollinsworth Rd, Marsden Park	<30	<30	48	Compliant
I8	23 Hollinsworth Rd, Marsden Park	<30	<30	68	Compliant
I9	24 Hollinsworth Rd, Marsden Park	47	48	68	Compliant
R10	372 Dortmund Cres, Marsden Park	<30	<30	35	Compliant
R11	67B Amelia Way Bidwill	<30	<30	35	Compliant
R12	11 Pine Cres, Bidwill	<30	31	35	Compliant
R13	15 Loranthus Cres, Bidwill	<30	34	35	Compliant
R14	8 Amaryllis Way, Bidwill	<30	32	35	Compliant

The predictions show compliance with noise criteria considering a worst-case scenario and assuming a weather enhanced situation also occurs.

Table 5-8 Operational noise predictions – night – sleep disturbance (L_{AMAX} dBA)

ID	Address	Predicted level		Screening criterion	Compliance
		Standard metrological	Weather enhanced		
R10	372 Dortmund Cres, Marsden Park	40	45	52	Compliant
R11	67B Amelia Way, Bidwill	<30	<30	52	Compliant
R12	11 Pine Cres, Bidwill	36	41	52	Compliant
R13	15 Loranthus Cres, Bidwill	*54*	*57*	52	*Non-Compliant*
R14	8 Amaryllis Way, Bidwill	46	50	52	Compliant

The noise impact assessment has identified an exceedance of the initial screening criterion at one of the five residential locations and therefore an assessment of sleep disturbance is necessary.

A detailed maximum noise level event assessment has been undertaken using the NSW *Road Noise Policy* (RNP) which contains additional guidance relating to potential sleep disturbance impacts.

A review of research on sleep disturbance in the *RNP* indicates that in some circumstances, higher noise levels may occur without significant sleep disturbance.

Based on currently available research results, the *RNP* concludes that:

- "Maximum internal noise levels below 50dBA to 55dBA is unlikely to cause awakening reactions."
- "One or two noise events per night, with maximum internal noise levels of 65 dBA to 70 dBA, are not likely to affect health and wellbeing significantly."

Considering a typical worst-case where a bedroom window is sufficiently open for ventilation, a reduction across the façade is typically 10dB and, on this basis, the following is applicable when measured externally to a bedroom window:

- External maximum levels of up to 65dBA is unlikely to cause awakenings.
- One or two external maximum levels of between 75 and 80dBA is not likely to affect health and wellbeing significantly.

The predictions of maximum noise level events show levels below 65dBA even assuming a weather enhanced situation occurs. On this basis and considering the latest information from the *RNP*, such levels are unlikely to cause awakening reactions.

5.5 Cumulative Operational Noise Impacts

The residential receivers surrounding SBP are located within a "suburban" area with referenced to the locality description in the *NPfI*. The amenity noise criteria assigned for a suburban area is a relevant approach in controlling industrial noise from existing and future approved developments in the area.

For this project and the potential cumulative impact from other current and future projects, the residential area to the south has been considered as the most risk of such impact. It has been conservatively assumed that the worst case 15minute predicted noise would not occur for 50% of the day, evening or night period and therefore the estimated amenity level would be 3dB below these predicted noise levels.

Based on this approach and considering the worst case impacted residential receiver to the south, the noise levels would be well below the relevant acceptable amenity level. For instance, at night the estimated $L_{Aeq\ (night)}$ of 31 (34-3) dBA is 9dB below the amenity of 40dBA. On this basis the risk of impact from cumulative industrial noise impacting the residential receivers to the south is considered low.

6 OPERATIONAL NOISE CONTROL MEASURES

To ensure the warehouse noise emission comply with the noise criteria, the following two commitments are recommended:

1. Subject to a final detailed design, the following preliminary mitigation is recommended for mechanical plant:
    - The rooftop mechanical units are to be located evenly across the roof of Warehouse 1 and 4.
    - The rooftop mechanical units are to be located towards the north-western quarter of the roof for Warehouse 2 and 3.
    - The number of mechanical plant operating shall not exceed the assumptions as per and shall be selected with a sound power level of no greater than 80dBA – where this is not possible, an allowance of a screen may be necessary for Warehouse 4.
2. A 2.7m high noise barrier is to be constructed on part of the south-western boundary corner of Warehouse 4 (refer **Figure 6-1**).

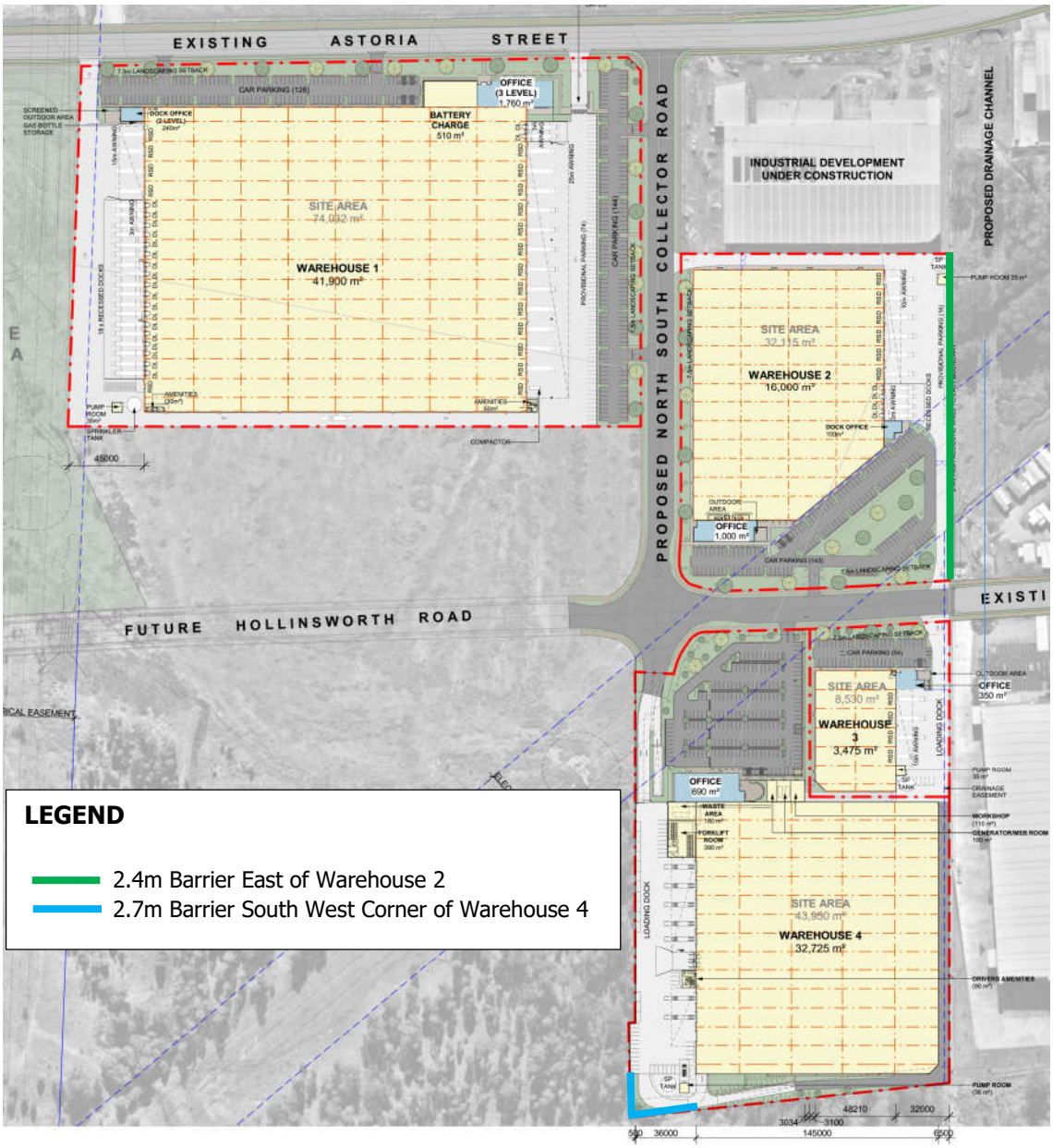
To manage noise impacts to the caravan park, SBP have previously provided noise barriers to the boundary of the caravan park. This is above what is necessary to meet noise criteria and this approach will be continued for this project. As such, SBP proposes to install a 2.4m high noise barrier to be located on the eastern boundary between Warehouse 2 and the caravan park (refer **Figure 6-1**) in order to further reduce noise levels the caravan park.

It should be noted that this barrier is not required to meet the noise criterion of 68dBA derived for the caravan park.

Subject to final detailed design, the two barriers mentioned above should consist of the following properties:

- The construction of the proposed noise barrier may be formed precast/aerated concrete, fibreglass reinforced plasterboard with dense infill material, 12mm thick compressed fibre cement panel or similar material with a density of greater than 20kg/m^2.
- All joints between panels that make up the barrier should not have gaps be well sealed. If a gap is required underneath the barrier, we recommend that the gap be kept to a minimum so that it is installed close to the ground as much as possible. If an opening such as a gate is necessary, the opening should be minimised and consideration during detailed design should be given to the location of this opening to maximise the acoustic benefit of the barrier. The gate should be solid and constructed of a material with a density of at least 10kg/m^2 and all gaps around the gate minimised when in the closed position.

Figure 6-1 Proposed barriers



7 CONSTRUCTION NOISE

7.1 Construction Equipment Noise Source Levels

At this stage, a detailed list of equipment likely to be used during the construction project was not provided. Therefore, based on experience from similar projects, the construction project is divided into three separate work stages and it is assumed works will take place at all warehouses simultaneously (this is a conservative assumption as all four houses are unlikely to be constructed at the same time). The typical equipment expected to be used is also assumed in each construction stage. The stages and assumptions include (for each warehouse site):

- Stage 1: Earthworks
    - typical plant will be dozer/front end loader, haul trucks and excavators.
    - total sound power level for such works is typically 112 to 118dBA.
- Stage 2: Concrete works
    - bored piling/auger expected in this stage initially.
    - concrete trucks and pumps will largely dominate the main works in this stage.
    - total sound power level for such works is typically 105 to 109dBA for bored piling but during the concreting part of this stage, typically 108 to 114dBA is expected depending on the number of teams of trucks and pumps.
- Stage 3: Warehouse construction
    - this stage is largely expected to include truck deliveries, cranes and the use of elevated platforms and powered hand tools.
    - there will be up to several teams on each warehouse with expected sound power levels of 108dBA to 114dBA expected with much of the work elevated to greater than 10m when roofing works are being conducted.

Given the early stage of this project, preliminary assumptions to provide noise predictions are provided in **Table 7-1**. These assumptions can be revisited at detailed design stage and once a construction contractor has been appointed.

Table 7-1 Assumed total sound power level of plant (dBA)

Warehouse No.	Earthworks	Concrete Works	Warehouse Construction
1	118	114	114
2	115	111	111
3	112	108	108
4	115	111	111

Note: Warehouse Construction works assumed to occur at a height of at least 10m

7.2

7.2 Construction Noise Impact Predictions

The *ICNG* requires predicted noise levels at receivers to be based on 15-minute periods. The noise impact predictions assume a "typical worst-case" scenario whereby all the plant is running continuously.

As such, the impact predictions represent the likely noise levels that would occur during intensive periods of construction. Therefore, the presented noise levels can be considered in the upper range of noise levels that can be expected at surrounding receivers when the various construction stages occur.

Based on the above, resultant noise levels at receivers have been predicted, as shown in **Table 7-2**.

Table 7-2 Predicted L_{Aeq} construction noise dBA for each construction stage

Receiver ID	Receivers	Construction stages			NML
		1	2	3	Daytime
I1	376 South St, Marsden Park	59	54	58	70
I2	25 Harris Ave, Marsden Park	32	<30	30	70
I3	22 Astoria St, Marsden Park	69	62	65	70
I4	19 Astoria St, Marsden Park	62	57	63	70
I5	140 Hollinsworth Rd, Marsden Park	64	59	63	70
I6	105 Hollinsworth Rd, Marsden Park	32	<30	33	70
W7	45 Hollinsworth Rd, Marsden Park	<30	<30	<30	55
I8	23 Hollinsworth Rd, Marsden Park	68	63	68	70
I9	24 Hollinsworth Rd, Marsden Park	42	39	45	70
R10	372 Dortmund Cres, Marsden Park	39	35	41	45
R11	67B Amelia Way Bidwill	34	<30	34	45
R12	11 Pine Cres, Bidwill	**48**	43	**48**	45
R13	15 Loranthus Cres, Bidwill	**56**	**48**	**56**	45
R14	8 Amaryllis Way, Bidwill	**49**	43	**49**	45

The predicted noise levels throughout the construction works comply with the NML at all non-residential receiver locations. However, the earthworks and construction works are predicted to exceed the NML at receivers from R12 to R14, located south of the site. The concrete works is predicted to exceed the day NML at receiver R13.

Given the distance and shielding, no exceedances have been predicted to the residential receivers to the north-west (R10).

Such exceedances can be managed and a preliminary construction noise management plan to minimise the noise impact on surrounding receivers is provided in **Section 9**.

8 NOISE FROM TRAFFIC GENERATED BY THE DEVELOPMENT

Additional traffic movements along the current road network will result from both the construction and the operational phases of this development.

At this stage, we have been advised that construction may begin this year (subject to approval) and that the development is likely to be operational during 2021.

Furthermore, we have been advised that Marsden Park Precinct will likely be completed and fully operational by 2036. At such time it is likely that several road upgrade projects currently proposed by Transport for NSW will be completed and the road network and traffic volumes will be significantly higher than currently experienced in the area.

On this basis, the noise impact associated with traffic generated by this development has assumed that during construction and following opening of all four warehouses that all traffic associated with the development will use the existing upgraded roads along Astoria Avenue via either Hawthorne Avenue or Hollinsworth Road to get to/from Richmond Road. Based on this approach, the impact of the traffic generated by this proposal will potentially impact residential receivers located along some sections of Richmond Road.

This approach is considered to result in a worst case scenario given that in the future more roads leading to Richmond Road will be upgraded. In addition, the traffic volumes along all roads in the area will progressively increase.

8.1 Typical Existing Traffic Volumes and Noise along Richmond Road

There is no recent traffic count data or noise logging data along Richmond Road in the vicinity of the Marsden Park Precinct, however data from the following sources is considered sufficient to confirm the acoustic impact due to the increase in traffic from this development is negligible:

- Marsden Park Precinct – Environmental Noise & Vibration Impact Assessment (ref: TF497-01F02 (rev 4) dated 12 July 2012, prepared by Renzo Tonin & Associates
- 2018 Average Daily Traffic Count for Richmond Road (350m East of Symonds Road – Station ID:71059), Transport for NSW Traffic Volume Viewer

From the above two sources, the following information is most relevant:

1. Existing traffic noise levels along Richmond Road are conservatively at least 5dB above the criteria nominated in **Table 4-8** and as such the notion of an allowance of up to a 2dB increase in noise from additional traffic along Richmond Road due to the development is relevant. All reasonable and feasible mitigation shall be assessed as considered necessary if a 2dB exceedance is predicted.
2. Existing movements along Richmond Road in the vicinity of the Precinct are conservatively assigned an average daily traffic count of 35,915 vehicles.
3. The existing distribution of the 35,915 vehicles is estimated to be (using the assumptions in the Marsden Park Precinct (85% day and 15% day/night split and 7.7% heavy vehicles):
    a. Daytime 28177 light vehicles and 2351 heavy vehicles
    b. Night-time 4972 light vehicles and 415 heavy vehicles

8.2 Assessment of Airborne Noise from Off-site Construction Vehicle Movements

Following discussions with ARUP (the traffic consultant for this development) and SBP, the following has been determined to represent a typical worst case day with regards to construction traffic movements. Most days will not reach such levels even in the unlikely case that all warehouses are constructed simultaneously.

- 130 light vehicle movements and 40 heavy vehicle movements during the daytime.
- No construction vehicle movements during the night-time.
- Movements are distributed along Richmond Road assuming 50% travel east and 50% travel west.

Based on the above, the relative increase in noise is calculated using the *Calculation of Road Traffic Noise* (CoRTN) and is predicted to be <0.1dB and is considered an insignificant change in noise levels.

8.3 Assessment of Airborne Noise from Off-site Operational Vehicle Movements

In terms of operational vehicle movements, following discussions with SBP and considering the worst case operations as per **Table 5-5, Table 5-6** and **Table 5-7**, the following has been determined to represent a worst case day and a worst case night with regards to operational traffic movements. Most of the time such number of movements will not be reached as it assumes all warehouses are working at capacity for a given day or night.

- 248 light vehicle movements (assuming 2 worst case hours occur) and 126 heavy vehicle movements during the night-time (assuming worst case hours occur during all 9 night hours).
- 744 light vehicle movements (assuming 3 worst case hours occur) and 632 heavy vehicle movements during the daytime (assuming worst case hours occur during all 15 day hours).
- Movements are distributed along Richmond Road assuming 50% travel east and 50% travel west.

Based on the above, the relative increase in noise is calculated using the *Calculation of Road Traffic Noise* (CoRTN) and is predicted to be < 0.5dB during both the daytime and night-time. Such a change is considered insignificant and it is worthy to appreciate that the changes in traffic from one day to the next would result in greater changes to noise.

9 CONSTRUCTION NOISE MANAGEMENT PLAN

9.1.1 Noise Management Control

Construction noise level was predicted to exceed the NML mainly at receiver located south of the site during the earthworks and construction stage. However, noise levels were still within the highly affected noise limit of 75dB as prescribed within the *ICNG*. Noise management control should be implemented in order to minimise noise impact on the surrounding receivers. The following preliminary controls should be applied:

- *Site Induction Training* - Training should include noise awareness component, community consultation and response to complaints as provided in the construction management plan.
- *Operator Instruction* - Operators should be trained in order to raise their awareness of potential noise problems and to increase their use of techniques to minimise noise emission.
- *Site Noise Planning* - Where practical, the layout and positioning of fixed noise-producing plant and activities away from the nearby receivers.
- *Scheduling* - Where practical, minimise the number of tools and machines operating simultaneously.
- *Plant Equipment* - Where possible, plant and equipment with a low sound power level should be selected while still maintaining efficiency of function.
- *Construction Traffic* - All movements to follow the recommendations within **Section 8**.

9.1.2 Community Consultation

Consultation with and the provision of information to the surrounding community is regarded as a major factor in controlling the negative reaction to the inevitable impacts associated with construction works. Contact details on site on the site boundary fence should be posted.

9.1.3 Response to Complaints

Should ongoing complaints of excessive noise and vibration impacts occur measures shall be undertaken to investigate the complaint, the cause of the complaint identified and changes to work practices implemented.

Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated. If a noise and vibration complaint is received the complaint should be recorded. The complaint form should list:

- The name and location of the complainant (if provided) as well as the time, date and nature of the complaint was received;
- The name of the employee who received the complaint and actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action by a site manager or as detailed in this report; and
- Summary of feedback to the complainant.

A permanent Register of Complaints should be held. All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable:

- measurements at the affected receiver;
- an investigation of the activities occurring at the time of the incident;
- inspection of the activity; and
- whether work practices were being carried out either within established guidelines or outside these guidelines.

10 CONCLUSION

Wilkinson Murray has conducted a noise and vibration impact assessment of four proposed warehouse and distribution facilities in the area known as 'Stage 3' (site). The proposed site is in the south-western area of the Sydney Business Park, Marsden Park.

The facilities are proposed to operate up to 24 hours a day, 7 days a week.

A review of the construction and operation activities confirms that there are no vibration intensive activities proposed.

On this basis, a detailed vibration assessment is not deemed necessary and this report will focus on impacts associated with construction noise and operational noise only.

It can be concluded that the operational noise will meet the noise criteria derived as per NSW *Noise Policy for Industry* considering worst case noise scenarios and assuming a weather enhanced situation occurs.

Furthermore, the following impacts have been assessed and at best would be considered a low risk:

- cumulative operational noise from on-site activities
- operational sleep disturbance from on-site activities
- operational traffic movements along the road network
- construction traffic movements along the road network

For compliance to be ensured, operational noise control measures as per **Section 6** of this report have been recommended.

All construction scenarios comply with the relevant NML at nearby industrial sensitive receivers. However, the earthworks and the warehouse construction works are predicted to exceed the NML at receivers from R12 to R14, located south of the site. The concrete works is predicted to exceed the day NML at receiver R13. Given the distance and shielding, no exceedances have been predicted to the residential receivers to the north-west (R10).

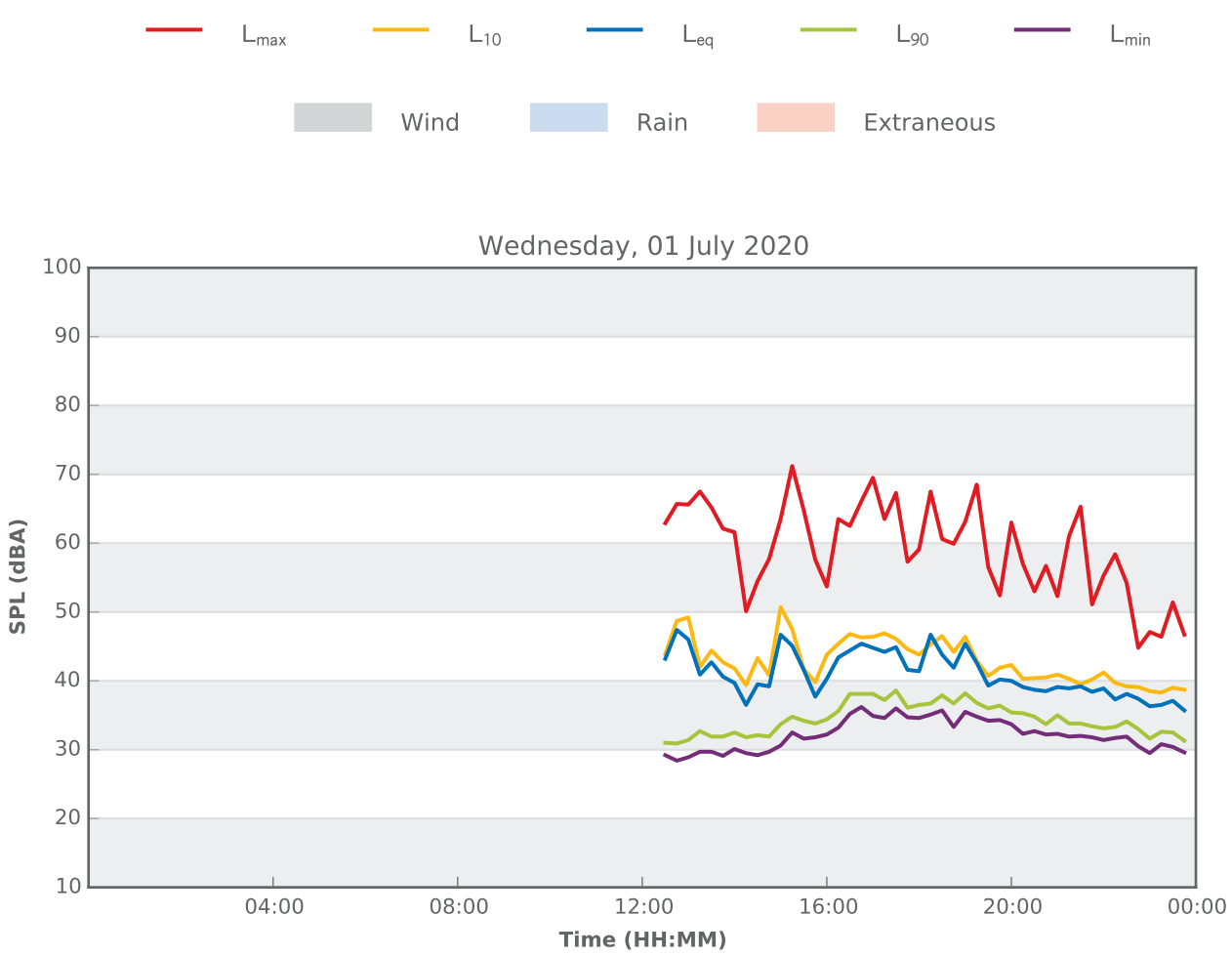
Noise management should be implemented to ensure noise amenity at the nearest surrounding locations is maintained. A construction noise management plan is provided in **Section 9**.

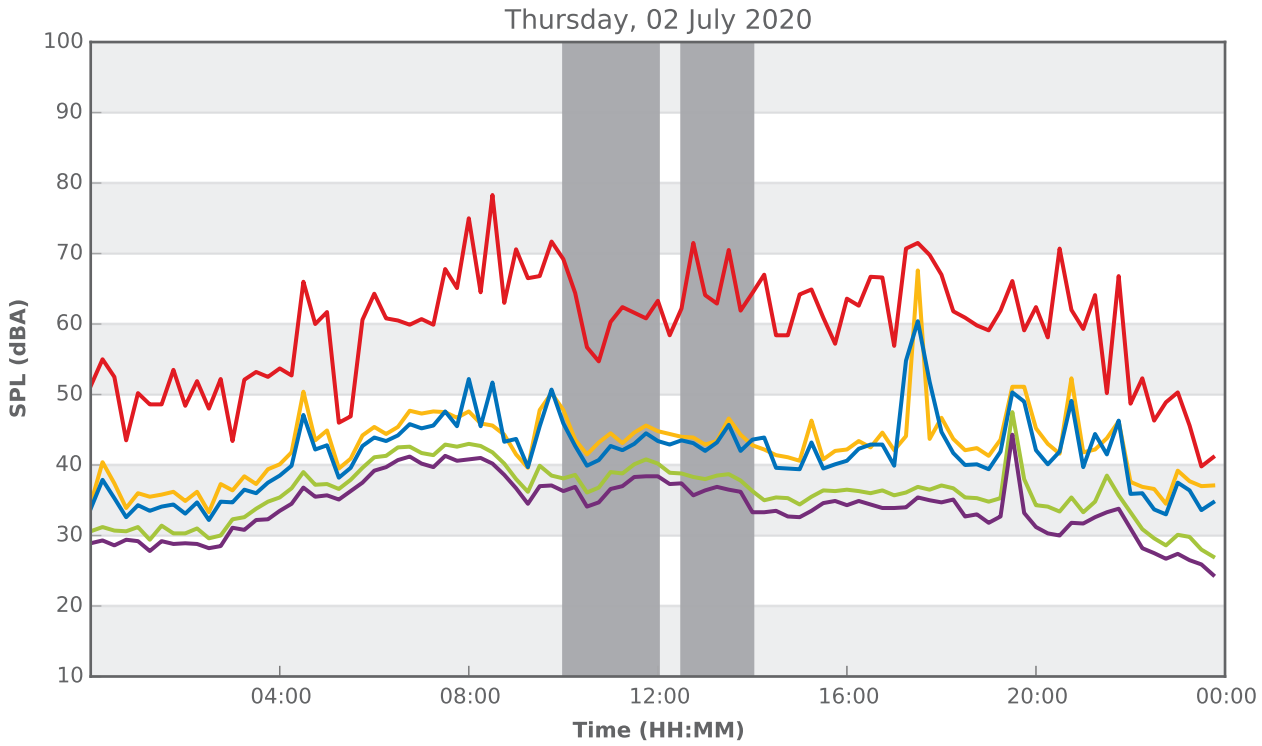
APPENDIX A

NOISE MEASUREMENT RESULTS

- NL1 : 18 Aubusson Street, Marsden Park
- NL2 : 15 Roche Grove, Shalvey

18 Aubusson Street, Marsden Park





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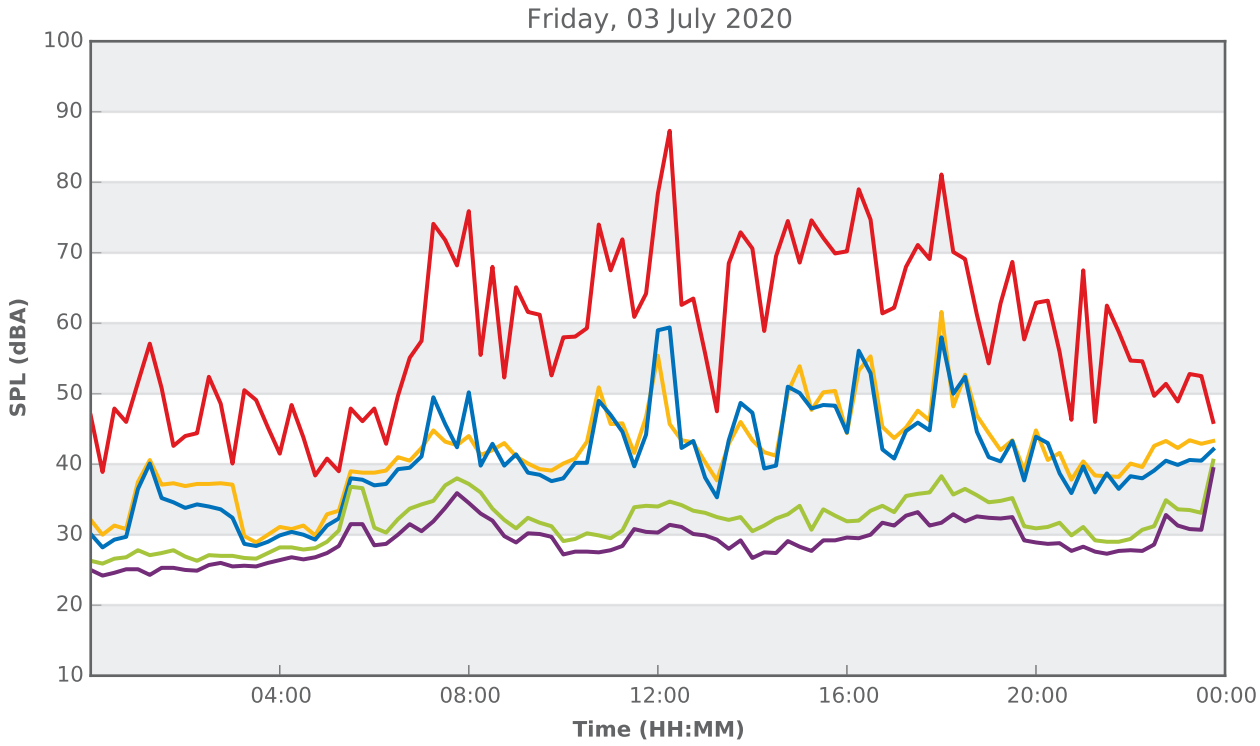

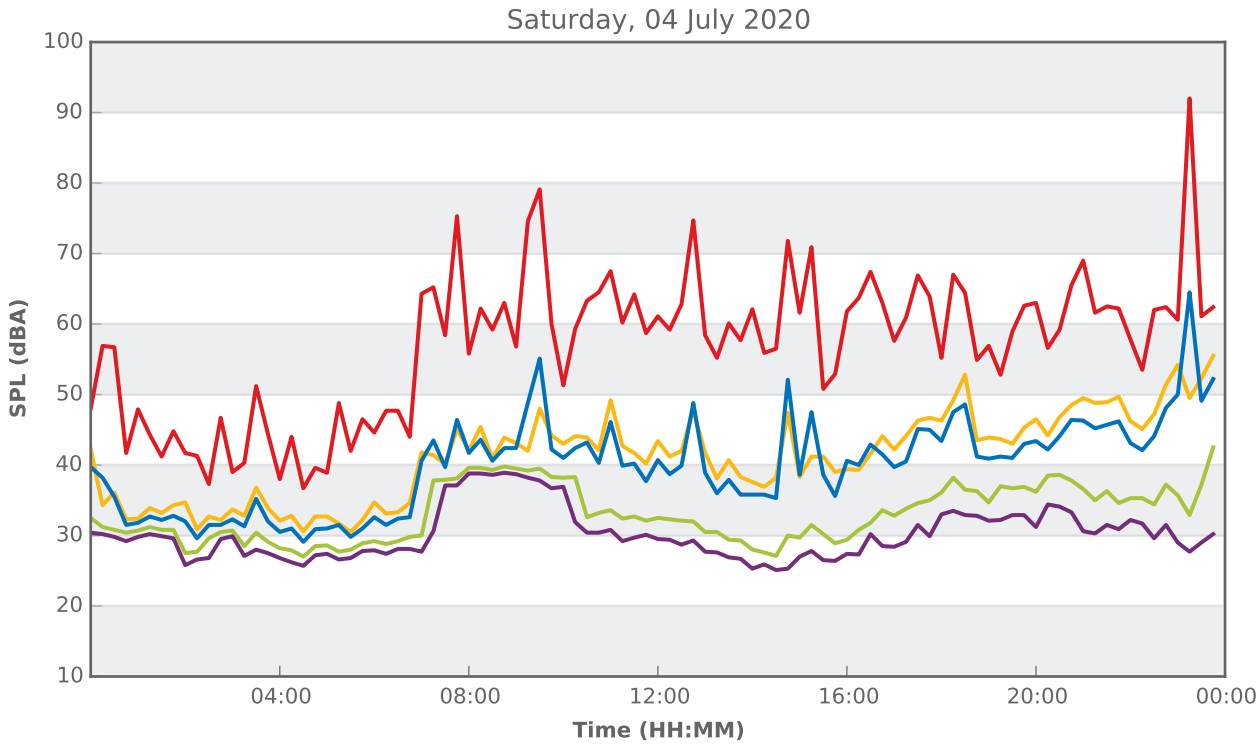

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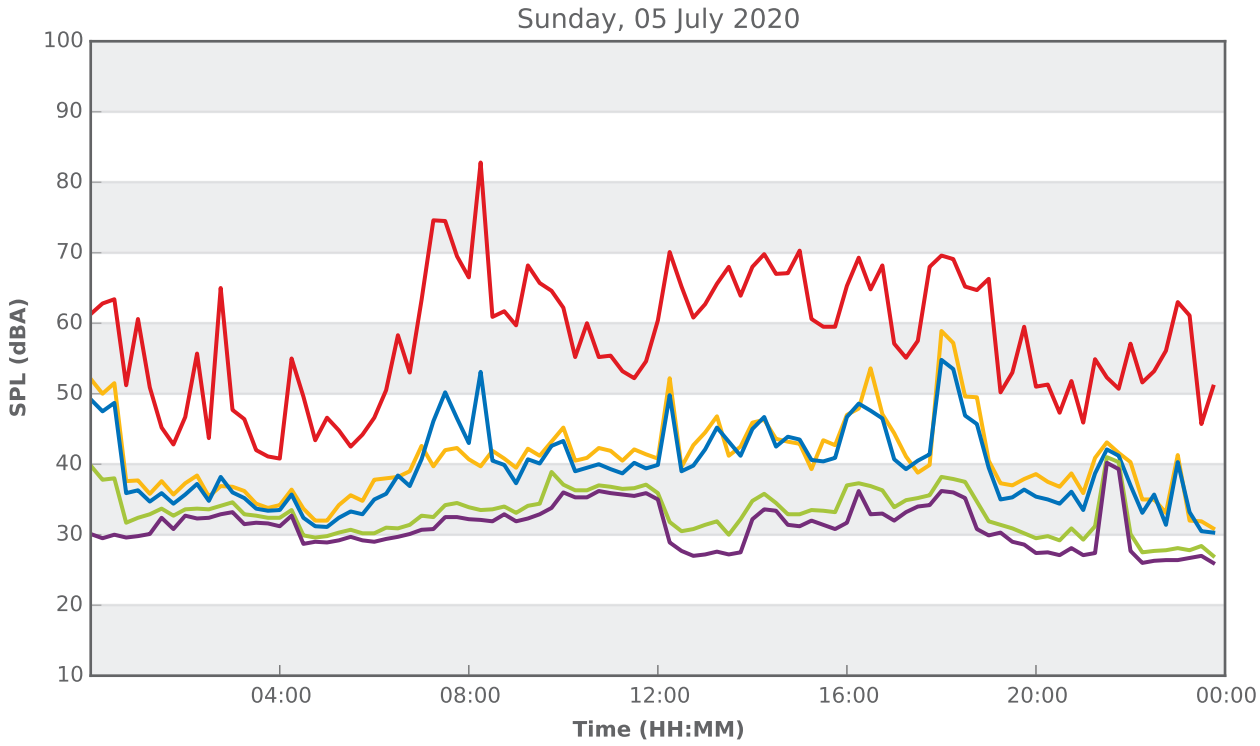
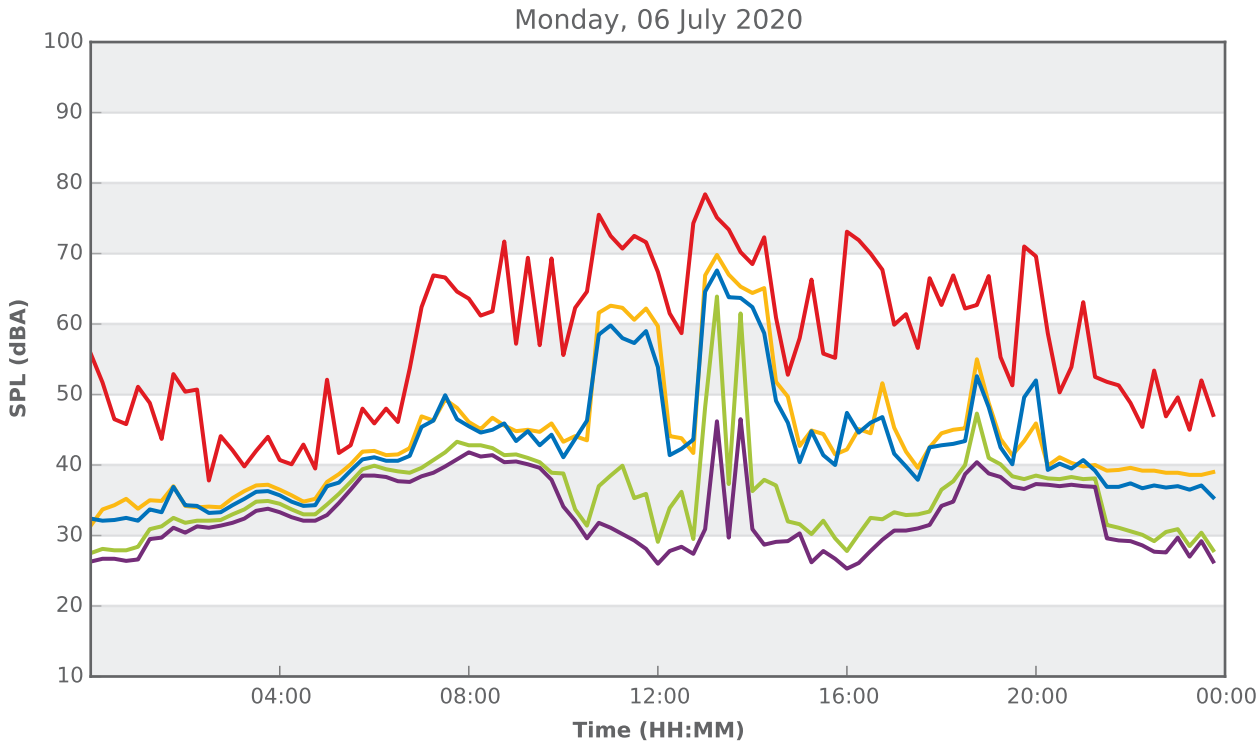
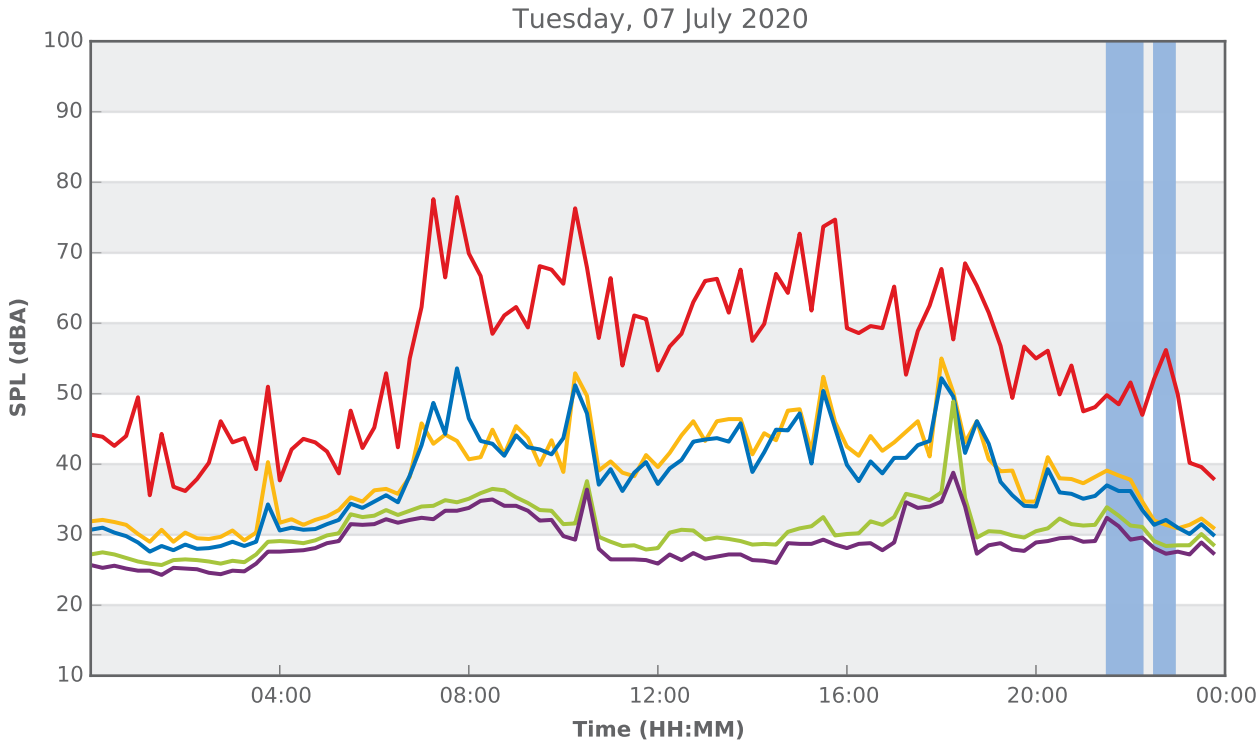
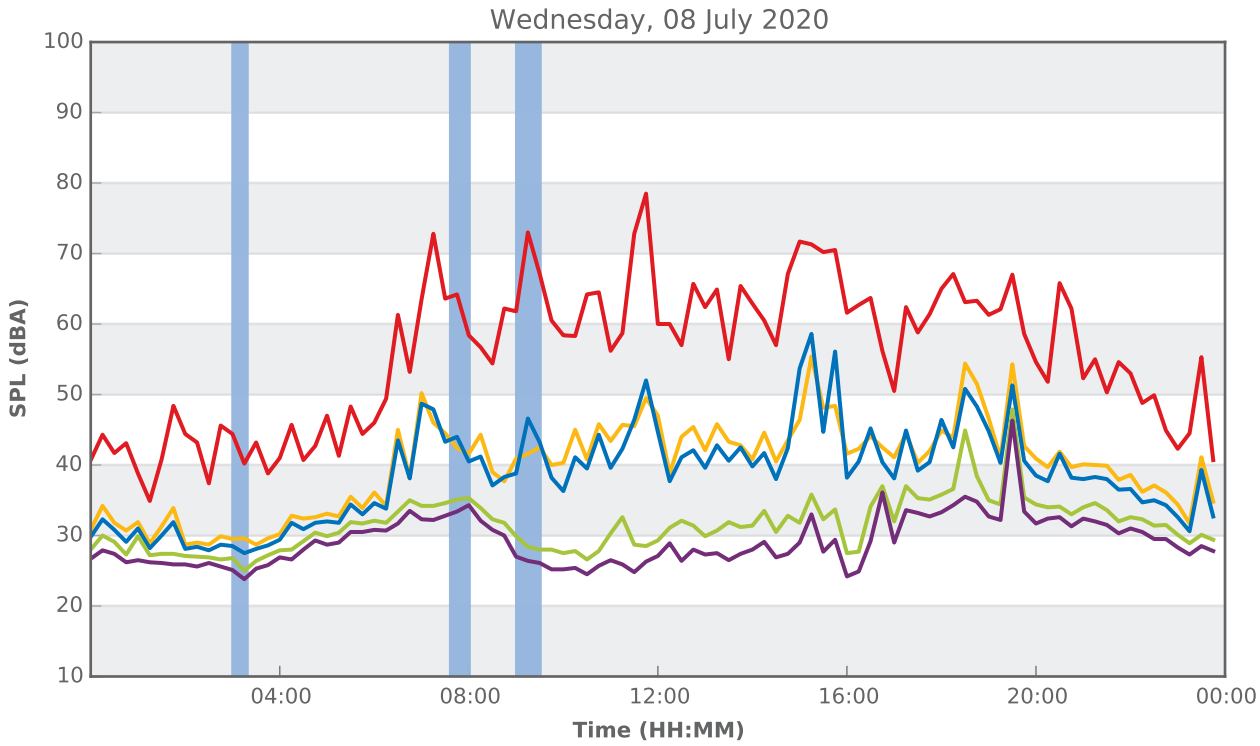




18 Aubusson Street, Marsden Park





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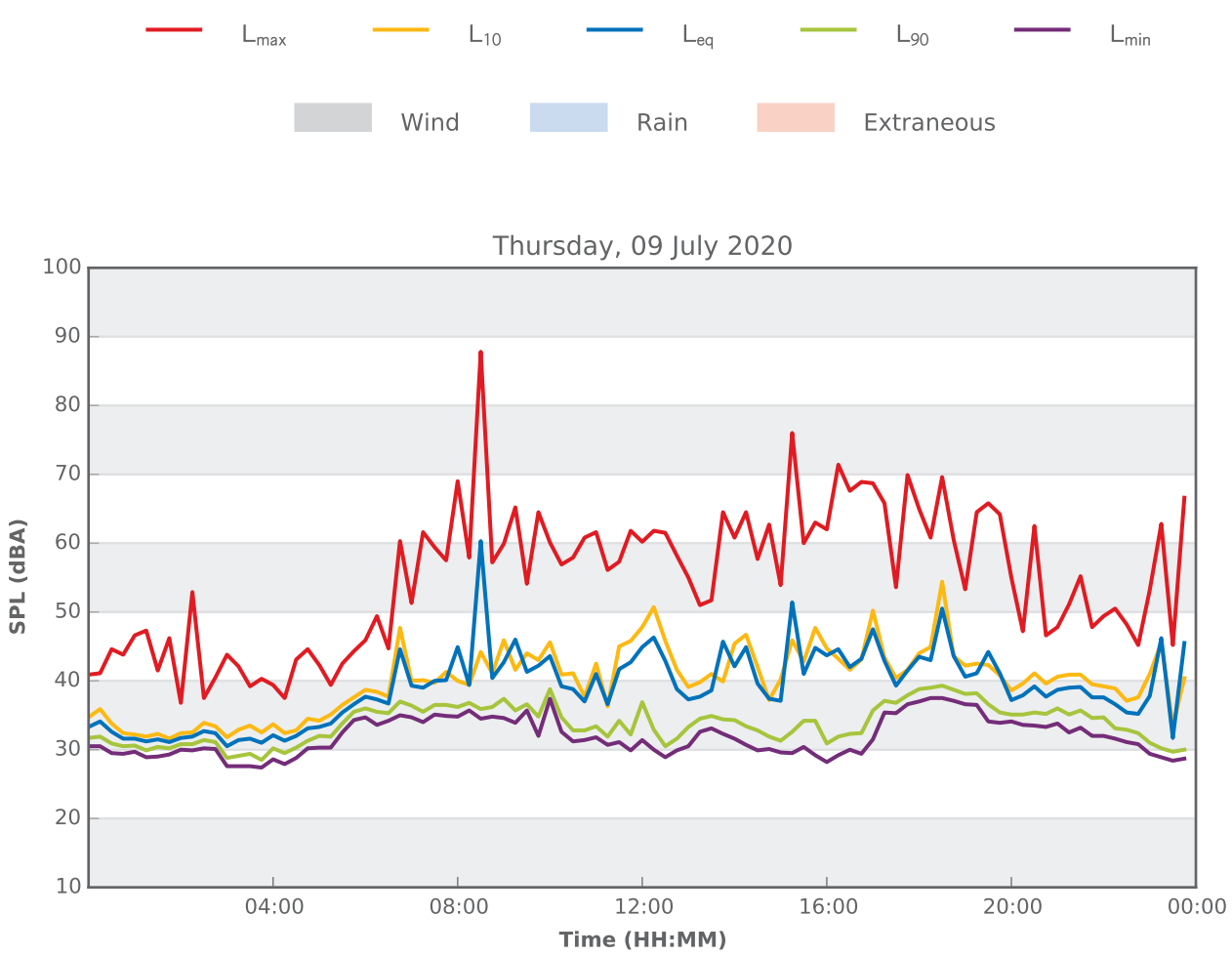
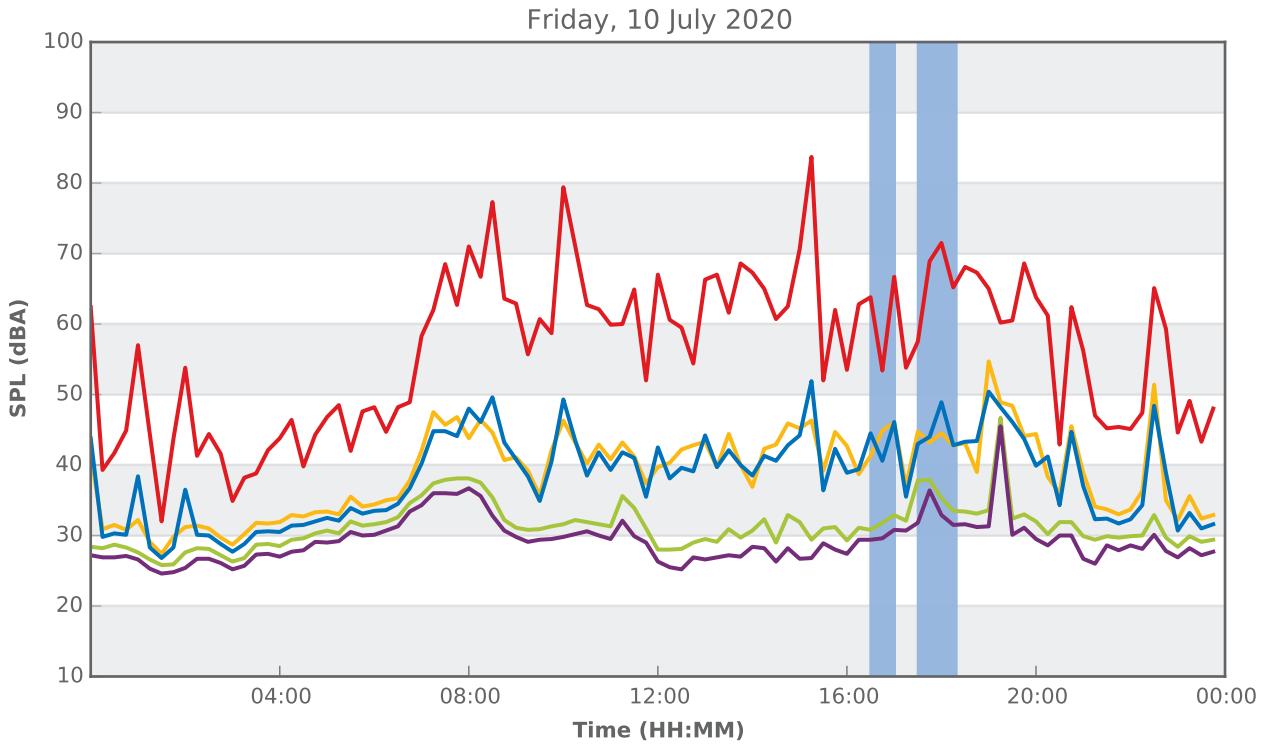
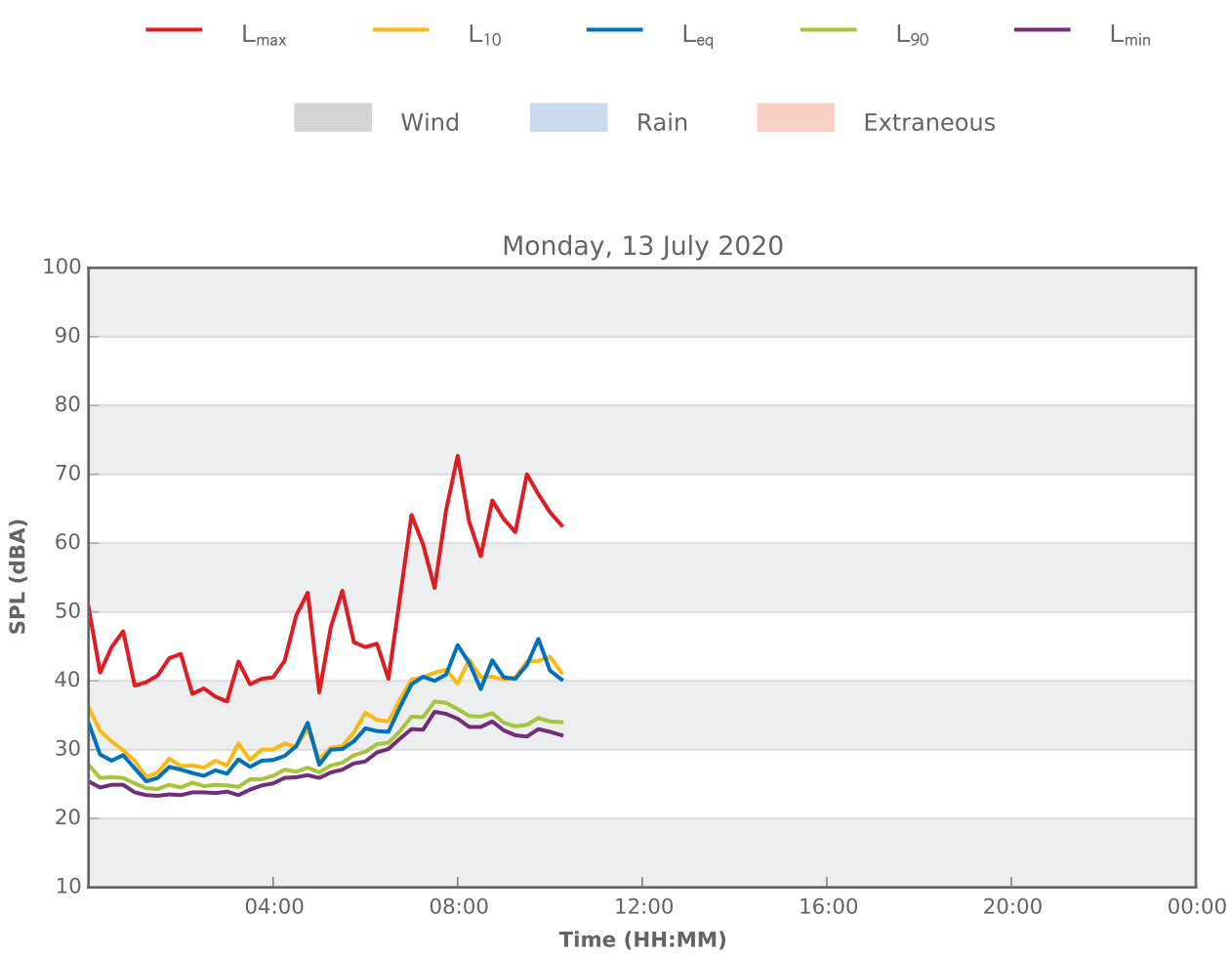


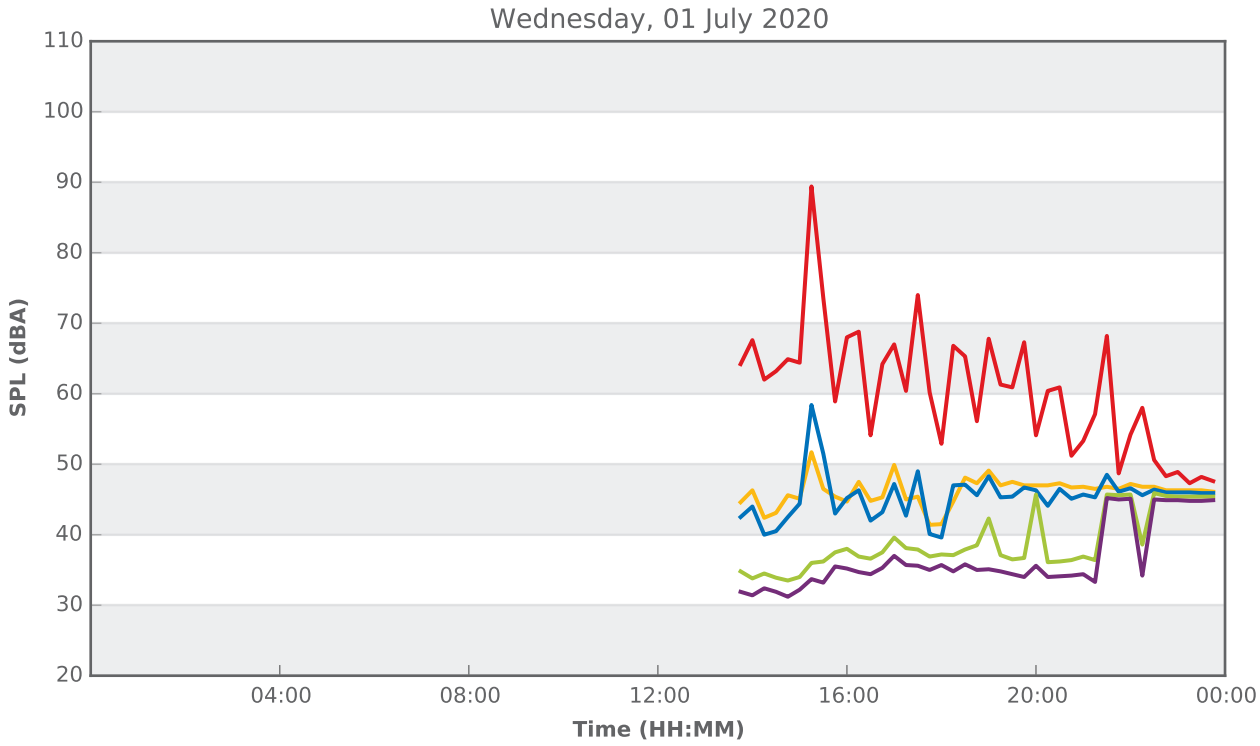


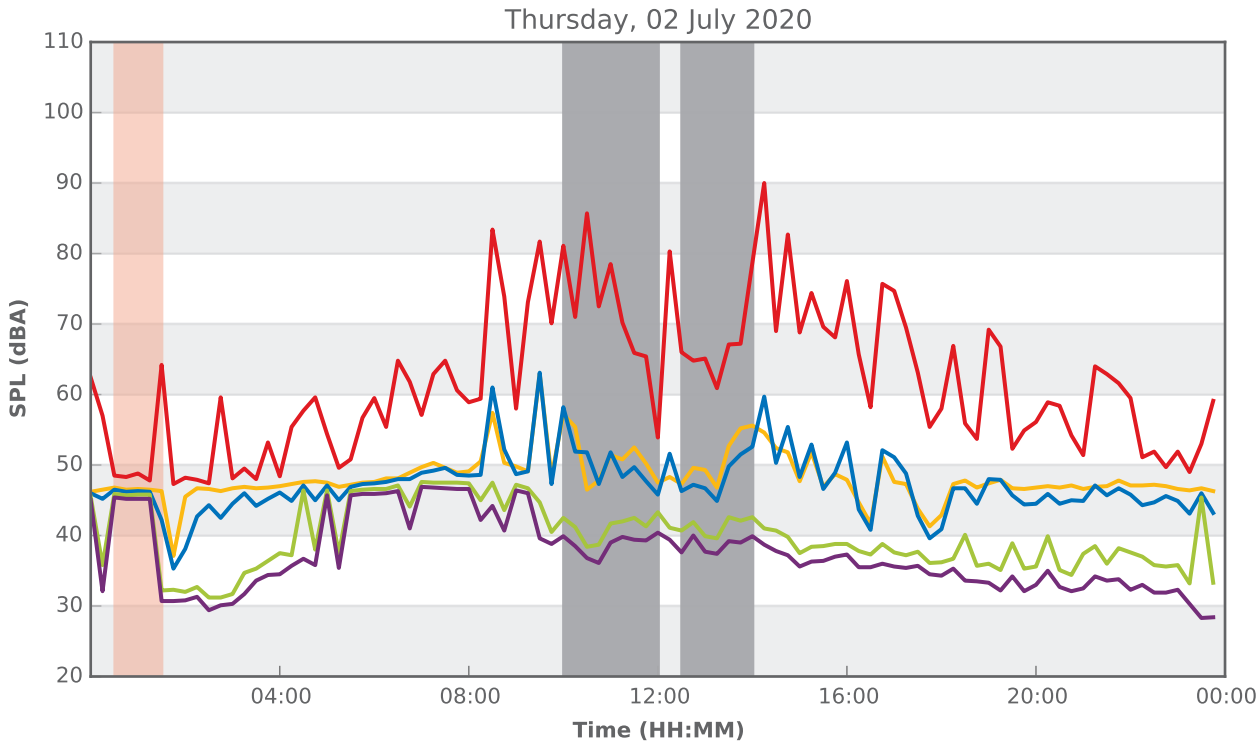
18 Aubusson Street, Marsden Park

18 Aubusson Street, Marsden Park

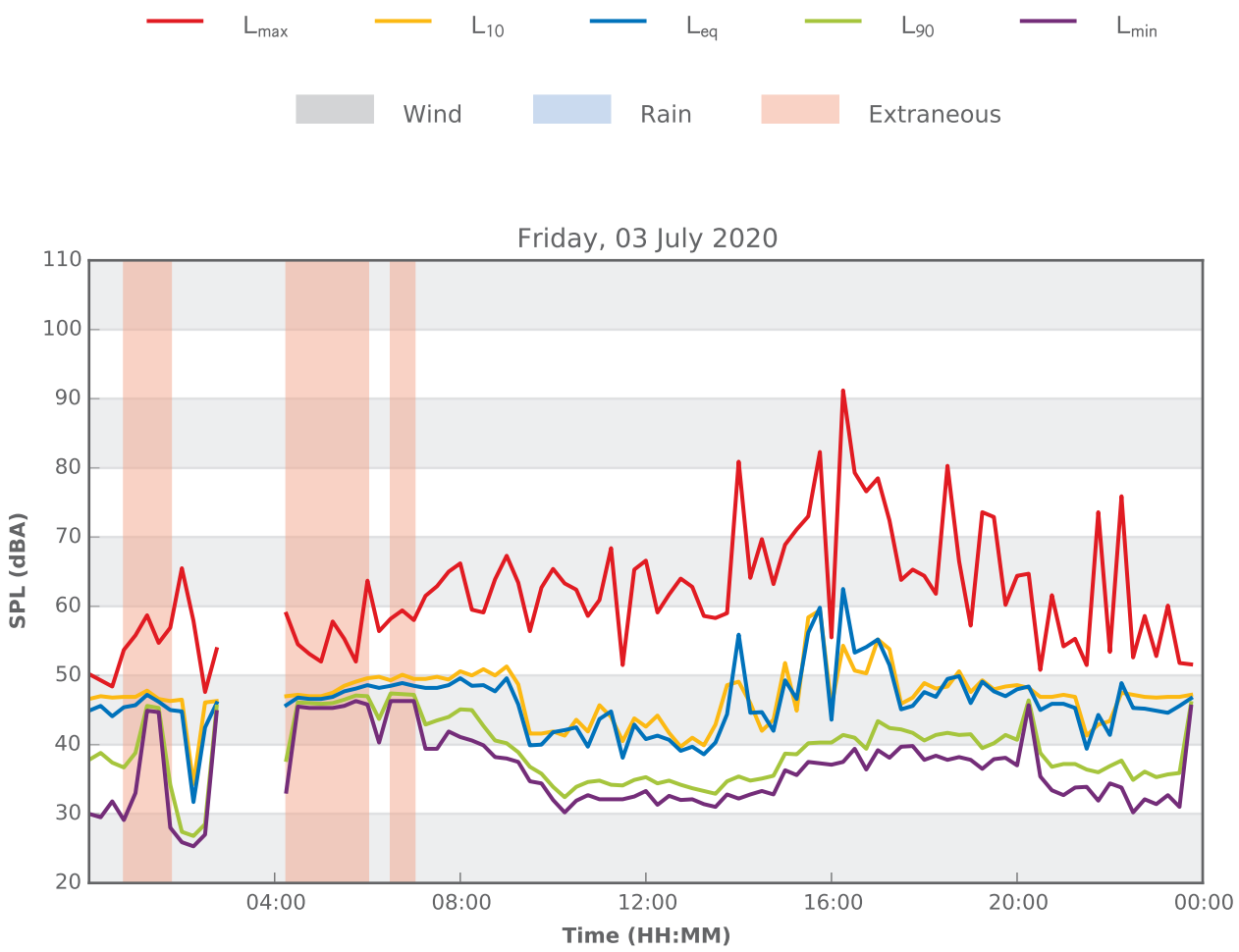


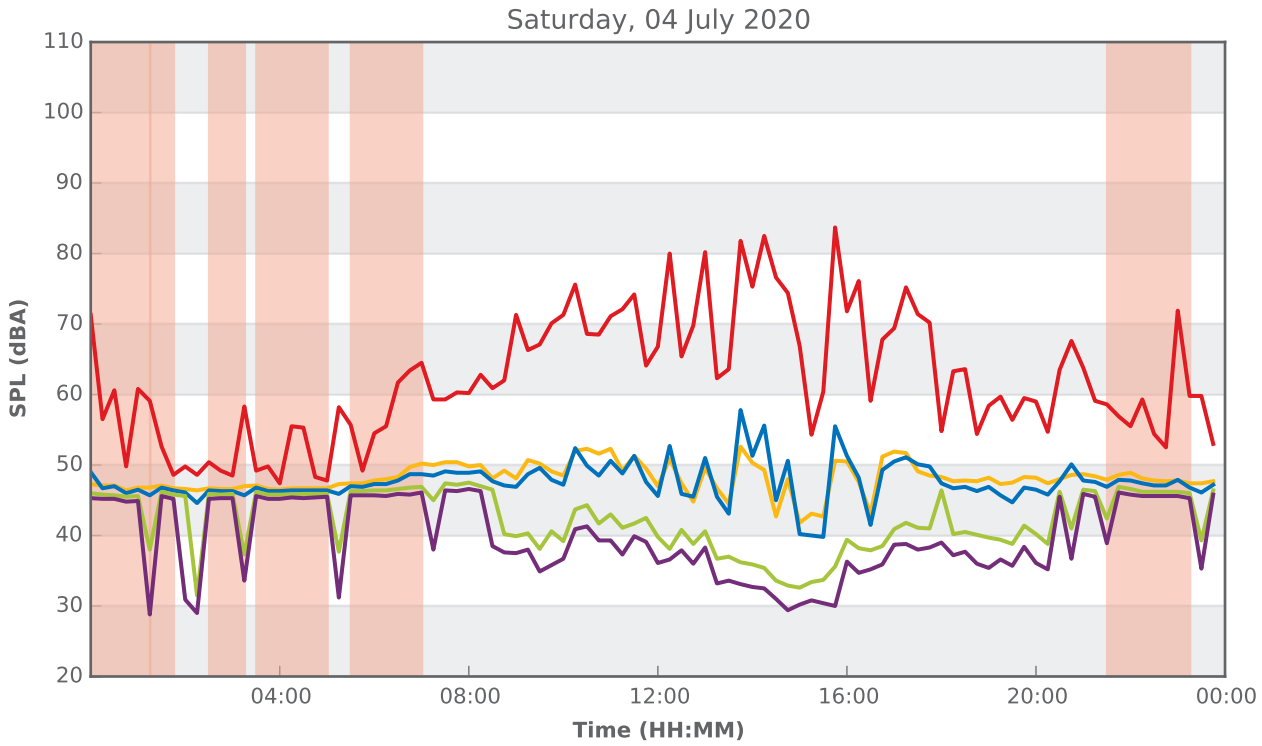
15 Roche Grove, Shalvey





15 Roche Grove, Shalvey





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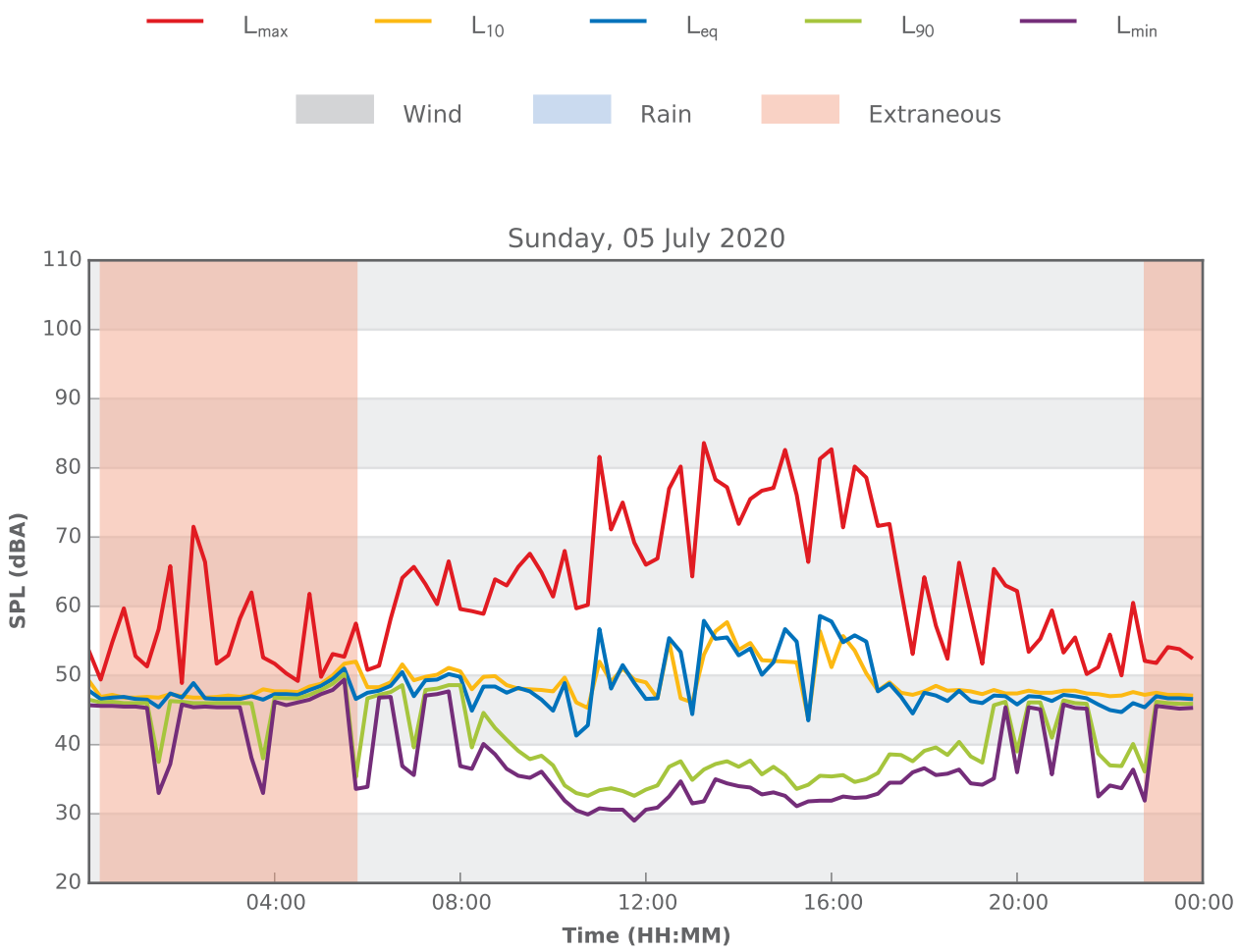

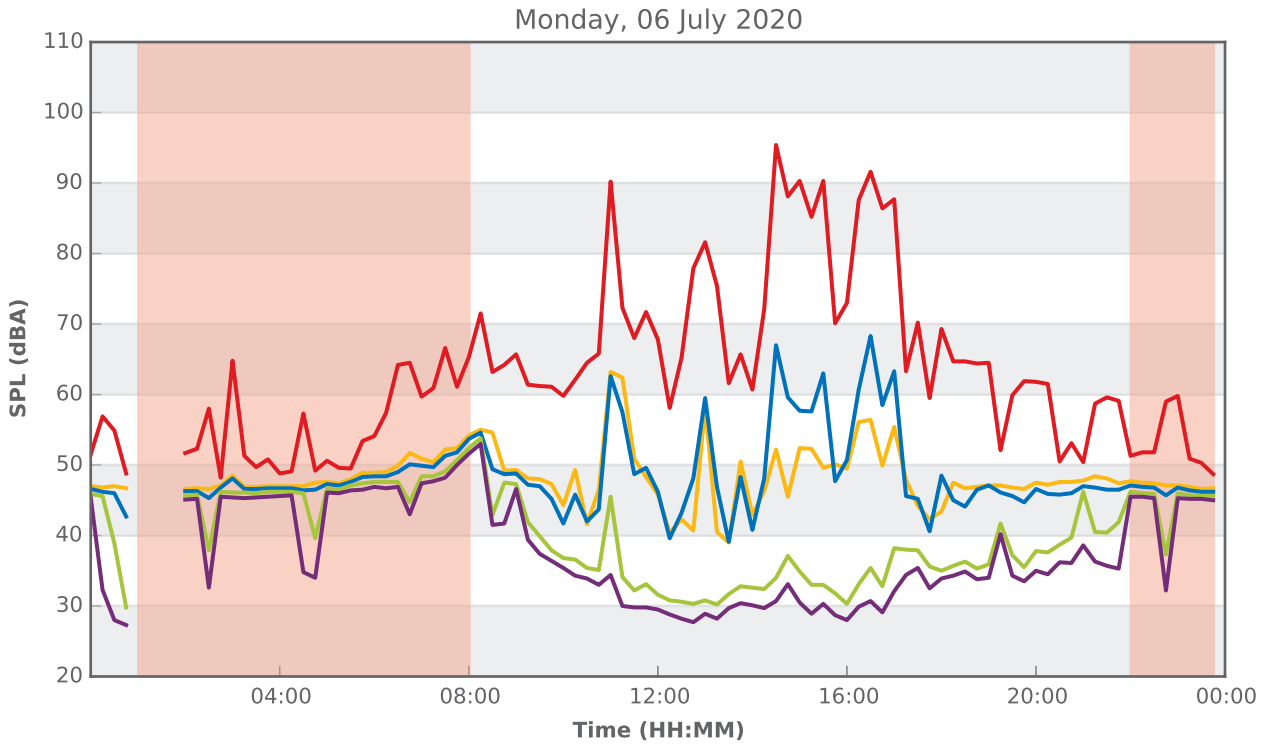

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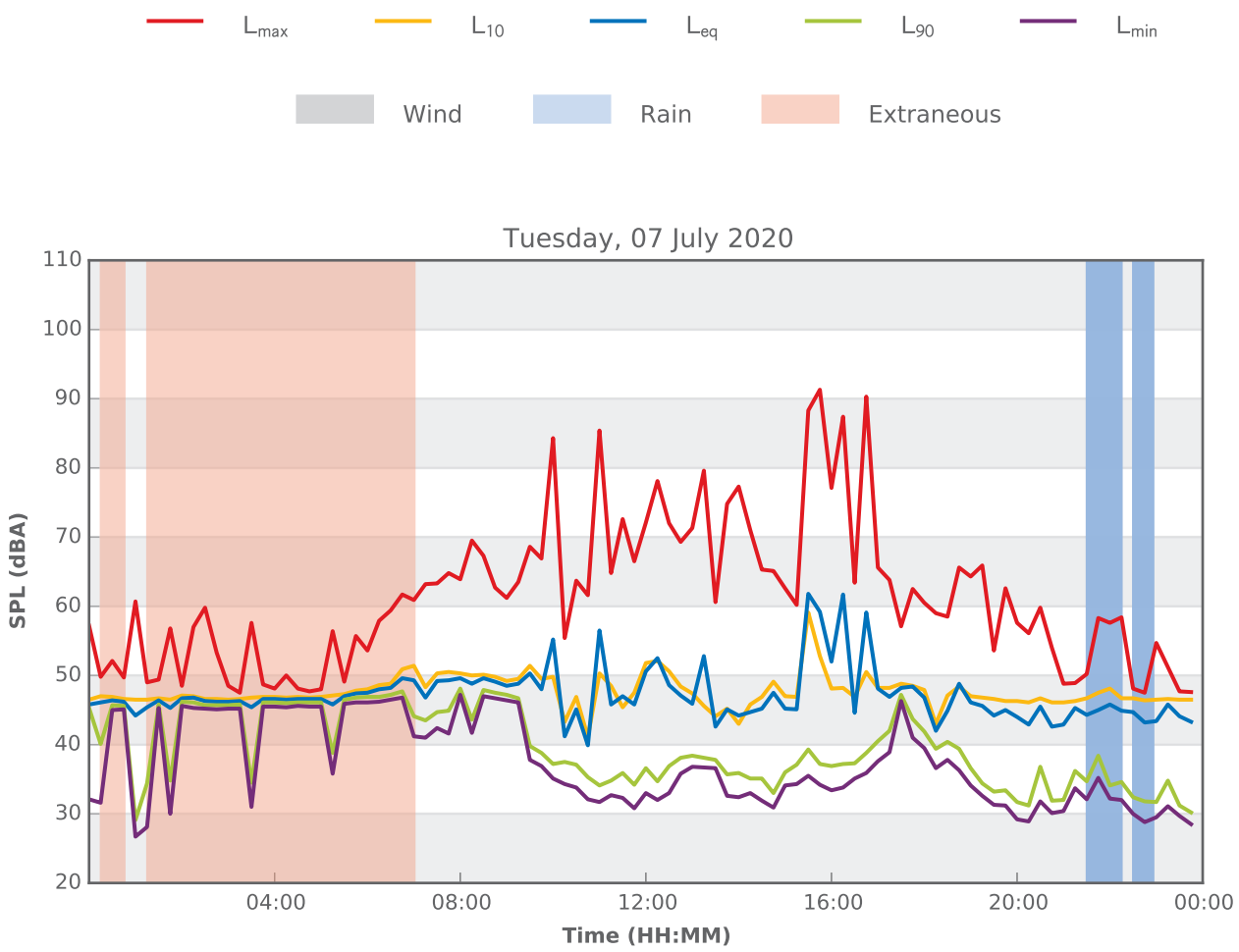

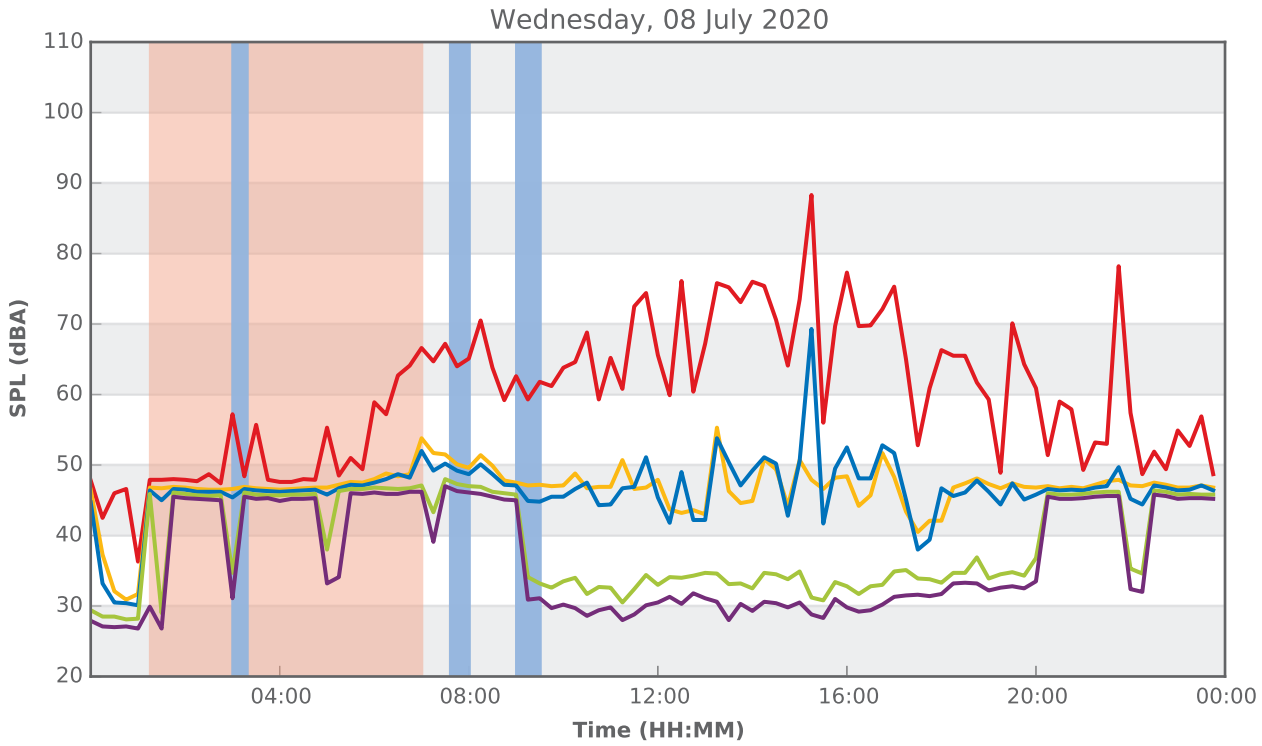

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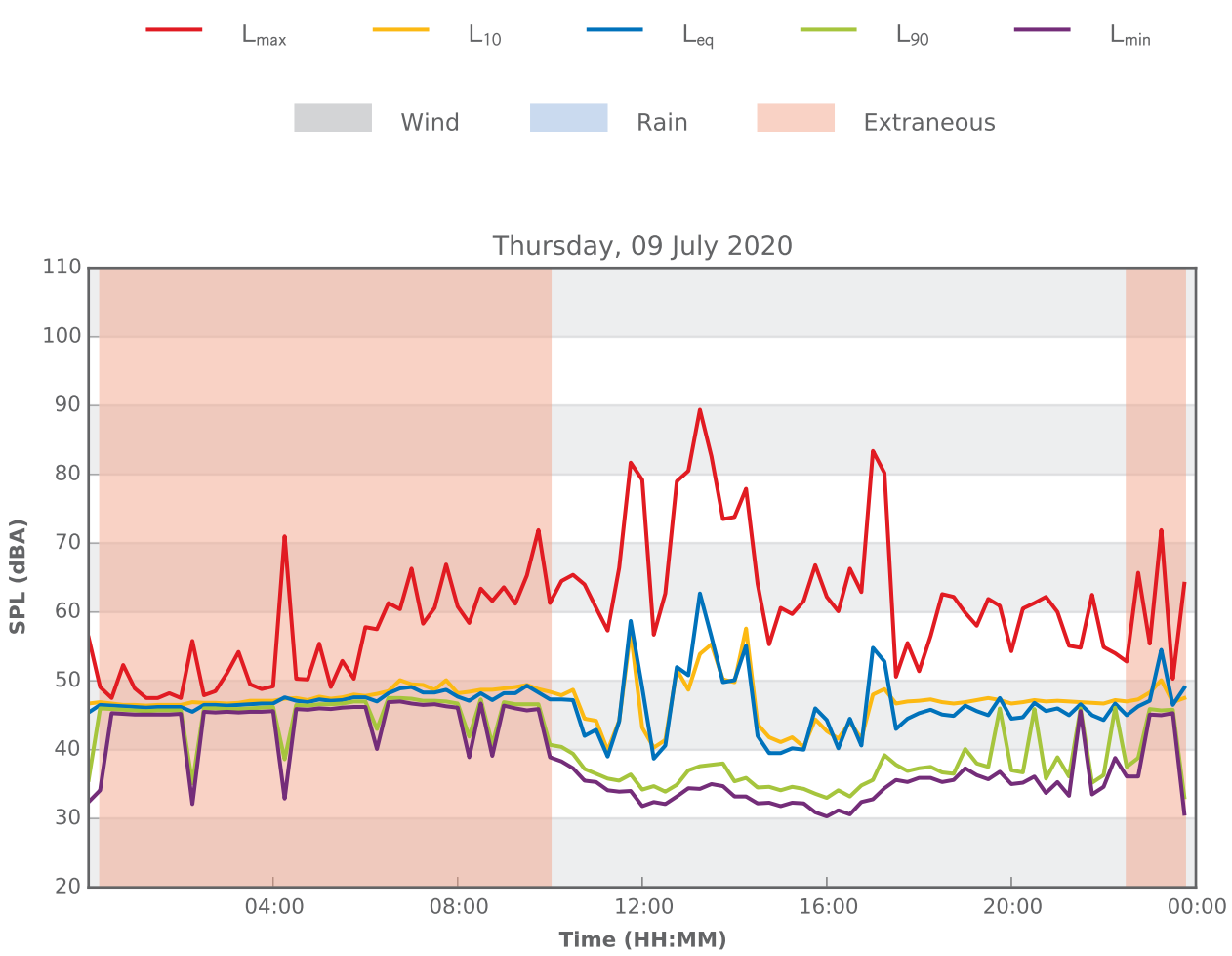

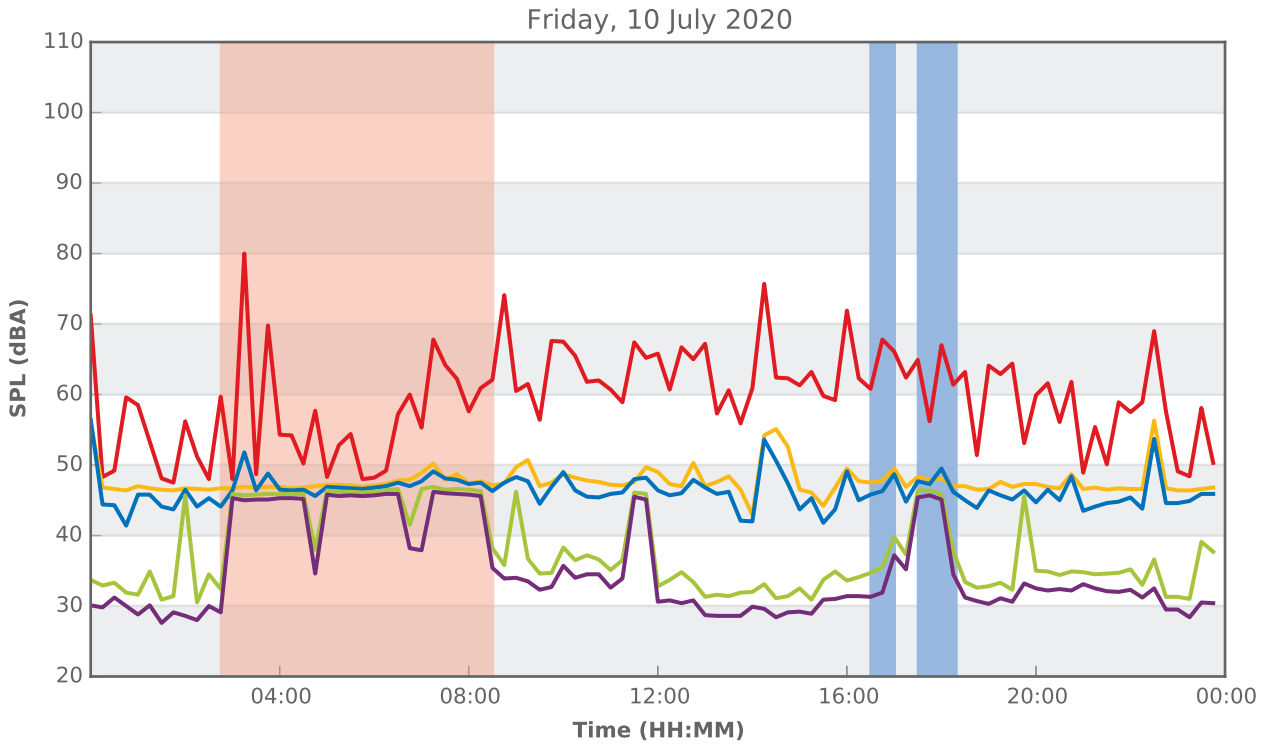

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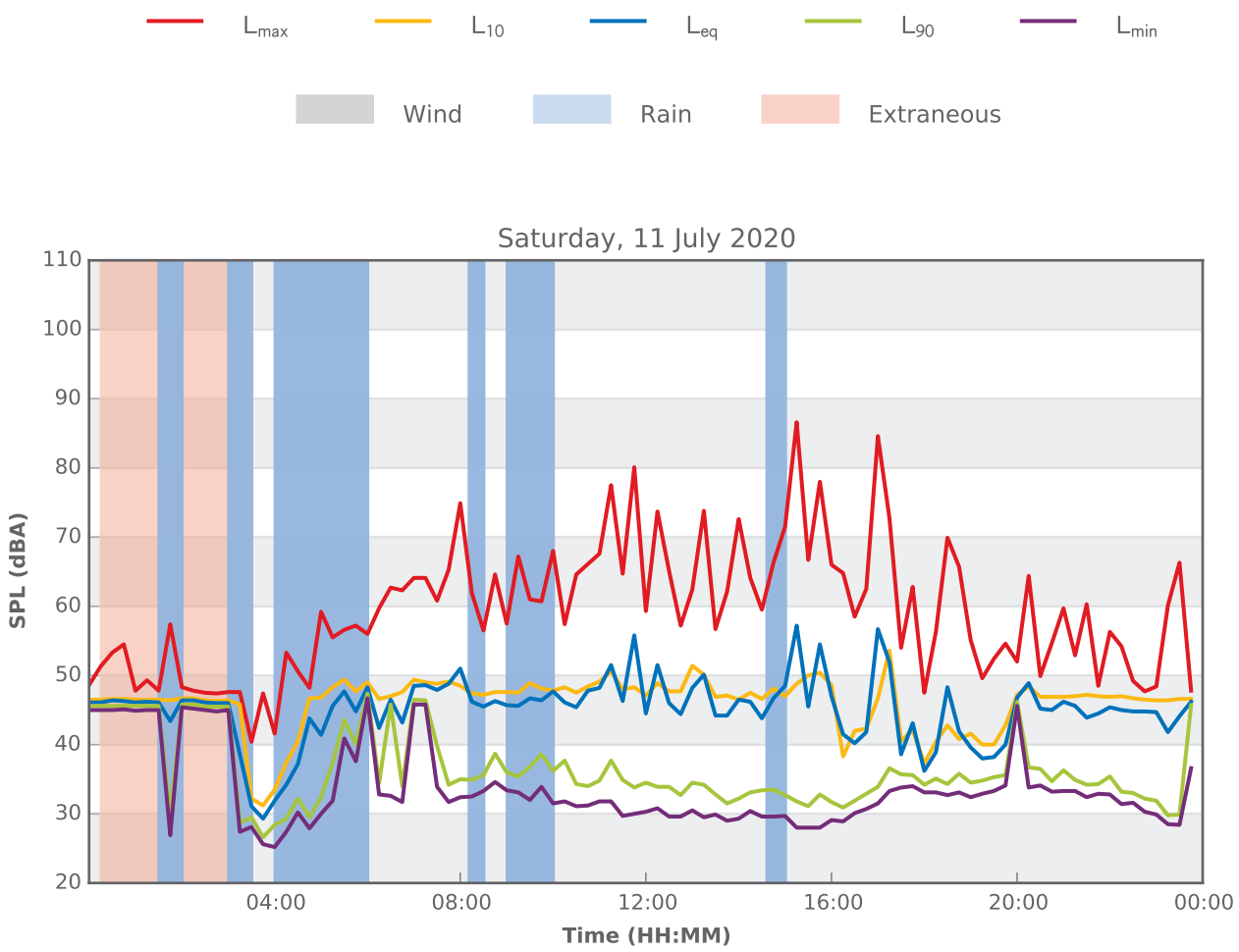

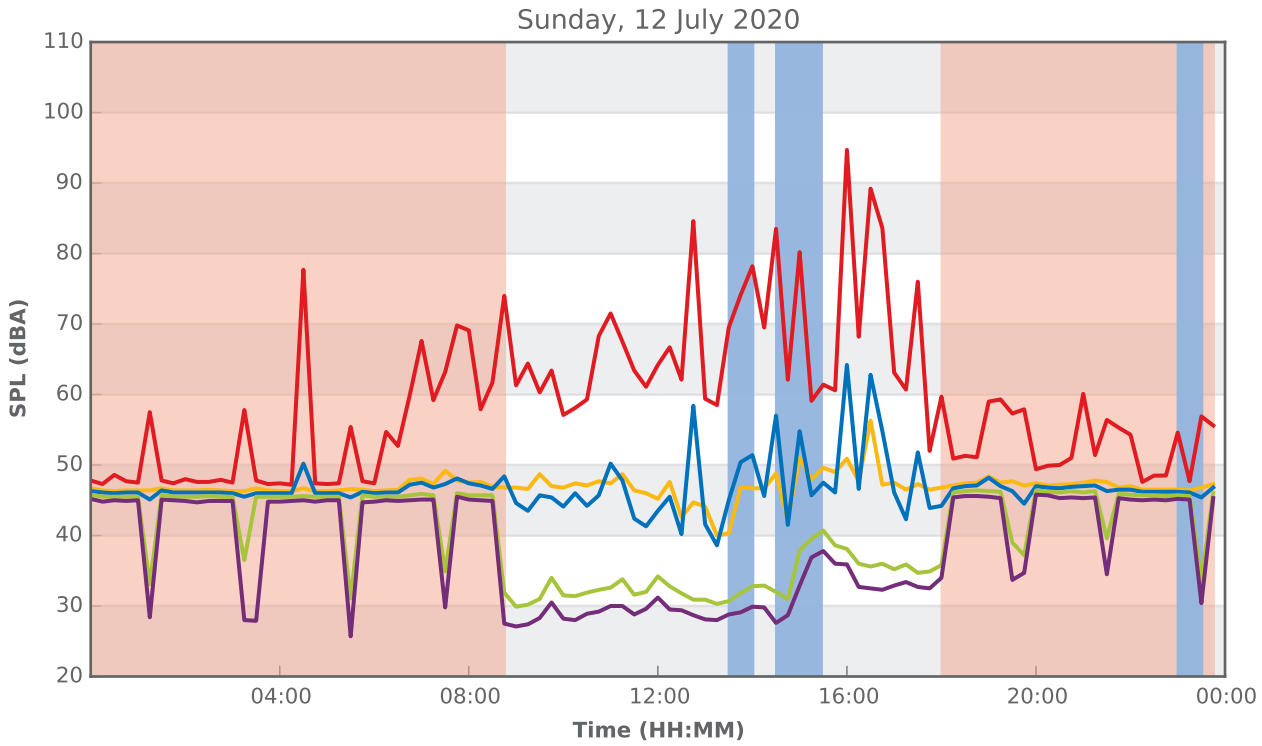

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