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Building 4,Stage 3 Facilities - Sydney Business Park at Marsden Park

Construction Noise and Vibration Management Plan

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1 INTRODUCTION

Acoustic Logic Consultancy has been engaged to prepare a Noise and Vibration Management Plan for the construction of warehouse and distribution facilities, building 4 - Stage 3 Facilities - Sydney Business Park. The proposed site is located at south-west area of Sydney Business Park, at Marsden Park.

This report has been prepared to satisfy Condition B16, Condition B17, Condition B18, Condition B19, and Condition B20 in the draft '*Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979*' by the Energy, Industry and Compliance, application no. SSD-10477. The conditions have been addressed as follow:

- Condition B16, Condition B17: *'Hours of Work';*
- Condition B18: *'Construction Noise Limits';*
- Condition B19 and Condition B20: *'Construction Noise Management Plan'*.

The report will address the following elements:

- Identification of the noise and vibration guidelines which will be applicable to this project;
- Identification of potentially impacted nearby development;
- Identify likely sources of noise and vibration generation and predicted noise levels at nearby development;
- Formulation of a strategy to comply with the standards identified and mitigation treatments in the event that compliance is not achievable.

This assessment is based on previous unattended noise monitoring data and engineering assumptions in the report of '*STAGE 3 FACILITIES - SYDNEY BUSINESS PARK, (MARSDEN PARK), SSD NOISE & VIBRATION IMPACT ASSESSMENT*', report No. 20232, VERSION B, provided by Wilkinson Murray Pty Limited, dated July 2020.

2 SITE DESCRIPTION

The project site is located at the Hollinsworth Road (future), Marsden Park and noise sensitive development in the vicinity of the project site consists of the following:

- Receiver 1: Ikea DC Sydney - existing industrial receivers, located to the north-west of the site;
- Receiver 2: Residential building Ingenia Estate, located to the north-east of the site;
- Receiver 3: Logos Property - existing industrial receivers, located to the east of the site;
- Receiver 4: Existing residential receivers located to the east of the site; and
- Receiver 5: Existing residential receiver located to the south of the site.

It is noted that there is an existing 2.5 m high noise barrier constructed to the north-east of the site along the southern boundary of the Ingenia Estate (R2) (as highlighted in red in Figure 1 below).

A site map with measurement description is presented in below.

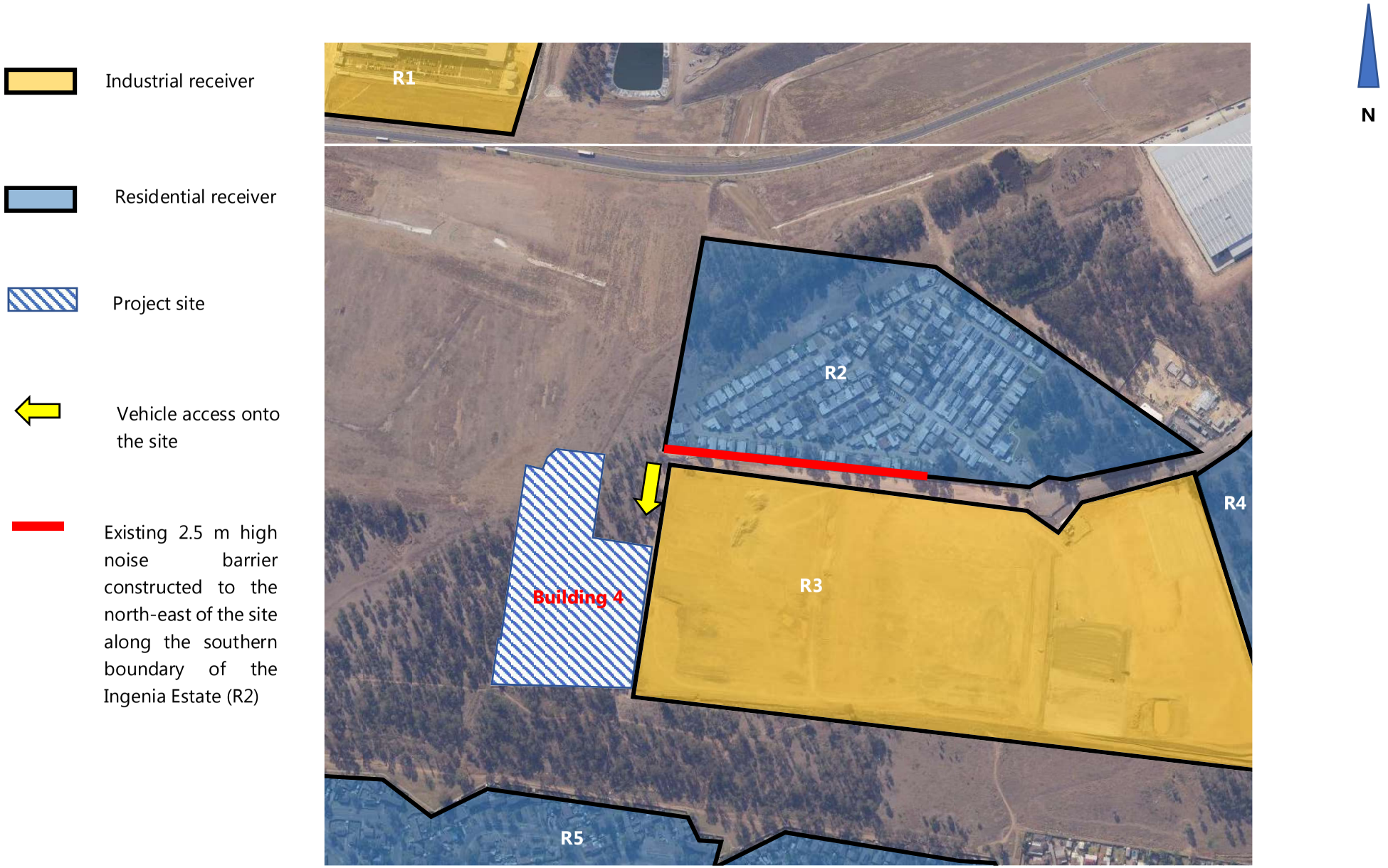


Figure 1: Site Map from SIXMaps

3 PROPOSED CONSTRUCTION WORKS

This office has been advised as following:

- The proposed construction works, and corresponding durations are summarised as following:
    - Excavation (including Piling): 6 weeks
    - Construction: 27 weeks
- The proposed construction works do not include demolition, and therefore these items do not form part of this management plan;
- Vehicle access onto the site will be existing turning head, adjacent to the Orrcon Facility, on Hollinsworth Road as indicated in figure 1 above;
- There is no specific location for the mobile cranes and pumps (variable locations);

4 CONSTRUCTION HOURS

Condition B16 and Condition B17, in the draft '*Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979*' by the Energy, Industry and Compliance, application no. SSD-10477, states the following:

"NOISE

Hours of Work

B16. The Applicant must comply with the hours detailed in 0, unless otherwise agreed in writing by the Planning Secretary.

Hours of Work

Activity	***Day***	***Time***
Earthworks and construction	*Monday – Friday* *Saturday*	*7 am to 6 pm* *8 am to 1 pm*
Operation	*Monday – Sunday*	*24 hours*

B17. Works outside of the hours identified in condition 0 may be undertaken in the following circumstances:

a) works that are inaudible at the nearest sensitive receivers;
b) works agreed to in writing by the Planning Secretary;
c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
d) *where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.* "

4.1 PROPOSED CONSTRUCTION HOURS

The proposed working hours (construction) are:

- 7:00am -6:00pm, Monday to Friday
- 8:00am -1:00pm, Saturday

5 BACKGROUND NOISE LEVELS

Existing environmental noise survey (see figure 1) was based on a long-term unattended monitoring summarized in the report of '*STAGE 3 FACILITIES - SYDNEY BUSINESS PARK, (MARSDEN PARK), SSD NOISE & VIBRATION IMPACT ASSESSMENT*', report No. 20232, VERSION B, provided by Wilkinson Murray Pty Limited, dated July 2020.

5.1.1 Measured Background Noise Levels

Table 3-2 in Section 3.1 of '*STAGE 3 FACILITIES - SYDNEY BUSINESS PARK, (MARSDEN PARK), SSD NOISE & VIBRATION IMPACT ASSESSMENT*' outlined the rating background levels of unattended noise monitoring (see table 2 below).

The background noise levels established from the unattended noise monitoring are detailed in table below.

Table 1 – Measured Background Noise Level (Unattended Noise Monitors)

Location	Time of Day	Rating Background Level dB(A)L_{90}
NL1 – 18 Aubusson St, Marsden Park	Day	35
	Evening	30
	Night	30
NL2 – 15 Roche Gr, Shalvey	Day	35
	Evening	33
	Night	30

6 NOISE LEVEL AND VIBRATION GUIDELINE

6.1 NOISE

Noise associated with excavation and construction activities on the site will be assessed in accordance with the following guidelines:

- The draft *'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979'* by the Energy, Industry and Compliance, application no. SSD-10477.; and
- NSW EPA Interim Construction Noise Guideline.

6.1.1 Condition B19 & Condition B20

Conditions B19 and B20 of *'Construction Noise Management Plan'* in the draft *'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979'* by the Energy, Industry and Compliance, application no. SSD-10477. states:"

Construction Noise Management Plan

B19. The Applicant must prepare a Construction Noise Management Plan for the development to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with condition C2 and must:

a) be prepared by a suitably qualified and experienced noise expert;
b) be approved by the Planning Secretary prior to the commencement of construction of each stage of the development;
c) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009) (as may be updated or replaced from time to time);
d) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;
e) include strategies that have been developed with the community for managing high noise generating works; and
f) describe the community consultation undertaken to develop the strategies in condition 0e).
g) include a complaints management system that would be implemented for the duration of the development.

B20. The Applicant must:

a) not commence construction of any relevant stage until the Construction Noise Management Plan required by condition 0 is approved by the Planning Secretary; and
b) implement the most recent version of the Construction Noise Management Plan approved by the Planning Secretary for the duration of construction."

6.1.2 EPA Interim Construction Noise Guidelines

The "quantitative" assessment procedure, as outlined in the Interim Construction Noise Guideline (ICNG) will be used. The quantitative assessment method requires:

- Determination of noise and vibration management levels (based on ambient noise levels and receiver type)
- Prediction of operational noise and vibration levels at nearby development
- Recommendation of control strategies in the event that management levels are exceeded.

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

- "*Noise affected level*". (NML) Where construction noise is predicted to exceed the "*noise effected*" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise effected level". For residential properties, the "noise effected" level occurs when construction noise exceeds ambient levels by more than 10dB(A) $L_{eq(15min)}$ within Recommended standard hours (Monday to Friday, 7 am to 6 pm; Saturday 8 am to 1 pm; No work on Sundays or public holidays).

The "noise effected" level occurs when construction noise exceeds ambient levels by more than 5dB(A)$L_{eq(15min)}$ within "*outside recommended standard hours*",

- "*Highly noise affected level" (HNML).* Where noise emissions are such that nearby properties are "highly noise effected", noise controls such as respite periods should be considered. For residential properties, the "highly noise effected" level occurs when construction noise exceeds 75dB(A)$L_{eq(15min)}$ at nearby residences.

In addition to the above goals for residential receivers, section 4.1.3 Commercial and industrial premises of the ICNG states the following:

"Due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories. The external noise levels should be assessed at the most-affected occupied point of the premises: industrial premises: external $L_{Aeq\ (15\ min)}$ 75 dB(A)"

The project specific management levels determined using the ICNG are summarised in the following table.

Table 2 -Summarised Noise Management Levels

Location	**Day**	**Time**	**Noise Management Level dB(A)$L_{eq,\ 15min}$**	**Highly Affected Management Level dB(A)$L_{eq,\ 15min}$**
Residential Receivers R2, R4, R5	Monday to Friday	7am-6pm	45	75
	Saturday	8am-1pm	45	
Industrial Premises R1, R3	When in use	When in use	75 externally	N/A

6.2 VIBRATION

Vibration caused by construction at any residence or structure outside the subject site must be limited to the following:

- For human exposure to vibration, the acceptable vibration values set out in the *Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006)*; *and*
- For structural damage vibration, German Standard '*DIN 4150-3 Structural Vibration: Effects of Vibration on Structures*'.

6.2.1 Assessing Amenity

The NSW EPA document "*Assessing Vibration: A Technical Guideline*" provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings and is used in the assessment of vibration impact on amenity. Relevant vibration levels are presented below.

Table 3 – EPA Recommended Vibration Levels

		RMS acceleration (m/s^2)		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices		0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices		0.64	1.28	13.0	26.0	18.0	36.0
Workshops		0.64	1.28	13.0	26.0	18.0	36.0

6.2.2 Structure Borne Vibrations (Building Damage Criteria)

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 4.

It is noted that the peak velocity is the value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 4 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

	TYPE OF STRUCTURE	PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			**Plane of Floor of Uppermost Storey**
		< 10Hz	**10Hz to 50Hz**	**50Hz to 100Hz**	**All Frequencies**
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

The industrial premises would be considered a Type 1 structure, whilst residences would be considered a Type 2 structure.

7 NOISE ASSESSMENT

7.1 NOISE SOURCE DATA

The excavation/construction period has been divided into a number of work phases, along with the main noise producing equipment and activities likely to occur in each phase. Typical noise emission levels from equipment associated with the louder activities are provided in the following table.

Table 5 - Sound Power Levels of the Proposed Equipment

CONSTRUCTION ACTIVITY	EQUIPMENT /PROCESS	SOUND POWER LEVEL - dB(A)
Excavation	Excavator (bucket attachment)	105
	Excavator (hydraulic hammer attachment) (Rock breaker)	120
	Bobcat	100
	Grader	110
	Truck (>20 tonne)	110
Piling	Piling (Auger)	120
Construction	Hand tool	105
	Concrete Pumps	105
	Mobile Crane (diesel)	105
	Boom lifts	105

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

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

7.2 NOISE IMPACT ASSESMENT METHODOLOGY

The predicted noise levels during excavation and construction will depend on:

- The activity undertaken.
- The distance between the work site and the receiver. For many of the work areas, the distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented below. Predictions take into account the following:

- Noise reduction as a result of distance.
- Depending on the management level adopted, noise emission is predicted to either external areas (property boundaries/building facades/most affected area) or internal areas. Where noise levels are predicted to internal areas, the NSW EPA Interim Construction Noise Guideline suggests that a reduction from external noise levels to internal spaces of 10dB(A) is a conservative estimate.

7.3 PREDICTED NOISE LEVELS TO RECEIVERS

Noise emissions are assessed with reference to the relevant criteria in Section 6.1. Please see tables below for predicted noise levels for each receiver

7.3.1 Prediction to receiver 1: industrial receiver to the north-west

Predicted noise levels of industrial receivers to the north-west of the site are as follows:

Table 6 – Predicted Noise Level to R1

Stage	Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Excavation	Excavator bucket attachment	40-44	Noise level will generally meet noise management level of 75dB(A)
	Excavator (hydraulic hammer attachment) (Rock breaker)	55-59	
	Bobcat	35-39	
	Truck (>20 tonne)	45-48	
	Grader	45-49	
Pilling	Piling (Auger)	55-59	
Construction	Hand tool	40-44 prior to construction of building shell; <30 after construction of building shell	
	Concrete Pumps	40-44	
	Mobile Crane (diesel)	40-44	
	Boom lifts	40-44	

The predictions indicate that all equipment will generally meet noise management level of 75dB(A).

7.3.2 Prediction to receiver 2: residential receiver to the north-east

Predicted noise levels of residential receivers to the north-east of the site are as follows:

Table 7 – Predicted Noise Level to R2

Stage	Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Excavation	Excavator bucket attachment	46-63	Noise level will exceed noise management level of 45dB(A), but generally meet highly affected management level of 75dB(A)
	Excavator (hydraulic hammer attachment) (Rock breaker)	61-78	Noise level will exceed highly affected management level of 75dB(A), when equipment is operating close to the receiver. Refer to Section 9.1 for Recommendations
	Bobcat	41-58	Noise level will exceed noise management level of 45dB(A), but generally meet highly affected management level of 75dB(A)
	Truck (>20 tonne)	51-72	
	Grader	51-68	
Pilling	Piling (Auger)	61-78	Noise level will exceed highly affected management level of 75dB(A) when equipment is operating close to the receiver. Refer to Section 9.1 for Recommendations
Construction	Hand tool	46-63 prior to construction of building shell; 26-43 after construction of building shell	Noise level will exceed noise management level of 45dB(A), but generally meet highly affected management level of 75dB(A)
	Concrete Pumps	46-63	
	Mobile Crane (diesel)	46-63	
	Boom lifts	46-63	

The predictions indicate there will be minor exceedance of highly affected management level, when hydraulic hammering and pilling (Auger) is operating close to the north boundary. When operating away from the boundary noise levels will not exceed the highly affected management level. Given the relatively short period of excavation/ pilling, that the exceedances of the highly affected management level will only occur when operating close to the boundary, the equipment will move around the site which makes localised barriers impractical, it is not reasonable to mitigate noise levels other than to manage impacts as recommended below (selecting quietest feasible plant, notification, etc).

7.3.3 Prediction to receiver 3: industrial receiver to the east

Predicted noise levels of industrial receivers to the east of the site are as follows:

Table 8 – Predicted Noise Level to R3

Stage	Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Excavation	Excavator bucket attachment	43-75	Noise level will generally meet noise management level of 75dB(A)
	Excavator (hydraulic hammer attachment) (Rock breaker)	58-90	Noise level will exceed noise management level of 75dB(A) when equipment is operating close to the receiver. Refer to Section 9.1 for Recommendations
	Bobcat	38-70	Noise level will generally meet noise management level of 75dB(A)
	Truck (>20 tonne)	48-80	Noise level will exceed noise management level of 75dB(A) when equipment is operating close to the receiver. Refer to Section 9.1 for Recommendations
	Grader	48-80	
Pilling	Piling (Auger)	58-90	Noise level will exceed noise management level of 75dB(A) when equipment is operating close to the receiver. Refer to Section 9.1 for Recommendations
Construction	Hand tool	43-75 prior to construction of building shell; 23-55 after construction of building shell	Noise level will generally meet noise management level of 75dB(A)
	Concrete Pumps	43-75	
	Mobile Crane (diesel)	43-75	
	Boom lifts	43-75	

The predictions indicate that the use of hydraulic hammers, piling (Auger), and truck movement, will always exceed the NML, and by a significant level. Given the limited extent of works requiring this activity and the movement of this activity around the site it is not practical to install permanent barriers. Where practical, temporary barriers between the work site can be erected using builders site fencing draped with heavy carpet or with loaded viny pinned to the fence to form an acoustic barrier. The fences can be relocated as work moves around the site.

Also, it is not reasonable to mitigate noise levels other than to manage impacts as recommended below (selecting quietest feasible plant, notification, etc).

7.3.4 Prediction to receiver 4: residential receiver (further) to the east

Predicted noise levels of residential receivers to the east of the site are as follows:

Table 9 – Predicted Noise Level to R4

Stage	Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Excavation	Excavator bucket attachment	33-35	Noise level will generally meet noise management level of 45dB(A)
	Excavator (hydraulic hammer attachment) (Rock breaker)	48-50	Noise level will exceed noise management level of 45dB(A), but generally meet highly affected management level of 75dB(A)
	Bobcat	28-30	Noise level will generally meet noise management level of 45dB(A)
	Truck (>20 tonne)	38-40	
	Grader	38-40	
Pilling	Piling (Auger)	48-50	Noise level will exceed noise management level of 45dB(A), but generally meet highly affected management level of 75dB(A)
Construction	Hand tool	33-35 prior to construction of building shell; <30 after construction of building shell	Noise level will generally meet noise management level of 45dB(A)
	Concrete Pumps	33-35	
	Mobile Crane (diesel)	33-35	
	Boom lifts	33-35	

It is noted that the existing building shell of facilities (Logos Property), located to the east of the site will provide significant noise shielding to the receivers to the east of the site. The predictions indicate that use of hydraulic hammers, piling (Auger) will have exceedance of noise management level of 45dB(A), when hydraulic hammering and pilling (Auger) is operating close to the east boundary. however, use of hydraulic hammering and pilling (Auger) will still meet highly affected management level of 75dB(A). Additionally, the predictions indicate that any other equipment will generally meet noise management level of 45dB(A).

7.3.5 Prediction to receiver 5: residential receiver (further) to the south

Predicted noise levels of residential receivers to the south of the site are as follows:

Table 10 – Predicted Noise Level to R5

Stage	Activity	Predicted Level – dB(A) $L_{eq(15min)}$ (External Areas)	Comment
Excavation	Excavator bucket attachment	44-54	Noise level will exceed noise management level of 45dB(A), but generally meet highly affected management level of 75dB(A)
	Excavator (hydraulic hammer attachment) (Rock breaker)	59-69	
	Bobcat	39-49	
	Truck (>20 tonne)	49-59	
	Grader	49-59	
Pilling	Piling (Auger)	44-54	
Construction	Hand tool	44-54 prior to construction of building shell; 24- 34 after construction of building shell	
	Concrete Pumps	44-54	
	Mobile Crane (diesel)	44-54	
	Boom lifts	44-54	

The predictions indicate that use of all equipment will generally meet highly affected management level of 75dB(A). Noise impacts can also be optimised by avoiding activities of using rock breaker or piling (auger) between 7am and 8am. Refer below.

8 ASSESSMENT OF VIBRATION

8.1 VIBRATION PRODUCING ACTIVITIES

Proposed activities that have the potential to produce significant ground vibration is Excavator working.

8.2 SAFEGUARDS TO PROTECT SENSITIVE STRUCTURES

It is impractical to predict the vibrations induced by the excavation/construction operations on site at potentially affected receivers. This is because vibration level is principally proportional to the energy impact which is unknown nature of terrain in the area (type if soil), drop weight, height etc.

8.3 VIBRATION MONITORING (IF REQUIRED)

In the event that complaints are made from neighbouring properties regarding vibration impacts from the subject site, vibration monitors will be installed at the property boundaries of the neighbouring properties nearest to the subject site to monitor vibration levels.

8.3.1 Download of vibration logger

Downloading of the vibration logger will be conducted on a regular basis. In the event exceedance of vibration criteria or alarms occurs, downloading of logger will be conducted more frequently. Results obtained from the vibration monitor will be presented in a graph formant and will be forwarded to client for review. It is proposed that reports are provided fortnightly with any exceedance in the vibration criteria reported as detailed in this report.

8.3.2 Presentation of Vibration Logger Results

A fortnightly report will be submitted to client via email summarising the vibration events. The vibration exceedance of limit is recorded the report shall be submitted within 24 hours. Complete results of the continuous vibration logging will be presented in fortnight reports including graphs of collected data.

8.3.3 Persons to receive alarms

The following personnel will receive GSM alarms:

- Acoustic consultant/advisor (1 person)
- Excavation site foreman
- Main builder foreman (where applicable)
- Client nominated two representatives

9 AMELIORATIVE MEASURES

9.1 SITE SPECIFIC RECOMMENDATIONS

Site specific recommendations as follows:

9.1.1 Excavation

- Residents at south of the site (R5), and the industrial receivers to the east (R3) and north-east (R2), to be notified of anticipated period of excavation including use of hydraulic hammer.
- Vehicles to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours.
- Hydraulic Hammer:
    - No use prior to 8:00am to mitigate noise impact onto the neighbouring residents.
    - Fit more efficient silencer or exhaust silencer.
    - Enclosure panels, when fitted, should be kept closed.
    - Where practical install temporary barriers as described in the Plan adjacent to the work point to screen the residential receivers to the south.
- Vehicle Noise:
    - Truck movements should not commence prior to 7am. Trucks are not to idle with their engines running outside the site prior to 7am.
    - Trucks must turn off their engines during idling to reduce impacts on nearby receivers (unless truck ignition needs to remain on during concrete pumping).
- Bobcat:
    - Fit more efficient silencer or exhaust silencer.
    - Enclosure panels, when fitted, should be kept closed

9.1.2 Piling

- Residents and industrial receivers to be notified of anticipated period of piling.
- Careful alignment of the pile and rig.
- No piling work before 8:00am to mitigate noise impact onto the neighbouring residents.

9.1.3 Construction

- Concrete pumps and mobile crane.
    - Equipment is to be located as far as practical from the closest receivers around the site.
    - Notification of adjacent residential development should be provided prior to days of concrete pours.
    - Cement mixing trucks must turn off their engines when on site to reduce impacts on adjacent land use (unless truck engine needs to remain on during concrete pumping).
- Hand tools
    - The south and east facades of the proposed development should be erected as soon as practical to form "natural" barriers to the nearest receivers.
    - Noise from hand tools is typically quieter than the maximum allowable noise levels.
- In the event of complaint, the procedures in Section 11 are to be adopted.

9.2 ACTIVITIES OUTSIDE PERMITTED HOURS OF CONSTRUCTION

Construction can occur outside of the permitted hours for a number of reasons including if noise is inaudible at the surrounding sensitive receivers. In this context, sensitive receivers would be the residential receivers to the south of the site and industrial receivers to the east of the site.

Activities that could be undertaken include maintenance of equipment using hand tools, internal works such as painting and other quiet works. Other works may be able to be undertaken but should be specifically assessed by an acoustic specialist before being undertaken.

9.3 GENERAL RECOMMENDATIONS

Other noise management practices which may be adopted are discussed below. In addition, notification, reporting and complaints handling procedures should be adopted as recommended in section 11 of this report.

9.3.1 Acoustic Barrier (if required)

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

The placement of barriers at the source is generally only effective for static plant (cranes). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15 dB(A) can be affected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8 dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

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

9.3.2 Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

9.3.3 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

9.3.4 Treatment of Specific Equipment

In certain cases, it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

9.3.5 Establishment of Site Practices

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

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

9.3.6 Strategic Positioning of Processes On-Site

Where practicable, particular processes of activities can be located in particular positions on site to minimise noise to surrounding sensitive receivers

For example, stationary plant may be positioned where direct line of sight shielding can be achieved using natural barriers or temporary screens, or may maximise the distance to the nearest sensitive receiver.

9.3.7 Management Training

All site managers should be made aware of noise and vibration limits, applicable control measures and methods. They should ensure that all agreed noise and vibration measures are carried out by employees and sub-contractors.

9.3.8 Combination of Methods

In some cases, it may be necessary that two or more control measures be implemented to minimise noise.

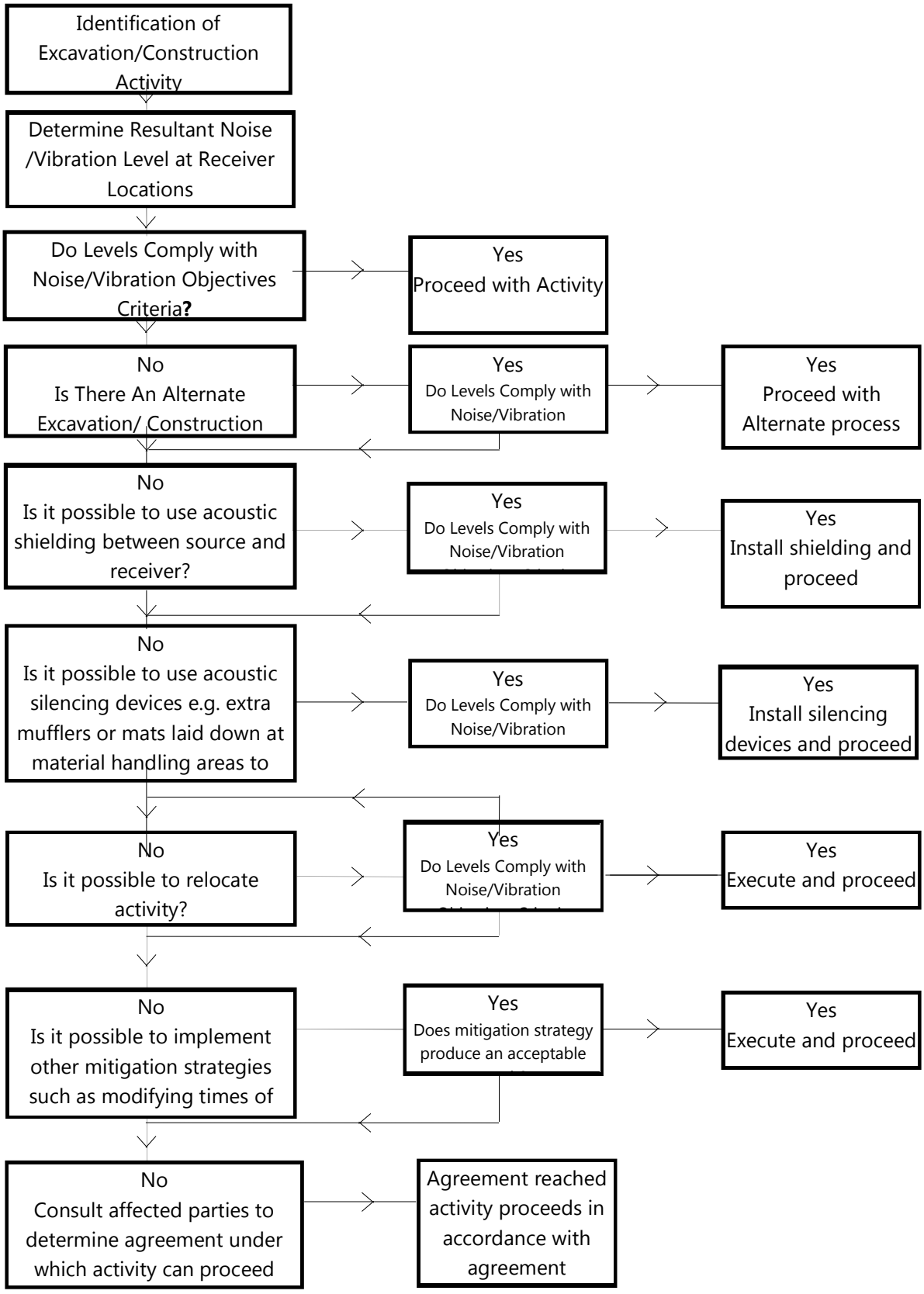
9.3.9 Maintenance of Plant, Equipment and Machinery

Construction Profile will ensure all plant, equipment and machinery are regularly serviced and maintained at optimum operating conditions, to ensure excessive noise emissions are not generated from faulty, overused or unmaintained machinery.

10 ASSESSMENT METHODOLOGY AND MITIGATION METHODS

The flow chart that follows illustrates the process to be followed to minimise the impact associated with these activities.

Noise sources with the potential to exceed the management level set out in section 6 have been identified and discussed in section 7 and 9.



11 COMMUNITY INTERACTION AND COMPLIANTS HANDLING

Should ongoing complaints of excessive noise, vibration or dust occur, immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration and dust limits, all work potentially producing vibration or dust shall cease until the exceedance is investigated.

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

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- If necessary, setup vibration monitoring at the location representing the nearest affected vibration receiver, with alarm device which can inform the project manager on site if the vibration exceedance happened.
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

11.1 COMMUNITY CONSULTATION

11.1.1 Requirement

Condition B19 (f) and Condition B19 (g), *'Construction Noise Management Plan'* in in the draft *'Development Consent, Section 4.38 of the Environmental Planning and Assessment Act 1979'* by the Energy, Industry and Compliance, application no. SSD-10477. states the following:"

(f) describe the community consultation undertaken to develop the strategies in condition 0e).

(g) include a complaints management system that would be implemented for the duration of the development."

11.1.2 Community Consultation Undertaken

The community consultation undertaken and the processes to be implemented are provided in Appendix 1 attached. The outcomes of the consultation undertaken to date have been incorporated into the management plan, and the outcomes of ongoing consultation during the construction period will be incorporated as necessary in the management of impacts.

12 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process
2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implement additional acoustic treatment in the form of localised barriers, silencers etc where practical.
4. Selecting alternative equipment/processes where practical
5. If necessary, setup noise/vibration and dust monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

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

13 CONCLUSION

This report presents an assessment of noise and vibration impacts associated with the excavation, pilling and construction activities for the proposed building 4 - Stage 3 Facilities - Sydney Business Park, at Marsden Park.

An assessment of potential noise and vibration impacts resulting from the proposed activities on site is summarised in Sections 7 and 8 of the report. The assessment was undertaken using NSW EPA Interim Construction Noise Guideline and indicates there is generally a low to moderate risk of adverse impacts due to the nature of the works and the significant distance separation to sensitive receivers. The results of the assessment have been used to develop ameliorative treatments to further reduce these impacts, which are detailed in Section 9 and Section 10.

Provide that the recommendations, management controls and procedures outlined in this report are implemented, noise and vibration impact from the proposed works will be minimised.

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

Yours faithfully,

Acoustic Logic Pty Ltd
Hugh Cao

APPENDIX 1: COMMUNITY CONSULTATION

17/10/2017

API PROJECT – MARSDEN PARK 1211

COMMUNITY CONSULTATION AND ENGAGEMENT PLAN

27/01/2021

RICHARD CROOKES CONSTRUCTIONS

Delivering Certainty

Contents

Revision

Rev Date	Revision Description	PM's Initials (acceptance of changes)
27/01/2020	Original Issues	

1 Introduction

This Community Consultation and Engagement Plan forms part to the Project Management Pan for

1.1 Purpose of the Plan

Richard Crookes Constructions (RCC) recognises the importance of trust in relationship building with stakeholders involved with the project. Consequently, being accountable is paramount and we seek to be transparent with our communications and documentation.

Further, in line with our company commitment to continual improvement, we constantly aim for a greater level of engagement and interaction with stakeholders, particularly when our project activities may impact on the communities in which we operate.

The purpose of this plan is to outline processes for:

- Achieving our Objectives and Targets;
- Consultation Strategies;
- Identification of Stakeholders;
- Responsibilities for Implementing the Plan; and
- Stakeholder Grievances and Concerns.

2 RCC Objectives and Targets

RCC's overall objective is to promote an open communications environment that will minimise disruptions and issues for both the project team and the community.

To support this, and in line with commitments made in RCC's Environmental Policy, project level objectives and targets include:

- Community complaints are to be actioned within 24hours;
- No repeat complaints for the same issue.

3 Description of the Project

3.1 General

A total of 31,030m2 of warehouses for API with the associated office totalling to 690m2, hardstand and landscaping.

3.2 Hours of Operation

The Development Consent hours of operation for the construction project are:

Monday to Friday 7:00am to 6:00pm and Saturday 8:00am to 1:00pm

3.3 Proposed Timeframes

The table below provides an overview of the construction activities and the timeframe for the works.

Construction Activities –		
Activity	Methodology	Timeframe
Site set up including environmental controls	Perimeter fencing / sediment controls / site hoardings	
Bulk earthworks & spoil removal	Site clearance/strip top soil/filling/proof roll & trim	
In ground services	Civil (stormwater) / Electrical / Mechanical / Hydraulic	
Footings, foundations & anchors	Footings to Warehouse (including offices)	
BDR Building Delivery and Installation	Structural Steel / Precast / Roof & Wall Cladding / High level services	
Fit-out of final finishes & furniture	Fit-out to amenities and offices	
External works incl. pavements, landscaping	External hardstand, carpark and landscaping	

4 Site Management Contact Details

Key contact details are provided below:

Position	Name	Phone (W)	Phone (M)
Construction Manager	Claude Concha	9902 4700	0434 077 660
Project Manager	Ben Kilby	9902 4700	0409 684 119
Contract Administrator	Tariq Haque	9902 4700	0420 834 440
Project Engineer	John Kassaa	9902 4700	0428 261 413
Site Engineer	Shek Yuen	9902 4700	0418 735 657
Site Manager	Troy Daly	9902 4700	0437 851 142
Foreman	Ali Mourad	9902 4700	0425 344 188
WHS Management Rep.	Leigh MacDonald	9902 4700	0415 634 771

5 Balancing Community Expectation and RCC Obligations

Balanced community engagement involves both a commitment from RCC and an expectation from the community, as summarised below.

	Inform	Consult	Involve	Collaborate
Community Expectation	To get balanced and objective information about aspects of the project that impact on us	To be asked our opinions and allow us to provide feedback to the company on the matters that concern us	To be involved in the decision making process and the exploration of alternatives regarding those issues that are of concern to us	To create a partnership with us whereby we have faith that our concerns and ideas are integrated into the decision making process
RCC Obligation	We will keep the community well informed	We will listen and acknowledge community concerns and provide evidence that concerns are considered in decision making	We will work with the community to make sure concerns and issues are reflected in any alternatives developed. Provide feedback to the community on how their inputs has influenced outcomes	We will look to the community for advice and innovation in solving issues and concerns and incorporate their advice into the decision making process to the maximum extent possible.

6 Consultation and Strategy/Our Approach to Dialogue

6.1 General

Community consultation can be involving, meaningful, useful and effective if the following principles are used as a starting point for making consultation work:

- Making it timely: participation should not be so late in the process of an issue that it is tokenistic or merely confirms decisions already made. Give people enough time to express their views.
- Making it inclusive: Participation should be selected in a way that is not open to manipulation, and should include a cross section of the participation.
- Making it community focused: Ask participants not what they personally want but what is appropriate in their role as a citizen.
- Making it interactive: avoid reducing questions to a simplistic response. Allow consideration of the big picture so people can readily become engaged.
- Making it effective: Although decision making can strive for consensus, complete agreement may not be the outcome. Be clear on how the decisions will be made so

participants understand the impact of their involvement. Allow enough time for participants to become familiar with the project issues.

- Making it Matter: it is important that a strong likelihood that any recommendations that emerge from the consultative process will be accepted. If they are not, it is important that a public explanation is provided.

6.2 Ways to Consult

Different community stakeholder groups need different consultation methods at different stages of the project. Some of the processes that may be used are listed below.

Consultation Method	Inform	Consult	Involve	Collaborate
Tools	Fact Sheet / flyers Website Project Open days Briefings 24 hrs. contact points Media Direct personal visits Project inductions	Public submissions Focus groups Public meetings Surveys	Community liaison groups Workshops Submissions Community projects / sponsorship Local suppliers preference policy	Advisory groups Decision making Consensus building

Appendix 1 identities how these methods will be employed specifically to this project.

6.3 Letter Box Drops and Public Notices

Letter box drops or public notices will include at least the following:

- Why the works are required;
- When they will occur;
- What mitigation measures are in place to minimise any community or environmental impacts;
- Who will be doing the work and a contact phone number for further information; and
- Emergency Contact number / community complaints line.

6.4 Communication Protocols

The protocols for establishing and continuing community consultation for this project include:

- Communicating clearly;
- Including 3 or 4 main messages, and repeat them in different ways;
- Ensuring information is structured around the same messages i.e. Consistency;
- Ensuring project staff are clear about main messages, so stakeholders receive consistent messages;
- Providing information promptly;
- Establishing timelines and lines of communication: for this project a 2 day response time to deal with community concerns has been determined;

- Making the information accessible to all interested parties; and
- Being open to changes that may result from listening and incorporating innovations or concerns from the community into the project activities and methodologies.

7 Identification of Stakeholders for this Project

7.1 General

Key stakeholders are generally identified as people who are adversely or positively impacted by our operations, those who have an interest in / influence on what we do.

Our project sites are required to identify their key stakeholders and consider their expectations and concerns during design (where achievable) and operational activities.

These projects key stakeholders are many and varied and may include:

- RCC's Employees Client and end users, subcontractors, and suppliers;
- Local and Indigenous communities;
- Customers;
- Surrounding property occupiers or owners;
- Community organisations that represent local and indigenous communities near our projects, particularly in regional NSW;
- Unions who are concerned about upholding workers' rights and interests; and
- Governments – local & state;
- The media; and
- Industry associations.

Within these groups, there are stakeholders that may be interested in specific issues or affected by a range of issues.

7.2 Community Consultation Planning

Appendix 1 summarises the Community and Stakeholders Mapping Guide and overall consultation strategy planned for this project.

7.3 Stakeholders Identified for this Project & Consultation Strategies

For this project, business, residential and other stakeholders that may be specifically impacted by project works and the corresponding consultation strategy have been listed in the table below:

Stakeholders and Consultation Strategies		
Precinct	Impacts	Consultation Strategy
Businesses	During Construction: extra traffic (concrete trucks)	A construction update advising of progress of current works and advice of commencement of soft ground works will be issue in advance of works commencing Personal consultation – a visit will be made to update

Stakeholders and Consultation Strategies		
Precinct	Impacts	Consultation Strategy
		progress on works and inform businesses of upcoming works Community Liaison Group (CLG) – monthly meetings Ongoing communication with the Client, Property managers and business tenants via regular email flyers and project updates. The agreed complaint handling procedures will be implemented
Residents	During Construction: Noise, Traffic, Dust	Prior to works starting, notification and consultation will be undertaken with the identified key sensitive receivers. Personal consultation will be undertaken with identified sensitive receivers to make them aware of works, and the potential issues such as concrete trucks utilising site on a 10 hour basis Monday to Friday. Personal consultation will be undertaken with the residents potentially impacted by regenerated noise and vibration The agreed complaint handling procedures will be implemented
Employees & Subcontractors	WHS concerns Career progression & learning opportunities For those who live in regional communities where our projects are based – interactions out of work hours, business creation during the life of the project, supporting social infrastructure	Both the Head Office at Atarmon and project sites, employees and contractors are expected to participate in company improvements, via: Safety committees Performance appraisals Direct communications between employees & management Newsletters & alerts Intranet Monthly reporting & corporate reports IT helpdesk

Stakeholders and Consultation Strategies		
Precinct	**Impacts**	**Consultation Strategy**
Local & Indigenous Communities	Disengagement of local & indigenous communities with the project Non – fulfilment of GC21 Contract obligations contained in Aboriginal Participation Plans Miss-alignment of RCC's policies and the NSW Government's commitment to creating outcomes (training, employment, enterprise development) for Aboriginal people, as referred to in the Making It Our Business Strategy and procurement in construction policy. Potential to affirm and respect indigenous and other heritage & cultural values	Development of Aboriginal Participation Plans to involve the indigenous community Community consultation groups Newsletters and other targeted communications Monthly reporting & corporate reports Community perception surveys
Suppliers	Suppliers and subcontractors not aware of RCCs expectations Impacts of RCC's payment terms and conditions on suppliers and subcontractors	Technology exchanges Identification of risks associated with their activities and implementation of controls Seek to utilise local suppliers and support these suppliers
Community Organisations	Assurance that potential impacts (social, environmental, safety etc.) have been considered during RCC's projects and mitigated RCC's community interactions and support are mutually beneficial and sustainable	Community consultation and engagement groups Support local sporting and other groups Corporate programs
Unions	Freedom of our employees to choose to join labour unions	Communicate with unions on specific issues, RCC's CBA etc.
Regulators	Government has mechanisms of regulation that cover a range of aspects within RCC including industrial, safety, environment	RCC's activities required to work within legislative frameworks and local and state levels Meetings with Council, BCA consultant with respect to planning and design issues Onsite meetings with Local Council, DECC, WorkCover, ABCC to ensure RCC works complying with legislation, minimising impacts to stakeholders, minimising industrial relations conflicts etc.

7.4 Indigenous Stakeholders

RCC recognises and respects the importance of Indigenous peoples' culture, heritage and traditional rights and supports the identification, recording, management and protection of indigenous cultural heritage sites.

Indigenous cultural heritage is broadly defined to include matters that are significant to either Indigenous peoples or under legislation, such as dreaming, ceremonial, sacred and burial sites; archaeological sites where evidence of the past occupation and use by Indigenous peoples can be found; more contemporary historic sites; and traditional knowledge.

We recognise that Indigenous peoples have a vital role to play in identifying and properly managing cultural heritage, especially where it could be affected by our activities.

Where identified by the planning process, projects will undertake early consultations and assessments with Indigenous peoples to ascertain whether our proposed activities are likely to impact cultural heritage values and, in conjunction with Indigenous peoples and relevant authorities, determine how best to plan and undertake those activities to avoid or minimise such impacts.

RCC also actively seeks to utilise traditional knowledge in the development of site-based practices such as environmental management plans (refer Section 4 and Appendix 1 of the Project Management Plan).

7.5 Aboriginal Participation Plan

Aboriginal Participation Plans will be developed for a project in accordance with the Contract requirements or where there is a significant potential to benefit the local community in line with the NSW Government's policies (see Appendix 1 of the Project Management Plan).

8 Responsibility for Implementing the Plan

The Project Manager is responsible for developing and implementing the Community Consultation and Engagement Plan for this project. Where required, specialist consultants will be engaged.

9 Stakeholder Grievances and Concerns

Project sites are required to maintain a register of concerns, complaints and relevant external communications.

Concerns and complaints are to be investigated as incidents, using RCC's standard investigation processes (Form 01.1), and outcomes and actions are reported back to relevant stakeholders.

10 Is the Plan Effective?

Monitoring public opinion and complaints will identify how successful the project Community Consultation and Engagement Plan is:

- If issues can be resolved by consultation and collaboration, then the program is successful.
- If issues are escalating and resolution is improbable, the program is to working.

A regular review process during the project is also a central requirement of stakeholder identification, to ensure that all appropriate groups and individuals are effectively identified and suitably engaged.

11 Resources

http://www.vlgaconsultation.org.au/
http://www.communitysolutions.com.au/index.html

Landcom Booklet Stakeholder Consultation Workbook (available on internet)

Appendix 1 – Stakeholder Table

Community Stakeholder Mapping Guide								
Stakeholder	Issue / Impact	Does the stakeholder have / require?			Implementation Requirements			Affected / Level of Impact
		Information Needs	Expertise / Knowledge	Regulation	Planning Approval	Construction Management Plans e.g. Noise & Vibration	Contract Requirement	
Residents	Dust, noise	3	1	1	1	2	3	3
Business	Traffic	3	1	1	1	1	3	3
Community Groups	Traffic	2	1	1	1	1	1	1
Indigenous Group	Heritage							
Client	Operations							
EPA	Environment							
WorkSafe	Safety							
Local Council	Building							
Union	IR							

Stakeholder	Level of Impact	Consultation Strategy			
		Inform	Consult	Involve	Collaborate
Residents	3	✓	✓	✓	
Business	3	✓	✓	✓	
Community Groups	1	✓			
Indigenous Group					
Client					
EPA		✓			✓
WorkSafe		✓	✓		
Local Council		✓	✓		
Union		✓			

Step 1:

Rank why a particular group is a stakeholder for this project i.e. is their interest low, medium, high?

1 = low

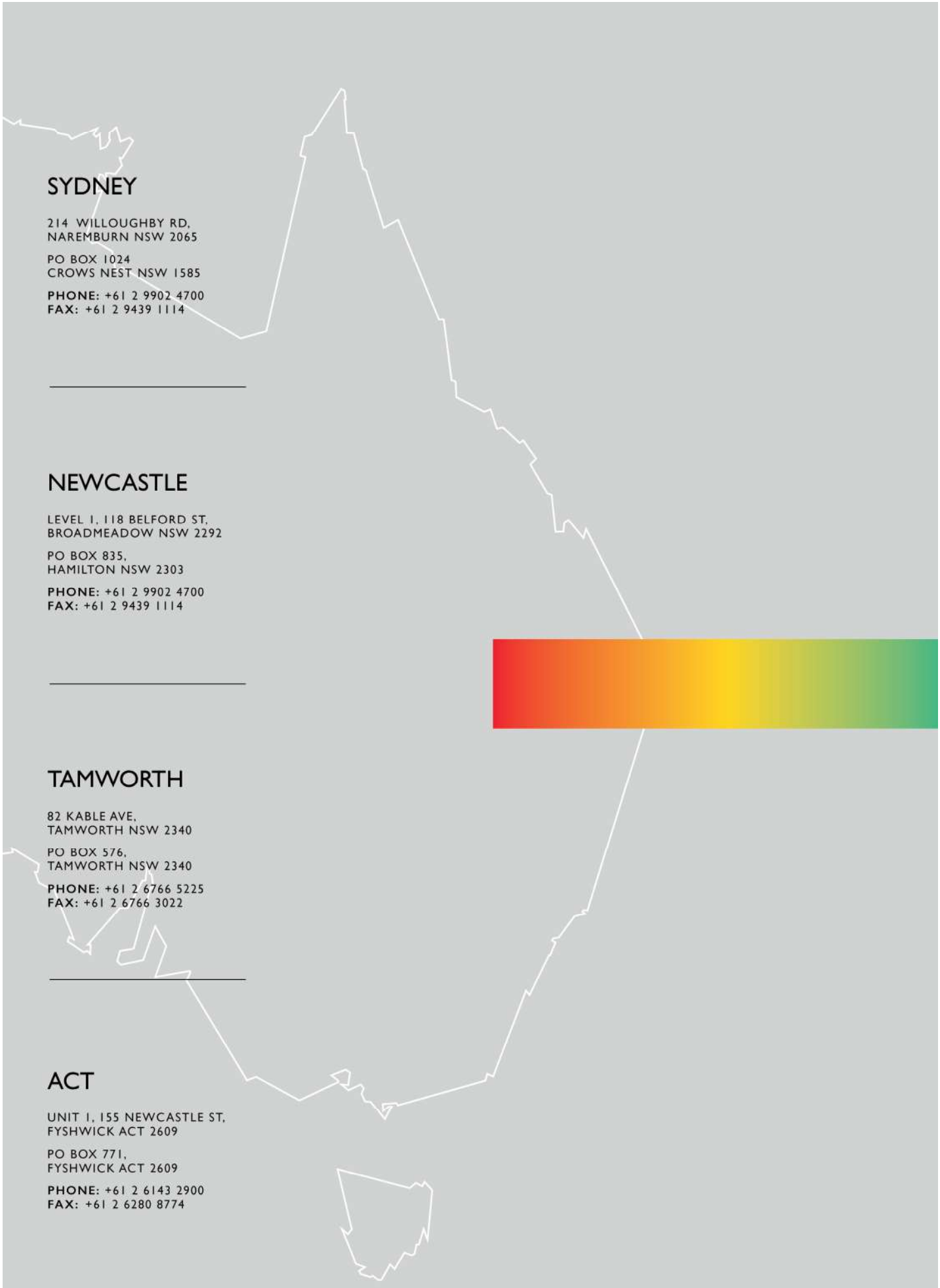
2 = medium

3 = high

Step 2:

✓ Indicate Consultation Strategy employed

Details provided in Section 7.0.



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HAMILTON NSW 2303

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FAX: +61 2 9439 1114

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TAMWORTH NSW 2340

PO BOX 576,
TAMWORTH NSW 2340

PHONE: +61 2 6766 5225
FAX: +61 2 6766 3022

ACT

UNIT 1, 155 NEWCASTLE ST,
FYSHWICK ACT 2609

PO BOX 771,
FYSHWICK ACT 2609

PHONE: +61 2 6143 2900
FAX: +61 2 6280 8774

richardcrookes.com.au

APPENDIX 2: NOISE MONITORING DATA

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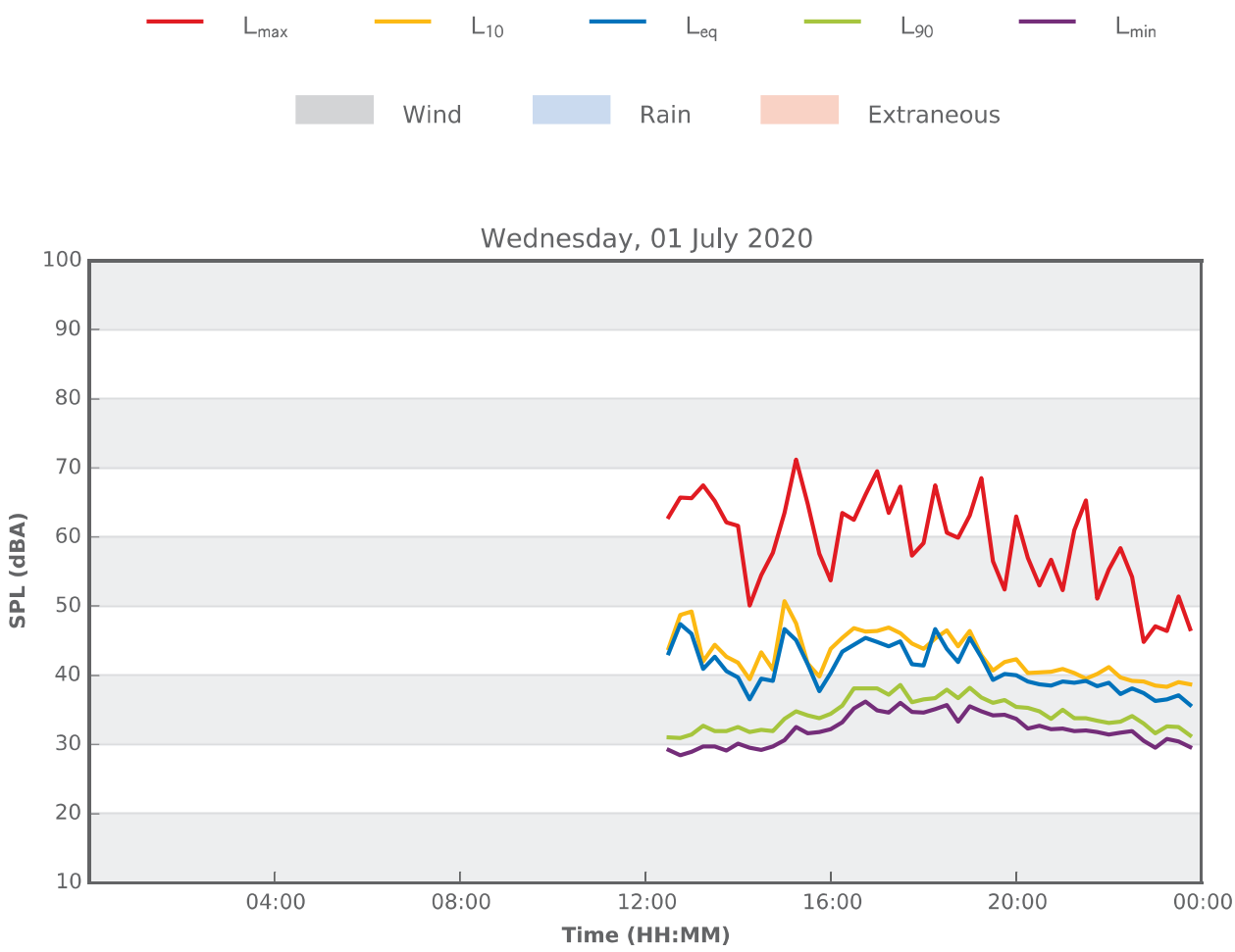

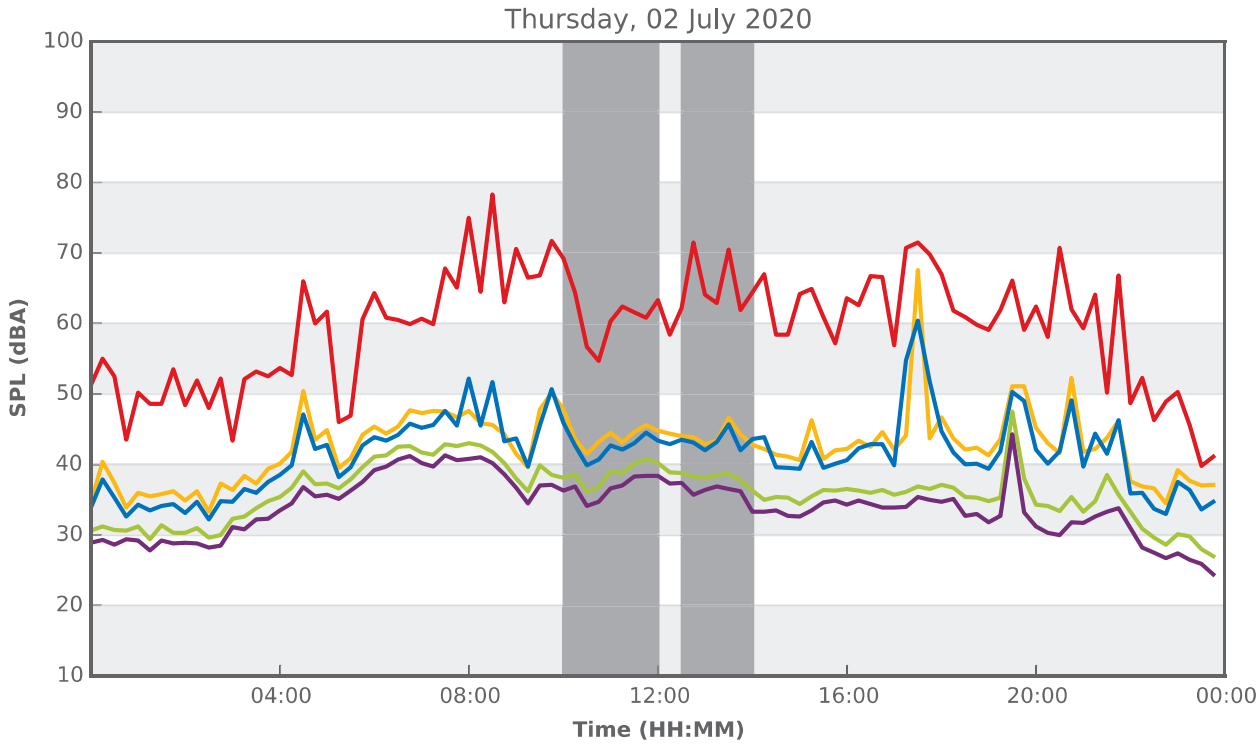

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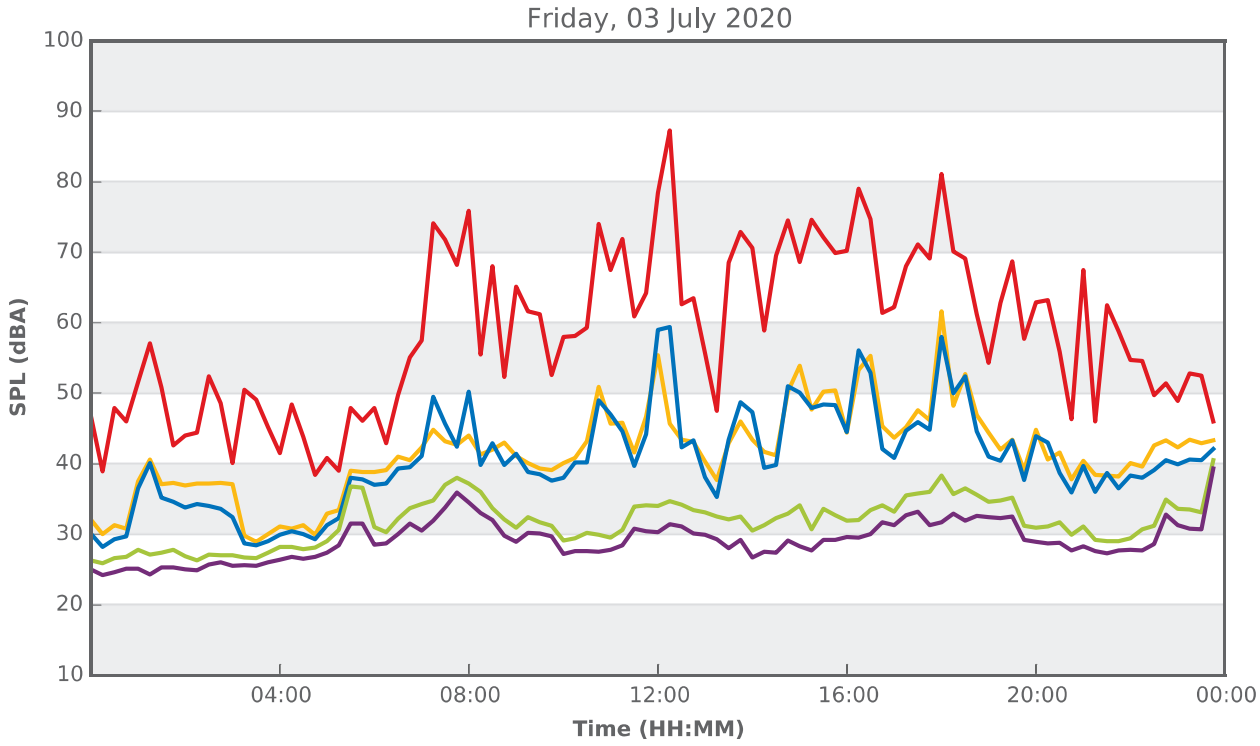

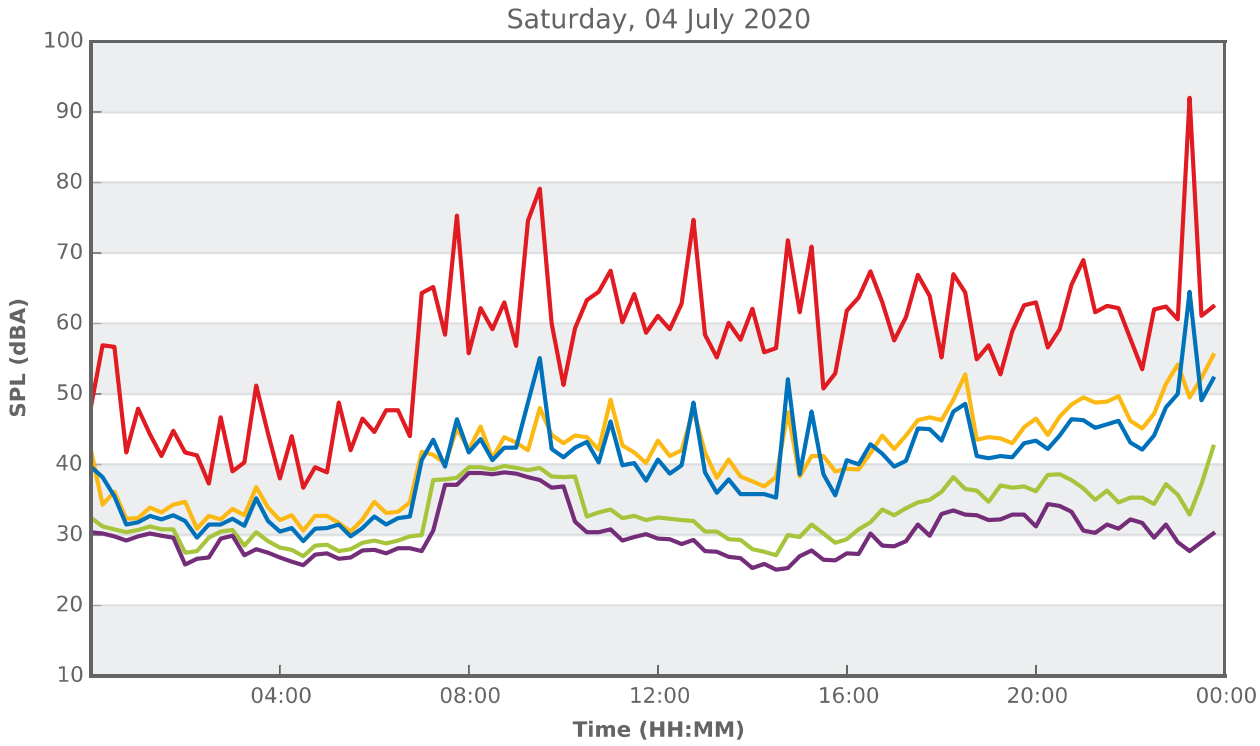

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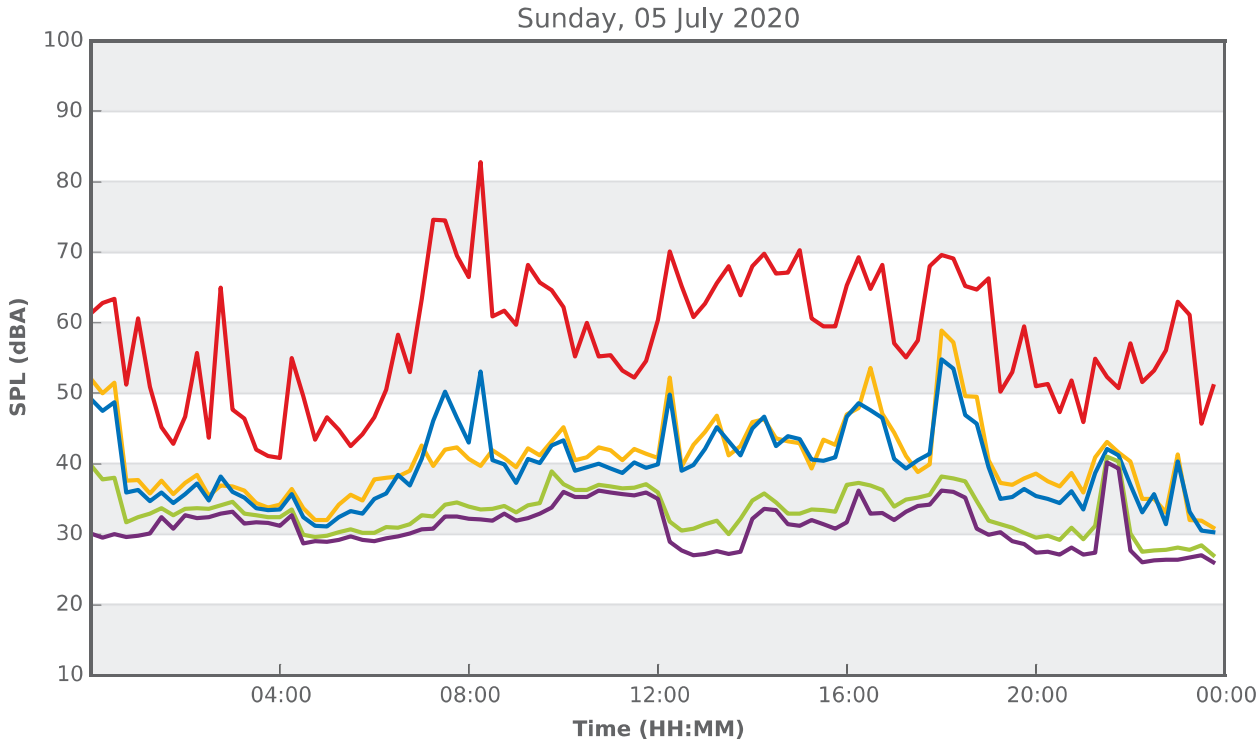

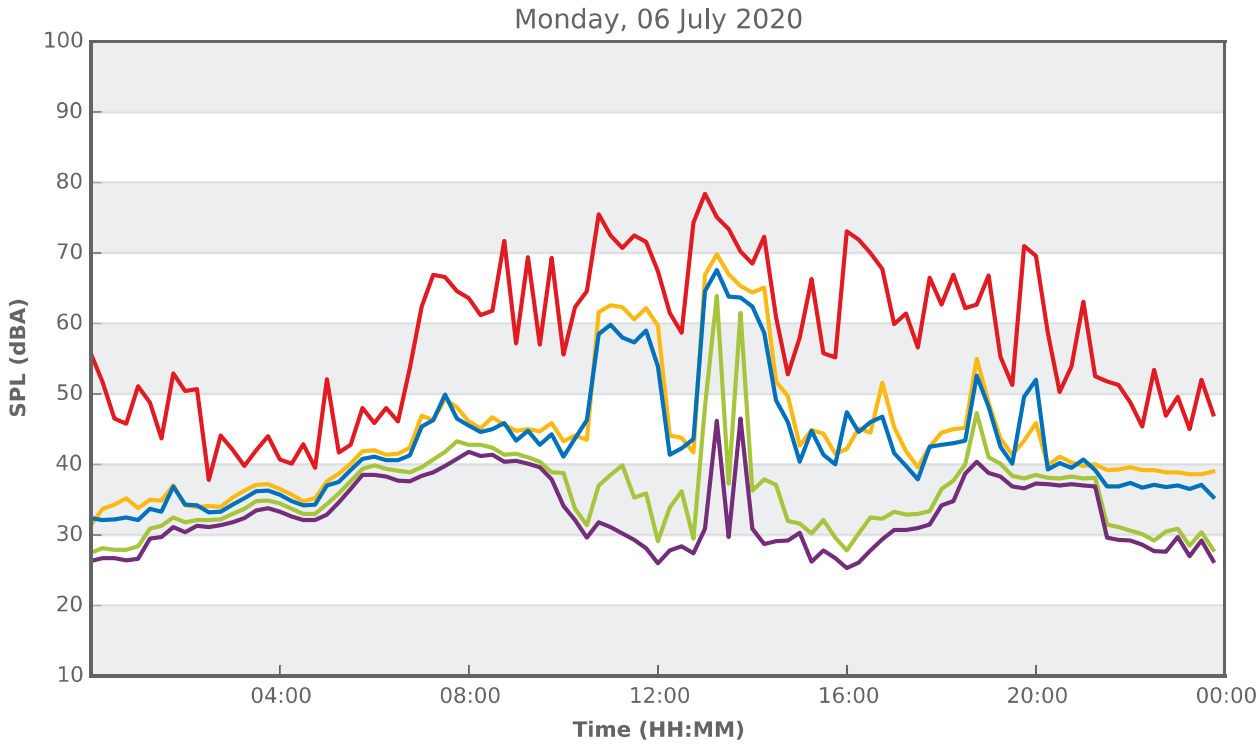

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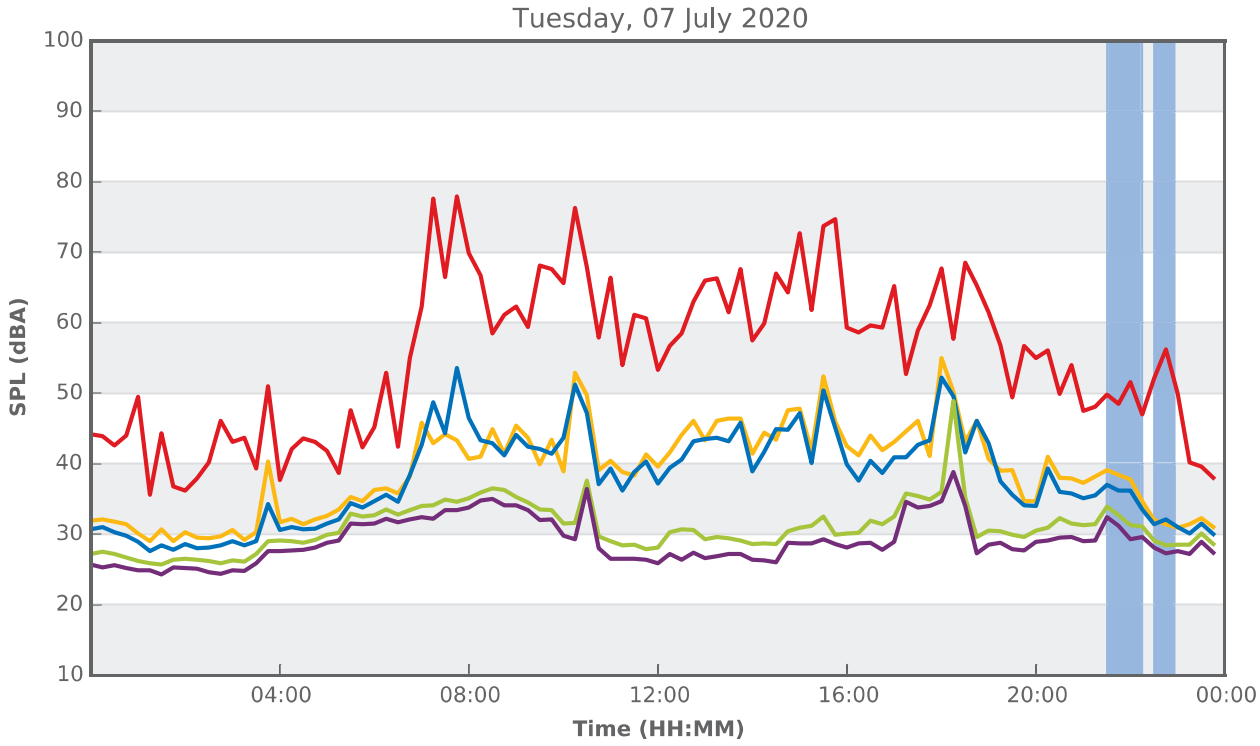

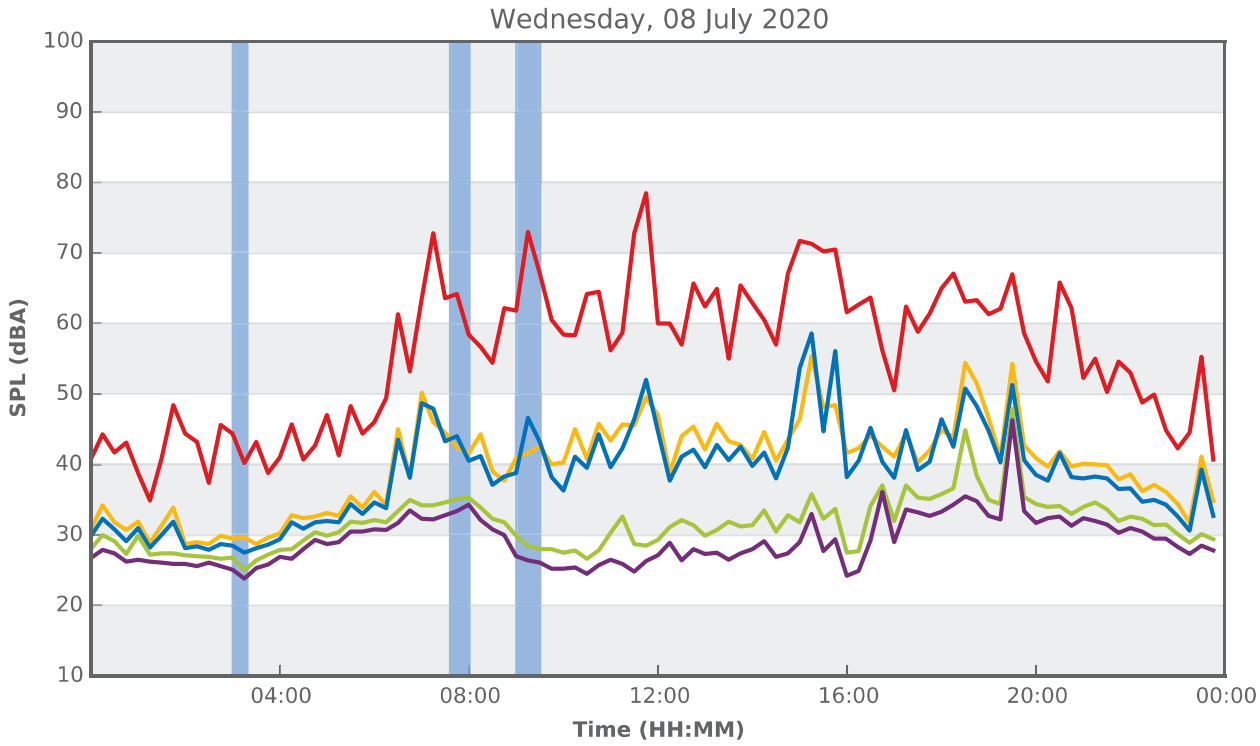

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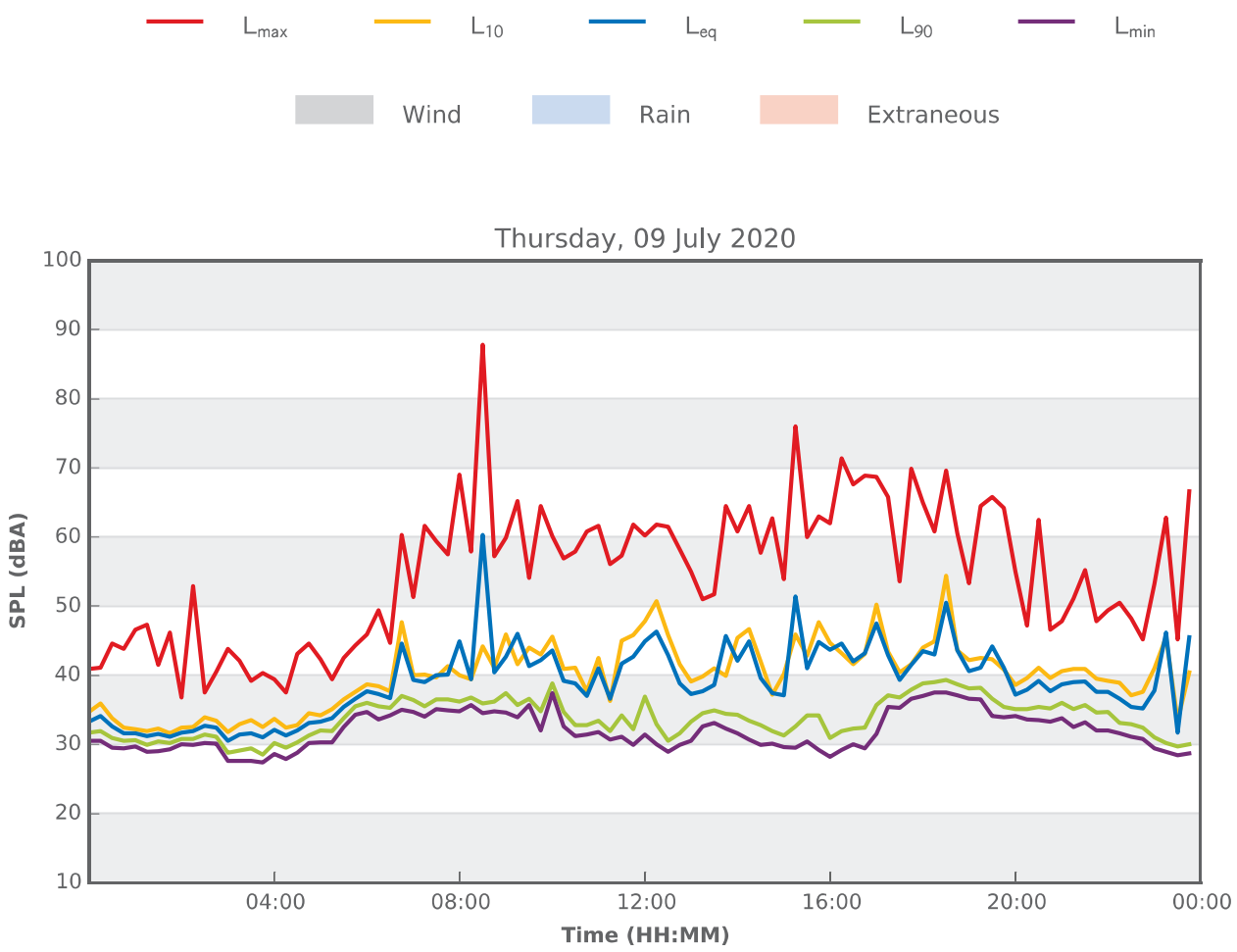

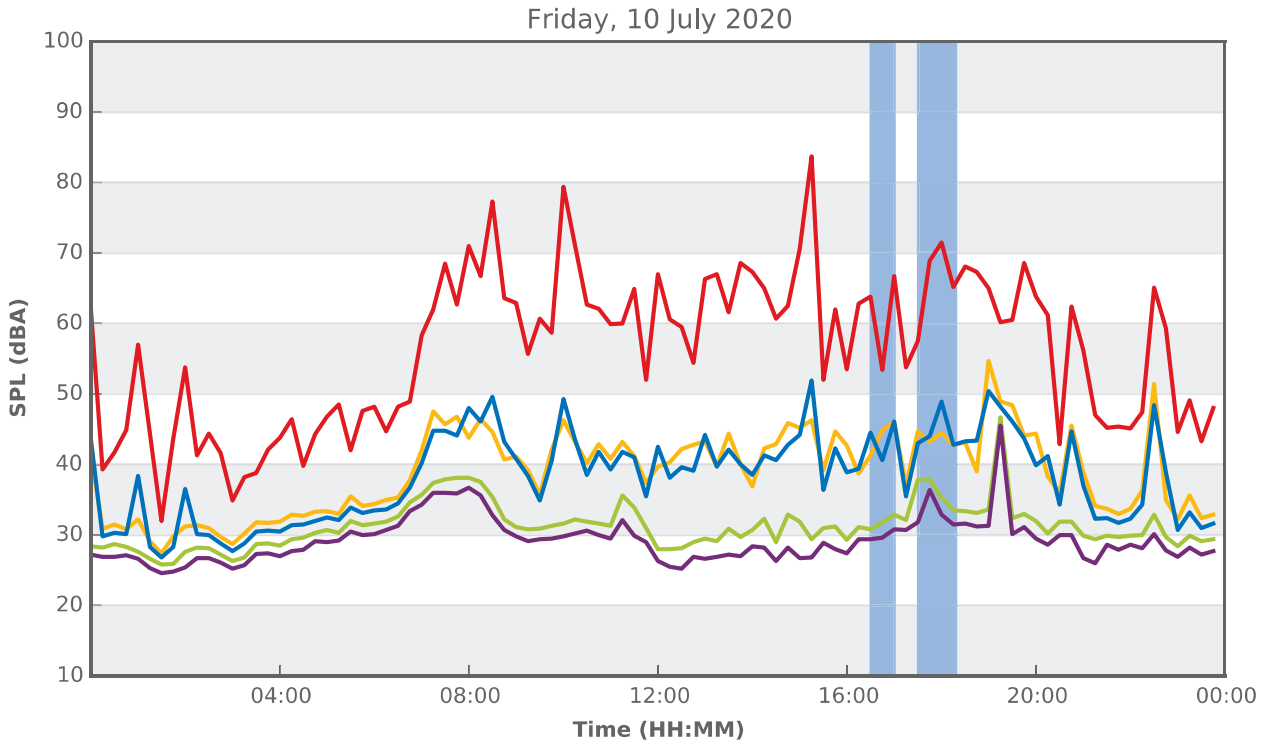

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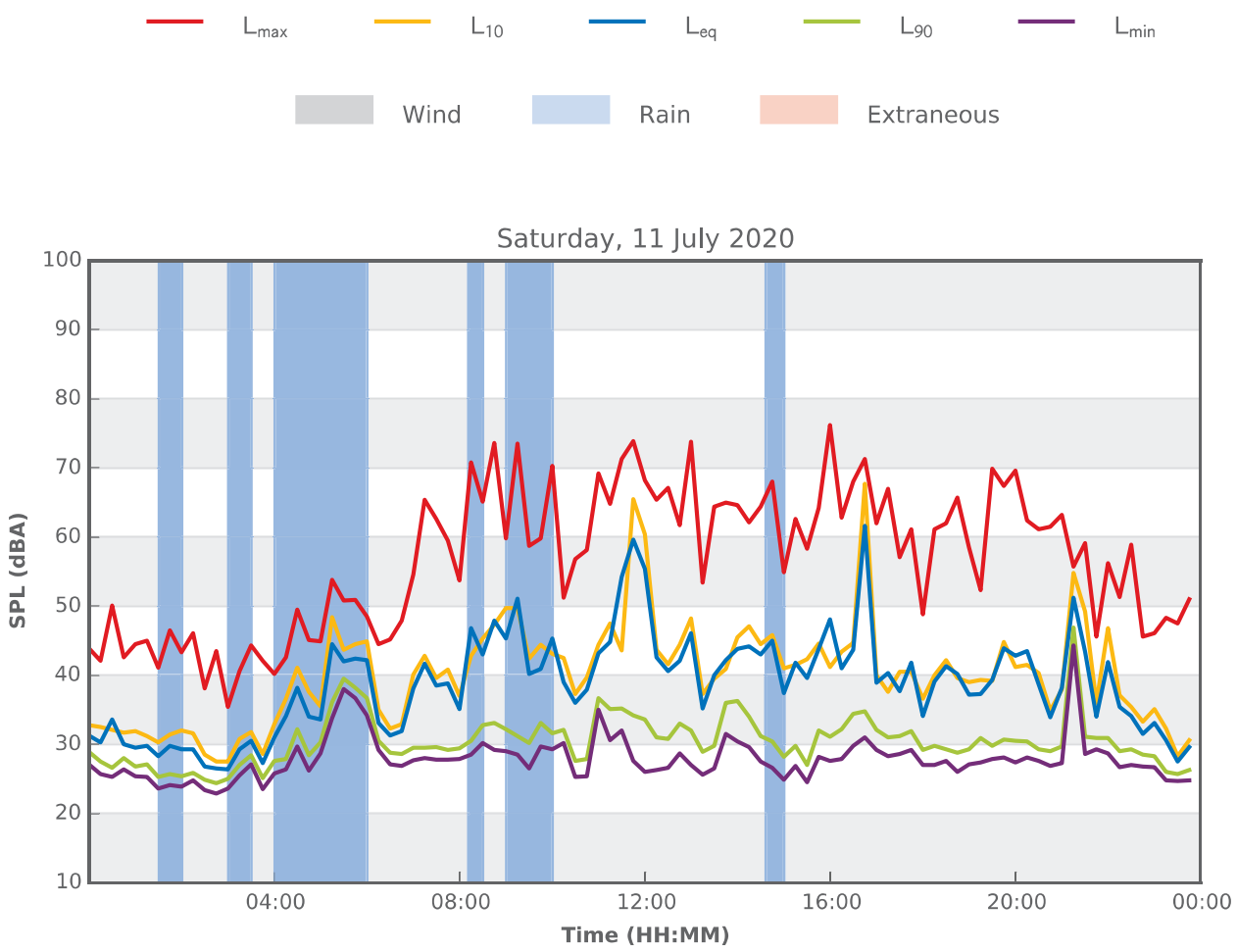

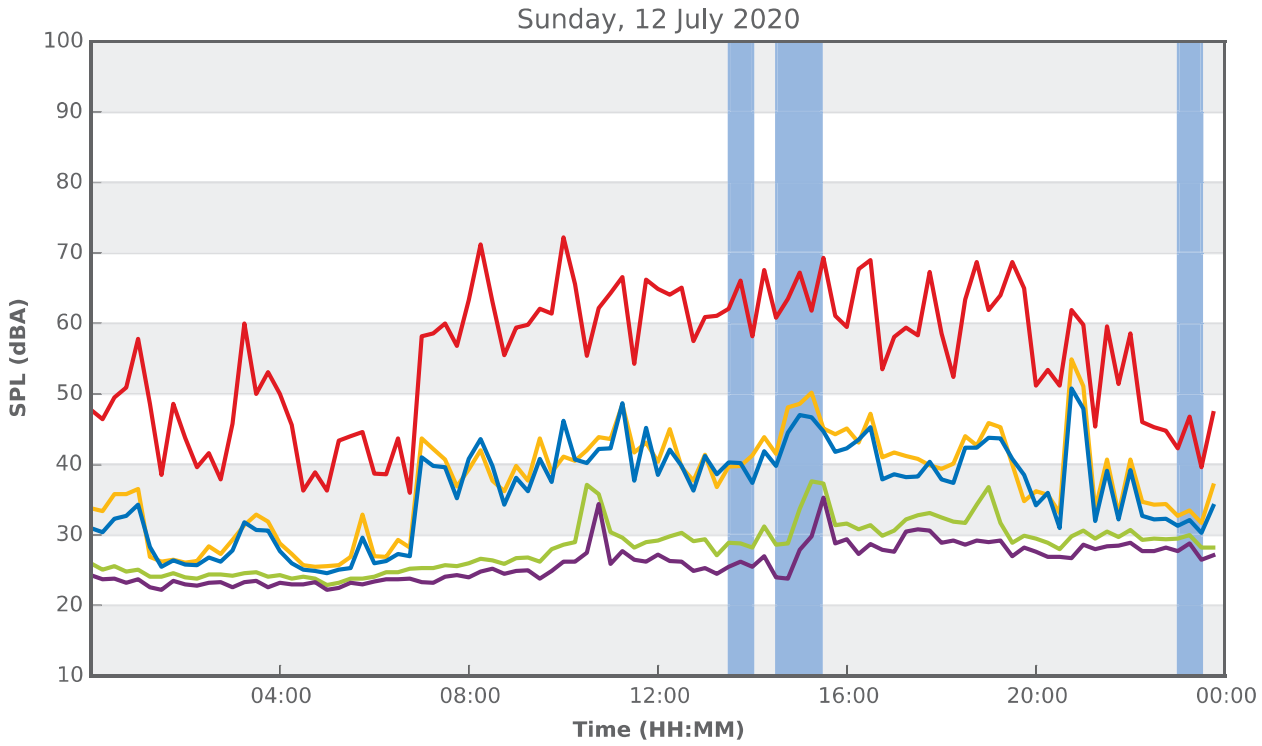

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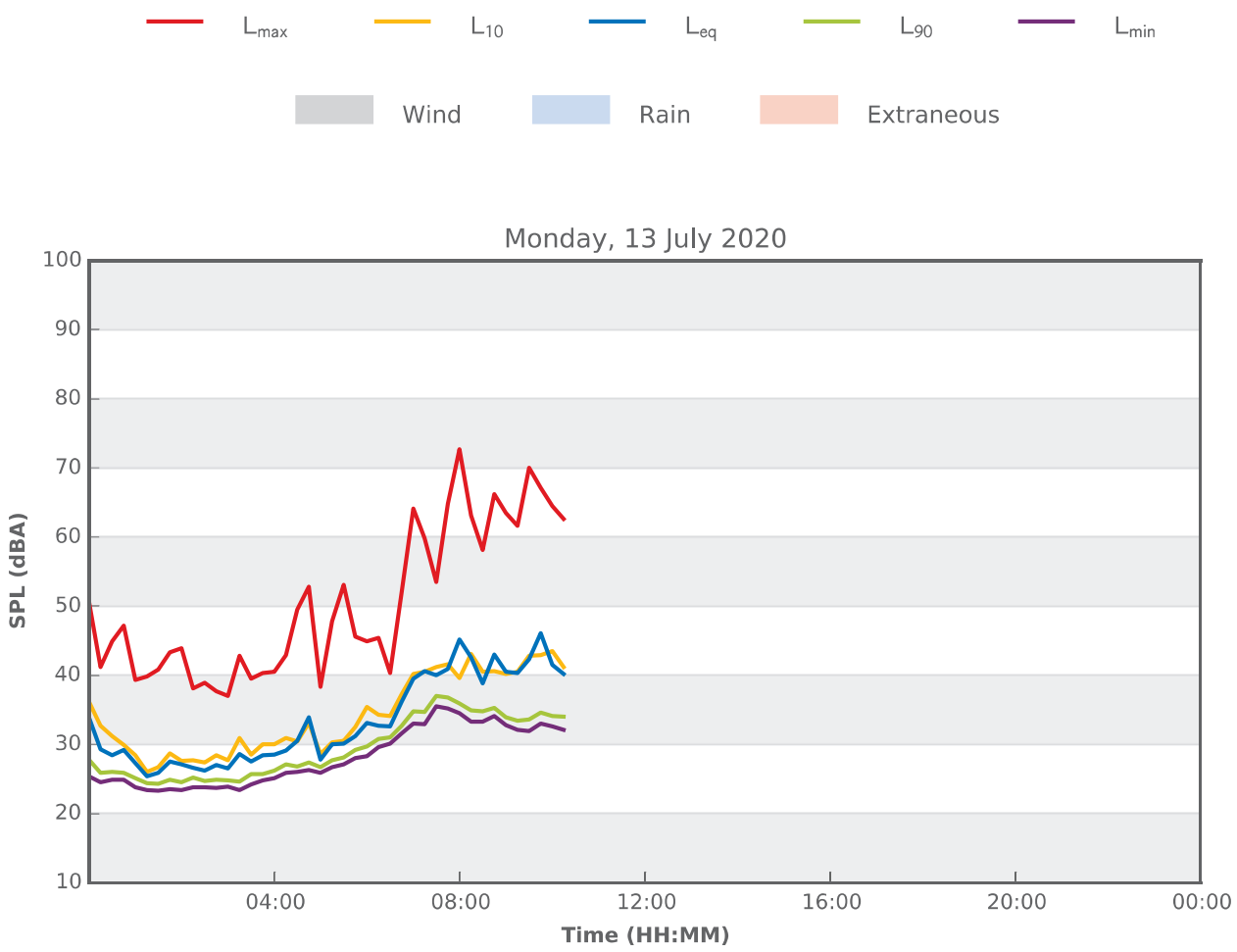

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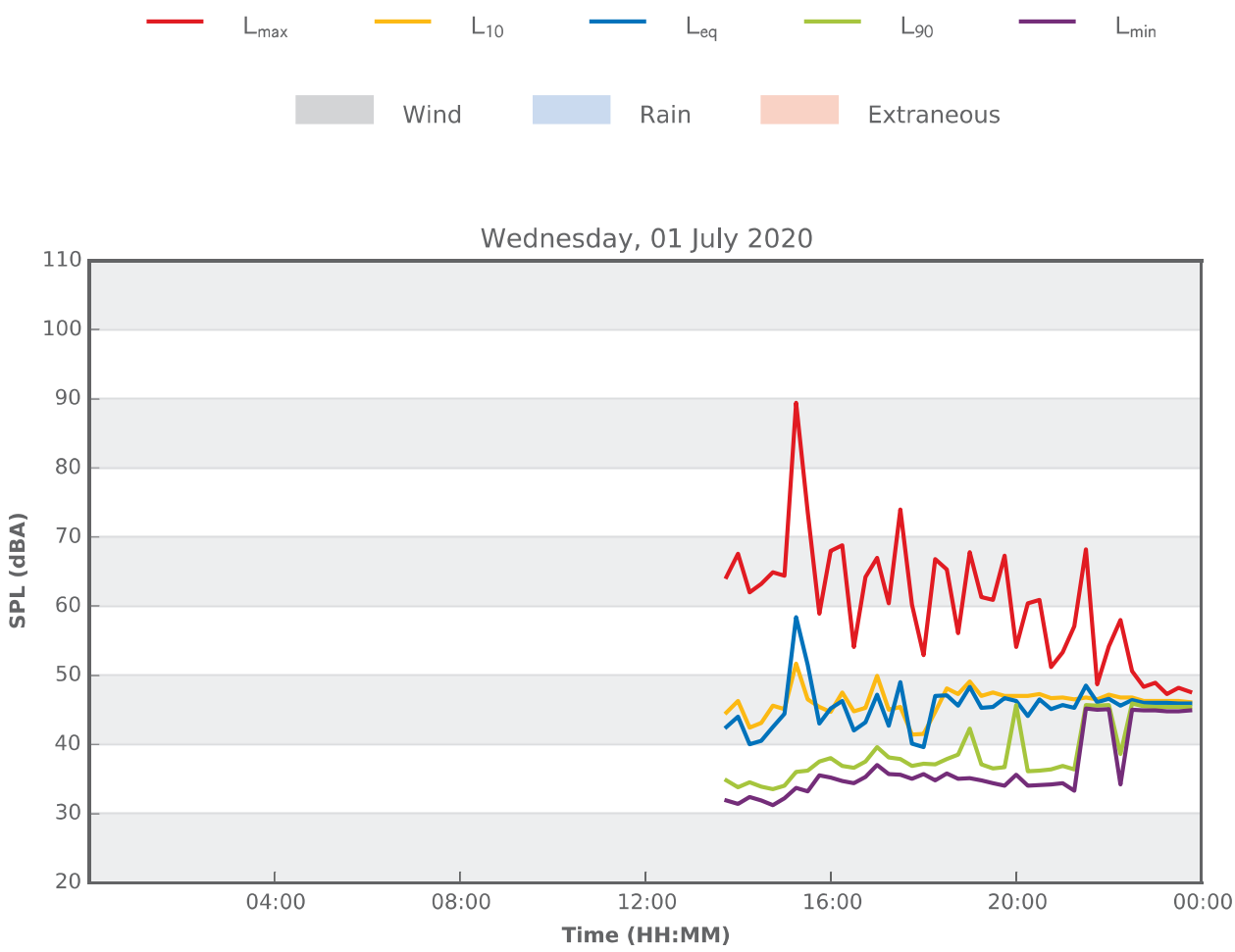

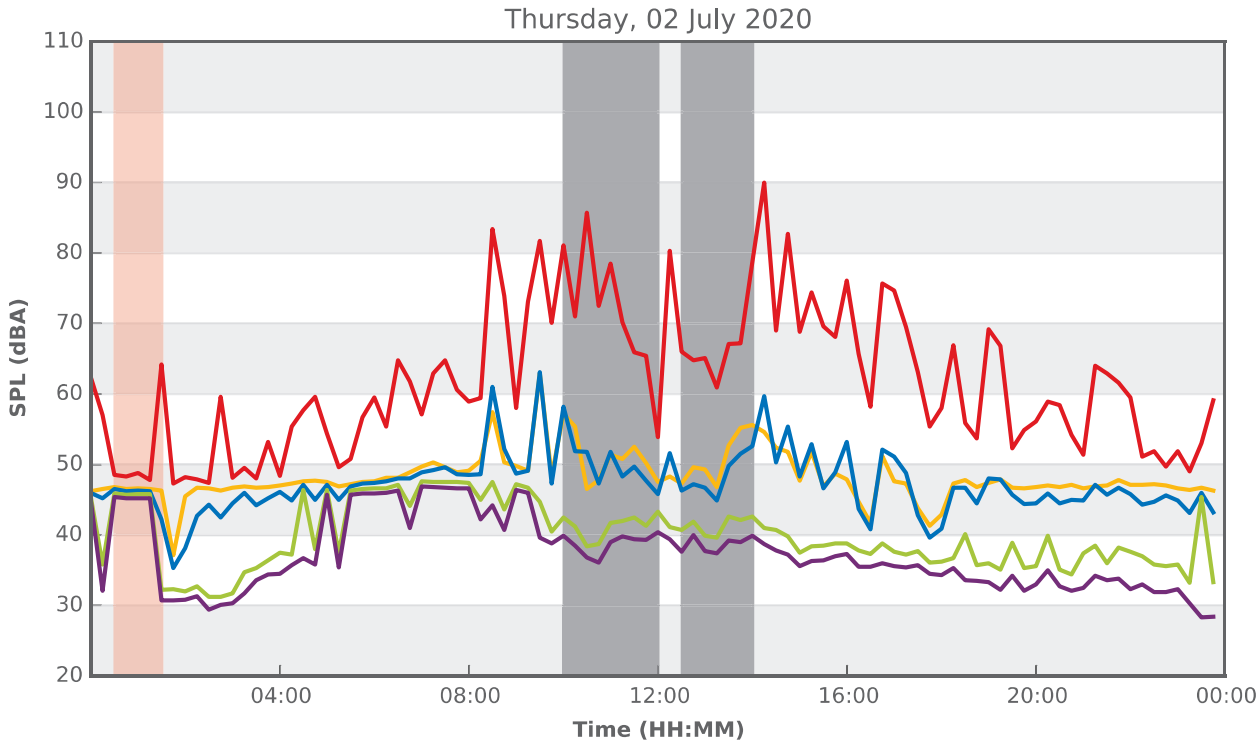

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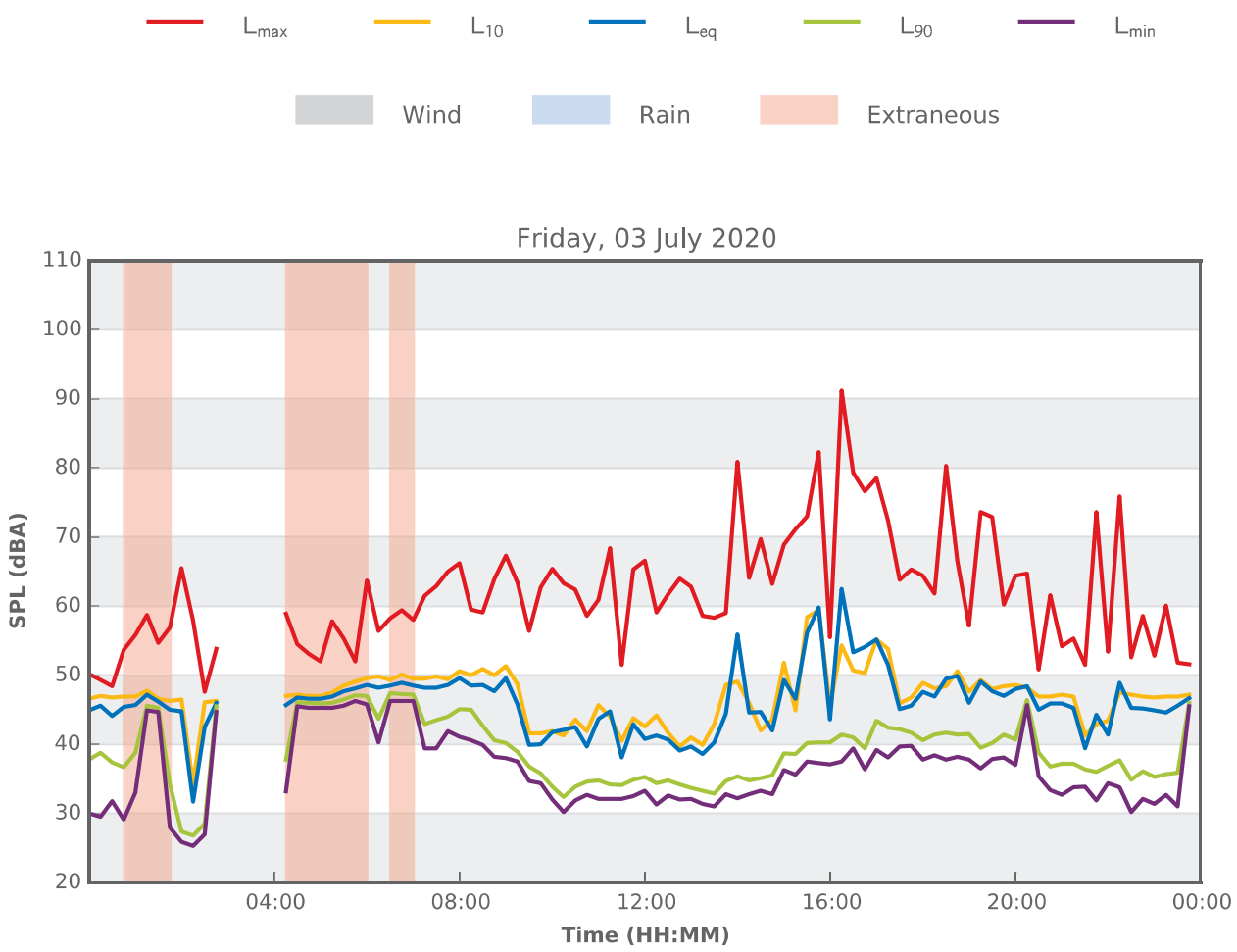

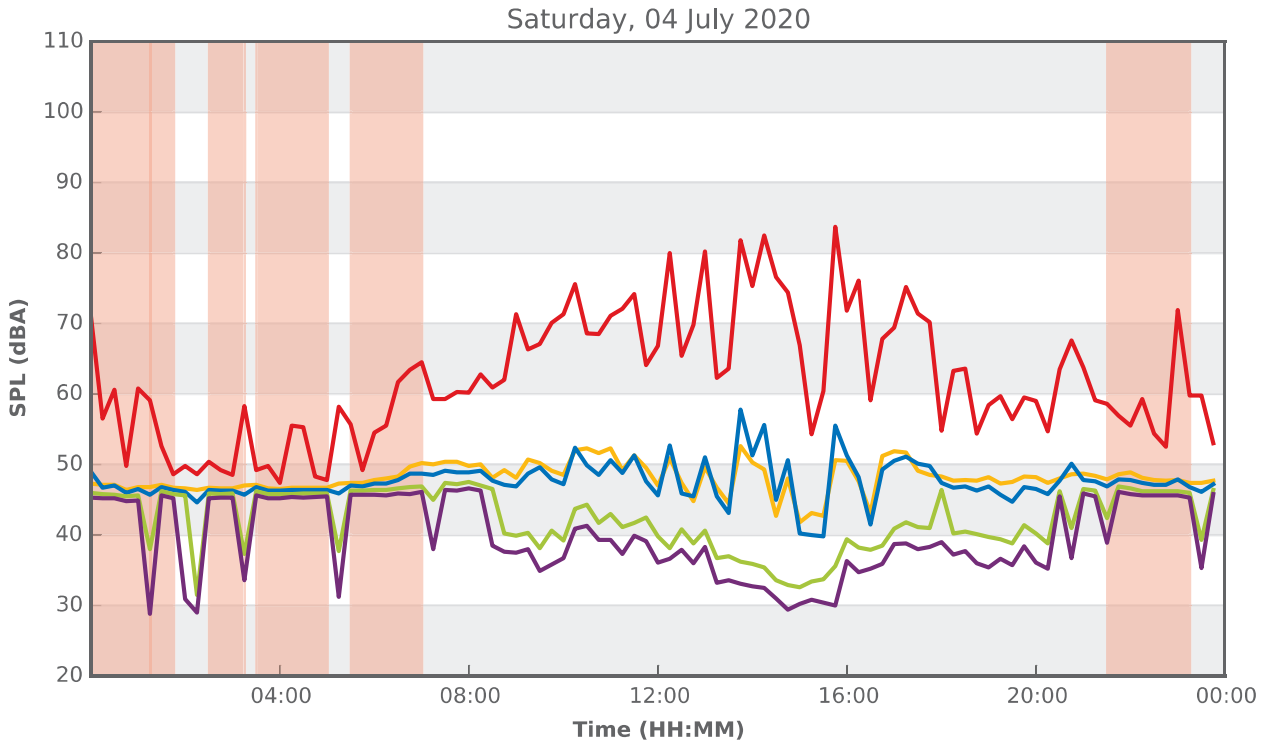

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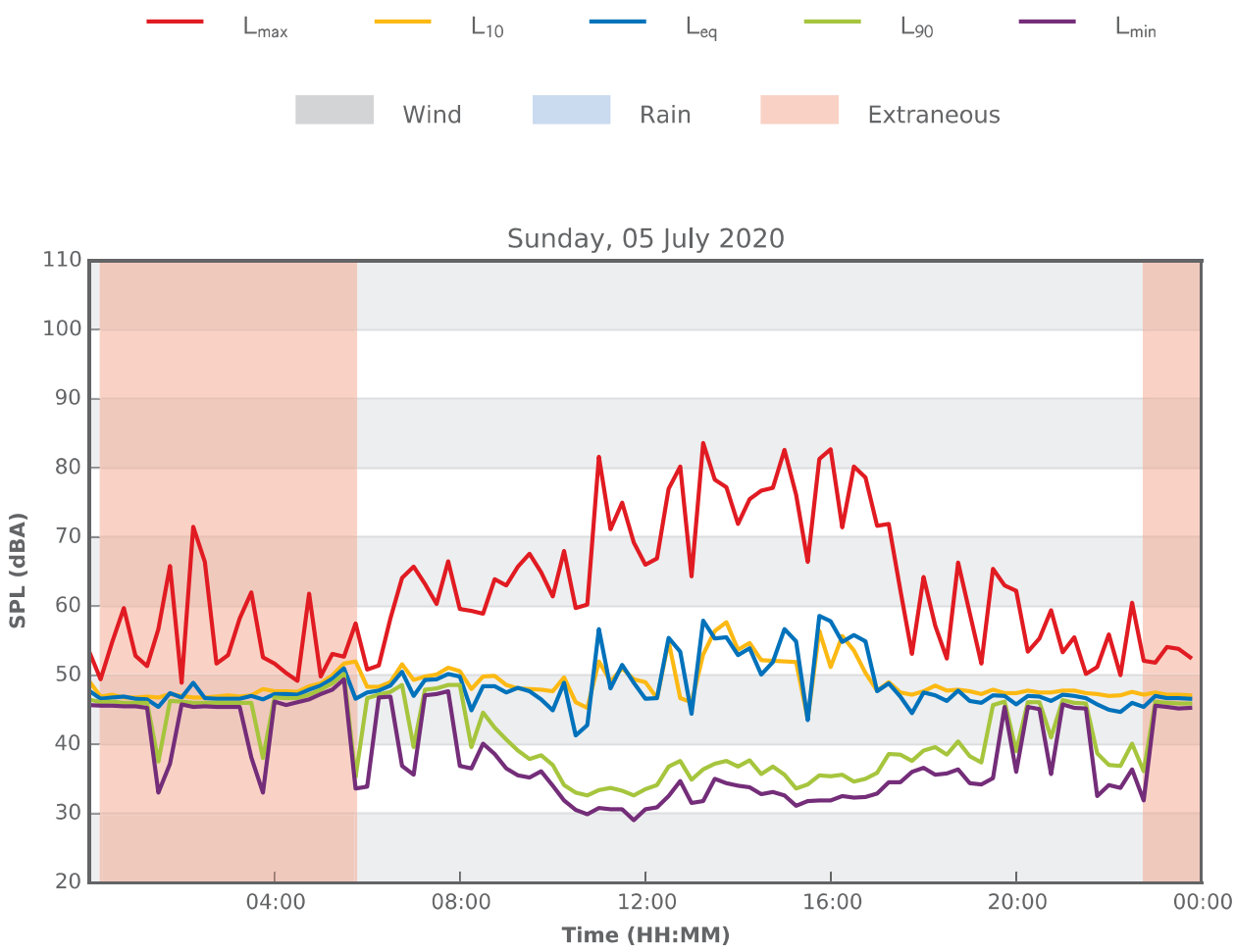

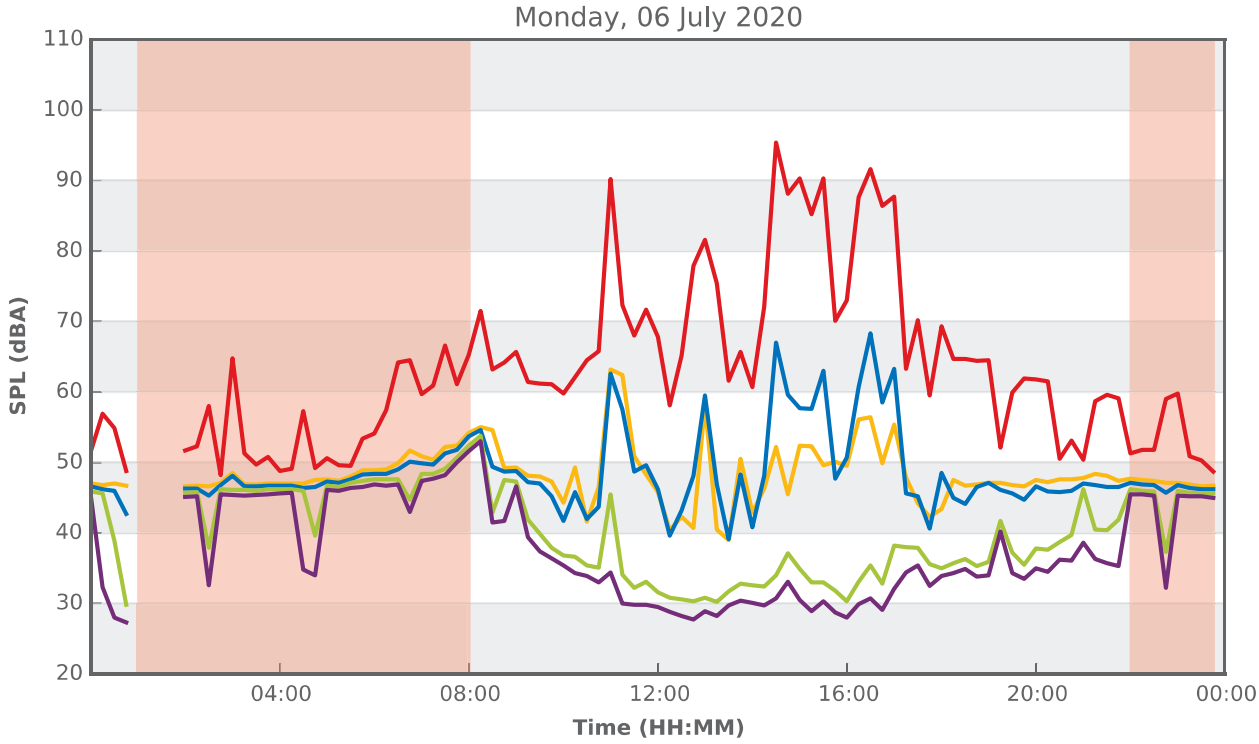

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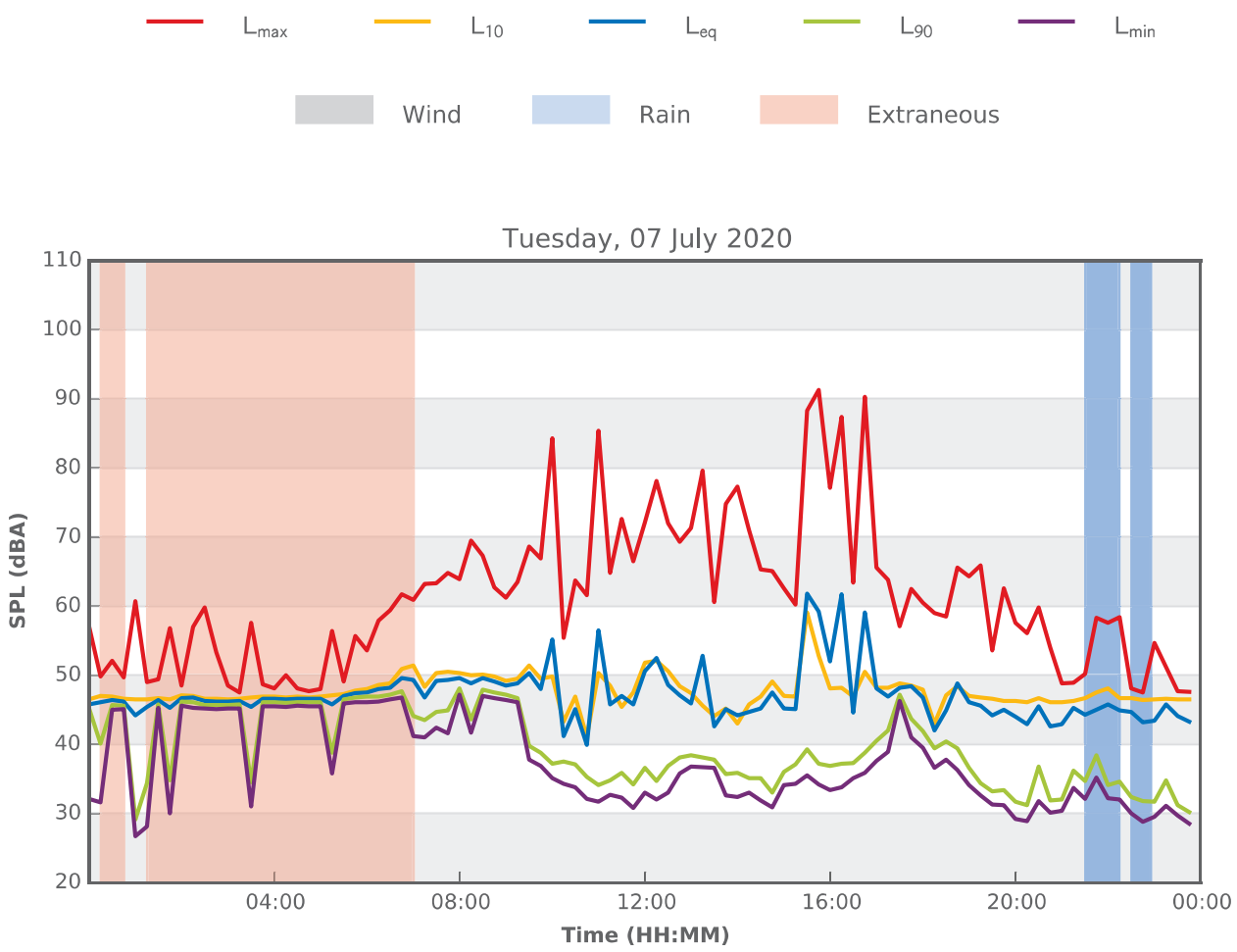
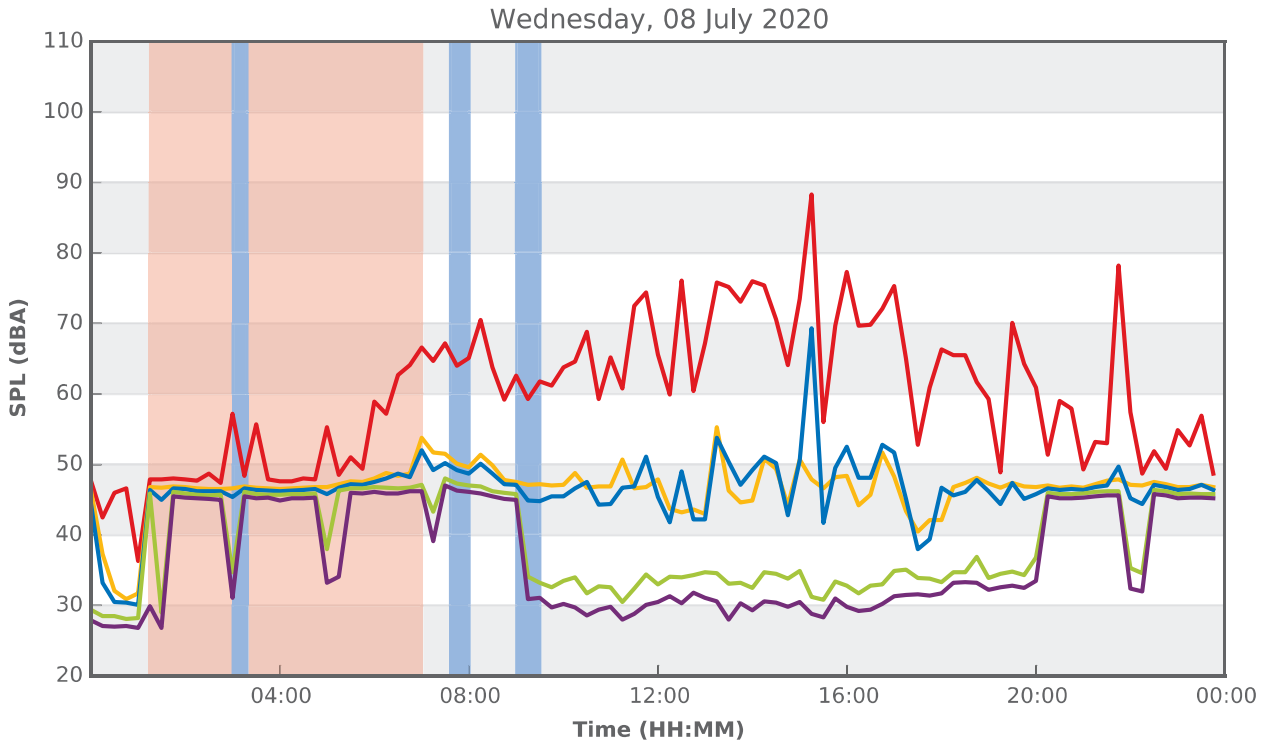
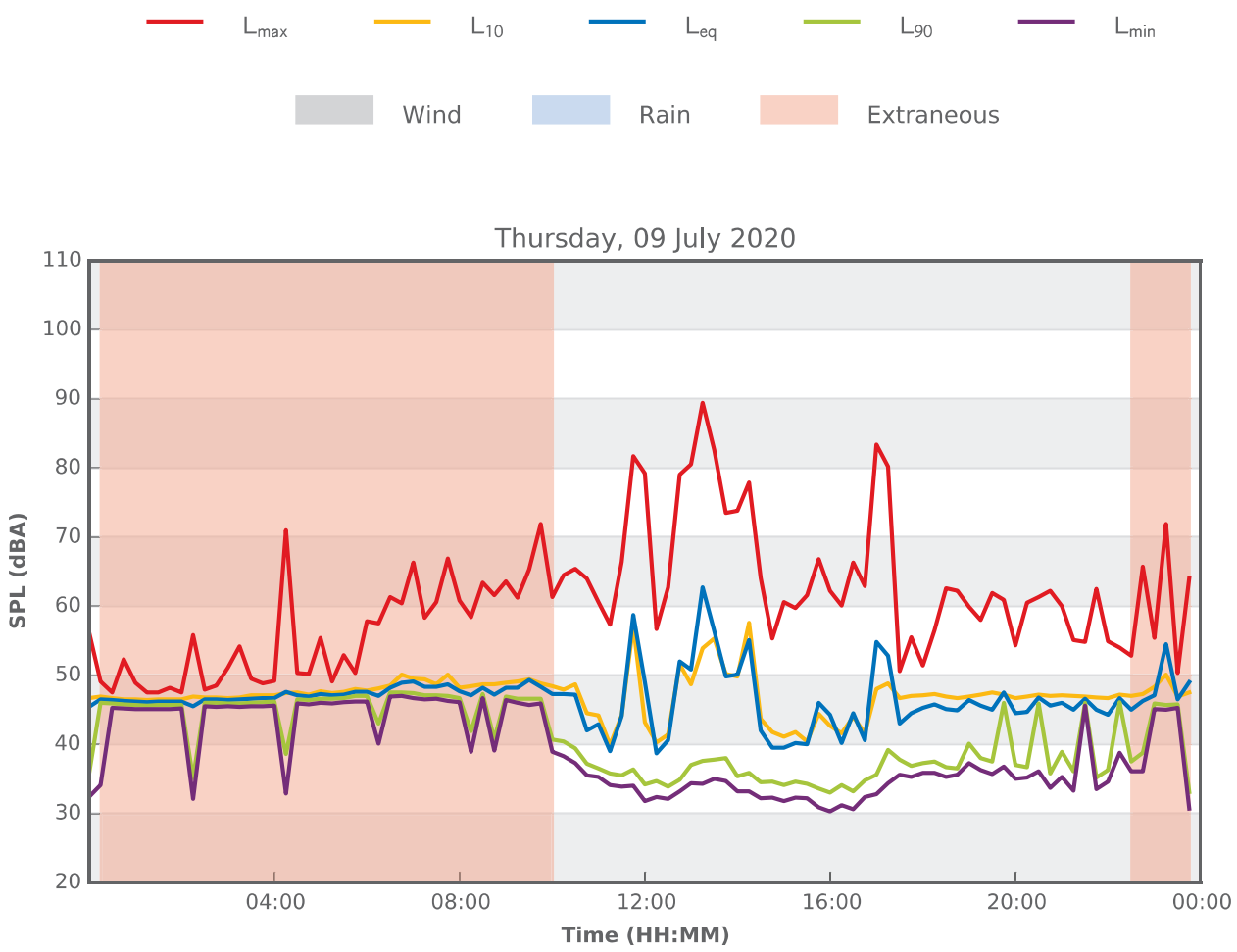
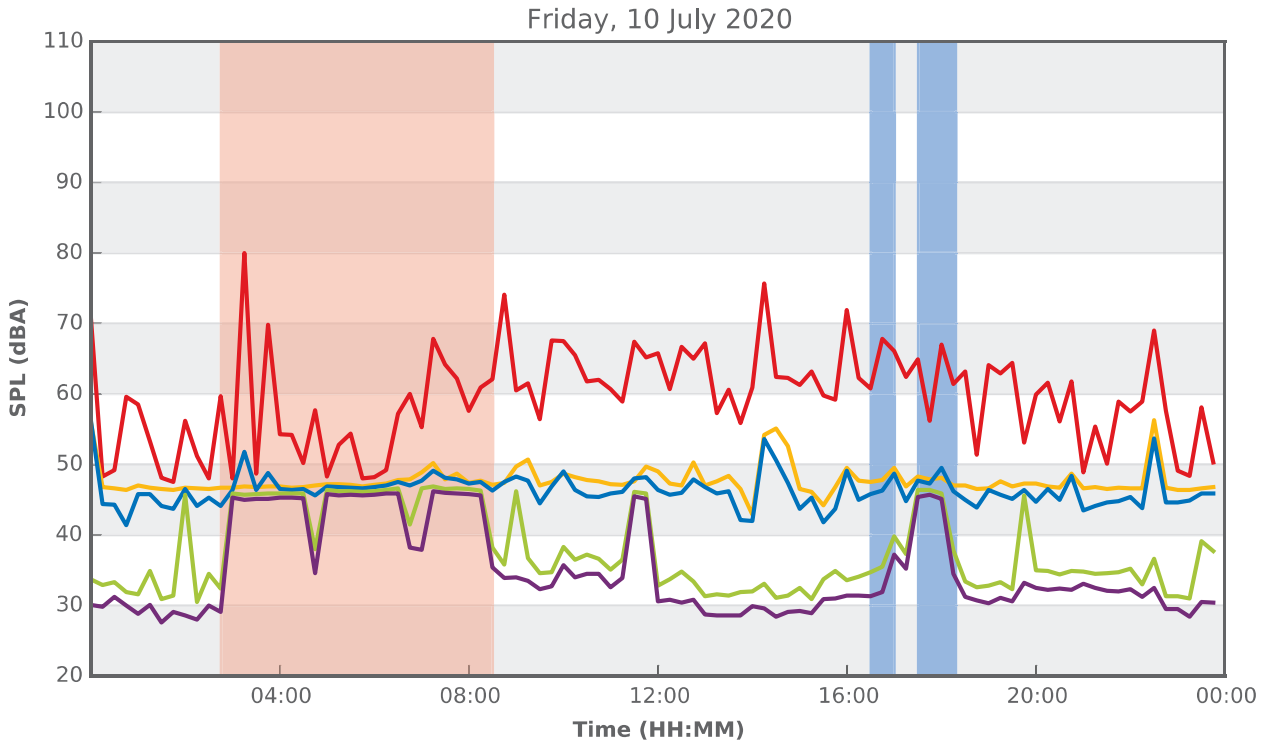




15 Roche Grove, Shalvey





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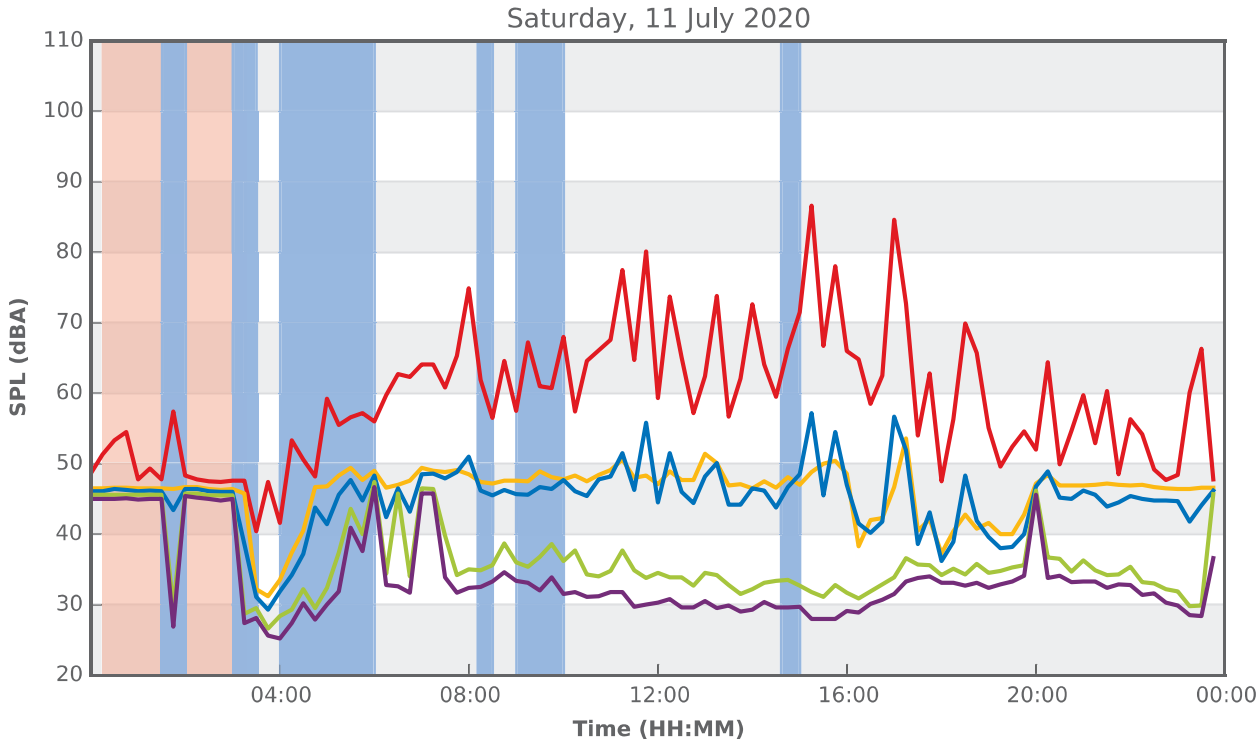

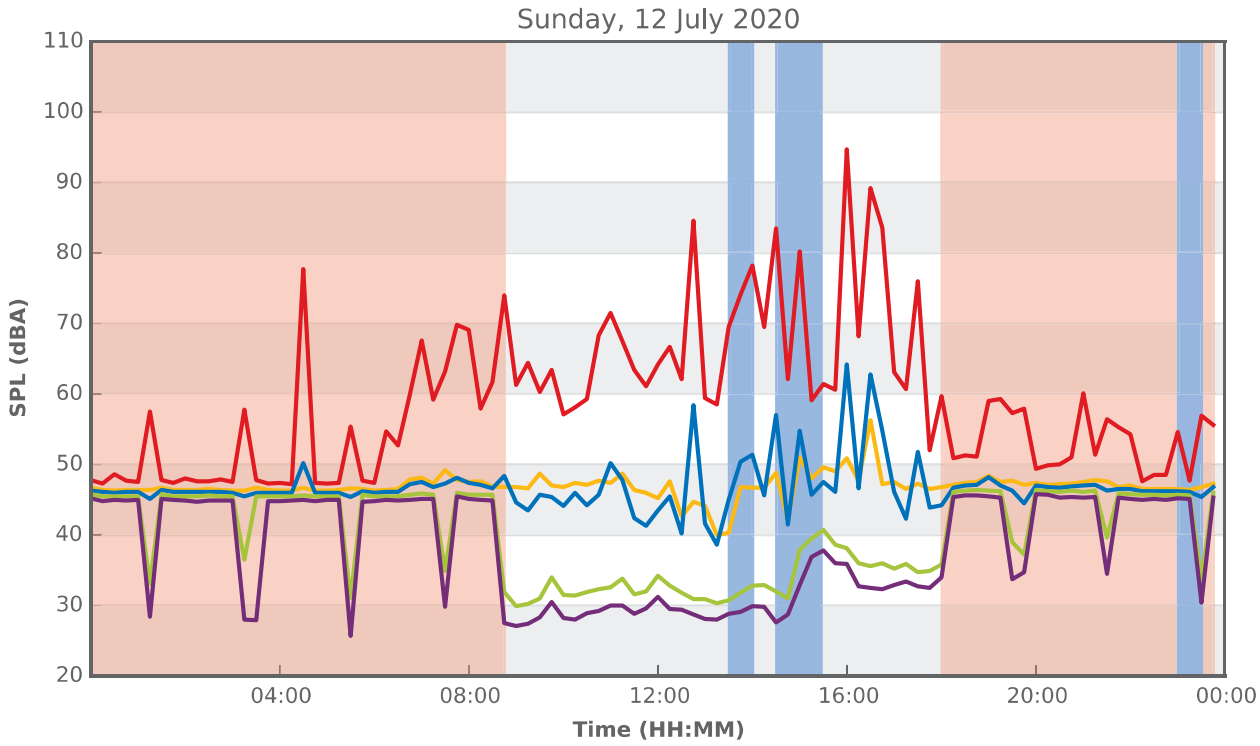

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