ACOUSTICS AND AIR

DUNMORE SAND & SOIL

NOISE COMPLIANCE ASSESSMENT REPORT - 2018

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VERSION A

SEPTEMBER 2018

PREPARED FOR

BORAL PROPERTY GROUP
38 TABBITA ROAD
DUNMORE NSW 2259

WILKINSON MURRAY

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	7 September 2018	Nic Hall	John Wassermann
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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.

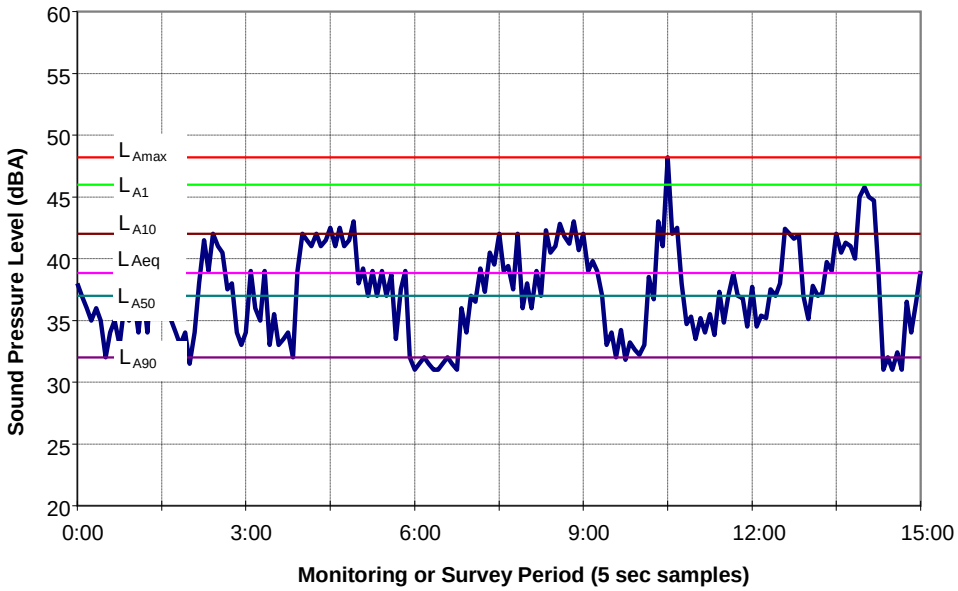
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

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 Pty Limited has been commissioned by Boral Property Group (Boral) to prepare an annual noise compliance assessment report for the operation of the Dunmore Sand and Soil (DSS) project.

The monitoring and assessment of operational noise from the project were conducted to satisfy condition 17 of the Development Consent (DA 195-8-2004).

The assessment comprised attended noise measurements and unattended noise monitoring, during the period of 13-24 August 2018, at several locations identified in the Development Consent. The measurement methodology, results and assessment of compliance are discussed in the following sections.

The measurements and assessment of compliance were conducted in accordance with:

- The conditions of consent;
- Australian Standard *AS 1055-1997: Description and Measurement of Environmental Noise*;
- The *NSW Industrial Noise Policy* (EPA, 2000); and,
- The *Noise Policy for Industry* (EPA, 2017).

2 NOISE CRITERIA

2.1 Development Consent Noise Limits

The Development Consent (DA 195-8-2004) for the DSS project specifies noise limits for the operation of the project, as presented in Table 2-1.

Table 2-1 Noise Limits

Residential Location	Shoulder ($L_{Aeq,15min}$)	Day ($L_{Aeq,15min}$)	Evening ($L_{Aeq,15min}$)	Night ($L_{Aeq,15min}$)
Renton	46	46	43	37
Dunmore Village Residences	47	49	44	41
Stocker	47	49	44	38

The residential locations identified in Table 2-1 are shown in Figure 2-1.

Figure 2-1 Noise Limit Locations

3 NOISE MONITORING METHODOLOGY

3.1 Measurement Locations

Noise measurements were conducted at the locations identified in the Development Consent, namely:

- Renton residence;
- Dunmore Village residences; and,
- Stocker residence.

For the Dunmore Village residences, measurements were conducted at 25 Dunmore Road, consistent with previous noise compliance assessments.

The Measurement locations are shown in Figure 3-1.

Figure 3-1 Noise Measurement Locations

Noise measurements at each location were conducted at the most potentially affected point on or within the property boundary, not more than 30 metres from the dwelling.

3.2 Attended Noise Measurements

Attended measurements were conducted using a Bruel and Kjaer Model 2260 sound level meter. This sound level meter conforms to Australian Standard 1259 *Acoustics – Sound Level Meters* as a Type 1 precision sound level meter which has an accuracy suitable for field and laboratory use. The A-weighting filter of the meter was applied to all broadband noise descriptors and the time response of the meter was set to "Fast".

The calibration of the meter was checked before and after the measurements with a Bruel and Kjaer Model 4231 calibrator and no significant drift was noted.

The Model 2260 sound level meter and Model 4231 calibrator have been NATA laboratory calibrated within the previous two years in accordance with Wilkinson Murray's Quality Assurance procedures.

During attended measurements, observations were made regarding:

- Dominant sources of ambient noise levels;
- The contribution from DSS to overall noise levels;
- Audible activities on the DSS site; and,
- Weather conditions

On several occasions, activities on the DSS site were either barely audible or completely inaudible at the measurement locations. In these cases, it is not possible to accurately determine the $L_{Aeq,15min}$ noise levels from DSS. However, where activities on DSS are barely audible over the measurement period, it can conservatively be assumed that the $L_{Aeq,15min}$ noise level from DSS is 10 dBA below the overall ambient $L_{Aeq,15min}$ noise level. Where DSS is totally inaudible over the measurement period, the $L_{Aeq,15min}$ noise level from DSS is taken to be 10 dBA below the ambient $L_{A90,15min}$ noise level.

3.3 Unattended Noise Monitoring

Over the period of the noise compliance assessment measurements, unattended noise monitoring was also conducted at each location. The results of unattended noise monitoring are not suitable for demonstrating instances of compliance, or non-compliance. However, unattended noise monitoring data can be used to investigate trends in the ambient noise levels over time.

Unattended noise monitoring was conducted using "ARL type 315" environmental noise loggers set to A-weighted, fast response, continuously monitoring over 15-minute sampling periods. This equipment is capable of remotely monitoring and storing noise level descriptors for later detailed analysis. The equipment calibration was checked before and after the survey and no significant drift was noted.

4 RESULTS

4.1 Attended Measurement Results

The results of the attended noise measurements are shown in Table 4-1. For each measurement, the table shows:

- Time and date;
- Overall measured L_{Amax}, L_{A90} and $L_{Aeq,15min}$ noise levels;
- Cloud cover and wind speed and direction;
- A description of the dominant ambient noise sources and any audible activities on DSS;
- The audibility of DSS activities;
- An estimation of the $L_{Aeq,15min}$ noise level at the measurement location due to DSS alone; and,
- A comparison against the applicable noise limit.

Table 4-1 Attended Noise Measurement Results

Location	Date	Start Time	Measured Noise Levels			Comments	DSS Noise Level ($L_{Aeq,15min}$)	Noise Limit	Complies?
			L_{Amax}	$L_{A90,15min}$	$L_{Aeq,15min}$				
Renton	14/08/18	9:15am	65	41	45	Clear skies, calm winds Highway traffic dominates noise Trucks operating, barely audible	35	46	Yes
Dunmore Village	14/08/18	9:40am	62	54	57	Clear skies, calm winds Highway traffic dominates noise Trucks and dozer operating, barely audible	47	49	Yes
Stocker	14/08/18	10:05am	61	44	50	Clear skies, calm winds Highway traffic dominates noise DSS inaudible	34	49	Yes
Renton	14/08/18	10:25am	67	42	46	Clear skies, 0-1 m/s southerly winds Highway traffic dominates noise Trucks and dozer operating, barely audible	36	46	Yes
Dunmore Village	14/08/18	10:55am	71	48	53	Clear skies, calm winds Highway traffic dominates noise Trucks and dozer operating, barely audible	43	49	Yes
Stocker	14/08/18	11:20am	61	45	51	Clear skies, calm winds Highway traffic dominates noise DSS inaudible	35	49	Yes
Renton	15/08/18	5:00am	50	37	40	Clear skies, 2-3 m/s north westerly winds Highway traffic dominates noise Little DSS activity, inaudible	27	46	Yes

Location	Date	Start Time	Measured Noise Levels			Comments	DSS Noise Level ($L_{Aeq,15min}$)	Noise Limit	Complies?
			L_{Amax}	$L_{A90,15min}$	$L_{Aeq,15min}$				
Dunmore Village	23/08/18	5:20am	76	53	57	Clear skies, 1-2 m/s north westerly winds Highway traffic dominates noise Little DSS activity, inaudible	43	47	Yes
Stocker	23/08/18	5:43am	59	41	46	Clear skies, 1-2 m/s westerly winds Highway traffic dominates noise Quarries audible, DSS inaudible	31	47	Yes
Renton	23/08/18	6:05am	66	44	47	Clear skies, 1-3 m/s westerly winds Highway traffic dominates noise Quarries audible, DSS inaudible	34	46	Yes
Dunmore Village	23/08/18	6:27am	72	48	61	Clear skies, 1-3 m/s westerly winds Highway traffic dominates noise Little DSS activity, inaudible	38	47	Yes
Stocker	23/08/18	6:51am	62	48	51	Clear skies, 2-4 m/s westerly winds Highway traffic dominates noise Quarries audible, DSS inaudible	38	47	Yes
Renton	23/08/18	10:13am	63	48	51	Scattered cloud, 1-2 m/s southerly winds Highway traffic dominates noise Little DSS activity, inaudible	38	46	Yes
Dunmore Village	23/08/18	10:51am	65	48	52	Scattered cloud, 1-2 m/s southerly winds Highway traffic dominates noise Little DSS activity, inaudible	38	49	Yes
Stocker	23/08/18	11:34am	62	48	52	Scattered cloud, 1-2 m/s southerly winds Highway traffic dominates noise DSS inaudible	38	49	Yes

Location	Date	Start Time	Measured Noise Levels			Comments	DSS Noise Level ($L_{Aeq,15min}$)	Noise Limit	Complies?
			L_{Amax}	$L_{A90,15min}$	$L_{Aeq,15min}$				
Renton	23/08/18	12:05pm	59	48	51	Scattered cloud, 2-3 m/s south easterly winds Highway traffic dominates noise Little DSS activity, inaudible	38	46	Yes
Dunmore Village	23/08/18	12:30pm	62	46	51	Scattered cloud, 1-2 m/s south easterly winds Highway traffic dominates noise Little DSS activity, inaudible	36	49	Yes
Stocker	23/08/18	12:57pm	65	48	53	Scattered cloud, 1-2 m/s south easterly winds Highway traffic dominates noise DSS inaudible	38	49	Yes

4.2 Unattended Monitoring Results

The results of the unattended noise monitoring are presented in Table 4-2. The table presents the $L_{Aeq,period}$ noise level and the Rating Background Level (RBL), calculated in accordance with the *Noise Policy for Industry* (NPfI) (EPA, 2017), for the day, evening and night time periods. Periods of rain or high wind, as identified using data from the on-site weather station, were omitted from the analysis in accordance with the NPfI.

Table 4-2 Unattended Noise Monitoring Results

Monitoring location	Time period	Noise Levels (dBA)	
		RBL	L_{Aeq}
M1	Day (7:00am – 6:00pm)	42	55
	Evening (6:00pm – 10:00pm)	38	51
	Night (10:00pm – 7:00am)	34	49
M2	Day (7:00am – 6:00pm)	48	60
	Evening (6:00pm – 10:00pm)	49	58
	Night (10:00pm – 7:00am)	32	57
M3	Day (7:00am – 6:00pm)	42	53
	Evening (6:00pm – 10:00pm)	43	51
	Night (10:00pm – 7:00am)	33	49

5 ASSESSMENT OF COMPLIANCE

The results of attended noise measurements, as presented in Table 4-1, indicate compliance with the applicable noise limits at all times. Furthermore, activities on the DSS site were often found to be inaudible at the measurement locations.

At all measurement locations, traffic noise from the nearby Princes Highway was the dominant noise source.

6 CONCLUSION

Wilkinson Murray Pty Limited has been commissioned by Boral Property Group (Boral) to prepare an annual noise compliance assessment report for the operation of the Dunmore Sand and Soil (DSS) project.

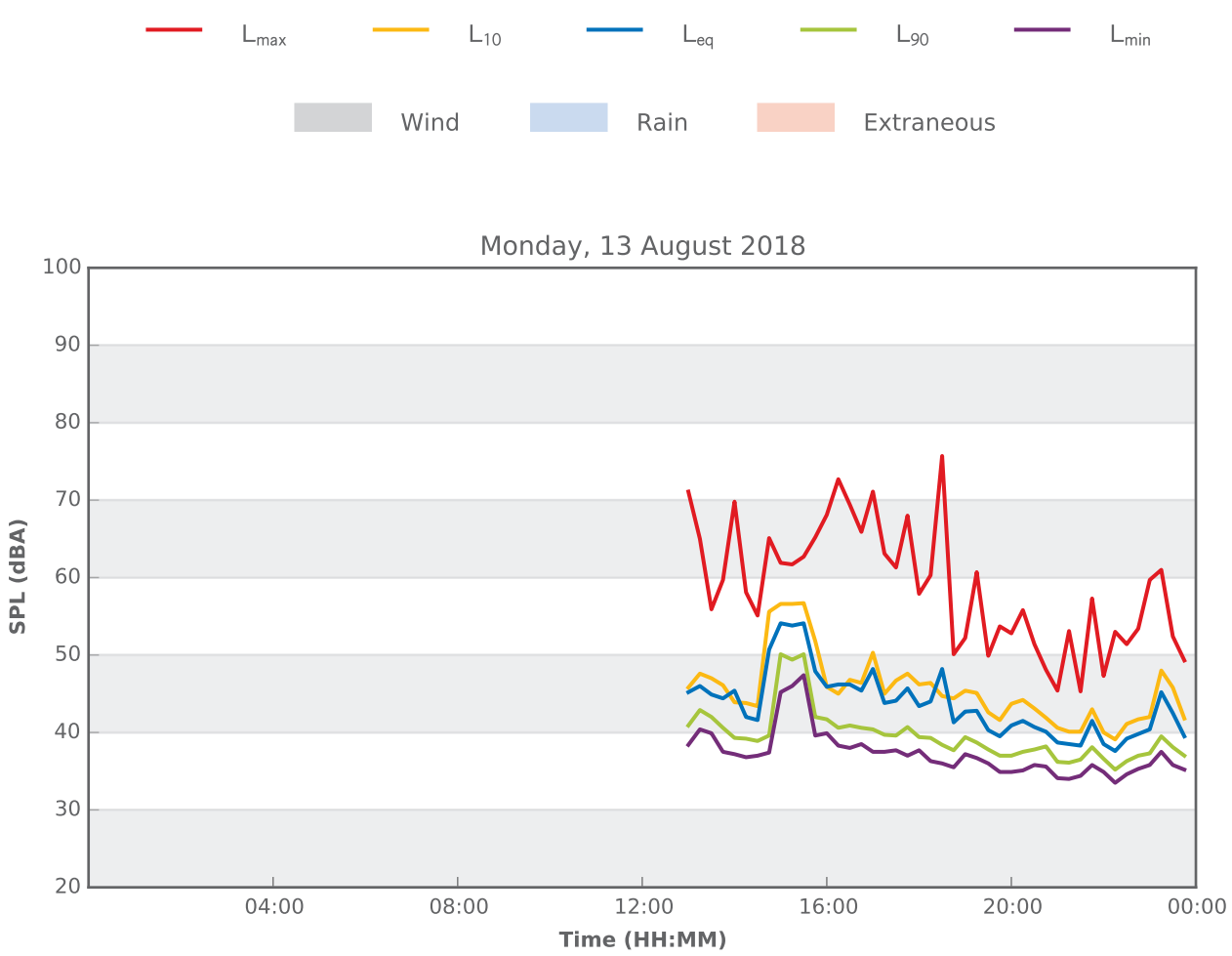
The monitoring and assessment of operational noise from the project were conducted to satisfy condition 17 of the Development Consent (DA 195-8-2004).

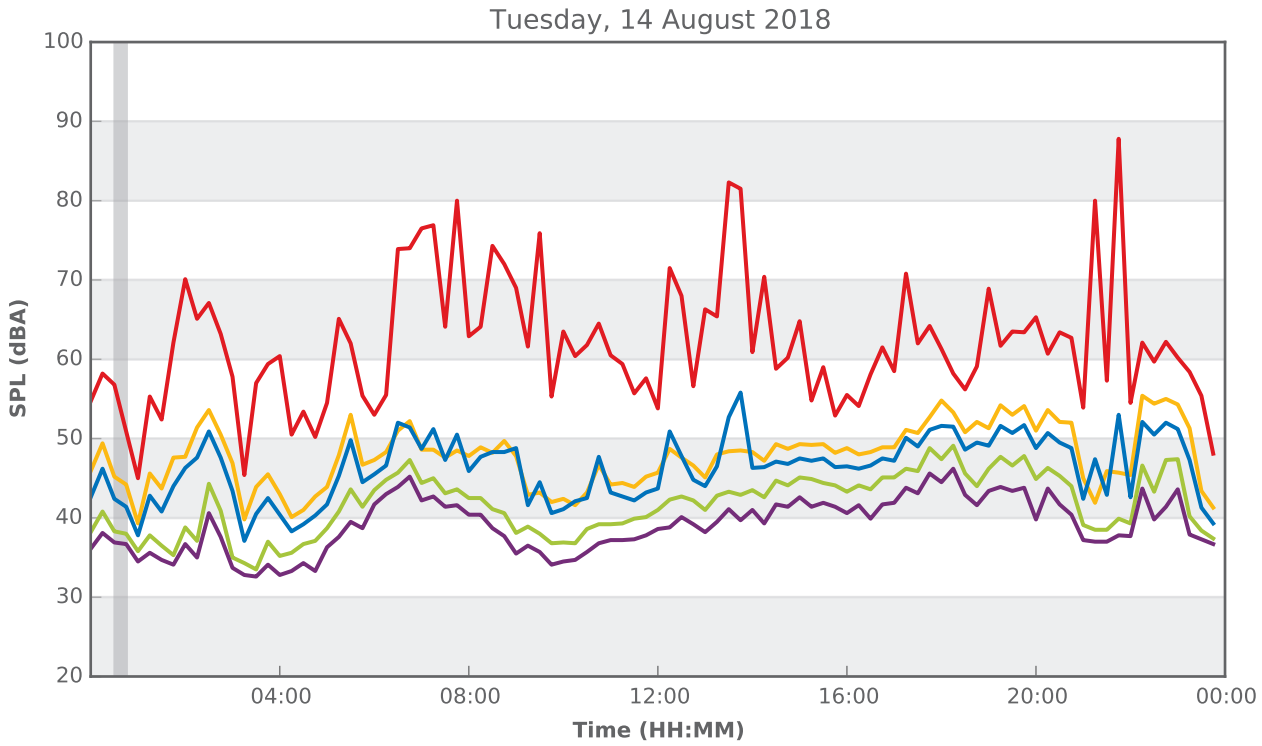
Attended noise measurements at all locations identified in the Development Consent indicated compliance with the noise limits at all times.

APPENDIX A

NOISE MEASUREMENT RESULTS

Renton Residence





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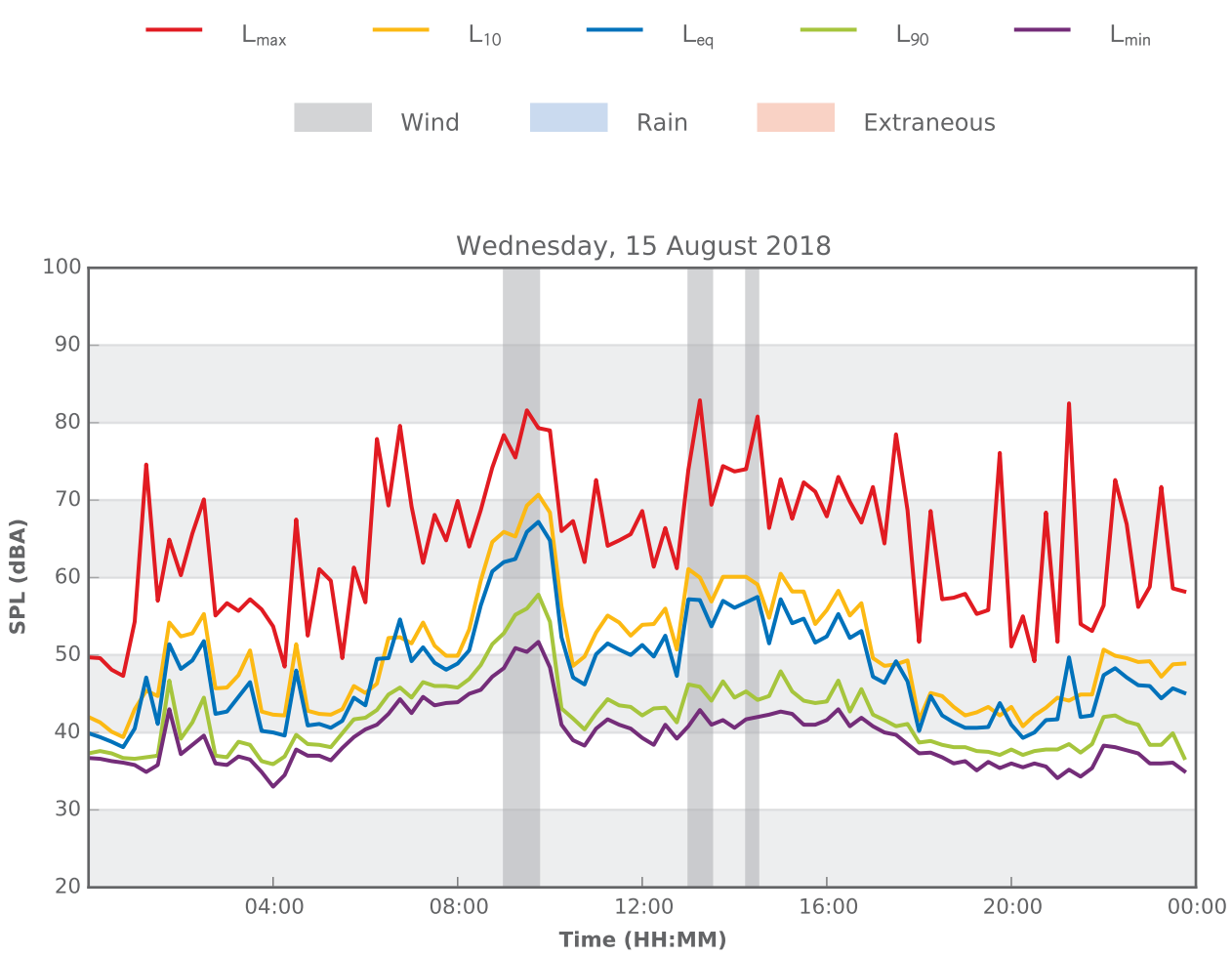

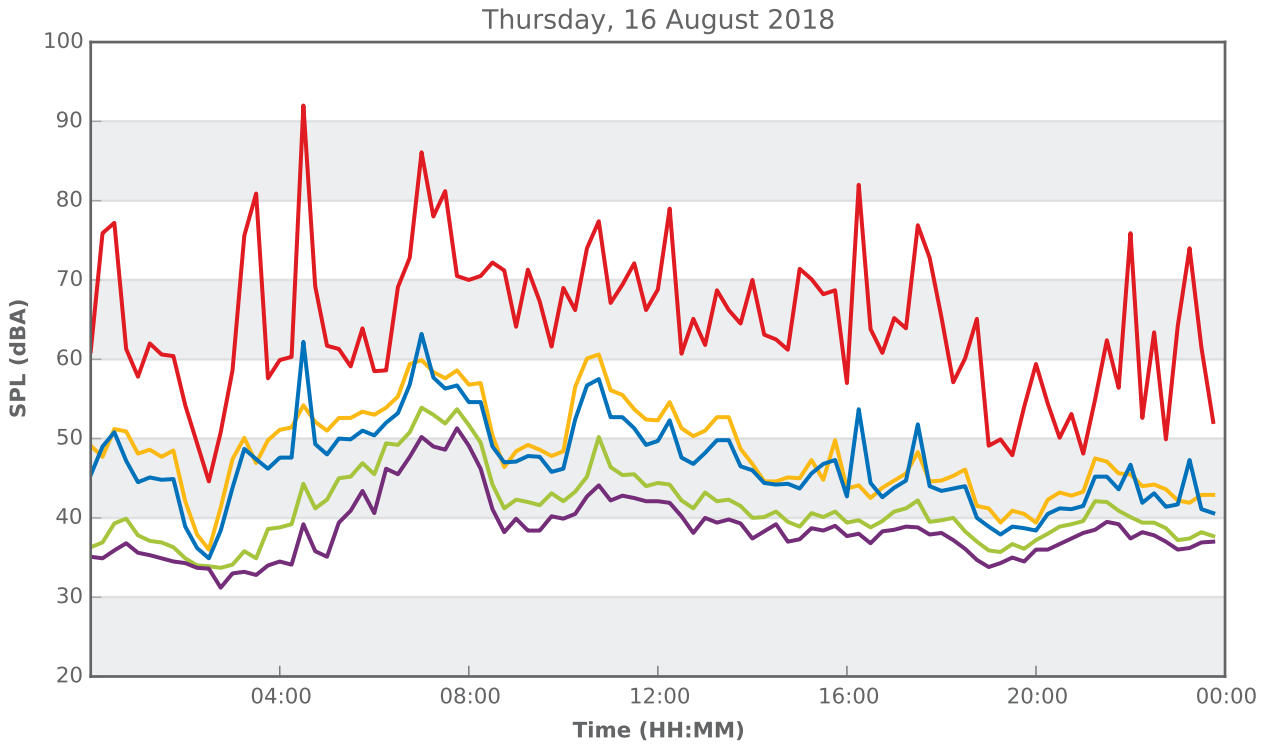

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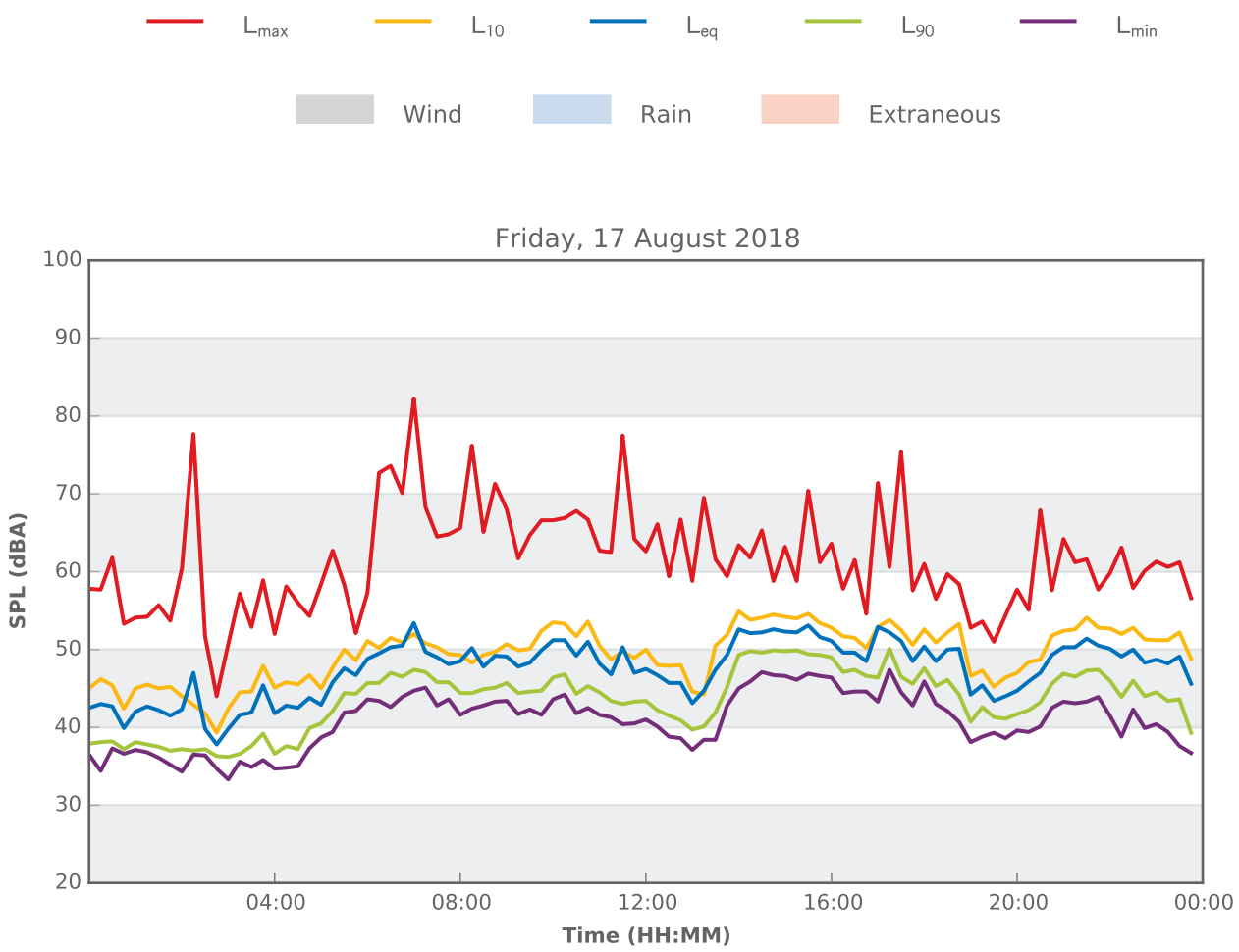

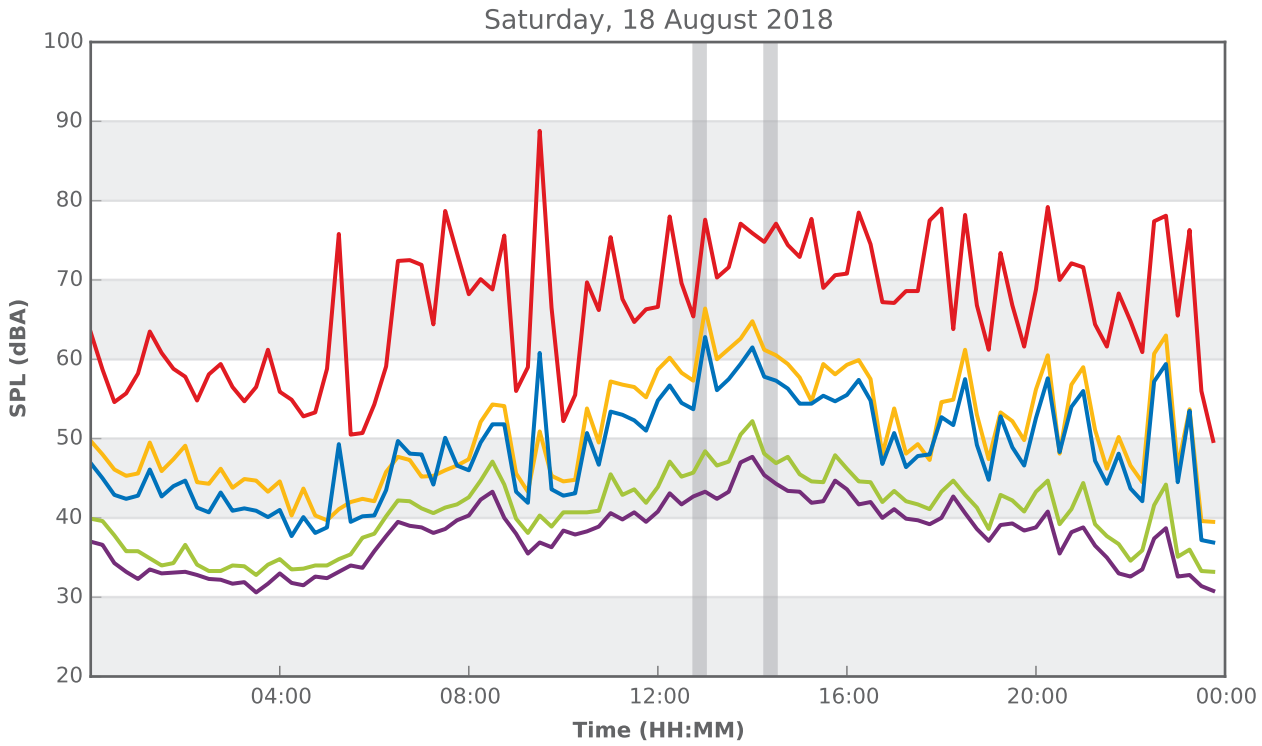

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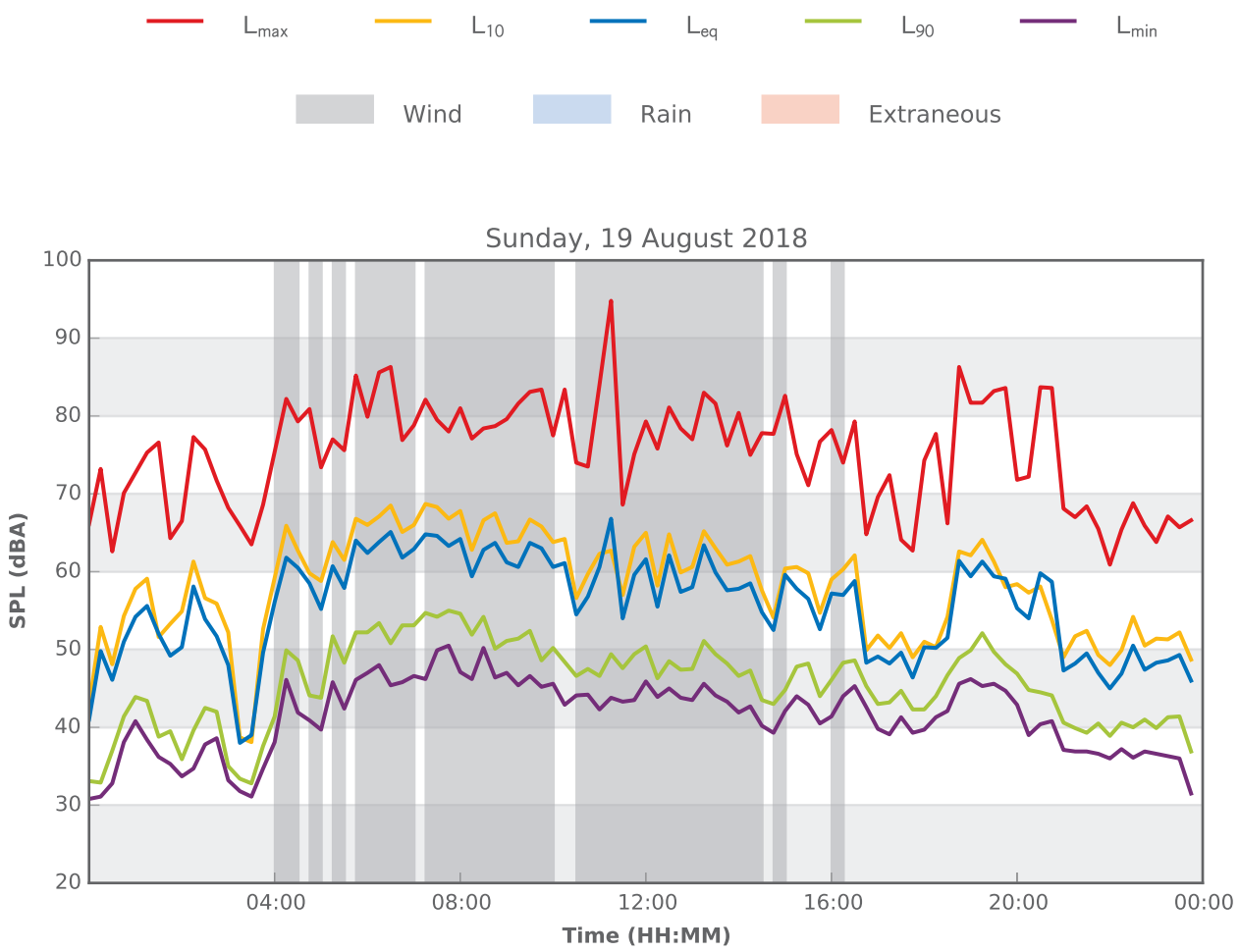

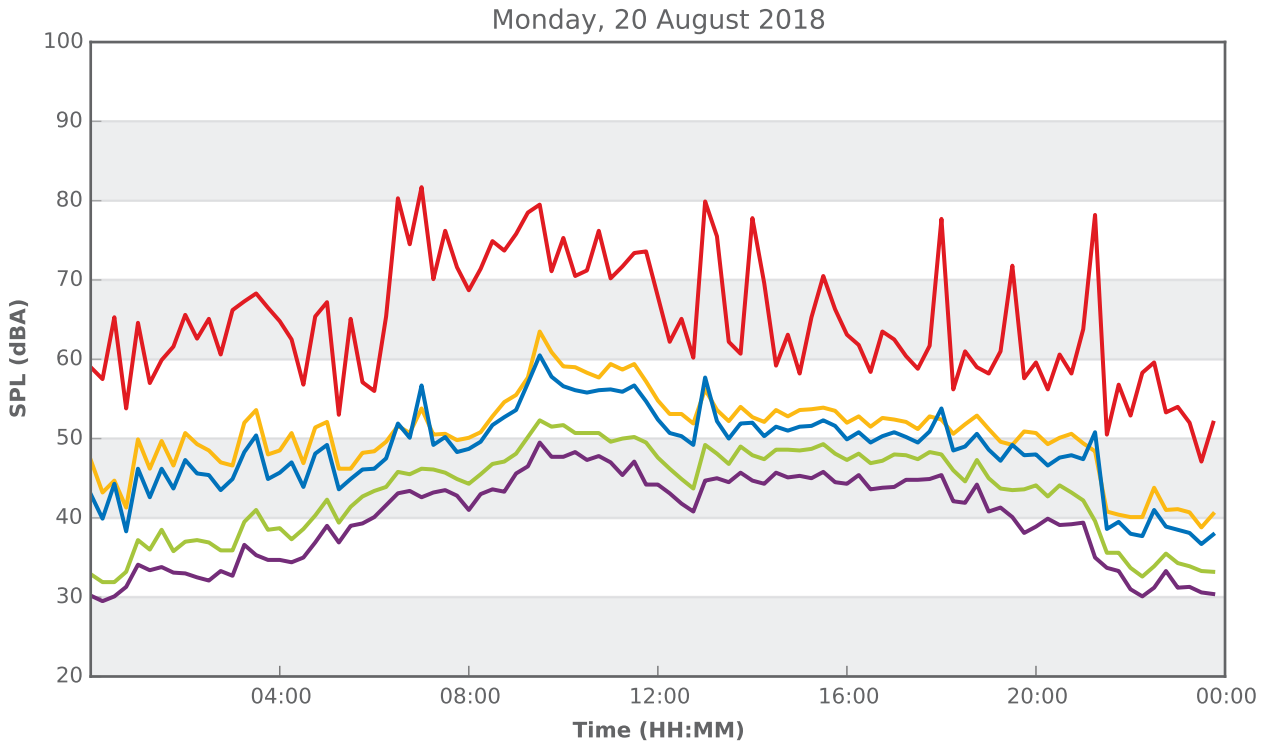

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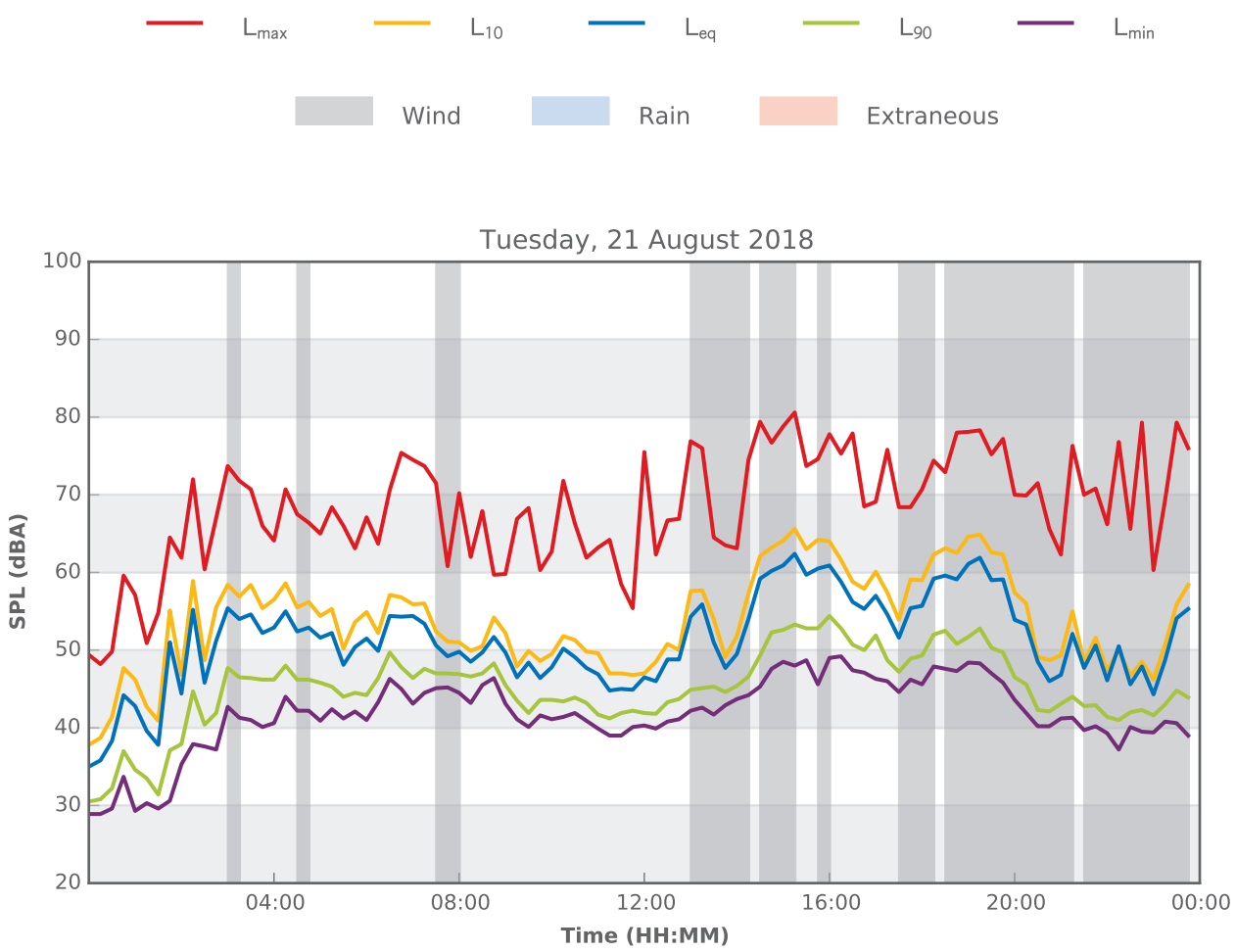

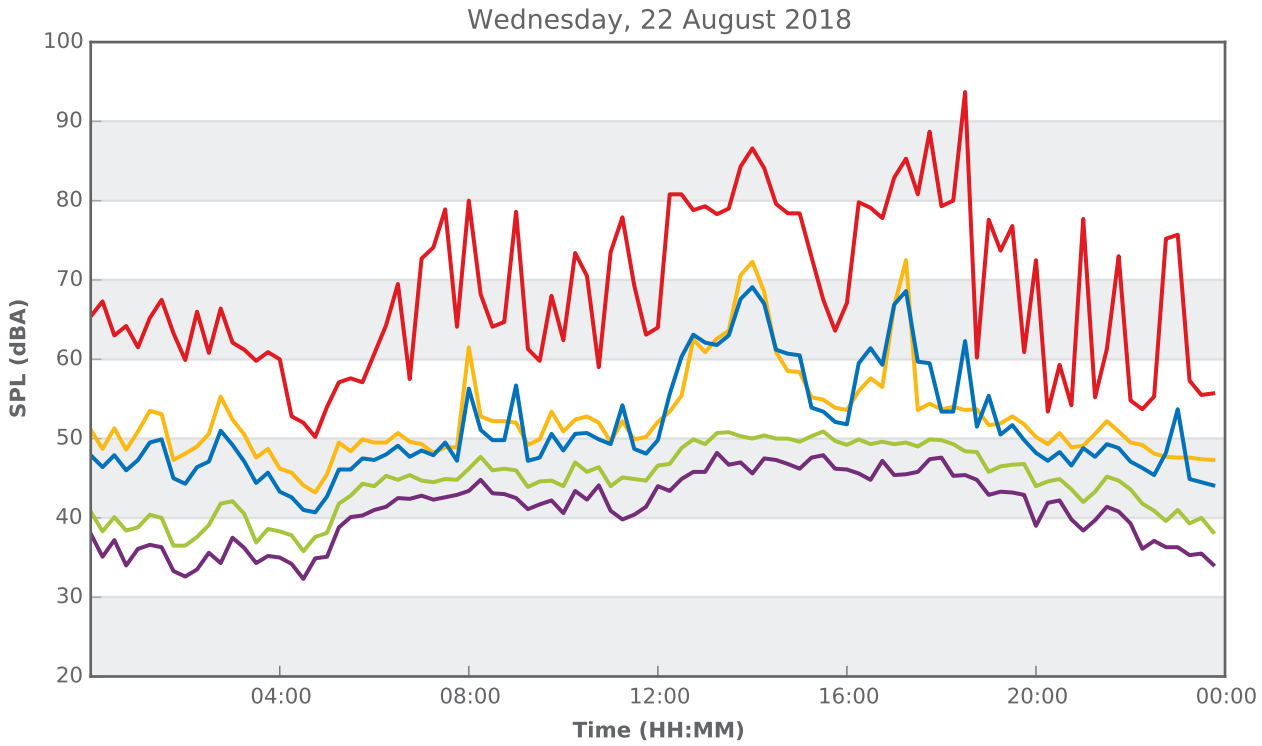

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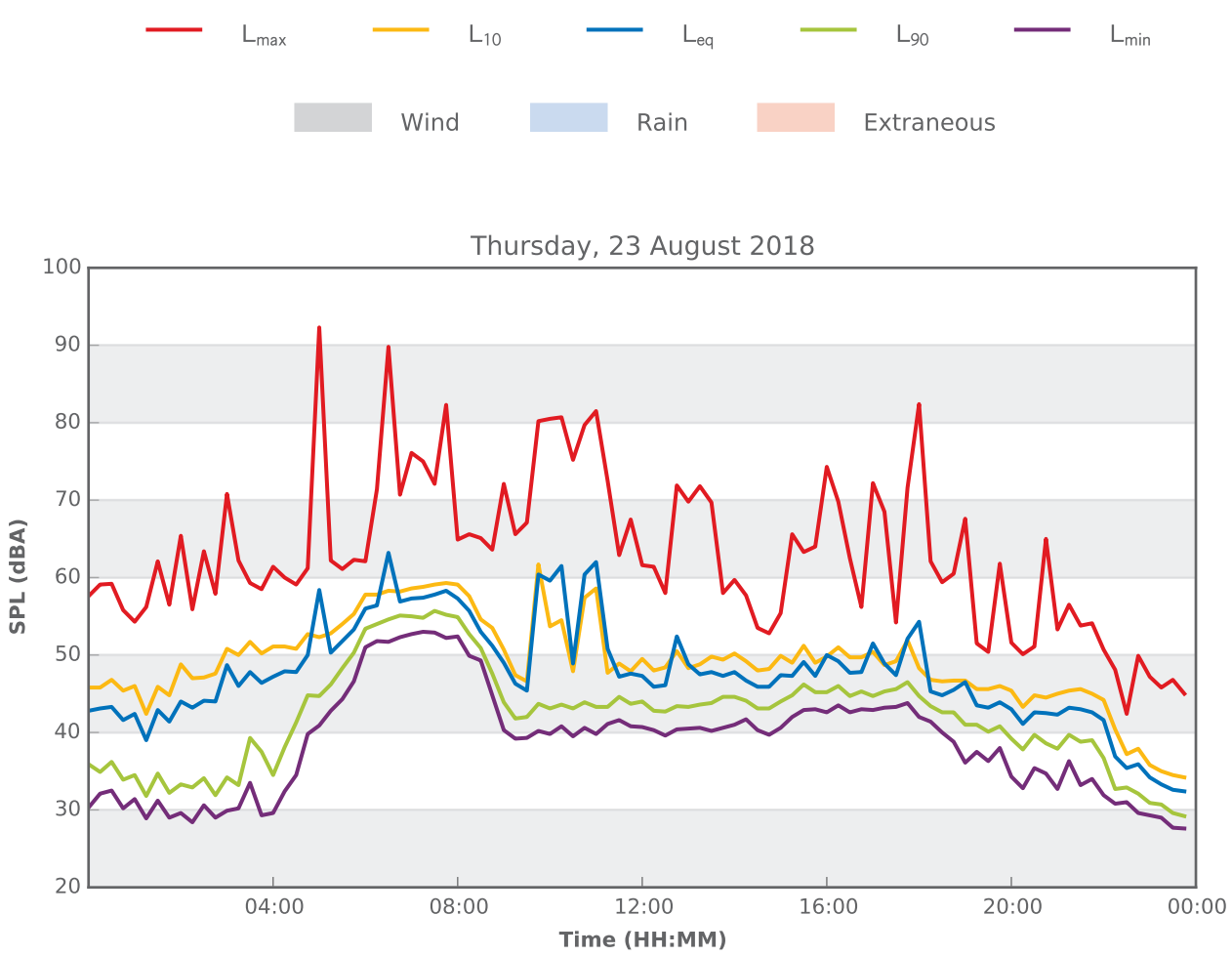

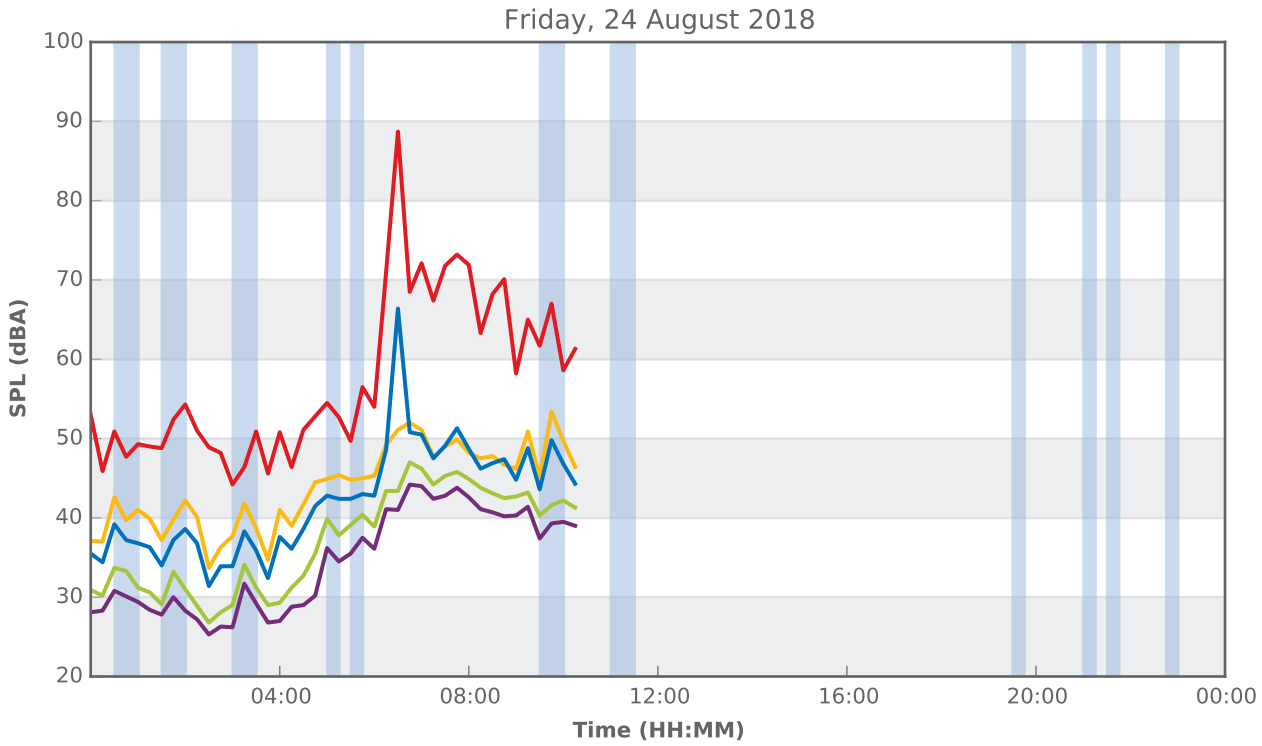

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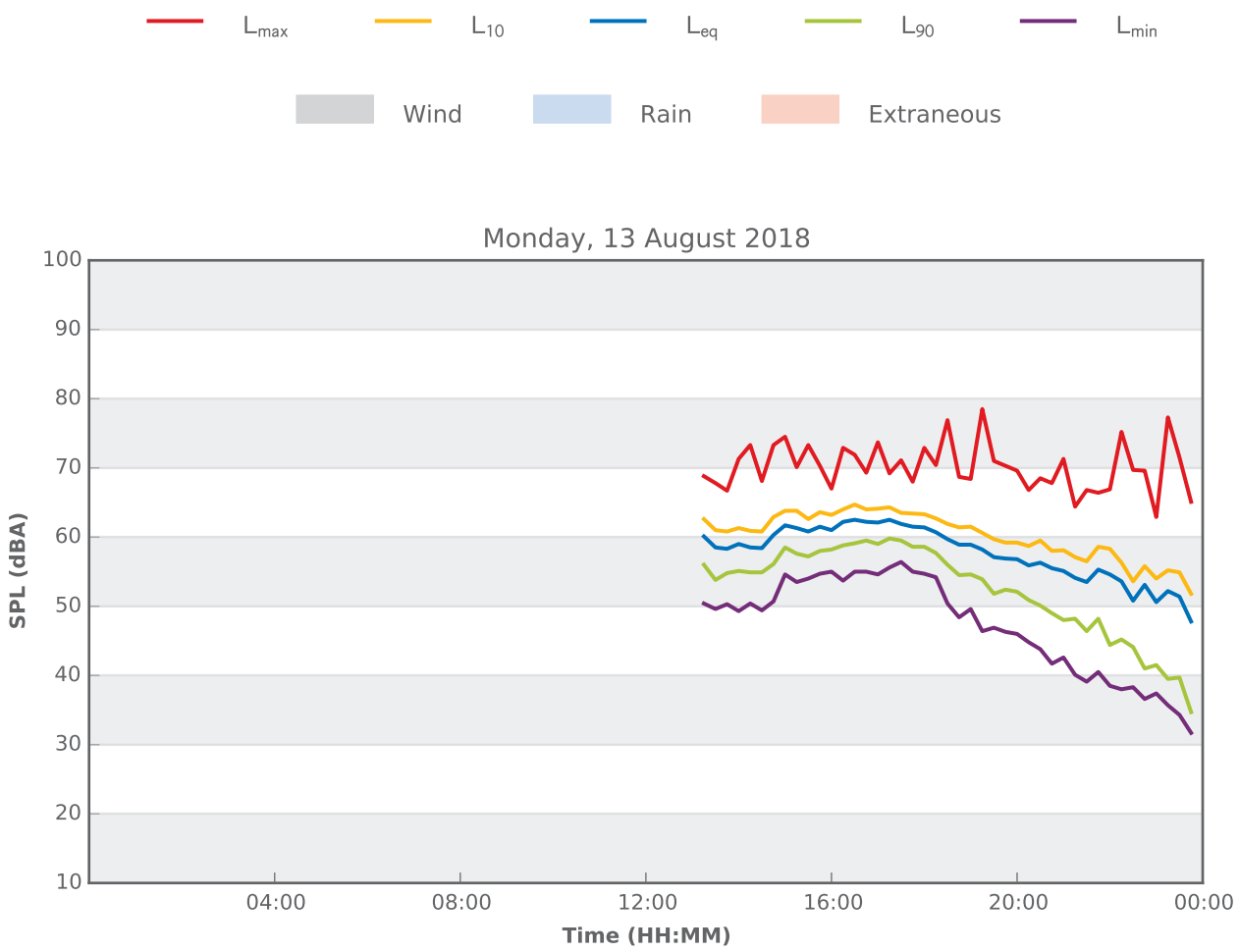

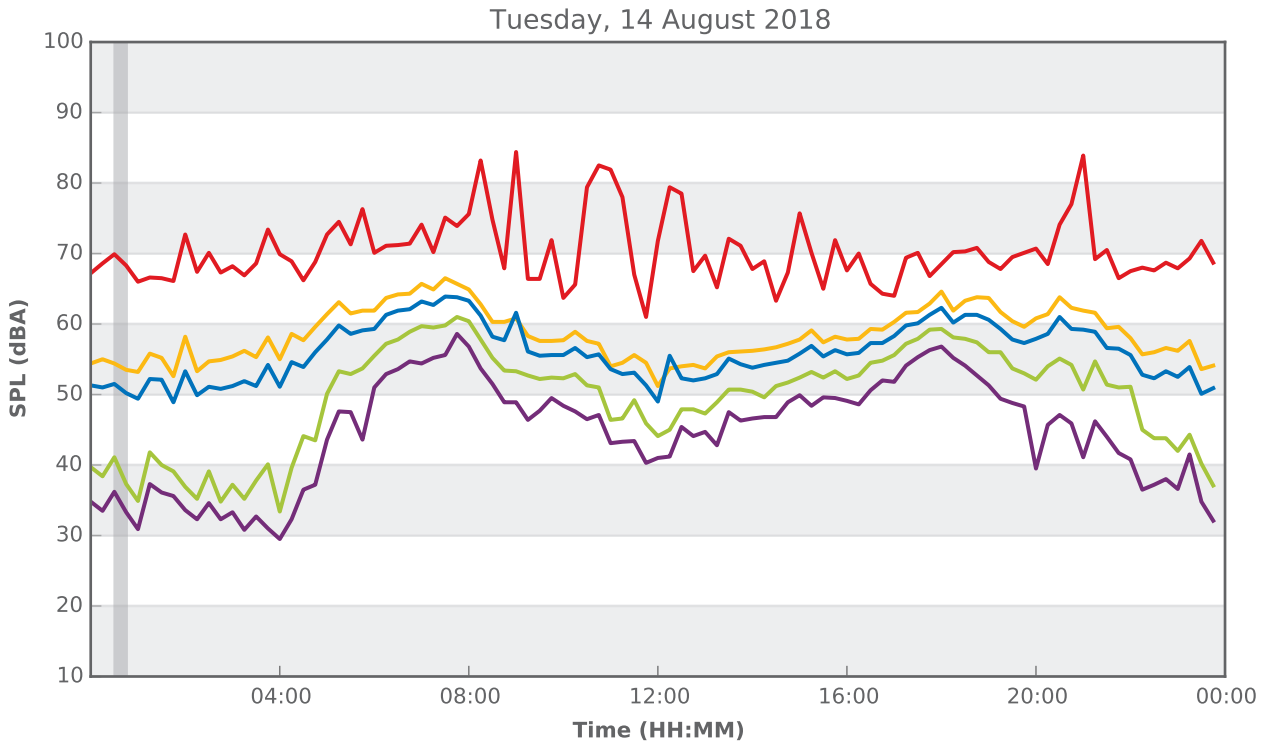

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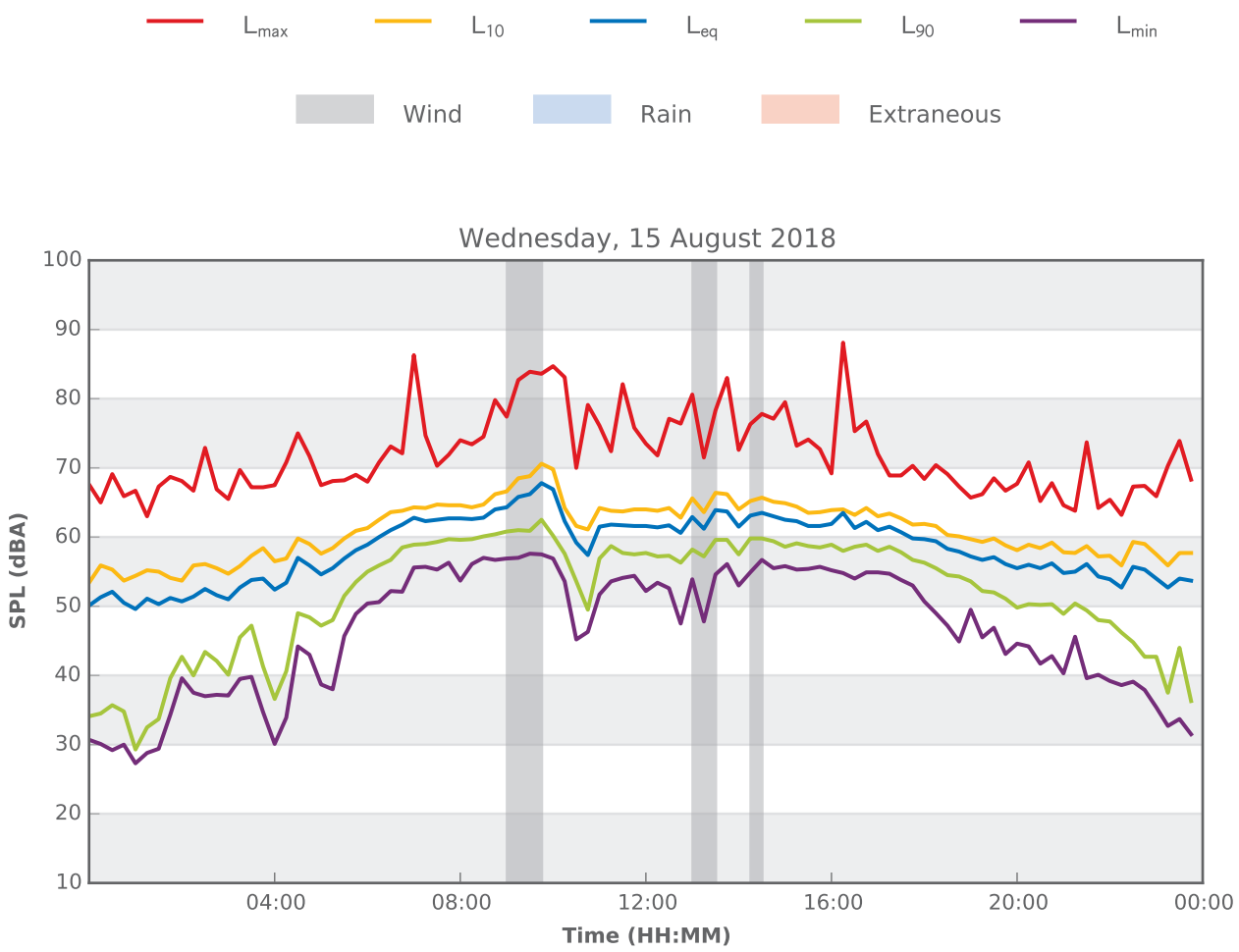

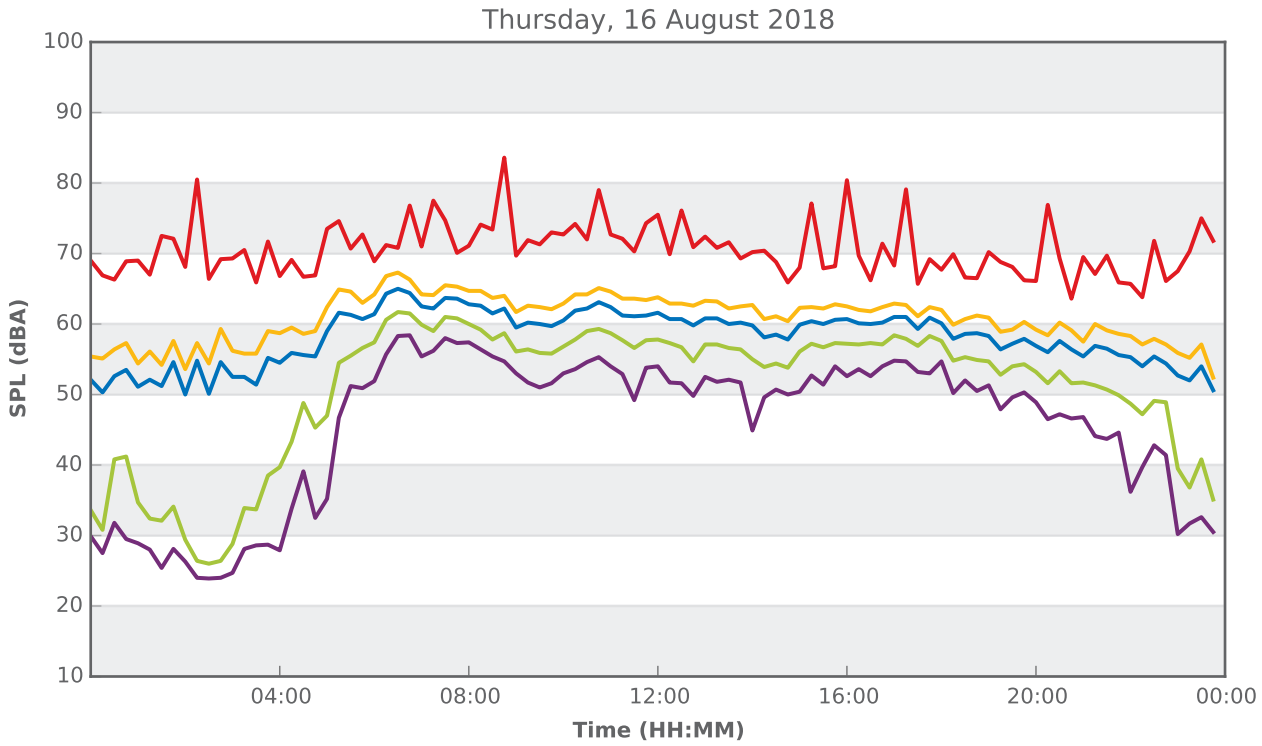

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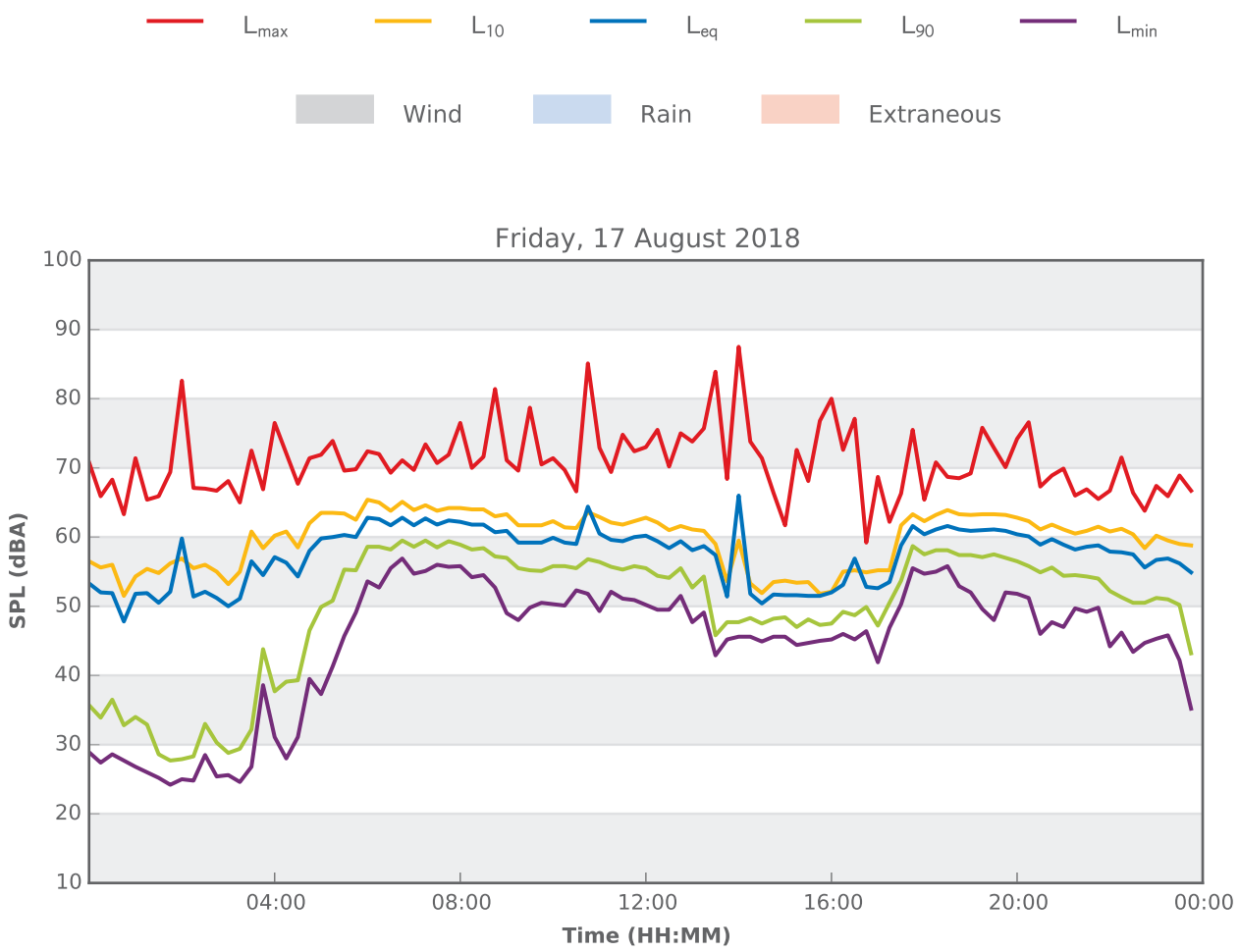

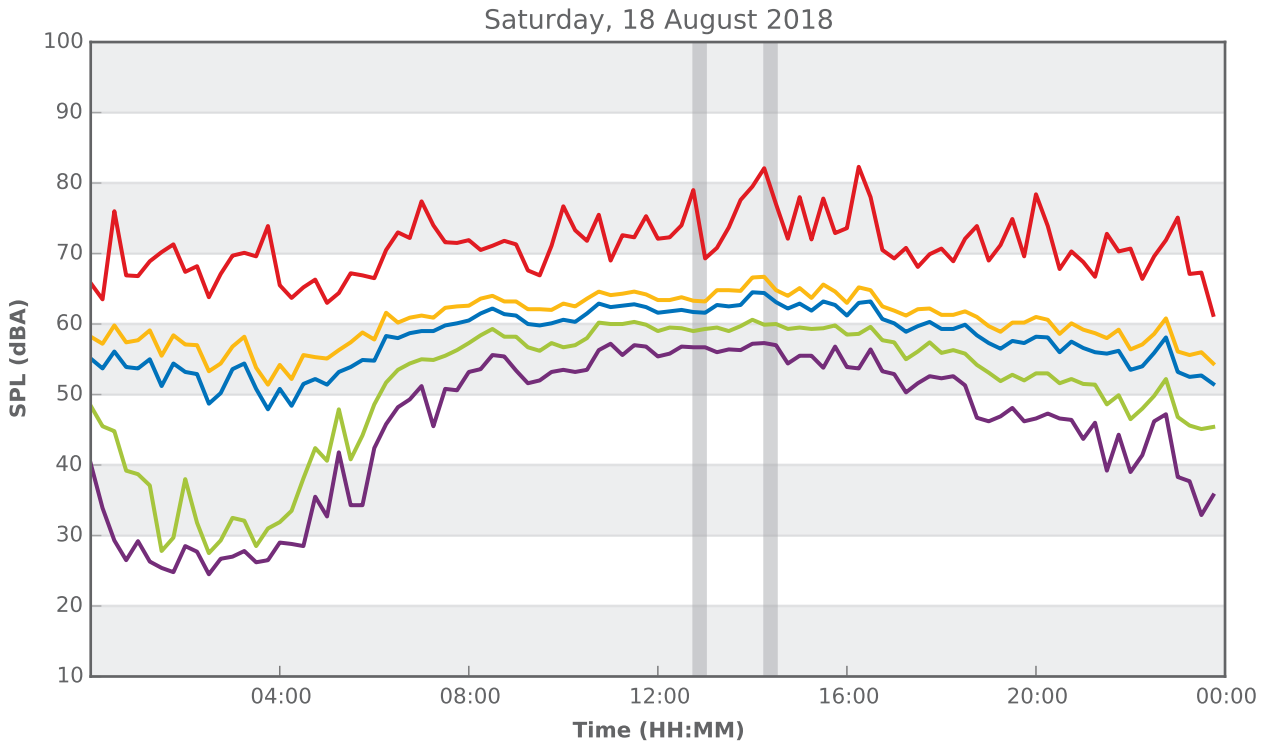

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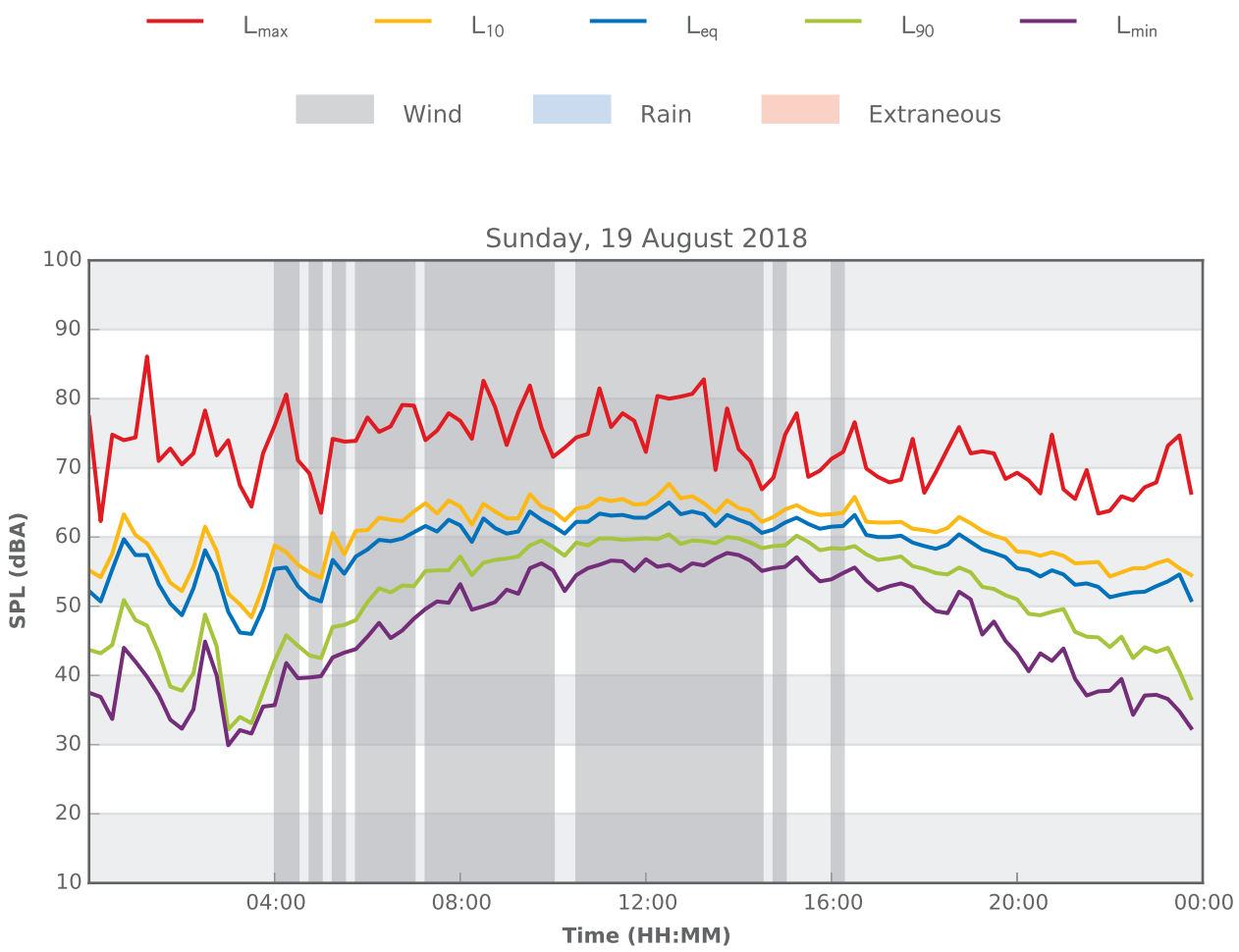

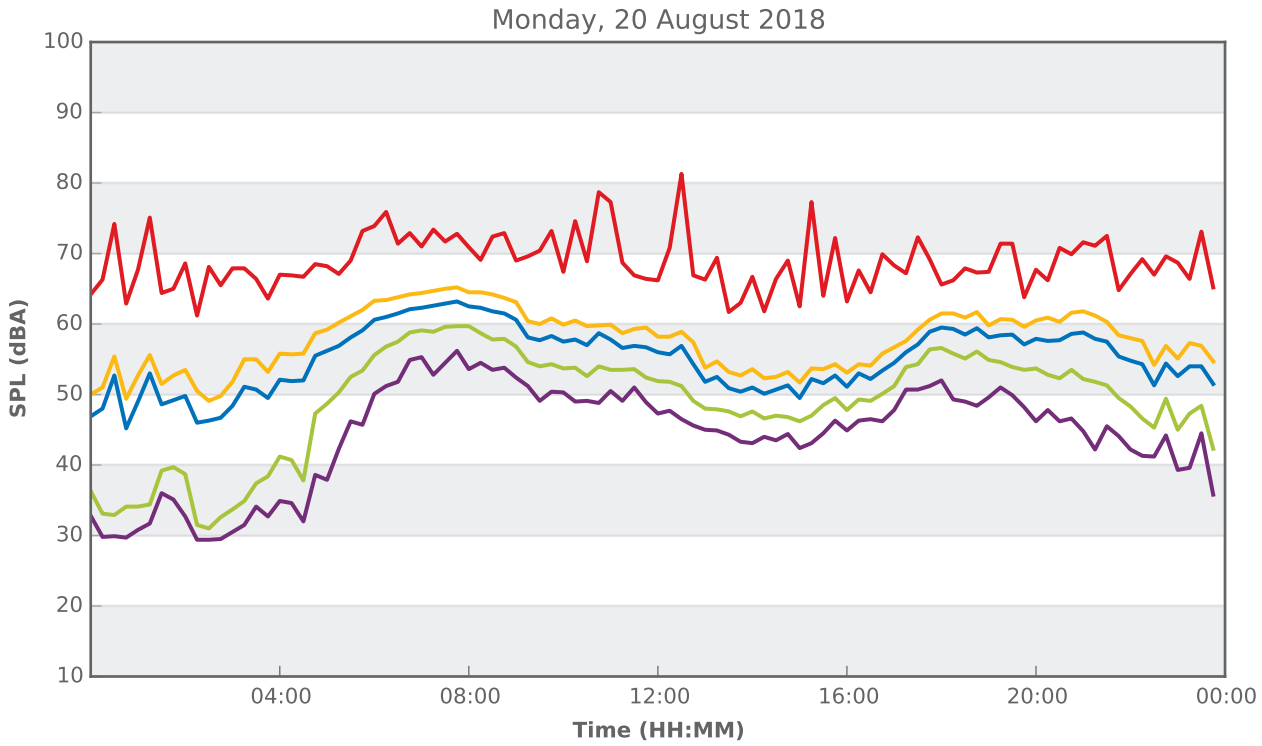

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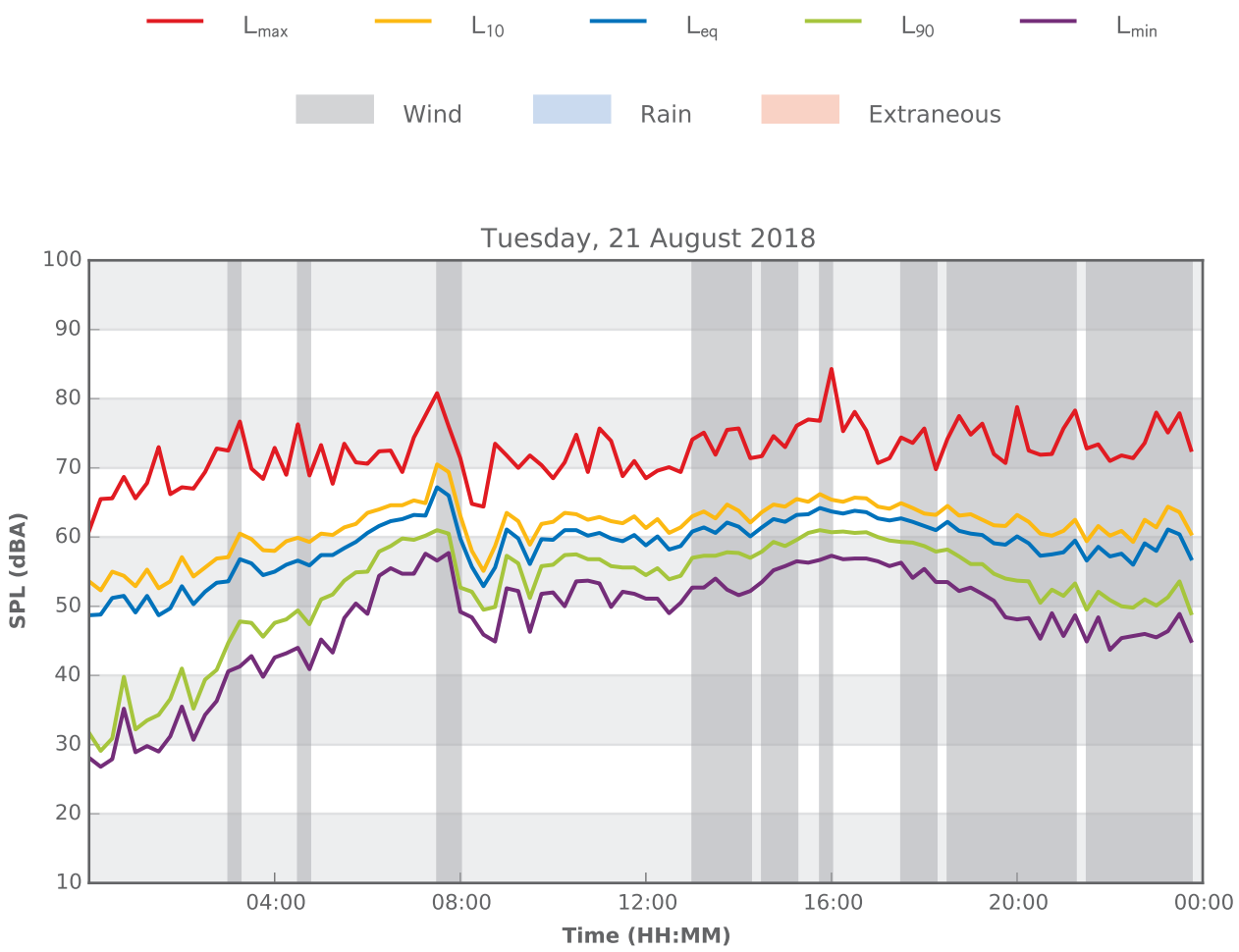

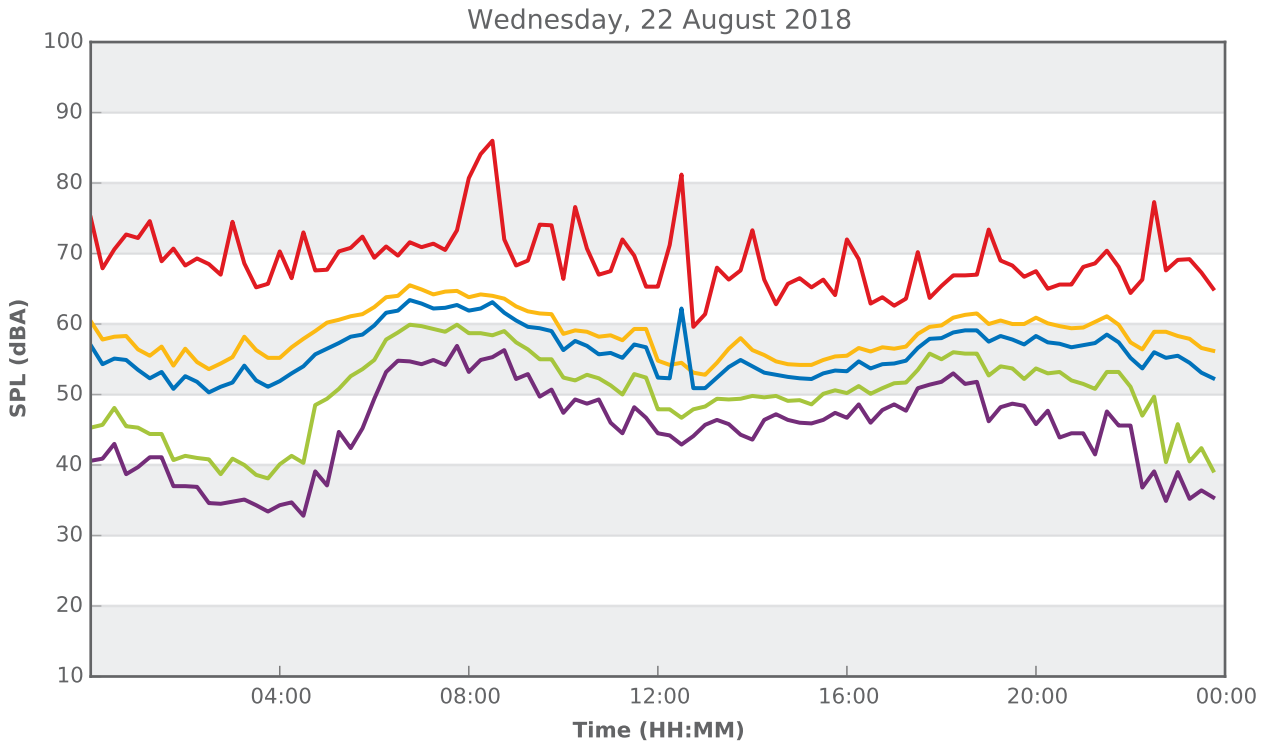

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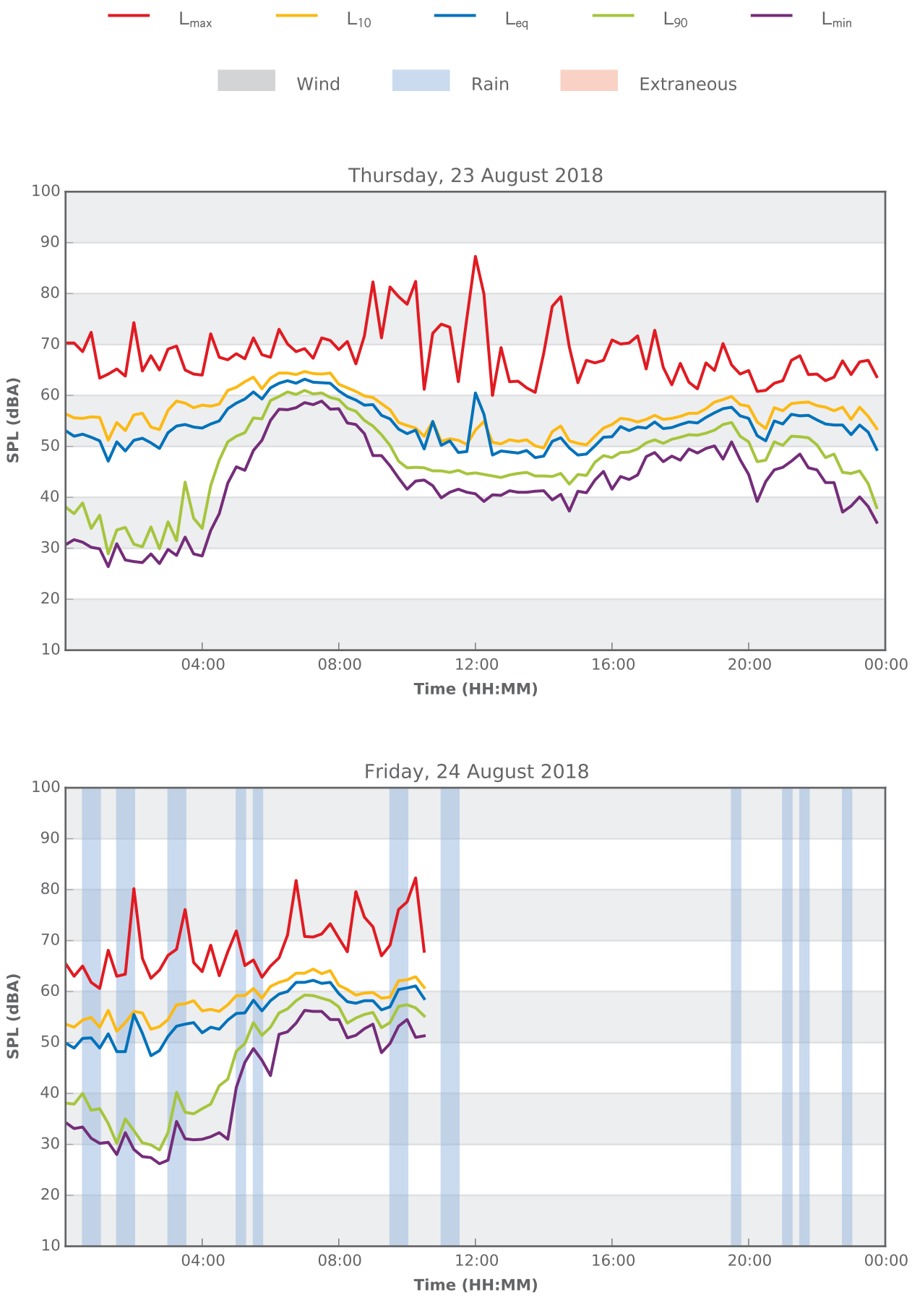
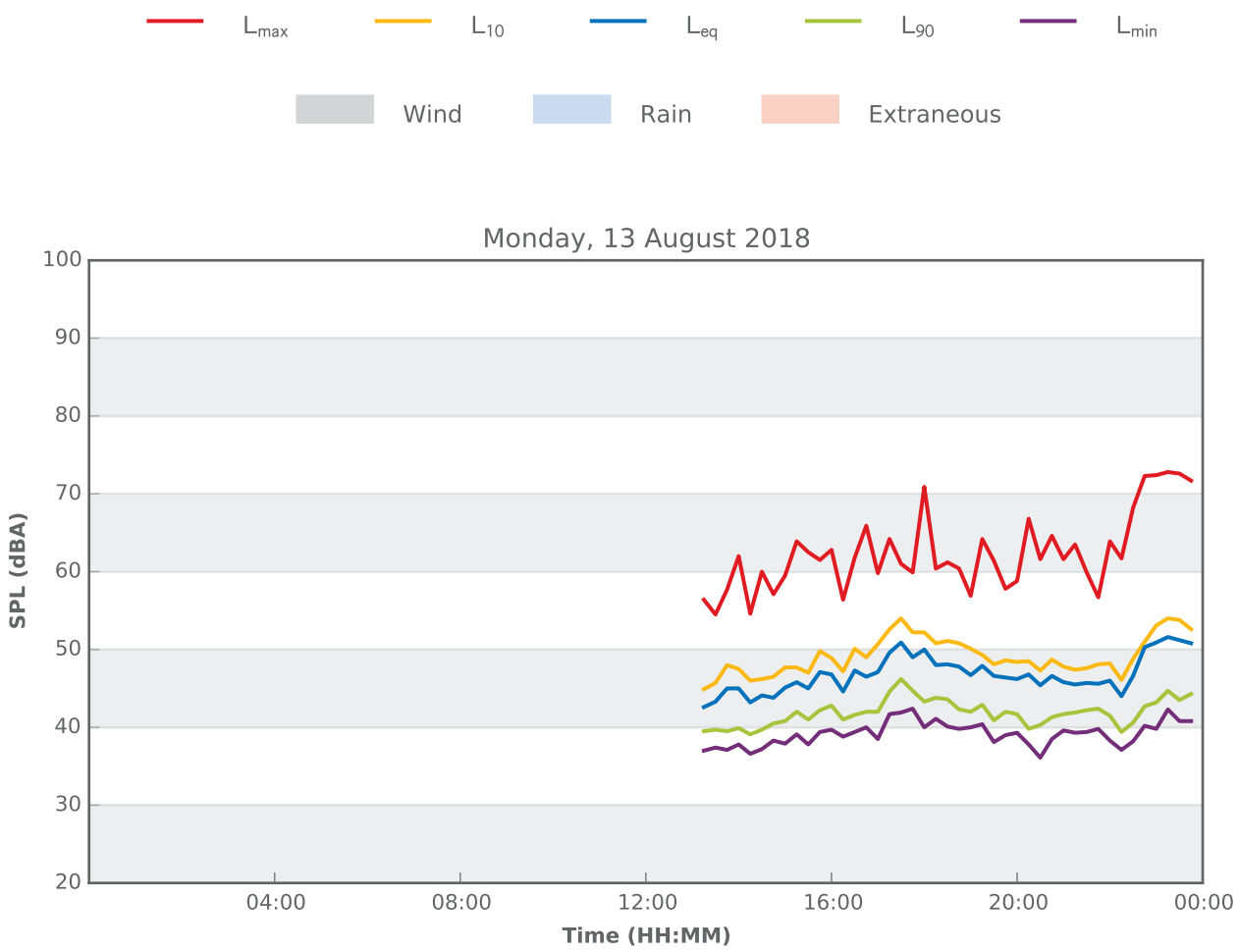
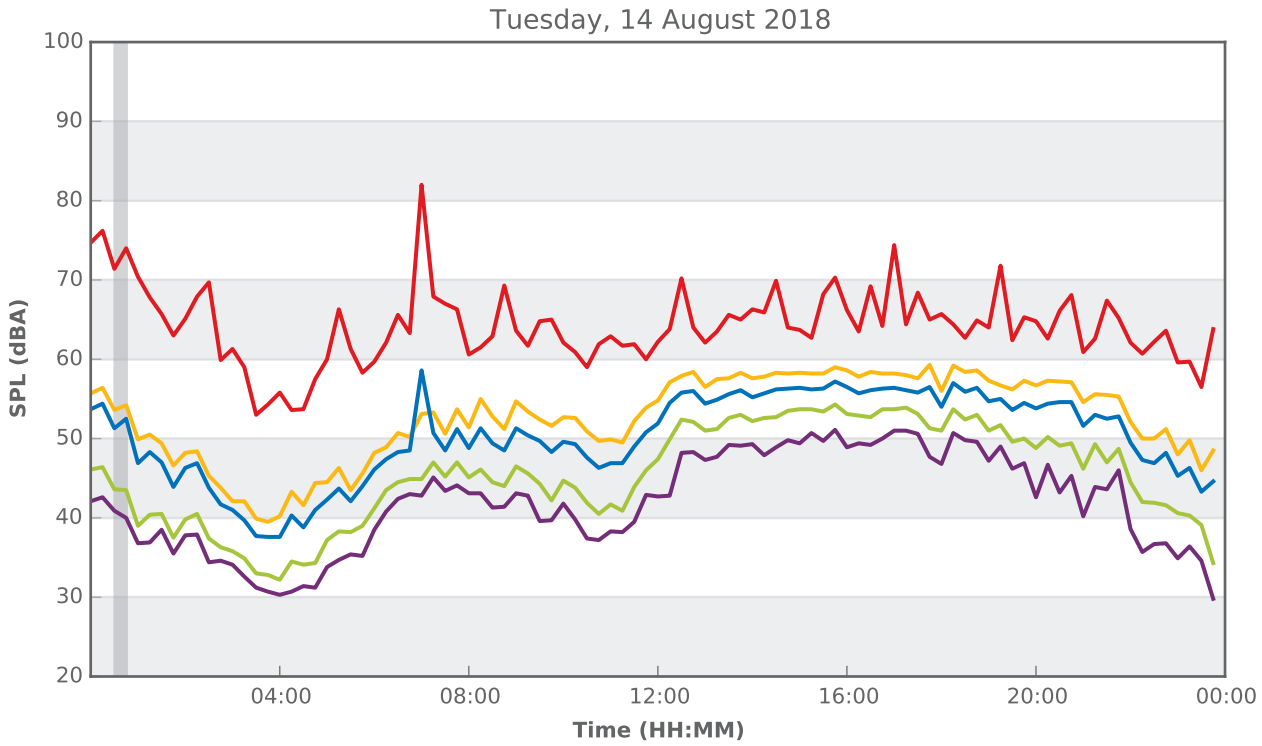


Stocker Residence





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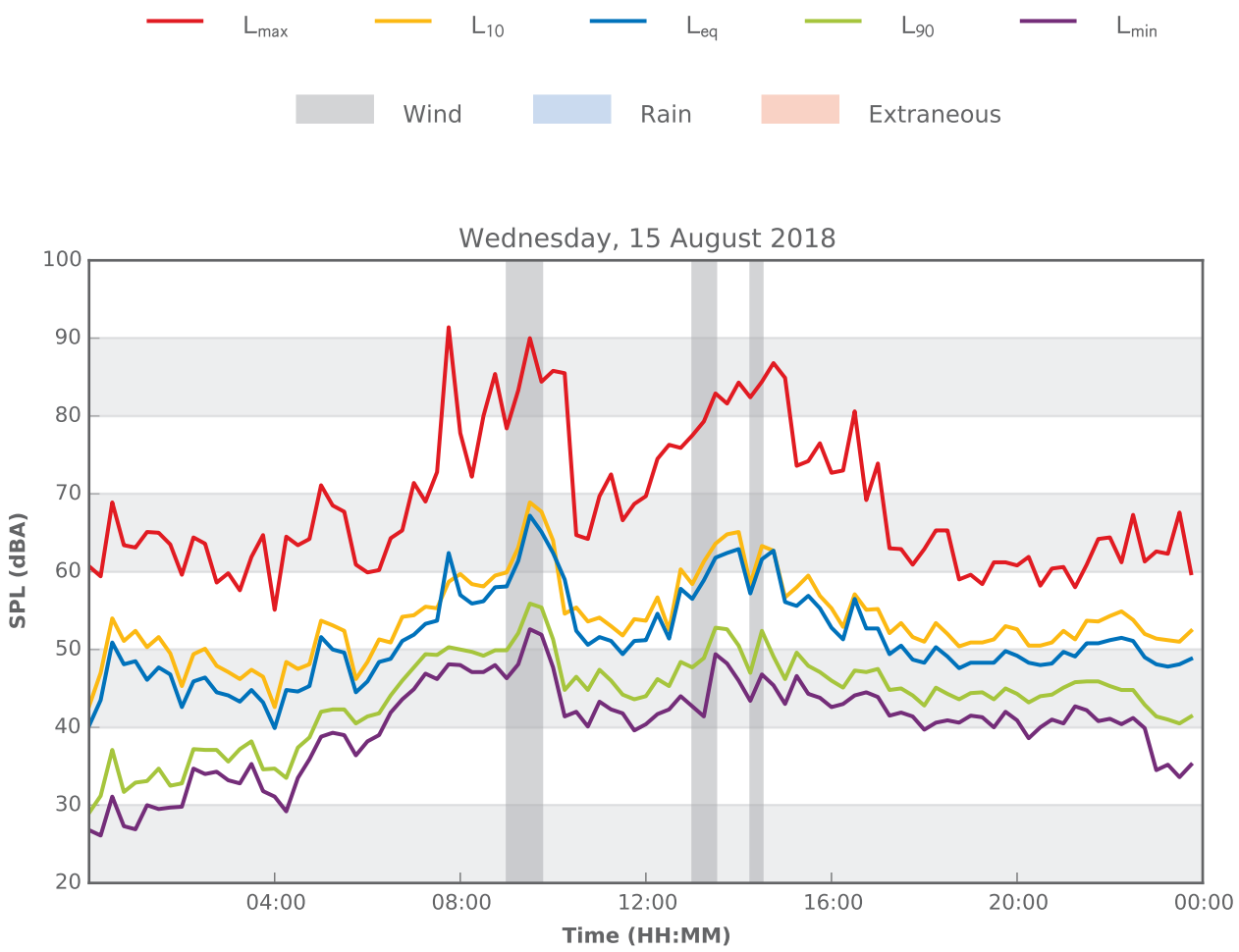

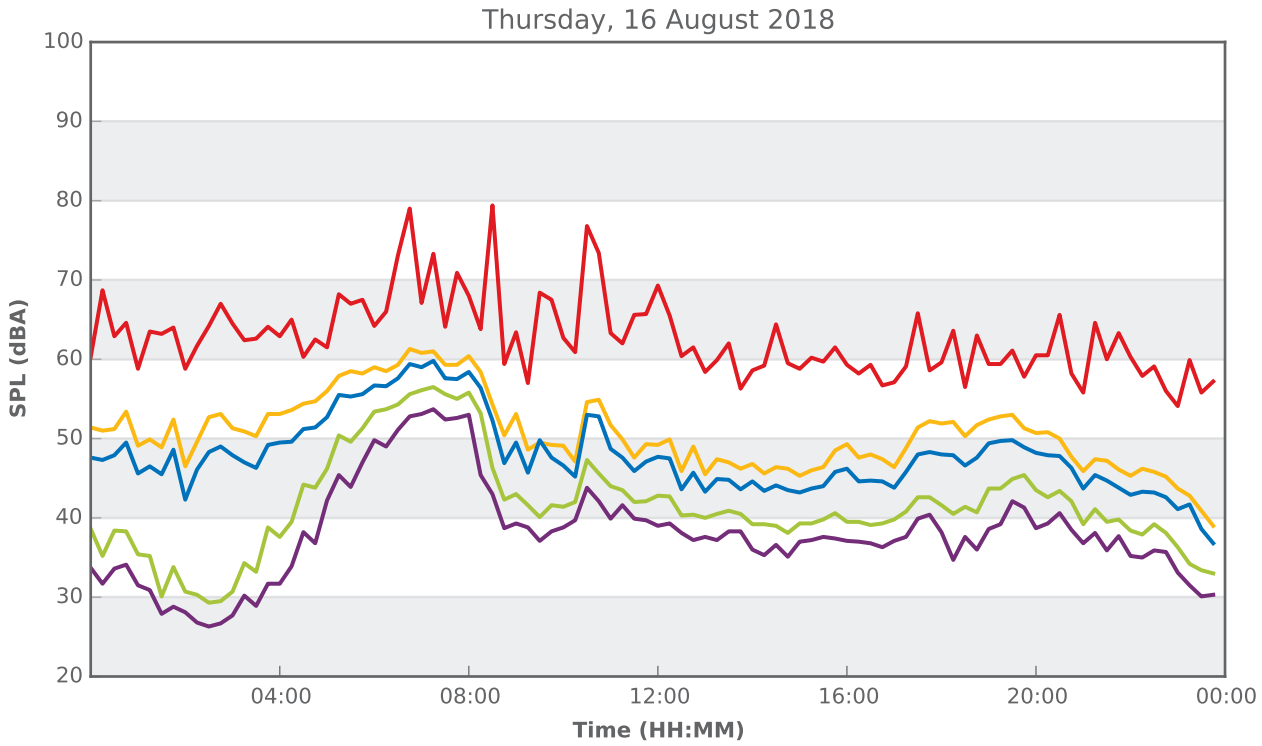

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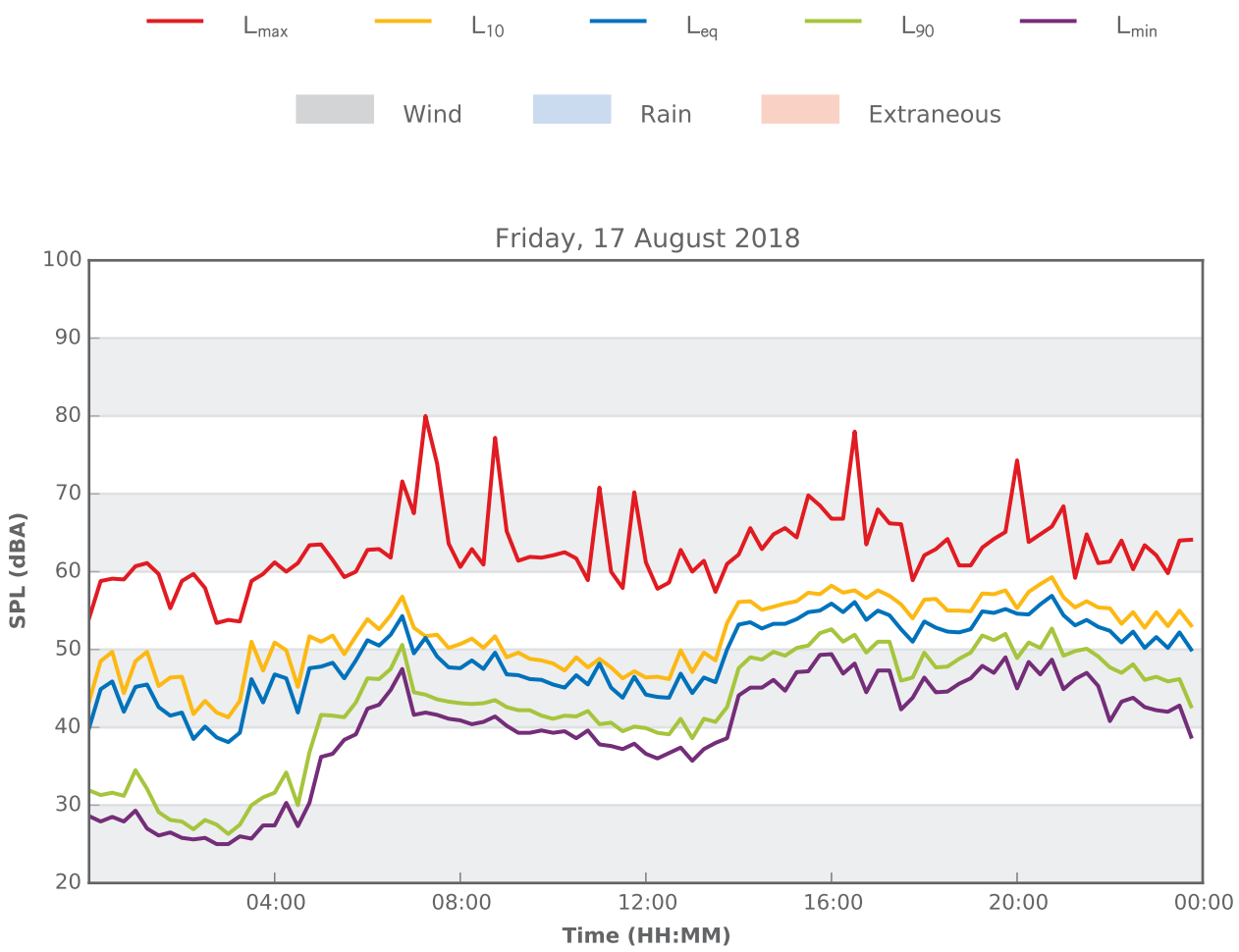

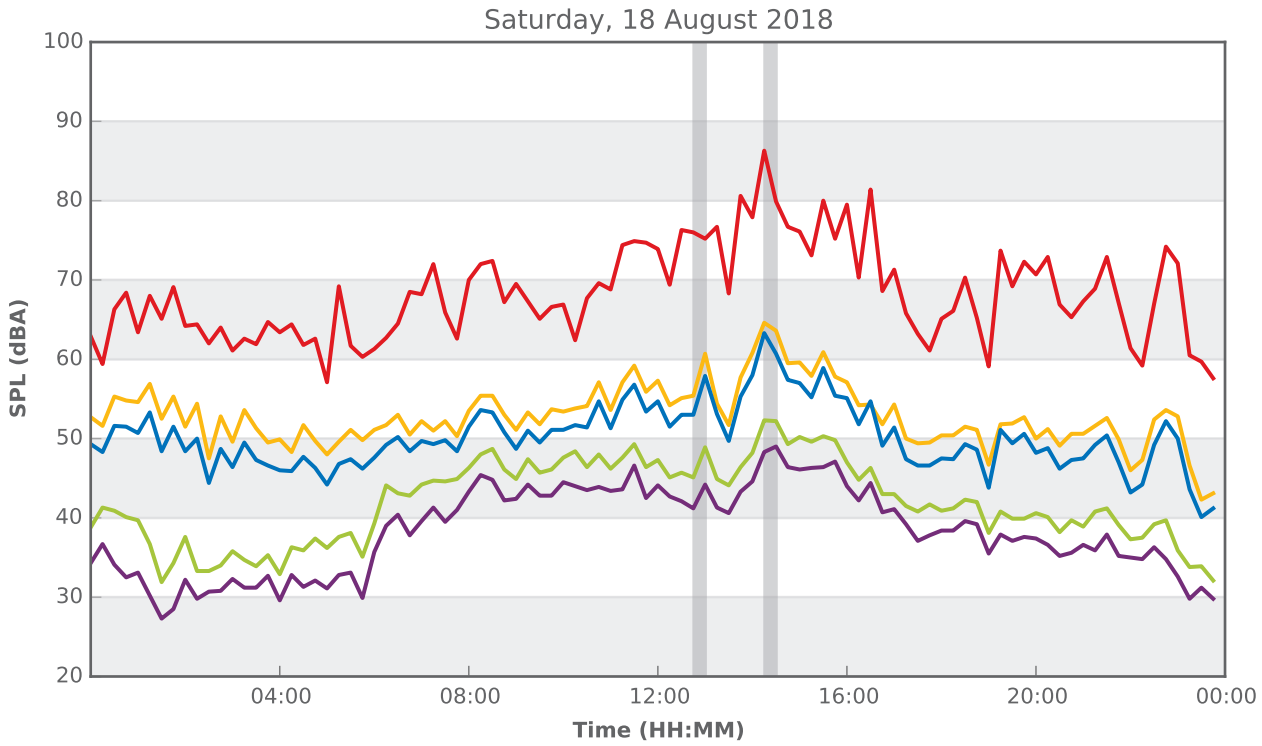

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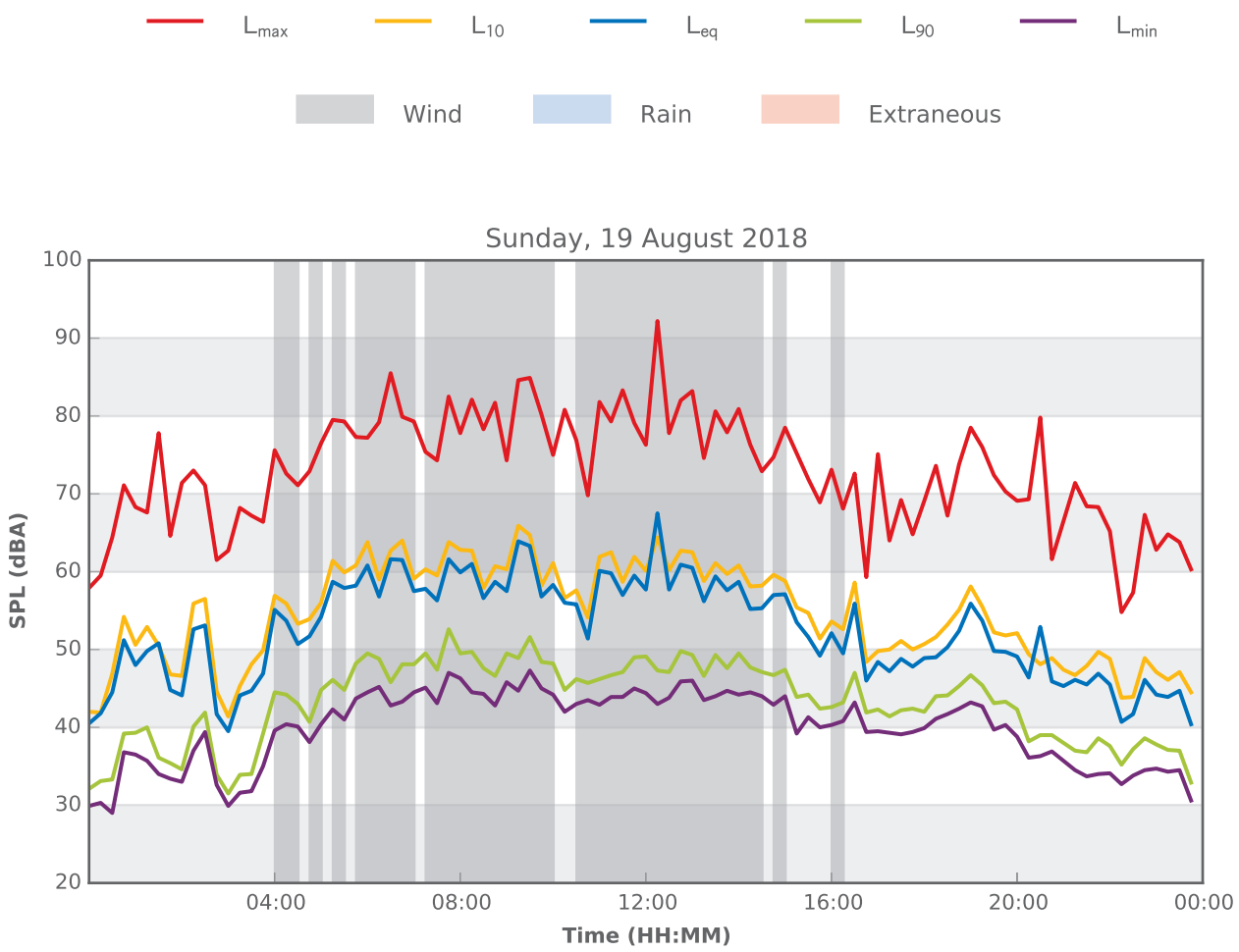
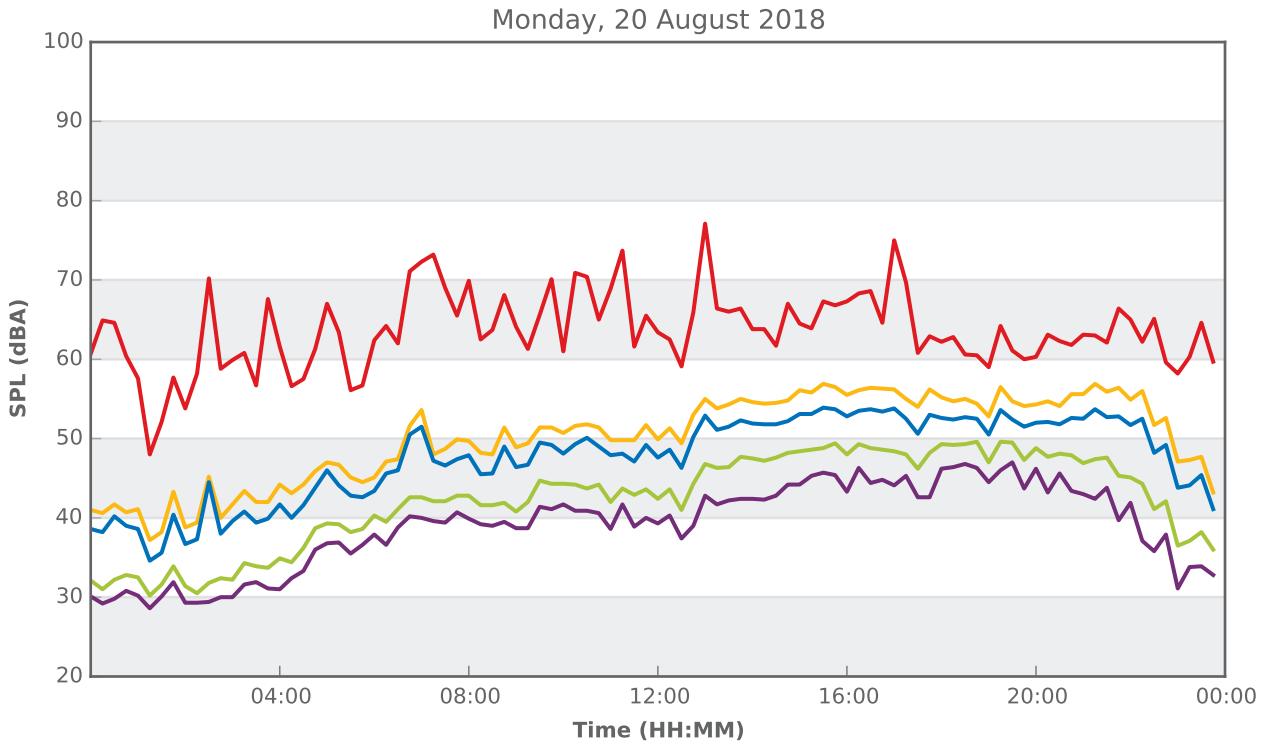
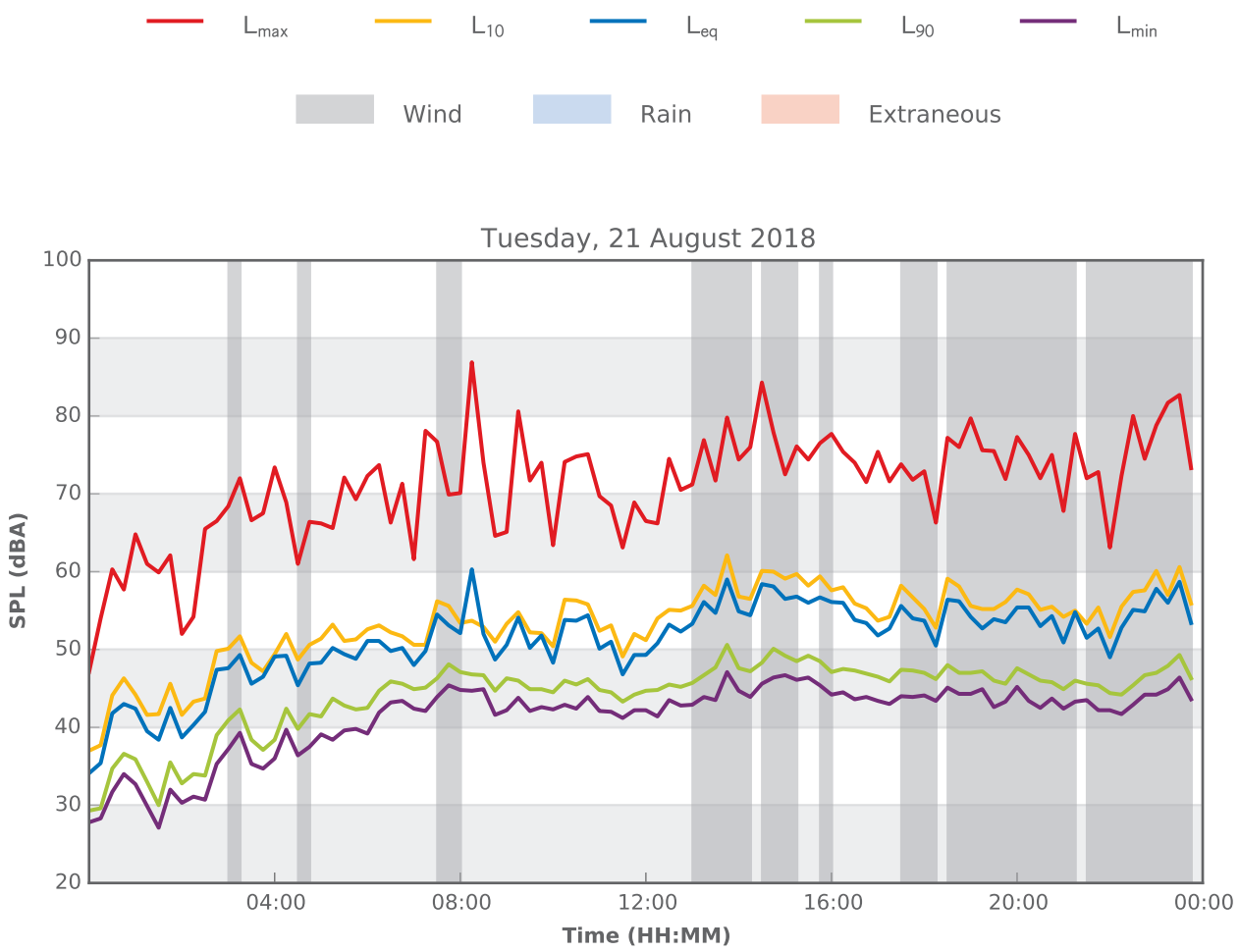
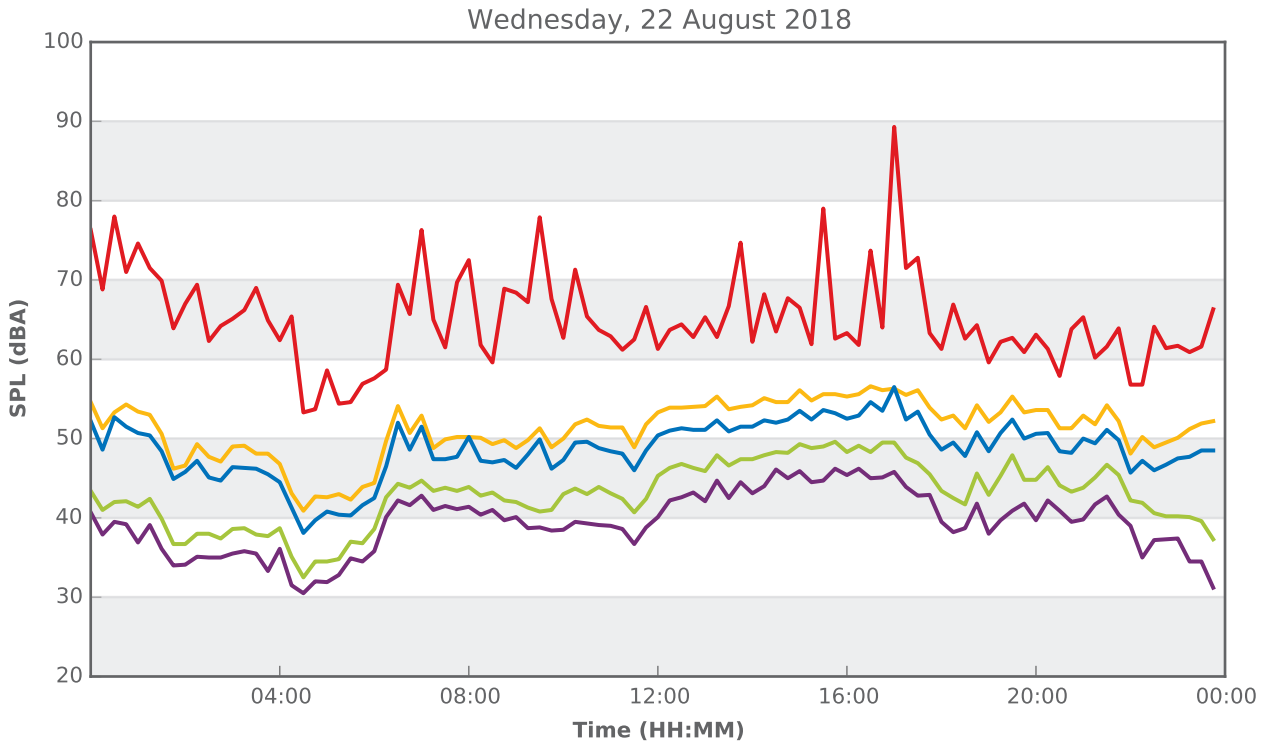




Stocker Residence





Stocker Residence