REEF ACOUSTICS

Friday, 25 March 2022

Project ID: 2022.049_TOMRA Lakemba

Tomra Recycling facilities
Unit 2, 39 Herbert Street,
St Leonards NSW 2065
Australia

Attention: Azhar Ali **(Tomra Recycling Facilities Australia)**

Noise Impact Assessment for Container Recycling Facility at 82 Yerrick Road, Lakemba

Document Details

Reef Acoustics Reference	2022.049.REPORT_TOMRA Lakemba
Revision	1
Date	23 March 2022
Project	82 Yerrick Road, Lakemba
Client Name	Tomra Recycling Facilities Australia
Client Details	Unit 2, 39 Herbert Street, St Leonards NSW 2065
Attention	Azhar Ali (Tomra)
Authorised	AS

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Contents

1 Introduction

Reef Acoustics has been appointed by Tomra Recycling Facilities Australia to conduct an acoustic noise impact assessment at their Lakemba 'return and earn' container recycling facility located at 82 Yerrick Road, Lakemba. The existing facility is currently operating Monday to Saturday, and is proposing to increase operating hours to include Sundays and Public holidays. This noise impact assessment is conducted as per the *Noise Policy for Industry 2017* assessment, to determine the noise impacts on nearby sensitive receivers, and provide any recommendations on mitigation measures to be put in place.

This assessment establishes noise emission criteria, assesses the noise emission from the industrial facility, and recommends any mitigation measures necessary to achieve compliance with relevant criteria.

The client has informed Reef Acoustics that there are a number of irregular daily impulsive noise events when bins of glass containers are emptied into trucks to be taken off-site. There is a number of events each day which varies. Trucks enter through a large roller door facing Yerrick Road.

The most sensitive receiver is identified as a residential receiver at 74 Yerrick Road, Lakemba, as shown in Figure 1. The directly adjacent sites are an industrial stonemason, and an industrial/commercial furniture wholesaler. There are a number of industrial sites directly across Yerrick Road including warehousing spaces that utilise small industrial machinery, and truck deliveries. The industrial spaces have loud impulsive noises throughout the day, so will not be negatively affected by infrequent noise events associated with the Tomra facility. Further to this, the sensitive areas of the Macdonalds site are significantly offset and setback from the Tomra noise source. Thus, the most sensitive receiver will be the residential receiver at 74 Yerrick Road. Note that this receiver is adjacent to our assessment site, but does not have direct line of sight of the facility, with the stonemason building separating the two.

This assessment has been based on site measurements, a site inspection, and desktop calculations and modelling.

2 Ambient Noise Level Survey

To characterise the existing acoustic environment of the area, unattended noise monitoring has been conducted between the dates of 11/03/2022 and 18/03/2022. Two noise monitors were set up on site, with attended measurements conducted to supplement and validate unattended data.

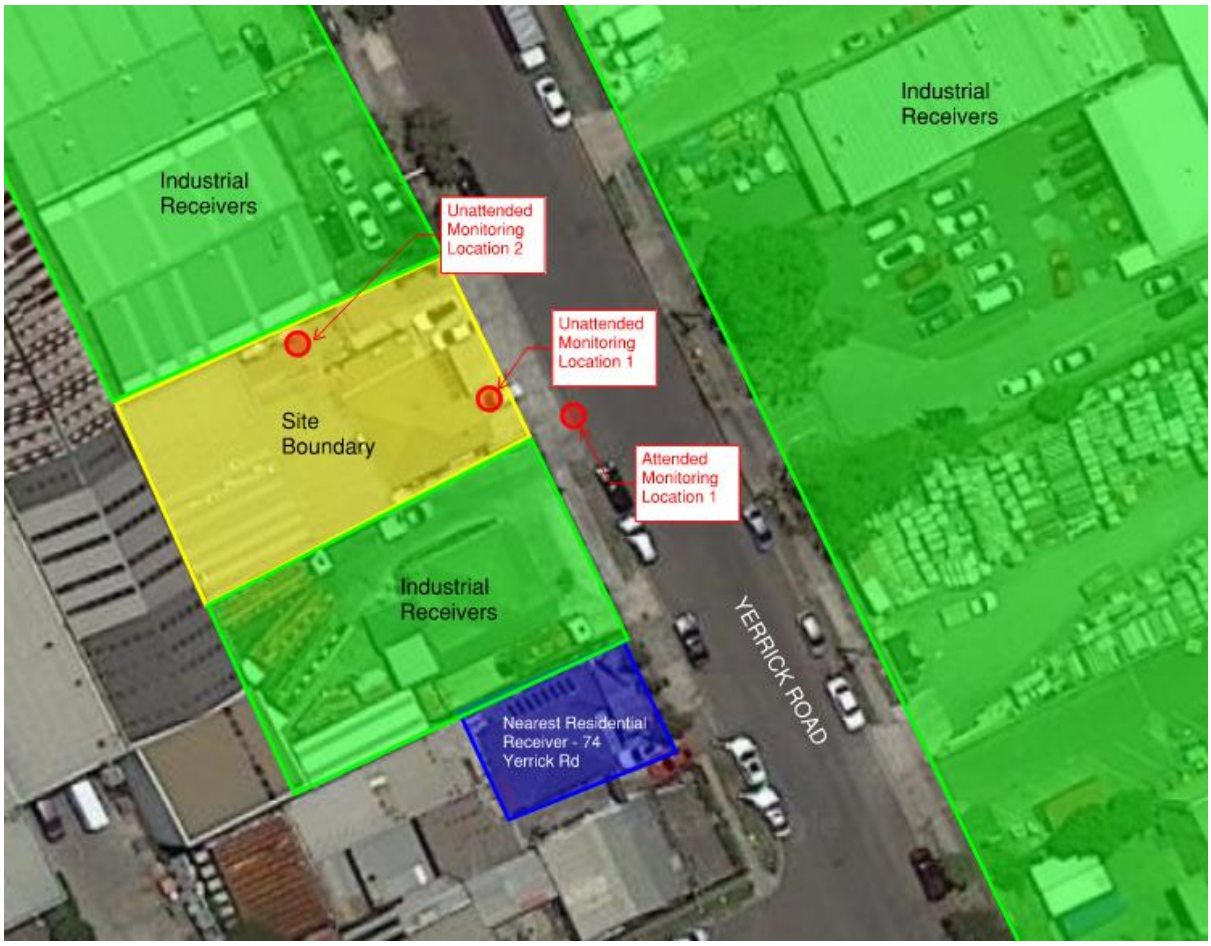
Table 1 below identifies the equipment used in our measurements.

Table 1 - Equipment List

Equipment	Location
Acoustic Research Labs EL-215 Noise Logger (S/N 194444)	Location 1 unattended (outside facility)
Acoustic Research Labs EL-215 Noise Logger (S/N 194678)	Location 2 unattended (inside facility - BOH)
NTi Audio XL2-TA (S/N A2A-18887-E0)	Location 1 attended (outside facility)
Pulsar Model 105 Acoustic Calibrator (S/N 83439)	-

All equipment was calibrated before and after use, and no drift in calibration was detected.

Figure 1 - Site plan and monitoring locations



Logger Location 1 was selected to understand the existing ambient noise levels in the area, and investigate noise transmission from truck unloading events on nearby industrial and residential facilities.

Logger Location 2 was selected to investigate the noise events associated with trucks entering and leaving the facility, as well as container transfer noise. The number of events, their duration and maximum noise levels were determined.

The measured data has been filtered to exclude adverse weather data as per the requirements and methodology defined in the *Noise Policy for Industry 2017 - Appendix A4*. Weather data was obtained from the BOM Canterbury Racecourse weather station. There were a number of short periods excluded due to both rain and wind speed. The monitors were left on site for a total of 8 days to ensure a total minimum 7 days of valid data was captured.

2.1 Unattended Noise Monitoring

To assess the impact of the industrial facility on neighbouring premises, Logger 1 was used to determine the existing ambient noise levels. Table 2 below shows the Rating Background Level (RBL) and LAeq noise levels recorded during the daytime, evening and night-time periods. Data affected by adverse meteorological conditions has been excluded from the results. Detailed daily monitoring graphs are shown in Appendix A.

Table 2 - Measured Ambient Noise Levels corresponding to EPA NPfI assessment time periods

Noise Monitoring Location	Period	L_{A90} (RBL)	L_{Aeq}
Location 1 (outdoor at 1m from site boundary)	Daytime	52	60
	Evening	50	62
	Night-time	43	53

The time periods correspond to the assessment periods defined in the NPfI. Daytime refers to the hours between 7:00am and 6:00pm. Evening period refers to the hours between 6:00pm and 10:00pm. Night period refers to the hours between 10:00pm and 7:00am. On Sundays and Public Holidays, the NPfI defines these periods differently, with Daytime defined as 8:00am-6:00pm, Evening as 6:00pm-10:00pm, and Night as 10:00pm-8:00am.

Logger Location 2 (BOH) was selected to investigate the noise events associated with trucks entering and leaving the facility, as well as container transfer noise. The number of noise events and maximum noise levels during the measurement period were determined. These are shown in Table 3 below. Monitoring was conducted within the facility at an exposed internal location adjacent to the roller door. It should be noted that monitoring was conducted over an 8-day period with typical operations, and it was confirmed that all noise events occurred during the Daytime period as per the NPfI periods.

Table 3 – Number of noise incidents and corresponding measurement levels

Date	Measured number of noise events (trigger level Lmax > 90 dBA, LAeq > 80 dBA)	Loudest noise incident, Lmax dBA (internal measurement)	Loudest noise incident, Lmax dBA (external measurement)	Measured INTERNAL LAeq for corresponding 15-minute period	Measured EXTERNAL LAeq for corresponding 15-minute period
Friday 11th March 2022	0	-	-	-	-
Saturday 12th March 2022	4	94	79	73	62
Sunday 13th March 2022	0	-	-	-	-
Monday 14th March 2022	9	94	77	69	63
Tuesday 15th March 2022	6	95	80	70	67
Wednesday 16th March 2022	4	96	87	74	64
Thursday 17th March 2022	7	95	85	61	63
Friday 18th March 2022	7	93	80	71	61

Based on the measured levels of noise events shown in Table 3 above, we can deduce that the average level difference between internal and external measurements during Lmax event periods is 13 dBA. This level will be used in our assessment as an internal to external correction factor to account for the roller door and its opening area, directivity and other factors influencing noise transfer specific to the site.

It should be noted at this point that the external LAeq for periods including truck/container operations did not change significantly either side of the measured 15-minute periods. This suggests that there were significant external noises sources also impacting the site, and operations related to the Tomra facility were not significant over given the existing noise environment.

2.2 Attended Noise Monitoring

Attended monitoring was conducted outside the facility to supplement the data obtained from the unattended monitoring. The container pickup noise events are irregular, thus they will be assessed from unattended measurements. The attended measurements were used to establish if there were any unique elements of the soundscape or neighbouring environment that may need further assessment.

Location/ Description	Date/ Start time/ Weather	Primary Noise Descriptor (dB re 20 µPa)			Comments
		L_{AFmax}	L_{AF90}	L_{Aeq}	
Location 1 – outside roller door along Yerrick Road, external measurement at 1m from kerb.	Friday 11th March 2022, 14:30pm	91	53	63	Dominant noise source traffic noise along Yerrick Road and industrial operations noise from the warehousing facility across the road.

3 Criteria

External noise emission criteria have been established from the *Noise Policy for Industry*. The policy sets out the procedure to determine the project noise trigger levels relevant to a particular industrial development. If it is predicted that the development is likely to cause the project noise trigger level to be exceeded at existing noise-sensitive receivers, management measures need to be considered to seek to reduce the predicted noise level.

The Intrusiveness noise level is based on the measured background noise levels. In accordance with the NPfI, the equivalent continuous noise level (LAeq) of the source should not exceed the measured Rating Background Level (RBL) by more than 5 dBA over any 15-minute period within any assessment period.

The Amenity noise level is based on land use and associated activities (and their sensitivity to noise emissions). The study has been classified as 'Urban residential' for the purpose of this assessment, corresponding to an area dominated by "urban hum" with characteristically heavy and continuous traffic flows during peak periods and near commercial / industrial districts.

The processed results of the unattended noise monitoring have been used to establish the project noise trigger levels highlighted in yellow for the nearest residential receiver location.

Table 4 - Project Noise Trigger Levels for Receivers Surrounding the Tomra Lakemba site

Receiver	Time of Day	Recommended Amenity Noise Level (dBA)	Measured RBL LA90(15minute) (dBA)	Measured LAeq(period) Noise Level (dBA)	Project Noise Trigger Levels (dBA)	
					Intrusiveness LAeq(15minute)	**Amenity LAeq(period)**
Residential Location 1-74 Yerrick Road (20m to the southwest)	**Day**	**60**	**52**	**60**	**57**	**55**
	Evening	**50**	**50**	**62**	**55**	**47***
	Night	**45**	**43**	**53**	**48**	**40**

*Note 1: As per the NPfI areas which have high traffic levels (LAeq,traffic is 10 or more dB above amenity noise level), high traffic project amenity noise level for industrial developments equal to LAeq,traffic minus 15 dBA.

A maximum noise level assessment for sleep disturbance only needs to be conducted during the Night period. As all noise events at the facility are during the daytime period, a Sleep Disturbance assessment as per the NPfI is not necessary.

Table 5 below summarises the relevant criteria at the nearest residential boundary.

Table 5 - Project Specific criteria at nearest residential receiver

Receiver Location	Period	LA_{90} (RBL)	Noise Objectives
Receiver 1 (outdoor 1m from site boundary)	Daytime	52	**55 dB(A) Leq,15min**
	Evening	50	**47 dB(A) Leq,15min**
	Night-time	43	**40 dB(A) Leq,15min**

4 Facility Operation

This assessment has been based on the following assumptions, provided by Tomra:

- Noise events associated with the facility only occur during the Daytime period as defined by the NPfI.
- It has been assumed that the roller door is left open during noise events, and that this was the case during noise events measured.

5 Noise Assessment

All measured noise events occurred during the Daytime period. Unattended measurements demonstrated that noise events within the facility were achieving between 93-96 dBA Lmax. The corresponding 15-minute time periods were measured as LAeq 71-74 dBA. As a conservative approach, we will assess using 74 dBA LAeq as the internal reverberant noise source level.

Where a noise source contains certain characteristics, such as tonality, intermittency or impulsiveness, there is evidence to suggest that it can cause greater annoyance than other noises at the same level. The NPfI proposes correction factors to be used in assessments. The noise from our facility has been determined to be impulsive or intermittent in nature, and thus a 5dB penalty or correction factor is to be applied for our assessment.

The levels during noise events have been compared between the internal and external monitors, and thus a correction factor can be applied as per the results shown in Table 3. An average level difference of 13 dBA has been measured during Lmax noise events, which can be used to calibrate our predictions.

The predicted noise level at the receiver is shown in Table 6 below.

Table 6 - Predicted noise levels at receiver location

Receiver Location	Criteria (Day period), dB(A) Leq,15min	Predicted reverberant source noise level within facility, dB(A) Leq,15min	Impulsive noise correction factor added, dB(A) Leq,15min	Corrected level to external site boundary, dB(A) Leq,15min	Predicted noise level contribution at receiver location during noise events, dB(A) Leq,15min
Lot boundary a distance of 20m to the southeast (74 Yerrick Road)	**55**	**74**	**79**	**66**	**50***

*Note 1: This prediction took the corrected level at the Tomra site boundary of 66 dB(A), Leq,15min, and added a distance correction to 20m, as well as an angle of incidence correction as the noise source is shielded by the neighbouring industrial facility.

6 Recommendations

From the measurements and noise transfer predictions, it can be seen in Table 6 above that noise levels measured meet the relevant criteria at the nearest sensitive receiver.

As there is no separate criteria defined in the NPfI for Sunday and public holiday periods, the only requirement is that any operations occurring on a Sunday or Public Holiday will have to correspond with the altered Day period as per the NPfI.

During the period Monday to Saturday, daytime is defined as 7:00am – 6:00pm. During Sundays and Public Holidays, the Daytime period is defined as 8:00am – 6:00pm. It must be ensured that all noise events occur within this period. If noise events on Sundays/Public Holidays were allowed during the shoulder period prior to 8:00am, this would require the assessment to be conducted under the Night period criteria, thus exceeding the project noise trigger levels and likely requiring further noise mitigation measures than currently exist.

7 Conclusion

Reef Acoustics has conducted a noise impact assessment of the Tomra container recycling facility in regards to a proposal to extend the operational days from Monday-Saturday to include Sundays and Public Holidays. There are no changes in criteria for the Sunday period, although the assessment times for the Daytime period shift to be between 8:00am and 6:00pm. If it is ensured that all noise events at the facility occur between these hours, in our opinion there is no reason to refuse the amendment to operation days. No additional noise mitigation measures will be required for this operation mode.

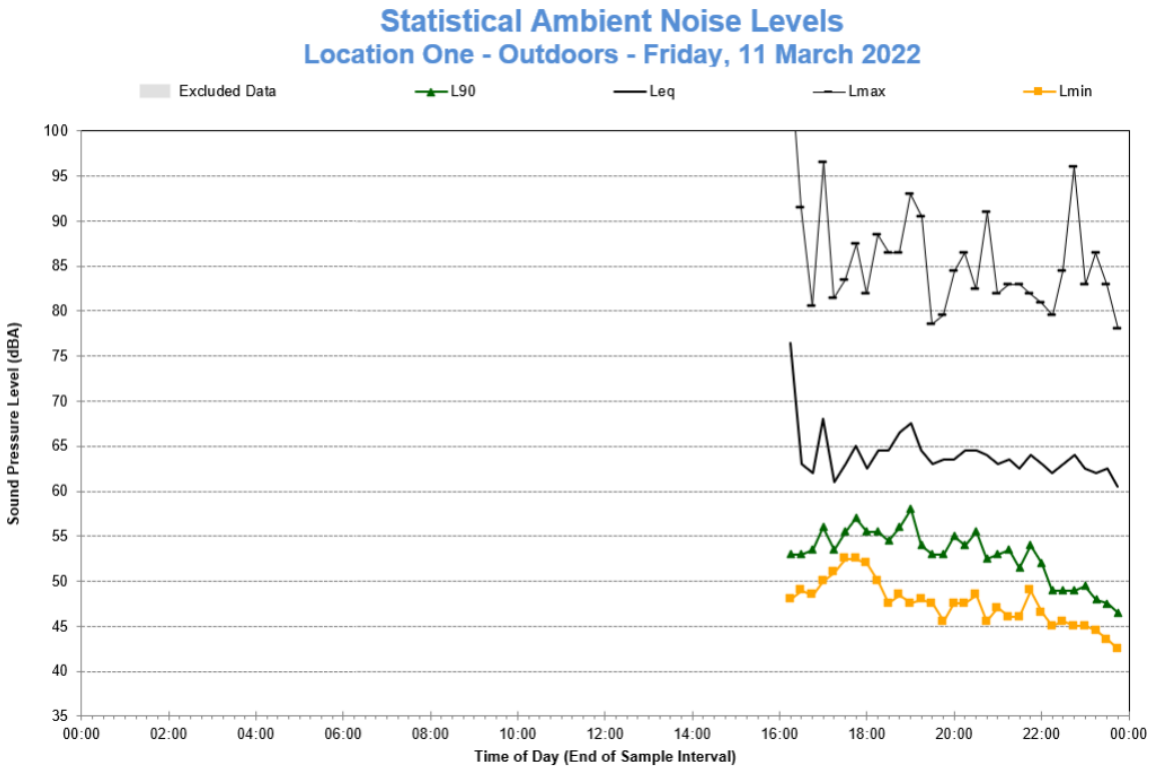
I confirm I am an active and practising member of the Australian Acoustic Society (AAS), and Engineers Australia. I have been practising Acoustic Consultancy for a continuous period of 9 years and am considered to be a qualified Acoustician.

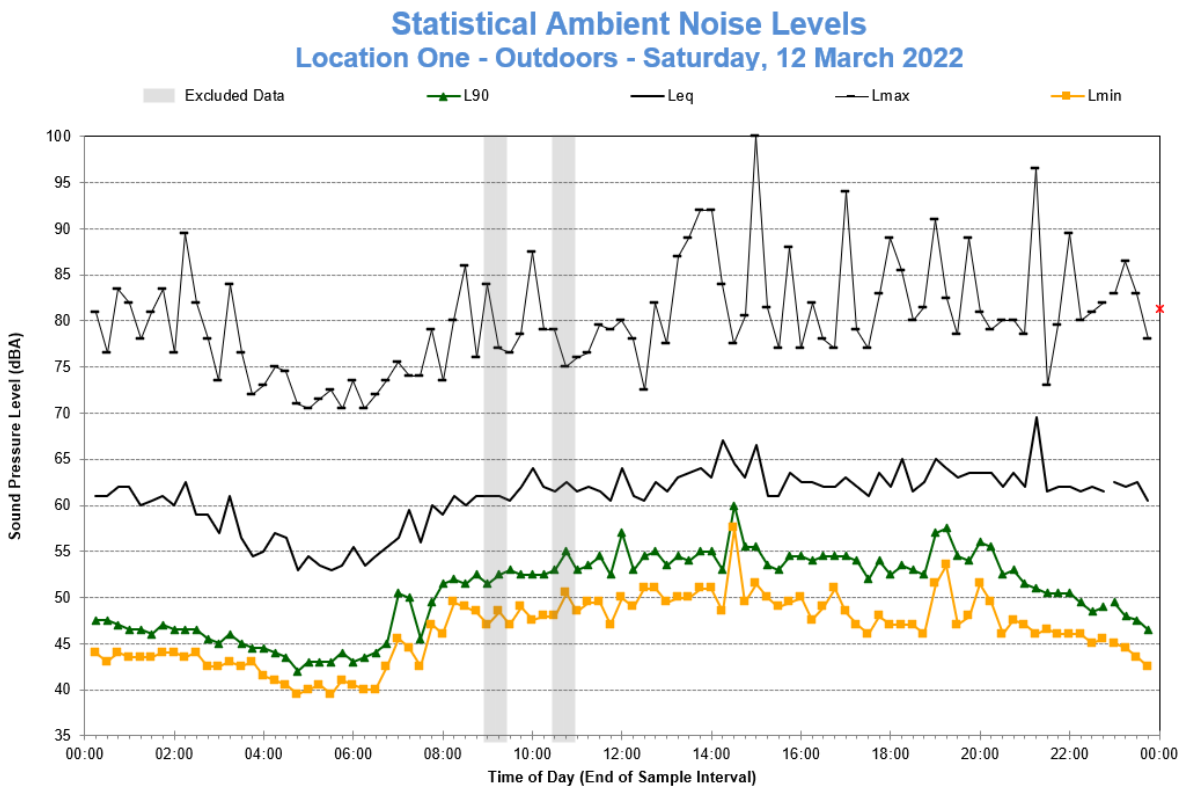
If any additional information or clarification is required to supplement this report, please do not hesitate to contact me on a.szabo@reefacoustics.com.au.

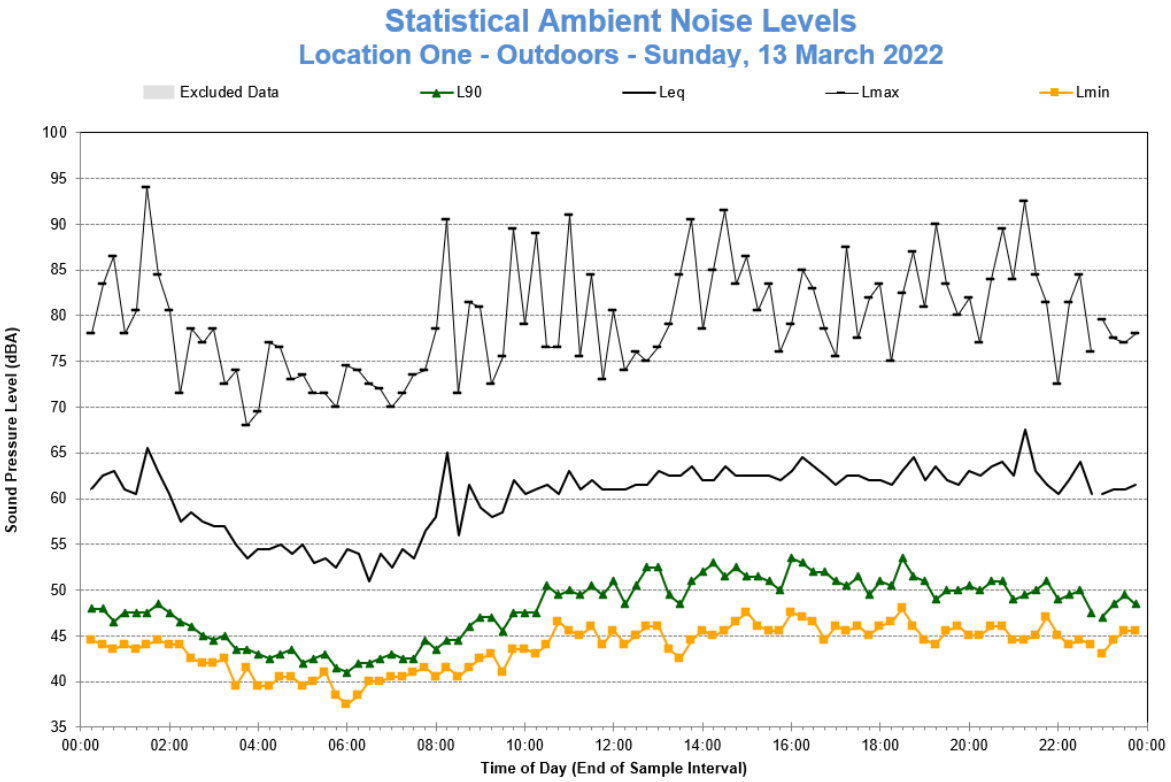
Best regards,

Attila Szabo
Reef Acoustics

APPENDIX A – STATISTICAL AMBIENT NOISE LEVEL GRAPHS



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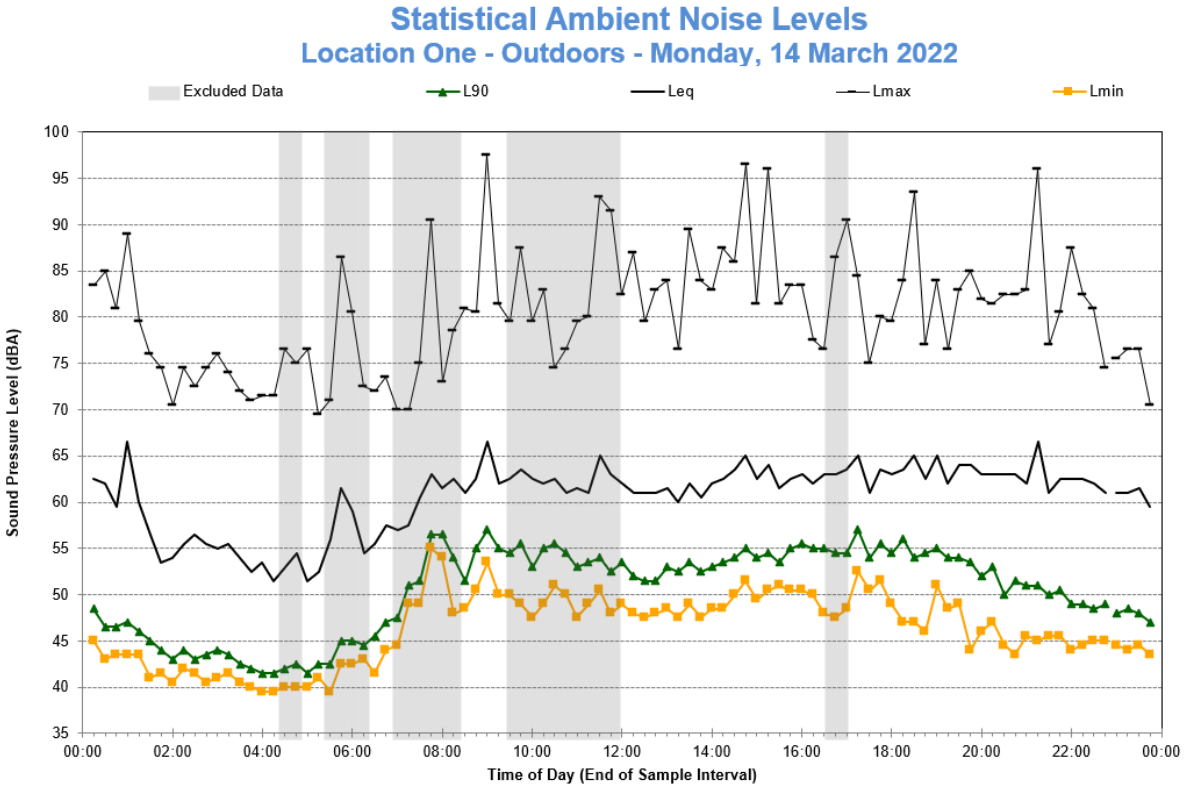
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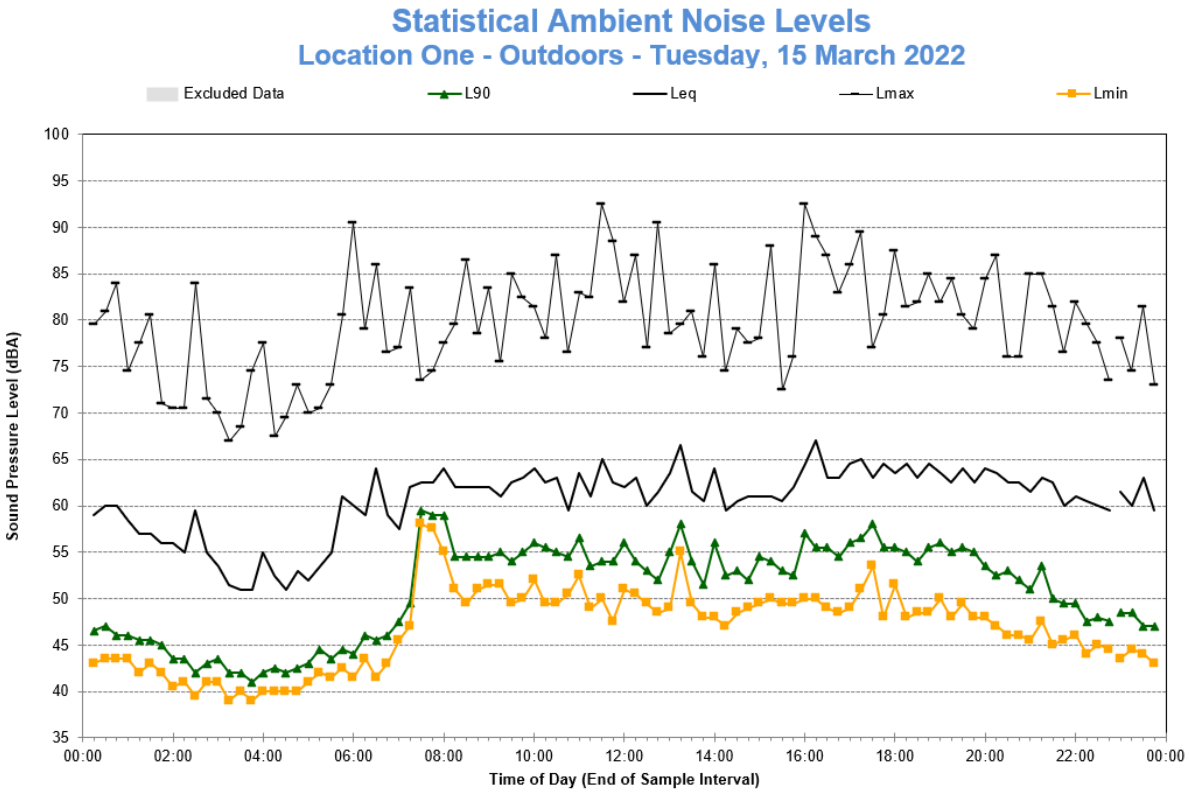
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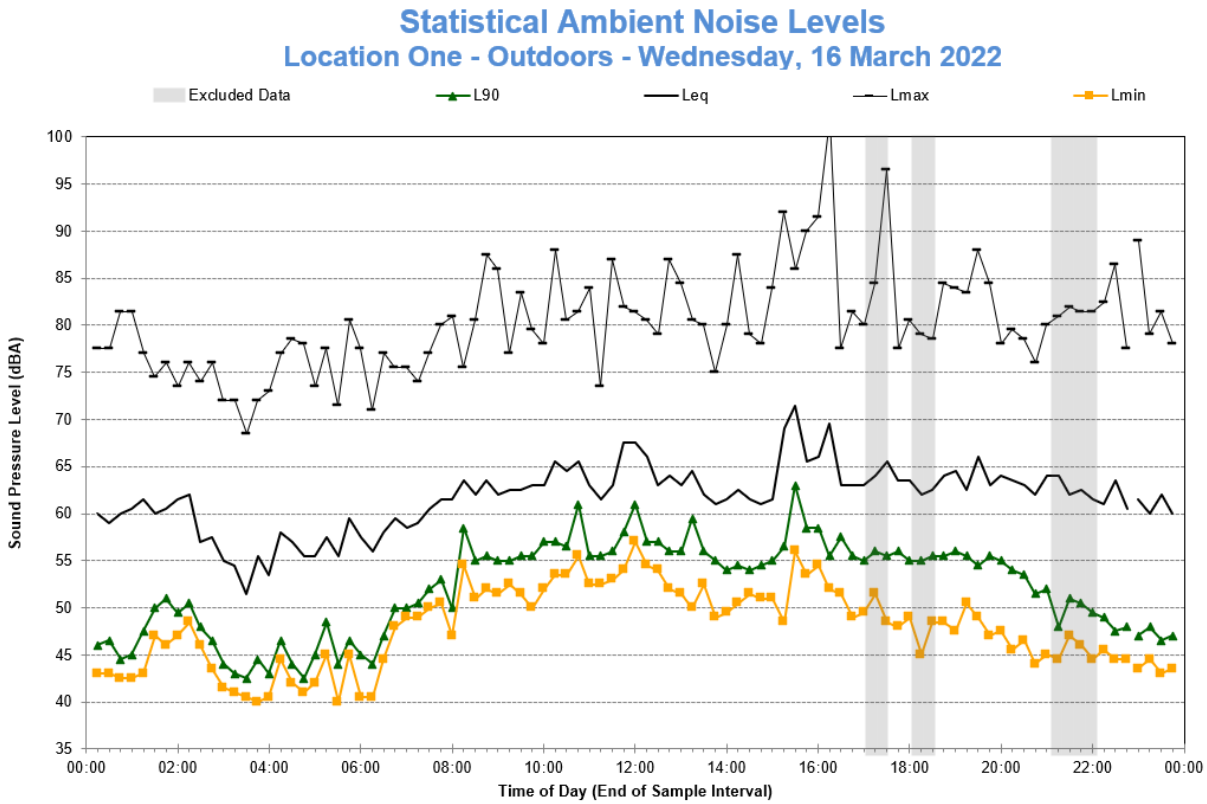
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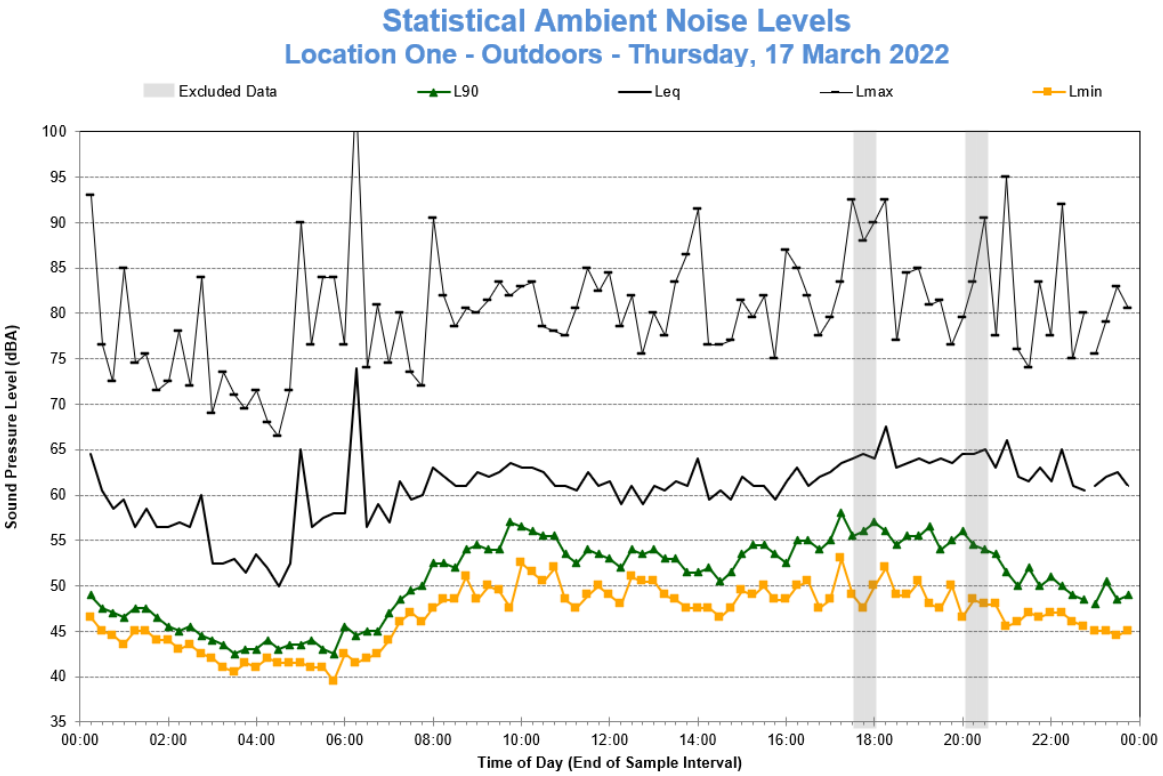
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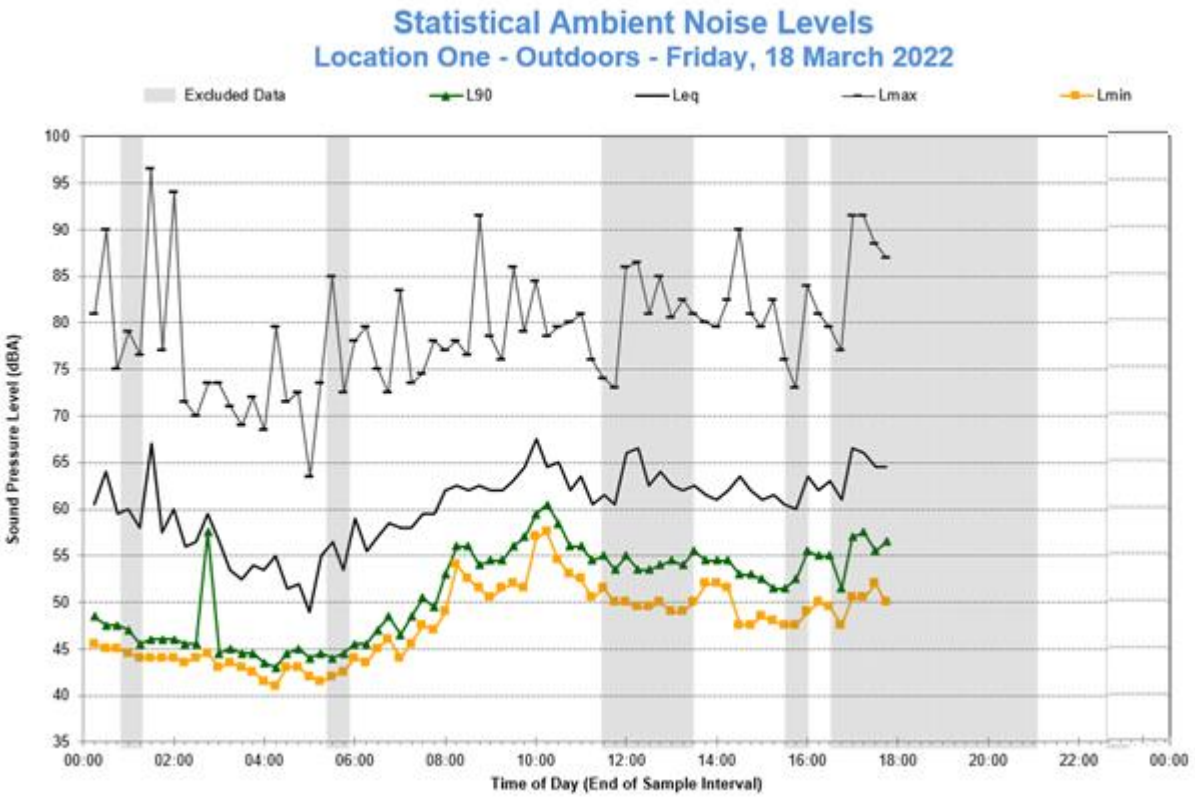
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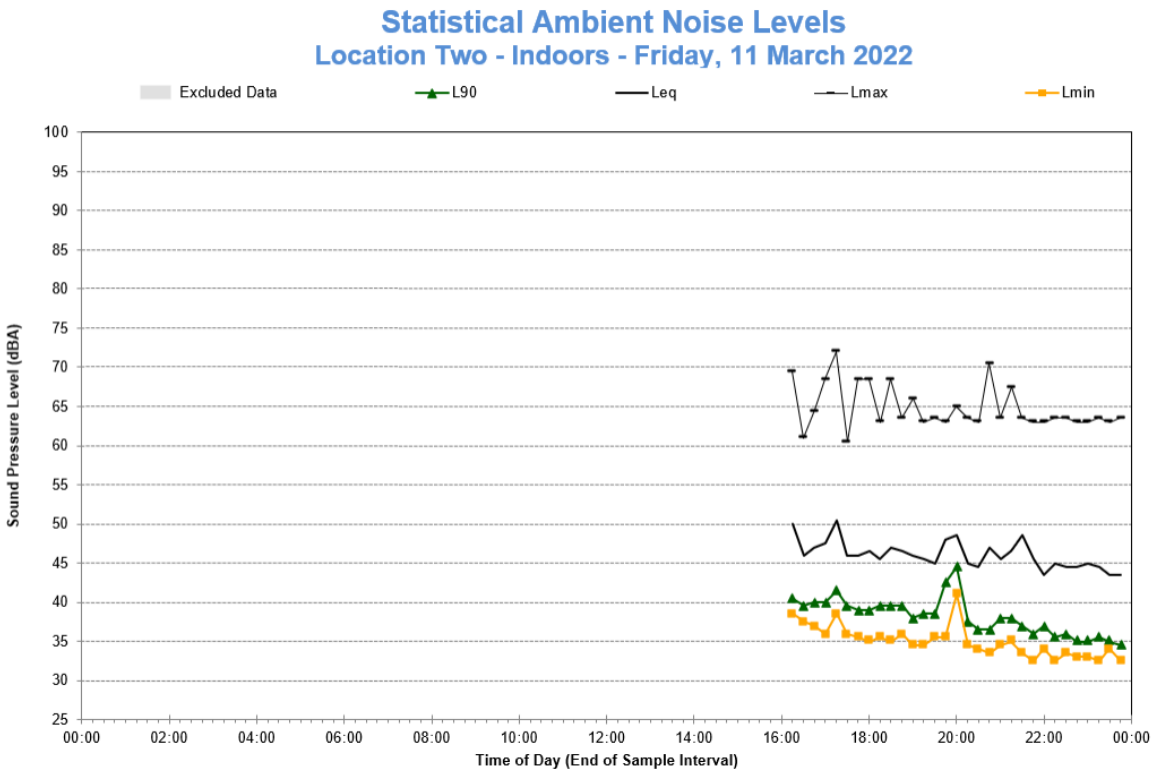
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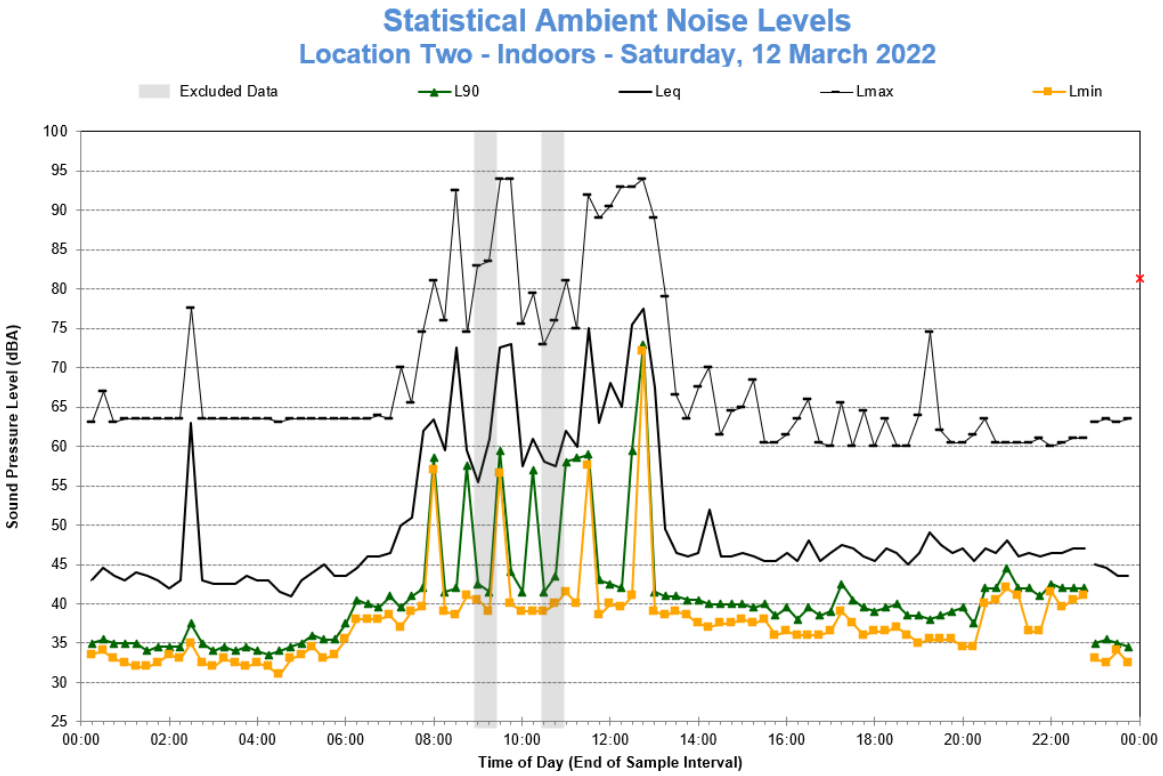
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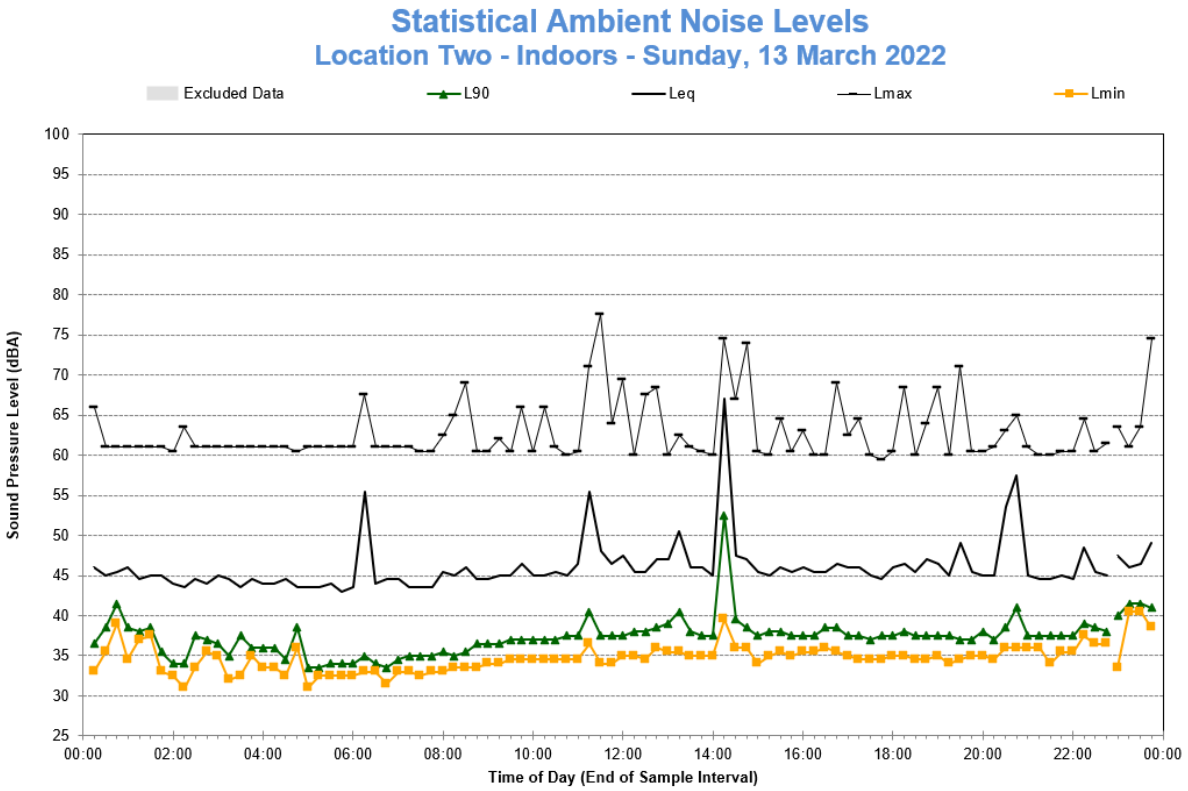
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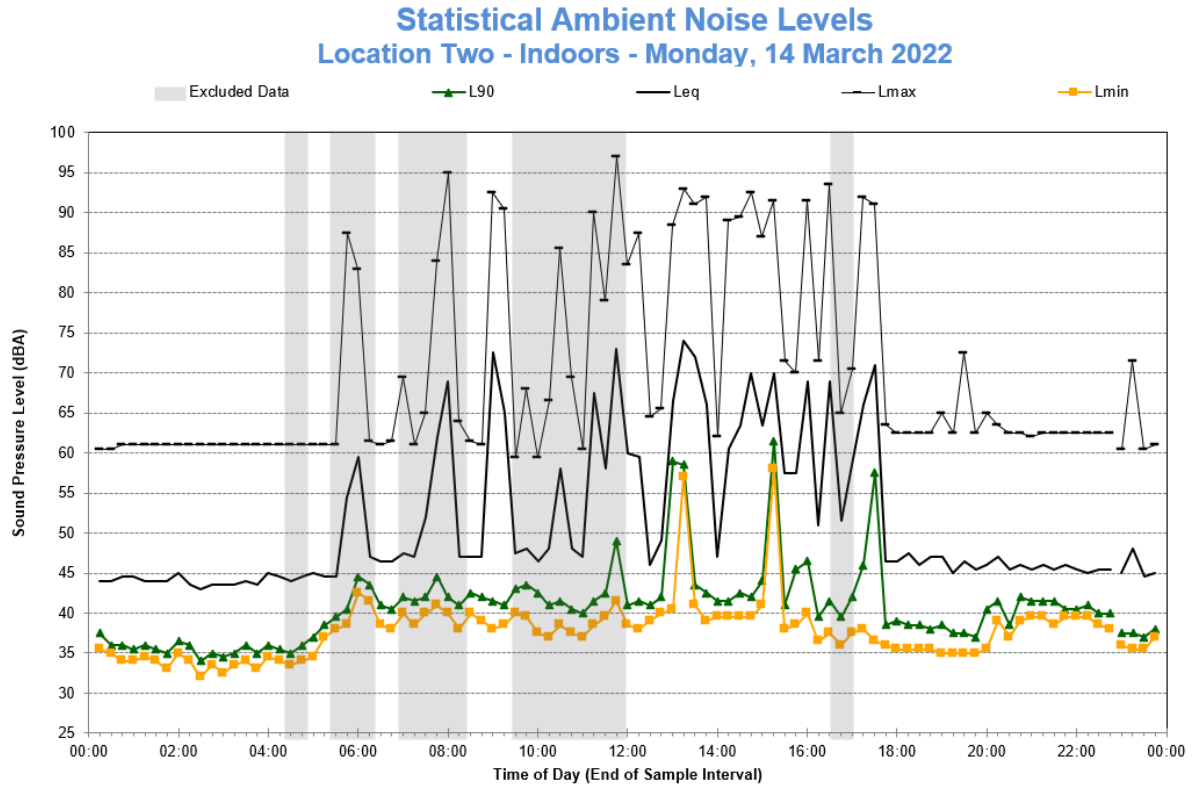
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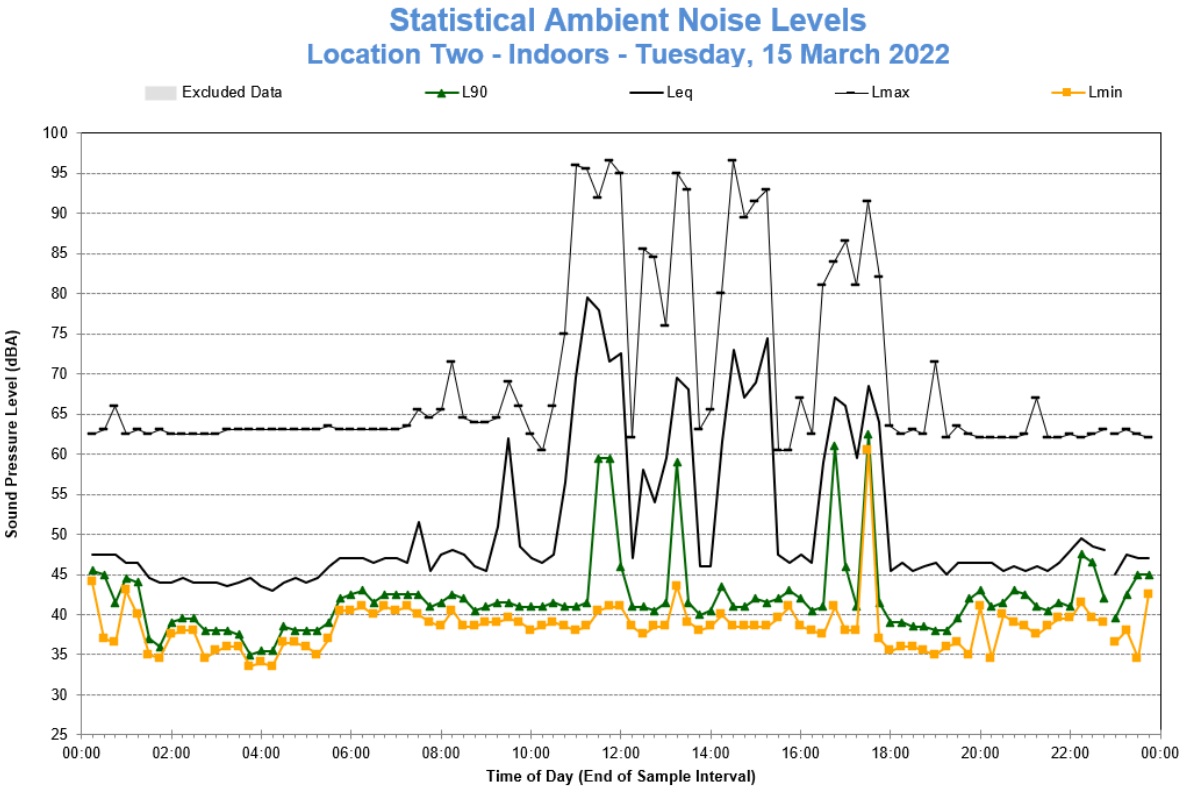
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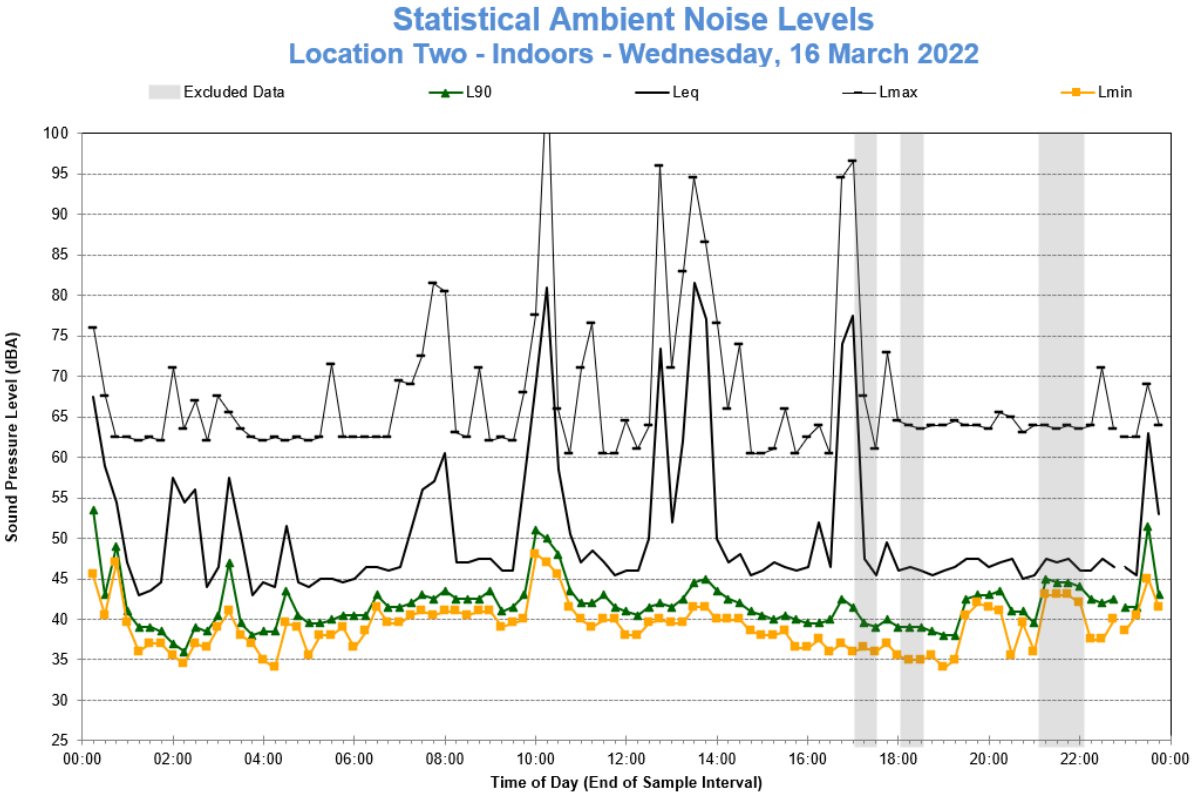
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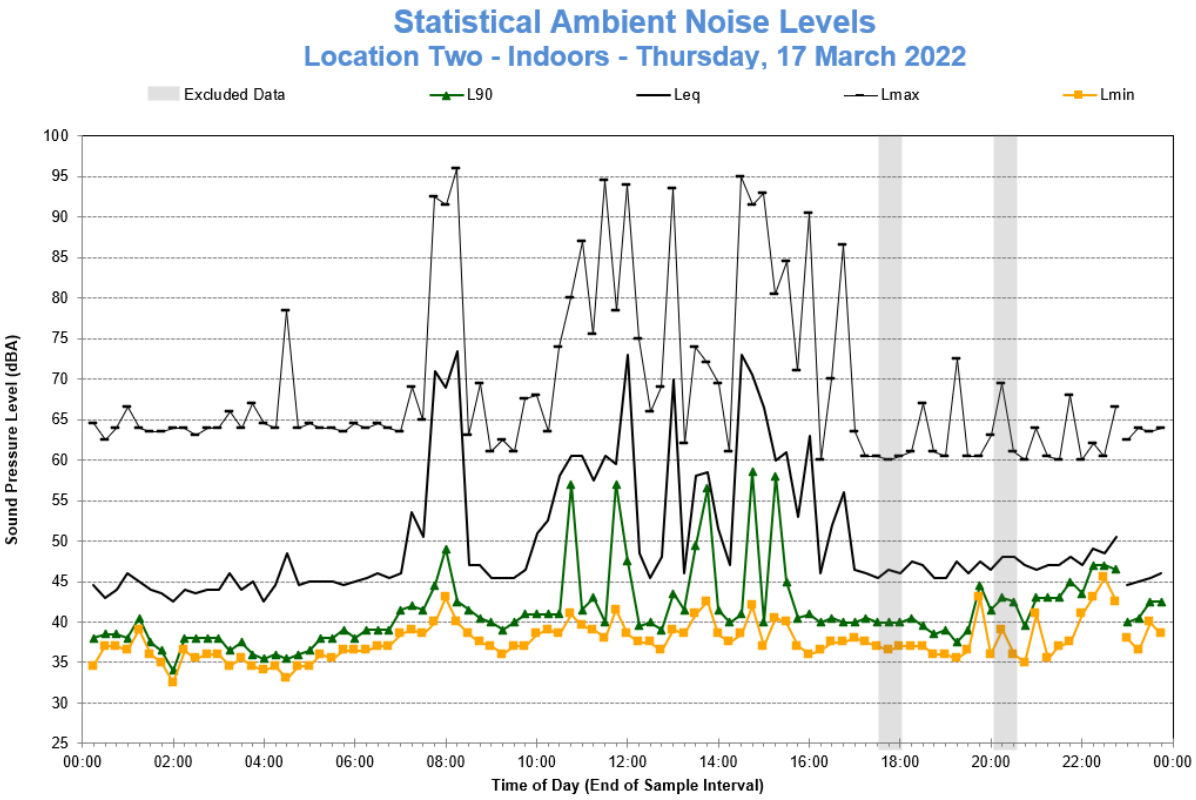
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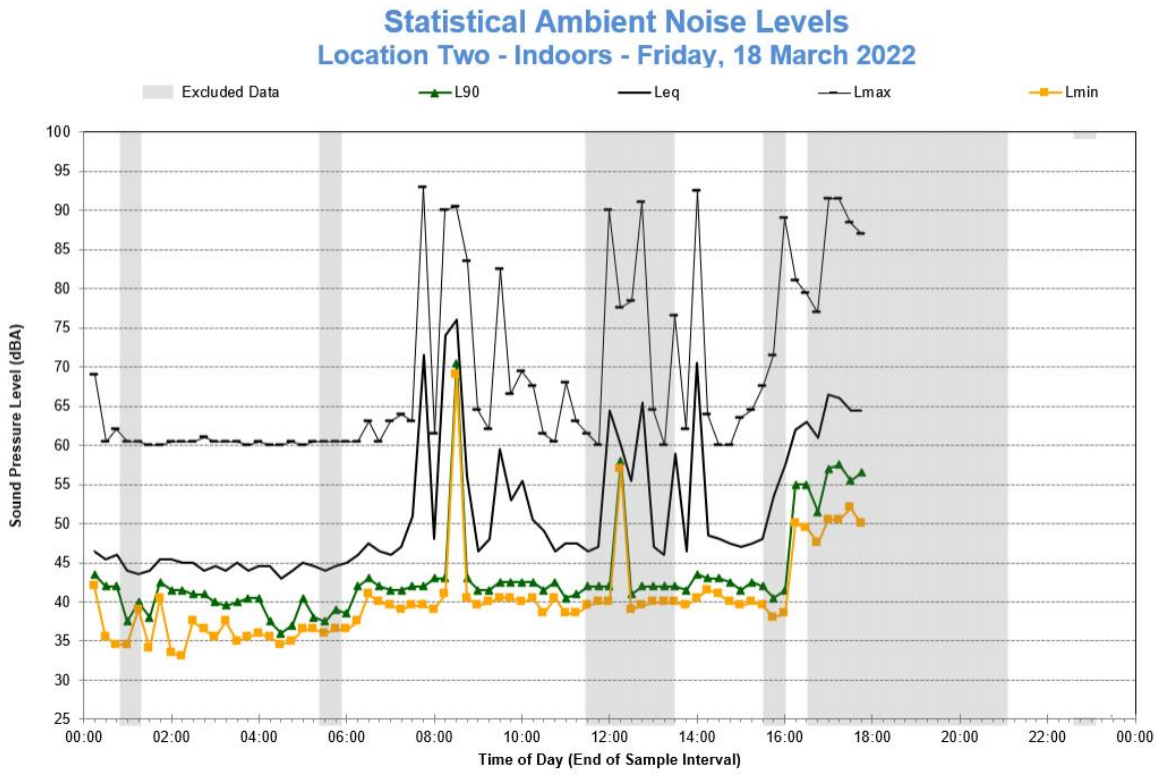
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