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Consulting Acoustical & Vibration Engineers

**ORICA AUSTRALIA PTY LTD.  
KOORAGANG ISLAND  
ENVIRONMENTAL NOISE AUDIT  
APRIL 2025**

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Rev 00

**Prepared for:** Orica Australia Pty Ltd  
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## 1.0 INTRODUCTION

*Atkins Acoustics* was retained by Orica Australia Pty Ltd (*Orica*) to conduct an environmental noise audit for their Kooragang Island plant. The audit included attended and unattended measurements at Stockton and on Kooragang Island during April 2025.

The report presents results and findings of the audit, an assessment of operational noise from the site including plant associated with the expansion of the ammonium nitrate plant (*the Project*) and the implementation of noise mitigation to existing plant. Works undertaken as part of the first phase of the *Orica* expansion are described in Environmental Noise Audit Report dated November 2012, include;

- a new Ammonia Plant Process air compressor;
- cooling tower cells and pumps to service the Ammonia Plant;
- steam power generator 183L; and
- de-commissioning two (2) process air compressors (102J and 122J).

In addition to the above uprate works, *Orica* implemented a site noise reduction program (*SNRP*). Details of those works are summarised in the *Atkins Acoustics* Environmental Noise Audit report dated March 2013. Site improvement works implemented during 2020 included the decommissioning of the off-site boiler, commissioning of a new site boiler and relocation of the CO<sub>2</sub> vent with an inline discharge attenuator.

## 2.0 OVERVIEW

To control industrial noise exposure for the Stockton residential area, the NSW Department of Planning (*Department*) concluded that any additional noise emitted from *the Project* must achieve a noise contribution at least 10dBA below the agreed existing levels determined prior to the proposed uprate works.

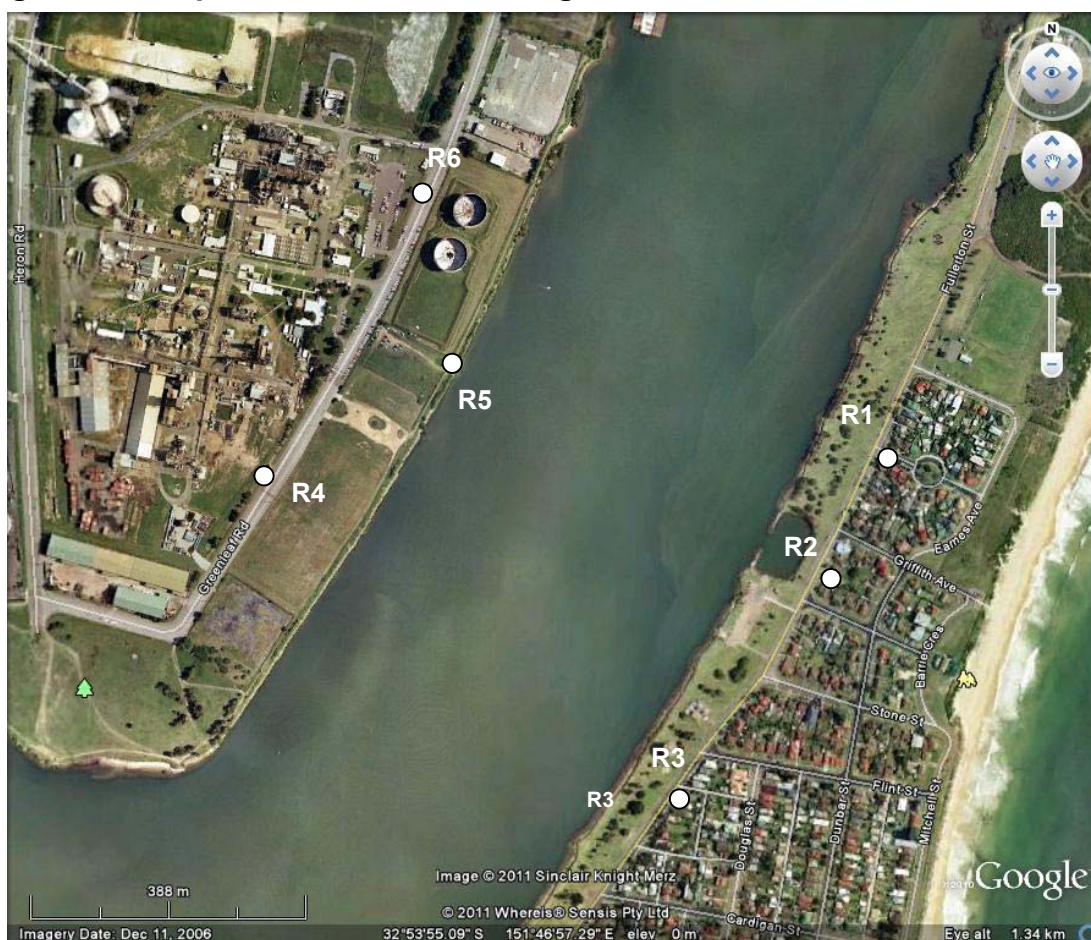
Initially noise audit monitoring locations were selected to provide for reliable site access to install instrumentation and security. The locations identified as R4 and R6 due to access arrangements and instrumentation security were relocated from the riverside to roadside positions. Similarly, due to access restrictions monitoring location R1 (294 Fullerton Street) was changed to 284 Fullerton Street, R2 (218 Fullerton Street) changed to 220 Fullerton Street and R3 186 (Fullerton Street) changed to 184 Fullerton Street. Resulting from new onsite construction works, R6 was relocated approximately 50 metres south of the previous location.

## 2.1 Compliance Noise Monitoring

For the assessment of noise emitted from *Orica*, six (6) reference assessment locations (*Figure 1*) were selected. The locations are referenced in the *Orica* Noise Management Plan (*NMP*), three (3) located at Stockton and three (3) on Kooragang Island.

- R1 - 284 Fullerton Street, Stockton.
- R2 - 220 Fullerton Street, Stockton.
- R3 – 184 Fullerton Street, Stockton.
- R4 - Roadside (south) site boundary opposite Ammonium Nitrate Area
- R5 - Riverside (central) water testing station opposite Administration Building.
- R6 - Roadside (north) east site boundary opposite the Ammonia Plant.

**Figure 1. Compliance Noise Monitoring Locations**



## 2.2. Competence Statement

Atkins Acoustics is a member firm of the Association of Australasian Acoustical Consultants (AAAC). Site attended audits and analysis were conducted by a staff member of Atkins Acoustics with tertiary qualifications and experience in the discipline of acoustics and a 'Member' of the Australian Acoustical Society (AAS)



### 3.0 STATUTORY REQUIREMENTS

The following *Project* noise assessment requirements are referenced in Schedule 3 'Specific Environmental Conditions' of the *Department* Project Approval (as modified) dated 1 December 2009.

#### Noise Limits

30. The Proponent shall ensure that noise levels from the operation of the Project are at least 10dB(A) below noise levels from the Initial Operations as specified by conditions 31 and 32.

*Note: Ammonia flaring events are excluded from the noise limits and levels referred to in conditions 30 and 31.*

#### Initial Operations - Noise Verification Program

31. Prior to the commencement of construction, the Proponent shall prepare and implement an Initial Operations Noise Verification Program to the satisfaction of the Secretary. The Program shall:
- a) be undertaken by a suitably qualified and experienced person;
  - b) identify future reference points that will be used to demonstrate compliance;
  - c) collect new or review existing data, and report on the seasonal background levels for the noise catchment; and
  - d) confirm the noise levels from the Initial Operations.

*Note: Some construction activities may occur under the Project Approval provided that such activity are not undertaken during the monitoring period or that the Proponent can demonstrate that the activity would not contribute to the background noise level, to the satisfaction of the Secretary.*

#### Noise and Vibration Management Plan

32. The Proponent shall prepare and implement a Noise and Vibration Management Plan for the Project to the satisfaction of the Secretary. The Plan shall:
- a) be prepared by a suitably qualified and experienced expert whose appointment has been agreed to in writing by the Secretary;
  - b) be approved by the Secretary (see Conditions 49A and 49B for scope and timing and Condition 49C for management plan requirements);
  - c) demonstrate how noise levels from the Project would be managed to ensure noise levels would be 10dB(A) below noise levels from the Proponent's Initial Operations (see Conditions 30 and 31);
  - d) include a detailed monitoring program for reporting on ongoing compliance. The monitoring program shall:
    - outline the proposed receiver sites at Stockton and sites on Kooragang Island that would be monitored;
    - include both attended and unattended noise monitoring;
    - verify that actual noise levels from the Project are consistent with the predictions made in the EA;
    - verify that noise levels from the Project are 10dB(A) below the noise levels identified in Condition 31 for the Proponent's Initial Operations;
  - e) provide details of any complaints received in the preceding year relating to noise generated by the Project, and action taken to respond to those complaints;
  - f) detail procedures for implementing additional reasonable and feasible noise mitigation measures for the Project in response to exceedance of limits and/or noise complaints;
  - g) be updated annually, unless otherwise agreed to by the Secretary; and

- h) describe the measures that will be implemented to prevent and minimise potential adverse noise and vibration impacts from the Project, including:
- reasonable and feasible measures being employed on the Project site;
  - plant and equipment being maintained to ensure that it is in good order;
  - how potential noise and vibration impacts will be minimised and managed; and
  - identification of the likely nature and timing of Project-related activities and works that could generate potential elevated noise emissions and a description of the mitigation measures that will be implemented to ensure compliance with the relevant conditions of this approval and the EPL,

This Annual Noise Audit is undertaken in accordance with the Noise Management Plan (as current at the time) and addresses the relevant requirements of Condition 32 as shown in the Compliance register in Table 1 below. For completeness the compliance status of the “Noise Verification Program” (completed in 2011) against Condition 31 is also documented:

**Table 1. Compliance Register – Noise Conditions**

| Consent Condition                                                                                                                                                                                                                                                                                                                                                                        | Relevant Document and Section                                                                                                                                       | Compliance                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <p><b>Noise limits</b></p> <p><b>Condition 30:</b></p> <p>The Proponent shall ensure that noise levels from the operation of the Project are at least 10dB(A) below noise levels from Initial Operations as specified by conditions 31 &amp; 32 below.</p> <p><i>Note: Ammonia flaring events are excluded from the noise limits and levels referred to in conditions 30 and 31.</i></p> | <p>Criteria noted in Section 3.0 of Annual Noise Audit and Table 1 and Section 6.0 of Noise and Vibration Management Plan (NMP)</p>                                 | <p>Compliant</p>                                                 |
| <p><b>Initial Operations – Noise Verification Program</b></p> <p><b>Condition 31:</b></p> <p>Prior to the commencement of construction, the Proponent shall prepare and implement an Existing Operations Noise Verification Program to the satisfaction of the Secretary. The Program shall:</p>                                                                                         | <p>The Noise Verification Assessment prepared by Atkins acoustic and Associates Pty. Ltd (41.6521.R1:GA/DESKTOP/2011 Rev 02) was submitted to DPHI in May 2011.</p> | <p>Compliant and closed</p>                                      |
| <p>a) be undertaken by a suitably qualified and experienced person;</p>                                                                                                                                                                                                                                                                                                                  | <p>Atkins Acoustic and Associates Pty. Ltd. prepared the report</p>                                                                                                 | <p>Compliant and closed – Suitably qualified consultant used</p> |

| Consent Condition                                                                                                                                                                                                                                                                                                                                                           | Relevant Document and Section                                                                                                                                                                                                                                                         | Compliance           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| b) identify future reference points that will be used to demonstrate compliance;                                                                                                                                                                                                                                                                                            | Figure 2 of the 2011 Noise Verification Assessment identifies the original compliance noise monitoring locations.<br><br>Section 3.0, 4.0 and Figure 1 of the NMP and Figure 1 of the Annual Noise Audit discuss and identify the current Compliance Noise Monitoring locations used. | Compliant and closed |
| c) collect new or review existing data, and report on the seasonal background levels for the noise catchment;<br>and                                                                                                                                                                                                                                                        | Section 5.3 of the 2011 Noise Verification Assessment reviewed seasonal weather effects.                                                                                                                                                                                              | Compliant and closed |
| d) confirm the noise levels from the Initial Operations.<br><br><i>Note: Some construction activities may occur under the Project Approval provided that such activity is not undertaken during the monitoring period or that the Proponent can demonstrate that the activity would not contribute to the background noise level, to the satisfaction of the Secretary.</i> | Baseline noise assessment levels were documented in Table 6 of the 2011 Noise Verification Assessment.                                                                                                                                                                                | Compliant and closed |
| <b>Noise and Vibration Management Plan</b><br><b>Condition 32:</b><br><br>32. The Proponent shall prepare and implement a Noise and Vibration Management Plan for the Project to the satisfaction of the Secretary. The Plan shall:                                                                                                                                         | The previous Noise Management Plan (September 2021 NMP) was most recently approved on 11 October 2023 ref. MP08_0129-PA-31.                                                                                                                                                           | Compliant            |
| a) be prepared by a suitably qualified and experienced expert whose appointment has been agreed to in writing by the Secretary;                                                                                                                                                                                                                                             | Competence Statement provided in Section 2.2 of the Annual Noise Audit and Section 7 of the NMP.                                                                                                                                                                                      | Compliant            |

| Consent Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Relevant Document and Section                                                                                                                                                                       | Compliance |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| b) be approved by the Secretary (see Conditions 49A and 49B for scope and timing and Condition 49C for management plan requirements);                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The Noise Management Plan was most recently approved on 11 October 2023 ref. MP08_0129-PA-31 (September 2021 NMP).<br><br>This revision of the NMP (June 2024) will also be submitted for approval. | Compliant  |
| c) demonstrate how noise levels from the Project would be managed to ensure noise levels would be 10dB(A) below noise levels from the Proponent's Initial Operations (see Conditions 30 and 31);                                                                                                                                                                                                                                                                                                                                                                                                                    | Refer top Section 5 of the NMP                                                                                                                                                                      | Compliant  |
| d) include a detailed monitoring program for reporting on ongoing compliance. The monitoring program shall: <ul style="list-style-type: none"> <li>• outline the proposed receiver sites at Stockton and sites on Kooragang Island that would be monitored;</li> <li>• include both attended and unattended noise monitoring;</li> <li>• verify that actual noise levels from the Project are consistent with the predictions made in the EA;</li> <li>• verify that noise levels from the Project are 10dB(A) below the noise levels identified in Condition 31 for the Proponent's Initial Operations;</li> </ul> | Refer to Section 6 of the NMP<br><br>Assessment of noise trends undertaken in Section 5.2.9 of Annual Noise Audit and in Section 7.1.2 of AEMR                                                      | Compliant  |
| e) provide details of any complaints received in the preceding year relating to noise generated by the Project, and action taken to respond to those complaints;                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Refer to Section 6.5 of NMP.<br><br>Refer to Section 5.2.6 and Attachment 2 of the Annual Noise Audit.                                                                                              | Compliant  |
| f) detail procedures for implementing additional reasonable and feasible noise mitigation measures for the Project in response to exceedance of limits and/or noise complaints;                                                                                                                                                                                                                                                                                                                                                                                                                                     | Refer to Section 6.3, 6.4, 6.5 and 7.0 of NMP                                                                                                                                                       | Compliant  |

| Consent Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Relevant Document and Section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Compliance       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <p>g) be updated annually, unless otherwise agreed to by the Secretary; and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>As noted in Section 8.4 and approved on 11 October 2023 ref. MP08_0129-PA-31 (September 2021 NMP).</p> <p><i>“The NMP will be reviewed periodically or as directed by the Secretary of the Department. The review will reflect changes to site operating conditions and assessment guidelines.</i></p> <p><i>As required or directed by the Secretary of the Department, the NMP will be updated and actions undertaken to improve the effectiveness of monitoring and follow-up investigations and management practices.”</i></p> | <p>Compliant</p> |
| <p>h) describe the measures that will be implemented to prevent and minimise potential adverse noise and vibration impacts from the Project, including:</p> <ul style="list-style-type: none"> <li>• reasonable and feasible measures being employed on the Project site;</li> <li>• plant and equipment being maintained to ensure that it is in good order;</li> <li>• how potential noise and vibration impacts will be minimised and managed; and</li> <li>• identification of the likely nature and timing of Project-related activities and works that could generate potential elevated noise emissions and a description of the mitigation measures that will be implemented to ensure compliance with the relevant conditions of this approval and the EPL.</li> </ul> | <p>Refer to Section 5.2, 5.3, 5.4, 5.5 of the NMP</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Compliant</p> |



## 4.0 PROJECT SPECIFIC NOISE CRITERIA

Night-time attended audits reported for the monitoring locations on Kooragang Island (2011) confirmed noise from *Orica* was steady state with minimal influence from other industrial sources. At the reference monitoring locations, it was reported there was minimal variation between the measured  $L_{A90}$  and  $L_{Aeq}$  levels.

Referring to the *Departments* Conditions for assessing noise trends and compliance status, operational noise resulting from *the Project* should be at least 10dBA below levels from *Orica's* existing plant. *Table 2* presents a summary of the baseline background levels and the Project noise criteria.

**Table 2. Project Noise Criteria**

*dBA re:  $20 \times 10^{-6}$  Pa*

| Reference Assessment Location | Baseline Background Sound Pressure Levels | Project Noise Criteria |
|-------------------------------|-------------------------------------------|------------------------|
|                               |                                           | dBA                    |
| Assessment Location R4        | 62                                        | 52                     |
| Assessment Location R5        | 57                                        | 47                     |
| Assessment Location R6        | 56                                        | 46                     |

### 4.1 Stockton Noise Criteria

Modelling reported for *the Project* (Atkins Acoustics Feb '09) predicted noise levels would satisfy *the Project* criteria. *Table 3.* presents a summary of noise levels predicted for the Stockton reference residential assessment locations from the existing plant and *the Project* for calm weather conditions.

**Table 3. Predicted Pre Uprate and Project Noise Contributions**

*dBA re:  $20 \times 10^{-6}$  Pa*

| Reference Assessment Location | Predicted Sound Pressure Levels |                             |
|-------------------------------|---------------------------------|-----------------------------|
|                               | dBA                             |                             |
|                               | Pre-Uprate Noise Levels         | Uprated Plant Contributions |
| Assessment Location R1        | 50                              | 37                          |
| Assessment Location R2        | 53                              | 41                          |
| Assessment Location R3        | 51                              | 39                          |

## 5.0 RESULTS AND ASSESSMENT

For the assessment of noise from *the Project* and compliance status, it was recognised that demonstration of compliance would be difficult to confirm by direct measurement alone due to the variability of ambient background levels and contributions being greater than 10dB below the pre-uprate level. Therefore, to assess compliance with *the Project* noise criteria in accordance with the *NMP*, it was proposed to:

- Update the site noise model following the commencement of operation of *the Project* to determine contributions from *the Project*; and
- undertake attended and unattended monitoring at the reference locations to assess changes in ambient background levels and noise trends.

### 5.1 Noise Model Updating

Modelling reported in the *Kooragang Island Noise Assessment (Report Number 39.6357.R1:GACD03 Rev 3, Atkins Acoustics, 2009)* was updated to determine predicted noise contributions from *the Project*.

*Table 4* presents a summary of the predicted pre-uprate noise contributions and levels from *the Project* (phase one). Compliance with *the Project* Approval Conditions was to be assessed against the pre-uprate noise levels.

**Table 4. Predicted Baseline and Project Noise Contributions**

*L<sub>Aeq</sub> re: 20 x 10<sup>-6</sup> Pa*

| Operating Plant Conditions                                           | Predicted Sound Pressure Level<br>dBA |      |      |      |      |      |
|----------------------------------------------------------------------|---------------------------------------|------|------|------|------|------|
|                                                                      | R1                                    | R2   | R3   | R4   | R5   | R6   |
| Pre Uprate                                                           | 50.4                                  | 52.1 | 49.9 | 66.3 | 62.6 | 59.1 |
| Uprate Plant (Phase one) Ammonia Plant Compressor and 183L Generator | 19.7                                  | 22.3 | 21.1 | 23.5 | 32.9 | 41.7 |

### 5.2 Site Attended Noise Audit (April 2025)

For noise compliance purposes attended audit measurements were undertaken on Wednesday night 16 April 2025. The noise measurements were conducted in accordance with procedures referenced in Australian Standard AS1055-1997 '*Acoustics - Description and Measurement of Environmental Noise*' and the *Noise Policy for Industry* (EPA 2017).

#### 5.2.1 Measurement Instrumentation

Instrumentation for the attended and unattended noise monitoring comprised Class 1 Svantek 949 and Svantek 957 Sound Level Meters. The instruments manufactured prior 2019 meet AS/NZS IEC 61672.1:2013 *Electroacoustics: sound level meter specifications* standards.

Instrumentation reference calibration levels were checked with a portable Bruel & Kjaer calibrator before and after the audit measurements to verify that the variation remained within  $\pm 0.5\text{dB}$ . The calibrator manufactured prior before 2017 meets AS/NZS IEC 60942:2017 *Electroacoustics: sound calibrators* standards.

Copies of the meter calibration certificates are available on request.

### 5.2.2 Noise Descriptors

Instrumentation was set for measurement time interval of 15 minutes and 'fast' (F) time weighting.

The noise descriptors for the purpose of the measurements included the following:

- equivalent A-weighted continuous sound level ( $L_{Aeq,T}$ )
- maximum A-weighted sound pressure level ( $L_{AFmax,T}$ )
- A-weighted sound pressure level exceeded for 90% of the measurement time ( $L_{AF90,T}$ )
- A-weighted sound pressure level exceeded for 10% of the measurement time ( $L_{AF10,T}$ ).

### 5.2.3 Meteorological Observations

Prevailing weather conditions during noise monitoring were extracted from data reported for Newcastle Nobby Signal Station (Lat:-32.92, Lon: 151.80, Height: 33.0m). During the attended noise audit, meteorological conditions varied from clear skies to overcast with rain showers, air temperature  $18^{\circ}\text{C}$ , south to south-west  $<5\text{m/sec}$  and relative humidity 86%.

### 5.2.4 Measurement Locations

Resulting from onsite construction works reference measurement location R6 was relocated to the site boundary and approximately fifty (50) metres south.

### 5.2.5 Site Operating Conditions

During the attended night audit and unattended measurements *Orica's* site operations were reported as normal.

### 5.2.6 Review of Complaints Reports

Orica's Senior Specialist - Environment confirmed two (2) noise complaints were reported during the period between June '24 and April '25 and investigated by staff. The reported noise complaints (29 July '24) related to the Ammonia plant during the process of shutting down when it tripped leading to a crash shut. This required the ammonia plant to vent to maintain safe operation, causing the short-term elevated noise levels. Given the plant shutdown occurred as designed, no specific correction actions were possible to prevent recurrence.

### 5.2.7 Site Attended Noise Measurement Results

Table 5 presents a summary of attended noise measurements and observations. During the attended night audit ambient background  $L_{A90}$  levels at Stockton were influenced by Orica and local intermittent road traffic.

Attended audits on Kooragang Island confirmed noise from Orica was steady state. The measurements confirmed Orica related maximum ( $L_{Amax}$ ) levels were not observed to cause exceedances greater than 5dBA above the  $L_{Aeq}$  levels.

Orica noise sources identified at the Stockton/Kooragang Island reference monitoring locations during attended audit included:

- General operational noise
- Ammonia Plant,
- NAP and AN Plants

**Table 5 Attended Noise Measurement Results/Observations**

dBA re:  $20 \times 10^{-6}$  Pa

| Location                | Sound Pressure Level<br>dBA |          |           |           |           |           | Comment                                                                                                                |
|-------------------------|-----------------------------|----------|-----------|-----------|-----------|-----------|------------------------------------------------------------------------------------------------------------------------|
|                         | $L_{Amax}$                  | $L_{A1}$ | $L_{A10}$ | $L_{A50}$ | $L_{A90}$ | $L_{Aeq}$ |                                                                                                                        |
| R1-284 Fullerton Street | 59.8                        | 57.6     | 54.5      | 50.4      | 50.4      | 52.4      | Ammonia plant; General Orica plant; Intermittent passing road traffic.                                                 |
| R2-220 Fullerton Street | 60.5                        | 58.1     | 55.4      | 53.3      | 50.6      | 53.4      | Ammonia plant; General Orica plant; Intermittent road traffic.                                                         |
| R3-184 Fullerton Street | 69.2                        | 67.1     | 56.9      | 48.4      | 47.0      | 55.3      | General Orica plant; Intermittent passing road traffic.                                                                |
| R4-Roadside (South)     | 65.2                        | 61.9     | 60.7      | 59.8      | 58.9      | 60.5      | General Orica plant; AN1 vent/valve/pipe noise; Steam pipe hammer $L_{Amax}$ 64/5dBA.                                  |
| R5-Riverside (Central)  | 62.5                        | 61.1     | 58.7      | 57.5      | 56.6      | 57.8      | Ammonia Plant; Steam pipe vent $L_{Amax}$ 60/1dBA; General Orica plant; AN1 vent/valve/pipe noise; NAP cooling towers. |
| R6-Roadside (North)     | 67.2                        | 66.1     | 65.2      | 64.4      | 63.7      | 64.6      | Ammonia Plant; Steam flow in pipes and venting; General Orica plant; Low frequency generator noise Air Liquide.        |

## 5.2.8 Unattended Noise Measurement Results

Table 6 presents a summary of the measured  $L_{A90}$  and  $L_{Aeq}$  levels from Wednesday 16 April May to Thursday 24 April 2025. Attachment 1 presents a summary of the measurement results in graphical form. Prevailing meteorological conditions reported for the audit included extended rain periods and winds greater than 5m/sec Noise measurements during these periods in accordance with *NPfI* procedures were removed from the results.

**Table 6. Summary of Rating Background (RBL) and Ambient Levels**

(Wednesday 16 April - Thursday 24 April 2025)

dBA re:  $20 \times 10^{-6}$  Pa

| Measurement Location                                         | Ambient Sound Pressure Levels |         |       |                    |         |       |
|--------------------------------------------------------------|-------------------------------|---------|-------|--------------------|---------|-------|
|                                                              | DBA                           |         |       |                    |         |       |
|                                                              | RBL                           |         |       | Ambient Levels     |         |       |
|                                                              |                               |         |       | $L_{Aeq}$ , period |         |       |
|                                                              | Day                           | Evening | Night | Day                | Evening | Night |
| RBL                                                          | 50.1                          | 50.2    | 50.8  |                    |         |       |
| Logarithmic Average $L_{Aeq}$                                |                               |         |       | 62.3               | 58.8    | 58.7  |
| <b>R2. 220 Fullerton Road (Residential)</b>                  |                               |         |       |                    |         |       |
| RBL                                                          | 48.9                          | 48.0    | 48.1  |                    |         |       |
| Logarithmic Average $L_{Aeq}$                                |                               |         |       | 59.1               | 57.8    | 54.9  |
| <b>R3. 184 Fullerton Road (Residential)</b>                  |                               |         |       |                    |         |       |
| RBL                                                          | 48.4                          | 48.9    | 48.4  |                    |         |       |
| Logarithmic Average $L_{Aeq}$                                |                               |         |       | 59.6               | 60.8    | 57.9  |
| <b>R4. Greenleaf Road Roadside Boundary (South)</b>          |                               |         |       |                    |         |       |
| RBL                                                          | 57.6                          | 58.5    | 59.1  |                    |         |       |
| Logarithmic Average $L_{Aeq}$                                |                               |         |       | 61.3               | 60.2    | 60.5  |
| <b>R5. Greenleaf Road Riverside Pump Station (Centre)</b>    |                               |         |       |                    |         |       |
| RBL                                                          | 50.2                          | 51.1    | 52.4  |                    |         |       |
| Logarithmic Average $L_{Aeq}$                                |                               |         |       | 58.6               | 53.1    | 56.4  |
| <b>R6. Greenleaf Road Road Site Boundary Carpark (North)</b> |                               |         |       |                    |         |       |
| RBL                                                          | 61.8                          | 62.9    | 63.8  |                    |         |       |
| Logarithmic Average $L_{Aeq}$                                |                               |         |       | 65.9               | 65.5    | 66.3  |

Notes: Daytime: 7.00am to 6.00pm Monday to Saturday, 8.00am to 6.00pm Sunday and Public Holidays.

Evening: 6.00pm to 10.00pm.

Night: 10.00pm to 7.00am Monday to Saturday, 10.00pm to 8.00am Sunday and Public Holidays.

## 5.2.9 Assessment of Noise Trends

For assessing noise trends associated with *Orica*, the *NMP* recommends that future noise monitoring on Kooragang Island (R4, R5 and R6) be considered. Baseline RBL's established for the Kooragang Island monitoring locations are referenced in *Atkins Acoustic (September 2012)*.

The results summarised in Table 7 demonstrate the night-time RBL at R4 (59.1) is marginally (0.3dB) lower than the long-term median level of 59.4, for R5 the RBL (52.4dB) is 3dB lower than the long-term medium of 55.6dB and for R6 the RBL (63.7) is 0.8dB higher than the long-term medium of 62.9dB

**Table 7. Baseline RBL Noise Trends**  
*dBA re:  $20 \times 10^{-6}$  Pa*

| Reference<br>Measurement<br>Location | Ambient Background RBL's<br>dBA |        |            |
|--------------------------------------|---------------------------------|--------|------------|
|                                      | Range                           | Median | April 2025 |
| R4 - Roadside (South)                | 54.2 to 63.0                    | 59.4   | 59.1       |
| R5 - Riverside (Central)             | 48.5 to 60.7                    | 55.6   | 52.4       |
| R6 - Roadside (North)                | 59.4 to 65.4                    | 62.9   | 63.7       |

## 6.0 SUMMARY

*Atkins Acoustics* was retained by *Orica* to conduct an environmental noise audit for the Kooragang Island plant. The audit included attended and unattended measurements at Stockton and on Kooragang Island during April 2025.

Resulting from onsite construction works reference measurement location R6 was relocated to the site boundary, approximately fifty (50) metres south of the previous monitoring location.

*Orica's Senior Specialist - Environment* confirmed two (2) noise complaint were reported during the twelve (12) months from June '24 to April '25 and investigated by staff. The two (2) reported noise complaints related to the Ammonia Plant shut down.

Prevailing weather conditions during noise monitoring were extracted from data reported for Newcastle Nobby Signal Station (Lat:-32.92, Lon: 151.80, Height: 33.0m). During the attended noise audit, meteorological conditions varied from clear skies to overcast with rain showers, air temperature 18°C, south to south-west <5m/sec and relative humidity 86%.

*Orica* noise sources identified at the Stockton/Kooragang Island reference monitoring locations during attended audit, included:

- General operational noise;
- NAP gallery steam pipe hammer;.
- AN1 vent/valve/pipe noise;
- NAP cooling towers;
- Ammonia Plant steam and valves;
- Low frequency generator noise Air Liquide .

The measurement results summarised in *Table 7* demonstrate the night-time RBL at R4 (59.1) is marginally (0.3dB) lower than the long-term median level of 59.4, for R5 the RBL (52.4dB) is 3dB lower than the long-term medium of 55.6dB and for R6 the RBL (63.7) is 0.8dB higher than the long-term medium of 62.9dB

The findings from the April 2025 audit demonstrate noise attributes from *the Project* satisfied the project noise criteria.

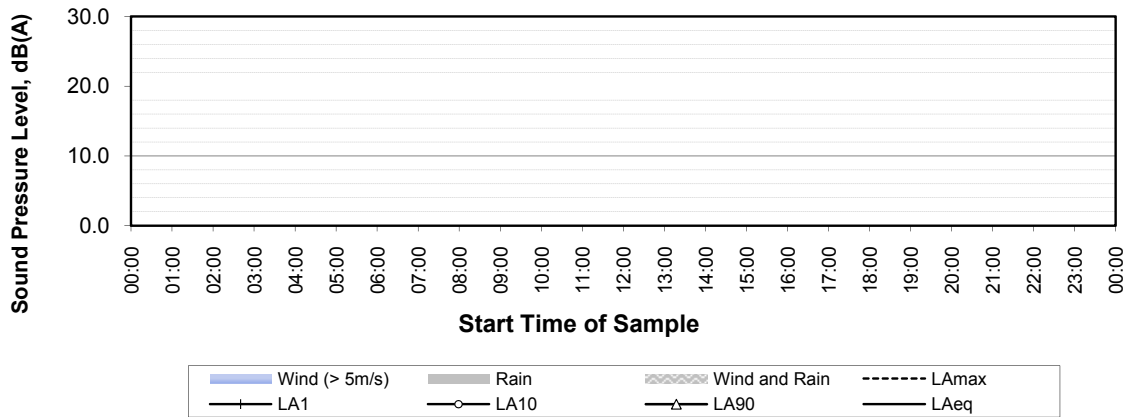
Attended night audits confirmed that *Orica* related maximum ( $L_{Amax}$ ) levels were not observed to cause exceedances greater than 5dBA above the measured  $L_{Aeq}$  levels at the referenced residential monitoring locations.

## **ATTACHMENT 1. AMBIENT SOUND PRESSURE LEVEL MEASUREMENT RESULTS**

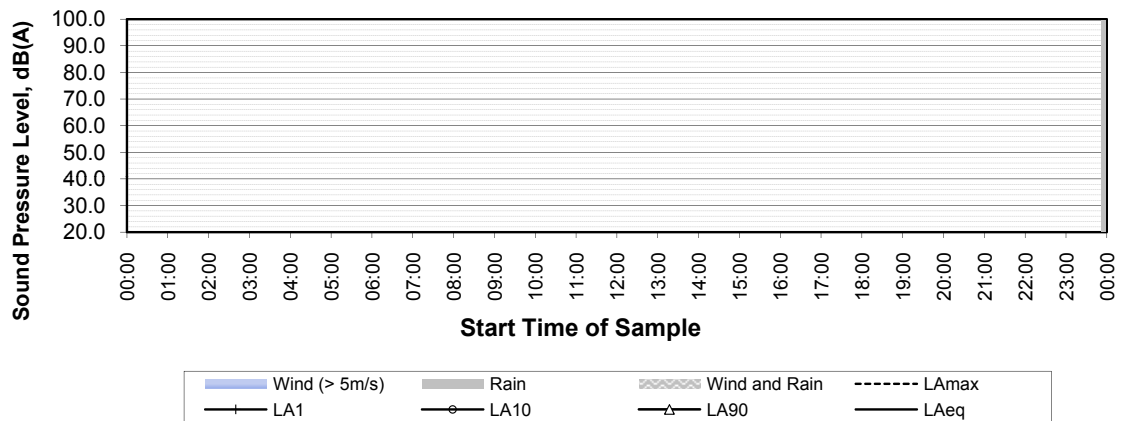


# Ambient Sound Pressure Levels

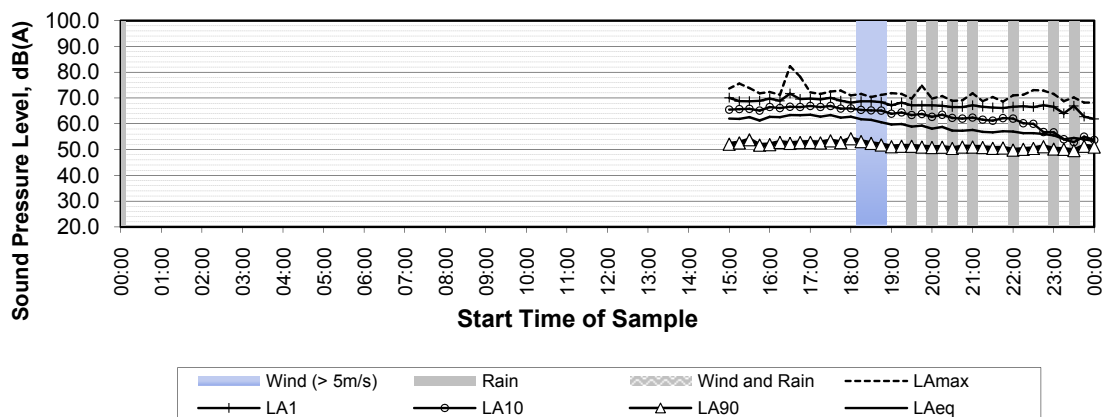
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Tuesday, 15 April 2025



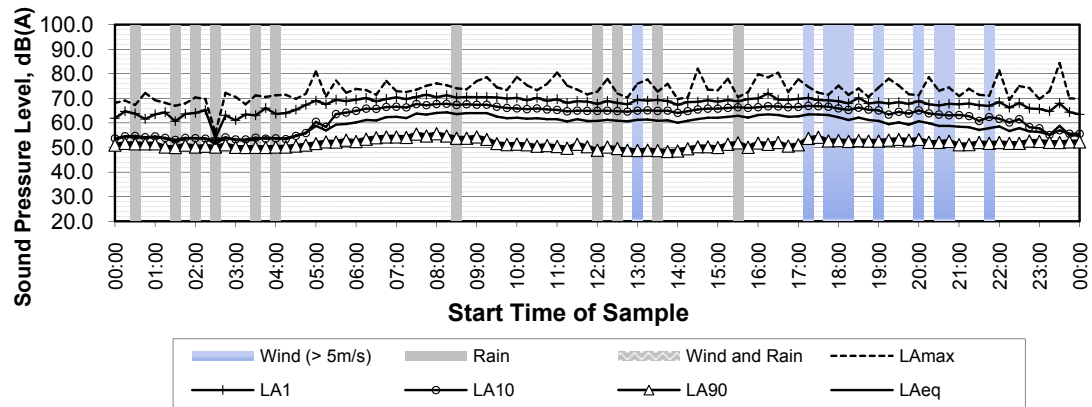
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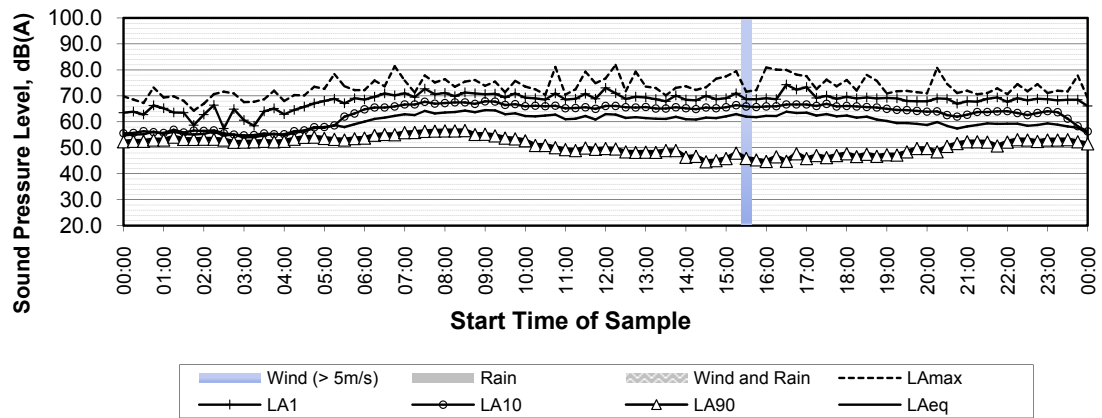
Reference Measurement R1  
284 Fullerton Road

# Ambient Sound Pressure Levels

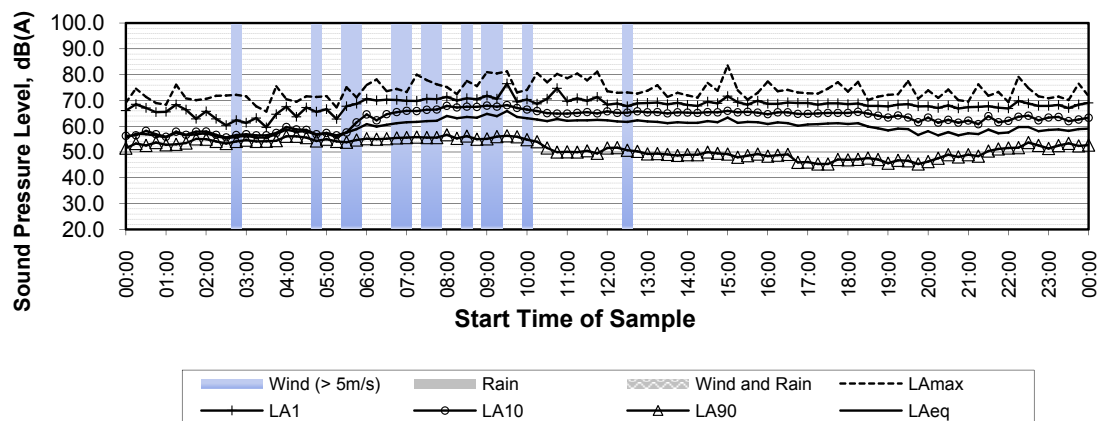
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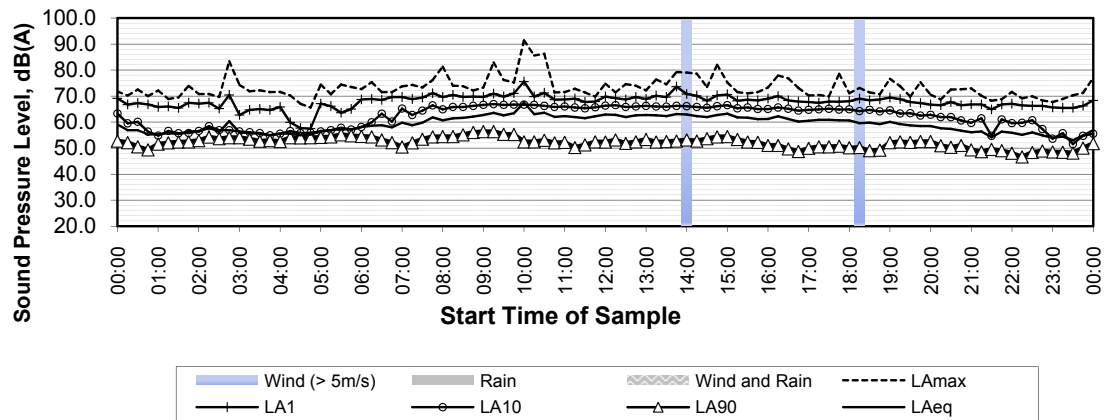
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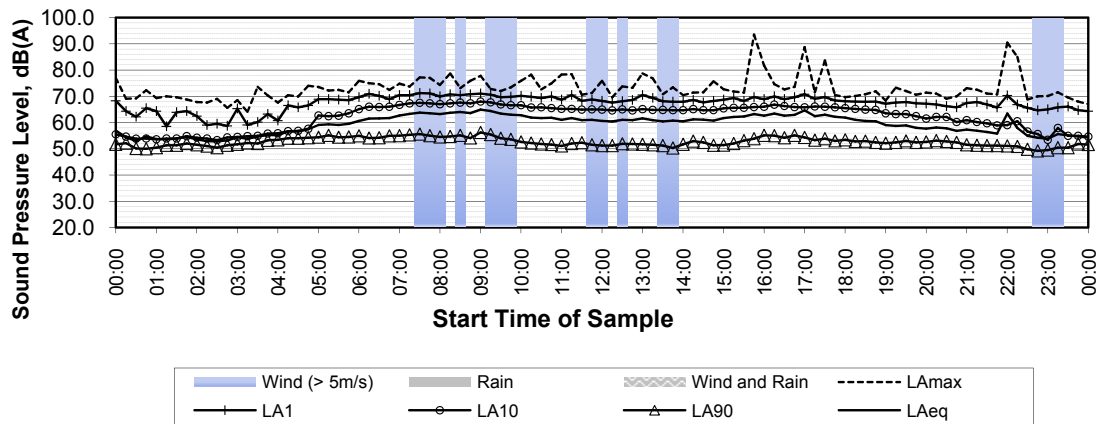
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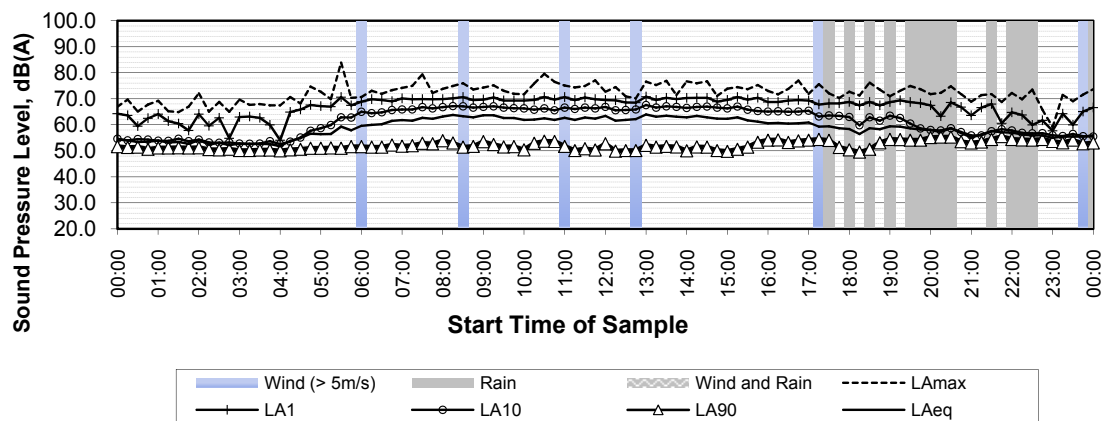
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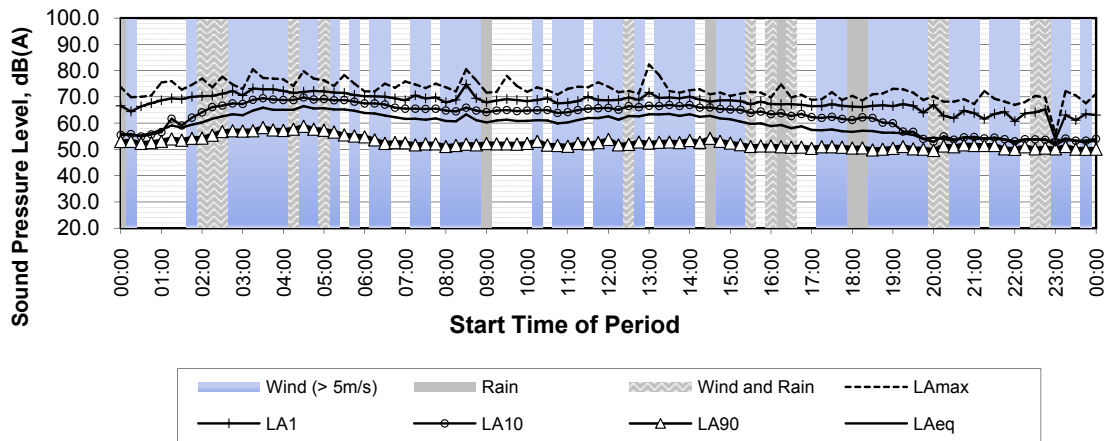
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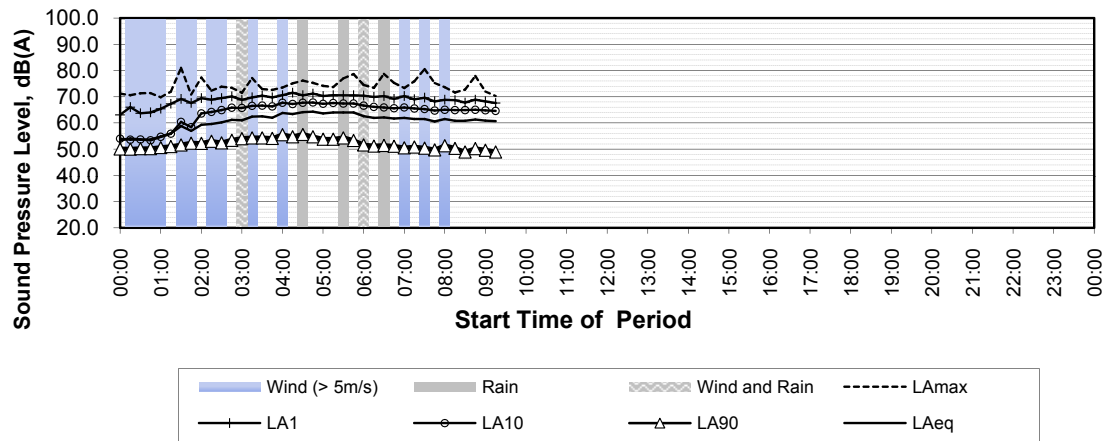
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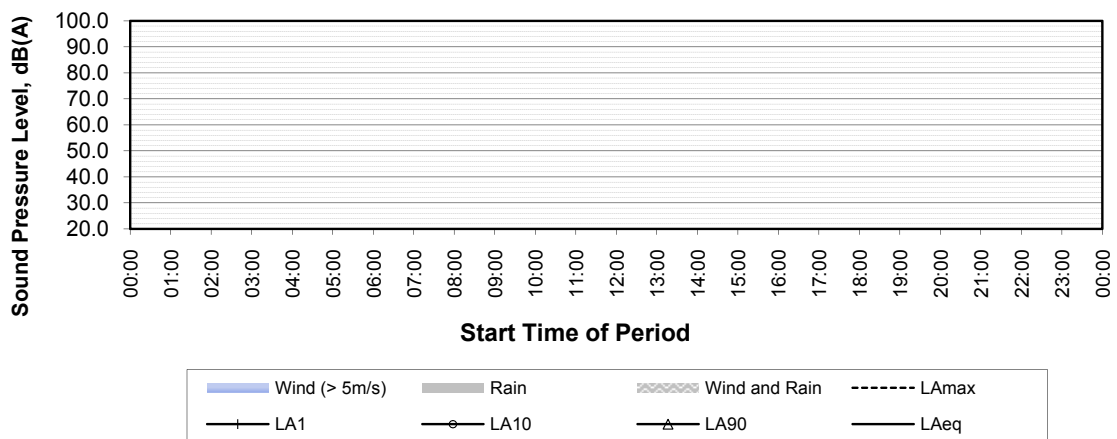
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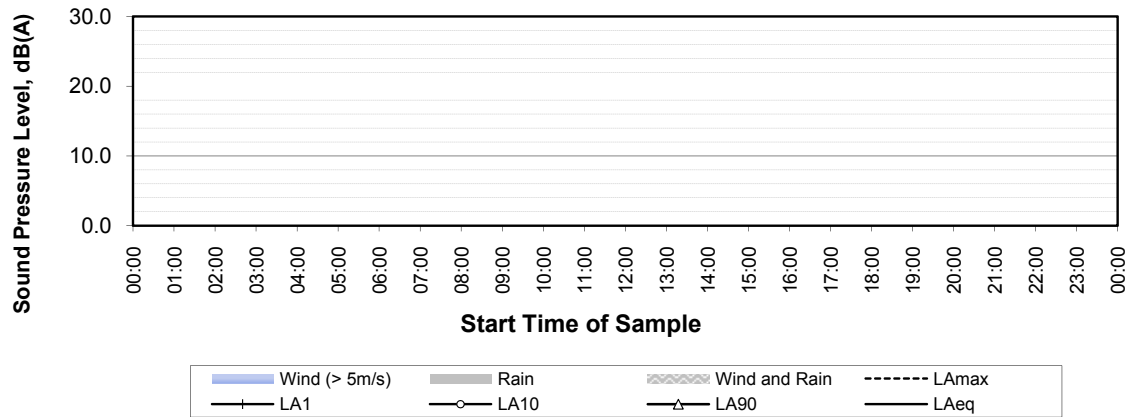
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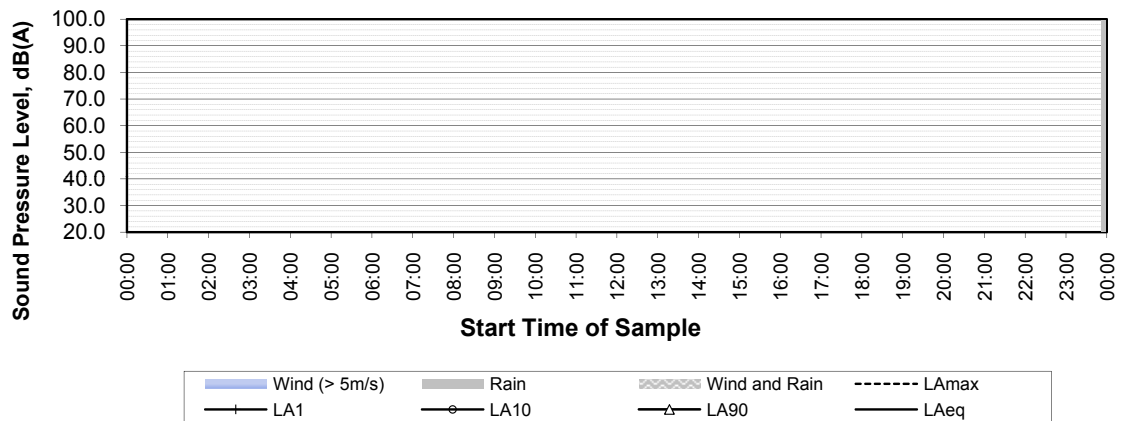
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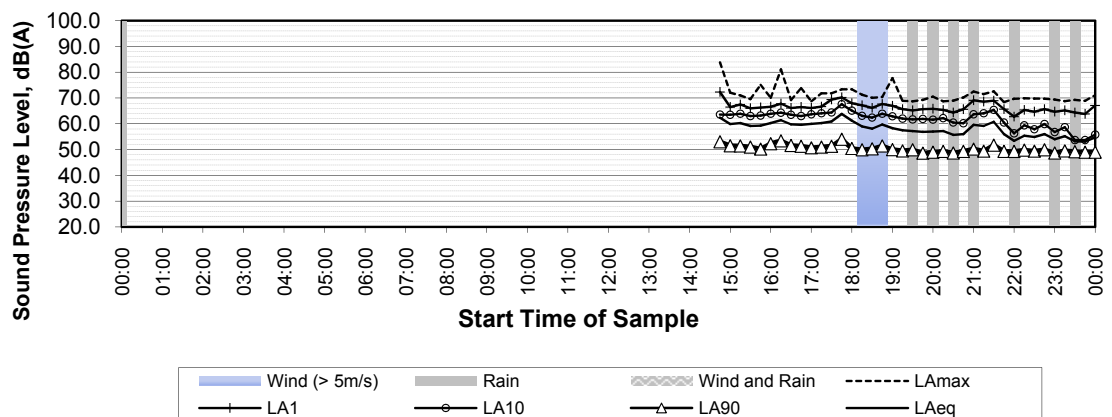
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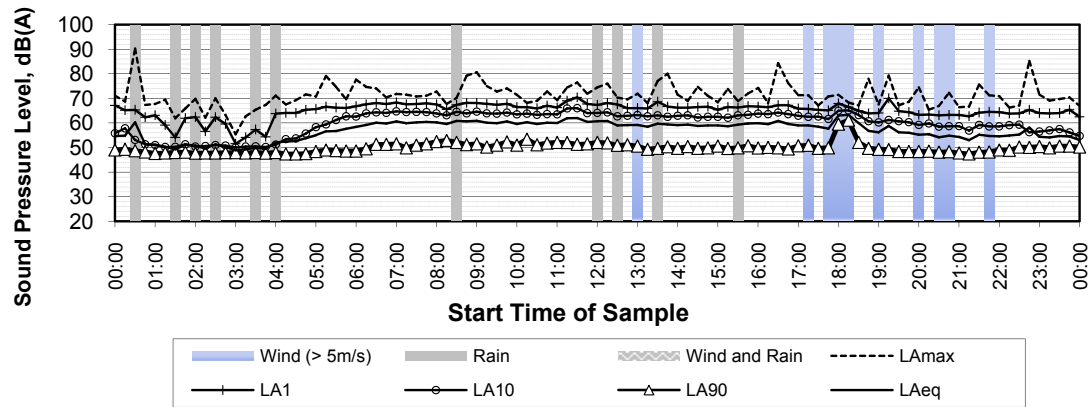
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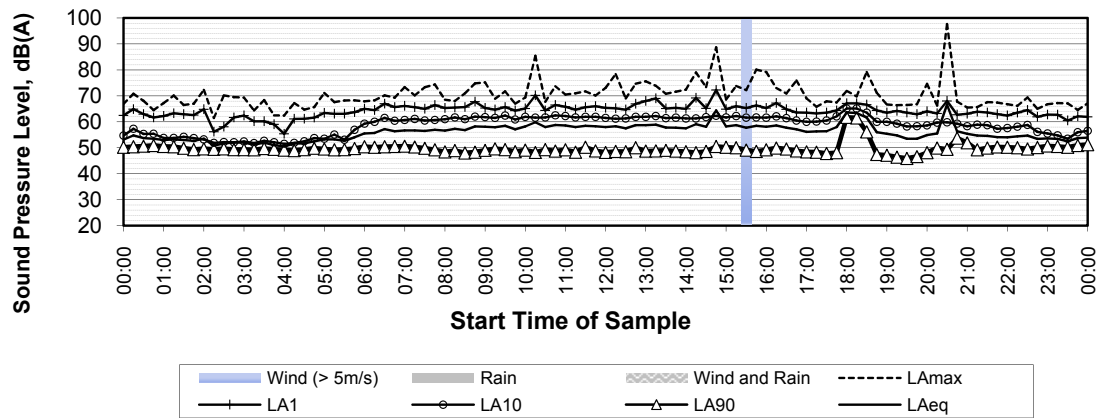
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220 Fullerton Road

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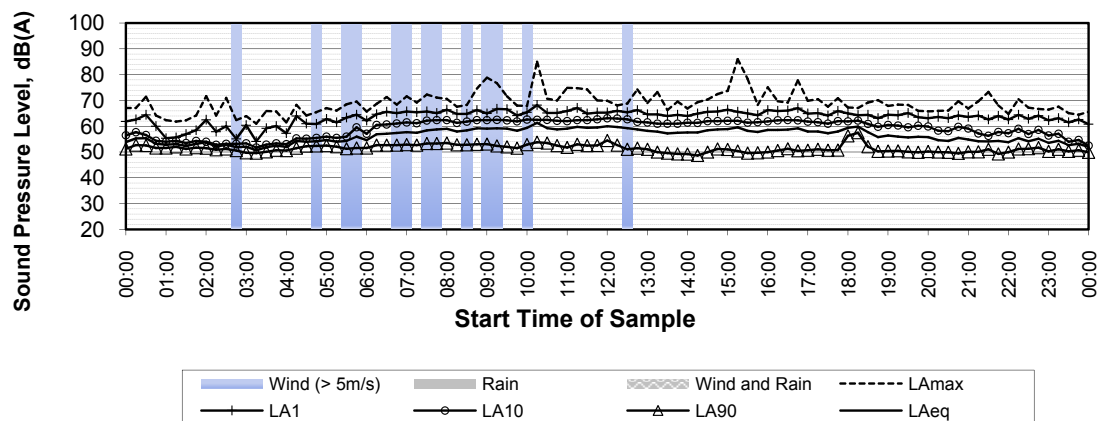
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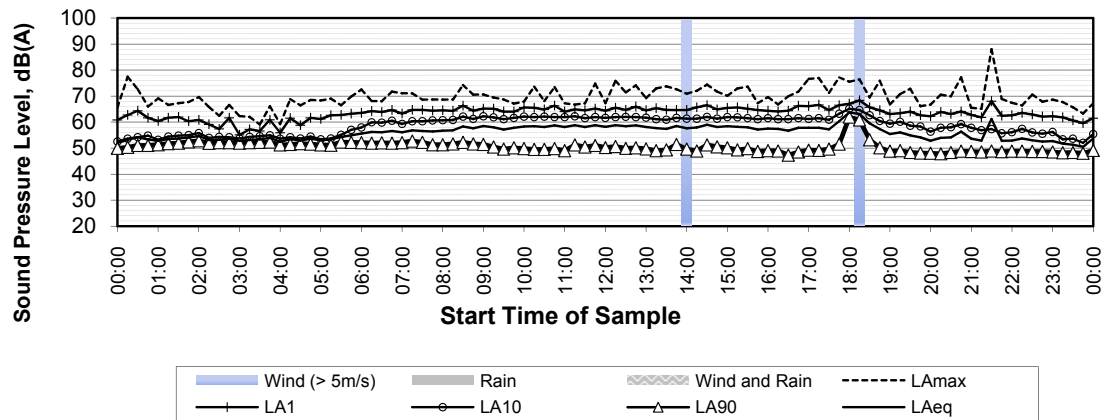
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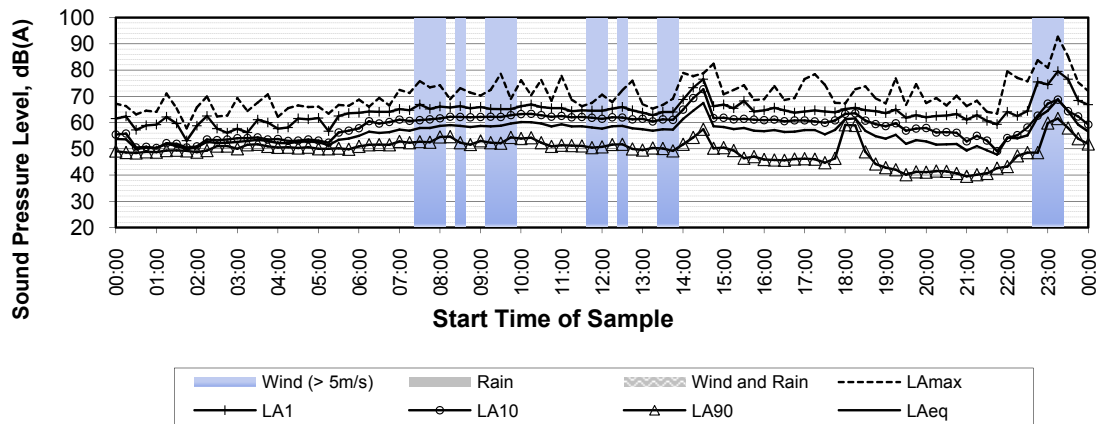
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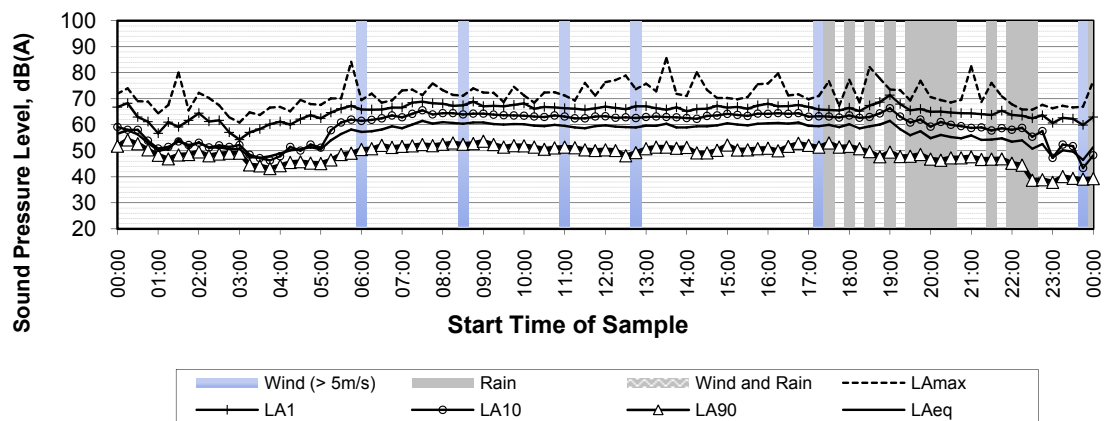
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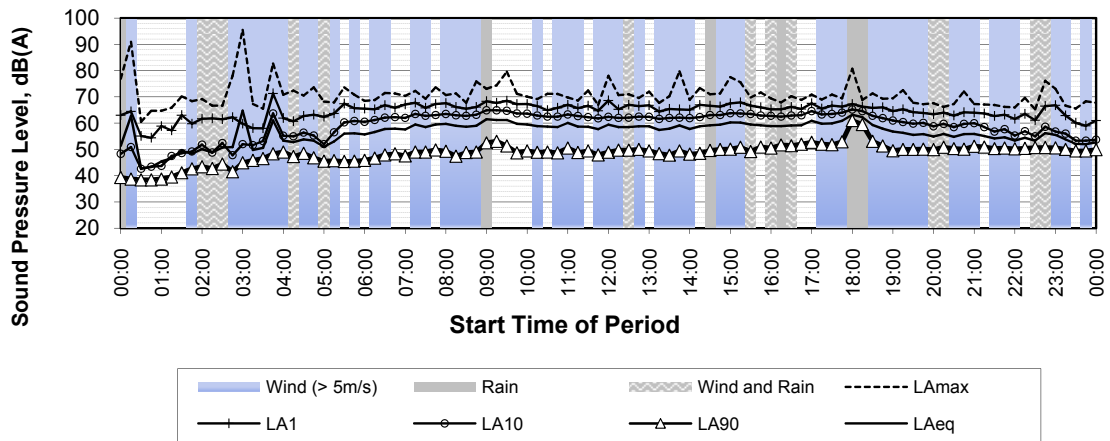
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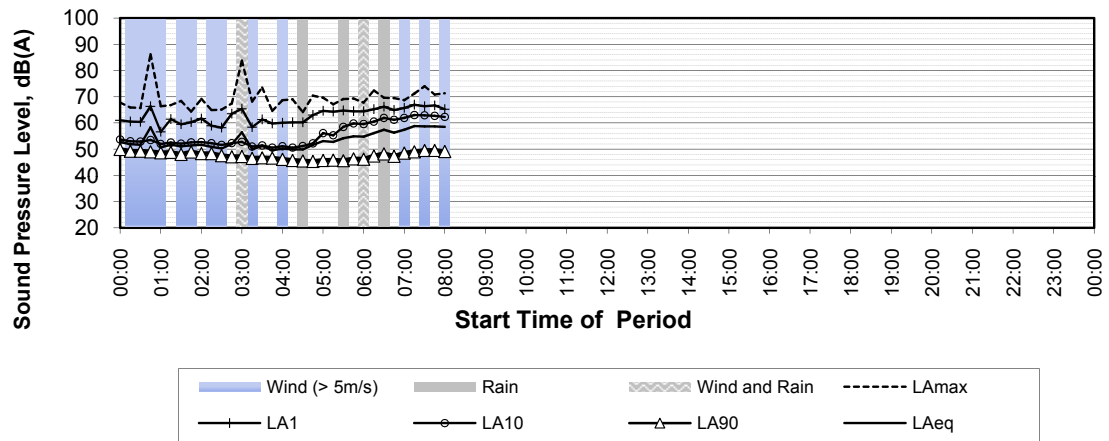
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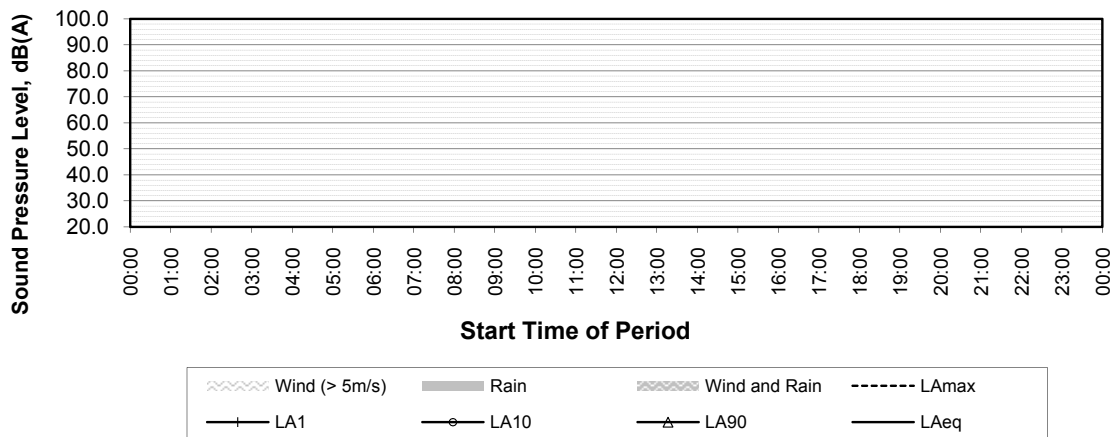
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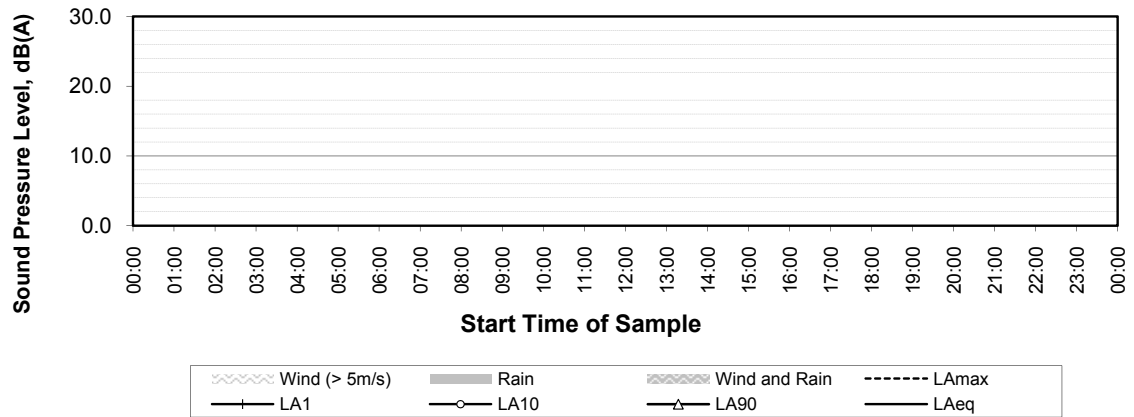


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220 Fullerton Road

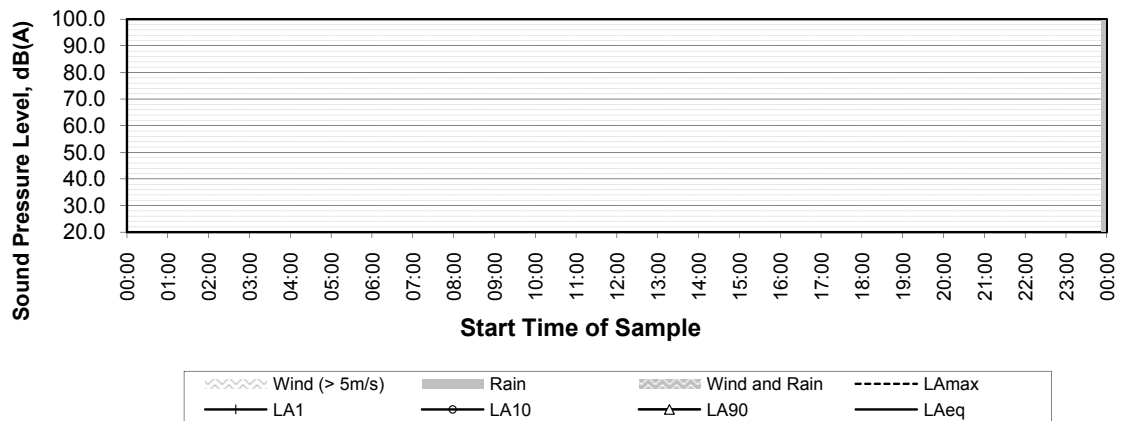


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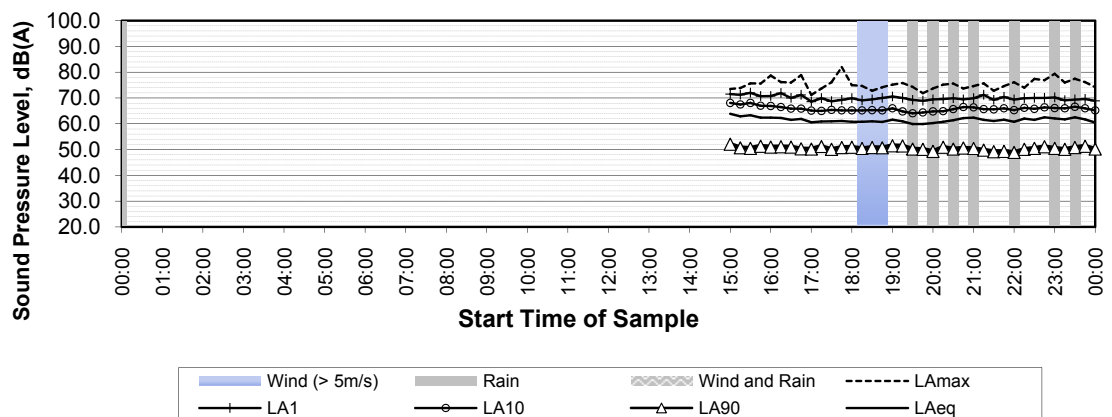
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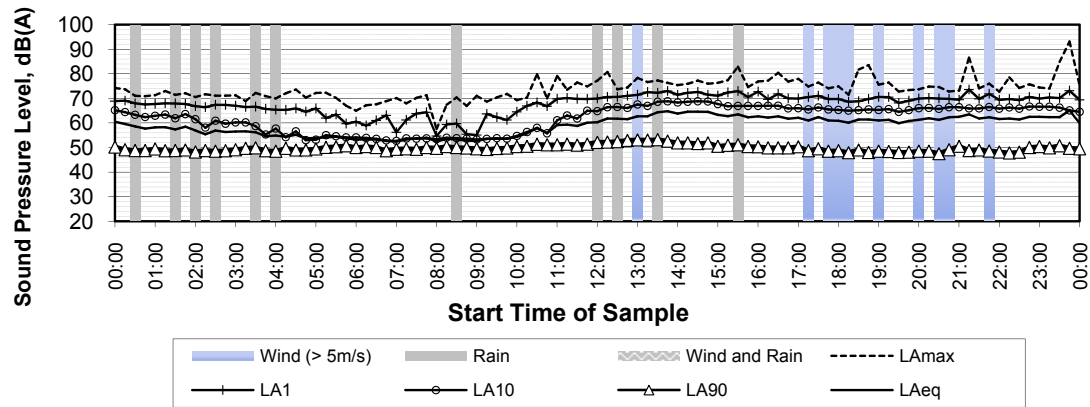
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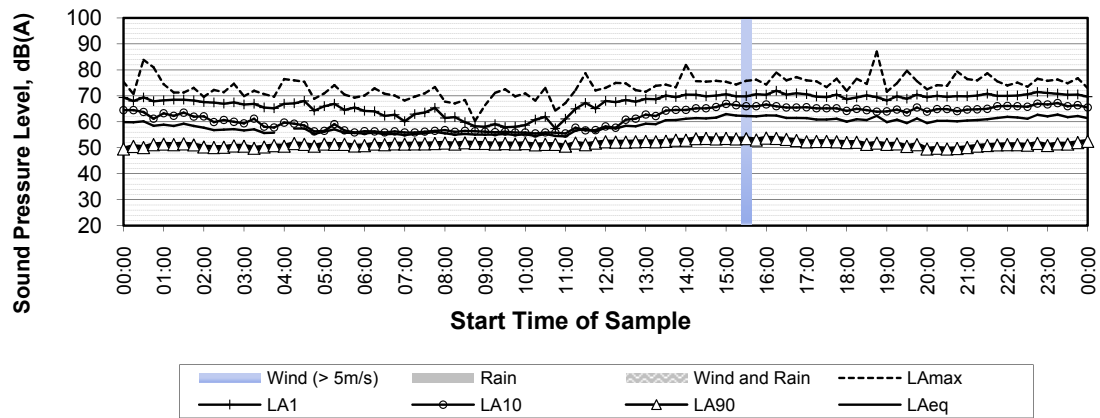
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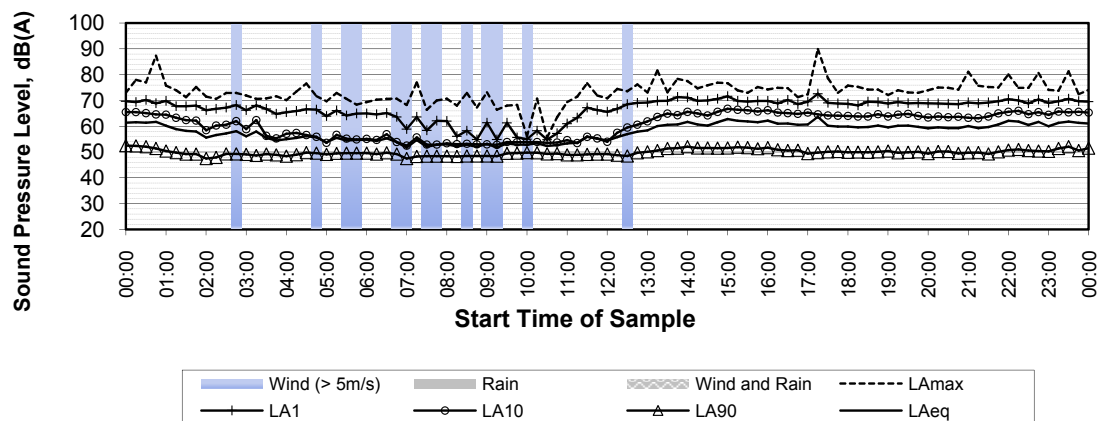
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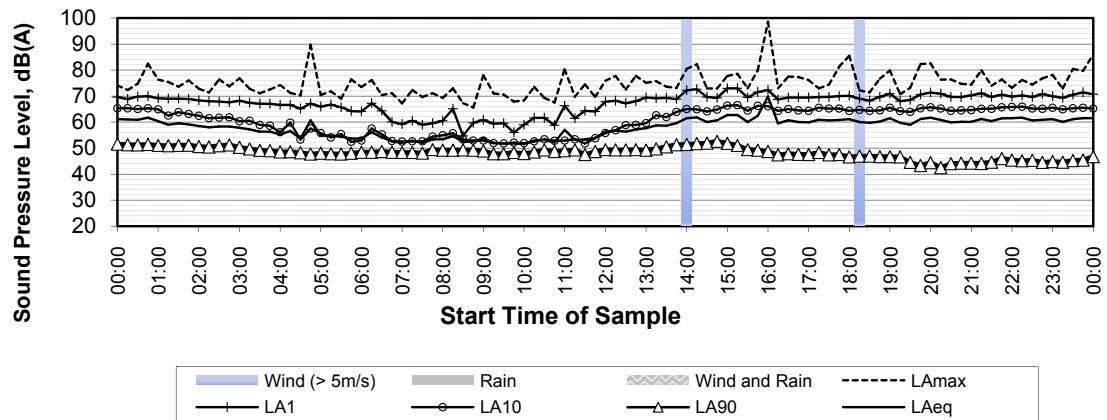
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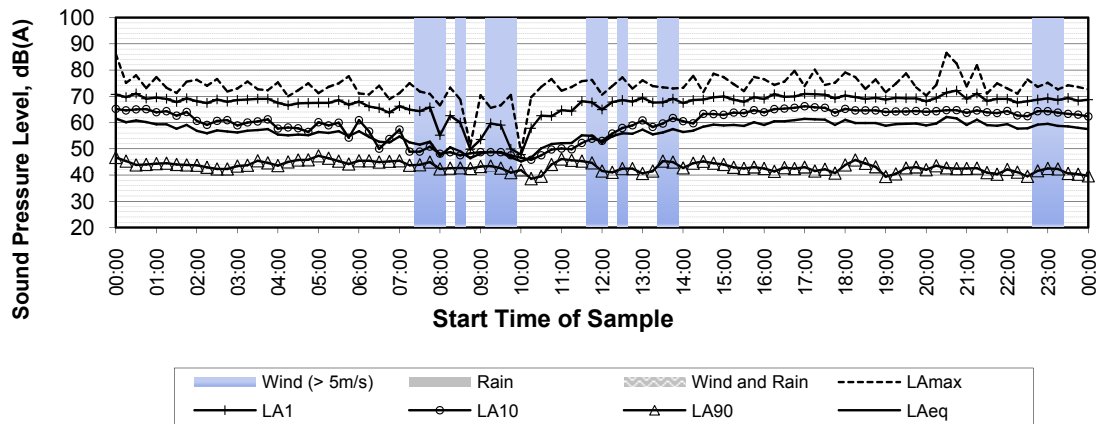
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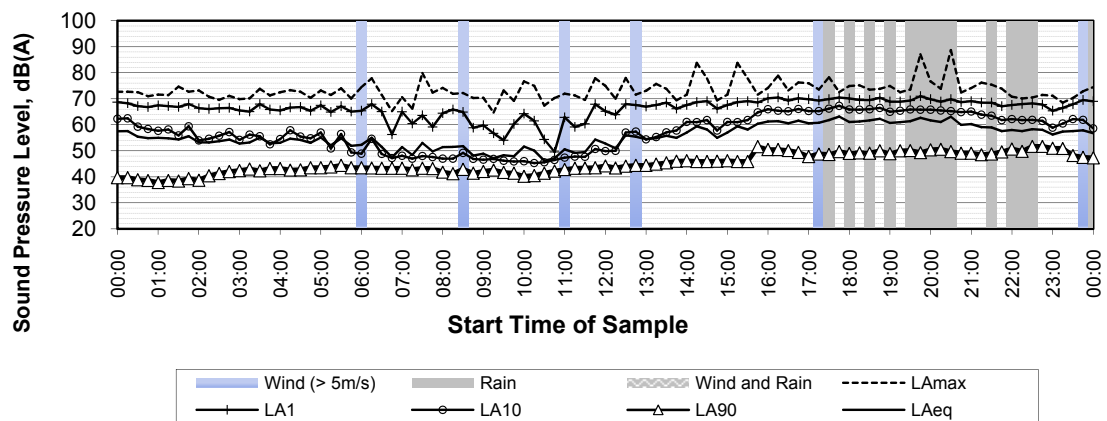
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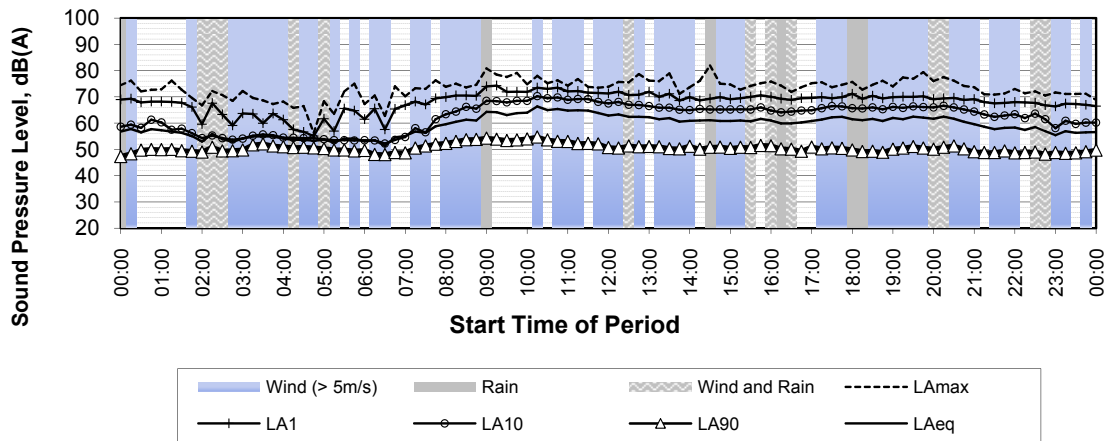
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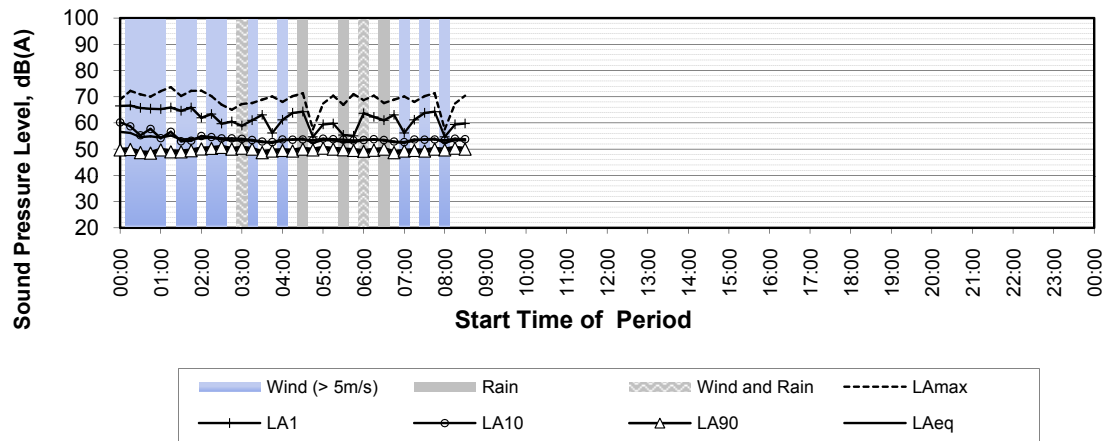
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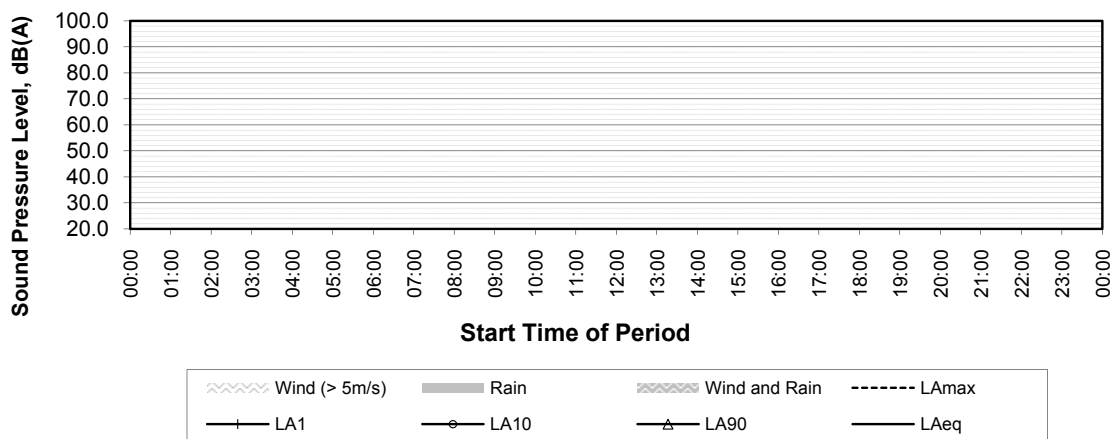
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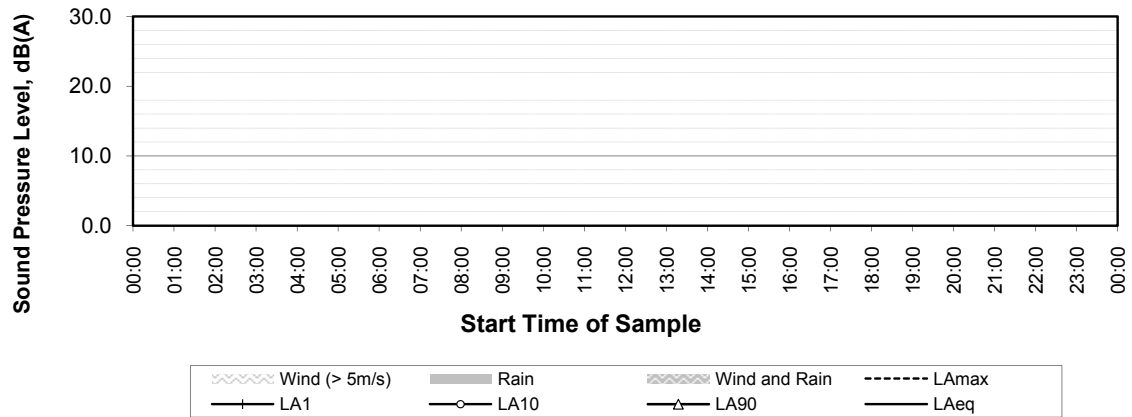
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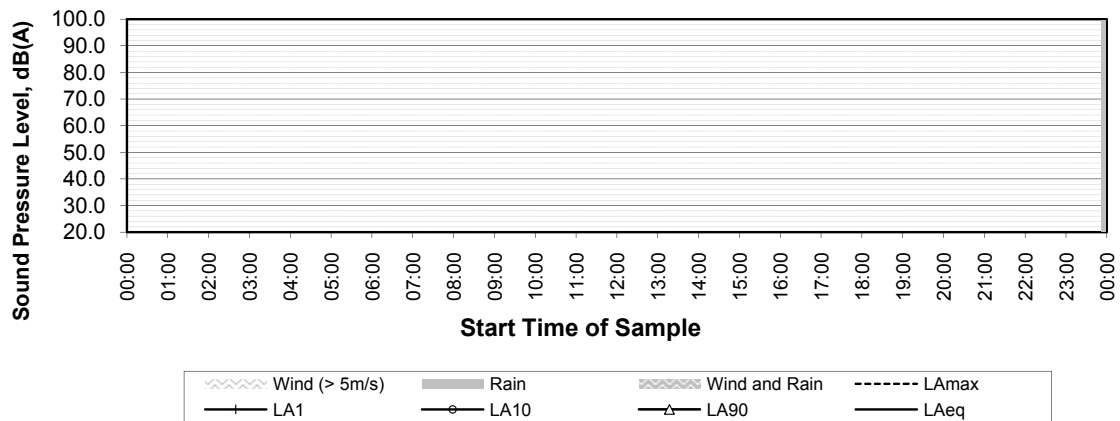
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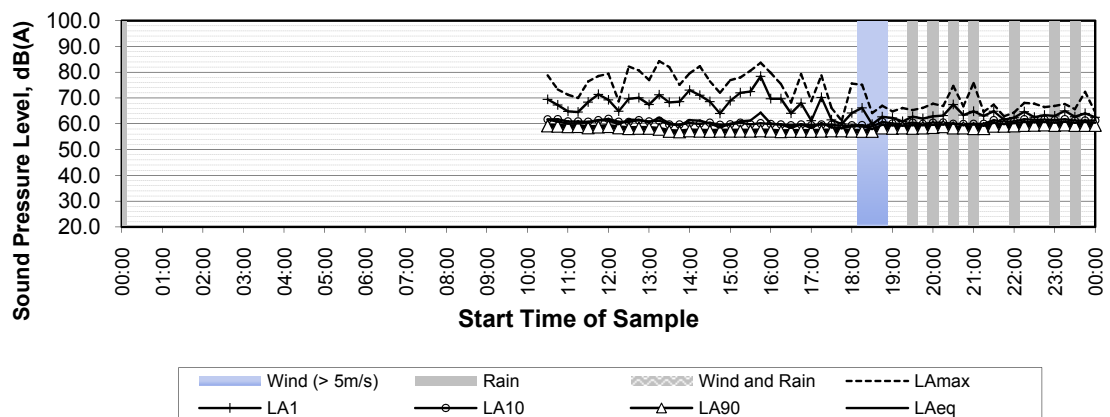
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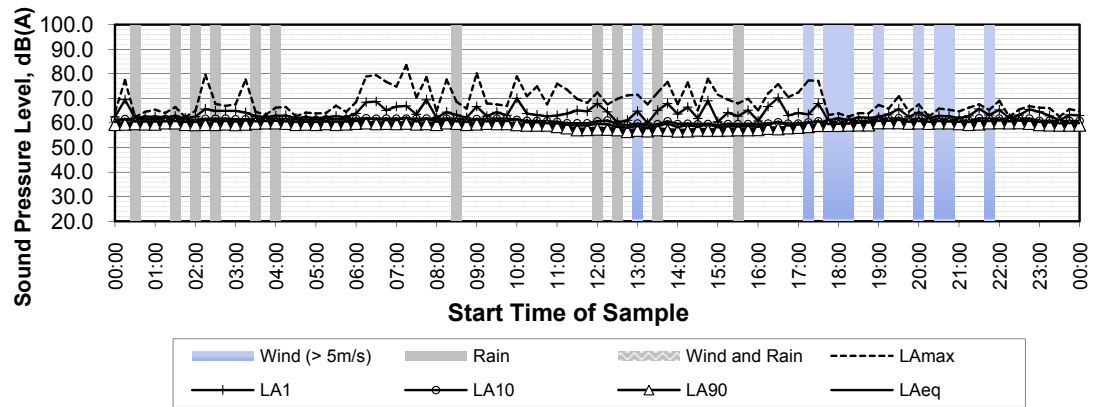
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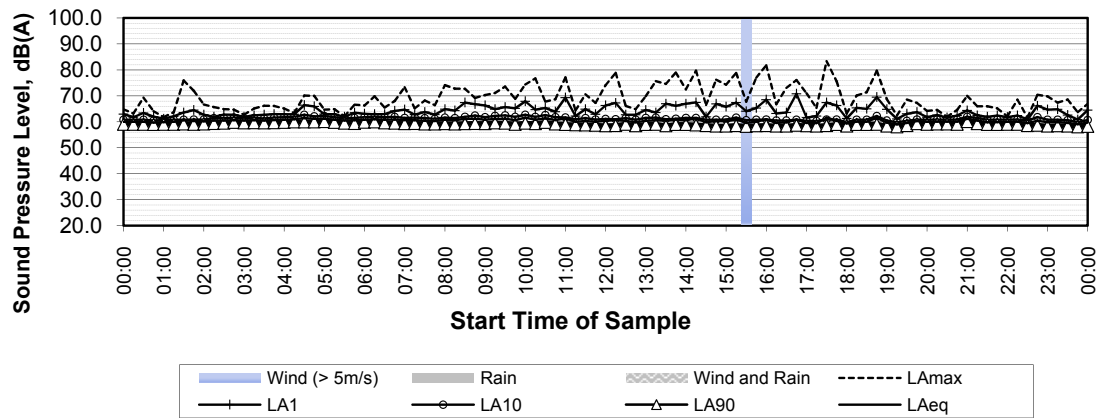
Reference Measurement R4  
Greenleaf Road (South)

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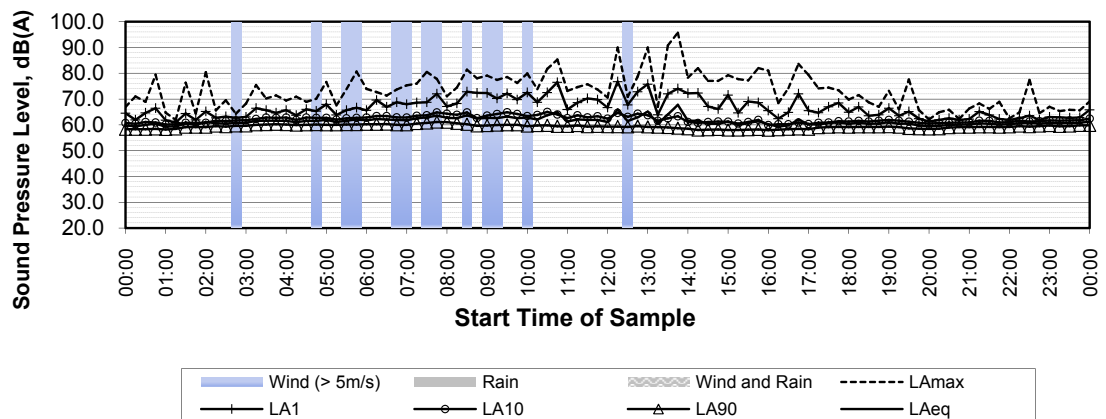
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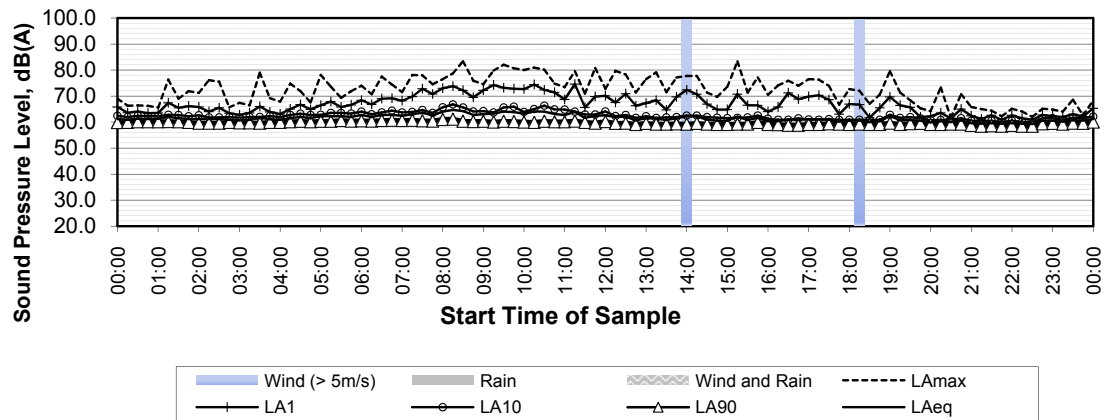
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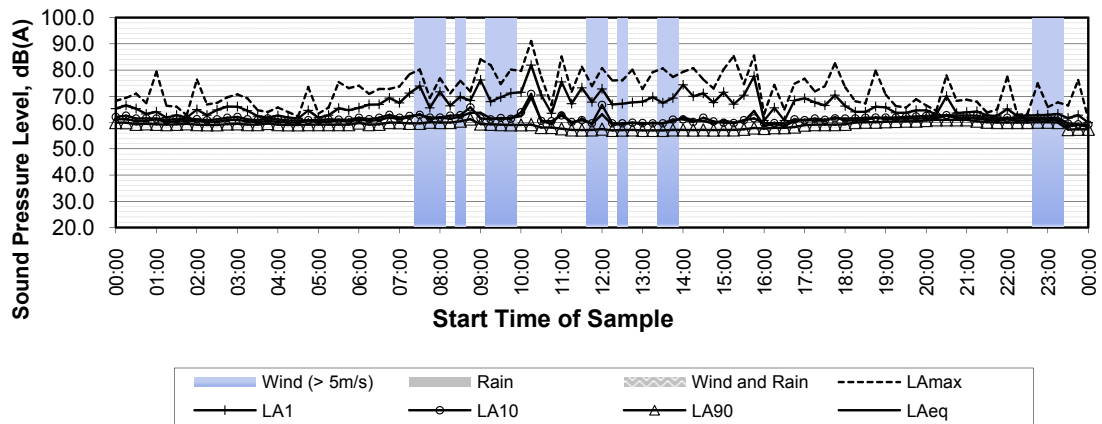
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Greenleaf Road (South)

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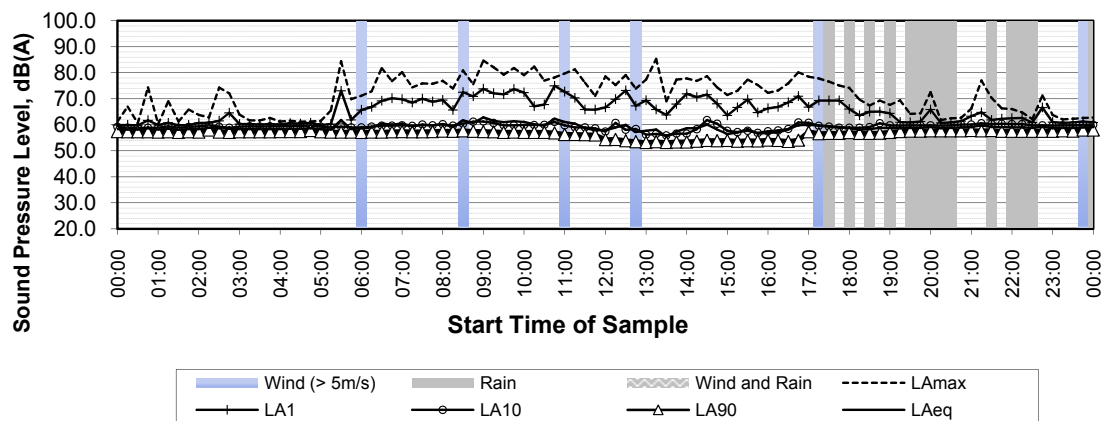
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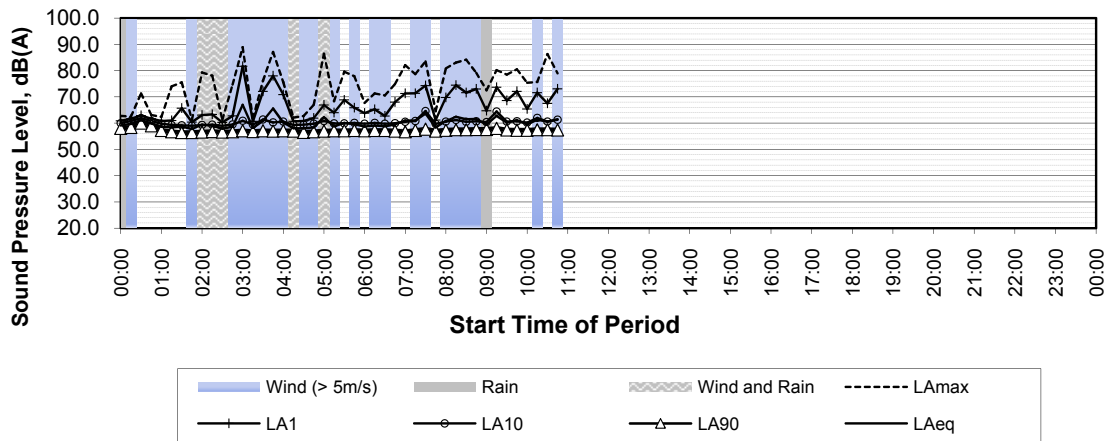
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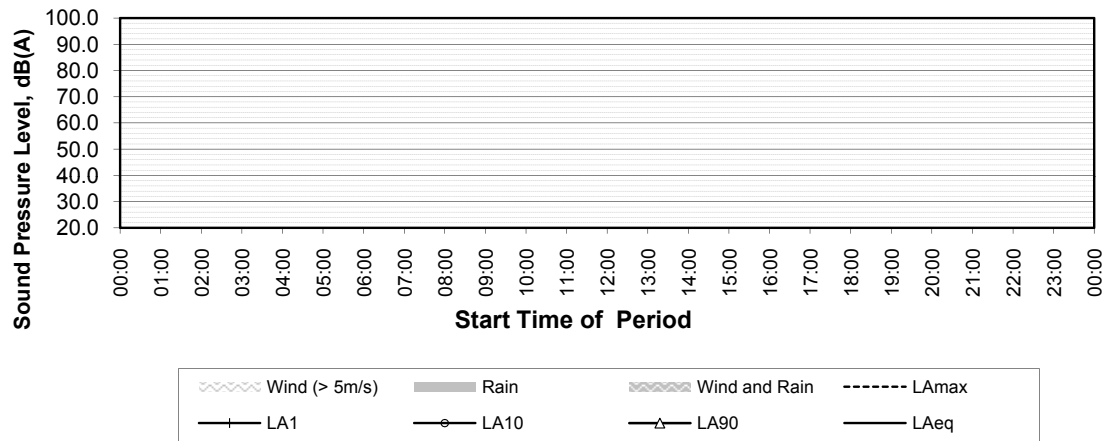
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Greenleaf Road (South)

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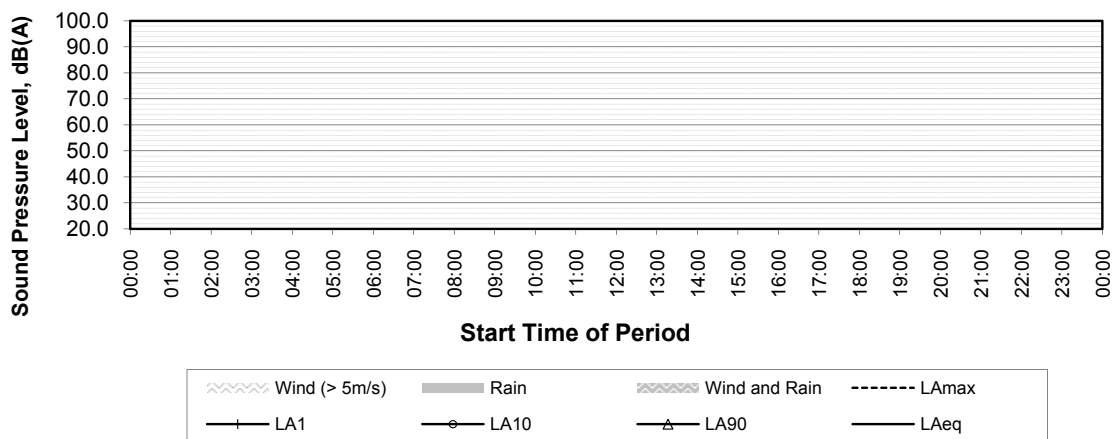
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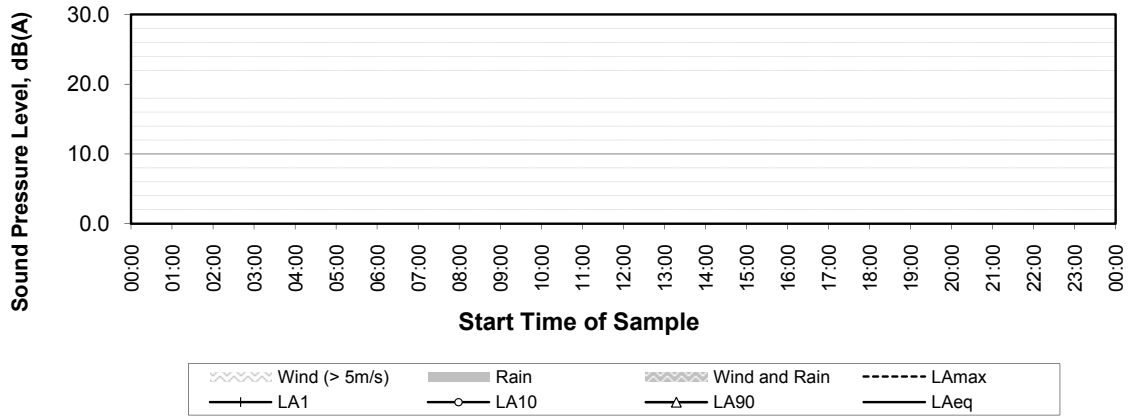


Reference Measurement R4  
Greenleaf Road (South)

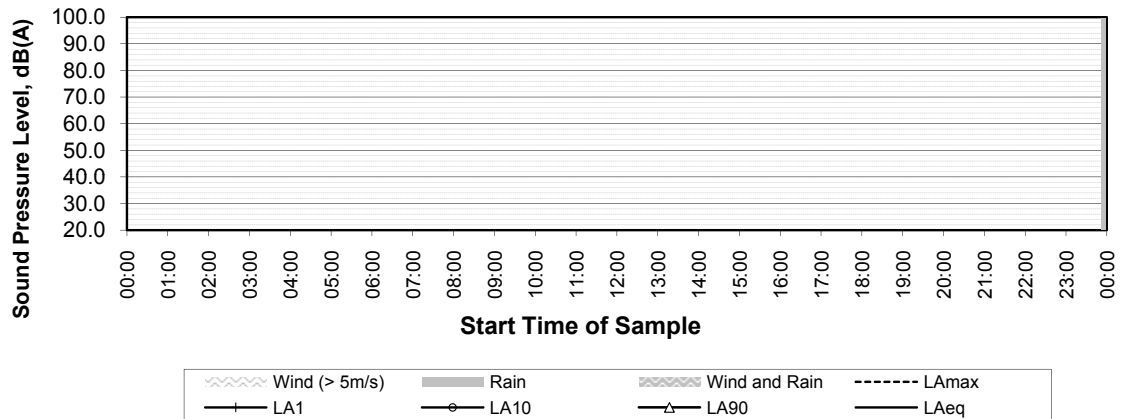


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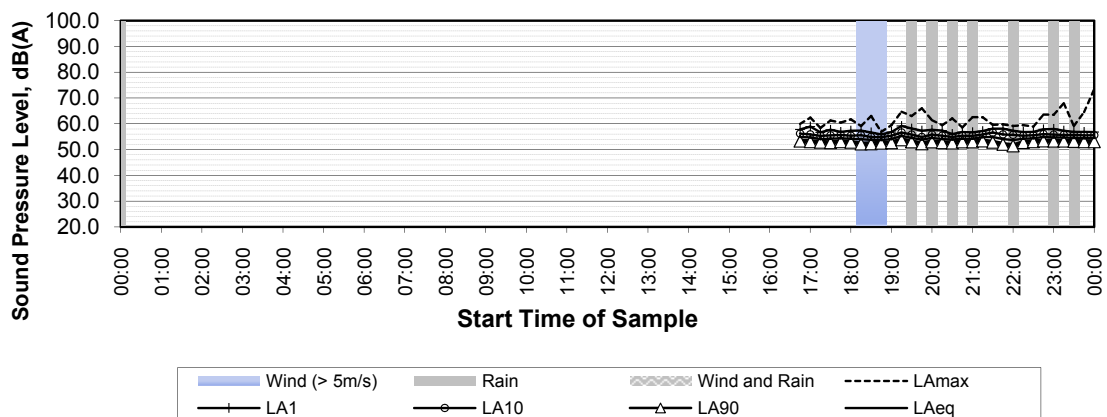
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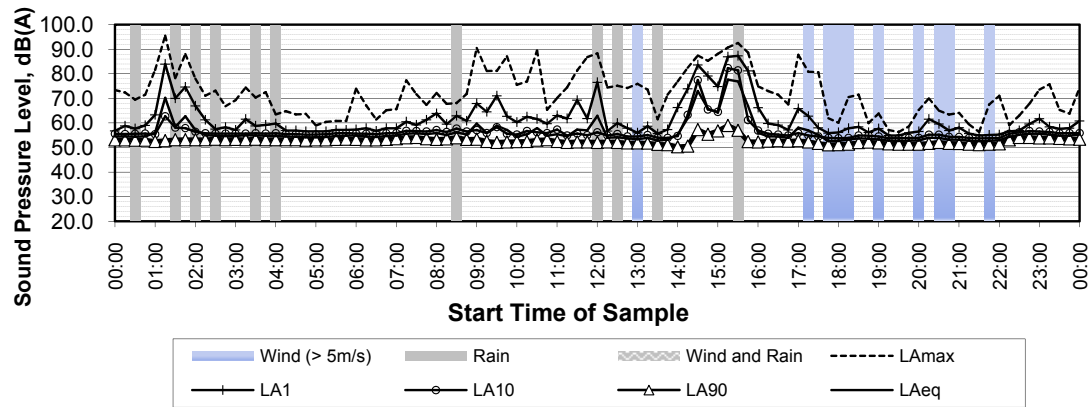
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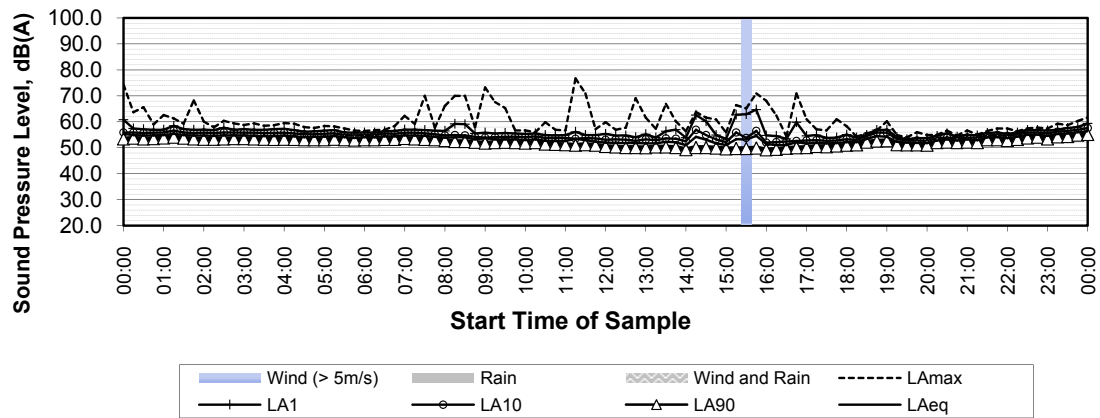
Reference Measurement R5  
Greenleaf Road (River Side)

# Ambient Sound Pressure Levels

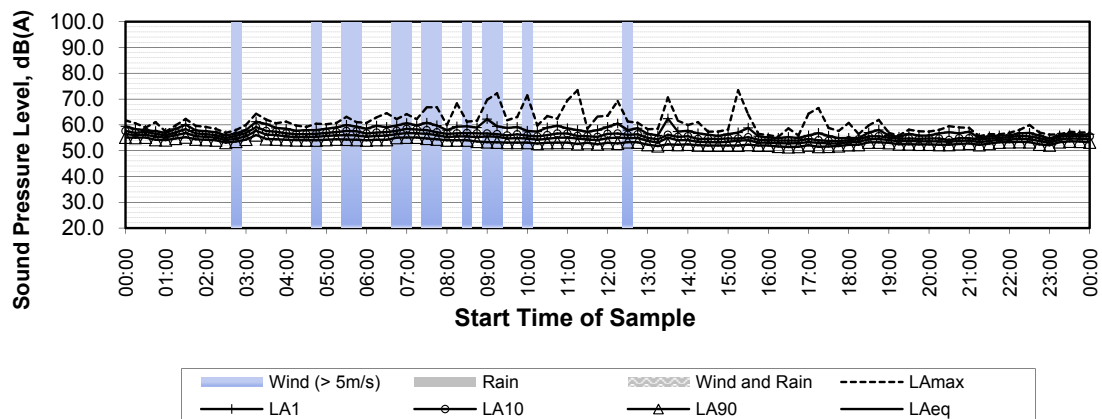
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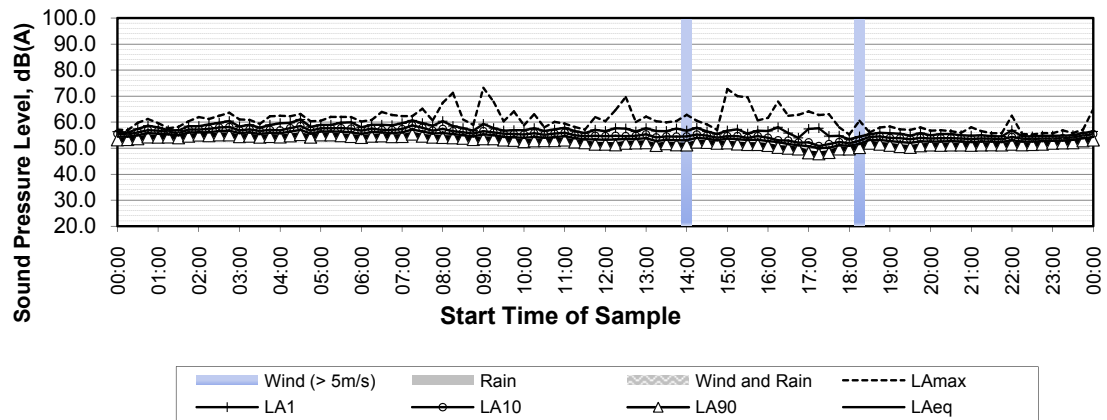
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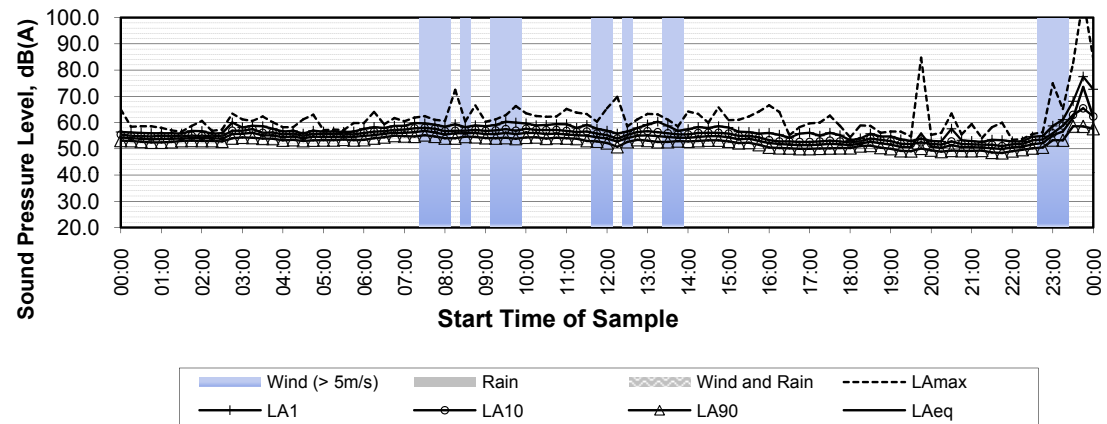
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Greenleaf Road (River Side)

# Ambient Sound Pressure Levels

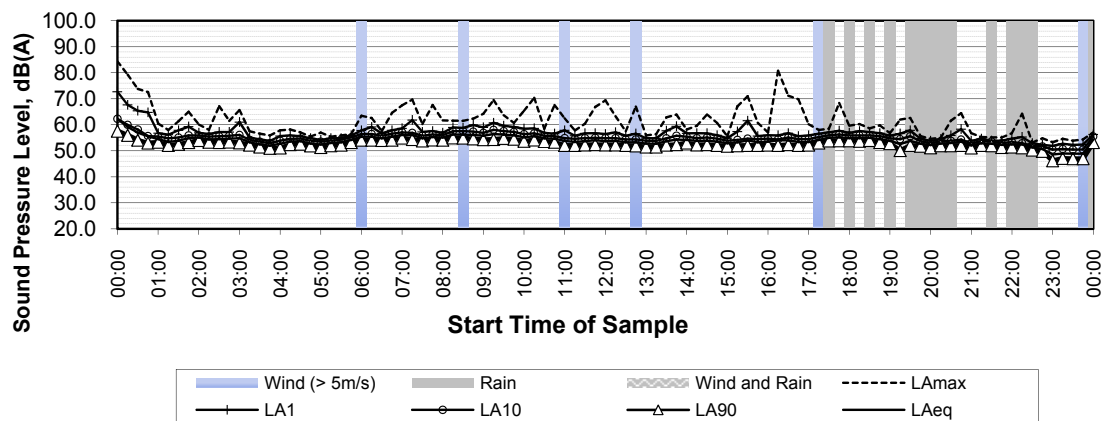
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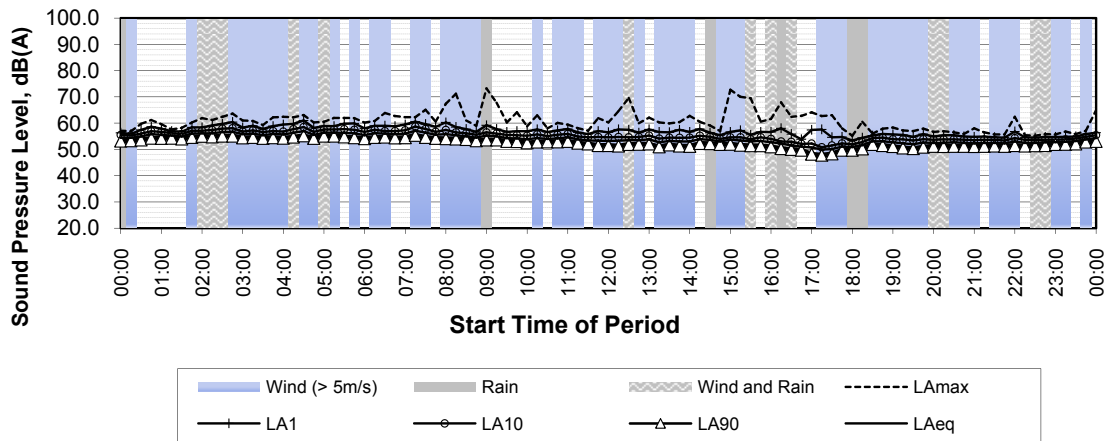
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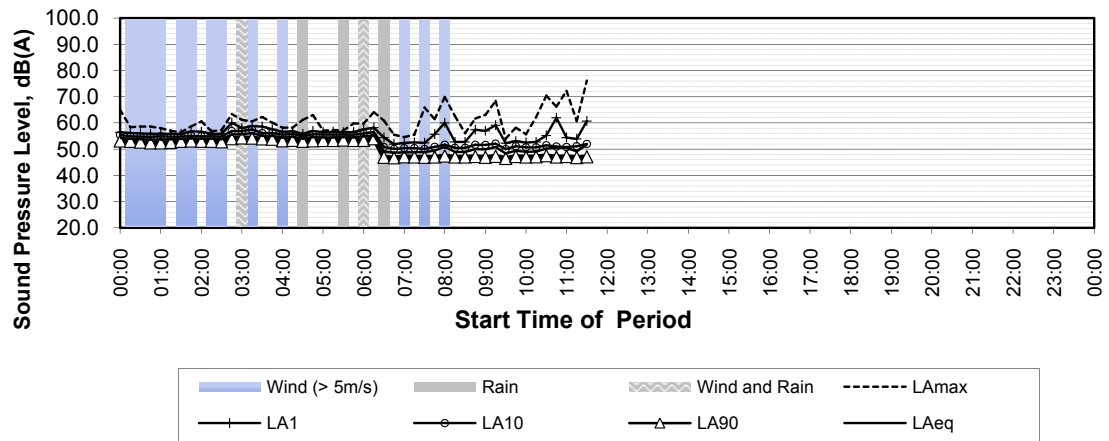
Reference Measurement R5  
Greenleaf Road (River Side)

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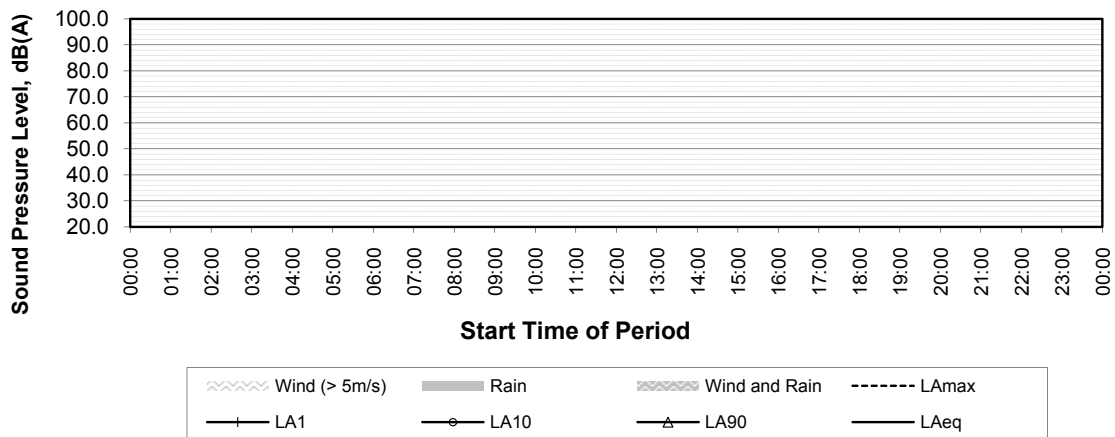
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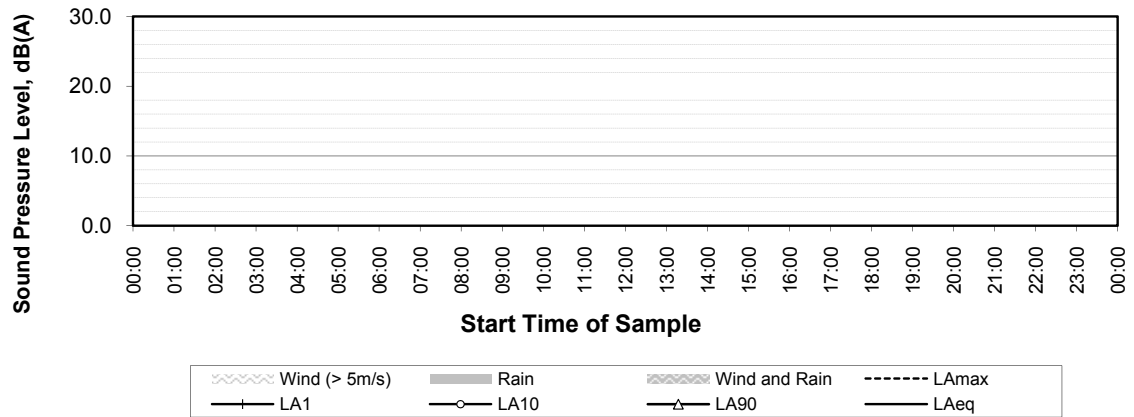
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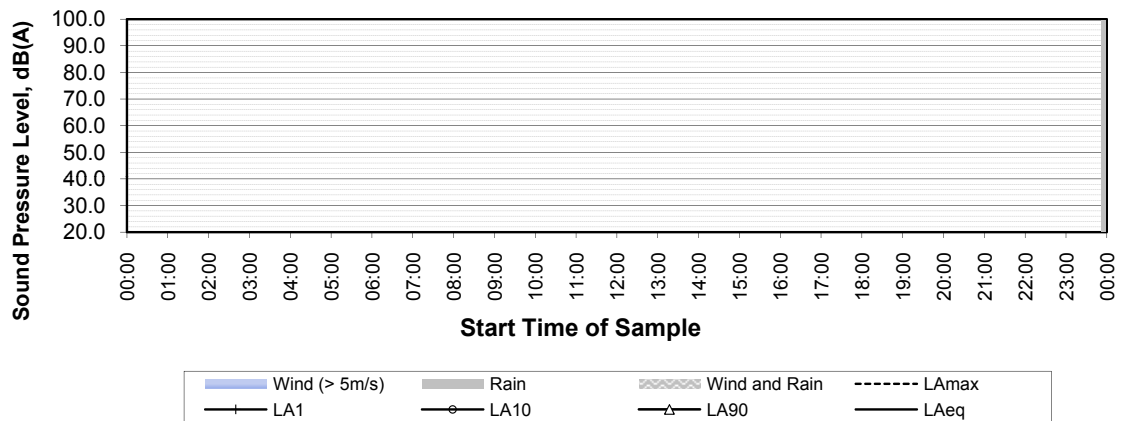
Reference Measurement R5  
Greenleaf Road (River Side)

# Ambient Sound Pressure Levels

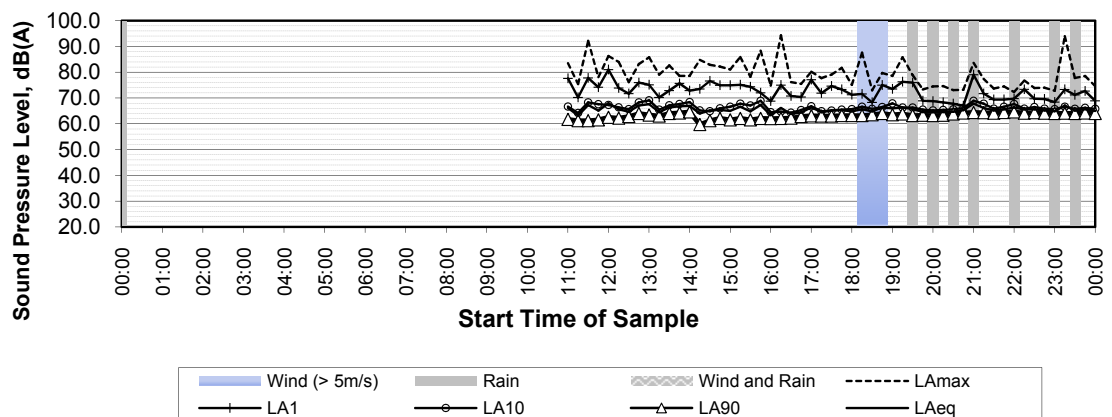
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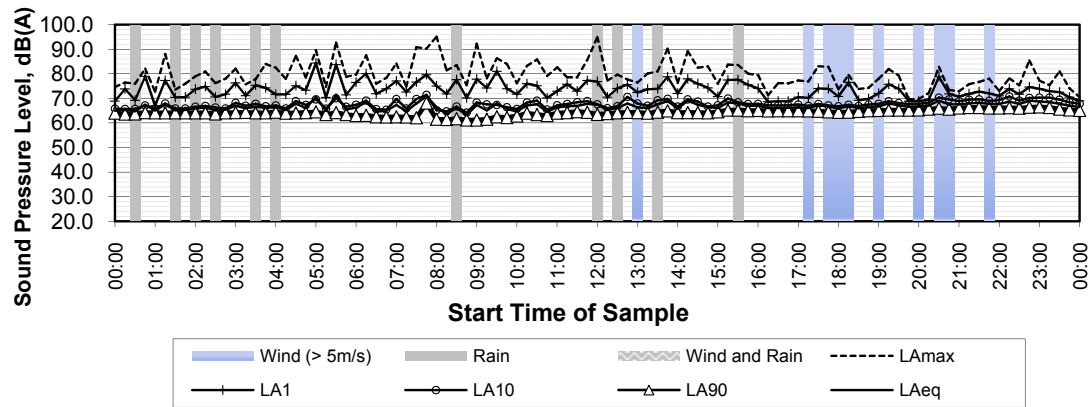
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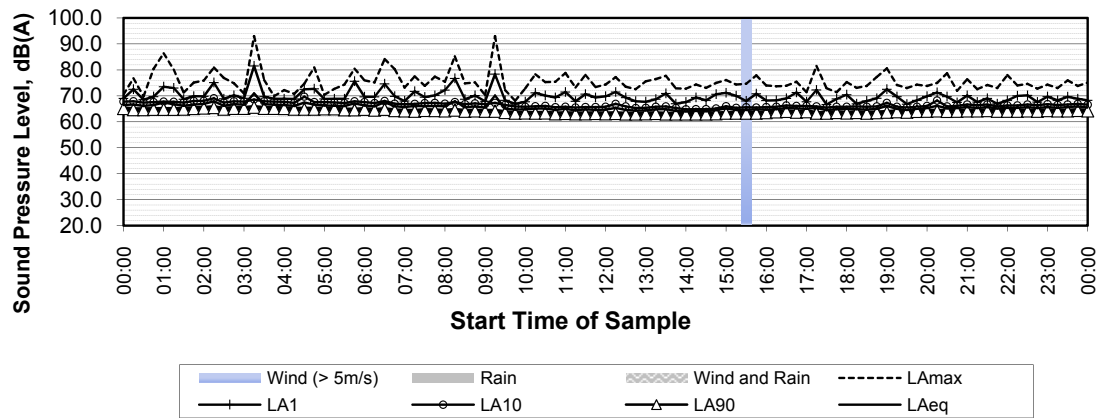
Reference Measurement R6  
Greenleaf Road Roadside (North)

# Ambient Sound Pressure Levels

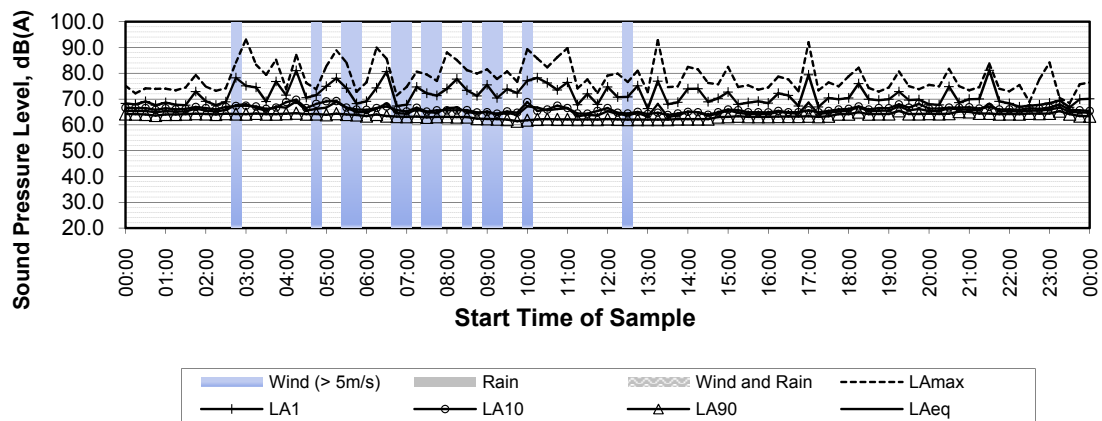
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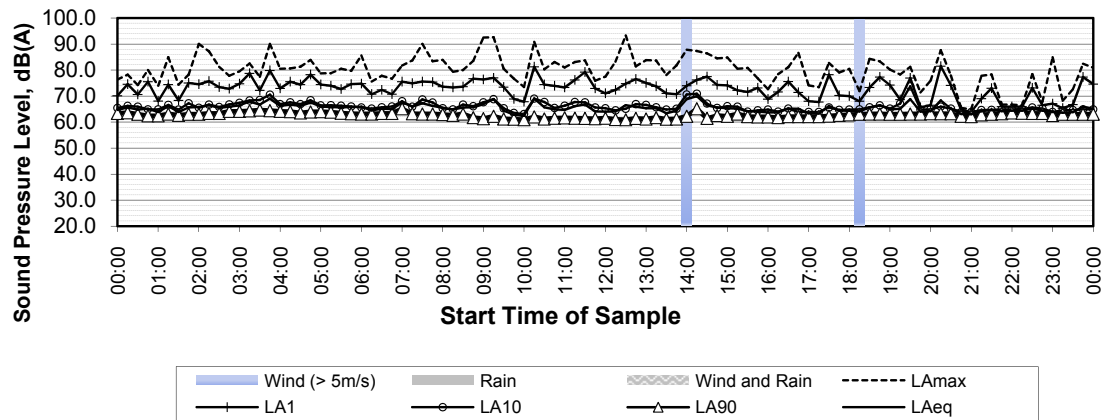
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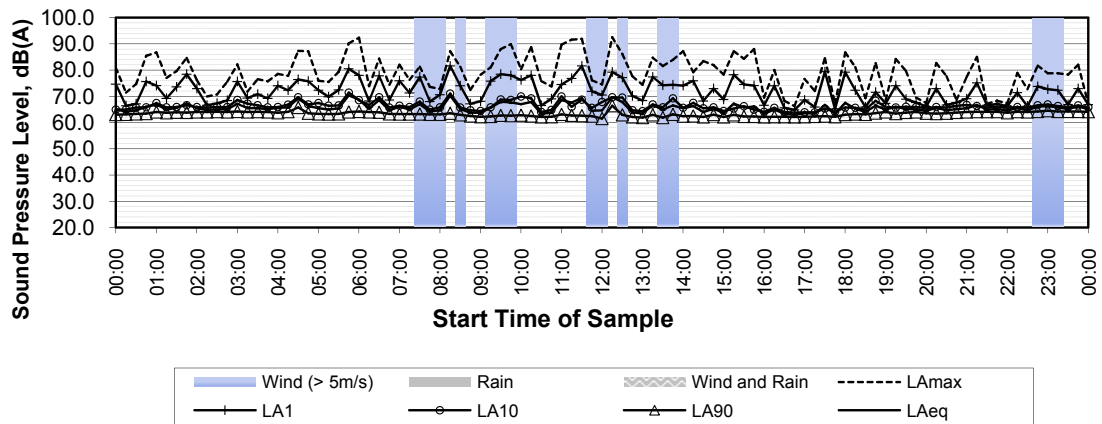
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Greenleaf Road Roadside (North)

# Ambient Sound Pressure Levels

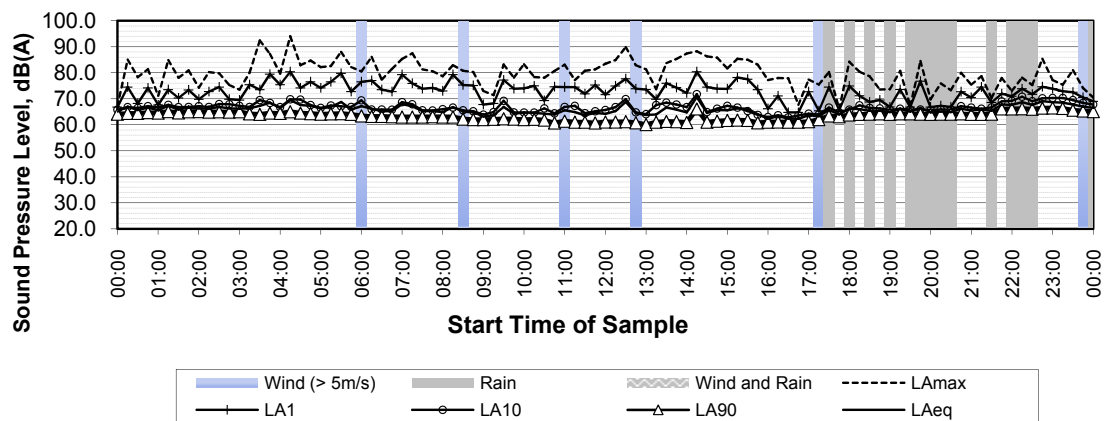
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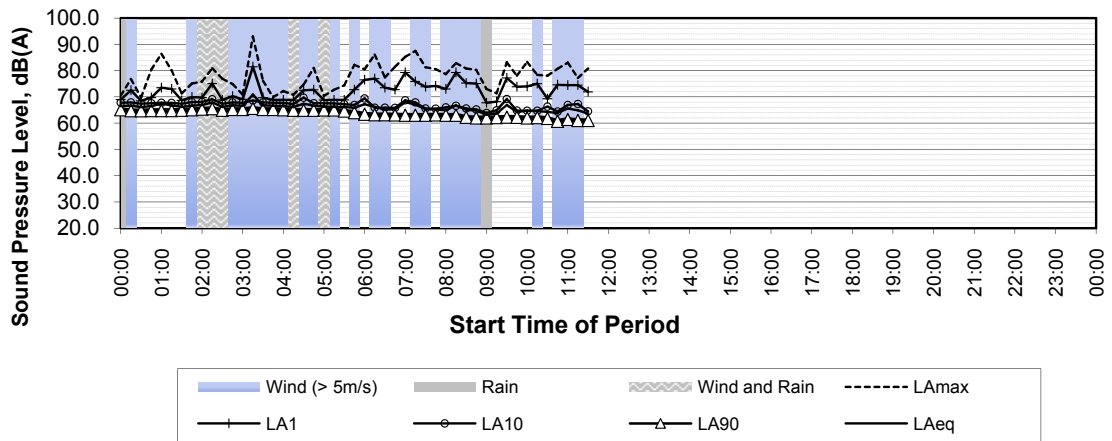
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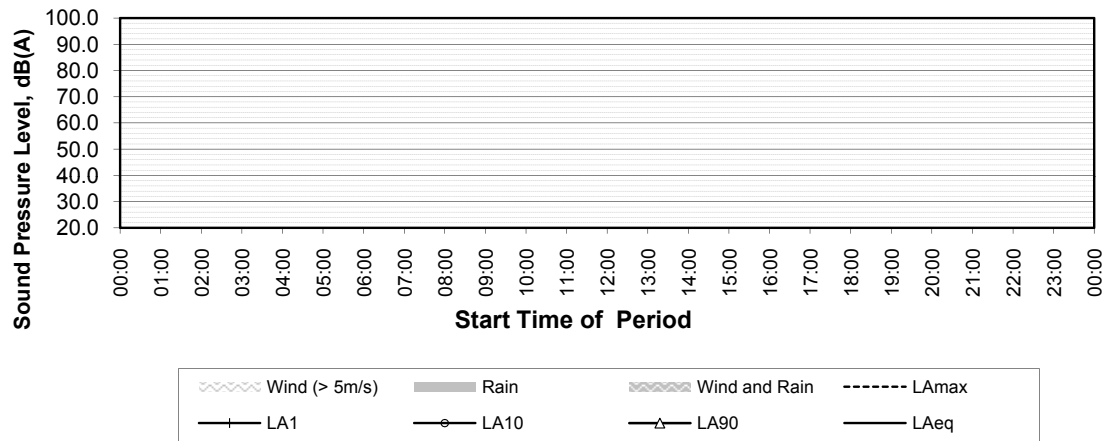
Reference Measurement R6  
Greenleaf Road Roadside (North)

# Ambient Sound Pressure Levels

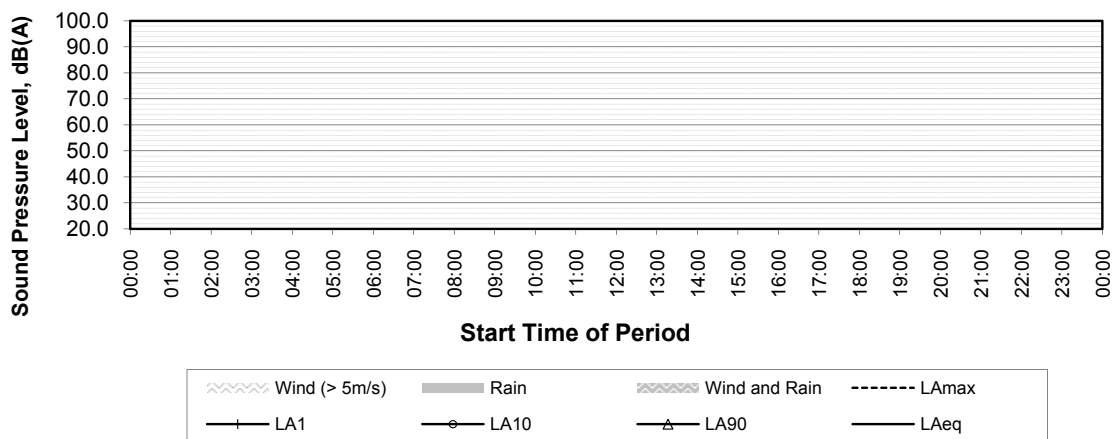
Wednesday, 23 April 2025



Thursday, 24 April 2025



Friday, 25 April 2025



Reference Measurement R6  
Greenleaf Road Roadside (North)



ATTACHMENT 2. SUMMARY of REPORTED NOISE COMPLAINTS

| Incident No    | Incident Date | Impact Classification | Severity         | Area          |
|----------------|---------------|-----------------------|------------------|---------------|
| 2024-00381594  | 29 July 24    | Community             | 0 –Reported Only | Ammonia Plant |
| 2024-003811488 | 29 July 24    | Community             | 0 –Reported Only | Ammonia Plant |
|                |               |                       |                  |               |
|                |               |                       |                  |               |
|                |               |                       |                  |               |
|                |               |                       |                  |               |
|                |               |                       |                  |               |