Sydney Metro City and Southwest – North Corridor Works
Technical Report - Noise Monitoring – OOHW P7a: 25 to 26 August 2018

Project

<table>
<thead>
<tr>
<th>Title</th>
<th>Technical Report – Noise Monitoring</th>
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<tr>
<td>Client</td>
<td>Sydney Metro City and Southwest</td>
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<tr>
<td>Document Reference No.</td>
<td>LOR-NCW-Noise Monitoring_WE08 OOHW P7 - 250818_260818.docx</td>
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<tr>
<td>Laing O’Rourke Project No.</td>
<td>K38</td>
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Document

<table>
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<tr>
<th>Date</th>
<th>6 September 2018</th>
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<tbody>
<tr>
<td>Monitoring Period</td>
<td>Saturday, 25 August to Sunday, 26 August 2018</td>
</tr>
<tr>
<td>Prepared by</td>
<td>Thomas Buchan</td>
</tr>
<tr>
<td>Reviewed by</td>
<td>Steven De Luzuriaga, Nathan Lynch</td>
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Revisions

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Description</th>
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<tbody>
<tr>
<td>06/09/18</td>
<td>V0.1</td>
<td>Technical Report - Noise Monitoring – OOHW P7a: 25 to 26 August 2018</td>
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1. Overview

Main North and North Shore Corridor Works Project (MNNSCW): Portion 7a - Northern Corridor Works (NCW) are being carried out by Laing O’Rourke Australia Construction Pty Ltd (LOR) on behalf of Transport for New South Wales (TfNSW). LOR has engaged Environmental Resources Management Australia Pty to (ERM) to undertake environmental noise and vibration monitoring during select works.

The monitoring is being undertaken with due regard to, and in accordance with, the NCW – Construction Nose and Vibration Management Plan (CNVMP), last updated March 2018 and other relevant policy, guidelines and standards as listed in the reference section of this report.

This technical report has been prepared to summarise the results and findings of operator attended and unattended noise measurements completed from Saturday, 25 August 2018 to Sunday, 26 August 2018.

The noise monitoring was conducted during Weekend 08 (WE08) track possession works as described in the approved Out-of-Hours Work (OOHW) application form, application number 14 (OOHWAF-014) prepared by LOR for Portion 7a of NCW. The potential for WE08 works to generate noise impacts was identified by LOR during works planning, hence the monitoring was required.

No vibration impacts were identified and hence vibration monitoring was not conducted.

A summary of the works and any complaints is provided in Section 2, with a summary of the resultant noise levels (and any recommendations) provided in Section 3. The noise monitoring methodology is documented in Appendix A, with the detailed noise data set provided in Appendix B.

2. Summary of WE08 Works

Between 25-Aug-18 and 26-Aug-18 WE08 works within the T1 North Shore rail corridor included activities associated with the augured piling, construction of three overhead wiring footings, two underline crossing (ULX) excavations and vegetation removal in the rail corridor.

The WE08 works were located within the rail corridor and required no trains running and high voltage power to be isolated. If these works were to occur during standard construction hours then personnel would be at risk of being struck by trains and electrocution.

Deliveries of major components associated with the possession works was limited to standard construction hours.
The plant and equipment listed for use in OOHWAF-014 for all associated activities are reproduced below, and generally aligned with that observed to be in use on site during the works:

- Lighting towers;
- Augured Piling Rigs;
- Hi Rail excavators of varying sizes;
- Concrete pumps, trucks and saws;
- Super Sucker;
- Chainsaws and Wood Chippers;
- Hydremas (dump truck);
- Vehicles – (light commercial); and
- General hand tools

Further detail of the WE08 work, specified management measures and other mitigation is provided in OOHWAF-014. This OOHWAF also noted that other works were being undertaken by LOR (NCW Portions 1 - 6) and other stakeholders (NRT) to utilise the weekend track possession and safe access to the rail corridor. These works were observed and were noted to generate similar impacts to that of the works conducted by LOR, and were not expected to result in cumulative noise impacts.

2.1 Summary of Complaints

It is understood that no complaints were received regarding noise during the monitoring period.

3. Monitoring Summary (WE08 Works)

Table 1 presents a summary of the highest measured site noise levels. The full noise data set presenting the measured overall and site Leq, 15minute noise level contributions in dBA is provided in Appendix B (operator attended) and Appendix C (unattended).
Operator attended noise measurements were conducted at three publically accessible locations adjacent to the rail corridor; refer Figure A1.0 of Appendix A. A total of 14 attended noise measurements were conducted. The closest receptors were targeted for monitoring, with actual measurement locations selected based on the position of site works and the potentially most affected receptors.

The five highest values (and comparison to the noise management levels (NML) identified in the CNVIS) for attended noise monitoring are presented below in Table 1.1. Refer Appendix B for full noise data set.

<table>
<thead>
<tr>
<th>ID</th>
<th>Item</th>
<th>Results</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operator Attended Noise Monitoring</td>
<td></td>
<td>The existing noise environment (in the absence of site noise) at the majority of community locations near to the WE08 works was generally dominated by non-project related noise emissions, including those generated by residences near the measurement position, animals (birds and insects, domestic animals), wind-blown vegetation and aircraft passing overhead. Measured site noise level contributions (Leq, 15 minute) were between 55-76 dBA over the two days, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average, site noise level contributions for the WE08 works were 26 dBA above the NML, which is to be expected for the type activities being undertaken. A comparison of site noise levels to the predicted values presented in OOHVAF-014 is provided Appendix B of this report. It indicates that on average, actual emissions associated with WE08 works were 1 dBA above the predicted values in OOHVAF-014. It should be noted that the difference in noise levels is partly related to the implementation of INP penalties for offensive noise characteristics. It is therefore apparent that these INP penalties need to be considered during the OOHW applications and incorporated into predicted noise impacts. While some noise from construction sites is inevitable, the aim of the CNVMP (and other relevant documents presented in the reference section of this report) is to protect the majority of residences and other sensitive land uses from noise pollution most of the time. It focuses on minimising construction noise impacts, rather than only on achieving numeric noise levels. Accordingly, specific recommendations suitable to the WE08 work and the magnitude and extend of impacts observed is provided in Section 3.1 of this report.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement Details</th>
<th>NML vs. Measured Assessment (Leq, 15 minute in dBA)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Date</td>
<td>Start Time (24 Hr)</td>
</tr>
<tr>
<td>Project 014</td>
<td>25-Aug-18</td>
<td>23:45 PM</td>
</tr>
<tr>
<td>Project 015</td>
<td>26-Aug-18</td>
<td>00:01 AM</td>
</tr>
<tr>
<td>Project 016</td>
<td>26-Aug-18</td>
<td>00:16 AM</td>
</tr>
<tr>
<td>Project 003</td>
<td>25-Aug-18</td>
<td>18:36 PM</td>
</tr>
<tr>
<td>Project 022</td>
<td>26-Aug-18</td>
<td>15:15 PM</td>
</tr>
</tbody>
</table>

1. All noise levels are expressed in dBA re 2 x 10-5 Pa.
2. Measured site noise levels include consideration of INP penalties for offensive noise characteristics.
One unattended noise monitoring device (UNM-01) was installed within the rail corridor, adjacent to the proposed work; refer Figure A1.0 of Appendix A.

The five highest values (and comparison to the noise management levels (NML) identified in the CNVIS) are presented below in Table 2.1. Refer Appendix C for full noise data set.

<table>
<thead>
<tr>
<th>ID</th>
<th>Item</th>
<th>Results</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Unattended Noise Monitoring</td>
<td>One unattended noise monitoring device (UNM-01) was installed within the rail corridor, adjacent to the proposed work; refer Figure A1.0 of Appendix A. The five highest values (and comparison to the noise management levels (NML) identified in the CNVIS) are presented below in Table 2.1. Refer Appendix C for full noise data set.</td>
<td>The existing noise environment (in the absence of site noise) at the majority of community locations near to the WE08 works was generally dominated by non-project related road traffic on public roads and train movements outside of track the possession hours. The highest road traffic noise emissions were associated with the Pacific Highway, Elizabeth Street and Drake Street. Other non-project related emissions included those generated by residences near the measurement position, animals (birds and insects, domestic animals), wind-blown vegetation and aircraft passing overhead. Project site noise contributions at UNM01 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest receptor (12 Drake Street) varied however Leq, 15 minute emissions up to 75 dBA were identified by UNM01 at the nearest receptor. Estimated site noise level contributions were above the NML’s at UNM01 which is expected for the type of activities being undertaken. Specific recommendations suitable to the WE08 work and the magnitude and extent of impacts observed is provided in Section 3.1 of this report.</td>
</tr>
</tbody>
</table>

Table 2.1 – Unattended Site Noise Level Assessment

<table>
<thead>
<tr>
<th>Measurement Details</th>
<th>NML vs. Measured Assessment (Leq, 15 minute in dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Unattended Noise Monitoring (Drake Street Rail Corridor)</td>
</tr>
<tr>
<td>Location</td>
<td>Date</td>
</tr>
<tr>
<td>UNM01</td>
<td>25-Aug-18</td>
</tr>
<tr>
<td></td>
<td>25-Aug-18</td>
</tr>
<tr>
<td></td>
<td>25-Aug-18</td>
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<tr>
<td></td>
<td>25-Aug-18</td>
</tr>
<tr>
<td></td>
<td>25-Aug-18</td>
</tr>
</tbody>
</table>

1. All noise levels are expressed in dBA re 2 x 10-5 Pa.
2. Measured site noise levels include consideration of INP penalties for offensive noise characteristics.
3.1 Recommendations

Based on the results and findings of the noise monitoring, it is recommended that:

- Staff on night shift should be reminded of suitable **behavioural practices** for working at night, for example:
  - No dropping of materials from height, throwing of metal items, and slamming of doors;
  - No excessive revving of plant and vehicle engines; and
  - Turning engines off when plant/equipment are not in use.

- LOR and their sub-contractors were observed to be utilising the **existing rail corridor noise barriers** to reduce site emissions. Based on measurements conducted during WE08 works and the previous works the existing rail noise barrier is reducing site noise emissions by approximately 10 dBA or more. This measure should therefore be implemented during future OOHW, particularly near the Hopetoun Avenue access/egress point, or for any high noise generating activities.

- LOR should consider **INP penalties for offensive noise characteristics** (i.e. tonal, low frequency and/or impulsive) during the OOHW applications and incorporate penalties into the predicted noise impacts. Based on the comparison of measured site noise levels associated with WE08 works and the predicted values in OOHWAF-014, it can be seen that the difference in noise levels is primarily related to the implementation of INP penalties for offensive noise characteristics.

- LOR should continue to implement the **CNVMP** (established with due regard to the CNVIS) during all future NCW activities, importantly during any OOHW that is approved following the appropriate NCW processes. **Noise (and/or vibration) monitoring** should continue to be conducted as per the requirements specified in the construction noise and vibration monitoring program established for NCW.
3.1.1 Closing

These recommendations are based on the findings documented in this report and are designed to reduce noise levels and minimise impacts as far as is considered feasible and reasonable for typical good practice construction management practices.

These noise mitigation, management measures and/or monitoring options have been recommended based on the magnitude and extent of impacts measured and/or observed but a detailed feasibility study has not been conducted. LOR will implement these recommendations where it is considered feasible, reasonable, practical and safe to do so.

Construction noise levels will be reduced and impacts minimised with the successful implementation of the recommendations provided in Section 3.1 above. Impacts may not be reduced to negligible levels for all receptors during all construction activities; however the recommendations presented here will ensure that any residual impacts are minimised as far as is practically achievable.

No further recommendations for mitigation and management, to those established by the findings of the noise monitoring, and documented in this report, are provided or warranted. LOR should however remain aware of the potential for nuisance, or an unacceptable level of amenity, to occur due to construction noise and vibration and continue to plan for and then manage the works accordingly.
References

Laing O’Rourke - Sydney Metro City and Southwest - Northern Corridor Works - Construction Noise and Vibration Impact Statement (CNVIS), prepared by ERM and last updated February 2018

Laing O’Rourke - Sydney Metro City and Southwest - Northern Corridor Works - Construction Noise and Vibration Management Plan (CNVMP), prepared by ERM and dated October 2017

Laing O’Rourke - Sydney Metro City and Southwest - Northern Corridor Works - Construction Noise and Vibration Monitoring Program, prepared by ERM and dated October 2017

NSW Environment Protection Authority – NSW Environmental Noise Management – Industrial Noise Policy (INP), January 2000 and relevant application notes

NSW Department of Environment and Climate Change – NSW Interim Construction Noise Guideline (ICNG), July 2009

NSW Government – Sydney Metro Construction Noise and Vibration Strategy (CNVS), August 2017

Standards Australia AS1055–1997™ (AS1055) – Description and Measurement of Environmental Noise, Parts 1, 2 and 3


Appendix A – Noise Monitoring Methodology

A summary of the noise monitoring methodology is provided below. The monitoring was conducted with due regard to an in accordance with the CNVMP and other relevant policy, guidelines and standards as listed in the reference section of this report; and as per the construction noise and vibration monitoring program established for NCW.

1. Overview

Attended noise monitoring

A qualified and suitably experienced operator visited community areas surrounding the NCW works from 25-Aug-18 to 26-Aug-18 and completed operator attended noise measurements at a total of three publically accessible locations adjacent to the rail corridor; refer Figure A1.0 below. A total of 14 noise measurements were conducted. The closest receptors were targeted for monitoring, with actual measurement locations selected based on the position of site works and the potentially most affected receptors.

Overall noise levels (Lmax, Lmin, Leq, L1, L10 and L90 in dBA) were measured at all locations; refer Appendix B. Based on the measured overall values and observations made during each operator attended noise measurement a site Leq, 15minute noise level contribution in dBA was determined in the absence of any influential source not associated with the project.

Unattended noise monitoring

An unattended noise monitoring device (UNM01) was installed within the rail corridor near Drake Street, Artarmon (Refer Figure A1.0 of Appendix 1) at approximately 22:30 on Saturday, 25 August 2018 and collected at approximately 01:45 on Sunday, 26 August 2018. Details of the unattended noise monitoring are summarised below:

- Unattended noise monitoring was conducted continuously at one location (UNM01). Refer Figure A1.0 of Appendix A. Overall noise levels (Lmax, Lmin, Leq, L1, L10 and L90 in dBA) were measured in 15 minutes samples;

- The unattended noise monitoring device does not directly measure the site contribution. To estimate potential site noise contributions (in the absence of any influential source not associated with the project) ERM has assumed that any measured Leq, 15 minute noise level above 35 dBA at UNM01 is associated with the site, whilst works are known to be in progress. These threshold values were determined based on recent monitoring and observations completed near the site;

- For data recorded at UNM01, the estimated site noise values have been extrapolated to the most affected location (12 Drake Street). This extrapolation was based on the distance from the works on site to the receptor (i.e. approximately 20 metres).

The results of the unattended noise data analysis have been provided in Appendix C.

The five highest values (and comparison to the NML identified in the CNVIS) for attended and unattended monitoring are presented in Table 1.1 and Table 2.1 of this report.
1.1 Monitoring Locations

Figure A1.0 identify the monitoring locations referenced in this report and other items of importance e.g. nearby roads. Each monitoring location is described in Table A1.

Table A1 – Noise Monitoring Locations

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>GPS Co-ordinates (Zone 56H)</th>
<th>Ground Height (AHD), metres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Easting</td>
<td>Northing</td>
</tr>
<tr>
<td>A01</td>
<td>14 Hawkins Street, facing west towards the rail corridor and works on site.</td>
<td>331804.00</td>
<td>6257823.00</td>
</tr>
<tr>
<td>A02</td>
<td>12 Drake Street, facing west towards site entrance and works on site.</td>
<td>331768.00</td>
<td>6257894.00</td>
</tr>
<tr>
<td>A03</td>
<td>Outside 10 Brand Street apartments on Valetta Lane, facing southwest towards stockpile area and works on site.</td>
<td>331883.00</td>
<td>6257735.00</td>
</tr>
<tr>
<td>UNM01</td>
<td>Within rail corridor near Drake Street, on 'up-line' side heading towards Central station. Approximately 20m from closest sensitive receptor.</td>
<td>331758.00</td>
<td>6257878.00</td>
</tr>
</tbody>
</table>

1. AHD = Australian Height Datum not determined during this monitoring event.

2. Technical Requirements

All construction noise monitoring was undertaken in accordance with the “construction noise and vibration monitoring guideline” that is included in Appendix A of the Construction Noise and Vibration Strategy (CNVS) and outlines the minimum requirements for contractors undertaking monitoring on the Sydney Metro Project.

In accordance with the CNVIS, both attended and unattended measurements were the focus of all noise monitoring based on the scope of works for P7a. Attended noise monitoring results fed back directly to the project team and actions taken without delay during the works. In accordance with Condition of Approval (CoA) – C11 monitoring data was made available to the construction team and LOR and this report can be provided to the Environmental Representative and/or Acoustics Advisor, the Department of Planning and Environment (DP&E) and the NSW Environment Protection Authority (EPA) if needed.

2.1 Noise Monitoring Equipment

All noise measurements were conducted by suitably experienced and qualified personnel with due regard to, and in accordance with, the relevant local and international standards for environmental monitoring.

The noise measurement instrumentation used to conduct the monitoring complied with the requirements of AS 61672.1 and AS/IEC 60942. Each noise device had current National Association of Testing Authorities, Australia (NATA) calibration certificates, with certification at intervals not exceeding two years at the time of use.

The equipment used for this assessment was as follows:

- 1 x ARL Ngara (Type 1) Environmental Noise Loggers;
• 1 x Brüel & Kjær 2250 Investigator (Type 1) Sound Analyser; and
• 1 x Brüel & Kjær 4231 (Type 1) Sound Level Calibrator.

Noise instrument calibration was checked prior to monitoring and again at the conclusion with no difference noted between the two measurements. All data handling and analysis has been completed by a suitably experienced person, and subsequently reviewed by a qualified and experienced acoustician.

2.2 Other requirements

All attended measurements were conducted by appropriately trained personnel in the measurement and assessment of construction noise and vibration. They are familiar with the requirements of the relevant standards and procedures.

The noise measurement procedures employed throughout the monitoring were established in accordance with the requirements of Australian Standard (AS) 1055:1997 Acoustics - Description and Measurement of Environmental Noise.

Attended noise measurements were conducted by an operator using a hand held Type 1 ‘integrating-averaging’ sound level meter. All measurements were completed with the sound level meter mounted to a tripod and with a windscreen fitted, at a height of 1.2 to 1.5 metres above the ground.

Instantaneous noise levels for all noted noise emission sources (extraneous or otherwise), meteorological conditions (average and maximum wind speeds, temperature, precipitation and cloud cover etc.) were recorded during all measurements. Relevant measurement parameters i.e. Leq, Lmin, Lmax, L1, L10 and L90 were recorded in dBA. All noise samples were recorded using the “fast” time response of the sound level meter.

Noise monitoring was not completed within 3.5 metres of any reflective structure or wall, unless behind a barrier. A reduction of up to 2.5 dB was not applied to the measured ambient or site noise contribution (Leq, 15 minute in dBA) as the barrier was reducing noise emissions from site and in general did not increase noise due to the reflective properties of the surface.

Noise monitoring was not completed during periods where wind speeds exceeded 5 m/s at the microphone. Noise monitoring was conducted during rain events however the rain was very light and had no effect on the measured data (if applicable).

The general setup of the sound level meter for attended noise measurements was as per Photo 4.1 of the Construction Noise and Vibration Monitoring Program established for NCW, as reproduced below as Photo A2.1.
Attended noise measurements were undertaken at the potentially most affected receptors identified in the LOR noise assessment (adapted for the phase of works) to confirm that the noise levels in the adjacent community were consistent with the predictions provided by LOR. Other potentially affected receptors were also considered as part of the monitoring regime. Monitoring occurred once works were underway but not at the commencement of activities. The duration of all community noise measurement samples was 15 minutes. The devices microphone was focused on the noise emission centre of the equipment being tested.
Figure A1.0 – Attended (A01-A03) and Unattended (UNM01) Noise Monitoring Locations
– NCW Portion 7A (WE08 - Saturday, 25 August to Sunday, 26 August 2018)
Appendix B – Recorded Noise Data Set – Operator Attended Noise Monitoring
Project 001
25-Aug-18 18:00 00:15:00 71.28 52.53 57.69 63.01 62.53 53.32 100
- 70 NCA-01 Evening 41 46 64 56 22 17 1.1
Project 001-002 (A01): Measurements taken outside 14 Hawkins Street, facing west towards the rail corridor and works on site. NCW P7 works included activities associated with concrete pouring (other general construction activities), which included the use of a Concrete Pump and truck, access / egress of light commercial vehicle, and general hand tools. Passing traffic along Elizabeth street was unaudible during site activities. Passing aeroplane, estimated noise: 50-55 dBA. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the two measurements, with non-project related noise sources generally inaudible throughout the measurement during times of site activity.

Project 003
25-Aug-18 18:32 00:15:00 93.42 59.11 69.18 82.87 66.66 60.02 100
- 69 Project 003-004 (A02): Measurements taken outside 12 Drake Street, facing west towards site entrance and works on site. NCW P7 works included activities associated with concrete pouring (and other general construction activities), which included the use of a concrete pump and truck, excavators, access / egress of light commercial vehicle, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the two measurements with non-project related traffic and other noise sources generally inaudible throughout the measurement during times of site activity.

Project 004
25-Aug-18 18:45 00:15:00 82.87 59.11 63.89 73.90 64.62 60.31 100
- 80 Project 005
25-Aug-18 19:07 00:15:00 82.38 58.84 67.87 72.40 70.42 61.89 100
- 68 Project 006
25-Aug-18 19:22 00:15:00 78.32 62.21 65.30 70.73 66.85 63.04 100
- 65 Project 013
25-Aug-18 23:30 00:15:00 68.91 41.16 55.29 64.69 60.92 42.51 100
- 55 Project 013-014 (A01): Measurement location outlined above (A01). NCW P7 works included activities associated with footing construction and augured piling, which included the use of a piling/drill rig, excavators, access / egress of light commercial vehicle, and general hand tools. Nearby wildlife, estimated noise: 55-65 dBA. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the two measurements with non-project related noise sources generally inaudible throughout the measurement during times of site activity.

Project 014
25-Aug-18 23:45 00:15:00 93.62 56.02 70.77 81.00 73.65 57.24 100
- 66 Project 015
26-Aug-18 00:01 00:15:00 81.21 58.43 65.01 71.76 67.29 61.22 100
- 65 Project 015-016 (A02): Measurement location outlined above (A02). NCW P7 works included activities associated with augured piling, which included the use of a piling/drill rig, excavators, access / egress of light commercial vehicle and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the two measurements with non-project related noise sources generally inaudible throughout the measurement during times of site activity.

Project 016
26-Aug-18 00:16 00:15:00 81.31 59.29 64.91 71.16 67.47 61.22 100
- 75 Project 019-020 (A01): Measurement location outlined above (A01). NCW P7 works included activities associated with concrete pouring (other general construction activities), which included the use of a Concrete Pump and truck, access / egress of light commercial vehicle, and general hand tools. Nearby wildlife, estimated noise: 55-65 dBA. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the two measurements with non-project related noise sources generally inaudible throughout the measurement during times of site activity.

Project 020
26-Aug-18 14:45 00:14:36 83.25 52.26 63.06 70.64 66.19 57.79 100
- 68 Project 021
26-Aug-18 15:01 00:14:12 77.88 52.07 61.07 73.21 62.32 55.02 100
- 62 Project 022
26-Aug-18 15:15 00:15:00 100.12 54.93 70.09 79.01 69.65 56.60 3 100
- 70 Project 021-022 (A02): Measurement location outlined above (A02). NCW P7 works included activities associated with augured piling (and other general construction activities), which included the use of excavators, access / egress of light commercial vehicle, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the two measurements with non-project related noise sources generally inaudible throughout the measurement during times of site activity.
Appendix C – Recorded Noise Data Set – Unattended Noise Monitoring
Measured Noise Levels
NCW P7 WE08 - UNM01 - Saturday 25 August 2018

Estimated Site Noise
Measured Noise Levels
NCW P7 WE08 - UNM01 - Sunday 26 August 2018

- Excluded (Manual)
- Lmax
- Lmin
- L1
- L90
- Leq
- Estimated Site Noise

Noise Level, dB(A)

Time (24 Hours)