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ACOUSTIC REPORT FOR DEVELOPMENT APPLICATION

CONSTRUCTION WASTE SORTING FACILITY

115 COWPASTURE ROAD, WETHERILL PARK NSW

Date: 28th August 2018

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ACOUSTIC REPORT FOR DEVELOPMENT APPLICATION

CONSTRUCTION WASTE SORTING FACILITY

115 COWPATURE ROAD, WETHERILL PARK NSW

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1.0 INTRODUCTION

Koikas Acoustics Pty Ltd (KA) was engaged by MRA Consulting Group to prepare an acoustic report for the development proposal at 115 Cowpasture Road, Wetherill Park Lane Cove seeking approval for the operation of a construction waste sorting facility.

The proposal will include specific mechanical plant and equipment items and will require heavy vehicles to enter and leave the premises on a regular basis. This will introduce noise into the local area. It is the purpose of this report to assess the resulting level of noise that is generated by the proposed development and to ensure that this noise does not impact unreasonable on the acoustic amenity of surrounding residential and industrial receivers.

In establishing suitable noise target levels, reference is made to relevant EPA acoustic planning guidelines, Noise Policy for Industry (EPA, 2017).

Contained within this report is a discussion relating to the adopted noise criteria for this assessment, the identified sources of noise that may impact the acoustic amenity of the neighbourhood as a direct result of the proposal, the predicted noise levels to surrounding premises and recommended noise attenuation measures to be considered in the design and operation of the premises.

Koikas Acoustics is reliant upon the accuracy of the information that has been provided at the time of conducting the assessment and any amendments or inconsistencies in the supplied data may, in turn, compromise the accuracy of our calculations and recommendations provided herein. This includes outdated or superseded architectural or mechanical drawings.

2.0 THE DEVELOPMENT

The proposed facility is described as a construction waste sorting facility. The site will initially manually process up to 10,000 tonnes per annum (TPA). This is proposed to increase to 20,000 TPA with the installation of a processing line. The proposed processing line is shown in Figure 1.

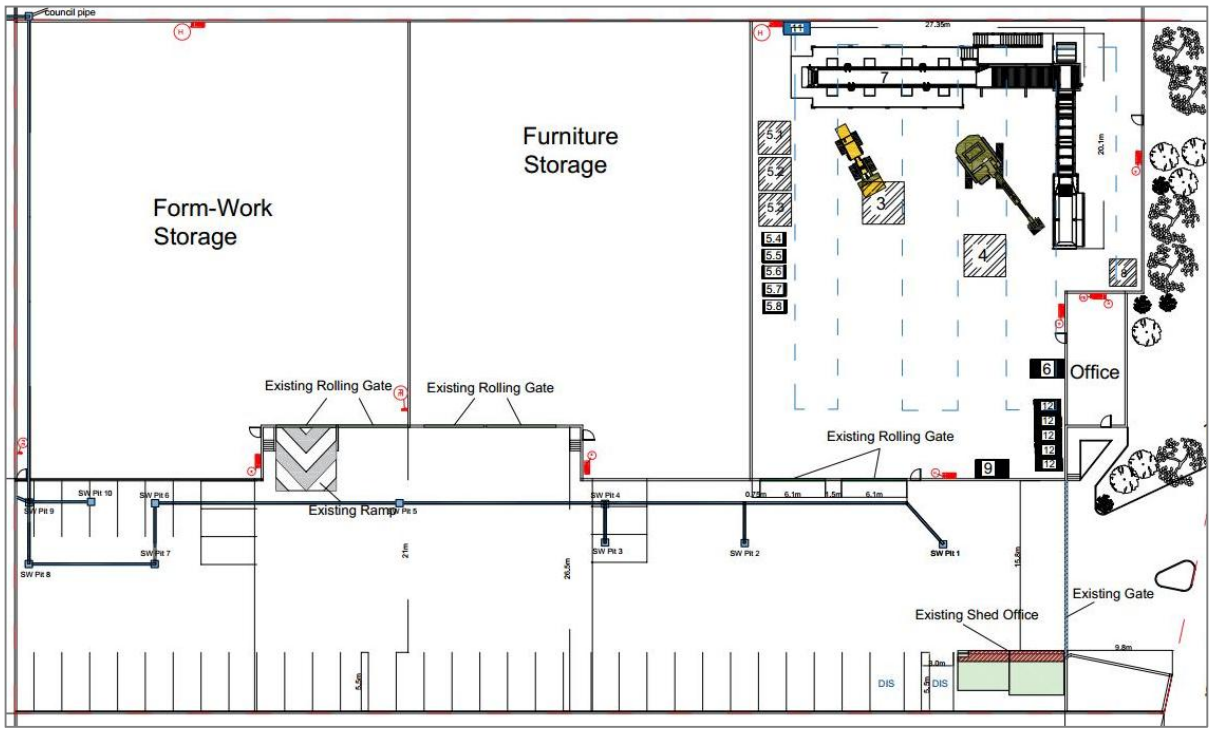


Figure 1. Proposed internal layout

The processing line will result in the following work schedule:

1. Trucks enter and are inspected at the weighbridge.
2. Construction waste material is unloaded onto the floor within the warehouse building.
3. A manual inspection is undertaken with large items removed via forklifts and stored in bins.
4. Material to be processed is transferred to an in-feed hopper by an excavator.
5. This material is then to be processed with a dual-deck vibrating screen.
6. The material is then transferred via conveyors through a manual sorting stage.
7. An overhead belt magnet removes ferrous material from the residual product.
8. Sorted material is transferred into bunkers by type and size.
9. Residual material is deposited on the floor.
10. An excavator or front-end loader is used to load residual and recyclable material into trucks.

Based on a 20,000 TPA capacity, the expectation is that 10 trucks will come and go from the site 5 times each per day. That equates to a total of 50 two-way truck movements per day.

A Lunch Room and Operations Supervisors Office are also proposed, detached from the main warehouse building and located along the northern site boundary.

The site is proposed to operate in two specific modes:

1. Early morning between 6am and 7am when trucks leave the site to deliver bins to construction sites. During this period, the processing line and noise-intensive internal works will not be occurring within the warehouse building.
2. The processing line will begin to operate from 7am onwards, until the end of the day which will not exceed 6pm in the afternoon.

The subject site is located within an industrial precinct. As such, the most noise-impacted premises will be the adjoining industrial sites to the north and south. The nearest and most noise sensitive residential property is located north of the subject site at 5 Trivet Street at a distance of approximately 130 metres.

3.0 AMBIENT NOISE SURVEY

Prevailing ambient noise levels in the local area were measured by installing a noise logger for a period of seven consecutive days. A Noise Sentry RTW noise logger was used for the survey (logger location shown in Figure 2). The microphone was placed at 1.5 metres above the existing ground level.

The instrument was set-up to measure A-frequency weighted and 'Fast'-time response noise levels. Noise level data was stored within the logger memory at 15-minutes intervals for a period of one week between Thursday 30th November and Wednesday 6th December 2017.

A calibration reading was taken before and after the survey with a NATA calibrated and certified Larson Davis CAL200 precision acoustic calibrator. No system drift was observed.

BOM weather records for the nearest available weather station indicate that rain periods were recorded in the area on Sunday 3rd December 2017. In accordance with standard assessment procedures, this data has been excluded from the overall results. Similarly, an instrument malfunction occurred between 11.45am and 4pm on Wednesday 6th December 2017 whereby no data was recorded. The overall results have been suitably corrected for this instrument error.

Table 1. Summary of environmental noise levels, [dB]

Location	Period	Ambient noise LAeq, Period	Background noise (RBL)[1]
Trivet Street, Wetherill Park	7am to 6pm	65	44
	6pm to 10pm	60	37
	6am to 7am	65	49

NOTES
1. RBL = rated background level calculated in accordance with assessment procedures of the EPA's NPfI

Ambient noise was observed on-site to be traffic dominated. The most significant traffic corridor in the area is Cowpasture Road. Limited vehicle pass-bys along Trivet Street also partially contribute to the overall ambient noise profile.

Ambient and background levels are shown to be high during the period of 6am to 7am on account of increased road traffic during morning peak periods.

4.0 DESIGN CRITERIA

Noise emission design targets have been referenced from the NSW EPA guidelines presented in the Noise Policy for Industry (EPA, 2017). The NPfI replaces the former Industrial Noise Policy, also prepared by the EPA.

The NPFI is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the Environment Operations Act 1997, Schedule 1. A construction waste sorting or processing facility is a scheduled activity under the POEO Act 1997 and, as such, the NPfI is appropriate to use as a guide when determining suitable noise emission targets.

The NPfI defines a project intrusiveness noise level and a project amenity noise level. The intrusiveness level assesses short-term intrusive aspects of noise over the worst-case 15-minutes period, whereas the amenity noise level considers the cumulative nature of all industrial noise so that a set threshold industrial noise level is not breached. The amenity criterion is defined over each relevant assessment period (day/evening/night).

The most stringent of the project intrusive noise level and project amenity noise level is applied as the **project noise trigger level**. The project noise trigger level is the point, above which noise emission from a source or development site would trigger a management response. Determination of the project noise trigger level must consider that a +3dB correction is applied to the project amenity noise level to equate the $L_{Aeq\ Period}$ to $L_{Aeq\ 15\ minutes}$.

During full-scale daytime operations, the following project noise trigger level applies to the nearest residence (5 Trivet Street) and industrial site (105-113 Cowpasture Road):

- Project intrusiveness noise level
    - Rating Background Level + 5 = $L_{Aeq\ 15\ minutes}$ 49dB
- Project amenity noise level
    - Suburban classification – daytime recommended amenity noise level $L_{Aeq\ Period}$ 55dB
    - During daytime hours the existing $L_{Aeq\ Period}$ of 65dB is 10dB above recommended amenity noise level. This triggers an assessment under Section 2.4.1 of the NPfI 'Amenity noise levels in areas of high traffic noise'.
    - Therefore, the project amenity noise level becomes $L_{Aeq\ Period\ (traffic)}$ – 15 = 50dB
    - +3dB correction to convert to $L_{Aeq\ 15\ minutes}$ = 53dB

- **Project noise trigger level for daytime hours = $L_{Aeq\ 15\ minutes}$ 49dB**
- **Industrial premises are only assessed to a project amenity noise level of $L_{Aeq\ 15\ minutes}$ 68dB**

During the early morning period between 6am and 7am when trucks leaving the site are the only noise-generating activity occurring, a sleep disturbance noise trigger level must also be determined in addition to the standard project noise trigger level. From 6am to 7am the following applies:

- Project intrusiveness noise level
    - Rating Background Level + 5 = $L_{Aeq\ 15\ minutes}$ 54dB
- Project amenity noise level
    - Suburban classification – night recommended amenity noise level $L_{Aeq\ Period}$ 40dB
    - Between 6am and 7am the existing $L_{Aeq\ Period}$ of 65dB is greater than 10dB above recommended amenity noise level. This triggers an assessment under Section 2.4.1 of the NPfI 'Amenity noise levels in areas of high traffic noise'.
    - Therefore, the project amenity noise level becomes $L_{Aeq\ Period\ (traffic)}$ – 15 = 50dB
    - +3dB correction to convert to $L_{Aeq\ 15\ minutes}$ = 53dB
- **Project noise trigger level for night-time hours = $L_{Aeq\ 15\ minutes}$ 53dB**
- **Sleep disturbance maximum noise levels**
    - **Part 1: Rating Background Level + 5 = $L_{Aeq\ 15\ minutes}$ 54dB**
    - **Part 2: Rating background level + 15 = L_{Amax} 64dB**
- **Industrial premises are only assessed to a project amenity noise level of $L_{Aeq\ 15\ minutes}$ 68dB**

5.0 ASSESSMENT OF POTENTIAL NOISE IMPACTS

This assessment considers noise emission from the proposed facility during the periods of 6am to 7am, and from 7am onwards under a worst-case operating condition. Where noise is shown to meet the design objective under this condition, ie. not exceed the project noise trigger level, then it is implied that noise emission under less noise intensive site works will also be acceptable.

Between 6am and 7am only trucks leaving the site are generating noise.

After 7am, noise emission from the site will be greatest once the processing line is installed and operating, and the site is operating to the 20,000 TPA annual capacity.

To predict the level of noise emitted from the site and its resulting impact on nearby noise sensitive residential and industrial receivers, a computer prediction model has been utilised. The program KA chooses to use is CadnaA, which is a comprehensive environmental noise prediction and analysis software program.

The program predicts noise levels to receiver points based on source sound power levels, source-receiver distances, the presence of any acoustic shielding objects, and the effects of acoustic absorption of the ground and other elements. Noise propagation calculations are determined in accordance with *ISO 9613 Acoustics – Attenuation of sound during propagation outdoors*.

5.1 SOURCE NOISE LEVELS

Three separate components of noise have been identified with regard to the proposed site and its operation:

1. Breakout noise from inside the warehouse building due to material drop-off, the processing line, and residual materials being re-loaded into trucks for removal from the site.
2. Trucks as they enter and leave the site.
3. Mechanical plant and equipment used to ventilate indoor areas such as air conditioning or other ventilation fans.

Breakout noise from the warehouse and mechanical ventilation equipment only applies during daytime hours. Trucks enter/leave the site during both the daytime and early-morning/night-time hours.

At the current DA application stage, no details are available for any air conditioning or ventilation designs. Therefore, ventilation noise emission cannot be assessed at this stage. However, it is the opinion of KA that air conditioning condensers would likely not emit audible noise at the nearest residences on account of the prevailing distance to the proposed site and masking effects due to existing levels of ambient noise. Any impact to industrial premises would likely be insignificant in relation to other noise sources associated with the proposal.

Noise associated with trucks as they enter and leave the site is referenced from a database of measurements conducted by KA for previous projects.

Breakout noise from inside the warehouse has been considered by preparing a representative noise prediction model of the operations within the building. Average noise levels were calculated at specific locations, such as at the two open roller door entry/exit points, around the buildings external wall façade, and at ceiling level. These average indoor levels were then used to calculate radiating area source sound power levels that would represent:

- Transmitted noise through open roller doors
- Transmitted noise through existing concrete walls
- Transmitted noise through existing colourbond sheet metal roofing

A summary of source sound power levels is included below.

Table 2. Summary of source sound power levels, [dB]

	1/1 octave band centre frequency [Hz]								
Noise source *Frequency*	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*	Total
Vibrating screen	80	87	96	99	99	99	98	93	106
Truck dumping material	82	88	92	95	97	95	92	85	102
Excavator loading material into hopper	82	91	95	102	101	99	95	86	106
Loader moving material into trucks	64	73	80	86	98	92	79	70	99
Trucks entering and leaving site (10kph) – LEQ	72	77	83	85	86	83	80	70	91
Trucks entering and leaving site (10kph) – LMAX	90	94	93	99	102	102	99	94	107

5.2 DETAILS OF NOISE PREDICTION MODEL CALCULATION PARAMETERS

5.2.1 Daytime operation

The project noise trigger level is assessed as L_{Aeq} over the worst case 15 minutes period. To approximate worst-case operating conditions, the noise model considers that the processing line and all internal works such as loading of the hopper and loading of residual material into trucks occur as a constant source of noise over a 15 minutes period.

Average noise levels in the warehouse during processing works, material drop-off – transfer – pick-up was found to be:

- 81-83dB(A) at the open roller door locations
- 83dB(A) across all exposed external wall sections
- 84dB(A) average across the ceiling/roof area

For trucks entering and leaving the site, it is assumed that as an absolute worst case, a maximum of 2 two-way truck movements will occur during any 15 minutes.

5.2.2 Early morning/night-time operation

Over a 15 minutes period, it is expected that all 10 trucks on-site may vacate the property. Therefore, 10 trucks exiting the premises have been considered in terms of the standard intrusive/amenity assessment and L_{Aeq} sleep disturbance screening assessment.

The maximum noise level generated by each truck when exiting the premises should be comparable, therefore, the maximum level is assessed on the basis of one standard truck leaving the site.

5.3 ASSESSED RECEIVER LOCATIONS

Receiver noise levels were calculated and assessed at the most noise-affected residential and commercial properties. These have been identified as:

- 5 Trivet Street, Wetherill Park (residential)
- 105-113 Cowpasture Road, Wetherill Park (industrial)

Each of these receiver locations can be seen on the CadnaA noise contour diagrams included in Appendix B of this report.

5.4 PREDICTED RECEIVER LEVELS

5.4.1 Daytime receiver noise levels

Receiver levels at the most affected point on the residential property within 30 metres of the residence are predicted to be 49dB(A). The predicted noise level does not exceed the project nose trigger level and, therefore, a further investigation into noise management is not required.

Furthermore, it is likely that the noise level predicted in the acoustic model is conservative, on the basis that not all noise generating equipment and/or work practices will be occurring at the same time.

The most affected point of the adjacent industrial premises is predicted to be exposed to noise levels of 60dB(A), which are well below the project amenity noise level for industrial sites of 68dB(A).

5.4.2 Early morning/night-time receiver noise levels

10 trucks leaving the site of a morning are predicted to generate noise levels of 34dB(A) at the nearest residential assessment location. The predicted noise level does not exceed the project noise trigger level and, therefore, a further investigation into noise management is not required.

Furthermore, maximum noise levels from trucks leaving the site are predicted to be 57-59dB(A) at the same residential site, within the management level of 64dB(A) that would trigger a further investigation into sleep disturbance.

The most affected point of the adjacent industrial premises is predicted to be exposed to noise levels of 46dB(A), which are well below the project amenity noise level for industrial sites of 68dB(A).

6.0 CONCLUSION

KA was requested to prepare an acoustic report for the site at 115 Cowpasture Road, Wetherill Park. The acoustic report was prepared to address noise issues related to an application to Council for a construction waste sorting facility.

To conduct the assessment and formulate reliable conclusions, reference was made to an outline of work practices provided by MRA Consulting Group, and a general site layout for the processing line prepared by RDT Engineering.

Furthermore, noise measurements were required to quantify the level of existing external ambient noise in the local area. The prevailing ambient noise levels are used to establish suitable planning levels with regards to noise emission. Ambient noise was subsequently identified as primarily resulting from traffic associated with Cowpasture Road and Trivet Street.

Our assessment concludes the following in relation to the assessed components of noise:

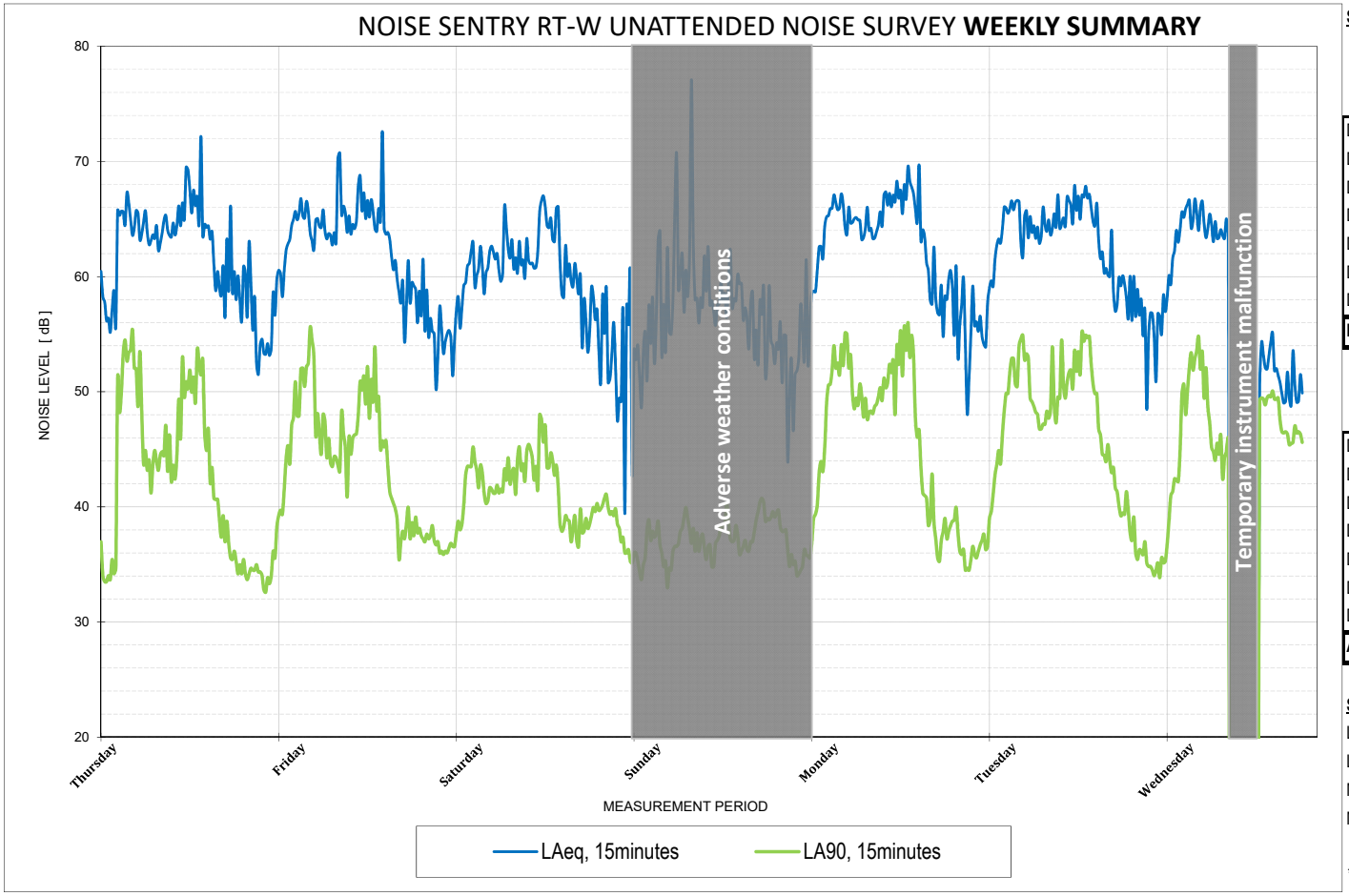
- Noise emission from the proposed facility when operating at its advised peak capacity of 20,000 TPA is predicted to be acceptable under standard EPA planning guidelines by not exceeding the project noise trigger level of the Noise Policy for Industry (EPA, 2017).
- The first stage of the application, whereby the site will not have the use of a processing line, but will rather manually sort material at a rate of 10,000 TPA will generate less noise than the site will under a future 20,000 TPA and processing line operating condition. It is implied that this will also be acceptable under standard EPA planning guidelines in terms of the resulting noise emission.
- Sleep disturbance is not expected during early morning hours when trucks are leaving the site to drop-off bins at construction sites.
- Mechanical ventilation plant and equipment has not been considered in this assessment of noise emission as system-specific details are not available at this time. Should mechanical ventilation systems be proposed as part of the development, their contribution to the overall noise output from the site should be assessed and verified prior to the site becoming operational.
- At this stage, KA is satisfied that the proposal will meet relevant EPA noise planning guidelines such that resulting noise levels to nearby residential and industrial receivers will not be deemed to adversely impact existing amenity conditions.

APPENDIX A

APPENDIX A

APPENDIX A

WEEKLY SUMMARY **LOGGER LOCATION:** 5-13 Trivett St **PERIOD:** 30th November to the 6th December 2017



SUMMARY OF AMBIENT NOISE LEVELS

	LA90 Daytime	*LA90* Evening	*LA90* Nighttime
Day 1	43	35	49
Day 2	44	37	48
Day 3	41	37	42
Day 4			
Day 5	48	36	51
Day 6	47	39	50
Day 7		46	49
RBL	**44**	**37**	**49**

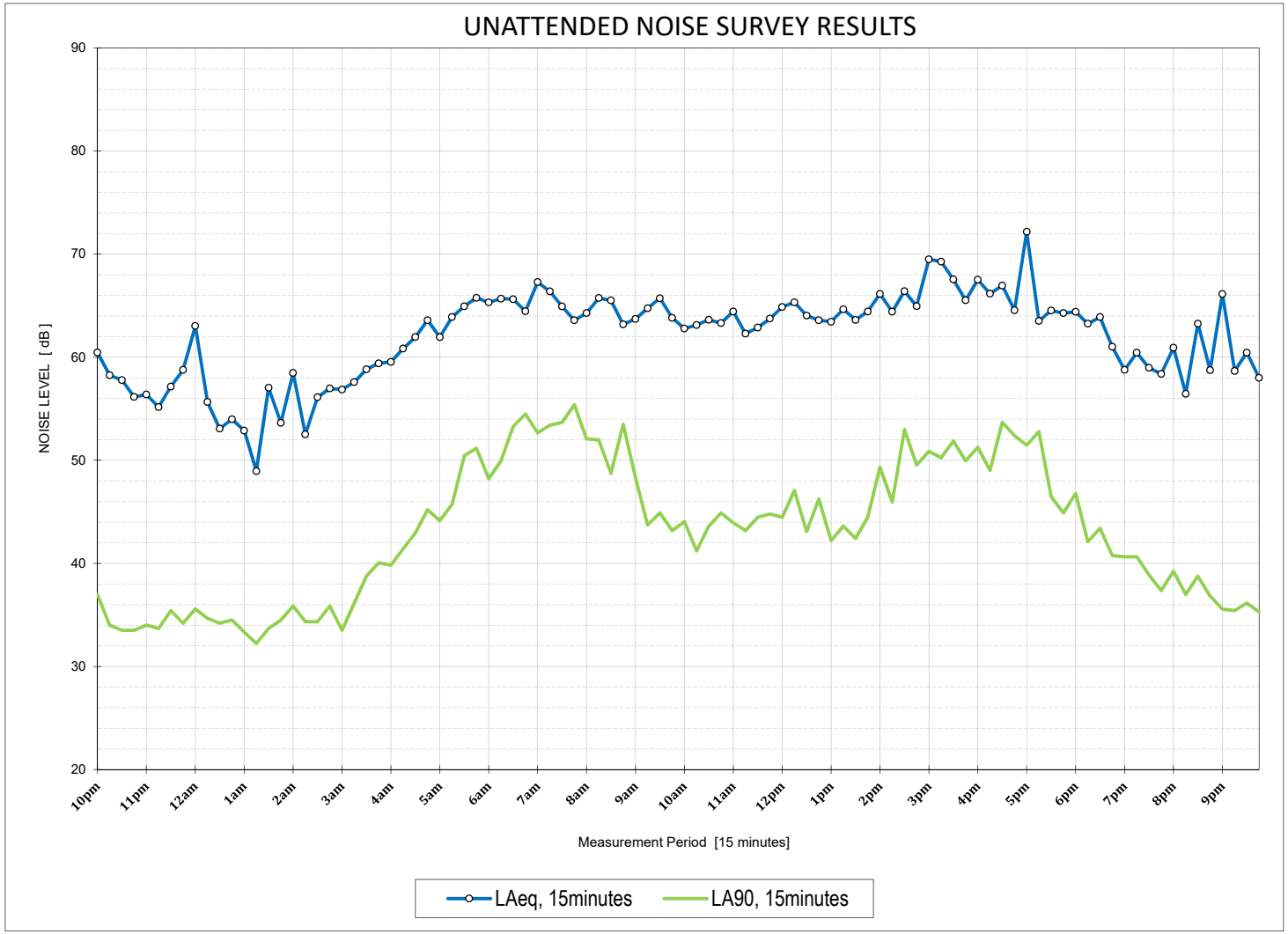
	LAeq Daytime	*LAeq* Evening	*LAeq* Nighttime
Day 1	66	62	65
Day 2	66	61	66
Day 3	63	59	61
Day 4			
Day 5	66	62	66
Day 6	65	61	66
Day 7		51	66
Average	**65**	**60**	**65**

SUMMARY OF TRAFFIC & MISC. NOISE LEVELS

LAeq 15 hrs	0700-2200	64	dB
LAeq 9 hrs	2200-0700	60	dB
Max LAeq 1 hr	0700-2200	67	dB
Max LAeq 1 hr	2200-0700	65	dB

* *Sundays and Public Holidays the hours change to*

DAY 1 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Thursday, 30 November 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	43	dB
LA90 Evening	1800-2200	35	dB
LA90 Nighttime	0600-0700	49	dB

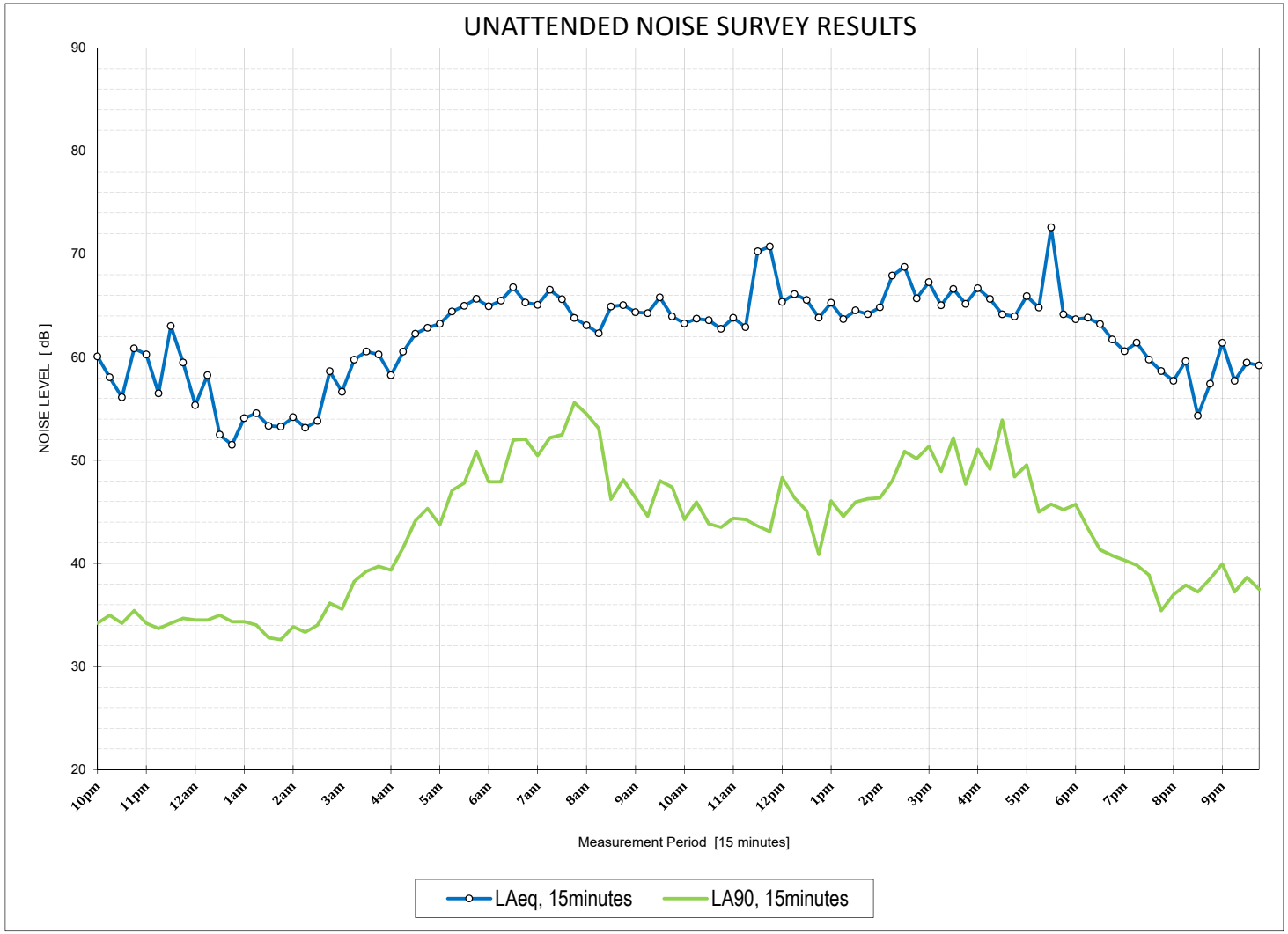
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	66	dB
LAeq Evening	1800-2200	62	dB
LAeq Nighttime	0600-0700	65	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	65	dB
LAeq 9 hours	2200-0700	61	dB
Max LAeq 1 hour	0700-2200	68	dB
Max LAeq 1 hour	2200-0700	65	dB

DAY 2 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Friday, 1 December 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	44	dB
LA90 Evening	1800-2200	37	dB
LA90 Nighttime	0600-0700	48	dB

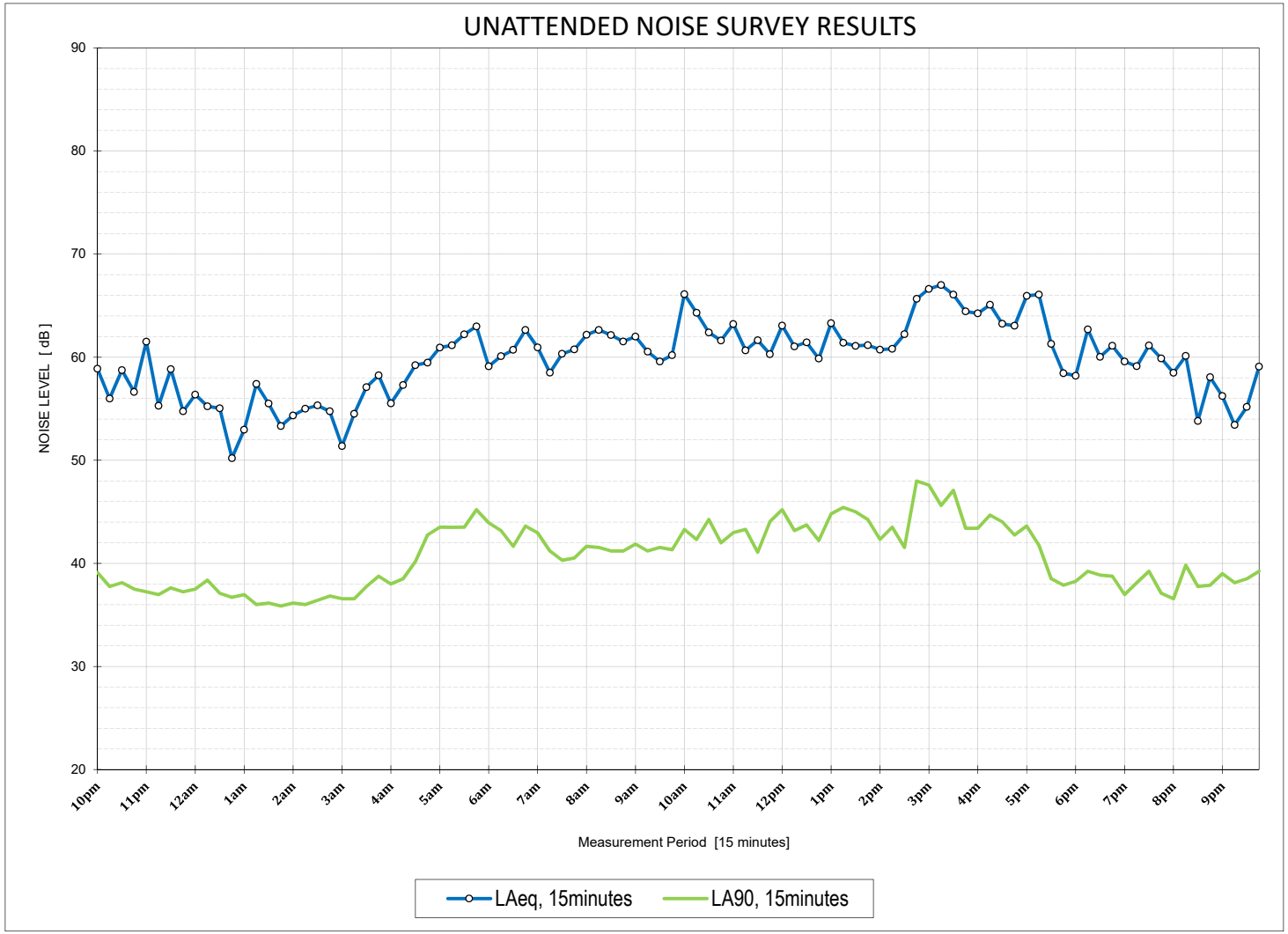
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	66	dB
LAeq Evening	1800-2200	61	dB
LAeq Nighttime	0600-0700	66	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	65	dB
LAeq 9 hours	2200-0700	61	dB
Max LAeq 1 hour	0700-2200	68	dB
Max LAeq 1 hour	2200-0700	65	dB

DAY 3 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Saturday, 2 December 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	41	dB
LA90 Evening	1800-2200	37	dB
LA90 Nighttime	0600-0700	42	dB

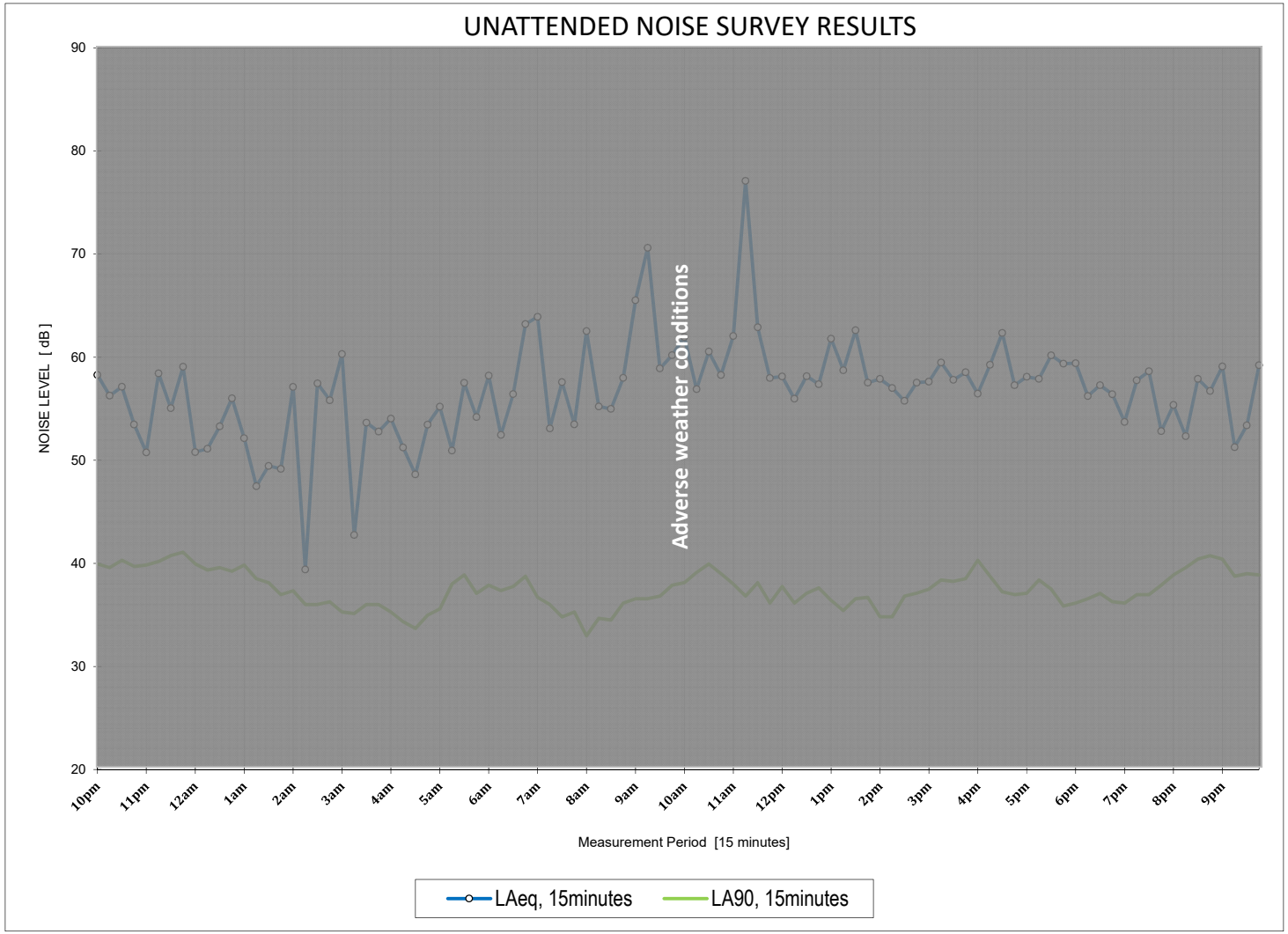
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	63	dB
LAeq Evening	1800-2200	59	dB
LAeq Nighttime	0600-0700	61	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	62	dB
LAeq 9 hours	2200-0700	58	dB
Max LAeq 1 hour	0700-2200	65	dB
Max LAeq 1 hour	2200-0700	61	dB

DAY 4 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Sunday, 3 December 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800		dB
LA90 Evening	1800-2200		dB
LA90 Nighttime	0600-0800		dB

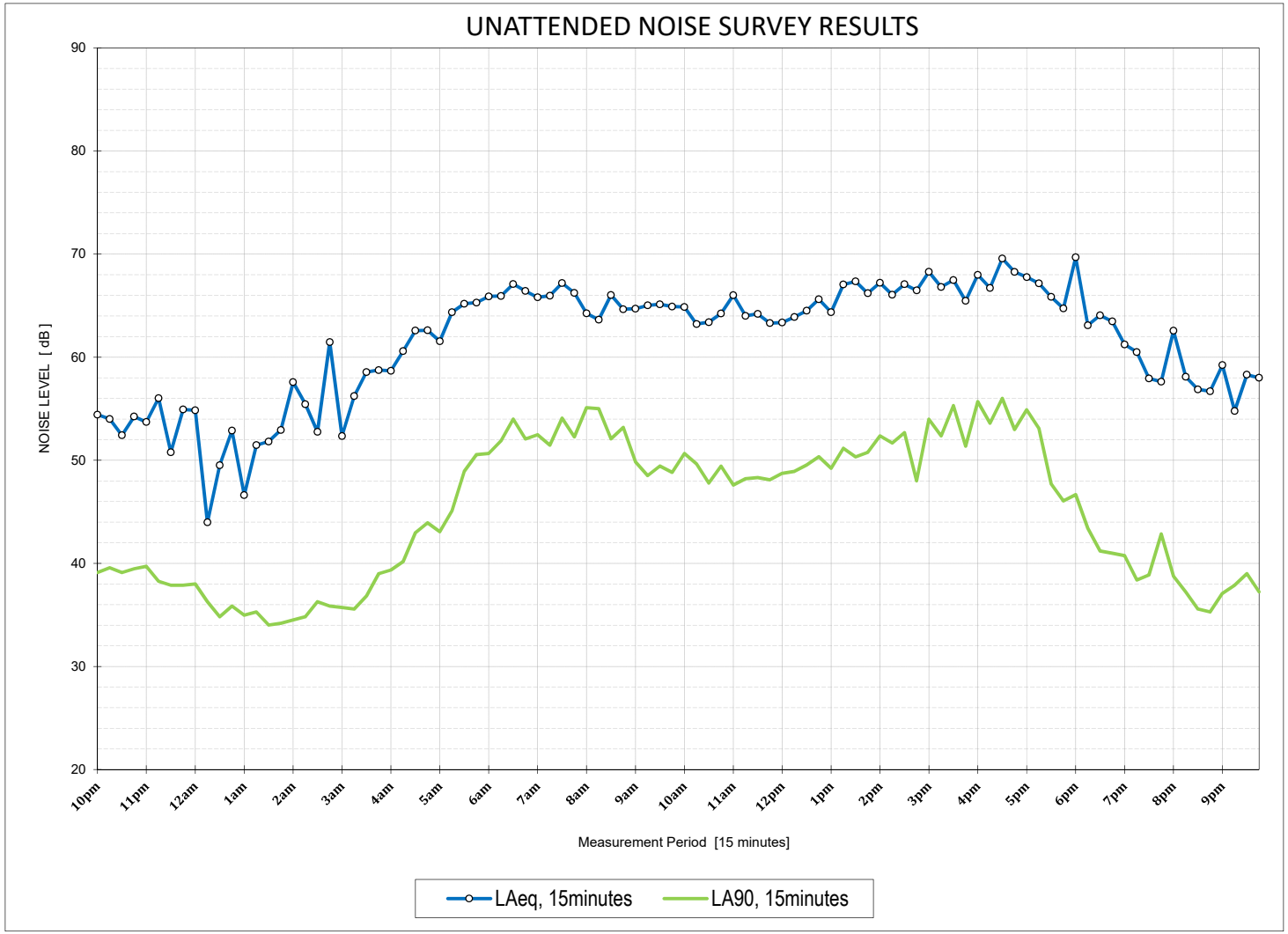
AMBIENT NOISE METRICS

LAeq Daytime	0800-1800		dB
LAeq Evening	1800-2200		dB
LAeq Nighttime	0600-0800		dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200		dB
LAeq 9 hours	2200-0700		dB
Max LAeq 1 hour	0700-2200		dB
Max LAeq 1 hour	2200-0700		dB

DAY 5 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Monday, 4 December 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	48	dB
LA90 Evening	1800-2200	36	dB
LA90 Nighttime	0600-0700	51	dB

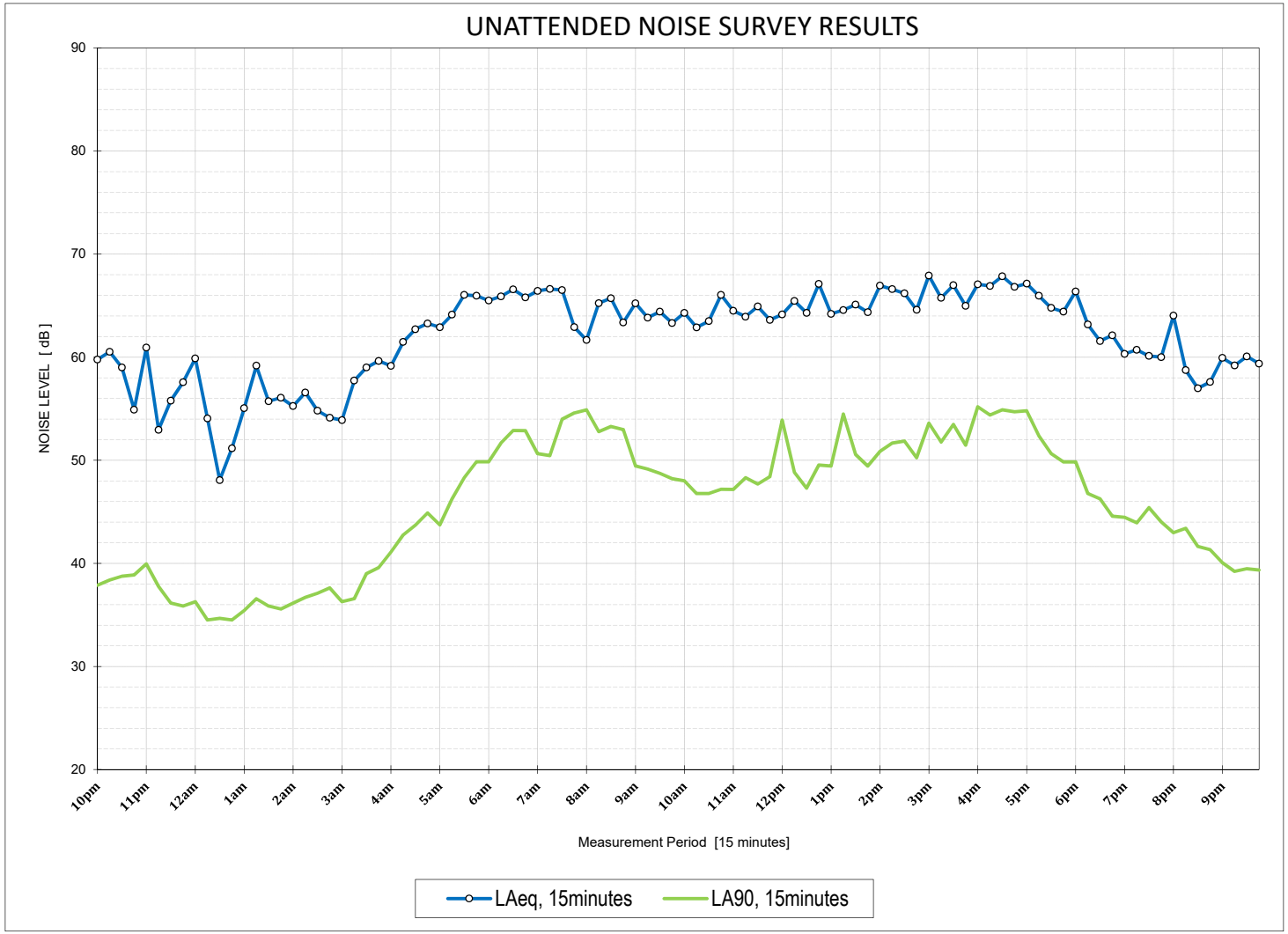
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	66	dB
LAeq Evening	1800-2200	62	dB
LAeq Nighttime	0600-0700	66	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	65	dB
LAeq 9 hours	2200-0700	61	dB
Max LAeq 1 hour	0700-2200	67	dB
Max LAeq 1 hour	2200-0700	65	dB

DAY 6 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Tuesday, 5 December 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	47	dB
LA90 Evening	1800-2200	39	dB
LA90 Nighttime	0600-0700	50	dB

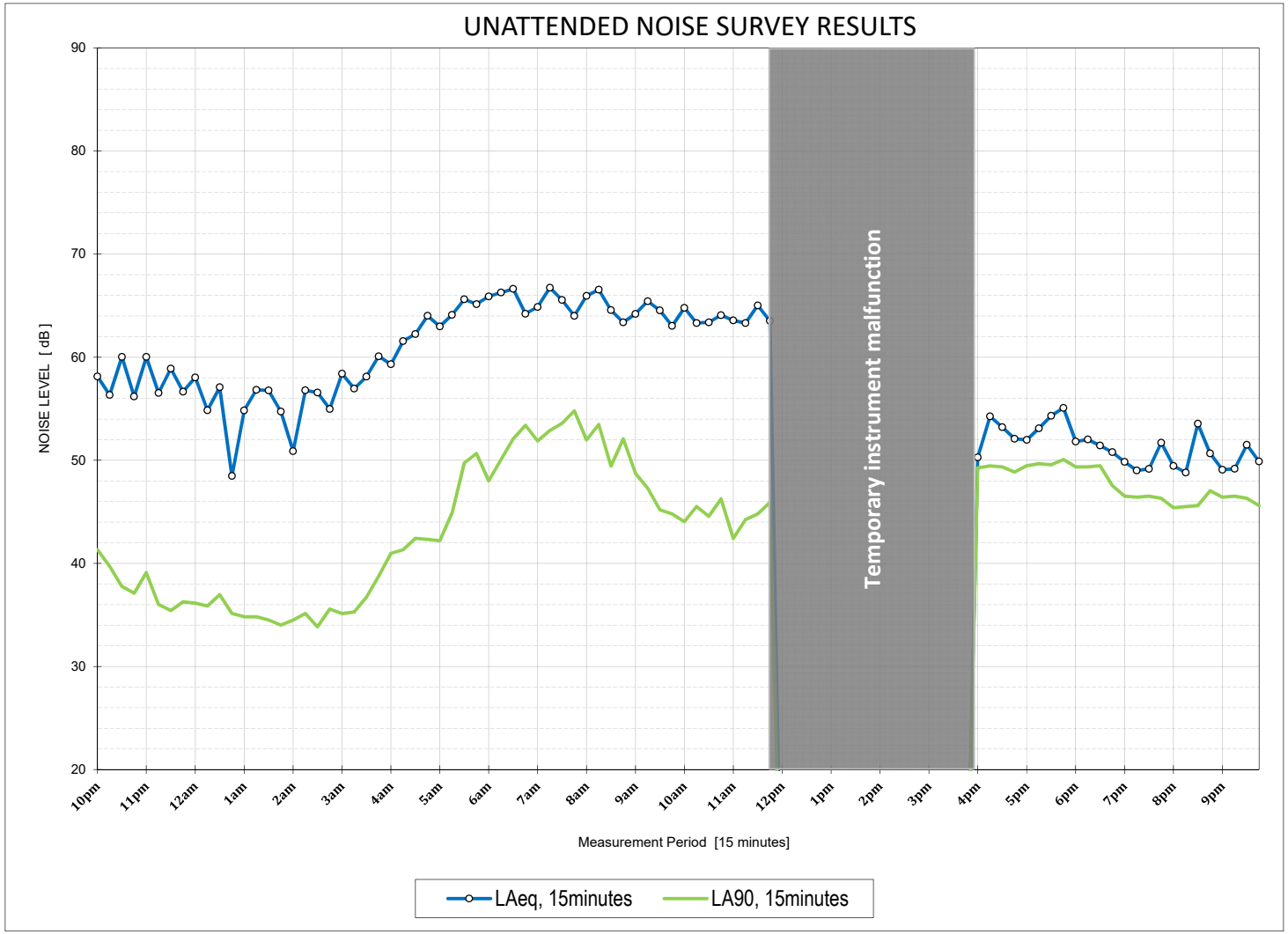
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	65	dB
LAeq Evening	1800-2200	61	dB
LAeq Nighttime	0600-0700	66	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	65	dB
LAeq 9 hours	2200-0700	61	dB
Max LAeq 1 hour	0700-2200	66	dB
Max LAeq 1 hour	2200-0700	65	dB

DAY 7 **LOGGER LOCATION:** 5-13 Trivett St **DATE:** Wednesday, 6 December 2017



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800		dB
LA90 Evening	1800-2200	46	dB
LA90 Nighttime	0600-0700	49	dB

AMBIENT NOISE METRICS

LAeq Daytime	0700-1800		dB
LAeq Evening	1800-2200	51	dB
LAeq Nighttime	0600-0700	66	dB

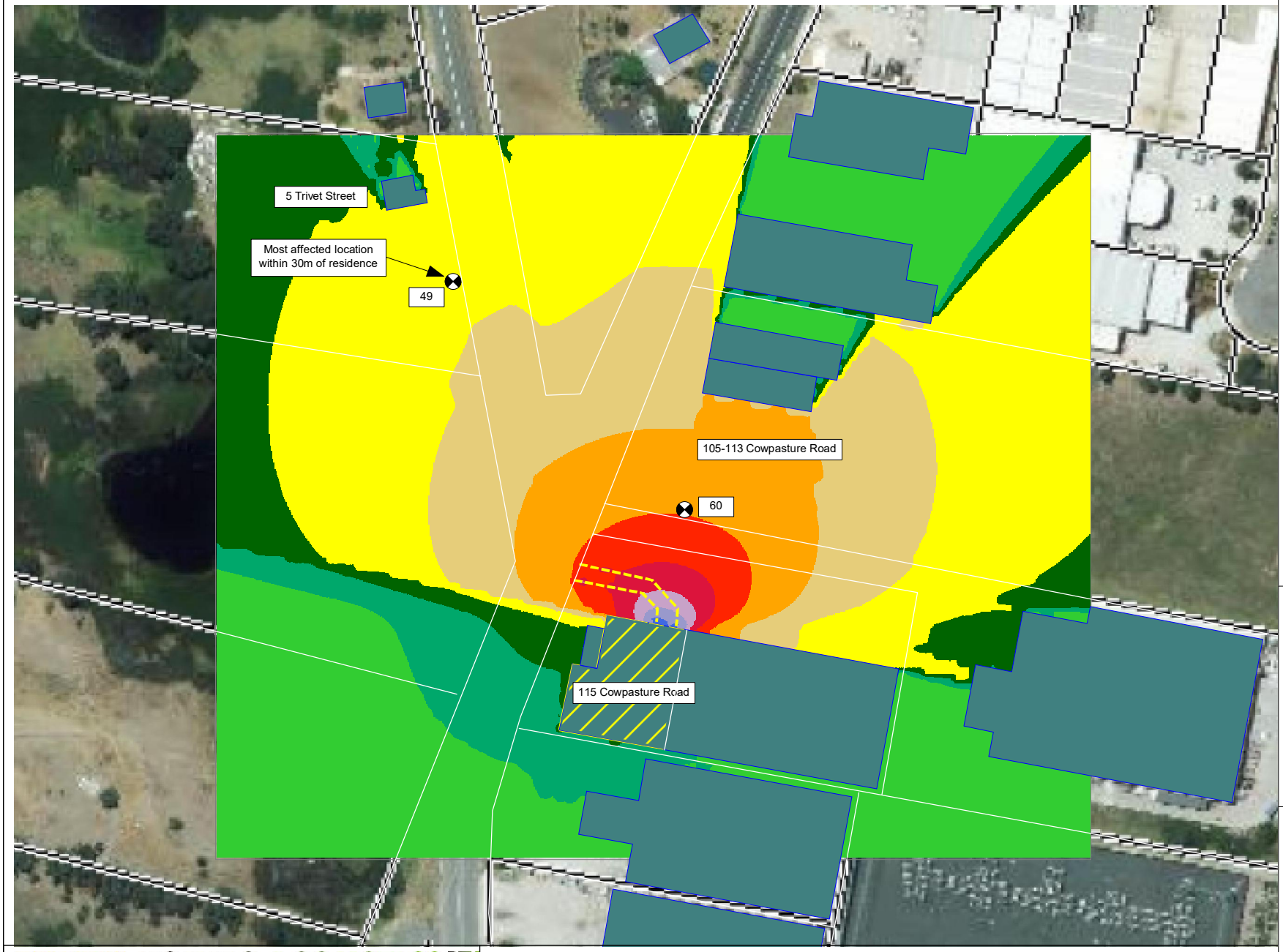
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200		dB
LAeq 9 hours	2200-0700	61	dB
Max LAeq 1 hour	0700-2200		dB
Max LAeq 1 hour	2200-0700	65	dB

APPENDIX B

APPENDIX B

APPENDIX B



**** NOISE SOURCES ****

~ Noise egress from warehouse building

- *processing line*
- *product delivery*
- *product removal*

~ Trucks entering and leaving site

NOTES:

1. Noise levels shown are LAeq 15 mins

2. Noise contours shown at 1.5m above ground

PRINT DATE: 15.12.2017

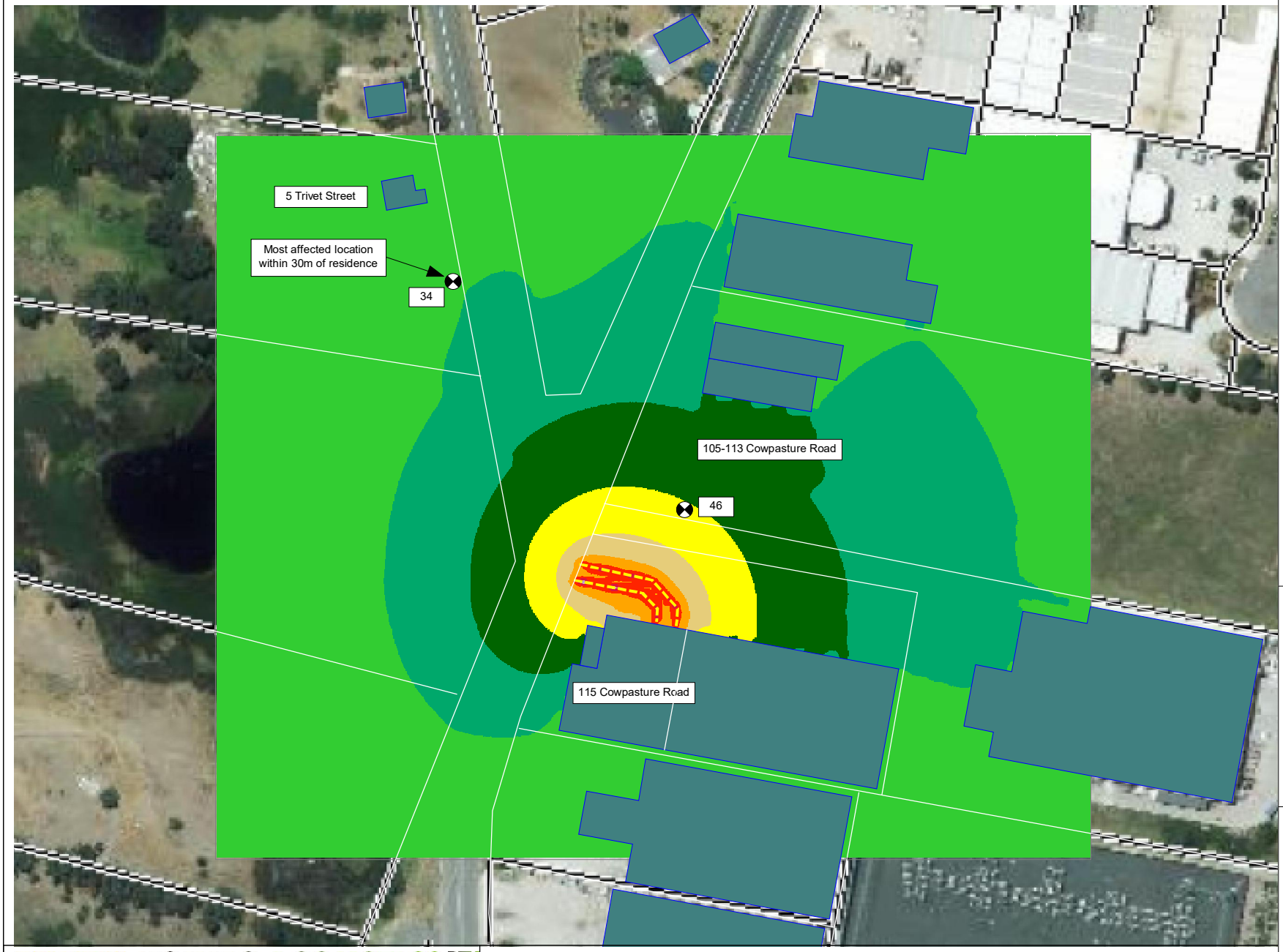
VERSION: EPA Day v1

Line Source
Area Source
vert. Area Source
Building
Contour Line
Receiver
Calculation Area

35.0 <= ... < 40.0
40.0 <= ... < 45.0
45.0 <= ... < 50.0
50.0 <= ... < 55.0
55.0 <= ... < 60.0
60.0 <= ... < 65.0
65.0 <= ... < 70.0
70.0 <= ... < 75.0
75.0 <= ... < 80.0
80.0 <= ... < 85.0
85.0 <= ... < 90.0
90.0 <= ... < 95.0
95.0 <= ... < 100.0
100.0 <= ...

KOIKAS ACOUSTICS PTY LTD
CONSULTANTS IN NOISE & VIBRATION
ABN 12 058 524 771 Commercial 1 (Unit 27), 637 - 645 Forest Road, Bexley 2207
E-mail Nick@KoikasAcoustics.com F (02) 9587 5337 P (02) 9587 9702

JOB NUMBER: 3321
CLIENT: MRA Consulting Group
SITE ADDRESS: 115 Copwasture Road, Wetherill Park
ASSESSED TO: EPA Noise Policy for Industry
LIMITING CRITERIA: See acoustic report



**** NOISE SOURCES ****

Assessment of the potential for sleep disturbance as trucks leave the site of a morning between the hours of 6am and 7am.

Worst case assume that all 10 trucks leave during a 15 minute period.

NOTES:

1. Noise levels shown are LAeq 15 mins

2. Noise contours shown at 1.5m above ground

PRINT DATE: 15.12.2017

VERSION: Sleep Leq v1

- Line Source
- Building
- Contour Line
- Receiver
- Calculation Area

- 35.0 <= ... < 40.0
- 40.0 <= ... < 45.0
- 45.0 <= ... < 50.0
- 50.0 <= ... < 55.0
- 55.0 <= ... < 60.0
- 60.0 <= ... < 65.0
- 65.0 <= ... < 70.0
- 70.0 <= ... < 75.0
- 75.0 <= ... < 80.0
- 80.0 <= ... < 85.0
- 85.0 <= ... < 90.0
- 90.0 <= ... < 95.0
- 95.0 <= ... < 100.0
- 100.0 <= ...

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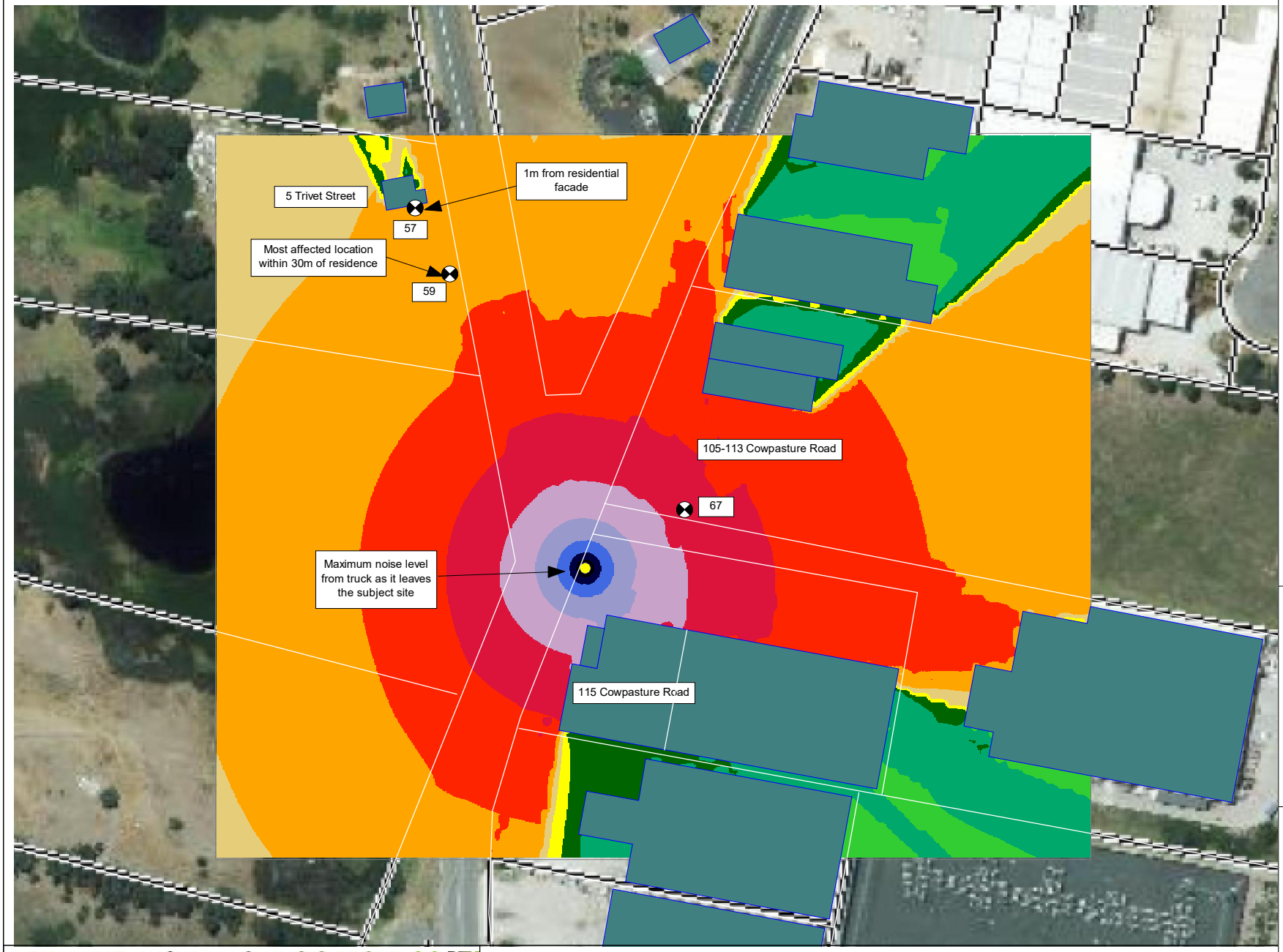
JOB NUMBER: 3321
CLIENT: MRA Consulting Group
SITE ADDRESS: 115 Copwasture Road, Wetherill Park
ASSESSED TO: Sleep disturbance
LIMITING CRITERIA: See acoustic report



**** NOISE SOURCES ****

Assessment of the potential for sleep disturbance as trucks leave the site of a morning between the hours of 6am and 7am.

No material processing will occur during this time.

NOTES:

1. Noise levels shown are LAmax

2. Noise contours shown at 1.5m above ground

PRINT DATE: 15.12.2017

VERSION: Sleep max v1

Point Source
Building
Contour Line
Receiver
Calculation Area

35.0 <= ... < 40.0
40.0 <= ... < 45.0
45.0 <= ... < 50.0
50.0 <= ... < 55.0
55.0 <= ... < 60.0
60.0 <= ... < 65.0
65.0 <= ... < 70.0
70.0 <= ... < 75.0
75.0 <= ... < 80.0
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85.0 <= ... < 90.0
90.0 <= ... < 95.0
95.0 <= ... < 100.0
100.0 <= ...

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LIMITING CRITERIA: See acoustic report