

Construction Noise and Vibration Assessment Report

Newell Highway Upgrade - Parkes
Bypass

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Executive summary

Transport for NSW (TfNSW) proposes to build a new 10.5 kilometres bypass approximately 1.5 to 2.0 kilometres west of the existing Newell Highway in Parkes, NSW. Cardno has been engaged to prepare a Construction Noise and Vibration Assessment Report (CNVAR) for the Parkes Bypass project.

This CNVAR has been prepared on the basis of the 100% detailed design for the project and provides updated predicted noise levels expected to impact nearby affected sensitive receivers from those previously contained in the project REF prepared by WSP in December 2019.

The new highway west of Parkes will be approximately 10.5 kilometres long and the key features will include:

- > A two-lane road (one lane in each direction) with four key intersections including:
 - North and south T-intersections with turn lanes between the existing Newell Highway and the Bypass
 - A split T-intersection at London Road
 - A split T-intersection at Brolgan Road
 - A four-way roundabout at Condobolin Road
- > Two bridges including:
 - A bridge over the Broken Hill (Sydney to Perth) and Parkes-Narromine rail lines and Hartigan Avenue
 - A local vehicle bridge with a shared path for cyclists and pedestrians over the bypass connecting Victoria Street and Back Trundle Road
- > An extension of Hartigan Avenue to connect to Brolgan Road, Billy Mac Place and Condobolin Road
- > Realignment, reconfiguration and modification to local roads including:
 - Realignment of Moulden Street
 - Maguire Road and Nock Road are converted to cul-de-sacs
 - Construction of a new road between Brolgan Road and Hartigan Avenue
 - Construction of a new road between Thomas Street and Mitchell Street
 - New T-intersection at Thomas Street and Reedsdale Road (no access between Thomas Street and Moulden Street)
 - New T-intersection at Brolgan Road (west) onto Hartigan Avenue extension (no access east/west along Brolgan Road across bypass)
- > A new shared path for pedestrians and cyclists parallel to the eastern side of the bypass, which would connect Brolgan Road, Condobolin Road and Victoria Street

This assessment considers the following policies and guidelines:

- > Assessing Vibration – A Technical Guideline (DEC 2008) (AVATG)
- > Construction Noise and Vibration Guideline (Roads and Maritime 2016) (CNVG)
- > Environmental Noise Management Manual (RTA 2001) (ENMM)
- > Road Noise Policy (DECCW 2011) (RNP)

In undertaking the assessment, a review of the REF Noise and Vibration Assessment Report: “*Parkes Bypass - Operational road traffic noise and construction noise and vibration assessment report, October 2018*” (File Ref: 07 NOISE – PS102430-NOI-REP-001 Rev C)” (The REF) was conducted. This assessment includes updated noise measurements undertaken for the 100% detailed design Operational Traffic Noise Assessment Report (OTNAR) and updated plant and equipment schedules intended for the various construction phases.

3D noise modelling software (SoundPLAN 8.2) was then used to predict construction noise impacts and compared to the relevant criteria to determine whether noise mitigation measures will be required. Noise mitigation measures have been designed for all sensitive receivers that qualify for mitigation in accordance with the CNVG.

On this basis, the assessment has identified the following conclusions:

Assessment conclusions

- > In accordance with the noise management levels stipulated in Section 5.1, dwellings exposed to levels of construction noise above 75 dB(A) are considered highly noise affected, with dwellings exposed to levels above the daytime RBL +10 dB(A) considered noise affected.
- > Construction noise levels are predicted to exceed the NSW ICNG noise management levels (NML) for “standard” hours at all noise catchment areas (NCAs) for all construction stages.
- > Construction noise levels are predicted to significantly exceed noise management levels for “non-standard” hours. This is due to the proximity of receivers to the construction works and low background noise levels in the rural area.
- > Predicted levels are expected to be highly intrusive at a significant number of receivers during both standard hours and OOHW periods for Scenarios 2, 3, 4, 6, and 7. Furthermore, predicted levels are expected to be highly intrusive during OOHW periods for Scenarios 8 and 9.
- > It should be noted that this assessment has endeavoured to carry out “worst case” noise modelling, and noise levels are predicted based on all modelled sources operating simultaneously. Should the work sites or plant and equipment be amended, the predicted noise levels will change accordingly.
- > The predicted exceedances are generally a result of works being located in close proximity to the adjacent receivers. This modelling has been carried out to provide a worst case scenario and it may be possible to reduce the number of plant operating simultaneously, particularly at night, once detailed construction schedules are known.
- > Provision of temporary noise barriers is not likely to be practical for this site given the extent of the project and the quantity of spread out receivers. However, provision of anti-gawk screens with no gaps around the work site may provide some screening to the closest ground level receivers, and should be investigated further as part of the project CNVMP assessment.
- > Best practice mitigation measures are recommended in Section 9 of this report.
- > An indicative assessment only of expected L_{Amax} impact has been carried out for this assessment as it is difficult to predict L_{Amax} for construction noise sources. It is generally expected that sleep disturbance criteria are likely to be exceeded if works are undertaken during the night period.
- > The minimum working distances indicated in Table 7-1 for cosmetic damage must be complied with at all times, unless otherwise approved by TfNSW or under the environmental license as relevant, as stipulated in the NSW Construction Noise and Vibration Guideline.
- > A detailed construction noise and vibration management plan should be prepared for the project prior to construction commencement to incorporate the recommendations detailed in Section 9 and updated to reflect the proposed staging and plant to be adopted for the project.
- > Recommendations for the mitigation of blasting impacts has been provided. We recommend that a detailed survey for potentially affected dwellings and structures (including underground services) is conducted prior to blasting activities. Furthermore, it is recommended that monitoring of airblast overpressure and ground vibration is conducted during blasting, and that initial trial blasts with conservative charge quantities are undertaken to verify site conditions.

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Technical terms

Term	Definition
Adverse Weather	Weather effects that enhance noise (that is, wind and rain) that occur at a site for a significant period of time (that is, wind exceeding 5 m/s and rain exceeding 0.5 mm per hour during any measurement period.)
A-weighted Level	As per dB(A) defined below.
Ambient Sound	Of an environment: the all-encompassing sound associated with that environment, being a composite of sounds from many sources, near and far.
AV:ATG	New South Wales Office of Environment and Heritage Assessing Vibration: A Technical Guide (DEC 2006)
Background Sound Level	The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted external ambient noise sources.
CoRTN	Calculation of Road Traffic Noise, HMSO 1988
Controlling Criterion	The greater exceedance of the “relative increase criterion” or the “road traffic noise assessment criteria (Table 3 and 4 in the RNP)”.
dB(A)	Unit of acoustic measurement electronically weighted to approximate the sensitivity of human hearing to sound frequency.
DEC	NSW Department of Environment and Conservation, now known as the NSW Office of Environment and Heritage
DECC	NSW Department of Environment and Climate Change, now known as the NSW Office of Environment and Heritage
DECCW	NSW Department of Environment and Climate Change and Water, now known as the NSW Office of Environment and Heritage
Decibel, dB	Unit of acoustic measurement. Measurements of power, pressure and intensity may be expressed in dB relative to standard reference levels.
ECRTN	New South Wales superseded Office of Environment and Heritage Environmental Criteria for Road Traffic Noise (EPA 1999).
ENMM	The New South Wales Department of Roads and Maritime Safety Environmental Noise Management Manual (RTA 2001).
EPA	New South Wales Environmental Protection Authority
ICNG	New South Wales Office of Environment and Heritage Interim Construction Noise Guideline (DECCW 1999).
INP	New South Wales Office of Environment and Heritage Industrial Noise Policy (EPA 2000).
L90, L10 etc.	A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, i.e. L90 is the level which is exceeded for 90 percent of an observation period. L90 is commonly referred to as a basis for measuring the background sound level.
LA _{bg} , T	The A-weighted background sound level measured over a time interval T.
LA _{eq} , T	Equivalent continuous A-weighted sound pressure level. This is the value of the A-weighted sound pressure level of a continuous steady sound that,

Term	Definition
	within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.
NSW	New South Wales
RBL	Rating Background Level
REF	Review of Environmental Factors
RMS	Roads and Maritime Services
RNP	New South Wales Office of Environment and Heritage Road Noise Policy (DECCW 2011).
RTA	NSW Roads and Traffic Authority, now known as the NSW Department of Transport, Roads and Maritime Services
Roads and Maritime	Roads and Maritime Services
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound Pressure Level, Lp, dB, of a sound	A measurement obtained directly obtained using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 microPascals.
Sound Power Level, Lw, dB of a source	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power level is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt.
TfNSW	Transport for NSW (formerly Roads and Maritime)

1 Introduction

Transport for NSW (TfNSW) proposes to build a new 10.5 kilometres bypass approximately 1.5 to 2.0 kilometres west of the existing Newell Highway in Parkes, NSW. Cardno has been engaged to prepare a Construction Noise and Vibration Assessment Report (CNVAR) for the project.

This CNVAR has been prepared on the basis of the 100% detailed design for the project and provides updated predicted noise levels expected to impact nearby affected sensitive receivers from those previously contained in the project REF prepared by WSP in December 2019.

The assessment has been based on the following statutory policies and guidelines:

- > Assessing Vibration – A Technical Guideline (DEC 2008) (AVATG)
- > Construction Noise and Vibration Guideline (Roads and Maritime 2016) (CNVG)
- > Environmental Noise Management Manual (RTA 2001) (ENMM)
- > Road Noise Policy (DECCW 2011) (RNP)

In undertaking the assessment, a review of the construction methodology in the REF Noise and Vibration Assessment Report: “*Parkes Bypass - Operational road traffic noise and construction noise and vibration assessment report, October 2018*” (File Ref: 07 NOISE – PS102430-NOI-REP-001 Rev C)” (The REF) was conducted. Some of the information from the REF was retained for this assessment.

This CNVMP was then updated to include, updated noise measurements undertaken for the 100% detailed design Operational Traffic Noise Assessment Report (OTNAR) and updated plant and equipment schedules intended for the various construction phases.

3D noise modelling software (SoundPLAN 8.2) was then used to predict construction noise impacts and compared to the relevant criteria to determine whether noise mitigation measures will be required. Noise mitigation measures have been designed for all sensitive receivers that qualify for mitigation in accordance with the CNVG.

1.1 Assessment objectives

The assessment objectives are to determine the predicted levels of construction noise and vibration impact on sensitive receivers located near to the project, and determine the levels of mitigation that are likely to be required, if applicable, to enable compliance with the current NSW legislation.

2 Project description

2.1 Existing site description

The areas surrounding the proposed bypass consist of freestanding residential dwellings, interspersed with other sensitive land uses including educational facilities, a child care centre, a place of worship, and outdoor recreational areas. A total of ten noise catchment areas (NCA) have been established to group together dwellings with similar representative land uses, ambient noise environments and potentially similar degree of impacts

The assessment area surrounding the bypass includes the following land uses:

1. Freestanding residential dwellings
2. Educational facilities
3. Outdoor recreational areas.

Figure 2-1 shows the 100% design alignment.

2.2 Proposed project

TfNSW proposes to build a new 10.5 kilometres bypass approximately 1.5 to 2.0 kilometres west of the existing Newell Highway in Parkes, NSW.

The proposal includes:

- > A two-lane road (one lane in each direction) with four key intersections including:
 - North and south T-intersections with turn lanes between the existing Newell Highway and the Bypass
 - A split T-intersection at London Road
 - A split T-intersection at Brolgan Road
 - A four-way roundabout at Condobolin Road
- > Two bridges including:
 - A bridge over the Broken Hill (Sydney to Perth) and Parkes-Narromine rail lines and Hartigan Avenue
 - A local vehicle bridge with a shared path for cyclists and pedestrians over the bypass connecting Victoria Street and Back Trundle Road
- > An extension of Hartigan Avenue to connect to Brolgan Road, Billy Mac Place and Condobolin Road
- > Realignment, reconfiguration and modification to local roads including:
 - Realignment of Moulden Street
 - Maguire Road and Nock Road are converted to cul-de-sacs
 - Construction of a new road between Brolgan Road and Hartigan Avenue
 - Construction of a new road between Thomas Street and Mitchell Street
 - New T-intersection at Thomas Street and Reedsdale Road (no access between Thomas Street and Moulden Street)
 - New T-intersection at Brolgan Road (west) onto Hartigan Avenue extension (no access east/west along Brolgan Road across bypass)
- > A new shared path for pedestrians and cyclists parallel to the eastern side of the bypass, which would connect Brolgan Road, Condobolin Road and Victoria Street

The key features of the project are presented in Table 2-1.

Table 2-1 Key features of the project (100% Detailed Design)

Item	Proposed works
Route	Provision of a new bypass 1-2 km west of the existing Newell Highway
Interchanges	A new two-lane bypass (one lane in each direction) with five key intersections at the following locations: <ul style="list-style-type: none"> > Southern Connection, (with the existing highway) > London Road > Roundabout at Condobolin Road > Bogan Road > Northern Connection, (with the existing highway)
Noise Barriers	None proposed
Design Pavement Surface – <i>No Mitigation Scenario</i>	<u>14 mm Spray Seal</u> <ul style="list-style-type: none"> > Newell Highway Bypass (south of London Road) > Newell Highway Bypass (north of Henry Parkes Way (Condobolin Road)) Various ramps and connections range between 14 mm spray seal and 14 mm re-seal <u>Dense Grade Asphalt</u> <ul style="list-style-type: none"> > Newell Highway Bypass (London Rd to Henry Parkes Way)
Design Pavement Surface – <i>With Mitigation Scenario</i>	<u>14 mm Spray Seal</u> <ul style="list-style-type: none"> > Newell Highway Bypass (south of London Road) > Newell Highway Bypass (north of Painter Street) Various ramps and connections range between 14 mm spray seal and 14 mm re-seal <u>Dense Grade Asphalt</u> <ul style="list-style-type: none"> > Newell Highway Bypass (London Rd to Henry Parkes Way) > Newell Highway Bypass between Henry Parkes Way (Condobolin Road) and Painter Street (north of Parkes)

2.3 Noise sensitive receivers in proximity to the project

The sensitive receivers located near to the project can be grouped into residential and non-residential noise sensitive receivers as follows:

2.3.1 Residential receivers

The existing acoustic environment varies throughout the project extent. Most of the residential properties are located east of the proposal footprint, west of Parkes town centre in medium density suburban developments. West of the proposal footprint, residential properties are typically isolated low-density rural residential dwellings across open farmland.

Most of the residential dwellings near the proposal are single storey with some isolated two storey dwellings.

2.3.2 Non-residential noise sensitive properties

The following non-residential receivers were identified in proximity to the project:

Table 2-2 Non-residential sensitive receivers

Land use	Address	Approximate minimum distance from proposal boundary (metres)
Child care centre - Outdoor passive recreational	97-105 Victoria Street	380
Outdoor active recreational	Scoble Place Park	330
Outdoor active recreational related facilities	99 London Road (Parkes Golf Course and Golf Club)	50
Educational	Back Trundle Road (Parkes Christian School)	550
Places of worship	182-184 Back Trundle Road (Kingdom Hall of Jehovah's Witnesses)	300



Figure 2-1 Detailed design alignment project extents (Cardno October 2020)

3 Existing noise environment

Noise monitoring was carried out by WSP for the REF assessment for the project. However, further noise monitoring was undertaken by Cardno in order to update the Operational Traffic Noise Assessment Report (OTNAR) for the project. This CNVAR has utilised data from both assessments, where appropriate.

3.1 Unattended noise monitoring methodology

Unattended noise measurements were recorded between 31 July and 6 August 2020 and 1 and 5 September 2020 to determine the existing noise environment of the study area. The noise monitoring was carried out in general accordance with Australian Standard AS 1055 Acoustics, Description and Measurement of Environmental Noise (Standards Australia, 1997) and the RNP (EPA, 2011).

Table 3-1 presents the noise monitoring equipment used onsite, with the monitoring locations shown in Figure 3-1. The purpose of the noise monitoring was to establish existing road traffic noise levels at noise sensitive properties. The data was gathered over a period of typical traffic movement, outside of school holidays.

The noise monitors were configured with the following instrument settings;

- > 'A' weighting
- > 'Fast' response
- > 15 minute statistical intervals
- > Measurement descriptors LAMax, LAeq, LA1, LA10, LA90

Unattended noise monitoring was carried out using the following equipment:

Table 3-1 Noise monitoring equipment – unattended monitoring

Location	Equipment type	Manufacturer and model	Serial number
1a	Logger	ARL NGARA	878002
1b	Logger	ARL NGARA	878007, 8780F0
2	Logger	ARL NGARA	8780FB
3	Logger	ARL NGARA	878042
4	Logger	ARL NGARA	87809E
5	Logger	ARL NGARA	87807B
6a	Logger	ARL NGARA	878079, 878083
6b	Logger	ARL NGARA	87812B

3.2 Equipment calibration

All monitoring equipment, has current NATA calibration certificates and were fitted with windshields and were field calibrated before and after monitoring, with no significant drifts in calibration (± 0.3 dB) were noted.

3.3 Meteorological monitoring conditions

The weather conditions at the time of monitoring were recorded at Parkes Airport automatic weather station (Bureau of Meteorology (BOM) station number 065068), which is located about eight kilometres east of the proposal. These have been included below for information.

3.3.1 Monitoring period 1 - 31 July to 6 August 2020

Conditions: Fine. Wind speeds were typically below 5 m/s during the day and night periods.
Wind: 0 to 5 m/s from various directions
Humidity: 53 to 99%
Temperature: -4 to 16°C

3.3.2 Monitoring period 2 - 1 to 5 September 2020

Conditions: Fine. Wind speeds were typically below 5 m/s during the day and night periods.
Wind: 0 - 10 m/s from various directions, predominantly, NW and NE.
Humidity: 56 - 83%
Temperature: - 1 to 23°C

Monitoring data was excluded during periods of weather that adversely affected the monitoring data; where wind speeds were greater than five metres per second and during significant rainfall, as recorded at the nearest meteorological station. Excluded data is indicated on the noise monitoring charts included in Appendix A.

3.4 Monitoring locations

The loggers were deployed at the following locations:

Table 3-2 Noise monitoring locations

Monitoring Location	Monitoring Period	Address
1a	September	40 Barkers Road, Parkes (on the property 50 metres from the existing highway)
1b	August & September	40 Barkers Road, Parkes (at the dwelling)
2	August	98 Bogan Road, Parkes
3	August	285 Newell Hwy, Parkes
4	August	41 Moulden Street, Parkes
5	August	55 Ballerdee Lane, Parkes
6a	August & September	59 Coronation Avenue
6b	September	51 Coronation Avenue

Figure 3-1 shows the locations where unattended noise monitoring was conducted.

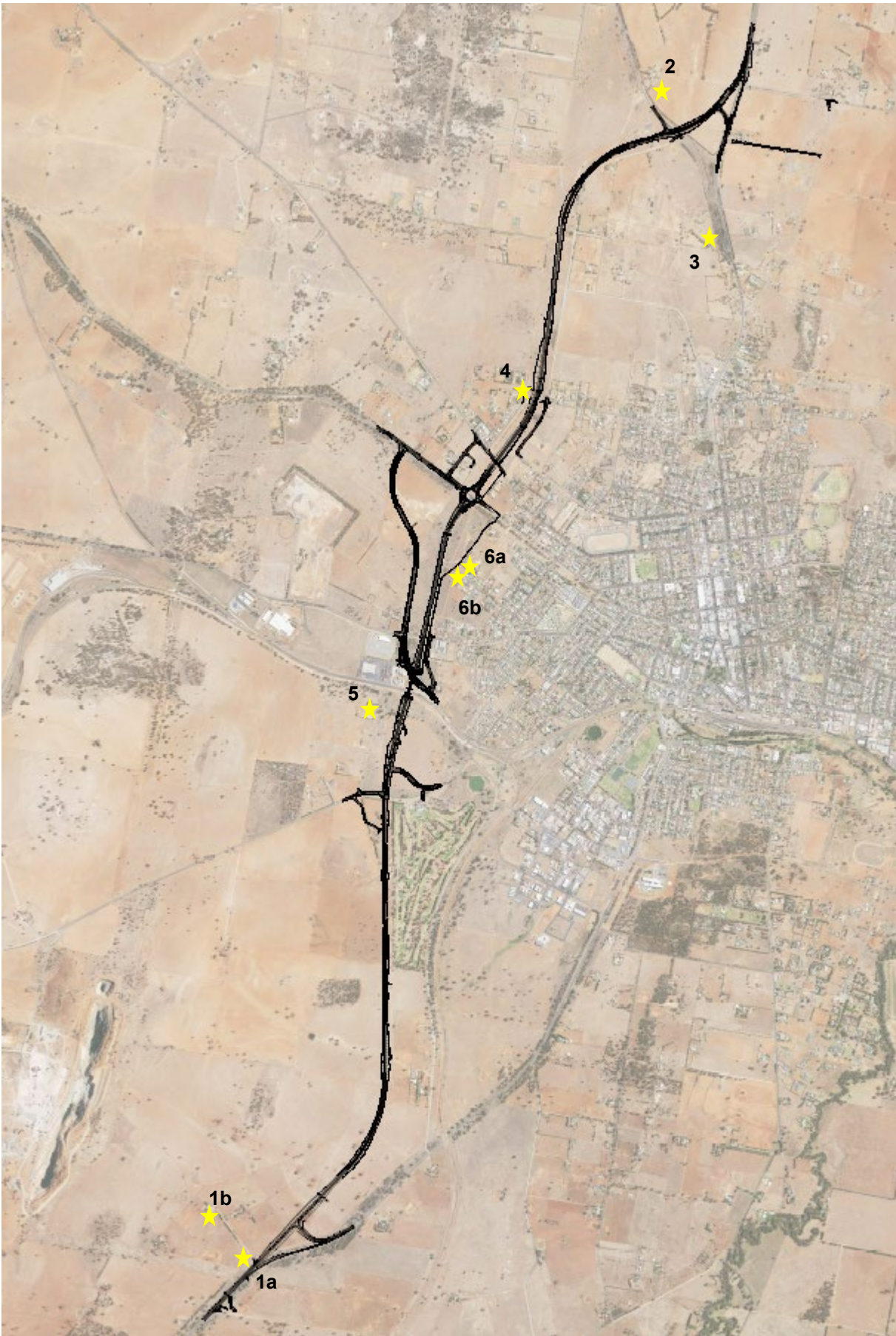


Figure 3-1 Noise monitoring locations

3.5 Measurement parameters

As environmental noise varies with time, the use of statistical descriptors is necessary to understand and describe these variations. For road traffic noise these descriptors are further classified for day time (7am - 10pm) and night time (10pm - 7am).

For environmental noise, the assessment period for day time is further split into day (7am – 6pm) and evening (6pm – 10pm). A-weighted statistical levels are used to describe ambient noise levels. The common descriptors used to describe environmental noise are described as follows:

- L_{Amax}: the A-weighted maximum noise level measured during the measurement period.
- L_{A1}: the A-weighted noise level exceeded for 1% of the measurement period.
- L_{A10}: the noise A-weighted level exceeded for 10% of the measurement period, generally referred to as the average maximum sound pressure level.
- L_{A90}: the A-weighted noise level exceeded for 90% of the measurement period, generally referred to as the background noise level (refer AS 1055.1 – 1997).
- L_{Aeq}: the equivalent continuous noise level over the measurement period, generally referred to as the energetical average sound pressure level over the measurement period.

3.6 Attended noise monitoring methodology

Attended noise monitoring was carried out 1 August and 1 September 2020. Attended measurements were recorded during the daytime period, outside of peak hour, with the exception of NM03 and NA03 which were carried out during the afternoon and morning peak respectively.

Table 3-3 presents the noise monitoring equipment used onsite, for attended monitoring with the monitoring locations shown in Figure 3-1.

Table 3-3 Noise monitoring equipment – attended monitoring

Location	Equipment type	Manufacturer and model	Serial number
1a, 1b, 3, 6a and 6b	Sound Level Meter	Rion NL-42	00184109

3.6.2 Observed existing noise environment

The REF noted that the following existing noise environment was observed at each logger location:

Table 3-4 Operator attended noise monitoring results

Logger	Location	Observed noise environment
1a	40 Barkers Road (50 metres from Newell Highway), Parkes	Some noise of wind in the trees. The primary source of noise was traffic on the Newell Highway.
1b	40 Barkers Road (Dwelling), Parkes	Ambient noise environment dominated by distant trees rustling and birds chirping, with the distant traffic from the Newell Highway audible at times. Heavier vehicles such as B doubles produced a more noticeable pass-by event
3	285 Newell Hwy, Parkes	The ambient noise environment was generally dominated by light and heavy vehicles on Newell Highway.
5	55 Ballerdee Lane	The primary source of noise was an industrial premises to the north and rail noise on the nearby rail corridor. Traffic on Hartigan Avenue was inaudible.

Logger	Location	Observed noise environment
6a	59 Coronation Avenue	The ambient noise environment generally dominated by cars and heavy vehicle pass-bys on Westlime Road. Industrial noise from a nearby source was also audible. Some noise from birds, insects and wind in the trees was observed.
6b	51 Coronation Avenue	As above

3.7 Measured noise levels

The measured Rating Background Levels (RBL) are presented in Table 3-5.

Table 3-5 Measured Rating Background Levels (RBLs)

Logger	Measurement location	Measured Rating Background Level, dB(A)		
		Day 07:00 18:00	Evening 18:00 22:00	Night 22:00 07:00
1a	40 Barkers Road, Parkes (on the property 50 metres from the existing highway)	46	30	30
1b	40 Barkers Road, Parkes (at the dwelling)	40	30	30
2	98 Bogan Road, Parkes	35	30	30
3	285 Newell Hwy, Parkes	38	34	33
4	41 Moulden Street, Parkes	35	30	30
5	55 Ballerdee Lane, Parkes	36	36	35
6a	59 Coronation Avenue	35	30	30
6b	51 Coronation Avenue	40	32	30

Noise monitoring charts for each location are provided in Appendix A.

3.8 Project REF RBLs

Noise monitoring was previously undertaken for the *Parkes Bypass Operational Road Traffic Noise and Construction Noise and Vibration Assessment Report* (WSP 2019) prepared as part of the project REF.

As the noise monitoring undertaken by Cardno was predominately intended to assist in verification of the operational traffic noise model, background noise levels from the project REF were used for certain locations. The RBLs from the project REF are presented in Table 3-6, with the noise monitoring locations presented in Figure 3-2.

Table 3-6 Project REF RBLs

Logger	Measurement location	Measured Rating Background Level, dB(A)		
		Day 07:00 18:00	Evening 18:00 22:00	Night 22:00 07:00
1	2683 Newell Hwy, Parkes	33	31	30
2	58 Brolgan Rd, Parkes	39	37	31
3	122 Condobolin Rd, Parkes	41	38	32

Logger	Measurement location	Measured Rating Background Level, dB(A)		
		Day 07:00 18:00	Evening 18:00 22:00	Night 22:00 07:00
4	35 Thomas St, Parkes	37	31	30
5	Lot 784 Newell Hwy, Parkes	40	32	30
6	1178 Bogan Rd, Goonumbla	31	30	30
7	TAFE, Bogan St, Parkes	51	45	35

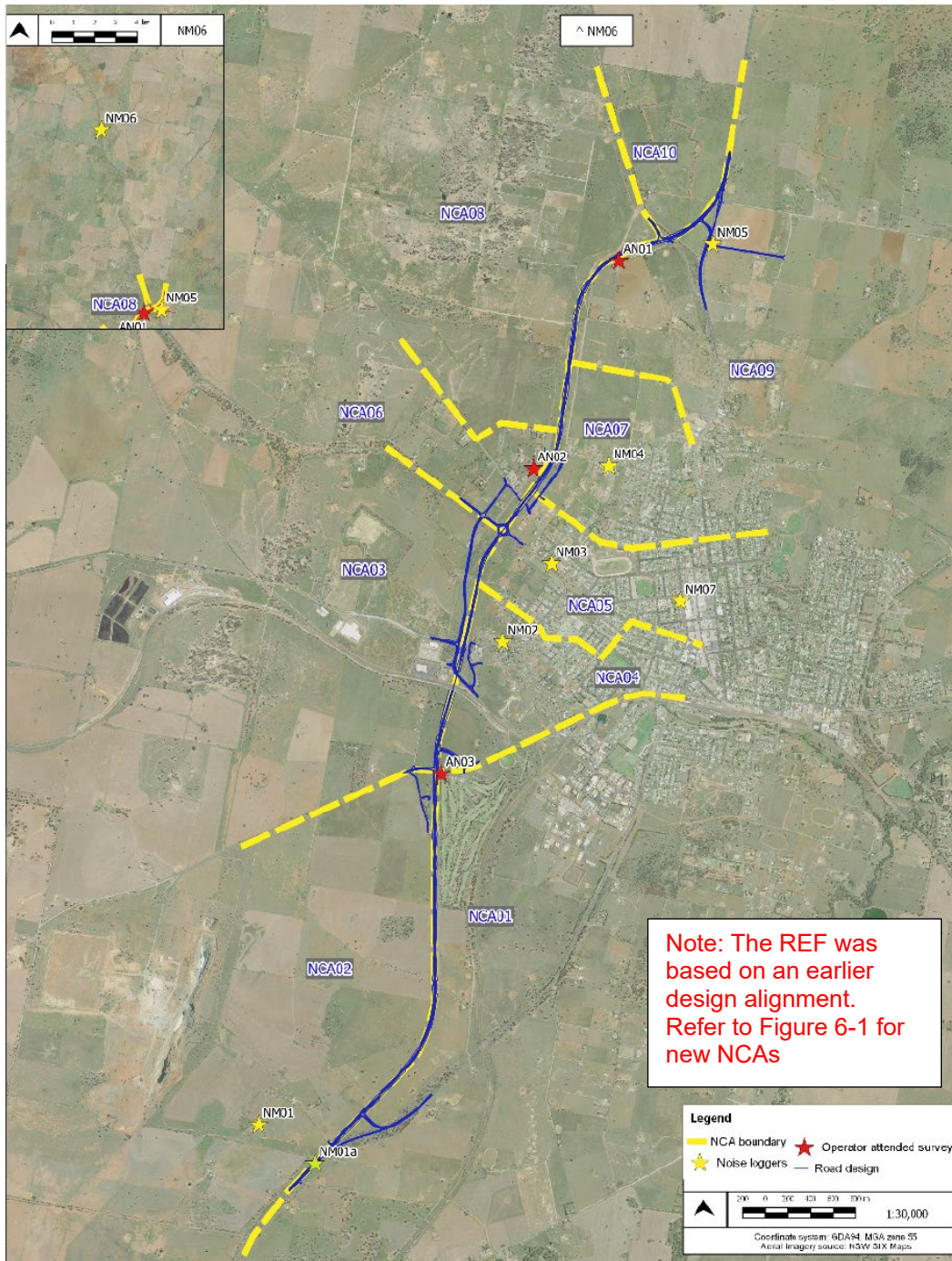


Figure 3-2 Project REF noise monitoring locations (Ref: WSP 2019)

4 Statutory assessment criteria

4.1 Noise criteria

4.1.1 Roads and Maritime Construction Noise and Vibration Guideline

The Roads and Maritime Construction Noise and Vibration Guideline (Roads and Maritime 2016) (CNVG) provides a framework for the assessment of noise during the construction phase of the project. The CNVG references the following documents to provide the criteria for the assessment of construction noise and vibration impacts:

- > EPA Interim Construction Noise Guideline
- > EPA Assessing Vibration – Technical Guideline
- > EPA Road Noise Policy (RNP).

The CNVG provides recommended minimum separation distances between vibration intensive plant and sensitive receivers for minimising the risk of cosmetic damage. The CNVG further states that the minimum working distance for cosmetic damage must be complied with at all times, unless otherwise approved by Transport for NSW or under the environmental licence as relevant. The minimum working distances are summarised below in Section 7.3.

4.1.2 Interim Construction Noise Guideline

4.1.2.1 Airborne construction noise

NSW Office of Environment & Heritage (OEH) provides guidance for assessing construction noise impacts in the Interim Construction Noise Guideline (DECC, 2009) (NSW ICNG).

The level of noise impact and the requirement for mitigation measures is generally determined by the timing and duration of the noise emissions and the perceived impact of the noise above existing background noise levels.

It is important to note that the guideline distinguishes between qualitative and quantitative noise assessments based on the type and duration of construction activities. For example, a qualitative assessment is warranted for road maintenance type works of short duration, whereas a quantitative assessment is preferred for major infrastructure works.

Section 4 of the guideline outlines the quantitative assessment method, which establishes noise management levels and assessment requirements for proposed construction activities over three weeks duration.

The noise management level for potentially affected residential properties, as taken from Section 4.2 of the ICNG, is detailed in Table 4-1.

Table 4-1 Noise at residences using quantitative assessment (Source: DECC, 2009)

Time of day	Management level $L_{Aeq(15\text{ min})}^*$	How to apply
Recommended standard hours: Monday to Friday: 7am to 6pm Saturday 8am to 1pm:	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq(15\text{ min})}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the

Time of day	Management level $L_{Aeq}(15\text{ min})^*$	How to apply
No work on Sundays or public holidays		expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.

Notes:

(1) For Residential receivers - Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence. Noise levels may be higher at upper floors of the noise affected residence.

(2) Other sensitive use receivers - Internal noise levels are to be assessed at the centre of the occupied room. External noise levels are to be assessed at the most affected point within 50 metres of the area boundary

A strong justification would typically be required for works outside the recommended standard hours (see Table 4-1). The proponent should apply all feasible and reasonable work practices to meet the noise affected level. The definition of feasible and reasonable work practices is outlined in Section 1.4 of the NSW ICNG, with the following excerpts providing a brief description:

“A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.”

“Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.”

A number of factors may be considered in selecting reasonable measures, including the level of impact, the number of people affected, and the order of treatments applied to previous, similar projects. Where all feasible and reasonable practices have been applied and noise remains more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community on suitable mitigation measures. For guidance on negotiating agreements see section 7.2.2 of the NSW ICNG.

4.1.2.2 Sleep disturbance

Section 4.3 of the NSW ICNG defines the assessment of sleep disturbance as follows:

“Where construction works are planned to extend over more than two consecutive nights, and a quantitative assessment method is used, the analysis should cover the maximum noise level, and the extent and the number of times that the maximum noise level exceeds the RBL. Some guidance indicating the potential for sleep disturbance is in the now superseded NSW Environmental Criteria for Road Traffic Noise (EPA 1999).” The NSW Environmental Criteria for Road Traffic Noise (EPA, 1999) (NSW ECRTN) discusses a number of methodologies with respects to sleep disturbance. In general, the methodologies address sleep disturbance due to continuous noise (expressed in terms of a $L_{Aeq, T}$) and the affect multiple short duration noise events (expressed as a L_{AMax}).

In addition to the night time noise criteria specified in Table 4-1 (which addresses the continuous noise component generated by construction activities), the application of a noise criteria addressing the maximum noise level from construction activities is appropriate when works are planned to extend over more than two consecutive nights. The NSW ECRTN draws the following conclusions with respects to noise limits for sleep disturbance:

“Considering all of the foregoing information the following conclusions can be drawn:

- > Maximum internal noise levels below 50–55 dB(A) are unlikely to cause awakening reactions.
- > One or two noise events per night, with maximum internal noise levels of 65–70 dB(A), are not likely to affect health and wellbeing significantly.

The NSW EPA confirm that a sleep disturbance criterion of $L_{A1, 1min} \leq L_{A90, 15min} + 15dB(A)$, is used for initial assessment for the purpose of this Review of Environmental Factors (REF). It should only be used as a first step guide and where the criteria is not met, more detailed analysis is required to be incorporated into the detailed design and Construction Noise and Vibration Management Plan. The Application Notes of the NSW Industrial Noise Policy (2010) note the detailed analysis should include:

- > the extent to which the maximum noise level exceeds the background level
- > the number of times this happens during the night-time period, and
- > the time of day (normally between 10 pm and 7 am).

4.1.3 Blasting

The applicable limits for ground vibration and air overpressure generated by blasting as referenced by the CNVG are contained within Australian Standard *AS2187.2-2006 Explosives-Storage and use, Part 2: Use of explosives*, British Standard *BS6472-1992 Evaluation of human exposure to vibration in buildings (1-80Hz)*, and British Standard *BS7385-2:1993 Evaluation and measurement for vibration in buildings, Part 2: Guide to damage levels from groundborne vibration*.

4.1.3.1 Human comfort limits

The applicable limits for blasting in relation to human comfort are taken from AS2187 and are presented in Table 4-2 (airblast overpressure) and Table 4-3 (ground vibration):

Table 4-2 Airblast overpressure limits for human comfort

Category	Type of blasting operations	Peak sound pressure level (dBL)
Sensitive Site*	Operations lasting longer than 12 months or more than 20 blasts	115 dBL for 95% blasts per year, 120 dBL maximum unless agreement is reached with occupier that a higher limit may apply.
Sensitive Site*	Operations lasting for less than 12 months or less than 20 blasts	120 dBL for 95% blasts per year, 125 dBL maximum unless agreement is reached with occupier that a higher limit may apply.

Category	Type of blasting operations	Peak sound pressure level (dBL)
Occupied non-sensitive sites, such as factories and commercial premises	All blasting	125 dBL maximum unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specifications or levels that can be shown to adversely effect the equipment operation.

* A sensitive site includes houses and low rise residential buildings, hospitals, theatres, schools, etc., occupied by people.

Table 4-3 Blasting ground vibration limits for human comfort

Category	Type of blasting operations	Peak component particle velocity (mm/s)
Sensitive Site*	Operations lasting longer than 12 months or more than 20 blasts	5 mm/s for 95% blasts per year, 10 mm/s maximum unless agreement is reached with occupier that a higher limit may apply.
Sensitive Site*	Operations lasting for less than 12 months or less than 20 blasts	10 mm/s maximum unless agreement is reached with occupier that a higher limit may apply.
Occupied non-sensitive sites, such as factories and commercial premises	All blasting	25mm/s maximum unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specifications or levels that can be shown to adversely effect the equipment operation.

* A sensitive site includes houses and low rise residential buildings, hospitals, theatres, schools, etc., occupied by people.

4.1.3.2 Structural damage limits

The applicable limits to prevent building damage from airblast overpressure are taken from AS2187 and are presented in Table 4-4:

Table 4-4 Recommended airblast limits for damage control

Category	Type of blasting operations	Peak sound pressure level (dBL)
Structures that include masonry, plaster and plasterboard in their construction and also unoccupied structures of reinforced concrete or steel construction	All blasting	133 dBL maximum unless agreement is reached with occupier that a higher limit may apply
Service structures, such as pipelines, powerlines and cables located above the ground	All blasting	Limit to be determined by structural design methodology

The limits for ground-borne vibration in relation to cosmetic structural damage are presented in Table 4-5, with reference to Table 4-6. The recommended limits for ground vibration impacting buried pipework, are presented in Table 4-7.

Table 4-5 Recommended ground vibration limits for damage control

Category	Type of blasting operations	Peak sound pressure level (dBL)
Structures that include masonry, plaster and plasterboard in their construction and also unoccupied structures of reinforced concrete or steel construction	All blasting	Frequency dependent damage limit criteria as per Table 4-6
Unoccupied structures of reinforced concrete or steel construction	All blasting	100 mm/s maximum unless agreement is reached with the owner that a higher limit may apply
Service structures, such as pipelines, powerlines and cables	All blasting	Limit to be determined by structural design methodology

Table 4-6 Transient vibration guide values for cosmetic damage (BS7385-2)

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or light framed structure. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Table 4-7 Guideline values for short term vibration on buried pipework (DIN 4150)

Pipe Material	Guideline values for velocity measured on the pipe in mm/s
Steel (including welded pipe)	100
Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	80
Masonry, plastic	50

4.2 Construction vibration criteria

4.2.1 Assessing Vibration: A Technical Guideline (Human Comfort)

Vibration from activities associated with the project could potentially impact on the amenity of the occupants of dwellings or buildings located close to the site. Generally, vibration impact can be summarised into two categories:

- > Effect on human comfort
- > Structural or cosmetic damage to buildings.

Human comfort vibration criteria is addressed in the NSW ICNG and refers to Section 2.5 of the document Assessing Vibration: A Technical Guideline (NSW AV:ATG) issued by DEC (2006).

The NSW AV:ATG outlines vibration limits in relation to human comfort. Criteria in this guideline are based on the British Standard *BS6472-1992 Evaluation of human exposure to vibration in buildings (1-80Hz)*.

Vibration sources are defined as continuous, impulsive or intermittent. Table 4-8 provides a definition and examples of each type of vibration.

Table 4-8 Types of vibration

Type of vibration	Definition	Examples
Continuous	Continues uninterrupted for a defined period (usually throughout the day-time and/or night-time).	Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery).
Impulsive	A rapid build-up to a peak followed by a damped decay that may or may not involve several cycles of vibration (depending on frequency and damping). It can also consist of a sudden application of several cycles at approximately the same amplitude, providing that the duration is short, typically less than 2 seconds.	Infrequent: Activities that create up to 3 distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading.
Intermittent	Can be defined as interrupted periods of continuous or repeated periods of impulsive vibration that varies significantly in magnitude.	Trains, nearby intermittent construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer, this would be assessed against impulsive vibration criteria.

The criteria are to be applied to a single weighted root mean square (rms) acceleration source level in each orthogonal axis. Section 2.3 of the guideline states: 'Evidence from research suggests that there are summation effects for vibrations at different frequencies. Therefore, for evaluation of vibration in relation to annoyance and comfort, overall weighted rms acceleration values of the vibration in each orthogonal axis are preferred (BS 6472).' When applying the criteria, it is important to note that vibration may enter the body along different orthogonal axes, i.e. x-axis (back to chest), y-axis (right side to left side) or z-axis (foot to head). The three axes are referenced to the human body. Thus, vibration measured in the horizontal plane should be compared with x- and y-axis criteria if the concern is for people in an upright position, or with the y and z- axis criteria if the concern is for people in the lateral position. Preferred and maximum values for continuous and impulsive vibration are defined in Table 2.2 of the guideline and are reproduced below in Section 5 of this report.

4.2.2 German Standard DIN 4150 (building damage)

In relation to structural damage, there is currently no Australian Standard that provides criteria for the assessment of structural damage to buildings. However, the German Standard *DIN 4150-3: 1999-02 - 'Structural vibration - Effects of vibration on structures'*, provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration. This standard also presents recommended maximum limits over a range of frequencies measured in any direction at the foundation or in the plane of the uppermost floor.

These criteria are summarised in Section 5.2.2.

4.2.3 Summary of minimum working distances for vibration intensive plant

The following table provides a summary of the minimum working distance for different types of sensitive receivers referenced from the standards described above.

Table 4-9 Recommended minimum working distances for vibration intensive plant from sensitive receivers

Plant item	Rating / description	Minimum working distance		
		Cosmetic damage (BS 7385)	Cosmetic damage (DIN 4150) Heritage and other sensitive structures	Human response (OH&E Vibration Guideline)
Vibratory roller	< 50 kN (typically 1-2 tonnes)	5 m	14 m	15 m to 20 m
	< 100 kN (typically 2-4 tonnes)	6 m	16 m	20 m
	< 200 kN (typically 4-6 tonnes)	12 m	33 m	40 m
	< 300 kN (typically 7-13 tonnes)	15 m	41 m	100 m
	> 300 kN (typically 13-18 tonnes)	20 m	54 m	100 m
	> 300 kN (> 18 tonnes)	25 m	68 m	100 m
Small hydraulic hammer	(300 kg - 5 to 12t excavator)	2 m	5 m	7 m
Medium hydraulic hammer	(900 kg – 12 to 18t excavator)	7 m	19 m	23 m
Large hydraulic hammer	(1600 kg – 18 to 34t excavator)	22 m	60 m	73 m
Vibratory pile driver	Sheet piles	2 m to 20 m	50 m	20 m
Pile boring	≤ 800 mm	2 m (nominal)	40 m	4 m
Jackhammer	Hand held	1 m (nominal)	2 m	2 m

The minimum working distances are indicative and will vary depending on the particular item of plant, local geotechnical conditions and the dominant frequency of the construction vibration levels. They apply to cosmetic damage of typical light-framed residential buildings and heritage/fragile buildings and assume that construction vibration could include low frequency content with associated increased risk of cosmetic damage. Vibration monitoring is recommended to confirm the minimum working distances at specific sites. Additionally, further detailed analysis based on the frequency dependent guideline vibration levels in BS7385-2:1993 and DIN4150-3:2016 may be utilised in conjunction with site-specific measurements to derive alternative cosmetic damage objectives and minimum working distances. For heritage listed / fragile structures, specialist advice from an appropriately qualified structural engineer who is familiar with heritage structures is required to support any proposed relaxation of the initial cosmetic damage screening criterion. Any such relaxation shall be approved by TfNSW or under the environmental license as relevant.

4.3 Referenced Standards

The following Australian and international standards provide criteria and methodologies that have been adopted in this assessment.

- > Australian Standard AS1055: Acoustics – Description and measurement of environmental noise
- > Australian Standard AS2187.2-2006 Explosives-Storage and use, Part 2: Use of explosives
- > Australian Standard AS2436-2010 Guide to noise and vibration control on construction, demolition and maintenance sites.
- > British Standard BS6472-1992 Evaluation of human exposure to vibration in buildings (1-80Hz)
- > British Standard BS7385-2:1993 Evaluation and measurement for vibration in buildings, Part 2: Guide to damage levels from groundborne vibration
- > German Standard DIN 4150-3: 1999-02 - 'Structural vibration - Effects of vibration on structures'

5 Summary of design benchmarks

5.1 Construction noise

The proposal area has been divided into noise catchment areas (NCA) where ambient noise levels are likely to be similar to assess the potential construction noise impacts on surrounding receivers. These catchment areas are shown in Figure 6-1.

Works may be carried out, outside of standard hours due to the nature of the project. For this reason noise management levels (NMLs) have been calculated for both standard and non-standard hours. The NMLs are detailed below in Table 5-1.

Taking into consideration the measured RBLs in Section 3.7 and the criteria from Section 4.1, the applicable construction noise management levels for standard and non-standard hours for the project are shown in Table 5-1.

Table 5-1 Construction noise management levels

Noise catchment area	Noise monitor	Monitoring undertaken by	Standard hours	OOHW 1		OOHW 2		Sleep disturbance, $L_{A1, 1min}$
				Day	Evening	Evening	Night	
NCA01	1	Cardno	50	45	35	35	35	60
NCA02	1	Cardno	50	45	35	35	35	60
NCA03	5	Cardno	46	41	41	41	40	60
NCA04	6	Cardno	45	40	35	35	35	60
NCA05	6	Cardno	45	40	35	35	35	60
NCA06	4	Cardno	45	40	35	35	35	60
NCA07	4	WSP	47	42	36	36	35	60
NCA08	2	Cardno	45	40	35	35	35	60
NCA09	3	Cardno	50	45	37	37	35	60
NCA10	2	Cardno	45	40	35	35	35	60

**Sleep disturbance criteria has been calculated based on an assumed typical internal LAeq noise level of 35 dB(A) referenced from Australian Standard AS:2107 and corrected with a typical inside to outside noise reduction of 10 dB(A).*

5.2 Construction vibration

5.2.1 Human comfort criteria

The following vibration criteria for human comfort apply to this proposal.

Table 5-2 Preferred and maximum levels for human comfort

Location	Assessment period	Preferred values		Maximum values	
		z axis	x & y axis	z axis	x & y axis
Continuous vibration ³ (Weighted RMS Acceleration, m/s^2 , 1-80Hz)					
Critical areas ²	Day- or night-time	0.005	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day- or night-time	0.020	0.014	0.040	0.028

Location	Assessment period	Preferred values		Maximum values	
		z axis	x & y axis	z axis	x & y axis
Workshops	Day- or night-time	0.04	0.029	0.080	0.058
Impulsive vibration ³ (Weighted RMS Acceleration, m/s ² , 1-80Hz)					
Critical areas ²	Day- or night-time	0.005	0.0036	0.010	0.0072
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day- or night-time	0.64	0.46	1.28	0.92
Workshops	Day- or night-time	0.64	0.46	1.28	0.92
Intermittent vibration ⁴ (Vibration Dose Values, VDV, m/s ^{1.75} , 1-80Hz)					
Critical areas ²	Day- or night-time	0.10	0.20	-	-
Residences	Daytime	0.20	0.40	-	-
	Night-time	0.13	0.26	-	-
Offices, schools, educational institutions and places of worship	Day- or night-time	0.40	0.80	-	-
Notes:	<p>1. Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am</p> <p>2. Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate tasks require more stringent criteria than the human comfort criteria specify above.</p> <p>3. Stipulation of such criteria is outside the scope of their policy and other guidance documents (e.g. relevant standards) should be referred to. Source: BS 6472-2008</p> <p>4. For continuous and impulsive vibration the preferred and maximum values are weighted acceleration rms values (m/s²)</p> <p>5. For intermittent vibration the preferred and maximum values are vibration dose values (VDVs), based on the weighted acceleration values (m/s^{1.75})</p>				

5.2.2 Building damage criteria

The minimum 'safe limit' of vibration at low frequencies for commercial and industrial buildings are presented in DIN 4150.3 is provided in Table 5-3.

Table 5-3 DIN 4150-3 Structural damage criteria

Group	Type of structure	Vibration velocity, mm/s			
		At foundation at frequency of			Plane of Floor uppermost storey
		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 - 40	40 - 50	40
2	Dwellings and buildings of similar design and/or use	5	5 - 15	15 - 20	15

Group	Type of structure	Vibration velocity, mm/s			
		At foundation at frequency of			Plane of Floor uppermost storey
		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Group 1 or 2 and have intrinsic value (e.g. buildings under a preservation order)	3	3 - 8	8 - 10	8
Note:	<i>At frequencies above 100 Hz, the values given in this column may be used as minimum values</i>				

5.3 Blasting limits

Assuming blasting for the project would be completed within a 12 month period, we recommend the limits presented in Table 5-4.

Table 5-4 Blasting limits

Category	Type of blasting operations	Airblast overpressure, dB liner peak	Peak component particle velocity (mm/s)
Limits for human comfort			
Sensitive site*	Operations lasting longer than 12 months or more than 20 blasts	120 dBL for 95% blasts per year, 125 dBL maximum	mm/s for 95% blasts per year, 10 mm/s maximum
Occupied non-sensitive sites, such as factories and commercial premises	All blasting	125 dBL maximum	25mm/s maximum
Limits for building damage			
Structures that include masonry, plaster and plasterboard in their construction and also unoccupied structures of reinforced concrete or steel construction	All blasting	133 dBL	Frequency dependent damage limit criteria as per Table 4-6
Service structures, such as pipelines, powerlines and cables located above the ground	All blasting	Limit to be determined by structural design methodology	Limit to be determined by structural design methodology
Unoccupied structures of reinforced concrete or steel construction	All blasting	N/A	100 mm/s maximum
Steel Pipes (including welded pipe)	All blasting	N/A	100
Pipes of Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	All blasting	N/A	80
Pipes of Masonry, plastic	All blasting	N/A	50

6 Construction noise impact assessment

6.1 Construction noise assessment methodology

An assessment on the potential level of construction noise impact has been carried out to determine whether mitigation will be required, and to determine appropriate management controls.

Details of proposed plant to be used for each construction stage was provided by TfNSW. Sound power levels for various items of plant and equipment were adopted based upon construction plant noise data provided in Table F-1 of the Roads and Maritime Construction Noise and Vibration Guideline (CNVG). Plant noise levels were also sourced from Australian Standard *AS2436-2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites* and measured library data where applicable.

This assessment has been prepared based on construction staging provided by TfNSW. A further assessment may be required to prepare a Construction Noise and Vibration Management Plan (CNVMP) once final construction staging detail becomes available during the next phase of the proposal.

The proposed works, with the potential to generate significant noise, are detailed below in Section 6.6. To provide an indicative assessment of construction noise impact, a noise model was created for each of the construction stages (Section 6.3).

6.2 Noise modelling inputs and assumptions

6.2.1 General modelling input data

The modelling inputs and assumptions made for the modelling are shown in Table 6-1.

Table 6-1 Modelling assumptions

Modelling element	Input / assumption. Source reference
Ground Elevation Geometry	Provided by Cardno
Proposed Elevation Geometry	Provided by Cardno
Road Alignment	Provided by Cardno
Ground Absorption	50% over soft ground 0% over water
Assessment Standard	ISO 9613-2:1996 – Acoustics – Attenuation of Sound During Propagation Outdoors (Part 2: General Method of Calculation)
Weather Conditions	Receiver is downwind of the source, as per the assumptions of ISO 9613.
Receiver Height	1.5 m above ground for prediction models for ground floor. Subsequent floor level receiver heights have been modelled at + 2.8 m above the floor below.

6.3 Modelled construction stages

The construction scenarios in Table 6-2 have been modelled for the proposed Parkes Bypass Project.

Table 6-2 Modelled construction stages

Stage No.	Construction stage description
1	Site establishment
2	Services Relocations
3	Corridor Clearing

Stage No.	Construction stage description
4	Bulk Earthworks
5	Rock Crushing and Screening
6	Drainage Infrastructure
7	Paving and asphaltting
8	Pile Load Testing
9	Bridgeworks
10	Site Compounds
11	Haulage

To provide an indicative assessment of construction noise impact, a noise model was created for each of the above construction scenarios.

6.4 Noise catchment areas

Noise modelling was conducted to determine the predicted level of noise impact at sensitive locations surrounding the project. Works associated with the modelled stages are likely to remain within a finite work area. Therefore construction works have been modelled as a number of point sources operating simultaneously for each construction stage to provide the worst case predicted noise levels at each sensitive location. Sensitive areas have been grouped into Noise Catchment Areas (NCAs) as shown in Figure 6-1.

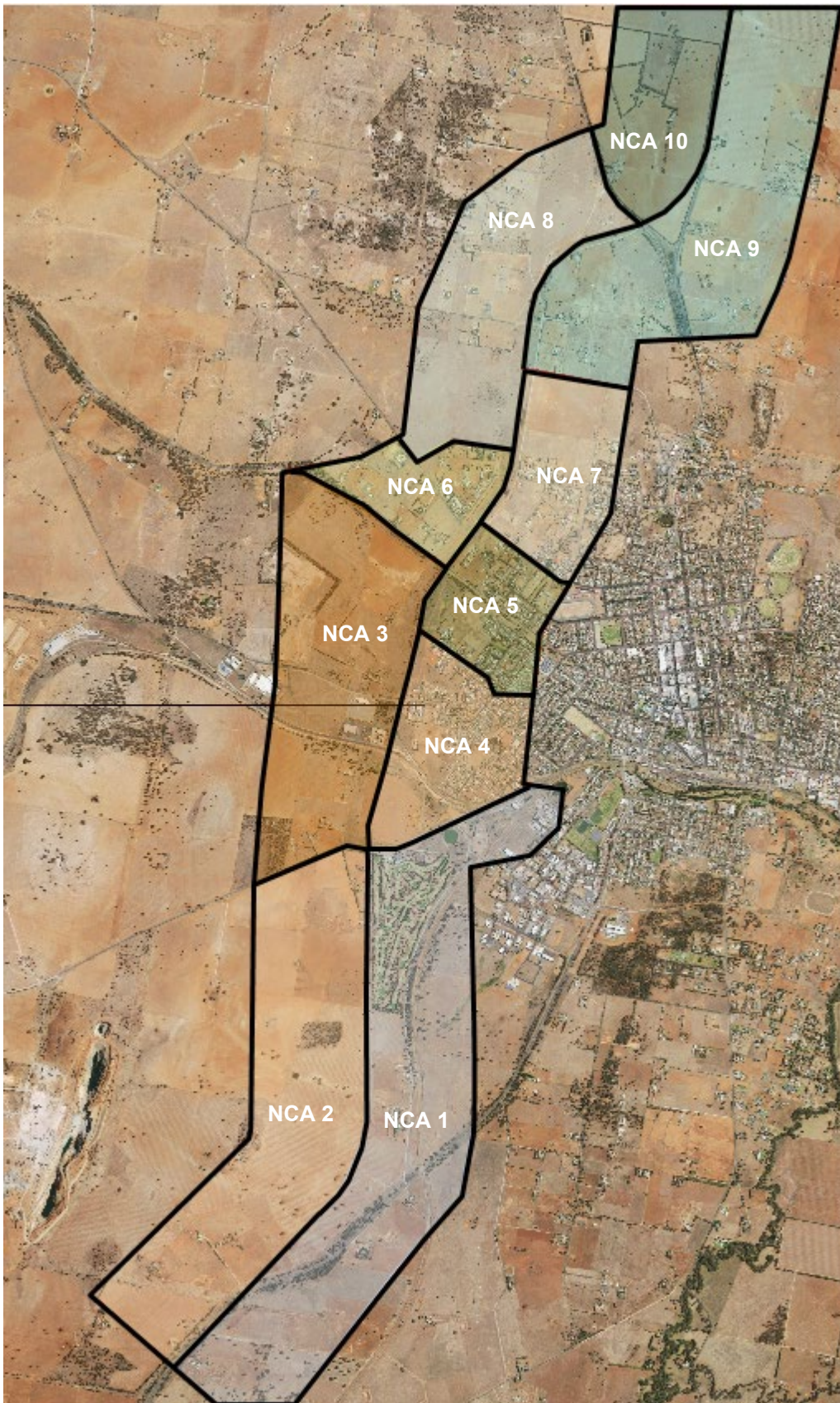


Figure 6-1 Noise Catchment Areas

6.5 Construction timing

We understand that some construction works are likely to be proposed for outside of standard hours as well as during standard hours for traffic safety reasons. All night work would be undertaken in accordance with Roads and Maritime Construction Noise & Vibration Guideline where feasible, or in consultation with the adjacent community.

6.6 Construction plant and equipment

The construction plant included in the noise models are presented in Table 6-3. The equipment sound power levels were sourced from the Roads and Maritime Construction Noise and Vibration Guideline, AS2436 and Cardno's measurement library.

Table 6-3 Construction plant sound power levels

Plant	Number of plant	Sound power level, L_{Aeq} , dB(A)
Scenario 1 – Site establishment	Total L_{Aeq}	109
Truck (medium rigid)	1	103
Road truck	1	108
Scenario 2 – Services Relocations	Total L_{Aeq}	121
Backhoe	1	111
Compactor	1	106
Concrete pump	1	109
Concrete saw	1	118
Concrete truck	1	109
Generator	1	95
Wacker/plate compactor	1	113
Welding equipment	1	106
Vacuum truck	1	109
Scenario 3 – Corridor clearing	Total L_{Aeq}	111
Backhoe	1	111
Bulldozer - D6	1	116
Bulldozer - D8	1	116
Chainsaw 4-5hp	1	114
Dump truck	1	110
Excavator tracked 8-30t	1	112
Front end loader 5-23t	1	112
Possitrack	1	112
Road truck	1	108
Truck - medium rigid	1	103
Tub grinder/mulcher	1	116
Scenario 4 – Bulk earthworks	Total L_{Aeq}	129
Airtrack drill	1	124

Plant	Number of plant	Sound power level, L_{Aeq} , dB(A)
Backhoe	1	111
Bulldozer - D6	1	116
Bulldozer - D8	1	116
Bulldozer - D9	1	116
Bulldozer - D10	1	116
Compactor	1	106
Compressor	1	109
Dump truck	1	110
Excavator tracked 8-30t	1	112
Excavator tracked 8-30t with hammer	1	122
Excavator tracked 50t	1	112
Excavator tracked 50t with hammer	1	122
Front end loader 5-23t	1	112
Grader	1	113
Road truck	1	108
Roller - large pad foot/ smooth drum	1	109
Scraper earthmoving - 30cm	1	113
Truck - medium rigid	1	103
Vibratory roller	1	109
Wacker/plate compactor	1	113
Water cart	1	107
Scenario 5 – Rock Crushing and Screening	Total L_{Aeq}	121
Bulldozer - D9	1	116
Dump truck	1	110
Excavator tracked 8-30t	1	112
Rock crushing plant	1	118
Scenario 6 – Drainage infrastructure	Total L_{Aeq}	127
Airtrack drill	1	124
Backhoe	1	111
Bulldozer - D10	1	116
Compressor	1	109
Concrete pump	1	109
Concrete truck	1	109
Concrete vibrator/ vibrating screed	1	113
Excavator tracked 8-30t	1	112
Excavator tracked 8-30t with hammer	1	122

Plant	Number of plant	Sound power level, L _{Aeq} , dB(A)
Franna crane 20t	1	98
Generator	1	95
Pneumatic hammer/drill	1	115
Quickcut saw	1	116
Road truck	1	108
Truck - medium rigid	1	103
Vibratory roller	1	109
Wacker/plate compactor	1	113
Water pump	1	105
Wood saw	1	112
Scenario 7 - Paving/asphalting	Total L_{Aeq}	124
Asphalt/bitumen truck, paver and sprayer	1	106
Concrete pump	1	109
Concrete saw	1	118
Concrete truck	1	109
Concrete vibrator/ vibrating screed	1	113
Grader	1	113
Possitrack	1	112
Profiler - 2m	1	116
Road broom	1	95
Road truck	1	108
Roller - large pad foot/ smooth drum	1	109
Stabiliser	1	113
Truck - medium rigid	1	103
Vacuum broom	1	105
Wacker/plate compactor	1	113
Water cart	1	107
Scenario 8 – Pile Load Testing	Total L_{Aeq}	116
Piling rig - driven	1	116
Scenario 9 – Bridgeworks	Total L_{Aeq}	122
Asphalt/bitumen truck, paver and sprayer	1	106
Compressor	1	109
Concrete pump	1	109
Concrete truck	1	109
Concrete vibrator/ vibrating screed	1	113
Excavator tracked 8-30t	1	112

Plant	Number of plant	Sound power level, L _{Aeq} , dB(A)
Mobile crane 20-600t	1	113
Franna crane 20t	1	98
Generator	1	95
Piling Rig - bored	1	112
Piling rig - driven	1	116
Pneumatic hammer/drill	1	115
Power generator	1	103
Scissor lift	1	98
Truck - medium rigid	1	103
Water pump	1	105
Welding equipment	1	106
Wood saw	1	112
Scenario 10 - Construction compound site establishment	Total L_{Aeq}	124
Asphalt/bitumen truck, paver and sprayer	1	106
Backhoe	1	111
Bulldozer - D6	1	116
Bulldozer - D8	1	116
Concrete truck	1	109
Concrete vibrator/ vibrating screed	1	113
Excavator tracked 8-30t	1	112
Mobile crane 20-600t	1	113
Front end loader 5-23t	1	112
Grader	1	113
Possitrack	1	112
Power generator	1	103
Road Truck	1	108
Roller - large pad foot/ smooth drum	1	109
Truck - medium rigid	1	103
Vibratory roller	1	109
Water cart	1	107
Asphalt/bitumen truck, paver and sprayer	1	106
Backhoe	1	111
Scenario 11 - Haulage	Total L_{Aeq}	124
Dump Truck	1-4 passess/hour	110
Light vehicles (e.g. 4WD)	10 passes/hour	103

6.7 Predicted construction noise levels

Predicted construction noise levels at each modelled NCA for each scenario are shown below in Table 6-4. The levels below represent the worst case predicted noise impact at the most affected receivers in each NCA. Noise levels as a result of construction activities are predicted to be lower than these levels for the remaining receivers within each associated NCA.

A full list of predicted noise levels at all modelled receivers is included in Appendix C, with the predicted noise impact from construction activities in the form of noise contour maps is presented in Appendix D. The predicted reduction of expected construction noise impact with distance is shown in the noise contour maps.

Table 6-4 Predicted construction noise impacts by NCA

NCA	Most affected receiver within NCA	Obj. No.	Floor	Façade	Predicted construction noise level, $L_{Aeq, 15 \text{ min}}$	Noise management level					Exceedance of noise management level				
						Standard hours	Out of hours work period 1		Out of hours work period 2		Standard hours	Out of hours work period 1		Out of hours work period 2	
						Day	Day	Eve	Eve	Night	Day	Day	Eve	Eve	Night
Noticeable:						STANDARD HOURS: NML					OOHW: <5dBA above NML				
Clearly audible:						STANDARD HOURS:<10 dBA above NML					OOHW: 5 to 15 dBA above NML				
Moderately intrusive:						STANDARD HOURS: 10 to 20 dBA above NML					OOHW: 16 to 25 dBA above NML				
Highly Intrusive:						STANDARD HOURS: >20 dBA above NML					OOHW: >25 dB(A) above NML				
Scenario 1 – Site establishment															
NCA01	41 Hideaway Lane	1233	GF	S	42	50	45	35	35	35	-	-	7	7	7
NCA02	40 Barkers Road	2204	GF	SE	40	50	45	35	35	35	-	-	5	5	5
NCA03	84 Brolgan Road	1563	GF	E	48	46	41	41	41	40	2	7	7	7	8
NCA04	52 Hartigan Ave	1377	GF	W	59	45	40	35	35	35	14	19	24	24	24
NCA05	147-151 Victoria Street	1782	GF	NW	56	45	40	35	35	35	11	16	21	21	21
NCA06	250 Henry Parkes Way	1849	GF	SW	56	45	40	35	35	35	11	16	21	21	21
NCA07	92-94 Thomas Street	1591	GF	W	49	47	42	36	36	35	2	7	13	13	14
NCA08	Lot 1086 Moulden Street	1954	GF	SE	45	45	40	35	35	35	-	5	10	10	10
NCA09	Lumeah Bogan Road	2205	GF	NW	54	50	45	37	37	35	4	9	17	17	19
NCA10	98 Bogan Road	1610	GF	E	39	45	40	35	35	35	-	-	4	4	4
Scenario 2 – Services Relocations															
NCA01	83 Hideaway Lane	1550	GF	N	49	50	45	35	35	35	-	4	14	14	14
NCA02	40 Barkers Road	2204	GF	SE	49	50	45	35	35	35	-	4	14	14	14
NCA03	33 Ballerdee Lane	1073	GF	E	73	46	41	41	41	40	27	32	32	32	33
NCA04	Country Energy	1917	GF	W	54	45	40	35	35	35	9	14	19	19	19
NCA05	147-151 Victoria Street	1782	GF	NW	77	45	40	35	35	35	32	37	42	42	42
NCA06	238 Henry Parkes Way	1845	GF	NW	59	45	40	35	35	35	14	19	24	24	24
NCA07	92-94 Thomas Street	1591	GF	W	69	47	42	36	36	35	22	27	33	33	34
NCA08	Lot 1086 Moulden Street	1954	GF	SE	54	45	40	35	35	35	9	14	19	19	19
NCA09	Lumeah Bogan Road	2205	GF	NW	66	50	45	37	37	35	16	21	29	29	31

NCA	Most affected receiver within NCA	Obj. No.	Floor	Façade	Predicted construction noise level, $L_{Aeq, 15 \text{ min}}$	Noise management level					Exceedance of noise management level				
						Standard hours	Out of hours work period 1		Out of hours work period 2		Standard hours	Out of hours work period 1		Out of hours work period 2	
							Day	Day	Eve	Eve		Night	Day	Day	Eve
NCA10	98 Bogan Road	1610	GF	E	41	45	40	35	35	35	-	1	6	6	6
Scenario 3 – Corridor clearing															
NCA01	41 Hideaway Lane	1233	GF	S	57	50	45	35	35	35	7	12	22	22	22
NCA02	40 Barkers Road	2204	GF	SE	54	50	45	35	35	35	4	9	19	19	19
NCA03	84 Brolgan Road	1563	GF	E	63	46	41	41	41	40	17	22	22	22	23
NCA04	52 Hartigan Ave	1377	GF	W	73	45	40	35	35	35	28	33	38	38	38
NCA05	147-151 Victoria Street	1782	GF	NW	70	45	40	35	35	35	25	30	35	35	35
NCA06	250 Henry Parkes Way	1849	GF	SW	71	45	40	35	35	35	26	31	36	36	36
NCA07	92-94 Thomas Street	1591	GF	W	63	47	42	36	36	35	16	21	27	27	28
NCA08	Lot 1086 Moulden Street	1954	GF	SE	60	45	40	35	35	35	15	20	25	25	25
NCA09	Lumeah Bogan Road	2205	GF	NW	69	50	45	37	37	35	19	24	32	32	34
NCA10	98 Bogan Road	1610	GF	E	54	45	40	35	35	35	9	14	19	19	19
Scenario 4 – Bulk earthworks															
NCA01	41 Hideaway Lane	1233	GF	S	59	50	45	35	35	35	9	14	24	24	24
NCA02	40 Barkers Road	2204	GF	SE	57	50	45	35	35	35	7	12	22	22	22
NCA03	84 Brolgan Road	1563	GF	E	65	46	41	41	41	40	19	24	24	24	25
NCA04	52 Hartigan Ave	1377	GF	W	76	45	40	35	35	35	31	36	41	41	41
NCA05	147-151 Victoria Street	1782	GF	NW	73	45	40	35	35	35	28	33	38	38	38
NCA06	250 Henry Parkes Way	1849	GF	SW	73	45	40	35	35	35	28	33	38	38	38
NCA07	92-94 Thomas Street	1591	GF	W	66	47	42	36	36	35	19	24	30	30	31
NCA08	Lot 1086 Moulden Street	1954	GF	SE	63	45	40	35	35	35	18	23	28	28	28
NCA09	Lumeah Bogan Road	2205	GF	NW	71	50	45	37	37	35	21	26	34	34	36
NCA10	98 Bogan Road	1610	GF	E	56	45	40	35	35	35	11	16	21	21	21
Scenario 5 – Rock Crushing and Screening															
NCA01	83 Hideaway Lane	1550	GF	N	22	50	45	35	35	35	-	-	-	-	-
NCA02	40 Barkers Road	2204	GF	SE	0	50	45	35	35	35	-	-	-	-	-
NCA03	84 Brolgan Road	1562	GF	N	43	46	41	41	41	40	-	2	2	2	3

NCA	Most affected receiver within NCA	Obj. No.	Floor	Façade	Predicted construction noise level, L _{Aeq, 15 min}	Noise management level					Exceedance of noise management level				
						Standard hours	Out of hours work period 1		Out of hours work period 2		Standard hours	Out of hours work period 1		Out of hours work period 2	
							Day	Day	Eve	Eve		Night	Day	Day	Eve
NCA04	59 Coronation Avenue	1431	GF	NE	50	45	40	35	35	35	5	10	15	15	15
NCA05	50 Coronation Avenue	1360	GF	NW	50	45	40	35	35	35	5	10	15	15	15
NCA06	238 Henry Parkes Way	1845	GF	NW	52	45	40	35	35	35	7	12	17	17	17
NCA07	80 Rose Street	2049	GF	NW	43	47	42	36	36	35	-	1	7	7	8
NCA08	Lot 1086 Moulden Street	1954	GF	SE	35	45	40	35	35	35	-	-	-	-	-
NCA09	128 Painter Street	2170	GF	W	31	50	45	37	37	35	-	-	-	-	-
NCA10	98 Bogan Road	1610	GF	E	4	45	40	35	35	35	-	-	-	-	-
Scenario 6 – Drainage infrastructure															
NCA01	41 Hideaway Lane	1233	GF	S	61	50	45	35	35	35	11	16	26	26	26
NCA02	40 Barkers Road	2204	GF	SE	58	50	45	35	35	35	8	13	23	23	23
NCA03	84 Brolgan Road	1563	GF	E	67	46	41	41	41	40	21	26	26	26	27
NCA04	52 Hartigan Ave	1377	GF	W	77	45	40	35	35	35	32	37	42	42	42
NCA05	147-151 Victoria Street	1782	GF	NW	74	45	40	35	35	35	29	34	39	39	39
NCA06	250 Henry Parkes Way	1849	GF	SW	75	45	40	35	35	35	30	35	40	40	40
NCA07	92-94 Thomas Street	1591	GF	W	67	47	42	36	36	35	20	25	31	31	32
NCA08	Lot 1086 Moulden Street	1954	GF	SE	64	45	40	35	35	35	19	24	29	29	29
NCA09	Lumeah Bogan Road	2205	GF	NW	72	50	45	37	37	35	22	27	35	35	37
NCA10	98 Bogan Road	1610	GF	E	58	45	40	35	35	35	13	18	23	23	23
Scenario 7 – Paving/asphalting															
NCA01	41 Hideaway Lane	1233	GF	S	57	50	45	35	35	35	7	12	22	22	22
NCA02	40 Barkers Road	2204	GF	SE	54	50	45	35	35	35	4	9	19	19	19
NCA03	84 Brolgan Road	1563	GF	E	63	46	41	41	41	40	17	22	22	22	23
NCA04	52 Hartigan Ave	1377	GF	W	73	45	40	35	35	35	28	33	38	38	38
NCA05	147-151 Victoria Street	1782	GF	NW	70	45	40	35	35	35	25	30	35	35	35
NCA06	250 Henry Parkes Way	1849	GF	SW	71	45	40	35	35	35	26	31	36	36	36
NCA07	92-94 Thomas Street	1591	GF	W	63	47	42	36	36	35	16	21	27	27	28
NCA08	Lot 1086 Moulden Street	1954	GF	SE	60	45	40	35	35	35	15	20	25	25	25

NCA	Most affected receiver within NCA	Obj. No.	Floor	Façade	Predicted construction noise level, L _{Aeq, 15 min}	Noise management level					Exceedance of noise management level				
						Standard hours	Out of hours work period 1		Out of hours work period 2		Standard hours	Out of hours work period 1		Out of hours work period 2	
							Day	Day	Eve	Eve		Night	Day	Day	Eve
NCA09	Lumeah Bogan Road	2205	GF	NW	69	50	45	37	37	35	19	24	32	32	34
NCA10	98 Bogan Road	1610	GF	E	54	45	40	35	35	35	9	14	19	19	19
Scenario 8 – Pile Load Testing															
NCA01	83 Hideaway Lane	1550	GF	N	20	50	45	35	35	35	-	-	-	-	-
NCA02	53 Barkers Road	1381	GF	NE	12	50	45	35	35	35	-	-	-	-	-
NCA03	84 Brolgan Road	1563	GF	E	43	46	41	41	41	40	-	2	2	2	3
NCA04	Country Energy	1925	GF	S	51	45	40	35	35	35	6	11	16	16	16
NCA05	147-151 Victoria Street	1782	GF	NW	61	45	40	35	35	35	16	21	26	26	26
NCA06	170 Back Trundle Road	1810	GF	SW	56	45	40	35	35	35	11	16	21	21	21
NCA07	80 Rose Street	2050	GF	SW	50	47	42	36	36	35	3	8	14	14	15
NCA08	Lot 1086 Moulden Street	1951	GF	SW	32	45	40	35	35	35	-	-	-	-	-
NCA09	128 Painter Street	2172	GF	S	28	50	45	37	37	35	-	-	-	-	-
NCA10	98 Bogan Road	1610	GF	E	0	45	40	35	35	35	-	-	-	-	-
Scenario 9 - Bridgeworks															
NCA01	83 Hideaway Lane	1550	GF	N	29	50	45	35	35	35	-	-	-	-	-
NCA02	53 Barkers Road	1381	GF	NE	22	50	45	35	35	35	-	-	-	-	-
NCA03	55 Ballerdee Lane	1404	GF	SE	52	46	41	41	41	40	6	11	11	11	12
NCA04	52 Hartigan Ave	1377	GF	W	61	45	40	35	35	35	16	21	26	26	26
NCA05	48 Coronation Avenue	1300	GF	SE	39	45	40	35	35	35	-	-	4	4	4
NCA06	238 Henry Parkes Way	1845	GF	NW	38	45	40	35	35	35	-	-	3	3	3
NCA07	136 Mitchell Street	1753	GF	NW	35	47	42	36	36	35	-	-	-	-	-
NCA08	Lot 1086 Moulden Street	1951	GF	SW	28	45	40	35	35	35	-	-	-	-	-
NCA09	128 Painter Street	2170	GF	W	25	50	45	37	37	35	-	-	-	-	-
NCA10	98 Bogan Road	1610	GF	E	-1	45	40	35	35	35	-	-	-	-	-
Scenario 10 – Construction compound site establishment															
NCA01	83 Hideaway Lane	1550	GF	N	34	50	45	35	35	35	-	-	-	-	-
NCA02	53 Barkers Road	1381	GF	NE	25	50	45	35	35	35	-	-	-	-	-

NCA	Most affected receiver within NCA	Obj. No.	Floor	Façade	Predicted construction noise level, $L_{Aeq, 15 \text{ min}}$	Noise management level					Exceedance of noise management level				
						Standard hours	Out of hours work period 1		Out of hours work period 2		Standard hours	Out of hours work period 1		Out of hours work period 2	
							Day	Day	Eve	Eve		Night	Day	Day	Eve
NCA03	33 Ballerdee Lane	1073	GF	E	54	46	41	41	41	40	8	13	13	13	14
NCA04	7 Rosewood Avenue	2064	GF	SW	53	45	40	35	35	35	8	13	18	18	18
NCA05	146 Condobolin Road	1775	GF	NW	53	45	40	35	35	35	8	13	18	18	18
NCA06	238 Henry Parkes Way	1845	GF	NW	57	45	40	35	35	35	12	17	22	22	22
NCA07	80 Rose Street	2050	GF	SW	46	47	42	36	36	35	-	4	10	10	11
NCA08	Lot 1086 Moulden Street	1951	GF	SW	39	45	40	35	35	35	-	-	4	4	4
NCA09	128 Painter Street	2170	GF	W	35	50	45	37	37	35	-	-	-	-	-
NCA10	98 Bogan Road	1610	GF	E	7	45	40	35	35	35	-	-	-	-	-
Scenario 11 – Haulage															
NCA01	2850 Newell Hwy	1906	GF	NW	44	50	45	35	35	35	-	-	9	9	9
NCA02	40 Barkers Road	2204	GF	SE	33	50	45	35	35	35	-	-	-	-	-
NCA03	84 Brolgan Road	1563	GF	E	41	46	41	41	41	40	-	-	-	-	1
NCA04	1 Rosewood Avenue	2061	GF	SW	54	45	40	35	35	35	9	14	19	19	19
NCA05	147-151 Victoria Street	1782	GF	NW	48	45	40	35	35	35	3	8	13	13	13
NCA06	250 Henry Parkes Way	1849	GF	SW	49	45	40	35	35	35	4	9	14	14	14
NCA07	92-94 Thomas Street	1591	GF	W	42	47	42	36	36	35	-	-	6	6	7
NCA08	Lot 1086 Moulden Street	1954	GF	SE	38	45	40	35	35	35	-	-	3	3	3
NCA09	Lumeah Bogan Road	2205	GF	NW	47	50	45	37	37	35	-	2	10	10	12
NCA10	98 Bogan Road	1610	GF	E	32	45	40	35	35	35	-	-	-	-	-

The above results indicate the following in relation to each scenario:

Scenario 1: The results for Scenario 1 indicate that noise impacts at NCAs 4, 5, and 6 are predicted to be moderately intrusive during Standard Hours, therefore additional mitigation would be required for works undertaken during this time period. Works are predicted to be moderately intrusive during the Out of Hours Works (OOHW) periods, therefore additional mitigation measures would be required for receivers within all NCAs for works undertaken during these time periods.

Scenario 2: The results for Scenario 2 indicate that noise impacts at some locations within NCAs 3, 5 and 7 would be considered Highly Intrusive during Standard Hours. The properties with the potential to have Highly Intrusive noise impacts during this period are as follows:

- > 33 Ballerdee Lane
- > 55 Ballerdee Lane
- > 147-151 Victoria Street
- > 65 Thomas Street
- > 92-94 Thomas Street

Furthermore, there are receivers within NCA 9 that are predicted to be impacted at levels considered Moderately Intrusive during Standard Hours. Therefore additional mitigation measures may be required to address noise from works during this time period.

Up to 7 receivers are predicted to be impacted at levels considered Highly Intrusive during OOHW periods, therefore if night works are considered to be necessary for safety reasons, reduced operations are recommended and careful planning will be required for proposed works for all time periods to manage potential impacts

Scenario 3: The results for Scenario 3 indicate that noise impacts at some locations within NCAs 4, 5, and 6 would be considered Highly Intrusive during Standard Hours. The properties with the potential to have Highly Intrusive noise impacts during this period are as follows:

- > 52 Hartigan Avenue (NCA04)
- > 147-151 Victoria Street, Parkes (NCA05)
- > 250 Henry Parkes Way (NCA06)

Furthermore, there are receivers within NCAs 3, 7, and 9 that are predicted to be impacted at levels considered Moderately Intrusive during Standard Hours. Therefore additional mitigation measures may be required to address noise from works during this time period.

Up to 29 receivers are predicted to be impacted at levels considered Highly Intrusive during OOHW periods, therefore if night works are considered to be necessary for safety reasons, reduced operations are recommended and careful planning will be required for proposed works for all time periods to manage potential impacts.

Scenario 4: The results for Scenario 4 indicate that noise impacts at some locations within NCAs 4, 5, 6 and 9 would be considered Highly Intrusive during Standard Hours. The properties with the potential to be highly noise affected during this period are as follows:

- > 52 Hartigan Avenue (NCA04)
- > 147-151 Victoria Street (NCA05)
- > 1 Moulden Street (NCA06)
- > 3 Moulden Street (NCA06)
- > 170 Back Trundle Road (NCA06)
- > 176-180 Back Trundle Road (NCA06)
- > 238 Henry Parkes Way (NCA06)
- > 250 Henry Parkes Way (NCA06)
- > Lumeah Bogan Road, Parkes (NCA09)

Furthermore, there are receivers within NCAs 3, and 7 to 9 that are predicted to be impacted at levels considered Moderately Intrusive during Standard Hours. Therefore, additional mitigation measures may be required to address noise from works during this time period.

Up to 56 receivers are predicted to be impacted at levels considered Highly Intrusive during OOHW periods, therefore if night works are considered to be necessary for safety reasons, reduced operations are recommended and careful planning will be required for proposed works for all time periods to manage potential impacts.

Scenario 5: The results for Scenario 5 indicate that noise impacts at NCAs 4, 5, and 6 are predicted to be clearly audible during Standard Hours, therefore additional mitigation would not be required for works undertaken during this time period. Works are predicted to be moderately intrusive during the Out of Hours Works (OOHW) periods, therefore additional mitigation measures would be required for receivers within all NCAs for works undertaken during these time periods.

Scenario 6: The results for Scenario 6 indicate that noise impacts at up to 23 Receivers within NCAs 3 to 6 and 9 would be considered Highly Intrusive during Standard Hours. Furthermore, there are receivers within NCAs 7, 8 and 10 that are predicted to be impacted at levels considered Moderately Intrusive during Standard Hours. Therefore, additional mitigation measures may be required to address noise from works during this time period.

Up to 82 receivers are predicted to be impacted at levels considered Highly Intrusive during OOHW periods, therefore if night works are considered to be necessary for safety reasons, reduced operations are recommended and careful planning will be required for proposed works for all time periods to manage potential impacts.

Scenario 7: The results for Scenario 7 indicate that noise impacts at some locations within NCAs 4, 5 and 6 would be considered Highly Intrusive during Standard Hours. The properties with the potential to be highly noise affected during this period are as follows:

- > 52 Hartigan Avenue (NCA04)
- > 147-151 Victoria Street (NCA05)
- > 1 Moulden Street (NCA06)
- > 1A Moulden Street (NCA06)
- > 170 Back Trundle Road (NCA06)
- > 176-180 Back Trundle Road (NCA06)
- > 238 Henry Parkes Way (NCA06)
- > 250 Henry Parkes Way (NCA06)

Up to 30 receivers are predicted to be impacted at levels considered Highly Intrusive during OOHW periods, therefore if night works are considered to be necessary for safety reasons, reduced operations are recommended and careful planning will be required for proposed works for all time periods to manage potential impacts.

Scenario 8: The results for Scenario 1 indicate that noise impacts at NCAs 5, and 6 are predicted to be moderately intrusive during Standard Hours, therefore additional mitigation would be required for works undertaken during this time period. Works are predicted to be highly intrusive during the Out of Hours Works (OOHW) periods, therefore additional mitigation measures would be required for works undertaken during these time periods.

Scenario 9: The results for Scenario 9 indicate that noise impacts at one resident located at 52 Hartigan Avenue (NCA04) would be considered Moderately Intrusive during Standard Hours. For the remaining residents, impacts will range from Noticeable to Clearly Audible.

One receiver located at 52 Hartigan Avenue (NCA04) is predicted to be impacted at levels considered Highly Intrusive, and a further 19 receivers within NCAs 3 to 5 would experience Moderately Intrusive impacts during OOHW periods, therefore if night works are considered to be necessary for safety reasons, reduced operations are recommended and careful planning will be required for proposed works for all time periods to manage potential impacts.

Scenario 10: The results for Scenario 10 indicate that noise impacts at two locations within NCA 6 are predicted to be moderately intrusive during Standard Hours, therefore mitigation may be required for works undertaken during this time period. Works are predicted to be moderately intrusive during the Out of Hours Works (OOHW) periods, therefore additional mitigation measures would be required for receivers within NCAs 3-7 for works undertaken during these time periods.

Scenario 11: The results for Scenario 11 indicate that noise impacts at NCAs 4, 5, and 6 are predicted to be clearly audible during Standard Hours, therefore additional mitigation would not be required for works undertaken during this time period. Works are predicted to be moderately intrusive during the Out of Hours Works (OOHW) periods, therefore additional mitigation measures would be required for receivers within all NCAs for works undertaken during these time periods.

6.8 Predicted number of exceedances

The number of predicted exceedances for each scenario are detailed below in Table 6-5:

Table 6-5 Predicted number of receivers where NMLs are exceeded

Scenario	Predicted number of receivers where NMLs are exceeded					Highly noise affected
	Standard hours	Out of hours work period 1		Out of hours work period 2		
	Day	Day	Eve	Eve	Night	
1	29	124	392	392	399	0
2	262	502	593	593	595	1
3	569	596	597	597	597	0
4	593	597	597	597	597	2
5	39	168	314	314	315	0
6	596	597	597	597	597	2
7	569	596	597	597	597	0
8	16	68	211	211	218	0
9	70	129	248	248	248	0
10	144	344	487	487	487	0
11	15	33	116	116	120	0

6.9 Sleep disturbance

Maximum noise levels have been predicted to the nearest affected residential receivers to allow a review of the potential for sleep disturbance from construction activities at night. In the absence of measurement data typical construction source L_{Amax} noise levels were assumed to be 10 dB(A) above the predicted L_{Aeq} noise levels, on the basis of measurements from previous projects. On this basis, the receivers where the sleep disturbance criteria is likely to be exceeded are summarised in Table C3 of Appendix C.

The predicted L_{Amax} results detailed in Table C3 indicate that maximum construction noise levels at all NCAs are likely to exceed the sleep disturbance criteria for all OOHW construction scenarios, at all assessed receivers when construction works are located nearby. For this reason it is recommended that activities with potentially high maximum levels such as the use of pneumatic tools and drilling are minimised at these locations during the quietest periods of the overall night-time period.

7 Construction vibration assessment

7.1 Vibration limits

Vibration from construction activities associated with the project could potentially impact on the amenity of the occupants of dwellings or buildings located close to the construction works. Generally, vibration impact can be summarised into two categories:

- a Effect on human comfort
- b Structural or cosmetic damage to buildings.

Vibration criteria is addressed in the NSW ICNG and refers to Section 2.5 of the document Assessing Vibration: A Technical Guideline (NSW AVATG) issued by DEC (2006). The NSW AVATG outlines vibration limits in relation to human comfort. Criteria in this guideline are based on the British Standard BS6472-1992 Evaluation of human exposure to vibration in buildings (1-80Hz). A summary of these criteria are detailed in Table 5-2.

In relation to structural damage, there is currently no Australian Standard that provides criteria for the assessment of structural damage to buildings. However, the British Standard BS7385 Part 2 can be used to assess structural damage to buildings. It defines damage in several categories including, for example, “cosmetic”, “minor” and “major” damage. Alternatively, the German Standard DIN4150 Part 3 provides maximum vibration levels, which are assessed over a frequency range. These criteria are summarised in Table 5-3.

The recommended minimum working distance between vibration intensive plant and sensitive receivers for minimising the risk of cosmetic damage are listed in the Roads and Maritime Construction Noise and Vibration Guideline and are shown in Table 7-1.

The minimum working distances for cosmetic damage as outlined in Table 7-1 must be adhered to unless otherwise approved by TfNSW.

7.2 Vibration assessment

For the purposes of this assessment, the following proposed plant with the potential to generate significant vibration has been considered:

- > Bored Piling Rig
- > Vibratory Roller
- > Rock hammers
- > Rock Drill
- > Truck movements.

Construction vibration levels vary depending on the distance from the equipment in use, the energy level imparted to the ground by the construction process, and the bedrock type. The most significant vibration sources associated with the construction work will be vibratory rollers and piling rigs.

The Transit Noise and Vibration Impact Assessment (TNVIA) (US Federal Transit Administration (FTA), 2006) outlines calculation methods for construction equipment vibration levels. These levels are expressed in terms of Peak Particle Velocity (PPV, mm/s), with vibration levels provided for a number of plant items. The TNVIA specifies that:

“It should be noted that there is a considerable variation in reported ground vibration levels from construction sites. The data provides a reasonable estimate for a wide range of soil conditions.”

The data provided by the TNVIA results in a graph as shown in Figure 7-1.

Depending on the actual ground conditions (i.e. greater density of rock) vibration levels may increase and affect residents to a greater extent subjectively.

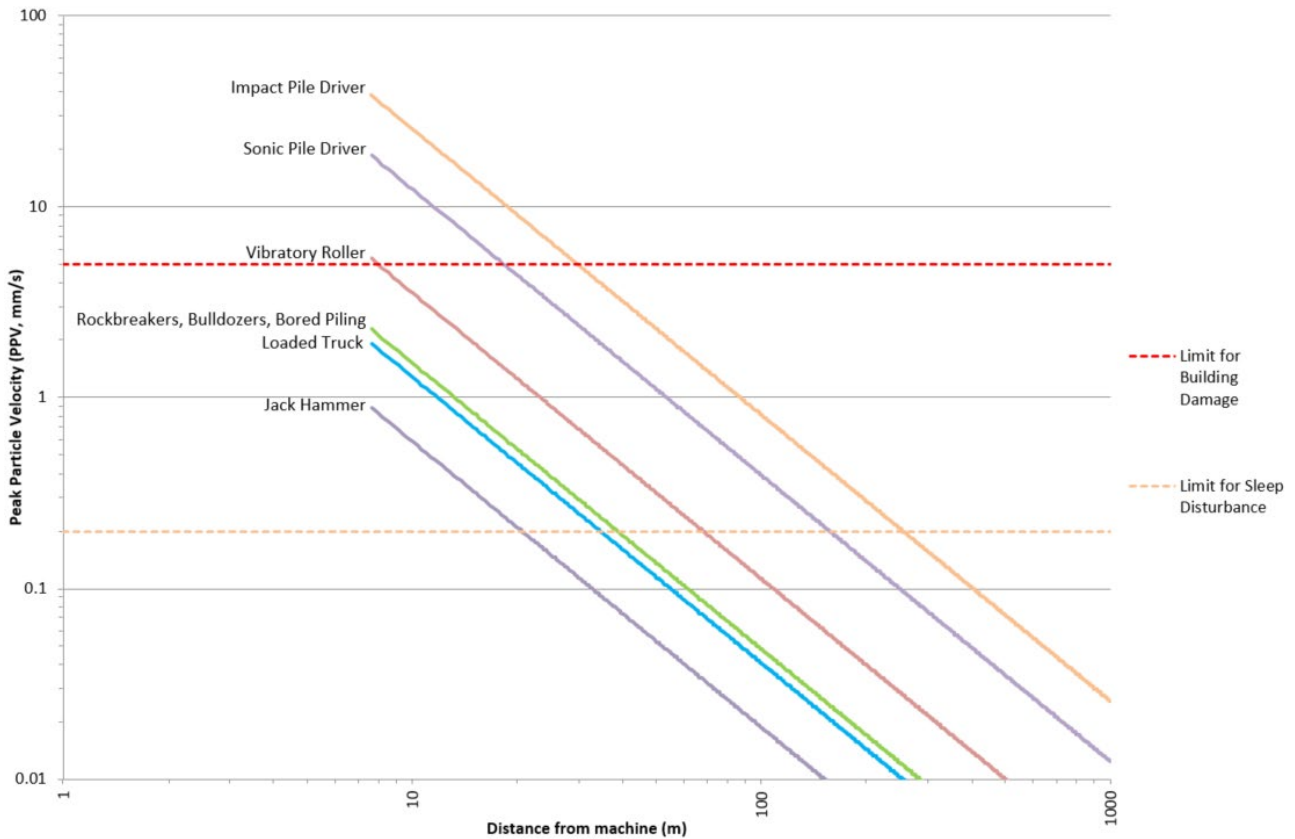


Figure 7-1 Estimates of vibration levels generated by common construction activities / equipment at various distances (Source: FTA 2006)

Note: The predicted vibration levels in the figure above include a safety margin for varying ground types.

Construction works including bored piling may be undertaken with a minimum separation distance of 4-5 metres from the nearest residential buildings, based on the expected plant to be used for the project as detailed in Table 6-3. Where impacted buildings are heritage listed or of similar more sensitive construction the minimum separation distance should be increased to 40 metres.

However for rock hammers and vibratory rollers the minimum required safe working distance is increased as detailed below in Table 7-1 between construction activities and sensitive receivers to reduce vibration to within levels unlikely to cause building damage.

7.3 Minimum working distance (Roads and Maritime CNVG)

The minimum working distance for vibration intensive plant from sensitive receivers is listed in Table 2 of the CNVG. Table 7-1 below presents these recommended minimum working distances for specific construction activities.

Table 7-1 Recommended minimum working distances for vibration intensive plant from sensitive receivers

Plant item	Rating / description	Minimum working distance		
		Cosmetic damage (BS 7385)	Cosmetic damage (DIN 4150) Heritage and other sensitive structures	Human response (OH&E Vibration Guideline)
Vibratory roller	< 50 kN (Typically 1-2 tonnes)	5 m	14 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	16 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	33 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	41 m	100 m
	> 300 kN (Typically 13-18 tonnes)	20 m	54 m	100 m
	> 300 kN (> 18 tonnes)	25 m	68 m	100 m
Small hydraulic hammer	(300 kg - 5 to 12t excavator)	2 m	5 m	7 m
Medium hydraulic hammer	(900 kg – 12 to 18t excavator)	7 m	19 m	23 m
Large hydraulic hammer	(1600 kg – 18 to 34t excavator)	22 m	60 m	73 m
Vibratory pile driver	Sheet Piles	2 m to 20 m	50 m	20 m
Pile boring	≤ 800 mm	2 m (nominal)	40 m	4 m
Jackhammer	Hand Held	1 m (nominal)	2 m	2 m

8 Blasting noise and vibration assessment

The assessment of potential blasting impacts resulting in overpressure and ground vibration is based on the calculation methodology outlined in AS2187.2. We are advised the blasting is to be conducted in the following locations:

- > Cut 2 – CH30030 to CH30170
- > Cut 3 – CH33080 to CH33440
- > Cut 4 – CH34170 to CH34380

Generally, the assessment of air overpressure and ground vibration takes into account:

- > The Maximum Instantaneous Charge (MIC) in kilograms.
- > Distance from the MIC to the receiver or structure in metres
- > Site specific variables

As site specific conditions are not known, the assessment has assumed conservative site specific constants. Furthermore, AS2187.2 notes the following:

- > “In unfavourable meteorological conditions, it is common for airblast levels to be increased by up to 20 dBL due to the combined effects of an increase with altitude of temperature (an inversion) and/or wind velocity (windshear). Effective assessment of meteorological reinforcement requires accurate measurement of temperature, wind speed, and wind direction, generally at heights up to 1000 metres above the ground.”
- > As many site factors will affect the transmission of vibration through the ground, the most accurate prediction graph for a site will be that generated from vibration measurements taken at the site.
- > Ground vibration levels depend on the maximum instantaneous charge (effective charge weight per delay), and not the total charge weight, provided the effective delay interval is appropriate.

As site specific variables and distances to receivers are largely uncontrollable, the main variable under the control of the contractor is the MIC. However as there is the potential for actual measurement results to vary from predicted levels, it may be appropriate to undertake initial trial blasts with conservative charge quantities. An initial determination of predicted suitable MIC masses is presented in Section 8.1 (Airblast Overpressure) and Section 8.2 (Ground Vibration). Both assessments assume that charges will be confined to blastholes, and unconfined surface charges will not be used.

8.1 Airblast overpressure assessment

Airblast overpressure levels were calculated by applying the formula in AS 2187.2 as follows:

$$P = K_a \left(\frac{R}{Q^{1/3}} \right)^a$$

where

- P = pressure, in kilopascals
- Q = explosives charge mass, in kilograms
- R = distance from charge, in metres
- K_a = site constant
- a = site exponent

AS2187 notes the for confined blasthole charges, when using the standard default site exponent (a) of -1.45, the site constant (K_a) is commonly in the range of 10 to 100. Figure 8-1 presents the predicted airblast overpressure, and assumes a site constant (K_a) of 100, a site exponent (a) of -1.45, and assumes blasting will be undertaken for less than 1 year.

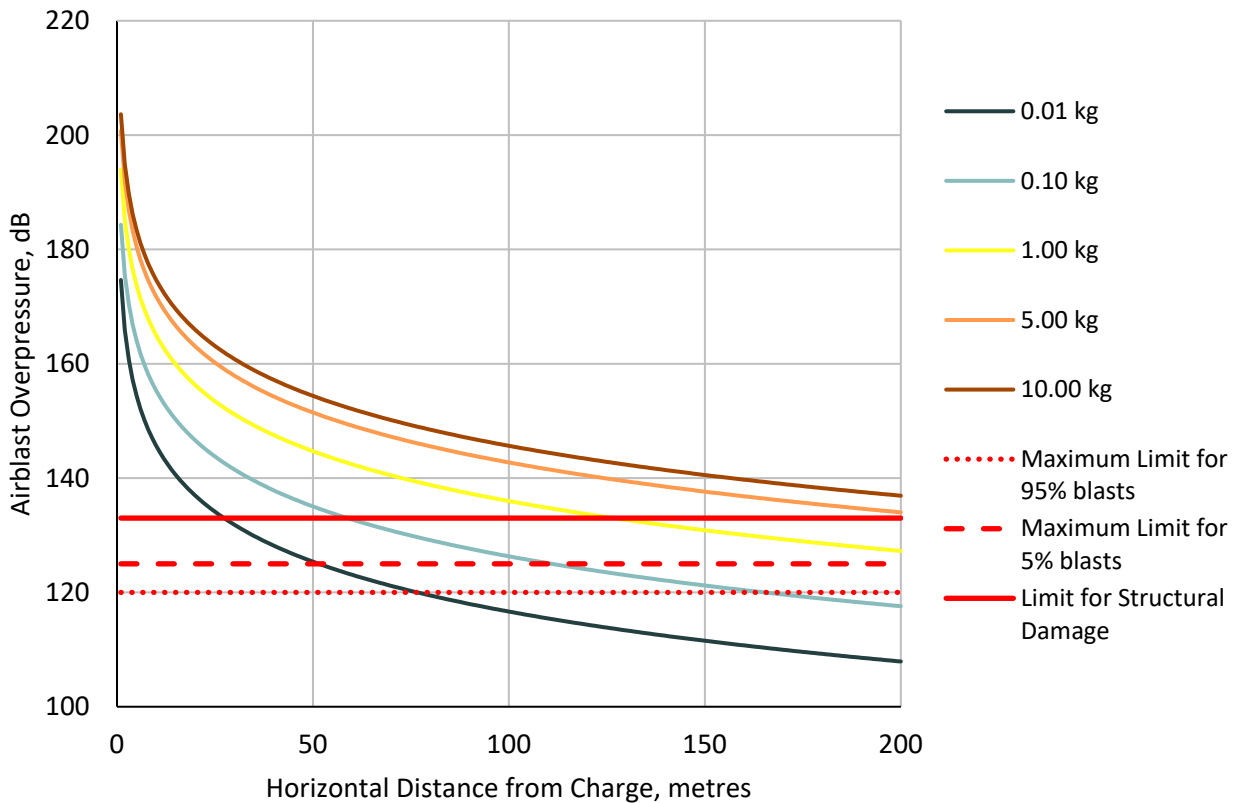


Figure 8-1 Predicted airblast overpressure level, charge weight 0.01 to 10.0 kg

Note that AS2187 indicates that levels may be up to 20dB higher than the levels presented above, due to unfavourable meteorological conditions.

Applying the above levels presented in Figure 8-1, to current site conditions result in recommended MIC masses for cuts 2 to 4.

Table 8-1 Recommended MIC for airblast overpressure mitigation

Cut	Receiver	Address	Structure type	Approximate distance to blast	Airblast overpressure limit	Recommended MIC, kg ⁽¹⁾
2	1	123 London Road	Dwelling	50	120	0.003
	2	123 London Road	Horse sheds	120	125	0.13
	3	Parkes Golf Club	Sheds (x2)	220	125	0.8
	4	Parkes Golf Club	Clubhouse	250	120	0.35
3	1	Moulden Street	Dwellings (x5)	100	120	0.02
	2	Victoria Street	Dwellings (x2)	75	120	0.01
4	1	Lot 1086 Moulden Street	Dwelling	115	120	0.035
	2	41 Moulden Street	Dwelling	280	120	0.5
	3	128 Painter Street	Dwelling	380	120	1.3

- (1) As there is the potential for actual measurement results to vary from predicted levels, it may be appropriate to undertake initial trial blasts with conservative charge quantities (i.e. less than the recommended MIC).

8.2 Blasting ground vibration assessment

Blasting ground vibration levels were calculated by applying the formula in AS 2187.2 as follows:

$$V = K_g \left(\frac{R}{Q^{1/2}} \right)^{-B} \quad \dots J7.3(1)$$

Where

V = ground vibration as vector peak particle velocity, in millimetres per second

R = distance between charge and point of measurement, in metres

Q = maximum instantaneous charge (effective charge mass per delay), in kilograms

K_g, B = constants related to site and rock properties for estimation purposes

Figure 8-1 presents the predicted groundborne vibration levels, and assumes a site constant (K_g) of 1140, a site exponent (b) of 1.6, and assumes blasting will be undertaken for less than 1 year.

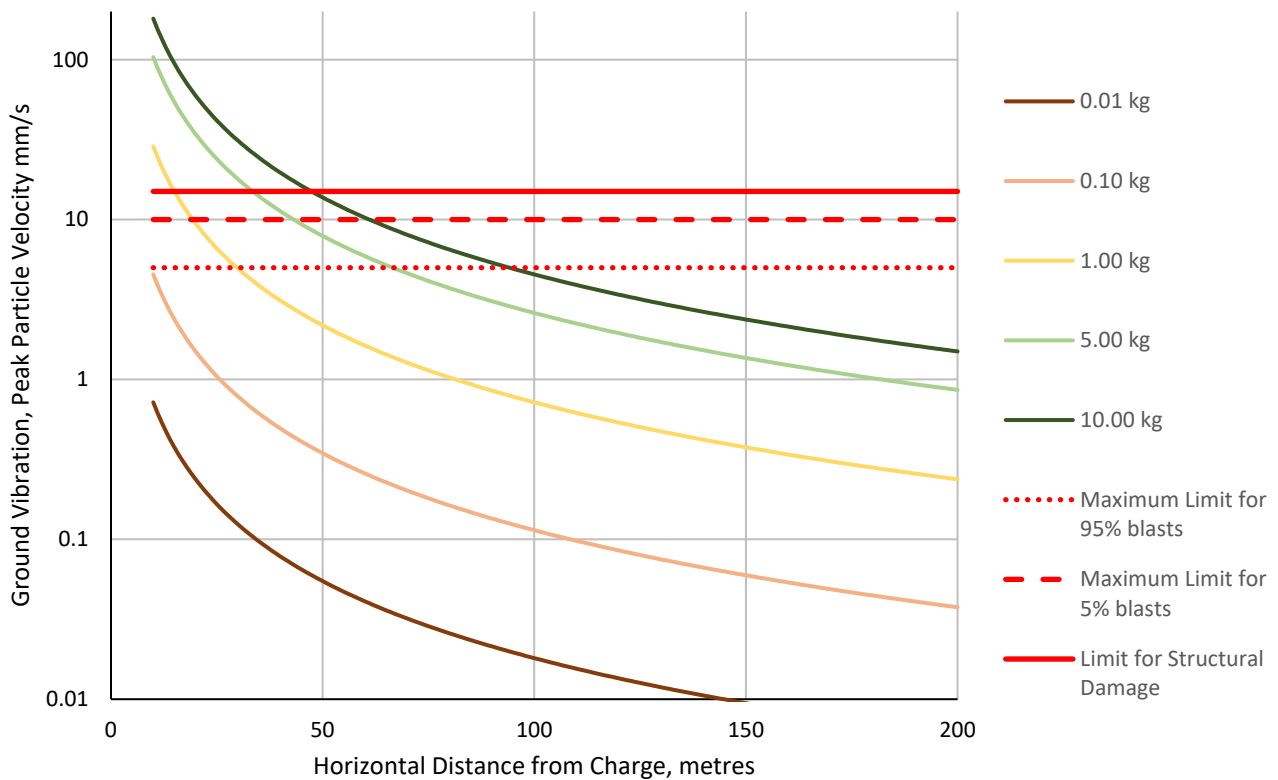


Figure 8-2 Predicted groundborne vibration levels, charge weight 0.01 to 10.0 kg

Note that AS2187 indicates that levels may be up to 20dB higher than the levels presented above, due to unfavourable meteorological conditions.

Applying the above levels presented in Figure 8-1, to current site conditions result in recommended MIC masses for cuts 2 to 4.

Table 8-2 Recommended MIC for groundborne vibration mitigation

Cut	Receiver	Address	Structure type	Approximate distance to blast	Vibration limit, PPV mm/s	Recommended maximum MIC, kg ^{(1) (2)}
2	1	123 London Road	Dwelling	50	5	2.8
	2	123 London Road	Horse sheds	120	15	64
	3	Parkes Golf Club	Sheds (x2)	220	15	215
	4	Parkes Golf Club	Clubhouse	250	5	70
3	1	Moulden Street	Dwellings (x5)	100	5	11
	2	Victoria Street	Dwellings (x2)	75	5	6.4
4	1	Lot 1086 Moulden Street	Dwelling	115	5	15
	2	41 Moulden Street	Dwelling	280	5	88
	3	128 Painter Street	Dwelling	380	5	163

(1) As there is the potential for actual measurement results to vary from predicted levels, it may be appropriate to undertake initial trial blasts with conservative charge quantities (i.e. less than the recommended MIC).

- (2) Recommended MIC for airblast overpressure may be the determining factor for the final MIC masses. Refer to Table 8-2.

9 Recommended mitigation measures

9.1 ICNG & AS 2436 Recommended Mitigation Measures

9.1.1 General mitigation measures

The following best practice construction noise and vibration mitigation measures are based on recommendations provided within the NSW ICNG and Australian Standard AS 2436-1981: Guide to Noise Control on Construction, Maintenance and Demolition Sites. The following best practice measures apply to the proposed construction activities.

Table 9-1 Noise and vibration safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
NV1	Noise and vibration	<p>Preparation of a noise and vibration management plan based on recommendations provided within the NSW ICNG and Australian Standard AS 2436-1981: Guide to Noise Control on Construction, Maintenance and Demolition Sites. This is to include, but not be limited to:</p> <ul style="list-style-type: none"> > Plant controls: <ul style="list-style-type: none"> – Use of noise attenuating controls at the source, such as mufflers, acoustic screens, etc. – Plant and equipment would be in good working order to prevent excess noise generation. – Locating static sources of noise such as the generators as remotely as possible from noise sensitive receivers – Use of broadband reversing alarms, or “quackers”, on mobile equipment in accordance with the relevant health and safety regulations – Use of temporary noise barriers where practical. The height and location of these barriers would be determined during preparation of the construction noise and vibration management plan when more information regarding the proposed plant to be used for each construction stage is available. – Investigate whether “at plant” mitigation or muffled plant is available for plant with high source noise levels such as rock hammers and piling rigs, and plant emitting continuous noise such as generators. – Acoustic curtains (generally loaded vinyl based products), attached to wire construction fencing or laid over steel scaffold can also provide practical temporary noise barriers. We recommend that this is investigated for stationery plant within the worksites once a detailed schedule of works and plant is available. – Provision of a solid 2 metre high anti-gawk barrier along the site work area boundaries (with the gap covered over with loaded vinyl where there is a gap between the base on upper sections of the barrier) may provide some reduction to nearby receivers, however this is only expected to benefit the lower levels of the nearby receivers. Local barriers will have minimal effects on noise reduction for receivers with multiple levels as there will still be a clear line of sight from the works to the receivers. Inclusion of an angled return at the top of the barrier (if this is practical to construct) may provide increased benefit to multiple storey receivers when the plant is located close to the barrier and is generally stationery. We recommend that this is further investigated once a detailed schedule of works and plant is available. > Management and behavioural controls: <ul style="list-style-type: none"> – Ensure that managers effectively communicate acceptable and unacceptable work practices for the site, through staff site inductions, notice boards, and prestart meetings. – Avoid the need for reversing in the construction area by creating a loop road or similar. 	Contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> – Avoid dropping materials from height. – Workers should avoid shouting, minimise talking loudly, and avoid slamming vehicle doors. > Allowing construction to occur only during approved construction hours, unless otherwise required as a condition of TfNSW safety requirements > Conducting noise monitoring during all construction phases/scenarios considering the potential exceedances for the purposes of assisting in noise mitigation and to verify the findings of this noise assessment. > Implementing a procedure for dealing with complaints to ensure that all complaints are registered and dealt with appropriately. > Conducting additional monitoring if complaints are received or proposed activities and number of plant exceed those assumed in this assessment > Preparation of an Out of Hours procedure detailing works schedule, approval process, communications requirements and management. > Modification of work activities where noise or vibration is found to cause unacceptable impact. > Application of respite periods for noise activities. 		
NV2	Noise and vibration	<ul style="list-style-type: none"> > Carrying out works within standard daytime hours as follows: <ul style="list-style-type: none"> – 7:00 am to 6:00 pm Monday to Friday – 8:00 am to 1:00 pm Saturdays, no work on Sundays or public holidays. > Should operations be required outside standard hours, all reasonable and feasible efforts should be undertaken to ensure noise levels would not exceed the ICNG noise management levels stated in Section 5.1 of this assessment by carrying out night-works with reduced numbers of plant for example. 	Contractor	Construction
NV3	Noise and vibration	<ul style="list-style-type: none"> > Notification of potentially affected receivers detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the work (where applicable) and contact telephone number. > Notification should be a minimum of 7 calendar days prior to the start of work. > A contact telephone number and email address will be available for community feedback 	TfNSW / Contractor	Pre-construction
NV4	Noise	Conduct short term background noise monitoring prior to construction to confirm the ambient noise levels presented in this report, which were carried out during COVID 19 and may not be representative of typical levels.	TfNSW / Contractor	Pre-construction
NV5	Vibration impact to	Where works are proposed within the safe working limits, for the heritage structures, specialist advice should be sought from an appropriately qualified structural engineer who is familiar with heritage structures to support any proposed relaxation of the initial cosmetic damage screening criterion. Any such relaxation shall	Contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
	heritage structures	be approved by TfNSW or under the environmental license as relevant. Vibration monitoring should be carried out to confirm vibration levels prior to construction commencement.		
NV6	Vibration	Where buildings are located within the safe working distance zone, dilapidation surveys shall be carried out prior to construction.	Contractor	Pre-construction / Construction
NV7	Vibration	Where receivers are located within the safe work distance zones, vibration monitoring shall be carried out to ensure compliance with the required criteria. If exceedances are recorded, works should be modified accordingly to reduce vibration levels.	Contractor	Pre-construction / Construction
NV8	Blasting	A detailed field survey including Dial Before You Dig (DBYD) search, shall be undertaken prior to blasting activities in order to identify structures, heritage buildings, and services potentially impacted by blasting activities.	Contractor	Pre-construction / Construction
NV9	Blasting	Ground vibration and airblast overpressure monitoring shall be undertaken in proximity to locations with the highest potential for impact.	Contractor	Pre-construction / Construction
NV10	Blasting	Due to the proximity of dwellings and other structures, it may be appropriate to undertake initial trial blasts with conservative charge quantities (i.e. less than the recommended MIC stipulated in Table 8-1). Ground vibration and airblast overpressure monitoring shall be undertaken during the trial blasts to verify site conditions.	Contractor	Construction

9.2 Roads & Maritime Construction Noise and Vibration Guideline Noise Management Recommendations

The RMS CNVG stipulates that additional noise management measures may be required where noise levels are predicted to exceed the noise management levels.

The range of additional mitigation measures include, but are not limited to:

- > Notification via letterbox or phone call
- > Respite periods
- > Alternative accommodation.

Identification of where additional mitigation measures may be required is based on the information presented below in Table 9-2.

Table 9-2 Triggers for additional mitigation measures – airborne noise

Predicted airborne $L_{Aeq(15min)}$ noise level at receiver			Type of additional mitigation measures	Mitigation levels:
Perception	dB(A) above RBL	dB(A) above NML		
All hours				
75dBA or greater	-	-	N, V, PC, RO	HA
Standard hours: Mon - Fri (7am - 6pm), Sat (8am - 1pm), Sun/Pub Hol (Nil)				
Noticeable	5 to 10	0	-	NML
Clearly audible	10 to 20	< 10	-	NML
Moderately intrusive	20 to 30	10 to 20	N, V	NML + 10
Highly intrusive	> 30	> 20	N, V	NML + 20
OOHW Period 1: Mon - Fri (6pm - 10pm), Sat (7am - 8am & 1pm - 10pm), Sun/Pub Hol (8am - 6pm)				
Noticeable	5 to 10	< 5	-	NML
Clearly audible	10 to 20	5 to 15	N, R1, DR	NML + 5
Moderately intrusive	20 to 30	15 to 25	V, N, R1, DR	NML + 15
Highly intrusive	> 30	> 25	V, IB, N, R1, DR, PC, SN	NML + 25
OOHW Period 2: Mon - Fri (10pm - 7am), Sat (10pm - 8am), Sun/Pub Hol (6am - 7am)				
Noticeable	5 to 10	< 5	N	NML
Clearly audible	10 to 20	5 to 15	V, N, R2, DR	NML + 5
Moderately intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML + 15
Highly intrusive	> 30	> 25	AA, V, IB, N, PC, SN, R2, DR	NML + 25
<p><i>Notes:</i></p> <p>AA = Alternative Accommodation V = Verification IB = Individual Briefings N = Notification PC = Phone Calls SN = Specific Notifications</p> <p>R1 = Respite Period 1 R2 = Respite Period 2 RO = Respite Offers DR = Duration Respite Perception = relates to level above RBL NML = Noise Management Level HA = Highly Affected (> 75 dB(A) - applies to residences only</p>				

A detailed description of each additional mitigation measure is presented below.

Additional mitigation measures may be required where noise levels are predicted to exceed the noise management levels. Refer to Table 9-3 for areas where this is predicted to occur.

The range of additional mitigation measures are itemised below.

Notification (N)

Notification using letterbox drop or equivalent for advanced warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of 5 working days prior to the start of works. The approval conditions for projects may also specify requirements for notification to the community about works that may impact on them.

Specific notifications (SN)

Specific notifications are letterbox dropped (or equivalent) to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.

The exact conditions under which specific notifications would proceed are defined in Table 9-3 below. This form of communication is used to support periodic notifications, or to advertise unscheduled works.

Phone calls (PC)

Phone calls detailing relevant information made to identified/affected stakeholders within seven calendar days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs. Where the resident cannot be telephoned then an alternative form of engagement should be used.

Individual briefings (IB)

Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Project representatives would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project. Where the resident cannot be met with individually then an alternative form of engagement should be used.

Respite offers (RO)

Respite Offers should be considered where there are high noise and vibration generating activities near receivers. As a guide work should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of and amenity at nearby receivers.

The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis, and may not be applicable to all projects.

Respite period 1 (R1)

Out of hours construction noise in out of hours period 1 shall be limited to no more than three consecutive evenings per week except where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and no more than 6 evenings per month.

Respite period 2 (R2)

Night time construction noise in out of hours period 2 shall be limited to two consecutive nights except for where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and 6 nights per month. Where possible, high noise generating works shall be completed before 11pm.

Duration respite (DR)

Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that the project can be completed more quickly.

The project team should engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite.

Where there are few receivers above the NML each of these receivers should be visited to discuss the project to gain support for Duration Respite.

Alternative accommodation (AA)

Alternative accommodation options may be offered to residents living in close proximity to construction works that are likely to experience highly intrusive noise levels. The specifics of the offer will be identified on a project-by-project basis. Additional aspects for consideration shall include whether the highly intrusive activities occur throughout the night or before midnight.

Verification (V)

Routine checks of noise levels or following reasonable complaints. This verification should include measurement of the background noise level and construction noise. Note this is not required for projects less than three weeks unless to assist in managing complaints.

Table 9-3 identifies required additional mitigation measures that may be implemented where exceedances of the NML are predicted.

Table 9-3 Triggers for additional mitigation measures – airborne noise

NCA	Type of Additional Mitigation Measures for Noise Catchment Area	
	OOHW Period 1	OOHW Period 2
Scenario 1 Site establishment		
NCA01	N, R1, DR	V, N, R2, DR
NCA02	N, R1, DR	V, N, R2, DR
NCA03	N, R1, DR	V, N, R2, DR
NCA04	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA05	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA06	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA07	N, R1, DR	V, N, R2, DR
NCA08	N, R1, DR	V, N, R2, DR
NCA09	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA10	-	N
Scenario 2 Services Relocations		

NCA	Type of Additional Mitigation Measures for Noise Catchment Area	
	OOHW Period 1	OOHW Period 2
NCA01	N, R1, DR	V, N, R2, DR
NCA02	N, R1, DR	V, N, R2, DR
NCA03	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA04	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA05	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA06	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA07	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA08	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA09	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA10	N, R1, DR	V, N, R2, DR
Scenario 3 Corridor Clearing		
NCA01	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA02	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA03	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA04	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA05	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA06	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA07	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA08	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA09	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA10	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
Scenario 4 Bulk Earthworks		
NCA01	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA02	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA03	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA04	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA05	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA06	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA07	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA08	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA09	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA10	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
Scenario 5 Rock Crushing and Screening		
NCA01	-	-
NCA02	-	-
NCA03	-	N
NCA04	N, R1, DR	V, N, R2, DR
NCA05	N, R1, DR	V, N, R2, DR
NCA06	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA07	N, R1, DR	V, N, R2, DR
NCA08	-	-

NCA	Type of Additional Mitigation Measures for Noise Catchment Area	
	OOHW Period 1	OOHW Period 2
NCA09	-	-
NCA10	-	-
Scenario 6 Drainage Infrastructure		
NCA01	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA02	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA03	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA04	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA05	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA06	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA07	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA08	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA09	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA10	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
Scenario 7 Paving and Asphaltting		
NCA01	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA02	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA03	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA04	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA05	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA06	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA07	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA08	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA09	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA10	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
Scenario 8 Pile Load Testing		
NCA01	-	-
NCA02	-	-
NCA03	-	N
NCA04	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA05	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA06	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA07	N, R1, DR	V, N, R2, DR
NCA08	-	-
NCA09	-	-
NCA10	-	-
Scenario 9 Bridgeworks		
NCA01	-	-
NCA02	-	-
NCA03	N, R1, DR	V, N, R2, DR
NCA04	V, IB, N, R1, DR, PC, SN	AA, V, IB, N, PC, SN, R2, DR
NCA05	-	N

NCA	Type of Additional Mitigation Measures for Noise Catchment Area	
	OOHW Period 1	OOHW Period 2
NCA06	-	N
NCA07	-	-
NCA08	-	-
NCA09	-	-
NCA10	-	-
Scenario 10 Site Compounds		
NCA01	-	-
NCA02	-	-
NCA03	N, R1, DR	V, N, R2, DR
NCA04	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA05	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA06	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA07	N, R1, DR	V, N, R2, DR
NCA08	-	N
NCA09	-	-
NCA10	-	-
Scenario 11 Haulage		
NCA01	N, R1, DR	V, N, R2, DR
NCA02	-	-
NCA03	-	-
NCA04	V, N, R1, DR	V, IB, N, PC, SN, R2, DR
NCA05	N, R1, DR	V, N, R2, DR
NCA06	N, R1, DR	V, N, R2, DR
NCA07	N, R1, DR	V, N, R2, DR
NCA08	-	N
NCA09	N, R1, DR	V, N, R2, DR
NCA10	-	-

10 Conclusions

This assessment has determined the following conclusions:

- > In accordance with the noise management levels stipulated in Section 5.1, dwellings exposed to levels of construction noise above 75 dB(A) are considered highly noise affected, with dwellings exposed to levels above the daytime RBL +10 dB(A) considered noise affected.
- > Construction noise levels are predicted to exceed the NSW ICNG noise management levels (NML) for “standard” hours at all NCAs for all construction stages.
- > Construction noise levels are predicted to significantly exceed noise management levels for “non-standard” hours. This is due to the proximity of receivers to the construction works and low background noise levels in the rural area.
- > Predicted levels are expected to be highly intrusive at a significant number of receivers during both standard hours and OOHW periods for Scenarios 2, 3, 4, 6, and 7. Furthermore, predicted levels are expected to be highly intrusive during OOHW periods for Scenarios 8 and 9.
- > It should be noted that this assessment has endeavoured to carry out “worst case” noise modelling, and noise levels are predicted based on all modelled sources operating simultaneously. Should the work sites or plant and equipment be amended, the predicted noise levels will change accordingly.
- > The predicted exceedances are generally a result of works being located in close proximity to the adjacent receivers. This modelling has been carried out to provide a worst case scenario and it may be possible to reduce the number of plant operating simultaneously, particularly at night, once detailed construction schedules are known.
- > Provision of temporary noise barriers is not likely to be practical for this site given the extent of the project and the quantity of spreadout receivers. However, provision of anti-gawk screens with no gaps around the work site may provide some screening to the closest ground level receivers, and should be investigated further as part of the project CNVMP assessment.
- > Best practice mitigation measures are recommended in Section 9 of this report.
- > An indicative assessment only of expected L_{Amax} impact has been carried out for this assessment as it is difficult to predict L_{Amax} for construction noise sources. It is generally expected that sleep disturbance criteria are likely to be exceeded if works are undertaken during the night period.
- > The minimum working distances indicated in Table 7-1 for cosmetic damage must be complied with at all times, unless otherwise approved by TfNSW or under the environmental license as relevant, as stipulated in the NSW Construction Noise and Vibration Guideline.
- > A detailed construction noise and vibration management plan should be prepared for the project prior to construction commencement to incorporate the recommendations detailed in Section 9 and updated to reflect the proposed staging and plant to be adopted for the project.
- > Recommendations for the mitigation of blasting impacts has been provided. We recommend that a detailed survey for potentially affected dwellings and structures (including underground services) is conducted prior to blasting activities. Furthermore, it is recommended that monitoring of airblast overpressure and ground vibration is conducted during blasting, and that initial trial blasts with conservative charge quantities are undertaken to verify site conditions.

Newell Highway Upgrade - Parkes
Bypass

APPENDIX A
NOISE MONITORING CHARTS

Ambient Noise Levels Measured at 40 Barkers Road (50 metres from the Newell Highway)
Between 1-5 September 2020

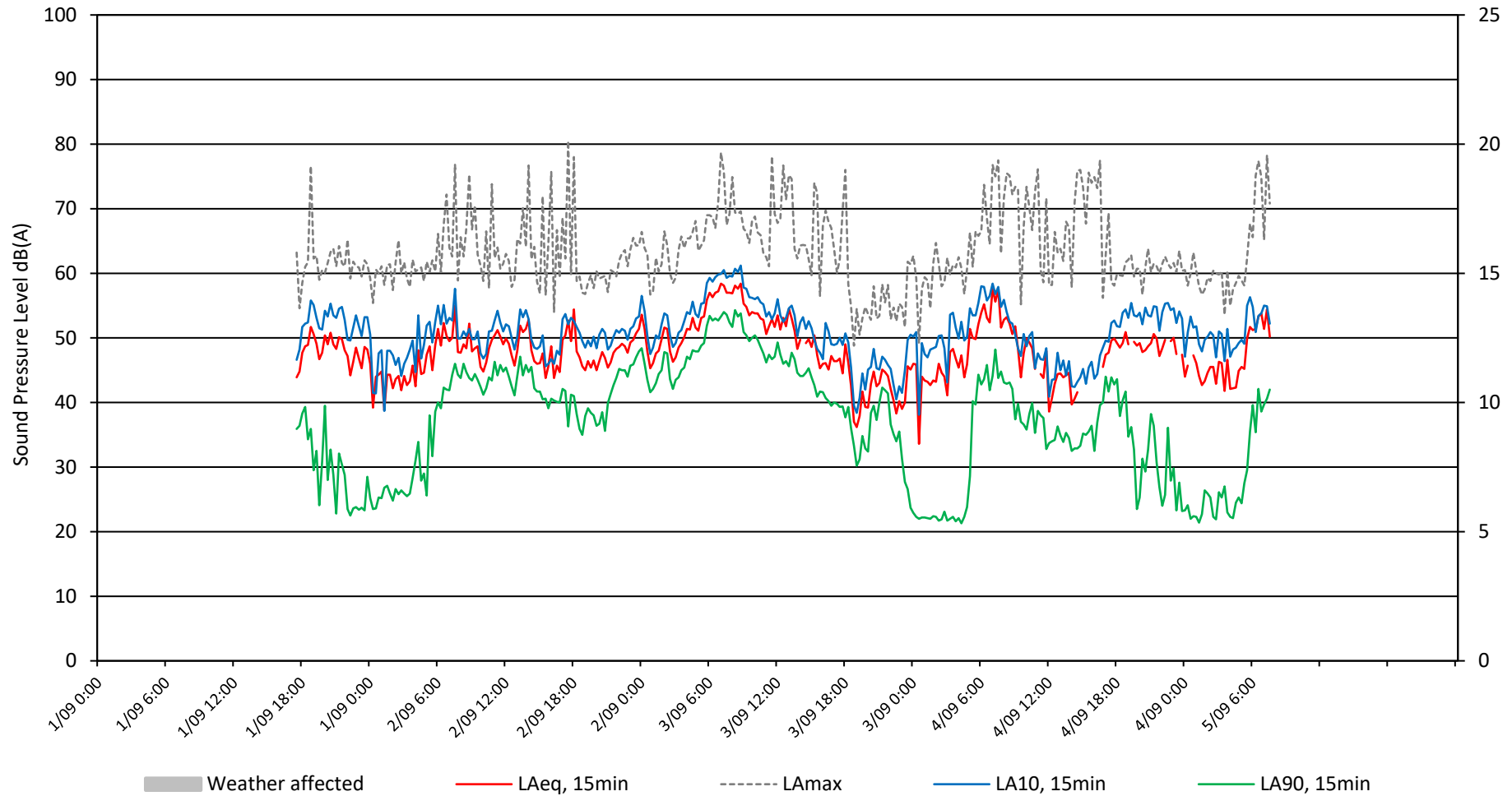


Figure A1 Noise monitoring chart – location 1A

Ambient Noise Levels Measured at 40 Barkers Road (at the Dwelling)
Between 1-5 September 2020

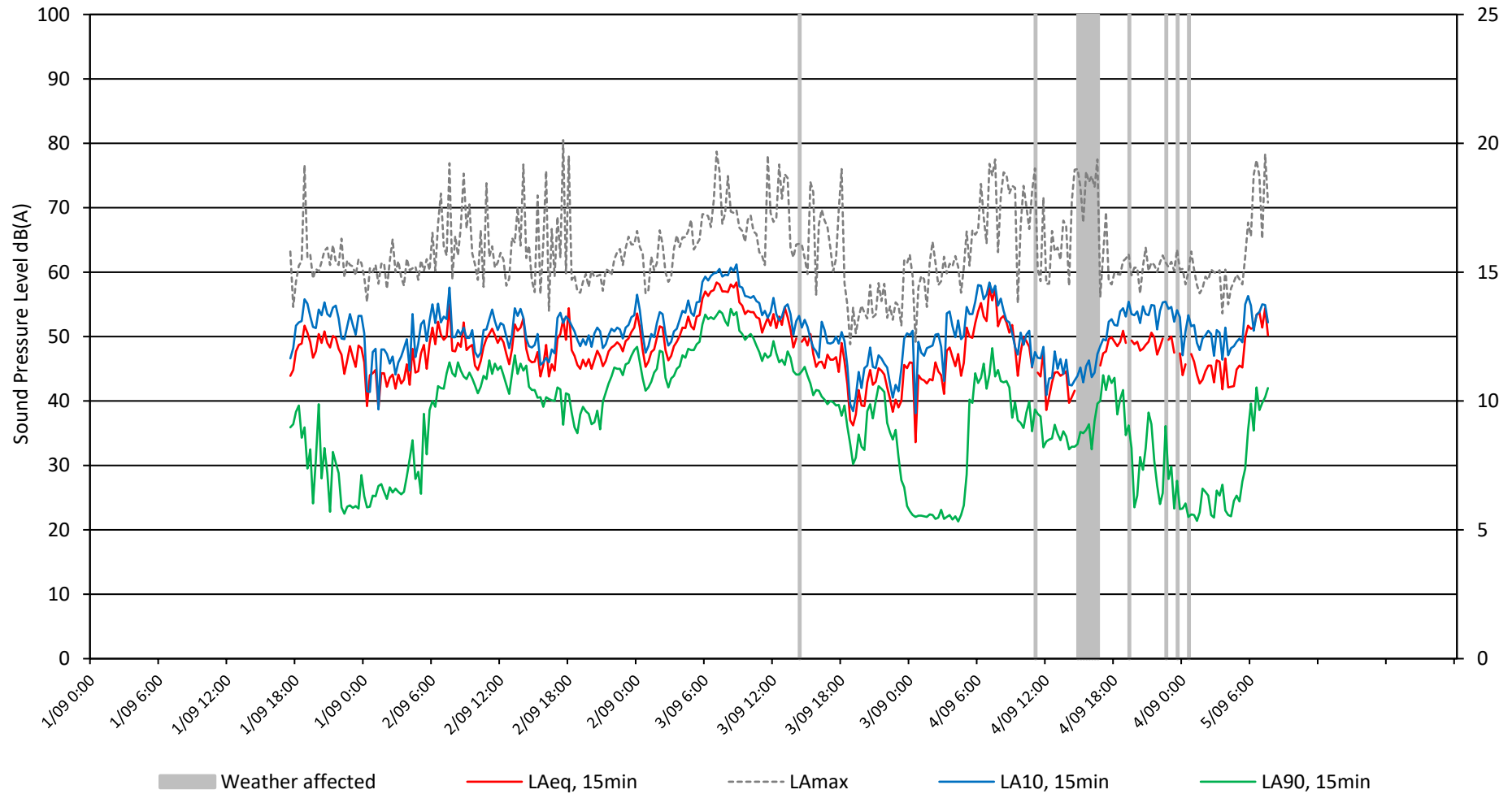


Figure A2 Noise monitoring chart – location 1B

Ambient Noise Levels Measured at 98 Bogan Road
Between 30 July & 7 August 2020

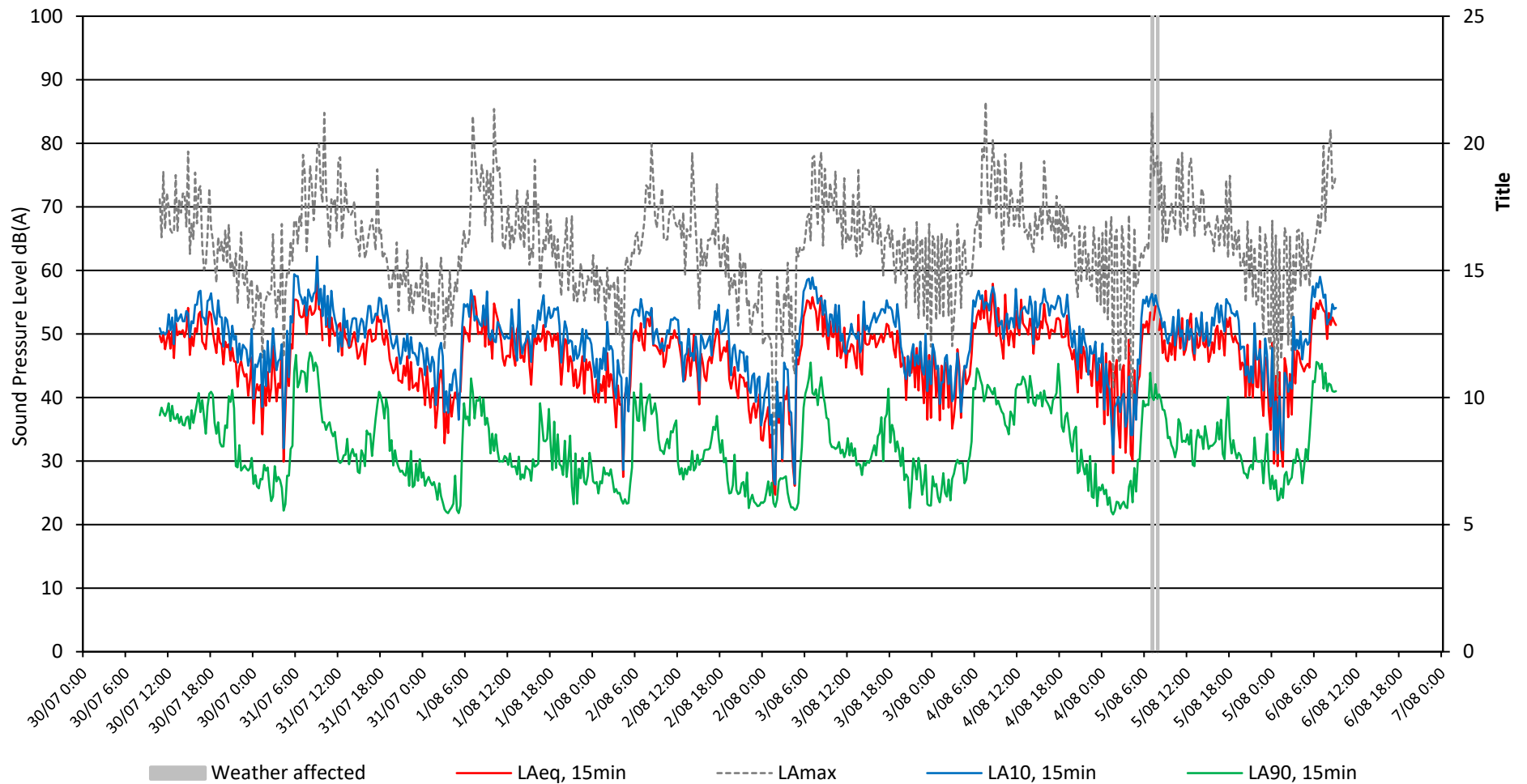


Figure A3 Noise monitoring chart – location 2

Ambient Noise Levels Measured at 285 Newell Highway
Between 30 July & 3 August 2020

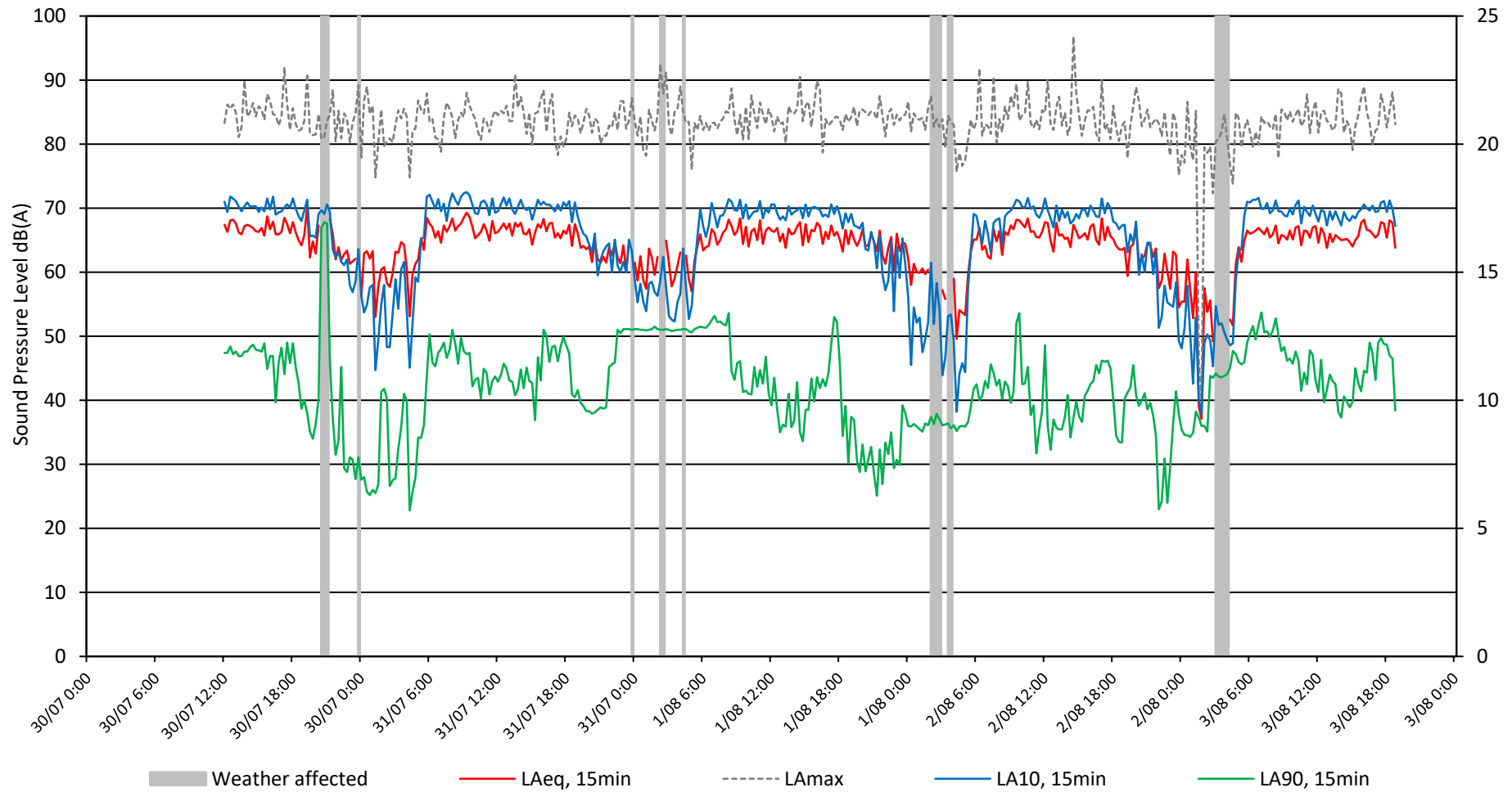


Figure A4 Noise monitoring chart – location 3

Ambient Noise Levels Measured at 41 Moulden Street
Between 30 July - 7 August 2020

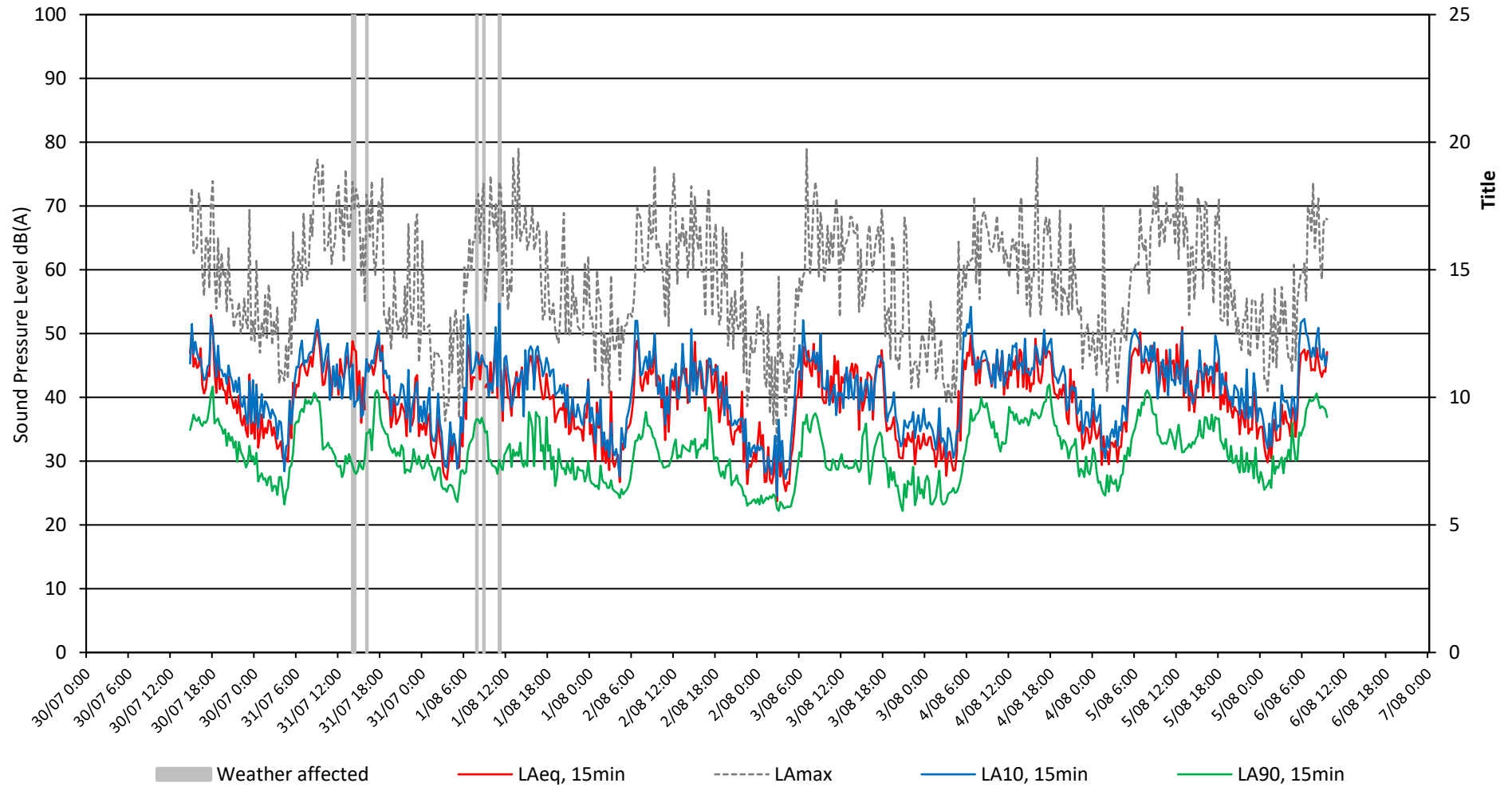


Figure A5 Noise monitoring chart – location 4

Ambient Noise Levels Measured at 41 Moulden Street
Between 30 July & 7 August 2020

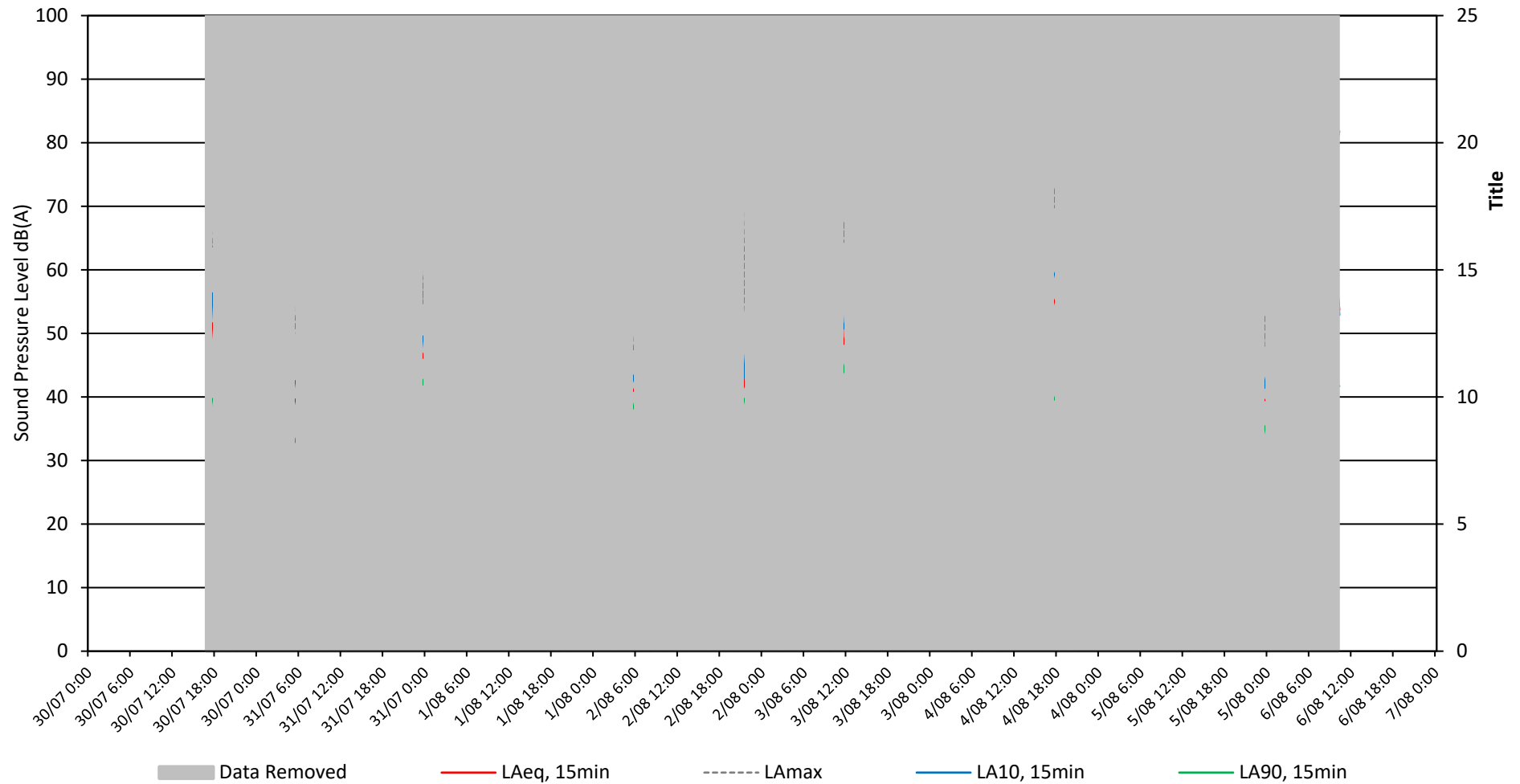


Figure A6 Noise monitoring chart – location 5

Ambient Noise Levels Measured at 59 Coronation Avenue
Between 1 & 5 September 2020

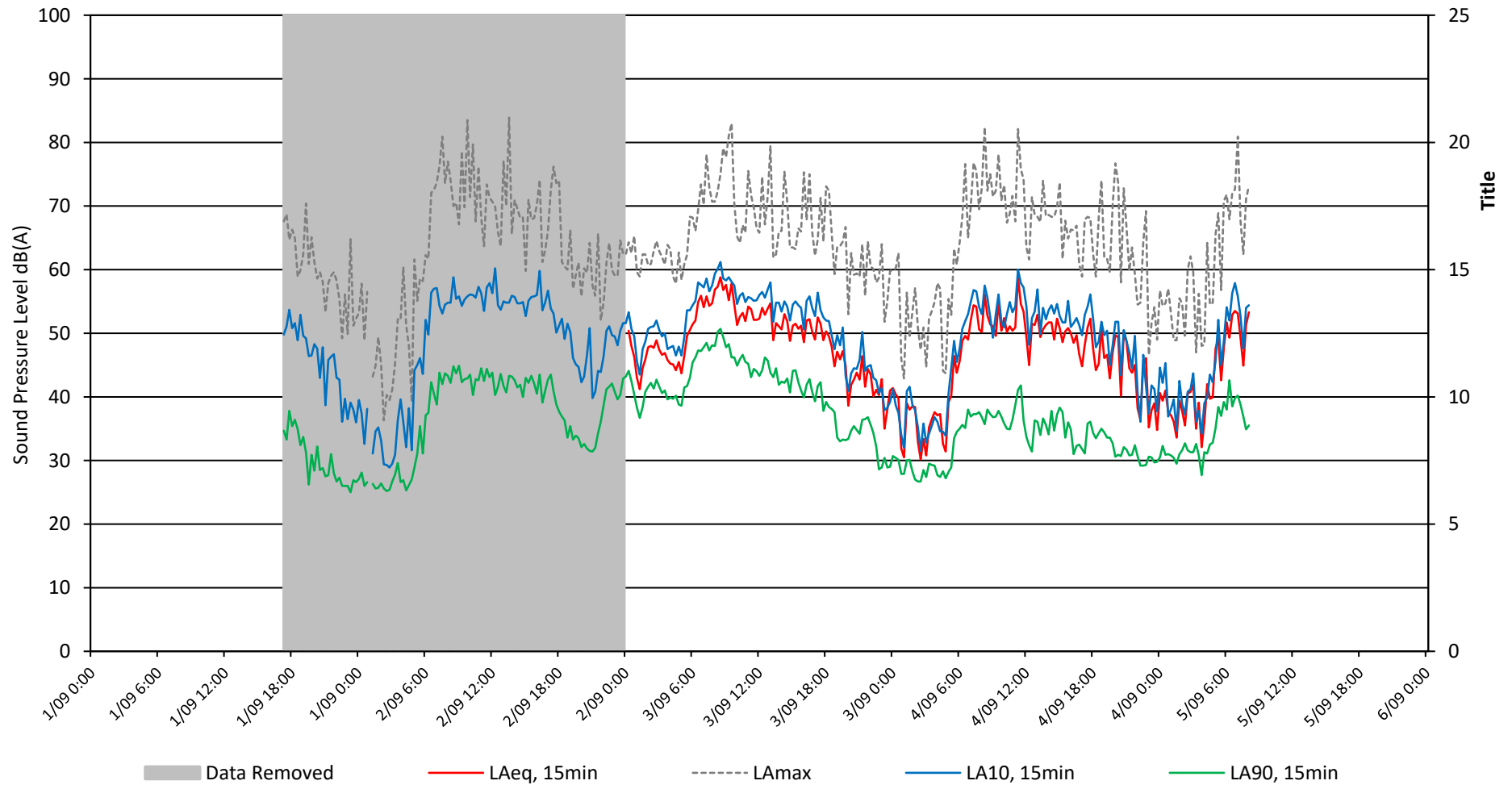


Figure A7 Noise monitoring chart – location 6A

Ambient Noise Levels Measured at 51 Coronation Avenue
Between 1-6 September 2020

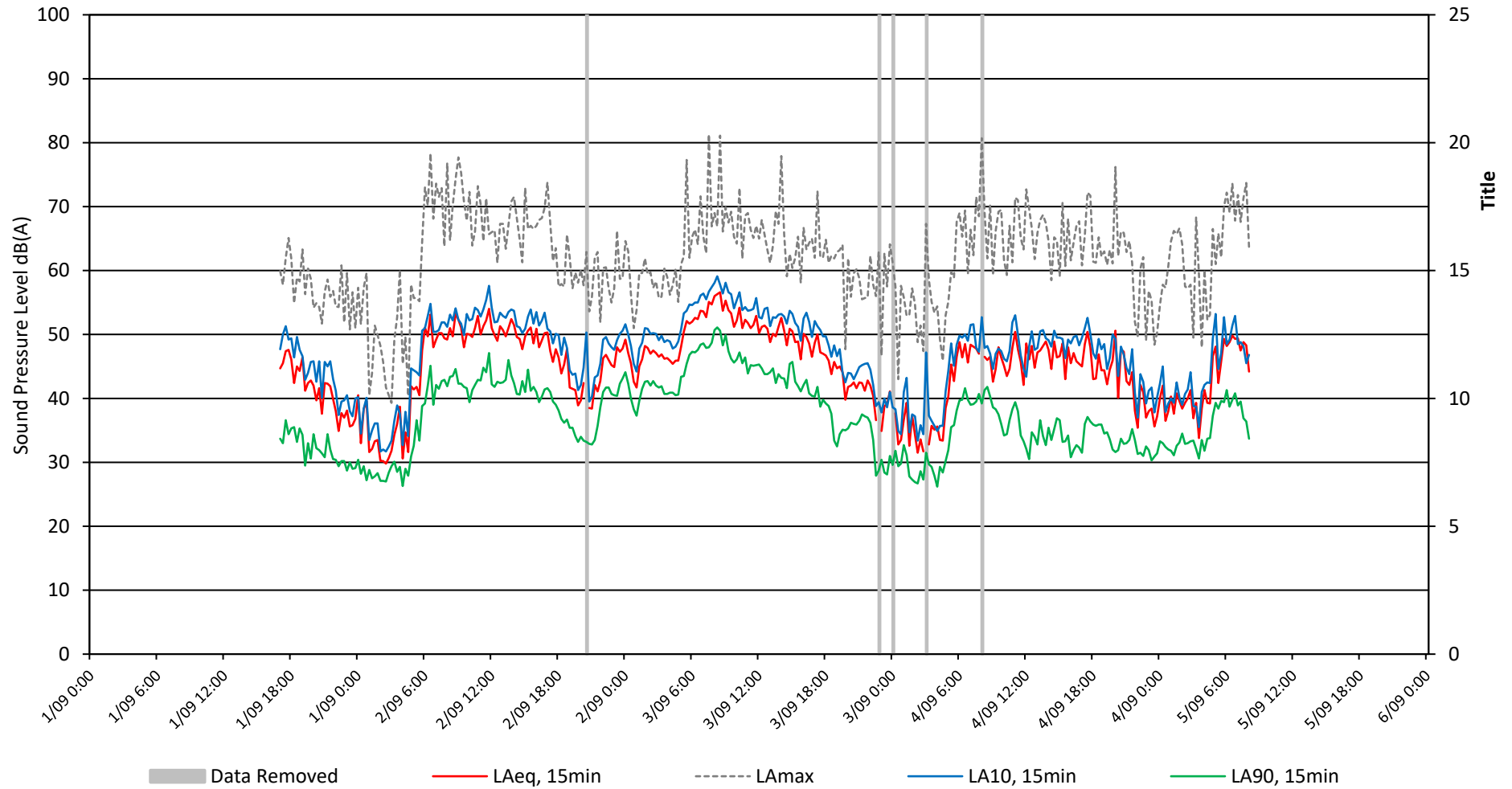


Figure A8 Noise monitoring chart – location 6B

Newell Highway Upgrade - Parkes
Bypass

APPENDIX B
MODELLED RECEIVER LOCATIONS

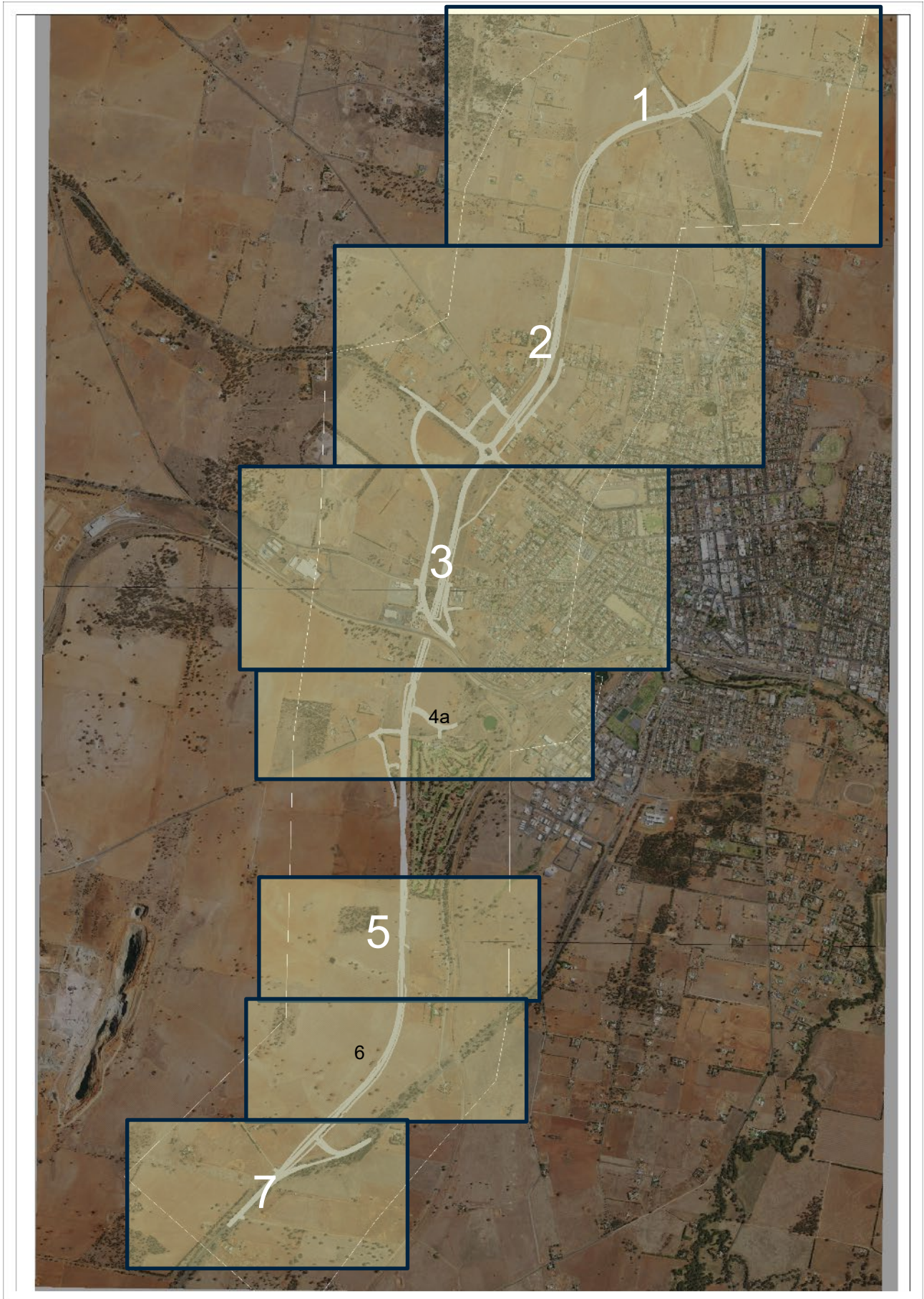


Figure B1 Modelled receiver locations – legend



Figure B2 Modelled receiver locations – Area 1



Figure B3 Modelled receiver locations –Area 2



Figure B4 Modelled receiver locations – Area 3



Figure B5 Modelled receiver locations – Area 4



Figure B6 Modelled receiver locations – Area 5



Figure B7 Modelled receiver locations – Area 6



Figure B8 Modelled receiver locations – Area 7

Newell Highway Upgrade - Parkes
Bypass

APPENDIX C
PREDICTED NOISE LEVELS – ALL
RECEIVERS

Table C1 Predicted noise impacts – standard hours

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
Noticeable:												
Clearly audible:												
Moderately intrusive:												
Highly intrusive:												
41 Hideaway Lane	42	57	59	61	57	27	32	18	27	32	59	50
83 Hideaway Lane	41	55	58	59	55	29	34	20	29	34	58	50
2636 Newell Hwy	40	55	57	59	55	17	21	8	17	21	66	50
2791 Newell Hwy	41	55	58	59	55	22	26	13	22	26	64	50
2850 Newell Hwy	37	52	55	56	52	24	29	15	24	29	68	50
40 Barkers Road	40	54	57	58	54	2	6	-7	2	6	57	50
53 Barkers Road	36	50	53	54	50	22	25	12	22	25	53	50
2683 Newell Hwy	35	49	52	53	50	20	24	11	20	24	52	50
11 Ballerdee Lane	42	56	59	60	56	44	50	33	44	50	59	46
33 Ballerdee Lane	44	58	61	62	59	48	54	36	48	54	62	46
55 Ballerdee Lane	44	58	61	62	59	52	53	39	52	53	62	46
84 Brolgan Road	48	63	65	67	63	48	47	43	48	47	65	46
166 London Road	40	55	57	58	55	40	47	31	40	47	58	46
172 London Road	37	51	54	55	51	40	44	30	40	44	55	46
206 London Road	37	51	54	55	52	40	44	30	40	44	55	46
1 Best Street	32	47	49	51	47	36	38	29	36	38	52	45
Country Energy Brolgan Road	58	73	76	77	73	56	48	51	56	48	75	45
1 Endeavour Place	38	52	55	56	52	35	46	34	35	46	55	45
1-3 Friendship Place	35	50	53	54	50	36	42	32	36	42	52	45
1 Guillan Place	36	51	54	55	51	40	47	31	40	47	55	45
1 Koala Street	36	50	53	54	50	46	38	37	46	38	54	45
1 Marie Rose Close	33	48	51	52	48	35	37	26	35	37	51	45
1 Mimosa Road	45	59	62	63	59	38	44	32	38	44	62	45
1 Rosewood Avenue	47	62	65	66	62	42	51	19	42	51	78	45
1 Scoble Place	36	51	53	55	51	47	36	37	47	36	55	45
Scoble Place Park Scoble Place	42	56	59	60	57	50	46	43	50	46	60	45
1 Warragrah Place	36	51	53	55	51	32	39	27	32	39	55	45
1 Willow Place	32	47	49	51	47	37	37	22	37	37	53	45
2 Carinya Street	44	59	62	63	59	54	48	43	54	48	62	45
2 Cedar Crescent	41	56	58	60	56	51	44	43	51	44	59	45
2 Endeavour Place	40	54	57	58	55	35	44	34	35	44	57	45
2 Friendship Place	37	52	54	56	52	42	39	36	42	39	55	45
2 Guillan Place	40	54	57	58	54	44	42	34	44	42	56	45
4 Guillan Place	39	53	56	57	53	46	45	38	46	45	56	45
2 Guillan Place	39	53	56	57	53	44	45	36	44	45	56	45
2 Koala Street	38	53	55	56	53	46	42	38	46	42	56	45
2 Mimosa Road	41	55	58	59	55	35	46	31	35	46	58	45
2 Warragrah Place	38	52	55	56	52	43	41	36	43	41	56	45
3 Alder Avenue	33	48	50	51	48	34	36	27	34	36	52	45
3 Best Street	31	46	49	50	46	35	37	26	35	37	55	45
3 Blaxland Street	36	50	53	54	51	34	35	29	34	35	53	45
3 Carmelite Close	34	49	51	53	49	37	39	28	37	39	51	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
3 Cedar Crescent	38	53	55	57	53	43	39	33	43	39	55	45
5 Cedar Crescent	39	54	57	58	54	47	48	40	47	48	58	45
3 Cedar Crescent	39	54	57	58	54	47	48	40	47	48	58	45
3 Coronation Avenue	34	49	52	53	49	42	40	35	42	40	52	45
3 Endeavour Place	38	52	55	56	53	38	44	35	38	44	55	45
3 Guillan Place	35	50	52	54	50	40	40	31	40	40	54	45
3 Jacaranda Road	38	52	55	56	52	43	42	22	43	42	60	45
3 Marie Rose Close	32	47	49	51	47	34	32	29	34	32	52	45
3 Mimosa Road	45	59	62	63	59	39	44	36	39	44	62	45
3 Monastery Close	30	45	47	49	45	34	32	24	34	32	50	45
3 Mossgiel Close	40	55	57	59	55	38	47	35	38	47	57	45
3 Rosewood Avenue	47	61	64	65	61	42	51	21	42	51	78	45
3 Scoble Place	37	51	54	55	51	47	37	37	47	37	55	45
3 Thomas Tom Crescent	33	47	50	51	48	38	35	30	38	35	51	45
3 Warragrah Place	39	53	56	57	53	35	37	24	35	37	60	45
3 Westcott Crescent	33	48	51	52	48	31	41	23	31	41	53	45
3 Willow Place	37	51	54	55	51	39	38	20	39	38	58	45
4 Alder Avenue	34	48	51	52	48	32	38	25	32	38	51	45
4 Carinya Street	44	59	61	63	59	54	48	44	54	48	62	45
4 Carmelite Close	33	47	50	51	47	37	34	26	37	34	51	45
4 Cedar Crescent	43	58	60	62	58	51	48	41	51	48	61	45
4 Endeavour Place	41	55	58	59	55	35	46	34	35	46	58	45
4 Friendship Place	36	51	53	55	51	38	43	32	38	43	53	45
4 Guillan Place	35	49	52	53	50	40	35	30	40	35	52	45
4 Jacaranda Road	36	51	53	55	51	43	44	33	43	44	59	45
4 Koala Street	37	52	55	56	52	41	40	31	41	40	55	45
4 Marie Rose Close	32	47	49	51	47	44	30	36	44	30	51	45
4 Mimosa Road	40	55	58	59	55	40	46	33	40	46	58	45
4 Monastery Close	33	48	50	52	48	40	30	31	40	30	53	45
4 Mossgiel Close	41	56	59	60	56	31	43	33	31	43	59	45
4 Rosewood Avenue	40	55	57	59	55	43	47	20	43	47	66	45
4 Scoble Place	36	51	54	55	51	46	40	37	46	40	55	45
4 Warragrah Place	32	47	49	51	47	40	35	23	40	35	55	45
4 Westcott Crescent	35	50	52	54	50	28	42	19	28	42	53	45
4 Willow Place	35	50	53	54	50	42	43	33	42	43	56	45
5 Alder Avenue	31	45	48	49	45	35	35	29	35	35	52	45
5 Best Street	34	49	51	53	49	30	41	27	30	41	53	45
5 Blaxland Street	36	51	53	55	51	34	37	28	34	37	54	45
5 Cedar Crescent	40	55	58	59	55	50	48	40	50	48	60	45
5 Coronation Avenue	32	47	50	51	47	31	38	24	31	38	51	45
5 Endeavour Place	38	53	56	57	53	39	45	33	39	45	56	45
5 Friendship Place	35	50	52	54	50	35	41	30	35	41	52	45
5 Guillan Place	35	49	52	53	49	43	37	32	43	37	53	45
5 Koala Street	34	48	51	52	48	40	41	31	40	41	53	45
5 Mimosa Road	43	57	60	61	58	41	42	37	41	42	60	45
5 Monastery Close	30	45	48	49	45	36	29	27	36	29	50	45
5 Mossgiel Close	41	55	58	59	55	33	45	35	33	45	58	45
5 Rosewood Avenue	45	59	62	63	59	36	52	25	36	52	74	45
3 Scoble Place	28	43	45	47	43	31	28	23	31	28	48	45
5 Scoble Place	37	52	54	56	52	47	38	37	47	38	56	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
5 Thomas Tom Crescent	31	46	48	50	46	31	33	22	31	33	50	45
5 Warragrah Place	35	49	52	53	49	35	42	26	35	42	59	45
7 Westcott Crescent	35	49	52	53	50	41	39	33	41	39	56	45
5 Westcott Crescent	35	49	52	53	50	40	39	33	40	39	53	45
6 Alder Avenue	33	48	50	52	48	37	41	29	37	41	51	45
6 Carinya Street	44	58	61	62	59	53	47	46	53	47	62	45
6 Endeavour Place	40	55	58	59	55	33	45	33	33	45	58	45
6 Friendship Place	35	50	52	53	50	36	40	30	36	40	52	45
6 Guillan Place	35	50	52	54	50	40	36	34	40	36	52	45
8 Guillan Place	41	55	58	59	56	47	51	34	47	51	67	45
6 Guillan Place	33	47	50	51	47	40	36	34	40	36	51	45
6 Jacaranda Road	41	55	58	59	56	47	51	32	47	51	67	45
6 Koala Street	38	52	55	56	52	46	36	38	46	36	55	45
6 Mimosa Road	41	56	58	60	56	36	41	31	36	41	58	45
4 Mimosa Road	35	50	52	54	50	30	34	22	30	34	53	45
6 Mimosa Road	41	56	58	60	56	37	46	34	37	46	58	45
6 Monastery Close	34	48	51	52	48	38	28	30	38	28	52	45
6 Mossgiel Close	44	58	61	62	58	31	44	29	31	44	61	45
6 Scoble Place	37	52	54	56	52	46	41	37	46	41	56	45
6 Warragrah Place	32	46	49	50	46	35	36	27	35	36	56	45
6 Westcott Crescent	34	49	51	53	49	34	39	25	34	39	57	45
7 Alder Avenue	30	45	48	49	45	32	37	27	32	37	51	45
7 Best Street	34	49	52	53	49	31	43	27	31	43	55	45
7 Blaxland Street	37	51	54	55	51	36	39	28	36	39	54	45
7 Cedar Crescent	42	57	59	60	57	51	48	41	51	48	61	45
7 Coronation Avenue	34	48	51	52	48	35	39	29	35	39	51	45
7 Endeavour Place	39	54	56	57	54	38	44	34	38	44	56	45
7 Friendship Place	35	50	52	54	50	33	39	32	33	39	52	45
7 Guillan Place	34	49	51	53	49	39	34	32	39	34	51	45
5 Guillan Place	32	47	49	51	47	40	37	28	40	37	51	45
7 Koala Street	33	48	51	52	48	37	34	28	37	34	51	45
5 Koala Street	33	47	50	51	47	36	31	27	36	31	51	45
7 Koala Street	34	48	51	52	48	37	36	28	37	36	51	45
7 Mimosa Road	43	58	61	62	58	45	41	40	45	41	60	45
7 Mossgiel Close	40	54	57	58	54	32	44	34	32	44	57	45
7 Rosewood Avenue	44	59	61	63	59	44	53	27	44	53	78	45
7 Scoble Place	38	53	55	57	53	48	38	38	48	38	57	45
7 Warragrah Place	37	51	54	55	51	37	43	27	37	43	60	45
7 Westcott Crescent	35	50	52	54	50	41	39	33	41	39	54	45
8 Alder Avenue	33	47	50	51	48	40	37	33	40	37	51	45
8 Carinya Street	43	58	60	62	58	53	44	45	53	44	61	45
8 Cedar Crescent	43	58	60	62	58	51	48	41	51	48	62	45
8 Endeavour Place	40	55	57	59	55	42	45	34	42	45	57	45
8 Friendship Place	36	50	53	54	50	32	44	32	32	44	53	45
8 Guillan Place	35	50	52	54	50	41	36	34	41	36	52	45
8 Monastery Close	34	48	51	52	48	36	32	27	36	32	53	45
8 Mossgiel Close	44	59	61	63	59	32	47	34	32	47	61	45
8 Rosewood Avenue	41	56	58	60	56	48	52	38	48	52	67	45
8 Scoble Place	38	52	55	56	53	47	40	37	47	40	56	45
8 Warragrah Place	31	45	48	49	45	33	35	28	33	35	56	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
9 Alder Avenue	31	46	48	50	46	34	39	29	34	39	53	45
9 Best Street	34	49	51	53	49	33	35	26	33	35	54	45
9 Blaxland Street	36	51	53	55	51	39	40	28	39	40	54	45
9 Cedar Crescent	43	57	60	61	57	50	48	40	50	48	61	45
9 Coronation Avenue	35	50	53	54	50	35	37	30	35	37	53	45
9 Endeavour Place	38	52	55	56	52	46	45	39	46	45	55	45
9 Friendship Place	35	50	52	54	50	30	44	34	30	44	52	45
9 Guillan Place	36	50	53	54	50	38	35	31	38	35	53	45
9 Koala Street	34	48	51	52	49	37	34	29	37	34	51	45
9 Mimosa Road	44	58	61	62	58	42	45	39	42	45	61	45
7 Mimosa Road	42	56	59	60	56	42	33	39	42	33	59	45
9 Mimosa Road	45	59	62	63	59	40	45	37	40	45	62	45
9 Monastery Close	34	48	51	52	49	33	36	28	33	36	54	45
9 Mossgiel Close	40	55	57	59	55	37	46	33	37	46	57	45
9 Rosewood Avenue	41	56	58	60	56	48	53	37	48	53	72	45
9 Scoble Place	39	54	57	58	54	46	38	38	46	38	57	45
9 Warragrah Place	36	50	53	54	50	33	37	24	33	37	61	45
9 Westcott Crescent	35	49	52	53	50	40	39	33	40	39	54	45
10 Alder Avenue	36	50	53	54	50	39	40	30	39	40	54	45
10 Carinya Street	43	58	60	62	58	52	47	45	52	47	61	45
10 Endeavour Place	39	54	56	58	54	45	45	35	45	45	57	45
10 Koala Street	35	50	52	54	50	45	36	37	45	36	54	45
10 Mimosa Road	42	57	59	61	57	37	46	34	37	46	59	45
10 Monastery Close	34	49	51	53	49	41	30	31	41	30	54	45
10 Mossgiel Close	45	60	62	64	60	41	47	39	41	47	62	45
10 Scoble Place	40	55	57	59	55	48	46	38	48	46	59	45
10 Warragrah Place	34	48	51	52	48	32	36	26	32	36	57	45
11 Best Street	35	49	52	53	50	34	40	31	34	40	53	45
11 Blaxland Street	36	50	53	54	50	42	40	35	42	40	54	45
11 Cedar Crescent	43	57	60	61	57	51	49	40	51	49	62	45
11 Coronation Avenue	35	49	52	53	49	32	34	26	32	34	52	45
13 Coronation Avenue	40	55	57	59	55	36	46	34	36	46	58	45
11 Mossgiel Close	40	55	57	59	55	36	46	34	36	46	58	45
11 Warragrah Place	37	52	54	56	52	28	43	21	28	43	62	45
11 Westcott Crescent	36	51	53	55	51	40	40	34	40	40	54	45
12 Carinya Street	43	58	61	62	58	51	46	45	51	46	61	45
12 Koala Street	35	50	52	54	50	35	34	25	35	34	53	45
12 Mossgiel Close	44	59	61	63	59	39	41	37	39	41	61	45
12 Rosewood Avenue	41	56	58	60	56	49	51	38	49	51	64	45
12 Scoble Place	39	54	56	58	54	49	44	40	49	44	58	45
12 Warragrah Place	33	47	50	51	47	32	36	23	32	36	58	45
13 Alder Avenue	38	52	55	56	52	43	46	28	43	46	57	45
13 Best Street	30	44	47	48	44	32	34	27	32	34	52	45
13 Blaxland Street	37	51	54	55	51	42	41	35	42	41	54	45
13 Coronation Avenue	36	50	53	54	50	34	44	34	34	44	53	45
13 Koala Street	37	52	54	55	52	45	36	36	45	36	55	45
13 Westcott Crescent	34	49	51	53	49	32	38	27	32	38	53	45
14 Alder Avenue	32	47	49	51	47	37	32	26	37	32	51	45
14 Carinya Street	43	57	60	61	57	51	44	44	51	44	60	45
14 Koala Street	35	50	52	54	50	36	38	28	36	38	53	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
14 Rosewood Avenue	40	55	57	59	55	48	51	38	48	51	63	45
14 Scoble Place	40	55	57	59	55	48	44	41	48	44	59	45
14 Warragrah Place	32	47	49	50	47	32	34	26	32	34	58	45
15 Best Street	33	48	50	51	48	37	35	30	37	35	53	45
17 Blaxland Street	36	50	53	54	51	42	43	35	42	43	55	45
15 Blaxland Street	36	50	53	54	50	42	41	35	42	41	53	45
15 Coronation Avenue	36	50	53	54	51	29	43	34	29	43	53	45
15 Koala Street	36	51	53	54	51	44	40	36	44	40	54	45
15 Warragrah Place	38	52	55	56	52	35	45	25	35	45	64	45
15 Westcott Crescent	30	45	47	49	45	26	32	26	26	32	57	45
16 Alder Avenue	36	51	53	55	51	35	41	24	35	41	53	45
16 Koala Street	36	50	53	54	50	43	42	36	43	42	54	45
16 Rosewood Avenue	39	54	56	57	54	45	50	31	45	50	61	45
16 Warragrah Place	36	50	53	54	50	33	34	24	33	34	61	45
17 Alder Avenue	37	52	54	56	52	44	48	25	44	48	58	45
17 Best Street	36	50	53	54	50	34	39	29	34	39	53	45
17 Blaxland Street	36	51	53	55	51	42	41	36	42	41	54	45
17 Coronation Avenue	36	51	53	55	51	32	45	32	32	45	53	45
17 Koala Street	35	50	52	54	50	41	40	30	41	40	53	45
17 Westcott Crescent	31	45	48	49	45	38	34	33	38	34	57	45
18 Koala Street	36	50	53	54	50	44	40	36	44	40	54	45
18 Rosewood Avenue	39	53	56	57	54	45	50	34	45	50	60	45
18 Warragrah Place	34	48	51	52	48	33	42	24	33	42	63	45
19 Alder Avenue	41	55	58	59	56	49	50	39	49	50	60	45
19 Best Street	37	51	54	55	51	35	40	30	35	40	54	45
19 Blaxland Street	35	49	52	53	49	37	40	27	37	40	55	45
21 Blaxland Street	36	50	53	54	50	37	40	27	37	40	54	45
19 Blaxland Street	36	50	53	54	50	36	40	27	36	40	54	45
19 Koala Street	32	46	49	50	47	36	37	27	36	37	50	45
19 Westcott Crescent	29	43	46	47	43	34	33	23	34	33	56	45
20 Koala Street	37	52	55	56	52	47	44	36	47	44	56	45
20 Warragrah Place	36	50	53	54	50	34	39	25	34	39	66	45
21 Alder Avenue	40	55	58	59	55	50	49	39	50	49	60	45
21 Blaxland Street	35	49	52	53	50	37	42	27	37	42	54	45
21 Coronation Avenue	38	53	55	57	53	37	45	33	37	45	56	45
21 Koala Street	32	46	49	50	46	34	40	26	34	40	50	45
21 Westcott Crescent	30	45	47	49	45	33	31	26	33	31	55	45
21A Coronation Avenue	41	56	58	60	56	39	45	34	39	45	58	45
22 Rosewood Avenue	38	53	55	57	53	46	41	37	46	41	58	45
23 Alder Avenue	39	54	56	58	54	45	48	33	45	48	59	45
23 Coronation Avenue	41	55	58	59	56	36	45	33	36	45	58	45
23 Warragrah Place	39	53	56	57	53	38	44	28	38	44	64	45
23 Westcott Crescent	27	42	45	46	42	32	32	22	32	32	55	45
24 Rosewood Avenue	34	48	51	52	49	40	38	35	40	38	56	45
24 Warragrah Place	36	51	53	55	51	34	45	26	34	45	60	45
25 Alder Avenue	37	52	54	56	52	46	45	39	46	45	55	45
25 Brolgan Road	35	49	52	53	49	32	42	28	32	42	52	45
25-27 Coronation Avenue	40	55	58	59	55	35	46	33	35	46	58	45
25 Koala Street	34	49	51	53	49	36	41	33	36	41	52	45
25 Rosewood Avenue	42	56	59	60	56	50	51	39	50	51	63	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
25 Westcott Crescent	29	44	46	48	44	31	33	26	31	33	54	45
26 Warragrah Place	36	51	53	55	51	34	45	25	34	45	63	45
27 Alder Avenue	37	52	54	56	52	47	41	36	47	41	55	45
27 Best Street	32	46	49	50	47	34	36	26	34	36	53	45
29 Best Street	33	47	50	51	47	36	40	28	36	40	55	45
27 Blaxland Street	36	50	53	54	51	36	40	27	36	40	55	45
27 Koala Street	35	50	52	54	50	33	43	31	33	43	53	45
27 Rosewood Avenue	41	56	58	60	56	49	50	39	49	50	62	45
27 Warragrah Place	40	54	57	58	54	33	43	24	33	43	64	45
27 Westcott Crescent	31	46	48	50	46	34	39	24	34	39	53	45
28 Warragrah Place	37	52	54	55	52	39	44	29	39	44	67	45
29 Alder Avenue	39	54	56	57	54	41	43	33	41	43	56	45
29 Best Street	34	48	51	52	49	34	40	29	34	40	52	45
29 Blaxland Street	36	51	53	55	51	40	39	29	40	39	56	45
29 Westcott Crescent	31	46	48	50	46	34	37	26	34	37	54	45
30 Blaxland Street	38	53	55	57	53	41	42	23	41	42	60	45
30 Warragrah Place	38	52	55	56	52	38	40	28	38	40	65	45
31 Best Street	32	47	49	51	47	34	32	24	34	32	51	45
31 Blaxland Street	35	50	52	54	50	41	39	26	41	39	56	45
31 Brolgan Road	34	49	52	53	49	37	43	31	37	43	53	45
31-37 Coronation Avenue	41	56	58	60	56	32	47	34	32	47	58	45
31 Westcott Crescent	32	47	49	51	47	40	33	34	40	33	54	45
32 Blaxland Street	39	54	56	58	54	39	39	23	39	39	62	45
32 Brolgan Road	32	47	49	50	47	29	31	22	29	31	49	45
32 Warragrah Place	39	54	57	58	54	28	47	25	28	47	70	45
32 Westcott Crescent	33	48	50	52	48	32	37	22	32	37	57	45
33 Best Street	35	49	52	53	49	40	37	32	40	37	52	45
33 Blaxland Street	34	48	51	52	48	35	40	23	35	40	60	45
33 Brolgan Road	38	52	55	56	52	38	43	37	38	43	55	45
33 Westcott Crescent	30	44	47	48	44	32	33	25	32	33	54	45
34 Blaxland Street	42	56	59	60	56	36	40	30	36	40	64	45
34 Brolgan Road	31	46	48	50	46	29	33	31	29	33	49	45
34 Warragrah Place	40	55	57	59	55	42	48	34	42	48	72	45
34 Westcott Crescent	33	47	50	51	47	33	35	26	33	35	52	45
35 Best Street	32	46	49	50	47	40	40	36	40	40	50	45
35 Blaxland Street	32	47	49	50	47	34	41	26	34	41	65	45
35 Brolgan Road	38	52	55	56	53	41	43	31	41	43	55	45
35 Westcott Crescent	33	47	50	51	47	36	37	26	36	37	54	45
36 Best Street	32	47	50	51	47	35	31	26	35	31	53	45
36 Blaxland Street	42	57	59	61	57	42	40	20	42	40	68	45
37 Best Street	37	51	54	55	51	41	41	34	41	41	54	45
37 Blaxland Street	42	57	60	61	57	32	45	22	32	45	69	45
37 Westcott Crescent	33	48	50	52	48	32	33	25	32	33	54	45
38 Best Street	34	48	51	52	48	38	34	30	38	34	53	45
38 Brolgan Road	34	49	51	52	49	37	38	30	37	38	52	45
39 Best Street	39	54	56	57	54	40	41	32	40	41	56	45
39 Brolgan Road	38	53	55	57	53	46	43	39	46	43	57	45
39 Coronation Avenue	39	54	56	58	54	30	48	34	30	48	56	45
39 Rosewood Avenue	39	53	56	57	53	48	45	38	48	45	58	45
39 Westcott Crescent	33	47	50	51	47	29	35	22	29	35	54	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
40 Best Street	33	48	50	52	48	36	32	27	36	32	53	45
40 Brolgan Road	31	46	48	50	46	35	37	28	35	37	49	45
41 Best Street	38	53	55	57	53	42	42	33	42	42	56	45
41 Brolgan Road	37	52	54	55	52	46	41	39	46	41	56	45
41 Rosewood Avenue	38	53	55	56	53	47	35	37	47	35	58	45
41 Westcott Crescent	33	48	50	52	48	30	35	24	30	35	51	45
42 Best Street	35	49	52	53	49	39	35	30	39	35	53	45
42 Brolgan Road	29	44	46	48	44	35	36	27	35	36	47	45
43 Brolgan Road	36	51	53	55	51	46	37	39	46	37	55	45
44 Best Street	35	50	52	53	50	44	32	37	44	32	53	45
44 Brolgan Road	41	55	58	59	55	47	46	39	47	46	58	45
45 Brolgan Road	38	52	55	56	52	47	38	39	47	38	56	45
46-48 Brolgan Road	40	54	57	58	55	31	45	33	31	45	57	45
47 Best Street	38	53	55	57	53	49	43	40	49	43	57	45
47 Brolgan Road	38	53	55	57	53	47	46	38	47	46	57	45
47 Coronation Avenue	42	56	59	60	56	37	49	37	37	49	59	45
49 Brolgan Road	39	53	56	57	54	48	44	38	48	44	58	45
49 Coronation Ave	44	58	61	62	58	42	51	37	42	51	61	45
49A Brolgan Road	38	53	55	57	53	47	44	36	47	44	57	45
50 Brolgan Road	37	52	55	56	52	27	44	30	27	44	54	45
51 Brolgan Road	36	50	53	54	51	41	40	35	41	40	55	45
52-54 Brolgan Road	39	53	56	57	54	33	44	31	33	44	56	45
52 Hartigan Ave	59	73	76	77	73	61	51	48	61	51	76	45
53 Brolgan Road	32	47	49	51	47	40	35	33	40	35	51	45
54 Best Street	40	55	57	58	55	47	42	39	47	42	57	45
55 Brolgan Road	40	55	57	59	55	43	46	36	43	46	58	45
56 Best Street	38	52	55	56	52	48	41	39	48	41	55	45
56 Brolgan Road	37	51	54	55	52	34	41	33	34	41	54	45
57 Brolgan Road	36	51	53	54	51	43	34	31	43	34	54	45
58 Best Street	38	53	55	56	53	49	41	39	49	41	56	45
58-62 Brolgan Road	40	54	57	58	54	43	44	34	43	44	57	45
59 Brolgan Road	43	58	60	62	58	52	47	44	52	47	61	45
59 Coronation Avenue	47	61	64	65	61	43	51	37	43	51	64	45
60 Best Street	39	54	57	58	54	50	37	40	50	37	58	45
62 Best Street	40	55	57	59	55	50	43	40	50	43	58	45
62-64 Brolgan Road	41	55	58	59	55	42	45	33	42	45	58	45
64 Best Street	41	55	58	59	55	51	46	41	51	46	59	45
66 Best Street	41	56	58	60	56	51	46	41	51	46	60	45
68 Best Street	41	56	59	60	56	52	46	41	52	46	60	45
66 Best Street	34	49	51	53	49	35	38	28	35	38	53	45
68 Best Street	41	56	59	60	56	52	46	41	52	46	60	45
70 Best Street	42	56	59	60	57	52	47	42	52	47	61	45
70 Brolgan Road	37	51	54	55	51	26	46	30	26	46	55	45
72 Brolgan Road	35	50	52	54	50	35	36	34	35	36	52	45
78 Brolgan Road	48	63	65	67	63	38	44	36	38	44	65	45
94 Close Street	30	45	47	49	45	29	33	22	29	33	51	45
96 Close Street	32	47	49	51	47	29	35	24	29	35	53	45
98 Close Street	29	44	46	47	44	30	33	27	30	33	58	45
100 Close Street	31	46	48	50	46	33	37	25	33	37	57	45
102 Close Street	33	47	50	51	48	38	34	32	38	34	55	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
104 Close Street	33	48	50	52	48	35	39	26	35	39	55	45
106 Close Street	31	46	48	50	46	32	36	23	32	36	54	45
108 Close Street	31	46	48	50	46	37	37	25	37	37	64	45
110 Close Street	31	46	49	50	46	38	37	32	38	37	64	45
112 Close Street	34	48	51	52	48	29	40	23	29	40	70	45
1 Angeleish Avenue	35	49	52	53	49	35	39	26	35	39	52	45
1 Arana Place	36	50	53	54	50	35	43	34	35	43	53	45
1 Basil Avenue	38	52	55	56	52	36	46	41	36	46	55	45
2 Angeleish Avenue	34	48	51	52	49	28	43	20	28	43	51	45
2 Arana Place	36	50	53	54	50	28	41	25	28	41	53	45
3 Angeleish Avenue	38	52	55	56	52	34	45	25	34	45	55	45
3 Arana Place	34	49	52	53	49	27	44	33	27	44	51	45
3 Basil Avenue	36	50	53	54	51	34	42	41	34	42	53	45
3 Marshall Place	36	50	53	54	50	36	31	37	36	31	53	45
4 Angeleish Avenue	32	47	49	51	47	17	43	30	17	43	49	45
4 Arana Place	37	51	54	55	51	31	40	21	31	40	54	45
4 Basil Avenue	39	54	56	58	54	29	47	42	29	47	56	45
4 Flinders Street	36	51	53	55	51	27	43	32	27	43	53	45
4 Marshall Place	35	49	52	53	49	31	40	36	31	40	52	45
5 Angeleish Avenue	37	51	54	55	51	34	43	32	34	43	54	45
5 Arana Place	36	50	53	54	51	36	40	34	36	40	53	45
5 Basil Avenue	37	52	54	56	52	33	46	41	33	46	54	45
5 Marshall Place	35	50	52	54	50	34	45	28	34	45	52	45
6 Angeleish Avenue	35	49	52	53	50	32	44	29	32	44	52	45
6 Arana Place	37	51	54	55	52	38	40	34	38	40	55	45
6 Basil Avenue	40	55	57	59	55	32	48	43	32	48	57	45
6 Marshall Place	32	47	50	51	47	36	38	26	36	38	50	45
7 Angeleish Avenue	37	51	54	55	51	34	42	27	34	42	54	45
7 Arana Place	36	51	53	54	51	30	41	32	30	41	53	45
9 Arana Place	36	51	53	55	51	35	41	41	35	41	53	45
7 Arana Place	36	51	53	55	51	35	41	33	35	41	53	45
7 Basil Avenue	37	52	54	56	52	33	42	41	33	42	54	45
8 Angeleish Avenue	35	49	52	53	49	30	44	35	30	44	52	45
8 Arana Place	35	50	52	54	50	35	43	34	35	43	53	45
8 Basil Avenue	40	55	58	59	55	34	47	43	34	47	57	45
8 Flinders Street	35	49	52	53	49	37	44	32	37	44	52	45
9 Angeleish Avenue	35	50	52	54	50	34	43	31	34	43	53	45
9 Arana Place	36	51	53	55	51	28	39	33	28	39	53	45
9 Basil Avenue	38	53	55	57	53	33	46	39	33	46	55	45
10 Angeleish Avenue	35	50	52	54	50	33	44	26	33	44	53	45
10 Arana Place	38	53	56	57	53	17	46	22	17	46	55	45
10 Basil Avenue	40	55	57	58	55	30	47	43	30	47	57	45
10 Coronation Avenue	35	50	53	54	50	31	40	34	31	40	53	45
10 Flinders Street	36	51	53	55	51	27	42	35	27	42	53	45
11 Arana Place	37	52	54	56	52	27	44	35	27	44	54	45
11 Basil Avenue	39	53	56	57	53	26	46	39	26	46	56	45
11a Angeliesh Avenue	37	52	54	56	52	33	45	36	33	45	55	45
11b Angeliesh Avenue	37	52	54	56	52	32	44	36	32	44	55	45
12 Angeleish Avenue	35	50	52	54	50	34	42	23	34	42	52	45
12 Arana Place	37	52	54	56	52	34	46	34	34	46	54	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
13 Angeliesh Avenue	38	52	55	56	52	32	43	25	32	43	55	45
14 Angeliesh Avenue	35	49	52	53	49	25	45	30	25	45	52	45
14 Arana Place	40	54	57	58	54	34	46	34	34	46	57	45
14 Coronation Avenue	36	51	53	55	51	33	44	30	33	44	53	45
14 Flinders Street	34	48	51	52	48	35	36	27	35	36	51	45
15 Angeliesh Avenue	40	55	57	59	55	32	48	37	32	48	57	45
15 Arana Place	36	51	54	55	51	38	41	33	38	41	53	45
15 Basil Avenue	39	53	56	57	53	33	46	39	33	46	56	45
16 Angeliesh Avenue	35	50	52	54	50	25	44	30	25	44	53	45
16 Arana Place	40	54	57	58	54	33	48	36	33	48	57	45
16 Basil Avenue	40	55	57	59	55	34	47	42	34	47	57	45
16 Coronation Avenue	37	51	54	55	51	34	37	33	34	37	54	45
17 Angeliesh Avenue	40	55	57	59	55	36	48	37	36	48	57	45
18 Angeliesh Avenue	39	53	56	57	53	29	48	29	29	48	56	45
18 Arana Place	36	50	53	54	51	25	45	24	25	45	53	45
20 Arana Place	40	54	57	58	54	33	46	34	33	46	57	45
18 Arana Place	40	54	57	58	54	33	46	34	33	46	57	45
18 Basil Avenue	40	55	57	58	55	34	46	40	34	46	57	45
18 Coronation Avenue	38	52	55	56	52	28	47	35	28	47	55	45
19 Angeliesh Avenue	40	55	57	58	55	34	48	37	34	48	57	45
20 Arana Place	39	54	57	58	54	26	46	33	26	46	57	45
20 Coronation Avenue	39	54	56	58	54	36	47	34	36	47	56	45
20 Flinders Street	35	50	52	54	50	25	43	34	25	43	52	45
Lot 20 Mitchell Street	39	54	56	58	54	33	45	38	33	45	56	45
22 Arana Place	39	53	56	57	53	26	46	33	26	46	56	45
22 Flinders Street	37	52	54	56	52	38	41	27	38	41	55	45
24-30 Coronation Avenue	39	54	56	58	54	33	44	34	33	44	56	45
24 Flinders Street	34	48	51	52	48	35	39	34	35	39	52	45
28 Flinders Street	36	50	53	54	50	26	43	34	26	43	53	45
30 Flinders Street	34	48	51	52	48	29	44	27	29	44	51	45
32 Coronation Avenue	41	56	58	59	56	33	48	35	33	48	58	45
32 Flinders Street	35	50	52	53	50	17	41	35	17	41	52	45
34 Flinders Street	35	49	52	53	50	36	42	36	36	42	53	45
35 Flinders Street	36	51	53	55	51	35	44	29	35	44	54	45
36 Flinders Street	31	46	49	50	46	28	43	25	28	43	49	45
37 Flinders Street	30	45	47	49	45	22	35	19	22	35	47	45
38-40 Coronation Avenue	41	55	58	59	56	35	48	36	35	48	58	45
38 Flinders Street	34	49	51	53	49	38	39	30	38	39	52	45
39 Flinders Street	33	48	50	52	48	35	38	29	35	38	51	45
40 Flinders Street	34	48	51	52	48	35	40	27	35	40	51	45
42 Coronation Avenue	40	55	58	59	55	38	48	36	38	48	58	45
43 Flinders Street	34	48	51	52	48	35	39	28	35	39	51	45
45 Flinders Street	35	50	52	53	50	35	38	27	35	38	52	45
48 Coronation Avenue	41	55	58	59	55	39	51	35	39	51	58	45
50 Coronation Avenue	45	59	62	63	59	37	51	35	37	51	62	45
85 Victoria Street	34	49	51	53	49	23	43	35	23	43	51	45
87 Victoria Street	33	48	51	52	48	28	44	33	28	44	51	45
89 Victoria Street	34	49	51	53	49	35	44	24	35	44	52	45
91 Victoria Street	31	46	49	50	46	29	43	28	29	43	49	45
93 Victoria Street	36	51	53	54	51	36	44	26	36	44	53	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
95 Victoria Street	36	50	53	54	50	36	39	37	36	39	52	45
97-105 Victoria Street	37	52	54	56	52	35	48	39	35	48	55	45
97 Victoria Street	37	52	54	56	52	33	48	29	33	48	54	45
107-109 Victorial Street	37	52	54	56	52	34	46	33	34	46	55	45
108 Condobolin Road	37	51	54	55	51	36	45	31	36	45	54	45
110 Condobolin Road	37	51	54	55	51	36	45	26	36	45	54	45
111 Victoria Street	36	51	53	55	51	34	46	40	34	46	54	45
112 Condobolin Road	37	52	54	56	52	35	47	24	35	47	55	45
113-119 Mitchell Street	40	55	57	59	55	34	46	41	34	46	57	45
113-117 Victoria Street	37	52	54	55	52	34	47	31	34	47	54	45
114-120 Condobolin Road	34	48	51	52	49	16	26	38	16	26	51	45
119 Victoria Street	41	56	58	59	56	35	49	43	35	49	58	45
121-123 Victoria Street	41	56	59	60	56	36	50	44	36	50	58	45
122 Condobolin Road	37	52	55	56	52	16	42	39	16	42	55	45
122-124 Victoria Street	36	51	54	55	51	34	46	40	34	46	54	45
123 Mitchell St	41	55	58	59	55	34	47	42	34	47	58	45
124-126 Condobolin Road	37	51	54	55	51	16	43	33	16	43	54	45
126 Victoria Street	33	48	51	52	48	14	32	38	14	32	50	45
127 Mitchell St	44	58	61	62	59	34	48	47	34	48	61	45
128-132 Condobolin Road	40	54	57	58	55	35	43	41	35	43	57	45
128 Victoria Street	39	53	56	57	54	34	48	41	34	48	56	45
130 Victoria Street	33	47	50	51	47	24	31	32	24	31	50	45
131-133 Victoria Street	43	57	60	61	57	35	51	43	35	51	60	45
132 Victoria Street	40	54	57	58	54	34	48	42	34	48	57	45
134-138 Condobolin Road	40	54	57	58	54	17	35	44	17	35	57	45
135 Victoria Street	44	59	62	63	59	36	52	48	36	52	61	45
138 Victoria Street	39	53	56	57	53	35	49	44	35	49	56	45
140-144 Condobolin Road	42	56	59	60	56	36	51	43	36	51	59	45
144 Victoria Street	42	57	59	61	57	35	49	45	35	49	59	45
146 Condobolin Road	44	58	61	62	58	38	53	44	38	53	61	45
147-151 Victoria Street	56	70	73	74	70	35	52	61	35	52	72	45
150 Victoria Street	42	56	59	60	56	35	50	50	35	50	59	45
151-153 Condobolin Road	36	51	53	54	51	36	43	36	36	43	53	45
154 Victoria Street	46	61	63	65	61	17	50	54	17	50	63	45
155 Condobolin Road	32	47	49	51	47	28	35	19	28	35	49	45
157 Condobolin Road	32	47	50	51	47	31	42	24	31	42	50	45
159 Condobolin Road	32	46	49	50	46	29	43	20	29	43	49	45
161-163 Condobolin Road	36	51	53	54	51	28	43	36	28	43	53	45
165 Condobolin Road	36	51	53	55	51	23	46	37	23	46	53	45
167 Condobolin Road	36	51	54	55	51	24	47	37	24	47	53	45
169 Condobolin Road	36	51	53	55	51	29	46	37	29	46	53	45
171 Condobolin Road	37	52	54	56	52	34	46	38	34	46	54	45
173 Condobolin Road	38	52	55	56	52	34	45	38	34	45	55	45
175 Condobolin Road	38	52	55	56	53	34	46	38	34	46	55	45
177 Condobolin Road	40	54	57	58	55	34	47	39	34	47	57	45
179-187 Condobolin Road	41	56	59	60	56	35	51	39	35	51	59	45
189-197 Condobolin Road	42	57	59	61	57	38	51	41	38	51	59	45
1 Moulden Street Parkes	55	69	72	73	70	34	50	52	34	50	72	45
Parkes Christian School Back Trundle Road	41	56	58	60	56	34	46	35	34	46	58	45

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
Parkes Christian School, Back Trundle Road	40	54	57	58	55	32	44	34	32	44	57	45
1A Moulden Street	51	65	68	69	66	35	56	50	35	56	68	45
3 Cookapie Street	42	57	59	61	57	30	42	36	30	42	59	45
3 Dunns Lane	44	59	61	62	59	32	46	42	32	46	61	45
3 Moulden Street	49	64	66	68	64	33	48	50	33	48	66	45
5 Cookapie Street	41	55	58	59	55	30	42	36	30	42	58	45
5 Moulden Street	48	63	65	66	63	33	47	48	33	47	65	45
7 Cookapie Street	41	55	58	59	55	30	42	36	30	42	57	45
7 Dunns Lane	42	57	59	61	57	32	42	43	32	42	59	45
7 Moulden Street	48	62	65	66	62	33	46	47	33	46	65	45
9 Dunns Lane	43	58	60	62	58	32	46	41	32	46	60	45
10 Cookapie Street	39	54	56	58	54	31	44	37	31	44	56	45
11 Moulden Street	47	62	64	66	62	32	45	44	32	45	64	45
13 Moulden Street	47	62	64	66	62	32	44	43	32	44	64	45
14 Dunns Lane	42	56	59	60	57	32	44	40	32	44	59	45
15 Cookapie Street	39	54	56	58	54	30	43	36	30	43	56	45
15 Moulden Street	47	62	64	66	62	32	39	42	32	39	64	45
17 Moulden Street	48	63	65	67	63	32	44	43	32	44	65	45
19 Cookapie Street	41	56	58	60	56	32	45	38	32	45	58	45
19 Moulden Street	48	63	65	67	63	31	35	43	31	35	65	45
21-29 Moulden Street	48	63	65	66	63	30	43	39	30	43	65	45
31-39 Moulden Street	47	61	64	65	61	31	42	37	31	42	64	45
41 Moulden Street (Shed)	43	58	60	62	58	30	42	36	30	42	60	45
41 Moulden Street Parkes	47	62	64	66	62	23	41	30	23	41	64	45
170 Back Trundle Road	55	69	72	73	70	34	50	56	34	50	72	45
176-180 Back Trundle Road	51	66	68	69	66	33	49	47	33	49	68	45
182-184 Back Trundle Road	45	60	62	64	60	33	48	37	33	48	62	45
186-192 Back Trundle Road	37	52	55	56	52	13	27	26	13	27	54	45
194 Back Trundle Road	42	56	59	60	56	33	46	34	33	46	58	45
209 Back Trundle Road	46	60	63	64	60	34	50	43	34	50	63	45
215 Back Trundle Road	43	58	60	61	58	33	46	40	33	46	60	45
238 Henry Parkes Way	55	70	72	74	70	38	57	43	38	57	72	45
250 Henry Parkes Way	56	71	73	75	71	35	51	38	35	51	73	45
302A Henry Parkes Way	39	54	56	58	54	32	43	32	32	43	56	45
302B Henry Parkes Way	41	55	58	59	55	32	43	33	32	43	58	45
1 Highland Avenue	39	53	56	57	54	34	44	38	34	44	56	47
2 Highland Avenue	37	52	54	56	52	33	43	37	33	43	54	47
3 Highland Avenue	39	54	56	58	54	33	44	38	33	44	56	47
4 Highland Avenue	38	53	55	57	53	33	43	37	33	43	55	47
6 Highland Street	38	53	55	57	53	33	43	37	33	43	55	47
4 Highland Avenue	36	50	53	54	50	22	38	36	22	38	53	47
6 Highland Street	38	53	55	57	53	33	43	37	33	43	55	47
8 Highland Street	38	53	56	57	53	33	43	37	33	43	55	47
10 Highland Avenue	39	53	56	57	53	33	44	38	33	44	56	47
8 Highland Street	33	47	50	51	47	21	29	25	21	29	50	47
10 Highland Avenue	39	53	56	57	53	33	44	38	33	44	56	47
10 Jack Burch Road	41	56	58	60	56	32	43	40	32	43	58	47
12 Highland Avenue	38	53	56	57	53	33	43	36	33	43	55	47
25-27 Thomas Street	36	51	54	55	51	30	37	27	30	37	53	47

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
31-33 Thomas Street	38	53	55	57	53	31	40	36	31	40	55	47
35-37 Thomas Street	38	53	56	57	53	31	40	36	31	40	55	47
39-41 Thomas Street	39	53	56	57	53	31	40	36	31	40	56	47
41 Ainsworth Street	38	53	55	57	53	32	41	37	32	41	55	47
43-45 Thomas Street	37	52	54	55	52	31	41	37	31	41	54	47
47 Thomas Street	41	55	58	59	56	31	41	37	31	41	58	47
50 Thomas Street	37	51	54	55	51	24	38	33	24	38	54	47
53 Thomas Street (Shed)	42	57	59	61	57	31	42	39	31	42	59	47
64-70 Rose Street	42	56	59	60	56	33	43	42	33	43	59	47
65 Thomas Street (Shed)	47	62	64	66	62	31	43	42	31	43	64	47
65 Thomas Street	48	62	65	66	62	31	42	40	31	42	64	47
68-72 THomas Street	40	54	57	58	54	30	40	36	30	40	57	47
74-78 Thomas Street	39	54	56	58	54	30	40	36	30	40	56	47
78 Rose Street	44	58	61	62	58	33	45	47	33	45	61	47
80 Rose Street	47	61	64	65	61	33	46	50	33	46	64	47
80-82 Thomas Street	40	55	57	59	55	30	41	37	30	41	57	47
82 Rose Street	43	57	60	61	57	34	46	44	34	46	60	47
84-86 Thomas Street	42	56	59	60	56	31	41	38	31	41	59	47
88-90 THomas Street	44	59	61	63	59	31	41	36	31	41	61	47
92-94 Thomas Street	49	63	66	67	63	31	42	39	31	42	66	47
124 Mitchell Street	30	44	47	48	45	33	37	27	33	37	48	47
126 Mitchell Street	36	50	53	54	50	33	43	36	33	43	53	47
130 Mitchell Street	35	50	52	54	50	33	43	28	33	43	53	47
134 Mitchell Street	38	52	55	56	52	34	44	37	34	44	55	47
136 Mitchell Street	38	52	55	56	52	35	43	38	35	43	55	47
138 Mitchell Street	36	51	54	55	51	33	42	38	33	42	54	47
140 Mitchell Street	40	54	57	58	54	33	45	39	33	45	57	47
154 Mitchell Street	42	56	59	60	56	34	46	42	34	46	59	47
7 Goldrush Road	36	50	53	54	50	24	34	25	24	34	53	45
9 Goldrush Road	38	53	55	56	53	24	33	25	24	33	55	45
30 Heraghty Road	35	50	52	53	50	20	29	20	20	29	52	45
101 Heraghty Rd	35	50	52	54	50	20	29	20	20	29	52	45
103 Heraghty Road	37	51	54	55	51	21	29	21	21	29	54	45
115 Heraghty Rd	37	52	54	55	52	21	30	21	21	30	54	45
127 Heraghty Rd	37	52	54	56	52	22	30	22	22	30	54	45
130 Heraghty Rd	37	52	55	56	52	22	31	23	22	31	55	45
139 Heraghty Rd	36	51	53	55	51	23	31	23	23	31	53	45
Lot 152 Goldrush Road	39	54	56	57	54	26	35	27	26	35	56	45
163 Goldrush Road	40	55	57	58	55	25	34	26	25	34	57	45
163a Goldrush Road	41	56	58	59	56	23	32	24	23	32	58	45
Lot 1086 Moulden Street	45	60	63	64	60	28	39	32	28	39	62	45
Lumeah Bogan Road	54	69	71	72	69	22	31	22	22	31	71	50
Lot 2 Endicott Street	43	58	60	62	58	24	33	26	24	33	60	50
47 Bleechmore Road	35	49	52	53	49	21	29	22	21	29	55	50
57 Bleechmore Road	35	50	53	54	50	21	29	21	21	29	56	50
59 Maguire Road	37	51	54	55	51	0	23	15	0	23	54	50
63 Maguire Road	40	54	57	58	54	0	23	14	0	23	57	50
71 Bleechmore Road	31	45	48	49	46	19	24	18	19	24	50	50
79 Maguire Road	35	50	53	54	50	0	22	14	0	22	52	50
81 Bleechmore Road	35	50	52	54	50	6	22	17	6	22	54	50

Address	Construction noise level, dBA LAeq, 15min											Standard hours criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
128 Painter Street	43	57	60	61	57	25	35	28	25	35	59	50
285 Newell Highway	38	53	56	57	53	22	31	22	22	31	61	50
300 Newell Highway	36	51	53	55	51	2	10	2	2	10	59	50
340 Newell Highway	37	51	54	55	51	20	28	21	20	28	57	50
Lot 720 Painter Street	38	53	55	57	53	25	34	28	25	34	55	50
Lot 731 Endicott Street	40	55	58	59	55	24	33	26	24	33	57	50
98 Bogan Road	39	54	56	58	54	-1	7	-1	-1	7	56	45

Table C2 Predicted noise impacts – OOHW, night period

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
Noticeable:	OOHW: <5dBA above NML											
Clearly audible:	OOHW: 5 to 15 dBA above NML											
Moderately intrusive:	OOHW: 16 to 25 dBA above NML											
Highly intrusive:	OOHW: >25 dB(A) above NML											
41 Hideaway Lane	42	44	57	59	21	61	57	18	27	32	59	35
83 Hideaway Lane	41	49	55	58	22	59	55	20	29	34	58	35
2636 Newell Hwy	40	48	55	57	0	59	55	8	17	21	66	35
2791 Newell Hwy	41	48	55	58	13	59	55	13	22	26	64	35
2850 Newell Hwy	37	42	52	55	18	56	52	15	24	29	68	35
40 Barkers Road	40	49	54	57	0	58	54	-7	2	6	57	35
53 Barkers Road	36	43	50	53	0	54	50	12	22	25	53	35
2683 Newell Hwy	35	45	49	52	0	53	50	11	20	24	52	35
11 Ballerdee Lane	42	58	56	59	32	60	56	33	44	50	59	40
33 Ballerdee Lane	44	73	58	61	34	62	59	36	48	54	62	40
55 Ballerdee Lane	44	70	58	61	35	62	59	39	52	53	62	40
84 Brolgan Road	48	59	63	65	43	67	63	43	48	47	65	40
166 London Road	40	54	55	57	31	58	55	31	40	47	58	40
172 London Road	37	49	51	54	30	55	51	30	40	44	55	40
206 London Road	37	47	51	54	31	55	52	30	40	44	55	40
1 Best Street	32	40	47	49	35	51	47	29	36	38	52	35
Country Energy Brolgan Road	58	54	73	76	42	77	73	51	56	48	75	35
1 Endeavour Place	38	45	52	55	44	56	52	34	35	46	55	35
1-3 Friendship Place	35	44	50	53	40	54	50	32	36	42	52	35
1 Guillan Place	36	43	51	54	38	55	51	31	40	47	55	35
1 Koala Street	36	44	50	53	35	54	50	37	46	38	54	35
1 Marie Rose Close	33	42	48	51	34	52	48	26	35	37	51	35
1 Mimosa Road	45	51	59	62	42	63	59	32	38	44	62	35
1 Rosewood Avenue	47	45	62	65	15	66	62	19	42	51	78	35
1 Scoble Place	36	42	51	53	28	55	51	37	47	36	55	35
Scoble Place Park Scoble Place	42	48	56	59	40	60	57	43	50	46	60	35
1 Warragrah Place	36	42	51	53	27	55	51	27	32	39	55	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
1 Willow Place	32	39	47	49	31	51	47	22	37	37	53	35
2 Carinya Street	44	50	59	62	40	63	59	43	54	48	62	35
2 Cedar Crescent	41	48	56	58	35	60	56	43	51	44	59	35
2 Endeavour Place	40	48	54	57	40	58	55	34	35	44	57	35
2 Friendship Place	37	45	52	54	32	56	52	36	42	39	55	35
2 Guillan Place	40	47	54	57	41	58	54	34	44	42	56	35
4 Guillan Place	39	46	53	56	38	57	53	38	46	45	56	35
2 Guillan Place	39	46	53	56	35	57	53	36	44	45	56	35
2 Koala Street	38	46	53	55	39	56	53	38	46	42	56	35
2 Mimosa Road	41	45	55	58	42	59	55	31	35	46	58	35
2 Warragrah Place	38	43	52	55	36	56	52	36	43	41	56	35
3 Alder Avenue	33	42	48	50	32	51	48	27	34	36	52	35
3 Best Street	31	40	46	49	35	50	46	26	35	37	55	35
3 Blaxland Street	36	44	50	53	29	54	51	29	34	35	53	35
3 Carmelite Close	34	42	49	51	37	53	49	28	37	39	51	35
3 Cedar Crescent	38	46	53	55	37	57	53	33	43	39	55	35
5 Cedar Crescent	39	46	54	57	40	58	54	40	47	48	58	35
3 Cedar Crescent	39	46	54	57	39	58	54	40	47	48	58	35
3 Coronation Avenue	34	43	49	52	40	53	49	35	42	40	52	35
3 Endeavour Place	38	46	52	55	40	56	53	35	38	44	55	35
3 Guillan Place	35	42	50	52	27	54	50	31	40	40	54	35
3 Jacaranda Road	38	42	52	55	16	56	52	22	43	42	60	35
3 Marie Rose Close	32	41	47	49	18	51	47	29	34	32	52	35
3 Mimosa Road	45	49	59	62	43	63	59	36	39	44	62	35
3 Monastery Close	30	38	45	47	18	49	45	24	34	32	50	35
3 Mossgiel Close	40	48	55	57	46	59	55	35	38	47	57	35
3 Rosewood Avenue	47	45	61	64	15	65	61	21	42	51	78	35
3 Scoble Place	37	43	51	54	28	55	51	37	47	37	55	35
3 Thomas Tom Crescent	33	41	47	50	29	51	48	30	38	35	51	35
3 Warragrah Place	39	39	53	56	32	57	53	24	35	37	60	35
3 Westcott Crescent	33	41	48	51	24	52	48	23	31	41	53	35
3 Willow Place	37	39	51	54	25	55	51	20	39	38	58	35
4 Alder Avenue	34	42	48	51	35	52	48	25	32	38	51	35
4 Carinya Street	44	50	59	61	40	63	59	44	54	48	62	35
4 Carmelite Close	33	41	47	50	30	51	47	26	37	34	51	35
4 Cedar Crescent	43	49	58	60	39	62	58	41	51	48	61	35
4 Endeavour Place	41	48	55	58	45	59	55	34	35	46	58	35
4 Friendship Place	36	45	51	53	42	55	51	32	38	43	53	35
4 Guillan Place	35	43	49	52	27	53	50	30	40	35	52	35
4 Jacaranda Road	36	42	51	53	27	55	51	33	43	44	59	35
4 Koala Street	37	46	52	55	38	56	52	31	41	40	55	35
4 Marie Rose Close	32	39	47	49	19	51	47	36	44	30	51	35
4 Mimosa Road	40	46	55	58	45	59	55	33	40	46	58	35
4 Monastery Close	33	41	48	50	19	52	48	31	40	30	53	35
4 Mossgiel Close	41	49	56	59	41	60	56	33	31	43	59	35
4 Rosewood Avenue	40	41	55	57	22	59	55	20	43	47	66	35
4 Scoble Place	36	43	51	54	35	55	51	37	46	40	55	35
4 Warragrah Place	32	38	47	49	22	51	47	23	40	35	55	35
4 Westcott Crescent	35	42	50	52	26	54	50	19	28	42	53	35
4 Willow Place	35	42	50	53	36	54	50	33	42	43	56	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
5 Alder Avenue	31	40	45	48	30	49	45	29	35	35	52	35
5 Best Street	34	41	49	51	35	53	49	27	30	41	53	35
5 Blaxland Street	36	44	51	53	32	55	51	28	34	37	54	35
5 Cedar Crescent	40	46	55	58	38	59	55	40	50	48	60	35
5 Coronation Avenue	32	41	47	50	28	51	47	24	31	38	51	35
5 Endeavour Place	38	47	53	56	42	57	53	33	39	45	56	35
5 Friendship Place	35	43	50	52	39	54	50	30	35	41	52	35
5 Guillan Place	35	41	49	52	33	53	49	32	43	37	53	35
5 Koala Street	34	42	48	51	32	52	48	31	40	41	53	35
5 Mimosa Road	43	48	57	60	39	61	58	37	41	42	60	35
5 Monastery Close	30	38	45	48	19	49	45	27	36	29	50	35
5 Mossgiel Close	41	49	55	58	42	59	55	35	33	45	58	35
5 Rosewood Avenue	45	45	59	62	15	63	59	25	36	52	74	35
3 Scoble Place	28	36	43	45	22	47	43	23	31	28	48	35
5 Scoble Place	37	43	52	54	29	56	52	37	47	38	56	35
5 Thomas Tom Crescent	31	40	46	48	20	50	46	22	31	33	50	35
5 Warragrah Place	35	41	49	52	26	53	49	26	35	42	59	35
7 Westcott Crescent	35	42	49	52	26	53	50	33	41	39	56	35
5 Westcott Crescent	35	42	49	52	25	53	50	33	40	39	53	35
6 Alder Avenue	33	42	48	50	38	52	48	29	37	41	51	35
6 Carinya Street	44	49	58	61	43	62	59	46	53	47	62	35
6 Endeavour Place	40	48	55	58	43	59	55	33	33	45	58	35
6 Friendship Place	35	43	50	52	34	53	50	30	36	40	52	35
6 Guillan Place	35	43	50	52	29	54	50	34	40	36	52	35
8 Guillan Place	41	45	55	58	28	59	56	34	47	51	67	35
6 Guillan Place	33	39	47	50	27	51	47	34	40	36	51	35
6 Jacaranda Road	41	45	55	58	16	59	56	32	47	51	67	35
6 Koala Street	38	45	52	55	31	56	52	38	46	36	55	35
6 Mimosa Road	41	46	56	58	39	60	56	31	36	41	58	35
4 Mimosa Road	35	42	50	52	30	54	50	22	30	34	53	35
6 Mimosa Road	41	46	56	58	43	60	56	34	37	46	58	35
6 Monastery Close	34	41	48	51	18	52	48	30	38	28	52	35
6 Mossgiel Close	44	51	58	61	42	62	58	29	31	44	61	35
6 Scoble Place	37	44	52	54	31	56	52	37	46	41	56	35
6 Warragrah Place	32	38	46	49	27	50	46	27	35	36	56	35
6 Westcott Crescent	34	42	49	51	28	53	49	25	34	39	57	35
7 Alder Avenue	30	40	45	48	28	49	45	27	32	37	51	35
7 Best Street	34	42	49	52	22	53	49	27	31	43	55	35
7 Blaxland Street	37	44	51	54	36	55	51	28	36	39	54	35
7 Cedar Crescent	42	48	57	59	40	60	57	41	51	48	61	35
7 Coronation Avenue	34	42	48	51	37	52	48	29	35	39	51	35
7 Endeavour Place	39	47	54	56	42	57	54	34	38	44	56	35
7 Friendship Place	35	44	50	52	36	54	50	32	33	39	52	35
7 Guillan Place	34	43	49	51	31	53	49	32	39	34	51	35
5 Guillan Place	32	40	47	49	27	51	47	28	40	37	51	35
7 Koala Street	33	41	48	51	28	52	48	28	37	34	51	35
5 Koala Street	33	40	47	50	28	51	47	27	36	31	51	35
7 Koala Street	34	42	48	51	33	52	48	28	37	36	51	35
7 Mimosa Road	43	48	58	61	33	62	58	40	45	41	60	35
7 Mossgiel Close	40	47	54	57	38	58	54	34	32	44	57	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
7 Rosewood Avenue	44	45	59	61	15	63	59	27	44	53	78	35
7 Scoble Place	38	44	53	55	30	57	53	38	48	38	57	35
7 Warragrah Place	37	40	51	54	27	55	51	27	37	43	60	35
7 Westcott Crescent	35	43	50	52	26	54	50	33	41	39	54	35
8 Alder Avenue	33	41	47	50	27	51	48	33	40	37	51	35
8 Carinya Street	43	49	58	60	39	62	58	45	53	44	61	35
8 Cedar Crescent	43	49	58	60	41	62	58	41	51	48	62	35
8 Endeavour Place	40	48	55	57	43	59	55	34	42	45	57	35
8 Friendship Place	36	45	50	53	42	54	50	32	32	44	53	35
8 Guillan Place	35	42	50	52	28	54	50	34	41	36	52	35
8 Monastery Close	34	42	48	51	18	52	48	27	36	32	53	35
8 Mossgiel Close	44	51	59	61	47	63	59	34	32	47	61	35
8 Rosewood Avenue	41	48	56	58	36	60	56	38	48	52	67	35
8 Scoble Place	38	44	52	55	31	56	53	37	47	40	56	35
8 Warragrah Place	31	38	45	48	29	49	45	28	33	35	56	35
9 Alder Avenue	31	41	46	48	29	50	46	29	34	39	53	35
9 Best Street	34	39	49	51	33	53	49	26	33	35	54	35
9 Blaxland Street	36	44	51	53	36	55	51	28	39	40	54	35
9 Cedar Crescent	43	49	57	60	38	61	57	40	50	48	61	35
9 Coronation Avenue	35	44	50	53	34	54	50	30	35	37	53	35
9 Endeavour Place	38	46	52	55	43	56	52	39	46	45	55	35
9 Friendship Place	35	44	50	52	42	54	50	34	30	44	52	35
9 Guillan Place	36	44	50	53	32	54	50	31	38	35	53	35
9 Koala Street	34	42	48	51	31	52	49	29	37	34	51	35
9 Mimosa Road	44	49	58	61	44	62	58	39	42	45	61	35
7 Mimosa Road	42	47	56	59	29	60	56	39	42	33	59	35
9 Mimosa Road	45	51	59	62	44	63	59	37	40	45	62	35
9 Monastery Close	34	42	48	51	33	52	49	28	33	36	54	35
9 Mossgiel Close	40	48	55	57	45	59	55	33	37	46	57	35
9 Rosewood Avenue	41	47	56	58	35	60	56	37	48	53	72	35
9 Scoble Place	39	47	54	57	29	58	54	38	46	38	57	35
9 Warragrah Place	36	39	50	53	25	54	50	24	33	37	61	35
9 Westcott Crescent	35	43	49	52	31	53	50	33	40	39	54	35
10 Alder Avenue	36	44	50	53	37	54	50	30	39	40	54	35
10 Carinya Street	43	49	58	60	41	62	58	45	52	47	61	35
10 Endeavour Place	39	46	54	56	38	58	54	35	45	45	57	35
10 Koala Street	35	42	50	52	27	54	50	37	45	36	54	35
10 Mimosa Road	42	49	57	59	44	61	57	34	37	46	59	35
10 Monastery Close	34	41	49	51	18	53	49	31	41	30	54	35
10 Mossgiel Close	45	52	60	62	46	64	60	39	41	47	62	35
10 Scoble Place	40	46	55	57	30	59	55	38	48	46	59	35
10 Warragrah Place	34	39	48	51	31	52	48	26	32	36	57	35
11 Best Street	35	42	49	52	36	53	50	31	34	40	53	35
11 Blaxland Street	36	44	50	53	36	54	50	35	42	40	54	35
11 Cedar Crescent	43	48	57	60	38	61	57	40	51	49	62	35
11 Coronation Avenue	35	43	49	52	32	53	49	26	32	34	52	35
13 Coronation Avenue	40	46	55	57	44	59	55	34	36	46	58	35
11 Mossgiel Close	40	46	55	57	44	59	55	34	36	46	58	35
11 Warragrah Place	37	41	52	54	24	56	52	21	28	43	62	35
11 Westcott Crescent	36	44	51	53	37	55	51	34	40	40	54	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
12 Carinya Street	43	49	58	61	41	62	58	45	51	46	61	35
12 Koala Street	35	43	50	52	27	54	50	25	35	34	53	35
12 Mossgiel Close	44	51	59	61	39	63	59	37	39	41	61	35
12 Rosewood Avenue	41	47	56	58	25	60	56	38	49	51	64	35
12 Scoble Place	39	46	54	56	31	58	54	40	49	44	58	35
12 Warragrah Place	33	40	47	50	35	51	47	23	32	36	58	35
13 Alder Avenue	38	44	52	55	37	56	52	28	43	46	57	35
13 Best Street	30	40	44	47	27	48	44	27	32	34	52	35
13 Blaxland Street	37	45	51	54	36	55	51	35	42	41	54	35
13 Coronation Avenue	36	45	50	53	42	54	50	34	34	44	53	35
13 Koala Street	37	44	52	54	27	55	52	36	45	36	55	35
13 Westcott Crescent	34	42	49	51	34	53	49	27	32	38	53	35
14 Alder Avenue	32	40	47	49	18	51	47	26	37	32	51	35
14 Carinya Street	43	48	57	60	34	61	57	44	51	44	60	35
14 Koala Street	35	43	50	52	25	54	50	28	36	38	53	35
14 Rosewood Avenue	40	47	55	57	36	59	55	38	48	51	63	35
14 Scoble Place	40	47	55	57	30	59	55	41	48	44	59	35
14 Warragrah Place	32	40	47	49	30	50	47	26	32	34	58	35
15 Best Street	33	39	48	50	34	51	48	30	37	35	53	35
17 Blaxland Street	36	45	50	53	41	54	51	35	42	43	55	35
15 Blaxland Street	36	44	50	53	36	54	50	35	42	41	53	35
15 Coronation Avenue	36	45	50	53	41	54	51	34	29	43	53	35
15 Koala Street	36	43	51	53	27	54	51	36	44	40	54	35
15 Warragrah Place	38	43	52	55	21	56	52	25	35	45	64	35
15 Westcott Crescent	30	38	45	47	20	49	45	26	26	32	57	35
16 Alder Avenue	36	43	51	53	38	55	51	24	35	41	53	35
16 Koala Street	36	43	50	53	24	54	50	36	43	42	54	35
16 Rosewood Avenue	39	45	54	56	36	57	54	31	45	50	61	35
16 Warragrah Place	36	40	50	53	31	54	50	24	33	34	61	35
17 Alder Avenue	37	43	52	54	34	56	52	25	44	48	58	35
17 Best Street	36	44	50	53	37	54	50	29	34	39	53	35
17 Blaxland Street	36	44	51	53	38	55	51	36	42	41	54	35
17 Coronation Avenue	36	44	51	53	42	55	51	32	32	45	53	35
17 Koala Street	35	42	50	52	27	54	50	30	41	40	53	35
17 Westcott Crescent	31	37	45	48	20	49	45	33	38	34	57	35
18 Koala Street	36	43	50	53	30	54	50	36	44	40	54	35
18 Rosewood Avenue	39	46	53	56	36	57	54	34	45	50	60	35
18 Warragrah Place	34	40	48	51	32	52	48	24	33	42	63	35
19 Alder Avenue	41	47	55	58	25	59	56	39	49	50	60	35
19 Best Street	37	44	51	54	37	55	51	30	35	40	54	35
19 Blaxland Street	35	43	49	52	36	53	49	27	37	40	55	35
21 Blaxland Street	36	44	50	53	36	54	50	27	37	40	54	35
19 Blaxland Street	36	44	50	53	36	54	50	27	36	40	54	35
19 Koala Street	32	39	46	49	27	50	47	27	36	37	50	35
19 Westcott Crescent	29	34	43	46	16	47	43	23	34	33	56	35
20 Koala Street	37	44	52	55	25	56	52	36	47	44	56	35
20 Warragrah Place	36	41	50	53	15	54	50	25	34	39	66	35
21 Alder Avenue	40	46	55	58	32	59	55	39	50	49	60	35
21 Blaxland Street	35	43	49	52	36	53	50	27	37	42	54	35
21 Coronation Avenue	38	46	53	55	44	57	53	33	37	45	56	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
21 Koala Street	32	41	46	49	26	50	46	26	34	40	50	35
21 Westcott Crescent	30	38	45	47	18	49	45	26	33	31	55	35
21A Coronation Avenue	41	48	56	58	43	60	56	34	39	45	58	35
22 Rosewood Avenue	38	44	53	55	35	57	53	37	46	41	58	35
23 Alder Avenue	39	46	54	56	38	58	54	33	45	48	59	35
23 Coronation Avenue	41	48	55	58	43	59	56	33	36	45	58	35
23 Warragrah Place	39	42	53	56	27	57	53	28	38	44	64	35
23 Westcott Crescent	27	34	42	45	26	46	42	22	32	32	55	35
24 Rosewood Avenue	34	41	48	51	16	52	49	35	40	38	56	35
24 Warragrah Place	36	43	51	53	27	55	51	26	34	45	60	35
25 Alder Avenue	37	44	52	54	37	56	52	39	46	45	55	35
25 Brolgan Road	35	43	49	52	33	53	49	28	32	42	52	35
25-27 Coronation Avenue	40	48	55	58	44	59	55	33	35	46	58	35
25 Koala Street	34	44	49	51	32	53	49	33	36	41	52	35
25 Rosewood Avenue	42	48	56	59	37	60	56	39	50	51	63	35
25 Westcott Crescent	29	36	44	46	25	48	44	26	31	33	54	35
26 Warragrah Place	36	42	51	53	31	55	51	25	34	45	63	35
27 Alder Avenue	37	43	52	54	38	56	52	36	47	41	55	35
27 Best Street	32	39	46	49	30	50	47	26	34	36	53	35
29 Best Street	33	39	47	50	25	51	47	28	36	40	55	35
27 Blaxland Street	36	42	50	53	25	54	51	27	36	40	55	35
27 Koala Street	35	44	50	52	39	54	50	31	33	43	53	35
27 Rosewood Avenue	41	48	56	58	37	60	56	39	49	50	62	35
27 Warragrah Place	40	42	54	57	34	58	54	24	33	43	64	35
27 Westcott Crescent	31	39	46	48	27	50	46	24	34	39	53	35
28 Warragrah Place	37	44	52	54	23	55	52	29	39	44	67	35
29 Alder Avenue	39	46	54	56	41	57	54	33	41	43	56	35
29 Best Street	34	42	48	51	38	52	49	29	34	40	52	35
29 Blaxland Street	36	42	51	53	25	55	51	29	40	39	56	35
29 Westcott Crescent	31	40	46	48	28	50	46	26	34	37	54	35
30 Blaxland Street	38	41	53	55	22	57	53	23	41	42	60	35
30 Warragrah Place	38	43	52	55	30	56	52	28	38	40	65	35
31 Best Street	32	40	47	49	21	51	47	24	34	32	51	35
31 Blaxland Street	35	41	50	52	22	54	50	26	41	39	56	35
31 Brolgan Road	34	42	49	52	40	53	49	31	37	43	53	35
31-37 Coronation Avenue	41	49	56	58	44	60	56	34	32	47	58	35
31 Westcott Crescent	32	39	47	49	27	51	47	34	40	33	54	35
32 Blaxland Street	39	39	54	56	21	58	54	23	39	39	62	35
32 Brolgan Road	32	40	47	49	29	50	47	22	29	31	49	35
32 Warragrah Place	39	43	54	57	32	58	54	25	28	47	70	35
32 Westcott Crescent	33	40	48	50	26	52	48	22	32	37	57	35
33 Best Street	35	42	49	52	36	53	49	32	40	37	52	35
33 Blaxland Street	34	42	48	51	23	52	48	23	35	40	60	35
33 Brolgan Road	38	46	52	55	37	56	52	37	38	43	55	35
33 Westcott Crescent	30	38	44	47	25	48	44	25	32	33	54	35
34 Blaxland Street	42	37	56	59	22	60	56	30	36	40	64	35
34 Brolgan Road	31	41	46	48	31	50	46	31	29	33	49	35
34 Warragrah Place	40	44	55	57	27	59	55	34	42	48	72	35
34 Westcott Crescent	33	40	47	50	26	51	47	26	33	35	52	35
35 Best Street	32	40	46	49	36	50	47	36	40	40	50	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
35 Blaxland Street	32	40	47	49	22	50	47	26	34	41	65	35
35 Brolgan Road	38	46	52	55	40	56	53	31	41	43	55	35
35 Westcott Crescent	33	39	47	50	27	51	47	26	36	37	54	35
36 Best Street	32	40	47	50	24	51	47	26	35	31	53	35
36 Blaxland Street	42	39	57	59	15	61	57	20	42	40	68	35
37 Best Street	37	45	51	54	39	55	51	34	41	41	54	35
37 Blaxland Street	42	42	57	60	22	61	57	22	32	45	69	35
37 Westcott Crescent	33	40	48	50	26	52	48	25	32	33	54	35
38 Best Street	34	42	48	51	24	52	48	30	38	34	53	35
38 Brolgan Road	34	42	49	51	28	52	49	30	37	38	52	35
39 Best Street	39	47	54	56	39	57	54	32	40	41	56	35
39 Brolgan Road	38	45	53	55	23	57	53	39	46	43	57	35
39 Coronation Avenue	39	47	54	56	46	58	54	34	30	48	56	35
39 Rosewood Avenue	39	45	53	56	28	57	53	38	48	45	58	35
39 Westcott Crescent	33	40	47	50	30	51	47	22	29	35	54	35
40 Best Street	33	41	48	50	25	52	48	27	36	32	53	35
40 Brolgan Road	31	39	46	48	35	50	46	28	35	37	49	35
41 Best Street	38	46	53	55	39	57	53	33	42	42	56	35
41 Brolgan Road	37	44	52	54	23	55	52	39	46	41	56	35
41 Rosewood Avenue	38	42	53	55	16	56	53	37	47	35	58	35
41 Westcott Crescent	33	39	48	50	28	52	48	24	30	35	51	35
42 Best Street	35	43	49	52	31	53	49	30	39	35	53	35
42 Brolgan Road	29	37	44	46	28	48	44	27	35	36	47	35
43 Brolgan Road	36	43	51	53	23	55	51	39	46	37	55	35
44 Best Street	35	43	50	52	24	53	50	37	44	32	53	35
44 Brolgan Road	41	48	55	58	42	59	55	39	47	46	58	35
45 Brolgan Road	38	44	52	55	24	56	52	39	47	38	56	35
46-48 Brolgan Road	40	48	54	57	43	58	55	33	31	45	57	35
47 Best Street	38	46	53	55	38	57	53	40	49	43	57	35
47 Brolgan Road	38	44	53	55	25	57	53	38	47	46	57	35
47 Coronation Avenue	42	49	56	59	48	60	56	37	37	49	59	35
49 Brolgan Road	39	45	53	56	23	57	54	38	48	44	58	35
49 Coronation Ave	44	51	58	61	49	62	58	37	42	51	61	35
49A Brolgan Road	38	43	53	55	22	57	53	36	47	44	57	35
50 Brolgan Road	37	45	52	55	42	56	52	30	27	44	54	35
51 Brolgan Road	36	42	50	53	21	54	51	35	41	40	55	35
52-54 Brolgan Road	39	46	53	56	42	57	54	31	33	44	56	35
52 Hartigan Ave	59	52	73	76	30	77	73	48	61	51	76	35
53 Brolgan Road	32	39	47	49	21	51	47	33	40	35	51	35
54 Best Street	40	48	55	57	39	58	55	39	47	42	57	35
55 Brolgan Road	40	48	55	57	37	59	55	36	43	46	58	35
56 Best Street	38	46	52	55	39	56	52	39	48	41	55	35
56 Brolgan Road	37	45	51	54	40	55	52	33	34	41	54	35
57 Brolgan Road	36	39	51	53	22	54	51	31	43	34	54	35
58 Best Street	38	44	53	55	39	56	53	39	49	41	56	35
58-62 Brolgan Road	40	47	54	57	42	58	54	34	43	44	57	35
59 Brolgan Road	43	49	58	60	34	62	58	44	52	47	61	35
59 Coronation Avenue	47	53	61	64	50	65	61	37	43	51	64	35
60 Best Street	39	44	54	57	33	58	54	40	50	37	58	35
62 Best Street	40	45	55	57	31	59	55	40	50	43	58	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
62-64 Brolgan Road	41	48	55	58	42	59	55	33	42	45	58	35
64 Best Street	41	46	55	58	33	59	55	41	51	46	59	35
66 Best Street	41	46	56	58	32	60	56	41	51	46	60	35
68 Best Street	41	46	56	59	30	60	56	41	52	46	60	35
66 Best Street	34	40	49	51	22	53	49	28	35	38	53	35
68 Best Street	41	46	56	59	20	60	56	41	52	46	60	35
70 Best Street	42	46	56	59	40	60	57	42	52	47	61	35
70 Brolgan Road	37	43	51	54	42	55	51	30	26	46	55	35
72 Brolgan Road	35	43	50	52	31	54	50	34	35	36	52	35
78 Brolgan Road	48	50	63	65	42	67	63	36	38	44	65	35
94 Close Street	30	37	45	47	24	49	45	22	29	33	51	35
96 Close Street	32	39	47	49	31	51	47	24	29	35	53	35
98 Close Street	29	38	44	46	27	47	44	27	30	33	58	35
100 Close Street	31	38	46	48	23	50	46	25	33	37	57	35
102 Close Street	33	38	47	50	23	51	48	32	38	34	55	35
104 Close Street	33	41	48	50	24	52	48	26	35	39	55	35
106 Close Street	31	39	46	48	24	50	46	23	32	36	54	35
108 Close Street	31	39	46	48	25	50	46	25	37	37	64	35
110 Close Street	31	39	46	49	32	50	46	32	38	37	64	35
112 Close Street	34	41	48	51	34	52	48	23	29	40	70	35
1 Angeleish Avenue	35	43	49	52	32	53	49	26	35	39	52	35
1 Arana Place	36	44	50	53	33	54	50	34	35	43	53	35
1 Basil Avenue	38	47	52	55	44	56	52	41	36	46	55	35
2 Angeleish Avenue	34	42	48	51	43	52	49	20	28	43	51	35
2 Arana Place	36	44	50	53	32	54	50	25	28	41	53	35
3 Angeleish Avenue	38	45	52	55	43	56	52	25	34	45	55	35
3 Arana Place	34	43	49	52	41	53	49	33	27	44	51	35
3 Basil Avenue	36	46	50	53	40	54	51	41	34	42	53	35
3 Marshall Place	36	45	50	53	27	54	50	37	36	31	53	35
4 Angeleish Avenue	32	40	47	49	36	51	47	30	17	43	49	35
4 Arana Place	37	45	51	54	38	55	51	21	31	40	54	35
4 Basil Avenue	39	49	54	56	45	58	54	42	29	47	56	35
4 Flinders Street	36	46	51	53	42	55	51	32	27	43	53	35
4 Marshall Place	35	43	49	52	43	53	49	36	31	40	52	35
5 Angeleish Avenue	37	44	51	54	35	55	51	32	34	43	54	35
5 Arana Place	36	44	50	53	37	54	51	34	36	40	53	35
5 Basil Avenue	37	48	52	54	44	56	52	41	33	46	54	35
5 Marshall Place	35	45	50	52	36	54	50	28	34	45	52	35
6 Angeleish Avenue	35	43	49	52	44	53	50	29	32	44	52	35
6 Arana Place	37	45	51	54	37	55	52	34	38	40	55	35
6 Basil Avenue	40	51	55	57	45	59	55	43	32	48	57	35
6 Marshall Place	32	43	47	50	29	51	47	26	36	38	50	35
7 Angeleish Avenue	37	44	51	54	38	55	51	27	34	42	54	35
7 Arana Place	36	45	51	53	38	54	51	32	30	41	53	35
9 Arana Place	36	47	51	53	38	55	51	41	35	41	53	35
7 Arana Place	36	46	51	53	38	55	51	33	35	41	53	35
7 Basil Avenue	37	47	52	54	39	56	52	41	33	42	54	35
8 Angeleish Avenue	35	43	49	52	43	53	49	35	30	44	52	35
8 Arana Place	35	45	50	52	37	54	50	34	35	43	53	35
8 Basil Avenue	40	50	55	58	45	59	55	43	34	47	57	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
8 Flinders Street	35	44	49	52	41	53	49	32	37	44	52	35
9 Angeleish Avenue	35	43	50	52	38	54	50	31	34	43	53	35
9 Arana Place	36	45	51	53	37	55	51	33	28	39	53	35
9 Basil Avenue	38	48	53	55	44	57	53	39	33	46	55	35
10 Angeleish Avenue	35	43	50	52	42	54	50	26	33	44	53	35
10 Arana Place	38	46	53	56	44	57	53	22	17	46	55	35
10 Basil Avenue	40	50	55	57	44	58	55	43	30	47	57	35
10 Coronation Avenue	35	45	50	53	36	54	50	34	31	40	53	35
10 Flinders Street	36	46	51	53	38	55	51	35	27	42	53	35
11 Arana Place	37	46	52	54	41	56	52	35	27	44	54	35
11 Basil Avenue	39	49	53	56	43	57	53	39	26	46	56	35
11a Angeliesh Avenue	37	45	52	54	40	56	52	36	33	45	55	35
11b Angeliesh Avenue	37	45	52	54	38	56	52	36	32	44	55	35
12 Angeleish Avenue	35	43	50	52	43	54	50	23	34	42	52	35
12 Arana Place	37	46	52	54	45	56	52	34	34	46	54	35
13 Angeliesh Avenue	38	45	52	55	40	56	52	25	32	43	55	35
14 Angeliesh Avenue	35	42	49	52	34	53	49	30	25	45	52	35
14 Arana Place	40	47	54	57	44	58	54	34	34	46	57	35
14 Coronation Avenue	36	44	51	53	43	55	51	30	33	44	53	35
14 Flinders Street	34	42	48	51	32	52	48	27	35	36	51	35
15 Angeliesh Avenue	40	49	55	57	46	59	55	37	32	48	57	35
15 Arana Place	36	46	51	54	42	55	51	33	38	41	53	35
15 Basil Avenue	39	48	53	56	43	57	53	39	33	46	56	35
16 Angeliesh Avenue	35	42	50	52	32	54	50	30	25	44	53	35
16 Arana Place	40	48	54	57	47	58	54	36	33	48	57	35
16 Basil Avenue	40	51	55	57	44	59	55	42	34	47	57	35
16 Coronation Avenue	37	45	51	54	33	55	51	33	34	37	54	35
17 Angeliesh Avenue	40	49	55	57	47	59	55	37	36	48	57	35
18 Angeliesh Avenue	39	47	53	56	47	57	53	29	29	48	56	35
18 Arana Place	36	43	50	53	44	54	51	24	25	45	53	35
20 Arana Place	40	48	54	57	44	58	54	34	33	46	57	35
18 Arana Place	40	48	54	57	44	58	54	34	33	46	57	35
18 Basil Avenue	40	49	55	57	44	58	55	40	34	46	57	35
18 Coronation Avenue	38	46	52	55	45	56	52	35	28	47	55	35
19 Angeliesh Avenue	40	48	55	57	46	58	55	37	34	48	57	35
20 Arana Place	39	48	54	57	44	58	54	33	26	46	57	35
20 Coronation Avenue	39	47	54	56	44	58	54	34	36	47	56	35
20 Flinders Street	35	45	50	52	40	54	50	34	25	43	52	35
Lot 20 Mitchell Street	39	50	54	56	42	58	54	38	33	45	56	35
22 Arana Place	39	48	53	56	44	57	53	33	26	46	56	35
22 Flinders Street	37	45	52	54	33	56	52	27	38	41	55	35
24-30 Coronation Avenue	39	47	54	56	46	58	54	34	33	44	56	35
24 Flinders Street	34	42	48	51	28	52	48	34	35	39	52	35
28 Flinders Street	36	45	50	53	35	54	50	34	26	43	53	35
30 Flinders Street	34	41	48	51	43	52	48	27	29	44	51	35
32 Coronation Avenue	41	49	56	58	46	59	56	35	33	48	58	35
32 Flinders Street	35	45	50	52	28	53	50	35	17	41	52	35
34 Flinders Street	35	42	49	52	40	53	50	36	36	42	53	35
35 Flinders Street	36	45	51	53	42	55	51	29	35	44	54	35
36 Flinders Street	31	40	46	49	41	50	46	25	28	43	49	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
37 Flinders Street	30	38	45	47	34	49	45	19	22	35	47	35
38-40 Coronation Avenue	41	49	55	58	46	59	56	36	35	48	58	35
38 Flinders Street	34	44	49	51	32	53	49	30	38	39	52	35
39 Flinders Street	33	42	48	50	35	52	48	29	35	38	51	35
40 Flinders Street	34	42	48	51	35	52	48	27	35	40	51	35
42 Coronation Avenue	40	48	55	58	47	59	55	36	38	48	58	35
43 Flinders Street	34	42	48	51	37	52	48	28	35	39	51	35
45 Flinders Street	35	44	50	52	34	53	50	27	35	38	52	35
48 Coronation Avenue	41	48	55	58	48	59	55	35	39	51	58	35
50 Coronation Avenue	45	51	59	62	50	63	59	35	37	51	62	35
85 Victoria Street	34	44	49	51	40	53	49	35	23	43	51	35
87 Victoria Street	33	41	48	51	39	52	48	33	28	44	51	35
89 Victoria Street	34	42	49	51	36	53	49	24	35	44	52	35
91 Victoria Street	31	39	46	49	42	50	46	28	29	43	49	35
93 Victoria Street	36	44	51	53	43	54	51	26	36	44	53	35
95 Victoria Street	36	47	50	53	34	54	50	37	36	39	52	35
97-105 Victoria Street	37	47	52	54	44	56	52	39	35	48	55	35
97 Victoria Street	37	45	52	54	46	56	52	29	33	48	54	35
107-109 Victorial Street	37	47	52	54	38	56	52	33	34	46	55	35
108 Condobolin Road	37	44	51	54	42	55	51	31	36	45	54	35
110 Condobolin Road	37	44	51	54	42	55	51	26	36	45	54	35
111 Victoria Street	36	44	51	53	33	55	51	40	34	46	54	35
112 Condobolin Road	37	45	52	54	43	56	52	24	35	47	55	35
113-119 Mitchell Street	40	51	55	57	42	59	55	41	34	46	57	35
113-117 Victoria Street	37	46	52	54	48	55	52	31	34	47	54	35
114-120 Condobolin Road	34	44	48	51	24	52	49	38	16	26	51	35
119 Victoria Street	41	51	56	58	46	59	56	43	35	49	58	35
121-123 Victoria Street	41	51	56	59	47	60	56	44	36	50	58	35
122 Condobolin Road	37	48	52	55	30	56	52	39	16	42	55	35
122-124 Victoria Street	36	46	51	54	44	55	51	40	34	46	54	35
123 Mitchell St	41	52	55	58	43	59	55	42	34	47	58	35
124-126 Condobolin Road	37	48	51	54	34	55	51	33	16	43	54	35
126 Victoria Street	33	43	48	51	27	52	48	38	14	32	50	35
127 Mitchell St	44	57	58	61	44	62	59	47	34	48	61	35
128-132 Condobolin Road	40	50	54	57	41	58	55	41	35	43	57	35
128 Victoria Street	39	48	53	56	44	57	54	41	34	48	56	35
130 Victoria Street	33	45	47	50	29	51	47	32	24	31	50	35
131-133 Victoria Street	43	54	57	60	49	61	57	43	35	51	60	35
132 Victoria Street	40	50	54	57	46	58	54	42	34	48	57	35
134-138 Condobolin Road	40	51	54	57	33	58	54	44	17	35	57	35
135 Victoria Street	44	56	59	62	47	63	59	48	36	52	61	35
138 Victoria Street	39	50	53	56	46	57	53	44	35	49	56	35
140-144 Condobolin Road	42	52	56	59	48	60	56	43	36	51	59	35
144 Victoria Street	42	53	57	59	47	61	57	45	35	49	59	35
146 Condobolin Road	44	54	58	61	49	62	58	44	38	53	61	35
147-151 Victoria Street	56	77	70	73	47	74	70	61	35	52	72	35
150 Victoria Street	42	53	56	59	46	60	56	50	35	50	59	35
151-153 Condobolin Road	36	45	51	53	41	54	51	36	36	43	53	35
154 Victoria Street	46	60	61	63	46	65	61	54	17	50	63	35
155 Condobolin Road	32	40	47	49	33	51	47	19	28	35	49	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
157 Condobolin Road	32	41	47	50	44	51	47	24	31	42	50	35
159 Condobolin Road	32	39	46	49	44	50	46	20	29	43	49	35
161-163 Condobolin Road	36	46	51	53	44	54	51	36	28	43	53	35
165 Condobolin Road	36	46	51	53	45	55	51	37	23	46	53	35
167 Condobolin Road	36	47	51	54	45	55	51	37	24	47	53	35
169 Condobolin Road	36	47	51	53	46	55	51	37	29	46	53	35
171 Condobolin Road	37	47	52	54	46	56	52	38	34	46	54	35
173 Condobolin Road	38	47	52	55	47	56	52	38	34	45	55	35
175 Condobolin Road	38	48	52	55	45	56	53	38	34	46	55	35
177 Condobolin Road	40	49	54	57	48	58	55	39	34	47	57	35
179-187 Condobolin Road	41	50	56	59	48	60	56	39	35	51	59	35
189-197 Condobolin Road	42	52	57	59	44	61	57	41	38	51	59	35
1 Moulden Street Parkes	55	55	69	72	45	73	70	52	34	50	72	35
Parkes Christian School Back Trundle Road	41	49	56	58	43	60	56	35	34	46	58	35
Parkes Christian School, Back Trundle Road	40	48	54	57	40	58	55	34	32	44	57	35
1A Moulden Street	51	59	65	68	49	69	66	50	35	56	68	35
3 Cookapie Street	42	52	57	59	38	61	57	36	30	42	59	35
3 Dunns Lane	44	53	59	61	42	62	59	42	32	46	61	35
3 Moulden Street	49	55	64	66	45	68	64	50	33	48	66	35
5 Cookapie Street	41	50	55	58	38	59	55	36	30	42	58	35
5 Moulden Street	48	55	63	65	43	66	63	48	33	47	65	35
7 Cookapie Street	41	50	55	58	39	59	55	36	30	42	57	35
7 Dunns Lane	42	50	57	59	36	61	57	43	32	42	59	35
7 Moulden Street	48	55	62	65	43	66	62	47	33	46	65	35
9 Dunns Lane	43	51	58	60	42	62	58	41	32	46	60	35
10 Cookapie Street	39	49	54	56	40	58	54	37	31	44	56	35
11 Moulden Street	47	55	62	64	42	66	62	44	32	45	64	35
13 Moulden Street	47	55	62	64	41	66	62	43	32	44	64	35
14 Dunns Lane	42	51	56	59	41	60	57	40	32	44	59	35
15 Cookapie Street	39	48	54	56	39	58	54	36	30	43	56	35
15 Moulden Street	47	55	62	64	33	66	62	42	32	39	64	35
17 Moulden Street	48	56	63	65	41	67	63	43	32	44	65	35
19 Cookapie Street	41	50	56	58	41	60	56	38	32	45	58	35
19 Moulden Street	48	56	63	65	28	67	63	43	31	35	65	35
21-29 Moulden Street	48	56	63	65	40	66	63	39	30	43	65	35
31-39 Moulden Street	47	55	61	64	38	65	61	37	31	42	64	35
41 Moulden Street (Shed)	43	53	58	60	38	62	58	36	30	42	60	35
41 Moulden Street Parkes	47	55	62	64	38	66	62	30	23	41	64	35
170 Back Trundle Road	55	53	69	72	45	73	70	56	34	50	72	35
176-180 Back Trundle Road	51	52	66	68	44	69	66	47	33	49	68	35
182-184 Back Trundle Road	45	51	60	62	43	64	60	37	33	48	62	35
186-192 Back Trundle Road	37	47	52	55	23	56	52	26	13	27	54	35
194 Back Trundle Road	42	50	56	59	42	60	56	34	33	46	58	35
209 Back Trundle Road	46	52	60	63	46	64	60	43	34	50	63	35
215 Back Trundle Road	43	50	58	60	43	61	58	40	33	46	60	35
238 Henry Parkes Way	55	59	70	72	52	74	70	43	38	57	72	35
250 Henry Parkes Way	56	56	71	73	48	75	71	38	35	51	73	35
302A Henry Parkes Way	39	47	54	56	40	58	54	32	32	43	56	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
302B Henry Parkes Way	41	48	55	58	41	59	55	33	32	43	58	35
1 Highland Avenue	39	50	53	56	41	57	54	38	34	44	56	35
2 Highland Avenue	37	47	52	54	41	56	52	37	33	43	54	35
3 Highland Avenue	39	50	54	56	41	58	54	38	33	44	56	35
4 Highland Avenue	38	49	53	55	41	57	53	37	33	43	55	35
6 Highland Street	38	49	53	55	40	57	53	37	33	43	55	35
4 Highland Avenue	36	46	50	53	38	54	50	36	22	38	53	35
6 Highland Street	38	49	53	55	40	57	53	37	33	43	55	35
8 Highland Street	38	49	53	56	40	57	53	37	33	43	55	35
10 Highland Avenue	39	49	53	56	40	57	53	38	33	44	56	35
8 Highland Street	33	45	47	50	26	51	47	25	21	29	50	35
10 Highland Avenue	39	49	53	56	40	57	53	38	33	44	56	35
10 Jack Burch Road	41	53	56	58	40	60	56	40	32	43	58	35
12 Highland Avenue	38	49	53	56	39	57	53	36	33	43	55	35
25-27 Thomas Street	36	48	51	54	36	55	51	27	30	37	53	35
31-33 Thomas Street	38	50	53	55	37	57	53	36	31	40	55	35
35-37 Thomas Street	38	50	53	56	37	57	53	36	31	40	55	35
39-41 Thomas Street	39	51	53	56	37	57	53	36	31	40	56	35
41 Ainsworth Street	38	49	53	55	38	57	53	37	32	41	55	35
43-45 Thomas Street	37	49	52	54	37	55	52	37	31	41	54	35
47 Thomas Street	41	53	55	58	38	59	56	37	31	41	58	35
50 Thomas Street	37	48	51	54	35	55	51	33	24	38	54	35
53 Thomas Street (Shed)	42	55	57	59	38	61	57	39	31	42	59	35
64-70 Rose Street	42	54	56	59	40	60	56	42	33	43	59	35
65 Thomas Street (Shed)	47	68	62	64	39	66	62	42	31	43	64	35
65 Thomas Street	48	69	62	65	39	66	62	40	31	42	64	35
68-72 THomas Street	40	52	54	57	37	58	54	36	30	40	57	35
74-78 Thomas Street	39	51	54	56	37	58	54	36	30	40	56	35
78 Rose Street	44	57	58	61	42	62	58	47	33	45	61	35
80 Rose Street	47	67	61	64	43	65	61	50	33	46	64	35
80-82 Thomas Street	40	53	55	57	37	59	55	37	30	41	57	35
82 Rose Street	43	55	57	60	43	61	57	44	34	46	60	35
84-86 Thomas Street	42	56	56	59	38	60	56	38	31	41	59	35
88-90 THomas Street	44	60	59	61	38	63	59	36	31	41	61	35
92-94 Thomas Street	49	69	63	66	38	67	63	39	31	42	66	35
124 Mitchell Street	30	38	44	47	38	48	45	27	33	37	48	35
126 Mitchell Street	36	45	50	53	40	54	50	36	33	43	53	35
130 Mitchell Street	35	44	50	52	41	54	50	28	33	43	53	35
134 Mitchell Street	38	47	52	55	42	56	52	37	34	44	55	35
136 Mitchell Street	38	47	52	55	40	56	52	38	35	43	55	35
138 Mitchell Street	36	48	51	54	38	55	51	38	33	42	54	35
140 Mitchell Street	40	50	54	57	42	58	54	39	33	45	57	35
154 Mitchell Street	42	53	56	59	42	60	56	42	34	46	59	35
7 Goldrush Road	36	46	50	53	30	54	50	25	24	34	53	35
9 Goldrush Road	38	48	53	55	30	56	53	25	24	33	55	35
30 Heraghty Road	35	45	50	52	25	53	50	20	20	29	52	35
101 Heraghty Rd	35	45	50	52	25	54	50	20	20	29	52	35
103 Heraghty Road	37	47	51	54	26	55	51	21	21	29	54	35
115 Heraghty Rd	37	47	52	54	26	55	52	21	21	30	54	35
127 Heraghty Rd	37	48	52	54	27	56	52	22	22	30	54	35

Address	Construction noise level, dBA LAeq, 15min											Night time criteria
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
130 Heraghty Rd	37	48	52	55	28	56	52	23	22	31	55	35
139 Heraghty Rd	36	46	51	53	28	55	51	23	23	31	53	35
Lot 152 Goldrush Road	39	49	54	56	32	57	54	27	26	35	56	35
163 Goldrush Road	40	50	55	57	30	58	55	26	25	34	57	35
163a Goldrush Road	41	51	56	58	29	59	56	24	23	32	58	35
Lot 1086 Moulden Street	45	54	60	63	35	64	60	32	28	39	62	35
Lumeah Bogan Road	54	66	69	71	27	72	69	22	22	31	71	35
Lot 2 Endicott Street	43	59	58	60	30	62	58	26	24	33	60	35
47 Bleechmore Road	35	42	49	52	26	53	49	22	21	29	55	35
57 Bleechmore Road	35	42	50	53	25	54	50	21	21	29	56	35
59 Maguire Road	37	38	51	54	20	55	51	15	0	23	54	35
63 Maguire Road	40	40	54	57	20	58	54	14	0	23	57	35
71 Bleechmore Road	31	37	45	48	20	49	46	18	19	24	50	35
79 Maguire Road	35	37	50	53	19	54	50	14	0	22	52	35
81 Bleechmore Road	35	39	50	52	19	54	50	17	6	22	54	35
128 Painter Street	43	58	57	60	31	61	57	28	25	35	59	35
285 Newell Highway	38	47	53	56	27	57	53	22	22	31	61	35
300 Newell Highway	36	42	51	53	6	55	51	2	2	10	59	35
340 Newell Highway	37	42	51	54	25	55	51	21	20	28	57	35
Lot 720 Painter Street	38	51	53	55	31	57	53	28	25	34	55	35
Lot 731 Endicott Street	40	54	55	58	29	59	55	26	24	33	57	35
98 Bogan Road	39	41	54	56	4	58	54	-1	-1	7	56	35

Table C3 Predicted night time maximum construction noise levels

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
1	41 Hideaway Lane	52	54	67	69	31	71	67	28	37	42	45	60
1	83 Hideaway Lane	51	59	65	68	32	69	65	30	39	44	44	60
1	2636 Newell Hwy	50	58	65	67	10	69	65	18	27	31	52	60
1	2791 Newell Hwy	51	58	65	68	23	69	65	23	32	36	50	60
1	2850 Newell Hwy	47	52	62	65	28	66	62	25	34	39	54	60
2	40 Barkers Road	50	59	64	67	10	68	64	3	12	16	43	60
2	53 Barkers Road	46	53	60	63	10	64	60	22	32	35	39	60
2	2683 Newell Hwy	45	55	59	62	10	63	60	21	30	34	38	60
3	11 Ballerdee Lane	52	68	66	69	42	70	66	43	54	60	45	60
3	33 Ballerdee Lane	54	83	68	71	44	72	69	46	58	64	48	60
3	55 Ballerdee Lane	54	80	68	71	45	72	69	49	62	63	48	60
3	84 Brolgan Road	58	69	73	75	53	77	73	53	58	57	51	60
3	166 London Road	50	64	65	67	41	68	65	41	50	57	44	60
3	172 London Road	47	59	61	64	40	65	61	40	50	54	41	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
3	206 London Road	47	57	61	64	41	65	62	40	50	54	41	60
4	1 Best Street	42	50	57	59	45	61	57	39	46	48	38	60
4	1 Endeavour Place	48	55	62	65	54	66	62	44	45	56	41	60
4	1-3 Friendship Place	45	54	60	63	50	64	60	42	46	52	38	60
4	1 Guillan Place	46	53	61	64	48	65	61	41	50	57	41	60
4	1 Koala Street	46	54	60	63	45	64	60	47	56	48	40	60
4	1 Marie Rose Close	43	52	58	61	44	62	58	36	45	47	37	60
4	1 Mimosa Road	55	61	69	72	52	73	69	42	48	54	48	60
4	1 Rosewood Avenue	57	55	72	75	25	76	72	29	52	61	64	60
4	1 Scoble Place	46	52	61	63	38	65	61	47	57	46	41	60
4	1 Warragrah Place	46	52	61	63	37	65	61	37	42	49	41	60
4	1 Willow Place	42	49	57	59	41	61	57	32	47	47	39	60
4	2 Carinya Street	54	60	69	72	50	73	69	53	64	58	48	60
4	2 Cedar Crescent	51	58	66	68	45	70	66	53	61	54	45	60
4	2 Endeavour Place	50	58	64	67	50	68	65	44	45	54	43	60
4	2 Friendship Place	47	55	62	64	42	66	62	46	52	49	41	60
4	2 Guillan Place	50	57	64	67	51	68	64	44	54	52	42	60
4	4 Guillan Place	49	56	63	66	48	67	63	48	56	55	42	60
4	2 Guillan Place	49	56	63	66	45	67	63	46	54	55	42	60
4	2 Koala Street	48	56	63	65	49	66	63	48	56	52	42	60
4	2 Mimosa Road	51	55	65	68	52	69	65	41	45	56	44	60
4	2 Warragrah Place	48	53	62	65	46	66	62	46	53	51	42	60
4	3 Alder Avenue	43	52	58	60	42	61	58	37	44	46	38	60
4	3 Best Street	41	50	56	59	45	60	56	36	45	47	41	60
4	3 Blaxland Street	46	54	60	63	39	64	61	39	44	45	39	60
4	3 Carmelite Close	44	52	59	61	47	63	59	38	47	49	37	60
4	3 Cedar Crescent	48	56	63	65	47	67	63	43	53	49	41	60
4	5 Cedar Crescent	49	56	64	67	50	68	64	50	57	58	44	60
4	3 Cedar Crescent	49	56	64	67	49	68	64	50	57	58	44	60
4	3 Coronation Avenue	44	53	59	62	50	63	59	45	52	50	38	60
4	3 Endeavour Place	48	56	62	65	50	66	63	45	48	54	41	60
4	3 Guillan Place	45	52	60	62	37	64	60	41	50	50	40	60
4	3 Jacaranda Road	48	52	62	65	26	66	62	32	53	52	46	60
4	3 Marie Rose Close	42	51	57	59	28	61	57	39	44	42	38	60
4	3 Mimosa Road	55	59	69	72	53	73	69	46	49	54	48	60
4	3 Mossgiel Close	50	58	65	67	56	69	65	45	48	57	43	60
4	3 Rosewood Avenue	57	55	71	74	25	75	71	31	52	61	64	60
4	3 Scoble Place	47	53	61	64	38	65	61	47	57	47	42	60
4	3 Thomas Tom Crescent	43	51	57	60	39	61	58	40	48	45	37	60
4	3 Warragrah Place	49	49	63	66	42	67	63	34	45	47	46	60
4	3 Westcott Crescent	43	51	58	61	34	62	58	33	41	51	39	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	3 Willow Place	47	49	61	64	35	65	61	30	49	48	44	60
4	4 Alder Avenue	44	52	58	61	45	62	58	35	42	48	37	60
4	4 Carinya Street	54	60	69	71	50	73	69	54	64	58	48	60
4	4 Carmelite Close	43	51	57	60	40	61	57	36	47	44	37	60
4	4 Cedar Crescent	53	59	68	70	49	72	68	51	61	58	47	60
4	4 Endeavour Place	51	58	65	68	55	69	65	44	45	56	44	60
4	4 Friendship Place	46	55	61	63	52	65	61	42	48	53	39	60
4	4 Guillan Place	45	53	59	62	37	63	60	40	50	45	38	60
4	4 Jacaranda Road	46	52	61	63	37	65	61	43	53	54	45	60
4	4 Koala Street	47	56	62	65	48	66	62	41	51	50	41	60
4	4 Marie Rose Close	42	49	57	59	29	61	57	46	54	40	37	60
4	4 Mimosa Road	50	56	65	68	55	69	65	43	50	56	44	60
4	4 Monastery Close	43	51	58	60	29	62	58	41	50	40	39	60
4	4 Mossgiel Close	51	59	66	69	51	70	66	43	41	53	45	60
4	4 Rosewood Avenue	50	51	65	67	32	69	65	30	53	57	52	60
4	4 Scoble Place	46	53	61	64	45	65	61	47	56	50	41	60
4	4 Warragrah Place	42	48	57	59	32	61	57	33	50	45	41	60
4	4 Westcott Crescent	45	52	60	62	36	64	60	29	38	52	39	60
4	4 Willow Place	45	52	60	63	46	64	60	43	52	53	42	60
4	5 Best Street	44	51	59	61	45	63	59	37	40	51	39	60
4	5 Blaxland Street	46	54	61	63	42	65	61	38	44	47	40	60
4	5 Cedar Crescent	50	56	65	68	48	69	65	50	60	58	46	60
4	5 Coronation Avenue	42	51	57	60	38	61	57	34	41	48	37	60
4	5 Endeavour Place	48	57	63	66	52	67	63	43	49	55	42	60
4	5 Friendship Place	45	53	60	62	49	64	60	40	45	51	38	60
4	5 Guillan Place	45	51	59	62	43	63	59	42	53	47	39	60
4	5 Koala Street	44	52	58	61	42	62	58	41	50	51	39	60
4	5 Mimosa Road	53	58	67	70	49	71	68	47	51	52	46	60
4	5 Mossgiel Close	51	59	65	68	52	69	65	45	43	55	44	60
4	5 Rosewood Avenue	55	55	69	72	25	73	69	35	46	62	60	60
4	5 Scoble Place	47	53	62	64	39	66	62	47	57	48	42	60
4	5 Thomas Tom Crescent	41	50	56	58	30	60	56	32	41	43	36	60
4	5 Warragrah Place	45	51	59	62	36	63	59	36	45	52	45	60
4	7 Westcott Crescent	45	52	59	62	36	63	60	43	51	49	42	60
4	5 Westcott Crescent	45	52	59	62	35	63	60	43	50	49	39	60
4	6 Alder Avenue	43	52	58	60	48	62	58	39	47	51	37	60
4	6 Carinya Street	54	59	68	71	53	72	69	56	63	57	48	60
4	6 Endeavour Place	50	58	65	68	53	69	65	43	43	55	44	60
4	6 Friendship Place	45	53	60	62	44	63	60	40	46	50	38	60
4	6 Guillan Place	45	53	60	62	39	64	60	44	50	46	38	60
4	8 Guillan Place	51	55	65	68	38	69	66	44	57	61	53	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	6 Guillan Place	43	49	57	60	37	61	57	44	50	46	37	60
4	6 Jacaranda Road	51	55	65	68	26	69	66	42	57	61	53	60
4	6 Koala Street	48	55	62	65	41	66	62	48	56	46	41	60
4	6 Mimosa Road	51	56	66	68	49	70	66	41	46	51	44	60
4	4 Mimosa Road	45	52	60	62	40	64	60	32	40	44	39	60
4	6 Mimosa Road	51	56	66	68	53	70	66	44	47	56	44	60
4	6 Monastery Close	44	51	58	61	28	62	58	40	48	38	38	60
4	6 Mossgiel Close	54	61	68	71	52	72	68	39	41	54	47	60
4	6 Scoble Place	47	54	62	64	41	66	62	47	56	51	42	60
4	6 Warragrah Place	42	48	56	59	37	60	56	37	45	46	42	60
4	6 Westcott Crescent	44	52	59	61	38	63	59	35	44	49	43	60
4	7 Best Street	44	52	59	62	32	63	59	37	41	53	41	60
4	7 Blaxland Street	47	54	61	64	46	65	61	38	46	49	40	60
4	7 Cedar Crescent	52	58	67	69	50	70	67	51	61	58	47	60
4	7 Coronation Avenue	44	52	58	61	47	62	58	39	45	49	37	60
4	7 Endeavour Place	49	57	64	66	52	67	64	44	48	54	42	60
4	7 Friendship Place	45	54	60	62	46	64	60	42	43	49	38	60
4	7 Guillan Place	44	53	59	61	41	63	59	42	49	44	37	60
4	5 Guillan Place	42	50	57	59	37	61	57	38	50	47	37	60
4	7 Koala Street	43	51	58	61	38	62	58	38	47	44	37	60
4	5 Koala Street	43	50	57	60	38	61	57	37	46	41	37	60
4	7 Koala Street	44	52	58	61	43	62	58	38	47	46	37	60
4	7 Mimosa Road	53	58	68	71	43	72	68	50	55	51	46	60
4	7 Mossgiel Close	50	57	64	67	48	68	64	44	42	54	43	60
4	7 Rosewood Avenue	54	55	69	71	25	73	69	37	54	63	64	60
4	7 Scoble Place	48	54	63	65	40	67	63	48	58	48	43	60
4	7 Warragrah Place	47	50	61	64	37	65	61	37	47	53	46	60
4	7 Westcott Crescent	45	53	60	62	36	64	60	43	51	49	40	60
4	8 Alder Avenue	43	51	57	60	37	61	58	43	50	47	37	60
4	8 Carinya Street	53	59	68	70	49	72	68	55	63	54	47	60
4	8 Cedar Crescent	53	59	68	70	51	72	68	51	61	58	48	60
4	8 Endeavour Place	50	58	65	67	53	69	65	44	52	55	43	60
4	8 Friendship Place	46	55	60	63	52	64	60	42	42	54	39	60
4	8 Guillan Place	45	52	60	62	38	64	60	44	51	46	38	60
4	8 Monastery Close	44	52	58	61	28	62	58	37	46	42	39	60
4	8 Mossgiel Close	54	61	69	71	57	73	69	44	42	57	47	60
4	8 Rosewood Avenue	51	58	66	68	46	70	66	48	58	62	53	60
4	8 Scoble Place	48	54	62	65	41	66	63	47	57	50	42	60
4	9 Alder Avenue	41	51	56	58	39	60	56	39	44	49	39	60
4	9 Best Street	44	49	59	61	43	63	59	36	43	45	40	60
4	9 Blaxland Street	46	54	61	63	46	65	61	38	49	50	40	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	9 Cedar Crescent	53	59	67	70	48	71	67	50	60	58	48	60
4	9 Coronation Avenue	45	54	60	63	44	64	60	40	45	47	39	60
4	9 Endeavour Place	48	56	62	65	53	66	62	49	56	55	41	60
4	9 Friendship Place	45	54	60	62	52	64	60	44	40	54	38	60
4	9 Guillan Place	46	54	60	63	42	64	60	41	48	45	39	60
4	9 Koala Street	44	52	58	61	41	62	59	39	47	44	37	60
4	9 Mimosa Road	54	59	68	71	54	72	68	49	52	55	47	60
4	7 Mimosa Road	52	57	66	69	39	70	66	49	52	43	45	60
4	9 Mimosa Road	55	61	69	72	54	73	69	47	50	55	48	60
4	9 Monastery Close	44	52	58	61	43	62	59	38	43	46	40	60
4	9 Mossgiel Close	50	58	65	67	55	69	65	43	47	56	43	60
4	9 Rosewood Avenue	51	57	66	68	45	70	66	47	58	63	58	60
4	9 Scoble Place	49	57	64	67	39	68	64	48	56	48	43	60
4	9 Warragrah Place	46	49	60	63	35	64	60	34	43	47	47	60
4	9 Westcott Crescent	45	53	59	62	41	63	60	43	50	49	40	60
4	10 Alder Avenue	46	54	60	63	47	64	60	40	49	50	40	60
4	10 Carinya Street	53	59	68	70	51	72	68	55	62	57	47	60
4	10 Endeavour Place	49	56	64	66	48	68	64	45	55	55	43	60
4	10 Koala Street	45	52	60	62	37	64	60	47	55	46	40	60
4	10 Mimosa Road	52	59	67	69	54	71	67	44	47	56	45	60
4	10 Monastery Close	44	51	59	61	28	63	59	41	51	40	40	60
4	10 Mossgiel Close	55	62	70	72	56	74	70	49	51	57	48	60
4	10 Scoble Place	50	56	65	67	40	69	65	48	58	56	45	60
4	10 Warragrah Place	44	49	58	61	41	62	58	36	42	46	43	60
4	11 Best Street	45	52	59	62	46	63	60	41	44	50	39	60
4	11 Blaxland Street	46	54	60	63	46	64	60	45	52	50	40	60
4	11 Cedar Crescent	53	58	67	70	48	71	67	50	61	59	48	60
4	11 Coronation Avenue	45	53	59	62	42	63	59	36	42	44	38	60
4	13 Coronation Avenue	50	56	65	67	54	69	65	44	46	56	44	60
4	11 Mossgiel Close	50	56	65	67	54	69	65	44	46	56	44	60
4	11 Warragrah Place	47	51	62	64	34	66	62	31	38	53	48	60
4	11 Westcott Crescent	46	54	61	63	47	65	61	44	50	50	40	60
4	12 Carinya Street	53	59	68	71	51	72	68	55	61	56	47	60
4	12 Koala Street	45	53	60	62	37	64	60	35	45	44	39	60
4	12 Mossgiel Close	54	61	69	71	49	73	69	47	49	51	47	60
4	12 Rosewood Avenue	51	57	66	68	35	70	66	48	59	61	50	60
4	12 Scoble Place	49	56	64	66	41	68	64	50	59	54	44	60
4	12 Warragrah Place	43	50	57	60	45	61	57	33	42	46	44	60
4	13 Alder Avenue	48	54	62	65	47	66	62	38	53	56	43	60
4	13 Blaxland Street	47	55	61	64	46	65	61	45	52	51	40	60
4	13 Coronation Avenue	46	55	60	63	52	64	60	44	44	54	39	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	13 Koala Street	47	54	62	64	37	65	62	46	55	46	41	60
4	13 Westcott Crescent	44	52	59	61	44	63	59	37	42	48	39	60
4	14 Alder Avenue	42	50	57	59	28	61	57	36	47	42	37	60
4	14 Carinya Street	53	58	67	70	44	71	67	54	61	54	46	60
4	14 Koala Street	45	53	60	62	35	64	60	38	46	48	39	60
4	14 Rosewood Avenue	50	57	65	67	46	69	65	48	58	61	49	60
4	14 Scoble Place	50	57	65	67	40	69	65	51	58	54	45	60
4	14 Warragrah Place	42	50	57	59	40	60	57	36	42	44	44	60
4	15 Best Street	43	49	58	60	44	61	58	40	47	45	39	60
4	17 Blaxland Street	46	55	60	63	51	64	61	45	52	53	41	60
4	15 Blaxland Street	46	54	60	63	46	64	60	45	52	51	39	60
4	15 Coronation Avenue	46	55	60	63	51	64	61	44	39	53	39	60
4	15 Koala Street	46	53	61	63	37	64	61	46	54	50	40	60
4	15 Warragrah Place	48	53	62	65	31	66	62	35	45	55	50	60
4	16 Alder Avenue	46	53	61	63	48	65	61	34	45	51	39	60
4	16 Koala Street	46	53	60	63	34	64	60	46	53	52	40	60
4	16 Rosewood Avenue	49	55	64	66	46	67	64	41	55	60	48	60
4	16 Warragrah Place	46	50	60	63	41	64	60	34	43	44	47	60
4	17 Alder Avenue	47	53	62	64	44	66	62	35	54	58	44	60
4	17 Best Street	46	54	60	63	47	64	60	39	44	49	39	60
4	17 Blaxland Street	46	54	61	63	48	65	61	46	52	51	40	60
4	17 Coronation Avenue	46	54	61	63	52	65	61	42	42	55	39	60
4	17 Koala Street	45	52	60	62	37	64	60	40	51	50	39	60
4	18 Koala Street	46	53	60	63	40	64	60	46	54	50	40	60
4	18 Rosewood Avenue	49	56	63	66	46	67	64	44	55	60	46	60
4	18 Warragrah Place	44	50	58	61	42	62	58	34	43	52	49	60
4	19 Alder Avenue	51	57	65	68	35	69	66	49	59	60	46	60
4	19 Best Street	47	54	61	64	47	65	61	40	45	50	40	60
4	19 Blaxland Street	45	53	59	62	46	63	59	37	47	50	41	60
4	21 Blaxland Street	46	54	60	63	46	64	60	37	47	50	40	60
4	19 Blaxland Street	46	54	60	63	46	64	60	37	46	50	40	60
4	19 Koala Street	42	49	56	59	37	60	57	37	46	47	36	60
4	20 Koala Street	47	54	62	65	35	66	62	46	57	54	42	60
4	20 Warragrah Place	46	51	60	63	25	64	60	35	44	49	52	60
4	21 Alder Avenue	50	56	65	68	42	69	65	49	60	59	46	60
4	21 Blaxland Street	45	53	59	62	46	63	60	37	47	52	40	60
4	21 Coronation Avenue	48	56	63	65	54	67	63	43	47	55	42	60
4	21 Koala Street	42	51	56	59	36	60	56	36	44	50	36	60
4	21A Coronation Avenue	51	58	66	68	53	70	66	44	49	55	44	60
4	22 Rosewood Avenue	48	54	63	65	45	67	63	47	56	51	44	60
4	23 Alder Avenue	49	56	64	66	48	68	64	43	55	58	45	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	23 Coronation Avenue	51	58	65	68	53	69	66	43	46	55	44	60
4	23 Warragrah Place	49	52	63	66	37	67	63	38	48	54	50	60
4	24 Rosewood Avenue	44	51	58	61	26	62	59	45	50	48	42	60
4	24 Warragrah Place	46	53	61	63	37	65	61	36	44	55	46	60
4	25 Alder Avenue	47	54	62	64	47	66	62	49	56	55	41	60
4	25 Brolgan Road	45	53	59	62	43	63	59	38	42	52	38	60
4	25-27 Coronation Avenue	50	58	65	68	54	69	65	43	45	56	44	60
4	25 Koala Street	44	54	59	61	42	63	59	43	46	51	38	60
4	25 Rosewood Avenue	52	58	66	69	47	70	66	49	60	61	49	60
4	26 Warragrah Place	46	52	61	63	41	65	61	35	44	55	49	60
4	27 Alder Avenue	47	53	62	64	48	66	62	46	57	51	41	60
4	27 Best Street	42	49	56	59	40	60	57	36	44	46	39	60
4	29 Best Street	43	49	57	60	35	61	57	38	46	50	41	60
4	27 Blaxland Street	46	52	60	63	35	64	61	37	46	50	41	60
4	27 Koala Street	45	54	60	62	49	64	60	41	43	53	39	60
4	27 Rosewood Avenue	51	58	66	68	47	70	66	49	59	60	49	60
4	27 Warragrah Place	50	52	64	67	44	68	64	34	43	53	50	60
4	27 Westcott Crescent	41	49	56	58	37	60	56	34	44	49	39	60
4	28 Warragrah Place	47	54	62	64	33	65	62	39	49	54	53	60
4	29 Alder Avenue	49	56	64	66	51	67	64	43	51	53	42	60
4	29 Best Street	44	52	58	61	48	62	59	39	44	50	38	60
4	29 Blaxland Street	46	52	61	63	35	65	61	39	50	49	42	60
4	29 Westcott Crescent	41	50	56	58	38	60	56	36	44	47	40	60
4	30 Blaxland Street	48	51	63	65	32	67	63	33	51	52	46	60
4	30 Warragrah Place	48	53	62	65	40	66	62	38	48	50	51	60
4	31 Best Street	42	50	57	59	31	61	57	34	44	42	37	60
4	31 Blaxland Street	45	51	60	62	32	64	60	36	51	49	42	60
4	31 Brolgan Road	44	52	59	62	50	63	59	41	47	53	39	60
4	31-37 Coronation Avenue	51	59	66	68	54	70	66	44	42	57	44	60
4	31 Westcott Crescent	42	49	57	59	37	61	57	44	50	43	40	60
4	32 Blaxland Street	49	49	64	66	31	68	64	33	49	49	48	60
4	32 Brolgan Road	42	50	57	59	39	60	57	32	39	41	35	60
4	32 Warragrah Place	49	53	64	67	42	68	64	35	38	57	56	60
4	32 Westcott Crescent	43	50	58	60	36	62	58	32	42	47	43	60
4	33 Best Street	45	52	59	62	46	63	59	42	50	47	38	60
4	33 Blaxland Street	44	52	58	61	33	62	58	33	45	50	46	60
4	33 Brolgan Road	48	56	62	65	47	66	62	47	48	53	41	60
4	34 Blaxland Street	52	47	66	69	32	70	66	40	46	50	50	60
4	34 Brolgan Road	41	51	56	58	41	60	56	41	39	43	35	60
4	34 Warragrah Place	50	54	65	67	37	69	65	44	52	58	58	60
4	34 Westcott Crescent	43	50	57	60	36	61	57	36	43	45	38	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	35 Best Street	42	50	56	59	46	60	57	46	50	50	36	60
4	35 Blaxland Street	42	50	57	59	32	60	57	36	44	51	51	60
4	35 Brogan Road	48	56	62	65	50	66	63	41	51	53	41	60
4	35 Westcott Crescent	43	49	57	60	37	61	57	36	46	47	40	60
4	36 Best Street	42	50	57	60	34	61	57	36	45	41	39	60
4	36 Blaxland Street	52	49	67	69	25	71	67	30	52	50	54	60
4	37 Best Street	47	55	61	64	49	65	61	44	51	51	40	60
4	37 Blaxland Street	52	52	67	70	32	71	67	32	42	55	55	60
4	37 Westcott Crescent	43	50	58	60	36	62	58	35	42	43	40	60
4	38 Best Street	44	52	58	61	34	62	58	40	48	44	39	60
4	38 Brogan Road	44	52	59	61	38	62	59	40	47	48	38	60
4	39 Best Street	49	57	64	66	49	67	64	42	50	51	42	60
4	39 Brogan Road	48	55	63	65	33	67	63	49	56	53	43	60
4	39 Coronation Avenue	49	57	64	66	56	68	64	44	40	58	42	60
4	39 Rosewood Avenue	49	55	63	66	38	67	63	48	58	55	44	60
4	39 Westcott Crescent	43	50	57	60	40	61	57	32	39	45	40	60
4	40 Best Street	43	51	58	60	35	62	58	37	46	42	39	60
4	40 Brogan Road	41	49	56	58	45	60	56	38	45	47	35	60
4	41 Best Street	48	56	63	65	49	67	63	43	52	52	42	60
4	41 Brogan Road	47	54	62	64	33	65	62	49	56	51	42	60
4	41 Rosewood Avenue	48	52	63	65	26	66	63	47	57	45	44	60
4	41 Westcott Crescent	43	49	58	60	38	62	58	34	40	45	37	60
4	42 Best Street	45	53	59	62	41	63	59	40	49	45	39	60
4	43 Brogan Road	46	53	61	63	33	65	61	49	56	47	41	60
4	44 Best Street	45	53	60	62	34	63	60	47	54	42	39	60
4	44 Brogan Road	51	58	65	68	52	69	65	49	57	56	44	60
4	45 Brogan Road	48	54	62	65	34	66	62	49	57	48	42	60
4	46-48 Brogan Road	50	58	64	67	53	68	65	43	41	55	43	60
4	47 Best Street	48	56	63	65	48	67	63	50	59	53	43	60
4	47 Brogan Road	48	54	63	65	35	67	63	48	57	56	43	60
4	47 Coronation Avenue	52	59	66	69	58	70	66	47	47	59	45	60
4	49 Brogan Road	49	55	63	66	33	67	64	48	58	54	44	60
4	49 Coronation Ave	54	61	68	71	59	72	68	47	52	61	47	60
4	49A Brogan Road	48	53	63	65	32	67	63	46	57	54	43	60
4	50 Brogan Road	47	55	62	65	52	66	62	40	37	54	40	60
4	51 Brogan Road	46	52	60	63	31	64	61	45	51	50	41	60
4	52-54 Brogan Road	49	56	63	66	52	67	64	41	43	54	42	60
4	52 Hartigan Ave	69	62	83	86	40	87	83	58	71	61	62	60
4	53 Brogan Road	42	49	57	59	31	61	57	43	50	45	37	60
4	54 Best Street	50	58	65	67	49	68	65	49	57	52	43	60
4	55 Brogan Road	50	58	65	67	47	69	65	46	53	56	44	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
4	56 Best Street	48	56	62	65	49	66	62	49	58	51	41	60
4	56 Brolgan Road	47	55	61	64	50	65	62	43	44	51	40	60
4	57 Brolgan Road	46	49	61	63	32	64	61	41	53	44	40	60
4	58 Best Street	48	54	63	65	49	66	63	49	59	51	42	60
4	58-62 Brolgan Road	50	57	64	67	52	68	64	44	53	54	43	60
4	59 Brolgan Road	53	59	68	70	44	72	68	54	62	57	47	60
4	59 Coronation Avenue	57	63	71	74	60	75	71	47	53	61	50	60
4	60 Best Street	49	54	64	67	43	68	64	50	60	47	44	60
4	62 Best Street	50	55	65	67	41	69	65	50	60	53	45	60
4	62-64 Brolgan Road	51	58	65	68	52	69	65	43	52	55	44	60
4	64 Best Street	51	56	65	68	43	69	65	51	61	56	45	60
4	66 Best Street	51	56	66	68	42	70	66	51	61	56	46	60
4	68 Best Street	51	56	66	69	40	70	66	51	62	56	46	60
4	66 Best Street	44	50	59	61	32	63	59	38	45	48	39	60
4	68 Best Street	51	56	66	69	30	70	66	51	62	56	46	60
4	70 Best Street	52	56	66	69	50	70	67	52	62	57	47	60
4	70 Brolgan Road	47	53	61	64	52	65	61	40	36	56	41	60
4	72 Brolgan Road	45	53	60	62	41	64	60	44	45	46	38	60
4	78 Brolgan Road	58	60	73	75	52	77	73	46	48	54	51	60
4	96 Close Street	42	49	57	59	41	61	57	34	39	45	39	60
4	100 Close Street	41	48	56	58	33	60	56	35	43	47	43	60
4	102 Close Street	43	48	57	60	33	61	58	42	48	44	41	60
4	104 Close Street	43	51	58	60	34	62	58	36	45	49	41	60
4	106 Close Street	41	49	56	58	34	60	56	33	42	46	40	60
4	108 Close Street	41	49	56	58	35	60	56	35	47	47	50	60
4	110 Close Street	41	49	56	59	42	60	56	42	48	47	50	60
4	112 Close Street	44	51	58	61	44	62	58	33	39	50	56	60
5	1 Angeleish Avenue	45	53	59	62	42	63	59	36	45	49	38	60
5	1 Arana Place	46	54	60	63	43	64	60	44	45	53	39	60
5	1 Basil Avenue	48	57	62	65	54	66	62	51	46	56	41	60
5	2 Angeleish Avenue	44	52	58	61	53	62	59	30	38	53	37	60
5	2 Arana Place	46	54	60	63	42	64	60	35	38	51	39	60
5	3 Angeleish Avenue	48	55	62	65	53	66	62	35	44	55	41	60
5	3 Arana Place	44	53	59	62	51	63	59	43	37	54	37	60
5	3 Basil Avenue	46	56	60	63	50	64	61	51	44	52	39	60
5	3 Marshall Place	46	55	60	63	37	64	60	47	46	41	39	60
5	4 Angeleish Avenue	42	50	57	59	46	61	57	40	27	53	35	60
5	4 Arana Place	47	55	61	64	48	65	61	31	41	50	40	60
5	4 Basil Avenue	49	59	64	66	55	68	64	52	39	57	42	60
5	4 Flinders Street	46	56	61	63	52	65	61	42	37	53	39	60
5	4 Marshall Place	45	53	59	62	53	63	59	46	41	50	38	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
5	5 Angeleish Avenue	47	54	61	64	45	65	61	42	44	53	40	60
5	5 Arana Place	46	54	60	63	47	64	61	44	46	50	39	60
5	5 Basil Avenue	47	58	62	64	54	66	62	51	43	56	40	60
5	5 Marshall Place	45	55	60	62	46	64	60	38	44	55	38	60
5	6 Angeleish Avenue	45	53	59	62	54	63	60	39	42	54	38	60
5	6 Arana Place	47	55	61	64	47	65	62	44	48	50	41	60
5	6 Basil Avenue	50	61	65	67	55	69	65	53	42	58	43	60
5	6 Marshall Place	42	53	57	60	39	61	57	36	46	48	36	60
5	7 Angeleish Avenue	47	54	61	64	48	65	61	37	44	52	40	60
5	7 Arana Place	46	55	61	63	48	64	61	42	40	51	39	60
5	9 Arana Place	46	57	61	63	48	65	61	51	45	51	39	60
5	7 Arana Place	46	56	61	63	48	65	61	43	45	51	39	60
5	7 Basil Avenue	47	57	62	64	49	66	62	51	43	52	40	60
5	8 Angeleish Avenue	45	53	59	62	53	63	59	45	40	54	38	60
5	8 Arana Place	45	55	60	62	47	64	60	44	45	53	39	60
5	8 Basil Avenue	50	60	65	68	55	69	65	53	44	57	43	60
5	8 Flinders Street	45	54	59	62	51	63	59	42	47	54	38	60
5	9 Angeleish Avenue	45	53	60	62	48	64	60	41	44	53	39	60
5	9 Arana Place	46	55	61	63	47	65	61	43	38	49	39	60
5	9 Basil Avenue	48	58	63	65	54	67	63	49	43	56	41	60
5	10 Angeleish Avenue	45	53	60	62	52	64	60	36	43	54	39	60
5	10 Arana Place	48	56	63	66	54	67	63	32	27	56	41	60
5	10 Basil Avenue	50	60	65	67	54	68	65	53	40	57	43	60
5	10 Coronation Avenue	45	55	60	63	46	64	60	44	41	50	39	60
5	10 Flinders Street	46	56	61	63	48	65	61	45	37	52	39	60
5	11 Arana Place	47	56	62	64	51	66	62	45	37	54	40	60
5	11 Basil Avenue	49	59	63	66	53	67	63	49	36	56	42	60
5	11a Angeliesh Avenue	47	55	62	64	50	66	62	46	43	55	41	60
5	11b Angeliesh Avenue	47	55	62	64	48	66	62	46	42	54	41	60
5	12 Angeleish Avenue	45	53	60	62	53	64	60	33	44	52	38	60
5	12 Arana Place	47	56	62	64	55	66	62	44	44	56	40	60
5	13 Angeliesh Avenue	48	55	62	65	50	66	62	35	42	53	41	60
5	14 Angeliesh Avenue	45	52	59	62	44	63	59	40	35	55	38	60
5	14 Arana Place	50	57	64	67	54	68	64	44	44	56	43	60
5	14 Coronation Avenue	46	54	61	63	53	65	61	40	43	54	39	60
5	14 Flinders Street	44	52	58	61	42	62	58	37	45	46	37	60
5	15 Angeliesh Avenue	50	59	65	67	56	69	65	47	42	58	43	60
5	15 Arana Place	46	56	61	64	52	65	61	43	48	51	40	60
5	15 Basil Avenue	49	58	63	66	53	67	63	49	43	56	42	60
5	16 Angeliesh Avenue	45	52	60	62	42	64	60	40	35	54	39	60
5	16 Arana Place	50	58	64	67	57	68	64	46	43	58	43	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
5	16 Basil Avenue	50	61	65	67	54	69	65	52	44	57	43	60
5	16 Coronation Avenue	47	55	61	64	43	65	61	43	44	47	40	60
5	17 Angeliesh Avenue	50	59	65	67	57	69	65	47	46	58	43	60
5	18 Angeliesh Avenue	49	57	63	66	57	67	63	39	39	58	42	60
5	18 Arana Place	46	53	60	63	54	64	61	34	35	55	39	60
5	20 Arana Place	50	58	64	67	54	68	64	44	43	56	43	60
5	18 Arana Place	50	58	64	67	54	68	64	44	43	56	43	60
5	18 Basil Avenue	50	59	65	67	54	68	65	50	44	56	43	60
5	18 Coronation Avenue	48	56	62	65	55	66	62	45	38	57	41	60
5	19 Angeliesh Avenue	50	58	65	67	56	68	65	47	44	58	43	60
5	20 Arana Place	49	58	64	67	54	68	64	43	36	56	43	60
5	20 Coronation Avenue	49	57	64	66	54	68	64	44	46	57	42	60
5	20 Flinders Street	45	55	60	62	50	64	60	44	35	53	38	60
5	Lot 20 Mitchell Street	49	60	64	66	52	68	64	48	43	55	42	60
5	22 Arana Place	49	58	63	66	54	67	63	43	36	56	42	60
5	22 Flinders Street	47	55	62	64	43	66	62	37	48	51	41	60
5	24-30 Coronation Avenue	49	57	64	66	56	68	64	44	43	54	42	60
5	24 Flinders Street	44	52	58	61	38	62	58	44	45	49	38	60
5	28 Flinders Street	46	55	60	63	45	64	60	44	36	53	39	60
5	30 Flinders Street	44	51	58	61	53	62	58	37	39	54	37	60
5	32 Coronation Avenue	51	59	66	68	56	69	66	45	43	58	44	60
5	32 Flinders Street	45	55	60	62	38	63	60	45	27	51	38	60
5	34 Flinders Street	45	52	59	62	50	63	60	46	46	52	39	60
5	35 Flinders Street	46	55	61	63	52	65	61	39	45	54	40	60
5	36 Flinders Street	41	50	56	59	51	60	56	35	38	53	35	60
5	38-40 Coronation Avenue	51	59	65	68	56	69	66	46	45	58	44	60
5	38 Flinders Street	44	54	59	61	42	63	59	40	48	49	38	60
5	39 Flinders Street	43	52	58	60	45	62	58	39	45	48	37	60
5	40 Flinders Street	44	52	58	61	45	62	58	37	45	50	37	60
5	42 Coronation Avenue	50	58	65	68	57	69	65	46	48	58	44	60
5	43 Flinders Street	44	52	58	61	47	62	58	38	45	49	37	60
5	45 Flinders Street	45	54	60	62	44	63	60	37	45	48	38	60
5	48 Coronation Avenue	51	58	65	68	58	69	65	45	49	61	44	60
5	50 Coronation Avenue	55	61	69	72	60	73	69	45	47	61	48	60
5	85 Victoria Street	44	54	59	61	50	63	59	45	33	53	37	60
5	87 Victoria Street	43	51	58	61	49	62	58	43	38	54	37	60
5	89 Victoria Street	44	52	59	61	46	63	59	34	45	54	38	60
5	91 Victoria Street	41	49	56	59	52	60	56	38	39	53	35	60
5	93 Victoria Street	46	54	61	63	53	64	61	36	46	54	40	60
5	95 Victoria Street	46	57	60	63	44	64	60	47	46	49	38	60
5	97-105 Victoria Street	47	57	62	64	54	66	62	49	45	58	41	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
5	97 Victoria Street	47	55	62	64	56	66	62	39	43	58	40	60
5	107-109 Victorial Street	47	57	62	64	48	66	62	43	44	56	41	60
5	108 Condobolin Road	47	54	61	64	52	65	61	41	46	55	40	60
5	110 Condobolin Road	47	54	61	64	52	65	61	36	46	55	40	60
5	111 Victoria Street	46	54	61	63	43	65	61	50	44	56	40	60
5	112 Condobolin Road	47	55	62	64	53	66	62	34	45	57	41	60
5	113-119 Mitchell Street	50	61	65	67	52	69	65	51	44	56	43	60
5	113-117 Victoria Street	47	56	62	64	58	65	62	41	44	57	40	60
5	114-120 Condobolin Road	44	54	58	61	34	62	59	48	26	36	37	60
5	119 Victoria Street	51	61	66	68	56	69	66	53	45	59	44	60
5	121-123 Victoria Street	51	61	66	69	57	70	66	54	46	60	44	60
5	122 Condobolin Road	47	58	62	65	40	66	62	49	26	52	41	60
5	122-124 Victoria Street	46	56	61	64	54	65	61	50	44	56	40	60
5	123 Mitchell St	51	62	65	68	53	69	65	52	44	57	44	60
5	124-126 Condobolin Road	47	58	61	64	44	65	61	43	26	53	40	60
5	126 Victoria Street	43	53	58	61	37	62	58	48	24	42	36	60
5	127 Mitchell St	54	67	68	71	54	72	69	57	44	58	47	60
5	128-132 Condobolin Road	50	60	64	67	51	68	65	51	45	53	43	60
5	128 Victoria Street	49	58	63	66	54	67	64	51	44	58	42	60
5	130 Victoria Street	43	55	57	60	39	61	57	42	34	41	36	60
5	131-133 Victoria Street	53	64	67	70	59	71	67	53	45	61	46	60
5	132 Victoria Street	50	60	64	67	56	68	64	52	44	58	43	60
5	134-138 Condobolin Road	50	61	64	67	43	68	64	54	27	45	43	60
5	135 Victoria Street	54	66	69	72	57	73	69	58	46	62	47	60
5	138 Victoria Street	49	60	63	66	56	67	63	54	45	59	42	60
5	140-144 Condobolin Road	52	62	66	69	58	70	66	53	46	61	45	60
5	144 Victoria Street	52	63	67	69	57	71	67	55	45	59	45	60
5	146 Condobolin Road	54	64	68	71	59	72	68	54	48	63	47	60
5	147-151 Victoria Street	66	87	80	83	57	84	80	71	45	62	58	60
5	150 Victoria Street	52	63	66	69	56	70	66	60	45	60	45	60
5	151-153 Condobolin Road	46	55	61	63	51	64	61	46	46	53	39	60
5	154 Victoria Street	56	70	71	73	56	75	71	64	27	60	49	60
5	155 Condobolin Road	42	50	57	59	43	61	57	29	38	45	35	60
5	157 Condobolin Road	42	51	57	60	54	61	57	34	41	52	36	60
5	159 Condobolin Road	42	49	56	59	54	60	56	30	39	53	35	60
5	161-163 Condobolin Road	46	56	61	63	54	64	61	46	38	53	39	60
5	165 Condobolin Road	46	56	61	63	55	65	61	47	33	56	39	60
5	167 Condobolin Road	46	57	61	64	55	65	61	47	34	57	39	60
5	169 Condobolin Road	46	57	61	63	56	65	61	47	39	56	39	60
5	171 Condobolin Road	47	57	62	64	56	66	62	48	44	56	40	60
5	173 Condobolin Road	48	57	62	65	57	66	62	48	44	55	41	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
5	175 Condobolin Road	48	58	62	65	55	66	63	48	44	56	41	60
5	177 Condobolin Road	50	59	64	67	58	68	65	49	44	57	43	60
5	179-187 Condobolin Road	51	60	66	69	58	70	66	49	45	61	45	60
5	189-197 Condobolin Road	52	62	67	69	54	71	67	51	48	61	45	60
6	1 Moulden Street Parkes	65	65	79	82	55	83	80	62	44	60	58	60
6	Parkes Christian School Back Trundle Roa	51	59	66	68	53	70	66	45	44	56	44	60
6	Parkes Christian School, Back Trundle Ro	50	58	64	67	50	68	65	44	42	54	43	60
6	1A Moulden Street	61	69	75	78	59	79	76	60	45	66	54	60
6	3 Cookapie Street	52	62	67	69	48	71	67	46	40	52	45	60
6	3 Dunns Lane	54	63	69	71	52	72	69	52	42	56	47	60
6	3 Moulden Street	59	65	74	76	55	78	74	60	43	58	52	60
6	5 Cookapie Street	51	60	65	68	48	69	65	46	40	52	44	60
6	5 Moulden Street	58	65	73	75	53	76	73	58	43	57	51	60
6	7 Cookapie Street	51	60	65	68	49	69	65	46	40	52	43	60
6	7 Dunns Lane	52	60	67	69	46	71	67	53	42	52	45	60
6	7 Moulden Street	58	65	72	75	53	76	72	57	43	56	51	60
6	9 Dunns Lane	53	61	68	70	52	72	68	51	42	56	46	60
6	10 Cookapie Street	49	59	64	66	50	68	64	47	41	54	42	60
6	11 Moulden Street	57	65	72	74	52	76	72	54	42	55	50	60
6	13 Moulden Street	57	65	72	74	51	76	72	53	42	54	50	60
6	14 Dunns Lane	52	61	66	69	51	70	67	50	42	54	45	60
6	15 Cookapie Street	49	58	64	66	49	68	64	46	40	53	42	60
6	15 Moulden Street	57	65	72	74	43	76	72	52	42	49	50	60
6	17 Moulden Street	58	66	73	75	51	77	73	53	42	54	51	60
6	19 Cookapie Street	51	60	66	68	51	70	66	48	42	55	44	60
6	19 Moulden Street	58	66	73	75	38	77	73	53	41	45	51	60
6	21-29 Moulden Street	58	66	73	75	50	76	73	49	40	53	51	60
6	31-39 Moulden Street	57	65	71	74	48	75	71	47	41	52	50	60
6	41 Moulden Street (Shed) Parkes	53	63	68	70	48	72	68	46	40	52	46	60
6	41 Moulden Street Parkes	57	65	72	74	48	76	72	40	33	51	50	60
6	170 Back Trundle Road	65	63	79	82	55	83	80	66	44	60	58	60
6	176-180 Back Trundle Road	61	62	76	78	54	79	76	57	43	59	54	60
6	182-184 Back Trundle Road	55	61	70	72	53	74	70	47	43	58	48	60
6	186-192 Back Trundle Road	47	57	62	65	33	66	62	36	23	37	40	60
6	194 Back Trundle Road	52	60	66	69	52	70	66	44	43	56	45	60
6	209 Back Trundle Road	56	62	70	73	56	74	70	53	44	60	49	60
6	215 Back Trundle Road	53	60	68	70	53	71	68	50	43	56	46	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
6	238 Henry Parkes Way	65	69	80	82	62	84	80	53	48	67	58	60
6	250 Henry Parkes Way	66	66	81	83	58	85	81	48	45	61	59	60
6	302A Henry Parkes Way	49	57	64	66	50	68	64	42	42	53	42	60
6	302B Henry Parkes Way	51	58	65	68	51	69	65	43	42	53	44	60
7	1 Highland Avenue	49	60	63	66	51	67	64	48	44	54	42	60
7	2 Highland Avenue	47	57	62	64	51	66	62	47	43	53	40	60
7	3 Highland Avenue	49	60	64	66	51	68	64	48	43	54	42	60
7	4 Highland Avenue	48	59	63	65	51	67	63	47	43	53	41	60
7	6 Highland Street	48	59	63	65	50	67	63	47	43	53	41	60
7	4 Highland Avenue	46	56	60	63	48	64	60	46	32	48	39	60
7	6 Highland Street	48	59	63	65	50	67	63	47	43	53	41	60
7	8 Highland Street	48	59	63	66	50	67	63	47	43	53	41	60
7	10 Highland Avenue, Highland Avenue	49	59	63	66	50	67	63	48	43	54	42	60
7	8 Highland Street	43	55	57	60	36	61	57	35	31	39	36	60
7	10 Highland Avenue, Highland Avenue	49	59	63	66	50	67	63	48	43	54	42	60
7	10 Jack Burch Road	51	63	66	68	50	70	66	50	42	53	44	60
7	12 Highland Avenue	48	59	63	66	49	67	63	46	43	53	42	60
7	25-27 Thomas Street	46	58	61	64	46	65	61	37	40	47	40	60
7	31-33 Thomas Street	48	60	63	65	47	67	63	46	41	50	41	60
7	35-37 Thomas Street	48	60	63	66	47	67	63	46	41	50	41	60
7	39-41 Thomas Street	49	61	63	66	47	67	63	46	41	50	42	60
7	41 Ainsworth Street	48	59	63	65	48	67	63	47	42	51	41	60
7	43-45 Thomas Street	47	59	62	64	47	65	62	47	41	51	40	60
7	47 Thomas Street	51	63	65	68	48	69	66	47	41	51	44	60
7	50 Thomas Street	47	58	61	64	45	65	61	43	34	48	40	60
7	53 Thomas Street (Shed) Parkes	52	65	67	69	48	71	67	49	41	52	45	60
7	64-70 Rose Street	52	64	66	69	50	70	66	52	43	53	45	60
7	65 Thomas Street (Shed) Parkes	57	78	72	74	49	76	72	52	41	53	50	60
7	65 Thomas Street Parkes	58	79	72	75	49	76	72	50	41	52	50	60
7	68-72 THomas Street	50	62	64	67	47	68	64	46	40	50	43	60
7	74-78 Thomas Street	49	61	64	66	47	68	64	46	40	50	42	60
7	78 Rose Street	54	67	68	71	52	72	68	57	43	55	47	60
7	80 Rose Street	57	77	71	74	53	75	71	60	43	56	50	60
7	80-82 Thomas Street	50	63	65	67	47	69	65	47	40	51	43	60
7	82 Rose Street	53	65	67	70	53	71	67	54	44	56	46	60
7	84-86 Thomas Street	52	66	66	69	48	70	66	48	41	51	45	60
7	88-90 THomas Street	54	70	69	71	48	73	69	46	41	51	47	60
7	92-94 Thomas Street	59	79	73	76	48	77	73	49	41	52	52	60

NCA	Address	Construction Noise Level, dBA LAMax											Sleep Disturbance Criteria
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10	Scenario 11	
7	126 Mitchell Street	46	55	60	63	50	64	60	46	43	53	39	60
7	130 Mitchell Street	45	54	60	62	51	64	60	38	43	53	39	60
7	134 Mitchell Street	48	57	62	65	52	66	62	47	44	54	41	60
7	136 Mitchell Street	48	57	62	65	50	66	62	48	45	53	41	60
7	138 Mitchell Street	46	58	61	64	48	65	61	48	43	52	40	60
7	140 Mitchell Street	50	60	64	67	52	68	64	49	43	55	43	60
7	154 Mitchell Street	52	63	66	69	52	70	66	52	44	56	45	60
8	7 Goldrush Road	46	56	60	63	40	64	60	35	34	44	39	60
8	9 Goldrush Road	48	58	63	65	40	66	63	35	34	43	41	60
8	30 Heraghty Road	45	55	60	62	35	63	60	30	30	39	38	60
8	101 Heraghty Rd	45	55	60	62	35	64	60	30	30	39	38	60
8	103 Heraghty Road	47	57	61	64	36	65	61	31	31	39	40	60
8	115 Heraghty Rd	47	57	62	64	36	65	62	31	31	40	40	60
8	127 Heraghty Rd	47	58	62	64	37	66	62	32	32	40	40	60
8	130 Heraghty Rd	47	58	62	65	38	66	62	33	32	41	41	60
8	139 Heraghty Rd	46	56	61	63	38	65	61	33	33	41	39	60
8	Lot 152 Goldrush Road	49	59	64	66	42	67	64	37	36	45	42	60
8	163 Goldrush Road	50	60	65	67	40	68	65	36	35	44	43	60
8	163a Goldrush Road	51	61	66	68	39	69	66	34	33	42	44	60
8	Lot 1086 Moulden Street	55	64	70	73	45	74	70	42	38	49	48	60
9	Lumeah Bogan Road	64	76	79	81	37	82	79	32	32	41	57	60
9	Lot 2 Endicott Street	53	69	68	70	40	72	68	36	34	43	46	60
9	47 Bleechmore Road	45	52	59	62	36	63	59	32	31	39	41	60
9	57 Bleechmore Road	45	52	60	63	35	64	60	31	31	39	42	60
9	59 Maguire Road	47	48	61	64	30	65	61	25	10	33	40	60
9	63 Maguire Road	50	50	64	67	30	68	64	24	10	33	43	60
9	79 Maguire Road	45	47	60	63	29	64	60	24	10	32	38	60
9	81 Bleechmore Road	45	49	60	62	29	64	60	27	16	32	40	60
9	128 Painter Street	53	68	67	70	41	71	67	38	35	45	45	60
9	285 Newell Highway	48	57	63	66	37	67	63	32	32	41	47	60
9	300 Newell Highway	46	52	61	63	16	65	61	12	12	20	45	60
9	340 Newell Highway	47	52	61	64	35	65	61	31	30	38	43	60
9	Lot 720 Painter Street	48	61	63	65	41	67	63	38	35	44	41	60
9	Lot 731 Endicott Street	50	64	65	68	39	69	65	36	34	43	43	60
NCA10	98 Bogan Road	49	51	64	66	14	68	64	9	9	17	42	60

Newell Highway Upgrade - Parkes
Bypass

APPENDIX D
PREDICTED CONSTRUCTION NOISE
LEVELS

Figure D1 Predicted construction noise levels – Scenario 1 – northern project extent

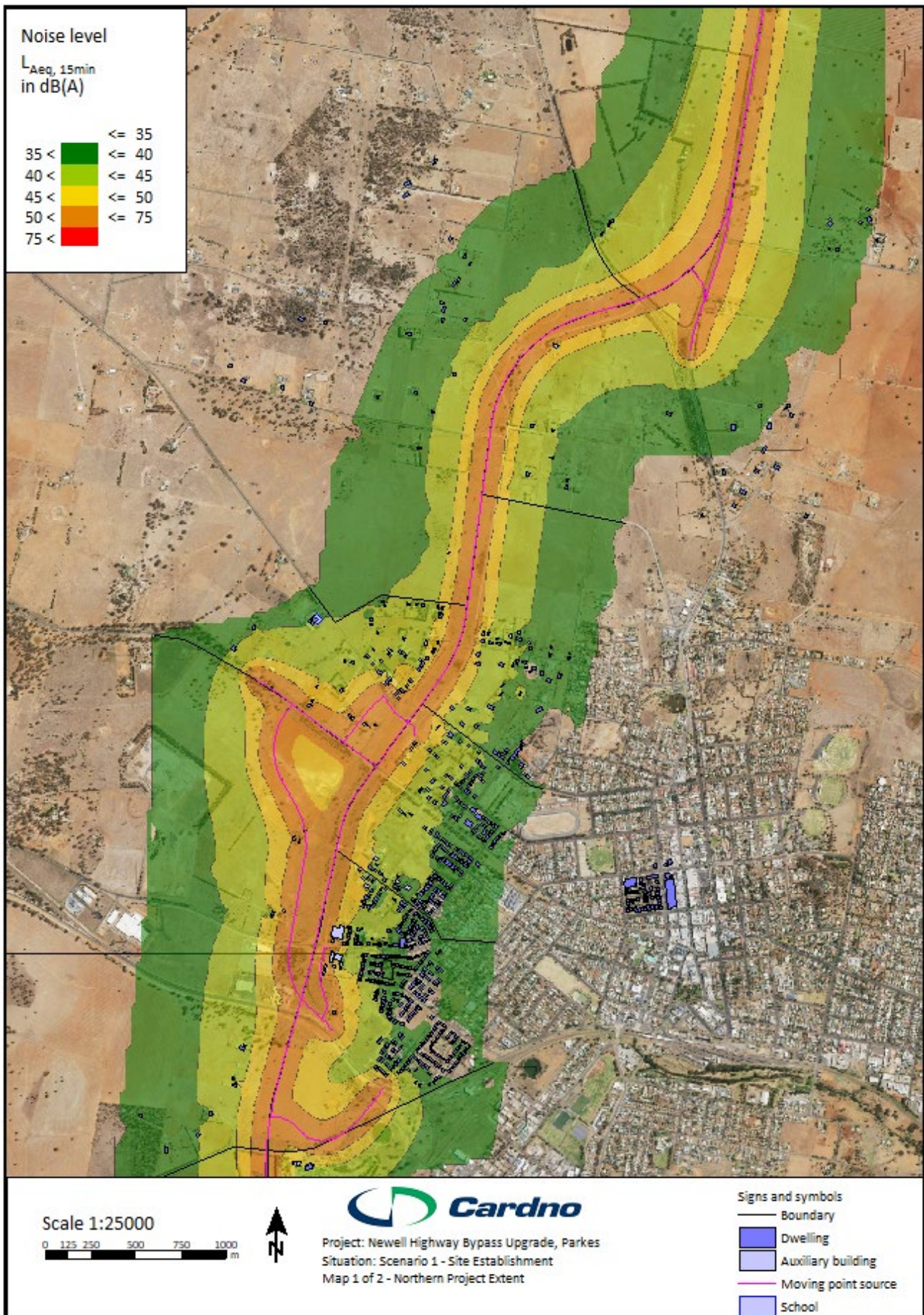


Figure D2 Predicted construction noise levels – Scenario 1 – southern project extent

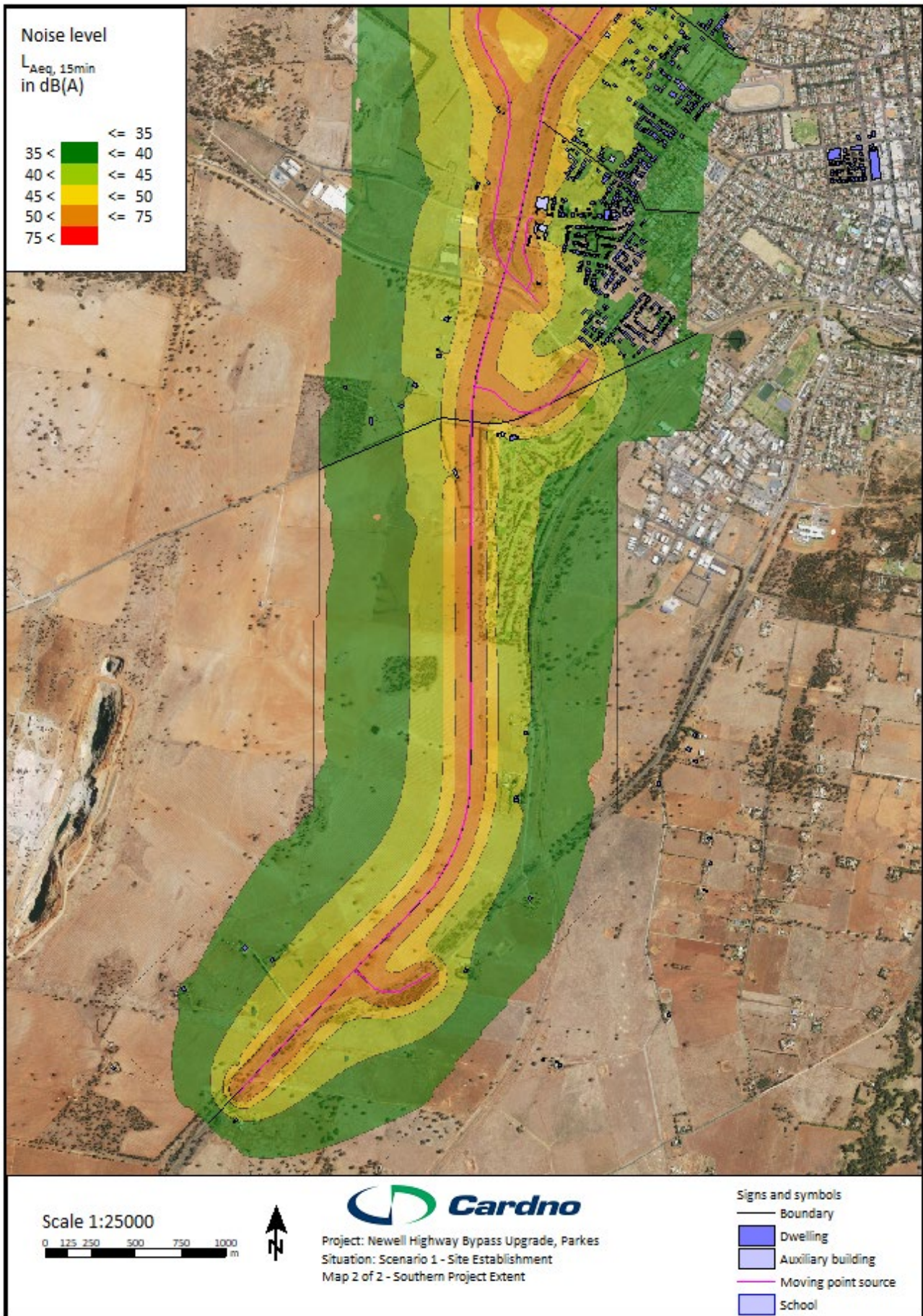


Figure D3 Predicted construction noise levels – Scenario 2 – northern project extent

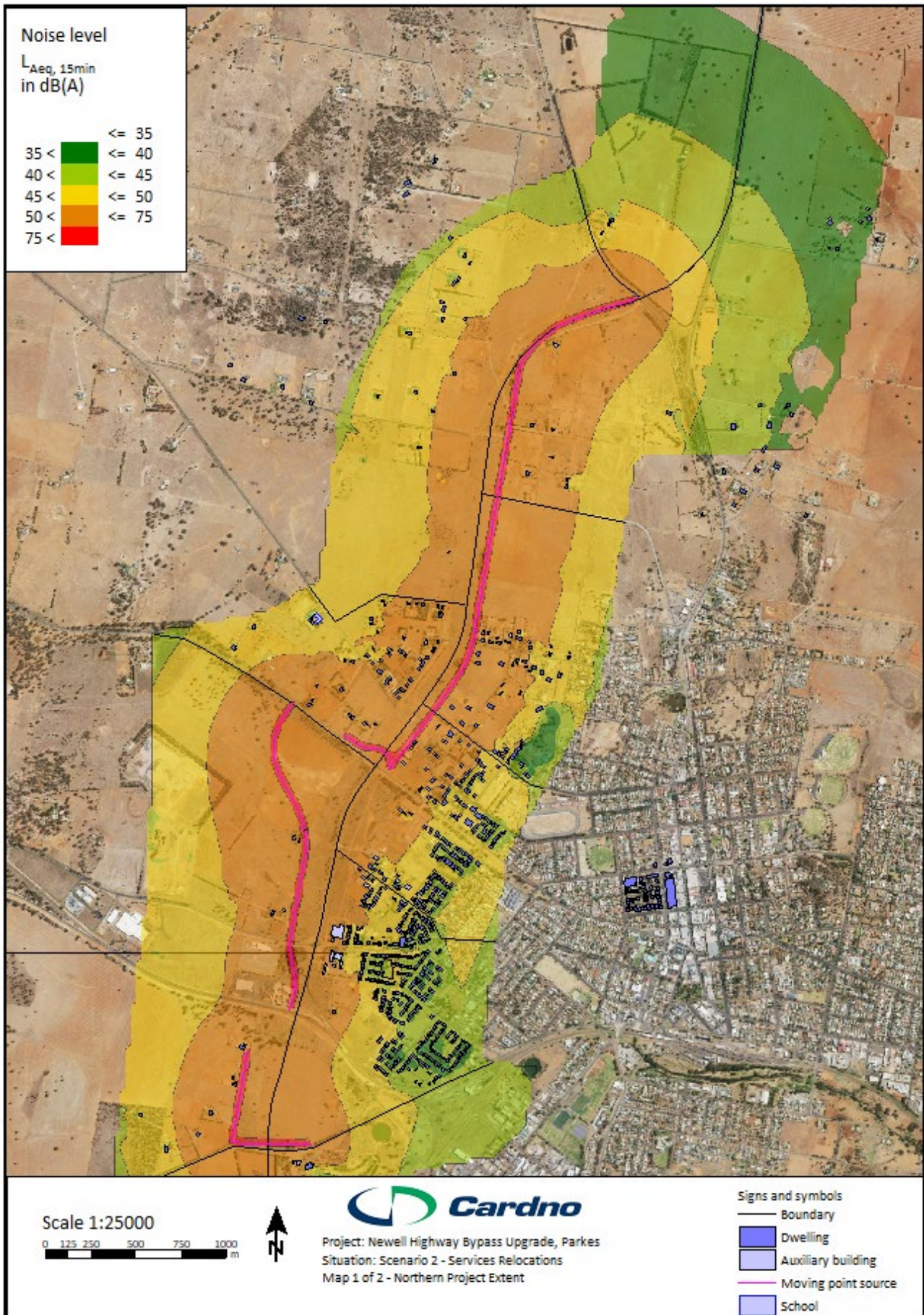


Figure D4 Predicted construction noise levels – Scenario 2 – southern project extent

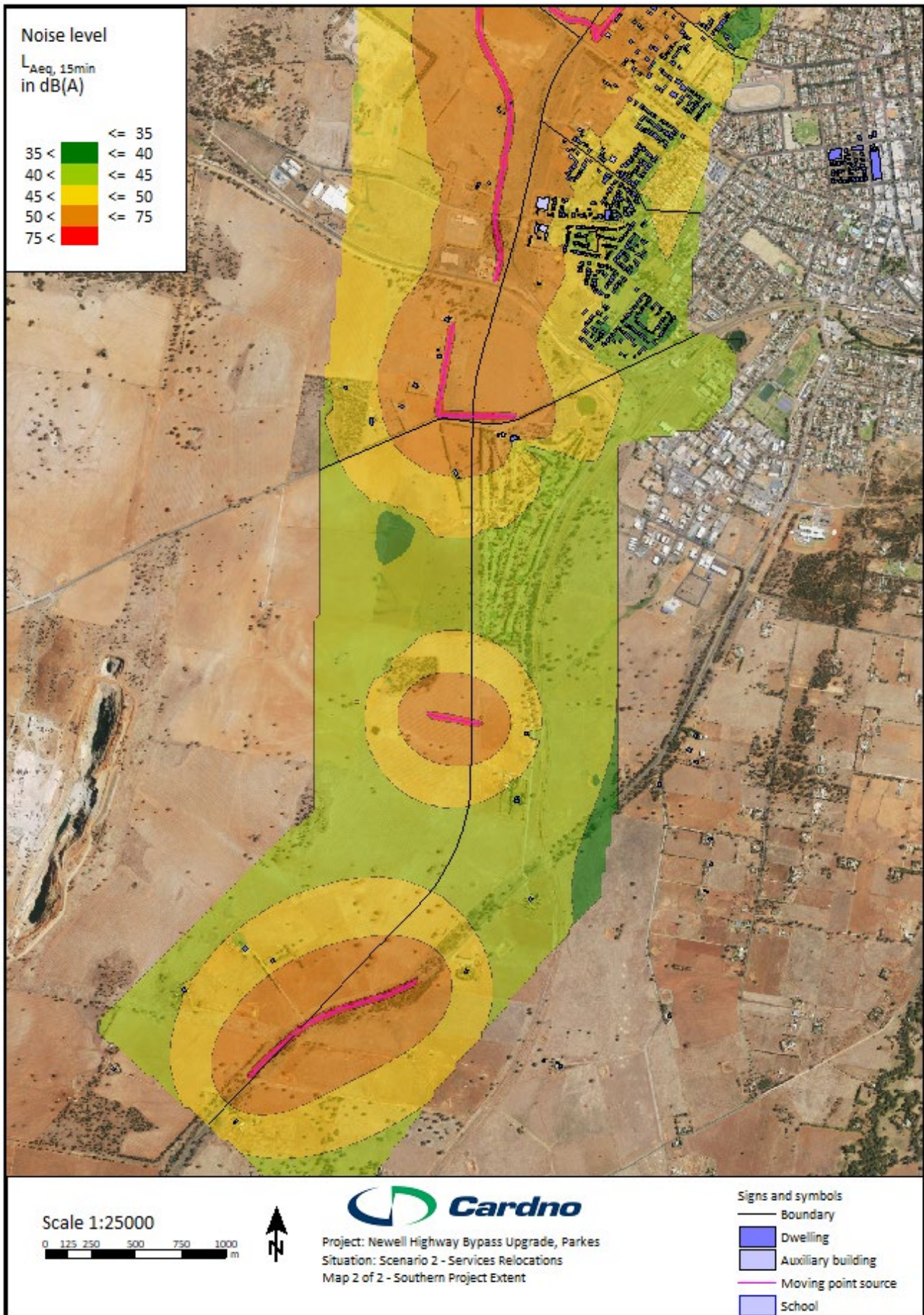


Figure D5 Predicted construction noise levels – Scenario 3 – northern project extent

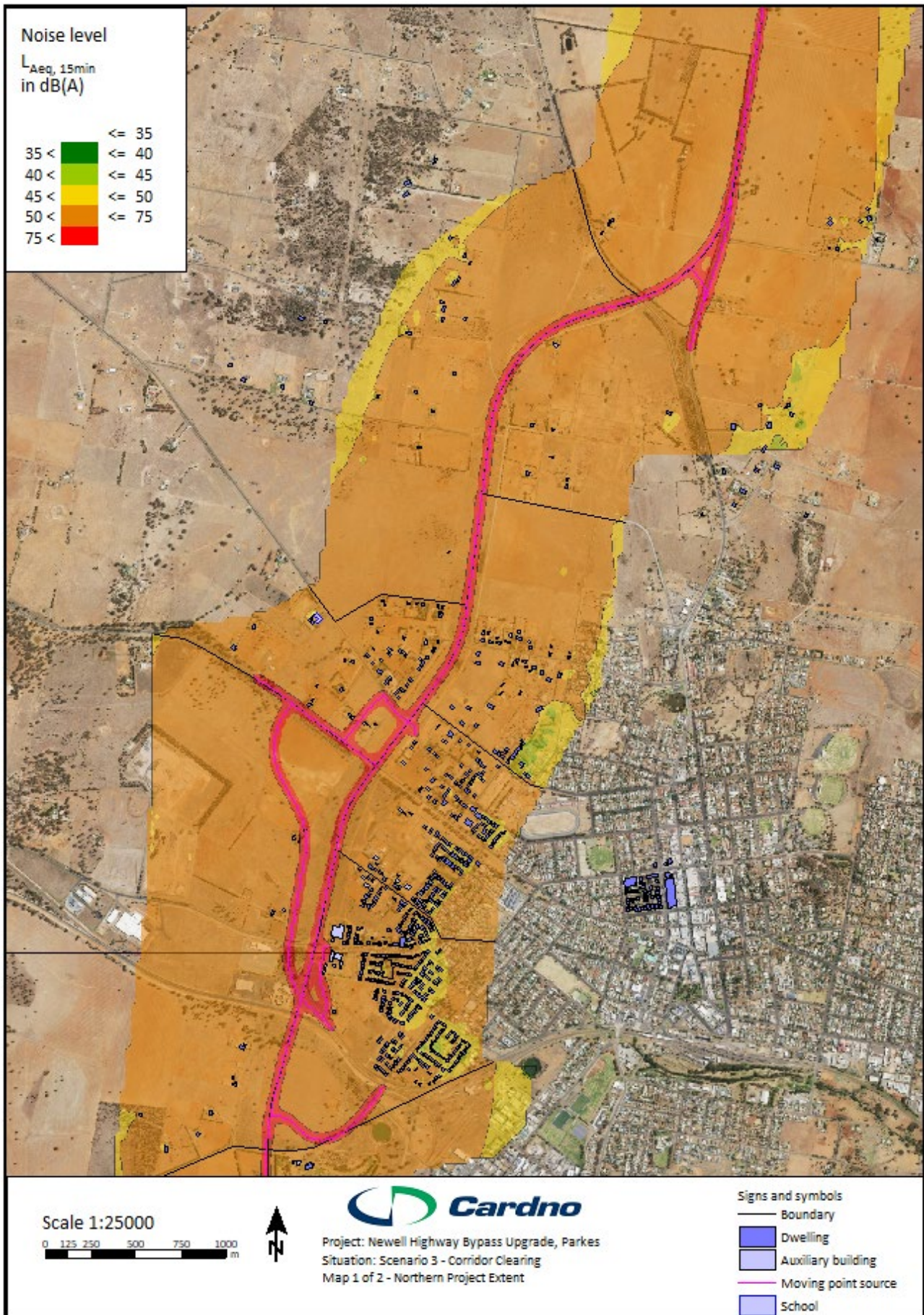


Figure D6 Predicted construction noise levels – Scenario 3 – southern project extent

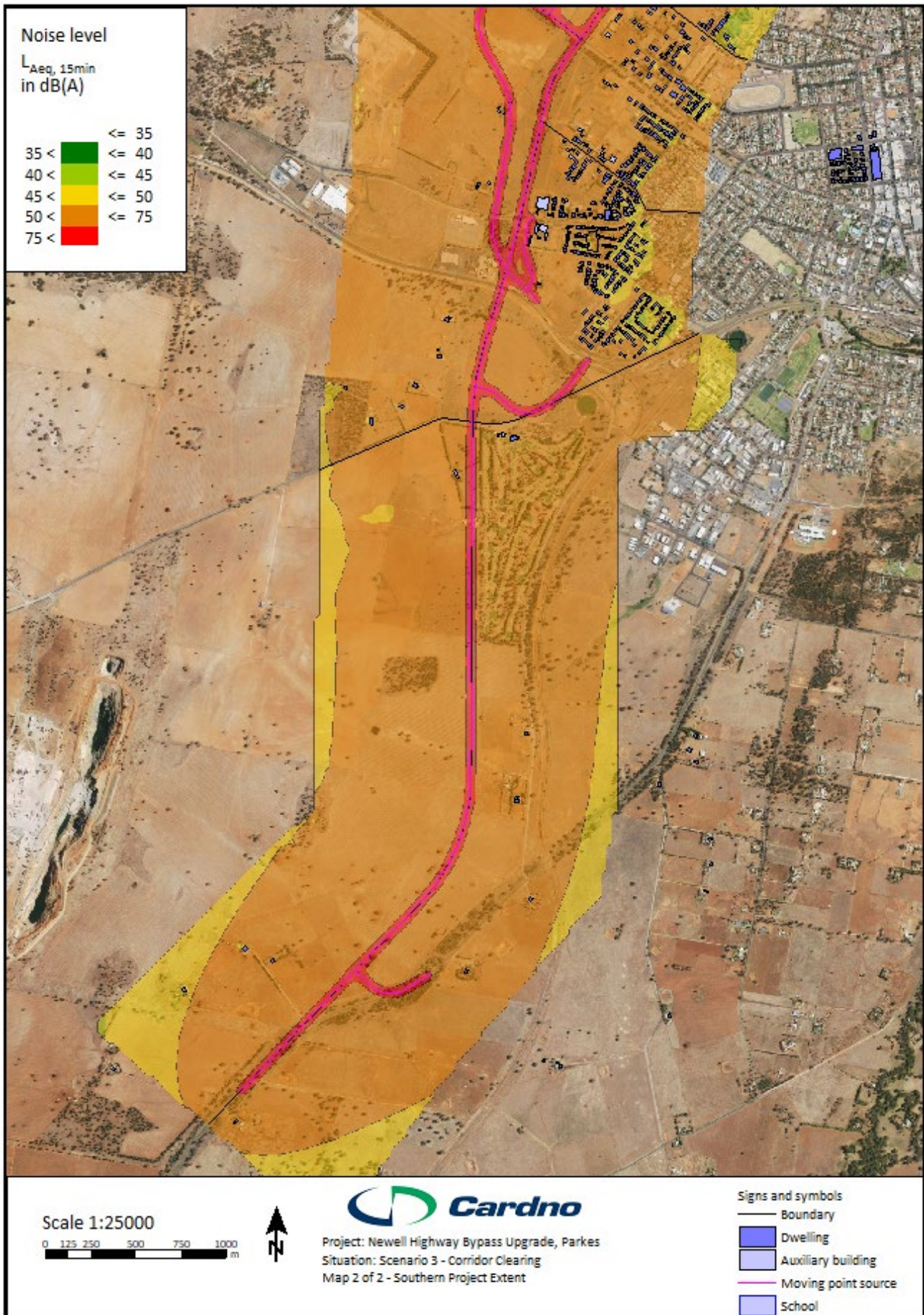


Figure D7 Predicted construction noise levels – Scenario 4 – northern project extent

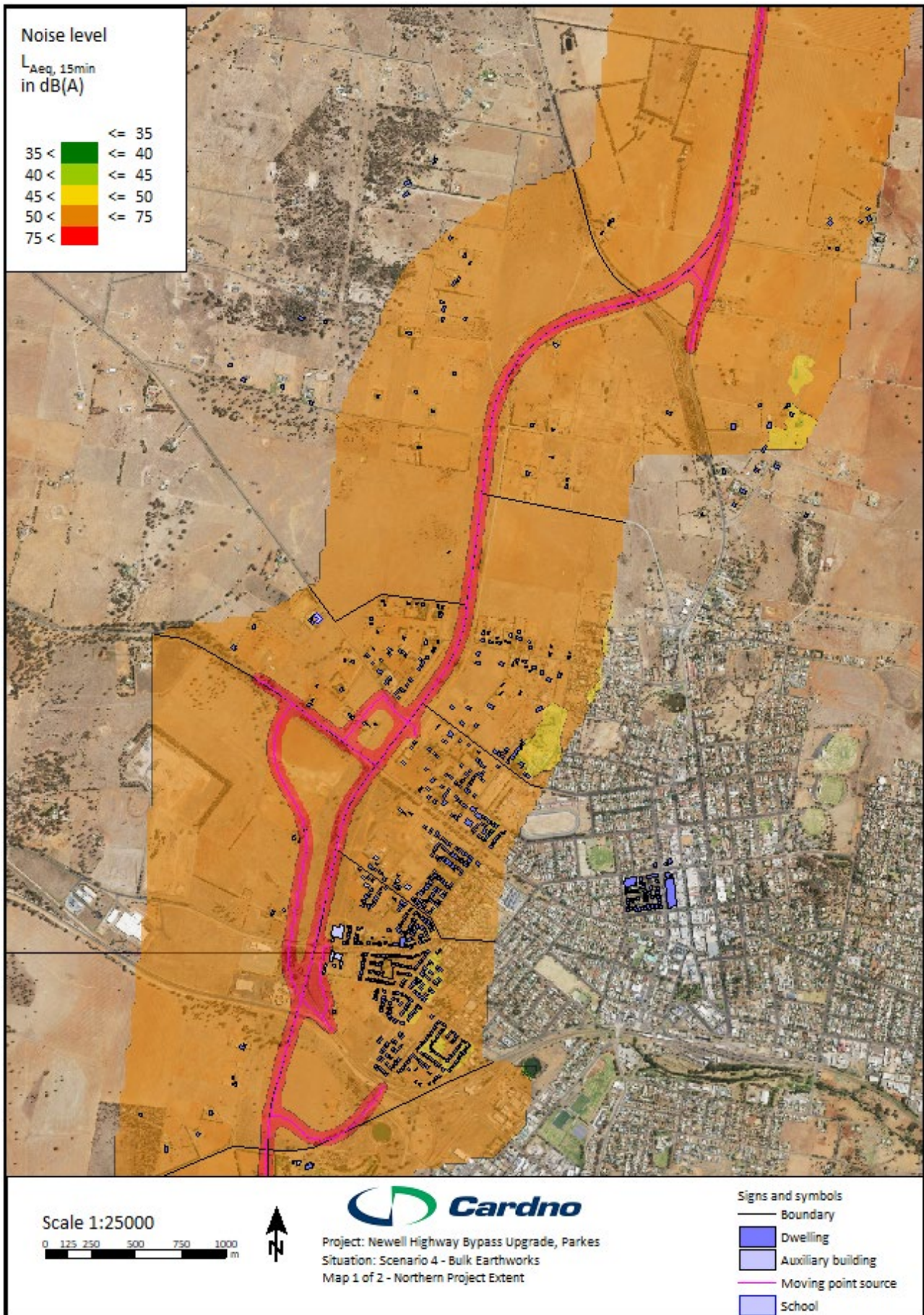


Figure D8 Predicted construction noise levels – Scenario 4 – southern project extent

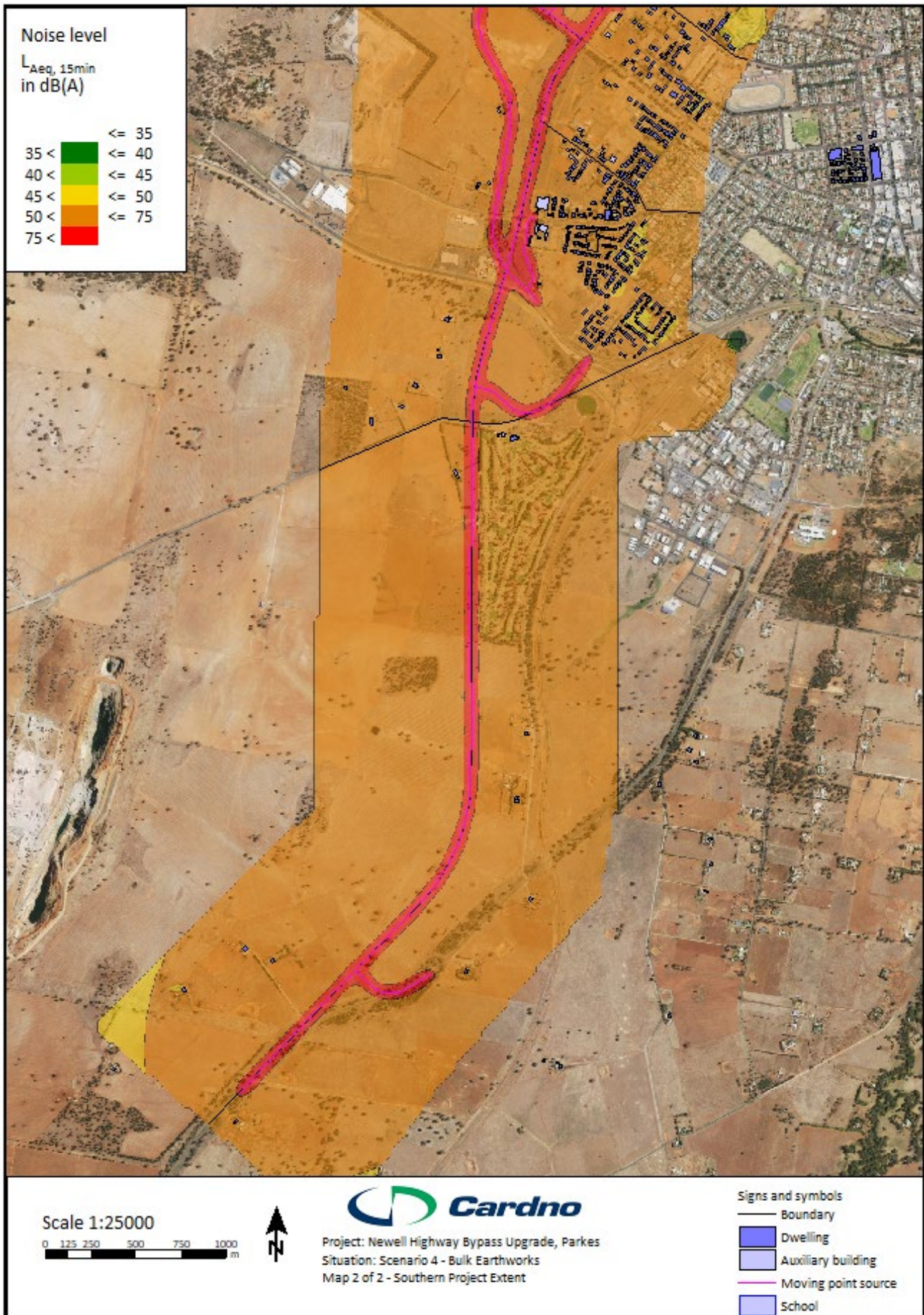


Figure D9 Predicted construction noise levels – Scenario 5

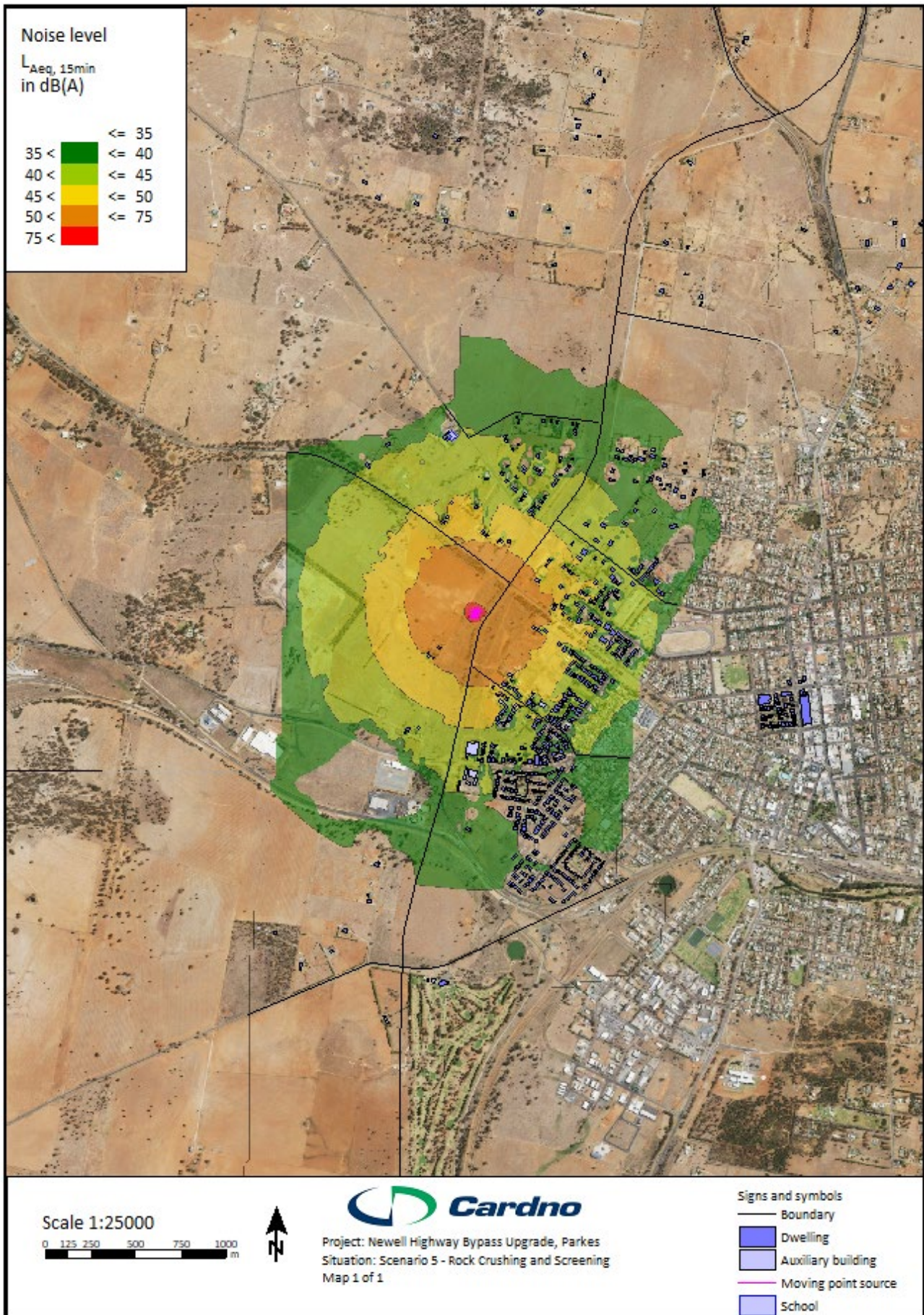


Figure D10 Predicted construction noise levels – Scenario 6 – northern project extent

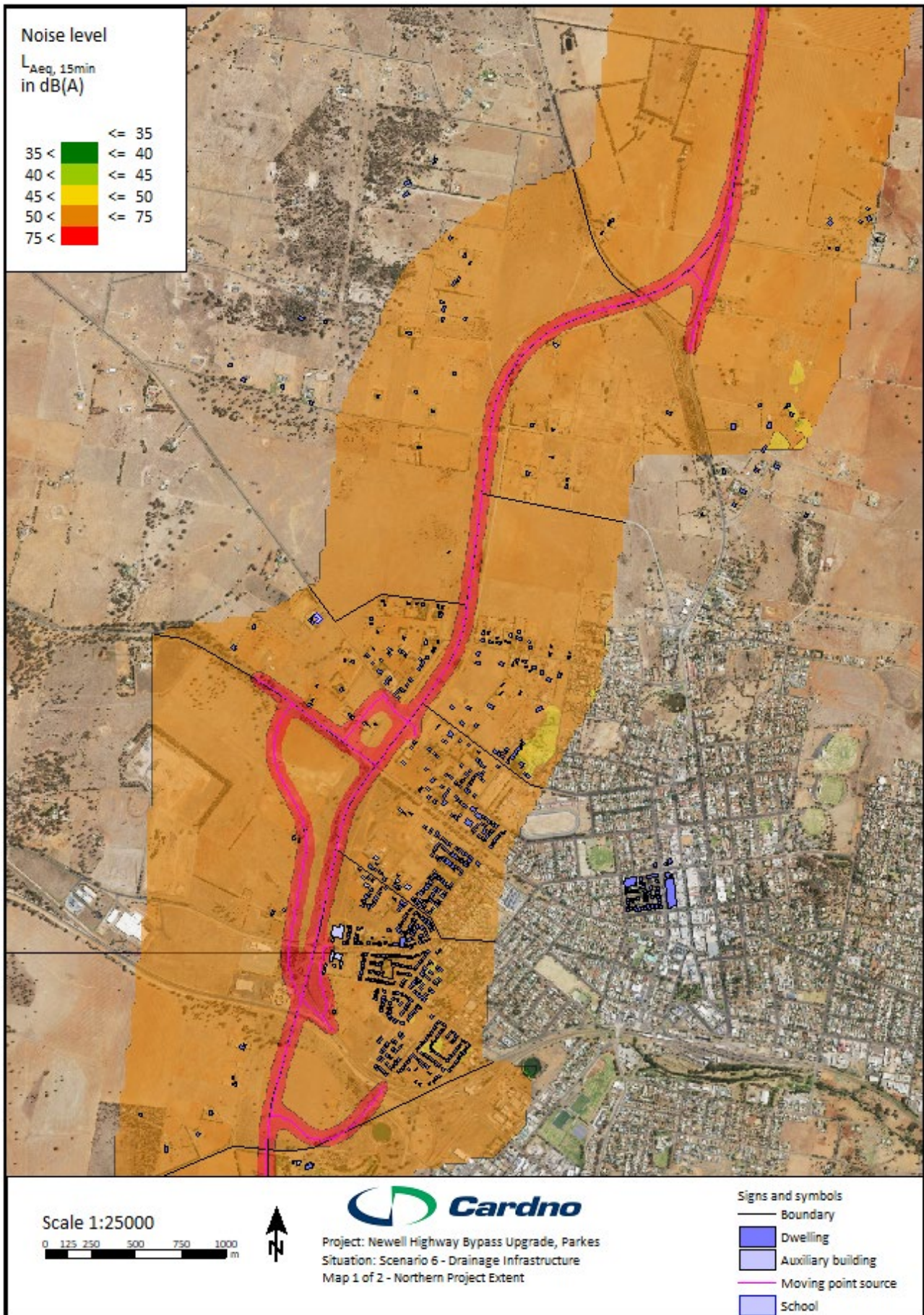


Figure D11 Predicted construction noise levels – Scenario 6 – southern project extent

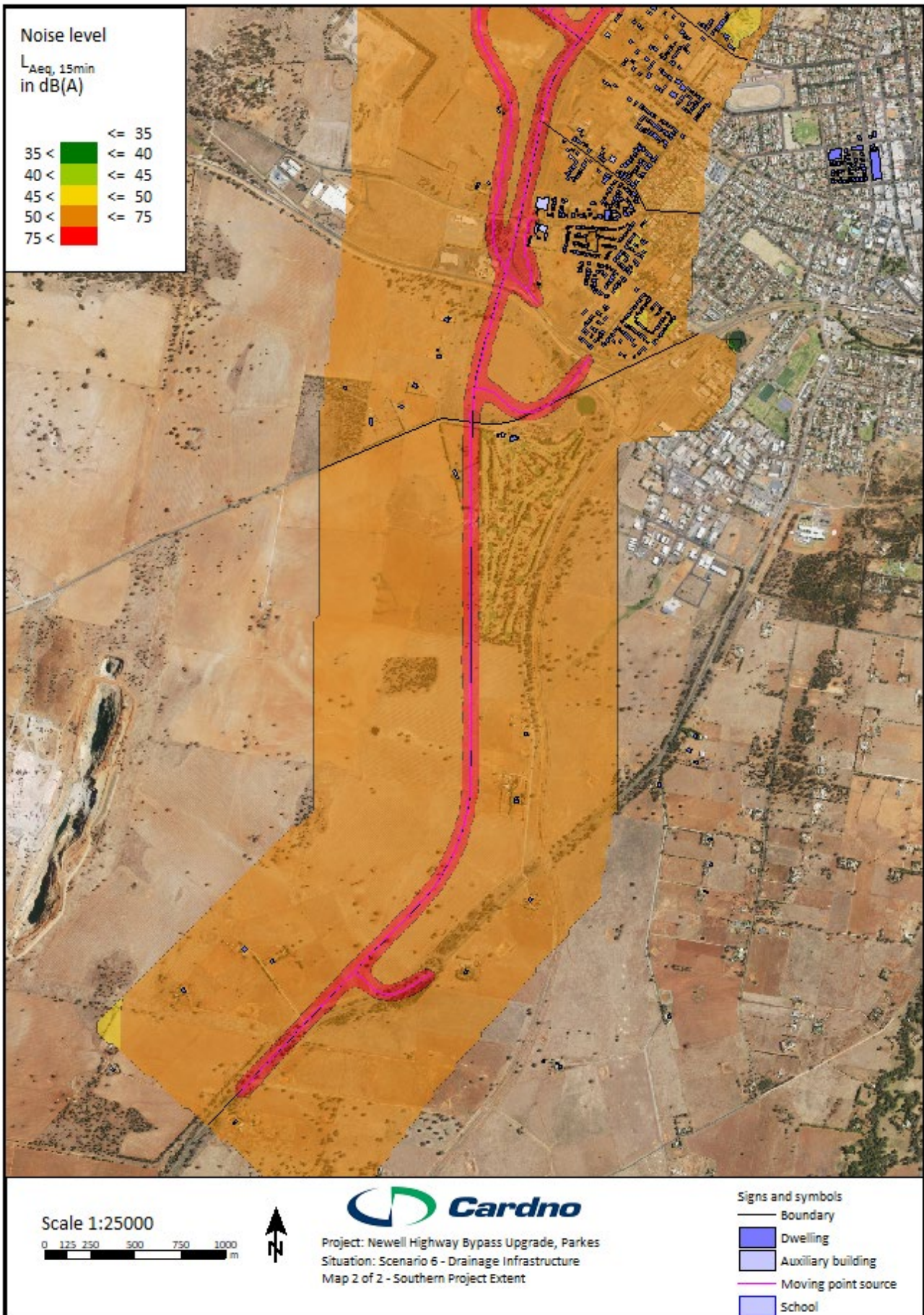


Figure D12 Predicted construction noise levels – Scenario 7 – northern project extent

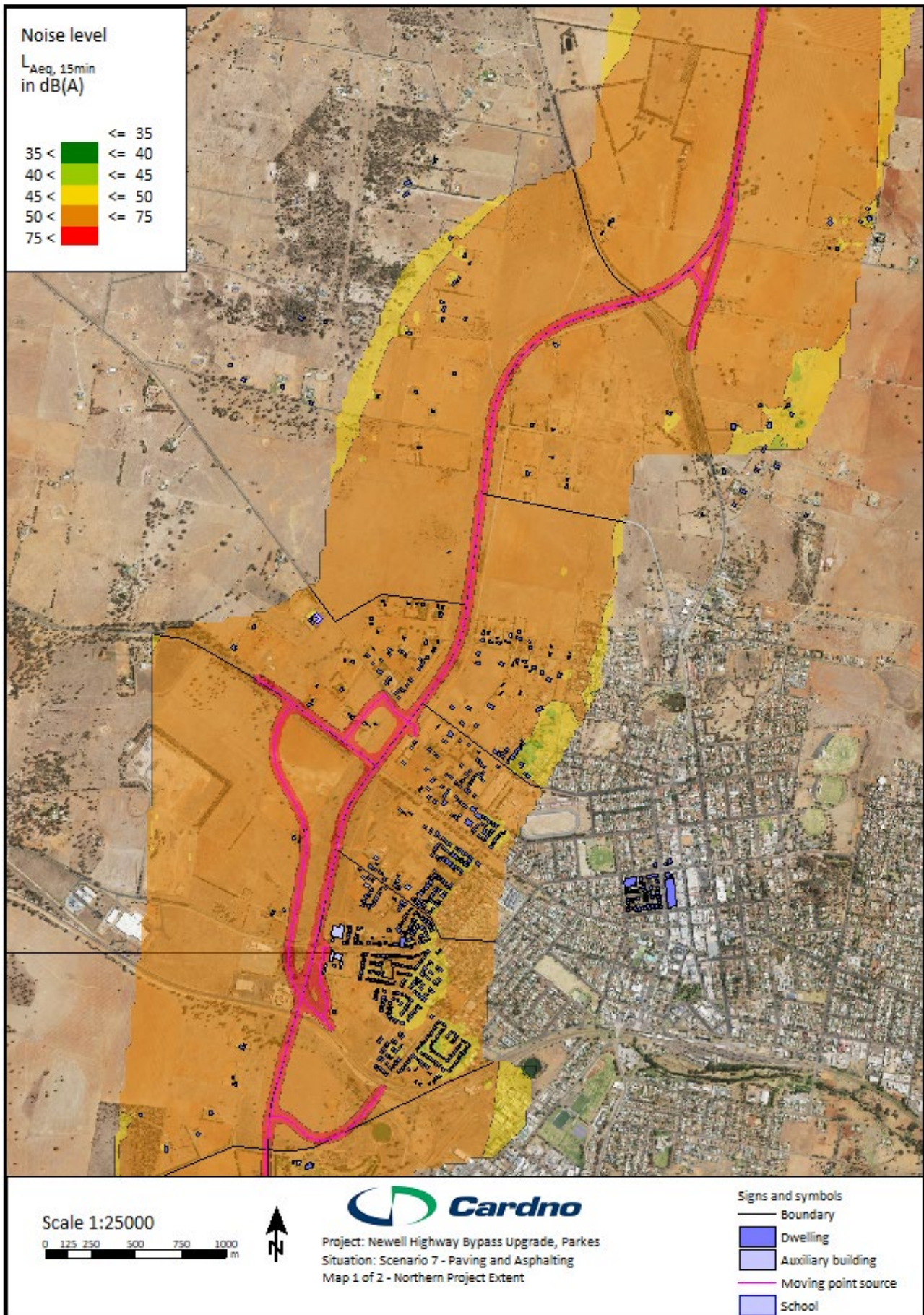


Figure D13 Predicted construction noise levels – Scenario 7 – southern project extent

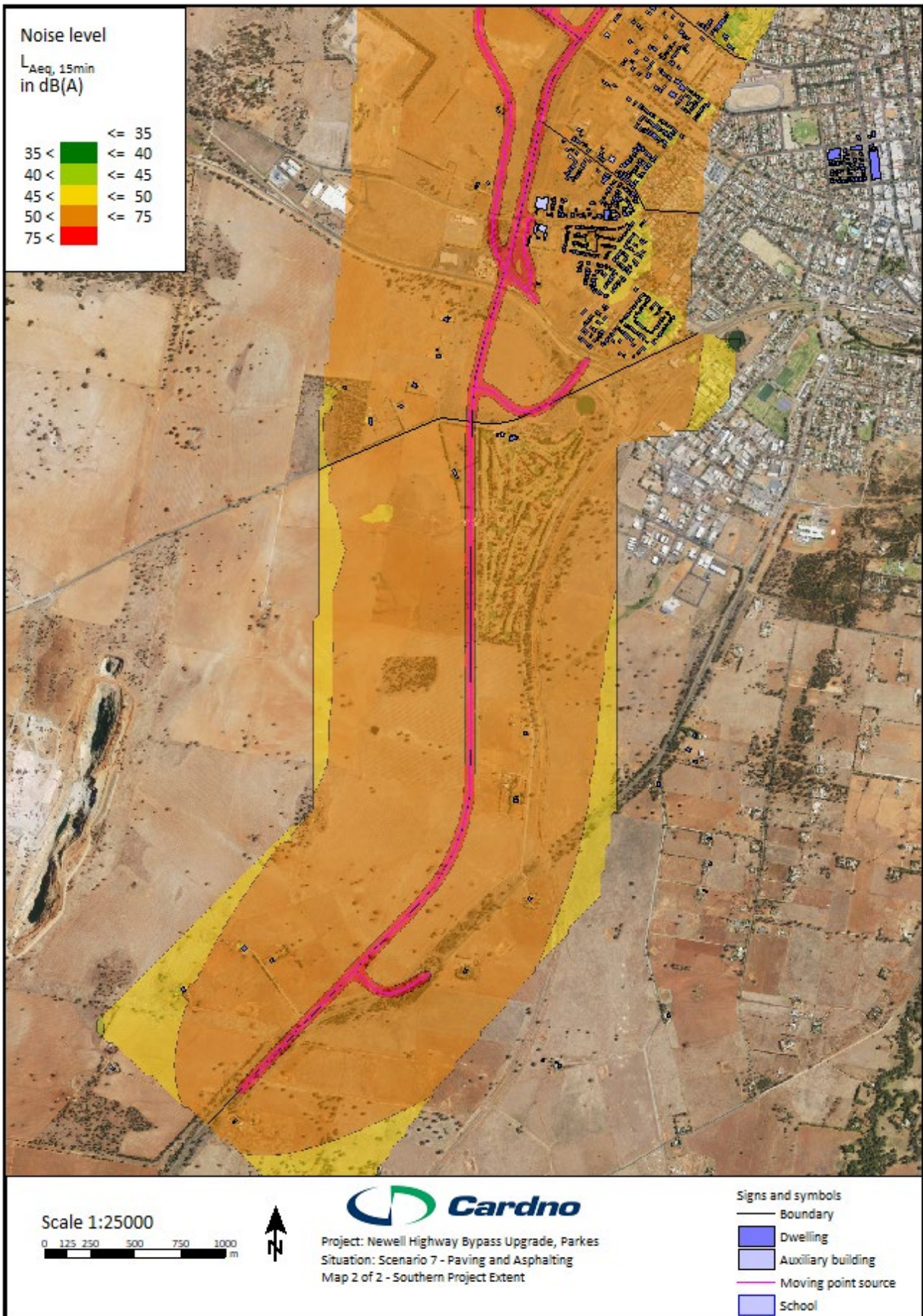


Figure D14 Predicted construction noise levels – Scenario 8

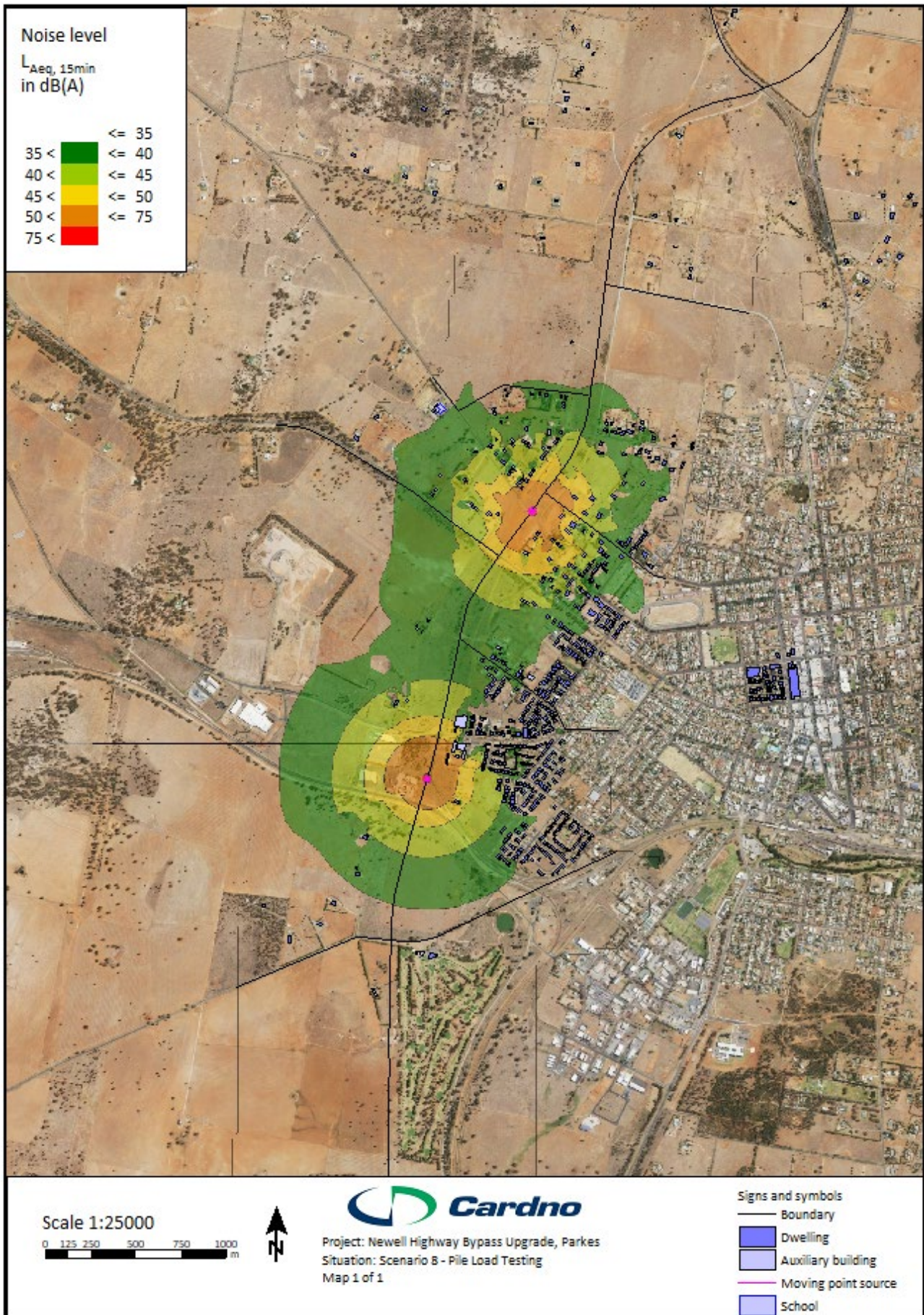


Figure D15 Predicted construction noise levels – Scenario 9

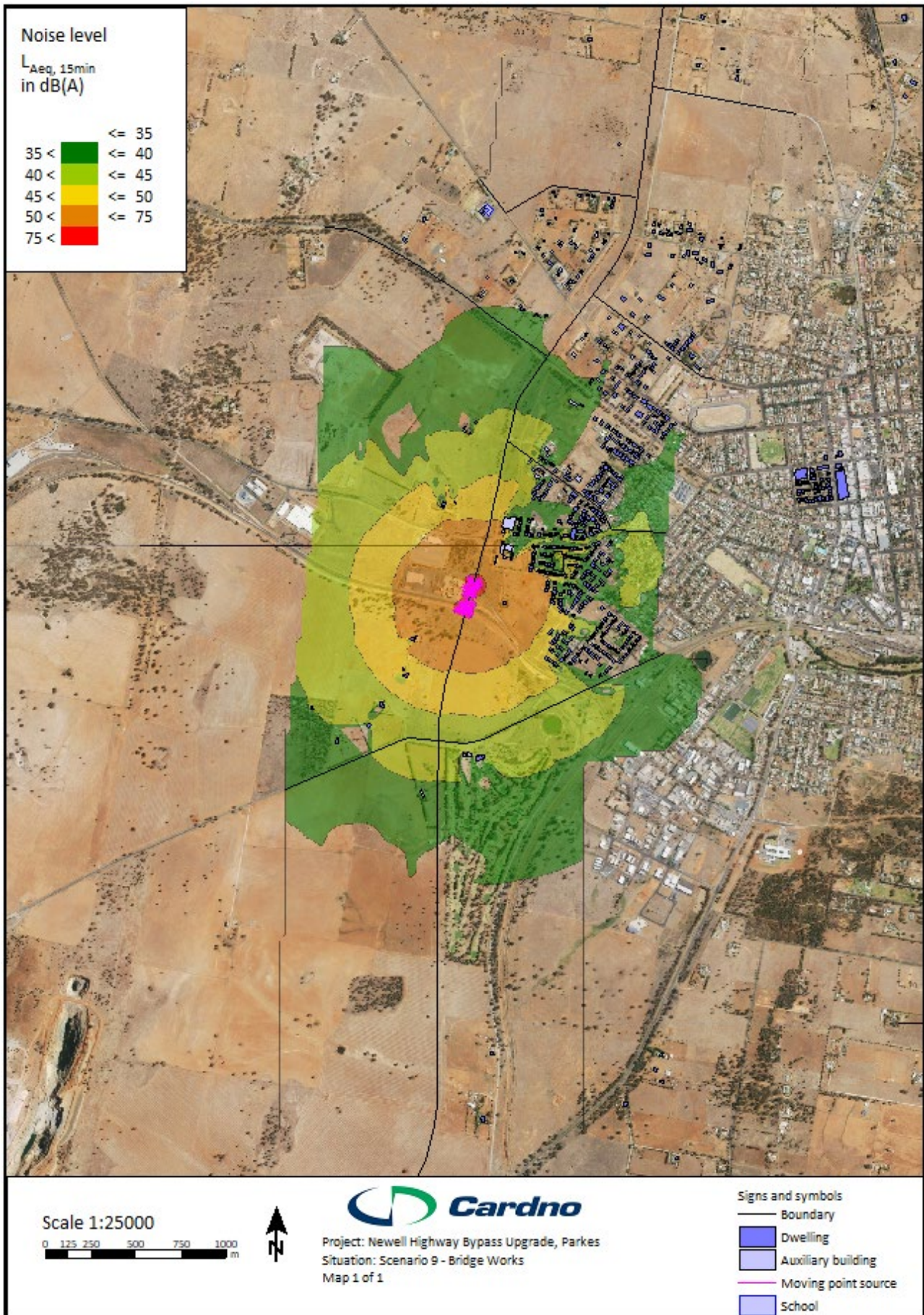


Figure D16 Predicted construction noise levels – Scenario 10 – northern site compound

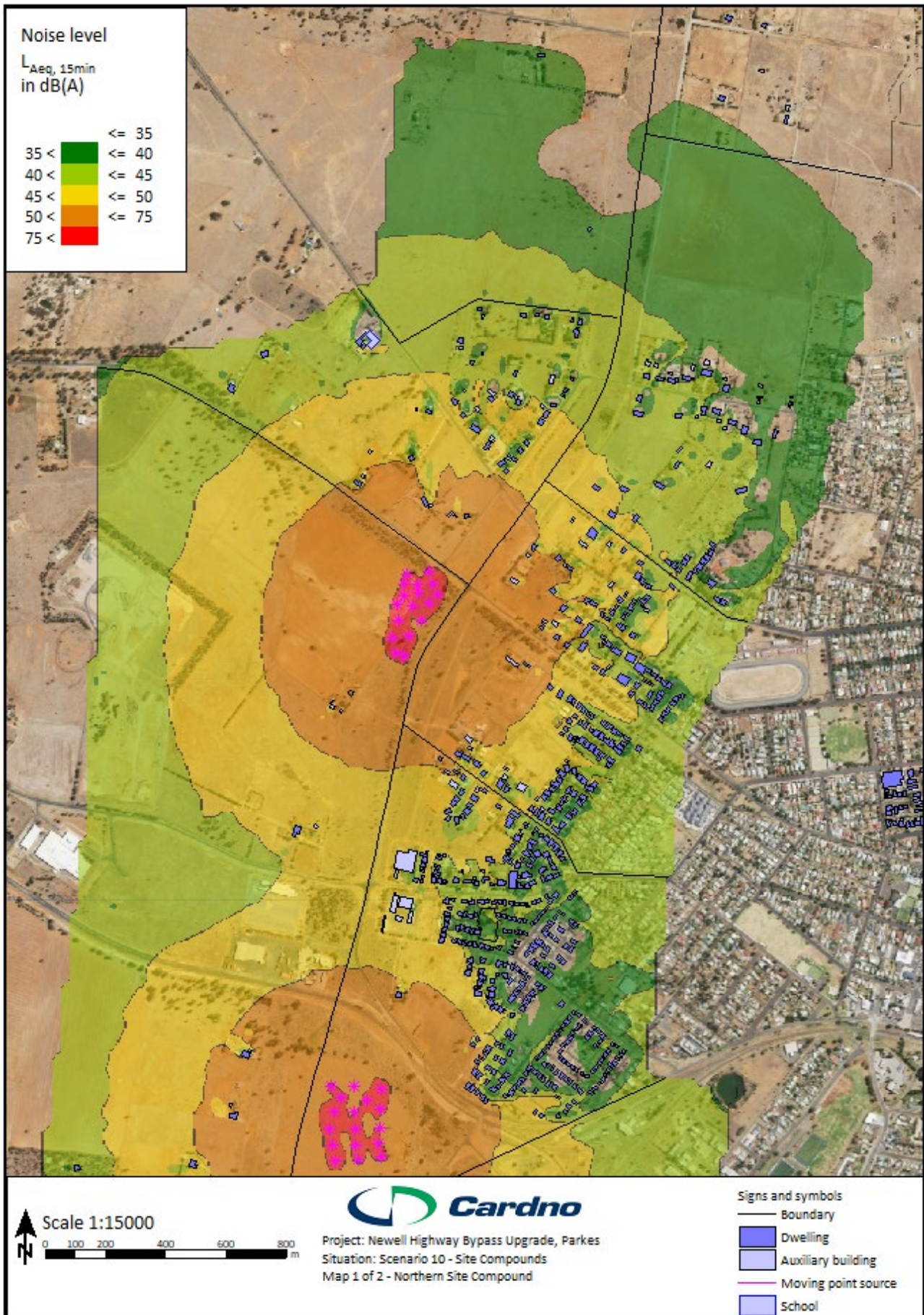


Figure D17 Predicted construction noise levels – Scenario 10 – southern site compound

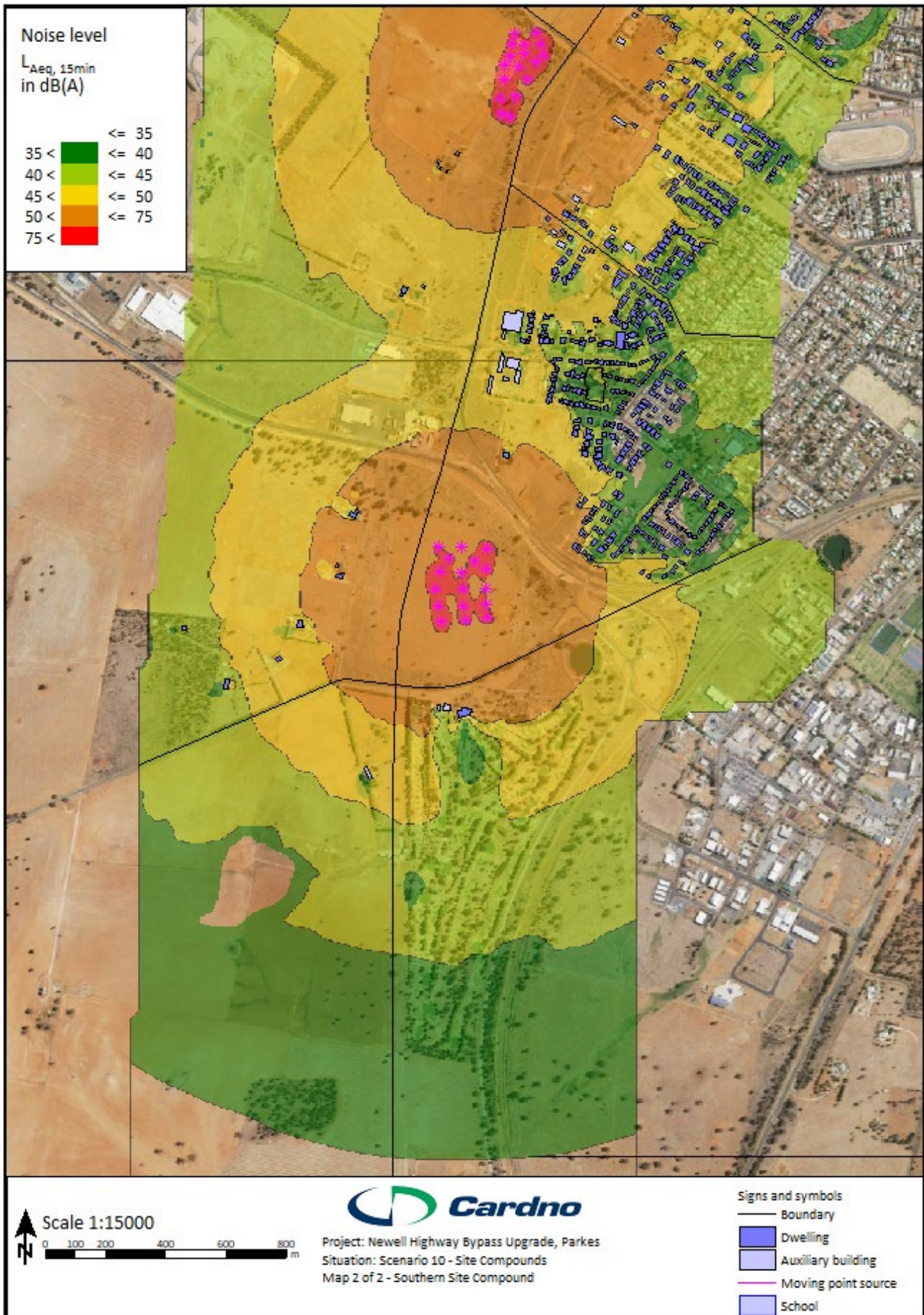


Figure D18 Predicted construction noise levels – Scenario 11 – northern project extent

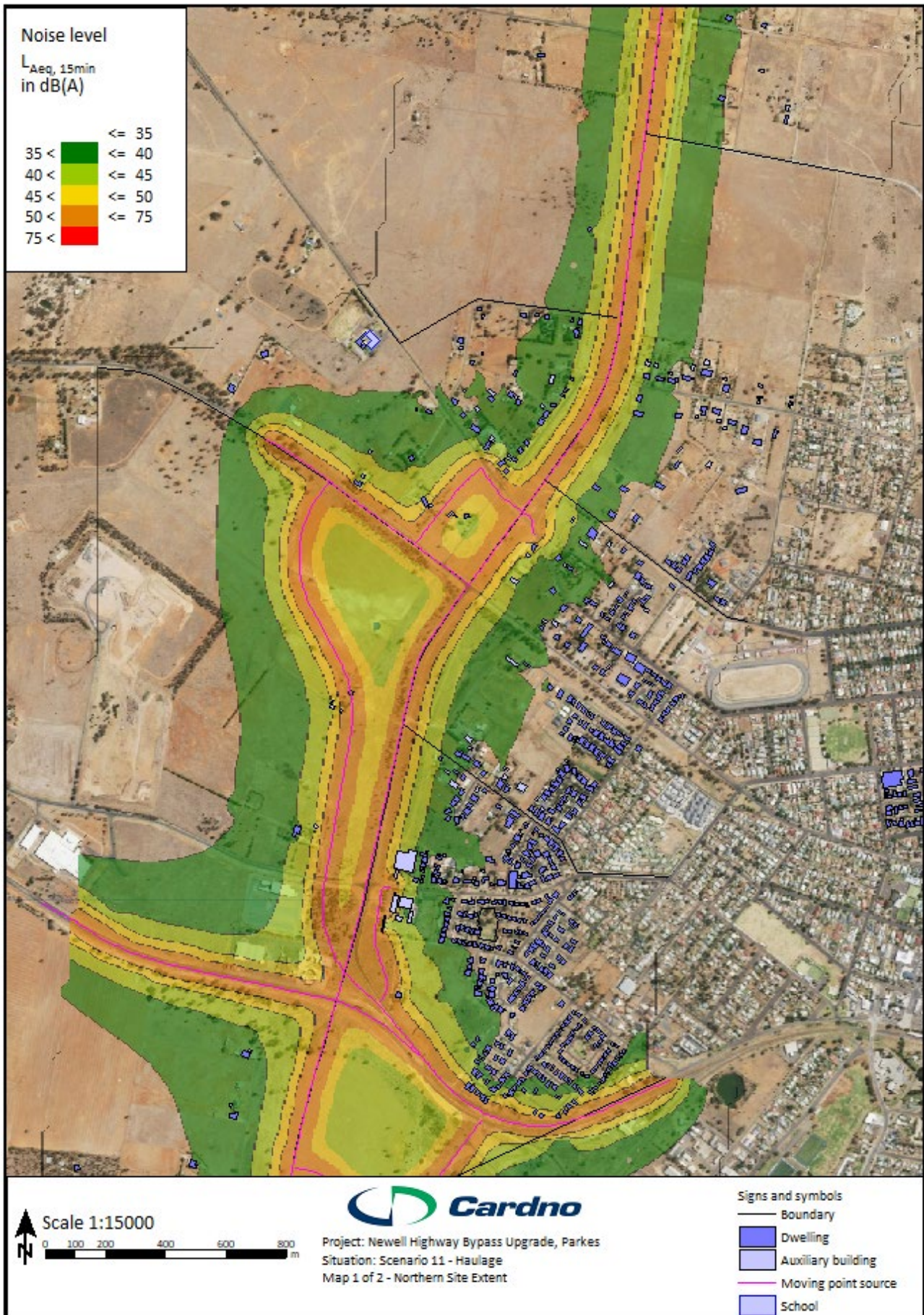


Figure D19 Predicted construction noise levels – Scenario 11 – southern project extent

