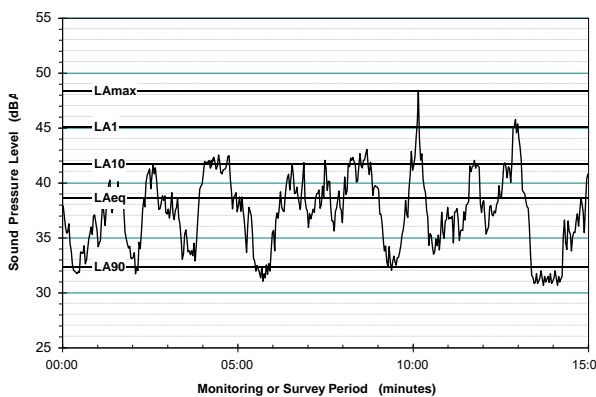


ACOUSTIC TERMINOLGY

This Report makes repeated reference to certain noise level descriptors, in particular the LA10, LA90 and LAeq and LAmix noise levels.

- The LA10 is the A-weighted sound pressure level exceeded 10% of a given measurement period and is utilised normally to characterise typical maximum noise levels.
- The LAeq is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound over the same measurement period. The LAeq(15hour) is the measurement parameter used to describe the road traffic noise level over the entire daytime (7:00 am to 10:00 pm) period. The LAeq(9hour) is the measurement parameter used to describe the road traffic noise level over the entire night-time (10:00 pm to 7:00 am) period. Similarly, the LAeq(1hour) is the measurement parameter used to describe the road traffic noise level during the loudest 1-hour period during the daytime or night-time periods.
- The LA90 noise level is the A-weighted sound pressure level exceeded 90% of a given measurement period and is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the “background” level.
- The LAmix noise level is the maximum A-weighted noise level associated with road traffic movements.

**Graphical Display of Typical Noise Indices**



**Typical Noise Levels**

The following table presents examples of typical noise levels.

Typical Noise Levels		
Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	noisy
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerb side of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to Quiet
50	General Office	
40	Inside private office	Quiet to Very quiet
30	Inside bedroom	
20	Unoccupied recording studio	Almost silent

**A-Weighting or dBA Noise Levels**

The overall level of a sound is usually expressed in terms of dBA, which is measured using the “A-weighting” filter incorporated in sound level meters. These filters have a frequency response corresponding approximately to that of human hearing. People’s hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the “loudness” of that sound. Different sources having the same dBA level generally sound about equally as loud, although the perceived loudness can also be affected by the character of the sound (eg the loudness of human speech and a distant motorbike may be perceived differently, although they are of the same dBA level).

**Sensitivity of People to Noise Level Changes**

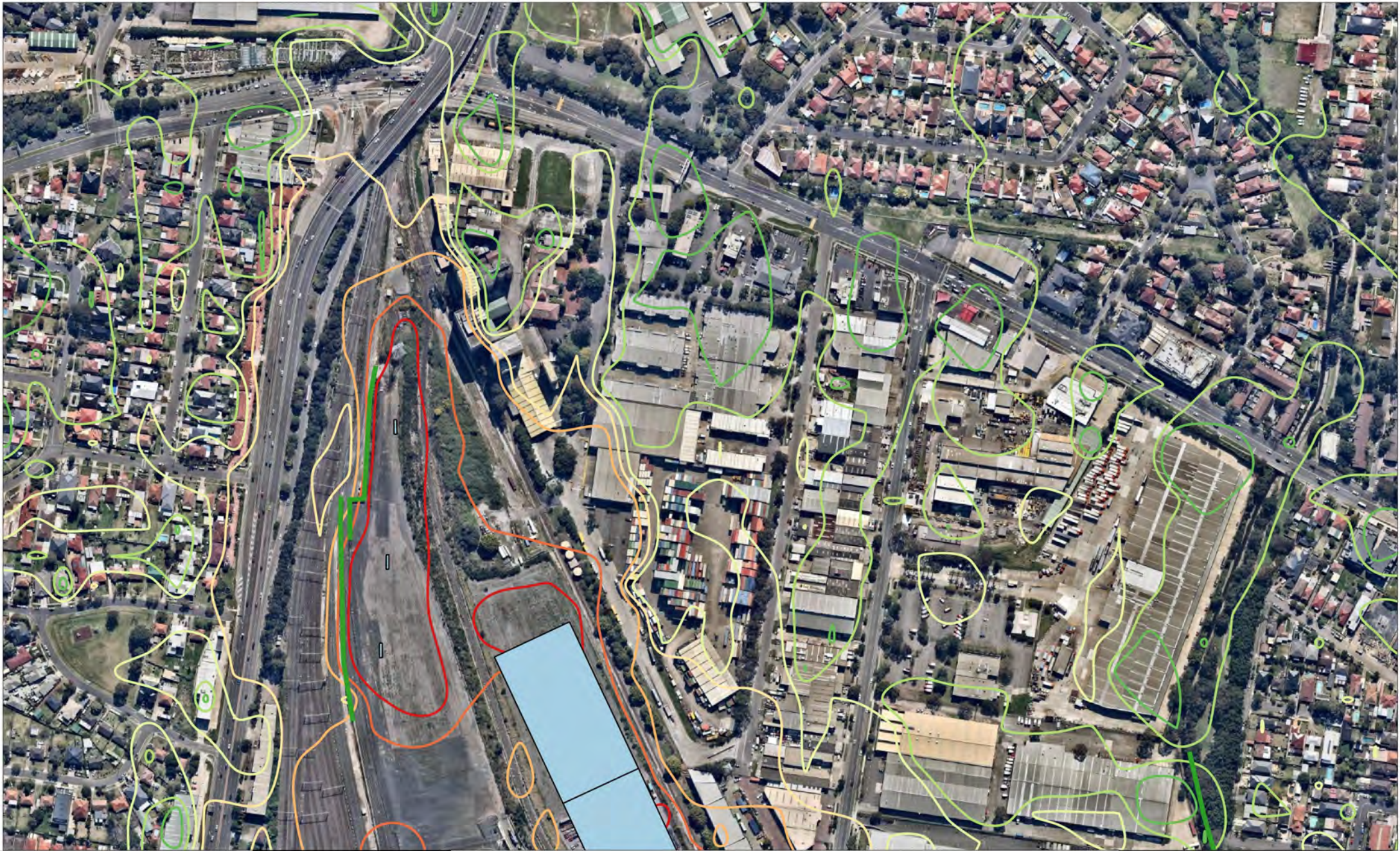
A change of up to 3 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness.

**Appendix B1**

Report Number 610.16722.00500

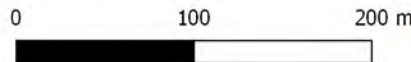
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NOISE CONTOURS – DAYTIME CALM



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Scale: 1:4,256  
Sheet Size: @A4  
Projection: GDA 1994 MGA Zone 56



**Noise Contours**

- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA

**Legend**

- Noise Barriers

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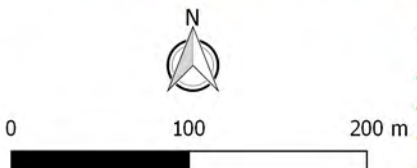
**Operational Noise Assessment - MOD 14**  
L<sub>Aeq</sub> (15 min)  
Daytime - Calm

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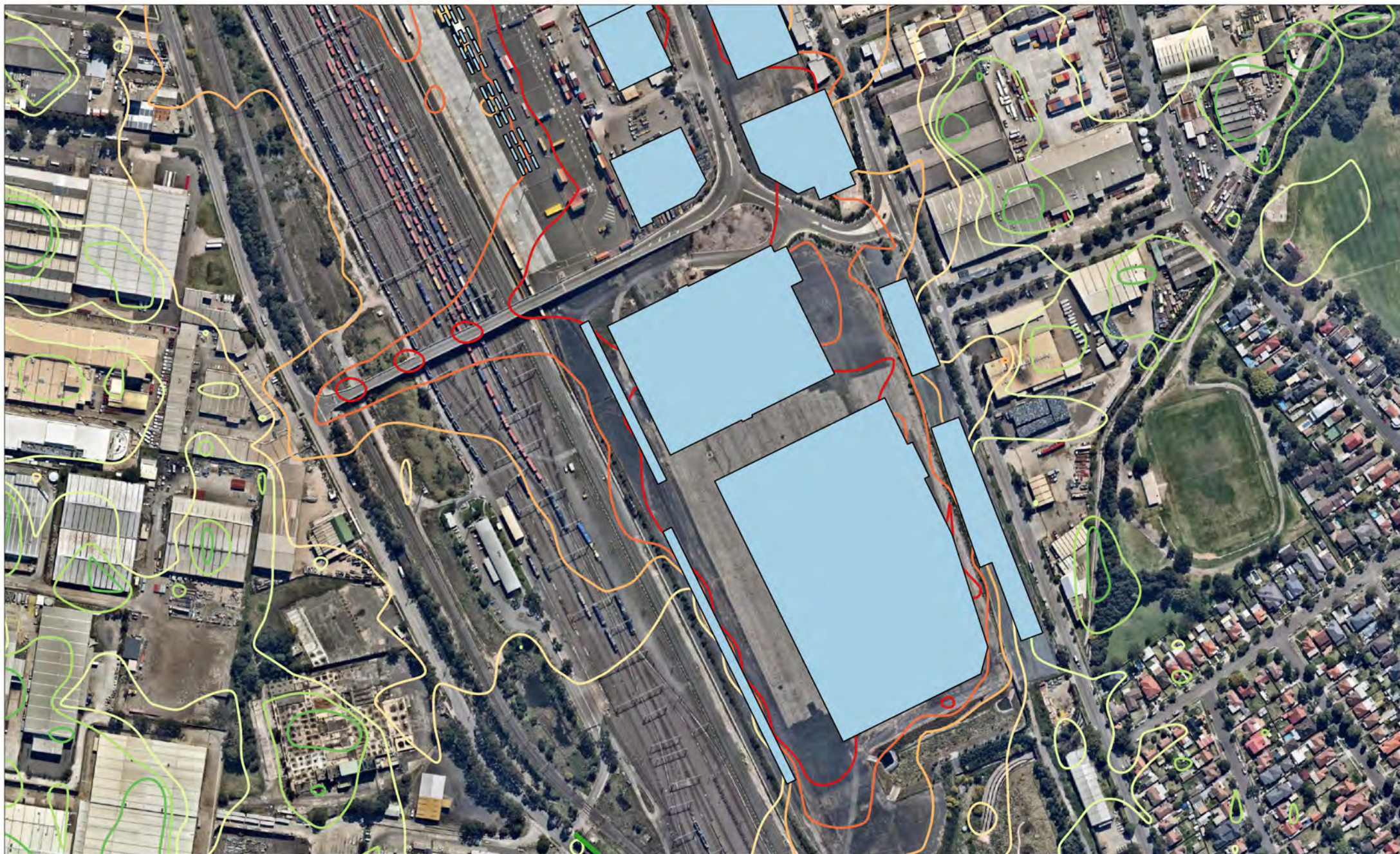
**Noise Contours**

— 25 dBA	— 45 dBA
— 30 dBA	— 50 dBA
— 35 dBA	— 55 dBA
— 40 dBA	— 60 dBA

**Legend**  
 — Noise Barriers

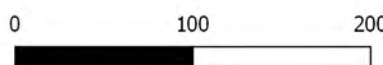
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- Noise Contours**
- 25 dBA
  - 30 dBA
  - 35 dBA
  - 40 dBA
  - 45 dBA
  - 50 dBA
  - 55 dBA
  - 60 dBA

- Legend**
- Noise Barriers

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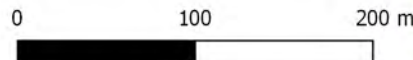
**Operational Noise Assessment - MOD 14**  
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**Noise Contours**

- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA

**Legend**

- Noise Barriers

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**Operational Noise Assessment - MOD 14**  
LAeq (15 min)  
Daytime - Calm

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**Appendix B2**

Report Number 610.16722.00500

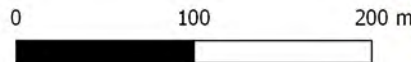
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**NOISE CONTOURS – NIGHT-TIME CALM**



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Projection: GDA 1994 MGA Zone 56



**Noise Contours**

- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA

**Legend**

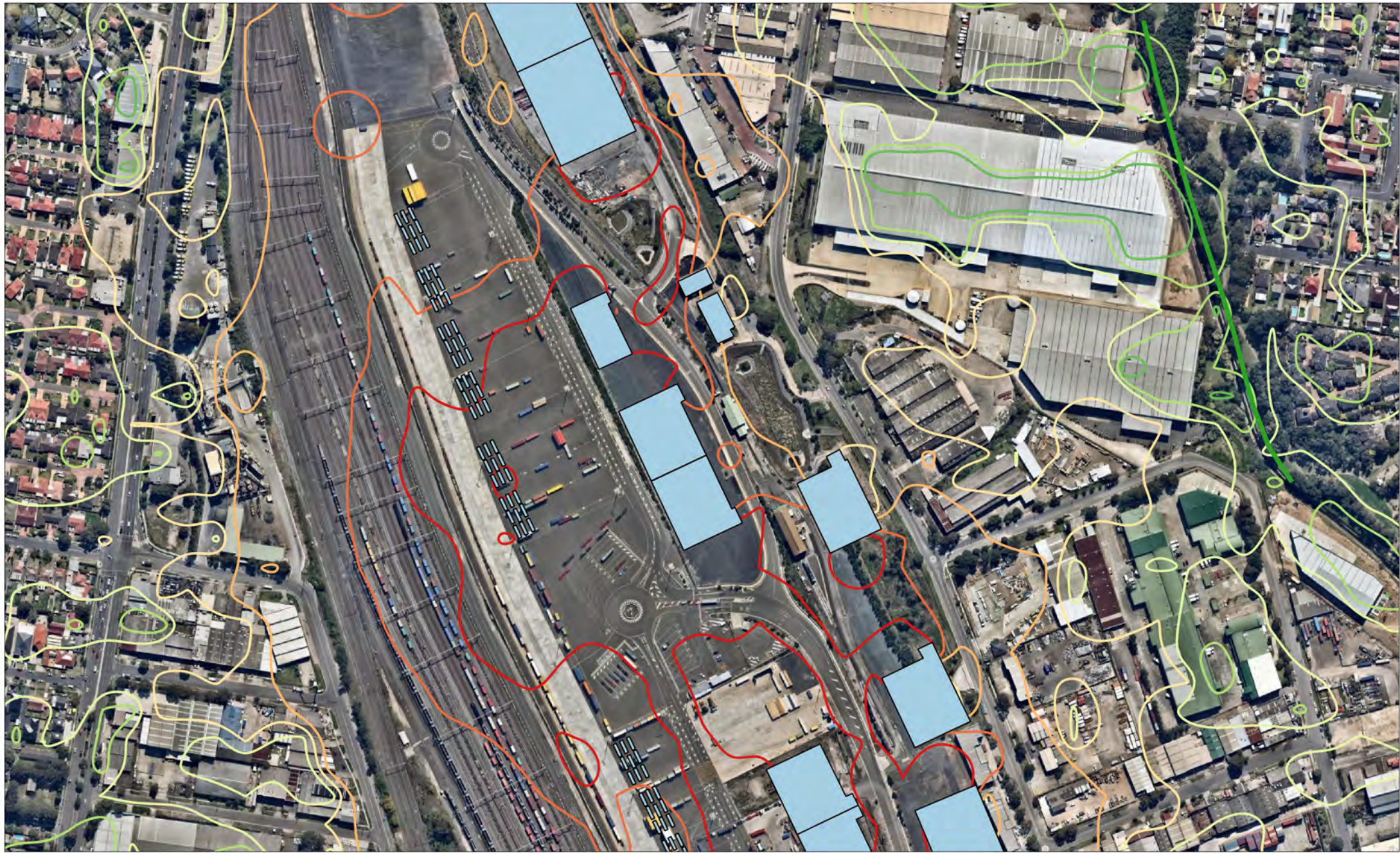
- Noise Barriers

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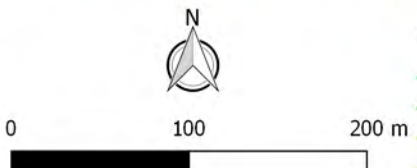
**Operational Noise Assessment - MOD 14**  
L<sub>Aeq</sub> (15 min)  
Night-time - Calm

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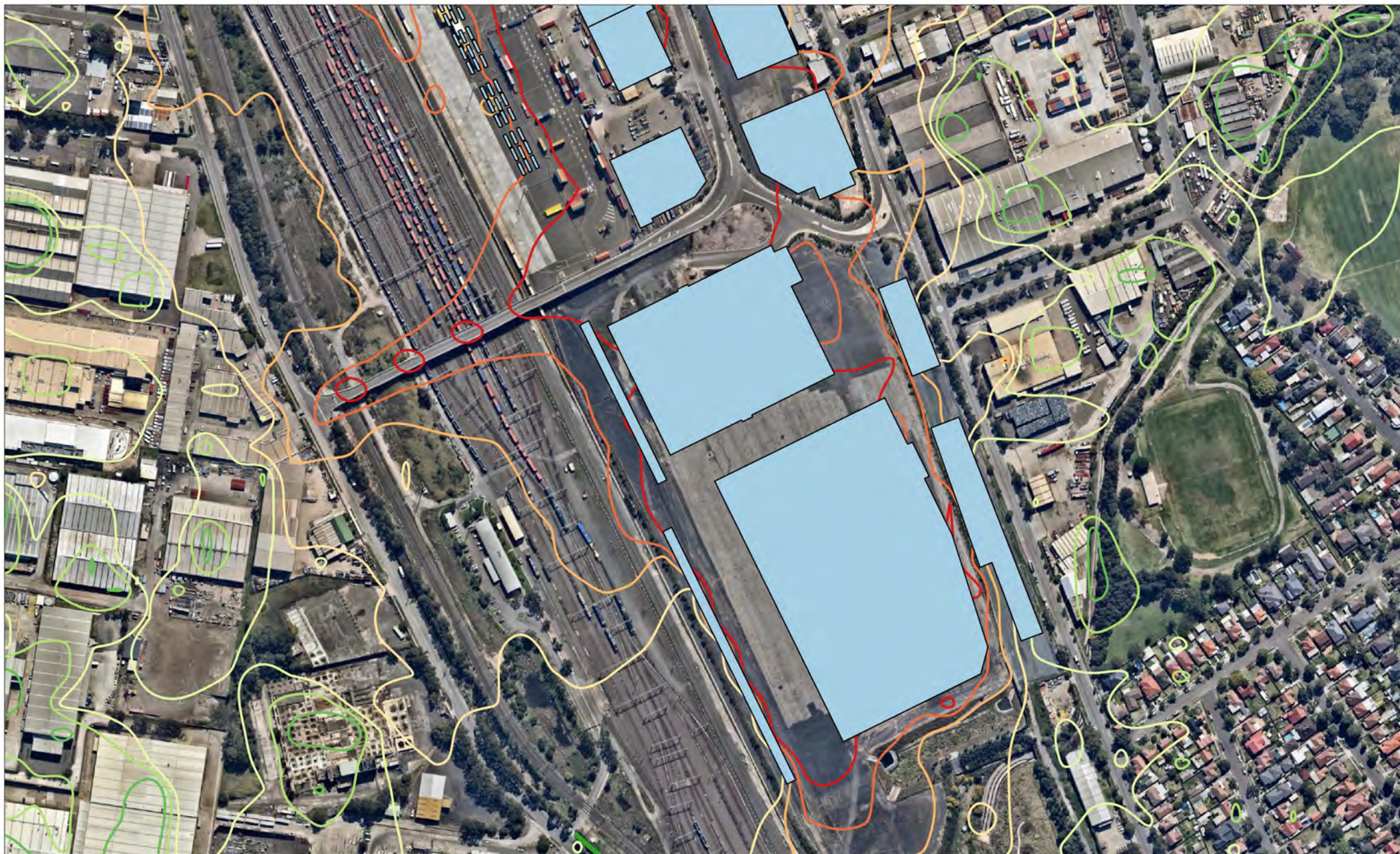
**Noise Contours**

— 25 dBA	— 45 dBA
— 30 dBA	— 50 dBA
— 35 dBA	— 55 dBA
— 40 dBA	— 60 dBA

**Legend**  
 — Noise Barriers

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 LAeq (15 min)  
 Night-time - Calm

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**Noise Contours**

<span style="color: green;">—</span> 25 dBA	<span style="color: yellow;">—</span> 45 dBA
<span style="color: lightgreen;">—</span> 30 dBA	<span style="color: orange;">—</span> 50 dBA
<span style="color: yellowgreen;">—</span> 35 dBA	<span style="color: darkorange;">—</span> 55 dBA
<span style="color: yellow;">—</span> 40 dBA	<span style="color: red;">—</span> 60 dBA

**Legend**

— Noise Barriers

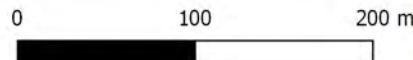
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**Noise Contours**

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- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA

**Legend**

- Noise Barriers

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