ILLAWARRA INTERNATIONAL HEALTH PRECINCT

TRAFFIC NOISE ASSESSMENT

ACOUSTICS AND AIR

REPORT NO. 09069-T
VERSION A

WILKINSON MURRAY

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MAY 2009

PREPARED FOR

LA VIE DEVELOPMENTS
MARINERS COURT, MCELHONE STREET
WOOLLOOMOOLOO NSW 2011

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APPENDIX A – Glossary of Terms

1 INTRODUCTION

Wilkinson Murray Pty Ltd has conducted a traffic noise assessment of the proposed Illawarra International Health Precinct (IIHP) at Huntley.

This report describes the assessment of potential traffic noise impact as representative residences surrounding the precinct based on projected traffic flows documented by Cardno in the project Traffic Report (TMAP) number FR108121 dated 23 April 2009.

2 PROJECT AND SITE DESCRIPTION

The Illawarra International Health Precinct at Huntley is to be located on a triangular parcel of land between Avondale Road, Huntley Road and Goolagong Street Huntley as shown in Figure 2-1

Figure 2-1 Site Location

.The site is to be developed over eight stages as follows

- Stage 1 – Specialist and Surgicentre;
- Stage 2 – Radiology and Pathology;
- Stage 3- Hospital - Casualty and Medical Centre;
- Stage 4- Hospital - Obstetric Unit;
- Stage 5- 352 Bed Tertiary Referral;
- Stage 6 - Nurse, Medical Student, Resident Medical Officers and Registrar Accommodation;
- Stage 7- Huntley Further Education Facility; and,
- Stage 8 – Illawarra Aged and Disability Centre.

This assessment relates to all stages up to 2026 when the site is proposed to be totally developed. The stages of the development are shown in Figure 2-2.

Figure 2-2 Staging Plan

3 ASSESSMENT LOCATIONS

The Cardno TMAP report provides traffic projections at a significant number of intersections surrounding the IIHP site. Therefore we have selected residences at three locations that are considered as representative of residential properties that surround the site that are potentially affected by traffic noise from the facility. These representative residences are;

- Location A A single rural residence on Avondale Road
- Location B Residences on the Northern Side on Huntley Road West of Penrose Dr.
- Location C Residences on Turnbull Crescent

Figure 3.1 illustrates the assessment locations.

Figure 3.1 Traffic Noise Assessment Locations

4 TRAFFIC NOISE CRITERIA

Currently guidance on the setting of traffic noise criteria applicable to public roads in NSW is provided by the DECC's Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999).

Table 1 of this document provides the following guidance for Collector and Local roads.

Type of Development	**Criteria**		
	Day (7am–10pm) dB(A)	Night (7am–10pm) dB(A)	Where Criteria are Already Exceeded
8. Land use developments with potential to create additional traffic on collector road	$L_{eq(1hr)}$ 60	$L_{eq(1hr)}$ 55	Where feasible and reasonable, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; using clustering; using 'quiet' vehicles; and using barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.
13. Land use developments with potential to create additional traffic on local roads	$L_{eq(1hr)}$ 55	$L_{eq(1hr)}$ 50	Where feasible and reasonable, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; using clustering; using 'quiet' vehicles; and using barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.

Avondale and Huntley Roads are classified as collector roads whilst Turnbull Crescent is a local road. For the purpose of noise calculations in the following sections it has been assumed that the average vehicle speed is 60km/hr on collector roads and 50 km/hr on local roads.

5 TRAFFIC NOISE PREDICTIONS

To assess likely potential traffic noise impacts, the traffic noise level emissions associated with the site in 2016 and 2026 have been calculated for hourly intervals during peak hourly periods.

Noise predictions have been based on projected traffic volumes in 2016 and 2026 as detailed in the "SIDRA INTERSECTION Summaries" in Appendix A of the TMAP report (as supplied by the traffic consultant Cardno). Two way AM and PM peak hour traffic flows have been provided for the "base case" and "base case with development".

Traffic noise levels at the facade of assessment residences have been predicted using the *Calculation of Road Traffic Noise (CORTN)* traffic noise prediction technique. The technique tables into account the following factors;

- Hourly traffic flows,
- Vehicle speeds,
- Distance to residences from each traffic lane,
- Percentage heavy vehicles, and;
- Shielding from barriers or topography.

Tables 5-1 and 5-2 present vehicle speed and volumes used in the model.

Table 5-1 2016 Traffic Volumes – AM and PM Peak Hour Flows

Roadway		VPH (% Heavy Vehicles)		Speed (km/h)
		No Development	With Development	
Location A – Avondale Rd				
	AM	998 (3.9)	990 (3.9)	60
	PM	1064 (3.8)	1057 (5.1)	
Location B – Huntley Rd				
	AM	1325 (4.1)	1385 (4.1)	60
	PM	1423 (4.3)	1595 (5.3)	
Location C – Turnbull Cr				
	AM	400 (1.5)	388 (1.5)	50
	PM	353 (2)	339 (2.1)	

Table 5-2 2026 Traffic Volumes – AM and PM Peak Hour Flows

Roadway		VPH (% Heavy Vehicles)		Speed (km/h)
		No Development	With Development	
Location A – Avondale Rd				
	AM	463 (1.7)	447 (1.6)	60
	PM	n/a*	358 (2.2)	
Location B – Huntley Rd				
	AM	1541 (4.1)	1452 (4.1)	60
	PM	n/a*	1644 (4.8)	
Location C – Turnbull Cr				
	AM	463 (1.7)	447 (1.6)	50
	PM	n/a*	358 (2.2)	

* No SIDRA data was reported for this case.

Predictions of traffic noise levels at the facades of identified residential locations are shown in Tables 5-3 and 5-4.

Table 5-3 Predicted 2016 Traffic AM & PM Peak Hour Noise Level – $L_{Aeq,1hr}$ dBA.

Roadway		Traffic Noise Levels (dBA)		Noise Criteria
		No Development	With Development	
Location A – Avondale Rd				
	AM	68.8	68.7	60
	PM	69.3	69.7	
Location B – Huntley Rd				
	AM	70.4	70.6	60
	PM	70.6	71.4	
Location C – Turnbull Cr				
	AM	60.1	59.9	55
	PM	60.2	60.2	

Table 5-4 Predicted 2026 Traffic AM & PM Peak Hour Noise Level – $L_{Aeq,\ 1hr}$ dBA.

Roadway		Traffic Noise Levels (dBA)		Noise Criteria
		No Development	With Development	
Location A – Avondale Rd				
	AM	70.7	70.4	60
	PM	-	71.5	
Location B – Huntley Rd				
	AM	71.2	71.6	60
	PM	-	73.3	
Location C – Turnbull Cr				
	AM	60.8	60.7	55
	PM	-	60.2	

A review of predicted traffic noise levels at the facades of residences facing the assessed roads indicates that noise levels will exceed DECC objectives. However, it is noted that it is not the IIHP generated traffic that is the cause of the exceedance, rather the projected “base case” traffic flows in 2016 and 2026 are responsible for the increase in traffic noise.

A review of the “base plus development” traffic noise levels indicates that compliance with the requirement that noise levels should not increase by more than 2 dBA is achieved. Therefore it can be concluded that the noise associated with the projected traffic generated by the IIHP developments will comply with established noise criteria.

6 CONCLUSION

An assessment of future traffic noise at representative residence surrounding the IIHP site at Huntley has been conducted based on future traffic flows provided in the TMAP produced by Cardno. The assessment has determined that traffic noise levels are likely to exceed DECC noise criteria for the base case no development in 2016 and 2026.

The traffic noise contribution associated with projected road traffic will not lead to a further increase in traffic noise level of more than 2 dBA. Therefore it can be concluded that the noise associated with the projected traffic generated by the IIHP facilities will comply with established noise criteria.

Note
All materials specified by Wilkinson Murray Pty Limited have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose.

Quality Assurance
We are committed to and have implemented AS/NZS ISO 9001:2000 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.

AAAC
This firm is a member firm of the Association of Australian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.

Version	Status	Date	Prepared by	Checked by
A	Final	19 May 2009	Brian Clarke	John Wasserman

APPENDIX A

GLOSSARY OF TERMS

GLOSSARY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph overleaf, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

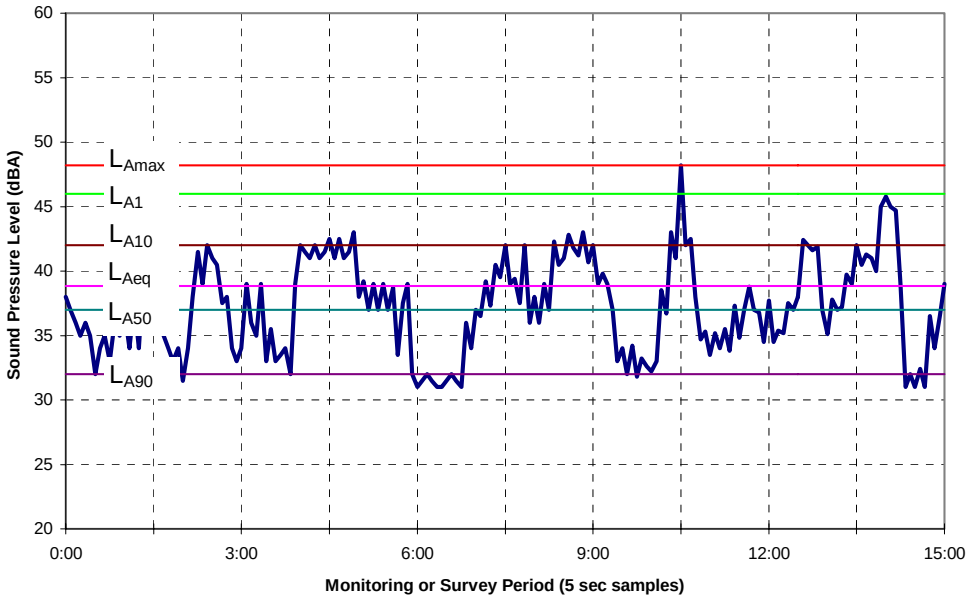
L_{A50} – The L_{A50} level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the L_{A50} level for 50% of the time.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10^{th} percentile (lowest 10^{th} percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period **–** daytime, evening and night time.

SEL – Sound exposure level abbreviated as SEL and L_{AE}, is the total noise energy produced from a single noise event. The Sound Exposure Level is a metric used to describe the amount of noise from an event such as an individual aircraft flyover. It is computed from measured dBA sound levels. The Sound Exposure Level is the integration of all the acoustic energy contained within the event.


60
55
50
45
40
35
30
25
20
Sound Pressure Level (dBA)
LAmax
LA1
LA10
LAeq
LA50
LA90
0:00
3:00
6:00
9:00
12:00
15:00
Monitoring or Survey Period (5 sec samples)