

Short Term Monitoring Program WA, Manning Report

July 2012

Version Control

Version Number	Date	Detail
1.0	July 2012	Initial Release.
2.0	August 2012	Updated table 2 for LAeq and Background noise levels. Updated Glossary of Terms.

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This report contains a summary of data collected over the specified period and is intended to convey the best information available from the NFPMS at the time. The system databases are to some extent dependent upon external sources and errors may occur. All care is taken in preparation of the report but its complete accuracy can not be guaranteed. Airservices Australia does not accept any legal liability for any losses arising from reliance upon data in this report which may be found to be inaccurate.

Short Term Monitoring Program - Manning WA

The purpose of this report is to provide a summary of the aircraft noise and operational data collected by a short term Environmental Monitoring Unit (EMU) installation. The report is designed to provide the results captured by the monitor and some analysis of the data, but not to provide detailed analysis of the results.

An explanation for terms used within this report can be found in the Glossary at the end of the report.

Deployment Purpose

To monitor aircraft noise levels within the Manning area from jet aircraft departing south off Perth Airport's main runway (Runway 21) then turning to the west.

Reporting Period

20/12/2011 – 16/01/2012

EMU Details

Location	Manning Primary School
Latitude	32° 00' 48.37" S
Longitude	115° 51'51.08" E
Capture Zone	2km radius with 7,000ft max altitude
Threshold Settings	46.8 dB(A) to 55.9 dB(A) depending on time of day

Figure 1 Capture Zone with Sample of Jet Departures

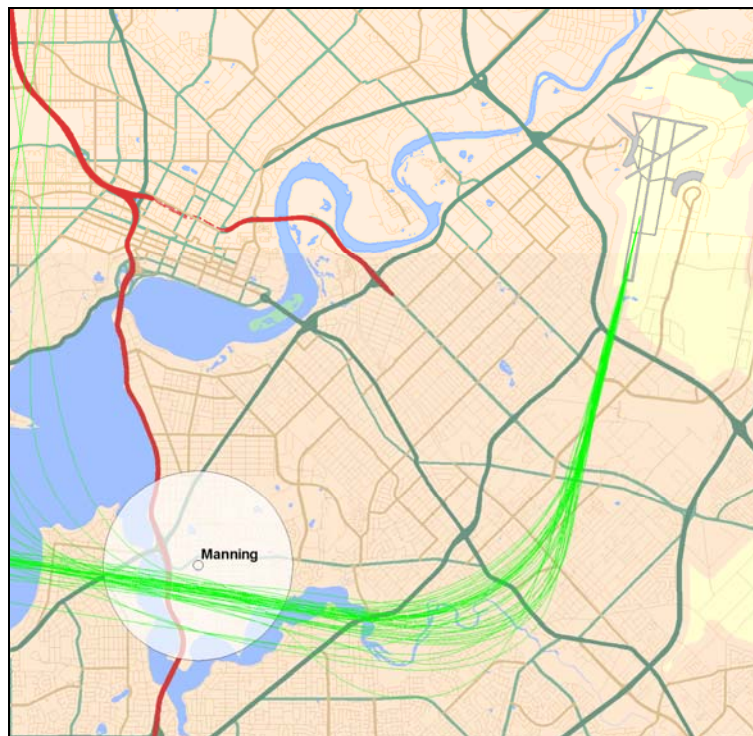
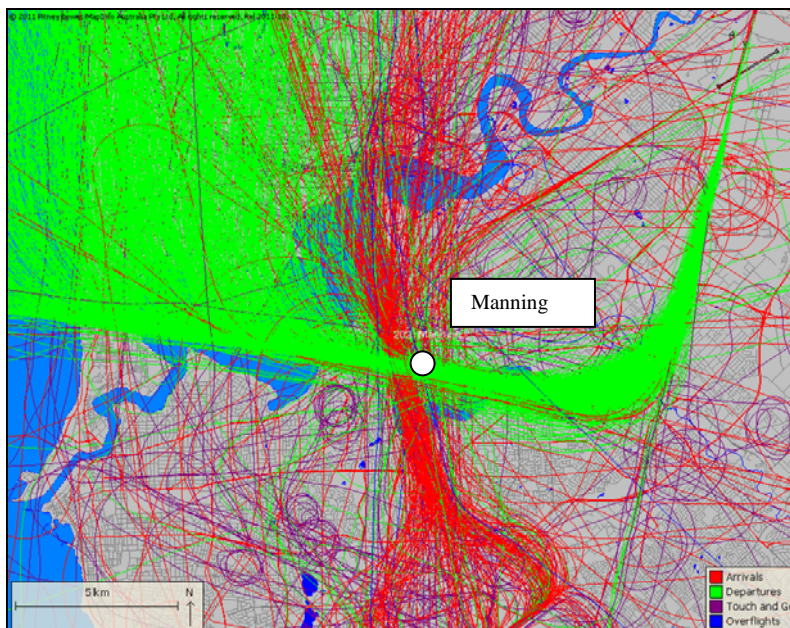


Figure 2 Total Movements Captured**Findings**

- in total there were 3,435 departures (all aircraft types) off Runway 21 during the period of the study. 1,307 of these aircraft flew within the capture zone of the Manning EMU
- of these there were 2,636 jet departures off Runway 21 during the period of the study. 1,046 of these jet departures flew within the capture zone of the Manning EMU and caused a correlated noise event (CNE). This equates to 40% of jet departures off Runway 21 flying through the capture zone
- average height of jet departures over the noise terminal was around 4,500ft. This ranged from 2,580ft to 6,990ft
- noise events of 65dB(A) or above (CNE 65) occurred during both the night (11:00pm to 6:00am) and day (6:00am to 11:00pm) periods
- information about the background noise levels, overall noise summary, CNE 65 count by hour and noise levels by aircraft type are provided below

Correlation Summary

An evaluation of the number of aircraft operations that were matched with noise events by the EMU is an important aspect of assessing performance of the noise monitoring installation. Ideally, all operations passing the EMU within a reasonable proximity will be matched to the appropriate noise event. Whilst complete matching is not expected, a lack of matches will reveal the need to investigate the reason for anomalies. The following table assesses the correlation results for south westerly departures over Manning.

Table 1 Correlation Table

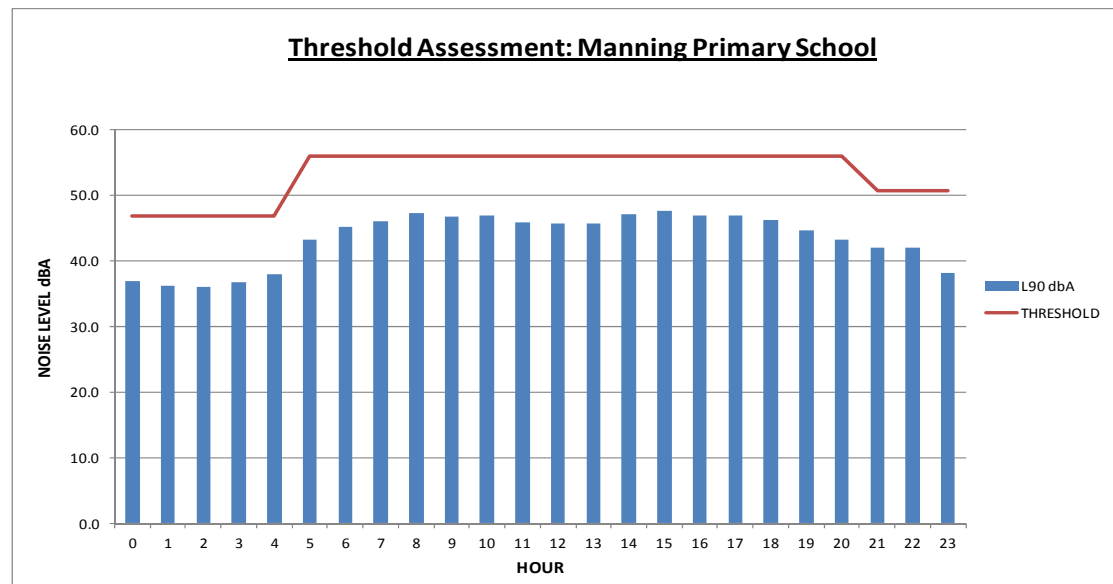
EMU	Operations Within Zone Runway 21 Departures (all aircraft types)	Number of Correlated Noise Events RWY 21 Departures (all aircraft types)	Correlation Summary
Manning - 202	1,307	1,074	82%

A correlation summary of 82% is considered good, based on experience at EMUs nationally.

Background Noise Levels and Threshold Settings

At each monitoring site, background noise levels are first assessed to determine the appropriate threshold settings for the EMU. The result of background noise assessment and threshold settings is provided below.

Figure 3 Background and Threshold Assessment



Noise Summary

The following table presents a summary of the noise data for aircraft that flew through the capture zone and caused a CNE. Information is provided for those aircraft that departed from Runway 21 that flew over the EMU, as well as all aircraft that flew over the EMU, noting that this area is affected by arrivals, departures and training flights, as shown in Figure 2.

Table 2 Noise Summary

NOISE PARAMETERS	Departures Rwy 21	All Aircraft
L _{Aeq} 24 hr, dBA	TBA	TBA
L _{Aeq} (night), dBA	TBA	TBA
Background Day (L ₉₀ dBA)	TBA	TBA
Background Night (L ₉₀ dBA)	TBA	TBA
Total number of Correlated Noise Events (CNE 24hr)	1,074	1,311
Number of Correlated Noise Events at night (CNE night)	170	202
Operational Days	28.0	28.0
Number of Correlated Noise Events CNExx day/night	CNExx	CNExx
CNE ₆₀ – day	882	1040
CNE ₆₀ - night	165	181
CNE ₆₅ – day	549	600
CNE ₆₅ – night	123	127
CNE ₇₀ – day	95	101
CNE ₇₀ - night	44	45
CNE ₇₅ – day	4	5
CNE ₇₅ - night	9	9
CNE ₈₀	0	0
CNE ₉₀	0	0
Number of Correlated Noise Events (CNExx) per 24hr period min – max		
CNE ₆₀	1 to 73	3 to 92
CNE ₆₅	1 to 53	1 to 61
CNE ₇₀	0 to 12	0 to 12
CNE ₇₅	0 to 2	0 to 2
CNE ₈₀	0	0
CNE ₉₀	0	0
Average number of noise events Nxx day/night		
N ₆₀ – day	31.5	37.1
N ₆₀ – night	5.9	6.5
N ₆₅ – day	19.6	21.4
N ₆₅ – night	4.4	4.5
N ₇₀ – day	3.4	3.6
N ₇₀ - night	1.6	1.6
N ₇₅ – day	0.1	0.2
N ₇₅ - night	0.3	0.3
N ₈₀	0.0	0.0
N ₉₀	0.0	0.0

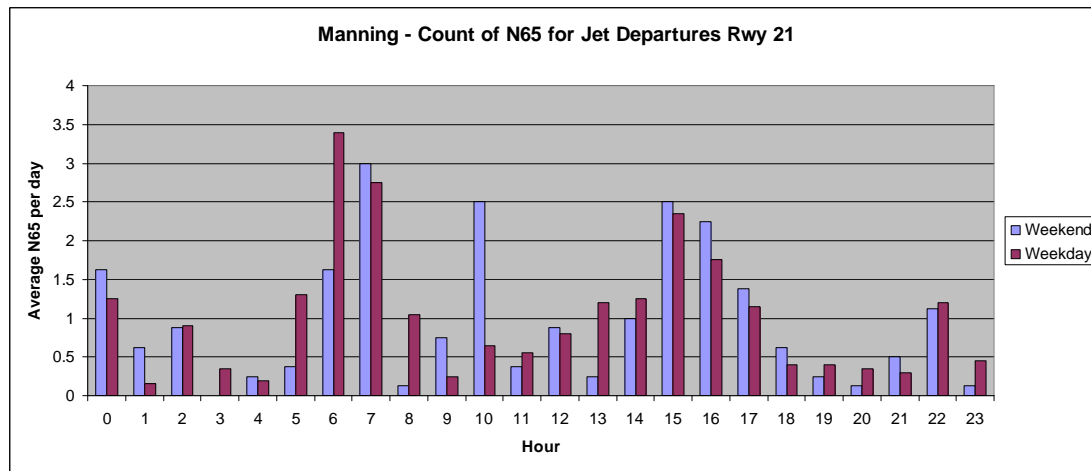
Note: Day period is from 6:00am to 11:00pm. Night period is 11:00pm to 6:00am

N65 Count by Hour

A large number of noise events are between the N65 and N70 category. It was therefore decided to perform further investigation on the N65 events to reveal patterns and determine what time of the day the majority of these events occurred.

The following table presents daily average noise events 65dB(A) or above (N65) broken down on an hourly basis for weekdays and weekends. The table focuses on jet departures from Runway 21.

Figure 4 Count of N65 for Jet Departures from Runway 21



Aircraft Noise Levels

Table 3 presents the top 10 noisiest aircraft types captured by the EMU during the reporting period. Table 4 shows the 10 most frequent aircraft types that flew over the EMU.

Table 3 Top 10 Average Aircraft Noise Levels (LAmax) at Manning EMU

Aircraft Type	Airport	Operation Type	Runway	No. Correlated Noise Events	Average LAmax dB
R200	Jandakot	D	unknown	1	76.8
A343	Perth	D	21	17	74.3
unknown	Jandakot	A	H	1	74.0
A332	Perth	D	21	5	73.8
A124	Perth	D	21	1	72.4
B412	Murray Field	O	n/a	1	72.2
B744	Perth	D	21	1	70.5
A333	Perth	D	21	141	70.0
S64	Jandakot	A	H	1	69.1
B77W	Perth	D	21	20	68.6

Table 4 Top 10 Most Frequent Aircraft Types Over the Manning EMU

Aircraft Type	Airport	Operation Type	Runway	No. Correlated Noise Events	Average LAmax dB
B738	Perth	D	21	262	65.5
A320	Perth	D	21	151	65.0
A333	Perth	D	21	141	70.0
F100	Perth	D	21	107	65.7
B712	Perth	D	21	106	63.5
E190	Perth	D	21	64	65.0
B772	Perth	D	21	60	67.6
RJ1H	Perth	D	21	50	65.9
PC12	Jandakot	A	24R	41	61.4
B463	Perth	D	21	23	64.3

Recommendations

It is recommended that additional short term monitoring is performed at the same location during winter. This will establish any change in noise levels and noise events during winter months, when the eastern states are not within Daylight Saving Time.

Further Information

Further information about Airservices' noise monitoring program is available on the Airservices website, including reports of the noise and operational data collected by the Noise and Flight Path Monitoring System, as well as fact sheets about topics related to aircraft noise. The website is available at:

<http://www.airservicesaustralia.com/aircraftnoise/>

Glossary of Terms

A	Arrivals
Background noise level (L90)	The sound level in dB(A) that is exceeded 90% of the time
CNE	Correlated noise events - noise events which are matched with aircraft movements
D	Departures
H	Helicopters
Jet	Jet aircraft
LAeq	Continuous equivalent noise level over a time period.
LAeq 24hr	Continuous equivalent noise level over a 24 hour period.
LAeq night	Continuous equivalent noise level over the night time period (hours of 11:00pm to 6:00am)
LAm _{ax}	Maximum sound level in dB(A)
Movement	An aircraft operation, such as a take-off or landing
N _{xx}	Average daily number of correlated noise events equal to or greater than XX dB(A)
NFPMS	Noise and Flight Path Monitoring System
Noise Event	A noise that exceeds the threshold sound level for longer than the threshold time that is set
Non-Jet	Non-jet aircraft
O	Overflight i.e. an aircraft movement that flew over the area but did not arrive or depart from the airport of concern

Note:

For more information see Australian Standard 1055.1–1997 “Acoustics – Description and measurement of environmental noise”.