

Short Term Monitoring Program

Stoneville 2, WA

Change Summary

Version 1: 28 Jan 2014		
Section/ Clause	Summary	NRFC

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1. Deployment Details

1.1 Deployment Purpose

Following recommendations made in the 'Review of the Perth Environmental Monitoring Units' undertaken by Airservices in 2011, Stoneville was selected as a Short Term Monitoring Location.

The original 'Stoneville Short Term Monitoring Program Report' was produced in July 2013. In December 2013, Airservices became aware of a technical issue that resulted in high threshold settings being used. As this may have inadvertently excluded some noise events, the data has been reprocessed with lower threshold settings.

Stoneville is located to the north east of Perth airport. During the reporting period the suburb was predominately traversed by Runway 06 departures.

The purpose of this report is to provide a technical summary of the recorded aircraft noise and operational data collected at Stoneville over a four week period.

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

1.2 Deployment Monitoring Period

10/06/2013 12:00am – 08/07/2013 12:00am

1.3 Noise Monitoring Terminal (NMT) Details

Location	Stoneville Road Private Residence, Stoneville, WA 6081
Latitude	31°51'49.77"S
Longitude	116°10'16.09"E
NMT Altitude	919ft above mean sea level
Capture Zone	2.5km radius with 8,000ft (above ground level) height for noise data capture
Threshold Settings	45.0 dB(A) to 52.0 dB(A) depending on time of day

2. Location Images

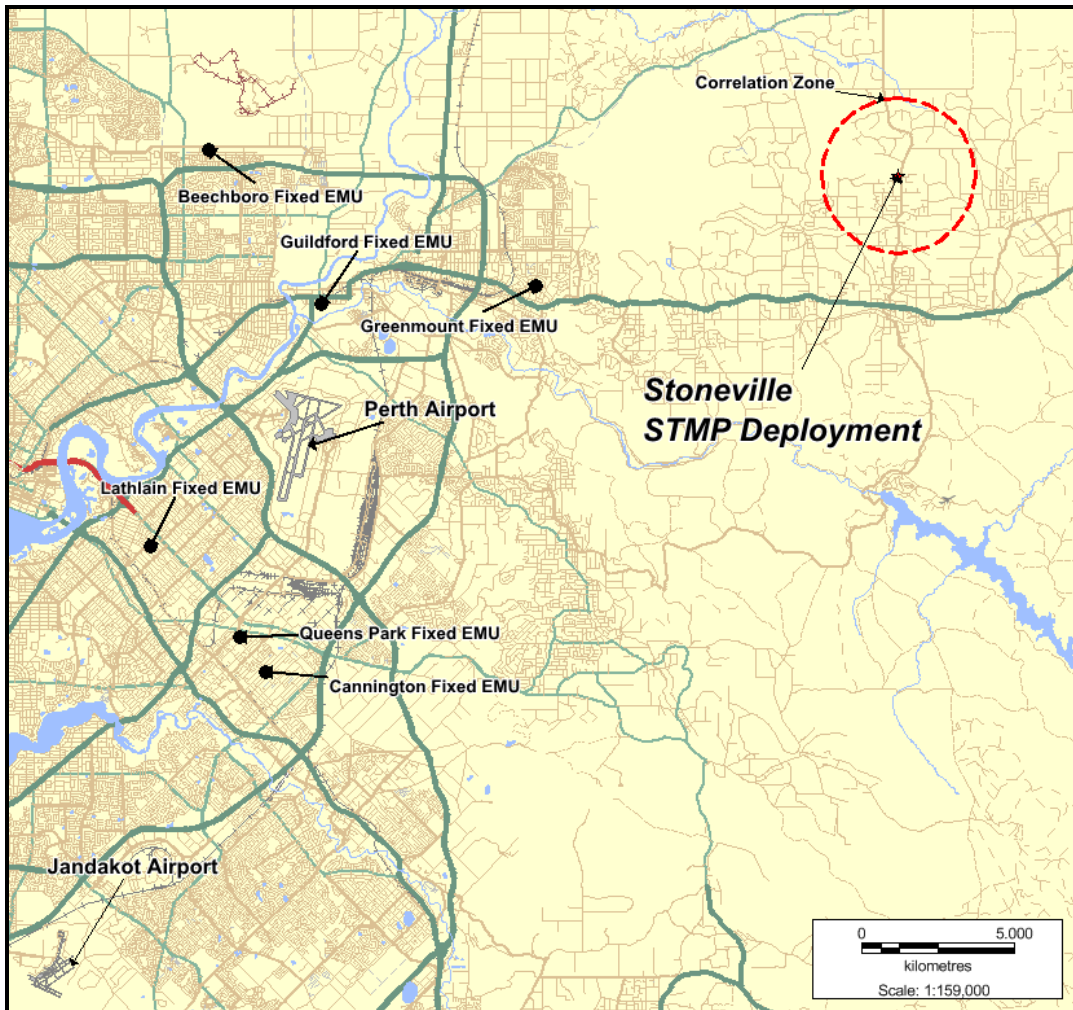


Figure 1: Perth Fixed EMU Locations and the Stoneville Short Term Monitoring Program Deployment Location

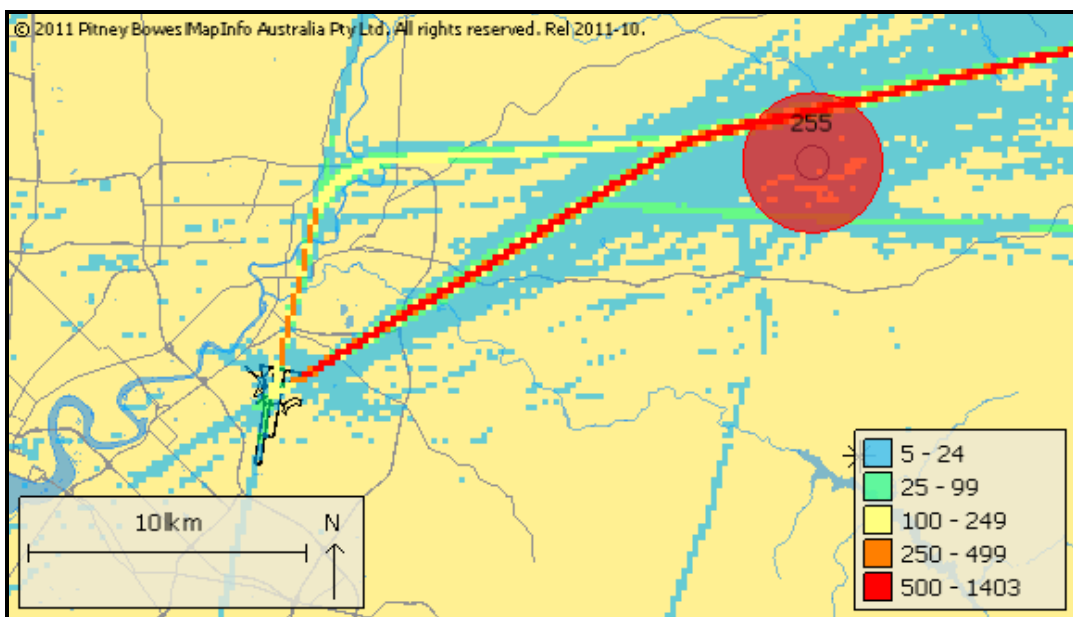


Figure 2: Total Movements Captured Track Density

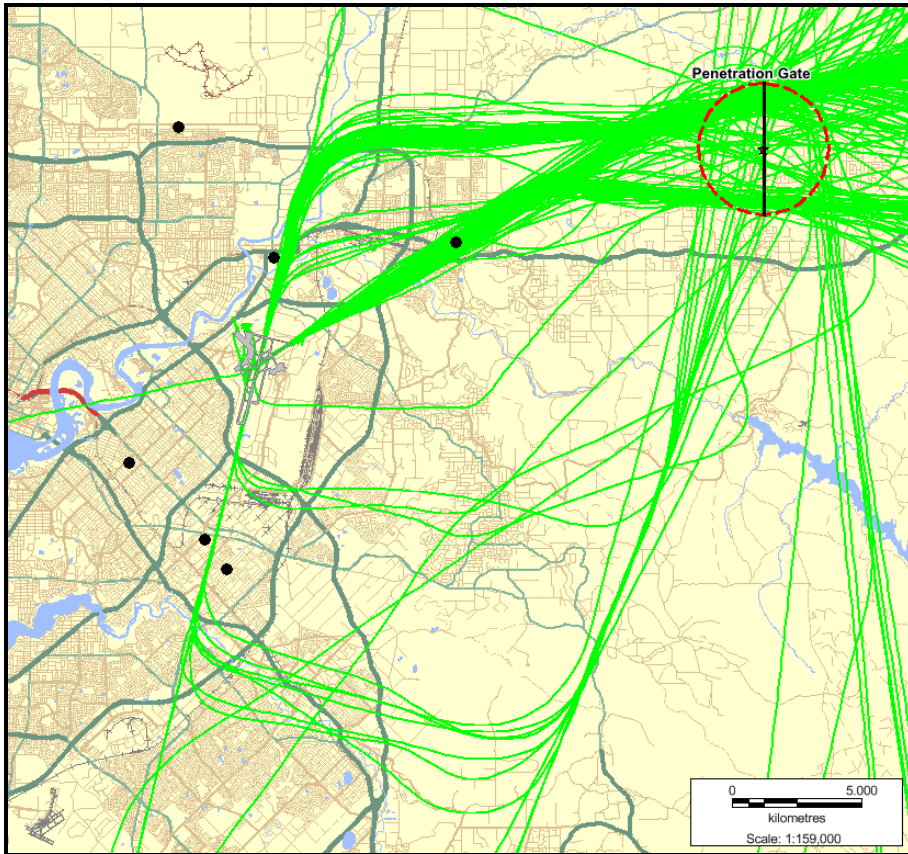


Figure 3: Perth Airport Movements Captured

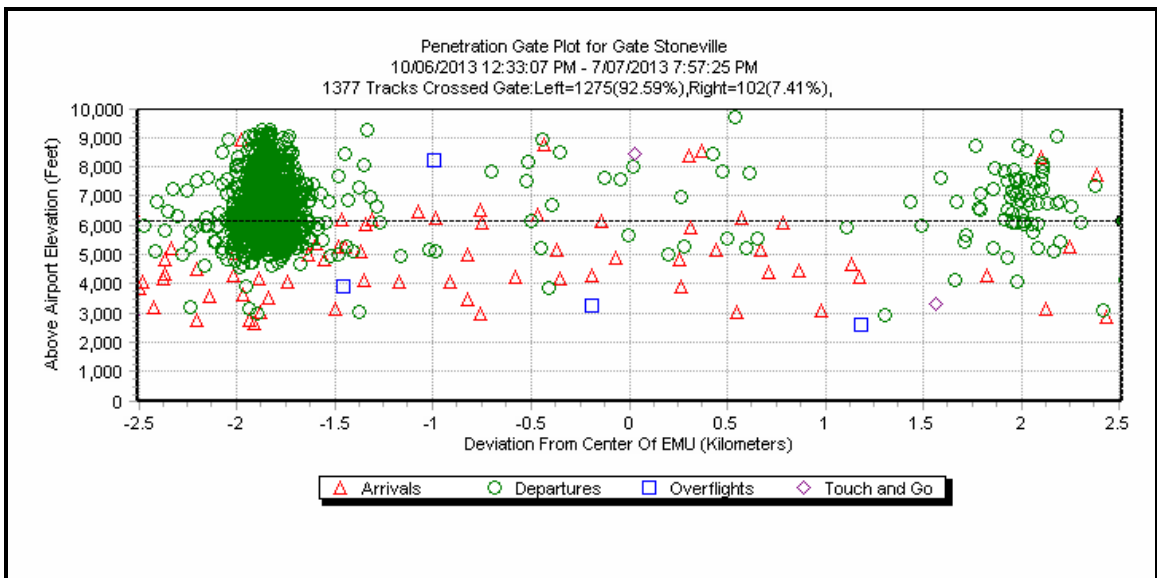


Figure 4: Stoneville Movements Through Capture Zone Penetration Gate

Note: Perth Airport is 67ft above mean sea level. NMT altitude is 919ft above mean sea level. The NMT altitude should be adjusted from the data shown above in order to draw conclusions about height above ground of aircraft operations.

The black line through the capture zone in Figure 3 is a penetration gate, which was crossed by all the flights shown in Figure 4. Some movements within the capture zone are not shown as they did not cross the penetration gate. Some flights may cross the penetration gate more than once, at different altitudes. This may happen, for example, if a flight passes through the penetration gate at a low altitude soon after take off, then again after having climbed to a higher altitude.

3. Deployment Findings

The following tables present a summary of the operations data.

Table 1 Movement Summary (10/06/2013 12:00am – 08/07/2013 12:00am)

Type of Operation	Perth Movements	All Movements
Number of Movements Through Capture Zone*	1,298	1,403
Number of Correlated Noise Events (CNE)	630	707
Number of Movements with Correlated Noise Events (CNE)	626	690
Correlation Summary	48.23%	49.18%

Note: * Includes all aircraft with transponder flying through area, regardless of destination/origin airport.

Note: ** May include operations that produced multiple noise events.

3.1 Correlation Summary

An evaluation of the number of aircraft operations were matched with noise events recorded by the NMT. This is an important aspect of assessing performance of the noise monitoring installation. Ideally, all operations passing the NMT 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. A correlation summary for all movements of 49% is considered to be an average result, based on reviews of fixed noise monitoring terminals nationally.

3.2 Movement Analysis

Table 2 Height (in feet, above ground level) Above The Monitor Summary

Type of Operation	Min*	Max*	Average*
Departures Through Capture Zone**	2,051	8,829	5,823
Arrivals Through Capture Zone**	1,791	8,103	4,120
All Operations Through Capture Zone**	1,738	8,829	5,723

Note: * Flight tracks are susceptible to an altitude error of up to 200ft which is consistent with normal radar tolerances.

Note: ** Includes all airports within Perth Basin.

Table 3 Captured Movements Breakdown By Airport and Aircraft Category

Airport	Jet	Turboprop	Light Propeller	Helicopter	Unknown*	Grand Total
Perth	1,225	70	3	0	0	1,298
Jandakot	1	7	86	1	5	100
Other	0	0	1	3	1	5
Grand Total	1,226	77	90	4	6	1,403

Note: *These non-flight planned operations are generally recreational aircraft conducting private flights and will account for the very low altitudes by some aircraft.

3.3 Background Noise Levels and Threshold Settings

At the monitoring site, background noise levels are first assessed to determine the appropriate threshold settings for the NMT. The threshold setting must be above the background noise level in order to clearly distinguish aircraft noise events from other noise sources. The result of background noise assessment and threshold settings are provided below in Figure 5.

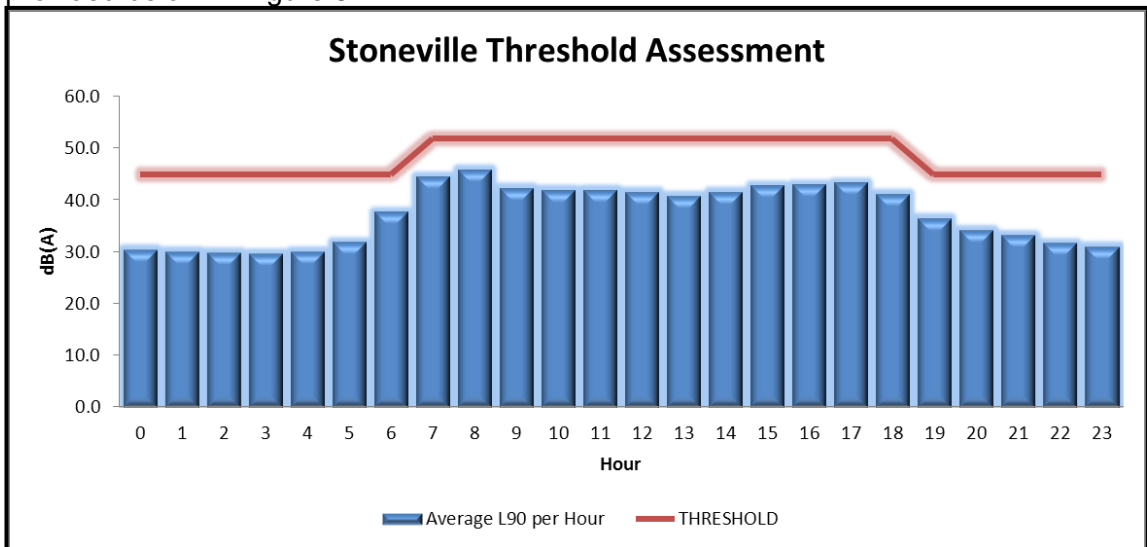


Figure 5: Background and Threshold Assessment

4. Noise Level Summary

The following tables present a summary of the noise data for aircraft that flew through the capture zone and caused a Correlated Noise Event (CNE). Information is provided for Perth Airport movements that flew over the NMT, as well as all aircraft that flew over the NMT, noting that this area is affected by arrivals, departures and training flights, as shown in Figure 2 and Figure 3.

Table 4 Noise Summary

Noise Parameters	Noise Level (dB(A))
LAeq 24 hr, dB(A)	51.4
LAeq (night), dB(A)	43.9
Background Day (L90 dB(A))	40.3
Background Night (L90 dB(A))	30.5

Note: LAeq 24hr: The continuous equivalent noise level over a 24 hour period, including noise from aircraft and the wider environment.

Note: LAeq (night): The continuous equivalent noise level over the night time period (hours of 11:00pm to 6:00am), including noise from aircraft and the wider environment.

Table 5 Correlated Noise Events Summary

	Perth Movements	All Aircraft
Total number of Correlated Noise Events (CNE 24hr)	630	707
Number of Correlated Noise Events at night (CNE night)	115	115
Operational Days	28	28
Number of Correlated Noise Events (CNE _{xx}) day/night	CNE _{xx}	CNE _{xx}
CNE ₆₀ – day	443	461
CNE ₆₀ – night	95	95
CNE ₆₅ – day	118	121
CNE ₆₅ – night	18	18
CNE ₇₀ – day	6	6
CNE ₇₀ - night	0	0
CNE ₇₅ – day	1	1
CNE ₇₅ - night	0	0
CNE ₈₀ – day	0	0
CNE ₈₀ - night	0	0

Number of Correlated Noise Events (CNExx) per 24hr period min – max	Perth Movements	All Aircraft
CNE ₆₀	0 to 46	0 to 47
CNE ₆₅	0 to 13	0 to 13
CNE ₇₀	0 to 1	0 to 1
CNE ₇₅	0 to 1	0 to 1
CNE ₈₀	0 to 0	0 to 0
Average Number of Correlated Noise Events (CNExx Ave.) day/night	CNExx Ave.	CNExx Ave.
CNE ₆₀ Ave. – day	15.82	16.46
CNE ₆₀ Ave. – night	3.39	3.39
CNE ₆₅ Ave. – day	4.21	4.32
CNE ₆₅ Ave. – night	0.64	0.64
CNE ₇₀ Ave. – day	0.21	0.21
CNE ₇₀ Ave. – night	0.00	0.00
CNE ₇₅ Ave. – day	0.04	0.04
CNE ₇₅ Ave. – night	0.00	0.00
CNE ₈₀ Ave. – day	0.00	0.00
CNE ₈₀ Ave. – night	0.00	0.00

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

Table 6 L_Amax Summary

Min dB(A)	Max dB(A)	Average dB(A)
48.9	75.7	62.3

Note: Summary for operations that passed through the correlation zone (2.5km radius with 8,000ft height AGL)

5. Aircraft Noise Levels

Table 7 presents the top 10 average noisiest aircraft types captured during the reporting period. Table 8 shows the 10 most correlated aircraft types that flew over the noise monitoring terminal.

Table 7 Top 10 Average Aircraft Noise Levels (LAmax) at the Stoneville Noise Monitoring Terminal

Aircraft Type	Airport	Operation Type	Runway	No. Correlated Noise Events	LAmax dB(A)		Highest No. CNE in One Day
					Average	Maximum	
Eurocopter EC-135 (H)	Fremantle Heliport	O	Unknown	1	68.6	68.6	1
Airbus A330-300 (J)	Perth	A	3	1	65.6	65.6	1
Airbus A330-200 (J)	Perth	D	6	87	65.6	71.5	11
Airbus A330-200 (J)	Perth	D	3	24	65.3	69.4	6
Boeing 737-300 (J)	Perth	D	6	1	65.2	65.2	1
Fokker 100 (J)	Perth	D	3	4	65.2	69.1	2
Beechcraft BE58 Baron (P)	Jandakot	D	Unknown	1	64.9	64.9	1
Boeing 767-300 (J)	Perth	D	6	25	64.6	67.5	4
Airbus A321 (J)	Perth	D	06	6	64.5	67.9	1
Airbus A330-300 (J)	Perth	D	06	3	64.0	65.6	1

Table 8 Top 10 Most Correlated Aircraft Types Over the Stoneville Noise Monitoring Terminal

Aircraft Type	Airport	Operation Type	Runway	No. Correlated Noise Events	LAmax dB(A)		Highest No. CNE in One Day
					Average	Maximum	
Boeing 737-800 (J)	Perth	D	06	124	62.9	72.0	12
Fokker 100 (J)	Perth	D	06	92	62.6	68.0	9
Airbus A330-200 (J)	Perth	D	06	87	65.6	71.5	11
Airbus A320 (J)	Perth	D	06	55	61.3	69.5	6
Boeing 737-800 (J)	Perth	D	03	40	62.9	75.7	6
Airbus A320 (J)	Perth	D	03	39	61.4	65.6	7
Boeing 717-200 (J)	Perth	D	06	27	61.4	66.3	4
Boeing 767-300 (J)	Perth	D	06	25	64.6	67.5	4
Airbus A330-200 (J)	Perth	D	03	24	65.3	69.4	6
Fokker 50 (T)	Perth	D	06	15	60.5	68.9	2

Note: Aircraft Category: Jet (J), Turboprop (T), Propeller (P), Helicopter (H), Unknown (U)

Note: Operation Type: Departure (D), Arrival (A), Overflight (O)

6. Conclusions

Short term noise monitoring was conducted in Stoneville during the period of 10th June to 8th July 2013. This followed the recommendations made in the 'Review of the Perth Environmental Monitoring Units' undertaken by Airservices in 2011.

During the reporting period the most common aircraft movements to traverse the Stoneville community were Perth Regular Public Transport (RPT) jet departures off Runway 06.

Throughout the reporting period the highest number of correlated aircraft noise events exceeding 65dB(A) in one day was 13. Residents in the area of Stoneville were exposed to a correlated noise events exceeding 65dB(A) during the hours of day and night. There were 95 correlated noise events above 60dB(A) that occurred during the hours of night. The average L_{Amax} during the reporting period was 62.3dB(A), with a max level of 75.7dB(A) and minimum level of 48.9dB(A) recorded.

A review of Tables 7 and 8 indicates the most frequent and generally the loudest movements to correlate at Stoneville tend to be Perth Airport departures.

The correlation summary of 49% for all movements is considered a relatively average result based on reviews of fixed noise monitoring terminals nationally. During the reporting period Perth movements had a correlation summary of 48%.

Due to the distinctive flight paths and distance from Perth Airport, it is not expected the ratio of arrival and departure flights over Stoneville will change due to seasonal variation over a twelve month period.

7. 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/>

8. Contact us

To lodge a complaint or make an enquiry about aircraft operations, you can go to WebTrak (www.airservicesaustralia.com/aircraftnoise/webtrak/) use our online form (www.airservicesaustralia.com/aircraftnoise/about-making-a-complaint/) telephone 1800 802 584 (freecall) or 1300 302 240 (local call –Sydney) fax (02) 9556 6641 or write to, Noise Complaints and Information Service, PO Box 211, Mascot NSW 1460.

9. Glossary of Terms

A	Arrivals
AGL	Above Ground Level
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
CNExx	Correlated noise events that are equal or greater than the noise level XX dB(A)
D	Departures
Day	6:00am to 11:00pm
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)
LAmx	Maximum sound level in dB(A)
Local	Operation that departs and arrives at the same airport. Local movements include circuits and training flights.
Movement	An aircraft operation, such as a take-off or landing
Nxx	Average daily number of correlated noise events equal to or greater than XX dB(A)
Night	11:00pm to 6:00am
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
NMT	Noise Monitoring Terminal
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
T	Local Operation (Departure & Arrival)

Note: For further information on the metrics used in this report refer to Australian Standard 1055.1–1997 “Acoustics – Description and measurement of environmental noise”.

Note: Airservices welcomes comments about this report. Please contact us via e-mail at community.relations@airservicesaustralia.com if you would like to provide feedback.