Independent Noise Data from Overflights at Parafield Airport

Submission to the Senate Standing Committee on Rural & Regional Affairs & Transport
Re: Inquiry into the effectiveness of Airservices Australia's management of aircraft noise

Martin Lewicki

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This document surveys noise level readings in selected suburban areas exposed to overflight noise from Parafield Airport, South Australia. Training flights at Parafield Airport have gradually increased over the years so that the frequency of noise events have exacerbated the detrimental effects on thousands of residents. In addition it will be shown how Airservices Australia's published noise level readings underrate the actual frequency that residents are exposed to overflight noise. Included in this document are graphical representations of noise data of overflights and information about the method and noise meter used.

Why this Noise is Especially Irritating

Light aircraft are powered by piston engines. These have a noise characteristic like a lawnmower or chainsaw when in full throttle with the same torturous mental and physiological effects on residents over which they fly. By contrast background road traffic noise is a constant wash that is more like white noise. Residents along Salisbury Highway near Parafield must also suffer the detrimental effect of heavy traffic noise. Parafield flight training overflights however affect *tens of thousands of residents* over a wide area.

Unlike light aircraft, jet engine manufactures have responded to noise issues over the years by improving design to reduce engine noise from commercial airline jets. While 30 years ago I had to block my ears while spotting jets taking off over Tapleys Hill road adjacent to Adelaide Airport, now there is no need to do this and one can carry out a conversion with little difficulty while a jet is taking off overhead.

By contrast there seems to have been no attempt by the light aircraft manufacturing industry to address noise issues nor attempts by Parafield Airport to seriously address the widespread complaints and effects on residents. While residents living under Adelaide Airport flight paths also suffer overflight noise, the worst affected have been provided with double glazed windows and other noise insulation. Many of these residents who live under the flight paths actually fly on the planes themselves as passengers when they travel for business and pleasure. That is, Adelaide Airport provides a general aviation service to the community at large thereby to some extent justifying its activities. Not so for Parafield. Only a minority of the flights are general aviation. The remainder are flight training movements that mostly benefit investors running the flight training schools to the detriment thousands of residents.

The repetitive, droning noise of these air craft as they climb at full throttle in their turning arcs is

gut wrenching and distracting. As the data below shows there can be 60 overflights per hour with noise levels exceeding tolerances set by Australian Standard (AS2021-2000). Repetitive exposure to this level of noise for many people can wear down psychological resistance, inducing emotional stress and making it difficult concentrate on reading or studying. On a fine day when you wish to enjoy the amenity of your back yard you are soon driven indoors by continuous droning overflights.

Noise Studies at Parafield

Airservices Australia (ASA) has conducted its own noise level data collection for overflights at Parafield that include Australian Noise Exposure Forecast (ANEF) contour maps and noise levels for certain aircraft. However their results are not easy to relate to actual level of annoyance in practice. Also the location of ASA's Noise Monitoring Terminal (NMT) at Parafield Gardens was placed under coasting paths of the aircraft when they are more likely throttled down. A survey was also conducted by the Residents Against Aircraft Noise (RAAN) in 1993. More information about Parafield noise and aviation here.

My Noise Measurements

I decided to make my own independent readings with a noise meter in locations where aircraft ascend on full throttle turning arcs with the greatest detrimental effect on residents. Readings were taken outdoors and indoors to get a sense of how the levels (in decibels) correspond to level of annoyance during overflights. My readings confirm the levels measured by RAAN in 1993 but since then the *frequency* of noise events from training overflights have greatly increased due to increased flight training activities over that time. It should be noted that noise measurement is a complex science that takes a number of objective and subjective factors into account. Measurements are usually taken over a period of months and processed to produce a ANEF factor that is used for city zone planning. More information can be found in the ASA publication cited. My measurements are a more immediate representation of the noise level and frequency rather than the average and processed data presented by ASA.

Noise levels consistently are above tolerable standards

The data I have gathered show a high rate of noise levels exceeding 60dB for outdoors and exceeding 50dB for indoors. Measurements were acquired in half-hour blocks. The choice of these time-blocks were conditioned by personal availability due to life and employment demands but also they are representative samples of continuous overflights that can last for hours over these residential areas between 7.30am and 11.00pm. Measurements were taken during characteristic overflight sessions over a typically affected residential area such as Pooraka.

The noise level graphs were acquired using a CEL 460 dosimeter that is used for measuring industrial noise exposure. Measurements made were in the dB-A band that is sensitive to the human audio range. The dosimeter microphone was aimed upward about 1.2 meters above the

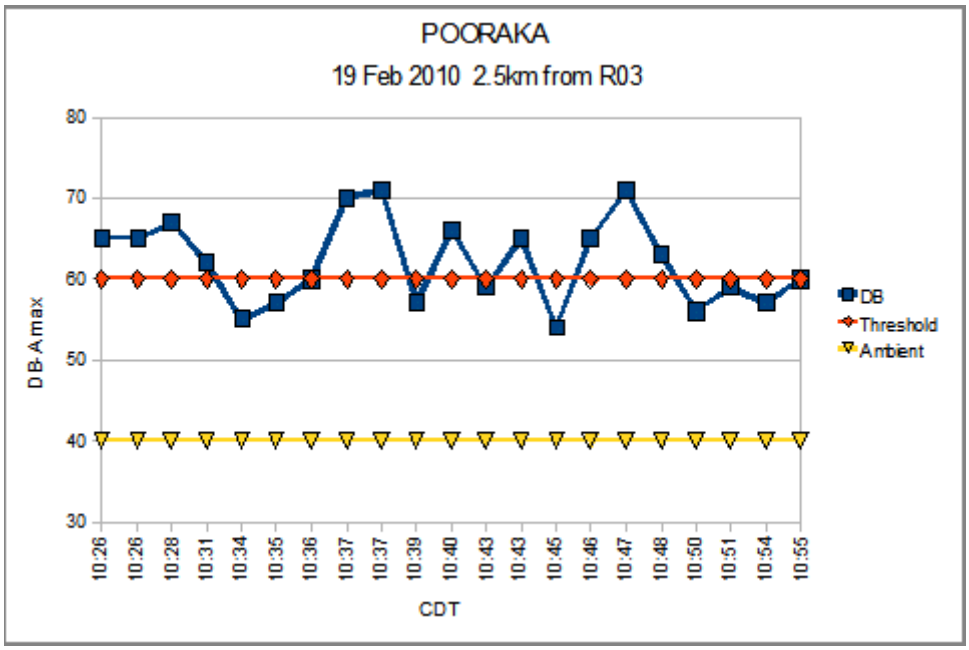
ground taking the MAX (maximum decibel) of each overflight. Readings were taken from three locations 1.5km and 2.5 km south of Runway 03 (R03). These areas were chosen because they are typical of the general area surrounding the airport that suffer incessant flight circuit noise day and night. Readings were also taken indoors from the 2.5km location with one widow open. They were recorded into a spreadsheet each with a decibel (dB) reading and with time stamp and graphed as illustrated below. As the graphs indicate, repetitive noise levels are consistently higher than the acceptable level of 60dB for outdoor living spaces and 50dB for indoor living spaces as prescribed by Australian Standard AS2021-2000 for aviation noise levels in residential areas.

The varying noise level readings reflect the distances of each overflight from the noise meter and different levels of throttle depending on flight characterised and aircraft type. The noise is particularly excessive during ascending turning arcs over the measuring location.

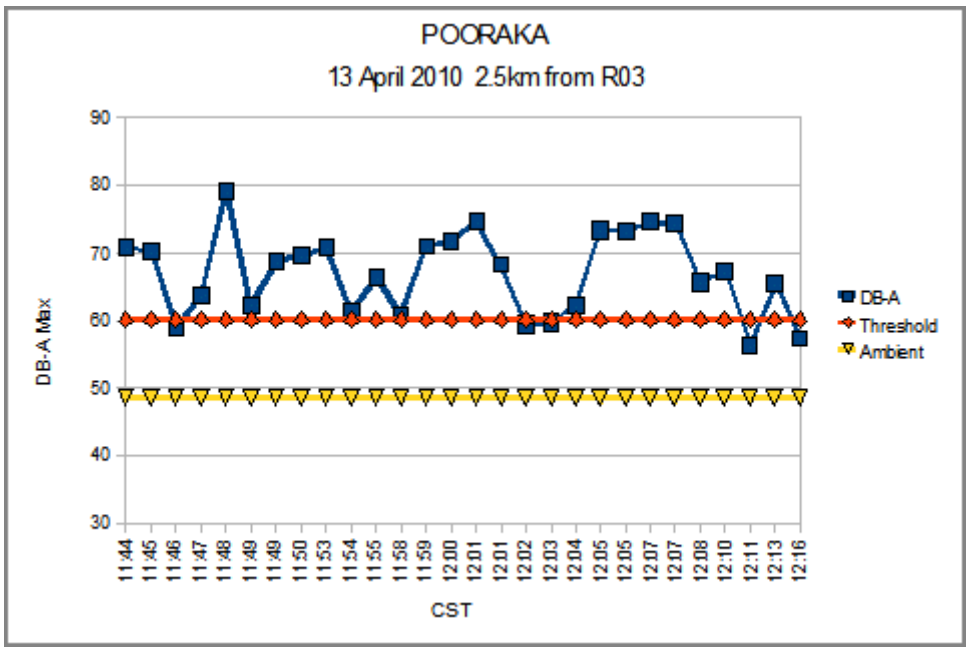
The Graphical Data

Following are the decibel readings in graphical form. Most graphs are for a 30-minute time span each. Each blue plot represents an overflight averaging about one per minute.

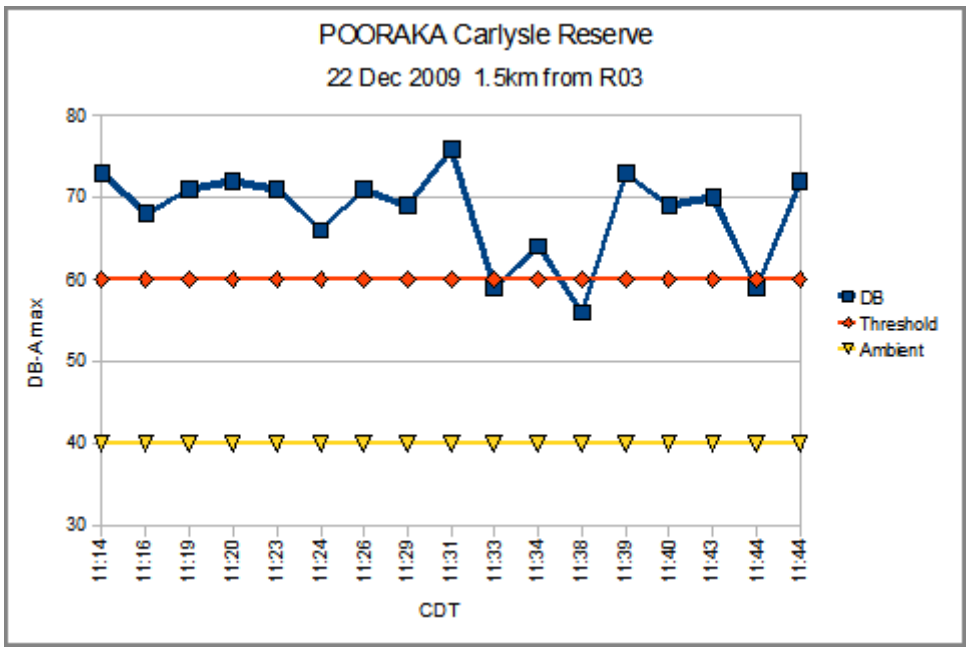
Outdoor readings



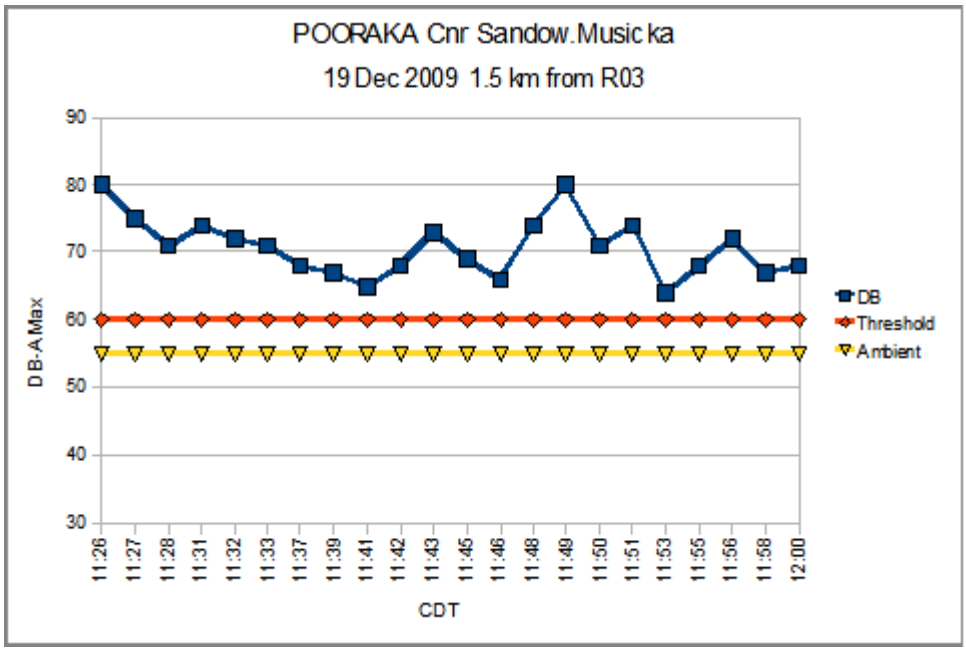
1. These readings indicate that out of 21 overflights over a 30-minute time span, 11 exceeded 60dB (red line). For a day of constant overflights between 7.30am to 11pm this suggests a noise level of could reach 340 excessive events. Those over 70dB would extrapolate to as many as 46 noise events per day. The yellow line is the average background (ambient) noise level between overflights.



2. Some days the levels are consistently excessive. Here the maxima exceeded 70 dB nine times in 30 minutes out of 28 overflights. Almost all were over 60dB and 11 were 70 dB or more. One overflight attained nearly 80dB, the same as a kitchen blender at a distance from 2 metres!



3. Carlysle Reserve is 1.5 km from Runway 03. Residents in this area experienced 9 overflights equal or exceeding 70 decibels in 30 minutes. Extrapolated to a typical day of flight training circuit noise this could amount to as much as 279 events over 70 decibels in a day .



4. At a distance 1.5 km in this 35-minute span out of 22 overflights 12 were equal to or above 70 dB. Two events were at 80dB. The ambient level is higher due to a nearby highway but still below 60dB.

By contrast the ASA Noise Measuring Terminal (NMT) located at a much quieter "aircraft coasting area" over a school at Parafield Gardens appears to show only a fraction of this thereby obscuring the real level of annoyance experienced by those who live in noisy aircraft climb areas. ASA measurements were acquired over a continuous period 26 September 2006 to 18 October 2006 and averaged out. But my samples of approximately 30-minute each extrapolated to continuous overflights in the period 7.30am to 11pm each day indicates a much greater frequency levels suffered by residents.

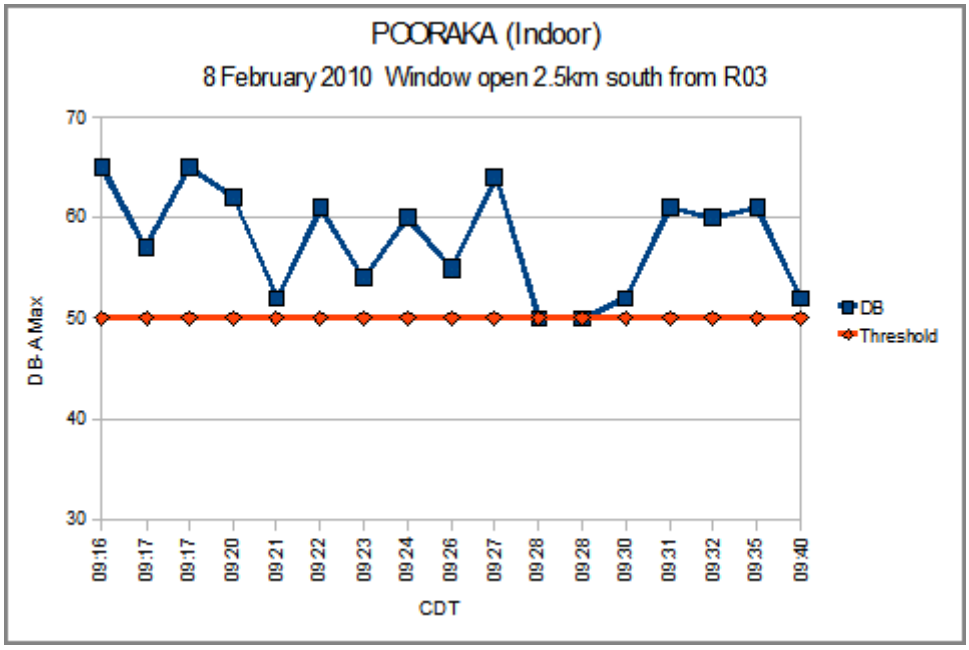
Noise Levels - Airservices Australia (Parafield Gardens NMT)	Noise Levels - Pooraka CEL-460 extrapolated continuous 7.30am -11pm and half numbers
N60 = 37.3	N60 = 340 (170)
N70 = 6.7	N70 = 279 (140)
N80 = 0.2	N80 = 62 (31)

Table above compares ASA Parafield Gardens averaged data with my measurements at Cnr Sandow/Musika Pooraka on 19 December 2009 (see graph 4). The “N” rating is number of times a day the noise exceeds a given decibel level. Eg N60 = 20 means 20 events exceeded 60dB in that day. N80 = 3 mean only 3 events exceeded 80dB in that day.

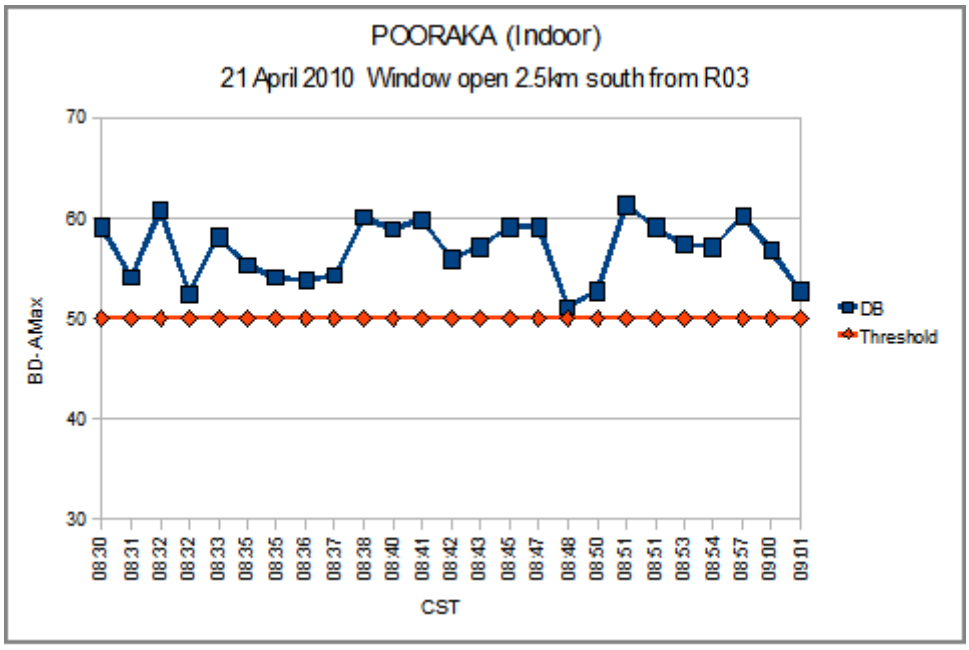
There appears to be a large disparity between ASA Parafield Gardens report and the extrapolations from my independent Pooraka data. In practice there are respite periods of varying duration during daily flight training cycles. The average length of these respite periods have not been measured. We therefore rely on reports of affected residents who indicate that on many days the droning goes on “for hours” — morning to night, insinuating little respite. But even if we were to halve the N-frequencies to accommodate putative respite periods the levels still far exceed those of ASA's report.

Indoor noise readings

According to Australian Standard AS2021-2000 indoor noise level from outdoor aviation activity should not exceed 50 dB. However the following readings show this is exceed regularly.



5. Indoor readings are made within a living space with one window open. Here too noise levels for almost all overflights exceed 50dB.



6. Repetitive noise levels exceeding 50dB every minute, often for hours on end. Without double glazing or other acoustic insulation makes it impossible to enjoy indoor amenity during these periods. Watching TV programs is regularly dashed as much of the audio content is lost unless volume is increased to harassing levels.

The Noise Meters

7. *Right* The **CEL-460** that was used to make the overflight noise measurements and at *left* a **Bruel Kjoer 2209** noise meter used to calibrate the CEL-460. They were found to be commensurate within a decibel in the A-band used for the overflight noise readings. The meters were loaned courtesy of the *Civil Engineering Laboratories, University of South Australia.*

Conclusion

Further measurements in the suburbs surrounding Parafield Airport would help map out noisy "hot spots" with more accuracy. Regardless, a significant number of residents are adversely affected and have attempted to make their complaints known to ASA and other authorities in vain. The issues are regularly exposed in the local newspaper, if only to record that flight training noise is a pervasive and growing problem. The small study presented here serves to support the complaints and that noise levels from training overflights are excessively high and frequent, and often exceed the Australian Standard for aircraft noise levels capped for residential areas.

Martin Lewicki