

Great South Land Minerals oil/gas drilling project 2007-2008

Field report for noise monitoring of Moomba (SA) drillsite locations

General

Great South Land Minerals Limited has proposed a drilling program in search of oil/gas resources in Tasmania. Current drilling operations in the Cooper Basin oil/gas fields west of Moomba, SA provided a preview opportunity for assessing likely noise incursion that may be expected in Tasmanian operations. Hunt Energy Rig #2 was in operation, and the subject of this examination. Local staff advised that Rig #3 was to be used in Tasmania, and that it was regarded as being a quieter unit than Rig #2.

Field noise monitoring locations (140 km drive west of Moomba) were visited 6-7/3/2008 for operational noise measurements, and included site, weather and noisescapes observations. Fieldwork was undertaken over the times: 18:00-22:00, 22:20-23:20, 06:30-07:00 and 07:40-09:10.

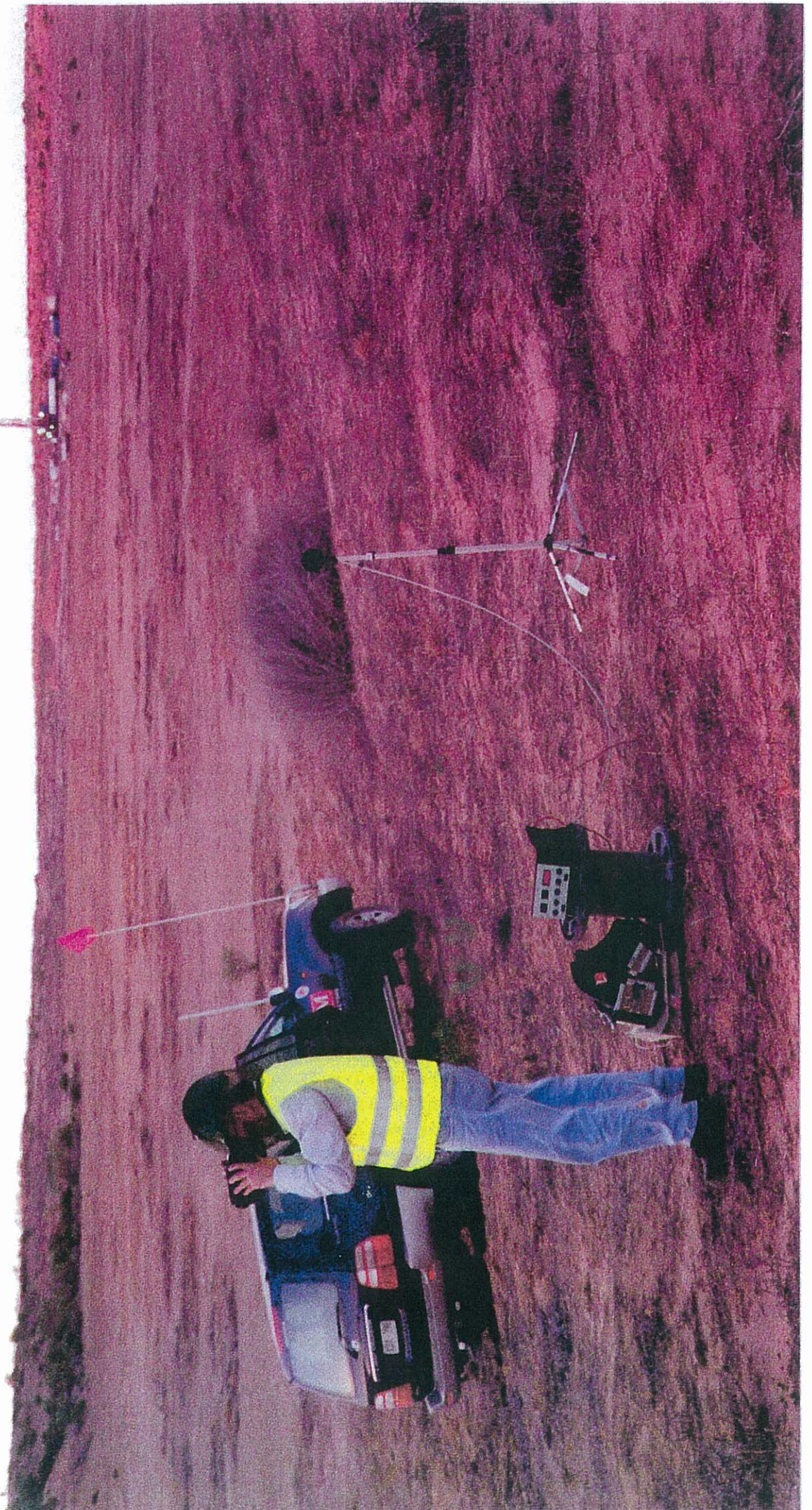
Unfortunately, the Rig was not fully operational for much of the window of opportunity of this visit. Furthermore, the site visit was truncated due to sudden vehicle transport shortage and necessity of meeting airline timetable for travelling drilling staff. These constrained the scope of measurements and observations.

Acknowledgements

Great South Land Minerals Limited (Duncan New) kindly arranged the logistics for this valuable opportunity. While we failed to note all names and affiliations, we are indebted to the Hunt Energy camp staff and site crew for considerate hosting. We appreciate discussions with foreman Michael Coleman and geologist Les Burgess (who also loaned us his 4WD), and cooperation of Mick Ommundson (OH&S). We thank the camp staff for comfortable accommodation, and the chef/cook for excellent fare, and Peter Slade for safe driving from Moomba. We also enjoyed hospitality of Santos cafeteria staff at Moomba.

Instruments used

- Brüel & Kjær Statistical Noise Analyser Type 4426 s/n 957489, Laboratory Certified October 2007;
- Brüel & Kjær Level Recorder Type 2306;
- Brüel & Kjær Precision Integrating Sound Level Meter Type 2218 s/n 784345, with
Brüel & Kjær Octave Filter Set Type 1613 s/n 643248, both Laboratory Certified December 2006;
Brüel & Kjær 1/3 Octave Filter Set Type 1616 s/n 661719, Laboratory Certified December 2006;
- Brüel & Kjær Sound Level Calibrator Type 4230 s/n 1207368, Laboratory Certified December 2006;
- Brüel & Kjær Precision Sound Level Meter Type 2232 s/n 1129761, Lab. Certified December 2006;
- Brüel & Kjær Noise Dose Meter Type 4436 s/n 1628859, Laboratory Certified June 2006;
- Weather Instruments (Aneroid barometer, Zeal Wet/Dry bulb Psychrometer, Suunto KB-14/360R compass, Kaindl Windmaster 2 wind speed meter);
- Fibreglass measuring tape



Notes on individual noise monitoring locations - Hunt Energy Rig #2

Location 1 (850 m south of Rig #2)

This was a line-of-sight location part way up a dune 850 m from the drill rig at 170° magnetic bearing, separated by low sandy flats. The Rig and Location were some 5 m above the flats.

Detailed measurements are tabulated and graphed.

Noises noted include:

- Drilling operations
- Pump and generator operations
- Tanker and other vehicles
- Crickets
- Breeze at times

Location 2 (250 m south of Rig #2)

This was a line of sight location on the far side of a trench on the flats 250 m south of the drill rig.

Detailed measurements are tabulated and graphed.

Noises noted include:

- Clangs – 50 dB(A) Impulse, 60 dB(A) Impulse
- Horn toot – 62 dB(A) Impulse
- Crane lifting – 50 dB(A)
- Pump and generator operations
- Crickets
- Breeze

Location 3 (12.5 m east of Compressor)

The release of air was measured, facing the compressor 12.5 m away:

- Initial burst L_{max}=101.3 dB(A)
- Average of release L_{max}=93.6 dB(A)

Location 4 (40 m east of line of main motors)

Various noise events were measured at this monitoring site, located 40 m from the main rig motors, mud pumps and generators, 30 m from the sub base of the rig.

Noise events:

- Clank – L_{max} exceeded 94 dB(A) instrument limit
- Air tugger – L_{max} 80.5 dB(A)
- Average operating noise - 72.6 dB(A)
- Drilling friction noise - 74.3 dB(A)
- Loader start (20 m away) – 95.2 dB(A)
- Tanker
- Vehicles

Main noise sources operating continuously:

- 2 x rig drive motors
- 2 x mud pumps
- 2 x generators
- compressor

Detailed measurements included noise dose analysis; tabulated and graphed.

**Statistical distribution summary table of noise and event data
Hunt Drill Rig #2, Moomba western exploration area, SA, 6-7/3/2008**

Location	1	2	1	1
Location distance from Rig #2	850	250	850	850
Date	6/3/08	6/3/08	7/3/08	7/3/08
Time	19:39	21:01	8:14	8:42
Duration, minutes	15	1	15	15
Samples	9000	1	9000	9000
Drill operating	no	no	yes	yes
Mud pumps	yes	yes	yes	yes
Generators	yes	yes	yes	yes
Compressor	yes	yes	yes	yes
Noise level, dB(A)				
L1	39.3		51.3	40.3
L2	38.5		50.8	39.5
L5	37.5		50	38.3
L10	36.5		49.3	36.8
L20	35.3		48.0	35.3
L50	33.3		44.3	32.8
L90	31.0		40.0	30.5
L99	29.0		38.5	29.8
Leq	33.9	42.6	45.6	34

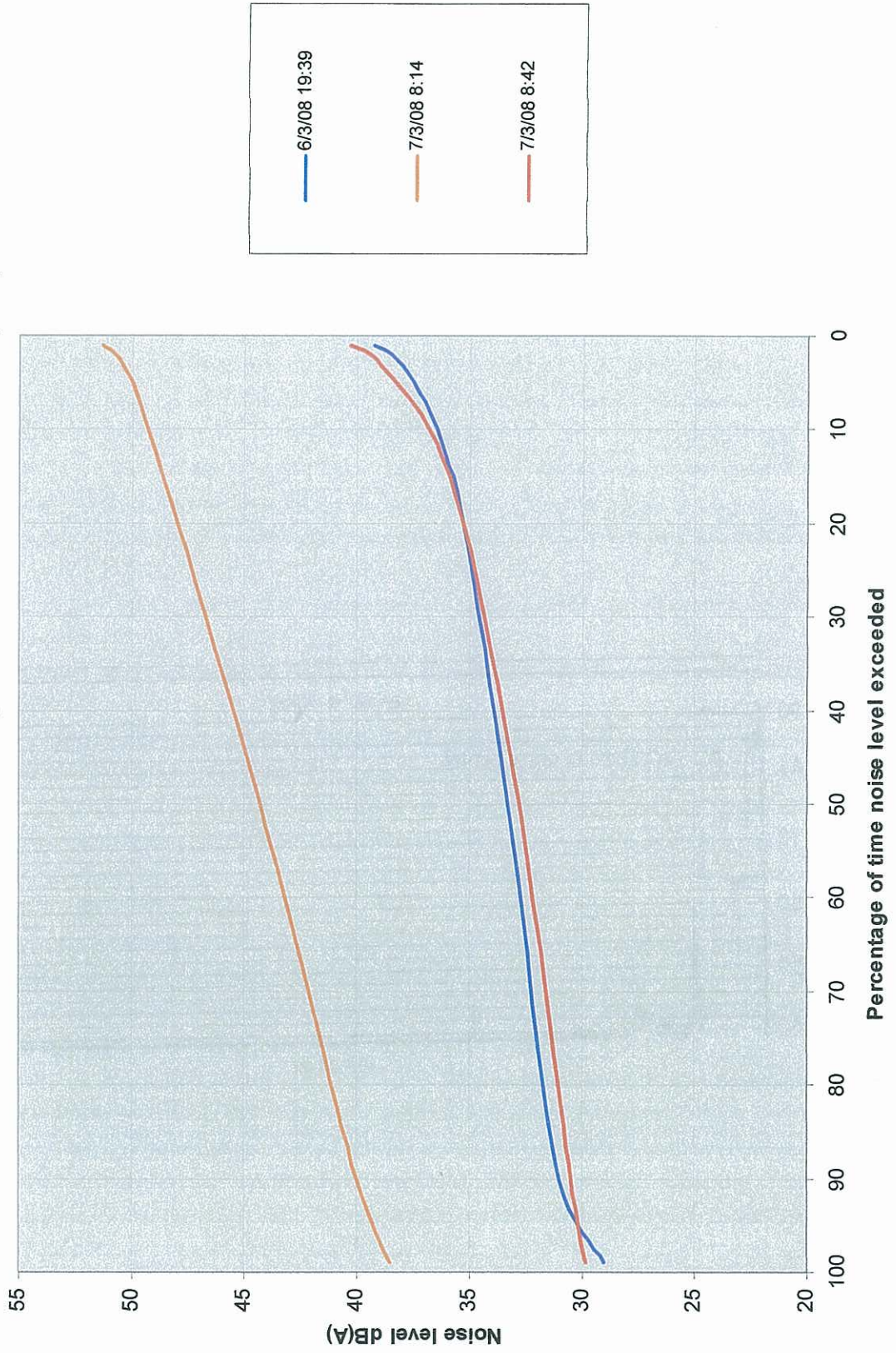
Partial log of movements – Mick Ommundson 6/3/2008

Time	Situation (Hunt Energy Rig #2)
19:00	Drill floor running in drill collars1
19:07	Draw works Engine # 1 lifting elevators
19:18	Draw works Engine #1 lifting D/C
19:20	Standing in front of shale shakers
19:22	Agitator motor
19:24	Mud pump #2 idle
19:25	Mud pump #1 idle
19:26	Gen #1 back of
19:27	Gen #1 front of
19:28	Gen #1 besides
19:29	Screw compressor
19:30	Smoke stack

Weather records for site visits

Date	6/3/2008	7/3/2008	7/3/2008
Location	1	1	Moomba
Time	19:40	8:20	14:30
Temp °C	33	24	36
Relative Humidity %	21	37	21
Pressure hPa	1012	1017	
Wind speed average m/s	1.0	calm	
Wind speed maximum m/s	2.2		
Wind direction	SE		
Cloud cover x/8	0	0	0

**Statistical Analysis, 15 minute sampling periods
Location 1, 850 m from Hunt Rig #2, west Moomba fields, SA, 6-7/3/2008**



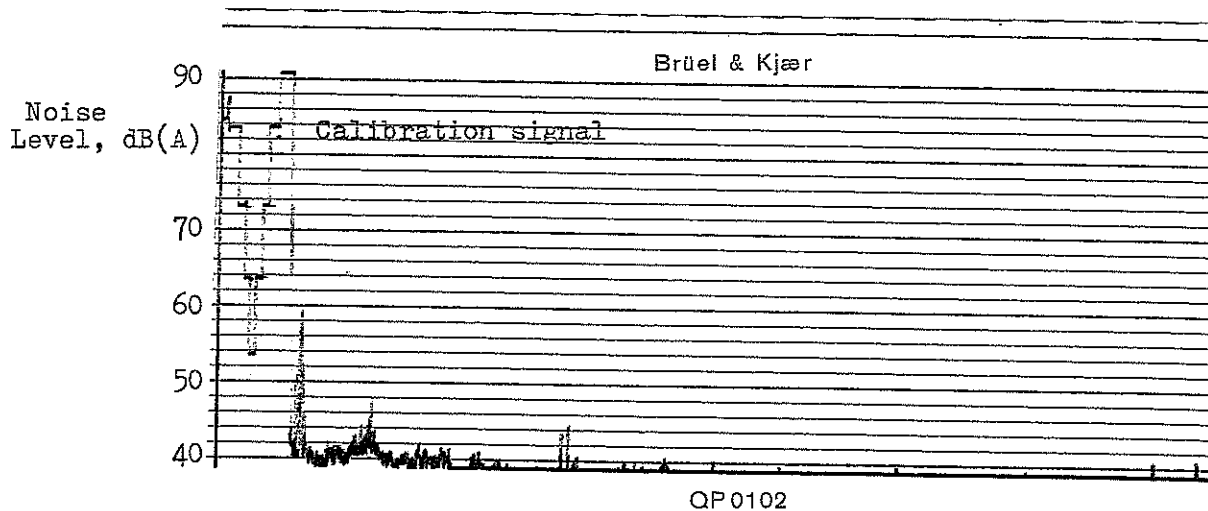
Time recording of noise at Location 1, Hunt Rig 2.

Trace of period commencing 08:42, 7/3/2008

Chart speed 0.3 mm/s. Scale 18 mm = 1 minute.

Note decline of levels to below scale minimum
within short period of sunrise over flats.

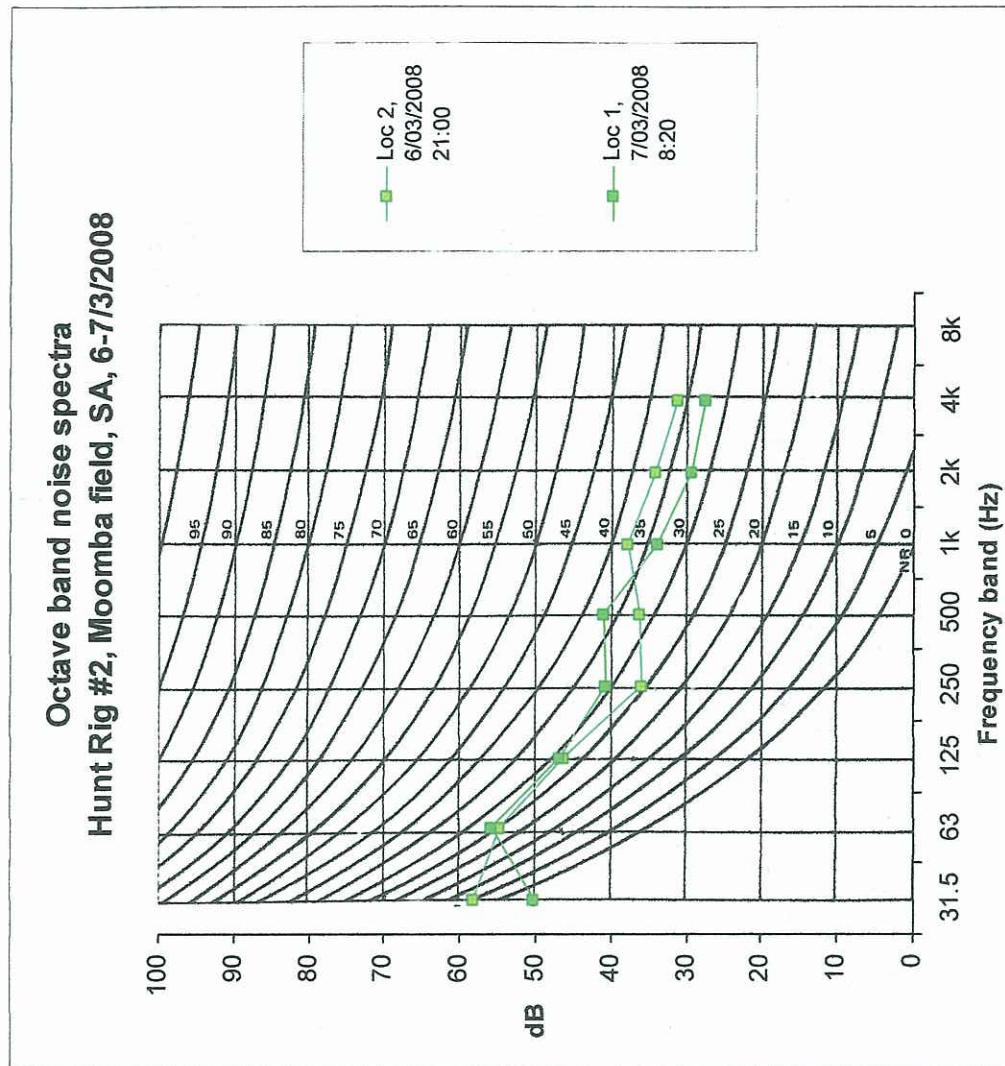
Drill rig was operating during this time.



Octave spectral distribution – Hunt Rig #2

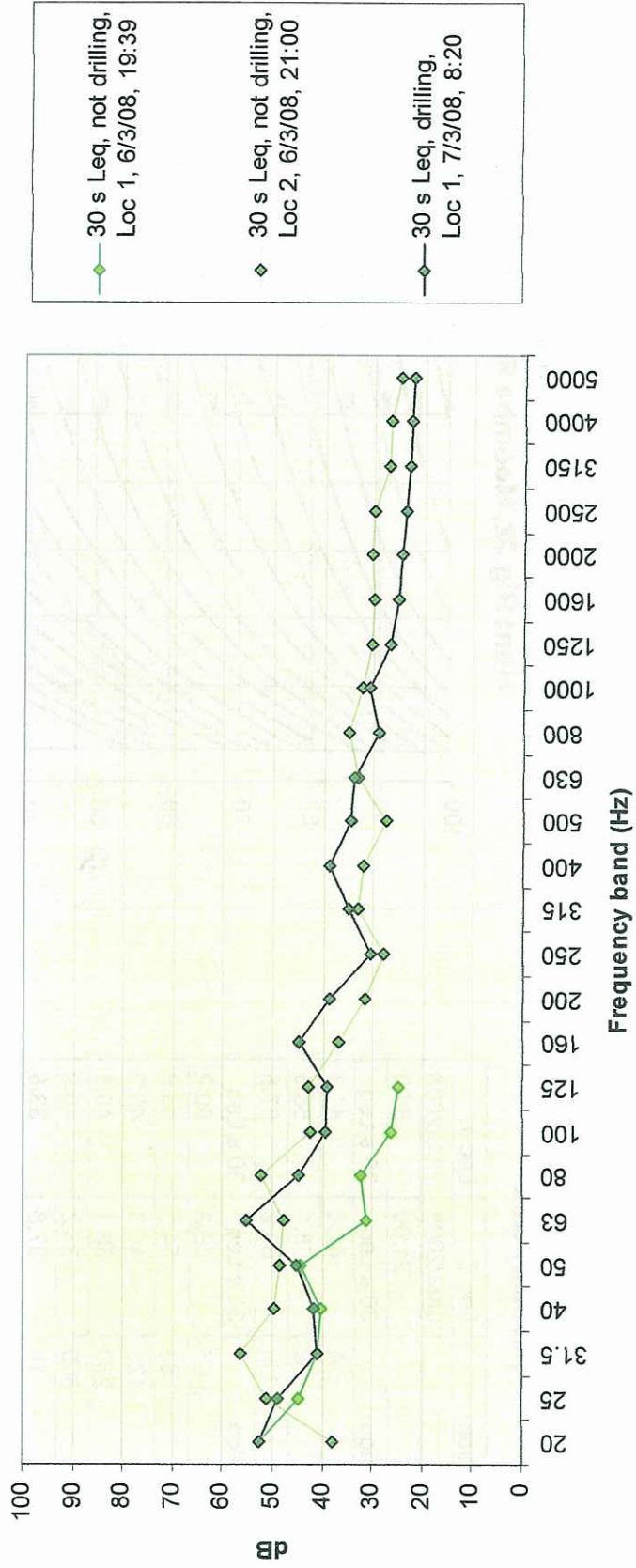
Summary table

Location	Loc 2,	Loc 1,
Date	6/03/2008	7/03/2008
Time	21:00	8:20
Duration	30 s Leq	30 s Leq
A	41.9	41.3
C	58.1	56.5
Lin	60.2	57.5
Duration	30 s Leq	30 s Leq
31.5	58.3	50.2
63	54.8	55.9
125	46.3	46.9
250	36.1	40.8
500	36.2	40.9
1k	37.8	33.8
2k	34.2	29.3
4k	31.1	27.4
8k		



Noise spectral distribution by $\frac{1}{3}$ octave bands

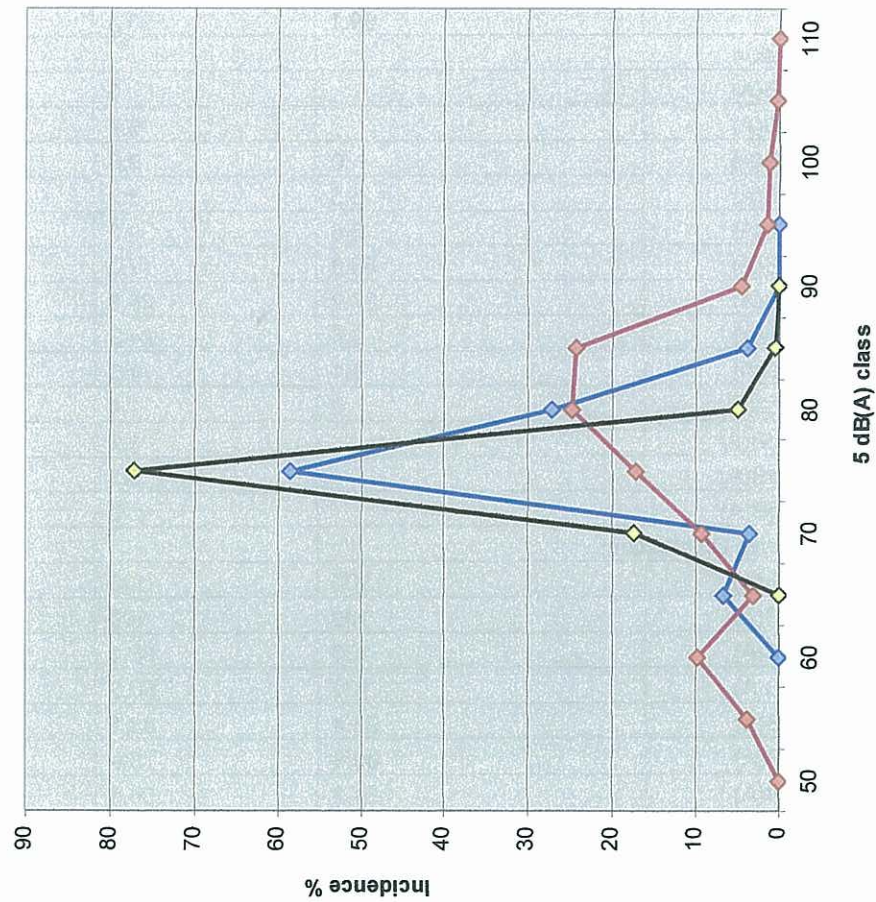
Frequency band Hz		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k A	L	
30 s Leq, not drilling, Loc 1, 6/3/08, 19:39		52.8	44.7	41.1	40.3	44.5	31.2	32.4	26.2	25																		
		37.9	51.2	56.5	49.6	48.5	47.9	52.4	42.6	42.9	36.8	31.7	27.7	32.9	31.9	27.3	33.2	34.9	32.5	30.5	30.1	30.5	30.1	27	26.6	25	42.6	60.5
		52.7	48.9	41	41.7	45.2	55.1	44.8	39.6	39.2	44.7	38.9	30.5	35.1	38.6	34.5	33.7	28.8	30.8	26.6	25.3	24.5	23.6	23	22.6	22.2	38.4	51.5

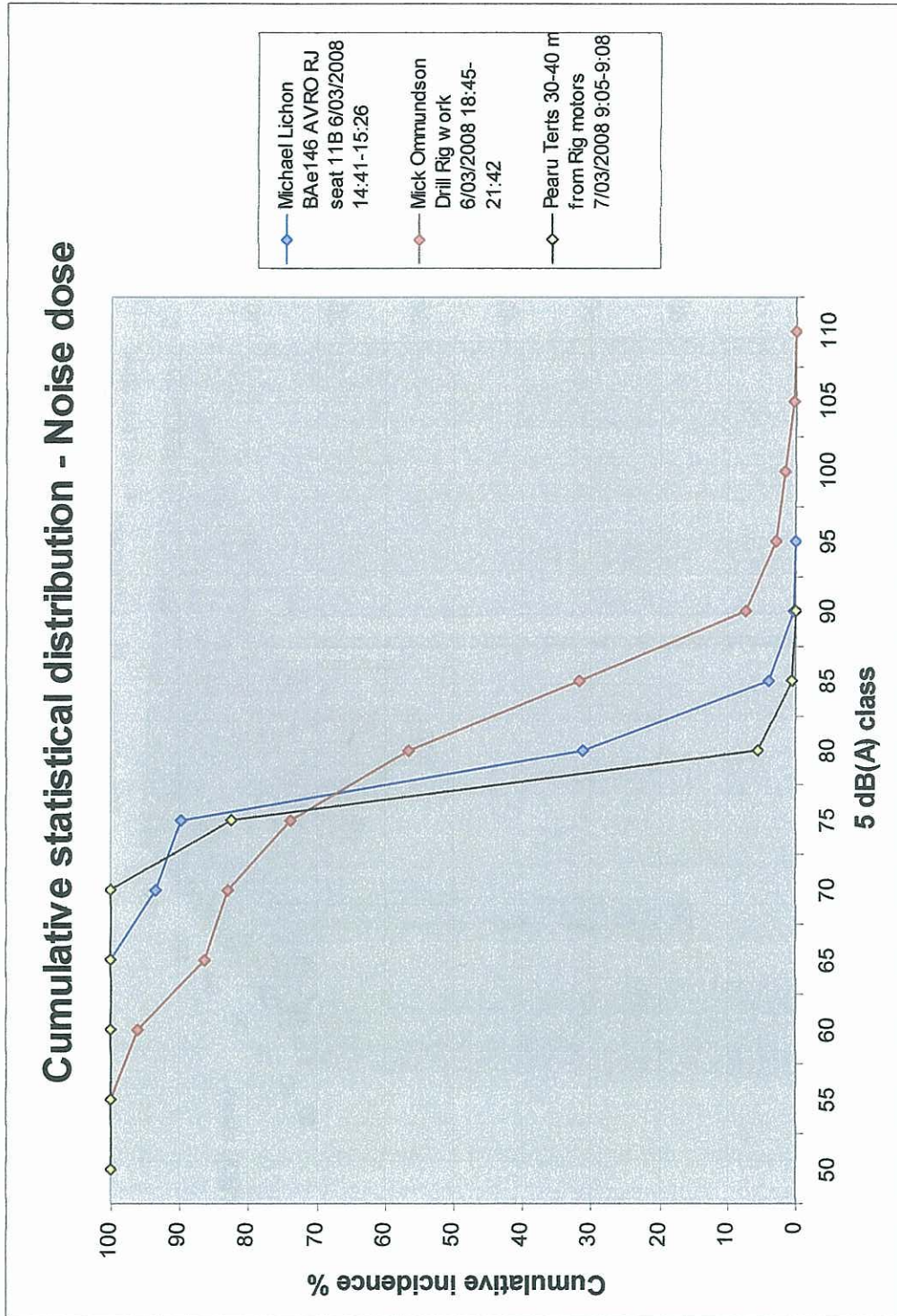
Noise spectra by $\frac{1}{3}$ octaves

Statistical distribution of noise – noise dose measurements

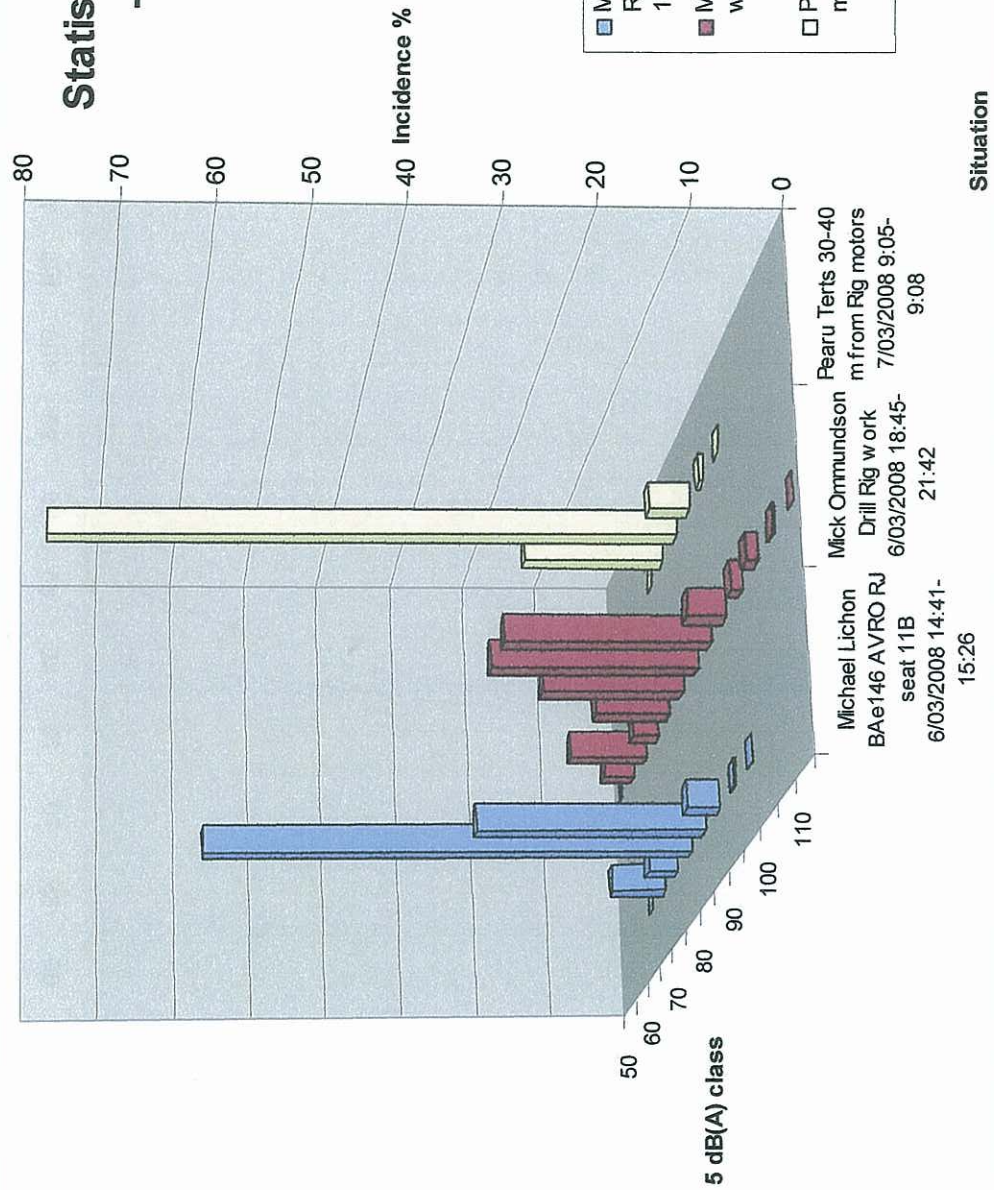
Person	Michael Lichon	Mick Ommundson	Pearu Terts
Area	BAe146 AVRO RJ seat 11B	Drill Rig work	30-40 m from Rig motors
Date	6/03/2008	6/03/2008	7/03/2008
Time	14:41-15:26	18:45-21:42	9:05-9:08
Duration minutes	45	177	3
Leq dB(A)	79.6	87.8	76.9
Exceed 140 dB(A)	no	no	no
Exceed 115 dB(A)	no	no	no
Lmax	90.8	105.4	85.9
Pmax	117.1	134.3	117.9
SEL	113.7	127.9	99.8
Dose % daily	3	71	0
Dose % 8 hour	29	193	15
P_a^2h	0.03	0.72	0
$P_{a(8\text{ hour})}^2h$	0.29	1.95	0.16
LEP,d	79.6	87.8	76.9
PSEL	69.1	83.3	55.2
Distribution			
% 50 dB(A)		0	
% 55 dB(A)		3.9	
% 60 dB(A)	0	9.8	
% 65 dB(A)	6.6	3.2	0
% 70 dB(A)	3.6	9.3	17.5
% 75 dB(A)	58.6	17.3	77
% 80 dB(A)	27.2	24.8	5
% 85 dB(A)	3.8	24.3	0.5
% 90 dB(A)	0.1	4.5	0
% 95 dB(A)	0	1.4	
% 100 dB(A)		1.3	
% 105 dB(A)		0.3	
% 110 dB(A)		0	
Cumulative Distribution			
% 50 dB(A)	100	100	100
% 55 dB(A)	100	100	100
% 60 dB(A)	100	96.1	100
% 65 dB(A)	100	86.3	100
% 70 dB(A)	93.4	83.1	100
% 75 dB(A)	89.8	73.8	82.5
% 80 dB(A)	31.2	56.5	5.5
% 85 dB(A)	4	31.7	0.5
% 90 dB(A)	0.2	7.4	0
% 95 dB(A)	0	2.9	
% 100 dB(A)		1.5	
% 105 dB(A)		0.2	
% 110 dB(A)		0	

Statistical distribution - Noise dose





Statistical distribution - Noise dose



Notes on noise monitoring - Hunt Energy Camp

Various positions around the camp were examined. The camp is home to workers for 2-3 weeks at a time. Sound sleep is conducive to safe work.

Situation	Distance from Generator housing, m	Noise level, dB(A)
Inside generator housing	-1	101.5
Outside generator housing door	1	85.0
Camp corridor	5	74.4
Road side of generator	5	70.2
Rear side of generators – exhaust direction	5	80.5
Trench side of generators	5	70.4
Camp corridor - start of dormitory	18	66.0
Camp corridor – outside dormitory room "O"	38	61.5
Inside centre room "O" – aircon ON		47.5
Inside centre room "O" – aircon OFF		37.0
Inside centre room "O" – aircon OFF, snoring ON		48
Inside crib room – ambient – refrigeration, radio, fans, outside hum incursion etc		57
Inside crib room – chef whipping cream		69

Sleeping areas exceed noise levels expected for a rural/remote location.

Measures recommended for reducing camp noise from generators

1. Install Secondary mufflers or replace with Residential muffler
2. Line inside of housing with acoustic materials
3. Increase Generators distance from camp
4. Place Generators behind mound to provide intervening barrier
5. Install wooden skirt under front of housing

Notes on noise monitoring – aircraft travel

Workers commute by air to Moomba from Adelaide each 2-3 weeks. Noise dose analysis was undertaken during the National Jet flight which included a turnaround before landing. Results are tabulated and graphed.

Appendix B
Noise Monitoring of Proposed Tasmanian Drill Sites,