



VIPAC ENGINEERS & SCIENTISTS

Vipac Engineers & Scientists Limited A.C.N. 005 453 627

5/324 Great Eastern Highway, Ascot, W.A., 6104, AUSTRALIA

Telephone (+61 8) 9277 3335, Facsimile (+61 8) 9277 3325, www.vipac.com.au

Technical Report

Attention: Neil Marston	Reference 60W-05-1649-TRP-185082-1 - Wrd
Company: Grange Resources	Date: 6 April 2006
Facsimile: +61 8 9321 1523	Pages: 1 of 6
Email: neil@grnl.com.au	Project No.: 60W-05-1649
From: Phil Lucas	Reviewed Hugh Richardson

This Facsimile is Commercial-in-Confidence. If this Facsimile does not reach the intended recipient, please telephone the number above (reverse charges). Thank you

Dear Neil,

Re: Noise Assessment of the proposed operations at the Southdown Magnetite Project.

Attached is our report summarising our noise assessment of the proposed operations at the Southdown Magnetite Project

If you required further details or clarification please don't hesitate to contact the undersigned,

Yours sincerely

VIPAC ENGINEERS & SCIENTISTS LTD

Phil Lucas

Senior Project Engineer

Email: phill@vipac.com.au

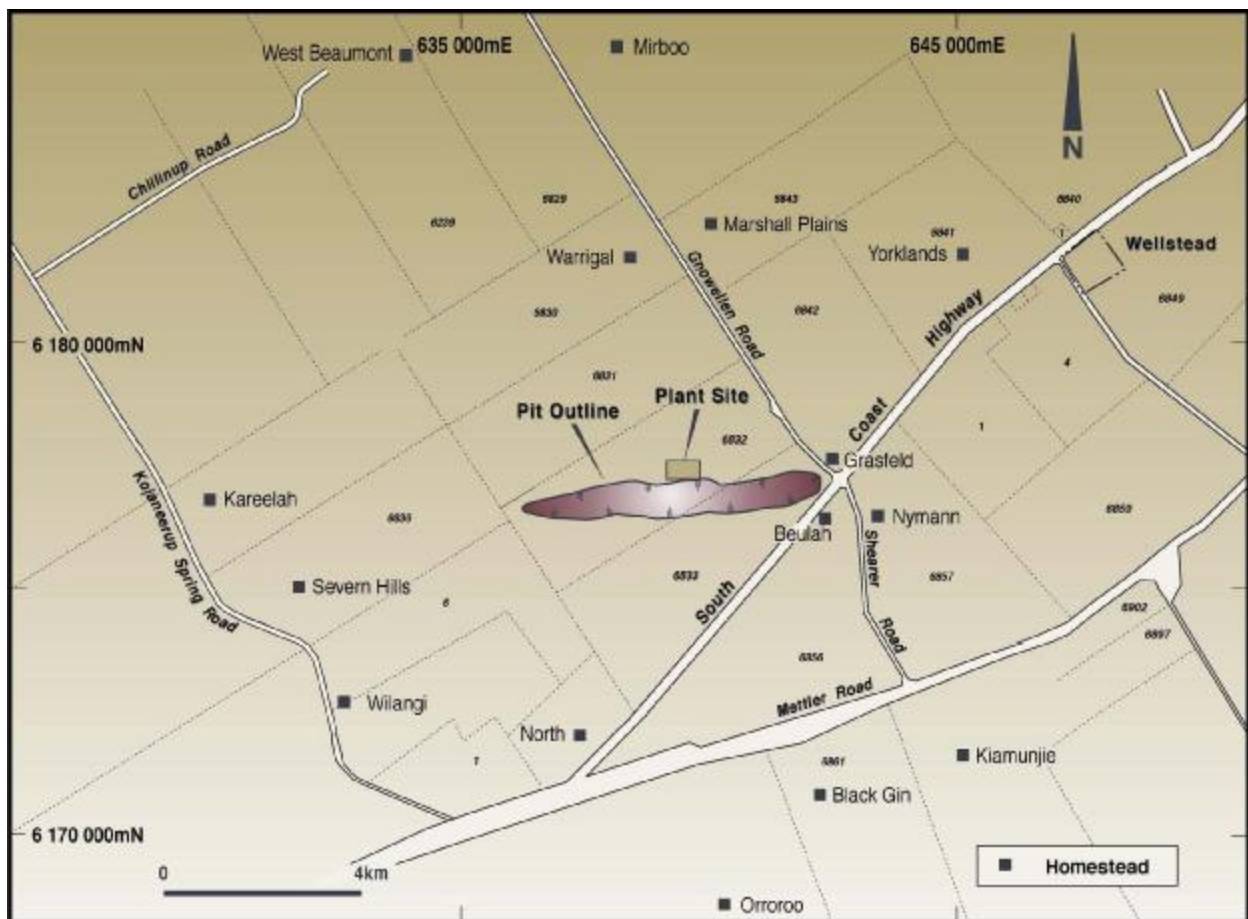


INTRODUCTION

Vipac Scientists & Engineers was commissioned by Grange Resources Limited to assess the noise impact of the operations proposed for their Southdown Magnetite Project, and in particular whether it can comply with Environmental Protection (Noise) Regulations 1997.

LAYOUT

Figure 1 - Plan of the Proposed Mine Operations and nearest residences.



CRITERIA

The noise criteria as defined by Environmental Protection (Noise) Regulations 1997 is summarised in Table 1 below.



Table 1 EPA Assigned Noise Levels

Type of premises receiving noise	Time of day	Assigned level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday	45 + IF	55 +IF	65 + IF
	0900 to 1900 hours Sunday and public holidays	40 + IF	50 + IF	65 + IF
	1900 to 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + IF	45 + IF	55 + IF
Noise sensitive premises at locations further than 15 metres from a building		60	75	80
Commercial premises		60	75	80
Industrial and utility premises		65	80	90

'IF' represents an influencing factor which increases along with the number of busy roads, and commercial and industrial areas that surround the noise sensitive premises.

Neighbours to the mine site are rural residential and L_{A10} assigned levels would be 35 dB at night.

Penalties apply for noise that has characteristics of impulsive, tonal or modulation.

ANALYSIS

Based on supplied drawings and noise levels of similar equipment measured at other sites, the following list of noise sources were assumed for the plant, figures are in sound power (dB(A))

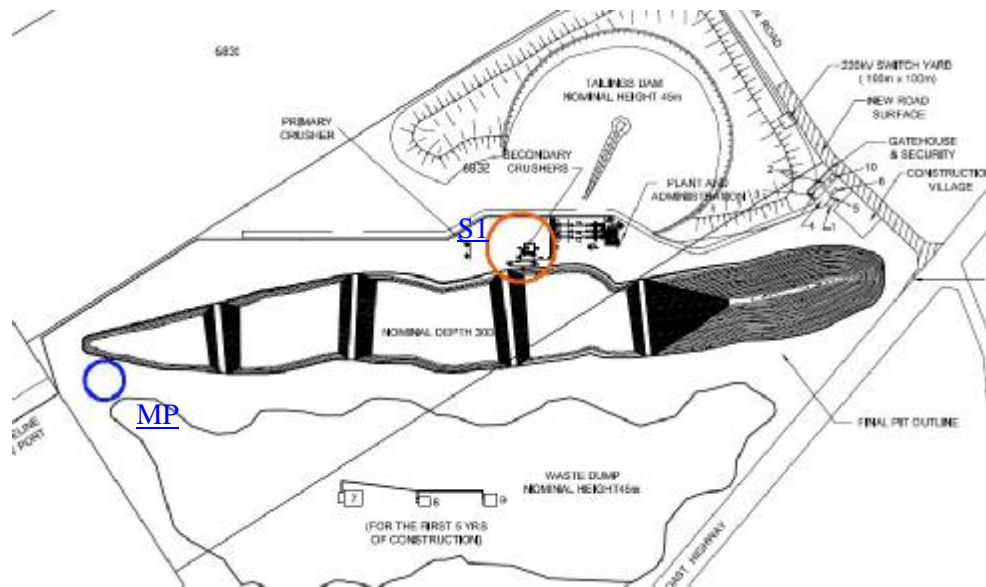
Table 2 Fixed Plant (S1) sound power

	S	31.5	63.0	125.0	250.0	500.0	1000.0	2000.0	4000.0	8000.0
Primary Crusher	110.0	83.1	94.5	97.8	100.4	103.8	102.3	104.0	100.3	95.4
Secondary Crusher	110.0	76.8	88.3	95.9	101.7	103.7	104.5	103.3	98.0	89.3
Conveyors (3000m)	112.5	84.9	96.0	101.0	104.6	107.2	106.3	103.9	99.8	93.4
Conveyor Drives	112.0	77.8	91.5	98.6	103.9	106.4	106.5	104.7	97.9	86.6
Total	117.3	87.9	99.5	104.7	109.0	111.6	111.2	110.0	105.1	98.4

For calculation purposes the plant noise was assumed to be concentrated at location 639200(E), 6177200(N). This is the approximate position of the Secondary crusher shown in Figure 2.



Figure 2 – Position of Secondary Crusher (Circled Red), Assumed to be the acoustic centre of all fixed plant noise



The blue circle in Figure 2 (636500(E), 6176000(N)) is the approximate ‘worst case’ location for mobile plant (MP).

Similarly for mobile plant the following noise sources were assumed, again values are in sound power (dB(A)).

Table 3 Mobile Plant sound power

	S	31.5	63	125	250	500	1000	2000	4000	8000
Haul Truck	120.0	85.8	99.4	102.2	103.8	116.0	113.5	113.1	106.0	109.3
Front end Loader	118.0	82.6	96.3	99.0	107.2	109.2	113.3	111.4	106.4	109.3
Total	122.1	87.5	101.2	103.9	108.9	116.8	116.5	115.3	109.2	112.3

Distances of the various residences from these locations are shown in Table 4.



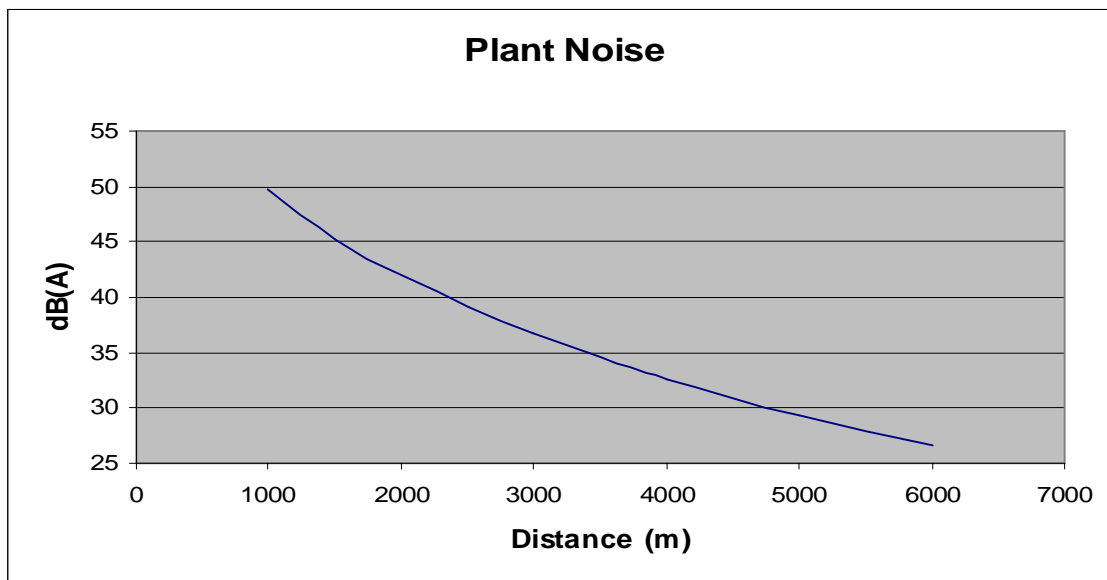
Table 4 Location of residences and their distances from Fixed plant noise (S1) and Mobile plant noise (MP)

Name	Easting	Northing	Dist to S1	Dist to MP
Marshall Plains	640060	6182370	5241	7297
Warrigal	638420	6181690	4557	6005
Grasfeld	642425	6177555	3244	6126
North	637450	6171950	5534	4160
Wilangi	632680	6172640	7956	5087
Severn Hills	631780	6174980	7745	4829
Kareelah	629980	6176750	9231	6563
Kiamunjie	645150	6171560	8198	9723
Black Gin	642280	6170760	7139	7802
Mirboo	638170	6185820	8681	9961
West Beaumont	633890	6185680	10005	10026
Orroroo	640380	6168500	8780	8444
Yorklands	645130	6181730	7462	10359
Beulah	642260	6176425	3157	5776
Nymann	643435	6176415	4307	6947

RESULTS

Assuming worst case meteorological conditions (CONCAWE category 6: 50% RH, 3 m/s, 20°C). Figure 3 shows the relationship between sound pressure levels and distance from the Fixed plant.

Figure 3 Predicted plant noise (dB(A)) with respect to distance from the Fixed plant





Similarly Figure 4 shows the equivalent relationship with regard to Plant noise. The effect of a 20m high barrier within 200m of the Mobile plant is also shown at the western end of the mine. The barrier modelled is accommodated by the proposed noise bund, and operational requirement that mobile plant operating on the spoils dump is on a lower bench at night, not the top of the dump. This shielding is only likely to be relevant with regard to residences to the west ie Wilangi, Severn Hills, Kareelah and possibly North

Figure 4 Predicted Mobile Plant noise (dB(A)) with respect to distance from the plant

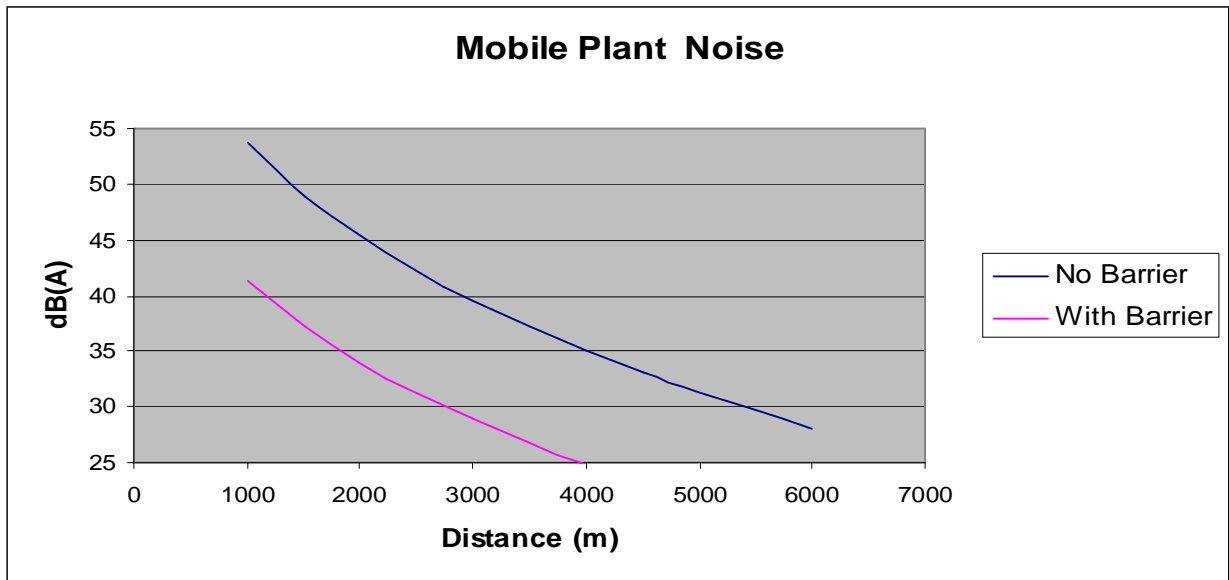
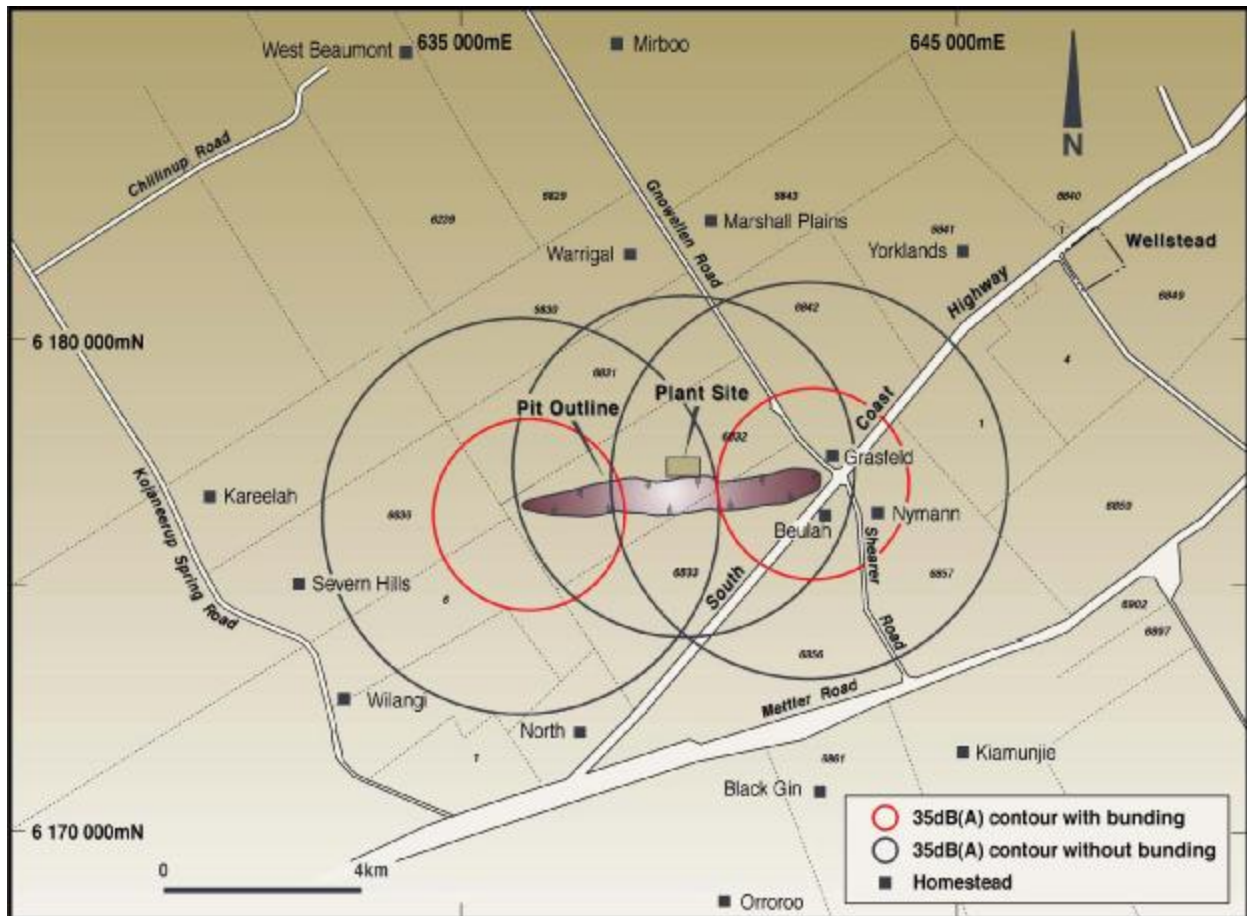


Figure 5 - Noise propagation from Fixed and Mobile plant



When the mining operations approach the eastern end, similar bunding and night-time operations limit may apply to that of the western end. Figure 5 shows noise contours for the fixed and mobile plant. The blue circles indicate the 35 dB(A) contour with no bunding, the red show the 35 dB(A) contour with bunding.

CONCLUSIONS

Combined noise from mobile plant and fixed plant at Grange Resource operations at the Southdown mine site is likely to exceed the night-time assigned levels at residences within approximately 4.5 km of mining operation's mobile plant. This would then affect one residence (North) when mining is at the western end of the proposed open pit. We recommend ensuring that an effective barrier exists between mobile plant noise and this residence for night-time operation. As the mining operations approach the eastern end, residents nearby will be similarly affected, requiring construction of suitable noise bunding and night-time operational limits to any haul trucks outside the pit.

Note that this analysis is based on 'best estimates' with regard to similar plant and mobile equipment operating elsewhere, and applied in this analysis. Actual plant noise levels may vary from these estimates and should be modified or treated to fall within the conditions of this noise analysis.