Appendix P
Noise Report

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ACOUSTIC ASSESSMENT

COBURN MINERAL SANDS PROJECT

FOR

URS AUSTRALIA PTY LTD

BY

HERRING STORER ACOUSTICS

DECEMBER 2004

REFERENCE: 3892-2-04132

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1.0 INTRODUCTION

Herring Storer Acoustics (HSA) was commissioned by URS Australia Pty Ltd (URS) to undertake a noise level impact assessment of noise emissions from the proposed Coburn Mineral Sand Project.

The scope of work for the study was to:

2. Develop a computer model based on the computer modelling programme SoundPlan 6.1 (SoundPlan) and predict the noise propagation to any noise sensitive premises.

3. Assess the noise received at the neighbouring residences against the prescribed standards of the *Environmental Protection (Noise) Regulations 1997* (the Regulations) by way of noise contours and single point calculations.

4. Where required, determine appropriate noise control techniques to ensure compliance with the Regulations.

The results and methodology of the above are detailed within this report.

2.0 SUMMARY

The mine will operate 24 hours per day and as such the most critical time in terms of compliance with the *Environmental Protection (Noise) Regulations 1997*, will be the night period. The assigned L_{A10} noise level during this period at the nearest residences is 35 dB(A).

Noise emissions from the proposed mining operations will comply with Regulatory requirements at all times and no noise amelioration is required.

The movement of concentrate by truck from the mine site to Geraldton will comply with the EPA's Draft Statement No. 14.

3.0 CRITERIA

3.1 Environmental Protection (Noise) Regulations 1997

Environmental noise is governed by the *Environmental Protection Act 1986* through the *Environmental Protection (Noise) Regulations 1997* (the Regulations). The noise from the site is required to comply with the assigned noise levels as detailed in Regulations 7, 8 and 9.

Regulations 7 and 8 stipulate maximum allowable external noise levels, which for a noise sensitive premises are determined by the calculation of an influencing factor, added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base assigned noise levels are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVELS

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive*	0700 - 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays	40 + IF	50 + IF	65 + IF
	1900 - 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
Industrial	All hours	65	80	90

Note: The L_{A10} is the noise level exceed for 10% of the time.
The L_{A1} is the noise level exceed for 1% of the time.
The L_{Amax} is the maximum noise level.
The assessment period ("the time") is to be considered representative and lie between 15 minutes and 4 hours.
* To be within 15 metres of a building associated with a noise sensitive use.

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at another premises, defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Where the above characteristics are present and cannot be practicably removed, adjustments are made to the measured or predicted level at that other premises. The possible adjustments for annoying characteristics are listed in Table 3.2.

TABLE 3.2 – ADJUSTMENTS FOR ANNOYING CHARACTERISTICS

Where tonality is present	Where modulation is present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB

The influencing factor (IF) for noise sensitive premises located around the mine is 0. Therefore, the assigned noise levels are as listed in Table 3.3.

TABLE 3.3 - ASSIGNED NOISE LEVELS AT CLOSEST RESIDENCES

Time of Day	Assigned Noise Level		
	L_{A10}	L_{A1}	L_{max}
0700 - 1900 hours - Monday to Saturday	45	55	65
0900 - 1900 hours - Sunday & Public Holidays	40	50	65
1900 - 2200 hours - All Days	40	50	55
2200 - 0700 hours - Monday to Saturday	35	45	55
2200 - 0900 hours - Sunday & Public Holidays	35	45	55

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.

3.2 EPA Statements for EIA No. 14 (Version 3) Road and Rail Transportation Noise

Noise emissions from trucks operating on roads exempt from the *Environmental Protection (Noise) Regulation 1997* by regulation 3a. The Environmental Protection Authority has produced a draft guidance document being *EPA Statements for EIA No. 14 (Version 3) Road and Rail Transportation Noise*, with the relevant section being 5.3 “Criteria for proposed increase in road or rail traffic”. Section 5.3 states:

“The objectives are:-

i. that the noise levels inside noise-sensitive premises associated with the proposed traffic should meet acceptable levels, or that the degree of increase in noise levels should be of low significance; and

ii. that the noise emissions of the vehicles associated with the specific proposal should comply with “best practice”.”

Guidance on the acceptable noise level increase can be taken from Section 5.3.2 and shown below in Table 3.4.

TABLE 3.4 – ACCEPTABLE NOISE LEVEL INCREASE

Rating Before Increase	Acceptable Increase in $L_{Aeq,T}$ Noise Level
N0	4 dB, or top of N0, whichever is greater
N1	3 dB
N2	1.5 dB
N3	0.5 dB
N4	0 dB

The rating before the increase is as defined below in Table 3.5.

TABLE 3.5 – NOISE RATING VALUES, dB

Rating	L_{Aeq} Day Noise Level	L_{Aeq} Night Noise Level
N0	<50	<40
N1	51 – 55	41 – 45
N2	56 – 60	46 – 50
N3	61 –65	51 –55
N4	66 - 70	56 - 60

Day means 7am – 10pm and Night means 10pm – 7am

4.0 FACILITY OPERATIONS

From information supplied by URS, it is understood that full scale mining will occur 24 hours per day, using the following equipment:

- 2 x bucket wheel excavators
- 2 x D10 bulldozers
- 2 x caterpillar Scrapers
- Wet Plant with gas turbine generators

During the first two years of operation the project will require up to 3 return trips per day to haul 300 tonnes of mineral to Geraldton. This will double to six return trips when production increases. Therefore, the total number of truck movements will be 6 per day during the first two years and 12 per day from the third year of operation.

5.0 METHODOLOGY

5.1 Mining

Modelling of noise emission propagation was carried out using “SoundPlan”. Both single point and noise contour calculations were used to determine the noise level that would be received at noise sensitive premises located around the proposed facility. Noise contours show the overall noise level that would be received at a location due to the various activities carried out, whereas single point calculations show the influence of individual items on the overall noise resulting at a specific location.

SoundPlan uses the theoretical sound power levels determined from measured sound pressure levels to calculate the noise level received at a specific location.

Calculations were based on the following input data:

- Ground contours.
- Sound power levels for mining equipment, as listed in Table 5.1.

TABLE 5.1 – SOURCE SOUND POWER LEVELS, dB

Item	dB(A)
Scraper	118
Front End Loader	113
Dozer	115
Excavator	112
Wet Plant*	103

* Assumed generator would be in an enclosure and noise emission would be limited to 85 dB(A) at 1m

Modelling was carried out under the weather conditions as listed in the *EPA Draft Guidance for Assessment of Environmental Factors No. 8 – Environmental Noise*, and as shown below in Table 5.2.

TABLE 5.2 – METEOROLOGICAL INFORMATION

Parameter	Night Time
Temperature (^{o}C)	15
Humidity (%)	50
Wind Speed (m/s)	3*
Pasquil Stability Class	E#

* Wind Direction is from the loading facility to the residence.
\# Pasquil stability class E was used as this class closely approximates a temperature inversion of 20/100 metre

Modelling was based on the full scale mining occurring at the current ground levels to represent the worst case scenario. The following scenarios were modelled:

1) Mining at closest point to the Coburn Homestead
2) Mining at the northern end of the operations.

The above was then assessed against the prescribed standards of the Regulations (refer Section 6.0 Results).

5.2 Truck Movements

Even under the ultimate number of truck movements (ie after 2 years) the influence of 12 movements per day on the noise received at any noise sensitive premises would be negligible. Therefore, no further analysis is required.

6.0 RESULTS & ASSESSMENT

6.1 Mining

Noise received at the closest residences located to the south west and north west (i.e. the Coburn and Hamelin homesteads) were calculated for both the L_{A1} and L_{A10} scenarios, with the results listed in Table 6.1.

TABLE 6.1 – PREDICTED L_{A10} NOISE LEVELS AT CLOSEST RESIDENCES

Operation	Calculated Noise Level (dB(A))
Southern (to Coburn Homestead)	10
Northern (to Hamelin)	11

The noise contour plots for the mining scenarios modelled are shown in Appendix B as Figures B1 and B2.

6.2 Truck Movements

Noise received at a noise sensitive premises from the road trains would comply with the EPA's Draft Statement No. 14.

7.0 CONCLUSION

Noise received at the closest residences from the mining operations would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

Truck movements would also comply with the EPA's Draft Statement No. 14.

For: **HERRING STORER ACOUSTICS**

Tim Reynolds

21 December 2004

APPENDIX A

LOCALITY MAP

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N

LEGEND

Pastoral Lease Boundary

Shark Bay World Heritage Property Boundary

Exploration Licence Boundary

KILOMETRES 0 10 20 30

(Source: Geoscience Australia, 1:250000 Map Series, 2002)

CARBALA PASTORAL LEASE

HAMELIN PASTORAL LEASE

COBURN PASTORAL LEASE

NERREN NERREN PASTORAL LEASE

MEADOW PASTORAL LEASE

ZUYTDORP NATURE RESERVE

SHARK BAY WORLD HERITAGE PROPERTY

Hamelin Homestead

Coburn Homestead

Amy Zone Operation Area

Exploration Licence Boundary

Amy Zone Orebody

Hamelin - Coburn Pastoral Lease Boundary fence

Access Road

Job No.	42905540
Prep. By	TRS 29 Jun 04
Chk'd By	TRS 29 Jun 04
Revision No.	0

AMY ZONE OPERATION AREA TOPOGRAPHIC INFORMATION AND PASTORAL LEASE BOUNDARIES

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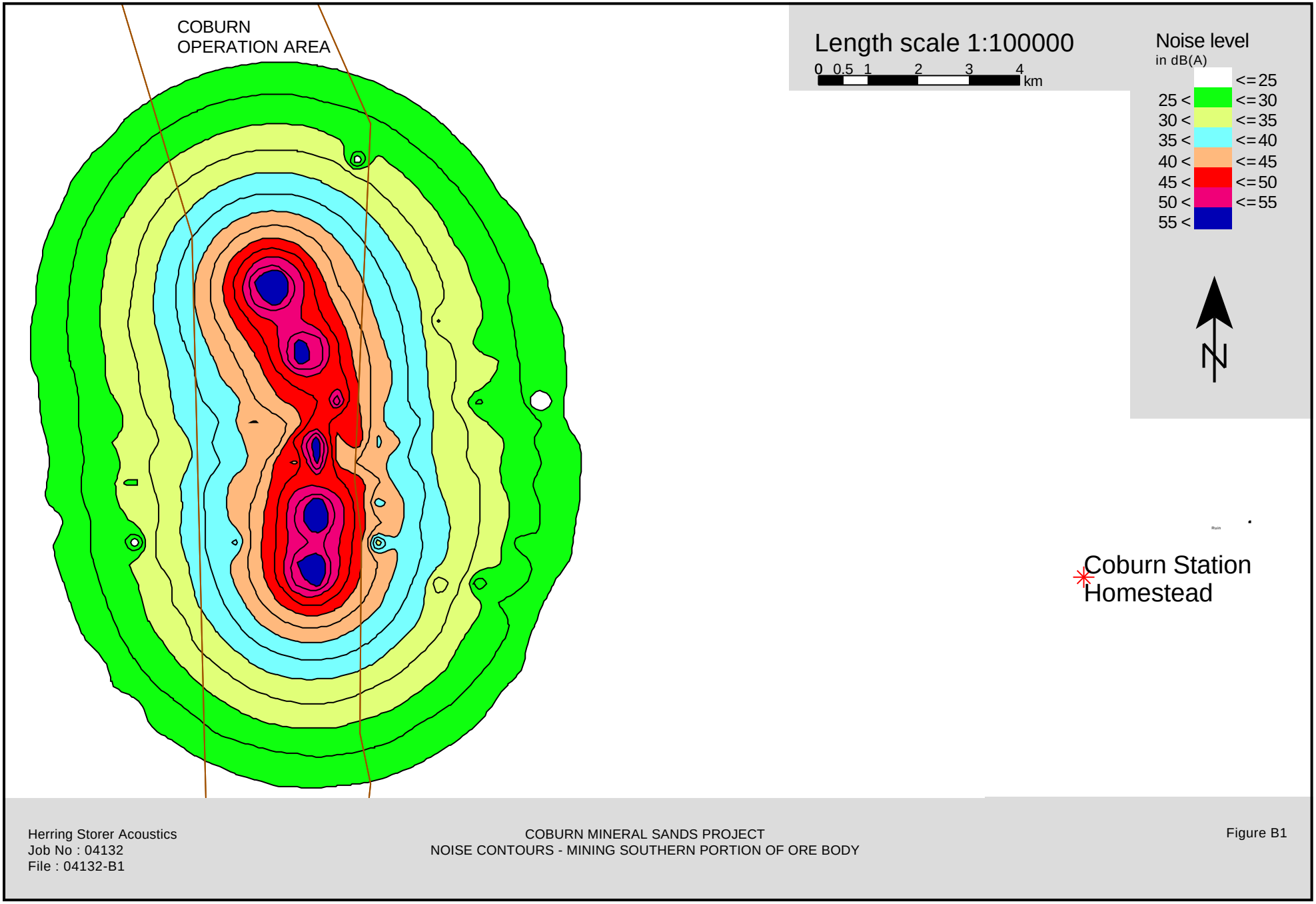
Figure 1

URS

APPENDIX B

NOISE LEVEL CONTOURS



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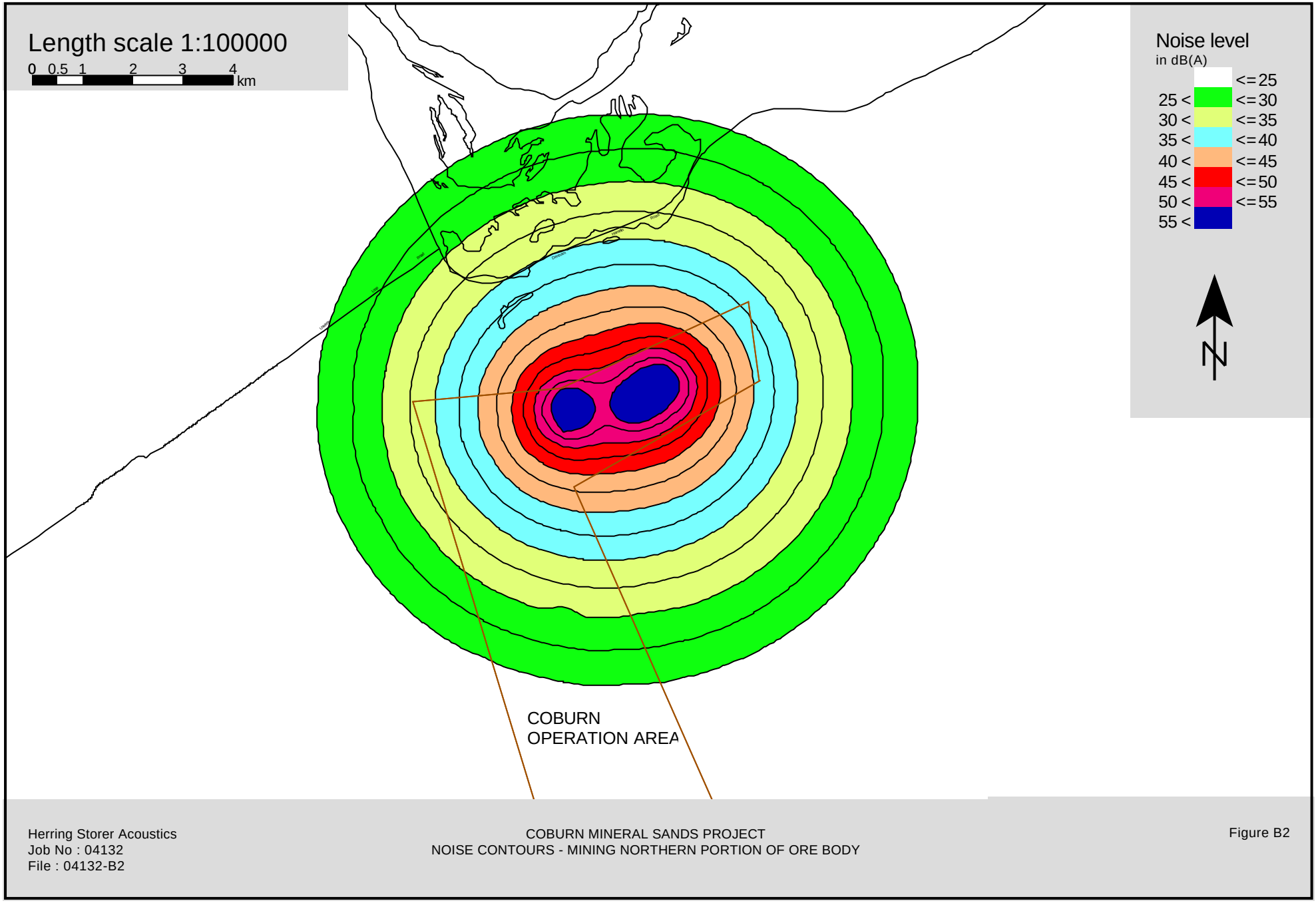
File : 04132-B1

COBURN MINERAL SANDS PROJECT
NOISE CONTOURS - MINING SOUTHERN PORTION OF ORE BODY

Figure B1



Herring Storer Acoustics
Job No : 04132
File : 04132-B2

COBURN MINERAL SANDS PROJECT
NOISE CONTOURS - MINING NORTHERN PORTION OF ORE BODY

Figure B2