



HEGGIES

REPORT 30-1664R1R0

Revision 0

**Quarterly Noise Monitoring Report
Austar Coal Mine
Middle Road, Paxton NSW
January 2007**

PREPARED FOR

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P.O Box 806
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14 MAY 2007



Quarterly Noise Monitoring Report

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Middle Road, Paxton NSW

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Reference	Status	Date	Prepared	Checked	Authorised
30-1664R1R0	Revision 0	26 February 2007	OM	JC	JC



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1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been commissioned by Austar Coal Mine Pty Ltd to conduct quarterly noise monitoring of its operations at Paxton, NSW.

The purpose of the monitoring was to identify the contribution of noise from mining operations at surrounding residential receivers. The monitoring report has been prepared to address requirements of the Austar Noise Monitoring Program that was prepared to satisfy the requirements of the Notice of Modification issued by the Minister for Planning in September 2006. The assessment also takes into account the noise goals outlined in Environmental Protection Licence Number 416.

Additionally, the monitoring undertaken in this assessment was conducted in accordance with Australian Standard AS 1055-1997 "*Description and Measurement of Environmental Noise*" Part 1, 2 and 3, the New South Wales Industrial Noise Policy (INP) and the NSW Environmental Noise Control Manual (ENCM).



2 DESCRIPTION OF FACILITY, OPERATIONS AND NOISE GOALS

2.1 Project Overview

The mine was originally developed from the old Pelton Colliery, mining coal in the Greta Seam in 1978. Longwall production commenced in 1983 and continued until the mine, known then as Ellalong Colliery, was closed by Oakbridge in May 1998. In July 1998, Southland Coal acquired the assets of Ellalong and Pelton Collieries from Oakbridge and amalgamated with the Bellbird South assets already held by Southland Coal.

Southland Coal developed a longwall operation that mined the substantial Bellbird South coal reserves utilising the existing Ellalong facilities and infrastructure. In December 2003 a fire in the underground workings caused the sealing of the mine to extinguish the fire. Following the fire, the mine was recovered and placed on “care and maintenance” and the company was placed in receivership.

Yanzhou Coal Mining Company Limited purchased the mine in December 2004 and changed the name to Austar Coal Mine (Austar). The acquisition of Southland Coal Mine was completed early in 2005 and a subsidiary company was formed to hold the assets.

Austar recommenced longwall extraction of coal in the Greta seam in late September 2006. This followed modification to the development consent (DA 29/95) to allow the introduction of Longwall Top Coal Caving Method (LTCC). The modification was approved subject to a number of conditions. The principle change allowed for an increase in the thickness of coal extracted from the Greta seam using LTCC technology in addition to modifications to surface infrastructure. This included an upgrade to the mine ventilation system and water treatment systems.



2.2 Plant and Equipment

Acoustically significant plant and equipment utilised on site include the following:

2.2.1 Washery

There are a range of noise sources at the washery that contribute to the overall ambient noise levels at surrounding receptors. These sources include:

- train movements;
- dozer;
- washery;
- trucks;
- waste water treatment plant; and
- conveyors.

2.2.2 Infrastructure Upgrade Area (Kalingo)

Identified noise sources on the Kalingo site that have potential to impact surrounding residential receivers are listed below in order of highest expected noise contribution:

- ventilation fan;
- compressors;
- nitrogen plant;
- Kalingo dam pump; and
- occasional truck movements.

2.3 Noise Impact Assessment Noise Goals

2.3.1 Washery Noise Goals

The relevant noise criteria and goals for the site outlined in the EPL and are provided in **Table 1**.

Table 1 Relevant Noise Criteria and Goals

Receiver	Location	Criteria/Goal	Source
A	Pelton Village	43 dB(A) _{L90}	Environment Protection Licence No 416
B	South of Bimbadeen Road, Mt View (previously referred to as Pyne residence)	40 dB(A) _{L90}	Environment Protection Licence No 416
C	Bimbadeen Road, Mt View (previously referred to as O'Hearn residence)	37 dB(A) _{L90}	Environment Protection Licence No 416

The location of the receivers are shown in **Appendix A**.



2.3.2 Infrastructure Upgrade Areas (Kalingo) Noise Goals

The relevant noise criteria and goals for the site outlined the Notice of Modification dated 27 September 2006 are reproduced in **Table 2**.

Table 2 Relevant Noise Criteria and Goals

Receiver	Location	Criteria/Goal	Source
D	Nash Lane, Quorrobolong	35 dB(A) LAeq(15minute)	Notice of Modification dated 27 September 2006
E	Glennie St, Ellalong	35 dB(A) LAeq(15minute)	Notice of Modification dated 27 September 2006

Receivers D and E are the nearest residential receptors to Kalingo Infrastructure Area and are shown in **Appendix A**.

Notes accompanying the Notice of Modification are reproduced as follows:

Notes:

a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance within the above table. Where it can be demonstrated that the direct measurement of noise from the development is impractical, the Department and DEC may accept alternative means of determining compliance (see chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW INP shall also be applied to the measured noise levels where applicable.

b) The noise emission limits identified in the above table apply under meteorological conditions of:

- Wind speeds of up to 3 m/s at 10 metres above ground level: or*
- Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

2.4 Determining Compliance

It should be noted that compliance of license conditions is typically determined by direct measurement or by modelling, the results for either are compared against the relevant consent or license condition. Notwithstanding this, the NSW INP identifies in Section 11.1.3 that noise levels may be up to 2 dB above the statutory noise limits. Section 11.1.3 is reproduced below :

“A development will be deemed to be in non-compliance with a noise consent or license condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or license condition.”



2.5 Noise Monitoring Locations

The nearest potentially affected residential receivers are shown in **Appendix A**. Five (5) monitoring locations representative of the surrounding receivers have been selected as reference locations and form the basis for evaluating and assessing noise emissions from mining operations from the Washery and Kalingo Area.

2.5.1 Washery Monitoring Locations

Table 3 presents the receiver identifier and location for assessed receivers with respect to the Washery and noise goals specified in Environment Protection Licence No 416.

Table 3 Monitoring Receivers (Washery)

Receiver	Receiver Location	Receiver Description
A	Pelton Village	South-east of washery
B	Pyne Residence, South of Bimbadeen Road, Mt View.	West of washery
C	O'Hearn Residence, Bimbadeen Road, Mt View.	North-west of washery

2.5.2 Infrastructure Upgrade Area (Kalingo)

Table 4 presents the receiver identifier and location for assessed receivers with respect to the Kalingo Area and requirements specified in the Notice of Modification dated 27 September 2006.

Table 4 - Kalingo Area

Receiver	Receiver Location	Receiver Description
D	Nash Lane Quorrobolong	East of Kalingo infrastructure site
E	Glennie St Ellalong	West of Kalingo infrastructure site

Monitoring locations within the Austar Kalingo lease have been used as reference positions for comparison with modelled noise levels for surrounding receivers location D (Nash Lane, Quorrobolong) and location E (Glennie Street, Ellalong). Noise levels were modelled to residential receivers using an ENM validation model to incorporate the meteorological conditions stated in *Note B* from the *Notice of Modification*. Direct measurement during these conditions is impractical as they rarely occur during field surveys.



3 RESULTS

Noise levels were monitored from 30 January 2007 to 31 January 2007 at five locations surrounding the Austar Coal Mine operations. A Brüel and Kjær 2260 sound level meter was used to record statistical noise indices including LA1, LA10, LA90, LAeq and LAmax. To determine mine noise contribution the amplitude of non-mining and mining noise sources were noise recorded and later analysed by using Brüel and Kjær Type 7820 Evaluator Software. This software package assists in establishing the contribution of mining activities with respect to the overall noise level by excluding extraneous and non-mining noise sources that typically dominate noise measurements.

3.1 Operator Attended Noise Survey

3.1.1 Washery

Noise levels measured during January 2007 quarterly survey at the monitored locations adjacent to the Washery area for day, evening and night periods are presented in **Table 5** to **Table 7**.

Table 5 Summary of Operator Attended Monitoring Results – Daytime, January 2007

Monitoring Location Date Start Wind Speed	Criteria/Goal	Primary Noise Descriptor (dBA ref 20µPa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
		LAmax	LAeq	LA1	LA10	LA90	
A : Pelton Village 30/01/2007 14:47 WNW 1m/s to 2m/s	43 dB(A) L ₉₀	72	54	66	57	44	Traffic 40 to 68 Insects 36 to 40 Washery and Train – just audible
Estimated LA90 Mine Contribution : <40 dBA							
B: Pyne 30/01/2007 15:21 WNW 0.5m/s to 1m/s	40 dB(A) L ₉₀	71	44	54	45	36	Birds 38 Wind 46 to 50 Washery audible 35 Pool pump 42 Dogs 40 to 71
Estimated LA90 Mine Contribution: < 36 dBA							
C: O’Hearn 30/01/2007 15:58 WNW 0.5m/s to 1m/s	37 dB(A) L ₉₀	72	50	62	49	33	Wind 35 to 38 Neighbour Noise Washery not audible Train audible – 37
Estimated LA90 Mine Contribution : <33 dBA							



Table 6 Summary of Operator Attended Monitoring Results – Evening, January 2007

Monitoring Location Date Start Wind Speed	Criteria/Goal	Primary Noise Descriptor (dBA ref 20µPa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
		L _{Amax}	L _{Aeq}	L _{A1}	L _{A10}	L _{A90}	
A : Pelton Village 30/01/2007 19:54 NNW 1m/s	43 dB(A) L ₉₀	78	58	70	59	48	Traffic 45 to 60 Insects 5 to 60 Washery and Train – not audible
Estimated LA90 Mine Contribution: < 40 dBA							
B: Pyne 30/01/2007 20:22 ENE 1m/s	40 dB(A) L ₉₀	69	47	54	51	43	Insects 30 to 35 Car 52 Washery audible 40 to 42 Washery Dozer 35
Estimated LA90 Mine Contribution: 41 dBA							
C: O'Hearn 30/01/2007 20:44 ENE 0.5m/s	37 dB(A) L ₉₀	55	38	47	40	34	Insects 38 to 40 Washery audible 32 to 35 Washery Dozer 36 to 43
Estimated LA90 Mine Contribution: 34 dBA							

Table 7 Summary of Operator Attended Monitoring Results – Night, January 2007

Monitoring Location Date Start Wind Speed	Criteria/Goal	Primary Noise Descriptor (dBA ref 20µPa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
		L _{Amax}	L _{Aeq}	L _{A1}	L _{A10}	L _{A90}	
A : Pelton Village 31/01/2007 00:39 NNW 0.5m/s	43 dBA (L _{A90})	63	46	55	48	43	Dogs 52 to 60 Insects 44 to 46 Washery 43 Traffic 57 to 63 Train 42 to 53
Estimated LA90 Mine Contribution: 43 dBA							
B: Pyne 31/01/2007 01:04 NNW 0.5m/s	40 dBA (L _{A90})	55	36	47	36	31	Insects 42 to 55 Washery 32 to 36 Aircraft 48 to 50 Train 34
Estimated LA90 Mine Contribution : 31 dBA							
C: O'Hearn 31/01/2007 01:29 SSW 2m/s to 3m/s	37 dBA (L _{A90})	69	42	49	43	37	Wind 36 to 69 Washery dozer just Audible
Estimated LA90 Mine Contribution : < 37 dBA							



3.1.2 Infrastructure Upgrade Area (Kalingo)

Noise levels measured during January 2007 quarterly survey at the monitored locations adjacent to the Kalingo area for day, evening and night periods are presented in **Table 8**.

Table 8 Summary of Operator Attended Monitoring Results – January 2007

Monitoring Location Date Start Wind Speed	Primary Noise Descriptor (dBA ref 20 μ Pa)					Observations, Description of Noise Emission & Typical Maximum Levels (dBA)
	L _{Amax}	L _{Aeq}	L _{A1}	L _{A10}	L _{A90}	
Day						
Kalingo East 30/01/2007 16:41 WNW 0.5m/s to 1m/s	67	51	59	55	46	Birds 50 to 67 Insects 45 to 48 Nitrogen + compressor 30 to 35 Ventilation Fan 40
Measured Mine Contribution : 41 dBA						
Kalingo SW 30/01/2007 17:11 NW 0.5m/s to 1m/s	59	44	53	46	33	Construction: 42 to 60 Water Pump – not audible Wind 30 to 42
Measured Mine Contribution : <33 dBA						
Evening						
Kalingo East 30/01/2007 19:00 NNW 1m/s	70	55	64	58	47	Nitrogen + compressor <35 Ventilation Fan 46 Security Guard up to 70
Measured Mine Contribution : 46 dBA						
Kalingo SW 30/01/2007 19:23 NNW 1m/s	69	47	57	49	38	Water Pump Not Audible Insects 32 to 36 Birds 42 to 69
Measured Mine Contribution : <30 dBA						
Night						
Kalingo East 30/01/2007 23:42 WNW 0.5m/s	52	47	49	48	47	Ventilation Fan 46 Nitrogen Plant and Compressors 38 Security Guard 52
Measured Mine Contribution : 47 dBA						
Kalingo SW 31/01/2007 00:10 WNW 0.5 m/s	57	33	37	35	30	Water Pump –audible, not measurable Insects 32 to 57
Measured Mine Contribution : < 30 dBA						

Note : Noise measurements for the Kalingo infrastructure area were conducted within the boundary of the south west and east perimeter of the site. ENM was used to model and verify noise levels to location D (Nash Lane, Quorrobolong) and location E (Glennie St, Ellalong) to incorporate meteorological conditions as per conditions identified in of Modification dated 27 September 2006.



3.2 DISCUSSION

3.2.1 Receiver A : Pelton Village

Road traffic from Wollombi Road is the dominant noise source at this measurement location generating sound pressure levels of between 40 dBA to 70 dBA throughout the monitoring session. Additionally, other noise sources included insects and birds that were audible throughout the survey and dominated noise levels during the night noise survey period.

Audible mining noise source contributions included the washery, washery dozer and train noise from trains travelling to the coal handling area via the South Main Railway Line. The Austar washery was audible throughout the monitoring period when breaks in traffic occurred. The mine noise contribution from the washery was established as 42 dBA when winds were from the north west direction (from the washery to this receiver). Operation of the washery is continuous and the mine noise contribution is comparable to the (LA90) noise criterion for this location. Therefore, the measured mining contribution of 43 dBA is equal to the relevant criterion specified in the licence for this location.

3.2.2 Receiver B: Pyne Residence

Non-mining noise sources measured at this location included dogs, insect and birds that occurred throughout all measurements at this location generating sound pressure levels of between 35 dBA to 55 dBA.

Mining noise sources audible at this measurement location included dozer and washery noise that contributed to a maximum noise level of approximately 41 dBA during the evening period. The continual nature of the washery allows for comparison of the contribution with the 40 dBA (LA90) noise goal. In accordance with Section 11.1.3 of the INP, this level is compliant with the Licence as it is less than 2 dBA above the goal specified (refer to section 2.4 of this report).

3.2.3 Receiver C: O'Hearn Residence

Non-mining noise sources at this receiver included wind gusts and insect noise generating sound pressure levels of up to 72 dBA. Excluding these non-mining noise sources from the data set allows for the mine noise contribution to be established. Mine noise included washery and dozer noise from the Austar pit-top operations, with the dozer being the dominant noise source associated with these operations.

During the daytime and night periods the mining noise contribution was not measurable above non-mining noise sources. During the evening period dozer noise levels (although not continuous throughout the entire measurement) with the addition minor contributions from the Austar washery resulted in a mining noise contribution of 34 dBA, below the relevant criteria specified in the Licence for this location.



3.2.4 Kalingo East and Kalingo South West

Monitoring locations situated within the Kalingo Area are considered the worst case positions for monitoring noise emissions from surface operations from Austar Mine. Monitored locations are situated within the Austar Kalingo lease and while they are not residential receivers they have been used as reference positions for comparison with modelled noise levels for surrounding receivers location E (Glennie St, Ellalong) and location D (Nash Lane, Quorrobolong).

Noise monitoring adjacent of the east boundary of the Kalingo area was undertaken to determine the noise contribution of the nearby ventilation fan, nitrogen plant and compressors. For the Kalingo west monitoring location the dominant mining noise source is the dam pump that emits high frequency noise levels. The Kalingo east monitoring location noise levels from non-mining noise sources dominated the day measurement with insects and birds generating sound pressure levels up to 67 dBA. The ventilation fan at the Kalingo site typically generated noise levels between 43 dBA to 47 dBA. The compressor and nitrogen plant combined to generate sound pressure levels of up to 35 dBA. The contribution of these noise sources are used in the validation model to determine their noise levels at adjacent residential receivers as presented in **Table 9**.

During measurement at the Kalingo south west site it was evident that non-mining noise sources dominated measurements at this location, although the dam pump was audible during the evening period. It should be noted that wind throughout the measurement directed emissions from the dam pump away from this monitoring location. Noise modelling conducted for this assessment at these two monitoring positions (as discussed in the next section of this report) addresses potential issues when source to receiver winds may occur as per requirements of the Notice of Modification dated 27 September 2006.

3.3 Validation Noise Model

To identify mine noise contribution during meteorological conditions specified in the consent a validation model was developed for neighbouring receivers. This model was and calibrated using the reference location at the eastern boundary of the Kalingo area. Meteorological conditions that occurred during the night survey were adopted in the noise model and then compared meteorological conditions identified in the Notice of Modification dated 27 September 2006 and described in Heggies Report 30-1629 'Austar Coal Mine – Noise Monitoring Program', 15 December 2007. Results of this model are presented in **Table 9**.

Table 9 Modelled Noise Emissions - Validation of Existing Operations

Location	Measured Mine LAeq(15minute) Contribution WNW Wind Drift (0.5m/s)	Predicted LAeq WNW Wind Drift (0.5m/s)	Predicted LAeq Source to Receiver 3m/s Wind	Predicted LAeq 3°/100m Inversion
Kalingo East (reference point)	47 dBA	47 dBA	48 dBA	47 dBA
D. Nash Lane, Quorrobolong	N/A	<30 dBA	31 dBA	<30 dBA
E. Glennie St, Ellalong	N/A	<30 dBA	32 dBA	<30 dBA

Noise modeling identifies that during noise enhancing meteorological conditions, noise emissions from the Kalingo surface operations comply with the 35 dB(A) LAeq(15minute) noise criteria at location D (Nash Lane, Quorrobolong) and location E (Glennie St, Ellalong).



4 CONCLUSION

Heggies have completed a noise monitoring assessment for Austar Coal Mine situated at Paxton, NSW. The objective of the monitoring assessment was to determine compliance with relevant noise goals, in particular during noise enhancing meteorological conditions.

The combination of monitoring and validation modelling has identified that noise emissions generated by the Austar surface operations generally comply with respect to the relevant statutory noise limit specified in consent or licence conditions.

Appendix A

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Appendix A

