Appendix 6

NOISE ASSESSMENT

REPORT 10-1863-R4
Revision 0

Whitehaven Coal Mine
Canyon Extension
Noise Impact Assessment

Prepared for

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Whitehaven Coal Mine
Canyon Extension
Noise Impact Assessment

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Reference	Status	Date	Prepared	Checked	Authorised
10-1863-R4	Revision 0	17 December 2004	Rod Linnett	John Cotterill	John Cotterill

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EXECUTIVE SUMMARY

Richard Heggie Associates Pty Ltd (Heggies) has been engaged by Whitehaven Coal Mining Ltd (WCML) to undertake a noise impact assessment of a proposed extension to the existing Whitehaven Coal Mine (WCM), located 16 km east-southeast of Boggabri, NSW. The proposed extension, known as the Canyon Extension, is to the south of the existing mine. The aim is to extract resource that was previously regarded as unsuitable for mining. The annual production rate and operating hours for the WCM will not alter as a result of the Canyon Extension.

The nearest non project related residential receivers beyond the mine lease are the Gundawarra, Woodlands, Broadwater and Braymont properties. The nearest project related residential receivers beyond the mine lease are the Whitehaven, Bungalow, Wilga, Merton, Wilgai and Blue Vale properties.

The three (3) scenarios modelled are generally conservative representing worst-case scenarios with mobile equipment located in elevated positions where appropriate.

Predicted noise levels from mining operations for Scenario 1 of the Canyon Extension meet the noise design goals at all locations under calm and prevailing conditions for all operating periods.

Predicted noise levels from mining operations for Scenarios 2 and 3 of the Canyon Extension meet the noise design goals at all residential receiver locations during all operating periods except at the Broadwater residence which will meet marginal compliance for the evening and night-time periods under a prevailing 3 m/s ENE wind.

The annual production rate of the mine from the proposed extension will not alter and hence road traffic generated would also remain unchanged. At the current approved extraction rate of 1.25 Mtpa, road traffic noise levels from the transportation of coal will meet the road traffic noise design goals.

1 INTRODUCTION

Richard Heggie Associates Pty Ltd (Heggies) has been engaged by Whitehaven Coal Mining Ltd (WCML) to undertake a noise impact assessment of a proposed extension to the mine known as the Canyon Extension.

The Whitehaven Coal Mine (WCM) located some 16 km east-southeast of Boggabri NSW and commenced operations in 2000 and has an approved production rate of 1.25 Mtpa. Most open-cut mining activities are approved to occur between 7.00 am to 10.00 pm Monday to Saturday and are generally undertaken from 7.00 am to 6.00 pm. Limited activities are permitted between 10.00 pm to about 2.00 am. The approved mine has a current projected remaining life of approximately one (1) year.

2 PROJECT DESCRIPTION

WCML proposes to extend the existing mine to the south to extract resource that was previously regarded as unsuitable for mining.

As a consequence of greater than expected demand for Whitehaven coal by both domestic and overseas customers, the increased demand for coal in general and the upward movement in coal prices, WCM has re-evaluated the remaining resource on its "Whitehaven" and "Womboola" properties within ML 1471. As a result of this re-evaluation, the economic overburden stripping ratio at the mine has been extended, with a further 2.4 Mt coal (approximately) assessed as amenable to open cut mining.

The area of disturbance associated with the proposed extension would approximate 46 ha and will be mined with existing equipment and methods, and within existing hours of operations. Details of the proposed extension are shown in **Appendix A**.

2.1 Plant and Equipment

A noise survey of acoustically significant plant and equipment used on site was conducted by Heggies previously during February 2002. Details of the sound power levels and octave band levels determined from these measurements are contained in **Table 1**. Further details regarding the measurements can be found in **Report 10-1863-R2**.

Table 1 On-site Measured Maximum Operating Sound Power Levels (dBA re 1pW)

Equipment Description	Operating Condition	Octave Band Centre Frequency - (Hz)									Overall Level
		31.5	63	125	250	500	1k	2k	4k	8k	
CAT 777 Haul Truck	Level Travel	78	97	105	108	111	111	111	103	94	117
	Upgrade Haul	83	96	104	112	112	111	112	106	103	118
	Mean	81	97	105	110	112	111	112	105	101	118
CAT 785 Haul Truck	Upgrade Haul	83	118	108	116	118	115	115	110	100	123
	Downgrade Travel	81	108	111	117	120	116	115	110	99	124
	Mean	82	110	110	117	119	115	115	110	100	123
CAT D11R Dozer	Dozing	71	86	99	108	114	115	113	111	102	120
	Reverse Level	72	87	100	114	123	124	124	119	102	129
	Mean	72	86	99	112	121	121	121	117	102	127
CAT D11N Dozer	Dozing	79	92	96	105	116	111	112	111	102	119
	Reverse Upgrade	79	91	96	105	111	113	113	112	99	119
	Mean	79	92	96	105	114	112	113	112	61	119
CAT D9L Dozer	Ripping	75	86	99	104	112	111	110	111	98	117
	Reverse Level	74	86	100	108	116	116	118	119	99	124
	Mean	75	86	100	107	114	114	116	116	98	121
Hitachi 3600 Excavator	Rear Excavating	107	107	118	113	110	108	107	102	97	114
CAT 988B Front End Loader	Rear Loading	76	85	108	102	112	111	113	107	101	118
CAT 980C Front End Loader	Rear Loading	69	84	100	103	108	112	109	108	103	116
Scraper 627, 637	Scraping	66	87	96	97	101	103	102	95	88	107
Water Cart	Level Travel	78	97	105	108	111	111	111	103	94	117
CAT 14G Grader	Levelling	96	107	102	101	93	95	91	87	77	107
Ingersoll Rand PM45 Drill	Drilling	56	85	101	103	110	112	109	104	101	116
Processing Plant	Operating	75	89	101	101	102	105	104	104	97	111

2.2 Operating Hours

Permissible existing operating hours are nominated in Department of Infrastructure Planning and Natural Resources (DIPNR, formerly DUAP) Development Consent Condition 6.3 and 6.4.2 as amended and are summarised in **Table 2**. The nominated hours of operations as presented in **Table 2** are, with the exception of a restriction on blasting on public holidays, essentially duplicated in the WCM EPL.

Table 2 Summary of Normal Mine Operating Hours

Phase	DUAP Consent
Construction	7.00 am to 10.00 pm, Monday to Saturday
Mine Operations	7.00 am to 10.00 pm, Monday to Saturday with limited activities to 2am
Highwall Mining[1]	24 hours Monday to Sunday
Coal Transportation	7.00 am to 10.00 pm hours Monday to Saturday (except Public Holidays)
Blasting Operations	9.00 am to 5.00 pm, Monday to Saturday

Note: Highwall mining is not currently undertaken nor currently considered viable.

The schedules of plant and equipment employed at the mine site are presented in **Table 3** for the daytime, evening and night-time periods.

Table 3 Whitehaven Mine Plant and Equipment

Description	Type	Day Shift	Evening	Night-Shift
Haul Trucks	CAT 785 CAT 777	2 3	2 2	2 N/A
Excavators	Hitachi 3600 Komatsu PC1250	1 1	1 1	1 N/A
Front End Loader	CAT 988 CAT 980	1 1	1 1	N/A N/A
Blast hole Drill	Ingersoll Rand DML 45	1	1	N/A
Scrapers	627 637	1 1	1 1	N/A
Track Dozers	CAT D11R CAT D11R CAT D10	1 1 1	1 1 1	1* 1 1
Grader	CAT 14G	1	1	1*
Water Cart	15000L	1	1	1*
Processing Plant	600 tph	1	1	N/A

*Note: * only one item operating at any given time*

It is proposed that the operating hours for the Canyon Extension will be unchanged from existing approved hours of operation.

3 SITE DETAILS

The WCM is located 16 km east-southeast of Boggabri, NSW The nearest rural dwellings beyond the mine lease area described in **Table 4** together with an estimate of the distance from the outer extent of the proposed extension to the open-cut area. A location map outlining the nearest residential receivers are shown in **Appendix A**.

Table 4 Location of Nearest Rural Dwellings with Respect to WCM Site

Property	Location	Status
Braymont	5000 m north-northwest	Private Property
Bungalow	3800 m north-northwest	WCM owned
Gundawarra	3100 m north east	Private Property
Whitehaven	2100 m north	WCM owned
Merton	2000 m east-north east	Private Property*****
Willgai	1900 m east-north east	Private Property*****
Woodlands	3200 m east-north east	Private Property
Wilga	650 m south	Leased by WCM
Blue Vale	1800 m south-south west	Project Related
Broadwater	3300 m south west	Private Property

*Note: * Subject to a negotiated agreement for night-time operations.*

4 IMPACT ASSESSMENT PROCEDURES

Currently, the Whitehaven Coal Mine has noise consent conditions from DIPNR and the DEC in the form of an EPL as well as DEC General Terms of Approval.

It is envisaged that the submission of this Development Application for the proposed extension will result in a consolidation of consent conditions for WCM in alignment with the objectives of the INP.

4.1 General Objectives

Residential Receiver

Responsibility for the control of noise emission in New South Wales is vested in Local Government and the DEC. The DEC released an Industrial Noise Policy in December 1999 that provides a framework and process for deriving noise criteria for consents and licences that will enable the EPA to regulate premises that are scheduled under the Protection of the Environment Operations Act 1997.

The specific policy objectives are:

- To establish noise criteria that would protect the community from excessive intrusive noise and preserve amenity for specific land uses.
- To use the criteria as the basis for deriving project specific noise levels.
- To promote uniform methods to estimate and measure noise impacts, including a procedure for evaluating meteorological effects.
- To outline a range of mitigation measures that could be used to minimise noise impacts.
- To provide a formal process to guide the determination of feasible and reasonable noise limits for consents or licences that reconcile noise impacts with the economic, social and environmental considerations of industrial development.
- To carry out functions relating to the prevention, minimisation and control of noise from premises scheduled under the Act.

Assessing Intrusiveness

For assessing intrusiveness, the background noise needs to be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than 5 dBA above the measured background level (L_{A90}).

Assessing Amenity

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include road, rail or community noise. The existing noise level from industry is measured. If it approaches the criterion value, then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion. For high-traffic areas there is a separate amenity criterion. The cumulative effect of noise from industrial sources needs to be considered in assessing impact.

The INP states that these criteria have been selected to protect at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided the criteria in the INP are achieved, it is unlikely that most people would consider the resultant noise levels excessive.

Assessing Sleep Disturbance

The DEC has acknowledged that the relationship between maximum noise levels and sleep disturbance is not currently well defined. Criteria for assessing sleep disturbance has not been defined under the INP but it is assumed that conformance with the INP would protect against the likelihood of awakening reactions. Not withstanding the preceding, sleep arousal has been assessed using the guidelines set out in the DEC's Environmental Noise Control Manual Section 19-3.

To avoid sleep disturbance the EPA recommends that the L_{A1} of the noise source under consideration should not exceed the background noise level (L_{A90}) by more than 15 dBA when measured outside the bedroom window of the receiver during the night-time hours (10.00 pm to 7.00 am).

In those cases where the INP project specific assessment criteria are not achieved, it does not automatically follow that all people exposed to the noise would find the noise unacceptable. In subjective terms, exceedances of the INP project specific assessment criteria can be generally described as follows:

- Negligible noise level increase < 1 dBA
  (Not detectable by all people)
- Marginal noise level increase 1 dBA to 2 dBA
  (Not detectable by most people)
- Moderate noise level increase 3 dBA to 5 dBA
  (Not detectable by some people but may be detectable by others)
- Appreciable noise level increase > 5 dBA (detectable by most people)

In view of the foregoing, **Table 5** presents the methodology for assessing noise levels which may exceed the INP project specific noise assessment criteria.

Table 5 Noise Impact Assessment Methodology

Assessment Criteria	Project Specific Criteria	Noise Management Zone	Noise Affectation Zone
Intrusive	Rating background level plus 5 dBA	≤ 5 dBA above project specific criteria	> 5 dBA above project specific criteria
Amenity	INP based on existing industrial level	≤ 5 dBA above project specific criteria	> 5 dBA above project specific criteria

For the purposes of assessing the potential noise impacts the project specific, management and affectation criteria are further defined as follows:

INP Project Specific Criteria

Most people in the broader community would generally consider exposure to noise levels corresponding to this zone acceptable.

Noise Management Zone

Depending on the degree of exceedance of the project specific criteria (1 dBA to 5 dBA) noise impacts could range from negligible to moderate. It is recommended that management procedures be implemented including:

- Prompt response to any community issues of concern.
- Noise monitoring on site and within the community.
- Refinement of on site noise mitigation measures and plant operating procedures where practical.
- Consideration of acoustical mitigation at receivers.
- Consideration of negotiated agreements with property holders.

Noise Affectation Zone

Exposure to noise levels corresponding to this zone may be considered unacceptable by some property holders and it is recommended that the proponent explore the following:

- Discussions with relevant property holders to assess concerns and provide solutions.
- Implementation of acoustical mitigation at receivers.
- Negotiated agreements with property holders where required.

Assessing Road Traffic Noise

The EPA released the Environmental Criteria for Road Traffic Noise (ECRTN) in May 1999. The policy sets out noise criteria applicable to different road classifications for the purpose of defining traffic noise impacts.

5 PROJECT SPECIFIC NOISE DESIGN GOALS

5.1 Operational Noise Design Goals

Residential receiver locations surrounding the WCM best described as the rural receiver type.

The WCM noise emission design goals have been set with reference to the INP outlined in **Section 4**.

An Assessment Background Level (ABL) of 30 dBA has been adopted from previous assessments of existing WCM operations.

Therefore the project specific noise design goal at each residential receiver is 35 dBA $L_{Aeq(15minute)}$ for day, evening and night-time periods.

5.2 Sleep Disturbance Noise Design Goals

The sleep disturbance noise emission design goals for the night- time period have been set with reference to the ENCM as outlined in Section 4**.**

Therefore the project specific sleep disturbance noise design goal for all residential receivers is 45 dBA $L_{A1(1minute)}$.

5.3 Road Traffic Noise Design Goals

The Environment Protection Authority released the “Environmental Criteria for Road Traffic Noise” in May 1999.

The policy sets out noise criteria applicable to different road classifications for the purpose of defining traffic noise impacts. Many of the roads along the haulage route would normally be classified as 'local roads' under the Policy. However, the ECRTN document indicates:

"It is noted that some industries (such as mines and extractive industries) are, by necessity in locations that are not often served by arterial roads. Heavy vehicles must be able to get to their bases of operation, and this may mean travelling on local roads. Good planning practice recognises that we must acknowledge this type of road use and develop ways of managing any associated adverse impacts. To this end, the concept of 'principal haulage routes' has been endorsed by the Department of Urban Affairs and Planning's North Coast Extractive Industries Standing Committee. Ways of identifying 'principal haulage routes' and managing associated adverse impacts have not yet been fully defined. Where local authorities identify a 'principal haulage route', the noise criteria for the route should match those for collector roads, recognising the intent that they carry a different level and mix of traffic to local roads."

Hence the roads utilised along the haulage route could be classified as a principal haulage route from the mine can be categorised as a collector road and it is for this reason the noise criteria outlined in **Table 6** have been adopted. This methodology was applied to the initial EIS for the WCM operation.

Table 6 EPA Environmental Criteria for Road Traffic Noise

Policy	Descriptor	Traffic Noise Goal
8. Land use developments with the potential to create additional traffic on a collector road	$L_{Aeq(1hour)}$ daytime	60 dBA*
	$L_{Aeq(1hour)}$ night-time	55 dBA*

*Note: * In all cases (where criteria are already exceeded, or where existing noise levels are within 2 dBA of the criterion), traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dBA.*

6 EFFECTS OF METEOROLOGICAL CONDITIONS

6.1 INP Assessment of Prevailing Weather Conditions

Wind

Wind has the potential to increase noise at a receiver when it is light and stable and blows from the direction of the noise source. As the strength of the wind increases the noise produced by the wind will obscure noise from most industrial and transport sources.

Wind effects need to be considered when wind is a feature of the area under consideration. Where wind blows from the source to the receiver at speeds up to 3 m/s for more than 30% of the time in any seasonal assessment period (ie day, evening or night), then wind is considered to be a feature of the area and noise level predictions must be made under these conditions.

In order to determine the prevailing conditions for the subject site, weather data was obtained from the weather station at the WCM site from January 2001 to December 2002.

This data was analysed to determine the frequency of occurrence of winds of speeds up to 3 m/s in each season during these periods. The results of the analysis showed that there are prevailing winds for the site as defined by the 30% threshold.

The results of the weather analysis for daytime, evening, and night-time winds are presented in **Table 7**, **Table 8** and **Table 9** respectively. In each table, the wind directions and percentage occurrence are those dominant during each season.

Table 7 Seasonal Frequency of Occurrence Wind Speed Intervals - Daytime (7.00 am – 6.00 pm)

Period	Calm	Wind Direction	0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	0.8%	SW±45	3.1%	4.1%	7.2%
Autumn	4.7%	SW±45	8.4%	6.8%	15.2%
Winter	8.8%	WSW±45	9.4%	6.3%	15.7%
Spring	2.4%	WSW±45	4.7%	4.3%	8.9%

Table 8 Seasonal Frequency of Occurrence Wind Speed Intervals – Evening (6.00 pm – 10.00 pm)

Period	Calm	Wind Direction	0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	6.6%	ENE±45	8.6%	6.2%	14.8%
Autumn	8.2%	ENE±45	14.9%	13.5%	28.4%
Winter	**8.8%**	**ENE±45**	**16.3%**	**19.9%**	**36.3%**
Spring	8.2%	ENE±45	13.8%	12.1%	25.9%

Table 9 Seasonal Frequency of Occurrence Wind Speed Intervals – Night-time (10.00 pm – 7.00 am)

Period	Calm	Wind Direction	0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Summer	10.9%	ENE±45	11.2%	8.0%	19.2%
Autumn	18.5%	ENE±45	17.9%	11.6%	29.4%
Winter	**18.3%**	**ENE±45**	**21.9%**	**17.3%**	**39.3%**
Spring	**14.7%**	**ENE±45**	**18.5%**	**14.0%**	**32.6%**

Seasonal wind records indicate that significant winds (of up to 3 m/s) are a feature of the area, as the percentage of occurrence of winds from the east – north east exceeds the 30% threshold during winter evenings and spring and winter nights. Therefore, an assessment of noise impacts under this prevailing wind has been conducted as part of this assessment.

Temperature Inversion

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions occur predominantly at night during the winter months. For a temperature inversion to be a significant characteristic of the area it needs to occur for approximately 30% of the total night-time during winter or about two (2) nights per week.

The INP states that temperature inversions need only be considered for the night-time noise assessment period (10.00 pm to 7.00 am). Temperature inversion data from January 2001 to December 2002 from the weather station situated at the WCM site was analysed to determine the frequency of occurrence temperature inversions.

Table 10 Weak to Strong Temperature Inversion Frequency of Occurrence – Evening & Night (6.00 pm - 7.00 am)

Stability Class	Winter	Estimated ELR ^{o}C/100 m	Qualitative Description
A	0	<-1.9	Lapse
B	0	-1.9 to-1.7	Lapse
C	0	-1.7 to-1.5	Lapse
D	37.2 %	-1.5 to-0.5	Neutral
E	13.7 %	-0.5 to 1.5	Weak Inversion
F + G	49.0 %	>1.5	Moderate to Strong Inversion

Note: ELR (Environmental Lapse Rate)

The frequency of occurrence of atmospheric stability classes indicates that temperature inversions are also a feature of the site. For approximately 49% of winter evening and night-time period (ie 6.00 pm to 7.00 am) moderate to strong temperature inversions may prevail during the night-time period.

Therefore, as per INP methodology, noise impacts under temperature inversion have been conducted as part of this assessment.

Drainage Flow

Drainage flow is the low level wind associated with the flow of cold air from higher ground to lower during the presence of a temperature inversion

The INP states that the "*drainage-flow wind default value should generally be applied where a development is at a higher altitude than a residential receiver*."

Of the residential properties surrounding the WCM, Broadwater, Gundawarra, Merton, Wilgai and Braymont are below the elevation of the perimeter of the mine pit.

Due to the intervening topography in the form of a hill between the WCM and the Broadwater residence, drainage flow has not been assessed for this residence.

It should be noted that all equipment operating during the night-time period at the WCM in all scenarios operate below the perimeter of the mine pit or adjacent natural ground surface.

The Gundawarra property is located at the base of a hill located to the north east. The drainage flow of cold air as a result of this hill would be in an easterly or north easterly direction. Consequently, if a drainage flow associated with a night-time temperature inversion from WCM in the direction of Gundawarra did occur, it would be of a velocity much lower than 2 m/s.

Furthermore the ridge formed at the Run of Mine (ROM) Pad provides a topographical barrier, creating a drainage flow from an easterly or north easterly direction into the mine pit or to the west of the WCM.

Based on the above, drainage flow from noise sources within the mine pit is unlikely to occur.

7 ASSESSMENT OF NOISE IMPACTS

7.1 Noise Modelling and Meteorology

The Whitehaven computer model was developed to incorporate the significant noise sources associated with the existing and anticipated mine operation. Additional surrounding terrain and nearby potentially affected residential properties were also included in the model.

The Whitehaven computer model was prepared using RTA Software's Environmental Noise Model (ENM for Windows, Version 3.06), a commercial software system developed in conjunction with the NSW EPA. The acoustical algorithms utilised by this software have been endorsed by the Australian and New Zealand Environment Council and all State Environmental Authorities throughout Australia as representing one of the most appropriate predictive methodologies currently available.

For the purpose of predicting the noise emission levels during the mine's operations, the following scenarios were assessed:

- **Whitehaven Mine Scenario 1** – Represents mining operations approximately for the period July 2006 to January 2007 as presented in Figure 2.3(b) of the WCM Canyon Extension SoEE.
- **Whitehaven Mine Scenario 2** – Represents mining operations approximately for the period February 2007 to November 2007 as presented in Figure 2.3(c) of the WCM Canyon Extension SoEE.
- **Whitehaven Mine Scenario 3** – Represents mining operations approximately for the period December 2007 to December 2008 as presented in Figure 2.3(d) of the WCM Canyon Extension SoEE.

The mine noise model included all existing and proposed plant items operating concurrently to simulate the overall maximum energy equivalent (ie L_{Aeq}) noise emission. A large proportion of the mobile equipment is operated in repeatable routines and a relatively smaller proportion of noise emissions are from continuous fixed plant items.

The three (3) scenarios modelled are generally conservative with mobile equipment located in elevated positions where appropriate.

The L_{Aeq} sound power levels given for each item of mobile equipment do not include noise emissions, which emanate from reversing alarms. In the event that reversing alarm noise is considered to be a source of disturbance, the alarm noise level should be checked against the appropriate Department of Mineral Resources requirements and the necessary mitigating action taken to achieve an acceptable noise reduction without compromising safety standards.

The predicted noise emission levels for the three (3) scenarios have been calculated for the range of weather conditions arising from the INP assessment and are presented in **Table 11**.

Table 11 Mine Noise Modelling Weather Conditions

Mining Operation	Assessment Period & Atmospheric Conditions	Air Temp (ºC)	Relative Humidity (%)	Wind Velocity & Direction	Temp Gradient
Scenario 1	Day – Calm	20	65	Calm	N/A
	Evening – Wind	12	75	3 m/s ENE	N/A
	Night – Wind	6	90	3 m/s ENE	N/A
	Night Temp Inversion	6	90	N/A	4ºC/100 m
	Night – Temp Inversion & Drainage flow	6	90	2 m/s *	4ºC/100 m
Scenario 2	Day – Calm	20	65	Calm	N/A
	Evening – Wind	12	75	3 m/s ENE	N/A
	Night – Wind	6	90	3 m/s ENE	N/A
	Night Temp Inversion	6	90	N/A	4ºC/100 m
	Night – Temp Inversion & Drainage flow	6	90	2 m/s*	4ºC/100 m
Scenario 3	Day – Calm	20	65	Calm	N/A
	Evening – Wind	12	75	3 m/s ENE	N/A
	Night – Wind	6	90	3 m/s ENE	N/A
	Night Temp Inversion	6	90	N/A	4ºC/100 m
	Night – Temp Inversion & Drainage flow	6	90	2 m/s *	4ºC/100 m

*Note: * 2 m/s source to receiver drainage flow to the Braymont residence*

7.2 Predicted Operational Mine Noise Levels

Predicted operational noise emissions for the Canyon Extension Scenarios 1, 2 and 3 are shown in **Table 12**, **Table 13** and **Table 14** respectively.

Table 12 Predicted Mine Noise Levels – Scenario 1

Receiver	Predicted Noise Level $L_{Aeq(15minute)}$ dBA				
	Day – Calm	Evening – Wind	Night – Wind	Night – Temp	Night – Temp & Drainage
Braymont	< 30 dBA	< 30 dBA	< 30 dBA	< 30 dBA	35 dBA
Gundawarra	< 30 dBA	< 30 dBA	< 30 dBA	< 30 dBA	N/A
Wilgai	31 dBA	< 30 dBA	< 30 dBA	< 30 dBA	N/A
Woodlands	< 30 dBA	< 30 dBA	< 30 dBA	< 30 dBA	N/A
Broadwater	< 30 dBA	33 dBA	< 30 dBA	< 30 dBA	N/A
Merton	32 dBA	< 30 dBA	< 30 dBA	< 30 dBA	N/A

Predicted noise levels from mining operations for Scenario 1 meet the noise design goals at all locations under calm and prevailing conditions for all operating periods.

Table 13 Predicted Mine Noise Levels – Scenario 2

Receiver	Predicted Noise Level $L_{Aeq(15minute)}$ dBA				
	Day – Calm	Evening - Wind	Night - Wind	Night - Temp	Night – Temp & Drainage
Braymont	< 30 dBA	< 30 dBA	< 30 dBA	31 dBA	35 dBA
Gundawarra	< 30 dBA	< 30 dBA	< 30 dBA	34 dBA	N/A
Wilgai	31 dBA	< 30 dBA	< 30 dBA	33 dBA	N/A
Woodlands	< 30 dBA	< 30 dBA	< 30 dBA	32 dBA	N/A
Broadwater	< 30 dBA	35 dBA	37 dBA*	35 dBA	N/A
Merton	31 dBA	< 30 dBA	< 30 dBA	38 dBA^{+}	N/A

*Note: * Does not exceed project specific noise design goals by more than 2dB*
$^{+}$complies by virtue of negotiated agreement

Predicted noise levels from mining operations for Scenario 2 meet the noise design goals at all residential receiver locations during all operating periods except at the Broadwater residence which will meet marginal compliance (< 2 dBA above the goal) for the night-time period. This minor exceedance of 2 dBA a during the night-time period under a prevailing 3 m/s ENE and wind is unlikely to be noticeable by most people.

Table 14 Predicted Mine Noise Levels – Scenario 3

Receiver	Predicted Noise Level $L_{Aeq(15minute)}$ dBA				
	Day – Calm	Evening - Wind	Night - Wind	Night - Temp	Night – Temp & Drainage
Braymont	< 30 dBA	< 30 dBA	< 30 dBA	< 30 dBA	< 30 dBA
Gundawarra	< 30 dBA	< 30 dBA	< 30 dBA	32 dBA	N/A
Wilgai	30 dBA	< 30 dBA	< 30 dBA	30 dBA	N/A
Woodlands	< 30 dBA	< 30 dBA	< 30 dBA	< 30 dBA	N/A
Broadwater	< 30 dBA	36 dBA*	34 dBA	33 dBA	N/A
Merton	30 dBA	< 30 dBA	< 30 dBA	34 dBA	N/A

*Note: * Does not exceed project specific noise design goals by more than 2dB*

Predicted noise levels from mining operations for Scenario 3 meet the noise design goals at all residential receiver locations for all operating periods, except at the Broadwater residence which will meet marginal compliance (< 2 dBA above the goal) for the evening period. This exceedance of 1 dBA during the evening under a prevailing 3 m/s ENE wind and is unlikely to be noticeable by most people.

7.3 Traffic Noise Assessment

An assessment of the noise impact at residences adjacent to the southernmost section of Hoads Lane, Blue Vale Road and the Kamilaroi Highway from the haulage of coal has been undertaken by Wilkinson Murray Pty Ltd as part of the Belmont Coal Mine development proposal in November 2002. The assessment, undertaken under the EPA's Environmental Criteria for Road Traffic Noise, was based on the haulage of 1.95 Mtpa of coal, that is, the combined maximum production from the proposed Belmont Coal Mine and the then approved maximum production from the Whitehaven Coal Mine. Each of Hoads Lane, Blue Vale Road and the Kamilaroi Highway was considered to constitute "collector roads".

The assessment concluded that with a coal transportation rate of 1.95 Mtpa, at the closest residences to each of Hoads Lane (650 m), Blue Vale Road (70 m) and the Kamilaroi Highway (90 m), $L_{Aeq(1hour)}$ traffic noise levels from all sources would be 48 dBA, 57 dBA and 59 dBA and satisfies the 60 dBA criterion. A despatch level of 1.25 Mtpa from the Whitehaven Mine as proposed would, in the absence of the Belmont development results in a lesser noise level. Wilkinson Murray also noted that as each residence potentially affected by noise from trucks moving on the Siding Access Road is located substantially closer to the Kamilaroi Highway, the noise impact from the haulage activities on that road would be insignificant.

8 CONCLUSION

The three (3) Canyon Extension scenarios modelled are generally conservative representing worst-case scenarios with mobile equipment located in elevated positions where appropriate. The mine noise model included all existing and proposed plant items operating concurrently to simulate the overall maximum energy equivalent (ie L_{Aeq}) noise emission

Mining Operations

Predicted noise levels from mining operations for the Canyon Extension Scenario 1 meet the noise design goals at all locations under calm and prevailing conditions for all operating periods.

Predicted noise levels from mining operations for the Canyon Extension Scenario 2 and Scenario 3 and meet the noise design goals at all residential receiver locations during all operating periods except at the Broadwater residence which will meet marginal compliance (< 2 dBA above the goal) for the evening and night-time periods.

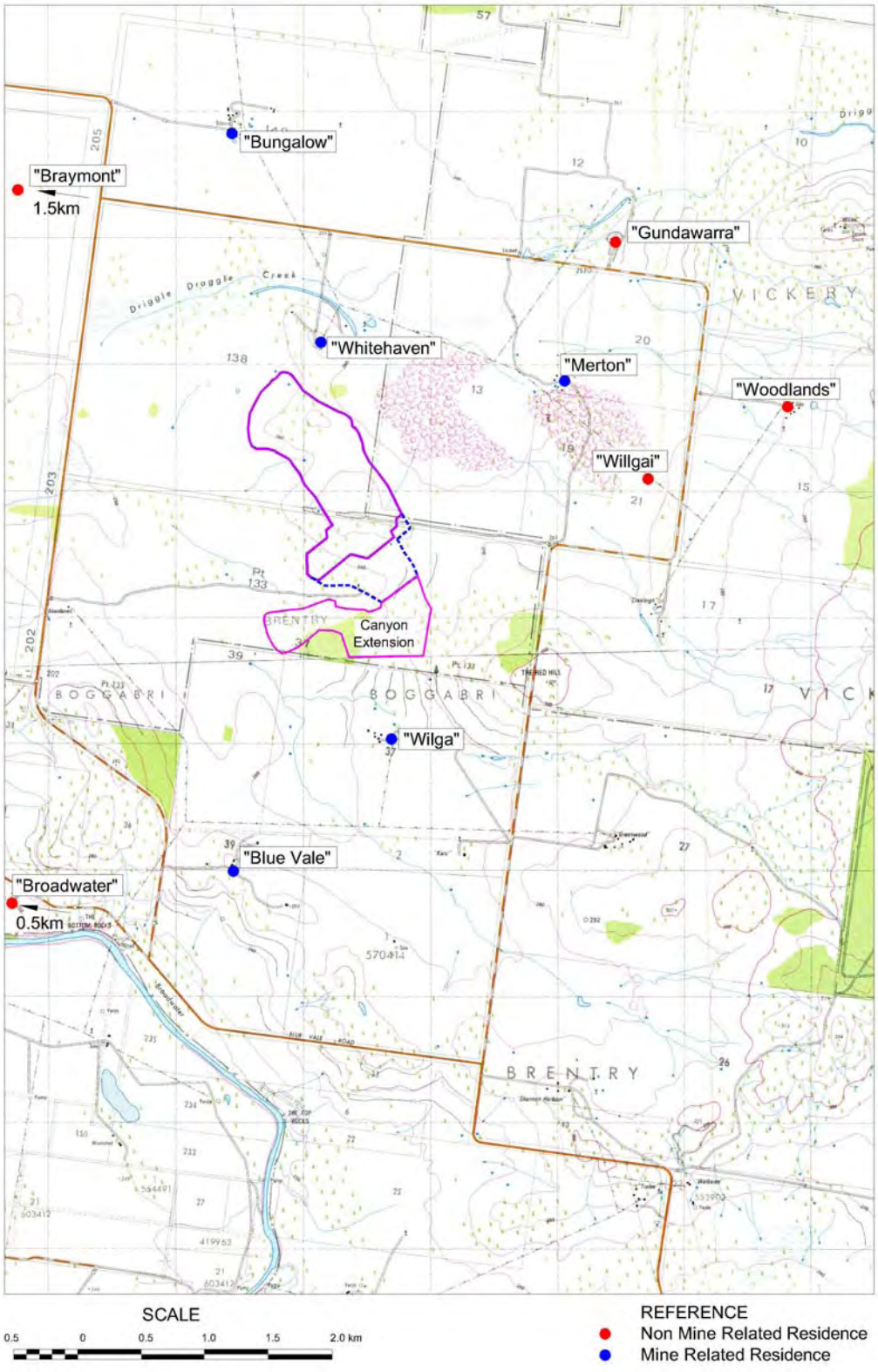
This minor exceedance of 1 dBA during the evening (Scenario 3) and 2 dBA during the night-time period (Scenario 2) occurs under a prevailing 3 m/s ENE wind and is unlikely to be noticeable by most people.

Road Traffic Noise

The annual production rate of the mine from the proposed extension will not alter and hence road traffic generated would also remain unchanged. At the current approved extraction rate of 1.25 mtpa, road traffic noise levels from the transportation of coal will meet the road traffic noise design goals.

APPENDIX A

Location Map


"Bungalow"
"Braymont"
1.5km
"Gundawarra"
"Whitehaven"
"Merton"
"Woodlands"
"Willgai"
Canyon Extension
"Wilga"
"Blue Vale"
"Broadwater"
0.5km
VICKERY
BOGGABRI
BRENTRY
SCALE
0.5 0 0.5 1.0 1.5 2.0 km
REFERENCE
Non Mine Related Residence
Mine Related Residence