Appendix 7*

Noise Monitoring Reports

*This appendix is presented on the CD included on the inside back cover of this report

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Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending June 2011

Report Number 630.01053-R1

2 August 2011

PO Box 675
Green Hills NSW 2320

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Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending June 2011

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630.01053-R1	Draft 1	2 August 2011	Nathan Archer	John Cotterill	

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

1 INTRODUCTION

Development consent was obtained by Donaldson Coal Pty Ltd for the Donaldson Mine in October 1999 following a Commission of Inquiry. Development Consent number N97/00147 was issued by the Minister for Urban Affairs pursuant to Section 101 of the Environmental Planning and Assessment Act 1979.

Project Approval (Application No. 05_0136) granted by the Minister of Planning was obtained by Donaldson Coal Pty Ltd for Abel Coal Mine in 2008.

Donaldson Coal Pty Ltd has commissioned SLR Consulting Pty Ltd (SLR Consulting) to conduct quarterly noise monitoring surveys for the Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Mine Project Noise Monitoring Program, dated 27 May 2008.

The objectives of the noise monitoring survey for this operating quarter were as follows:

- Measure the ambient noise levels at five (5) focus receptor locations (potentially worst affected) surrounding Donaldson Coal Mine and Abel Coal Mine.
- Qualify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of individual noise sources.
- Assess the noise emissions of Donaldson Coal Mine and Abel Coal Mine with respect to the limits contained in the Development Consent.

2 DEVELOPMENT CONSENT AND PROJECT APPROVAL

2.1 Donaldson Coal Mine Development Consent Conditions

The Development Consent nominates hours of operation and mine noise emission goals in the Sections entitled "*Operation of Development, Condition No. 3(1) and 3(2)*", and "*Noise and Vibrational Noise Limits: Condition No. 15*" as follows:

"3.(1) Subject to (2) the approved hours of operation are as follows:

Works	*Period*	*Hours*
Construction, including construction of any bunds	*Monday to Friday* *Saturday*	*7 am to 6 pm* *8 am to 1 pm*
Mining operations, including mining, haulage of waste to dumps and coal processing	*Monday to Friday* *Saturday, Sunday*	*24 hours per day* *7 am to 6 pm*
Road Transportation and stockpiling of coal	*7 days per week*	*24 hours per day*
Rail loading of coal	*7 days per week*	*7 am to 10 pm*
Maintenance of mobile and fixed plant	*7 days per week*	*24 hours per day*
Blasting, not involving closure of John Renshaw Drive	*Monday to Saturday*	*7 am to 5 pm*
Blasting, involving closure of John Renshaw Drive	*Monday to Saturday*	*10 am to 2 pm*

Notes: *Restrictions on Public Holidays are the same as Sundays*

(2) The Applicant shall submit a report to the Director-General's satisfaction demonstrating the noise limits in Condition 15 can be met while rail loading of coal is occurring during the period from 6 pm to 10 pm. If that report does not demonstrate that the noise limits can be met to the Director-General's satisfaction, then the hours of operation for rail loading of coal shall be restricted to 7 am to 6 pm."

15. Unless subject to a negotiated agreement in accordance with Condition 23, the Applicant shall ensure that the noise emission from construction or mining operations, when measured or computed at the boundary of any dwelling not owned by the applicant (or within 30 metres of the dwelling, if the boundary is more that 30 metres from the dwelling), shall not exceed the following noise limits:

Location	*LA10(15minute) Noise Limits (dBA)*	
	Daytime	*Night-time*
Beresfield area (residential)	*45*	*35*
Steggles Poultry Farm	*50*	*40*
Ebenezer Park Area	*46*	*41*
Black Hill Area	*40*	*38*
Buchanan and Louth Park Area	*38*	*36*
Ashtonfield Area	*41*	*35*
Thornton Area	*48*	*40*

Note: Daytime is 7 am to 10 pm Monday-Saturday, and 8 am to 10 pm Sundays and Public Holidays. Night-time is 10 pm to 7 am Monday-Saturday, and 10 pm to 8 am Sundays and Public Holidays.

The noise limits apply for prevailing meteorological conditions (winds up to 3 m/s), except under conditions of temperature inversions."

Other Conditions of Consent relevant to noise are as follows:

"18. The applicant shall survey and investigate noise reduction measures from plant and equipment and set targets for noise reduction in each Annual Environmental Management Report (AEMR), taking into consideration valid noise complaints received in the previous year. The Report shall also include remedial measures.

19. The Applicant shall revise the Noise Management Plan as necessary and provide an updated Plan five years after commencement of mining to the Director-General, the independent noise expert (Condition 48), EPA, Councils and the Community Consultative Committee."

2.2 Abel Coal Mine – Project Approval

The relevant conditions relating to noise from the Abel Coal Mine approval are reproduced below.

Schedule 4

NOISE

Note: These conditions should be read in conjunction with section 3 of the Statement of Commitments.

Noise Limits

23 The Proponent shall ensure that the noise generated by the Project does not exceed at any privately-owned residence the levels set out in the following table for the monitoring location nearest that residence.

Table 1: Noise limits dB(A)

Day	Evening	Night		Location and Locality*
LAeq(15 minutes)	LAeq(15 minutes)	LAeq(15 minutes)	LA1(1 minute)	
50	48	41	51	**A** Weakleys Dr, Beresfield
50	48	41	51	**B** Yarrum Rd, Beresfield
43	44	38	50	**C** Phoenix Rd, Black Hill
41	40	36	46	**D** Black Hill School
41	40	36	46	**E** Brown Rd, Black Hill
41	40	36	46	**F** Black Hill Rd, Black Hill
43	41	36	46	**G** Buchanan Rd, Buchanan
43	41	36	46	**H** Mt Vincent Rd, Louth Park
44	46	38	48	**I** Lord Howe Dr, Ashtonfield
49	47	40	50	**J** Kilarney St, Avalon Estate
41	40	37	46	**K** Catholic Diocese (Former Bartter) K1, K2, K3
46	46	40	53	**L** Kilshanny Ave, Ashtonfield

Notes:

- *To determine compliance with the LAeq(15 minute) limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECC 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 Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
- *To determine compliance with the LA1(1 minute) limit, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Noise Policy.*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

* Revised to list alphabetically

Noise Monitoring

24. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:

(a) be submitted to the Director-General for approval within 6 months of this approval;

(b) be prepared in consultation with the DECC; and

(c) use a combination of attended and unattended monitoring measures to monitor the performance of the project.

2.2.1 Statement of Commitments

3.3 Monitoring

Within 6 months of this approval being granted a Noise Monitoring Program shall be prepared and implemented for the Abel Underground Mine and the Bloomfield CHPP, to the satisfaction of the Director-General. The Noise Monitoring Program shall include a combination of real-time and supplementary attended monitoring measures, and a noise monitoring protocol for evaluating compliance with the noise environmental assessment. This plan will be integrated with the monitoring plans for the Tasman, Donaldson and Bloomfield Mines to provide a single integrated Noise Monitoring Program for all 4 mines.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring programme was conducted with reference to Development Consent N97/00147 (Donaldson Coal Mine), Project Approval 05_0136 (Abel Coal Mine), and in accordance with Heggies Report 30-1409-R2 dated 27 May 2008 (*Abel Mine Project Noise Monitoring Program)* and AS 1055-1997 "*Acoustics - Description and Measurement of Environmental Noise*".

3.2 Monitoring Locations

Baseline and preceding operational quarterly surveys have been conducted at 11 locations surrounding the Donaldson Mine and Abel Coal Mine sites. With the experience of these previous surveys, it was decided to concentrate noise monitoring at five (5) focus locations that represent the potentially most noise affected areas from Donaldson Mine and Abel Coal Mine. The details of the monitoring locations are contained within **Table 1**.

Table 1 Monitoring Locations

Noise Monitoring Location	Description
A	98 Weakleys Drive, Beresfield
F	Lot 684 Black Hill Road, Black Hill
G	156 Buchannan Road, Buchannan
L	17 Kilshanny Ave, Ashtonfield
K	Catholic Diocese of Maitland (formerly Bartter Enterprises)

A map giving the approximate location of the noise monitoring sites is contained within **Appendix A**.

3.3 Unattended Continuous Noise Monitoring

Environmental noise loggers were deployed for approximately a seven (7) day period between 17 June 2011 and 7 July 2011 at each of the five (5) nominated locations given in **Table 1**. All unattended monitoring equipment was programmed to continuously record statistical noise level indices in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A90}, L_{A99}, L_{Amin} and L_{Aeq}. The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the 15 minute interval. The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. The L_{A10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The L_{Aeq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period. The L_{Amax} is the maximum noise level recorded over the interval. Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

3.4 Operator Attended Monitoring

Operator attended surveys were conducted at each of the five (5) monitoring locations during daytime, evening and night-time periods, to verify the unattended logging results and to determine the character and contribution of ambient noise sources.

3.5 Equipment Operation

The mobile equipment operating on the Donaldson Mine site during the survey period are contained in **Appendix B**.

During the survey period the following operations were being undertaken:

- Overburden removal and mining was being undertaken in Strips 1, 2 and 3 in the Square Pit.
- Overburden was placed in the East Pit.
- The grader and water cart was working on the surface during the reporting period.

The only surface equipment operating on the Abel Coal Mine site during the survey periods was a ventilation fan.

4 OPERATOR ATTENDED NOISE MONITORING

4.1 Results of Operator Attended Monitoring

Operator attended noise measurements were conducted during the daytime on Friday 17 June 2011 and Friday 24 June 2011, during the evening on Wednesday 29 June 2011 and during the night-time on Wednesday 29 June 2011. All operator attended noise surveys were conducted using a Brüel & Kjær 2270 Type 1, 1/3 octave band, integrating sound level meter (s/n: 2679254) and a SVAN 957 Type 1, 1/1 octave band, integrating sound level meter (s/n: 20666).

The results of the operator attended noise measurements are given in **Table 2** to **Table 6**. Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, and mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location.
- Date & start time.
- Wind velocity (m/s) and Temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Mine contributions listed in the tables are from Donaldson Mine and Abel Coal Mine and are stated only when a contribution could be quantified.

Table 2 Location A Weakleys Drive, Beresfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
17/6/2011 10:05 W = 2-3 m/s SE - NE Temp = 18°C Cloud cover = 0/8	Daytime Ambient	70	60	57	51	54	Road Traffic (Weakleys Dr) ~ 54-60 Leaf rustle ~ 50-52 Bird/Geese ~ 54-59
		Donaldson mine ~ inaudible.					
29/6/2011 20:50 W = Calm Temp = 14°C Cloud cover = 6/8	Evening Ambient	77	73	67	51	63	Road Traffic ~ 64, 66, 67, 74 Birds/Insects ~ 45 Aircraft ~ 53
		Donaldson mine ~ Inaudible					
29/6/2011 23:45 W = Calm Temp = 12°C Cloud cover = 6/8	Night-time Ambient	77	74	63	47	61	Road Traffic (Weakleys Dr) ~ 50 – 77 Insects ~ 50
		Donaldson mine ~ Inaudible					

Table 3 Location F Lot 684 Black Hill Road, Black Hill

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
17/6/2011 10:32 W = 2-3 m/s SE - NE Temp = 18°C Cloud cover = 0/8	Daytime Ambient	81	69	57	49	57	Traffic (John Renshaw Dr) ~ up to 63 Traffic (Black Hill Rd) ~ up to 81. Insects ~ 48-52, Leaf rustle ~ 45-50. Donaldson mine ~ inaudible.
		Donaldson mine ~ Inaudible					
29/6/2011 20:50 W = Calm Temp = 14°C Cloud cover = 6/8	Evening Ambient	83	69	57	53	59	Traffic (John Renshaw Dr) ~ 69 Crickets/insects/frogs ~ 54 Distant Road Traffic ~ 53 Road Traffic (Black Hill Rd) ~ 83 Donaldson mine ~ inaudible.
		Donaldson mine ~ Inaudible					
29/6/2011 23:10 W = Calm Temp = 12°C Cloud cover = 6/8	Night-time Ambient	75	61	57	53	56	Traffic (John Renshaw Dr) ~ up to 57-66. Crickets/insects/frogs ~ 55-57. Operator noise ~ 75. Mine noise to north east ~ up to 50. Donaldson mine ~ haul trucks audible up to 56 Quaker ~ 53
		Estimated Donaldson LA10(15min) contribution ~ 50 dBA					

Table 4 Location G 156 Buchanan Road, Buchanan

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
24/6/2011 17:30 W = Calm Temp = 18°C Cloud cover = 0/8	Daytime Ambient	70	59	44	37	46	Distant Traffic (Buchannan Rd) ~ up to 46, Birds/insects ~ 36 Wind and leaf rustle ~ 38. Operator noise ~ 70.
		Donaldson mine ~ Inaudible					
29/6/2011 16:40 W = <1 NE Temp = 26°C Cloud cover = 1/8	Evening Ambient	65	54	50	42	47	Road Traffic (Buchannan Rd) ~ 46-48 Distant road traffic (John Renshaw Drive) ~ 48 Insects/crickets ~ up to 52 Operator noise ~ 65. Bloomfield Haul trucks ~ 44-48 Track slap ~ 45
		Donaldson mine ~ Inaudible					
29/6/2011 22:20 W = Calm Temp = 13°C Cloud cover = 6/8	Night-time Ambient	64	51	44	40	43	Frogs/Insects ~ 44 (dominant). Operator noise ~ 64. Distant road traffic ~ 42-51. Bloomfield engine noise ~ haul and excavator ~ 41-43.
		Donaldson mine ~ Inaudible					

Table 5 Location L 17 Kilshanny Ave, Ashtonfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
24/6/2011 17:08 Calm Temp = 18°C Cloud cover = 0/8	Daytime Ambient	72	58	43	35	46	Birds/insects ~ up to 44, Road traffic ~ 51, Car door ~ 54, Dog bark ~ 35-40.
		Donaldson mine ~ Inaudible					
29/6/2011 19:30 W = Calm Temp = 15°C Cloud cover = 5/8	Evening Ambient	74	57	46	42	49	Road traffic ~ 74 Insects ~ 42 Aircraft ~ 49 Rail ~ 42-44 Bloomfield trackslap occasionally just audible in lows
		Donaldson mine ~ Inaudible					
29/6/2011 22:00 W = Calm Temp = 13°C Cloud cover = 6/8	Night-time Ambient	63	55	45	41	45	Distant road traffic ~ 46, Road traffic ~ 63 Birds/insects ~ 44. Bloomfield ~ train ~ 43. ~ ROM just audible in lows
		Donaldson mine ~ Inaudible					

Table 6 Location K Catholic Diocese of Maitland (formerly Bartter Enterprises)

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
24/6/2011 16:15 W = Calm Temp = 18°C Cloud cover = 0/8	Daytime Ambient	76	65	59	50	56	Road Traffic ~ to 59 Birds/Insects ~ 47-57 Local construction works ~ 57-76
		Donaldson mine ~ Inaudible					
29/6/2011 21:26 21:05 W = Calm Temp = 14°C Cloud cover = 6/8	Evening Ambient	89	81	73	48	70	Road Traffic ~ to 89 Donaldson Mine haul trucks possibly just audible between road traffic in lows of < 45
		Estimated Donaldson LA10(15min) contribution ~ < 39 dBA					
29/6/11 23:25 W = Calm Temp = 12°C Cloud cover = 6/8	Night-time Ambient	89	80	69	43	68	Road Traffic ~ up to 89 Water pump ~ 42 Donaldson haul trucks 40-43
		Estimated Donaldson LA10(15min) contribution ~ 43 dBA					

4.2 Operator Attended Monitoring Summary

4.2.1 Donaldson Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations as well as "natural" noise such as birds, insects and leaf rustle.

Donaldson Mine operations were observed to be audible at Location K Catholic Diocese of Maitland (formerly Bartter Enterprises) during the evening and night-time and at Location F Black Hill Road during the night-time period.

Condition 23 of Schedule 2 of the Donaldson Mine consent is currently operable at the Catholic Diocese site with an agreement in place for the receiver to accept higher noise levels. However, SLR Consulting understand the dwellings on the Catholic Diocese site are currently unoccupied and therefore determining whether consent is achieved at this location is unnecessary. Attended noise surveys conducted with relevance to Location K have therefore been used to assess noise levels at nearest occupied residential receivers to the Catholic Diocese site in the Black Hill area.

To determine whether compliance is achieved, the mine contribution recorded at location K has been used to calculate the contribution to the nearest residential receivers in Black Hill. This calculated contribution was then compared to the Black Hill consent limit. Calculations found that the mine contribution at these residential locations was less than 33 dBA during the evening and approximately 37 dBA during the night-time which is in compliance with Donaldson Mine consent.

The estimated Donaldson contribution at Location F during the night-time was approximately L_{A10} 50 dBA. This is an exceedence of the consent noise limits, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the consent conditions.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

4.2.2 Abel Coal Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations.

Abel Project operations were inaudible at all residential locations during all operator attended noise surveys. As such, it is likely that contributed noise levels from Abel Project did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

5 UNATTENDED CONTINUOUS NOISE MONITORING

5.1 Results of Unattended Continuous Monitoring

Unattended continuous noise monitoring was conducted between 17 June 2011 and 7 July 2011 at each of the five (5) nominated locations given in **Table 1**. ARL Type EL-316 noise loggers were used to monitor the ambient noise levels at each location. Details of the noise loggers used for the unattended continuous noise monitoring are given in **Table 7**.

Table 7 Noise Loggers and Noise Monitoring Locations

Location	Noise Logger Serial Number	Date of Logging
A – Weakleys Drive, Beresfield	16-306-039	17/06/2011-24/06/2011
F – Black Hill Road, Black Hill	16-103-494	17/06/2011-24/06/2011
G – Buchanan Road, Buchanan	16-301-473	24/06/2011-07/07/2011
L – Kilshanny Ave, Kilshanny	16-203-531	24/06/2011-07/07/2011
K – Catholic Diocese of Maitland (formerly Bartter Enterprises)	16-103-494	24/06/2011-07/07/2011

Note: Unattended noise monitoring continued into July 2011 (ie Quarter 3) due to inclement weather conditions during the noise monitoring period.

The unattended ambient noise logger data from each monitoring location are presented graphically on a daily basis and are attached as **Appendices C1** to **C5**. A summary of the results of the unattended continuous noise monitoring is given in **Table 8**. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as designated in the NSW Industrial Noise Policy (INP). The day, evening and night periods replace the day and night periods defined under the Environmental Noise Control Manual (ENCM). However, as the Donaldson conditions of consent are under the ENCM, these periods have also been reported.

Precautions can be taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data for the subject area during the noise monitoring period was provided by Donaldson Coal. Noise data during periods of any rainfall and/or wind speeds in excess of 5 m/s (approximately 9 knots) were discarded in accordance with INP weather affected data exclusion methodology.

Table 8 Unattended Continuous Monitoring Ambient Noise Levels (dBA Re 20 µPa)

Location	Period	Primary Noise Descriptor (dBA re 20 µPa)			
		LA1	LA10	LA90	LAeq
A Weakleys Drive, Beresfield	Daytime	56	51	42	52
	Evening	54	49	40	48
	ENCM Daytime	55	50	40	49
	Night	53	47	32	46
F Lot 684 Black Hill Road, Black Hill	Daytime	68	58	46	58
	Evening	53	53	45	53
	ENCM Daytime	68	57	45	56
	Night	57	50	43	52
G 156 Buchannan Road, Buchannan	Daytime	50	43	32	45
	Evening	47	42	36	41
	ENCM Daytime	49	42	32	45
	Night	43	40	32	40
L 17 Kilshanny Ave, Ashtonfield	Daytime	56	47	35	51
	Evening	51	41	35	43
	ENCM Daytime	55	46	33	48
	Night	43	38	31	40
K Catholic Diocese of Maitland	Daytime	57	53	45	54
	Evening	55	51	40	49
	ENCM Daytime	56	52	43	52
	Night	54	49	36	49

Note: EPA periods used for the Industrial Noise Policy (INP) are defined as Daytime - 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday; Evening - 6.00 pm 10.00 pm; Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.
EPA Periods used for the Environmental Noise Control Manual (ENCM) Daytime 7.00 am to 10.00 pm, Night 10.00 pm to 7.00 am.

5.2 Long-term Unattended Continuous Monitoring Summary for Donaldson Mine and Abel Coal Mine

5.2.1 Ambient L_{A90} Noise Levels

The long term ambient L_{A90} noise levels collected from each monitoring location are presented graphically in **Figure 1**, **Figure 2** and **Figure 3** for the daytime, evening and night-time respectively.

Figure 1 Long-term Daytime L_{A90} Noise Levels

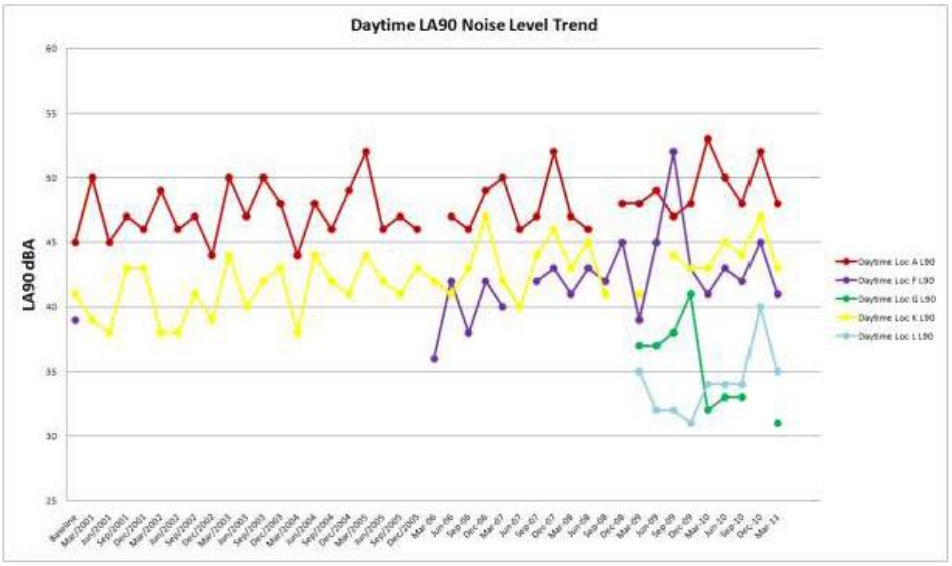


Figure 2 Long-term Evening L_{A90} Noise Levels

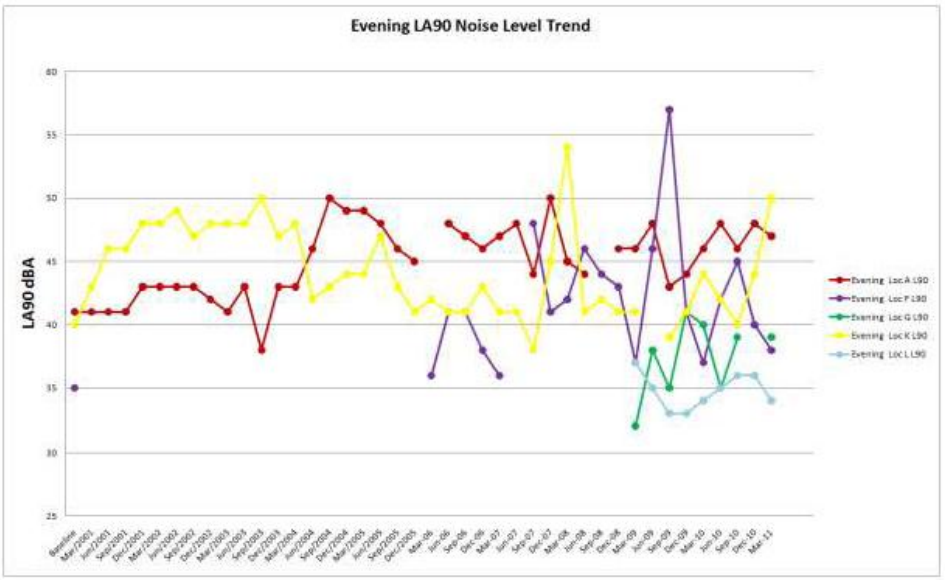
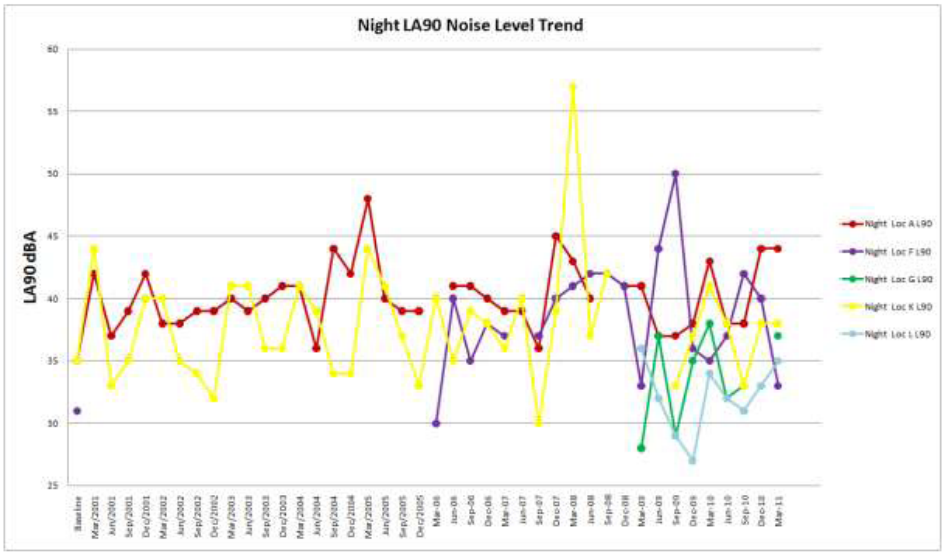


Figure 3 Long-term Night-time L_{A90} Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 1**, **Figure 2** and **Figure 3** show that ambient L_{A90} noise levels recorded for the quarter ending June 2011 were lower than levels recorded during the baseline monitoring process at Location A by 4 dBA during the daytime, 9 dBA during the evening and 8 dBA during the night-time. Increases of 7 dBA, 9 dBA and 11 dBA were recorded respectively in the daytime, evening and night-time at Location F. Noise levels at Location K showed an increase from baseline of 4 dBA in the daytime 1 dBA during the night-time.

Given that no data was available at Locations G and L during baseline measurements no comparisons can be made.

Previous Quarter (March 2011)

A comparison of the current monitoring period with the previous monitoring period shows that L_{A90} noise levels were generally similar (within 2 dBA) or lower than those recorded during the March 2011 by up to 13 dBA at Locations A, G, L and K. Increases of 5 dBA, 6 dBA and 10 dBA were recorded respectively in the daytime, evening and night-time periods at Location F.

Coinciding Period Last Year (June 2010)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that L_{A90} noise levels were generally similar (within 1 dBA) or lower than those recorded in 2010 at Locations A, G, K and L.

At Location F L_{A90} noise levels were higher than those recorded in 2010 by 3 dBA, 2 dBA and 5 dBA during the daytime, evening and night-time respectively.

5.2.2 Ambient L_{A10} Noise Level Comparison

The long term ambient L_{A90} noise levels collected from each monitoring location are presented graphically in **Figure 1**, **Figure 2** and **Figure 3** for the daytime, evening and night-time respectively.

Figure 4 Long-term Daytime L_{A10} Noise Levels

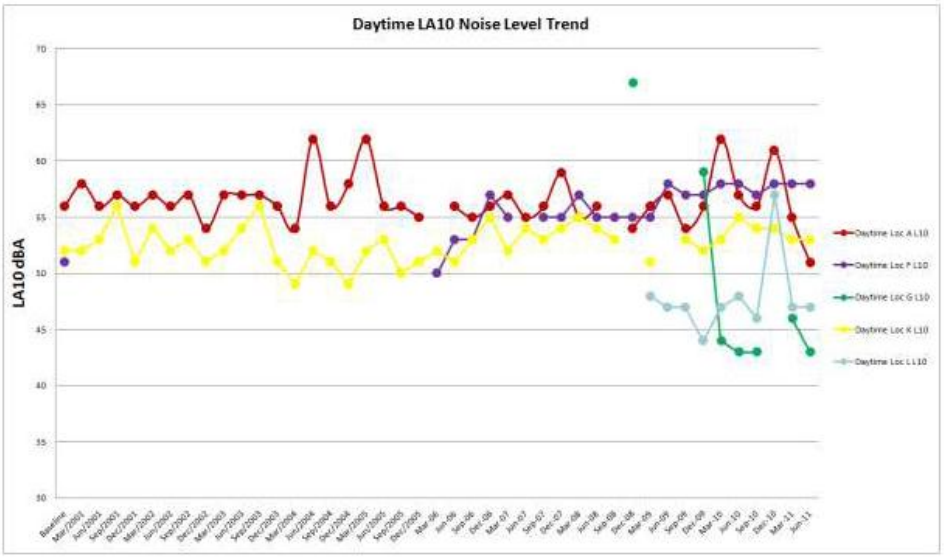


Figure 5 Long-term Evening L_{A10} Noise Levels

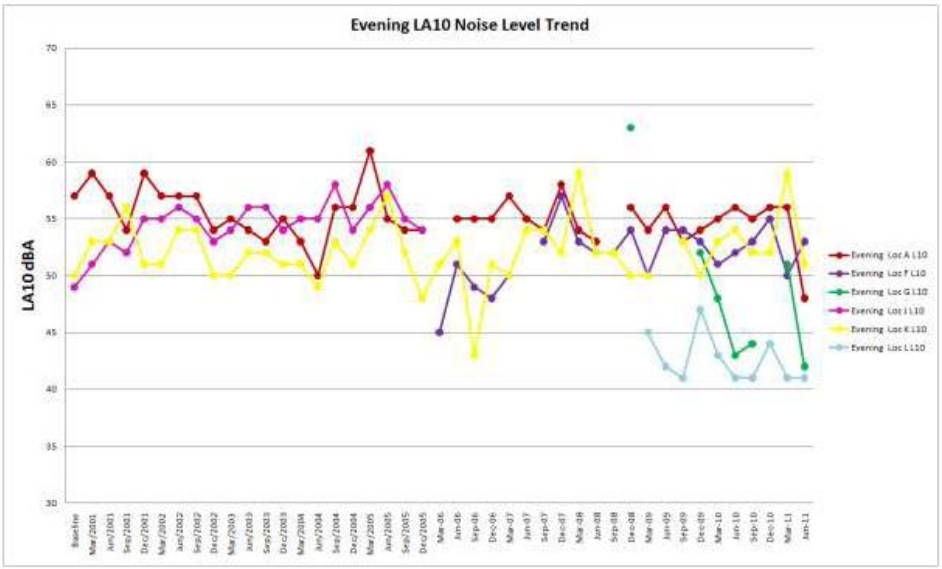
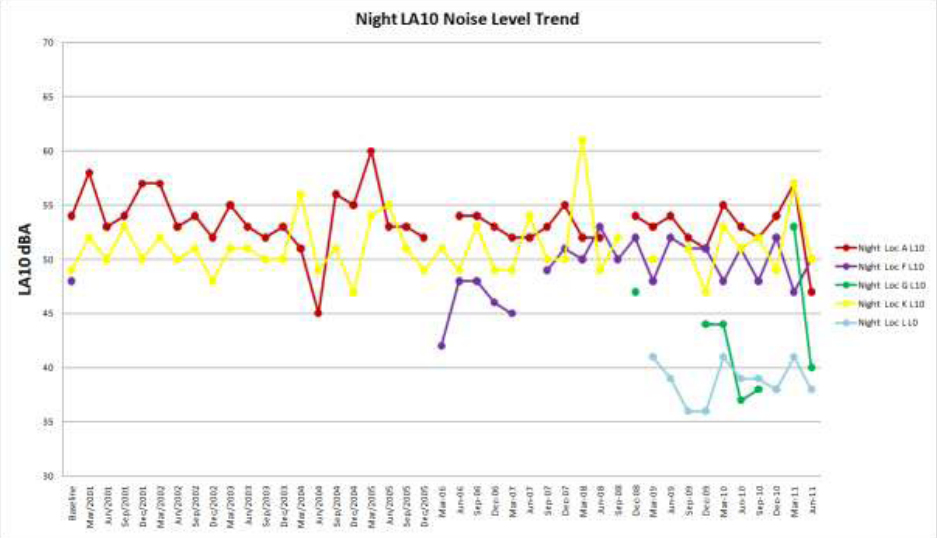


Figure 6 Long-term Night-time LA10 Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 4**, **Figure 5** and **Figure 6** show that ambient LA10 noise levels recorded for the quarter ending June 2011 were 7 dBA greater than levels recorded during the baseline monitoring process at Location F during the daytime, 4 dBA higher during the evening and 3 dBA higher during the night-time. At Location A LA10 noise levels were lower than those recorded during the baseline monitoring period during all periods. At Location K, noise levels were 4 dBA higher during the daytime and 1 dBA higher during the night-time.

Given that no data was available at Locations G and L during baseline measurements no comparison can be made.

Previous Quarter (March 2011)

A comparison of the current monitoring period with the previous monitoring period shows that recorded LA10 noise levels at Locations A, G, L and K were generally lower than levels recorded during the March 2011 quarterly monitoring. Noise levels at Location F were the 3 dBA higher than those recorded in the previous monitoring period during the evening and night-time.

Coinciding Period Last Year (June 2010)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that LA10 noise levels were similar (within 1 dBA) or lower than those recorded in June 2010 with the exception of a 3 dBA increase at Location G during the night-time.

5.3 Discussion

Based on the observations made during the operator attended noise surveys, where noise levels have been observed to increase at locations A, G and L, the ambient noise environment is dominated by road traffic, natural noises or other local mining operations and not Donaldson Mine.

Noise level increases measured at Location K Catholic Diocese of Maitland are likely to be influenced by mining operations at Donaldson, however Condition 23 of Schedule 2 of the Donaldson Mine consent is currently operable at the Catholic Diocese site with an agreement in place for the receiver to accept higher noise levels. Furthermore, SLR Consulting understand the dwellings on the Catholic Diocese site are currently unoccupied and therefore determining whether consent is achieved at this location is unnecessary. Calculated noise levels indicate that Donaldson Mine operations are in compliance with the relevant consent conditions when calculated to the nearest residences in Black Hill.

Noise level increases measured at Location F are also likely to be influenced by mining operations at Donaldson, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the Consent Conditions.

6 SUMMARY OF RESULTS AND FINDINGS

SLR Consulting were engaged by Donaldson Coal Pty Ltd to conduct quarterly noise monitoring surveys for Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Coal Mine Noise Monitoring Program, dated 27 May 2008.

The results of the operator-attended noise measurements conducted at five (5) focus locations surrounding the mine site are included in **Table 2** to **Table 6**.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

Abel Mine operations were inaudible at all residential locations during all periods and as such it is likely that contributed noise levels from Abel Mine did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

A comparison of ambient L_{A10} and L_{A90} noise levels recorded during the current monitoring period (June 2011), the baseline monitoring period, the last monitoring period (March 2011), and the coinciding monitoring period from last year (June 2010) has been conducted.

In summary, where noise levels have risen at Locations A, G and L, the ambient noise environment has been identified to generally contain traffic and natural noise sources or noise from other local mining operations and not noise from Donaldson Mine or Abel Mine activity.

Noise level increases at Location K are likely to be associated with mining operations at Donaldson, however, there is currently an agreement in place for the receiver to accept higher noise levels. Calculated noise levels to the nearest receivers in Black Hill indicate that noise levels from Donaldson Mine comply with noise emission goals for all periods.

Noise level increases at Location F are also likely to be associated with mining operations at Donaldson, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the Consent Conditions.

7 CLOSURE

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

Appendix A
Report Number 630.01053-R1
Page 1 of 1

Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending September 2011

Report Number 630.01053-R1

18 October 2011

2011 Donaldson Coal Pty Ltd
PO Box 675
Green Hills NSW 2320

Version: Draft 1

Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending September 2011

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630.01053-R1	Draft 1	18 October 2011	Nathan Archer	John Cotterill	

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

1 INTRODUCTION

Development consent was obtained by Donaldson Coal Pty Ltd for the Donaldson Mine in October 1999 following a Commission of Inquiry. Development Consent number N97/00147 was issued by the Minister for Urban Affairs pursuant to Section 101 of the Environmental Planning and Assessment Act 1979.

Project Approval (Application No. 05_0136) granted by the Minister of Planning was obtained by Donaldson Coal Pty Ltd for Abel Coal Mine in 2008.

Donaldson Coal Pty Ltd has commissioned SLR Consulting Pty Ltd (SLR Consulting) to conduct quarterly noise monitoring surveys for the Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Mine Project Noise Monitoring Program, dated 27 May 2008.

The objectives of the noise monitoring survey for this operating quarter were as follows:

- Measure the ambient noise levels at five (5) focus receptor locations (potentially worst affected) surrounding Donaldson Coal Mine and Abel Coal Mine.
- Qualify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of individual noise sources.
- Assess the noise emissions of Donaldson Coal Mine and Abel Coal Mine with respect to the limits contained in the Development Consent.

2 DEVELOPMENT CONSENT AND PROJECT APPROVAL

2.1 Donaldson Coal Mine Development Consent Conditions

The Development Consent nominates hours of operation and mine noise emission goals in the Sections entitled "*Operation of Development, Condition No. 3(1) and 3(2)*", and "*Noise and Vibrational Noise Limits: Condition No. 15*" as follows:

"*3.(1) Subject to (2) the approved hours of operation are as follows:*

Works	*Period*	*Hours*
Construction, including construction of any bunds	*Monday to Friday* *Saturday*	*7 am to 6 pm* *8 am to 1 pm*
Mining operations, including mining, haulage of waste to dumps and coal processing	*Monday to Friday* *Saturday, Sunday*	*24 hours per day* *7 am to 6 pm*
Road Transportation and stockpiling of coal	*7 days per week*	*24 hours per day*
Rail loading of coal	*7 days per week*	*7 am to 10 pm*
Maintenance of mobile and fixed plant	*7 days per week*	*24 hours per day*
Blasting, not involving closure of John Renshaw Drive	*Monday to Saturday*	*7 am to 5 pm*
Blasting, involving closure of John Renshaw Drive	*Monday to Saturday*	*10 am to 2 pm*

Notes: *Restrictions on Public Holidays are the same as Sundays*

(2) The Applicant shall submit a report to the Director-General's satisfaction demonstrating the noise limits in Condition 15 can be met while rail loading of coal is occurring during the period from 6 pm to 10 pm. If that report does not demonstrate that the noise limits can be met to the Director-General's satisfaction, then the hours of operation for rail loading of coal shall be restricted to 7 am to 6 pm."

15. Unless subject to a negotiated agreement in accordance with Condition 23, the Applicant shall ensure that the noise emission from construction or mining operations, when measured or computed at the boundary of any dwelling not owned by the applicant (or within 30 metres of the dwelling, if the boundary is more that 30 metres from the dwelling), shall not exceed the following noise limits:

Location	***LA10(15minute) Noise Limits (dBA)***	
	Daytime	***Night-time***
Beresfield area (residential)	*45*	*35*
Steggles Poultry Farm	*50*	*40*
Ebenezer Park Area	*46*	*41*
Black Hill Area	*40*	*38*
Buchanan and Louth Park Area	*38*	*36*
Ashtonfield Area	*41*	*35*
Thornton Area	*48*	*40*

Note: Daytime is 7 am to 10 pm Monday-Saturday, and 8 am to 10 pm Sundays and Public Holidays. Night-time is 10 pm to 7 am Monday-Saturday, and 10 pm to 8 am Sundays and Public Holidays.

The noise limits apply for prevailing meteorological conditions (winds up to 3 m/s), except under conditions of temperature inversions."

Other Conditions of Consent relevant to noise are as follows:

"18. The applicant shall survey and investigate noise reduction measures from plant and equipment and set targets for noise reduction in each Annual Environmental Management Report (AEMR), taking into consideration valid noise complaints received in the previous year. The Report shall also include remedial measures.

19. The Applicant shall revise the Noise Management Plan as necessary and provide an updated Plan five years after commencement of mining to the Director-General, the independent noise expert (Condition 48), EPA, Councils and the Community Consultative Committee."

2.2 Abel Coal Mine – Project Approval

The relevant conditions relating to noise from the Abel Coal Mine approval are reproduced below.

Schedule 4

NOISE

Note: These conditions should be read in conjunction with section 3 of the Statement of Commitments.

Noise Limits

23 The Proponent shall ensure that the noise generated by the Project does not exceed at any privately-owned residence the levels set out in the following table for the monitoring location nearest that residence.

Table 1: Noise limits dB(A)

Day	Evening	Night		Location and Locality*
LAeq(15 minutes)	LAeq(15 minutes)	LAeq(15 minutes)	LA1(1 minute)	
50	48	41	51	**A** Weakleys Dr, Beresfield
50	48	41	51	**B** Yarrum Rd, Beresfield
43	44	38	50	**C** Phoenix Rd, Black Hill
41	40	36	46	**D** Black Hill School
41	40	36	46	**E** Brown Rd, Black Hill
41	40	36	46	**F** Black Hill Rd, Black Hill
43	41	36	46	**G** Buchanan Rd, Buchanan
43	41	36	46	**H** Mt Vincent Rd, Louth Park
44	46	38	48	**I** Lord Howe Dr, Ashtonfield
49	47	40	50	**J** Kilarney St, Avalon Estate
41	40	37	46	**K** Catholic Diocese (Former Bartter) K1, K2, K3
46	46	40	53	**L** Kilshanny Ave, Ashtonfield

Notes:

- *To determine compliance with the LAeq(15 minute) limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECC 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 Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
- *To determine compliance with the LA1(1 minute) limit, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Noise Policy.*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

* Revised to list alphabetically

Noise Monitoring

24. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:

(a) be submitted to the Director-General for approval within 6 months of this approval;

(b) be prepared in consultation with the DECC; and

(c) use a combination of attended and unattended monitoring measures to monitor the performance of the project.

2.2.1 Statement of Commitments

3.3 Monitoring

Within 6 months of this approval being granted a Noise Monitoring Program shall be prepared and implemented for the Abel Underground Mine and the Bloomfield CHPP, to the satisfaction of the Director-General. The Noise Monitoring Program shall include a combination of real-time and supplementary attended monitoring measures, and a noise monitoring protocol for evaluating compliance with the noise environmental assessment. This plan will be integrated with the monitoring plans for the Tasman, Donaldson and Bloomfield Mines to provide a single integrated Noise Monitoring Program for all 4 mines.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring program was conducted with reference to Development Consent N97/00147 (Donaldson Coal Mine), Project Approval 05_0136 (Abel Coal Mine), and in accordance with Heggies Report 30-1409-R2 dated 27 May 2008 (*Abel Mine Project Noise Monitoring Program)* and AS 1055-1997 "*Acoustics - Description and Measurement of Environmental Noise*".

3.2 Monitoring Locations

Baseline and preceding operational quarterly surveys have been conducted at 11 locations surrounding the Donaldson Mine and Abel Coal Mine sites. With the experience of these previous surveys, it was decided to concentrate noise monitoring at five (5) focus locations that represent the potentially most noise affected areas from Donaldson Mine and Abel Coal Mine. The details of the monitoring locations are contained within **Table 1**.

Table 1 Monitoring Locations

Noise Monitoring Location	Description
A	98 Weakleys Drive, Beresfield
F	Lot 684 Black Hill Road, Black Hill
G	156 Buchannan Road, Buchannan
L	17 Kilshanny Ave, Ashtonfield
K	Catholic Diocese of Maitland (formerly Bartter Enterprises)

A map giving the approximate location of the noise monitoring sites is contained within **Appendix A**.

3.3 Unattended Continuous Noise Monitoring

Environmental noise loggers were deployed for approximately a seven (7) day period between 20 September 2011 and 4 October 2011 at each of the five (5) nominated locations given in **Table 1**. All unattended monitoring equipment was programmed to continuously record statistical noise level indices in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A90}, L_{A99}, L_{Amin} and L_{Aeq}. The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the 15 minute interval. The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. The L_{A10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The L_{Aeq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period. The L_{Amax} is the maximum noise level recorded over the interval. Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

3.4 Operator Attended Monitoring

Operator attended surveys were conducted at each of the five (5) monitoring locations during daytime, evening and night-time periods, to verify the unattended logging results and to determine the character and contribution of ambient noise sources.

3.5 Equipment Operation

The mobile equipment operating on the Donaldson Mine site during the survey period are contained in **Appendix B**.

During the survey period the following operations were being undertaken:

- Overburden removal and mining was being undertaken in Strips 1, 2 3 and 4 in the Square Pit.
- Overburden was placed in the East Pit and West Pit
- The grader and water cart was working on the surface during the reporting period.

The only surface equipment operating on the Abel Coal Mine site during the survey periods was a ventilation fan.

4 OPERATOR ATTENDED NOISE MONITORING

4.1 Results of Operator Attended Monitoring

Operator attended noise measurements were conducted during the daytime on Thursday 22 September 2011, during the evening on Wednesday 21 September 2011 and during the night-time on Wednesday 21 September 2011. All operator attended noise surveys were conducted using a Brüel & Kjær 2270 Type 1, 1/3 octave band, integrating sound level meter (s/n: 2679254) and a Brüel & Kjær 2231 Type 1, 1/1 octave band, integrating sound level meter (s/n: 1221076).

The results of the operator attended noise measurements are given in **Table 2** to **Table 6**. Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, and mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location.
- Date & start time.
- Wind velocity (m/s) and Temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Mine contributions listed in the tables are from Donaldson Mine and Abel Coal Mine and are stated only when a contribution could be quantified.

Table 2 Location A Weakleys Drive, Beresfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
22/9/2011 15:40 W = 1-2 m/s SE Temp = 26°C Cloud cover = 0/8	Daytime Ambient	74	66	60	51	57	Road Traffic (Weakleys Dr) ~ 50-55 Motorbikes next door ~ 64 Door slam ~ 74 Donaldson inaudible
		Donaldson mine ~ inaudible.					
21/9/2011 18:45 W = Calm Temp = 15°C Cloud cover = 0/8	Evening Ambient	76	71	66	54	63	Road Traffic ~ up to 76 Birds/Insects ~ 50 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/9/2011 22:00 W = Calm Temp = 11°C Cloud cover = 6/8	Night-time Ambient	73	70	64	50	61	Road Traffic (Weakleys Dr) ~ 50 – 73 Insects ~ 50 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 3 Location F Lot 684 Black Hill Road, Black Hill

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
22/9/2011 15:00 W = 1-2 m/s SE Temp = 26°C Cloud cover = 0/8	Daytime Ambient	87	79	64	47	65	Traffic (John Renshaw Dr) ~ up to 66 Traffic (Black Hill Rd) ~ up to 87. Insects ~ 47-50, Donaldson mine ~ inaudible.
		Donaldson mine ~ Inaudible					
21/9/2011 19:20 W = Calm Temp = 15°C Cloud cover = 0/8	Evening Ambient	83	74	58	48	61	Traffic (John Renshaw Dr) ~ 73 Crickets/insects/frogs ~ 48-51 Distant Road Traffic ~ 48-50 Road Traffic (Black Hill Rd) ~ 83 Donaldson Haul ~ 50-54
		Estimated Donaldson LA10(15min) contribution ~ 50 dBA					
21/9/2011 22:30 W = Calm Temp = 11°C Cloud cover = 6/8	Night-time Ambient	79	65	55	45	55	Traffic (John Renshaw Dr) ~ up to 57-66. Traffic (Black Hill Rd) ~ 79 Crickets/insects/frogs ~ 49. Donaldson haul ~ 45- 50.
		Estimated Donaldson LA10(15min) contribution ~ 45 dBA					

Table 4 Location G 156 Buchanan Road, Buchanan

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
22/9/2011 14:00 W = 1-2 m/s N Temp = 26°C Cloud cover = 0/8	Daytime Ambient	67	51	40	33	41	Distant Traffic (Buchannan Rd) ~ up to 38, Birds/insects ~ 41-46 Residential noise ~ 35. Operator noise ~ 67. Other mine noise just audible in lows ~ 30 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/9/2011 20:15 W = Calm Temp = 15°C Cloud cover = 0/8	Evening Ambient	60	47	42	35	40	Road Traffic (Buchannan Rd) ~ 46-48 Insects/crickets ~ up to 52 Aircraft ~ 47 Operator noise ~ 60 Other mine noise~ 36-38 Quackers~ 45 Donaldson Inaudible
		Donaldson mine ~ Inaudible					
21/9/2011 23:25 W = Calm Temp = 10°C Cloud cover = 0/8	Night-time Ambient	66	51	39	31	39	Frogs/Insects ~ 33-36 (dominant). Operator noise ~ 66. Distant road traffic ~ 34-39. Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 5 Location L 17 Kilshanny Ave, Ashtonfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
22/9/2011 13:30 1-3 m/s NW Temp = 26°C Cloud cover = 0/8	Daytime Ambient	77	67	48	37	53	Distant road traffic ~ up to 38, Road traffic ~ 77, Leaf rustle~ 41-46, Construction ~53. Donaldson ~ Inaudible
		Donaldson mine ~ Inaudible					
21/9/2011 21:05 W = Calm Temp = 11°C Cloud cover = 0/8	Evening Ambient	73	51	43	38	44	Road traffic ~ 73 Distant road traffic ~ 39-44 Insects ~ 39 Operator noise ~ 73 Donaldson inaudible
		Donaldson mine ~ Inaudible					
29/6/2011 23:55 W = Calm Temp = 10°C Cloud cover = 0/8	Night-time Ambient	58	47	40	34	38	Distant road traffic ~ 46, Birds/insects ~ 38. Other mine noise ~ occasional trackslap ~ 42-45 once to 49 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 6 Location K Catholic Diocese of Maitland (formerly Bartter Enterprises)

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
22/9/2011 15:20 W = 1-2 m/s SE Temp = 26°C Cloud cover = 0/8	Daytime Ambient	91	85	80	56	75	Road Traffic ~ to 91 Birds/Insects ~ 47-57 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/9/2011 19:05 W = Calm Temp = 15°C Cloud cover = 0/8	Evening Ambient	95	84	75	53	73	Road Traffic ~ to 85 Donaldson Mine haul trucks possibly just audible between road traffic in lows – not measurable
		Estimated Donaldson LA10(15min) contribution ~ < 43 dBA					
21/9/2011 22:15 W = Calm Temp = 11°C Cloud cover = 6/8	Night-time Ambient	87	82	75	52	71	Road Traffic ~ up to 87 Donaldson haul trucks and squeaky tracks 50-52
		Estimated Donaldson LA10(15min) contribution ~ 45 dBA					

4.2 Operator Attended Monitoring Summary

4.2.1 Donaldson Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations as well as "natural" noise such as birds, insects and leaf rustle.

Donaldson Mine operations were observed to be audible at Location K Catholic Diocese of Maitland (formerly Bartter Enterprises) and at Location F Black Hill Road during the evening and night-time period.

Condition 23 of Schedule 2 of the Donaldson Mine consent is currently operable at the Catholic Diocese site with an agreement in place for the receiver to accept higher noise levels. However, SLR Consulting understand the dwellings on the Catholic Diocese site are currently unoccupied and therefore determining whether consent is achieved at this location is unnecessary. Attended noise surveys conducted with relevance to Location K have therefore been used to assess noise levels at nearest occupied residential receivers to the Catholic Diocese site in the Black Hill area.

To determine whether compliance is achieved, the mine contribution recorded at location K has been used to calculate the contribution to the nearest residential receivers in Black Hill. This calculated contribution was then compared to the Black Hill consent limit. Calculations found that the mine contribution at these residential locations was less than 31 dBA during the evening and approximately 33 dBA during the night-time which is in compliance with Donaldson Mine consent.

The estimated Donaldson contribution at Location F during the evening and night-time was approximately L_{A10} 50 dBA and 45 dBA respectively. This is an exceedence of the consent noise limits, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the consent conditions.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

4.2.2 Abel Coal Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations.

Abel Project operations were inaudible at all residential locations during all operator attended noise surveys. As such, it is likely that contributed noise levels from Abel Project did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

5 UNATTENDED CONTINUOUS NOISE MONITORING

5.1 Results of Unattended Continuous Monitoring

Unattended continuous noise monitoring was conducted between 20 September 2011 and 4 October 2011 at each of the five (5) nominated locations given in **Table 1**. ARL Type EL-316 and ARL Type EL-215 noise loggers were used to monitor the ambient noise levels at each location. Details of the noise loggers used for the unattended continuous noise monitoring are given in **Table 7**.

Table 7 Noise Loggers and Noise Monitoring Locations

Location	Noise Logger Serial Number	Date of Logging[1]
A – Weakleys Drive, Beresfield	194581	22/09/2011-04/10/2011
F – Black Hill Road, Black Hill	194678	22/09/2011-04/10/2011
G – Buchanan Road, Buchanan	16-306-039	20/09/2011-28/09/2011
L – Kilshanny Ave, Kilshanny	16-103-494	20/09/2011-28/09/2011
K – Catholic Diocese of Maitland (formerly Bartter Enterprises)	N/A	Not conducted[2]

Note1: Unattended noise monitoring continued into October 2011 (ie Quarter 4) due to inclement weather conditions during the noise monitoring period.

Note 2: Unattended noise logging was not conducted at location K due to site access issues.

The unattended ambient noise logger data from each monitoring location are presented graphically on a daily basis and are attached as **Appendices C1** to **C5**. A summary of the results of the unattended continuous noise monitoring is given in **Table 8**. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as designated in the NSW Industrial Noise Policy (INP). The day, evening and night periods replace the day and night periods defined under the Environmental Noise Control Manual (ENCM). However, as the Donaldson conditions of consent are under the ENCM, these periods have also been reported.

Precautions can be taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data for the subject area during the noise monitoring period was provided by Donaldson Coal. Noise data during periods of any rainfall and/or wind speeds in excess of 5 m/s (approximately 9 knots) were discarded in accordance with INP weather affected data exclusion methodology.

Table 8 Unattended Continuous Monitoring Ambient Noise Levels (dBA Re 20 µPa)

Location	Period	Primary Noise Descriptor (dBA re 20 µPa)			
		LA1	LA10	LA90	LAeq
A Weakleys Drive, Beresfield	Daytime	59	56	48	56
	Evening	60	55	47	54
	ENCM Daytime	59	56	47	55
	Night	59	54	40	52
F Lot 684 Black Hill Road, Black Hill	Daytime	70	59	44	58
	Evening	63	52	45	54
	ENCM Daytime	69	58	44	57
	Night	58	50	40	53
G 156 Buchanan Road, Buchanan	Daytime	52	47	33	47
	Evening	50	46	39	48
	ENCM Daytime	51	46	32	47
	Night	42	37	29	42
L 17 Kilshanny Ave, Ashtonfield	Daytime	56	47	33	54
	Evening	52	42	35	48
	ENCM Daytime	56	47	32	50
	Night	44	41	33	44
K Catholic Diocese of Maitland	Daytime	-	-	-	-
	Evening	-	-	-	-
	ENCM Daytime	-	-	-	-
	Night	-	-	-	-

Note: Periods used for the Industrial Noise Policy (INP) are defined as Daytime - 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday; Evening - 6.00 pm 10.00 pm; Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.
EPA Periods used for the Environmental Noise Control Manual (ENCM) Daytime 7.00 am to 10.00 pm, Night 10.00 pm to 7.00 am.

5.2 Long-term Unattended Continuous Monitoring Summary for Donaldson Mine and Abel Coal Mine

5.2.1 Ambient L_{A90} Noise Levels

The long term ambient L_{A90} noise levels collected from each monitoring location are presented graphically in **Figure 1**, **Figure 2** and **Figure 3** for the daytime, evening and night-time respectively.

Figure 1 Long-term Daytime L_{A90} Noise Levels

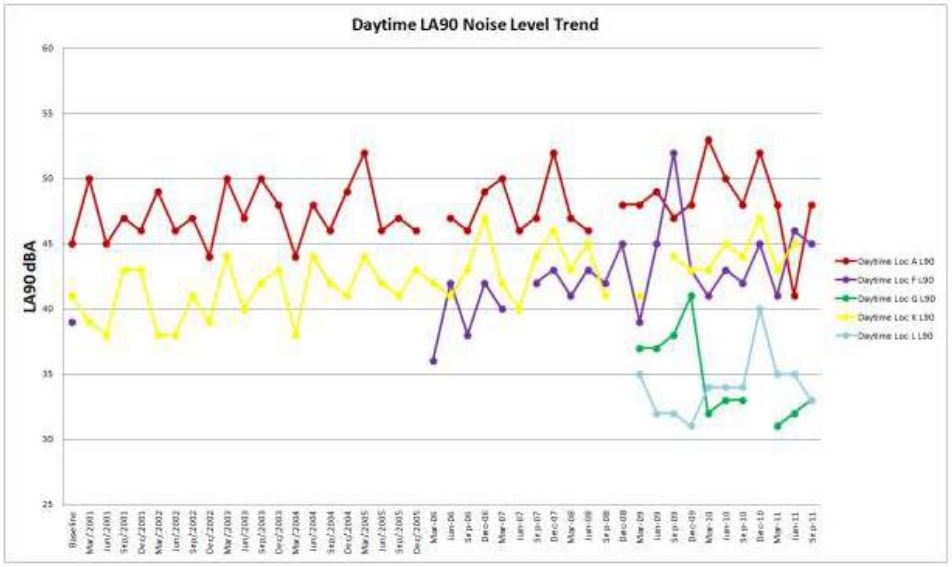


Figure 2 Long-term Evening L_{A90} Noise Levels

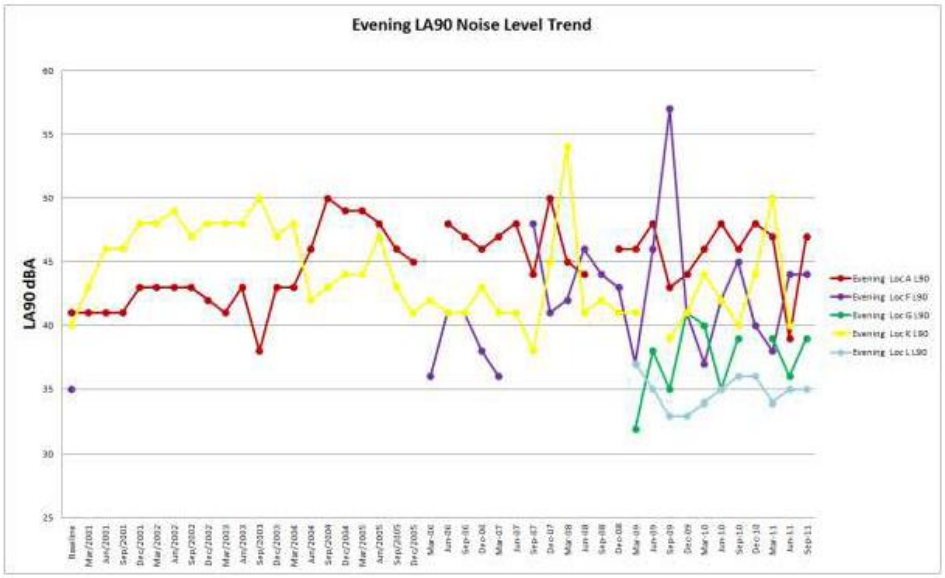
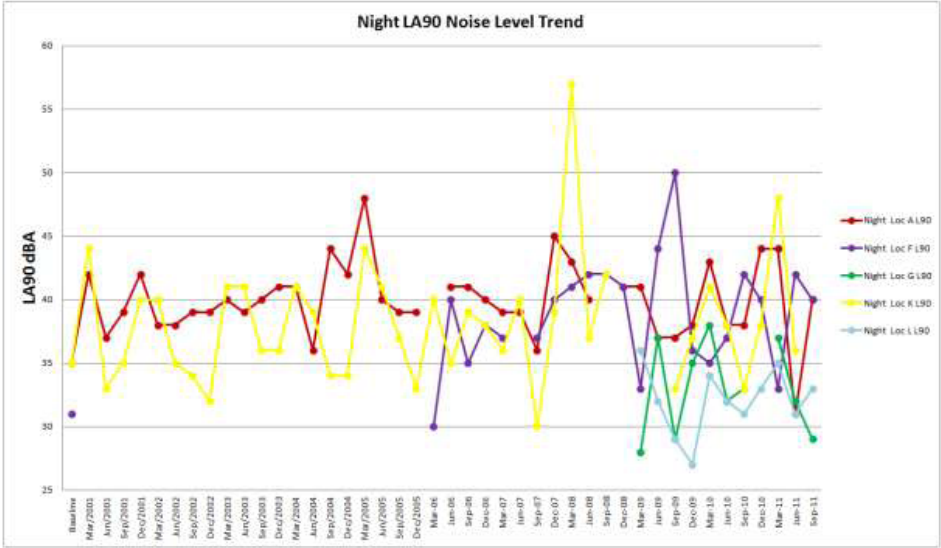


Figure 3 Long-term Night-time LA90 Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 1**, **Figure 2** and **Figure 3** show that ambient LA90 noise levels recorded for the quarter ending September 2011 were higher than levels recorded during the baseline monitoring process at Location A by 3 dBA during the daytime and 1 dBA during the night-time. Increases of 5 dBA, 10 dBA and 9 dBA were recorded respectively in the daytime, evening and night-time at Location F.

Given that no data was available at Locations G and L during baseline measurements and no monitoring was conducted at Location K during the September quarter no comparisons can be made.

Previous Quarter (June 2011)

A comparison of the current monitoring period with the previous monitoring period shows that LA90 noise levels were generally similar (within 2 dBA) or lower than those recorded during the June 2011 Locations F, G, and L. Increases of 7 dBA, 8 dBA and 9 dBA were recorded respectively in the daytime, evening and night-time periods at Location A and an increase of 3 dBA was recorded at location G in the evening.

Given that no monitoring was conducted at Location K during the September quarter no comparisons can be made.

Coinciding Period Last Year (September 2010)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that LA90 noise levels were generally similar (within 2 dBA) or lower than those recorded in 2010 at all locations.

Given that no monitoring was conducted at Location K during the September quarter no comparisons can be made.

5.2.2 Ambient LA10 Noise Level Comparison

The long term ambient LA10 noise levels collected from each monitoring location are presented graphically in **Figure 4**, **Figure 5**, and **Figure 6**, for the daytime, evening and night-time respectively.

Figure 4 Long-term Daytime LA10 Noise Levels

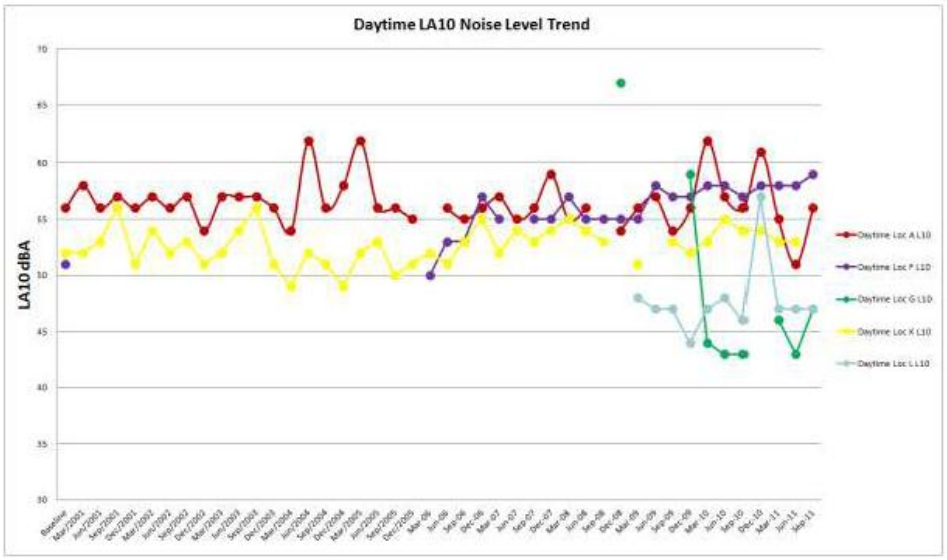


Figure 5 Long-term Evening LA10 Noise Levels

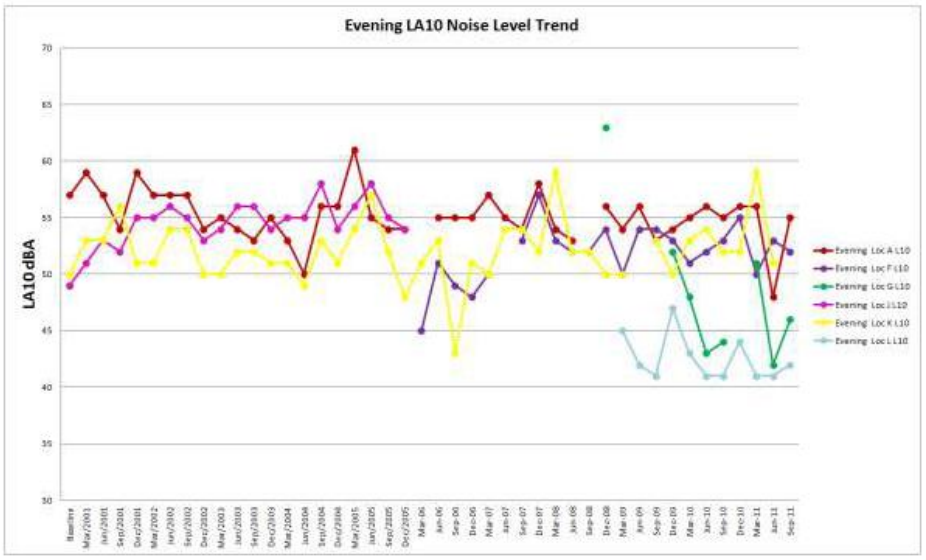
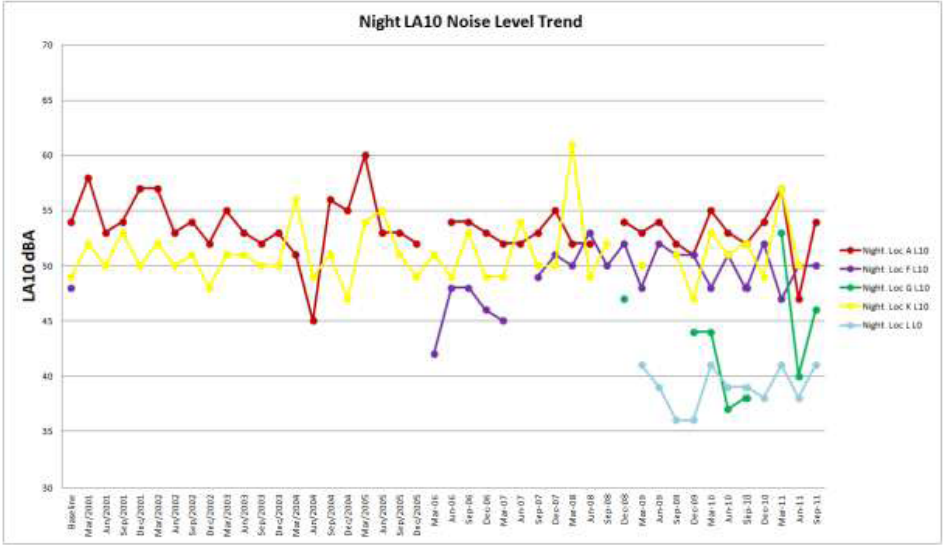


Figure 6 Long-term Night-time L_{A10} Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 4**, **Figure 5** and **Figure 6** show that ambient L_{A10} noise levels recorded for the quarter ending September 2011 were 8 dBA greater than levels recorded during the baseline monitoring process at Location F during the daytime, 3 dBA higher during the evening and 3 dBA higher during the night-time. At Location A L_{A10} noise levels were similar (within 2 dBA) to those recorded during the baseline monitoring period during all periods.

Given that no data was available at Locations G and L during baseline measurements and no monitoring was conducted at Location K during the September quarter no comparisons can be made.

Previous Quarter (June 2011)

A comparison of the current monitoring period with the previous monitoring period shows that recorded L_{A10} noise levels at Location A was 5 dBA higher during the daytime and 7 dBA higher during the evening and night-time.

Noise levels at location F were similar (within 1 dBA) to those recorded in June 2011. Noise levels at location G were 4 dBA higher during the daytime and evening and 3 dBA lower during the night-time. Noise levels at location L were up to 3 dBA higher than those recorded in the previous monitoring period.

Given that no monitoring was conducted at Location K during the September quarter no comparisons can be made.

Coinciding Period Last Year (September 2010)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that L_{A10} noise levels were similar (within 2 dBA) or lower than those recorded in September 2010 with the exception of a 4 dBA increase at Location G during the daytime.

Given that no monitoring was conducted at Location K during the September quarter no comparisons can be made.

5.3 Discussion

Based on the observations made during the operator attended noise surveys, where noise levels have been observed to increase at locations A, G and L, the ambient noise environment is dominated by road traffic, natural noises or other local mining operations and not Donaldson Mine.

Noise level increases measured at Location F are also likely to be influenced by mining operations at Donaldson, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the Consent Conditions.

6 SUMMARY OF RESULTS AND FINDINGS

SLR Consulting were engaged by Donaldson Coal Pty Ltd to conduct quarterly noise monitoring surveys for Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Coal Mine Noise Monitoring Program, dated 27 May 2008.

The results of the operator-attended noise measurements conducted at five (5) focus locations surrounding the mine site are included in **Table 2** to **Table 6**.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

Abel Mine operations were inaudible at all residential locations during all periods and as such it is likely that contributed noise levels from Abel Mine did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

A comparison of ambient L_{A10} and L_{A90} noise levels recorded during the current monitoring period (September 2011), the baseline monitoring period, the last monitoring period (June 2011), and the coinciding monitoring period from last year (Septmebr 2010) has been conducted.

In summary, where noise levels have risen at Locations A, G and L, the ambient noise environment has been identified to generally contain traffic and natural noise sources or noise from other local mining operations and not noise from Donaldson Mine or Abel Mine activity.

Noise level increases at Location F are also likely to be associated with mining operations at Donaldson, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the Consent Conditions.

7 CLOSURE

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of 2011 Donaldson Coal Pty Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

Appendix A
Report Number 630.01053-R1

Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending December 2011

Report Number 630.01053-R1

20 February 2012

2011 Donaldson Coal Pty Ltd
PO Box 675
Green Hills NSW 2320

Version: Draft 1

Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending December 2011

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Reference	Status	Date	Prepared	Checked	Authorised
630.01053-R1	Draft 1	20 February 2012	Nathan Archer	John Cotterill	

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

1 INTRODUCTION

Development consent was obtained by Donaldson Coal Pty Ltd for the Donaldson Mine in October 1999 following a Commission of Inquiry. Development Consent number N97/00147 was issued by the Minister for Urban Affairs pursuant to Section 101 of the Environmental Planning and Assessment Act 1979.

Project Approval (Application No. 05_0136) granted by the Minister of Planning was obtained by Donaldson Coal Pty Ltd for Abel Coal Mine in 2008.

Donaldson Coal Pty Ltd has commissioned SLR Consulting Pty Ltd (SLR Consulting) to conduct quarterly noise monitoring surveys for the Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Mine Project Noise Monitoring Program, dated 27 May 2008.

The objectives of the noise monitoring survey for this operating quarter were as follows:

- Measure the ambient noise levels at five (5) focus receptor locations (potentially worst affected) surrounding Donaldson Coal Mine and Abel Coal Mine.
- Qualify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of individual noise sources.
- Assess the noise emissions of Donaldson Coal Mine and Abel Coal Mine with respect to the limits contained in the Development Consent.

2 DEVELOPMENT CONSENT AND PROJECT APPROVAL

2.1 Donaldson Coal Mine Development Consent Conditions

The Development Consent nominates hours of operation and mine noise emission goals in the Sections entitled "*Operation of Development, Condition No. 3(1) and 3(2)*", and "*Noise and Vibrational Noise Limits: Condition No. 15*" as follows:

"*3.(1) Subject to (2) the approved hours of operation are as follows:*

Works	*Period*	*Hours*
Construction, including construction of any bunds	*Monday to Friday* *Saturday*	*7 am to 6 pm* *8 am to 1 pm*
Mining operations, including mining, haulage of waste to dumps and coal processing	*Monday to Friday* *Saturday, Sunday*	*24 hours per day* *7 am to 6 pm*
Road Transportation and stockpiling of coal	*7 days per week*	*24 hours per day*
Rail loading of coal	*7 days per week*	*7 am to 10 pm*
Maintenance of mobile and fixed plant	*7 days per week*	*24 hours per day*
Blasting, not involving closure of John Renshaw Drive	*Monday to Saturday*	*7 am to 5 pm*
Blasting, involving closure of John Renshaw Drive	*Monday to Saturday*	*10 am to 2 pm*

Notes: *Restrictions on Public Holidays are the same as Sundays*

(2) The Applicant shall submit a report to the Director-General's satisfaction demonstrating the noise limits in Condition 15 can be met while rail loading of coal is occurring during the period from 6 pm to 10 pm. If that report does not demonstrate that the noise limits can be met to the Director-General's satisfaction, then the hours of operation for rail loading of coal shall be restricted to 7 am to 6 pm."

15. Unless subject to a negotiated agreement in accordance with Condition 23, the Applicant shall ensure that the noise emission from construction or mining operations, when measured or computed at the boundary of any dwelling not owned by the applicant (or within 30 metres of the dwelling, if the boundary is more that 30 metres from the dwelling), shall not exceed the following noise limits:

Location	*LA10(15minute) Noise Limits (dBA)*	
	Daytime	*Night-time*
Beresfield area (residential)	*45*	*35*
Steggles Poultry Farm	*50*	*40*
Ebenezer Park Area	*46*	*41*
Black Hill Area	*40*	*38*
Buchanan and Louth Park Area	*38*	*36*
Ashtonfield Area	*41*	*35*
Thornton Area	*48*	*40*

Note: Daytime is 7 am to 10 pm Monday-Saturday, and 8 am to 10 pm Sundays and Public Holidays. Night-time is 10 pm to 7 am Monday-Saturday, and 10 pm to 8 am Sundays and Public Holidays.

The noise limits apply for prevailing meteorological conditions (winds up to 3 m/s), except under conditions of temperature inversions."

Other Conditions of Consent relevant to noise are as follows:

"18. The applicant shall survey and investigate noise reduction measures from plant and equipment and set targets for noise reduction in each Annual Environmental Management Report (AEMR), taking into consideration valid noise complaints received in the previous year. The Report shall also include remedial measures.

19. The Applicant shall revise the Noise Management Plan as necessary and provide an updated Plan five years after commencement of mining to the Director-General, the independent noise expert (Condition 48), EPA, Councils and the Community Consultative Committee."

2.2 Abel Coal Mine – Project Approval

The relevant conditions relating to noise from the Abel Coal Mine approval are reproduced below.

Schedule 4

NOISE

Note: These conditions should be read in conjunction with section 3 of the Statement of Commitments.

Noise Limits

23 *The Proponent shall ensure that the noise generated by the Project does not exceed at any privately-owned residence the levels set out in the following table for the monitoring location nearest that residence.*

Table 1: Noise limits dB(A)

Day	Evening	Night		Location and Locality*
LAeq(15 minutes)	LAeq(15 minutes)	LAeq(15 minutes)	LA1(1 minute)	
50	48	41	51	**A** Weakleys Dr, Beresfield
50	48	41	51	**B** Yarrum Rd, Beresfield
43	44	38	50	**C** Phoenix Rd, Black Hill
41	40	36	46	**D** Black Hill School
41	40	36	46	**E** Brown Rd, Black Hill
41	40	36	46	**F** Black Hill Rd, Black Hill
43	41	36	46	**G** Buchanan Rd, Buchanan
43	41	36	46	**H** Mt Vincent Rd, Louth Park
44	46	38	48	**I** Lord Howe Dr, Ashtonfield
49	47	40	50	**J** Kilarney St, Avalon Estate
41	40	37	46	**K** Catholic Diocese (Former Bartter) K1, K2, K3
46	46	40	53	**L** Kilshanny Ave, Ashtonfield

Notes:

- *To determine compliance with the LAeq(15 minute) limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECC 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 Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
- *To determine compliance with the LA1(1 minute) limit, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Noise Policy.*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

* Revised to list alphabetically

Noise Monitoring

24. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:

(a) be submitted to the Director-General for approval within 6 months of this approval;

(b) be prepared in consultation with the DECC; and

(c) use a combination of attended and unattended monitoring measures to monitor the performance of the project.

2.2.1 Statement of Commitments

3.3 Monitoring

Within 6 months of this approval being granted a Noise Monitoring Program shall be prepared and implemented for the Abel Underground Mine and the Bloomfield CHPP, to the satisfaction of the Director-General. The Noise Monitoring Program shall include a combination of real-time and supplementary attended monitoring measures, and a noise monitoring protocol for evaluating compliance with the noise environmental assessment. This plan will be integrated with the monitoring plans for the Tasman, Donaldson and Bloomfield Mines to provide a single integrated Noise Monitoring Program for all 4 mines.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring program was conducted with reference to Development Consent N97/00147 (Donaldson Coal Mine), Project Approval 05_0136 (Abel Coal Mine), and in accordance with Heggies Report 30-1409-R2 dated 27 May 2008 (*Abel Mine Project Noise Monitoring Program)* and AS 1055-1997 "*Acoustics - Description and Measurement of Environmental Noise*".

3.2 Monitoring Locations

Baseline and preceding operational quarterly surveys have been conducted at 11 locations surrounding the Donaldson Mine and Abel Coal Mine sites. With the experience of these previous surveys, it was decided to concentrate noise monitoring at five (5) focus locations that represent the potentially most noise affected areas from Donaldson Mine and Abel Coal Mine during the December 2011 Quarter. The details of the monitoring locations are contained within **Table 1**.

Table 1 Monitoring Locations

Noise Monitoring Location	Description
A	98 Weakleys Drive, Beresfield
F	Lot 684 Black Hill Road, Black Hill
G	156 Buchannan Road, Buchannan
L	17 Kilshanny Ave, Ashtonfield
D	Black Hill School, Black Hill

A map giving the approximate location of the noise monitoring sites is contained within **Appendix A**.

3.3 Unattended Continuous Noise Monitoring

Environmental noise loggers were deployed for approximately a seven (7) day period between 7 December 2011 and 22 December 2011 at each of the five (5) nominated locations given in **Table 1**. All unattended monitoring equipment was programmed to continuously record statistical noise level indices in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A90}, L_{A99}, L_{Amin} and L_{Aeq}. The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the 15 minute interval. The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. The L_{A10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The L_{Aeq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period. The L_{Amax} is the maximum noise level recorded over the interval. Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

3.4 Operator Attended Monitoring

Operator attended surveys were conducted at each of the five (5) monitoring locations during daytime, evening and night-time periods, to verify the unattended logging results and to determine the character and contribution of ambient noise sources.

3.5 Equipment Operation

The mobile equipment operating on the Donaldson Mine site during the survey period are contained in **Appendix B**.

During the survey period the following operations were being undertaken:

- Overburden removal and mining was being undertaken in Strips 1 - 7 in the Square Pit.
- Overburden was placed in the East Pit.
- The grader and water cart was working on the surface during the reporting period.

The only surface equipment operating on the Abel Coal Mine site during the survey periods was a ventilation fan.

4 OPERATOR ATTENDED NOISE MONITORING

4.1 Results of Operator Attended Monitoring

Operator attended noise measurements were conducted during the daytime on Monday 12 December 2011 and Thursday 15 December 2011, during the evening on Wednesday 21 December 2011 and during the night-time on Wednesday 21 December 2011. All operator attended noise surveys were conducted using a Brüel & Kjær 2231 Type 1, 1/1 octave band, integrating sound level meter (s/n: 1221076).

The results of the operator attended noise measurements are given in **Table 2** to **Table 6**. Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, and mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location.
- Date & start time.
- Wind velocity (m/s) and Temperature (ºC) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Mine contributions listed in the tables are from Donaldson Mine and Abel Coal Mine and are stated only when a contribution could be quantified.

Table 2 Location A Weakleys Drive, Beresfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
12/12/2011 14:05 W = Calm Temp = 22°C Cloud cover = 8/8	Daytime Ambient	72	63	57	50	55	Road Traffic (Weakleys Dr) ~ 50-55 Local industry ~ 55 Geese ~ 52 Door slam ~ 72 Donaldson inaudible
		Donaldson mine ~ inaudible.					
21/12/2011 21:10 W = Calm Temp = 20°C Cloud cover = 6/8	Evening Ambient	78	71	66	52	62	Road Traffic ~ up to 78 Birds/Insects ~ 50 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/12/2011 23:55 W = Calm Temp = 20°C Cloud cover = 6/8	Night-time Ambient	75	71	63	48	60	Road Traffic (Weakleys Dr) ~ 50 – 75 Insects ~ 48-53 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 3 Location F Lot 684 Black Hill Road, Black Hill

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
12/12/2011 15:10 W = 1-2 m/s SE Temp = 23°C Cloud cover = 6/8	Daytime Ambient	86	81	68	47	67	Traffic (John Renshaw Dr) ~ up to 66 Traffic (Black Hill Rd) ~ up to 86. Insects ~ 47 Donaldson mine ~ inaudible.
		Donaldson mine ~ Inaudible					
21/12/2011 20:30 W = Calm Temp = 20°C Cloud cover = 6/8	Evening Ambient	75	64	57	51	56	Traffic (John Renshaw Dr) ~ 75 Crickets/insects/frogs ~ 52 Donaldson track slap just audible in lulls – not measureable
		Estimated Donaldson LA10(15min) contribution ~ 41 dBA					
21/12/2011 23:10 W = Calm Temp = 20°C Cloud cover = 8/8	Night-time Ambient	70	62	56	50	54	Traffic (John Renshaw Dr) ~ up to 70. Crickets/insects/frogs ~ 48-50. Donaldson inaudible
		Donaldson mine ~ inaudible					

Table 4 Location G 156 Buchanan Road, Buchanan

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
12/12/2011 14:30 W = 1-2 m/s SE Temp = 22°C Cloud cover = 8/8	Daytime Ambient	59	52	45	38	43	Distant Traffic (Buchannan Rd) ~ up to 46, Birds/insects ~ 38-46 Operator noise ~ 59. Other mine noise occasionally just audible in lows ~ 39 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/12/2011 19:30 W = 1 m/s SE Temp = 22°C Cloud cover = 6/8	Evening Ambient	71	51	44	38	43	Road Traffic (Buchannan Rd) ~ 39-50 Insects/crickets ~ up to 42 Kookaburras ~ 50 Operator noise ~ 71 Other mine noise ~ 39 Donaldson Inaudible
		Donaldson mine ~ Inaudible					
21/12/2011 22:20 W = Calm Temp = 21°C Cloud cover = 8/8	Night-time Ambient	68	51	46	41	44	Frogs/Insects ~ 42-50 (dominant). Operator noise ~ 68. Distant road traffic ~ 43. Aircraft ~ 50-53 Other mine noise just discernible in lulls Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 5 Location L 17 Kilshanny Ave, Ashtonfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
15/12/2011 10:20 1-3 m/s E Temp = 23°C Cloud cover = 5/8	Daytime Ambient	74	61	48	41	49	Distant road traffic ~ 41, Road traffic ~ 74, Leaf rustle~ 51, Residential noise ~43. Donaldson ~ Inaudible
		Donaldson mine ~ Inaudible					
21/12/2011 19:00 W = 3 m/s SE Temp = 22°C Cloud cover = 4/8	Evening Ambient	60	51	48	44	46	Distant road traffic ~ 44 Leaf rustle ~ 45-52 Residential grinding ~ 46 Operator noise ~ 60 Other mining noise ~ 44 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/12/2011 22:00 W = Calm Temp = 20°C Cloud cover = 6/8	Night-time Ambient	74	60	52	39	51	Distant road traffic ~ 54, Residential xmas music ~ 40 Birds/insects ~ 53. Other mine noise occasionally just audible in lulls ~ 36 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 6 Location D Black Hill School, Black Hill

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
15/12/2011 11:45 W = Calm Temp = 23°C Cloud cover = 4/8	Daytime Ambient	85	68	59	49	59	Road Traffic ~ 80 Birds/Insects ~ 49 Construction at school ~ 60-85 Donaldson inaudible
		Donaldson mine ~ Inaudible					
21/12/2011 20:50 W = Calm Temp = 20°C Cloud cover = 6/8	Evening Ambient	73	66	58	45	56	Road Traffic ~ 73 Insects/frogs ~ 56-58 Distant road traffic just audible Donaldson inaudible
		Donaldson mine – inaudible					
21/12/2011 23:30 W = Calm Temp = 20°C Cloud cover = 6/8	Night-time Ambient	78	70	56	39	56	Road Traffic ~ 78 Distant road traffic ~ 43 Frogs/insects ~ 49-57 Donaldson inaudible
		Donaldson mine ~ inaudible					

4.2 Operator Attended Monitoring Summary

4.2.1 Donaldson Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations as well as "natural" noise such as birds, insects and leaf rustle.

Donaldson Mine operations were observed to be audible at Location F Black Hill Road during the evening period. Donaldson Mine operations were inaudible at all other locations.

The estimated Donaldson contribution at Location F during the evening was approximately L_{A10} 41 dBA respectively. This is a minor (1 dBA) exceedence of the consent noise limits, however, Location F is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the consent conditions.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

4.2.2 Abel Coal Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations.

Abel Project operations were inaudible at all residential locations during all operator attended noise surveys. As such, it is likely that contributed noise levels from Abel Project did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

5 UNATTENDED CONTINUOUS NOISE MONITORING

5.1 Results of Unattended Continuous Monitoring

Unattended continuous noise monitoring was conducted between 7 December 2011 and 22 December 2011 at each of the five (5) nominated locations given in **Table 1**. ARL Type EL-215 noise loggers were used to monitor the ambient noise levels at each location. Details of the noise loggers used for the unattended continuous noise monitoring are given in **Table 7**.

Table 7 Noise Loggers and Noise Monitoring Locations

Location	Noise Logger Serial Number	Date of Logging
A – Weakleys Drive, Beresfield	194574	13/12/2011-21/12/2011
F – Black Hill Road, Black Hill	194636	13/12/2011-22/12/2011
G – Buchanan Road, Buchanan	194643	13/12/2011-22/12/2011
L – Kilshanny Ave, Kilshanny	194410	07/12/2011-15/12/2011
D – Black Hill School, Black Hill	194410	15/12/2011-22/12/2011

The unattended ambient noise logger data from each monitoring location are presented graphically on a daily basis and are attached as **Appendices C1** to **C5**. A summary of the results of the unattended continuous noise monitoring is given in **Table 8**. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as designated in the NSW Industrial Noise Policy (INP). The day, evening and night periods replace the day and night periods defined under the Environmental Noise Control Manual (ENCM). However, as the Donaldson conditions of consent are under the ENCM, these periods have also been reported.

Precautions can be taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data for the subject area during the noise monitoring period was provided by Donaldson Coal. Noise data during periods of any rainfall and/or wind speeds in excess of 5 m/s (approximately 9 knots) were discarded in accordance with INP weather affected data exclusion methodology.

Table 8 Unattended Continuous Monitoring Ambient Noise Levels (dBA Re 20 µPa)

Location	Period	Primary Noise Descriptor (dBA re 20 µPa)			
		LA1	LA10	LA90	LAeq
A Weakleys Drive, Beresfield	Daytime	61	57	50	56
	Evening	61	56	48	58
	ENCM Daytime	61	57	49	57
	Night	59	54	44	52
F Lot 684 Black Hill Road, Black Hill	Daytime	71	59	44	58
	Evening	67	55	42	56
	ENCM Daytime	70	58	43	58
	Night	58	53	40	54
G 156 Buchanan Road, Buchanan	Daytime	54	48	37	47
	Evening	57	52	42	58
	ENCM Daytime	56	49	38	54
	Night	53	50	42	48
L 17 Kilshanny Ave, Ashtonfield	Daytime	64	59	51	69
	Evening	62	57	51	64
	ENCM Daytime	61	57	51	69
	Night	61	55	50	72
D Black Hill School, Black Hill	Daytime	-	-	-	-
	Evening	-	-	-	-
	ENCM Daytime	-	-	-	-
	Night	-	-	-	-

Note: Periods used for the Industrial Noise Policy (INP) are defined as Daytime - 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday; Evening - 6.00 pm 10.00 pm; Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.
EPA Periods used for the Environmental Noise Control Manual (ENCM) Daytime 7.00 am to 10.00 pm, Night 10.00 pm to 7.00 am.

Due to a logger error, no continuous monitoring results were recorded for location D.

5.2 Long-term Unattended Continuous Monitoring Summary for Donaldson Mine and Abel Coal Mine

5.2.1 Ambient L_{A90} Noise Levels

The long term ambient L_{A90} noise levels collected from each monitoring location are presented graphically in **Figure 1**, **Figure 2** and **Figure 3** for the daytime, evening and night-time respectively.

Figure 1 Long-term Daytime L_{A90} Noise Levels

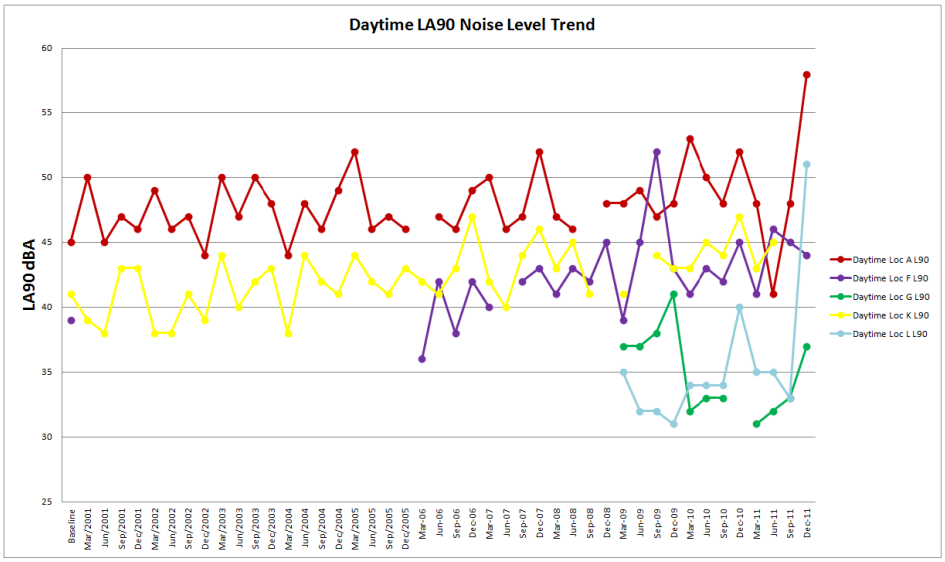


Figure 2 Long-term Evening L_{A90} Noise Levels

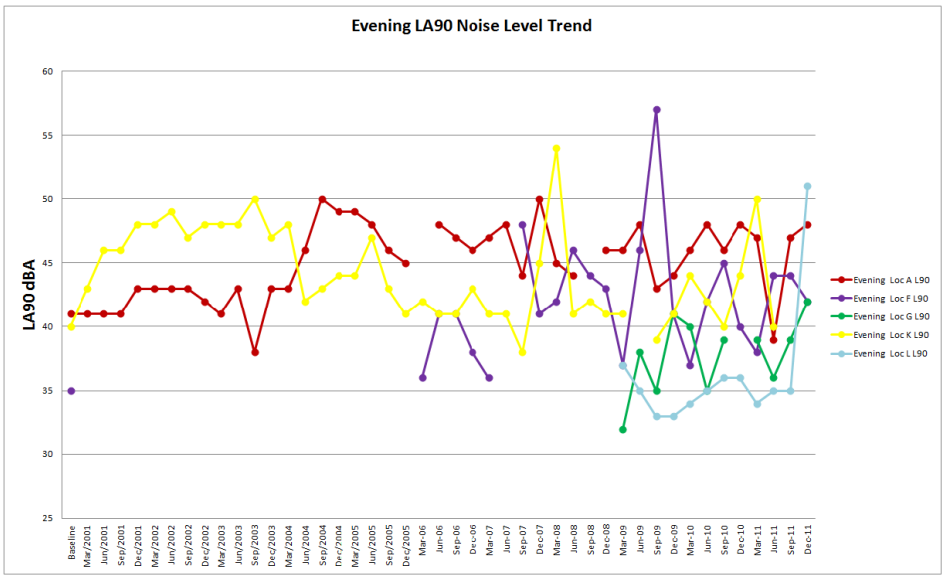
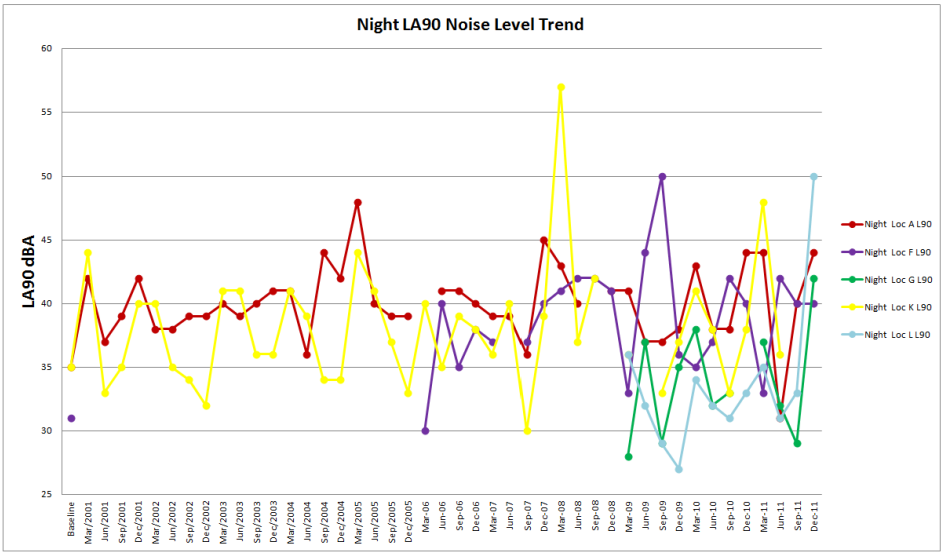


Figure 3 Long-term Night-time L_{A90} Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 1**, **Figure 2** and **Figure 3** show that ambient L_{A90} noise levels recorded for the quarter ending December 2011 were higher than levels recorded during the baseline monitoring process at Location A by 5 dBA during the daytime and night-time. Increases of 5 dBA, 7 dBA and 9 dBA were recorded respectively in the daytime, evening and night-time at Location F.

Given that no data was available at Locations G and L during baseline measurements and no monitoring was conducted at Location K during the September quarter no comparisons can be made.

Previous Quarter (September 2011)

A comparison of the current monitoring period with the previous monitoring period shows that L_{A90} noise levels were the same or lower than those recorded during the September 2011 at Location F. Increases of 2 dBA, 1 dBA and 4 dBA were recorded respectively in the daytime, evening and night-time periods at Location A and an increase of 4 dBA, 3 dBA and 13 dBA were recorded respectively in the daytime, evening and night-time periods at location G.

Significant increases in the L_{A90} noise levels were recorded at location L during the daytime, evening and night-time periods. It is considered that this is likely due to the impact of local insect and frog activity.

Coinciding Period Last Year (December 2010)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that L_{A90} noise levels were generally similar (within 2 dBA) or lower than those recorded in 2010 locations A and F.

Significant increases (up to 17 dBA) in the L_{A90} noise levels were recorded at location L during the daytime, evening and night-time periods. It is considered that this is likely due to the impact of local insect and frog activity.

5.2.2 Ambient L_{A10} Noise Level Comparison

The long term ambient L_{A10} noise levels collected from each monitoring location are presented graphically in **Figure 4**, **Figure 5**, and **Figure 6**, for the daytime, evening and night-time respectively.

Figure 4 Long-term Daytime L_{A10} Noise Levels

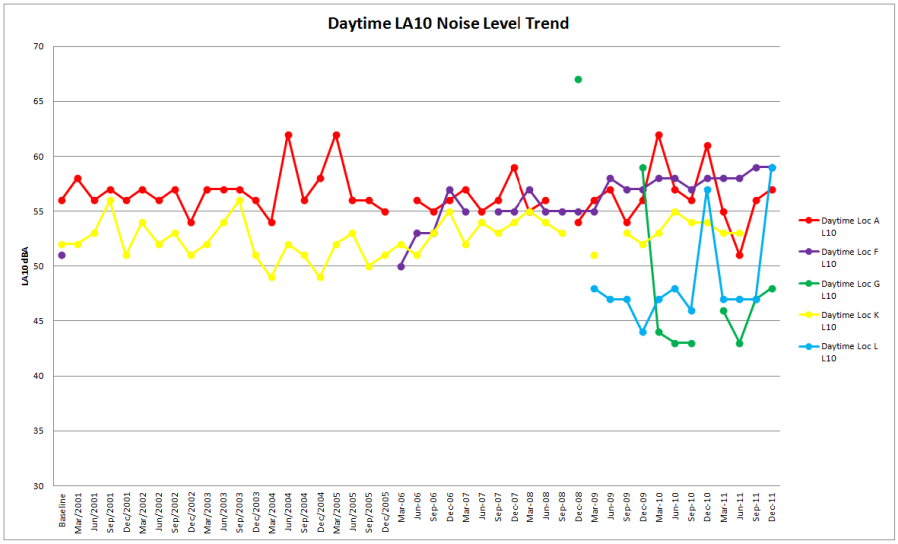


Figure 5 Long-term Evening L_{A10} Noise Levels

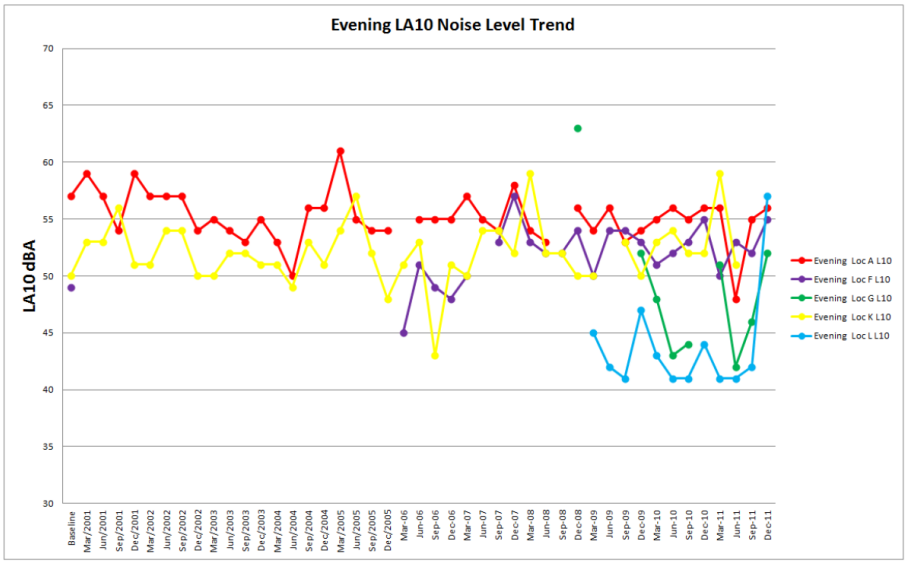
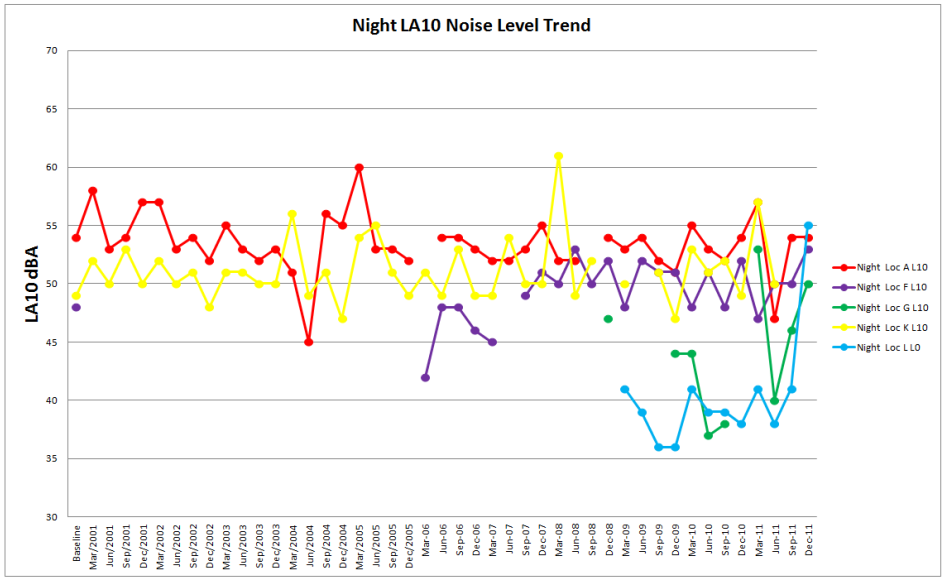


Figure 6 Long-term Night-time L_{A10} Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 4**, **Figure 5** and **Figure 6** show that ambient L_{A10} noise levels recorded for the quarter ending December 2011 were 8 dBA greater than levels recorded during the baseline monitoring process at Location F during the daytime and 6 dBA higher during the evening and night-time. At Location A L_{A10} noise levels were similar (within 1 dBA) to those recorded during the baseline monitoring period during all periods.

Given that no data was available at Locations G and L during baseline measurements and no monitoring was conducted at Location K during the December quarter no comparisons can be made.

Previous Quarter (September 2011)

A comparison of the current monitoring period with the previous monitoring period shows that recorded L_{A10} noise levels at Location A were similar (within 1 dBA) to those recorded in September 2011.

Noise levels at location F were 3 dBA higher than those recorded in June 2011 during the evening and night-time. Noise levels at location G were 1 dBA higher during the daytime, 6 dBA higher during the evening and 13 dBA higher during the night-time. Noise levels at location L were up to 15 dBA higher than those recorded in the previous monitoring period.

Coinciding Period Last Year (December 2010)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that L_{A10} noise levels were similar (within 1 dBA) or lower than those recorded in December 2010 at locations A and F.

Noise levels at location L are significantly higher (up to 17 dBA) than during the same period last year.

Given that no monitoring was conducted at Location G during December 2010 no comparisons can be made.

5.3 Discussion

Based on the observations made during the operator attended noise surveys, where noise levels have been observed to increase at locations A, F and G, the ambient noise environment is dominated by road traffic, natural noises or other local mining operations and not Donaldson Mine.

During the operator attended noise monitoring, no unusual noise sources were noted at location L to account for the significant increase in ambient noise levels. It is considered likely that noise level increase were likely to have been due to localised insect activity (ie cricket noise) near to the microphone.

6 SUMMARY OF RESULTS AND FINDINGS

SLR Consulting were engaged by Donaldson Coal Pty Ltd to conduct quarterly noise monitoring surveys for Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Coal Mine Noise Monitoring Program, dated 27 May 2008.

The results of the operator-attended noise measurements conducted at five (5) focus locations surrounding the mine site are included in **Table 2** to **Table 6**.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

Abel Mine operations were inaudible at all residential locations during all periods and as such it is likely that contributed noise levels from Abel Mine did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

A comparison of ambient L_{A10} and L_{A90} noise levels recorded during the current monitoring period (December 2011), the baseline monitoring period, the last monitoring period (September 2011), and the coinciding monitoring period from last year (December 2010) has been conducted.

In summary, where noise levels have risen at Locations A, , F and G, the ambient noise environment has been identified to generally contain traffic and natural noise sources or noise from other local mining operations and not noise from Donaldson Mine or Abel Mine activity.

During the operator attended noise monitoring, no unusual noise sources were noted at location L to account for the significant increase in ambient noise levels. It is considered likely that noise level increase were likely to have been due to localised insect activity (ie cricket noise) near to the microphone.

7 CLOSURE

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of 2011 Donaldson Coal Pty Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

Appendix A
Report Number 630.01053-R1

global environmental solutions

Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending March 2012

Report Number 630.01053

24 April 2012

Donaldson Coal Pty Ltd
PO Box 675
GreenHills NSW 2320

Version: Draft 1

Donaldson and Abel Coal Mines

Quarterly Noise Monitoring

Quarter Ending March 2012

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
630.01053	Draft 1	24 April 2012	Nicholas Vandenberg	Nathan Archer	

TABLE OF CONTENTS

TABLES

TABLE OF CONTENTS

FIGURES

1 INTRODUCTION

Development consent was obtained by Donaldson Coal Pty Ltd for the Donaldson Mine in October 1999 following a Commission of Inquiry. Development Consent number N97/00147 was issued by the Minister for Urban Affairs pursuant to Section 101 of the Environmental Planning and Assessment Act 1979.

Project Approval (Application No. 05_0136) granted by the Minister of Planning was obtained by Donaldson Coal Pty Ltd for Abel Coal Mine in 2008.

Donaldson Coal Pty Ltd has commissioned SLR Consulting Pty Ltd (SLR Consulting) to conduct quarterly noise monitoring surveys for the Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Mine Project Noise Monitoring Program, dated 27 May 2008.

The objectives of the noise monitoring survey for this operating quarter were as follows:

- Measure the ambient noise levels at five (5) focus receptor locations (potentially worst affected) surrounding Donaldson Coal Mine and Abel Coal Mine.
- Qualify all sources of noise within each of the attended surveys, including estimated contribution or maximum level of individual noise sources.
- Assess the noise emissions of Donaldson Coal Mine and Abel Coal Mine with respect to the limits contained in the Development Consent.

2 DEVELOPMENT CONSENT AND PROJECT APPROVAL

2.1 Donaldson Coal Mine Development Consent Conditions

The Development Consent nominates hours of operation and mine noise emission goals in the Sections entitled "*Operation of Development, Condition No. 3(1) and 3(2)*", and "*Noise and Vibrational Noise Limits: Condition No. 15*" as follows:

"*3.(1) Subject to (2) the approved hours of operation are as follows:*

Works	*Period*	*Hours*
Construction, including construction of any bunds	*Monday to Friday* *Saturday*	*7 am to 6 pm* *8 am to 1 pm*
Mining operations, including mining, haulage of waste to dumps and coal processing	*Monday to Friday* *Saturday, Sunday*	*24 hours per day* *7 am to 6 pm*
Road Transportation and stockpiling of coal	*7 days per week*	*24 hours per day*
Rail loading of coal	*7 days per week*	*7 am to 10 pm*
Maintenance of mobile and fixed plant	*7 days per week*	*24 hours per day*
Blasting, not involving closure of John Renshaw Drive	*Monday to Saturday*	*7 am to 5 pm*
Blasting, involving closure of John Renshaw Drive	*Monday to Saturday*	*10 am to 2 pm*

Notes: *Restrictions on Public Holidays are the same as Sundays*

(2) The Applicant shall submit a report to the Director-General's satisfaction demonstrating the noise limits in Condition 15 can be met while rail loading of coal is occurring during the period from 6 pm to 10 pm. If that report does not demonstrate that the noise limits can be met to the Director-General's satisfaction, then the hours of operation for rail loading of coal shall be restricted to 7 am to 6 pm."

15. Unless subject to a negotiated agreement in accordance with Condition 23, the Applicant shall ensure that the noise emission from construction or mining operations, when measured or computed at the boundary of any dwelling not owned by the applicant (or within 30 metres of the dwelling, if the boundary is more that 30 metres from the dwelling), shall not exceed the following noise limits:

Location	***LA10(15minute) Noise Limits (dBA)***	
	Daytime	***Night-time***
Beresfield area (residential)	*45*	*35*
Steggles Poultry Farm	*50*	*40*
Ebenezer Park Area	*46*	*41*
Black Hill Area	*40*	*38*
Buchanan and Louth Park Area	*38*	*36*
Ashtonfield Area	*41*	*35*
Thornton Area	*48*	*40*

Note: Daytime is 7 am to 10 pm Monday-Saturday, and 8 am to 10 pm Sundays and Public Holidays. Night-time is 10 pm to 7 am Monday-Saturday, and 10 pm to 8 am Sundays and Public Holidays.

The noise limits apply for prevailing meteorological conditions (winds up to 3 m/s), except under conditions of temperature inversions."

Other Conditions of Consent relevant to noise are as follows:

"18. The applicant shall survey and investigate noise reduction measures from plant and equipment and set targets for noise reduction in each Annual Environmental Management Report (AEMR), taking into consideration valid noise complaints received in the previous year. The Report shall also include remedial measures.

19. The Applicant shall revise the Noise Management Plan as necessary and provide an updated Plan five years after commencement of mining to the Director-General, the independent noise expert (Condition 48), EPA, Councils and the Community Consultative Committee."

2.2 Abel Coal Mine – Project Approval

The relevant conditions relating to noise from the Abel Coal Mine approval are reproduced below.

Schedule 4

NOISE

Note: These conditions should be read in conjunction with section 3 of the Statement of Commitments.

Noise Limits

23 The Proponent shall ensure that the noise generated by the Project does not exceed at any privately-owned residence the levels set out in the following table for the monitoring location nearest that residence.

Table 1: Noise limits dB(A)

Day	***Evening***	***Night***		***Location and Locality****
LAeq(15 minutes)	***LAeq(15 minutes)***	***LAeq(15 minutes)***	***LA1(1 minute)***	
50	*48*	*41*	*51*	***A** Weakleys Dr, Beresfield*
50	*48*	*41*	*51*	***B** Yarrum Rd, Beresfield*
43	*44*	*38*	*50*	***C** Phoenix Rd, Black Hill*
41	*40*	*36*	*46*	***D** Black Hill School*
41	*40*	*36*	*46*	***E** Brown Rd, Black Hill*
41	*40*	*36*	*46*	***F** Black Hill Rd, Black Hill*
43	*41*	*36*	*46*	***G** Buchanan Rd, Buchanan*
43	*41*	*36*	*46*	***H** Mt Vincent Rd, Louth Park*
44	*46*	*38*	*48*	***I** Lord Howe Dr, Ashtonfield*
49	*47*	*40*	*50*	***J** Kilarney St, Avalon Estate*
41	*40*	*37*	*46*	***K** Catholic Diocese (Former Bartter) K1, K2, K3*
46	*46*	*40*	*53*	***L** Kilshanny Ave, Ashtonfield*

Notes:

- *To determine compliance with the LAeq(15 minute) limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECC 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 Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
- *To determine compliance with the LA1(1 minute) limit, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Noise Policy.*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

* Revised to list alphabetically

Noise Monitoring

24. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:

(a) be submitted to the Director-General for approval within 6 months of this approval;

(b) be prepared in consultation with the DECC; and

(c) use a combination of attended and unattended monitoring measures to monitor the performance of the project.

2.2.1 Statement of Commitments

3.3 Monitoring

Within 6 months of this approval being granted a Noise Monitoring Program shall be prepared and implemented for the Abel Underground Mine and the Bloomfield CHPP, to the satisfaction of the Director-General. The Noise Monitoring Program shall include a combination of real-time and supplementary attended monitoring measures, and a noise monitoring protocol for evaluating compliance with the noise environmental assessment. This plan will be integrated with the monitoring plans for the Tasman, Donaldson and Bloomfield Mines to provide a single integrated Noise Monitoring Program for all 4 mines.

3 PROCEDURES AND METHODOLOGY

3.1 General Requirements

The operational noise monitoring program was conducted with reference to Development Consent N97/00147 (Donaldson Coal Mine), Project Approval 05_0136 (Abel Coal Mine), and in accordance with Heggies Report 30-1409-R2 dated 27 May 2008 (*Abel Mine Project Noise Monitoring Program)* and AS 1055-1997 "*Acoustics - Description and Measurement of Environmental Noise*".

3.2 Monitoring Locations

Baseline and preceding operational quarterly surveys have been conducted at 11 locations surrounding the Donaldson Mine and Abel Coal Mine sites. With the experience of these previous surveys, it was decided to concentrate noise monitoring at five (5) focus locations that represent the potentially most noise affected areas from Donaldson Mine and Abel Coal Mine during the March 2012 Quarter. The details of the monitoring locations are contained within **Table 1**.

Table 1 Monitoring Locations

Noise Monitoring Location	Description
A	98 Weakleys Drive, Beresfield
F	Lot 684 Black Hill Road, Black Hill
G	156 Buchannan Road, Buchannan
L	17 Kilshanny Ave, Ashtonfield
D	Black Hill School, Black Hill

A map giving the approximate location of the noise monitoring sites is contained within **Appendix A**.

3.3 Unattended Continuous Noise Monitoring

Environmental noise loggers were deployed for approximately a seven (7) day period between 14 March 2012 and 29 March 2012 at each of the five (5) nominated locations given in **Table 1**. All unattended monitoring equipment was programmed to continuously record statistical noise level indices in 15 minute intervals including the L_{Amax}, L_{A1}, L_{A10}, L_{A90}, L_{A99}, L_{Amin} and L_{Aeq}. The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the 15 minute interval. The L_{A90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. The L_{A10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The L_{Aeq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period. The L_{Amax} is the maximum noise level recorded over the interval. Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

3.4 Operator Attended Monitoring

Operator attended surveys were conducted at each of the five (5) monitoring locations during daytime, evening and night-time periods, to verify the unattended logging results and to determine the character and contribution of ambient noise sources.

3.5 Equipment Operation

The mobile equipment operating on the Donaldson Mine site during the survey period are contained in **Appendix B**.

During the survey period the following operations were being undertaken:

- Overburden removal and mining was being undertaken in Strips 1 - 7 in the Square Pit.
- Overburden was placed in the East Pit and West Pit.
- The grader and water cart was working on the surface during the reporting period.

The only surface equipment operating on the Abel Coal Mine site during the survey periods was a ventilation fan.

4 OPERATOR ATTENDED NOISE MONITORING

4.1 Results of Operator Attended Monitoring

Operator attended noise measurements were conducted during the daytime on Wednesday 14 March 2012, during the evening on Monday 26 March 2012 and during the night-time on Monday 26 March 2012. All operator attended noise surveys were conducted using a Brüel & Kjær 2231 Type 1, integrating sound level meter (s/n: 1221076).

The results of the operator attended noise measurements are given in **Table 2** to **Table 6**. Ambient noise levels given in the tables include all noise sources such as traffic, insects, birds, and mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location.
- Date & start time.
- Wind velocity (m/s) and Temperature (°C) at the measurement location.
- Typical maximum (L_{Amax}) and contributed noise levels.

Mine contributions listed in the tables are from Donaldson Mine and Abel Coal Mine and are stated only when a contribution could be quantified.

Table 2 Location A Weakleys Drive, Beresfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
14/03/2012 11:00 W = Calm Temp = 25°C Cloud cover = 4/8	Daytime Ambient	70	66	59	50	57	Road Traffic (Weakleys Dr) ~ 65-70 Local industry ~ 70 Insects ~ 52 Donaldson inaudible
		Donaldson mine ~ inaudible.					
26/03/2012 18:30 W = 1 m/s E Temp = 22°C Cloud cover = 3/8	Evening Ambient	78	74	68	53	65	Road Traffic ~ up to 78 Birds/Insects ~ 50-54 Distant Traffic ~ 49 Donaldson inaudible
		Donaldson mine ~ Inaudible					
27/03/2012 00:06 W = Calm Temp = 27°C Cloud cover = 2/8	Night-time Ambient	79	72	63	48	60	Road Traffic (Weakleys Dr) ~ 55 – 78 Distant Traffic ~ 42-54 Insects ~ 46-46 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 3 Location F Lot 684 Black Hill Road, Black Hill

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
14/03/2012 14:15 W = Calm Temp = 26°C Cloud cover = 7/8	Daytime Ambient	99	83	65	48	70	Traffic (John Renshaw Dr) ~ 55-99 Traffic (Black Hill Rd) ~ up to 74. Distant Road Traffic ~50 Insects/Birds ~ 50 Donaldson mine ~ inaudible.
		Donaldson mine ~ Inaudible					
26/03/2012 19:04 W = 0.5m/s E Temp = 21°C Cloud cover = 5/8	Evening Ambient	67	62	60	43	55	Traffic (John Renshaw Dr) ~ 45-63 Crickets/insects/frogs ~ 40-51 Leaves Rustling ~ 38-40 Dozer TS at the end <38~44
		Estimated Donaldson LAeq Contribution~ 40 dBA					
26/03/2012 23:42 W = Calm Temp = 17°C Cloud cover = 0/8	Night-time Ambient	67	58	52	47	50	Traffic (John Renshaw Dr) ~ up to 56. Crickets/insects/frogs ~ 45-52. Local Traffic ~ 65 Mines audible ~ <40-45
		Estimated Donaldson LAeq Contribution ~ 40 dBA					

Table 4 Location G 156 Buchanan Road, Buchanan

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
14/03/2012 13:05 W = Calm Temp = 26°C Cloud cover = 5/8	Daytime Ambient	79	62	50	41	52	Distant Traffic ~ 45 Residential Road Traffic – 77. insects ~ 47-51. Donaldson inaudible
		Donaldson mine ~ Inaudible					
26/03/2012 21:45 W = Calm Temp = 19°C Cloud cover = 0/8	Evening Ambient	59	58	56	46	51	Road Traffic ~ 52-56 Dist Traffic ~ 38-45 Insects/crickets ~ 43-55 Donaldson in audible Mine Noise ~ 33
		Donaldson mine ~ Inaudible					
26/03/2012 22:00 W = Calm Temp = 19°C Cloud cover = 0/8	Night-time Ambient	59	58	57	47	53	Frogs/Insects ~ 46-58 (dominant). Distant road traffic ~ 38-48. Aircraft ~ 50 Traffic ~ 48-58 Mine Noise - <30 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 5 Location L 17 Kilshanny Ave, Ashtonfield

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
14/03/2012 12:35 Wind: Calm Temp = 25°C Cloud cover = 4/8	Daytime Ambient	65	55	44	<30	43	Distant road traffic ~ 44, Insects~ 43-49, Donaldson ~ Inaudible
		Donaldson mine ~ Inaudible					
26/03/2012 20:15 W = Calm Temp = 19°C Cloud cover = 2/8	Evening Ambient	83	64	51	46	56	Distant road traffic ~ 43-53 Insects ~ 46-52 Local Disturbance ~ 53 Local Traffic ~ 74-82 Plane ~ 55 Donaldson inaudible
		Donaldson mine ~ Inaudible					
26/03/2012 22:37 W = Calm Temp = 17°C Cloud cover = 0/8	Night-time Ambient	77	59	50	45	52	Distant road traffic ~ 40-45, Birds/insects ~ 49-51. Local Traffic ~ 77 Jet ~ 52-60 Donaldson inaudible
		Donaldson mine ~ Inaudible					

Table 6 Location D Black Hill School, Black Hill

Date/Start Time/Weather	Measurement Description	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emission and Typical Maximum Levels LAmax – dBA
		LAmax	LA1	LA10	LA90	LAeq	
14/03/2012 11:30 W = Calm Temp = 23°C Cloud cover = 4/8	Daytime Ambient	73	69	53	41	55	Road Traffic ~ 73 Birds/Insects ~ 47-49 school Noise ~45 Donaldson inaudible
		Donaldson mine ~ Inaudible					
26/03/2012 19:05 W = Calm Temp = 23°C Cloud cover = 7/8	Evening Ambient	78	64	60	46	57	Road Traffic ~ 66-77 Insects/Birds ~ 48-60 Distant road traffic ~ 48-58 Donaldson inaudible
		Donaldson mine – inaudible					
26/03/2012 23:18 W = Calm Temp = 17°C Cloud cover = 0/8	Night-time Ambient	59	53	49	44	47	Distant road traffic ~ 49-59 Frogs/insects ~ 43-47 Animals ~ 44-52 Donaldson Audible~ <37
		Estimated Donadson LAeq Contribution ~ 37					

4.2 Operator Attended Monitoring Summary

4.2.1 Donaldson Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations as well as "natural" noise such as birds, insects and leaf rustle.

Donaldson Mine operations were observed to be audible at Location F Black Hill Road during the evening period and at Location F Black Hill Road and Location D Black Hill School during the night time period. Donaldson Mine operations were inaudible at all other locations.

The estimated Donaldson contribution at Location F during the evening was approximately L_{Aeq} 40 dBA. This is within the consent noise limits.

The estimated Donaldson contribution at Location F and Loaction D during the night was approximately L_{Aeq} 40 dBA and 37dBA respectively. This is within the consent conductions with the exception of Location F which is now a mine owned property and therefore the noise limits do not apply in accordance with Condition 15 of the consent conditions.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

4.2.2 Abel Coal Mine

Noise generated by local and distant traffic was a significant contributor to noise levels at all monitored locations.

Abel Project operations were inaudible at all residential locations during all operator attended noise surveys. As such, it is likely that contributed noise levels from Abel Project did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

5 UNATTENDED CONTINUOUS NOISE MONITORING

5.1 Results of Unattended Continuous Monitoring

Unattended continuous noise monitoring was conducted between 14 March 2012 and 29 March 2012 at each of the five (5) nominated locations given in **Table 1**. ARL Type EL-316, ARL Type EL-215 and SVAN 957 Environmental noise loggers were used to monitor the ambient noise levels at each location. Details of the noise loggers used for the unattended continuous noise monitoring are given in **Table 7**.

Table 7 Noise Loggers and Noise Monitoring Locations

Location	Noise Logger Serial Number	Date of Logging
A – Weakleys Drive, Beresfield	16-203-531	14/03/2012-22/03/2012
F – Black Hill Road, Black Hill	20666	16/03/2012-22/03/2012
G – Buchanan Road, Buchanan	16-306-039	14/03/2012-22/03/2012
L – Kilshanny Ave, Kilshanny	16-306-039	22/03/2012-29/03/2012
D – Black Hill School, Black Hill	16-203-531	15/03/2012-22/03/2012

The unattended ambient noise logger data from each monitoring location are presented graphically on a daily basis and are attached as **Appendices C1** to **C5**. A summary of the results of the unattended continuous noise monitoring is given in **Table 8**. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character.

The measured ambient noise levels were divided into three periods representing day, evening and night as designated in the NSW Industrial Noise Policy (INP). The day, evening and night periods replace the day and night periods defined under the Environmental Noise Control Manual (ENCM). However, as the Donaldson conditions of consent are under the ENCM, these periods have also been reported.

Precautions can be taken to minimise influences from extraneous noise sources (eg optimum placement of the loggers away from creeks, trees, houses, etc), however, not all these sources or their effects can be eliminated. This is particularly the case during the warmer times of year when noise from insects, frogs, birds and other animals can become quite prevalent.

Weather data for the subject area during the noise monitoring period was provided by Donaldson Coal. Noise data during periods of any rainfall and/or wind speeds in excess of 5 m/s (approximately 9 knots) were discarded in accordance with INP weather affected data exclusion methodology.

Table 8 Unattended Continuous Monitoring Ambient Noise Levels (dBA Re 20 µPa)

Location	Period	Primary Noise Descriptor (dBA re 20 µPa)			
		LA1	LA10	LA90	LAeq
A Weakleys Drive, Beresfield	Daytime	59	56	48	54
	Evening	58	54	46	60
	ENCM Daytime	59	55	46	57
	Night	58	54	43	53
F Lot 684 Black Hill Road, Black Hill	Daytime	70	58	41	58
	Evening	65	52	40	57
	ENCM Daytime	70	58	42	58
	Night	58	49	36	53
G 156 Buchanan Road, Buchanan	Daytime	54	49	39	49
	Evening	57	55	46	56
	ENCM Daytime	56	52	40	53
	Night	54	53	46	54
L 17 Kilshanny Ave, Ashtonfield	Daytime	57	46	32	53
	Evening	55	45	36	51
	ENCM Daytime	56	45	33	50
	Night	45	42	36	42
D Black Hill School, Black Hill	Daytime	60	54	40	56
	Evening	55	52	45	67
	ENCM Daytime	58	53	40	62
	Night	53	50	44	51

Note: Periods used for the Industrial Noise Policy (INP) are defined as Daytime - 7.00 am to 6.00 pm Monday to Saturday, 8.00 am to 6.00 pm Sunday; Evening - 6.00 pm 10.00 pm; Night - 10.00 pm to 7.00 am pm Monday to Saturday, 10.00 pm to 8.00 am Sunday.
EPA Periods used for the Environmental Noise Control Manual (ENCM) Daytime 7.00 am to 10.00 pm, Night 10.00 pm to 7.00 am.

5.2 Long-term Unattended Continuous Monitoring Summary for Donaldson Mine and Abel Coal Mine

5.2.1 Ambient L_{A90} Noise Levels

The long term ambient L_{A90} noise levels collected from each monitoring location are presented graphically in **Figure 1**, **Figure 2** and **Figure 3** for the daytime, evening and night-time respectively.

Figure 1 Long-term Daytime L_{A90} Noise Levels

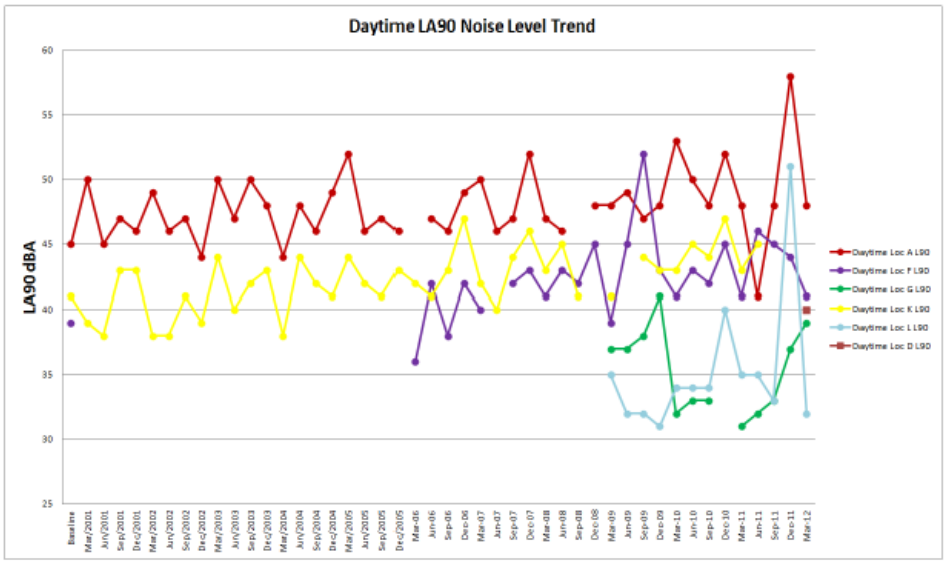


Figure 2 Long-term Evening L_{A90} Noise Levels

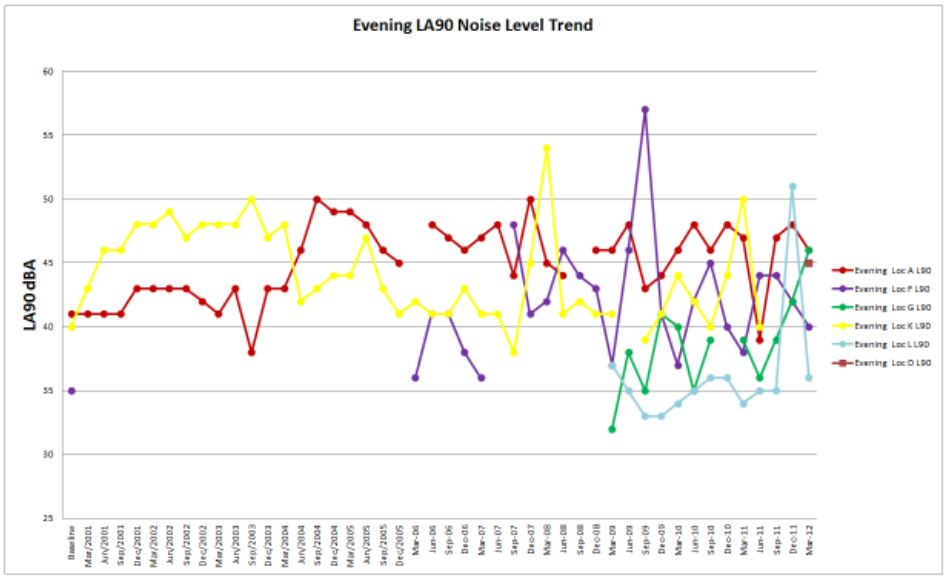
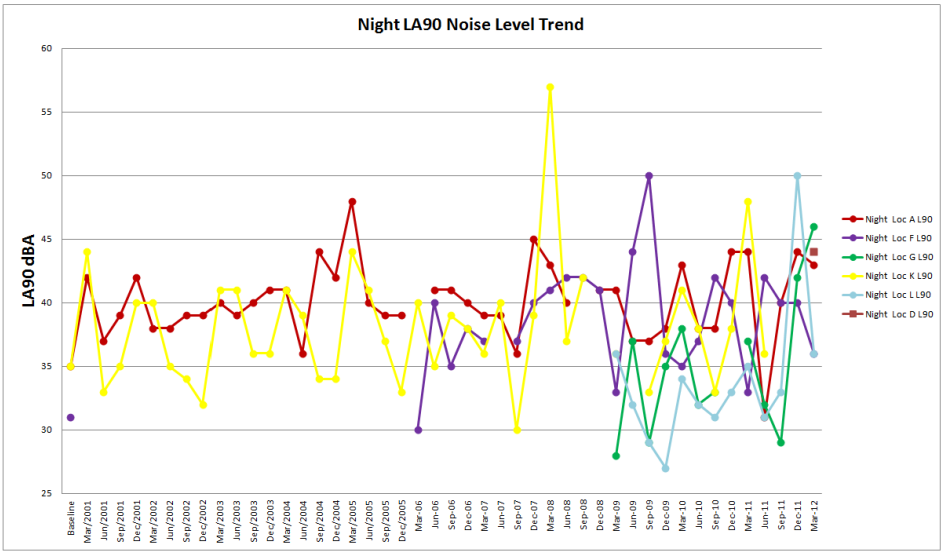


Figure 3 Long-term Night-time L_{A90} Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 1**, **Figure 2** and **Figure 3** show that ambient L_{A90} noise levels recorded for the quarter ending March 2012 were higher than levels recorded during the baseline monitoring process at Location A by 3 dBA, 5 dBA and 8 dBA were recorded respectively during the daytime, evening and night-time. Increases of 2 dBA were recorded in the daytime, and increases of 5 dBA were recorded in the evening and night-time at Location F.

Given that no data was available at Locations D, G and L during baseline measurements and no monitoring was conducted at Location K during the March 2012 quarter no comparisons can be made.

Previous Quarter (December 2011)

A comparison of the current monitoring period with the previous monitoring period shows that L_{A90} noise levels were the same or lower than those recorded during December 2011 at Location A, F and L. Increases of 2 dBA, 8 dBA and 4 dBA were recorded respectively in the daytime, evening and night-time periods at Location G.

Due to a logger error, no data was recorded for the December 2011 period at Location D.

Coinciding Period Last Year (March 2011)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that L_{A90} noise levels were generally similar (within 3 dBA) or lower than those recorded in 2011 locations A, F, L and D.

Significant increases (up to 8 dBA) in the L_{A90} noise levels were recorded at location G during the daytime, evening and night-time periods. It is considered that this is likely due to the impact of local insect and frog activity.

5.2.2 Ambient L_{A10} Noise Level Comparison

The long term ambient L_{A10} noise levels collected from each monitoring location are presented graphically in **Figure 4**, **Figure 5**, and **Figure 6**, for the daytime, evening and night-time respectively.

Figure 4 Long-term Daytime L_{A10} Noise Levels

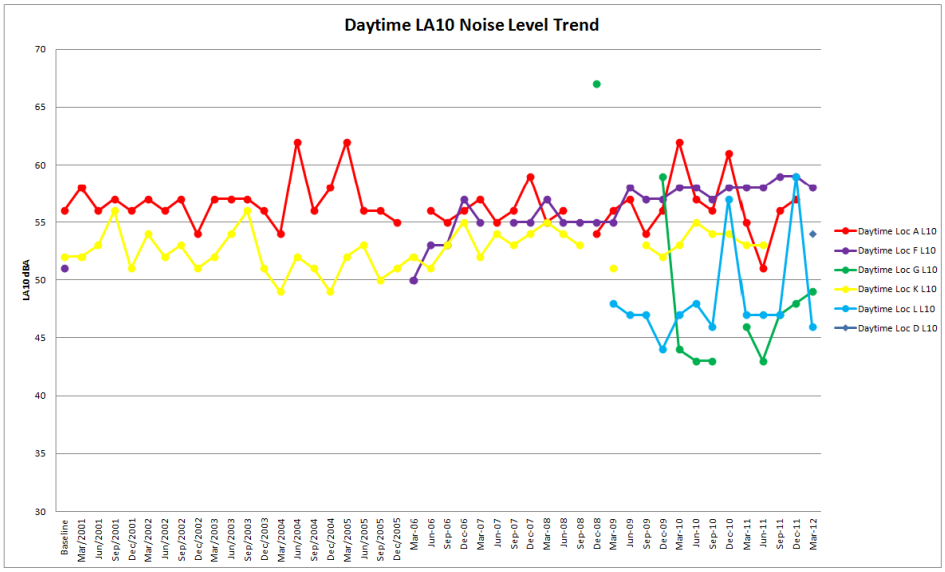


Figure 5 Long-term Evening L_{A10} Noise Levels

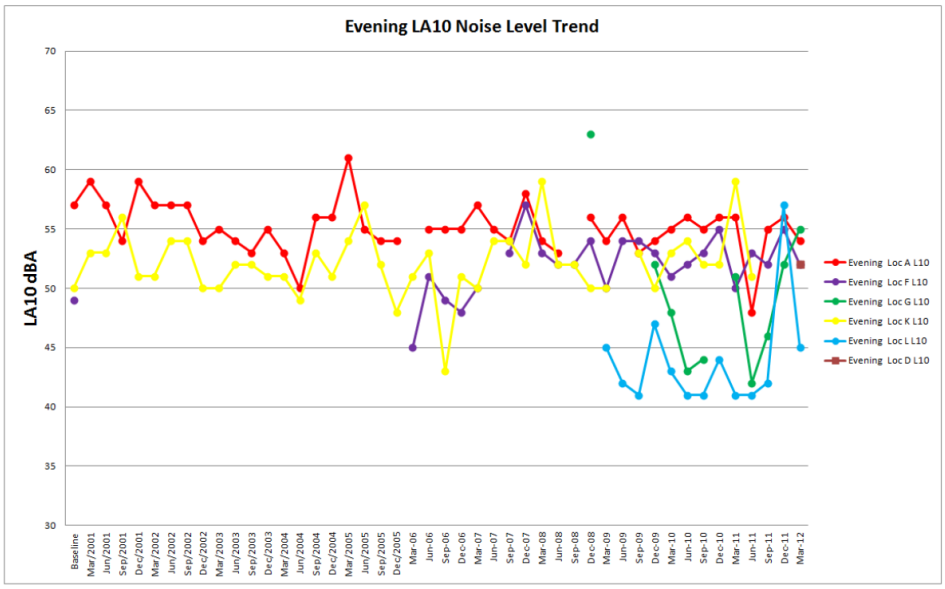
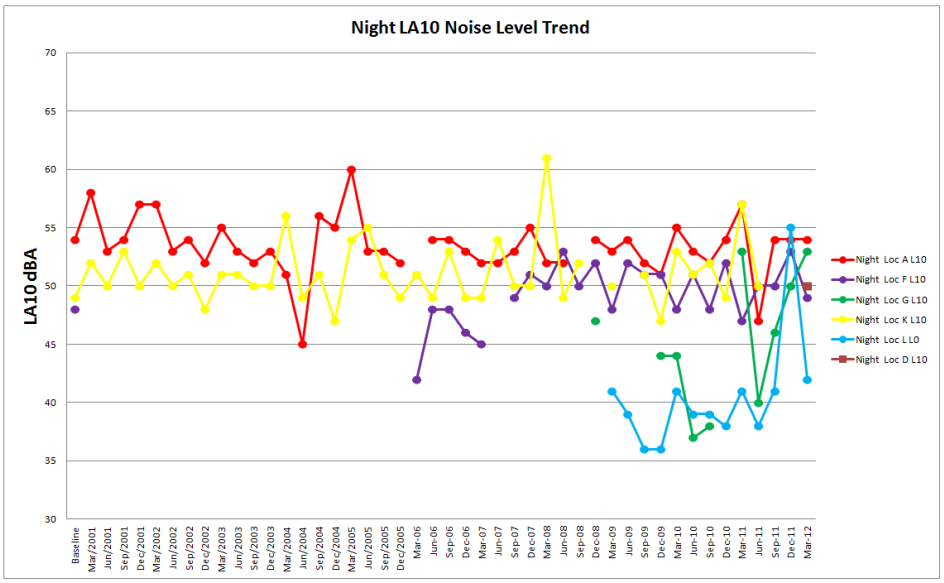


Figure 6 Long-term Night-time L_{A10} Noise Levels



Baseline

The summary of results in **Table 8** and **Figure 4**, **Figure 5**and **Figure 6** show that ambient L_{A10} noise levels recorded for the quarter ending March 2012 were 7 dBA greater than levels recorded during the baseline monitoring process at Location F during the daytime and 3 dBA higher during the evening and within 1dBA during the night-time. At Location A L_{A10} noise levels were either similar to the levels recorded during the baseline monitoring process or up to 3 dBA below.

Given that no data was available at Locations G, L and D during baseline measurements and no monitoring was conducted at Location K during the March 2012 quarter no comparisons can be made.

Previous Quarter (December 2011)

A comparison of the current monitoring period with the previous monitoring period shows that recorded L_{A10} noise levels at Location A, F and G were similar (within 3 dBA) or lower to those recorded in December 2011.

Noise levels at location L decreased significantly (up to 13 dBA) than those recorded in December 2011 during the day, evening and night-time..

Due to a logger error, no data was recorded for the December period at Location D.

Coinciding Period Last Year (March 2011)

A comparison of the current monitoring period with the coinciding monitoring period last year indicates that L_{A10} noise levels were similar (within 2 dBA) or lower than those recorded in March 2011 at locations A, D and F.

Noise levels at location G and L are up to 4 dBA higher than during the same period last year.

5.3 Discussion

Based on the observations made during the operator attended noise surveys, where noise levels have been observed to increase at location G, the ambient noise environment is dominated by road traffic, natural noises or other local mining operations and not Donaldson Mine.

6 SUMMARY OF RESULTS AND FINDINGS

SLR Consulting were engaged by Donaldson Coal Pty Ltd to conduct quarterly noise monitoring surveys for Donaldson Coal Mine and Abel Coal Mine in accordance with the Abel Coal Mine Noise Monitoring Program, dated 27 May 2008.

The results of the operator-attended noise measurements conducted at five (5) focus locations surrounding the mine site are included in **Table 2** to **Table 6**.

Based on the results and observations from operator attended surveys, it is likely that contributed noise levels from Donaldson Mine comply with noise emission goals for all periods.

Abel Mine operations were inaudible at all residential locations during all periods and as such it is likely that contributed noise levels from Abel Mine did not exceed noise emission goals (including night-time sleep arousal criteria) and were in compliance with the Abel Mine *Project Approval*.

A comparison of ambient L_{A10} and L_{A90} noise levels recorded during the current monitoring period (March 2012), the baseline monitoring period, the last monitoring period (December 2011), and the coinciding monitoring period from last year (March 2011) has been conducted.

In summary, where noise levels have risen at Location G, the ambient noise environment has been identified to generally contain traffic and natural noise sources or noise from other local mining operations and not noise from Donaldson Mine or Abel Mine activity.

I trust the preceding meets your current requirements. If you have any questions or would like any further information please do not hesitate to contact me on (02) 4908 4500 or email nvandenberg@slrconsulting.com

Regards,

Nicholas Vandenberg
Technical Officer – Noise and Vibration
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