

Appendix 10

NOISE MONITORING RESULTS

Attended Noise Monitoring

June 2009

June 2009 (Blair Athol)

September 2009

September 2009 (Blair Athol)

December 2009

March 2010

March 2010 (Blair Athol)



29 June 2009

Ref: 04095/3156

Mr Danny Young

Tarrawonga Coal Pty Ltd

PO Box 600

GUNNEDAH NSW 2380

RE: TARRAWONGA MINE - JUNE 2009 NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) on Monday 15th and Tuesday 16th June 2009.

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) $L_{Aeq}(15\text{ minute})$	Evening $L_{Aeq}(15\text{ minute})$	Night $L_{Aeq}(15\text{ minute})$	Night $L_{A1}(1\text{ minute})$
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the $L_{Aeq}(15\text{ minute})$ noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the $L_{A1(1\text{ minute})}$ noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening $L_{Aeq}(1\text{ hour})$	Night $L_{Aeq}(1\text{ hour})$	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

Note: The road traffic noise criteria apply to the cumulative impact from all mine-related sources

Section 11.1.3 of the EPA's *NSW Industrial Noise Policy* (INP) defines non-compliance with noise limits as follows:

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

The 2 dB ‘tolerance’ is given because this represents the theoretical minimum noise level difference discernible by the human ear. Section 11.1.3 of the INP goes on to define a breach as:

“A development will be in breach of a noise consent or license condition if sustained non-compliances are not addressed and rectified.”

These statements mean that a breach occurs when noise emissions are repeatedly measured at a level more than 2 dB above the limit given in the consent, and the proponent does not endeavour to manage or mitigate the exceedance.

NOISE MONITORING LOCATIONS

Noise monitoring locations were nominated in the Noise Management Plan (NMP) and Road Noise Management Plan (RNMP) for the project. These locations are listed in **Table 1** below and shown on **Figure 1**.

TABLE 1 TCM Noise Monitoring Locations		
Mine site noise monitoring locations		
Receiver (see Figure 1)	Land owner	
N1 – “Templemore”	P. & A. Laird ¹²	
N2 – “Bollol Creek Station”	J. Picton ²	
N3 – “Tarrawonga”	R. & R. McGregor ¹	
N4 – “Ambardo”	D. Wellwood	
Road traffic noise monitoring locations		
Receiver	Land owner	Road type
“Ambardo”	D. Wellwood	Private
“Pine Grove”	J., S., M, & C. Bull	Private
“Brooklyn”	R. Kelly	Public

¹ This property is now mine-owned.

² Templemore and Bollol Creek Station are very close together relative to their distance from TCM and a measurement at either is considered representative of the noise level at both.

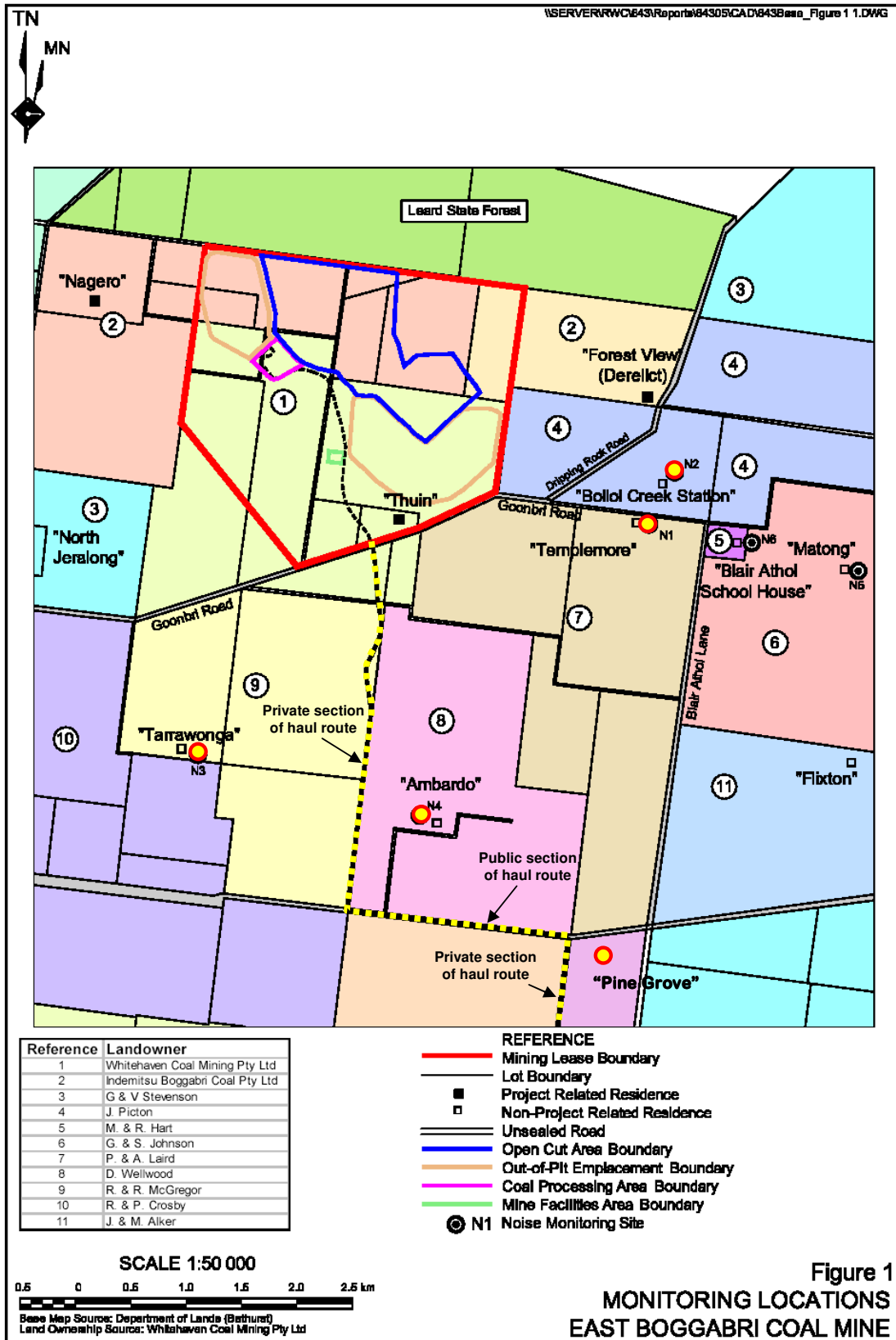
Monitoring location *N4* (“Ambardo”) is included for both site (operational) noise and coal transport noise. “Pine Grove” is very unlikely to be affected by site noise but is the closest residence to a private section of the haul route (shown as a yellow dotted line in Figure 1).

The Kelly residence “Brooklyn” is south of Canyon (formerly Whitehaven) mine on Blue Vale Road and cumulative noise from road haulage of coal is subject to the criteria in Condition 4(7) above. Traffic noise monitoring at this location is the subject of a separate report.

NOISE MONITORING PROGRAM

TCM is in its operational phase and noise monitoring was conducted at Locations *N2*, *N3* and *N4*. Locations *N1* and *N2* are very close together relative to their distance from TCM and the measurement at *N2* was considered to represent the worst case for both. Coal was being transported from TCM to the Whitehaven Coal Preparation Plant near Gunnedah, so measurements were also taken at “Pine Grove”.

Noise emission levels were measured with either a Brüel & Kjær Type 2260 or 2250 Precision Sound Analyser. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.



MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in the tables below. The total measured $L_{Aeq(15min)}$ is shown. The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the mine and other significant noise sources to the overall to be quantified. The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). Noise from TCM is shown in bold type. Where noise from TCM is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

In keeping with requirements of the TCM Noise Monitoring Programme noise levels were recorded for each of the L_{eq} (15 min), L_{max} , L_1 , L_{10} , L_{90} and L_{min} percentiles. As shown in the “Noise Criteria” section of this report, the noise criterion for the operational phase of the TCM project is **35 dB(A) L_{eq} (15 min)** for all operating times.

The results shown in **Tables 2, 3 and 4**, below, represent the total 15 minute L_{eq} noise level for all noise sources and the relative contributions of each. This is the compliance criterion for the operation of the mine. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request.

The exception to the above is the L_1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Location	Time	dB(A), L_{eq}	Wind speed/ direction	Identified Noise Sources
N2 Bollol Creek	9:04 am	41	1 m/s S	Birds (41), Total mine noise (28) ¹ (TCM est. 26)
N3 Tarrawonga	9:25 am	43	1 m/s S	Birds (42), Domestic noise (35), TCM Inaudible
N4 Ambardo	7.25 am	49	Calm	Birds (48), TCM (40 = trucks 40)*
Pine Grove	7:00 am	48	Calm	Birds (47), TCM (41 = trucks 41)* , Traffic ² (30)

¹ Total mine noise includes non-TCM and TCM mine.

² TCM trucks and other traffic on the Manilla Road section of the haul route. Criterion on this section is 60 dB(A).

* See discussion section

Location	Time	dB(A), L_{eq}	Wind speed/ direction	Identified Noise Sources
N2 Bollol Creek	9:10 pm	36	<1 m/s S	Total mine noise (35) ¹ (TCM est. 33), Insects (22)
N2 Tarrawonga	9:30 pm	30	<1 m/s S	Insects (30), Total mine noise (incl. TCM) (<25) ¹
N4 Ambardo	8:50 pm	42	<1 m/s S	TCM (40 = trucks 40, operations 24)* , Birds (36), Traffic ² (34)

* See discussion section

TCM Noise Monitoring Results – 15 June 2009 (night) (as Leq (15 min))				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
N2 Bollol Creek	10:45 pm	33	<0.5 m/s S	Total mine noise (33) ¹ (TCM est. 31), Insects (22)
N3 Tarrawonga	11:07 pm	31	<0.5 m/s S	Insects (28), Total mine noise (27) ¹ (TCM est. <25)
N4 Ambardo	11:18 pm	25	Calm	Birds (23), domestic noise (20), TCM inaudible

DISCUSSION OF RESULTS

The results in Tables 2-4 show that noise emissions from mining operations at TCM did not exceed the operational noise criterion of 35 dB(A),_{L_{eq}(15min)} at any residence. Noise from trucks using the private haul road, however, exceeded the noise criterion at Ambardo during the evening measurement on June 15 and at Ambardo and Pine grove during the measurement on June 16.

An analysis of the truck movements showed that at Ambardo during the day time measurement there were a total of 8 vehicle movements along the private haul road past the monitoring point. This consisted of 5 haul trucks (4 full and 1 empty), 2 light heavy vehicles and a 4WD going to the mine.

During the evening measurement at Ambardo there were 6 haul truck movements (3 full and 3 empty) on the private haul road. The noise from mining operations was audible in between truck pass bys. It consisted of engine revs, dozer track noise and general mine hum. This noise was at variable levels throughout the monitoring period and the results shown represent the calculated 15 minute Leq as determined from an analysis of the 1 second recorded statistics.

At Pine Grove there were 9 haul truck movements (7 full and 2 empty) on the private haul road.

Data for the 15 minute Leq noise levels were analysed using the “Evaluator” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

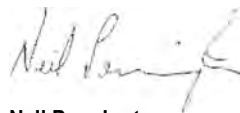
In addition to the operational noise, the noise from TCM must not exceed 45 dB(A) L1 (1 min) between the hours of 10 pm and 7 am. During the night time measurement circuit the L1 (1 min) noise from TCM did not exceed 45 dB(A) at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0406 670677.

Yours faithfully,

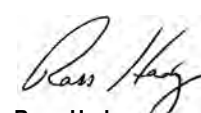
SPECTRUM ACOUSTICS PTY LIMITED

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30 June 2009

Ref: 04095/3158

Mr Danny Young
 Tarrawonga Coal Pty Ltd
 PO Box 600
 GUNNEDAH NSW 2380

RE: JUNE 2009 – ADDITIONAL NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise monitoring conducted for the Tarrawonga Coal Mine (TCM) on Monday 15th and Tuesday 16th June 2009 at the residence at the location of the old Blair Athol School House (see Figure 1) and traffic noise monitoring on Tuesday 16th June at “Kyalla” (on Manilla Road noted as the public section of the haul route in Figure 1).

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) <i>L_{Aeq(15 minute)}</i>	Evening <i>L_{Aeq(15 minute)}</i>	Night <i>L_{Aeq(15 minute)}</i>	Night <i>L_{A1(1 minute)}</i>
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the L_{Aeq(15 minute)} noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the $L_{A1(1\text{ minute})}$ noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening $L_{Aeq}(1\text{ hour})$	Night $L_{Aeq}(1\text{ hour})$	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

Note: The road traffic noise criteria apply to the cumulative impact from all mine-related sources

Section 11.1.3 of the EPA's *NSW Industrial Noise Policy* (INP) defines non-compliance with noise limits as follows:

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

The 2 dB ‘tolerance’ is given because this represents the theoretical minimum noise level difference discernible by the human ear. Section 11.1.3 of the INP goes on to define a breach as:

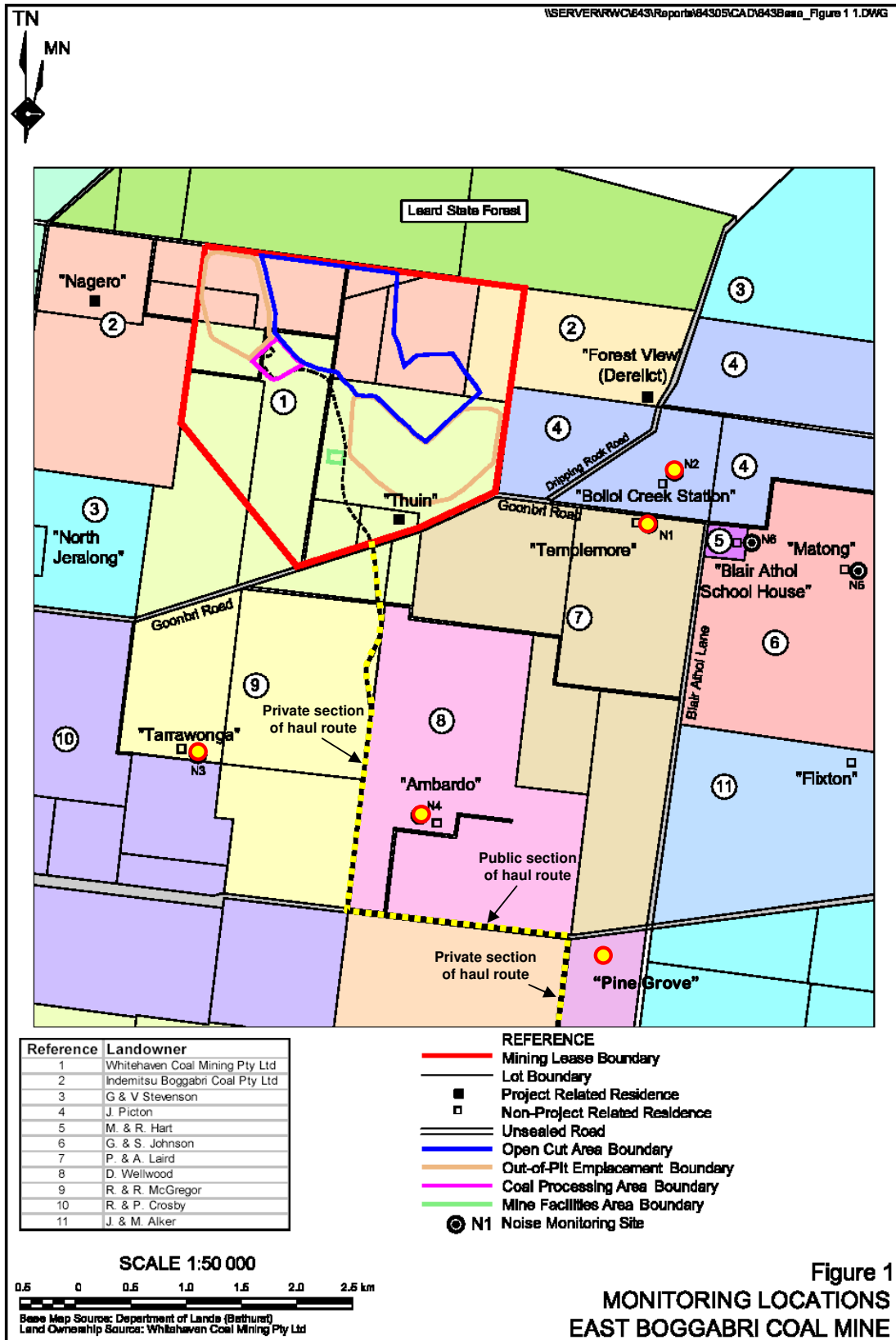
“A development will be in breach of a noise consent or license condition if sustained non-compliances are not addressed and rectified.”

These statements mean that a breach occurs when noise emissions are repeatedly measured at a level more than 2 dB above the limit given in the consent, and the proponent does not endeavour to manage or mitigate the exceedance.

NOISE MONITORING

The locations for the additional noise monitoring are shown in Figure 1 as detailed above.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.



MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in **Tables 1** and **2**. The total measured $L_{Aeq(15min)}$ is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise source(s). The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). The noise criterion for the operational phase of the TCM project is **35dB(A) $L_{Aeq(15 min)}$** for all operating times and all receivers.

Table 1 TCM Noise Monitoring Results – 15 and 16 June 2009 (as Leq (15 min))				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Blair Athol	9:40 am	49	1 m/s S	Birds & Insects (49), TCM inaudible
Blair Athol	9:35 pm	32	<1 m/s S	TCM (31), wind (25)
Blair Athol	10.40 pm	32	<0.5 m/s S	TCM (30), insects (26)

Table 2 TCM Noise Monitoring Results – 16 June 2009				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Kyalla	7:50 am	48	Calm	Birds (44), traffic (44), TCM (40, haul trucks)

DISCUSSION OF RESULTS

The results in Table 1 show that, under the operational and atmospheric conditions at the time, noise emissions from mining operations at TCM were significantly below the noise criterion at all times at the residence at Blair Athol. The noise was audible as general mine hum and occasional engine revs.

The noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy and during the night time measurement circuit the L1 (1 min) noise from TCM did not exceed 45 dB(A).

The results in Table 2 show that, under the operational and atmospheric conditions at the time, noise emissions associated with TCM were higher than the noise criterion when measured 30m from the façade of the residence at Kyalla.

The measurement at Kyalla was carried out over a 30 minute period in the morning when haul trucks were travelling along the Tarrawonga haul route. These trucks travel along the private section of the route, along Manilla Road (public road) and then back onto another private section of road.

During the 30 minute measurement a total of 21 haul trucks travelled past the monitoring location. Noise from these trucks was audible as they travelled along the southern section of the haul road and it is this noise that was the major contributor to the TCM component of the noise detailed in Table 2. Note that although the measurement was made over a 30 minute period the rate of trucks passing the monitoring location was fairly consistent and the noise level shown can be equated to a 15 minute compliance measurement.

Noise from the trucks travelling along the public section of the haul route (Manilla Road) is shown as “traffic” in Table 2. This noise is significantly lower than the criterion for this section of road of 60 dB(A)

Leq (1 hour). Note that, as above, the rate of trucks passing the monitoring location was fairly consistent and the noise level shown can be equated to a 1 hour compliance measurement.

TCM environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. At the time of the monitoring at Kyalla the atmospheric conditions were cold and clear with no wind. Given our experience at this, and other similar, sites it is likely that temperature inversion conditions were in effect at the time. It is not possible to confirm this, or determine inversion strength with the available metrological data.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0406 670677.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

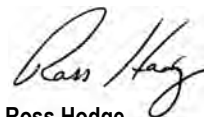
Author:



Neil Pennington

Acoustical Consultant

Review:



Ross Hodge

Acoustical Consultant



18 September 2009

Ref: 04095/3267

Mr Danny Young

Tarrawonga Coal Pty Ltd

PO Box 600

GUNNEDAH NSW 2380

RE: TARRAWONGA MINE - SEPTEMBER 2009 NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) on Wednesday 9th and Thursday 10th September 2009.

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the Leq(15 min) noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the L1 (1 min) noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening Leq (1 hr)	Night Leq (1 hr)	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

Note: The road traffic noise criteria apply to the cumulative impact from all mine-related sources

Section 11.1.3 of the EPA's *NSW Industrial Noise Policy* (INP) defines non-compliance with noise limits as follows:

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

The 2 dB ‘tolerance’ is given because this represents the theoretical minimum noise level difference discernible by the human ear. Section 11.1.3 of the INP goes on to define a breach as:

“A development will be in breach of a noise consent or license condition if sustained non-compliances are not addressed and rectified.”

These statements mean that a breach occurs when noise emissions are repeatedly measured at a level more than 2 dB above the limit given in the consent, and the proponent does not endeavour to manage or mitigate the exceedance.

NOISE MONITORING LOCATIONS

Noise monitoring locations were nominated in the Noise Management Plan (NMP) and Road Noise Management Plan (RNMP) for the project. These locations are listed in **Table 1** below and shown on **Figure 1**.

TABLE 1 TCM Noise Monitoring Locations		
Mine site noise monitoring locations		
Receiver (see Figure 1)	Land owner	
N1 – “Templemore”	P. & A. Laird ¹	
N2 – “Bollol Creek Station”	J. Picton	
N3 – “Tarrawonga”	R. & R. McGregor ¹	
N4 – “Ambardo”	D. Wellwood	
Road traffic noise monitoring locations		
Receiver	Land owner	Road type
“Ambardo”	D. Wellwood	Private
“Pine Grove”	J., S., M. & C. Bull	Private
“Brooklyn”	R. Kelly	Public

¹ This property is now mine-owned.

Monitoring location *N4* (“Ambardo”) is included for both site (operational) noise and coal transport noise. “Pine Grove” is very unlikely to be affected by site noise but is the closest residence to a private section of the haul route (shown as a yellow dotted line in Figure 1).

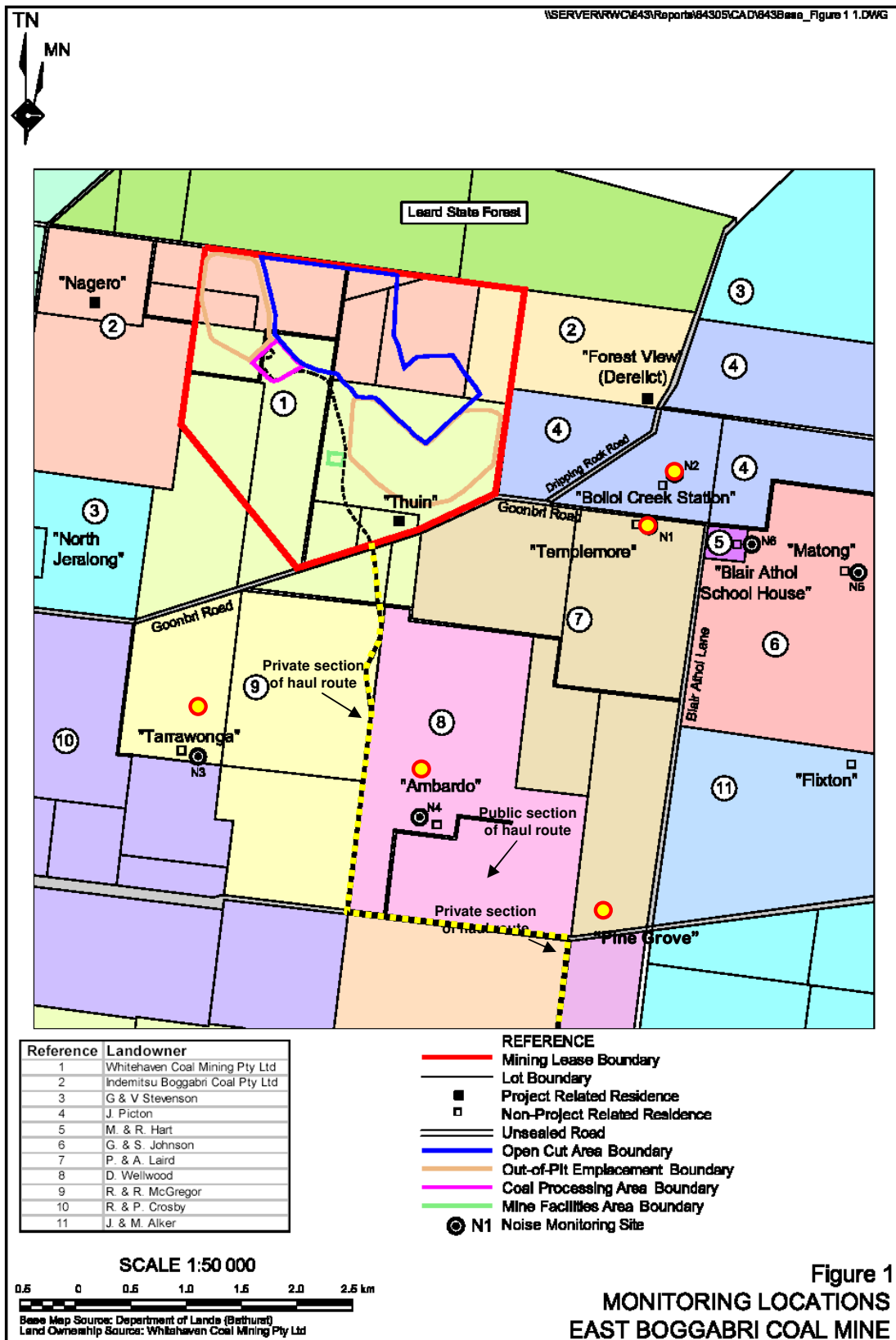
The Kelly residence “Brooklyn” is south of Canyon (formerly Whitehaven) mine on Blue Vale Road and cumulative noise from road haulage of coal is subject to the criteria in Condition 4(7) above. Traffic noise monitoring at this location is the subject of a separate report (Spectrum Acoustics Rpt no. 6259/3256, September, 2009).

NOISE MONITORING PROGRAM

TCM is in its operational phase and noise monitoring was conducted at Locations *N2*, *N3* and *N4*. Locations *N1* and *N2* are very close together relative to their distance from TCM and the measurement at *N2* was considered to represent the worst case for both. Coal was being transported from TCM to the Whitehaven Coal Preparation Plant near Gunnedah, so measurements were also taken at “Pine Grove”.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was taken using a hand held weather station at a height of approximately 2m above ground level.



MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in **Tables 2, 3** and **4**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise source(s). The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). The noise criterion for the operational phase of the TCM project is **35dB(A) Leq (15 min)** for all operating times and all receivers.

Table 2 TCM Noise Monitoring Results – 9/10 September 2009 (day)				
Location	Time	dB(A),Leq (15 min)	Wind speed/direction	Identified Noise Sources
N2 Bollol Creek	4:50 pm	45	2 m/s W	Birds & Insects (45), TCM (30)
N3 Tarrawonga (10th)	8:04 am	39	Calm	Birds (35), TCM (37)
N4 Ambardo (10th)	7:20 am	43	Calm	Birds (42), TCM (37)
Pine Grove (10th)	7:00 am	48	Calm	Birds (47), TCM (36) , traffic ¹ (35)

¹ TCM trucks and other traffic on the Manilla Road section of the haul route. Criterion on this section is 60 dB(A).

Table 3 TCM Noise Monitoring Results – 9 September 2009 (evening)				
Location	Time	dB(A),Leq (15 min)	Wind speed/direction	Identified Noise Sources
N2 Bollol Creek	8:21 pm	37	1 m/s W	TCM (35) , frogs & insects (32)
N2 Tarrawonga	9:30 pm	25	1 m/s W	Insects (25), TCM inaudible
N4 Ambardo	9:05 pm	37	1 m/s W	TCM (34) , traffic ¹ (32), birds & insects (29)

¹ TCM trucks and other traffic on the Manilla Road section of the haul route. Criterion on this section is 60 dB(A).

Table 4 TCM Noise Monitoring Results – 9 September 2009 (night)				
Location	Time	dB(A),Leq (15 min)	Wind speed/direction	Identified Noise Sources
N2 Bollol Creek	10:51 pm	34	<0.5 m/s W	TCM (33) , insects (25)
N3 Tarrawonga	11:35 pm	25	<0.5 m/s W	Insects (25), TCM inaudible
N4 Ambardo	11:17 pm	23	<0.5 m/s W	Insects (23), TCM inaudible

DISCUSSION OF RESULTS

The results in Tables 1-3 show that noise emissions from operations associated with TCM exceeded the operational noise criterion of 35 dB(A),Leq (15 min) at the monitoring locations at Tarrawonga, Ambardo and Pine Grove during the morning of September 10, 2009.

At Pine Grove the exceedance was due to emissions from trucks travelling on the private section of the haul road. At Ambardo the total measured noise was a result of emissions from the open cut operations (dozer tracks and engine noise) and trucks travelling on the private section of the haul road. At Tarrawonga the mine noise was due to emissions from the open cut operations (dozer tracks and engine noise).

TCM environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data was not available to determine the presence of temperature inversions.

Data from those times where TCM operations were audible was analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from TCM must not exceed 45 dB(A) L1 (1min) between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

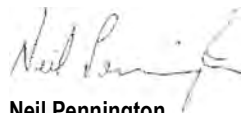
During the night time measurement circuit the L1 (1min) noise from TCM did not exceed 45 dB(A) at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

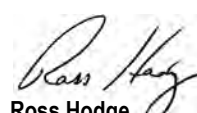
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
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Review:



Ross Hodge
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18 September 2009

Ref: 04095/3268

Mr Danny Young
 Tarrawonga Coal Pty Ltd
 PO Box 600
 GUNNEDAH NSW 2380

RE: SEPTEMBER 2009 – ADDITIONAL NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise monitoring conducted for the Tarrawonga Coal Mine (TCM) on Wednesday 9th and Thursday 10th September 2009. The monitoring was undertaken at the residence at the location of the old Blair Athol School House as shown in Figure 1.

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) <i>L_{Aeq(15 minute)}</i>	Evening <i>L_{Aeq(15 minute)}</i>	Night <i>L_{Aeq(15 minute)}</i>	Night <i>L_{A1(1 minute)}</i>
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the L_{Aeq(15 minute)} noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the $L_{A1}(1 \text{ minute})$ noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening $L_{Aeq}(1 \text{ hour})$	Night $L_{Aeq}(1 \text{ hour})$	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

Note: The road traffic noise criteria apply to the cumulative impact from all mine-related sources

Section 11.1.3 of the EPA's *NSW Industrial Noise Policy* (INP) defines non-compliance with noise limits as follows:

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

The 2 dB 'tolerance' is given because this represents the theoretical minimum noise level difference discernible by the human ear. Section 11.1.3 of the INP goes on to define a breach as:

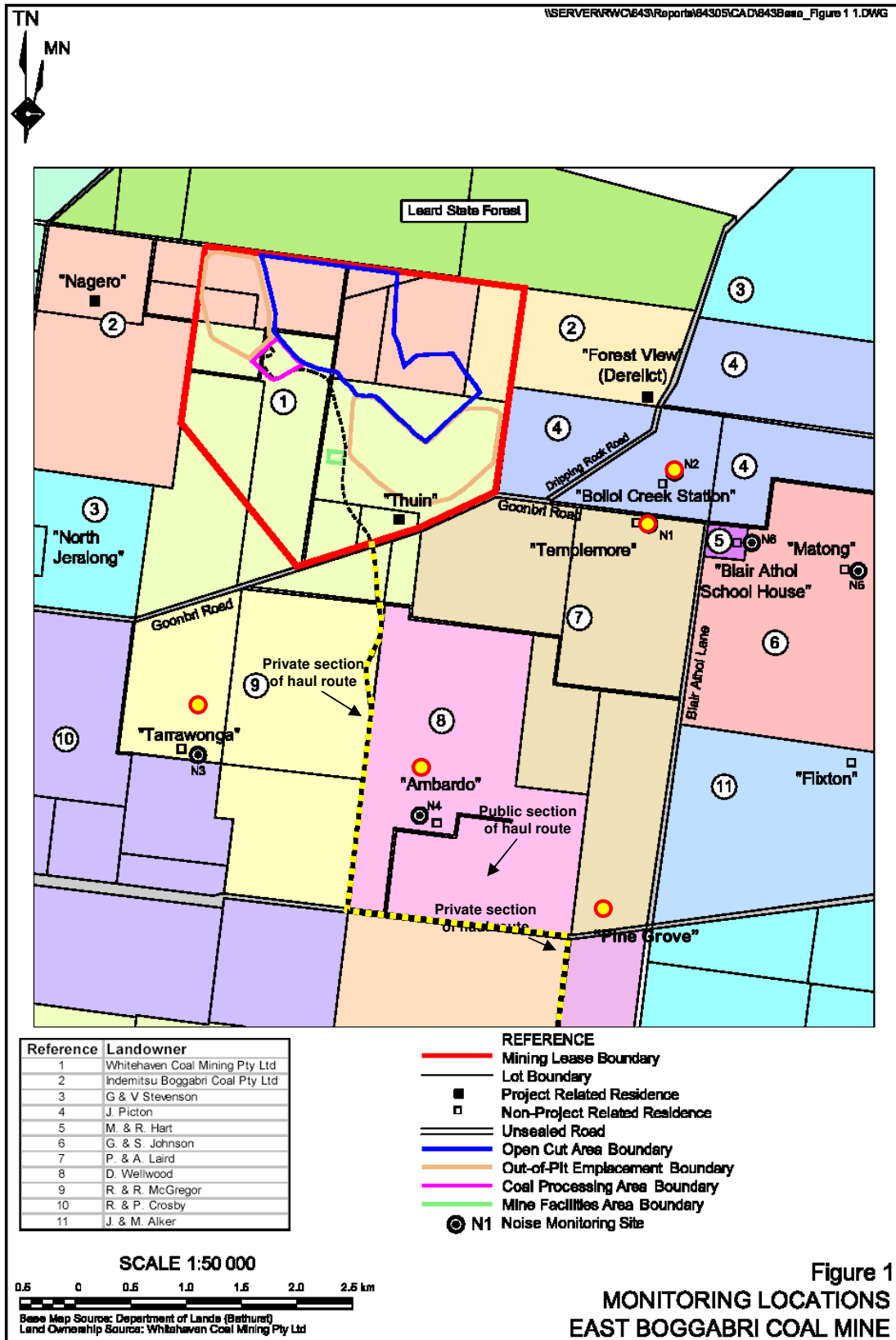
"A development will be in breach of a noise consent or license condition if sustained non-compliances are not addressed and rectified."

These statements mean that a breach occurs when noise emissions are repeatedly measured at a level more than 2 dB above the limit given in the consent, and the proponent does not endeavour to manage or mitigate the exceedance.

NOISE MONITORING

The location for the current additional noise monitoring is shown as N6 on **Figure 1**.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.



MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in **Table 1**. The total measured $L_{Aeq(15min)}$ is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise source(s). The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). The noise criterion for the operational phase of the TCM project is **35dB(A) $L_{eq(15 min)}$** for all operating times and all receivers.

Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Blair Athol (10 th)	7:44 am	42	Calm	Birds & Insects (39), TCM (38)
Blair Athol	8:00 pm	35	1 m/s W	TCM (34) , insects (29)
Blair Athol	10.30 pm	31	<0.5 m/s W	TCM (31) , insects (20)

DISCUSSION OF RESULTS

The results in Tables 1 show that, under the operational and atmospheric conditions at the time, noise emissions from mining operations at TCM exceeded the noise criterion during the morning monitoring on September 10. The mining noise was attributed to mine hum, engine revs and dozer tracks.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0406 670677.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

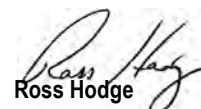
Author:



Neil Pennington

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Review:



Ross Hodge

Acoustical Consultant



16 December 2009

Ref: 04095/3362

Mr Danny Young

Tarrawonga Coal Pty Ltd

PO Box 600

GUNNEDAH NSW 2380

RE: TARRAWONGA MINE - DECEMBER 2009 NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) on Monday 7th and Tuesday 8th December 2009.

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the Leq(15 min) noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the L1 (1 min) noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening Leq (1 hr)	Night Leq (1 hr)	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

Note: The road traffic noise criteria apply to the cumulative impact from all mine-related sources

Section 11.1.3 of the EPA's *NSW Industrial Noise Policy* (INP) defines non-compliance with noise limits as follows:

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

The 2 dB ‘tolerance’ is given because this represents the theoretical minimum noise level difference discernible by the human ear. Section 11.1.3 of the INP goes on to define a breach as:

“A development will be in breach of a noise consent or license condition if sustained non-compliances are not addressed and rectified.”

These statements mean that a breach occurs when noise emissions are repeatedly measured at a level more than 2 dB above the limit given in the consent, and the proponent does not endeavour to manage or mitigate the exceedance.

NOISE MONITORING LOCATIONS

Noise monitoring locations were nominated in the Noise Management Plan (NMP) and Road Noise Management Plan (RNMP) for the project. These locations are listed in **Table 1** below and shown on **Figure 1**.

TABLE 1 TCM Noise Monitoring Locations		
Mine site noise monitoring locations		
Receiver (see Figure 1)	Land owner	
N1 – “Templemore”	P. & A. Laird ¹	
N2 – “Bollol Creek Station”	J. Picton	
N3 – “Tarrawonga”	R. & R. McGregor	
N4 – “Ambardo”	D. Wellwood	
Road traffic noise monitoring locations		
Receiver	Land owner	Road type
“Ambardo”	D. Wellwood	Private
“Pine Grove”	J., S., M. & C. Bull	Private
“Brooklyn”	R. Kelly	Public

¹ This property is now mine-owned.

Monitoring location *N4* (“Ambardo”) is included for both site (operational) noise and coal transport noise. “Pine Grove” is very unlikely to be affected by site noise but is the closest residence to a private section of the haul route (shown as a yellow dotted line in Figure 1).

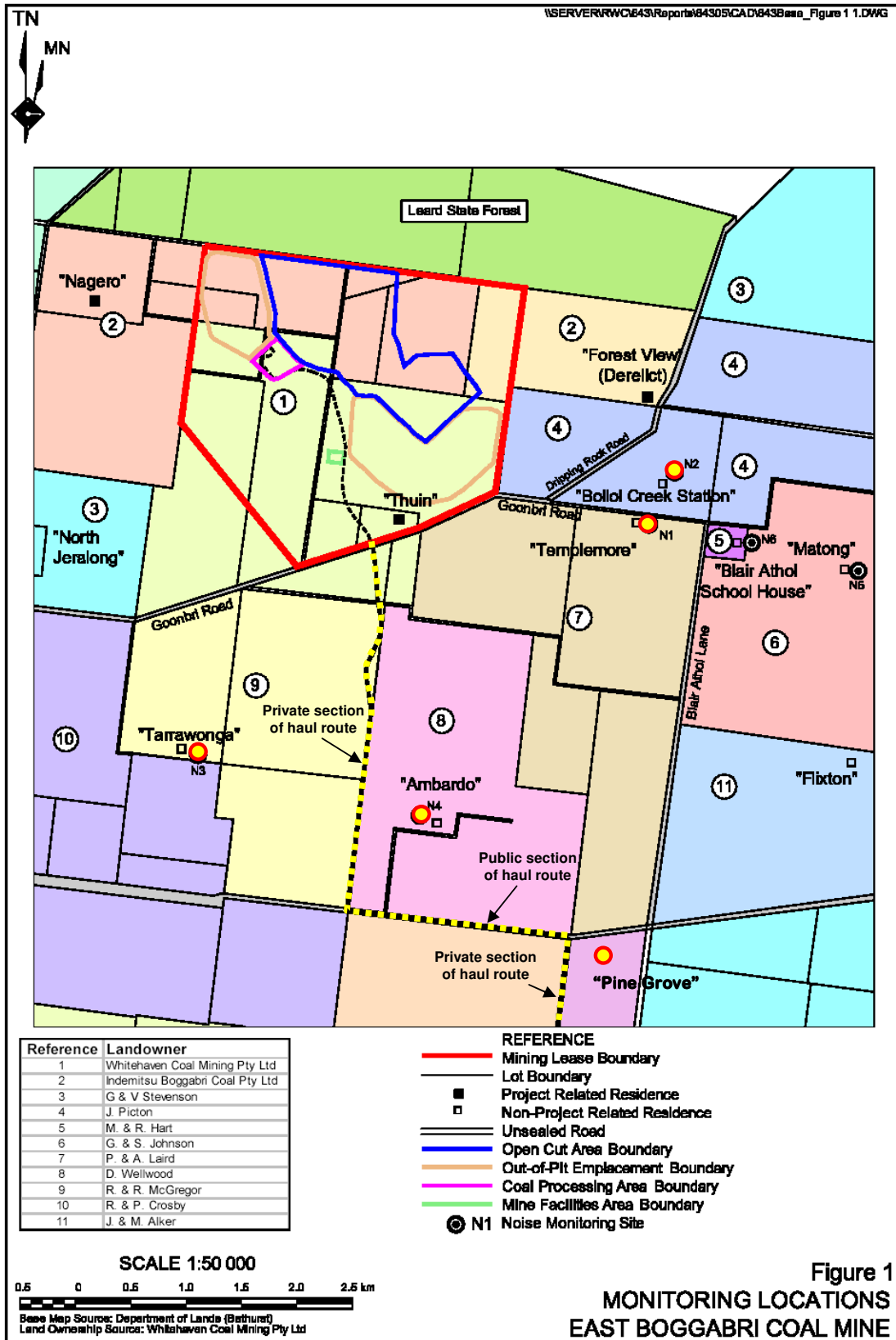
The Kelly residence “Brooklyn” is south of Canyon (formerly Whitehaven) mine on Blue Vale Road and cumulative noise from road haulage of coal is subject to the criteria in Condition 4(7) above. Traffic noise monitoring at this location is the subject of a separate report (Spectrum Acoustics Rpt no. 6259/3370, December, 2009).

NOISE MONITORING PROGRAM

TCM is in its operational phase and noise monitoring was conducted at Locations *N2*, *N3* and *N4*. Locations *N1* and *N2* are very close together relative to their distance from TCM and the measurement at *N2* was considered to represent the worst case for both. Coal was being transported from TCM to the Whitehaven Coal Preparation Plant near Gunnedah, so measurements were also taken at “Pine Grove”.

Noise emission levels were measured by two personnel using Brüel & Kjær Type 2260 and 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was taken using a hand held weather station at a height of approximately 2m above ground level.



MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in **Tables 2, 3 and 4**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise source(s). The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). The noise criterion for the operational phase of the TCM project is **35dB(A) Leq (15 min)** for all operating times and all receivers.

Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources
N2 Bollol Ck Station	5:10 pm	42	2-3 m/s SW	Birds & insects (42), TCM (30)
N3 Tarrawonga	4:05 pm	38	2-3 m/s SW	Birds (37), TCM inaudible
N4 Ambardo	7:03 am	56	Calm	Birds (56), TCM (34) , traffic ¹ (32)
Pine Grove	7:23 am	43	Calm	Birds (41), TCM (36) , traffic ¹ (31)

¹ TCM trucks and other traffic on the Manilla Road section of the haul route. Criterion on this section is 60 dB(A).

Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources
N2 Bollol Ck Station	7:20 pm	36	1.5 m/s NW	Insects (36), Total mine noise (20), (TCM est. 18)
N3 Tarrawonga	7:41 pm	49	1 m/s NW	Birds (49), TCM (25)
N4 Ambardo	8:00 pm	45	< 0.5 m/s NW	Birds & insects (45), TCM (30)

Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources
N2 Bollol Ck Station	11:03 pm	32	< 0.5 m/s SW	Dogs & birds (32), Total mine noise (22)² (TCM est. 20)
N3 Tarrawonga	11:27 pm	29	< 0.5 m/s SW	Insects (28), traffic (22), TCM inaudible
N4 Ambardo	11:48 pm	28	Calm	Insects (28), TCM (<20)

DISCUSSION OF RESULTS

The results in Tables 1-3 show that noise emissions from operations associated with TCM were higher of the operational noise criterion of 35 dB(A),Leq (15 min) at the monitoring locations at Pine Grove during the morning of December 8, 2009. The noise was due to emissions from trucks travelling on the private section of the haul road. TCM currently has an agreement in place with the owner of Pine Grove in respect to elevated noise levels from haul trucks and, therefore, under this agreement the measured noise level is not considered an exceedance of the noise criterion.

TCM environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Data were not available to determine the presence of temperature inversions.

Data from those times where TCM operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from TCM must not exceed 45 dB(A) L1 (1min) between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit the L1 (1min) noise from TCM did not exceed 45 dB(A) at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
Acoustical Consultant

Review:



Ross Hodge
Acoustical Consultant



12 April 2010

Ref: 04095/3362

Mr Danny Young

Tarrawonga Coal Pty Ltd

PO Box 600

GUNNEDAH NSW 2380

RE: TARRAWONGA MINE - MARCH 2010 NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise compliance monitoring conducted for the Tarrawonga Coal Mine (TCM) on Thursday 25th and Friday 26th March 2010.

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) Leq (15 min)	Evening Leq (15 min)	Night Leq (15 min)	Night L1 (1 min)
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the Leq(15 min) noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the L1 (1 min) noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening Leq (1 hr)	Night Leq (1 hr)	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

Note: The road traffic noise criteria apply to the cumulative impact from all mine-related sources

Section 11.1.3 of the EPA’s *NSW Industrial Noise Policy* (INP) defines non-compliance with noise limits as follows:

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

The 2 dB ‘tolerance’ is given because this represents the theoretical minimum noise level difference discernible by the human ear. Section 11.1.3 of the INP goes on to define a breach as:

“A development will be in breach of a noise consent or license condition if sustained non-compliances are not addressed and rectified.”

These statements mean that a breach occurs when noise emissions are repeatedly measured at a level more than 2 dB above the limit given in the consent, and the proponent does not endeavour to manage or mitigate the exceedance.

NOISE MONITORING LOCATIONS

Noise monitoring locations were nominated in the Noise Management Plan (NMP) and Road Noise Management Plan (RNMP) for the project. These locations are listed in **Table 1** below and shown on **Figure 1**.

TABLE 1 TCM Noise Monitoring Locations		
Mine site noise monitoring locations		
Receiver (see Figure 1)	Land owner	
N1 – “Templemore”	P. & A. Laird ¹	
N2 – “Bollol Creek Station”	J. Picton	
N3 – “Tarrawonga”	R. & R. McGregor	
N4 – “Ambardo”	D. Wellwood	
Road traffic noise monitoring locations		
Receiver	Land owner	Road type
“Ambardo”	D. Wellwood	Private
“Pine Grove”	J., S., M, & C. Bull	Private
“Brooklyn”	R. Kelly	Public

¹ This property is now mine-owned.

Monitoring location *N4* (“Ambardo”) is included for both site (operational) noise and coal transport noise. “Pine Grove” is very unlikely to be affected by site noise but is the closest residence to a private section of the haul route (shown as a yellow dotted line in Figure 1).

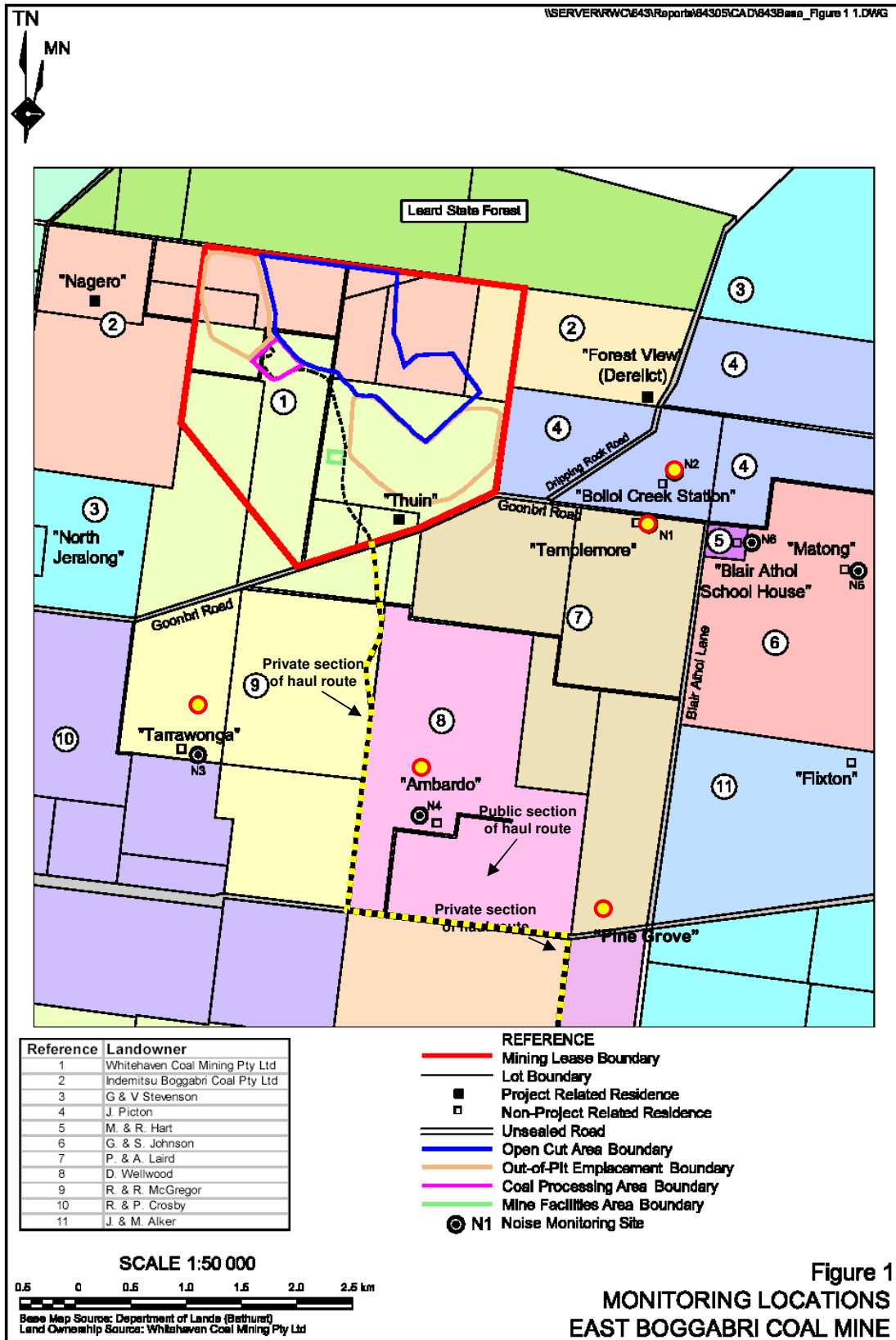
The Kelly residence “Brooklyn” is south of Canyon (formerly Whitehaven) mine on Blue Vale Road and cumulative noise from road haulage of coal is subject to the criteria in Condition 4(7) above. Traffic noise monitoring at this location is the subject of a separate report.

NOISE MONITORING PROGRAM

TCM is in its operational phase and noise monitoring was conducted at Locations *N2*, *N3* and *N4*. Locations *N1* and *N2* are very close together relative to their distance from TCM and the measurement at *N2* was considered to represent the worst case for both. Coal was being transported from TCM to the Whitehaven Coal Preparation Plant near Gunnedah, so measurements were also taken at “Pine Grove”.

Noise emission levels were measured by two personnel using Brüel & Kjær Type 2260 and 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was taken using a hand held weather station at a height of approximately 2m above ground level.



MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in **Tables 2, 3 and 4**. The total measured Leq (15 min) is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise sources. The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). The noise criterion for the operational phase of the TCM project is **35dB(A) Leq (15 min)** for all operating times and all receivers.

Table 2 TCM Noise Monitoring Results – 25/26 March 2010 (Day) (pm on 25/3 and am on 26/3)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources
N2 BolloI Ck Station	3:53 pm	33	0.5 m/s SE	Birds & insects (32), TCM (29)
N3 Tarrawonga	3:10 pm	38	0.5 m/s SE	Birds & insects (38), TCM barely audible (est. <20)
N4 Ambardo	7:00 am	51	Calm	Birds (49), TCM (43) ¹ , traffic ² (39)
Pine Grove	7:23 am	48	Calm	Birds (47), TCM (38) ¹ , traffic ² (35)

¹ Trucks on private section of haul road.

² TCM trucks and other traffic on the Manila Road section of the haul route. Criterion on this section is 60 dB(A).

Table 3 TCM Noise Monitoring Results – 25 March 2010 (evening)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources
N2 BolloI Ck Station	8:50 pm	43	Calm	Birds & insects (43), TCM (29)
N3 Tarrawonga	8:17 pm	48	Calm	Insects (47), TCM (22) ¹
N4 Ambardo	7:17 pm	47	Calm	Insects (45), TCM (37) ¹ , traffic ² (34)

¹ Trucks on private section of haul road.

² TCM trucks and other traffic on the Manila Road section of the haul route. Criterion on this section is 60 dB(A).

Table 4 TCM Noise Monitoring Results – 25 March 2010 (night)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources
N2 BolloI Ck Station	11:48 pm	43	< 0.5 m/s NW	Insects (43), TCM (33)
N3 Tarrawonga	11:49 pm	37	Calm	Insects (37), TCM (<20)
N4 Ambardo	10:57 pm	40	Calm	Insects (40), TCM (<20)

DISCUSSION OF RESULTS

The results in Tables 1-3 show that noise emissions from operations associated with TCM were higher of the operational noise criterion of 35 dB(A),Leq (15 min) at the monitoring locations at Pine Grove and Ambardo during the morning and evening surveys. The noise was due to emissions from trucks travelling on the private section of the haul road. We understand that TCM currently has an agreement in place with these two receivers in respect to elevated noise levels from haul trucks.

TCM environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a

temperature inversion of greater than +3° C/100m. Data were not available to determine the presence of temperature inversions.

Data from those times where TCM operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from TCM must not exceed 45 dB(A) L1 (1min) between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

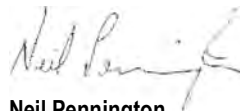
During the night time measurement circuit the L1 (1min) noise from TCM did not exceed 45 dB(A) at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington

Acoustical Consultant

Review:



Ross Hodge

Acoustical Consultant



20 April 2009

Ref: 04095/3510

Mr Danny Young

Tarrawonga Coal Pty Ltd

PO Box 600

GUNNEDAH NSW 2380

RE: MARCH 2010 – ADDITIONAL NOISE MONITORING RESULTS

This letter report presents the results of attended operational noise monitoring conducted for the Tarrawonga Coal Mine (TCM) on Thursday 25th March 2010. The monitoring was undertaken at the residence at the old Blair Athol School House as shown in Figure 1.

NOISE CRITERIA

Construction and operational noise criteria for TCM are contained in Conditions 4(6) and 4(7) of the Development Consent, as reproduced below.

- 4(6) *The Applicant shall ensure that the noise generated by the development, including the noise generated on the private sections of the transport route, does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.*

Day (Operational Stage) <i>L_{Aeq(15 minute)}</i>	Evening <i>L_{Aeq(15 minute)}</i>	Night <i>L_{Aeq(15 minute)}</i>	Night <i>L_{A1(1 minute)}</i>
35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Notes:

- *Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,*
- *To determine compliance with the $L_{Aeq(15\text{ minute})}$ noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*

- The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the $L_{A1}(1 \text{ minute})$ noise limits in the above table
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

4(7) The Applicant shall ensure that the noise generated by the development on public roads does not exceed the criteria in Table 8.

Day/Evening $L_{Aeq}(1 \text{ hour})$	Night $L_{Aeq}(1 \text{ hour})$	Property
60	55	Any residence on privately-owned land.

Table 8: Road Traffic Noise Criteria dB(A)

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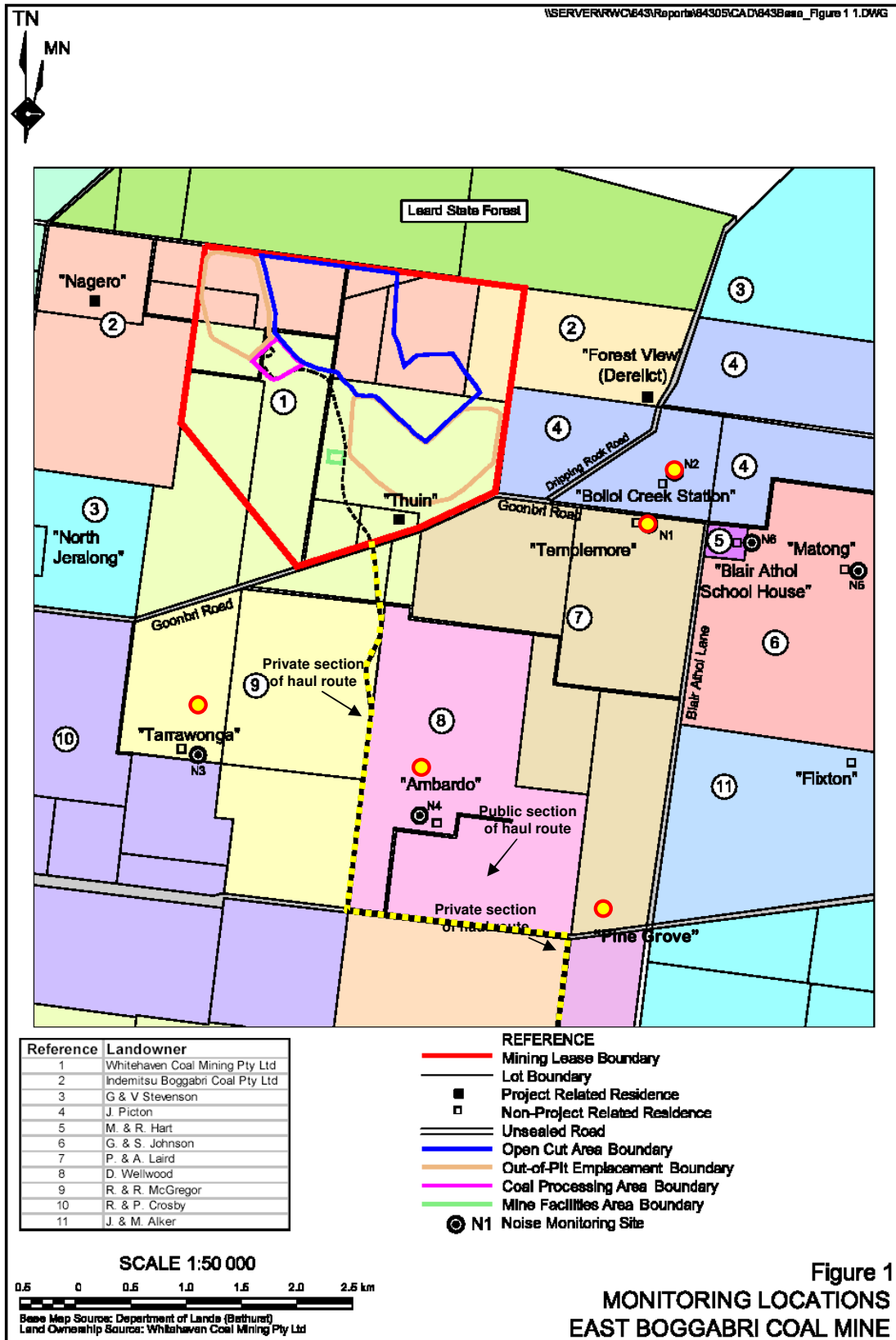
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NOISE MONITORING

The location for the current additional noise monitoring is shown as N6 on **Figure 1**.

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MEASURED NOISE LEVELS

Measured noise levels at each location are summarised in **Table 1**. The total measured $L_{Aeq(15min)}$ is shown. Bruel & Kjaer “*Evaluator*” analysis software was used to quantify the contributions of the various noise source(s). The identified noise sources are listed, along with the contribution of each source, in descending order (shown in brackets). The noise criterion for the operational phase of the TCM project is **35dB(A) $L_{eq(15 min)}$** for all operating times and all receivers.

Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Blair Athol	3:39 pm	32	Calm	Birds & Insects (32), TCM (20)
Blair Athol	9:09 pm	39	Calm	Insects (38), TCM (33)
Blair Athol	11:32 pm	40	Calm	Insects (39), TCM (32)

DISCUSSION OF RESULTS

The results in Tables 1 show that, under the operational and atmospheric conditions at the time, noise emissions from mining operations at TCM did not exceed the noise criterion of 35 dB(A),Leq(15 min).

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0409 181888.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

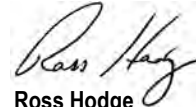
Author:



Neil Pennington

Acoustical Consultant

Review:



Ross Hodge

Acoustical Consultant

Road Noise Monitoring

June 2009

December 2009

April 2010



29 June 2009

Ref: 06259/3151

Mr. Danny Young
Whitehaven Coal Mine
PO Box 600
GUNNEDAH NSW 2380

RE: WHITEHAVEN COAL – ROAD HAULAGE NOISE MONITORING, JUNE 2009

This letter report presents the results of a road noise measurements conducted for the Whitehaven Coal Mine (WCM), Tarrawonga Coal Mine (TCM) and Rocglen Coal Mine (RCM). The measurements were conducted at “Brooklyn” and “Werona” on Blue Vale Road with the intention of determining the $L_{Aeq(1\text{ hour})}$ noise contribution from mine-related vehicles, particularly coal haul trucks. There are two separate residences on “Brooklyn” and simultaneous noise measurements were made at the front of both residences. Residence 1 is closest to Blue Vale Road (approximately 90m) whilst residence 2 is approximately 480m from the road.

The approvals granted for TCM and RCM state that the cumulative noise level from traffic generated by the three mines must not exceed 60 dB(A), $L_{Aeq(1\text{hour})}$ during the day and 55 dB(A), $L_{Aeq(1\text{hour})}$ during the night at these locations. For the purposes of traffic noise assessment the DECC *Environmental Criteria for Road Traffic Noise* (ECRTN) defines day as 7am – 10pm and night as 10pm – 7am. On Sundays and public holidays the 7am transition changes to 8am.

The noise measurements were made adjacent to the front (eastern) facade of both residences at “Brooklyn” between 9:06 am and 10:06 am and at “Werona” between 10.28 am and 11.28 am on Wednesday 17th June 2009 with third-octave band Bruel & Kjaer Observer sound level meters (IEC Type 1). The sound level meters were placed on tripods and recorded continuously at 1-second statistical intervals while notes on passing vehicles were written down.

Over the course of the measurement period at “Brooklyn” there were 27 coal truck movements related to WCM, TCM and RCM as well as some light vehicles associated with the mine. Other significant noise sources observed throughout the monitoring period included a contribution from birds and insects and planes. The total measured noise level for the one hour period as dB(A), L_{Aeq} , therefore, represents that from the trucks, birds, wind and other sources.

Due to the discrete nature of the coal truck movements the sound level as each truck past the measurement point (that is from when each truck became audible until it was inaudible again) was readily discernable and the contribution of truck noise could be accurately determined. A breakdown of the heavy vehicle movements for “Brooklyn” is summarised in **Table 1**.

Table 1	
Coal Truck pass bys - “Brooklyn”, Blue Vale Road 17/06/09	
Time	Vehicle direction of travel
9:06	Empty coal truck to mine
9:09	Empty coal truck to mine
9:10	Mine related 4WD
9:10	Mine related 4WD
9:11	Laden coal truck to CPP
9:12	Empty coal truck to mine
9:14	Empty coal truck to mine
9:14	Empty coal truck to mine
9:18	Fuel truck to mine
9:19	Empty coal truck to mine
9:22	Laden coal truck to CPP
9:22	Laden coal truck to CPP
9:24	Empty coal truck to mine
9:26	Laden coal truck to CPP
9:30	Laden coal truck to CPP
9:31	Mine related 4WD
9:32	Laden coal truck to CPP
9:32	Laden coal truck to CPP
9:37	Empty coal truck to mine
9:43	Empty coal truck to mine
9:42	Empty coal truck to mine
9:45	Empty coal truck to mine
9:53	Laden coal truck to CPP
9:54	Laden coal truck to CPP
9:56	Laden coal truck to CPP
9:57	Laden coal truck to CPP
9:58	Empty coal truck to mine
10:01	Laden coal truck to CPP
10:06	Empty coal truck to mine
10:06	Laden coal truck to CPP
10:06	Empty coal truck to mine

The total measured contribution from mine-related vehicles at Residence 1 at “Brooklyn” was **54.0 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

The total measured contribution from mine-related vehicles at Residence 2 was **45 dB(A)**, L_{eq} (1 hour). This is below the daytime criterion of **60 dB(A)** L_{eq} (1 hour).

Over the course of the measurement period at “Werona” there were 30 coal truck movements related to WCM, TCM and RCM. A breakdown of the heavy vehicle movements for “Werona” is summarised in **Table 2**.

Table 2	
Coal Truck pass bys - “Werona”, Blue Vale Road 17/06/09	
Time	Vehicle direction of travel
10:28	Empty coal truck to mine
10:30	Empty coal truck to mine
10:35	Empty coal truck to mine
10:36	Empty coal truck to mine
10:39	Laden coal truck to CPP
10:40	Empty coal truck to mine
10:40	Empty coal truck to mine
10:42	Empty coal truck to mine
10:42	Laden coal truck to CPP
10:48	Laden coal truck to CPP
10:58	Empty coal truck to mine
11:00	Empty coal truck to mine
11:00	Empty coal truck to mine
11:05	Empty coal truck to mine
11:05	Laden coal truck to CPP
11:08	Empty coal truck to mine
11:09	Empty coal truck to mine
11:10	Empty coal truck to mine
11:11	Laden coal truck to CPP
11:12	Empty coal truck to mine
11:12	Empty coal truck to mine
11:18	Laden coal truck to CPP
11:20	Laden coal truck to CPP
11:20	Laden coal truck to CPP
11:20	Laden coal truck to CPP
11:22	Empty coal truck to mine
11:22	Empty coal truck to mine
11:23	Laden coal truck to CPP
11:26	Laden coal truck to CPP

The total measured contribution from mine-related vehicles at “Werona” was **47.0 dB(A)**, L_{eq} (1 hour). This is below the daytime criterion of **60 dB(A)** L_{eq} (1 hour).

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0412 023 455.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge
Acoustical Consultant

Review:



Neil Pennington
Acoustical Consultant



21 December 2009

Ref: 06259/3370

Mr. Danny Young
Whitehaven Coal Mine
PO Box 600
GUNNEDAH NSW 2380

RE: WHITEHAVEN COAL – ROAD HAULAGE NOISE MONITORING, DECEMBER 2009

This letter report presents the results of a road noise measurements conducted for the Whitehaven Coal Mine (WCM), Tarrawonga Coal Mine (TCM) and Rocglen Coal Mine (RCM). The measurements were conducted at “Brooklyn” and “Werona” on Blue Vale Road with the intention of determining the $L_{Aeq(1\text{ hour})}$ noise contribution from mine-related vehicles, particularly coal haul trucks. There are two separate residences on “Brooklyn” and simultaneous noise measurements were made at the front of both residences. Residence 1 is closest to Blue Vale Road (approximately 90m) whilst residence 2 is approximately 480m from the road.

The approvals granted for TCM and RCM state that the cumulative noise level from traffic generated by the three mines must not exceed 60 dB(A), $L_{Aeq(1\text{hour})}$ during the day and 55 dB(A), $L_{Aeq(1\text{hour})}$ during the night at these locations. For the purposes of traffic noise assessment the DECC *Environmental Criteria for Road Traffic Noise* (ECRTN) defines day as 7am – 10pm and night as 10pm – 7am. On Sundays and public holidays the 7am transition changes to 8am.

The noise measurements were made adjacent to the front (eastern) facade of both residences at “Brooklyn” between 9:45 am and 10:15 am on Tuesday 8 December and at “Werona” between 9.30 am and 10.30 am on Friday 18 December 2009 with third-octave band Bruel & Kjaer Observer sound level meters (IEC Type 1). The sound level meters were placed on tripods and recorded continuously at 1-second statistical intervals while notes on passing vehicles were written down.

Over the course of the measurement period at “Brooklyn” there were 20 coal truck movements related to WCM, TCM and RCM associated with the mine. Other significant noise sources observed throughout the monitoring period included a contribution from birds and insects and planes. The total measured noise level for the one hour period as dB(A), L_{Aeq} , therefore, represents that from the trucks, birds, wind and other sources. At approximately 10:15 am a wind shift occurred and strong winds blew up from the North West. The survey was, consequently abandoned at that time.

Due to the discrete nature of the coal truck movements the sound level as each truck past the measurement point (that is from when each truck became audible until it was inaudible again) was readily discernable and the contribution of truck noise could be accurately determined. A breakdown of the heavy vehicle movements for “Brooklyn” is summarised in **Table 1**.

Table 1	
Coal Truck pass bys - “Brooklyn”, Blue Vale Road 8/12/09	
Time	Vehicle direction of travel
9:46	Empty coal truck to mine
9:49	Laden coal truck to CPP
9:49	Laden coal truck to CPP
9:49	Laden coal truck to CPP
9:51	Empty coal truck to mine
9:53	Laden coal truck to CPP
9:56	Empty coal truck to mine
9:58	Laden coal truck to CPP
9:59	Laden coal truck to CPP
10:01	Empty coal truck to mine
10:04	Empty coal truck to mine
10:05	Empty coal truck to mine
10:07	Empty coal truck to mine
10:07	Laden coal truck to CPP
10:08	Laden coal truck to CPP
10:10	Laden coal truck to CPP
10:10	Empty coal truck to mine
10:12	Laden coal truck to CPP
10:13	Laden coal truck to CPP
10:15	Empty coal truck to mine

Based on the 30 minute measurement the calculated contribution from mine-related vehicles at Residence 1 at “Brooklyn” was **52.0 dB(A), $L_{eq}(1 \text{ hour})$** . This is below the daytime criterion of **60 dB(A) $L_{eq}(1 \text{ hour})$** .

The calculated contribution from mine-related vehicles at Residence 2 was **38.8 dB(A), $L_{eq}(1 \text{ hour})$** . This is below the daytime criterion of **60 dB(A) $L_{eq}(1 \text{ hour})$** .

Over the course of the measurement period at “Werona” there were 40 coal truck movements related to WCM, TCM and RCM. A breakdown of the heavy vehicle movements for “Werona” is summarised in **Table 2**.

Table 2	
Coal Truck pass bys - "Werona", Blue Vale Road 18/12/09	
Time	Vehicle direction of travel
9:31	Laden coal truck to CPP
9:32	Laden coal truck to CPP
9:35	Empty coal truck to mine
9:36	Laden coal truck to CPP
9:37	Laden coal truck to CPP
9:39	Empty coal truck to mine
9:40	Empty coal truck to mine
9:41	Empty coal truck to mine
9:43	Laden coal truck to CPP
9:45	Laden coal truck to CPP
9:46	Empty coal truck to mine
9:49	Laden coal truck to CPP
9:49	Laden coal truck to CPP
9:50	Empty coal truck to mine
9:52	Laden coal truck to CPP
9:53	Empty coal truck to mine
9:54	Empty coal truck to mine
9:54	Laden coal truck to CPP
9:56	Empty coal truck to mine
9:57	Empty coal truck to mine
9:58	Empty coal truck to mine
9:58	Laden coal truck to CPP
10:00	Laden coal truck to CPP
10:03	Empty coal truck to mine
10:05	Empty coal truck to mine
10:09	Empty coal truck to mine
10:09	Empty coal truck to mine
10:09	Laden coal truck to CPP
10:10	Empty coal truck to mine
10:10	Laden coal truck to CPP
10:11	Laden coal truck to CPP
10:12	Empty coal truck to mine
10:15	Empty coal truck to mine
10:15	Laden coal truck to CPP
10:17	Empty coal truck to mine
10:20	Empty coal truck to mine
10:22	Laden coal truck to CPP
10:25	Laden coal truck to CPP
10:26	Empty coal truck to mine
10:29	Empty coal truck to mine

The total measured contribution from mine-related vehicles at "Werona" was **49.5 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge
Acoustical Consultant

Review:



Neil Pennington
Acoustical Consultant



6 April 2010

Ref: 06259/3492

Mr. Danny Young
Whitehaven Coal Mine
PO Box 600
GUNNEDAH NSW 2380

RE: WHITEHAVEN COAL – ROAD HAULAGE NOISE MONITORING, MARCH 2010

This letter report presents the results of a road noise measurements conducted for the Tarrawonga Coal Mine (TCM) and Rocglen Coal Mine (RCM). The measurements were conducted at “Brooklyn” and “Werona” on Blue Vale Road with the intention of determining the $L_{Aeq(1\text{ hour})}$ noise contribution from mine-related vehicles, particularly coal haul trucks. There are two separate residences on “Brooklyn” and simultaneous noise measurements were made at the front of both residences. Residence 1 is closest to Blue Vale Road (approximately 90m) whilst Residence 2 is approximately 480m from the road.

The approvals granted for TCM and RCM state that the cumulative noise level from traffic generated by the two mines must not exceed 60 dB(A), $L_{Aeq(1\text{ hour})}$ during the day and 55 dB(A), $L_{Aeq(1\text{ hour})}$ during the night at these locations. For the purposes of traffic noise assessment the DECCW *Environmental Criteria for Road Traffic Noise* (ECRTN) defines day as 7am – 10pm and night as 10pm – 7am. On Sundays and public holidays the daytime transition changes to 8am.

The noise measurements were made adjacent to the front (eastern) facade of both residences at “Brooklyn” between 3:40 pm and 4:40 pm and at “Werona” between 2.20 pm and 3.20 pm on Wednesday 31 March with third-octave band Bruel & Kjaer Observer sound level meters (IEC Type 1). The sound level meters were placed on tripods and recorded continuously at 1-second statistical intervals while notes on passing vehicles were written down.

Over the course of the measurement period at “Brooklyn” there were 37 coal truck movements related to TCM and RCM. Other significant noise sources observed throughout the monitoring period included a contribution from birds and insects and a dog barking. The total measured noise level for the measurement period as dB(A), L_{Aeq} , therefore, represents that from the trucks, birds, wind and other sources.

Due to the discrete nature of the coal truck movements the sound level as each truck past the measurement point (that is from when each truck became audible until it was inaudible again) was readily discernable and the contribution of truck noise could be accurately determined. A breakdown of the heavy vehicle movements for “Brooklyn” is summarised in **Table 1**.

Time (pm)	Vehicle direction of travel
3:39	Laden coal truck to CPP
3:40	Laden coal truck to CPP
3:40	Laden coal truck to CPP
3:44	Laden coal truck to CPP
3:45	Empty coal truck to mine
3:45	Empty coal truck to mine
3:46	Laden coal truck to CPP
3:47	Empty coal truck to mine
3:48	Laden coal truck to CPP
3:50	Empty coal truck to mine
3:52	Laden coal truck to CPP
3:53	Empty coal truck to mine
3:53	Empty coal truck to mine
3:59	Empty coal truck to mine
4:01	Laden coal truck to CPP
4:02	Empty coal truck to mine
4:04	Laden coal truck to CPP
4:07	Laden coal truck to CPP
4:10	Laden coal truck to CPP
4:11	Laden coal truck to CPP
4:12	Empty coal truck to mine
4:15	Laden coal truck to CPP
4:16	Laden coal truck to CPP
4:17	Empty coal truck to mine
4:20	Laden coal truck to CPP
4:22	Empty coal truck to mine
4:23	Empty coal truck to mine
4:24	Laden coal truck to CPP
4:24	Laden coal truck to CPP
4:29	Laden coal truck to CPP
4:30	Laden coal truck to CPP
4:31	Empty coal truck to mine
4:34	Laden coal truck to CPP
4:35	Laden coal truck to CPP
4:35	Empty coal truck to mine
4:35	Empty coal truck to mine
4:38	Laden coal truck to CPP

The total measured noise level at Residence 1 at “Brooklyn was 58 dB(A) $L_{eq}(1 \text{ hour})$, and the calculated contribution from mine-related vehicles was **53 dB(A), $L_{eq}(1 \text{ hour})$** . This is below the daytime criterion of **60 dB(A) $L_{eq}(1 \text{ hour})$** .

The calculated contribution from mine-related vehicles at Residence 2 was **41 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

Over the course of the measurement period at “Werona” there were 40 coal truck movements related to TCM and RCM. A breakdown of the heavy vehicle movements for “Werona” is summarised in **Table 2**.

Time (pm)	Vehicle direction of travel
2:18	Laden coal truck to CPP
2:22	Laden coal truck to CPP
2:23	Empty coal truck to mine
2:24	Empty coal truck to mine
2:25	Laden coal truck to CPP
2:27	Empty coal truck to mine
2:27	Empty coal truck to mine
2:29	Laden coal truck to CPP
2:31	Empty coal truck to mine
2:31	Empty coal truck to mine
2:32	Laden coal truck to CPP
2:35	Empty coal truck to mine
2:35	Empty coal truck to mine
2:39	Laden coal truck to CPP
2:40	Laden coal truck to CPP
2:41	Laden coal truck to CPP
2:41	Empty coal truck to mine
2:43	Empty coal truck to mine
2:44	Empty coal truck to mine
2:44	Laden coal truck to CPP
2:45	Empty coal truck to mine
2:46	Empty coal truck to mine
2:46	Empty coal truck to mine
2:48	Laden coal truck to CPP
2:49	Empty coal truck to mine
2:49	Empty coal truck to mine
2:50	Empty coal truck to mine
2:52	Laden coal truck to CPP
2:52	Empty coal truck to mine
2:54	Laden coal truck to CPP
2:58	Empty coal truck to mine
2:59	Empty coal truck to mine
2:59	Empty coal truck to mine
3:01	Laden coal truck to CPP
3:03	Laden coal truck to CPP
3:04	Empty coal truck to mine
3:08	Laden coal truck to CPP
3:10	Laden coal truck to CPP
3:10	Empty coal truck to mine
3:15	Laden coal truck to CPP

The total measured contribution from mine-related vehicles at "Werona" was **48 dB(A), L_{eq} (1 hour)**. This is below the daytime criterion of **60 dB(A) L_{eq} (1 hour)**.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge
Acoustical Consultant

Review:



Neil Pennington
Acoustical Consultant