ACOUSTICS AND AIR

SUNNYSIDE COAL MINE MODIFICATION

NOISE & BLASTING REVIEW

REPORT NO. 14225
VERSION A

MAY 2015

PREPARED FOR

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

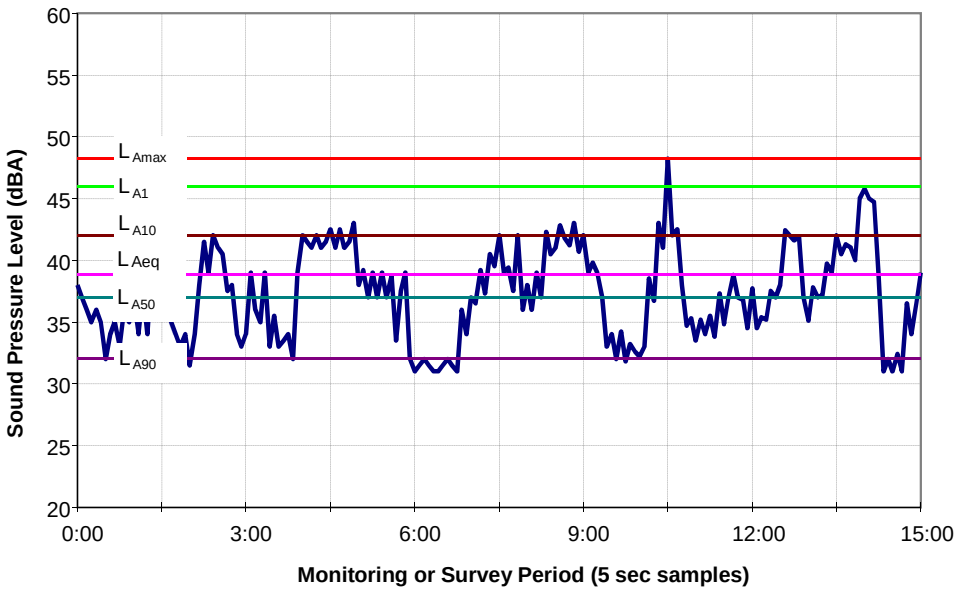
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Wilkinson Murray has been engaged by Whitehaven Coal Mining (Whitehaven) to complete a noise and blasting review for a proposed modification to the Sunnyside Coal Mine approval (the Modification).

The Modification relates to the proposed potential recommencement of operations to extract remaining coal within the approved mining footprint and approval is sought under Section 75W of the Environmental Planning and Assessment Act.

2 BACKGROUND

The Sunnyside Coal Mine is currently approved to extract up to 1 million tonnes per annum of run-of-mine (ROM) coal. In accordance with Condition 5, Schedule 2 of Project Approval 06_0308, mining operations may take place for 7 years from the grant of the mining lease for the Project. The Sunnyside mining lease (ML 1624) was granted on 5 November 2008, which means that mining operations are currently approved until 5 November 2015.

Due to unfavourable economic conditions, Whitehaven discontinued mining operations at Sunnyside on 29 November 2012; however, stockpiled ROM coal continued to be transported to Whitehaven's Gunnedah coal handling and preparation plant (CHPP) on a campaign basis until May 2013. Activities at the mine site since then have been limited to the clearing of remaining ROM coal stockpiles, environmental monitoring, ongoing rehabilitation, and care and maintenance of the site (including spontaneous combustion management).

3 THE MODIFICATION

Whitehaven wish to maintain a current Development Consent at the Sunnyside Mine to enable the extraction of the remaining coal within the approved open cut footprint should current adverse economic conditions change.

The proposal would extend the life of the Sunnyside Coal Mine beyond the currently approved 2015 date.

Accordingly, Whitehaven requires a modification to Project Approval 06_0308 (the Modification) to authorise the extraction of coal from the existing open pit area after November 2015 for a further period of up to 5 years. The Modification would not change the following aspects of the approved operations, which are relevant to noise and blasting:

- Maximum annual ROM coal or waste rock production.
- Extent of mining operations (i.e. no change to the footprints of the open pit or waste rock emplacement).
- Mining methods, including blasting.
- Vehicle fleet.
- Hours of operation (e.g. daytime and evening mining operations only).

- Product transport via on-highway truck to the Whitehaven CHPP in Gunnedah.

This report reviews the potential noise, vibration and airblast impacts associated with the continuation of the following aspects of the Modification:

- Blasting over pressure and vibration;
- On-site extraction/loading; and
- Truck haulage to the CHPP via the public road network.

4 PREVIOUS NOISE & VIBRATION ASSESSMENT

A noise and vibration assessment of the Sunnyside project is summarised in a report of March 2008 (Spectrum Acoustics, 2008). This report identified the following receivers, which are also shown on Figure 1.

Table S1 Residential receivers near the Project Site

R1 "Flodden" (now Innisvale)	R7 "Woodlawn"	R13 "Meeralong"
R2 "Ivanhoe"	R8 "Sugarloaf"	R14 "Skipton"
R3 "Werona"[1]	R9 "Lilydale" [1]	R15 "Glendower"
R4 "Illili"	R10 "Mulwalla" (1)	R16 "Carramar"
R5 "Ferndale"	R11 "Mulwalla" (2)	R17 "Crendon"
F6 "Plain View"	R12 "Lyndon Park"	R18 "Glenfenzie"

Note: 1. This property has been purchased by Whitehaven.

Whitehaven has subsequently purchased the Lilydale (R9) and Werona (R3) properties. Whitehaven has also entered into a private agreement with the owners of the Plain View (R6) property and offered to reach agreement with Glendower (R15) property, although no formal agreement was finalised.

The noise and vibration assessment report prepared by Spectrum Acoustics (2008) assessed the following activities for the Sunnyside Coal Mine:

- Mining operations, with ROM coal production up to 1 Mtpa and the associated mobile fleet;
- On-site blasting;
- Daytime and evening mining operations only;
- On-site coal processing (size reduction and screening only); and
- Transportation of product coal from the on-site size reduction and screening facility to the Whitehaven CHPP and Rail Loading Facility by road.

The mine site layout for the approved operations is shown below in Figure 2.

INSERT FIGURE 1
RECEIVER LOCATION FIGURE

INSERT FIGURE 2
CURRENTLY APPROVED MINING LAYOUT

Summary of Previous Assessment – Operational Noise

During Year 1 of operations, minor exceedances of up to 2dB(A) of the project specific noise level of 35dB(A) were predicted to occur at Illili, Ferndale and Glendower under certain meteorological conditions (south-south west winds and during inversion conditions) with two scrapers used at ground level.

From Year 2 until the end of the mine's life, exceedances of up to 4dB(A) were predicted to occur at Illili and Ferndale during south-southwest winds and temperature inversions during waste emplacement at higher elevations.

These predicted impacts were subsequently approved for the Sunnyside Coal Mine subject to the conditions of Project Approval (06_0308), which include:

- The owner of the Lilydale property being afforded acquisition upon request rights for predicted noise levels greater than 40dBA.
- The owners of the Illili and Ferndale properties being afforded mitigation upon request rights for predicted noise level greater than 37dBA.

In addition, the owner of the Lilydale property was afforded acquisition upon request rights in Project Approval (06_0308) due to predicted noise impacts. This property has subsequently been purchased by Whitehaven.

Summary of Previous Assessment – Blasting

No exceedances of blast and overpressure criteria were predicted, except when mining progresses to within 1500m of the nearest residence, during which time blasts would need to be appropriately modified to achieve compliance with the overpressure criterion.

Summary of Previous Assessment – Road Traffic Noise

The EA traffic assessment indicated, for 14 truck movements per hour, no exceedances of the traffic noise criteria were predicted, although levels equal to the 'local road' criterion were predicted at the two residences set back from Torrens Road.

5 CURRENT APPROVAL

The potential noise and blasting impacts predicted for Sunnyside were approved, subject to the conditions of Project Approval (06_0308) in September 2008.

Relevant conditions of Project Approval (06_0308) are repeated below.

ACQUISITION OF AFFECTED PROPERTIES

Acquisition upon Request

1. Upon receiving a written request for acquisition from the owner of "Lilydale", the Proponent shall acquire the land in accordance with the procedures in Conditions 8-10 of Schedule 4.

Limits on Approval

5. Mining operations may take place on the site for 7 years from the grant of the mining lease for the project.

   Note: Under this Approval, the Proponent is required to rehabilitate the site to the satisfaction of the Director-General and DPI. Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated to a satisfactory standard.

6. The Proponent shall not extract more than 1 million tonnes of ROM coal a year from the site.

7. The Proponent shall use the coal transport route shown in Figure 2 of Appendix 2 to transport all coal from the site to the Whitehaven Siding CHPP.

Hours of Operation

8. Construction activities may take place only between 7 am to 6 pm each Monday to Friday and 7 am to 4 pm on Saturdays, and not on Public Holidays.

9. Mining operations may take place only between 7 am to 10 pm each Monday to Friday and 7 am to 6 pm on Saturdays, and not on Public Holidays.

10. Transport of coal may take place only between 7 am to 6 pm Monday to Friday (or between 7 am to 8 pm during Eastern Summer Time) and between 7 am to 4 pm on Saturdays, and not on Public Holidays.

    Note: See Condition 39 of Schedule 3.

NOISE

Note: These conditions must be read in conjunction with Section 8 of the Statement of Commitments.

Operational Noise Impact Assessment Criteria

3. The Proponent shall ensure that the noise generated during mining operations and other activities on the site does not exceed the level set out in Table 2:

Table 2: Operational noise impact assessment criterion dB(A)

Day / Evening $L_{A10(15min)}$	Land
35	Any residence on, or more than 25% of, any privately owned land (except at "Lilydale")

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 project 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.*
- *These limits apply under meteorological conditions of:*
  - *wind speeds of 3 m/s at 10 metres above ground level; or*
  - *up to 3oC/100 m temperature inversion strength for all receivers, plus a 2 m/s source-to-receiver component drainage flow wind at 10 metres above ground level for those receivers where applicable.*

However, if the Proponent has a written negotiated noise agreement with the landowner of any land, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 or Table 2 on that land in accordance with the negotiated noise agreement.

Additional Operational Noise Mitigation Measures

5. Upon receiving a written request from the landowner of:

   a) "Illili", "Ferndale", or

   b) any residence on privately owned land where noise generated by the project exceeds 37dB(A) $L_{Aeq(15\ min)}$,

   the Proponent shall implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner.

   These additional mitigation measures must be reasonable and feasible.

   If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

   Within 3 months of this approval, the Proponent shall notify all applicable landowners of their entitlements under this condition.

Traffic Noise Impact Assessment Criteria

6. The Proponent shall implement all reasonable and feasible measures to ensure that the traffic noise generated by the project combined with the traffic noise generated by other mines does not exceed the level in Table 4:

Table 4: Traffic noise criterion dB(A)

Day / Evening $L_{Aeq(1hr)}$	Road
55	Any residence adjacent to Torrens Road

Note: Traffic noise generated by the project is to be measured in accordance with the relevant procedures in the DECC's Environmental Criteria for Road Traffic Noise.

BLASTING & VIBRATION

Note: These conditions should be read in conjunction with Section 8 of the Statement of Commitments.

Airblast Overpressure Limits

10. The Proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 5 at any residence on privately-owned land.

Table 5: Airblast overpressure impact assessment criteria

Airblast overpressure level (dB Lin Peak)	Allowable exceedance
115	5% of the total number of blasts in a 12 month period
120	0%

Note: The overpressure values in Table 5 apply when the measurements are performed with equipment having a lower cut-off frequency of 2 Hz or less. If the instrumentation has a higher cut-off frequency a correction of 5 dB should be added to the measured value. Equipment with a lower cut-off frequency exceeding 10 Hz should not be used.

Ground Vibration Impact Assessment Criteria

11. The Proponent shall ensure that the ground vibration level from blasting, or any other activity at the project does not exceed the levels in Table 6 at any residence on privately-owned land.

Table 6: Ground vibration impact assessment criteria

Peak particle velocity (mm/s)	Allowable exceedance
5	5% of the total number of blasts in a 12 month period
10	0%

6 REVIEW OF ACTUAL SUNNYSIDE OPERATIONS & MONITORING DATA

Mining operations at Sunnyside occurred from 2008 to 2012. Annual coal production during this period is provided in the table below.

Reporting Period	Coal Transported to CHPP (tonnes)
1 December 2008 to 30 November 2009	89,725
1 December 2009 to 30 November 2010	279,720
1 December 2010 to 30 November 2011	361,485
1 December 2011 to 30 November 2012	517,453

Information extracted from the annual reports from 2010-2011 and 2011-2012 (i.e. the years of maximum coal production) are summarised below.

6.1 YEAR 2010-2011

6.1.1 Summary of Activities

During the 2010-2011 reporting period, a total of 360,592 tonnes of ROM coal was produced at the Sunnyside site, with 361,481 tonnes transported to the Whitehaven CHPP in Gunnedah.

The following mining equipment was reported to be on site during this period:

Mining Equipment

Item (or equivalent)	No.	Function
Excavator (Hitachi EX1900)	1	Overburden and coal excavation
Excavator (Liebherr 994)	1	Overburden and coal excavation
Volvo IT Front-End Loader	1	Coal excavation and loading
CAT 785 Rear Dump Truck (150t capacity)	2	Overburden and coal haulage
CAT 777 Rear Dump Truck (90t capacity)	4	Overburden and coal haulage
Drilling rig (intermittent)	1	Overburden drilling
Blasting truck (intermittent)	1	Blasting campaigns
CAT 657 Scraper Up to	3	Soil and overburden removal
CAT D10T and CAT D11R Bulldozer	2	Overburden removal and ancillaries
CAT 14H Grader	1	Ancillaries
16 kL Water Truck	1	Dust suppression
Lighting Plants	6	Lighting
100 kVA Diesel Generator	1	Electricity generation (for site services)
840 kVA Diesel Generator	1	Electricity generation (for crushing plant)

6.1.2 Complaints

Three complaints were received in this period which are relevant to this assessment; one regarding traffic noise and two regarding blasting. Whitehaven investigated these complaints in accordance with their respective Management Plan requirements.

For one of the blast complaints, it was determined that the blast had exceeded the blast limits, and Whitehaven notified the relevant stakeholders accordingly.

For the other complaints Whitehaven's investigation indicated they were in compliance with their limits.

6.1.3 Blasting

In accordance with the Blast Management Plan, blast monitoring is conducted at Innisvale (R1), Ivanhoe (R2), Illili (R4) and Plain View (R6), and on occasions at Ferndale (R5).

Of the 18 blasts recorded there were two minor exceedances recorded at Plain View (for which Whitehaven has now entered into a private noise agreement with the owner of this property) (115.1dB and 115.9dB) and one other exceedance (up to 128.9dB at Innisvale) recognised as a design fault. It is noted that during 2014 there was an exceedance of the 120dB criteria during spontaneous combustion remediation works.

In accordance with the requirements of the Blast Management Plan the reasons for each failure were investigated by the blast contractor and Whitehaven representatives and, where appropriate, amendments made to the blast design.

6.1.4 Operational Noise

In accordance with the Noise Management Plan operational noise monitoring was conducted at the most likely affected residences comprising Ivanhoe (R2), Illili (R4), Ferndale (R5), Plain View (R6), and Lilydale (R9).

Appendix A is an extract from the noise and vibration assessment showing noise predictions in relation to Year 2 which best represents the year 2010-2011 (Table 11). The measured noise levels for this period are also summarised in Appendix A (Table 2).

Noise monitoring indicated the Sunnyside Coal Mine was generally inaudible and complied with the 35dBA limit at all receivers during the year except in August where a noise level at Plain View of 37dBA was measured (it is noted Whitehaven has now entered into a private agreement with the owner of this property).

The monitored data is generally consistent with the noise predictions of Spectrum Acoustics (2008).

6.1.5 Traffic Noise

In accordance with the Noise Management Plan traffic noise monitoring is conducted at the Roslyn property on Torrens Lane. This property is owned by Whitehaven and is the closest residence to the coal haulage route (with the next closest residence being some 60m further away from the coal haulage route).

In the two 1-hour periods where traffic noise was measured, there were 8 trucks per hour resulting in an L_{Aeq} of 51dBA and then 19 trucks per hour resulting in an L_{Aeq} of 54dBA. Accordingly, as monitored noise levels complied with the traffic noise criteria of 55dBA at the Roslyn residence, it follows that compliance would have been achieved at other residences located further from the coal haulage route.

6.2 Year 2011 – 2012

6.2.1 Summary of Activities

During the reporting period, a total of 690,014 tonnes of ROM coal was produced at the Sunnyside site, with 517,453 tonnes transported to the Whitehaven CHPP in Gunnedah.

The table below summarises the mining equipment (which was a slightly reduced fleet compared to previous years and less than modelled in the Noise Assessment).

Mining Equipment

Item (or equivalent)	No.	Function
Excavator (Liebherr 994)	1	Overburden and coal excavation
Volvo IT Front-End Loader	1	Coal excavation and loading
Komatsu 785 Rear Dump Truck (90t capacity)	3	Overburden and coal haulage
CAT D10T	1	Overburden removal and ancillaries
CAT 14H Grader	1	Ancillaries
CAT 980H Wheel Loader	1	ROM coal loading
16 kL Water Truck	1	Dust suppression
Lighting Plants	6	Lighting
100 kVA Diesel Generator	1	Electricity generation (for site services)
840 kVA Diesel Generator	1	Electricity generation (for crushing plant)

6.2.2 Complaints

Two complaints were received during this period, both regarding blasting. Whitehaven investigated these complaints in accordance with the Management Plan requirements, with noise and vibration limits being met on both occasions.

6.2.3 Operational Noise

Appendix B is an extract from the noise and vibration assessment in relation to Year 5 which best represents the year 2011-2012 (Table 11). The measured noise levels for this period are also summarised in Appendix B (Table 2).

The Sunnyside Coal Mine was generally inaudible and monitored noise levels complied with the 35dBA criterion, with the exception of one instance during the daytime (February) when 38dBA was recorded at Plain View under a south-westerly wind, one instance during the evening (May) when 37dBA was recorded at Ferndale during a southerly wind and one instance during the day (May) when 36dBA was recorded at Glendower during a southerly wind.

The measured noise levels for Plain View, Ferndale and Glendower are consistent with the predicted noise levels in the EA particularly in relation to the exceedances for Year 5 which occur under inversions or downwind.

It should be noted Whitehaven has entered into a private agreement with the owner of Plain View, and the owner of Ferndale is afforded the right to request noise mitigation works at the residence in accordance with the existing Project Approval conditions.

6.2.4 Blasting

There were 20 blasts in this period. Only one exceeded 120dB by a marginal amount (122.2 at Plain View; Whitehaven has entered into a private noise agreement with the owner of Plain View). In accordance with the requirements of the Blast Management Plan the reasons for each failure were investigated by the blast contractor and where appropriate amendments made to the blast design. Poor blast timing was the reason for this exceedance.

6.2.5 Traffic Noise

Measured noise levels at the closest property called Roslyn (which is mine owned) during the reporting period were as follows:

- In February, traffic noise was measured as 56dB for 18 trucks.
- In May, traffic noise was measured as 57dB for 18 trucks.
- In September, traffic noise was measured as 56dB for 18 trucks.

As described above, Roslyn is some 60m closer to the coal haulage route than the nearest privately owned receiver. Noise levels are expected to be some 4.5dB lower at these other receivers located further away from the coal haulage route in comparison to noise levels at Roslyn (Section 7.3.1), and on this basis, compliance with road noise limit would have been achieved at these other receiver locations assuming similar coal haulage conditions.

7 ASSESSMENT SUMMARY

Our review of the available data indicates the following in relation to the proposed Modification to the Sunnyside Coal Mine:

7.1 Blasting

Providing correct blast design and preparation is undertaken, the blast results have complied with the 115dB overpressure limit and 5 mm/s vibration limit.

Any exceedances have been identified as a result of poor blast design or poor blast preparation.

The Modification would not change approved potential blasting impacts as there would be no change to blasting (e.g. blast size or proximity to receivers) in comparison to what was previously assessed and currently approved by Project Approval 06_0308.

Therefore, it is expected Sunnyside could continue to operate in accordance with relevant airblast Project Approval limits during the proposed additional mine life.

7.2 Operational Noise

As indicated in the EA, $L_{Aeq,15min}$ noise levels were predicted to exceed the 35dBA limit under adverse conditions at some receivers, and as such, these receivers were afforded acquisition upon request rights or mitigation upon request rights in accordance with the Project Approval.

Monitoring data collected during operations generally supports the noise predictions in the EA, and indicates Sunnyside is inaudible and/or compliant with noise limits under calm or neutral meteorological conditions, and may exceed noise limits under adverse conditions at the closest properties where exceedances were predicted by Spectrum Acoustics (2008) for the EA.

It is noted that since approval of the Sunnyside Coal Mine, of the receivers predicted to exceed the noise limits in the EA, Whitehaven has purchased the Lilydale property, and the Illili and Ferndale properties have been afforded mitigation upon request rights in the existing Project Approval conditions. In addition, Whitehaven has purchased or entered into a private agreement with receivers in close proximity to the operations (e.g. the Werona and Plain View properties).

While the annual extraction rate during operations was lower when compared to the annual extraction rate assumed for the noise modelling conducted for the EA, the operational fleet during 2010 to 2012 was generally consistent with what was assessed for the noise modelling.

As there would be no increase to the mine fleet for the proposed modification or the location of noise sources, there is no evidence to suggest that the extraction of remaining coal already approved to be mined for the proposed modification would result in $L_{Aeq,15min}$ noise levels any greater than those nominated in the EA, and subsequently approved for the Sunnyside Coal Mine.

Accordingly, it is expected Sunnyside could continue to operate in accordance with the existing Project Approval noise limits.

In addition, it is also noted that there would be no change to the operational hours of the Sunnyside Coal Mine. As such, no activity would occur during the night time for the proposed Modification, which is generally considered to be the most noise sensitive period for residences.

7.3 Traffic Noise

7.3.1 Condition of Approval

The current Condition of Approval requires noise levels to meet 55dBA over any 1-hour period at residences along Torrens Road.

Traffic noise measurements at the closest residence (Roslyn), which is mine owned, have indicated noise levels of up to 57dBA $L_{Aeq,1hr}$. This information can be used to determine the traffic noise levels at other residences which are all further away.

The predicted noise levels from the EA based on 14 truck movements per hour is repeated below.

Table 16 Receivers along Off-site Coal Transport Route & Predicted Levels

Receiver	Section of Coal Transport Route	Distance, m	Speed, km/h	Criterion dB(A), $L_{eq,1hr}$	Predicted dB(A), $L_{eq,1hr}$
"Lilydale" (R9)	Coocooboonah Lane	200	80	55	34
"Woodlawn"	Oxley Highway	290	100	60	<50
"Pyramid Hill"	Oxley Highway	360	100	60	<50
"Toryburn"	Oxley Highway	100	100	60	50.5
"Rai Lee"	Oxley Highway	150	100	60	<50
"Roslyn"	Torrens Road	40	60	55	55
"The Dog House"	Quia Road (rail underpass)	260	60	60	<50

Note: 1. Worst case predicted level over all years and weather conditions, assuming 40-tonne trucks.

Whilst the table shows compliance with 55dBA in any 1-hour period with 14 trucks at all residences, it also indicates that the criteria is only just met at Roslyn and noise levels higher than 55dBA would be expected for more than 14 trucks. The noise levels for up to 18-19 trucks have been measured as up to 57dBA. However, the noise levels at the other listed residences further away are shown to be at least 4.5dB lower than at Roslyn; therefore, on a 1-hour basis, all these other residences would experience noise levels of 52-53dBA which is less than the 55dBA in the current Condition of Approval assuming similar coal haulage conditions.

7.3.2 Road Noise Policy

Since the EA was prepared and Project Approval granted, there has been a change in the assessment requirements of road traffic noise and the *Environmental Criteria for Road Traffic Noise (ECRTN)* has been replaced with the *Road Noise Policy (RNP)*.

The requirements of the *RNP* for this project are summarised under 3 and 6 in Table 7-1.

Table 7-1 Traffic noise assessment criteria extracted from the NSW *RNP*

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from **new** freeway/arterial/sub-arterial road corridors	$L_{Aeq,\ (15\ hour)}$ 55 (external)	$L_{Aeq,\ (9\ hour)}$ 50 (external)
	2. Existing residences affected by noise from **redevelopment** of existing freeway/arterial/sub-arterial roads 3. Existing residences affected by **additional traffic** on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,\ (15\ hour)}$ 60 (external)	$L_{Aeq,\ (9\ hour)}$ 55 (external)
Local roads	4. Existing residences affected by noise from **new** local road corridors 5. Existing residences affected by noise from **redevelopment** of existing local roads 6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments	$L_{Aeq,\ (1\ hour)}$ 55 (external)	$L_{Aeq,\ (1\ hour)}$ 50 (external)

The policy also deals specifically with principal haulage routes.

2.2.2 Principal haulage routes along public roads

Some industries such as mines and extractive industries are, by necessity, in locations that are often not served by arterial roads. Heavy vehicles must be able to access these often more remote sites and this may mean travelling on local public roads. Good planning practice acknowledges this type of road use and develops ways of managing any associated adverse noise impacts. Principal haulage routes are distinct from private haul roads – further guidance on private haul roads is provided in **Appendix C4**.

Where local authorities identify a 'principal haulage route', the noise criteria for the route should match those for arterial/sub-arterial roads, recognising that they carry a different level and mix of traffic to local roads.

It is considered Torrens Lane (Local Road classification in the EA) would now be a principal haulage route.

The changes relevant to this project if it were to be addressed in accordance with the *RNP* relate to the road classification, as collector roads are no longer included. Roads are either local roads or non-local roads (including principal haulage routes). An assessment in accordance with the new *Road Noise Policy* would change the assessment of traffic noise to be based on a 15-hour (daytime) requirement rather than any 1-hour in the daytime period. The criteria would also increase from 55dBA to 60dBA. This is point 3 in the Table 7-1.

Trucking is permitted for 11 hours in non-daylight saving (7.00am to 6.00pm) and 13 hours in daylight saving (7.00am to 8.00pm), resulting in approximately 150-180 movements per day. This is consistent with the higher daily volumes from the traffic studies.

Whitehaven has advised, that should operations recommence, there would be 150-180 trucks per day on average. For this reason, the 15-hour L_{Aeq} traffic noise level would be based on an average of 14 trucks per hour and is expected to be approximately 1-2dBA lower than the 1-hour level based on 18-19 trucks per hour.

The predicted $L_{Aeq,15hr}$ level would therefore fall in the range of 51-52dBA and will also comply with 15-hour criterion of 60dBA for a sub-arterial road.

8 CONCLUSION

Whitehaven proposes to modify the Project Approval for the Sunnyside Coal Mine to extend the life of the mine for period of up to 5 year.

The Modification would not change key aspects relevant to noise and blasting in comparison to the currently approved operations.

Following review of the previous modelling predictions, as well as blast and noise monitoring results during the operation of the Sunnyside Coal Mine, it is expected the modified Sunnyside Coal Mine could continue to operate in accordance with the existing noise and blasting limits specified in the current Project Approval.

APPENDIX A

NOISE MONITORING RESULTS - 2010-2011

Table 2 SCM Noise Monitoring Results – 8 February 2011 (Evening)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
Illili	8:23 pm	52	5m/s ESE	Birds & insects (52), wind in trees (48), SCM (est. <30)
Ferndale	9:05 pm	52	3.5m/s ESE	Birds & insects (52), wind (40), SCM (30)
Plain View	8:03 pm	50	4m/s SE	Birds & insects (50), wind in trees (40), SCM inaudible
Lilydale	7:45 pm	45	4m/s SE	Birds & insects (42), wind in trees (40), traffic (38), SCM inaudible

Table 3 SCM Noise Monitoring Results – 9 February 2011 (Day)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Illili	9:45 am	45	3m/s E	Birds (45), traffic (35), SCM (<30)
Ferndale	10:03 am	55	3m/s E	Traffic (55), birds & insects (41), SCM inaudible
Plain View	10:22 am	47	2.5m/s E	Birds (47), traffic (35), SCM inaudible
Lilydale	10:40 am	43	2.5m/s E	Traffic (40), birds & insects (39), wind (30), SCM inaudible

Table 2 SCM Noise Monitoring Results – 8 & 9 February 2011 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
8 February	8:45 pm	46	3.5m/s ESE	Birds & insects (44), wind (40), SCM (34), traffic (30)
9 February	9:20 am	46	3m/s E	Birds (45), traffic (40), SCM (<30)

Table 2 SCM Noise Monitoring Results – 19 May 2011 (Day)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
Illili	4:19 pm	41	1.2m/s S	Birds & insects (40), SCM (33)
Ferndale	4:55 pm	43	1m/s S	Birds & insects (40), traffic (39), SCM (30)
Plain View	4:00 pm	40	2m/s SSW	Birds & insects (38), traffic (36), SCM inaudible
Lilydale	3:40 pm	40	2m/s SSW	Traffic (39), birds (32), SCM inaudible

Table 3 SCM Noise Monitoring Results – 19 May 2011 (Evening)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Illili	8:24 pm	34	0.3m/s S	Birds (30), SCM (29), traffic (28)
Ferndale	9:05 pm	32	Calm	SCM (32), insects (23)
Plain View	7:58 pm	35	0.8m/s S	Traffic (33), insects (30), SCM (<25)
Lilydale	7:40 pm	26	0.8m/s S	Insects (26), SCM inaudible

Table 2 SCM Noise Monitoring Results – 19 May 2011 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
19 May	4:38 pm	46	1.2m/s S	Birds & insects (45), traffic (38), SCM (31)
19 May	8:44 pm	33	Calm	SCM (31), traffic (26), birds (26)

Table 2 SCM Noise Monitoring Results – 4 August 2011 (Day)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
Illili	3:35 pm	37	0.5m/s SE	Birds (37), traffic (39), SCM (25)
Ferndale	4:17 pm	45	1m/s SE	Traffic (45), birds (35), SCM (<20)
Plain View	3:13 pm	33	1m/s SE	Birds (32), SCM (25)
Lilydale	2:55 pm	54	2m/s SE	Birds (54), SCM (30)

Table 3 SCM Noise Monitoring Results – 4 August 2011 (Evening)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Illili	8:23 pm	29	0.4m/s SE	SCM (29)
Ferndale	9:02 pm	30	1.2m/s S	SCM (30)
Plain View	8:00 pm	42	0.5m/s SE	Plane (40), SCM (37), traffic (30)
Lilydale	7:38 pm	39	0.5m/s SE	Traffic (36), SCM (36)

Table 2 SCM Noise Monitoring Results – 4 August 2011 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
4 August	3:55 pm	42	0.6m/s SE	Birds (42), traffic (30), SCM (<20)
4 August	8:41 pm	28	Calm	Dog (27), SCM (22)

Table 2 SCM Noise Monitoring Results – 7 November 2011 (Day)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
Illili	4:00 pm	37	2m/s NW	Birds (37), SCM inaudible
Ferndale	4:38 pm	39	2.5m/s NW	Birds & insects (37), SCM inaudible
Plain View	3:43 pm	39	2m/s NW	Birds & insects (36), traffic (36), SCM (25)
Lilydale	3:25 pm	43	2m/s NW	Traffic (41), SCM (34), birds & insects (33)

Table 3 SCM Noise Monitoring Results – 7 November 2011 (Evening)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Illili	7:39 pm	44	0.5m/s NW	Birds & insects (44), SCM inaudible
Ferndale	7:21 pm	46	0.5m/s NW	Birds & sheep (46), SCM inaudible
Plain View	8:02 pm	45	0.5m/s NW	Birds & insects (45), SCM (25)
Lilydale	8:19 pm	41	0.5m/s NW	Birds & insects (39), traffic (38), SCM (30)

Table 2 SCM Noise Monitoring Results – 7 November 2011 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
7 November	4:17 pm	41	2m/s NW	Birds (41), traffic (31), SCM inaudible
7 November	8:47 pm	37	0.5m/s NW	Insects (37), SCM inaudible

APPENDIX B

NOISE MONITORING RESULTS - 2011-2012

Table 2 SCM Noise Monitoring Results – 7 February (Day)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
Illili	4:19 pm	47	2m/s SW	Traffic (45), Birds (38), wind (38), **SCM inaudible**
Ferndale	5:05 pm	46	1-2m/s SW	Birds (45), domestic noise (35), **SCM inaudible**
Plain View	4:21 pm	42	1-2m/s SW	**SCM (38)**, wind (38), Birds & insects (33)
Lilydale	3:55 pm	44	2m/s SW	Birds & insects (40), Traffic (38), **SCM (31)**

Table 3 SCM Noise Monitoring Results – 7 February 2011 (Evening)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Illili	8:19 pm	44	2-3m/s SW	Birds & insects (42), wind (36), **SCM (30)**
Ferndale	8:44 pm	50	2-3m/s SW	Birds & insects (50), **SCM (28)**
Plain View	8:31 pm	54	2-3m/s SW	Birds & insects (53), traffic (42), **SCM inaudible**
Lilydale	8:09 pm	45	1-2m/s SW	Traffic (43), Birds & insects (36), **SCM (<30)**

Table 2 SCM Noise Monitoring Results – 7 February 2012 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
7 February	4:39 pm	47	2m/s SW	Birds (44), traffic (41), wind (41), **SCM inaudible**
7 February	7:58 pm	49	1-2m/s SW	Insects (48), wind (40), **SCM (32)**

Table 2 SCM Noise Monitoring Results – 29 May 2012 (Day)				
Location	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
Illili	4:23 pm	41	1m/s S	Birds (41), **SCM (35)**, traffic (32)
Ferndale	5:12 pm	46	1.5m/s S	Traffic (45), **SCM (35)**, birds (33)
Plain View	3:58 pm	48	2-3m/s S	Birds (47), wind in trees (40), traffic (32), **SCM inaudible**
Lilydale	3:35 pm	44	1.5m/s S	Traffic (42), birds & insects (41), **SCM inaudible**

Table 3 SCM Noise Monitoring Results – 29 May 2012 (Evening)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
Illili	8:08 pm	39	2m/s S	Birds & insects (36), **SCM (33)**, traffic (30), wind in trees (30)
Ferndale	9:01 pm	41	1.5m/s S	Birds (38), **SCM (37)**, traffic (30)
Plain View	7:36 pm	51	2-3m/s S	Insects (51), wind in trees (44), traffic (35), **SCM inaudible**
Lilydale	7:10 pm	41	1.5m/s S	Traffic (39), birds & insects (33), **SCM inaudible**

Table 2 SCM Noise Monitoring Results – 29 May 2012 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
29 May	4:50 pm	44	1.5m/s S	Birds (43), **SCM (36)**, traffic (35)
29 May	7:58 pm	36	1m/s S	**SCM (35)**, insects (28)

Table 1
SCM Operational Noise Monitoring Results – 17 September 2012 (day)

Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Illili	3:55 pm	44	3 m/s NW	Birds & insects (44), traffic (35), **SCM (25)**
Ferndale	12:25 pm	42	2 m/s NW	Birds & insects (42), **SCM inaudible**
Plain View	2:02 pm	42	1.5 m/s NW	Birds & insects (42), **SCM (22)**
Lilydale	3:35 pm	46	3 m/s NW	Traffic (44), birds & insects (39), **SCM (32)**

Table 2
SCM Operational Noise Monitoring Results – 17 September 2012 (evening)

Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Illili	7:30 pm	30	0.5 m/s SE	Insects (27), traffic (27), **SCM (<20)**
Ferndale	8:10 pm	25	Calm	Insects (23), **SCM (21)**
Plain View	6:48 pm	42	0.5 m/s SE	Insects (41), traffic (35), **SCM (21)**
Lilydale	6:30 pm	43	0.5 m/s SE	Traffic (41), birds & insects (38), **SCM (<20)**

Table 3
SCM Operational Noise Monitoring Results – 18 September 2012 (day)

Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Illili	12:49 pm	36	1.5 m/s NW	Birds & insects (36), **SCM (<20)**
Ferndale	2:27 pm	47	1 m/s N	Traffic (45), birds & insects (42), **SCM inaudible**
Plain View	n/a	n/a	3 m/s NW	Rain - no mining from mid afternoon

Table 4
SCM Operational Noise Monitoring Results – 18 September 2012 (evening)

Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Illili	8:40 pm	25	1 m/s N	Traffic (23), insects (20), **SCM inaudible**
Ferndale	8:03 pm	29	1 m/s N	Sheep (26), insects (25), traffic (20), **SCM inaudible**
Plain View	9:19 pm	33	0.5 m/s N	Traffic (31), insects (29), **SCM inaudible**

Table 5
SCM Operational Noise Monitoring Results – 19 September 2012 (day)

Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Illili	2:08 pm	45	1.5 m/s, NW	Birds & insects (45), traffic (30), **SCM inaudible**
Ferndale	12:34 pm	47	1.5 m/s NW	Traffic (46), birds & insects (43), **SCM barely audible**
Plain View	4:05 pm	41	0.5 m/s NW	Birds & insects (40), traffic (35), **SCM (25)**

Table 6
SCM Operational Noise Monitoring Results – 19 September 2012 (evening)

Location	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Identified Noise Sources
Illili	6:26 pm	35	Calm	Traffic (35), insects (25), **SCM inaudible**
Ferndale	6:59 pm	47	Calm	Traffic (47), insects (32), **SCM (<20)**
Plain View	7:39 pm	41	Calm	**SCM (39)**, traffic (33), plane (32), insects (26)

Table 2 SCM Noise Monitoring Results – 19 September 2012 - Glendower				
Date	Time	dB(A),Leq (15 min)	Wind speed/ direction	Identified Noise Sources as dB(A) Leq (15 min)
19 September	3:42 pm	40	1 m/s NW	Birds 7 insects (40), **SCM (25)**
19 September	6:05 pm	47	Calm	Birds & insects (47), traffic (34), **SCM (20)**