



APPENDIX A NOISE AND BLASTING IMPACT ASSESSMENT





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Wilpinjong Modification 6 Noise and Blasting Impact Assessment

Report Number 610.10806.00300-R2

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Wilpinjong Modification 6

Noise and Blasting Impact Assessment

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1 INTRODUCTION

1.1 Background

Wilpinjong Coal Pty Ltd (WCPL), a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody Energy), owns and operates the Wilpinjong Coal Mine (Wilpinjong). In 2006, WCPL was granted approval to develop Wilpinjong (Project Approval 05_0021), with production involving conventional open cut operations commencing in late 2006. Wilpinjong is situated approximately 40 kilometres (km) north-east of Mudgee, near the village of Wollar, within the Mid-Western Regional Local Government Area, in central New South Wales (NSW).

WCPL is seeking approval for Modification 6 to Project Approval (05_0021) (the Modification) to facilitate a higher run-of-mine (ROM) production rate from 15 million tonnes per annum (Mtpa) up to approximately 16 Mtpa. Since transitioning to an owner-operator mine in Quarter 2 of 2013, WCPL has implemented a mining efficiency and improvement programme. A review of the outcomes of this programme has identified that the higher ROM production rate (ie 16 Mtpa) could be achieved with minimal alteration to the major mining fixed plant and mobile equipment fleet.

SLR Consulting Australia Pty Ltd (SLR) has been engaged by WCPL to evaluate and assess the potential noise and blasting impacts associated with the Modification. In preparing this assessment SLR has considered several documents including the following:

- *Wilpinjong Noise Monitoring Program (NMP)* (WCPL, 2011)¹;
- *Wilpinjong Blast Management Plan (BMP)* (WCPL, 2011)¹;
- *WCM Modification Noise and Blasting Impact Assessment (NIA Mod 5)* (SLR, 2013);
- *WCM Modification Environmental Assessment (EA Mod 5)* (WCPL, 2013);
- *Wilpinjong Bi-Monthly Environmental Noise Monitoring* (Global Acoustics, 2013);
- *Wilpinjong Bi-Monthly Environmental Noise Monitoring* (Global Acoustics, 2014); and
- *Annual Review and Environmental Management Report 2013 (AR&EMR 2013)* (WCPL, 2014).

1.2 Assessment Requirements

The noise and blasting impacts for the Modification have been guided by the assessment guidelines presented in **Table 1**.

¹ Noise and blast management plans for the Wilpinjong Coal Mine are currently under review and revision by WCPL.

Table 1 Impact Assessment Procedure Guidelines

Assessment Guideline	Criteria	Impact
Operating Noise Guided by the requirements of the NSW <i>Industrial Noise Policy</i> (INP) (EPA, 2000) and associated Application Notes dated 12 June 2013 in relation to setting acceptable project specific noise levels (PSNLs) and assessing any impacts.	Section 5	Section 7
Noise Amenity Cumulative Guided by the requirements of the INP in relation to existing and successive industrial development by setting acceptable (and maximum) cumulative equivalent continuous noise level (LAeq[period]) amenity levels for all industrial (ie non-transport related) noise in a receiver area.	Section 5	Section 8
Blast Emission Guided by the requirements of the Australian and New Zealand Environment Council's <i>Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration</i> (ANZEC, 1990) in relation to setting acceptable blast emission levels which cause human discomfort.	Section 10	Section 10
Note: The Environment Protection Authority (EPA) existed as a legal entity and operated within the NSW Office of Environment and Heritage (OEH) which came into existence in 2011. The EPA became a separate statutory authority on 29 February 2012. The OEH was previously part of the NSW Department of Environment, Climate Change and Water (DECCW). The DECCW was also recently known as the NSW Department of Environment and Climate Change (DECC), and prior to that the NSW Department of Environment and Conservation (DEC).		

1.3 Other Relevant Approved or Proposed Projects

Other relevant approved or proposed projects in the vicinity of Wilpinjong are summarised in **Table 2**.

Table 2 Other Relevant Approved or Proposed Projects

Proponent	Project	Status
Moolarben Coal Mines Pty Ltd (MCMPL)	Moolarben Coal Project Stage 1	Project Approval (MP 05_0117) dated 6 September 2007 (as modified). A Stage 1 Optimisation Modification (Mod 9) was lodged with the NSW Minister for Planning on 1 May 2013. Yet to be determined.
	Moolarben Coal Project Stage 2	A Major Project Application for the Moolarben Coal Project Stage 2 was lodged with the NSW Minister for Planning on 1 May 2008. Subsequently, MCMPL prepared and exhibited the Stage 2 Preferred Project Report (PPR) dated January 2012 and more recently the Stage 2 PPR Response to Submissions dated June 2012. Yet to be determined.
Ulan Coal Mines Ltd (UCML)	Ulan Coal Mine Stage 4	Development Consent (DA-113-12-98) dated 20 December 1999 (as modified).
	Ulan Continued Operations Project	Project Approval (MP 08_0184) dated 15 November 2010 (as modified).

The Ulan Continued Operations Project and the Moolarben Coal Project Stage 2 are considered cumulatively for operational noise (refer to **Section 8**) in this assessment.

In addition, it is noted that the *Moolarben Coal Project Stage 1 Optimisation Modification Environmental Assessment* (EMGA Mitchell McLennan, 2013) was placed on public exhibition in June 2013. Review of predicted noise impacts, as described in the Environmental Assessment (EA) indicates that the Modified Stage 1 operations would not have the potential to increase noise in the vicinity of Wilpinjong above the levels identified in the PPR for the Stage 2 operations.

2 EXISTING WILPINJONG

2.1 Overview

Wilpinjong has an approved ROM coal mining rate of 15 Mtpa and saleable product railing rate of 12.5 Mtpa and operates 24 hours a day.

Mining of ROM coal involves conventional drill and blast, truck and shovel open cut extractive methods with on-site coal handling, washing and stockpiling. Mining operations are supported by existing on-site facilities including a Coal Handling and Preparation Plant (CHPP), infrastructure area, water management storages and rail loading facilities.

All product coal from Wilpinjong is transported by rail to domestic electricity generation customers and to the Port of Newcastle for export.

2.2 Approvals

With respect to noise and blasting emissions, WCPL recently received consent for Modification 5 to operate in accordance with the following project approval and licence conditions:

- NSW Department of Planning and Infrastructure Project Approval (05_0021) dated 1 February 2006 (as modified) with the relevant sections attached as **Appendix A1**.
- EPA Environment Protection Licence (EPL) No 12425 anniversary date 8 February with the relevant sections attached as **Appendix A2**.

It is noted that the Project Approval (05_0021) daytime noise limit in Wollar Village is 36 A-weighted decibels (dBA), whereas the EPL nominates 35 dBA. The Project Approval (05_0021) evening and night-time noise limits in Wollar Village are both 35 dBA, the same as the EPL. In addition, in accordance with Table 3 of the Project Approval (05_0021), residences on properties identified as numbers 69, 129, 135 and 137 are subject to additional noise mitigation (ie double glazing, insulation and/or air conditioning) upon request. It is noted that properties 129 and 135 are under contract of sale to Peabody Energy.

2.3 Noise Management and Compliance

2.3.1 Noise Management Plan

The approved NMP dated September 2011 describes the current noise management regime, which consists of five off-site operator-attended monitoring sites, three off-site continuous real-time monitors together with an on-site Automatic Weather Station (AWS) and 60 metres (m) high Permanent Temperature Tower (PTT) as shown on the Environmental Monitoring Site Plan **Appendix B**. In accordance with the NMP, operator-attended noise monitoring is used for demonstrating compliance with noise criteria, whilst continuous real-time monitoring is used as a noise management tool to assist WCPL to take pre-emptive noise management actions to avoid potential non-compliances. It is noted that the NMP is currently under review and amendment as a result of the Modification 5 approval.

A summary of recent noise monitoring sites and associated monitoring frequency are presented in **Table 3** together with a cross reference to the Land Ownership Details presented in **Section 3.2** (and **Appendix C3**). The three real-time monitors are periodically relocated (ie hence more than three sites are listed in **Table 3**).

Table 3 Recent Noise Monitoring Programme Summary

Locality	Receiver ID ¹	Site	Parameter	Frequency
Cumbo	1_WF	N4 "Hillview", Cumbo Road	Operator-attended monitoring	Every 2 months
Wollar	900	N6 St Laurence O'Toole Catholic Church		
Araluen	1_45	N7 Smith, Ulan-Wollar Road		
Slate Gully	1_58	N9 Maher, Slate Gully Road		
Moolarben	32_32C	N12 Ulan Coal Mine, Ulan-Wollar Road	Real-time monitoring	Continuous
Araluen	1_143	SentineX 30 Araluen Lane		
Wollar	1_WR	SentineX 31 ("Wandoona")		
	942	SentineX 33 ("Wollar Central")		

Note 1: Refer **Section 3.2** and **Appendix C3**.
 ID = Identification.

Due to recent property acquisitions, WCPL now owns previous privately held landholdings where operator-attended monitoring is conducted (ie N4, N7 and N9), while N12 is owned by Ulan Coal Mines (refer **Appendix B**). WCPL also owns the land on which the real-time monitoring is undertaken.

2.3.2 Operator-attended Noise Compliance Results 2013

As described in the AR&EMR 2013, operator-attended noise monitoring was undertaken on a bi-monthly basis at five locations in 2013, including the Langshaw (6) dwelling (N4), St Laurence O'Toole Catholic Church (Wollar - Residential) (N6), Ulan-Wollar Road (East) (N7), Maher dwelling (Slate Gully Road - Wollar) (N9) and Ulan-Wollar Road (west) (Ulan Coal Mines - N12).

Due to the implementation of the Wilpinjong noise management strategy as described **Section 2.3.4**, WCPL has maintained a strong record of recent compliance with the approved noise limits, with no exceedances at privately owned receivers recorded during the 2013 reporting period.

2.3.3 Operator-attended Noise Compliance Results 2014

Consistent with the bi-monthly operator-attended monitoring described in **Section 2.3.2**, a review of the Environmental Noise Monitoring reports (Global Acoustics) for February 2014 and April 2014 indicate no exceedances of the relevant intrusive LAeq(15minute) and or LAeq(1minute) noise limits at privately owned receivers were recorded up until April 2014.

2.3.4 Noise Management Strategy

WCPL implements a noise management strategy at Wilpinjong that includes general noise management measures, continuous real-time noise monitoring, implementation of noise investigation triggers and modification of operations as required.

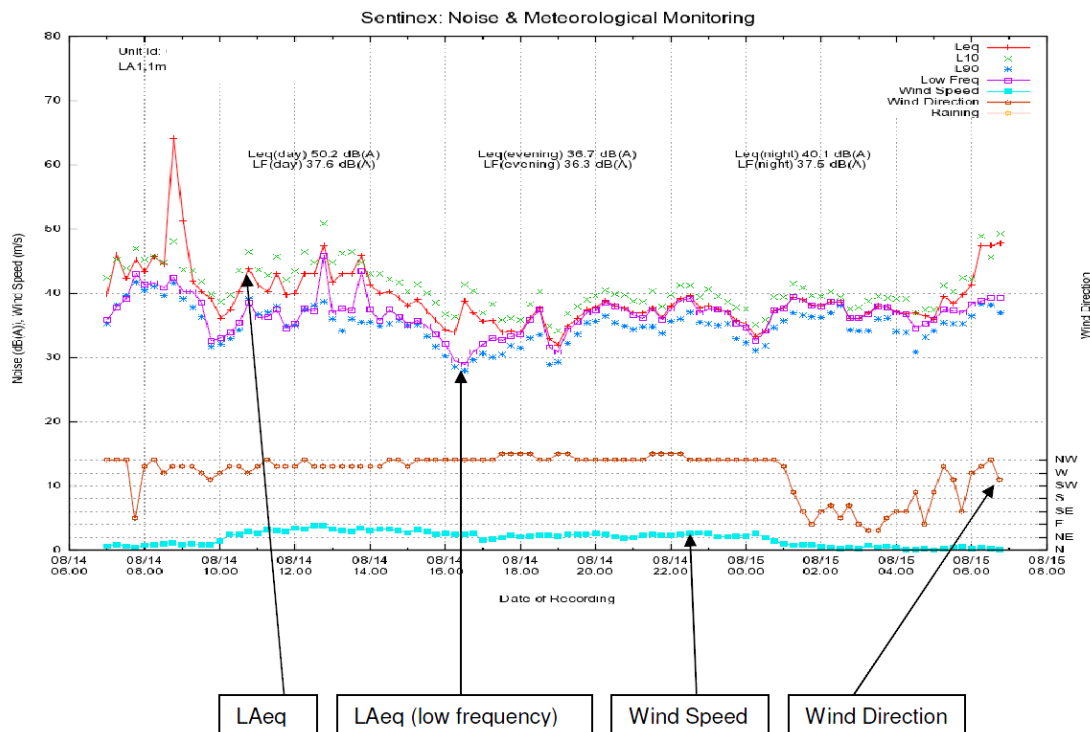
2.3.4.1 General Noise Management Measures

WCPL implements general noise management measures as part of typical operations including:

- Developing an awareness and understanding of noise issues through site inductions for all staff and contractors.
- Avoiding the simultaneous use of significant noise generating equipment wherever possible.
- Preferentially scheduling the noisiest activities to the least sensitive times of the day.
- Maintaining all machinery and plant used on site, in order to minimise noise generation.

- Using the results of continuous real-time noise monitoring to assist in the implementation of pre-emptive management actions to avoid potential non-compliances. A graphical summary of the previous 24 hours noise levels (**Figure 1**) is sent to key Wilpinjong staff at 0700 hours each morning for review and follow-up investigation (as required).
- Monitoring weather conditions via the on-site AWS and PTT and where adverse conditions are experienced or predicted operational changes are made to avoid or reduce noise impacts.

Figure 1 Sample 24 Hour Real-time Noise Monitoring Chart



Source: WCPL

2.3.4.2 Continuous Real-time Noise Monitoring

Continuous real-time noise monitoring is used by WCPL as an ongoing noise management tool to maintain noise levels from Wilpinjong below relevant noise criteria.

Noise Investigation Triggers

Noise investigation triggers are set at a suitable level below the approved noise limit, and are used between the hours of 2000 hours and 1000 hours (to minimise false triggers). As described above the real-time monitoring is not used for compliance monitoring. The focus of real-time monitoring is therefore on the periods when adverse weather conditions that increase noise propagation (eg temperature inversions) are likely to occur, and sources of extraneous noise are less prevalent.

In the event of noise, as recorded by the real-time noise monitors, exceeding a noise investigation trigger, an SMS message is sent to the Control Room Operator, who will then implement the response protocol described in the NMP, as summarised below:

- Step 1: Download audio file from relevant noise monitor to determine noise source.
- Step 2: If found to be extraneous noise then no further action is taken.
- Step 3: If found to be mine noise then monitor noise levels.

- Step 4: If mine noise equals noise limits systematically stand-down machinery.
- Step 5: Continue to stand-down machinery until mine noise reduces to at least 2 dBA below the limit.
- Step 6: Continue to monitor situation and repeat Steps 1 to 5 if re-triggered.
- Step 7: Record details of the investigation, type of response and real-time noise monitor level.
- Step 8: Review of data and response by Environmental Manager (or delegate).

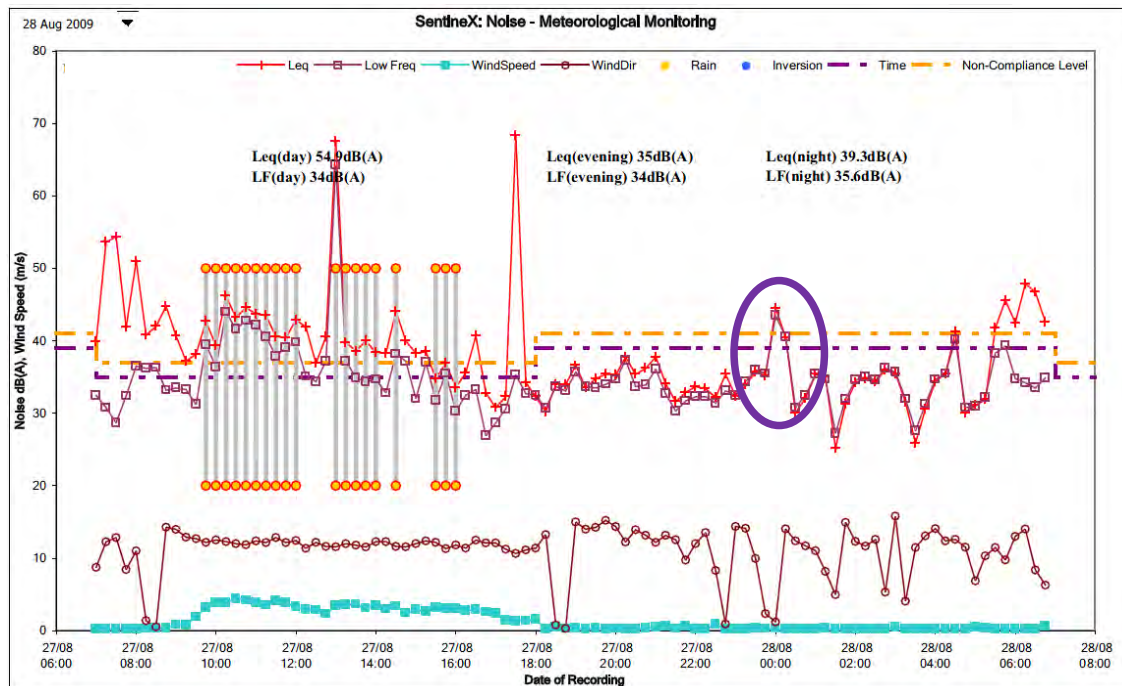
The relevant trigger and response measures in the NMP are periodically updated to reflect any relevant improvements to site operating procedures. As noted above the approved NMP is currently under revision.

Response Protocol Example

Figure 2 presents a sample period (27-28 August 2009) which demonstrates the effectiveness of the Wilpinjong noise management strategy in maintaining mine noise level below the approved limits. This example is from real-time monitoring in Slate Gully. The approximate sequence of events can be summarised as follows:

- Around midnight the noise investigation trigger was triggered and a consequent SMS message sent to the control room notifying of the exceedance.
- Having listened the real-time audio recording, the control room confirmed that the trigger was due to Wilpinjong activities.
- The control room advised the Open Cut Examiner (OCE) of the confirmed trigger.
- The OCE stood-down mobile equipment operating in Pit 2, including one excavator, three haul trucks and one dozer, plus one dozer operating on a waste emplacement area.
- The next noise level update indicates that the ambient noise level has reduced to just below the noise limit (of 39 dBA) for the nearby private receiver, but is still above the trigger level (of 37 dBA). Subjectively, the real-time audio stream indicates that the ambient noise level is controlled by Wilpinjong activities.
- The OCE proceeds to stand-down all mobile equipment.
- The next noise level update indicates that the ambient noise level has reduced to 30 dBA and only Wilpinjong washery mine hum is discernible on the real-time audio.
- The OCE gradually brings equipment back on-line starting with equipment operating in Pit 5 and ROM area, followed by Pit 2 and dozer fleets.
- Both the real-time audio and ambient noise levels are monitored by the control room and OCE for the remainder of the night-time period, with equipment turned-off and on (primarily equipment in Pit 2 and dozers on waste in Pit 5), as required, throughout the period based on both subjective and objective observations by the control room and OCE.

Figure 2 Real-time Noise Management Example and Recorded Mine Noise Levels



Source: WCPL

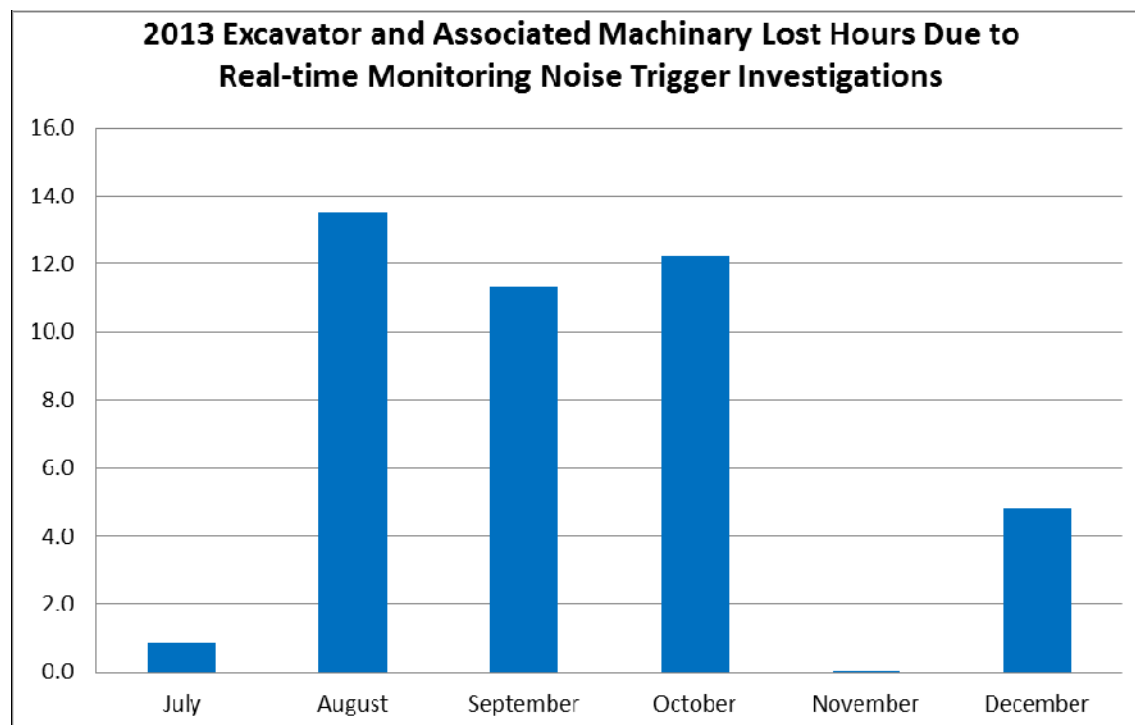
The above example demonstrates how Wilpinjong noise levels are actively managed to maintain mine noise levels below approved limits including when weather conditions are outside those nominated in the Wilpinjong approvals.

Equipment Stand-downs during Implementation of Response Protocols

As described above, in response to Wilpinjong noise levels exceeding noise investigation triggers, equipment is stood-down as required.

During the second half of 2013 a total of 43 excavator and associated machinery hours were lost as a direct response of noise investigation triggers being exceeded. **Figure 3** presents the monthly machinery hours lost due to noise investigation triggers and associated stand-downs (between 2000 hours and 1000 hours) during the second half (H2) of 2013.

Figure 3 Machinery Lost Hours due to Noise Trigger Investigations H2 2013



Source: WCPL

Figure 3 shows the concentration of lost excavator and associated machinery hours during the cooler seasons (ie 38 hours) coinciding with the increased strength and frequency of temperature inversions. It is noted that at the end of 2012, there were no longer any private landholdings in Slate Gully. The real-time monitor in Slate Gully was therefore relocated in November 2012. The Slate Gully real-time noise monitoring was previously a large contributor to excavator lost hour totals prior to 2013.

2.4 Blast Management and Compliance

2.4.1 Blast Management Plan

The approved BMP dated September 2011 describes the current blast management regime, which consists of blast emission monitoring at a range of locations as presented in **Table 4** and shown on the Environmental Monitoring Site Plan **Appendix B**. In accordance with the BMP, blast emission monitoring is used for demonstrating compliance with relevant ground vibration and airblast limits. It is noted that the BMP is currently under review and amendment as a result of the Modification 5 approval.

Table 4 Blast Emissions Monitoring Programme Summary

Monitoring Parameter	Monitoring Sites ¹	Frequency
Ground vibration	• Aboriginal Rock Art sites 72 (V1), 152 (V2) and 153 (V3)	• Every blast within 1 km of sites
	• Power poles	• Every blast within 350 m of sites
	• Railway culverts	
	• Railway bridge	
Ground vibration and airblast	• Privately owned residences	• All blasts within 3 km of residences

Source: WCPL

Note 1: Refer to Environmental Monitoring Site Plan **Appendix B**.

In addition, blast emission monitoring is conducted at the Wollar Primary School in accordance with Condition M8.1 of EPL 12425.

2.4.2 Blast Emission Compliance Results 2013

Based on the AR&EMR 2013, the information presented in **Table 5** relates to blast emission monitoring and management during the 12 month reporting period to December 2013.

Table 5 Blast Emission Monitoring Results Summary 2013¹

	Rock Art (Site 152) Pit 5 South (Southern Site)		Rock Art (Site 153) Pit 5 South (Northern Site)		TD6	
	Vibration ² (mm/s)	Airblast ³ (dBLpk)	Vibration ² (mm/s)	Airblast ³ (dBLpk)	Vibration ² (mm/s)	Airblast ³ (dBLpk)
Maximum	4.1	n/a	8.3	n/a	13.2	n/a
Minimum	0.0	n/a	0.0	n/a	5.8	n/a
	Wollar Public School		Cumbo Culvert Pit 3		Main Rail Culvert Pit 4	
	Vibration ² (mm/s)	Airblast ³ (dBLpk)	Vibration ² (mm/s)	Airblast ³ (dBLpk)	Vibration ² (mm/s)	Airblast ³ (dBLpk)
Maximum	0.6	110	19.6	n/a	52.2	n/a
Minimum	0.0	76	1.8	n/a	3.5	n/a

Source: WCPL

Note 1: Airblast limit not applicable (n/a).

Note 2: Vibration (mm/s) - PPV.

Note 3: dBLpk re 20 µPa.

As described in the AR&EMR 2013, there were no exceedances of the relevant ground vibration and airblast limits at the respective blast emission monitoring sites during the 2013 reporting period.

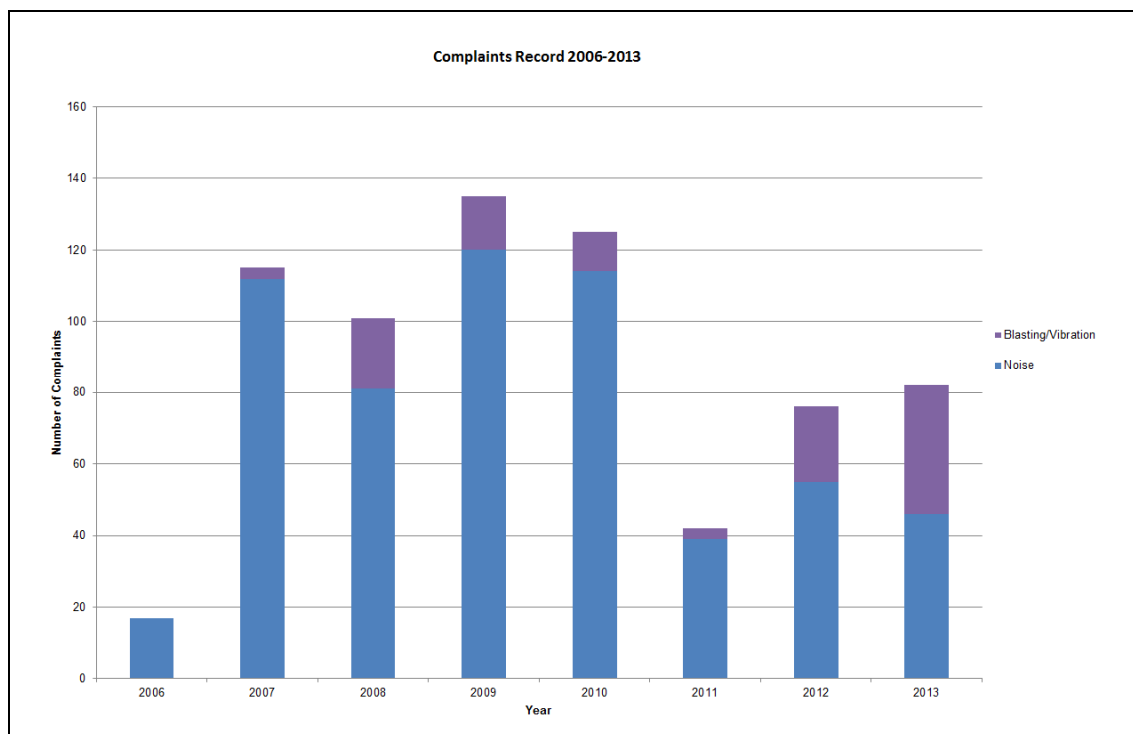
2.5 Noise and Blasting Complaints Summary

WCPL maintains a complaints register in accordance with Project Approval (05_0021). A summary of the complaint records from 2006 to 2013 are presented in **Figure 4** including operating noise and blast complaints. **Figure 4** shows the number of noise related complaints has diminished significantly from a peak recorded in 2009/2010. The reduction in noise-related complaints coincides with the continued implementation of WCPL's proactive noise management strategy.

All complaints received by WCPL relating to noise or blasting were responded to in accordance with the Complaint Response Protocol detailed in both the NMP and BMP. Following each noise related complaint the source and noise levels were determined or verified. In some instances, mining operations were altered in response to a complaint lodged with WCPL during adverse weather conditions. However, there were no reportable environmental incidents relating to noise in the 2013 reporting period.

Similarly, all blasting complaints were responded to and investigations undertaken. There were no reportable incidents relating to blasting in the 2013 reporting period.

Figure 4 Noise and Blasting Complaints Register Summary 2006 to 2013



Source: WCPL

3 PROPOSED MODIFICATION

3.1 Approved and Proposed Hours of Operation

There would be no change in the approved operating hours of Wilpinjong due to the Modification as presented in **Table 6**.

Table 6 Approved WILPINJONG and Proposed Modification Hours of Operation

Operation	Description	Currently Approved ¹	Modification
On-Site Operation	Construction works	Generally daytime (0700 hours to 1800 hours, 7 days per week)	Unchanged
	Mine maintenance, operation, coal handling	24 hours, 7 days per week	Unchanged
	Blasting Operations	0900 hours to 1700 hours A maximum of 2 blasts per day and 5 blasts per week on average over any 12 month period	Unchanged
Off-Site Operation	Train Traffic	24 hours, 7 days per week	Unchanged
	Road Traffic	Wilpinjong main access road via Ulan-Wollar Road 24 hours, 7 days per week	Unchanged

Note 1: As per Project Approval (05-0021) dated 1 February 2006 (as modified) refer **Appendix A1**.

3.2 Wilpinjong Site and Land Ownership

The Dwelling Location Plan (**Appendix C1**) identifies the nearest receivers together with the Land Ownership Plan (**Appendix C2**) and Land Ownership Details (**Appendix C3**) including a list of property ID numbers, landowners and dwelling co-ordinates.

The Mid Western Regional Council Land Zoning Plan (**Appendix C4**) shows the land use zones in the vicinity of Wilpinjong being dominated by Primary Production and Environmental Management zones. In addition, Wollar Village is zoned Village, and there are a large number of passive recreation areas including the Goulburn River National Park and Munghorn Gap Nature Reserve.

3.3 Overview

Since transitioning to an owner-operator mine in 2013, WCPL has been implementing a continuous improvement programme for materials handling/mining. The outcomes of this programme indicate a higher ROM coal production rate could be achieved with only minor changes to the existing mining fleet. An increased rate of annual ROM coal production would provide operational flexibility to maintain WCPL's competitive advantage as a low cost thermal coal producer. WCPL has determined that a number of minor alterations to the approved Wilpinjong Coal Mine are therefore required, including:

- An increase in the upper rate of ROM coal production (from 15 Mtpa to approximately 16 Mtpa).
- A minor increase in the upper annual rate of waste rock production (from 33.3 million bank cubic metres [Mbcm] to approximately 34.1 Mbcm).
- Mine sequencing revisions associated with updated geological modelling/mine planning and the accelerated re-mining of a temporary waste rock emplacement.

There would be no change arising from the Modification to the following aspects of the approved Wilpinjong Coal Mine:

- Open cut and contained infrastructure area;
- Mine life;
- Saleable coal transport off-site (12.5 Mtpa) or associated average or maximum rail movements; and
- Operational workforce (up to approximately 550 people).

The increase in the ROM coal production rate would marginally increase product coal output at times (to approximately 12.6 Mtpa). However, off-site product coal railings would not exceed 12.5 Mtpa in any calendar year (ie rail movements would not be above the approved maximum).

The Modification would not require any significant alteration to the approved Wilpinjong operations and general supporting infrastructure.

3.4 Mining Operation

The Modification would use the existing infrastructure and service facilities at Wilpinjong, including the CHPP. Relevant to this assessment, the main activities associated with the Modification would include:

- No additional construction would be required and there is no change to the approved open cut extents for the Modification.
- Modification 5 anticipated two short campaigns for the development of an elevated waste rock emplacement area up to approximately 450 m Australian Height Datum (AHD) within the footprint of Pit 2 in 2014. It is now anticipated that the second campaign for development of the elevated waste rock emplacement may carry over into early 2015.
- The Modification mine schedule and comparison to the production rates from 2014 onwards are provided in **Table 7**.

Table 7 Modification Mine Schedule 2014 to 2026³

Year		Waste Rock (Mbcm)		ROM Coal (Mt)		Product Coal (Mt)	
		Wilpinjong	Proposed	Wilpinjong	Proposed ¹	Wilpinjong	Proposed ²
2014	9	31.9	31.6	14.9	15.8	12.2	12.6
2015	10	29.3	34.1	15.0	16.0	12.5	12.5
2016	11	28.0	32.4	15.0	15.9	11.9	12.5
2017	12	27.0	32.2	15.0	14.5	11.3	12.5
2018	13	33.3	24.2	14.7	12.5	11.0	12.2
2019	14	18.4	18.2	7.8	7.7	5.9	8.2
2020	15	17.4	19.1	7.3	6.5	5.5	6.2
2021	16	18.6	20.0	7.6	6.6	5.7	6.3
2022	17	21.0	18.7	8.0	5.6	5.8	5.3
2023	18	20.7	16.9	7.2	7.1	5.2	6.7
2024	19	20.2	12.5	7.1	6.7	5.1	6.4
2025	20	10.1	7.6	4.7	2.4	3.4	2.2
2026	21	4.7	3.7	3.2	3.1	2.3	2.8

Note 1: Some ROM coal would report to on-site stockpiles and would not contribute to product totals in that year.

Note 2: Some product coal would report to on-site stockpile and would not increase calendar year railings above 12.5 Mtpa.

Note 3: Mining sequence and rate of mining would continue to be subject to review on the basis of market conditions or unforeseen change to mining conditions. Relevant changes to the mining sequence, mining activities and mine landforms would be approved by the Division of Resources and Energy via revision of the Mining Operations Plan as required.

- Some revision of the open-cut mining sequence is required and the key change is the development of the southern part of Pit 3 and the current alignment of Cumbo Creek would be delayed until later in the mine life, and this would affect the sequencing of other parts of the mine as shown in **Appendix D**.
- With the gains in efficiency that have been recently realised with the owner operator mobile equipment fleet which would be supplemented by three additional D11 dozers, a ROM coal mining rate above 15 Mtpa could be achieved for periods of the mine life (**Table 7**). **Table 8** provides a comparison of the Wilpinjong owner mobile equipment fleet with the Modification.

Table 8 Comparative Owner Operator Mobile Equipment Fleet - 24 Hour Operation

Description	Wilpinjong	Modification
Excavator	4 x R9350, 1 x R9400	4 x R9350, 1 x R9400
Haul Truck	22 x CAT 789	22 x CAT 789
D10 Dozer, D11 Dozer	7, 12	7, 15
Front End Loader	1 x CAT 993K, 1 x CAT 994K	1 x CAT 993K, 1 x CAT 994K
Grader	5 x CAT 16M	5 x CAT 16M
Water Truck	3 x Haulmax 3900, 1 x Volvo Water Cart	3 x Haulmax 3900, 1 x Volvo Water Cart
Drill	2 x ROCD65, 2 x PitViper235	2 x ROCD65, 2 x PitViper235
Tyre Handler	2 x MHT10180T	2 x MHT10180T

- WCPL would also continue to utilise some additional contractor supporting fleet during the daytime. This supporting daytime only equipment would include a range of supplementary equipment including watercarts, graders and smaller dozers for improved road maintenance and watering, rehabilitation activities, supplementary daytime dozer push and general site maintenance work. **Table 9** provides a comparison of the Wilpinjong contractor mobile equipment support fleet with the Modification.

Table 9 Comparative Contractor Mobile Support Fleet - Daytime Only Operation

Description	Wilpinjong	Modification
Topsoil Removal	1 x Front-end loader	-
	1 x Scraper	2 x Scraper (Cat 637)
	3 x MOXY Trucks	4 x 777 Trucks
	-	Watercart (Cat 769)
Supplementary Topsoil Removal/ Rehabilitation/Cleanup/ Dozer Push	-	Dozer D9R
	-	2 x Dozer D10
Additional Watering/Road Maintenance	-	Grader (14M)
	-	Watercart (Cat 775D)
	-	Grader (16H)
Construction (Belt Press Filter)	1 x Front-end loader	1 x Front-end loader
	1 x Bobcat	1 x Bobcat
	2 x Crane	2 x Crane
	1 x Concrete truck	1 x Concrete truck
	1 x Semi-trailer	1 x Semi-trailer
	-	Excavator (120t)

3.5 On-site Blasting

There would be no change in the approved Wilpinjong blasting regime due to the Modification.

3.6 Off-site Road Transport

There would be no material change in the approved Wilpinjong daily road traffic generation due to the Modification and off-site road transport is not further considered in this report.

3.7 Off-site Rail Transport

The Modification would not change approved rates of maximum product transport (12.5 Mtpa) or the approved number of average (6) and maximum (10) daily trains dispatched from Wilpinjong. Train loading would continue to be conducted 24 hours per day, 7 days per week.

Given there would be no change to currently approved rail movements or rail loading hours at Wilpinjong, off-site rail transport noise is not further considered in this report.

4 EXISTING METEOROLOGICAL AND NOISE ENVIRONMENT

4.1 Meteorological Environment

An assessment of the Site Meteorological Measurement Methodology was prepared for Modification 5 as presented in **Appendix E** based on the analysis of the wind velocity and temperature gradients derived from the (new) on-site AWS and PTT. The INP assessable meteorological noise modelling parameters are presented **Table 10**. The INP assessable wind conditions for the Modification are generally consistent with the Project Approval (05_0021) Appendix 10 (refer **Appendix A1**).

The introduction of the PTT and associated direct temperature gradient measurements (refer **Appendix E**) has provided additional data regarding the characterisation of temperature gradients that occur in the Wilpinjong area.

Based on analysis of available data, it was determined that noise impacts and temperature gradients up to 5.5 degrees Celsius (°C)/100 m were assessable, in accordance with the INP, as these temperature inversions occur greater than 10 percent (%) of the time during the evening/night periods during winter. The local temperature inversion data gathered from the PTT has, therefore, introduced more noise enhancing temperature inversion conditions for noise modelling.

Table 10 INP Assessable Meteorological Noise Modelling Parameters

Period	Meteorological Parameter	Air Temperature	Relative Humidity	Wind Velocity	Temperature Gradient
Daytime	Calm	17°C	56%	0 m/s ²	0°C/100 m
Evening	Calm	16°C	62%	0 m/s	0°C/100 m
	Summer Wind 30% (occurrence)	22°C	53%	ESE 3 m/s	0°C/100 m
Night-time	Calm	11°C	80%	0 m/s	0°C/100 m
	Summer Wind > 30 % (occurrence)	18°C	69%	ESE, SE, E 3 m/s,	0°C/100 m
	Strong Inversion (10% exceedance) ¹	5°C	87%	0 m/s	5.5°C/100 m

Note 1: Winter evening/night-time 10% exceedance temperature gradient in accordance with INP **Appendix E Table E5**.

Note 2: m/s = metres per second.

4.2 Noise Environment

The existing Wilpinjong operations have an effect on local noise levels and, therefore, it is appropriate to review the pre-mining background noise data (from 2004) to determine the relevant Rating Background Levels (RBLs) and noise amenity levels (LAeq(period)) in accordance with the INP procedures. In addition, supplementary ambient noise monitoring was conducted in December 2012 as well as measurement of existing road traffic noise off Ulan Road.

Background Noise August - September 2004

Comprehensive background noise surveys to characterise and quantify the pre-mine noise environment in the area surrounding Wilpinjong were conducted in August and September 2004. The measurement methodology and analysis procedures are described in the Wilpinjong Coal Project Environmental Impact Statement (EIS). The unattended background noise logger data from each monitoring location, together with the on-site weather conditions are presented graphically on a daily basis in Report 30-1313R1 *Wilpinjong Coal Project, Construction, Operation and Transportation Noise and Blasting Impact Assessment* (Heggies Pty Ltd, 2005). The ambient noise data was then processed in accordance with the requirements of the INP to derive the ambient noise levels presented in **Table 11**.

The pre-mine background noise levels are summarised in **Table 11** where daytime, evening and night-time are defined as 0700 hours to 1800 hours, 1800 hours to 2200 hours and 2200 hours to 0700 hours respectively.

Table 11 Unattended Noise Monitoring Results 2004 (dBA re 20 µPa)

Locality	Project EIS Reference/ Landowner	Rating Background Level ^{1,2} All Noise Sources			LAeq(period) ³ All Noise Sources		
		Daytime	Evening	Night-time	Daytime	Evening	Night-time
Cumbo	6 Langshaw (dwelling)	27	22	22	51	41	41
	6 Langshaw (25 m from road)	27	23	23	51	44	41
Wollar	900 St Laurence O'Toole Catholic Church (boundary)	31	26	27	64	42	50
Araluen	139 Woolford (dwelling)	25	24	24	43	39	41
Slate Gully	WG Cumbo Pty Ltd (potential dwelling site)	25	22	22	50	44	40
Wilpinjong	WB Cumbo Pty Ltd (dwelling)	27	28	23	52	41	39
Wilpinjong	WF Cumbo Pty Ltd (75 m from Railway)	28	34 ⁴	27	53	51	51
Murrumbidgee	42 Little/Salter (dwelling)	26	24	24	54	38	42
	34 Birt/Hayes (dwelling)	28	43 ⁴	23	46	49	30

Note 1: Measured noise levels less than 31 dBA may have a signal to noise ratio less than 5 dBA.

Note 2: In accordance with the NSW INP (2000), if the RBL is below 30 dBA, then 30 dBA shall be the assumed RBL.

Note 3: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

Note 4: Affected by insect noise or diesel generator in the evening period.

Ambient Noise December 2012

Supplementary noise surveys to quantify ambient noise levels (ie all noise sources) and to estimate industrial noise only (ie in the absence of transport, natural and domestic noise) were conducted in December 2012. Four unattended noise loggers were positioned at 160 Private, 102 Private, 1_155 Peabody and 32_32 Cascade properties for periods of up to 14 days.

In order to supplement the unattended logger and to assist in identifying the character and duration of the noise sources, operator-attended night-time measurements were also conducted in the vicinity of the logging locations. The Site Noise Measurement Methodology and analysis procedures are described in **Appendix F**. The operator-attended measurement results are summarised in **Table 12**.

Table 12 Operator-Attended Ambient Noise Survey Results 2012 (dBA re 20 µPa)

Locality	Modification Reference/ Landowner	Measured LA90(15minute) ¹ All Noise Sources			Measured LAeq(period) ¹ All Noise Sources			Estimated LAeq(period) ¹ Industrial Noise Only		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wollar	160 Private	-	-	21	-	-	54	-	-	<34
Mogo	102 Private	-	-	34	-	-	48	-	-	<34
Tichular	1_155 Peabody	-	-	21	-	-	58	-	-	<34
Coggan	32_32 Cascade	-	-	26	-	-	47	-	-	<34

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours and Night-time 2200 hours to 0700 hours.

The unattended ambient noise logger data from each monitoring location and the on-site weather conditions were analysed on a daily basis and presented graphically as statistical 24 hour ambient noise profiles in the NIA Mod 5 (Appendices F2 to F5). The ambient noise data were then processed in accordance with the requirements of the INP to derive the ambient noise levels presented in **Table 13**.

Table 13 Unattended Noise Ambient Monitoring Results 2012 (dBA re 20 µPa)

Locality	Modification Reference/ Landowner	Measured RBL ^{1,2} All Noise Sources			Measured LAeq(period) ² All Noise Sources			Estimated LAeq(period) ² Industrial Noise Only		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wollar	160 Private	13	23	12	57	56	46	<44	<39	<34
Mogo	102 Private	22	30	12	41	51	45	<44	<39	<34
Tichular	1_155 Peabody	23	22	18	44	43	45	<44	<39	<34
Coggan	32_32 Cascade	19	24	13	54	53	52	<44	<39	<34

Note 1: In accordance with the NSW INP (2000), if the RBL is below 30 dBA, then 30 dBA shall be the assumed RBL.

Note 2: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

During the monitoring period, existing Wilpinjong noise was either barely audible or inaudible; however the INP data analysis procedure tends to minimise the potential for very low level intrusive mine noise to influence resultant RBLs. Moreover, insect noise was common and likely to be a regular seasonal feature of the noise environment, particularly in the warmer months.

Background Noise and Amenity Levels for INP Assessment Purposes

The RBLs adopted for assessment purposes are representative of the background noise environment, with all RBLs at 30 dBA, except for Wollar which has a daytime RBL of 31 dBA. Furthermore, industrial noise amenity levels (ie non-transport related noise) from other mines in the locality are minimal at non-mine owned residences. The RBLs are typical for a rural environment where there is minimal industrial noise and relatively low use transport corridors. In view of the foregoing, the RBLs and noise amenity levels (LAeq(period)) are presented in **Table 14**, which form the basis of establishing the Project-specific noise assessment criteria (**Section 5.1**).

Table 14 Background Noise and Amenity Levels for Assessment Purposes

Locality	Estimated RBL ^{1,2} All Noise Sources			Estimated LAeq(period) ^{1,2} Industrial Noise Only		
	Daytime	Evening	Night-time	Daytime	Evening	Night-time
Wollar Village Residential	31	30	30	<44	<39	<34
All other Privately Owned Land	30	30	30	<44	<39	<34

Note 1: Estimated RBLs and noise amenity levels in the absence of WILPINJONG operation.

Note 2: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours and Night-time 2200 hours to 0700 hours.

The established background noise levels presented in **Table 14** are consistent with the two localities of Wollar Village Residential and other Privately Owned Land contained in the Project Approval (05_0021) (**Appendix A1**).

5 NOISE ASSESSMENT CRITERIA

5.1 Project Operating Assessment Criteria

The EPA has regulatory responsibility for the control of noise from “scheduled premises” under the *Protection of the Environment Operations Act, 1997*. In implementing the INP, the EPA has two broad objectives:

- Controlling intrusive noise levels in the short-term; and
- Maintaining noise amenity levels for particular land uses over the medium to long-term.

The INP prescribes detailed calculation routines for establishing PSNLs (ie LAeq[15minute] intrusive criteria and LAeq[period] amenity criteria) at potentially affected receivers for an industrial development. Ideally, the intrusive noise level should not exceed the background level by more than 5 dBA. Similarly, the noise amenity level should not exceed the specified INP “acceptable” or “maximum” noise level appropriate for the particular land use. The applicable acceptable and maximum noise amenity levels for receivers in the vicinity of Wilpinjong are shown in **Table 15**.

Table 15 INP Acceptable and Maximum Noise Amenity Levels (dBA re 20 µPa)

Locality	LEP Zone ¹	INP Noise Amenity Zone	Amenity LAeq(period) ² Acceptable			Amenity LAeq(period) ² Maximum		
			Day	Evening	Night	Day	Evening	Night
Wollar Village	Village	Rural Residential	50	45	40	55	50	45
Other Privately Owned Land	Primary Production, Large Lot Residential, Environmental Management	Rural Residential	50	45	40	55	50	45
Any	Village	School, Hall ³	External 45 when in use			External 50 when in use		
Any	Primary Production	Church ³	External 50 when in use			External 55 when in use		
Any	National Parks and Nature Reserves	Passive Recreation	External 50 when in use			External 55 when in use		

Note 1: LEP = Local Environmental Plan.

Note 2: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

Note 3: External criteria equivalent to internal criteria plus 10 dBA.

In accordance with the INP’s Chapter 2 Industrial Noise Criteria and associated Application Notes (12 June 2013), the PSNLs for the residential and other localities in the vicinity of Wilpinjong are presented **Table 16** for both intrusive noise and amenity. These criteria are nominated for the purposes of assessing potential noise impacts from Wilpinjong incorporating the Modification.

Table 16 Project-specific Noise Levels and Assessment Criteria (dBA re 20 µPa)

Locality	Land Use	Intrusive LAeq(15minute) ¹			Amenity LAeq(period) ¹		
		Day	Evening	Night	Day	Evening	Night
Wollar Village	Rural Residential ²	36	35	35	50	45	40
	Rural Vacant Land ³						
Other Privately Owned Land	Rural Residential ²	35	35	35	50	45	40
	Rural Vacant Land ³						
Any	School ⁴	Intrusive noise criteria not applicable			External 45 when in use		
Any	Church, Hall ⁴	Intrusive noise criteria not applicable			External 50 when in use		
Any	Passive Recreation	Intrusive noise criteria not applicable			External 50 when in use		

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

Note 2: At the most-affected point within 30 m of the residential area.

Note 3: Where exceedances are predicted over 25% of the vacant land area.

Note 4: External criteria equivalent to internal criteria plus 10 dBA.

The Wollar Village and Other Privately Owned Land amenity criteria nominated in **Table 16** are reflective of the general rural area following review of the Mid-Western Regional Council LEP (**Appendix C4**). The intrusiveness criterion is met if the LAeq(15minute) is less than or equal to the RBL plus 5 dBA, where the RBL is determined from monitoring data following the INP procedures discussed in **Section 4.2**. Thus, the most stringent PSNLs for Wilpinjong incorporating the Modification at rural residential receivers (and vacant land) would be the LAeq(15minute) intrusiveness criterion.

As the INP Acceptable noise level sets the maximum total noise level from all industrial noise sources, cumulative impacts from Wilpinjong incorporating the Modification are assessed against the amenity $L_{Aeq}(\text{period})$ acceptable noise levels specified in **Table 15**.

The INP states that the PSNLs are based on preserving the amenity of at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided the PSNLs are achieved, then most people would consider the resultant noise levels acceptable. In those cases where the PSNLs are not achieved, it does not automatically follow that all people exposed to the noise would find the noise unacceptable. In subjective terms, exceedances of the PSNLs can be described as follows:

- Negligible noise level increase <1 dBA - not noticeable by all people.
- Marginal noise level increase 1 dBA to 2 dBA - not noticeable by most people.
- Moderate noise level increase 3 dBA to 5 dBA - not noticeable by some people but may be noticeable by others.
- Appreciable noise level increase >5 dBA - noticeable by most people.

5.2 Low Frequency Noise Modifying Adjustment Factors

In accordance with the INP's Chapter 4 Modifying factor adjustments, where a noise source contains certain characteristics, such as a dominant low frequency content, the INP states that there is evidence to suggest that it can cause greater annoyance than other noise at the same noise level. The modifying factors (if applicable) are to be applied to the measured or predicted noise level at the receiver and then assessed against the PSNLs. In the case of low frequency (20 hertz [Hz] to 250 Hz) noise, the INP requires a 5 decibel (dB) correction to be applied to the measured or predicted noise levels where the difference between the A and C weighted level is 15 dB (or more) at the receiver.

Targeted low frequency noise measurements of Wilpinjong's noise emissions in Wollar Village (coinciding with temperature inversions) were conducted by SLR in December 2012 using a full spectrum noise monitor located at receiver 900 (St Laurence O'Toole Catholic Church - representative of Wollar Village).

The noise data were then analysed in accordance with the INP requirements to derive the intrusive $L_{eq}(15\text{minute})$ A and C weighted noise levels of Wilpinjong operations and this coincided with strong temperature inversions (up to approximately 5.5°C/100 m) between 0000 hours to 0500 hours.

The measurement results at receiver 900 (St Laurence O'Toole Catholic Church) show a mean difference of 12.6 dB between the (mine-contributed) intrusive $L_{Aeq}(15\text{minute})$ and the $L_{Ceq}(15\text{minute})$ noise levels (ie below the INP's low frequency modifying threshold of 15 dB). On review of this data and previous attended noise monitoring summaries, it is concluded that Wilpinjong noise emissions do not contain "dominant low frequency content" in accordance with the INP's assessment procedures.

5.3 Project Sleep Disturbance Assessment Criteria

The EPA's INP Application Notes dated 12 June 2013 recognise that the current $LA_{1(1\text{minute})}$ sleep disturbance criterion of 15 dBA above the prevailing $LA_{90(15\text{minute})}$ level is not ideal. The assessment of potential sleep disturbance is complex and not fully understood; however the EPA believes that there is insufficient information to determine a suitable alternative criterion.

Appendix B (Technical Background to Road Traffic Noise Criteria) of the *Environmental Criteria for Road Traffic Noise* (EPA, 1999) contains a comprehensive review of research into sleep disturbance and traffic noise. The review has been more recently updated in The NSW RNP (DECCW, 2011) (**Section 5.3** Sleep Disturbance) however the EPA's conclusion remains unchanged as follows:

- Maximum *internal* noise levels below 50 to 55 dBA are unlikely to cause awakening reactions; and
- One or two noise events per night, with maximum *internal* noise level of 65 to 70 dBA, are not likely to affect health and wellbeing significantly.

It is noteworthy that conditions of approval generally include external noise limits. The internal noise levels (presented above) can be conservatively transposed to an external noise level by adding 10 dBA (or 12.5 dBA when measured 1 m from the dwelling facade). It follows, that an external LA1(1minute) noise criteria of 60 dBA would appear to be consistent with the current research in relation to this matter.

The EPA continues to review research on sleep disturbance as it becomes available and in the interim, the EPA suggests that the LA1(1minute) level of 15 dBA above the RBL is a suitable screening criterion for sleep disturbance for the night-time period. This approach is generally consistent with the Project Approval (05_0021) (**Appendix A1**). The Modification night-time LA1(1minute) Sleep Disturbance Noise Levels (SDNLs) are presented in **Table 17** together with the comparable approved LA1(1minute) noise limit.

Table 17 Night-time LA1(1minute) Sleep Disturbance Criteria (dBA re 20 µPa)

Locality	Wilpinjong LA1(1minute) Night-time ¹ Limit	Modification LA1(1minute) Night-time ¹ Criteria
Wollar Village	45	45
Other Privately Owned Land	45	45

Note 1: Monday to Saturday 2200 hours to 0700 hours; Sundays and Public Holidays 2200 hours to 0800 hours.

The proposed night-time operation of the Modification is anticipated to involve a larger proportion of the mobile equipment being operated in repeatable routines and a relatively smaller proportion of continuous fixed plant. Noise emissions from the mobile equipment are typically variable, whereas fixed plant noise emissions are relatively continuous (or steady) levels. When mobile equipment and fixed plant operate simultaneously, some noise sources (including the operation of trains on the rail loop) have the potential to emerge audibly above the overall mine noise.

The bi-monthly operator-attended noise monitoring reports prepared by Global Acoustics comprising monitoring locations N4, N6, N7, N9 and N12 have been examined to determine the mean difference between the intrusive LAeq(15minute) and the corresponding LA1(1minute) noise levels. The results of night-time noise monitoring for the 24 month period ending December 2013 are summarised in **Table 18** including the measured mean (mine-contributed) intrusive LAeq(15minute) and the LA1(1minute) noise levels.

Table 18 Measured Night-time LAeq(15minute) and LA1(1minute) Noise Levels (dBA re 20 µPa)

Locality	Receiver ID ¹	Site	Mean LAeq(15minute)	Mean LA1(1minute)	Mean Difference
Cumbo	1_WF	N4 "Hillview", Cumbo Road	31 dBA	38 dBA	7.1 dBA
Wollar	900	N6 St Laurence O'Toole Catholic Church	28 dBA	37 dBA	8.2 dBA
Araluen	1_45	N7 Smith, Ulan-Wollar Road	33 dBA	40 dBA	7.1 dBA
Slate Gully	1_58	N9 Maher, Slate Gully Road	32 dBA	39 dBA	6.8 dBA
Moolarben	32_32C	N12 Ulan Coal Mines, Ulan-Wollar Road	32 dBA	38 dBA	5.8 dBA
Overall			31 dBA	38 dBA	7.0 dBA

Note 1: Refer **Section 3.2** and **Appendix C**.

The measured results at locations N4, N6, N7, N9 and N12 show a mean difference of 7 dBA between the (mine-contributed) intrusive LAeq(15minute) and the LA1(1minute) noise levels and are therefore consistent with similar mining operations where the difference is typically <10 dBA. Hence, if the intrusive PSNLs (refer **Section 5.1** ie RBL plus 5 dBA) are achieved, then the SDNLs (ie RBL plus 15 dBA) would also be met. This relationship enables the noise assessment process to focus on the setting and assessment of INP-based intrusive noise and amenity levels which aim to minimise annoyance at noise sensitive receiver locations.

Notwithstanding the foregoing, the predicted LA1(1minute) night-time noise levels are presented in **Section 7.3** together with an assessment of potential sleep disturbance impacts from Wilpinjong incorporating the Modification.

5.4 Modification Cumulative Noise Impact Assessment Methodology

In view of the foregoing, **Table 19** presents the methodology for assessing the Modification operating noise levels against the intrusive and amenity PSNLs (**Table 16**) and the LA1(1minute) SDNLs (**Table 17**) together with cumulative amenity noise levels (**Table 15**) for assessing operating noise levels from existing, approved and proposed mining developments in the vicinity of Wilpinjong.

Table 19 Modification and Cumulative Noise Impact Assessment (dBA re 20 µPa)

Assessment Source	Assessment Parameter	Assessment Criteria	Noise Management Zone ¹		Noise Affection Zone
			Marginal	Moderate	
Modification	PSNL Intrusive	RBL plus 5 dBA	1 to 2 dBA above assessment criteria	3 to 5 dBA above assessment criteria	> 5 dBA above assessment criteria ²
	PSNL Amenity	INP acceptable			
	SDNL LA1(1minute)	RBL plus 15 dBA			
Mine Developments	Cumulative Amenity	INP acceptable	1 to 2 dBA above assessment criteria	3 dBA above assessment criteria	> 3 dBA above assessment criteria ³

Note 1: Depending on the degree of predicted exceedance of the relevant assessment parameter potential noise impacts in the noise management zone could range from marginal to moderate (in terms of the perceived noise increase).

Note 2: Exposure to Project noise levels greater than 5 dBA above the relevant PSNL and or SDNL may be considered unacceptable by some landowners.

Note 3: Exposure to cumulative mine noise levels greater than 3 dBA above the relevant INP acceptable noise level may be considered unacceptable by some landowners.

For the purposes of assessing any potential the Modification noise impacts, the noise management and affection zones are further defined as follows.

Project Noise Management Zone

Depending on the degree of predicted exceedance of the PSNL and or SDNL (1 to 5 dBA), potential noise impacts in the noise management zone could range from marginal to moderate (in terms of the perceived noise increase). In addition to the noise mitigation measures included in the predictive modelling (**Section 6**), noise management procedures would include:

- Noise monitoring on-site and within the community.
- Prompt response to any community issues of concern.
- Refinement of on-site noise mitigation measures and operating procedures where practicable.
- Implementation of reasonable and feasible acoustical mitigation at receivers (which may include measures such as enhanced glazing, insulation and/or air-conditioning) at receivers where noise monitoring shows mine noise levels are 3 to 5 dBA above the relevant criteria.

Project Noise Affection Zone

Exposure to Project noise levels greater than 5 dBA above the relevant PSNL and or SDNL may be considered unacceptable by some landowners. These landowners are typically afforded rights for acquisition upon request in the relevant approval documentation.

Management procedures for the Noise Affection Zone would include:

- Discussions with relevant land owners to assess concerns and define responses.
- Implementation of reasonable and feasible acoustical mitigation at receivers (which may include measures such as enhanced glazing, insulation and/or air-conditioning) at receivers where noise monitoring shows mine noise levels are >5 dBA above the relevant criteria.
- Negotiated agreements with land owners where required.

6 NOISE MODELLING METHODOLOGY

6.1 Noise Mitigation and Management Measures

6.1.1 NIA Mod 5

WCPL is obligated to manage noise levels from Wilpinjong in accordance with the noise limits specified in Project Approval (05_0021) using reasonable and feasible mitigation measures. The obligation to meet the noise limits specified in Project Approval (05_0021) has been achieved through a combination of the following:

- Property acquisition which has had the effect of reducing the number of privately owned receivers that could potentially be affected by noise impacts from Wilpinjong operations.
- For the remaining privately owned receivers, the implementation of the noise management strategy as per the NMP, including the use of real-time noise monitoring to manage noise levels during the night.

Further detail regarding the Wilpinjong noise management strategy and WCPL's recent compliance with the noise limits specified in Project Approval 05_00136 is provided in **Section 2.3**, including:

- A description of real-time noise investigation triggers and the response protocol (**Section 2.3.4**).
- An example of when a response protocol was implemented to reduce noise levels from Wilpinjong following an exceedance of the noise investigation trigger level (**Section 2.3.4**).
- Demonstration that WCPL is altering its operations to reduce noise levels from Wilpinjong, (ie the stand-down of machinery as a direct response to noise investigation triggers) (**Section 2.3.4**).

- A summary of attended monitoring results that show WCPL was in compliance with the noise limits specified in Project Approval 05_0031 in the 2013 reporting period (refer **Section 2.3.2**).
- A summary of complaints received by WCPL, shows the number of noise related complaints has diminished significantly from a peak recorded in 2009/2010 (**Section 2.5**).

6.1.2 Wilpinjong Operations Incorporating the Modification

WCPL would continue to meet its obligation to comply with the noise limits specified in Project Approval (05_0021) through the continued implementation of the noise management strategy.

This would include the continuation of real-time monitoring (eg at Wollar), and the stand-down of equipment, as required, as part of the response to an exceedance of noise investigation triggers. On this basis, the noise modelling for the Modification incorporates real-time noise controls under particular adverse meteorological conditions (eg equipment stand-downs) in accordance with this commitment, and to reflect existing operations at Wilpinjong.

Further details regarding the existing owner-operated fleet and the implementation of real-time noise controls are provided in **Sections 6.2** and **6.5**, respectively.

6.2 Mobile Equipment and Fixed Plant Sound Power Levels

The potential for machinery to emit noise is quantified as the sound power level (SWL). At the receptor, the received noise is quantified as the sound pressure level (SPL). In general terms, any variation in the on-site plant and equipment SWLs will produce a similar variation in the off-site SPL at the receiver (eg an increase of 5 dBA in the SWL of equipment operating at a site may result in a corresponding 5 dBA increase in SPL of intrusive noise at the receiver, when averaged over the same 15 minute period).

Comparative mobile equipment, fixed plant and total SWLs are presented in **Table 20** for the existing owner-operated fleet utilised for both Wilpinjong (Modification 5) and the proposed Modification. The NIA Mod 5 established the daytime and evening/night-time total site SWL for the period 2013 to 2018 was approximately 141 dBA. From 2019 onwards, the total number of plant items would decrease, and the associated total site SWL would decrease to approximately 140 dBA.

A detailed breakdown of the daytime and evening/night-time SWLs for the proposed Modification are presented in **Appendix G1** and **Appendix G2** respectively.

Table 20 Wilpinjong (Modification 5) and Modification Sound Power Levels (SWLs)

Wilpinjong (Modification 5)	Years 2013 to 2018			Years 2019 to 2021			Years 2022 to 2023			Years 2024 to 2026		
	Mobile	Total	Total SWL	Mobile	Total	Total SWL	Mobile	Total	Total SWL	Mobile	Total	Total SWL
Wilpinjong (Modification 5)												
Daytime	61	102	141.3	45	86	140.1	45	86	140.1	45	86	140.1
Evening/ Night-time	61	91	141.3	45	75	140.1	45	75	140.1	45	75	140.1
Modification 6												
Daytime	64	114	141.8	49	99	140.7	32	82	139.2	20	70	137.7
Evening/Night- time	64	94	141.6	49	79	140.4	32	62	138.7	20	50	137.0
Difference Modification 6 to Wilpinjong (Modification 5)												
Daytime	3	12	0.5	4	13	0.6	-13	-4	-0.9	-25	-16	-2.4
Evening/ Night-time	3	3	0.3	4	4	0.3	-13	-13	-1.4	-25	-25	-3.1

As shown in **Table 20**, due to the additional owner-operated and contractor mobile equipment (refer **Table 8** and **Table 9**) the proposed Modification daytime total site SWL is up to 0.6 dBA higher by comparison to the existing Wilpinjong (Modification 5) in years 2013 to 2021. However, as discussed in **Section 5.1**, an increase in the noise level of <1 dBA would not be noticeable. From year 2022, the total site SWL during the daytime is anticipated to decrease relative to the approved Wilpinjong (Modification 5).

Similarly, due to the additional owner-operated mobile equipment (refer **Table 8**) the proposed Modification evening/night-time total site SWL is up to 0.3 dBA higher by comparison to the existing Wilpinjong (Modification 5) in years 2013 to 2021. From year 2022, the total site SWL during the evening/night-time is anticipated to decrease relative to the approved Wilpinjong (Modification 5).

The L_{Aeq} SWLs given for each item of mobile equipment do not include noise emissions which emanate from alarms or communication “horns”. It is noted that WCPL have installed broad-band “quacker” reversing alarms on the majority of the Wilpinjong mobile equipment fleet. Further, implementation of positive radio communication is being progressed in place of horns, where safe to do so.

6.3 Wilpinjong Noise Model Validation

The noise model for Wilpinjong was prepared using RTA Software's Environmental Noise Model (ENM for Windows, Version 3.06), a commercial software system developed in conjunction with the NSW EPA. The acoustical algorithms utilised by this software have been endorsed by the ANZEC and all State Environmental Authorities throughout Australia as representing one of the most appropriate predictive methodologies currently available. ENM has been used for all major noise assessments at Wilpinjong including the *Wilpinjong Coal Project Construction, Operation and Transportation Noise and Blasting Impact Assessment* (Heggies Pty Ltd, 2005) and the *Wilpinjong Coal Mine - 75W Noise Impact Assessment* (Heggies Pty Ltd, 2010).

SLR conducted a noise investigation survey in December 2012 to update and validate the Wilpinjong noise model and reflect as-built noise emissions, as follows:

- On-site noise measurements to determine fixed plant SWLs installed since Modification 3 including upgraded CHPP, new conveyors and drives (CV104, CV105, CV202, CV605, CV606, and CV802), ROM Bin 2, Sizing Station as well as locomotives operating on the rail loop.
- The digital terrain was updated to extend receiver area coverage as well as incorporating the proposed Modification mine plans and significant mobile equipment and fixed plant.
- Additional noise sources were added into the model to more accurately reflect the number of as-built noise emitting sources located at the CHPP and materials handling area.
- Far-field operator-attended noise surveys (2 validation locations) were conducted to determine Wilpinjong noise level contribution at each location. For each survey the ambient weather conditions and the location of operating plant and equipment were recorded.
- The outcome of the validation exercise resulted in no change to the previous noise model calibration factor (of 1.8 dBA) which has been included in the Modification assessment (while noting that the validation outcomes are generally consistent with field measurement and modelling results from similar large scale resource developments).

The two operational noise modelling scenarios (described below) include all existing and proposed plant items operating concurrently to simulate the overall maximum energy equivalent (ie $L_{Aeq}(15\text{minute})$) intrusive noise level. A large proportion of the mobile equipment is operated in repeatable routines and a relatively smaller proportion of the emissions emanate from continuous fixed plant items.

6.4 Noise Modelling Scenarios

In accordance with INP requirements, the Modification description was reviewed to determine representative scenarios to assess potential noise impacts. Scenarios representing typical operations of Wilpinjong incorporating the Modification in 2015 and 2018 were selected. Justification for these scenarios is provided below. It is noted that from 2019 the Modification total site SWL would be within the range as previously assessed and approved for Modification 5.

6.4.1 Year 2015 Scenario

The 2015 scenario represents potential worst case noise impacts at the Araluen privately owned receivers, as in this year operations for Wilpinjong incorporating the Modification would:

- Have an north-eastern focus (ie towards Araluen);
- Be at the maximum ROM coal production rate (16.0 Mtpa) and waste rock production rate (34.1 Mtpa); and
- Involve the operation of the maximum number of mobile equipment items (**Table 21**) in addition to CHPP, coal stockpiling, rail loading and maintenance operations.

Table 21 Year 2015 Scenario Typical Owner-operated Mobile Equipment Fleet Distribution

Pit 3	Pit 4	Pit 5	CHPP/ROM Area	Maintenance (Out of Service)
Waste Fleet 1: 1 x Liebherr Excavators R9350 2 x D11 3 x CAT 789D Haul Trucks 2 x D10	Coal Fleet: 2x Atlas Copco PitViper235 Drills 1 x Liebherr Excavators R9400 2 x D11 3 x CAT 789D Haul Trucks	Coal Fleet: 1 x Liebherr Excavators R9350 2 x D11 4 x CAT 789D Haul Trucks	1 x D10 (S/Pile) (ROM) 2 x D11 (S/Pile) (Product) 1 x 994K Wheel Loader (ROM) 2 x CAT 789D haul trucks (ROM) 1 x CAT 789D haul trucks (Reject)	Daytime: 3 x D11 2 x CAT 789D Haul Trucks 2 x D10 1 x 993K Wheel Loader (general) 1 x CAT 16M Grader
Waste Fleet 2: 2 x Atlas Copco ROCD65 Drills 1 x Liebherr Excavators R9350 2 x D11 3 x CAT 789D Haul Trucks 1 x D10	Contractor Fleet: (Top Soil Removal - daytime only) 1 x 120 tonne Excavator 2 x Scraper 4 x CAT 777 Trucks 1 x CAT 769 Water Cart 1 x D9 1 x D10	Waste Fleet: 1 x Liebherr Excavators R9350 2 x D11 4 x CAT 789D Haul Trucks 1 x D10	Construction Fleet: (Belt Press Filter - daytime only) 1 x Front-end loader 1 x Bobcat 2 x Crane 1 x Concrete truck 1 x Semi-trailer	Evening / Night-time: 3 x D11 2 x CAT 789D Haul Trucks 1 x D10 1 x 993K Wheel Loader (general) 1 x CAT 16M Grader
Contractor Fleet: (Additional Watering/Road Maintenance - Daytime only) 1 x CAT 16M Grader 1 x CAT 14M Grader 1 x CAT 775D Water Cart				
Support Fleet: 2 x Haulmax 3900 Water Cart 1 x CAT 16M Grader	Support Fleet: 1 x Haulmax 3900 Water Cart 1 x CAT 16M Grader	Support Fleet: 1 x Haulmax 3900 Water Cart 2 x CAT 16M Grader		Evening / Night-time: 2 x Haulmax 3900 Water Cart

Source: WCPL

Note: Conservative fleet for 2014 construction activities included to demonstrate no material effect at private receivers.

6.4.2 Year 2018 Scenario

The 2018 scenario represents potential worst case noise impacts at Wollar Village privately owned receivers, as in this year operations for Wilpinjong incorporating the Modification would:

- Have an eastern and south-eastern focus (ie towards Wollar Village);
- Be near maximum ROM coal production rate (approximately 12.5 Mtpa); and
- Involve the operation of the maximum number of mobile equipment items (**Table 22**) in addition to CHPP, coal stockpiling, rail loading and maintenance operations.

Table 22 Year 2018 Scenario Typical Owner-operated Mobile Equipment Fleet Distribution

Pit 2	Pit 3	Pit 5	CHPP/ROM Area	Maintenance (out of service)
Coal Fleet: 1 x Liebherr Excavators R9400 2 x D11 4 x CAT 789D Haul Trucks	Waste Fleet 1: 2 x Atlas Copco ROCD65 Drills 1 x Liebherr Excavators R9350 2 x D11 3 x CAT 789D Haul Trucks 1 x D10	Coal Fleet: 1 x Liebherr Excavators R9350 2 x D11 4 x CAT 789D Haul Trucks	1 x D10 (S/Pile) (ROM) 2 x D11 (S/Pile) (Product) 1 x 994K Wheel Loader (ROM) 2 x CAT 789D haul trucks (ROM) 1 x CAT 789D haul trucks (Reject)	Daytime: 3 x D11 2 x CAT 789D Haul Trucks 2 x D10 1 x 993K Wheel Loader 1 x CAT 16M Grader
	Waste Fleet 2: 2x Atlas Copco PitViper235 Drills 1 x Liebherr Excavators R9350 2 x D11 3 x CAT 789D Haul Trucks 2 x D10	Waste Fleet: 1 x Liebherr Excavators R9350 2 x D11 3 x CAT 789D Haul Trucks 2 x D10		Evening / Night-time : 3 x D11 2 x CAT 789D Haul Trucks 1 x D10 1 x 993K Wheel Loader 1 x CAT 16M Grader
	Contractor Fleet: (Top Soil Removal - daytime only) 1 x 120 tonne Excavator 2 x Scraper 4 x CAT 777 Trucks 1 x CAT 769 Water Cart 1 x D9 1 x D10	Contractor Fleet: (Additional Watering/Road Maintenance - Daytime only) 1 x CAT 16M Grader 1 x CAT 14M Grader 1 x CAT 775D Water Cart		
Support Fleet: 1 x Haulmax 3900 Water Cart 1 x CAT 16M Grader	Support Fleet: 2 x Haulmax 3900 Water Cart 1 x CAT 16M Grader	Support Fleet: 1 x Haulmax 3900 Water Cart 2 x CAT 16M Grader		Evening / Night-time : 2 x Haulmax 3900 Water Cart

Source: WCPL

6.5 Preliminary Noise Modelling

Preliminary noise modelling for the Modification indicated that if no real-time noise response controls were implemented, marginal exceedances (ie 1 dBA to 2 dBA) of the consented noise limits (refer **Appendix A1**) could occur at some privately owned receivers in Araluen (ie properties 129, 135 and 137) and Mogo (ie property 102) in Years 2015 and 2018 during the night-time under the worst-case adverse weather conditions assessable under INP based on recent PTT monitoring (ie temperature inversions of 5.5°C/100m). As such, the stand-down of some equipment is expected to be required during worst-case weather conditions to reduce noise levels such that marginal exceedances of the consented noise limits do not occur. It is noted that properties 129 and 135 are under contract of sale to Peabody Energy.

The preliminary modelling indicated that compliance with the consented noise limits could be achieved at Araluen and Mogo through the implementation of various responses, including the following alternative measures for any residences where a 2 dBA reduction may be required:

- Stand-down of the operations in either of the two nearest operating areas, plus an additional D11 dozer in the other corresponding nearest operating area; or
- Stand-down of various mobile fleet combinations from the two nearest operating areas (ie a number of combinations of haul truck and dozer stand-downs).

Stand-downs to achieve a lesser (1 dBA) reduction as required could be readily achieved with a wide range of alternative measures. Actual fleet items stood-down by WCPL during operations to achieve the consented noise limits in Araluen (ie property 129, 135 and 137) and Mogo (ie property 102) would be determined, as required, in accordance with the existing response protocol for exceedances of the noise investigation trigger and relevant operational priorities at the time (refer to **Section 2.3.4.2**).

The preliminary modelling indicated that exceedances of the consented noise limits at a limited number of private receivers in Araluen and Mogo (in the absence of real-time noise controls under adverse weather conditions) would occur during approximately 12% of all night-time periods (2200 hours to 0700 hours) in 2015 and 2018. This represents approximately 5% of all available operating hours in 2015 and 2018.

The implementation of the existing real-time noise control protocols (ie stand-down of equipment) to comply with existing noise limits at Araluen and Mogo is an operational cost to WCPL. WCPL considers this operational cost to be reasonable, as the stand-down of equipment during the implementation of a particular response protocol would directly benefit the four subject properties and there would be a similar benefit (ie 1 dBA to 2 dBA noise reduction) at corresponding private receivers in Wollar Village at the same time.

Given the above, and consistent with existing operations, WCPL considers it is both reasonable and feasible to stand-down equipment, as required, in order to avoid marginal exceedances of the consented noise limits at the limited number of relevant privately owned receivers in Araluen and Mogo. Therefore, the night-time intrusive and SDNL for 2015 and 2018 presented in **Section 7** incorporate the implementation of real-time noise controls under worst-case adverse weather conditions for the limited number of private receivers in Araluen and Mogo.

If the relevant private properties are acquired by Peabody Energy, the implementation of the above operational controls under adverse weather conditions would not be required. It is noted that properties 129 and 135 are currently under contract of sale to Peabody Energy.

7 OPERATING NOISE IMPACT ASSESSMENT

7.1 Daytime Operating Intrusive Noise Levels

The predicted daytime intrusive LAeq(15minute) levels for the 2015 and 2018 operating scenarios are presented in **Table 23** for privately owned receivers together with the relevant PSNLs and consented noise limits (**Appendix A1**).

Table 23 Years 2015 and 2018 Daytime Intrusive LAeq(15minute) Noise Levels (dBA re 20 µPa)

ID No and Landholder	Year 2015 ³ Calm With Elevated Waste Area	Year 2015 ³ Calm Without Elevated Waste Area	Year 2018 ³ Calm	PSNL	Consented Noise Limit
Privately Owned Receivers (excluding Wollar Village)					
69 ¹ Moolarben	14	15	14	35	36
102 Mogo	19	19	18		35
129 ^{1,2} Araluen	18	18	18		37
135 ^{1,2} Araluen	18	18	18		38
137 ¹ Araluen	17	17	17		37
153 Tochilar	11	11	11		35
157 Tochilar	7	7	7		
160A Barigan	7	7	7		
160B Barigan	6	6	6		
Wollar Village					
903 Wollar	16	16	21	35	35
908 Wollar	15	15	18		
914 Wollar	14	14	18		
921 Wollar	15	15	17		
933 Wollar	15	15	17		
942 Wollar	15	15	17		
947 Wollar	15	15	17		
952 Wollar	16	16	17		
953 Wollar	16	16	17		

Note 1: Properties subject to noise mitigation upon request in accordance with Project Approval (05_0021) Table 3.

Note 2: Properties currently under contract of sale to Peabody Energy.

Note 3: Highest predicted noise levels from the INP meteorological conditions in **Table 10** for each receiver.

Note 4: Predicted LAeq(15minute) noise level complies with the PSNLs.

No exceedance of the PSNLs or the consented noise limits are predicted at any privately owned receivers during the day in 2015 or 2018 (**Table 23**). The predicted daytime intrusive noise levels at resource-company owned receivers are presented in **Appendix I1** and summarised in **Appendix I4**.

7.2 Evening Operating Intrusive Noise Levels

The predicted evening intrusive LAeq(15minute) levels for the 2015 and 2018 operating scenarios are presented in **Table 24** for privately owned receivers together with the relevant PSNLs and consented noise limits (**Appendix A1**).

Table 24 Years 2015 and 2018 Evening Intrusive LAeq(15minute) Noise Levels (dBA re 20 µPa)

ID No and Landholder	Year 2015 ³ With Elevated Waste Area		Year 2015 ³ Without Elevated Waste Area		Year 2018 ³		PSNL	Consented Noise Limit
	Calm	Wind	Calm	Wind	Calm	Wind		
Privately Owned Receivers (excluding Wollar Village)								
69 ¹ Moolarben	14	29	15	29	14	31	35	36
102 Mogo	19	14	19	15	18	14		35
129 ^{1,2} Araluen	18	14	18	14	18	14		37
135 ^{1,2} Araluen	18	13	18	13	18	14		38
137 ¹ Araluen	17	13	17	13	17	12		37
153 Tochilar	11	8	11	8	11	7		35
157 Tochilar	6	3	7	3	7	3		
160A Barigan	7	3	7	3	7	2		
160B Barigan	6	2	6	2	6	2		
Wollar Village								
903 Wollar	16	12	16	12	21	18	35	35
908 Wollar	15	10	15	10	18	13		
914 Wollar	14	10	14	10	18	13		
921 Wollar	15	10	15	10	17	12		
933 Wollar	15	10	15	10	17	12		
942 Wollar	15	10	15	10	17	12		
947 Wollar	15	11	15	11	17	13		
952 Wollar	16	11	16	11	17	13		
953 Wollar	16	11	16	11	17	13		

Note 1: Properties subject to noise mitigation upon request in accordance with Project Approval (05_0021) Table 3.

Note 2: Properties currently under contract of sale to Peabody Energy.

Note 3: Highest predicted noise levels from the INP meteorological conditions in **Table 10** for each receiver.

Note 4: Predicted LAeq(15minute) noise level complies with the PSNLs.

No exceedance of the PSNLs or the consented noise limits are predicted at any privately owned receiver during the evening in 2015 or 2018 (**Table 24**). The predicted evening intrusive noise levels at resource-company owned receivers are presented in **Appendix I2** and summarised in **Appendix I4**.

7.3 Night-time Operating Intrusive Noise and Sleep Disturbance

The predicted night-time intrusive LAeq(15minute) and sleep disturbance LA1(1minute) levels for the 2015 and 2018 operating scenarios for privately owned receivers are presented in **Table 25** together with the relevant PSNLs, DSNLs and consented noise limits (**Appendix A1**).

Table 25 Years 2015 and 2018 Night-time Intrusive LAeq(15minute) Noise Levels (dBA re 20 µPa)

ID No and Landowner	Year 2015 ⁴ With Elevated Waste Area			Year 2015 ⁴ Without Elevated Waste Area			Year 2018 ⁴			PSNL/ SDNL	Consented Noise Limit
	Calm	Wind or Inversion	LA1(1min)	Calm	Wind or Inversion	LA1(1min)	Calm	Wind or Inversion	LA1(1min)		
Privately Owned Receivers (excluding Wollar Village)											
69 ¹ Moolarben	15	35	42	15	35	42	15	35	42	35/45	36/45
102 Mogo ³	19	35	42	19	35	42	18	35	42		35/45
129 ^{1,2} Araluen ³	19	37	44	19	37	44	19	35	42		37/45
135 ^{1,2} Araluen ³	18	38	45	18	38	45	19	38	45		38/45
137 ¹ Araluen ³	17	37	44	18	37	44	17	37	44		37/45
153 Tochilar	11	31	38	11	31	38	12	32	39		35/45
157 Tochilar	7	24	31	7	24	31	7	25	32		
160A Barigan	8	28	35	8	28	35	7	26	33		
160B Barigan	7	28	35	7	28	35	7	26	33		
Wollar Village											
903 Wollar	17	33	40	17	34	41	22	35	42	35/45	35/45
908 Wollar	15	32	39	15	33	40	18	31	38		
914 Wollar	15	33	40	15	34	41	18	32	39		
921 Wollar	15	33	40	15	34	41	17	33	40		
933 Wollar	15	34	41	15	35	42	17	35	42		
942 Wollar	16	34	41	16	35	42	17	35	42		
947 Wollar	16	34	41	16	35	42	18	35	42		
952 Wollar	16	33	40	16	34	41	18	35	42		
953 Wollar	16	33	40	16	34	41	18	35	42		

- Note 1: Properties subject to noise mitigation upon request in accordance with Project Approval (05_0021) Table 3.
- Note 2: Properties currently under contract of sale to Peabody Energy.
- Note 3: As described in **Section 6.5**, the night-time noise levels incorporate the implementation of real-time noise controls to achieve compliance with the consented noise limits at private residences in Araluen and Mogo.
- Note 4: Highest predicted noise levels from the INP meteorological conditions **Table 10** for each receiver.
- Note 5: Predicted LAeq(15minute) noise level complies with the intrusive PSNLs.
- Note 6: Predicted marginal noise exceedance 1 to 2 dBA above intrusive PSNLs.
- Note 7: Predicted moderate noise exceedance 3 to 5 dBA above intrusive PSNLs.

The predicted night-time results in **Table 25** show:

- Marginal exceedance of 2 dBA above the PSNL 35 dBA at receiver 129 (2015) and receiver 137 (2015 and 2018);
- Moderate exceedance of 3 dBA above the PSNL 35 dBA at receiver 135 (2015 and 2018); and
- No exceedance of the consented noise limits at any privately owned receiver during the night in 2015 or 2018.

It is noted that the predicted noise level at property 69 of 35 dBA is marginally lower (ie 1 dBA) by comparison with 36 dBA as presented in the NIA Mod 5. However, this assessment is concentrated on the short to medium term, with an eastern focus and when production and fleet numbers are up. Later in the mine the life Property 69 may still receive 36 dBA as previously presented in NIA Mod 5.

The predicted night-time intrusive noise levels at resource-company owned receivers are presented in **Appendix I3** and summarised in **Appendix I4**.

Night-time Intrusive Noise Contours

The outer envelope night-time $L_{Aeq}(15\text{minute})$ intrusive noise contours for Years 2015 and 2018 are presented in **Appendices H1** and **H2** respectively. The noise contours presented incorporate the implementation of real-time noise controls to achieve consented noise limits at Araluen and Mogo.

The calculation of the noise contours involves numerical interpolation of a noise level array with a graphical accuracy of up to approximately ± 2 dBA. This means that in some cases the noise contours will differ slightly from the values in **Table 25**.

7.4 Impact Assessment Summary and Comparison with NIA Mod 5

In summary, the predicted noise levels show that:

- Compliance is generally determined by night-time noise levels, due to the noise enhancing meteorological conditions (refer **Table 10**) that occur at night.
- During the daytime and evening, no privately owned receivers are predicted to exceed the intrusive PSNLs or the consented noise limits.
- During the night-time marginal noise exceedances of 1 to 2 dBA above PSNL 35 dBA are predicted at privately owned receivers 129 and 137 and a moderate noise exceedance of 3 dBA above PSNL 35 dBA is predicted at privately owned receiver 135. These exceedance results are consistent with the existing consented noise levels for these receivers.
- During the night-time no exceedance of the consented noise limits at any privately owned receiver in 2015 or 2018.

Given the above, three receivers (129, 135 and 137) continue to be identified as being in the Noise Management Zone due to Wilpinjong incorporating the Modification. It is noted that two of these receivers are under a contract of sale to Peabody Energy. No receivers were identified as being in the Noise Affection Zone. **Table 26** presents the privately owned receivers with predicted intrusive $L_{Aeq}(15\text{minute})$ noise level exceedances of the PSNLs and $LA_{1(1\text{minute})}$ exceedances of the SDNLs.

Table 26 Privately Owned Receivers¹ with Intrusive PSNL Exceedances

Period	Noise Management Zone		Noise Affection Zone
	1 dBA to 2 dBA above PSNL/SDNL	3 dBA to 5 dBA above PSNL/SDNL	> 5 dBA above PSNL/SDNL
Daytime	-	-	-
Evening	-	-	-
Night-time	129 ² , 137	135 ²	-

Note 1: Refer **Section 3.2** and **Appendix C**.

Note 2: Private receiver under contract of sale to Peabody Energy.

This outcome is consistent with the findings of NIA Mod 5, where four private receivers (namely 69, 129, 135 and 137) were identified as being in the Noise Management Zone.

7.5 Privately Owned Vacant Land Impact Assessment

The noise impacts on vacant land have been assessed in accordance with **Section 5.1** (refer **Table 16**). **Table 27** identifies those properties for all scenarios where exceedances of the intrusive $L_{Aeq}(15\text{minute})$ noise level is predicted for more than 25% of a vacant land.

It is predicted that one privately owned property (ID 146) would experience noise levels exceeding the PSNL on greater than 25% of the property.

Table 27 Privately Owned Vacant Land¹ with Intrusive LAeq(15minute) PSNL Exceedances

Period	Noise Management Zone	Noise Affection Zone
	1 dBA to 5 dBA above PSNL	> 5 dBA above PSNL
Daytime	-	-
Evening	-	-
Night-time	146	-

Note 1: Refer **Section 3.2** and **Appendix C**.

7.6 Review of Existing Wilpinjong Noise Management Plan

In accordance with Project Approval (05_0021), Schedule 2 Condition 5, WCPL are required to prepare a revised NMP that documents the current noise management strategy (refer **Appendix A1**).

8 CUMULATIVE NOISE AMENITY ASSESSMENT

8.1 LAeq(Period) Noise Amenity Criteria

The INP provides non-mandatory cumulative noise assessment guidelines that address existing and successive industrial development by setting acceptable (and maximum) cumulative LAeq(period) noise amenity levels for all industrial noise sources only (ie non-transport related) for a particular land use. It is noted that the INP does not set acceptable cumulative LAeq(15minute) intrusive criteria for all industrial noise sources, but rather seeks to control cumulative noise via the LAeq(period) noise amenity criterion (refer **Section 5.1**).

8.2 Modification Operating Noise Amenity Levels

The predicted daytime, evening and night-time LAeq(period) noise amenity levels for the operating scenarios in Years 2015 and 2018 are presented in **Table 28** for privately owned receivers.

Table 28 Noise Amenity LAeq(period) Years 2015 and 2018 (dBA re 20 µPa)

ID No and Landowner	Year 2015 ³ With Elevated Waste Area			Year 2015 ³ Without Elevated Waste Area			Year 2018 ³			INP Acceptable Amenity Level		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Privately Owned Receivers (excluding Wollar Village)												
69 ¹ Moolarben	11	26	31	11	27	31	11	28	32	50	45	40
102 Mogo	15	17	29	15	17	29	14	17	29			
129 ^{1,2} Araluen	14	17	31	14	17	31	14	17	28			
135 ^{1,2} Araluen	13	16	33	14	16	33	14	16	31			
137 ¹ Araluen	13	16	31	13	16	31	13	15	31			
153 Tochilar	7	9	24	7	10	24	7	10	25			
157 Tochilar	2	5	18	3	5	18	3	5	18			
160A Barigan	3	6	21	3	6	21	2	5	19			
160B Barigan	2	5	21	2	5	21	2	5	20			
Wollar Village												
903 Wollar	12	15	26	12	15	27	17	20	28	50	45	40
908 Wollar	10	13	25	10	13	26	13	16	25			
914 Wollar	10	13	26	10	13	27	13	16	25			
921 Wollar	11	13	26	11	13	27	12	15	26			
933 Wollar	11	13	27	11	13	28	12	15	28			
942 Wollar	11	13	27	11	13	29	13	15	28			
947 Wollar	11	14	27	11	14	28	13	15	28			
952 Wollar	11	14	26	11	14	27	13	16	28			
953 Wollar	11	14	26	11	14	27	13	15	28			
901 School	11	14	27	11	14	28	13	16	28	External 45 when in use		
944 School	11	14	27	11	14	28	13	16	28			
900 St Laurence O'Tools Catholic Church	11	13	23	10	13	24	13	15	23	External 50 when in use		
150A St Luke's Anglican Church	11	14	28	12	14	29	15	17	34			
935 Community Hall	11	13	28	11	13	29	12	15	28	External 45 when in use		

Note 1: Properties subject to noise mitigation upon request in accordance with Project Approval (05_0021) Table 3.

Note 2: Properties currently under contract of sale to Peabody Energy.

Note 3: Highest predicted noise levels from the INP meteorological conditions **Table 10** for each receiver.

Note 4: Predicted LAeq(period) noise level complies with the amenity (INP acceptable) PSNL.

A summary of potential noise impacts at privately owned receivers and other land uses is presented in **Sections 8.2.1** and **8.2.2** respectively. The predicted daytime, evening and night-time LAeq(period) at resource-company owned receivers are presented in **Appendix J1** and summarised in **Appendix J2**.

8.2.1 Privately Owned Receivers Impact Assessment

In summary, the predicted noise levels show that:

- Compliance is generally determined by night-time noise levels, due to the noise enhancing meteorological conditions (refer **Table 10**) that occur at night.
- During the daytime, evening and night-time, no privately owned receivers are predicted to exceed the intrusive PSNLs or the consented noise limits.

8.2.2 Consideration of other Land Uses Impact Assessment

The receiver 901 (School), 944 (School), 900 St Laurence O'Tools Catholic Church, 150A St Lukes Anglican Church and 935 Community Hall are assessed as noise amenity receivers (**Table 28**). The predicted noise levels at all five receivers are below the relevant acceptable INP amenity criteria (**Table 16**).

Consistent with previous assessments, review of the noise contours presented in **Appendices H1** and **H2** indicate that the LAeq 50 dBA noise criterion would be exceeded at both the Goulburn River National Park and the Munghorn Gap Nature Reserve in the vicinity of Wilpinjong. However, Wilpinjong noise emission levels in these areas would be generally comparable to those assessed for the approved mine. It is noted that public facilities in these reserved areas (e.g. camping grounds) are not located in the proximity of the mine.

8.3 Existing, Approved and Proposed Industrial Developments

A summary of the major existing, approved and proposed industrial developments in the vicinity of Wilpinjong are presented in **Table 29**. In addition, predicted noise levels from the Moolarben Coal Project Stage 2 and Ulan Continued Operations Project were also conservatively considered. The estimated mine operating evening and night-time LAeq(period) noise amenity levels from each these developments have been established by reviewing the EA (where available). These are then used for the purposes of the cumulative evening and night-time noise amenity assessment.

Table 29 Existing, Approved or Proposed Developments in the Vicinity of Wilpinjong

Development Site	Approval Date	Consent	Status	Source of Noise Data
Wilpinjong ¹	26 November 2010	DA 23-98/99	Existing/Approved	<i>Wilpinjong Coal Mine - 75W Noise Impact Assessment</i> (Heggies Pty Ltd, 2010)
Wilpinjong incorporating the Modification	-	-	Proposed	Refer Table 28
Ulan Continued Operations Project	15 November 2010	MP 08_0184	Existing/Approved	<i>Ulan Coal Continued Operations Environmental Assessment</i> (Umwelt, 2009)
Moolarben Coal Project Stage 2 ²	-	-	Proposed	<i>Moolarben Coal Mine Stage 2 Preferred Project Report</i> (EMGA Mitchell McLennan, 2012)

Note 1: The existing Wilpinjong operations to be modified by the Modification.

Note 2: Incorporating Stage 1 noise predictions.

In addition, it is noted that the Moolarben Coal Project Stage 1 Optimisation Modification EA was placed on public exhibition in June 2013. Review of predicted noise impacts, as described in the EA indicates that the Modified Stage 1 operations would not have the potential to increase noise in the vicinity of Wilpinjong above the levels identified in the Preferred Project Report (PPR) for the Stage 2 operations. It should be noted that for each of the developments noted above, the likelihood of the existing, approved and proposed developments emitting simultaneous maximum noise emissions is remote, due to the range of development locations and directional and other differences in the noise enhancing weather effects. This cumulative assessment is therefore considered to be conservative.

8.4 Cumulative Evening and Night-time Noise Amenity Assessment

In accordance with the INP Chapter 2 Industrial Noise Criteria, the evening LAeq(4hour) and night-time LAeq(9hour) cumulative sum of the existing, approved and proposed developments noise amenity levels were determined for privately owned and resource-company owned receivers. In summary, the predicted cumulative LAeq(period) noise amenity levels show that no privately owned receivers are predicted to exceed the INP recommended acceptable amenity level during evening or night-time.

The predicted cumulative noise amenity levels at resource-company owned receivers are summarised in **Appendix J3**.

8.5 Consideration of other Land Uses Impact Assessment

The receiver 901 (School), 944 (School), 900 St Laurence O'Tools Catholic Church, 150A St Lukes Anglican Church and 935 Community Hall were all modelled as amenity noise receivers. The predicted noise levels at all five receivers are below INP recommended acceptable amenity level during evening or night-time.

9 BLASTING IMPACT ASSESSMENT

9.1 Review of Existing Wilpinjong Blast Management Plan

A comprehensive blast impact assessment is presented in NIA Mod 5. A review of Blast Management and Compliance is presented in **Section 2.4** of this report. As noted in **Section 3.5**, there would be no change in the approved Wilpinjong blasting regime due to the Modification.

In accordance with Project Approval (05_0021), Schedule 2 Condition 15, WCPL are required to prepare a revised BMP that documents the current blast management strategy (refer **Appendix A1**).

10 SUMMARY OF FINDINGS

10.1 Noise Assessment Criteria

10.1.1 Operating Assessment Criteria

The NSW EPA has regulatory responsibility for the control of noise from "scheduled premises" under the *Protection of the Environment Operations Act 1997*. In implementing the INP, the EPA has two broad objectives.

- Controlling intrusive noise levels in the short-term; and
- Maintaining noise amenity levels for particular land uses over the medium to long-term.

In accordance with the INP's Chapter 2 Industrial Noise Criteria and associated Application Notes dated 12 June 2013, the PSNLs for the residential, industrial and other localities are presented in **Table 30** for intrusive noise and amenity levels. These criteria are nominated for the purposes of assessing potential noise impacts from the Modification.

Table 30 Project Specific Noise Levels and Assessment Criteria (dBA re 20 µPa)

Locality	Land Use	Intrusive LAeq(15minute) ¹			Amenity LAeq(period) ¹		
		Day	Evening	Night	Day	Evening	Night
Wollar Village	Rural Residential ²	36	35	35	50	45	40
	Rural Vacant Land ³						
Other Privately Owned Land	Rural Residential ²	35	35	35	50	45	40
	Rural Vacant Land ³						
Any	School ⁴	Intrusive noise criteria not applicable			External 45 when in use		
Any	Church, Hall ⁴	Intrusive noise criteria not applicable			External 50 when in use		
Any	Passive Recreation	Intrusive noise criteria not applicable			External 50 when in use		

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

Note 2: At the most-affected point within 30 m of the residential area.

Note 3: Where exceedances are predicted over 25% of the vacant land area.

Note 4: External criteria equivalent to internal criteria plus 10 dBA.

The INP states that the PSNLs have been selected to preserve the amenity of at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided the PSNLs are achieved, then most people would consider the resultant noise levels acceptable. In those cases where the PSNLs are not achieved, it does not automatically follow that all people exposed to the noise would find the noise unacceptable.

10.1.2 Sleep Disturbance Assessment Criteria

The INP Application Notes dated 12 June 2013 suggest that the LA1(1minute) level of 15 dBA above the RBL is a suitable criterion for assessing sleep disturbance for the night-time period. The Modification night-time LA1(1minute) SDNLs are presented in **Table 31** together with the comparable approved LA1(1minute) noise limit.

Table 31 Night-time LA1(1minute) Sleep Disturbance Noise Levels (dBA re 20 µPa)

Locality	Wilpinjong LA1(1minute) Night-time ¹ Limit	Modification LA1(1minute) Night-time ¹ Criteria
Wollar Village	45	45
Other Privately Owned Land	45	45

Note 1: Monday to Saturday 2200 hours to 0700 hours; Sundays and Public Holidays 2200 hours to 0800 hours.

10.1.3 INP Assessable Meteorological Conditions

An assessment of the Site Meteorological Measurement Methodology was prepared for Modification 5 as presented in **Appendix E** based on the analysis of the wind velocity and temperature gradients derived from the (new) on-site AWS and PTT. The INP assessable meteorological noise modelling parameters are presented **Table 10**. The INP assessable wind conditions for the Modification are generally consistent with the Project Approval (05_0021) Appendix 10 (refer **Appendix A1**).

10.1.4 Noise Impact Assessment Methodology

Table 32 presents the methodology for assessing the Modification operating noise levels against the intrusive and amenity PSNLs and the LA1(1minute) SDNLs together with cumulative amenity noise levels (refer **Table 15**) for assessing operating noise levels from existing, approved and proposed mining developments in the vicinity of the Modification.

Table 32 Modification and Cumulative Mine Noise Impact Assessment (dBA re 20 µPa)

Assessment Source	Assessment Parameter	Assessment Criteria	Noise Management Zone ¹		Noise Affection Zone
			Marginal	Moderate	
Modification	PSNL Intrusive	RBL plus 5 dBA	1 to 2 dBA above assessment criteria	3 to 5 dBA above assessment criteria	> 5 dBA above assessment criteria ²
	PSNL Amenity	INP acceptable			
	SDNL LA1(1minute)	RBL plus 15 dBA			
Mine Developments	Cumulative Amenity	INP acceptable	1 to 2 dBA above assessment criteria	3 dBA above assessment criteria	> 3 dBA above assessment criteria ³

Note 1: Depending on the degree of predicted exceedance of the relevant assessment parameter potential noise impacts in the noise management zone could range from marginal to moderate (in terms of the perceived noise increase).

Note 2: Exposure to Project noise levels greater than 5 dBA above the relevant PSNL and/or SDNL may be considered unacceptable by some landowners.

Note 3: Exposure to cumulative mine noise levels greater than 3 dBA above the relevant INP acceptable noise level may be considered unacceptable by some landowners.

10.1.5 Noise Mitigation Measures

WCPL is obligated to manage noise levels from Wilpinjong in accordance with the noise limits specified in Project Approval (05_0021) using reasonable and feasible mitigation measures. This has been achieved through a combination of the following:

- Property acquisition which has had the effect of reducing the number of privately owned receivers that could potentially be affected by noise impacts from Wilpinjong operations.
- For the remaining privately owned receivers, the implementation of the noise management strategy as per the NMP, including the use of real-time noise monitoring and response protocols (ie standing down of equipment) as required to manage noise levels during the night.

WCPL would continue to meet its obligation to comply with the noise limits specified in Project Approval (05_0021) for the Modification through the continued implementation of the noise management strategy. This would include the continuation of real-time monitoring and the standing down of equipment, as required, as part of the response to an exceedance of noise investigation triggers. On this basis, the noise modelling for the Modification incorporates real-time noise controls under particular adverse meteorological conditions (eg equipment stand-downs) in accordance with this commitment, and to reflect existing operations at Wilpinjong.

10.2 Modification and Cumulative Mine Operating Noise Impact Assessment

10.2.1 Privately Owned Receivers and Vacant Land

The exceedances at privately owned receivers and vacant land of the PSNLs, SDNLs, and INP's acceptable noise amenity levels are presented in **Table 33** together with the consented noise limits.

Table 33 Summary of Criteria Exceedances at Privately Owned Receivers¹ and Vacant Land

Exceedance Range	Intrusive LAeq(15minute)	Sleep Disturbance LA1(1minute)	Amenity LAeq(period) (ie school, hall, church)
Consented Noise Limits	Nil	Nil	Nil
Exceedance Range	1 to 2 dBA above PSNL	3 to 5 dBA above PSNL	> 5 dBA above PSNL
Intrusive LAeq(15minute)	129 ^{2,3} , 137 ²	135 ^{2,3}	-
Exceedance Range	1 to 2 dBA above SDNL	3 to 5 dBA above SDNL	> 5 dBA above SDNL
Sleep Disturbance LA1(1minute)	-	-	-
Exceedance Range	1 to 2 dBA above PSNL	3 to 5 dBA above PSNL	> 5 dBA above PSNL
Amenity LAeq(period)	-	-	-
Exceedance Range	1 to 2 dBA above INP Acceptable	3 dBA above INP Acceptable	> 3 dBA above INP Acceptable
Cumulative Amenity LAeq(period)	-	-	-
Exceedance Range	1 to 5 dBA above PSNL		> 5 dBA above PSNL
Vacant Land Intrusive LAeq(15minute)	146		

Note 1: Refer **Section 3.2** and **Appendix C3**.

Note 2: Properties subject to noise mitigation upon request in accordance with Project Approval (05_0021) Table 3.

Note 3: Properties currently under contract of sale to Peabody Energy.

In summary, during the daytime and evening, no privately owned receivers are predicted to exceed the intrusive PSNLs or the consented noise limits. At night-time, consistent with the currently consented limits marginal noise exceedances of 1 to 2 dBA above PSNL 35 dBA are predicted at privately owned receivers 129 and 137 and a moderate noise exceedance of 3 dBA above PSNL 35 dBA is predicted at privately owned receiver 135.

No exceedance of the currently consented noise limits are predicted at any privately owned receiver in 2015 or 2018 at night with the continued implementation of the noise management strategy.

10.3 The Review of Existing Management Measures

10.3.1 Noise Management Plan

In accordance with Project Approval (05_0021), Schedule 2 Condition 5, WCPL are currently revising the NMP to document the current noise management strategy.

10.3.2 Blast Management Plan

In accordance with Project Approval (05_0021), Schedule 2 Condition 15, WCPL are currently revising the BMP to document the current blast management strategy.

PROJECT APPROVAL (05_0021) DATED 1 FEBRUARY 2006 (AS MODIFIED)

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Proponent shall acquire the land in accordance with the procedures in conditions 6 – 7 of schedule 4.

Table 1: Land subject to acquisition upon request

30 – Gaffney

Note:

- To interpret the locations referred to in Table 1, see the applicable figures in Appendix 7.

Noise Criteria

2. Except for the land referred to in Table 1, the Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land or at the other specified locations.

Table 2: Noise Impact assessment criteria dB(A)

Location	Day	Evening	Night	
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{A1} (1 minute)
135	38	38	38	45
129 and 137	37	37	37	45
69	36	36	36	45
Wollar Village – Residential	36	35	35	45
All other privately owned land	35	35	35	45
901 – Wollar School	35(internal) 45 (external) When in use			-
150A – St Luke's Anglican Church	40 (internal) When in use			-
900 – St Laurence O'Toole Catholic Church				-
Goulburn River National Park/Munghorn Gap Nature Reserve	50 When in use			-

Noise generated by the project is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy. Appendix 11 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

However, the criteria in Table 2 do not apply if the Proponent has an agreement with the relevant owner/s to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

Notes:

- To interpret the locations referred to in Table 2, see the applicable figures in Appendix 7; and
- For the Goulburn River National Park/Munghorn Nature Reserve noise levels are to be assessed at the most affected point at the boundary of the Goulburn River National Park/Munghorn Nature Reserve.

Mitigation Upon Request

3. Upon receiving a written request from the owner of any residence on the land listed in either Table 1 or Table 3, the Proponent shall implement additional noise mitigation measures (such as double-glazing, insulation and/or air conditioning) at the residence in consultation with the landowner. These measures must be reasonable and feasible, and directed towards reducing the noise impacts of the project on the residence.

If within 3 months of receiving this request from the owner, the Proponent and the owner 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.

PROJECT APPROVAL (05_0021) DATED 1 FEBRUARY 2006 (AS MODIFIED)

Table 3: Land subject to additional noise mitigation upon request

Receiver ID
69, 129, 135 and 137

Note: To interpret the land referred to in Table 3, see the applicable figures in Appendix 7.

Operating Conditions

4. The Proponent shall:
- implement best management practice to minimise the operational, road, and rail noise of the project;
 - operate a comprehensive noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day to day planning of mining operations, and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this approval;
 - minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply (see Appendix 11);
 - only use locomotives and rolling stock that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL;
 - co-ordinate noise management at the site with the noise management at Moolarben and Ulan mines to minimise cumulative noise impacts; and
 - carry out regular monitoring to determine whether the project is complying with the relevant conditions of this approval, and publish these monitoring results on its website, to the satisfaction of the Director-General.

Noise Management Plan

5. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be prepared in consultation with the EPA, and submitted to the Director-General for approval by the end of May 2014;
 - describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval;
 - describe the proposed noise management system in detail; and
 - include a monitoring program that:
 - evaluates and reports on:
 - the effectiveness of the noise management system;
 - compliance against the noise criteria in this approval; and
 - compliance against the noise operating conditions;
 - includes a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time (so the real-time noise monitoring program can be used as a better indicator of compliance with the noise criteria in this approval and trigger for further attended monitoring); and
 - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

BLASTING

Blast Impact Assessment Criteria

6. The Proponent shall ensure that blasting on the site does not cause exceedances of the criteria in Table 4.

PROJECT APPROVAL (05_0021) DATED 1 FEBRUARY 2006 (AS MODIFIED)

Table 4: Blasting impact assessment criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Residence on privately owned land	115	5	5% of the total number of blasts over a period of 12 months
	120	10	0%
All public infrastructure	-	50 (or a limit determined by the structural design methodology in AS 2187.2-2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Director-General)	0%

However, these criteria do not apply if the Proponent has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.

- 7 Blank
- 8 Blank

Blasting Hours

9. The Proponent shall only carry out blasting on the site between 9am and 5pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Director-General.

Blasting Frequency

10. The Proponent may carry out a maximum of:
 - (a) 2 blasts a day; and
 - (b) 5 blasts a week, averaged over a calendar year, at the project site.

This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, blast misfires or blasts required to ensure the safety of the mine or its workers.

Note: For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.

Property Inspections

11. If the Proponent receives a written request from the owner of any privately-owned land within 2 kilometres of any approved open cut mining pit on site for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection updated, then within 2 months of receiving this request the Proponent shall:
 - (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to:
 - establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and
 - identify measures that should be implemented to minimise the potential blasting impacts of the project on these buildings and/or structures; and
 - (b) give the landowner a copy of the new or updated property inspection report.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Director-General for resolution.

PROJECT APPROVAL (05_0021) DATED 1 FEBRUARY 2006 (AS MODIFIED)

Property Investigations

12. If any landowner of privately-owned land claims that buildings and/or structures on his/her land have been damaged as a result of blasting associated with the project, then within 3 months of receiving this request, the Proponent shall:
- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to investigate the claim; and
 - (b) give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or the landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Director-General for resolution.

Operating Conditions

13. During mining operations on the site, the Proponent shall:
- (a) implement best blasting practice to:
 - protect the safety of people and livestock in the area surrounding blasting operations;
 - protect public or private infrastructure/property and Aboriginal cultural heritage sites in the area surrounding blasting operations from blasting damage; and
 - minimise the dust and fume emissions from blasting at the project;
 - (b) limit temporary blasting-related road closures to 1 per day;
 - (c) co-ordinate the timing of blasting on site with the timing of blasting at the adjoining Moolarben and Ulan coal mines to minimise the potential cumulative blasting impacts of the three mines, ~~and~~
 - (d) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site,
 - (e) carry out regular monitoring to determine whether the project is complying with the relevant conditions of this approval, and publish these monitoring results on its website, to the satisfaction of the Director-General.
14. Prior to carrying out any blasting within 500 metres of a public road or railway on the site, the Proponent shall obtain approval from Council (in respect of public roads) and ARTC (in respect of the Gulgong-Sandy Hollow railway).

Blast Management Plan

15. The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with the EPA, and submitted to the Director-General for approval by the end of May 2014;
 - (b) (describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this approval;
 - (c) (propose and justify any alternative ground vibration limits for public infrastructure in the vicinity of the site (if relevant); and
 - (d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions of this approval.

Operational Noise

WCPL will continue to implement real-time noise monitoring and associated controls, such that noise from the Wilpinjong Coal Mine will comply with relevant Project Approval noise criteria (including a commitment to modify the operations as required to achieve continued compliance with project specific noise levels in the Village of Wollar under relevant meteorological conditions, as described in the Project Approval, EPL 12425 and the amended Noise Management Plan).

PROJECT APPROVAL (05_0021) DATED 1 FEBRUARY 2006 (AS MODIFIED)

Blasting

WCPL will include the results of all blast monitoring required by Environment Protection Licence 12425 as a Blast Monitoring Report with the Licence Annual Return. The Blast Monitoring Report will include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return:

- the date and time of each blast;
- the location of each blast on the premises;
- the blast monitoring results (airblast overpressure and ground vibration) and at each blast monitoring location; and
- an explanation for any missing blast monitoring results.

**APPENDIX 10
NOISE COMPLIANCE ASSESSMENT**

Applicable Meteorological Conditions

1. The noise criteria in Table 2 of the conditions are to apply under all meteorological conditions except the following:
 - (a) during periods of rain or hail;
 - (b) average wind speed at microphone height exceeds 5 m/s;
 - (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or
 - (d) temperature inversion conditions greater than 5.5°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.
4. This monitoring must be carried out at least 12 times a year, unless the Director-General directs otherwise.
5. Unless the Director-General agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy (as amended from time to time), in particular the requirements relating to:
 - (a) monitoring locations for the collection of representative noise data;
 - (b) meteorological conditions during which collection of noise data is not appropriate;
 - (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
 - (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

EXTRACT EPA ENVIRONMENT PROTECTION LICENCE NO 12425

L5 Noise limits

- L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The locations referred to in the table below are indicated by the property identification numbers on Figure 4A Relevant Land Ownership Plan Wilpinjong Coal Mine Mining Rate Modification Environmental Assessment 17 May 2010. The property identification numbers are indicated on Figure 4B Relevant Land Ownership List Wilpinjong Coal Mine Mining Rate Modification Environmental Assessment 17 May 2010.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village	35	35	35	45
Goulburn River National Park	50	50	50	-
Munhorn Gap Nature Reserve	50	50	50	-
All other privately owned land (outside the village of Wollar)	35	35	35	45

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

- L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

- L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- b) Temperature inversion conditions up to 3°C/100m and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- c) Temperature inversion conditions greater than 3°C/100m.

- L5.4 For the purpose of condition L5.3:

- a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
- b) Temperature inversion conditions (vertical temperature gradient in degrees C) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 of Appendix E to the NSW Industrial Noise Policy.

- L5.5 To determine compliance:

- a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:
 - i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
 - ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
 - iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve
- b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.
- c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
 - i) at the most affected point at a location where there is no dwelling at the location; or
 - ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

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- L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:
- a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
 - b) at a point other than the most affected point at a location.
- L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

L6 Blasting

- L6.1 The overpressure level from blasting operations at the premises must not exceed 115 dB (Lin Peak) at any noise sensitive location for more than five percent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- L6.2 The overpressure level from blasting operations at the premises must not exceed 120 dB (Lin Peak) at any noise sensitive at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- L6.3 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5 mm/sec at any noise sensitive locations for more than five percent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- L6.4 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10 mm/sec at any noise sensitive location at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.
- Note: "Noise sensitive locations" includes buildings used as a residence, hospital, school, child care centre, place of public worship and nursing homes. A noise sensitive location includes the land within 30 metres of the building.
- L6.5 Blasting operations at the premises may only take place between 9:00am – 5:00pm Monday to Saturday. Blasting outside the hours specified in this condition can only take place with the written approval of the EPA.
- L6.6 Blasting at the premises is limited to the following:
- a) a maximum of 2 blasts per day;
 - b) a maximum of 5 blasts per week, on average over a 12 month period;
 - c) a maximum of 2 blasts per week where the maximum instantaneous charge is greater than 400 kg; and
 - d) a maximum of 1 blast per week where the maximum instantaneous charge is greater than 400 kg, when averaged over a 12 month period.

EXTRACT EPA ENVIRONMENT PROTECTION LICENCE NO 12425

M4 Weather monitoring

- M4.1 The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified in condition M4.2.
- M4.2 For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency specified opposite in the other columns.

Point 21

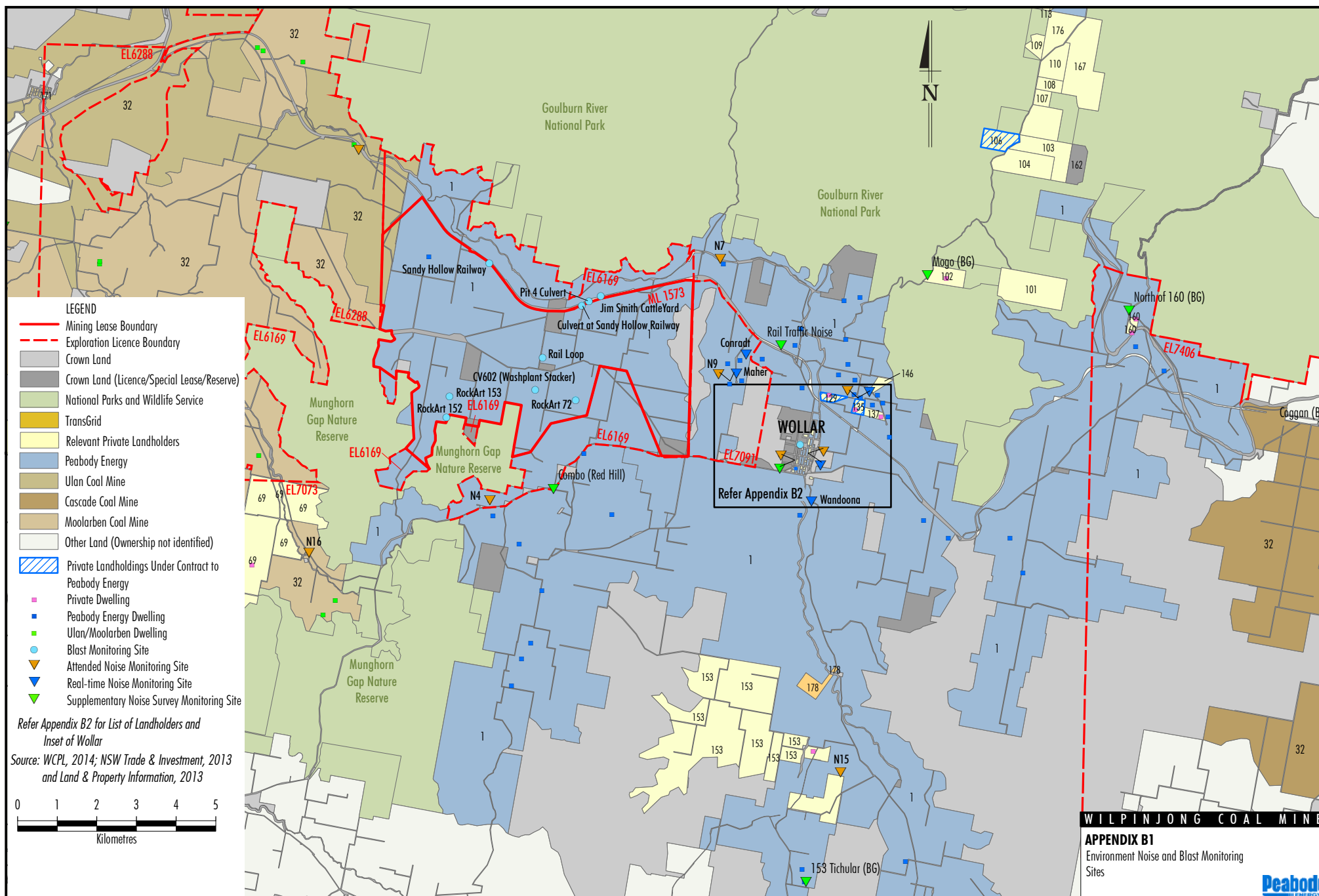
Parameter	Unit of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	Degress celsius	Continuous	1 hour	AM-4
Wind direction	Degrees	Continuous	15 minute	AM-2 & AM-4
Wind speed	m/s	Continuous	15 minute	AM-2 & AM-4
Temperature lapse rate	Degrees	Continuous	15 minute	Part E2 & E4 of the Nsw Industrial Noise Policy
Rainfall	mm	Continuous	24 hour	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

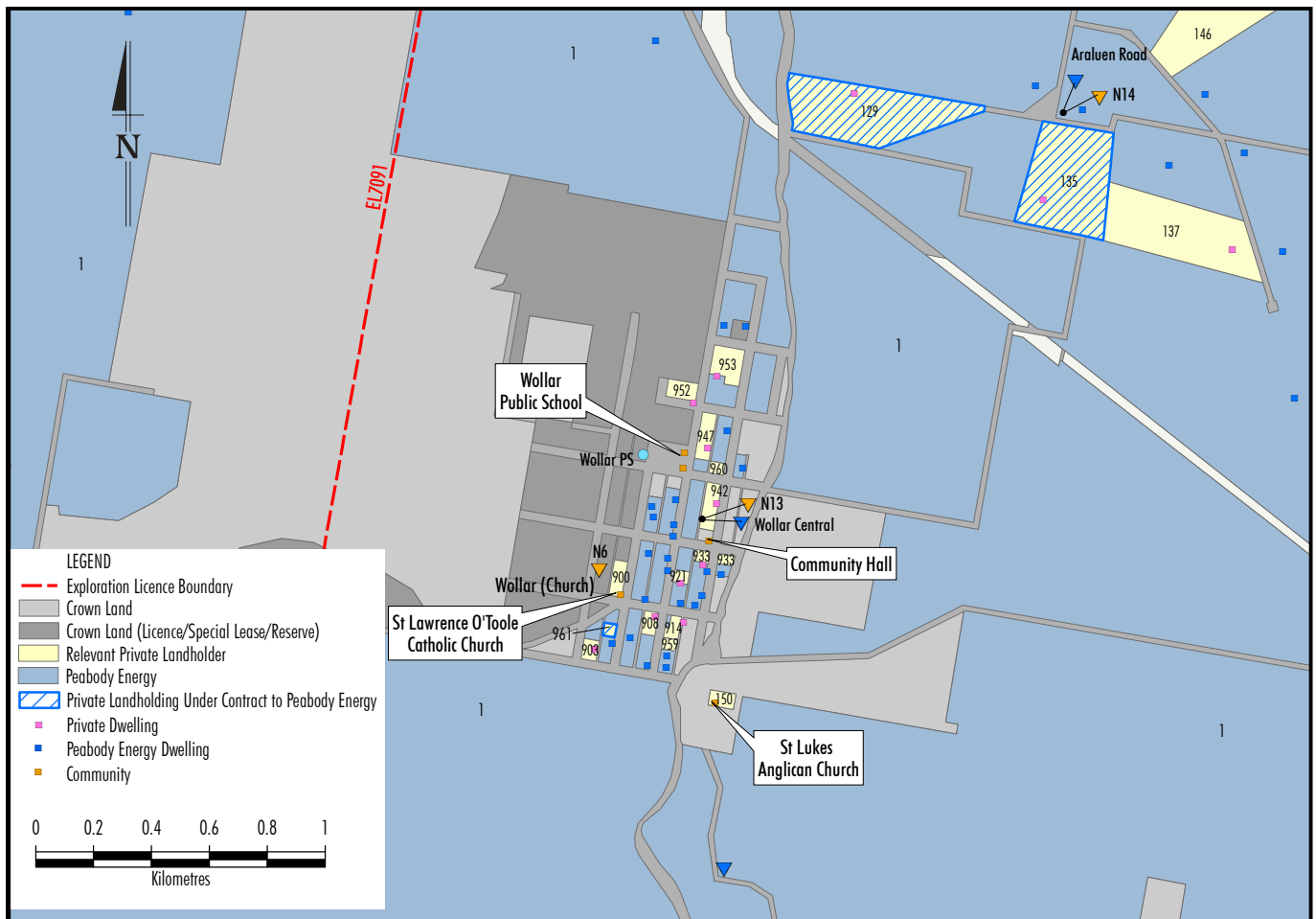
M8 Blasting

- M8.1 To determine compliance with condition(s) L6.1 to L6.4:

- a) Airblast overpressure and ground vibration levels experienced at the following noise sensitive locations must be measured and recorded for all blasts carried out on the premises;
 - approximately 50m west of the Wollar Primary School grounds - E 777403 N6416219 (MGA94, Zone 55)
- b) Instrumentation used to measure and record the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006.

Note: A breach of the licence will still occur where airblast overpressure or ground vibration levels from the blasting operations at the premises exceeds the limit specified in conditions L6.1 to L6.4 at any "noise sensitive locations" other than the locations identified in the above condition.





Ref No.	Landholder
1	Peabody Energy
32	Ulan/Moolarben/Cascade Coal Controlled Land
69	DJ & JG Stokes
80	RB Cox
101	NAB Pierce
102	W Filipczyk
103	MR Molloy
104	J & I Hartig
106	JA Sales (Under Contract to Peabody Energy)
107	RJ Lee
108	Crosse
109	MO Vaisey
113	AJ Brett & S & D Hilt
114	C Ware & N Parker
129	K & R Roser (Under Contract to Peabody Energy)
135	K & R Roser (Under Contract to Peabody Energy)
137	A & C Chetcuti
146	D & B Spearpoint
150	Edmund Tindale, Alexander McDonald, Will
153	Terrence William Marskell
160	B Smiles & A Smiles-Schmidt

Ref No.	Landholder
162	Special lease 1969/7 Daniel Ponton
167	G Jaques
169	J Asztalos
170	MB Cox
110	Patricia Ann Crosse
175	SF & MR Andrews
176	Shaun Rayner
178	TransGrid
900	Catholic Church
903	M Hardiman & D Hogan
908	A & A Lynch
914	Paul Warwick Nicod & Philip John Slade
921	EH Toombs
933	CR Faulkner
942	Robert & Susan Schneider
947	Scott & Jane Lillis
952	B & D O'Hara
953	B Marshall & R Muller
959	CJ Clarke
960	Scott Lillis
961	Jaques Family Investments P/L (Under Contract to Peabody Energy)

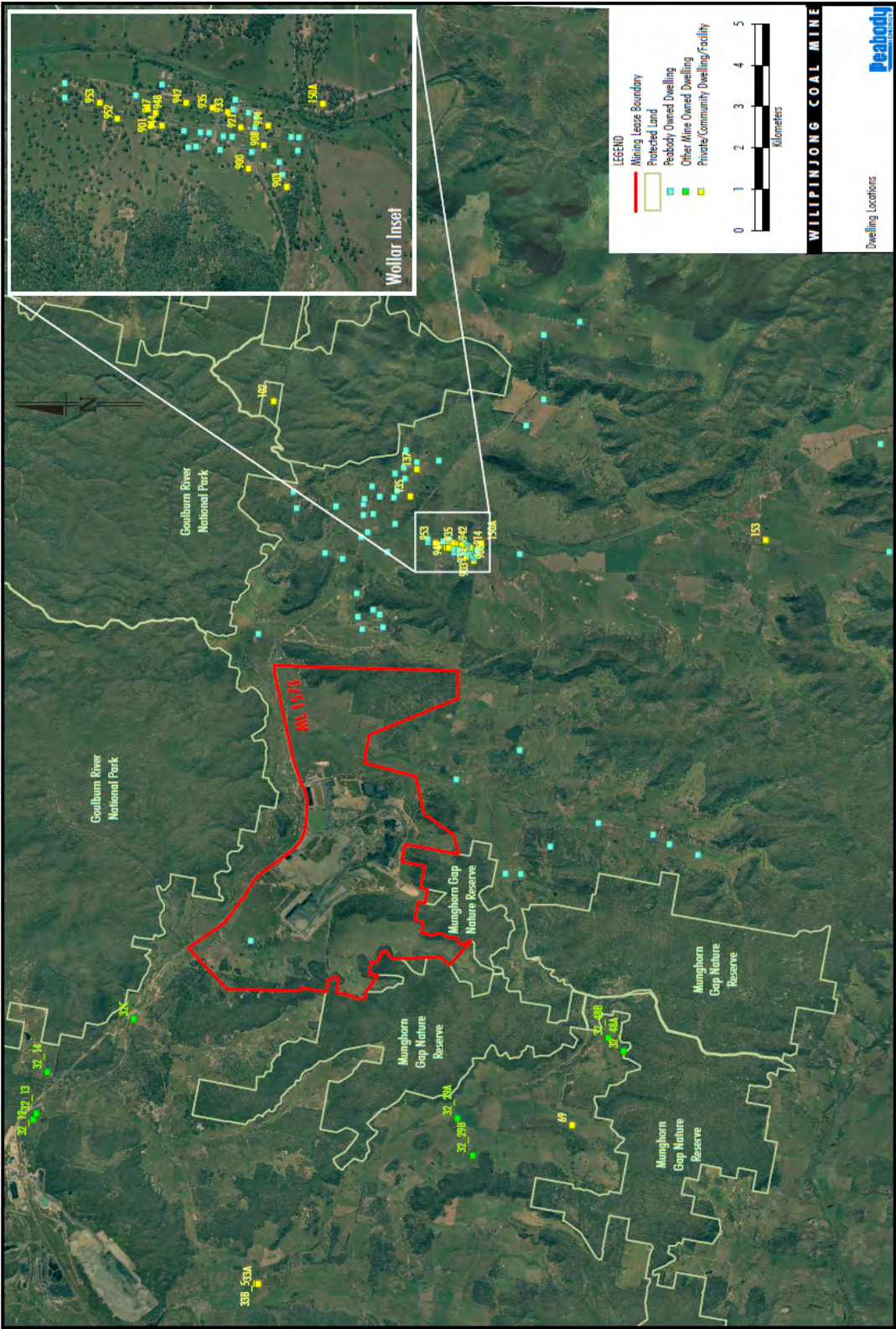
Source: WCPL, 2014; NSW Trade & Investment, 2013 and Land & Property Information, 2013

WILPINJONG COAL MINE

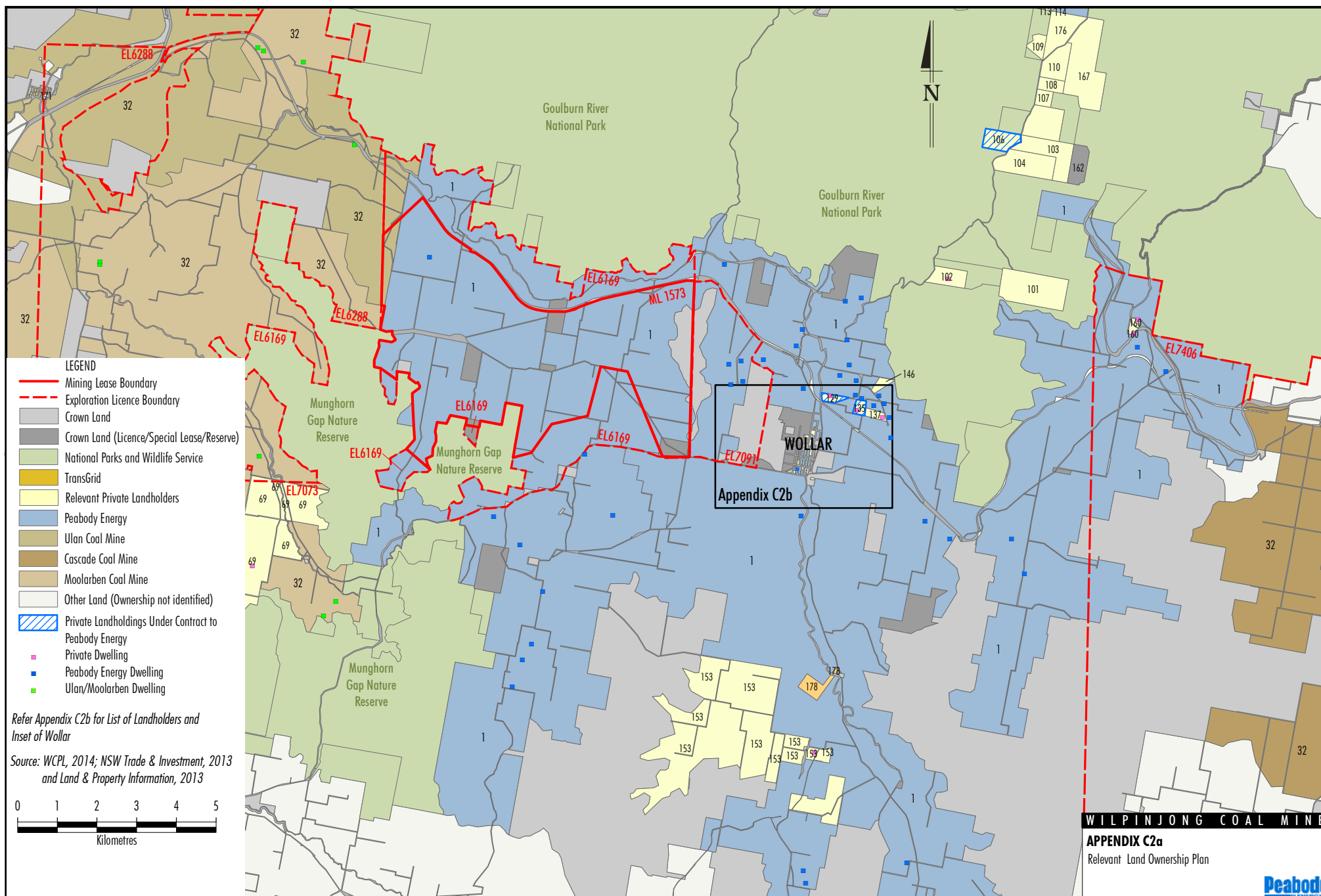
APPENDIX B2

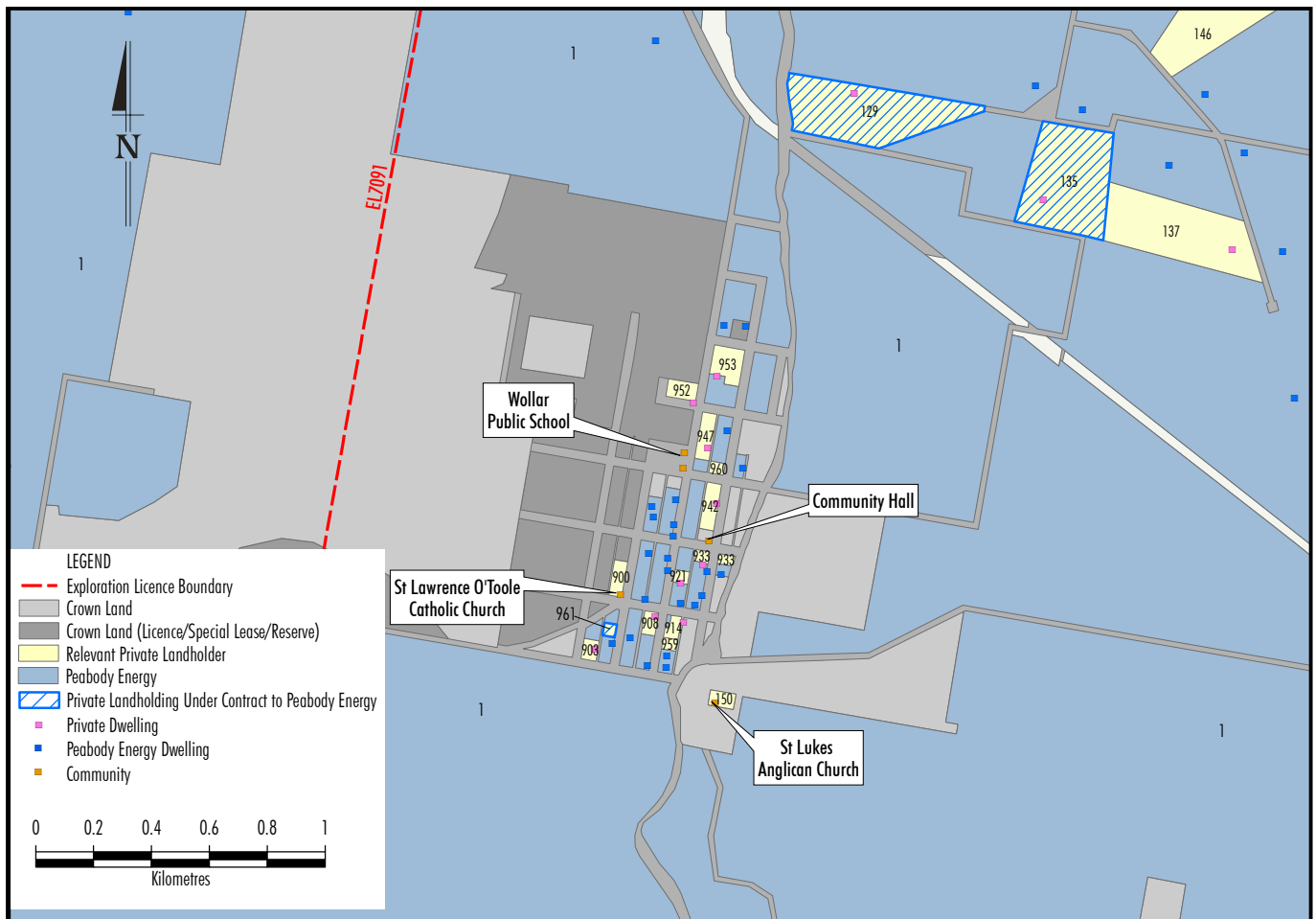
Environment Noise and Blast Monitoring
Sites - Wollar





WIL-13-13_35WMod12_Cond_2020A





Ref No.	Landholder
1	Peabody Energy
32	Ulan/Moolarben/Cascade Coal Controlled Land
69	DJ & JG Stokes
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103	MR Molloy
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137	A & C Chetcuti
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952	B & D O'Hara
953	B Marshall & R Muller
959	CJ Clarke
960	Scott Lillis
961	Jaques Family Investments P/L (Under Contract to Peabody Energy)

Source: WCPL, 2014; NSW Trade & Investment, 2013 and Land & Property Information, 2013

WILPINJONG COAL MINE

APPENDIX C2b

Wollar Inset and Relevant Land Ownership List
(refer to Figure 4a for Land Ownership Plan)



Appendix C3

Report Number 610.10806.00300-R2

Page 1 of 3

LAND OWNERSHIP DETAILS

DWELLING ID (September 2012)	Easting	Northing	Elevation	Occupation Building Status	Ownership (May 2013)
Privately Owned					
Moolarben, Mogo, Araluen, Tochilar, Barigan, Wollar					
69	763579	6413175	545	Occupied	Private
102	781087	6420412	440	Occupied	Private
129*	778134	6417466	374	Occupied	Private*
135*	778787	6417102	390	Occupied	Private*
137	779441	6416929	375	Occupied	Private
153	777729	6408478	403	Occupied	Private
157	779778	6401722	452	Occupied	Private
160A	785872	6419380	238	Occupied	Private
160B	785768	6419042	235	Occupied	Private
Wollar Village					
903	777235	6415547	370	Occupied	Private
908	777444	6415660	365	Occupied	Private
914	777544	6415640	362	Occupied	Private
921	777533	6415777	365	Occupied	Private
933	777611	6415840	362	Occupied	Private
942	777658	6416052	362	Occupied	Private
947	777608	6416207	365	Occupied	Private
952	777578	6416399	365	Occupied	Private
953	777660	6416492	363	Occupied	Private
Wollar Village - School					
901	777547	6416227	365	School	Private
944	777543	6416175	366	School	Private
Wollar Village - Church					
900	777326	6415738	369	Church	Private
150A	777654	6415365	364	Church	Private
Wollar Village - Community - Hall					
935	777633	6415922	363	Hall	Community
Resource-company Owned					
Moolarben Coal Mines Pty Ltd					
32_12	763719	6426239	442	Occupied	Moolarben
32_13	763859	6426158	438	Occupied	Moolarben
32_14	764861	6425876	420	Occupied	Moolarben
32_29A	763746	6415947	500	Occupied	Moolarben
32_29B	762841	6415592	528	Occupied	Moolarben
32_48A	765370	6411929	580	Occupied	Moolarben
32_48B	765680	6412292	555	Occupied	Moolarben
32_32C	766154	6423779	412	Occupied	Moolarben
32_33A	759734	6420774	450	Occupied	Moolarben
32_33B_5	759740	6420835	450	Occupied	Moolarben
Peabody Energy					
1_100B	781139	6413853	419	Occupied	Peabody Energy
1_127	778549	6418884	368	Renovate	Peabody Energy
1_131	778786	6417847	375	Occupied	Peabody Energy
1_133	778761	6417492	388	Occupied	Peabody Energy
1_136	779222	6417219	375	Occupied	Peabody Energy
1_140	779656	6416414	379	Renovate	Peabody Energy
1_142	779616	6416921	372	Occupied	Peabody Energy

Appendix C3

Report Number 610.10806.00300-R2

Page 2 of 3


LAND OWNERSHIP DETAILS

DWELLING ID (September 2012)	Easting	Northing	Elevation	Occupation Building Status	Ownership (May 2013)
1_143	778924	6417412	390	Occupied	Peabody Energy
1_145	779348	6417464	370	Occupied	Peabody Energy
1_151	770124	6410133	465	Occupied	Peabody Energy
1_152	779484	6417262	371	Occupied	Peabody Energy
1_154	777451	6405506	437	Occupied	Peabody Energy
1_155	777507	6405187	446	Occupied	Peabody Energy
1_156	780057	6405697	440	Occupied	Peabody Energy
1_158	782693	6413867	349	Occupied	Peabody Energy
1_159	783017	6412974	315	Occupied	Peabody Energy
1_162	785864	6418687	248	Occupied	Peabody Energy
1_163	786574	6418088	237	Occupied	Peabody Energy
1_164	771950	6415993	398	Occupied	Peabody Energy
1_18	778908	6419926	450	Occupied	Peabody Energy
1_19	778509	6419848	420	Occupied	Peabody Energy
1_25	777277	6418726	375	Occupied	Peabody Energy
1_26	777427	6419148	355	Occupied	Peabody Energy
1_26	778340	6418222	360	Renovate	Peabody Energy
1_28C	777447	6417650	375	Occupied	Peabody Energy
1_30	778369	6417986	360	Occupied	Peabody Energy
1_31	776448	6418380	390	Occupied	Peabody Energy
1_45	775463	6420780	356	Occupied	Peabody Energy
1_49	772652	6414452	455	Occupied	Peabody Energy
1_52A	775932	6417838	408	Occupied	Peabody Energy
1_53	775883	6418356	397	Occupied	Peabody Energy
1_55	775576	6418269	392	Occupied	Peabody Energy
1_58	775624	6417748	400	Occupied	Peabody Energy
1_83	778608	6418243	360	Occupied	Peabody Energy
1_905	777297	6415569	369	Occupied	Peabody Energy
1_907	777359	6415587	367	Occupied	Peabody Energy
1_910	777418	6415491	365	Occupied	Peabody Energy
1_912	777486	6415527	363	Occupied	Peabody Energy
1_913	777483	6415485	362	Occupied	Peabody Energy
1_915	777410	6415720	368	Occupied	Peabody Energy
1_916	777533	6415707	364	Occupied	Peabody Energy
1_917	777584	6415700	362	Commercial	Peabody Energy
1_920	777608	6415735	362	Occupied	Peabody Energy
1_923	777489	6415820	367	Occupied	Peabody Energy
1_926	777626	6415817	362	Occupied	Peabody Energy
1_927	777674	6415806	361	Occupied	Peabody Energy
1_929	777490	6415863	367	Occupied	Peabody Energy
1_931	777422	6415880	368	Occupied	Peabody Energy
1_934	777509	6415939	366	Occupied	Peabody Energy
1_937	777510	6415979	366	Occupied	Peabody Energy
1_938	777439	6416006	368	Occupied	Peabody Energy
1_939	777435	6416041	369	Occupied	Peabody Energy
1_941	777517	6416064	367	Occupied	Peabody Energy
1_946	777750	6416175	360	Occupied	Peabody Energy
1_950	777696	6416304	361	Renovate	Peabody Energy
1_956	777684	6416665	361	Occupied	Peabody Energy

LAND OWNERSHIP DETAILS

DWELLING ID (September 2012)	Easting	Northing	Elevation	Occupation Building Status	Ownership (May 2013)
1_957	777759	6416664	360	Occupied	Peabody Energy
1_W88A	770376	6410814	453	Occupied	Peabody Energy
1_W88B	770611	6411217	449	Occupied	Peabody Energy
1_WA	768038	6420964	423	Occupied	Peabody Energy
1_WF	769652	6414414	445	Occupied	Peabody Energy
1_WJ	770312	6413714	472	Occupied	Peabody Energy
1_WK	770890	6412538	431	Occupied	Peabody Energy
1_WR	777395	6414444	370	Occupied	Peabody Energy
1_WT	780517	6414297	402	Occupied	Peabody Energy
Livestock, Aboriginal Heritage and Infrastructure					
Stockyard – Livestock	772379	6410975	375	-	-
Aboriginal – RockArt 72	771739	6417366	433	-	-
Aboriginal – RockArt 152	768479	6416911	475	-	-
Aboriginal – RockArt 153	768560	6417441	480	-	-
Roadway – Culvert	772077	6419833	375	-	-
Railway – Rail Loop	770911	6418415	390	-	-
Railway – Rail Line	770911	6418415	390	-	-

* Private receiver under contract of sale to Peabody Energy.



Mid-Western
Regional Council
Regional Local
Environmental
Plan 2012

Land Zoning Map - Sheet LZN_008A

Zone

E1

Neighbourhood Centre

E2

Local Centre

E3

Commercial Core

E4

Mixed Use

E5

Business Development

E6

National Parks and Nature Reserves

E7

Environmental Management

E8

General Industrial

E9

Light Industrial

E10

Heavy Industrial

R1

General Residential

R2

Low Density Residential

R3

Medium Density Residential

R4

Large Lot Residential

R5

Public Recreation

R6

Private Recreation

R7

Primary Production

R8

Forestry

R9

Primary Production Small Lots

R10

Village

S1

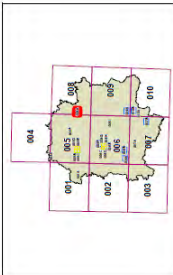
Infrastructure


S2


Tourist

Cadastre

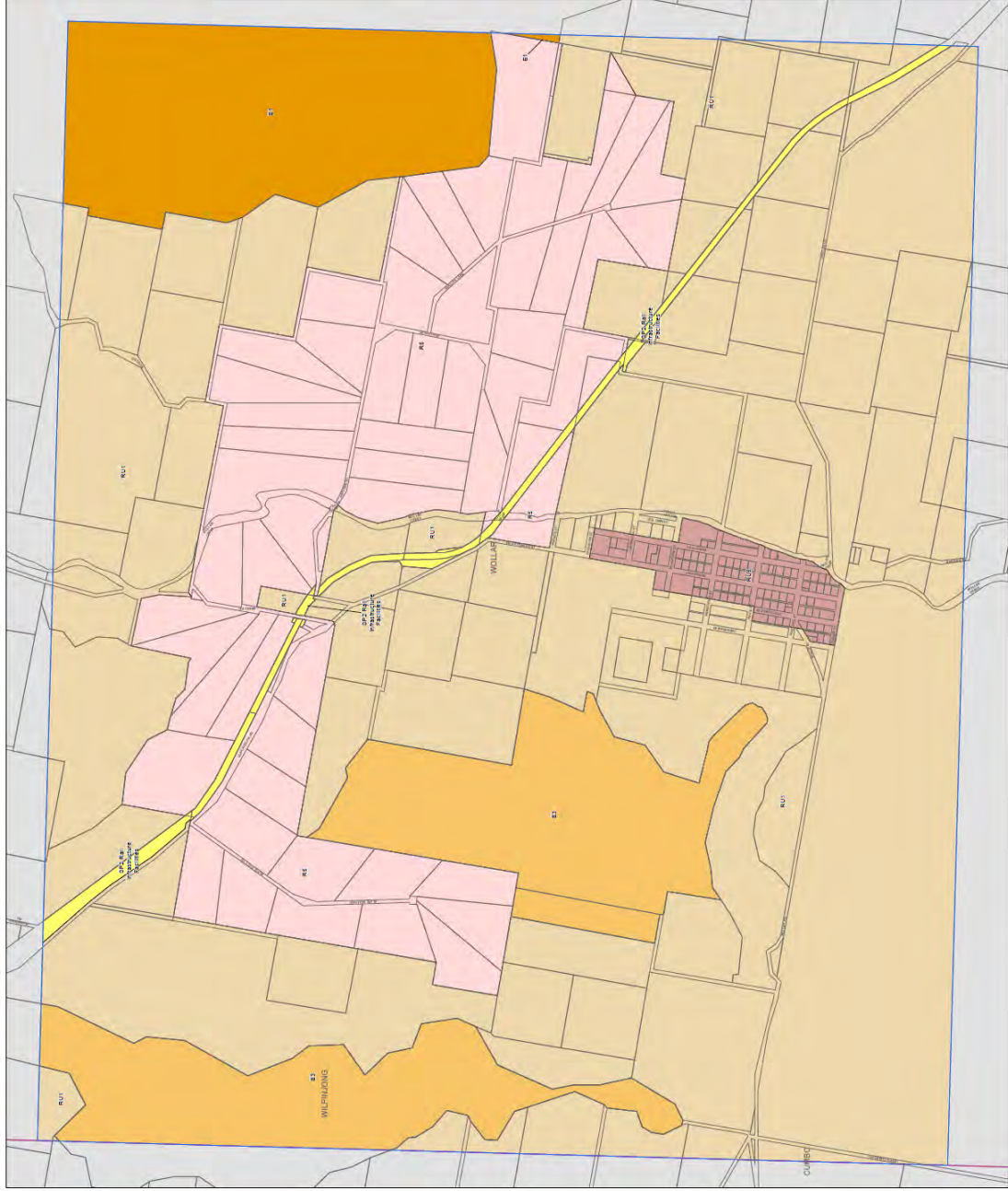
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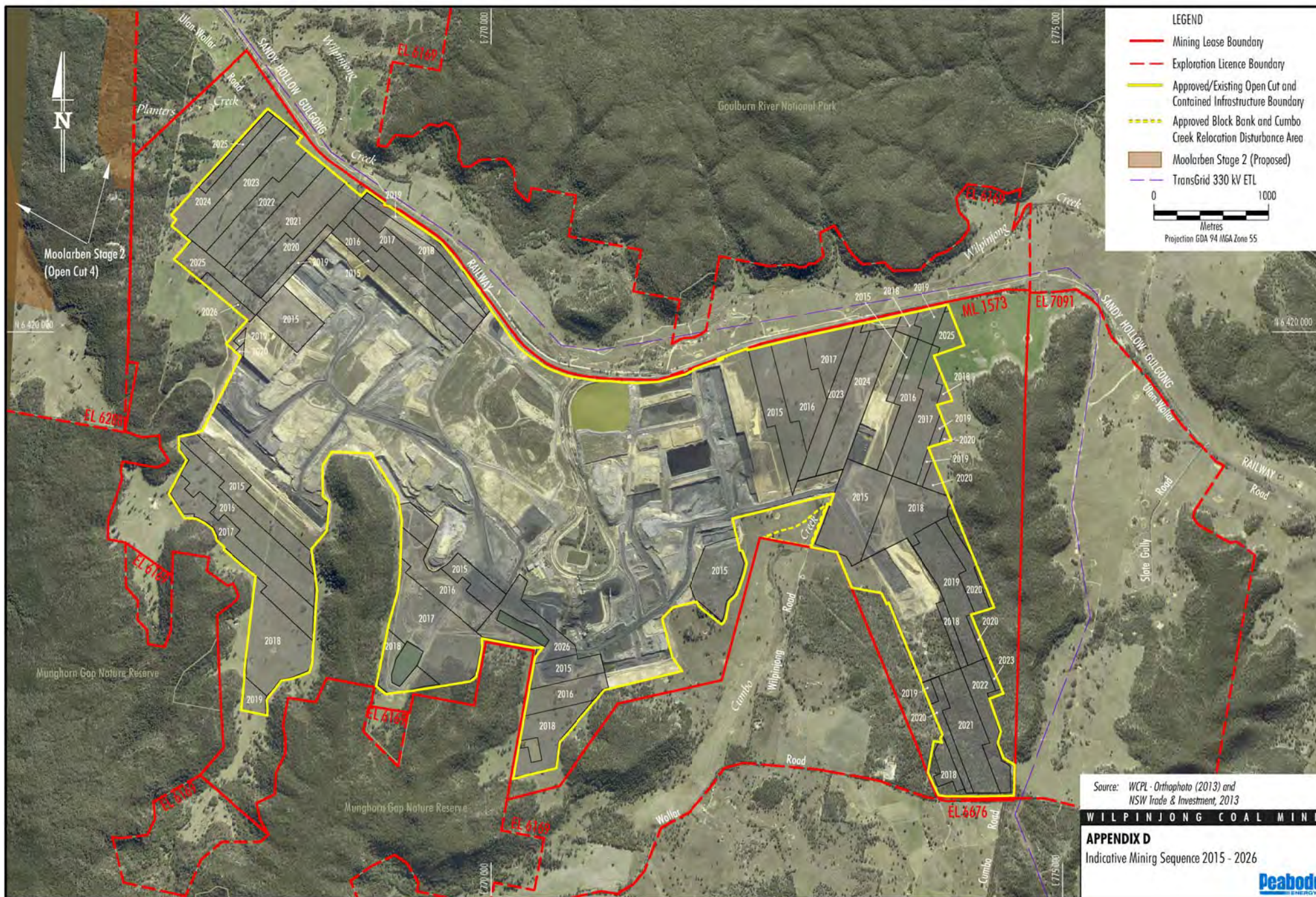






Projection: GDA 1984
Scale: 1:20,000 @ A3
Map identification number: 5270_COM_LZN_008A_20120618





SITE METEOROLOGICAL MEASUREMENT METHODOLOGY

1 Prevailing Winds

Section 5.3 of the INP, Wind Effects, states:

“Wind effects need to be assessed where wind is a feature of the area. Wind is considered to be a feature where source to receiver wind speeds (at 10 m height) of 3 m/s or below occur for 30 percent of the time or more in any assessment period in any season.”

An assessment of prevailing wind conditions was derived from the (new) on-site Automatic Weather Station (AWS) located in the mine facilities area. The dominant seasonal wind speeds and directions for the period August 2011 to September 2012 are presented in **Appendix A** for daytime (0700 hours to 1800 hours), evening (1800 hours to 2200 hours) and night-time (2200 hours to 0700 hours) in accordance with a methodology consistent with the requirements of the INP.

Based on this analysis, the prevailing winds less than (or equal to) 3 m/s with a frequency of occurrence greater than (or equal to) 30% are presented in **Table E1** and considered to be relevant to Wilpinjong in accordance with the INP.

Table E1 Prevailing Seasonal 10 m Wind Velocities In Accordance with the INP

Season	Winds ± 45 degrees \leq 3 m/s with Frequency of Occurrence \geq 30%		
	Daytime	Evening	Night-Time
Annual	Nil	Nil	Nil
Summer	Nil	ESE (30%)	ESE (44%), SE (39%), E (38%)
Autumn	Nil	Nil	Nil
Winter	Nil	Nil	Nil
Spring	Nil	Nil	Nil

2 Temperature Inversions

Section 5.2 of the INP, Temperature Inversions, states:

“Assessment of impacts is confined to the night noise assessment period (10.00 pm to 7.00 am), as this is the time likely to have the greatest impact - that is, when temperature inversions usually occur and disturbance to sleep is possible.”

“Where inversion conditions are predicted for at least 30% (or approximately two nights per week) of total night-time in winter, then inversion effects are considered to be significant and should be taken into account in the noise assessment”.

An assessment of winter temperature gradients and atmospheric stability was derived from the (new) on-site Temperature Tower (TT) located in the mine facilities area. Presented in **Appendix B** is the winter Temperature Gradient Exceedance Levels summary and **Appendix C** winter Temperature Gradient Exceedance Levels 24 hour profile and winter Temperature Gradient Cumulative Frequency Distribution for the 13 month period (August 2011 to September 2012) in accordance with a methodology consistent with the requirements of the INP.

Based on this analysis, the seasonal combine evening/night-time temperature gradients and atmospheric stability are presented in **Table E2** and considered to be relevant to Wilpinjong in accordance with the INP. Similarly, the winter daytime, evening, night-time and combine evening/night-time temperature gradients and atmospheric stability are presented in **Table E3**.

SITE METEOROLOGICAL MEASUREMENT METHODOLOGY

Table E2 Prevailing Seasonal Temperature Gradients in Accordance with the INP

Stability Class	Frequency of Occurrence – Evening/Night-time					Temperature Gradient °C/100 m ¹	Qualitative Description
	Annual	Summer	Autumn	Winter	Spring		
A	0.3%	0.7%	0.1%	0.0%	0.5%	<-1.9	Lapse
A	0.3%	0.7%	0.1%	0.0%	0.5%	-1.9 to -1.7	Lapse
B	0.6%	1.2%	0.4%	0.0%	0.7%	-1.7 to -1.5	Lapse
C	0.8%	1.8%	0.5%	0.0%	1.3%	-1.5 to -0.5	Neutral
D	33.7%	58.3%	26.7%	18.7%	34.6%	-0.5 to 1.5	Weak inversion
F	23.8%	5.5%	29.9%	35.6%	21.3%	1.5 to 4	Moderate inversion
G	13.5%	0.5%	14.3%	24.4%	12.4%	>4.0	Strong inversion
F+G	37.3%	6.0%	44.2%	60.0%	33.7%	>1.5	Moderate to Strong

Note 1: °C/100 m = Degrees Celsius per 100 metres.

Table E3 Prevailing Winter Temperature Gradients in Accordance with the INP

Stability Class	Frequency of Occurrence - Winter Season				Temperature Gradient °C/100 m ¹	Qualitative Description
	Daytime	Evening	Night	Evening/Night		
A	17.6%	0.0%	0.0%	0.0%	<-1.9	Lapse
B	10.7%	0.0%	0.0%	0.0%	-1.9 to -1.7	Lapse
C	11.9%	0.0%	0.0%	0.0%	-1.7 to -1.5	Lapse
D	38.9%	25.3%	15.8%	18.7%	-1.5 to -0.5	Neutral
E	11.8%	25.4%	19.5%	21.3%	-0.5 to 1.5	Weak Inversion
F	6.9%	26.1%	39.8%	35.6%	1.5 to 4.0	Moderate Inversion
G	2.1%	23.2%	24.9%	24.4%	>4.0	Strong Inversion
F+G	9.0%	49.3%	64.7%	60.0%	>1.5	Moderate to Strong

Note 1: °C/100 m = Degrees Celsius per 100 metres.

In accordance with **Table E2** of the INP, the combined frequency of occurrence of moderate to strong (ie >1.5 °C/100 m) winter temperature inversions is greater than 30% (actually 60%) during the combined evening/night-time period and therefore requires assessment (EPA, 2000).

In addition, the INP Section 5.2 *Temperature Inversions* also states:

“The drainage-flow wind default value should generally be applied where a development is at a higher altitude than a residential receiver, with no intervening higher ground (for example, hills). In these cases, both the specified wind and temperature inversion default values should be used in the noise assessment for receivers at the lower altitude.”

All receivers [with the exception of receiver 1_45 (WCPL)] are positioned at higher elevation relative to Wilpinjong and/or there is intervening topography between the site and the receiver. As receiver 1_45 is mine owned and located to the immediate north-east of Wilpinjong, a specific drainage flow wind has not been further considered in this assessment.

Noise Model Meteorological Parameters

Further analysis of the winter Temperature Gradient Exceedance Levels 24 hour profile (**Appendix C**) has been carried-out and summarised in **Table E4**.

SITE METEOROLOGICAL MEASUREMENT METHODOLOGY

Table E4 Winter Gradient Exceedance Levels 24 hour Profile

Morning Shoulder 0700 to 0900 hours	Daytime 0900 to 1700 hours	Afternoon Shoulder 1700 to 1800 hours	Evening Period 1800 to 2200 hours	Night-time Period 2200 to 0700 hours
Moderate inversion 10% exceedance 3.9°C/100 m	Temperature Lapse 10% exceedance -1.0°C/100 m	Weak inversion 10% exceedance 1.4°C/100 m	Strong inversion 10% exceedance 5.5°C/100 m	Strong inversion 10% exceedance 5.5°C/100 m

Note 1: °C/100 m = Degrees Celsius per 100 metres

Based on the foregoing analysis of the wind velocity and temperature gradients derived from the (new) on-site automatic weather station (AWS) and temperature Tower (TT), the INP meteorological parameters presented in **Table E5**.

Table E5 INP Assessable Meteorological Noise Modelling Parameters

Period	Meteorological Parameter	Air Temperature	Relative Humidity	Wind Velocity	Temperature Gradient
Daytime INP	Calm	17°C	56%	0 m/s	0°C/100 m
Evening INP	Calm	16°C	62%	0 m/s	0°C/100 m
	Summer Wind 30% (occurrence)	22°C	53%	ESE 3 m/s	0°C/100 m
Night-time INP	Calm	11°C	80%	0 m/s	0°C/100 m
	Summer Wind > 30 % (occurrence)	18°C	69%	ESE, SE, E 3 m/s	0°C/100 m
	Strong Inversion (10% exceedance) ¹	5°C	87%	0 m/s	5.5°C/100 m

Note 1: Winter evening/night-time 10% exceedance temperature gradient in accordance with INP **Appendix E Table E2**

SITE METEOROLOGICAL MEASUREMENT METHODOLOGY

ATTACHMENT A

New on-site Automatic Weather Station (AWS) - August 2011 to September 2012

Seasonal Frequency of occurrence 10 m Wind Velocity - Daytime

Period	Calm (<0.5 m/s)	Wind Direction ±45°	Wind Speed		
			0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Annual	13%	E	14%	10%	24%
Summer	6%	E	13%	15%	28%
Autumn	18%	E	18%	9%	27%
Winter	17%	E	11%	6%	17%
Spring	9%	E	14%	10%	24%

Seasonal Frequency of occurrence 10 m Wind Velocity - Evening

Period	Calm (<0.5 m/s)	Wind Direction ±45°	Wind Speed		
			0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Annual	24%	ESE	14%	8%	22%
Summer	8%	ESE	16%	14%	<u>30%</u>
Autumn	32%	ESE	15%	10%	25%
Winter	37%	WNW	11%	9%	20%
Spring	16%	E, ESE	14%, 15%	8%, 8%	22%, 22%

Seasonal Frequency of occurrence 10 m Wind Velocity - Night-Time

Period	Calm (<0.5 m/s)	Wind Direction ±45°	Wind Speed		
			0.5 to 2 m/s	2 to 3 m/s	0.5 to 3 m/s
Annual	45%	ESE	15%	8%	23%
Summer	24%	ESE, SE, E	25%, 22%, 21%	19%, 17%, 17%	<u>44%, 39%, 38%</u>
Autumn	52%	ESE	12%	7%	19%
Winter	59%	NW	10%	7%	17%
Spring	45%	ESE	17%	7%	24%

ATTACHMENT B

New on-site Temperature Tower - August 2011 to September 2012

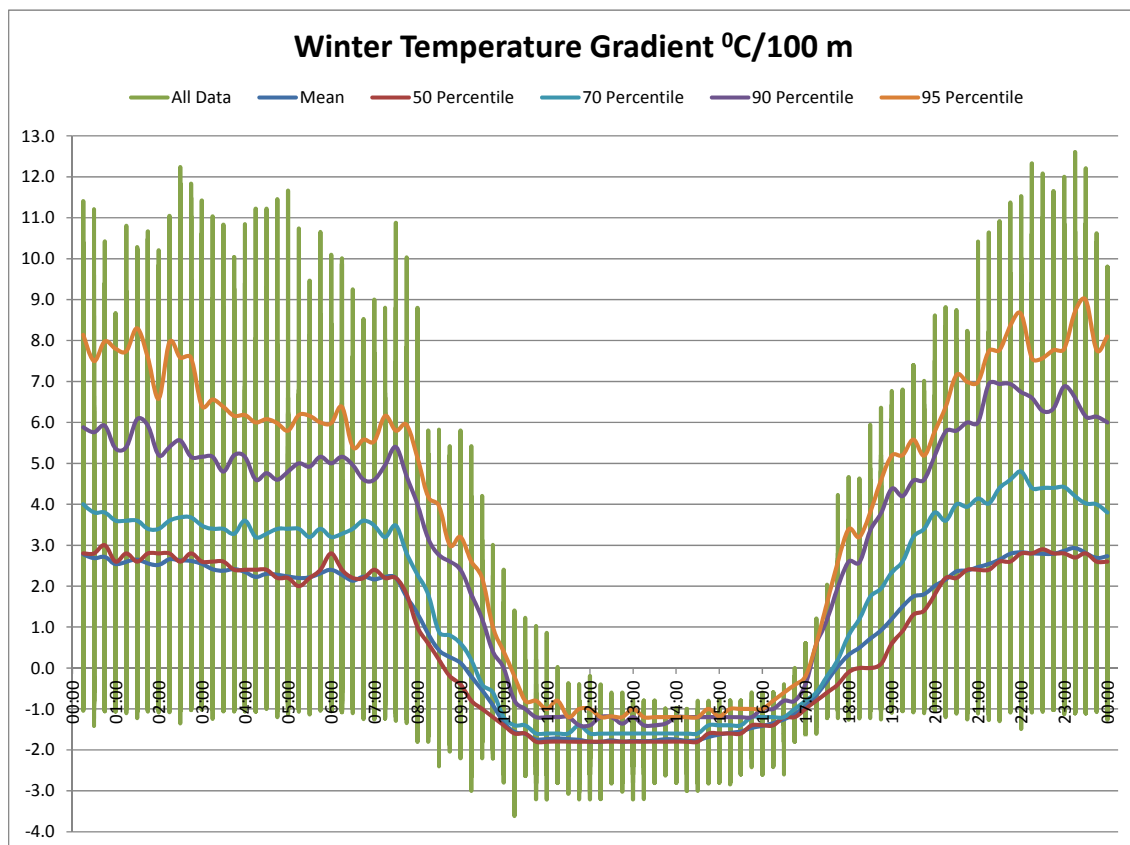
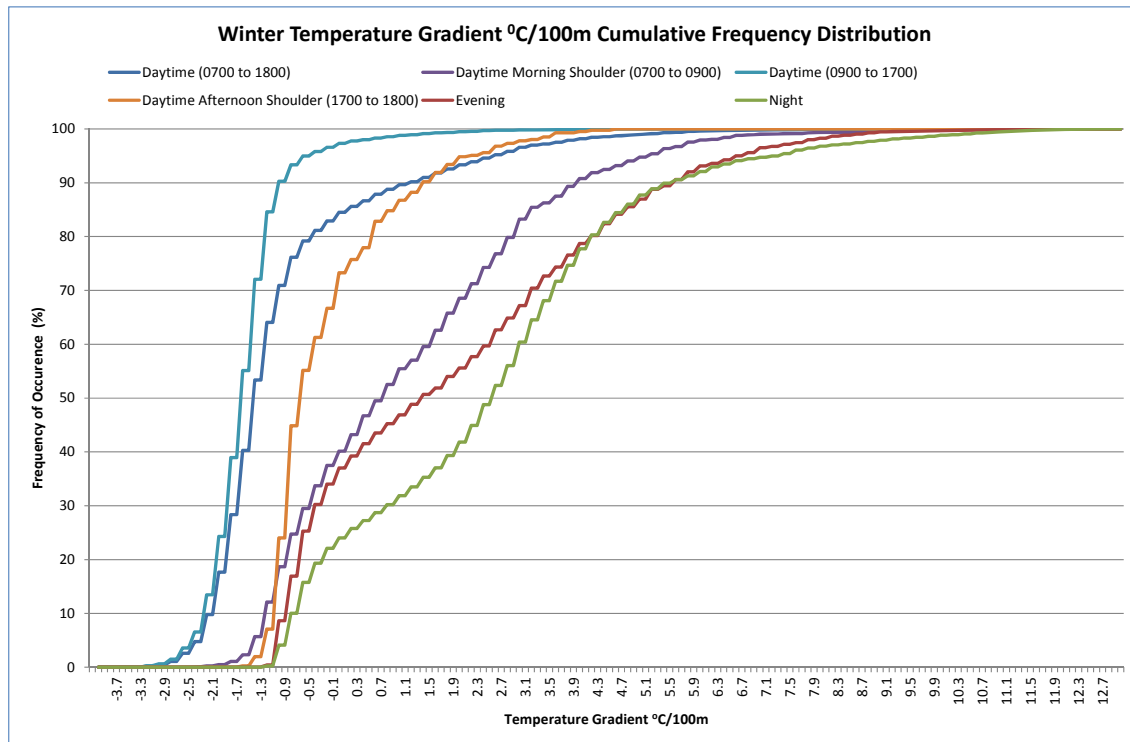
Winter Temperature Gradient Exceedance Level (Degrees C per 100 m) Summary

Daytime Exceedance				Evening Exceedance					Night-time Exceedance				
0700 to 1800 hours				1800 to 2200 hours					2200 to 0700 hours				
50%	30%	10%	5%	50%	30%	21%	10%	2%	50%	30%	22%	10%	3%
-1.4	-1.0	1.1	2.5	1.3	3.2	4.0	5.5	8.0	2.6	3.6	4.0	5.5	8.0

Morning Shoulder, Daytime and Afternoon Shoulder Exceedance											
0700 to 0900 hours				0900 to 1700 hours				1700 to 1800 hours			
50%	30%	10%	5%	50%	30%	10%	5%	50%	30%	10%	5%
0.6	2.2	3.9	5.1	-1.6	-1.4	-1.0	-0.6	-0.6	0.0	1.4	2.0

SITE METEOROLOGICAL MEASUREMENT METHODOLOGY

ATTACHMENT C



SITE NOISE MEASUREMENT METHODOLOGY

Overview of Methodology

A noise monitoring programme was conducted in December 2012 to quantify ambient noise levels (ie all noise sources) and to estimate industrial noise only (ie in the absence of transport, natural and domestic noise) at four representative residential receiver areas in the vicinity of the Wilpinjong Coal Mine in relation to the proposed Project.

In order to supplement the unattended logger measurements and to assist in identifying the character and duration of the noise sources, operator-attended night-time surveys were also conducted at all the vicinity of the logging locations. The ambient noise monitoring programme was implemented in accordance with AS 1055-1997 *Acoustics-Description and Measurement of Environmental Noise* and the *NSW Industrial Noise Policy* (INP) (New South Wales Environment Protection Authority, 2000).

Instrumentation and Measurement Parameters

All acoustic instrumentation employed throughout the noise monitoring programme has been designed to comply with the requirements of Australian Standard (AS) 1259.2-1990 *Sound Level Meters* and carries current National Association of Testing Authorities (NATA) or manufacturer calibration certificates.

A description of instrumentation, designated type and serial numbers is shown in **Table F1**.

Table F1 Acoustic Instrumentation Schedule

ID/Landowner	Location	Survey	Instrumentation
161 Private	Wollar	Ambient noise	SVAN 20665
102 Private	Mogo		SVAN 23815
1_155 Peabody	Tochilar		SVAN 27578
32 Cascade	Coggan		SVAN 23247
Corner of Ulan and Lagoons Roads	Ulan	Road Traffic	SVAN 20675

Note 1: Refer **Section 3.2** and **Appendix C**.

All instrumentation was programmed to record continuously the noise exceedance levels in 15 minute intervals including the L_{Amax} , $LA1$, $LA10$, $LA50$, $LA90$, $LA99$, L_{Amin} and the LA_{eq} . Instrument calibration was conducted before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dBA.

Weather Monitoring Station

Meteorological data were obtained from the new on-site Automatic Weather Station (AWS) and a 60 m high Permanent Temperature Tower (PTT) as shown on the Environmental Monitoring Site Plan **Appendix B1**.

Unattended Ambient Noise Monitoring Results

The unattended ambient noise logger data from each monitoring location, together with the on-site weather conditions were analysed on a daily basis.

The statistical noise exceedance levels (L_{AN}) are the levels exceeded for N% of the interval period. The LA_{90} represents the level exceeded for 90% of the interval period and is referred to as the average minimum or ambient noise level. The LA_{10} is the level exceeded for 10% of the time and is usually referred to as the average maximum noise level. The LA_{eq} is the equivalent continuous sound pressure level and represents the steady sound level which is equal in energy to the fluctuating level over the interval period.

Prior to further analysis, the ambient noise data from each location which correlated with periods of unstable weather (e.g. rainfall greater than 0.5 millimetres [mm] or wind speed greater than 5 metres per second [m/s]) were discarded. The acceptable ambient noise data were then processed in accordance with the INP "Appendix B - Applying the Background Noise Policy" to derive the Monday to Sunday ambient noise levels presented in **Table F2**.

SITE NOISE MEASUREMENT METHODOLOGY

Table F2 Unattended Ambient Noise Logger Results 2012 (dBA re 20 µPa)

Ref/Landholder	Measured RBL ^{1,2} All Noise Sources			Measured LAeq(period) ² All Noise Sources			Estimated LAeq(period) ² Industrial Noise Only		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
161 Private	13	23	12	57	56	46	<44	<39	<34
102 Private	22	30	12	41	51	45	<44	<39	<34
1_155 peabody	23	22	18	44	43	45	<44	<39	<34
32 Cascade	19	24	13	54	53	52	<44	<39	<34
Ulan Road	29	38	27	52	52	50	<44	<39	<34

Note 1: In accordance with the NSW INP (2000), if the RBL is below 30 dBA, then 30 dBA shall be the assumed RBL.

Note 2: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

µPa = micro Pascal.

Operator-Attended Ambient Noise Survey Results

Operator-attended noise surveys of 15 minutes duration were conducted with a precision integrating sound level meter in order to qualify the results obtained with the unattended noise loggers. During the attended noise surveys, the operator identified the character and duration of acoustically significant ambient noise sources. Wherever applicable the operator quantified local traffic flow and made a qualitative assessment of the prevailing weather conditions.

The night-time operator-attended noise surveys for the four ambient noise monitoring locations are presented below:

161 - Private

Date/Start Time Weather		Primary Noise Descriptor (dBA re 20uPa)					Typical maximum Levels LAmax - dBA
		Leq	L1	L10	L50	L90	
Night 04/12/12 0021 hrs 2 Okta, calm	Ambient	54	30	26	23	21	Insects 26-27 Mine 15-18
	Industrial	Estimated from Wilpinjong Mine LAeq ≈18 dBA					

102 - Private

Date/Start Time Weather		Primary Noise Descriptor (dBA re 20uPa)					Typical maximum Levels LAmax - dBA
		Leq	L1	L10	L50	L90	
Night 04/12/12 0056 hrs 2 Okta, calm	Ambient	48	39	38	35	34	Insects 36-39
	Industrial	Estimated LAeq ≈16 dBA					Mine (barely discernable) 12-16

1_155 - Peabody

Date/Start Time Weather		Primary Noise Descriptor (dBA re 20uPa)					Typical maximum Levels LAmax - dBA
		Leq	L1	L10	L50	L90	
Night 04/12/12 0159 hrs 1 Okta, calm	Ambient	58	32	24	22	21	Insects 21-41 Cows 24-38
	Industrial	Not discernable					

32 Cascade

Date/Start Time Weather		Primary Noise Descriptor (dBA re 20uPa)					Typical maximum Levels L _{max} - dBA
		Leq	L1	L10	L50	L90	
Night 04/12/12 0119 hrs 2 Okta, calm	Ambient	47	34	31	28	26	Insects 28-32 Cows 29-33 Bird 33-34 Traffic 33-39

Modification 6 - Daytime Plant And Equipment Sound Power Levels (SWL) dBA Re 1 Pw

Make and Model (or equivalent)	Years 2013 to 2018			Years 2019 to 2021			Years 2022 to 2023			Years 2024 to 2026		
	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL
Drills	4	120	126 dBA	3	120	125 dBA	2	120	123 dBA	1	120	120 dBA
Excavator (R9350)	4	121	127 dBA	3	121	126 dBA	1	121	121 dBA	-	121	-
Excavator (R9400)	1	121	121 dBA	1	121	121 dBA	1	121	121 dBA	1	121	121 dBA
Haul Truck (CAT 785C)	-	123	-	-	123	-	-	123	-	-	123	-
Haul Truck (CAT 789D)	22	125	138 dBA	18	125	137 dBA	12	125	136 dBA	6	125	133 dBA
Dozer (CAT D8)	-	-	-	-	-	-	-	-	-	-	-	-
Dozer (CAT D9)	-	-	-	-	-	-	-	-	-	-	-	-
Dozer (CAT D10)	6	122	130 dBA	4	122	128 dBA	3	122	126 dBA	1	122	122 dBA
Dozer (CAT D10T)	1	122	122 dBA	1	122	122 dBA	-	122	-	-	122	-
Dozer (CAT D11TQ - In-Pit)	5	125	132 dBA	3	125	130 dBA	2	125	128 dBA	2	125	128 dBA
Dozer (CAT D11TQ - Bulk Push)	5	125	132 dBA	3	125	130 dBA	2	125	128 dBA	2	125	128 dBA
Dozer (CAT D11TQ - Stockpile)	2	125	128 dBA	2	125	128 dBA	2	125	128 dBA	2	125	128 dBA
Dozer (CAT D11TQ - Overburden (Wilkie Creek))	3	125	130 dBA	2	125	128 dBA	1	125	125 dBA	1	125	125 dBA
Grader	5	115	122 dBA	4	115	121 dBA	2	115	118 dBA	1	115	115 dBA
Water Truck	4	-	121 dBA	3	116	121 dBA	2	116	119 dBA	1	116	116 dBA
Front End Loader (CAT 992K)	-	115	-	-	115	-	-	115	-	-	115	-
Front End Loader (CAT 993K)	1	118	118 dBA	1	118	118 dBA	1	118	118 dBA	1	118	118 dBA
Front End Loader (CAT 994K)	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA
Overall Mobile Plant (Owner's Fleet)	64		142 dBA	49		140 dBA	32		139 dBA	20		137 dBA
Loader	TopSoil Removal	-	115	-	115	-	-	115	-	-	115	-
Scraper (CAT 637)		2	111	2	111	114 dBA	2	111	114 dBA	2	111	114 dBA
777 Trucks		4	118	4	118	124 dBA	4	118	124 dBA	4	118	124 dBA
Watercart (CAT 769)		1	115	1	115	115 dBA	1	115	115 dBA	1	115	115 dBA
Dozer D9R	Supplementary Topsoil Removal/Rehabilitation/Cleanup/Dozer Push	1	120	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA
Dozer D10		2	122	2	122	125 dBA	2	122	125 dBA	2	122	125 dBA
Grader (CAT 14M)	Additional Watering/Road Maintenance	1	114	1	114	114 dBA	1	114	114 dBA	1	114	114 dBA
Watercart (CAT775D)		1	118	1	118	118 dBA	1	118	118 dBA	1	118	118 dBA
Grader (CAT 16H)		1	115	1	115	115 dBA	1	115	115 dBA	1	115	115 dBA

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Make and Model (or equivalent)		Years 2013 to 2018			Years 2019 to 2021			Years 2022 to 2023			Years 2024 to 2026		
		No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL
Front-end loader	Construction (Belt Press Filter)	1	110	110 dBA	1	110	110 dBA	1	110	110 dBA	1	110	110 dBA
Bobcat		1	104	104 dBA	1	104	104 dBA	1	104	104 dBA	1	104	104 dBA
Crane		2	101	104 dBA	2	101	104 dBA	2	101	104 dBA	2	101	104 dBA
Concrete truck		1	106	106 dBA	1	106	106 dBA	1	106	106 dBA	1	106	106 dBA
Semi-trailer		1	106	106 dBA	1	106	106 dBA	1	106	106 dBA	1	106	106 dBA
Excavator (120t)		1	110	110 dBA	1	110	110 dBA	1	110	110 dBA	1	110	110 dBA
Overall Support Fleet (Contractor Fleet)		20		129 dBA	20		129 dBA	20		129 dBA	20		129 dBA
Coal Preparation Plant		1	120	120 dBA	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA
ROM Bin & Feeder		2	106	109 dBA	2	106	109 dBA	2	106	109 dBA	2	106	109 dBA
Reject Bin		1	109	109 dBA	1	109	109 dBA	1	109	109 dBA	1	109	109 dBA
Sizer and Crashers		2	116	119 dBA	2	116	119 dBA	2	116	119 dBA	2	116	119 dBA
Stockpile Discharge		4	100	106 dBA	4	100	106 dBA	4	100	106 dBA	4	100	106 dBA
Transfer Station		4	100	106 dBA	4	100	106 dBA	4	100	106 dBA	4	100	106 dBA
Train Loadout Bin		1	113	113 dBA	1	113	113 dBA	1	113	113 dBA	1	113	113 dBA
Locos		3	100	105 dBA	3	100	105 dBA	3	100	105 dBA	3	100	105 dBA
Raw Coal Conveyor		5	-	109 dBA	5	-	0 dBA	5	-	0 dBA	5	-	0 dBA
Reject Conveyor		1	99 dBA/ 100m	99 dBA	1	99 dBA/ 100m	0 dBA	1	99 dBA/ 100m	0 dBA	1	99 dBA/ 100m	0 dBA
Product Conveyor		4	100 dBA/ 100m	108 dBA	4	100 dBA/ 100m	0 dBA	4	100 dBA/ 100m	0 dBA	4	100 dBA/ 100m	0 dBA
Recalim Conveyor		1	106 dBA/ 100m	106 dBA	1	106 dBA/ 100m	0 dBA	1	106 dBA/ 100m	0 dBA	1	106 dBA/ 100m	0 dBA
Train Loadout Conveyor		1	106 dBA/ 100m	108 dBA	1	106 dBA/ 100m	0 dBA	1	106 dBA/ 100m	0 dBA	1	106 dBA/ 100m	0 dBA
Overall Fixed Plant		30		124 dBA	30		124 dBA	30		124 dBA	30		124 dBA
		114		141.8 dBA	99		140.7 dBA	82		139.2 dBA	70		137.7 dBA

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Modification 6 - Evening/Night-time Plant and Equipment Sound Power Levels (SWL) dBA re 1 pW

Make and Model (or equivalent)	Years 2013 to 2018			Years 2019 to 2021			Years 2022 to 2023			Years 2024 to 2026		
	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL
Drills	4	120	126 dBA	3	120	125 dBA	2	120	123 dBA	1	120	120 dBA
Excavator (R9350)	4	121	127 dBA	3	121	126 dBA	1	121	121 dBA	-	121	-
Excavator (R9400)	1	121	121 dBA	1	121	121 dBA	1	121	121 dBA	1	121	121 dBA
Haul Truck (CAT 785C)	-	123	-	-	123	-	-	123	-	-	123	-
Haul Truck (CAT 789D)	22	125	138 dBA	18	125	137 dBA	12	125	136 dBA	6	125	133 dBA
Dozer (CAT D8)	-	-	-	-	-	-	-	-	-	-	-	-
Dozer (CAT D9)	-	-	-	-	-	-	-	-	-	-	-	-
Dozer (CAT D10)	6	122	130 dBA	4	122	128 dBA	3	122	126 dBA	1	122	122 dBA
Dozer (CAT D10T)	1	122	122 dBA	1	122	122 dBA	-	122	-	-	122	-
Dozer (CAT D11TQ - In-Pit)	5	125	132 dBA	3	125	130 dBA	2	125	128 dBA	2	125	128 dBA
Dozer (CAT D11TQ - Bulk Push)	5	125	132 dBA	3	125	130 dBA	2	125	128 dBA	2	125	128 dBA
Dozer (CAT D11TQ - Stockpile)	2	125	128 dBA	2	125	128 dBA	2	125	128 dBA	2	125	128 dBA
Dozer (CAT D11TQ - Overburden (Wilkie Creek))	3	125	130 dBA	2	125	128 dBA	1	125	125 dBA	1	125	125 dBA
Grader	5	115	122 dBA	4	115	121 dBA	2	115	118 dBA	1	115	115 dBA
Water Truck	4	-	121 dBA	3	116	121 dBA	2	116	119 dBA	1	116	116 dBA
Front End Loader (CAT 992K)	-	115	-	-	115	-	-	115	-	-	115	-
Front End Loader (CAT 993K)	1	118	118 dBA	1	118	118 dBA	1	118	118 dBA	1	118	118 dBA
Front End Loader (CAT 994K)	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA
Overall Mobile Plant (Owner's Fleet)	64		142 dBA	49		140 dBA	32		139 dBA	20		137 dBA
Loader	TopSoil Removal	-	115	-	115	-	-	115	-	-	115	-
Scraper (CAT 637)		-	111	-	111	-	-	111	-	-	111	-
777 Trucks		-	118	-	118	-	-	118	-	-	118	-
Watercart (CAT 769)		-	115	-	115	-	-	115	-	-	115	-
Dozer D9R	Supplementary Topsoil Removal/Rehabilitation /Cleanup/Dozer Push	-	120	-	120	-	-	120	-	-	120	-
Dozer D10		-	122	-	122	-	-	122	-	-	122	-
Grader (CAT 14M)	Additional Watering/ Road Maintenance	-	114	-	114	-	-	114	-	-	114	-
Watercart (CAT775D)		-	118	-	118	-	-	118	-	-	118	-
Grader (CAT 16H)		-	115	-	115	-	-	115	-	-	115	-
Front-end loader	Construction	-	110	-	110	-	-	110	-	-	110	-

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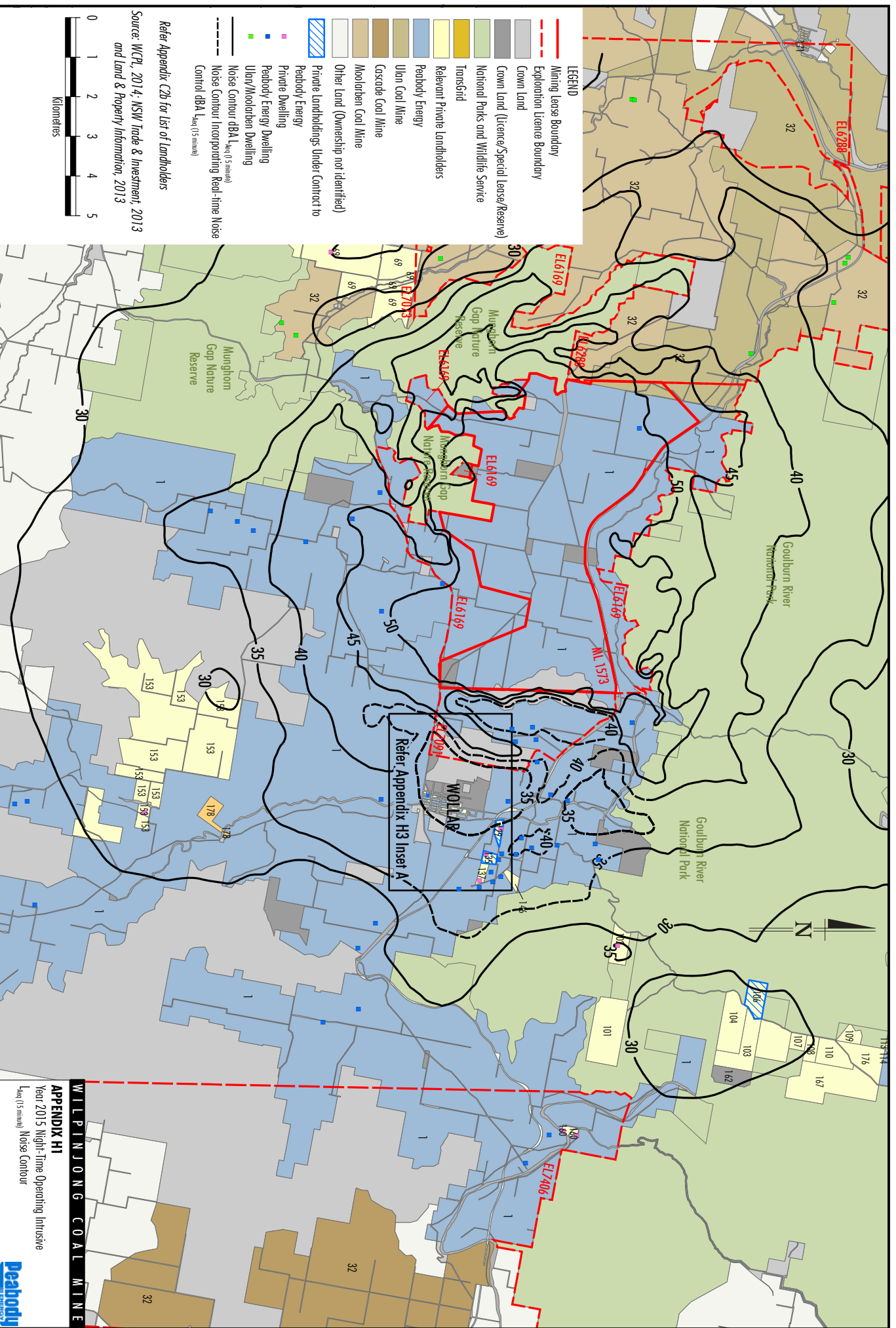
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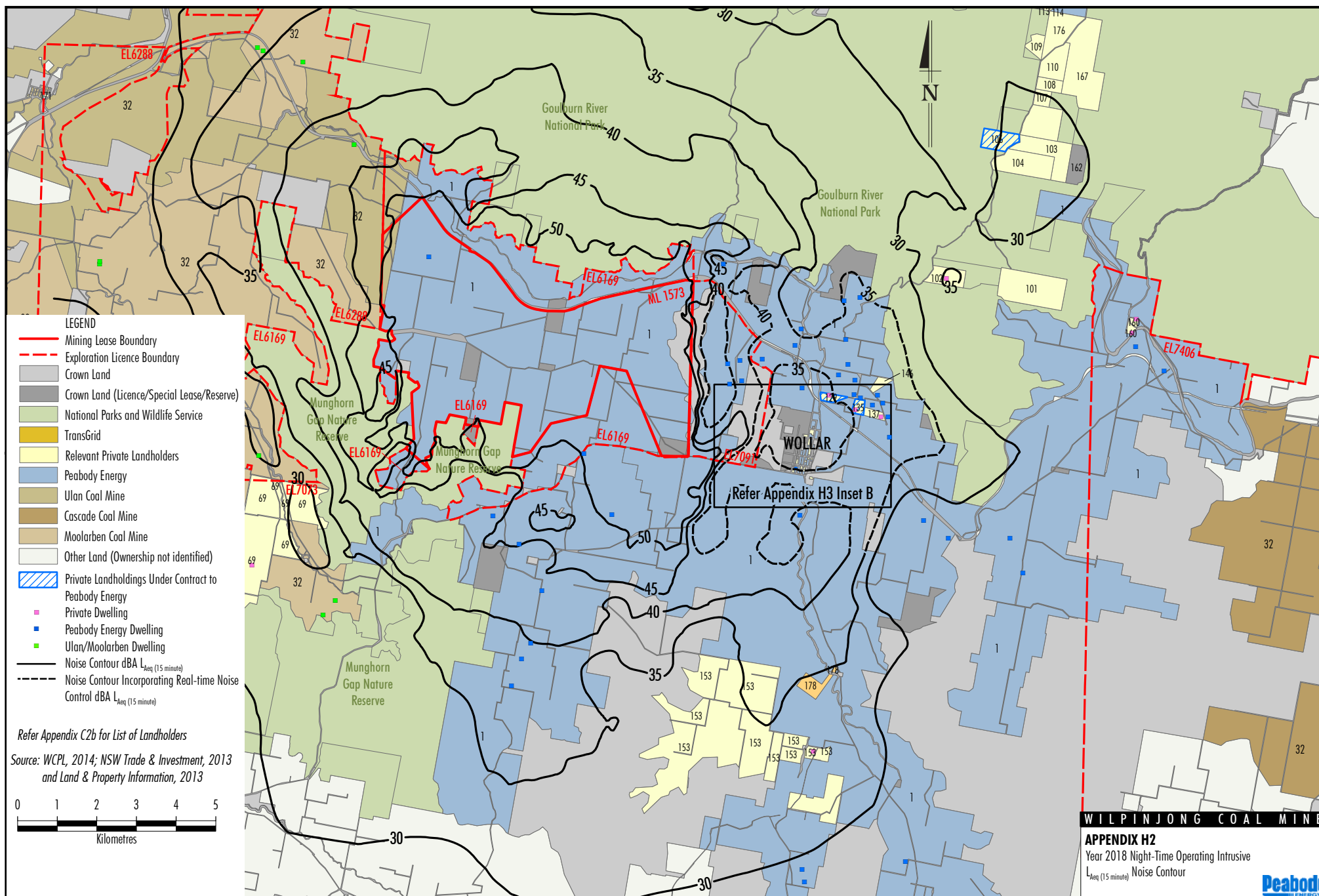
Make and Model (or equivalent)	Years 2013 to 2018			Years 2019 to 2021			Years 2022 to 2023			Years 2024 to 2026		
	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL	No of Items	Item SWL	Total SWL
Bobcat (Belt Press Filter)	-	104	-	-	104	-	-	104	-	-	104	-
Crane	-	101	-	-	101	-	-	101	-	-	101	-
Concrete truck	-	106	-	-	106	-	-	106	-	-	106	-
Semi-trailer	-	106	-	-	106	-	-	106	-	-	106	-
Excavator (120t)	-	110	-	-	110	-	-	110	-	-	110	-
Overall Support Fleet (Contractor Fleet)	0		0 dBA	0		0 dBA	0		0 dBA	0		0 dBA
Coal Preparation Plant	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA	1	120	120 dBA
ROM Bin & Feeder	2	106	109 dBA	2	106	109 dBA	2	106	109 dBA	2	106	109 dBA
Reject Bin	1	109	109 dBA	1	109	109 dBA	1	109	109 dBA	1	109	109 dBA
Sizer and Crashers	2	116	119 dBA	2	116	119 dBA	2	116	119 dBA	2	116	119 dBA
Stockpile Discharge	4	100	106 dBA	4	100	106 dBA	4	100	106 dBA	4	100	106 dBA
Transfer Station	4	100	106 dBA	4	100	106 dBA	4	100	106 dBA	4	100	106 dBA
Train Loadout Bin	1	113	113 dBA	1	113	113 dBA	1	113	113 dBA	1	113	113 dBA
Locos	3	100	105 dBA	3	100	105 dBA	3	100	105 dBA	3	100	105 dBA
Raw Coal Conveyor	5	-	109 dBA	5	-	0 dBA	5	-	0 dBA	5	-	0 dBA
Reject Conveyor	1	99 dBA/ 100 m	99 dBA	1	99 dBA/ 100 m	0 dBA	1	99 dBA/ 100 m	0 dBA	1	99 dBA/ 100 m	0 dBA
Product Conveyor	4	100 dBA/ 100 m	108 dBA	4	100 dBA/ 100 m	0 dBA	4	100 dBA/ 100 m	0 dBA	4	100 dBA/ 100 m	0 dBA
Recalim Conveyor	1	106 dBA/ 100 m	106 dBA	1	106 dBA/ 100 m	0 dBA	1	106 dBA/ 100 m	0 dBA	1	106 dBA/ 100 m	0 dBA
Train Loadout Conveyor	1	106 dBA/ 100 m	108 dBA	1	106 dBA/ 100 m	0 dBA	1	106 dBA/ 100 m	0 dBA	1	106 dBA/ 100 m	0 dBA
Overall Fixed Plant	30		124 dBA	30	0	124 dBA	30		124 dBA	30		124 dBA
	94		141.6 dBA	79		140.4 dBA	62		138.7 dBA	50		137.0 dBA

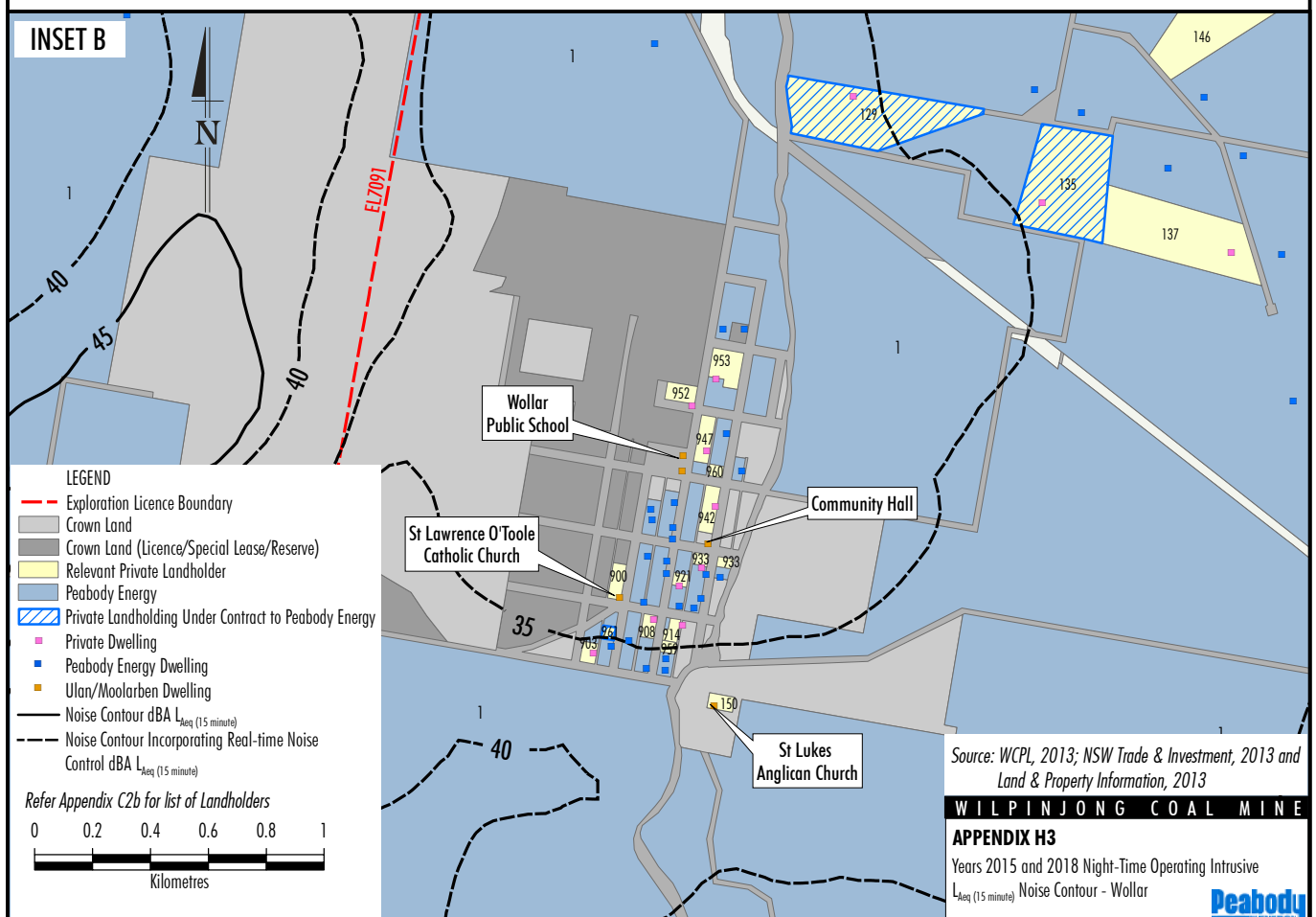
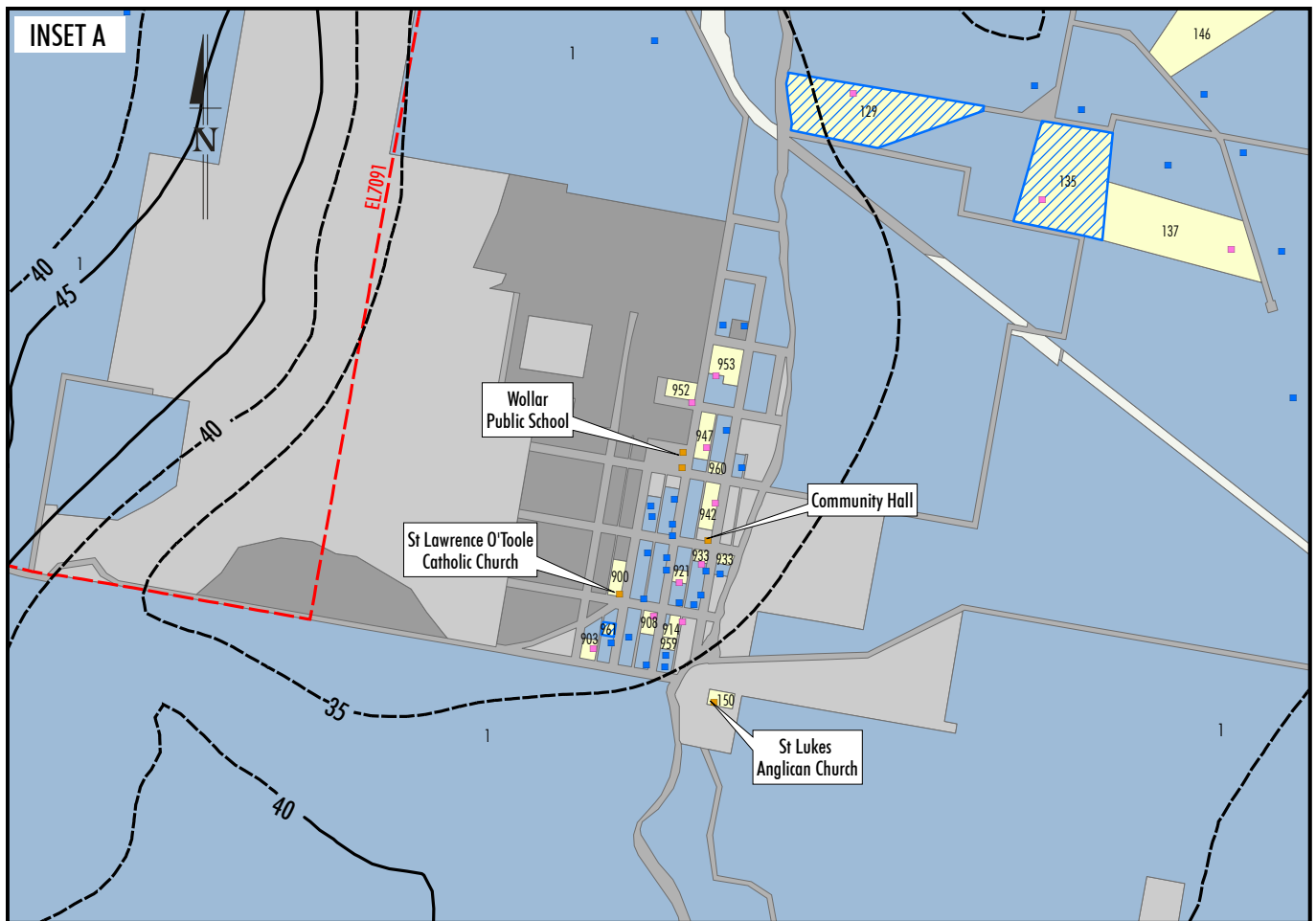
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RESOURCE-COMPANY OWNED RECIEVERS - YEARS 2015 & 2018 DAYTIME INTRUSIVE NOISE

ID No and Landholder	Year 2015 With Elevated Waste Area	Year 2015 Without Elevated Waste Area	Year 2018
Resource-company - Moolarben			
32_12 Moolarben	20	20	21
32_13 Moolarben	20	20	21
32_14 Moolarben	17	17	18
32_29A Moolarben	15	15	15
32_29B Moolarben	16	16	16
32_48A Moolarben	16	16	16
32_48B Moolarben	15	15	16
32C Moolarben	26	26	27
33A Moolarben	10	10	10
33B_5 Moolarben	10	11	10
Resource-company - Peabody			
1_100B Peabody	11	12	12
1_127 Peabody	19	19	19
1_131 Peabody	18	18	18
1_133 Peabody	18	18	19
1_136 Peabody	17	17	18
1_140 Peabody	16	16	16
1_142 Peabody	16	17	17
1_143 Peabody	18	18	18
1_145 Peabody	17	18	18
1_151 Peabody	18	18	19
1_152 Peabody	17	17	17
1_154 Peabody	9	9	9
1_155 Peabody	9	9	9
1_156 Peabody	10	10	10
1_158 Peabody	11	11	12
1_159 Peabody	7	7	7
1_162 Peabody	6	6	6
1_163 Peabody	5	6	6
1_164 Peabody	36	38	37
1_18 Peabody	22	22	21
1_19 Peabody	22	22	21
1_25 Peabody	21	21	22
1_26 Peabody	17	16	18
1_26 Peabody	19	19	18
1_28C Peabody	18	18	19
1_30 Peabody	18	18	18
1_31 Peabody	22	22	22
1_45 Peabody	33	33	31
1_49 Peabody	35	36	39
1_52A Peabody	24	24	26
1_53 Peabody	24	24	26
1_55 Peabody	24	24	26

RESOURCE-COMPANY OWNED RECIEVERS - YEARS 2015 & 2018 DAYTIME INTRUSIVE NOISE

ID No and Landholder	Year 2015 With Elevated Waste Area	Year 2015 Without Elevated Waste Area	Year 2018
1_58 Peabody	24	24	27
1_83 Peabody	18	18	18
1_905 Peabody	16	16	20
1_907 Peabody	16	16	19
1_910 Peabody	16	16	19
1_912 Peabody	16	16	20
1_913 Peabody	16	16	20
1_915 Peabody	14	14	17
1_916 Peabody	14	14	17
1_917 Peabody	15	15	17
1_920 Peabody	15	15	17
1_923 Peabody	15	15	17
1_926 Peabody	15	15	17
1_927 Peabody	15	15	17
1_929 Peabody	15	15	17
1_931 Peabody	15	15	17
1_934 Peabody	15	15	17
1_937 Peabody	15	15	17
1_938 Peabody	15	15	17
1_939 Peabody	15	15	17
1_941 Peabody	15	15	17
1_946 Peabody	15	15	17
1_950 Peabody	15	15	17
1_956 Peabody	16	16	17
1_957 Peabody	16	16	17
1_W88A Peabody	19	19	20
1_W88B Peabody	20	20	21
1_WA Peabody	43	43	45
1_WF Peabody	22	22	30
1_WJ Peabody	29	29	32
1_WK Peabody	22	22	24
1_WR Peabody	17	18	20
1_WT Peabody	10	10	11

Note 1: Highest predicted noise levels from the INP meteorological conditions in **Table 10** for each receiver.

Note 2: Predicted LAeq(15minute) noise level complies with the intrusive PSNL.

Note 3: Predicted marginal noise exceedance 1 to 2 dBA above intrusive PSNL.

Note 4: Predicted moderate noise exceedance 3 to 5 dBA above intrusive PSNL.

Note 5: Predicted appreciable noise exceedance > 5 dBA above intrusive PSNL.

RESOURCE-COMPANY OWNED RECIEVERS - YEARS 2015 & 2018 EVENING INTRUSIVE NOISE

ID No and Landowner	Year 2015 With Elevated Waste Area		Year 2015 Without Elevated Waste Area		Year 2018	
	Calm	Wind	Calm	Wind	Calm	Wind
Resource-company - Moolarben						
32_12 Moolarben	20	32	21	32	21	31
32_13 Moolarben	20	31	20	31	21	32
32_14 Moolarben	17	30	18	30	18	32
32_29A Moolarben	15	25	15	25	15	27
32_29B Moolarben	16	32	17	32	16	33
32_48A Moolarben	16	27	16	28	16	29
32_48B Moolarben	15	27	15	27	16	28
32C Moolarben	26	36	26	36	27	37
33A Moolarben	10	30	10	30	10	30
33B_5 Moolarben	11	30	11	30	10	30
Resource-company - Peabody						
1_100B Peabody	11	7	12	7	12	8
1_127 Peabody	19	15	19	15	19	15
1_131 Peabody	18	13	18	14	18	14
1_133 Peabody	18	13	18	13	18	14
1_136 Peabody	17	14	17	14	17	13
1_140 Peabody	16	11	16	11	16	11
1_142 Peabody	16	13	16	13	17	12
1_143 Peabody	18	13	18	13	18	14
1_145 Peabody	17	13	18	13	18	14
1_151 Peabody	18	16	18	16	19	23
1_152 Peabody	17	13	17	13	17	13
1_154 Peabody	9	5	9	5	9	6
1_155 Peabody	9	5	9	5	9	6
1_156 Peabody	10	6	10	6	10	6
1_158 Peabody	11	7	11	7	12	7
1_159 Peabody	7	3	7	2	7	2
1_162 Peabody	6	2	6	2	7	2
1_163 Peabody	5	1	6	1	6	1
1_164 Peabody	35	34	38	36	37	45
1_18 Peabody	22	18	22	18	21	17
1_19 Peabody	22	18	22	18	21	18
1_25 Peabody	21	16	21	16	21	18
1_26 Peabody	17	12	16	12	18	14
1_26 Peabody	18	14	19	14	18	14
1_28C Peabody	18	14	18	14	19	15
1_30 Peabody	18	13	18	13	18	14
1_31 Peabody	22	17	22	17	22	18
1_45 Peabody	33	29	33	29	31	27
1_49 Peabody	34	31	36	33	39	42
1_52A Peabody	24	19	24	19	26	22
1_53 Peabody	24	19	24	19	25	22
1_55 Peabody	24	20	24	20	26	22

RESOURCE-COMPANY OWNED RECIEVERS - YEARS 2015 & 2018 EVENING INTRUSIVE NOISE

ID No and Landowner	Year 2015 With Elevated Waste Area		Year 2015 Without Elevated Waste Area		Year 2018	
	Calm	Wind	Calm	Wind	Calm	Wind
1_58 Peabody	24	19	24	19	26	23
1_83 Peabody	18	14	18	14	18	14
1_905 Peabody	16	12	16	12	20	16
1_907 Peabody	16	11	16	11	19	15
1_910 Peabody	16	12	16	12	19	16
1_912 Peabody	16	11	16	11	20	17
1_913 Peabody	16	12	16	12	20	16
1_915 Peabody	14	10	14	10	17	12
1_916 Peabody	14	10	14	10	17	12
1_917 Peabody	14	10	14	10	17	12
1_920 Peabody	15	10	15	10	17	12
1_923 Peabody	15	10	15	10	17	12
1_926 Peabody	15	10	15	10	17	12
1_927 Peabody	15	10	15	10	17	12
1_929 Peabody	15	10	15	10	17	12
1_931 Peabody	15	11	15	11	17	13
1_934 Peabody	15	10	15	10	17	12
1_937 Peabody	15	10	15	10	17	12
1_938 Peabody	15	11	15	11	17	12
1_939 Peabody	15	11	15	11	17	13
1_941 Peabody	15	11	15	11	17	12
1_946 Peabody	15	10	15	10	17	12
1_950 Peabody	15	11	15	11	17	12
1_956 Peabody	16	11	16	11	17	12
1_957 Peabody	16	11	16	11	17	12
1_W88A Peabody	18	17	19	17	20	25
1_W88B Peabody	19	18	20	18	22	26
1_WA Peabody	43	48	43	48	45	53
1_WF Peabody	22	32	22	32	31	37
1_WJ Peabody	29	32	29	32	32	36
1_WK Peabody	22	20	22	20	24	27
1_WR Peabody	17	12	18	13	20	15
1_WT Peabody	10	5	10	5	11	6

Note 1: Highest predicted noise levels from the INP meteorological conditions in **Table 10** for each receiver.
Note 2: Predicted LAeq(15minute) noise level complies with the intrusive PSNL.
Note 3: Predicted marginal noise exceedance 1 to 2 dBA above intrusive PSNL.
Note 4: Predicted moderate noise exceedance 3 to 5 dBA above intrusive PSNL.
Note 5: Predicted appreciable noise exceedance > 5 dBA above intrusive PSNL.

RESOURCE-COMPANY OWNED RECIEVERS - YEARS 2015 & 2018 NIGHT-TIME INTRUSIVE NOISE

ID No and Landowner	Year 2015 With Elevated Waste Area			Year 2015 Without Elevated Waste Area			Year 2018		
	Calm	Wind or Inversion	LA1 (1min)	Calm	Wind or Inversion	LA1 (1min)	Calm	Wind or Inversion	LA1 (1min)
Resource-company - Moolarben									
32_12 Moolarben	21	35	42	21	35	42	22	34	41
32_13 Moolarben	21	34	41	21	34	41	22	35	42
32_14 Moolarben	18	32	39	18	32	39	19	36	43
32_29A Moolarben	16	28	35	16	28	35	15	30	37
32_29B Moolarben	17	36	43	17	36	43	16	35	42
32_48A Moolarben	16	34	41	17	34	41	16	36	43
32_48B Moolarben	16	33	40	16	34	41	16	36	43
32C Moolarben	27	40	47	27	40	47	28	41	48
33A Moolarben	11	31	38	11	31	38	11	30	37
33B_5 Moolarben	11	31	38	11	31	38	11	31	38
Resource-company - Peabody									
1_100B Peabody	12	31	38	12	31	38	13	28	35
1_127 Peabody	20	40	47	20	40	47	19	39	46
1_131 Peabody	18	41	48	19	41	48	19	38	45
1_133 Peabody	18	41	48	19	41	48	19	38	45
1_136 Peabody	18	33	40	18	34	41	18	36	43
1_140 Peabody	16	38	45	16	38	45	16	38	45
1_142 Peabody	17	38	45	17	38	45	17	38	45
1_143 Peabody	18	41	48	18	40	47	19	38	45
1_145 Peabody	18	39	46	18	39	46	19	37	44
1_151 Peabody	18	37	44	19	37	44	20	38	45
1_152 Peabody	18	38	45	18	38	45	18	38	45
1_154 Peabody	9	28	35	9	28	35	10	29	36
1_155 Peabody	9	28	35	9	28	35	9	29	36
1_156 Peabody	10	27	34	10	27	34	10	28	35
1_158 Peabody	12	27	34	12	27	34	12	27	34
1_159 Peabody	7	23	30	7	23	30	7	24	31
1_162 Peabody	7	28	35	7	28	35	7	27	34
1_163 Peabody	6	28	35	6	28	35	6	27	34
1_164 Peabody	36	48	55	39	50	57	37	50	57
1_18 Peabody	22	41	48	22	41	48	22	41	48
1_19 Peabody	22	40	47	22	40	47	22	38	45
1_25 Peabody	21	45	52	21	45	52	22	41	48
1_26 Peabody	17	22	29	17	22	29	18	23	30
1_26 Peabody	19	42	49	19	41	48	19	37	44
1_28C Peabody	18	33	40	18	35	42	19	36	43
1_30 Peabody	18	42	49	18	41	48	19	37	44
1_31 Peabody	22	40	47	22	38	45	22	34	41
1_45 Peabody	34	48	55	34	48	55	31	45	52
1_49 Peabody	35	49	56	37	49	56	40	51	58
1_52A Peabody	24	46	53	24	46	53	27	42	49
1_53 Peabody	24	43	50	24	43	50	26	42	49

RESOURCE-COMPANY OWNED RECIEVERS - YEARS 2015 & 2018 NIGHT-TIME INTRUSIVE NOISE

ID No and Landowner	Year 2015 With Elevated Waste Area			Year 2015 Without Elevated Waste Area			Year 2018		
	Calm	Wind or Inversion	LA1 (1min)	Calm	Wind or Inversion	LA1 (1min)	Calm	Wind or Inversion	LA1 (1min)
1_55 Peabody	25	39	46	25	41	48	26	42	49
1_58 Peabody	24	41	48	24	42	49	27	42	49
1_83 Peabody	19	42	49	19	42	49	19	38	45
1_905 Peabody	16	33	40	16	34	41	21	35	42
1_907 Peabody	16	32	39	16	32	39	20	34	41
1_910 Peabody	17	33	40	17	35	42	20	40	47
1_912 Peabody	16	34	41	16	34	41	21	35	42
1_913 Peabody	17	34	41	17	35	42	21	39	46
1_915 Peabody	15	31	38	15	33	40	18	31	38
1_916 Peabody	15	32	39	15	34	41	17	31	38
1_917 Peabody	15	32	39	15	34	41	17	31	38
1_920 Peabody	15	33	40	15	34	41	17	33	40
1_923 Peabody	15	33	40	15	35	42	18	34	41
1_926 Peabody	15	33	40	15	35	42	17	34	41
1_927 Peabody	15	34	41	15	35	42	17	34	41
1_929 Peabody	16	33	40	16	34	41	18	34	41
1_931 Peabody	16	33	40	16	35	42	18	34	41
1_934 Peabody	16	34	41	16	35	42	18	36	43
1_937 Peabody	16	34	41	16	35	42	18	35	42
1_938 Peabody	16	34	41	16	35	42	18	35	42
1_939 Peabody	16	34	41	16	35	42	18	35	42
1_941 Peabody	16	34	41	16	35	42	18	35	42
1_946 Peabody	16	34	41	16	35	42	17	35	42
1_950 Peabody	16	33	40	16	35	42	18	35	42
1_956 Peabody	16	32	39	16	33	40	18	34	41
1_957 Peabody	16	33	40	16	34	41	18	34	41
1_W88A Peabody	19	38	45	19	38	45	21	39	46
1_W88B Peabody	20	39	46	20	39	46	22	40	47
1_WA Peabody	43	51	58	43	51	58	46	53	60
1_WF Peabody	22	43	50	23	44	51	32	44	51
1_WJ Peabody	30	45	52	30	46	53	32	48	55
1_WK Peabody	22	42	49	22	42	49	24	43	50
1_WR Peabody	18	39	46	18	39	46	20	42	49
1_WT Peabody	10	25	32	10	25	32	11	26	33

Note 1: Highest predicted noise levels from the INP meteorological conditions in Table 10 for each receiver.

Note 2: Predicted LAeq(15minute) noise level complies with the intrusive PSNL.

Note 3: Predicted marginal noise exceedance 1 to 2 dBA above intrusive PSNL.

Note 4: Predicted moderate noise exceedance 3 to 5 dBA above intrusive PSNL.

Note 5: Predicted appreciable noise exceedance > 5 dBA above intrusive PSNL.

RESOURCE-COMPANY OWNED RECEIVERS - YEARS 2015 & 2018 INTRUSIVE NOISE IMPACT

The current WCPL property acquisition strategy has resulted in a 'buffer' mine owned lands surrounding the majority of Wilpinjong. Consequently, predicted noise levels are elevated at some resource-company owned properties. In addition, a number of properties in the vicinity of Wilpinjong are owned by MCMPL.

In summary, the predicted operating intrusive LAeq(15minute) noise levels at resource-company owned receivers show that:

- 1 Compliance is generally determined by night-time noise levels, due to the noise enhancing meteorological conditions (refer **Table 10**) that occur at night.
- 2 A total of 40 resource-company owned receivers exceed the PSNLs, including 19 receivers within the Noise Management Zone and 21 receivers in the Noise Affection Zone.
- 3 During the daytime, up to 2 resource-company owned receiver are within the Noise Management Zone and 1 receivers is in the Noise Affection Zone.
- 4 During the evening, up to 3 resource-company owned receivers are within the Noise Management Zone and 3 receivers are in the Noise Affection Zone.
- 5 During the night-time, up to 19 resource company-owned receivers are within the Noise Management Zone and 21 receivers are in the Noise Affection Zone.
- 6 **Table I1** and **Table I2** present the resource company-owned receivers with predicted intrusive LAeq(15minute) noise level exceedances of the PSNLs and predicted LA1(1minute) exceedances of the SDNLs respectively.

Table I1 and **Table I2** present the resource company-owned receivers with predicted intrusive LAeq(15minute) noise level exceedances of the PSNLs and predicted LA1(1minute) exceedances of the SDNLs respectively.

Table I1 Resource Company-owned Receivers¹ with Intrusive PSNL Exceedances

Period	Noise Management Zone		Noise Affection Zone
	1 dBA to 2 dBA above PSNL	3 dBA to 5 dBA above PSNL	> 5 dBA above PSNL
Daytime	-	1_164, 1_49	1_WA
Evening	32C, 1_WF, 1_WJ	-	1_164, 1_49, 1_WA
Night-time	32_14, 32_29B, 32_48A, 32_48B, 1_136, 1_28C, 1_934	1_127, 1_140, 1_142, 1_145, 1_151, 1_152, 1_19, 1_31, 1_910, 1_913, 1_W88A, 1_W88B	32C, 1_131, 1_133, 1_143, 1_164, 1_18, 1_25, 1_26, 1_30, 1_45, 1_49, 1_52A, 1_53, 1_55, 1_58, 1_83, 1_WA, 1_WF, 1_WJ, 1_WK, 1_WR

Note 1: Refer **Section 3.2** and **Appendix C**.

Table I2 Resource Company-owned Receivers¹ Night-time LA1(1minute) SDNL Exceedances

Period	Noise Management Zone		Noise Affection Zone
	1 dBA to 2 dBA above SDNL	3 dBA to 5 dBA above SDNL	> 5 dBA above SDNL
Night-time	1_127, 1_145, 1_19, 1_31, 1_910, 1_913, 1_W88A, 1_W88B	32C, 1_131, 1_133, 1_143, 1_18, 1_26, 1_30, 1_53, 1_55, 1_58, 1_83, 1_WK, 1_WR	1_164, 1_25, 1_45, 1_49, 1_52A, 1_WA, 1_WF, 1_WJ

Note 1: Refer **Section 3.2** and **Appendix C**.

RESOURCE-COMPANY OWNED RECEIVERS - YEARS 2015 & 2018 NOISE AMENITY LEVELS

ID No and Landowner	Year 2015 With Elevated Waste Area			Year 2015 Without Elevated Waste Area			Year 2018		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Resource-company - Moolarben									
32_12 Moolarben	17	29	32	18	29	32	19	29	32
32_13 Moolarben	17	29	32	18	29	32	19	29	32
32_14 Moolarben	15	27	30	15	27	30	15	29	33
32_29A Moolarben	13	22	25	13	22	25	12	24	27
32_29B Moolarben	13	29	33	13	29	33	13	30	33
32_48A Moolarben	13	25	29	13	25	30	13	26	31
32_48B Moolarben	12	24	29	12	24	29	12	25	31
32C Moolarben	23	33	37	23	33	37	24	35	38
33A Moolarben	8	27	29	8	27	29	8	27	29
33B_5 Moolarben	8	27	29	8	27	29	8	27	29
Resource-company - Peabody									
1_100B Peabody	7	10	24	7	10	24	8	11	21
1_127 Peabody	15	18	33	15	18	33	15	18	32
1_131 Peabody	14	16	34	14	16	34	14	17	31
1_133 Peabody	14	16	34	14	16	34	14	17	31
1_136 Peabody	13	16	27	13	16	27	13	16	29
1_140 Peabody	12	14	31	12	14	31	12	14	31
1_142 Peabody	12	15	31	12	15	31	12	15	31
1_143 Peabody	14	16	34	14	16	33	14	17	32
1_145 Peabody	13	16	32	13	16	32	14	17	30
1_151 Peabody	14	17	31	15	17	31	15	21	32
1_152 Peabody	13	16	31	13	16	31	13	15	31
1_154 Peabody	5	7	21	5	7	22	5	8	22
1_155 Peabody	5	7	21	5	7	21	5	8	22
1_156 Peabody	6	8	20	6	9	20	6	8	21
1_158 Peabody	7	10	20	7	10	20	7	10	21
1_159 Peabody	3	5	16	3	5	16	3	5	17
1_162 Peabody	2	5	21	2	5	21	2	5	20
1_163 Peabody	1	4	21	1	4	21	1	4	20
1_164 Peabody	33	35	43	35	37	44	34	43	46
1_18 Peabody	18	20	34	18	20	34	17	20	34
1_19 Peabody	18	20	34	18	20	33	17	20	32
1_25 Peabody	17	19	38	17	19	38	17	20	34
1_26 Peabody	13	15	17	13	15	17	15	16	19
1_26 Peabody	14	17	35	14	17	35	14	17	31
1_28C Peabody	14	16	27	14	16	28	15	17	29
1_30 Peabody	14	16	35	14	16	35	14	16	30
1_31 Peabody	18	20	33	17	20	32	18	20	28
1_45 Peabody	29	32	41	29	32	41	27	29	38
1_49 Peabody	31	33	42	33	35	43	36	40	46
1_52A Peabody	20	22	39	20	22	39	22	25	35
1_53 Peabody	20	22	36	20	22	36	22	24	35

RESOURCE-COMPANY OWNED RECEIVERS - YEARS 2015 & 2018 NOISE AMENITY LEVELS

ID No and Landowner	Year 2015 With Elevated Waste Area			Year 2015 Without Elevated Waste Area			Year 2018		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
1_55 Peabody	20	23	32	20	22	34	22	24	35
1_58 Peabody	20	22	34	19	22	35	23	25	35
1_83 Peabody	14	16	35	14	17	35	14	16	31
1_905 Peabody	12	14	27	12	14	27	16	19	28
1_907 Peabody	11	14	25	11	14	25	15	18	27
1_910 Peabody	12	15	26	12	15	28	15	18	33
1_912 Peabody	12	14	27	12	14	28	16	19	28
1_913 Peabody	12	14	27	12	14	28	16	19	32
1_915 Peabody	10	13	24	10	13	26	13	15	24
1_916 Peabody	10	13	25	10	13	27	13	15	24
1_917 Peabody	10	13	25	10	13	27	13	15	25
1_920 Peabody	10	13	26	10	13	28	12	15	26
1_923 Peabody	11	13	26	11	13	28	13	15	27
1_926 Peabody	11	13	27	11	13	28	12	15	27
1_927 Peabody	11	13	27	11	13	28	12	15	27
1_929 Peabody	11	13	26	11	13	28	13	15	27
1_931 Peabody	11	14	26	11	14	28	13	15	27
1_934 Peabody	11	13	27	11	13	28	13	15	29
1_937 Peabody	11	13	27	11	13	28	13	15	28
1_938 Peabody	11	13	27	11	13	28	13	15	28
1_939 Peabody	11	14	27	11	14	28	13	15	28
1_941 Peabody	11	14	27	11	14	28	13	15	28
1_946 Peabody	11	13	27	11	13	28	13	15	28
1_950 Peabody	11	14	27	11	14	28	13	15	28
1_956 Peabody	12	14	26	11	14	26	13	15	27
1_957 Peabody	12	14	26	12	14	27	13	15	27
1_W88A Peabody	15	18	32	15	18	32	16	24	32
1_W88B Peabody	16	19	32	16	19	33	18	24	33
1_WA Peabody	41	46	49	41	47	49	44	51	52
1_WF Peabody	18	30	37	18	29	38	27	35	39
1_WJ Peabody	25	31	39	25	31	40	28	34	42
1_WK Peabody	18	21	35	18	21	36	20	25	37
1_WR Peabody	13	16	32	13	16	32	15	18	35
1_WT Peabody	6	8	18	6	8	18	6	9	19

Note 1: Highest predicted noise levels from the INP meteorological conditions in Table 10 for each receiver.
Note 2: Predicted LAeq(period) noise level complies with the amenity (INP acceptable) PSNL.
Note 3: Predicted marginal noise exceedance 1 to 2 dBA above amenity (INP acceptable) PSNL.
Note 4: Predicted moderate noise exceedance 3 to 5 dBA above amenity (INP acceptable) PSNL.
Note 5: Predicted appreciable noise exceedance > 5 dBA above amenity (INP acceptable) PSNL.

RESOURCE-COMPANY OWNED RECEIVERS - YEARS 2015 & 2018 NOISE AMENITY IMPACT

In summary, the predicted LAeq(period) amenity noise levels show that:

- 1 Compliance is generally determined by night-time noise levels, due to the noise enhancing meteorological conditions (refer **Table 10**) that occur at night.
- 2 A total of 5 resource-company owned receivers exceed the PSNLs, including 2 receivers within the Noise Management Zone and 3 receiver in the Noise Affection Zone.
- 3 During the daytime, no resource-company owned receivers are within the Noise Management Zone and no receivers are in the Noise Affection Zone.
- 4 During the evening, up to no resource-company owned receivers are within the Noise Management Zone and 1 receiver are in the Noise Affection Zone.
- 5 During the night-time, up to 2 resource-company owned receivers are within the Noise Management Zone and 3 receivers are in the Noise Affection Zone.

Table J1 presents the resource-company owned receivers with predicted LAeq(period) amenity noise level exceedance of the PSNLs.

Table J1 Resource-company Owned receivers¹ with LAeq(period) PSNL Exceedances

Period	Noise Management Zone		Noise Affection Zone
	1 dBA to 2 dBA above PSNL	3 dBA to 5 dBA above PSNL	> 5 dBA above PSNL
Daytime	-	-	-
Evening	-	-	1_WA
Night-time	1_45, 1_WJ	-	1_164, 1_49, 1_WA,

Note 1: Refer to **Appendix C2** for land ownership details.

RESOURCE-COMPANY OWNED RECEIVERS - CUMULATIVE AMENITY NOISE IMPACT

In summary, the predicted cumulative LAeq(period) noise amenity levels show that:

- 1 Compliance is generally determined by night-time noise levels, due to the noise enhancing meteorological conditions (refer **Table 10**) at night.
- 2 All but 3 receiver comply with the INP recommended maximum amenity noise levels.
- 3 A total of 5 resource-company owned receivers exceed the INP's acceptable amenity levels, including 3 receiver within the Noise Management Zone and 4 receivers in the Noise Affection Zone.
- 4 During the evening, no resource-company owned receivers are within the Noise Management Zone and 1 receiver is in the Noise Affection Zone.
- 5 During the night-time, up to 5 resource-company owned receiver is within the Noise Management Zone and 3 receivers are in the Noise Affection Zone.
- 6 Cumulative noise exceedances are largely dominated by the Modification 6 with the exception of 32_13, 32_14, and 32C Moolarben which are owned by MCMPL.

Table J2 presents the resource-company owned receivers with predicted noise level exceedance of the INP's acceptable amenity levels.

Table J2 Resource-company Owned Receivers¹ with INP Acceptable Amenity Level Exceedances

Period	Noise Management Zone		Noise Affection Zone
	1 dBA to 2 dBA above INP Acceptable	3 dBA above INP Acceptable	> 3 dBA above INP Acceptable
Evening	-	-	1_WA
Night-time	32_13, 32_14, 1_45, 1_WJ	32C,	1_164, 1_49, 1_WA

Note 1: Refer to **Appendix C2** for land ownership details.