

METROPOLITAN COAL

NOISE MANAGEMENT PLAN



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Revision Status Register

Section/Page/ Annexure	Revision Number	Amendment/Addition	Distribution	DP&E Approval Date
All	NMP-R01-A	Original	DECCW and DoP	-
All	NMP-R01-B	Minor amendments or formatting	DoP	26 August 2010
Sections 7 and 8, Figures 2 and 4, Appendix E	NMP-R01-C	Revision to reflect modified Project Approval	DoP	-
Section 8	NMP-R01-D	Revision to reflect Independent Environmental Audit Recommendations regarding blasting	DP&I	-
All	NMP-R01-E	Minor amendments following submission of the 2013 Annual Review/AEMR and inclusion of a real-time noise performance indicator	DP&E	25 August 2014

June 2014

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1 INTRODUCTION

Metropolitan Coal is a wholly owned subsidiary of Peabody Energy Australia Pty Ltd. Metropolitan Coal was granted approval for the Metropolitan Coal Project (the Project) under Section 75J of the New South Wales (NSW) *Environmental Planning and Assessment Act, 1979* (EP&A Act) on 22 June 2009 (the Approval). A copy of the Project Approval is available on the Peabody website (<http://www.peabodyenergy.com.au>).

The Project comprises continuation, upgrade and extension of underground coal mining operations and surface facilities at Metropolitan Coal. The Approved underground mining Project layout is shown on Figure 1. The extent of the mine's Major Surface Facilities Area is shown on Figure 2.

1.1 PURPOSE AND SCOPE

This Noise Management Plan (NMP) has been prepared for the Project in accordance with Condition 8, Schedule 4 of the Project Approval.

The relationship of this NMP to the Metropolitan Coal Environmental Management Structure is shown on Figure 3.

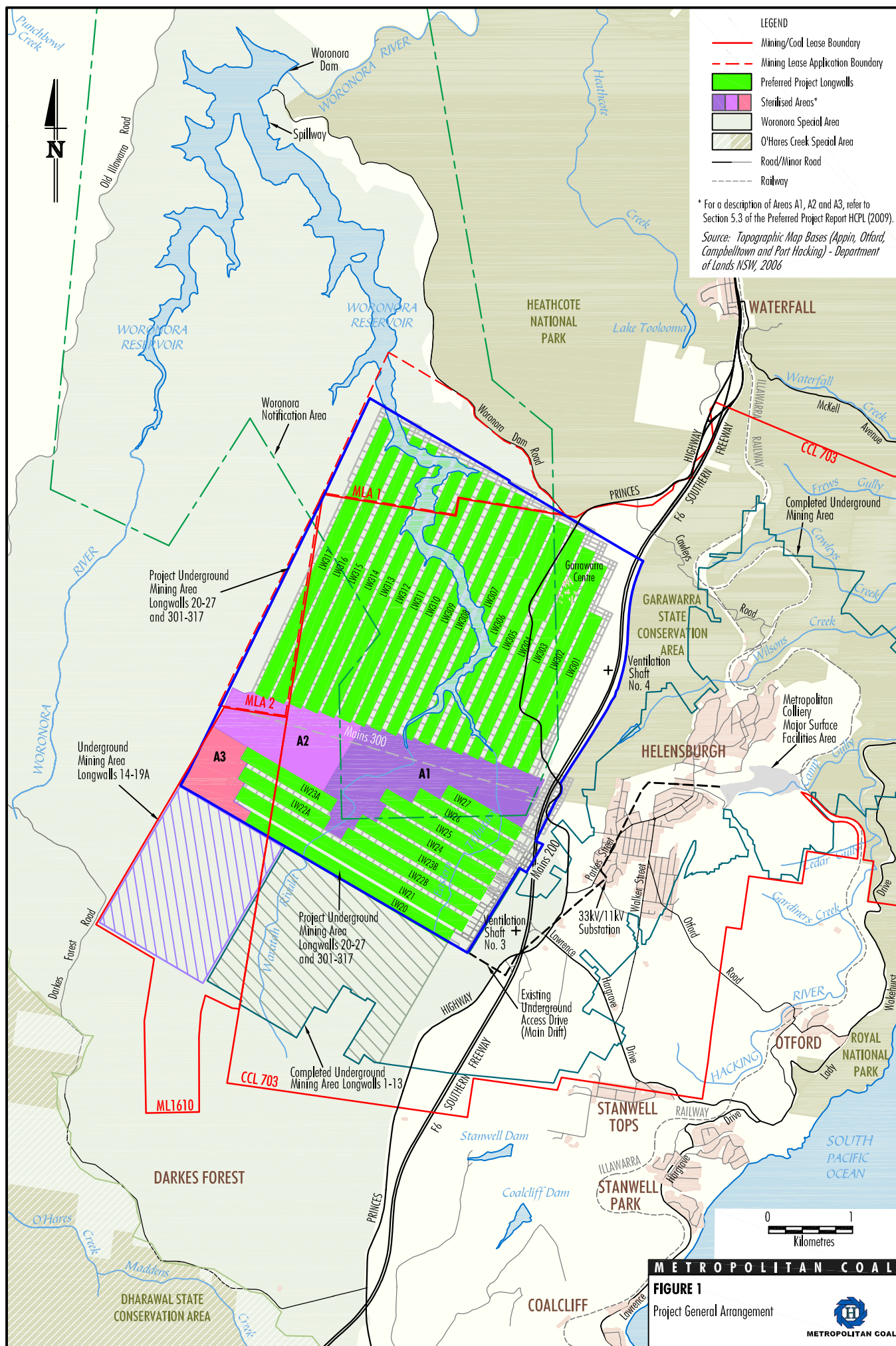
This NMP has been prepared by Heggies Pty Ltd (Heggies) and Metropolitan Coal.

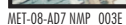
1.2 STRUCTURE OF THE NMP

The remainder of the NMP is structured as follows:

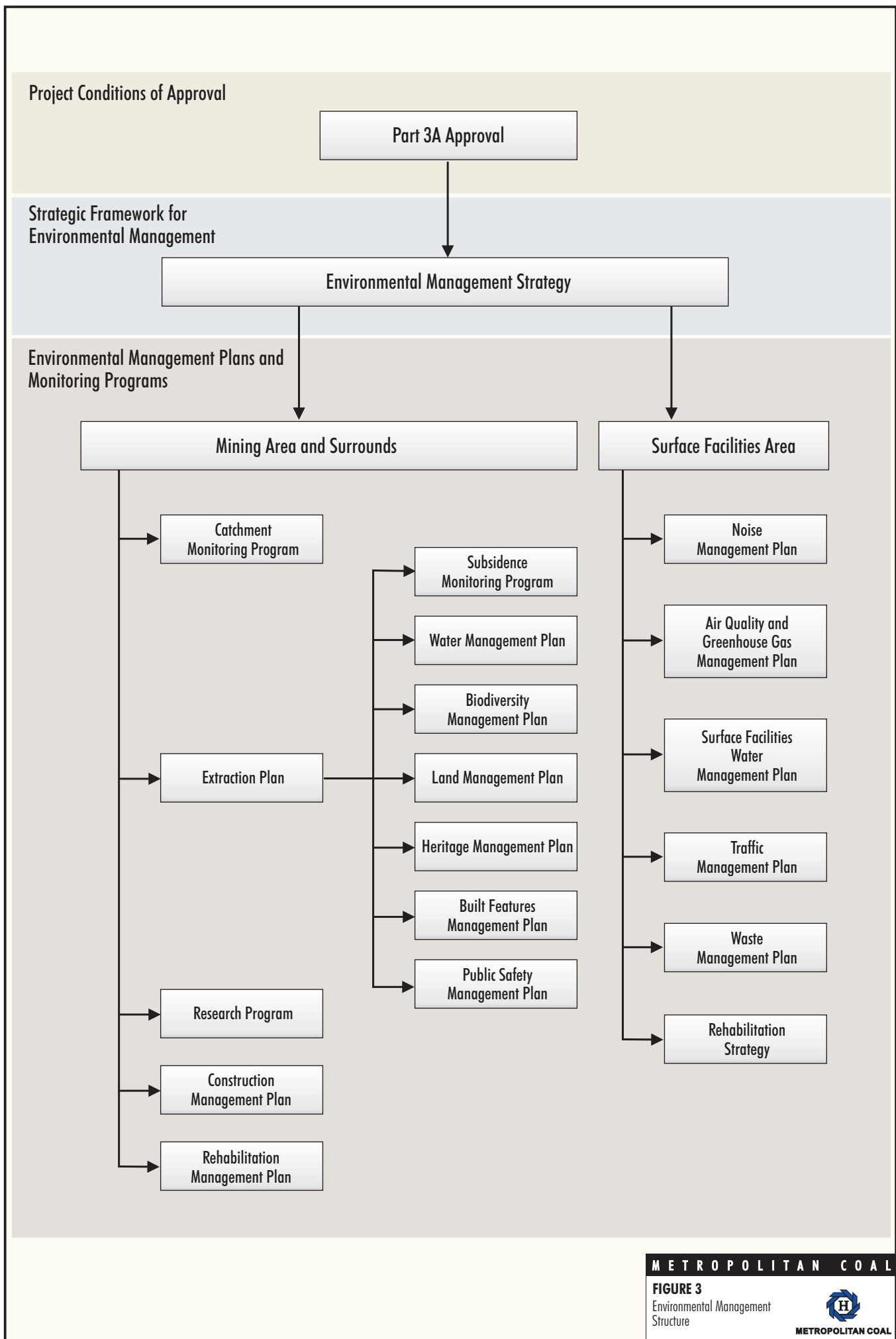
- Section 2: Describes the review and update of the NMP.
- Section 3: Outlines the statutory requirements applicable to the NMP.
- Section 4: Describes the key noise generating activities.
- Section 5: Details the noise criteria and performance indicators that will be used to assess the Project.
- Section 6: Provides the detailed baseline data.
- Section 7: Describes the monitoring program.
- Section 8: Describes the noise management measures.
- Section 9: Provides a Contingency Plan to manage any unpredicted impacts and their consequences.
- Section 10: Describes the annual review and improvement of environmental performance process.
- Section 11: Describes the management and reporting of incidents, complaints and non-compliances.
- Section 12: Lists the references cited.

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FIGURE 3
Environmental Management
Structure



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2 NMP REVIEW AND UPDATE

In accordance with Condition 4, Schedule 7 of the Project Approval, this NMP will be reviewed within three months of the submission of:

- an audit under Condition 8 of Schedule 7;
- an incident report under Condition 6 of Schedule 7;
- an annual review under Condition 3 of Schedule 7; and

if necessary, the NMP will be revised to the satisfaction of the Director-General of the Department of Planning and Environment (DP&E), to ensure the plan is updated on a regular basis and to incorporate any recommended measures to improve environmental performance.

The NMP will also be reviewed within three months of approval of any Project modification and if necessary, revised to the satisfaction of the DP&E.

The revision status of this NMP is indicated on the title page of each copy. The distribution register for controlled copies of the NMP is described in Section 2.1.

2.1 DISTRIBUTION REGISTER

In accordance with Condition 10, Schedule 7 'Access to Information', Metropolitan Coal will make the NMP publicly available on the Peabody website. A hard copy of the NMP will also be maintained at the mine site.

Metropolitan Coal recognises that various regulators have different distribution requirements, both in relation to whom documents should be sent and in what format. An Environmental Management Plan and Monitoring Program Distribution Register will be established in consultation with the relevant agencies and infrastructure owners that indicates:

- to whom the Metropolitan Coal plans and programs, such as the NMP, will be distributed;
- the format (i.e. electronic or hard copy) of distribution; and
- the format of revision notification.

Metropolitan Coal will make the Distribution Register publicly available on the Peabody website.

Metropolitan Coal is responsible for maintaining the Distribution Register and for ensuring that the notification of revisions is sent by email or post as appropriate.

In addition, Metropolitan Coal employees with local computer network access will be able to view the controlled electronic version of this NMP on the Metropolitan Coal local area network. Metropolitan Coal will not be responsible for maintaining uncontrolled copies beyond ensuring the most recent version is maintained on Metropolitan Coal's computer system and the Peabody website.

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3 STATUTORY REQUIREMENTS

Metropolitan Coal's statutory obligations are contained in:

- (i) the conditions of the Project Approval;
- (ii) relevant licences and permits, including conditions attached to mining leases; and
- (iii) other relevant legislation.

These are described below.

3.1 EP&A ACT APPROVAL

Condition 8 of Schedule 4 of the Project Approval requires the preparation of a NMP for the Project. Approval Condition 8 states:

Noise Management Plan

8. *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 DECC by a suitably qualified expert whose appointment has been approved by the Director-General, and submitted to the Director-General for approval by the end of June 2010. It must also provide for real-time noise monitoring.*

In addition, Condition 2 of Schedule 7 outlines the management plan requirements that are applicable to the preparation of the NMP. Table 1 indicates where each component of the conditions is addressed within this NMP.

3.2 LICENCES, PERMITS AND LEASES

In addition to the Project Approval, all activities at or in association with Metropolitan Coal will be undertaken in accordance with the following licences, permits and leases which have been issued or are pending issue.

- The conditions of mining leases issued by the Division of Resources and Energy (DRE), within the NSW Department of Trade and Investment, Resources and Energy (NSW T&I), under the *NSW Mining Act, 1992* (e.g. Consolidated Coal Lease [CCL] 703, Mining Lease 1610, Coal Lease 379, Mining Purpose Lease 320 and Authorisation 200).
- The *Metropolitan Coal Mining Operations Plan 1 October 2012 to 30 September 2019* approved by NSW T&I.
- The conditions of Environment Protection Licence (EPL) No. 767 issued by the NSW Environment Protection Authority (EPAH) under the *NSW Protection of the Environment Operations Act, 1997*. Revision of the EPL will be required prior to the commencement of Metropolitan Coal activities that differ from those currently licensed.
- The prescribed conditions of new mining leases issued by DRE, under the *Mining Act, 1992* for the two Mining Lease Application areas to the west of CCL 703 and specific surface access leases within CCL 703 for the installation of surface facilities as required. An application for the mining leases has been lodged and their grant is pending.

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Table 1
Management Plan Requirements

Project Approval Condition	NMP Section
Condition 2 of Schedule 7	
2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	
a) detailed baseline data;	Section 6
b) a description of:	
• the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 3
• any relevant limits or performance measures/criteria;	Section 5
• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	Section 5
c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Sections 7, 8 and 9
d) a program to monitor and report on the:	Sections 7, 8 and 10
• impacts and environmental performance of the project;	
• effectiveness of any management measures (see c above);	
e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 9
f) a program to investigate and implement ways to improve the environmental performance of the project over time;	Section 10
g) a protocol for managing and reporting any:	
• incidents;	Section 11
• complaints;	Section 11
• non-compliances with statutory requirements; and	Section 11
• exceedances of the impact assessment criteria and/or performance criteria; and	Section 9
h) a protocol for periodic review of the plan.	Section 2

- Water extraction licences issued by the NSW Office of Water under the *NSW Water Act, 1912*, to be converted to licences under the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources, 2011* and the *Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources, 2011* in accordance with the *Water Management Act, 2000*.
- Mining and occupational health and safety related approvals granted by NSW T&I and WorkCover NSW.
- Supplementary approvals obtained from the Sydney Catchment Authority (SCA) for surface activities within the Woronora Special Area (e.g. fire road maintenance activities).

3.3 OTHER LEGISLATION

Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act.

The following Acts may be applicable to the conduct of the Project (Helensburgh Coal Pty Ltd [HCPL], 2008):

- *Contaminated Land Management Act, 1997*;
- *Dangerous Goods (Rail and Rail Transport) Act, 2008*;

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- *Mining Act, 1992;*
- *Noxious Weeds Act, 1993;*
- *Rail Safety (Adoption of National Law) Act, 2012;*
- *Roads Act, 1993;*
- *Protection of the Environment Operations Act, 1997;*
- *Threatened Species Conservation Act, 1995;*
- *Sydney Water Catchment Management Act, 1998;*
- *Coal Mine Health and Safety Act, 2002;*
- *Crown Lands Act, 1989;*
- *Dams Safety Act, 1978;*
- *Energy and Utilities Administration Act, 1987;*
- *Fisheries Management Act, 1994;*
- *Water Act, 1912; and*
- *Water Management Act, 2000.*

Relevant licences or approvals required under these Acts will be obtained as required.

4 KEY NOISE GENERATING ACTIVITIES

Metropolitan Coal is an underground mining operation and noise emissions are therefore restricted to surface facilities. Key activities at the surface facilities and their respective hours of operation are summarised in Table 2. The general arrangement of the Major Surface Facilities Area is shown on Figure 2.

Table 2
Mine Activity and Hours of Operation

Phase	Activity	Hours of Operation
On-site Operation	Maintenance	24 hours per day 7 days per week
	Coal mining, crushing, washing, handling and stockpiling	24 hours per day 7 days per week
	Loading product coal to trains	24 hours per day 7 days per week
	Loading product coal to trucks	7.00 am to 6.00 pm 5 days per week
	Loading coal reject to trucks	7.00 am to 6.00 pm 5 days per week

The Metropolitan Coal Project Environmental Assessment (HCPL, 2008) included a noise impact assessment which modelled noise emissions at residences for the existing operations, and at 3 years and 15 years after commencement of the Project upgrades.

Key noise generating activities at the surface facilities, generally in decreasing order of noise emissions are as follows:

- operation of front end loaders loading trains;
- operation of general mobile equipment including front end loaders, dozers, water carts etc.;
- coal handling and preparation plant (CHPP);
- haul trucks;
- transfer conveyors; and
- conveyor motor drives.

Existing and predicted Project related daytime, evening/night-time noise levels at the nearest receivers are presented in Tables 3 and 4, respectively.

Table 3
Predicted Noise Emissions for Daytime Operations

Receiver Location	Existing	Year 3	Year 15
2 to 18 Oxley Place	56 dBA to 57 dBA	54 dBA to 56 dBA	50 dBA to 51 dBA
53 to 55A Parkes Street	47 dBA to 54 dBA	43 dBA to 48 dBA	40 dBA to 46 dBA
48 to 52/54 Parkes Street	48 dBA to 50 dBA	48 dBA to 49 dBA	47 dBA to 48 dBA

Notes: 1. Predicted noise levels are for neutral or calm meteorological conditions.
2. The range of noise level shown correspond to that expected across the residences in each receiver location. The receivers are as shown on Figure 4, with O2 to O18 corresponding to Oxley Place, and P53 to P55A and P48 to P52/54 corresponding to Parkes Street.

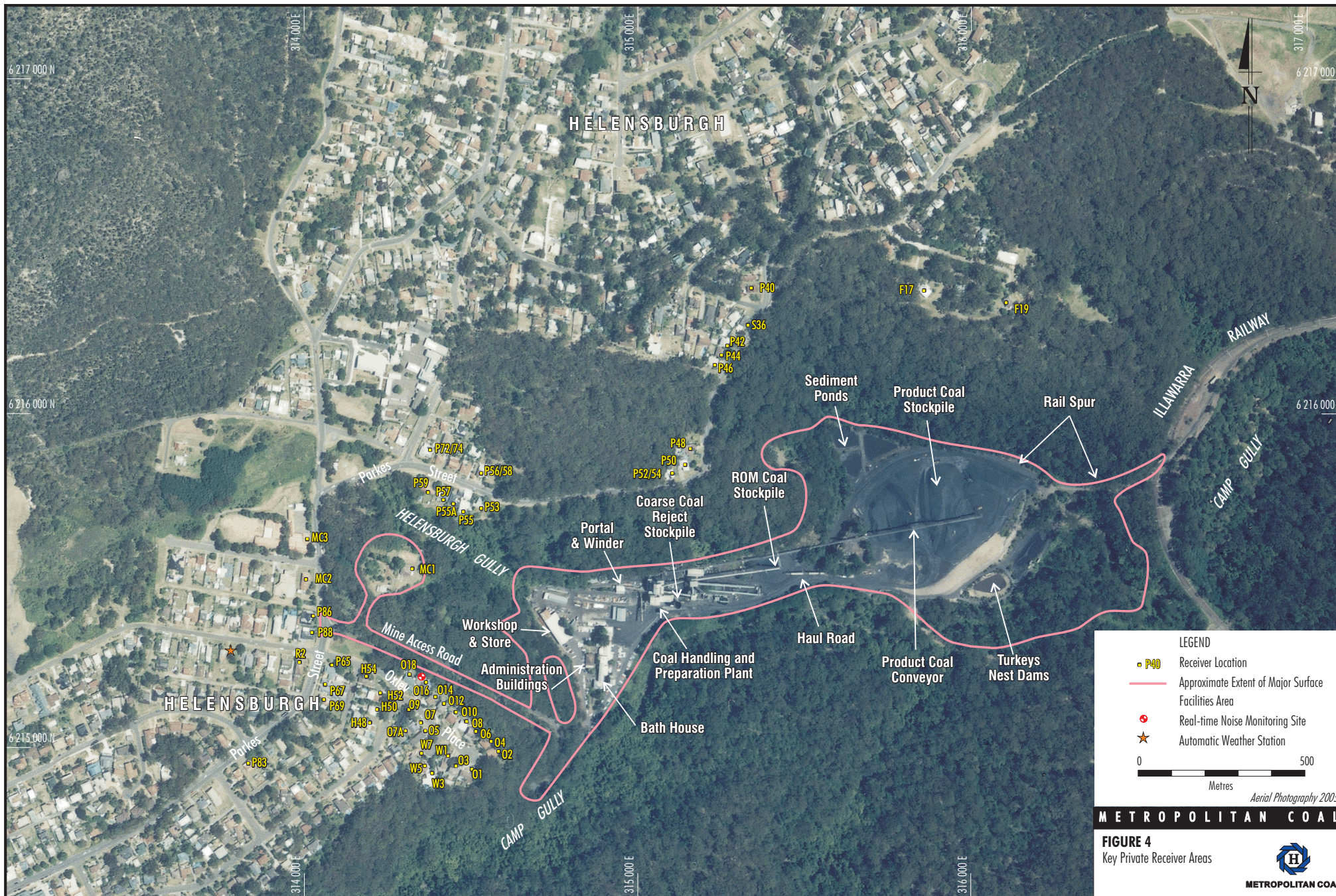
Table 4
Predicted Noise Emissions for Evening/Night-time Operations

Receiver Location	Existing	Year 3	Year 15
2 to 18 Oxley Place	50 dBA to 55 dBA	44 dBA to 47 dBA	42 dBA to 45dBA
53 to 55A Parkes Street	45 dBA to 53 dBA	38 dBA to 45 dBA	36 dBA to 43 dBA
48 to 52/54 Parkes Street	48 dBA to 50 dBA	48 dBA to 49 dBA	46 dBA to 48 dBA

Notes: 1. Predicted noise levels for neutral or calm meteorological conditions.
2. The range of noise level shown correspond to that expected across the residences in each receiver location. The receivers are as shown on Figure 4, with O2 to O18 corresponding to Oxley Place, and P53 to P55A and P48 to P52/54 corresponding to Parkes Street.

Figure 2 shows the general arrangement of the Major Surface Facilities Area, and Figure 4 shows the key private receivers nearest to the Major Surface Facilities Area. Modelling of noise emissions indicates that receivers at Oxley Place and 53 to 55A Parkes Street are generally more affected by fixed plant while receivers at 48 to 52/54 Parkes Street are affected by fixed plant, coal stockpile and train coal loading activities.

Detailed predictions of noise levels at nearby private receivers are provided in Appendix A.



5 NOISE CRITERIA AND PERFORMANCE INDICATORS

5.1 NOISE CRITERIA

The Project Approval requires Metropolitan Coal by the end of 2014 to ensure that the noise generated by the Project does not exceed the noise impact assessment criteria in Table 2 of Condition 1, Schedule 4 at any residence on privately-owned land, or on more than 25% of any privately-owned land.

Table 2: Noise Impact Assessment Criteria

Day $L_{Aeq}(15 \text{ min})$	Evening $L_{Aeq}(15 \text{ min})$	Night $L_{Aeq}(15 \text{ min})$	Night $L_{A1}(1 \text{ min})$
50 dB(A)	45 dB(A)	45 dB(A)	50 dB(A)

Notes:

- To determine compliance with the $L_{Aeq(15 \text{ min})}$ noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy) may be accepted. The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the $L_{A1}(1 \text{ min})$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy) may be accepted.
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level; or
 - temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level,
 determined in accordance with the NSW Industrial Noise Policy.

If after 2014, the noise generated by the Project exceeds the criteria in Table 3 of Condition 1, Schedule 4 at any residence on privately-owned land, or on more than 25% of any privately-owned land, Metropolitan Coal will, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in Conditions 5-7 of Schedule 5.

Table 3: Noise Acquisition Criteria

Day $L_{Aeq}(15 \text{ min})$	Evening $L_{Aeq}(15 \text{ min})$	Night $L_{Aeq}(15 \text{ min})$
55 dB(A)	50 dB(A)	50 dB(A)

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2 of Condition 1. For this condition to apply, the exceedances of the criteria must be systemic.

If after 2014, the noise generated by the Project exceeds the criteria in Table 4 of Condition 1, Schedule 4 at any residence on privately-owned land, Metropolitan Coal will, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner. If within 3 months of receiving this request from the landowner, Metropolitan Coal and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General of the DP&E for resolution.

Table 4: Additional Noise Mitigation Criteria

Day $L_{Aeq}(15 \text{ min})$	Evening $L_{Aeq}(15 \text{ min})$	Night $L_{Aeq}(15 \text{ min})$
53 dB(A)	48 dB(A)	48 dB(A)

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2 of Condition 1.

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5.2 NOISE PERFORMANCE INDICATORS

The progressive implementation of noise mitigation as part of the Project upgrades will provide opportunities to decrease noise emissions at the nearest private receivers. Therefore as the major surface facilities are upgraded (e.g. CHPP upgrades), incremental reductions in operational noise emissions from the site will be achieved.

While the noise criteria in Section 5.1 will not apply until the end of 2014, to gauge the ongoing noise performance of the site it is appropriate to adopt interim noise performance indicators. These will allow tracking of performance of received noise at the nearest residential locations at which the Project noise criteria will be applicable from the end of 2014.

The noise performance indicators have been developed to reflect the significance of the upgrades to the coal processing and materials handling systems to the timing of improvement in site noise performance.

5.2.1 During Major Surface Facilities Upgrade Design/Construction

During the design and construction of the upgrades to the Major Surface Facilities Area there are three key performance indicators:

- Establishment of a quarterly operational attended noise monitoring regime and real-time noise monitoring system at the site by December 2010.
- Design of the major surface facilities fixed plant upgrades (and any associated mobile plant upgrades) is to be undertaken cognisant of the material noise reductions at the site that will be required to meet the end 2014 noise criteria (Section 5.1).
- Undertake noise modelling of the preferred upgrade design prior to construction of major surface fixed plant components (e.g. conveyors, transfer points and CHPP upgrades) to determine if sufficient noise reduction is likely to be achieved from the planned fixed and mobile plant upgrades, and if necessary additional feasible and reasonable noise controls will be added.

5.2.2 Major Surface Facilities Upgrade – Nearing Commissioning

During the initial preparation of the Noise Management Plan, it was anticipated that the major surface facilities upgrades would be commissioned prior to the end of 2014. However, commissioning of the major surface facilities upgrades (e.g. CHPP upgrade, paste plant and materials handling systems) is not anticipated to occur until post 2014. Notwithstanding, it is considered appropriate to introduce progressive performance indicators for operational noise, prior to the application of the noise performance criteria post-2014.

The performance indicators adopted reflect a material reduction in the received noise levels from the existing surface facilities noise levels predicted in the Heggies Report 10-5055-R1 *Metropolitan Coal Project Noise Impact Assessment* (2008a), with some allowance for additional incremental noise improvements to occur, when the noise criteria (Section 5.1) will apply.

The attended noise monitoring performance indicators that will apply from the 1 September to 31 December 2014 are presented in Table 5. These performance indicators represent a significant noise improvement over the pre-Project surface facilities noise levels predicted by Heggies (2008a).

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Table 5
Noise Performance Indicators
for the Major Surface Facilities Upgrades

Day $L_{Aeq}(15 \text{ minute})$	Evening $L_{Aeq}(15 \text{ minute})$	Night $L_{Aeq}(15 \text{ minute})$	Night $L_{A1}(1 \text{ minute})$
53 dBA	48 dB(A)	48 dB(A)	53 dB(A)

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2 of Condition 1, Schedule 4.

5.2.3 Major Surface Facilities– Post-2014

Post-2014 the noise performance criteria apply.

A real-time performance indicator has been developed for the management of noise post-2014:

The $L_{Aeq}(5 \text{ minute})$ night-time noise level does not exceed 50 dB(A) for six consecutive 5 minute samples.

Section 7 describes the monitoring that will be conducted to assess the Project against the noise performance indicators and noise criteria. The monitoring program includes both real-time continuous noise monitoring (Section 7.1.1) and attended noise monitoring (Section 7.1.2).

6 BASELINE DATA

Heggies report 10-5055-R3 *PRP 12 Noise Reduction Programme Stage 2 Noise Mitigation Investigation* (2008b), contained a noise audit for fixed and mobile plant operating at the Project site. The audit has been used as a basis for determining the baseline noise source data for the Project as presented in Appendix B.

As shown in Appendix B, measured Sound Power Levels (SWLs) for significant fixed plant, such as the CHPP, crusher, conveyors and drives, and mobile equipment such the front end loaders, dozers, haul trucks, etc. have been detailed and this provides a baseline for future review of SWL improvements of upgraded or replaced machinery.

In addition, attended daytime noise monitoring was conducted during late 2007 and early 2008 at residential locations representative of those at 2 to 18 Oxley Place and 53 to 59 Parkes Street. These measurements provide a baseline for attended monitoring results for review against future noise monitoring and predicted noise levels as presented in Section 7. Baseline attended monitoring results are presented in Table 6.

Table 6
Operator-Attended Intrusive Mine Noise Levels

Location	Operation	Intrusive $L_{Aeq}(15\text{minute})$ November 2007 (Spring Calm)	Intrusive $L_{Aeq}(15\text{minute})$ March 2008 (Autumn Northerly Wind)
2 Oxley Place	Plant	49, 50 (no truck haulage)	55, 56
53 Parkes Street	Plant	50, 50	47, 49

7 NOISE MONITORING

7.1 GENERAL REQUIREMENTS

The noise measurement procedures employed throughout the monitoring program will be in accordance with the requirements of Australian Standard (AS) 1055:1997 *Acoustics - Description and Measurement of Environmental Noise* and the NSW Department of Environment and Climate Change (DECC's) Industrial Noise Policy (INP) (DECC, 2000).

Noise monitoring for the Project will consist of attended and unattended measurements. Attended measurements will be performed and analysed by a suitably qualified acoustical consultant directly engaged by Metropolitan Coal. Unattended measurements will be analysed by a suitably qualified acoustical consultant directly engaged by Metropolitan Coal.

Real-time noise monitoring for the Project will be undertaken using an unattended statistical noise logger. The Project site noise emissions will be monitored continuously at one location from December 2010.

This continuous monitoring will be supplemented by attended monitoring. Attended noise monitoring will be conducted quarterly and additional monitoring may also be conducted in the event of ongoing noise complaints from a particular landholder/locality that requires further investigation.

At the commencement of the monitoring program (by December 2010), unattended noise monitoring equipment will initially be installed at the representative receiver location(s) for a period of one week in order to determine the received noise levels from the Project and will be supplemented with operator-attended noise surveys. Following this initial monitoring, recommendations on subsequent monitoring locations may be made by the acoustic consultant, dependent upon the measured noise levels at the surrounding sensitive receiver locations.

7.1.1 Real-time Continuous Monitoring and Location

Purpose

Real-time noise monitoring will be used as an internal Metropolitan Coal noise management tool and not for compliance purposes.

Real-time Noise Monitoring Location(s)

The nearest residences to the Project were identified by Heggies (2008a) and are shown on Figure 4. As shown on Figure 4 the nearest residences occur in five general areas to the north, west and south-west of the Major Surface Facilities Area as follows:

- residences to the south-west at 2 to 18 Oxley Place;
- residences to the west north-west at 53 to 59 Parkes Street;
- residences to the north-west at 48, 50, 52/54 Parkes Street;
- residences further to the north-west at 42, 44 and 46 Parkes Street; and
- residences to the north at 17 and 19 Old Farm Road.

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Of the five general receiver areas, the three closest are at similar distances from the main surface facilities. Heggies (2008a) predicted noise levels at these receivers and for existing, Year 3 and Year 15 of the Project and the highest predicted noise levels under either neutral or adverse meteorological conditions are summarised in Table 7. Full details of predicted noise levels are presented in Appendix A.

Note Heggies (2008a) modelling of Year 3 included an upgraded CHPP and ongoing site construction activities, while Year 15 included peak coal production and implementation of additional feasible and reasonable noise controls. Existing modelling corresponded to the unmitigated noise levels of the surface facilities prior to the implementation of Project noise controls.

Table 7
Highest Predicted Project Noise Levels at General Private Receiver Areas

Receiver	Day $L_{Aeq}(15 \text{ minute})$			Evening/Night $L_{Aeq}(15 \text{ minute})$		
	Existing (dBA)	Year 3 (dBA)	Year 15 (dBA)	Existing (dBA)	Year 3 (dBA)	Year 15 (dBA)
2 to 18 Oxley Place	57	56	51	56	49	47
53-59 Parkes Street	54	48	46	53	45	43
48, 50, 52/54 Parkes Street	50	49	48	50	49	48
42, 44, 46 Parkes Street	47	47	47	47	47	46
17 and 19 Old Farm Road	31	31	31	31	31	30

Notes: Daytime L_{Aeq} noise levels include trucks.

A real-time noise monitoring site is located at the northern boundary of 16 Oxley Place (Figure 4). This location has been selected based on the following:

- This location is representative of receivers with the predicted current highest noise levels, for both daytime and evening/night-time.
- This location is adjacent to the attended quarterly noise monitoring conducted at 16 Oxley Street, enabling ongoing correlation between attended and unattended noise monitoring. The location of the monitor is adjacent to, and north of the solid boundary fence of 16 Oxley Street. As such the noise levels are façade reflected and typically 2.5 dB higher than equivalent free field measurements. The façade reflected noise levels were confirmed by simultaneous measurements at the real time monitor location, and free field measurements at a higher elevation above the fence.
- This location is adjacent to the Metropolitan Coal private site access road enabling the noise from the daytime on-site movement of coal and reject haul trucks to be included in the measurement.
- This location is more remote from local traffic (in particular Parkes Street) which will influence the ambient noise environment at all of the private receivers located on Parkes Street.

Once the major surface facilities upgrades are complete, the quarterly attended monitoring may indicate that the real-time noise monitoring should be relocated to another receiver area. The area 48-52/54 Parkes Street is more influenced by rail noise and had the highest predicted evening/night-time noise levels later in the Project life (Table 7). A further review of the location(s) for real-time monitoring will be undertaken once the washery façade is upgraded and/or the major surface facilities upgrades are complete.

Methodology

The real-time noise monitor includes the following general specifications:

- Records 15 minute statistical noise data.
- Records real-time audio (MP3 or wav) files continuously.
- Produces daily reports, including:
 - 15 minute statistical data (L_{A10} , L_{A90});
 - $L_{Aeq(15 \text{ minute})}$ and $L_{Aeq(\text{period})}$ noise levels;
 - $L_{Aeq(15 \text{ minute})}$ in 1/3 octave; and
 - $L_{Aeq(15 \text{ minute})}$ in the 12.5 to 630 Hertz (Hz) (low frequency) range.

The real-time noise monitor records noise levels 24 hours a day, 7 days a week, and a graphical summary of the previous 24 hours of noise is sent to mine staff via email on a daily basis (see Appendix C for an example). The continuous recording includes an audio function which allows the monitor to record audio of the noise signal. This audio information can be downloaded in order to allow the listener to determine whether the noise source is Project related. There are numerous other potential noise sources apart from Project noise, such as insects, frogs, local vehicles, domestic activities (lawn mowers, etc.) and wind and rain, which may influence noise monitoring results.

The real-time continuous noise monitoring system was installed in 2010. A real-time noise performance indicator has also been developed in consideration of façade reflection and as an alert to the potential exceedance of the noise acquisition criteria. The real-time noise performance indicator, *The $L_{Aeq(5 \text{ minute})}$ night-time noise level does not exceed 50 dB(A) for six consecutive 5 minute samples*, will be applicable from the 1 January 2015. The real-time noise performance indicator includes an allowance of 2.5 dB for façade reflection.

Analysis of the Real-Time Monitoring Data

Real-time noise monitoring includes an ‘alarm’ function whereby noise data is processed and compared against the real-time noise performance indicator. A text message will be sent to the mobile phone of the Manager – Safety & Environmental Services, or their delegate, if the real-time noise performance indicator has been exceeded. The audio of these events can then be reviewed to see if the cause is Project related, allowing Metropolitan Coal to investigate the causes and potential controls for high Project related noise events.

The real-time noise performance indicator will be considered to be exceeded if the $L_{Aeq(5 \text{ minute})}$ night-time noise level exceeds 50 dB(A) for six consecutive 5 minute samples.

Response to Exceedance of the Real-Time Noise Performance Indicator

The protocol for responding to an exceedance of the real-time noise performance indicator includes:

- Examination by the Manager - Safety & Environmental Services (or their delegate) of the noise levels and the audio to determine whether the noise is Project related.
- Review of the meteorological conditions to determine if these are influencing the noise levels.
- Investigation by Metropolitan Coal into the possible causes and potential solutions for high Project related noise events.

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- Recording of the noise sources and actions taken, assessment of the effectiveness of implemented controls, and recording of any follow up actions required.
- Review of real-time monitoring data by the Manager - Safety & Environmental Services (or their delegate) to check the effectiveness of the response to an exceedance of the real-time noise performance indicator.

7.1.2 Attended Monitoring and Locations

Purpose

Results from the attended monitoring program will be used to verify data collected from the real-time noise monitor and to track the noise performance of the mine prior to 2014. Post-2014 attended monitoring will be utilised to determine compliance with noise impact criteria (Section 5.1).

Attended noise measurements and recordings will be conducted quarterly to quantify the intrusive noise emissions from the mine, including processing and transportation operations as well as the overall level of ambient noise. The attended monitoring data will also be used to determine whether there is a consistent relationship between real-time continuous noise levels and long-term attended monitoring data. For example if there is a consistent correlation between a real-time monitor and an attended monitoring site, then the real-time monitoring results could reasonably be used to predict noise levels at the attended site when attended monitoring is not being undertaken. This will be conducted annually to complement the regular maintenance and calibration of the real-time monitor(s).

Attended Noise Monitoring Locations

The attended noise monitoring program will be conducted at sites representative of the nearest residences to the Project that are potentially most affected by Project noise emissions. As presented in Section 7.1.1 the nearest residences are:

- residences to the south-west at 2 to 18 Oxley Place;
- residences to the west north-west at 53 to 59 Parkes Street;
- residences to the north-west at 48, 50, 52/54 Parkes Street; and
- residences further to the north-west at 42, 44 and 46 Parkes Street.

Methodology

Attended noise monitoring will be carried out by an independent expert (i.e. not by Project staff) and will be conducted quarterly. Monitoring will be conducted in accordance with Australian Standard (AS) 1055:1997 *Acoustics – Description and Measurement of Environmental Noise* and the INP (DECC, 2000). These operator-attended noise measurements will be conducted during normal Project operations to quantify the intrusive noise emissions from the Project as well as the overall level of ambient noise.

Timing

Attended noise monitoring will be conducted for 15 minute periods during the daytime, evening and night-time periods. Daytime is defined as being between 7.00 am and 6.00 pm, Monday to Saturday and 8.00 am to 6.00 pm on Sunday and public holidays. Evening is between 6.00 pm and 10.00 pm and night-time is between 10.00 pm and 7.00 am, on Monday to Saturday, and 10.00 pm to 8.00 am on Sunday and public holidays.

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The monitoring will be carried out on two consecutive days and nights resulting in at least two 15 minute samples for each monitoring location every three months.

Daytime monitoring at residences to the south-west at 2 to 18 Oxley Place is to be conducted in the morning period, to include a representative number of reject and product truck movements on the Mine Access Road.

By sampling two consecutive nights, it is likely that different meteorological conditions will be sampled for each site, providing a more diverse set of noise emission data. Particular attention will be given to monitoring between 7.00 pm and 8.00 am (i.e. evening, night-time and early morning periods). Experience has shown that it is during these periods that noise can be at its most intrusive and results in more complaints. This is due to the lower background noise levels experienced during these periods and the potential presence of temperature inversions during colder months.

Measurement

All acoustic instrumentation employed throughout the monitoring program will be designed to comply with the requirements of AS IEC 61672.1:2004 *Electroacoustics - Sound level meters - Specifications* and carry current National Association of Testing Authorities or manufacturer calibration certificates.

The operator will quantify and characterise the maximum (L_{Amax} and $L_{A1(1minute)}$) and the average ($L_{Aeq(15minute)}$) intrusive noise level from processing operations and transportation (on-site) over a 15 minute measurement period. In addition, the operator will quantify and characterise the overall levels of ambient noise (i.e. L_{Amax} , L_{A1} , L_{A10} , L_{A50} , L_{A90}) over the 15 minute measurement interval.

A measurement of $L_{A1(1\text{ minute})}$ corresponds to the highest noise level generated for 0.6 seconds during one minute. In practical terms this is the highest noise level emitted from the Project during the entire measurement period (i.e. the highest level of the maximum minute during the 15 minute measurement).

Instrument calibration will be checked before and after each measurement survey, with the variation in calibrated levels not to exceed ± 0.5 dBA.

Recording

An example of an attended monitoring recording sheet is provided in Appendix D. During attended monitoring, the following information will be recorded:

- operator's name;
- locations of attended and unattended noise instruments;
- recording intervals;
- meteorological conditions (i.e. temperature, humidity, cloud cover, and wind speed and direction);
- statistical noise level descriptors together with notes identifying the principle noise sources (including the observed number of reject/product trucks on the Mine Access Road when monitoring at Oxley Place); and
- instrument make, model, serial number and calibration details.

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Assessment of Results

The acoustical consultant conducting the attended noise monitoring will have access to the real-time noise monitoring results. The results of attended noise monitoring will be compared against the relevant performance indicators and noise criteria set out in Sections 5.1 and 5.2 of this NMP.

The comparison will be undertaken following the exclusion of data using meteorological conditions described as part of the notes to Table 2 of Condition 1, Schedule 4 as well as observations of non-Project noise by the person undertaking the attended noise monitoring program. In the event of an exceedance of the performance indicators and/or applicable noise criteria post-2014, an assessment will be conducted to determine:

- Timing of the exceedance.
- Location(s) of the exceedance.
- Exclusion of non-Project related noise and noise from non-Metropolitan Coal mining activities (e.g. can the exceedance be attributed directly to the Project). This will include consideration of:
 - the methods and type of equipment being used by Metropolitan Coal at the time of the exceedance and proximity to the locations at which the exceedance was recorded; and
 - the location of non-Metropolitan Coal activities or local domestic activities and proximity to the locations at which the exceedance was recorded.
- Meteorological conditions at the time of the exceedance, including confirmation that meteorological conditions are in accordance with the notes to Table 2 of Condition 1, Schedule 4.

If the above assessment determines that an exceedance is due to Project noise then management strategies detailed in Sections 8 and 9 to help prevent recurrence will be implemented in an effort to reduce noise levels below those required to comply with the performance indicators (or noise criteria post-2014).

Post-2014, in the event that the noise impact assessment criteria (Section 5.1) are exceeded, in accordance with Condition 1 of Schedule 5 of the Project Approval, Metropolitan Coal will notify affected landowners and tenants and provide quarterly monitoring results as required.

7.2 METEOROLOGICAL DATA

The AWS monitors the following parameters:

- rainfall;
- temperature at 10 m;
- temperature at 2 m;
- relative humidity;
- net solar radiation;
- sigma theta;
- wind direction; and
- wind speed.

The AWS has been installed at 12 Robertson Street, Helensburgh, shown on Figure 4. The AWS will be used to determine meteorological exclusion conditions in accordance with the Project Approval.

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7.3 ASSESSMENT AGAINST NOISE CRITERIA AND PERFORMANCE INDICATORS

The monitoring results will be used to assess the Project against the performance indicators and performance criteria detailed in Table 8.

Figure 5 illustrates the generic Project monitoring and performance indicators and criteria assessment process. If data analysis indicates a performance indicator has been exceeded or is likely to be exceeded, management measures will be implemented and an assessment will be made against the performance criteria. As described in Section 7, post-2014 real-time noise monitoring data will be used to assess the real-time noise performance indicator, and attended noise monitoring data will be utilised to determine compliance with noise impact criteria. If any noise criteria are considered likely to have been exceeded or are likely to be exceeded, the Contingency Plan will be implemented (Section 9). Metropolitan Coal will implement suitable contingency measures (Section 9) and continue to monitor (Section 7).

8 MANAGEMENT MEASURES

The Project comprises continuation, upgrade and extension of underground coal mining operations and major surface facilities at the existing mine, and an integral part of the works will be a range of noise control and management measures to reduce the Project noise emissions. This section outlines the noise control and management measures required as well as Pollution Reduction Program (PRP) measures already in place.

The actual timing of the implementation of some of the noise controls will be dependent on the timing of the mine upgrade and replacement/upgrade of existing surface facilities and mobile plant.

Current Approvals and PRP Measures in Place

Metropolitan Coal is regulated via the NSW Environment Protection Authority (EPA) Environment Protection Licence (EPL) Licence No 767. Noise related PRPs previously completed by Metropolitan Coal are summarised as follows:

- PRP 9 – Noise Assessment Report

The aim of this PRP was for the licensee to assess noise emissions from the premises in accordance with the INP, and to determine if the premises can meet the requirements of the Policy. The primary aim is to eliminate public concern caused by machinery operations at night. Completed 31 October 2004.

- PRP 11 Noise Emission Reduction Program

The aim of this PRP was to identify measures to reduce noise emissions from the premises. Completed 20 April 2006.

- PRP 12 Noise Investigation and Mitigation Program

The aim of this PRP was to build on previous investigations by conducting detailed monitoring and computer modelling to assess noise impacts and identify reasonable and feasible noise controls and management measures for the premises. Completed 31 March 2008.

As a result of the PRPs noise controls and management measures have been identified. These noise controls and management measures have already either been implemented or are ongoing.

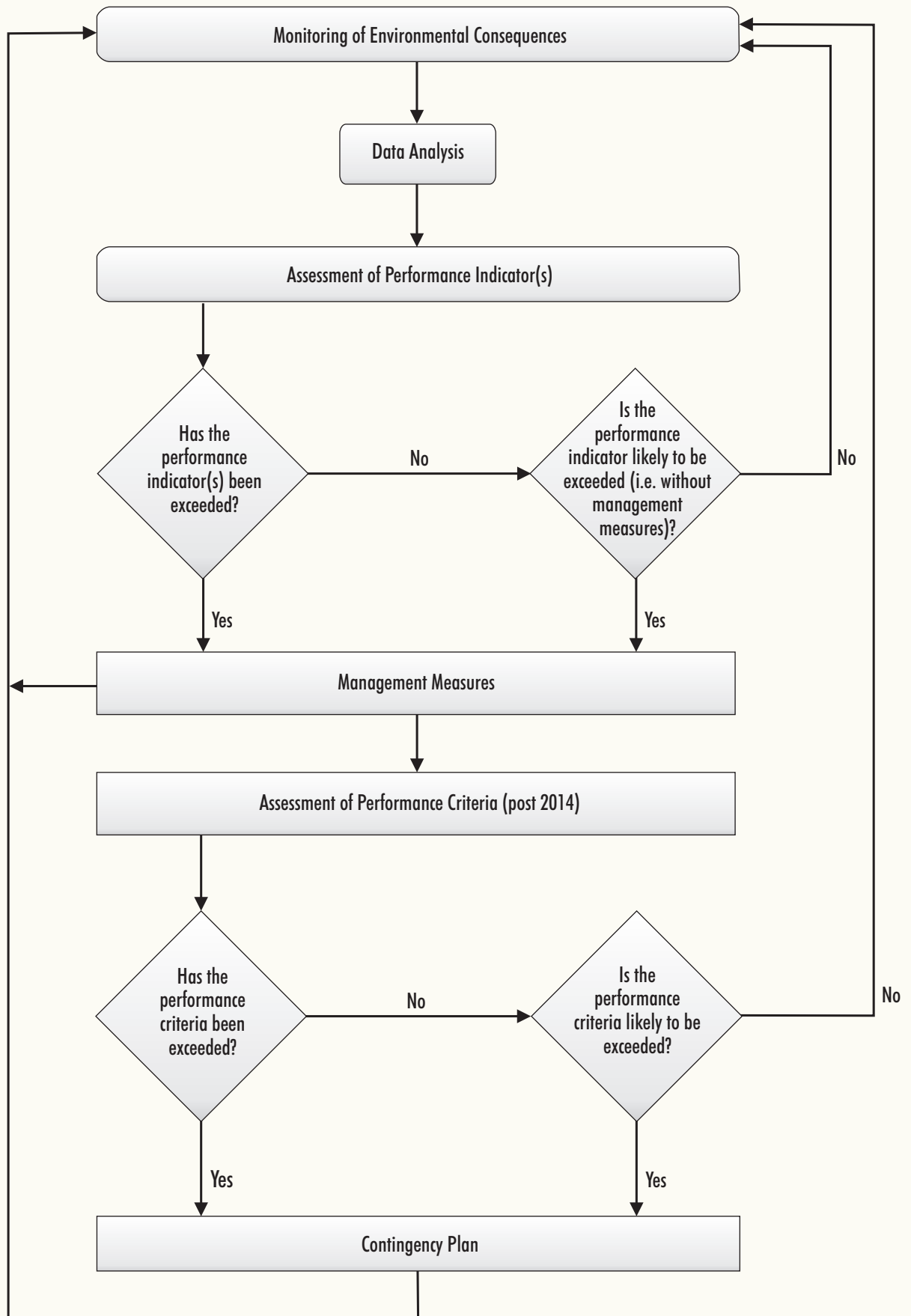
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Table 8
Monitoring of Environmental Consequences against Performance Indicators and Criteria

Status of Major Surface Facilities Upgrades	Performance Indicator(s) /Criteria	Monitoring of Environmental Consequences			Data Analysis to Assess against Performance Indicator(s)	Assessment of Performance Indicator(s)	Assessment of Performance Criteria	Relevant Management and Contingency Measures
		Sites	Parameters	Frequency				
Major Surface Facilities Upgrades Design/ Construction.	Establishment of a quarterly operational attended noise monitoring program and real-time noise monitoring system at the site by December 2010.	Four representative attended monitoring locations. One real-time monitoring location.	Refer Section 7.1.2 Refer Section 7.1.1	Three monthly Continuous	Noise Monitoring - noise measurement procedures in accordance with the requirements of AS 1055 1997 <i>Acoustics - Description and Measurement of Environmental Noise</i> and the INP.	The performance indicator will be considered to be exceeded if the installation and commissioning of the real-time noise monitor and commencement of quarterly attended noise monitoring is not undertaken prior to 31 December 2010.	N/A	<ul style="list-style-type: none"> Install real-time instrumentation and commence quarterly attended monitoring.
	Design of the major surface facilities fixed plant upgrades (and any associated mobile plant upgrades) is to be undertaken cognisant of the material noise reductions at the site that will be required.	N/A	N/A	N/A	Metropolitan Coal to formally advise the design/engineering team of the need to incorporate significant noise reduction measures in the design of the upgraded major surface facilities and facilitate provision of acoustical consultant advice as necessary.	The performance indicator will be considered to be exceeded if the formal notification of the design/engineering team is not undertaken.	N/A	<ul style="list-style-type: none"> Provide formal advice to the design/ engineering team.
	Undertake noise modelling of the preferred upgrade design prior to construction to determine if sufficient noise reduction is likely to be achieved from the planned fixed and mobile plant upgrades.	N/A	N/A	N/A	<ul style="list-style-type: none"> Complete a SWL audit of the site to evaluate the noise reductions undertaken to date and to document existing fixed and mobile plant noise sources. Noise modelling review of the likely noise performance of the upgraded major surface facilities is to be conducted by an acoustical consultant prior to construction of the major upgrade components. Metropolitan Coal and the design/engineering team to review the noise reductions that are predicted to be achieved with the upgrades in consultation with an acoustical consultant and if necessary design and include additional reasonable and feasible noise controls in the upgrades. 	The performance indicator will be considered to be exceeded if the SWL audit and noise modelling review (and associated additional design work if necessary) is not undertaken.	N/A	<ul style="list-style-type: none"> Complete the SWL audit, noise modelling review and associated design review.
Major Surface Facilities Upgrades – Nearing Commissioning (from 1 September to 31 December 2014).	Performance indicators described in Table 5.	Four representative attended monitoring locations.	Refer Section 7.1.2	Three monthly	<ul style="list-style-type: none"> Noise monitoring - noise measurement procedures in accordance with the requirements of AS 1055:1997 <i>Acoustics - Description and Measurement of Environmental Noise</i> and the INP. 	The performance indicator will be considered to be exceeded if the indicators noise levels in Table 5 are not met at the nearest private receivers.	N/A	<ul style="list-style-type: none"> Review noise reduction program. Complete an additional SWL audit of the site. Re-model noise emissions from the site. Implement any additional reasonable and feasible noise reduction measures.

Table 8 (Continued)
Monitoring of Environmental Consequences against Performance Indicators and Criteria

Status of Major Surface Facilities Upgrades	Performance Indicator(s) /Criteria	Monitoring of Environmental Consequences			Data Analysis to Assess against Performance Indicator(s)	Assessment of Performance Indicator(s)	Assessment of Performance Criteria	Relevant Management and Contingency Measures
Major Surface Facilities (Post-2014).	Real-time noise performance indicator: The $L_{Aeq(5\text{ minute})}$ night-time noise level does not exceed 50 dB(A) for six consecutive 5 minute samples.	Real-time monitoring site.	Refer Section 7.1.1	Real-time	Noise monitoring - noise measurement procedures in accordance with the requirements of AS 1055 1997 <i>Acoustics - Description and Measurement of Environmental Noise</i> and the INP.	The real-time noise performance indicator will be considered to be exceeded if the $L_{Aeq(5\text{ minute})}$ night-time noise level exceeds 50 dB(A) for six consecutive 5 minute samples.	N/A	<ul style="list-style-type: none">Metropolitan Coal implements additional reasonable and feasible at source noise controls.Metropolitan Coal implements reasonable and feasible at receiver noise controls.
	Noise Criteria detailed in Section 5.1.	Four representative attended monitoring locations.	Refer Section 7.1.2	Three monthly	Noise monitoring - noise measurement procedures in accordance with the requirements of AS 1055 1997 <i>Acoustics - Description and Measurement of Environmental Noise</i> and the INP.	N/A	<p>The performance criteria in Table 2 of Condition 1, Schedule 4 is exceeded when:</p> <ul style="list-style-type: none">the recorded noise levels are more than 2 dB above the noise criteria specified in the Project Approval; andif sustained non-compliances are not addressed and rectified.	<ul style="list-style-type: none">Metropolitan Coal implements additional reasonable and feasible at source noise controls.Metropolitan Coal implements reasonable and feasible at receiver noise controls in accordance with Condition 3, Schedule 4.Metropolitan Coal acquires affected properties in accordance with Condition 2, Schedule 4.



METROPOLITAN COAL

FIGURE 5
Monitoring of Environmental
Consequences against Performance
Indicators and Criteria



METROPOLITAN COAL

Implemented Noise Controls and Management Measures

- Crusher building cladding upgrade. Cladding and absorptive lining fitted to the eastern facade.
- Pumps and compressors. The installation of generic silences.
- Transfer points, chutes and stockyard coal fall. The installation of 'soft flow chutes'.
- Conveyor Main Drive 1 (MD1) motor and gearbox replaced as part of the expansion project.
- CHPP cladding upgrade. Works completed March 2010 include re-cladding of the northern facade, eastern facade and western facade. These works effectively replaced openings and broken windows with new material and barn doors were installed on the western facade to enable maintenance access. Furthermore, elements of the replaced facades comprise the translucent material Alysinite to provide natural light.
- Installation of a high performance noise suppressive cladding on two extensions to the CHPP in 2013.
- Cladding and insulation of conveyor motors in the CHPP area.
- Replacement of Front End Loader 988B with new Front End Loader 988H.
- Installation of audible and visible alarms at each of the train level crossings on site as part of planned changes coordinated with Pacific National to cease the use of train horns on site except in emergency situations.

Ongoing Noise Controls and Management Measures

- CHPP cladding upgrade and internal acoustic absorption. Ongoing re-cladding works and the provision of 750 square metres (m²) of internal acoustic absorption, such as 50 millimetre Rockwool sealed in a thin mylar film and perforated steel sheeting (or equivalent).
- Maintenance of previously installed cladding on the CHPP.
- Project surface construction activities to be generally restricted to daytime hours.
- No off-site road haulage of product coal or coal reject during the evening or night-time periods.
- No truck haulage of coal reject between the CHPP and the temporary stockpile or between the CHPP and the backfill paste plant to be undertaken in the evening and night-time periods.
- Use of broadband reversing alarms on existing and future equipment adjusted to meet occupational health and safety (OHS) requirements.
- Replacement of and acquisition of new plant and equipment with low noise variants where possible.
- Correct and efficient operation of all machinery working in the Major Surface Facilities Area.
- Regular servicing and maintenance of all machinery.
- Education of all drivers hauling materials on the public road network through nearby residential areas.
- Toolbox talks for mobile plant operators to minimise noise impacts whilst loading trains.
- Continual awareness of improvement and noise reduction opportunities.
- Registering all noise related complaints to identify actions that may be necessary to further reduce noise emissions from the site.

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- Use of a portable noise monitor at sensitive receivers.
- Discussions with Pacific National to cease the use of train horns on site except in emergency situations.

Proposed Noise Controls and Management Measures

Metropolitan Coal commissioned a Noise Mitigation Strategy in 2013 to identify the key receivers surrounding the Colliery, rank the contribution of the Colliery noise sources in each receiver area, and determine and evaluate suitable mitigation for the dominant noise sources. As a result of the strategy, a number of additional initiatives will be implemented including:

- Extending the application of high performance acoustic cladding to enclose the Coarse Coal Building and Crusher Tower by 31 December 2014.
- Use of noise engineering consultants to optimise the application of cladding on fixed plant. Design on lower noise source building - Fine Coal Building to be completed by 31 December 2014.
- Acoustic cladding to be installed on new winder building during construction and completed by 31 December 2014.
- Investigation of low noise idlers for conveyors in and around the CHPP.
- Investigating varying or limiting the number of trucks arriving or departing on the Colliery access road to reduce noise levels.
- Investigating fitting noise mitigation kits to mobile plant.
- Considering limiting dozers on the product coal stockpile to first gear during evening and night-time operation to reduce engine noise.

Continuous Noise Improvement for Future Developments

In addition to the improvements described in the implemented, ongoing and proposed noise controls and management measures above there may be opportunity to implement a continuous noise improvement program involving an Acoustical Design, Procurement, Construction and Commissioning process for all future significant upgrades and replacements including:

- Noise limits and acoustical specifications:
 - best available technology noise limits for each stage of development; and
 - environmental and OHS acoustical specifications for all equipment types.
- Desktop design validation and supplier shop testing:
 - equipment suppliers must demonstrate acoustical conformance during tender phase; and
 - environmental and OHS acoustical shop testing during procurement phase.
- *In situ* acceptance testing:
 - environmental and OHS acoustical field testing during plant commissioning; and
 - refitting and or replacement in the event of non-compliance.
- Computer-based acoustical modelling:
 - acoustical modelling of installed plant using actual achieved SWLs; and
 - preparation of detailed acoustical compliance report for each Stage of development.

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- Noise emission monitoring and reporting:
 - on-site and off-site operator-attended noise surveillance measurements of acoustically significant plant.
- In the event of community concerns:
 - prompt response and targeted noise monitoring where required; and
 - refinement of on-site noise operating procedures where practicable.

Replacement Drift Construction Modification

Metropolitan Coal received approval from the Director-General of the Department of Planning and Infrastructure (now the DP&E) in September 2010 of a modification of the Project Approval under Section 75W of the EP&A Act for the construction of a replacement underground drift, including construction of a new drift portal at the Major Surface Facilities Area (Figure 2).

In accordance with the Metropolitan Mine Replacement Drift Modification Environmental Assessment (HCPL, 2010), Metropolitan Coal will implement noise mitigation and management measures specifically focused on noise emissions associated with fixed plant for the construction of the replacement drift (Appendix E). These measures will include the use of low noise or noise-reducing components and the placement of key noise-generating components in locations to minimise noise emissions at private receivers.

Rail Noise Management

Metropolitan Coal will use its best endeavours to minimise night-time rail movements on the Metropolitan rail spur, and will liaise with the Community Consultative Committee and the rail service provider to facilitate resolution of rail noise or rail vibration issues that may arise from coal haulage over the life of the Project.

Additional Noise Management Measures

Post-2014 Metropolitan Coal will implement reasonable and feasible noise mitigation at residences where noise emissions exceed the criteria in Table 4 of Condition 3, Schedule 4 of the Project Approval, upon receiving a written request from the landowner.

Blasting

In accordance with Condition 8, Schedule 4 of the Project Approval, no blasting activities have been conducted at the Major Surface Facilities Area. In the event that blasting at the Major Surface Facilities Area is required, written approval from the Director-General of the DP&E would be sought, and management measures implemented prior to conducting the blasting activities.

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9 CONTINGENCY PLAN

The Project Contingency Plan will come into effect when compliance with the Project noise criteria is required, being after the end of 2014.

In the event that a noise criteria detailed in Section 5.1 is considered to have been exceeded, Metropolitan Coal will implement the following Contingency Plan:

- The exceedance of the noise criteria will be reported to the Manager - Safety & Environmental Services within 24 hours of assessment completion.
- The Manager - Safety & Environmental Services will report the likely exceedance to the General Manager as soon as practicable after becoming aware of the exceedance.
- Metropolitan Coal will report the exceedance of the noise criteria to the EPA and DP&E as soon as practicable after Metropolitan Coal becomes aware of the exceedance.
- Metropolitan Coal will identify an appropriate course of action with respect to the identified impact(s), in consultation with specialists and EPA, as necessary. For example:
 - proposed contingency measures; and
 - a program to review the effectiveness of the contingency measures.

Contingency measures will be developed in consideration of the specific circumstances of the exceedance and the assessment of environmental consequences. Potential contingency measures include the management measures described in Section 8 of this NMP.

- Metropolitan Coal will, on request, submit the proposed course of action to the DP&E for approval.
- Metropolitan Coal will implement the approved course of action to the satisfaction of the DP&E.

9.1 POTENTIAL CONTINGENCY MEASURES

Potential contingency measures include:

- Metropolitan Coal will notify affected landholder/tenants of the exceedance and provide the affected landowner/tenants with quarterly noise monitoring results, until the results show that the Project is complying with the criteria in accordance with Condition 1, Schedule 5 of the Project Approval.
- Metropolitan Coal will complete a SWL review and remodel the noise emissions for examination of additional noise controls and implement additional reasonable and feasible at source noise controls.
- Metropolitan Coal will on request implement reasonable and feasible at receiver noise controls in accordance with Condition 3, Schedule 4.
- Metropolitan Coal will acquire affected properties on request in accordance with Condition 2, Schedule 4.

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10 ANNUAL REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE

In accordance with Condition 3, Schedule 7 of the Project Approval, Metropolitan Coal will conduct an Annual Review of the environmental performance of the Project by the end of March each year.

The Annual Review will specifically address the environmental performance of the NMP and will:

- describe the works carried out in the past year, and the works proposed to be carried out over the next year;
- include a comprehensive review of the monitoring results and complaints records for the Project over the past year, including a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions in the EA, Preferred Project Report and Extraction Plan;
- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the Project;
- identify any discrepancies between the predicted and actual impacts of the Project, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the Project.

As described in Section 2, this NMP will be reviewed within three months of the submission of an Annual Review, and revised where appropriate.

11 REPORTING

11.1 INCIDENTS

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the Project Approval.

The reporting of incidents will be conducted in accordance with Condition 6, Schedule 7 of the Project Approval. Metropolitan Coal will notify the Director-General of the DP&E and any other relevant agencies of any incident associated with the Project as soon as practicable after Metropolitan Coal becomes aware of the incident. Within seven days of the date of the incident, Metropolitan Coal will provide the Director-General of the DP&E and any relevant agencies with a detailed report on the incident.

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11.2 COMPLAINTS

A protocol for the managing and reporting of complaints has been developed as a component of Metropolitan Coal's Environmental Management Strategy and is described below.

The Manager - Safety & Environmental Services is responsible for maintaining a system for recording complaints.

Metropolitan Coal will maintain public signage advertising the telephone number on which environmental complaints can be made. The Manager - Safety & Environmental Services is responsible for ensuring that the currency and effectiveness of the service is maintained. Notifications of complaints received are to be provided as quickly as practicable to the Manager - Safety & Environmental Services.

Complaints and enquiries do not have to be received via the telephone line and may be received in any other form. Any complaint or enquiry relating to environmental management or performance is to be relayed to the Manager - Safety & Environmental Services as soon as practicable. All employees are responsible for ensuring the prompt relaying of complaints. All complaints will be recorded in a complaints register.

For each complaint, the following information will be recorded in the complaints register:

- date and time of complaint;
- method by which the complaint was made;
- personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- nature of the complaint;
- the action(s) taken by Metropolitan Coal in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by Metropolitan Coal, the reason why no action was taken.

The Manager - Safety & Environmental Services is responsible for ensuring that all complaints are appropriately investigated, actioned and that information is fed back to the complainant, unless requested to the contrary.

In accordance with Condition 10, Schedule 7 of the Project Approval, the complaints register will be made publicly available on the website and updated on a monthly basis. A summary of complaints received and actions taken will be presented to the Community Consultative Committee as part of the operational performance review.

11.3 NON-COMPLIANCES WITH STATUTORY REQUIREMENTS

A protocol for the managing and reporting of non-compliances with statutory requirements has been developed as a component of Metropolitan Coal's Environmental Management Strategy and is described below.

Compliance with all approvals, plans and procedures will be the responsibility of all personnel (staff and contractors) employed on or in association with Metropolitan Coal, and will be developed through promotion of Metropolitan Coal ownership under the direction of the General Manager.

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The Technical Services Manager and/or Manager - Safety & Environmental Services will undertake regular inspections, internal audits and initiate directions identifying any remediation/rectification work required, and areas of actual or potential non-compliance.

As described in Section 11.1, Metropolitan Coal will notify the Director-General of the DP&E and any other relevant agencies of any incident associated with Metropolitan Coal as soon as practicable after Metropolitan Coal becomes aware of the incident. Within seven days of the date of the incident, Metropolitan Coal will provide the Director-General of the DP&E and any relevant agencies with a detailed report on the incident.

A review of Metropolitan Coal's compliance with all conditions of the Project Approval, mining leases and all other approvals and licences will be conducted prior to (and included within) each Annual Review. The Annual Review will be made publicly available on the Peabody website.

Additionally, in accordance with Condition 8, Schedule 7 of the Project Approval, an independent environmental audit will be conducted by the end of December 2011, and a minimum of once every three years thereafter. A copy of the audit report will be submitted to the Director-General of the DP&E and made publicly available on the Peabody website. The independent audit will be conducted by an appropriately qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General of the DP&E.

12 REFERENCES

Department of Environment and Climate Change (2000) *Industrial Noise Policy*.

Heggies (2008a) *Metropolitan Coal Project Noise Impact Assessment*. Report 10-5055-R1.

Heggies (2008b) *Noise Reduction Programme Stage 2 Noise Mitigation Investigation*.
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Helensburgh Coal Pty Ltd (2008) *Metropolitan Coal Project Environmental Assessment*.

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APPENDIX A

DETAILED DAYTIME, EVENING AND NIGHT-TIME NOISE LEVEL PREDICITONS
AT NEARBY PRIVATE RECEIVERS

Metropolitan Coal – Noise Management Plan		
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Table A-1
Predicted Daytime¹ Intrusive L_{Aeq(15minute)} Noise Levels (dBA re 20 µPa)

Receiver Area	ID	Location	Existing Mine - Calm ¹		Project Year 3 - Calm ¹		Project Year 15 - Calm ¹	
			With Trucks	Without Trucks	With Trucks	Without Trucks	With Trucks	Without Trucks
Near Project Boundary	O1	1 Oxley Place	47	47	44	43	41	40
	O3	3 Oxley Place	41	41	39	38	37	36
	O5	5 Oxley Place	44	43	42	40	40	38
	O7	7 Oxley Place	46	44	43	41	40	38
	O7A	7a Oxley Place	38	36	36	32	33	31
	O9	9 Oxley Place	48	45	47	42	42	39
	W1	1 Wills Place	45	44	42	40	40	38
	W3	3 Wills Place	35	35	42	30	29	28
	W5	5 Wills Place	35	35	31	30	30	28
	W7	7 Wills Place	48	47	42	41	40	39
	O2	2 Oxley Place	56	54	54	49	50	47
	O4	4 Oxley Place	56	54	54	48	50	47
	O6	6 Oxley Place	56	53	54	48	50	46
	O8	8 Oxley Place	56	53	54	48	50	46
	O10	10 Oxley Place	56	53	55	48	50	46
	O12	12 Oxley Place	56	52	55	48	50	45
	O14	14 Oxley Place	57	52	55	48	51	45
	O16	16 Oxley Place	57	52	56	49	51	45
	O18	18 Oxley Place	56	51	55	48	50	44
	P40	40 Parkes St	32	32	32	32	31	31
	S36	36 Old Station	47	47	47	47	47	46
	P42	42 Parkes Street	47	47	47	47	47	46
	P44	44 Parkes Street	47	47	47	47	47	46
	P46	46 Parkes Street	47	47	47	47	47	46
	P48	48 Parkes Street	48	47	48	48	48	48
	P50	50 Parkes Street	49	49	49	48	48	48
	P52/54	52/54 Parkes Street	50	50	49	49	47	47
	P53	53 Parkes Street	54	53	48	45	46	45
	P55	55 Parkes Street	51	51	47	42	44	43
	P55A	55a Parkes Street	47	46	43	39	40	37
	P57	57 Parkes Street	47	45	43	39	39	37
	P59	59 Parkes Street	46	44	43	38	39	36
	P56/58	56/58 Parkes Street	41	36	40	34	36	32
	P72/74	72/74 Parkes Street	39	32	37	30	32	26
	P86	86 Parkes Street	55	48	54	45	49	37
	P88	88 Parkes Street	54	47	53	45	48	37
	R2	2 Robertson Street	45	37	45	37	40	33
	P65	65 Parkes Street	52	47	51	44	46	40
	P67	67 Parkes Street	45	37	45	36	40	29
	P69	69 Parkes Street	39	33	39	31	34	27
	H48	48 Hume Drive	41	38	40	36	37	35
	H50	50 Hume Drive	47	44	45	41	41	37
	H52	52 Hume Drive	48	47	43	41	40	39
	H54	54 Hume Drive	53	49	52	45	47	41
North of Project Boundary	F17	17 Old Farm Road	31	31	31	31	31	30
	F19	19 Old Farm Road	30	30	30	30	30	30

Notes:

¹ Daytime 7.00 am to 6.00 pm.² Daytime meteorological parameters as described in Table A-4.

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Table A-2
Predicted Evening¹ Intrusive L_{Aeq(15minute)} Noise Levels (dBA re 20 µPa)

Receiver Area	ID	Location	Existing Mine		Project Year 3		Project Year 15	
			Calm ²	NNE ²	Calm ²	NNE ²	Calm ²	NNE ²
Near Project Boundary	O1	1 Oxley Place	47	48	43	45	40	43
	O3	3 Oxley Place	41	43	38	41	36	40
	O5	5 Oxley Place	43	45	40	43	37	41
	O7	7 Oxley Place	44	46	41	43	38	41
	O7A	7A Oxley Place	36	38	32	34	29	32
	O9	9 Oxley Place	44	46	41	44	38	41
	W1	1 Wills Place	44	46	40	43	38	41
	W3	3 Wills Place	35	36	29	32	27	30
	W5	5 Wills Place	35	36	30	32	28	30
	W7	7 Wills Place	47	49	41	44	39	42
	O2	2 Oxley Place	53	54	47	49	45	47
	O4	4 Oxley Place	55	56	47	49	44	47
	O6	6 Oxley Place	53	54	46	48	44	46
	O8	8 Oxley Place	52	53	46	48	44	46
	O10	10 Oxley Place	52	53	46	48	43	46
	O12	12 Oxley Place	51	53	45	47	43	45
	O14	14 Oxley Place	51	52	45	47	43	45
	O16	16 Oxley Place	51	52	45	47	42	45
	O18	18 Oxley Place	50	51	44	46	42	44
	P40	40 Parkes Street	32	29	32	29	30	27
	S36	36 Old Station Road	47	44	47	44	46	43
	P42	42 Parkes Street	47	45	47	45	46	44
	P44	44 Parkes Street	47	45	47	45	46	44
	P46	46 Parkes Street	47	45	47	45	46	45
	P48	48 Parkes Street	48	49	48	49	48	49
	P50	50 Parkes Street	49	50	48	50	47	49
	P52/54	52/54 Parkes Street	50	51	49	50	46	48
	P53	53 Parkes Street	53	53	45	45	43	42
	P55	55 Parkes Street	46	51	42	42	40	40
	P55A	55A Parkes Street	45	46	38	38	36	36
	P57	57 Parkes Street	44	45	38	38	36	36
	P59	59 Parkes Street	41	44	37	37	34	34
	P56/58	56/58 Parkes Street	35	35	32	32	30	30
	P72/74	72/74 Parkes Street	30	30	27	27	25	26
	P86	86 Parkes Street	45	47	40	42	36	39
	P88	88 Parkes Street	45	47	39	42	36	39
	R2	2 Robertson Street	36	39	35	39	33	37
	P65	65 Parkes Street	46	48	41	44	38	41
	P67	67 Parkes Street	34	36	31	34	38	32
	P69	69 Parkes Street	32	34	28	32	26	30
	H48	48 Hume Drive	38	41	36	39	34	38
	H50	50 Hume Drive	43	45	40	43	37	40
	H52	52 Hume Drive	47	49	41	44	39	41
	H54	54 Hume Drive	48	50	42	45	40	42
North of Project Boundary	F17	17 Old Farm Road	31	28	31	27	30	26
	F19	19 Old Farm Road	30	26	30	26	30	25

Notes:

¹ Evening 6.00 pm to 10.00 pm.² Evening meteorological parameters as described in Table A-4.

Table A-3
Predicted Night-time¹ Intrusive L_{Aeq(15minute)} Noise Levels (dBA re 20 µPa)

Receiver Area	ID	Location	Existing Mine		Project Year 3		Project Year 15	
			Calm ²	North ²	Calm ²	North ²	Calm ²	North ²
Near Project Boundary	O1	1 Oxley Place	47	48	43	45	40	42
	O3	3 Oxley Place	41	43	38	41	36	39
	O5	5 Oxley Place	43	45	40	43	37	40
	O7	7 Oxley Place	44	45	41	43	38	40
	O7A	7A Oxley Place	36	38	32	34	29	32
	O9	9 Oxley Place	44	46	41	43	38	40
	W1	1 Wills Place	44	46	40	43	38	41
	W3	3 Wills Place	35	36	29	31	27	29
	W5	5 Wills Place	34	36	30	32	28	30
	W7	7 Wills Place	47	48	41	44	39	42
	O2	2 Oxley Place	53	54	47	49	45	46
	O4	4 Oxley Place	55	56	47	49	44	46
	O6	6 Oxley Place	53	54	46	48	44	46
	O8	8 Oxley Place	52	53	46	48	44	45
	O10	10 Oxley Place	52	53	46	48	43	45
	O12	12 Oxley Place	51	53	45	47	43	45
	O14	14 Oxley Place	51	52	45	47	43	44
	O16	16 Oxley Place	51	52	45	46	42	44
	O18	18 Oxley Place	50	51	44	45	42	43
	P40	40 Parkes Street	32	29	32	28	30	26
	S36	36 Old Station Road	47	43	47	43	46	42
	P42	42 Parkes Street	47	43	47	43	46	42
	P44	44 Parkes Street	47	43	47	43	46	42
	P46	46 Parkes Street	47	43	47	43	46	42
	P48	48 Parkes Street	48	46	48	46	48	45
	P50	50 Parkes Street	49	48	48	47	47	46
	P52/54	52/54 Parkes Street	50	50	49	48	46	45
	P53	53 Parkes Street	53	53	45	44	43	42
	P55	55 Parkes Street	46	50	42	41	40	39
	P55A	55A Parkes Street	45	45	38	37	36	35
	P57	57 Parkes Street	44	44	38	37	36	35
	P59	59 Parkes Street	41	43	37	36	34	34
	P56/58	56/58 Parkes Street	35	34	32	31	30	29
	P72/74	72/74 Parkes Street	30	29	27	25	25	24
	P86	86 Parkes Street	45	45	40	40	36	37
	P88	88 Parkes Street	45	45	39	40	36	37
	R2	2 Robertson Street	36	38	35	37	33	35
	P65	65 Parkes Street	46	47	41	42	38	40
	P67	67 Parkes Street	34	35	31	33	38	40
	P69	69 Parkes Street	32	33	28	30	26	29
	H48	48 Hume Drive	38	40	36	39	34	37
	H50	50 Hume Drive	43	44	40	42	37	39
	H52	52 Hume Drive	47	48	41	43	39	41
	H54	54 Hume Drive	48	49	42	44	40	41
North of Project Boundary	F17	17 Old Farm Road	31	27	31	27	30	26
	F19	19 Old Farm Road	30	26	30	26	30	25

Notes:

¹ Night-time 10.00 pm to 7.00 am.² Night-time meteorological parameters as described in Table A-4.

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Table A-4
Calm (neutral) and Noise Enhancing Meteorological Modelling Parameters

Period	Meteorological Parameter	Air Temp	Relative Humidity	Wind Velocity	Temperature Gradient
Daytime	Annual Calm	20°C	70%	0 m/s	0°C/100 m
Evening	Summer Wind only	15°C	80%	NNE 3 m/s	0°C/100 m
Night-time	Summer Wind only	15°C	80%	N 3 m/s	0°C/100 m

APPENDIX B

FIXED AND MOBILE PLANT SOUND POWER AUDIT RESULTS NOVEMBER 2007

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Table B-1
Fixed Plant Noise Audit - Sound Power Levels (dBA re 10pW)

System	Description	Condition	No, Area or Length	Overall L _{Aeq} SWL ¹ – PRP12
Coarse Washery Buildings	Levels 1-6	Windows/Openings	68 m ²	116
	Levels 1-6	Enclosed	1150 m ²	108
	Ground Level	Openings	136 m ²	108
	Ground West	Enclosed	124 m ²	89
	Sub-Total		1478 m²	117
Pump and Compressor Units	Exhaust	Partially silenced	3 off	112
	Pump	Partially enclosed	3 off	101
	Sub-Total			112
Building Crusher	Levels 1-4	Enclosed	480 m ²	99
	Ground	Openings	120 m ²	102
	Sub-Total		600 m²	104
Fine Washery Building	Building	Openings	540 m ²	102
	Building	Enclosed	760 m ²	89
	Sub-Total		1300 m²	102
Winder House	Building	Openings	3 m ²	85
	Door	Enclosed	280 m ²	84
	Sub-Total		283 m²	88
Koepe Winder	Sub-Total	Enclosed	640 m²	88
MD1	Conveyor Drive	400 kW		102
	Axial Cooling Fan	-		111
CV1	Conveyor Drive	37 kW		91
	Transfer Conveyor	500 t/hr, 3.4m/s	70 m	102
RC2	Conveyor Drive	45 kW		92
	Transfer Conveyor	500 t/hr, 3.4 m/s	71 m	102
RC3	Conveyor Drive	15 kW		97
	Transfer Conveyor	500 t/hr, 3.4 m/s	24 m	98
RC4	Conveyor Drive	75 kW		94
	Transfer Conveyor	500 t/hr, 3.4 m/s	94 m	104
RC5	Conveyor Drive	45 kW		92
	Transfer Conveyor	500 t/hr, 3.4 m/s	40 m	100
RC6	Conveyor Drive	7.5 kW		84
	Transfer Conveyor	500 t/hr, 3.4 m/s	14 m	95
RC7	Conveyor Drive	75 kW		94
	Transfer Conveyor	500 t/hr, 3.4 m/s	116 m	105
Recycle	Conveyor Drive	7.5 kW		84
	Transfer Conveyor	500 t/hr, 3.4 m/s	35 m	99
Reject	Conveyor Drive	15 kW	2 off	91
	Transfer Conveyor	250 t/hr, 3.4 m/s	2*40m	100
Tailings	Conveyor Drive	7.5 kW		84
	Transfer Conveyor	250t/hr, 3.4 m/s	35m	96
Coarse/Fine	Conveyor Drive	7.5 kW	2 off	95
	Transfer Conveyor	500 t/hr, 3.4 m/s	2*19m	100
	Conveyor Drive	45 kW	2 off	95
	Transfer Conveyor	500 t/hr, 3.4 m/s	2*450m	113
Sub-Total	Conveyor Drives + Fan	7.5 to 400 kW	850kW	112
	Transfer Conveyors	250-500 t/hr, 3.4 m/s	1516m	115
Stockyard	Fine Coal Falling	500 t/hr	-	97
	Coarse Coal Falling	500 t/hr	-	111
FIXED PLANT	TOTAL SWL			121 dBA

Note:

70 Where plant was unavailable (or inaccessible) for direct measurement a SWL has been calculated.

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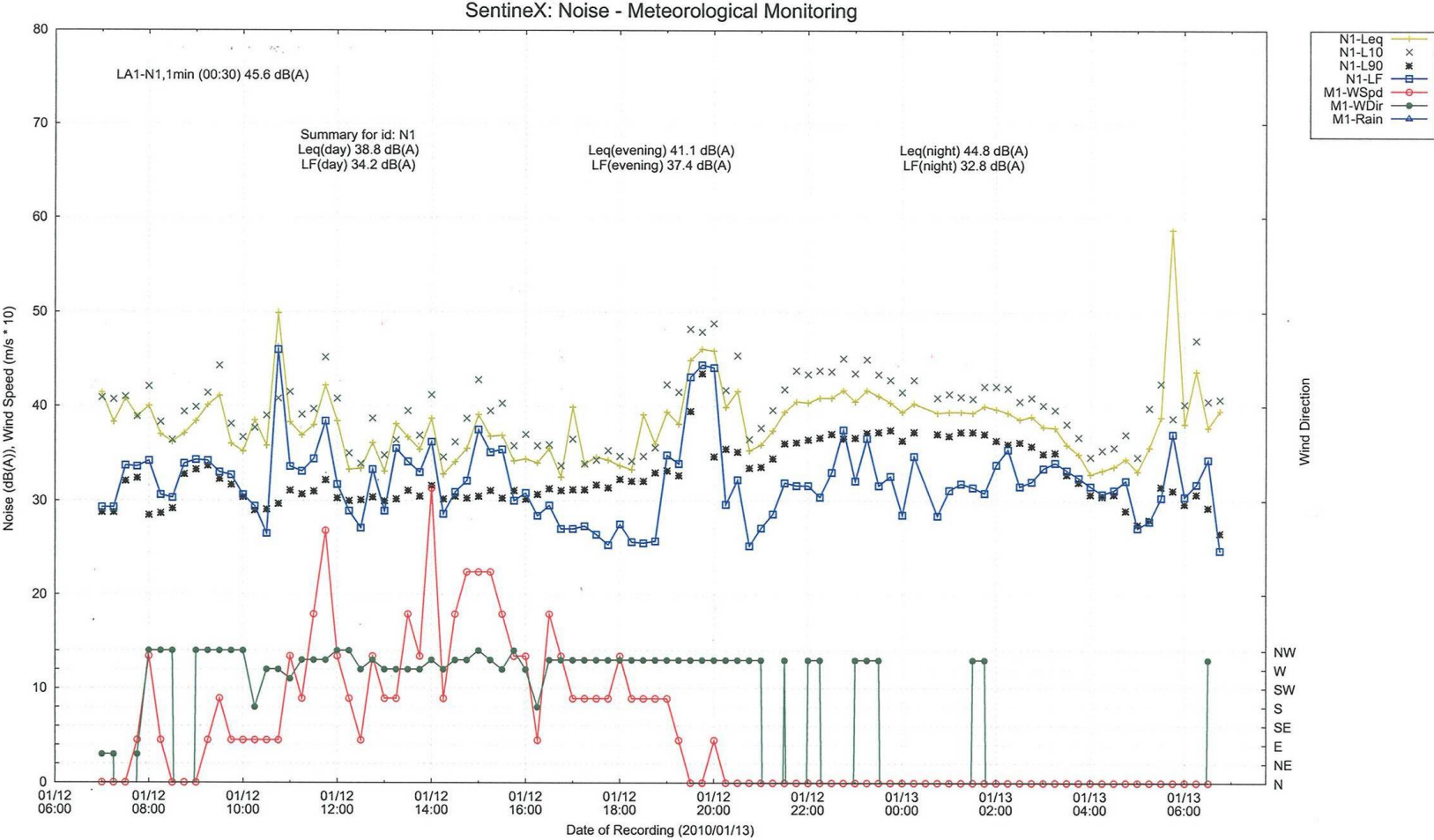
Table B-2
Mobile Equipment Noise Audit - Sound Power Levels (dBA re 10pW)

System	Description	Condition	Number, Capacity	Overall L _{Aeq} SWL
Washery Mobile Equipment	Front-end Loader	CAT988F/B	3 off	118
	Front-end Loader	CAT980F		111
	Front-end Loader	KOMWA470		112
	Track Dozer	CATD8R		114
	Track Dozer	CATD7		113
	Sub-Total			121
Other Mobile Equipment	Forklift	Omega 33B6		101
	Forklift	Hyster		98
	Bobcat	-		98
	Water Cart	-	15 t	108
	Grader	Case		108
	Street Sweeper	McDonald		108
	Sub-Total			113
Off-site Mobile	Reject/Product Truck	Uphill	1 off	116
	Reject/Product Truck	Downhill	1 off	110
	Locomotives	Idle	2 off	93
MOBILE	TOTAL SWL			123 dBA

APPENDIX C

SAMPLE DAILY REAL-TIME NOISE MONITORING REPORT

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APPENDIX D

EXAMPLE ATTENDED MONITORING RECORDING SHEET

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Operator Attended Noise Monitoring

Job Number: Job Title: Description : Brüel & Kjær Path \ File # : Measurement Description: Name : Date / Time : Location :		Site Diagram	
Measured Parameter	Notes	Comments (time/SPL range etc..)	
L _{Amax}			
L _{A1}			
L _{A10}			
L _{Aeq}			
L _{A90}			
Wind Speed (m/s) & Dir :		Temp/Cloud cover: °C / 8	Cal.Check : Pre - Post -
Instrumentation Type/ Serial No.		Microphone:	SLM: Calibrator:

Operator Attended Noise Monitoring

Job Number: Job Title: Noise Measurement Description : Brüel & Kjær Path \ File # : Noise Measurement Description Name : Date / Time : Location :		Site Diagram	
Measured Parameter	Notes	Comments (time/SPL range etc..)	
L _{Amax}			
L _{A1}			
L _{A10}			
L _{Aeq}			
L _{A90}			
Wind Speed (m/s) & Dir :		Temp/Cloud cover: °C / 8	Cal.Check : Pre - Post -
Instrumentation Type/ Serial No.		Microphone:	SLM: Calibrator:

APPENDIX E

REPLACEMENT DRIFT CONSTRUCTION
FIXED PLANT SOUND POWER LEVELS

Metropolitan Coal – Noise Management Plan		
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Table E-1
Fixed Plant Operating Sound Power Levels (SWLs)

Equipment	Construction Phase and Approximate Duration	Capacity or Specification (or Equivalent)	Mitigation (or Equivalent) and estimated reductions - Subject to detailed Acoustical Design and Procurement Specification	Operating LAeq SWL
Axial Fan	Phase 2 - 3 months	100 kW	High Performance Silencer - 12 dBA reduction Indicatively 2D silencer on the fan inlet and exhaust. Fan supply louver to be directed in the east.	103 dBA
35 m conveyor	Phase 2 - 12 months	1000 t/hr	Install low noise idlers - 10 dBA reduction	95 dBA/10 m
Conveyor Drive	Phase 2 - 12 months	160 kW	Install low noise drive - 7 dBA reduction	93 dBA/unit
Diesel Gensets	Phase 2 - 12 months	2*1320 kVA	High Performance Enclosure - 15 dBA reduction Indicatively double skin construction (typically metal decking//100mm insulation//10mm fibrous cement sheeting) fully internally lined with 50 mm insulation faced with perforated metal. Acoustic louvers to be provided by supply and return air located on the eastern side of the building. High performance exhaust muffler to limit the sound pressure to less than 85 dBA @ 1m from the exhaust.	101 dBA/unit
Axial Fan	Phase 3 - 27 months	250 kW	High Performance Silencer - 18 dBA reduction Indicatively 2D podded silencer on the fan inlet and exhaust. Fan housed within the portal to reduce noise breakout from the fan casing.	101 dBA
50 m conveyor	Phase 3 - permanent	1000 t/hr	Install low noise idlers - 10 dBA reduction	95 dBA/10 m
Conveyor Drive	Phase 3 - permanent	2*250 kW	Install low noise drive - 7 dBA reduction	95 dBA/unit
New Substation	Phase 3 - permanent	33 kV/11 kV	Enclosed and located at Mine Managers Residence	70 dBA

Source: Heggies (2010).

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