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MT ARTHUR COAL MINE
MODIFICATION 2

Modification Report

Appendix A

Noise and Blasting Assessment

Resource Strategies

REPORT

MT ARTHUR MOD 2 NOISE AND BLASTING REPORT

THOMAS MITCHELL DRIVE, MUSWELLBROOK

NOISE AND BLASTING ASSESSMENT
RWDI # 2101370
September 2023

SUBMITTED TO

Hunter Valley Energy Coal

SUBMITTED BY

Roman Haverkamp
Senior Engineer
Roman.haverkamp@rwdi.com

Davis Lai
Project Manager
Davis.lai@rwdi.com

RWDI Australia Pty Ltd (RWDI)
ABN: 86 641 303 871

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Version	Status	Date	Prepared By	Reviewed By
A	Final	July 2023	Roman Haverkamp	John Wassermann
A	Final	September 2023	John Wassermann	Davis Lai

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1 INTRODUCTION

1.1 Overview of Mt Arthur Coal Mine

The Mt Arthur Coal Mine (MAC) is an existing open cut coal mining operation located approximately 5 kilometres (km) south-west of Muswellbrook, within the Muswellbrook Local Government Area (LGA) in the Upper Hunter Valley of New South Wales (NSW) (**Figure 1-1**). The MAC is owned and operated by Hunter Valley Energy Coal Pty Ltd (HVEC), a wholly owned subsidiary of BHP. MAC is currently approved to operate until 30 June 2026 in accordance with Project Approval MP 09_0062 (MP 09_0062).

Coal mine development at MAC commenced in the early 1960s in the Bayswater No. 2 Open Cut mining area. Coal production progressively increased and approval to extract coal from the Bayswater No. 3 Open Cut was granted in 1994.

In 2013, HVEC submitted an application to modify MP 09_0062 to extend the mine life of the MAC (MOD 1). Subsequent to the approval of MOD 1, MP 09_0062 permits the extraction of up to 32 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from the open cut operations until 30 June 2026.

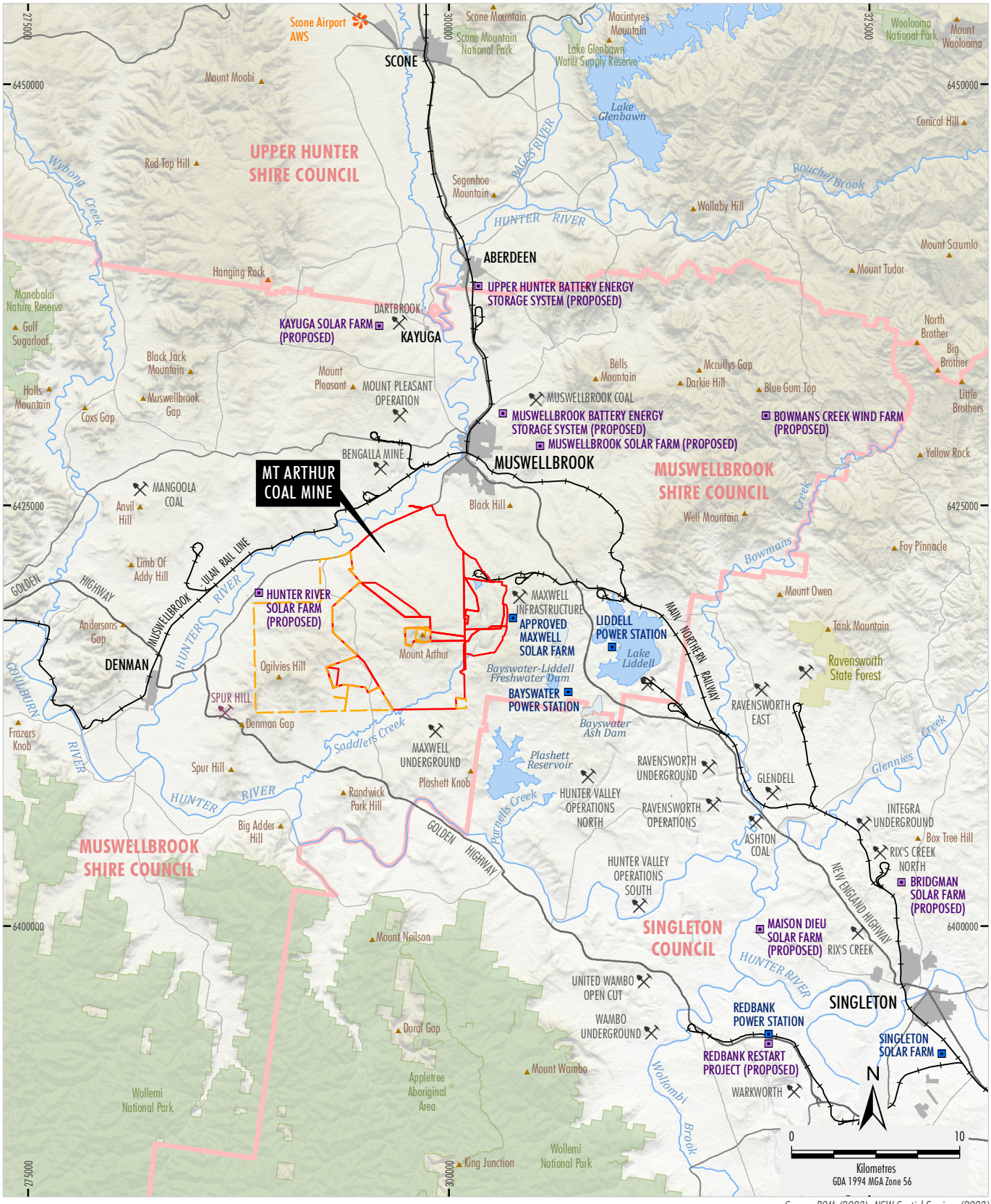
In June 2022, HVEC announced a decision to cease mining at MAC in 2030, as part of a plan to provide a pathway to closure of the operation. Accordingly, HVEC is seeking a modification of the MP 09_0062 to approve a four-year extension of the MAC to 30 June 2030 (the Modification).

A glossary of terms and definitions is provided as **Appendix A** of this report.

1.2 Objectives of this Study

The primary objective of this Study is to provide an assessment of the potential noise and blasting impacts associated with the proposed Modification. The impact is assessed according to criteria set out in the existing MP 09_0062 in consideration of the *Noise Policy for Industry* (NSW Environmental Protection Authority [EPA], 2017) (NPfI). In addition, the assessment is based on the following NSW noise policies and guidelines:

- Australian and New Zealand Environment Council (1990) *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration*.
- NSW Department of Environment and Conservation (2006) *Assessing Vibration: a technical guideline*.
- NSW Department of Environment, Climate Change & Water (DECCW) (2011) *NSW Road Noise Policy* (RNP).
- NSW Department of Planning and Environment (DPE) (2018) *Voluntary Land Acquisition and Mitigation Policy* (VLAMP).
- EPA (2013) *Rail Infrastructure Noise Guideline.* .



HVE-19-09 MOD2_NB_2028

Source: BOM (2023); NSW Spatial Services (2023)

LEGEND

- State Forest
- National Parks and Wildlife Estate
- Local Government Area
- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Mining Operation
- Proposed Mining Operations (Application Lodged)
- Existing/Approved Energy Generation Site
- Proposed Energy Generation Site
- Weather Station

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MT ARTHUR COAL MINE MODIFICATION 2

Regional Location

Figure 1-1

2 MODIFICATION OVERVIEW

2.1 Background

The MAC currently extracts coal within Mining Leases 1548, 1487, 1358, 1655, 1739, 1757, and 1593; Mining Purpose Lease 263; Sublease Coal Leases 229 and 395; Coal Lease 396 and Consolidated Coal Lease 744. MAC currently produces up to 32 Mtpa of ROM coal from the open cut mining operations and handles up to 36 Mtpa of ROM coal in total (including 4 Mtpa ROM coal from the approved underground mine, which is approved but not operational).

The existing mine includes a Coal Handling and Preparation Plant (CHPP) for processing up to 36 Mtpa of ROM coal from open cut and underground operations, product coal loading facilities and overland connecting conveyors (**Figure 2-1**). Export product coal is loaded onto trains at the rail loading facility for transport to the Port of Newcastle via the Antiene Rail Spur and Main Northern Railway line.

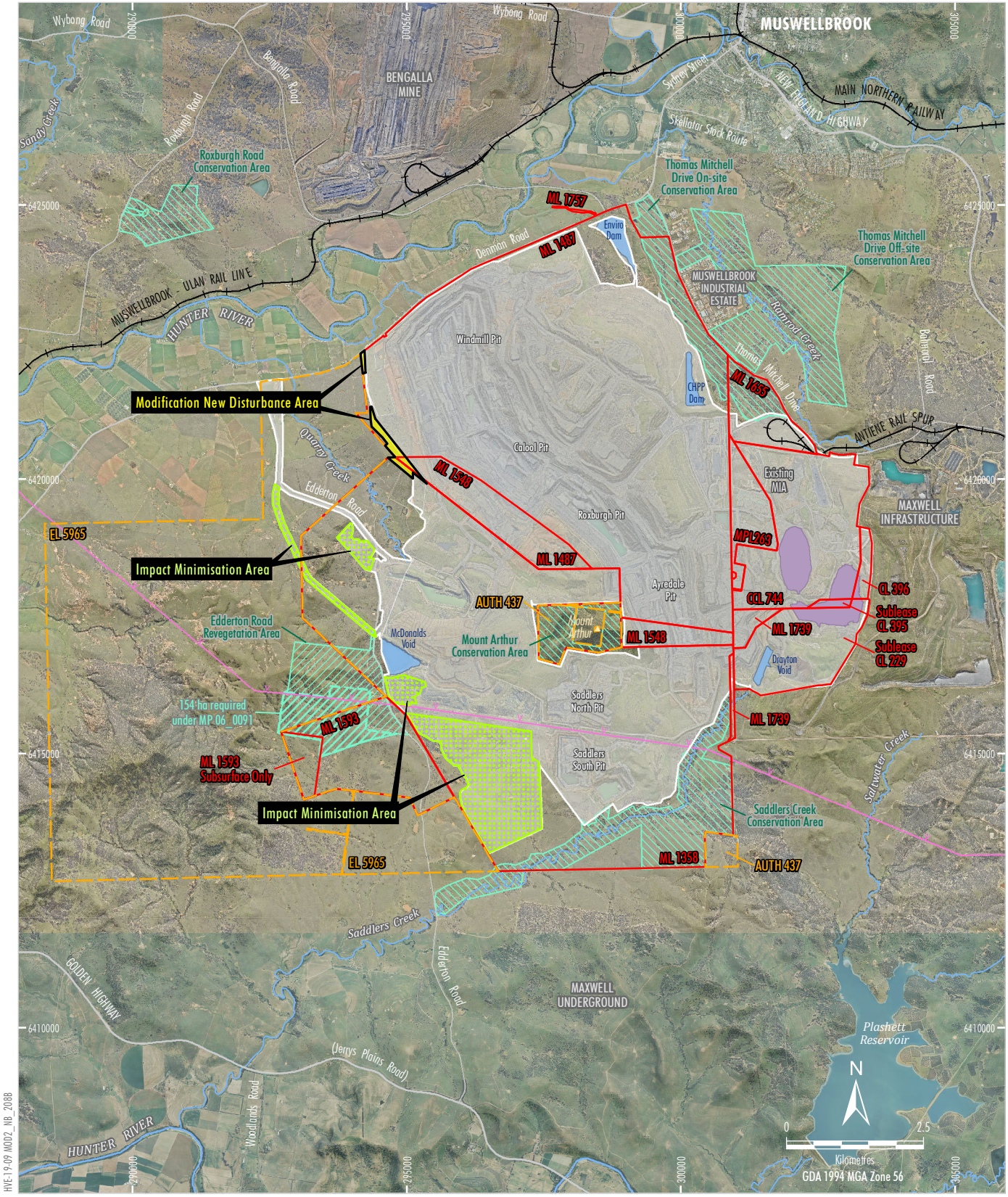
Other existing and approved general infrastructure at the MAC include an electricity supply and distribution system, water reticulation system and water storages, retention basins and associated water management structures (**Figure 2-1**).

2.2 Modification Summary and Objectives

In June 2022, HVEC announced a decision to cease mining at MAC in 2030, as part of a plan to provide a pathway to closure of the operation. Accordingly, HVEC is planning to pursue a modification to MP 09_0062 for a four-year extension of the MAC to 30 June 2030 (the Modification). The proposed Modification would be sought under section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Key aspects of the Modification would include:

- a four-year extension of mining activities to 30 June 2030;
- a reduction in the approved open cut mining rate from 32 Mtpa of ROM coal to a maximum of 25 Mtpa ROM coal (similar to current actual ROM coal production);
- reduction in the cumulative open cut and underground ROM coal handling rate from 36 Mtpa to 29 Mtpa;
- reduction in maximum total (open cut and underground) coal rail transportation from 27 Mtpa of product coal to 20 Mtpa, and a reduction in train movements from 30 to 20 movements per day;
- minor extension of the approved disturbance area in the north-west corner of the operation predominantly to allow for access and ancillary infrastructure (Modification New Disturbance Area) (**Figure 2-1**);
- an overall reduction (387 ha) in approved disturbance, as some previously approved disturbance areas are no longer intended to be disturbed (Impact Minimisation Area) (**Figure 2-1**); and
- a revised final landform and final void configuration, including an overall reduction in the approved height of the northern overburden emplacement areas and the final landform (to reflect the current actual height).



HVE-19-09 MOD2_N0_2088

Source: BHP (2023); NSW Spatial Services (2023)
Orthophoto Mosaic: BHP (2022-2020)

LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Existing 500kV Electricity Transmission Line
- Existing Conservation/Offset Area
- Edderton Road Revegetation Area
- Approximate Extent of Existing/Approved Surface Development
- Tailings Storage Facility
- Water Storage
- Modification New Disturbance Area
- Impact Minimisation Area

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MT ARTHUR COAL MINE MODIFICATION 2

Modification General Arrangement

Figure 2-1

The Modification would involve no change to:

- existing mining tenements;
- existing coarse rejects and tailings management;
- existing workforce;
- the existing explosives facility;
- existing site accesses;
- existing electricity supply and distribution;
- existing offset and rehabilitation objectives;
- existing services, plant and equipment; and
- the existing hours of operation and associated activities (undertaken 24-hours per day, seven days a week).

The Modification would not involve any material/discrete construction and/or development activities warranting particular consideration from a noise emissions point of view. Therefore, construction noise was not addressed as part of this assessment.

2.3 Modification Activities

2.3.1 Open Cut Mining Operations

Hours of Operation

Consistent with the existing MAC, open cut mining activities and associated mobile equipment movements would continue to be undertaken 24-hours per day, seven days per week, subject to compliance with relevant environmental management criteria (e.g. real-time air quality and noise operational trigger levels).

Mining Method and Schedule

There would be no additional open cut pit mining areas as part of the Modification, however a minor extension of the Windmill Pit would be required for access and ancillary infrastructure to support existing mining operations.

Conventional truck and shovel open cut strip (Windmill, Calool, Roxburgh and Saddlers [north and south] Pits) and terrace (Ayredale Pit) mining methods would continue to be used at the MAC for a further four years until 2030. A mix of on-seam and on-bench mining, depending on the coal seam dip, as well as use of through-seam blasting techniques would also continue to be used at the MAC.

The Modification would involve the extraction of approximately 100 million tonnes of ROM coal across the four year mine-life extension. Open cut operations would occur at a rate of up to 25 Mtpa, which is a 7 Mtpa reduction from what is currently approved (i.e., 32 Mtpa). An indicative mine schedule for the MAC Modification is provided in the main text of the Modification Report.

Overburden Management

Over the life of the Modification, overburden material would be used to progressively backfill the northern open cut pits; and the southern portion of the out-of-pit emplacement area would no longer be required due to the reduced mining rate and impact minimisation areas.

2.3.2 Product Coal Rail Movements

As part of the Modification, transport of product coal would decrease from 27 Mtpa to 20 Mtpa, with a decrease of maximum rail movements from 30 per day to 20 per day (i.e. 10-laden trains departures per day after approval of the Modification).

2.3.3 Water Supply and Water Management

The existing water management system at the Mt Arthur Coal Mine would continue to be used to support ongoing mining activities and would be progressively augmented as water management requirements change over the life of the Modification.

The existing surface water runoff controls to prevent up-catchment runoff water from entering open cut mining operation areas would be retained and where necessary upgraded for the Modification. A description of the water management system is provided in Appendix G of the Modification Report.

2.3.4 CHPP Rejects Management

The Modification would result in a reduction in overall approved ROM coal handling rate from 36 Mtpa to 29 Mtpa, and would therefore allow for the continued use of the CHPP to facilitate the processing of up to 29 Mtpa of ROM coal. The Modification does not require any upgrades to the CHPP.

Consistent with existing operations, all course rejects produced by the CHPP would continue to be co-disposed within the overburden emplacement areas or utilised in the construction of tailings dams, stockpiles or other infrastructure.

3 REVIEW OF ENVIRONMENTAL PERFORMANCE

3.1 Environmental Noise Performance

Noise management at the MAC is currently undertaken in accordance with the MAC Noise Management Plan MAC-ENC-MTP-032 (BHP, 2023) (NMP), which outlines:

- MP 09_0062 noise criteria;
- Noise management and control measures;
- Noise monitoring programs;
- Consultation and communication approaches; and
- Management of exceedances and complaints.

Compliance noise monitoring conducted for MAC includes:

- Attended compliance noise monitoring undertaken on a monthly basis by an independent acoustic consultant;
- Continuous real-time monitoring to actively manage noise emissions on-site;
- Sound power level monitoring for operational mobile fleet associated with critical pit areas and haul routes to achieve best practice noise suppression and ensure appropriate management of noise emissions.

Environmental performance related to noise was reviewed for the last seven years of operation (i.e., Financial Year 2016 [FY16] to FY22). Findings from the environmental noise performance review are summarised below.

3.1.1 Attended Compliance Noise Monitoring

HVEC is responsible for completing monthly attended noise monitoring to be carried out by an independent acoustic consultant. The monthly attended noise survey – conducted at eight locations surrounding the site and representative of the different noise-sensitive residential areas potentially affected by MAC (shown as locations NP04, NP07, NP10, NP12, NP13, NP14, NP15 and NP16 in Appendix 1 of the NMP) – comprises one 15-minute measurement at each monitoring location during the night-time assessment period (10:00 pm – 7:00 am). The monthly attended noise monitoring quantifies the $L_{Aeq,15min}$ and $L_{A1,1min}$ noise contributions from MAC (when measurable) with consideration of low-frequency noise (LFN) characteristics potentially warranting modifying factor corrections.

Review of attended compliance noise monitoring results from FY16 to FY22 (BHP, 2016, 2017, 2018, 2019, 2021 and 2022) indicates compliance with the relevant noise criteria, with the exception of a small 1 decibel (dB) exceedance on 18 October 2021 at monitoring site NP04. In line with the NMP, appropriate Mt Arthur Coal stakeholders were notified and operational changes were made in line with the Mt Arthur Noise Trigger Action Response Plan (TARP). The exceedance was reported to the Department of Planning and Environment (hereafter referred to as the Department[1]) and HVEC were issued with a Show Cause. Since this time, it is understood that additional monitoring has been installed and furthermore noise considerations have been included in training packages for site personnel.

The Show Cause process led to the issuance of an official Caution, which alleged a breach of Section 4.2 of the EP&A Act. The allegation stated that there was a failure to comply with Condition 9 Schedule 3 of the MP 09_0062 by not implementing the NMP.

3.1.2 Real-Time Noise Monitoring

HVEC implements a real-time monitoring network to ensure site responsiveness to adverse meteorological conditions. Real-time noise monitoring data guides the day-to-day planning of mining operations, and the implementation of both proactive and reactive noise mitigation measures to manage compliance with the relevant conditions of MP 09_0062.

Consistent with MP 09_0062 and the NMP, HVEC has continued the use of a real-time noise monitoring system to help manage noise appropriately during the review period FY16 to FY22 (BHP, 2016, 2017, 2018, 2019, 2020, 2021 and 2022).

3.1.3 Noise Complaints

Noise-related complaints had the highest number in FY16. However, the monitoring results suggested that no unusual mining operations were undertaken during the complaint period. The review also indicates a significant reduction in the number of complaints from FY17 onward, which were found to remain below 20 per year. In FY22, a total of six noise-related complaints were recorded, which is the same as FY21 with six noise complaints and lower than FY20 with 19 noise complaints (BHP, 2022).

Noise complaints were generally found to come from a limited number of complainants (e.g., all complaints received for FY22 came from one complainant [Roxburgh Road]) (BHP, 2022).

For all complaints, results at the nearest real-time monitors showed that the relevant noise criteria were met, and no exceedance was recorded (BHP, 2022).

Numbers of noise-related complaints from FY16 to FY22 are summarised in **Table 3-1**.

[1] Collectively referred to the Department of Planning and Environment and all its historical titles.

Table 3-1: Number of Noise-Related Complaints from FY16 to FY22

Financial Year (FY)	Number of Noise-Related Complaints
FY16	69
FY17	14
FY18	9
FY19	16
FY20	19
FY21	6
FY22	6

Source: Mt Arthur Coal Annual Review FY16 to FY22 (BHP, 2016, 2017, 2018, 2019, 2020, 2021 and 2022)

3.1.4 Government Fines & Penalties Related to Noise

No government fines or penalties related to noise were issued and no related reportable incidents were recorded during the review period (BHP, 2022).

3.1.5 Review of Noise Management Practices

HVEC periodically reviews noise management practices to identify opportunities to improve and keep implementing best practice noise management, minimise potential noise impacts, and ensure compliance with the noise criteria in MP 09_0062.

3.2 Environmental Blasting Performance

Blast management at the MAC is currently undertaken in accordance with the MAC Blast Management Plan MAC-ENC-MTP-015 (BHP, 2021) (BMP), which outlines:

- MP 09_0062 blast criteria;
- Blast activity design;
- Blast management and control measures;
- Blast monitoring and reporting regimes; and
- Exceedance protocol, emergency response and complaint handling.

Compliance blast monitoring conducted for MAC is undertaken through a web-based blast monitoring system that provides real-time vibration and overpressure data from six permanent blast monitoring sites (shown as locations BP04, BP07, BP08, BP09B, BP10 and BP11 in Appendix 1 of the BMP). Monitoring site BP08 (mine-owned "Edinglassie" homestead) is designated for internal use only to provide indicative measure of blasting impacts for management of nearby historic heritage sites (BHP, 2021).

Summaries of blast compliance monitoring results and blast-related complaints are provided in the Mt Arthur Coal Annual Review reports (BHP, 2016, 2017, 2018, 2019, 2020, 2021 and 2022). Environmental blast performance was reviewed for the last seven years of operation (i.e. FY16 to FY22). Findings from the environmental blasting performance reviews are summarised below.

3.2.1 Blast Compliance

Monthly blast compliance monitoring is undertaken by suitably qualified and experienced personnel at five statutory monitoring sites surrounding MAC (shown as locations BP04, BP07, BP09B, BP10 and BP11 in Appendix 1 of the BMP).

Review of blast compliance monitoring results from September 2016 to November 2022 indicate compliance with the relevant blast criteria with the exception of four blast overpressure exceedances and two blasts not recorded over the seven-year review period (BHP, 2016, 2017, 2018, 2019, 2020, 2021 and 2022).

Blast measurement results indicate that blast activities were compliant with the maximum regulatory limits for ground vibration (10 millimetres per second [mm/s]) (BHP, 2019, 2020 and 2021).

One exceedance occurred with an airblast overpressure level of 120.6 dBL recorded at the Denman Road West monitor (BP09) on 24 December 2018 (FY19 Annual Review) (BHP, 2019). This exceedance was notified to both the Department and the EPA.

On 8 August 2019 there was an exceedance of the 120 dBL overpressure criteria recorded at Sheppard Ave (120.5 dBL). An investigation was undertaken by external blasting experts which determined that there was significant wind interference which caused the elevated level. The exceedance was reported to the EPA and the Department. The Department have undertaken an investigation with no further regulatory action being undertaken.

On the 13 August 2020 HVEC recorded a minor exceedance of the ground vibration Peak Particle Velocity (ppv) limit (50mm/s) for Public Infrastructure. An investigation was undertaken which identified that there was an error made by the expert third party consultant, when assessing the modelled vibration impacts against the public infrastructure criteria. The exceedance was reported to the Department and the infrastructure owner. The Department later investigated the exceedance and issued the MAC with a warning.

Another exceedance resulted in blast ground vibration monitoring result of 13.5 mm/s at Denman Road West monitor (BP09) on 23 July 2021 (BHP, 2022). The exceedance was reported to the Department and EPA. Further investigation was undertaken by independent consultants and a regression analysis determined all monitored blast vibration levels resulted in a calculated maximum ground vibration level of 6 mm/s at the nearest private residence to blast monitor BP09A. As a result of the investigation the Department noted that no exceedance of the 10 mm/s ground vibration criterion occurred at the nearest private residence to BP09 (BHP, 2022). Subsequent to the exceedance recorded at BP09, HVEC relocated this blast vibration monitoring point to its existing location named BP09B.

Overall, blast events did not exceed the five per cent (%) allowable exceedance limits for both ground vibration and airblast overpressure (BHP, 2016, 2017, 2018, 2019, 2021 and 2022).

In accordance with the BMP, potential impacts to public infrastructure were calculated based on ground vibration levels measured at the nearest monitor to the blast location and public infrastructure, by applying distance corrections with reference to the Site Law database.

Review of the Annual Review reports indicates that potential impacts to public infrastructure were calculated for all blast events and found to be compliant with the relevant criteria throughout the review period, except for one blast in Saddlers Pit on 13 August 2020, which exceeded the default criterion for public infrastructure (50 mm/s) at the TransGrid 2 and TransGrid 3 locations. The exceedance event was reported to the Department, and a warning was issued by the Department (BHP, 2021).

3.2.2 Blast Complaints

Numbers of blast-related complaints from FY16 to FY22 are summarised in **Table 3-2**. The complaints may relate to ground vibration, airblast overpressure and/or fume.

Table 3-2: Number of Blast-Related Complaints from FY16 to FY21

Financial Year	No. of Blast-Related Complaints
FY16	13
FY17	16
FY18	3
FY19	17
FY20	7
FY21	9
FY22	9

Source: Mt Arthur Coal Annual Review FY16 to FY22 (BHP, 2016, 2017, 2018, 2019, 2021 and 2022)

With the exception of the blast overpressure exceedance of 120.6 dBL recorded at BP09 on 24 December 2018, which resulted in two complaints, all blast results were within the maximum regulatory limits for ground vibration and airblast overpressure on dates when the blast complaints were received (BHP, 2016, 2017, 2018, 2019, 2020, 2021 and 2022).

3.2.3 Review of Blast Management Practices

HVEC periodically reviews blast management practices to identify opportunities to improve and keep implementing best practice blast management, minimise potential blast impacts, and ensure compliance with the blast criteria in MP 09_0062. This includes updating the Site Law database and improving the predictive model to allow for increased accuracy in determining vibrations and overpressure levels at the design stage.

4 NOISE-SENSITIVE RECEIVERS & SURROUNDING LAND USES

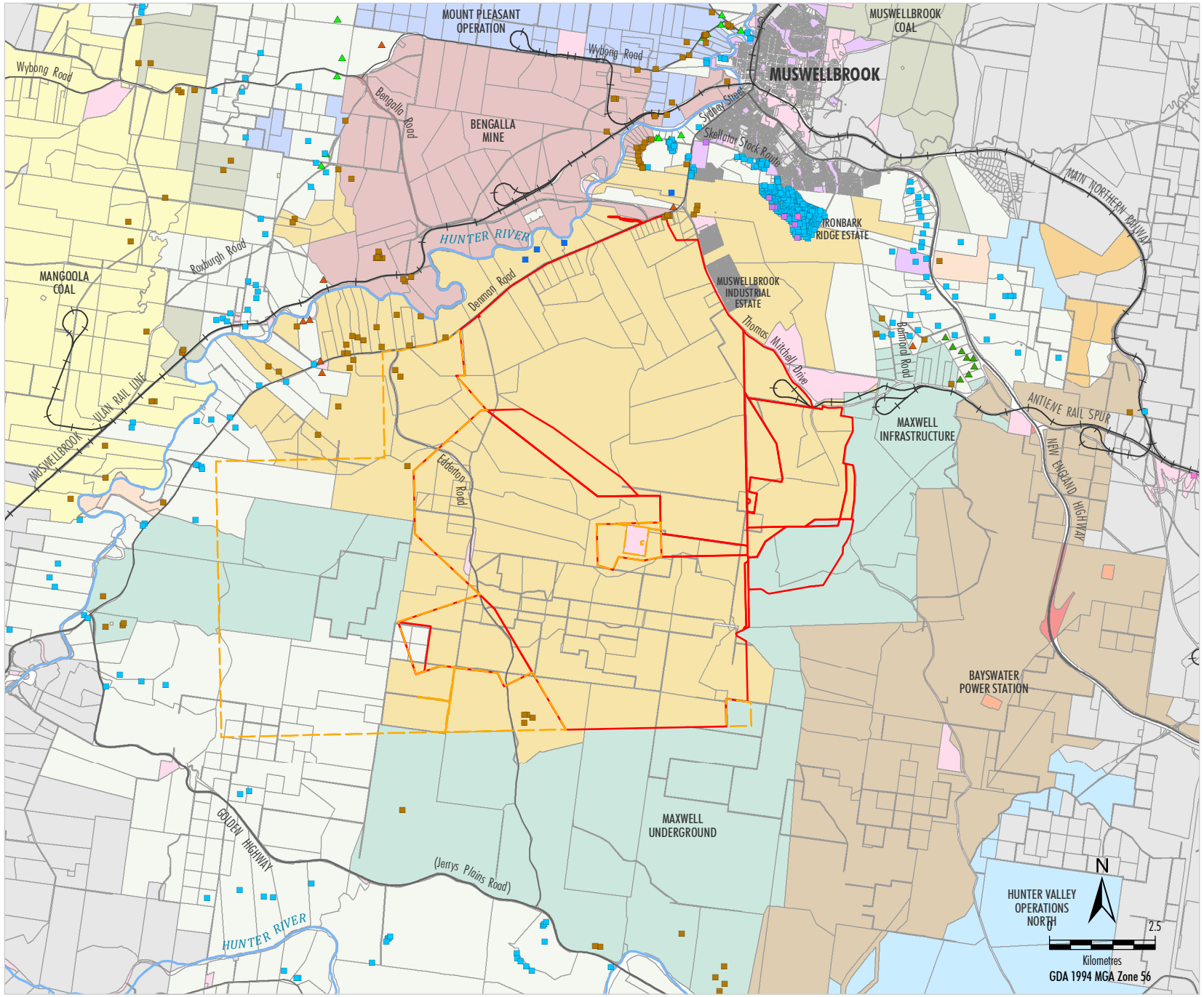
The assessment considers all surrounding noise-sensitive receivers potentially impacted by the MAC.

To determine the receivers of relevance to the assessment, a comprehensive receiver identification and verification study was completed. Given the large number of structures identified, only those structures considered sensitive to potential noise impacts have been explicitly modelled. The key potentially affected receivers closer to MAC were identified and assessed, followed by identification of receivers further away from MAC. For practical reasons, only the western and southern outskirts of the township of Muswellbrook were included. Where potential receivers could not be categorically characterised, they were conservatively assumed to be residences. In total, 500 receivers have been modelled, comprising:

- 301 privately-owned residential receivers;
- 76 privately-owned vacant lots with approved Development Applications (DAs) to construct a dwelling (Ironbark Ridge Estate);
- Six Council-owned vacant lots with approved DAs to construct a dwelling (Ironbark Ridge Estate);
- 115 mine-owned residential receivers; and
- Two commercial receivers (including the Muswellbrook Shire Council).

Buildings such as aged care facilities, schools and churches were not identified as receivers that could be affected by the Modification, as they were considered too remote from MAC to warrant assessment.

Figure 4-1 shows the noise-sensitive receivers surrounding the MAC and highlights the receivers that currently have mitigation or acquisition rights due to proximity to the approved MAC operation. A detailed list identifying all residential receivers considered in the assessment is provided in **Appendix B**.



LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Mt Arthur-controlled
- Maxwell-controlled
- Bengalla-controlled
- AGL-controlled
- Mount Pleasant-controlled
- Mangoola-controlled
- Glencore-controlled
- HVO-controlled
- Industrial Zone
- Muswellbrook Coal-controlled
- Other Mining/Resource Company-controlled
- Crown/The State of NSW
- Muswellbrook Shire Council
- Transport for NSW
- TransGrid
- Privately-owned Land
- Owner not Identified

Dwellings

- Mine-owned Receiver
- The State of NSW (Crown)
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver
- Privately-owned - Mitigation/Acquisition on Request (BHP)
- Privately-owned - Mitigation/Acquisition on Request (MACH)
- Privately-owned - Mitigation/Acquisition on Request (Maxwell)

Source: NSW Spatial Services (2023)

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MT ARTHUR COAL MINE MODIFICATION 2

Land Ownership Overview

Figure 4-1

HVE-19-09 MOD2_NB_212B

5 OPERATIONAL NOISE CRITERIA

Noise related conditions of MP 09_0062 that discuss operational noise criteria, and acquisition and additional noise mitigation rights are included in this section.

5.1 Acquisition Upon Request

Condition 1, Schedule 3, of MP 09_0062 requires HVEC, upon receiving a written request for acquisition from an owner of the land listed in **Table 5-1**, to acquire the land in accordance with the procedures in Conditions 7-8 of Schedule 4 of MP 09_0062.

Table 5-1: Land Subject to Acquisition Upon Request

Acquisition Basis	Receiver ID
Noise	101[1] & 102
Air Quality and Noise	209[2], 210[2], 211[2]
Air Quality	6, 203[2], 204[2], 206[2], 226, 241[2] & 264[3]

Notes:

1. HVEC is only required to acquire this property if acquisition is no longer reasonably achievable under the approval for the Drayton mine.
2. These properties are now owned by HVEC.
3. HVEC is only required to acquire this property if acquisition is not reasonably achievable under a separate approval for the Bengalla mine.

5.2 Additional Noise Mitigation

Condition 7, Schedule 3, of MP 09_0062 requires HVEC, upon receiving a written request from the owner of any residence on the land listed in **Table 5-2**, to implement reasonable and feasible noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner.

Table 5-2: Land Subject to Additional Noise Mitigation Upon Request

Basis	Receiver ID
Noise	94, 100, 204[1], 206[1] & 226

Notes:

1. These properties are now owned by HVEC.

5.3 Noise Impact Assessment Criteria

Condition 2, Schedule 3, of the MP 09_0062 requires HVEC to ensure that the noise generated by MAC does not exceed the criteria in **Table 5-3** at any residence on privately-owned land, except where such exceedances were predicted in the Mt Arthur Coal Open Cut Modification Environmental Assessment (EA) (MOD 1) (HVEC, 2013).

The criteria specified in **Table 5-3** do not apply to the noise-affected land subject to acquisition upon request conditions or if HVEC has a written agreement with the relevant landowner to exceed the criteria, and HVEC has advised the Department in writing of the terms of this agreement.

Residential receivers have been grouped into eight residential zones (Zones A-H) for noise assessment purposes. The zones referred to in **Table 5-3** are shown in **Figure 5-1 a** to **Figure 5-1 c.**

Table 5-3: Noise Impact Assessment Criteria

Location	Day[1] ($L_{Aeq,15min}$)	Evening[1] ($L_{Aeq,15min}$)	Night[1] ($L_{Aeq,15min}$)	Night[1] ($L_{A1,1min}$)
A – Antiene Estate	37	40	38	45
B – Skellatar Stock Route, Thomas Mitchell Drive, Denman Road East	39	38	37	45
C – Racecourse Road	41	40	39	45
D – Denman Road North-west, Roxburgh Vineyard (north-east), Roxburgh Road (north-east)	37	36	35	45
E – South Muswellbrook	39	39	39	45
F – Denman Road West, Roxburgh Vineyard (west), Mangoola Road	37	36	35	45
G – East Antiene, New England Highway	41	40	39	45
H – South of Mine	35	35	35	45

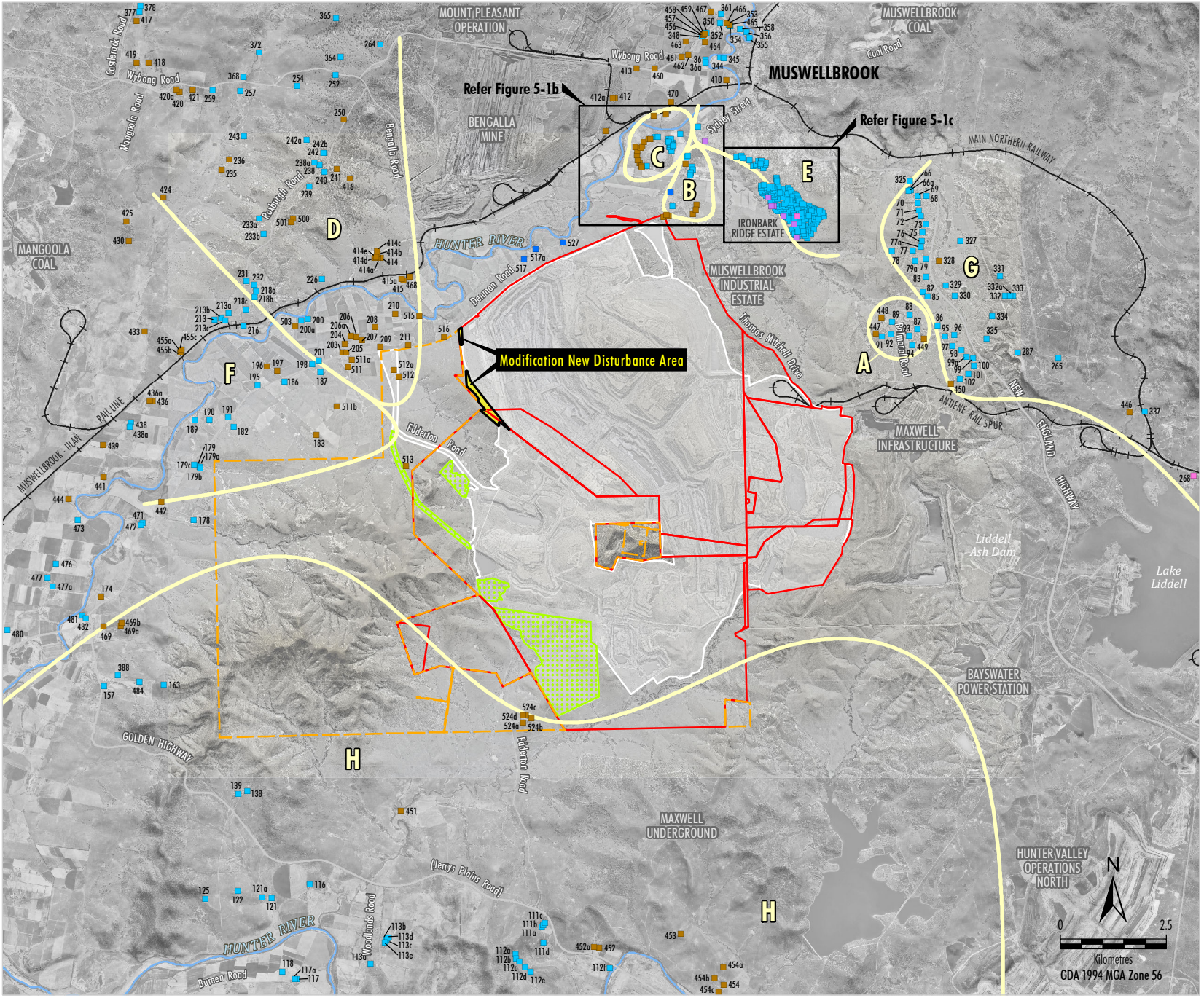
Note:

1. Day: 7:00 am - 6:00 pm; Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.

As the Modification is a four-year extension of the MAC, the existing noise impacts criteria in Schedule 3, condition 2 of the MP 09_0062 were used to assess the potential impacts of the Modification. This also allows for consistency of assessment with the previous Modification 1 and Consolidation Project.

A number of the identified receivers have not been included in the previous noise assessments and are not clearly located within any of the above residential zones (i.e. have been constructed subsequent to previous assessments or are included in the current assessment to be conservative). For those new receivers, noise impact assessment criteria had to be established. **Table 5-4** identifies the new receivers and summarises the noise impact assessment criteria assigned to them.

With regard to $L_{A1,1min}$ noise criteria, the same criterion of 45 dBA currently used for all receivers was assigned to all the newly identified receivers.



LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Approximate Extent of Existing/Approved Surface Development
- Modification New Disturbance Area
- Impact Minimisation Area
- Receiver Zone

Dwellings

- Mine-owned Receiver
- The State of NSW (Crown)
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver

Source: BHP (2023); NSW Spatial Services (2023)
Orthophoto Mosaic: BHP (2022-2020)

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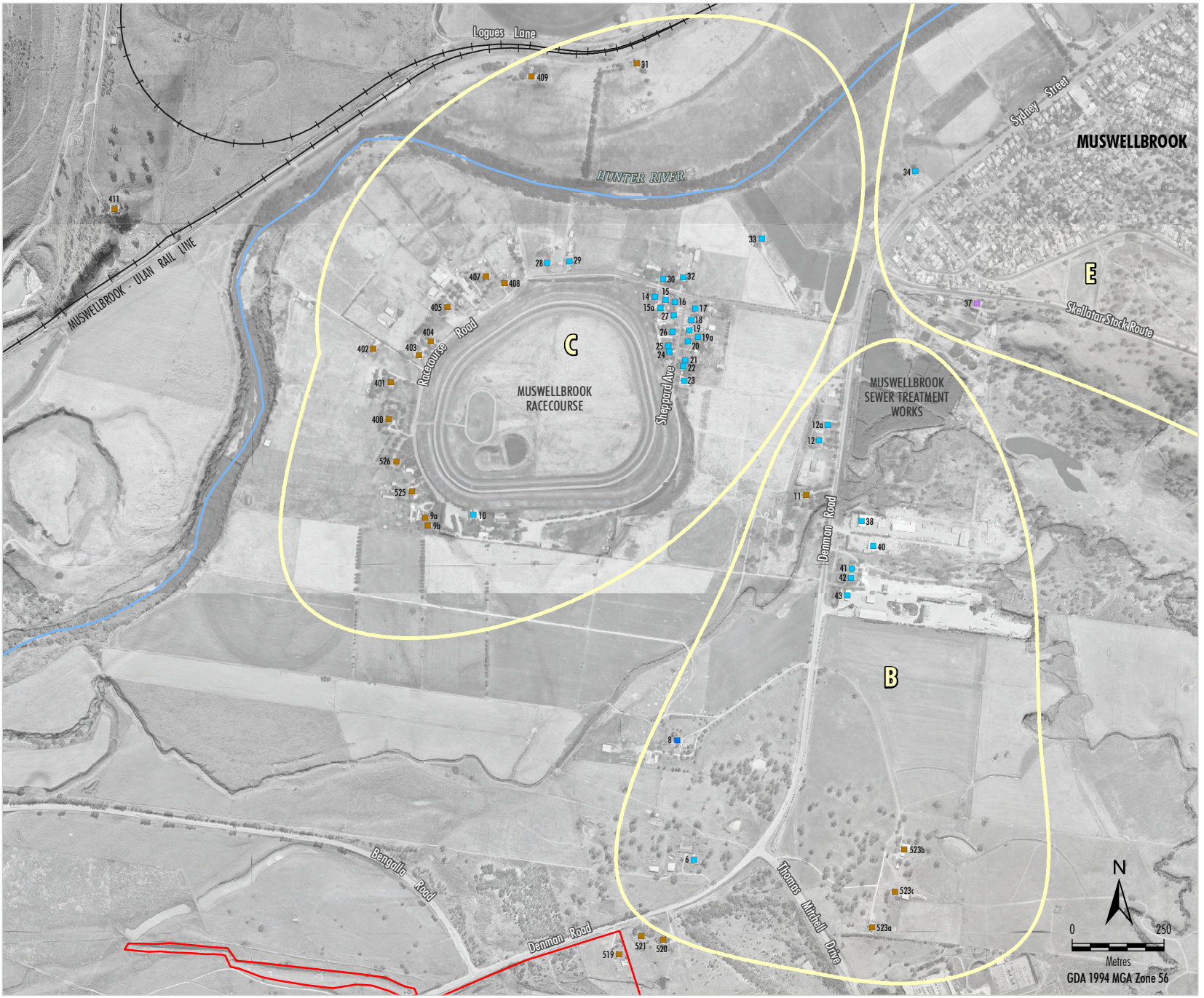
MT ARTHUR COAL MINE MODIFICATION 2

Receiver Zones Overview

Figure 5-1a

HVE-19-09 MOD2_NB_205C



LEGEND

Mining and Coal Lease Boundary (ML, MPL, CL, CCL)

Receiver Zone

Dwellings

- Mine-owned Receiver
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver

Refer Figure 5-1a for Overview.

Source: BHP (2023); NSW Spatial Services (2023)
Orthophoto Mosaic: BHP (2022-2020)

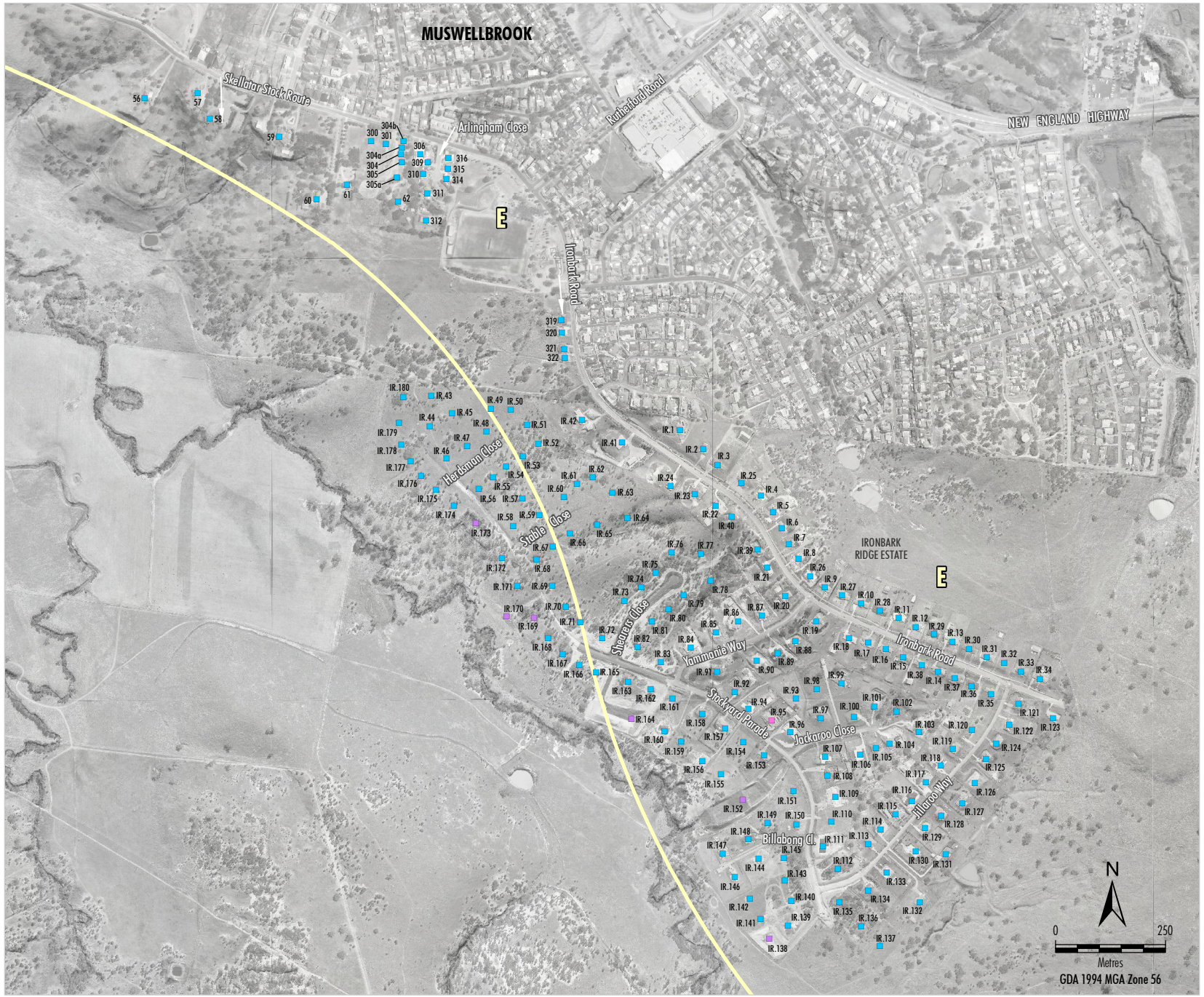
BHP

MT ARTHUR COAL MINE MODIFICATION 2

Receiver Zones B and C Inset

Figure 5-1b

HVE-19-09 MOD2_NB_206A



LEGEND

Receiver Zone

Dwellings

- The State of NSW (Crown)
- Muswellbrook Shire Council
- Privately-owned Receiver

Refer Figure 5-1a for Overview.

Source: BHP (2023); NSW Spatial Services (2023)
Orthophoto Mosaic: BHP (2022-2020)

BHP

MT ARTHUR COAL MINE MODIFICATION 2

Receiver Zone E Inset

Figure 5-1c

HVE-19-09 MOD2_NB_204A

Table 5-4: Noise Impact Assessment Criteria for New Receivers

Location[1]	Receiver ID	Rationale[2]	New Noise Impact Assessment Criteria			
			Day[3] (LAeq,15 min)	Evening[3] (LAeq,15 min)	Night[3] (LAeq,15 min)	Night[3] (LA1,1min)
Western receivers between Zones F and H	157, 163, 178, 388, 471, 472, 473, 476, 477, 477a, 480, 481, 482, 484, 485, 485a	Western receivers between Zones F and H were conservatively allocated to Zone H, which has the most stringent criteria.	35	35	35	45
North-eastern Receivers outside of Zone E	IR.43, IR.44, IR.45, IR.46, IR.47, IR.48, IR.49, IR.54, IR.55, IR.56, IR.57, IR.58, IR.59, IR.67, IR.68, IR.69, IR.70, IR.71, IR.166, IR.167, IR.168, IR.169, IR.170, IR.171, IR.172, IR.173, IR.174, IR.175, IR.176, IR.177, IR.178, IR.179, IR.180	As receivers are contiguous with the Ironbark Ridge area, $L_{Aeq,15min}$ operational noise criteria was conservatively assumed to be consistent with the rest of South Muswellbrook (i.e. Zone E).	39	39	39	45
Receiver north-east of Zone D	264	Receiver 264 located just outside Zone D was allocated to Zone D.	37	36	35	45
Receivers east of Zone G	265, 268, 331, 332, 332a, 333, 337	In consideration of the setback distances separating these receivers to the New England Highway, they were conservatively assumed to be outside Zone G and assigned the same noise criteria as Zone H.	35	35	35	45

Location[1]	Receiver ID	Rationale[2]	New Noise Impact Assessment Criteria			
			Day[3] (LAeq,15 min)	Evening[3] (LAeq,15 min)	Night[3] (LAeq,15 min)	Night[3] (LA1,1min)
Receivers west of Muswellbrook	36, 36a, 344, 345, 348, 350, 352, 353, 354, 355, 356, 358, 361	As receivers west of Muswellbrook were not allocated to any residential zone, $L_{Aeq,15min}$ operational noise criteria was conservatively assumed to be consistent with the rest of Muswellbrook (i.e. Zone E).	39	39	39	45

Notes:

1. Based on figure included in Appendix 5 of MP 09_0062 and/or Figure 21 of Mt Arthur Coal Consolidation Project Environmental Impact Statement (EIS) (Hansen Bailey, 2009).
2. Rationale relevant to $L_{Aeq,15min}$ noise criteria only. Newly identified receivers were assigned the same $L_{A1,1min}$ noise criterion as all residential zones.
3. Day: 7:00 am – 6:00 pm; Evening: 6:00 pm – 10:00 pm; Night: 10:00 pm – 7:00 am.
4. See Glossary of Acoustic Terms.

5.4 Cumulative Noise Criteria

Under the NPfI, HVEC is required to consider cumulative operational noise generated by the Modification and other nearby industrial sources.

5.4.1 Amenity Noise Criteria

The NPfI specifies amenity noise criteria which aims to maintain noise amenity over the whole day, evening or night-time period where a receiver is subjected to cumulative noise from a number of industrial sources.

The amenity noise criteria are relevant in the context of controlling cumulative noise impacts resulting from the concurrent operation of the MAC and the other potential sources of industrial noise (e.g., the Bengalla Mine and Mount Pleasant Operation located north of the Project [Figure 1-1]). The amenity noise criteria set the upper limits to control the total $L_{Aeq,Period}$ noise levels at a given receiver from all industrial sources over the day, evening and night-time periods. In this case, the surrounding rural receivers are situated in an area which would be classified as "Rural" under the NPfI. The relevant recommended $L_{Aeq,Period}$ amenity noise criteria for the rural noise amenity area are presented in **Table 5-5**. These amenity noise criteria are considered conservative for receivers located within the township of Muswellbrook, as this area could be classified as "Urban" under the NPfI based on the *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP) zoning. However, as the Ironbark Ridge development is classified as R5 (Large Lot Residential) under the Muswellbrook LEP, Table 2.3 of the NPfI specifies that this area should be considered as rural.

The NPfI also stipulates that noise criteria should be expressed as $L_{Aeq,15min}$ values and provides the following method to convert $L_{Aeq,Period}$ levels into $L_{Aeq,15min}$ levels:

$$L_{Aeq,15min} = L_{Aeq,Period} + 3\ dB$$

In view of the above, $L_{Aeq,15min}$ amenity noise criteria have also been presented in **Table 5-5**.

Table 5-5: Cumulative Noise Criteria

Receiver	Noise Amenity Area	Time of day	$L_{Aeq,period}$, dB(A)	$L_{Aeq,15min}$ (dBA)
Residential	Rural	Day	50	53
		Evening	45	48
		Night	40	43

Notes:

1. Day = 7.00 am to 6.00 pm (Monday to Saturday), and 8.00 am to 6.00 pm (Sundays and public holidays).
2. Evening = 6.00 pm to 10.00 pm.
3. Night = the remaining periods.

5.4.2 Project Amenity Noise Criteria

The recommended amenity noise levels in **Section 5.4.1** represent the objective for total industrial noise at a receiver location, whereas the project amenity noise level presented in this sub section represents the objective for noise from a single industrial development at a receiver location. In accordance with the NPfI, amenity noise criteria are applicable to the Modification in order to ensure total industrial noise levels remain within the recommended amenity levels as follows:

$$\text{Project amenity noise criteria} = \text{Amenity noise criteria} - 5\ dB$$

Table 5-6 summarises the relevant Project amenity noise criteria.

Table 5-6: Relevant Project Amenity Noise Criteria

Receiver	Noise Amenity Area	Assessment Period	$L_{Aeq,Period}$ (dBA)	$L_{Aeq,15min}$ (dBA)
Residential	Rural	Day	45	48
		Evening	40	43
		Night	35	38

Notes:

1. Day = 7.00 am to 6.00 pm (Monday to Saturday), and 8.00 am to 6.00 pm (Sundays and public holidays).
2. Evening = 6.00 pm to 10.00 pm.
3. Night = the remaining periods.

5.5 Modifying Factor Adjustments

5.5.1 Low-Frequency Noise

A LFN assessment was conducted to ascertain whether any of the identified receivers may be subject to a modifying factor correction due to dominant low-frequency content. Where a noise source contains certain annoying characteristics, such as LFN, the NPfI states that a penalty should be applied to predicted noise levels before comparing to the relevant noise impact assessment criteria.

The NPfI provides a method of LFN assessment based on:

- overall C-weighted and A-weighted predicted or measured levels; and
- one-third octave predicted or measured levels in the range 10–160 Hertz (Hz).

Two penalties are nominated in the NPfI:

2 dB (evening and night)	if the C- minus A-weighted noise level over the same period is 15 dB or more, and where any of the third octave noise levels in Table C2 of the NPfI (**Table 5-7**) are exceeded by up to and including 5 dB and cannot be mitigated
2 dB (daytime) and 5 dB (evening and night)	if the C- minus A-weighted noise level over the same period is 15 dB or more, and where any of the third octave noise levels in Table C2 of the NPfI are exceeded by more than 5 dB and cannot be mitigated

Table C2 of the NPfI is reproduced below:

Table 5-7: One-third octave low-frequency noise thresholds (Table C2; NSW EPA, 2017)

Hz/dB(Z)	***One-third octave $L_{Zeq,15min}$ threshold level***												
Frequency (Hz)	*10*	*12.5*	*16*	*20*	*25*	*31.5*	*40*	*50*	*63*	*80*	*100*	*125*	*160*
dB(Z)	*92*	*89*	*86*	*77*	*69*	*61*	*54*	*50*	*50*	*48*	*48*	*46*	*44*

Note:

- *dB(Z) = decibel (Z frequency weighted).*

A LFN review for the Modification is provided in **Section 6.6**. The review concludes no modifying factor correction for LFN is warranted for the Modification.

5.5.2 Tonal & Intermittent Noise

The potential for the Modification to generate tonal and intermittent noise was considered in the noise assessment but deemed irrelevant for the following reasons:

- large-scale mining projects are not expected to generate tonal or intermittent noise due to the large number of noise sources on site and the considerably large distances separating noise sources and receivers;
- noise sources at coal mines are generally atonal in nature; and
- compliance noise measurements conducted for MAC have not indicated any tonality or intermittency issues.

6 OPERATIONAL NOISE ASSESSMENT

6.1 Noise Modelling Methodology

Operational noise levels at nearby receivers have been calculated using the Environmental Noise Model (ENM) (a proprietary computer program from RTA Technology Pty Ltd). This modelling software is compatible with the NPfI and has been previously accepted by the EPA and the Department for use in environmental noise assessments including at MAC. The assessment models the total operational noise from MAC incorporating the Modification at each receiver. Total operational noise levels are then compared with the noise impact assessment criteria summarised in **Table 5-3** and **Table 5-4**.

6.1.1 Noise Assessment Scenario

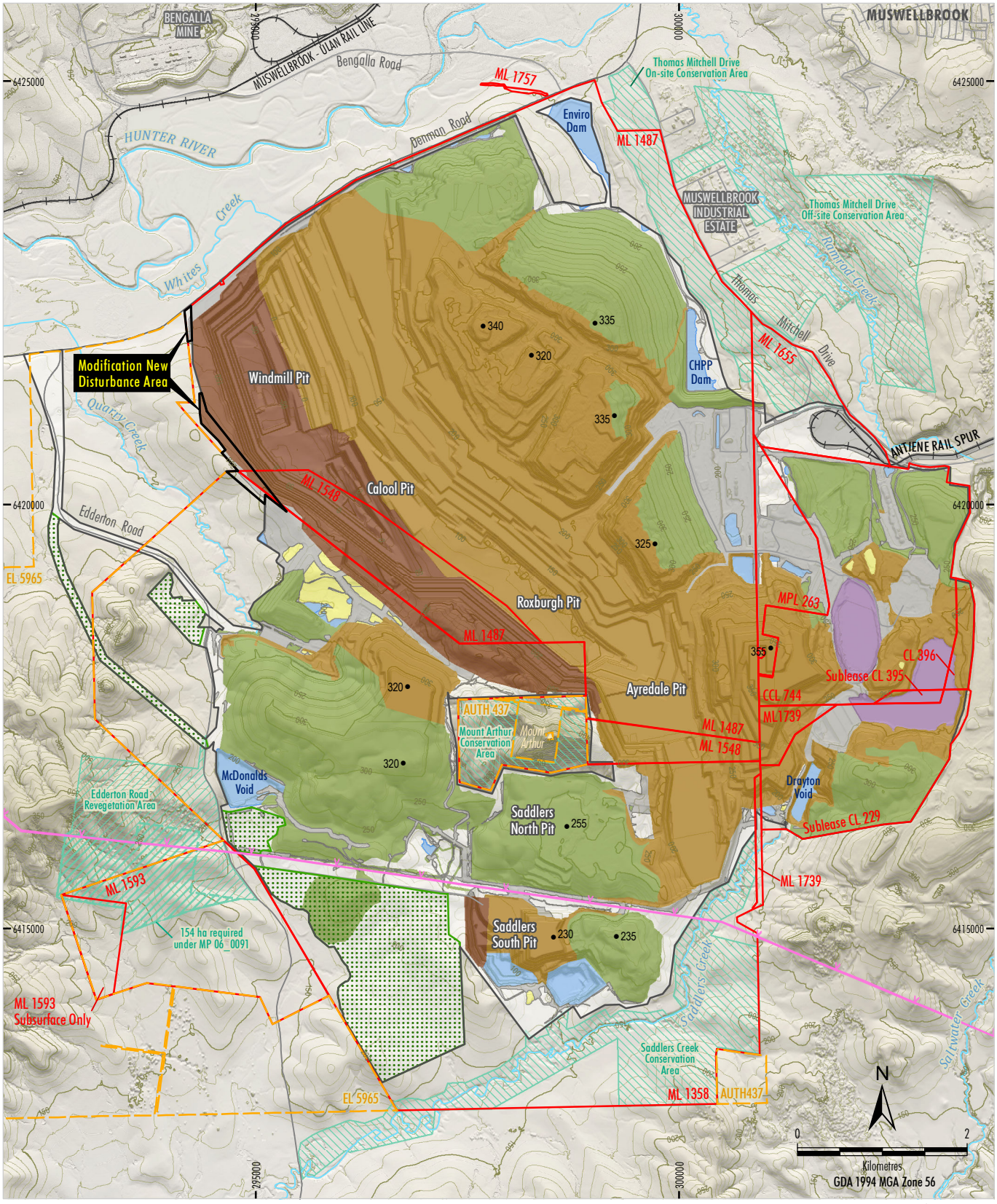
The assessment considers one indicative mine plan year (scenario) to represent the Modification. The FY30 scenario was chosen to represent potential worst-case impacts with consideration of:

- the location of the activity and the potential to generate noise at the sensitive receptor locations, operations are at their westernmost extent; and
- production from FY29 was used as it is the last full production year (maximum coal extraction, handling and processing rate of 25 Mtpa) scheduled before operations ease down to closure on 30 June 2030.

Accordingly, the scenario selected is a conservative combination of operations occurring at their westernmost extent at (or very near) the maximum proposed production rate prior to closure. Open cut mining operations would consist of a drill and blast, truck and shovel operation to remove overburden material and extract the coal resources. For the FY30 scenario, mining activity would occur in the Windmill, Calool and Roxburgh pits at a ROM coal mining rate of 24.9 Mtpa. Overburden emplacement would typically occur behind the progression of the mine extraction with rehabilitation of emplacement areas progressing as they are completed. An indicative mine plan for the FY30 scenario is presented in **Figure 6-1.**

It should be noted that, MP 09_0062 contains the approval for the handling of an additional 4 Mtpa of ROM coal from the underground operations which would be processed through the same CHPP as the 24.9 Mtpa of ROM extracted from the open cut operations. Although the underground mine is not currently producing coal it has conservatively been considered in this assessment. The additional 4 Mtpa of ROM coal from the underground operation is not anticipated to change the predicted noise levels and outcome of the assessment for the following reasons:

- the operational noise assessment is based on the typical worst-case 15-minute period where all CHPP infrastructure items are assumed to be operating at typical full capacity;
- the assessment of amenity and cumulative noise levels conservatively assume continuous operation of all CHPP infrastructure items at typical full capacity; and
- the additional 4 Mtpa of ROM coal from the underground operations would not result in increases in the noise emissions considered for the operational noise assessment (typical full capacity) but in longer durations of those emissions.



HVE-19-09 MOD2_N0_230C

Source: BHP (2023); NSW Spatial Services (2023)

LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Existing Conservation/Offset Area
- Edderton Road Revegetation Area
- Existing 500kV Electricity Transmission Line
- Approximate Extent of Existing/Approved Surface Development
- Modification New Disturbance Area
- Impact Minimisation Area
- Active Mining Area
- Overburden Emplacement Area
- Tailings Storage Facility
- Infrastructure Area
- Topsoil Stockpile
- Rehabilitation Area
- Water Management Area
- 320 Approximate Elevation (m AHD)

BHP

MT ARTHUR COAL MINE MODIFICATION 2

Conceptual General Arrangement
Year 2030

Figure 6-1

6.1.2 Meteorological Environment for Noise Assessment Purposes

Fact Sheet D of the NPfI defines standard and noise-enhancing meteorological conditions to be considered for the assessment. The definition of those conditions is provided in Table D1 of Fact Sheet D, which is reproduced in **Table 6-1.**

Table 6-1: Standard and noise-enhancing meteorological conditions (Table D1; NSW EPA, 2017)

Meteorological conditions	*Meteorological parameters*
Standard meteorological conditions	*Day/evening/night: stability categories A-D with wind speed up to 0.5 m/s at 10 m AGL.*
Noise-enhancing meteorological conditions	*Daytime/evening: stability categories A-D with light winds (up to 3 m/s at 10 m AGL).* *Night-time: stability categories A-D with light winds (up to 3 m/s at 10 m AGL) and/or stability category F with winds up to 2 m/s at 10 m AGL.*

Notes: *m/s = metres per second; m = metres; AGL = above ground level; where a range of conditions is nominated, the meteorological condition delivering the highest predicted noise level should be adopted for assessment purposes. However, feasible and reasonable noise limits in consents and licences derived from this process would apply under the full range of meteorological conditions nominated under standard or noise-enhancing conditions as relevant. All wind speeds are referenced to 10m AGL. Stability categories are based on the Pasquill-Gifford stability classification scheme.*

Fact Sheet D provides two options when considering meteorological effects:

1. Conservatively adopt noise-enhancing meteorological conditions without processing meteorological data local to the site; or
2. Determine the significance of noise-enhancing meteorological conditions based on local meteorological data and adopt significant noise-enhancing conditions for the assessment. Where noise-enhancing meteorological conditions are deemed non-significant, standard meteorological conditions may be adopted.

The second approach was adopted for the noise assessment as it would provide a more representative estimate of potential noise impacts.

The analysis of noise-enhancing meteorological conditions is based on data obtained from the on-site weather station (WS09, near the site infrastructure area) for the five-year period January 2016 to December 2020 . The dataset includes wind speed, wind direction and observations of sigma-theta used to determine Pasquill-Gifford stability categories.

In accordance with the NPfI, analysis of local meteorology was conducted for each season separately. Any season where less than two months' worth of data was available was excluded from the analysis.

Analysis of the data in accordance with Fact Sheet D of the NPfI determined that no light winds are significant during the day, evening or night-time assessment periods in the area surrounding MAC.

The analysis also determined that the percentage of occurrence of moderate-to-strong temperature inversions in winter months was 20.5%. Although this percentage is below the threshold of occurrence of 30% to qualify as a significant noise-enhancing condition, given the location of the MAC in the Hunter Valley, which is known for inversion conditions, moderate-to-strong inversions have conservatively been assumed for the night-time period.

Fact Sheet D of the NPfI states that where moderate-to-strong inversions (Stability Categories F and G) are relevant for an assessment, winds up to 2 metres per second (m/s) during such inversions should be considered. However, no guidance is provided to determine an applicable wind speed for a site if winds of that magnitude are infrequent in combination with moderate-to-strong inversions.

The meteorological data suggests light winds up to 2 m/s occur less than 5% of the time in any single direction during moderate-to-strong inversions at night in winter. If a 2 m/s wind in combination with a moderate-to-strong inversion were to be adopted, it would significantly overstate the potential noise impacts of the Modification. The default wind speed applicable under standard conditions (0.5 m/s) has therefore conservatively been applied in all applicable directions (i.e., as a source-to-receiver wind directions).

The above approach results in the use of a temperature inversion of 4 degrees Celsius per 100 m (°C/100 m) combined with 0.5 m/s source-to-receiver winds. This is deemed representative of the range of potential local conditions when inversions occur and slightly conservative when compared with the single representative noise-enhancing meteorological condition of 4°C/100 m with no wind used for the Consolidation Project and MOD 1 Noise and Blasting Impact Assessments (Wilkinson Murray, 2009 & 2013). It is important to note that this single representative weather condition (4°C/100 m) was verified as most representative of winter nights according to a calibration exercise conducted for the South Pit Extension EA (Wilkinson Murray, 2013).

The standard and noise-enhancing meteorological conditions relevant to the Modification are summarised in **Table 6-2**.

Table 6-2: NPfI Meteorological Conditions Relevant to the Assessment

Assessment Period[1]	Meteorological Condition	Description of Meteorological Parameters
Daytime	Standard meteorological conditions	0.5 m/s wind in source-to-receiver direction[2]; stability categories A-D
Evening	Standard meteorological conditions	0.5 m/s wind in source-to-receiver direction[2]; stability categories A-D
Night	Standard meteorological conditions	0.5 m/s wind in source-to-receiver direction[2]; stability categories A-D
	Noise-enhancing meteorological conditions	0.5 m/s wind in source-to-receiver direction[2]; stability category F[3]

Notes:

1. Day: 7:00 am - 6:00 pm; Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.
2. Wind in source-to-receiver direction was considered using the closest direction in a 16-direction compass to the source-to-receiver direction.
3. Stability Category F was modelled using a temperature inversion of 4°C/100 m in accordance with the NPfI.

6.2 Investigation of Feasible & Reasonable Noise Mitigation Measures

HVEC applies a comprehensive suite of noise mitigation and noise management measures on-site which are described in the NMP. These include (BHP, 2023):

- Contemporary technology fixed plant, including acoustic design such as extensive cladding of bins, crushers, conveyors and the washery.
- Noise suppression, currently fitted on all major mobile equipment where reasonable and feasible.
- Mobile equipment is operated in less exposed areas during the evening and night.
- Implementation of additional pro-active and reactive mitigation measures based on the predictive modelling system and real-time monitoring and in accordance with MAC's TARP.

Table 6-3 provides a summary of the mitigation measures proposed for the Modification in order to reduce potential noise emissions.

Table 6-3: Mitigation Measures for Modification

Mitigation Measures for Modification
Continued use of noise suppressed mobile equipment.
Continued use of acoustically designed fixed plant at the CHPP.
Continued use of noise bunds to control noise in transmission.
Continued use of the real-time monitoring and forecasting system, incorporating noise and meteorological monitoring, with the purpose of anticipating upcoming periods of noise-enhancing meteorological conditions that may generate noise exceedances at receivers surrounding the mine. MAC's TARP allows the mine operator to prepare to modify operations to reduce noise levels as far as reasonably and feasibly practical in the event that predicted adverse meteorological conditions are experienced (BHP, 2023). Details regarding the TARP are provided in BHP (2023).

6.3 Trigger Action Response Plan

HVEC has a real-time monitoring and forecasting system in place to assist with managing noise levels during upcoming periods of noise-enhancing meteorological conditions. If noise levels exceed the noise alert thresholds outlined in Table 3 of the NMP, alert triggers are automatically generated. Following the generation of an alert trigger the MAC Open Cut Examiners are notified to activate the TARP.

The TARP described in the NMP is a reactive noise mitigation tool whereby a dashboard presents a visual map with real-time updates of logged L_{Aeq} and/or L_{A90} levels at unattended directional loggers situated around the mine (BHP, 2023). When activated, the TARP facilitates the reasonable modification of mining activity to mitigate intrusive noise emissions from MAC mining activities in order to avoid exceedances of the criteria in **Table 5-3** and comply with the relevant statutory requirements.

This system would continue to be used to assist with the management of noise for the additional four years proposed as part of the Modification. Noise-enhancing meteorological conditions would be identified by a combination of noise and meteorological monitoring and meteorological forecasting, where noise monitoring indicates the trend in actual noise levels at a location and meteorological monitoring and forecasting indicates the likelihood that the current trend would continue or intensify over the ensuing period.

If and when the real-time monitoring and meteorological forecasting system predicts elevated noise levels at receivers, mine operators would implement the TARP and adjust operations to minimise noise impacts during predicted adverse meteorological conditions.

6.3.1 Example of Pro-Active Mitigation Scenario Implemented in Accordance with the TARP

Following initial modelling undertaken for the Modification, the risk of minor exceedances of the noise criteria during adverse meteorological conditions in **Table 5-3** was noted at privately owned receivers to the north-west of the MAC. For these receivers, proactive controls were investigated. A typical example of a pro-active mitigation scenario to address potential exceedances at the closest privately-owned residential receivers north-west of the site during noise-enhancing meteorological conditions is provided in **Table 6-4**.

Table 6-4: Typical Example Pro-Active Mitigation Scenario – North-West Receivers

Applicable Modelling Scenario	Example of Pro-Active Mitigation Scenario	Approximate Total Site Noise Reduction
Evening/Night	Shutdown two overburden extraction fleets (e.g., excavator, dozer, and associated haul trucks) and some ancillary equipment (e.g., some drills and support dozers)	0.5 - 1 dB

6.3.2 Meteorological Conditions Requiring Pro-Active Mitigation Scenarios

A summary of the meteorological conditions expected to necessitate pro-active mitigation measures for the north-west receivers is presented below. It is important to note these meteorological conditions are representative of the year with the highest predicted noise impacts (FY30) and wind directions relevant to the closest noise-sensitive receivers requiring the most intensive mitigation measures.

Very noise-enhancing meteorological conditions represent conditions outside the range of either standard or noise-enhancing conditions deemed significant to the study in accordance with the NPfI (**Table 6-2**), and may include conditions during which operational noise criteria do not apply (e.g., stability category G). Notwithstanding, consistent with the NMP, if the very noise-enhancing meteorological conditions were to elevate noise levels above the noise alert thresholds outlined in Table 3 of the NMP, HVEC would implement the pro-active mitigation measures included in the TARP. In effect, this would minimise noise impacts on the surrounding community, and as such infrequent "non-licensable" meteorological conditions (i.e. those conditions outside of the nominated meteorological conditions in the conditions of approval/license) are also included below:

Very noise-enhancing meteorological conditions (evening):

North-east wind direction:

- 1.5-3 m/s wind; stability category F or G
- 3 m/s wind; stability category E

East wind direction:

- 1-3 m/s wind; stability category F or G
- 2-3 m/s wind; stability category E
- 3 m/s wind; stability category D

South-east wind direction:

- 1-3 m/s wind; stability category F or G
- 2-3 m/s wind; stability category E
- 3 m/s wind; stability category D

South wind direction:

- 1.5-3 m/s wind; stability category F or G
- 2.5-3 m/s wind; stability category E

Adverse and very noise-enhancing meteorological conditions (night):

North-east wind direction:

- 0.5-2.5 m/s wind; stability category F or G
- 2.5-3 m/s wind; stability category E

East wind direction:

- 0.5-3 m/s wind; stability category F or G
- 1.5-3 m/s wind; stability category E
- 2.5-3 m/s wind; stability category D

South-east wind direction:

- 0.5-3 m/s wind; stability category F or G
- 1.5-3 m/s wind; stability category E
- 2.5-3 m/s wind; stability category D
- 3 m/s wind; stability categories A-C

South wind direction:

- 0.5-3 m/s wind; stability category F or G
- 2-3 m/s wind; stability category E
- 3 m/s wind; stability category D

6.3.3 Frequency of Occurrences

To determine whether modifications to the planned operations of this scale are feasible with regard to achieving the overall production schedule, the frequency at which the pro-active mitigation measures are potentially required has been considered.

Based on statistical occurrences of local meteorological conditions obtained from WS09 for the five-year period January 2016 to December 2020 and noise predictions under local meteorological conditions, an analysis was conducted to determine the frequency of occurrences of weather conditions resulting in noise exceedances and requiring pro-active mitigation measures. **Table 6-5** summarises indicative seasonal frequencies of occurrences of meteorological conditions requiring pro-active mitigation measures for the north-west receivers during the evening and night-time periods. These frequencies of occurrences consider all wind directions potentially impacting on the north-west receivers (i.e., north-easterly, easterly, south-easterly, and southerly winds).

The percentages presented in **Table 6-5** represent the directions relevant to the closest noise-sensitive receivers.

Table 6-5: Indicative Frequencies of Occurrences of Meteorological Conditions Requiring Pro-Active Mitigation Measures – North-West Receivers

Season	Evening	Night
Winter	14.6%	13.1%
Summer	13.0%	29.6%
Spring	12.6%	23.7%
Autumn	20.3%	28.7%

Note:

1. Evening: 6:00 pm – 10:00 pm; Night: 10:00 pm – 7:00 am.

HVEC has advised that the estimated frequency of pro-active operational noise mitigation measures can be accommodated by the Modification schedule.

Therefore, the assessed noise levels in **Section 6.7** assumes the implementation of the existing pro-active mitigation measures in **Table 6-4**. However, in implementing the TARP, these measures are examples only and HVEC may invoke other measures to achieve the criteria in **Table 5-3** (as is currently the case for the approved operation).

The real-time monitoring and forecasting system used for the Modification would be based on the current system already in place and successfully implemented for the approved MAC.

A summary of the local meteorological conditions requiring pro-active mitigation measures is provided in **Table 6-6** below. Under the meteorological conditions described in **Table 6-2** and following an Alert Level 2-Site Specific Trigger (BHP, 2023), HVEC would first confirm that the alert was due to mining noise, then evaluate reasonable and feasible mitigation measures. Following these steps, BHP would implement proactive mitigation in accordance with the TARP. This would involve the modification of dozer, dumping and hauling operations.

In the event of an exceedance determined by a third party consultant, MAC would refer to the Alert Level 3 action response plan which may require temporary shutdowns, for example shutdowns of specific dozer, dumping and haulage operations.

Table 6-6: Meteorological Conditions Requiring Pro-Active Mitigation Scenarios – North-West Receivers

Assessment Period[1]	Meteorological Condition	Description of Meteorological Parameters	Indicative Seasonal Frequency of Occurrence of Adverse/Very Noise Enhancing Meteorological Conditions (%)
Evening	Very noise-enhancing meteorological conditions	North-east wind direction: • 1.5-3 m/s wind; stability category F or G • 3 m/s wind; stability category E East wind direction: • 1-3 m/s wind; stability category F or G • 2-3 m/s wind; stability category E • 3 m/s wind; stability category D South-east wind direction: • 1-3 m/s wind; stability category F or G • 2-3 m/s wind; stability category E • 3 m/s wind; stability category D South wind direction: • 1.5-3 m/s wind; stability category F or G • 2.5-3 m/s wind; stability category E	**Winter** 14.6% **Summer** 13.0% **Spring** 12.6% **Autumn** 20.3%
Night	Noise-enhancing meteorological conditions	North-east wind direction: • 0.5-2 m/s wind; stability category F East wind direction: • 0.5-2 m/s wind; stability category F South-east wind direction: • 0.5-2 m/s wind; stability category F South wind direction: • 0.5-2 m/s wind; stability category	**Winter** 6.8% **Summer** 8.7% **Spring** 10.0% **Autumn** 10.9%

Assessment Period[1]	Meteorological Condition	Description of Meteorological Parameters	Indicative Seasonal Frequency of Occurrence of Adverse/Very Noise Enhancing Meteorological Conditions (%)
	Very noise-enhancing meteorological conditions	North-east wind direction: • Stability category G • 2.5 m/s wind; stability category F • 2.5-3 m/s wind; stability category E East wind direction: • Stability category G • 2.5-3 m/s wind; stability category F • 1.5-3 m/s wind; stability category E • 2.5-3 m/s wind; stability category D South-east wind direction: • Stability category G • 2.5-3 m/s wind; stability category F • 1.5-3 m/s wind; stability category E • 2.5-3 m/s wind; stability category D • 3 m/s wind; stability categories A-C South wind direction: • Stability category G • 2.5-3 m/s wind; stability category F • 2-3 m/s wind; stability category E • 3 m/s wind; stability category D	**Winter** 6.3% **Summer** 20.9% **Spring** 13.7% **Autumn** 17.8%

Note:

1. Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.

6.4 Indicative Equipment List

Table 6-7 presents an indicative equipment and infrastructure list used for impact assessment purposes. Mining fleet would be confirmed during detailed mine design and would be subject to change throughout the life of the Modification.

Table 6-7: Indicative Equipment/Infrastructure List – FY30

Equipment Item	Function	Number of Equipment	Period
Shovel 4100	Waste rock removal	1	Day, Evening and Night
Excavator 800 tonne (t)	Waste rock removal	2	Day, Evening and Night
Excavator 600 t	Waste rock removal	4	Day, Evening and Night

Equipment Item	Function	Number of Equipment	Period
		3	Day, Evening and Night
Excavator 400 t	Coal removal	2	Day, Evening and Night
		1	Day, Evening and Night
Haul Truck 360 t	Waste rock removal	23	Day, Evening and Night
Haul Truck 220 t	Coal removal	4	Day, Evening and Night
	Waste rock removal	8	Day, Evening and Night
		17	Day, Evening and Night
Haul Truck 180 t	Coal removal	3	Day, Evening and Night
		6	Day, Evening and Night
Dozer CAT D11	Waste rock emplacement	7	Day, Evening and Night
		3	Day, Evening and Night
	Coal and partings preparation	2	Day, Evening and Night
Dozer CAT D10	Coal and partings preparation	3	Day, Evening and Night
		4	Day, Evening and Night
Wheel Dozer CAT 854	Coal and partings preparation	2	Day, Evening and Night
Grader CAT 24M	Haul road maintenance	3	Day, Evening and Night
		1	Day, Evening and Night
Grader CAT 16M	Haul road maintenance	2	Day, Evening and Night
		1	Day, Evening and Night
Water Truck	Haul road maintenance	6	Day, Evening and Night
		3	Day, Evening and Night
Large Blasthole Drill	Waste rock removal	7	Day, Evening and Night
Mobile Crusher	Waste rock removal	3	Day, Evening and Night
		1	Day, Evening and Night
Wheel Loader CAT 992	ROM coal stockpile	1	Day, Evening and Night
Dozer CAT D11	Product coal stockpile	5	Day, Evening and Night
Water Truck	CHPP	1	Day, Evening and Night
Primary Crusher	Coal processing	2	Day, Evening and Night

Equipment Item	Function	Number of Equipment	Period
Secondary Crusher	Coal processing	2	Day, Evening and Night
CPP Module	Coal processing	3	Day, Evening and Night
Vibratory Feeder	Coal processing	1	Day, Evening and Night
Surge Bin	Coal processing	3	Day, Evening and Night
Rejects Bin	Coal processing	1	Day, Evening and Night
Primary Crusher	Coal processing	2	Day, Evening and Night
Secondary Sizing Station	Coal processing	2	Day, Evening and Night
Transfer Station	Coal processing	5	Day, Evening and Night
Train Load-out Bin	Coal processing	1	Day, Evening and Night
Stacker System	Coal processing	2	Day, Evening and Night
Reclaimer System	Coal processing	1	Day, Evening and Night
Locomotive	Rail transport	3	Day, Evening and Night

Note:

1. CHPP infrastructure items listed in table do not include conveyor systems (belts + drives).

6.5 Indicative Sound Power Levels

Table 6-8 presents modelled plant sound power levels (SWLs) and references for all the SWLs used in the assessment in accordance with the NPfI.

Most of the nominated SWLs included in **Table 6-8** were established from direct measurements at MAC and are generally indicative of leading practice mining equipment for noise performance.

HVEC recognises the importance of input data such as SWLs as a source of variability in noise model predictions and understands the importance of consistent SWLs in order to inform the noise modelling of the Modification. As such, HVEC implements and manages proper care and maintenance of the equipment to avoid any deterioration and/or damage of noise attenuation components for the approved operation and intends on continuing to do so for the Modification (BHP, 2023).

Table 6-8: Indicative Equipment/Infrastructure Sound Power Levels

Equipment Item	Indicative Sound Power Level per Item – L_{Aeq} (dBA)	Reference
Mobile Fleet		
Shovel 4100	121	Based on SWL testing conducted at MAC (2008)

Equipment Item	Indicative Sound Power Level per Item – L_{Aeq} (dBA)	Reference
		(ref. Mt Arthur Coal Open Cut Modification - Noise & Blasting Assessment, Wilkinson Murray, 2013)
Excavator 800 t	117	Based on SWL testing conducted at MAC (2018, 2019)
Excavator 600 t	117	Based on SWL testing conducted at MAC (2021)
Excavator 400 t	114	Based on SWL testing conducted at MAC (2021)
Haul Truck 360 t	116	Based on SWL testing conducted at MAC (2019, 2020, 2021)
Haul Truck 220 t	116	Based on SWL testing conducted at MAC (2017, 2018, 2019)
Haul Truck 180 t	116	Based on SWL testing conducted at MAC (2017, 2018, 2019, 2021)
Dozer CAT D11	116	Based on SWL testing conducted at MAC (2017, 2018, 2019)
Dozer CAT D10	115	Based on SWL testing conducted at MAC (2017, 2019)
Wheel Dozer CAT 854	115	Based on SWL testing conducted at MAC (2019)
Wheel Loader CAT 992	116	Based on SWL testing conducted for Mt Pleasant Operation (ref. Mt Pleasant Optimisation Project - Noise & Blasting Assessment, Wilkinson Murray, 2020)
Grader CAT 24M	109	Based on SWL testing conducted at MAC (2019)
Grader CAT 16M	107	Based on SWL testing conducted at MAC (2017, 2018, 2019)
Water Truck	115	Based on SWL testing conducted at MAC (2017, 2021)
Large Blasthole Drill	113	Based on SWL testing conducted at MAC (2021)
Mobile Crusher	115	Based on SWL testing conducted at MAC (2008) (ref. Mt Arthur Coal Open Cut Modification - Noise & Blasting Assessment, Wilkinson Murray, 2013)
CHPP Infrastructure		
Primary Crusher	115	Mt Arthur Coal Open Cut Modification - Noise & Blasting Assessment, (Wilkinson Murray, 2013)
Secondary Crusher	115	
CPP Module	112	
Vibratory Feeder	96	
Surge Bin	96	
Rejects Bin	96	
Secondary Sizing Station	115	

Equipment Item	Indicative Sound Power Level per Item – L_{Aeq} (dBA)	Reference
Transfer Station	112	
Train Load-out Bin	106	
Stacker System	97	
Reclaimer System	115	
Conveyor Drive	102	
Conveyor Belt	79/m[1]	
Rail Transport		
Locomotive	102	Based on SWL testing conducted at Maules Creek Coal Project (2018)

Note:

1. Sound power level per linear metre.

6.6 Low-Frequency Noise Assessment Results

A LFN assessment was conducted to ascertain whether any of the identified receivers should be subject to a modifying factor correction due to dominant low-frequency content. If required, such correction factors would be applied to the predicted noise levels before comparing to the relevant Project noise trigger levels.

As stated in **Section 5.5.1**, the NPfI provides a method for assessing LFN based on:

- overall 'C' weighted and 'A' weighted predicted or measured levels; and
- one-third octave predicted or measured levels in the range 10–160 Hz.

For clarity, the first component is effectively a screening assessment to determine if the second component applies, that is receiver locations are first screened for the C-A noise level assessment, then, if relevant, receivers that trigger this are taken on to the one-third octave assessment.

6.6.1 Unbalanced Frequency Spectra

A C-weighted noise level minus A-weighted noise level assessment was carried out to determine the potential presence of unbalanced spectra containing major components within the low-frequency range of the spectrum at receivers surrounding MAC. The assessment was conducted for a selection of key receivers deemed representative of the eight residential zones (Zones A-H) (**Figure 5-1**) and of receivers outside those zones (**Table 5-4**). Predictions were based on the relevant night-time NPfI meteorological conditions (**Table 6-2**) resulting in the highest noise levels.

Table 6-9 sets out the representative receivers and summarises the C-weighted noise level minus A-weighted noise level assessment results for FY30. Differences of 15 dB or more are shown in yellow.

Table 6-9: C-A-Weighted Noise Level Assessment Results – FY30

Residential Zone[1]	Representative Receiver	C-A-Weighted $L_{Aeq,15min}$ Noise Level (dB)
A – Antiene Estate	93	11.6
B – Thomas Mitchell Drive, Denman Road East	41	13.8
C – Racecourse Road	29	13.6
D – Denman Road North-west, Roxburgh Vineyard (north-east), Roxburgh Road (north-east)	238	14.5
E – South Muswellbrook	IR.103	13.4
F – Denman Road West, Roxburgh Vineyard (west), Mangoola Road	438	16.7
G – East Antiene, New England Highway	73	14.9
H – South of Mine	112c	19.6
Western receivers between Zones F and H	482	17.6
Receivers east of Zone G	333	14.8
Receivers west of Muswellbrook	36	15.1

Note:

1. Residential zones listed in table include receivers outside the eight identified residential zones (Zones A-H).

The results indicate that a number of areas would be exposed to unbalanced spectra containing major components within the low-frequency range of the spectrum (C – A dB ≥ 15 dB). This is generally the case for residential zones located further away from the site.

The low-frequency contents of the resultant spectra are generally found to be consistent with results from other desktop LFN assessments of comparable operations and do not reflect uncharacteristically high energy in the low frequencies of total noise emissions or unusual sound propagation pathways resulting in highly unbalanced spectra.

Residential zones expected to be subject to unbalanced spectra were further considered and compared with the relevant one-third octave LFN threshold levels provided in Table C2 of the NPfI.

6.6.2 Low-Frequency Noise Thresholds

All predicted operational noise levels reported in the assessment are based on octave band noise predictions ranging between 31.5 Hz to 16 kilohertz (kHz). As such, predictions do not provide third octave band levels and do not include frequency bands between 10 Hz and 160 Hz as required for comparison with the relevant LFN threshold levels. In order to estimate levels at those lower frequencies, the 63 Hz third octave band level – generally considered to be a relatively reliable component of a source spectrum – was interpolated from the predicted octave band spectra and used as the basis for the normalisation of a typical spectrum shape of past LFN measurements.

It should be noted that past and recent attended compliance noise monitoring conducted for the MAC indicate no LFN issues. As such, it was not deemed necessary to conduct site-specific LFN measurements and the Bulga Village Noise Audit measurements[2] were used for the assessment.

A typical LFN spectrum shape of long-distance mining noise in third octave bands between 10 Hz to 160 Hz was measured as part of a noise audit conducted at Bulga Village (Wilkinson Murray, 2016). The spectrum shape, shown in **Table 6-10**, corresponds to an average of 130 LFN measurements (normalised to a same broadband level) of mining noise from an open cut coal mine comparable in size and operation to MAC (i.e. using loaders and excavators and loading into trucks for haulage to the ROM pad at the mine infrastructure area via internal haul roads). The LFN measurements were conducted at an approximate distance of 3 to 4 km from the mine with a propagation path comparable to those surrounding the Modification.

Table 6-10: Typical Measured Low-Frequency Spectrum Shape – Bulga Village Noise Audit

	Third Octave Band Centre Frequency, Hz												
	10	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Measured level (dB(Z))	49	54	55	52	51	51	51	52	49	50	48	45	40

The resultant normalised LFN spectra for all representative receivers exposed to unbalanced spectra are presented in **Appendix C**.

All spectra were found to be below the LFN threshold curve (**Section 5.5.1**). As such, it is unlikely that any of the receivers surrounding MAC would be subject to dominant LFN and no modifying factor correction for LFN is warranted for the Modification.

This is consistent with attended monitoring at the existing MAC, which has indicated noise levels experienced at monitoring locations do not contain dominant LFN.

[2] Bulga Village Noise Audit measurements are considered suitable in accordance with the methodology described as best practice in Gordon Downey's article *An example approach to consider low frequency noise in the context of the NSW Noise Policy for Industry* (Acoustics Australia [2020], Volume 48: 149-180, August 2020)

6.7 Operational Noise Levels Assessment

Predicted $L_{Aeq,15min}$ operational noise levels at all identified receivers are presented in **Appendix D**. Results reflect the FY30 scenario under the applicable Fact Sheet D meteorological conditions (**Table 6-1**) resulting in the maximum predicted noise levels. Operational noise levels at privately-owned residential receivers predicted to exceed the noise impact assessment criteria are highlighted in yellow. Mine-owned residential receivers and other receiver types do not have noise impact assessment criteria and are included for information only.

As mentioned previously, the noise levels of the 15 receivers located north-west of MAC in Zones D and F during adverse and very noise enhancing meteorological conditions would trigger the proactive mitigation measures that would be implemented in accordance with the TARP for night time and evening periods (**Table 6-6**) (BHP, 2023). Implementation of these measures will achieve compliance with the criteria for the majority of these receivers (with the exception of the three mentioned above). For completeness, noise levels during those periods without pro-active noise mitigation measures have been included in **Appendix E** for those 15 receivers.

Figures showing indicative day, evening and night-time noise contours of noise levels predicted under the relevant Fact Sheet D meteorological conditions (**Table 6-1**) for FY30 are presented in **Appendix H**.

Noise results indicate that noise predictions are expected to comply with the day and evening noise impact assessment criteria at all privately-owned receivers in FY30. As such, the Modification is not expected to impact on the acoustic amenity of the surrounding community during the day and evening periods.

Night-time predictions show exceedances of the noise impact assessment criteria at a number of privately-owned receivers. A summary of those receivers is provided in **Table 6-11**. The receivers are grouped according to noise impacts as interpreted by the VLAMP and the NPfI.

The exceedance level ascribed to the receivers listed in **Table 6-11** is reflective of the assessed year with potentially the most impact (FY30) (which has been modelled assuming the highest production levels [FY29]). It is expected that those receivers may at times be subject to lesser impact and/or no impact during the life of the Modification.

Table 6-11: Summary of Potential Night-Time Exceedances at Privately-Owned Residential Receivers – FY30

Zone	Exceedance Level	Privately-Owned Residential Receivers[1] Predicted to Exceed Night-Time Noise Impact Assessment Criteria – FY30
Noise Management Zone	1 to 2 dB	-
	3 to 5 dB	Receivers 200[2], 200a[3] and 226[4]

Notes:

1. To identify the locations of these receivers, refer to **Figure 4-1**.
2. This receiver has the right to additional air quality mitigation upon request in MP 09_0062 for the approved mine.
3. Receiver 200a is assumed to be subject to the same rights as receiver 200.
4. This receiver is subject to acquisition upon request in MP 09_0062 for the approved mine for predicted air quality impacts.

"Moderate" night-time exceedances (between 3-5 dB according to the VLAMP and NPfI) are predicted at three receivers (**Appendix D**). One of these receivers (receiver 226) is already subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts associated with the approved operation. The other two receivers (receivers 200 and 200a), which already have the right to additional air quality mitigation upon request according to MP 09_0062, would be afforded the right to additional noise mitigation upon request should the Modification be approved.

Predictions for the last year of the MOD 1 (FY26), were provided as part of the MOD 1 Noise and Blasting Assessment (Wilkinson Murray, 2013), and have been compared with the FY30 noise predictions. As expected, night-time levels were generally found to have marginally increased by 1-2 dB as the acoustic centre of pit activities for FY30 are located further west and thus closer to the north-western receivers. Meteorology is also expected to have contributed to the increase in noise levels. The meteorological conditions assumed for the assessment, are consistent with Fact Sheet D of the NPfI, which is relatively more conservative than the meteorological conditions described in the *NSW Industrial Noise Policy* (EPA, 2000) and used in the MOD 1 Noise and Blasting Assessment (Wilkinson Murray, 2013). Specifically, this assessment included a temperature inversion of 4°C/100 m combined with a 0.5 m/s source-to-receiver light wind at night whilst the MOD 1 predictions were based on 4°C/100 m with no wind.

6.8 Vacant Land Noise Assessment

A contemporary assessment of potential impacts on vacant land has been conducted in accordance with the NSW Government's VLAMP (DPE, 2018). Under the policy, landowners are eligible to voluntary land acquisition rights when noise generated by the development contributes to exceedances of the acceptable noise levels plus 5 dB in Table 2.2 of the NPfI on more than 25% of privately-owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls.

The vacant land assessment noise criteria, based on the acceptable noise levels plus 5 dB in Table 2.2 of the NPfI, are summarised below. Those criteria correspond to the "rural" noise amenity area and apply to $L_{Aeq,Period}$ noise levels.

- Day - 55 dBA $L_{eq,11hr}$
- Evening - 50 dBA $L_{eq,4hr}$
- Night - 45 dBA $L_{eq,9hr}$

The vacant land assessment was based on noise contours generated for the Modification. A correction was applied to the contours to account for the fact that the assessment is based on $L_{Aeq,Period}$ noise levels as opposed to $L_{Aeq,15min}$ noise levels (i.e. according to the NPfI, $L_{Aeq,period}$ noise levels are converted to $L_{Aeq,15min}$ noise levels by adding 3 dB).

Based on the methodology described above, noise generated by the Modification is predicted to comply with the vacant land noise assessment criteria on all privately-owned land (regardless of whether there is an existing dwelling or where a dwelling could be built under existing planning controls).

6.9 Project Amenity and Cumulative Noise Levels Assessment

6.9.1 Project Amenity Noise Level Assessment

As discussed in **Section 5.4.2**, the project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

Predicted $L_{Aeq,15min}$ operational noise levels from the Modification were compared with the Project amenity noise criteria (**Section 5.4.2**) at all identified receivers (**Table F-1** of **Appendix F**). Noise predictions exceeding the Project amenity noise criteria are shown in yellow.

Predictions are presented as $L_{Aeq,15min}$ noise levels under Fact Sheet D meteorological conditions (**Section 6.1.2**) and as such are identical to the operational noise levels presented in **Appendix D**.

Noise results indicate that noise predictions are expected to comply with the day and evening Project amenity noise criteria at all privately-owned receivers in FY30.

Night-time predictions show exceedances of the Project amenity noise criteria at 26 privately-owned receivers. A summary of those receivers is provided in **Table 6-12.** The receivers are grouped according to noise impacts as interpreted by the VLAMP and the NPfI.

The exceedance level ascribed to the receivers listed in **Table 6-12** is reflective of worst-case noise emissions and it is expected those receivers may at times be subject to lesser impact and/or no impact during the life of the Modification.

Table 6-12: Summary of Potential Night-Time Exceedances of Project Amenity Criteria at Privately-Owned Residential Receivers – FY30

Zone	Exceedance Level	Privately-Owned Residential Receivers[1] Predicted to Exceed Night-Time Noise Impact Assessment Criteria – FY30
Noise Management Zone	**1 to 2 dB**	78, IR.13, IR.20, IR.21, IR.22, IR.23, IR.24, IR.29, IR.30, IR.31, IR.32, IR.33, IR.34, IR.35, IR.36, IR.37, IR.39, IR.40, IR.76, IR.77, IR.119, IR.120, IR.121, IR.122, IR.123, IR.124

Notes:

1. To identify the locations of these receivers, refer to **Figure 4-1**.
2. This receiver is subject to acquisition upon request in MP 09_0062 for the approved mine for predicted noise impacts.

26 privately-owned residential receivers located within Zones E (25 receivers) and G (one receiver) are predicted to experience “negligible” night exceedances (between 1-2 dB according to the VLAMP and NPfI). Such “negligible” exceedances would not be discernible by the average listener in accordance with the VLAMP and NPfI. It is noted that the Zone E receivers are in the “Ironbark Ridge” estate which has been developed since the Mt Arthur Consolidation Project was approved (MP 09_0062), hence the development of these residences has occurred in a noise environment where the Mt Arthur Coal mine has been active.

Exceedances of the amenity noise level are highlighted in yellow in **Appendix F.**

Section 2.4 of the NPfI provides some further context for the project amenity criteria:

> *Where the project amenity noise level applies and it can be met, no additional consideration of cumulative industrial noise is required. However, in circumstances where this level cannot be feasibly and reasonably met, an assessment of existing industrial noise, and the combined resulting noise level from existing and the proposed industries, is required so the impact of the residual noise levels can be determined in accordance with Section 4.2.*
>
> *Therefore, it may be prudent to determine the existing level of industrial noise during initial surveys. Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess reasonable and feasible mitigation options, and subsequently determine achievable noise requirements.*

Given the above-mentioned negligible exceedances of the project amenity criteria, consistent with the NPfI, a cumulative noise assessment is presented in **Section 6.9.2**. Furthermore, it is anticipated that the Modification, if approved, would continue to be regulated against the Project Approval noise criteria (i.e. Schedule 3, condition 2 of MP 09_0062) rather than the project amenity criteria.

6.9.2 Cumulative Noise Levels Assessment

If approved, the Modification would continue to operate concurrently with Bengalla Continuation of Mining Project, Mount Pleasant Operation, Maxwell Underground Coal Mine Project and Mangoola Coal Continued Operations Project to 2030.

The assessment of cumulative impacts considers the total noise from the Modification and the following neighbouring operations (shown on Figure 1-1):

- Bengalla Continuation of Mining Project – Project Approval SSD-5170, approved in 2015[3].
- Mount Pleasant Operation – SSD-10418, approved in 2022.
- Maxwell Underground Coal Mine Project – SSD-9526, approved in 2020.
- Mangoola Coal Continued Operations Project – SSD-8642, approved in 2021.

The contributions of noise from the above operations have been taken from predictions of noise emissions included in the following documents:

- Bengalla Continuation of Mining Project – Environmental Impact Statement – Acoustic Impact Assessment prepared by Bridges Acoustics (2013a).
- Bengalla Mine – Development Consent Modification 4 – Statement of Environmental Effects prepared by Hansen Bailey (2017).
- Mount Pleasant Optimisation Project – Environmental Impact Statement – Noise and Blasting Assessment prepared by Wilkinson Murray (2020).
- Maxwell Project – Noise Impact Assessment prepared by Wilkinson Murray (2019).
- Maxwell Underground Mine Project – Modification 2 – Noise Assessment prepared by RWDI (2022).

[3] Bengalla Mod 5 added a mobile crushing plant to their fleet and also removed part of a bund on site. Their Noise Assessments concluded that the increase in noise as a result would be negligible (i.e. the operational noise generated by the Modification is expected to be at least 10 dBA below the noise criteria [James Bailey and Associated, 2021] Bengalla Mine Modification 5 Report For Bengalla Mining Company Pty Limited), so no further consideration of this is warranted.

- Mangoola Coal Continued Operations Project – Noise Impact Assessment prepared by Global Acoustics Pty Ltd (2019).

It should be noted that subsequent modifications for the above projects were also considered as part of the cumulative noise assessment and it was found they resulted in no material changes to the above assessments.

All noise contributions from Bengalla Continuation of Mining Project, Mount Pleasant Operation, Maxwell Underground Coal Mine Project and Mangoola Coal Continued Operations Project are provided in **Appendix F**. Not all privately-owned residential receivers potentially impacted by cumulative noise were included in the above assessments. For those receivers, conservative assumptions were made with noise levels inferred from nearby receiver predictions and noise contours.

Cumulative noise levels from all mining operations (including the Modification) are summarised in **Appendix F**. The methodology used for assessment of cumulative impacts was to logarithmically sum the predicted day, evening and night-time noise levels for each mine for all identified privately-owned receivers. The overall cumulative noise levels were then assessed against the relevant recommended cumulative noise criteria (**Section 5.4.1**).

For the purposes of cumulative assessment, the closest available corresponding noise prediction year for the four other mining projects were selected, noting that Bengalla Mine, Mount Pleasant Operation, Maxwell Underground Coal Mine Project and Mangoola Coal are approved to operate until 2038, 2048, 2047 and 2031, respectively. FY30 was chosen as the assessment year as it is representative of maximum noise emissions (Section 6.1.1). The summation of the various noise predictions used for cumulative assessment is summarised below:

- Cumulative FY30 = Modification (FY30) + Bengalla Mine (Project Year 15 [2029]) + Mount Pleasant Operation (2028) + Maxwell Underground Coal Mine Project (Project Year 4 onward [2024 onward]) + Mangoola Coal Continued Operations Project (Project Year 8 [2029])

When considering the maximum noise emissions for FY30, all cumulative noise level predictions comply with the cumulative noise criteria during the day, evening and night assessment periods.

6.10 Maximum Noise Level Event Assessment

6.10.1 Maximum Noise Level Event Assessment – Noise Assessment Criteria

As mentioned in **Section 5.3**, the noise impact assessment criteria set in MP 09_0062 include an $L_{A1,1min}$ night-time noise criterion of 45 dBA for all privately-owned receivers surrounding the site (monitoring data is shown in **Appendix G**).

6.10.2 Maximum Noise Level Event Assessment – Methodology

An ENM operational noise model was developed to analyse $L_{A1,1min}$ noise emissions for FY30.

$L_{A1,1min}$ noise predictions adopted the same plant locations and meteorological conditions as those assumed for the operational noise levels assessment (i.e., NPfI meteorological conditions summarised in **Table 6-2** resulting in the maximum noise levels).

The maximum noise level event sources that may potentially generate sleep disturbance in the surrounding community and their typical SWLs are summarised in **Table 6-13**.

It should be noted that the SWLs summarised in **Table 6-13** refer to L_{AFmax} levels, which are generally marginally higher than $L_{A1,1min}$ levels. Notwithstanding, it was conservatively assumed that $L_{A1,1min}$ SWLs would be the same as L_{AFmax} SWLs for the purpose of the assessment.

Table 6-13: Maximum Noise Level Event Sources & L_{AFmax} Sound Power Levels

Maximum Noise Level Event Sources	Typical L_{AFmax} SWL (dBA)
Excavator dumping material in empty truck	115-125
Dozer track noise in 1st gear	114-124
CHPP impact noise	110-125
Haul truck passby	<118
Impact noise associated with trucks, dozers, loaders and excavators travelling/manoeuvring	113-118
Train load-out bin impact noise	110-114

To be conservative the upper end of the nominated level ranges has been used for the noise predictions.

All potential maximum noise level event sources were predicted separately, with the highest predicted $L_{A1,1min}$ noise level considered for the assessment.

As maximum noise level events would occur together with some level of continuous operational noise emission, $L_{A1,1min}$ noise levels were conservatively added to the $L_{Aeq,15min}$ operational noise levels (**Appendix D**) before assessing against the $L_{A1,1min}$ night-time noise criterion. This is deemed conservative as, in terms of meteorology the highest $L_{A1,1min}$ noise levels were added to the highest $L_{Aeq,15min}$ predictions. However, in reality weather conditions resulting in the highest $L_{Aeq,15min}$ level may be different to those generating the highest $L_{A1,1min}$ level.

6.10.3 Maximum Noise Level Event Assessment – Predicted Levels

The predicted night-time $L_{A1,1min}$ noise levels at receivers surrounding the site are summarised in **Appendix G**. Mine-owned residential receivers and other receiver types do not have noise impact assessment criteria and are included for information only.

$L_{A1,1min}$ noise results indicate that compliance with the $L_{A1,1min}$ night-time noise criterion would be achieved at all privately-owned residential receivers.

Results show that $L_{A1,1min}$ noise levels would emerge by an average of 2 dB over the predicted $L_{Aeq,15min}$ operational noise levels. This is consistent with RWDI's experience from attended measurements around open cut coal mines in that instantaneous changes in noise levels due to maximum noise level events are generally relatively small as mining noise is affected by numerous lower-level noise sources.

7 ROAD TRAFFIC NOISE

7.1 Introduction

The Modification seeks a reduction in the approved open cut mining rate from 32 Mtpa ROM to a maximum of 25 Mtpa ROM and would employ a total workforce of approximately 2,200 full-time equivalent (FTE) employees, which is less than the historical peak of approximately 2,600 FTE employees at peak production associated with the approved operations. Therefore, the Modification is not expected to increase road traffic noise on the local road network when compared with the approved operations. Notwithstanding, road traffic noise has been considered in the assessment for completeness. Road traffic noise was assessed against the road traffic noise criteria in MP 09_0062 and the noise criteria recommended in the RNP (DECCW, 2011).

7.2 Road Traffic Noise Criteria

7.2.1 Project Approval Road Traffic Noise Criteria

Condition 6, Schedule 3, of MP 09_0062 requires HVEC to take all reasonable and feasible measures to ensure that the traffic noise generated by the Mt Arthur mine complex does not exceed the traffic noise impact assessment criteria in **Table 7-1**.

Table 7-1: Project Approval Road Traffic Noise Criteria

Road	Day / Evening ($L_{Aeq,1hr}$)	Night ($L_{Aeq,1hr}$)
Thomas Mitchell Drive	60	55
Denman Road, east of Thomas Mitchell Drive	60	55
Denman Road, west of Thomas Mitchell Drive	55	50

Notes:

1. Day: 7:00 am - 6:00 pm; Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.
2. Traffic noise generated by the Mt Arthur mine complex is to be assessed and measured in accordance with the relevant procedures in the NSW RNP.

7.2.2 RNP Road Traffic Noise Criteria

Criteria for assessment of noise from traffic on public roads are set out in the RNP. Thomas Mitchell Drive and Denman Road are both considered as "sub-arterial" roads under this policy.

Table 3 of the RNP is copied in **Table 7-2** with the relevant sections highlighted.

Table 7-2: Road Traffic Noise Criteria – Privately-owned Residences

Table 3 Road traffic noise assessment criteria for residential land uses

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

Reference is also made to sections 3.4 and 3.4.1 of the RNP. Section 3.4 notes that:

> *"In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person."*

Section 3.4.1 notes:

> *"For existing residences and other sensitive land uses affected by **additional traffic on existing roads generated by land use developments**, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'."*

7.3 Road Traffic Noise Assessment Methodology

7.3.1 Road Sections Excluded in Assessment

Key sections of local roads shown on **Figure 7-1** were excluded from further road noise assessment as described below.

Thomas Mitchell Drive

On the basis that MAC-related traffic volumes are lower on the section of Thomas Mitchell Drive east of the MAC and Bayswater access roads compared with the section west of the access roads, and that the receivers along the eastern section of Thomas Mitchell Drive are in the affectation/management zone for noise, no further assessment of this section is warranted.

As no residential receivers are located along Thomas Mitchell Drive west of the MAC and Bayswater access roads, this section was also not included in the assessment.

Denman Road West of Thomas Mitchell Drive

When considering that residential receivers along Denman Road west of Thomas Mitchell Drive and east of Edderton Road are mine-owned or in the affectation zone for noise, no further assessment is warranted for that road section.

West of Edderton Road the Denman Road volumes are diluted due to MAC-related traffic travelling along Edderton Road, as such no further assessment is warranted west of Edderton Road.

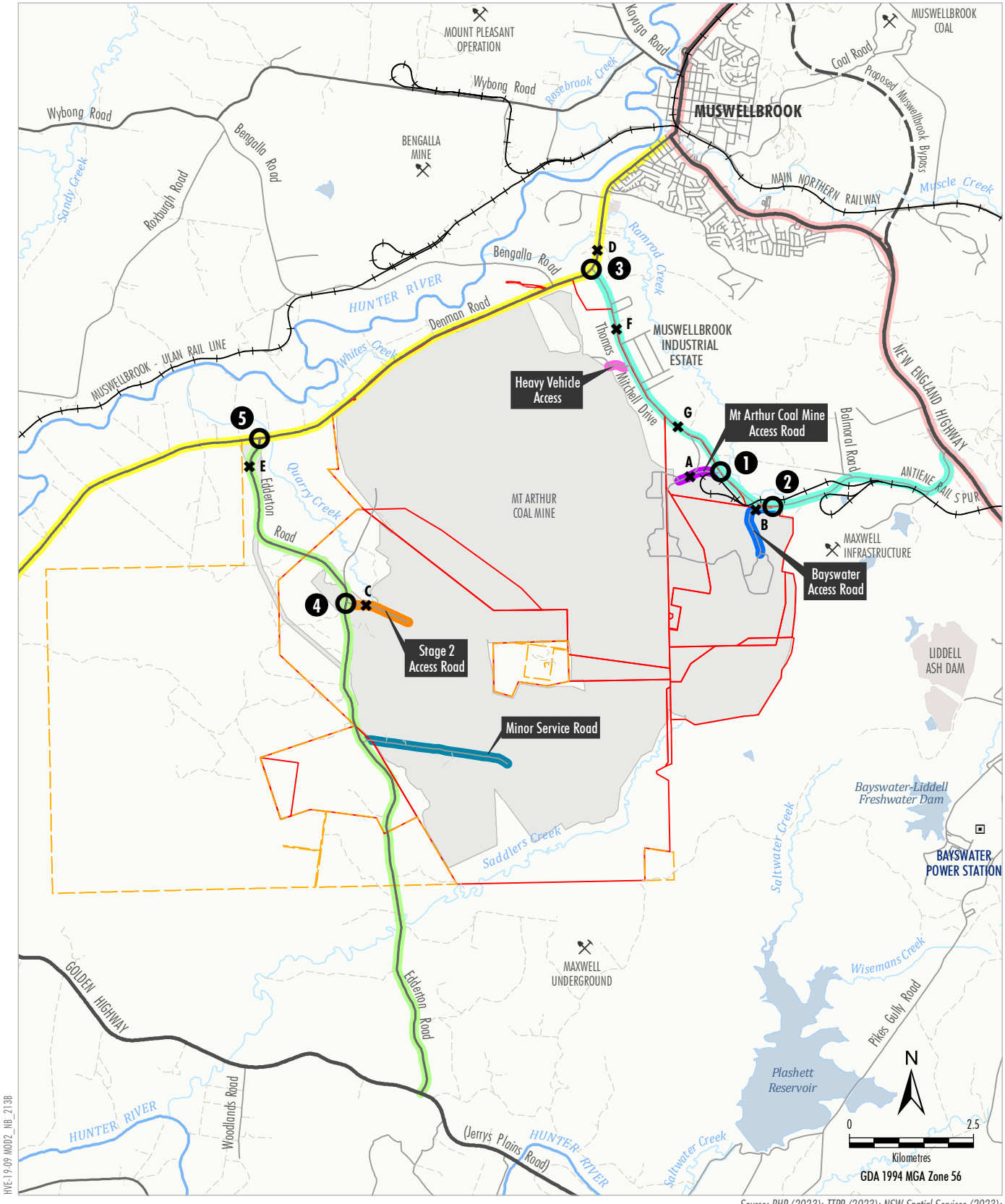
Edderton Road

Edderton Road was not addressed in the assessment due to the absence of residential receivers along Edderton Road.

7.3.2 Road Traffic Noise Prediction Methodology

Traffic noise levels have been predicted using the *Calculation of Road Traffic Noise* (CoRTN) model (United Kingdom Department of Transport, 1988), which takes into account the following factors:

- Traffic flow volumes
- Average vehicle speed
- Percentage of heavy vehicles
- Gradient of road
- Type of road pavement
- Distance from receiver location to road
- Shielding from barriers / building and intervening topography
- Reflections from barriers / buildings
- Angle of view



HVE-19-09 MOD2_N0_2138

Source: BHP (2023); TTPP (2023); NSW Spatial Services (2023); Transport for NSW (2020)

LEGEND

- Mining Operation
- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Approximate Extent of Existing/Approved Surface Development
- Railway
- Highway
- Arterial Road
- Sub-arterial Road
- Local Road
- Track

Key Roads

- New England Highway
- Denman Road
- Thomas Mitchell Drive
- Edderton Road
- MAC Main Access Road
- MAC Bayswater Access Road
- MAC Stage 2 Access Road
- MAC Heavy Vehicle Access
- MAC Minor Service Road

Proposed Traffic Survey Locations

- Intersection Survey Location
- Midblock Tube Count

BHP

MT ARTHUR COAL MINE MODIFICATION 2

Traffic Survey Locations

Figure 7-1

- Building facade reflection correction
- Ground absorption

The CoRTN model has been used on a number of projects with comparable road characteristics and traffic configuration, with good correlation between noise predictions and measured noise levels.

7.4 Road Traffic Volumes

For assessment against the Project Approval road noise traffic criteria, **Table 7-3** and **Table 7-4** summarise peak hour traffic volumes from the MAC incorporating the Modification as provided by The Transport Planning Partnership (TTPP) for the day and night peak hours, respectively (TTPP, 2023).

Table 7-3: Peak Hour Road Traffic Volumes from MAC Incorporating Modification

Road Section	MAC Peak Hour	Day Peak Hour	
		Light	Heavy
Day			
Denman Road, east of Thomas Mitchell Drive	5:30 pm – 6:30 pm	182	12
Night			
Denman Road, east of Thomas Mitchell Drive	5:30 am – 6:30 am	238	47

To allow assessment with the noise criteria recommended by the RNP, 2030 total daily traffic projections were provided by TTPP for non-MAC-related traffic and traffic associated with the MAC incorporating the Modification. **Table 7-4** and **Table 7-5** present total traffic volumes for the day (7:00 am – 10:00 pm) and night (10:00 pm – 7:00 am) assessment periods, respectively. 2030 was selected by TTPP (2023) for the assessment scenario and adopted the maximum operating characteristics of the Modification in this year.

Table 7-4: Total Road Traffic Volumes – Day (7:00 am – 10:00 pm)

Road Section	Day		
	Light	Heavy	Total
MAC with Modification Traffic			
Denman Road, east of Thomas Mitchell Drive	930	147	1,077
Non-MAC-Related Traffic			
Denman Road, east of Thomas Mitchell Drive	6,555	480	7,035
TOTAL			
Denman Road, east of Thomas Mitchell Drive	7,485	627	8,112

Table 7-5: Total Road Traffic Volumes – Night (10:00 pm – 7:00 am)

Road Section	Night		
	Light	Heavy	Total
MAC with Modification Traffic			
Denman Road, east of Thomas Mitchell Drive	514	52	566
Non-MAC-Related Traffic			
Denman Road, east of Thomas Mitchell Drive	1,575	75	1,650
TOTAL			
Denman Road, east of Thomas Mitchell Drive	2,089	127	2,216

7.5 Road Traffic Noise Assessment

7.5.1 Assessment with Project Approval Road Traffic Noise Criteria

Based on the traffic volumes presented in **Table 7-3,** peak hour traffic noise levels at the closest privately-owned residential receivers to Denman Road (east of Thomas Mitchell Drive), namely receivers 12 and 33, have been predicted and are presented in **Table 7-6**. The level highlighted in yellow indicates an exceedance of the MP 09_0062 road traffic noise criteria.

Table 7-6: Modification Traffic Noise Predictions

Road Section	Closest Privately-Owned Receiver	Distance from Road	Predicted Level, $L_{Aeq,1hr}$ (dBA)	
			Day Peak Hour	Night Peak Hour
Denman Road, east of Thomas Mitchell Drive	Receiver 12	44 m	56	60
	Receiver 33	288 m	45	48

Note:

1. All predictions include building facade reflection correction.

Noise results indicate that road traffic noise levels generated by the MAC with the Modification are expected to exceed the night-time MP 09_0062 road traffic noise criterion of 55 dBA by 5 dB at receiver 12. The daytime noise level at the receiver would comply with the criterion of 60 dBA.

Road traffic noise predictions at the next closest receiver, namely receiver 33, would comply with all relevant MP 09_0062 road traffic noise criteria and it can be inferred that all other privately-owned residential receivers would comply with the criteria.

7.5.2 Assessment with RNP Road Traffic Noise Criteria

Based on the traffic data presented in **Table 7-4** and **Table 7-5**, traffic noise levels at the closest residential receivers have been predicted and are presented in **Table 7-7**. Levels highlighted in yellow indicate exceedances of the relevant RNP road traffic noise criteria.

Table 7-7: Traffic Noise Predictions for RNP Assessment

Road Section	Closest Privately-Owned Receiver	Predicted Level, $L_{Aeq,Period}$ (dBA)					
		Non-MAC		Non-MAC + Mod		Relative Increase	
		Day Peak Hour	Night Peak Hour	Day Peak Hour	Night Peak Hour	Day Peak Hour	Night Peak Hour
Denman Road, east of Thomas Mitchell Drive	Receiver 12	60	56	61	57	0.8	1.5
	Receiver 33	49	44	49	46	0.8	1.5

Note:

1. All predictions include building facade reflection correction.

Total traffic noise levels are expected to exceed the RNP road traffic noise criteria at receiver 12 during the day and night periods. The receiver would be exposed to "negligible" exceedances (between 1-2 dB according to the NPfI) due to added traffic from MAC. As described in the NPfI, such "negligible" exceedances would not be discernible by the average listener. It should be noted that receiver 12 will already experience exceedances at night without MAC-related traffic; for this receiver the Modification would not cause new night-time exceedances.

Receiver 12 would be subject to an increase in traffic noise of less than 2.0 dB, representing a minor impact considered barely perceptible to the average person in accordance with the RNP.

Compliance of the RNP noise criteria is expected at receiver 33 and all other privately-owned residential receivers.

7.5.3 Discussion

Road traffic noise monitoring conducted in 2015 (Mt Arthur Coal Mine - Road Traffic Noise Monitoring, May 2015, Global Acoustics) (which is also referenced in Global Acoustics [2020], Appendix 6 of the NMP) concluded that MAC-related traffic is expected to comply with the approved road traffic noise criteria at Thomas Mitchell Drive (day and night) and Denman Road (day only). Noise levels during the night-time peak hours were predicted to exceeded by 1 and 3 dB at Denman Road west and east of Thomas Mitchell Drive, respectively. However, it was noted that MAC-related traffic was a relatively small contributor to overall traffic noise levels.

As advised by the Global Acoustics report, it is impossible to quantify accurately MAC-related traffic noise levels even with the use of traffic counts to complement attended noise measurements (Global Acoustics, 2015). On this basis, the report recommended that regular road traffic noise compliance monitoring requirements be removed from the NMP, noting compliance assessments are still required if workforce numbers exceed the peak numbers modelled in the EIS and in the event of road traffic noise complaints.

Quantitative assessment according to the RNP has demonstrated that overall traffic noise levels may result in negligible exceedances at receiver 12, which would be subject to an increase in traffic noise of less than 2.0 dB, representing a minor impact considered barely perceptible to the average person in accordance with the RNP and NPfI. In addition, MAC Annual Reviews (BHP, 2016, 2017, 2018, 2019, 2020, 2021 and 2022) show no record of non-compliance nor community complaint.

In consideration of the above, assessors should consider the removal/rationalisation of traffic noise monitoring requirements within MP 09_0062.

8 RAIL TRANSPORTATION NOISE

Product coal from MAC is currently being transported by rail from the onsite CHPP via the Antiene Rail Spur and the Main Northern Railway to domestic customers and the Port of Newcastle for export.

The Modification proposes a reduction in the approved transportation quantity of product coal from 27 Mtpa to 20 Mtpa, which would result in a corresponding decrease of train movements from 30 to 20 movements per day (similar to actual movements). Given the proposed one third reduction in rail movements associated with the Modification, assessment of rail transportation noise on the Antiene Rail Spur and the broader state rail network is not warranted.

9 BLASTING ASSESSMENT

9.1 Background to the Study

The Modification would not involve any changes to the drill and blast programme and blast designs. As such, the blasting assessment is based on the blasting analysis undertaken as part of the Noise and Blasting Impact Assessment for the Consolidation Project (Wilkinson Murray, 2009).

The blasting analysis conducted for the Consolidation Project established two Blast Control Areas within which HVEC is required to manage blasts to achieve compliance with the relevant blasting impact assessment criteria. Those Blast Control Areas were extended as part of the Noise and Blasting Assessment conducted for MOD 1 (Wilkinson Murray, 2013) to include an additional surface development area to the north-west of the site.

As the Modification proposes a minor extension of the Windmill Pit (**Figure 2-1**), a blasting assessment is required to address the additional blasting area and update the Blast Control Areas.

9.2 Blasting Impact Assessment Criteria

9.2.1 Project Approval Blasting Impact Assessment Criteria

Condition 10, Schedule 3, of MP 09_0062 stipulates that blasts on site shall not cause exceedances of the blasting impact assessment criteria as summarised in **Table 9-1**.

Table 9-1: Project Approval Blasting Impact Assessment Criteria

	Airblast Overpressure - Peak (dBL)	Ground Vibration – PPV (mm/s)	Allowable Exceedance
Residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts in a financial year
Public Infrastructure	-	50	0%

Note:

An alternative limit for public infrastructure may be determined by the Secretary in accordance with the structural design methodology in AS2187.2-2006, or another methodology acceptable to the Secretary.

According to MP 09_0062, the above criteria do not apply if BHP 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.

Written agreements with Roads and Maritime Services (RMS), Telstra and Ausgrid are in place allowing an increase in the ground vibration blast impact assessment criteria for public infrastructure associated with Denman Road and services along Denman Road as follows:

- RMS: 150 mm/s, with notification prior to blasting for blasts predicted to exceed 100 mm/s.
- Ausgrid: 100 mm/s, with ten per cent of the total number of blasts over a period of 12 months allowed between 100 mm/s and 150 mm/s.
- Telstra: 100 mm/s, with ten per cent of the total number of blasts over a period of 12 months allowed to exceed 100 mm/s.

9.2.2 Blasting Impact Assessment Criteria for Heritage Structures

A number of mine-owned heritage-listed structures were considered in the Noise and Blasting Impact Assessment for the Consolidation Project (Wilkinson Murray, 2009). These structures, located on the northern side of Denman Road (**Figure 9-1**), are identified as follows:

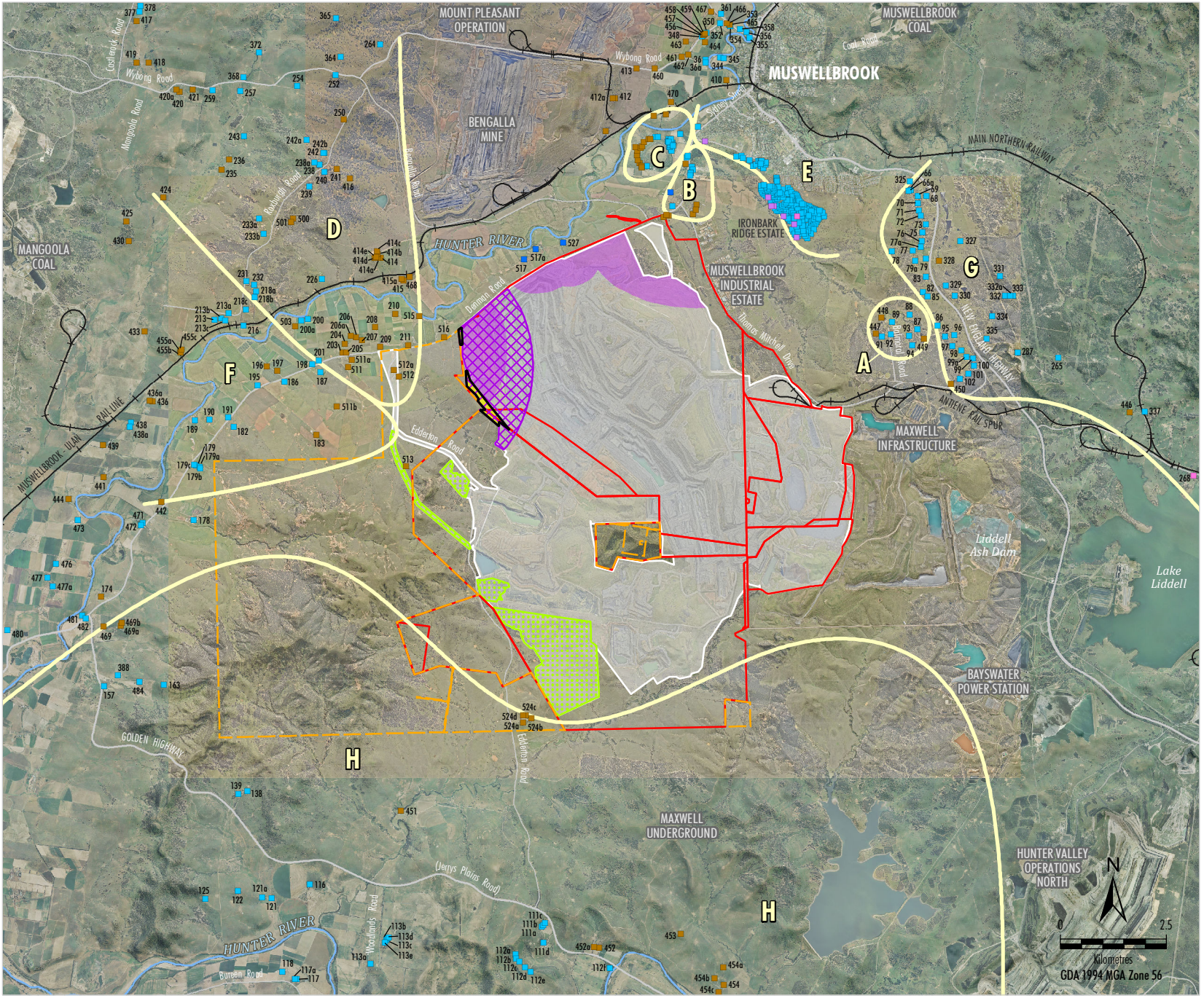
- "Edinglassie" homestead (receiver 517a);
- "Rous-Lench" homestead (receiver 527); and
- "Balmoral" homestead (receiver 8).

The assessment adopted a ground vibration criterion of 10 mm/s and airblast overpressure criterion of 130 dBL for the "Edinglassie" and "Rous-Lench" homesteads. These are based on a blast vibration vulnerability assessment conducted for the two properties (*Edinglassie Homestead & Rous Lench – Blast Vibration Vulnerability*, Bill Jordan & Associates Pty Ltd, 2009) which concluded that blasting activities below these criteria could be undertaken safely, and further, that these criteria are deemed conservative with no damage incurred even at higher levels.

As no specific criteria have been provided by a structural engineer for the "Balmoral" property, RWDI recommends using the same criteria as for the "Edinglassie" and "Rous-Lench" homesteads.

9.3 Prediction of Airblast Overpressure and Ground Vibration Levels

The Blast Control Areas are deemed conservative in that they are based on blast procedures and technology used prior to the Consolidation Project. Notwithstanding, the methodology used to predict airblast overpressure and ground vibration levels from the Modification is the same as that used for the Consolidation Project Noise and Blasting Impact Assessment (Wilkinson Murray, 2009).



LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Approximate Extent of Existing/Approved Surface Development
- Modification New Disturbance Area
- Impact Minimisation Area
- Existing Blast Control Area
- Recommended Blast Control Zone
- Receiver Zone

Dwellings

- Mine-owned Receiver
- The State of NSW (Crown)
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver

Source: BHP (2023); NSW Spatial Services (2023)
Orthophoto Mosaic: BHP (2022-2020)

BHP

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Blast Control Areas

Figure 9-1

HVE-19-09 MOD2_NB_207B

9.4 Blast Designs

Blast designs and sizes in the additional mining area would depend on numerous factors including the depth of coal seams and design of benches. Consistent with the Consolidation Project Noise and Blasting Impact Assessment, three typical blast designs have been provided, with differing values of Maximum Instantaneous Charge (MIC) as follows:

- Deep interburden/overburden: MIC 1681 kilogram (kg);
- Intermediate interburden: MIC 812 kg; and
- Shallow interburden: MIC 182 kg.

It is assumed that any of these three general blast types may be required at any location, and hence potential impacts should be assessed using the deep interburden/overburden blast design, representing the maximum potential impact.

According to MP 09_0062, blasting on site would only occur between the hours of 8.00 am and 5.00 pm Monday to Saturday (with no blasting permitted on Sundays and public holidays).

As stipulated in the MP 09_0062, up to three blasts per day, four blasts a day on a maximum of 12-days each financial year, and up to 12 blasts per week, averaged over any financial year, would occur on-site (unless blasts generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or additional blasts are required following misfires or for the safety of the mine, its workers or the general public).

9.5 Blast Control Areas

The assessment of Blasting follows from the analysis of the Mt Arthur Coal Open Cut Modification – Noise and Blasting Assessment (Wilkinson Murray, 2013). Based on the Modification New Disturbance Area it is recommended that the western Blast Control Area be extended to satisfy the relevant criteria as shown on **Figure 9-1**.

An additional heritage structure was identified on the "Edinglassie" property, which was not considered in the previous blasting assessments for the Project, namely receiver 517 (**Figure 9-1**) (Wilkinson Murray, 2020). Adopting the same criteria as those recommended for the "Edinglassie" homestead, it is recommended that the northern Blast Control Area be extended further west in consideration of the additional heritage structure.

As mentioned above, the Blast Control Areas shown in **Figure 9-1** are deemed conservative in that they are based on blast procedures and technology used prior to the Consolidation Project. Notwithstanding, several management and mitigation options are available for reducing blast impacts within the Blast Control Areas, including reducing bench heights and the use of electronic detonators to provide accurate timing of charges. In addition, vibration impacts are particularly very dependent on local geology, so that results from blasting in other mining areas provide only a guide to expected levels in the proposed new mining areas.

9.6 Potential Flyrock Impacts

Consistent with the BMP, the section of Denman Road within 500 m of blasting activities would be closed and public access restricted during blasting events by use of road closure signs and sentries at either end of the roadway.

All land within 500 m of proposed open cut areas is owned by HVEC (other than Denman Road). HVEC would employ measures to minimise livestock grazing on HVEC-owned land within 500 m of a blast zone. No heritage sites are within 500 m of a proposed additional blasting area.

9.7 Blast Impact on Public Infrastructure

In accordance with the BMP (BHP, 2021), potential impacts to public infrastructure associated with the Modification would be calculated based on ground vibration levels measured at the nearest monitor to the blast location and public infrastructure, by applying distance corrections with reference to the Site Law database.

Consistent with the BMP (BHP, 2021), monitoring of ground vibration at public infrastructure would be conducted under the following scenarios:

- Blasting in Roxburgh Pit within 500 m of 11 Kilovolt (kV) feeder to Mt Arthur and Mt Arthur infrastructure; and
- Blasting in Windmill Pit within 300 m of 66 kV twin feeder, optic fibre line along Denman Road.

9.8 Blast Management

HVEC would continue to implement management and mitigation measures for the Blast Control Areas described in **Section 9.5,** as well as all requirements under conditions of MP 09_0062.

Blasting options would continue to be investigated as a part of mining operations and as new technology is proven, with a view to developing methods and practices to achieve relevant criteria and minimise blasting impacts at all surrounding residences and other structures.

Electronic detonators were introduced on site for vibration management in August 2010. Electronic detonators improve the blast initiation sequence by accurately controlling timing delays of blasts, increasing rock fragmentation, lowering vibration levels and decreasing the potential of flyrock.

Sonic Detection and Ranting is currently applied at MAC and would continue to be applied to determine appropriate meteorological conditions for blasting.

As discussed in Section 3.2.1, a review of past blast monitoring has shown that, with the implementation of the existing mitigation measures, including the Blast Control Areas, MAC generally complies with blasting criteria. Given the small increase in open cut areas proposed by the Modification, it follows that with the ongoing implementation of the same measures, it is expected that MAC can continue to comply with the blasting criteria of MP 09_0062.

10 CONCLUSION

The assessment has addressed the potential noise and blasting impacts associated with the proposed Modification with the assumption that HVEC continues to implement the noise and blasting management and mitigation measures in place for the approved MAC operation.

It was found that operational noise generated by the Modification would comply with the operational noise criteria during the day and evening assessment periods. Exceedances of the MP 09_0062 noise levels are predicted for a small number of receivers to the north-west of the MAC. "Moderate" night-time exceedances (between 3-5 dB) of $L_{Aeq,15min}$ criteria are predicted at three receivers, one of which (receiver 226) is already entitled to acquisition upon request for predicted air quality impacts associated with the MAC in accordance with MP 09_0062.The other two receivers (receivers 200 and 200a) which already have the right to additional air quality mitigation upon request according to MP 09_0062, would be afforded the right to additional noise mitigation upon request should the Modification be approved.

Predicted noise levels for receivers located to the north-west of MAC in Zones D and F, are indicative of the proactive mitigation measures that would be implemented in accordance with the TARP for night time and evening periods during the adverse and very noise enhancing meteorological conditions that are relevant to the assessment.

The TARP described in the NMP is a reactive noise mitigation tool whereby a dashboard presents a visual map with real-time updates of logged L_{Aeq} levels at unattended noise loggers situated around the mine (BHP, 2023). When activated, the TARP facilitates reasonable and feasible modification of mining operations, aimed at preventing exceedances of the noise criteria outlined in **Table 5-3**.

Cumulative noise predictions from the operation of the MAC, Bengalla Mine, Mt Pleasant Operations, Mangoola Coal Mine and Maxwell Underground Coal Mine were conducted. When considering the maximum noise emissions for FY30, all cumulative noise level predictions comply with the amenity noise levels during the day, evening and night assessment periods.

Road traffic noise at Denman Road, east of Thomas Mitchell Drive was assessed against the road traffic noise criteria in MP 09_0062 and the noise criteria recommended in the RNP. Noise results indicate that road traffic noise levels generated by the MAC with the Modification in place are expected to exceed the night-time approved road traffic noise criterion of 55 dBA by 5 dB at receiver 12. The daytime noise level at the receiver would comply with the criterion of 60 dBA.

Traffic noise levels are expected to exceed the RNP road traffic noise criteria at receiver 12 during the day and night periods. The receiver would be exposed to "negligible" exceedances (between 1-2 dB according to the NPfI) due to added traffic from MAC. As described in the NPfI, such "negligible" exceedances would not be discernible by the average listener. It should be noted that receiver 12 already experience exceedances at night without MAC-related traffic; for this receiver the Modification would not cause new night-time exceedances. Compliance with the RNP noise criteria is expected at receiver 33 and all other privately-owned residential receivers.

As the Modification proposes a reduction to the coal rail transportation rate, with no increase in the maximum daily train movements, the assessment of rail transportation noise on the Antiene Spur and the broader state rail network was not warranted for the Modification.

The Modification proposes a reduction in the approved transportation quantity of product coal from 27 Mtpa to 20 Mtpa, which would result in a corresponding decrease of train movements from 30 to 20 movements per day (similar to actual movements). Furthermore, no increase in the maximum daily train movements during the day or at night is proposed as part of the Modification. As such, assessment of rail transportation noise on the Antiene Spur and the broader state rail network is not warranted for the Modification.

In consideration of the minor extension of the Windmill Pit proposed as part of the Modification, a blasting assessment has determined that the western Blast Control Area must be extended to satisfy the relevant criteria. A review of past blast monitoring has shown that, with the implementation of the existing mitigation measures, including the Blast Control Areas, MAC generally complies with blasting criteria. Given the small increase in open cut areas proposed by the Modification, it follows that with the ongoing implementation of the same measures, it is expected that MAC can continue to comply with the blasting criteria of MP 09_0062.

11 STATEMENT OF LIMITATIONS

This report entitled *Mt Arthur Coal Mine – MOD 2 – Noise and Blasting Report*, dated July 2023, was prepared by RWDI Australia Pty Ltd ("RWDI") for Resource Strategies Pty Ltd ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

12 REFERENCES

Australian and New Zealand Environment Council (1990) *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration*

BHP (2016-2022) *Mt Arthur Coal - Annual Review FY16-FY22*

BHP (2023) *MAC Noise Management Plan – MAC-ENC-MTP-032*

BHP (2021) *MAC Blast Management Plan – MAC-ENC-MTP-015*

Bill Jordan & Associates Pty Ltd (2009) *Edinglassie Homestead & Rous Lench – Blast Vibration Vulnerability*

Environment Protection Authority (2000) Industrial Noise Policy.

Global Acoustics (2015) *Mt Arthur Coal Mine - Road Traffic Noise Monitoring*

Global Acoustics (2019) *Sound Power by Sound Pressure Level Reports*

Gordon Downey (2020) *Acoustics Australia - Volume 48: 149-180 - An example approach to consider low frequency noise in the context of the NSW Noise Policy for Industry*

Hushpak Engineering (2017-2018) *Acoustic Reports*

NSW Department of Environment and Conservation (2011) *Assessing Vibration: a technical guideline*

NSW Department of Environment, Climate Change & Water (2011) *NSW Road Noise Policy*

NSW Department of Planning and Environment (2018) *Voluntary Land Acquisition and Mitigation Policy*

NSW Environment Protection Authority (2013) *Rail Infrastructure Noise Guideline*

NSW Environment Protection Authority (2000) *Industrial Noise Policy*

HVEC (2013) *Mt Arthur Coal Open Cut Modification - Environmental Assessment*

The Transport Planning Partnership (2023) *Mt Arthur Coal Modification 2 – Road Transport Assessment*

Thearle Engineering (2018-2021) *Sound Power Determination Reports - Mobile Machinery*

WesTrac Pty Ltd (2018-2019) *Sound Power by Sound Pressure Level, Operator Noise, and Whole-Body Vibration Exposure Assessments*

Wilkinson Murray (2009) *Mt Arthur Coal – Consolidation Project – Noise and Blasting Impact Assessment*

Wilkinson Murray (2013) *Mt Arthur Coal Open Cut Modification – Noise & Blasting Assessment*

Wilkinson Murray (2016) *Bulga Village Noise Audit – Final Report*

Wilkinson Murray (2020) *Mount Pleasant Optimisation Project – Noise & Blasting Assessment*

APPENDIX A

GLOSSARY OF ACOUSTIC TERMS

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

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

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

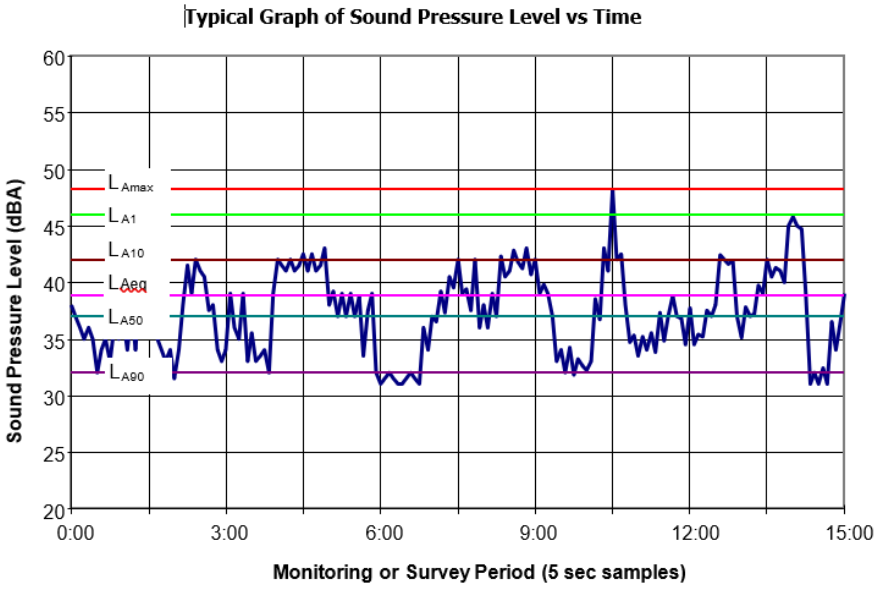
L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

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

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

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

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



APPENDIX B

NOISE SENSITIVE RECEIVERS

Receiver ID	Landholders	Easting	Northing
6	JIM ROD SCRIVEN	299204	6425199
10	MUSWELLBROOK RACE CLUB LIMITED	298604	6426138
12	CAROLINE JOY TUBB, DANIEL RUDOLPH TUBB	299544	6426340
12a	CAROLINE JOY TUBB, DANIEL RUDOLPH TUBB	299568	6426382
14	DOROTHY LYNETTE ROBINSON	299097	6426729
15	LESA JOAN DOBIE, MICHAEL CRAIG DOBIE	299126	6426722
15a	LESA JOAN DOBIE, MICHAEL CRAIG DOBIE	299113	6426701
16	ELIZABETH ANN SWEENEY, MARK LESLIE SWEENEY	299152	6426716
17	JASON ROGER GLEESON, MELANIE RUTH CRANFIELD	299208	6426699
18	ROBERT RICHARD ALLAN FARNSWORTH	299197	6426668
19	NARELLE JOY KEEVERS	299191	6426638
19a	NARELLE JOY KEEVERS	299215	6426621
20	CHRISTINE BERNADETTE MCINTOSH, WILLIAM JOHN MCINTOSH	299187	6426609
21	AMBER LYNN THOMSON-WEIR, RHYS COWAN WEIR	299180	6426558
22	ENGLEBRECHT RACING STABLES PTY. LIMITED	299175	6426542
23	RITA HELEN ENGLEBRECHT	299177	6426503
24	SUSAN YVONNE JOHNSON	299137	6426582
25	GAVIN LESLEY ANDREWS, KIRRALEE LOUISE ANDREWS	299134	6426597
26	MICHAEL ADAM MOLLER, REBECCA ANN BYRNES	299145	6426635
27	TREVOR DOUGLAS BARRON	299149	6426680
28	MARK JAMES MCGOLDRICK	298804	6426823
29	JOSEPHINE ANNE BARNETT, KENNETH BRIAN BARNETT	298865	6426827
30	DOUGLAS PETER ENGLEBRECHT	299120	6426780
32	NITA MARY ENGLEBRECHT, PAMELA MAY HUME, WALTER DAVID GEORGE ALMOND	299175	6426784
33	KERRY LYN BARKLEY, SCOTT WILLIAM BARKLEY	299389	6426888
34	WALTER JAMES HARDES	299807	6427072
36	CHRISTOPHER HORNE	299987	6428649
36a	CHRISTOPHER HORNE	299981	6428578
37	THE COUNCIL OF THE MUNICIPALITY OF MUSWELLBROOK	299974	6426713

Receiver ID	Landholders	Easting	Northing
38	MONADELPHOUS PROPERTIES PTY LTD	299661	6426121
40	JOHN RICHARD BUCKLEY, JUDITH ANN BUCKLEY	299692	6426052
41	RUTH FRANCES RAY, STANLEY RICHARD PHILLIP RAY	299634	6425991
42	DULCIE JOAN HALLETT, JAMES EWEN ANDERSON, JOHN CAMPBELL, KIM LEE CAMPBELL, MELISSA VIVIAN HALLETT, SUE ELLEN HALLETT, TREVLYN PETER HALLETT	299632	6425966
43	DULCIE JOAN HALLETT, JAMES EWEN ANDERSON, JOHN CAMPBELL, KIM LEE CAMPBELL, MELISSA VIVIAN HALLETT, SUE ELLEN HALLETT, TREVLYN PETER HALLETT	299621	6425918
56	JOHN TERRANCE BANCROFT, SHARYN ELAINE BANCROFT	300712	6426365
57	GARY JOHN MEYER	300833	6426376
58	ANTONY REGINALD MASTERS	300860	6426319
59	DEBRA ANNE OSBORN, RAYMOND JOHN DOUGLAS OSBORN	301018	6426278
60	DAVIN PERCY LARGE, LYNETTE ANN LARGE	301102	6426135
61	JAYSON RAYMOND HALL	301171	6426169
62	BARBARA MARIE KILLEN	301287	6426131
66	JOHN GRANT ABERCROMBIE	304829	6425572
66a	JOHN GRANT ABERCROMBIE	304767	6425562
68	BRUCE LESLIE BENNETT, JO-ANNE MARGARET BENNETT	305190	6425431
69	BRIAN STUART WELLS, MARILYN BROWN WELLS	304990	6425435
70	DEBBIE ROSE FOLPP, JOHN ALBERT FOLPP	304989	6425269
71	IAN ELIJAH HUNT, LINDA FLORENCE HUNT	305016	6425085
72	JEANETTE MARY BUDDEN, WALTER RONALD BUDDEN	305051	6424972
73	PATRICK JOHN HOGAN	305176	6424761
75	DOUG HARRIS	305097	6424577
76	MERLAUST PTY LIMITED	305079	6424360
77	MARY TERESA PERRAM	304864	6424159
77a	MARY TERESA PERRAM	305059	6424243
78	KARL CASBEN	304376	6424137
79	MUSWELLBROOK SHIRE COUNCIL	305178	6423954
79a	MUSWELLBROOK SHIRE COUNCIL	304920	6423905

Receiver ID	Landholders	Easting	Northing
82	JODIE WHITE, MARK THOMAS BARRY	305106	6423175
83	JULIE FOX	305174	6423525
85	RODNEY WALTER KERR	305221	6423060
86	IRENE DALE BAXTER, RONALD ERIC BAXTER	305453	6422383
87	ROBERT BOURNE HALLORAN	304976	6422282
88	JOHN WILLIAM NASH	304794	6422638
89	KYLE THOMAS RYAN	304389	6422458
91	AFRICK VERONICA DOHERTY, MICHAEL FRANCIS DOHERTY	304139	6422116
92	COLIN JOHN DUCK, LEANNE ELIZABETH DUCK	304348	6422171
93	DEBRA ANN OSBORN, RAYMOND JOHN DOUGLAS OSBORN	304780	6422140
94	LORRAINE TERESE SKINNER, ROGER CAMPBELL SKINNER	304853	6421916
95	GERRIT HENDRIK JOHAN DE BOER, PAMELA HARCOURT DE BOER	305624	6422117
96	PAUL ANDREW CAVANAGH, KELLIE MELISSA CAVANAGH	305849	6422167
97	PAUL CLIFTON, KATHLEEN CLIFTON	305807	6421894
98	BARBARA JONES	306007	6421800
99	LOUISE KATHERINE NASH	306292	6421610
99a	LOUISE KATHERINE NASH	306136	6421635
100	ERIC JOHN SHARMAN, MAUREEN CAMILLA SHARMAN	306310	6421439
101	PETER GUY HORDER	306175	6421247
102	NGAIRE HELOISE ROBERTSON	305984	6421127
111a	CALOGO BLOODSTOCK AG	296124	6408219
111b	CALOGO BLOODSTOCK AG	296159	6408251
111c	CALOGO BLOODSTOCK AG	296197	6408291
111d	CALOGO BLOODSTOCK AG	296167	6407835
112a	CALOGO BLOODSTOCK AG	295508	6407554
112b	CALOGO BLOODSTOCK AG	295517	6407450
112c	CALOGO BLOODSTOCK AG	295599	6407384
112d	CALOGO BLOODSTOCK AG	295727	6407254
112e	CALOGO BLOODSTOCK AG	295863	6407149
112f	CALOGO BLOODSTOCK AG	297732	6407244

Receiver ID	Landholders	Easting	Northing
113a	GODOLPHIN AUSTRALIA PTY LIMITED	292092	6407335
113b	GODOLPHIN AUSTRALIA PTY LIMITED	292457	6407903
113c	GODOLPHIN AUSTRALIA PTY LIMITED	292485	6407928
113d	GODOLPHIN AUSTRALIA PTY LIMITED	292518	6407959
113e	GODOLPHIN AUSTRALIA PTY LIMITED	292433	6407832
116	HYNKEN PTY LIMITED	290653	6409203
117	HYNKEN PTY LIMITED	290350	6406976
117a	HYNKEN PTY LIMITED	290304	6406976
118	NOEL EDGAR RAY	290014	6407156
121	JEFFREY NEVILLE WOLFGANG, JENNIFER ELIZABETH WOLFGANG	289756	6408885
121a	JEFFREY NEVILLE WOLFGANG, JENNIFER ELIZABETH WOLFGANG	289532	6408902
122	WILLIAM ROBIN LAURIE WOLFGANG	288968	6409056
125	TIMOTHY LAURIE WOLFGANG	288192	6408863
138	PETER MARK WOLFGANG, BRADLEY ROBERT WOLFGANG, DEANNA ELIZABETH WOLFGANG	289188	6411398
139	PETER MARK WOLFGANG, BRADLEY ROBERT WOLFGANG, DEANNA ELIZABETH WOLFGANG	288978	6411330
157	GIUSEPPE MEDIATI	285804	6413872
163	WONARUA SUPER PTY LTD, MARCUS HUMPHREY WOLFGANG, MARCUS HUMPHREY WOLFGANG	287221	6413909
178	BLAKEFIELD PTY LIMITED	287925	6417792
179	MARGARET BURGMANN, PHILIP RICHARD BURGMANN	287988	6419082
179a	MARGARET BURGMANN, PHILIP RICHARD BURGMANN	288066	6419050
179b	MARGARET BURGMANN, PHILIP RICHARD BURGMANN	288071	6419004
179c	MARGARET BURGMANN, PHILIP RICHARD BURGMANN	287933	6419095
182	KAREN MAREE PAULSEN, TONY ROSS PAULSEN	288861	6419989
186	MARK WILLIAM TURNER	290061	6421069
187	MALCOLM JAMES DUNCAN, MARILYN JOY DUNCAN	290912	6421269
189	RODNEY WILLIAM JONES	287951	6420135
190	DANIEL JOHN PHILLIPS	288292	6420167
191	RAYMOND LESLIE WILKS	288729	6420219

Receiver ID	Landholders	Easting	Northing
195	CAMILLA ANN MACPHERSON, LACHLAN ALEXANDER MACPHERSON	289424	6420979
198	MALCOLM JAMES DUNCAN, MARILYN JOY DUNCAN	290718	6421467
200	GEOFFREY ROGER WALSH, MELISSA KAY WALSH	290619	6422528
200a	GEOFFREY ROGER WALSH, MELISSA KAY WALSH	290459	6422499
201	CAROL ANNE DENTON, EDWARD JAMES DENTON	290871	6421547
213	S.R. & J. W. LAWSON (LINDISFARNE) PTY. LIMITED	288413	6422516
213a	S.R. & J. W. LAWSON (LINDISFARNE) PTY. LIMITED	288744	6422670
213b	S.R. & J. W. LAWSON (LINDISFARNE) PTY. LIMITED	288563	6422550
213c	S.R. & J. W. LAWSON (LINDISFARNE) PTY. LIMITED	288663	6422488
216	ANTHONY ANDREW MEYER, BELINDA THERESE MEYER	289101	6422375
218a	JOHN DAVID MICHAEL MARKHAM	289391	6423191
218b	JOHN DAVID MICHAEL MARKHAM	289359	6423042
218c	JOHN DAVID MICHAEL MARKHAM	289154	6422757
226	TREVOR WAYNE ROOTS	290948	6423469
231	PETER JOHN BROWN	289166	6423423
232	JUNE IRENE BROWN, PETER JOHN BROWN	289352	6423345
233a	KATHLEEN FRANCIS MERRICK, RAYMOND MORRIS MERRICK	289458	6424902
233b	KATHLEEN FRANCIS MERRICK, RAYMOND MORRIS MERRICK	289574	6424547
238	MARK ROBERT PEEL	290893	6426165
238a	MARK ROBERT PEEL	290771	6426234
239	PETER RAYMOND ELLIS	290650	6425665
240	PETER STUART JOHN MURRAY	291001	6426005
242	NEVILLE JOHN ELLIS, RUTH YVONNE ELLIS	290978	6426456
242a	NEVILLE JOHN ELLIS, RUTH YVONNE ELLIS	290581	6426753
242b	NEVILLE JOHN ELLIS, RUTH YVONNE ELLIS	291000	6426444
243	GRAEME TIMOTHY MCNEILL	289104	6426843
252	BRADLEY ATHOL STRACHAN, TRACEY ELIZABETH STRACHAN	291265	6428277
254	ADRIAN RONALD FLETCHER, FIONA FLETCHER	290362	6428029
257	REGINALD BRUCE PARKINSON	289022	6427911
259	FRANCIS NOEL GOOGE, WENDY LEE GOOGE	288368	6427932

Receiver ID	Landholders	Easting	Northing
264	JONATHAN BUCHANAN MOORE	292319	6429013
265	RONALD DAVID WIEKENS, MAARTJE MARIJKE WIEKENS	308305	6421623
268	THE STATE OF NEW SOUTH WALES	311493	6418846
287	WILD GROUP PTY LIMITED	307345	6421749
300	NATALIE ANNE LANESBURY, STEVEN RONALD LANESBURY	301226	6426267
301	DALE ROBERT SIMPSON, KATRINA MICHELLE SIMPSON	301260	6426262
304	Unknown owner - strata title	301294	6426239
304a	Unknown owner - strata title	301296	6426254
304b	Unknown owner - strata title	301300	6426267
305	JOSHUA STEPHEN DANIEL	301296	6426220
305a	JOSHUA STEPHEN DANIEL	301284	6426186
306	BRUCE PATRICK HONEYSETT, CHRISTINE JANE HONEYSETT	301338	6426238
309	JODIE ELIZABETH AYRE, MICHAEL ALLAN BUNT	301355	6426221
310	GARY TREVOR JOHNSON, NOELINE VERA MORTON	301345	6426193
311	FRANCIE JEAN GAGELER	301354	6426149
312	JOAN IRENE HOBBS	301351	6426087
314	RAYMOND ARTHUR CHILLINGWORTH, THERESA KIM CHILLINGWORTH	301397	6426182
315	KATHRYN BARBARA KILLEN, WAYNE JOHN KILLEN	301401	6426205
316	DANIEL LEIGH O'CONNOR	301402	6426229
319	DENNIS HOWARD BURTON, DORIS JOAN BURTON	301658	6425861
320	KR TIMPSON & ASSOCIATES PTY LIMITED	301660	6425834
321	JAMIE FIBBENS, NICOLE JANE FIBBENS	301665	6425796
322	JOSEPH GEORGE MADIKIAN, MARGARET ALICE MADIKIAN	301666	6425777
325	GRAHAM KEITH BRIDGE, JENNIFER MARGARET BRIDGE	304802	6425787
327	BARBARA JOY HOPMANS, WALTER JOHN HOPMANS	305991	6424365
329	ELLEN JOZINA WALLMAN, MARK JAMES WALLMAN	305647	6423320
330	MITCHELL JOHN WARD, SHARI LEIGH WARD	305857	6423073
331	TRAVIS RAVA ZOLNIKOV, KAREN SUZANNE ZOLNIKOV	306923	6423536
332	BRIAN TERENCE DAVIS, JUDITH ELIZABETH DAVIS	307051	6423083
332a	BRIAN TERENCE DAVIS, JUDITH ELIZABETH DAVIS	307163	6423084

Receiver ID	Landholders	Easting	Northing
333	BRADLEY JAMES KING	307233	6423085
334	JUDITH ANNE FISHER, CHRISTOPHER IAN DENNIS	306736	6422603
335	KEVIN CROSS, KAREN IRENE CROSS	306609	6422064
337	WAYNE DAVID SMITH	310331	6420362
344	ELIZABETH ANNE LAWMAN, ROBERT ALAN LAWMAN	300328	6428693
345	BRAD LAWMAN	300416	6428684
348	PHILIP NORMAN SIMPSON	299896	6429203
350	MARIA SORMAZ, NIKOLA SORMAZ	300004	6429277
352	BIANCA ELLEN WHITEHEAD, WAYNE BARRY WHITEHEAD	300331	6429494
353	LAWRENCE GREGORY WICKS	300536	6429474
354	MARY HELEN RAY	300571	6429446
355	ANDREW KENT BIRCH	301019	6429169
356	CAROL MAY KELMAN, LEONARD GEORGE KELMAN	300958	6429302
358	GWEN ELIZABETH PITMAN	300797	6429363
361	COWTIME INVESTMENTS PTY LIMITED	300343	6429725
364	JONATHAN BUCHANAN MOORE	291386	6428704
365	BRUCE LEONARD BATES, MARY LLEWELLYN BATES	291276	6429621
368	JASON LEE SMITH, KERRIE LEA BALMER	289094	6428237
372	JOHN MICHAEL LONERGAN, SANDRA THERESE LONERGAN, LINDA ANNE PARKES, PATRICIA MARY HOWARD, JOHN EDWARD LONERGAN	289455	6428817
377	SCOTT HEYWOOD JENNAR	286649	6429789
378	SCOTT HEYWOOD JENNAR	286664	6429919
388	WONARUA SUPER PTY LTD, MARCUS HUMPHREY WOLFGANG, MARCUS HUMPHREY WOLFGANG	286143	6414130
438	MARK ANTHONY & SONYA ANN GREENTREE AND GRANT KINGSLEY & MAYBERY SUSAN GREENTREE	286450	6420099
438a	MARK ANTHONY & SONYA ANN GREENTREE AND GRANT KINGSLEY & MAYBERY SUSAN GREENTREE	286413	6419986
471	KIERAN DENIS FALVEY	286716	6417722
472	PADRAE PTY LTD	286682	6417667
473	DUNBIER PASTORAL PTY LIMITED	285189	6417802

Receiver ID	Landholders	Easting	Northing
476	JANE MAREA THRIFT	284677	6416760
477	BRIAN ROBERT PARKER, DEBRA ANN PARKER	284476	6416436
477a	BRIAN ROBERT PARKER, DEBRA ANN PARKER	284597	6416229
480	DEXTER WILLIAM BURKILL	283536	6415202
481	VICTORIA ELIZABETH SOWTER, CHRISTOPHER JAMES SOWTER	285288	6415547
482	ELIZABETH MARIE ROBINSON, MARK EDWARD WILSON	285375	6415475
484	PHILIP JOHN NICHOLS, BELINDA MAREE NICHOLS	286641	6413978
485	IVAN HOWARD BURKILL, ELISEN MANUELA BURKILL	282978	6415475
485a	IVAN HOWARD BURKILL, ELISEN MANUELA BURKILL	283234	6415566
IR.1	MADISON JAYNE FORD, MARK DAVID THORLEY	301927	6425612
IR.2	KEVIN JOHN NILON	301980	6425569
IR.3	BRETT JAMES OSBORN	302013	6425533
IR.4	ISSAM HAMWI, JULIANNE MAREE GILL	302111	6425464
IR.5	KAROLYN ELIZABETH MCGEACHIE, SCOTT DAVID MCGEACHIE	302139	6425427
IR.6	BRONWEN CARRALL SMITH, DANIEL HEATH SMITH	302159	6425390
IR.7	SCOTT ANTHONY FULLOON, TARA DANIELLE FULLOON	302175	6425354
IR.8	KARLENE HOLLAND	302197	6425321
IR.9	TIMOTHY JOHN VANDERWERF, TONI LEIGH VANDERWERF	302256	6425255
IR.10	KRISTON ROBERT BAKER, NICOLE RENEE BAKER	302339	6425219
IR.11	JULIE ANN DANIEL, LLOYD GEORGE DANIEL	302424	6425186
IR.12	ROBERT JOHN CULLEN, SUSAN MAY CULLEN	302462	6425165
IR.13	HEATHER CLARE MCBRIDE, LINDSAY CECIL MCBRIDE	302546	6425133
IR.14	ANGELA LOUISE DAWSON, CAMERON JAMES DAWSON	302513	6425065
IR.15	JESSICA MARIE HINSCHEN, MATTHEW ROSS HINSCHEN	302434	6425098
IR.16	NEIL THOMAS POLLARD, SUZANNE MAREE POLLARD	302395	6425116
IR.17	ALISON LEANNE BRADSTREET, DAVID BRENDAN BRADSTREET	302355	6425129
IR.18	ANDREW JAMES WRIGHT, HOLLIE ANN WRIGHT	302311	6425140
IR.19	CATHERINE ELIZABETH MAY, SCOTT THOMAS NOONAN	302237	6425178
IR.20	BENJAMIN SCOTT WALSH, RENAE JANE WALSH	302166	6425235
IR.21	STANISLAV STRIJAKOV	302125	6425300

Receiver ID	Landholders	Easting	Northing
IR.22	BAZIL JOHN WILCHER, RACHEL-ANN WILCHER	302009	6425441
IR.23	CATHY LEANNE LANGFORD, PETER JOHN LANGFORD	301961	6425468
IR.24	BRUCE DAVID WEBBER	301906	6425486
IR.25	CAROL LEA HUGHES, CHRIS MAURICE KNOWLES	302067	6425492
IR.26	HAMISH WILLIAM HARTLEY WING	302223	6425281
IR.27	MATHEW DAVID STAFA, MELISSA JAYNE STAFA	302295	6425237
IR.28	JENNY-LOU HINSCHEN, KELVIN JOHN HINSCHEN	302381	6425202
IR.29	LAUREN ANGELA MCINTOSH, SHANE JOHN MCINTOSH	302505	6425149
IR.30	DARRAN EDWARD ELLIOTT, LISA MAREE ELLIOTT	302584	6425116
IR.31	DONNA ANNE LLOYD, GRANT BERNARD LLOYD	302624	6425097
IR.32	MICHAEL LAURENCE BURKE, SARAH-JAYNE LOUISE BURKE	302663	6425084
IR.33	KIEREN WADE O'BRIEN, STACEY ELIZABETH O'BRIEN	302701	6425064
IR.34	HERBERT BRUCE BAXTER, JULIE ALETA BAXTER	302745	6425048
IR.35	KARLIE ANN NORMAN, SCOTT EDMOND NORMAN	302634	6425013
IR.36	BIJESH JOHN, JAYA BIJESH	302589	6425031
IR.37	BENJAMIN THOMAS CARTER, STACEY JAYNE CARTER	302551	6425050
IR.38	CHRISTOPHER JAMES CRANDELL, NATASHA ANN MARIE WHITE	302476	6425079
IR.39	CATHERINE MICHELLE MAREE EDWARDS, GREGORY JOHN EDWARDS	302104	6425342
IR.40	CHERYL ANN HILLERY	302045	6425416
IR.41	ALI MOURAD, FATIMA ISSA	301796	6425584
IR.42	BRADLEY JOHN SWANN, NAOMI LISA SWANN	301705	6425635
IR.43	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301363	6425690
IR.44	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301359	6425621
IR.45	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301410	6425651
IR.46	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301397	6425547
IR.47	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301444	6425576
IR.48	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301488	6425609
IR.49	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301498	6425660
IR.50	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301543	6425658
IR.51	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301580	6425623
IR.52	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301606	6425581

Receiver ID	Landholders	Easting	Northing
IR.53	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301571	6425552
IR.54	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301533	6425530
IR.55	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301503	6425505
IR.56	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301470	6425478
IR.57	RICHARD THOMAS PATRICK HILTON	301570	6425457
IR.58	DEBABRATA DAS & RASHMI REKHA DAS	301549	6425395
IR.59	DAVID GATT & CATHERINE ANNE GALEA	301608	6425419
IR.60	ALEXANDER JOEL LENNON & SILVANA LENNON	301664	6425460
IR.61	GOLAM SARWAR & AMRIN SARWAR	301694	6425490
IR.62	KENDALL JADE STEELE & KIERAN WILLIAM STEELE	301729	6425505
IR.63	MOHSIN ZAMAN	301774	6425470
IR.64	SHIVANDHANA NARAYAN	301808	6425412
IR.65	MARILYN AGUILELLA	301739	6425398
IR.66	DAMEN ANTHONY NIXON & JORDAN PATRICIA PAGETT	301678	6425378
IR.67	GURDEEP KUMAR	301639	6425348
IR.68	KIERON TROY GALLETLY	301602	6425318
IR.69	ANTHONY WILLIAM POWER & KATHERINE ASHLEY BAXTER	301638	6425258
IR.70	NARINDER SINGH	301668	6425211
IR.71	JOSEY LEE MANSFIELD & SAPNA SIDHU	301701	6425176
IR.72	SHASHI KANTH SINGH THAKUR & SANYOGITA SINGH	301751	6425140
IR.73	JOSHYMON JOSEPH & JISHA THOMAS	301801	6425225
IR.74	JESSY JAMES & SIBI ENCHENATTU CHACKOCHAN	301840	6425256
IR.75	AKHIL KATHURIA	301872	6425289
IR.76	MCDONALD JONES COMMUNITIES PTY LTD	301908	6425334
IR.77	MCDONALD JONES COMMUNITIES PTY LTD	301975	6425331
IR.78	MARIE ANTHONETTE SANTOS BERMEJO	301997	6425270
IR.79	DIANA PAULA ORTANEZ COLLO & JANE REINA SANTOS BERMEJO	301936	6425237
IR.80	DARYL GAVIDIA & SUSAN ROSSMERY CARRASCO ATAUPILLCO	301901	6425207
IR.81	SHIRLEY LAI	301864	6425178
IR.82	JOSH MICHAEL WHYBURN & LUCY MARGARET PRUDDEN	301831	6425120
IR.83	CRAIG JOHN WALLIS	301884	6425085

Receiver ID	Landholders	Easting	Northing
IR.84	DAVID COLIN GEORGE SHIBBLE, MARSHA SALLY SHIBBLE	301952	6425119
IR.85	MITCHELL BENNET KELLY, TAMMY MARIE KELLY	302010	6425153
IR.86	MATTHEW GARY CLARK, MELINDA LEE MONTEFIORE	302059	6425178
IR.87	JAYE FOOT, KRISTAL ANNE FOOT	302113	6425191
IR.88	BRETT ROBERT MILLER, CHELSEA LOUISE RICHENS	302189	6425134
IR.89	CLINTON WAYNE MOBBERLEY	302149	6425106
IR.90	KANE DAVID DENNIS	302102	6425088
IR.91	JULIANNE HERBERT, MARK GREGORY HERBERT	302012	6425065
IR.92	JESSICA ALMOND, JOHNATHON WILLIAM ASHFORD	302052	6425018
IR.93	FAYE WEBBER, IAN RAYMOND WEBBER	302191	6425002
IR.94	AIMIE LOUISE NICHOLS, CHRISTOPHER JOHN NICHOLS	302083	6424979
IR.95	NSW TRUSTEE AND GUARDIAN	302136	6424953
IR.96	PHILIP KEITH BERNARD, SUE ELLEN BERNARD	302178	6424926
IR.97	DAVID LENICE MOFFITT, KERRY ACKERS MOFFITT	302247	6424958
IR.98	FAYE WEBBER, IAN RAYMOND WEBBER	302238	6425024
IR.99	CAMERON GEORGE AYRES, KRYSTAL ANN AYRES	302294	6425038
IR.100	ANGUS ALEXANDER NAPIER, ANITA MARIJKE NAPIER	302323	6424962
IR.101	DOMINIC WALTER PIKE	302369	6424984
IR.102	MELANIE JEAN O'NIONS, STEPHEN JOHN O'NIONS	302419	6424974
IR.103	AMY-LOUISE FLEMING, ROBERT MATTHEW FLEMING	302470	6424926
IR.104	JULIE MAREE DELFORCE, SHANE MATHEW DELFORCE	302403	6424900
IR.105	SAMUEL DAVID DOYLE	302372	6424891
IR.106	LORNA MAREE COX, SHANE MALCOLM COX	302337	6424876
IR.107	DAMIAN JOHN CHICK	302257	6424870
IR.108	BRETT ANDREW MICHAEL, SHANNON JADE MICHAEL	302263	6424828
IR.109	AIDAN THOMAS PONT	302280	6424779
IR.110	RYAN PETER LANGFORD	302271	6424724
IR.111	KRISTEN JOY SEYMOUR, TIMOTHY FRANCIS SEYMOUR	302252	6424668
IR.112	CHAD CLEEVELY	302286	6424616
IR.113	BRADLEY JOHN WESTGATE, KELLY WESTGATE	302355	6424673

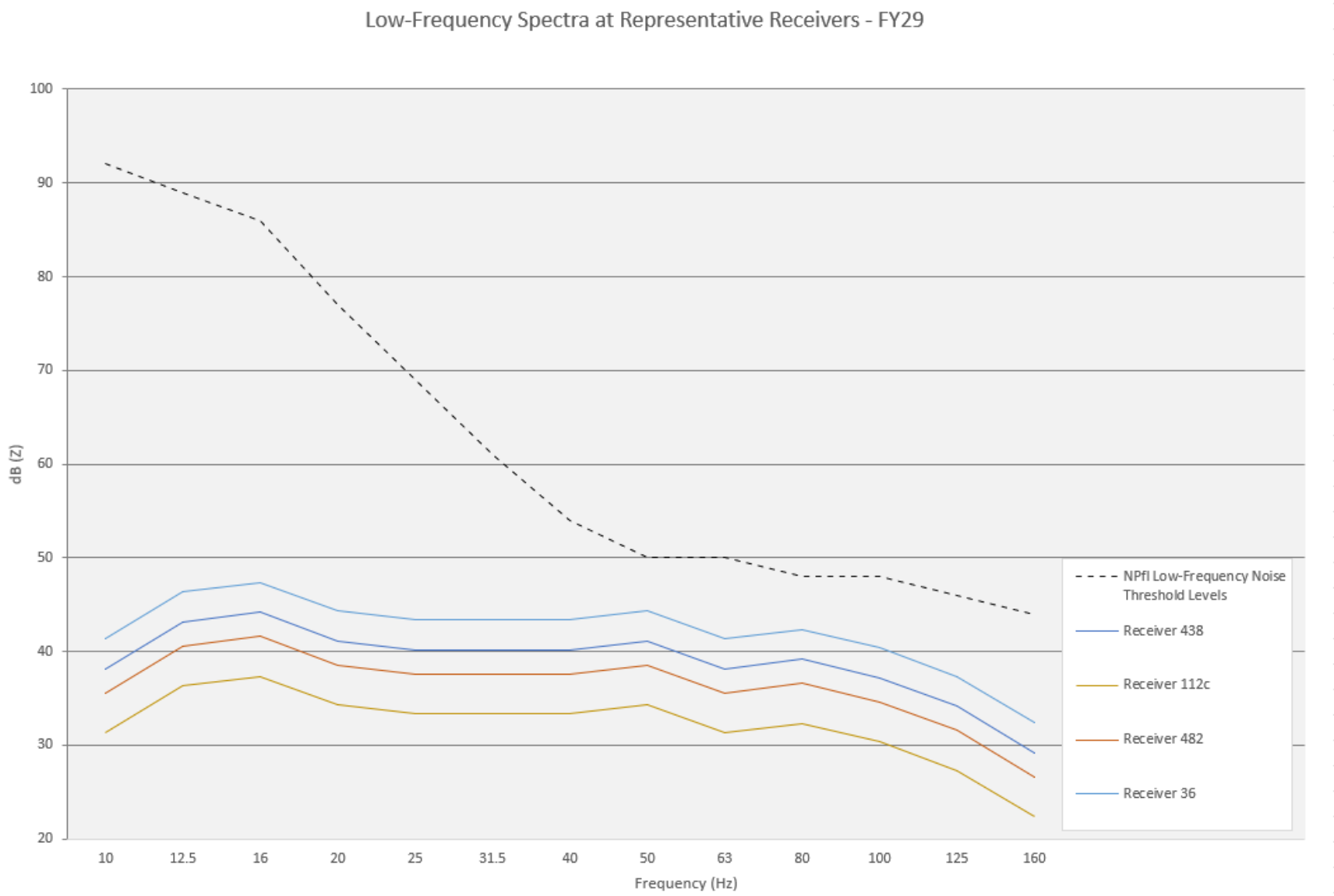
Receiver ID	Landholders	Easting	Northing
IR.114	BARRY KEITH MOFFITT	302383	6424705
IR.115	ANDREW BRIAN HINES, REBECCA LEE HINES	302417	6424741
IR.116	KRISTEN LEIGH CLAPHAM, STEPHEN MURRAY BRYAN CLAPHAM	302454	6424770
IR.117	ANTHONY GRAHAM MARGETTS	302486	6424813
IR.118	HAYLEY ERIN MCCAUGHEY, PHILLIP WILLIAM MCCAUGHEY	302519	6424851
IR.119	IAN WILLIAM GOUGH, LISA MAREE GOUGH	302547	6424889
IR.120	LINDSEY BEAU ARCHIBALD, TONYA TEREAZA MCQUILTY	302590	6424933
IR.121	BELINDA LEANNE ROUSELL, MATTHEW CHRISTOPHER ROUSELL	302696	6424991
IR.122	LUKE DOMINIC SANDELL-HAY, TAHNEE ELISE O'HALLORAN	302675	6424944
IR.123	PATRICK JOHN HOGAN	302774	6424959
IR.124	PATRICK JOHN HOGAN	302645	6424900
IR.125	AMANDA LOUISE CRAIG, BRADY BORG	302622	6424866
IR.126	LINDSEY FRANCIS SMITH, SAVANNAH MACY MELICHAR	302597	6424811
IR.127	TROY ENZO MUSSIO, TUMAY ANNITRA MUSSIO	302568	6424766
IR.128	JOANNE GOLDTHORPE, NATHAN ALLEN BRIND	302521	6424737
IR.129	JEREMY RICHARD PAINE	302484	6424709
IR.130	KATHERINE ANN VANDENBERG, STEPHEN JOHN VANDENBERG	302462	6424656
IR.131	DAYARNE REBECCA SMITH, MATHEW LINCON SMITH	302531	6424650
IR.132	REBECCA JANE GUMB	302472	6424541
IR.133	MARK SHANE MCCREERY, MICHELLE SOPHIA MCCREERY	302397	6424608
IR.134	DANIEL BRIAN KELLY, NATALIE LOUISE KELLY	302354	6424568
IR.135	CHRISTOPHER CHARLES GEORGE & RACHAEL ANN GEORGE	302289	6424541
IR.136	HERBERT BRUCE BAXTER & JULIE ALETA BAXTER	302339	6424485
IR.137	MATTHEW PETER LEVEN	302381	6424441
IR.138	MUSWELLBROOK SHIRE COUNCIL	302130	6424458
IR.139	DAHLIA BINTE HAMZAH	302173	6424488
IR.140	MARK SHANE MCCREERY & MICHELLE SOPHIA MCCREERY	302180	6424543
IR.141	SCOTT DOUGLAS PARKER	302110	6424503
IR.142	DANIEL STEPHEN DENNIS & ASHLEY JEAN JONES	302086	6424549
IR.143	JAMES MARK BARNETT	302165	6424590

Receiver ID	Landholders	Easting	Northing
IR.144	FAYE WEBBER, IAN RAYMOND WEBBER	302163	6424641
IR.145	FAYE WEBBER, IAN RAYMOND WEBBER	302106	6424640
IR.146	MARION MARGARET BROTHERTON	302052	6424598
IR.147	CHRISTOPHER JAMES KENNEDY, DEBRA KENNEDY	302025	6424651
IR.148	FIONA HELEN MCGUINNES	302083	6424684
IR.149	FAYE WEBBER, IAN RAYMOND WEBBER	302126	6424720
IR.150	CAMERON JOHN BENKOVIC, NICHOLA LEA BENKOVIC	302192	6424717
IR.151	FAYE WEBBER, IAN RAYMOND WEBBER	302185	6424793
IR.152	MUSWELLBROOK SHIRE COUNCIL	302070	6424774
IR.153	HUGH SNEDDON, JULIE ANN SNEDDON	302119	6424874
IR.154	DANIEL LEWIS KILKOLLY	302071	6424903
IR.155	MICHAEL JOSEPH STUART MURDOCH	302020	6424831
IR.156	FAYE WEBBER, IAN RAYMOND WEBBER	301978	6424861
IR.157	DANIELLE JANE JACKSON, PETER ANTHONY JACKSON	302030	6424936
IR.158	CINDY LEE HUGO, GLENN ANTHONY HUGO	301978	6424968
IR.159	FAYE WEBBER, IAN RAYMOND WEBBER	301930	6424905
IR.160	CARLA MAE DUNN, LIAM JOHN DUNN	301892	6424930
IR.161	FAYE WEBBER, IAN RAYMOND WEBBER	301910	6425004
IR.162	ALEXANDRIA HELEN STEVENSON & BRODIE MICHAEL RONALD SMITH	301861	6425024
IR.163	MORGAN NEIL WEBBER	301810	6425041
IR.164	MUSWELLBROOK SHIRE COUNCIL	301817	6424957
IR.165	MARK JOHN MCCANN & MEGAN LOUISE MCCANN	301737	6425063
IR.166	KEYREN MICHAEL FORBES & LEAH MAREE HARDY	301699	6425079
IR.167	KALLAN JOHN WATSON	301661	6425104
IR.168	DWAYNE RAYMOND O'BRIEN & JESSICA MYRA O'BRIEN	301628	6425140
IR.169	MUSWELLBROOK SHIRE COUNCIL	301596	6425187
IR.170	MUSWELLBROOK SHIRE COUNCIL	301534	6425190
IR.171	CHRISTOPHER IAN RODNEY SCRIVEN & BRIANA JADE SCRIVEN	301558	6425259
IR.172	DAVID JOHN FRIEND & NATALIE JAYNE FRIEND	301523	6425322
IR.173	MUSWELLBROOK SHIRE COUNCIL	301464	6425401
IR.174	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301414	6425441

Receiver ID	Landholders	Easting	Northing
IR.175	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301373	6425477
IR.176	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301339	6425508
IR.177	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301316	6425542
IR.178	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301295	6425579
IR.179	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301290	6425628
IR.180	IAN RAYMOND WEBBER & CATHERINE LOUISE WEBBER	301299	6425687

APPENDIX C

LOW-FREQUENCY NOISE SPECTRA AT REPRESENTATIVE RECEIVERS


Low-Frequency Spectra at Representative Receivers - FY29
dB (Z)
100
90
80
70
60
50
40
30
20
10
12.5
16
20
25
31.5
40
50
63
80
100
125
160
Frequency (Hz)
NPfl Low-Frequency Noise Threshold Levels
Receiver 438
Receiver 112c
Receiver 482
Receiver 36

APPENDIX D

PREDICTED OPERATIONAL NOISE LEVELS

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
Privately-Owned Residential Receivers							
6[2]	B	22	22	36	39	38	37
12	B	21	21	36	39	38	37
14	C	23	23	37	41	40	39
15	C	23	23	37	41	40	39
15a	C	23	23	37	41	40	39
16	C	23	23	37	41	40	39
17	C	21	21	37	41	40	39
18	C	22	22	37	41	40	39
19	C	23	23	37	41	40	39
19a	C	21	21	37	41	40	39
20	C	22	22	37	41	40	39
21	C	21	21	37	41	40	39
22	C	21	21	37	41	40	39
23	C	21	21	37	41	40	39
24	C	22	22	37	41	40	39
25	C	23	23	37	41	40	39
26	C	23	23	37	41	40	39
27	C	23	23	37	41	40	39
28	C	24	24	38	41	40	39
29	C	24	24	38	41	40	39
30	C	23	23	37	41	40	39
32	C	23	23	37	41	40	39
33	C	21	21	36	41	40	39
34	E	22	22	36	39	39	39
36	-[7]	23	23	34	39	39	39
36a	-[7]	22	22	34	39	39	39
41	B	21	21	36	39	38	37

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
56	E	27	27	38	39	39	39
57	E	27	27	38	39	39	39
58	E	27	27	38	39	39	39
59	E	27	27	38	39	39	39
60	E	27	27	38	39	39	39
61	E	27	27	38	39	39	39
62	E	27	27	38	39	39	39
66	G	16	16	20	41	40	39
66a	G	17	17	21	41	40	39
68	G	15	15	21	41	40	39
69	G	14	14	19	41	40	39
70	G	15	15	19	41	40	39
71	G	15	15	20	41	40	39
72	G	16	16	21	41	40	39
73	G	17	17	25	41	40	39
75	G	18	18	26	41	40	39
76	G	17	17	24	41	40	39
77	G	17	17	22	41	40	39
78	G	28	28	39	41	40	39
79	G	19	19	24	41	40	39
79a	G	19	19	23	41	40	39
82	G	23	23	37	41	40	39
83	G	22	22	32	41	40	39
85	G	23	23	38	41	40	39
86	G	22	22	36	41	40	39
87	A	23	23	36	37	40	38
88	A	22	22	34	37	40	38
89	A	23	23	28	37	40	38

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
91	A	25	25	32	37	40	38
92	A	24	24	29	37	40	38
93	A	24	24	37	37	40	38
94	A	24	24	37	37	40	38
95	G	23	23	38	41	40	39
96	G	23	23	38	41	40	39
97	G	24	24	38	41	40	39
98	G	24	24	38	41	40	39
99	G	26	26	38	41	40	39
99a	G	24	24	38	41	40	39
100	G	26	26	38	41	40	39
101[3]	G	25	25	37	41	40	39
102[4]	G	24	24	35	41	40	39
111a	H	9	9	15	35	35	35
111b	H	9	9	15	35	35	35
111c	H	9	9	14	35	35	35
111d	H	9	9	17	35	35	35
112a	H	8	8	15	35	35	35
112b	H	8	8	15	35	35	35
112c	H	8	8	17	35	35	35
112d	H	8	8	17	35	35	35
112e	H	9	9	19	35	35	35
112f	H	7	7	16	35	35	35
113a	H	16	16	24	35	35	35
113b	H	14	14	23	35	35	35
113c	H	13	13	23	35	35	35
113d	H	13	13	23	35	35	35
113e	H	14	14	23	35	35	35

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
116	H	15	15	24	35	35	35
117a	H	16	16	24	35	35	35
118	H	16	16	24	35	35	35
121	H	7	7	13	35	35	35
121a	H	7	7	17	35	35	35
122	H	7	7	18	35	35	35
125	H	10	10	21	35	35	35
138	H	7	7	15	35	35	35
139	H	7	7	16	35	35	35
157	-[8]	10	10	21	35	35	35
163	-[8]	10	10	18	35	35	35
178	-[8]	15	15	24	35	35	35
179	F	16	16	26	37	36	35
179a	F	16	16	27	37	36	35
179b	F	16	16	27	37	36	35
179c	F	15	15	25	37	36	35
182	F	22	22	32	37	36	35
186	F	25	25	34	37	36	35
187	F	25	25	35[14]	37	36	35
189	F	16	16	22	37	36	35
190	F	23	23	32	37	36	35
191	F	22	22	32	37	36	35
195	F	25	25	34	37	36	35
198	F	24	24	34	37	36	35
200	D	30	30	38[14]	37	36	35
200a	D	30	30	38[14]	37	36	35
201	D	25	25	35	37	36	35
213	F	26	26	33	37	36	35

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
213a	F	28	28	35	37	36	35
213c	F	27	27	35	37	36	35
216	F	28	28	35[14]	37	36	35
218a	D	29	29	35[14]	37	36	35
218b	D	29	29	35[14]	37	36	35
218c	F	28	28	35[14]	37	36	35
226[2]	D	32	32	38[14]	37	36	35
231	D	29	29	35[14]	37	36	35
232	D	29	29	35[14]	37	36	35
233a	D	25	25	30	37	36	35
233b	D	25	25	31	37	36	35
238	D	31	31	35[14]	37	36	35
238a	D	31	31	35[14]	37	36	35
239	D	31	31	35[14]	37	36	35
240	D	29	29	34	37	36	35
242	D	29	29	33	37	36	35
242a	D	22	22	29	37	36	35
242b	D	29	29	34	37	36	35
243	D	24	24	30	37	36	35
252	D	23	23	29	37	36	35
254	D	20	20	27	37	36	35
257	D	22	22	29	37	36	35
259	D	22	22	29	37	36	35
264[6]	-[9]	23	23	28	37	36	35
265	-[10]	13	13	22	35	35	35
268	-[10]	10	10	23	35	35	35
287	G	26	26	35	41	40	39
300	E	27	27	38	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
301	E	26	26	38	39	39	39
304	E	27	27	38	39	39	39
304a	E	27	27	38	39	39	39
304b	E	26	26	38	39	39	39
305	E	27	27	38	39	39	39
305a	E	27	27	38	39	39	39
306	E	26	26	38	39	39	39
309	E	27	27	38	39	39	39
310	E	26	26	38	39	39	39
311	E	27	27	38	39	39	39
312	E	27	27	38	39	39	39
314	E	27	27	38	39	39	39
315	E	27	27	38	39	39	39
316	E	23	23	28	39	39	39
319	E	26	26	38	39	39	39
320	E	26	26	38	39	39	39
321	E	26	26	38	39	39	39
322	E	26	26	38	39	39	39
325	G	16	16	19	41	40	39
327	G	20	20	32	41	40	39
329	G	23	23	37	41	40	39
330	G	23	23	37	41	40	39
331	-[10]	23	23	35	35	35	35
332	-[10]	23	23	35	35	35	35
332a	-[10]	24	24	35	35	35	35
333	-[10]	24	24	35	35	35	35
334	G	21	21	25	41	40	39
335	G	25	25	37	41	40	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
337	-[10]	14	14	27	35	35	35
344	-[7]	20	20	34	39	39	39
345	-[7]	20	20	33	39	39	39
348	-[7]	23	23	34	39	39	39
350	-[7]	22	22	34	39	39	39
352	-[7]	19	19	33	39	39	39
353	-[7]	19	19	33	39	39	39
354	-[7]	19	19	33	39	39	39
355	-[7]	19	19	33	39	39	39
356	-[7]	20	20	33	39	39	39
358	-[7]	19	19	33	39	39	39
361	-[7]	20	20	33	39	39	39
364	D	22	22	28	37	36	35
365	D	22	22	29	37	36	35
368	D	23	23	29	37	36	35
372	D	22	22	29	37	36	35
377	D	18	18	25	37	36	35
378	D	18	18	25	37	36	35
388	-[8]	10	10	21	35	35	35
438	F	20	20	29	37	36	35
438a	F	18	18	28	37	36	35
471	-[8]	16	16	26	35	35	35
472	-[8]	16	16	26	35	35	35
473	-[8]	17	17	26	35	35	35
476	-[8]	16	16	25	35	35	35
477	-[8]	16	16	25	35	35	35
477a	-[8]	16	16	25	35	35	35
480	-[8]	15	15	24	35	35	35

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
481	-[8]	16	16	25	35	35	35
482	-[8]	16	16	25	35	35	35
484	-[8]	9	9	19	35	35	35
485	-[8]	15	15	24	35	35	35
485a	-[8]	15	15	24	35	35	35
IR.1	E	27	27	38	39	39	39
IR.2	E	27	27	38	39	39	39
IR.3	E	27	27	38	39	39	39
IR.4	E	28	28	37	39	39	39
IR.5	E	28	28	38	39	39	39
IR.6	E	28	28	38	39	39	39
IR.7	E	28	28	38	39	39	39
IR.8	E	28	28	38	39	39	39
IR.9	E	28	28	38	39	39	39
IR.10	E	28	28	38	39	39	39
IR.11	E	28	28	38	39	39	39
IR.12	E	28	28	38	39	39	39
IR.13	E	29	29	39	39	39	39
IR.14	E	29	29	38	39	39	39
IR.15	E	28	28	38	39	39	39
IR.16	E	28	28	38	39	39	39
IR.17	E	28	28	38	39	39	39
IR.18	E	28	28	38	39	39	39
IR.19	E	28	28	38	39	39	39
IR.20	E	28	28	39	39	39	39
IR.21	E	29	29	39	39	39	39
IR.22	E	28	28	39	39	39	39
IR.23	E	28	28	39	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.24	E	28	28	39	39	39	39
IR.25	E	28	28	36	39	39	39
IR.26	E	28	28	38	39	39	39
IR.27	E	28	28	38	39	39	39
IR.28	E	28	28	38	39	39	39
IR.29	E	28	28	39	39	39	39
IR.30	E	29	29	39	39	39	39
IR.31	E	29	29	39	39	39	39
IR.32[13]	E	29	29	39	39	39	39
IR.33	E	29	29	39	39	39	39
IR.34	E	29	29	39	39	39	39
IR.35	E	29	29	39	39	39	39
IR.36	E	28	28	39	39	39	39
IR.37	E	28	28	39	39	39	39
IR.38	E	28	28	38	39	39	39
IR.39	E	29	29	39	39	39	39
IR.40	E	29	29	39	39	39	39
IR.41	E	27	27	38	39	39	39
IR.42	E	26	26	37	39	39	39
IR.43[13]	E	25	25	37	39	39	39
IR.44[13]	E	25	25	37	39	39	39
IR.45[13]	E	25	25	37	39	39	39
IR.46[13]	E	24	24	37	39	39	39
IR.47[13]	E	25	25	37	39	39	39
IR.48[13]	E	25	25	37	39	39	39
IR.49[13]	E	26	26	37	39	39	39
IR.50[13]	E	26	26	37	39	39	39
IR.51[13]	E	26	26	37	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.52[13]	E	26	26	37	39	39	39
IR.53[13]	E	26	26	37	39	39	39
IR.54[13]	E	25	25	37	39	39	39
IR.55[13]	E	25	25	37	39	39	39
IR.56[13]	E	24	24	37	39	39	39
IR.57[13]	E	25	25	37	39	39	39
IR.58[13]	E	25	25	37	39	39	39
IR.59[13]	E	26	26	37	39	39	39
IR.60[13]	E	27	27	37	39	39	39
IR.61[13]	E	26	26	37	39	39	39
IR.62[13]	E	26	26	37	39	39	39
IR.63[13]	E	27	27	38	39	39	39
IR.64[13]	E	27	27	38	39	39	39
IR.65[13]	E	26	26	37	39	39	39
IR.66[13]	E	27	27	37	39	39	39
IR.67[13]	E	26	26	37	39	39	39
IR.68[13]	E	26	26	37	39	39	39
IR.69[13]	E	26	26	36	39	39	39
IR.70[13]	E	26	26	36	39	39	39
IR.71[13]	E	26	26	36	39	39	39
IR.72[13]	E	25	25	36	39	39	39
IR.73[13]	E	26	26	37	39	39	39
IR.74[13]	E	27	27	38	39	39	39
IR.75[13]	E	28	28	38	39	39	39
IR.76[13]	E	28	28	39	39	39	39
IR.77[13]	E	28	28	39	39	39	39
IR.78[13]	E	27	27	38	39	39	39
IR.79[13]	E	27	27	38	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.80[13]	E	27	27	38	39	39	39
IR.81[13]	E	27	27	37	39	39	39
IR.82[13]	E	26	26	36	39	39	39
IR.83[13]	E	27	27	36	39	39	39
IR.84	E	27	27	37	39	39	39
IR.85	E	27	27	38	39	39	39
IR.86	E	28	28	38	39	39	39
IR.87	E	28	28	38	39	39	39
IR.88	E	28	28	38	39	39	39
IR.89	E	28	28	38	39	39	39
IR.90	E	28	28	38	39	39	39
IR.91	E	27	27	38	39	39	39
IR.92	E	27	27	37	39	39	39
IR.93[13]	E	27	27	37	39	39	39
IR.94	E	27	27	37	39	39	39
IR.95	E	28	28	37	39	39	39
IR.96	E	27	27	37	39	39	39
IR.97	E	27	27	37	39	39	39
IR.98[13]	E	27	27	37	39	39	39
IR.99	E	28	28	38	39	39	39
IR.100	E	27	27	38	39	39	39
IR.101	E	27	27	38	39	39	39
IR.102[13]	E	27	27	38	39	39	39
IR.103	E	27	27	38	39	39	39
IR.104	E	28	28	38	39	39	39
IR.105	E	28	28	38	39	39	39
IR.106	E	26	26	37	39	39	39
IR.107	E	27	27	37	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.108	E	27	27	37	39	39	39
IR.109	E	27	27	37	39	39	39
IR.110[13]	E	27	27	37	39	39	39
IR.111	E	27	27	37	39	39	39
IR.112[13]	E	27	27	37	39	39	39
IR.113	E	28	28	38	39	39	39
IR.114	E	28	28	38	39	39	39
IR.115	E	28	28	38	39	39	39
IR.116	E	27	27	38	39	39	39
IR.117	E	28	28	38	39	39	39
IR.118	E	28	28	38	39	39	39
IR.119	E	28	28	39	39	39	39
IR.120	E	28	28	39	39	39	39
IR.121	E	29	29	39	39	39	39
IR.122	E	28	28	39	39	39	39
IR.123	E	28	28	39	39	39	39
IR.124	E	28	28	39	39	39	39
IR.125	E	28	28	38	39	39	39
IR.126	E	28	28	38	39	39	39
IR.127	E	28	28	38	39	39	39
IR.128	E	28	28	38	39	39	39
IR.129	E	28	28	38	39	39	39
IR.130	E	27	27	38	39	39	39
IR.131	E	27	27	38	39	39	39
IR.132	E	27	27	38	39	39	39
IR.133	E	28	28	38	39	39	39
IR.134	E	28	28	38	39	39	39
IR.135[13]	E	27	27	37	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.136[13]	E	27	27	37	39	39	39
IR.137[13]	E	27	27	37	39	39	39
IR.138[13]	E	25	25	36	39	39	39
IR.139[13]	E	26	26	36	39	39	39
IR.140[13]	E	27	27	36	39	39	39
IR.141[13]	E	25	25	35	39	39	39
IR.142[13]	E	26	26	35	39	39	39
IR.143[13]	E	27	27	37	39	39	39
IR.144[13]	E	27	27	37	39	39	39
IR.145	E	26	26	36	39	39	39
IR.146	E	25	25	35	39	39	39
IR.147	E	26	26	35	39	39	39
IR.148	E	26	26	36	39	39	39
IR.149[13]	E	27	27	37	39	39	39
IR.150	E	27	27	37	39	39	39
IR.151[13]	E	26	26	37	39	39	39
IR.152[13]	E	26	26	36	39	39	39
IR.153	E	28	28	37	39	39	39
IR.154[13]	E	27	27	37	39	39	39
IR.155[13]	E	26	26	36	39	39	39
IR.156	E	26	26	36	39	39	39
IR.157	E	27	27	37	39	39	39
IR.158	E	27	27	37	39	39	39
IR.159[13]	E	26	26	36	39	39	39
IR.160	E	26	26	36	39	39	39
IR.161	E	26	26	36	39	39	39
IR.162[13]	E	26	26	36	39	39	39
IR.163[13]	E	26	26	36	39	39	39

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.164[13]	E	25	25	36	39	39	39
IR.165[13]	E	25	25	36	39	39	39
IR.166[13]	E	26	26	36	39	39	39
IR.167[13]	E	25	25	36	39	39	39
IR.168[13]	E	25	25	36	39	39	39
IR.169[13]	E	24	24	36	39	39	39
IR.170[13]	E	23	23	35	39	39	39
IR.171[13]	E	25	25	36	39	39	39
IR.172[13]	E	25	25	36	39	39	39
IR.173[13]	E	24	24	36	39	39	39
IR.174[13]	E	24	24	37	39	39	39
IR.175[13]	E	25	25	37	39	39	39
IR.176[13]	E	25	25	36	39	39	39
IR.177[13]	E	24	24	36	39	39	39
IR.178[13]	E	25	25	37	39	39	39
IR.179[13]	E	25	25	37	39	39	39
IR.180[13]	E	25	25	37	39	39	39
Commercial Receivers							
10	-[11]	23	23	38	n/a[12]	n/a[12]	n/a[12]
37	-[11]	26	26	37	n/a[12]	n/a[12]	n/a[12]
Mine-Owned Residential Receivers							
9a	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
9b	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
11	-[11]	21	21	36	n/a[12]	n/a[12]	n/a[12]
31	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
174	-[11]	16	16	26	n/a[12]	n/a[12]	n/a[12]
183	-[11]	25	25	35	n/a[12]	n/a[12]	n/a[12]
196	-[11]	27	27	37	n/a[12]	n/a[12]	n/a[12]

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
203	-[11]	27	27	38	n/a[12]	n/a[12]	n/a[12]
204	-[11]	30	30	42	n/a[12]	n/a[12]	n/a[12]
205	-[11]	28	28	39	n/a[12]	n/a[12]	n/a[12]
206	-[11]	31	31	42	n/a[12]	n/a[12]	n/a[12]
206a	-[11]	31	31	42	n/a[12]	n/a[12]	n/a[12]
207	-[11]	31	31	43	n/a[12]	n/a[12]	n/a[12]
208	-[11]	32	32	43	n/a[12]	n/a[12]	n/a[12]
209	D	31	31	42	37	36	35
210	D	35	35	42	37	36	35
211	D	33	33	44	37	36	35
250	-[11]	31	31	35	n/a[12]	n/a[12]	n/a[12]
328	-[11]	20	20	32	n/a[12]	n/a[12]	n/a[12]
400	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
401	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
402	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
403	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
404	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
405	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
407	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
408	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
409	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
410	-[11]	19	19	34	n/a[12]	n/a[12]	n/a[12]
411	-[11]	24	24	39	n/a[12]	n/a[12]	n/a[12]
412	-[11]	25	25	37	n/a[12]	n/a[12]	n/a[12]
412a	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
413	-[11]	23	23	35	n/a[12]	n/a[12]	n/a[12]
414	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414a	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
414b	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414c	-[11]	36	36	41	n/a[12]	n/a[12]	n/a[12]
414d	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414e	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
415	-[11]	36	36	44	n/a[12]	n/a[12]	n/a[12]
415a	-[11]	36	36	44	n/a[12]	n/a[12]	n/a[12]
416	-[11]	31	31	35	n/a[12]	n/a[12]	n/a[12]
417	-[11]	18	18	24	n/a[12]	n/a[12]	n/a[12]
418	-[11]	22	22	28	n/a[12]	n/a[12]	n/a[12]
419	-[11]	22	22	27	n/a[12]	n/a[12]	n/a[12]
420	-[11]	23	23	28	n/a[12]	n/a[12]	n/a[12]
420a	-[11]	23	23	28	n/a[12]	n/a[12]	n/a[12]
421	-[11]	23	23	29	n/a[12]	n/a[12]	n/a[12]
424	-[11]	22	22	29	n/a[12]	n/a[12]	n/a[12]
425	-[11]	22	22	28	n/a[12]	n/a[12]	n/a[12]
430	-[11]	21	21	27	n/a[12]	n/a[12]	n/a[12]
433	-[11]	15	15	21	n/a[12]	n/a[12]	n/a[12]
436	-[11]	23	23	31	n/a[12]	n/a[12]	n/a[12]
436a	-[11]	22	22	31	n/a[12]	n/a[12]	n/a[12]
439	-[11]	19	19	27	n/a[12]	n/a[12]	n/a[12]
441	-[11]	17	17	27	n/a[12]	n/a[12]	n/a[12]
442	-[11]	17	17	27	n/a[12]	n/a[12]	n/a[12]
444	-[11]	17	17	26	n/a[12]	n/a[12]	n/a[12]
446	-[11]	11	11	18	n/a[12]	n/a[12]	n/a[12]
447	-[11]	28	28	38	n/a[12]	n/a[12]	n/a[12]
448	-[11]	24	24	30	n/a[12]	n/a[12]	n/a[12]
449	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]
450	-[11]	24	24	35	n/a[12]	n/a[12]	n/a[12]

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
451	-[11]	17	17	29	n/a[12]	n/a[12]	n/a[12]
452	-[11]	8	8	12	n/a[12]	n/a[12]	n/a[12]
452a	-[11]	7	7	14	n/a[12]	n/a[12]	n/a[12]
453	-[11]	14	14	25	n/a[12]	n/a[12]	n/a[12]
454a	-[11]	9	9	25	n/a[12]	n/a[12]	n/a[12]
454b	-[11]	8	8	19	n/a[12]	n/a[12]	n/a[12]
454c	-[11]	10	10	23	n/a[12]	n/a[12]	n/a[12]
455a	-[11]	26	26	33	n/a[12]	n/a[12]	n/a[12]
455b	-[11]	26	26	33	n/a[12]	n/a[12]	n/a[12]
455c	-[11]	26	26	33	n/a[12]	n/a[12]	n/a[12]
456	-[11]	23	23	34	n/a[12]	n/a[12]	n/a[12]
457	-[11]	22	22	34	n/a[12]	n/a[12]	n/a[12]
458	-[11]	22	22	34	n/a[12]	n/a[12]	n/a[12]
459	-[11]	22	22	34	n/a[12]	n/a[12]	n/a[12]
460	-[11]	24	24	36	n/a[12]	n/a[12]	n/a[12]
461	-[11]	23	23	35	n/a[12]	n/a[12]	n/a[12]
462	-[11]	23	23	35	n/a[12]	n/a[12]	n/a[12]
463	-[11]	23	23	34	n/a[12]	n/a[12]	n/a[12]
464	-[11]	23	23	34	n/a[12]	n/a[12]	n/a[12]
465	-[11]	19	19	33	n/a[12]	n/a[12]	n/a[12]
466	-[11]	19	19	33	n/a[12]	n/a[12]	n/a[12]
467	-[11]	22	22	33	n/a[12]	n/a[12]	n/a[12]
468	-[11]	37	37	44	n/a[12]	n/a[12]	n/a[12]
469	-[11]	10	10	17	n/a[12]	n/a[12]	n/a[12]
469a	-[11]	8	8	16	n/a[12]	n/a[12]	n/a[12]
469b	-[11]	10	10	16	n/a[12]	n/a[12]	n/a[12]
470	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
500	-[11]	31	31	36	n/a[12]	n/a[12]	n/a[12]

OPERATIONAL NOISE LEVELS ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			Noise Impact Assessment Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
501	-[11]	31	31	36	n/a[12]	n/a[12]	n/a[12]
503	-[11]	29	29	39	n/a[12]	n/a[12]	n/a[12]
511	-[11]	30	30	41	n/a[12]	n/a[12]	n/a[12]
511a	-[11]	30	30	42	n/a[12]	n/a[12]	n/a[12]
511b	-[11]	29	29	40	n/a[12]	n/a[12]	n/a[12]
512	-[11]	29	29	42	n/a[12]	n/a[12]	n/a[12]
512a	-[11]	30	30	43	n/a[12]	n/a[12]	n/a[12]
513	-[11]	28	28	40	n/a[12]	n/a[12]	n/a[12]
515	-[11]	37	37	46	n/a[12]	n/a[12]	n/a[12]
516	-[11]	37	37	49	n/a[12]	n/a[12]	n/a[12]
517	-[11]	32	32	45	n/a[12]	n/a[12]	n/a[12]
519	-[11]	22	22	35	n/a[12]	n/a[12]	n/a[12]
520	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]
521	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]
523a	-[11]	25	25	38	n/a[12]	n/a[12]	n/a[12]
523b	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
523c	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
524a	-[11]	16	16	29	n/a[12]	n/a[12]	n/a[12]
524b	-[11]	16	16	30	n/a[12]	n/a[12]	n/a[12]
524c	-[11]	17	17	29	n/a[12]	n/a[12]	n/a[12]
524d	-[11]	16	16	28	n/a[12]	n/a[12]	n/a[12]
525	-[11]	25	25	38	n/a[12]	n/a[12]	n/a[12]
526	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
527	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]

Notes:

1. Day: 7:00 am - 6:00 pm; Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.
2. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts.
3. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts. HVEC is only required to acquire the property if acquisition is no longer reasonably achievable under the approval for the Drayton mine.
4. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts.

5. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise and air quality impacts.
6. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts. HVEC is only required to acquire the property if acquisition is not reasonably achievable under the approval for the Bengalla mine.
7. Receivers west of Muswellbrook were not allocated to any residential zone and were therefore assigned noise criteria based on the 2018 background noise survey conducted for Mount Pleasant Optimisation Project. See **Table 5-5** for more details.
8. Western receivers between Zones F and H were not allocated to any residential zone and therefore were conservatively assigned to Zone H, which has the most stringent criteria.
9. Receiver 264 not allocated to any residential zone but located just outside Zone D was assigned to Zone D.
10. Receivers east of Zone G were conservatively assigned the same criteria as Zone H due to the setback distance separating these receivers to New England Highway.
11. Residential zones provided only for privately-owned residential receivers.
12. Mine-owned and commercial receivers are included for information only. No noise impact assessment criteria applicable for those receivers.
13. Vacant block with approved DA for construction of future dwelling.
14. Level includes pro-active mitigation measures.

APPENDIX E

PREDICTED OPERATIONAL NOISE LEVELS WITHOUT PRO-ACTIVE MITIGATION MEASURES

OPERATIONAL NOISE LEVELS ASSESSMENT WITHOUT PRO-ACTIVE MITIGATION MEASURES			
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)	Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
Privately-Owned Residential Receivers			
187	F	36	35
200	D	39	35
200a	D	39	35
216	F	36	35
218a	D	36	35
218b	D	36	35
218c	F	36	35
226[3]	D	39	35
231	D	36	35
232	D	36	35
238	D	36	35
238a	D	36	35
239	D	36	35

Notes:

1. Night: 10:00 pm - 7:00 am.
2. Receiver subject to acquisition rights in accordance with Project Approval 09_0062 for predicted air quality impacts.

APPENDIX F

PROJECT AMENITY AND CUMULATIVE OPERATIONAL NOISE LEVELS

Table F-1: Project Amenity Noise Level Assessment

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
Privately-Owned Residential Receivers							
6[2]	B	22	22	36	48	43	38
12	B	21	21	36	48	43	38
14	C	23	23	37	48	43	38
15	C	23	23	37	48	43	38
15a	C	23	23	37	48	43	38
16	C	23	23	37	48	43	38
17	C	21	21	37	48	43	38
18	C	22	22	37	48	43	38
19	C	23	23	37	48	43	38
19a	C	21	21	37	48	43	38
20	C	22	22	37	48	43	38
21	C	21	21	37	48	43	38
22	C	21	21	37	48	43	38
23	C	21	21	37	48	43	38
24	C	22	22	37	48	43	38
25	C	23	23	37	48	43	38
26	C	23	23	37	48	43	38
27	C	23	23	37	48	43	38
28	C	24	24	38	48	43	38
29	C	24	24	38	48	43	38
30	C	23	23	37	48	43	38
32	C	23	23	37	48	43	38
33	C	21	21	36	48	43	38
34	E	22	22	36	48	43	38
36	-[7]	23	23	34	48	43	38
36a	-[7]	22	22	34	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
41	B	21	21	36	48	43	38
56	E	27	27	38	48	43	38
57	E	27	27	38	48	43	38
58	E	27	27	38	48	43	38
59	E	27	27	38	48	43	38
60	E	27	27	38	48	43	38
61	E	27	27	38	48	43	38
62	E	27	27	38	48	43	38
66	G	16	16	20	48	43	38
66a	G	17	17	21	48	43	38
68	G	15	15	21	48	43	38
69	G	14	14	19	48	43	38
70	G	15	15	19	48	43	38
71	G	15	15	20	48	43	38
72	G	16	16	21	48	43	38
73	G	17	17	25	48	43	38
75	G	18	18	26	48	43	38
76	G	17	17	24	48	43	38
77	G	17	17	22	48	43	38
78	G	28	28	39	48	43	38
79	G	19	19	24	48	43	38
79a	G	19	19	23	48	43	38
82	G	23	23	37	48	43	38
83	G	22	22	32	48	43	38
85	G	23	23	38	48	43	38
86	G	22	22	36	48	43	38
87	A	23	23	36	48	43	38
88	A	22	22	34	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
89	A	23	23	28	48	43	38
91	A	25	25	32	48	43	38
92	A	24	24	29	48	43	38
93	A	24	24	37	48	43	38
94	A	24	24	37	48	43	38
95	G	23	23	38	48	43	38
96	G	23	23	38	48	43	38
97	G	24	24	38	48	43	38
98	G	24	24	38	48	43	38
99	G	26	26	38	48	43	38
99a	G	24	24	38	48	43	38
100	G	26	26	38	48	43	38
101[3]	G	25	25	37	48	43	38
102[4]	G	24	24	35	48	43	38
111a	H	9	9	15	48	43	38
111b	H	9	9	15	48	43	38
111c	H	9	9	14	48	43	38
111d	H	9	9	17	48	43	38
112a	H	8	8	15	48	43	38
112b	H	8	8	15	48	43	38
112c	H	8	8	17	48	43	38
112d	H	8	8	17	48	43	38
112e	H	9	9	19	48	43	38
112f	H	7	7	16	48	43	38
113a	H	16	16	24	48	43	38
113b	H	14	14	23	48	43	38
113c	H	13	13	23	48	43	38
113d	H	13	13	23	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
113e	H	14	14	23	48	43	38
116	H	15	15	24	48	43	38
117a	H	16	16	24	48	43	38
118	H	16	16	24	48	43	38
121	H	7	7	13	48	43	38
121a	H	7	7	17	48	43	38
122	H	7	7	18	48	43	38
125	H	10	10	21	48	43	38
138	H	7	7	15	48	43	38
139	H	7	7	16	48	43	38
157	-[8]	10	10	21	48	43	38
163	-[8]	10	10	18	48	43	38
178	-[8]	15	15	24	48	43	38
179	F	16	16	26	48	43	38
179a	F	16	16	27	48	43	38
179b	F	16	16	27	48	43	38
179c	F	15	15	25	48	43	38
182	F	22	22	32	48	43	38
186	F	25	25	34	48	43	38
187	F	25	25	35[14]	48	43	38
189	F	16	16	22	48	43	38
190	F	23	23	32	48	43	38
191	F	22	22	32	48	43	38
195	F	25	25	34	48	43	38
198	F	24	24	34	48	43	38
200	D	30	30	38[14]	48	43	38
200a	D	30	30	38[14]	48	43	38
201	D	25	25	35	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
213	F	26	26	33	48	43	38
213a	F	28	28	35	48	43	38
213c	F	27	27	35	48	43	38
216	F	28	28	35[14]	48	43	38
218a	D	29	29	35[14]	48	43	38
218b	D	29	29	35[14]	48	43	38
218c	F	28	28	35[14]	48	43	38
226[2]	D	32	32	38[14]	48	43	38
231	D	29	29	35[14]	48	43	38
232	D	29	29	35[14]	48	43	38
233a	D	25	25	30	48	43	38
233b	D	25	25	31	48	43	38
238	D	31	31	35[14]	48	43	38
238a	D	31	31	35[14]	48	43	38
239	D	31	31	35[14]	48	43	38
240	D	29	29	34	48	43	38
242	D	29	29	33	48	43	38
242a	D	22	22	29	48	43	38
242b	D	29	29	34	48	43	38
243	D	24	24	30	48	43	38
252	D	23	23	29	48	43	38
254	D	20	20	27	48	43	38
257	D	22	22	29	48	43	38
259	D	22	22	29	48	43	38
264[6]	-[9]	23	23	28	48	43	38
265	-[10]	13	13	22	48	43	38
268	-[10]	10	10	23	48	43	38
287	G	26	26	35	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
300	E	27	27	38	48	43	38
301	E	26	26	38	48	43	38
304	E	27	27	38	48	43	38
304a	E	27	27	38	48	43	38
304b	E	26	26	38	48	43	38
305	E	27	27	38	48	43	38
305a	E	27	27	38	48	43	38
306	E	26	26	38	48	43	38
309	E	27	27	38	48	43	38
310	E	26	26	38	48	43	38
311	E	27	27	38	48	43	38
312	E	27	27	38	48	43	38
314	E	27	27	38	48	43	38
315	E	27	27	38	48	43	38
316	E	23	23	28	48	43	38
319	E	26	26	38	48	43	38
320	E	26	26	38	48	43	38
321	E	26	26	38	48	43	38
322	E	26	26	38	48	43	38
325	G	16	16	19	48	43	38
327	G	20	20	32	48	43	38
329	G	23	23	37	48	43	38
330	G	23	23	37	48	43	38
331	-[10]	23	23	35	48	43	38
332	-[10]	23	23	35	48	43	38
332a	-[10]	24	24	35	48	43	38
333	-[10]	24	24	35	48	43	38
334	G	21	21	25	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
335	G	25	25	37	48	43	38
337	-[10]	14	14	27	48	43	38
344	-[7]	20	20	34	48	43	38
345	-[7]	20	20	33	48	43	38
348	-[7]	23	23	34	48	43	38
350	-[7]	22	22	34	48	43	38
352	-[7]	19	19	33	48	43	38
353	-[7]	19	19	33	48	43	38
354	-[7]	19	19	33	48	43	38
355	-[7]	19	19	33	48	43	38
356	-[7]	20	20	33	48	43	38
358	-[7]	19	19	33	48	43	38
361	-[7]	20	20	33	48	43	38
364	D	22	22	28	48	43	38
365	D	22	22	29	48	43	38
368	D	23	23	29	48	43	38
372	D	22	22	29	48	43	38
377	D	18	18	25	48	43	38
378	D	18	18	25	48	43	38
388	-[8]	10	10	21	48	43	38
438	F	20	20	29	48	43	38
438a	F	18	18	28	48	43	38
471	-[8]	16	16	26	48	43	38
472	-[8]	16	16	26	48	43	38
473	-[8]	17	17	26	48	43	38
476	-[8]	16	16	25	48	43	38
477	-[8]	16	16	25	48	43	38
477a	-[8]	16	16	25	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
480	-[8]	15	15	24	48	43	38
481	-[8]	16	16	25	48	43	38
482	-[8]	16	16	25	48	43	38
484	-[8]	9	9	19	48	43	38
485	-[8]	15	15	24	48	43	38
485a	-[8]	15	15	24	48	43	38
IR.1	E	27	27	38	48	43	38
IR.2	E	27	27	38	48	43	38
IR.3	E	27	27	38	48	43	38
IR.4	E	28	28	37	48	43	38
IR.5	E	28	28	38	48	43	38
IR.6	E	28	28	38	48	43	38
IR.7	E	28	28	38	48	43	38
IR.8	E	28	28	38	48	43	38
IR.9	E	28	28	38	48	43	38
IR.10	E	28	28	38	48	43	38
IR.11	E	28	28	38	48	43	38
IR.12	E	28	28	38	48	43	38
IR.13	E	29	29	39	48	43	38
IR.14	E	29	29	38	48	43	38
IR.15	E	28	28	38	48	43	38
IR.16	E	28	28	38	48	43	38
IR.17	E	28	28	38	48	43	38
IR.18	E	28	28	38	48	43	38
IR.19	E	28	28	38	48	43	38
IR.20	E	28	28	39	48	43	38
IR.21	E	29	29	39	48	43	38
IR.22	E	28	28	39	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.23	E	28	28	39	48	43	38
IR.24	E	28	28	39	48	43	38
IR.25	E	28	28	36	48	43	38
IR.26	E	28	28	38	48	43	38
IR.27	E	28	28	38	48	43	38
IR.28	E	28	28	38	48	43	38
IR.29	E	28	28	39	48	43	38
IR.30	E	29	29	39	48	43	38
IR.31	E	29	29	39	48	43	38
IR.32[13]	E	29	29	39	48	43	38
IR.33	E	29	29	39	48	43	38
IR.34	E	29	29	39	48	43	38
IR.35	E	29	29	39	48	43	38
IR.36	E	28	28	39	48	43	38
IR.37	E	28	28	39	48	43	38
IR.38	E	28	28	38	48	43	38
IR.39	E	29	29	39	48	43	38
IR.40	E	29	29	39	48	43	38
IR.41	E	27	27	38	48	43	38
IR.42	E	26	26	37	48	43	38
IR.43[13]	E	25	25	37	48	43	38
IR.44[13]	E	25	25	37	48	43	38
IR.45[13]	E	25	25	37	48	43	38
IR.46[13]	E	24	24	37	48	43	38
IR.47[13]	E	25	25	37	48	43	38
IR.48[13]	E	25	25	37	48	43	38
IR.49[13]	E	26	26	37	48	43	38
IR.50[13]	E	26	26	37	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.51[13]	E	26	26	37	48	43	38
IR.52[13]	E	26	26	37	48	43	38
IR.53[13]	E	26	26	37	48	43	38
IR.54[13]	E	25	25	37	48	43	38
IR.55[13]	E	25	25	37	48	43	38
IR.56[13]	E	24	24	37	48	43	38
IR.57[13]	E	25	25	37	48	43	38
IR.58[13]	E	25	25	37	48	43	38
IR.59[13]	E	26	26	37	48	43	38
IR.60[13]	E	27	27	37	48	43	38
IR.61[13]	E	26	26	37	48	43	38
IR.62[13]	E	26	26	37	48	43	38
IR.63[13]	E	27	27	38	48	43	38
IR.64[13]	E	27	27	38	48	43	38
IR.65[13]	E	26	26	37	48	43	38
IR.66[13]	E	27	27	37	48	43	38
IR.67[13]	E	26	26	37	48	43	38
IR.68[13]	E	26	26	37	48	43	38
IR.69[13]	E	26	26	36	48	43	38
IR.70[13]	E	26	26	36	48	43	38
IR.71[13]	E	26	26	36	48	43	38
IR.72[13]	E	25	25	36	48	43	38
IR.73[13]	E	26	26	37	48	43	38
IR.74[13]	E	27	27	38	48	43	38
IR.75[13]	E	28	28	38	48	43	38
IR.76[13]	E	28	28	39	48	43	38
IR.77[13]	E	28	28	39	48	43	38
IR.78[13]	E	27	27	38	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.79[13]	E	27	27	38	48	43	38
IR.80[13]	E	27	27	38	48	43	38
IR.81[13]	E	27	27	37	48	43	38
IR.82[13]	E	26	26	36	48	43	38
IR.83[13]	E	27	27	36	48	43	38
IR.84	E	27	27	37	48	43	38
IR.85	E	27	27	38	48	43	38
IR.86	E	28	28	38	48	43	38
IR.87	E	28	28	38	48	43	38
IR.88	E	28	28	38	48	43	38
IR.89	E	28	28	38	48	43	38
IR.90	E	28	28	38	48	43	38
IR.91	E	27	27	38	48	43	38
IR.92	E	27	27	37	48	43	38
IR.93[13]	E	27	27	37	48	43	38
IR.94	E	27	27	37	48	43	38
IR.95	E	28	28	37	48	43	38
IR.96	E	27	27	37	48	43	38
IR.97	E	27	27	37	48	43	38
IR.98[13]	E	27	27	37	48	43	38
IR.99	E	28	28	38	48	43	38
IR.100	E	27	27	38	48	43	38
IR.101	E	27	27	38	48	43	38
IR.102[13]	E	27	27	38	48	43	38
IR.103	E	27	27	38	48	43	38
IR.104	E	28	28	38	48	43	38
IR.105	E	28	28	38	48	43	38
IR.106	E	26	26	37	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.107	E	27	27	37	48	43	38
IR.108	E	27	27	37	48	43	38
IR.109	E	27	27	37	48	43	38
IR.110[13]	E	27	27	37	48	43	38
IR.111	E	27	27	37	48	43	38
IR.112[13]	E	27	27	37	48	43	38
IR.113	E	28	28	38	48	43	38
IR.114	E	28	28	38	48	43	38
IR.115	E	28	28	38	48	43	38
IR.116	E	27	27	38	48	43	38
IR.117	E	28	28	38	48	43	38
IR.118	E	28	28	38	48	43	38
IR.119	E	28	28	39	48	43	38
IR.120	E	28	28	39	48	43	38
IR.121	E	29	29	39	48	43	38
IR.122	E	28	28	39	48	43	38
IR.123	E	28	28	39	48	43	38
IR.124	E	28	28	39	48	43	38
IR.125	E	28	28	38	48	43	38
IR.126	E	28	28	38	48	43	38
IR.127	E	28	28	38	48	43	38
IR.128	E	28	28	38	48	43	38
IR.129	E	28	28	38	48	43	38
IR.130	E	27	27	38	48	43	38
IR.131	E	27	27	38	48	43	38
IR.132	E	27	27	38	48	43	38
IR.133	E	28	28	38	48	43	38
IR.134	E	28	28	38	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.135[13]	E	27	27	37	48	43	38
IR.136[13]	E	27	27	37	48	43	38
IR.137[13]	E	27	27	37	48	43	38
IR.138[13]	E	25	25	36	48	43	38
IR.139[13]	E	26	26	36	48	43	38
IR.140[13]	E	27	27	36	48	43	38
IR.141[13]	E	25	25	35	48	43	38
IR.142[13]	E	26	26	35	48	43	38
IR.143[13]	E	27	27	37	48	43	38
IR.144[13]	E	27	27	37	48	43	38
IR.145	E	26	26	36	48	43	38
IR.146	E	25	25	35	48	43	38
IR.147	E	26	26	35	48	43	38
IR.148	E	26	26	36	48	43	38
IR.149[13]	E	27	27	37	48	43	38
IR.150	E	27	27	37	48	43	38
IR.151[13]	E	26	26	37	48	43	38
IR.152[13]	E	26	26	36	48	43	38
IR.153	E	28	28	37	48	43	38
IR.154[13]	E	27	27	37	48	43	38
IR.155[13]	E	26	26	36	48	43	38
IR.156	E	26	26	36	48	43	38
IR.157	E	27	27	37	48	43	38
IR.158	E	27	27	37	48	43	38
IR.159[13]	E	26	26	36	48	43	38
IR.160	E	26	26	36	48	43	38
IR.161	E	26	26	36	48	43	38
IR.162[13]	E	26	26	36	48	43	38

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
IR.163[13]	E	26	26	36	48	43	38
IR.164[13]	E	25	25	36	48	43	38
IR.165[13]	E	25	25	36	48	43	38
IR.166[13]	E	26	26	36	48	43	38
IR.167[13]	E	25	25	36	48	43	38
IR.168[13]	E	25	25	36	48	43	38
IR.169[13]	E	24	24	36	48	43	38
IR.170[13]	E	23	23	35	48	43	38
IR.171[13]	E	25	25	36	48	43	38
IR.172[13]	E	25	25	36	48	43	38
IR.173[13]	E	24	24	36	48	43	38
IR.174[13]	E	24	24	37	48	43	38
IR.175[13]	E	25	25	37	48	43	38
IR.176[13]	E	25	25	36	48	43	38
IR.177[13]	E	24	24	36	48	43	38
IR.178[13]	E	25	25	37	48	43	38
IR.179[13]	E	25	25	37	48	43	38
IR.180[13]	E	25	25	37	48	43	38
Commercial Receivers							
10	-[11]	23	23	38	63	63	63
37	-[11]	26	26	37	63	63	63
Mine-Owned Residential Receivers							
9a	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
9b	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
11	-[11]	21	21	36	n/a[12]	n/a[12]	n/a[12]
31	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
174	-[11]	16	16	26	n/a[12]	n/a[12]	n/a[12]
183	-[11]	25	25	35	n/a[12]	n/a[12]	n/a[12]

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
196	-[11]	27	27	37	n/a[12]	n/a[12]	n/a[12]
203	-[11]	27	27	38	n/a[12]	n/a[12]	n/a[12]
204	-[11]	30	30	42	n/a[12]	n/a[12]	n/a[12]
205	-[11]	28	28	39	n/a[12]	n/a[12]	n/a[12]
206	-[11]	31	31	42	n/a[12]	n/a[12]	n/a[12]
206a	-[11]	31	31	42	n/a[12]	n/a[12]	n/a[12]
207	-[11]	31	31	43	n/a[12]	n/a[12]	n/a[12]
208	-[11]	32	32	43	n/a[12]	n/a[12]	n/a[12]
209[5]	D	31	31	42[14]	48	43	38
210[5]	D	35	35	42[14]	48	43	38
211[5]	D	33	33	44[14]	48	43	38
235	-[11]	18	18	26	n/a[12]	n/a[12]	n/a[12]
236	-[11]	20	20	26	n/a[12]	n/a[12]	n/a[12]
241	-[11]	26	26	32	n/a[12]	n/a[12]	n/a[12]
250	-[11]	31	31	35	n/a[12]	n/a[12]	n/a[12]
328	-[11]	20	20	32	n/a[12]	n/a[12]	n/a[12]
400	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
401	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
402	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
403	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
404	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
405	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
407	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
408	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
409	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
410	-[11]	19	19	34	n/a[12]	n/a[12]	n/a[12]
411	-[11]	24	24	39	n/a[12]	n/a[12]	n/a[12]
412	-[11]	25	25	37	n/a[12]	n/a[12]	n/a[12]

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
412a	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
413	-[11]	23	23	35	n/a[12]	n/a[12]	n/a[12]
414	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414a	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414b	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414c	-[11]	36	36	41	n/a[12]	n/a[12]	n/a[12]
414d	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
414e	-[11]	36	36	42	n/a[12]	n/a[12]	n/a[12]
415	-[11]	36	36	44	n/a[12]	n/a[12]	n/a[12]
415a	-[11]	36	36	44	n/a[12]	n/a[12]	n/a[12]
416	-[11]	31	31	35	n/a[12]	n/a[12]	n/a[12]
417	-[11]	18	18	24	n/a[12]	n/a[12]	n/a[12]
418	-[11]	22	22	28	n/a[12]	n/a[12]	n/a[12]
419	-[11]	22	22	27	n/a[12]	n/a[12]	n/a[12]
420	-[11]	23	23	28	n/a[12]	n/a[12]	n/a[12]
420a	-[11]	23	23	28	n/a[12]	n/a[12]	n/a[12]
421	-[11]	23	23	29	n/a[12]	n/a[12]	n/a[12]
424	-[11]	22	22	29	n/a[12]	n/a[12]	n/a[12]
425	-[11]	22	22	28	n/a[12]	n/a[12]	n/a[12]
430	-[11]	21	21	27	n/a[12]	n/a[12]	n/a[12]
433	-[11]	15	15	21	n/a[12]	n/a[12]	n/a[12]
436	-[11]	23	23	31	n/a[12]	n/a[12]	n/a[12]
436a	-[11]	22	22	31	n/a[12]	n/a[12]	n/a[12]
439	-[11]	19	19	27	n/a[12]	n/a[12]	n/a[12]
441	-[11]	17	17	27	n/a[12]	n/a[12]	n/a[12]
442	-[11]	17	17	27	n/a[12]	n/a[12]	n/a[12]
444	-[11]	17	17	26	n/a[12]	n/a[12]	n/a[12]
446	-[11]	11	11	18	n/a[12]	n/a[12]	n/a[12]

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
447	-[11]	28	28	38	n/a[12]	n/a[12]	n/a[12]
448	-[11]	24	24	30	n/a[12]	n/a[12]	n/a[12]
449	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]
450	-[11]	24	24	35	n/a[12]	n/a[12]	n/a[12]
451	-[11]	17	17	29	n/a[12]	n/a[12]	n/a[12]
452	-[11]	8	8	12	n/a[12]	n/a[12]	n/a[12]
452a	-[11]	7	7	14	n/a[12]	n/a[12]	n/a[12]
453	-[11]	14	14	25	n/a[12]	n/a[12]	n/a[12]
454a	-[11]	9	9	25	n/a[12]	n/a[12]	n/a[12]
454b	-[11]	8	8	19	n/a[12]	n/a[12]	n/a[12]
454c	-[11]	10	10	23	n/a[12]	n/a[12]	n/a[12]
455a	-[11]	26	26	33	n/a[12]	n/a[12]	n/a[12]
455b	-[11]	26	26	33	n/a[12]	n/a[12]	n/a[12]
455c	-[11]	26	26	33	n/a[12]	n/a[12]	n/a[12]
456	-[11]	23	23	34	n/a[12]	n/a[12]	n/a[12]
457	-[11]	22	22	34	n/a[12]	n/a[12]	n/a[12]
458	-[11]	22	22	34	n/a[12]	n/a[12]	n/a[12]
459	-[11]	22	22	34	n/a[12]	n/a[12]	n/a[12]
460	-[11]	24	24	36	n/a[12]	n/a[12]	n/a[12]
461	-[11]	23	23	35	n/a[12]	n/a[12]	n/a[12]
462	-[11]	23	23	35	n/a[12]	n/a[12]	n/a[12]
463	-[11]	23	23	34	n/a[12]	n/a[12]	n/a[12]
464	-[11]	23	23	34	n/a[12]	n/a[12]	n/a[12]
465	-[11]	19	19	33	n/a[12]	n/a[12]	n/a[12]
466	-[11]	19	19	33	n/a[12]	n/a[12]	n/a[12]
467	-[11]	22	22	33	n/a[12]	n/a[12]	n/a[12]
468	-[11]	37	37	44	n/a[12]	n/a[12]	n/a[12]
469	-[11]	10	10	17	n/a[12]	n/a[12]	n/a[12]

PROJECT AMENITY NOISE LEVEL ASSESSMENT							
Rec ID	Residential Zone	$L_{Aeq,15min}$ Noise Prediction – FY30 (dBA)			$L_{Aeq,15min}$ Project Amenity Noise Criteria (dBA)		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
469a	-[11]	8	8	16	n/a[12]	n/a[12]	n/a[12]
469b	-[11]	10	10	16	n/a[12]	n/a[12]	n/a[12]
470	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
500	-[11]	31	31	36	n/a[12]	n/a[12]	n/a[12]
501	-[11]	31	31	36	n/a[12]	n/a[12]	n/a[12]
503	-[11]	29	29	39	n/a[12]	n/a[12]	n/a[12]
511	-[11]	30	30	41	n/a[12]	n/a[12]	n/a[12]
511a	-[11]	30	30	42	n/a[12]	n/a[12]	n/a[12]
511b	-[11]	29	29	40	n/a[12]	n/a[12]	n/a[12]
512	-[11]	29	29	42	n/a[12]	n/a[12]	n/a[12]
512a	-[11]	30	30	43	n/a[12]	n/a[12]	n/a[12]
513	-[11]	28	28	40	n/a[12]	n/a[12]	n/a[12]
515	-[11]	37	37	46	n/a[12]	n/a[12]	n/a[12]
516	-[11]	37	37	49	n/a[12]	n/a[12]	n/a[12]
517	-[11]	32	32	45	n/a[12]	n/a[12]	n/a[12]
519	-[11]	22	22	35	n/a[12]	n/a[12]	n/a[12]
520	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]
521	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]
523a	-[11]	25	25	38	n/a[12]	n/a[12]	n/a[12]
523b	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
523c	-[11]	24	24	37	n/a[12]	n/a[12]	n/a[12]
524a	-[11]	16	16	29	n/a[12]	n/a[12]	n/a[12]
524b	-[11]	16	16	30	n/a[12]	n/a[12]	n/a[12]
524c	-[11]	17	17	29	n/a[12]	n/a[12]	n/a[12]
524d	-[11]	16	16	28	n/a[12]	n/a[12]	n/a[12]
525	-[11]	25	25	38	n/a[12]	n/a[12]	n/a[12]
526	-[11]	24	24	38	n/a[12]	n/a[12]	n/a[12]
527	-[11]	23	23	36	n/a[12]	n/a[12]	n/a[12]

Notes:

1. Day: 7:00 am - 6:00 pm; Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.
2. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts.
3. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts. HVEC is only required to acquire the property if acquisition is no longer reasonably achievable under the approval for the Drayton mine.
4. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts.
5. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise and air quality impacts.
6. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts. HVEC is only required to acquire the property if acquisition is not reasonably achievable under the approval for the Bengalla mine.
7. Receivers west of Muswellbrook were not allocated to any residential zone and were therefore assigned noise criteria based on the 2018 background noise survey conducted for Mount Pleasant Optimisation Project. See Table 5-5 for more details.
8. Western receivers between Zones F and H were not allocated to any residential zone and therefore were conservatively assigned to Zone H, which has the most stringent criteria.
9. Receiver 264 not allocated to any residential zone but located just outside Zone D was assigned to Zone D.
10. Receivers east of Zone G were conservatively assigned the same criteria as Zone H due to the setback distance separating these receivers to New England Highway.
11. Residential zones provided only for privately-owned residential receivers.
12. Mine-owned and commercial receivers are included for information only. No noise impact assessment criteria applicable for those receivers.
13. Vacant block with approved DA for construction of future dwelling.
14. Level includes pro-active mitigation measures.

Table F-2: Cumulative Noise Assessment

Rec ID	ZONE	CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
		Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
6[2]	B	22	22	36	25	20	25	26	26	33	31	31	37	30	30	30	35	35	41
12	B	21	21	36	25	20	25	29	28	36	31	31	36	30	30	30	35	35	41
14	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	36	42
15	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
15a	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
16	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
17	C	21	21	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
18	C	22	22	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
19	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
19a	C	21	21	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
20	C	22	22	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
21	C	21	21	37	20	15	20	29	28	37	32	32	36	30	30	30	35	35	42
22	C	21	21	37	20	15	20	29	28	37	32	32	36	30	30	30	35	35	42
23	C	21	21	37	20	15	20	29	28	37	32	32	36	30	30	30	35	35	42
24	C	22	22	37	20	15	20	29	28	37	32	32	36	30	30	30	36	35	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
25	C	23	23	37	20	15	20	29	29	37	32	32	36	30	30	30	36	35	42
26	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
27	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	35	42
28	C	24	24	38	20	15	20	29	29	38	33	33	36	30	30	30	36	36	42
29	C	24	24	38	20	15	20	29	29	38	32	32	36	30	30	30	36	36	42
30	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	36	42
32	C	23	23	37	20	15	20	30	29	37	32	32	36	30	30	30	36	36	42
33	C	21	21	36	20	15	20	31	30	37	32	32	36	30	30	30	36	36	41
34	E	22	22	36	30	25	30	31	30	36	31	31	35	30	30	30	37	36	41
36	-[7]	23	23	34	20	15	20	34	33	38	33	33	35	30	30	30	38	37	41
36a	-[7]	22	22	34	20	15	20	34	33	38	33	33	35	30	30	30	38	37	41
41	B	21	21	36	25	20	25	28	27	35	31	31	36	30	30	30	35	35	41
56	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
57	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
58	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
59	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
60	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
61	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
62	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
66	G	16	16	20	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
66a	G	17	17	21	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
68	G	15	15	21	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
69	G	14	14	19	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
70	G	15	15	19	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
71	G	15	15	20	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
72	G	16	16	21	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
73	G	17	17	25	30	24	28	25	25	30	26	26	32	30	30	30	34	33	37
75	G	18	18	26	30	25	29	25	25	30	26	26	32	30	30	30	34	33	37
76	G	17	17	24	32	26	30	25	25	30	26	26	32	30	30	30	35	33	37
77	G	17	17	22	32	26	30	25	25	30	26	26	32	30	30	30	35	33	37

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
78	G	28	28	39	32	26	30	25	25	30	26	26	32	30	30	30	36	34	41
79	G	19	19	24	33	27	31	25	25	30	26	26	32	30	30	30	36	34	37
79a	G	19	19	23	33	28	32	25	25	30	26	26	32	30	30	30	36	34	37
82	G	23	23	37	37	30	35	25	25	30	26	26	32	30	30	30	38	35	41
83	G	22	22	32	35	29	33	25	25	30	26	26	32	30	30	30	37	34	39
85	G	23	23	38	37	31	35	25	25	30	26	26	32	30	30	30	38	35	41
86	G	22	22	36	38	30	37	25	25	30	26	26	32	30	30	30	39	35	41
87	A	23	23	36	41	34	38	25	25	30	26	26	32	30	30	30	42	36	41
88	A	22	22	34	40	33	36	25	25	30	26	26	32	30	30	30	41	36	40
89	A	23	23	28	40	34	37	25	25	30	26	26	32	30	30	30	41	36	40
91	A	25	25	32	42	36	39	25	25	30	26	26	32	30	30	30	43	38	41
92	A	24	24	29	42	36	39	25	25	30	26	26	32	30	30	30	43	38	41
93	A	24	24	37	42	35	39	25	25	30	26	26	32	30	30	30	43	37	42
94	A	24	24	37	43	35	40	25	25	30	26	26	32	30	30	30	43	37	43
95	G	23	23	38	39	31	38	25	25	30	26	26	32	30	30	30	40	35	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
96	G	23	23	38	37	31	37	25	25	30	26	26	32	30	30	30	38	35	42
97	G	24	24	38	40	32	39	25	25	30	26	26	32	30	30	30	41	36	43
98	G	24	24	38	38	33	38	25	25	30	26	26	32	30	30	30	39	36	42
99	G	26	26	38	38	32	37	25	25	30	26	26	32	30	30	30	39	36	42
99a	G	24	24	38	38	31	38	25	25	30	26	26	32	30	30	30	39	35	42
100	G	26	26	38	39	32	37	25	25	30	26	26	32	30	30	30	40	36	42
101[3]	G	25	25	37	40	33	38	25	25	30	26	26	32	30	30	30	41	36	42
102[4]	G	24	24	35	42	34	40	25	25	30	26	26	32	30	30	30	43	37	42
111a	H	9	9	15	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
111b	H	9	9	15	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
111c	H	9	9	14	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
111d	H	9	9	17	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
112a	H	8	8	15	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
112b	H	8	8	15	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
112c	H	8	8	17	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
112d	H	8	8	17	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
112e	H	9	9	19	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
112f	H	7	7	16	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
113a	H	16	16	24	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
113b	H	14	14	23	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
113c	H	13	13	23	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
113d	H	13	13	23	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
113e	H	14	14	23	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
116	H	15	15	24	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
117a	H	16	16	24	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
118	H	16	16	24	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
121	H	7	7	13	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
121a	H	7	7	17	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
122	H	7	7	18	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
125	H	10	10	21	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
138	H	7	7	15	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
139	H	7	7	16	25	25	30	20	20	25	21	21	27	30	30	30	32	32	35
157	-[8]	10	10	21	20	20	25	20	20	25	26	26	32	28	28	29	31	31	35
163	-[8]	10	10	18	20	20	25	20	20	25	26	26	32	28	28	29	31	31	35
178	-[8]	15	15	24	20	20	25	20	20	25	26	26	32	31	31	32	33	33	36
179	F	16	16	26	25	25	30	10	11	15	23	23	33	33	33	34	34	34	38
179a	F	16	16	27	25	25	30	10	10	15	23	23	33	32	33	34	33	34	38
179b	F	16	16	27	25	25	30	10	10	15	23	23	33	32	33	34	33	34	38
179c	F	15	15	25	25	25	30	10	10	16	23	23	33	33	33	34	34	34	38
182	F	22	22	32	25	25	30	20	20	23	22	22	35	32	33	34	34	34	39
186	F	25	25	34	25	25	30	20	20	24	24	24	39	31	31	32	34	34	41
187	F	25	25	35[12]	25	25	30	22	22	25	26	26	40	29	30	31	33	33	42
189	F	16	16	22	25	25	30	18	18	22	20	20	34	35	35	36	36	36	39
190	F	23	23	32	25	25	30	19	19	23	20	20	34	34	34	36	35	35	40
191	F	22	22	32	25	25	30	19	19	23	21	21	35	33	34	35	34	35	40

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
195	F	25	25	34	25	25	30	19	19	23	22	22	37	31	32	33	33	34	40
198	F	24	24	34	25	25	30	21	21	25	25	25	39	30	30	31	33	33	41
200	D	30	30	38[12]	25	25	30	20	20	25	24	24	39	29	29	31	34	34	42
200a	D	30	30	38[12]	25	25	30	19	19	25	24	24	39	29	29	31	34	34	42
201	D	25	25	35	25	25	30	21	21	25	25	25	40	28	28	30	32	32	42
213	F	26	26	33	25	25	30	13	13	21	21	21	34	32	33	34	34	35	39
213a	F	28	28	35	25	25	30	13	13	21	21	21	34	34	35	37	36	36	41
213c	F	27	27	35	25	25	30	13	13	21	21	21	34	34	35	37	35	36	41
216	F	28	28	35[12]	25	25	30	13	13	20	21	21	34	33	34	35	35	36	40
218a	D	29	29	35[12]	25	25	30	18	18	24	25	25	37	34	34	36	36	36	41
218b	D	29	29	35[12]	25	25	30	19	19	24	24	24	36	33	34	35	35	36	41
218c	F	28	28	35[12]	25	25	30	14	14	20	22	22	35	33	34	36	35	36	41
226[2]	D	32	32	38[12]	25	25	30	21	21	26	27	27	41	27	28	29	35	35	43
231	D	29	29	35[12]	25	25	30	19	19	24	26	26	35	35	35	36	37	37	41
232	D	29	29	35[12]	25	25	30	19	18	25	26	26	36	34	34	36	36	36	41

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
233a	D	25	25	30	25	25	30	19	19	25	31	31	32	34	34	36	37	37	39
233b	D	25	25	31	25	25	30	19	19	25	31	31	33	34	34	36	36	36	39
238	D	31	31	35[12]	25	25	30	25	26	33	42	42	41	30	30	31	43	43	43
238a	D	31	31	35[12]	25	25	30	25	26	32	42	42	41	30	30	31	43	43	43
239	D	31	31	35[12]	25	25	30	27	27	32	40	40	39	28	29	30	41	41	42
240	D	29	29	34	25	25	30	23	23	31	41	41	39	28	29	30	42	42	41
242	D	29	29	33	25	25	30	24	24	32	43	43	42	28	29	30	44	44	43
242a	D	22	22	29	25	25	30	24	24	32	40	40	35	28	29	30	40	41	39
242b	D	29	29	34	25	25	30	24	24	32	45	45	42	28	29	30	46	46	43
243	D	24	24	30	25	25	30	15	15	23	32	32	27	33	33	34	36	36	37
252	D	23	23	29	25	25	30	26	26	34	39	39	34	29	29	30	40	40	39
254	D	20	20	27	25	25	30	18	18	27	39	39	31	29	29	30	39	39	36
257	D	22	22	29	25	25	30	17	17	29	36	36	32	31	31	32	37	37	38
259	D	22	22	29	25	25	30	22	21	30	35	35	32	32	33	34	37	38	38
264[6]	-[9]	23	23	28	25	25	30	30	31	38	46	46	39	29	29	30	46	46	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
265	-[10]	13	13	22	28	20	26	25	25	30	26	26	32	30	30	30	34	33	36
268	-[10]	10	10	23	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
287	G	26	26	35	33	26	31	25	25	30	26	26	32	30	30	30	36	34	39
300	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
301	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
304	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
304a	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
304b	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
305	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
305a	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
306	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
309	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
310	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
311	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
312	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
314	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
315	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
316	E	23	23	28	30	25	30	30	30	35	31	31	37	30	30	30	36	36	40
319	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
320	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
321	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
322	E	26	26	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
325	G	16	16	19	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
327	G	20	20	32	35	30	35	25	25	30	26	26	32	30	30	30	37	34	39
329	G	23	23	37	34	28	33	25	25	30	26	26	32	30	30	30	36	34	40
330	G	23	23	37	33	30	33	25	25	30	26	26	32	30	30	30	36	35	40
331	-[10]	23	23	35	28	26	29	25	25	30	26	26	32	30	30	30	34	34	39
332	-[10]	23	23	35	30	27	30	25	25	30	26	26	32	30	30	30	35	34	39
332a	-[10]	24	24	35	29	27	29	25	25	30	26	26	32	30	30	30	34	34	39
333	-[10]	24	24	35	29	26	29	25	25	30	26	26	32	30	30	30	34	34	39

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
334	G	21	21	25	32	29	32	25	25	30	26	26	32	30	30	30	35	34	37
335	G	25	25	37	34	29	34	25	25	30	26	26	32	30	30	30	37	35	40
337	-[10]	14	14	27	30	25	30	25	25	30	26	26	32	30	30	30	34	33	37
344	-[7]	20	20	34	20	15	20	33	32	37	33	33	35	30	30	30	37	37	41
345	-[7]	20	20	33	20	15	20	33	32	37	33	33	35	30	30	30	37	37	40
348	-[7]	23	23	34	20	15	20	34	32	38	34	34	34	30	30	30	38	37	41
350	-[7]	22	22	34	20	15	20	34	32	38	34	34	34	30	30	30	38	37	41
352	-[7]	19	19	33	20	15	20	33	31	37	34	34	34	30	30	30	37	37	40
353	-[7]	19	19	33	20	15	20	33	31	37	34	34	34	30	30	30	37	37	40
354	-[7]	19	19	33	20	15	20	33	31	37	34	34	34	30	30	30	37	37	40
355	-[7]	19	19	33	20	15	20	31	30	36	34	34	34	30	30	30	37	36	40
356	-[7]	20	20	33	20	15	20	32	30	36	34	34	34	30	30	30	37	37	40
358	-[7]	19	19	33	20	15	20	32	30	37	34	34	34	30	30	30	37	36	40
361	-[7]	20	20	33	20	15	20	34	31	38	34	34	33	30	30	30	38	37	41
364	D	22	22	28	20	20	25	26	27	38	38	38	31	29	29	30	39	39	40

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
365	D	22	22	29	20	20	25	26	26	40	42	42	35	26	27	28	42	42	42
368	D	23	23	29	20	20	25	16	16	28	36	36	33	30	30	31	37	37	37
372	D	22	22	29	20	20	25	19	19	32	37	37	32	29	29	30	38	38	37
377	D	18	18	25	20	20	25	12	12	24	36	36	32	32	32	34	38	38	37
378	D	18	18	25	20	20	25	12	12	23	36	36	32	32	32	33	38	38	36
388	-[8]	10	10	21	20	20	25	20	20	25	26	26	32	28	28	29	31	31	35
438	F	20	20	29	20	20	25	16	16	21	21	21	35	35	35	36	35	35	39
438a	F	18	18	28	20	20	25	16	16	21	21	21	35	35	35	36	35	35	39
471	-[8]	16	16	26	20	20	25	20	20	25	26	26	32	31	32	33	33	33	37
472	-[8]	16	16	26	20	20	25	20	20	25	26	26	32	31	32	33	33	33	37
473	-[8]	17	17	26	20	20	25	20	20	25	26	26	32	33	33	34	34	34	37
476	-[8]	16	16	25	20	20	25	20	20	25	26	26	32	31	30	32	33	32	36
477	-[8]	16	16	25	20	20	25	20	20	25	26	26	32	29	29	31	32	32	36
477a	-[8]	16	16	25	20	20	25	20	20	25	26	26	32	29	29	30	32	32	35
480	-[8]	15	15	24	20	20	25	20	20	25	26	26	32	29	28	30	32	31	35

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
481	-[8]	16	16	25	20	20	25	20	20	25	26	26	32	28	28	29	31	31	35
482	-[8]	16	16	25	20	20	25	20	20	25	26	26	32	28	28	29	31	31	35
484	-[8]	9	9	19	20	20	25	20	20	25	26	26	32	28	28	29	31	31	35
485	-[8]	15	15	24	20	20	25	20	20	25	26	26	32	29	28	30	32	31	35
485a	-[8]	15	15	24	20	20	25	20	20	25	26	26	32	29	28	30	32	31	35
IR.1	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.2	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.3	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.4	E	28	28	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.5	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.6	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.7	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.8	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.9	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.10	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.11	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.12	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.13	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.14	E	29	29	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.15	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.16	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.17	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.18	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.19	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.20	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.21	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.22	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.23	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.24	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.25	E	28	28	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.26	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.27	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.28	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.29	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.30	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.31	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.32[11]	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.33	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.34	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.35	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.36	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.37	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.38	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.39	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.40	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.41	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.42	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.43[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.44[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.45[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.46[11]	E	24	24	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.47[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.48[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.49[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.50[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.51[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.52[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.53[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.54[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.55[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.56[11]	E	24	24	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.57[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.58[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.59[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.60[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.61[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.62[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.63[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.64[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.65[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.66[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.67[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.68[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.69[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.70[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.71[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.72[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.73[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.74[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.75[11]	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.76[11]	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.77[11]	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.78[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.79[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.80[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.81[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.82[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.83[11]	E	27	27	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.84	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.85	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.86	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.87	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.88	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.89	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.90	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.91	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.92	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.93[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.94	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.95	E	28	28	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.96	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.97	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.98[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.99	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.100	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.101	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.102[11]	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.103	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.104	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.105	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.106	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.107	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.108	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.109	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.110[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.111	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.112[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.113	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.114	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.115	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.116	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.117	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.118	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.119	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.120	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.121	E	29	29	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.122	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.123	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.124	E	28	28	39	30	25	30	30	30	35	31	31	37	30	30	30	37	36	43
IR.125	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.126	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.127	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.128	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.129	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.130	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.131	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.132	E	27	27	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.133	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.134	E	28	28	38	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.135[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.136[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.137[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.138[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.139[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.140[11]	E	27	27	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.141[11]	E	25	25	35	30	25	30	30	30	35	31	31	37	30	30	30	37	36	41
IR.142[11]	E	26	26	35	30	25	30	30	30	35	31	31	37	30	30	30	37	36	41
IR.143[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.144[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.145	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.146	E	25	25	35	30	25	30	30	30	35	31	31	37	30	30	30	37	36	41
IR.147	E	26	26	35	30	25	30	30	30	35	31	31	37	30	30	30	37	36	41
IR.148	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.149[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.150	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.151[11]	E	26	26	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.152[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.153	E	28	28	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.154[11]	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.155[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.156	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.157	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.158	E	27	27	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.159[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.160	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.161	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.162[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.163[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.164[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.165[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.166[11]	E	26	26	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.167[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.168[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.169[11]	E	24	24	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.170[11]	E	23	23	35	30	25	30	30	30	35	31	31	37	30	30	30	36	36	41
IR.171[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.172[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.173[11]	E	24	24	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.174[11]	E	24	24	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

		CUMULATIVE NOISE ASSESSMENT																	
		$L_{Aeq,15min}$ Noise Predictions																	
Rec ID	ZONE	Project			Maxwell Underground Project			Mount Pleasant Operation			Bengalla Coal Mine			Mangoola Coal Mine			Cumulative		
		Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]	Day[1]	Eve.[1]	Night[1]
IR.175[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.176[11]	E	25	25	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.177[11]	E	24	24	36	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.178[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.179[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42
IR.180[11]	E	25	25	37	30	25	30	30	30	35	31	31	37	30	30	30	37	36	42

Notes:

1. Day: 7:00 am - 6:00 pm; Evening: 6:00 pm - 10:00 pm; Night: 10:00 pm - 7:00 am.
2. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts.
3. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts. HVEC is only required to acquire the property if acquisition is no longer reasonably achievable under the approval for the Drayton mine.
4. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts.
5. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise and air quality impacts.
6. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts. HVEC is only required to acquire the property if acquisition is not reasonably achievable under the approval for the Bengalla mine.
7. Receivers west of Muswellbrook were not allocated to any residential zone and were therefore assigned noise criteria based on the 2018 background noise survey conducted for Mount Pleasant Optimisation Project. See **Table 5-5** for more details.
8. Western receivers between Zones F and H were not allocated to any residential zone and therefore were conservatively assigned to Zone H, which has the most stringent criteria.
9. Receiver 264 not allocated to any residential zone but located just outside Zone D was assigned to Zone D.
10. Receivers east of Zone G were conservatively assigned the same criteria as Zone H due to the setback distance separating these receivers to New England Highway.
11. Vacant block with approved DA for construction of future dwelling.
12. Level includes pro-active mitigation measures.

APPENDIX G

PREDICTED $L_{A1,1MIN}$ OPERATIONAL NOISE LEVELS FOR NIGHT-TIME OPERATIONS

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
Privately-Owned Residential Receivers			
6[2]	B	37	45
12	B	37	45
14	C	38	45
15	C	38	45
15a	C	38	45
16	C	38	45
17	C	38	45
18	C	38	45
19	C	38	45
19a	C	38	45
20	C	38	45
21	C	38	45
22	C	38	45
23	C	38	45
24	C	38	45
25	C	38	45
26	C	39	45
27	C	39	45
28	C	39	45
29	C	39	45
30	C	38	45
32	C	38	45
33	C	37	45
34	E	37	45
36	-[7]	35	45
36a	-[7]	35	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
41	B	37	45
56	E	40	45
57	E	39	45
58	E	40	45
59	E	40	45
60	E	40	45
61	E	40	45
62	E	40	45
66	G	21	45
66a	G	23	45
68	G	24	45
69	G	21	45
70	G	21	45
71	G	23	45
72	G	26	45
73	G	27	45
75	G	28	45
76	G	26	45
77	G	23	45
78	G	41	45
79	G	27	45
79a	G	27	45
82	G	40	45
83	G	37	45
85	G	41	45
86	G	40	45
87	A	41	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
88	A	40	45
89	A	34	45
91	A	37	45
92	A	31	45
93	A	42	45
94	A	42	45
95	G	41	45
96	G	41	45
97	G	41	45
98	G	41	45
99	G	41	45
99a	G	41	45
100	G	41	45
101[3]	G	41	45
102[4]	G	41	45
111a	H	18	45
111b	H	17	45
111c	H	16	45
111d	H	20	45
112a	H	18	45
112b	H	18	45
112c	H	20	45
112d	H	21	45
112e	H	22	45
112f	H	18	45
113a	H	25	45
113b	H	24	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
113c	H	24	45
113d	H	24	45
113e	H	24	45
116	H	26	45
117a	H	25	45
118	H	25	45
121	H	16	45
121a	H	19	45
122	H	19	45
125	H	22	45
138	H	19	45
139	H	19	45
157	-[8]	22	45
163	-[8]	20	45
178	-[8]	26	45
179	F	28	45
179a	F	29	45
179b	F	29	45
179c	F	28	45
182	F	33	45
186	F	36	45
187	F	38	45
189	F	27	45
190	F	33	45
191	F	34	45
195	F	36	45
198	F	38	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
200	D	41	45
200a	D	41	45
201	D	39	45
213	F	34	45
213a	F	36	45
213c	F	36	45
216	F	37	45
218a	D	37	45
218b	D	37	45
218c	F	37	45
226[2]	D	41	45
231	D	37	45
232	D	37	45
233a	D	32	45
233b	D	33	45
238	D	38	45
238a	D	37	45
239	D	38	45
240	D	36	45
242	D	35	45
242a	D	32	45
242b	D	35	45
243	D	31	45
252	D	31	45
254	D	30	45
257	D	30	45
259	D	30	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
264[6]	-[9]	31	45
265	-[10]	24	45
268	-[10]	27	45
287	G	37	45
300	E	40	45
301	E	40	45
304	E	40	45
304a	E	40	45
304b	E	40	45
305	E	40	45
305a	E	40	45
306	E	40	45
309	E	40	45
310	E	40	45
311	E	40	45
312	E	40	45
314	E	40	45
315	E	40	45
316	E	31	45
319	E	39	45
320	E	39	45
321	E	39	45
322	E	39	45
325	G	21	45
327	G	35	45
329	G	39	45
330	G	39	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
331	-[10]	37	45
332	-[10]	37	45
332a	-[10]	37	45
333	-[10]	37	45
334	G	29	45
335	G	39	45
337	-[10]	30	45
344	-[7]	35	45
345	-[7]	34	45
348	-[7]	35	45
350	-[7]	35	45
352	-[7]	34	45
353	-[7]	34	45
354	-[7]	34	45
355	-[7]	34	45
356	-[7]	34	45
358	-[7]	34	45
361	-[7]	34	45
364	D	31	45
365	D	30	45
368	D	30	45
372	D	30	45
377	D	26	45
378	D	26	45
388	-[8]	22	45
438	F	30	45
438a	F	29	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
471	-[8]	27	45
472	-[8]	27	45
473	-[8]	27	45
476	-[8]	26	45
477	-[8]	26	45
477a	-[8]	26	45
480	-[8]	24	45
481	-[8]	26	45
482	-[8]	26	45
484	-[8]	21	45
485	-[8]	24	45
485a	-[8]	24	45
IR.1	E	39	45
IR.2	E	39	45
IR.3	E	39	45
IR.4	E	38	45
IR.5	E	39	45
IR.6	E	39	45
IR.7	E	39	45
IR.8	E	39	45
IR.9	E	39	45
IR.10	E	39	45
IR.11	E	39	45
IR.12	E	39	45
IR.13	E	40	45
IR.14	E	39	45
IR.15	E	39	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.16	E	39	45
IR.17	E	39	45
IR.18	E	39	45
IR.19	E	39	45
IR.20	E	40	45
IR.21	E	40	45
IR.22	E	40	45
IR.23	E	40	45
IR.24	E	40	45
IR.25	E	38	45
IR.26	E	39	45
IR.27	E	39	45
IR.28	E	39	45
IR.29	E	40	45
IR.30	E	40	45
IR.31	E	40	45
IR.32[13]	E	40	45
IR.33	E	41	45
IR.34	E	41	45
IR.35	E	40	45
IR.36	E	40	45
IR.37	E	40	45
IR.38	E	39	45
IR.39	E	40	45
IR.40	E	40	45
IR.41	E	39	45
IR.42	E	38	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.43[13]	E	38	45
IR.44[13]	E	38	45
IR.45[13]	E	38	45
IR.46[13]	E	38	45
IR.47[13]	E	38	45
IR.48[13]	E	38	45
IR.49[13]	E	38	45
IR.50[13]	E	38	45
IR.51[13]	E	38	45
IR.52[13]	E	38	45
IR.53[13]	E	38	45
IR.54[13]	E	38	45
IR.55[13]	E	38	45
IR.56[13]	E	38	45
IR.57[13]	E	38	45
IR.58[13]	E	38	45
IR.59[13]	E	38	45
IR.60[13]	E	38	45
IR.61[13]	E	38	45
IR.62[13]	E	38	45
IR.63[13]	E	39	45
IR.64[13]	E	39	45
IR.65[13]	E	38	45
IR.66[13]	E	38	45
IR.67[13]	E	38	45
IR.68[13]	E	38	45
IR.69[13]	E	38	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.70[13]	E	38	45
IR.71[13]	E	38	45
IR.72[13]	E	38	45
IR.73[13]	E	38	45
IR.74[13]	E	39	45
IR.75[13]	E	39	45
IR.76[13]	E	40	45
IR.77[13]	E	40	45
IR.78[13]	E	39	45
IR.79[13]	E	39	45
IR.80[13]	E	39	45
IR.81[13]	E	38	45
IR.82[13]	E	38	45
IR.83[13]	E	38	45
IR.84	E	39	45
IR.85	E	39	45
IR.86	E	39	45
IR.87	E	39	45
IR.88	E	39	45
IR.89	E	39	45
IR.90	E	39	45
IR.91	E	39	45
IR.92	E	39	45
IR.93[13]	E	39	45
IR.94	E	39	45
IR.95	E	39	45
IR.96	E	39	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.97	E	39	45
IR.98[13]	E	39	45
IR.99	E	39	45
IR.100	E	39	45
IR.101	E	39	45
IR.102[13]	E	40	45
IR.103	E	39	45
IR.104	E	40	45
IR.105	E	40	45
IR.106	E	39	45
IR.107	E	39	45
IR.108	E	39	45
IR.109	E	39	45
IR.110[13]	E	39	45
IR.111	E	39	45
IR.112[13]	E	39	45
IR.113	E	40	45
IR.114	E	40	45
IR.115	E	39	45
IR.116	E	39	45
IR.117	E	40	45
IR.118	E	40	45
IR.119	E	40	45
IR.120	E	40	45
IR.121	E	40	45
IR.122	E	40	45
IR.123	E	40	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.124	E	40	45
IR.125	E	40	45
IR.126	E	39	45
IR.127	E	39	45
IR.128	E	39	45
IR.129	E	39	45
IR.130	E	39	45
IR.131	E	40	45
IR.132	E	40	45
IR.133	E	40	45
IR.134	E	40	45
IR.135[13]	E	39	45
IR.136[13]	E	39	45
IR.137[13]	E	40	45
IR.138[13]	E	40	45
IR.139[13]	E	39	45
IR.140[13]	E	38	45
IR.141[13]	E	39	45
IR.142[13]	E	39	45
IR.143[13]	E	39	45
IR.144[13]	E	39	45
IR.145	E	39	45
IR.146	E	39	45
IR.147	E	39	45
IR.148	E	39	45
IR.149[13]	E	39	45
IR.150	E	39	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.151[13]	E	39	45
IR.152[13]	E	39	45
IR.153	E	39	45
IR.154[13]	E	39	45
IR.155[13]	E	39	45
IR.156	E	39	45
IR.157	E	39	45
IR.158	E	39	45
IR.159[13]	E	38	45
IR.160	E	38	45
IR.161	E	38	45
IR.162[13]	E	38	45
IR.163[13]	E	38	45
IR.164[13]	E	38	45
IR.165[13]	E	38	45
IR.166[13]	E	38	45
IR.167[13]	E	38	45
IR.168[13]	E	38	45
IR.169[13]	E	37	45
IR.170[13]	E	37	45
IR.171[13]	E	38	45
IR.172[13]	E	38	45
IR.173[13]	E	38	45
IR.174[13]	E	38	45
IR.175[13]	E	38	45
IR.176[13]	E	38	45
IR.177[13]	E	38	45

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
IR.178[13]	E	38	45
IR.179[13]	E	38	45
IR.180[13]	E	38	45
Commercial Receivers			
10	-[11]	40	n/a[12]
37	-[11]	39	n/a[12]
Mine-Owned Residential Receivers			
9a	-[11]	40	n/a[12]
9b	-[11]	40	n/a[12]
11	-[11]	37	n/a[12]
31	-[11]	38	n/a[12]
174	-[11]	27	n/a[12]
183	-[11]	37	n/a[12]
196	-[11]	39	n/a[12]
203	-[11]	41	n/a[12]
204	-[11]	44	n/a[12]
205	-[11]	41	n/a[12]
206	-[11]	44	n/a[12]
206a	-[11]	44	n/a[12]
207	-[11]	44	n/a[12]
208	-[11]	45	n/a[12]
209	D	45	45
210	D	46	45
211	D	47	45
250	-[11]	36	n/a[12]
328	-[11]	36	n/a[12]
400	-[11]	40	n/a[12]

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
401	-[11]	40	n/a[12]
402	-[11]	40	n/a[12]
403	-[11]	40	n/a[12]
404	-[11]	40	n/a[12]
405	-[11]	39	n/a[12]
407	-[11]	39	n/a[12]
408	-[11]	39	n/a[12]
409	-[11]	38	n/a[12]
410	-[11]	35	n/a[12]
411	-[11]	41	n/a[12]
412	-[11]	38	n/a[12]
412a	-[11]	39	n/a[12]
413	-[11]	36	n/a[12]
414	-[11]	43	n/a[12]
414a	-[11]	43	n/a[12]
414b	-[11]	43	n/a[12]
414c	-[11]	42	n/a[12]
414d	-[11]	43	n/a[12]
414e	-[11]	43	n/a[12]
415	-[11]	46	n/a[12]
415a	-[11]	46	n/a[12]
416	-[11]	37	n/a[12]
417	-[11]	25	n/a[12]
418	-[11]	29	n/a[12]
419	-[11]	28	n/a[12]
420	-[11]	29	n/a[12]
420a	-[11]	29	n/a[12]

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
421	-[11]	30	n/a[12]
424	-[11]	30	n/a[12]
425	-[11]	29	n/a[12]
430	-[11]	28	n/a[12]
433	-[11]	25	n/a[12]
436	-[11]	32	n/a[12]
436a	-[11]	32	n/a[12]
439	-[11]	28	n/a[12]
441	-[11]	28	n/a[12]
442	-[11]	28	n/a[12]
444	-[11]	27	n/a[12]
446	-[11]	21	n/a[12]
447	-[11]	40	n/a[12]
448	-[11]	35	n/a[12]
449	-[11]	41	n/a[12]
450	-[11]	41	n/a[12]
451	-[11]	33	n/a[12]
452	-[11]	14	n/a[12]
452a	-[11]	16	n/a[12]
453	-[11]	30	n/a[12]
454a	-[11]	29	n/a[12]
454b	-[11]	26	n/a[12]
454c	-[11]	27	n/a[12]
455a	-[11]	34	n/a[12]
455b	-[11]	34	n/a[12]
455c	-[11]	34	n/a[12]
456	-[11]	35	n/a[12]

MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
457	-[11]	35	n/a[12]
458	-[11]	35	n/a[12]
459	-[11]	35	n/a[12]
460	-[11]	37	n/a[12]
461	-[11]	36	n/a[12]
462	-[11]	36	n/a[12]
463	-[11]	35	n/a[12]
464	-[11]	35	n/a[12]
465	-[11]	34	n/a[12]
466	-[11]	34	n/a[12]
467	-[11]	34	n/a[12]
468	-[11]	46	n/a[12]
469	-[11]	20	n/a[12]
469a	-[11]	19	n/a[12]
469b	-[11]	20	n/a[12]
470	-[11]	38	n/a[12]
500	-[11]	37	n/a[12]
501	-[11]	37	n/a[12]
503	-[11]	41	n/a[12]
511	-[11]	42	n/a[12]
511a	-[11]	44	n/a[12]
511b	-[11]	41	n/a[12]
512	-[11]	44	n/a[12]
512a	-[11]	45	n/a[12]
513	-[11]	42	n/a[12]
515	-[11]	48	n/a[12]
516	-[11]	51	n/a[12]

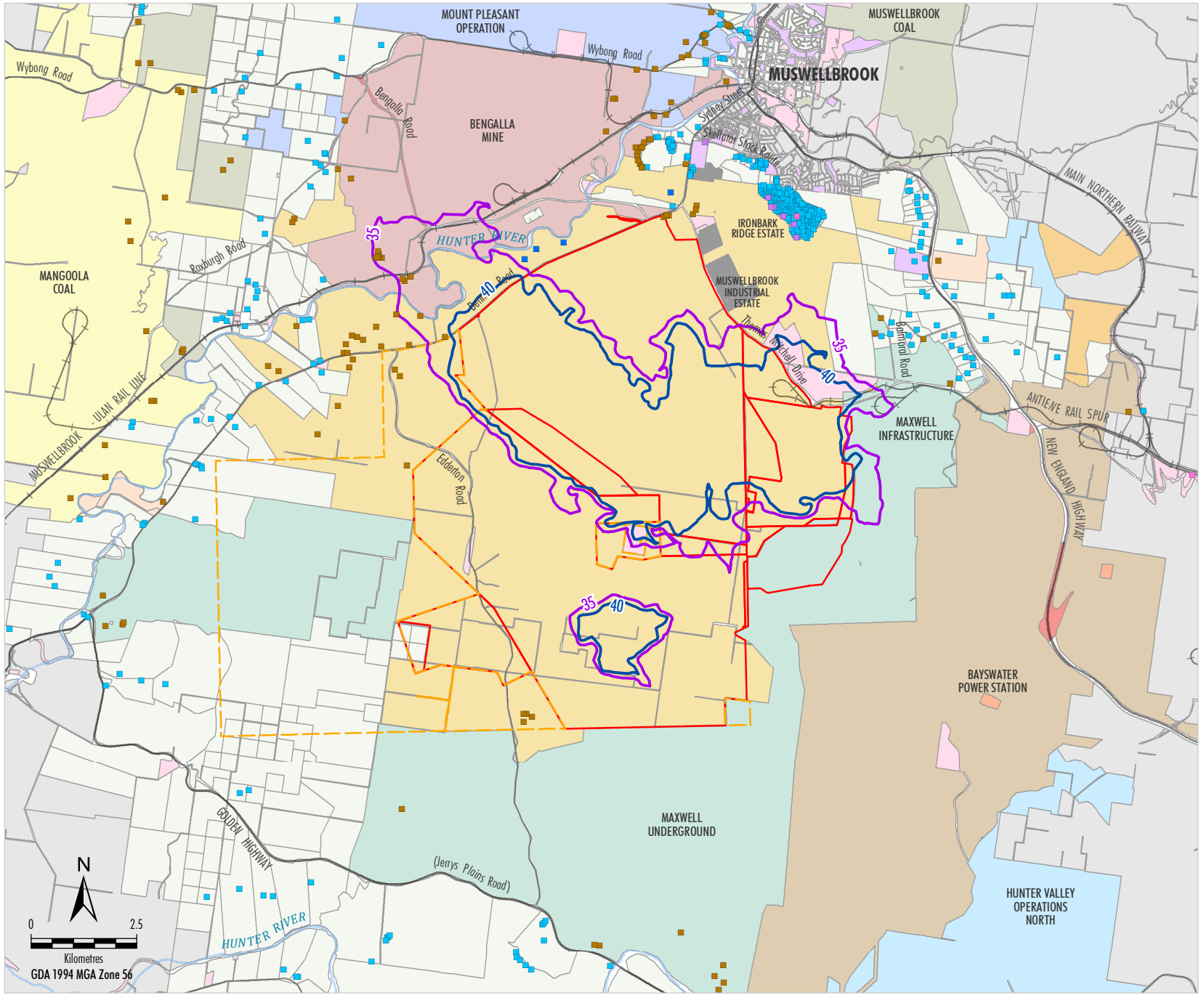
MAXIMUM NOISE LEVEL EVENT ASSESSMENT			
Rec ID	Residential Zone	$L_{A1,1min}$ Noise Predictions – FY30 (dBA)	$L_{A1,1min}$ Noise Impact Assessment Criteria (dBA)
		Night[1]	Night[1]
517	-[11]	50	n/a[12]
519	-[11]	37	n/a[12]
520	-[11]	38	n/a[12]
521	-[11]	38	n/a[12]
523a	-[11]	39	n/a[12]
523b	-[11]	38	n/a[12]
523c	-[11]	38	n/a[12]
524a	-[11]	31	n/a[12]
524b	-[11]	31	n/a[12]
524c	-[11]	31	n/a[12]
524d	-[11]	31	n/a[12]
525	-[11]	40	n/a[12]
526	-[11]	40	n/a[12]
527	-[11]	39	n/a[12]

Notes:

1. Night: 10:00 pm - 7:00 am.
2. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts.
3. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts. HVEC is only required to acquire the property if acquisition is no longer reasonably achievable under the approval for the Drayton mine.
4. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise impacts.
5. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted noise and air quality impacts.
6. Receiver subject to acquisition rights in accordance with MP 09_0062 for predicted air quality impacts. HVEC is only required to acquire the property if acquisition is not reasonably achievable under the approval for the Bengalla mine.
7. Receivers west of Muswellbrook were not allocated to any residential zone and were therefore assigned the same $L_{A1,1min}$ noise criterion as all residential zones.
8. Western receivers between Zones F and H were not allocated to any residential zone and were therefore assigned the same $L_{A1,1min}$ noise criterion as all residential zones.
9. Receiver 264 not allocated to any residential zone but located just outside Zone D was assigned the same $L_{A1,1min}$ noise criterion as all residential zones.
10. Receivers east of Zone G were assigned the same $L_{A1,1min}$ noise criterion as all residential zones.
11. Residential zones provided only for privately-owned residential receivers.
12. Mine-owned and commercial receivers are included for information only. No noise impact assessment criteria applicable for those receivers.
13. Vacant block with approved DA for construction of future dwelling.

APPENDIX H

NOISE CONTOURS



LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Mt Arthur-controlled
- Maxwell-controlled
- Bengalla-controlled
- AGL-controlled
- Mount Pleasant-controlled
- Mangoola-controlled
- Glencore-controlled
- HVO-controlled
- Industrial Zone
- Muswellbrook Coal-controlled
- Other Mining/Resource Company-controlled
- Crown/The State of NSW
- Muswellbrook Shire Council
- Transport for NSW
- TransGrid
- Privately-owned Land
- Owner not Identified

Dwellings

- Mine-owned Receiver
- The State of NSW (Crown)
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver

Noise Contours

- 35 dBA
- 40 dBA

Source: BHP (2023); NSW Spatial Services (2023)

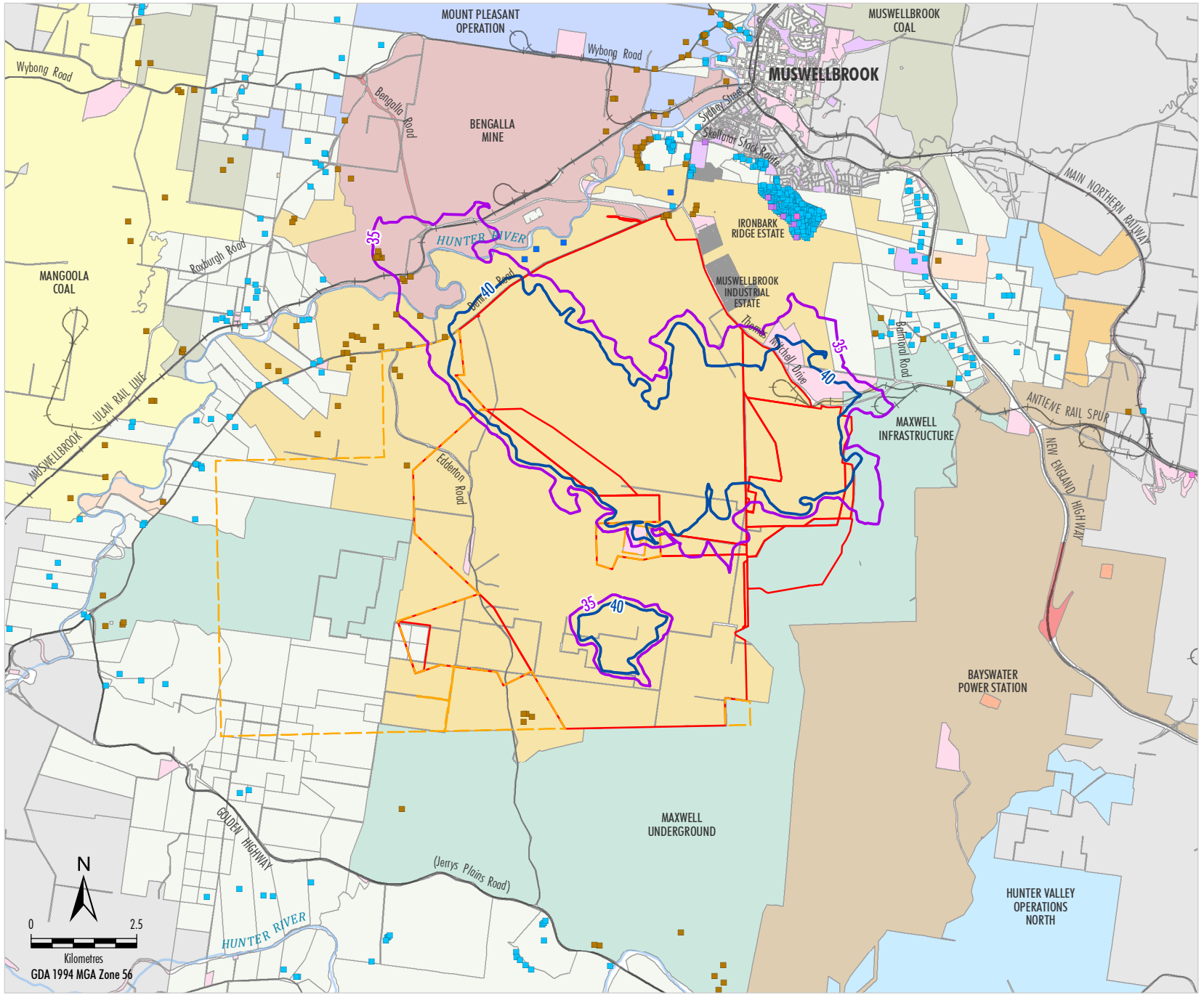
BHP

MT ARTHUR COAL MINE MODIFICATION 2

Day Intrusive $L_{Aeq\ (15\ min)}$ Noise Contours 2030

Figure H-1

HVE-19-09 MOD2_NB_209D



LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Mt Arthur-controlled
- Maxwell-controlled
- Bengalla-controlled
- AGL-controlled
- Mount Pleasant-controlled
- Mangoola-controlled
- Glencore-controlled
- HVO-controlled
- Industrial Zone
- Muswellbrook Coal-controlled
- Other Mining/Resource Company-controlled
- Crown/The State of NSW
- Muswellbrook Shire Council
- Transport for NSW
- TransGrid
- Privately-owned Land
- Owner not Identified

Dwellings

- Mine-owned Receiver
- The State of NSW (Crown)
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver

Noise Contours

- 35 dBA
- 40 dBA

Source: BHP (2023); NSW Spatial Services (2023)

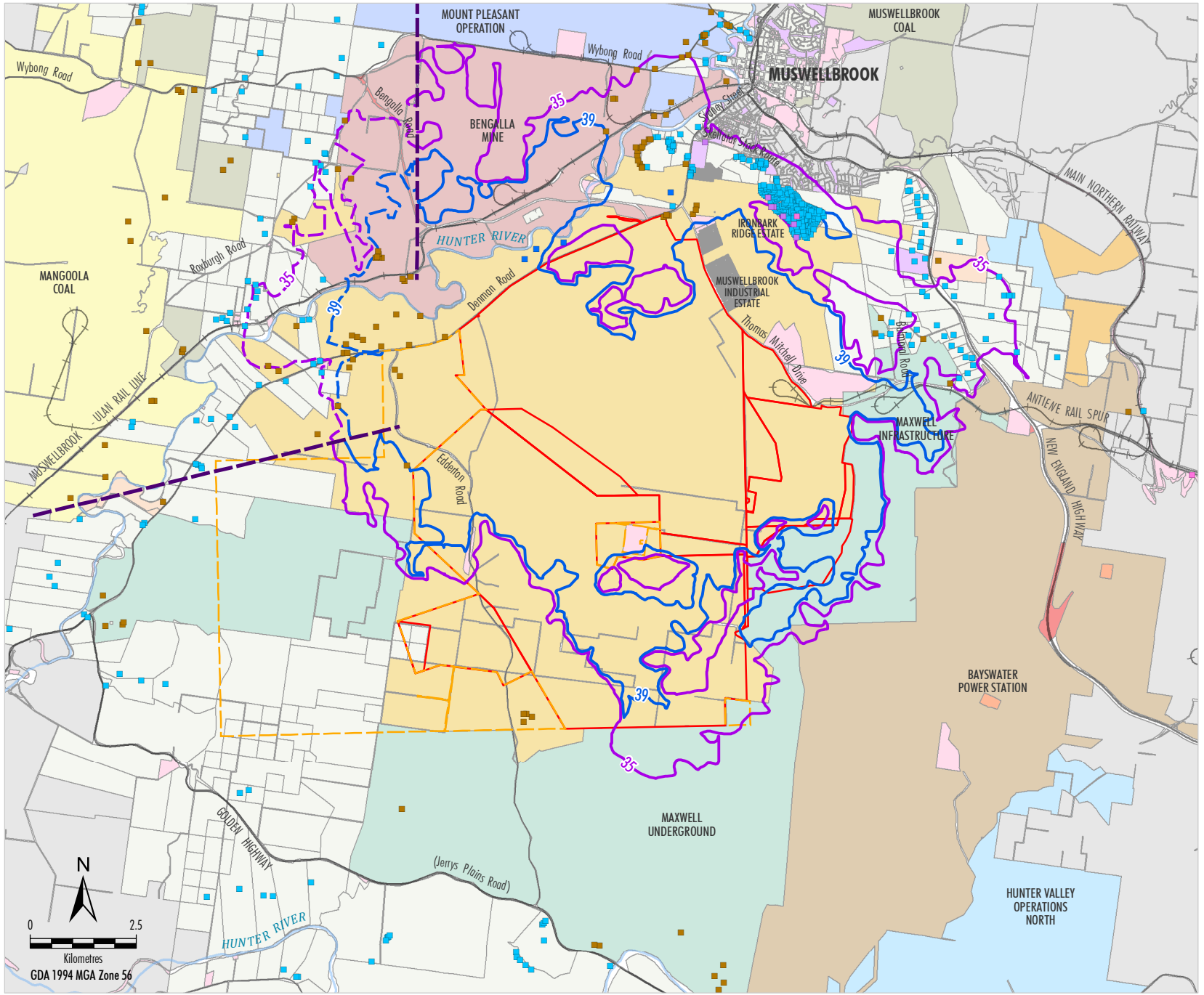
BHP

MT ARTHUR COAL MINE MODIFICATION 2

Evening Intrusive $L_{Aeq\ (15\ min)}$ Noise Contours 2030

Figure H-2

HVE-19-09 MOD2_NB_210C



LEGEND

- Exploration Licence Boundary (EL, AUTH)
- Mining and Coal Lease Boundary (ML, MPL, CL, CCL)
- Mt Arthur-controlled
- Maxwell-controlled
- Bengalla-controlled
- AGL-controlled
- Mount Pleasant-controlled
- Mangoola-controlled
- Glencore-controlled
- HVO-controlled
- Industrial Zone
- Muswellbrook Coal-controlled
- Other Mining/Resource Company-controlled
- Crown/The State of NSW
- Muswellbrook Shire Council
- Transport for NSW
- TransGrid
- Privately-owned Land
- Owner not Identified

Dwellings

- Mine-owned Receiver
- The State of NSW (Crown)
- Muswellbrook Shire Council
- Heritage Listed Dwelling
- Privately-owned Receiver
- Night Mitigated Noise Contour Boundary

Noise Contours

- 35 dBA
- 39 dBA
- 35 dBA (Mitigated)
- 39 dBA (Mitigated)

Source: BHP (2023); NSW Spatial Services (2023)

BHP

MT ARTHUR COAL MINE MODIFICATION 2

Night (Mitigated) Intrusive $L_{Aeq\ (15\ min)}$ Noise Contours 2030

Figure H-3

HVE-19-09 MOD2_NB_211D