Centennial Coal

Noise Management Plan

Northern Region

March 2021

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DOCUMENT CONTROL

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	2	SSD-5145 Modification 1	Update of administrative conditions
	3	SSD-5144 IEA	Update of administrative conditions
	4	EPL 365 Variation of Licence	Update of noise monitoring conditions

Abbreviations

AR	Annual Review (formerly Annual Environmental Monitoring Report)
CCL	Consolidated Coal Lease
CoA	Conditions of Approval
dB	Decibel
DoP	Former NSW Department of Planning
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental Impact Assessment
EPA	Environment Protection Authority
EPL	Environment Protection Licence
EMS	Environmental Management Strategy
ML	Mining Lease
Mtpa	Million Tonnes per Annum
POEO Act	Protection of the Environment Operations Act 1997
RBL	Rating background level
ROM	Run of Mine

Glossary

dB	Decibel is the logarithmic unit used for expressing the sound pressure level (SPL) or power level (SWL) in acoustics.
dB(A)	Frequency weighting filter used to measure 'A-weighted' sound pressure levels, which conforms about to the human ear response.
$L_{Aeq\ (period)}$	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{A90\ (period)}$	The sound pressure level exceeded for 90% of the measurement period.
Day	7 am to 6 pm – Monday to Friday, 8 am to 6 pm – Sundays and Public Holidays
Evening	6 pm to 10 pm
Night	10 pm to 7 am – Monday to Saturday, 10 pm to 8 am – Sundays and Public Holidays

1 Introduction

1.1 Commitment and policy

Centennial Coal Company (Centennial) is a coal mining company supplying thermal and coking coal to the domestic and export markets. Centennial is a major fuel supplier to the New South Wales (NSW) energy industry, fuelling approximately 40% of the State's coal-fired electricity.

Centennial is one of the largest underground coal producers in NSW and, as part of Banpu, a member of the largest independent pan-Asian coal group. Centennial's northern region operations, located in the Lake Macquarie and Wyong Local Government Areas (LGAs), include Mandalong Mine, Myuna Colliery, Newstan Colliery, and Northern Coal Services.

1.2 Objectives

The purpose of this Noise Management Plan (NMP) is to ensure that operational and construction noise impacts on the local community are minimised and appropriate management measures are identified and response protocols detailed should noise criteria be exceeded. This NMP has been developed to:

- address the CoA for the northern region operations in relation to noise;
- address the requirements of Environment Protection Licenses (EPL);
- identify noise impact pathways from Centennial operations in the northern region;
- provide a description of noise management measures implemented across these operations;
- outline noise monitoring requirements and standards; and
- provide a procedure to manage and respond to complaints relating to noise or a measured noise incident.

1.3 EMS integration

This NMP is part of the Environmental Management Strategy (EMS) that has been developed for each operation.

1.4 Management plan approach

Noise emissions from Centennial's operations within the northern region have, historically, been individually managed. A 'regional' approach has been adopted in preparation of this NMP. The aims of adopting a regional approach to the management and monitoring of noise emissions include the following:

- provide consistent and consolidated management measures and procedures across all sites;
- management of cumulative impacts, rather than focusing on individual operations; and
- rationalise monitoring procedures and locations with consideration of cumulative impacts.

A 'short term' and 'long term' approach has also been adopted, acknowledging that some changes will take time and require discussions and approval from the relevant authorities. The short term plans would be implemented immediately, with a transitional period for some operations to achieve the long term approach.

The NMP outlines the management and monitoring measures that will be implemented at all operations. Specific requirements for each operation are provided in **Appendix A** to **Appendix D**.

1.5 Scope

This NMP has been prepared in accordance with the respective operations CoA and requirements of the sites Environment Protection Licence (EPL) to manage noise impacts to sensitive receivers and the wider environment from mining operations and associated mining related activities within Centennial's northern region.

1.6 Site operations

Figure 1 shows the location of each operation within the northern region.

A brief overview of each operation within Centennial's northern region is provided in the sub-sections below.

1.6.1 Mandalong Mine

Mandalong Mine is an existing underground coal mine operation located approximately 35 kilometres south-west of Newcastle and approximately 130 kilometres north of Sydney within the Lake Macquarie and Wyong Local Government Areas. Underground longwall mining operations commenced at Mandalong Mine in January 2005. Current approvals authorise the extraction of up to 6.5 million tonnes of coal per annum using a combination of continuous miner and longwall mining methods. The key infrastructure at the Mandalong Mine comprises the surface infrastructure including administration buildings, workshop and mine ventilation facilities at the Mandalong Mine Access Site, the ventilation facilities at the Cooranbong Entry Site and proposed new ventilation and mine support infrastructure at the Mandalong South Surface Site. An underground coal delivery system links Mandalong Mine to Delta Entry Site, where coal is handled before being transported to the Vales Point Power Station by the Delta Electricity overland conveyor. The underground coal delivery system and the handling and transport of coal at Delta Entry Site are approved under separate Development Consents.

1.6.2 Myuna Colliery

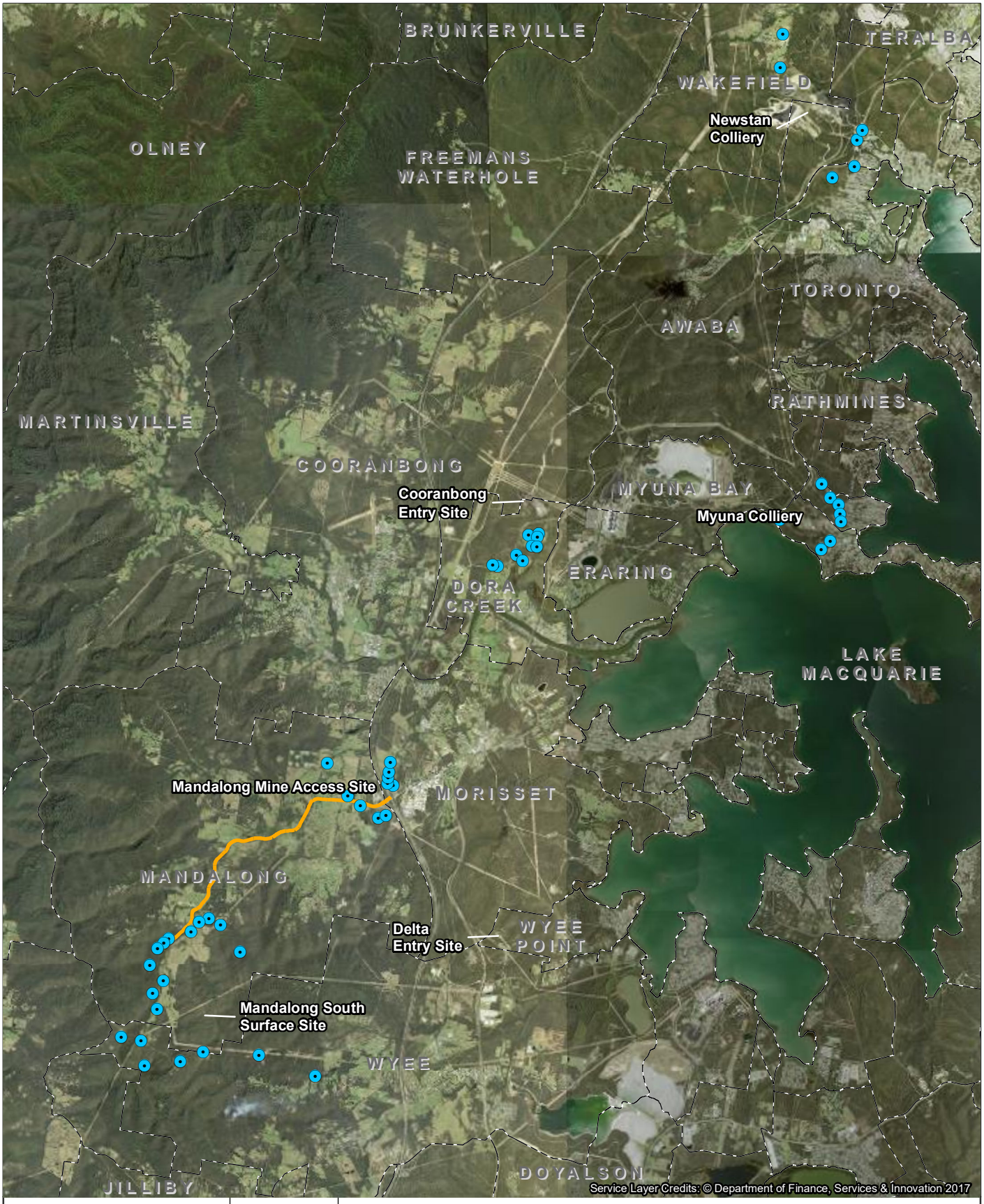
Myuna Colliery is an underground coal mine located approximately 25 kilometres south-west of Newcastle, and approximately 135 kilometres north of Sydney within the Lake Macquarie and Wyong Local Government Areas. The development of Myuna Colliery commenced in 1979 and underground mining using bord and pillar mining methods commenced in 1982. Current approvals authorise the extraction of up to 3 million tonnes of coal per annum using bord and pillar mining methods. The key infrastructure at the Myuna Colliery surface facilities area comprises administration buildings, bathhouse, workshop, coal handling infrastructure and mine ventilation infrastructure. All coal is transported directly from the Myuna Colliery surface facilities area to the Eraring Power Station via a dedicated overland conveyor owned and operated by Origin Energy.

1.6.3 Newstan Colliery

Newstan Colliery is an existing underground coal mine located approximately 25 kilometres south-west of Newcastle and 140 kilometres north of Sydney within the Lake Macquarie Local Government Area. Newstan Colliery began mining operations in 1887. Current approvals authorise the extraction of up to 4 million tonnes of coal per annum using a combination of continuous miner and longwall mining methods. The key infrastructure at the Newstan Colliery comprises the ventilation facilities at the Newstan Colliery Surface Site and at the Main Ventilation Fan Site which is located approximately 365 metres west north-west of the Awaba Colliery Surface Site. The Newstan development consent includes noise conditions relevant to construction outside of standard hours and operation of the ventilation fans at Awaba. No construction is planned outside of standard hours and the fans are not yet operational. This management plan will be updated prior to the ventilation fans being installed and becoming operational. Additional mine support infrastructure is located at the Newstan Services compound (located approximately 550 metres north north-west of the Awaba Colliery Surface Site) and at the Forest Road Site located off Forest Road at Awaba.

1.6.4 Northern Coal Services

Northern Coal Services operations are located on the western side of Lake Macquarie approximately 25 kilometres south-west of Newcastle and 140 kilometres north of Sydney in New South Wales (NSW). The Northern Coal Services operations comprises the water management and surface coal handling and processing facilities at the Newstan Colliery Surface Site and Mandalong Mine - Cooranbong Entry Site (Cooranbong Entry Site), along with existing private haul roads and rail loading infrastructure. The facilities of the Northern Coal Services operations are used by Centennial to process and wash coal from Mandalong and Newstan mines and to facilitate the distribution of coal to local power stations via private haul roads and rail, and also transport coal for export to the ports of Newcastle or Port Kembla by rail.



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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Suburb
- Haul Road
- Sensitive receiver

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Centennial Coal Northern Region Environmental Monitoring Operation Locations and Sensitive Receivers

Centennial Coal

DATE 11/08/2020

Figure 1

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1.7 Approvals and licensing requirements

Centennial conducts its operations in accordance with relevant legislation and regulatory requirements. Legislative and regulatory requirements are generally recognised through the imposition of CoA and various licences or mining approvals.

Centennial operates under a number of different approvals including:

- CoA issued by the Department of Environment, Industry and Environment (DPIE);
- Environment Protection Licence (EPL) issued by the NSW Environment Protection Authority (EPA);
- a Mining Operations Plan (MOP) approved by the Division of Resources & Geoscience (DRG);
- mining tenements issued by the Division of Resources and Geoscience (DRG); and
- water licences and approvals issued by the NSW Lands & Water Division (LWD).

1.7.1 Development Consents and Planning Approvals

A summary of the relevant Development Consents and Planning Approvals for each respective northern operation is listed in **Table 1-1**. The site-specific development consent and approval conditions that the NMP has been prepared to address appear in the site specific Appendices A to D.

Table 1-1 - Development Consents/Planning Approvals

Site	Development Consent/Planning Approval ID
Mandalong Mine	SSD 5144
	DA 35-2-2004
Myuna Colliery	PA 10_0080
Newstan Colliery	DA 73-11-98
Northern Coal Services	SSD 5145

1.7.2 Environment Protection Licences

A summary of the relevant EPLs for each respective operation is listed in **Table 1-2.**

Table 1-2 - Environment Protection Licences

Site	EPL ID
Mandalong Mine	EPL 365
Myuna Colliery	EPL 366
Newstan Colliery	EPL 395
Northern Coal Services	EPL 395 and EPL 365

1.7.3 Mining Leases

A summary of the relevant Mining Leases and Exploration Licences for each respective northern operation is listed in **Table 1-3.**

Table 1-3 - Mining Leases and Exploration Licences and Mineral Authorities

Site	ML/EL and Mineral Authority ID
Mandalong Mine	MPL191, ML1744, ML1543, CCL762, ML1443, ML1553, ML1431, ML1722, EL4968, A404, EL4969, EL5892, EL6317, EL4443
Myuna Colliery	ML1370, ML1632, MPL 334, EL4444, EL6640
Northern Coal Services	CCL727, CCL746, CCL762, CCL763, CCL764, ML1480, ML1587, MPL191, MPL304, MPL305, MPL327, MPL329
Newstan Colliery	CCL746, MPL 304, MPL305, MPL 327, MPL328, ML1380, ML1480, ML1452, CCL764,ML1586,CCL727, CCL763,PLL497, ML1587, EL5138, A399, EL6641

1.8 Performance criteria, limits and goals

Noise criteria are provided in the CoA and/or EPL for each operation. The site-specific requirements and receiver locations referred to in the CoA are also provided in **Appendix A** to **Appendix D.**

2 Existing environment

2.1 Meteorology

The geographical area of the northern region operations is within a 'temperate' climatic zone. The subclass for the region is mostly 'no dry season', due to the low variation month to month in average rainfall, and 'hot summer'. Otherwise, the 'no dry season' sub-class has isolated pockets of 'warm summer' due to proximity to the coast.

While the northern region operations are close to the coast, the Great Dividing Ranges themselves are capable of providing some protection of prevailing winds.

Winter westerly winds are a dominant feature as the sub-tropical ridge migrates to the north before spending a greater time to the south for the warmer months. Local winds associated with funnelling through valley systems produce local effects that mask the more regional to synoptic scale weather patterns. Therefore, most winds during the cooler months (winter plus the latter part of autumn and the earlier part of spring) are from the south-west or north-west quadrant, depending on local valley funnelling effects.

A reversal occurs for the warmer months, with a more easterly component, as the sub-tropical ridge migrates to the south and land surfaces warm up (to give a greater contrast to the Tasman Sea water temperature). East to north-east winds become dominant, with some localised valley funnelling to the south-east quadrant, and can be quicker than in winter in areas with coastal exposure bringing sea breezes and sheltering from any pre-frontal westerlies (the same Great Dividing Ranges protection also diminishes the average wind strength of the winter westerlies).

Average annual rainfall is over the 1 m mark mostly due to the coastal influence and any moist easterlies experiencing orographic lifting (winds forced higher by the ranges to the west) leading to enhanced precipitation. Summer rain events can be heavier due to enhanced convective activity, assisted by warmer surface temperatures, and result in these months having slightly higher monthly rainfall averages than the rest of the year. East coast lows may form at any time of the year and provide extreme rainfall events which occur on an ad-hoc basis.

2.2 Sensitive receivers

Sensitive receivers within the northern region predominantly consist of residential properties. Other sensitive receivers include educational facilities such as Fassifern Public School.

Residential areas or rural properties are located around all operations within the northern region, as shown in Figure 1. More urbanised residential properties are concentrated in areas such as Fassifern (Newstan Colliery Surface Operations) and Wangi Wangi (Myuna Colliery).

A detailed map of residential properties surrounding each operation within the northern region is provided in each site appendix – **Appendix A** to **Appendix D**.

2.3 Baseline noise levels

Noise monitoring has been undertaken by Centennial in the northern region operations for many years. Long term trends in noise levels have been established around all operations, inclusive of background reference levels. This data is typically summarised in Noise Impact Assessments, monitoring reports and Annual Reviews for each operation.

Baseline noise levels have been measured throughout the planning and approvals phase for each operation. These baseline levels are then used to establish operational noise limits for each operation, which are contained with the CoA.

Ongoing noise monitoring is then undertaken to assess compliance with these CoA.

Noise monitoring locations are discussed further in **Section 4** and individual site appendices. Maps showing noise monitoring locations are provided in **Appendix A** to **Appendix E**.

3 Management measures

Activities that have been identified as sources of noise within the northern region operations include:

- truck movements on private haul roads;
- overland conveyors and conveyor drives;
- operation of mobile equipment – e.g. trucks, dozers, loaders;
- coal processing infrastructure (rotary breakers, wash plant, crushers, screens etc.);
- rail loading operations; and
- ventilation shafts.

The sections below outline the noise management measures which are 'common' across all operations within the northern region operations.

Noise management or mitigation measures which are specifically required at individual operations in addition to these common measures are provided in **Appendix A** to **Appendix D**.

3.1 "Common measures"

The measures outlined in **Table 3-1** are currently being implemented to minimise noise emissions to the greatest extent practicable. These measures are implemented across all operations, where applicable. Following industry-leading practice, these are a mixture of routine design and operational controls. Any operation-specific measures are provided in the relevant appendix.

Table 3-1 - Common noise management and mitigation measures

Emission source	Control measure
Train loading operations	• Modifying the locations of trains idling while being loaded/waiting to enter the network to minimise offsite noise impacts at sensitive receptors. • Installation of a sound wall adjacent to the rail loop in the direction of sensitive receivers (Newstan Colliery).
Overland Conveyors	• A combination of partial and fully enclosed conveyors and conveyor drives. • Regular inspection of conveyor idlers and prompt replacement of damaged or highly worn idlers during maintenance.

Emission source	Control measure
Mobile Equipment	• Regular maintenance of plant and equipment in accordance with the manufacturer's specifications to ensure optimal operating conditions. • Installation of frequency modulated reversing alarms or "quakers" on mobile plant. • Switching off vehicles and plant when not in use. • Operating mobile plant in a quiet, efficient manner and regular training of operators. • Selecting low noise plant for operation on site.
Coal processing infrastructure	• Installing acoustic enclosures around processing plants. • Sealing all unnecessary openings. • Establishment of buffer zones between operations and sensitive receptors.
Truck haulage	• Regular inspections and maintenance of haul road surfaces. • Limiting truck speeds on private haul roads.

3.2 Proactive planning

A number of measures are implemented to proactively plan and manage noise emissions from the northern region operations. Measures implemented by Centennial include:

- a region-wide monitoring rationalisation to make more use of real-time noise monitoring to provide more informative data and enable more timely response to elevated noise levels from site operations;
- procurement of quieter equipment whenever new items or maintenance work are required;
- regular (annual) reviews of monitoring and management measures; and
- impact assessments of future changes/expansions.

4 Monitoring program

4.1 Objective

The objective of the noise monitoring program is to enable Centennial to assess compliance with the noise limits of the relevant CoA.

The results of the noise monitoring will be used to identify key noise sources and review and improve Centennial's operational noise management practices.

4.2 Monitoring standards

Noise monitoring is undertaken in accordance with the following standards:

- AS/NZS IEC 61672.1-2019: *Electroacoustics – Sound level meters – Specifications;*
- AS 1055:2018 *Description and measurement of environmental noise;*
- EPA NSW Noise Policy for Industry (2017) - *applies to SSD-5145; and*
- EPA NSW Industrial Noise Policy (2000).

4.3 Monitoring methods

Noise monitoring is undertaken to quantify the noise impact from operations and assess individual operations contribution and cumulative noise levels against regulatory requirements. Monitoring is typically undertaken at sensitive receiver (i.e. residence) locations, or at a representative location.

Off-site noise monitoring locations are selected based on those sensitive receivers predicted to have the highest level of impact (typically based on predictive modelling from impact assessment reports).

The sections below outline the types of noise monitoring utilised by Centennial.

Noise monitoring will be undertaken by suitably qualified acoustic consultants.

4.3.1 Real time noise monitoring

Continuous real time noise monitoring allows instantaneous feedback of noise levels at the monitoring site. Real time feedback can allow for immediate ameliorative action to be taken if elevated noise levels are recorded and linked back to a source that can be 'managed'.

Real time monitoring is used to guide the level of noise mitigation and management implemented on site. Results from the real time monitoring system will not be used to determine compliance, as noise levels recorded do not represent only noise from the operation, rather noise from all sources.

There are currently three real-time noise monitors in operation within the northern region; real-time noise monitors are installed at Cooranbong Entry site, Myuna Colliery and Newstan Colliery.

Further details of the real time noise monitoring systems used at these sites are provided in the relevant site-specific **Appendix B** and **Appendix C**.

4.3.2 Attended monitoring

Attended noise monitoring is used to assess compliance with the relevant noise criteria at sensitive receiver locations.

Attended monitoring allows for the contribution of mining activities to be determined from the total measured noise level. This contribution can be estimated or calculated by the operator by noting measureable noise events and their source throughout each 15-minute noise monitoring period.

Non-mining related noise, such as insect noise, bird noise, road traffic noise and wind noise can also be quantified and excluded from the measurement where possible.

Attended noise monitoring will be conducted in accordance with *NSW Industrial Noise Policy 2000 (NSW Noise Policy for Industry 2017 applies to SSD-5145)* guidelines and AS 1055:2018: *Description and measurement of environmental noise*.

If site noise is not measurable due to masking, then suitable methods must be employed as per the *NSW Industrial Noise Policy 2000 (NSW Noise Policy for Industry 2017 applies to SSD-5145)* (e.g. measure closer to the source and then back calculate to the receptor location) to determine a value for assessment of compliance. Concurrent real-time monitoring data will be utilised at Myuna Colliery, Cooranbong Entry Site and Newstan Colliery to assist in determining the operations contribution to total measured noise levels at attended monitoring locations.

The characteristics of measured site noise must also be considered and modifying factors applied according to the requirements of Section 4 of the *NSW Industrial Noise Policy 2000 (NSW Noise Policy for Industry 2017 applies to SSD-5145)*, where applicable.

In accordance with the relevant CoA, attended noise monitoring is typically undertaken over multiple periods of 15 minutes duration. Monitoring is typically undertaken during each of the day, evening and night periods. However, compliance monitoring is often most effective during the evening and night period, for a number of reasons, including:

- operations occur 24-hours per day;
- extraneous noise from sources such as traffic typically reduces during the night time, making it easier to distinguish mine-related noise; and
- meteorological conditions during the evening and night often produce highest operational noise levels.

Given the above, Centennial will initially undertake day, evening and night compliance noise monitoring at each operation with a view of reducing to evening and night only once it has been determined that monitoring during the day period is unnecessary.

The frequency of attended monitoring surveys can vary from quarterly to annually, depending on individual site's CoA. For operations where day-to-day activities remain similar, quarterly noise monitoring surveys aim to capture operational noise levels during a range of weather conditions and are generally considered sufficient to assess ongoing compliance with noise criteria. For operations with a low risk of adverse noise impacts, annual compliance monitoring can be acceptable. Additional monitoring is undertaken in response to community complaints, if they are received.

4.3.3 Meteorological monitoring

Meteorological monitoring is used to determine prevailing regional and local weather conditions.

Concurrent local meteorological data is required during attended noise monitoring surveys to determine if the noise criteria are applicable. The CoA for each operation provides meteorological conditions under which the noise limits are applicable. These conditions are provided in **Appendix A** to **Appendix C**.

The noise monitoring contractor is provided with the most representative meteorological data (from one of three weather stations within Centennial's northern region operations), covering the 24-hour period around the time of monitoring.

Historical meteorological information also provides useful data in assisting in determining the source of noise (e.g. downwind/upwind) especially during the analysis of any noise events.

A standard Automatic Weather Station (AWS) most often measures wind speed and direction, (dry bulb) temperature (optionally with a temperature gradient – typically 2 m and 10 m) and global solar radiation.

4.4 Monitoring devices

Noise monitoring is typically undertaken using one or more of the following devices:

- real-time noise monitor;
- sound level meter; and
- unattended noise logger.

The following sections provide a summary of noise monitoring devices and the standard procedures for use for Centennial operations.

4.4.1 Real time noise monitors

Real-time noise loggers are used and operate continuously within Centennial northern region operations. Their location is selected to provide useful information regarding instantaneous noise. Real-time noise loggers continuously sample, integrate and record statistical noise levels.

Myuna Colliery, Cooranbong Entry site and Newstan Colliery utilise real-time noise loggers. Trigger noise levels will be established at these real-time monitoring sites, corresponding to the consent noise limits at sensitive receivers. These trigger levels continue to be refined through the use of attended noise monitoring and noise modelling software to determine attenuation factors from the real-time monitoring location to sensitive receivers. If the trigger level is exceeded, the Mine Manager and Environmental Coordinator are notified and the procedure outlined in Section 5.1 is followed.

4.4.2 Sound level meters

Sound Level Meters (SLM) used for attended noise monitoring shall be Type 1 or Type 2 (Type 1 preferred), and conform to the requirements of AS/NZS IEC 61672.1-2019 *Electroacoustics – Sound level meters – Specifications.*

The procedure for undertaking attended noise monitoring is outlined below:

- attended noise monitoring/measurement shall be conducted during operations of the site that are expected to represent the highest potential for noise impacts;
- the measurement location and microphone height will be representative of the sensitive noise receiver;
- observations of any apparent tonal, low frequency or impulsive noise will be made during the measurements and the appropriate correction factors will be applied to measured noise levels as per the *NSW Industrial Noise Policy 2000 (NSW Noise Policy for Industry 2017 applies to SSD-5145)*, where applicable;
- record the time average A-weighted sound pressure level $L_{Aeq,T}$ (as per Clause 3.22 of AS 1055:2018), which represents the noise level measured at an appropriate free-field location;
- meteorological conditions shall be noted for noise monitoring purposes, as per Clause 6.3 of AS 1055:2018. Meteorological conditions during the time of monitoring should be obtained from the nearest or most representative meteorological station to determine in the relevant noise limits are applicable. In addition, a hand held anemometer should also be used to assess the local weather conditions at the noise monitoring location;
- notes will be taken on the types of noise sources present during monitoring through site observation (especially noise sources from mining operations). Where possible, noise levels from individual sources on site should be quantified, with the aim of determining the mining noise contribution alone to the overall measured noise level;
- field calibration shall be undertaken immediately pre and post measurement using a Sound Calibrator to the satisfaction Clause 5.6 of AS 1055:2018;
- where adjustment to the measured noise levels is necessary due to certain nature of noise (e.g. tonality, low-frequency, impulsive and intermittent), it shall be conducted in accordance with Section 4 of the *NSW Industrial Noise Policy 2000 (NSW Noise Policy for Industry 2017 applies to SSD-5145)*; and
- measurement details shall be recorded in accordance with Clause 7 of AS 1055:2018, which include:
    - type of instrumentation, make, model and serial numbers, date of most recent calibration, measurement procedure including results of reference level checking or portable calibrator checks and any calculation employed;
    - description of the time aspect of the measurements, i.e. the reference and measurement time intervals, including details of any sampling used, and the methods of processing data;

- positions of measurements, and any adjustment made for presence or absence of nearby reflecting surfaces. This shall include a plan identifying structures, noise source locations and measurement positions; and
- results of noise monitoring, including site observations and estimated site. contribution.

4.4.3 Unattended noise loggers

Unattended noise loggers typically use Type 1 or Type 2 sound level meters, as used for attended monitoring. The sound level meters are set up in a weather proof case with microphone typically attached to an external pole or similar at a height of 1.2 – 1.5 m above ground level.

Figure 2 - Example unattended noise logger setup

4.4.4 Equipment calibration

Monitoring equipment will be maintained and calibrated on a regular basis in accordance with the relevant Australian Standard. The calibration requirements for noise monitoring equipment are summarised below in **Table 4-1**.

- all instrumentation used to monitoring for compliance will be NATA calibrated on an annual basis and calibration should be checked before and after each measurement, with a maximum deviation of ±0.5 dB; and
- field calibration shall be undertaken immediately pre and post measurement using a Sound Calibrator to the satisfaction Clause 5.6 of AS 1055:2018.

Table 4-1 - Monitoring equipment calibration requirements

Equipment	Relevant Standard	Calibration frequency	Calibration description
Real-time monitor	AS 1055:2018 AS/NZS IEC 61672.1-2019	No greater than 2 years	NATA laboratory responsible for calibration of measuring equipment used (if used to monitor compliance). Regular checks recommended.
Sound Level Meter	AS 1055:2018 AS/NZS IEC 61672.1-2019	No greater than 2 years	NATA laboratory calibration. Field checks pre and post each monitoring round.
Noise logger	AS 1055:2018 AS/NZS IEC 61672.1-2019	No greater than 2 years	NATA laboratory calibration. Field checks pre and post each monitoring round.

4.5 Monitoring program summary

Centennial operate a comprehensive noise monitoring program in the northern region involving the use of real-time and attended monitors as well as meteorological stations. This monitoring program allows Centennial to quantify noise impacts from northern region operations at sensitive receiver locations for analysis and comparison of the environmental performance against relevant CoA and EPLs. The monitoring program also allows for the effectiveness of noise management measures to be measured.

A summary table of all existing (short term program) noise monitoring undertaken in Centennial's northern region is provided in **Table 4-2** and shown on **Figure 3**. As Mandalong and the Cooranbong Entry Site (operated in accordance with the Northern Coal Logistics Project) have transitioned to the long term monitoring program, the short term monitoring program has been removed from this Management Plan as the short term monitoring program is no longer applicable.

Table 4-2 - Short term noise monitoring summary

Operation	Location	Attended monitoring	Frequency	Continuous real-time monitor
Mandalong Mine	Mandalong Mine Access Site	NA	NA	NA
	Mandalong South Surface Site	NA	NA	NA
Myuna Colliery	Myuna Colliery	8	Quarterly	1
Northern Coal Services	Newstan Colliery	5	Quarterly	1
	Cooranbong Entry Site	NA	NA	NA

The long term noise monitoring program is summarised in **Table** 4-3 and shown on **Figure 4**.

Table 4-3 - Long term noise monitoring summary

Approval	Operation	Attended monitoring locations	Frequency	Continuous real-time monitor
Mandalong Mine	Mandalong Mine Access Site	5	Quarterly	0

Approval	Operation	Attended monitoring locations	Frequency	Continuous real-time monitor
	Mandalong South Surface Site	1	Quarterly	0
Myuna Colliery	Myuna Colliery	4	Quarterly	1
Northern Coal Services	Newstan Colliery	5	Quarterly	1
	Cooranbong Entry Site	1	Quarterly	1

4.5.1 Monitoring data and trends

Monitoring data will be uploaded to the Centennial Coal Environment and Community Database. Monitoring data will be analysed to establish both short term ($L_{Aeq\ 15\ minute}$) impacts and long term trends and reported annually in the Annual Review.

The primary use of monitoring data is to demonstrate that Centennial operations are complying with the relevant CoA. Secondly, noise monitoring data is used to guide the implementation of mitigation and management measures on site as required.

The effectiveness of this NMP will be reviewed following an incident, non-compliance or complaint and revised as required.

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Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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LEGEND

- Suburb
- Haul Road
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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Centennial Coal
Northern Region
Environmental Monitoring
Overview
Short Term noise monitoring

Centennial Coal

DATE 11/09/2020

Figure 3

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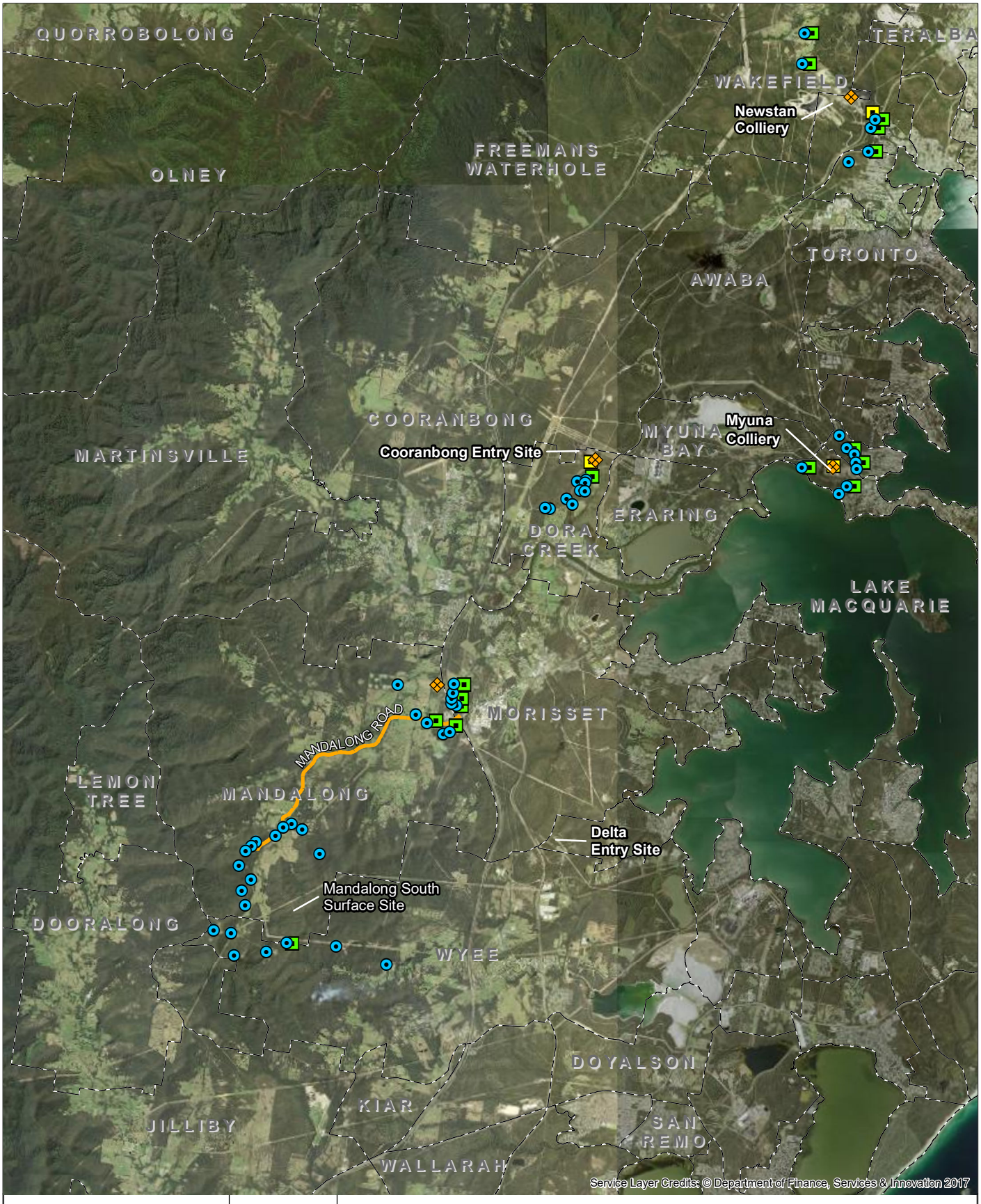
Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:tmorton



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0 550 1,100 2,200 3,300 4,400

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Suburb
- Haul Road
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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LOCATION	-
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Centennial Coal
Northern Region
Environmental Monitoring
Overview
Long term noise monitoring

Centennial Coal

DATE 11/09/2020

Figure 4

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP003_LT_NoiseMonitoring_Overview_0.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tmorton

4.6 Reporting

4.6.1 Annual Review

An Annual Review (formerly known as the Annual Environmental Management Report) is to be completed in accordance with the requirements of the CoA for each operation. The Annual Review includes:

- information on the development and activities carried out in the past calendar year;
- information on the activities proposed to be carried out over the current calendar year;
- a comprehensive review of the monitoring results and complaint records of the development over the past calendar year;
- a comparison of monitoring results against:
  - the relevant statutory requirements, limits or performance measures/criteria;
  - the monitoring results of previous years; and
  - the relevant predictions in the EIS.
- information on any non-compliances over the past year, and what actions were (or are being) taken to ensure compliance;
- an identification of any trends in the monitoring data;
- identification of any discrepancies between the predicted and actual impacts of the development, and an analysis of the potential cause of any significant discrepancies; and
- a description of what measures will be implemented over the next calendar year to improve the environmental performance of the development.

The Annual Review is to be made available on the Centennial Coal website.

4.6.2 Annual Return

An Annual Return stating the sites compliance with the conditions of its EPL is completed and submitted to the EPA on an annual basis. This is done in accordance with the EPL conditions and by the due date as stated in the EPL.

4.6.3 Monthly website environmental monitoring report

A monitoring report is published on the website to satisfy the requirements under the Protection of the Environment Legislation Amendment Act 2011 (POELA Act) to publish or make pollution monitoring data available to members of the public.

4.6.4 Community Consultative Committee

Community Consultative Committees (CCC) meet on a regular basis. Some of the information reported at the CCCs includes:

- operational issues;
- monitoring and environmental performance; and
- community complaints and the response to complaints.

5 Contingency measures

5.1 Managing unpredicted impacts

Unpredicted noise impacts may result from such things as:

- maintenance work or malfunction of operating equipment;
- the temporary use of different equipment on site or use of equipment in locations different to 'normal' operations; and/or
- a sudden change in weather conditions which could generate noise enhancing conditions.

When unpredicted impacts are noted, an immediate review of operations would be undertaken to determine potential operational changes to reduce noise generation.

The following procedure will be implemented following recognition of an unexpected noise impact:

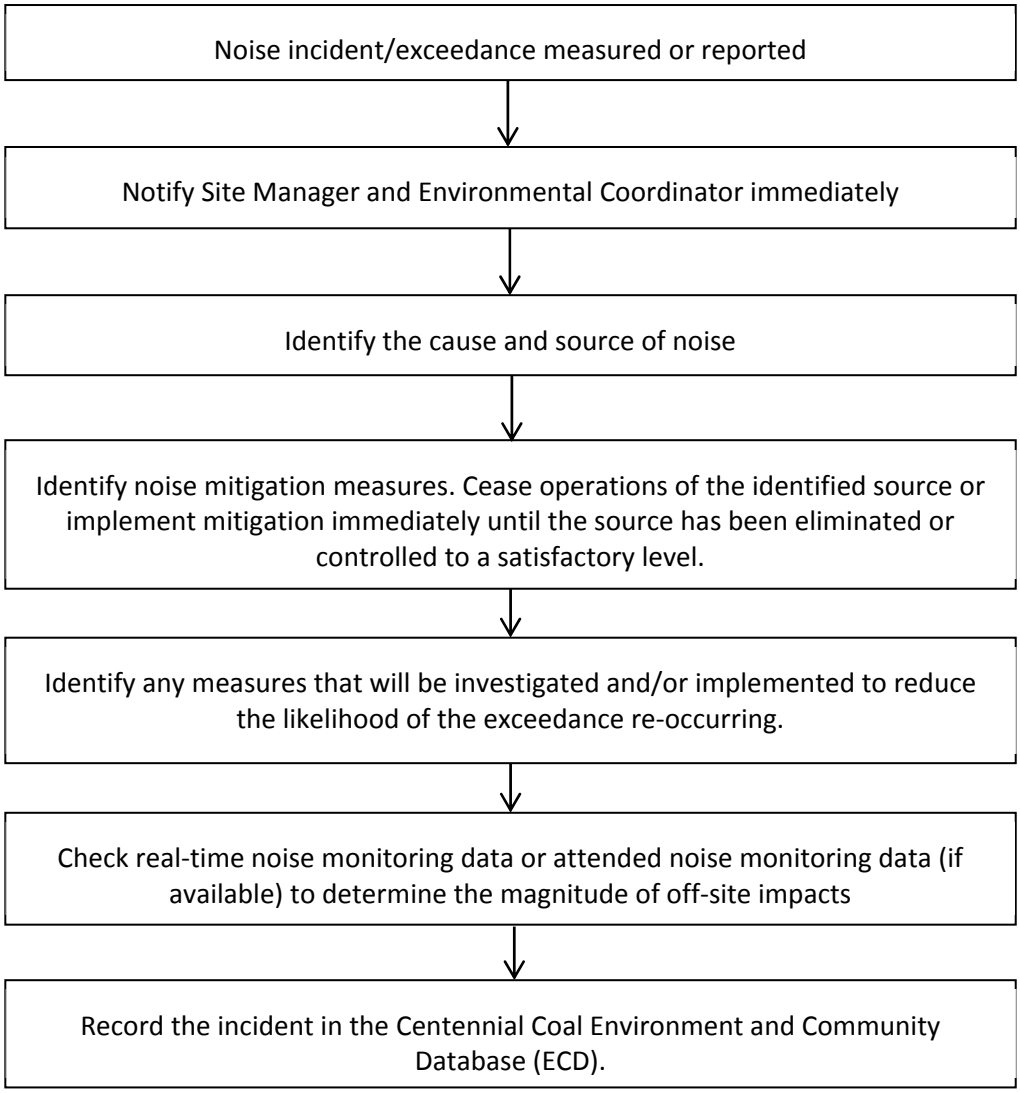

Figure 5 - Unexpected noise exceedance management procedure

5.2 Trigger Action Response Plans

The Trigger Action Response Plan (TARP) defines the minimum set of corrective actions that are required by site personnel in response to unpredicted impacts or deviation in the mine conditions from normality.

The TARP defines what is “normal” by way of a set of criteria for a range of aspects and are shown as green in the TARP. Criteria relating to abnormal conditions including trigger values are also defined in the TARP and are rated based on increased risk and potential impact and shown as orange or red. Corresponding corrective actions for each risk level are also clearly defined. The trigger levels are based on previous monitoring, CoA and EPL criteria.

It is important to note that corrective actions do not have to wait until a trigger is exceeded. Site personnel may notice abnormal levels of noise and initiate corrective actions earlier than required under the TARP.

Table 5-1 - TARP - noise

Aspect	Condition Green	Condition Orange	Condition Red
Noise	**Trigger**	**Trigger**	**Trigger**
	Monitoring results within criteria.	Real time monitoring indicates noise levels approaching noise criteria level (within 2 dB(A)).	Attended compliance monitoring indicates an exceedance of the noise criteria.
	Action	**Action**	**Action**
	No response required. Continue monitoring program.	Consider a review of operations to reduce noise emissions. Modify operations where possible.	Complete incident investigation to determine the cause of the exceedance. Review effectiveness of mitigation measures. Modify operations where possible. Notify relevant government agencies and impacted landowners in accordance with the procedure in the Noise Management Plan. Consider a review of the Noise Management Plan in accordance with the CoA.

6 Noise Incidents, complaints and exceedances

6.1 Noise Incidents

A noise incident is defined as an exceedance of the Development Consent or EPL noise criteria detected by statutory noise monitoring.

All noise incidents that occur need to be reported in accordance with the Centennial Incident Reporting Standard (CIMOS-006) with corrective and preventative actions identified. This includes:

- minor incidents resulting in no off-site impact but requiring immediate mitigation and instigation of any mitigation action(s); and
- off-site impacts, such those which prompt complaints, requiring notification to the Site Manager or Environment & Community Coordinator.

In the event of an incident or complaint, the following procedure will be followed:

- investigate the likely source of noise emission, based on current equipment or activities operating within nearby mining operations;
- mitigate the source immediately through application of mitigation measures where possible, such as relocation of noise generating activities or ceasing the operation if mitigation is not feasible;
- log the complaint/incident; and
- create an incident report, including the corrective actions that were taken and who was involved, that documents preventative actions required to prevent a recurrence of the event and includes a sign-off by an authorised person at the site.

6.2 Community enquiries or complaints

Centennial will record and respond to any community enquiries or complaints received as described in the respective site's Community Complaints and Enquiries Procedure and investigate the nature of the complaint / enquiry.

Complaints will be followed up by the Mine Manager or Environment & Community Coordinator as soon as the outcomes of the investigation have been identified.

All community complaints and enquiries will be recorded in the Centennial Coal Environment and Community Database (ECD). Complaints will be entered into the Community Complaints Register and listed on the Centennial Coal website.

6.3 Non-compliance notification procedure

The following procedure will be implemented following a measured exceedance of CoA or EPL noise criteria:

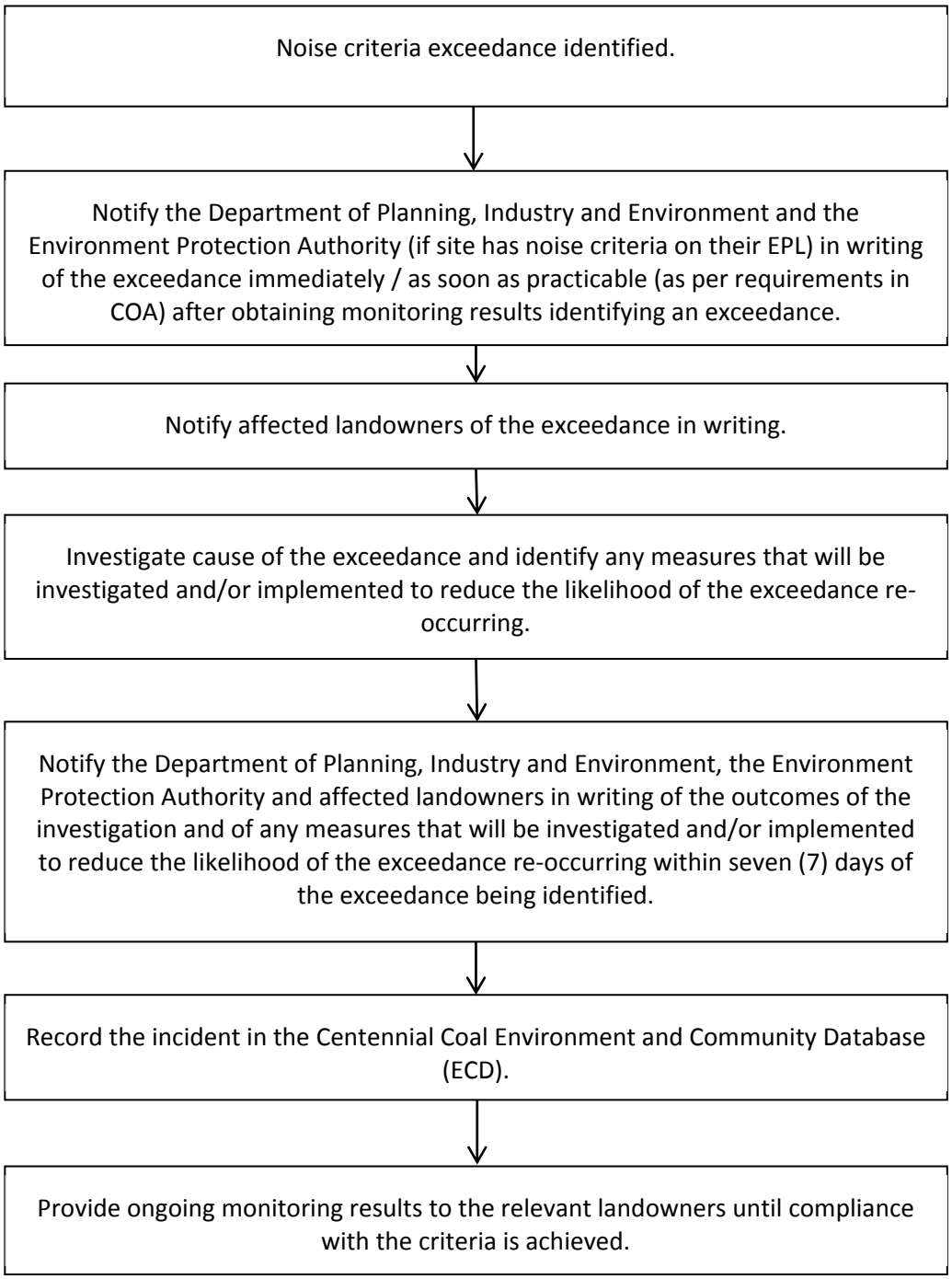

Figure 6 - Noise exceedance notification procedure

7 Roles and responsibilities

Each employee and contactor is responsible for adhering to the Centennial Coal Environmental Policy. Whilst the obligation of complying with the Environmental Policy lies with the entire workforce, further environmental management responsibilities that are considered as a part of the normal functioning of some positions relevant to the EMS are described as follows:

Mine Manager

- authorisation of the EMS;
- approval of environmental and community objectives and targets for the operations Annual Strategic Plan;
- reporting of significant environmental incidents to external stakeholders as required,
- promoting compliance with the Environmental Policy and fulfilling relevant requirements of the EMS and this Management Plan;
- compliance with all licences and approvals for management of the site.
- delegation of resources to ensure environmental risk mitigation strategies are implemented; and
- delegation of duties during the absence of the Environment & Community Coordinator.

Mine/Operations Superintendents

- maintaining the highest possible environmental standards within their designated areas of responsibility;
- make use of all resources available to prevent or reduce environmental risks; and
- immediately reporting environmental incidents and non-compliances to the Environment & Community Coordinator.

Environment & Community Coordinator

- compliance with the Centennial Environmental Policy;
- reporting of environmental incidents as required to external stakeholders;
- development and implementation of environmental strategies, plans, and procedures;
- regulatory and community consultation;
- registration of community complaints and regulatory liaison in the Environment and Community Database (ECD);
- development and implementation of environmental work procedures;
- development and implementation of environmental training and inductions;
- auditing the effectiveness of the EMS and this Management Plan; and
- compliance with all licences and approvals for environmental management of the site.

Employees and Contractors

- compliance with the Centennial Environmental Policy, standards and procedures;
- immediately reporting of environmental incidents and community complaints or enquiries to the Environment & Community Coordinator;
- conducting operations in compliance with the Centennial environmental management plans and procedures; and
- identifying and implementing appropriate controls for environmental risks from any risk assessments and job safety analysis and communicating these with responsible staff.

Health, Safety, Environment & Community Committee

- promoting environmental awareness within the workforce and contractors; and
- raising environmental issues and programs that will improve compliance with the Environmental Policy, standards and procedures at committee meetings for appropriate staff to consider.

Delegation of roles or responsibilities may be determined by the Mine Manager at any time.

8 Training

Training of Centennial staff and contractors may include, but need not be limited to:

- induction training;
- environmental and community awareness training; and
- toolbox training.

8.1 Induction training

All Centennial employees and contractors are inducted prior to commencing work on site. The environmental component of the new employees' induction includes:

- the importance of Centennial's Environmental Policy;
- regulatory requirements;
- overview of the framework of Centennial's EMS;
- roles and responsibilities;
- significant environmental aspects, impacts and consequences; and
- environmental procedures.

Additionally, site specific issues are incorporated into the new employee and contractor site inductions and the competency of inducted personnel assessed.

Visitors to Centennial operations will undertake a brief visitor induction, with an awareness section on key environment components.

8.2 Targeted environmental training

Targeted environmental training of key staff, workforce and contractors in environmental procedures and programs will also be conducted. Specific environmental training may be delivered in the form of toolbox talks, training and assessment packages and accredited training programs to update personnel on the Centennial procedures and environmental programs.

8.3 Environmental training competence

The Centennial induction and environmental awareness training incorporates a section to assess the competency of employees and contractors against environmental requirements.

9 Management plan review

Revisions of this NMP are to be instigated by the site Environment & Community Coordinator or delegate. The outcomes of a review will be documented by updating sections of these documents where required. Revised documents will be approved by the Group Manager Environment and Mine Manager and submitted to DPIE for approval. Once approved, the revised Management Plan will be placed on the Centennial Coal Website.

9.1 Review following an environmental audit

Audits can provide an assessment of compliance with CoA, the EMS and management plans. They also allow for continual improvement and resource allocation.

The objectives of an audit are to:

- identify compliance with the statutory requirements, and
- to identify opportunities for improvement.

If required, this Management Plan will be reviewed following the completion of an environment audit.

9.2 Review following non compliance

Non-compliances may be identified during site inspections, through audit findings, noise monitoring and as a result of either an exceedance, incident or community complaint. Non-compliances identified shall be investigated and consider:

- the cause of the non-conformance,
- a review of existing controls to identify modifications required to avoid repetition of the non-conformance; and
- identification of the appropriate corrective or preventative action.

This Management Plan will be reviewed following any non-compliance investigation.

9.3 Review following submission of Annual Review

This Management Plan will be reviewed, and if necessary revised following the submission of the Annual Review.

9.4 Event based review

Other events which may trigger a review of this Management Plan include:

- modifications / improvements to the system;
- changes in the operation;
- modifications to or new approvals, guidelines or codes of practice that require a review of the strategy; or
- as otherwise directed by the Secretary.

Appendix A – Mandalong Mine

A.1 Conditions of Consent: Noise Management Plan – Mandalong Mine (SSD 5144)

This Noise Management Plan has been prepared to satisfy the conditions of consent for the Mandalong Southern Extension Project (SSD 5144). The conditions of consent that relate to this Noise Management Plan and where they have been addressed is provided below. It is noted that an underground coal delivery system connects Mandalong Mine to Delta Entry Site, where coal is handled before being transported to the Vales Point Power Station by the Delta Electricity overland conveyor. The underground coal delivery system and the handling and transport of coal at Delta Entry Site are approved under separate Development Approvals.

Table 1 - Conditions of Consent – Mandalong Mine Noise Management Plan

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 2	The applicant must ensure that the operational noise generated by the development (including maintenance activities, shaft construction and exploration drilling) does not exceed the criteria in Table 2 at any residence on privately owned land.	Section 3 Section 4 Section 5 Appendix A.5 Appendix A.8 Appendix A.9
Schedule 3 Condition 3(a)	The Applicant must: (a) implement best management practice to minimise the construction, operational and road noise of the development;	Section 3 Appendix A Mandalong Mine
Schedule 3 Condition 3(b)	(b) use its best endeavours to facilitate the connection to, and use of, a permanent electricity source to undertake ventilation shaft sinking activities at the MSSS;	Mandalong South Surface Site Construction Environmental Management Plan.
Schedule 3 Condition 3(c)	(c) operate an on-site noise management system that uses a combination of predictions, forecasting, and attended and unattended monitoring of all noise associated with the development, to ensure compliance with the relevant conditions of this consent,	Section 3 Section 4 Section 5 Appendix A Mandalong Mine

Condition No.	Condition of Consent	Where Addressed
	including noise during construction and operations;	
Schedule 3 Condition 3(d)	(d) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 3); and	Appendix A Mandalong Mine
Schedule 3 Condition 3(e)	(e) regularly assess noise monitoring data to determine whether the development is complying with the relevant conditions of consent, to the satisfaction of the Secretary.	Section 4.5.1 Appendix A Mandalong Mine
Schedule 3 Condition 4	The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary.	This Noise Management Plan was approved by the Secretary on 25/5/18.
	This plan must:	
Schedule 3 Condition 4(a)	be prepared in consultation with EPA, by suitable qualified and experienced persons whose appointment has been approved by the Secretary;	This Noise Management Plan was prepared in consultation with the EPA. A consultation log is provided as Appendix F. Tristan Gribble of GHD was appointed by the Department of Planning and Environment as a suitably qualified and experienced person on 2 November 2015.
Schedule 3 Condition 4(b)	be submitted to the Secretary for approval prior to the commencement of construction of the MSSS, or by 31 March 2016, whichever is sooner;	This Noise Management Plan was submitted to the Secretary on 24 March 2016.
Schedule 3 Condition 4(c)	describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions of this consent, including management of out-of-hours noise associated with shaft construction;	Section 3 Section 4 Section 5 Appendix A.5 Appendix A.8 Appendix A.9

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 4(d)	describe the proposed noise management system in detail;	Section 4 Appendix A.8
Schedule 3 Condition 4(e)	include a noise monitoring program that evaluates and reports on:	
	the effectiveness of the noise management system;	Section 4 Appendix A.8 Appendix A.9
	compliance against the noise criteria in this consent; and	Section 4.3.2 Appendix A.8 Appendix A.9
	compliance against the operating conditions in condition 3 above;	Section 4 Appendix A.9
Schedule 3 Condition 4(f)	defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents; and	Section 6
Schedule 3 Condition 4(g)	outlines procedures to manage responses to any complaints or issues raised by the owners of affected residences	Section 6.2
Schedule 3 Condition 4	The Applicant must implement the approved management plan as approved from time to time by the Secretary.	
Schedule 3 Condition 6	The Applicant must implement best blasting management practice to:	
Schedule 3 Condition 6(a)	Protect the safety of people in the surrounding area;	Appendix A.10
Schedule 3 Condition 6(b)	Protect public infrastructure and private property in the surrounding area from any damage; and	Appendix A.10

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 6(c)	Minimimise the dust and fum emissions of any blasting, to the satisfaction of the Secretary.	Appendix A.10

A.2 Statement of Commitments

The Environmental Impact Statement (EIS) that was prepared for the Mandalong Southern Extension Project (SSD-5144) contained a Statement of Commitments (SoCs) that included a number of statements regarding construction noise management at the Mandalong South Surface Site. Specific commitments made by Centennial within the SoCs that are relevant to this Management Plan are outlined in **Table 2**.

Table 2 - Construction noise management commitments in SoCs

Commitment	Where Addressed
Noise impacts are minimised with mitigation measures included in the Noise Management Plan.	Appendix A Mandalong Mine
Rock hammering activities will be undertaken in areas that are away from the majority of residences and limited to between 8.00 am and 4.00 pm Monday to Friday and between 9.00 am and 1.00 pm on Saturdays (no rock hammering on Sundays or public holiday).	Appendix A Mandalong Mine
Where necessary, and in consultation with potentially affected residents, temporary noise barriers will be established and maintained.	Appendix A Mandalong Mine
To provide acoustic shielding for the shaft sinking activity at the Mandalong South Surface Site, a temporary barrier measuring seven metres high and 20 metres long will be installed at a distance of 20 metres from the drill rig at the intake shaft site.	Appendix A Mandalong Mine
Centennial Mandalong will update the existing Noise Management Plan to include quarterly operator attended noise monitoring at and around the Mandalong South Surface Site.	Appendix A Mandalong Mine

Specific commitments made by Centennial within the SoCs that are relevant to the construction of the 33kV power line are outlined in **Table 3**. The commitments are addressed within the Mandalong 33kV Power Line Construction Environmental Management Plan.

Table 3 - SOC MOD 7 - Construction of 33kV Powerline

Commitment	Where Addressed
To minimise noise emissions from construction works the following reasonable and feasible controls will be implemented: • Community consultation will be undertaken prior to the commencement of and during construction. All residents who will likely experience noise levels above the noise affected levels for construction work prescribed in the ICNG will be informed of the nature of works to be carried out, the expected noise levels and duration, as well as contact details in the event of a complaint; • Construction activities will be restricted to the day period (Monday to Friday 7:00am to 6:00pm, Saturday 8:00am to 1:00pm and no work on Sundays or public holidays). It should be noted that there may be a requirement for certain activities such as stringing or cutting in to occur outside of these hours however Centennial Mandalong will consult as necessary with affected residents; • Quietest available equipment will be selected where possible for affected locations and noisy activities should be scheduled for the least noise sensitive time of day; • The mulcher will not operate within 100 m of any residence; • Clearing crews that include a mulcher will maintain a separation of 900 m when working on the proposed easement north of Schofield Road; • All equipment will be inspected and maintained on a regular basis to ensure they are in good working order; • Simultaneous operation of plant will be restricted where possible; • Operations will be modified in the event of enhancing weather conditions that cause an unacceptable increase in offsite noise levels; • The noise mitigation measures will be included in the CEMP developed for the project; and • Centennial will consult and undertake ongoing consultation with affected residents to give sufficient notice of any helicopter activity.	Mandalong 33kV Power Line Construction Environmental Management Plan.

A.3 Overview

The sections below provide site specific information which supplements the information provided in the NMP around 'common' noise sources, mitigation and management measures.

Site specific sources of noise are identified. Noise mitigation and management measures which are specific to Mandalong Mine operations are also outlined and discussed.

The noise monitoring network around Mandalong Mine Access Site and Mandalong South Surface Site are also outlined. As discussed in the NMP, a short term and long term approach has been taken when preparing the noise monitoring program for Centennial operations. As Mandalong has transitioned to the long term monitoring program, the short term monitoring program has been removed from this Management Plan as the short term monitoring program is no longer applicable. The long term monitoring has been prepared to satisfy the regulatory requirements for Mandalong Mine.

A.4 Site specific noise sources

The following sources of noise identified in the NMP are relevant for Mandalong Mine operations:

- operation of mobile equipment – e.g. trucks, dozers, loaders;
- substation;
- coal transporting activities – e.g. overland conveyors, haul trucks; and
- ventilation fans.

A.5 Site specific noise mitigation and management measures

Mandalong Mine implements noise mitigation in accordance with the mitigation measures outlined in **Section 3.1** of the NMP.

The following noise mitigation measures have previously been undertaken at the Mandalong Mine Access Site (MMAS):

- Mandalong Mine annual noise compliance monitoring;
- acoustic bunding to the east and west of the MMAS; and
- squawker alarms installed on all surface forklifts.

A.6 Noise criteria

The applicable noise limits for Mandalong Mine set out in the Development Consent SSD-5144 and EPL 365 are combined in Table 4 below.

Table 4 Mandalong Mine EPL 365 and SSD-5144 noise criteria dB(A)

Location Receiver number	Day	Evening	Night	
	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{A1\ (1\ min)}$
R2 (82)	40	40	40	52
R3 (97)	42	42	**42**	**52**

Location Receiver number	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$
M4 - EPA Point 21				
R4 (109)	39	39	39	52
R5 (110) M6 - EPA Point 22	41	41	**41**	**61**
R6 (86)(87)	40	40	40	61
R7 (85)(89) M7 - EPA Point 23	43	43	**43**	**61**
R8 (72) M8 - EPA Point 24	43	43	**43**	**61**
R9 (73)	42	42	42	61
R10 (66) M10 - EPA Point 25	39	39	**39**	**61**
All other privately-owned land M11 – EPA Point 26 **(R20)**	35	35	**35**	**45**

Note: Locations R2, R3, R4, R5, R6, R7, R8, R9, R10 and All other residences on privately-owned land are as defined in Development Consent SSD-5144 MOD8.

BOLD = Applicable to EPL only

Appendix 3 of SSD 5144 outlines the conditions under which the noise criteria are applicable:

1. *The noise criteria in Tables 2 of the conditions are to apply to a receiver under all meteorological conditions except under:*

   (a) wind speeds greater than 3 m/s at 10 m above ground level; or

   (b) temperature inversion conditions between 1.5° C and 3° C/100 m and wind speeds greater than 2 m/s at 10 m above ground level; or

   (c) temperature inversion conditions greater than 3° C/100 m.

2. *Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located in the vicinity of the site.*

3. *Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.*

4. *Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy (as amended from time to time), in particular the requirements relating to:*

   (a) monitoring locations for the collection of representative noise data;

   (b) meteorological conditions during which collection of noise data is not appropriate;

   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and

   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

A.7 EPL 365 conditions

EPL 365 for Mandalong Mine contains noise limits as specified under condition L5. In order to determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.2 to L5.5. These conditions within the EPL are reproduced below:

L5.2 For the purpose of condition L5.1:

(a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and public holidays;

(b) Evening is defined as the period 6pm to 10pm, and

(c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

L5.3 The noise limits set out in conditions L5.1 apply under all meterorological conditions except for any one of the following:

(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or

(b) Stability category F temperature inversion conditions and wind speeds greater the 2 metres/second at 10 metres above ground level; or

(c) Stability category G temperature inversion conditions.

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

(a) the meteorological data to be used for determining meteorological conditions is the data recorded at the closest or most representative of climatic conditions to noise monitoring points in condition P1.3, using EPA Point 27 (W1) or EPA Point 28 (W2) meteorological stations.

(b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy (EPA 2000)

Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.

L5.5 For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.

Condition M8 Noise monitoring - Requirement to monitor noise of EPL 365 states:

M8 Noise monitoring

M8.1 To assess compliance with the noise limits specified within this licence, the licensee must undertake operator attended noise monitoring at each specified noise monitoring point in accordance with the table below.

POINT 20,21,22,23,24,25,26

Assessment period	*Minimum frequency in a reporting period*	*Minimum duration within assessment period*	*Minimum number of assessment period*
Night	*Quarterly*	*15 minutes*	*1 operation day*

M8.2 To assess compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with Conditions L5.2 to L5.5:

a) at the EPA points 20 to 26 identified in P1.3; and

b) occur every third month in a reporting period; and

d) occur during one night time period as defined in the Noise Policy for Industry 2017 for a minimum of 15 minutes at each location from a), and when relevant b) during the night.

M8.3 For the purposes of compliance monitoring and determining the noise generated at the premises the modification factors in the EPA's Fact Sheet C of the Noise Policy for Industry (2017) must be applied, as appropriate, to the noise levels measured by noise monitoring equipment.

Definitions

Noise refers to 'sound pressure levels' for the purpose of conditions L5.1 to L.5.5 and condition M8.

M8.4 Where required in writing by the EPA, the Licensee must carry out attended monitoring at sensitive receivers in addition the monitoring required by Condition M8.1.

Condition R4 of the EPL requires a Noise Compliance Assessment Report to be submitted to the EPA at the end of each reporting period. Condition R4 is reproduced below:

R4.1 The licensee must submit to the EPA a noise compliance assessment report at the end of each reporting period. The report must be submitted with the Environment Protection Licence Annual Return. The report must be prepared by a suitably qualified and experienced acoustical consultant which:

(a) details the noise monitoring undertaken in accordance with condition M8;

(b) assess compliance with noise limits presented in condition L5.1, and

(c) outlines any management actions taken within the monitoring period to address any exceedences of limits contained in condition L5.1.

R4.4 A noise compliance assessment report must be submitted to EPA on an annual basis with the Annual Return. The report must be prepared by an accredited acoustical consultant and determine compliance with the noise limits in Condition L5.1. The report must also include any corrective or preventative actions taken where noise levels were identified as exceeding the noise limits in Condition L5.1.

This noise management plan will be reviewed if Centennial is issued with updated/new EPL conditions for operations.

A.8 Noise monitoring

Mandalong Mine has operated a noise monitoring program for several years. Data from noise monitoring is used to determine compliance with noise criteria at identified sensitive receivers and to quantify the effectiveness of noise mitigation and management measures.

A review of the noise monitoring network was undertaken in 2015 in response to SSD 5144. The aim of this review was to identify methods to improve the efficiency and value provided from the noise monitoring network. The review considered:

- changes in the regulatory requirements;
- changes in operations and predicted noise impacts from environmental assessments;
- long term trends in monitoring data from Annual Reviews and monthly monitoring reports; and
- complaints relating to noise.

The EPA accepted the long term noise monitoring program on 10 July 2020 as part of the EPL 365 variation of licence.

The long term monitoring program is outlined below.

A.8.1 Long term

As per Condition M8.1 of EPL 365, quarterly attended monitoring at EPA Points 20 to 26 tabled in condition L5.1 will be undertaken quarterly for a minimum of 15 minutes during the night for one operational day.

A summary of the long term noise monitoring to be undertaken at Mandalong Mine is provided in **Table 5** and shown in **Figure 1a** and **Figure 1b**.

Due to operational noise critiera being the same during day, evening and night time periods, compliance monitoring is proposed to be undertaken during the night time periods only. A recorded non compliance at a noise monitoring location during the night time period will represent a non compliance at all corresponding receiver locations for the day and evening periods as well.

In addition to the attended noise monitoring, one (1) unattended noise monitor will be installed at the Mandalong Mine Access Site for the duration of quarterly attended noise monitoring to assist in determining noise contributions from the site.

Table 5 – Mandalong Mine long term noise monitoring locations

Representative Noise Monitoring Location Short Term	Monitoring Location		Monitor type	Frequency	Purpose	Receiver Site ID	Receiver Location		Noise Monitoring Criteria				Approval
	Easting	Northing					Easting	Northing	Day Laeq (15 min)	Evening Laeq (15 min)	Night Laeq (15 min)	Night La1 (1 min)	
M4 EPA Point 21	356216	6334412	Attended	Quarterly	Compliance	R2	355895	6334569	40	40	40	52	SSD-5144 EPL 365
						R3	356184	6334348	42	42	**42**	**52**	
M6 EPA Point 22	356727	6334290	Attended	Quarterly	Compliance	R4	356581	6334067	39	39	39	52	SSD-5144 EPL 365
						R5	356760	6334116	41	41	**41**	**61**	
M7 EPA Point 23	356855	6334788	Attended	Quarterly	Compliance	R6	356922	6334796	40	40	40	61	SSD-5144 EPL 365
						R7	356800	6334852	43	43	**43**	**61**	
M8 EPA Point 24	356867	6334974	Attended	Quarterly	Compliance	R8	356805	6334981	43	43	**43**	**61**	SSD-5144 EPL 365
						R9	356831	6335113	42	42	42	61	
M10 EPA Point 25	356887	6335120	Attended	Quarterly	Compliance	R10	356863	6335341	39	39	**39**	**61**	SSD-5144 EPL 365
M11 EPA Point 26*	352607	6328751	Attended	Quarterly	Compliance	R20	352607	6328751	35	35	**35**	**45**	SSD-5144 SSD-5144

Representative Noise Monitoring Location Short Term	Monitoring Location		Monitor type	Frequency	Purpose	Receiver Site ID	Receiver Location		Noise Monitoring Criteria				Approval
	Easting	Northing					Easting	Northing	Day Laeq (15 min)	Evening Laeq (15 min)	Night Laeq (15 min)	Night La1 (1 min)	
MMAS	356371	6334490	Unattended	Quarterly	Noise contribution from site	-	-	-	-	-			

*Day, Evening and night time monitoring to continue until the completion of construction activities. Transition to night time monitoring only once the MSSS is operational

BOLD = Applicable to EPL only

1:10,000 for A4

0 40 80 160 240 320

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Site boundary
- Suburb
- MET station
- Noise attended
- Sensitive receiver

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LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
Environmental Monitoring
Mandalong Mine Access Site
Long term noise monitoring

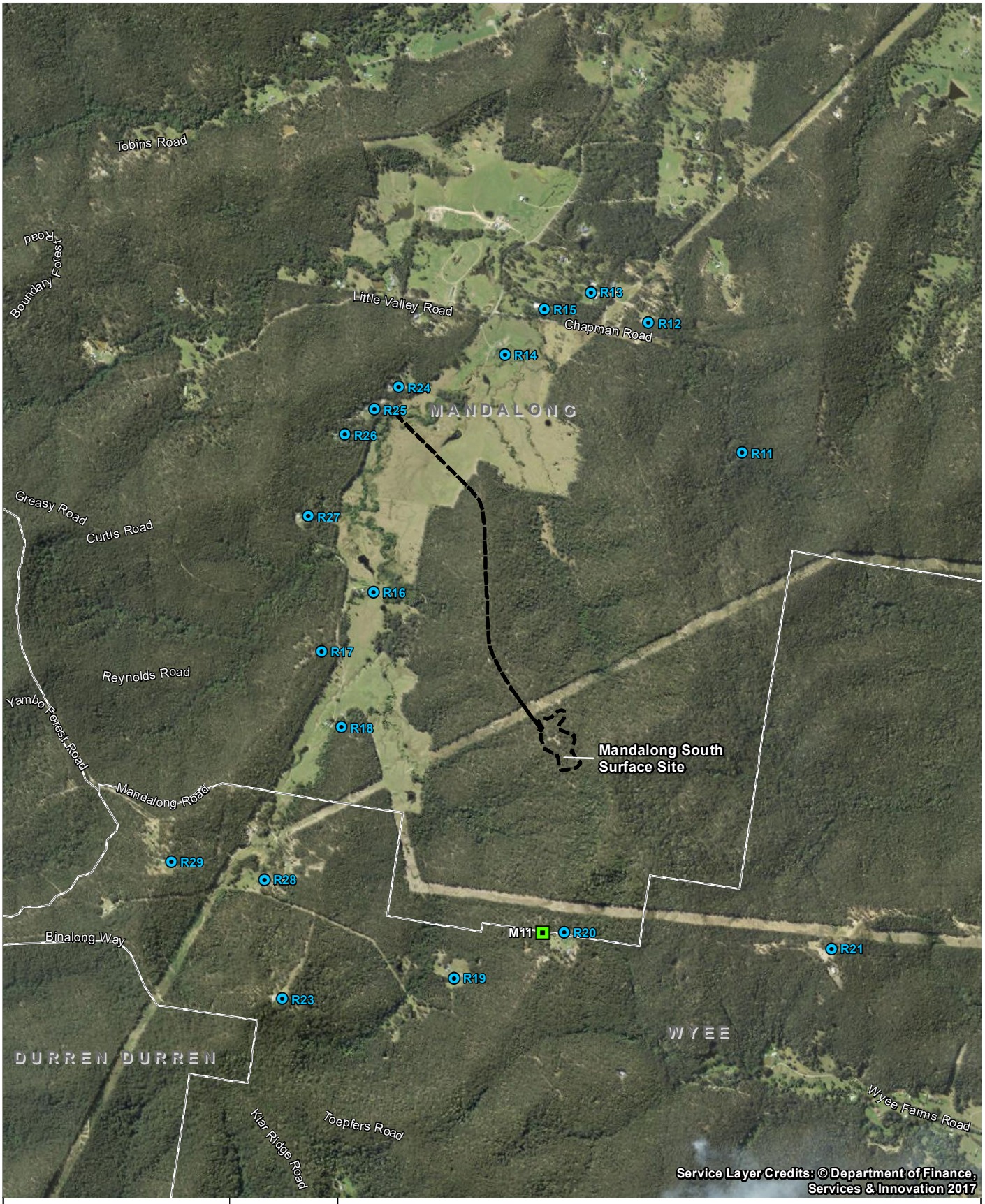
Centennial Coal

DATE 11/08/2020

Figure 1a

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP002_LT_NoiseData_DDP_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:TMorton



1:25,000 for A4

0 105 210 420 630 840

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Site boundary
- Suburb
- Noise attended
- Sensitive receiver

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LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
Environmental Monitoring
Mandalong South Surface Site
Long term noise monitoring

Centennial Coal

DATE 11/08/2020

Figure 1b

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP002_LT_NoiseData_DDP_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:TMorton

A.9 Mandalong South Surface Site and Associated Infrastructure Construction

Schedule 3 Condition 1 of SSD 5144 specifies that noise generated by construction activity (excluding shaft sinking) will be managed in accordance with the requirements of the *Interim Construction Noise Guideline* (DECC, 2009). Schedule 3 Condition 2 of SSD 5144 specifies noise criteria for shaft sinking activities. The noise criteria applicable to shaft sinking activities is detailed in **Table 7** below.

Table 7 – Mandalong Mine noise criteria dB(A) for shaft sinking activities

Location Receiver number	Day	Evening	Night	
	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{A1\ (1\ min)}$
All other privately-owned land	35	35	35	45

A.9.1 Construction Hours

All construction activity will occur between 7:00 am and 6:00 pm Monday to Friday and between 8:00 am and 1:00 pm on Saturday. There will be no construction activities undertaken on Sundays or public holidays. The only exception to these hours of operation will be the construction of the ventilation shafts, which will be undertaken 24 hours a day, seven days a week.

Furthermore, rock hammering will be restricted to between the hours of 8.00 am and 4.00 pm Monday to Friday and between 9.00 am and 1.00 pm Saturday (no rock hammering on Sundays or public holidays).

A.9.2 Construction Noise Mitigation

The noise and vibration mitigation measures described in Table 8 will be implemented during construction of the Mandalong South Surface Site and associated infrastructure..

Table 8 –Noise and Vibration Management during Construction of the MSSS and associated infrastructure

Type of Mitigation	Description of Measures to be Implemented
Noise Barriers	To provide additional acoustic shielding for the shaft sinking activity at the Mandalong South Surface Site at sensitive residential receiver locations (if required) for the duration of the construction program. The design and location of acoustic shielding at these residences will be agreed in consultation with the affected residents.
Competency, Training and Awareness	All Project personnel will be advised of the potential noise and vibration impacts on sensitive receptors from construction activities during the compulsory site health, safety and environment induction delivered by the Contractor. The site induction will include an overview of the Project's noise compliance limits and details of the practical measures that should be implemented to limit noise generation during construction, as described in this CNVMSP.
	Personnel engaged in noise and vibration generating activities will be suitably qualified and experienced for the task they are performing. This will include having the experience to be able to recognise maintenance issues with plant and equipment causing excessive noise. Plant and equipment competency pre-requisites will form a key component of the site health, safety and environmental management system.
	Documentation of records of induction, competencies, and training will be maintained by the Contractor.
Maintenance	The following maintenance measures will be implemented during construction: • All machinery and vehicles with internal combustion engines will be maintained in good working order and made to comply with relevant exhaust standards; • Regular inspections of plant and equipment will be undertaken and where maintenance issues are identified, the item will be taken out of service. Equipment will not be operated until it is maintained or repaired, where maintenance or repair would address the annoying character of the noise identified; and • Any hired equipment that is causing excessive noise will be returned to the hire company and replaced with a lower noise generating equivalent.

Type of Mitigation	Description of Measures to be Implemented
Equipment selection	The following equipment selection measures will be implemented during construction: • Where and when possible, construction equipment with reduced sound power levels will be sourced and used; • Super silenced compressors and damped bits will be selected wherever practicable; • Similarly, quieter items of plant and equipment will be selected for rental, where feasible and reasonable; • Where feasible and reasonable, less annoying alternatives to the typical 'beeper' alarms (e.g. smart alarms or multi-frequency alarms) will be installed in mobile equipment; and • In-cabin communication systems will be installed in mobile equipment and be used for general communications between mobile equipment operators. Furthermore, the contractor responsible for shaft sinking will use its best endeavours to facilitate the connection to, and use of, a permanent electricity source to undertake ventilation shaft sinking activities at the MSSS.
Equipment operation	The following methods of operating equipment will be employed during construction to minimise noise and vibration impacts on sensitive receptors: • Where possible, throttle settings will be reduced to only the maximum necessary to complete the task at hand; • Equipment will be turned off when not in use; • Where and when possible, noisy equipment will be oriented away from noise sensitive receivers; • Rigid dump trucks used to haul waste material from the MSSS during construction will be limited to operating within standard construction hours; and • The use of reversing alarms will be avoided where possible by designing site layouts to avoid the need for reversing, such as by including drive through for parking and deliveries.
	A designated route will be established for deliveries of materials and equipment to site during construction and details of this route will be provided to all delivery drivers to ensure trucks and other vehicles remain on-route and avoid any unnecessary impacts on sensitive receptors along local roads. Truck drivers will also be informed of parking locations, acceptable delivery hours or other relevant practices (for example, minimising the use of engine brakes, and no extended periods of engine idling).

Type of Mitigation	Description of Measures to be Implemented
Engagement of Contractors and Subcontractors	Centennial will include in tender specifications the requirement to comply with the Construction Environmental Management Plans .
Work Methods	The following work methods will be implemented to minimise noise and vibration impacts during construction: • Where feasible and reasonable, the Contractor will examine alternatives to rock-breaking work methods, such as the use of hydraulic splitters for rock, hydraulic jaw crushers, and controlled blasting such as penetrating cone fracture. The suitability of alternative methods will be considered on a case-by-case basis and in consultation with Centennial; • Where possible, temporary site buildings and material stockpiles will be sited so as to provide physical noise barriers between work sites and sensitive receptors; and • As much distance as possible will be placed between operating plant or equipment and sensitive receptors.
Consultation	Consultation with potentially-affected residences will be undertaken regarding the timing of excessive-noise-generating activities and, where possible, construction during the most sensitive times of the day will be limited. All potentially affected residents will be informed of the following prior to the commencement of excessive-noise-generating construction activities at the MSSS: • The nature and duration of the works to be carried out; • The expected noise levels; and • Relevant contact details for site personnel.
Activities during adverse weather conditions	In response to information received from the Mandalong Mine Meteorological Monitoring Station, the Contractor will complete a review of construction activities, and where practicable, modify works to reduce noise impacts during adverse weather conditions. Adverse weather conditions include: • Wind speeds greater than 3 m/s at 10 m above ground level; • Temperature inversion conditions between 1.5^{o}C and 3^{o}C/100 m and wind speeds greater than 2 m/s at 10 m above ground level; or • Temperature inversion conditions greater than 3^{o}C/100 m.

A.9.3 Noise Monitoring During Construction

In addition to the noise monitoring program detailed above, the following monitoring will be undertaken during construction activities:

- monitoring of emitted noise and vibration levels using a hand-held noise monitor during potentially noisy works to verify compliance and assess the need, if any, for further noise/vibration attenuation measures.
- site-wide inspection to identify any ad-hoc noise and vibration issues such as faulty equipment, suitability of noise barriers, works in proximity to sensitive receptors.

Quarterly construction noise monitoring will be one 15 minute measurement for day, evening, and night at selected monitoring locations.

A.10 Blast Management

Blasting on the surface of the site will be carried out only between 9.00 am and 5.00 pm Monday to Saturday inclusive. No blasting will be undertaken on Sundays, Public Holidays, or at any other time, without the written approval of the Secretary.

Best blasting management practice will be implemented to the satisfaction of the Secretary and detailed in any Construction Environment Management Plan required by the conditions of consent.

A.11 Meteorological monitoring

In accordance with Condition 11 of the CoA, meteorological data for Mandalong Mine is measured from the Mandalong Mine weather station (W1) or the Cooranbong Entry Site weather station (W2).

EPL 365 provides monitoring parameter requirements in Condition M4.

M4 Weather monitoring

M4.1 For each monitoring point specified in the table below, the licensee must monitor (by sampling obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns: Point EPA Point 27 (W1) or EPA Point 28 (W2).

Table 9 – Meteorological monitoring requirements

Parameter	*Units of Measure*	*Frequency*	*Averaging Period*	*Sampling Method*
Rainfall	*Mm*	*Continuous*	*24 hour*	*AM-4*
Wind direction	*Degrees*	*Continuous*	*1 hour*	*AM-2 and AM-4*
Wind Speed	*Metres per second*	*Continuous*	*1 hour*	*AM-2 and AM-4*
Air temperature	*Degrees Celsius*	*Continuous*	*1 hour*	*AM-4*
Sigma-theta	*Degrees*	*Continuous*	*15 minute*	*AM-2 and AM-4*
Relative humidity	*percentage*	*Continuous*	*1 hour*	*AM-4*

The weather station continuously monitors weather parameters. Monitoring parameters are summarised in **Table 6.**

In addition, the weather station will be capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy 2000*.

Table 10 – Mandalong Mine meteorological monitoring

Site ID	X (m)	Y (m)	Parameter	Instrument	Frequency	Purpose
Mandalong Mine AWS	356278	6335320	Temperature Humidity Barometric Pressure Wind – speed and direction Rainfall Sigma-theta	Automatic weather station	15 minute data intervals	Proactive monitoring Weather analysis during noise monitoring Rainfall information
Cooranbong Entry Site AWS	366780	6350350	Temperature Humidity Barometric Pressure Wind – speed and direction Rainfall Sigma-theta	Automatic weather station	15 minute data intervals	Proactive monitoring Weather analysis during noise monitoring Rainfall information

Appendix B – Myuna Colliery

B.1 Conditions of Consent – Myuna Colliery (PA10_0080)

This Noise Management Plan has been prepared to satisfy the conditions of consent for Myuna Colliery (PA10_0080). The conditions of consent that relate to this Noise Management Plan and where they have been addressed is provided below.

Table 1 – Conditions of Consent – Myuna Colliery

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 11	The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 3 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.	Appendix B.5 Appendix B.7
Schedule 3 Condition 12	The Proponent shall implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction and operational noise generated by the Project.	Section 3 Section 4 Section 5 Appendix B.4
Schedule 3 Condition 13	The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary.	The original Noise Management Plan was approved by the Secretary on 30 July 2012. This Noise Management Plan was approved by the Secretary on 10/10/17.
Schedule 3 Condition 13(a)	This plan must:	
	be submitted for approval to the Secretary within 7 months of the date of this approval;	The original Noise Management Plan was submitted to the Secretary on 27 July 2012. This Noise Management Plan was submitted to the Secretary on 11 July 2017.

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 13(b)	describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;	Section 3 Section 4 Section 5 Appendix B.4
Schedule 3 Condition 13(c)	outline procedures to manage responses to any complaints or issues raised by the owners of affected residences;	Section 6.2
Schedule 3 Condition 13(d)	include a noise monitoring program that:	
	uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the project; and	Section 4.3 Appendix B.7
	includes a protocol for determining exceedances of the relevant conditions of this approval.	Section 4.3.2 Appendix B.7
Schedule 3 Condition 14	The Proponent shall limit construction activities to 7 am – 6 pm weekdays and 8 am to 1 pm Saturdays with no construction operations on Sundays or Public Holidays. Construction noise shall be managed in accordance with EPA's Interim Construction Noise Guideline 2009.	

B.2 Overview

The sections below provide site specific information which supplements the information provided in the NMP around 'common' noise sources, mitigation and management measures.

Site specific sources of noise are identified. Noise mitigation and management measures which are specific to Myuna Colliery operations are also outlined and discussed.

The noise monitoring network around Myuna Colliery is also outlined. As discussed in **Section 1.4** of this document, a short term and long term approach has been taken when preparing the noise monitoring program for Centennial operations. The short term monitoring has been prepared to satisfy the existing regulatory requirements for Myuna Colliery. The long term program has been prepared as part of the regional management plan and may require a transitional period where changes from short term and long term are discussed with the relevant authorities, finalised and implemented.

B.3 Site specific noise sources

The following sources of noise identified in the NMP are relevant for Myuna Colliery operations:

- operation of mobile equipment – e.g. trucks and loaders during emergency day noise limits only;
- coal handling and preparation – e.g. conveyors, breaker and crusher; and
- coal transporting activities – e.g. centennial owned overland conveyors.

There are no additional sources of noise specifically identified for Myuna Colliery operations.

B.4 Site specific noise mitigation and management measures

Myuna Colliery implements noise mitigation in addition to the mitigation measures outlined in **Section 3.1** of the NMP.

Key noise mitigation measures for Myuna Colliery operations include:

- all enclosure doors on the rotary breaker, crusher and crusher conveyor drive house will remain closed during the night-time period, specifically:
  - roller shutter doors on the north-east and south-west façades of the crusher enclosure; and
  - doors on the north-east façade and northern corner of the rotary breaker to be kept closed at night-time.
- the forklift will not conduct activities, such as moving metal objects around the materials yard, during the night-time period; and
- the use of a real-time noise monitor with the capability of sending an alert in the event that a pre-set noise level is exceeded.

All other mitigation measures identified in the NMP are utilised as required and implementation of noise mitigation measures are triggered by a range of methods, including:

- compliance noise monitoring results, indicating an exceedance of noise criteria;
- on-site noise levels continuously monitored by a real-time noise monitor;
- site inspections and observation of unusually noisy equipment; and
- a complaint relating to noise from mining operations.

Myuna Colliery operates in accordance with the Trigger Action response Plan (TARP) provided in **Section 5.2** of the NMP.

B.5 Noise criteria

Project Approval PA10_0080 sets noise criteria specifically for eight nearby residential receivers as well as general noise criteria for "A*ll other privately-owned land*". Criteria are established for typical operating conditions as well as "Emergency Day"; applicable during the Day period when the Eraring Power Station overland conveyor is not in operation and the project's Emergency Coal Stockpile must be used.

Condition 11 of Schedule 3: Environmental Performance Conditions states:

The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 3 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Note Table 3 in Schedule 3: Environmental Performance Conditions has been reproduced below as **Table 2**.

Table 2 - Noise criteria dB(A)

Land	Day $L_{Aeq(15\ min)}$	Emergency Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night	
				$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
R1, R2 and R3 Summerhill Drive and Wangi Close, Wangi Wangi	35	40	35	35	45
R4, Donelly road, Arcadia Vale	35	44	40	38	49
R5, R6, R7 and R8 Donelly road, Arcadia Vale	37	44	42	39	49
All other privately-owned land	35	40	35	35	45

Notes:

- *Emergency Day noise limits only apply during the Day period when the Eraring Power Station overland conveyor is not in operation and the project's Emergency Coal Stockpile must be used.*
- *To identify the locations referred to, see the figure in Appendix 4 of PA 10_0080*
- *Noise generated by the project is to be measured in accordance with the relevant procedures and exceptions (including certain meteorological conditions) of the INP.*

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

Schedule 3 Condition 12 : Noise - Operating Conditions states:

> *The Proponent shall implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction and operational noise generated by the Project.*

Schedule 3 Condition 13: Noise Management Plan states:

> *The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:*
>
> *a) be submitted for approval to the Secretary within 7 months of the date of this approval;*
>
> *b) describe the measures that would be implemented to ensure compliance with the relevant conditions of approval;*
>
> *c) outline procedures to manage responses to any complaints or issues raised by the owners of affected residences; and*

d) include a noise monitoring program that:

- *uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the project, and*
- *includes a protocol for determining exceedances of the relevant conditions of this approval.*

Schedule 3 Condition 14 : Construction Noise states:

The Proponent shall limit construction activities to 7 am – 6 pm weekdays and 8 am to 1 pm Saturdays with no construction operations on Sundays or Public Holidays. Construction noise shall be managed in accordance with EPA's Interim Construction Noise Guideline 2009.

B.6 EPL 366

EPL 366 for Myuna Colliery contains noise limits as specified under Condition L5. In addition to this, Condition M4 states;

In order to determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.5 and L5.6, and

a) at each one of the locations listed in condition L5.1;

b) occur quarterly within the reporting period of the Environmental Protection Licence with a least 2 months between monitoring periods;

c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 15 minutes for three of the quarters;

d) the night time 15 minute attended monitoring in accordance with (c) must be undertaken between the hours of 1am and 4am;

e) one quarterly monitoring must occur during each day, evening and night period as defined in the in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hours during the night;

f) each quarterly monitoring must be undertaken on a different day of the week not including Saturdays, Sundays and Public Holidays; and

g) these monitoring conditions take effect in the 2015 Environment Protection Licence Period.

Note: For the Annual Reporting Period 2014 the EPA will accept all monitoring required by the current Department of Planning and Environment consent (usually quarterly monitoring for noise as dB(A) Leq15minutes) for compliance with noise monitoring requirements in this Licence, as a single report, and that the process in the consent and noise management plan, if it addresses monitoring, is followed.

This Noise Management Plan will be reviewed upon Centennial being issued with updated or new EPL conditions for operations.

B.7 Noise monitoring

Myuna Colliery has operated a noise monitoring program for several years. A review of this noise monitoring network was undertaken in 2015. The aim of this review was to identify methods to improve the efficiency and value provided from the noise monitoring network. The review considered:

- changes in the regulatory requirements;
- changes in operations and predicted noise impacts from environmental assessments;
- long term trends in monitoring data from Annual reviews and monthly monitoring reports; and
- complaints relating to noise.

Attended noise surveys are undertaken on a quarterly basis during each of the day, evening and night time periods, on a different day each quarter. As discussed in the NMP, night time noise monitoring typically provides conditions where the contribution of mine noise can be most accurately measured.

Condition L5.6 of EPL 366 states that the night time $L_{A1(1\ minute)}$ is to be measured 1 metre away from the façade of the receiver's dwelling. This might be disruptive to sleeping occupants and increases the chances of alarming any pet dogs, which in turn may disturb occupants. For these reasons it is preferable that the $L_{A1(1\ minute)}$ be measured at the same location that the $L_{Aeq(15\ minute)}$ is measured.

Condition M4.1 of EPL 366 requires that night time attended measurements be taken between 1 am and 4 am. The basis of this requirement is unclear since mining operations typically produce a constant noise source, and mining noise should be just as easily measured during a night time period prior to the specified monitoring period. Furthermore, as well as this specified monitoring period not providing any benefit to the measurement, this requirement presents additional safety and fatigue issues for the contractor conducting the attended monitoring.

For these reasons a licence variation application will be submitted to vary the EPL to change the night time monitoring time frame. Until the licence has been varied however, night time monitoring will continue to be undertaken between 1 am and 4 am as per EPL condition M4.1.

The short term and long term monitoring programs are outlined below. The timing to implement the long term monitoring program depends on many factors, such as regulatory approvals, landholder consultation, procurement of equipment and installation.

B.7.1 Short term

The short term monitoring program will consist of 8 attended noise monitoring locations and one real-time noise monitoring location. Attended monitoring surveys are conducted quarterly, on a different day each quarter.

The short term noise monitoring network is shown in **Figure 1**.

B.7.2 Long term

The long term monitoring network is provided based on the rationalisation of the short term noise monitoring network.

Based on this rationalisation, a number of monitoring locations will be removed from the Myuna Colliery monitoring network in the long term. Justification for their removal is provided below:

- the requirement to conduct attended noise monitoring during the day could be removed as the historical data has shown the day time monitoring to add little or no value to the monitoring programme. Attended noise monitoring could be restricted to evening and night time periods when the ambient noise environment is comparatively lower, and mining noise is more likely to be audible;
- monitoring locations R1 and R2 could be grouped since each of these locations are likely to be representative of the other, due to similar direction and distance from Myuna Colliery;
- monitoring location R3 is to remain as this is an isolated receiver;
- monitoring locations R4 and R5 could be grouped since each of these locations are likely to be representative of the other, due to similar direction and distance from Myuna Colliery; and
- monitoring locations R6, R7 and R8 could be grouped since each of these locations are likely to be representative of the others, due to similar direction and distance from Myuna Colliery.

Long term, the frequency of attended noise monitoring surveys will remain quarterly. Monitoring locations and frequency of monitoring will be reviewed in line with the NMP and revised if required. This site-specific NMP will be updated accordingly.

This Management Plan forms part of the consultation process for moving from the short term monitoring program to the long term monitoring program. This management plan will need to be approved prior to the site moving to the long term monitoring program. As the long term monitoring program is different to what is detailed in an EPL, an EPL variation will also be sought prior to moving to the long term monitoring program.

The long term noise monitoring network is shown in **Figure 2.**

The long term monitoring at Myuna Colliery will consist of 4 attended noise monitoring locations and 1 real time noise monitor. A summary of the noise monitoring to be undertaken at Myuna Colliery is provided in **Table 4** and **Table 5**.

Table 4 – Myuna Colliery short term noise monitoring locations

Representative Noise Monitoring Location Short Term	Monitoring Location		Monitor type	Frequency	Purpose	Receiver Site ID	Receiver Location		Noise Monitoring Criteria					Approval
	Easting	Northing					Easting	Northing	Day L_{Aeq} (15 min)	Emergency Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$	
R1	366858	6340370	Attended	Quarterly	Compliance	R1	366858	6340370	35	40	35	35	45	PA 10_0080 & EPL 366
R2	366652	6340175	Attended	Quarterly	Compliance	R2	366652	6340175	35	40	35	35	45	PA 10_0080 & EPL 366
R3	365707	6340844	Attended	Quarterly	Compliance	R3	365707	6340844	35	40	35	35	45	PA 10_0080 & EPL 366
R4	366662	6341662	Attended	Quarterly	Compliance	R4	366662	6341662	35	44	40	38	49	PA 10_0080 & EPL 366
R5	366856	6341338	Attended	Quarterly	Compliance	R5	366857	6341348	37	44	42	39	45	PA 10_0080 & EPL 366
R6	367049	6341185	Attended	Quarterly	Compliance	R6	367049	6341185	37	44	42	39	45	PA 10_0080 & EPL 366
R7	367075	6340970	Attended	Quarterly	Compliance	R7	367091	6340965	37	44	42	39	45	PA 10_0080 & EPL 366
R8	367100	6340807	Attended	Quarterly	Compliance	R8	367072	6340821	37	44	42	39	45	PA 10_0080 & EPL 366
Real-time Noise Logger	366364.883	6340885.278	Unattended	Continuous	Additional information	-	-	-	-	-	-	-	-	

Table 5 - Myuna Colliery long term noise monitoring locations

Representative Noise Monitoring Location Short Term	Monitoring Location		Monitor type	Frequency	Purpose	Receiver Location			Noise Monitoring Criteria					Approval
	Easting	Northing				Receiver Site ID	Easting	Northing	Day $L_{Aeq\ (15\ min)}$	Emergency Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$	
R1	366858	6340370	Attended	Quarterly	Compliance	R1	366858	6340370	35	40	35	35	45	PA 10_0080 & EPL 366
						R2	366652	6340175	35	40	35	35	45	PA 10_0080 & EPL 366
R3	365707	6340844	Attended	Quarterly	Compliance	R3	365707	6340844	35	40	35	35	45	PA 10_0080 & EPL 366
R5	366856	6,341,338	Attended	Quarterly	Compliance	R4	366662	6341662	35	44	40	38	49	PA 10_0080 & EPL 366
						R5	366857	6341348	37	44	42	39	45	PA 10_0080 & EPL 366
R7	367075	6,340,970	Attended	Quarterly	Compliance	R6	367049	6341185	37	44	42	39	45	PA 10_0080 & EPL 366
						R7	367091	6340965	37	44	42	39	45	PA 10_0080 & EPL 366
						R8	367072	6340821	37	44	42	39	45	PA 10_0080 & EPL 366
Real-time Noise Logger	366364.883	6340885.278	Unattended	Continuous	Additional information	-	-	-	-	-	-	-	-	

B.7.3 Real time monitoring

Myuna implements a proactive on-site noise management system which includes an on-site continuous real-time noise monitor.

Myuna Colliery has worked with a contractor to determine onsite noise levels that correspond to a receiver level at the nearest receiver equal to the EPL limit. When the determined on-site $L_{Aeq(60\ second)}$ trigger level is exceeded, a SMS text message is sent to the Environment & Community Coordinator to alert them of the potential off site exceedance. This system is used to guide the day to day planning of Myuna Colliery.

Implementation of management and control measures will then be undertaken with consideration to the NMP.

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Site boundary
- Suburb
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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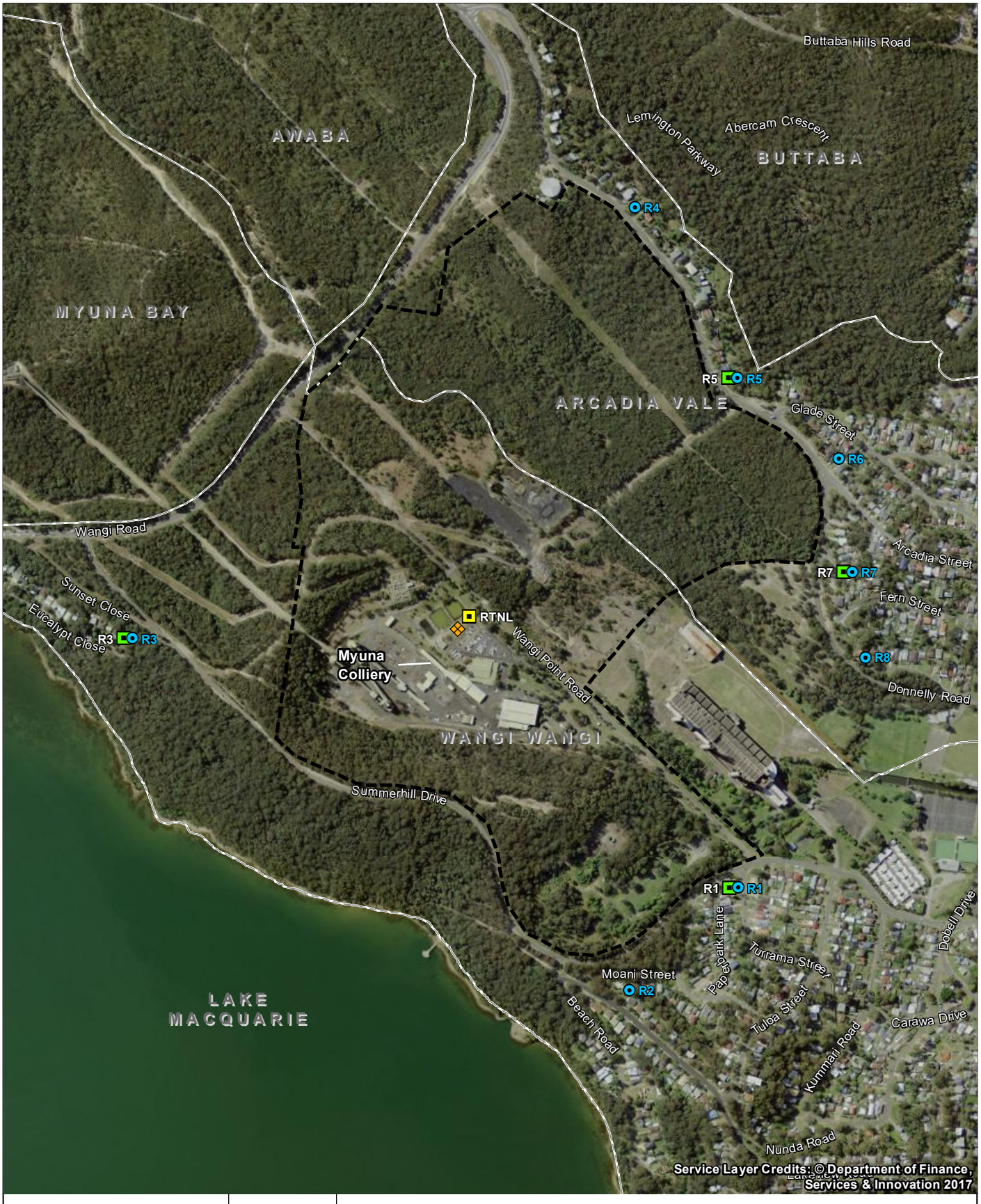
Figure 1

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP005_ST_NoiseMonitoring_MyunaColliery_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:TMorton



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Metres

Map Projection: Universal Transverse Mercator
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Figure 2

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Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:TMorton

B.8 Meteorological monitoring

In accordance with Schedule 3 Condition 20 of PA 10_080,, meteorological data for Myuna Colliery is measured from the Myuna Colliery weather station.

EPL 366 provides monitoring parameter requirements in Condition M5.

The weather station continuously monitors weather parameters. Monitoring parameters are summarised in **Table 6.**

In addition, the weather station complies with the requirements of the *Approved Methods for Sampling Air Pollutants in NSW,* and will be capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy 2000*.

The weather station continuously monitors weather parameters.

Table 6 – Myuna Colliery meteorological monitoring

Site ID	X (m)	Y (m)	Parameter	Instrument	Frequency	Purpose
Myuna AWS	366340	6340860	Temperature Humidity Barometric Pressure Wind – speed and direction Rainfall Solar radiation Sigma-theta	Automatic weather station	10 minute data intervals	Proactive monitoring Weather analysis during noise monitoring Rainfall information

Appendix C – Northern Coal Services

C.1 Conditions of Consent – Northern Coal Services SSD-5145

This Noise Management Plan has been prepared to satisfy the conditions of consent for Northern Coal Services (SSD-5145). The conditions of consent that relate to this Noise Management Plan and where they have been addressed is provided below.

Table 1 - Conditions of Consent – Northern Coal Services

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 5	The Applicant must prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary.	This Noise Management Plan was approved by the Secretary on 10/10/17.
	This plan must:	
Schedule 3 Condition 5(a)	be prepared in consultation with the EPA, by suitably qualified and experienced persons whose appointment has been approved by the Secretary;	This Noise Management Plan was prepared in consultation with the EPA. A consultation log is provided as Appendix F. Tristan Gribble of GHD was appointed by the Department of Planning and Environment as a suitably qualified and experienced person on 2 November 2015.
Schedule 3 Condition 5(b)	be submitted to the Secretary for approval by 31 march 2016 unless otherwise agreed by the Secretary;	This Noise Management Plan was originally submitted to the Secretary on 24 March 2016.
Schedule 3 Condition 5(c)	describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions of this consent;	Section 3 Section 4 Section 5 Appendix C.4
Schedule 3 Condition 5(d)	describe the proposed noise management system in detail;	Section 4 Appendix C.6

Condition No.	Condition of Consent	Where Addressed
Schedule 3 Condition 5(e)	include a monitoring program that evaluates and reports on:	
	the effectiveness of the on-site noise management system;	Section 4.3.1 Appendix C.6
	compliance against the noise criteria in this consent; and	Section 4 Appendix C.6
	compliance with the noise operating conditions in condition 4 above;	Section 4 Appendix C.6
Schedule 3 Condition 5(f)	include a program to calibrate and validate the real-time monitoring results with the attended monitoring results over time, so the real-time noise monitoring program can be used to better indicate compliance with the noise criteria in this consent, and trigger further attended monitoring as necessary;	Section 4.3.1
Schedule 3 Condition 5(g)	defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents; and	Section 6
Schedule 3 Condition 5(h)	outlines procedures to manage responses to any complaints or issues raised by the owners of affected residences.	Section 6
Schedule 3 Condition 5	The Applicant must implement the plan as approved by the Secretary	

C.2 Overview

Northern Coal Services covers the surface infrastructure at both Cooranbong Entry Site and Newstan Colliery Surface Site. The sections below provide site specific information which supplements the information provided in the NMP around 'common' noise sources, mitigation and management measures.

Site specific sources of noise are identified. Noise mitigation and management measures which are specific to Northern Coal Services operations are also outlined and discussed.

The noise monitoring network around Northern Coal Services operations is also outlined. As discussed in the NMP, a short term and long term approach has been taken when preparing the noise monitoring program for Centennial operations. The short term monitoring has been prepared to satisfy the existing regulatory requirements for the Newstan Colliery Surface Site and Cooranbong Entry Site. The long term program has been prepared as part of the regional management plan and may require a transitional period where changes from short term and long term are discussed with the relevant authorities, finalised and implemented. The Cooranbong Entry Site has already transitioned to the long term monitoring program and as such, the short term monitoring program has been removed from this Management Plan as the short term monitoring program is no longer applicable.

C.3 Site specific noise sources

C.3.1 Cooranbong Entry Site

The following sources of noise identified in the NMP are relevant for Cooranbong Entry Site operations:

- operation of mobile equipment – e.g. trucks, dozers, loaders;
- coal handling and preparation – e.g. conveyors; and
- coal transporting activities – e.g. overland conveyors, truck loading system.

There are no additional sources of noise specifically identified for Cooranbong Entry Site operations.

C.3.2 Newstan Colliery Surface Site

The following sources of noise identified in the NMP are relevant for the Newstan Colliery Surface Site operations:

- operation of mobile equipment – e.g. trucks, dozers, loaders
- coal handling and preparation – e.g. conveyors; and
- coal transporting activities – e.g. train loop, haul trucks.
- Newstan ventilation shaft site at Awaba.

There are no additional sources of noise specifically identified for Newstan Colliery operations.

C.4 Site specific noise mitigation and management measures

C.4.1 Cooranbong Entry Site

Key noise mitigation measures for Cooranbong Entry Site operations include:

- acoustic cladding of the Rotary Breaker and Coal Handling Plant building;
- acoustic barrier installed on eastern side (side of sensitive receivers) of CES truck loading bin; and

- the use of a real-time noise monitor with the capability of sending an alert in the event that a pre-set noise level is exceeded.All other mitigation measures identified in the NMP are utilised as required and implementation of noise mitigation measures are triggered by a range of methods, including:
- compliance noise monitoring results, indicating an exceedance of noise criteria;
- on-site noise levels continuously monitored by a real-time noise monitor;
- proactive noise planning in consultation with short-term meteorological forecasts to detect the onset of noise enhancing weather conditions e.g. temperature inversion;
- site inspections and observation of unusually noisy equipment; and
- a complaint relating to noise from mining operations.

C.4.2 Newstan Colliery Surface Site

Newstan Colliery Surface Site implements noise mitigation in addition to the mitigation measures outlined in **Section 3.1** of the NMP.

Key noise mitigation measures for Newstan Colliery operations include:

- attenuation of the CPP including the continuance of existing plant external walls down to the ground and fully enclosing exposed conveyors with Colorbond steel;
- attenuation of the Reclaim Conveyor Transfer House including: the sealing of openings in all the walls around the conveyor transfer house, as required; the continuance of existing plant external walls down to the ground level, as required; fully enclosing exposed conveyors with Colorbond steel; and
- a 6-metre-high noise bund was constructed on the south eastern side of the coal train rail loop, to block line of sight between the coal train loading activities and receivers between R6 and R3.

All other mitigation measures identified in the NMP are utilised as required and implementation of noise mitigation measures are triggered by a range of methods, including:

- compliance noise monitoring results, indicating an exceedance of noise criteria;
- on-site noise levels continuously monitored by a real-time noise monitor;
- proactive noise planning in consultation with short-term meteorological forecasts to detect the onset of noise enhancing weather conditions e.g. temperature inversion;
- site inspections and observation of unusually noisy equipment; and
- a complaint relating to noise from mining operations.

Northern Coal Services operates in accordance with the Trigger Action response Plan (TARP) provided in **Section 5.2** of the NMP.

C.5 Noise criteria

Schedule 3 Condition 2 Operational Noise Criteria of SSD-5145, provides noise criteria and relevant conditions for surface infrastructure operating under Northern Coal Services.

The following conditions are from SSD-5145, Schedule 3:

1 Condition 1: The Applicant must ensure that the noise generated by construction activities is managed in accordance with the requirements of the *Interim Construction Noise Guideline* (DECC, 2009), as may be updated from time to time.

2 Condition 2: Until the automated coal recovery and train loading system required by condition 8 of Schedule 2 is in use, the Applicant must ensure that the operational noise generated by the development (including maintenance activities) does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2 from SSD-5145, Schedule 3 Condition 2, is reproduced below as **Table 2**.

Table 2 – Northern Coal Services noise criteria dB(A) $L_{Aeq\ (15\ min)}$

Receiver	Noise Limit (dB(A))				
	Morning Shoulder $L_{Aeq(15\ min)}$	Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night $L_{Aeq(15\ min)}$	Night $L_{A1(1\ min)}$
NC2	36	36	35	35	45
NC3, residence around NC6	40	40	39	39	45
23	-	37	37	37	45
26	-	36	36	36	45
All other residences on privately-owned land	-	35	35	35	45
		$L_{Aeq(1\ hour)}$			
NC6 (School), when in use	-	45 (external to school building)		-	-

Notes on Table 2:

- The receiver locations in Table 2 are shown in Figures 1 and 2 of Appendix 4 of SSD-5145
- Criteria for the morning Shoulder period only applicable where these have been specifically developed for this period.

Noise generated from by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA 2017). Appendix 3 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria in Table 2, and the Applicant has advised the Department in writing of the terms of the agreement.

Schedule 3 Condition 3 states: Once the automated coal recovery and train loading system required by condition 8 of schedule 2 is in use, and thereafter, the Applicant must ensure that the operational noise generated by the development (including maintenance activities) does not exceed the criteria in Table 3 at any privately-owned land.

Table 3 from SSD-5145, Schedule 3 Condition 3, is reproduced below as **Table 3**.

Table 3 - Northern Coal Services Operational Noise Citeria

receiver	Noise Limit (dB(A))				
	morning Shoulder $L_{Aeq(15\ min)}$	Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night $L_{Aeq(15\ min)}$	Night $L_{A1(1\ min)}$
NC2	35	35	35	35	45
NC3, residence around NC6	38	38	37	37	45
23	-	37	37	37	45
26	-	36	36	36	45
All other residences on privately-owned land	-	35	35	35	45
		$L_{Aeq(1\ hour)}$			
NC6 (School), when in use	-	45 (external to school building)		-	-

Notes on Table 3:

- The receiver locations in Table 3 are shown in Figures 1 and 2 of Appendix 4 of SSD-5145
- Criteria for the morning Shoulder period only applicable where these have been specifically developed for this period.

Noise generated from by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the *NSW Noise Policy for Industry (EPA 2017)*. Appendix 3 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

1. *The noise criteria in Tables 2 and 3 of the conditions are to apply under all meteorological conditions except the following:*

   (a) Wind speeds greater than 3 m/s at 10m above ground level; or

   (b) Stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or

   (c) Stability category G temperature inversion conditions.

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

3. *Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.*

4. *Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Noise Policy for Industry (EPA 2017) (as amended from time to time), in particular the requirements relating to:*

   (a) monitoring locations for the collection of representative noise data;

   (b) meteorological conditions during which collection of noise data is not appropriate;

   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and

   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

However, these criteria do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria in Table 2, and the Applicant has advised the Department in writing of the terms of the agreement.

C.6 Noise monitoring

Northern Coal Services operates a noise monitoring program to monitor the surface infrastructure noise emissions at Newstan Colliery and Cooranbong Entry Site. A review of this noise monitoring network was undertaken in 2015. The aim of this review was to identify methods to improve the efficiency and value provided from the noise monitoring network. The review considered:

- changes in the regulatory requirements;
- changes in operations and predicted noise impacts from environmental assessments;
- long term trends in monitoring data from Annual reviews and monthly monitoring reports; and
- complaints relating to noise.

Newstan Colliery attended noise surveys are undertaken on a quarterly basis during each of the day, evening and night time periods.

The EPA accepted the long term noise monitoring program on 10 July 2020 as part of the EPL 365 variation of licence for the Cooranbong Entry Site. The Cooranbong Entry Site attended noise surveys will be undertaken on a quarterly basis during night time period.

The short term and long term monitoring programs are outlined below. The timing to implement the long term monitoring program depends on many factors, such as regulatory approvals, landholder consultation, procurement of equipment and installation.

C.6.1 Short term - Newstan Colliery Surface Site

The short term Newstan Colliery monitoring program will consist of 6 attended noise monitoring locations and one real-time noise monitoring location. Attended monitoring surveys are conducted quarterly.

The Newstan Colliery Surface Site short term noise monitoring network is shown in **Figure 1a**.

C.6.2 Long term - Newstan Colliery Surface Site

The long term Newstan Colliery monitoring network is provided based on the rationalisation of the short term noise monitoring network.

Based on this rationalisation, a single monitoring location (NC5) will be removed from the Newstan Colliery monitoring network in the long term. Justification for the removal of monitoring location NC5 is based on a review of historical noise compliance reporting which indicated NC5 was at low risk of noise impact.

Long term, the frequency of Newstan Colliery attended noise monitoring surveys will remain quarterly. Monitoring locations and frequency of monitoring will be reviewed in line with the NMP and revised if required. This site-specific NMP will be updated accordingly.

The Newstan Colliery Surface Site long term noise monitoring network is shown in **Figure 1b**.

C.6.3 Long term - Cooranbong Entry Site

As per Condition M8.1 of EPL 365, due to operational noise critiera being the same during day, evening and night time periods, compliance monitoring is proposed to be undertaken during the night time periods only. A recorded non compliance at the noise monitoring location during the night time period will represent a non compliance at all corresponding receiver locations for the day and evening periods as well.

The Cooranbong Entry Site long term noise monitoring network is shown in **Figure 2**.

A summary of the Northern Coal Services noise monitoring network is provided in **Table 4** and **Table 5**.

Table 4 – Northern Coal Services short term noise monitoring locations

Representative Noise Monitoring Location Short Term	Monitoring Location		Monitor type	Frequency	Purpose	Receiver Site ID	Receiver Location		Noise Monitoring Criteria					Approval
	Easting	Northing					Easting	Northing	Morning Shoulder $L_{Aeq\ (15\ min)}$	Day L_{Aeq} (15 min)	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$	
NC1 (Newstan)	365780	6351882	Attended	Quarterly	Compliance	R1	365780	6351882	-	35	35	35	45	SSD-5145
NC2 (Newstan)	365720	6351116	Attended	Quarterly	Compliance	R2	365720	6351115	36	36	35	35	45	SSD-5145
NC3 (Newstan)	367463	6349487	Attended	Quarterly	Compliance	R3	367463	6349487	40	40	39	39	45	SSD-5145
NC4 (Newstan)	367399	6348880	Attended	Quarterly	Compliance	R4	367399	6348880	-	35	35	35	45	SSD-5145
NC5 (Newstan)	366904	6348626	Attended	Quarterly	Compliance	R5	366904	6348626	-	35	35	35	45	SSD-5145
NC6 (Newstan)	367581	6349694	Attended	Quarterly	Compliance	R6	367581	6349694	-	45*	-	-	-	SSD-5145
Real-time Noise Logger (Newstan)	367361	6349864	Unattended	Continuous	Additional information	-	-	-	-	-	-	-	-	SSD-5145

* $L_{Aeq\ (1\ hour)}$ External to school building.

Table 5 - Northern Coal Services long term noise monitoring locations

Representative Noise Monitoring Location Long Term	Monitoring Location		Monitor type	Frequency	Purpose	Receiver Site ID	Receiver Location		Noise Monitoring Criteria					Approval
	Easting	Northing					Easting	Northing	Morning Shoulder $L_{Aeq\ (15\ min)}$	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$	
NC1 (Newstan)	365780	6351882	Attended	Quarterly	Compliance	R1	365780	6351882	-	35	35	35	45	SSD-5145
NC2 (Newstan)	365720	6351116	Attended	Quarterly	Compliance	R2	365720	6351115	36	36	35	35	45	SSD-5145
NC3 (Newstan)	367463	6349487	Attended	Quarterly	Compliance	R3	367463	6349487	40	40	39	39	45	SSD-5145
NC4 (Newstan)	367399	6348880	Attended	Quarterly	Compliance	R4	367399	6348880	-	35	35	35	45	SSD-5145
NC6 (Newstan)	367581	6349694	Attended	Quarterly	Compliance	R6	367581	6349694	-	45*	-	-	-	SSD-5145
Real-time Noise Logger (Newstan)	367361	6349864	Unattended	Continuous	Additional information	-	-	-	-	-	-	-	-	SSD-5145
M1 EPA Point 20 (Cooranbong)	360188	6340617	Attended	Quarterly	Compliance	C1 (23)	360227	6340525	-	37	37	**37**	**45**	EPL 365 SSD-5145
						C2 (26)	360202	6340461	-	36	36	36	45	SSD-5145
						C3 (22)	360000	6340497	-	35	35	35	45	SSD-5145
						C4 (28)	360078	6340255	-	35	35	35	45	SSD-5145
						C5 (32)	360190	6340230	-	35	35	35	45	SSD-5145
Real-time Noise Logger (Cooranbong)	360195	6340983	Unattended	Continuous	Additional information	-	-	-	-	-	-	-	-	

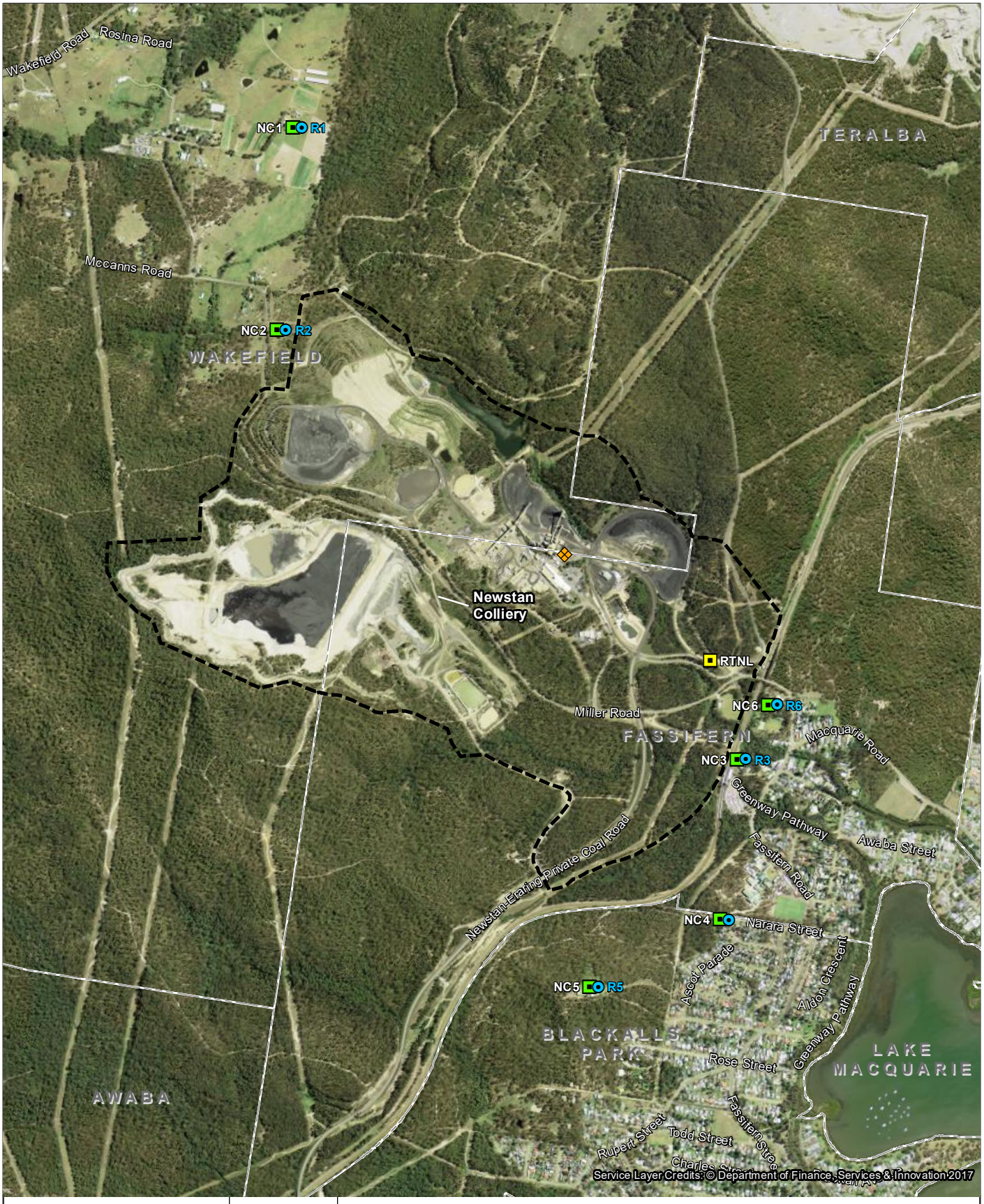
* $L_{Aeq\ (1\ hour)}$ External to school building.

BOLD = Applicable to EPL only

C.6.4 Real time monitoring

Northern Coal Services implements a proactive on-site noise management system which includes an on-site continuous real-time noise monitor at the Newstan Colliery Surface Site and Cooranbong Entry Site.

Onsite noise levels that correspond to a receiver level at the nearest receiver equal to the Development Consent limit has been determined. When the determined on-site trigger level is exceeded, an alarm is sent to the control room to alert the site of the potential off site exceedance. This system is used to guide the day to day planning of poerations at the Newstan Colliery Surface Site and Cooranbogn Entry Site.



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Metres

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Horizontal Datum: Geodetic Datum of Australia 1994
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Figure 1a

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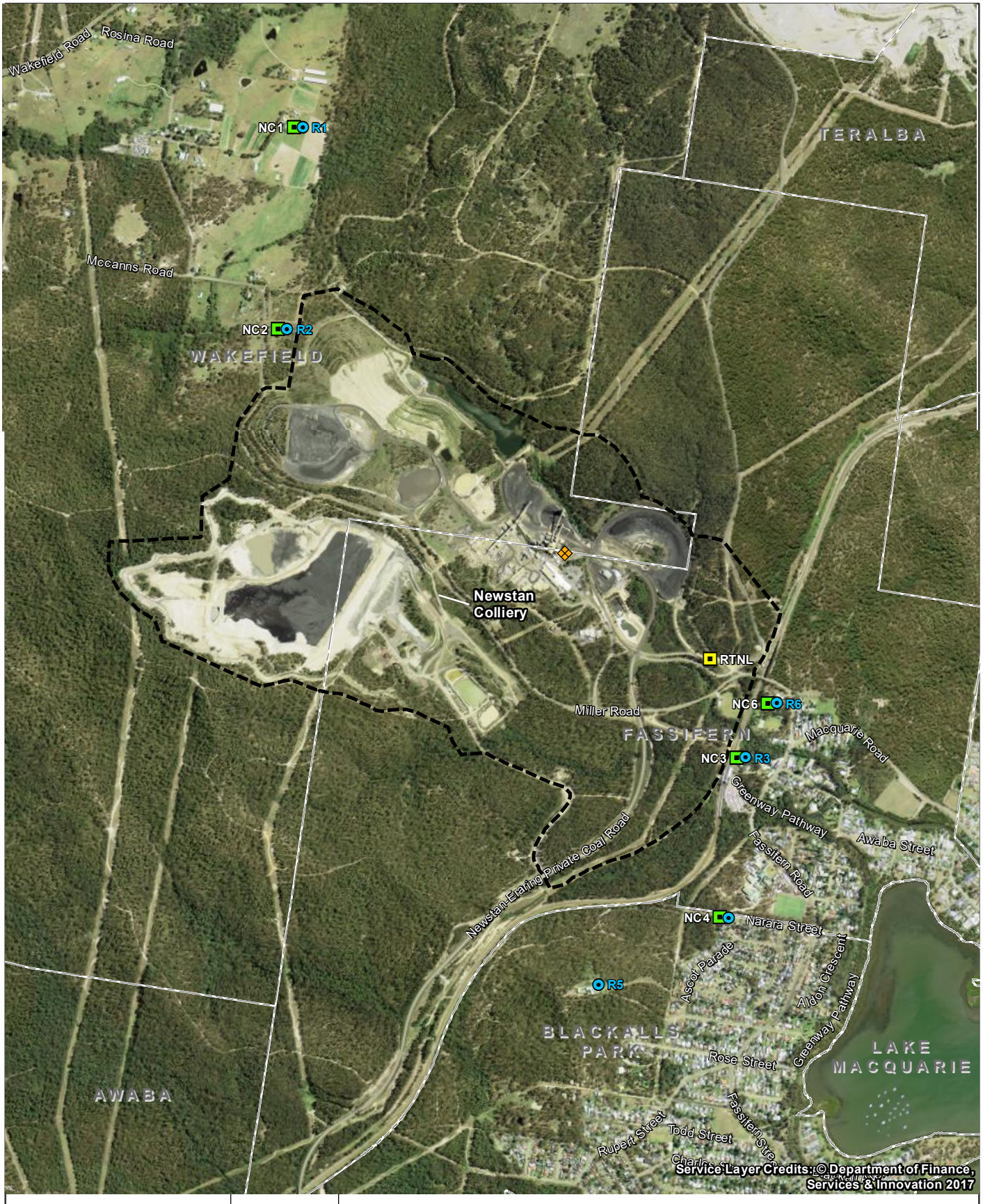

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Figure 2a

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
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Figure 2b

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP002_LT_NoiseData_DDP_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:tmorton

C.7 Meteorological monitoring

To satisfy Condition 11 of SSD 5145, meteorological data for Northern Coal Services is measured from Newstan Colliery and the Cooranbong Entry Site meteorological stations.

The following parameters are required to be monitored:

- temperature
- wind speed and direction;
- Sigma-theta; and
- rainfall/humidity.

Monitoring parameter are summarised in **Table 6**.

In addition, the weather station will be capable of continuous real-time measurement of the atmospheric stability category determined by the sigma theta method in accordance with the NSW Noise Policy for Industry (EPA 2017).

Table 6 – Northern Coal Services meteorological monitoring

Site ID	X (m)	Y (m)	Parameter	Instrument	Frequency	Purpose
Newstan Colliery	366780	6350350	Temperature Humidity Barometric Pressure Wind – speed and direction Rainfall Solar radiation Sigma-theta	Automatic weather station	5 minute data intervals	Proactive monitoring Weather analysis during noise monitoring Rainfall information
Cooranbong Entry Services AWS	360308	6341036	Temperature Humidity Barometric Pressure Wind – speed and direction Rainfall Sigma-theta	Automatic weather station	15 minute data intervals	Proactive monitoring Weather analysis during noise monitoring Rainfall information

Appendix D – Newstan Colliery

D.1 Conditions of Consent – Newstan Colliery DA 73-11-98

This Noise Management Plan has been prepared to satisfy the conditions of consent for Newstan Colliery (DA 73-11-98). The Conditions of Consent that relate to this Noise Management Plan and where they have been addressed is provided below.

Table 1 – Conditions of Consent – Newstan Colliery

Condition No.	Condition of Consent	Where Addressed
Schedule 2 Condition 6.4D	The Application shall ensure that the noise generated at the Newstan ventilation shaft site at Awaba does not exceed the noise impact assessment criteria in Table 3A for any privately owned residence.	Appendix D.2
Schedule 2 Condition 6.4D	The applicant shall ensure that noise caused by construction activities at the Newstan ventilation shaft ste at Awaba outside of the hours 7am to 6pm Monday to Friday and 8am to 1pm Saturdays does not exceed the operational noise criteria in Table 3A.	Appendix D.2
Schedule 2 Condition 6.4D	Prior to the commencement of construction activities at the Newstan ventilation shaft site at Awaba the Applicant shall prepare and implement a Noise Monitoring Program for the Awaba surface facilities and ventilation shaft to the satisfactory of the Secretary. This program must:	Appendix D.2
	be submitted to the Secretary for approval; and	Appendix D.2
	Provide for the monitoring of both construction and operational activities.	Appendix D.2

D.2 Overview

Newstan Colliery DA 73-11-98 noise conditions specifically relate to to the Newstan Ventilation Shaft Site at Awaba. The development consent includes noise conditions relevant to construction outside of standard hours and operation of the ventilation fans at Awaba. No construction is planned outside of standard hours and the fans are not yet operational. This management plan will be updated prior to the ventilation fans being installed and becoming operational.

C.5 Noise criteria

Schedule 2 Condition 6.4D Operational Noise Criteria of DA 73-11-98, provides noise criteria and relevant conditions for the Newstan Ventilation Shaft Site at Awaba.

Table 3A from DA 73-11-98, Schedule 2 Condtion 6.4D, is reproduced as **Table 2**.

Location	Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night $L_{Aeq(15\ min)}$
All privately owned residences	38	40	36

Notes on **Table 2**:

a) Noise from the development is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more that 30 metres from the boundary, to determine compliance with the $L_{Aeq\ (15\ min)}$ noise limits in the above table. The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

b) Where is can be demonstrated that direct measurement of noise from the development is impractical, the OEH may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).

c) The noise emission limits identified in the above table apply under meteorological conditions of:

- Wind speeds of up to 3 m/s at 10 metres above ground level; or
- Temperature inversion conditions of up to 3^{o}C/100m, and wind speeds of up to 2m/s at 10 metres above ground level.

d) In this condition:

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

Appendix E – Maps

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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1:25,000 for A4

0 105 210 420 630 840
Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND
- Suburb
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
Environmental Monitoring
Myuna Colliery Regional overview
Short Term noise monitoring

Centennial Coal

DATE 11/09/2020

Appendix E1a

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP006_AppendixE_ST_DDP_Regional_Noise_0.mxd

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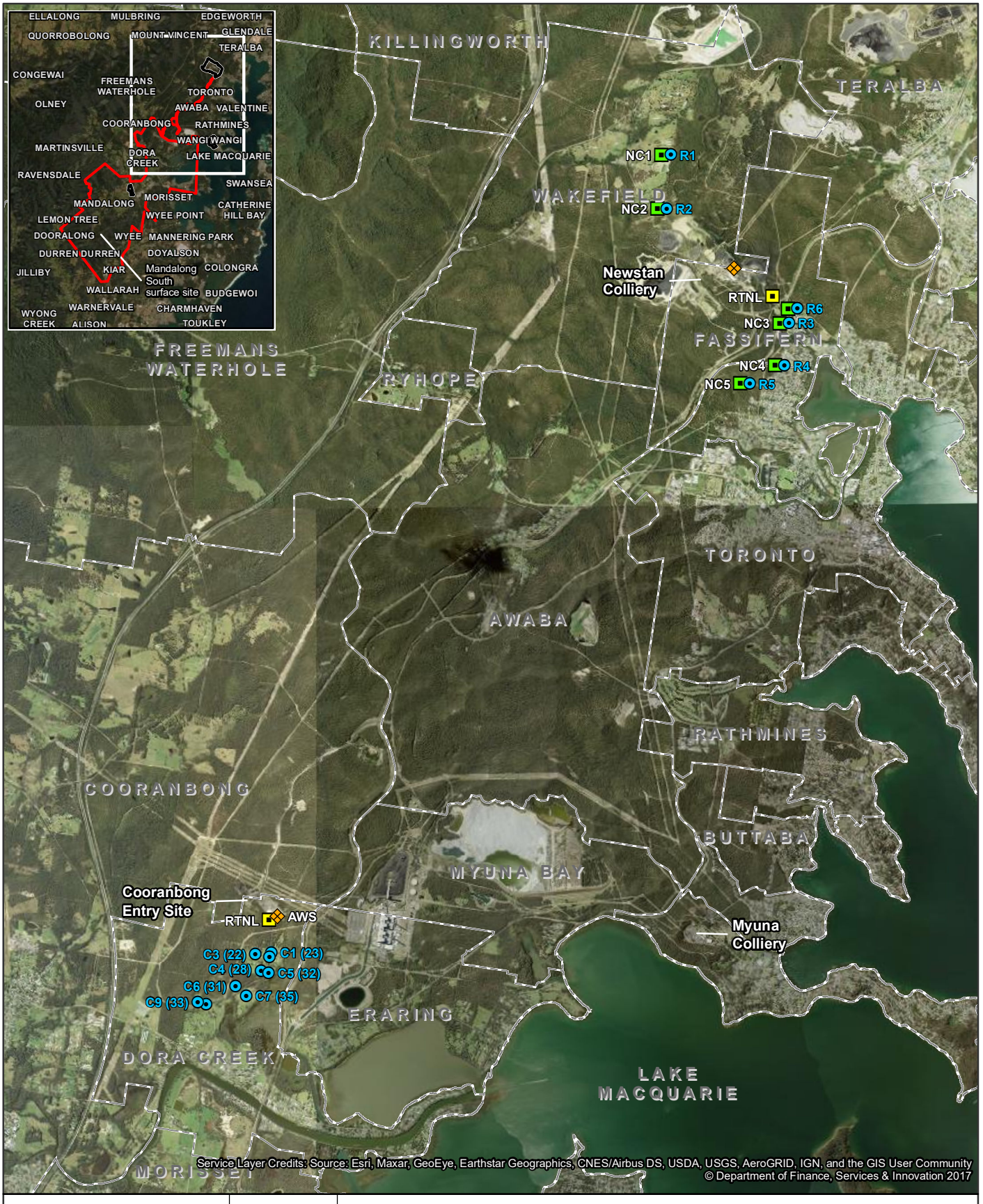

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0 310 620 1,240 1,860 2,480

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Suburb
- Sensitive receiver
- MET station
- Noise attended
- Noise unattended

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LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
Environmental Monitoring
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Short Term noise monitoring

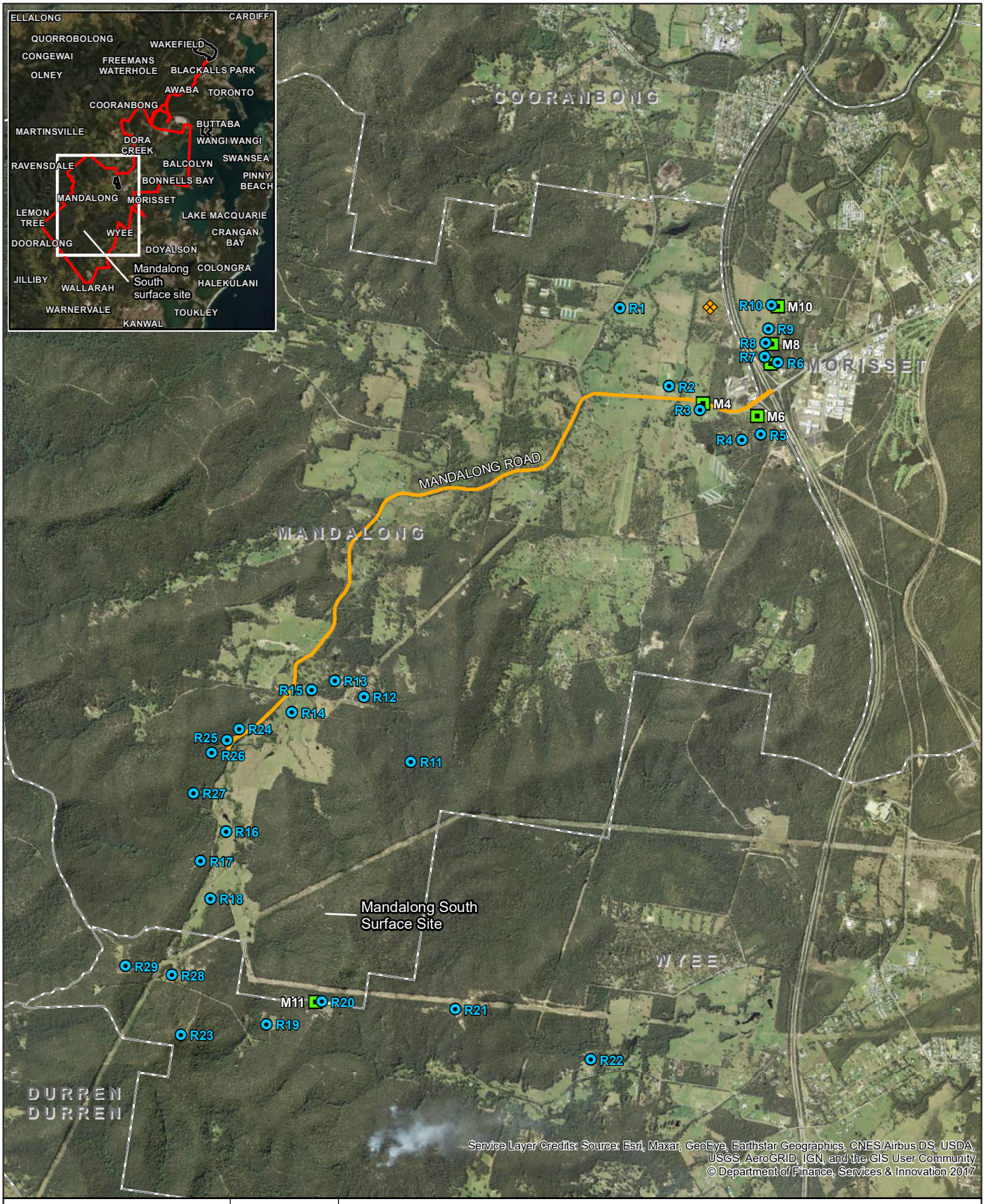
Centennial Coal

DATE 11/09/2020

Appendix E1b

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP006_AppendixE_ST_DDP_Regional_Noise_0.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tmorton



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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Project application area boundary
- Suburb
- Haul Road
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
Environmental Monitoring
Mandalong Regional overview
Long term noise monitoring

Centennial Coal

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Appendix E2a

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP007_AppendixE_LT_DDP_Regional_Noise_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:tmorton

1:25,000 for A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Project application area boundary
- Suburb
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
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Appendix E2b

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP007_AppendixE_LT_DDP_Regional_Noise_0.mxd

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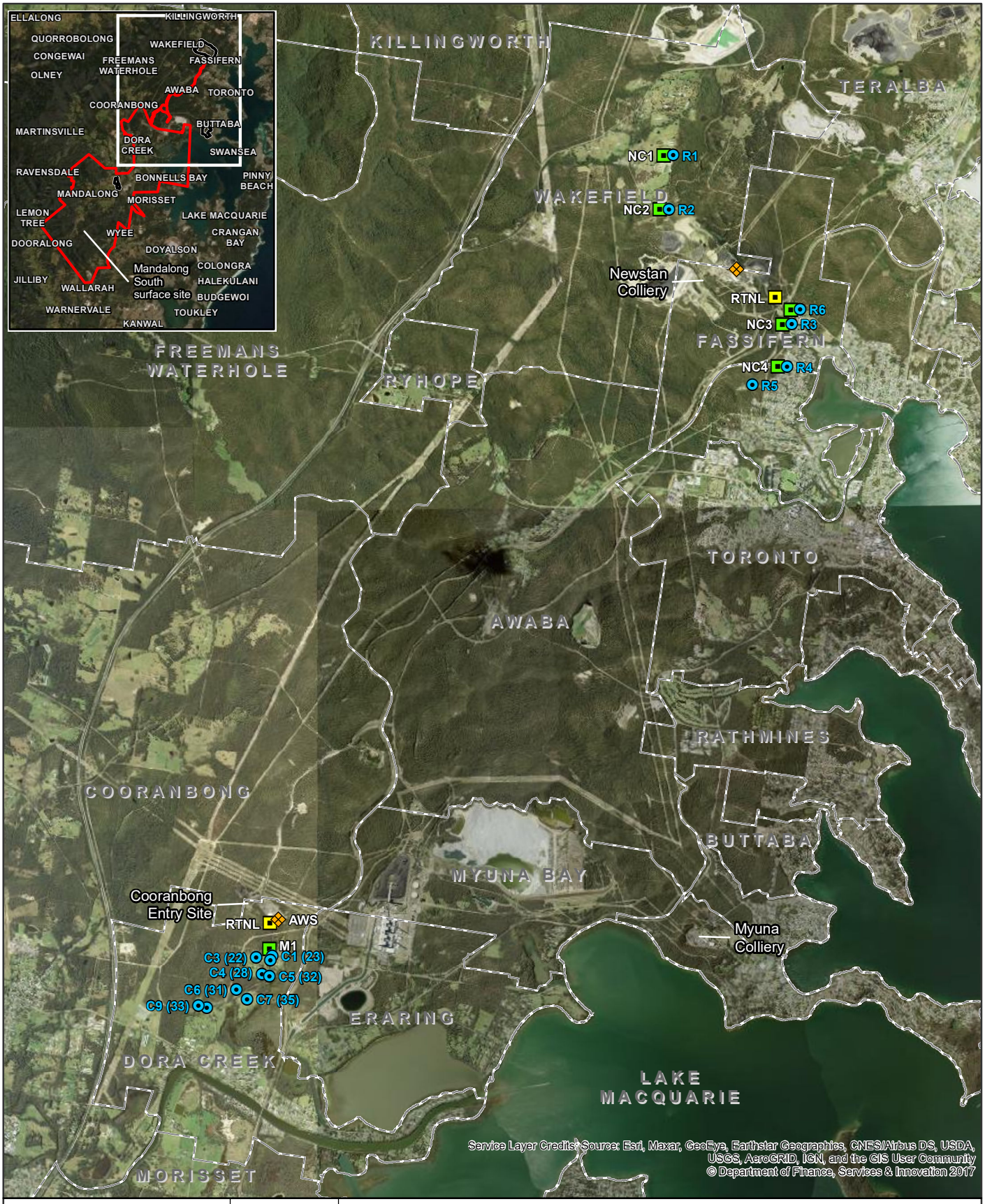

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0 310 620 1,240 1,860 2,480

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Project application area boundary
- Suburb
- MET station
- Noise attended
- Noise unattended
- Sensitive receiver

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LOCATION	-
DRAWN	T.M
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SCALE	refer to scalebar

Centennial Coal
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Appendix E2c

GIS Filename: G:\22\12532516\GIS\Maps\Deliverables\NoiseManagementPlan\12532516_NMP007_AppendixE_LT_DDP_Regional_Noise_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:tmorton

Appendix F – Consultation log

Consultation Date	Description
27 July 2012	Original Noise Management Plan submitted to the Secretary.
30 October 2015	Letter sent to the DPE (now DPIE) requesting approval to consolidate the Noise Management Plan into a regional Management Plan.
30 October 2015	Letter sent to the DPE (now DPIE) seeking the appointment of Tristan Gribble of GHD to prepare the Noise Management Plan
2 November 2015	Letter from the DPE (now DPIE) approving the appointment of Tristan Gribble of GHD to prepare the Noise Management Plan
17 November 2015	Meeting with the EPA (Sydney) discussed regional approach being undertaken for the development of the Management Plans.
19 November 2015	Approval received from the DPE (now DPIE) to consolidate the Management Plans into regional Management Plans.
26 November 2015	Meeting with EPA (Newcastle) to which included discussion on management plans.
23 February 2016	Draft Management Plan submitted to the EPA for review and comment.
2 March 2016	Feedback from EPA received. No issues with Management Plan.
24 March 2016	Management Plan submitted to DPE (now DPIE) for review/approval.
31 May 2016	Feedback on Management Plan from DPE (now DPIE) received.
6 July 2016	Revised Noise Management Plan re-submitted to DPE (now DPIE) for approval
9 August 2016	Further feedback on Management Plan from DPE (now DPIE) received
23 August 2016	Request submitted to DPE (now DPIE) seeking approval to submit Management Plan on a staged basis for the Northern Coal Services Project construction activities
1 September 2016	Approval from DPE (now DPIE) to submit Management Plan on a staged basis for the Northern Coal Services Project construction activities

Consultation Date	Description
12 September 2016	Revised Noise Management Plan re-submitted to EPA for review and comment
19 September 2016	Revised Management Plan re-submitted to DPE (now DPIE) for approval
17 July 2017	Revised Management Plan re-submitted to DPE (now DPIE) for approval following Mandalong Consent Modification and Annual Reviews.

DPE (now DPIE) Matters Raised and How Addressed

Description of Consultation	How Addressed in Management Plan
24/03/16 RNMP submitted to DPE (now DPIE) for review/approval. DPE (now DPIE) responded on 31/05/16 by email raising the matters below. Centennial's response dated 6/07/16 is reproduced below.	
The NMP proposes short and long term monitoring programs. In section 4 please provide more information on the review of the noise monitoring network that was undertaken in 2015. Please summarise the outcomes of the review.	Each site specific appendix details the review of the existing monitoring network undertaken to develop a 'long term' monitoring programme. The monitoring review recommendations are provided as summaries in the 'long term' monitoring section of each site specific Appendix.
When is Centennial proposing to commence the long term monitoring program?	Section 1.4 of the Noise Management Plan acknowledges that to implement the long term strategy, some changes will take time and require discussions and approval from the relevant authorities. The time required for discussion and approval with relevant authorities is not managed by Centennial, and how long this will take is unknown. Both the short term and long term monitoring programmes will continue to allow the operations to demonstrate compliance with the noise criteria within the consent.
Has EPA been consulted with on the proposed long term monitoring program?	The consultation log provided as Appendix F to the Management Plan details the consultation undertaken with the EPA in relation to the management plan and the approach adopted within the management plan.

Description of Consultation	How Addressed in Management Plan
Attachment A Mandalong Mine, please address conditions 1 and 3(b) of Schedule 3 and the relevant commitments made in Appendix 8 of SSD 5144.	Condition 1 of schedule 3 relates to construction noise. As is detailed in Section 1.2 of the management plan, this management plan is associated with operational noise from the northern region operations. Management of construction noise is considered as part of the Construction Environmental Management Plan as detailed within the Statement of Commitments for the Mandalong Southern Extension Project and provided as Appendix 8 to the SSD 5144 conditions of consent. The connection of underground power supply is within the current plan and schedule for the duration of the construction of the shaft. The connection of power will be specified during the Tender process for the shaft construction activities. This commitment has been included in the Mandalong Mine site specific appendix.
Attachment C Northern Coal Services: Please include the meteorological conditions under which the criteria applies. A few coordinates are missing from Table 4, please add them in.	The meteorological conditions that apply to the noise criteria, as described in Appendix 3 of the SSD 5145, have been included in the Northern Coal Services site specific appendix of the Noise Management Plan.
Attachments A-C in the table of conditions of consent, please include the condition numbers.	The missing coordinates for the two monitoring locations have been included.
Attachment E, please include a copy of the EPA's feedback dated 2 March 2016.	This appears in Appendix F.
Resubmitted the RNMP to DPE (now DPIE) for review/approval. DPE (now DPIE) responded on 10/10/17 to conditionally accept the RNMP subject to the minor comments below.	
Provide evidence of consultation with the EPA and the Department in relation to the RNMP and indicate how any matters raised have been addressed.	Updates to Consultation Log and 'How addressed' tables in Appendix F.
Liaise with the EPA and seek a variation to the EPL in relation to noise monitoring times and locations. Note: the 'long term' noise monitoring program will need to continue if and until a variation to the EPL is granted.	Centennial will seek a variation to the EPL as noted by the Department with the 'short term' noise monitoring remaining in place until the variation is approved.

Description of Consultation	How Addressed in Management Plan
In Section 6.1 of the RNMP, include a clear definition of what constitutes a noise incident (i.e. an exceedance of noise criteria during attended compliance monitoring).	Section 6.1 has been updated accordingly to include a clear definition of what constitutes a noise incident.
The RNMP should include a table indicating the site-specific conditions of approval/consent that the plan has been prepared to address.	Additional text has been added to Section 1.7.1 to outline that the site-specific conditions of approval/consent are outlined in Appendices A-D.

EPA Matters Raised and How Addressed

Description of Consultation	How Addressed in Management Plan
17/11/15 Meeting with EPA (Sydney) Proposed approach to the development of regional management plans was discussed with the EPA (Sydney).	Development of this regional noise management plan.
26/11/15 Meeting with EPA (Newcastle) Proposed approach to the development of regional management plans was discussed with the EPA (Newcastle).	Development of this regional noise management plan.
23 February 2016 Letter to EPA requesting review and comment on the draft RNMP.	No actions to be addressed.
2 March 2016 Letter from EPA stating "*The EPA has not reviewed these reports and accordingly offers no comments in relation to them".*	No actions to be addressed.
1 September 2016 Letter to EPA requesting review and comment on the revised RNMP.	No response to date and no actions to be addressed.

NSW GOVERNMENT | Planning & Environment

Planning Services
Resource Assessments
Name: Genevieve Seed
Phone: 9228 6489
Email: genevieve.seed@planning.nsw.gov.au

Mr James Wearne
Group Approvals Manager
Centennial Coal Company Ltd
Level 18 BT Tower
1 Market Street
Sydney NSW 2000

Dear James Wearne

Preparation of Management Plans
Mandalong Southern Extension Project (SSD 5144) and
Northern Coal Logistics Project (SSD 5145)

I refer to your letter dated 30 October 2015 requesting the Secretary's approval for the appointment of consultants to prepare management plans for the Mandalong Southern Extension Project and the Northern Coal Logistics Project.

The Secretary has approved the appointment of:

- Mr Tristan Gribble, to prepare the Noise and Air Quality & Greenhouse Gas Management Plans; and
- Dr Stuart Gray and Mr Lachlan Hammersley, to prepare the Water Management Plans.

If you have any enquiries about this matter, please contact Genevieve Seed.

Yours sincerely

Howard Reed 2.11.15
Howard Reed
Director
Resource Assessments
As nominee of the Secretary