INVINCIBLE COLLIERY
AIR QUALITY MANAGEMENT PLAN

Shoalhaven Coal Pty Limited

DRAFT

October 2022

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1.0 Introduction

1.1 Background

Shoalhaven Coal Pty Limited (Shoalhaven Coal), trading as Castlereagh Coal Pty Ltd (Castlereagh Coal), owns the Invincible Colliery (Invincible), a coal mine located approximately 25 kilometres (km) north-west of Lithgow in New South Wales (NSW) (refer to **Figure 1.1**). The town of Cullen Bullen is located approximately 3 km north-west of Invincible.

In 2015, the Manildra Group's Shoalhaven Coal purchased Invincible, and the nearby Cullen Valley Mine, to secure continued supply of a speciality coal product, known as 'nut' coal, for the Shoalhaven Starches Plant located at Bomaderry on the NSW South Coast (refer to **Figure 1.1**). More recently, Shoalhaven Coal was purchased in November 2021 via a 100% share transaction by an all-Australian locally based ownership team which is primarily focussing on supply of coal to the power stations and domestic markets in NSW. The Invincible Colliery has a long history of mining, with operations dating back to 1901. Open cut mining has been carried out at Invincible at various times ranging from the 1940s through to the mine being placed into care and maintenance in 2013 when the available coal within the approved mining area was exhausted. The existing operations are shown in **Figure 1.2**.

In 2016, Shoalhaven Coal sought to modify the Invincible Project Approval 07_0127 (Project Approval Mod 5) to extend open cut mining operations to the south of the existing approved mining area (Southern Extension). The modification was approved by the Planning Assessment Commission (PAC) on 2 February 2018. The Project Approval permits mining operations to be carried out until 31 December 2025.

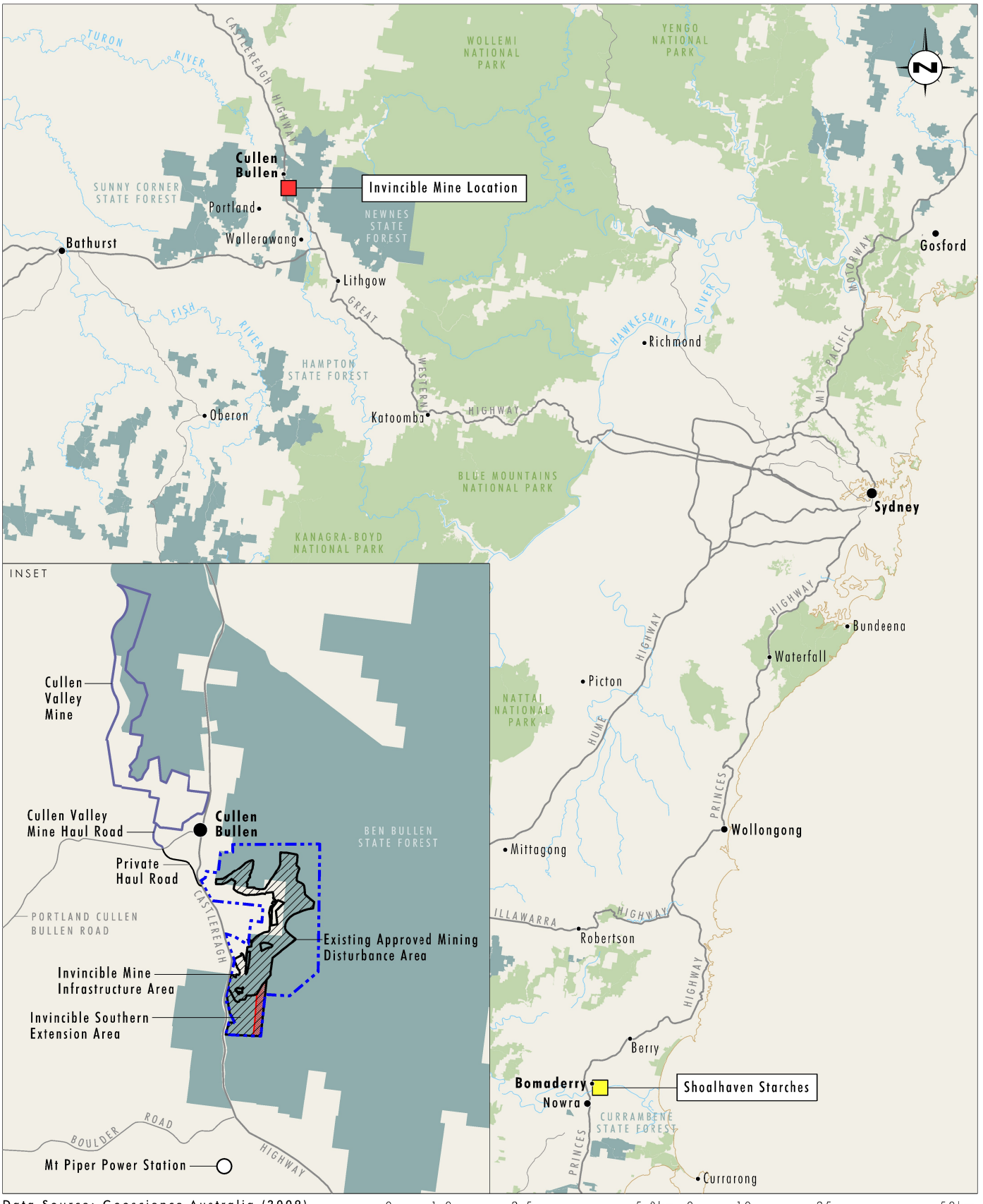
The Project Approval for the Southern Extension Project permits:

- extending the open cut mining area to mine down to, and including, the Lithgow Seam to the south of the existing mine in the Southern Extension Area
- maximum mining and production rates of up to 1.2 Mtpa product coal
- removal and emplacement of overburden and the extraction of coal between the hours of 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and public holidays (Daytime)
- processing of coal onsite and/or transport of coal from site between the hours of 7am to 10pm on Monday to Saturday, and 8am to 10pm on Sundays and public holidays (daytime and evening)
- the undertaking of maintenance activities and safety procedures as directed by DRG at any time
- product coal transport arrangements (with coal to be transported from the site by road truck
- use of existing open cut voids and former underground workings for temporary water storage
- continued use of existing Invincible infrastructure (including maintenance work, and minor upgrades and operation of the existing Invincible Coal Preparation Plant (Invincible CPP)
- rehabilitation of the Southern Extension and all existing disturbance areas at Invincible by reshaping and backfilling mining areas to remove voids and revegetating the reshaped landform with locally endemic woodland and forest communities
- product coal transport arrangements, with coal to be transported from the site by road truck to customers in NSW including Mt Piper Power Station (and Manildra's Shoalhaven Starch facility).

1.2 Purpose and Scope

The purpose of this Air Quality Management Plan (AQMP) is to describe the air quality management strategies, procedures, controls and monitoring programs to be implemented at Invincible to minimise the potential impacts on air quality. This AQMP applies to all activities undertaken within the Invincible project approval boundary, as shown on **Figure 1.2.**

This AQMP addresses the relevant requirements of the Project Approval and Environment Protection Licence (EPL) 1095. The Project Approval conditions and relevant air quality management commitments made within the Environmental Assessment (EA) are provided in **Section 2.1**. EPL conditions relevant to this plan are provided in **Section 2.2**.



Data Source: Geoscience Australia (2009), OEH (2013)

Legend

- Existing Approved Mining Disturbance Area
- Invincible Project Approval Boundary
- Mining Restriction Area

FIGURE 1.1

Locality Plan

File Name (A4): R50/3968_060.dgn
20181017 9.42

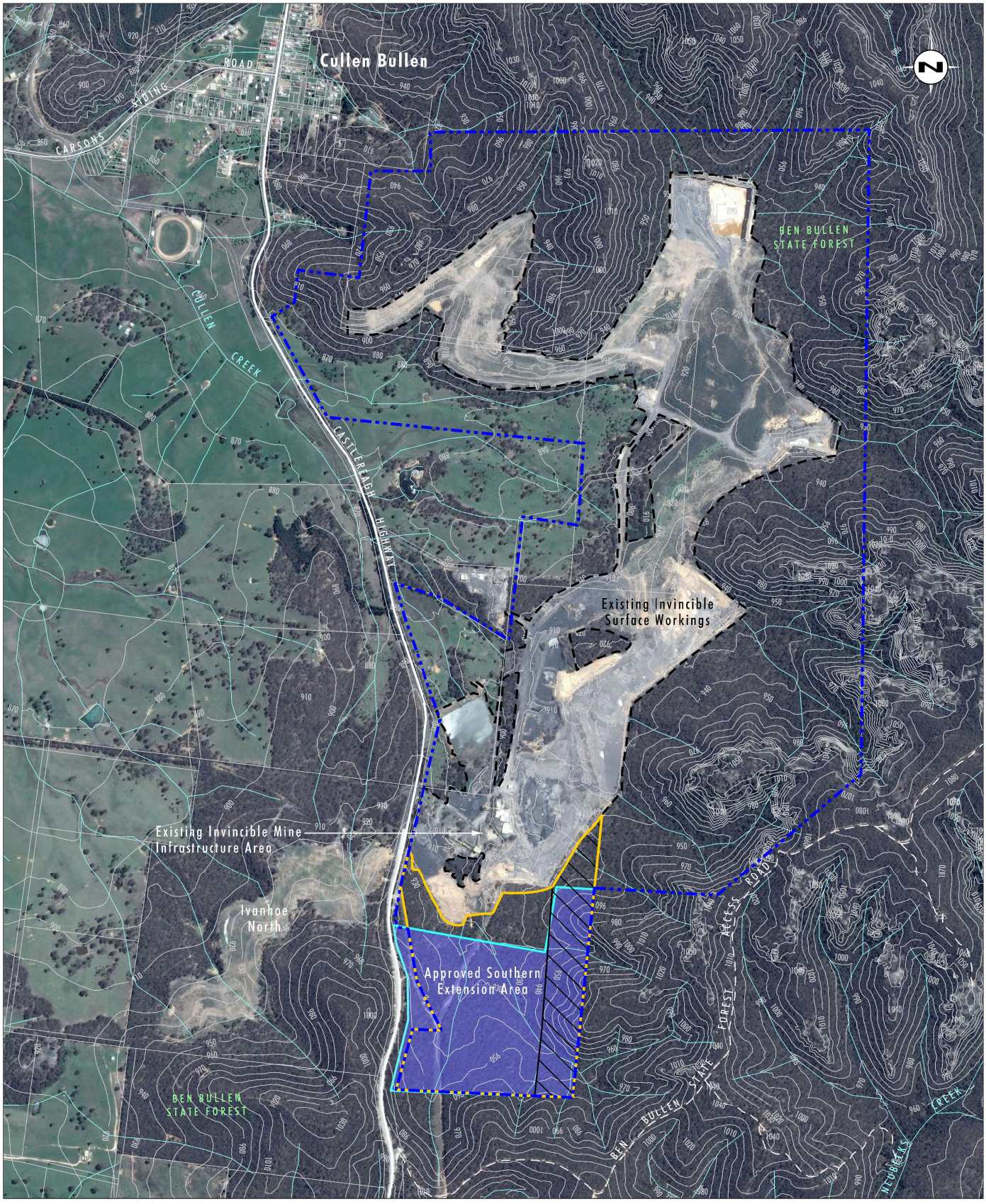


Image Source: Google Earth - CNES/Astrium (Oct 2016)
Data Source: LPI (2016), Forest Corporation of NSW (2015)
Note: Contour Interval 10m

0 0.25 0.5 1.0km
1:20 000

Legend

- Existing Approved Mining Disturbance Area
- Approved Southern Extension Area
- Mining Restriction Area
- Invincible Project Approval Boundary
- MLA431

FIGURE 1.2

Invincible Southern Extension Project

File Name (A4): R50/3968_061.dgn
20181017 9.45

2.0 Regulatory Requirements

2.1 Project Approval Conditions

Table 2.1 identifies the specific environmental air quality related Project Approval conditions (i.e. Schedule 3 of the project approval) and where they have been addressed within this AQMP.

Table 2.1 Project Approval Conditions

<table>
<tr><th>Condition</th><th>Description</th><th>Section/s Addressed</th></tr>
<tr><td colspan="3">Schedule 2 – Administrative Conditions</td></tr>
<tr><td colspan="3">Obligation to Minimise Harm to the Environment</td></tr>
<tr><td>1</td><td>In addition to meeting the specific performance criteria established under this approval, the Proponent must implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from construction, operation, or rehabilitation of the development.</td><td>Section 5.0</td></tr>
<tr><td colspan="3">Schedule 3 – Specific Environmental Conditions</td></tr>
<tr><td colspan="3">Odour</td></tr>
<tr><td>15</td><td>The Proponent must ensure that no offensive odours are emitted from the site, as defined under the POEO Act.</td><td>Sections 4.0 and 5.0</td></tr>
<tr><td colspan="3">Air Quality Criteria</td></tr>
<tr><td>16</td><td>The Proponent must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the particulate emissions generated by the project do not exceed the criteria listed in Tables 4, 5 and 6 at any residence on privately-owned land.

Table 4: Long term criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>[d] Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>[a] 90 µg/m^3</td></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>Annual</td><td>[a] 30 µg/m^3</td></tr>
</table>
Table 5: Short term criterion for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>[d] Criterion</th></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>24 hour</td><td>[a] 50 µg/m^3</td></tr>
</table>
Table 6: Long term criteria for deposited dust
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr>
<tr><td>[c] Deposited dust</td><td>Annual</td><td>[b] 2 g/m^2/month</td><td>[a] 4 g/m^2/month</td></tr>
</table>
Notes for Tables 4 to 6:

[a] Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources);
[b] Incremental impact (i.e. incremental increase in concentrations due to the project on its own);
[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method; and
[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary.
</td><td>Sections 4.0, 5.0 and 6.0</td></tr>
</table>

Condition	Description	Section/s Addressed
Mine-owned Land		
17	The Proponent must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not cause exceedances of the criteria in Tables 4-6 at any occupied residence on mine-owned land (including land owned by another mining company) unless: (a) the tenant and landowner (if the residence is owned by another mining company) has been notified of any health risks associated with such exceedances in accordance with the notification requirements in schedule 4 of this consent; (b) the tenant of any land owned by the Proponent can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice; (c) air mitigation measures (such as air filters, a first flush roof water drainage system and/or air condition) are installed at the residence, if requested by the tenant or landowner (if the residence is owned by another mining company) (d) air quality monitoring is regularly undertaken to inform the tenant or landowner (if the residence is owned by another mining company) of the likely concentrations of particulate emissions at the residence; and (e) data from this monitoring is presented to the tenant or landowner (if the residence is owned by another mining company) in an appropriate format for a medical practitioner to assist the tenant or landowner in making informed decisions on the health risks associated with occupying the residence, to the satisfaction of the Secretary.	**Sections 4.0** and **5.0**
Operating Conditions		
18	The proponent must: (a) implement all reasonable and feasible measures to minimise the odour, fume and dust emissions of the project (including those generated by spontaneous combustion) and the release of greenhouse gas emissions from the site. (b) minimise any visible off-site air pollution generated by the project; (c) ensure that all loaded trucks leaving the site are adequately covered at all times; (d) minimise the air quality impacts on the project during adverse meteorological conditions and extraordinary events (see note below), (e) co-ordinate the air quality management on site with the air quality management at the Cullen Valley mine to minimise any cumulative air quality impacts; and (f) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this approval. *Note: Extraordinary events include bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary.*	**Sections 4.0** and **5.0**

Condition	Description	Section/s Addressed
Air Quality Management Plan		
19	Prior to recommencing mining operations, unless the Secretary agrees otherwise, the Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:	**This Plan**
	(a) be prepared in consultation with the EPA;	**Section 2.3**
	(b) describe the measures that would be implemented to ensure compliance with air quality criteria and operating conditions of this approval;	**Section 5.0**
	(c) describe the proposed air quality management system in detail;	**Section 5.0**
	(d) include a review of all air quality management measures against best practice guidelines; and	**Section 5.0**
	(e) include an air quality monitoring program that: • evaluates and reports on: ○ the effectiveness of the air quality management system; ○ compliance with the air quality criteria; ○ compliance with the air quality operating conditions; and	**Section 6.0**
	• defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.	**Section 7.0**
20	The Air Quality Management Plan approved by the Secretary must be implemented.	**Noted**
Meteorological Monitoring		
21	During the life of the project, the Proponent must ensure that there is a meteorological station operating in the vicinity of the site that: (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and	**Section 6.3**
	(b) is capable of continuous real-time measurement of temperature inversions in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Secretary following consultation with the EPA.	**Section 6.3**
Schedule 5 – Environmental Management, Reporting and Auditing		
Management Plan Requirements		
3	The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data	**Section 3.2**
	(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	**Sections 2.0** and **4.0**
	(c) a description of the measures that would be implemented to comply with the	**Section 5.0**

	relevant statutory requirements, limits, or performance measures/criteria;	
	(d) a program to monitor the: • impacts and environmental performance of the project; • effectiveness of any management measures (see c above);	**Section 6.0**
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	**Section 5.2**
	(f) a program to investigate and implement ways to improve the environmental performance of the project over time;	**Section 8.0**
	(g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and	**Section 7.0**
	(h) a protocol for periodic review of the plan.	**Section 8.0**

The Implementation of measures within this management plan will satisfy these conditions.

2.1.1 Environmental Assessment Commitments

Condition 2 Schedule 2 of the Project Approval stipulates that, the mine must be developed and operated generally in accordance with the EA reports prepared for the development and subsequent modifications. **Table 2.2** summarises the management commitments relating to air quality management that have been identified in the Invincible Southern Extension Project EA.

Table 2.2 Relevant Environmental Assessment Air Quality Management Commitments

Source	Description	Section/s Addressed
EA Section 6.7.6	Castlereagh Coal will prepare and implement an Air Quality Management Plan for the Southern Extension Project. The plan will incorporate a range of proactive and reactive dust control strategies. The controls to be implemented include the following key measures:	**This Plan**
	Proactive air quality management will involve the planning of activities in advance of potentially adverse conditions. Specifically, the proactive air quality management approach will include: • implementation of a system to provide environmental personnel with a daily forecast of expected dust conditions in the vicinity of the operation • discussion of the dust forecast at daily pre-shift meetings • modifying the planned mining activities, as appropriate, to minimise or avoid the potential dust impacts.	**Section 5.1**
EA Section 6.7.6	Reactive air quality management will include modification or suspension of activities in response to identified triggers including: • visual conditions, such as visible dust from trucks above wheel height • meteorological conditions, such as dry, windy conditions, with winds blowing towards sensitive receptors.	**Sections 5.1** and **5.2**

EA Section 6.7.6	<u>Dust Management Measures</u> Castlereagh Coal will implement a range of dust management measures for the key dust generating activities including: • watering of haul routes • water injection, dust curtains • enclosure • watering / moist travel routes • water sprays • partial rehabilitation / stabilisation. Castlereagh Coal will minimise clearing ahead of construction and operational activities.	**Section 5.1**

2.2 Environment Protection Licence

Air quality monitoring will be undertaken in accordance with the conditions of EPL 1095. The EPL was issued by the Environment Protection Authority (EPA) under the *Protection of the Environment Operations (POEO) Act 1997* for coal mining works at Castlereagh Highway, Cullen Bullen NSW 2790.

Table 2.3 lists the EPL conditions relating to air quality monitoring and where it has been addressed within this document. Prior to commencement of operations and in consultation with the NSW EPA, an application to vary the Environmental Projection Licence will be made to reflect standard licencing conditions with respect to the management of dust generation at the premises and the emission of odour. These standard licencing conditions are consistent with the commitments summarised in Table 2.2 of the AQMP (re dust generation) and condition 15, Schedule 3 of Project Approval 07_0127 (Mod 5) re odour generation (refer to **Section 6.0**).

Table 2.3 Relevant Environment Protection Licence Conditions

<table>
<tr><th>Condition</th><th>Description</th><th>Section/s Addressed</th></tr>
<tr><td>O3.1</td><td>The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.</td><td>Section 5.0</td></tr>
<tr><td>M2.1</td><td>For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:</td><td>Section 6.0</td></tr>
<tr><td>M2.2</td><td>Air Monitoring Requirements
POINT 3
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Particulate matter</td><td>micrograms per cubic metre</td><td>Weekly</td><td>AS/NZS 3580.9.3:2003</td></tr>
<tr><td>Particulates - Deposited Matter</td><td>grams per square metre per month</td><td>Once a month (min. of 4 weeks)</td><td>Australian Standard 3580.10.1-2003</td></tr>
<tr><td>PM10</td><td>micrograms per cubic metre</td><td>Weekly</td><td>AS/NZS 3580.9.6:2003</td></tr>
</table>
POINT 4,5,6,7
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Particulates - Deposited Matter</td><td>grams per square metre per month</td><td>Once a month (min. of 4 weeks)</td><td>Australian Standard 3580.10.1-2003</td></tr>
</table></td><td>Section 6.0</td></tr>
</table>

M3.1	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".	**Section 6.0**

2.3 Stakeholder Consultation

In accordance with Schedule 3, Condition 19(a) of the Project Approval, this AQMP has been prepared in consultation with the EPA. Written advice was received following review of the AQMP by the EPA on 20 June 2022. A copy of the EPA correspondence is provided in **Appendix 1**.

2.4 Guidelines, Policies and Standards

Shoalhaven Coal will manage air quality from operations and undertake environmental monitoring as reasonably and feasibly practicable in accordance with the following guidelines, policies and standards applicable to air quality management at the mine:

- Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007);
- *Protection of the Environment Operation* (POEO) *Act 1997;*
- Standard AS 3580.14:2011: Methods for Sampling and Analysis of Ambient Air – Meteorological Monitoring for Ambient Air Quality Monitoring Applications;
- Standard AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method;
- Standard AS 2923-1987: Ambient air - Guide for measurement of horizontal wind for air quality applications; and
- Standard AS 2724.1-1984 - Ambient air - Particulate matter Determination of deposited matter expressed as insoluble solids, ash, combustible matter, soluble solids and total solids.

Additional monitoring using alternative equipment and/or technologies may be utilised on site in to augment the management of air quality. As in the case of the necessary but temporary suspension of the Hi-Vol PM10 monitor at IDD1, where any special circumstances apply and it is not practicable to utilise existing equipment (for safety or other reasons) then proven monitoring units similar to those used elsewhere in the region and NSW by EPA-licensed mining industry operations will be utilised to ensure the continuity of monitoring activity and data reporting. Any such temporary arrangements will be notified to the Department of Planning and Environment and consultation undertaken with EPA and/or other agencies as appropriate.

2.5 Further Studies

There are no requirements under the Project Approval to undertake any further studies relevant to the AQMP.

2.6 Hold Points

There are 3 hold points within the Project Approval and EPL related to air quality with respect to monitoring and notifying landowners prior to the recommencement of mining operations.

Hold Point 1

Schedule 3, Condition 19 requires that prior to recommencing mining operations, unless the Secretary agrees otherwise, the Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. A copy of the relevant correspondence is included in **Appendix 1**.

Note: Appendix 1 will be updated following the approval of the AQMP by the Secretary.

Hold Point 2

Schedule 3, Condition 21 of the Project Approval requires Shoalhaven Coal so that, for the life of the project, there is a meteorological station operating in the vicinity of the site that:

- complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and
- is capable of continuous real-time measurements of temperature inversions in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Secretary following consultation with the EPA.

Meteorological monitoring undertaken by Shoalhaven Coal is detailed in **Section 6.3**.

Hold Point 3

Prior to the recommencement of mining operations, in accordance with Schedule 4, Condition 1 of the Project Approval, Shoalhaven Coal must:

- notify the tenants of any mine-owned land of their rights under the approval; and
- send a copy of the NSW Health fact sheet entitled “Mine Dust and You” (as may be updated from time to time) to the owners and/or existing tenants of any land (including mine-owned land) where the predictions in the EA identify that dust emissions generated by the project are likely to be greater than the relevant air quality criteria in Schedule 3 at any time during the life of the project.

The management measures to address hold point 3 are included in **Section 5.2**.

3.0 Existing Air Quality Environment

Invincible is located in an area of historical mining operations associated with the western coalfield of NSW, including the former mining operations at Cullen Valley Mine, Baal Bone Colliery, Pine Dale and Ivanhoe Colliery (Umwelt 2018). The Southern Extension is located within the Ben Bullen State Forest to the east of the Castlereagh Highway and is surrounded by existing mining operations to the north, Ivanhoe mine rehabilitation site to the west, State Forest to the east and west, and rural land to the north-west (Umwelt 2016).

3.1 Sensitive Receivers

The closest privately owned residence is located approximately 820 m to the north-west of the Southern Extension. Other sensitive receiver locations include scattered privately owned rural residences to the west of the Southern Extension and those within the township of Cullen Bullen, which is located approximately 3 km to the north north-west of the Invincible mine infrastructure area (Umwelt 2016) Modelling results from the Invincible Southern Extension Mod 5 application (Jacobs 2016) demonstrate that air quality criteria will not be exceeded at any sensitive receivers, Figure 6.2.

3.2 Ambient Air Quality Levels

An Air Quality Impact Assessment (AQIA) was prepared for Shoalhaven Coal to assess the potential air quality impacts of the Southern Extension (Jacobs 2016). As part of this assessment, a review of air quality monitoring data was undertaken to establish the existing air quality environment surrounding the mine.

The assumed background levels that apply at sensitive receptors are shown below in **Table 3.1**.

Table 3.1 Ambient Air Quality Levels

Substance	Averaging time	Assumed background level that applies at sensitive receptors	Notes
Particulate matter (PM_{10})	24-hour	23 µg/m^3	95th percentile of Invincible and Cullen Valley PM_{10} monitoring data for 2009 to 2015.
Particulate matter (PM_{10})	Annual	10 µg/m^3	Average of Invincible and Cullen Valley PM_{10} monitoring data for 2009 to 2015.
Particulate matter (TSP)	Annual	26 µg/m^3	Estimated from PM_{10}, assuming 40% of TSP is PM_{10}.
Deposited dust	Annual	1.2 g/m^2/month	Average of Invincible dust deposition monitoring data for 2008 to 2015

3.3 Meteorological Conditions

Analysis of annual wind patterns from the Invincible meteorological station indicate the most common winds in the area are from the northeast and southwest (Jacobs 2016).

4.0 Air Quality Criteria

Air quality criteria for the mine are detailed in Schedule 3, Condition 16 of the Project Approval and are specified below in **Table 4.1**.

Table 4.1 Air Quality Criteria

Pollutant	Averaging Period	[d] Criterion
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3
	24 hour	[a] 50 µg/m^3
[c] Deposited dust	Annual (maximum increase)	[b] 2 g/m^2/month
	Annual (maximum total)	[a] 4 g/m^2/month

Notes to Table 4.1

- *[a] Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources);*
- *[b] Incremental impact (i.e. incremental increase in concentrations due to the project on its own);*
- *[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method; and*
- *[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary*

Shoalhaven Coal must facilitate the implementation of all reasonable and feasible avoidance and mitigation measures so that the particulate emissions generated by Invincible do not exceed the criteria shown in **Table 4.1** at any residence on privately owned land. This is inclusive of residences occupying mine-owned land as specified in Schedule 3, Condition 17 of the Project Approval, where the sub elements of this condition have not been satisfied. Implementation of the measures outlined in this plan will satisfy this commitment.

4.1 Odour

In accordance with Schedule 3, Condition 15 of the Project Approval, Shoalhaven Coal must also implement mitigation measures so that no offensive odours are emitted from the site, as defined under the *Protection of the Environment Operation* (POEO) *Act 1997.*

Spontaneous combustion events have the potential to give rise to odour impacts. Spontaneous combustion is a low risk at Invincible given the information obtained during the project life to date. However, weekly inspections will be undertaken for the presence of any spontaneous combustion with management actions implemented as required (e.g. the placement of inert materials over these areas).

Spontaneous Combustion and Subsurface Heating will be minimised and mitigated utilising the hierarchy of controls:

- Eliminate – Avoid lengthy stockpiling timeframes to limit oxidation potential for spontaneous combustion, allowing rapid processing and transport product coal to end users.
- Separate – Where mined material is considered prone to (or demonstrates) spontaneous combustion, stockpile separately and observe as per inspection program / treat as required with sprinklers.
  Where burial of carbonaceous material considered prone to spontaneous combustion increases the likelihood of subsurface heating, bury and cover to the timeframe and depths determined via the pre-mining risk assessment, to reduce oxidation and prevent oxygen ingress.

Review the Spontaneous Combustion PHMP and supporting risk assessment hazards and associated controls prior to design of strips associated with known underground workings – Implement as required.

- Engineering – Where in-situ coal presents spontaneous combustion propensity as determined via the pre-mining risk assessment, minimise likelihood via establishing sprinklers/bench flooding ability to treat coal prior to mining and implement selective extraction as required.
- Administrative – Know your coal – Conduct risk-based assessment and develop Spontaneous Combustion PHMP and ahead of mining to identify material bands that are prone to spontaneous combustion and implement selective mining as required.
  Implement a weekly program of inspection of stockpiled prone carbonaceous material and buried materials to observe for tell-tale signs including the presence of steam and smoke, surface discolouration and / or the odour of spontaneous combustion.

4.2 Blast Fumes

Blasting will not be implemented to support the open cut mining activities proposed for the extraction of coal at the Invincible Southern Extension.

In the unlikely event that blasting is required, a Blast Management Plan will be developed prior to any blasting on site, to the approval of Secretary and relevant regulatory agencies. Castlereagh Coal recognises however, that blasting can generate oxides of nitrogen (NOx) together with other gases as by-products of ammonium nitrate-based explosives manifesting in odour and visual pollution in the form of yellow to dark red clouds. Castlereagh Coal commits to addressing these emissions in an Invincible Colliery Blast Management Plan in the unlikely event blasting is required.

This plan will address the requirement associated with blast fume odour in addition to blasting criteria, blasting hours, property inspections, investigations and operating conditions.

4.3 Greenhouse Gas Emissions

The primary sources of greenhouse gas emissions at Invincible are associated with diesel consumption. To address this issue, Castlereagh Coal will implement a range of measures where they are both technically feasible and financially reasonable to minimise greenhouse gas emissions.

Castlereagh Coal further commits to investigate options for improving the efficiency of operations through the life of the Southern Extension Project; and investigating the options for use of alternative fuels such as biodiesel, where reasonable and feasible. Accordingly, there are financial drivers for undertaking operations in a manner which reduces diesel consumption. **Section 5.0** details the range of management and mitigation measures to be implemented.

5.0 Air Quality and Greenhouse Gas Management Measures

Shoalhaven Coal understands that air quality is an important issue for the community and designed the Southern Extension to minimise air quality impacts, including:

- development of a mine plan that allows for progressive rehabilitation of the Southern Extension and the previously mined areas;
- minimising the length of haul roads (where practicable) and adopting controls for haul road dust emissions;
- minimising the area of disturbed land at any one time as much as practicable; and
- using temporary rehabilitation and stabilisation measures on disturbed land.

5.1 Management Measures

Shoalhaven Coal is committed to effectively managing the air quality impacts associated with the Invincible Southern Extension including the minimisation of any visible off-site air pollution generated by the project. Shoalhaven Coal commits to the implementation of the management measures in **Table 5.1** to minimise dust and greenhouse gas emissions and address the minimisation of visible offsite air pollution. Management measures will be regularly revisited to assess against industry best practice

Proposed management measures within this AQMP were reviewed against best practice guidelines by Mr Greg Collins of RAPT Consulting who holds over 30-years' experience in the specialty fields of air quality and acoustics throughout Australia and Internationally. The review confirmed that air quality management measures employed for the Project are based upon the recommendations of the NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Donnelly et al., 2011) (the Best Practice Report), a study that was commissioned by the NSW EPA.

Table 5.1 Air Quality and Greenhouse Gas Management and Mitigation Measures

Management or Mitigation Measure and Specific Actions	Timing	Responsibility	Performance Indicator
Air Quality Project Design Management Measures			
• Development of a mine plan that allows for progressive rehabilitation of the Southern Extension and the previously mined areas to minimise dust and visible offsite air pollution. • Minimising the length of haul roads (where practicable) and adopting controls for haul road dust emissions. • Minimising the area of disturbed land at any one time as much as practicable. • Using temporary rehabilitation and stabilisation measures on disturbed land.	Mine plan design	Mine Manager	Secretary's satisfaction of Rehabilitation Strategy
Minimise clearing ahead of construction and operational activities.	Mine plan design	Mine Manager	Annual Review
Greenhouse Gas Project Design Management Measures			
Consider the following aspects in the preparation of the mine plan which are designed to lower diesel consumption: • limit the length of material haulage routes; • optimising ramp gradients; • improving rolling resistance of haul roads; • optimising fleet efficiency (e.g. payload size, reducing idling times, scheduling activities so that equipment and vehicle operation is optimised, utilising fuel efficient equipment and consideration of alternative fuels (biodiesel); and working machines to their upper design performance.)	Mine plan design	Mine Manager	Annual Review
Consider diesel use, energy efficiency and ability to use alternative fuels when purchasing or replacing equipment.	Ongoing	Mine Manager	Procurement records Maintenance records
Air Quality Training Management Measures			
Awareness training of operators of mobile plant regarding measures to minimise dust impacts on sensitive receivers (e.g. drop height of material, vehicle speed, sensitive receiver locations, causes of dust emissions etc.), including the practical implementation of these measures.	Prior to works and ongoing	Mine Manager	Training records Monthly Environmental Inspection

Management or Mitigation Measure and Specific and Actions	Timing	Responsibility	Performance Indicator
Greenhouse Gas Training Management Measures			
Awareness training of operators of mobile plant aware of measures to minimise greenhouse gas emissions	Prior to works and ongoing	Mine Manager	Site Condition Checklist records Training records
Air Quality Operational - Predictive / Proactive Management Measures			
Implement the following Operations / Predictive / Proactive Management measure and specific actions to minimise dust and visible offsite air pollution including: • Implement a system where the Environmental Officer provides advice to management personnel regarding the implementation of dust mitigation and controls given the forecast weather conditions for the next shift.	Ongoing	Environmental Officer	Daily pre shift meetings
• Review and provide a weather and the dust forecast to operators at daily pre-shift meetings	Ongoing	Environmental Officer	Daily pre shift meetings
• Modify the mining activities as appropriate, to minimise or avoid the potential dust impacts	During unfavourable weather conditions	Mine Manager	Daily pre shift meetings
Apply watering (water cart or sprays) for the following activities: • Stripping topsoil by scraper • Hauling of overburden or coal • Grading roads • Stockpiling (ROM and product) • Conveyors to stockpiles (transfer points)	Ongoing	Mine Manager	Operational inspection conducted by statutory personnel Monthly Environmental Inspection
Implement water injection or dust curtains for drilling activities	Ongoing	Mine Manager	Operational inspection conducted by statutory personnel Monthly Environmental Inspection
Rehabilitate / stabilise partially rehabilitated dumps	Ongoing	Mine Manager	Operational inspection conducted by statutory personnel Monthly Environmental Inspection
Processing of coal within an enclosure	Ongoing	Mine Manager	Operational inspection conducted by statutory personnel Monthly Environmental Inspection

Management or Mitigation Measure and Specific and Actions	Timing	Responsibility	Performance Indicator
Modify or suspend activities in response to identified triggers to minimise dust and visible offsite air pollution including: • visual conditions, such as visible dust from trucks above wheel height • meteorological conditions, such as dry, windy conditions, with winds blowing towards sensitive receptors.	Ongoing	Mine Manager	Operational inspection conducted by statutory personnel Monthly Environmental Inspection
Co-ordinate the air quality management on site with the air quality management at the Cullen Valley mine to minimise any cumulative air quality impacts by: • Review of monthly air quality and meteorological data from both sites to determine potential triggers for cumulative air quality exceedances • Daily communication between Invincible and Cullen Valley Mine of prevailing air quality and forecast conditions • Trigger based communication between Invincible and Cullen Valley Mine of air quality conditions requiring the implementation of mitigative actions to minimise dust and visible offsite air pollution	Ongoing	Mine Manager	Communication records
Confirm that all loaded trucks leaving the site are adequately covered at all times	Ongoing	Mine Manager	Visual inspection Monthly Environmental Inspection
Greenhouse Gas Operational - Predictive / Proactive Management Measures			
Manage haul road surface conditions to minimise rolling resistance	Mine plan design	Mine Manager	Site Condition Checklist
Assess fleet efficiency aspects (e.g. payload size, idling times, activity scheduling, suitability of equipment to the task and optimise as applicable.	Mine plan design	Mine Manager	Site Condition Checklist
Maintain mobile and fixed equipment to minimise exhaust and greenhouse gas emissions	Ongoing	Mine Manager	Maintenance records
Monitoring / Verification Management Measures			
Assess operations status relative to the mine plan sequence	Ongoing	Environmental Officer	Annual Review
Undertake air quality monitoring in accordance with the air quality monitoring program (**Section 6.0**)	Ongoing	Environmental Officer	Monthly Monitoring reports / Annual Review
Maintain and operate a meteorological station in the vicinity of the site (refer to **Figure 6.1**)	Continuous	Environmental Officer	Meteorological monitoring data

Review monitoring results against criteria detailed in Section 4.0	Ongoing	Environmental Officer	Monthly Monitoring Reports / Annual Review
Visual inspection to validate management measures are being implemented and performing as expected	Ongoing	Environmental Officer	Monthly Environmental Inspection
Implement a program of weekly inspection of stockpiled prone carbonaceous material and buried materials to observe for tell-tale signs including the presence of steam and smoke, surface discolouration and / or the odour of spontaneous combustion	Ongoing	Mine Manager	Inspection records

5.1.1 Training and Awareness

All personnel and contractors working at the mine will undergo an induction. This induction includes information on the management of dust, odour and greenhouse gases while working on site.

Tool-box meetings are held to discuss whole-of-site production, management, safety and environmental issues. Matters relating to air quality and potential adverse meteorological conditions are raised during these meetings, when necessary. Discussion of the dust forecast at daily pre-shift meetings is also conducted.

5.2 Reactive Management Measures

In addition to the operational controls outlined in **Section 5.1**, specific reactive management measures will be implemented in response to identified triggers, as a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible as detailed in **Table 5.2**.

Table 5.2 Reactive Air Quality Triggers and Responses

Trigger	Response/Corrective Action
Receipt of air quality complaint	Following a complaint, appropriate action will be taken within one working day to determine the cause of the complaint and identify appropriate actions to remediate the complaint source. The following details will be recorded: • The date and time of the complaint • Method by which the complaint was made • Personal details of the complainant • Nature of the complaint • Action taken in relation to the complaint, including follow up with the complainant; and • If no action taken, the reasons why no action was taken. All complaints will be investigated and an appropriate response provided to the complainant. The investigation may include the following: • A review of continuous monitoring data relevant to the time of the complaint • A review of the activities and/or equipment being carried out or operated at the time of the complaint • A review of whether activities outside the normal 'day-to-day' operations were being carried out on site at the time of the complaint • A review of whether any activities or extraordinary events/conditions in the locality may have contributed to the complaint • Recommendation of any actions that may be carried out to resolve the complaint and/or minimise the likelihood of further complaints.

Trigger	Response/Corrective Action

Air quality criteria exceedance	If air quality monitoring indicates that the air quality criteria has been exceeded, the following responses and action plan will be implemented:
	• The Environmental Officer (or delegated representative) will review meteorological conditions at the time of the exceedance to assess whether these represent conditions for which the air quality criteria do not apply (see **Section 2.1** (Schedule 3 Condition 16) for applicable Extraordinary Event).
	• The Environmental Officer, in consultation with the Mine Manager, will identify potential emission sources, review the operations performance and if necessary make arrangements to alter the configuration of equipment, or stand down specific equipment, so that dust levels are reduced to achieve compliance with the air quality criteria.
	• The Mine Manager (or delegated representative) will immediately notify DPE and any other relevant agencies of the exceedance.
	• Within 7 days of the date of the exceedance occurring, the Mine Manager will provide DPE and any other relevant agencies with a detailed report of the exceedance, and such further reports as may be requested.
	• The Mine Manager (or delegated representative) will provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.
	• As soon as practicable after obtaining monitoring result showing an exceedance of air quality criteria, the Mine Manager will:
	  ○ notify the affected landowners in writing of the exceedance, and provide regular monitoring results to each affected land owner until the project is again complying with the air quality criteria; and
	  ○ send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).
	• Any exceedance of the air quality criteria will be reported in the Annual Review.
	• In the event of ongoing or regular exceedances of the air quality criteria, the Environmental Officer, in consultation with the Mine Manager will investigate the feasibility of any reasonable additional controls or treatments on individual sources within the mine, or other long term means of reducing air quality levels to comply with the air quality criteria.

Extraordinary Event or Conditions	During times when extraordinary events are forecast or observed, it is the Mine Manager's responsibility to limit or modify operations as required to ensure that air quality impacts are limited as much as practically possible. Extraordinary events as defined by the Project Approval include bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary.

6.0 Air Quality Monitoring

Air quality monitoring requirements for the Invincible operation are provided in the Project Approval and EPL. Schedule 3, Condition 18(f) of the Project Approval requires regular monitoring to be carried out to determine whether the development is complying with the relevant air quality criteria as detailed in **Section 4.0**. Schedule 3, Condition 21 of the Project Approval also requires that there is a meteorological station operating in the vicinity of the site.

6.1 PM_{10} and Dust Depositional Monitoring Locations

In order to monitor air quality and assess compliance at the mine, monitoring will occur at the locations shown on **Figure 6.1.**

The air quality monitoring network consists of:

- six dust deposition gauges (identified as IDD1, IDD2, IDD3, IDD4, IDD5 and IDD6, on **Figure 6.1**)
  Note: IDD6 satisfies NSW EPA recommendation dated 23 September 2022.

- two High Volume Air Samplers (HVAS) sampling PM10 and TSP identified as HVAS on **Figure 6.1**.

Table 6.1 below outlines the air quality sampling methods and frequencies to be undertaken in accordance with the Project Approval conditions and EPL for PM_{10} and depositional dust monitoring.

Table 6.1 Air Quality Monitoring – Sampling Method and Frequency

Pollutant	Units of measure	Sampling Period	Averaging Period	Frequency	NSW DEC Sampling Method
PM_{10}	µg/m^3	24 hour	Annual	Weekly[1]	AS/NZS 3580.9.6:2003
Particulates - TSP	µg/m^3	24 hour	Annual	Weekly[1]	AS/NZS 3580.9.3:2003
Deposited Dust	g/m^2 per month	Monthly	Annual	Monthly[1]	AS/NZS 3580.10.1:2003

[1] Detailed in Condition M2.1 of the EPL

6.2 Meteorological Monitoring

Schedule 3, Condition 21 of the Project Approval requires that, during the life of the project, Shoalhaven Coal will operate a meteorological station in the vicinity of the site that:

- complies with the requirements in the Approved Methods for Sampling and Air Pollutants in New South Wales guideline

- is capable of continuous real-time measurement of temperature inversions in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Secretary following consultation with the EPA.

A meteorological station has been established at Invincible (see **Figure 6.1**) and measures the meteorological parameters as shown in **Table 6.2.**

Table 6.2 Meteorological Measurement Parameters

Measured Parameter	Unit	Sample Interval
Mean wind speed	km/hr	15 minute
Mean wind direction	Degrees	15 minute
Aggregate rainfall	mm	15 minute
Mean air temperature	^{o}C	15 minute
Air temperature at 2m	^{o}C	15 minute
Air temperature at 10m	^{o}C	15 minute
Humidity	%	15 minute

Note: Air temperature is measured at 2 m and 10 m above ground level to account for temperature inversions.

6.3 Monitoring Standards

- Air quality monitoring will be undertaken in accordance with the relevant Australian Standards, legislation and EPA approved methods for sampling with a program to monitor the impacts and environmental performance of the project and effectiveness of any management measures, in particular:
  - all sampling and analysis will be undertaken in accordance with the *Protection of the Environment Operations (Clean Air) Regulation 2010* and the guidelines specified in the EPA's publication *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* guideline (DEC 2007)
  - other monitoring standards applied to operations include:
    - AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method
    - AS/NZS 3580.9.3:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Suspended Particulate Matter – Total Suspended Particulate Matter (TSP) – High Volume Sampler Gravimetric Method
    - AS 3580.14:2011: Methods for Sampling and Analysis of Ambient Air – Meteorological Monitoring for Ambient Air Quality Monitoring Applications
    - AS 2923-1987: Ambient air - Guide for measurement of horizontal wind for air quality applications.

Additional monitoring using alternative equipment and/or technologies may be utilised on site in to augment the measurement and management of air quality.

6.4 Monitoring Records

In accordance with the requirements outlined in M1 of the EPL, the results of any monitoring required to be conducted must be recorded and retained.

All monitoring records will be:

- kept in a legible form, or in a form that can readily be reduced to a legible form
- kept for at least 4 years after the monitoring or the event to which they relate took place

- produced in a legible form to any authorised officer of the EPA who asks to see them.

The following records will be kept in respect of air quality monitoring undertaken:

- the dates on which the monitoring was undertaken
- the times at which the monitoring was undertaken
- the point at which the monitoring was undertaken
- the name of the person who undertook the monitoring.

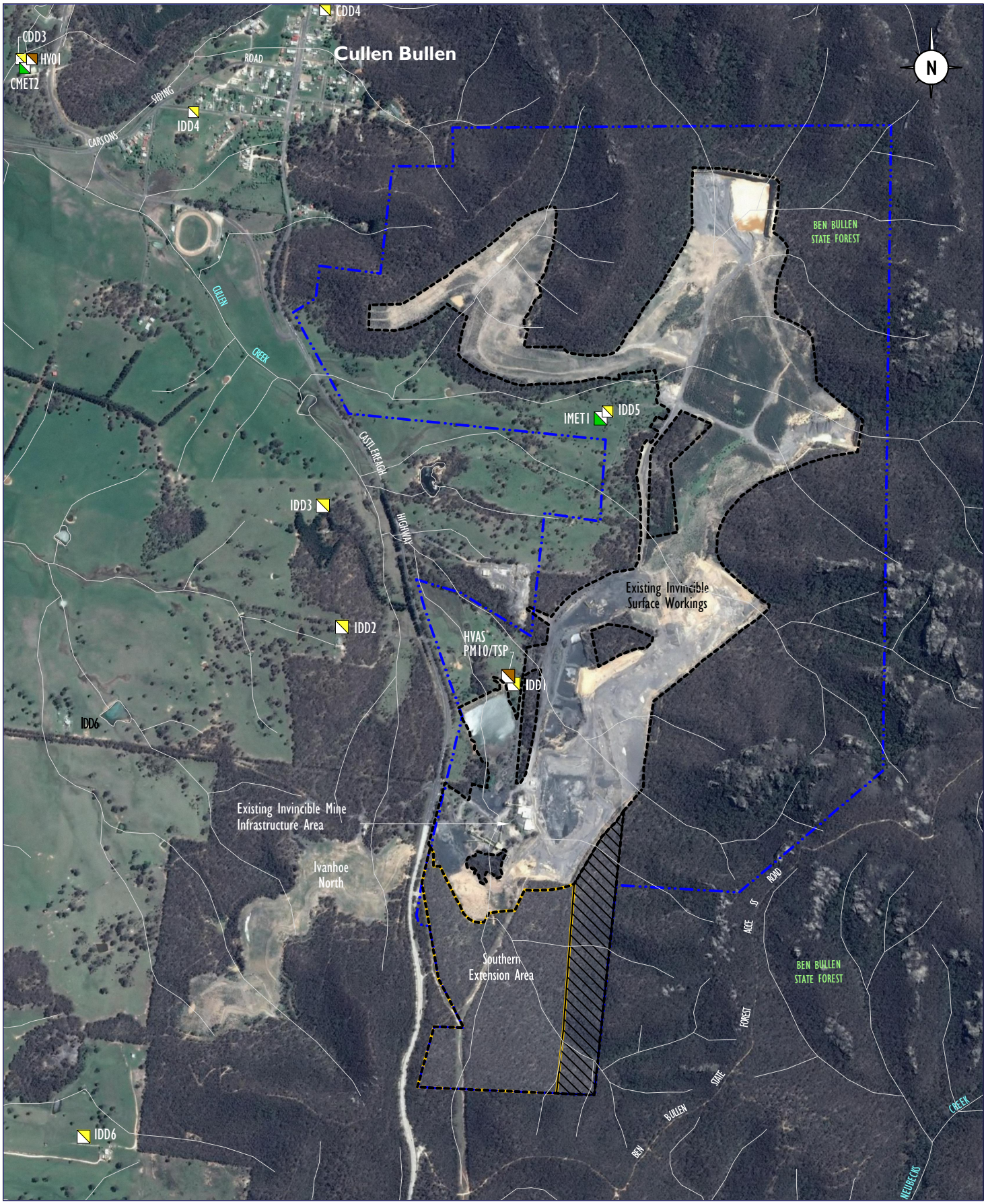


Image Source: Google Earth - CNES/Astrium (Oct 2016)
Data Source: Sedgman (2014)

0 0.25 0.5 1.0km

Legend

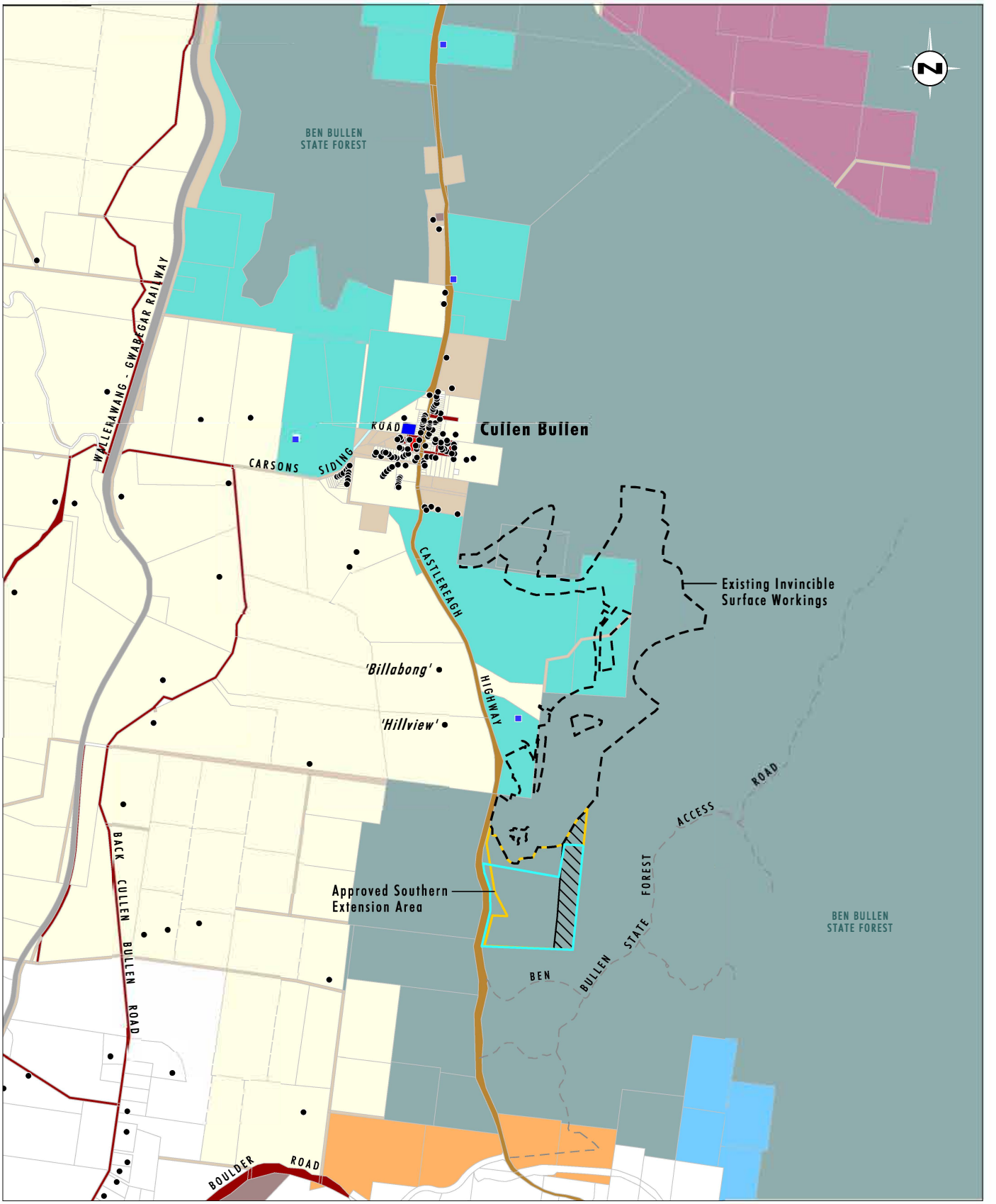
- Existing Approved Mining Disturbance Area
- Southern Extension Area
- Mining Restriction Area
- Invincible Project Approval Boundary
- Depositional Dust
- Meteorological Station
- PM_{10} Monitor/TSP Monitor

FIGURE 6.1

Air Quality
Monitoring Locations

CEH SURVEY

Liability limited by a scheme approved under Professional Standards Legislation



Data Source: Sedgman (2016), LPI (2016)

0 0.5 1.0 2.0km
1:40 000

Legend

- Existing Approved Mining Disturbance Area
- Approved Southern Extension Area
- Mining Restriction Area
- ML431
- Castlereagh Highway
- Centennial Pty Ltd
- Council
- Cullen Bullen Primary School
- Delta Energy
- Industry
- Minister for Education
- Private
- Rail Corporation NSW
- Shoalhaven Coal Owned
- State Forest
- State Government
- Wallerawang Collieries
- Not searched
- Crown
- Sensitive Receiver Private Residence
- Sensitive Receiver Mine Owned Residence

FIGURE 6.2

Sensitive Receivers

File Name (A4): R50/3968_063.dgn
20181015 9.25

7.0 Reporting

7.1 External Reporting

A summary of air quality monitoring results and statements of compliance with Project Approval and EPL conditions will be provided in Shoalhaven Coal's Annual Review and EPL Annual Return.

The Annual Review will be prepared and submitted to the Secretary, in accordance with Schedule 5, Condition 4 of the Project Approval. The Annual Review will be made available to the public through the Castlereagh Coal web site (http://www.castlereaghcoal.com.au). In addition, in accordance with Schedule 5, Condition 13 of the Project Approval, Shoalhaven Coal will publish air quality monitoring results on the Castlereagh Coal website.

Any non-compliances relating to exceedances will be investigated in accordance with the process detailed in **Section 7.2**. A summary of the non-compliance will be included in the Annual Review.

Updated versions of this AQMP will be made publicly available on the Castlereagh Coal website in accordance with Schedule 5, Condition 13 of the Project Approval.

7.2 Air Quality Criteria Exceedance Reporting

Schedule 5, Condition 9 of the Project Approval requires any exceedance of the air quality criteria in **Section 4.0** to be reported to DPE and any other relevant agencies immediately. Within 7 days of the date of the exceedance, Shoalhaven Coal must provide the DPE and any relevant agencies with a detailed report on the exceedance, and such further reports as may be requested.

In accordance with Schedule 4, Condition 1 of the Project Approval, as soon as practicable after obtaining monitoring results showing an exceedance of air quality criteria (outlined in **Section 4.0**), Shoalhaven Coal must notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the project is again complying with the relevant criteria. Shoalhaven Coal must also send a copy of the NSW Health fact sheet entitled 'Mine Dust and You' (as may be updated from time to time) to affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

7.3 Adaptive Management

In accordance with Schedule 5, Condition 2 of the Project Approval, Shoalhaven Coal must assess and manage air quality related risks so that there are no exceedances of the criteria outlined in **Section 4.0**.

Where an exceedance of the air quality criteria in **Section 4.0** has occurred, Shoalhaven Coal will, at the earliest opportunity:

- take all reasonable and feasible steps so that the exceedance ceases and does not recur
- consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action
- implement remediation measures as directed by the Secretary.

7.4 Community Complaints

Complaints relating to air quality management at Invincible Colliery are to be managed in accordance with the requirements of the reactive management procedures outlined in **Section 4.2**. A register of complaints will be published on the Shoalhaven Coal website and will be updated monthly. A summary of complaints will be provided in the Annual Review (refer to **Section 6.1**).

7.5 Independent Review

In the event an owner of privately-owned land considers Shoalhaven Coal to be exceeding air quality criteria outlined in **Section 4.0** then he/she may ask the Secretary in writing for an independent review of the impacts of the project on his/her land. The independent review will be conducted in accordance with the procedures described in Schedule 4, Condition 4 of the Project Approval.

8.0 Review and Improvement

In order to improve the environmental performance of the project over time, ongoing monitoring and review of the performance and implementation of this AQMP will be undertaken in accordance with the Schedule 5, Condition 5 of the Project Approval, which states that review of the plan will occur within 3 months of:

- the submission of an annual review under Schedule 5, Condition 4
- the submission of an incident report under Schedule 5, Condition 7
- the submission of an audit report under Schedule 5, Condition 9
- any modification of the conditions of this approval, (unless the conditions require otherwise).

Shoalhaven Coal will notify DPE in writing of any review of this AQMP. Should a review lead to revisions to this AQMP, the revised document will be submitted to DPE within 4 weeks of the review, unless the Secretary agrees otherwise. Updated versions of this AQMP will be made publicly available on the Shoalhaven Coal website in accordance with Schedule 5 Condition 15 of the Project Approval.

9.0 Responsibilities

Environmental management at the mine is the responsibility of all employees and contractors, with the Mine Manager having overall responsibility for environmental management of the operation. Environmental responsibilities for key personnel at the mine are outlined in **Table 9.1** below.

Table 9.1 Roles and Responsibilities

Role	Accountabilities for this document
Shoalhaven Coal Owner's Representative	• Facilitate the implementation of sufficient resources to carry out the requirements of this AQMP.
Mine Manager	• Oversee the implementation of this AQMP; • Have working knowledge of this AQMP; • Facilitate reviews of meteorological forecasts on a daily basis prior to the commencement of operations and confirm that activities are modified as relevant; • Coordinate the implementation of air quality management measures and strategies in accordance with this AQMP (refer to **Section 5.0**); • Be aware of the environmental legislative requirements associated with the mine and take measure to facilitate compliance; and • Confirm employees are competent through training and awareness programs
Environmental Officer	• Coordinate the review of this AQMP in accordance with the requirements of the Project Approval • Coordinate the air quality monitoring requirements of this AQMP • Evaluate and report monitoring results as required • Coordinate air quality related incident investigations and reporting as required by legislation • Provide primary contact for complaints and supply follow-up information to any complainant • Initiate investigations of complaints as received from the public or government agency • Prepare a report to government agencies or neighbours following an incident (refer to **Section 7.0**) • Inform the Mine Manager of elevated dust levels during operations • Undertake regular review of this AQMP in accordance with the requirements of the Project Approval.
All employees and contractors	• Comply with all requirements in this AQMP • Report all potential environmental incidents to the Mine Manager immediately • Operate in a manner that minimises risks of incidents to themselves, fellow workers or the surrounding environment.

10.0 Definitions

The terminology utilised within this AQMP is defined in **Table 10.1** below.

Table 10.1 Definitions

Term	Definition
CCC	Community Consultative Committee
DEC	Department of Environment and Conservation
DPE	Department of Planning and Environment
Dust Deposition	Dust particles that settle out from the air - measured in grams per square metre per unit time (g/m^2/month)
EA	Environmental Assessment
EPA	Environment Protection Authority
EPL	Environment Protection Licence
Exceedance	Occurs when environmental monitoring result is above or below the criteria in the Project Approval
HVAS	High Volume Air Sampler
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this approval
POEO	Protection of the Environment Operations Act
PM_{10}	Particulate matter less than 10 micrometres (µm) in size
Project Approval	07_0127 (Mod 5)
Proponent	Shoalhaven Coal Pty Limited, or any person who seeks to carry out the development under the Project Approval 07_0127
Secretary	The Secretary of the NSW Department of Planning and Environment, including any authorised delegate or nominee.
TSP	Total Suspended Particulates. The nominal size of this fraction has particles with a diameter of up to 50 micrometres (µm).
$\mu g/m^3$	Micrograms per cubic metre

11.0 References

Australian Standard AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

AS/NZS 3580.9.3:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Suspended Particulate Matter – Total Suspended Particulate Matter (TSP) – High Volume Sampler Gravimetric Method.

Australian Standard 3580.14:2011: Methods for Sampling and Analysis of Ambient Air – Meteorological Monitoring for Ambient Air Quality Monitoring Applications.

AS 2923-1987: Ambient air - Guide for measurement of horizontal wind for air quality applications.

Department of Environment and Conservation (DEC), 2007, *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

Jacobs, 2016, *Air Quality Impact Assessment,* report prepared for Invincible Southern Extension Project for Shoalhaven Coal Pty Ltd.

NSW Minerals Council, 2000, *Technical Paper – Particulate Matter and Mining Interim Report*.

Pacific Environment Limited (Pacific Environment), 2014, *Air Quality Impact Assessment – Coalpac Modification*.

Protection of the Environment Operations (Clean Air) Regulation 2010.

Umwelt (Australia) Pty Limited (Umwelt), 2016, *Invincible Southern Extension Project Environmental Assessment,* report prepared for Shoalhaven Coal Pty Limited.

Umwelt (Australia) Pty Limited (Umwelt), 2018, *Invincible Colliery Annual Review 7 January – 31 December 2017,* report prepared for Shoalhaven Coal Pty Limited.

APPENDIX 1

Stakeholder Consultation

Appendix 1 --- Correspondence with EPA 2018 - 2022

From: Andrew Helms <Andrew.Helms@epa.nsw.gov.au>
Sent: Wednesday, 11 May 2022 11:18 am
To: Almy Bryce <almy.bryce@ccoal.com.au>
Subject: RE: 3968 - Draft Invincible Colliery Management Plans and EPL Variation

Hi Almy – I can see from our record system that these draft management plans (including the water management plan a month later) were received by the EPA in late 2018. There is, however, no outward correspondence which would indicate to me that the plans might not have been reviewed (unless a reply e-mail was sent back to Luke Bettridge by Allan which itself was not filed).

If Shoalhaven Coal needs these plans reviewed by the EPA at this point, and assuming the draft plans are still relevant (up-to-date) for the proposed activities at Invincible, then I would suggest sending them in again to our Branch mailbox at EPA.Southopsregional@epa.nsw.gov.au and marked to the attention of our acting Manager Sheridan Ledger.

Regards,

Andrew Helms
Regional Operations Officer
Regulatory Operations
NSW Environment Protection Authority
D 02 6333 3805

www.epa.nsw.gov.au @NSW_EPA

The EPA acknowledges the traditional custodians of the land and waters where we work. As part of the world's oldest surviving culture, we pay our respect to Aboriginal elders past, present and emerging.

Report pollution and environmental incidents
131 555 or +61 2 9995 5555

From: Almy Bryce <almy.bryce@ccoal.com.au>
Sent: Wednesday, 11 May 2022 7:38 AM
To: Andrew Helms <Andrew.Helms@epa.nsw.gov.au>
Subject: FW: 3968 - Draft Invincible Colliery Management Plans and EPL Variation

Hi Andrew
As per our phone conversation yesterday, below is what I forwarded to Alan.
We are unable to find his response to this email.

Your help will much appreciated

Thanks

Almudena Bryce
Environmental Manager and Community Liaison Officer

M +61418 436 866
Almy.Bryce@ccoal.com.au
Castlereagh Coal
Castlereagh Hwy, Cullen Bullen NSW 2790

From: Luke Bettridge <Luke Bettridge>
Sent: Monday, 19 November 2018 3:06 pm
To: Allan.Adams@epa.nsw.gov.au; central.west@epa.nsw.gov.au
Cc: Brett Moore <brett.moore@manildra.com.au>; Bruce Wright <Bruce@wrightcorp.com.au>; 'Graham Goodwin' <Graham.Goodwin@manildra.com.au>; Rod Williams
Subject: 3968 - Draft Invincible Colliery Management Plans and EPL Variation

Allan,

For and on behalf Shoalhaven Coal Pty Limited please see attached letter. The management plans as noted in the letter are attached to this email.

Shoalhaven Coal will also be seeking a variation to the existing EPL to incorporate the proposed changes and will be in contact later this week to discuss the EPL variation.

Please do not hesitate to contact me should you have any questions.

Regards

Luke Bettridge
Manager Operational Environmental Support NSW

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DOC22/425339-1

Mr Kenny Barry
Director
Sustainability Support Group, on behalf of Shoalhaven Coal Pty Limited

Via e-mail: kenny.barry@sustainabilitysupportgroup.com.au; almy.bryce@ccoal.com.au

20 June 2022

Dear Mr Barry

MISCELLANEOUS MANAGEMENT PLANS
Invincible Colliery - Licence 1095

I refer to your e-mail dated 30 May 2022 and request for the Environment Protection Authority (EPA) to review a noise management plan prepared for the Invincible Colliery. I also refer to an e-mail received from Ms Almy Bryce, dated 11 May 2022, in regard to an air quality management plan and a water management plan and a similar request for EPA comment on these plans.

The EPA encourages the development of Environmental Management Plans/Programs to ensure that proponents have determined how they will meet their statutory obligations and environmental objectives as specified by any Project/Development Approval and/or the conditions of an Environment Protection Licence. Please note however that it is not the EPA's role to endorse these plans given the EPA sets conditions/criteria for environmental protection and management and therefore cannot be directly involved in the development of strategies to comply with such conditions/criteria.

The EPA has reviewed its files and can confirm that no advice was provided to Shoalhaven Coal Pty Limited in 2018 with respect to any of the three draft management plans. Regardless, the EPA has now reviewed the following 3 plans and provides comment on each below:

- Invincible Colliery: Water Management Plan (December 2018, Draft)
- Invincible Colliery: Air Quality Management Plan (November 2018, Draft)
- Invincible Colliery: Noise Management Plan (May 2022, Draft).

Site Water Management Plan

The EPA notes that:

- The Southern Extension Project will not alter the catchment managed within the current water management system compared to the existing or approved operations.
- Sediment dam 3 is currently undersized however Shoalhaven Coal commits to enlarging this dam prior to the recommencement of mining activities.
- A clean water diversion strategy will be prepared by Shoalhaven Coal prior to the recommencement of mining activities.

- Calculations were made in 2018 regarding the volume of water (540 ML) that would be required to be dewatered from the Ivanhoe No.2 historical workings to the old Invincible workings to enable excavation at the Southern Extension Project. The EPA queries whether the predicted volume is still accurate considering the significant rainfall within the past 2 years and the potential for this volume to be greater than the capacity of the old Invincible workings to receive this water. The EPA is also aware that Baal Bone ceased pumping groundwater in 2019 which may also diminish this capacity. The water management plan should consider what contingencies may need to manage excessive groundwater noting that a direct discharge to the environment (via surface waters) would not be viewed by the EPA as an appropriate management method.
- Environment Protection Licence number 1095 (the licence) for the Invincible Colliery will require varying to update water quality limits and associated operational conditions to reflect standard licencing conditions with respect to dam maintenance and wet weather events. It is recommended Invincible Colliery submit a licence variation application as a matter of urgency. Appropriate supporting documentation will be required with any application received.

Air Quality Management Plan

The EPA notes that:

- In section 2.2 of the Air Quality Management Plan (AQMP), a statement is made regarding the need to vary the licence to reflect the proposed monitoring as described in section 6.0 of the AQMP. The proposed changes to the air monitoring schedule include the relocation of the PM10 high volume air sampler to an off-site location and the dropping of the total suspended particulate matter sampling (to be determined via calculation from PM10 measurements). The EPA has not received any application to vary the licence at this point. A detailed rationale for the proposed changes would be required to support such an application and why there is a need to deviate away from what is currently undertaken at the premises and from what was proposed in the Mod 5 Environmental Assessment (Umwelt, 2016).
- The licence will require varying to reflect standard licencing conditions with respect to the management of dust generation at the premises and the emission of odour. These standard licencing conditions are consistent with the commitments summarised in Table 2.2 of the AQMP (re dust generation) and condition 15, Schedule 3 of Project Approval 07_0127 (Mod 5) re odour generation.

Noise Management Plan

The EPA notes that:

- Figures 1 and 2 were not included in the draft document provided to the EPA.
- The licence will require varying to reflect the noise limits in Project Approval 07_0127 (Mod 5), to update the ancillary noise conditions to reflect current standard wording and to include a reference to the Noise Policy for Industry in relation to noise modification factors.
- Prior to any licence variation, the EPA would require clarification regarding the acquisition status of the properties Hill View and Billabong (these properties have specific noise limits in the Project Consent).

If you have any specific questions regarding this matter please contact Mr Andrew Helms on 6333 3805 or via e-mail at EPA.Southopsregional@epa.nsw.gov.au. For general enquiries to the EPA please call (02) 9995 5000 or e-mail info@epa.nsw.gov.au.

Yours sincerely

SHERIDAN LEDGER
A/Manager
Regulatory Operations Regional South

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MP07-0127 condition 15, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Proponent must ensure that no offensive odours are emitted from the site, as defined under the POEO Act.	**Partial**	Commitment to minimise odour in section 4.1. Mitigation measures for spontaneous combustion are not detailed clearly. Subsurface heating is mentioned in section 5, but not 4.1.	Please include specific details of how odour will be minimised through the mitigation of spontaneous combustion and subsurface heating, using clear committal language and specific actions that will be implemented.	See additions to Section 4.1 Odour and Table 5.1 Management or Mitigation Measure and Specific Actions
MP07-0127 condition 16, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Proponent must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the particulate emissions generated by the project do not exceed the criteria listed in Tables 4, 5 and 6 at any residence on privately-owned land.	**Partial**	Air quality criteria included in section 4.	Please address comments related to management measures and the monitoring program throughout this review table.	See comment Section 4. Implementation of these measures will satisfy this commitment.

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Table 4: Long term criteria for particulate matter

Pollutant	*Averaging period*	*[d] Criterion*
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 5: Short term criterion for particulate matter

Pollutant	*Averaging period*	*[d] Criterion*
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

Table 6: Long term criteria for deposited dust

Pollutant	*Averaging period*	*Maximum increase in deposited dust level*	*Maximum total deposited dust level*
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes for Tables 4 to 6:

- *[a] Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources);*
- *[b] Incremental impact (i.e. incremental increase in concentrations due to the project on its own);*
- *[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and*
- *[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary.*

MP07-0127 condition 17, Schedule 3 **Mine-owned Land**	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Proponent must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not cause exceedances of the criteria in Tables 4-6 at any occupied residence on mine-owned land (including land owned by another mining company) unless: (a) the tenant and landowner (if the residence is owned by another mining company) has been notified of any health risks associated with such exceedances in accordance with the notification requirements in schedule 4 of this consent;	**Partial**	Requirement included in section 2	Please address comments related to management measures and the monitoring program throughout this review table.	Addressed throughout document. See also comment below Table 2.1. The implementation of measures within this management plan will satisfy these conditions.

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(b) the tenant of any land owned by the Proponent can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice; (c) air mitigation measures (such as air filters, a first flush roof water drainage system and/or air condition) are installed at the residence, if requested by the tenant or landowner (if the residence is owned by another mining company) (d) air quality monitoring is regularly undertaken to inform the tenant or landowner (if the residence is owned by another mining company) of the likely concentrations of particulate emissions at the residence; and (e) data from this monitoring is presented to the tenant or landowner (if the residence is owned by another mining company) in an appropriate format for a medical practitioner to assist the tenant or landowner in making informed decisions on the health risks associated with occupying the residence, to the satisfaction of the Secretary				
MP07-0127 condition 18, Schedule 3 Operating Conditions	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Proponent must: (a) implement all reasonable and feasible measures to minimise the odour, fume and dust emissions of the project (including those generated by spontaneous combustion) and the release of greenhouse gas emissions from the site;	**Partial**	Commitment to minimise odour in section 4.1. Mitigation measures for spontaneous combustion are not detailed clearly. Subsurface heating is mentioned in section 5, but not 4.1. Section 4.2 identifies that blast fumes will be managed under the Blast Management Plan.	Please include specific details of how odour will be minimised through the mitigation of spontaneous combustion and subsurface heating, using clear committal language and specific actions that will be implemented. Include a clear commitment to continue to investigate options for efficiency	See additions to Section 4.1 Odour and Table 5.1 Management or Mitigation Measure and Specific Actions. See additions to Section 4.3 Greenhouse Gas emissions. See additions to Table 5.1 Greenhouse Gas Project

				Design Management Measures.

		Dust and greenhouse gas mitigation measures included in section 5 The EA contains a commitment to "…continue to investigate options for improving the efficiency of operations through the life of the Southern Extension Project. Castlereagh Coal will also investigate options for use of alternative fuels such as biodiesel, where reasonable and feasible." Please include this commitment in relation to the minimisation of greenhouse gas emissions.	improvements and alternative fuels.	
(b) minimise any visible off-site air pollution generated by the project;	**Partial**	Section 5 includes commitment to modify or suspend activities in response to visual conditions, but does not specify	Please include a clear commitment and specific actions that will be implemented to minimise visible off-	See addition to Section 5.1 Management Measures and Table 5.1 Air Quality and Greenhouse Gas Management and

			site air pollution.	Mitigation Measures.

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		minimisation of off-site air pollution..		
(c) ensure that all loaded trucks leaving the site are adequately covered at all times;	**Yes**	Commitment included in Section 5		
(d) minimise the air quality impacts on the project during adverse meteorological conditions and extraordinary events (see note below); *Note: Extraordinary events include bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary.*	**Yes**	Commitment included in Section 5.		
(e) co-ordinate the air quality management on site with the air quality management at the Cullen Valley mine to minimise any cumulative air quality impacts; and	**Partial**	Commitment included in Section 5, however no detail provided on how air quality management would be coordinated.	Please provide more detail on specific actions that will be undertaken to coordinate air quality management measures with Cullen Valley Mine.	See additions to Table 5.1 Air Quality Operational - Predictive / Proactive Management Measures and clarifying Specific Measures and Actions.
(f) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this approval.	**Partial**	Monitoring program described in section 6	See comments on monitoring program below.	Addressed throughout the document
MP07-0127 condition 19, Schedule 3 **Air Quality Management Plan**	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
Prior to recommencing mining operations, unless the Secretary agrees otherwise, the Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:	-			

(a) be prepared in consultation with the EPA;	**Partial**	The Department notes that consultation with the EPA has been undertaken, however, evidence of this consultation and how it has been addressed has not been included in this revision.	Please include evidence of consultation with the EPA and how the EPA's comments have been addressed in the management plan.	Correspondence with the EPA is in Appendix 1. The proposed changes to the air monitoring schedule previously proposed by Umwelt included the relocation of the HVAS PM10 to an off-site location (HVAS02) and dust site IDD 5 to location IDD 6, plus the dropping of the total suspended particulate matter sampling (to be determined via calculation from PM10 measurements). Whilst the ratio method for determination of TSP from PM10 has been used at site, a dedicated TSP unit will be installed at the IDD1 location prior to commencement to compliment HVAS PM 10 monitor. This is consistent with the EPL monitoring point plan held by the

				EPA as shown in Figure 6.1. Justification for retaining the existing monitoring locations followed detailed review of the Jacobs AQ Impact Assessment (Umwelt 2016) for Mod 5 by Greg Collins of RAPT Consulting. The Impact assessment report clearly states, the Project will not cause adverse air quality impact at any off-site sensitive receptor location. Emissions from diesel exhausts associated with off-road vehicles and equipment were also investigated and, again, the Project is not expected to result in any adverse air quality impacts, based on model predictions which showed compliance with air quality criteria. See Section 2.2 regarding variation to EPL.

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(b) describe the measures that would be implemented to ensure compliance with air quality criteria and operating conditions of this approval;	**Partial**	Measures are included in Sections 5, 6.	Please address other specific comments on the management measures and monitoring program throughout this review table.	Comments and additions throughout this AQMP.
(c) describe the proposed air quality management system in detail;	**Partial**	Air quality management system described throughout the management plan	Please address other specific comments on the management measures and monitoring program throughout this review table.	Comments and additions throughout this AQMP.
(d) include a review of all air quality management measures against best practice guidelines; and	**No**	No review against best practice guidelines included	Please include review of the proposed management measures against best practice guidelines.	Measures reviewed against best practice by Greg Collins RAPT Consulting (Section 5.1), confirming air quality management measures employed for the Project are based on the recommendations of the NSW Coal Mining Benchmarking Study: International

				Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Donnelly et al., 2011) (the Best Practice Report), a study that was commissioned by the NSW EPA.
(e) include an air quality monitoring program that: • evaluates and reports on: o the effectiveness of the air quality management system; o compliance with the air quality criteria; o compliance with the air quality operating conditions; and	**Partial**	Air quality monitoring program described in section 6. The monitoring locations do not appear to have been reviewed or revised with respect to the southern extension area. For example, no monitoring points are located in the vicinity of sensitive receivers to the south west of the southern extension area.	Please review and update the existing monitoring program with regard to the southern extension area, consistent with the commitments made in the EA: "Castlereagh Coal will review and consolidate the air quality monitoring currently operating to meet the needs of the Southern Extension Project. Specifically, the locations and	Based on model predictions from the Jacobs AQ Impact Assessment (Umwelt 2016) for Mod 5 all variables were below EPA criteria, and it was concluded that the Project will not cause adverse air quality impacts at any off-site sensitive receptor locations. Emissions from diesel exhausts associated with off-road vehicles and

				equipment were also investigated and, again, the Project is not expected to result in any adverse air quality impacts, based on model predictions which showed compliance with air quality criteria." Review of the Jacobs predictions against the existing Invincible monitoring program justified maintaining the existing monitoring program in place in accordance with updated Figure 6.1

		The proposed location of the PM10 monitor is unclear. Section 1.1 indicates that a temporary monitor will be installed at IDD1 while the HV powerlines are removed (ie. no change to the PM10 monitor location), however Figure 6.1 shows the PM10 monitor at location IDD2.	types of monitoring will consider the location of sensitive receptors, prevailing meteorological conditions, and location of mining activities…" As part of this review, please clarify the location of the PM10 monitor and update Figure 6.1 accordingly.	
• defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.	**Yes**	Included in sections 7.1 and 7.2		
MP07-0127 condition 21, Schedule 3 **Meteorological Monitoring**	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
During the life of the project, the Proponent must ensure that there is a meteorological station operating in the vicinity of the site that: (a) complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and	**Yes**	Included in section 6.3.		
(b) is capable of continuous real-time measurement of temperature inversions in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Secretary following consultation with the EPA.	**Yes**	Included in section 6.3.		
MP07-0127 condition 3, Schedule 5 **Management Plan Requirements**	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	-			

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(a) detailed baseline data;	**Partial**	Existing air quality environment, closest sensitive receiver, and meteorological conditions described in section 3.	Please include sensitive receiver locations on a figure.	See Figure 6.2
(b) a description of: • the relevant statutory requirements (including and relevant approval, licence or lease conditions);	**Partial**	Regulatory requirements included in section 2, however condition 3 of Schedule 5 "Management Plan Requirements" is not included.	Include condition 3 of Schedule 5 "Management Plan Requirements" in table 2.1.	Added to Table 2.1.
• any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	**Yes**	Air quality criteria included in section 4		
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	**Partial**	Management measures included in section 5.	Please address comments related to management measures throughout this review table.	Comments and additions throughout this AQMP.
(d) a program to monitor and report on the: • impacts and environmental performance of the project; • effectiveness of any management measures (see c above)	**Partial**	Monitoring program described in section 6	Please address comments related to the monitoring program throughout this review table.	Comments and additions throughout this AQMP.

(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	**Yes**	Reactive management measures included in section 5.2		
(f) a program to investigate and implement ways to improve the environmental performance of the project over time;	**Yes**	Included in section 8.		

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(g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and	**Yes**	Included in section 5.2 and 7.		
(h) a protocol for periodic review of the plan.	**Yes**	Included in section 8.	•	
General Comments			**Action Required**	**Company Response**
• Figures are low quality and difficult to read.			• Recommend replacing figures with higher quality versions	Higher resolution versions in clean pdf

DOC22/804417-5

Mr Jarrod Blane
Senior Planning Officer
Department of Planning and Environment

Via: Major Projects Portal

23 September 2022

Dear Mr Blane

INVINCIBLE COLLIERY
Air Quality Management Plan

I refer to your request, received via the Major Projects Portal (PAE-48319706) on 9 September 2022, for the Environment Protection Authority (EPA) to comment on the proposed air monitoring locations for the Invincible Coal Project (MP07_0127).

The EPA has reviewed the following documents in response to your request:

- Department of Planning and Environment's (DP&E) request to Castlereagh Coal (dated 1 August 2022) for further information on how compliance with air quality limits can be demonstrated by the existing air quality monitoring network.
- Castlereagh Coal's response to DP&E (undated).
- Draft Invincible Colliery Air Quality Management Plan (AQMP) dated July 2022.

The EPA has previously provided comment on a draft version of the AQMP (November 2018) to Castlereagh Coal on 20 June 2022. From a brief review, the 2018 draft is consistent with the July 2022 draft. In our previous advice, the EPA recommended that the proposal to relocate the high volume air sampler to an off-site location would need to be supported by detailed rationale. The EPA also noted that the environment protection licence will require varying to reflect modern, standard operating conditions with respect to dust and odour management. Castlereagh Coal responded to the EPA on 20 July 2022 confirming that the plan to relocate the Hi-Vol air sampler to a new location had ceased and acknowledged the need for the updating of the licence.

With respect to the recent communications between the Department of Planning & Environment (DP&E) and Castlereagh Coal, the EPA notes the advice provided by Castlereagh Coal that there will be a reduction in the proposed annual run-of-mine production by nearly half and a three-fold reduction in the annual tonnage of overburden handling. Castlereagh Coal reiterates the advice provided by their consultant, RAPT Consulting, following a review of the AQMP, that modelling under worst case scenarios indicates no exceedances of project air quality criteria at sensitive receivers. Furthermore, Castlereagh Coal state that the existing air monitoring points IDD1 and IDD2 are comparable to the modelling predictions at the sensitive receivers to the south-west of the southern extension project and that the existing network is appropriate.

While the EPA acknowledges the modelling results, plus the subsequent operational changes that will likely further reduce the potential for excessive emissions of dust from the premises, the addition of a dust deposition gauge to the south-west of the proposed southern workings would be a prudent decision. The use of modelling as a predictive tool is useful to assist in the development of a project however there is no substitute for quantitative results from an environmental monitoring device. This dust deposition gauge would be a low-cost addition to the monitoring network and would assist Castlereagh Coal demonstrate compliance with project air quality limits and provide transparency, to this effect, for those residents to the south-west of the mine.

Please note however that the EPA relies on real-time observations of site operations in parallel with appropriate licence conditions to regulate the emission of dust generation at a premises. As stated above, the EPA will be reviewing the licence for the Invincible Colliery, prior to the recommencement of operations, to ensure that it is fit-for-purpose.

If you have any specific questions regarding this matter please contact Mr Andrew Helms on 6333 3805 or via e-mail at EPA.Southopsregional@epa.nsw.gov.au. For general enquiries to the EPA please call (02) 9995 5000 or e-mail info@epa.nsw.gov.au.

Yours sincerely

SHERIDAN LEDGER
A/Manager
Regulatory Operations Regional South

Department of Planning and Environment

Our ref: Invincible Coal Mine MP 07_0127-PA-7

Mr Kevin Reed
Director
Castlereagh Coal
63 Main Street
LITHGOW NSW 2790

29 September 2022

Subject: Addendum to Request for Additional Information

Dear Mr Reed

I refer to the revised Invincible Colliery Air Quality Management Plan dated 25 July 2022, the Department's addendum request for additional information (RFI) dated 11 August 2022 and your response to that addendum RFI dated 26 August 2022. The Department has reviewed your response and sought advice from the NSW Environment Protection Authority (EPA) (see **Attachment A**).

The Department has carefully considered EPA's advice and agrees with the recommendation that an additional deposited dust monitor should be established to the southwest of the Southern Extension Area. The Department therefore requests that you provide a revised Air Quality Management Plan, which includes as part of the air quality monitoring program, a deposited dust monitor to the southwest of the Southern Extension Area in a location representative of the residence on Lot 186 DP755769.

You are requested to provide the information, or notification that the information will not be provided, to the Department by 19 October 2022. If you are unable to provide the requested information within this timeframe, you are requested to provide, and commit to, a timeframe detailing the provision of this information.

If you have any enquiries, please contact Jarrod Blane on (02) 8275 1831 or jarrod.blane@dpie.nsw.gov.au.

Yours sincerely,

JEvans

Jessie Evans
Director
Resource Assessments

as delegate for the Planning Secretary