



**TARRAWONGA COAL MINE
ENVIRONMENTAL
MANAGEMENT SYSTEM**

Document Owner:	Env. Manager
Revision Period:	2 years
Issue:	1
Last Revision Date:	28/01/2015
Date Printed:	23/03/2015

WHC_PLN_TAR_AIR QUALITY & GREENHOUSE GAS MANAGEMENT PLAN

AIR QUALITY AND GREENHOUSE GAS MANAGEMENT PLAN

Edition	Rev.	Comments	Author	Authorised By	Date
1	0	Initial document	R.W. Corkery & Co. Pty Ltd	Keith Ross	December 2005
	1	Document review	Jill Scealy	Danny Young	June 2009
2	0	2010 Modification review	Jill Scealy	Danny Young	March 2011
	1	Inclusion of greenhouse gas management information	Jill Johnson	Danny Young	January 2012
	2	PA 11_0047 review	Lachy Johnson	Jill Johnson	June 2014
	3	PA 11_0047 review	Lachy Johnson	Jill Johnson	September 2014
	4	PA 11_0047 review	Lachy Johnson	Jill Johnson	January 2015



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ACRONYMS USED THROUGHOUT THIS DOCUMENT

AEMR	-	Annual Environmental Management Report
AQGGMP	-	Air Quality & Greenhouse Gas Management Plan
AS	-	Australian Standard
BTM	-	Boggabri – Tarrawonga - Maules Creek
CCC	-	Community Consultative Committee
CL	-	Coal Lease
DP&E	-	Department of Planning and Environment
DRE	-	Division of Resources and Energy
EA	-	Environmental Assessment
EPA	-	Environment Protection Authority
EPL	-	Environment Protection Licence
GSC	-	Gunnedah Shire Council
HVAS	-	High Volume Air Sampler
ML	-	Mining Lease
MLA	-	Mining Lease Application
NATA	-	National Association of Testing Authorities
NSC	-	Narrabri Shire Council
OEH	-	Office of Environment and Heritage (interchangeable with EPA)
PM ₁₀	-	Particulate Matter with aerodynamic diameter less than 10µg
TCM	-	Tarrawonga Coal Mine
TCPL	-	Tarrawonga Coal Pty Ltd
TSP	-	Total Suspended Particulate Matter



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1 INTRODUCTION

The Tarrawonga Coal Mine (TCM) is located approximately 15km northeast of Boggabri, 10km north of the Canyon Coal Mine (formerly Whitehaven, in closure) and south of, and adjacent to, the Boggabri Coal Mine (Figure 1). The mine site is contained within Mining Lease (ML) 1579, ML 1693 and ML 1685 as shown in Figure 1. The mine is being developed by Tarrawonga Coal Pty Ltd (TCPL), a joint venture between Whitehaven Coal Mining Pty Ltd (70%) and Idemitsu Boggabri Coal Pty Ltd (30%), and operates under Environment Protection Licence (EPL) 12365 and Project Approval (PA) 11_0047.

It is recognised that the operation of the mine has the potential to impact on the air quality within and beyond the boundaries of the mine site. In order to manage the potential impacts on local air quality, and in compliance with Condition 3(29) of PA 11_0047, this Air Quality & Greenhouse Gas Management Plan (AQGGMP) has been developed. The main sources of dust or other air quality impacts from the Tarrawonga mine comprise:

- Clearing and topsoil stripping and replacement activities;
- Overburden handling and dumping;
- Dust generation from operating haul trucks;
- Dust generation from excavators at the dig face;
- Dust generation from blasting activities;
- Dust dispersal from wind impacts on exposed surfaces;
- Dust generation from coal crushing and loading activities;
- Odour generation from spontaneous combustion events;
- Greenhouse gas emissions associated with diesel combustion and fugitive emissions from exposed coal.

The AQGGMP has been prepared with reference to relevant legislation, approvals and guidelines, follows the management plan requirements specified in Condition 5(3) of PA 11_0047 and is consistent with the following documents:

- Tarrawonga Coal Project Environmental Assessment January 2012 – specifically Section 4.7; and
- Tarrawonga Coal Project – Appendix D Air Quality Impact Assessment.

As required by PA 11_0047, the EPA has been consulted during preparation of this plan (Appendix 1).

TCM has been in consultation with the nearby Boggabri Coal Mine and Maules Creek Project in relation to developing an Air Quality Management Strategy for the Boggabri – Tarrawonga – Maules Creek (BTM) Complex incorporating cumulative air quality monitoring and management, as required under the conditions of consent for the Tarrawonga Coal Mine. The Strategy has been submitted to the Department of Planning and Environment (DP&E) for approval. Once approved, the Strategy will be appended to this Plan.



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In the meantime, Tarrawonga and Boggabri Coal continue to operate shared air quality monitors. Boggabri Coal, Tarrawonga and the Maules Creek Project participate in monthly meetings to discuss cumulative impact management measures.

The AQGGMP presents the relevant conditions of the PA 11_0047 (see Section 2) and includes air quality controls and management procedures (Section 3) to assist with compliance with air quality criteria identified in Section 2. Section 4 presents the specific features of the AQGGMP including monitoring locations, parameters measured and frequency of monitoring whilst Section 5 includes procedures for addressing complaints, exceedances and non-compliances.

The Tarrawonga Coal Mine Project Environmental Assessment and previous Annual Environmental Management Reports/Annual Reviews (AEMR/Annual Review) for the site should be referred to for comprehensive baseline data. In general terms, the monitoring network around the Tarrawonga site has identified the current annual average PM₁₀ concentration from over 5 years of data at 19.61µg/m³. Deposited dust values have shown significant variability over time, with other factors (such as gravel roads and farming activities) influencing the measured dust levels. Deposited dust gauges located on privately owned properties have shown annual averages over the last 5 years range from 0.6g/m²/month to 5.8g/m²/month Insoluble Solids. Relevant trends in PM₁₀ and dust deposition are provided in the Tarrawonga AEMR's/Annual Review documents.



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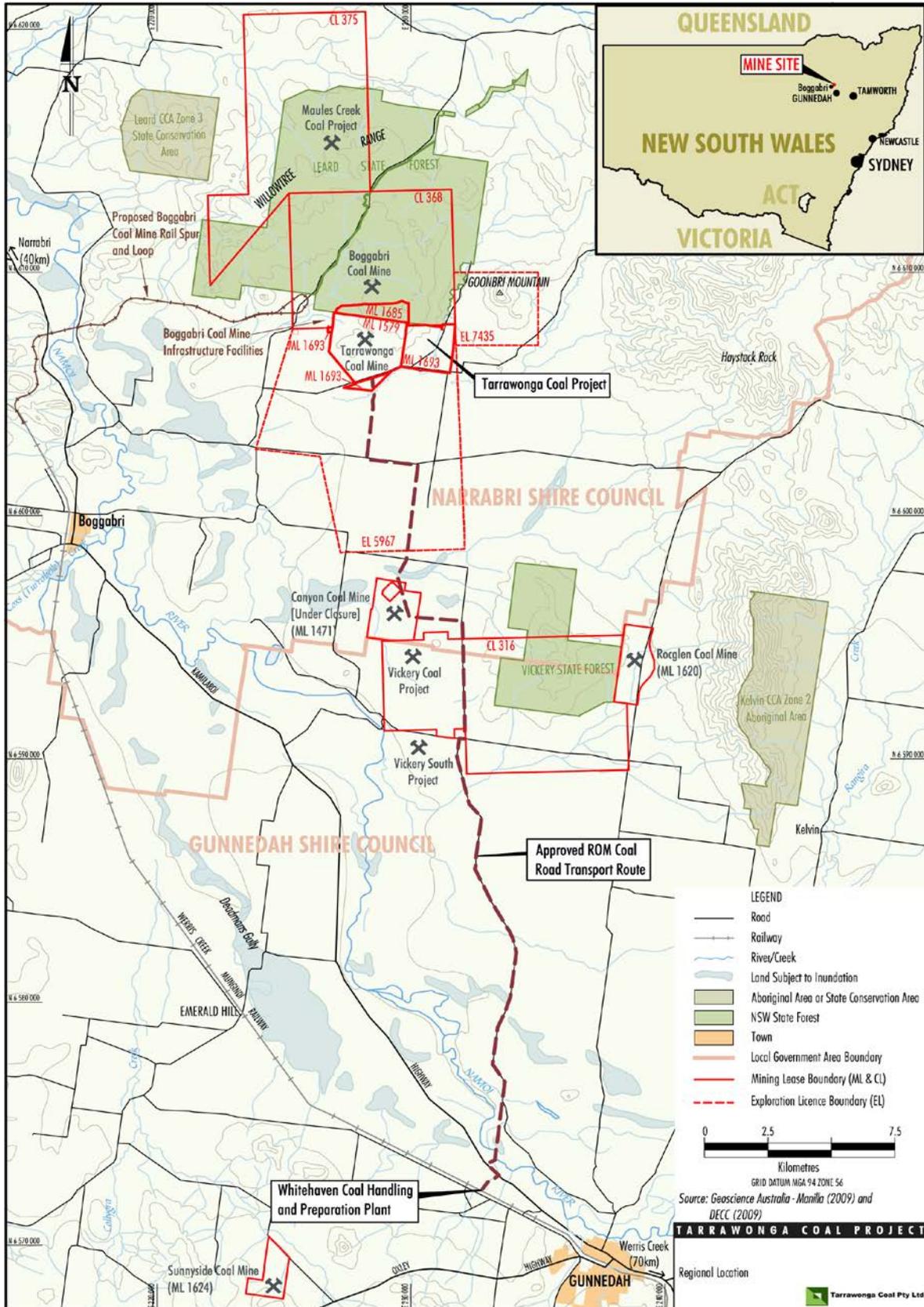


Figure 1 Tarrawonga Coal Mine Location



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2 AIR QUALITY STATUTORY REQUIREMENTS

In order to manage the potential impacts on local air quality, and in compliance with Condition 3(29) of PA 11_0047, this AQGGMP has been developed.

The air quality statutory criteria for the project have been incorporated in PA 11_0047 Conditions 3(22) – 3(30) as reproduced below. These conditions relate to both concentration thresholds applicable at the site and management/operational requirements to mitigate air quality impacts, not only in relation to dust, but also relating to odour and greenhouse gas emissions. In addition to ensuring that the site monitors and manages air quality impacts in accordance with these statutory requirements, the site will also ensure that any conditional requirements that attach to the sites Environment Protection Licence 12365 relating to air quality monitoring and management are adhered to at all times.

Odour

22. *Unless otherwise authorised by an EPL, the Proponent shall ensure that no offensive odours are emitted from the site, as defined under the POEO Act.*

Greenhouse Gas Emissions

23. *The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.*

Air Quality Criteria

24. *The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that the particulate emissions generated by the project do not exceed the criteria listed in Tables 6, 7 and 8 at any residence on privately-owned land or on more than 25 per cent of any privately owned-land.*

The assessment acknowledges that it may not be reasonable and feasible to prevent exceedance of the PM₁₀ criteria in Table 6 at property^e 45 and exceedance of the criteria in Table 7 in year 16 at property^f 49. (To interpret the property locations referred to see the applicable figure(s) in Appendix 5.)

Table 6: 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 7: 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 8: Long term criteria for deposited dust

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



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Notes for Tables 6-8:

- ^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 Particulates – Deposited Matter – Gravimetric Method.
- ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agree to by the Director-General in consultation with DECCW.
- ^e Property 45 has been acquired (joint ownership between Boggabri Coal and Tarrawonga Coal) and is now project owned land.
- ^f Property 49 is a vacant landholding with no residence

Mine Specific Air Quality Criteria

25. The Proponent shall ensure that particulate matter emissions generated by the project do not exceed the criteria listed in Table 9 at any residence on privately- owned land or on more than 25 percent of privately-owned land, except on property 49 in year 16.

Table 9: Long term land acquisition criteria for particulate matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Notes:

As provided by the EP&A Act, the criterion in Table 9 may be amended to a more stringent criterion in an EPL, after the first review of the EPL under section 78 of the POEP Act.

Air Quality Acquisition Criteria

26. If particulate matter emissions generated by the project exceed the criteria, or contribute to an exceedance of the relevant cumulative criteria, in Tables 10, 11 or 12, at any residence on privately-owned land or on more than 25 percent of any privately-owned land, then upon receiving a written request for acquisition from the landowner the Proponent shall acquire the land in accordance with the procedures in conditions 8-9 of schedule 4.

Table 10: Long term land acquisition 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 11: Short term land acquisition criteria for particulate matter

Pollutant	Averaging period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 150 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³

Table 12: Long term land acquisition 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 to Tables 10-12:

^a Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);



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^b Incremental impact (ie 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;

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, or any other activity agreed by the Director-General.

Mine-owned Land

27. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that particulate matter emissions generated by the project do not exceed the criteria in Tables 6, 7, and 8 at any occupied residence on any mine-owned land (including land owned by adjacent mines), unless:

- (a) the tenant and/or landowner has been notified of any health risks in accordance with the notification requirements under schedule 4 of this approval;
 - (b) the tenant on project-related land can terminate the tenancy agreement without penalty, subject to giving reasonable notice, and the Proponent uses its best endeavours to provide assistance with relocation and sourcing of alternative accommodation;
 - (c) air mitigation measures such as air filters, a first flush roof water drainage system and/or air conditioning) are installed at the residence, if requested by the tenant and landowner (where owned by another mine other than the Proponent);
 - (d) particulate matter air quality monitoring is undertaken to inform the tenant and landowner of potential health risks; and
 - (e) monitoring data is presented to the tenant in an appropriate format, for a medical practitioner to assist the tenant in making an informed decision on the health risks associated with occupying the property,
- to the satisfaction of the Director-General.

Operating Conditions

28. The Proponent shall:

- (a) implement best practice management to minimise the off-site odour, fume and dust emissions of the project;
 - (b) operate a comprehensive air quality management system on site that uses a combination of predictive meteorological forecasting, predictive and real time air dispersion modelling and real-time air quality monitoring data to guide the day-to-day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this approval;
 - (c) manage PM_{2.5} levels in accordance with any requirements of an EPL;
 - (d) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see noted under Table 8);
 - (e) minimise any visible off-site air pollution;
 - (f) minimise the surface disturbance of the site generated by the project; and
 - (g) co-ordinate the air quality management on site with the air quality management at other mines within the Leard Forest Mining Precinct to minimise the cumulative air quality impacts of the mines,
- to the satisfaction of the Director-General.

Air Quality and Greenhouse Gas Management Plan

29. The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This plan must:



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- (a) *be prepared in consultation with the EPA and be submitted to the Director-General for approval by the end of May 2013;*
- (b) *describe the measures that would be implemented to ensure:*
 - *best practice management is being employed;*
 - *the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and*
 - *compliance with the relevant conditions of this approval;*
- (c) *describe the proposed air quality management system;*
- (d) *include a risk/response matrix to codify mine operational responses to varying levels of risk resulting from weather conditions and specific mining activities;*
- (e) *include commitments to provide summary reports and specific briefings at CCC meetings on issues arising from air quality monitoring;*
- (f) *include an air quality monitoring program that:*
 - *uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the project;*
 - *adequately supports the proactive and reactive air quality management system;*
 - *includes PM_{2.5} monitoring;*
 - *includes monitoring of occupied mine-owned residences and residences on the air quality affected land in Table 1, subject to the agreement of the tenant and/or landowner;*
 - *evaluates and reports on the effectiveness of the air quality management system;*
 - *includes sufficient random audits of operating responses to real time air quality management systems to determine the ongoing effectiveness of these responses in maintaining the project within the relevant criteria in this schedule and the requirements of conditions 24 and 25, above;*
 - *includes a protocol for determining any exceedances of the relevant conditions in this approval; and*
- (g) *includes a Leard Forest Mining Precinct Air Quality Management Strategy that has been prepared in consultation with other coal mines in the Precinct to minimise the cumulative air quality impacts of all mines within the Precinct, that includes:*
 - *systems and processes to ensure that all mines are managed to achieve their air quality criteria;*
 - *a shared environmental monitoring network and data sharing protocol;*
 - *control monitoring site(s) to provide real time data on background air quality levels (ie not influenced by mining in the Leard Forest Mining Precinct and representative of regional air quality);*
 - *a shared predictive and real time air dispersion model covering the Leard Forest Mining Precinct to be used for assessment of cumulative impacts, optimising location of the shared real time monitoring network, validation of air predictions and optimising mitigation measures; and*
 - *procedures for identifying and apportioning the source/s and contribution/s to cumulative air impacts for both mines and other sources, using the air quality and meteorological monitoring network and appropriate investigative tools such as modelling of post incident plume dispersion, dual synchronised monitors and chemical methods of source apportionment (where possible).*

Notes:

- *The requirement for regionally based control sites can be further reviewed if a regional air monitoring network is implemented and operated by the EPA as recommended in the draft Strategic Regional Land Use Plan for New England North West.*
- *The Leard Forest Mining Precinct Air Quality Management Strategy can be developed in stages and will need to be subject to ongoing review dependent upon the determination of and commencement of other mining projects in the area.*
- *The management plan should be consistent with the EPA's guidance on Best Management Practice reporting and Reactive Particulate Management Strategies.*



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Meteorological Monitoring

30. *For the life of the project, the Proponent shall ensure that there is a meteorological station 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*
 - (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Director-General following consultation with the EPA.*



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3 AIR QUALITY CONTROLS AND MANAGEMENT PROCEDURES

TCM adopts a range of design and operational safeguards and operational procedures for the mine to ensure that the effectiveness of the air quality controls are optimised throughout all stages of the mine's development and operation.

The controls have been selected largely based on their proven effectiveness at both TCM and other similar mines.

Vegetation Clearing and Soil Stripping

- Cleared trees and branches are retained where possible for the use in stabilising slopes identified for rehabilitation with native woodland communities.
- Where practicable, soil stripping is undertaken at a time when there is sufficient soil moisture to prevent significant dust lift-off.
- Stripping soil is avoided in periods of high winds.
- Dust suppression by water application is used to increase soil moisture if stripping occurs during periods of high wind or low soil moisture.
- Vegetation clearance and soil stripping will be confined to an area sufficient for the following 12 months mining activities. This will minimise impact on hibernating/roosting/nesting fauna, and minimise the areas exposed to dust lift off as much as practically possible.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.

Drilling and Blasting Activities

- Drill rigs utilise water injection or alternatively, are fitted with dust collectors.
- Blast hole stemming is used to prevent venting of explosion gases.
- Blasting is conducted both before the establishment, and after the break-up of, low-level atmospheric temperature inversions.
- Blasting will be subject to a regular assessment of weather conditions prior to and on the day of a blast, to ensure that wind speed and direction will not result in significant dust emissions or blast fume impacts on neighbouring residences.
- Review of geological conditions to inform blast design;
- Minimise the time between drilling, loading and shooting the blast
- The following factors contributing to non-ideal detonation behaviour and higher emission (principally NO₂) concentrations are avoided whenever possible.
 - weak overburden which reduces the necessary explosive confinement is ripped in preference to blasting.



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- water infiltration.
- long explosive columns.
- explosive pre-compression, caused by hole-to-hole shock propagation due to wet overburden and clay veins.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.

Overburden Ripping and Coal Mining

- Ripping of softer overburden material is avoided during periods of high wind.
- Low moisture coal is sprayed with water prior to excavation to raise moisture content to > 5.5%.
- Use predictive meteorological forecasting and predictive air dispersion modelling, together with real time monitoring data to inform operational practices in advance of the commencement of shift. This will aid in the day to day planning of mining activities giving due consideration to prevailing weather conditions and potential for dust generation and dispersion.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.

Internal Road and Hardstand Area Construction

- Clearing ahead of construction activities is minimised.
- Cleared areas are watered regularly during any construction activities, where appropriate.
- Unsealed roads used regularly for access will be watered utilising site water carts to minimise dust generation. Where necessary additional water applications will be made, and/or chemical dust suppressants will be used to minimise dust lift off from unsealed roads.
- Mine vehicles and coal haulage trucks will be subject to speed limits in place at the site. Speed limits are 60km/hr on the access road and in pit area, 10km/hr at the workshop area and 30km/hr at the ROM and load-out bin. At all times, operators are to drive to conditions and obey speed restriction signs.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.



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Coal Processing Area

- Water is applied to the coal at the feed hopper, crusher and at all conveyor transfer and discharge points.
- All conveyors are fitted with appropriate cleaning and collection devices to minimise the amount of material falling from the return of conveyor belts.
- Some flexibility exists to temporarily cease operation in the event of protracted dry periods, high winds, or significant dust generation and dispersal towards the surrounding residences.
- Trucks transporting coal offsite from the Coal Processing Area must be covered immediately after loading to prevent windblown emissions and spillage. The covering must be maintained until immediately before unloading the trucks (as per Condition O3.2 of EPL 12365).
- In dry windy conditions, trucks on the loading bin loop will be speed limited to 10km/hr to reduce potential for dust lift off.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.

Wind Erosion Management

- The extent of clearing/site preparation in advance of mining is minimised.
- Progressive rehabilitation of areas of disturbance, including topsoil and subsoil stockpiles is undertaken.
- Bund walls and windbreaks are constructed as required.
- Use predictive meteorological forecasting and predictive air dispersion modelling, together with real time monitoring data to inform operational practices in advance of the commencement of shift. This will aid in the day to day planning of mining activities giving due consideration to prevailing weather conditions and potential for dust generation and dispersion.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.

Internal Transport

- The road for the transportation of coal product between the mine facilities area and mine entrance is sealed.



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- Unsealed roads regularly used on the mine site will be watered utilising site water carts to minimise dust generation.
- Dust suppressants may be used from time to time to reduce dust and particulate generation, especially during excessive dry weather periods or when site water levels are low or restricted.
- All roads are speed limited and enforced to ensure that dust generation is at acceptable levels.
- Earthmoving equipment and on-site vehicles:
 - are fitted with exhaust controls which satisfy NSW EPA emission requirements;
 - are properly maintained and any mobile equipment which does not comply with NSW EPA guidelines is removed; and
 - have the exhausts directed upwards or to the side (where applicable) so as not to cause dust lift-off.
- Operators, maintenance, staff and contractors advised of real time 24 hour average dust levels at the commencement of both shifts. All employees and contractors undertake toolbox talks to identify, report, and minimise dust levels originating from mining operations.

The controls and management procedures will be reviewed in response to the results of air quality monitoring, complaints or comments identified through TCPL's consultation effort. Any changes made will be noted as part of annual environmental reporting in the AEMR/Annual Review.

Pollution Reduction Programs

Of relevance to the overall objective of minimising dust emissions from the Tarrawonga site, EPL 12365 has some Pollution Reduction Program (PRP) measures that the site is implementing. These include:

- Wheel generated dust control efficiencies on active haul roads;
- Assessment and implementation of best practice measures to minimise dust from disturbing and handling overburden in adverse weather conditions (Appendix 3). Appendix 2 provides the Daily Visual Dust Inspection which includes triggers for adverse weather conditions (per Appendix 3) and the response taken by site to minimise dust impacts. The site surveillance camera may be referenced to assist in visual dust inspections;
- Participation in an Australian Coal Association Research Project (ACARP) study to trial best practice measures for disturbing and handling overburden.

Where relevant, appropriate revisions/updates will be made to this management plan following the outcomes of the PRPs nominated above.



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4 MONITORING AND REPORTING

This section outlines the monitoring and reporting requirements to measure the impacts and environmental performance of the mine and the effectiveness of air quality management measures.

4.1 Risk/Response Matrix

A risk/response matrix has been developed for the site to identify operational practices or weather conditions that require specific action to mitigate potential impacts. The intent behind the risk/response matrix is to understand the prevailing conditions and implement management practices accordingly to avoid subsequent air quality impacts. The risk/response matrix has been developed based on colour coding and key operational and weather conditions, and proximity of privately owned receptors to mining operations. The Environmental Officer will be responsible for implementation of the risk/response matrix in consultation with the Operations Manager. Refer to Appendix 2 for further information regarding the air quality risk matrix.

The wind direction nominated on the risk/response matrix is the direction from which the wind is blowing, with the level of risk cognisant of the location of privately owned dwellings around the project site (see Figure 2). The risk/response matrix will be used in conjunction with the Adverse Weather Condition TARP developed out of the Tarrawonga PRP – Identification of Adverse Weather Conditions for Overburden Handling (Pacific Environment, 2014). Whilst it is acknowledged that calm conditions or low level temperature inversions may result in poor dust dispersion, creating visual dust above the mine site, these conditions are less likely to result in actual impact at surrounding properties comparative to stronger wind conditions.

The risk/response matrix is effectively a short term tool for the site to manage observed dust levels pending the implementation of the cumulative air quality monitoring network in conjunction with Boggabri Coal and the Maules Creek project. As described in the Air Quality Management Strategy for the BTM Complex, a wider network of monitoring equipment will be established across the precinct to inform the sites of their performance in relation to dust generation. This network will also include meteorological forecasting, and development of predicted dust plumes based on the forecast weather conditions. The results of the forecasting and dust plume predictions will form the basis of a pre-shift status report which will identify any potential dust risks from planned operations and enable proactive operational adjustments where required. The monitoring network will then provide real time data in relation to dust level performance during the shift.

4.1.1 Adverse and Extraordinary Weather Dust Management

Tarrawonga Coal engaged Pacific Environment to assess at what wind speed and direction that Total Suspended Particulate dust emissions become excessive. The air quality model found that dust levels start to increase after 7m/s and increase exponentially after 10m/s.



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This information was used to develop a Trigger Action Response Plan (TARP) for responding to adverse weather conditions, and is outlined in Table 1.

Table 1 Adverse Weather TARP

Location	Wind Speed >7m/s	Wind Speed >10m/s ^{1,2}				Visual Assessment Level 3 ^{1,2}	Visual Assessment Level 4 ^{1,2}
		North	South	East	West		
Wind Direction	All	North	South	East	West	All	All
Highest dumping area close to southern boundary	Visual inspection for dust by site Environmental Officer or alternate ^{1,2}	STOP	STOP	STOP	STOP	CHECK	STOP
Elevated dumping area close to southern boundary		STOP	Check	STOP	STOP	CHECK	STOP
Elevated dumping area close to northern boundary		STOP	STOP	STOP	STOP	CHECK	STOP
Highest Dumping area close to western and northern boundaries		STOP	STOP	STOP	STOP	CHECK	STOP
Elevated central dumping area		Check	Check	Check	Check	CHECK	STOP
Soil Stripping and Vegetation Clearing		STOP	STOP	STOP	STOP	CHECK	STOP
Crusher and Loader		Check	Check	Check	Check	CHECK	STOP
Excavators and Dozers		Check	Check	Check	Check	CHECK	STOP

¹ May result in assessment and implementation of additional mitigation measures or suspension of activity.

² SMS message also sent to OCE, Operations Manager and Environmental Officer.

Under extraordinary weather events, such as those identified in condition 26(d) ie bushfires, prescribed burning and dust storms, the operations will review their activities, and mitigate wherever practicable, material contribution to poor ambient air quality.

Wind speed trigger levels for adverse and extraordinary weather conditions will be subject to ongoing review based on on-site visual assessment of dust lift off, and results of air quality monitoring.



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4.2 Monitoring Program

4.2.1 Parameters Measured

Activities on the mine site will emit dust in various forms, namely total suspended particulate matter (TSP), particulate matter with aerodynamic diameters less than 10 μ m (PM₁₀), particulate matter with aerodynamic diameters less than 2.5 μ m (PM_{2.5}), and deposited dust (which is assessed as insoluble solids as defined in Australian Standard AS 3580.10.1-2003 Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method).

Section 2 presented the concentration or deposition rate (in the case of deposited dust) thresholds that must not be exceeded at any residence on, or on more than 25 percent of, any privately-owned land. Monitoring implemented to ensure compliance with these criteria will include monitoring of dust deposition rates as well as PM₁₀ and PM_{2.5} concentrations at nominated residences surrounding the mine site. The location of monitoring points is shown on Figure 2. The High Volume Air Sampler located at "Templemore" will be relocated as defined in Section 4.2.2; and will sample on a six (6) day cycle. No monitoring of TSP is proposed as PM₁₀ concentrations are considered of greater significance given its synergies with health-related issues. This approach was accepted by DP&E for all Whitehaven sites in a letter dated 5th August 2011.

In addition to these monitoring sites, Tarrawonga will implement, in consultation with the other mining operations in the precinct and in accordance with the Air Quality Management Strategy for the BTM Complex, a predictive meteorological forecasting tool and dispersion model, to inform mine planning on a day to day basis, giving due consideration to the potential cumulative impacts of all mining operations in the area. Additional monitoring points to inform cumulative air quality management will also be established.

A record of site activities undertaken and meteorological records during the period of recording will also be retained. This will initially be undertaken in accordance with the Daily Dust Inspection (Appendix 2) and updated once the cumulative network is implemented.

4.2.2 Monitoring Locations

Figure 2 presents the locations of the dust deposition gauges and TEOM's for measuring PM₁₀ and PM_{2.5} concentrations. The locations have been selected taking into account local meteorological conditions, the proximity of surrounding residences and the locations of likely dust emission sources from the mine site. Table 2 presents a summary of the air quality monitoring sites.

With respect to Project conditions 27(d) and 29(f), dust impacts on tenants of mine owned residences, "Tarrawonga" is the only mine residence predicted to exceed air quality criteria and is not currently tenanted.

The monitoring network includes a continuous real time PM₁₀ monitor at the "Flixton" property, which is south/south east of the mine and owned by Whitehaven. The southern quadrant is considered the most appropriate location given prevailing wind directions and proximity to privately owned dwellings, especially given the Boggabri Coal project is located



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to the immediate north of the Tarrawonga site. This location was also selected on the basis of specific consideration to cumulative impacts from the Tarrawonga, Boggabri and Maules Creek projects, and nominated by PAE Holmes as a key location for future monitoring requirements.

Regional monitoring of PM_{2.5} concentrations will also be undertaken via a real time monitor located at the “Will-gai” Property, approximately 10km from the Tarrawonga mine.

The High Volume Air Sampler (HVAS) currently located on “Templemore” is to be relocated to a private receiver; Coomalgah or Sylvania within 6 months of the approval of this MP. The final location will be determined following agreement with the property owner.

The real time monitors are integrated with existing real time noise monitoring equipment and allow air quality results to be viewed from the site office in real time. This system also provides for site alerts in the event that air quality measurements approach compliance thresholds. The monitoring locations identified include mine owned land, that may, from time to time, be occupied under lease. Any lessees will be informed of any potential air quality impacts at the residence, and provided with any monitoring data as it comes available in accordance with the requirements of Condition 3(27).

In addition, a CCTV camera has been installed at Tarrawonga to assist in monitoring dust levels. As noted in section 3, the site camera may be referenced to assist in visual dust inspections.

Notwithstanding the above monitoring activities specific to Tarrawonga operations, under the terms of the Air Quality Management Strategy for the BTM Complex, it is intended to install additional E-Sampler (or similar) monitors in proximity to operations at Maules Creek, Boggabri and Tarrawonga. Data from these monitors will be used to inform performance against criteria, and the capacity to identify source contribution to enable active management. The specific detail around activation of these E-Samplers will be included in the BTM Complex Plan once a supplier has been confirmed.



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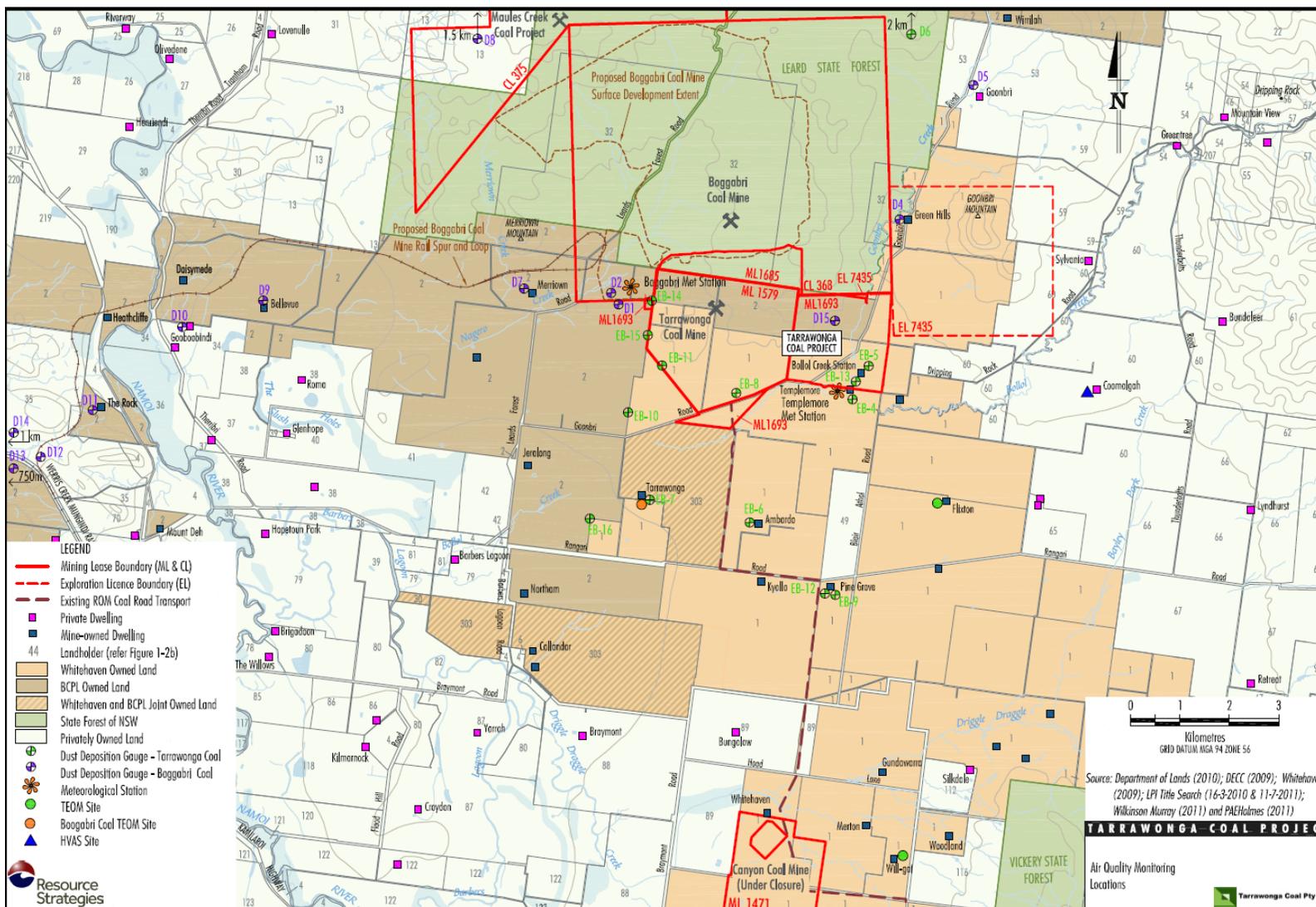


Figure 2 Air Quality Monitoring Locations



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Table 2 Air Quality Monitoring Locations

Reference*	EPL ID #	Easting	Northing	Residence/Property	Deposited Dust	PM ₁₀	PM _{2.5}
EB-4	-	230897	6605869	"Templemore"	✓		
EB-5	-	231117	6606212	"Bollol Creek Station"	✓		
EB-6	-	229044	6603178	"Ambaro"	✓		
EB-7	-	226672	6603754	"Tarrawonga"	✓		
EB-8	-	228756	6605863	"Thuin"	✓		
EB-9	-	230504	6601914	"Pine Grove"	✓		
EB-10	-	226420	6605376	"Tarrawonga Mine"	✓		
EB-11	-	227176	6606259	SW of boundary of ML 1579	✓		
EB-14	-	226926	6607770	Tarrawonga Coal Mine	✓		
EB-15	-	226872	6606994	Tarrawonga Coal Mine	✓		
EB-16	-	225440**	660331**	"Taylor Vale"	✓		
Real Time Monitor	28	232784	6603658	"Flixton"		✓	
Real Time Monitor	-	231803	6596402	"Will-gai"		✓***	✓
HVAS	-			Coomalgah		✓	
* See Figure 2 ** Estimated *** Not a requirement of Project Approval							

4.2.3 Monitoring Frequency

The monitoring frequency for deposited dust, PM₁₀ and PM_{2.5} is as follows:

- Deposited dust – continuous
- PM₁₀ – continuous (TEOM)
- PM_{2.5} – continuous (TEOM)
- PM₁₀ – every 6 days (HVAS)

4.2.4 Monitoring Summary

Table 3 summarises all relevant information for the air quality monitoring. This table will be updated with the relevant details from BTM Complex monitoring network once this is formalised with the selected supplier.



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Table 3 Air Quality Monitoring Program and Criteria

Purpose	Location*	Parameter to be Analysed	Criteria	Frequency/Timing of Monitoring
Air quality compliance monitoring	EB-4 – EB-11, EB14, EB15, EB16	Dust Deposition (g/m ² /month)	4.0g/m ² /month 2.0g/m ² /month maximum increase	Continuous (monthly)
	Real Time Monitor (TEOM) – “Flixton”	Particulate Matter <10µg/m ³	No compliance criteria apply. A trigger level of 40µg/m ³ against the PM ₁₀ 24hr criteria has been set where this level is maintained over a 30 minute period. A second trigger is set for peak 1hr PM ₁₀ concentrations at 90µg/m ³ for a 1 hour period in order to take any management measures prior to potential impacts on maintaining compliance with the 24hr PM ₁₀ criteria. The alert trigger for 1hr PM ₁₀ concentrations is constrained by wind direction so as to only trigger when within the zone of influence from the Tarrawonga site, being 270-20°. The PM ₁₀ 24hr concentration alert trigger is not constrained by wind direction.	Continuous
	Real Time Monitor (TEOM) – “Will-gai”	Particulate Matter <2.5µg/m ³	Whilst no criteria apply, TCPL will compare actual results against target levels of 8µg/m ³ for Annual Average and 25µg/m ³ for 24 hour maximum	Continuous
	HVAS Monitor (PM10) – “Coomalgah”	PM10	50 µg/m ³ 24hr 30 µg/m ³ rolling annual average	Every 6 days
	Dust Inspections	Visible Dust	Whilst no criteria apply, TCPL will assess visible dust levels against objective of minimising visible off-site air pollution, and take appropriate management actions in accordance with Appendix 2 and Table 1	Continuous (all employees) Once per day – Appendix 2 (Environmental Officer or alternate)

4.2.5 Campaign Monitoring

Subject to landholder approval, campaign PM₁₀ monitoring will be undertaken at closest private residences. In conjunction an assessment of meteorological data and calibration (to monitoring sites) of air model will be undertaken to determine Tarrawonga contribution, and hence compliance with PM₁₀ criteria. Results from the campaign monitoring will be used to inform site air quality management, and will be presented in the AEMR/Annual Review.



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4.2.6 Dust Inspections

As noted in Table 2 and Appendix 2 dust inspections are undertaken formally on a daily basis by the site Environmental Officer, or alternate, and informally on a continuous basis by all employees. Employees are trained via toolbox talks on potential for air quality impacts, including basis to air quality and meteorological condition assessment.

4.3 Monitoring Procedures, Data Recording and Reporting

4.3.1 Monitoring Procedures

Monitoring will be undertaken according to the DEC (2006) document *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales 2006*. Specifically, monitoring will be conducted in accordance with the following Australian Standards:

- AS/NZS 3580.1.1:2007 “Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment”.
- AS/NZS 3580.9.6 – 2003 “Methods for sampling and analysis of ambient air – Determination of suspended particulate matter PM₁₀ high volume sampler with size-selective inlet – Gravimetric Method”.
- AS 3580.10.1-2003 “Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method” (NSW DEC Method AM-19).
- AS 3580.9.8-2001 “Methods for the Sampling and Analysis of Ambient Air (NSW DEC Method AM-22).
- AS/NZS 3580.9.8-2008 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser.
- AS/NZS 3580.9.13-2013 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{2.5} continuous direct mass method using a tapered element oscillating microbalance analyser.

4.3.2 Data Recording

For each deposited dust monitoring location, once each month the glass container used to capture the deposited dust will be removed, replaced and sent to a NATA accredited laboratory for analysis.

Condition M1.3 of EPL 12365 requires the following records to be kept:

- The date(s) on which the sample was taken;
- The time(s) at which the sample was collected;
- The point at which the sample was taken; and
- The name of the person who collected the sample.



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In addition to these requirements, any notable activities or conditions at or around the monitoring location should be noted at the time of sample collection. Site activities that could impact on air quality results as well as any relevant regional conditions (eg. bushfires, dust storms) should be noted when they occur.

Data obtained from the real-time air quality monitoring network will be available in real time via access to the web interface, as well as through daily reporting from the monitoring unit to selected personnel. Key personnel for the provision of daily reports will be the Group Environment Manager, the Operations Manager for the Tarrawonga site and the Environmental Officer. In addition to daily reports, the monitor will be downloaded at regular intervals with data available on an archival basis. Real time data will be maintained on an archival basis at a central repository that can be retrieved on an as needs basis.

Upon establishment of the BTM Complex monitoring network, data from the additional E-Samplers (or similar) and other monitoring equipment will be accessible via the same methodology as proposed for the Tarrawonga monitoring program.

4.3.3 Data Reporting

A summary of air quality monitoring results will be reported internally on a monthly basis as well as on a quarterly basis to the Community Consultative Committee (CCC) via the Environment Monitoring Report. This report will be uploaded onto the company's website (www.whitehavencoal.com.au).

Air quality monitoring required by the EPL must be published on the Whitehaven website within 14 days of receiving the results.

Each year, the results of the air quality monitoring program will be summarised and presented in the AEMR/Annual Review together with reference to the prevailing meteorological data and site activities during the measurement period(s). Reporting will also include an analysis of the monitoring results against the exceedance criteria, previous monitoring results and predictions made in the EA.

Dust monitoring results will be issued to EPA via the Annual Return for EPL 12365 for licenced monitoring points.

Reporting requirements for exceedances, complaints and non-compliances are specified in Section 5. The extent of notification and reporting requirements depends on the severity of the issue but generally includes notification to DP&E and EPA and/or the affected landholder as well as discussion in CCC Environment Monitoring Reports and the AEMR/Annual Review.

In addition to the reporting requirements listed above, air quality monitoring data will be made available to the public upon request. The real time air quality monitoring data, in the form of the 24hr average PM₁₀ concentration for the preceding period, daily weather forecasts for the week ahead, and operational responses to forecasts and monitoring data for the preceding period will also be made available on the Whitehaven Coal website on a daily basis, in accordance with Project Approval requirements. It should be noted that the 24hr average PM₁₀ concentration result is from all sources and not wholly related to mining activities, and therefore not validated to confirm mine related contributions.



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4.4 Cumulative Air Quality and GHG Management Strategy

TCM has been in consultation with the nearby Boggabri Coal Mine and Maules Creek Project in developing the Air Quality Management Strategy for the BTM Complex in order to minimise cumulative impacts on air quality. The Strategy has been submitted to DP&E for approval and will be appended to this Plan once approved.

TCM and Boggabri Coal currently continue to operate shared air quality monitors, whilst Boggabri Coal, Tarrawonga and the Maules Creek Project participate in monthly meetings to discuss cumulative impact management measures.

4.5 Community Consultative Committee

As part of the quarterly Community Consultative Committee meeting, an environmental monitoring report is presented to the members with detailed explanation of the air quality monitoring results for the corresponding quarterly period. Dust deposition results and PM₁₀ monitoring are summarised by month with an annual average also provided alongside the compliance criteria. Any exceedance is clearly explained as to the location and type of exceedance, as well a discussion on any queries or actions from the members of the committee.



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5 MANAGEMENT OF EXCEEDANCES, COMPLAINTS AND NON-COMPLIANCE

5.1 Air Quality Compliance Criteria Exceedance

On identification of an exceedance of the air quality compliance criteria presented in Section 2, the following response protocol is to be followed. It is noted that the response to an exceedance will vary depending on whether it is an exceedance of dust deposition or PM₁₀ criteria.

1. **Confirmation of Exceedance**

For deposited dust results, the analysing laboratory will be contacted to ensure no error has been made in storing, analysing or recording the sample or result. Should this investigation conclude the treatment, analysis and result recording for the sample are satisfactory, TCPL will proceed to response point 2.

In terms of the triggering of alerts at site in relation to dust levels from the real time monitoring network, a trigger level of 40µg/m³ against the PM₁₀ 24hr criteria has been set where this level is maintained over a 30 minute period. A second trigger is set for peak 1hr PM₁₀ concentrations at 90µg/m³ for a 1 hour period in order to take any management measures prior to potential impacts on maintaining compliance with the 24hr PM₁₀ criteria. The alert trigger for 1hr PM₁₀ concentrations is constrained by wind direction so as to only trigger when within the zone of influence from the Tarrawonga site, being 270-20°. The PM₁₀ 24hr concentration alert trigger is not constrained by wind direction. These alerts provide site with opportunities to modify operations where appropriate in order to minimise dust generation and potential exceedances of compliance criteria. The implementation of the BTM Complex Air Quality Monitoring network will impact on site alert arrangements, and any revisions to alert levels or monitoring networks will be reflected in an update to this plan.

No criteria currently apply for PM_{2.5}.

2. **Notification (of exceedance)**

The Group Environment Manager must determine whether there is a risk of material harm to the environment as a result of the exceedance. If so, the exceedance must be reported immediately as per the site's Pollution Incident Response Management Plan, and Condition 8 of Schedule 5 of the Project Approval. Section 147 of the POEO Act defines material harm as follows:

147 Meaning of material harm to the environment

(1) For the purposes of this Part:

(a) harm to the environment is material if:

(i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

(ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and



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(b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

(2) For the purposes of this Part, it does not matter that harm to the environment is caused only in the premises where the pollution incident occurs.

If the exceedance has not caused, or will not cause, material harm to the environment, and the exceedance is determined to be related to operations at Tarrawonga, the EPA & DP&E should be notified as soon as practicable of exceedances for licenced monitoring points. Dust monitoring results are also provided in the EPL Annual Return and AEMR/Annual Review. Any breach of Project Approval condition/s will be reported to DP&E.

Exceedances that could occur are:

Monthly dust deposition exceedance ($4\text{g}/\text{m}^2/\text{month}$) or monthly maximum increase in deposited dust level ($2\text{g}/\text{m}^2/\text{month}$): It should be noted that the criteria for dust deposition is an annual average value and therefore a dust deposition value of $>4\text{g}/\text{m}^2$ or an increase of $>2\text{g}/\text{m}^2$ for any given month is not strictly an exceedance (and therefore not reportable), rather an indication that should there be no change to dust generating or suppression activities there is a high probability of an exceedance once the annual average is calculated.

Annual average exceedance of dust deposition ($4\text{g}/\text{m}^2/\text{month}$) or annual maximum increase in deposited dust level ($2\text{g}/\text{m}^2/\text{month}$) or PM_{10} ($30\mu\text{g}/\text{m}^3$): In the event that the annual average dust deposition recorded at any off-site monitoring location exceeds $4\text{g}/\text{m}^2/\text{month}$ or the annual deposited dust increase exceeds $2\text{g}/\text{m}^2/\text{month}$, the Group Environment Manager will notify EPA as to the nature of the exceedance(s) if they are identified as being related to operations at Tarrawonga. If it is determined that mine related activities have caused the exceedance in annual average criteria, a corrective action plan will be developed in consultation with EPA to address air quality improvements and ensure future compliance with the annual average criteria.

Exceedance of 24 hour PM_{10} criteria ($50\mu\text{g}/\text{m}^3$) or annual average PM_{10} criteria ($30\mu\text{g}/\text{m}^3$): As the TEOMs are designed to be management tools, results from the units will not be used by EPA or DP&E for compliance. Instead, results nearing or reaching the nominated criteria will trigger actions onsite to assess the source of dust and modify operations if it is determined to be related to Tarrawonga operations.

Condition 4(3) requires TCPL to notify affected landowners of air quality criteria within 2 weeks of obtaining results. The NSW Health fact sheet "Mine Dust and You" must be provided while regular monitoring results must also be provided until the site returns to compliance.

3. Corrective Action Plan and Re-assessment

If review of monitoring real time data or measured dust deposition indicate compliance related problems, a corrective action plan will be initiated.

Where it is determined that a corrective action plan is necessary, TCPL will prepare the plan to reduce dust generation and thereby reduce dust deposition, $\text{PM}_{2.5}$ and/or PM_{10} concentrations around the mine site and return the operation to compliance. Preparation of



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the plan may require the assistance of a specialist air quality consultant and the plan should include a schedule for re-assessment. Details on the preparation of the corrective action plan and re-assessment will be included in the relevant AEMR/Annual Review and EPL Annual Return and to EPA prior to implementation.

4. Notification (of compliance)

TCPL will notify EPA and other relevant government agency(ies) and local stakeholder(s) of the return to compliance following the successful completion of Step 3.

5. Independent Review and Land Acquisition

If an owner of privately-owned land considers the mine to be exceeding air quality criteria, they may ask the Director-General in writing for an independent review of the impacts on their land. Conditions 4, 5 and 6 of Schedule 4 of PA 11_0047 specify the independent review process.

Within 3 months of receiving a written request from a landholder with acquisition rights, TCPL shall make a binding written offer as detailed in Condition 4(8) of PA 11_0047. Air quality acquisition criteria are specified in Condition 3(26) while Condition 4(8) requires TCPL to pay all reasonable costs associated with the land acquisition process.

It should be noted that under PA 11_0047, property ID 49 retains existing acquisition rights on the basis of air quality impacts, and can, on making a written request as per Condition 3(1), seek acquisition under the terms of Conditions 4(8) and 4(9). Property ID's 44 and 45, listed in PA 11_0047, have been acquired and are now project related properties.

6. Reporting

The recorded exceedance, corrective actions and reassessment will be reported to the CCC and included in each relevant AEMR/Annual Review.

The implementation of real time air quality monitoring will provide TCPL with additional information on which to make operational decisions on a day to day basis. The results of predictive meteorological forecasting and predictive real time air dispersion modelling, coupled with real time air quality monitoring will provide site management with appropriate tools to plan daily mining activities, identify causes of any elevated dust results and make changes to site operations accordingly to ensure compliance. This management tool should reduce the overall potential for TCPL to exceed operational air quality criteria on an annual average and 24 hour basis through the provision of alerts and active management on site where dust contributions are related to site activities. Exceedances in 24 hour or annual average results may still occur due to regional and/or other dust sources, however, the data available in real time, coupled with predictive forecasting will provide the relevant information to assess contributing sources and appropriate response at a site level.

5.2 Complaints

Whilst all endeavours will be made by TCPL to avoid adverse air quality impacts on local landowners / residents, it is acknowledged that from time to time such impacts may occur. In order to ensure an appropriate and consistent level of reporting, response and follow-up



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Document Owner:	Env. Manager
Revision Period:	2 years
Issue:	1
Last Revision Date:	28/01/2015
Date Printed:	23/03/2015

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to any complaints is adopted by TCPL, the following complaints management protocol will be followed:

- A publicly advertised telephone complaints line will be in place to receive complaints during operating hours and record complaints at other times.
- Each complaint received will be recorded on a Complaints Register, which will include the following details:
 - The date and time of complaint.
 - Any personal details the complainant wishes to provide or if no such details are provided a note to that effect.
 - The nature of the incident that led to the complaint, including the time of the dispersal and its duration.
 - The action taken by TCPL in relation to the complaint, including any follow-up contact with the complainant.
 - If no action was taken by TCPL, the reason why no action was taken.
- The Group Environment Manager will be responsible for ensuring that an initial response is provided within 24 hours of receipt of a complaint (except in the event of complaints recorded when the mine is not operational).
- Data from the site weather station will be obtained for the time applicable to the complaint for use in determination of cause and identification of future remedial actions.
- Additional measures will be undertaken as required to address the complaint. This may include visiting the complainant, or inviting the complainant to the mine site.
- Once the identified measures are undertaken, the Group Environment Manager will sign off on the relevant complaint within the Complaints Register.
- If necessary, follow-up monitoring will take place to confirm the source of the complaint is adequately mitigated.
- A copy of the Complaints Register will be kept by TCPL and made available to the CCC and the complainant (on request). A summary of complaints received every 12 months will be provided to DP&E, GSC, NSC, EPA, DRE and the CCC through the AEMR/Annual Review.

Based on the nature of individual complaints, specific contingency measures may be implemented to the (reasonable) satisfaction of the complainant. The Group Environment Manager retains ultimate responsibility to ensure that complaints received are properly recorded and addressed appropriately.

5.3 Non-Compliance

With the exception of air quality criteria exceedances (as discussed in Section 5.1), non-compliances relating to air quality would most likely relate to issues with monitoring such as



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monitor interference/malfunction. Such non-compliances will be detailed in the EPL Annual Return and/or AEMR/Annual Review.

5.4 Unpredicted Impact Protocol

In the event that unpredicted or unforeseen air quality impacts are identified, the following protocol will be adopted.

Table 4 Unpredicted Impact Protocol

Step	Procedure
1	Review the unpredicted impact including consideration of: <ul style="list-style-type: none">• Any relevant monitoring data; and• Current mine activities as well as activities in the vicinity of the issue.
2	Commission an investigation by an appropriate specialist into the unpredicted impact, if considered appropriate.
3	Develop appropriate ameliorative measures based on the results of the above investigations, in consultation with relevant government departments.
4	Implement additional monitoring, where relevant, to measure the effectiveness of the improvement measures.



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6 GREENHOUSE GAS MANAGEMENT

TCM forms part of the Whitehaven Group's National Greenhouse and Energy Reporting Scheme (NGERS) reporting requirements.

Until recently, the site was included in Whitehaven's Energy Efficiency Opportunities (EEO) program, administered by the Federal Government. Assessments of available efficiencies at the site included improved mine planning to improve the efficiency of ancillary equipment such as water carts and graders. The mine fleet has also been streamlined as a result.

TCPL will continue to record emissions generated by the site and assess and implement any identified feasible efficiencies in the future.

7 DOCUMENT REVIEW AND CONTINUOUS IMPROVEMENT

This document will be reviewed internally on an annual basis following completion of the AEMR/Annual Review, and/or following an air quality related incident, audit, or modification to the conditions of approval. In addition, every 2 years, the plan will be subject to review with consultation with the relevant agencies.

TCPL will investigate and implement ways to improve the environmental performance of the project over time. This will be achieved by undertaking internal audits and keeping abreast of best practice in the industry for air quality controls and reporting on outcomes of air quality monitoring annually in the AEMR/Annual Review.

In accordance with Schedule 3 Condition 29(f), random audits of operating responses to real time air quality management systems will be undertaken through triggering of the TEOM alert, and assessment of site dust generation and required management actions as per Appendix 2. The results of random audits will be reported annually within the AEMR/Annual Review.



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Document Owner:	Env. Manager
Revision Period:	2 years
Issue:	1
Last Revision Date:	28/01/2015
Date Printed:	23/03/2015

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Appendix 1 Consultation with EPA

From: Khari Turnbull [Khari.Turnbull@epa.nsw.gov.au] Sent: Mon 6/05/2013 4:26
To: Danny Young
Cc:
Subject: Tarrawonga Environment Management Plans

Hi Danny

Thank you for forwarding the following Tarrawonga Environment Management Plans for our records:

Noise Management Plan
Blast Management Plan
Air Quality and Greenhouse Gas Monitoring Plan

The Environment Protection Authority (EPA) encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, we do not approve or endorse these documents as our role is to set environmental objectives for environmental/ conservation management, not to be directly involved in the development of strategies to achieve those objectives.

Should you have any further enquiries please do not hesitate to contact me.

Regards

Khari Turnbull
Regional Operations Officer- North Branch | NSW Environment Protection Authority |



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Document Owner:	Env. Manager
Revision Period:	2 years
Issue:	1
Last Revision Date:	28/01/2015
Date Printed:	23/03/2015

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Appendix 2 Daily Dust Inspection

WHITEHAVEN COAL				TARRAWONGA				
Inspected By				Temp Inversion	Wind Speed and Direction			
Signature				TARP Investigation Level Triggered (wind speed > 7 m/s)(condition level 3)				
Date		Time		TARP Action Level Triggered (wind speed > 10 m/s)(condition level 4)				
Activity/Area	Conditions				Comments/Actions			
Scrapers	4	3	2	1				
Drill Rigs	4	3	2	1				
Haul Roads	4	3	2	1				
Excavators	4	3	2	1				
Dozers - Inpit	4	3	2	1				
Dozers - Rehab	4	3	2	1				
Overburden/Dumping	4	3	2	1				
ROM Pad & Coal Bin	4	3	2	1				
Crusher and Loader	4	3	2	1				
Unsealed Local Roads	4	3	2	1				

1	No visible dust
2	Minimal dust
3	Elevated dust levels
4	Significant Offsite Impact

	Low Risk – Monitor conditions regularly in case of worsening weather conditions.
	Moderate Risk – Monitor conditions regularly and initiate environmental checklist. Implement dust mitigation measures if required such as lowering speed limits and increasing water truck workloads.
	High Risk – Initiate measures to minimise air quality impacts. Measures include but not limited to lowering speed limits, increasing water truck workloads, suspension of high dust generating activities such as outer pit dumping or scraper movements.

Note: Photographs must be taken when deemed necessary



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Document Owner:	Env. Manager
Revision Period:	2 years
Issue:	1
Last Revision Date:	24/12/2014
Date Printed:	23/03/2015

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Appendix 3 Handling Tarrawonga PRP – Identification of Adverse Weather Conditions for Overburden