BULGA
COAL

GLENCORE

Air Quality and Greenhouse Gas Management

Plan

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Table of Contents

1. Purpose

This Air Quality and Greenhouse Gas Management Plan (AQGGMP) provides the framework for the management of air quality and greenhouse gas impacts from the Bulga Coal Complex (BCC). The AQGGMP is intended to meet both statutory and internal requirements, notably the Glencore Coal Assets Australia (GCAA) Standards, Development Consents and Environment Protection Licence (EPL). The statutory requirements are documented in ***Appendix A***.

The BCC comprises an open cut coal mine, the Bulga Open Cut (BOC), an underground coal mine, Bulga Underground Operations (BUO), and a Coal Handling and Preparation Plant (CHPP).

Bulga Coal currently operates under development consent ***SSD-4960*** for the BOC, and development consent ***DA 376-8-2003,*** for the BUO. BUO ceased underground mining in May 2018. However, gas drainage infrastructure, a gas fired power station, goaf drainage system and associated flares are still being operated by Bulga Coal.

2. Objectives and Targets

This AQGGMP aims to achieve the following objectives in relation to air quality and greenhouse gas management at BCC:

- outline the air quality management system and air quality monitoring program;
- outline the measures implemented to minimise Scope 1 and Scope 2 greenhouse gas emissions;
- facilitate compliance with regulatory standards, conditions and commitments; and
- mitigate air quality related risks and complaints from the regulators, community and / or other stakeholders.

3. Scope

This AQGGMP provides the framework for the management of particulate matter (PM_{10}, $PM_{2.5}$, Total Suspended Particulates (TSP)), fume (oxides of nitrogen), gas from spontaneous combustion, odour and Scope 1 and Scope 2 greenhouse gas emissions from activities under development consent ***SSD-4960*** and development consent ***DA 376-8-2003.***

The AQGGMP applies to BCC employees and contractors working for or on behalf of Bulga Coal within the development consent and EPL boundaries and forms part of BCC's Environmental Management System (EMS).

Air quality monitoring and management measures implemented by Bulga Coal to minimise air quality impacts on the Mushroom Composting Facility are included in the Eastern Emplacement Area Air Quality Management Framework.

4. Legislative Requirements

Key regulatory requirements for air quality and greenhouse gas management relevant to this plan are contained in development consent ***SSD-4960***, for BOC, development consent ***DA 376-8-2003***, for BUO, and ***Environment Protection Licence (EPL) 563***, for BCC. Approval conditions relevant to air quality and greenhouse gas management, including where they are addressed in this plan, are detailed in ***Appendix A***.

5. Planning

5.1 Potential Impacts

The key air quality issues to be managed at the BCC include:

- Dust (that is, particulate matter in the form of TSP, PM_{10} or $PM_{2.5}$) from general mining activities;
- Fume (that is, NO_x emissions) from blasting; and
- Odour and other substances due to potential spontaneous combustion.

Dust

Dust emissions from general mining activities are from a variety of sources including material handling, material transport, processing, wind erosion, and blasting. These emissions mainly comprise of particulate matter in the form of TSP, PM_{10} and $PM_{2.5}$.

The three most significant sources, in terms of TSP emissions, are:

- Coal and overburden haulage, resulting in wheel-generated dust.
- Exposed mining and emplacement areas, resulting in wind-generated dust.
- Loading and unloading coal and overburden to trucks

The emission sources have been identified in order to develop the most effective management measures and to target the most significant sources.

Fume

Post-blast fume can be produced in non-ideal explosive conditions of the ammonium nitrate / fuel oil (ANFO) and visible as an orange / brown plume. Post-blast fumes comprise of oxides of nitrogen (NO_x) including nitric oxide (NO) and nitrogen dioxide (NO_2). In general, at the point of emission, NO will comprise the greatest proportion of the total emission. Typically this is 90% by volume of the NO_x. The remaining 10% will comprise mostly NO_2. It is the NO_2 which has been linked to adverse health effects.

Odour

Spontaneous combustion of coal and other carbonaceous materials is the main potential source of odour. “Self-heating” occurs when coal and other carbonaceous materials undergo an exothermic reaction when exposed to oxygen in the air, to generate heat. This process causes the temperature of the material to rise which in turn accelerates the oxidation and, in turn, the heat generation process. As the material temperature rises above about 70°C the temperature acceleration is rapid enough to result in ignition of the material. This ignition is referred to as spontaneous combustion.

The propensity of coal (or carbonaceous material) to self-heat and potentially combust is governed by many factors but most commonly by the type of coal, the carbon content, the size of the particles, the material temperature, the presence of oxygen and quantity of coal. Spontaneous combustion results in the emission of noxious gases including carbon dioxide, carbon monoxide, sulphur dioxide, hydrogen sulphide, nitrogen oxides, acid mist and a range of volatile organic compounds.

The emissions to air have the potential to lead to the following hazards:

- Adverse health effects due to inhalation;
- Nuisance effects due to odour;
- Fire and hot material; and
- Smoke and effects on visibility.

5.2 Baseline Data

The existing air quality and meteorological environment has been characterised by monitoring data collected from a network of monitors operated by Bulga Coal, the locations of which are shown in ***Figure 5-2***.

5.2.1 Air Quality

A summary of historical annual average PM_{10} results from the BCC monitoring network, are provided in ***Table 5-1*** below. Monitoring locations are shown on ***Figure 5-2.*** The measured levels include PM_{10} from all mining and non-mining sources, including extraordinary events such as bushfires and dust storms.

Table 5-1 – Measured annual average PM_{10} concentrations ($\mu g/m^3$)

Year	D1	D3	D5	D11	Applicable criterion
2013	18	17	17	-	30
2014	17	16	14	-	30
2015	12	12	11	-	30
2016	12	12	12	20	30
2017	14	13	12	22	30
2018	15	20	19	22	30
2019	22	28	25	28	30

A summary of historical annual average $PM_{2.5}$ results from the BCC monitoring network are provided in ***Table 5-2*** below. Monitoring locations are shown on ***Figure 5-2***. Measured levels include $PM_{2.5}$ from all mining and non-mining sources, including extraordinary events such as bushfires.

Table 5-2 – Measured annual average $PM_{2.5}$ concentrations (µg/m³)

Year	D2	D10	Applicable criterion
2013	6	-	NA
2014	6	7	NA
2015	5	6	NA
2016	7	7	NA
2017	5	6	NA
2018	6	6	NA
2019	11	15	NA

A summary of historical annual average TSP results from the BCC monitoring network are provided in ***Table 5-3*** below. Monitoring locations are shown on ***Figure 5-2***. Measured levels include TSP from all mining and non-mining sources, including extraordinary events such as bushfires and dust storms.

Table 5-3 – Measured annual average TSP concentrations (µg/m³)

Year	Dawtrey	D10	Hill Street	Applicable criterion
2013	30	32	-	90
2014	35	40	-	90
2015	28	31	-	90
2016	32	37	-	90
2017	30	37	26	90
2018	43	37	32	90
2019	56	49	51	90

A summary of historical annual average Depositional Dust results from the BCC monitoring network are provided in ***Table 5-4*** below. Monitoring locations are shown on ***Figure 5-2***. Measured levels include dust from all mining and non-mining sources, including extraordinary events such as bushfires and dust storms.

Table 5-4 – Summary of measured of depositional dust concentrations

Year	A3	C5	D6	D9	D10	N5	F3	Redibar	Sharrock	Hedley	Applicable Criterion
2013	2.0	2.7	2.2	2.4	1.5	1.7	1.7	2.3	1.3	-	4
2014	1.7	1.8	2.3	1.7	1.6	2.0	2.2	1.9	1.3	-	4
2015	1.6	1.4	1.5	1.6	1.4	2.5	1.9	1.8	1.4	-	4

Year	A3	C5	D6	D9	D10	N5	F3	Redibar	Sharrock	Hedley	Applicable Criterion
2016	1.1	1.5	1.4	1.2	1.3	2.0	1.6	1.5	1.4	-	4
2017	1.4	1.1	1.1	1.5	1.3	1.3	1.8	2.0	0.9	1.4	4
2018	2.2	1.2	2.1	1.9	1.7	2.4	1.8	1.3	1.1	1.5	4
2019	2.1	1.5	2.0	2.3	2.0	2.4	2.3	1.7	1.3	1.9	4

In summary, the monitoring of key indicators of particulate matter has shown that existing levels have not exceeded the applicable criteria.

5.2.2 Meteorology

Local environmental conditions with direct implications for air quality management include the prevailing meteorology and location of sensitive receptors in relation to the BCC. The nearest sensitive receptors are predominantly to the west, southwest and south of the BCC.

Meteorological conditions are important for determining the direction and rate at which emissions from activities, such as mining, will disperse. The key meteorological parameters for air quality management are wind speed and wind direction.

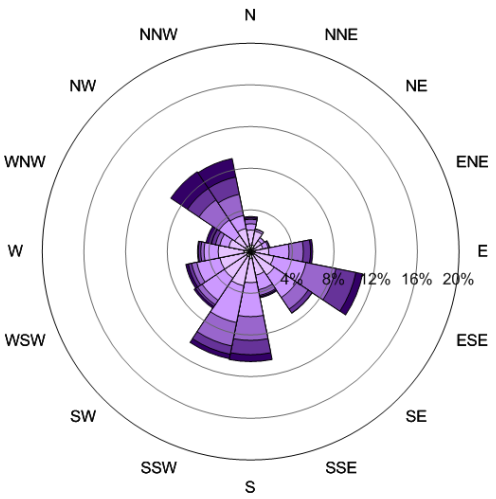
The prevailing winds in the vicinity of the BCC are from northwest, south and southeast. This is demonstrated by the wind-roses shown in ***Figure 5-1*** which summarise the wind data collected at the BCC in 2014 (a representative year).

The meteorological conditions that most commonly lead to elevated dust concentrations include:

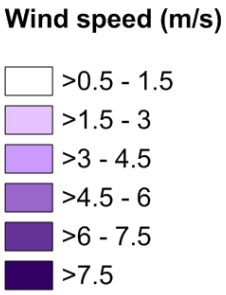
- Warm weather and extended periods without rainfall, resulting in less surface moisture;
- Wind speeds greater than 5 m/s. These winds are conducive to higher wind erosion rates; and
- Stable conditions, such as at night with light winds and when a temperature inversion is present. Under these conditions, plume dispersion is poor and elevated dust concentrations can occur due to mechanically generated emissions.

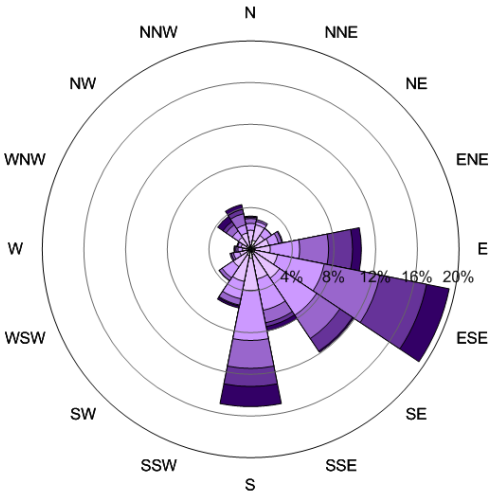
Temperature inversions are most common during the cooler months from May to August. The existing environment is characterised by higher rainfall in summer and lower rainfall in winter.

The most effective emission mitigation measures will focus on controlling emissions under unfavourable meteorological conditions, such as dry, windy, stable night-time conditions and/or when winds are blowing from mining activities towards sensitive receptors.



Annual
Calms = 0.6%





Summer
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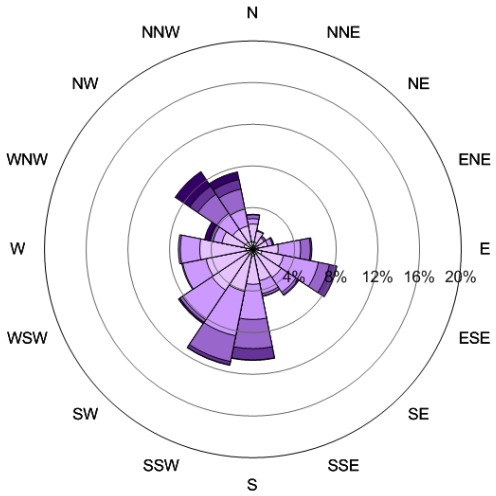

Autumn
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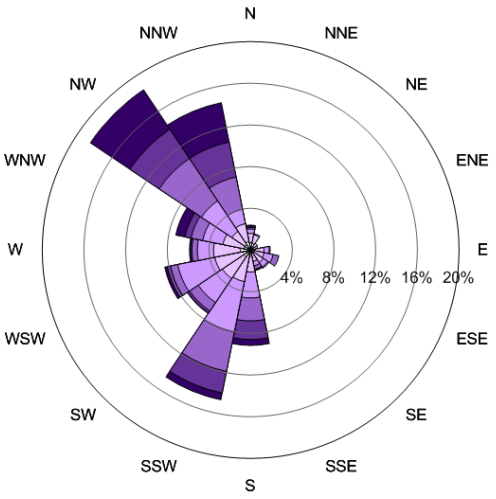

Winter
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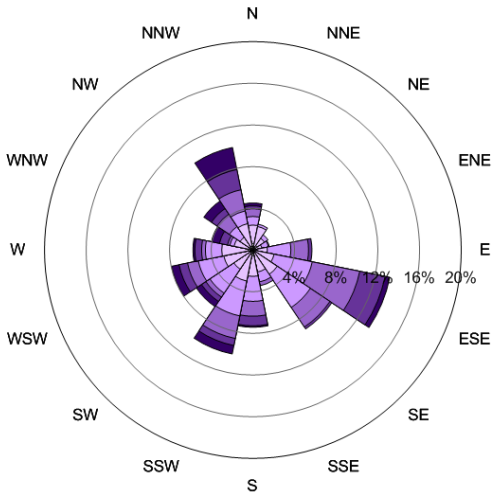

Spring
Calms = 0.3%

Figure 5-1 – Annual and seasonal wind-roses for data collected at the BCC in 2014

5.2.3 Diesel Exhaust Emissions

A diesel combustion emissions baseline for BCC is provided in ***Table 5-5*** and ***Table 5-6***. ***Table 5-5*** provides explicit estimates of PM_{10} and $PM_{2.5}$ due only to diesel plant and equipment exhausts. Emission factors for "Industrial off-road vehicles and equipment" from the EPA's 2008 Air Emissions Inventory (EPA 2012) were used for the calculations. These factors relate to diesel exhaust and evaporative emissions. It is conservative estimate. These estimates are based on generic emission factors for the industry and is not specific to data produced directly from the Original Equipment Manufacturers (OEMs) of equipment.

Table 5-5 – Estimate of PM_{10} and $PM_{2.5}$ emissions from diesel engines

Total fuel used (litres) (based on maximum annual fuel usage between 2015 and 2017) (L/y)	**Emissions factors (kg/kL)**		**Emissions (kg/y)**	
68,061,340	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	2.84	2.75	193,294	187,495

Emissions of NO_x from diesel exhausts have been estimated using fuel consumption data and an emissions factor from the EPA's Air Emissions Inventory (EPA 2012). Estimates are presented in ***Table 5-6*** below.

Table 5-6 – Estimated NOx emissions from diesel exhausts

Item	**Value**
Total fuel used (litres) (based on maximum annual fuel usage between 2015 and 2017)	68,061,340
Diesel exhaust emission factor (kg/kL)	40.77
Diesel exhaust emissions – all equipment (kg/y)	2,774,861

5.3 Impact Assessment Criteria

The relevant air quality impact assessment criteria for residences on privately owned land are presented in ***Table 5-7*** below.

Table 5-7 – Air Quality Criteria

Pollutant	**Averaging Period**	**Criterion**
Particulate Matter <10µm (PM_{10})	Annual	[a,c] 25µg/m^3
Particulate Matter <10µm (PM_{10})	24-hour	[b] 50µg/m^3
Particulate Matter <2.5µm ($PM_{2.5}$)	Annual	[a,c] 8µg/m^3
Particulate Matter <2.5µm ($PM_{2.5}$)	24-hour	[b] 25µg/m^3
Total Suspended Particulates (TSP)	Annual	[a,c] 90µg/m^3

Pollutant	Averaging Period	Criterion
Deposited Dust	Annual	[b]2g/m^2/month [a]4g/m^2/month

Notes:
• [a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
• [b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
• [c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed to by the Secretary.
• 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.

The air quality criteria in ***Table 5-7*** do not apply if the Bulga Coal has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and has advised DPIE in writing of the terms of this agreement.

5.4 Predicted Air Quality Impacts

Properties likely to experience air quality impacts from BOC and BUO were identified in the Bulga Optimisation Project Air Impact Assessment (Pacific Environment Limited, 2013), review of the Bulga Optimisation Project Air Impact Assessment undertaken by Todoroski Air Sciences (2014) and Bulga Coal Complex Modification 3 Air Quality Impact Assessment (Jacobs, 2019).

5.4.1 Bulga Optimisation Project Modification 3 and Bulga Underground Modification 7

Bulga Optimisation Project Modification 3 and Bulga Underground Modification 7 was approved by the Department of Planning, Industry and the Environment in July 2020. The modification generally comprises:

- extension of mining areas to the south and west to access an approximately 63 Mt of additional ROM coal by accessing deeper resources within the approved open cut pit and in the proposed extension area
- realignment of the western highwall to improve long term stability and allow access to additional coal resources
- an additional disturbance of 20.2 hectares (ha) to accommodate the proposed extension of mining areas to the south and west
- re-disturbance and rehabilitation of approximately 200ha of existing immature mine rehabilitation
- removal and relocation of the tailings material currently stored in the existing Tailings Storage Facility (TSF) to the Main Pit TSF. The capacity of the currently approved Main Pit TSF will be expanded to receive the relocated tailings.
- construction of infrastructure associated with the relocation of tailings from the existing Deep Pit and Bayswater Pit tailings facilities and reprocessing infrastructure
- relocation and removal of infrastructure servicing the open cut and Bulga Underground Operations including workshops, gas infrastructure and power generator, electrical sub-station, fuel and oil storage

- continued use of temporary mine infrastructure area (MIA) known as East Pit Muster Area
- construction of new water management structures to manage changes to the site surface water catchments
- the use of all existing or approved infrastructure and mobile equipment with some additions to the existing mobile equipment fleet over the life of the Project
- reprocessing of tailings where practicable. Any reprocessed coal from tailings would form part of the 20Mt of product coal approved from the BCC, and not included in the BOC annual limit of ROM coal mined.

The Air Quality Impact Assessment (Jacobs, 2019) for Bulga Optimisation Project Modification 3 and Bulga Underground Modification 7 identified that annual average PM_{10} concentrations were predicted to exceed the EPA's criterion of 25µg/m^3 (introduced in 2017) at one property, 1A (to the north of BCC), in one or more future years. Property 1A is entitled to voluntary mitigation and acquisition under the Voluntary Land Acquisition Mitigation Policy (VLAMP), based on cumulative PM_{10} levels that are predicted to exceed the 25µg/m^3 criterion in 2022, 2026 and 2031. The predicted contribution from BCC is approximately 7 µg/m^3. Property 1A is also entitled to voluntary land acquisition under the development consent for the Mt Thorley Continuation Project (SSD 6465).

Compliance with the EPA's annual average PM_{10} criterion is predicted at all other private sensitive receptors.

There are no privately owned properties which are predicted to experience exceedances of the PM_{25}, TSP or dust deposition criteria.

5.4.2 Bulga Optimisation Project

The review of the Bulga Optimisation Project Air Impact Assessment (Pacific Environment Limited, 2013) undertaken by (Todoroski Air Sciences, 2014) found that up to two additional days of potential cumulative 24-hour average PM_{10} impact may occur at the receptors to the northeast of the site near the Mount Thorley Industrial Estate. These properties (8, 3, 323, 324 and 325) are entitled to air quality mitigation under development consent ***SSD-4960.*** Air quality mitigation has been installed on properties 324 and 325.

5.4.3 Air Quality Mitigation and Acquisition

Land subject to acquisition and mitigation for air quality impacts is shown in ***Table 5-8*** and ***Table 5-9*** below.

Table 5-8 Land subject to air quality acquisition upon request under SSD-4960

Acquisition Basis	Land
Air	1A[b]

Notes:

[a] To interpret the land referred to in Table 1, see the applicable figure in Appendix 5.

[b] The Applicant is only required to acquire this land if acquisition is not reasonably achievable under the development consent for the Mt Thorley Continuation Project (SSD 6465).

Table 5-9 Land subject to additional noise and/or air quality mitigation upon request upon request under SSD-4960

Mitigation Basis	Residence
Noise and Air Quality	8, 1A
Air Quality	3,323,324,325

Note: To interpret the land referred to in Table 2, see the applicable Figure in Appendix 5.

5.5 Air Quality Risk Register

Air quality assessments undertaken for BCC and subsequent changes to the operation are used to determine the particulate matter risk to sensitive receivers and prioritise dust controls by source.

The top five sources of TSP, PM_{10} and $PM_{2.5}$ emissions for BCC, as identified in the Modification 3 Air Impact Assessment (Jacobs, 2019) are listed in ***Table 5-10***. Air quality management measures targeting these and other activities are documented within ***Section 6***.

Table 5-10 –Top Five Particulate Matter Sources at BCC (Jacobs, 2019)

Ranking	Activity with risk of air quality impacts
1	Hauling overburden to overburden emplacement area
2	Wind erosion in the active pit
3	Wind erosion in the active overburden
4	Wind erosion in the shaped overburden
5	Loading open cut ROM coal from pit to trucks

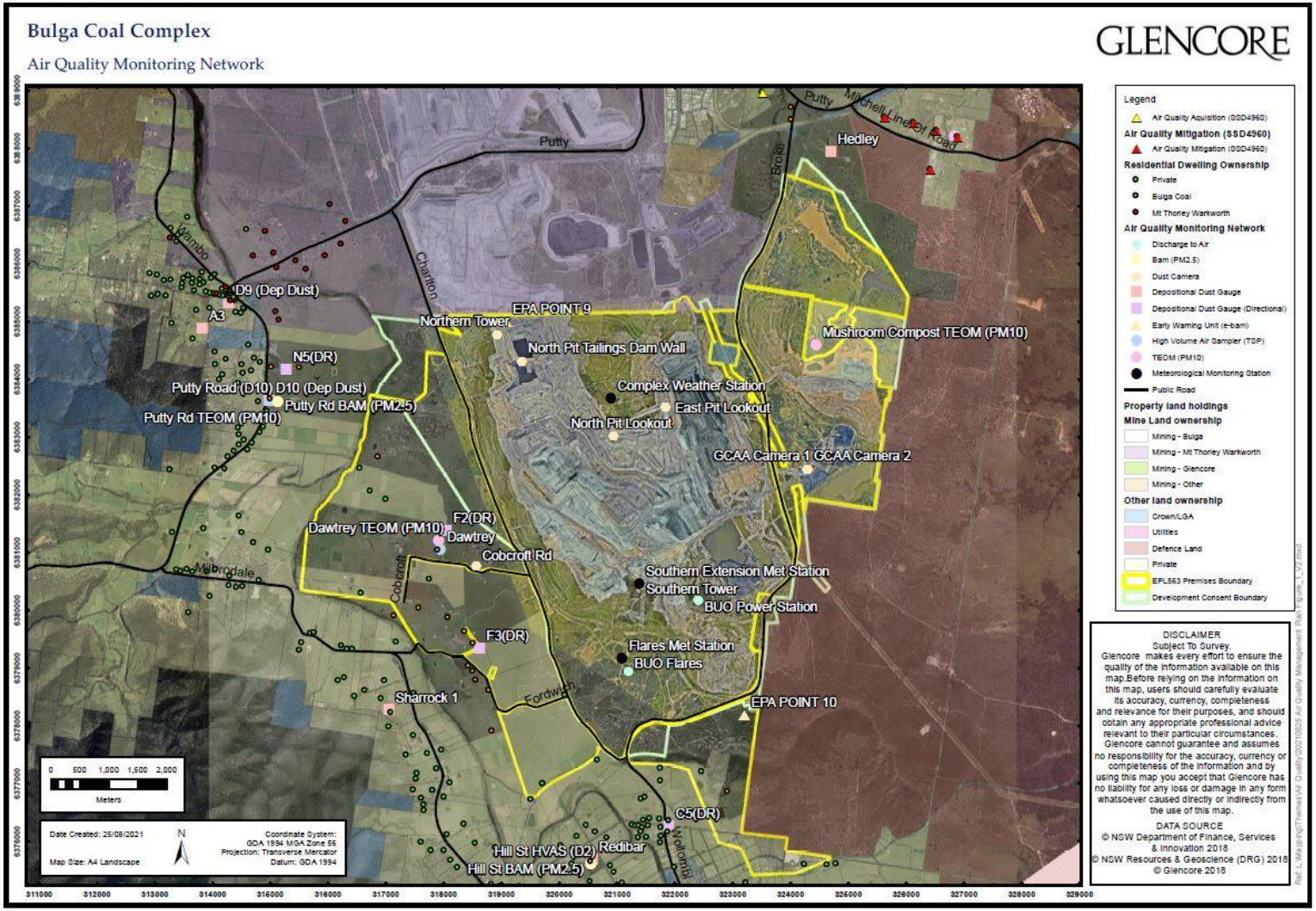

Figure 5-2 – Air Quality Monitoring Network.

6. Implementation

6.1 Dust Management Measures

Bulga Coal will implement the controls in ***Table 6-1***.

Table 6-1 – Source-Specific Air Quality Management Measures Implemented.

Activity / Source:	Management Measures	Source
Unsealed Roads	Watering haul routes	SEE (Umwelt, 2019)
	Restricting vehicle speeds	SEE (Umwelt, 2019)
	Clearly marking haul routes	SEE (Umwelt, 2019)
	Optimising the fleet to reduce vehicle kilometres travelled	SEE (Umwelt, 2019)
	Prompt clean-up of any material spillage	SEE (Umwelt, 2019)
	Avoiding the overwatering of haul roads	AQGGMP
	Visual monitoring and inspections of dust from unsealed roads to determine control effectiveness of the measures applied	AQGGMP
	In the event that road dust is visible and sustained above wheel height truck, operators will call for additional dust suppression until such time that road dust is no longer visible above wheel height.	AQGGMP
	If dust is visible above the tray height for a sustained period, operations will be modified to reduce dust, e.g. by reducing vehicle speed. In the event that the modification of operations does not reduce visible dust below tray height, supervisors will call for additional dust suppression or cease operations until further dust suppression is applied to the roadway.	AQGGMP
	Management measures implemented at BCC to control dust emissions from unsealed roads are documented in the: • BOC Surface Transport Management Plan; and • BOC Operation of Water Cart Procedure.	N/A
Grading Roads	Watering haul routes	SEE (Umwelt, 2019)
	Restricting vehicle speeds	SEE (Umwelt, 2019)
	Clearly marked routes	SEE (Umwelt, 2019)
Exposed Areas - General	Minimising disturbed areas and undertaking timely rehabilitation of disturbed areas	AQGGMP
	Partial rehabilitation/stabilisation to minimise wind erosion from partially rehabilitated dumps	SEE (Umwelt, 2019)
	The management measures implemented at BCC to control dust emissions from exposed areas are documented in the BCC Annual Rehabilitation Plan.	N/A
	Water sprays on ROM coal stockpiles	SEE (Umwelt, 2019)

Activity / Source:	Management Measures	Source
Coal Stockpiles	Minimising drop heights when loading	SEE (Umwelt, 2019)
	Visually monitoring dust emissions from coal stockpiles, including the operation of a dust camera surveillance network	AQGGMP
	Avoiding the double handling of ROM on stockpiles by transferring ROM directly into the plant, where possible	AQGGMP
	The controls implemented to control dust from in-pit stockpiles are included in the BOC Operation of Water Cart Procedure.	N/A
Coal Handling	Water sprays and partial enclosure on the ROM hopper	SEE (Umwelt, 2019)
	Covered/enclosure	SEE (Umwelt, 2019)
	Belt cleaning as required	SEE (Umwelt, 2019)
	Wet suppression around the ROM Hopper	AQGGMP
	Operating water sprays on selected ROM conveyors	AQGGMP
	Full enclosure of the train loading bin, conveyor and transfer chutes	AQGGMP
Dozers or loaders on ROM and product coal stockpiles	Watering travel routes	SEE (Umwelt, 2019)
	Minimising use during dusty conditions	SEE (Umwelt, 2019)
	Reducing travel speed during dusty conditions	SEE (Umwelt, 2019)
Stripping Topsoil by Dozer	Watering haul routes	SEE (Umwelt, 2019)
	Restricting vehicle speeds	SEE (Umwelt, 2019)
Topsoil Stockpiles	Stripping and placing topsoil on shaped areas, with topsoil-related activities ceased when available controls are unable to mitigate impacts due to adverse meteorological conditions	AQGGMP
	Seeding topsoil stockpiles as soon as possible after placement	AQGGMP
	The management measures implemented at BCC to control dust emissions from topsoil stockpiles are documented in the BCC Rehabilitation Strategy.	N/A
Material Extraction and Dumping – General, Truck and Shovel, Loaders	Minimising fall distances during unloading and loading	SEE (Umwelt, 2019)
	Planning dump locations based on weather conditions	SEE (Umwelt, 2019)
	Ceasing operations during adverse dust conditions	SEE (Umwelt, 2019)
	Undertaking sheltered dumping during periods of high winds	AQGGMP
Material Crushing and Screening	Operating automated sprays on crusher systems	AQGGMP
	Minimum partial enclosure of CHPP crushers	AQGGMP

Activity / Source:	Management Measures	Source
Mobile Crushing Units	Fixed dust suppression on all mobile crushing units and a storage tank to supply water to each crushing unit	AQGGMP
	Varying the feed rate of the crushing unit to ensure the dust suppression system is effective for the type of material being crushed	AQGGMP
	Maintaining the height of the product stockpile at a suitable level to minimise the drop height of the product material	AQGGMP
	Minimising the drop height of the raw material into the crushing unit	AQGGMP
	Modifying crushing activities depending on wind direction and speed. If unable to control, ceasing crushing activities during high winds	AQGGMP
Dozer Operations	Minimising dozer travel speed in dusty conditions	AQGGMP
	Cessation or modification of dozer operations, where necessary, during adverse weather conditions in accordance with the BOC Air Quality Management Procedure	AQGGMP
Scraper Operations	Avoiding using scrapers at wind exposed areas during dry, windy conditions	AQGGMP
	Visually monitoring dust levels from scraper operations, and modifying or ceasing operations when elevated dust levels are observed to occur	AQGGMP
	Using water trucks to suppress dust on scraper travel roads and work areas	AQGGMP
Blasting Operations	Watering of blast areas prior to the loading of shots to suppress the dispersion of fine and dry material and form crusting on drill hole cuttings	AQGGMP
	Pre-blast check including review of meteorological conditions	SEE (Umwelt,2019)
	Using stemming material in overburden blasts	AQGGMP
	The management measures implemented at BCC to control dust emissions from blasting are documented in the BOC Blast Management Plan, BOC Blast Design Procedure and BOC Blast Clearance and Firing Procedure.	N/A
Drilling Operations	Dust curtains	SEE (Umwelt, 2019)
	Water injection and application of water to drill cuttings upon removal	SEE (Umwelt, 2019)
	Stopping drilling operations if the dust suppression system is inoperable or dust is visible above the drill deck level for a sustained period in accordance with the BOC Dust TARP	SEE (Umwelt, 2019)
	Water spraying of drill pads during drilling	AQGGMP
Rail Loading Operations	Use of efficient load profiling systems to achieve streamlined and consistent coal surfaces within rail wagons	AQGGMP
	Monitoring coal moisture	AQGGMP
	Camera monitoring of the departing loaded trains	AQGGMP
	Spraying of loaded wagons	AQGGMP

Bulga Coal will also use a range of proactive and reactive dust control strategies informed by real-time dust and meteorological monitoring systems. Proactive strategies will include utilising meteorological forecasting to plan activities in advance of potentially adverse conditions. Reactive strategies will include the modification or suspension of activities in response to a series of triggers such as visual conditions, meteorological conditions or elevated ambient air quality conditions.

6.2 Fume Management

Controls implemented at BCC to minimise blast fume are described in the Bulga Open Cut Blast Management Plan. In summary, these include:

- blast design;
- geotechnical investigations;
- explosive product selection and quality;
- minimising the contamination of explosives in blast holes; and
- implementing on-bench practises such as the construction water diversion bunds or drains that minimise the potential for water ingress into blasting areas, drill holes and loaded shots

6.3 Spontaneous Combustion Management

The controls implemented by BCC to manage spontaneous combustion are contained in the Bulga Open Cut Spontaneous Combustion Management Plan. Controls include:

- testing coal to identify coal types with the potential for spontaneous combustion;
- mine design, including production schedules, that consider:
  - current references to any high potential self-heating materials, including all identified spontaneous combustion areas, and marking these areas on a mine plan; and
  - mining methods that assist in eliminating or minimising the development of conditions that can cause spontaneous combustion.
- mining blasted inventory of in-situ carbonaceous material with the potential to self-heat and spontaneously combust within 3 months, where practicable;
- avoiding tipping significant quantities of carbonaceous material over an advancing tip face to reduce the likelihood of self-heating;
- monitoring and managing the underground environment to prevent and mitigate a spontaneous combustion event; and
- inspections and monitoring.

6.4 Greenhouse Gas and Energy Efficiency

Bulga Coal will use a number of measures to minimise greenhouse gas emissions. A summary of the mitigation measures to be implemented at the BCC are outlined below.

6.4.1 Bulga Underground Operations

Measures implemented at Bulga Underground Operations to reduce greenhouse gas emissions include flaring underground goaf drainage gas and operating a gas fired power station. Underground goaf gas is drained and flared to maintain a safe working environment for open cut mining through underground workings.

Gas is pre-drained from the underground workings prior to mining to make underground workings safe for personnel working in the underground mine environment.

The operation of the flares and power station significantly reduce Scope 1 greenhouse gas emissions via the combustion of CH_4 into CO_2.

6.4.2 Improving Diesel use Efficiency

Bulga Coal will implement the following measures to improve diesel use efficiency:

- limiting the length of material haulage routes (where feasible), thus minimising transport distances and associated fuel consumption;
- optimising ramp gradients according to pit geometry parameters;
- using fuel efficient haul trucks;
- monitoring and managing payloads;
- maximising truck payloads;
- improving rolling resistance of haul roads;
- reducing idling times;
- scheduling activities so that equipment and vehicle operation is optimised;
- using fuel efficient equipment;
- through seam blasting;
- developing long, medium and short term operational plans to optimise the recovery of resources;
- preventing the unnecessary water ingress; and
- in-pit servicing.

6.4.3 Minimising Scope 2 Emissions

Bulga Coal will implement the following measures to minimise scope 2 emissions (i.e. emissions from the consumption of purchased electricity emissions):

- using electricity generated from the onsite gas fired power station;
- reducing reject percentage; and
- using high efficiency motors, variable speed drives and optimising motor size load in the coal handling and processing plant.

6.4.4 The Safeguard Mechanism

Bulga Coal is currently subject to the Safeguard Mechanism emissions caps. The Safeguard Mechanism sets a maximum emissions cap (a Safeguard Number) for all Australian facilities that emit over 100,000 tonnes CO_2-e per year. If an Australian facility exceeds its Safeguard Number, it is nominally required to offset its exceedance by surrendering Australian Carbon Credit Units (ACCU) to the Clean Energy Regulator (CER).

A Safeguard Number of 3,099,839t CO_2-e for 2019-2020 is currently set for BOC and BUO, as a combined facility. Bulga Coal aims to manage greenhouse gas emissions from the combined facility below this Safeguard Number.

6.5 Management of Diesel Combustion Emissions

In accordance with development consent ***SSD-4960***, Bulga Coal will ensure that all new 'non-road' mobile diesel equipment used in undertaking the development includes reasonable and feasible diesel emissions reduction technology.

Bulga Coal will maintain emissions reductions components in accordance with manufacturer specifications so they remains fit for purpose over there whole life cycle.

6.6 Trigger Action Response Plans

Bulga Coal implement a Trigger Action Response Plan (TARP) for air quality management (***BULOC-1104430715-5602***). The TARP outlines the system for the proactive and reactive management of dust emissions from BOC activities to prevent potential air quality impacts.

The TARP is informed by visual monitoring, air quality and meteorological monitoring, and meteorological and dust risk forecast systems. The BOC TARP has been provided as ***Appendix B***.

6.7 Awareness and Training

BCC provides training commensurate with the roles and responsibilities of personnel outlined in ***Section 9***. Bulga Coal will provide air quality management training through site "Familiarisation Inductions" provided to employees and contractors and issue specific training sessions provided to employees and contractors as required.

Communication sessions and pre-start meetings are will also be used to communicate air quality management responsibilities to BCC employees and contractors.

6.8 Additional Mitigation Upon Request

Upon receiving a written request from the owner of any residence listed in ***Table 5-9,*** Bulga Coal will implement additional air quality mitigation measures (such as air filters, a first flush roof water drainage system and/or air conditioning) at the residence in consultation with the landowner.

If within 3 months of receiving this request from the owner, Bulga Coal and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then BCC may refer the matter to the DPIE for resolution.

6.9 Management of Cumulative Air Quality impacts

Bulga Coal will liaise with the adjacent Mt Thorley mine, where necessary, to manage cumulative air quality management impacts and share air quality data. Mt Thorley mine will also be informed of proposed blasting activities at Bulga Open Cut to minimise cumulative air quality impacts.

6.10 Management of Air Quality Impacts on the Mushroom Composting Facility

The *BULOC-1104430715-5837 Eastern Emplacement Area Air Quality Management Framework* (EEAAQMF) was developed to manage air quality impacts from Bulga Coal on the Mushroom Composting Facility (MCF) in May 2016.

The EEAAQMF was developed by the Eastern Emplacement Area Technical Review Committee (TRC). The TRC consists of an independent chair, Bulga Coal representatives, a Mushroom Composter representative, an air quality expert nominated by the Mushroom Composters and an air quality expert nominated by Bulga Coal.

The EEAAQMF includes a PM10 impact assessment level specific to the Mushroom Composting Facility. The assessment level applies during the MCF approved operating hours.

A real-time air quality monitor at the MCF is used to measure PM10 and meteorological conditions at the MCF.

A Trigger Action Response Plan (TARP) is used identify air quality impacts and trigger actions to minimise impacts. Triggers consist of increasing PM10 levels, and increasing wind speeds from Bulga Open Cut toward the MCF. Actions include inspecting activities for visible dust, planning for contingencies and implementing mitigation actions such as additional watering, and reducing, relocating or ceasing activities.

6.11 Consultation

The EEAAQMF Technical Review Committee was consulted on the revision of this plan on 23 October 2020 (***Appendix E***). No comments were received.

7. Measurement and Evaluation

7.1 Monitoring Program

The BCC air quality monitoring network consists of TSP, PM_{10} and $PM_{2.5}$ concentration monitors, dust deposition gauges, and directional dust deposition gauges near the mine and at locations representative of the nearest sensitive receptors.

Meteorological monitoring will be undertaken at three monitoring sites. Bulga Coal will undertake air quality monitoring as per ***Table 7-1*** and at the locations shown in ***Figure 5-2***.

Air quality monitoring will be undertaken in accordance with the relevant Australian Standards and legislation listed in the reference section of this Plan and the EPA's "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales" (DEC, 2007).

Bulga Coal will also operate continuous near real-time PM_{10} monitoring units within the EPL premises boundary at the locations shown on ***Figure 5-2***. The two near-site monitors are not used for assessing

compliance with the Development Consent or EPL criteria, but rather form part of the Air Quality Management TARP and are used to proactively and reactively manage PM_{10} emissions on site and prevent air quality impacts at sensitive receptors. The operation of the real-time monitoring system is described in the Air Quality Management TARP included in ***Appendix B.***

Table 7-1 – Bulga Coal Complex Air Quality Monitoring Network

Site ID	Location (Onsite/ Offsite)	Included in EPL 563 Monitoring Network (Yes/No)	Monitoring Instrument	Parameters Monitored	Units of Measure	Averaging period	Frequency	Sampling Method
A3, C5 (DR[1]), D6, D9, D10, N5 (DR[1]), F3 (DR[1]) Redibar, Sharrock, Hedley, F2 (DR[1])	Offsite	No	Depositional Dust Gauge	Dust deposition, Directional dust deposition	g/m²/month	Month, annual.	Monthly (30 days ± 2)	AM-19
D10, Dawtrey, Hill St	Offsite	No	HVAS[4]	TSP Matter	µg/m³	24 hour, annual	24 hours, every 6 days	AS/NZS 3580.9.3:2003
Putty Rd, Dawtrey, Hill St, Mitchell Line Road, Mushroom Composters	Offsite	No	TEOM[5]	PM_{10}	µg/m³	Continuous	Continuous	AS3580.9.8-2008
Hill St, Putty Rd	Offsite	No	BAM[6]	$PM_{2.5}$	µg/m³	Continuous	Continuous	No NSW EPA approved sampling standard
EPL No. 9, EPL No. 10	Onsite[2]	Yes	E-Bam	PM_{10}	µg/m³	Continuous	Continuous	Special Method 1 – E-Bam Particulate Monitor Operation Manual
Dust cameras	Onsite[3]	No	N/A	Visible particulates	N/A	N/A	As required	N/A

[1] Indicates Directional Depositional Dust Monitor.
[2]Two continuous dust and weather monitoring units operate at Bulga Open Cut to monitor Particulate Matter (PM_{10}) and weather conditions (wind speed and wind direction) at locations within the operational boundary. These monitors are referred to as Early Warning Units and form part of the sites Air Quality Trigger Action Response Plan.
[3] Cameras are located around the operations and are used by the Dispatch personnel to assess dust levels within the operations.
[4] High Volume Air Sampler
[5] Tapered Element Oscillating Microbalance. [6] Beta Attenuation Monitor

7.2 Commissioning of Ventilation Shafts or Power Station

In the event that the Bulga Coal installs a new ventilation shaft at BUO, discharge gases will be analysed within three months of commissioning the shaft, according to the requirements of ***DA 376-8-2003*** Condition 4.27 and the results provided to the EPA.

When Bulga Coal commissions any gas engine within a power generation plant and/or a Ventilation Air Methane (VAM) abatement unit, the discharge gases will be analysed according to the requirements of ***DA 376-8-2003*** Condition 4.28A and the results provided to the EPA.

Details about the parameters for these measurements are included in ***Appendix A***.

7.3 Evaluation of Impacts and Performance

Bulga Coal regularly evaluates the outcomes of the air quality monitoring results to evaluate the success of air quality mitigation measures. The performance of the BCC in relation to air quality management will be evaluated through:

- quarterly monitoring reports, which are made available on the BCC website;
- the EPL Annual return which is submitted to the EPA;
- the Annual Review which is submitted to the DPI&E and relevant agencies;
- undertaking comparisons of monitoring results against the predictions made in the EIS/EA;
- independent environmental audits, which are made available on the BCC website; and
- engaging specialists to undertake independent dust investigations as required (refer ***Section 7.4.2***).

7.3.1 Independent Dust Investigations

If a landowner considers the development to be exceeding the air quality impact assessment criteria and the DPIE Secretary considers that an independent investigation is warranted, then an independent investigation will be undertaken. This will include:

- consulting with the landowner to determine his/her concerns;
- commissioning a suitably qualified, experienced and independent person, approved by the DPIE, to conduct monitoring on the land, to:
- determine whether the development is complying with the relevant impact assessment criteria;
- identify the source(s) and scale of any impact on the land, and BCC's contribution to this impact; and
- provide a copy of the independent review to the Secretary and the landowner.

7.3.2 Notification of Landowners/Tenants

Bulga Coal has notified the relevant owners of land as specified in ***Section 5.4*** that they have the right for Bulga Coal to request additional air quality mitigation measures to be installed at their residence.

Prior to entering into any tenancy agreement for any land owned by Bulga Coal that is predicted to experience exceedances of the prescribed air quality criteria, Bulga Coal will advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled "Mine Dust and You" and advise the prospective tenants

of the rights they have under ***SSD-4960***. Prior notification is also provided to tenants if BCC is predicted to exceed the air quality criteria. Additionally, the standard terms of the GCAA tenancy agreement include the provision that the tenant of any GCAA owned residence can terminate their tenancy agreement without penalty at any time, subject to giving 14 days notice.

As soon as practicable after obtaining monitoring results showing an exceedance of any relevant criteria caused by particulate matter emissions generated by the Bulga mine complex, Bulga will notify the affected landowners and tenants (including tenants of mine-owned land) in the region where the exceedance was recorded. The notification will be made in writing.

Bulga will also provide regular monitoring results to these landowners/tenants until the development is again complying with the relevant criteria andprovide a copy of the NSW Health "Mine Dust and You "fact sheet.

7.3.3 Incident Notification and Reporting

For the purposes of this AQGGMP, an air quality incident is defined as an exceedance of the air quality criteria in ***SSD-4960*** or ***DA 376-8-2003***.

Bulga Coal will notify the DPIE and any other relevant agencies immediately after becoming aware of an air quality incident. Notification will be made in writing to *compliance@planning.nsw.gov.au* and identify the development (including the application number and name) and set out the location and nature of the incident.

7.3.4 Non-compliance Notification and Reporting

Within seven days of becoming aware of a non-compliance, Bulga Coal will notify the DPIE of the non-compliance. The notification will be made in writing to *compliance@planning.nsw.gov.au* and identify the development (including the development application number and name), set out the conditions of the consent that the Development is non-compliant with, why does it not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. .

7.3.5 External Communication, Reporting and Notification

A summary of air quality and greenhouse gas related external communication, reporting and notification is provided in ***Table 7-2***.

Table 7-2 – External Communication and Reporting Requirements

Stakeholder / Regulatory Authority	Reporting Requirement	Description of Report Content	Delivery Schedule
NSW EPA	Annual Return	A statement of compliance with EPL 563, and a monitoring and complaints summary.	Annually
NSW EPA / DPI&E/ NRAR/Resources Regulator/ Singleton Council/ Community Consultative Committee (CCC)	Annual Review	By the end of March each year Bulga Coal will submit an Annual Review that includes: • a review of the air quality monitoring results and complaints; • identification of any air quality non-compliances; • identification of any discrepancies between the predicted and actual air quality impacts; and • a description of the measures that will be implemented to improve air quality performance.	Annually

Stakeholder / Regulatory Authority	Reporting Requirement	Description of Report Content	Delivery Schedule
NSW EPA / DPIE / Public	Environmental Monitoring Reports	A summary of air quality monitoring results and an assessment of compliance with DA/EPL air quality criteria.	Quarterly
NSW EPA / Public	Publication of air pollution monitoring data as required by the *Protection of the Environment Legislation Amendment Act 2011*.	A meaningful summary of the monitoring data on at least a monthly basis as outlined in the EPA requirements; and Information regarding when and to what extent the performance limits specified within the licence were not met and why, when the monitoring data indicates that a limit has been exceeded.	Within 14 days of obtaining the data and/or receiving a written request from the EPA.
Community Consultative Committee (CCC)	Provision of information to the CCC as per development consent conditions.	Provide the CCC with regular information on mine operations and future developments, environmental performance and actions taken to improve environmental performance.	Regularly, as agreed by the CCC.

8. Review and Improvement

This plan was developed in consultation with the EPA and DPIE (DPIE Major Projects Portal). The AQGGMP will be reviewed periodically as required following changes to the sites internal or external context. BCC will review, and if necessary revise the AQGGMP within 3 months of:

- the submission of an annual review;
- the submission of an incident report;
- the submission of an audit report; or
- any modification to the conditions of either consent.

Where this review leads to revisions in the AQGGMP, then within 4 weeks of the review the revised document will be submitted to the Planning Secretary of the DPIE for approval. The objective of the scheduled review process will be primarily to:

- monitor and report on compliance with objectives and targets which cover statutory requirements and other commitments;
- account for changes in environmental requirements, technology or operational procedures; and
- identify opportunities to drive continuous improvement and to reduce the overall risk profile of the operation.

A copy of the current approved version this management plan will be made available on the BCC website.

9. Accountabilities

Role:	Responsibilities:
BOC Operations Manager	Identify and allocate sufficient resources to manage air quality related risks by supporting AQGGMP implementation.
BOC Mining Manager	Oversee the implementation of dust management measures for mining activities.
CHPP Manager	Oversee the implementation of dust management measures at CHPP locations.
Production and Mining Superintendents	Oversee the day to day implementation of dust management measures contained in the mining area.
Open Cut Examiner/Team Leader	Coordinate mining operations to minimise dust generation. Modify operations that are generating excessive dust emissions. Report excessive dust emissions to the relevant Mining or CHPP Manager. Suspend or modify operations when dust suppression systems are not operational or effective. Implement appropriate contingency measures in the event of triggers in the Dust TARP. Team leader/OCE to notify Environment and Community Manager/Officer or Mine Manager about operations that are creating excessive dust or if the measures listed in this AQGGMP are not being implemented or if they are not effective in mitigating air emissions.
Mining and Production Personnel and Contractors	Demonstrate an awareness of dust emission sources and related risks, both generally and specifically in relation to their own site activities. Identify and report incidents involving excessive dust emissions. Implement dust management measures integrated within site operating procedures.
Environment & Community Manager	Oversee the implementation, monitoring and review of the Plan in accordance with applicable legal and other requirements pertaining to air quality. Record, investigate and respond to air quality related incidents and complaints in accordance with site complaint and incident management procedures. Periodically assess dust management performance and review the AQGGMP to reduce the overall risk profile. Provide training to employees and contractors for the implementation of dust management related controls, systems and procedures. Provide induction programs for employees, contractors and visitors addressing relevant air quality management objectives, hazards, risks, controls, behaviours and consequences of inappropriate behaviour. Consult with affected stakeholders regarding air quality issues; maintaining records of consultation, personnel participating in the consultation and the issues discussed. Report air quality performance as per the Communications and Reporting Schedule outlined in the AQGGMP.

Role:	Responsibilities:
Environment and Community Coordinators/Officers	Have a sound understanding of mine-related dust emission sources and controls. Implement, monitor and review programs, systems and procedures linked to the AQGGMP, including the Dust Monitoring Program, the Dust TARP and air pollution measure control effectiveness monitoring. Monitor and review the data that is being sent to BCCs Environmental Monitoring Database (EMD). Monitor, document and communicate progress against dust management objectives and targets as per the Communication and Reporting Schedule. Review the monitoring reports provided by monitoring contractors to assess compliance with the limits.
Air Quality Monitoring Contractor(s)	Collect, analyse and report air quality related data to BCC Environment and Community personnel in accordance with legislative requirements, Australian Standards and recognised Quality Control Procedures.
Employees and Contractors	Carry out work activities in a manner that minimises dust emissions. Report excessive dust emissions to their supervisor.

10. Document Information

This section includes relevant legislation, standards and other documents referenced in the AQGGMP.

10.1 Related Documents

Related documents, listed in ***Table 10-1*** below, are internal documents directly related to or referenced from this document.

Table *10*-1 – Related documents

Number	Title
GCAA-625378177-9978	*11.0 Environment*
GCAA-625378177-9977	*10.0 Community and Stakeholder Engagement Policy*
GCAA-625378177-10324	*11.10 Air Quality Management Protocol*
GCAA-625378177-10263	*11.01 Real Time Monitoring*
BULOC-699580939-6	*Annual Rehabilitation and Land Management Plan*
BULOC-1104430715-5602	*Air Quality Management Trigger Action Response*
BULOC-1104430715-25226	*Operation of Water Carts*
BULOC-1104430715-287	*Dragline Operation in Adverse Weather*
BULOC-1104430715-317	*Blast Design Procedure*
BULOC-1104430715-25194	*Blast Clearance and Firing Procedure*
BULOC-1104430715-1736	*Operation of Drills Procedure*
BULOC-1104430715-5443	*Train Loading Procedure*
BULCX-2103827161-3082	*Environmental Management Strategy*

10.2 Reference Information

Reference information, listed in ***Table 10-2*** below, is information that is directly related to the development of this document or referenced from within this document.

Table 10-2 – Reference information

Reference	Title
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000 (NSW)*
POEO Act	*Protection of the Environment Operations Act 1997*
POELA Act	*Protection of the Environment Legislation Amendment Act 2011*

Reference	Title
DEC, 2007	Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, December 2007. Department of Environment and Conservation.
EPA, 2016	Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, November January 2016
AS/NZS 3580.1.1:2007	AS/NZS 3580.1.1:2007 Guide to siting air monitoring equipment
AS 3580.10.1-2003	AS 3580.10.1-2003 Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method
AS/NZS 3580.9.3-2003	AS/NZS 3580.9.3-2003 Methods for the Sampling and Analysis of Ambient Air – Determination of Suspended Particular Matter – Total Suspended Particulate Matter (TSP) – High Volume Air Sampler Gravimetric Method
AS 3580.9.6-2003	AS 3580.9.6-2003 Particulate Matter - PM_{10} - high volume sampler with size-selective inlet
AS 3580.9.8-2008	AS 3580.9.8-2008 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM_{10} continuous direct mass method using a tapered element oscillating microbalance analyser
Pacific Environment Limited, 2013	Bulga Optimisation Project Air Impact Assessment
Todoroski Air Sciences, 2014	Bulga Optimisation Project Air Impact Assessment
Jacobs, 2019	Air Quality Impact Assessment, Bulga Coal Complex Modification 3.
Umwelt, 2019	Bulga Optimisation Project Modification 3 and Bulga Underground Modification 7 Statement of Environmental Effects

10.3 Change Information

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in ***Table 10-3*** below. Example detail shown below.

Table 10-3 – Change information

Version	Date	Review team (consultation)	Change Summary
4.0	19 May 2017		Updated Front Page, Header & Footer.
5.0	16/1/2019	S.Wolfenden, Ralph Northey	Change from E-Sampler to E-BAM air quality monitors at EPA Point 9 and 10. Inclusion of new Environmental Protection Licence air quality conditions. Removal of D10 and Dawtrey HVAS (PM10). Inclusion of directional deposition dust gauge F2(DR).
1.0	21/7/2020	S.Wolfenden, J.Caldwell Review by S Lakmaker	Updated for SSD4960 MOD 3 for Bulga Open Cut and DA 376-8-2003 for Bulga Underground Operations. Inclusion of greenhouse gas management measures.

Version	Date	Review team (consultation)	Change Summary
2.0	19/10/2020	Jack Caldwell	No changes were made to document. An adjustment was made to the footer to fix the document properties in sharepoint.
Draft 1 **3.0**	28/05/2021	S.Wolfenden, R.Northey	Appointment of experts letter from DPI&E included in Appendix D. The details of consultation with the Technical Review Committee were included in Section 6.11 Table 6-1 was updated to note the source of the commitment. Section 6.4.3 was updated to specifically note the controls aimed at minimising Scope 2 emissions. A summary of the EEAQMF was included in Section 6.10. The latest modification and predicted impacts were described in Section 5.4.
Draft 2 **3.0**	11/02/2021	Scott Wolfenden	Updated Section 7.3.2 to include notification of landowners/tenants following exceedances of air quality criteria caused by emissions from Bulga Coal Complex.
Draft 3 **3.0**	18/03/2022	Sarah Moore R Northey	In response to a DPIE Request for More Information (RFI) received on 08/03/2022: • Evidence of consultation with the Technical Review Committee has been included in Appendix E. • Section 6.10 has been updated with a hyperlink to the EEAMF, and A.1 in Appendix A has been updated to reference Section 6.10.
3.0	24/03/2022	Sarah Moore Ralph Northey	In response to a DPIE request received on 18/03/2022, Appendix C (DPIE approval letter) was removed. The draft version was also changed to version 3, because within sharepoint, the document was already version 2 (no changes were made when it became version 2, the footer was just fixed). Table 10-3 was updated to reflect this.

10.4 Definitions

Term	Definition
AQGGMP	Air Quality and Greenhouse Gas Management Plan

Term	Definition
BCC	Bulga Coal Complex
BCM	Bulga Coal Management
BOC	Bulga Open Cut
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DA	Development Application
DPIE	Department of Planning, Industry and Environment
Dust	Refers to any particulate matter that can be carried in the atmosphere
EMD	Environmental Monitoring Database
EMS	Environmental Management System
EPL	Environment Protection Licence
GCAA	Glencore Coal Assets Australia
Mtpa	Million tonnes per annum
OEH	NSW Office of Environment and Heritage
PM_{10}	Particulate matter less than 10 micrometres in aerodynamic equivalent diameter
$PM_{2.5}$	Particulate matter less than 2.5 micrometres in aerodynamic equivalent diameter
Sensitive receptor	A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area.
TARP	Trigger Action Response Plan
TSP	Total Suspended Particulates

Appendix A - Air Quality Statutory Requirements

A.1 SSD-4960

<table>
<tr><th>Section</th><th>Condition</th><th>Section Addressed</th></tr>
<tr><td>Schedule 3 Condition 1.</td><td>AQUISITION UPON REQUEST
1. Upon receiving a written request from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and conditions 6 of schedule 4.

Table 1: Land subject to acquisition upon request.
<table>
<tr><th>Acquisition Basis</th><th>Land</th></tr>
<tr><td>Noise</td><td>149, 150</td></tr>
<tr><td>Air</td><td>1A[b]</td></tr>
</table>
Notes

[a] To interpret the land referred to in Table 1, see the applicable figure in Appendix 5.

[b] The Applicant is only required to acquire this land if acquisition is not reasonably achievable under the development consent for the Mt Thorley Continuation Project (SSD 6465).</td><td>Section 6.8</td></tr>
<tr><td>Schedule 3, Condition 2</td><td>ADDITIONAL MITIGATION UPON REQUEST
2. Upon receiving a written request from the owner of any residence on the land listed in Table 1 (unless the landowner of that land has requested acquisition) or Table 2, the Applicant shall implement additional:
(a) noise mitigation measures (such as double-glazing, insulation and/or air conditioning); and/or
(b) air quality mitigation measures (such as air filters, a first flush roof water drainage system and/or air conditioning),
at the residence in consultation with the landowner.

These measures must be reasonable and feasible, and directed towards reducing the noise and/or air quality impacts of the development on the residence.

If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Planning Secretary for resolution.

Table 2: Land subject to additional noise and/or air quality mitigation upon request
<table>
<tr><th>Mitigation Basis</th><th>Residence</th></tr>
<tr><td>Noise and Air Quality</td><td>8, 1A</td></tr>
<tr><td>Noise</td><td>97, 157, 179, 195, 232, 235, 237, 239, 240, 261, 262</td></tr>
<tr><td>Air Quality</td><td>3, 323, 324, 325</td></tr>
</table>
Note: To interpret the land referred to in Table 2, see the applicable figure in Appendix 5.</td><td>Section 6.8</td></tr>
</table>

<table>
<tr><th>Section</th><th>Condition</th><th>Section Addressed</th></tr>
<tr><td>Schedule 3, Condition 16</td><td>16. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the particulate emissions generated by the Bulga mine complex do not exceed the criteria listed in Tables 5at any residence on privately-owned land.

Table 5: Air quality criteria
<table>
<tr><td>Pollutant</td><td>Averaging Period</td><td colspan="2">Criterion</td></tr>
<tr><td>Particulate matter <10µm (PM_{10})</td><td>Annual</td><td colspan="2">[a, c] 25 µg/m^3</td></tr>
<tr><td></td><td>24-hour</td><td colspan="2">[b] 50 µg/m^3</td></tr>
<tr><td>Particulate matter <2.5µm (PM_{10})</td><td>Annual</td><td colspan="2">[a, c] 8 µg/m^3</td></tr>
<tr><td></td><td>24-hour</td><td colspan="2">[b] 25 µg/m^3</td></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td colspan="2">[a, c] 90 µg/m^3</td></tr>
<tr><td>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:
•[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
•[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
• [c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed to by the Secretary.
•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.</td><td>Section 6.1</td></tr>
<tr><td>Schedule 3 Condition 16A</td><td>The air quality criteria in Table 5 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.</td><td>Section 6.3</td></tr>
<tr><td rowspan="4">Schedule 3, Condition 17</td><td>Mine-owned Land
17. The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the Bulga mine complex do not cause exceedances of the criteria in Tables 5, 6 and 7 at any occupied residence on mine-owned land (including land owned by another mining company) unless:
(a) the tenant or 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;</td><td>Section 7.4.3</td></tr>
<tr><td>(b) the tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving 14 days notice;</td><td>Section 7.4.3</td></tr>
<tr><td>(c) air quality monitoring is regularly undertaken to inform the tenant or landowner (if the residence is owned by another mining company) of the actual particulate emissions at the residence; and</td><td>Section 7.4.3</td></tr>
<tr><td>(d) data from this monitoring is presented to the tenant or landowner (if the residence is owned by another mining company) in an appropriate format</td><td>Section 7.4.3</td></tr>
</table>

Section	Condition	Section Addressed
	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 Planning Secretary.	
Schedule 3, Condition 18	**Air Quality Operating Conditions** 18. The Applicant must: (a) implement all reasonable and feasible measures to: (i) minimise odour, fume and particulate matter (including PM_{10} and $PM_{2.5}$) emissions of the development, payment particular attention to minimising wheel-generated haul road emissions; (ii) eliminate or minimise the risk of spontaneous combustion; (iii) improve energy efficiency and reduce greenhouse gas management gas emissions of the development; (iv) minimise any visible air pollution generated by the development; (v) minimise the surface disturbance of the site;	**Section 6.1, Section 6.2** **Section 6.3** **Section 6.4** **Section 6.1, Appendix B** **Section 6.1**
	(b) ensure that all new 'non-road' mobile diesel equipment used in undertaking the development includes reasonable and feasible diesel emissions reduction technology; ;	**Section 6.5**
	(c) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting, predictive 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 consent;	**Appendix B**
	(d) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note c to Table 5above);	**Appendix B**
	(e) minimise the air quality impacts of the development on air quality-affected land referred to in Table 1 for as long as the land remains privately-owned (ie. until it is acquired);	**Section 7.4.3**
	(f) manage activities at the Eastern Overburden Emplacement Area to minimise potential air quality impacts on the mushroom composting facility during its operating hours, to the greatest extent practicable;	**Addressed in the Eastern Emplacement Area Air Quality Management Framework** **Section 6.10**
	(g) use all reasonable efforts to co-ordinate the air quality management at the Bulga mine complex with the air quality management at the Mt Thorley and Warkworth mines to minimise any cumulative air quality impacts; and	**Section 5.5**
	(h) carry out regular air quality monitoring to determine whether the development is complying with the relevant conditions of this consent; and	**Section 7.1**
	(i) regularly assess meteorological and air quality monitoring data and modify operations on the site to ensure compliance with the relevant conditions of this consent to the satisfaction of the Planning Secretary.	**Appendix B**

Section	Condition	Section Addressed
Schedule 3, Condition 22	**Air Quality and Greenhouse Gas Management Plan** 22. The Applicant must prepare a detailed Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	**Table 10.3** **Appendix C**
	(b) be prepared in consultation with the EPA and the Technical Review Committee established in accordance with condition 20, and submitted to the Planning Secretary for approval within 3 months of the approval of Modification 3;	**Appendix D** **Appendix E** **Section 6.11**
	(c) describe the measures that would be implemented to ensure: (i) compliance with air quality criteria and operating conditions of this consent; (ii) best management practice is being employed to: • minimise the developments air quality impacts; • minimise the developments Scope 1 and Scope 2 greenhouse gas emissions; • improve the development's energy efficiency; and	**Section 6.1** **Section 6.1** **Section 6.4** **Section 6.4.2** **Section 6.4.3**
	(d) describe the air quality management system; and	**Section 6.1**
	(e) include an air quality monitoring program, undertaken in accordance with the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007) that: • establishes a diesel combustion emissions baseline; • uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development against the air quality criteria in this consent and guide day to day planning of mining operations; • adequately supports the proactive and reactive air quality management system; • evaluates and reports on: o the effectiveness of the air quality management system; and o compliance with the air quality operating conditions; and • 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; and	**Section 7.1** **Section 5.2.5** **Section 6.5.6** **Appendix B** **Section 6.5.6** **Appendix B** **Section 7.4.6** **Section 7.4.4**
	(f) include detailed measures to manage air quality impacts on the mushroom composting facility, as described in the EEAMF. The Applicant must implement the Air Quality and Greenhouse Gas Management Plan as approved by the Planning Secretary,	**Addressed in the Eastern Emplacement Area Air Quality Management Framework** **Section 6.10**
Schedule 5, Condition 3	**Management Plan Requirements** 3. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data;	**Section 5.2**
	(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria;	**Section 5.1** **Section 5.3**

Section	Condition	Section Addressed
	• the specific performance indicators that are proposed to be used to judge the performance of, or • guide the implementation of, the development or any management measures;	
	(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	**Section 6.1**
	(d) a program to monitor and report on the: • impacts and environmental performance of the development; • effectiveness of any management measures (see c above);	**Section 7.1** **Section 7.4.6**
	(e) a contingency plan to manage any unpredicted impacts and their consequences;	**Section 5.2, Section 6.4.2 and the TARP**
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	**Section 7.3** **Section 7.4.6**
	(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 7.4.5** **Section 7.4.1** **Section 7.4.5** **Section 7.4.5**
	(h) a protocol for periodic review of the plan. Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	**Section 8**
Schedule 5, Condition 4	**Annual Review** 4. By the end of March each year, unless the Planning Secretary agrees otherwise, the Applicant shall review the environmental performance of the development to the satisfaction of the Planning Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the past financial year, and the development that is proposed to be carried out over the next year; (b) include a comprehensive review of the monitoring results and complaints records of the development over the past financial year, which includes a comparison of these results against the: • relevant statutory requirements, limits or performance measures/criteria; • requirements of any plan or program required under this consent; • monitoring results of previous years; and • relevant predictions in the EIS; (c) identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.	**Section 7.4.6**
Schedule 5, Condition 5	**Revision of Strategies, Plans and Programs** 5. Within 3 months of: (a) the submission of an annual review under Condition 4 above; (b) the submission of an incident report under Condition 7 below; (c) the submission of an audit report under Condition 9 below; or (d) any modification to the conditions of this consent (unless the conditions require otherwise),	**Section 8**

Section	Condition	Section Addressed
	the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Planning Secretary. Within 4 weeks of conducting such review, the Applicant must advise the Planning Secretary of the outcomes of the review, and provide any revised documents to the Planning Secretary for review and approval. . Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.	
Schedule 5A, Condition 7	The Applicant may at any time submit revised strategies, plans or programs for the approval of the Planning Secretary. With agreement of the Planning Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.	**N/A**
Schedule 5B, Condition 7	With the approval of the Planning Secretary, the Applicant may integrate any strategy, plan, program, report, review or audit for other components of the Bulga Mining Complex.	**Table 10.3**
Schedule 5C, Condition 7	With the agreement of the Planning Secretary, the Applicant must undertake activities associated with Modification 3 prior to the revision of relevant strategies, plans or monitoring programs, provided the Secretary is satisfied that the activities area appropriately covered by the measures and controls in an existing approved strategy, plan or monitoring program for the development.	**N/A**
Schedule 5, Condition 7	**REPORTING** **Incident Notification** 7. The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of any incident. The notification must be writing to *compliance@planning.nsw.gov.au* and identify the development (including the development application number and name) and set out the location and nature of the incident.	**Section 7.4.4**
Schedule 5, Condition 7A.	Within seven days of becoming aware of non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing to *compliance@planning.nsw.gov.au* and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why does it not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	**Section 7.4.4**
Schedule 5, Condition 8	**Regular Reporting** 8. The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	**Section 7.4.6**
Schedule 5, Condition 10A	**Monitoring and Environmental Audits** Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.	**N/A**

Section	Condition	Section Addressed
	Note: For the purpose of this condition, as set out in the EP&A Act, "monitoring is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.	
Schedule 5, Condition 10B	Noise and/or air quality monitoring under this consent may be undertaken at suitable representative monitoring locations instead of at privately-owned residences or other locations listed in Schedule 4, providing that these representative monitoring locations are set out in the respective management plan's.	**Section 7.1**
Schedule 4, Condition 1	**NOTIFICATION OF LANDOWNERS/TENANTS** 1. Within 1 month of the date of this consent, the Applicant shall: (a) notify in writing the owners of: • the land listed in Table 1 of schedule 3 that they have the right to require the Applicant to acquire their land at any stage during the development and/or request the Applicant to ask for additional noise and/or air quality mitigation measures (whichever is relevant) to be installed at their residence at any stage during the development (if they have not requested acquisition); • any residence on the land listed in Table 2 of schedule 3 that they have the right to request the Applicant to ask for additional noise and/or air quality mitigation measures (whichever is relevant) to be installed at their residence at any stage during the development; and • any privately-owned land within 2 kilometres of the approved open cut mining pit/s that they are entitled to ask for an inspection to establish the baseline condition of any buildings or structures on their land, or to have a previous property inspection report updated; (b) notify the tenants of any mine-owned land of their rights under this consent (see condition 17 of schedule 3); and (c) 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 EIS identify that dust emissions generated by the development are likely to be greater than the relevant air quality criteria in schedule 3 at any time during the life of the development.	**Section 7.4.3**
Schedule 4, Condition 2	2. Prior to entering into any tenancy agreement for any land owned by the Applicant that is predicted to experience exceedances of the recommended dust and/or noise criteria, or for any of the land listed in condition 1 that is subsequently purchased by the Applicant, the Applicant shall: (a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time); and (b) advise the prospective tenants of the rights they would have under this consent.	**Section 7.4.3**
Schedule 4, Condition 3	3. As soon as practicable after obtaining monitoring results showing: (a) an exceedance of any relevant criteria in schedule 3, the Applicant shall notify the affected landowners in writing of the exceedance, and provide regular monitoring results to these landowners until the development is again complying with the relevant criteria; and (b) an exceedance of any relevant air quality criteria in schedule 3, the Applicant shall 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).	**Section 7.4.3**

Section	Condition	Section Addressed
Schedule 4, Condition 4	**INDEPENDENT REVIEW** 4. If an owner of privately-owned land, excluding the mushroom composting facility, considers the development to be exceeding the relevant criteria in schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land. If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant shall: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to: • consult with the landowner to determine his/her concerns; • conduct monitoring to determine whether the development is complying with the relevant criteria in schedule 3; • if the development is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and • in cases where there is an exceedance of any air quality criteria, and more than one mine is responsible for the exceedance, determine the relative share of each mine regarding the impact of the development; and (b) give the Secretary and landowner a copy of the independent review.	**Section 7.4.3**

A.2 EPL 563

<table>
<tr><th>Section</th><th>Condition</th><th>Section Addressed</th></tr>
<tr><td>P1.1</td><td>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.
<table>
<tr><th>EPA Identification No.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location description</th></tr>
<tr><td>9</td><td>Particulate Matter Monitoring</td><td>-</td><td>eBAM Monitor "D9" at coordinates 319066 6384996 (Easting Northing) identified as EPA Point 9 on "Figure 1 EPL563 Premises Boundary" dated 11/6/21.</td></tr>
<tr><td>10</td><td>Particulate Matter Monitoring</td><td>-</td><td>eBAM Monitor "D10" at coordinates 323196 6378178 (Easting Northing) identified as EPA Point 10 on"Figure 1 EPL563 Premises Boundary" dated 11/6/21.</td></tr>
</table></td><td>Section 7.1</td></tr>
<tr><td>O1.1</td><td>Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity.</td><td>Section 6.1</td></tr>
<tr><td>O2.1</td><td>All plant and equipment installed at the premises or used in connection with the licensed activity:
must be maintained in a proper and efficient condition; and
must be operated in a proper and efficient manner.</td><td>Section 6.1</td></tr>
</table>

<table>
<tr><th>Section</th><th>Condition</th><th>Section 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 6.1</td></tr>
<tr><td>O3.2</td><td>All trafficable areas, coal storage areas and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust.</td><td>Section 6.1</td></tr>
<tr><td>O3.3</td><td>All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.</td><td>Section 6.1</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 7.1</td></tr>
<tr><td>M2.2</td><td>Air Monitoring Requirements
Point 9,10
<table><tr><th>Pollutant</th><th>Units of Measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>PM10</td><td>micrograms per cubic metre</td><td>Continuous</td><td>Special Method 1</td></tr></table>Note: For the purpose of condition M2.1, Special Method 1 requires the licensee to undertake the monitoring of PM10 concentrations strictly in accordance with the manufacturer’s operating manual supplied with the continuous monitoring equipment and titled “E-BAM Particulate Monitor Operation Manual E-BAM-9800 Rev M” by Met One Instruments, Inc. (EPA Reference DOC19/970477).</td><td>Section 7.1</td></tr>
</table>

A.3 DA 376-8-2003

<table>
<tr><th>Section</th><th>Condition</th><th>Section Addressed</th></tr>
<tr><td>Schedule 4, Condition 22</td><td>Impact Assessment Criteria
The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are implemented so that particulate matter emissions generated by the Bulga mining complex do not cause exceedances of the criteria listed in Table 3at any residence on privately-owned land.
Table 3: Air quality criteria
<table>
<tr><td>Pollutant</td><td>Averaging Period</td><td colspan="2">Criterion</td></tr>
<tr><td>Particulate matter <10µm (PM_{10})</td><td>Annual</td><td colspan="2">[a, c] 25 µg/m^3</td></tr>
<tr><td></td><td>24-hour</td><td colspan="2">[b] 50 µg/m^3</td></tr>
<tr><td>Particulate matter <2.5µm (PM_{10})</td><td>Annual</td><td colspan="2">[a, c] 8 µg/m^3</td></tr>
<tr><td></td><td>24-hour</td><td colspan="2">[b] 25 µg/m^3</td></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td colspan="2">[a, c] 90 µg/m^3</td></tr>
<tr><td>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:
•[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
•[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
• [c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed to by the Secretary.
•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.</td><td>Section 5.3</td></tr>
<tr><td>Schedule 4, Condition 23</td><td>The air quality criteria in Table 3 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.</td><td>Section 5.3</td></tr>
<tr><td>Schedule 4, Condition 24</td><td>Air Quality Operating Conditions
The Applicant must:
(a) implement best practice air quality management on site, including all reasonable and feasible measures to minimise the off-site odour, fume and particulate matter (including PM_{10} and $PM_{2.5}$) emissions generated by the development, including those generated by any spontaneous combustion;
(b) minimise any visible air pollution generated by the development;
(c) regularly assess meteorological forecasting data and relocate, modify and/or suspend operations to ensure compliance with the relevant conditions of this consent; and
(d) co-ordinate air quality management on site with the air quality management at nearby mines, including the Bulga Mining Complex to minimise the cumulative air quality impacts of the mines,
to the satisfaction of the Planning Secretary.</td><td>Section 6.1, Section 6.2, Section 6.3
Appendix B
Appendix B
Section 6.9</td></tr>
</table>

<table>
<tr><th>Section</th><th>Condition</th><th>Section Addressed</th></tr>
<tr><td>Schedule 4, Condition 24A</td><td>Air Quality & Greenhouse Gas Management Plan
The Applicant must prepare a detailed Air Quality & Greenhouse Gas Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:

(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;
(b) be prepared in consultation with the EPA and submitted to the Planning Secretary for approval by the end of March 2014;
(c) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, including consideration of applying a real-time air quality management system that employs both reactive and proactive mitigation measures;
(d) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site; and
(e) include an air quality monitoring program undertaken in accordance with the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007) that uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development, and includes a protocol for determining exceedances with the relevant conditions of this consent.

The Applicant must implement the Air Quality & Greenhouse Gas Management Plan as approved by the Planning Secretary.</td><td>Appendix C

Appendix D

Section 6.1
Appendix B

Section 6.4

Section 6.6

Appendix B</td></tr>
<tr><td>Schedule 4, Condition 27</td><td>Post Commissioning Report
Within 3 months of commissioning a ventilation shaft discharge vent, the Applicant shall:
(a) carry out ventilation shaft monitoring (by sampling and obtaining results by analysis) of the concentration of each parameter in Table 10, using the specified sampling method; and
(b) submit the results to EPA.
Table 10: Ventilation Shaft Monitoring
<table>
<tr><th>Parameter</th><th>Units of Measure</th><th>Sampling method[1]</th></tr>
<tr><td>Solid Particles</td><td>mg/m^3</td><td>TM-15</td></tr>
<tr><td>Odour</td><td>OU</td><td>OM-7</td></tr>
<tr><td>Velocity</td><td>m/s</td><td>TM-2</td></tr>
<tr><td>Volumetric flow rate</td><td>m^3/s</td><td>TM-2</td></tr>
<tr><td>Temperature</td><td>^{0}C</td><td>TM-2</td></tr>
<tr><td>Moisture</td><td>%</td><td>TM-22</td></tr>
<tr><td>Dry gas density</td><td>Kg/m^3</td><td>TM-23</td></tr>
<tr><td>Molecular weight of stack gases</td><td>g/g.mol</td><td>TM-23</td></tr>
</table></td><td>Section 7.2</td></tr>
</table>

<table>
<tr><th>Section</th><th>Condition</th><th>Section Addressed</th></tr>
<tr><td></td><td>
<table>
<tr><td>Carbon dioxide</td><td>%</td><td>TM-24</td></tr>
<tr><td>Selection of sampling positions</td><td>-</td><td>TM-1</td></tr>
</table>
[1] NSW EPA, 2001, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.
</td><td></td></tr>
<tr><td>Schedule 4, Condition 28</td><td>If the results of the ventilation shaft monitoring are outside the range used in the dispersion modelling study in the EIS as modified by the 2007 SEE, the Applicant shall reassess the odour and dust impacts from the ventilation shafts, and submit the results to EPA.</td><td>Section 7.2</td></tr>
<tr><td>Schedule 4, Condition 28A</td><td>
Post Commissioning Report – Power Generation Plant and VAM Abatement Unit
Within 3 months of commissioning any gas engine within a power generation plant and/or the VAM abatement unit, the Applicant shall:
(a) carry out air emissions monitoring (by sampling and obtaining results by analysis) of the concentration of each parameter in Table 11, for the stack serving each gas-fired engine and the stack serving the VAM abatement unit;
(b) demonstrate compliance with EPA's ground level concentration criteria; and
(c) submit the results to EPA.
Table 11: Power Generation Plant and VAM Abatement Unit Monitoring
<table>
<tr><th>Parameter</th><th>Units of Measure</th><th>Sampling method[1]</th></tr>
<tr><td>Carbon Monoxide</td><td>mg/m^3</td><td>TM-32</td></tr>
<tr><td>Nitrogen dioxide (NO2) or nitric oxide (NO)</td><td>mg/m^3</td><td>OM-11</td></tr>
<tr><td>Volatile organic compounds</td><td>mg/m^3</td><td>TM-34</td></tr>
<tr><td>Volumetric flow rate</td><td>m^3/s</td><td>TM-2</td></tr>
<tr><td>Oxygen</td><td>^0C</td><td>TM-25</td></tr>
<tr><td>Moisture</td><td>%</td><td>TM-22</td></tr>
<tr><td>Dry gas density</td><td>Kg/m^3</td><td>TM-23</td></tr>
<tr><td>Molecular weight of stack gases</td><td>g/g.mol</td><td>TM-23</td></tr>
<tr><td>Selection of sampling positions</td><td>-</td><td>TM-1</td></tr>
</table>
[1] NSW EPA, 2001, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.
</td><td>Section 7.2</td></tr>
</table>

Appendix B - Bulga Open Cut Air Quality Management Trigger Action Response Procedure

BULOC-1104430715-5602 Bulga Open Cut Air Quality Management Trigger Action Response Procedure

Appendix C - DPIE Appointment of Experts

Planning, Industry & Environment

Ralph Northey
Environment and Community Manager
Bulga Coal Management Pty Ltd
Via email: Ralph.Northey@glencore.com.au

16/09/2020

Dear Mr Northey

Bulga Optimisation Project (SSD 4960) & Bulga Underground Operations (DA 376-8-2003)
Appointment of Experts & Mining in the Whybrow Wedge Section of SSD 4960

I refer to the your letter and supporting curriculum vitae's requesting the Planning Secretary's approval of suitably qualified and experienced persons to assist in revising the Rehabilitation Strategy and a number of management plans for the Bulga Optimisation Project (SSD 4960 – Modification 3) and the Bulga Underground Operations (DA 376-8-2003 – Modification 7), in accordance with Conditions 15(a), 22(a), 28(a), 34(a), 42(a) and 56(c) of Schedule 3 of SSD 4960 and Conditions 24A(a), 7G(a) and 32C(a) of Schedule 4 of DA 376-8-2003.

The Department has reviewed the nominations and information provided by Bulga Coal and is satisfied that the experts listed below are suitably qualified and experienced to assist in preparing the revised Rehabilitation Strategy and various management plans.

Accordingly, the Planning Secretary approves the appointment of the following persons to prepare the revised Rehabilitation Strategy and the following revised management plans in accordance with the relevant conditions of SSD 4960 and DA 376-8-2003.

Name	Company	Relevant Plan/ Strategy
Thomas Lewandowski	Enviro Strata Consulting Pty Ltd	Blast Management Plan
Shane Lakmaker	Jacobs	Air Quality and Greenhouse Gas Management Plan
Anthony Marszalek	Hydro Engineering & Consulting Pty Ltd	Water Management Plan
Rebecca Vere	Umwelt	Biodiversity Management Plan
Ben Churcher	Ozark	Heritage Management Plan
Adam Williams	SLR Consulting	Rehabilitation Strategy
Dorian Walsh	Hansen Bailey	Exploration Activities and Minor Surface Infrastructure Management Plan
Tony Welbourne	Global Acoustics	Noise Management Plan

I also refer to your letter and supporting figure requesting the written agreement of the Planning Secretary to commence mining within the Whybrow Wedge section of the recently approved SSD 4960 – Modification 3, prior to the revision and approval of the Noise, Blasting, Water, Air Quality and Greenhouse Gas Management Plans in accordance with Condition 5C of Schedule 5 of SSD 4960.

The Department has reviewed the existing approved Environmental Management Strategy (EMS) for the site and considers that the operational and environmental controls currently being implemented by Bulga Coal as part of the existing approved consent conditions, EMS and associated

management plans would continue to be fit for purpose for undertaking activities within the Whybrow Wedge.

As such, in accordance with Condition 5C of Schedule 5 of SSD 4960, the Planning Secretary agrees that Bulga Coal may undertake approved mining activities within the Whybrow Wedge area prior to revision of the Noise, Blasting, Water, Air Quality and Greenhouse Gas Management Plans required following the approval of Modification 3 to SSD 4960.

For the sake of clarity, I wish to confirm that this approval is limited to the approved surface disturbance area known as the Whybrow Wedge and does not extend to other activities approved under Modification 3. I also note that Bulga Coal must continue to apply and complying with the approved consent conditions, the existing management plans and EMS for the site.

Finally, I would like to take this opportunity to remind you that Bulga Coal is required to submit any revisions of the strategies, plans, and programs required under SSD 4960 – Modification 3 and DA 376-8-2003 – Modification 7 to the Planning Secretary for approval by October 2020 in accordance with Conditions 15 (b) and 22 (b) of Schedule 3, 5 (d) of Schedule 5 of SSD 4960 and Condition 5 (d) of Schedule 6 of DA 376-8-2003.

If you have any questions, please contact Tegan Cole via email at Tegan.Cole@planning.nsw.gov.au.

Yours sincerely

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)
as nominee of the Planning Secretary

Appendix D - EPA Consultation

Our ref: DOC21/742035-3

Ms Melissa Anderson
Energy and Resource Assessments – Planning and Assessment
4 Parramatta Square
PARRAMATTA NSW

Returned via the Major Projects Portal

1 September 2021

Dear Ms Anderson,

Bulga Optimisation Project (Glencore) Air Quality and Greenhouse Gas Management Plan

I refer to your request reminder sent on 25 August 2021 via the Department of Planning, Industry and Environment's Major Projects Portal requesting the Environment Protection Authority (EPA) to review the Bulga Optimisation Project (Glencore) Air Quality and Greenhouse Gas Management Plan (SSD-4960). I apologize for the delay in providing our response.

The EPA encourages the development of such plans to ensure that licensees have determined how they will meet their statutory obligations and designated environmental objectives.

Being a regulatory authority, the EPA's role is to set environmental management objectives rather than being directly involved in the development of strategies to achieve those objectives.

Accordingly, the EPA has not reviewed this management plan.

If you have any questions about this matter, please contact Kasey Williams on (02) 4908 6859 or by email to RegOps.MetroRegulation@epa.nsw.gov.au.

Yours sincerely

STEVEN JAMES
Unit Head Regulatory Operations Metro North
Environment Protection Authority

Phone 131 555
Phone 02 4908 6800
Fax 02 4908 6810
TTY 133 677
ABN 43 692 285 758
PO Box 488G
Newcastle
NSW 2300 Australia
117 Bull St
Newcastle West
NSW 2302 Australia
info@epa.nsw.gov.au
www.epa.nsw.gov.au

Appendix E - Technical Review Committee Consultation

From: Lakmaker, Shane <Shane.Lakmaker@jacobs.com>
Sent: Monday, 26 October 2020 8:33 AM
To: Wolfenden, Scott (Bulga Surface Ops - AU)
Subject: RE: Air Quality Management Plan and Air Quality Management TARP - TRC consultation

External sender
All good from my perspective Scott

Shane

From: Scott.Wolfenden@glencore.com.au <Scott.Wolfenden@glencore.com.au>
Sent: Friday, 23 October 2020 10:57 AM
To: drmush@iinet.net.au; graeme.ross@camm.net.au; Lakmaker, Shane <Shane.Lakmaker@jacobs.com>; David.Rollings@aecom.com
Cc: Ralph.Northey@glencore.com.au
Subject: [EXTERNAL] Air Quality Management Plan and Air Quality Management TARP - TRC consultation

Hi,

As discussed in the meeting, please find attached our revised Bulga Complex Air Quality Management Plan and Air Quality Trigger Action Response Procedure. We have a development consent requirement to consult with the TRC.

There are no material changes to air quality management at the Eastern Emplacement Area. The main changes relate to the inclusion of greenhouse gas mitigation measures and energy efficiency measures.

Could you please review and let me know if you have any comments?

Regards,

Scott

Scott Wolfenden
Environment and Community
Bulga Open Cut