

ASSESSMENT REPORT

Bulga Underground Coal Mine Section 75W Modification (DA 376-8-2003 MOD 4)

1 BACKGROUND

The Bulga Mining Complex is located near Broke in the Hunter Valley, approximately 12 kilometres (km) southwest of Singleton (see Figure 1), and comprises both open cut and underground mining operations. It is owned and operated by Bulga Coal Management Pty Limited (Bulga), a subsidiary of Xstrata Coal Pty Limited.

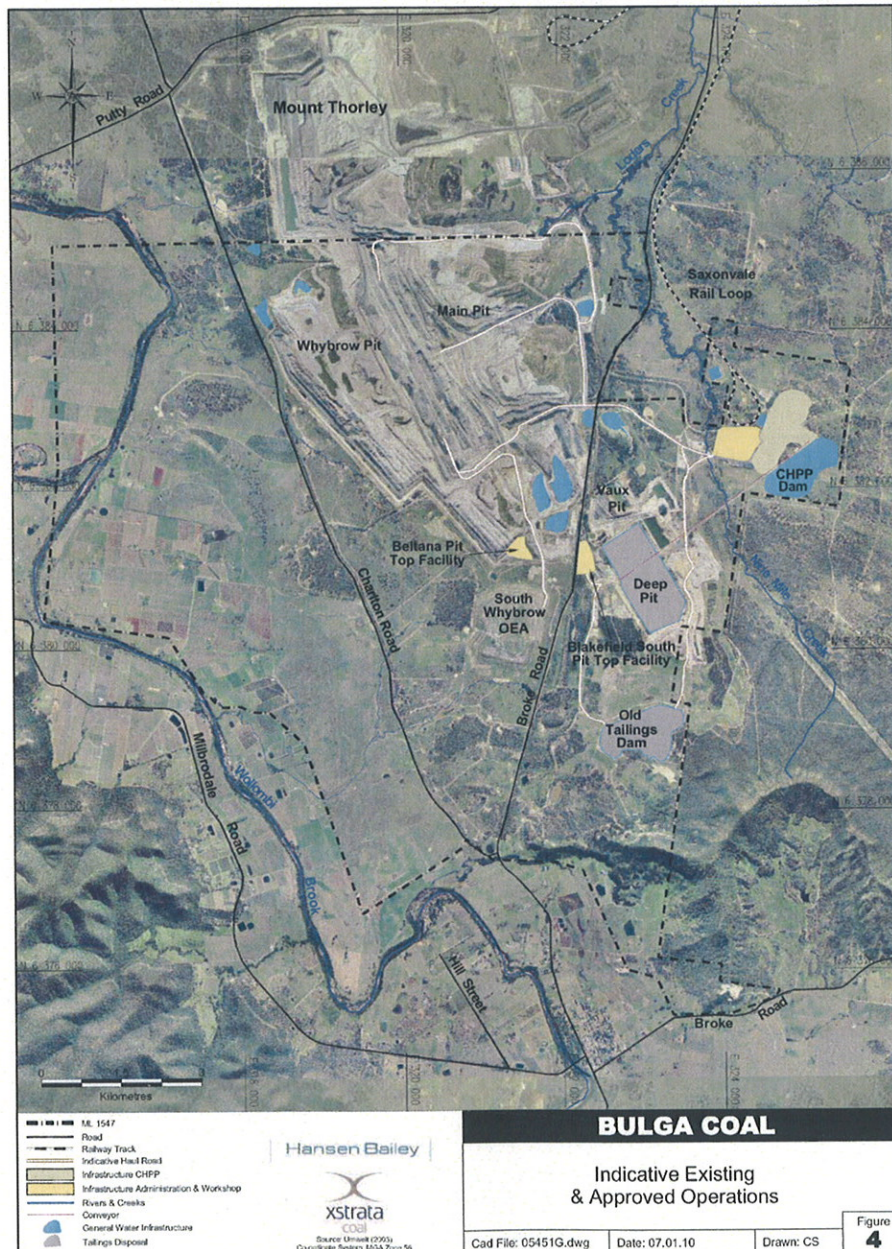


Figure 1: Location of the Bulga Mining Complex

Bulga's underground mining operations (also known as Beltana underground mine) are regulated by a Ministerial development consent (DA 376-8-2003), which was granted on 23 February 2004, and an approval under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (2002/773). Under its Ministerial consent, Bulga is allowed to extract up to 14 million tonnes per annum of run-of-mine (ROM) coal from its underground mining operations, and use the Bulga Coal Surface Operations Coal Handling and Preparation Plant (CHPP) and rail loading facility to dispatch product coal by rail to the Port of Newcastle for export.

2 PROPOSED MODIFICATION & PROJECT NEED

On 12 February 2009, Bulga submitted an application to the Department, seeking to modify the Minister's consent for the Bulga underground mining operations under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Bulga proposes to:

- install and operate 8 gas-fired reciprocating engine electrical generator units generating up to 25 megawatts (MW) of power, and associated infrastructure;
- construct and operate a pilot Ventilation Air Methane (VAM) abatement system; and
- contemporise all noise-related conditions in the consent, so that they reflect current NSW Government policy and take into account additional controls proposed by Bulga to better mitigate and manage its noise emissions.

In order to provide a safe working environment within the underground workings, methane must be drained from the area to be mined. Methane is greenhouse gas which has 21 times the global warming potential of carbon dioxide. The proposed modifications would allow Bulga to capture methane gas to produce electricity and treat a proportion of the methane associated with the mine's ventilation system, thereby reducing the greenhouse gas emissions associated with Bulga's underground mining operations by two separate means. The proposed modifications are described below and shown in Figure 2.

Gas-fired Electrical Generator Units

Up to 8 gas-fired engines generating a combined maximum of 25MW of electrical power are proposed. The generator units are proposed to be located on a cleared site approximately 150 metres (m) to the south of the No. 2 Ventilation Fan site (see Figure 2). Each generator unit would be approximately 24m in length, 4m wide and 12m high at the top of the exhaust stack, with the combined capacity to use approximately 2,250 litres per second of methane gas to generate 25MW of power. The units would be housed in a weatherproof zincaneal enclosure to provide for sound attenuation and security. The methane gas used to power the generators would initially come from both the pre- and post-mining gas drainage systems currently under construction for the approved Blakefield South underground mine and then from the Glen Munro and Woodlands Hill seam as mining progresses (see Figure 3). Electricity produced from the generator units would be used to power some of Bulga's site infrastructure, with surplus electricity fed back into the national power grid. Any methane gas drained from the mine which is in excess of installed generator capacity would be flared by one of the 7 approved flares for the mine (see Figure 2).

The modification also requires construction of additional supporting infrastructure, including:

- a 2.5km gas pipeline to deliver gas to the power generation plant from Bulga's underground operations;
- extension of existing power lines by 3 to 4 poles to transmit electricity from the system;
- a gas monitoring and switch room;
- a control room; and
- two gas treatment plants.

Construction activities for the proposed generation plant and VAM abatement facility would be undertaken over a 26 week period, from 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays. No construction activities would take place on Sundays or public holidays.

VAM Abatement System

Bulga also proposes to install a VAM abatement unit as a pilot to enable sufficient data to be collected to evaluate the greenhouse gas abatement capacity and potential beneficial use of the heat generated. This system would use reverse flow thermal reactor (RFTR) technology for abatement of VAM by oxidising methane associated with the mine ventilation system and converting it to carbon dioxide (CO₂) and water vapour. The VAM abatement system would be located on

previously disturbed land adjacent to the approved Blakefield South Ventilation Fan No. 2 (currently under construction).

Noise Conditions

Bulga proposes to contemporise all noise-related conditions in the consent, in line with the recently approved modification to its open cut consent, so that they reflect current NSW Government policy and take into account additional controls proposed by Bulga to better mitigate and manage its noise emissions.



Figure 2: Location of Proposed Methane Gas Power Generation and Ventilation Air Methane Abatement System Sites

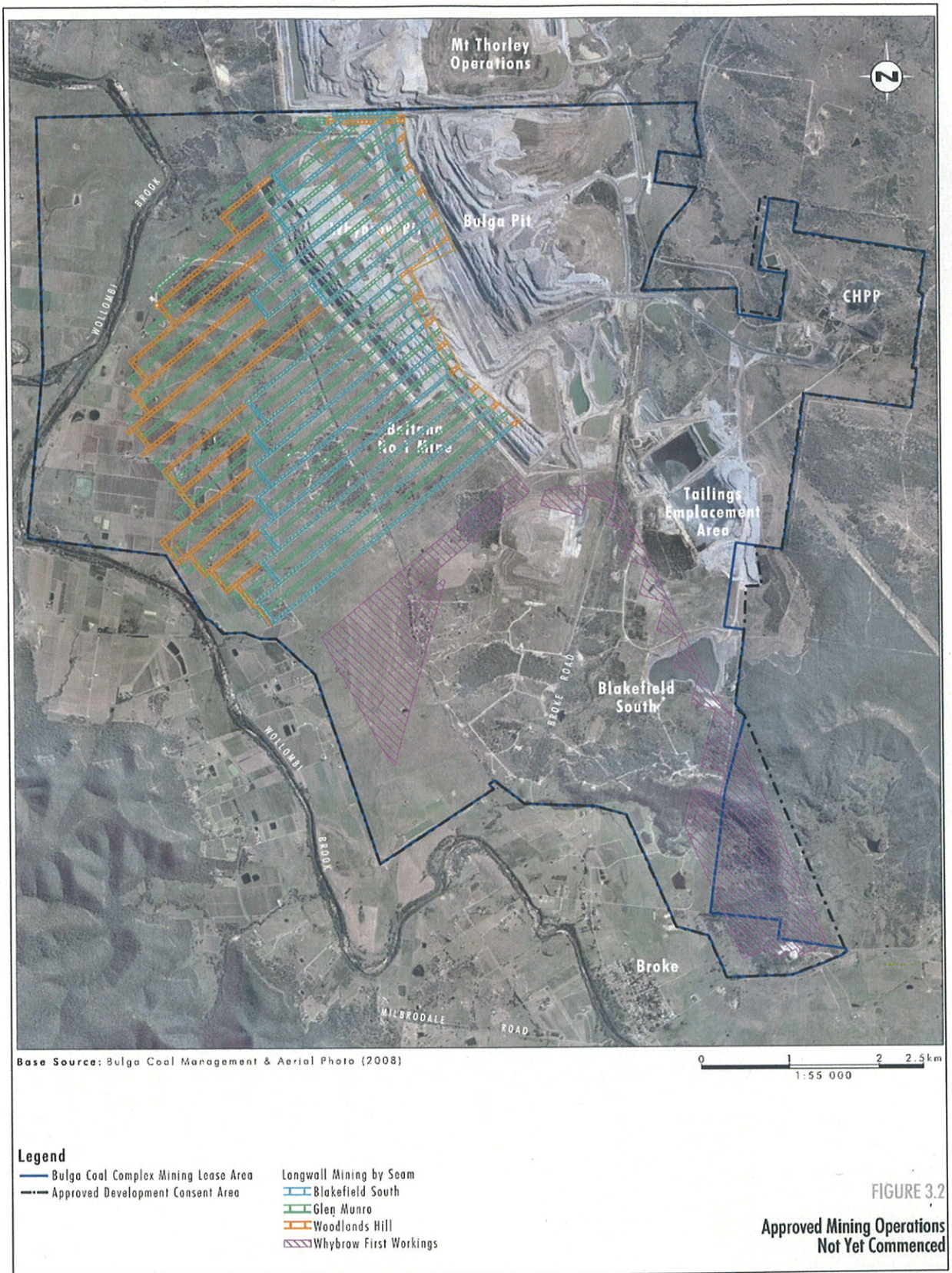


Figure 3: Location of Bulga's Approved Underground Mining Operations

3 STATUTORY CONTEXT

Assessment Process

Under Clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* (as in force at the relevant date), a development consent granted under Part 4 of the EP&A Act may be modified under Section 75W (ie Part 3A) of the EP&A Act, but only if:

- a) *the consent was granted with respect to development that would be a project to which Part 3A of the Act applies but for the operation of Clause 6 (2) (a) of State Environmental Planning Policy (Major Development) 2005, and*
- b) *the Minister approves of the development consent being treated as an approval for the purposes of Section 75W of the Act.*

On 17 March 2009, the Director-General (as delegate for the then Minister) agreed to treat the development consent for Bulga Underground Coal Mine (DA 376-8-2003) as an approval for the purposes of Section 75W of the EP&A Act. Recent amendments to Clause 8J have had the effect of preserving this decision (see Clause 8J(8A)). Consequently, the application for the proposal may be assessed and determined under Section 75W of the EP&A Act.

Consent Authority

The Minister was the consent authority for the original development application, and is consequently the approval authority for this application. However, on 25 January 2010, the Minister delegated his powers and functions as an approval authority to modify certain project approvals under section 75W of the EP&A Act to the Director, Mining and Industry Projects. This modification application meets the terms of this delegation; therefore the Director may determine the application under delegated authority.

Modification

The proposed modification does not involve changes to any of the mine's operating functions or approved extraction volume. Consequently, the Department is satisfied that the proposed modification falls within the scope of Section 75W of the EP&A Act and may therefore be determined.

4 CONSULTATION

Under Section 75W of the EP&A Act the Department is not required to notify or exhibit the application. However, the Department referred the application to the **Department of Environment, Climate Change and Water (DECCW)**, **NSW Office of Water** within DECCW (NOW), **Department of Industry and Investment (DII)** and **Singleton Shire Council (SSC)** for comment. One submission from a community group was also received. A summary of the submissions is provided in Table 1.

Table 1: Summary of Submissions

Entity	Issues Raised
Department of Environment, Climate Change and Water (DECCW)	<ul style="list-style-type: none">Recommended that Bulga provide a quantitative assessment of potential ground level air-quality impacts.Recommended that Bulga consider electricity generation from the proposed VAM plant in its assessment of the proposal.
NSW Office of Water (NOW)	<ul style="list-style-type: none">Noted that the proposal complies with licences issued to Bulga under the <i>Water Act 1912</i>.Recommended that existing conditions of consent be extended to capture the proposal, with any water extraction from underground mine workings as a result of the proposal included to be reported in the annual site water balance.
Department of Industry and Investment (DII)	<ul style="list-style-type: none">No objections.
Singleton Shire Council (SSC)	<ul style="list-style-type: none">No comments.
Hunter Valley Protection Alliance	<ul style="list-style-type: none">Raised concerns about community consultation and cumulative impacts from both the coal mining industry and other industries in the Singleton area.

Bulga has provided responses to the issues raised in submissions. The Department has considered the issues raised, and Bulga's response to these issues, in its assessment of the proposed modification.

5 ASSESSMENT

The Department considers the key environmental issues requiring assessment in respect of the proposed modification are greenhouse gas emissions, noise and air quality impacts. Other issues include potential impacts to visual amenity, flora and fauna, Aboriginal heritage, water resources, traffic and lighting.

Greenhouse Gas Emissions

The GHG assessment indicates that the VAM abatement unit and gas engines would together reduce *direct* (ie Scope 1 and Scope 2) GHG emissions from Bulga's underground operations by a net 4,662kt CO₂-e or approximately 12.5% over the life of the mine. However, there would be no effective reduction in *indirect* GHG emissions. The key sources of *direct* greenhouse gas (GHG) emissions from Bulga's underground mining operations include:

- coal seam methane drained from the coal seam in advance of mining operations, which is currently flared; and
- dilute concentrations of methane in the mine ventilation air, which is currently free vented to the atmosphere.

Scope 1 GHG Direct Emissions

The GHG assessment indicates that installing and operating the VAM abatement unit (assuming 90% availability) would lead to a net reduction in direct GHG emissions by around 45.9kt CO₂-e per day or 827.2kt CO₂-e over the life of the project. This is equivalent to a reduction of direct GHG emissions of approximately 2.2% over the life of the mine. The concentration of methane free-vented to the atmosphere in mine ventilation air would be reduced from an average 0.60% to 0.018%, when treated by the VAM system. However, the pilot RFTR unit would treat only about 2.9% of mine ventilation air. If the unit was to be expanded at a later date, clearly the proportion of direct emissions avoided (2.2%) would increase significantly.

Scope 2 GHG Direct Emissions

Use of the gas engines at full capacity to generate electricity would lead to a net reduction in direct external Scope 2 GHG emissions by 3,898kt CO₂-e over the life of the mine by displacing electricity generated by a coal-fired power plant. This is equivalent to a reduction in direct external GHG emissions of approximately 10.4% (ie nearly 5 x the GHG reduction benefit of the VAM unit). The Bulga mining complex currently uses approximately 23MW of power sourced from the public electricity grid and the group of gas-fired generators has been sized to approximate this power requirement. Hence all electricity generated by the gas-fired generators would be generally consumed by the Bulga complex, which little or no excess to be sold into the public grid.

Scope 3 GHG Indirect Emissions

The proposal would lead to no effective change in Scope 3 (ie indirect) emissions, which are dominated by the downstream burning of product coal. The proposed modification would not increase the total amount of coal to be extracted from the mine. Accordingly, the total GHG emissions resulting from mining and burning this coal would not change over the life of the mine.

The Department therefore considers that the overall impacts from GHG emissions (ie direct and indirect emissions in total) would remain similar over the life of the mine, but with a notable (12.5%) reduction in *direct* GHGs resulting from the pilot VAM abatement system and gas engines. The construction and operation of the pilot VAM abatement system and the installation of gas engines to convert methane into electricity is an important step forward for underground coal mines in NSW, and is strongly supported by the Department.

Noise

The proposal has the potential to generate noise emissions from construction activities, and during the operation of the gas-fired generators and VAM abatement system.

The nearest private residence is located 2.6km west of the proposed power generation and VAM abatement site, with other privately owned residences approximately 2.9km south and southwest of the site (see Figure 4).

The Department recently approved a modification to contemporise all noise-related conditions within Bulga's development consent for its open cut operations (DA 41-03-99 MOD 5), so that they reflect current NSW Government policy and take into account additional controls proposed by Bulga to better mitigate and manage its noise emissions.

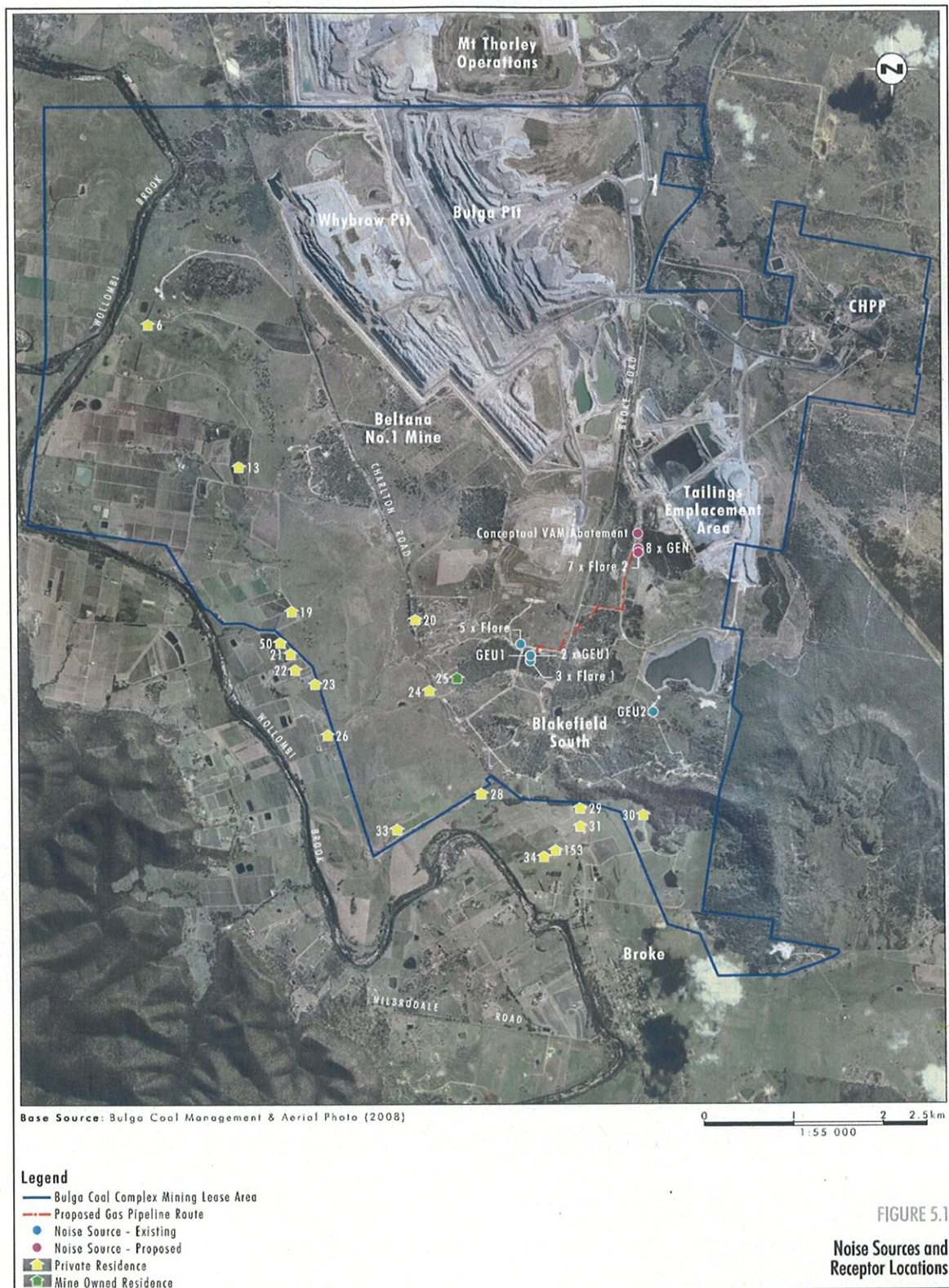


Figure 4: Location of Bulga Mining Complex and Proposed Methane Gas Power Generation and Ventilation Air Methane Abatement System Sites and nearby residences

The company has modelled noise emissions from the entire Bulga mining complex, including contributions from its approved underground mining operations and this proposed modification. The Department is satisfied that noise generated as a result of the proposed modification would not be significant. However, as a part of the approved modification to Bulga's open cut development consent, the Department recommended a comprehensive suite of conditions requiring Bulga to comply with specific noise limits for the mine. That assessment report is able to be viewed at <http://majorprojects.planning.nsw.gov.au/page/determinations/>.

The Department considers it appropriate to incorporate these same noise management conditions into the development consent for Bulga's Underground operations. This would ensure noise from the mine is monitored for the mining complex as a whole, and would enable more effective regulation of noise emissions from Bulga's mining operations.

Accordingly, the Department has recommended a number of conditions to contemporise and expand operational noise controls at the mine, including requiring Bulga to:

- comply with contemporary noise impact assessment criteria;
- undertake additional noise mitigation measures (such as double glazing, insulation and/or air conditioning), at the request of the landowner, on any residence where monitoring indicates that noise limits are being exceeded by between 3 and 5 decibels;
- acquire any property, at the request of the landowner, where subsequent monitoring indicates that the criteria are being exceeded by more than 5 decibels; and
- prepare a detailed Noise Management Plan for the development, which reflects the mitigation and management controls committed to in the EA, and a combination of attended and unattended noise monitoring to demonstrate compliance with noise criteria.

Construction Noise

The assessment included a Construction Noise Assessment undertaken by Global Acoustics Pty Ltd. The assessment adopted a construction noise criterion of 35db $L_{Aeq\ 15\ minute}$ based on a background level of 30db L_{A90} . The noise modelling accounted for construction equipment, atmospheric absorption and ground attenuation. Predicted noise levels at the nearest residential receiver due to construction activities were 27dB, well below the proposal's construction noise criterion.

The Department is satisfied that construction noise impacts from the proposal would not be significant and would not exceed the relevant criterion at nearby residential receivers.

Other Air Quality Issues

Air quality within the area surrounding the Bulga mining complex is influenced by dust emissions from surrounding open cut mining operations. Dust is measured as total suspended particulates (TSP), particulate matter <10 microns in diameter (PM_{10}) and deposited dust. The air quality impacts from the proposed modification are limited to the construction and operation of the gas engines, VAM abatement system and flares. The dust generated by construction would be minimal as the areas to be disturbed are small and the nature of the construction involves little soil disturbance. Bulga has committed to minimising vehicle movements across exposed soils and ceasing construction works (other than operation of spray water vehicles) if excessive dust plumes are generated in windy conditions.

DECCW recommended that Bulga provide a quantitative air quality assessment of potential ground level impacts of emissions from the gas engines. Bulga subsequently provided an Air Quality Assessment (AQA) for the proposal undertaken by PAE Holmes in accordance with DECCW's *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW*.

The AQA contains predictions of emission levels for carbon monoxide (CO), nitrogen oxides (NO_x) and volatile organic compounds (VOC), using local meteorological data and known emission characteristics for gas engines. The primary emission from the proposal is mixed oxides of nitrogen (NO_x). The assessment assumed that 100% of NO_x is comprised of NO_2 , which is considered by DECCW and the Department to be conservative.

The assessment predicted that ground level contaminant concentrations would be below the maximum and cumulative 15 minute, 1 hour and 24 hour criteria for CO , NO_2 and SO_2 , as established by DECCW under the relevant NEPM at all private receptor locations. DECCW's review confirmed these predictions. However, DECCW considered that the emission rate for each engine should be approximately 2.5 times the emission rate used in the assessment. Nonetheless it considered that, even with this correction, there would be minimal risk of adverse impacts at nearby sensitive receptors.

The Department is therefore satisfied that air quality impacts as a result of the proposal would be insignificant. Nevertheless, the Department has recommended a condition requiring Bulga to monitor air emissions from the power generation plant and VAM abatement facility, to demonstrate compliance with DECCW's ground level concentration criteria.

Other Issues

Other environmental issues associated with the proposal are considered in Table 2 below.

Table 2: - Assessment of other issues

ISSUE	POTENTIAL IMPACT AND CONSIDERATION	CONCLUSION
Visual	<ul style="list-style-type: none"> The proposal has the potential to impact on the visual amenity of the area. The components of the proposal, including exhaust stacks, would generally be less than 12m high, with the exception of the works to connect the RFTR to Ventilation Fan No 2 which would be up to 17m high. The EA assessed the visual impacts of the proposal and found that the proposal would generally not be visible from the three nearest private residences, located approximately 2.5km southwest of the project. This is primarily due to an existing tree screen along Broke Road. Views to the north, east and west are limited by mining activities in the immediate area surrounding the proposal. The gas engines and the VAM abatement facility would be partially visible between trees to users of Broke Road, however visual impacts are not predicted to be significant. To minimise visual impacts Bulga proposes to design construction materials to blend with the surrounding environment as far as possible. The Department therefore considers residual visual impacts as a result of the proposed modification to be negligible and able to be managed in accordance with the existing conditions of consent for the mine. 	<ul style="list-style-type: none"> No additional control measures required.
Flora & Fauna	<ul style="list-style-type: none"> The site for the proposed gas engines and the VAM abatement infrastructure has been highly disturbed by previous mine related activities. The alignment of the proposed power line extension is adjacent to the existing construction haul road and has been previously disturbed. Similarly, the location of the proposed pipeline has been previously disturbed by easement clearing and road construction activities. No tree clearing would be required for the proposed modification. However, two small areas, totalling 0.1 hectares (ha), of temporary rehabilitation would be cleared to the north and south of the power generation compound. The assessment indicates that 29 fauna species listed under the <i>Threatened Species Conservation Act 1995</i>, including 15 bird species and 12 mammals, and 2 bird species listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>, potentially occur within the Bulga mining complex area. These species are considered unlikely to be impacted by the proposed modification, as no natural vegetation or hollow bearing trees would be cleared. The Department is satisfied that potential impacts to flora and fauna would be minimal and able to be managed in accordance with the approved Flora and Fauna Management Plan for the mine. 	<ul style="list-style-type: none"> No additional control measures required.
Aboriginal Heritage and Non Aboriginal-Heritage	<ul style="list-style-type: none"> The project area has been previously surveyed for archaeological sites in 1981, 1999 and 2003. The assessment indicates that there are no known items of Aboriginal or non-Aboriginal heritage significance within the VAM abatement system or gas engine sites. These sites have also been highly disturbed by previously approved mine works, road construction and/or easement clearing. Consequently, the Department considers the potential impacts to Aboriginal heritage and non-Aboriginal heritage from the proposal are negligible and can be managed in accordance with Bulga's existing Aboriginal Heritage Management Plan and the existing conditions of consent for the mine. 	<ul style="list-style-type: none"> No additional control measures required.
Water Resources	<ul style="list-style-type: none"> Construction activities would require areas to be cleared, which could cause sediment run-off and siltation of local waterways. To minimise potential impacts to surface water resources, construction activities would be conducted in accordance with Bulga's existing Erosion and Sediment Control Plan. Bulga has also committed to minimising ground disturbance and promptly rehabilitating areas disturbed by the proposal. NOW noted that the proposal complies with licences issued to Bulga under the <i>Water Act 1912</i>. Nevertheless, to satisfy NOW's requirements for reporting on use of extracted water, NOW recommended that existing conditions of consent be extended to capture the proposal, with the reporting of any water extraction from underground mine workings as a result of the proposal then included in the annual site water balance. The Department notes that the existing conditions of consent for the mine require Bulga to re-calculate the site water balance for the development each year, and report the results of this review in its Annual Environmental Management Report. Accordingly, the Department is satisfied that potential impacts to water resources as a result of the proposal are unlikely to be significant and can be managed in accordance with the approved Site Water Management Plan for the mine. 	<ul style="list-style-type: none"> No additional control measures required.
Traffic	<ul style="list-style-type: none"> The proposal has the potential to impact on traffic volumes during construction activities. The assessment indicates that average two-way daily road traffic in the vicinity of Bulga's operations is approximately 380 vehicles per day. 	<ul style="list-style-type: none"> No additional control measures required.

ISSUE	POTENTIAL IMPACT AND CONSIDERATION	CONCLUSION
	<ul style="list-style-type: none"> The assessment found the proposed modification would add an additional 10 light vehicles and 5 heavy vehicle movements per day over the 26 week construction period. Approximately 20 wide, heavy low loads and 20 heavy vehicle movements would also be required to transport the power generators, RFTR and related infrastructure to site. The Department is satisfied that traffic impacts as a result of the proposal are minimal and can be accommodated by the local road network. 	
Lighting	<ul style="list-style-type: none"> Construction activities would not occur at night. Any lighting in the vicinity of the gas engines would be in an area close to the existing mine site. The Department is satisfied that lighting impacts as a result of the proposal would be negligible compared to Bulga's existing operations. 	<ul style="list-style-type: none"> No additional control measures required.

6 RECOMMENDED CONDITIONS

The Department has drafted recommended conditions for the modification, including noise impact criteria. Bulga has reviewed and accepted these conditions.

7 CONCLUSION

The Department has assessed the modification application, EA, submissions on the proposal, and Bulga's response to submissions in accordance with the relevant requirements of the EP&A Act, including the objects of the EP&A Act and the principles of ecologically sustainable development.

Based on this assessment, the Department considers that the proposed modification represents a change that is consistent with the approved development. The assessment has found that the proposed power generation plant and VAM abatement facility would not generate any adverse environmental impacts above and beyond those associated with the approved underground mining operation and would result in a reduction in direct GHGs by around 12.5% over the life of the mine.

The proposal would also contemporise noise management conditions within the development consent and enable Bulga to expand operational noise controls at the mine, to better mitigate and manage its noise emissions and enable better regulation of noise emissions.

Consequently, the Department is satisfied that the proposed modification is in the public interest and should be approved, subject to conditions.

8 RECOMMENDATION

It is RECOMMENDED that the Director, as delegate of the Minister:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modification falls within the scope of section 75W of the EP&A Act;
- **approve** the application under section 75W, subject to conditions; and
- **sign** the notice of modification in Appendix A.

Howard Reed

Howard Reed
Manager
Mining Projects

13.7.10

David Kitto 14/7/10

David Kitto
Director
Mining and Industry Projects