NSW EPA

Your reference:
Our reference: PART 3A DOC12/49090; LIC08/957-05
Contact: Karen Marler (02) 4908 6803

Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

17 DEC 2012

Attention: David Mooney

Dear Mr Mooney

DA 376-8-2003 MOD5, Bulga Underground - Modification 5 - Blakefield North Longwall Modification and Gas Fired Power Plant

I refer to your email of 23 November 2012 and the document titled: *"Environmental Assessment Proposed Modification to DA 376-8-2003 under Section 75W of Part 3A of the EP&A Act 1979 Blakefield North Underground Mine Project"* (the EA) prepared by GSS Environmental and dated November 2012 and requesting comments and recommended conditions of approval from the Environment Protection Authority (EPA) for the proposed project.

The EPA has reviewed the EA, and understands that the proponent is seeking to modify the existing Bulga underground mining operations as follows:

- Realign the longwall layout and extraction width;
- Increased pre- and post-mining gas drainage and associated infrastructure above longwall panels;
- Construction of a gas drainage plant which includes goaf vacuum plant, gas compressors, workshop, offices, hardstand areas, buried pipelines.
- Relocation of 5 goaf extraction unit flares and 5 pre-mining gas drainage flares associated with the Blakefield South Underground Mine will be relocated to the above proposed new gas drainage plant;
- Modified mine ventilation;
- Construction of a power plant generating up to 32 MW of electricity including 5 new gas flares
- On-going exploration activities at Bulga Underground Operations.

The proposed modifications do not change the rate or method of coal extraction or any surface infrastructure for receiving and process the coal.

The EPA provides the following comments and advice in relation to the project. Recommended conditions of approval are provided at **Attachment A**.

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Air Quality

1. **Emissions from the approved 25 MW of gas-fired power generation have not been included in the air impact assessment and the method of transformation from NO to NO_2 has not been specified.**

The maximum predicted 1-hour average nitrogen dioxide (NO_2) concentration is 44% of the assessment criterion which is significant.

Consent modification MOD 4 (July 2010) approved the installation and operation of 8 gas-fired reciprocating engine electrical generation units generating up to 25 MW of electricity from the methane captured by pre- and post-mine drainage of the approved Blakefield South Underground Mine as well as the future Glen Munro and Woodlands Hill seams as mining progresses. Currently 9 MW of plant, including five gas flares has been constructed as a part of the MOD 4 approval.

Despite the potential for the plant associated with the 25 MW of gas-fired electricity generation to be a significant nitrogen oxide (NO_x) emission source, it is not included in the assessment of air emissions from Bulga Underground Operations and the project operations.

The EPA recommends the Air Quality Impact Assessment provided as part of the EA be revised to include all existing, approved and proposed nitrogen oxide emission sources.

The Air Quality Impact Assessment assumes NO_x emissions comprise 20% NO_2 at the emission point. It is not clear what, if any, method was used to further assess the transformation of NO to NO_2 in the atmosphere, as required by the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Approved Methods).

The EPA recommends the Air Quality Impact Assessment be revised to include further detail to clarify the method used to estimate NO_2 impacts. Specifically more detail is required on the method used in the assessment to model the oxidation of NO to NO_2.

2. **The worst case project dust emissions result in only a small increase in cumulative impacts, however cumulative 1-hour average NO_2 impacts are 57% of the assessment criteria**

The dust generated by the Project is estimated to be 0.4% of the dust generated by the three nearby open cut mines of Bulga, Mt Thorley and Warkworth. Consequently the predicted level of impact from dust emissions due to the Project are not expected to be discernable from emissions from other sources (cumulative emissions).

The impact from project and background emissions combined is predicted to be 57% and 17% of the 1-hour and annual average NO_2 assessment criteria.

The EPA is aware that the project will form a part of the existing Bulga Complex licensed premises with existing mining related particulate matter emissions being addressed via the Dust Stop Pollution Reduction Programs.

3. **The Project's extra power generation capacity will exceed the *Protection of the Environment Operations Act 1997* (POEO Act) threshold for general electricity works and will consequently trigger the requirement for load based licensing.**

The Project will add another either 30 MW or 32 MW of gas-fired power generation to the existing approved 25 MW. These operations will consequently fall under the POEO Act scheduled activity of general electricity works. Recommended conditions of approval that include requirements for each emission point associated with each power generation unit are provided at **Attachment A**. An Environment Protection Licence will be required to be issued to authorise both the scheduled development works (the construction of electricity works) and the operation of the electricity works.

Noise Assessment

The EA does not appear to comply with the *New South Wales Industrial Noise Policy* (EPA, 2000) (INP) in its assessment of low-frequency noise or construction noise impacts. The EA assesses low frequency noise against criteria specified by Broner (2010) rather than the procedure used in the INP. The INP procedure is current government policy and should be used to assess the impact of low-frequency noise on sensitive receivers unless it results in perverse environmental outcomes - this approach was agreed with the Department of Planning and Infrastructure in December 2010. The EPA notes that both construction and operational phases of the project will have a significant low-frequency noise component at sensitive receivers as defined in the INP. The *Interim Construction Noise Guideline* (DECC 2009) does not generally apply to mining, therefore the INP criteria apply.

Data provided in the EA indicates that twelve sensitive receivers will experience noise in excess of 5 dBA above the Project Specific Noise Level of $L_{eq(15minute)}$ 35 dBA, and the EPA does not propose to licence these impacts. The Negotiated Agreement provisions of the INP are available to the proponent and the EPA recommends that the most appropriate way to deal with these impacts is by negotiation between the proponent and the affected receivers – a 'Private Negotiated Agreement'. Private Negotiated Agreements may be reached between a proponent and the owners of non-associated sensitive receivers to accept a higher level of noise impact from a proposal. Noise impacts at Private Negotiated Agreement locations should be managed, or agreements administered, through conditions of development consent rather than the premises' Environment Protection Licence but should not result in adverse health impacts. General guidance on Private Negotiated Agreements is provided in the INP.

The EPA is concerned that the choice of two "worst case" vertical well drilling locations appears to have underestimated the noise impact of this activity on sensitive receivers, and that therefore more receivers may be significantly affected than those indicated in the EA. With reference to Figure 8 of the EA, it appears that a number of sensitive receivers will be in close proximity to vertical well and goaf well drilling operations and experience noise impacts of greater than 5 dBA above the PSNL at various stages throughout the life of the project (20 years), as the actual drilling locations are proposed to be distributed across each longwall. The EPA therefore does not expect to be able to licence noise impacts at the following sensitive receivers and recommends that the proponent pursue a Private Negotiated Agreement. Noise impacts at these premises should be regulated through any consent issued for the project: 160 Dwyer, 217A, 217B and 217C Russell, 156A and 156B Todhunter & Brook, 179 Brooks & Thompson, 162 Lamaro, 164 Sharrock, 195 Kennedy, 154 Rath, 169B McCraw, 171 Owens, 151 (Unknown) and 197 (Unknown).

Proposed noise limits are included in the recommended conditions of approval at **Attachment A**.

Meteorological conditions

Noise levels for the project have been predicted for the adverse meteorological condition of temperature inversions up to 3°C per 100 metres.

The noise limits specified at Attachment A will apply under temperature inversions of up to 3°C per 100 metres. For the proponent and the EPA to assess compliance with these noise limits, the proponent will need to implement a method for directly measuring temperature lapse rate. The EPA's preference, as specified in Attachment A, is for this to be calculated as twice the temperature differential over 50 metres vertically, from continuous temperature measurements recorded at 10 metres and 60 metres above the ground level on a fixed tower. Further guidance is provided in Appendix E of the Industrial Noise Policy.

Alternatively, the proponent could provide noise level predictions for the F Class Stability Category, which could be established for compliance purposes from appropriate wind measurements at 10m above ground level and a method such as the sigma theta method.

Please contact me on (02) 4908 6803 if you require any further information regarding this matter.

Yours sincerely

KAREN MARLER
Head Regional Operations Unit – Hunter
Environment Protection Authority

ATTACHMENT A

RECOMMENDED CONDITIONS OF APPROVAL AND LICENCE CONDITIONS FOR BULGA UNDERGROUND COAL MINE MOD 5 – BLAKEFIELD NORTH LONGWALL MODIFICATION AND GAS FIRED POWER PLANT

ADMINISTRATIVE CONDITIONS

Works to be undertaken in accordance with information supplied

1. Except as provided by these recommended conditions of approval, the works and activities shall be undertaken in accordance with the proposal contained in:

   (a) The development application DA-376-8-2003 MOD 5 submitted to the NSW Department of Planning and Infrastructure;
   (b) The document *"Environmental Assessment Proposed Modification to DA 376-8-2003 under Section 75W of Part 3A of the EP&A Act 1979 Blakefield North Underground Mine Project"* prepared by GSS Environmental and dated November 2012

   unless otherwise specified in these conditions of approval.

NOISE CONDITIONS

2. Limit Conditions

2.1 Noise generated at the premises must not exceed the noise limits in the table below. The locations referred to in the table below are indicated by *Figure 2 and Figure 3 in Appendix A, Bulga Coal Complex Pollution Reduction Program Environmental Noise, prepared by Global Acoustics, dated 28 September 2012.*

Receptor ID and Location	NOISE LIMITS dB(A)			
	Day	Evening	Night	
	$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{A1\ (1\ minute)}$
232 Medhurst	39	39	37	45
234 Thompson, 235 Caban, 240 Godyn, 307 Mobberly	38	38	38	45
237 Ryan & Harrison, 239 Waters, 261 Smith, 262 Smith	38	38	37	45
230A Cant, 230B Cant, 233 Vikas	38	38	36	45
191 Robards & Myers, 192 Carr, 193 Britten & Healy, 199 Gould, 225 Harris, 305 Anderson	37	37	37	45

Receptor ID and Location	NOISE LIMITS dB(A)			
	Day	Evening	Night	
	$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{A1\ (1\ minute)}$
241 Kaizer, 243 Neville, 263 Reid, 264 Reid, 265 Turnbull, 266 Hedley & Louis, 267 Powis, 272 Bulga Community Centre Incorporated, 273 Silk, 274 Dragicevic, 275 Dragicevic, 276 Cooke, 277 Grainger, 279 Bendall, 280 Magin, 281 Harris & Ferguson, 283 Saunders, 284 Nichols & Anderson, 288 Ford	37	37	36	45
170 Owens, 184 Esslemont Family Holdings Pty Limited, 226 Vassallo, 228 Lamb, 229 Ritchie, 231 Dawson, 236 Krey, 238 Topham, 242 Bridge	37	37	35	45
83 Nightingale Vineyards Pty Ltd, 85 Towns, 98 Fromberg, 140 Logan, 142B Ewen, 143B Lawson, 165 Garton, 211 Brennan, 213 Icelink Pty Ltd, 214 Sydney Gas Operations Pty Ltd, 221 Brasington, 247 Upward, 285 Harris, 301 Powell & Shannon, 303 McKenzie, 306 Gregory, 311 Mulally McMaugh & Burke, 314 Hanson	36	36	36	45
144 Bevan, 174 Kastelic, 175 Grapemen Holdings Pty Limited, 183 Foster, 185 Poulos, 222 Vassallo, 223 Jackson, 227 Beavis, 244 Caban, 254 Mitchell, 256 Cameron, 286 McLachlan, 287 McLauglin, 289 Pringle, 290 van Rensburg, 291 Adamthwaite, 292 Evans, 293 Gallagher, 294 Brown, 295 Carnevale Testa & Angelatos	36	36	35	45
8 Marland, 82 Mears, 86 Richardson, 97 Lambkin, 126B Coranton Pty Ltd, 132 McLaughlin, 142C Ewen, 190 Gallagher, 198 Orton, 200 Benchoam, 203 Schipper, 206 Helliker, 309 Louis, 316A Caban, 316B Caban, 319A Estvale Holdings Pty Ltd	35	35	35	45

2.2 For the purpose of condition 2.1;

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

2.3 The noise limits set out in condition 2.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Temperature inversion conditions greater than 3°C/100m.

2.4 For the purposes of condition 2.3:

a) Data recorded by the meteorological station identified as Identification Point (to be confirmed by licensee) must be used to determine meteorological conditions ; and
b) Temperature inversion conditions (vertical temperature gradient in degrees C) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 of Appendix E to the NSW Industrial Noise Policy.

2.5 To determine compliance:

a) with the $L_{eq(15\ minute)}$ noise limits in condition 2.1, the noise measurement equipment must be located:
   - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
   - within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
   - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) with the $L_{A1(1\ minute)}$ noise limits in condition 2.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits in condition 2.1, the noise measurement equipment must be located:
   - at the most affected point at a location where there is no dwelling at the location; or
   - at the most affected point within an area at a location prescribed by conditions 2.5(a) or 2.5(b).

2.6 A non-compliance of condition 2.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by conditions 2.5(a) and 2.5(b); and/or
- at a point other than the most affected point at a location.

2.7 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

3. Monitoring Conditions

Meteorological Monitoring

3.1 The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified in condition 3.2.

3.2 For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Point (Point number as per Environment Protection Licence)

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	°C	Continuous	1 hour	AM-4
Wind direction	°	Continuous	15 minute	AM-2 & AM-4
Wind speed	m/s	Continuous	15 minute	AM-2 & AM-4
Temperature lapse rate	°	Continuous	15 minute	Part E2 Appendix E of the NSW Industrial Noise Policy
Rainfall	mm	Continuous	15 minute	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

Requirement to Monitor Noise

3.3 To assess compliance with Condition 2.1, attended noise monitoring must be undertaken in accordance with Conditions 2.5 and:

a) at each one of the locations or at a location representative of the most-affected locations listed in Condition 2.1;
b) occur quarterly in a reporting period;
c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of:

- 1.5 hours during the day;
- 30 minutes during the evening; and
- 1 hour during the night.

d) occur for three consecutive operating days.

4. Reporting Conditions

4.1 Noise Monitoring Report

A noise compliance assessment report must be submitted to the EPA with the Annual Return. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:

a) the results of all quarterly monitoring carried out under the conditions of this licence;
b) an assessment of compliance with noise limits presented in Condition 2.1;
c) measurement and reporting of C-weighted noise levels; and
d) an outline of any management actions taken within the monitoring period to address any exceedences of the noise limits specified in the licence.

Definition of Terms

- NSW Industrial Noise Policy - the document entitled "New South Wales Industrial Noise Policy published by the Environment Protection Authority in January 2000."
- Noise - sound pressure levels.

AIR CONDITIONS

5. Flare related conditions

Location of monitoring/discharge points and areas

5.1 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.

Air

EPA Identification No.	Type of monitoring point	Type of discharge point	Description of location
X (to be specified in the Environment Protection Licence)	Air emissions monitoring	Discharge to air	Enclosed Ground Level Flare as identified in (location reference to be provided by the proponent)
Y (to be specified in the Environment Protection Licence)	Air emissions monitoring	Discharge to air	Enclosed Ground Level Flare as identified in (location reference to be provided by the proponent)

Limit Conditions

6. Combustion Parameters

6.1 For each monitoring/discharge point or utilisation area specified below (by point number), the parameter must be equal to or greater than the limit specified for that parameter in the table:

POINT X, Y

Parameter	Units of measure	Lower Limit	Averaging Period
Residence time	Seconds	0.6	Hourly rolling
Temperature	°C	760	Hourly rolling

6.2 Any flare must have no visible emission other than for a total period of no more than 5 minutes in any 2 hour period.

7 Operating Conditions

Flare

7.1 Any flare must be operated in such a way that a flame is present at all times while air impurities are required to be treated.

8 Monitoring and Recording Conditions

Requirement to monitor combustion parameters

8.1 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:

POINT X, Y

Parameter	Units of measure	Frequency	Sampling method
Volumetric flowrate	cubic metres per second	Continuous	CEM-6
Temperature	°C	Continuous	TM-2

9. Power generation related conditions:

Location of monitoring/discharge points and areas

9.1 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.

Air

EPA Identification No.	Type of monitoring point	Type of discharge point	Description of location
Z (each discharge stack to be identified as a	Air emissions monitoring	Discharge to air	Stack serving each MW power generation unit

point in the Environment Protection Licence)

10. Limit Conditions

Load Limits

10.1 The actual load of an assessable pollutant discharged from the premises during the reporting period must not exceed the load limit specified for the assessable pollutant in the table below.

10.2 The actual load of an assessable pollutant must be calculated in accordance with the relevant load calculation protocol.

Assessable Pollutant	**Load limit (kg)**
Nitrogen Oxides (Air)	(to be determined)

Note: An assessable pollutant is a pollutant which affects the licence fee payable for the licence.

Air Concentration Limits

10.3 For each monitoring/discharge point or utilisation area specified below (by point number), the parameter must be equal to or greater than the limit specified for that parameter in the table:

POINT Z

Pollutant	**Units of measure**	**100 percentile concentration limit**	**Reference conditions**	**Oxygen correction**
Nitrogen Oxides	milligrams per cubic metre	450	Dry, 273 K, 101.3 kPa	3 percent
Volatile organic compounds (VOCs), as n-propane	milligrams per cubic metre	40 mg/m^3 VOCs or 125 mg/m^3 CO	Dry, 273 K, 101.3 kPa	3 percent

11. Monitoring and Recording Conditions

Air Monitoring Requirements

11.1 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:

POINT X, Y

Pollutant	Units of measure	Frequency	Sampling method
Nitrogen Oxides	milligrams per cubic metre	Continuous	CEM-2
Volatile organic compounds (VOCs), as n-propane	milligrams per cubic metre	Yearly	TM-34