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bhpbilliton ILLAWARRA COAL

PRELIMINARY ENVIRONMENTAL ASSESSMENT
Appin Colliery Area 7 - Goaf Gas Drainage Project

December 2008

bhpbilliton ILLAWARRA COAL

Cardno Forbes Rigby Reference: 109033-01 Report 001 Rev 1

CARDNO FORBES RIGBY PTY LTD

PRELIMINARY ENVIRONMENTAL ASSESSMENT

Appin Colliery Goaf Gas Drainage Project - Appin Area 7

Report 001 Rev 1

Final Report
December 2008

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EXECUTIVE SUMMARY

BHP Billiton Illawarra Coal Pty. Ltd. (BHPBIC) holds Consolidated Coal Lease (CCL) 767, which forms part of Appin Colliery. To meet customer requirements BHPBIC intend to mine Appin Area 7 Longwalls 701 – 710 within CCL 767. BHPBIC has Subsidence Management Plan (SMP) approval to mine longwalls 701 to 704 granted by the Department of Primary Industries in December 2006 and is now seeking SMP approval to mine longwalls 705 to 710.

BHPBIC is currently preparing a Part 3A Environmental Assessment for Appin and West Cliff Collieries to ensure relevant planning approval by 1 August 2010 as required by the NSW State Environmental Planning Policy (Major Projects). This is the 'Bulli Seam' major Project.

Part 5(1)(a) of Schedule 1 of the NSW State Environmental Planning Policy (Major Projects) 2005 directs that coal mining activities requiring approval will be determined under Part 3A of the Environmental Planning & Assessment Act 1979. This Preliminary Environmental Assessment (PEA) is the first part of this assessment process.

BHPBIC are seeking approval for works associated with the drainage of goaf gas for Appin Area 7 Longwalls 703-704. Goaf gas is the accumulation of coal seam methane in the area of collapsed rock strata associated with the extraction of coal by the longwall mining method. If unmanaged, goaf gas can enter the ventilation system within the mine and cause safety and operational issues. BHPBIC use plant to draw the goaf gas to the surface to limit the potential for gas build up in the mine ventilation system.

BHPBIC plan to evaluate different management options for the goaf gas. These are:

1. *Ventilation to the atmosphere*
2. *Flaring at the well head or a central location*
3. *Capture and utilisation at the Appin West gas fired power station operated by EDL*

The forthcoming Environmental Assessment (EA) will fully assess all management options that BHPBIC may implement to confirm there will be no significant impacts. However, BHPBIC intend to select a preferred management option prior to the preparation of the EA.

BHPBIC are consulting with landowners in relation to this project. The consultation process will be refined based on the management option chosen as this dictates specifically where works will take place. The EA will describe the consultation process, any feedback and integrate any relevant mitigation measures from the consultation process.

The type and location of the development also influences the applicable Environmental Planning Instruments and state legislation. This PEA identifies the relevant legislative regime and the EA will demonstrate the proposed developments accord with all policies.

The Appin Area 7 goaf gas drainage project is likely to have minimal environmental impacts due to the temporary nature of the works and long-term agricultural landuse of the project area. Notwithstanding this, the EA will investigate the following potential environmental impacts from goaf gas drainage:

- *Greenhouse gas emissions*
- *Air quality*
- *Noise*
- *Aboriginal cultural and European heritage*
- *Flora and fauna*
- *Visual*
- *Waste management*
- *Soil & water*
- *Traffic.*

Specialist consultant reports, such as flora & fauna, noise and Aboriginal heritage, will support the assessments to confirm potential impacts or advise suitable mitigation measures. The EA will discuss the suitability of mitigation measures and confirm those BHPBIC will implement.

BHPBIC have a strong understanding of heritage and flora and fauna impacts in the works area from previous projects. This information will allow many potential environmental impacts to be 'designed out' as the development can avoid significant vegetation and heritage sites.

BHPBIC will implement a health, safety, and environmental management plan. The EA will describe matters for inclusion in these plans.

The BHPBIC "Bulli Seam" Major Project for ongoing mining operations at Appin & West Cliff Collieries will ultimately incorporate the requirements of this application into it. However, this application is necessary to implement the proposed works before mining of longwalls 703 to 704 commences in 2009.

The information provided in this PEA should allow DoP to prepare and release the Director-General's Requirements for the proposal, allowing the EA to be prepared.

1. INTRODUCTION

This section describes the background to the proposal and the reason for change.

1.1. PURPOSE OF APPLICATION

BHP Billiton Illawarra Coal Pty. Ltd. (BHPBIC) is seeking Part 3A approval for surface works and activities related to the drainage of goaf gas from the proposed coal mining of longwalls 703 – 704. These are longwalls located at an approximate depth of 500m below ground level and approximately 6km north-west of the township of Appin. Refer to **Figure 1** that shows a map of the general area of activities described in this report.

At the time of preparing this Preliminary Environmental Assessment (PEA), BHPBIC are reviewing different options for the drainage, collection, distribution and management of goaf gas. This PEA describes the options under selection and identifies associated environmental impacts.

The purpose of this PEA is to advise the Department of Planning (DoP) of the following:

1. General project activities
2. Applicable legislation and planning policies
3. Anticipated consultation requirements and methodology
4. Expected environmental impacts
5. Proposed construction methodology.

The information in this PEA will allow DoP to better understand the scope of the development and review the expected environmental impacts. It will therefore assist the Director-General to issue his requirements for the project. These Director-General Requirement's (DGR's) will further guide the direct of assessments for the project.

BHPBIC have commissioned Cardno Forbes Rigby (Cardno) to prepare this PEA in relation to the proposed goaf gas drainage project.

1.2. BACKGROUND & CONTEXT

This project is an integral aspect of BHPBIC's ongoing mining activities related to the Appin Colliery that forms part of Consolidated Coal Lease (CCL) 767. The drainage of goaf gas is an activity carried out in relation to longwall mining activities. As mining of the longwalls progress the surface gas drainage equipment moves in association.

BHPBIC has conducted detailed environmental and heritage related studies of the area in which the goaf gas drainage surface equipment is proposed through the Appin Area 7 longwalls 701 to 704 Subsidence Management Plan (SMP) which has been granted approval by the DPI on 1 November 2006. BHPBIC has submitted an SMP application for Appin Area 7 longwalls 705 to 710 and is seeking approval to mine these longwalls. The activities proposed in this PEA have direct relation to these Appin Colliery mining works and are required to ensure safety of underground employees and the efficient operation of mining.

For further information on how these activities fit within the Appin Colliery mining works please refer to **Section 2.1**.

CAMPBELLTOWN LGA

WOLLONDILLY LGA

APPIN COLLIERY

WEST CLIFF COLLIERY

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General Location Plan

APPIN GOAF GAS DRAINAGE PROJECT

Legend

- Towns
- Proposed Goaf Gas Works (BHPBIC)
- General Works Area
- Motorway
- Primary Road
- Arterial Road
- Local Roads
- Railway
- Watercourses
- LGA Boundaries
- Appin Mining Lease 767 (BHPBIC)
- Waterbodies
- Appin/West Cliff Surface Lease Boundaries (BHPBIC)

Landuse (ABS)

- Other
- Agricultural/Rural
- Commercial
- Industrial
- Bushland
- Residential

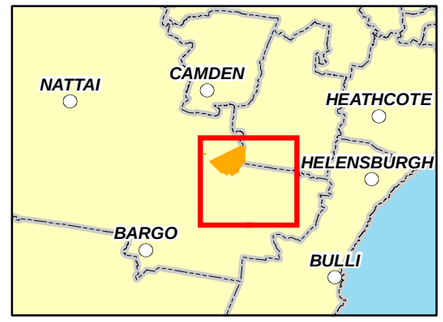


FIGURE 1

N
W E
S

Scale 1:50,000 (at A3)

Metres

0 500 1,000 1,500 2,000 2,500

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 8 December 2008
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109033-01_1802_GeneralLocationPlan.mxd

Data sourced from Department of Lands (LPI) unless otherwise stated.

The works described in this PEA are intended to be for an interim period until the BHPBIC's Major Project application for the continuation of mining operations at the Appin and West Cliff Collieries (commonly referred to as the Bulli Seam Project) is approved in 2010. This is Major Project reference MP 08_0150. DoP rereleased the DGRs for the Bulli Seam Project on the 18 August 2008. BHPBIC are currently preparing the Environmental Assessment report for this project.

The Bulli Seam Project requires extensive environmental assessments and thorough reporting which is a time consuming process. The approval sought in this Major Project application is necessary to meet BHPBICs operational timeframes until determination of the Bulli Seam Project. It is recommended that any requirements of this approval be incorporated into the Bulli Seam Part 3A upon its approval in due course.

1.3. PROJECT OBJECTIVES

This project seeks approval for drilling and surface activities related to the drainage of goaf gas from coal mining. The objectives of this project are:

1. Implement a procedure to safely drain the goaf gas from the underground mining area
2. Safely capture, reticulate and manage the goaf gas
3. Minimise impacts on cultural heritage and the natural and urban environment
4. Minimise greenhouse gas (GHG) emissions.

BHPBIC will work to achieve these objectives whilst understanding that each has various constraints.

1.4. MAJOR PROJECT CLASSIFICATION

This project is classified as a Major Project by Part 5(1)(a) of Schedule 1 of the State Environmental Planning Policy (SEPP) Major Projects 2005 because it is development for the purposes of coal mining. Part 5 of Schedule 1 reads as follows:

5. Mining

1) Development for the purpose of mining that:
   a) is coal or mineral sands mining, or
   b) is in an environmentally sensitive area of State significance, or
   c) has a capital investment value of more than $30 million or employs 100 or more people.
2) Extracting a bulk sample as part of resource appraisal or a trial mine comprising the extraction of more than 20,000 tonnes of coal or of any mineral ore.
3) Development for the purpose of mining related works (including primary processing plants or facilities for storage, loading or transporting any mineral, ore or waste material) that:
   a) is ancillary to or an extension of another Part 3A project, or
   b) has a capital investment value of more than $30 million or employs 100 or more people.

1.5. ANTICIPATED TIMING

BHPBIC aim to implement the project at the earliest opportunity to ensure no impacts on the coal supply chain. **Table 4.1** shows the programme of works and proposed indicative timing:

Table 1.1 – Anticipated Timing of the Part 3A Application

Stage		Due Date
1.	Prepare Preliminary Environmental Assessment	December 2008
2.	Submission PEA to Department of Planning	December 2008
3.	Director-General's Requirements	February 2009
4.	Submission of Environmental Assessment to DoP for Adequacy Review	April 2009
5.	Public Exhibition and Agency Consultation	April 2009
6.	Completion of DoP assessment	June 2009
7.	Minister's Decision	July 2009

1.6. STRUCTURE OF THIS REPORT

The report structure is as follows:

- **Section 2** – explains how the project relates to underground mining and describes the proposed developments
- **Section 3** – reviews planning policies relating to the proposed development
- **Section 4** – details consultation proposals
- **Section 5** – identifies key environmental impacts
- **Section 6** – identifies secondary environmental impacts
- **Section 7** – reviews construction safety
- **Section 8** – concludes the PEA
- **Section 9** – lists the references used in the preparation of this report.

2. PROPOSED DEVELOPMENT

This section explains goaf gas and describes the proposed developments.

2.1. GOAF GAS

BHP Billiton Illawarra Coal Pty Ltd (BHPBIC) currently operates Appin Colliery. This is within Wollondilly Shire local government area (refer **Figure 1**).

BHPBIC carry out underground mining activities within the Appin Coal Lease areas. The mined coal travels on underground conveyors to the Appin pit top prior to processing and transportation to customers. To meet customer requirements, and in accordance with BHPBIC business plan, the extent of coal mining within the lease area gradually increases as the coal is extracted.

Coal mining takes place in parallel sections called longwalls with roadways between each longwall. This process divides the coal seam into a series of parallel blocks, or panels, which are several kilometres in length and 300m in width. A series of roadways allow underground access for mining equipment, services and ventilation. The works area for the developments in this PEA is located above the associated longwall sections (refer to **Figure 2**).

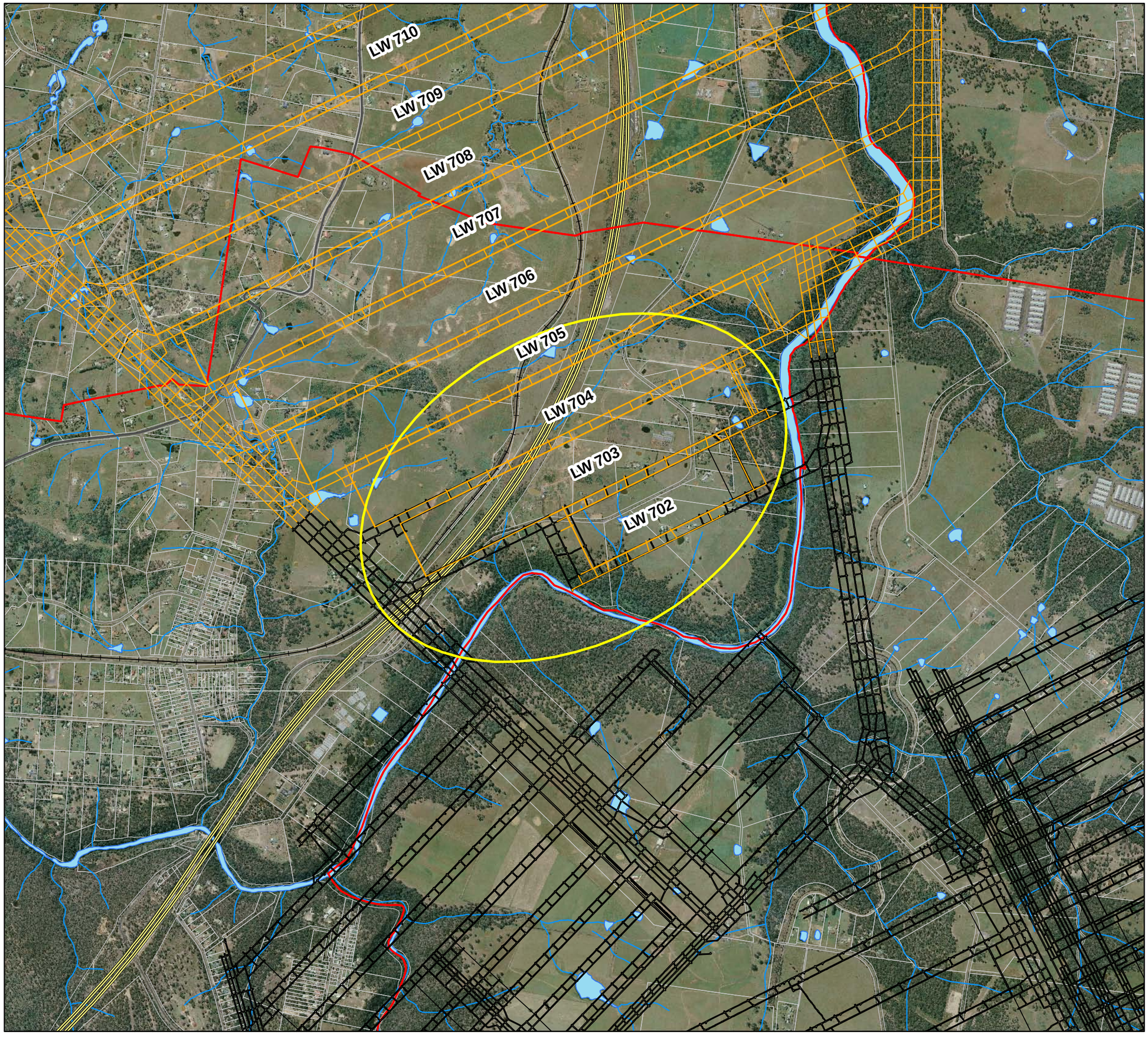
A Longwall Shearer is a cutting machine that extracts coal from the surrounding earth and deposits the material on a conveyor for transport to the pit top. As the Longwall Shearer cuts through the coal seam it uses hydraulic roof supports to prevent tunnel collapse. The rock stratum collapses after the Longwall Shearer mines the coal because the tunnel is no longer required. The goaf is the fallen strata behind the Longwall Shearer. Refer to **Figure 3** for a visual representation of longwall mining.

The coal seam contains methane gas that the Longwall Shearer releases during mining. The fracturing of the earth in the goaf gives rise to the potential for methane to rapidly flow into the mine ventilation system. If the concentration of goaf gas in the mine reaches 5% it forms an explosive mixture.

Every coalmine has to control ventilation methane gas concentration levels in the mine to ensure miners are able to work in a safe and efficient environment. Mining may have to slow or cease in periods of high gas concentrations in the ventilation air if the goaf gas is not adequately controlled.

Every mine has to put in place procedures for controlling the gas concentrations in their ventilation systems. BHPBIC propose to drain goaf gas from the proposed longwall sections of Appin mine by drilling boreholes, called wells, between the goaf and the surface. The goaf gas will be drawn up the boreholes by an extraction plant located on the surface to ensure underground concentrations remain well below 1.25%.

The extraction plant uses a vacuum pump to draw the goaf gas to, and up, the wells thus minimising gas in the goaf from entering the workings in the mine.



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Site Plan

APPIN GOAF GAS DRAINAGE PROJECT

Legend

- Longwall Layout (BHPBIC)
- Western Workings (BHPBIC)
- General Works Area
- Motorway
- Primary Road
- Arterial Road
- Local Roads
- Railway
- Watercourses
- Cadastre
- Waterbodies
- Suburb Boundaries

N
W E
S

FIGURE 2

Scale 1:20,000 (at A3)

Metres
0 250 500 1,000

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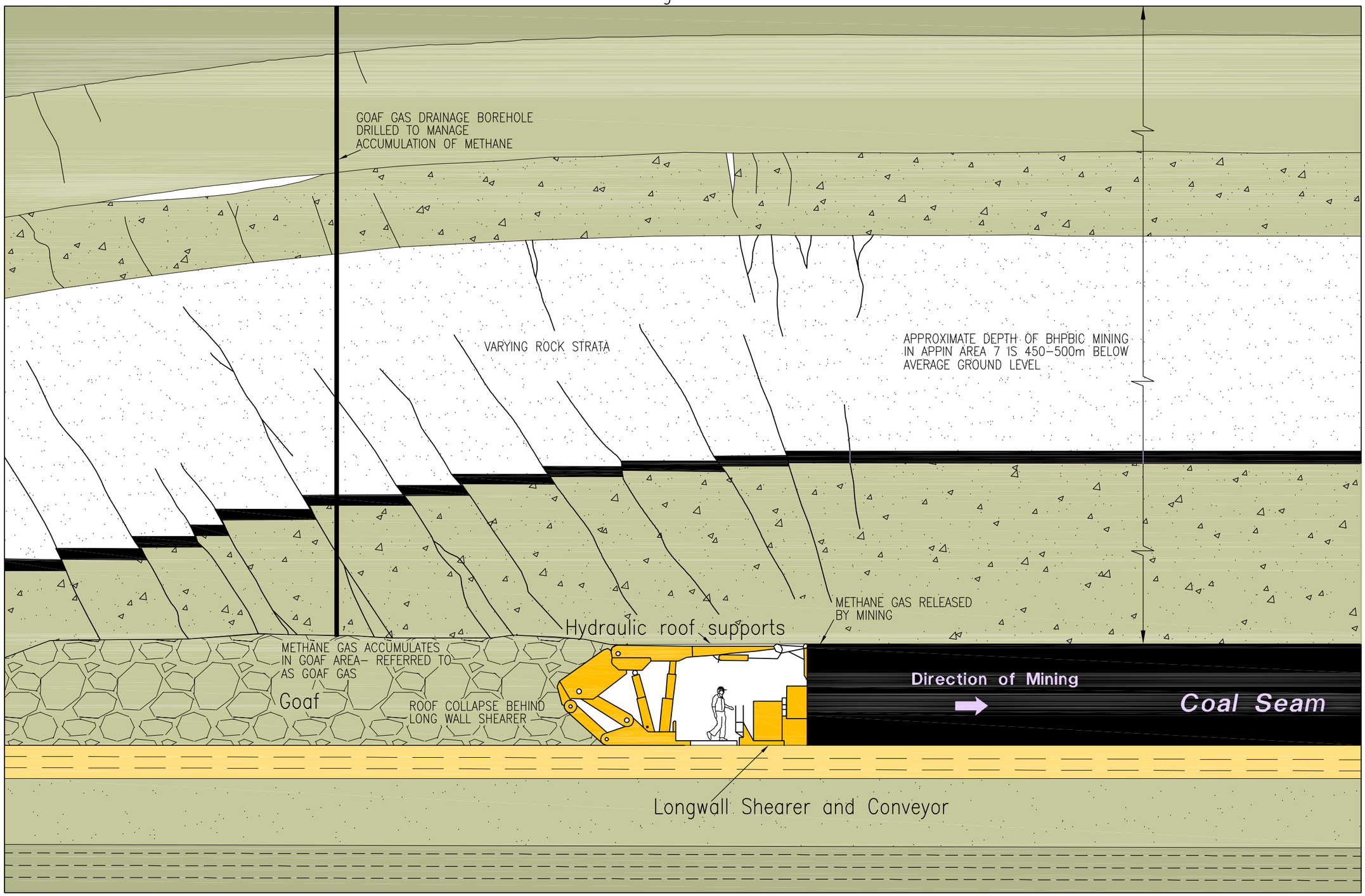
Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 8 December 2008
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109033-01_1801_Site_Plan.mxd

Data sourced from Department of Lands (LPI) unless otherwise stated.
Aerial imagery supplied by BHPBIC

Average Ground Level



Plan based on an MSEC figure &
Hasen Consulting Figure

REV	DATE	BY	APP.	DETAILS

DRAWING STATUS		
DESIGN BY	JAL	02/12/08
DRAWN BY	Sai Ram	02/12/08
DRAFTING CHECK		
DESIGN CHECK		
FINAL APPROVAL		

PRELIMINARY

bhpbilliton ILLAWARRA COAL

SCALE: (on A1 Original) N.T.S.

HEIGHT DATUM AHD

Cardno Forbes Rigby

278 KEIRA STREET, WOLLONGONG, NSW 2500

Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN: 051 074 992

PROJECT TITLE

APPIN GOAF
GAS DRAINAGE PROJECT
for
BHP BILLITON ILLAWARRA COAL

DRAWING TITLE

FIGURE 3
TYPICAL LONGWALL
CROSS SECTION

Project No.	Com No.	Drawing No.	REV
109033	1	1001	0

Figure 4 shows a typical goaf gas extraction plant. This consists of:

- Vacuum pump with electric motor, and inlet/outlet manifolds
- Gas/water separator
- Flow control recirculation
- Discharge gas pipe work to discharge point
- Discharge stack
- Associated diesel powered electricity generator.

Figure 4 – Extraction Plant

The proposed extraction plant will be in a centralised location remote from the individual well heads. The plant may draw gas from multiple wells that are connected by a reticulation system as required by the mining operation. A separate diesel powered electricity generator is necessary to start the plant and provides approximately 175kVA. Experience indicates that this will require filling once a week by a mobile diesel tanker. Alternatively, electrical power may be able to be supplied by existing distribution mains.

BHPBIC will obtain approval from the landowner prior to implementation of the extraction plant and/or well heads. The facilities are temporary and only require a small area that is usually in an open paddock and sited to avoid or minimise environmental impacts.

The facility does not require permanent staff because monitoring and safety systems allow remote operation of the extraction plant via radio communications.

Well flows are variable but BHPBIC expect each well would flow up to 1000L/s of goaf gas for a period of approximately 4-12 weeks. Expected average flow over the life of a well would be around 500L/s. Nominal capacity of the extraction plant is 2000L/s.

2.2. BOREHOLES & WELL HEADS

A borehole connects the longwall goaf to the surface. BHPBIC are considering two types of boreholes (refer to **Figure 5**) for this project:

- Vertical wells – a 250mm borehole drilled vertically from surface level to the goaf
- Medium Radius Drilled (MRD) wells - a 250mm hole, which starts vertically from the goaf and is steered to near horizontal for some distance above the goaf. The MRD hole may have a number of branches to improve gas flow.

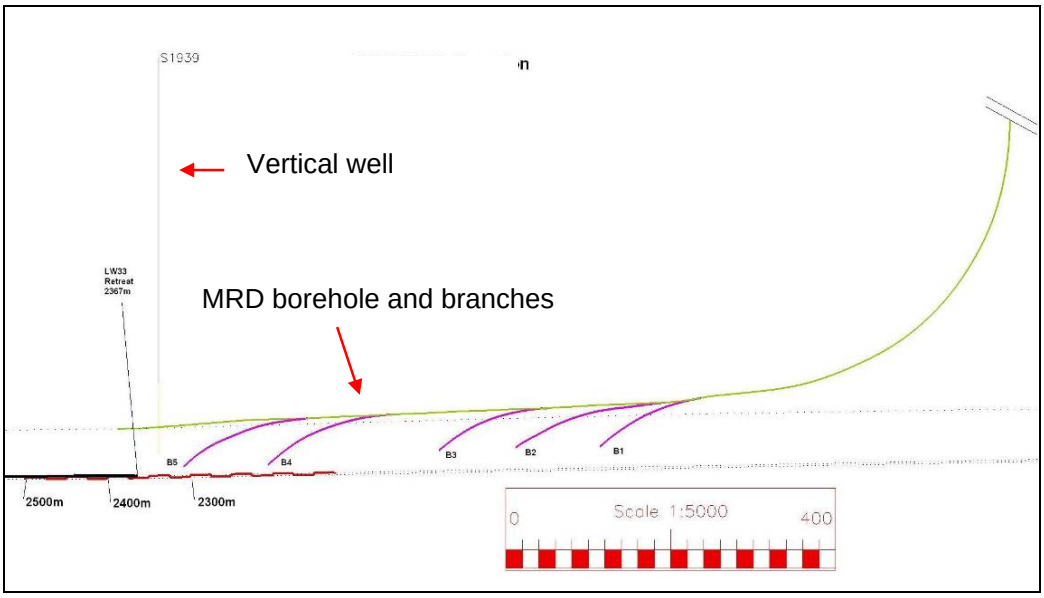


Figure 5 – Example Cross Section of Vertical Well & MRD Borehole

The vertical well is drilled from the surface using a mobile drilling rig. A temporary fence would surround the rig and associated equipment during drilling. Associated equipment includes a rod trailer, pond, compressors, storage shed and toilet. The compound would be approximately 30m x 40m.

Surface to in-seam, medium radius drilled, gas drainage wells have emerged over the past two years as a viable addition or alternative to underground based in-seam drilling in coal mines and vertical well hydro-fracture for coal seam methane exploitation.

The basic MRD well consists of an inclined, medium radius borehole collared at the surface to tangentially intersect the target coal seam and continue in-seam for up to 1000m terminating at the intersection of a previously positioned vertical production well (refer **Figure 5**) (GeoGAS Systems, 2003).

On the surface, the two borehole types appear identical. Each borehole has a well head, this is where the borehole breaks the ground surface (refer to **Figure 6**). The following equipment is proposed for installation at each wellhead:

- Shut off valve
- Non–return valve
- Flame trap
- Gas monitoring fittings
- Flow monitoring fittings
- Polyethylene piping to carry the gas away to the extraction plant
- Fencing to prevent unauthorised access.

Figure 6 – Wellhead Installation

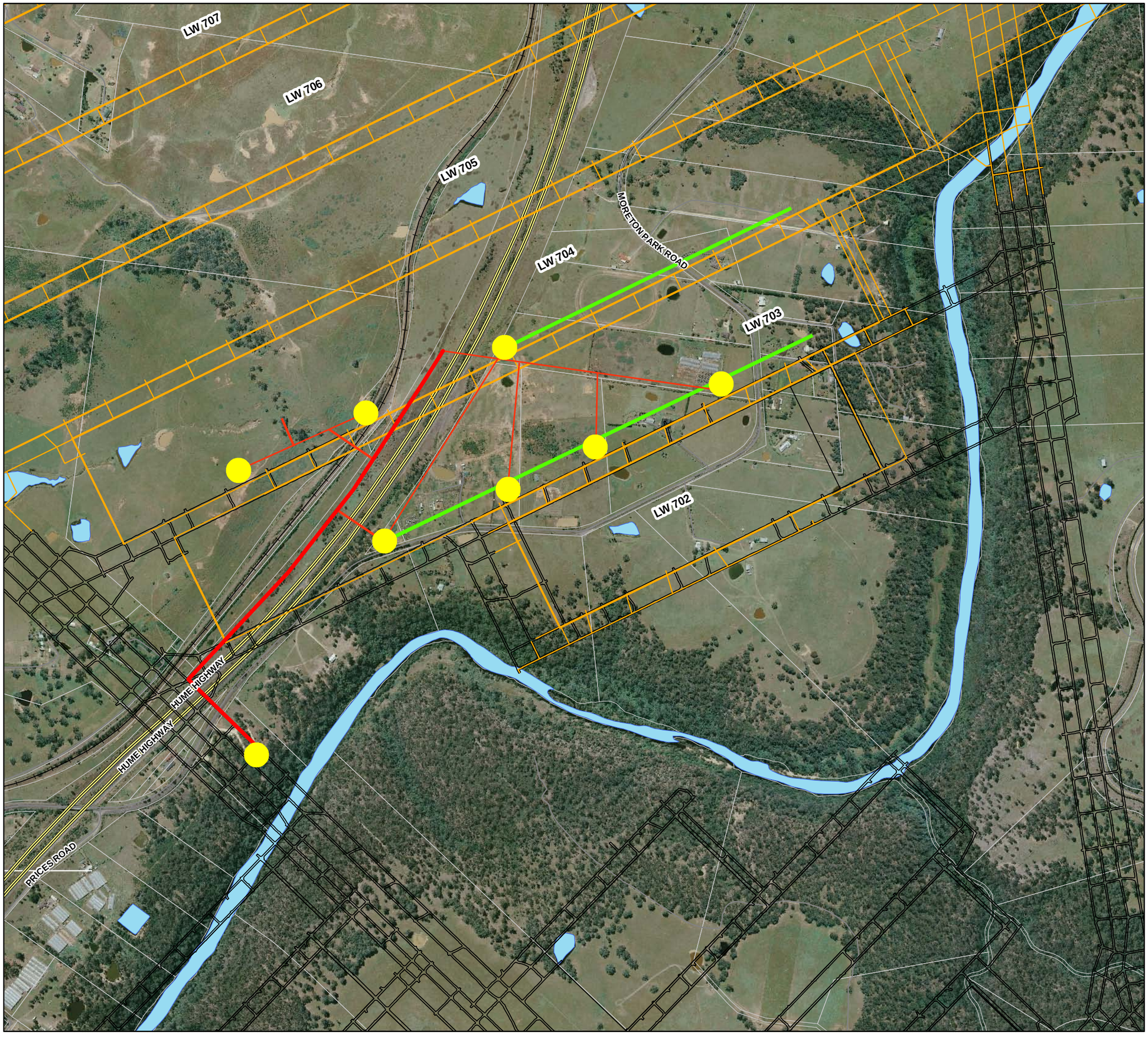
Pipes will be underground where possible and range in diameter from 250mm at the wellhead up to 600mm for the main trunk pipeline to the extraction plant.

2.3. LOCATION OF DRAINAGE

Figure 7 identifies the concept drainage layout for Appin Area 7 Longwalls 703 to 704.

The wellheads are the top of the borehole and the proposed goaf gas pipes are at, or near, surface level. The proposed pipes are located through private property, BHPBIC have, or are in the process of, seeking approval from relevant property owners.

The location of wellheads responds to the longwall design and the goaf areas. As it is vital for the borehole to access the goaf area, which is at an approximate depth of 450 – 500m below average ground level, there is only limited opportunity to alter the location of the wells. Selection for the location of the proposed pipes is the shortest distance between surface wells to permit the interconnection as shown in **Figure 7**.



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Concept Goaf Gas Drainage Plan

APPIN GOAF GAS DRAINAGE PROJECT

Legend

- Proposed Verticle Borehole (BHPBIC)
- 6" Pipe (BHPBIC)
- 10" Pipe (BHPBIC)
- 18" Pipe (BHPBIC)
- MRD Borehole (BHPBIC)
- Appin Area 7 Longwall Layout (BHPBIC)
- Western Works (BHPBIC)
- Motorway
- Primary Road
- Arterial Road
- Local Roads
- Railway
- Waterbodies
- Cadastre

FIGURE 7

N
W E
S

Scale 1:10,000 (at A3)

Metres
0 100 200 400

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 16 December 2008
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109033-01_1803_GoafDrainagePlan.mxd

Data sourced from Department of Lands (LPI) unless otherwise stated.
Aerial imagery supplied by BHPBIC

2.4. GOAF GAS MANAGEMENT OPTIONS

BHPBIC is identifying the primary method for the reticulation and management or utilisation of the captured goaf gas. At this time BHPBIC, wish to make DoP aware of these different options and the related potential environmental impacts as this Part 3A application needs to progress in order for the goaf gas drainage to be in place prior to the planned commencement of mining Longwall 703 in September 2009.

The different development options being considered are discussed in the following sections.

2.4.1. Natural Ventilation

The discharge of goaf gas to the atmosphere is the least desirable application for the gas because the vast majority of scientific studies conclude that this has greenhouse gas implication contributes significantly to climate change.

To employ this option discharge occurs using a vertical discharge stack at least 100m from the extraction plant for safety reasons. **Figure 8** is a photograph of a typical goaf gas discharge stack.

Figure 8 – Vertical Goaf Gas Discharge Stack

Irrespective of the goaf gas management option selected, a vertical gas discharge stack is required for emergency venting upon failure/shut down of gas surface management equipment or in the event that gas flow exceeds the capacity of the management system.

2.4.2. Flaring

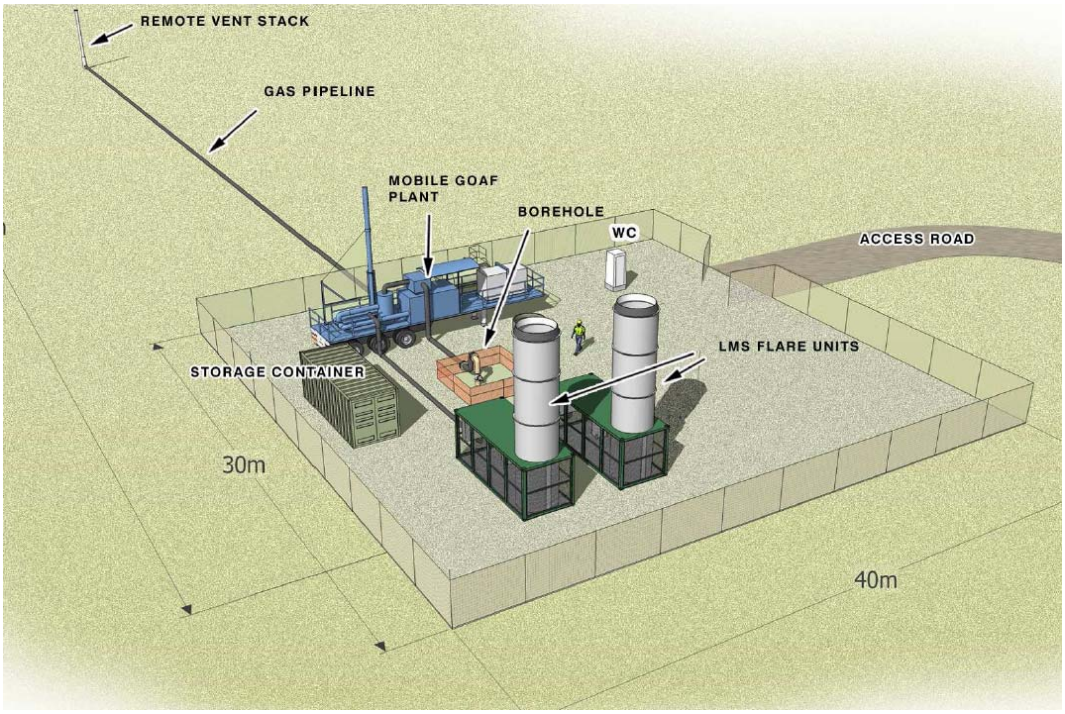
The procedure known as flaring operates by surface level equipment burning the goaf gas as extraction from the goaf occurs. Purpose built enclosed gas combustion units burn the gas cleanly and in a controlled manner. The flame is not visible as the combustion is completely enclosed and controlled within the stack. **Figure 9** is a photograph of a goaf gas flaring unit.

Figure 9 – Enclosed Goaf Gas Flaring Units

BHPBIC will minimise the number of flare stacks through identification of a suitable location(s) so the facility can service numerous well heads. It is likely that two flare units will work in tandem with one goaf gas extraction unit. Each flare unit has a nominal capacity of 250L/s, which meets the expected flow rate of the wells. In the event that flow rates exceed 500L/s venting to the atmosphere has to occur to maintain safety.

The wellhead, extraction plant, electricity generator and flare units would be in a fenced compound of approximately 30m x 30m. The vertical vent stack would be located outside of the compound at a minimum distance of 100m from the flare units for safety reasons.

Figure 10 is a visual representation of a typical BHPBIC compound for the management goaf gas using the flaring method. Maurice Hayler & Associate Architects prepared this drawing for the BHPBIC West Cliff Surface Gas Drainage Project in 2007.



Source: Maurice Hayler & Associates Architects

Figure 10 – Artist's Impression of a Typical Goaf Gas Management Compound

2.4.3. Electricity Generation

BHPBIC currently supply a gas fired electricity generating station operated by Energy Developments Ltd (EDL). This is located at the Appin West Cliff Colliery pit top and consists of a series of gas engines that generate electricity. BHPBIC use electricity generated by this for mining activities and supply to the NSW electricity grid thus reducing their demand on the electricity grid and greenhouse gas emissions.

BHPBIC are investigating the possibility of linking the goaf gas drainage system proposed in this Part 3A application with the existing underground gas drainage system servicing the Appin West colliery. A separate borehole into the underground drainage system would be necessary to allow the goaf gas drawn from Appin Area 7 Longwalls 703 – 704 to combine with other methane gas in the existing drainage system en-route to the Appin West power plant. The EDL Appin West power plant has sufficient capacity to consume this additional goaf gas as it is supplemented by external natural gas sources.

This process burns the methane to minimise greenhouse gas emissions and uses the heat generated to create electricity. This reduces BHPBIC's net use of electricity drawn from the grid as well as minimising the potential impacts on climate change.

To link the Appin Area 7 goaf gas drainage system to the existing system, significant pipe and/or drilling works are necessary. This will increase the area of impact from the development proposed in this Part 3A application and may increase surface environmental impacts. It is necessary to identify these potential impacts and balance them against the beneficial environmental impacts from directing the Appin goaf gas to the Appin West power plant. BHPBIC are carrying out this work at present.

Other constraints to this goaf gas management option include:

- Landowner consent for access to and work on their property
- Financial cost of installing the additional pipe work or drilling
- Requirement for a large single control station and associated equipment.

2.5. IDENTIFICATION OF A PREFERRED OPTION

BHPBIC intend to have a final selection of the primary method for managing the goaf gas prior to submission of the Environmental Assessment.

The EA will contain a full evaluation of alternative methods of goaf gas drainage and the management options. This will justify BHPBIC's reasons for the preferred option selected.

2.6. CONSEQUENCES OF NOT PROCEEDING

If the development proposed in this Part 3A project were not to proceed this may prevent the mining of Appin Area 7 longwalls 703 – 704. This would have the following impacts.

2.6.1. Financial

If the mining of these longwalls does not progress, the NSW state government would lose taxes and royalties associated with coal extraction. This would reduce the capital funds available for the State Government to invest in NSW. The current economic climate increases the importance of all taxes received by Government.

A reduction in the rate or extent of mining in Appin Area 7 may reduce the number of BHPBIC mining and surface employees in the Illawarra because coal production and processing amount would drop. This would lower the financial multiplier effects from BHPBIC's mining activities in the Illawarra region.

2.6.2. Customer Requirements

BHPBIC may be unable to meet their customer requirements if they cannot access all the financially viable coal reserves within the mining lease areas or extract coal in an efficient manner. This may result in customers sourcing coal from other Australian States or another country. In addition to weakening BHPBIC in Australia this would increase the financial implications discusses in **Section 2.6.1**.

2.6.3. Use of Goaf Gas

At present, goaf gas enters the ventilation system of the Appin Colliery and is ultimately emitted to the atmosphere via ventilation shafts. The proposed works provide the potential opportunity to reduce BHPBIC GHG emissions by flaring and/or utilisation in electricity generation.

3. REGULATORY FRAMEWORK

This section outlines the current regulatory framework within which BHPBIC operate and the relevant policies that the EA proposes to address.

3.1. PLANNING APPROACH

Section 1.4 identifies that this proposal has the characteristics of a Major Project, consequently on receipt of this PEA the Minister will be requested to confirm the development is a 'Major Project' under SEPP (Major Projects) 2005 and issue the DGR's. Following receipt of the DGR's, the Environmental Assessment will be lodged and the Minister will assume the responsibility of the consent authority.

3.2. FEDERAL GUIDANCE & CONTROLS

The EA will assess relevant Federal legal controls:

- **Environment Protection & Biodiversity Conservation Act 1999** – the EA will show that the proposal will not have any impact on a location or species listed under this act.
- **Greenhouse Gas Emissions** – the Federal Government provide requirements and guidance on GHG emissions through a variety of legislation and regulations. **Section 5.1** of this PEA provides further detail on this topic. The EA will address these policies and demonstrate the proposed development complies.

3.3. STATE & STRATEGIC PLANNING CONTROLS

The EA will assess relevant state planning controls and strategic planning guidance. This will include a review of the following polices:

- **Environmental Planning & Assessment Act 1979** – as discussed this proposal is applicable for determination under Part 3A of this Act. This PEA and the subsequent EA will be prepared in accordance with this legislation.
- **Environmental Planning & Assessment Regulation 2000** – the EA will demonstrate that this Part 3A application will be conducted in accordance with the requirements of this regulation.
- **Mining Act 1992** – currently, regulation of Appin Colliery activities is via approvals and titles granted under the Mining Act 1992. These titles provide the control mechanism for government by stipulating operating and environmental conditions. The EA will demonstrate how the proposed development is in accordance with activities permitted by the Mining Act 1992.
- **Protection of the Environment Operation Act 1997** – an Environmental Protection License is unlikely to be required for the works in this application. The EA will review this requirement.
- **Threatened Species Conservation Act 1995 & National Parks & Wildlife Act 1974** – the EA will include assessments of the development areas by a specialist environmental and cultural heritage consultant demonstrating the development has no impact on the ecological environment or cultural heritage.

- **State Environmental Planning Policy (Major Projects) 2005** – this SEPP guides the type of developments to which Part 3A of the EP&A Act is applicable. The EA will include confirmation of this SEPP applicability to the proposed project.
- **State Environmental Planning Policy (Mining, Petroleum, Production & Extractive Industries) 2007** – the EA will review this document and assess the proposed developments against the applicable policies.
- **Sydney Regional Environment Plan No. 20 Hawkesbury – Nepean River** – the EA will determine if the proposed works are within land where this Regional Environmental Plan (REP) applies. If so, the development will be assessed against relevant policies in this REP.

3.4. LOCAL PLANNING CONTROLS

3.4.1. Wollondilly Local Environmental Plan 1991

The area in which works are proposed in this Part 3A application is zoned 1 (a1) (Rural A1 Zone) and 5(a) 'Arterial Road' (Special Uses "A" Zone) under the Wollondilly Local Environmental Plan 1991 (refer to **Figure 11**).

The primary objective of the rural A1 zone is to protect land for agricultural uses, prevent inappropriate, premature and sporadic subdivisions that may prevent planned urban growth and protect the scenic quality and rural character. Mining works are permissible with DA consent within this zone.

The primary use of the 5(a) 'Arterial Road' (Special Uses "A" Zone) is to identify and set aside land required for essential public services.

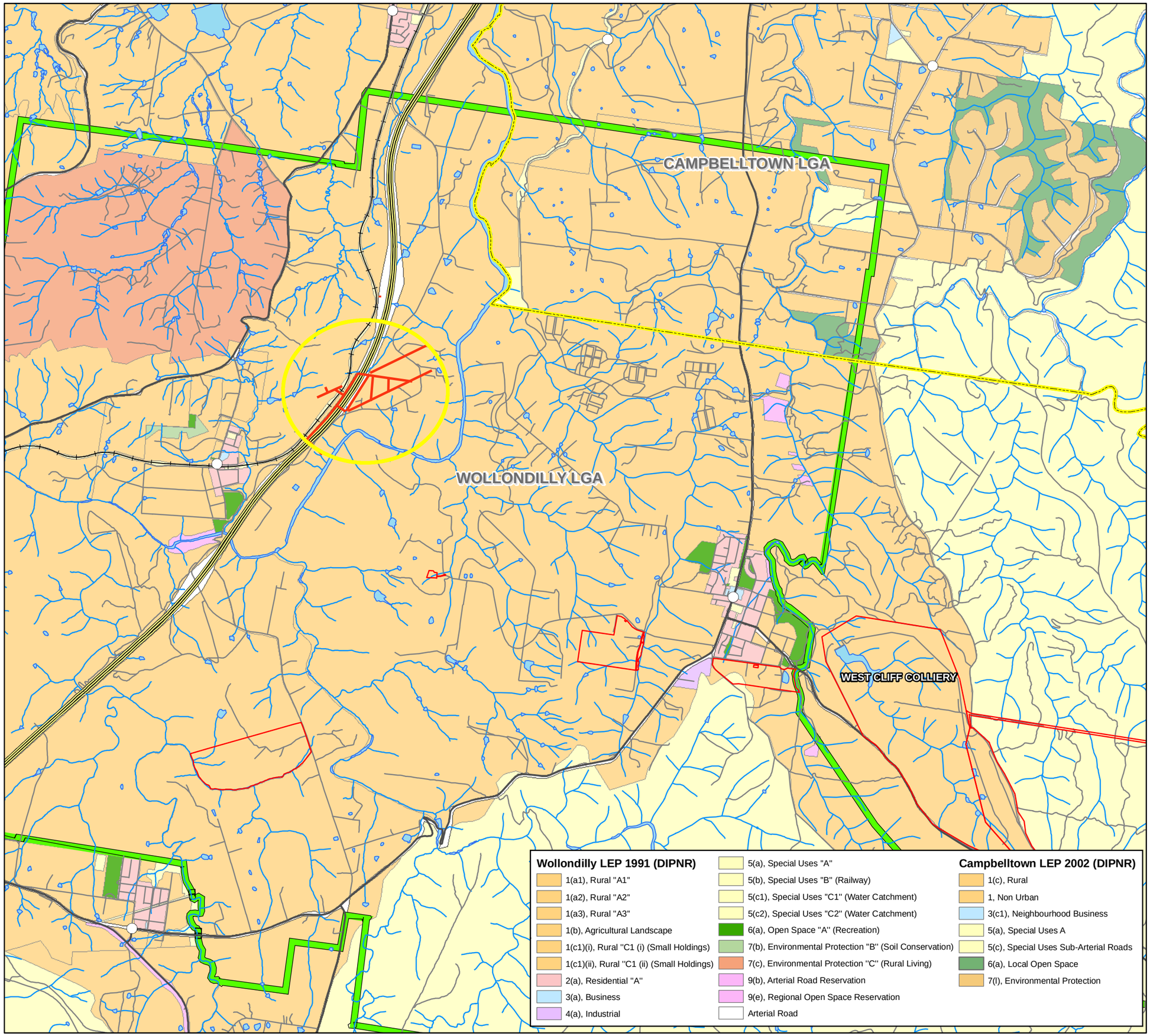
The EA will assess the proposed development against the relevant policies in the Wollondilly Local Environmental Plan (LEP) 1991.

3.4.2. Development Control Plans

Wollondilly Shire Council has two Development Control Plans (DCPs) that are applicable to the type of development proposed or the area in which the works are to take place. These are:

1. DCP 36 – Development in Rural Areas
2. DCP – Wollondilly Agricultural Lands

The EA will review these documents and assess the development against relevant policies.



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Zoning Plan

APPIN GOAF GAS DRAINAGE PROJECT

Legend

- Towns
- Proposed Goaf Gas Works (BHPBIC)
- General Works Area
- Motorway
- Primary Road
- Arterial Road
- Local Roads
- Railway
- Watercourses
- LGA Boundaries
- Appin Mining Lease 767 (BHPBIC)
- Waterbodies
- Appin/West Cliff Surface Lease Boundaries (BHPBIC)

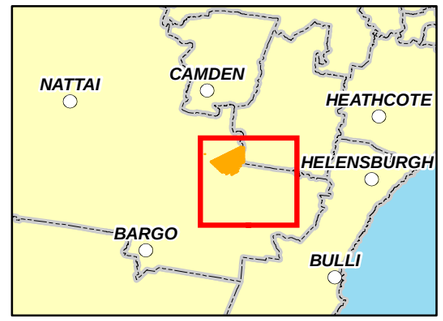


FIGURE 11

N
W E
S

Scale 1:50,000 (at A3)

Metres
0 250 500 1,000 1,500 2,000 2,500

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 16 December 2008
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109033-01_1805_ZoningPlan.mxd

Data sourced from Department of Lands (LPI) unless otherwise stated.

4. CONSULTATION

This section describes the existing consultation as part of this PEA and considers required consultation as part of the EA.

4.1. STATUTORY

Due to the relatively minor nature of the proposal, contact has not been made with any Government departments at this early stage of the Part 3A application. Limited consultation will be required due to the minor scale of the proposal. DoP will advise of stakeholders in the DGR's. BHPBIC propose to contact these stakeholders and report all comments to DoP to expedite the determination of this application.

Liaison with Government will continue as required throughout the project, to discuss and confirm requirements, source information and to discuss outcomes of environmental assessments.

Consultation with the following stakeholders will occur during the preparation of the EA:

- Department of Planning
- Department of Environment and Climate Change
- Department of Primary Industries
- Road and Traffic Authority
- Wollondilly Shire Council
- Appin Area Community Working Group.

4.2. COMMUNITY

BHPBIC are already in the process of contacting landowners affected by this proposal. This contact will continue throughout the preparation of the EA to seek approval to access relevant parcels of land. The EA will describe the approach taken by BHPBIC to inform landowners of the proposed goaf gas drainage project and provide results of this consultation strategy.

BHPBIC will notify the local residential community of the proposed developments through a local newspaper, information on the internet and contact with the established Appin Area Community Working Group (AACWG). This group meets on a regular basis to discuss new and ongoing BHPBIC mining activities. These meetings provide BHPBIC with comments or concerns from members of the community allowing the provision of further information to, and consultation with, concerned residents. In addition to these community consultation meetings, BHPBIC operate a shop front at Appin and 24-hour telephone line for the local community.

BHPBIC has strong working relationships with representatives from Aboriginal groups in the Appin area. BHPBIC will liaise with these groups as advised by the cultural heritage consultant.

The EA will describe all contact with the community and identify concerns raised and suggested solutions.

5. KEY ENVIRONMENTAL IMPACTS

This section identifies key environmental impacts that the EA will assess.

5.1. GREENHOUSE GAS EMISSIONS

The Federal Government is under increasing pressure to reduce greenhouse gas (GHG) emissions nationally in order to manage climate change. The States and Territories are required to facilitate this aim through controls on existing and proposed developments. The emission of goaf gas to the atmosphere contributes to climate change by releasing methane.

The three goaf gas management options discussed in **Section 2.4** have differing climate change impacts because differing amounts of goaf gas will be released into the atmosphere.

The EA will include GHG emission calculations for the goaf gas management option selected. Preparation of these will use methodology and emissions factors outlined in the *National Greenhouse Accounts (NGA) Factors* (2008) and best industry practice. All methodologies are underpinned by frameworks outlined in documents produced by the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) with due regard to the Kyoto Protocol.

Consistent with the protocols of IPCC and UNFCCC three scopes of GHG emissions drainage project will include three emission types. These are Scope 1, Scope 2, and Scope 3 emissions. A description of each is below:

- **Scope 1** – include direct emissions from sources within the boundary of an organisation such as fuel combustion and manufacturing processes.
- **Scope 2** – include indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation. Scope 2 emissions result from the combustion of fuel to generate electricity, steam, or heat and do not include emissions associated with the production of fuel. Scopes 1 and 2 are careful to ensure that two or more organisations do not report the same emissions in the same scope.
- **Scope 3** – include all other indirect emissions that are a consequence of an organisation's activities but are not from sources owned or controlled by the organisation. Examples of Scope 3 emissions include indirect emissions associated with the extraction/production of fuels used onsite, fuel extraction and line loss associated with the consumed electricity, transport of product outside the organisation, and emissions associated with end use of that product.

The EA will categorise activities associated with the goaf gas drainage within the three scopes to allow correct calculations of GHG emissions associated with this project. The EA will provide calculation methodologies in addition to results.

5.2. AIR QUALITY

Previous goaf gas drainage projects identify that drainage and ventilation to the atmosphere can have the following air quality impacts:

1. Odour from the ventilation of the goaf gas
2. Dust from the borehole drilling
3. Diesel related air pollution from the electricity generator for the extraction plant.

The MRD borehole drainage method would limit the range of air quality impacts as only a single wellhead and extraction compound is necessary for the drainage of multiple goaf areas. However, this would not reduce the amount of gas drained.

The use of the gas in the Appin West power plant facility would remove air quality impacts from the general area of works for this project. This is because:

1. The goaf gas would be utilised at Appin West power plant to create electricity
2. There would be no requirement for diesel power generators as this option directs all the goaf gas to the existing drainage system eliminating the requirement for individual extraction plants.

Existing air quality controls, enforced via the Appin West power plant Environmental Protection Licence, would ensure no significant air quality impacts from the burning of the goaf gas from this project.

The EA will identify air quality impacts from the goaf gas management option selected. BHPBIC will engage a specialist air quality consultant if required and all reporting will be included in the EA submission. Any mitigation measures will be fully discussed in the EA with an assessment of the reduction in air quality impacts.

5.3. NOISE

Previous goaf gas drainage work identifies that the following activities or plant generate noise:

- Borehole drilling
- Diesel powered electricity generator
- Extraction plant
- Flaring goaf gas
- Emission from the vertical gas discharge stack.

These sources have the potential to cause ‘offensive noise’ as defined by the Protection of the Environment Operations Act 1997, if they are located in close proximity to sensitive receivers.

If there is a possibility that noise from the proposed development could be ‘offensive’ to sensitive receivers BHPBIC will engage a specialist noise consultant to determine background noise levels and calculate impacts.

If this assessment determines that the noise levels at the sensitive receiver will be ‘offensive’, BHPBIC will identify relevant mitigation measures in the EA to mitigate this impact.

The noise assessment will focus on the chosen method of goaf gas management as this affects the development’s noise potential.

5.4. HERITAGE

BHPBIC have a thorough understanding of Aboriginal and European heritage in the proposed works area. This is through long-term relationships with local Aboriginal groups and previous work with local specialist cultural heritage consultants.

The EA will review previous heritage studies of the area and state and federal heritage registers as appropriate. Consultation with local Aboriginal groups will also provide information on areas of heritage significance. This will ensure the proposed development avoids any known heritage sites. Once there is confirmation of the specific sitting for the boreholes, pipe-work and compounds, an archaeologist that specialises in Aboriginal heritage will assess the areas of ground disturbance. BHPBIC will take guidance from the archaeologist regarding the requirement for the local Aboriginal group's involvement in the assessment.

Upon the identification of any Aboriginal archaeological sites or artefacts in a development area, BHPBIC will attempt to avoid these sites. If this is not possible, the EA will review other options and take into account guidance from the archaeologist and local Aboriginal groups.

The option to implement numerous vertical wells and associated reticulation pipe ranges and extraction plant may have the greatest potential impact on Aboriginal archaeology, as this requires the highest amount of ground disturbance works. The use of MRD drilling allowing drainage to a single wellhead and the drainage of goaf gas to be either flared or utilised may minimise impacts on Aboriginal archaeology.

The EA will provide full details on heritage assessments including any reports or correspondence from specialist consultants.

5.5. FLORA & FAUNA

The following activities associated with the proposed development may have an impact on flora and fauna:

- Drilling of boreholes
- Implementation of the goaf gas management compound and associated equipment
- Trenching for drainage pipes
- Vehicular access to the drilling or gas management compound.

BHPBIC will engage specialist flora and fauna consultants to identify areas of significant flora, fauna habitat or fauna species within the general work area prior to the submission of the EA. BHPBIC will endeavour to retain all activities within areas of previous land disturbance.

The EA will report the method of assessment used to identify environmentally sensitive areas and the results of this assessment. If it is necessary to disturb any area of significant vegetation or habitat the EA will discuss the reasons and suggest suitable environmental mitigation measures.

The EA will focus on impact assessments from the goaf gas management option that BHPBIC will be implementing. The flaring at each wellhead option has the potential for the greatest impact due to the higher number of installations required.

The EA will include copies of any sub-consultant reports in relation to impacts on flora and fauna.

5.6. VISUAL

The general works area for this goaf gas drainage project is within a previously cleared, agricultural landscape. The area is generally open and sparsely populated resulting in few, if any, sensitive visual corridors. The area does not include any landscape features of note and is not a tourist attraction or scenic route.

Visual impacts from the proposed developments will be minor and generally for a short duration. The majority of the above ground installations will be temporary, though this will vary depending upon the goaf gas management option implemented. The drilling phase of the development will last approximately one week per borehole and utilise a mobile drilling rig with an approximate height of 9m. The drainage stage will last approximately 6 – 8 weeks per vertical well and utilise associated extraction plant and flaring units. These facilities will move to a different wellhead once drainage of the goaf is complete removing the visual feature. There may be an opportunity to link vertical wells via a common reticulation system to a central extraction plant and flare.

Facilities associated with MRD boreholes would remain in place significantly longer than the equipment for vertical wells as they would be draining gas from numerous goaf areas. However, this reduces the number of wellhead facilities required at the surface thus reducing the amount of visual impacts.

The drainage of goaf gas to the Appin West power plant facility will minimise the amount of surface equipment for this project. Some equipment is required to draw the goaf gas up the boreholes but flaring units would be not be necessary. The laying of pipelines to transport the goaf gas to a location where it can connect to the underground gas reticulation pipe range may result in increased visual impact during the short works period but this would not be significant.

The EA will thoroughly assess the potential for visual impact from any above ground installations. The EA will discuss relevant visual impact mitigation measures if necessary.

6. SECONDARY ENVIRONMENTAL IMPACTS

This section identifies secondary environmental impacts that the EA will assess.

6.1. WASTE MANAGEMENT

This project will generate minimal waste. Typical waste streams include:

- Sewage from temporary portable toilets located within drilling compounds
- General waste (e.g. food & drink containers) from the small workforce carrying out any drilling or facility implementation activity
- General waste (e.g. cardboard, metal & packaging) from the delivery of equipment to drilling or drainage compounds.

The different goaf gas management options affect the amount of waste generated as the number of wells and extraction compounds will vary. The EA will identify waste streams from the project and advise management procedures.

6.2. STORMWATER & SOIL

The ground works for this project have the potential to affect stormwater flows and cause erosion and sediment runoff. Any impact is likely to be minimal due to the small amount of earthworks required. The goaf gas management option selected will alter the level of impact as the MRD boring reduces surface level earth works, but laying additional pipes to direct the Appin Area 7 goaf gas to a central location for flaring or reticulation to the underground gas management system will have additional soil and water impacts.

The EA will assess potential impacts on stormwater and soil in accordance with the management option selected. The development will employ relevant work procedures such as sediment and erosion controls to reduce, or prevent, impacts.

6.3. TRAFFIC

The project may require equipment and diesel deliveries to the drilling and extraction compounds during the course of the project. Additionally the small (normally 6-person) work force during the drilling phase is likely to travel to site by car. There is adequate site access from existing public roads for the project.

The EA will describe potential traffic impacts and consider any implications on the road network. This will take into account the goaf gas management option selected as this may slightly alter the level or type of traffic impact.

7. CONSTRUCTION MANAGEMENT

The project requires little in the way of construction. The drilling works and implementation of the extraction plant and flaring units form the majority of such 'construction' works. BHPBIC will ensure all such works progress in a safe method whilst also using measures to reduce environmental impacts. Works will progress in accordance with the BHPBIC Environmental Management System (EMS), which has accreditation to the ISO 14001 standard.

7.1. ENVIRONMENTAL MANAGEMENT PLAN

BHPBIC, or any contractor appointed to undertake the construction works, will prepare Health and Safety and Environmental documentation that includes details of the environmental controls for the worksite. Compliance with the following requirements will be a minimum:

- All staff will be briefed on environmental controls prior to the commencement of work.
- Mitigation measures for control of erosion and water pollution in accordance with the soil and construction handbook (Soils and Construction, Volume 1, 4th edition March 2004, LANDCOM)
- Plant will be inspected on arrival to site and prior to use to ensure it is complies with its safety specifications
- Daily inspection of plant to ensure it remains safe for use.

7.2. CONSTRUCTION SAFETY

All work carried out for BHPBIC mining activities must be covered by a Authority to Work (ATW)permit that is issued by the Mine Site Safety Personnel. The Contractor will be required to complete a risk assessment in relation to activities involved in the construction of the project. Once approved by BHPBIC the risk assessment will form part of the ATW that controls all safety management aspects of the development.

Workplace safety is of importance to BHPBIC and relevant measures are in place to increase safety. These include:

- Site induction including safety awareness and hazard specific training
- Mandatory wearing of the following Personal Protective Equipment (PPE):
    - Steel toe-capped footwear
    - Hard hat
    - High visibility vest or coat
    - Hand protection
    - Eye protection
    - Hearing protection (wherever applicable).

In addition to compliance with site safety regulations, protective equipment and attendance at site induction the Contractor will be responsible for the safety of their employees and sub-contractor employees.

7.3. EQUIPMENT INSPECTION

All motorised plant in use during construction may be subject to inspection by the Mine Electrical and Mechanical Engineers. The construction work will meet Coal Mine Safety equipment requirements. Equipment that does not meet relevant standards will be removed from site.

7.4. POLLUTION CONTROL MEASURES

The development will ensure that appropriate measures are in place to ensure control of stormwater and silt runoff during construction. Such measures will include silt fencing and diversion drains.

The Construction Management Plan will detail all such protection measures and compliance with these during construction will be mandatory.

8. CONCLUSION

This section outlines the conclusions of this Preliminary Environmental Assessment.

8.1. DISCUSSION

This Preliminary Environmental Application (PEA) forms the first stage of an application under Part 3A of the Environmental Planning & Assessment Act 1979 for drilling and surface equipment associated with the drainage of goaf gas from proposed BHPBIC longwall mining activities located approximately 5km north-west of Appin.

BHPBIC propose to continue longwall mining at the Appin Colliery within Consolidated Coal Lease 767. This mining process requires methane gas, referred to as goaf gas, drainage from the mining area via boreholes to the surface.

BHPBIC are reviewing options for managing this goaf gas, and these options are:

1. Ventilation to the atmosphere
2. Flaring at the point of extraction or at a central flaring location
3. Piping to the BHPBIC Appin West gas fired power station.

BHPBIC intend to select an option prior to the preparation of the Environmental Assessment (EA), as there are important differences in work locations, type of drilling and extent of potential environmental impacts.

The approval of this application allows BHPBIC to meet customer requirements and continue mining in accordance with SMP approval for Longwalls 701 to 704 within Appin Area 7 granted by the DPI on 1 November 2006. This has important 'knock-on' and 'multiplier' affects as staff will have continued employment, federal and state governments will continue to receive taxes and royalties and spending of associated wages will continue in the Illawarra.

The works to drain goaf gas will have minimal environmental impacts due to the location away from sensitive receivers and the ability to site the developments avoiding known areas of significant vegetation or cultural heritage. The majority of the equipment for drainage will be temporary, resulting in the removal of any impacts in the long term. BHPBIC will rehabilitate all disturbed sites to their pre-existing state.

Notwithstanding this, the EA will identify impacts from the preferred goaf gas management method and undertake further study in the following areas:

- Greenhouse gas emissions
- Air quality
- Noise
- Aboriginal cultural and European heritage
- Flora & Fauna
- Visibility
- Waste Management
- Stormwater & Soil
- Traffic.

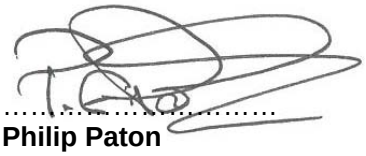
The development proposed in this application is shown to meet the definition of a Major Project in Part 5(1)(a) of Schedule 1 of the SEPP Major Projects 2005. Following review of this PEA the Director-General of the Department of Planning is requested to issue his requirements for the assessment of the project.

8.2. ASSOCIATION WITH OTHER MAJOR PROJECT

This Part 3A application seeks DoP approval to the goaf gas drainage project but understands that BHPBIC is currently preparing a separate Major Project Application known as the 'Bulli Seam Project' for the continuation of mining operations at West Cliff and Appin Collieries. A determination of the Bulli Seam Major Project is not required until 1 August 2010, and it is suggested that any requirements of this approval be ultimately incorporated into the Bulli Seam Project approval.

In order to facilitate safe and efficient mining of Appin Area 7 approved Longwalls 703 to 704 prior to approval of the Bulli Seam Major Project, BHPBIC are seeking approval of the works described in this PEA.

Prepared by
for and on behalf of
FORBES RIGBY PTY LTD



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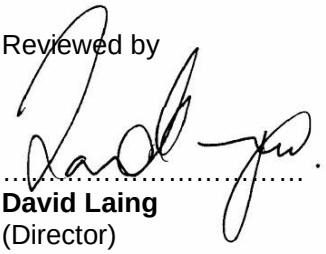
Philip Paton
(Town Planner)

Reviewed by



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David Laing
(Director)

Cardno Forbes Rigby Pty Ltd
278 Keira Street
WOLLONGONG NSW 2500
Telephone: (02) 4228 4133
Facsimile: (02) 4228 6811

9. REFERENCES

This section cites the resource material that assists in the production of this PEA.

BHP Billiton Illawarra Coal, 2008, Bulli Seam Operations Project Description Report and Preliminary Assessment

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Hansen Consulting, 2006, BHP Billiton Illawarra Coal Douglas Area 7 Environmental Impact Statement, Figure 3.9 Cross Section Through Typical Longwall Face

Heggies Pty. Ltd., 2008, West Cliff Mine, Surface Gas Drainage Project Greenhouse Gas Assessment

Holmes Air Sciences, 2007, Air Quality Impact Assessment: West Cliff Mine Surface Gas Drainage Project

Maurice Hayler & Associates Architects, 2007, Visual Impact Study, West Cliff Mine Surface Gas Drainage Project

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