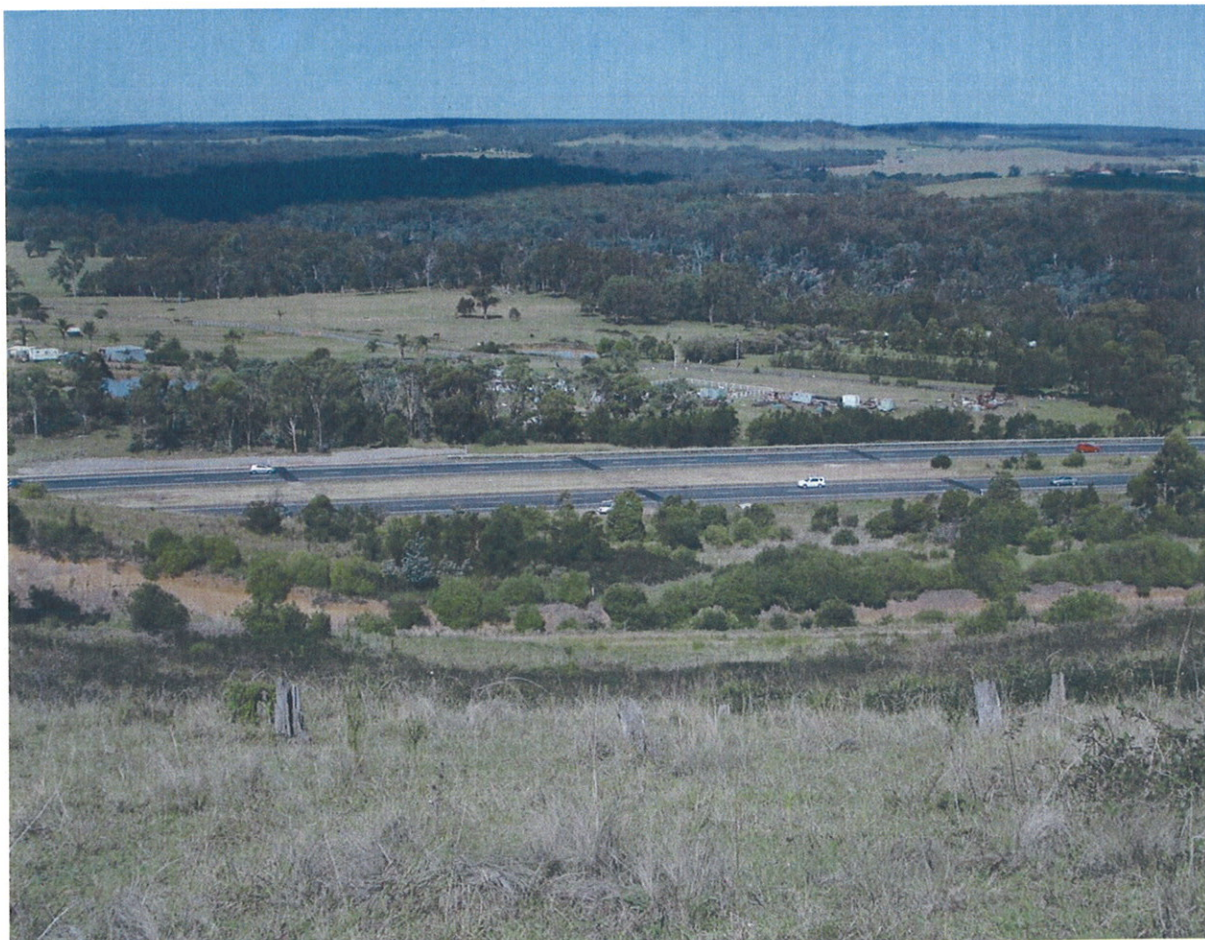


**MAJOR PROJECT ASSESSMENT:  
Appin Gas Drainage Project  
(08\_0256)**



Director-General's  
Environmental Assessment Report  
Section 75I of the  
*Environmental Planning and Assessment Act 1979*

September 2009

Cover Photo: Project setting.

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## EXECUTIVE SUMMARY

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BHP Billiton Illawarra Coal Holdings Pty Ltd (Illawarra Coal) owns and operates the Appin Colliery in the Southern Coalfield. Illawarra Coal is proposing to drain coal seam gas from an approved underground mining domain, located approximately 6 km northwest of Appin, in the Wollondilly LGA. Drainage of this coal seam gas to the surface would ensure safe and efficient mining of Longwalls 703 and 704.

The project (known as the Appin Gas Drainage Project) involves the drilling of 8 boreholes to a depth of approximately 500 m through which methane gas would be drained from the goafs of Longwalls 703 and 704. The gas would be transferred via a surface pipeline reticulation system to an extraction plant and then transferred to the EDL Power Station to be re-used to generate electricity.

The project is classified a major project under Part 3A of the *Environmental Planning and Assessment Act 1979*, and consequently the Minister for Planning is the approval authority for the application.

The project has a capital investment value of \$5 million, and would create 2 construction jobs over the life of the project.

The Department exhibited the Environmental Assessment for the project between 7 July and 7 August 2009 and received a total of 5 submissions, all from government authorities, none of which objected to the project. However, they raised concerns about the potential impact to the Endangered Ecological Community *Cumberland Plain Woodland*, the potential impact of the contingency extraction plant on a tributary creek that flows into the Nepean River and impacts to the Hume Highway and Main Southern Rail Line from under-boring.

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

Based on this assessment, the Department is satisfied that the project can be managed in a manner that would not result in any significant impacts on the environment or surrounding land owners.

The project does have the potential to cause noise impacts to surrounding privately owned residences. However, as the noise impacts would be short term and Illawarra Coal has committed to implementing best management practices, the Department is satisfied surrounding residents would not be adversely affected for a prolonged period. The Department has recommended conditions requiring Illawarra Coal to prepare and implement a Noise Management Plan, including noise monitoring to manage the performance of the project.

The project would also result in the clearing of approximately 0.16 hectares of *Cumberland Plain Woodland*, however Illawarra Coal has committed to rehabilitating the site with local native species characteristic of the CPW community, at the completion of the project.

The Department has also recommended a broad range of other conditions to ensure that the project operates within accepted and best practice environmental standards.

The Department is satisfied that the project would facilitate workplace safety and allow for Illawarra Coal to avoid any interruption to operations at the mine, which is a significant contributor to the Illawarra economy. Furthermore, the Department believes harnessing coal seam gas resources associated with the project, rather than simply flaring the gas, is a positive step towards reducing greenhouse gas emissions and an innovative means of electricity generation.

On balance, the Department believes the benefits of the project outweigh its potential costs, that it is in the public interest and should therefore be approved, subject to conditions.

## 1. BACKGROUND

BHP Billiton Illawarra Coal Holdings Pty Limited (Illawarra Coal) owns and operates the Appin Colliery in the Southern Coalfield. In November 2006, the Department of Primary Industries (now the Department of Industry and Investment (DII)) granted Illawarra Coal approval to mine Longwalls 701 to 704 at the Colliery, which is located approximately 6 km northwest of the township of Appin (see Figure 1).

Illawarra Coal has mined Longwalls 701 and 702, with the mining of Longwall 703 planned to commence in November 2009. In order to ensure safe and efficient mining of Longwalls 703 and 704, goaf gas (ie. the accumulation of coal seam methane in the area of collapsed rock strata or 'goaf' left following the extraction of coal by longwall mining methods) must be drained following mining. Goaf gas consists primarily of methane (90%), which if not removed can result in an increased risk to the safety of underground workers, delays in the mining schedule due to high gas concentrations within the mine, and the increased emission of greenhouse gasses in mine ventilation air.

To increase safety for underground workers and to reduce greenhouse gas emissions, Illawarra Coal is proposing to drill 8 boreholes to drain goaf gas from Longwalls 703 and 704 following mining.

On 22 December 2008, Illawarra Coal lodged an application for this project (MP 08\_0256) seeking approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

## 2. PROJECT DESCRIPTION

The key components of the Appin Gas Drainage Project are summarised in Table 1, depicted in Figure 1, and described in detail in the Environmental Assessment (EA) for the project (see Appendix E).

**Table 1:** Components of the Appin Gas Drainage Project

Aspect	Description		
<b>Project Summary</b>	<b>Construction and operation of 8 boreholes to extract goaf gas following mining and convey the extracted gas to EDL's (Energy Developments Limited) gas fired power stations at Appin Colliery to generate electricity.</b>		
<b>Project Location</b>	At the surface above Longwalls 703 and 704, which are located within the Appin 'Area 7' mining domain, approximately 6 km northwest of the township of Appin (see Figure 1).		
<b>Hours of Operation</b>	Activity	Hours	Time Frame
	Construction - Site establishment of drilling compounds	Monday to Friday 7am – 6pm, Saturday 8am – 1pm and at no time on Sundays or Public Holidays	Approximately 1 week
	Construction - Drilling vertical boreholes and downhole		Approximately 3 weeks per borehole
	Construction - Site establishment for extraction plant/s and surface pipeline reticulation system works		Approximately 8 weeks
	Construction - Under-bore of Hume Highway and Main Southern Rail Line	7:00am – 6:00pm, 7 days per week	Approximately 2 weeks
	Construction - Drilling MRD boreholes 1 and 2	24 hours a day, 7 days per week	Approximately 6 weeks per borehole
	Operation - Goaf gas drainage phase including extraction plant operation	24 hours a day, 7 days per week	Approximately 2 years - 4 to 12 weeks for vertical boreholes; and - 44 weeks for MRD boreholes
<b>Project Life</b>	Up to 3 years for drilling and up to 10 years for extraction.		

<i>Project Details</i>	<p>The project would involve the drilling of 8 boreholes; consisting of 6 vertical boreholes and 2 MRD boreholes, a downhole, extraction plant(s) and a surface pipeline reticulation system (see Figure 1).</p> <p>Both vertical and MRD boreholes would comprise a 250 mm borehole, drilled to a depth of approximately 500 m. The vertical boreholes would finish 5 m above the top of the Bulli coal seam, whereas the MRD boreholes would start vertically and be steered horizontally within the Scarborough Sandstone (the section of strata above the Bulli coal seam) where a number of branches would extend from the main borehole, to approximately 5 m above the top Bulli coal seam, to improve gas flow.</p> <p>A vertical downhole would be drilled over the workings of Longwall 704, not for goaf gas drainage, but to convey the extracted gas back underground to the existing connection to the EDL's gas fired power stations (see Figure 1).</p> <p>An extraction plant would be assembled on the western side of the highway (see Figure 1). The extraction plant was originally located approximately 150 m northeast of the current location (see Figure 1 Option A). However, 'Dial Before You Dig' investigations identified Telstra fibre optic cables in that location, and hence in its Response to Submissions document Illawarra Coal relocated the extraction plant, and associated vertical borehole and MRD borehole 1, to the location in Figure 1 (Option B). The location of the extraction plant requires boring under the Hume Highway and the Main Southern Rail Line to connect the boreholes servicing Longwall 703 (on the eastern side of the Highway). The gas would be extracted via a surface pipeline reticulation system to the extraction plant. From the extraction plant, the majority of the methane gas would be piped back underground using the downhole to the existing underground connection to EDL's gas fired power stations located at Appin West Pit Top and Appin No. 2 Shaft.</p> <p>A small amount of goaf gas may be vented to the atmosphere via a remote vertical gas discharge stack, for emergency venting upon failure/shut down of gas surface management equipment or in the event that gas flow exceeds the capacity of the extraction plant.</p> <p>If approval for under-boring is not granted by the Roads and Traffic Authority, a contingency extraction plant would be constructed on the eastern side of the highway (see Figure 1). However, as there is no downhole available on the eastern side of the highway, the gas drained from Longwall 703 would be flared via enclosed flaring units, which would be located within the contingency extraction plant compound.</p>
<i>Associated Facilities</i>	<p>Access roads, gas wellheads, to be located at the top of each borehole, and a surface reticulation system consisting of, polyethylene pipeline buried just below the ground surface, to transfer gas to the extraction plant and then onto the down hole.</p>
<i>Borehole and Extraction Plant Site Disturbance</i>	<p><b>Vertical Borehole</b></p> <ul style="list-style-type: none"> <li>- Each vertical borehole would be located within a 40 m by 50 m fenced compound, which would contain the well head, drill rig, sump and site shed.</li> </ul> <p><b>MRD Borehole</b></p> <ul style="list-style-type: none"> <li>- Each MRD borehole would be located within a 30 m by 40 m fenced compound, which would contain the well head, drill rig, sumps, mud pumps and site office.</li> </ul> <p><b>Extraction Plant(s)</b></p> <ul style="list-style-type: none"> <li>- Mobile, semi-trailer mounted extraction plant(s) would be located within a 30 m by 40 m fenced compound, which would contain the well head, cooling water tanks, pumps, transformer, gas analyser and control room; as well as a 5 m by 5 m area 100 m outside the extraction plant compound for the discharge stack, and flaring units if required.</li> </ul> <p>Based on the locations chosen for the 8 boreholes, downhole, extraction plant(s) and surface reticulation system, clearing of the following vegetation would be required:</p> <ul style="list-style-type: none"> <li>• 1.2 hectares (ha) of cleared paddocks; and</li> <li>• 0.16 ha of Cumberland Plain Woodland.</li> </ul>
<i>Employment</i>	<p>Require a total of 10 employees and would create 2 construction jobs.</p>
<i>Residential Receivers</i>	<p>There are 16 residential properties within 500 m of the proposed project.</p>
<i>Capital Cost</i>	<p>\$5,000,000.</p>
<i>Rehabilitation</i>	<p>Each borehole would be decommissioned in accordance with <i>EDG01 Borehole Sealing Requirements on Land</i> (DMR, 1997). Upon decommissioning, the surface site associated with each borehole and extraction plant would be rehabilitated to the previous land use with the respreading of topsoil, seeding with native vegetation and weed control.</p>



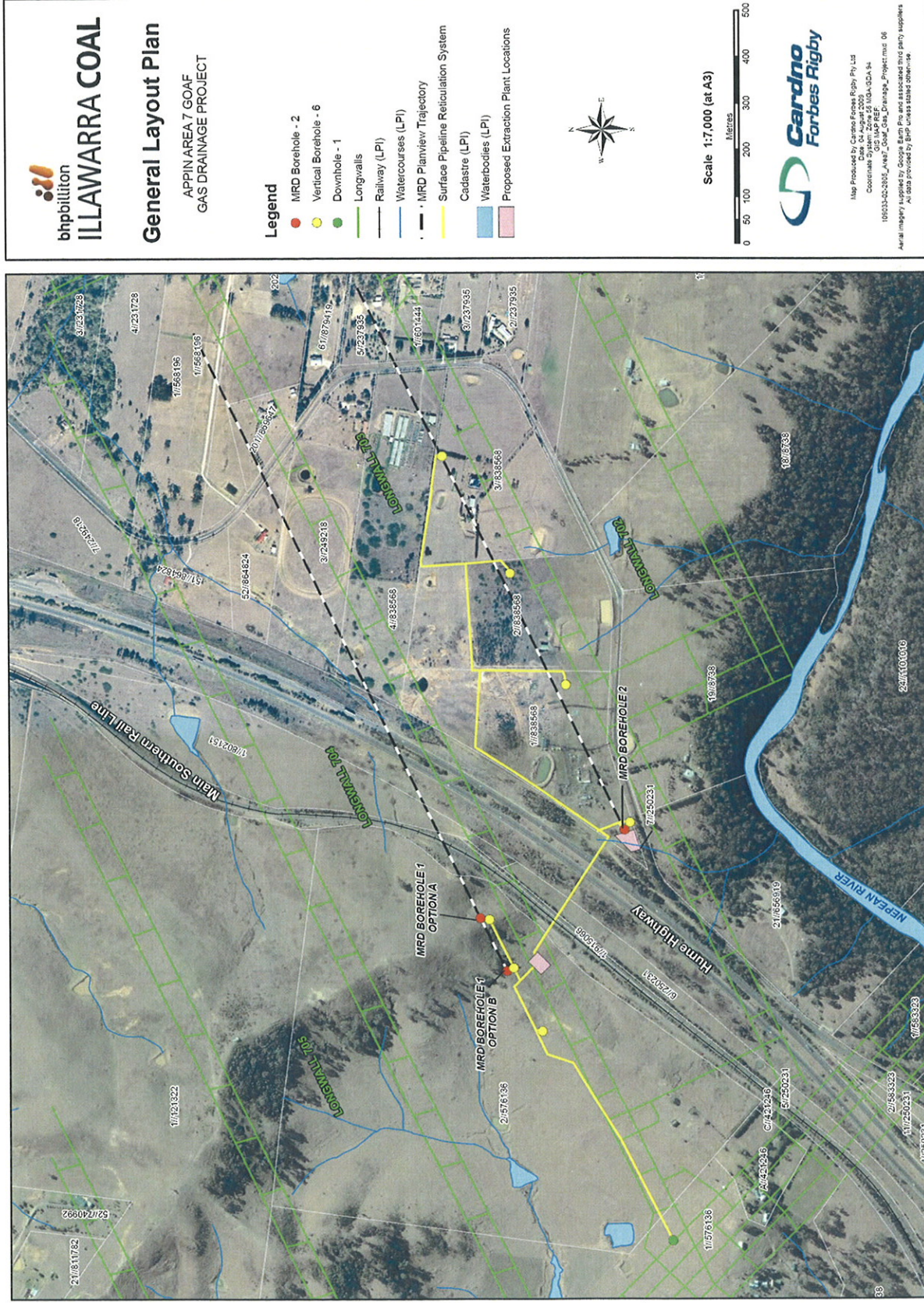


Figure 1: Project location, borehole locations and type

### 3. STATUTORY CONTEXT

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#### 3.1. Major Project

The project is classified as a major project under Part 3A of the EP&A Act because it constitutes development for the purpose of coal mining, and therefore meets the criteria in Clause 5 of Schedule 1 of *State Environmental Planning Policy (Major Development) 2005*. As such, the Minister for Planning is the approval authority.

However, on 4 March 2009, the Minister delegated to the Director-General her powers and functions as an approval authority under Section 75J of the EP&A Act, to approve project applications with less than 25 public submissions and with a capital investment value under \$50 million. The project meets these criteria and consequently the Director-General may determine the application under delegated authority.

#### 3.2. Permissibility

Land associated with the project is zoned 1 (a1) (Rural "A1" Zone) under the *Wollondilly Local Environmental Plan 1991*. Development for the purpose of coal mining is permissible with consent in this zone. Consequently, the Minister may approve the carrying out of the project.

#### 3.3. Exhibition

Under Section 75H(3) of the EP&A Act, the Director-General is required to make the Environmental Assessment (EA) for a project publicly available for at least 30 days. After accepting the EA for the Project, the Department:

- made the EA publicly available from 7 July 2009 until 7 August 2009:
  - on the Department's website;
  - at the Department's Information Centre;
  - at the BHP Billiton Illawarra Coal Regional Office;
  - at the BHP Billiton Illawarra Coal Appin Community Office;
  - at Wollondilly Shire Council; and
  - at the Nature Conservation Council,
- notified relevant State government authorities and Wollondilly Shire Council by letter; and
- advertised the exhibition in the Illawarra Mercury on 7 July 2009.

This satisfies the requirements of Section 75H(3) of the EP&A Act.

During the assessment process the Department also made a number of documents available for download on the Department's website. These documents included the:

- project application;
- Director-General's environmental assessment requirements;
- EA; and
- Illawarra Coal's response to issues raised in submissions.

#### 3.4. Environmental Planning Instruments

Under Sections 75I(2)(d) and 75I(2)(e) of the EP&A Act respectively, the Director-General's report is required to include a copy of, or reference to, the provisions of any:

- State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project; and
- any environmental planning instrument (EPI) that would (except for the application of Part 3A) substantially govern the carrying out of the project and has been taken into consideration during the assessment of the project.

The Department has considered the project against the provisions of relevant SEPPs and other EPIs, and is satisfied that none of these instruments substantially govern (or would govern) the carrying out of the project (see Appendix D).

#### 3.5. Objects of the Act

The Minister's consideration and determination of the application must be consistent with the relevant provisions of the EP&A Act, including the objects set out in the Act. The objects of most relevance to the Minister's decision on whether or not to approve the Act's application are found in Sections 5(a)(i), (ii), (iv) & (vii). They are:

*"The objects of this Act are:*



- (a) to encourage:
  - (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
  - (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
  - (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
  - (vii) *ecologically sustainable development"*

The Department has fully considered the objects of the EP&A Act, including the encouragement of ESD, in its assessment of the application. The assessment integrates all significant economic and environmental considerations and seeks to avoid any potential serious or irreversible damage to the environment, based on an assessment of risk-weighted consequences.

The Department is satisfied that the project is able to be undertaken in a manner that is consistent with the objects of the EP&A Act.

### 3.6. Statement of Compliance

Under Section 75I of the EP&A Act, the Director-General's report is required to include a statement relating to compliance with the environmental assessment requirements issued for the project. The Department is satisfied that the Director-General's environmental assessment requirements have been complied with.

## 4. ISSUES RAISED IN SUBMISSIONS

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The Department received a total of 5 submissions on the project, all from government authorities, none of which objected to the project. A summary of the issues raised in these submissions is provided below and a full copy is attached in Appendix C.

The **Department of Environment, Climate Change and Water** (DECCW) supports the project but recommended conditions relating to greenhouse gas reporting and biodiversity conservation to adequately manage impacts associated with the project. In addition, the Office of Water (OOW) within DECCW had concerns regarding the impact of the contingency extraction plant on a tributary creek that flows into the Nepean River.

The **Department of Industry and Investment** (DII) supports the project as an appropriate use of the State's energy resources, however notes that Illawarra Coal would be required to amend the mine's Mining Operations Plan (MOP) to incorporate the gas drainage activities, and that rehabilitation should be addressed within an Environmental Management Strategy for the project.

The **Roads and Traffic Authority** (RTA) did not object to the project, but recommended conditions of approval relating to the under boring of the Hume Highway.

**Wollondilly Shire Council** (WSC) had no objection to the project.

### 4.1 Response to submissions

Illawarra Coal has provided a response to the issues raised in submissions (see Appendix B). The response to submissions document was made publicly available on the Department's website.



## 5. ASSESSMENT

### 5.1 Noise

The EA includes a noise impact assessment undertaken by specialist acoustics consultants Wilkinson Murray Pty Limited in accordance with DECC's *Environmental Noise Control Manual* (ENCM) and *Industrial Noise Policy* (INP). There are 16 private residences located within 500 m of the proposed project boreholes, which could potentially be affected by noise associated with the project (see Figure 2).

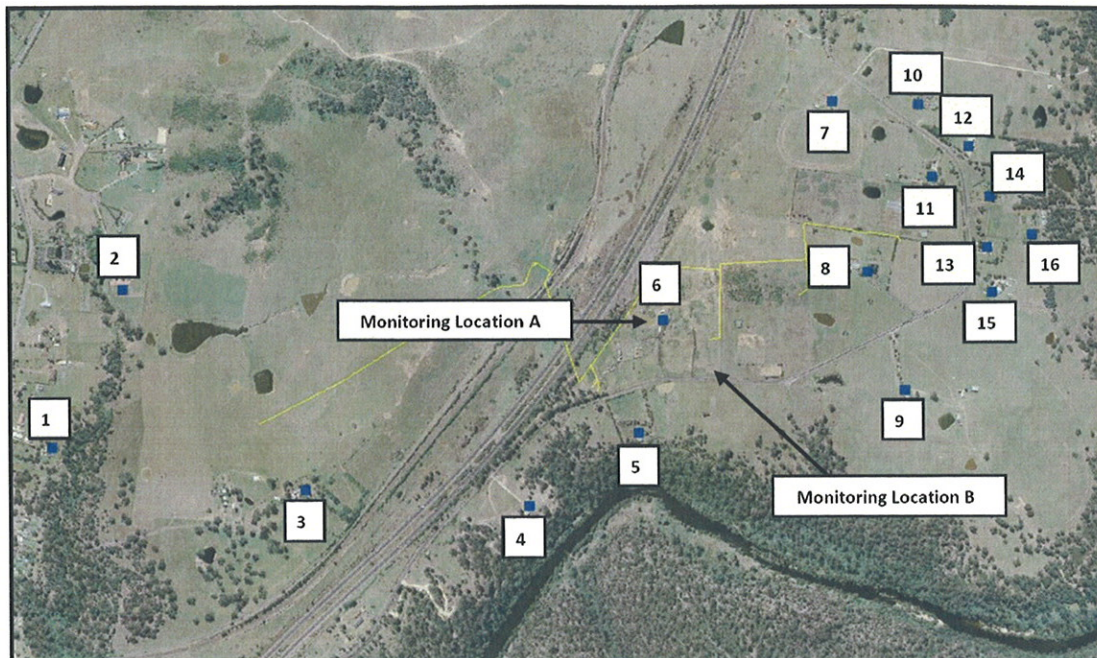


Figure 2: Private residences and noise monitoring locations

#### Construction Noise

Construction activities would include the establishment of drilling compounds and extraction plant(s), drilling boreholes, assembling the surface pipeline reticulation system and under-boring the Hume Highway and Main Southern Rail Line. Construction activities are expected to occur at various times throughout the project as they would be influenced by mining schedules.

Construction activities would generally be undertaken between the hours of 7am and 6pm Monday to Friday, 8am and 1pm Saturday and at no time on Sundays or Public Holidays, except for under-boring activities and drilling MRD boreholes. Under-boring is proposed to be carried out between 7am and 6pm 7 days per week for approximately 2 weeks in order to install the pipeline as soon as possible to prevent unnecessary venting of extracted gas. MRD boreholes require continuous drilling for operational reasons and therefore require 24/7 drilling for approximately 6 weeks.

To mitigate noise impacts associated with under-boring and MRD drilling, Illawarra Coal has committed to installing temporary noise barriers between the operations and potentially affected residents. The company has also committed to using quiet and well maintained plant, orienting noise-generating equipment away from affected residents, and keeping potentially affected residents well informed about the nature and duration of the works.

Despite these measures, the noise assessment predicted that the construction activities (except drilling) would exceed the construction noise criteria at most residential receivers (by up to 15 dBA) when construction noise is at its maximum. Although these exceedances are relatively significant, the Department is satisfied that they are unlikely to result in significant impacts on the amenity of surrounding residents, given that the construction activities (except drilling) would only be carried out during the day and would move through the project area as each section of pipeline is installed. Notwithstanding, the Department has recommended a condition requiring Illawarra Coal to prepare and implement a Noise Management Plan for the project to minimise, manage and monitor noise emissions.

With regard to drilling, the noise assessment indicates that drilling of vertical boreholes would exceed the construction noise criteria at most surrounding residences by up to 15 dBA. As drilling of these boreholes would be restricted to daytime hours, and would be of short duration only (3 weeks), the Department is satisfied that these operations would not have a significant impact on the amenity of surrounding residents, subject to the implementation of the Noise Management Plan.

As stated above, drilling of the two MRD boreholes would require 24 hr drilling 7 days a week over a period of up to 6 weeks. The noise assessment predicted that the construction noise from drilling MRD borehole 1 would meet the relevant criteria at all surrounding residences. However, even after the implementation of mitigation measures (ie. noise barriers), the noise from drilling MRD borehole 2 would exceed the criteria at 2 privately-owned residences during the day and evening, and at 6 privately-owned residences at night, with exceedances up to 14 dBA above the criteria predicted (see Table 2).

**Table 2:** Noise predictions from the drilling of MRD borehole 2

Receiver	Criteria (dBA)			Noise Prediction (dBA) MRD 2			Assessment
	Day	Evening	Night	Day	Evening	Night	
3	55	55	43	44	45	47	Up to 4dBA above criteria
4	55	55	43	46	47	48	Up to 5dBA above criteria
5	50	50	41	53	54	54	Up to 13dBA above criteria
6	55	55	43	57	58	57	Up to 14dBA above criteria
8	50	50	41	49	50	50	Up to 9dBA above criteria
9	50	50	41	45	48	47	Up to 6dBA above criteria

The Department considers that this 24 hour drilling is likely to have a significant impact on the amenity of these surrounding residents, given the continuous nature of the drilling operations. Accordingly, the Department has recommended that the Noise Management Plan include specific measures to minimise and manage noise impacts associated with drilling of MRD borehole 2. The Department understands that Illawarra Coal has been working with the affected residents in relation to mitigating these impacts (including offers for short-term accommodation in hotels during the noisiest activities).

With the implementation of these measures, the Department is satisfied that the short term noise impacts associated with construction activities can be effectively managed.

#### Operational Noise

Operational activities would include the goaf gas drainage phase, operation of the extraction plant(s), and potential flaring and venting operations. Operational activities would be undertaken 24 hours a day, 7 days a week, up to a period of ten years.

The assessment found that noise impacts associated with operation of both the preferred extraction plant and the contingency extraction plant would result in the operational noise criteria being met at all 16 privately-owned residences during the day, evening and night, under various meteorological conditions. This is due to Illawarra Coal's commitment to construct an earth mound at the preferred extraction plant location and a noise barrier at the contingency extraction plant location (if required), which brought the original assessment predictions down to within the criteria.

In addition to the mitigation measures already proposed by Illawarra Coal, the Department has recommended conditions that would require Illawarra Coal to prepare and implement a Noise Management Plan for the project, which includes noise monitoring of the performance of the construction and operational phases of the project.

With these measures in place, the Department is satisfied that the project can be undertaken in a manner that would not result in any long-term or significant noise impacts to surrounding privately-owned residences.



## 5.2 Flora and Fauna

The EA included a flora and fauna assessment <sup>that</sup> was undertaken by Biosis Research, which included on-ground survey work on 8 April 2009.

The majority of land within the project area comprises cleared agricultural land with scattered trees. Biosis identified a total of 45 plant species within the project area, made up of 18 native species and 27 exotic species as well as a number of noxious weeds. No threatened flora species were recorded within the project area.

The location for the proposed contingency extraction plant supports a relatively small stand of *Cumberland Plain Woodland* (CPW), which is listed as an Endangered Ecological community under the *Threatened Species Conservation Act 1995* (see Figure 3). Within this stand, trees are approximately 15 m in height and the understorey is mostly dominated by exotic grasses and a low number of native understorey species. Biosis assessed this stand to be in poor condition due to the altered state of the surrounding environment and low species diversity.



**Figure 3:** Location of contingency extraction plant showing *Cumberland Plain Woodland* community

Biosis did not locate any threatened fauna during the assessment and the habitat in the project area was considered to be in poor condition, due to the limited nesting opportunities and the lack of leaf litter in the understorey for foraging. However, the project area does contain potential habitat for 14 threatened species, such as nomadic bird and bat species.

The project would impact directly on flora and fauna through the clearing of approximately 1.2 ha of cleared paddocks and 0.16 ha of CPW for vehicle access to the MRD borehole drilling compound on the eastern side of the highway. The impact to this vegetation stand would not be significant as it is located within a highly disturbed agricultural landscape, is not contiguous with other nearby CPW stands and is of low conservation status. Clearing of 0.16 ha equates to clearing less than 10 trees and would only result in a 0.008% reduction of this vegetation type within a 10km radius of the project area. This amount of clearing would be unlikely to impact on the viability of the community. In addition, Biosis noted that this particular CPW stand would have some natural resilience due to the semi-established canopy cover and native species in the understorey, which would aid rehabilitation efforts.



Potential indirect impacts to flora and fauna include soil erosion resulting in pollution of watercourses and a reduction in the habitat quality, as well as general disturbance to the natural environment from increased human activity.

Illawarra Coal has committed to a number of mitigation and management measures, including the rehabilitation of the MRD and contingency extraction plant site above Longwall 703 with local native species characteristic of CPW after the cessation of the project.

The Department is satisfied that the impacts of the proposed project on flora and fauna would be minor as the majority of the works associated with the project would be carried out within areas of significantly disturbed vegetation. The Department has recommended conditions that would require Illawarra Coal to rehabilitate all land affected by the project to the satisfaction of the Director-General and DII.

### 5.3 Water Resources

#### **Surface water**

Water demand for the project would be minimal and no surface water would be extracted from the Upper Nepean Catchment. All water used would be potable water supplied by a Sydney Water Authorised User, which would be brought onsite and stored in drilling sumps and tanks located within the drilling and extraction plant compounds.

Drilling sumps would be lined with an impermeable layer to prevent water loss and would be deep enough to hold the volume of water required throughout the drilling process and to prevent overflow during rainfall. Therefore, it is not predicted that any significant discharges would occur as a result of the construction or operational phases of the project.

None of the infrastructure to be constructed as part of the proposed project would significantly impact the ground surface, and therefore it is not expected that any impacts on surface water flows would occur as a result of the project. OOW had concerns regarding the location of the contingency extraction plant and the impact it could have on the headwaters of a tributary creek that flows into the Nepean River (see Figure 1). However, as the extraction plant would be trailer-mounted (see Figure 4) the Department is satisfied that any impact to surface water flows as a result of the project would be minimal.



**Figure 4:** Example of trailer-mounted Extraction Plant



### Groundwater

No groundwater would be extracted as part of the proposed project. However, there is the potential for the project to impact groundwater quality as a result of drilling fluid inflow to the borehole and cross contamination of groundwater between aquifers, as well as the potential for groundwater to be released to the surface.

The boreholes would intersect groundwater aquifers between depths of 100 m and 110 m, however the boreholes would be cased appropriately and grouted in place, to a depth (250 m for vertical boreholes and 450 m for MRD boreholes) well below that of any regionally significant aquifers that may be present within the project area. The casing and grouting of the boreholes would therefore negate the potential for drilling fluid inflow to, cross contamination of any aquifers or release of groundwater to the surface via the boreholes during the operational phase of the project.

The Department has recommended conditions requiring Illawarra Coal to develop a Water Management Plan for the project, including the preparation of an Erosion and Sediment Control Plan. The Department is satisfied that the impacts on the quantity and quality of surface and groundwater can be managed to an acceptable standard.

### 5.4 Greenhouse Gas

The project would generate direct and indirect greenhouse gas emissions (GHGEs) that would contribute to global warming and climate change.

The majority of the extracted gas is proposed to be reticulated to EDL's gas fired power stations, located at Appin West Pit Tip and Appin No. 2 Shaft for electricity generation. EDL's power stations at Appin Colliery generate and supply electricity to Illawarra Coal's mining activities, and to the NSW grid, thus reducing the demand on coal fired power stations for the production of electricity.

In order to connect the gas network servicing Longwall 703 to the extraction plant and downhole on the other side of the highway, approval to under-bore the Hume Highway and Main Southern Rail Line is required from the RTA. If approval is not granted a second extraction plant and gas flaring chambers (see Figure 5) would be required to extract and flare gas from Longwall 703.



Figure 5: Typical Enclosed Flaring Unit

Based on the possible scenarios, a breakdown of the likely distribution of gas flow streams is presented in Table 3.



**Table 3:** Distribution of gas flow streams under different scenarios

<b>Extraction Phase/ Operational Scenario</b>	<b>Percentage of Extracted Gas</b>		
	<b>Electricity Generation</b>	<b>Onsite Flaring*</b>	<b>Onsite Venting</b>
MRD and Vertical Boreholes <b>with</b> under-boring	99%	0%	1%
MRD and Vertical Boreholes <b>without</b> under-boring	52%	47%	1%

Venting goaf gas would only be undertaken in emergency situations such as, failure/shut down of gas surface management equipment or if gas flow exceeds the capacity of the extraction plant. Under these circumstances gas would be vented via a discharge stack (see Figure 6), which would be located approximately 100 m from the extraction plant compound. If ongoing venting occurs, Illawarra Coal would install on-site flaring units (see Figure 5) within the extraction plant compound to minimise GHGEs associated with venting.

**Figure 6:** Typical Vertical Gas Discharge Stack

The assessment calculated direct and indirect GHGEs associated with the project (see Table 4), including Scope 1 emissions (direct GHGEs from sources controlled by Illawarra Coal), such as diesel combustion during transportation, construction and installation works as well as venting and flaring coal seam gas to the atmosphere. No Scope 2 GHGEs (ie emissions from the consumption of purchased electricity) would be generated by the project. Scope 3 emissions include all other indirect emissions as a consequence of the project, and include the extraction and transportation of fuels associated with Scope 1 emissions, and the production of gases during the combustion of extracted gas at EDL's Appin Colliery Power Station.

**Table 4:** GHGEs from the implementation of the project

Operation	GHGEs (kt CO <sub>2</sub> -e)			Equivalent Annual GHG Emission (kt CO <sub>2</sub> -e)
	Scope 1	Scope 3	Total	
Without project implementation	2028	-	2028	1193
With project implementation	1636	58	1694	996
Emissions reduction	-	-	334	196*

\* Discrepancy due to rounding.

The project would result in an overall net reduction in GHGEs at Appin Mine of 334,000 t CO<sub>2</sub>-e over the 1.7 year gas drainage phase of the project, which is equivalent to an annual average of 196,000 t CO<sub>2</sub>-e/yr. This represents a reduction of 0.15% of the NSW total annual GHGEs. The utilisation of extracted coal seam gas at the EDL Power Station is also estimated to result in a minimum GHGE offset of approximately 44-89 kt CO<sub>2</sub>-e/yr. Without the implementation of the project all goaf gas would be emitted to the atmosphere by the Appin Mine Ventilation Air upcast shafts. There is the potential for residual quantities of goaf gas to be extracted past the 1.7 year gas drainage phase of the project. As a result the Department has recommended a condition permitting Illawarra Coal to carry out extraction operations for a 10 year period, in order to prevent unnecessary venting which would contribute to GHGEs.

Capture of extracted goaf gas for use at the EDL Power Station for electricity generation is beneficial as it reduces the demand on coal fired power stations and the use of natural gas for the generation of electricity. Some of the electricity supply from the EDL Power Station is then used for Illawarra Coal mining operations, further minimising GHGEs.

The Department is satisfied that GHGEs from the project can be adequately managed and that implementation of the project would result in a significant net reduction in GHGEs from Appin Mine which would have a positive impact on the environment in terms of GHGEs for NSW and Australia.

### 5.5 Other Issues

The Department's assessment of other environmental issues is summarised in Table 5.

**Table 5:** Assessment of other environmental issues.

Issue	Potential Impacts/Consideration	Conclusion
Traffic	<ul style="list-style-type: none"> <li>Under-boring of the Hume Highway is required to connect the boreholes servicing Longwall 703 to the extraction plant and downhole on the western side of the Highway.</li> <li>Illawarra Coal has committed to the RTA's design requirements, including installing the pipe outside the Hume Highway road reserve, to a depth of approximately 10 m below the road infrastructure.</li> <li>Access to the various borehole sites would be from either Moreton Park Road or Camden Road.</li> <li>The project would require a maximum workforce during the construction period of approximately 10 employees, which would result in approximately 20 light vehicle movements to and from the site per day.</li> <li>The workforce would be reduced significantly during operation, with only 1 or 2 employees visiting the site per day.</li> <li>It is predicted that approximately one 20 tonne truck would access each site per week to remove the spoil from the borehole drilling and under-boring process.</li> </ul>	<ul style="list-style-type: none"> <li>The Department is satisfied that the impact to the Hume Highway would be minimal and that additional light vehicles and trucks using the local roads would have no discernible impact on traffic flows along local roads or the highway.</li> <li>The Department has included contemporary traffic management conditions, including a condition that requires Illawarra Coal to meet all RTA design requirements and obtain all relevant approvals from the RTA prior to the commencement of under-boring.</li> </ul>
Heritage	<ul style="list-style-type: none"> <li>An archaeological and cultural heritage assessment of the study area was undertaken by Biosis. During the</li> </ul>	<ul style="list-style-type: none"> <li>The Department has recommended conditions</li> </ul>

	<p>survey, which was attended by representative of the Tharawal Local Aboriginal Land Council and the Cubbitch Barta Native Title Claimants, 20 Aboriginal sites were identified very close to or within areas associated with the project.</p> <ul style="list-style-type: none"> <li>• Four sites in particular may be impacted by the installation of the surface pipeline reticulation system, however these sites were considered to be of low archaeological significance.</li> <li>• Biosis has prepared an Aboriginal Cultural Heritage Management Plan (ACHMP) on behalf of Illawarra Coal to facilitate the management, salvage and relocation of these sites, including ceasing works immediately in the event that any Aboriginal artefacts are encountered and obtaining a section 90 permit under the <i>National Parks and Wildlife Act 1974</i>.</li> <li>• No non-Aboriginal heritage sites were recorded within the project study area.</li> </ul>	<p>that would require Illawarra Coal to prepare an ACHMP.</p> <ul style="list-style-type: none"> <li>• The Department is satisfied that impact to Aboriginal heritage sites would be minimal and is confident that the ACHMP would ensure that all impacts to Aboriginal heritage sites are minimised and managed accordingly.</li> </ul>
Visual	<ul style="list-style-type: none"> <li>• Illawarra Coal commissioned a visual impact assessment as part of the EA which determined that the undulating topography of the project site and existing vegetation screening would shield most of the visual impacts associated with the drilling compounds and extraction plant(s) from the views of nearby residents and passing motorists.</li> <li>• Night-time drilling works at the MRD boreholes would be partially visible due to the lights at the drilling compounds. However, as these lights would mostly be obstructed by vegetation and the surrounding topography and would only be implemented for a 6 week period, the visual impacts are expected to be minimal.</li> <li>• Noise barriers may also be visible, however as they are only temporary and would result in a reduction in noise impacts the visual impact is justified.</li> </ul>	<ul style="list-style-type: none"> <li>• The Department has recommended conditions to ensure lighting emissions from the project are managed and minimised.</li> <li>• The Department is satisfied that that project would not have a significant visual impact on any sensitive visual receiver.</li> </ul>
Air Quality & Odour	<ul style="list-style-type: none"> <li>• During each borehole site establishment and drilling phase there is the potential for dust emissions to impact nearby residences. However, given the short-term nature of construction activities, the conservative nature of the predictions and the implementation of dust mitigation measures by Illawarra Coal, the Department is confident that dust emissions associated with the project would be minimal.</li> <li>• The assessment predicted NO<sub>2</sub> and CO concentrations from flaring coal seam gas would be below the DECCW criteria at the nearest private residence.</li> <li>• Emissions at EDL's power stations are predicted to continue to comply with the existing requirements of their Environment Protection Licences.</li> <li>• Coal seam gas is largely odourless and venting would only occur in emergencies. Odour levels during venting are predicted to be low and well within DECCW criteria at nearest residences.</li> </ul>	<ul style="list-style-type: none"> <li>• The Department is satisfied that air quality impacts from the project would be appropriately mitigated and any impact would be minimal.</li> <li>• No further measures required.</li> </ul>
Waste	<ul style="list-style-type: none"> <li>• The majority of waste associated with the project would be excavated material from drilling boreholes and under-boring activities.</li> <li>• Approximate quantities of 'spoil' produced from each borehole are predicted to be approximately four tonnes per day over a period of two weeks for each vertical borehole and six weeks for each MRD borehole.</li> <li>• Spoil would be stored at the borehole drilling compounds until it is removed offsite and trucked to the West Cliff Emplacement Area for use as capping material.</li> <li>• Other waste streams include excess construction material, sewerage from amenities within drilling compounds and general waste.</li> <li>• All waste streams would be removed offsite and disposed of at approved waste disposal facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• The Department is satisfied that waste streams would be minimal and would be adequately managed.</li> <li>• No further measures required.</li> </ul>



Rehabilitation	<ul style="list-style-type: none"> <li>• As site infrastructure associated with the project would be temporary in nature and would be decommissioned and removed at the cessation of operations, minimal surface rehabilitation would be required.</li> <li>• Stripped topsoil from the borehole and extraction plant compounds(s) would be stockpiled onsite and reinstated prior to seeding with native vegetation.</li> <li>• The MRD and contingency extraction plant site above Longwall 703 would be rehabilitated with local native species characteristic of CPW after the cessation of the project.</li> <li>• Excavated material from the trenching works associated with the surface pipeline reticulation system would be used to backfill the trenches and cover the pipes.</li> <li>• All boreholes would be sealed and reinstated in accordance with EDG01 Borehole Sealing Requirements on Land (DMR, 1997).</li> <li>• The pipeline underneath the Hume Highway and Main Southern Rail Line would be filled and sealed off at both ends in accordance with RTA requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• The Department has recommended conditions that would require Illawarra Coal to rehabilitate all land affected by the project to the satisfaction of the Director-General and DII.</li> <li>• The Department is confident rehabilitation activities proposed by Illawarra Coal would result in adequate rehabilitation of the land affected by the project.</li> </ul>
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## 6. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the project (see Appendix A).

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts of the project;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Illawarra Coal has reviewed and accepts the recommended conditions.

## 7. CONCLUSION

The Department has assessed the EA, submissions on the project and Illawarra Coal's response to submissions, in accordance with the objects of the EP&A Act, and is satisfied that the impacts of the project can be mitigated and/or managed to ensure an appropriate level of environmental performance.

The project would result in exceedances of the noise criteria during construction activities, however the Department is satisfied that the project can be undertaken in a manner that would not result in any long-term significant noise impacts to surrounding privately-owned residences.

The project would result in the clearing of approximately 0.16 ha of *Cumberland Plain Woodland*, which Illawarra Coal has committed to rehabilitating with local native species characteristic of CPW at the cessation of the project.

In addition, the Department has included conditions that require Illawarra Coal to prepare and implement a Noise Management Plan, which includes noise monitoring of the performance of the project.

The Department is satisfied that the proposed project would increase safety for underground mine workers, while also facilitating environmental benefits such as the use of coal seam methane to generate electricity. It would also generate \$5 million in capital investment and create 2 construction jobs.

The Department is confident that these benefits can be achieved without significant impacts to the environment or residents surrounding the sites. On balance, the Department believes the benefits of the project outweigh its potential costs, that it is in the public interest and that it should be approved, subject to conditions.

## 8. RECOMMENDATION

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

- consider the findings and recommendations of this report;
- approve the project application, subject to conditions; and
- sign the attached instrument of approval (Appendix A).

*Skitto* 25/9/09

Director, MDA

*[Signature]* 30/9/09

Deputy Director-General, DASP

*[Signature]*

28.9.09

Executive Director, MPA

*Shaddad*

Director-General

2/10/2009