Traffic and Transport Impact Assessment

APPENDIX 6

Ashton Coal Operations Limited
Gas Drainage Project

TRAFFIC IMPACT ASSESSMENT

- Final
- 11 May 2012

Ashton Coal Gas Drainage Project

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Executive Summary

This Traffic Impact Assessment (TIA) examines the impact of construction and operational traffic associated with the installation and ongoing operation of a number of gas wells and associated plant and reticulation pipes, to be installed in conjunction with the Ashton Coal underground mine.

There are three stages of traffic generation for the project – firstly the initial construction of the gas wells/reticulation pipeline network and the gas drainage plant, secondly the operation of the gas drainage plant and extensions to the reticulation network including new gas wells, and the third scenario which is the operation of the drainage plant and gas drainage network.

The scenario which results in the highest traffic generation is the initial construction period when the gas plant, gas wells and reticulation pipelines are under construction. During this short period, it is anticipated to generate a maximum of 25 vehicles per day. The scenario which includes operation of the plant and construction of additional gas wells is anticipated to generate 18 vehicles per day, and the most common scenario over the lifetime of the project is the operational phase, which is anticipated to generate 6 vehicles per day.

The vehicles will access the southern side of New England Highway for the duration of the project in order to construct the gas drainage plant. Vehicles will use either the unnamed Dairy Lane, or Brunkers Lane intersection with the New England Highway, dependant on the location of the work at the time. The construction work may take place concurrently with other ACOL construction projects, including the diversion of Bowmans Creek and a new 5.5m upcast ventilation shaft and associated infrastructure.

Vehicles at Brunkers Lane will use the existing intersection controls to gain access to and from the gas drainage project. No adjustments to this intersection are proposed. Vehicles accessing the gas drainage project from the unnamed Dairy Lane will use the existing intersection, with the exception of southbound right turning vehicles. An alternative access route would be put in place for these southbound right turning vehicles, with construction traffic to continue straight on and turn left into Glennies Creek Road, u-turn, and then travel northbound on New England Highway to turn left into the unnamed Dairy Lane.

Should the gas drainage project occur concurrently with other ACOL construction projects using either Brunkers Lane or unnamed Dairy Lane via short term construction traffic arrangements, then construction traffic would utilise these temporary traffic arrangements.

The maximum additional 25 vehicles per day arising from the gas drainage project would be added to the existing New England Highway traffic volumes. The impact of this small volume of

additional traffic is negligible given the current Average Annual Daily Traffic (AADT) of the New England Highway of around 11,000 vehicles per day.

Due to the small number of construction and operational trips arising, and there being no changes required to traffic conditions on the New England Highway to facilitate access, no significant cumulative impacts from other concurrent ACOL construction works are anticipated.

Given the small volume of traffic proposed to be generated by the gas drainage project, no special measures or traffic management strategies other than the southbound right turn detour are proposed.

1. Introduction

1.1. Scope and Objectives

This Traffic Impact Assessment (TIA) examines the impact of construction and operational traffic associated with the installation and ongoing operation of a number of gas wells and associated plant and reticulation pipes, to be installed in conjunction with the Ashton Coal underground mine.

The gas drainage project comprises a network of minor infrastructure over the area of the underground mine. The Ashton Coal Project comprises a number of concurrent projects including the recently approved Bowman's Creek Diversion, and the proposed upcast ventilation shaft and mine service drop holes. Previous studies and reports have been prepared which cover the impact of the other projects, this report concentrates on the additional traffic impact that the construction and operation of the proposed gas drainage project will have on the New England Highway and local traffic.

1.2. Construction and Operation Detail

There are three distinct elements to the Gas Drainage Project:

- Central Gas Drainage Plant;
- Gas Drainage Wells; and
- Gas Reticulation Network.

Each of these project elements has its own construction and operational stage requiring the use of different vehicle types. The impact of the traffic movements associated with each element, on the operation of the adjacent road network has been assessed for both the construction and operation stages.

Access to the Gas Drainage Plant would be solely gained via the unnamed Dairy Lane, while access to the Drainage Wells and Reticulation Network would be gained via the unnamed Dairy Lane and Brunkers Lane, depending on the location of the work being undertaken at the time.

The construction of the Gas Drainage Wells and Reticulation Network is an ongoing intermittent process which will continue throughout the underground mining operation. As mining progresses, new gas wells and sections of the reticulation network would be installed. Therefore the traffic demands associated with these elements will overlap with other ACOL projects including the operation stages of the various other elements of the underground mining project.

Construction Stage

Central Gas Drainage Plant:
Construction of the central gas drainage plant will require an excavator for site works which will remain on site for the duration of the activity. On a daily basis, an estimated 8 vehicles including light and heavy will be associated with construction.

Construction will take about 16 weeks for initial installation of the first two vacuum pumps, flares and vent stack. The remaining two vacuum pumps and additional flares will be progressed as required, depending on gas levels.

Gas Drainage Wells:
The gas wells will be drilled using a mobile drilling rig, which will remain on site over each of the days required to drill the well. The construction of the wells will be staged to suit the mining process and the varying levels of gas extraction required. The construction process will generate light vehicles associated with construction crew and heavy vehicles associated with the delivery of drilling rods and fuel which will be required approximately every two days. A mobile crane will also be required to lower casing into base holes. It is estimated that 4 vehicles per day will be required during the construction of each well.

Each well will take between 3 - 4 weeks to construct, (depending on drill depth). Progress will be made as required intermittently for the life of the mine.

Gas Reticulation Network and Access Tracks:
The construction of this element will be staged in the same way as the construction of the drainage wells, with sections of pipe added to connect active wells when required. This process will require a trailer mounted excavator (or equivalent, such as backhoe or trench digger). Approximately 4 vehicles per day will be generated, comprised of light and heavy vehicles, for the delivery of pipe and other required materials, in addition to the arrival of light vehicles associated with construction crew.

Construction of the pipeline will be progressed as required, and will be intermittent for the life of the mine.

Operation Stage

Gas will be extracted from the mining operations via a series of vertical boreholes and a surface pipeline reticulation system, connected to the gas drainage plant. Gas wells will continue to operate until completion of the underground mine, where they will be decommissioned and the infrastructure removed from site.

The traffic generation during the operation stage of the project is minimal, with up to 6 vehicles per day to observe the drainage wells, inspect the reticulation pipes and service the gas drainage plant.

Access to the gas wells will be via the New England Highway, at either Brunkers Lane or the adjacent unnamed Dairy Lane. No other regular traffic movements arising from the gas wells are anticipated during the operation stage.

2. Statutory Requirements

All temporary or permanent traffic controls put into place for the construction or operation of the Gas Wells will be in accordance with Australian Standards 1742 - Manual of Uniform Traffic Control Devices.

The Roads and Maritime Services (RMS) manual for Traffic Control at Worksites Revision 4 will be used to guide the installation of any temporary traffic controls required during the construction period.

Any changes required to the existing New England Highway or adjacent public roads either on a temporary or permanent basis will be referred to the RMS for approval. However, based on current estimated project related traffic movements no additional approval will be required from RMS.

3. Existing Environment

3.1. Adjoining Road Network

The Gas Drainage Project, comprising an additional component of the larger scale Ashton Coal Project (ACP), is located near the village of Camberwell, 16 kilometres north-west of Singleton on the New England Highway. The New England Highway is part of the National Highway network, and forms the main inland route between Sydney and Brisbane. The location of the mine is shown in **Figure 3-1** overleaf.

The ACP's current operations are accessed via Glennies Creek Road, which intersects with the New England Highway north-west of Camberwell. Current operations include administrative offices, a coal handling and processing plant, the north-east open cut (NEOC) and an underground mine.

In the vicinity of the ACP's operations, the highway varies in width from two to four lanes. South-east of the intersection with Glennies Creek Road the highway is generally one lane per direction; however a southbound overtaking lane commences approximately 1km south-east of the village of Camberwell. A four-lane section (two lanes per direction) begins north of the intersection with Glennies Creek Road and extends to the north-west. Details of the lane configuration of the New England Highway in the vicinity of the ACP are shown in **Figure 3-2**.

Glennies Creek Road is a local road providing access to the existing ACP, and to rural landholdings north of the New England Highway.

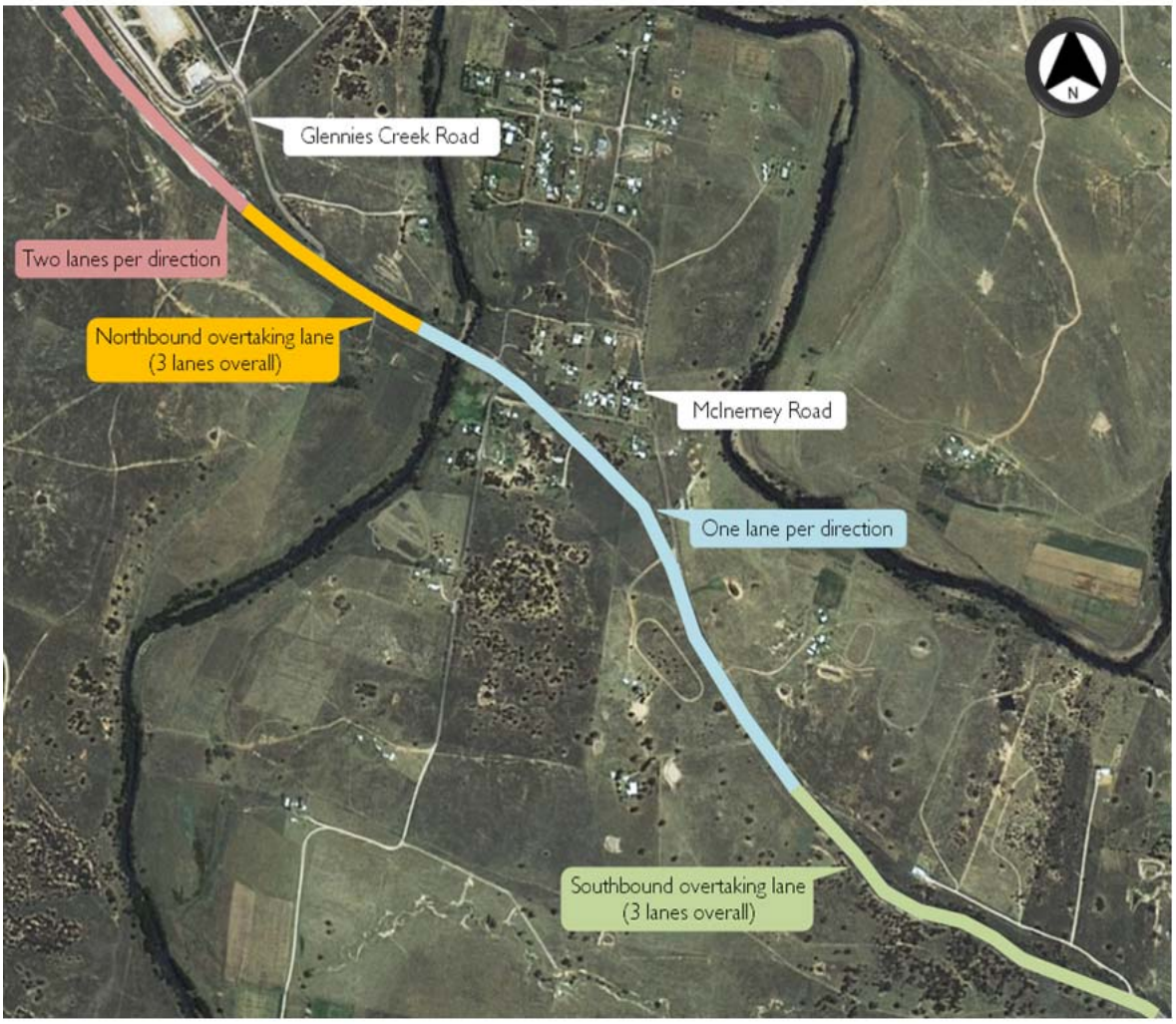
Brunkers Lane connects with the New England Highway to the north of the project area, and has dedicated deceleration lanes from the north and southbound directions. Brunkers Lane is sealed and provides ad-hoc access to adjacent rural lands and to the Ravensworth mine.

A rural access road known locally as "Dairy Lane', (unnamed Dairy Lane in this report) provides an unsealed access road to the surface of the underground mine and existing farm lands south of the New England Highway. The intersection with the New England Highway is informal, and coincides with a section of southbound overtaking lane on the New England Highway.

Figure 3-1 Site Location

Map source: Google Maps (2009)

- **Figure 3-2 Lane Configuration on New England Highway**

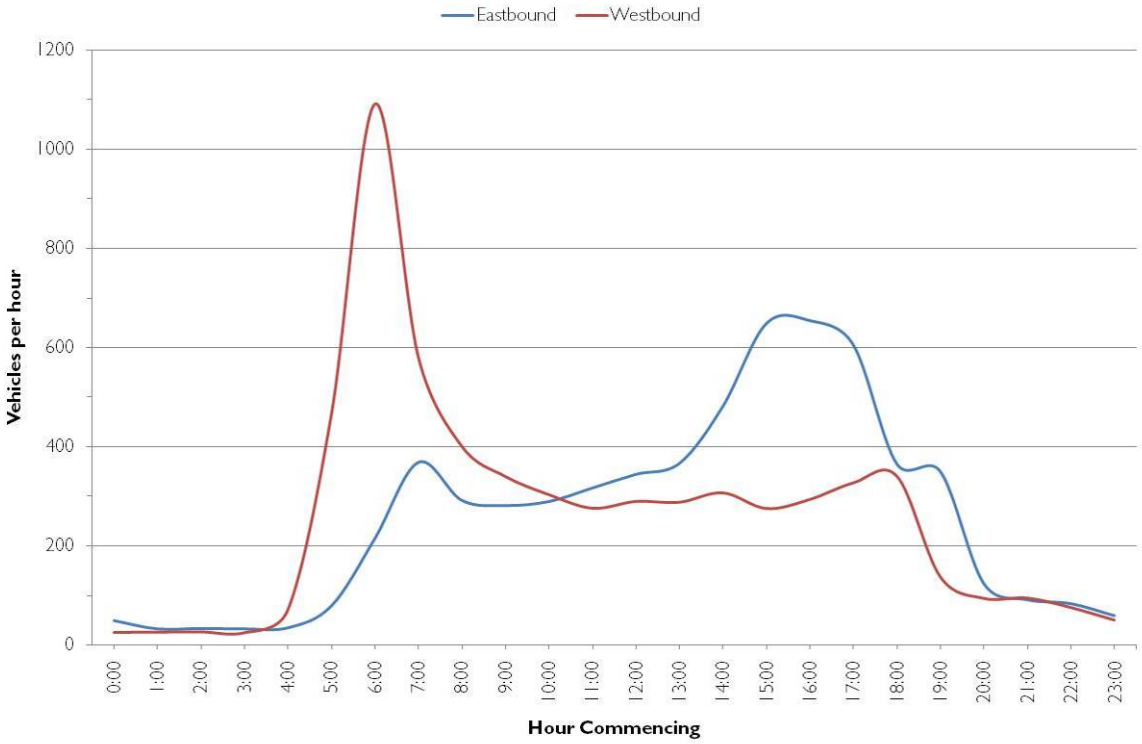


3.2. Existing Traffic Volumes

A 7-day classified count of traffic on the New England Highway east of Camberwell was undertaken from 23 to 29 October 2008. The average daily traffic volume during that week was 11,109 vehicles, including 17% heavy vehicles. The average weekday volume was slightly higher at 12,391 vehicles, including 18% heavy vehicles.

The average weekday hourly profile of traffic activity is shown in **Figure 3-3**.

- **Figure 3-3 New England Highway weekday average hourly profile**



The AM peak hour on a weekday is between 6:00 and 7:00AM, with an average weekday volume of 1,306 vehicles per hour, the majority of which are heading westbound. The PM peak is between 4:00 and 5:00PM, with an average of 947 vehicles per hour. The peak direction in the afternoon is eastbound. Peak hour volumes on the New England Highway are presented in **Table 3-1**.

- **Table 3-1 Peak hour volumes on the New England Highway**

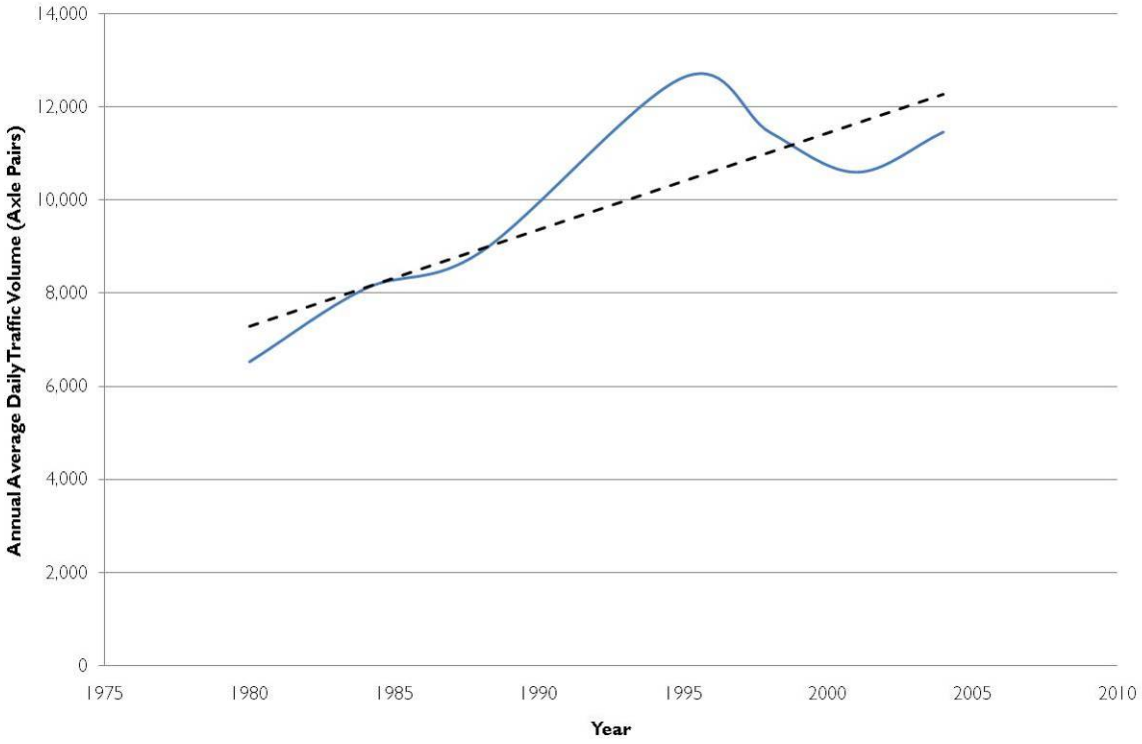
	October 2008	
	Eastbound	Westbound
AM	370	1,090
PM	650	340

The NSW Roads and Maritime Services (RMS) also collect and publish traffic volume data for the New England Highway. The nearest RMS data point is located at Foy Brook Bridge (over Bowmans Creek) in Camberwell (station number 05.037). **Figure 3-4** shows growth in traffic[1] on

[1] Volume at this location is measured in axle pairs, rather than vehicles. A 2-axle car is one axle pair. A 3-axle truck is 1.5 axle pairs. The number of vehicles is less than the number of axle pairs.

the New England Highway at this RMS data point since 1980. Traffic has generally risen steadily, with a peak in the late 1990s and an overall linear trend growth rate of 1.7% per annum (base year 2004).

- **Figure 3-4 Growth in Annual Average Daily Traffic on the New England Highway at Foy Brook Bridge, Camberwell (Station number 05.037)**



3.3. Road safety

Data was obtained from the RMS about the road crash history of the New England Highway between Singleton and Muswellbrook. In the five years from September 2003 to August 2008, there were 88 crashes recorded, including four fatal crashes and 32 injury crashes. The most common types of crashes involved the vehicle leaving the carriageway, accounting for 52% of all crashes. The number of crashes was highest in the year September 2003 to August 2004, when 24 crashes were recorded. There were 13 crashes recorded in the year September 2007 to August 2008.

A crash rate, where the number of crashes is compared to the volume of passing traffic, has been calculated at approximately 10 crashes per 100 Million Vehicle Kilometres Travelled (MVKT). This is significantly below the NSW state average crash rate of approximately 75 crashes per 100MVKT.

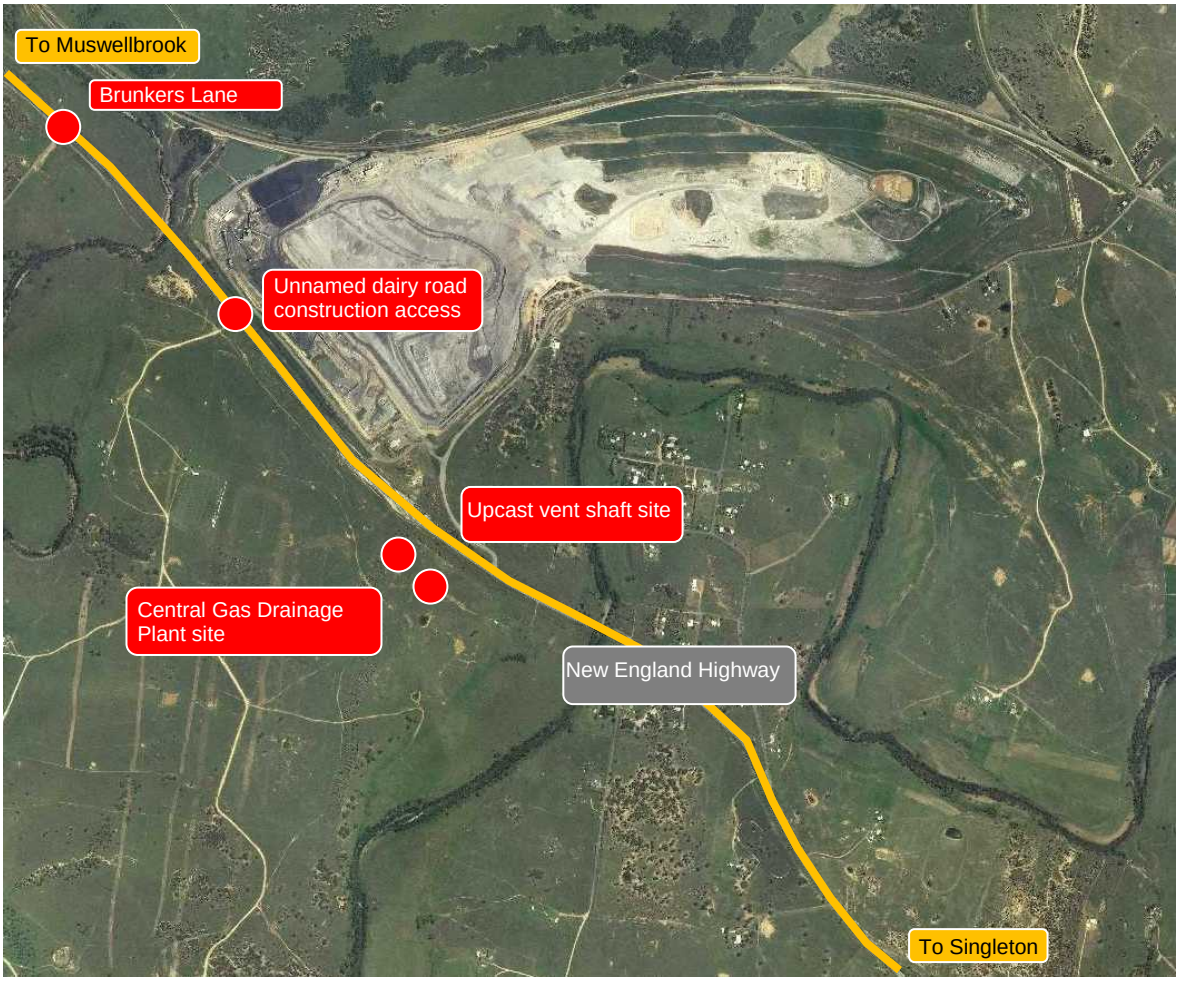
Three collisions, including one injury collision, were recorded in the between 2003 and 2008 within close proximity of Bowman's Creek and thus within close range of the proposed construction access points. These collisions involved two off-path type crashes and one collision where a temporary object on the roadway was hit.

4. Traffic Impacts

This TIA examines the potential impacts from the construction and operation of the gas drainage project on traffic flow in the area, with a particular focus on the impact it will have on the New England Highway. The gas drainage project will be located south of the New England Highway and cover the area of underground coal mining operations, generally between Brunkers Lane and to the south east of the unnamed Dairy Lane.

Construction work may be carried out concurrently with a number of ACOL projects including the Bowman's Creek Diversion Project and 5.5m upcast ventilation shaft. In order to assess the overall impact of the additional traffic generated as a result of the project, the traffic induced from all ACOL projects proposed in the area has been taken into account. **Figure 4.2** below shows the location of adjacent construction sites that have the potential to be active during gas well construction.

- **Figure 4.2: Location of adjacent potentially concurrent worksites**



The following assessment examines the two main access points on the New England Highway used by the gas drainage project and also the cumulative impacts that will arise from other concurrent ACOL works.

Access to the Gas Drainage Plant would be solely gained via the unnamed Dairy Lane, with access to the Drainage Wells and Reticulation Network gained via the unnamed Dairy Lane and Brunkers Lane, however, this would not happen concurrently.

4.1. Unnamed Dairy Lane

The unnamed Dairy Lane provides access to the southern side of New England Highway. The lane is owned and maintained by Ashton Coal and general public access is not permitted. It is an unsealed road serving as a right of way to an existing rural property and dairy farm, located to the south of the ACOL underground mine. Dairy operations will continue during the period of construction and operation of the gas wells, with a milk tanker and other farm associated minor traffic continuing to use the intersection.

The unnamed Dairy Lane joins the New England Highway on a straight alignment, where there is a southbound overtaking lane. The topography slopes uphill to the east of the intersection.

4.1.1. Works Proposed

The unnamed Dairy Lane will provide one of two work site access points for the Gas Drainage Project, with only one access point used at any one time during the construction and operation of the gas wells.

During the construction stage an excavator, drilling rig, a trailer mounted excavator (or equivalent) and a grader will remain on site. Light and heavy vehicles will arrive and depart throughout the day. It has been assumed that each light vehicle will arrive and depart the site twice per day during the construction phase. The maximum likely number of daily vehicles arising from the Gas Drainage Project occurs during the construction stage and is 25 vehicles per day, comprising 18 light vehicles and 7 heavy vehicles per day.

During the operation stage the expected traffic generation from the gas well sites will be significantly lower, with only light vehicle access expected with the potential for heavy vehicles during maintenance or plant upgrades. It is anticipated the maximum worst case average vehicle generation per day would be 6 vehicles, comprising 5 light vehicles and 1 heavy vehicle.

Table 4.1 summarises the expected number of vehicles generated.

- **Table 4.1: Expected Traffic Generation – vehicles per day**

Element	Trucks	Light Vehicles
Construction Stage		
Central Gas Drainage Plant	3	10
Gas Drainage Wells	2	4
Gas Reticulation Network	2	4
Operation Stage		
Central Gas Drainage Plant	1	1
Gas Drainage Wells	0	2
Gas Reticulation Network	0	2

As the construction and operation stages of the Gas Drainage Project will run concurrently, the maximum additional ongoing traffic generated may therefore be up to 18 vehicles per day, occurring at intermittent times, over the life of the project. The maximum additional traffic on an ongoing basis does not include traffic generated by the construction of the gas drainage plant, as this occurs only at the start of the project.

Construction vehicles accessing the site will utilise the existing northbound running lane and/or 2.5m wide shoulder lane on the New England Highway to decelerate and undertake left turns into the work site. The method of access for southbound vehicles will depend on the configuration of New England Highway and the Dairy Lane at the time.

4.1.2. Impacts Arising

The unnamed ‘dairy lane’ will provide the main work site access point for other ACOL construction works, including the ventilation and service shaft works and also a secondary work site access for the Bowmans Creek Diversion works. The unnamed ‘dairy lane’ is proposed to be

the main access point for the other works, and as such is anticipated to generate a combined total of 50 vehicles per day associated with these other projects. It is noted that the timing of projects has not been confirmed and it is currently unknown whether the projects will run concurrently.

The worst case scenario occurs where the gas drainage project and any other ACOL projects run concurrently. In this case, up to an aggregate maximum of 75 vehicles will be generated per day on the New England Highway by staff, delivery of materials and plant for all currently proposed ACOL projects. As such this cumulative volume of traffic is unlikely to be reached in practice. The increase in construction traffic associated with the gas drainage project is a maximum of 25 vehicles per day.

Construction vehicles accessing the work site approaching from the northbound direction will be required to decelerate on the New England Highway on approach to the unnamed Dairy Lane, which may have a minor impact on the travel speed of following traffic.

Traffic delays will be generally isolated to vehicles turning onto the New England Highway from the unnamed Dairy Lane. Left turns from the unnamed Dairy Lane to the New England Highway may impact on traffic flow on the New England Highway northbound as vehicles accelerate up to the posted speed limit. Sight distances in both directions are good, enabling entering traffic to select appropriate gaps.

Vehicles wishing to turn right from the New England Highway onto the unnamed Dairy Lane will be required to continue travelling along the highway until they reach Glennies Creek Road, turn left onto Glennies Creek Road, perform a U-turn on this road, turn right onto the New England Highway and turn left onto the unnamed Dairy Lane.

No significant impacts to traffic are expected to occur from construction and operation of the gas drainage project, given the small volume of traffic to be generated.

4.2. Brunkers Lane

Brunkers Lane is located at the western extremity of the project area. It is a local access road connecting a mining area and rural areas to the New England Highway, which is currently being upgraded as a replacement to Lemington Road by a neighbouring mine operator.

4.2.1. Works Proposed

Brunkers Lane will provide one of two work site access points for several gas drainage wells and sections of the pipeline network. No access via Brunkers Lane is required for construction of the gas drainage plant. Access for construction of the gas wells and reticulation pipeline will occur either at Brunkers Lane or from unnamed Dairy Lane.

During the periods of construction an excavator, drilling rig, a trailer mounted excavator (or equivalent) and a grader will remain on site. Light and heavy vehicles will arrive and depart throughout the day. It has been assumed that during the construction phase the light vehicles would make two round trips per day and each of the heavy vehicles one round trip per day. The maximum likely number of daily vehicle arising from the gas drainage project occurs during the times when construction and operations occur concurrently. This is expected to be 16 vehicles per day comprising 12 light vehicles and 4 heavy vehicles.

During the operation stage the expected traffic generation from the gas well sites at Brunkers Lane will be significantly lower, with only light vehicle access expected at a rate of 4 vehicles per day.

Table 4.3 summarises the expected vehicle volume at Brunkers Lane.

- **Table 4.3: Expected Traffic Generation for Brunkers Lane – vehicles per day**

Element	Trucks	Light Vehicles
Construction Stage		
Gas Drainage Wells	2	4
Gas Reticulation Network	2	4
Operation Stage		
Gas Drainage Wells	0	2
Gas Reticulation Network	0	2

The construction and operation stages of the gas drainage wells and reticulation network elements of the project may run concurrently, therefore the maximum additional traffic generated at the Brunkers Lane intersection may be up to 16 vehicles per day, occurring intermittently over the life of the project.

No works are proposed by ACOL at the New England Highway intersection or approaches, as the existing intersection is constructed to an AUSTROADS rural Type C intersection standard with additional acceleration and deceleration lanes provided for some turning traffic. However it is understood that a proposal by another mine operator exists to upgrade this intersection, however this is not anticipated to adversely impact on any proposed ACOL activities.

Construction vehicles will utilise the existing northbound deceleration lane on the New England Highway to undertake left turns into the work site. Similarly, southbound vehicles will use the southbound deceleration lane and right turn bay when undertaking right turns into the site.

4.2.2. Impacts Arising

Delays will be isolated to vehicles turning onto the New England Highway from Brunkers Lane. Left and right turns from Brunkers Lane to the New England Highway are unlikely to impact on traffic flow on the New England Highway as a result of the proposed intersection upgrades by the adjacent mine operator. Regardless, the impact of vehicles accelerating up to the sign posted speed

limit is not anticipated to have a significant adverse impact given the volume of ACOL vehicles proposed. Sight distances for these movements are good, allowing drivers to select appropriate gaps and limiting any impact on operation of the Highway.

Given the existing good safety history of the intersection, the very minor increase in traffic movements proposed by the works, and the good standard of construction of the existing intersection and proposed upgrade which is likely to improve conditions, the traffic impacts arising from construction of the gas wells at Brunkers Lane is expected to be negligible.

4.3. Cumulative Project Impacts

The gas drainage project will generate additional traffic along the New England Highway, using unnamed Dairy Lane and Brunkers Lane as site access points. Only one of these access points would be used at a time for construction of this project.

A maximum additional 25 vehicles per day would be added to the existing New England Highway traffic volume. The impact of this volume of additional traffic is negligible given the current AADT of the New England Highway of around 11,000 vehicles per day.

Due to the small volume of construction and operational trips arising, and there being no changes required to traffic conditions on the New England Highway, no significant cumulative impacts from other ACOL construction works are anticipated.

5. Management and Monitoring

5.1. Review of Existing Measures

Unnamed Dairy Lane

The unnamed Dairy Lane will provide the main work site access point for other ACOL works assessed in previous Ashton Coal traffic studies, including secondary work site access for the Bowman's Creek Diversion Project (expected completion date August 2012). The following mitigation measures are currently proposed to mitigate the potential impacts associated with turning vehicle movements at this location:

- Advance signage alerting motorists to the presence of turning trucks;
- Maintenance of the existing ‘give way’ control for vehicles turning out of the unnamed Dairy Lane onto the New England Highway; and
- Grass cutting in the vicinity of the intersection to enhance sight distance for vehicles turning out of the unnamed Dairy Lane onto the New England Highway.

Brunkers Lane

The very minor traffic generation and the existing standard of intersection, which is also proposed to be upgraded by the adjacent mine operators, is not anticipated to result in any significant adverse impact on the highway and as a result no mitigation measures are proposed.

5.2. Recommendations for Additional Measures

Vehicles travelling southbound and wishing to turn right from the New England Highway onto the unnamed Dairy Lane during the construction stage will be required to continue beyond the unnamed Dairy Lane, turn left onto Glennie Creek Road, perform a u-turn on this road, turn right onto the New England Highway and turn left onto the unnamed Dairy Lane. This vehicle movement will be maintained unless alternative intersection controls are put into place as a result of other ACOL works.

Given the very small volume of traffic proposed to be generated by the gas drainage project, no other special measures or traffic management strategies are proposed.

6. Conclusions

This Traffic Impact Assessment (TIA) examines the impact of construction and operational traffic associated with the installation and ongoing operation of a number of gas wells and associated gas drainage plant and pipeline network, to be installed in conjunction with the Ashton Coal underground mine.

The additional traffic generated by the construction of the Gas Drainage Project at the unnamed Dairy Lane amounts to 25 vehicles per day with the operational stage generating up to 6 vehicles per day. The construction and operation stages of the gas drainage wells and reticulation network elements of the project will run concurrently at times, in which case the expected maximum additional traffic generated during these intermittent works may be up to 18 vehicles per day, occurring intermittently throughout the life of the project.

At Brunkers Lane, the maximum additional traffic generated may be up to 16 vehicles per day, occurring intermittently over the life of the project. The average daily vehicle generation during the operational phase would be 4 vehicles per day.

The vehicles will access the southern side of New England Highway for the duration of the project in order to construct the gas wells and service the infrastructure. Vehicles will use either the unnamed Dairy Lane, or Brunkers Lane intersection with the New England Highway, dependant on the location of the work at the time. The construction work may take place concurrently with other ACOL construction projects, including the diversion of Bowmans Creek and 5.5m upcast ventilation shaft.

Vehicles at Brunkers Lane will use the existing intersection controls to access to and from the Gas Drainage Project. No adjustments to this intersection are proposed. Vehicles accessing the Gas Drainage project from the unnamed Dairy Lane will use the existing intersection..

Should the gas drainage project occur concurrently with other ACOL construction projects using either Brunkers Lane or unnamed Dairy Lane, then construction traffic would utilise the appropriately approved traffic arrangements.

The additional maximum 25 vehicles per day arising from the gas drainage project would be added to the existing New England Highway traffic volume. The impact of this small volume of additional traffic is negligible given the current AADT of the New England Highway of around 11,000 vehicles per day.

Due to the small number of construction and operational vehicles arising from the project, and there being no changes required to traffic conditions on the New England Highway to facilitate

access, no significant cumulative impacts from other concurrent ACOL construction works are anticipated.

Given the very small volume of traffic proposed to be generated by the gas drainage project, no special measures or traffic management strategies other than the southbound right turn detour are proposed.

7. References

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Modification of DA 309-11-2001-i (MOD 10)
Comprising central gas drainage pant and associated surface infrastructure
March 2012

Ashton Coal Operations Limited Ventilation and Service Shafts Project
Traffic Impact Assessment Report – Stage 1
November 2011