Cardno
Shaping the Future

Appin Colliery Area 7 Goaf Gas Drainage Project

Relocation of MRD and Vertical Boreholes and Alternative Access Route Environmental Assessment

Job Number: 109033-02 Report 003 Rev 0

Prepared for BHP Billiton Illawarra Coal

October 2010

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035
278 Keira Street, Wollongong
NSW 2500 Australia
PO Box 1285
Wollongong NSW 2500
Telephone: 02 4228 4133
Facsimile: 02 4228 6811
International: +61 2 4228 4133
Email: cfr@cardno.com.au
www.cardno.com.au

Document Control

Version	Date	Author		Reviewer	
Rev P0	8 October 2010	Alex Larance	AJL	Peter Chudleigh	PCC
Rev 0	8 October 2010	Alex Larance	AJL	Peter Chudleigh	PCC

Prepared by
for and on behalf of
CARDNO (NSW/ACT) PTY LTD

Alex Larance
Environmental Engineer

Reviewed by

Peter Chudleigh
Civil/Environmental Engineer

Table of Contents

List of Tables

List of Figures

Annexes

1 Introduction

1.1 Background

BHP Billiton Illawarra Coal (BHPBIC) submitted an Environmental Assessment (EA) to the Department of Planning (DoP) in 2009, as part of the development approval process under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the Appin Colliery Area 7 Goaf Gas Drainage Project.

The Appin Colliery Area 7 Goaf Gas Drainage Project comprises the installation of temporary gas extraction boreholes and mobile surface extraction plants and ancillary equipment to drain goaf gas from Longwalls 703 and 704 in Area 7. Project Approval was granted by the Minister for Planning on 2 October 2009 and BHPBIC commenced construction and operation of the project soon after.

Goaf gas extraction from Longwall 703 has successfully been implemented (and operated) in accordance with the Project Approval and as mining of Longwall 703 is nearing completion, implementation of goaf gas extraction infrastructure to service Longwall 704 has commenced.

This EA forms part of a s75W modification application under the EP&A Act to the existing Project Approval to facilitate the relocation of an MRD and vertical borehole, as well as the upgrade of existing access roads and the construction of a new section of access road.

1.2 Project Modification

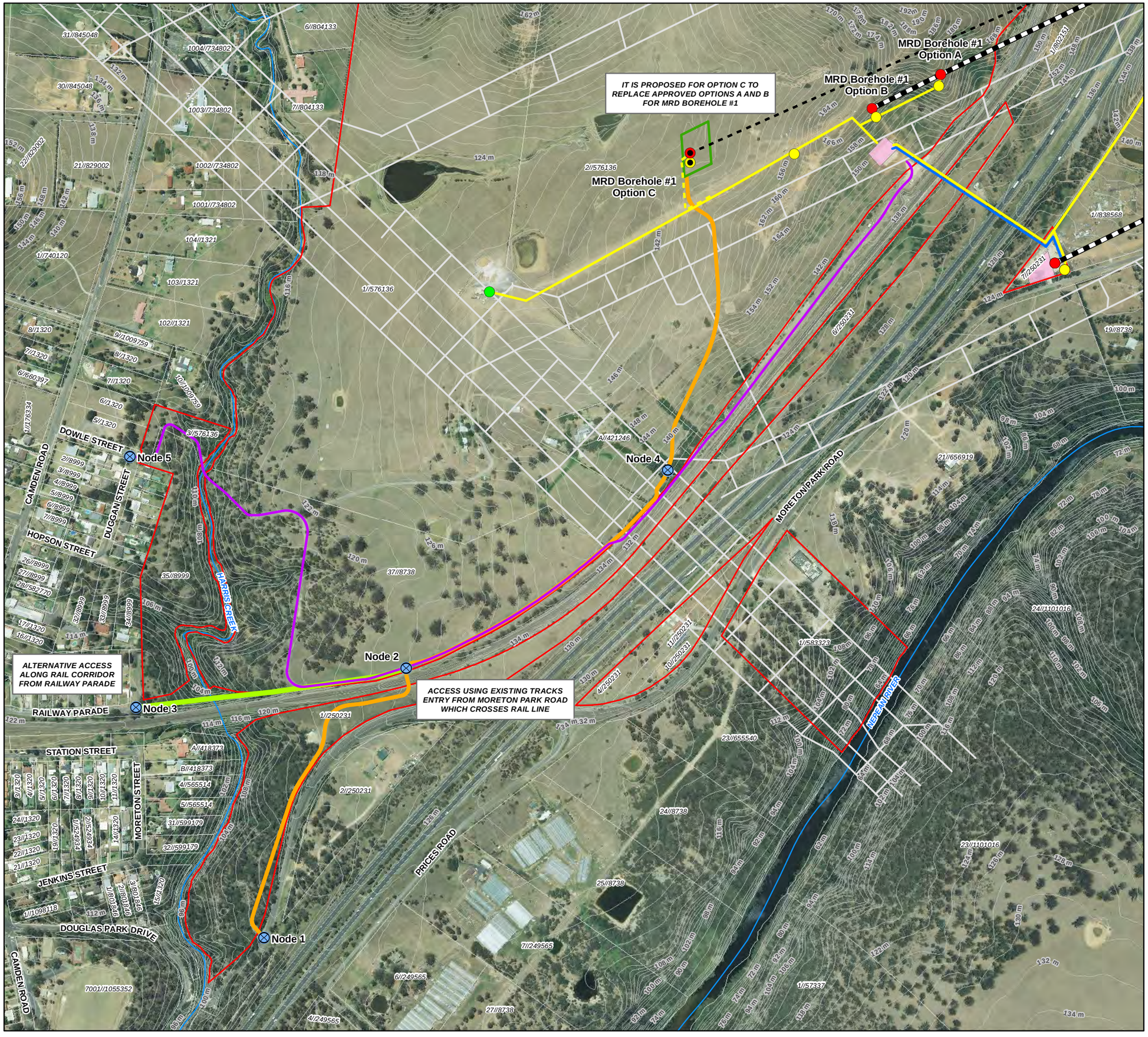
BHPBIC propose to relocate a MRD and vertical borehole, as well as the upgrade of existing access roads and the construction of a new section of access road for the Appin Area 7 Goaf Gas Drainage Project. All activities are proposed to take place on property owned by BHPBIC. The real property descriptions are provided in **Table 1** below.

Table 1: Real Property Descriptions for Modified Part of Project

Activity	Property Description (Lot/DP)
MRD and vertical borehole drilling and surface pipeline reticulation system	Lot 2/DP 576136
Access	Lot A/DP421246 Lot 1/576136 Lot 37/DP8738 Lot 1/DP250231

These modifications are attributed to the resumption of Dowle Street in Douglas Park, NSW, by the NSW Department of Education and Training which has blocked the heavy vehicle access to the site. The change in access route has also given rise to a change in the Medium Radius Drilling (MRD) pad location so that it minimises the level of site disturbance. Both the revised access route and MRD drill pad are co-located with the footprint of the proposed access road for the Appin No.6 Vent Shaft access road. The EA for the Appin No.6 Vent Shaft Project was submitted to the DoP on 28 September 2010.

The MRD and vertical borehole known as “MRD Borehole #1” located on the property described as Lot 2 DP576136 (refer **Figure 1**) is proposed to be relocated to a position approximately 300 m West of the approved location. The arrangement of the proposed relocated boreholes, and the associated drilling pad site, goaf gas drainage pipework and proposed access roads are shown on **Figure 1**.



LW703-704 Goaf Gas Drainage Project Modification

Boreholes (Approved)
- MRD Borehole
- Vertical Borehole
- Downhole

Boreholes (Proposed)
- MRD Borehole
- Vertical Borehole

- Longwalls
- 2m Contours (LPMA)
- Railway Parade Alternative Access
- MRD Drill Pad (Proposed)
- Existing Approved Access Road
- Proposed New Access Road Alignment
- Possible Water Supply

MRD Planview Trajectory
- Approved
- Proposed

Surface Pipeline Reticulation System
- Approved
- Proposed
- Cadastre
- BHPBIC Land
- Extraction Plant Locations

FIGURE 1

N W E S

Scale 1:6,000 (at A3)

Metres
0 50 100 150 200 250 300

Map Produced by Cardno Wollongong
Date: 8/10/2010
Coordinate System: GDA 1994 MGA Zone 56
Project: 109033-02
Map: 2811_NewAccessRoadAlignment.mxd 08

Imagery supplied by BHPBIC (December 2009)

The access to the BHPBIC property for the MRD and vertical borehole construction will utilise a number of existing roads and upgraded tracks. A new section of roadway will be required from Node 4 to allow access to the proposed boreholes. This section of access roadway has the same footprint as the proposed access road for the Appin No.6 Vent Shaft access road. Heavy articulated vehicular access will be via an upgraded existing track from Moreton Park Road (Node 1) that runs over a level crossing of the Main Southern Rail Line onto the site connecting up with an existing internal road (Node 2), while all heavy rigid and support vehicles will enter the site via the existing rail side roadway from Railway Parade in Douglas Park (Node 3). It is proposed that only light vehicles will enter via the Duggan Street entrance to the Mountbatten property (Node 5) to minimise impacts on the Douglas Park community.

It should be noted that the access route to the Mountbatten property (see Node 5 to Node 4 in **Figure 1**) was part of the previously approved route noted within the Appin Colliery Area 7 Goaf Gas Drainage Project EA. A new internal section of access road alignment (Node 4 to MRD Borehole #1), on the property described as Lot 2 DP576136, will be required to allow access to the relocated borehole drilling pad. This proposed road section is located between Node 4 and the MRD Borehole #1 pad as is indicated on **Figure 1**. Construction of the site access is expected to have a relatively short duration of ~150 days. The MRD and vertical borehole construction period is expected to have a relatively short duration of ~90 days.

Cardno has reviewed the environmental impact assessments relating to the proposed borehole relocation, connecting pipe work route and access road requirements and concurs with BHPBIC that there is unlikely to be any significant alteration in environmental impacts due to the relocation of the boreholes, pipework and access roads from those previously approved for the Appin Colliery Area 7 Goaf Gas Drainage Project.

The relocated position of MRD Borehole #1 and its associated access road requirements maintain a similar elevation, distance and exposure to the neighbouring receivers to the approved location. The relocated position for the MRD and vertical boreholes (refer MRD Borehole #1 on **Figure 1**) and associated pipework and access road requirements will not have any additional impacts on land use or visual sensitivity than what is currently approved.

Water and sediment control measures will be required for disturbed areas such as access roads, material stockpiles, pipe trenches and drill pads as per requirements outlined in Section 8.5 and Section 8.6 of the Appin Colliery Area 7 Goaf Gas Drainage Project EA, and the Management Plans that were approved by the DoP in October 2009.

Further assessment of the pertinent potential environmental impacts is provided in **Section 2** of this EA.

2 Environmental Impact Assessment

The Environmental Impacts associated with the proposed modification to the scope of the Approved Project have been assessed and are considered to be:

- **Noise** (assessed by Wilkinson Murray).
- **Flora and Fauna** (assessed by Niche Environment and Heritage).
- **Aboriginal Cultural Heritage** (assessed by Niche Environment and Heritage).
- **Traffic** (assessed by Cardno Traffic and Transport Planning).

These potential impacts are considered and assessed in the following subsections.

2.1 Noise

Wilkinson Murray (WM) have undertaken a noise impact assessment for the modified scope of the Project (refer **Annex A**). WM has assessed the drilling associated with the relocated MRD borehole (refer MRD Borehole #1 on **Figure 1**) and predicted that noise at residential receiver locations will comply with the DECCW's Interim Construction Noise Guideline criteria with mitigation measures installed that consist of a 5 m high temporary noise barrier located on the western and southern sides of the drilling rig. In order for BHPBIC to assess the need for any further mitigation it is recommended that night-time noise monitoring be undertaken at the commencement of drilling to verify the predicted levels and to subjectively assess the levels of annoyance.

WM predict that the drilling of the relocated vertical borehole (refer MRD Borehole #1 on **Figure 1**) will comply with the relevant noise assessment criteria with no additional mitigation measures being required.

The regular use of the access roads (refer **Figure 1**) will not result in any significant impacts to sensitive residential receivers, except at Receiver #3 during the night time shift change where only a minor 2 dBA exceedance is predicted. WM believe this minor noise impact will be acceptable considering short 15 min shift change duration, the instantaneous noise level is not predicted to exceed the sleep disturbance screen criterion and the context of the ambient noise environment, which includes the adjacent Hume Highway.

Overall WM have assessed the potential noise impacts and are of the opinion that the impacts can be successfully mitigated to acceptable levels if the following recommendations are implemented by BHPBIC:

- Construction hours shall be in accordance with the approved consent conditions.
- A 5 m high temporary noise mitigation barrier shall be installed on the Western and Southern sides of the MRD drilling rig.
- Night-time noise monitoring be undertaken at the commencement of drilling. This will verify the predicted levels and assess any annoyance of drilling noise in the context of the ambient noise environment, which includes the Hume Highway and Main Southern Rail Line.
- BHPBIC will ensure that further mitigation measures are negotiated with any affected residents should the need be determined from noise monitoring on site and at receivers or registered complaints.
- Heavy vehicles should not use the access road at night except in case of an emergency to ensure that possible associated noise impacts are minimised.

Please refer to **Annex A** for further details.

2.2 Flora and Fauna

Niche Environment & Heritage have assessed the potential impacts on flora and fauna relating to the proposed relocated position of the MRD and vertical boreholes and the proposed access roadways indicated in **Figure 1** (refer **Annex B**).

The flora and fauna assessment concludes that the relocated positions for the proposed MRD Borehole #1 drilling pad, access roads and pipeline will not significantly impact any protected species or communities. They also note that only a very small area of highly degraded Shale Sandstone Transition Forest is proposed to be cleared and that no important habitat for any threatened fauna will be lost as a result. The proposed s75W approval modification is therefore not likely to significantly impact any threatened species, population or ecological community, provided the following recommendations are implemented by BHPBIC:

- Silt fencing should be erected around any area where soil is deposited or disturbed to ensure sediment laden runoff does not enter the adjacent vegetation or the Harris Creek drainage line.
- Clean fill (crushed sandstone or similar sterile aggregate) should be used to upgrade the existing road. I.e. the fill should be weed free.

Please refer to **Annex B** for further details.

2.3 Aboriginal Cultural Heritage

Niche Environment & Heritage consultants have assessed potential impacts on Aboriginal cultural heritage for the relocated positions of the MRD and vertical boreholes, pipelines and the proposed access roadways indicated in **Figure 1** (refer **Annex B**).

The cultural heritage assessment has considered the potential impacts on Aboriginal cultural heritage sites and other sites with known heritage values in the vicinity of the modified project. This has been supported with a desktop search of the AHIMS database and a field survey of the area which includes the relocated boreholes pad, pipeline route and associated access roads, as well as site based assessments undertaken for the Appin No 6 Vent Shaft. The field survey of this area was undertaken in the presence of representation from the Tharawal Local Aboriginal Land Council.

The proposed access road upgrade areas were inspected on 16 July 2010 and the area has been assessed as having a generally low Aboriginal archaeological potential and has also been disturbed by repeated tilling for pasture improvement. Niche note that such localities do not usually contain Aboriginal objects.

Niche also make reference to the recently enacted National Parks and Wildlife Regulation 2010 which recognises the low risk presented by “low impact” activities such as the proposed upgrade of the access track off Moreton Park Road between Node 1 and Node 2 by providing a defence to strict liability offences to harm to Aboriginal objects under the National Parks and Wildlife Act 1974.

Niches report findings conclude that the relocated positions for the proposed MRD Borehole #1 drilling pad, pipeline routes or access roads will not impact on any Aboriginal objects or heritage values provided the following recommendations are implemented by BHPBIC:

- Should any Aboriginal object(s) be identified during works all work that continues to pose a risk of impact to the object(s) must cease and arrangement be made for the assessment of significance of the object, and its appropriate management prior to works again proceeding.
- Vegetation clearing in the vicinity of the Mountbatten Group must be kept to a minimum.

Please refer to **Annex B** for further details.

2.4 Traffic

Cardno Traffic and Transport Planning has assessed the traffic impacts relating to the proposed construction traffic routes for the relocated boreholes (refer **Annex C**).

The following construction traffic routes have been assessed for potential impacts:

- **Duggan Street/ Hopson Street** – Use of the existing approved access by light construction vehicles only.
- **Railway Parade** – Proposed use of the existing road running alongside the rail corridor to the site by heavy rigid construction vehicles.
- **Moreton Park Road** – Proposed use of the existing upgraded road by heavy articulated vehicles.
- **Railway Crossing** – Proposed temporary use of existing upgraded railway crossing by heavy articulated vehicles.

Cardno have assessed that improvements in traffic performance, safety and amenity for Douglas Park residents will result from the newly proposed vehicle routes as there will be a reduction in the traffic volumes along Duggan and Hopson Streets. Heavy vehicles will now be entering the site from Moreton Park Road rather than through Douglas Park village and the existing Duggan Street/Hopson Street access road.

Cardno have also assessed that the minor increases in traffic volumes expected at Railway Parade and Moreton Park Road will have negligible impact to existing traffic volumes.

The traffic movements entering and exiting the site from Moreton Park Road can be accommodated safely with the use of appropriate warning signs and traffic control measures. A Traffic Management Plan (TMP) for the Moreton Park Road intersection has been included in Cardnos assessment which recommends appropriate traffic control measures and the installation appropriate warning signs.

The railway crossing upgrade and access controls are being managed by BHPBIC in consultation with ARTC and RAILCON, who will provide a “Rail Protection Officer” to make arrangements and co-ordinate the crossing safe and to control traffic/train interactions.

Cardno has concluded that overall the proposed vehicular access associated with the construction of the relocated boreholes will not result in significantly increases in traffic impacts provided the following recommendations are implemented by:

- Approval to be given to the use of Railway Parade as a construction access route for heavy rigid vehicles.
- Approval be given to the use of Moreton Park Road as a construction access route for heavy articulated vehicles, subject to:
    - The provision of temporary signage as per Traffic Control Plan 1 for the duration of the project.

  - The provision of traffic control and flagmen signage when heavy articulated vehicles are entering and leaving the site access track, as per Traffic Control Plan 2.
- Drivers are required to continue to abide by the BHPBIC Douglas Park Drivers Code of Conduct (refer **Annex C**).

Please refer to **Annex C** for further details.

3 Conclusion

The reviews and assessments conducted in relation to the relocation of the MRD, one of the vertical boreholes and associated pipework on the property described as Lot 2 DP576136 and modified access on the properties described as Lot A / DP421246, Lot 1 / 576136, Lot 37 / DP 8738, Lot 1 / DP 250231 indicate that no significant noise, ecological, heritage, traffic or visual impacts are expected to occur provided the prescribed recommendations are implemented. In the event that noise monitoring or any sensitive receiver identifies sound level annoyance, BHPBIC would negotiate with the affected receiver and implement additional mitigation measures as deemed necessary.

The reviews and assessments conducted in relation to the relocation of the MRD and one of the vertical boreholes on the property described as Lot 2 DP576136 indicate there will be no additional impacts to those previously assessed in the Appin Colliery Area 7 Goaf Gas Drainage Project EA.

The findings of this EA therefore support BHPBICs application for a modification to the existing Appin Colliery Area 7 Goaf Gas Drainage Project Approval under Section 75W of the EP&A Act.

Cardno recommends this modification to the existing Project Approval be granted to allow the safe and efficient mining of Longwall 704 in Appin Area 7.

Annex A

A. Wilkinson Murray Revised Noise Assessment

APPIN AREA 7 GOAF GAS DRAINAGE

REVISED CONSTRUCTION NOISE ASSESSMENT

ACOUSTICS AND AIR

REPORT NO. 08396-A
VERSION C

WILKINSON MURRAY

APPIN AREA 7 GOAF GAS DRAINAGE

REVISED CONSTRUCTION NOISE ASSESSMENT

REPORT NO. 08396-A
VERSION C

SEPTEMBER 2010

PREPARED FOR

BHP BILLITON ILLAWARRA COAL

Wilkinson Murray (Sydney) Pty Limited · ABN 39 139 833 060
Level 2, 123 Willoughby Road, Crows Nest NSW 2065, Australia • **Offices in SE Qld & Hong Kong**
t +61 2 9437 4611 • **f** +61 2 9437 4393 • **e** acoustics@wilkinsonmurray.com.au • **w** www.wilkinsonmurray.com.au

TABLE OF CONTENTS

GLOSSARY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph overleaf, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

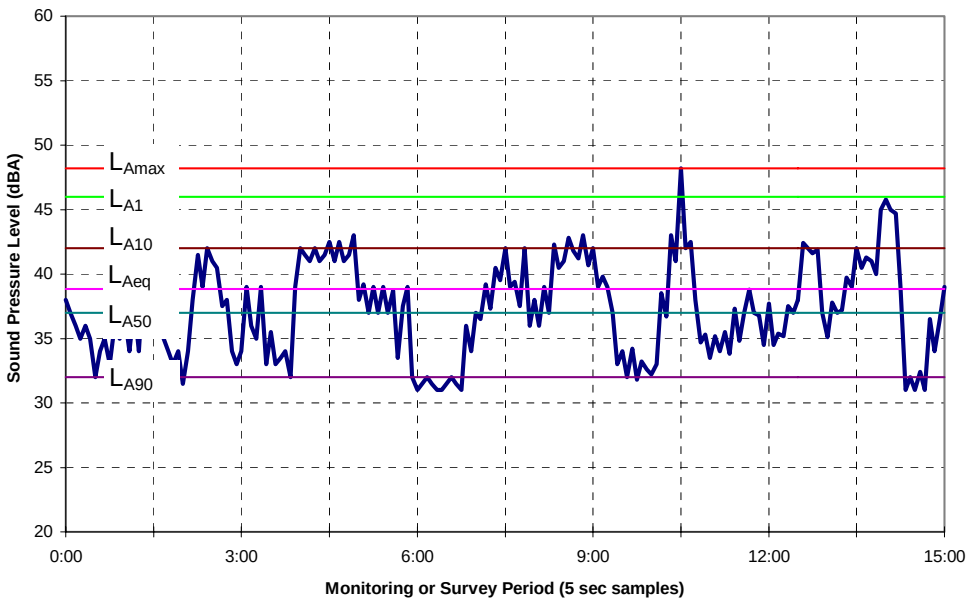
L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

L_{A50} – The L_{A50} level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the L_{A50} level for 50% of the time.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10^{th} percentile (lowest 10^{th} percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period **–** daytime, evening and night time.


60
55
50
45
40
35
30
25
20
Sound Pressure Level (dBA)
LAmax
LA1
LA10
LAeq
LA50
LA90
0:00
3:00
6:00
9:00
12:00
15:00
Monitoring or Survey Period (5 sec samples)

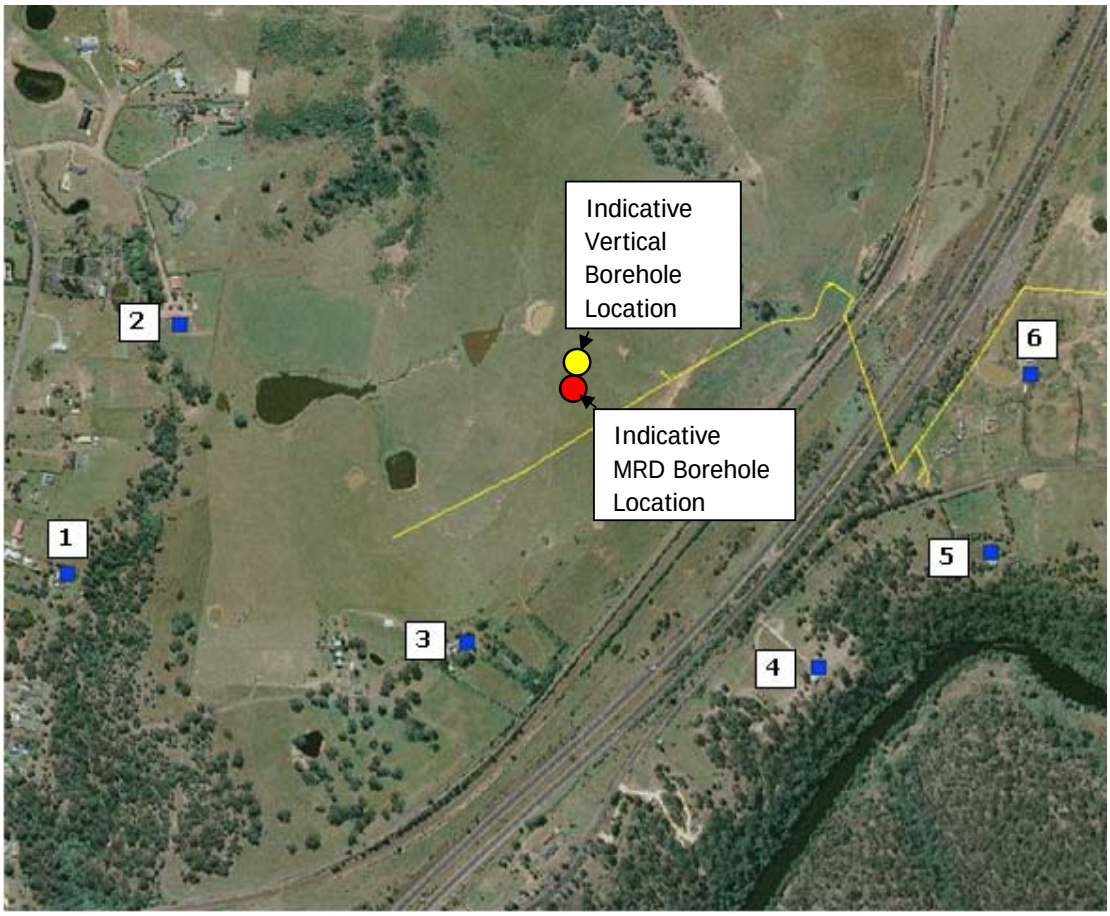
1 INTRODUCTION

Wilkinson Murray has previously undertaken an assessment of operational and construction noise for a GOAF Gas Drainage Plant at Appin Area 7 (WM Report 08396 VerB, May 2009). The locations of one of the MRD boreholes, a vertical borehole, and also the associated access roads have now changed from the approved locations and additional assessment by Wilkinson Murray has been sought. This report details our assessment of these changes.

2 SITE DESCRIPTION

An aerial photograph showing the indicative location of the MRD borehole and vertical borehole is shown in Figure 2-1. The nearest sensitive receivers are also shown.

Figure 2-1 Aerial Photograph



For engineering reasons the construction of the MRD Borehole requires 24 hour operation. Drilling of the vertical borehole as well as any upgrading works needed on the access road will be undertaken during standard construction hours.

3 NOISE CRITERIA

The NSW DECCW *Interim Construction Noise Guideline* recommends the following objectives:

Recommended standard hours of work:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1pm
- No work on Sundays or Public Holidays

Quantitative Management Noise Goals

Noise goals are detailed in the ICNG and are as follows in Table 3-1.

Table 3-1 Noise at Residences using Quantitative Assessment

Time of Day	Management Level $L_{Aeq,15min}$	How to Apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq,15\ min}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

Drilling the MRD borehole requires 24 hour operation and thus will occur outside standard construction hours. As this is an engineering requirement, justification for these works is considered to be present and so the management levels in Table 3-1 are applicable, i.e. RBL + 5 dB.

All other work will occur during standard construction hours and so a management level of RBL + 10 dB is applicable.

Table 3-2 presents a summary of the construction noise goals for each NCA for standard hours and out of hours work. These are based on RBL values shown in our previous report.

Table 3-2 Construction Noise Criteria

NCA	Standard Construction Hours $L_{Aeq(15mins)}$	Outside Standard Construction Hours $L_{Aeq(15mins)}$		
		Day	Evening	Night
1	50	45	45	41
2	50	45	45	41
3	55	50	50	43
4	55	50	50	43
5	50	45	45	41
6	55	50	50	43

At night there is a requirement to meet sleep disturbance criteria outlined in the ICNG for intermittent/impulsive noise. The ICNG requires quantitative assessment of the potential for sleep disturbance if works will occur for more than two consecutive nights. The ICNG refers to the *Environmental Criteria for Road Traffic Noise* (ECRTN) for guidance on applicable sleep disturbance criteria. A commonly used screening criterion for assessment of sleep disturbance, which is specified in the DECCW's Noise Guide for Local Government (NGLG), is that $L_{A1,1min}$ should not exceed the background noise level by more than 15 dBA. This applies to the level of construction noise external to any residence or other noise-sensitive receiver for the night period (10pm-7am).

Table 3-3 presents a summary of sleep disturbance screening noise levels for each NCA.

Table 3-3 Sleep Disturbance Construction Noise Goals

NCA	Night time Background Noise Level $L_{A90,15mins}$	Acceptable $L_{A1,1min}$ Noise Level Night
1	36	51
2	36	51
3	38	53
4	38	53
5	36	51
6	38	53

There is evidence in the appendices to the ECRTN to suggest that external noise levels less than 55 dBA are insufficient to cause awakening reactions. Therefore this criterion is considered conservative.

4 NOISE LEVEL PREDICTIONS

4.1 MRD Borehole Construction Noise Prediction

Noise levels were calculated using the ENM prediction algorithms. Because this activity will occur at night, when meteorological conditions can significantly affect noise propagation, statistical meteorological data was applied to the predictions to facilitate prediction of the seasonal 10th percentile exceedance noise levels (i.e. the level exceeded for 10% of the time). This approach has been accepted by NSW regulatory authorities and is the same approach that was used in our initial assessment. For further details of this prediction methodology please consult our initial report.

The predicted $L_{Aeq,15min}$ noise levels are presented in Table 4-1.

Table 4-1 Calculated MRD1 Borehole Drilling $L_{Aeq,15min}$ Noise Levels

Receiver	Predicted Level (dBA)						Criteria (dBA)		
	No Mitigation			5m Barrier / Mound					
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
1	47	**46**	**50**	33	32	35	50	45	41
2	**51**	**46**	**55**	38	36	40	50	45	41
3	**52**	50	**54**	40	38	41	55	50	43
4	31	29	31	31	29	31	55	50	43
5	31	28	31	31	28	31	50	45	41
6	33	30	33	32	29	33	55	50	43

The modelling predicts exceedances of criteria at three of the six receivers. The greatest exceedances will occur during the night time period.

In order to mitigate some of this noise a 5m barrier was modelled on the southern and western sides of the drill rig. Modelling assumed this barrier will be located 10m from the drill rig. To achieve this the layout of auxiliary items may need to be modified to fit the barrier. The predicted noise levels with this mitigation are also shown in Table 4-1. With the inclusion of this barrier, receiver noise levels are predicted to comply with criteria.

Table 4-2 presents the predicted $L_{A1,1min}$ receiver noise levels.

Table 4-2 Calculated MRD1 Borehole Drilling $L_{A1,1min}$ Noise Levels

Receiver	Predicted Level (dBA)		Criteria (dBA)
	No Mitigation	5m Barrier / Mound	
1	**53**	38	51
2	**58**	44	51
3	**57**	45	53
4	34	34	53
5	34	34	51
6	36	36	53

The $L_{A1,1min}$ noise levels without mitigation are predicted to exceed the sleep disturbance screening criteria. With the inclusion of the 5m barrier/mound discussed above all receivers are predicted to comply.

Given that receiver noise levels are predicted to approach criteria and are also expected to be audible at the nearest receivers, we recommend that noise monitoring be conducted at the commencement of drilling to confirm noise level predictions.

4.2 Vertical Borehole Construction Noise Prediction

Drilling of the vertical borehole adjacent to the MRD borehole will only occur during standard construction hours. The predicted $L_{Aeq,15min}$ noise level from this activity is presented in Table 4-3.

Table 4-3 Calculated Vertical Borehole Drilling $L_{Aeq,15min}$ Noise Levels

Receiver	Predicted Level (dBA)	Criteria (dBA)
1	47	50
2	49	50
3	51	55
4	30	55
5	30	50
6	31	55

Noise levels from drilling the vertical borehole are predicted to be within appropriate criteria at all receivers.

4.3 Access Road Noise Prediction

Use of the access road during the day is expected to have minimal impact. During the night time period the most intensive use will occur during shift change when four vehicles will use the road in one 15 minute period. The predicted $L_{Aeq,15min}$ and $L_{A1,1min}$ noise levels from this activity are presented in Table 4-4.

Table 4-4 Calculated Access Road Noise Levels

Receiver	Predicted Level (dBA)		Criteria (dBA)	
	$L_{Aeq,15min}$	$L_{A1,1min}$	$L_{Aeq,15min}$	$L_{A1,1min}$
1	35	40	41	51
2	31	35	41	51
3	45	52	43	53
4	36	41	43	53
5	32	36	41	51
6	30	34	43	53

Noise levels from the regular use of the access road are predicted to be within appropriate criteria for all receivers except receiver 3, where a minor 2 dB exceedance of the $L_{Aeq,15min}$ criterion is predicted. We note that these noise levels are based on a worst-case 15 minute period during shift change and that for much of the time lower or no noise emissions will be present.

We note that the instantaneous noise level is not predicted to exceed the sleep disturbance screening criterion. In light of this the noise levels from the access road are considered to be acceptable.

An alternative access road is proposed to join onto Railway Parade in Douglas Park. The majority of this route is identical to the one assessed, although this route will have slightly greater impacts on residences on Railway Parade. The noise emissions from this route will be akin to ordinary traffic noise, with a peak generation of four light vehicles during shift change. We note that this access option is an alternative route that will be used infrequently as a contingency, and conclude from our qualitative review that noise emissions from the ordinary use of this route are acceptable.

An existing access route currently exists, joining the wider road network in Douglas Park at Dowle Street.

Peak traffic generations on the access route will occur during the drilling rig initialisation. This will occur primarily during standard construction hours, unless required to occur at night due to restrictions on the road network. We expect that heavy vehicle movements on the access road will generate noise levels exceeding criteria at some surrounding receivers, particularly receiver 3. We therefore recommend that, if possible, heavy vehicles not use the access road at night except in the case of an emergency. This may require that oversize vehicles that need to travel at night should park at the start of the access road and complete the trip during the less sensitive daytime period.

5 MITIGATION MEASURES

Our assessment has identified the need for mitigation measures to be adopted. The most significant need for these is related to drilling the MRD borehole, which requires 24 hour operation.

A temporary noise barrier has been modelled and is proposed to be implemented. Pending the outcomes of initial noise monitoring on site, further mitigation measures may be required. This section of the report details potential noise mitigation options and their anticipated affect on noise emissions.

In general, management of noise requires attention to the following:

- Construction hours;
- Noise monitoring on site and at sensitive receivers;
- Training and awareness;
- Communication;
- Incident and emergency response; and
- Non-conformance, preventative and corrective action.

Where appropriate the specific noise mitigation measures could include the following.

- Orienting equipment away from sensitive receivers.
- Using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including cranes , excavators and trucks.
- Selecting plant and equipment based on noise emission levels.
- Using alternative construction methods to minimise noise levels.
- Providing alternative arrangements with affected residents such as temporary relocation.
- Using spotters, closed circuit television monitors, “smart” reversing alarms, or “quacker” type reversing alarms in place of traditional reversing alarms.

Education and training of site staff is necessary for satisfactory implementation of noise mitigation measures. Education and training strategies should focus on:

- site awareness training / environmental inductions that include a section on noise mitigation techniques / measures to be implemented throughout the project;
- ensuring work occurs within approved hours;
- locating noisy equipment away from sensitive receivers;
- using noise screens for mobile plant and equipment;
- ensuring plant and equipment is well maintained and not making excessive noise; and
- turning off machinery when not in use.

For noise mitigation measures that result in a direct reduction in noise level, indicative noise reductions that can potentially be achieved by these measures, subject to the type and number of equipment and intensity of construction activities, are shown in Table 5-1. Other measures that also provide significant benefits are listed in Table 5-2. It is recommended that these be considered in preparation of a construction noise management plan prior to commencing works on site.

Table 5-1 Measures to Reduce Construction Noise Levels

Management Measure	Potential Noise Reduction, dBA
Administrative Controls	
Turning off machinery when not in use	0-5
Engineering Controls	
Screen or enclosure for stationary equipment	10-15
Orienting equipment away from sensitive receivers.	3-9
Using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	5-10
Selecting site access points and roads as far as possible away from sensitive receivers	3-6
Employ non noise-generating structures such as site offices, storage sheds, stockpiles and tanks as noise barriers	5-10

Table 5-2 Other Measures to Mitigate Construction Noise Impacts

Management Measure
Administrative Controls
Operate during approved hours
Undertake regular noise monitoring to determine the impact of operating plant on sensitive receivers
Appropriate training of onsite staff
Undertake community consultation and respond to complaints in accordance with established project procedures
Engineering Controls
Using spotters, closed circuit television monitors, “smart” reversing alarms, or “squawker” type reversing alarms in place of traditional reversing alarms to minimise the intrusiveness of reversing alarms

6 CONCLUSION

Wilkinson Murray has conducted an assessment of construction noise from a revised MRD borehole, vertical borehole and access road at the Appin Area 7 GOAF Gas Drainage Plant.

Assessment has been conducted in general accordance with the DECCW's *Interim Construction Noise Guideline*.

Noise levels from drilling the relocated MRD borehole are predicted to exceed the relevant criteria without mitigation. A 5m temporary barrier has been modelled on the western and southern sides of the rig and is predicted to reduce noise levels sufficiently to comply with criteria. In order to assess the need for further mitigation we recommend that night-time noise monitoring be undertaken at the commencement of drilling to verify the predicted levels and subjectively assess the annoyance of drilling noise in the context of the ambient noise environment, which includes the Hume Highway.

Noise emissions from drilling the vertical borehole are predicted to comply with the relevant criteria.

Noise levels from the regular use of the access road are expected to generally comply with criteria, though a minor 2 dB exceedance of criteria is predicted at receiver 3 during the night time shift change. In light of the infrequent occurance of this noise level (i.e. once only per night) and also the minor magnitude of the exceedance, we consider it unlikely that this noise will significantly impact on receivers.

It is also recommend that, if possible, heavy vehicles not use the access road at night except in the case of an emergency.

Version	Status	Date	Prepared by	Checked by
A	Draft	24 September 2010	Adam Bioletti	Rob Bullen
B	Final	29 September 2010	Adam Bioletti	
B	Revised Final	5 October 2010	Adam Bioletti	

Annex B

B. Niche Environment and Heritage Ecology and Archaeological Assessment

Attention: Dr Bruce Blunden
Environmental Approvals Manager
Sustainable Development
BHP Billiton Illawarra Coal

PO Box 514 Unanderra
New South Wales 2526

5 October 2010

Via email: Bruce.Blunden@bhpbilliton.com

Dear Bruce

Appin Colliery Longwall 704: Section 75W Modification Goaf Gas Drilling Project – Ecology and Archaeological Assessment

As requested Niche Environment and Heritage (Niche) has undertaken an assessment of the ecological and heritage constraints and potential impacts for the modified Appin Longwall 704 Goaf Gas Drilling Project to be undertaken on the Mountbatten Stud property at Douglas Park NSW. This assessment supports a modification under Section 75W of the *Environmental Planning Assessment Act* (EP&A Act) 1979 to an existing approval for similar works associated with Appin Colliery.

The proposal

Figure 1 shows the proposed works associated with the proposed modification. The proposed works are outlined in Table 1.

The majority of the area associated with the proposed works has previously been assessed as part of a larger project known as the Appin Ventilation Shaft No .6 Project.

Table 1: Proposed works and assessment requirements

Proposed Works	Assessment Requirements
The installation of an access gate off Moreton Park Road (at Node 1) and widening of a section of existing access road (to 3.5 m) which runs off Moreton Park Road to the existing railway crossing (at Node 2). This work will involve the removal of a small area of vegetation at the entrance to the property off Moreton Park Road (approximately 10m^2) and then the removal of between 6-10 trees/stags along the alignment of the existing access track between Node 1 and Node 2. Note widening of the access road at the Moreton Park Junction (Node 1) will extend to 5.5 metres. Possible upgrading of a small pipe culvert half way between Node 1 and Node 2. Minor disturbance to Privet infestation possible. Possible minor levelling of some of the existing track. Addition of crushed rock to form a stable road base and dressing.	Site assessment for ecological values required. Risk assessment of cultural heritage impacts required.
The use of the existing access road from Douglas Park (at Node 5) into the Mount Batten Property for light vehicles only. No vegetation clearing or road upgrade works expected.	No further assessment required.
The use of the section of an existing access road running along the railway	No further assessment required.

corridor from Railway Parade at Node 3 through to Node 2. No vegetation clearing expected.	
The widening of a section of existing access road (to 5.5m) that runs from the railway crossing at Node 2 up until Node 4. Compacted crushed sandstone to be used as the road base material in the access road. No Vegetation clearing will be undertaken here.	Assessment of this section of infrastructure included in this assessment.
Development of a proposed access road from Node 4 running up to MRD Borehole #1 (Option C).	Assessment of this section of infrastructure included in this assessment.
The area of disturbance proposed at the proposed MRD Borehole #1 (Option C) site locality. This disturbance area will be a result of the establishment of the borehole drilling rig and works footprint.	Assessment of this section of infrastructure included in this assessment.

Ecological Assessment

A site assessment of the proposed access road between Moreton Park Road (Node 1) and the Southern Rail Line (Note 2) was undertaken on 16 September 2010. Alex Larance (Cardno Wollongong), Bruce Blunden (BHP Billiton Illawarra Coal) and Maurice Jarra (BHP Billiton Illawarra Coal) were present at the site assessment to discuss the extent of works required to improve the access track to a standard required for heavy vehicle access to the site. An assessment of the proposed access track and MRD borehole site was undertaken on 6 July 2010.

The site assessment confirmed that the proposed works would be restricted to the following:

- Removal of a very small area (approximately 10m^2) of highly disturbed native vegetation at Node 1 to widen the entry to the existing access road.
- Removal of approximately six to ten trees along the existing access road (between Node 1 and Node 2) to facilitate the safe passage of heavy vehicles along the existing access road.
- Possible upgrade works to the pipe culvert half way between Node 1 and Node 2 (no native vegetation clearing anticipated).
- Minor road upgrade works including the introduction of crushed sandstone (or similar aggregate) to form a stable road base (especially in low lying areas adjacent to the Southern Rail Line) and possibly levelling of higher 'bumps' in the existing road between Node 1 and Node 2.
- Removal of dumped rubbish from along the assess track between Node 1 and Node 2.
- Minor upgrade works to the existing access track between Node 2 and Node 4.
- Development of an access track between Node 4 and the proposed MRD borehole site.
- Development of the MRD borehole site footprint.

Existing Environment

Node 1 to Node 2

The access track between Node 1 and 2 exists within modified landscape. The access track is mostly level and is situated to the east of the Harris Creek gorge between Moreton Park Road and the Southern Railway.

The access track has been in operation for many years and for the most part runs adjacent to Moreton Park Road as it approaches the Southern Rail Line. A small pipe culvert is

located under the existing track (approximately midway between Node 1 and Node 2) and the remainder of the track has been subject to regular disturbance.

The existing track has been developed, for the most part, on the existing surface soil profile although it is obvious that in some places cut and fill has been used to level the road. In a number of areas the fill has included imported material such as blue metal, especially in proximity to the existing culvert.

The area adjacent to the access track varies from vegetation that is in moderate condition to areas where rubbish and construction waste has been dumped (see Plate 1)

Plate 1: Rubbish dumped beside assess track

Vegetation at Node 1 consists of a number of small trees (*Eucalyptus punctata*) and a thick small tree – shrub layer dominated by Privet (*Ligustrum* sp.). As stated above, a very small area of this vegetation (approximately 10m^2) will be disturbed in this location.

Plate 2: existing access track

Plate 3:Small area of vegetation at Node 1 to be removed

Approximately 6-10 trees (including those at Node 2) or dead stags may be removed for the proposal. These trees included Ironbarks (*Eucalyptus crebra* and *E. fibrosa*), a Stringybark (*E. globoidea*) and *Grey Gum* (*Eucalyptus punctata*). Several dead stags will also be removed. None of the trees which may potentially be removed retained any hollows.

Sydney Office
PO Box 231, Concord, NSW 2137
Mobile: 0488 224 888 **Fax:** 02 4017 0071
jreeves@niche-eh.com

Central Coast/Hunter Office
PO Box 3104, Umina Beach, NSW 2257
Mobile: 0488 224 999 **Fax:** 02 4017 0071
rharrington@niche-eh.com

Illawarra/Southern NSW Office
PO Box 12, Macarthur Square, NSW 2560
Mobile: 0488 224 777 **Fax:** 02 4017 0071
mrichardson@niche-eh.com

Node 2 to Node 4

Minor upgrade works along the section of existing access road between Nodes 2 and 4 will not result in any disturbance to native vegetation or fauna habitat. It should be noted that the area to the immediate north of the existing access track between Node 2 and Node 4 is considered to include vegetation that is representative of the Critically Endangered Ecological Community – Cumberland Plain Woodland (see the attached Figure) as mapped by Niche Environment and Heritage in 2010. This vegetation will not be disturbed by the current proposal.

No further consideration of this area is required in the ecological assessment.

Node 4 to the MRD Drill Site

The attached figure indicates that presence of some vegetation between Node 4 and the proposed MRD Drill site. This vegetation is part of the hedge surrounding the Mountbatten Stud Complex which consists of a range of introduced tree and shrub species including European Olive (*Olea europaea*) and Privet (*Ligustrum sp*).

The remainder of the access track and the MRD site itself occur within Exotic Pasture which is not a native vegetation community and which retains no important habitat for native fauna.

No further consideration of this area is required in the ecological assessment.

Plate 4: Olive and Privet hedge between Node 4 and the MRD borehole site.

Plate 5: Exotic pastures of the MRD Borehole Site and access track from Mountbatten Stud

Impact Assessment

Given the very small area of possible impact for the access road upgrade works no detailed data collection techniques (such as vegetation quadrats) were employed. Rather the entire area of possible disturbance was inspected as part of the field assessment. No threatened plant or animal species were recorded from the area of possible disturbance. A plant species list has not been prepared for this report.

As a general rule, it is possible for threatened plants to remain in the soil stored seed bank for some time. Given the highly disturbed nature of the proposed disturbance footprint, in this case, the retention of native species within the soil stored seed bank is considered

highly unlikely. Threatened plant species have not been considered further in this assessment.

The vegetation immediately adjacent to the access track has previously been mapped as Shale Sandstone Transition Forest (New South Wales National Parks and Wildlife Service (2002) *Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney, Final Edition* NSW NPWS, Hurstville.).

Shale Sandstone Transition Forest (SSTF) is listed as an Endangered Ecological Community (EEC) on both the NSW *Threatened Species Conservation Act* (TSC Act) (1995) and the *Commonwealth Environment Protection and Biodiversity Conservation Act* (EPBC Act) (1999). For the purposes of the assessment, the area of vegetation disturbance has been conservatively estimated to total 100m^2 or 0.01 ha of SSTF (this is taken to include the 10m^2 area of vegetation to be removed at Node 1 plus the 6-10 individual trees/stags). An Assessment of the significance of the impacts of the proposal on this EEC under the EP&A Act and the EPBC Act has been included below. The proposed upgrade works is not likely to be a significant impact on this vegetation community.

The very small are of highly degraded vegetation to be removed at Node 1 is highly unlikely to be important habitat for any threatened fauna. Similarly, given the lack of sheltering habitat (hollows) in the trees or stags to be removed and the abundance of similar habitat occurring within the Harris Creek gorge, the 6-10 trees or stags to be removed are not considered to be important habitat for threatened fauna in the locality. Threatened fauna have not been considered further in this assessment.

Conclusion

The proposed access road upgrade will result in the loss of a very small area of highly degraded Shale Sandstone Transition Forest. The proposal is not likely to significantly impact any threatened species, population or ecological community.

Archaeological Assessment

Context

The existing environment has been described above. Given the highly modified nature of the existing access road between Node 1 and Node 4, and the limited scope of potential impact from the proposed track upgrade a detailed archaeological assessment was not undertaken for this area.

A survey of the area between Node 4 and the relocated borehole site (including the MRD Site) was undertaken on 16 July 2010 in the presence of Donna Whilock of the Tharawal Local Aboriginal Land Council.

A search of the AHIMS database was conducted on 14 July 2010. The search returned 80 records within a 5 km radius of the proposed track upgrade. The nearest site to the proposed access road upgrade is approximately 150 m – 200 m away, being a rock art site in Harris Creek, on the western bank near Blades Bridge. Otherwise small artefact sites containing low numbers of artefacts are common in the region. Sandstone overhang sites are common in the deeply incised drainage lines in tributaries of the Nepean River. Scarred trees are present, but infrequent. A large stone artefact concentration is located on Harris Creek, on the northern side of the Hume Highway / Southern Railway corridor, as described in the Vent Shaft No. 6 Aboriginal Cultural Heritage Assessment. This site occurs adjacent to the

existing access road between Node 2 and Node 5. As no works are proposed for this section of the Access Track, this site has not been considered further in this assessment.

The Morton Park: Mountbatten Group is listed in the Wollondilly Draft Local Environmental Plan 2009 as an item heritage significance. The listing comprises:

- Morton Park: Mountbatten Group (State Heritage Inventory (SHI) database number 2690085)
- Mountbatten Garden Building: Mountbatten Group (SHI database number 2690088)
- Mountbatten House: Mountbatten Group (SHI database number 2690086)
- Mountbatten Stone Chapel: Mountbatten Group (SHI database number 2690087)

These items have been assessed to have local heritage significance, comprising historical, associative and aesthetic significance.

Impact Assessment

There are no known Aboriginal archaeological sites within close proximity to the proposed access road upgrade or the MRD Borehole Site. The area has been highly modified, with the track being a well established construction for the most part, being built up from the ground surface (which has been previously cleared and bladed) and dressed with crushed rock. The proposed access road upgrade presents a low risk of impact to Aboriginal archaeological objects, and will not impact Aboriginal heritage values of the landscape.

The proposed access road upgrade is being assessed under Part 3A of the *Environmental Planning and Assessment Act* 1979 (NSW). There is no major departure from ordinary approval requirements. The recently enacted National Parks and Wildlife Regulation 2010 (NSW) recognises the low risk presented by "low impact" activities such as the proposed access road upgrade between Node 1 and Node 2 by providing a defence to strict liability offences for harm to Aboriginal objects under the *National Parks and Wildlife Act* 1974 (NSW):

> **80B Defence of carrying out certain low impact activities: section 87 (4)**
> (1) It is a defence to a prosecution for an offence under section 86 (2) of the Act, if the defendant establishes that the act or omission concerned:
> (a) was maintenance work of the following kind on land that has been disturbed by previous activity:
> (i) maintenance of existing roads, fire and other trails and tracks,

The proposed track construction between Node 4 and the MRD site was inspected on 16 July 2010. Ground surface exposure condition were generally good for the discovery of Aboriginal archaeological objects. No Aboriginal objects were identified during the inspection, and the area is assessed of being an area of generally low Aboriginal archaeological potential as it crosses side slopes of hilly country, and is not in proximity to any significant drainage lines. The area has also been disturbed by repeated tilling for pasture improvement. Such localities do not usually contain Aboriginal objects in the southern Cumberland Plain. Previous investigations have shown that on the whole there is a very low density 'background scatter' of Aboriginal objects in the Douglas Park area, although larger sites may occur near drainage features (Biosis Research 2006a, 2006b, 2009).

The proposed access road, between Node 2 and the MRD site passes, at its closest point, within approximately 150 m of the Mountbatten Group. Where the road passes already contains a number of access roads and farm style tracks. The proposed access road is not of a scale or close proximity such that it will have a foreseeable impact on the heritage values

of the Mountbatten Group. The proposed access track will require some minor clearing of recently (post-1950) hedge-like vegetation, however this will not impact the heritage values of the Mountbatten Group.

Conclusion

The proposed access road upgrade involves works to an existing road or minor track development works (between Node 4 and the MRD borehole site) in a disturbed environment. The area is assessed as being of low Aboriginal archaeological potential. As such, there is no significant risk of impact to Aboriginal objects or heritage values.

The proposed works are not in proximity to the Morton Park: Mountbatten Group and are not of a scale to pose a risk of impact to the heritage values of the Mountbatten Group or its constituent items.

Recommendations

Given the nature of the proposal it is considered unlikely that any significant ecological or cultural heritage values will be impacted. The following recommendations have however been included in the assessment to further reduce or to ensure that the proposed activities remain low impact activities.

- ❒ Silt fencing should be erected around any area where soil is deposited or disturbed to ensure sediment laden runoff does not enter the adjacent vegetation or the Harris Creek drainage line.
- ❒ Clean fill (crushed sandstone or similar sterile aggregate) should be used to upgrade the existing road. I.e. the fill should be weed free.
- ❒ Any soils disturbance or vegetation clearing other than that described in this assessment will require further assessment.
- ❒ Should any Aboriginal object(s) be identified during works all work that continues to pose a risk of impact to the object(s)must cease and arrangements be made for the assessment of significance of the object, and its appropriate management prior to works again proceeding.
- ❒ Vegetation clearing in the vicinity of the Mountbatten Group must be kept to a minimum.

I trust that this advice is sufficient for your purposes. Should you require any further information please do not hesitate to contact me.
Yours sincerely

Matthew Richardson
Director/Botanist

Sydney Office
PO Box 231, Concord, NSW 2137
Mobile: 0488 224 888 **Fax:** 02 4017 0071
jreeves@niche-eh.com

Central Coast/Hunter Office
PO Box 3104, Umina Beach, NSW 2257
Mobile: 0488 224 999 **Fax:** 02 4017 0071
rharrington@niche-eh.com

Illawarra/Southern NSW Office
PO Box 12, Macarthur Square, NSW 2560
Mobile: 0488 224 777 **Fax:** 02 4017 0071
mrichardson@niche-eh.com

Endangered Ecological Communities – Assessment of Significance Shale Sandstone Transition Forest

How is the proposal likely to affect the lifecycle of a threatened species and/or population?

N/A

How is the Proposal likely to affect the habitat of a threatened species, population or ecological community?

A total of 0.01 ha of Shale Sandstone Transition Forest would be disturbed by the proposed access road upgrade works. Such a small area of vegetation is not likely to affect the availability of habitat for this ecological community in the locality.

Does the Proposal affect any threatened species or populations that are at the limit of its known distribution?

N/A

How is the proposal likely to affect current disturbance regimes?

Currently, the vegetation adjacent to the existing access track are subject to minor period disturbance from road upgrade activities and also from the dumping of rubbish. The proposal will not increase significantly the level of regular disturbance (due to maintenance of the road). The proposal should lead to a reduced incidence of rubbish dumping at the site as the access track will (a) be gated and locked and (b) be subject to regular vehicle traffic for the life of the project.

How is the Proposal likely to affect habitat connectivity?

The proposal is limited to the removal of no more than 0.01 ha of disturbed vegetation directly adjacent to the exiting access track. As the access road is already in existence and the proposed works will not result in a significant increase in the access road width, the proposal is considered unlikely to further affect habitat connectivity in the locality.

How is the Proposal likely to affect critical habitat?

No critical habitat as listed on the TSC Act will be affected by the proposal.

COMMONWEALTH SIGNIFICANT IMPACT CRITERIA – CRITICALLY ENDANGERED ECOLOGICAL COMMUNITIES

Shale Sandstone Transition Forest

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

Reduce the extent of an ecological community;

Shale Sandstone Transition Forest (SSTF) occurs around the edges of the Cumberland Plain (DECC 2005). Only 9,950 ha remains intact (22.6% of its original extent) and the bulk of this occurs in the Hawkesbury, Baulkham Hills, Liverpool, Parramatta, Penrith, Campbelltown and Wollondilly local government areas (DECC 2005).

Removal and modification of approximately 0.010 ha of SSTF represents a negligible amount of the of the local occurrence of the EEC.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;

The proposal is not likely to result in the fragmentation or isolation of any areas of SSTF..

The proposal is limited to the removal of no more than 0.01 ha of disturbed vegetation directly adjacent to the exiting access track. As the access road is already in existence and the proposed works will not result in a significant increase in the access road width, the proposal is considered unlikely to further affect habitat connectivity in the locality.

Adversely affect habitat critical to the survival of an ecological community;

To date, no critical habitat has been declared for SSTF.

Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;

The proposal will result in a very minor disturbance to a very small area of this vegetation community. The proposed upgrade works will not result in the modification or destruction of the a biotic factors necessary for the ecological communities survival.

Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;

The proposal will modify the composition of 0.01 ha of SSTF. The proposal is not considered likely to substantially and adversely modify the composition of SSTF such that its local occurrence is likely to be placed at risk of extinction.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to;

- ***assisting invasive species, that are harmful to the listed ecological community, to become established, or***
- ***causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or***

Whilst there is some potential for works plant and machinery to transport and disperse weed seed and soil pathogens throughout the Study Area, it would be anticipated that even in the worst case such potential invasion is unlikely to lead to a substantial reduction in the quality or integrity of an occurrence of SSTF in the locality. Mitigation measures such as washing down plant and machinery before entering or leaving sensitive areas and retaining plant on-site during works would minimise such impacts.

Interfere with the recovery of an ecological community.

The removal or modification of 0.01 ha of SSTF is considered to be a negligible impact. The proposal will not interfere with the recover of an ecological community. Further, the management of the property on which the proposed access road will be undertaken will

include the removal of rubbish from within vegetation adjacent to the access track. Such activities will likely lead to a localised recovery of the community along the access track.

Conclusion

The proposed action is considered unlikely to have a significant impact on SSTF.

Sydney Office
PO Box 231, Concord, NSW 2137
Mobile: 0488 224 888 **Fax:** 02 4017 0071
jreeves@niche-eh.com

Central Coast/Hunter Office
PO Box 3104, Umina Beach, NSW 2257
Mobile: 0488 224 999 **Fax:** 02 4017 0071
rharrington@niche-eh.com

Illawarra/Southern NSW Office
PO Box 12, Macarthur Square, NSW 2560
Mobile: 0488 224 777 **Fax:** 02 4017 0071
mrichardson@niche-eh.com

References

Biosis Research 2006a. Douglas Area 7 Project Environmental Impact Statement Appendix H: Impacts on Indigenous and Historical Archaeology – Revised Report. Unpublished report prepared for BHP Billiton Illawarra Coal.

Biosis Research 2006b. Douglas North 66/11kV Substation and Transmission Line Upgrade: Aboriginal and Historical Cultural Heritage Assessment. Unpublished report prepared for BHP Billiton Illawarra Coal.

Biosis Research 2009. Archaeological and Cultural Heritage Impact Assessment of Proposed Appin Area 7 Goaf Gas Drainage Project. Unpublished report prepared for BHP Billiton Illawarra Coal.

Sydney Office
PO Box 231, Concord, NSW 2137
Mobile: 0488 224 888 **Fax:** 02 4017 0071
jreeves@niche-eh.com

Central Coast/Hunter Office
PO Box 3104, Umina Beach, NSW 2257
Mobile: 0488 224 999 **Fax:** 02 4017 0071
rharrington@niche-eh.com

Illawarra/Southern NSW Office
PO Box 12, Macarthur Square, NSW 2560
Mobile: 0488 224 777 **Fax:** 02 4017 0071
mrichardson@niche-eh.com

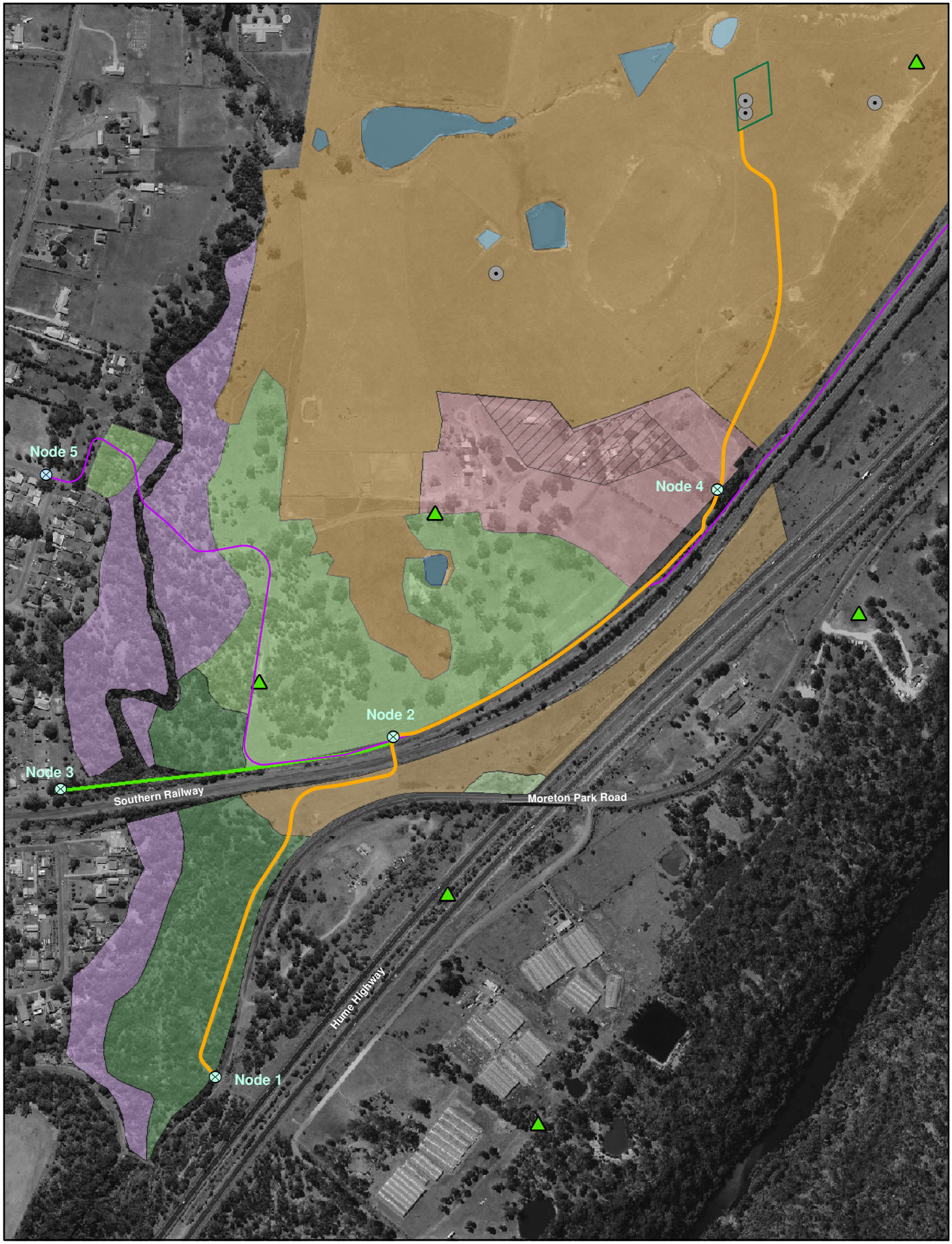


Figure 1. Proposed Access Road Upgrade MRD Site

5 October 2010

Boreholes

Access Road Upgrade

Proposed Work

- Existing Approved Access Road
- MRD Drill Pad
- Road Centreline
- Railway Pde Alternative Access

- Alluvial Woodland
- Homestead
- Shale Hills Woodland
- Shale Plains Woodland
- Shale Sandstone Transition Forest, High Sandstone Influence
- Exotic Pasture
- Dam

- Aboriginal Archaeological Sites
- Morton Park: Mountbatten Group

N
W E
S

Meters

0 50 100 200

niche
Environment and Heritage

Annex C

C. Cardno Traffic and Transport Planning Traffic Assessment and Management Plan BHPBIC Douglas Park Drivers Code of Conduct

Our Ref FR109033
Contact Ryan Miller/Sam Laybutt

29 September 2010

Alex Larance
Environmental Engineer
Cardno Pty Ltd
278 Keira Street
Wollongong, NSW 2500

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

Level 3
Cardno Building
910 Pacific Highway
Gordon NSW 2072
Australia

Phone: 61 2 9496 7700
Fax: 61 2 9499 3902

www.cardno.com.au

Dear Alex,

AA7 GOAF GAS DRAINAGE PROJECT – LONGWALL 704 DRAINAGE REVISED BOREHOLE LOCATIONS AND SITE ACCESS – TRAFFIC ASSESSMENT AND TRAFFIC MANAGEMENT PLAN

1 BACKGROUND

BHP Billiton Illawarra Coal Holdings Pty Ltd (BHPBIC) received Part 3A approval in October 2009 to undertake works associated with the drainage of goaf gas for Appin Colliery Area 7 Longwalls 703-704.

Construction of the part of the project to service Longwall 703 has already been constructed and it is now time to construct the component to service Longwall 704.

A Section 75W modification to the existing Part 3A approval is being submitted to allow for:

1. Relocation of approved Medium Radius Drilled (MRD) borehole and supporting vertical well for Longwall 704 to a new location that is better integrated with the underground workings.
2. Construction of a new access road capable of accommodating heavy vehicles, using an upgrade of existing farm roads/tracks, from Moreton Park Road and across the rail line (including an upgrade of an existing private level crossing).
3. Use of Railway Parade and the rail corridor access track as an access route to the site for heavy rigid vehicles to avoid the use of Hopson/Duggan Streets by heavy vehicles.

Cardno has been commissioned by BHPBIC to undertake a traffic assessment of the changes in access routes and prepare a Traffic Management Plan for use of the Moreton Park Road site access.

2 PURPOSE

The purpose of this letter is to assess the traffic impacts of the proposed construction traffic routes and to identify traffic control requirements for the intersection of Moreton Park Road and the Site Access Track.

3 CONSTRUCTION TRAFFIC

Traffic generation for the project occurs in 4 distinct chronological phases:

- Civil Construction (157 days).
- Drilling Mobilisation (5 days).
- Drilling Operation (81 days).
- Drilling Demobilisation (5 days).

As the phases vary in duration, the construction traffic generation will vary from day to day. In order to assess the worst case scenario, the peak daily traffic generation for each phase has been calculated. This information is summarised in Table 1. Light vehicle movements will not change from the previous approval and are consequently not included.

TABLE 1 PEAK CONSTRUCTION TRAFFIC GENERATION

Phase	Duration	Proposed Access Route	Peak Volume of Heavy Vehicles (per day)	Number of Trips (2-way)
Civil Construction	4 days	Railway Parade	30	60
Drilling Mobilisation	5 days	Moreton Park Road	12	24
Drilling Operation	81 days	Railway Parade	3	6
Drilling Demobilisation	5 days	Moreton Park Road	15	30

The peak traffic generation will occur during the civil construction phase when approximately 60 heavy vehicle trips (30 in/30 out) to/from the site will occur per day. This phase will include approximately 23 days to upgrade the access track from Moreton Park Road and the railway level crossing.

During the drilling operation phase, the only heavy vehicles will be water and fuel trucks, which will consist of approximately 3 trips in each direction per day.

During the drilling mobilisation and drilling demobilisation phases, vehicles will generally be heavy articulated vehicles and these will operate via Moreton Park Road.

4 CONSTRUCTION TRAFFIC ROUTES

The proposed construction traffic routes are as follows:

- Duggan Street/Hopson Street.
- Railway Parade.
- Moreton Park Road.
- Site Access Track from Moreton Park Road.

Duggan Street/Hopson Street

Duggan and Hopson Streets form part of the existing approved construction traffic route for this project. It is proposed that this route will continue to be used by light vehicles only, with heavy vehicles relocated onto alternative access routes. This will enable heavy vehicles to avoid the narrow pavement; right-angle bends and conflict with local traffic during school pick up/drop off periods, improving safety and amenity and reducing the traffic impacts.

Light vehicles using this access would comply with the Douglas Park Drivers Code of Conduct, which strongly discourages light vehicles from travelling through Douglas Park Village between 8:00am-9:30am and 2:30pm-4:00pm weekdays.

Railway Parade

Railway Parade is a local street in Douglas Park village with a pavement approximately 5 metres wide. An existing rail corridor access track branches off Railway Parade and leads to the project site.

It is proposed that Railway Parade will provide access to the site for heavy rigid vehicles. These movements will be limited to, approximately 10 vehicles per day, with an increase to approximately 30 vehicles per day over a week-long period during the construction phase, it is considered that there will be negligible impact on traffic conditions. Arrangements will be made between BHPBIC and the railway corridor owner to permit use of the access track.

Vehicles using Railway Parade to access the site will abide by the Douglas Park Drivers Code of Conduct, which restricts heavy vehicles from travelling through Douglas Park Village between 8:00am-9:30am and 2:30pm-4:00pm weekdays.

Moreton Park Road

Moreton Park Road has a sealed surface, approximately 8 metres wide, with a 60km/h speed limit in the vicinity of the site access track. North of the site access track, the speed limit is 100km/h and the pavement width varies between 5 and 8 metres. South of the site, there is a short steep and winding section approaching Blades Bridge, which is a single-lane steel truss bridge with a 40 tonne load limit. This road, north of the site access track, was recently used as a construction traffic route for another BHPBIC project, the Appin Area 7 Longwall 703 Boreholes.

Traffic volumes are very low; site observations indicated a typical traffic volume of less than 10 vehicles per hour in each direction (or approximately 100 vehicles per day). It is considered that the expected additional 30 vehicles per day will have a negligible impact.

It is proposed that all articulated vehicles will access the site via Moreton Park Road. Some light vehicles associated with the transportation of articulated vehicles may also access the site from this point. However general light traffic will continue to use the Duggan Street/Hopson Street route.

Site Access Track from Moreton Park Road

This is an existing unsealed, approximately 3.5m wide, access track which runs from Moreton Park Road to the site. This track will be upgraded and widened up to 5.5m on its existing alignment in order to accommodate heavy vehicles transporting drilling equipment to and from the site.

It is recommended that a speed limit of 40km/h be signposted for the access track. To restrict access to the general public, the gate should be kept locked when not in use by BHPBIC and/or 'No Entry – Authorised Vehicles Excepted' signage erected.

Moreton Park Road/Site Access Track intersection

The intersection with the proposed site access is a typical rural driveway intersection. The access road is unsealed and emerges from a clearing the vegetation from the western side of the road. Sight distance is adequate to and from the north. However, due to a horizontal curve, the sight distance to and from the south is restricted to approximately 20 metres. This is considered insufficient for the safe movement of heavy vehicles in and out of the site access track.

A swept path analysis was undertaken to assess the movement of large, articulated vehicles in and out of the site. The analysis showed that articulated vehicles exiting the site and turning left must cross onto the wrong side of Moreton Park Road. A copy of the swept path analysis is provided in Appendix A.

As a result of the site conditions discussed above, it is recommended that the speed limit in the vicinity of the intersection be reduced to 40km/h for the duration of the project. This will allow safer movement of articulated vehicles and for any other traffic which uses this access point. Traffic control should also be provided at the intersection of Moreton Park Rd/Site Access Track when heavy vehicles movements in or out of the site are being undertaken. Through the duration of the project, temporary warning signs should be placed on Moreton Park Road to warn drivers of the presence of the site access track.

Plans showing the signage requirements for the construction phase and for times when heavy vehicle movements are occurring are provided in Appendix B and Appendix C.

A separate Traffic Control Plan will be required to facilitate the upgrading of the access track in the immediate vicinity of the intersection of Moreton Park Road and any improvements to the Moreton Park Road intersection itself. This should be prepared by the relevant contractor.

Site Access Track – Railway Level Crossing

There is an existing private level crossing across the railway line between Moreton Park Road and the project site. This crossing is currently protected by stop signs. It is proposed that this level crossing will be upgraded in order to cater for the heavy vehicles transporting drilling equipment to/from the site.

Vehicle movements across the level crossing will only be undertaken under strict traffic control in co-operation with the rail authority. The rail contactor will provide the "Protection Officer" who will make appropriate arrangements to make the crossing safe and oversee the traffic movements. BHPBIC staff have communication with Michael Irons and Ross Barber from ARTC who have advised that the following will need to be approved by ARTC before upgrading works and use of the level crossing can proceed:

- Civil design for the level crossing upgrade.
- Safe Work Method Statement.
- Traffic Management Plan.
- Commitment from BHPBIC that the crossing will be removed once the project is completed.

When the crossing is not in use, drop posts or a gate will be installed and padlocked, to ensure that uncontrolled vehicle movements across the level crossing are prevented.

5 CONCLUSIONS

It is concluded that there are no traffic constraints which prevent the use of the Railway Parade and Moreton Park Road as construction traffic access routes for heavy vehicles.

It is considered that relocating heavy vehicles from Duggan and Hopson Streets will result in an improvement in traffic performance, safety and amenity for Douglas Park village and a reduction in traffic volumes along Duggan and Hopson Streets.

It is concluded that Railway Parade and Moreton Park Road will experience a minor increase in traffic volumes through the construction period. However, it is considered that this increase will have negligible impact.

It is considered that the movements in/out of Moreton Park Road can be accommodated safely with the use of appropriate warning signs and traffic control.

It is considered that the use of the railway level crossing can occur safely, provided that appropriate safe work practices and traffic control procedures are followed.

6 RECOMMENDATIONS

Based on the assessment outlined above, it is recommended that:

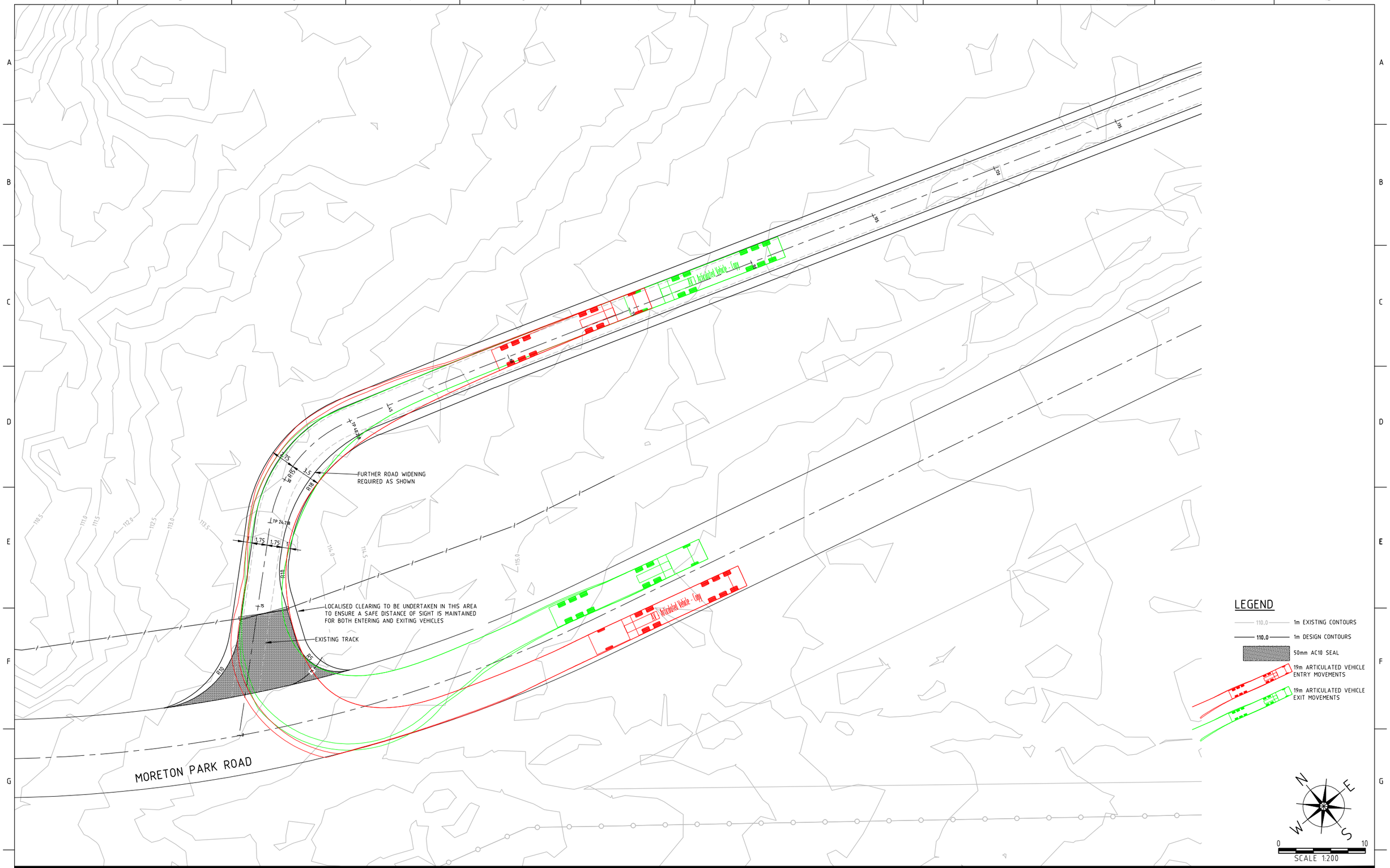
- Approval be given to the use of Railway Parade as a construction access route for heavy rigid vehicles.
- Approval be given to the use of Moreton Park Road as a construction access route for heavy articulated vehicles, subject to:
  - The provision of temporary signage as per Traffic Control Plan 1 for the duration of the project.
  - The provision of traffic control and flagman signage when heavy articulated vehicles are entering or leaving the site access track, as per Traffic Control Plan 2.
- Drivers be required continue to abide by the Douglas Park Drivers Code of Conduct.

Sam Laybutt
Transport Planner
for **Cardno Traffic & Transport Planning**

Enc:

Appendix A	Swept Path Analysis
Appendix B	Traffic Control Plan 1
Appendix C	Traffic Control Plan 2

DO NOT SCALE | IF IN DOUBT ASK



LEGEND

- 110.0 — 1m EXISTING CONTOURS
- 110.0 — 1m DESIGN CONTOURS
- 50mm AC10 SEAL
- 19m ARTICULATED VEHICLE ENTRY MOVEMENTS
- 19m ARTICULATED VEHICLE EXIT MOVEMENTS

N E S W

0 10
SCALE 1:200

REV	DATE	BY	APP.	DETAILS

DRAWING STATUS		
DESIGN BY	AJM	15/09/10
DRAWN BY	AJM	15/09/10
DRAFTING CHECK		
DESIGN CHECK		
FINAL APPROVAL		

PRELIMINARY

SCALE: (on A1 Original) 1:200

HEIGHT DATUM AHD

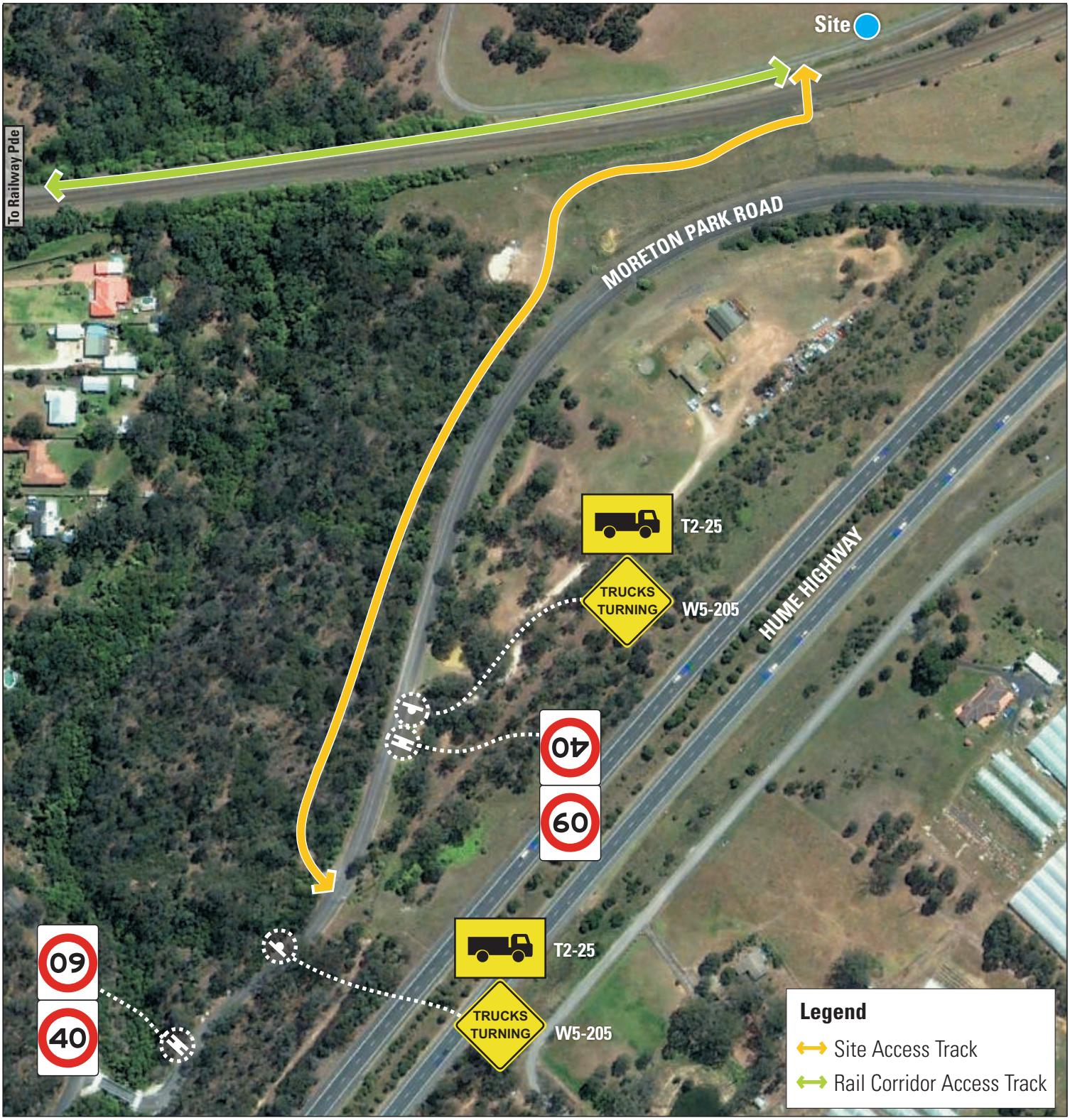
Cardno

278 KEIRA STREET, WOLLONGONG, NSW 2500
Ph: (02) 4228 4133 Facsimile: (02) 4228 6811 ACN 003 936 981

PROJECT TITLE
MRD DRILL SITE ACCESS WORKS for ILLAWARRA COAL

DRAWING TITLE
MORETON PARK ROAD ENTRTY TRUCK MOVEMENTS

Project No.	Com No.	Drawing No.	REV
110060	3	SK01	P0

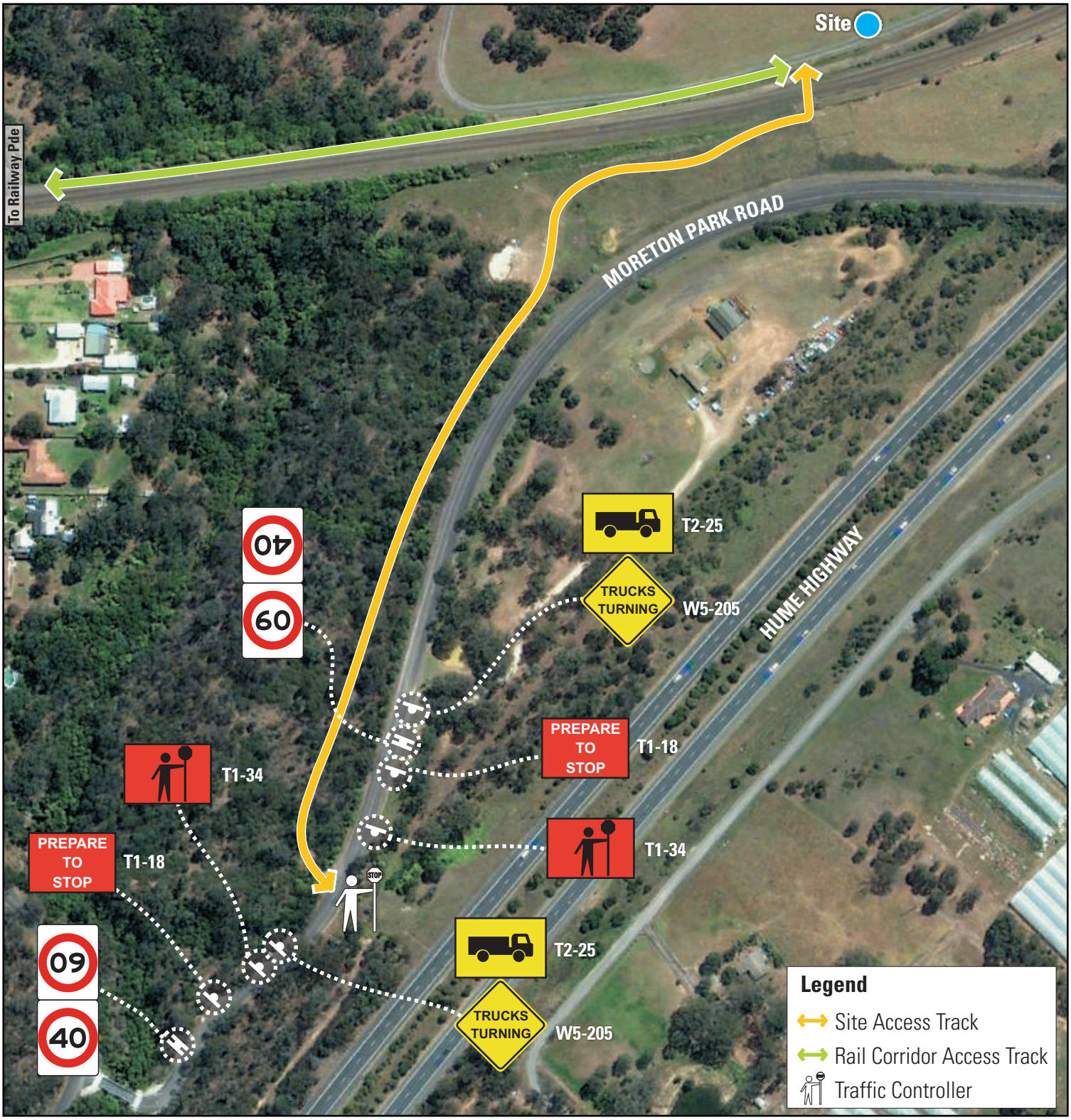


Cardno
Shaping the Future

Traffic Control Plan 1

Job Number: FR109033

29|09|2010



Cardno
Shaping the Future

Traffic Control Plan 2

Job Number: FR109033

29|09|2010

ILLAWARRACOAL
Pride, passion, performance.

Illawarra Coal Holdings
Coal
BHP Billiton Limited

POLICY

DEPARTMENT: Environment & Community

TITLE OF DOCUMENT:

DOUGLAS PARK DRIVERS CODE OF CONDUCT

OWNER:	Bruce Blunden
TITLE:	Environmental Approvals Manager

Aim

The Drivers Code of Conduct is in-force to protect the health, safety and amenity of the community in and around Douglas Park as well as Illawarra Coal employees and contractors. Illawarra Coal needs to work closely with the community and inappropriate driving behaviour and traffic impact to the community will reflect badly on Illawarra Coal.

As a person or company engaged to work with or for Illawarra Coal, you are required to drive in a responsible manner and adhere to the requirements of the Drivers Code of Conduct.

Major Access Issue

During 2010, the Department of Education has resumed Dowle Street. This now restricts access to the Mount Batten Stud via Hopson and Duggan Streets. Both Hopson and Duggan Streets are suburban streets that pose significant traffic hazards, especially around school drop off/pick up times. Access and parking for the Douglas Park Public School is via Hopson and Duggan Streets. Young school children, parents and staff from the School frequent this area and there is high potential for pedestrian and vehicle interactions.

The number of vehicles entering Mount Batten Stud should be minimised to limit traffic interactions with the community and the Douglas Park Public School.

When accessing the front entrance to Mount Batten Stud from Duggan Street the driver must:

- Reduce speed prior to entry
- Enter the gate or cattle grid at low speed (10 km/hr)
- Use low beam (at night, dusk, dawn, foggy)
- Minimise dust generation
- Minimise noise
- Not wait or park in this area

High Risk Interactions Times

The Douglas Park Public School is located adjacent to the entry to Mount Batten Stud. Children, parents and staff frequent this area and pose a high risk to vehicle movements. Traffic congestion occurs during school drop off and pick up times.

School drop off **08:00 – 09:30**
School pick-up **14:30 – 16:00**

Allowable Travel Times

No vehicles (other than personnel passenger vehicles) are to travel to or from Mount Batten Stud through the 50km/hr area in Douglas Park outside the times specified below. Vehicles should not travel on Camden Road, Hopson Street and Duggan Street (see map over page) outside the allowable travel times.

Allowable Travel Times	
Monday – Friday	7.00am-8.00am, 9.30am-2.30pm, 4.00pm-6.00pm
Weekend & Public Holiday	8.00am- 5.00pm

Personnel passenger vehicles are defined as vehicles used to transport people to and from work including trades persons required to travel with their tool of trade in work vehicles to get to and from work. Although personnel passenger vehicles may travel through Douglas Park village during curfew times we **strongly encourage all personnel to plan their work so travel is not required during curfew times**.

There are few heavy vehicle staging areas in close proximity to Douglas Park. Heavy vehicle movements must be planned to ensure that vehicles arrive at Douglas Park within the allowable times.

Recording of Breaches

A 24 hour Community Call Line (1800 102210) is in place for local residents to lodge complaints against any driver working for Illawarra Coal contravening this Code. All complaints are investigated and disciplinary action may be taken.

Event reports will be completed by relevant Appin Mine, Appin Area 9 Project or Exploration staff where a breach of the Code is identified.

Non-compliance

If you are found to be acting contrary to this Code, you or your company may be disciplined:

- 1st occurrence – warning letter
- 2nd occurrence – warning letter and suspension of driver from site for a period
- 3rd occurrence – final warning letter and review of your continued working association with Illawarra Coal.

Note that these warnings apply over a 12 month period. Illawarra Coal reserves the right to review your continued working association with us following any breaches of the Code.

Other Requirements

You MUST NOT:

- Drive to or from Mount Batten Stud through the curfew zone outside the allowable travel hours (unless in a personnel passenger vehicle)
- Bring oversize trucks onto Mount Batten Stud without an appropriate escort vehicle and appropriate regulatory approvals
- Exceed the maximum speed limits posted by the Road and Traffic Authority on any roads.
- Exceed 50km/hr on Hopkins or Duggan Streets at any time
- Park or wait in Hopkins or Duggan Streets at any time

You MUST:

- Take extreme care in Douglas Park township particularly on Camden Road, Hopkins and Duggan Streets.
- Be alert for pedestrians, parked vehicles.
- Obey all road rules
- Hold a current drivers licence for the class of vehicle you are driving
- Demonstrate driver courtesy
- Limit the use of compression braking (except where it is not safe to do so)
- Ensure that loads are properly secured and no loose items can dislodge from the vehicle

Alternative Access Routes

An alternative entry currently exists to enter Mount Batten Stud from Menangle Road just north of Spaniards Hill

This alternative is suitable for dry weather only access for off-road capable vehicles. Note that the entry to this access route has restricted sight lines. Great care needs to be taken when entering/exiting this access route. Where it is possible to do so, access to Mount Batten Stud via this route should be considered to minimise vehicle interaction with the Douglas Park Public School area.

Arrangements for access through the Alternative Route MUST be via Bruce Blunden (Manager Environmental Approvals, 42553312/0409 156695 or Bruce.Blunden@BHPBilliton.com). Several days notice is required so that residents on the property can be informed.

Entry to Mount Batten Stud via the farm gate between Spaniards Hill and Camden Road is not recommended at this stage.

Railway Access

Only people with a genuine rail related access requirement are allowed to enter the rail easement access track from Railway Parade.

Residential occupiers

Several people live on Mount Batten Stud and have occupancy rights. Their privacy is to be respected at all times. At no time should any traffic approach the residential houses on the property without prior approval. Approval should be sought from Bruce Blunden (Manager Environmental Approvals, 42553312/0409 156695 or Bruce.Blunden@BHPBilliton.com). Several days notice is required so that residents on the property can be informed.

Policy
Douglas Park Drivers Code of Conduct

Map: Douglas Park – Drivers Code of Conduct Area