

Rix's Creek Mine Cut and Cover Tunnel, New England Highway

STATEMENT OF ENVIRONMENTAL EFFECTS

- Final Version 1
- 6 May 2009



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1. Introduction

1.1. Proposal Identification

Rix's Creek Pty Limited proposes to construct a crossing in the form of a cut and cover tunnel (to be referred to as the tunnel) under the New England Highway, at Rix's Creek. Rix's Creek Mine is located approximately 4.7 kilometres (km) north east of Singleton. The proposed activity location is shown in **Figure 1-1**.

1.2. Background

The Rix's Creek Pty Limited's mining lease (1432 issued 24th June 1989) is bisected by the New England Highway (refer to **Figure 1-2**). Mining operations are undertaken on both sides of the Highway under the current approval. Current highway related infrastructure, that forms part of the operation, includes a bridge over the Highway. This bridge provides unrestricted access for mine vehicles to move coal from the southern mining areas, Pits 2 and 3to the Coal Handling and Preparation Plant (CHPP) on the northern side of the Highway. This bridge has also been used to move overburden for rehabilitation purposes. As mining has progressed in Pit 3, it was determined that it would be beneficial for the operation to have a second access across the Highway. This second crossing is proposed to be located 1km to the north of the existing bridge and is geographically located close to the centre of the mining lease (refer to **Figure 1-2**). This crossing will achieve a more sustainable route for the movement of coal and overburden material from an economic and environmental perspective.

The crossing will consist of a cut and cover tunnel under the existing Highway. The construction of this crossing will involve the diversion of the Highway onto a side track for an estimated 12 week period.

1.3. Scope and Objectives

The following details the proposed activities to be undertaken:

- Construct a cut and cover tunnel under the New England Highway; and
- Diversion of the Highway traffic onto a side track.

Specifically, the proposed works will improve access between the pits and the movement of coal to the washery and loader facilities. Refer to **Appendix A** for a copy of the concept design.

1.4. Local Government Area

Singleton Shire Council (SSC)





Figure 1-1 Locality Map of the Proposed Cut and Cover Tunnel





Figure 1-2 Rix's Creek Mine Site



Figure 1-3 Study Area



1.5. Project Cost and Construction Timeframe

The proposed tunnel will cost approximately \$16M to construct.

The proposal is to be completed by December 2009. The duration of the construction works is expected to be 20 weeks.

1.6. Purpose of the Report

This Statement of Environmental Effects (SEE) has been prepared by Sinclair Knight Merz (SKM) on behalf of Rix's Creek Pty Limited. The purpose of the SEE is to describe the proposal, document the potential impacts on the environment and describe protective measures to be implemented. Specifically, this report is an assessment of the potential environmental impacts in relation to the road corridor area only, as indicated in **Figure 1-3**. Rix's Creek Pty Limited's advised that their current Conditions of Approval cover works required for this activity on the adjacent mining lease area, outside of the road corridor.



2. Statutory and Planning Framework

2.1. Environmental Planning Instruments and Legislation

The *Environmental Planning & Assessment Act* 1979 (EP&A Act) provides the statutory context for the assessment of the Proposal. The EP&A Act provides for assessment and approval under the following sections:

- Part 3 provides for the process of forward planning, which involves the development of plans to regulate competing land uses. This is achieved through Environmental Planning Instruments (EPIs), of which there are 3 types: Local Environmental Plans (LEPs), Regional Environmental Plans (REPs) and State Environmental Planning Policies (SEPPs).
- Part 3A is where the Minister for Infrastructure and Planning is the approval authority for Major infrastructure and other projects;
- Part 4 provides Local or State Government Authorities with approval authority for developments; and
- Part 5 is where a State Government Authority is the determining authority for certain projects such as water, rail and road infrastructure.

Current mining operations were approved under Part 4 of the EP&A Act in 1989 by the Department of Planning (DoP). Conditions of Approval (CoA) were issued in 1995 (DA No. 49/94 16th October 1995), which govern the environmental management on site for current and future operations.

Rix's Creek Pty Limited propose to submit a modification under section 96 (1A) of the *Environmental Planning and Assessment Act 1979*, to the current development consent for the proposed activity. The proposal will, therefore, be assessed under Part 4 of the EP&A Act, with DoP as the determining authority.

2.2. Local Environmental Plans

The proposed tunnel is located within the road corridor of the New England Highway in the Singleton Shire Council (SSC) Local Government Area (LGA). The New England Highway is a classified state road owned and operated by the Roads and Traffic Authority (RTA).

Under SSC Local Environmental Plan (LEP) (SCC 1996), this section of the New England Highway road corridor, in which the proposed works are to be undertaken, is not zoned. The area surrounding the works is zoned 1(a) (Rural Zone).



2.2.1. Other Relevant Legislation

Table 2-1 details the legislation, the purpose of the legislation and relevance to the proposal.

Table 2-1 Consideration of Relevant Legislation

Legislation (Responsible Agency)	Purposes of Legislation	Relevance to the Proposal and Approvals Requirements
Road Act 1993 (RTA and NCC)	This act sets out rights of members of the public to pass along public roads, establishes procedures for opening and closing a public road, and provides for the classification of roads. It also provides for declaration of the Roads and Traffic Authority (RTA) and other public authorities such as Council as roads authorities for both classified and unclassified roads, and confers certain functions (in particular, the function of carrying out roadwork) on the RTA and other roads authorities.	Under Section 138 of the Roads Act, work on a public road requires consent of the relevant road authority. The New England Highway (HW9) is a classified State Road as part of the National Network. RTA's concurrence is required for the proposed works within the classified road reserve under Section 138 of the Act.
Fisheries Management Act 1994 (Department of Primary Industries (DPI))	The Act applies to all waters within the limits of the State, except where Commonwealth legislation applies. Part 7A Division 4 of the Act prohibits the carrying out, without a licence, of activities that damage habitats or harm threatened species, populations or ecological communities. In determining the significance of impacts, the determining authority must consider the matters listed in Section 5A of the EP&A Act.	The Proposal would not directly impact aquatic habitat or block the passage of fish, therefore notice to the Minister is not required.
Soil Conservation Act 1938 (DECC)	The purpose of the act is to conserve soil and water resources and mitigate soil erosion. Section 15A of the Act provides for Notices that would allow DECC to prescribe measures for erosion and sediment control that must be adopted.	Notices can be issued before construction begins or can be issued to halt an offending activity until proper erosion and sediment controls are instituted. The DECC can also undertake the specific works if it finds that the Section 15A Notice is not complied with. Provided the mitigation measures outlined in Section 6 are implemented no significant impacts are anticipated.
Water Management Act 2000 (Department of Water and Energy (DWE))	The WM Act replaces the licensing and approvals provisions of the <i>Water</i> <i>Act 1912</i> and the <i>Rivers and</i> <i>Foreshores Improvement Act 1948</i> (RFI Act). The Water Sharing Plan for the Hunter Regulated River Water Source commenced on 1 July 2004. However, the study area is not located on a regulated reach of the Hunter River.	Should the groundwater be intercepted or works include bores for the purpose of investigation, extraction, dewatering, testing or monitoring a licence obtained from DWE prior to their installation (refer to Section 6.5 to 6.11).



Legislation (Responsible Agency)	Purposes of Legislation	Relevance to the Proposal and Approvals Requirements
Native Vegetation Act 2003 (DECC)	The Act aims to prevent broad-scale clearing, to protect native vegetation of high conservation value and to improve the conditions of existing native vegetation.	Some of the road reserve landscaped areas will be cleared to cater for the proposed works. This will not require approval from the DECC.
National Parks and Wildlife Act 1974 (DECC)	This act aims to prevent the unnecessary or unwarranted destruction of relics and the active protection and conservation of relics with high cultural significance. This act covers relics of both 'Aboriginal and Non-indigenous' habitation in NSW. Approval is required from DECC to knowingly destroy, deface or damage; or knowingly cause or permit the destruction of or damage to an aboriginal object or aboriginal place.	There are no items or places of heritage listed under the Act within the proposed construction area. Due to the highly disturbed nature of the road corridor no sites of aboriginal significance were identified during the site inspection. Should any known or previously unknown Aboriginal sites or relics be found, approval may need to be obtained from the Director-General of DECC for a permit to excavate those sites or relics under Section 87(1) of the Act. Similarly, Section 90(2) of the Act would also apply where approval may be granted by the Director-General for a 'Consent to Destroy' archaeological sites or relics (refer to Section 6.7).
Heritage Act 1977 (NSW Department of Planning (DoP))	This Act is administered by the Heritage Office within the NSW Department of Planning (DoP) and is concerned with all aspects of conservation ranging from the most basic protection against damage and demolition to restoration and enhancement. The Act only applies if non-Indigenous items of heritage significance are affected or where non-Indigenous relics are uncovered during construction. The relevant provisions of the Act are Section 139, which prohibits disturbance of a 'relic' unless an excavation permit is obtained from the Heritage Office, and Section 148, which requires notification to the Heritage Office of any discovery of 'relics'.	The Proposal would not impact on any items of heritage significance. However, should the proposed development design change further cultural heritage assessment would be required (refer to Section 6.8) .
Threatened Species Conservation Act 1995 (DECC)	 This Act identifies threatened species, populations, endangered ecological communities, critical habitats and key threatening processes. Approval is required to: Harm any animal that is, or is part of, a threatened species, population or ecological community; Pick any plant that is of, or is 	Approval is not required as Section 6.4 of this SEE demonstrates that there would be no significant impacts on threatened species populations or ecological communities.



1			
	Legislation (Responsible Agency)	Purposes of Legislation	Relevance to the Proposal and Approvals Requirements
	Threatened Species Conservation Act 1995 (continued)	 part of, a threatened species, population or ecological community; Damage critical habitat; or Damage habitat of threatened species, population or ecological community. 	
	Noxious Weeds Act 1993 ((DPI)	This Act emphasises community cooperation to ensure a coordinated and uniform approach to the control of noxious weeds throughout the State. There are no approvals or permit requirements under the Act. However, the Act stipulates that as occupiers of land, must control noxious weeds on the land under their management.	Rix's Creek will implement relevant weed management processes as part of the Construction Environmental Management Plan (refer to Section 6.4).
	Waste Avoidance and Resource Recovery Act 2001 (DECC)	This Act aims to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste, and the reuse and recycling of waste in accordance with the principals of ecologically sustainable development.	The Proposal would generate waste and as such, is required to consider the hierarchy of resource management referred to in this Act (refer to Section 6.9).
	Environmentally Hazardous Chemicals Act 1985 (DECC)	This Act regulates the use and storage of environmentally hazardous chemicals. It provides the DECC with assessment and control mechanisms for chemicals and chemical wastes.	The act will only apply if environmentally hazardous chemicals are used during construction of the proposal. Any such chemicals will be identified in the Construction Environmental Management Plan.

2.3. Commonwealth Legislation

Consideration of Matters of National Environmental Significance (NES) and Commonwealth land is required in accordance with the *Environment Protection Biodiversity Conservation 2000* (EPBC Act), have been addressed in **Section 9**.

2.4. Confirmation of Statutory Position

The Department of Planning is the determining authority under Part 4 of the EP&A Act for the proposed activity. Concurrence from the RTA will be required as the proposed works is located within the road reserve.



3. Stakeholder and Community Consultation

3.1. Overview

This section provides a summary of the consultation undertaken for the proposal.

3.2. Consultation Strategy

Consultation involved direct contact and correspondence forwarded to government agencies outlining the proposed activity. Community consultation was also undertaken in the form of a presentation at a meeting to local community representatives.

3.3. Consultation

3.3.1. Community

Rix's Creek Mine undertook consultation with the community via their Community Consultation Committee (CCC) at their meeting held on 25th September 2008. No issues or concerns were raised (*pers comms* John Hindmarsh 9th December 2008).

3.3.2. Aboriginal Community

Correspondence outlining the proposed activities was forwarded to the Wannaruah Local Aboriginal Land Council. An inspection was undertaken by a representative of the LALC. Due to the highly disturbed nature of the road corridor no items of aboriginal heritage significance were identified within the study area (refer to **Section 6.7**).

3.3.3. Government Agency and Stakeholders

Direct consultation regarding the proposal has been undertaken with the RTA, SSC and DoP. No other government agencies have been consulted.

Rix's Creek Mine forwarded correspondence detailing the proposed works to the DoP. A response was provided in which assessment of traffic, noise, air quality, groundwater dependent ecosystems, flora and fauna, heritage and visual was requested (refer to **Appendix B**).

Correspondence describing the proposed works has also been provided to the RTA (refer to **Appendix B**).

The RTA conducted a preliminary review of the proposal as dated 10^{th} November 2008 concurrently with the proposed works provided that the following comments are addressed in the concept design stage (refer to **Appendix B**):



- The RTA is concerned regarding the proximity of the side track to the operating New England Highway. The proposed 4m clearance may not allow sufficient room for the construction and allow an 80km/hr speed limit. More details are to be provided to justify the separation width in the concept design report;
- The RTA is also concerned regarding the possible impacts of mine trucks on the proposed superstructure and piled walls. A risk assessment is to be conducted by SKM and mine personnel, and the results are to be included in the concept design report;
- All arrangements for the control of the traffic shall be in accordance with the RTA publication "Traffic Control and Work Sites". A Road Occupancy Licence is required prior to any works commencing within 3m of the travel lanes, and submission of a traffic control plan is required as part of the licence. The Road Occupancy Licence can be obtained by contacting Mr Bruce Kimber.
- A Works Authorisation deed (WAD) will be required to be entered into with the RTA. In this regard detailed design plans are required to be submitted and all relevant additional information, as may be required in the RTA's Work Authorisation Deed documentation, for each specific change to state road network for the RTAs assessment and final decision concerning the work. Please note that the RTA must provide a final consent for each specific change to the state road network prior to the commencement of any work within the road reserve of a classified road.

A meeting was held with Council on the 16th December 2008. This meeting was attended by:

Sue Moore	Mayor of Singleton Shire Council (SSC)
Gary Woodsman	Acting General Manager
Belinda Charlton	Director of Corporate and Development Services
Frank Sullivan	Development Engineer
Brendan Behringer	Works Engineer (Operations)
Gary Bailey	Rixs Creek Mine Manager
John Hindmarsh	Rixs Creek Environmental Officer
John Richardson	Richardson Coutts
Brian Watson	Sinclair Knight Merz

The project was outlined to the SSC attendees and no significant issues were raised. Matters referring to traffic management and community consultation were discussed and are addressed in relevant sections of this document.



3.3.4. Service Providers

Relevant service providers will be consulted prior to the commencement of constructions in conjunction with development of the CEMP. Consultation with PowerTel in relation to the relocation of fibre optic cable was undertaken in December 2008.

Power lines on the southern side of the Highway that service a building on the mine site will also require relocation. The service provider, Country Energy, will undertake these works at that time.

3.4. Ongoing or Future Consultation

Rix's Creek Mine will continue to consult directly with the community via the CCC, and the RTA during construction, and as required during operation.

A complaints protocol is in place for the mine site, which was developed at the commencement of operations. This protocol allows the community to report issues as they arise. All complaints received are investigated, with appropriate actions implemented to prevent reoccurrence. This protocol will be used to address any issues should they be reported by the community during the construction and operation of the tunnel.



4. Need and Options Considered

4.1. Need for Proposal

As mining has progressed, it was determined that it would beneficial to have a second access across the Highway. This crossing in the form of a cut and cover tunnel would improve access between the pits, washery, and unloading facilities.

4.2. Alternative and Options Considered

A number of options were considered, as outlined in Table 4-1.

Table 4-1 Options Considered

Option	Description	Comment
Do nothing	Continue utilising the existing road overbridge and movement of coal to the washery and coal unloading facilities.	The existing overbrige is a single lane bridge that allows the passage of coal trucks throughout the mine lease area. The location of this overbridge and design (being a single land bridge) restricts truck movements and therefore the mines operational capacity.
Option 1	Construction of an additional road overbridge	An additional overbridge would allow for access to be improved throughout the mine lease area. This could result in the risk of materials falling from the fully loaded trucks onto the road carriageway, additional visual impact and distraction to road users.
Option 2	Construction of a Cut and Cover Tunnel	Allows for improved access, for vehicles hauling coal and overburden, no risk of material falling onto the road carriageway, minimised visual impact. More economic than option 1.

4.3. Selection of Preferred Option

Option 2 was chosen as the preferred option.



5. Description of Proposal

5.1. Overview

This section outlines the proposed works including temporary and ancillary activities, and environmental management measures.

5.2. Existing Road and Infrastructure

New England Highway (HW9) is a classified State Road as part of the National Network and is under care and control of the RTA. Rix's Creek mine lease is bisected by the Highway (refer to **Figure 1-2**).

Current mine related infrastructure that impacts the road corridor is a bridge over the Highway providing unrestricted access for mine vehicles to move coal and overburden from the southern mining areas, to the CHPP and also facilitates the movement of ancillary mining vehicles between the northern and southern sections of the mine lease.

5.3. Existing and Forecast Traffic Volumes

The RTA collects and publishes traffic volume data for the New England Highway. The nearest RTA data point is located at Foy Brook Road at Camberwell, approximately 2km west of the project area.

Figure 5-1 shows growth in traffic¹ on the New England Highway at this location 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). In the absence of any major changes in rates of development in the corridor, it is reasonable to assume that traffic will continue to grow at this rate for the foreseeable future. Given this growth trend it is likely that during the 2009 construction period, volumes would be in the order of 13,300 axle pairs.

SINCLAIR KNIGHT MERZ





Figure 5-1 Growth in Annual Average Daily Traffic on the New England Highway

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.

5.4. Urban and Regional Design

The key urban and regional design issues related to the proposed works include:

- The profile of the bridge traffic barrier. The barrier will comply with the RTA standard drawing; therefore it will match the existing bridge barriers along the New England Highway.
- Full height traffic barriers and protection screens. These will be installed on both sides of the bridge to block the public view towards the tunnel crossing.

5.5. Design Parameters

5.5.1. Design Criteria

The following design criterion has been specified for the proposed works:

• The bridge superstructure and piled walls that form the tunnel crossing will be designed to AS5100 Bridge Design Code and RTA Bridge Policy Guidelines and Specifications.



5.5.2. Engineering Constraints

The following engineering constraints were considered in the design of the tunnel:

- Traffic would be designed to ensure that construction work will not significantly affect the traffic along New England Highway.
- Design of side track would ensure protection of the existing bridge over Rix's Creek to the south of the crossing; the existing culvert to the north of the crossing and the optic fibre cable along the highway.

5.5.3. Major Design Features

The tunnel will incorporate the following features:

- A bridge type superstructure consisting of 1500 precast T-beams with cast in-situ deck slab.
- Substructure consisting of contiguous bored piled wall directly propped by the bridge deck and restrained by rock anchors for the piled wall located next to the bridge deck.
- Full height concrete traffic barrier along both sides of the bridge deck with 3m high protection screens on top of the traffic barrier.

An outline of the proposed layout is provided in Appendix A.

5.6. Construction Activities

5.6.1. Work Methodology

Work would be scheduled as follows:

- Barricades will be placed along the New England Highway to provide separation between road users and the construction works;
- Traffic management systems including fixed and variable message signage will be installed to slow the traffic from 100km/hr to 80km/hr typically with provision to slow the traffic to 40km/hr for short periods of time for the barrier installation and traffic switches. The road would remain open to two lanes, except during traffic switches where it may need to be reduced to one lane controlled by portable traffic lights or traffic controllers. A Traffic Control Plan would be prepared to manage this situation;
- Service relocations will be undertaken including the removal of power lines on the southern side of the highway that service a building on the mine site, and the lowering of a fibre optic cable owned by PowerTel;
- Stripping of topsoil, stockpiling and installation of erosion and sediment control works;



- Preliminary excavation work will commence on the northern side of the highway to allow access to the piling rig that will be used to install the bored cast insitu concrete piles.
 Excavators, bulldozers and trucks will be used during this phase;
- A side track designed for an 80km/hr speed limit will be constructed along the southern side of the highway. This will involve typical road construction equipment. Sheet piling will be installed along the southern side of the existing highway at the tunnel location. This will require pile driving equipment, although sheets may be vibrated into position rather than hammer driven to reduce the noise and vibration impacts;
- Installation of the bored piles and capping beam will commence on the northern side of the highway. Traffic will be switched to operate on the side track following its completion and the piling will continue over the existing highway alignment. This work will involve piling equipment, concrete trucks and pumps and some earth moving equipment. The piles will extend 17 metres below existing ground level;
- When the piling across the highway is completed precast concrete girders will be lifted into position to form the highway deck over the tunnel. These 36m long girders are likely to be manufactured in the Newcastle area and transported to site at night under police escort. A 250 or 300 tonne crane will be required to lift the girders in position. A cast insitu concrete deck and traffic barriers will then be constructed over the girders using concrete trucks and pumps. Protection screens will then be fitted to the bridge to prevent items falling or being thrown from vehicles landing on the mine haul road below;
- When the deck is completed road works will be undertaken to tie the new bridge deck into the existing highway. Traffic will then be switched back onto the existing highway alignment;
- The sheet piling will be removed and piling works will continue to the south of the bridge deck;
- The side track and traffic barriers will be removed and the area where the side track was located will be reinstated, via removal of the road pavement and replacement with top soil, turfing and grass seeding;
- After the piling is completed excavation under the bridge will commence. The excavation is likely to be undertaken by the mine personnel. As the excavation progresses it will be necessary for the mine to install rock anchors to stabilise the pile walls. This will require the use of a rock drill and grout mixings and pumping equipment. The gaps between the piles will then be sealed with shotcrete; and
- The mine haul road will then be completed.



5.6.2. Plant and Equipment

Plant equipment to be used during construction would include:

- Excavators;
- Graders;
- Rollers;
- Loaders;
- Bituminous surfacing plant;
- Line-making equipment;
- Backhoe;
- Delivery trucks;
- Water carts;
- Piling rig;
- Bull dozers;
- Trucks;
- Concrete trucks;
- Pumps;
- Cranes; and
- Rock drilling machinery.

5.6.3. Source and Quantity of Materials

Material excavated to construct the tunnel will be stockpiled within the mine lease area and used in progressively backfilling of the existing mine works.

Construction materials such as gravel would be sourced locally, with exact locations to be determined during the detailed design phase. The girders are likely to be manufactured in the Newcastle area.

5.6.4. Traffic Management and Access

The works would be undertaken in accordance with the *RTA's Traffic Control at Worksites Manual* (2003) and AS1742.3Manual of Uniform Traffic Control Devices (2002). Section 6.2 below provides a summary of the existing traffic environment, potential impacts and proposed safeguards that would be implemented during construction.



5.6.5. Ancillary Facilities

A site compound with site sheds, parking and material set down areas will be installed within the mine lease area, adjacent to the proposed works.

A temporary road (side track) will also be constructed to allow for the maintenance of two lanes of traffic on the Highway during construction (refer to **Appendix A**).

5.6.6. Waste Management

During the construction period, construction areas would be organised and managed on a daily basis following the completion of daily activities. Wastes generated at the site would be temporarily contained and removed at regular intervals for reuse or recycling where possible or otherwise would be categorised and dispersed of at appropriate waste management facilities. Stockpiling of soils and overburden materials would occur within the Rix's Creek mine lease area.

Wastes that would be generated by the proposal include:

- Gravel material;
- Unsuitable fill material;
- Bitumen, concrete and asphalt;
- Excess spoil material;
- Domestic wastes; and
- Green waste.

At the time of writing, quantities of each type of waste were unknown.

5.6.7. Public Utilities Adjustment

In order to undertake the proposed works, relocation of a PowerTel owned fibre optic cable is required. Consultation with the service provider has been undertaken (refer to **Section 3**).

5.6.8. Property Acquisition

The scope of works is contained within the existing road corridor and Rix's Creek mine lease area, therefore, property acquisition is not required. Concurrence from the RTA is however, required for the proposed works within the road corridor.

Rix's Creek is, however, in process of negotiating purchase of adjacent land on the northern side of Highway to the location of the tunnel (Lot 1 DP 170704). Contracts exchanged for purchase of this land in May 2009.



6. Environmental Assessment

6.1. Overview

This section outlines the findings of the environmental assessments. The information provides an understanding of the environmental context in which the proposal should be considered. In addition, this section discusses the existing environment, environmental impacts and mitigation measures to be implemented during construction.

Appendix D details where monitoring for noise, air quality and water is currently undertaken by Rix's Creek mine.

6.2. Traffic

Existing Environment

The New England Highway is part of the National Highway network, and forms the main inland route between Sydney and Brisbane. The average daily traffic volumes on the New England Highway was 11,427 in 2004, and are forecast to be in the order of 13,300 during 2009.

In the vicinity of Rix's Creek Mining operations, the highway varies in width from 2 to 3 lanes and has a posted speed limit of 80-100km/hr. The transition from 80 to 100km/hr is located at the existing Rix's Creek mine overbridge. A northbound overtaking lane also commences at this location approximately 1km east of the proposed tunnel location.

South of Camberwell there is generally 1 lane west and east, although overtaking lanes are present at regular intervals along the New England Highway.

Access to the Rix's Creek mine site is via Rix's Creek Lane, located 2km to the east of the proposed tunnel location. Rix's Creek Lane is accessed via a T-intersection with a dedicated right turn lane and left slip lanes leading both into and out of Rix's Creek Lane. No direct access to the New England Highway is provided from Pits 2 and 3 on the southern side of the Highway, with access being via the bridge over the Highway.

Potential Impacts

The main impact as a result of the proposal on road traffic would be due to the works associated with the construction of bridge piers under existing carriageways, as well as from vehicles associated with construction works, and their travel to and from the site.

Construction would extend over a period of approximately 20 weeks, during which time there would be additional traffic accessing the site, generated mainly by the deliveries of plant, equipment and materials to site, along with construction workers' vehicles. These impacts will be short term and minor.



The construction of the cut and cover bridge requires the use of a side track to minimise the impact of the works on passing traffic. As a result, works will be required to facilitate construction of the side track and works under the bridge, also to re-establish the side track site once the original road alignment is reinstated.

As a result of these works, it is likely that increased travel times will be experienced by motorists on the New England Highway. Short delays may be experienced by motorists when 40km/hr speed zones are in place, and when traffic is operating in one lane only and is controlled by automatic traffic signals or traffic controllers. These will be for short durations only and scheduled to occur outside peak traffic times.

In its operational phase, the completed tunnel will have no impact on passing traffic.

Proposed Safeguards

The construction works will be undertaken in accordance with the RTA's *Traffic Control at Worksites Manual* (2003) and *AS1742.3Manual of Uniform Traffic Control Devices* (2002). In accordance with these requirements:

- Works will be undertaken between 7am and 6pm on Monday to Friday and between 8am and 1pm on Saturdays. No works will be undertaken on Sundays or public holidays.
- Relevant Road Occupancy Licences would be obtained as required;
- A pictorial record and notes on the condition of construction vehicle routes is to be undertaken prior to the commencement of work, to ensure that construction traffic does not result in a degradation of the road surface to the detriment of all road users; and
- Parking for construction workers will be within the Rix's Creek mine site and would not affect the normal operations of nearby roads or construction activities.

For the duration of the works, the existing 80km/hr speed zone will (currently terminating 1km east of the project site) be extended to cover the work area to protect the safety of workers.

The proposed bi-directional side track will be designed for 80km/hr speeds and would serve to minimise the impacts of the works on passing traffic.

Slower 40km/hr speed zones will be in place for short periods for tasks such as installing safety barriers and carrying out traffic switches. It may be necessary for traffic to operate in one lane while traffic switches are being carried out. On these occasions traffic will be controlled via automatic traffic lights or traffic controllers at either end of the work site.



6.3. Noise

Existing Environment

The area surrounding the study area is dominated by coal mining. The noise environment is dominated by road traffic noise from vehicles moving along the New England Highway, in addition to noise from nearby mining activities.

Nearby sensitive receivers were identified from aerial photography, and with reference to Rix's Creek Coal Mine's environmental noise monitoring regime. Identified sensitive receivers are outlined below and are shown in **Figure 6-1**:

- Location 1 Residential Properties, Maison Dieu Road, Singleton. These properties are located approximately 3.4km from the study area. The noise environment at this location is influenced primarily by local rural noise sources, such as farm machinery, livestock, birds and crickets. During the night, mining noise would be audible, although typically at low levels;
- Location 2 Unidentified Property, McDougal's Hill, New England Highway, Singleton. This
 residential property is situated approximately 3.7km from the study area, and adjacent to the
 New England Highway. The noise environment at this location would be strongly impacted by
 traffic noise, particularly heavy vehicles climbing McDougal's Hill out of Singleton on the
 New England Highway;
- Location 3 –Residential Properties, Gardiner Circuit, Singleton Heights. These properties are located on a quiet suburban street, approximately 3.3km from the study area, and over looks rural land to the west. The New England Highway would be clearly audible at these residences, particularly during night time hours. Mining noise would be audible at this location, particularly in the absence of other noise sources.
- Location 4 Parkland Motel, Singleton Heights. The Parkland Motel is located on the New England Highway and predominately serves as mid-term accommodation for mine related workers. Located 2.2km from the study area, it is heavily impacted by Highway traffic noise, particularly during night time hours as a result of heavy vehicle movements.

Background noise data for properties in the vicinity of Location 1 are outlined in the Rix's Creek Mining Lease Annual Environmental Management Report 2007. For the remaining locations, the average background levels contained in *Australian Standard AS1055 (Acoustics – Description and Measurement of Environmental Noise) Part 3, Appendix A (Estimated Average Background Sound Pressure Levels for Different Areas Containing Residences in Australia.)* have been used.





Figure 6-1 Nearest Sensitive Receiver Locations

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Locations 2 and 4 have been classed as areas with dense transportation (R4), whilst Location 3 has been classed as an area with low density transportation (R2). These background noise levels have been summarised below (refer **Table 6-1**):

Table 6-1 Background Noise Levels

Location	Daytime L _A 90 dB(A) (7am-6pm)	Evening L _A 90 dB(A) (6pm-10pm)	Night L₄90 dB(A) (10pm-6am)
Location 1	39	38	38
Location 2	55	50	45
Location 3	45	40	35
Location 4	55	50	45

Mine Operational Noise Conditions

Rix's Creek mine is obliged to operate under the conditions outlined in the mine's Development Consent conditions. These conditions contain recommended goals for $L_A 10$ night and daytime noise design levels at the following locations:

• Site 1: "The Retreat" off Bridgeman Road (lot 2 Lethbridge Road) located approximately 25m from the dwelling and 6m from the High Volume Air Sampler.

-	Day time Noise Level Design Goal (L _A 10)	42 dB(A)
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- Night time Noise Level Design Goal ($L_A 10$) 40 dB(A)
- Site 2: Maison Dieu Road (Lot A, Glen Lomon) located approximately 20m from the dwelling and 20m from Maison Dieu Road.

-	Day time Noise Level Design Goal (L _A 10)	38 dB(A)
_	Night time Noise Level Design Goal (L _A 10)	38 dB(A)

Site 3: Singleton Heights, Bower Parade- Day time Noise Level Design Goal (LA10)42 dB(A)- Night time Noise Level Design Goal (LA10)40 dB(A)

Given that these noise limits are defined as 'Noise Level Design Goals' they are not considered relevant to temporary construction related noise. However, where an assessment of noise levels at these locations is required, the following references should be used:



- 'The Retreat' is located approximately 3.4km west of the development area. In this report construction noise levels have been calculated using basic noise attenuation methods, and have not considered ground topography, therefore the attenuated construction noise levels will be the same as those calculated at the nominated Location 1 (Maison Dieu Road residences) shown on **Figure 6-1**, which is also 3.4km from the development area;
- Similarly, Maison Dieu Road may be defined as Location 1 (Maison Dieu Road); and
- Singleton Heights should refer to Location 3 (Gardiner Circuit).

Once operational the noise emitted from the tunnel would be governed by the normal operational noise limits contained in the Development Consent for the mine site.

Construction Noise Criteria

Generally, the acceptability of construction noise within a community depends on the potential for construction activities to interfere with day-to-day activities, the duration of the event, and the extent of its emergence above the background noise level. The DECC recommends that the free-field $LA_{10}(15\text{min})$ noise levels arising from a construction site (or works) and measured in the general vicinity of any noise sensitive premises should not exceed criteria detailed in the DECC's Environmental Noise Control Manual (ENCM, 1994), Chapter 171 Construction Site Noise. The noise criteria are dependent on the existing background noise levels and the expected duration of the works. The noise goals for construction activity are detailed in **Table 6-2**.

Table 6-2 Construction Criteria Guidelines

No.	Duration Of Works	LA ₁₀ Guidelines
1	Construction period of 4 weeks and under	The LA_{10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 20 dB(A).
2	Construction period greater than 4 weeks and not exceeding 26 weeks	The LA_{10} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 10 dB(A).
3	Construction period greater than 26 weeks	The EPA does not provide noise control guidelines for construction periods greater than 26 weeks duration, however, it is generally accepted that provided LA_{10} noise levels from the construction area do not exceed a level of 5 dB(A) above background, then adverse (intrusive) noise impacts are not likely to be experienced at nearest sensitive receptor locations.

The duration of construction work would be between 4 and 26 weeks. Applying these guidelines, the construction noise goals for each location have been set out in **Table 6-3**.



Sleep Disturbance Guidelines

Although the proponent has indicated that night time works are unlikely to be required for the completion of this project, an outline of the NSW DECC sleep disturbance guidelines has been included below for reference.

The DECC review research on sleep disturbance in the NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999). Due to the results being diverse this review concluded that it was not reasonable to issue new noise criteria for sleep disturbance.

From the research, the DECC recognised that the current sleep disturbance criterion of an LA_1 , (1 minute) not exceeding the LA_{90} , (15 minute) by more than 15 dB(A) would not be ideal. Nevertheless, as there is insufficient evidence to determine what should replace it, the DECC have advised that this should be used as a guide to identify the likelihood of sleep disturbance. This means that where the criterion is met, sleep disturbance is not likely, but where it is not met, a more detailed analysis may be required.

The calculated sleep disturbance criteria to be applied where construction works take place during night time hours are outlined in **Table 6-3**.

Location	Daytime L _A 10 dB(A) (7am-6pm)	Night L _A 1 dB(A) (10pm-6am)
Location 1	49	53
Location 2	65	60
Location 3	55	60
Location 4	65	50

Table 6-3 Project Construction Criteria

Vibration Guidelines

The effects of vibration can be divided into three main categories:

- Where occupants or users of the building are disturbed or inconvenienced;
- Those in which the building contents may be affected; and
- Circumstances in which the integrity of the building or the structure itself may be prejudiced.

Vibration may be transmitted through the ground or as low frequency pressure waves through the air. There are two types of vibration criteria that are used when assessing impacts. The first is the human comfort criteria, which as the name suggests is designed to minimise impacts that may



disrupt day to day activities of humans. The other form of vibration criteria is designed to avoid damage to buildings and structures.

Human Comfort

Vibration from construction activities with regard to human comfort within a building should comply with the *Department of Environment and Conservation (DEC) Assessing Vibration: A Technical Guideline*. It is not always possible to undertake major infrastructure projects in very close proximity to residential dwellings and comply with the more stringent human comfort criterion. However, this should always be used as the objective to aim for, and be the basis of assessment.

When assessing vibration, the DECC classifies vibration as one of three types:

- Continuous Where vibration occurs uninterrupted and can include sources such as machinery and constant road traffic;
- Impulsive Where vibration occurs over a short duration (typically less than 2 seconds) and
 occurs less than three times during the assessment period, which is not defined. This may
 include activities such as occasional dropping of heavy equipment or loading / unloading
 activities; and
- Intermittent Occurs where continuous vibration activities are regularly interrupted, or where impulsive activities recur. This may include activities such as rock hammering, drilling, pile driving and heavy vehicle or train passbys.

Continuous and Impulsive Vibration Criteria

Human sensitivities to vibration differ depending on the direction of movement. For this reason, the criteria outlined below in **Table 6-4**, provides different acceptable levels for vibration based on the direction of movement.

To assess human comfort vibration the measured levels are subjected to a summation and averaging method. This yields a result referred to as a Root Mean Squared Value (rms). This value is measured in m/s^2 , and is derived from the acceleration of the measured surface as a result of the induced vibration.

Continuous vibration sources have the potential to impact residents in close proximity to where they are operating, as such if continuous vibration is measured at levels lower than the criteria detailed in **Table 6-4** there should be no adverse impacts.



Location	Assessment	Preferre	d Values	Maximum Values		
Location	Period	Z axis	X + Y axes	Z axis	X + Y axes	
Critical Areas	Day + Night time	0.0050	0.0036	0.010	0.0072	
Residences	Day time	0.010	0.0071	0.020	0.014	
	Night time	0.007	0.005	0.014	0.010	
Schools, Churches, Offices	Day + Night time	0.020	0.014	0.040	0.028	
Workshops	Day + Night time	0.04	0.029	0.080	0.058	

Table 6-4 Preferred and Maximum Weighted rms Values for Continuous and Impulsive Vibration Acceleration (m/s²) 1- 80 Hz

Source: The guidelines are taken from Table 2.2 of the DECC Guidelines.

Intermittent Criteria

Where vibration is classed as intermittent, the DECC uses a vibration dose value (VDV) to assess levels of vibration (refer **Table 6-5**). VDV is calculated using the acceleration rate of the vibration event and the time over which it occurs. This method is more sensitive to the level of vibration than its duration, and is a measure of the total quantity of vibration perceived. The VDV method is the most suitable for assessing human comfort amenity from intermittent vibration sources.

Table 6-5 Acceptable Vibration Dose Values (VDV's) for Intermittent Vibration (m/s^{1.75}) 1- 80 Hz

Location	Day (7am-	time 10pm)	Night time (10pm-7am)		
	Preferred Value	Maximum Value	Preferred Value	Maximum Value	
Critical Areas (e.g. Hospitals)	0.10	0.20	0.10	0.20	
Residential buildings	0.20	0.40	0.13	0.26	
Offices, Schools, Churches, etc	0.40	0.80	0.40	0.80	
Workshops	0.80	1.60	0.80	1.6	

Criteria for Building Structures

When assessing potential vibration impacts on building structures, the velocity and direction of the movement is measured. The measurement is referred to as the Peak Particle Velocity (PPV), presented in mm/s.

SKM

Vibration from construction activities, with regard to building damage, is assessed using the German standard DIN 4150: Part 3 – 1999 *Effects of Vibration on Structures* (DIN Guideline). The DIN Guideline values for PPV measured at the foundation of various structures are summarised in **Table 6-6**.

 Table 6-6 Guideline Values of Vibration Velocity, for Evaluating the Effects of Short Term Vibration DIN 4150

		Guideline Values for Velocity, <i>v</i> _i (mm/s)					
Line	Type of Structure	Vibratior	Vibration at Horizontal Plane				
		1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz*	of Highest Floor at all Frequencies		
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40		
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15		
3	Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	8 to 10	8 to 10	8		
* For frequencies above 100Hz, at least the values specified in this column shall be applied							

Potential Impacts

Construction Noise Assessment

The stages of construction that may result in noise impacts include:

- General Earthworks carried out during general site establishment and landscaping;
- Road works during construction of temporary highway diversion;
- Vibratory sheet piling;
- Hammered piling;
- Concrete bridge girders delivery and installation; and
- Tunnelling excavation.

In assessing the potential noise impacts resulting from each construction activity, the following equipment was assumed (refer to **Table 6-7**).



Work Stage	Indicative Equipment List
General Earthworks	Front End Loader – CAT 980 Excavator – Komatsu PC400 Trucks (x2)– CAT 769 Backhoe (x2) – Hitachi UH07
Road Works	Excavator – Komatsu PC400 Backhoe (x2) – Hitachi UH07 Lambs foot Compactor (x2) – CAT 825C Vibratory Compactor (x2) – CP533 or similar Asphalt Paving Machine
Vibratory Piling	Vibratory Piling Machine – 52T Truck Mounted Crane - 100 – 200kW TIG Welder (x2)
Hammered Piling	Hydraulic Hammer Rig – Tubular Steel, 4T hammer Concrete Truck + Pump (x2) Truck Mounted Crane – 100 – 200kW TIG Welder (x2)
Concrete Bridge Girders	Large Semi trailer 250 – 300T Crane – Liebherr LTM1300 or similar Concrete Truck + Pump (x2) TIG Welder (x4)
Tunnelling Excavation	Loader - Wheel Cat 994 FEL Truck - Dump Cat - 789 Dozer - Crawler Cat - D9 Excavator Cat 245 Rockbreaker Cat - 240E

Table 6-7 Indicative Equipment List

Estimated sound power levels, based on information contained in internal and government databases for the equipment outlined above, has been presented in **Table 6-8**. Noise levels used in this table are indicative of similar type(s) of equipment, as detailed in the table above.

Table 6-8 Equipment Sound Power Level, L_A10 dB(A)

LWA
115
120
123
105
129
116
105



Equipment	LWA
Hand Tools TIG Welder	98
Excavator - Backhoe Hitachi	105
Compactor Cat - 825C Landfill compactor	110
Compactor Flat Drum - Vibratory roller	110
Loader Wheel Cat 992 loading	117
Piling Rig - Hydraulic Hammer (tubular steel, 4T hammer)	115
Dozer - Crawler Cat - D9	110
Loader - Wheel Cat 980C Loaded	111
300T Crane	109

This data has been used in conjunction with standard noise attenuation methods to calculate likely construction noise levels at the nominated sensitive receiver locations (refer **Table 6-9**). These calculations do not consider the absorption of noise by local geography, air or vegetation. Meteorological influences are, however, considered using the CONCAWE algorithm, with a weather category of Class 6. This assumes a clear sky and a light breeze blowing towards the receiver location. In addition, it has been assumed that all equipment, described in **Table 6-7**, would be operating at the same time at the nearest location to the receiver. As such, these calculations would be considered possible maximum noise levels, and may not be reached in actuality.

Receiver	Daytime Criteria	Estimated Construction Noise Level – dB(A)					
Location		General Earthworks	Road Works	Vibratory Piling	Hammered Piling	Concrete Girders	Tunnelling Excavation
Location 1	49	28	21	15	32	32	29
Location 2	65	27	20	13	30	30	27
Location 3	55	29	22	16	32	32	29
Location 4	65	39	29	24	40	40	36

Table 6-9 Estimated Construction Noise Levels

Given the hilly nature of the terrain between the proposed construction works, and Locations 2 and 4, noise levels at these locations would be likely to experience moderate levels of attenuation in all construction related noise, resulting in noise levels considerably lower than those outlined above.


Most activities associated with the tunnelling works will occur within the enclosed tunnel area, which will provide substantial screening/attenuation of this noise source, and as such noise levels at the nearest receiver locations are expected to be considerably lower than those calculated in **Table 6-9**.

From these calculations, construction noise levels are unlikely to approach the nominated daytime project criteria at any sensitive receiver location. During most construction activities, the work is likely to be inaudible at all receiver locations.

Construction Vibration Assessment

The prediction of vibration impacts from construction activities is not straight forward as the type and size of equipment, the proximity to a sensitive receiver and the local geology all play a significant role the in the actual vibration levels experienced at a residence. Estimates of vibration levels may be made, however these are based on typical conditions and equipment types. The primary method of ensuring no adverse vibration impacts are encountered is by setting vibration limits and carrying out monitoring during construction at potentially affected receiver locations.

An indication of generally accepted, minimum buffer distances is presented in **Table 6-10**. This table identifies distances where the more stringent human comfort criteria are likely to be met. These levels are for reference only and are not to be applied as project specific limits.

Table 6-10 Recommended Buffer Distances for Ground Vibration

Equipment Type	Buffer Distances from Sensitive Receiver
Hydraulic rock breaker	15 m
Vibratory Roller	25 m

Given that the nearest structure to the development area is the existing over bridge, which is located approximately 1km to the south east, any construction related vibration impacts are considered unlikely.

Operational Noise Assessment

During the operation of the proposed tunnel, the noise limits outlined in the Rix's Mine CoA would apply. The primary source of generated noise after commissioning would occur as a result of loaded mining trucks passing through the tunnel. Using noise measurements of a CAT 69B, 35t loaded dump truck (similar to a CAT 793 that will be used) (refer to **Table 6-7** and **Table 6-8**), the following noise levels have been calculated at each receiver (refer to **Table 6-11** below).



Location	Day time Noise Level Design Goals – L _A 10	Night time Noise Level Design Goals – L _A 10	Calculated Noise Level L _A 10
Maison Dieu / The Retreat	42	40	25
Singleton Heights	38 dB(A)	38 dB(A)	25 dB(A)

Table 6-11 Predicted Operation Noise Impact

These noise levels assume the operation of the trucks on open, soft ground, whereas in actuality they will be operating within the confines of the tunnel. The tunnel will offer screening and mitigation and consequently the predicted noise levels may lower. Additionally, the operation of this tunnel would result in reduced movements on the existing road overbridge which is considerably closer to the sensitive receivers. Use of the tunnel would assist the mine in maintaining noise levels within acceptable operational levels.

Proposed Safeguards

Restrictions are placed on the hours of construction to ensure that the acoustic amenity at the closest residences is protected. Where possible, the hours of operation for construction works would follow standard construction times:

- Monday to Friday 7am to 6 pm;
- Saturday 8 am to 1 pm; and
- No audible construction work to take place on Sundays or public holidays.

Any construction work outside the above hours would be carried in accordance with Practice Note (vii) of the RTA *Environmental Noise Management Manual*. Residents would be notified of works required outside of these normal hours, and where it is considered reasonable and feasible, agreement reached concerning the program of works. In addition, Rix's Creek Mine would need to inform the DECC of any proposed works outside of normal construction hours.

Other possible safeguards that would be considered during the period of construction include:

- Provide acoustic screening around semi permanent plant, such as compressors, generators or pumps;
- Consult affected residences prior to the commencement of construction;
- Construction noise monitoring to be conducted using unattended noise loggers or attended monitoring to confirm actual construction noise levels, especially during night time hours or where a noise complaint has been received;



- Construction timetabling, in particular where work outside standard hours is deemed essential, to minimise noise impacts. This may include time and duration restrictions and respite periods;
- Using noise source controls, such as the use of residential class mufflers where practicable, to
 reduce noise from all plant and equipment including cranes and air compressors; and
- Selection of plant and equipment based on noise emission levels.

6.4. Flora and Fauna

Existing Environment

The flora and fauna within the road reserve is characterised by a dense layer of exotic grasses and herbs. There are no trees or shrubs present, apart from a few young regenerating tree saplings.

The road reserve is dominated by the exotic Rhodes Grass (*Chloris gayana*) and Galenia (*Galenia pubescens*) in addition to a range of other less frequent exotic species including Fireweed (*Senecio madagascariensis*), Purple Top (*Verbena bonarienis*), African Lovegrass (*Eragrostis curvula*), Wild Oats (*Avena fatua*) and Quaking Grass (*Briza maxima*). Several native groundcover species were recorded although these occur in low abundance comprising Barb Wire Grass (*Cymbopogon refractus*), Common Everlasting (*Chrysocephalum apiculatum*) and several regenerating Narrow-leaved Ironbark (*Eucalyptus crebra*) approximately 1-2m high on the southern side of the New England Highway (refer to **Figure 6-2**).

 Figure 6-2 Southern Road Easement to the Right of Fence Showing Regenerating Trees in the Background





Narrow-leaved Ironbark is a characteristic species of the 'Hunter Lowlands Red Gum Forest' an Endangered Ecological Community (EEC) listed under Schedule 3 of the TSC Act. While this community may have historically occupied portions of the surrounding area it has been extensively cleared from the landscape and is no longer present in the road reserve.

Targeted searches were conducted for the Lobed Blue-grass (*Bothriochloa biloba*) listed as Vulnerable under the EPBC Act, and Heath Wrinklewort (*Rutidosis heterogama*) listed as Vulnerable under the TSC Act and the EPBC Act. Both species have been recorded within similar disturbed roadside habitats, and therefore considered to have the potential to occur in the proposal area. The results of the survey indicate that no threatened flora species occur within the road reserve.

Habitat for fauna comprises a modified cover of grass, providing some sheltering opportunities for reptiles and frogs. The lack of trees and shrubs limits the suitability of the habitat for many of the bird and mammal species characteristic of the region. The site may be intermittently utilised for foraging by highly mobile threatened fauna such as threatened woodland birds such as Grey-crowned Babblers and Hooded Robin previously recorded on the mine site (Envirosciences 1994) and microchiropteran bats. Foraging opportunities are, however and any use would be incidental only, with the site not provided significant or important habitat.

Adjacent mining areas support remnant vegetation and planted native trees. On the northern side of the New England Highway, outside the road corridor, planted Narrow-leaved Ironbark and Spotted Gum (*Corymbia maculata*) up to 5 m in height are present (refer to **Figure 6-3**). This vegetation has an understorey dominated by the exotic groundcover Galenia. On the southern side of the New England Highway adjacent mining areas support relatively mature remnant trees including a Narrow-leaved Ironbark near the road reserve (refer to **Figure 6-2**), from which regenerating trees in the road reserve have been recruited. These adjacent areas of remnant vegetation would support suitable habitat for threatened flora and fauna species within the local area, such as Grey-crowned Babblers, Hooded Robin, Squirrel Gliders and Speckled Warblers previously recorded during studies undertaken for the mine site (Envirosciences 1994).

Areas of remnant vegetation on adjacent mining lands (outside the study area) are likely to be part of local occurring EECs including Lower Hunter Spotted Gum - Ironbark Forest, Hunter Lowlands Red Gum Forest, and vegetation along Rix's Creek may have affinities to River-flat Eucalypt Forest.



- Figure 6-3 Northern Road Easement Showing Planted Regenerating Trees on Adjacent Mining Areas

Potential Impacts

Potential impacts on flora and fauna from the proposal will be minimal, based on the lack of any species or habitat of conservation significance. There is, however, potential for indirect impacts on adjacent habitats, including potential ground-water dependant ecosystems identified along the Rix's Creek corridor (refer to **Section 6.5**).

The conclusion of the site survey indicates that the habitat represented in the road reserve does not support threatened flora species, or any fauna habitat of significance to local threatened fauna. The vegetation of the road reserve does not comprise an Endangered Ecological community as listed under the TSC Act.

The high abundance and invasive nature of many of the weed species present within the road reserve, suggests there is potential for weed propagules to be spread from the road corridor into the adjacent areas during construction activities. Mitigation measures should be implemented to ensure that the spread of weed species is appropriately managed during construction.

Proposed Safeguards

The following will be implemented to limit the potential ecological impacts:

- A weed management strategy will be developed and implemented as part of the CEMP to limit the spread and propagation of weed species;
- Any proposed revegetation activities/landscaping associated with the project will utilise locally indigenous flora species sourced from the local area, where possible; and
- Erosion and sedimentation controls will be implemented during construction



6.5. Groundwater Dependent Ecosystems

Existing Environment

In November 2008, a geotechnical investigation was conducted, which included drilling four boreholes to between 10 and 20 m depth (SKM 2008) (refer to **Figure 6-4**). No groundwater was observed in the boreholes down to 12-14 m. Beyond these depths the holes were advanced via the addition of drilling water to assist the drilling process (and core recovery), and hence groundwater levels could not be determined from these bores. In BH1A no water was encountered to 12m, in BH2 no water was encountered to 14.7m and in BH3 no water was encountered to 11.6m (SKM, 2008). While an exact depth to the watertable was not quantified, the investigation did confirm that the watertable is deeper than approximately 15m below surface at the site.

Figure 6-4 Borehole Locations (SKM 2008)



APPROX. BOREHOLE LOCATIONS

The Rix's Creek Pty Limited's EIS (1994) indicated that the main aquifer in the area is formed by the coal seams, and primarily the upper coals seams, with permeability decreasing with depth. The first coals seams in the onsite bores were encountered at approximately 12m below the surface. The fact that these seams were dry is not surprising however, as the nearby open cut coal pit (only approximately100m north-east of the study area) pumps groundwater from the base of the pit, and hence the pit acts as regional groundwater drain, depressing the watertable around the pit.

Also at the time of drilling, no seepage was observed in the nearby pit face to depths of greater than 20 m. This indicates that the groundwater discharge into the pit is at a low rate, due to the low



transmissivity of the coal seam aquifer. The relatively low permeability of the coal seams was a fact already established in the EIS (Envirosciences, 1994).

Rix's Creek crosses the New England Highway approximately 300 m south of the borehole sites. This creek is generally dry all year around (based on monitoring records kept by the mine) and is only incised some three to four metres (maximum) into the landscape (*pers. comm.* McNally December 2008). This indicates that Rix's Creek sits well above the watertable and flow is not sustained by groundwater discharge.

A search of the NSW Groundwater Works database was completed for approximately a 10km radius around the study area (NSW Government 2008). The database map indicates there are no registered bores within approximately 5km radius of the site. Groundwater bores outside the greater 5km radius area are predominantly used for stock purposes. The bores which are drilled to 20 to 30 m produce low yields of groundwater (< 2 L/s) from sand and gravel alluvials from 7 to 13 m depth below ground level. One deep bore drilled as a fire fighting monitoring bore to 84 m depth produced a standing water level of 60 m depth from fractured coal and shale. These bores however were not mapped and related to topography, therefore, these provide only an indication of water levels in the region.

The EIS (Envirosciences, 1994) stated at the time mine dewatering was occurring at a rate of 26L/s for two to three days followed by intermittent pumping after subsiding of the initial rush. The potentiometric surface map indicated groundwater levels of around 70m AHD. The approximate surface elevation at the site is 80m AHD. When the drawdown resulting from the open cut operation is allowed for, the existing potentiometric surface is probably at least 5m lower than in 1994, which is consistent with the field investigation described above (i.e. a watertable depth of at least 15m within the study area).

The Rixs Creek 2006 Annual Environmental Management Report (RCM 2006) stated that due to the very dry year, it was not necessary to discharge any water. However, a water balance study completed for the site estimated that 0.3 to 6.8 ML/day would require dewatering and up to 40 ML/day after 10-mm or greater rainfall events.

The 2007 Annual Environmental Management Report (RCM 2007) stated that there was only minimal inflow into the active mining area from underground aquifers, mainly coal seams. This water is saline and unfit for discharge offsite.

Potential Impacts

Many groundwater dependent ecosystem (GDE) assessments for terrestrial vegetation assume that the risk to groundwater from extraction or other groundwater impacting activities is very low when the watertable is deeper than 10m (Eamus et al 2006 and Froend and Zencich 2002). This is due to the large soil store from which vegetation can obtain water, and /or the depth to watertable is



beyond the maximum root depth of many plant species. Given the depth to the watertable (i.e. deeper than 14.7m below surface) it is considered very unlikely that there is groundwater dependent vegetation within the study area. Further, Rix's Creek is considered to sit well above the watertable and does not interact with the regional groundwater table (at least at this location), so baseflow GDEs are also very unlikely to be present within the study area.

Therefore, it is considered very unlikely that GDE (terrestrial vegetation and/or baseflow GDEs) exist in the study area. Finally, and most significantly, the tunnel excavations will all occur above the watertable (i.e. the floor of the tunnel will be approximately 12-13m and the bored piles will be approximately 17m below the natural surface level), and hence there will be virtually no (hydraulic) impact on the watertable resulting from the construction or final infrastructure.

Proposed Safeguards

No safeguards are considered warranted.

6.6. Visual

Existing Environment

As detailed in **Section 6.3**, the study area is surrounded by mining activities. The nearest private resident is located approximately 3.5 km from the proposed Highway crossing. Visual screening bunds are located on either side of the road corridor, within the adjacent mining lease area (refer to **Figure 1-2**).

Potential Impacts

Potential impacts would be limited to road users being able to view construction activities and the operation of the tunnel.

Visual impacts would be acceptable and minimal due to the:

- Crossing being located underground;
- Vegetated visual screen by being located on the adjacent mine lease areas;
- Onsite reinstatement of vegetation within the road corridor will be reinstatement; and
- Background visual catchment is an operating mine and hence the tunnel becomes an integral component of the transport corridor and mining landscape.

Proposed Safeguards

No mitigation measures are considered warranted.



6.7. Indigenous Heritage

Existing Environment

The study area was formally occupied by family groupings of the Wannaruah people. The Wannaruah people would have had various base camps along tributaries of the Hunter. The Wannaruah Local Aboriginal Land Council is the aboriginal land council applicable to the study area.

A search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted in December 2008. The search indicated that 400 known Aboriginal sites have been recorded within 10km surrounding the study areas (refer to **Appendix C**). The search was refined as per National parks and Wildlife request to a 2km area. This search identified 7 known Aboriginal sites, including a number of open camp sites, with the nearest site located approximately 400m east of the study area.

A LALC representative inspected the study area on the 14^{th} December 2008, in which no sites, items or aboriginal heritage significance were identified. In addition, it was noted that (refer to **Appendix C**):

"the chance of locating cultural material in its natural context would be negligible and therefore we do not have any cultural heritage issues with this project proceeding."

Potential Impacts

The potential to find additional archaeological sites within this previously disturbed area of road corridor is considered low, given the high level of landscape modification and disturbance.

Proposed Safeguards

In the event that any artefacts are unearthed during earthworks, work would cease immediately in the affected area, and the LALC, RTA Aboriginal Heritage Advisor and DECC would be informed. Work would not commence in that area until permission has been given to proceed.

6.8. Non-Indigenous Heritage

Existing Environment

A search of national, state and local historic heritage databases was undertaken with the results detailed in **Table 6-12** below.



Register	Search Result
Singleton Shire Council LEP	Under Schedule 3 of the Singleton Shire Council LEP, no items were listed as having heritage significance within the study area. However 1 item was listed as having regional significance in the surrounding area. The Rix's Creek Coke Ovens are located within the mine site adjacent to Stone Quarry Gully.
Hunter Regional Environmental Plan 1989 (Heritage)	While the Hunter REP 1989 applies to the Singleton Local Government Area, the <i>Hunter Regional Environmental Plan 1989 (Heritage</i>) does not cover the Singleton LGA.
State Heritage Register	The State Heritage Register is maintained by the NSW Heritage Office. A search of the State Heritage Register for the study area returned no items of state significance. However, 1 item was listed as having regional significance in the surrounding area. The Rix's Creek Coke Ovens are located within the mine site adjacent to Stone Quarry Gully.
National Heritage List and Commonwealth Heritage List	The National Heritage List and Commonwealth Heritage List compromise a framework for the listing and protection of natural and cultural heritage places across Australia. The system operates under the (<i>Environment Protection and Biodiversity Conservation Act 1999</i>). No items were listed on this register.
Register of the National Estate	Before the introduction of the National Heritage List and Commonwealth Heritage List, the Register of the National Estate (RNE) was the Australian Government's register of heritage places around the country. No items were listed on this register.

Table 6-12 Results of Heritage Register Searches

Correspondence was forwarded to the RTA to clarify if non-Indigenous heritage items are located within the study area. A review of the RTA's S170 Register for the Hunter Region was undertaken. No items of significance were identified as being listed for the study area.

Potential Impacts

The construction and operation of the tunnel proposal would not result in disturbance to items of non-Indigenous cultural heritage.

Proposed Safeguards

The proposed works may proceed with no further heritage constraints. However, as a requirement by the *NSW Heritage Act 1977 (amended)*, in the event that unanticipated historic structural fabric or cultural deposits are encountered, works would cease immediately to allow an archaeologist to make an assessment of the finds. The archaeologist would then need to consult with the NSW Heritage Office concerning the significance of the historic cultural material unearthed.

6.9. Waste and Resources

Existing Environment

With the exception of domestic waste from road users, there are no sources of waste in the study area.



Potential Impacts

As detailed in **Section 5.6.6**, waste streams likely to be generated during the construction of the proposal may include bitumen, concrete and asphalt, excess spoil material, domestic wastes and green waste.

Proposed Safeguards

During the construction, areas would be delineated, organised and managed on a daily basis. Wastes generated at the construction site would be temporarily contained and then removed at regular intervals for reuse or recycling where possible or otherwise to an appropriate waste management facility. Excess spoil would be removed and beneficially placed as part of the open cut rehabilitation process.

6.10. Air Quality

Existing Environment

Air quality within the area is impacted by coal mining activities. Coal mines are considered a major contributor of particulate matter (PM_{10}) emissions within the area (SSC, 2007).

Operational procedures are in place to minimise these impacts in the surrounding environment including the application of water to haulage roads, sprinkler systems on coal stockpile areas and the surrounds of the washing plant, enclosed conveyors, and operational blasting controls.

An air quality monitoring program is undertaken by Rix's Creek to determine ambient air quality within the area surrounding the operation. A total of 30 dust deposition gauges are located on and around the mining lease area. High volume air samplers are located at three sites on the eastern side of the lease i.e. between the operation and the populated area of Singleton. In 2007 the Rix's Creek Annual Environmental Management Report (RCM 2007) indicated that:

- There was a17% exceedence of the annual average result of 2 g/m²/month for dust deposition gauges compared to 33% in 2006.
- Total Suspended Particulates (TSP) were below the limit set by the National Health & Medical Research Council (NHMRC) air quality guideline annual average of 90 ug/m³ in 2007.
- No site exceeded the PM₁₀ National Environment Protection Measure for Ambient Air Quality annual average guideline of 30 ug/m³ occurred.
- The daily goal PM_{10} of 50 ug/m^3 was exceeded at the Mines Rescue site on 1 day, Rix's Creek site on 5 days and Retreat site on 7 occasions.
- Three complaints were received concerning dust during the 2007 reporting period. They all related to blast on the 16th October 2007.

In 2008, the rolling annual average for dust deposition is below the $4g/m^2/m^2$ month guideline.



The air quality monitoring program results detailed above relate to ambient air quality monitoring results and are not a direct measurement of the Rix's Creek mining operational dust impacts.

Potential Impact

There is potential for particulate emissions (dust) to be generated during construction. Emissions from equipment vehicle exhaust would also contribute to local air quality impacts during construction.

Given that construction works will not be located in close proximity to residential dwellings there is no significant potential for dust nuisance to sensitive receivers. Dust will however, contribute to overall levels of air pollutants monitored by the mine site and mitigation would be required to ensure the mine continues to met their CoA and EPL requirements.

During operations within and adjacent to the tunnel has the potential to generate dust.

Proposed Safeguards

Measures to minimise dust generation during construction include:

- Pumps, generators and other machinery are to be turned off when not in use;
- All loose materials transported to and from the construction site would be covered;
- Stockpiles temporarily established would be covered or sprayed with water on a regular basis, particularly during dry or windy conditions;
- Water would be applied as necessary on temporary roadways, stockpiles and other exposed areas; and
- Dust generating activities during construction would be reduced or ceased during excessive wind events.

Operational Safeguards would include:

- Maintenance of mine equipment to ensure correct operation and emission control; and
- The road surface would be kept sufficiently moist to minimise dust generate.

6.11. Water Quality

Existing Environment

Rix's Creek is located approximately 200m south of the study area. This creek is an ephemeral stream, in which flows only result following rainfall. South of the Highway, Rix's Creek is a defined flow line amongst a belt of riparian vegetation (refer to **Figure 1-1**). Rix's Creek Mine monitors water quality in the Creek on a monthly basis.

Variations in water quality have been noted in the annual environmental management. Variations generally result from rain events and resultant runoff flushing stagnant water through the catchment



washing sediment and vegetative matter into the stream from the surrounding landscape. During times of nil flow the pH, electrical conductivity and total dissolved solids increase. Conversely total suspended solids are greatest following storm events and electrical conductivity and dissolved solutes decrease.

Potential Impacts

Water quality within the study area is not expected to be adversely affected by the Proposal. There is, however, potential for earth works to cause erosion, which may lead to increased turbidity and siltation of Rix's Creek. Fuel and oil spillages may also occur during earthworks activities, which could also be transported to the creek, particularly during rainfall events.

During operation runoff from undisturbed areas will continue to be directed away from mining operations through diversion banks and channels. Clean water will also continue to be directed into Rix's Creek.

Proposed Safeguards

Prior to the commencement of construction, a Soil and Water Management Plan (SWMP) would be prepared in accordance with the principles and practices outlined in:

- Landcom (2006), *Managing Urban Stormwater: Soils and Construction*, Volume 2 Book 4, Main Road Construction; and
- RTA (2000) RTA Road Design Guide, Section 8 'Erosion and Sedimentation'.

The SWMP would incorporate (but not be limited to) the following erosion and sediment control measures:

- Stockpile areas would be managed in accordance with the RTA's *Stockpile Management Procedures*. The following design criteria have been specified for the proposed works:
 - Appropriate measures to prevent wind-blown dust entering waterways would be undertaken;
 - All chemicals and fuels associated with construction would be stored in roofed and bunded areas;
 - Sediment traps and sediment filters (e.g. silt fences) would be installed as required;
 - Construction works would be completed as quickly as possible to minimise exposure of disturbed areas;
 - Where practical, earthworks would not be undertaken during periods of heavy rainfall events;
 - Progressive rehabilitation / re-vegetation would be undertaken as works are completed;
 - Straw mulch or a similar material would be used to protect exposed soil surfaces and to facilitate grass growth; and



- Drainage works would be regularly checked after heavy rain event during construction to ensure controls remain adequate.



7. Environmental Management

7.1. Environmental Management Plans (or Systems)

The safeguards described in this SEE would be incorporated into a Construction Environmental Management Plan (CEMP). The construction contractor will be responsible for implementing the requirements outlined in the CEMP.

7.2. Summary of Safeguards and Management Measures

The proposed safeguards associated with the proposal are included in **Table 7-1**.

Consideration	Safeguards
Traffic	The construction works will be undertaken in accordance with the RTA's <i>Traffic Control at Worksites Manual</i> (2003) and <i>AS1742.3Manual of Uniform Traffic Control Devices</i> (2002). In accordance with these requirements:
	 Works will be undertaken between 7am and 6pm on Monday to Friday and between 8am and 1pm on Saturdays. No works would be undertaken on Sundays or public holidays.
	 Relevant Road Occupancy Licences will be obtained as required;
	 A pictorial record and notes on the condition of construction vehicle routes is to be undertaken prior to the commencement of work, to ensure that construction traffic does not result in a degradation of the road surface to the detriment of all road users; and
	 Parking for construction workers will be within the Rix's Creek mine site and would not affect the normal operations of nearby roads or construction activities.
	For the duration of the works, the existing 80km/hr speed zone will be extended to cover the work area to protect the safety of workers.
	The proposed bi-directional side track will be designed for 80km/hr speeds and will serve to minimise the impacts of the works on passing traffic, which will utilise the existing carriageway until the sidetrack is built, and remain on the side track until works on the existing carriageway are complete.
	Slower 40km/hr speed zones will be in place for short periods for tasks such as installing safety barriers and carrying out traffic switches. It may be necessary for traffic to operate in one lane while traffic switches are being carried out. On these occasions traffic will be controlled via portable traffic lights or traffic controllers at either end of the work site.

Table 7-1 Summary of Proposed Environmental Safeguards



Consideration	Safeguards
Noise	Restrictions are placed on the hours of construction to ensure that the acoustic amenity at the closest residences is protected. Where possible, the hours of operation for construction works would follow standard construction times listed below:
	 Monday to Friday 7am to 6 pm;
	 Saturday 8 am to 1 pm; and
	 No audible construction work to take place on Sundays or public holidays.
	Any construction work outside the above hours would be carried in accordance with Practice Note (vii) of the RTA <i>Environmental Noise Management Manual</i> . Residents would be notified of works required outside of these normal hours, and where it is considered reasonable and feasible, agreement reached concerning the program of works. In addition, Rix's Creek Mine would need to inform the DECC of any proposed works outside of normal construction hours.
	Other possible safeguards that would be considered during the period of construction include:
	 Provide acoustic screening around semi permanent plant, such as compressors, generators or pumps;
	 Consult affected residences prior to the commencement of construction;
	 Construction noise monitoring to be conducted using unattended noise loggers or attended monitoring to confirm actual construction noise levels, especially during night time hours or where a noise complaint has been received;
	 Construction timetabling, in particular where work outside standard hours is deemed essential, to minimise noise impacts. This may include time and duration restrictions and respite periods;
	 Using noise source controls, such as the use of residential class mufflers where practicable, to reduce noise from all plant and equipment including cranes and air compressors; and
	 Selection of plant and equipment based on noise emission levels
Flora and Fauna	 A weed management strategy will be developed and implemented as part of the CEMP to limit the spread and propagation of weed species;
	 Any proposed revegetation activities/landscaping associated with the project will utilise locally indigenous flora species sourced from the local area, where possible; and
	 Erosion and sedimentation controls will be implemented during construction
Indigenous Heritage	 In the event that any bone or stone artefacts are unearthed during earthworks, work would cease immediately in the affected area, and the LALC, RTA Aboriginal Heritage Advisor and DECC would be informed. Work would not commence in that area until permission has been given to proceed
Non-Indigenous Heritage	 In the event that unanticipated historic structural fabric or cultural deposits are encountered, works would cease immediately to allow an archaeologist to make an assessment of the finds. The archaeologist would then need to consult with the NSW Heritage Office concerning the significance of the historic cultural material unearthed.
Waste and Resources	 During the construction, areas would be delineated, organised and managed on a daily basis following the completion of daily activities.
	 Wastes generated at the construction site would be temporarily contained and removed at regular intervals for reuse or recycling where possible or otherwise to an appropriate waste management facility. Excess spoil would be removed and beneficially placed as part of the open cut
	rehabilitation process



Consideration	Safeguards
Air Quality	 Pumps, generators and other machinery are to be turned off when not in use; All loose materials transported to and from the construction site would be covered; Stockpiles temporarily established would be covered or sprayed with water on a regular basis, particularly during dry or windy conditions; Hoses to suppress dust would be used on temporary roadways, stockpiles and other exposed areas; and Dust generating activities would be reduced or stopped during very windy conditions.
Water Quality	 Prior to the commencement of construction, a Soil and Water Management Plan (SWMP) would be prepared in accordance with the principles and practices outlined in: Landcom (2006), <i>Managing Urban Stormwater: Soils and Construction</i>, Volume 2 Book 4, Main Road Construction; and RTA (2000) <i>RTA Road Design Guide</i>, Section 8 'Erosion and Sedimentation'. The SWMP would incorporate (but not be limited to) the following erosion and sediment control measures: Stockpile areas would be managed in accordance with the RTA's <i>Stockpile Management Procedures</i>. The following design criteria have been specified for the proposed works: Appropriate measures to prevent wind-blown dust entering waterways would be undertaken; All chemicals and fuels associated with construction would be stored in roofed and bunded areas; Sediment traps and sediment filters (e.g. silt fences) would be installed as required; Construction works would be completed as quickly as possible to minimise exposure of disturbed areas; Where practical, earthworks would not be undertaken during periods of heavy rainfall events; Progressive rehabilitation / re-vegetation would be undertaken as works are completed; Straw mulch or a similar material would be used to protect exposed soil surfaces and to facilitate grass growth; and Drainage works would be regularly checked after heavy rain event during construction to ensure controls remain adequate. In addition, if activities are likely to cause pollution of Rix's Creek, a licence should be obtained for the proposed works under the POEO Act prior to commencement. Should groundwater be intercepted, or if the works include bores for the purpose of investigation, extraction, dewatering, testing or monitoring, a licence from the DWE would be required.

7.3. Licensing and Approvals

The following licences, approvals of permits would be required:

• The DECC would be informed of any proposed works outside of normal construction hours.

7.4. Environmental Monitoring and Management

As detailed in **Section 6.3**, construction noise monitoring will be conducted using unattended noise loggers or attended monitoring to confirm construction noise levels.



Rix's Creek Mine will continue to monitor air quality, noise and water quality as per their CoA and Environmental Protection Licence requirements (refer to **Appendix D**).

The existing monitoring undertaken has been reviewed and is considered adequate for the operation of the proposed tunnel. In addition, existing management techniques are considered adequate for the potential impacts identified for the proposed activity.



8. Justification and Conclusion

8.1. Justification

8.1.1. Social and Economic Factors

Short term adverse impacts that may be associated with construction of the proposal include increased levels of noise, nuisance dust and traffic delays. Safeguards have been detailed within this SEE for implementation during construction to minimise such impacts.

No significant impacts to the surrounding social or economic environment have been anticipated during operation.

8.1.2. Biophysical factors

The proposal would not result in any significant impacts to biophysical factors considered in this SEE. Although there would be no direct impact to water bodies within the study area, there is the potential for indirect impacts such as, erosion and sedimentation during construction of the crossing. These impacts would be managed through appropriate safeguards incorporated into the detailed design and construction phases.

8.1.3. Public Interest

The need for the proposed crossing relates directly to improved access for current mining operations on the Rix's Creek mine lease area.

Whilst there would be some impacts to the local environment as a result of the proposal, the majority of these would be temporary and provided the safeguards identified in the report are implemented, no significant impacts are anticipated.

8.1.4. Ecological Sustainable Development

Responses to the principles of Ecological Sustainable Development are provided below.

Precautionary Principle	The Proposal does not pose a threat of serious or irreversible damage to the environment. The potential impacts described in the SEE have been predicted with a reasonable level of scientific certainty. Mitigation measures have been proposed based on previous experience with similar projects. Therefore application of the precautionary principle is not appropriate for this proposal.
Intergenerational Equity	The short and long term impacts of the proposed tunnel have been considered and addressed through the development of the concept design and SEE to benefit both current and future generations.
Conservation of Biological Diversity and Ecological Integrity	The proposal would have minimal impact on the flora and fauna and would not compromise the biological diversity or ecological integrity of the study area.



Improved Valuation Pricing of Environme Resources	and The proposal reflects the natural, social and economic values of the locality. The value of the environmental safeguards is not able to be determined at this point in time. However, during the project implementation, it would be beneficial to calculate the percentage of overall project costs for inclusion in
	Rix's Creek Mine Pty Limited's corporate environmental reporting.

8.2. Conclusion

On the basis of the assessment provided in this SEE, it is concluded that an EIS and SIS are not required.



9. Statutory Checklists

9.1. EP&A Act Clause 228

Clause 228(2) of the *Environmental Planning and Assessment Regulation 2000* identifies the factors that must be taken into account when consideration is being given to the likely environmental impact of an activity. These factors are addressed in **Table 9-1**.

Table 9-1 Consideration of Clause 228 Factors

Clause 228 Factor	Description	Effect	Duration
a) any environmental impact on a community	The proposal has the potential to disrupt traffic during construction. However, the construction of a side track and effective traffic controls in place, this is expected to minimise delays to road users. Impacts on local air quality via dust generation during earthworks and the removal of vegetation, and noise from construction equipment are also expected. These would only be temporary impacts.	Negative	Short term
b) any transformation of a locality	Tunnel is ancillary to existing mining operations and will be rehabilitated in the long term.	Negative	Short term
c) any environmental impact on the ecosystems of the locality	No impact is anticipated.	Nil	-
d) any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	There would be localised, temporary impacts to traffic, air quality and noise levels during construction.	Negative	Short term
e) any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	No impacts to items of heritage significance have been identified.	Nil	-
f) any impact on the habitat of protected or endangered fauna (within the meaning of the National Parks and Wildlife Act 1974)	No impact	Nil	-
g) any endangering of any species of animal, plant or other form of life whether living on land, in water or in the air	No impact	Nil	-
h) any long-term effects on the environment	Positive impact expected as result of the incorporation of a fauna passage to be constructed following completion of mine activities. And rehabilitation of the tunnel.	Positive	Long term



Clause 228 Factor	Description	Effect	Duration
i) Any degradation of the quality of the environment	Refer to (a)	Negative	Short term
j) any risk to the safety of the environment	Refer to (a). In addition, construction of a tunnel for the Highway crossing reduces / eliminates the risks associated with trucks travelling over the highway, such as falling material and distraction to Highway road users.	Positive	Medium term
k) any reduction in the range of beneficial uses of the environment	The tunnel is ancillary to the mine operation and assists in the economic sustainability of the mine operation	Positive	Medium term
I) any pollution of the environment	Impacts on local air quality via dust generation and noise from construction equipment are also expected. These would only be temporary impacts. Implementation of the mitigation measures recommended in Section 6 would avoid, mitigate or manage the impacts identified.	Negative	Short term
m) any environmental problems associated with the disposal of waste.	No impact is anticipated.	Nil	-
n) any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	No impact is anticipated.	Nil	-
 o) any cumulative environmental effect with other or existing or likely future activities. 	No impact is anticipated.	Nil	-

9.2. Matters of National Environmental Significance

Actions that have the potential to significantly impact matters of national environmental significance (NES) need to be subject to rigorous assessment and approval under the provisions of the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). The matters of NES identified in the EPBC Act that trigger the Commonwealth assessment and approval regime are discussed in relation to the proposal and presented in **Table 9-2**.

Table 9-2 Matters of National Environmental Significance

Matter of NES	Comment
World Heritage Areas	The study area is not located near any World Heritage Property and therefore no direct or indirect impacts on World Heritage Properties would result from the proposed works.
National Heritage Places	The proposal would not affect any places listed on the National Heritage List.
Ramsar wetlands	The study area is not located near or upstream of any Ramsar wetlands and therefore no direct or indirect impacts the Ramsar would result from the proposed works.



Matter of NES	Comment
Threatened ecological communities and/or known habitat	No rare or threatened flora or fauna as listed under the EPBC Act or TSC Act were recorded or would be impacted by the proposal. Further the vegetation community present does not represent a national or state listed Endangered Ecological Community. Therefore the proposal would not impact on any of threatened species.
International migratory species	As no direct impacts on estuarine or inter-tidal habitats would occur as a result of the proposal, no migratory species or their habitat would be affected by the proposed development.
Nuclear actions	The proposal is not a nuclear action.
Commonwealth lands	The proposed works would primarily be confined to the road reserve and adjacent land. No commonwealth land would be impacted by the proposed works.

The foregoing assessment did not identify that the proposed development would result in a significant impact on any matters of NES, therefore it would not be necessary to refer the proposal to the Commonwealth Environment Minister.



10. Certification

This Statement of Environmental Effects provides a true and fair review of the proposed activity in relation to its likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed activity.

Name	Kim Collings
Signed	K.C.C.
Designation	Senior Environmental Scientist
Organisation	SINCLAIR KNIGHT MERZ
Date	May 2009

I have examined this Statement of Environmental Effects and the certification by Kim Collings of Sinclair Knight Merz and accept the Statement of Environmental Effects on behalf of the RTA.

Name	
Signed	
Designation	
Organisation	Rix's Creek Mine Pty Limited
Date	



11. References

Eamus et al 2006, Eamus, D., Froend, R., Loomes, R., Hose, G., Murray, B. (2006) A functional methodology for determining the groundwater regime needed to maintain the health of groundwater-dependant vegetation. *Australian Journal of Botany*, 54: 97-114.

Envirosciences 1994, Environmental Impact Statement for Proposed Modifications of Mining Operations – Rix's Creek Coal Mine, Envirosciences Pty Limited, 1994.

Froend and Zencich 2002, Froend R.H., Zencich S.J. (2002). Variability in vegetation groundwater use: challenges in determining vegetation water requirements for water resource allocation and planning. *In Balancing the Groundwater Budget-International Groundwater Conference*. Darwin, NT. May 12-17.

NSW Government 2008, *Groundwater Work Report*, NSW Natural Resource Atlas website. http://www.nratlas.nsw.gov.au

RCM 2006, *Rix's Creek Mine Annual Environmental Management Report*, Rix's Creek Mine Pty Limited, 2006.

RCM 2007, *Rix's Creek Mine Annual Environmental Management Report*, Rix's Creek Mine Pty Limited, 2007.

SKM 2008, *Rixs Creek Mine, Singleton – Results of Geotechnical Drilling for New England Highway Bridge*, 3-5 November 20008. Letter report NB30280, Greg McNally.



Appendix A Concept Design



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Appendix B Consultation



NSW GOVERNMENT
Department of Planning

Major Project Assessment Industry & Mining Phone: (02) 9228 6339 Fax: (02) 9228 6466 Email: alison.thomas@planning.nsw.gov.au Level 3 Room 305 23-33 Bridge Street GPO Box 39 SYDNEY NSW 2001

Our ref: S03/00462-19

Mr John Hindmarsh Environmental Officer Rix's Creek Pty Limited PO Box 4 EAST MAITLAND NSW 2323

Dear Mr Hindmarsh

Cut and Cover Tunnel Proposed Modification – Rix's Creek (DA 49/94)

I refer to your letter, dated 17 October 2008, seeking the Department's advice for a proposed modification of the Minister's consent for the Rix's Creek Mine (DA 49/94) under Section 96(1A) of the *Environmental Planning & Assessment Act 1979* (EP&A Act). The modification involves the construction of a cut and cover tunnel under the existing New England Highway, to allow mine vehicles to have unrestricted access between Pit 1 and Pits 2 and 3. The Department is of the view that the modification will need to be assessed under Section 96(2) of the EP&A Act.

If your proposal is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. It is your responsibility to contact the Department of the Environment, Water, Heritage and the Arts in Canberra (6274 1111 or http://www.environment.gov.au) to determine if the proposal requires an approval under the EPBC Act. The Commonwealth Government has accredited the NSW environmental assessment process, so if it is determined that an approval is required under the EPBC Act, please contact the Department immediately as supplementary requirements may need to be issued.

Statement of Environmental Effects Requirements

The modification application should be accompanied by a Statement of Environmental Effects (SEE) that addresses the potential impacts of the proposed modification. The SEE should include the following:

- **Description of the Proposal**: Describe and justify the proposal, clearly identifying the proposed modification, and the likely inter-relationship between this modification and the existing and/or approved mining operations at Rix's Creek Mine. Hours of operation during and following construction should be addressed.
- **Statutory Instruments**: Assess the proposal against relevant statutory provisions, including s138 of the *Roads Act 1993*, given that this modification constitutes Integrated Development. You should justify the use of section 96(2) of the EP&A Act for the proposed modification and address the relevant matters of section 79C of the Act.
- **Key Issues**: Assess the following potential impacts of the proposal and describe what measures would be implemented to avoid, mitigate, manage and/or off-set impacts:
 - (a) Road Design & Construction for both the cut and cover tunnel and the temporary highway diversion including design criteria; detailed engineering plans;

road safety issues; erosion & sedimentation impacts, changes to run-off patterns; impacts to creeks and drainage lines; a materials budget; and preparation of a construction management plan;

- (b) Traffic including construction and operational traffic impacts;
- (c) **Noise** including construction and operational noise impacts and hours of operation during construction and operation;
- (d) Air Quality;
- (e) **Flora and Fauna** including any impacts on critical habitats (including riparian habitat and groundwater dependent ecosystems), threatened species, populations, ecological communities and native vegetation;
- (f) Heritage both Aboriginal and non-Aboriginal; and
- (g) **Visual** including lighting impacts.
- Environmental Monitoring & Management: Describe how the proposed modification would be monitored and managed over time and integrated with existing monitoring and management measures at the mine.

Please also note that the Department may alter these requirements at any time.

Consultation

During the preparation of the SEE, you must consult with the Singleton Shire Council and the Roads and Traffic Authority.

The consultation process, and the issues raised during this process, must be described in the SEE.

Administration

You should notify the Department at least 2 weeks before you lodge the application for the proposed modification, so that necessary arrangements to exhibit the modification application and SEE can be made, including the provision of hard and soft copies of the SEE to government agencies and exhibition locations.

The Department intends to make all the relevant information associated with the proposal publicly available on its website during the assessment process. Consequently, I would appreciate it if you would ensure that all the documents you subsequently submit to the Department are in a suitable format for the web, and arrange for an electronic version of the SEE to be hosted on a suitable website during the exhibition period.

When you lodge the modification application you must include a cheque for the modification application and advertising fees (see clause 258 of the *Environmental Planning and Assessment Regulation 2000*), made payable to the Department.

If you have any enquiries about these requirements, please contact Alison Thomas on the details listed above.

Yours sincerely

Howard Reed 9.11.08

Howard Reed $\mathcal{F}_{\mathcal{H}}$ A/Manager Mining

Sinclair Knight Merz 100 Christie Street PO Box 164 St Leonards NSW Australia 1590

Tel: +61 2 9928 2100 Fax: +61 2 9928 2500 Web: www.skmconsulting.com



Mr John Farrell Manager, Land Use Development RTA Hunter Region 59 Darby Street Newcastle NSW 2300

2 October 2008

NB30280

Dear Sir

Rix's Creek Mine – 2nd Crossing of New England Highway Approval

We are writing to formalise the discussions in our meeting of 29 September with regard to the review and approval of the proposed second crossing of the New England Highway for the Rix's Creek Mine.

The Rix's Creek Mine has mining operations on both sides of the New England Highway approximately 5km to the north of Singleton. A single lane bridge was constructed over the highway in the mid 90's to provide unrestricted movement of mine vehicles across the highway, with the primary movement being the transport of coal from the western side to the coal washing and train loading facilities on the eastern side.

A need has been identified for a second crossing of the highway for the movement of overburden as well as an alternate and more direct route for the transport of coal to the eastern side of the highway.

Sinclair Knight Merz was engaged by Rix's Creek Mine in July to undertake a feasibility study into the design and cost of the second crossing. A number of options were developed in consultation with the mine and preliminary cost estimates prepared. The mine has selected a two lane cut and cover tunnel as the preferred option to develop for the feasibility study.

The tunnel will pass through the RTA corridor for the New England Highway and will impact on the highway operation and maintenance requirements so will therefore require RTA approvals before proceeding. In order for the Rix's Creek Board of Directors to review the feasibility study and make a decision on whether to proceed with the second crossing of the highway they will need to know the RTA conditions of approval and the associated fees and charges.

In the coming weeks SKM will undertake a geotechnical investigation at the tunnel site, develop the concept design further, undertake a detailed cost estimate of the proposed tunnel then prepare a feasibility study report for review and approval. The report will be submitted to

Sinclair Knight Merz Pty Limited ABN 37 001 024 095

Offices across Australia, New Zealand, UK, South East Asia, Middle East, the Pacific Islands and Americas

Rix's Creek Mine 2nd Crossing of the New England Highway



the RTA for review with the intention of obtaining agreement in principle for the crossing and the RTA conditions of approval should the project proceed to detailed design and construction. The report along with the RTA conditions will then be submitted to Rix's Creek Mine Board of Directors for their consideration.

The purpose of the meeting of 29 September was to obtain some initial comments on the proposed concept from the RTA before we proceed into the more detailed concept design phase. In particular we want to identify any aspects of the design and construction methods that the RTA have concerns or strong objections to so that we can focus on addressing these before we get to the formal review process of the concept design.

To assist in the discussions and RTA's understanding of the project we submitted the attached concept drawings during the meeting. The following aspects of the design and construction procedure were discussed in the meeting;

- The second crossing of the highway is proposed to be a cut and cover tunnel. The tunnel will have a horizontal clearance between barriers of 30 metres to allow the passing of two trucks and a vertical clearance of 10 metres to allow an excavator to be driven through the tunnel.
- The tunnel will consist of a 12 metre wide bridge between barriers to carry the existing lanes of the New England Highway with 3.5m lanes and 2.5 metre shoulders between the barriers. Provision will be made for a second bridge to the north of the existing highway for the future duplication of the highway. The setout will allow for a 12 metre median between the carriageways and a 10.5m bridge between the barriers with a 1m inside shoulder rather than the 2.5m shoulder for the two way existing highway.
- The intention was to construct the bridge with a two way cross fall and adjust it to a single cross wall if the duplication occurs in the future. RTA advised that it will probably recommend the bridge is constructed with a one way cross fall to simplify construction and any future adjustment.
- The bridge superstructure will consist of 1500mm deep precast, pretensioned T-girders with a cast insitu concrete deck. The superstructure will be made fully integral with the substructure so that it can prop the tunnel walls and to minimise future maintenance. The bridge will have full height concrete barriers with protection screens. The barriers on the bridge approaches will be compliant with RTA standard practice.
- The substructure will consist of 1200mm diameter contiguous bored cast in place concrete piles socketed 4 to 5 metres below the finished track level for lateral shear



restraint. A capping beam will be constructed at the top of the piles to tie them together. As noted above, the top of the piles will be propped by the bridge. Away from the bridge the piles will be restrained by a series of rock anchors, soil nails or rock bolts. The system for this restraint will be dependent on the soil and rock profile identified in the upcoming geotechnical investigation.

- The cut and cover tunnel will be constructed using a top down method to minimise the disruption to the highway operation. The construction sequence will be as follows;
 - 1) Barriers will be installed along the sides of the highway to isolate the construction works from the traffic.
 - 2) A fibre optic cable on the western side of the highway will be located and protected.
 - 3) A side track will be constructed on the western side of the highway.
 - 4) Excavation and the installation of piles will commence on the eastern side of the highway. The excavation will need to be 2 metres below the existing highway level with local 3 metre excavations at the pile wall locations for the construction of the capping beam. Temporary sheet piles will be used to shore the excavation adjacent to the highway.
 - 5) When the piling is completed up to the highway, the highway traffic will be moved across onto the side track. The side track has been designed for an 80km/hr design speed and has been positioned 4 metres away from the existing highway.
 - 6) The piling will continue across the existing highway then the bridge deck constructed. Once the bridge is completed the traffic will be moved back onto the existing highway alignment. It is estimated that the traffic will be on the side track for 12 weeks.
 - 7) The piling will continue across to the western side of the highway.
 - 8) Excavation will commence for the tunnel with rock anchors/bolts/soil nails will be installed progressively as the excavation continues down to the track level.
 - 9) The track will be formed at the bottom of the tunnel with a compacted crushed rock base material. Concrete barriers with earth fill behind them will be positioned off the piled walls to protect the piles and anchors from truck impact.



- 10) At the completion of the mine operations it is intended that the tunnel will be backfilled to within 3 metres of the deck soffit to form a fauna/farm crossing.
- After reviewing the design RTA expressed concern about the proximity of the side track to the operating highway. There was concern that the 4 metre clearance will not allow sufficient room for the construction and allow an 80km/hr speed limit to be achieved. SKM Traffic Engineer David Lowe advised that this separation width has been adopted on the Hume Highway Southern Alliance. SKM will provide more detail to justify the separation width in the concept design report.
- RTA also expressed concern about truck impacts on the superstructure and piled walls. A risk assessment will be conducted by SKM and the Mine and this will also be included in the report.
- The bore holes for the geotechnical investigation are proposed to be installed within the highway corridor. SKM are currently undertaking an environmental assessment and will submit these findings along with a traffic management procedure to the RTA for approval to proceed with the drilling.
- RTA will assign a Project Manager to this project. They will manage the initial review
 of the concept sketches submitted at the meeting and will provide details of the RTA
 requirements for the review process during this initial concept phase and the design
 and construction phases should the project proceed.

We thank you for this opportunity to meet on Monday and look forward to obtain the RTA review comments and requirements at your earliest convenience so that we can proceed with our concept design.

Yours sincerely

KOK SIONG WONG

^Ø**John Steele** Manager Bridge and Civil Structures

Phone:	+ 61 2 90321890
Fax:	+61 2 99282118
E-mail:	jsteele@skm.com.au

R T A

88_M.4014; 5 08/2355 AT

Senior Bridge Engineer Sinclair Knight Merz 100 Christie Street ST LEONARDS NSW 2065

Attn: Mr. John Steel

PROPOSED SECOND CROSSING ON NEW ENGLAND HIGHWAY FOR RIX'S CREEK MINE.

Dear Mr Steel

I refer to your email dated 7 November 2008 regarding the proposed second crossing on New England Highway and our meeting dated 29 September 2008.

The RTA's primary interests are in the road network, traffic and broader transport issues particularly the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport.

In accordance with the *Roads Act 1993*, the RTA has powers in relation to road works, traffic control facilities, connections to roads and other works on the classified road network. The New England Highway (HW9) is a classified State road and part of the National Network. RTA concurrence is required for works within the classified road reserve under Section 138 of the Act, with Council consent. Council is the roads authority for all public roads in the area.

The RTA has conducted a preliminary review of your proposal and would concur with the proposed works as shown on your plan (Drawing No. NB30280-SK03 and SK04), provided that the following comments are addressed at concept design stage:

- The RTA is concerned regarding the proximity of the side track to the operating New England Highway. The proposed 4m clearance may not allow sufficient room for the construction and allow an 80km/hr speed limit. More details are to be provided to justify the separation width in the concept design report.
- The RTA is also concerned regarding the possible impact of trucks on the proposed superstructure and piled walls. A risk assessment is to be conducted by SKM and the mine and be included in the concept design report.
- It is proposed that the bore holes for geotechnical investigation are to be drilled within the New England Highway corridor. SKM is to prepare a Traffic Management Plan (TMP) and submit it to the RTA for approval prior to undertaking the proposed drilling.

Roads and Traffic Authority ABN 64 480 155 255


- All arrangements for the control of traffic shall be in accordance with the RTA publication "Traffic Control at Work Sites". A Road Occupancy Licence is required prior to any works commencing within 3m of the travel lanes, and submission of a traffic control plan is required as part of this licence. The Road Occupancy Licence can be obtained by contacting Mr Bruce Kimber (Traffic Commander, Hunter) on (02) 4924 0617.
- A Works Authorisation Deed (WAD) will be required to be entered into with the RTA. In this
 regard detailed design plans are required to be submitted and all relevant additional information, as
 may be required in the RTA's Works Authorisation Deed documentation, for each specific change
 to state road network for the RTA's assessment and final decision concerning the work. Please
 note that the RTA must provide a final consent for each specific change to the state road network
 prior to the commencement of any work within the road reserve of a classified road.

It is emphasised that the comments provided above are of a preliminary nature and may change following formal review and assessment of submitted concept and detail design.

Should you require any further information please contact the undersigned on Phone: (02) 4924 0240.

Yours sincorely

John Farrell A/Manager, Land Use Development Hunter Operations and Engineering Services

10 November 2008



Appendix C Indigenous Heritage

SINCLAIR KNIGHT MERZ



15 December 2008

Ms K Collings Sinclair Knight Merz NEWCASTLE NSW 2300 (Sent by fax: 4979 2666)

Dear Kim

RE: PROPOSED CUT AND COVER TUNNEL – RIX'S CREEK NSW

Thank you for your letter dated 1 December 2008 and referring to our letter of 14 October 2008. The Wanaruah LALC inspected the proposed site of the tunnel works on the New England Highway at Rix's Creek as shown in Figure 1 of your letter.

An area of approximately 100m x 25m was walked covering both sides of the highway from power pole S1-20004 on the western side at the southern end and the property entrance 'Granbalang' on the western side to the north. Thick grass and earth/clay mounds were present and bare exposures were inspected revealing little gravel. Both sides of the road had been highly disturbed, with the road itself having been slightly raised above natural ground level and overgrown dish-drains on either side of the road base being present. The mining land on either side of the road beyond the fenceline has also been disturbed.

As predicted in our letter dated 14 October 2008, the chance of locating cultural material in its natural context would be negligible and therefore we do not have any cultural heritage issues with this project proceeding.



Thank you for this opportunity to inspect the site and to comment on this project. Should you require any information or advice on cultural heritage matters, please do not hesitate to contact us.

Yours sincerely,

) oal -

Suzie Worth Cultural Heritage Officer Wanaruah Local Aboriginal Land Council

Collings, Kim (SKM)

From: Sent: To: Subject: O'Connor, Kristen (SKM) Thursday, 18 December 2008 12:39 PM Collings, Kim (SKM) FW: Rix Creek Search

Kristen O'Connor

Graduate Environmental Scientist Tel: 02 4979 2660 Mobile: 0432276006 Email: KOConnor@skm.com.au

Sinclair Knight Merz achieve outstanding client success For further information, visit our website <u>www.skmconsulting.com</u> From: Edwards Maxine [mailto:Maxine.Edwards@environment.nsw.gov.au]

Sent: Thursday, 18 December 2008 12:17 PM To: O'Connor, Kristen (SKM) Subject: Rix Creek Search

Hi Kelly,

AHIMS has returned in excess of 400 sites within the nominated search area. Is it possible that you reduce your search area? We are unable to hand out such a considerable amount of information without an AHILA agreement in place.

Regards, Maxine

Maxine Edwards Ph: (02) 9585 6471 Fax: (02) 9585 6094

Aboriginal Heritage Information Officer Monday, Tuesday and Wednesday

Policy Officer (CADET) Thursday and Friday

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e	Fax to:	Kristen O'Conner	of:	Sinclair Knightz Merz Pty Limited						
	Fax no:	02 4979 2666								
	From:	Maxine Edwards	of:	Information & Assessments Unit						
Phone:		02 9585 6471		Cultural Heritage Division						
	cc:									
	Date:	18/12/2008	No o	No of pages (including this page): 4						

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PO Box 1967, Hurstville NSW 2220 43 Bridge Street, Hurstville NSW Tel: (02) 9995 5000 Fax: (02) 9585 6555 ABN 30 841 387 271 www.environment.nsw.gov.au



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Department of Environment and Climate Change (NSW)



Your reference Our reference

: Rix's Creek, Singleton : AHIMS #24588

Sinclair Knight Merz Pty Limited - Newcastle West P O Box 2147 Dangar NSW 2309

Thursday, 18 December 2008

Attention: Kristen O'Conner

Dear Sir or Madam:

Re: AHIMS Search for the following area at Rix's Creek, Singleton.;Z;56;E:320000-330000;N:6395000-6405000

I am writing in response to your recent inquiry in respect to Aboriginal objects and Aboriginal places registered with the NSW Department of Environment and Climate Change (DECC) at the above location.

A search of the DECC Aboriginal Heritage Information Management System (AHIMS) has shown that 7 Aboriginal objects and Aboriginal places are recorded in or near the above location. Please refer to the attached report for details.

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.

The following qualifications apply to an AHIMS search:

- AHIMS only includes information on Aboriginal objects and Aboriginal places that have been provided to DECC;
- Large areas of New South Wales have not been the subject of systematic survey or recording of Aboriginal history. These areas may contain Aboriginal objects and other heritage values which are not recorded on AHIMS;
- Recordings are provided from a variety of sources and may be variable in their accuracy. When an AHIMS search identifies Aboriginal objects in or near the area it is recommended that the exact location of the Aboriginal object be determined by re-location on the ground; and
- The criteria used to search AHIMS are derived from the information provided by the client and DECC assumes that this information is accurate.

All Aboriginal places and Aboriginal objects are protected under the National Parks and Wildlife Act 1974 (NPW Act) and it is an offence to destroy, damage or deface them without the prior consent of the DECC Director-General. An Aboriginal object is considered to be known if:

- It is registered on AHIMS;
- It is known to the Aboriginal community; or

PO Box 1967 Hurstville NSW 2220 43 Bridge Street Hurstville NSW 2220

Telephone (02) 9585 6345 Facsimile (02) 9585 6094

ABN 30 841 387 271 ahims@anvironment.nsw.gov.au www.environment.nsw.gov.au • It is located during an investigation of the area conducted for a development application.

If you considering undertaking a development activity in the area subject to the AHIMS search, DECC would recommend that an Aboriginal Heritage Assessment be undertaken. You should consult with the relevant consent authority to determine the necessary assessment to accompany your development application.

Yours Sincerely

Edwards, Maxine Administrator Information Systems & Assessment Section Culture & Heritage Division Phone: 02 9585 6471 Fax: 02 9585 6094

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Printed By Edwards, Maxine

Page 1 of 1

Number of Sites :7

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P.2/2

Thank you for this opportunity to inspect the site and to comment on this project. Should you require any information or advice on cultural heritage matters, please do not hesitate to contact us.

Yours sincerely,

Suzie Worth Cultural Heritage Officer Wanaruah Local Aboriginal Land Council



Appendix D Monitoring Locations

SINCLAIR KNIGHT MERZ

