Section 3

Issue Identification & Prioritisation

PREAMBLE

This section describes how the environmental issues assessed in the Environmental Assessment were identified and prioritised. In summary:

i) a comprehensive list of all relevant environmental issues was assembled through consultation with the local community and local and State government agencies, completion of preliminary environmental studies and a review of relevant legislation, planning documents and environmental guidelines;

ii) a review of the project design and local environment was undertaken to identify risk sources and potential environmental impacts for each environmental issue;

iii) an analysis of unmitigated risk for each potential environmental impact was then completed with a risk rating assigned to each impact based on likelihood and consequence of occurrence; and

iv) through a review of the allocated risk ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to provide an order of assessment and breadth of coverage within Section 4.

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3.1 INTRODUCTION

In order to undertake a comprehensive *Environmental Assessment* of the Pine Dale Coal Mine Yarraboldy Extension, appropriate emphasis needs to be placed on those issues likely to be of greatest significance to the local environment, neighbouring landowners and the wider community. To ensure this has occurred, a program of community and government consultation and review of environmental planning documentation was undertaken to identify relevant environmental issues and potential impacts. This was followed by an analysis of the risk posed by each potential impact in order to prioritise the assessment of the identified environmental issues within the *Environmental Assessment*.

3.2 ISSUE IDENTIFICATION

3.2.1 Introduction

Identification of environmental issues relevant to the Project involved a combination of consultation and background investigations and research. This included:

- consultation with surrounding landowners and the local community (Section 3.2.2.1);
- consultation with State and local government agencies (Section 3.2.2.2); and
- reference to relevant NSW government policies and guidelines (Section 3.2.3).

3.2.2 Consultation

3.2.2.1 Consultation with Surrounding Landowners and the Local Community

Consultation with landowners and the local community will be ongoing throughout the approval process, during construction and operations for the Project. Summarised below is the consultation program that was adopted for the Pine Dale Coal Mine – Yarraboldy Extension.

The Blackmans Flat, View Street and Wolgan Road residents, being within a 2 km range of Pine Dale Mine, and the Lithgow Council were each provided with a letter informing them of the nature of the Yarraboldy extension project and advised to visit the NSW Department of Planning website to view the *Preliminary Environmental Assessment*. An advertisement was placed in the Lithgow Mercury on 1 April 2010.

Residents of View Street and Wolgan Road being more than 1 km away from the Yarraboldy site were asked to contact the Company's hot line or telephone Mr John Doherty, Company Director for further information. One resident contacted the Operations Manager on two occasions regarding selling his house adjacent to the railway line, which is not part of the Yarraboldy extension project.

All residents of Blackmans Flat received a follow-up phone call or several calls if they did not answer. Each was invited to be interviewed. Nine phone calls resulted in a response from seven residents over the phone with two persons requesting interviews.

One person totally opposed the application and objected to the Government allowing any mining within 2 km of a property.

A second owner, not a resident, was pleased some future coal would be transported on the Private Coal Haul Road, although objected to 24 hour maintenance and raised noise as an issue for her tenant.

Five owners in Blackmans Flat said they had no problem with Yarraboldy extension project.

The Mayor and General Manager of the Lithgow City Council were consulted and advised that the Council had recently resolved to support coal mining development in the district.

Two persons interviewed by Mr Hilton Goldfinch (Operations Manager), and Mr Doherty both requested double-glazing of windows and one asked that improved 'greening' of the current bunds occur.

The consultation process will continue following application submissions as follows

- Formal advertising of the *Environmental Assessment* for the Project as required under legislation.
- A community meeting may be held if required after the *Environmental Assessment* is placed on exhibition to allow community member to discuss any issues and/or concerns relating to the Project that may not have already been identified to date.
- Ongoing informal consultation with community members as required.

3.2.2.2 Consultation with Government Agencies

Consultation with government agencies regarding this Project has been ongoing since its inception. Consultation has been on both a formal and informal basis. Summarised below are the key government stakeholders that have been consulted and what aspects of the Project they were consulted about.

- DoP – Various formal and informal discussions and emails regarding the process and timing of and approval process for the Project.
- I&I NSW – MR – Granting of mining leases.
- I&I NSW – Forests – access to the Ben Bullen State Forest and the potential recovery of commercial timber that would be cleared, access to areas not cleared in the State Forest under a mining lease, bushfire management within the State Forest and compensation agreements.
- DECCW – Informal and formal discussions regarding groundwater, informal discussions relating to impacts on native fauna.

Ongoing formal and informal consultation with various government agencies with an interest in the Project will continue through the approvals process and during site establishment and operations of the Yarraboldy Extension.

The main concerns and issues raised by various government agencies during consultation were:

- management of groundwater;
- noise and dust impacts;
- reinstatement of drainage lines feeding into Neubecks Creek that will be disturbed as part of mining operations;
- management of the discharge of water into Neubecks Creek; and
- impacts relating to species diversity.

3.2.3 Review of Planning Issues and Environmental Guidelines

3.2.3.1 Introduction

A number of NSW and regional planning instruments apply to the proposed Yarraboldy Extension. These planning instruments were reviewed to identify any environmental aspects requiring consideration in the *Environmental Assessment*. In addition, the DGRs identified a number of guideline documents to be referenced / reviewed during the preparation of the *Environmental Assessment*.

A brief summary of each relevant planning instrument is provided in the following sections. The application and relevance of planning instruments related to specific environmental issues have been assessed in the relevant specialist consultant assessments.

3.2.3.2 State Planning Issues

The following five State Environmental Planning Policies (SEPPs) have been identified which may apply to the Project.

- SEPP (Major Development) 2005.
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007.
- SEPP 33 – Hazardous and Offensive Development.
- SEPP 44 – Koala Habitat Protection.
- SEPP 55 – Remediation of Land.

State Environmental Planning Policy (Major Development) 2005

This SEPP was gazetted on 25 May 2005 and applies to all Projects satisfying nominated criteria made following this date. The purposes of this SEPP is to define those projects of State significance or proposed on State significant sites and therefore require Ministerial approval under the provisions of Part 3A of the EP&A Act 1979. This SEPP and Part 3A of the EP&A Act 1979 is a system introduced to specifically deal with the complexity of major projects and to streamline the assessment process.

Being a coal mine, the proposed Project is identified under Schedule 1 of the SEPP as a Group 2 class of development and hence is a Major Development to which Part 3A of the EP&A Act 1979 applies.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

This SEPP was gazetted on 17 February 2007, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries.

The SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development as defined in NSW legislation. **Table 3.1** presents a summary of the matters that a consent authority needs to consider when assessing a new or modified proposal (Part 3 - Clauses 12 to 17 of the SEPP) and a reference to the section in this *Environmental Assessment* where each element is addressed.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures, would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

The hazardous substances and dangerous goods to be held or used on the Project Site are required to be identified and classified in accordance with the risk screening method contained within the document entitled *Applying SEPP 33 Consultation Draft* (DoP, 2008) (**Appendix 4**). Hazardous materials are defined within *Applying SEPP 33 Consultation Draft* (DoP, 2008) as substances falling within the classification of the *Australian Code for Transportation of Dangerous Goods by Road and Rail* (Dangerous Goods Code).

The Project would involve the continued on-site storage and of up to 30 000L of diesel fuel, Class 3 C1 combustible liquid and small amounts of other hydrocarbons including lubricating oils and grease, Class 3 C2 combustible liquids. As the diesel fuel and lubricating oils and greases would not be stored adjacent to any other hazardous materials of the same class, SEPP 33 does not require these to be considered further.

Based on the risk screening method of *Applying SEPP 33 Consultation Draft* (DoP, 2008), neither the storage nor transportation of the hazardous materials to be stored on the Project Site would result in the Project being considered potentially hazardous under SEPP 33. As such, there is no requirement to undertake a Preliminary Hazard Analysis for the Project.

State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44)

The Greater Lithgow Council Area is identified in Schedule 1 of this policy as an area that could provide habitat for Koalas. The policy requires an investigation to be carried out to determine if any Koala feed trees are present within the Project Site. Schedule 2 of this policy also provides a list of tree species that are favoured food tree species of Koalas.

Table 3.1
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Relevant SEPP Clause	Description	EA Section
12: Compatibility with other land uses	Consideration is given to:	
	- the existing uses and approved uses of land in the vicinity of the development;	4A.3
	- the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and	4B
	- any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.	6.2.1
	The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared.	4B.12.3
	Measures proposed to avoid or minimise any incompatibility are considered.	4B
13: Compatibility with mining, petroleum production or extractive industry	Consideration is given to whether the development is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the development may be incompatible.	6.2
	Measures taken by the applicant to avoid or minimise any incompatibility are considered.	4B
	The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	4B.12.3, 6.2
14: Natural resource and environmental management	Consideration is given to ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure:	
	- impacts on significant water resources, including surface and groundwater resources, are avoided or minimised;	4B.1.6, 4B.2.7
	- impacts on threatened species and biodiversity are avoided or minimised; and	4B.3.5, 4B.4.5
	- greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	4B.9.5.4
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	2.10
16: Transportation	The following transport-related issued are considered.	
	- The transport of some or all of the materials from the site by means other than public road.	2.7
	- Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.	2.7
	- The preparation of a code of conduct for the transportation of materials on public roads.	4B.6.4
17: Rehabilitation	The rehabilitation of the land affected by the development is considered including:	
	- the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated;	Figure 2.8
	- the appropriate management of development generated waste;	2.5.5
	- remediation of any soil contaminated by the development; and	2.12.4
	- the steps to be taken to ensure that the state of the land does not jeopardize public safety, while being rehabilitated or at the completion of rehabilitation.	2.12

"Potential Koala Habitat" is defined as areas of vegetation where the trees listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. Studies completed by Geoff Cunningham Natural Resource Consultants have established that no native vegetation of types listed in Schedule 2 of SEPP 44 which provide potential koala habitat have been identified within the Project Site. As such SEPP 44 considerations are not applicable to the Project.

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 44)

SEPP 55 aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. In particular, this policy requires consideration of whether a development requires a consent for remediation works or not and requires that remediation works meet certain standards and notification requirements.

As the previous mining operation is not known to have generated any contamination that requires remediation work prior to undertaking the proposed mining operation, SEPP 55 is not relevant to the consideration of the Project.

3.2.3.3 Regional Planning Issues

Drinking Water Catchments Regional Environmental Plan No. 1 (REP No. 1)

The primary objectives of this plan are as follows.

- Create healthy water catchments that will deliver high quality water while sustaining diverse and prosperous communities.
- Achieve the water quality management goals of:
  - improving water quality in degraded areas and critical locations where water quality is not suitable for the relevant environmental values; and
  - maintaining or improving water quality where it is currently suitable for the relevant environmental values.

Clause 26 of the plan states that a consent authority cannot grant consent to the carrying out of development unless it has considered whether the proposed development would have a neutral or beneficial effect on water quality.

As the Minister for Planning is the consent authority, concurrence of the Chief Executive of the Sydney Catchment Authority is not required.

3.2.3.4 Local Planning Issues

The Project Site lies in an area zoned Rural 1f (Forestry) as listed under the Lithgow City Local Environmental Plan 1994 (LEP 1994). Mining activities as proposed are permissible activities within this zone, subject to development consent. The objectives of this zone identified within LEP 1994 include preserve existing forests within the City of Lithgow while allowing compatible development and to prevent pollution of water supply catchments and water quality within major water storages.

The Proponent recognises these objectives and has endeavoured to design the project in a matter which reflects these objectives to the greatest extent possible.

3.2.3.5 Environmental Guidelines

The DGRs require that, in assessing the identified key assessment requirements, reference be made to one or more guideline documents. In addition, a number of the government agencies consulted in relation to the Project required reference to other environmental guideline documents.

Each of these guidelines was obtained, reviewed and, where appropriate, forwarded to the relevant specialist consultant for incorporation into the specialist environmental studies. Where appropriate, the relevant guideline documents are also referred to throughout the *Environmental Assessment*.

3.2.4 Summary of Environmental Issues and Impacts

Table 3.2 presents a summary of the environmental issues identified, and the frequency with which each was identified, as part of the identification process. The frequency of identification of the various issues of the various issues provides an initial indication of those environmental aspects perceived to be at greatest risk and hence of greatest priority. **Table 3.2** has been ordered accordingly (from most to least frequently identified).

Table 3.2
Summary of Identified Environmental Issues

Environmental Issue	Source and Frequency of Identification			
	Government Consultation[1]	Community Consultation[2]	Specialist Consultant[3]	Summary
Aboriginal & European heritage	11	0	1	12
Resource type / assessment	2	0	1	3
Waste management	6	1	2	9
Property values	0	1	0	1
Rehabilitation and final land use	9	2	2	13
Erosion/sediment minimisation	1	0	1	2
Soils & Land Capability	3	0	1	4
Hazards / safety issues	3	0	0	3
Monitoring	5	2	4	11
Socio-economic impacts	4	2	0	6
Visual amenity	0	1	1	2
Groundwater	22	1	1	24
Surface Water	15	2	1	18
Threatened flora and fauna protection	15	1	2	18
Air pollution - dust/greenhouse gases	7	2	1	10
Traffic and transportation	13	3	1	17
Operational noise and vibration	6	3	2	11

Note 1: Summarised from the Director-General's Requirements and correspondence to DoP from consulted government agencies.
Note 2: Summarised from discussions held with surrounding landowners approached by the Proponent during the period of community consultation.
Note 3: Based on the identified constraints of environmental studies conducted by the specialist consultants for the Project.

3.3 ANALYSIS OF ENVIRONMENTAL RISK AND ISSUE PRIORITISATION

3.3.1 Analysis of Environmental Risk

Risk is the chance of something happening that will have an impact upon the objectives or the task, which in this case are ongoing operations of the Pine Dale Coal Mine – Yarraboldy Extension with minimal effect on the local environment. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified in **Table 3.3**, the potential environmental impacts have been allocated a risk rating based on the potential consequences and likelihood of occurrence and in accordance with Australian Standards HB 203:2006 and AS/NZS 4360:2004.

The allocation of a consequence rating was based on the definitions contained in **Table 3.4**. It is noted that the assigned consequence rating represents the highest level applicable, i.e. if a potential impact is assigned a level of 4 - Major based on impact to the environment and 2 - Minor based on area of impact, the consequence level assigned would be 4 - Major. The likelihood or probability of each impact occurring was then rated according to the definitions contained in **Table 3.5**.

The risk associated with each environmental impact was assessed **without** the inclusion of any operational controls or safeguards in place and based on the qualitative assessment of consequence and likelihood, a risk ranking of either; low, medium, high or extreme was assigned to each potential impact based on the matrix of **Table 3.6**.

The four risk rankings are defined as follows.

Low (L): requiring a basic assessment of proposed controls and residual impacts. Any residual impacts are unlikely to have any major impact on the local environment or stakeholders.

Moderate (M): requiring a medium level assessment of proposed controls and residual impacts. It is unlikely to preclude the development of the project but may result in impacts deemed unacceptable to some local or government stakeholders.

High (H): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures. Ultimately, this level of risk may preclude the development of the project.

Extreme (E): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures and possible preparation of a specialised management plan. Unless considered to be adequately managed by the controls and/or management plan, this level of risk is likely to preclude the development of the project.

Table 3.7 presents the identified potential impacts that may be associated with each environmental issue based on the source or risk or potential incident, potential consequences and local receptor/surrounding environment.

Table 3.3
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Groundwater	• Pollution of groundwater due to hydrocarbon spills.	• Community complaints. • Reduced reputation within the local community.	• Surrounding landholders utilising bores or spear pumps for household or agricultural use. • Groundwater dependent ecosystems.	• Reduced groundwater availability for existing uses. • Degradation of groundwater dependent ecosystems. • Impacts on groundwater quality.
	• Reduction of groundwater levels due to mine in-flows.	• Reduction in the quantity of water stored in aquifers intercepted by open cut mining. • Community complaints. • Reduced reputation within the local community	• Aquifers intercepted by open cut mining • Surrounding landholders utilising bores or spear pumps for household or agricultural use.	• Reduced availability of water to local landowners. • Degradation of groundwater dependent ecosystems.
	• Reduced yields of groundwater bores and/or springs.	• Decrease in availability of groundwater to adjoining landowners and/or groundwater dependent ecosystems. • Community complaints. • Reduced reputation within the local community.	• Groundwater bores and/or springs of adjoining landowners.	• Reduced availability of water to local landowners. • Degradation of groundwater dependent ecosystems. •
	• Reduced inflows to surrounding creek systems due to dewatering of the old Wallerawang Colliery underground workings.	• Reduced surface water flows in surrounding creek systems. • Less water available for landowners who extract water from the surrounding creek systems. • Reduced reputation within the local community.	• Surrounding creek systems and their associated aquatic communities. • Landowners who extract water from the surrounding creek systems.	• Degradation of aquatic communities. • Change in the hydrology/ geomorphology of the surrounding creek systems.
	• Pollution of surface lands or water as a consequence of uncontrolled discharge of dewatered mine in-flows.	• The risk sources and potential impacts are considered attributable to “surface water” and are considered in that section of the risk analysis.		
Surface Water	• Dam wall failure	• Reduced reputation within the local community. • Potential health effects to either humans or livestock. • Reduced surface water availability for existing uses. • Reduced downstream surface water quality. • Degradation of aquatic ecosystems. • Changes to stream hydrology and geomorphology.	• Downstream creeks and tributaries. • Downstream flora and fauna. • Downstream users of surface water.	• Impacts on downstream water quality. • Increased flows and/or flooding in natural drainage lines for a short period.

Table 3.3 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Surface Water (Cont'd)	• Discharge of dirty, saline, contaminated water outside licence conditions.	• Reduced reputation within the local community. • Potential health effects to either humans or livestock. • Reduced surface water availability for existing uses. • Degradation of aquatic ecosystems.	• Downstream creeks and tributaries. • Downstream flora and fauna. • Downstream users of surface water	• Decreased downstream water quality.
	• Flooding of mine site	• Reduced reputation within the local community. • Potential health effects to either humans or livestock. • Reduced surface water availability for existing uses. • Degradation of aquatic ecosystems.	• Downstream creeks and tributaries. • Downstream flora and fauna. • Downstream users of surface water	• Decreased downstream water quality. • Uncontrolled discharge of dirty, saline, contaminated water outside licence conditions.
	• Reduction in environmental flows through the mine site.	• Decreased availability of water to downstream stock watering dams. • Stress to, or alteration of native vegetation and/or fauna habitats. • Reduced viability of grazing lands. • Degradation of aquatic communities. • Change in the hydrology/ geomorphology of the surrounding creek systems.	• Downstream flora and fauna. • Downstream agricultural lands. • Aquatic communities in surrounding creek systems.	• Reduced flows to downstream vegetation. • Reduced flows in surrounding creek systems.
	• Altered flood regimes.	• Change to the structure or composition of vegetation communities and fauna habitat. • Reduction in value of affected agricultural land.	• Local communities. • Terrestrial and aquatic ecosystems. • Agricultural lands.	• Changes to coverage and frequency of flooding.
Erosion / Sediment Control	• Wind and/or water erosion.	• Reduced land stability. • Reduced ability for the land to support vegetative cover.	• Mine Site soil resource.	• Loss of soil resources.
	• Suspension of sediments within runoff.	• Decreased downstream water quality. • Degradation of aquatic ecosystems.	• Downstream creeks and tributaries. • Downstream aquatic ecosystems. • Downstream users of surface water.	• Increased sedimentation within downstream creeks. • Potential mobilisation of heavy metals in soil.

Table 3.3 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Threatened Flora and Fauna	• Removal threatened fauna habitat due to land clearing activities.	• Reduction in numbers and/or increased stress to threatened fauna whose habitat has been removed. • Reduced food source for threatened fauna predators.	• Threatened fauna habitat. • Threatened fauna. • Threatened fauna predators.	• Reduction in species diversity. • Loss of threatened fauna habitat.
	• Removal of threatened vegetation species or communities due to land clearing.	• Loss of habitat, food resource, etc. for fauna that rely on the threatened vegetation species or communities.	• Threatened vegetation species or communities. • Fauna that use the threatened vegetation species or communities for habitat, food resource etc.	• Loss of threatened vegetation species or communities. • Reduction in species diversity.
	• Damage to threatened aquatic vegetation as a result of saline water discharge.	• Threatened aquatic vegetation stress/death. • Reduction in food source, habitat etc for fauna that use the threatened aquatic vegetation.	• Threatened aquatic vegetation along water discharge routes.	• Reduction in threatened aquatic vegetation numbers. • Reduction in species diversity.
	• Disturbance to threatened flora and/or threatened fauna habitat as a result of project operations, e.g. noise, dust etc.	• Reduction in threatened vegetation species or threatened vegetation community numbers. • Reduction in food source, habitat etc for fauna that use the threatened vegetation species or community. • Reduction in species diversity.	• Local threatened vegetation species or communities. • Fauna that use the threatened vegetation species or communities for habitat, food resource etc.	• Threatened vegetation stress/death.
Aboriginal Heritage	• Removal or destruction of Aboriginal sites and/or artefacts due to mining activities.	• Reduced reputation within the local Aboriginal community. • Loss of Aboriginal heritage values. • Loss of archaeological knowledge.	• Local archaeological context. • Local Aboriginal community	• Disturbance to or destruction of Aboriginal sites or artefacts.
Noise	• Elevated noise levels resulting from site establishment, mining, product transport and processing activities.	• Reduced reputation within the local community. • Community complaints. • Decreased land values. •	• Residents, landowners and leaseholders of properties on and surrounding the Mine Site. • Livestock located on properties on and surrounding the mine site.	• Health related issues. • Sleep deprivation. • Impacts on livestock. • Reduced amenity of the local area.
	• Elevated overpressure (noise) from blasting operations.	• Community complaints. • Reduced reputation within the local community.	• Surrounding residences, buildings and other structures.	• Structural damage to buildings and structures. • Nuisance/amenity impacts on surrounding landowners / residents.

Table 3.3 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Vibration	• Elevated levels of vibration from blasting.	• Community complaints. • Reduced reputation within the local community. • Reduced agricultural production.	• Surrounding residences, buildings and other structures. • Local livestock.	• Structural damage to buildings and structures. • Nuisance/amenity impacts on surrounding landowners / residents.
	• Elevated vibration levels from surface operations.	• Community complaints. • Reduced reputation within the local community. • Reduced agricultural production.	• Surrounding residences, buildings and other structures. • Local livestock.	• Nuisance/amenity impacts on surrounding landowners / residents. • Sleep deprivation.
	• Low level vibration from crushing facility.	• Community complaints. • Reduced reputation within the local community. • Health issues relating to low level vibration.	• Surrounding residents.	• Nuisance/amenity impacts on surrounding landowners / residents.
Air Pollution – Dust, Odour, Greenhouse Gases, NOx, other	• Excessive dust generation resulting from site establishment, mining, product transport and processing activities (including wind erosion from stockpiles and disturbed surfaces).	• Nuisance/amenity impacts from dust deposited on window sills, cars, surfaces etc. • Adverse health impacts (if PM_{10} levels are excessive). • Reduced water quality in rainwater tanks. • Reduced ability for evapotranspiration in vegetation. • Community complaints. • Reduced reputation within the local community.	• Local airshed. • Residents, landowners and leaseholders of properties on and surrounding the Mine Site. • Vegetation communities surrounding the mine site.	• Increased deposited dust levels and suspended particulate matter concentration.
	• Spontaneous combustion outbreak.	• Community complaints. • Reduced reputation within the local community. • Reduced amenity. • Minor health impacts.	• Residents, landowners and leaseholders of properties on and surrounding the Mine Site.	• Release of sulphur dioxide and its associated odour.
	• The exposure of coal and vehicle emissions during mining operations.	• Contribution to the greenhouse effect.	• Local air-shed. • Global air-shed.	• Greenhouse and other gas emissions.

Table 3.3 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Air Pollution – Dust, Odour, Greenhouse Gases, NOx, other (Cont'd)	• The production of a large amount of nitrogen oxide from blasting operations.	• Community complaints. • Increased contribution to the greenhouse effect.	• Residents, landowners and leaseholders of properties on and surrounding the Mine Site. • Local air-shed. • Global air-shed.	• Minor health impacts. • Increased greenhouse emissions. • Reduced local amenity.
	• Emissions resulting from the transport and burning of the mined and sold coal.	• Contribution to the greenhouse effect.	• Local air-shed. • Global air-shed.	• Greenhouse and other gas emissions.
Visual Amenity	• Changes in visual characteristics of the Mine Site.	• Decreased visual amenity. • Community complaints.	• Surrounding residents and local motorists.	• Decreased visual amenity during the life of the mine. • Altered visual outlook following mine closure.
	• Lighting impacts from mining operations.	• Reduced visual amenity. • Community complaints. • Reduced reputation within the community.	• Residents, landowners and leaseholders of properties on and surrounding the Mine Site.	• Nuisance/amenity impacts from mine lighting. • Sleep deprivation.
Soil and Land Capability	• Reduction in soil quality and availability due to poor management practices.	• Structural damage and reduced biological activity of soils. • Reduced downstream water quality. • Reduced surface water availability for existing uses. • Degradation of aquatic ecosystems. • Reduced rehabilitation success.	• Mine Site soils. • Rehabilitated areas. • Local drainage lines. • Downstream users of surface water.	• Erosion of stripped, stockpiled and replaced soils. • Insufficient soil quantities/qualities for rehabilitation.
	• Decreased land capability in final landform.	• Reduced opportunity to relinquish the land at the end of the mine life.	• Rehabilitated areas.	• Reduced productivity of final landform.
	• Hydrocarbon/chemical spills.	• Reduced rehabilitation success. • Loss of soil resource. • Reduced downstream water quality. • Reduced surface water availability for existing uses. • Degradation of aquatic ecosystems.	• Existing landscape. • Rehabilitated land. • Surface water downstream. • Downstream surface water users.	• Contaminated soil and land.

Table 3.3 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Rehabilitation and Final Landform	• Final rehabilitation is not equal to or better than original landform and is not safe, stable or fit for purpose.	• Reduced land capability of the rehabilitated land. • Rework on rehabilitated areas.	• The mine site. • The end land user.	• Reduced amenity of the final landform. • Reduced productivity from the rehabilitated land.
	• Rehabilitated landform does not link or enhance surrounding native vegetation communities.	• Reduced habitat and corridors for native fauna. • Reduced vegetative species diversity	• Rehabilitated land. • Native fauna.	• Reduction in native fauna species diversity.
Impacts on State Forest	• Land clearing and mining activities.	• Destruction of timber resource. •	• Ben Bullen State Forest. •	• Loss of timber resource. •
	• Bushfire.	• Injury/death of native fauna. • Production of smoke, heat and flames. • Bushfire is not controlled within the forest. • Destruction of timber resource.	• Ben Bullen State Forest. • Native fauna • Residents surrounding the Mine Site.	• Reduction in native fauna populations and species diversity. • Loss or damage to property.
Waste Management	• Production of contaminating or polluting materials, e.g. acid producing overburden, waste oils, saline water, and general rubbish.	• Reduced reputation within the local community. • Reduced surface water and groundwater availability for existing uses. • Potential health effects in either humans or livestock. • Degradation of groundwater and surface water dependent ecosystems.	• The mine site land and water resources. • Downstream land and water resources. • Groundwater. • Downstream surface water and groundwater users.	• Contamination of downstream surface waters. • Contamination of groundwater. • Contamination of downstream lands. • Reduced visual amenity.
Land Contamination	• Mining and other excavations exposing previously contaminated materials.	• Transfer of contaminated materials to non-contaminated areas. • Reduced reputation with the local community. • Potential health effects to either humans or livestock. • Reduced surface water availability for existing uses. • Degradation of downstream aquatic ecosystems.	• Areas receiving contaminated material (including surface waters).	• Surface water and land contamination. • Reduced availability of soils.

Table 3.3 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Spontaneous Combustion	• Spontaneous combustion event.	• Release of sulphur dioxide. • Loss of coal resource. • Injury resultant from fire. • Impact on vegetation resultant from spreading fire.	• Coal stockpiles of the mine site. • Residents, landowners and leaseholders of properties on and surrounding the Mine Site.	• Odour and subsequent emission of sulphur dioxide. • Uncontrolled fire event.
Socio-Economic Impacts	• Alteration of social activities or employment due to capital expenditure.	• Change in employment rates and local spending. • Change in density of local traffic. • Change in the risk of accident/incident on local roads. • Change in traffic noise. • Change vehicle emissions.	• Local community and businesses. • Roads.	• Changed economic activity and related social impacts.
	• Perceived or real impacts on local amenity of neighbouring properties.	• Reduced property values. • Community complaints. • Reduced quality of life (actual or perceived). • Changed demand for goods and services in the local community.	• Surrounding property owners. • Local community.	• Changed socio-economic structure of the local community.
	• Reduction in property values due to mining operations.	• Changed make-up of the local community. • Changed demand for goods and services in the local community.	• Local community. • Local suppliers to the community.	• Changed socio-economic structure of the local community.

Source: Modified after template provided by HB203:2006 - Table 3

Table 3.4
Qualitative Consequence Rating

Level	Descriptor	Description
5	Catastrophic	• Massive and permanent detrimental impacts on the environment. • Very large area of impact. • Massive remediation costs. • Reportable to government agencies. • Large fines and prosecution resulting in potential closure of operation. • Severe injuries or death.
4	Major	• Extensive and/or permanent detrimental impacts on the environment. • Large area of impact. • Very large remediation costs. • Reportable to government agencies. • Possible prosecution and fine. • Serious injuries requiring medical treatment.
3	Moderate	• Substantial temporary or minor long term detrimental impact to the environment. • Moderately large area of impact. • Moderate remediation costs. • Reportable to government agencies. • Further action may be requested by government agency. • Injuries requiring medical treatment.
2	Minor	• Minor detrimental impact on the environment. • Affects a small area. • Minimal remediation costs. • Reportable to internal management only. • No operational constraints posed. • Minor injuries which would require basic first aid treatment.
1	Insignificant	• Negligible and temporary detrimental impact on the environment. • Affects an isolated area. • No remediation costs. • Reportable to internal management only. • No operational constraints posed. • No injuries or health impacts.
Source: modified after HB 203:2006 - Table 4(B)		

Table 3.5
Qualitative Likelihood Rating

Level	Descriptor	Description
A	Almost Certain	Is expected to occur in most circumstances.
B	Likely	Will probably occur in most circumstances.
C	Possible	Could occur.
D	Unlikely	Could occur but not expected.
E	Rare	Occurs only in exceptional circumstances.
Source: HB 203:2006 - Table 4(A)		

Table 3.6
Risk Rating

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (Almost Certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H
Note: Rating modified after HB 203:2006 - Table 4(C)					

Table 3.7
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.2)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Groundwater				
Reduced groundwater availability for existing uses	Impacts restricted to groundwater bores on Proponent owned land	3	D	M
	Reduction in availability of <15% of non-project related bores	3	E	M
	Reduction in availability of >15% of non-project related bores	3	E	M
Degradation of groundwater dependent ecosystems	Impacts restricted to groundwater bores on Proponent owned land	1	E	L
	Impacts to local groundwater dependent ecosystems	2	E	L
	Impacts to regional groundwater dependent ecosystems	2	E	L
Change in the hydrology/ geomorphology of the surrounding creek systems	Minor changes to hydrology/ geomorphology of the local creek systems	1	D	L
	Moderate changes to hydrology/ geomorphology of the local creek systems	2	E	L
	Large scale changes to hydrology/ geomorphology of the local creek systems	3	E	M
Impacts on groundwater quality		2	C	M
Reduced availability of water to local landowners		2	D	L
Degradation of aquatic communities	Impacts restricted to aquatic communities on Proponent owned land	1	E	L
	Impacts to local aquatic communities	2	E	L
	Impacts to regional aquatic communities	3	E	M
Surface Water				
Reduced downstream surface water quality	Impacts restricted to surface water on Proponent owned land	2	B	H
	Localised impacts to surface water	3	B	H
	Regional impacts to surface water	4	E	H
Reduced flows to downstream vegetation due to a reduction of environmental flows through the mine site		3	D	M
Reduced flows in surrounding creek systems due to a reduction of environmental flows through the mine site		2	D	L
Changes to the coverage and frequency of flooding due to altered flood regimes		3	B	H
Increased flows and/or flooding in natural drainage lines for a short period due to dam failure.		3	C	H
Uncontrolled discharge of dirty, saline, contaminated water outside licence conditions		3	C	H

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low
*See **Table 6.1** for complete analysis of risk following adoption of proposed management measures outlined within Section 4B.

Table 3.7 (Cont)
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.2)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Erosion and Sedimentation				
Loss of soil resources		2	A	H
Increased sedimentation within downstream creeks		2	C	M
Mobilisation of heavy metals		3	D	M
Threatened Flora and Fauna				
Loss of threatened fauna habitat		3	A	E
Threatened vegetation stress/death		1	E	L
Reduction in species diversity		2	A	H
Loss of threatened vegetation species communities		2	E	L
Reduction in threatened aquatic vegetation numbers	Increased stress to threatened aquatic fauna	1	E	L
	Reduction in localised numbers of aquatic threatened fauna	2	E	L
	Reduction in regional numbers of aquatic threatened fauna	3	E	M
Aboriginal Heritage				
Disturbance to or destruction of Aboriginal sites or artefacts	Destruction of a minor Aboriginal site or artefact	2	D	L
	Destruction of a significant Aboriginal site or artefact	3	D	M
Noise				
Health related issues to noise impacts		3	B	H
Sleep deprivation from noise impacts		3	D	M
Noise impacts on livestock		1	C	L
Nuisance/ amenity impacts on the surrounding landowners/ residents		2	B	H
Structural damage to buildings or structures from airblast overpressure	Minor damage to buildings or structures	2	C	M
	Significant damage to buildings or structures	3	D	M

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low
*See **Table 6.1** for complete analysis of risk following adoption of proposed management measures outlined within Section 4B.

Table 3.7 (Cont)
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.2)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Vibration				
Damage to buildings and structures	Minor damage to buildings or structures	2	C	M
	Significant damage to buildings or structures	3	D	M
Nuisance/ amenity impacts to surrounding landowners		2	D	L
Sleep deprivation due to low level vibration from the crushing facility		2	D	L
Air Pollution				
Increased deposited dust levels and suspended particulate matter concentration		3	A	E
The release of sulphur dioxide and its associated odour relating to a spontaneous combustion outbreak		1	D	L
Reduced local amenity due to the production of nitrogen oxide from blasting operations		1	D	L
Greenhouse and other gas emissions		3	A	E
Minor health impacts associated with emissions of sulphur dioxide and nitrogen oxide		2	D	L
Visual Amenity				
Decreased visual amenity during the life of the mine		3	D	M
Altered visual outlook following mine closure		3	C	H
Nuisance/ amenity impacts from mine lighting		2	A	H
Sleep deprivation from mine lighting		2	A	H
Impacts on State Forests				
Loss of timber resource.		3	A	E
Reduction in native fauna populations and species diversity.		2	C	M
Loss or damage to property.		3	C	H
Soil and Land Capability				
Erosion of stripped, stockpiled and replaced soils		2	A	H
Insufficient soil quantities/ qualities for rehabilitation		2	A	H
Reduced productivity of the final landform		3	B	H
Contaminated soil and land due to hydrocarbon/ chemical spills		2	C	M

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low
*See **Table 6.1** for complete analysis of risk following adoption of proposed management measures outlined within Section 4B.

Table 3.7 (Cont)
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.2)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Rehabilitation, and Final Landform				
Reduced amenity of the final landform		2	A	H
Reduced productivity of the rehabilitated land	<10% reduction in expected productivity	1	B	M
	10 – 50% reduction in expected productivity	2	B	H
	>50% reduction in expected productivity	3	C	H
Reduction in native fauna species diversity	<10% reduction in fauna species diversity	1	B	M
	10 – 50% reduction in fauna species diversity	2	B	M
	>50% reduction in fauna species diversity	3	D	M
Waste Management				
Contamination of downstream surface waters		2	C	M
Contamination of groundwater		2	D	L
Contamination of downstream lands		2	D	L
Reduced visual amenity		2	C	M
Land Contamination				
Surface water and land contamination	Minor surface water and land contamination	2	C	M
	Moderate surface water and land contamination	2	D	L
	Significant surface water and land contamination	3	E	M
Reduced availability of soils	<10% loss of soil resource	1	B	M
	10 – 50% loss of soil resource	2	C	M
	>50% loss of soil resource	2	D	L
Spontaneous Combustion				
Uncontrolled fire event		3	D	M
Odour and subsequent emission of sulphur dioxide		1	E	L

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low
*See **Table 6.1** for complete analysis of risk following adoption of proposed management measures outlined within Section 4B.

Table 3.7 (Cont)
Analysis of Unmitigated Environmental Risk*

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Potential Environmental Impacts (see Table 3.2)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Socio-Economic Impacts				
Changed economic activity and related social impacts		**N/A**	**N/A**	
Change in the socio economic structure of the local community	Minor change in the local community	**1**	**A**	**H**
	Moderate change in the local community	**2**	**B**	**H**
	Significant change in the local community	**3**	**D**	**M**

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low
*See **Table 6.1** for complete analysis of risk following adoption of proposed management measures outlined within Section 4B.

Table 3.7 provides an assessment of the **unmitigated** risk for each potential environmental impact based on the classifications and definitions provided. Where appropriate, and to provide a more realistic assessment of the risks posed by the various environmental issues, the environmental impacts have been further defined using either a level, range or scale of impact providing for the various circumstances which may apply. **Table 6.1** in Section 6 provides an analysis of risk following the implementation of operational and safeguards and/or control measures.

3.3.2 Environmental Issue Prioritisation

The issues identified as requiring assessment within the *Environmental Assessment* have been prioritised based, in decreasing order, of emphasis upon the following.

- The key assessment requirements of the DGRs (see Section 3.2.2.2 and **Appendix 2**).
- Issues identified with a greater frequency of impacts with high or extreme risk ratings (see **Table 3.7**).
- Issues with a high frequency of identification.

Based on the issues identified and the risk ratings allocated to the potential environmental impacts of these, the following order of priority has been determined. This order of priority provides for the order of assessment in Part 4B, namely:

1. Groundwater
2. Surface Water
3. Ecology
4. Aboriginal Heritage
5. Transportation
6. Noise
7. Blasting
8. Air Quality
9. Visibility
10. Soils and Land Capability
11. Socio-Economic Setting

It is noted that the inclusion of "Socio-economic Setting" at N^{o} 11 is not a direct consequence of the risk analysis. Rather, it is included at N^{o} 11 to enable all other issues to be considered prior to the consideration of the socio-economic setting as this issue invariably is inter-related with many of the preceding issues.

The sources of risk and potential environmental impacts associated with each issue are discussed within relevant subsections within Section 4B. All other issues generally allocated a "moderate" or "low" level of priority, have been addressed to the level considered appropriate throughout the *Environmental Assessment*.