

Section 3

Issue Identification and Prioritisation

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, and a review of relevant legislation, planning documents and environmental guidelines;*
 - (ii) a review of the project design and local environmental setting was undertaken to identify risk sources and potential environmental impacts for each environmental issue;*
 - (iii) an analysis of 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 depth of coverage within Section 4.*
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3.1 INTRODUCTION

In order to undertake a comprehensive *Environmental Assessment* of the proposed Belmont Coal Project, 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, preliminary environmental studies and literature review was undertaken to identify relevant environmental issues and potential impacts. This was followed by an analysis of the environmental 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 development and operation of the Belmont Coal 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

During the preparation of the preliminary Environmental Impact Statement for the Project in 2002, representatives of the Proponent consulted on a one-to-one basis with landowners and residents of surrounding properties. During this process, the nature of the Project was explained and issues of concern were identified and discussed. At that time, the issues raised primarily related to:

- hours of mining and coal transportation activities;
- traffic levels on Hoad Lane / Blue Vale Road;
- potential for blasting induced damage to houses and other structures;
- noise;
- groundwater and surface water/drainage issues;
- final landform and rehabilitation;
- visibility, in particular the direction of night lighting; and
- dust.



A range of economic and practical factors resulted in the Proponent suspending the development of the Belmont Coal Project in favour of other coal projects locally, eg. Tarrawonga Coal Mine and the Narrabri Coal Project. Following the resolution of those factors preventing the development of the Project, the Proponent recommenced consultation with surrounding landowners and residents in September 2006 to notify of the Proponent's intention to continue with the Project and submit an application for project approval. Each of those members of the local community consulted originally was contacted again and the revised planning process explained. A description of the Project was provided again and an invitation to comment or raise issues of concern provided again. Similar to the consultation undertaken in 2002, those consulted raised some issues of concern but were generally supportive of the Project and its likely direct and indirect benefits to Shire.

An "Application for the Project Approval" was advertised in the "Namoi Valley Independent" on 3 August 2006, with the associated Project Description Report (see **Appendix 1**) available on the DoP and R.W. Corkery & Co. Pty Limited websites for public viewing.

In January 2007, an information newsletter was prepared and hand delivered to all surrounding landowners and residents surrounding the Project Site and adjoining the transport route. The newsletter was also advertised locally and made available at the Proponent's Boggabri office. This newsletter provided information on the Belmont Coal Project, the environmental assessments that were being undertaken for compilation into the *Environmental Assessment* and the project assessment and approvals process under Part 3A of the *Environmental Planning and Assessment Act 1979*.

Between 10 July 2007 and 20 July 2007, a representative of the Proponent visited and discussed the current performance of coal haulage on Blue Vale Road with owners / residents of eight properties adjacent to the Blue Vale Road section of the transport route¹. Those consulted included:

- Mrs D. Mt T. Bernays of "Eldorado";
- Mr D. Cameron of "Burburgate";
- Messrs R. & B. Kelly of "Brooklyn";
- Mr W. Campbell of "Weroona";
- Mr R. Thompson of "Woodend";
- Mr M. Clarke & Mr W. Evans of "Calympha";
- Mr Keith Pitt of "Nalya" (farming contractor); and
- Mr & Mrs L. Waugh of "Kurrumbede".

Without exception, those consulted indicated that the performance of coal truck drivers between the operating coal mines and the Whitehaven CHPP has been good and they had no objection to the continued use of the local roads by coal carrying trucks. When the proposed increase in operating hours of the coal trucks was raised in the discussions, the majority of those consulted did not anticipate that any adverse impacts (on the basis of current performance and the distance

¹ The owner of the "Colstoun" property has recently passed away and no consultation was undertaken. The "Colstoun" property is very large and the homestead is remote from all roads. There is not anticipated to be any detrimental effect on the property or residents.



between their residence and the road). The owners of the “Weroona” property, however, expressed some concern over the proposed 24 hour transport of coal, on the basis of possible noise levels. Section 4B.5.5.6.1 discusses the potential noise impacts of the proposed transport of coal between 10:00pm and 7:00am.

3.2.2.2 Consultation with Government Agencies

During the preparation of the preliminary Environmental Impact Statement in 2002, the following government agencies and organisations were consulted by the Proponent and/or its specialist consultants.

- PlanningNSW (now the Department of Planning) (Sydney).
- Department of Land and Water Conservation * (now the Department of Water and Energy) (Gunnedah and Tamworth).
- Gunnedah Shire Council (Gunnedah) *.
- Department of Mineral Resources * (now part of the Department of Primary Industries – Mineral Resources) (Singleton).
- NSW Agriculture (now part of the Department of Primary Industries – Agriculture) (Gunnedah).
- Environment Protection Authority * (now part of the Department of Environment and Climate Change) (Armidale).
- NSW National Parks and Wildlife Service (now part of the Department of Environment and Climate Change) (Dubbo).
- Narrabri Shire Council (Narrabri).
- Roads and Traffic Authority (Grafton).
- Red Chief Local Aboriginal Land Council (Gunnedah).

Representatives of those government agencies identified with an asterisk (*) attended a Planning Focus Meeting convened by PlanningNSW (now Department of Planning) on 8 August 2002. Correspondence from the NPWS was tabled at the Planning Focus Meeting in the absence of a representative of the NPWS.

The Director-General’s requirements (DGRs), including correspondence from the then PlanningNSW, Environment Protection Authority, National Parks and Wildlife Service, Department of Land and Water Conservation, and Gunnedah Shire Council, is presented in **Appendix 2** as summary tables (**Table A2.1**, **Table A2.2** and **Table A2.3**).

Following the recommencement of plans to develop and operate the Belmont Coal Project in 2006, the Proponent sought the re-issue of the DGRs. Following consultation between representatives of the Proponent and the Department of Planning, it was agreed that an additional Planning Focus Meeting was not required but that the government agencies previously consulted be requested to review their previously provided requirements and update



or replace these, if appropriate. The DGRs, along with additional requirements from representatives of various NSW government agencies, were provided to the Proponent on 21 November 2006, with a modified version provided on 25 January 2007. The key issues, as identified by the DGRs, were as follows.

- **Traffic and Transport** – including a detailed quantitative traffic impact assessment of the coal transport route.
- **Surface and Groundwater** – including detailed modelling of potential surface and groundwater impacts, a site water balance, and a detailed description of any proposed creek diversions.
- **Flora and Fauna** – including any impacts on critical habitats, threatened species, populations, ecological communities, native vegetation and the Vickery State Forest and how any impacts on native flora and fauna would be offset.
- **Rehabilitation, Final Landform and Final Void Management** – including a justification of the proposed final landform and land use for the site, a description of rehabilitation and measures to protect the flora and fauna on the cessation of mining.
- **Noise** – impacts associated with construction, operation, and traffic of the Project.
- **Blasting and Vibration** – impacts on surrounding residences.
- **Air Quality** – impacts on the health and amenity of neighbouring land owners.
- **Greenhouse Gases** – a greenhouse gas assessment (including a quantitative analysis of greenhouse gas emissions associated with the combustion of product coal, and a qualitative assessment of the impacts of these emissions on the environment).
- **Heritage** – both Aboriginal and non-Aboriginal.
- **Visual Impacts.**
- **Social and Economic Impacts.**

A full copy of the DGRs along with a tabulated summary of all government agency requirements is presented as **Appendix 2**.

3.2.3 Review of Planning issues and Environmental Guidelines

3.2.3.1 Introduction

A number of State and regional planning instruments apply to the Project. 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* (see **Table A2-2**). It is noted that whilst the State Environmental Planning Policy - Mining Petroleum Production and Extractive Industries (2007) was gazetted following the lodgement of the application for project approval (and is therefore not applicable to the Project), this document addresses each of the relevant considerations included in the policy within the relevant section.



A brief summary of each relevant planning instrument is provided in Sections 3.2.3.2 to 3.2.3.4. The application and relevance of planning instruments related to specific environmental issues have been assessed in the relevant specialist consultant assessments. Section 3.2.3.5 briefly outlines the approach taken to referencing and reviewing environmental guideline documents.

3.2.3.2 State Planning Issues

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

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.

While it is noted that under the *Gunnedah Local Environmental Plan 1998*, the Project is not defined as an ‘industry’, 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 2nd edition*, (DUAP, 1997). As the hazardous substances and dangerous goods to be used / stored on the Project Site would be restricted to well managed diesel fuel, the Project is not considered to be a hazardous or offensive industry (see **Appendix 3**).

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

The Gunnedah Local Government Area (LGA) is identified in Schedule 1 of this policy as an area that could provide habitat for Koalas. The policy requires an investigation be carried out to determine if core or potential Koala habitat is present on the areas of the Project Site likely to be disturbed. Core Koala habitat comprises land with a resident population of Koalas whereas potential Koala habitat comprises land with native vegetation with known Koala feed trees constituting at least 15% of the total number of trees present on a site.

SEPP 44 has been addressed by the fauna consultant to the Project (Countrywide Ecological Service, 2007 - see *Specialist Consultant Studies Compendium* - Part 3).

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

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

- “a. To provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State.



- b. To facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources.
- c. To establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.”

The SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development, as defined in NSW legislation. 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) is as follows.

- **Clause 12:** Compatibility of proposed mine, petroleum production or extractive industry with other land uses.

Consideration must be given to:

- the existing uses and approved uses of land in the vicinity of the development;
- the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and
- any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.

The respective public benefits of the development and the existing, approved or preferred land uses must be evaluated and compared, along with any measures proposed by the applicant to avoid or minimise the incompatibility.

- **Clause 13:** Compatibility of proposed development with mining, petroleum production or extractive industry.

Consideration must be 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. Measures taken by the applicant to avoid or minimise any incompatibility are to be considered. The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.

- **Clause 14:** Natural resource management and environmental management.

Consideration must be 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;
- impacts on threatened species and biodiversity, are avoided or minimised; and



- greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.
- **Clause 15:** Resource recovery.
This clause requires the efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, be considered.
- **Clause 16:** Transportation.
Consideration must be given to alternative means of product transportation other than by road and that a code of conduct for the transport of materials on public roads is prepared.
- **Clause 17:** Rehabilitation.
The rehabilitation of the land affected by the development must be considered including:
 - the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated;
 - the appropriate management of waste generated by the development;
 - remediation of any soil contaminated as a result of the development; and
 - 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.

Section 6 reviews how each of the considerations presented in Clauses 12 to 17 is addressed in this document.

3.2.3.3 Regional Planning Issues

Orana Regional Environmental Plan (REP) No 1 – Siding Spring

The Project Site lies within a region called the Siding Spring Observatory Dark Skies Region, declared by the (then) Minister for Infrastructure and Planning to better protect the observing conditions at the Siding Spring Observatory. The new region includes all local government areas falling within 200km of the observatory. While the Project Site is approximately 130km from Siding Spring and lies within 200km of the Observatory, no consultation or concurrence is required with the Observatory Director as, under Section 8 of the REP, consultation or concurrence is only required for locations within 100km of the observatory. As such, this REP has not been considered further.

Additionally, the lighting proposed for the Project Site (Section 2.4.4.4), would be soft lighting to minimise visual intrusion to the surrounding landholders and as such, would not significantly impact on the Siding Spring Observatory given the separation distance.



3.2.3.4 Local Planning Issues

The areas to be developed within the Project Site and the constructed section of the transport route lie within the Gunnedah Shire with planning control covered by the Gunnedah Local Environmental Plan (LEP) 1998. The proposed activities would be undertaken within land zoned 1(b) Rural (General) Zone with mining permissible within this zone with development consent.

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 (see **Table A2-2** of **Appendix 2**). In addition, a number of the government agencies consulted in relation to the Project required reference to other environment 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.

3.2.4 Summary of Environmental Issues and Impacts

Through the consultation and review process described in Sections 3.2.2 to 3.2.3, the various environmental issues requiring coverage within the *Environmental Assessment* were identified. These are presented in the left hand column (Column 1) of **Table 3.1**.

The Project design, local environment and other factors, were then reviewed to identify all the potential risk sources (Column 2 of **Table 3.1**), consequences (Column 3 of **Table 3.1**), environmental receptors (Column 4 of **Table 3.1**) and corresponding potential environmental impacts (Column 5 of **Table 3.1**). **Table 3.1** presents these identified environmental risk sources and potential impacts that may be associated with each environmental issue.

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 is development and operation of the Project with minimal affect on the local environment. Environmental risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified in **Table 3.1**, the potential environmental impacts have been allocated an environmental risk rating based on the potential consequences and likelihood of occurrence².

The likelihood or probability of each impact occurring was then rated according to the definitions contained in **Table 3.2**.

² The risk rating has been determined in accordance with Australian Standards HB 203:2006 and AS/NZS 4360:2004 and through consideration of the potential consequence(s) of the environmental impacts.



Table 3.1
Risk Sources and Potential Environmental Impacts

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Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Groundwater	- Pollution of groundwater due to hydrocarbon spills. - Pollution of groundwater due to other contaminants, eg. Explosives residues, overburden etc.	Decreased groundwater quality.	Surrounding landholders utilising bores or spear pumps.	Reduced groundwater quality causing reduced availability for existing uses.
	Reduction of groundwater levels due to mine seepage and associated drawdown.	- Reduction in quantity of water stored in local aquifers. - Decrease in availability of groundwater to adjoining landowners and/or groundwater dependent ecosystems.	- Adjoining groundwater management areas. - Adjoining groundwater aquifers. - Groundwater bores of adjoining landowners.	- Reduction in water flows to the embargoed Great Artesian Basin. - Reduction in groundwater levels. - Reduced yields of local groundwater bores. - Degradation of groundwater dependent ecosystems.
Air Pollution – Dust, Odour, other	- Dust generation resulting from vehicle movements on unsealed roads. - Wind action on disturbed areas, overburden emplacements and stockpiles.	Increased deposited and suspended particulates.	- Surrounding residences and buildings. - Vickery State Forest and Community Conservation Area Zone 2 – Kelvin.	- Nuisance/amenity impacts from dust deposited on window sills, cars, surfaces etc. - Adverse health impacts (if PM₁₀ levels are excessive). - Stress of native vegetation, and indirect impacts on fauna habitat.
	Vehicle emissions.	Increased greenhouse and other gas emissions.	Local air-shed	Increased contribution to green house effect.
Erosion and Sedimentation	- Erosive actions of wind and water. - Elevated concentration of suspended sediments within runoff resulting from erosion of disturbed areas	- Loss of topsoil. - Increased sedimentation within downstream creeks and Namoi River.	- Project Site soils. - Local creeks and their tributaries. - Namoi River.	- Soil erosion. - Increased sediment load in drains and/or waterways.
	Increase in deposited dust and particulate matter concentration.	See “<i>air pollution</i>” above.	See “<i>air pollution</i>” above.	See “<i>air pollution</i>” above.
Surface Water / Flooding	Reduction in environmental flows through on-site capture of water.	- Reduced flows to downstream vegetation. - Decreased availability of water to downstream stock watering dams.	- Downstream flora and fauna. - Downstream agricultural lands.	Reduced natural surface water flows resulting in stress to native vegetation and degradation of fauna habitats and/or reduced viability of grazing lands.
	Discharge of dirty, saline or contaminated water.	- Decreased water quality. - Impacts on local soils and vegetation.	- Local creeks and tributaries. - Project Site soils and vegetation.	- Reduced quality of downstream waters. - Indirect impacts on soil quality and vegetation.
	Altered flood regimes.	Altered flood regimes.	Local communities and ecosystems.	Changes to local flooding patterns and indirect impacts on native vegetation communities and ecosystems.
Flora and Fauna Protection	Removal of native vegetation due to land clearing activities.	Removal of habitat and disturbance to threatened species.	Vegetation within Project Site and area of influence.	- Loss of, or alteration to, existing habitats. - Direct adverse impact on threatened species.
	Disturbance to fauna and fauna habitat as a result of project operations, eg. noise, dust etc.	Reduction in biodiversity of the Project Site.	Local communities and ecosystems.	- Reduced biodiversity. - Direct adverse impact(s) on threatened species, populations or communities.
Noise	Increased noise levels resulting from operation of mobile equipment, crushing and screening equipment and product transportation.	- Decreased amenity. - Health related issues. - Impacts on livestock. - Decreased land values.	Surrounding residents, landowners and livestock.	- Increased noise and levels associated with construction and operational activities causing annoyance, distractions, ie. amenity impacts. - Increased noise and/or vibration levels associated with the project road and rail traffic causing annoyance, distractions, ie. amenity impacts. - Sleep disturbance as a result of maximum noise levels. - Increased noise levels associated with the Project leading to reduced production, ie. impacts on livestock.
Vibration	- Increased levels of vibration from mine blasting. - Increased vibration levels from surface operations, including rail transport.	- Structural damage to buildings and structures. - Reduced local amenity. - Reduced production from livestock.	- Surrounding residences, buildings and other structures. - Local livestock.	- Structural damage to buildings and structures. - Nuisance/amenity impacts on surrounding landowners / residents. - Reduced agricultural production.
Rehabilitation, Final Landform & Biodiversity Offsets	- Modified landform on completion of the Project. - Modified land uses on the Project Site.	- Reduced amenity of the Project Site. - Reduced agricultural capability of Project Site lands.	- Project Site lands. - Surrounding land, eg. Neighbouring properties, Vickery State Forest.	- Reduced amenity of altered Project Site landform. - Reduced access to agricultural lands. - Increase in areas designated for native vegetation conservation.

Source: modified after HB203:2006 - Table 3



Table 3.1 (Cont'd)
Risk Sources and Potential Environmental Impacts

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Environmental Issue	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Visual Amenity	- Changes in visual characteristics of the Project Site. - Lighting influencing effectiveness of the Siding Springs Observatory.	- Changed visual outlook during operation - Reduced effectiveness of the Siding Springs Observatory.	- Surrounding residents and local motorists. - Siding Springs Observatory.	- Decreased visual amenity. - Reduced effectiveness of the Siding Springs Observatory.
Aboriginal Heritage	Removal or destruction of Aboriginal sites and/or artefacts due to Project Site construction and mining activities.	Loss or damage to Aboriginal artefacts.	Local Aboriginal community	- Impact on identified sites and/or artefacts of Aboriginal cultural heritage as a result of the proposed construction and mining activities. - Impact on unidentified sites and/or artefacts of Aboriginal cultural heritage as a result of subsidence.
European Heritage	Removal or destruction of sites of heritage significance due to project activities.	Loss or damage to heritage sites.	Identified heritage sites.	Loss or destruction to/of items of heritage significance.
Traffic and Transport	- Construction of access road to Blue Vale Road. - Increased traffic levels due to movement of workforce and contractors. - Increased heavy vehicle movements for product transportation to the Whitehaven Siding. - Additional rail movements between the Whitehaven Siding and Newcastle.	- Impacts associated with road construction (noise, dust, ecology, heritage etc.). - Increased vehicle movements (especially heavy vehicles) on local roads. - Increased rail movements on local rail network.	- See “<i>air pollution</i>”, “<i>flora and fauna protection</i>” and “<i>noise</i>” above, and “<i>Aboriginal heritage</i>” below. - Local road and rail network. - Existing road and rail users.	- See “<i>air pollution</i>”, “<i>flora and fauna protection</i>” and “<i>noise</i>” above, and “<i>Aboriginal heritage</i>” below. - Increased traffic congestion. - Elevated risk of accident/incident on local roads. - Road pavement deterioration. - Elevated risk of rail related accident/incident.
Waste Management	Production of contaminating or polluting materials, eg. acid producing overburden, waste oils, saline water, general rubbish.	- Contamination of downstream surface waters. - Contamination of groundwater. - Contamination of downstream lands. - Reduced visual amenity.	- Project Site land and water resources. - Downstream land and water resources. - Local and regional groundwater.	- Hydrocarbon or other pollutant contamination of surface water. - Hydrocarbon or other pollutant contamination of groundwater. - Acid generation from overburden used in construction of overburden emplacements. - Reduced amenity of Project Site due to poor rubbish, litter management.
Soil and Land Capability	- Reduction in soil quality and availability through poor management practices. - Increased erosion or erosion potential of soils - Decreased land capability in final landform.	- Structural damage to soils through poor soil management practices. - Reduced biological activity of soils. - See “<i>erosion and sedimentation</i>” above. - Reduced productivity of Project Site agricultural land.	- Project Site soils. - See “<i>erosion and sedimentation</i>” above. - Project Site soils.	- Insufficient soil quantities for rehabilitation. - Reduced soil quality. - See “<i>erosion and sedimentation</i>” above. - Decreased land and agricultural capability of the final landform.
Land Contamination	Mining and other excavations exposing previously contaminated materials.	Transfer of contaminated materials to non-contaminated areas.	Areas receiving contaminated material (including surface waters).	- Transfer of contaminated material. - Surface water contamination.
Bushfire	Initiation of fire on the Project Site and spread to adjoining agricultural lands and/or Vickery State Forest.	- Health and safety impacts to project personnel. - Damage to Project Site equipment. - Damage to adjoining agricultural lands and/or native vegetation.	- Project Site personnel and equipment. - Project Site and adjoining land.	- Injury or health impacts on project personnel. - Operational constraint posed by damaged equipment. - Crop and/or pasture damage. - Destruction / damage of native vegetation and fauna habitat.
Spontaneous Combustion	Spontaneous combustion event.	Uncontrolled fire event.	Coal stockpiles, Project Site and surrounding environs.	See “<i>bushfire</i>” above.
Socio-Economic Impacts	- Alteration of social activities or employment due to employment generation and capital expenditure. - Perceived or real impacts on local amenity of neighbouring properties.	- Reduced unemployment and increased local spending. - Reduced property values.	- Local community and businesses - Surrounding property owners.	- Improved economic activity and related social impacts attributable to reduced unemployment - Reduced quality of life (actual or perceived). - Reduced property values.
Property Values	Reduction in property values due to presence of mining operation.	Changed property values	Surrounding landowners	Possible short-term reduction in land values versus increases from increased economic growth.

Source: modified after HB203:2006 - Table 3



Table 3.2
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)		

The allocation of a consequence rating was based on the definitions contained in **Table 3.3**. It is noted that the assigned consequence rating represents the highest level applicable, ie. 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.

Table 3.3
Qualitative Consequence Rating

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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 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)		



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, an environmental risk ranking of either; low, medium, high or extreme was assigned to each potential impact based on the matrix of **Table 3.4**.

Table 3.4
Environmental 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)

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 3.5 provides an analysis of the unmitigated risk for each potential environmental impact based on the classifications and definitions provided on Pages 3-9 and 3-10. 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 the environmental risks following the implementation of operational and safeguards measures, ie. mitigated risks.

3.3.2 Environmental Issue Prioritisation

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

- The issues raised within the DGRs (see Section 3.2.2.2 and **Appendix 2**).
- Issues identified with a greater frequency of impacts with high or extreme environmental risk ratings (see **Table 3.6**).
- Issues with a high frequency of identification.

By considering both the number and respective proportion of higher risk impacts or potential incidents and proportion, the issues as requiring assessment within the *Environmental Assessment* have been prioritised. **Table 3.6** presents these issues in decreasing order of priority following consideration of the number and proportion of high and extreme risk impacts and incidents.

Table 3.5
Analysis of Unmitigated Environmental Risk

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Potential Environmental Impacts	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Groundwater				
Groundwater Pollution by leaking/spilt pollutant	Contamination requiring minor recovery works	2	D	M
	Contamination requiring major recovery works	4	E	H
Drawdown of groundwater levels	Significant drawdown (>2m) beyond 100m of the Project Site boundary	2	C	M
	Major drawdown (>10m) beyond 100m of the Project Site boundary	3	C	H
	Significant drawdown (>2m) beyond 500m of the Project Site boundary	3	C	H
	Significant drawdown (>10m) beyond 500m of the Project Site boundary	4	C	E
Reduction in groundwater bore yields	Impacts restricted to groundwater bores on the Project Site, or Proponent-owned land	1	A	H
	Reduction in yield of <15% of non-project related bores	2	B	H
	Reduction in yield of >15% of non-project related bores	3	C	H
Impacts on Groundwater Dependent Ecosystems		3	D	M
Air Quality				
Nuisance - deposited dust	Deposited dust levels attributable to the Project occasionally (for one or two months every year) above DECC guideline, affects only adjacent landholders.	2	C	M
	Deposited dust levels attributable to the Project regularly (exceedances greater than DECC guideline for >5 months per year) affects landholders some distance from the Project Site.	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				



Table 3.5 (Cont'd)
Analysis of Unmitigated Environmental Risk

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Potential Environmental Impacts	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Air Quality (Cont'd)				
Health - PM ₁₀	PM ₁₀ levels attributable to the Project occasionally (once every 1 to 2 years) above the Project goal, affects only adjacent landholders.	2	C	M
	PM ₁₀ levels attributable to the Project occasionally (>5 times per year) above the Project goal, affects landholders some distance from Project Site.	3	C	H
Greenhouse Gas Emissions		1	B	M
Erosion and Sedimentation				
Soil erosion	Minor gully erosion of drainage lines, stockpiles or created slopes	2	B	H
	Minor sheet or gully erosion of rehabilitated landform	2	C	M
	Major gully or sheet erosion formation	3	B	H
Sediment Load and Turbidity	One-off discharge of dirty water from the Project Site	2	A	H
	Regular discharge of dirty water from the Project Site	3	C	H
Surface Water/Flooding and Drainage				
Reduced natural surface water flows	Reduced productivity of downstream grazing lands	2	D	L
	Stressing of downstream native vegetation due to restricted flows	2	D	L
Reduced quality of downstream waters	Isolated and minor event resulting in temporary degradation of water quality in local creeks and tributaries, eg. Minor and one-off discharge of hydrocarbon	2	C	M
	Continuing discharge of contaminated water resulting in ongoing degradation of water quality in local creeks and tributaries, eg. frequent/periodic discharge of dirty water	4	D	H
	Isolated and major event resulting in temporary but wider spread degradation of water quality, eg. large discharge of hydrocarbons	3	D	M
	Repeated major event resulting in long-term and wide spread degradation of water quality, eg. continued discharge of dirty or contaminated water	4	D	H
Changes to local flooding patterns and indirect impacts on native vegetation communities and ecosystems.		3	D	M
Threatened Flora and Fauna				
Loss of, or alteration to, existing habitats.	Disturbance to native vegetation / habitat within nominated areas	2	A	H
	Disturbance to native vegetation / habitat outside nominated areas	3	D	M
Direct adverse impact on threatened species.	Disturbance to Threatened flora / fauna and endangered communities	3	C	H
	Disturbance leading to local population reduction	4	D	H
	Disturbance leading to local extinction(s)	5	E	E
Reduced biodiversity	Local biodiversity	3	D	M
	Regional biodiversity	4	D	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				



Table 3.5 (Cont'd)
Analysis of Unmitigated Environmental Risk

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Potential Environmental Impacts	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Noise and Vibration				
Increased noise levels associated with Project Site activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A))	2	B	H
	Regular minor exceedance of noise criteria (1-2dB(A))	3	C	H
	Occasional marginal exceedance of noise criteria (3-5dB(A))	3	B	H
	Regular marginal exceedance of noise criteria (3-5dB(A))	3	C	H
	Occasional major exceedance of noise criteria (>5dB(A))	B	4	E
	Regular major exceedance of noise criteria (>5dB(A))	C	4	E
Increased noise / vibration levels associated with project traffic activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A))	2	C	M
	Regular minor exceedance of noise criteria (1-2dB(A))	3	D	M
	Occasional marginal exceedance of noise criteria (3-5dB(A))	2	C	M
	Regular marginal exceedance of noise criteria (3-5dB(A))	3	D	M
	Occasional major exceedance of noise criteria (>5dB(A))	2	C	M
	Regular major exceedance of noise criteria (>5dB(A))	3	D	M
Maximum noise levels resulting in sleep disturbance.		2	C	M
Increased noise levels associated with the Project leading to reduced production, ie. impacts on livestock.		3	E	M
Noise and Vibration from blasting impacting on local amenity		3	D	M
Noise and Vibration from blasting impacting on local livestock		3	E	M
Vibration from blasting resulting in damage to non-project related buildings and structures		3	E	M
Traffic and Transport				
Increased traffic congestion		3	D	M
Increased noise levels at residences along the transport route		See "noise and vibration"		
Road pavement deterioration		3	C	H
Elevated risk of accident/incident on local roads	Minor accident – no injury	2	C	M
	Minor accident – minor injury	3	D	M
	Major accident – moderate injuries requiring hospitalisation	4	E	H
	Severe accident – severe injuries or death injury	5	E	H
Rehabilitation, Final Landform & Biodiversity Offsets				
Reduced access to agricultural lands.		2	C	M
Increase in areas designated for native vegetation conservation		n/a	n/a	n/a
Aboriginal Heritage				
Impact on identified sites and/or artefacts of Aboriginal cultural heritage as a result of the proposed construction and mining activities and without the permission of LALC or DECC		4	C	E
Impact on unidentified sites and/or artefacts of Aboriginal cultural heritage as a result of subsidence and without the permission of LALC or DECC		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				



Table 3.5 (Cont'd)
Analysis of Unmitigated Environmental Risk

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Potential Environmental Impacts	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
European Heritage				
Impact on identified sites of European cultural heritage		2	E	L
Visual Amenity				
Reduced amenity of altered Project Site landform	Temporary disturbance to landform	1	A	H
	Marginally identifiable change to landscape	2	A	H
	Highly identifiable change to landscape	3	C	H
Impacts on the effectiveness of the Siding Springs Observatory		2	D	L
Waste Management				
Contamination by waste oil.	Contamination requiring minor recovery works	2	D	L
	Contamination requiring major recovery works	3	E	M
Acid generation from overburden used in construction of overburden emplacements.		3	E	M
Reduced amenity of Project Site due to poor rubbish, litter management		1	C	L
Soil and Land Capability				
Insufficient soil quantities for rehabilitation.		3	C	H
Reduced soil quality	Temporary disturbance to soil	1	B	M
	Degradation of soil quality	2	C	M
Elevated erosion or erosion potential.		2	C	M
Decreased land and agricultural capability of the final landform		3	C	H
Land Contamination				
Transfer of contaminated material	Small area affected (<0.01ha)	2	D	L
	Large area affected (>0.01ha)	3	D	M
Contamination of surface water as a result of exposing contaminated lands	Minor and temporary contamination of water quality in local creeks and tributaries	2	C	M
	Minor and continuing contamination of water quality in local creeks and tributaries	3	D	M
	Major and temporary contamination of water quality in local creeks and tributaries	3	D	M
	Major and continuing contamination of water quality in local creeks and tributaries	5	E	H
Bushfire				
Initiation of fire leading to impacts on the Project Site	Minor disturbance to Project Site lands and equipment resulting in temporary suspension of operations	2	D	L
	Major damage to Project Site lands and equipment resulting in long-term or complete suspension of operations	4	E	H
	Impacts on health and safety of project personnel	5	E	H
Initiation of fire leading to impacts outside the Project Site	Minor disturbance to lands and property external to the Project Site	2	D	L
	Major disturbance to lands and property external to the Project Site, eg. Entry into Vickery State Forest	4	E	H
	Impacts on health and safety of local landowners, residents and the general public	5	E	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				



Table 3.5 (Cont'd)
Analysis of Unmitigated Environmental Risk

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Potential Environmental Impacts	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Spontaneous Combustion				
Injury sustained as a consequence of fire	Minor injury	2	D	L
	Moderate injury requiring first aid	3	E	M
	Injury requiring hospitalization	4	E	H
	Severe injury or death	5	E	H
Impacts on native flora and fauna in the event of fire spreading beyond coal stockpiles	Small fire within Project Site	2	D	L
	Moderate fire extending beyond the Project Site	3	E	M
	Large fire extending far beyond the Project Site	4	E	H
Socio-Economic Impacts and Property Values				
Improved economic activity and related social impacts attributable to reduced unemployment		n/a	n/a	n/a
Reduced quality of life (actual or perceived)		3	D	M
Reduced property values	Temporary decrease in property values	2	C	M
	Moderate term decrease in property values	3	C	H
	Long term decrease in property values	3	D	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				

On consideration of the issues identified by the DGRs and through consultation, the order of priority was modified slightly as issues related to fire took on less significance whereas those relevant to noise, vibration and air quality were given greater priority. The revised order of priority provides the order of assessment in Section 4, namely:

1. Groundwater
2. Flora & Fauna
3. Aboriginal Heritage
4. Noise and Vibration
5. Surface Water / Erosion and Sedimentation
6. Visual Amenity
7. Traffic
8. Air Quality
9. Fire (Bushfire and Spontaneous Combustion)
10. Socio-Economic Climate
11. Soil and Land Capability



Table 3.6
Environmental Issue Prioritisation

	Extreme		High		Combined	
	frequency	%	frequency	%	frequency	%
1. Groundwater	1	10%	6	60%	7	70%
2. Flora & Fauna	1	14%	4	57%	5	71%
3. Aboriginal Heritage	1	50%	1	50%	2	100%
4. Noise and Vibration	2	12%	5	30%	7	41%
5. Surface Water / Erosion and Sedimentation	0	0%	6	50%	6	50%
6. Visual Amenity	0	0%	3	75%	3	75%
7. Traffic	0	0%	3	50%	3	50%
8. Air Quality	0	0%	2	40%	2	40%
9. Fire (Bushfire & Spontaneous Combustion)	0	0%	7	54%	7	54%
10. Socio-economic Climate	0	0%	2	50%	2	50%
11. Soil and Land Capability	0	0%	2	40%	2	40%
12. Waste Management	0	0%	0	0%	0	0%
13. European Heritage	0	0%	0	0%	0	0%

It is noted that the inclusion of the “Socio-economic Setting” at N^o 10 is not a direct consequence of the environmental risk analysis. Rather, it is included at N^o 10 to enable the key issues to be addressed 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 4. All other issues generally allocated a “moderate” or “low” level of priority, have been addressed to the level considered appropriate throughout the *Environmental Assessment*.