Section 3
Consultation and Issue Identification

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 the local environment was undertaken to identify risk sources and potential environmental impacts for each environmental issue;*

iii) *an analysis of risk for each potential unmitigated 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.*

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3.1 INTRODUCTION

In order to undertake a comprehensive *Environmental Assessment* of the 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. In order to ensure this has occurred, a program of community and government consultation was undertaken to identify relevant environmental issues and potential impacts. This was followed by an analysis of the risk posed by each potential impact (initially without mitigation) 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 Oberon White Granite Quarry, as proposed within this *Environmental Assessment*, 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

The Proponent, together with R.W. Corkery & Co. Pty Limited, have undertaken a comprehensive consultation program with surrounding landowners and the local community commencing with notification of the adjacent neighbours in July 2007 of the Proponent's intentions to lodge an application for Project Approval. The adjacent neighbours were generally appreciative of the notification and indicated that they were not overly concerned at that stage. Since that time, consultation has been undertaken in a number of ways including the following.

1. Individual meetings with surrounding landholders.

   During January and February 2008, offers were made to surrounding landholders to meet with a representative from the Proponent and R.W. Corkery & Co. Pty Limited to discuss the Project. Formal face to face discussions where held with three landholders during February 2008 together with informal discussions with a number of additional landholders, either on their properties or at the Project Site. These meetings were considered valuable in assisting the understanding of each landholder's individual concerns.

2. Circulation of a Community Information and Feedback Package.

   A Community Information and Feedback package was circulated to all landholders within approximately a 2km radius of the Project Site during February 2008 via a hand delivered letterbox drop, mail-out and emails. The package contained a brief summary of the approved and proposed operations and a feedback form providing landholders the opportunity to comment on the existing and proposed operations.

Maps of the Project Site and surrounding landownership and residence locations were also provided and landowners encouraged to correct any matters of fact or comment directly on the mapping. An example copy of this package is provided in **Appendix 5**. A total of nine feedback forms were returned.

3. Convening of a Community Forum.

   A Community Forum was convened at the Oberon Public School on Saturday 19 July 2008 to provide the community with an update of the Project and to further discuss issues of interest to the local community building upon the feedback received to date. An invitation to the forum was circulated to landholders within approximately a 2km radius of the Project Site. An article was also published within the Oberon Review on Thursday 17 July 2008 inviting all members of the community to attend. Eighteen people attended the Community Forum including a representative from Oberon Council.

4. Various discussions and feedback via telephone calls and emails.

   A range of telephone discussion and emails were exchanged with more than 18 surrounding landholders to discuss the Project and landholders concerns and comments relating to the existing and proposed operations. Discussions were also held with the operator of the local school bus.

Most landholders approached responded positively to the consultation program and provided feedback on issues of interest or concern and were interested in receiving further information relating to the Project including a CD copy of the final *Environmental Assessment*.

In summary, feedback received from surrounding landholders and the local community in relation to the proposed Project indicated the following issues of interest or concern (listed in decreasing frequency). Cross reference to where the issue is covered within this report is also provided.

- Noise and blasting and impacts upon local amenity (12 residents/landowners) – *Section 4.7*.
- Traffic and transportation impacts (8 residents/landowners) – *Section 4.6*.
- Air quality impacts (7 residents/landowners) – *Section 4.8*.
- Groundwater impacts (6 residents/landowners) – *Section 4.3*.
- Visual amenity impacts (6 residents/landowners) – *Section 4.10*.
- Market demand (5 residents / landowners) – *Section 1.4*.
- Surface water impacts (4 residents/landowners) – *Section 4.2*.
- Flora and fauna impacts (4 residents/landowners) – *Section 4.4 and 4.5*.
- General amenity or lifestyle impacts (4 residents/landowners) – *Section 4.10*.
- Health and safety (4 residents/landowners) – *Section 2.11*.
- Land devaluation (2 residents/landowners) – *Section 4.10*.
- Resource details (1 resident / landowner) – *Section 2.2*.

In addition to the above issues, some residents raised concerns in relation to the existing quarry operations and non-compliances with the existing development consent, the need to clarify the economic benefits to the local community and a number of planning and process issues relating to the assessment process. Most of these issues were further discussed during the Community Forum and, where appropriate, have also been further addressed within the *Environmental Assessment*.

3.2.2.2 Consultation with Government Authorities

The Proponent and R.W. Corkery & Co. Pty Limited held various discussions with Oberon Council and State government agencies to discuss various aspects of the Project prior to applying to the Department of Planning for consideration of the Project as a 'Major Project' assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. Following acceptance of the Project as a 'Major Project' the Department of Planning convened a Planning Focus Meeting on 22 August 2007. During this meeting, a number of government agencies were presented with preliminary information about the Project and given the opportunity to inspect the Project Site prior to submitting their specific requirements for the *Environmental Assessment* to address.

The following government agencies were represented at this Planning Focus Meeting.

- Department of Planning (DoP).
- Department of Environment and Conservation (DECC) – now Department of Environment, Climate Change and Water (DECCW).
- Department of Water and Energy (DWE) – now DECCW NSW Office of Water.
- Department of Primary Industries (Mineral Resources) (DPI-MR) (representing all divisions within the DPI) – now Industry and Investment NSW (I&I NSW).
- Roads and Traffic Authority (RTA).
- Oberon Council.

A summary of issues raised during the Planning Focus Meetings together with a cross reference to where the issue is covered within this report is provided a follows.

- Ensuring enough time is allowed to complete blasts within allocated times – *Section 2.11*.
- Inclusion within the noise assessment of the 'worst case' scenario (using static or mobile processing equipment) – *Sections 4.7.5.1 and 4.7.5.2*.
- Ensuring all operational areas are included within the *Environmental Assessment – Figure 2.1*.
- Provision of a summary of the approximate proportion of the proposed products – *Section 2.2.2*.
- Inclusion of a water balance within the *Environmental Assessment* and confirmation of any groundwater interaction – *Section 4.2.4.4*.
- Ensuring all residence locations are updated and correct and acknowledgement of an approved dwelling entitlement on an adjoining landholding is given – *Table 4.2 and Figure 4.3.*

- Analysis of intersection performance (of Ferndale and Hampton Roads) with up to a 10 year projection of traffic levels – *Section 4.6.5*.
- Confirmation that the structural standard of Ferndale Road is sufficient to carry the increased truck movements – *Section 4.6.5*.
- Provision of further details in relation to the size and quality of the resource within the extraction zone – *Section 2.2*.

Following the Planning Focus Meeting, each agency responded with written requirements to be addressed within the *Environmental Assessment*. These written requirements are presented in **Appendix 2** and a summary listing the section(s) of the *Environmental Assessment* where each issue is addressed is presented in **Appendix 3**.

The issues raised in the DGRs have been incorporated into the environmental risk analysis presented in Section 3.3.

3.2.3 Review of Planning issues and Environmental Guidelines

3.2.3.1 Introduction

A number of State, regional and local 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 **Appendix 2**).

A brief summary of each relevant planning instrument is provided in Sections 3.2.3.2 and 3.2.3.3. The application and relevance of planning instruments related to specific environmental issues have been assessed in the relevant specialist consultant assessments. Section 3.2.3.4 briefly outlines the approach taken to referencing and reviewing environmental guideline documents.

3.2.3.2 State Planning Issues

Four potentially relevant State Environmental Planning Policies (SEPPs) were considered during the assessment of the Project are as follows.

State Environmental Planning Policy (Major Development) 2005

This SEPP was gazetted on 25 May 2005 and applies to all projects satisfying nominated criteria lodged following this date. As identified in Schedule 1 of the Policy, the Proponent's Project would be classified as a Group 2 development, i.e. mining, petroleum production, extractive industries and related industries, given the size of the resource is greater than 5 million tonnes and the annual rate of extraction would exceed 200 000 tonnes per year. The Project is therefore to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*.

Although the white granite is comprised of a number of minerals with potential industrial applications, it is noted that the Project has been assessed as an extractive industry as it is not proposed that the Proponent would undertake any beneficiation of the granite to separate these minerals. Hence products from the quarry would be sold as granite aggregates and ungraded or graded crushed and screened rock.

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.

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). Hazardous materials are defined within DUAP (1997) 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 on-site storage of approximately 5 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, DUAP (1997) does not require these to be considered further.

Furthermore, on average, less than one load of diesel, 5 000L in volume, would be required per fortnight. No assessment or screening thresholds are provided in relation to the transportation of Class 3 C1 or C2 combustible liquids. However, experience with determinations for Projects transporting similar (or greater) quantities of Class 3 hazardous materials, via comparable transportation routes suggests transport of diesel to the site would not be considered potentially hazardous.

Based on the risk screening method of DUAP (1997), 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 (SEPP 44) – Koala Habitat Protection

The Oberon Local Government 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 on the Project Site. Schedule 2 of this policy also provides a list of tree species that are favoured food tree species of Koalas.

"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. SEPP 44 has been addressed by the fauna specialist (Biodiversity Monitoring Services 2010 – *Specialist Consultant Studies Compendium* – Part 3) who established that the Project Site contains "Potential Koala Habitat" but does not contain "Core Koala Habitat". Further discussion is provided in Section 4.5 of the *Environmental Assessment*.

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

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.

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;	4.1.4
	• the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and	4.2.5, 4.3.4, 4.4.6, 4.5.5, 4.6.5, 4.7.5, 4.8.6, 4.9.7, 4.10.4, 4.11.2
	• 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.	4.11, 6.3.4
	Measures proposed to avoid or minimise any incompatibility are considered.	4.2.4, 4.3.3, 4.4.5, 4.5.4, 4.6.4, 4.7.4, 4.8.4, 4.9.5, 4.10.3
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.	6.2.2.3
	Measures taken by the applicant to avoid or minimise any incompatibility are considered.	4.2.4, 4.3.3, 4.4.5, 4.5.4, 4.6.4, 4.7.4, 4.8.4, 4.9.5, 4.10.3
	The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	4.11, 6.2
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	2.2.2
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.	Not practicable
	• Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.	2.7.2, 4.6.4
	• The preparation of a code of conduct for the transportation of materials on public roads.	4.6.4
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;	4.2.4, 4.2.5, 4.3.3, 4.3.4
	• impacts on threatened species and biodiversity are avoided or minimised; and	4.4.5, 4.4.6, 4.5.4, 4.5.5
	• greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	4.8.6.4
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 2.9
	• the appropriate management of development generated waste;	2.6
	• 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.	2.11

3.2.3.3 Regional and Local Planning Issues

Oberon Local Environmental Plan 1998

The Project Site is located within land zoned Rural 1A under the *Oberon Local Environmental Plan 1998*. Extractive industry is permissible within land zoned Rural 1A with development consent.

Development Control Plan 2001

In order to minimise land use conflicts and avoid undue interference with the amenity of residents, Development Control Plan 2001 (DCP) (as amended in February 2008) requires that residential development be located so as to ensure a 500m buffer from the footprint of operations of extractive industries. It notes that the buffer is to be provided wholly within the proponent's land or by appropriate lease over the buffer area.

It is noted that the amendment to the DCP was made following the commencement of operations and lodgement of the Project Application. In any event, Section A1.3 of the DCP notes that a proposal does not need to be consistent with the DCP and that the policy cannot apply equally in every situation.

Regardless, the Proponent has endeavoured to meet the objectives of the DCP through designing the proposed operations to meet accepted criteria regardless of the distance from the footprint of operations. Discussions with Department of Planning indicate that this is an acceptable approach.

Section 117(2) Direction

A direction under S117(2) (**Appendix 6**) has previously been issued by the, then, Minister for Planning in December 1994 covering the Oberon Local Government Area. The relevant plans issued with the direction identify that the Project Site is located within an area of significant alaskite resource (see boundary displayed on **Figure 1.2**).

The direction aims to make Council aware of the mineral resources within the Local Government Area and to prevent the unnecessary loss of important resources. The direction does not contain any relevant requirements relating to the assessment of proposed mining or extractive operations.

A range of other local planning issues have also been considered throughout the preparation of the *Environmental Assessment* and are referred to within the relevant sections and specialist reports.

3.2.3.4 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 the Identified Environmental Issues

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 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 Issue

	Source and Frequency of Identification			
Environmental Issue	**Government Consultation[1]**	**Community Consultation[2]**	**Specialist Consultant[3]**	**Summary**
Heritage	2	0	0	**2**
Resource type / assessment	1	1	0	**2**
Waste management	2	0	0	**2**
Property values	0	2	0	**2**
Rehabilitation and final land use	2	1	1	**4**
Erosion/sediment minimisation	2	1	1	**4**
Market assessment	0	5	0	**5**
Hazards / safety issues	1	4	0	**5**
Monitoring	1	1	4	**6**
Socio-economic impacts	0	6	0	**6**
Visual amenity	1	6	0	**7**
Groundwater	2	6	0	**8**
Surface Water	3	4	1	**8**
Threatened flora and fauna protection	4	4	1	**9**
Air pollution - dust/odour/other	1	7	1	**9**
Traffic and transportation	4	8	1	**13**
Operational noise and vibration	3	12	1	**16**

Note 1: Summarised from the Director-General's Requirements and correspondence to DoP from consulted government agencies.
Note 2: Summarised from discussions held with correspondence received from surrounding landowners and consultation undertaken with the wider community.
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 is development and operation of the Project with minimal affect on the local environment and surrounding landholders / residents. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified in **Table 3.2**, the potential environmental impacts (see **Table 3.6**) have been allocated a risk rating based on the potential consequences and likelihood of occurrence, i.e. without consideration of appropriate design and operational safeguards.

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, 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.

Table 3.3
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)		

The likelihood or probability of each impact occurring was then rated according to the definitions contained in **Table 3.4**.

Table 3.4
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 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 low, medium, high or extreme has been assigned to each potential impact based on the matrix of **Table 3.5**.

Table 3.5
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 3.6 presents the identified potential impacts that may be associated with each environmental issue presented in **Table 3.2** based on the source or risk or potential incident, potential consequences and local receptor/surrounding environment.

Table 3.7 provides an assessment of the unmitigated risk for each potential environmental impact based on the classifications and definitions outlined in **Table 3.3** to **Table 3.5**. The risk associated with identified environmental impacts of **Table 3.6** 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. 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 measures.

3.3.2 Environmental Issue Prioritisation

The issues identified as requiring assessment within the *Environmental Assessment* have been prioritised based upon the following.

- The key assessment requirements of the DGRs (see Section 3.2.2.3 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 (see **Table 3.2**).

The Proponent recognises that, due to the breadth of the consultation for the Project, some community representatives are likely to have been consulted on more than one occasion or as part of more than one stakeholder group. Similarly, the various government agencies consulted invariably duplicated many issues requiring assessment. As a consequence, the frequency of identification for some issues may be slightly elevated. Notwithstanding this duplication, and considering the comprehensive nature of the consultation program, the potentially elevated frequency of identification for some issues is not assessed as unduly influencing the prioritisation of issues given those issues likely to be repeated would generally be noted by many stakeholders and are therefore likely to be highly identified in any event.

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.

1. flora and fauna;
2. noise;
3. visual amenity;
4. transportation;
5. socio-economic;
6. surface water;
7. erosion and sedimentation;
8. air quality;
9. groundwater; and
10. heritage.

Table 3.6
Risk Sources and Potential Environmental Impacts

Environmental Issue (see Table 3.2)	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Groundwater	• Pollution of groundwater due to hydrocarbon spills.	• Decreased groundwater quality.	• Surrounding landholders utilising groundwater bores.	• Reduced groundwater quality causing reduced availability for existing uses.
	• Reduction of groundwater levels due to seepage and associated drawdown.	• Decrease in availability of groundwater to local landholders and groundwater dependent ecosystems. • Reduction or cessation of local springs flows. • Reduction in quantity of water stored in local aquifers.	• Surrounding landholders utilising groundwater bores. • Surrounding groundwater dependent ecosystems. • Local springs and groundwater aquifers.	• 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 and stockpiles.	• Increased deposited and suspended particulates.	• Surrounding residences and buildings.	• 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 upon fauna habitat.
	• Vehicle emissions.	• Increased greenhouse and other gas emissions.	• Local air shed.	• Increased contribution to greenhouse effect.
Erosion / Sediment Minimisation	• Suspension of sediments within runoff resulting from erosion of disturbed areas.	• Increased turbidity and sedimentation within downstream surrounding drains/ waterways.	• Adjacent drains and/or waterways.	• Increased sediment load and turbidity in drains and/or waterways resulting in degradation of water quality.
	• Erosive actions of wind and water.	• Lost of topsoil.	• Project Site soils.	• Soil erosion and degradation.
Threatened Flora and Fauna Protection	• Removal of native vegetation due to land clearing activities.	• Removal of habitat and disturbance of threatened species.	• Vegetation within Project Site and area of influence.	• Loss of or fragmentation of existing habitats. • Direct impacts upon threatened species.
	• Disturbance of fauna and fauna habitat as a result of Project operations, eg. noise, dust etc.	• Reduction in biodiversity in surrounding habitat.		

Table 3.6 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue (see Table 3.2)	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Operational Noise and Vibration (including blasting)	• Increased noise levels resulting from operation of mobile equipment on the Project Site. • Increased noise levels resulting from product transportation.	• Decreased amenity. • Health related issues. • Decreased land values. • Impacts on livestock.	• Surrounding residents, landowners and livestock.	• Increased noise levels associated with construction and operational activities causing annoyance, distractions, , i.e. amenity impacts. • Increased noise levels associated with loading and transport activities causing sleep disturbance. • Increased noise levels associated with the Project leading to reduced production, i.e. impacts on livestock. • Reduction in land values.
	• Noise and vibration resulting from blasts.	• Damage to residential buildings or other vibration sensitive structures, eg. Duckmaloi weir.	• Residences and other vibration sensitive structures.	• Damage to vibration sensitive structures.
Visual Amenity	• Changes in visual characteristics due to extraction and processing activities.	• Changed visual outlook during operation and prior to finalisation of rehabilitation.	• Surrounding landowners.	• Decreased visual amenity (prior to finalisation of rehabilitation). •
Heritage	• Removal or destruction of artefacts due to soil stripping and extraction activities.	• Loss or damage of artefacts.	• Local Aboriginal community and interested stakeholders.	• Impact on unidentified sites and/or artefacts of Aboriginal or European cultural heritage.
Socio-Economic Impacts	• Alteration of social activities or employment due to employment generation and capital expenditure.	• Reduced unemployment and increased local spending.	• Local community and businesses.	• Improved economic activity and related social impacts attributable to reduced unemployment and expenditure within the local community.
	• Perceived or real impacts on local amenity.	• Reduced property values.	• Surrounding residents/landholders.	• Reduced quality of life (actual or perceived). • Reduced property values.

Table 3.6 (Cont'd)
Risk Sources and Potential Environmental Impacts
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Environmental Issue (see Table 3.2)	Risk Source/potential incident(s)	Potential Consequences	Receptor/ Surrounding Environment	Potential Environmental Impacts
Surface Water	• Pollution of surface water due to mobilisation of sediments, hydrocarbon spill, etc. • Reduction in environmental flows through on-site capture of water.	• Reduced flows to downstream water users (including vegetation). • Decreased water quality.	• Downstream flora and fauna. • Downstream agricultural lands. • Local creeks and tributaries.	• Reduced natural surface water flows resulting in stress to native vegetation and degradation of fauna habitats and/or reduced availability to downstream users (eg. for stock watering, irrigation etc.). • Reduced quality of downstream waters.
Traffic and Transport	• Increased traffic levels due to movement of workforce. • Increased heavy vehicle movements for product transportation.	• Increase in frequency of light and heavy vehicle movements on public roads.	• Surrounding road network. • Existing and future road users.	• Deterioration of road pavement. • Traffic delays. • Increased chance of road accidents.
Property Values	• Reduction in property values due to presence of extraction and processing operations.	• Changed property values.	• Surrounding landholders.	• Possible short-term reduction in land values versus increases from increased economic growth.
Source: Modified after HB203:2006 - Table 3				

Table 3.7
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.6)	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 hydrocarbon	Contamination requiring minor recovery works.	**2**	**D**	**L**
	Contamination requiring major recovery works.	**3**	**E**	**M**
Drawdown of groundwater levels	Drawdown resulting in reduction of bore or local spring yields of <15%.	**2**	**D**	**L**
	Drawdown resulting in reduction of bore or local springs yields of >15%.	**3**	**E**	**M**
Impacts on Groundwater Dependent Ecosystems	Drawdown external to Project Site beyond natural fluctuation levels.	**3**	**E**	**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**	**D**	**M**
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**	**D**	**M**
Greenhouse Gas Emissions.		**1**	**B**	**M**
Erosion and Sedimentation				
Soil erosion	Minor erosion within Project Site.	**2**	**C**	**M**
	Minor erosion external to the Project Site.	**2**	**D**	**L**
	Major erosion external to the Project Site.	**3**	**E**	**M**
Sediment Load and Turbidity	One-off discharge of dirty water from the Project Site.	**2**	**C**	**M**
	Regular discharge of dirty water from the Project Site.	**4**	**D**	**H**
Surface Water				
Reduced natural surface water flows	Reduced availability of water for agriculture.	**3**	**D**	**M**
	Stressing of downstream native vegetation due to restricted flows.	**3**	**D**	**M**
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	**3**	**D**	**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**

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 analysis of risk following implementation of proposed management measures outlined within Section 4.

Table 3.7 (Cont'd)
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.6)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating*
Surface Water (Cont'd)				
Reduced quality of downstream waters	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	E	H
Flora and Fauna (terrestrial and aquatic)				
Loss of or fragmentation of 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	D	M
	Disturbance leading to local population reduction.	4	D	H
	Disturbance leading to local extinction(s).	5	E	E
Operational Noise and Vibration				
Increased noise levels associated with Project Site activities causing annoyance, distractions, i.e. 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)).	2	B	H
	Regular marginal exceedance of noise criteria (3-5dB(A)).	3	C	H
	Occasional major exceedance of noise criteria (>5dB(A)).	2	C	M
	Regular major exceedance of noise criteria (>5dB(A)).	4	D	H
Increased noise levels associated with Project related road traffic activities causing annoyance, distractions, i.e. 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)).	4	D	M
Maximum noise levels resulting in sleep disturbance.		3	D	M
Vibration from blasting resulting in damage to buildings and structures		3	E	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 analysis of risk following implementation of proposed management measures outlined within Section 4.

Table 3.7 (Cont'd)
Analysis of Unmitigated Environmental Risk*

Potential Environmental Impacts (see Table 3.6)	Level / Scale of Impact (if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating*
Traffic and Transportation				
Increased traffic congestion.		**2**	**C**	**M**
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**
Heritage				
Impact on unidentified sites and/or artefacts of Aboriginal or European cultural heritage as a result of soil stripping and extraction activities.		**3**	**D**	**M**
Visual Amenity				
Reduced Visual Amenity from surrounding residences.	Temporary views of disturbed areas.	2	B	H
	Medium-term views of disturbed areas.	2	A	H
	Long-term views of disturbed areas.	3	E	M
Reduced Visual Amenity from surrounding landholdings.	Temporary views of disturbed areas.	1	A	H
	Medium-term views of disturbed areas.	2	B	H
	Long-term views of disturbed areas.	2	C	M
Socio-Economic Impacts and Property Values				
Improved economic activity and related social impacts attributable to reduced unemployment and capital expenditure.		**n/a**	**n/a**	**n/a**
Reduced quality of life (actual or perceived).		**3**	**C**	**H**
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
* See **Table 6.1** for analysis of risk following implementation of proposed management measures outlined within Section 4.

It is noted that the order each issue as addressed in Section 4 reflects a logical progression through the environmental aspects rather than the priority determined from the risk analysis. In particular, the inclusion of "Socio-economic Issues" as Section 4.12 is not a consequence of the risk analysis. Rather, it is included at the end of Section 4 to enable all other issues to be considered prior to the socio-economic issues as this issue invariably is inter-related with many of the preceding issues.

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