

# Section 3

## Issue Identification and Prioritisation

### PREAMBLE

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

- i. a comprehensive list of all relevant environmental issues was assembled through consultation with the local community and local and State government agencies, completion of preliminary environmental studies and a review of relevant legislation, planning documents and environmental guidelines;*
- ii. a review of the Project design and local environment was undertaken to identify risk sources and potential environmental impacts for each environmental issue;*
- iii. an analysis of **unmitigated** risk for each potential environmental impact was then completed with a risk rating assigned to each impact based on likelihood and consequence of occurrence; and*
- iv. through a review of the allocated risk ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to provide an order of assessment and breadth of coverage within Section 5.*

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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, surrounding and nearby landowners and the wider community. The emphasis or prioritisation has been established from a program of community and government consultation, preliminary environmental studies and literature review. 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*.

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

- consultation with State and local government agencies (Section 3.2.1);
- consultation with surrounding landowners and the local community (Section 3.2.2);
- reference to relevant NSW government legislation and environmental guidelines (Section 3.3); and
- preliminary environmental studies (Section 3.4).

It is noted that Metromix commenced a program of consultation with the relevant government agencies and the local community in 2004, i.e. prior to the decision to set aside the preparation of the then EIS until a lease was negotiated with the landowner for the remaining life of the quarry. A total of five newsletters had been circulated throughout the community in 2004/2005. This sub-section focuses upon the recent consultation undertaken with both the government agencies and local community.

## **3.2 CONSULTATION**

### **3.2.1 Government Agencies**

Metromix consulted with the following relevant government agencies in October 2010 following the completion of the *Preliminary Environmental Assessment* (PEA). The PEA introduced the Project and provided the basis upon which each agency could provide their requirements for the *Environmental Assessment*.

- Department of Planning (DoP).
- Department of Environment, Climate Change and Water (DECCW).
- NSW Office of Water (NOW).
- Lake Macquarie City Council (LMCC).
- Roads and Traffic Authority (RTA).
- Industry & Investment NSW (I&I-NSW).
- Mine Subsidence Board (MSB).
- Hunter – Central Rivers Catchment Management Authority (HCRCMA).

It is noted that a number of these agencies were re-named in April 2011 – see Page ii.

Between November 2010 and March 2011, written requirements were provided by each of these agencies (except HCRCMA) together with the Director-General's Requirements (DGRs) from the then Department of Planning. **Appendix 2** provides a tabulated record of the DGRs and other government agency requirements received and where each have been addressed in the *Environmental Assessment* and *Specialist Consultant Studies Compendium*. The key issues, identified by each of the agencies have been categorised in **Table 3.1**. Written requirements relating to final landform design were provided by five of the seven government agencies, while traffic impacts, groundwater impacts, water quality/monitoring and soils were each identified by three of these agencies.

**Table 3.1**  
**Key issues identified by Government Agencies**

	DoP	DECCW	LMCC	I&I NSW	RTA	MSB	NOW	Total
Final Landform	✓	✓	✓	✓			✓	5
Traffic Impact Study					✓			1
Traffic Routes		✓			✓			2
Traffic Impacts	✓		✓		✓			3
Infrastructure Upgrades					✓			1
Operational Noise	✓	✓						2
Blasting	✓							1
Construction Noise		✓						1
Site Water Balance	✓							1
Water Management System	✓		✓					2
Surface Water Impacts	✓	✓						2
Surface Water Supply/Demands	✓						✓	2
Groundwater Impacts	✓	✓					✓	3
Groundwater Supply/Demands	✓						✓	2
Water Quality and Monitoring		✓	✓				✓	3
Soils		✓	✓				✓	3
Stormwater							✓	1
Fuel/Chemical Storage Areas		✓						1
Greenhouse Gas Emissions	✓							1
Air Pollution (Dust)		✓						1
Air Pollution (Odour)		✓						1
Air Quality Monitoring		✓	✓					2
Rehabilitation Strategy			✓					1
Threatened Species (Flora)	✓	✓						2
Threatened Species (Fauna)	✓	✓						2
Vegetation Clearing	✓	✓						2
Groundwater Dependent Ecosystems	✓						✓	2
Aboriginal Heritage	✓	✓						2
Planning Issues			✓	✓				2
Coal-related Issues				✓		✓		2
Visual Impacts	✓							1

### 3.2.2 Community Consultation

#### 3.2.2.1 Teralba and Surrounding Communities

During the preparation of the *Environmental Assessment*, one newsletter was circulated and community forum held to inform the local community of the proposed quarry extensions and provide an opportunity for community feedback. The more recent newsletter and forum followed a series of similar documents and events conducted in 2004 and 2005. More recently, the following was undertaken to inform the Teralba and surrounding communities about Metromix’s intentions and to seek feedback about the Project.

- November 2010 – Newsletter #6 was circulated amongst residents of Teralba, Wakefield and Barnsley (approximately 350 households) to inform all interested residents about the Project and to also invite them to a community forum / exhibit on 8th and 11th of December. Feedback forms were distributed with the Newsletter to enable interested residents to express their views and ask questions if they couldn’t attend the community forum / exhibition.
- 8th and 11th December 2010 – Community Forum / Exhibition at Teralba Community Hall. Metromix representatives and its consultants were available to outline the planned extensions to and discuss/record any issues that the community wanted to see covered in the *Environmental Assessment*. The community forum in December was attended by 12 persons. A total of 26 feedback forms were also received and responded to by Metromix.

The issues that were raised on the feedback forms and during the December 2010 forum are presented in **Table 3.2** together with reference to the relevant sections of the *Environmental Assessment* where these issues are addressed. Transportation and the use of the local Teralba road network by the product trucks were the most consistently raised community concerns.

**Table 3.2**  
**Issues raised by the Community in Feedback Sheets and During Forums**

Issues Raised	Number of Times Issue was Raised	Section in EA
Traffic	18	5.1
Noise	16	5.6
Dust	10	5.7
Supportive of Quarry	5	-
Community Benefits	3	5.14
Air Quality	3	5.7
Ecology	3	5.4, 5.5
Surface Water	2	5.3
Groundwater	2	5.2
Visual Amenity	2	5.8
Land Values	1	5.14
Source: Metromix 2011		

Further consultation, in the form of a Teralba Business Survey, was conducted with the Teralba Business Community in early May 2011 to ascertain the extent of adverse/beneficial impacts of the existing heavy vehicle traffic through Teralba and potentially in the future. It is noted that the trucks travelling to and from Teralba Quarry account for an average approximately 44% of total truck movements through Teralba, i.e. trucks with a net load of >4 tonnes.

Twelve businesses based in Teralba responded to a questionnaire circulated for the survey. The participating businesses had one to 80 employees and ranged from a pre-stressed concrete manufacturing business (in the Industrial Estate) to a hair dressing salon. The key truck-related issues arising from the survey are presented in **Table 3.3**. Of most concern to local business owners were trucks occasionally travelling too quickly through Teralba. Regular excessive truck noise and vibration, and difficulties experienced by pedestrians, were also identified as being of concern to some business owners.

**Table 3.3**  
**Teralba Business Survey Results**

<b>Issue</b>	<b>No</b>	<b>Rarely</b>	<b>Occasionally</b>	<b>Regularly</b>
Generate excessive noise	4	0	4	3
Generate excessive vibration	6	1	3	1
Travel too quickly	2	1	7	0
Obstruct traffic flow	3	4	4	0
Cause difficulties for pedestrians	4	3	2	2

Notwithstanding the identification of the nominated issues, the majority of the additional written comments provided by the business community showed support for the proposed extensions, acknowledging the long-term industrial nature of the suburb and the reliance many local businesses have on the surrounding mines and quarries. Notably, of the 144 people that were recorded as working for the local businesses that responded, a total of 17 lived in Teralba.

### **3.2.2.2 Consultation with Aboriginal Stakeholders**

Consultation with the local Aboriginal community was coordinated by Metromix’s consultant archaeologist, Archaeological Surveys & Reports (AS&R) and is summarised in AS&R (2011) (Part 9 of the *Specialist Consultant Studies Compendium*) and Section 5.9 of this document. This consultation involved correspondence circulated to a range of nominated parties and the placement of a public notice in the *Newcastle Post* and the *Newcastle Star* on 10 November 2010 inviting Aboriginal stakeholders to register their interest in the Project. As a consequence of the correspondence and public notices, nine stakeholders were identified.

Three of the nine stakeholders participated in the survey of the Project Site on 10 March 2011 and provided reports to be included in the cultural heritage assessment.

- Awabakaba-Ngariliko Aboriginal & Torres Straits Men’s Corporation (Awabakaba-Ngariliko Men’s Corporation);
- Awabakal Descendants Traditional Owners Aboriginal Corporation; and
- Cacatua Culture Consultants.

Copies of the draft assessment were sent to each of the nine registered Aboriginal stakeholders on 21 April 2011. No responses were received within the 21-day response period, however, two were received on later dates, one from Awabakal Descendants Traditional Owners Aboriginal Corporation and one from Awabakal Traditional Owners Aboriginal Corporation. AS&R (2011) includes copies of all relevant correspondence.

### 3.2.2.3 Coal Mining Interests

Two coal seams have been mined from beneath the Teralba Quarry, principally in the mid 1930s. The remaining coal resources beneath Teralba Quarry are covered by a Consolidated Coal Lease CCL718, currently held by Oceanic Coal. The lease is for coal only, i.e. embraces the mines, veins, beds and seams of coal only. During discussions with representatives of Oceanic Coal, the following issues were raised which they requested be addressed in the *Environmental Assessment* or subsequent documentation.

- Importance of maintaining a safe thickness of conglomerate for the ongoing upper level extraction (10m to 12m) above the top of the workings in the Great Northern Coal Seam.
- The blasting procedure adopted for the ongoing lower level extraction should continue to be consistent with the procedure developed in conjunction with Oceanic Coal.
- Importance of rehabilitating the final landform to create a safe and stable site.
- Avoidance of any activities that could contribute to the initiation of spontaneous combustion.

### 3.2.2.4 Other Site Users

Civilake, the Lake Macquarie Council civil works division, and Downer EDI Pty Ltd are both occupiers of the Teralba Quarry site, as detailed in Section 2.2.6. These two enterprises have been consulted throughout the design of the Project and the subsequent preparation of this *Environmental Assessment*. Information has been obtained from both Civilake and Downer EDI with respect to product transportation, air quality and noise controls and surface water management to ensure that a cumulative impact assessment could be effectively undertaken with respect to the surrounding land uses and industrial activities.

## 3.3 REVIEW OF PLANNING ISSUES AND ENVIRONMENTAL GUIDELINES

### 3.3.1 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 by the respective special consultants during the preparation of the *Environmental Assessment*. All relevant guidelines are referred to in their respective reports in the *Specialist Consultant Studies Compendium* supporting this document.

A brief summary of each relevant planning instrument and/or strategy is provided in Sections 3.3.2 to 3.3.4 along with a brief overview as to how these documents have been reviewed or referenced in this document. The application and relevance of planning instruments related to specific environmental issues have also been assessed in the relevant specialist consultant assessments.

### **3.3.2 State Planning Issues**

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

This SEPP was gazetted on 17 February 2007 in recognition of the importance to New South Wales of mining, petroleum production and extractive industries. The SEPP provides a definition for ‘extractive material’ to include sand, gravel, clay, soil, rock and stone and therefore applies to the Project. 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 Project Site;
  - the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the Project Site; and
  - any ways in which the Project may be incompatible with any of those existing, approved or preferred land uses.

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



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

Consideration must be given to whether the Project is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the Project may be incompatible. Measures taken by Metromix to avoid or minimise any incompatibility are to be considered. The public benefits of the Project 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 Project 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 re-use 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 Project 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 7 reviews how each of the considerations presented in Clauses 12 to 17 is addressed in this document.

### **State Environmental Planning Policy (Major Development) 2005**

This SEPP, gazetted on 25 May 2005, identifies projects of significance to NSW, which are to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. It applies to all projects satisfying nominated criteria contained within the schedules of the SEPP. Under Schedule 1 of the SEPP, the 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.

### **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.

In accordance with SEPP 33, 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 storage of up to approximately 40 000L of diesel fuel, a Class 3 C1 combustible liquid, and small amounts of other hydrocarbons including lubricating oils and grease, both Class 3 C2 combustible liquids. The diesel stored on the Project Site would be used principally to fuel the mobile equipment operating within the active extraction area and around the processing area. This fuel storage would supplement the periodic delivery of fuel by a fuel contractor directly to the mobile earthmoving equipment used for extraction operations. 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.

No assessment or screening thresholds are provided in relation to the transport of Class 3 C1 or C2 combustible liquids. However, experience with determinations for projects transporting similar quantities of Class 3 hazardous materials, via comparable transportation routes suggests transportation of diesel to the Project 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 used on the Project Site would result in the Project being considered potentially hazardous under SEPP 33. As such, there is no requirement to neither undertake a Preliminary Hazard Analysis for the Project nor consider SEPP 33 further.

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

Schedule 1 of SEPP 44 contains a list of local government areas to which the SEPP 44 applies; Lake Macquarie City Council is included in the schedule.

Schedule 2 contains a list of tree species that are favoured food tree species of koalas in NSW.

Potential koala habitat is defined in the SEPP as areas of vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. Two schedule 2 tree species occur on the Study Area these being grey gum and tallowwood.

A field survey did not reveal the presence of koalas within the Study Area and therefore did not confirm the Project Site as containing core koala habitat.

The NSW Wildlife Atlas search (7/3/2011) contains 7 records of koalas occurring within 5km of the Project Site, none of which occur within the Project Site. The closest koala record is approximate 3km (accuracy 10km) dated 1/7/2004 – 30/6/2006, the most recent record is dated 5/11/2008 and is approximately 6km (accuracy 500m) from the Project Site. It is considered that these records are not sufficient to indicate that a core koala population occurs within the Project Site.

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

SEPP 55 is considered not applicable given no area of the land within the Project Site is known to be contaminated.

### **Section 117(2) Direction**

The Teralba Quarry is the subject of a Section 117(2) direction issued under the *Environmental Planning and Assessment Act 1979* reflecting the regional importance of the resource within the quarry. The importance of the quarry to the construction industry within the Lake Macquarie Local Government Area has been recognised by Council in its Local Environmental Plans.

## **3.3.3 Regional Planning Issues**

### **Lower Hunter Regional Strategy**

The Lower Hunter Regional Strategy (“the Regional Strategy”) applies to five local government areas of Newcastle, Lake Macquarie, Port Stephens, Maitland and Cessnock and is one of a number of regional strategies prepared by the DoP.

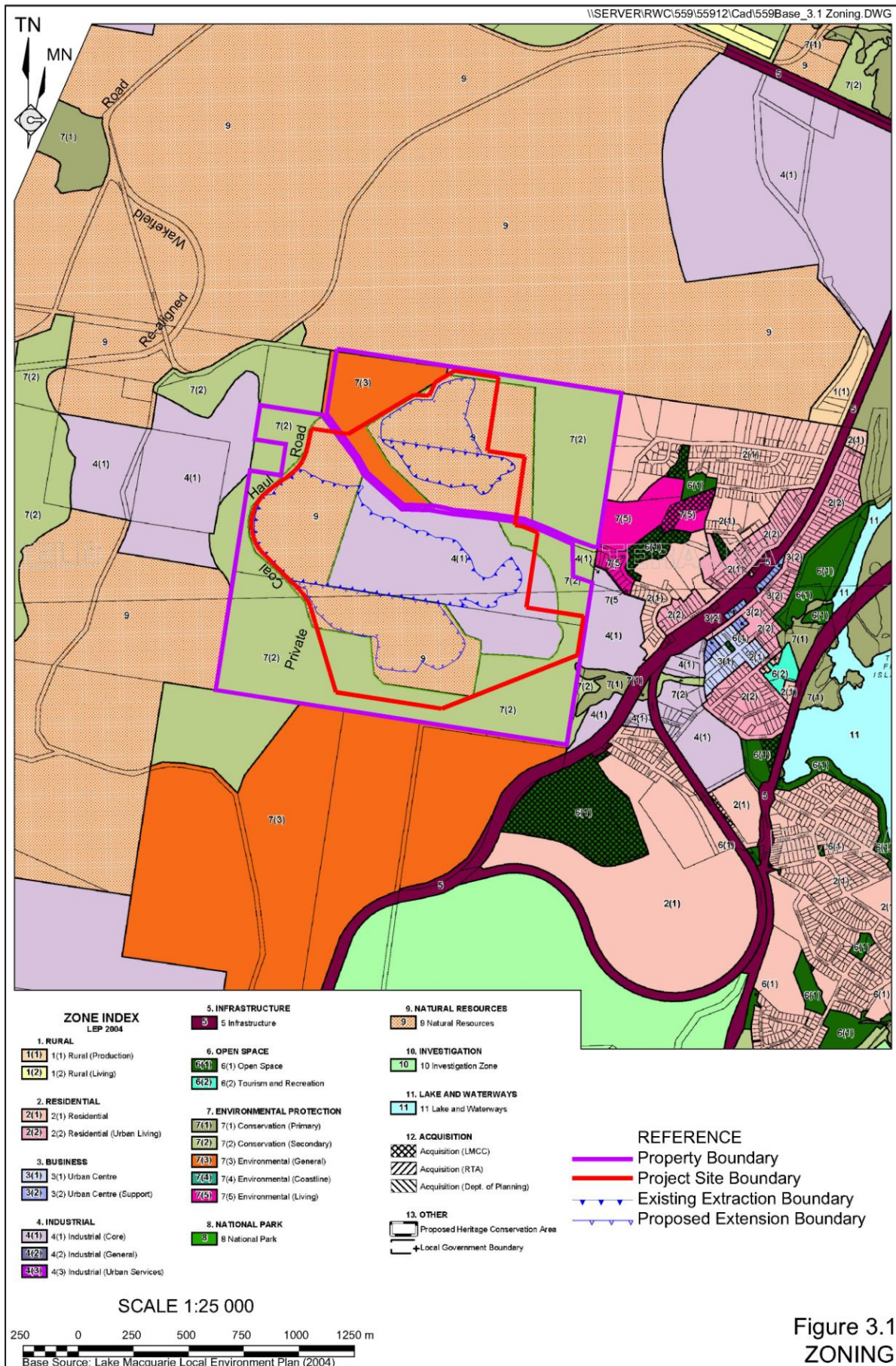
The Regional Strategy represents an agreed NSW government position on the future of the Lower Hunter. It is the pre-eminent planning document for the Lower Hunter Region and has been prepared to complement and inform other relevant State Planning instruments.

The Regional Strategy works with the Government’s Regional Conservation Plan to ensure that the future growth of the Lower Hunter makes a positive contribution to the protection of sensitive environments and biodiversity.

## **3.3.4 Local Planning Issues**

### **Lake Macquarie Local Environmental Plan (2004)**

The Lake Macquarie Local Environmental Plan (LMLEP) 2004 sets the framework for the land use structure throughout the local government area. It is noted that a draft LEP to replace this plan is still in preparation and has not yet been exhibited. The LMLEP 2004 includes a set of land use zones and provides detailed requirements for development. It also establishes what types of development may be permitted on a particular parcel of land with the permission of Council. **Figure 3.1** displays the land use zones across and surrounding the Project Site.



**Figure 3.1**  
**ZONING**

Under the provisions of the LMLEP, the existing Mid Pit Extraction Area, proposed Southern and Northern Extensions and approximately 35% of the existing Southern Extraction Area are zoned '9 – Natural Resources'. The remaining 65% of the existing Southern Extraction Area is zoned '4(1) Industrial (Core).'

It is noteworthy that "extractive industry" is a permissible use (with consent) within both Zones 4(1) and 9.

### **Zone 4(1) – Industrial (Core)**

The four objectives of Zone 4(1) are to:

- provide land for a wide range of employment-generating industries, including manufacturing, processing, assembly, storage and distribution uses, and
- provide land for a range of industrial uses that, because of their nature, require large areas of land or separation from more intensive forms of employment generating industries, and
- ensure that industries are designed and located so as not to cause unacceptable environmental harm or adversely affect the amenity of the environment, including residential neighbourhoods, and
- provide for sustainable water cycle management.

### **Zone 9 – Natural Resources**

The nine objectives of Zone 9 are to:

- provide land that has dual values as an economic natural resource and for environmental protection, and
- recognise the dual values of the land and integrate economic use of the land with ecological sustainability, and
- acknowledge the economic value of its natural resources, particularly for extraction of coal, gravel and timber, and
- acknowledge the long term value of the land for the management and maintenance of biodiversity, threatened species habitat, and corridors by minimising the adverse impacts of resource development, and
- rehabilitate disturbed land to a natural state, reflective of its long term value, and
- minimise earthworks while enabling productive use of the land, and
- permit habitat disturbance to facilitate forestry, surface activities for underground mining and other extraction of mineral and gravel resources and energy generation works, and
- acknowledge the multiple use of State forests for tourism, conservation and sustainable harvesting of timber, and
- provide for sustainable water cycle management.

A further two zones occur within the Project Site, namely 7(2) Conservation (Secondary) and 7(3) Environmental (General). No extraction or clearing would be undertaken on these sections of the Project Site.

The Draft LMLEP (2011) was scheduled for completion by 30 June 2011 but will likely be delayed as the Department of Planning & Infrastructure has identified that the plan has not yet met the 'milestone' markers that would allow the completion of the plan.

### **Development Control Plan No. 1**

The name of this Plan is Lake Macquarie Development Control Plan No. 1 – Principles of Development - Revision 06, (Abbreviated as DCP No.1).

The plan was adopted by Council on 14 March 2011. This plan commenced on 11 April 2011.

DCP No.1 applies to the local government area of Lake Macquarie covered by LMLEP, excluding the area referred to as North Wallarah under LEP 2000 Wallarah Peninsular.

The objectives of DCP No. 1 are to implement the Lifestyle 2020 Strategy (the strategy) by facilitating ecologically sustainable development.

The objectives of DCP No. 1 support the core values of the strategy of sustainability, equity, efficiency and, liveability to:

- promote environmentally sustainable and quality development in the City.
- provide detailed guidance to prospective applicants of Council's requirements for building, subdivision, and land development.
- elaborate on the requirements of the LMLEP as a key tool in the implementation of DCP No. 1.
- provide detailed criteria to assist Council in assessing Development Applications (as required by Section 79C(1)(a) of the *Environmental Planning and Assessment Act*).

DCP No.1 cross-references guidelines for assessing visual throughout the Lake Macquarie LGA. The visual assessment of the Teralba Quarry (Section 5.8) reflects the relevant elements of the guideline (LMCC, 2004).

### **Lifestyle Strategy 2020**

The LMCC Lifestyle 2020 Strategy has been created to provide a long term direction for the overall development of the City (term used in the strategy to refer to the Lake Macquarie LGA) and as a tool for managing private and public developments in Lake Macquarie. The relevant objectives of the Lifestyle 2020 Strategy to the Teralba Quarry extensions are to:

- provide the community with a realistic expectation about the future development patterns of the City, while retaining flexibility for land use decision making in the longer term;

- provide local employment opportunities for residents and to promote economic development consistent with the City's natural, locational and community resources;
- achieve a strong sense of positive community identity, through the development of local communities which are safe and liveable and offer a diversity of use, economic opportunity and ready access to services;
- develop an attractive urban setting for the City which reflects its physical and natural environment, and visual character;
- manage the City's natural environment so that its ecological functions and biological diversity are conserved and enhanced, and contribute to the City's overall wellbeing; and
- manage the City's heritage and economic resources, in a way that protects the value of these resources and enhances the City's character.

Metromix's Project is relevant to these objectives in that the ongoing operation of the quarry would promote economic development through almost 60 jobs and the provision of raw materials for the range of residences, commercial and public buildings and infrastructure throughout Lake Macquarie LGA. Further, the ongoing operation of the quarry has been designed in a balanced manner to manage ecological values whilst producing products required by the community. The quarry has also been designed to retain the visual character on the western side of Lake Macquarie.

### 3.3.5 Environmental Guidelines

The DGRs require that in assessing the identified key assessment requirements, reference be made to one or more guideline documents. In addition, a number of the government agencies consulted in relation to the Project required reference to other environment guideline documents. **Table A2.1** of **Appendix 2** identifies each of the relevant guidelines and identifies the relevant section(s) of the *Environmental Assessment* and / or part of the *Specialist Consultant Studies Compendium* where they are considered and/or addressed.

## 3.4 PRELIMINARY ENVIRONMENTAL STUDIES

During the initial project design phase, a number of preliminary environmental studies were commissioned to identify the constraints posed by the local environment and what elements of the local environment would require further consideration and assessment should the Project be considered for approval. Studies in the fields listed below were commenced.

- |               |                       |
|---------------|-----------------------|
| • Traffic     | • Flora and fauna     |
| • Air Quality | • Surface Water       |
| • Groundwater | • Aboriginal Heritage |
| • Noise       | • Soils               |

The preliminary studies identified issues within these fields which could potentially constrain the Project and have therefore been considered key issues for consideration during the design and assessment of the Project.

### **Traffic**

The key traffic-related issues identified in the preliminary studies were the number of product trucks travelling through Teralba, their hours of operation and the long term maintenance of the roads used by trucks travelling to and from Teralba Quarry.

Traffic modelling has shown that the intersections on the surrounding road network will continue to operate satisfactorily with the quarry traffic under current conditions as well as in 2022, 10 years after the forecast receipt of project approval, should it be granted.

No quarry trucks have to date been involved in any of the crashes identified on the surrounding road network and as the quarry will not be increasing production over the existing levels, there is no reason to believe that this will result in adverse safety conditions. Nonetheless, a code of conduct for drivers travelling to and from the quarry will be implemented to ensure that unacceptable driver behaviour is minimised.

### **Air Quality (Dust)**

SLR Consulting Pty Ltd has completed an Air Quality Impact Assessment for the Project and established that for all pollutants and all averaging periods Metromix's activities within the Project Site is not predicted to exceed the DECCW guideline values. 24 hour average PM<sub>10</sub> are predicted to exceed the DECCW guideline value of 50 µg/m<sup>3</sup> at and just beyond the northernmost border of the Project Site in an area that forms part of a coal mining operation and is not used for residential purposes.

Given that the Project is not predicted to impact upon the nearby residences it is anticipated that the level of emission control technology outlined in this assessment will be sufficient for the Project.

### **Groundwater**

The extraction areas across the Project Site are underlain by workings within the Great Northern Coal Seam and Fassifern Seam. Both of which are prominent aquifers in the local area. The conglomerate itself is sufficiently porous such that it does not hold any permanent groundwater following rainfall events.

The proposed quarry extensions were identified as unlikely to significantly impact upon the occurrence or quality of groundwater beneath the Project Site.

### **Surface Water and Water Resources**

Seven surface water catchments were identified within the Project Site. The northern catchments direct surface runoff towards Cockle Creek which in turn flows to Lake Macquarie. The southern catchments direct runoff to the east towards Lake Macquarie.

It is recognised that a proportion of the water in the dam at the outlet point of the underground adit (the Mine Adit Dam) also contains a small proportion of surface runoff from the processing plant catchment within the Project Site.



Surface water management for the proposed extensions was recognised to be manageable, particularly in light of the experience on site to date.

### Noise

Project specific noise criteria for the ongoing operation of Teralba Quarry were developed in accordance with procedures in the NSW Industrial Noise Policy (INP).

The results of the preliminary noise assessment identified adverse impacts as a result of the night time loading of trucks, trucks transporting quarry products and noise and vibration associated with blasting would be unlikely. There could, however, be some minor impacts at some residences in Railway Street as a result of noise from trucks using the eastern exit from the quarry.

### Flora

The Project Site contains two open forest type vegetation communities, neither of which are endangered. One species listed as threatened under both NSW and Commonwealth legislation, the shrub *Tetratheca juncea*, occurs in the main vegetation community of the Project Site, Spotted Gum – White Mahogany – Grey Iron Bark open forest and woodland. It was recognised it would be desirable to avoid where practicable, known populations of *Tetratheca juncea*.

### Fauna

The preliminary fauna assessment identified eight species listed as vulnerable under Schedule 2 of the *Threatened Species Conservation Act 1995*. The implementation of suitable design and operational safeguards has therefore been identified as important to ensure that the proposed quarry extensions would not result in any significant impacts upon these fauna of conservation significance.

### Aboriginal Heritage

Field investigations and stakeholder consultation has been undertaken on the Project Site in 2004, 2008 and 2010/2011.

In the absence of any artefactual material in a depositional context, or of known specific Aboriginal association with the survey area the research potential of the Project Site is assessed to be low.

Following the investigation in 2004, 2008 and 2011, all of the Aboriginal representatives concluded that there were no cultural constraints to the proposed quarry extensions.

### Soils

Three major soil types were identified within the Project Site. All of which are non sodic to marginally sodic throughout their profile. Most soil types were found to have suitable topsoil for reuse and rehabilitation. Land capability classifications across the Project Site range from Class VI to Class VII.

## 3.5 ANALYSIS OF RISK AND ISSUE PRIORITISATION

### 3.5.1 Analysis of Risk

Risk is the chance of something happening that will have an impact upon the objectives or the task, which in this case is the extension of extraction areas at Teralba Quarry without unacceptable environmental impact. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified as discussed in Sections 3.2 to 3.4, the potential environmental impacts have been allocated a risk rating based on the potential consequences and likelihood of occurrence in accordance with Australian Standards HB 203:2006 and AS/NZS 4360:2004.

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

**Table 3.4**  
**Qualitative Consequence Rating**

Level	Descriptor	Description
5	Catastrophic	<ul style="list-style-type: none"> <li>• Massive and permanent detrimental impacts on the environment.</li> <li>• Very large area of impact.</li> <li>• Massive remediation costs.</li> <li>• Reportable to government agencies.</li> <li>• Large fines and prosecution resulting in potential closure of operation.</li> <li>• Severe injuries or death.</li> </ul>
4	Major	<ul style="list-style-type: none"> <li>• Extensive and/or permanent detrimental impacts on the environment.</li> <li>• Large area of impact.</li> <li>• Very large remediation costs.</li> <li>• Reportable to government agencies.</li> <li>• Possible prosecution and fine.</li> <li>• Serious injuries requiring medical treatment.</li> </ul>
3	Moderate	<ul style="list-style-type: none"> <li>• Substantial temporary or minor long term detrimental impact to the environment.</li> <li>• Moderately large area of impact.</li> <li>• Moderate remediation costs.</li> <li>• Reportable to government agencies.</li> <li>• Further action may be requested by government agency.</li> <li>• Injuries requiring medical treatment.</li> </ul>
2	Minor	<ul style="list-style-type: none"> <li>• Minor detrimental impact on the environment.</li> <li>• Affects a small area.</li> <li>• Minimal remediation costs.</li> <li>• Reportable to internal management only.</li> <li>• No operational constraints posed.</li> <li>• Minor injuries which would require basic first aid treatment.</li> </ul>
1	Insignificant	<ul style="list-style-type: none"> <li>• Negligible and temporary detrimental impact on the environment.</li> <li>• Affects an isolated area.</li> <li>• No remediation costs.</li> <li>• Reportable to internal management only.</li> <li>• No operational constraints posed.</li> <li>• No injuries or health impacts.</li> </ul>

Source: modified after HB 203:2006 - Table 4(B)

**Table 3.5**  
**Qualitative Likelihood Rating**

Level	Descriptor	Description
A	Almost Certain	Is expected to occur in most circumstances.
B	Likely	Would 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 mitigation measures such as operational controls or systems or other safeguards in place. Based on a qualitative assessment of consequence and likelihood, a risk ranking of either; low, medium, high or extreme was assigned to each potential impact based on the matrix of **Table 3.6**.

**Table 3.6**  
**Risk Ranking**

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 3.7** presents the risk sources, identified receptors, potential consequences if actions are not mitigated and the likelihood of the consequence occurring. An assessment of the **unmitigated** risk for each potential scenario is presented based on the classifications and definitions provided.

**Table 3.7**  
**Analysis of Unmitigated Environmental Risk**

Environmental Issue	Risk Source(s)	Receptor / Surrounding Environment	Potential Consequence if not mitigated	Combined Consequence rank	Likelihood if unmitigated	Unmitigated or Raw Risk
Air Quality	<ul style="list-style-type: none"> <li>Dust from extraction and processing operations stockpiles and exposed quarry surfaces.</li> <li>Dust from vehicle movements on site and off site.</li> </ul>	<ul style="list-style-type: none"> <li>Residences and other local buildings.</li> <li>Local residents and businesses.</li> <li>Surface water bodies.</li> <li>Surrounding native vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Increased deposited dust and associated nuisance for local residents and business.</li> <li>Increased complaints to Metromix by community.</li> <li>Reduction in local water quality.</li> <li>Reduction in local air quality and resultant health effects for both people and vegetation.</li> </ul>	Moderate (3)	Likely (B)	High
	<ul style="list-style-type: none"> <li>Particulate and greenhouse emissions from vehicles and fixed plant on the site.</li> </ul>	<ul style="list-style-type: none"> <li>Local and regional air shed.</li> </ul>	<ul style="list-style-type: none"> <li>Cumulative reduction in local and regional air quality.</li> <li>Contribution to increase in greenhouse gas emissions to atmosphere.</li> </ul>	Insignificant (1)	Unlikely (D)	Low
Noise and Vibration	<ul style="list-style-type: none"> <li>Noise from fixed and mobile plant, and equipment on site and trucks on site and off site.</li> </ul>	<ul style="list-style-type: none"> <li>Local residents, business and land owners.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced amenity for local residents both locally and along transport routes.</li> <li>Increased complaints to Metromix by community.</li> </ul>	Moderate (3)	Possible (C)	High
		<ul style="list-style-type: none"> <li>Native fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of and/or reduction of local native fauna species due to noise disturbance.</li> <li>Possible loss of species in the local area.</li> </ul>	Minor (2)	Unlikely (D)	Low
	<ul style="list-style-type: none"> <li>Vibration from blasting and other extraction operations on site.</li> </ul>	<ul style="list-style-type: none"> <li>Local residents, business and land owners.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced amenity for local residents both locally and along transport routes.</li> <li>Damage to surrounding residences and buildings.</li> <li>Increased complaints to Metromix by community.</li> </ul>	Moderate (3)	Possible (C)	High
		<ul style="list-style-type: none"> <li>Native fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of and or reduction of local native fauna species due to noise disturbance leading to possible loss of species in the local area.</li> </ul>	Minor (2)	Unlikely (D)	Low

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

Environmental Issue	Risk Source(s)	Receptor / Surrounding Environment	Potential Consequence if not mitigated	Combined Consequence rank	Likelihood if unmitigated	Unmitigated or Raw Risk
Traffic	<ul style="list-style-type: none"> <li>Increased traffic levels on road network to the west of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Local residents, business, land owners.</li> </ul>	<ul style="list-style-type: none"> <li>Increased traffic congestion and accidents.</li> <li>Deterioration of road surface.</li> </ul>	Moderate (3)	Likely (B)	High
		<ul style="list-style-type: none"> <li>Native fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Native animals killed on road.</li> </ul>	Insignificant (1)	Possible (C)	Low
	<ul style="list-style-type: none"> <li>Consistent traffic levels to the east of the site at Teralba.</li> </ul>	<ul style="list-style-type: none"> <li>Local residents, business and land owners.</li> </ul>	<ul style="list-style-type: none"> <li>Contribution to traffic congestion and accidents.</li> <li>Continued deterioration of road surface.</li> </ul>	Moderate (3)	Likely (B)	High
		<ul style="list-style-type: none"> <li>Native fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Native animals killed on road.</li> </ul>	Insignificant (1)	Possible (C)	Low
Surface water resources and quality	<ul style="list-style-type: none"> <li>Construction of intersection on Rhondda Road.</li> </ul>	<ul style="list-style-type: none"> <li>Local residents, business and land owners.</li> </ul>	<ul style="list-style-type: none"> <li>Road construction delays and associated nuisance.</li> </ul>	Moderate (3)	Likely (B)	High
	<ul style="list-style-type: none"> <li>Capture and use of on-site surface water</li> </ul>	<ul style="list-style-type: none"> <li>Groundwater beneath the site.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced groundwater recharge beneath the site leading to reduced groundwater resource volumes.</li> </ul>	Moderate (3)	Possible (C)	High
		<ul style="list-style-type: none"> <li>Surface water contaminated with suspended solids from processing operations and site erosion, or from chemicals and fuels stored and used on site.</li> </ul>	<ul style="list-style-type: none"> <li>Local surface water resources.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in water quality on site and downstream of site (Lake Macquarie).</li> </ul>	Moderate (3)	Possible (C)
	<ul style="list-style-type: none"> <li>Groundwater beneath the site.</li> </ul>		<ul style="list-style-type: none"> <li>Reduction in quality of local groundwater resource.</li> </ul>	Moderate (3)	Possible (C)	High

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

<b>Environmental Issue</b>	<b>Risk Source(s)</b>	<b>Receptor / Surrounding Environment</b>	<b>Potential Consequence if not mitigated</b>	<b>Combined Consequence rank</b>	<b>Likelihood if unmitigated</b>	<b>Unmitigated or Raw Risk</b>
Groundwater resources and quality	<ul style="list-style-type: none"> <li>Abstraction of water at Mine Adit Dam.</li> </ul>	<ul style="list-style-type: none"> <li>Groundwater beneath the site.</li> <li>Local users of groundwater for resident / business purposes.</li> <li>Groundwater dependent ecosystems.</li> <li>Groundwater fed surface water courses.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction of volume and flow rates of local groundwater resource and subsequent availability to local users.</li> </ul>	Moderate (3)	Possible (C)	High
	<ul style="list-style-type: none"> <li>Groundwater contaminated with suspended solids from processing operations, erosion and/or chemicals and fuels used on site.</li> </ul>	<ul style="list-style-type: none"> <li>Local users of groundwater for resident/business purposes.</li> <li>Groundwater dependent ecosystems.</li> <li>Groundwater fed surface water bodies.</li> </ul>	<ul style="list-style-type: none"> <li>Groundwater resource is no longer suitable for use by local users.</li> <li>Local surface water bodies become contaminated.</li> <li>Impact to and possible loss of groundwater dependent ecosystems due to contamination of waters.</li> </ul>	Moderate (3)	Possible (C)	High
Flora and Fauna	<ul style="list-style-type: none"> <li>Removal of threatened flora and fauna species identified at the site through clearing activities.</li> </ul>	<ul style="list-style-type: none"> <li>Native flora on site and local fauna using the site including threatened species.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of local and regionally important threatened species (flora and fauna).</li> <li>Reduced local and regional biodiversity.</li> </ul>	Moderate (3)	Likely (B)	High
Bushfire	<ul style="list-style-type: none"> <li>Initiation of bushfire due to on site activities.</li> </ul>	<ul style="list-style-type: none"> <li>Local residents, local residences, local businesses.</li> <li>Native flora and fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of life, assets and property on site and in surrounding area.</li> <li>Reduction of operating performance for site and surrounding businesses.</li> <li>Destruction and damage of native flora and fauna.</li> </ul>	Moderate (3)	Likely (B)	High

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

Environmental Issue	Risk Source(s)	Receptor / Surrounding Environment	Potential Consequence if not mitigated	Combined Consequence rank	Likelihood if unmitigated	Unmitigated or Raw Risk
Soil Resources and Erosion	<ul style="list-style-type: none"> <li>Removal and loss or degradation of soil resource on site due to overburden stripping and surface water runoff.</li> </ul>	<ul style="list-style-type: none"> <li>On site soil resource.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced soil resource to undertake appropriate rehabilitation program.</li> <li>Compromised soil quality leads to poor vegetation regrowth on site.</li> </ul>	Moderate (3)	Likely (B)	High
		<ul style="list-style-type: none"> <li>On and off site surface water bodies.</li> </ul>	<ul style="list-style-type: none"> <li>Sedimentation of on-site and local surface water bodies resulting in poor water quality.</li> </ul>	Moderate (3)	Possible (C)	High
Rehabilitation and final landform	<ul style="list-style-type: none"> <li>Rehabilitated soils and vegetation of the site.</li> </ul>	<ul style="list-style-type: none"> <li>On site future land use.</li> </ul>	<ul style="list-style-type: none"> <li>Soils and vegetation quality and suitability for future use is compromised or restricted.</li> </ul>	Moderate (3)	Likely (B)	High
		<ul style="list-style-type: none"> <li>Surrounding residences.</li> </ul>	<ul style="list-style-type: none"> <li>Inadequate or inappropriate rehabilitation leads to reduced visual amenity of local residents.</li> </ul>	Moderate (3)	Likely (B)	High
	<ul style="list-style-type: none"> <li>Final landform and topography of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding residences.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced visual amenity of local residents.</li> </ul>	Moderate (3)	Likely (B)	High
		<ul style="list-style-type: none"> <li>On site future land use.</li> </ul>	<ul style="list-style-type: none"> <li>Landform and topography suitability for future use is compromised or restricted.</li> </ul>	Moderate (3)	Likely (B)	High
Heritage	<ul style="list-style-type: none"> <li>Clearing of land and general on site operations resulting in ground disturbance</li> </ul>	<ul style="list-style-type: none"> <li>Local Aboriginal community</li> <li>Local European heritage items</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of, damage to, or removal of known or unidentified Aboriginal heritage artefacts or heritage items.</li> </ul>	Moderate (3)	Possible (C)	High
Visual Amenity	<ul style="list-style-type: none"> <li>Changes in the visual character of the Project Site</li> </ul>	<ul style="list-style-type: none"> <li>Surrounding residents and passers by</li> </ul>	<ul style="list-style-type: none"> <li>Reduced visual amenity of local residents and passers by.</li> </ul>	Moderate (3)	Possible (C)	High
		<ul style="list-style-type: none"> <li>Residents on eastern side of Lake Macquarie (typically &gt;3km) and on Lake Macquarie</li> </ul>	<ul style="list-style-type: none"> <li>Reduced visual amenity from residences and for lake users</li> </ul>	Minor (2)	Likely (B)	High
Socio-economic	<ul style="list-style-type: none"> <li>Increase in local employment for quarry operations.</li> </ul>	<ul style="list-style-type: none"> <li>Local community and residents</li> </ul>	<ul style="list-style-type: none"> <li>Change of social activities in local settlements due to increased employment levels both directly and indirectly.</li> </ul>	Insignificant (1)	Possible (C)	Low
	<ul style="list-style-type: none"> <li>Proximity of quarry to local and neighbouring properties</li> </ul>	<ul style="list-style-type: none"> <li>Local community and residents</li> </ul>	<ul style="list-style-type: none"> <li>Perceived / loss of amenity at local and neighbouring properties.</li> </ul>	Moderate (3)	Possible (C)	High

### 3.5.2 Environmental Issue Prioritisation

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

- The key assessment requirements of the DGRs (see **Appendix 2**).
- Issues with a high frequency of identification by local government agencies (see **Table 3.1**) and the local community (**Table 3.2**).
- Environmental issues having a high or extreme **unmitigated** risk rating (see **Table 3.7**).

Based on the above three criteria, the following priority issues are identified for the assessment of the Teralba Quarry Extensions.

1. Traffic and Transport
2. Groundwater
3. Surface Water
4. Flora and Fauna
5. Rehabilitation and Final Landform
6. Noise and Vibration
7. Air Quality
8. Visual Amenity
9. Soils and Erosion
10. Aboriginal and European Heritage
11. Bushfire
12. Socio-Economic Setting

It is noted that the issues associated with “Rehabilitation / Final Landform” are included as part of the sections on water resources and soils.

The sources of risk and potential environmental impacts associated with each issue are discussed within relevant sub-sections within Section 5. All other issues generally allocated a “moderate” or “low” level of priority, have been addressed to the level considered appropriate throughout the *Environmental Assessment*.