GLOUCESTER RESOURCES LTD

ABN: 46 114 162 597

Documentation Supporting an Application for Director-General's Requirements for the

ROCKY HILL COAL PROJECT

Prepared by:

R.W. CORKERY & CO. PTY. LIMITED

February 2012

This page has intentionally been left blank

GLOUCESTER RESOURCES LTD

ABN: 46 114 162 597

Rocky Hill Coal Project

Documentation Supporting an Application for Director-General's Requirements

Prepared for:

Gloucester Resources Limited
ABN: 46 114 162 597
Level 37 Riverside Centre
123 Eagle Street
BRISBANE QLD 4000

Telephone: (07) 3006 1834
Facsimile: (07) 3006 1840
Email: gpolwarth@amci.com.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Brooklyn Office:
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Facsimile: (02) 9985 8208
Email: brooklyn@rwcorkery.com

Orange Office:
62 Hill Street
ORANGE NSW 2800

Telephone: (02) 6362 5411
Facsimile: (02) 6361 3622
Email: orange@rwcorkery.com

Brisbane Office:
Level 19, 1 Eagle Street
BRISBANE QLD 4000

Telephone: (07) 3360 0217
Facsimile: (07) 3360 0222
Email: brisbane@rwcorkery.com

Ref No. 806/02

February 2012

This Copyright is included for the protection of this document

CONTENTS

CONTENTS

Page

CONTENTS

Page

FIGURES

CONTENTS

Page

TABLES

PLATES

COVERAGE OF SUPPORTING DOCUMENTATION IN THIS DOCUMENT

Documentation	Coverage in this Document
1. **Site Details**	
(a) Local and regional context of the proposal	Section 3.1
(b) Surrounding development.	Section 3.3
(c) Potentially affected properties.	Section 3.3
(d) Location of key infrastructure.	Section 5.3
(e) Location of key environmental features.	Sections 5.1 to 5.10
2. **Development Description**	
(a) Concise summary of the proposal	Section 4
(b) Description of types of activities.	Sections 4.4, 4.5 and 4.6
3. **Permissibility and Strategic Planning**	
(a) Relevant strategic planning documents.	Section 2.2
(b) Relevant environmental planning instruments.	Section 2.2
(c) Key development standards.	Sections 5.1.2, 5.2.2 and 5.4.1
4. **Preliminary Environmental Assessment**	
(a) Preliminary risk assessment.	Section 2.4
(b) Expected environmental impacts.	Section 5
(c) Strategies to address expected impacts.	Section 5
5. **Justification**	
(a) Why were the site(s) chosen?	Section 4
(b) Alternatives considered.	Section 4.11
(c) Strategic context of the proposal.	Section 4.2
(d) Wider regional/state benefits.	Section 5.11.3
6. **Consultation**	
(a) Consultation with local community.	Section 1.4.1
(b) Consultation with local Council.	Section 1.4.2
(c) Consultation with NSW Government agencies.	Section 1.4.2
7. **Capital Investment Value**	
(a) Accurate estimate of the CIV.	Application Form
(b) Quantity surveyor's report.	Not Required*

* Not required for a coal mine.

This page has intentionally been left blank

COMMONLY USED ACRONYMS IN THIS DOCUMENT

AGL	AGL Upstream Infrastructure Investments Pty Ltd
ARTC	Australian Rail Track Corporation Ltd
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DGRs	Director-General's Requirements
DP&I	Department of Planning & Infrastructure (NSW)
DRE	Division of Resources and Energy (NSW)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services (NSW)
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPL	Environment Protection Licence
GRL	Gloucester Resources Limited
LEP	Local Environmental Plan
LGA	Local Government Area
NOW	NSW Office of Water
OEH	Office of Environment and Heritage (NSW)
ROM	Run-of-Mine
SEPP	State Environmental Planning Policy
TSC Act	*Threatened Species Conservation Act 1995 (NSW)*

SUMMARY OF KEY FACTS AND STATISTICS - PROPOSED ROCKY HILL COAL PROJECT

Applicant:
- Gloucester Resources Limited

Application Area/ Site
- Mine Area (745ha)
- Overland Conveyor Corridor (111ha)
- Rail Load-out Facility (45ha)

Area of Disturbance
- Mine Area (540ha)
- Overland Conveyor Corridor (25m x 2km = 5ha)
- Rail Load-out Facility (15ha)

Project Overview
- Project Life = up to 21 years (including construction and rehabilitation)
- In situ Resource (to 150m) = 42 million tonnes
- Recoverable Coal Resource up to 30 million tonnes [1]
- Targeted Coal Seams
  - Cloverdale
  - Bowen Road
  - Avon
  - Roseville
  - Glenview
  - Weismantel
  - Marker 1

  (and other marker and minor seams)
- All coal recovered by open cut methods
- Overburden/Interburden = up to 150 million bank cubic metres (Mbcm)
- Maximum Run-of-Mine (ROM) Coal Production = up to 2.5 million tonnes per annum (Mtpa)
- All ROM coal to be washed in on-site Coal Handling and Preparation Plant (CHPP)
- Product Coal Production = maximum 1.75 Mtpa (at 70% assumed yield)
- All CHPP coarse/fine rejects to be emplaced as backfill with overburden
- Access via The Bucketts Way/Jacks Road/Waukivory Road/McKinleys Lane/private mine access road
- Estimated employment: Construction (100)/Operations (150)
- All coal products despatched by rail: at maximum production approximately 2 trains per day (average)
- Hours of Operation

	Core Hours of Operation	**Potential Additional Hours of Operation**
Mining	7:00am – 10:00pm, Monday to Saturday	10:00pm – 7:00am (limited activities subject to satisfying sleep disturbance criteria)
CHPP	7:00am – 10:00pm, Monday to Saturday	
Train Loading	24hrs/day, 7 days per week	
Maintenance	24hrs/day, 7 days per week	

[1] The recoverable coal resource will be further defined following the receipt of additional quality data and detailed mine planning.

1. INTRODUCTION

This section introduces the Rocky Hill Coal Project ("the Proposal"), the Applicant and the Site. It also provides relevant background information and an overview of the consultation undertaken and proposed, and reviews the environmental studies commenced and the team assembled to undertake the assessment of the Proposal.

1.1 SCOPE

Gloucester Resources Limited ("the Applicant" or "GRL") proposes to develop and operate a small scale open cut coal mine 3.5km to 7km southeast of Gloucester (see **Figure 1.1**). This proposed mine and its associated overland conveyor and Rail Load-out Facility are located on land owned, under an option to purchase, or the subject of current negotiations by the Applicant.

This document has been assembled by R.W. Corkery & Co. Pty Limited on behalf of the Applicant to provide the NSW Department of Planning & Infrastructure (DP&I) and other relevant government agencies with sufficient information to enable the Director-General's Requirements (DGRs) for an Environmental Impact Statement to be prepared for "the Proposal".

This document identifies the key environmental issues identified by the Applicant and its consultant team and outlines further investigations planned, as well as the approach to the overall design of the proposed mine.

Although planning to date has adequately defined the location of most Proposal components, three options are presented for the supply of power to be used on site. The definition of the proposed power infrastructure will be finalised for inclusion in the *Environmental Impact Statement* for the Proposal.

1.2 THE APPLICANT AND THE SITE

1.2.1 The Applicant

The Applicant, Gloucester Resources Limited, was initially formed to focus on coal exploration activities within Exploration Licences (ELs) 6523, 6524 and 6563 within the Gloucester Basin and, subject to favourable results from those activities, to potentially develop the identified coal resources. The proposed Rocky Hill Coal Project has arisen as a result of the Applicant's exploration activities to date.

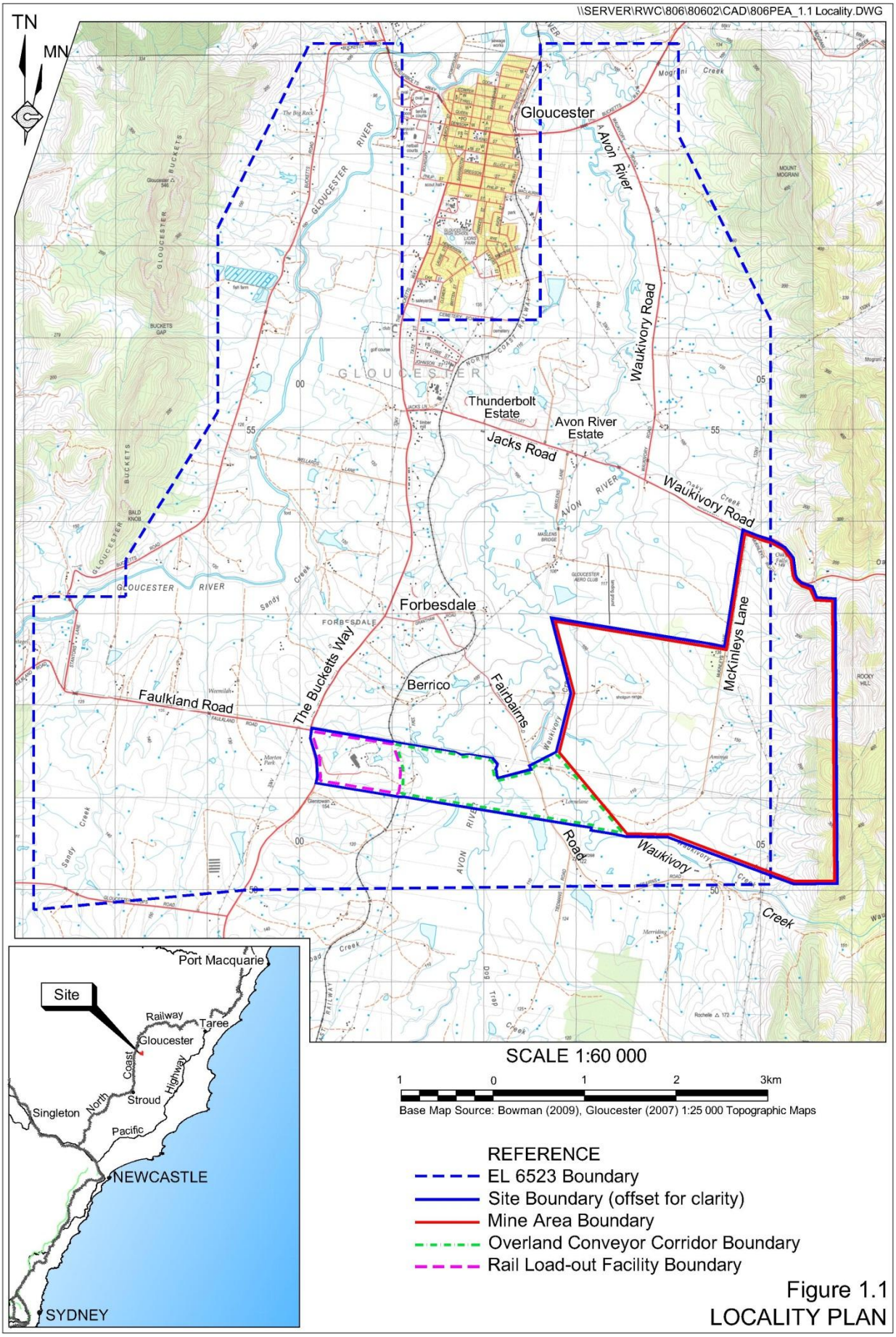


Figure 1.1
LOCALITY PLAN

GRL is operated by a board and management team with numerous years of experience in open cut and underground coal mining projects. The current board and the majority of the management team have been in place since early 2010. The key GRL personnel are as follows.

- Keith Ross – former Managing Director
- Grant Polwarth – Managing Director
- Bob Corbett – Environment Manager
- Ken Wilson – Technical Services Manager
- Mark Bobeldyk – Exploration Manager

Further information on the background which has culminated in the proposed Rocky Hill Coal Project is provided in Section 1.3.

1.2.2 The Site

The Site for the Rocky Hill Coal Project corresponds to the application area for development consent and comprises three proposed component areas, namely:

- the Mine Area;
- Overland Conveyor Corridor; and
- Rail Load-out Facility.

All land within the Site is owned, under an option to purchase, or the subject of current negotiations by the Applicant.

Figure 1.2 displays the location of each component area and **Table 1.1** lists the associated land titles. The majority of the Site lies within Exploration Licence (EL) 6523.

Table 1.1
Application Area Land Titles*

Mine Area	Conveyor Corridor	Rail Load-out Facility
Lot 2 DP 868581	Lot 1 DP 594237	Lot 28 DP 606093
Lot 21 DP 1048749	Lot 2 DP 1040412	Road Reserves
Lot 26 DP 1112877	Lot 26 DP 112877	
Lot 129 DP 979859	Lot 29 DP 606093	
Lot 222 DP 1061235	Fairbairns Road	
Lot 253 DP 785579	North Coast Railway	
Lot 251 DP 785579	Road Reserve	
Lots 301 to 304 DP 864518		
Lot 911 DP 748573		
Lot 252 DP 785579		
Council Public Road and Road Reserves		
* See **Figure 1.2** for land title boundaries		

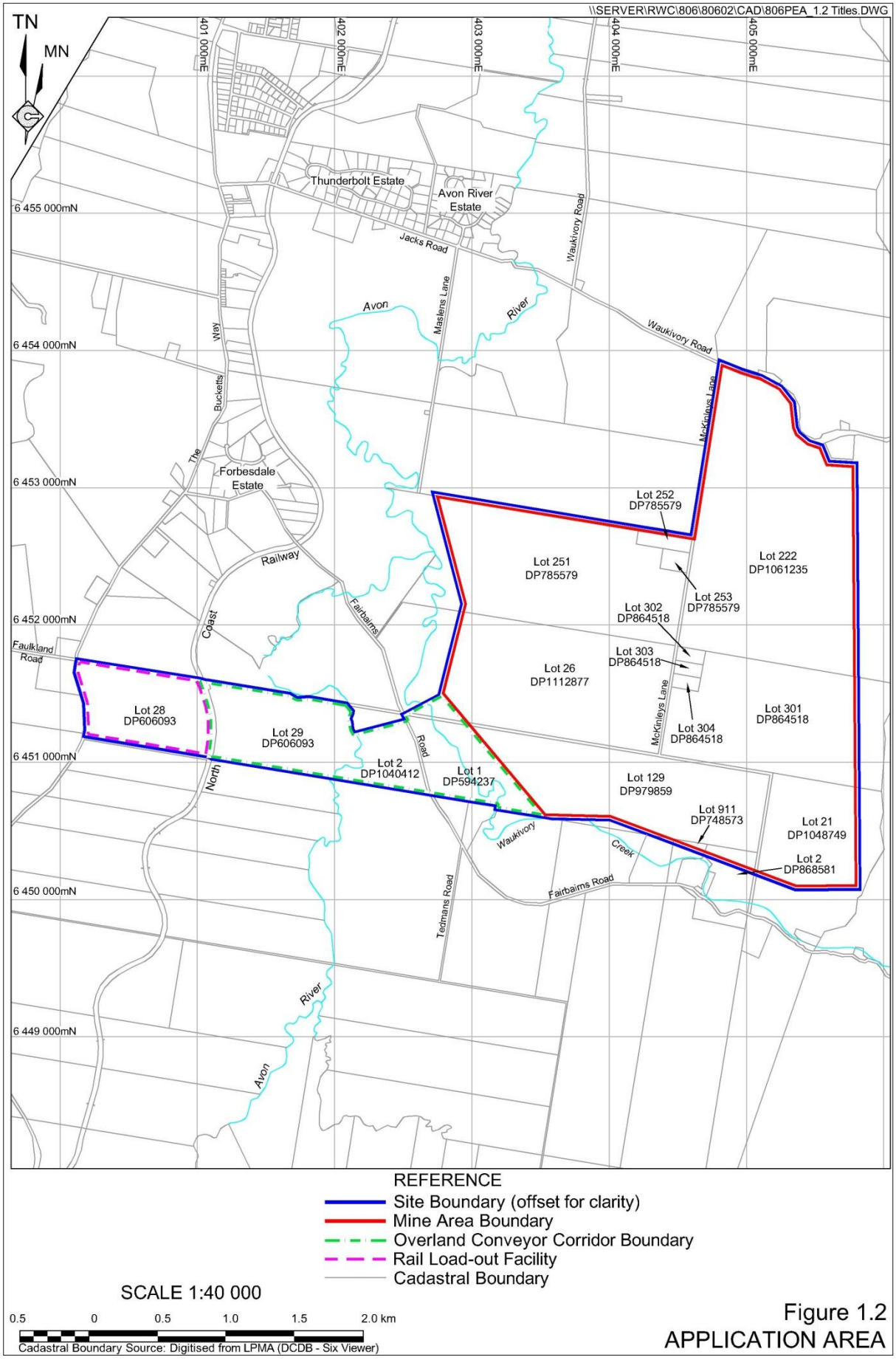


Figure 1.2
APPLICATION AREA

1.3 PROJECT BACKGROUND

Previous Coal Exploration

Coal was first discovered in the Gloucester Basin in 1855, although it was not until the early 1970s when exploration programs commenced and provided the basis for understanding the geology of the basin and the occurrence of the numerous coal seams.

Previous exploration in the Gloucester Basin was undertaken by Noranda Australia Limited, Blue Metal Industries Pty Ltd, Esso Exploration and Production Australia Inc., Excel Mining Pty Ltd and CIM Resources Ltd (now called Gloucester Coal Ltd).

In 2006, GRL was granted three exploration licences, namely EL6523, EL6524 and EL6563, covering an overall area of approximately 112km^2 (see **Figure 1.3**). The majority of the area covered by the exploration licences traversed the western side of the Gloucester Basin with a small section on the eastern side of the basin southeast of Gloucester. Following the grant of the three exploration licences, the then company management initiated a program of land acquisition and/or negotiated agreements with landowners to allow more detailed coal exploration to proceed and commenced limited exploration activities.

Recent Coal Exploration

In early 2010, the management of GRL changed and the new management adapted and accelerated the exploration program, initially concentrating in the area southeast of Gloucester within EL6523 and more recently, in the Woods Road area within EL6524 and EL6563 (see **Figure 1.3**). Exploration has now defined sufficient recoverable coal within the southeastern corner of EL6523 to allow the Applicant to develop plans for a proposed coal mine, i.e. the Rocky Hill Coal Project. The outcomes of the coal resource investigations within the Mine Area to date are summarised in Section 3.2.2.

Other Surrounding Projects

Figure 1.4 displays the location of the following two approved and/or proposed projects which need to be assessed in a cumulative manner (to the extent necessary) with the Applicant's Proposal.

Gloucester Coal Ltd – Coal Mining Operations

The exploration undertaken in the 1990s by the predecessors to Gloucester Coal Ltd (including CIM Resources Ltd and Excel Mining Pty Ltd) defined sufficient coal to allow coal mining to commence in the Stratford area. Gloucester Coal Ltd commenced coal production from the Main deposit at Stratford in 1995, its Duralie Mine in 2002, its Bowen Road North deposit in 2003 and its Roseville West Pit in 2009. The Bowen Road North and Roseville West deposits are located 1.5km north and 1km northwest of the Main deposit respectively. Gloucester Coal Ltd has recently announced that it intends to apply for development consent for an extension of its existing Stratford operations (Gloucester Coal, 2011).

The Stratford Extension Project would involve the extension of an existing approved open cut pit (Roseville West Pit) and two new additional open cut pits together with the extension of two existing waste emplacements. Other related activities include road re-alignments, continued backfill of completed open pits with an annual ROM coal production rate of 2.6Mtpa.

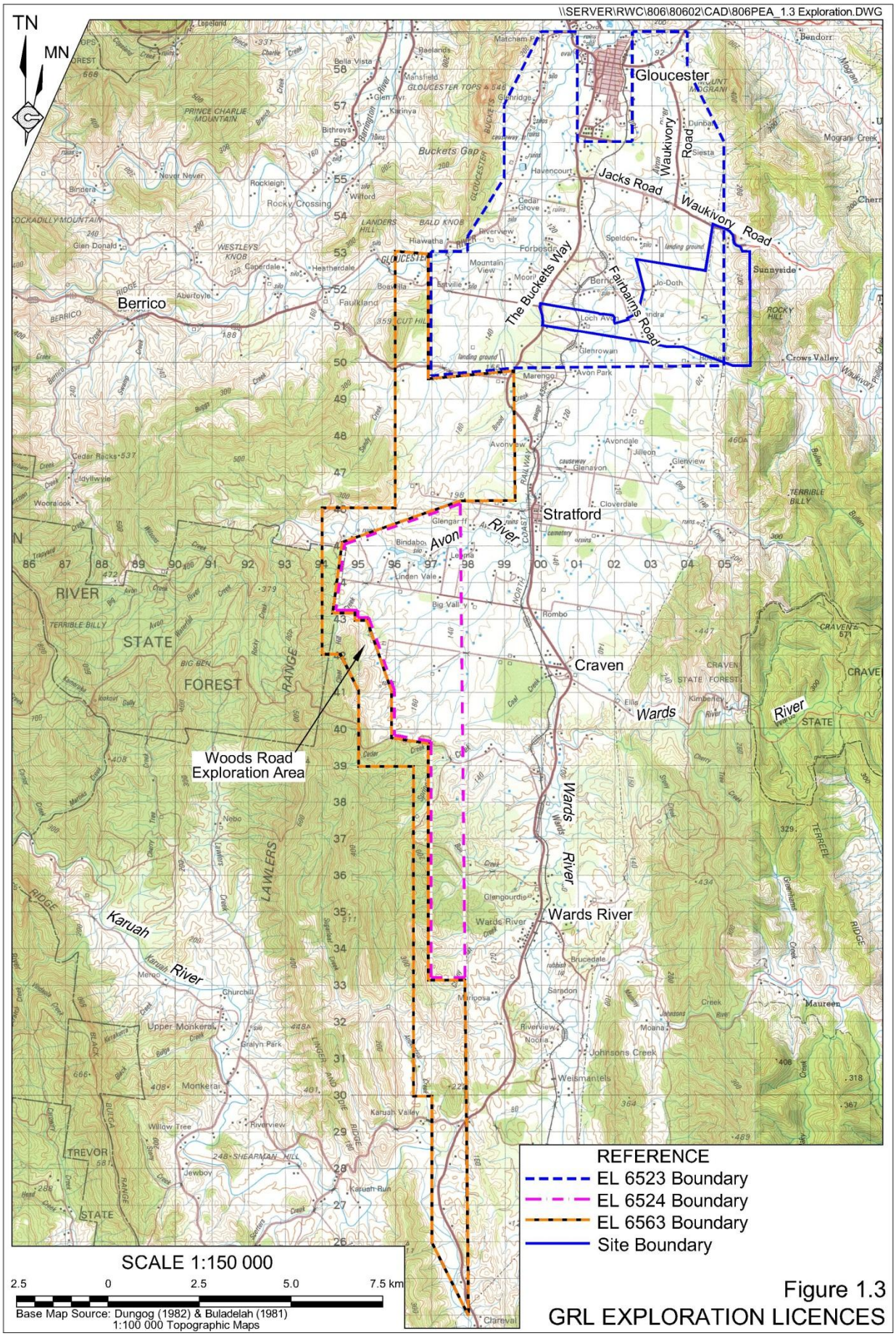


Figure 1.3
GRL EXPLORATION LICENCES

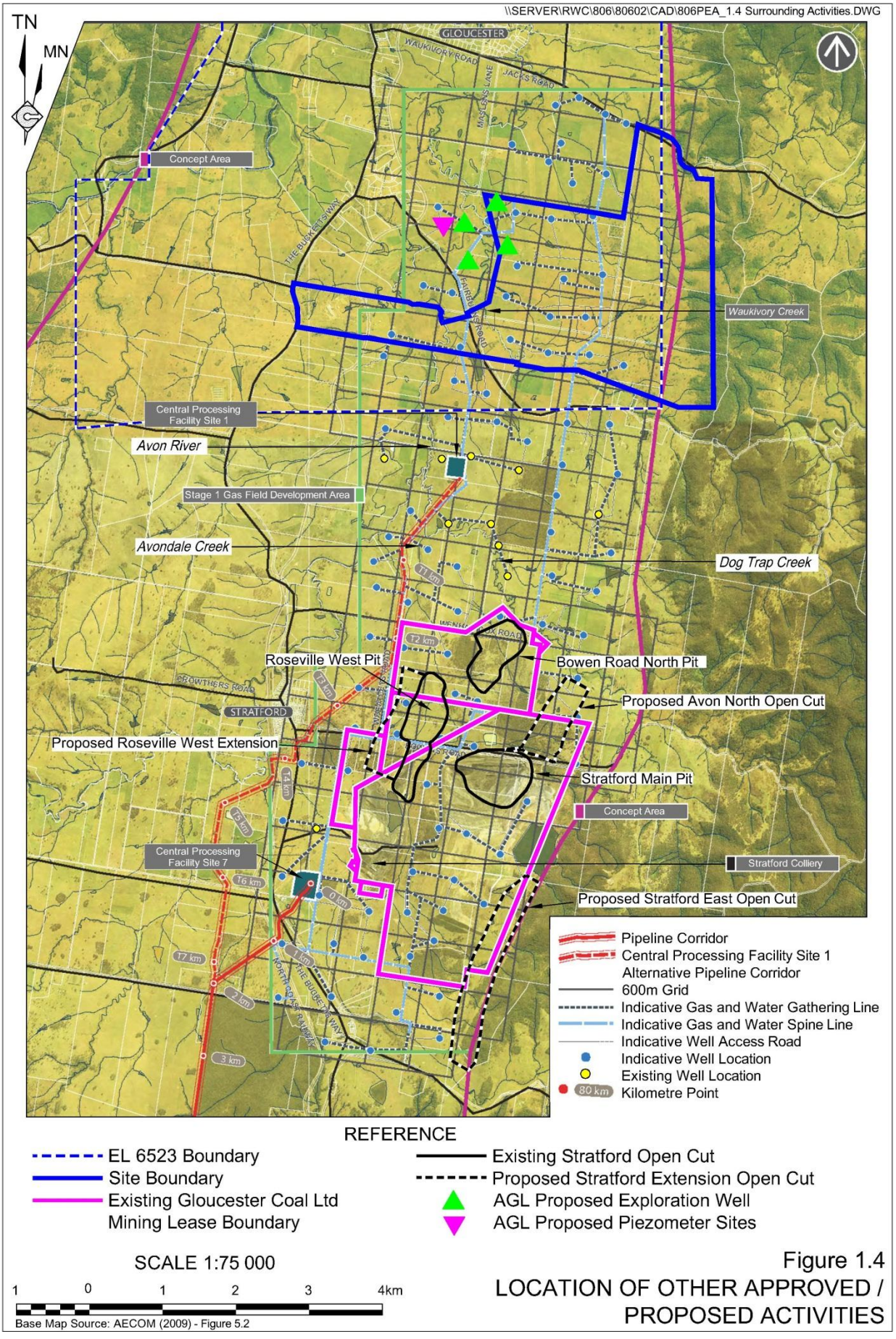


Figure 1.4
LOCATION OF OTHER APPROVED / PROPOSED ACTIVITIES

Subject to progress and information availability, the Stratford Extension Project proposed by Gloucester Coal Ltd to the south of the Site will be assessed by the consultant team advising the Applicant to ensure cumulative impacts of the two coal mining operations are clearly defined.

AGL Upstream Infrastructure Investments Pty Ltd – Coal Seam Gas Exploration and Production

AGL Upstream Infrastructure Investments Pty Ltd (AGL) has received approval (subject to a court appeal) to develop the Stage 1 Gas Field Development Area, centred on the town of Stratford. AGL has also received approval for four exploration (pilot) wells within and immediately adjacent to the Applicant's Mine Area and also plans to install two groundwater monitoring piezometers in the same area. The detailed environmental assessments of the Rocky Hill Coal Project would also address any cumulative impacts of the approved AGL Project and proposed ongoing exploration activities planned by AGL.

Both of these Projects are discussed further in Sections 6.2 and 6.3.

1.4 CONSULTATION

1.4.1 Community Consultation

Under the terms of ELs 6523, 6524 and 6563 administered by the Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS - formerly Department of Primary Industries – Mineral Resources), a community consultative community, known as the Gloucester Exploration Project Community Consultation Committee (CCC), was established in 2007 to:

> "*provide a forum for open discussion between the company, Gloucester Resources Limited, the appointed community representatives, other interested stakeholders and relevant government agencies. The process includes exchange of information, proper identification and addressing of potential concerns and conflicts of interest. Of equal importance, it is aimed at facilitating good working relationships amongst committee members and to act as a conduit to assist Gloucester Resources Limited to improve communication, education and notification with the general community*"[2].

The committee has held a total of 24 meetings to date with issues raised including land purchases, air quality and health impacts, mining in proximity to Gloucester, environmental data availability, and the development of a Company website.

[2] Source: Charter of the Gloucester Exploration Project Community Consultative Committee

Since the commencement of its exploration activities, the Applicant has also engaged in a program of individual landowner and, more recently, broader community consultation, to inform potentially affected persons and the broader community about its exploration activities and its environmental investigations. A program to discuss the planned mining operations with the broader community will be initiated. Community consultation undertaken to date has enabled the Applicant to engage with a number of potentially interested stakeholders about their concerns and identify issues that need to be addressed in the design of Proposal and subsequently covered in the *Environmental Impact Statement.* Issues raised during these various discussions have included air quality, health issues, noise, local traffic, employment potential and visibility.

Throughout the preparation of the *Environmental Impact Statement*, the Applicant intends to expand its program of community consultation through the Gloucester Exploration Project CCC, the release of newsletters, one-on-one discussions with all stakeholders who register an interest and facilitation of drop-in community forums. The Applicant maintains a website, www.grlcoal.com.au which, amongst other things, presents all approved environmental documentation pertaining to its exploration activities, and is developing a dedicated website for the Rocky Hill Coal Project. This website, www.rockyhillproject.com.au, will provide a mechanism for members of the community to pose questions and raise any issues/concerns as well as present summaries of air quality and meteorological monitoring data, fact and information sheets, and summaries of meetings of the Community Consultative Committee.

All relevant issues raised throughout the community consultation process will be comprehensively addressed in the *Environmental Impact Statement* and/or the appropriate specialist studies/assessments.

1.4.2 Government Agency Consultation

Preliminary discussions have already been held with Gloucester Shire Council, DRE (DTIRIS) DP&I and the NSW Office of Water (NOW) to introduce the Proposal to these agencies and to gain input on the studies required for the assessment of potential environmental impacts. Discussions have also been held with the Australian Rail Track Corporation Ltd (ARTC) and Essential Energy regarding the suitability of the existing rail and power infrastructure to support the Proposal.

The specific requirements of all relevant government agencies will be sought by DP&I in the near future following the circulation of this document and, if deemed warranted, a Planning Focus Meeting with representatives of each agency.

1.4.3 Other Resource Companies

GRL has initiated discussions with both Gloucester Coal Ltd and AGL Upstream Infrastructure Investments Pty Ltd regarding issues of mutual interest for their respective projects.

1.5 MANAGEMENT OF INVESTIGATIONS

This document has been prepared by Mr Rob Corkery, M.Appl.Sc., B.Sc (Hons), Principal of R.W. Corkery & Co Pty. Limited (RWC) and Mr Scott Hollamby B.EnvSc (Hons), Senior Environmental Consultant with RWC.

Details of the Proposal have been provided by the former Managing Director Mr Keith Ross, Mr Grant Polwarth and the other Directors of GRL and GRL's Environment Manager, Mr Bob Corbett, with the assistance of Mr Ken Wilson, Mr Mark Bobeldyk, MMG Civil, Mr Ken Byatt and Mr Aaron Donelan in the areas of coal quality, exploration, mine design and planning, coal processing, and geology and resource definition, respectively.

A range of environmental investigations have been initiated to identify the environmental constraints that need to be taken into account by the Applicant during the design of the Proposal. These studies are being undertaken by a team of specialist consultants managed by RWC including the following key individuals and companies

- Mr Ronan Kellaghan – PAEHolmes – Air Quality.
- Dr Marcus Lincoln-Smith – Cardno Ecology Lab Pty Ltd – Aquatic Ecology.
- Mr Brian Wilson – Ecotone Ecological Consultants Pty Ltd – Ecology.
- Mr Michael Batchelor – WRM Water & Environment Pty Ltd – Surface Water.
- Mr James Tomlin – Australasian Groundwater & Environmental Consultants Pty Ltd – Groundwater.
- Mr Adam Bioletti – Wilkinson Murray Pty Ltd – Noise and Vibration.
- Mrs Ellen Davis-Meehan and Ms Jenny Roberts – Key Insights Pty Ltd – Socio-Economic Issues.
- Mr John Appleton – Archaeological Surveys and Reports – Aboriginal and European Cultural Heritage
- Dr Richard Lamb – Richard Lamb & Associates – Visibility.
- Mr Geoff Cunningham – Geoff Cunningham Natural Resource Consultants Pty Ltd – Soils, Land Capability and Agricultural Impact.
- Mr Ben Rossiter – Constructive Solutions Pty Ltd – Traffic and Transport.

These and additional specialist consultancies will complete relevant assessments of the key issues and the identification of the design and operational safeguards for the Proposal for inclusion in the *Environmental Impact Statement*.

The Applicant also commissioned GSS Environmental to investigate and map the location of the alluvial sediments within and adjacent to the Mine Area and GHD to facilitate rail connection design and enquiries.

2. APPROVALS REQUIRED, PLANNING ISSUES AND THE APPROVALS PROCESS AND PRELIMINARY RISK ASSESSMENT

This section introduces the approvals the Applicant understands will be required for the Rocky Hill Coal Project to proceed. The State and local planning issues are canvassed and the overall approvals process outlined.

2.1 APPROVALS REQUIRED

Based upon the current design of the Proposal and understanding of relevant environmental issues, the Rocky Hill Coal Project would require the following approvals to proceed.

1. Development consent under the *Environmental Planning and Assessment Act 1979* as the Proposal, being for coal mining, is recognised as State Significant Development under *State Environmental Planning Policy (State and Regional Development) 2011* for which approval is required from the Minister for Planning and Infrastructure or the Planning Assessment Commission.
2. Mining Leases under the *Mining Act 1992* for the area nominated as the application area or Site. The issuing authority would be the Minister for Resources and Energy. Prior approval will be required from the Minister for Resources and Energy to enable a mining lease application to be lodged over the area external to the EL 6523 boundary which is required for mining purposes such as overburden emplacement.
3. An Environment Protection Licence under the *Protection of the Environment Operations Act 1997*. The issuing authority would be the Office of Environment and Heritage (Environment Protection Authority) (OEH (EPA)).
4. An Aquifer Interference Licence under the *Water Management Act 2000* for the removal of water from aquifer(s) during the course of mining. The issuing authority would be the NSW Office of Water (NOW).
5. A permit under the *Roads Act 1993* to undertake the proposed road and intersection works and improvements for the Proposal, together with the overland conveyor crossing either over or beneath Fairbairns Road. Gloucester Shire Council would be the issuing authority for the required permits.
6. Approval from the ARTC to construct an overland conveyor over the North Coast Railway.
7. Approval from the Minister for Resources and Energy under Section 100 of the *Coal Mine Health Safety Act 2002* for the establishment of emplacement areas within the Mine Area.

The Applicant also proposes to refer the Proposal to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) to establish whether the Proposal is a controlled action under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*. In the unlikely event the Proposal is determined to be a controlled action under the EPBC Act, an approval would be sought from the Commonwealth Minister for DSEWPaC.

It is noted that the issuing of a development consent as identified in 1. above is a pre-requisite for the receipt of approvals 2. to 5. and the EPBC Act approval, if required.

Following receipt of development consent, the Applicant would also seek the necessary approvals from Gloucester Shire Council for the closure of the section of McKinleys Lane south of the entrance to the proposed offices and amenities (**Figure 4.2**), that component of the east-west oriented Faulkland Road extension road reserve and the north-south road reserve adjacent to Lot 21 DP1048749 lying within the Site, and construction of buildings, structures and appropriate sewage treatment systems for the Proposal.

2.2 PLANNING ISSUES

2.2.1 State Planning Issues

The following five State Environmental Planning Policies (SEPPs) have been identified which do or could potentially apply to the Proposal.

- SEPP (State and Regional Development) 2011
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007
- SEPP 33 – Hazardous and Offensive Development
- SEPP 44 – Koala Habitat Protection
- SEPP 55 – Remediation of Land

State Environmental Planning Policy (State and Regional Development) 2011

Being a coal mine, the Applicant's Proposal is identified as State Significant Development under Schedule 1 of the SEPP which was gazetted on 1 October 2011.

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

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

The SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development. A summary of the matters that the consent authority needs to consider when assessing the Applicant's Proposal is as follows.

- **Clause 12**: Compatibility of proposed mine with other land uses.
- **Clause 13**: Compatibility of proposed development with mining.
- **Clause 14:** Natural resource management and environmental management.
- **Clause 15:** Resource recovery.
- **Clause 16:** Transportation.
- **Clause 17:** Rehabilitation.

An assessment of how each of these clauses is addressed with respect to the Applicant's Proposal will be provided within the *Environmental Impact Statement*.

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

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures, would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment. A risk screening for the Proposal would be undertaken in accordance with the document entitled *Applying SEPP 33,* (DoP, 2008).

State Environmental Planning Policy No. 44 – Koala Habitat Protection

The Gloucester 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 within the Site. Schedule 2 of this policy also provides a list of tree species that are favoured feed 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. Preliminary studies completed by Ecotone Ecological Consultants Pty Ltd have established that the Site contains three of the listed feed tree species, namely, red gum (*Eucalyptus tereticornis)*, grey gum (*E. punctata)* and tallowwood (*E. microcorys*). These species have been identified within the few areas of remnant vegetation present in parts of the Site and constitute at least 15% of these areas, albeit representing less than 5% of the total area to be disturbed throughout the life of the Proposal.

It is noteworthy no Koalas or evidence of Koalas were found during the ecological survey of the Site and its surrounds. Hence, no core Koala habitat is present. However, as a consequence of some areas of remnant vegetation containing greater than 15% of the favoured feed tree species, these parts are recognised to be "potential Koala habitat".

State Environmental Planning Policy No. 55 – Remediation of Land

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

As the areas proposed for disturbance within the Mine Area have previously been used only for dairying or grazing cattle, it is highly unlikely any contamination is present that requires remediation work prior to undertaking the proposed mining operation.

In May 2010, prior to GRL's acquisition of the proposed Rail Load-out Facility site, a Phase 1 environmental site assessment (ESA) of that component representing the decommissioned Boral Timber Mill site was undertaken by Coffey Environments Australia Pty Ltd (CE). The ESA identified 13 areas of environmental concern and recommended that a Phase 2 ESA and a Hazardous Materials Survey (HMS) be undertaken. The HMS, also undertaken in May 2010, established that no high risk (classified as A1 and A2) hazardous and/or asbestos containing

materials were present or suspected on site. The Phase 2 ESA undertaken in July 2010 (involving nine test pits, 37 soil samples and four stockpile samples) identified TPH contaminated surface soils near a former diesel tank and elevated levels of boron in an ash stockpile; recommended the off-site disposal of the ash stockpile and the management of the contaminated soil by way of an Environmental Management Plan (EMP). Under the supervision of CE, the ash stockpile and underlying soil was removed and CE also prepared an EMP for the site.

Based upon preliminary investigations regarding the grazing land and the surveys of the former Boral Timber Mill site, SEPP 55 may be relevant to the consideration of the demolition of the Boral timber treatment facility within the Rail Load-out Facility.

2.2.2 Local Planning Issues

The Site is located within the Gloucester Local Government Area for which the *Gloucester Local Environmental Plan* (LEP) *2010* is relevant. **Figure 2.1** displays the section of the Gloucester LEP 2010 relevant to the Site and its surrounds. Both the Mine Area and the Conveyor Corridor traverse both the E3 – Environmental Management Zone and RU1 – Primary Production Zone, while the Rail Load-out Facility is confined to the RU1 zone. **Figure 2.1** displays that two further zones lie within 2km of the Site, namely E2 – Environmental Conservation and Zone R5 – Large Lot Residential.

It is noted that Gloucester LEP 2010 nominates that mining is permissible with consent in the RU1 zone but is not permissible in the E3 zone. Notwithstanding the non-permissibility of mining in the E3 zone under the LEP, the proposed Rocky Hill Coal Project is permissible under the *State Environmental Planning Policy* (SEPP) *(Mining, Petroleum Production and Extractive Industry)* 2007 as Gloucester LEP 2010 nominates "extensive agriculture" as permissible in the subject area. The permissibility of agriculture is nominated in the SEPP (Mining, Petroleum Production and Extractive Industry) as a pre-requisite for the SEPP to allow mining to be permissible.

The planning objectives of the RU1 Zone (Primary Production) and E3 Zone (Environmental Management) are as follows.

Zone RU1 – Primary Production

The three objectives of the RU1 Zone are to:

1. encourage sustainable primary industry production by maintaining and enhancing the natural resources base, whilst promoting diversity in enterprise and systems appropriate to the area;
2. minimise the fragmentation of resource lands and any conflict between land uses within the zone and adjoining zones; and
3. encourage ecotourism enterprises that minimise any adverse effect on primary industry production and the scenic amenity of the area.

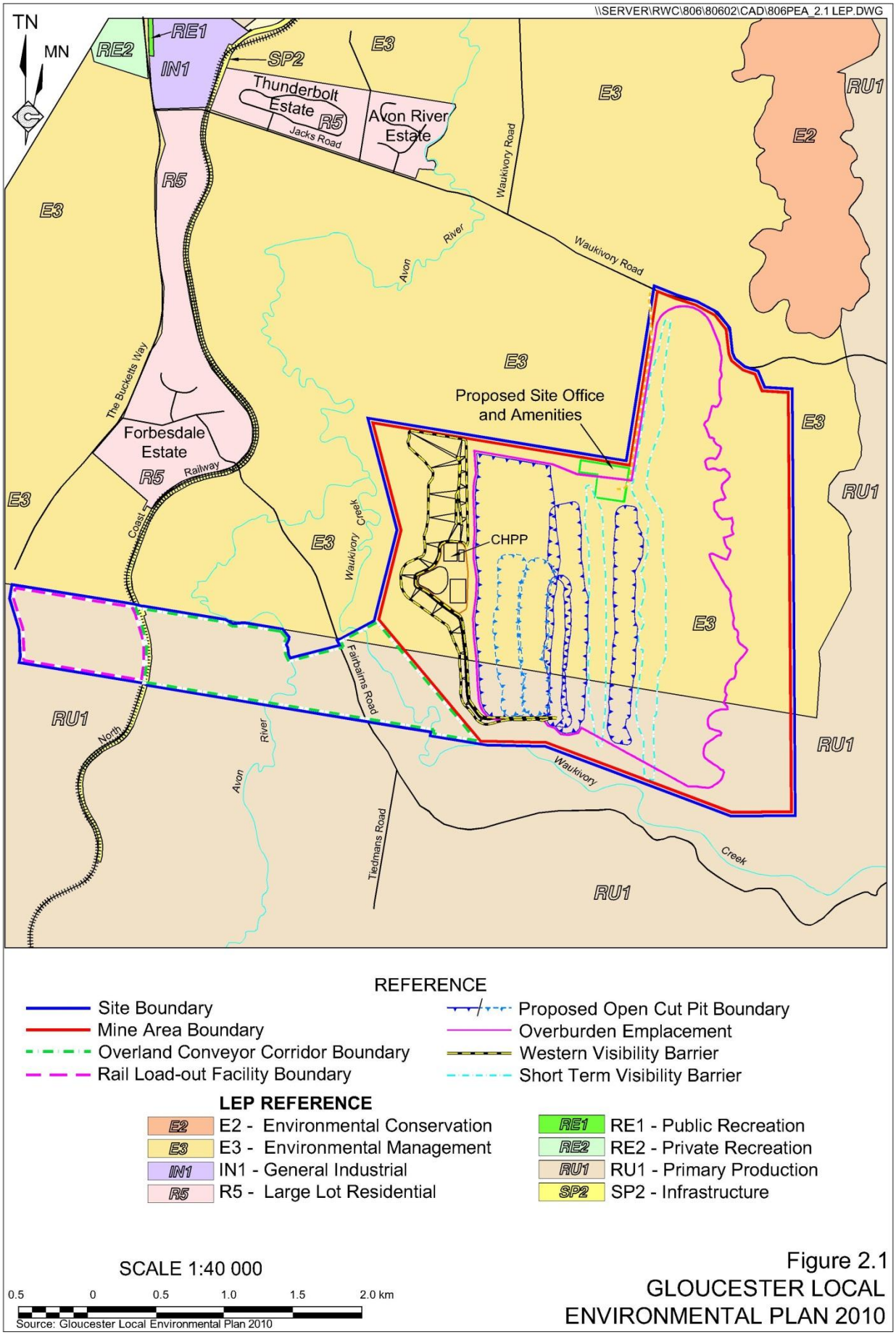


Figure 2.1
GLOUCESTER LOCAL ENVIRONMENTAL PLAN 2010

Zone E3 – Environmental Management

The three objectives of the E3 Zone are to:

i) protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values;

ii) provide for a limited range of development that does not have an adverse effect on those values; and

iii) conserve the biological diversity and native vegetation corridors, and their scenic qualities, in a rural setting.

The Applicant recognises these objectives and has endeavoured to design the Proposal, and will continue to refine the Proposal design, so as to reflect these objectives to the greatest extent possible.

2.3 THE APPROVALS PROCESS

Table 2.1 presents the component stages of the approvals process under the EP&A Act and for some of the other approvals referred to in Section 2.1 and provides an indicative Project timetable currently being followed by the Applicant. It is noted that the timing for a number of the component stages, namely those stages that are managed by the DP&I have been given an indicative timing based principally upon previous approvals issued for coal mining projects under Part 3A of the EP&A Act. However, based upon the submission of an adequate *Environmental Impact Statement* to be placed on public exhibition in September 2012 and the subsequent granting of development consent, assuming it is granted, the Applicant proposes to commence development of the mine during the first quarter of 2013 and despatch the first coal in the first quarter of 2014.

Table 2.1
Approvals Process for the Proposal and the Applicant's Indicative Timing

Page 1 of 2

Indicative Timing*	Activity
Ongoing	Extensive project planning as well as local and wider community consultation
Early February 2012	Submit Request for Director-General's Requirements and supporting documentation to the Department of Planning and Infrastructure
Mid February 2012	Refer the project to the Commonwealth Government in accordance with the requirements of the *EPBC Act 1999*
Mid March 2012	Commonwealth Government determines if the Proposal is a controlled action under the *EPBC Act 1999*
End March 2012	Department of Planning and Infrastructure issues Director-General's Requirements for the Environmental Impact Statement
Early April 2012	Lodge mining lease application(s) with Division of Resources and Energy
End July 2012	Lodge Development Application and Environmental Impact Statement with Department of Planning and Infrastructure for acceptance by the Department
Mid August 2012	Department of Planning and Infrastructure places Development Application and Environmental Impact Statement on public exhibition
September 2012	Public exhibition of the Environmental Impact Statement

Table 2.1 (Cont'd)
Approvals Process for the Proposal and the Applicant's Indicative Timing

Indicative Timing*	Activity
Early November 2012	Provide responses and clarification of issues arising from the exhibition of the Environmental Impact Statement to the Department of Planning and Infrastructure so that it can prepare its Assessment Report
Early November 2012	Lodge applications for an Environment Protection Licence as well as lodge applications for other approvals required under various other Acts.
End November 2012	Department of Planning and Infrastructure completes the assessment report
Late December 2012	Completion of assessment by Planning Assessment Commission
* Based on best estimates of the Applicant and RW Corkery & Co Pty Ltd.	

2.4 PRELIMINARY RISK ASSESSMENT

2.4.1 Introduction

The process adopted to identify the relevant issues and undertake a preliminary risk assessment has involved a combination of preliminary stakeholder consultation, preliminary environmental investigations and review of relevant documents culminating in an internal broad brush risk assessment workshop.

Further investigations on the depth and scope of the environmental issues requiring coverage in the *Environmental Impact Statement* documentation will be identified through the following processes.

- On-going consultation with the local community, and local and State government agencies, following receipt of DGRs.
- A detailed externally facilitated risk assessment undertaken in line with Australian Standards.
- Completion of preliminary environmental studies.
- Review of relevant legislation, planning documents and environmental guidelines.
- Qualitative analysis of risk for each potential environmental impact.

2.4.2 Preliminary 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 the development and operation of the Rocky Hill Coal Project. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified, the potential environmental impacts have been allocated a risk rating based on the potential consequences and likelihood of occurrence and reflecting the Applicant's and its specialists' understanding of the likely effectiveness of the required mitigation measures.

Table 2.2 presents a preliminary analysis of environmental risk for the key issues identified to date for assessment of the Rocky Hill Coal Project.

Table 2.2
Preliminary Risk Analysis

Activity / Impact	Assessed Risk
Air Quality	
Dust generation from Site activities causing reduced air quality	Medium
Greenhouse gas emissions from Project activities contributing to climate change	Low
Exhaust emissions from project-related plant and equipment causing reduced air quality	Low
Noise and Vibration	
Noise generated from Site activities causing nuisance and health impacts	Medium
Noise generated off site by project-related traffic and transport causing nuisance in the surrounding area	Low
Vibration from blasting and extraction processes causing nuisance and damage to buildings	Low
Traffic and Transportation	
Mine employees, service providers and deliveries to / from the Site adding to road vehicle use	Low
Changes to rail traffic levels and scheduling with other rail users between the Site and the product destination	Low
Surface Water Resources and Quality	
Alteration of natural surface water flows within the Site and surrounding local catchments	Low
Reduction of the surface water quality in the surrounding local catchments	Medium
Groundwater Resources and Quality	
Alteration of natural groundwater flows within the Site and surrounding local area	Medium
Reduction of the groundwater quality in the surrounding local area	Low
Visual Amenity	
Changes to the visual amenity of the Site causing loss of amenity in the surrounding area	Medium
Terrestrial Ecology	
Removal and loss of threatened native flora and fauna species due to direct clearing and on-going project-related activities	Low
Aquatic Ecology	
Changes to the surface water quality in the surrounding local catchment area, leading to adverse impacts on aquatic ecology	Low
Soil Resources and Erosion	
Removal and loss or degradation of soil resources within the Site	Low
Agricultural Land Capability and Productivity	
Site activities leads to loss of important productive agricultural land	Low
Rehabilitation and Final Landform	
Inadequate or inappropriate rehabilitation and final landform at the Site leading to compromised or restricted future land use.	Low
Heritage (Aboriginal and European)	
Site activities results in loss or damage to heritage items or sites.	Low
Socio-economic	
Changes in local employment and revenue due to Project activities	Medium
Proximity of Site and proposed activities to local residences, properties and business and associated change of amenity	Medium

3. ENVIRONMENTAL SETTING

This section provides a brief overview of the regional and local setting of the Site. The attributes of the environmental setting described relate to topography, drainage, geology, surrounding land ownership and residences and climate. Each of these attributes is referred to when discussing other environmental features of the local area and in the presentation of the preliminary environmental impact assessment in Section 5.

3.1 TOPOGRAPHY AND DRAINAGE

The Site is located within the Stroud - Gloucester Valley, a local valley comprising a series of ridges and undulating lowlands. The ridges generally trend north-south, rising 100m to 200m above the valley floor with side slopes ranging from approximately 14° to 45°. The undulating lowlands, with typical slopes of <5° and elevations of 100m AHD to 130m AHD, occur across the valley floor. Terracing occurs adjacent to the main watercourses and the lower parts of the valley are subject to periodic flooding.

Two main river systems are present within the Stroud - Gloucester Valley. The Avon River and Gloucester River system drain to the north and the Mammy Johnsons Creek and Karuah River system drain to the south (see **Figure 3.1**).

The Mine Area is located on the eastern side of the Stroud - Gloucester Valley and straddles the two major topographic units, namely the ridges and intermediate undulating lowlands. Within the Mine Area, the topography is mainly undulating with gentle slopes on the western side (elevations range from 100m AHD to 130m AHD) and low to moderate hills on the eastern margin (elevations range from 130m AHD to 180m AHD). The steepest slopes located east of McKinleys Lane are effectively the lower slopes of the eastern ridge. One named hill immediately east of the Mine Area is "Rocky Hill", with an elevation of approximately 440m AHD. The local topography is shown on **Figure 3.2**.

The topography within the Overland Conveyor Corridor is largely flat given the land comprises the flood plains of Waukivory Creek and the Avon River. Elevations along the Overland Conveyor Corridor vary from approximately 100m AHD to 115m AHD.

The land within the Rail Load-out Facility generally slopes to the east within elevations of approximately 145m AHD near The Bucketts Way falling to approximately 106m AHD near the North Coast Railway Line.

Figure 3.2 also displays the drainage lines within the Site. A total of ten individual catchments have been defined within the Mine Area all of which drain either westerly or northwesterly. The drainage within the Overland Conveyor Corridor is dominated by the presence of both Waukivory Creek and the Avon River while a total of three small catchments occur within the Rail Load-out Facility, all of which flow in a general easterly direction towards the Avon River.

Further consideration of surface water resources within and surrounding the Site is presented in Section 5.4.

3.2 GEOLOGICAL SETTING

3.2.1 Regional Setting

The Gloucester Basin is a north-south trending synclinal structure approximately 40km long and 10km wide and containing two Late Permian coal measures, namely the Gloucester Coal Measures and the underlying Dewrang Group. In general, the strata are folded and dip steeply along the eastern and western basin margins and are near horizontal towards the centre of the basin. Regionally, the strata have been affected by reverse and normal faulting throughout the basin. **Figure 3.3** displays the simplified geology of the Gloucester Basin.

On the basin's eastern margin, the Gloucester Coal Measures are interbedded with over 50 generally thin coal seams subcropping at the surface. A few of the coal seams are thick and traceable over almost the entire eastern margin of the basin and are of most economic importance. The economically important seams identified within the Mine Area are the Cloverdale, Roseville, Marker 1, Bowen Road, Glenview, Avon, and Weismantel, together with associated marker and minor seams. **Figure 3.4** displays the stratigraphic sequence of the Gloucester Basin and identifies the seams proposed to be mined as part of the Applicant's Proposal.

3.2.2 Mine Area

In 2009, under the previous GRL management, the initial Stage 1 exploration program, comprising 44 open holes in the area now defined as the Mine Area, was completed with some holes geophysically logged. Chip samples were collected from seven holes. An extension to the Phase 1 exploration program began in 2010 under the current company management, the bulk of which has been completed. In 2010, Velseis conducted a three-dimensional seismic survey over a 10km^2 area in the southeastern corner of EL 6523 for AGL. This survey data, together with the results of the more recent drilling programs, has been interpreted and used to assist in the generation of the geological model for the Mine Area.

Seven main coal seams have been identified within the Mine Area as shown in **Table 3.1,** together with some additional marker and minor seams. A number of the main seams incorporate plies of varying thicknesses separated by small bands of non-coal sedimentary rocks. A summary of the average thickness and angle of dip of the identified seams is also presented in **Table 3.1**. All coal seams have been shown to be oriented north-south across the Mine Area.

Table 3.1
Main Coal Seams and Marker Seams within the Mine Area

Seam Name *[1]	Average Thickness *[2] (m)	Average Seam Dip (degrees)
Cloverdale (1, 2, 2B and 2C)	7.8	44
Roseville	3.7	45
Marker (1, 1A, 1B, 1C, 1D and 1E)	4.9	46
Bowen Road (1A, 1B, 2, 3, 4 and Lower)	9.2	47
Glenview	1.2	48
Avon (1, 2, 3, 4A, 4B and Triple)	6.9	51
Weismantel (1, 2, 3, 4 and 5)	4.4	67

*[1] Identifiers in ( ) indicate named plies within each seam.
*[2] Based upon borehole intersection. The average thickness nominated is an accumulation of the average thickness of all plies within each seam.

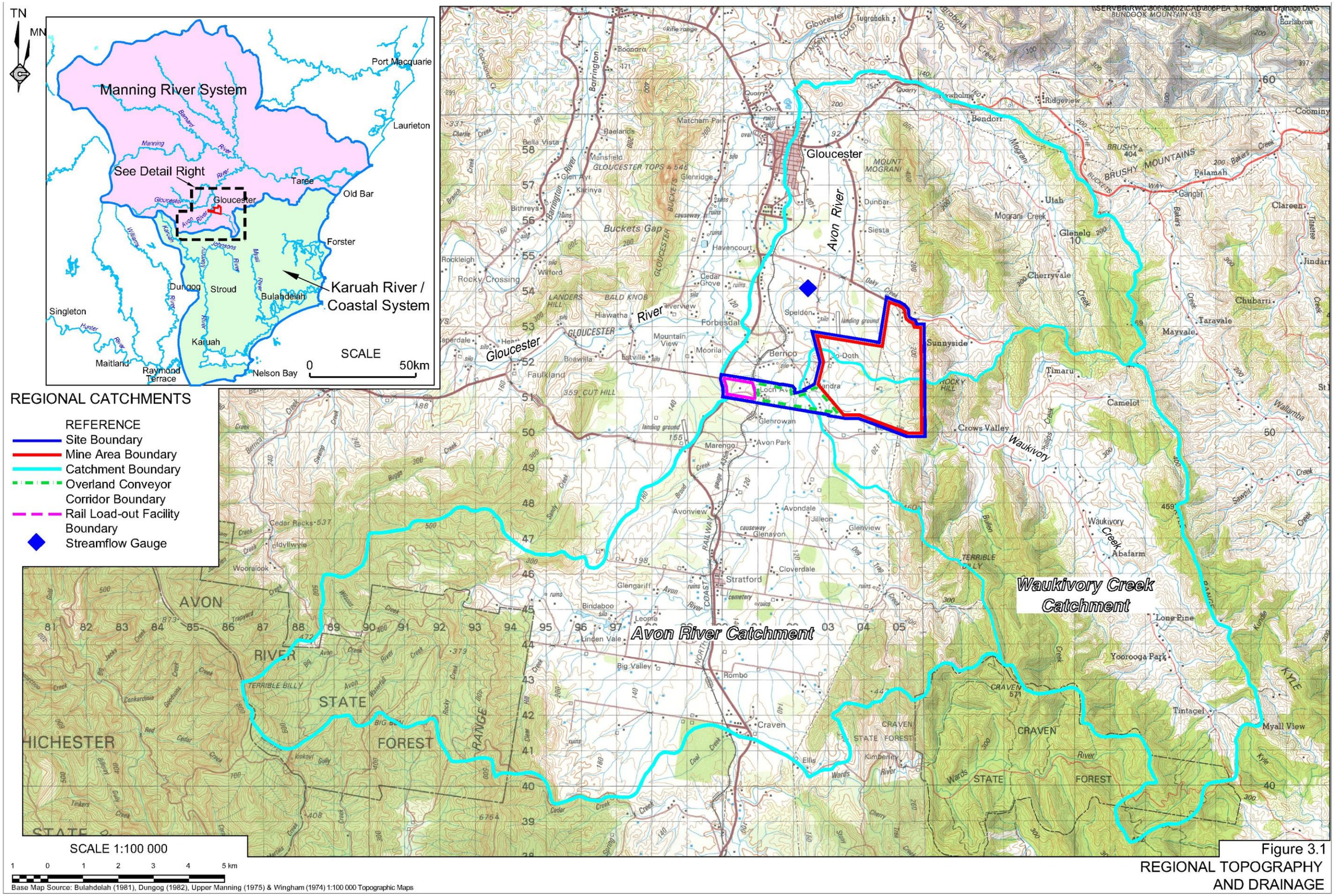


Figure 3.1
REGIONAL TOPOGRAPHY AND DRAINAGE

This page has intentionally been left blank

This page has intentionally been left blank

\\SERVER\RWC\806\80602\CAD\806PEA_3.1 Regional Drainage.DWG

TN
MN

REFERENCE
Site Boundary
Mine Area Boundary
Overland Conveyor Corridor Boundary
Rail Load-out Facility Boundary
Catchment Boundary
A Catchment Reference
1st Order Stream
2nd Order Stream
3rd Order Stream
4th Order Stream

Existing Meteorological Station

SCALE 1:20 000
200 0 200 400 600 800 1000 m

Base Map Source: Bowman (2009), Gloucester (2007) 1:25 000 Topographic Maps
Source of Stream Order: WRM Water and Environment

Figure 3.2
LOCAL TOPOGRAPHY AND DRAINAGE

This page has intentionally been left blank

This page has intentionally been left blank

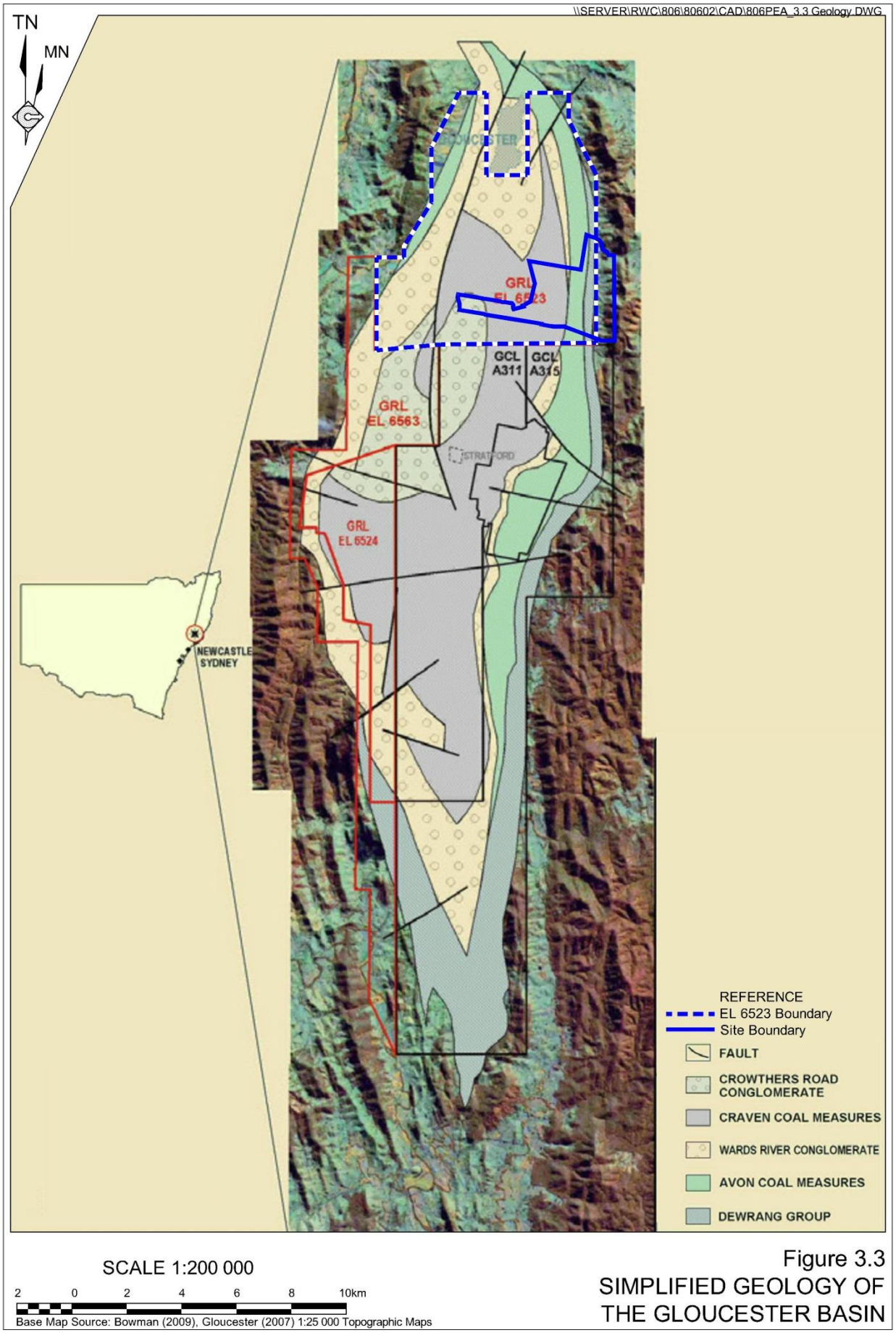


Figure 3.3
SIMPLIFIED GEOLOGY OF THE GLOUCESTER BASIN

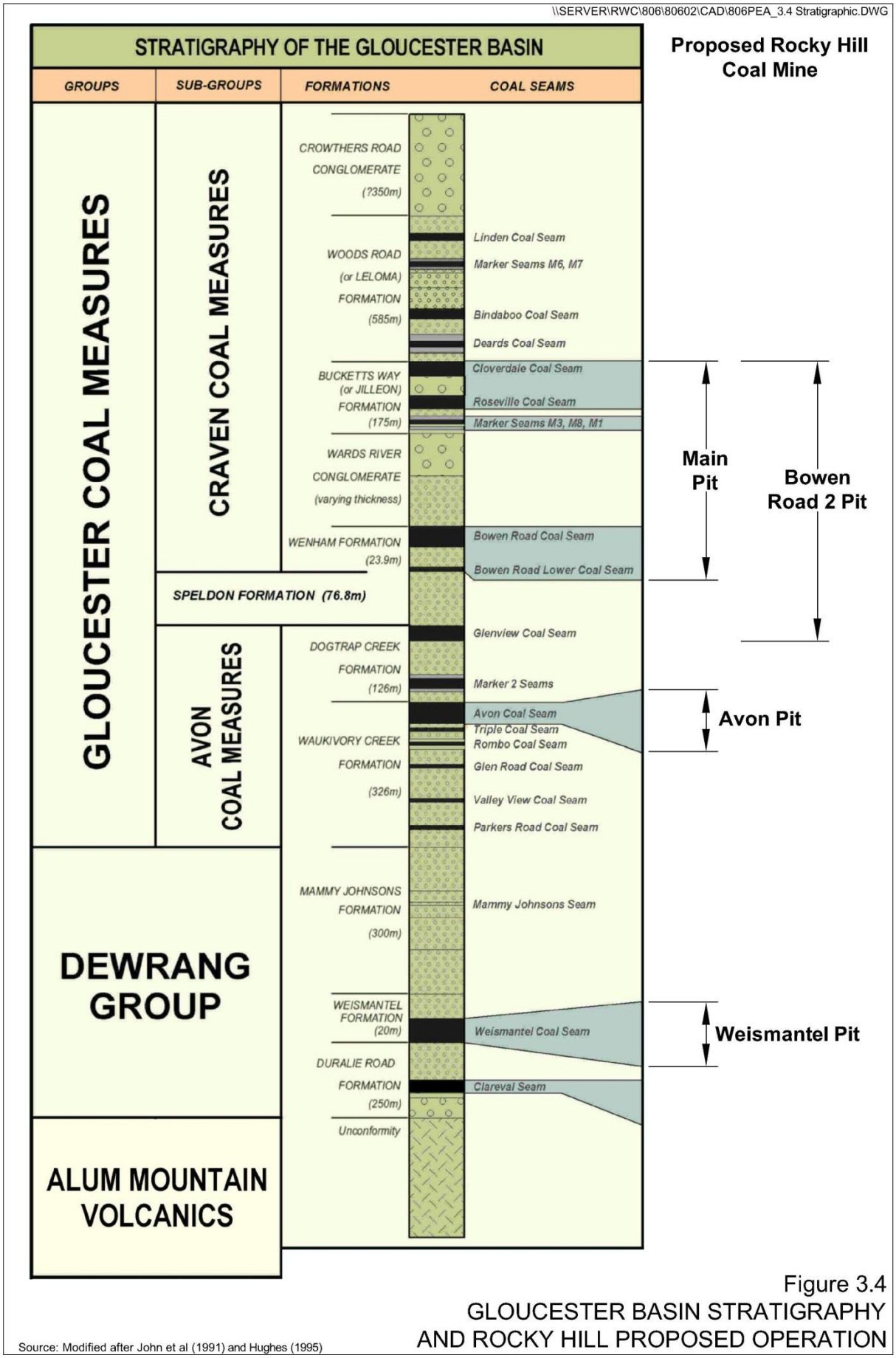


Figure 3.4
GLOUCESTER BASIN STRATIGRAPHY
AND ROCKY HILL PROPOSED OPERATION

Source: Modified after John et al (1991) and Hughes (1995)

Table 3.1 shows that the coal seams dip to the west at angles of approximately 44^{o} to 67^{o} with the dips increasing from west to east towards the basin margin, as can also be seen in the 3-dimensional view from the geological model provided in **Figure 3.5**.

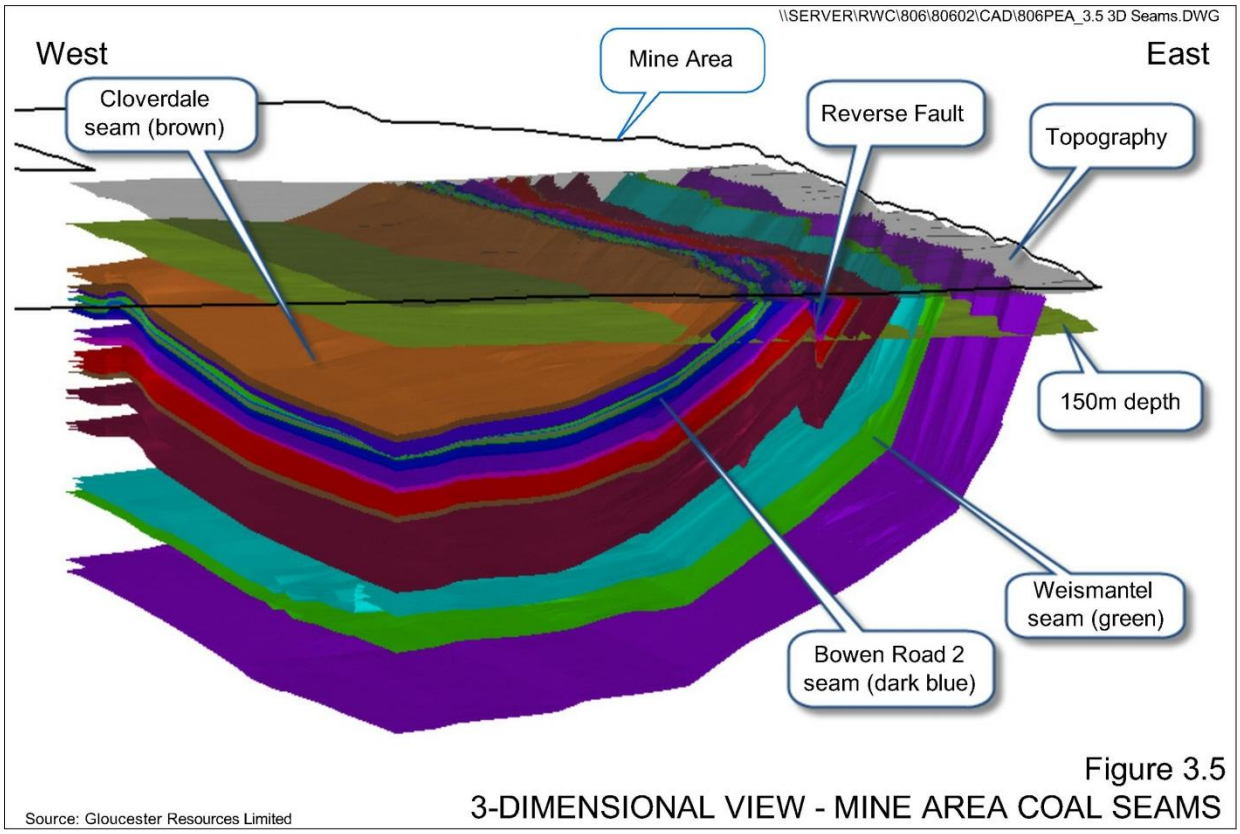


Figure 3.5
3-DIMENSIONAL VIEW - MINE AREA COAL SEAMS

The geological investigations undertaken across the Mine Area have also established the following.

- The depth of weathering within the Mine Area varies from approximately 4m to 37m and averages approximately 11m.
- The occurrence of one large reverse fault with a horizontal displacement of approximately 150m to 200m. The seismic data has also identified more complex faulting, both normal and reverse across the Mine Area but this has not been validated by drilling.
- A total of 13 holes intersected intrusions or basalts although only four holes contain intruded seams. Based on the current borehole data, intrusions do not appear to be a significant constraint to mine design or planned operations.
- Based on the data available, most of the seams analysed contain substantial quantities of bright coal with vitrinite ranges of 64.4% to 92.2%. The exceptions are the Bowen Road Seam samples with vitrinite contents of between 18.5% and 56.7% and one Avon Seam sample with a vitrinite content of 53.1%.
- Coal rank has also been determined from the chip samples with Rvmax varying from 0.83% to 0.92% in “V Steps” between 7 and 10.

3.3 SURROUNDING LAND OWNERSHIP AND RESIDENCES

All land within the Site is owned, under option to purchase, or the subject of current negotiations by the Applicant. The properties to the north, west and south of the Site are either agricultural properties varying in size from approximately 150ha to 250ha, or rural lifestyle blocks, typically of 4ha to 120ha in area. The landholdings to the east of the Mine Area comprise substantial agricultural properties, typically in excess of 200ha. **Figure 3.6** displays the land ownership status and the location of residences within and surrounding the Site.

Three rural-residential estates are located to the northwest and west of the Mine Area, namely the Thunderbolts and Avon River Estates (off Jacks Road – 104 lots) and Forbesdale Estate (off Fairbairns Road – 29 Lots). The lots within the Thunderbolts and Avon River Estates are typically approximately 6 000m^2 with a number of lots within both estates remaining without a residence. In the Forbesdale Estate, most land blocks have been sold and residences constructed, with most land blocks approximately 2ha in area. A number of rural lifestyle blocks are also present adjoining The Bucketts Way.

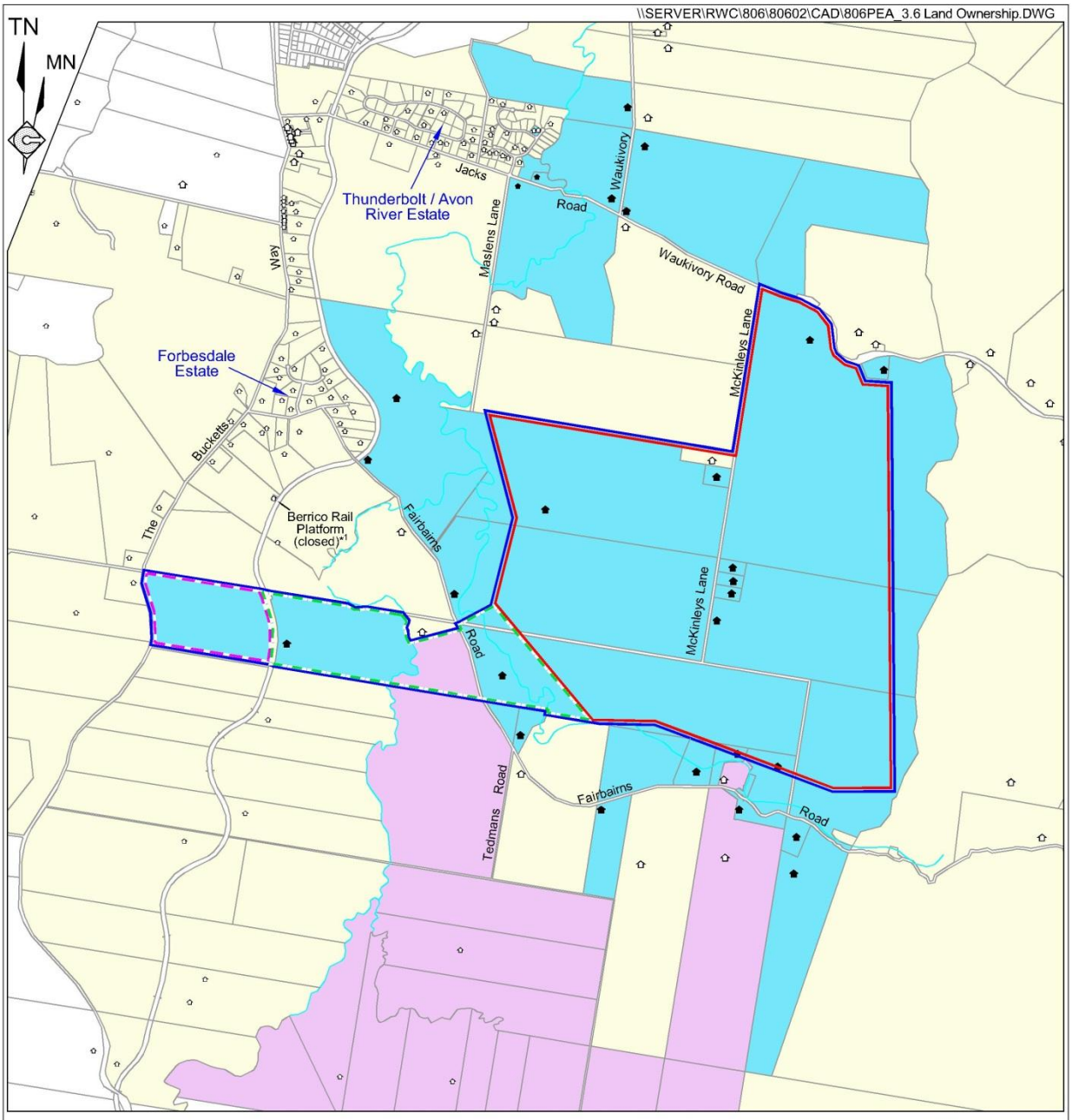
3.4 CLIMATE

The climate in the vicinity of Gloucester is warm temperate, i.e. warm to hot summers and mild to cool winters with the rainfall pattern having a summer maximum.

Long term climate data was sourced from the meteorological stations at Gloucester Post Office and Chichester Dam (38km southwest of Gloucester). Temperature, rainfall and evaporation (pan) data are presented in **Table 3.2**. The Applicant has established a comprehensive meteorological station within the Mine Area (see **Figure 3.2**). Data from the station will be incorporated into the *Environmental Impact Statement* and used/referenced in the various environmental assessments, where appropriate.

Table 3.2
Monthly Meteorological Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature (°C) Chichester Dam Station (Station # 061151)													
Mean maximum temperature	26.2	24.8	23.3	20.2	17.4	14.2	13.7	16.5	19.1	21.4	24.2	26.6	
Mean minimum temperature	16.7	16.7	16.2	12.7	9.7	7.0	6.2	6.9	9.8	12.1	14.9	17.2	
Rainfall (mm) Gloucester Post Office (Station # 060015)													
Mean monthly rainfall	115.1	122.3	127.7	77.3	68.6	67.1	51.3	46.5	51.4	69.2	83.4	104.4	982.7
Highest monthly rainfall	474.4	752.4	539.5	324.4	343.2	402.4	273.5	353.7	176.1	277.2	236.7	352.5	1875.2
Lowest monthly rainfall	0.0	2.5	9.8	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	498.4
Highest daily rainfall	154.9	158.2	170.2	108.0	152.4	112.6	114.3	109.2	89.7	121.4	107.4	112.4	
Evaporation (1975 to 2005) (mm) Data sourced from monthly evaporation maps													
Mean Monthly Evaporation	201.5	176.4	102.3	99.0	99.2	60.0	58.9	99.2	126.0	173.6	249.0	251.1	1696.2
Source: Bureau of Meteorology 2011													



REFERENCE

- Site Boundary
- Mine Area Boundary
- Cadastral Boundary
- Overland Conveyor Corridor Boundary
- Rail Load-out Facility Boundary
- Land Owned By or Under Option to the Applicant
- Land Owned By other Resource-related Companies
- Privately Owned Land
- Residence (Project-related)
- Residence (Non Project-related)

Note: *1 - Only a signalling hut remains at this location - the platform was removed in 1975

SCALE 1:50 000

0.5 0 0.5 1.0 1.5 2.0 2.5 km

Figure 3.6
LAND OWNERSHIP AND RESIDENCES

Temperature

December is the hottest month, with a mean maximum temperature of 26.6°C and a mean minimum temperature of 17.2°C. July is the coldest month with a mean maximum temperature of 13.7°C and a minimum temperature of 6.2°C.

Rainfall and Evaporation

Mean annual rainfall is 983mm, with rainfall distributed unevenly throughout the year. August is the driest month while the mean monthly rainfalls in December to March are greater than 100mm. Rainfall can, however, be extremely variable, with infrequent, high intensity rainfall events occurring. This is confirmed by the highest daily rainfall values shown in **Table 3.2**, and the fact that the maximum daily rainfall values are between 2 and 3.5 times average monthly rainfall values.

The period of above average rainfall between December and March poses the greatest risk for soil erosion, with the period from July to October posing the least risk.

Mean monthly evaporation varies throughout the year, from approximately 250mm in November and December to approximately 60mm in June and July. Annual evaporation exceeds rainfall by a factor of approximately 1.7.

Wind Speed and Direction

A summary of the wind behaviour from meteorological data collected at the Rocky Hill Coal Project Meteorological Station is presented in **Figure 3.7** for the period 1 November 2010 to 31 October 2011. Wind roses indicate that on an annual basis, prevailing winds are from the northeast and south. Seasonally, the winds from:

- the northeast and south dominate during summer;
- the south dominate during autumn;
- the southwest to south-southeast dominate during winter; while
- during spring, winds occur from all directions.

The average recorded wind speed is 2.5m/s and calm conditions occur for 2% of the year.

It is recognised the wind patterns recorded at the Rocky Hill Coal Project Meteorological Station differ slightly from those reported from a meteorological station installed at the Stratford Coal Mine to the south, reflecting the considerable influence the topography has upon wind directions throughout the Stroud - Gloucester Valley. The main difference between data recorded at the Stratford Coal Mine and the Rocky Hill Coal Project during the period 1 November 2010 to 31 October 2011 relates to the greater component of northerly winds at the Stratford station during all seasons with reduced easterly and westerly components. Notably, the southerly winds monitored at both locations are of similar wind speeds and occurrence.

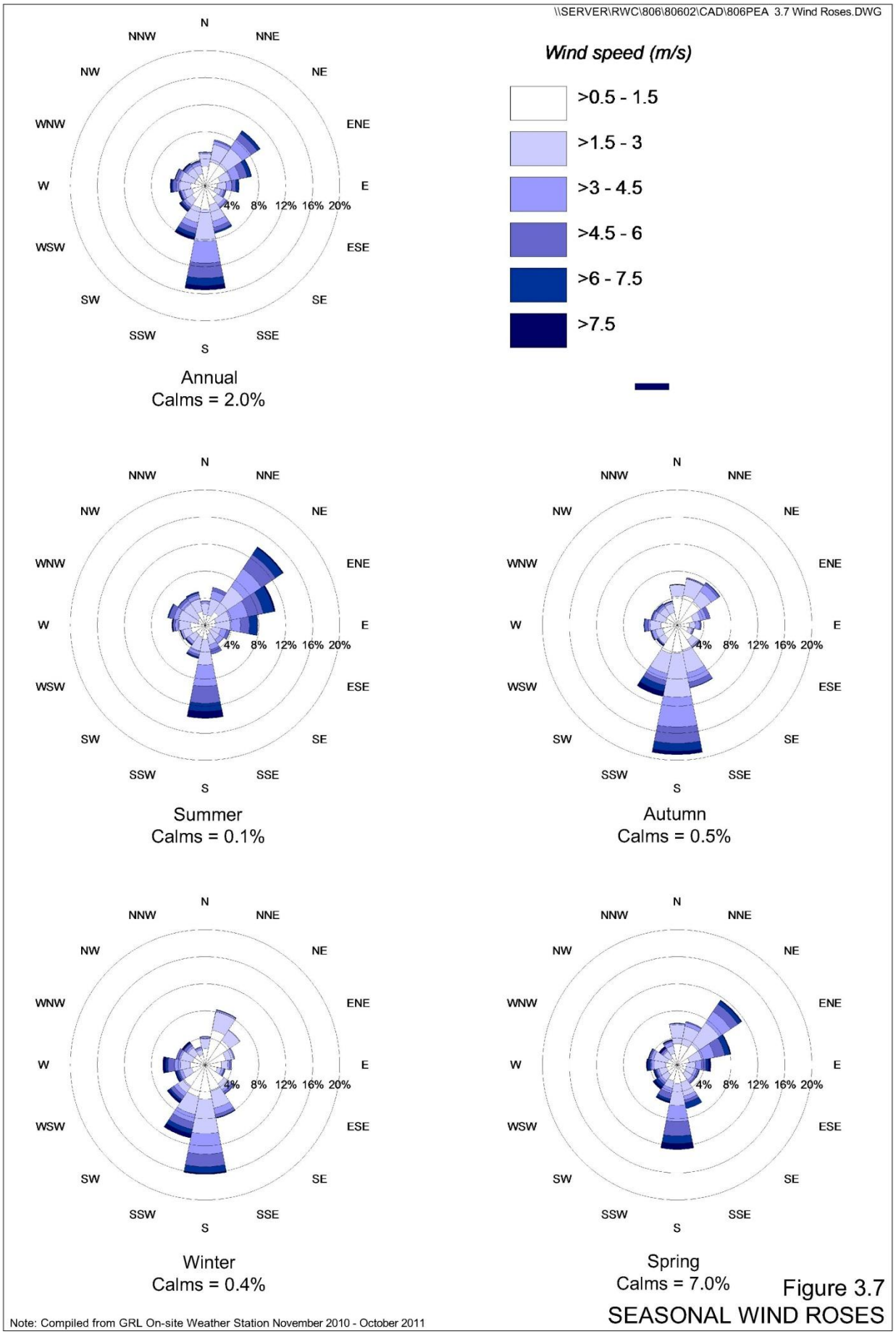


Figure 3.7
SEASONAL WIND ROSES

4. DESCRIPTION OF THE PROPOSAL

This section provides an overview of the Rocky Hill Coal Project ("the Proposal") in sufficient detail to enable the reader to understand the type and scale of activities proposed. A more detailed description of the Proposal would be included in the Environmental Impact Statement.

4.1 OBJECTIVES

The principal objectives of the Rocky Hill Coal Project are to:

1. maximise coal recovery and the efficiency of mining and processing operations;
2. provide a stimulus to the Gloucester and district economies through employment opportunities and supply of services required for the development and operation of the Proposal;
3. create a final landform that is safe, stable, visually and topographically sympathetic to the existing landform and amenable to the re-introduction of grazing activities, and nature conservation;
4. undertake all activities in an environmentally responsible manner to ensure compliance with relevant criteria/goals or reasonable community expectations; and
5. achieve the above objectives in a cost-effective manner to ensure the Rocky Hill Coal Project is viable.

4.2 NEED FOR THE PROPOSAL

Coal quality investigations indicate that the Rocky Hill Coal Project would produce two coal products suitable for the seaborne export market. The main product, a semi-hard coking coal for use in metallurgical processes, exhibits a higher fluidity, volatile content and swelling number and lower phosphorous content than the majority of coking coals produced in Australia. It also exhibits a relatively low sulphur content. The secondary, thermal coal product for use in power generation, though exhibiting a higher inherent ash than the coking coal, still exhibits a higher energy and calorific value than many other thermal products in the marketplace.

As a consequence, both product types would be in considerable demand throughout South East Asia and China, demand a higher price than many other similar export products in the marketplace, attract valuable income to Australia and help counter the Country's balance of payment.

Being located relatively close to the Port of Newcastle adjacent to a rail line which is under-utilized, the Rocky Hill Coal Project is also well positioned geographically and strategically to access the export market.

4.3 OVERVIEW OF THE PROPOSAL

4.3.1 Introduction

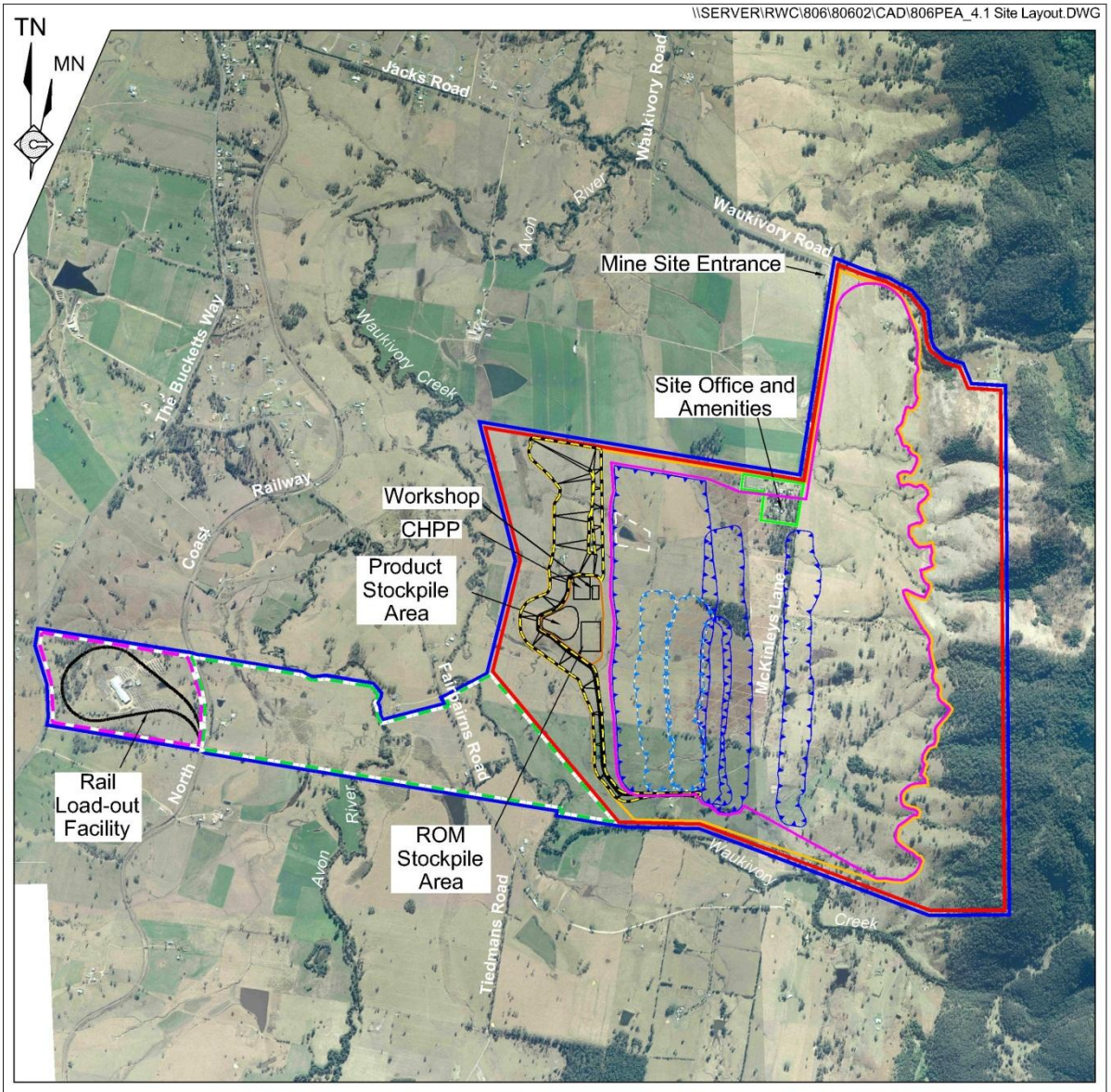
The Rocky Hill Coal Project comprises four principal components, (see **Figure 4.1**) namely:

1. four separate and/or contiguous open cut pits within the Mine Area;
2. a coal handling and preparation plant (CHPP) within the Mine Area;
3. an overland conveyor for transporting product coal to the Rail Load-out Facility; and
4. a Rail Load-out Facility (incorporating a rail loop).

4.3.2 Conceptual Mine Plan

Figure 4.1 displays the conceptual layout of the Mine Area comprising the following major components.

- The mine entrance off McKinleys Lane, 50m beyond the intersection of Waukivory Road.
- The mine access road to the site office and amenities, a road aligned generally parallel to but set back from McKinleys Lane.
- A site office and amenities complex on Company-owned land off McKinleys Lane.
- Four open cut pits (and their respective approximate depths from the base of weathering) namely the Weismantel Pit (60m – 70m), Avon Pit (80m – 90m), Bowen Road 2 Pit (70m – 80m) and Main Pit (180m) (see **Figures 4.2** and **4.3**), with mining within the limits of the Main Pit initially involving the development of two smaller, shallower sub-pits (Main Pit Sub-pit 1 (90m) and Main Pit Sub-pit 2 (70m)), to enable some production of the highest quality coals in the initial years of mining. The depths are nominal and based on current mine planning with the ultimate depths of development representing the optimisation of coal quality data and the outcomes of detailed mine planning as the mine progresses.
- Three generally north-south trending short term or long term visibility barriers. The barriers may be standalone structures or comprise the western margins of the out-of-pit emplacement as it is progressively developed.
- A series of cut-off grout curtains (or similar) in those areas where the proposed open cut pits encroach within 150m of alluvial sediments adjacent to Waukivory Creek. A similar treatment may be applied should structures be identified which would potentially provide a conduit for water movement to/from the alluvial sediments and the proposed open cut pits.
- An out-of-pit overburden emplacement overlying and extending beyond the open cut pits.
- A coal handling and preparation plant (CHPP) with associated run-of-mine (ROM) and product stockpile areas, a switchyard and a workshop.



REFERENCE
- Site Boundary
- Mine Area Boundary
- Overland Conveyor Corridor Boundary
- Rail Load-out Facility Boundary
- Proposed Open Cut Pit Boundary
- Proposed Overburden Emplacement
- Proposed Area of Disturbance
- Western Visibility Barrier

SCALE 1:40 000

0.5 0 0.5 1.0 1.5 2.0 km

Base Photograph Source: Geo-spectrum (Australia) Pty Ltd - Date of Photography: 29 June 2010

Figure 4.1
CONCEPTUAL SITE LAYOUT

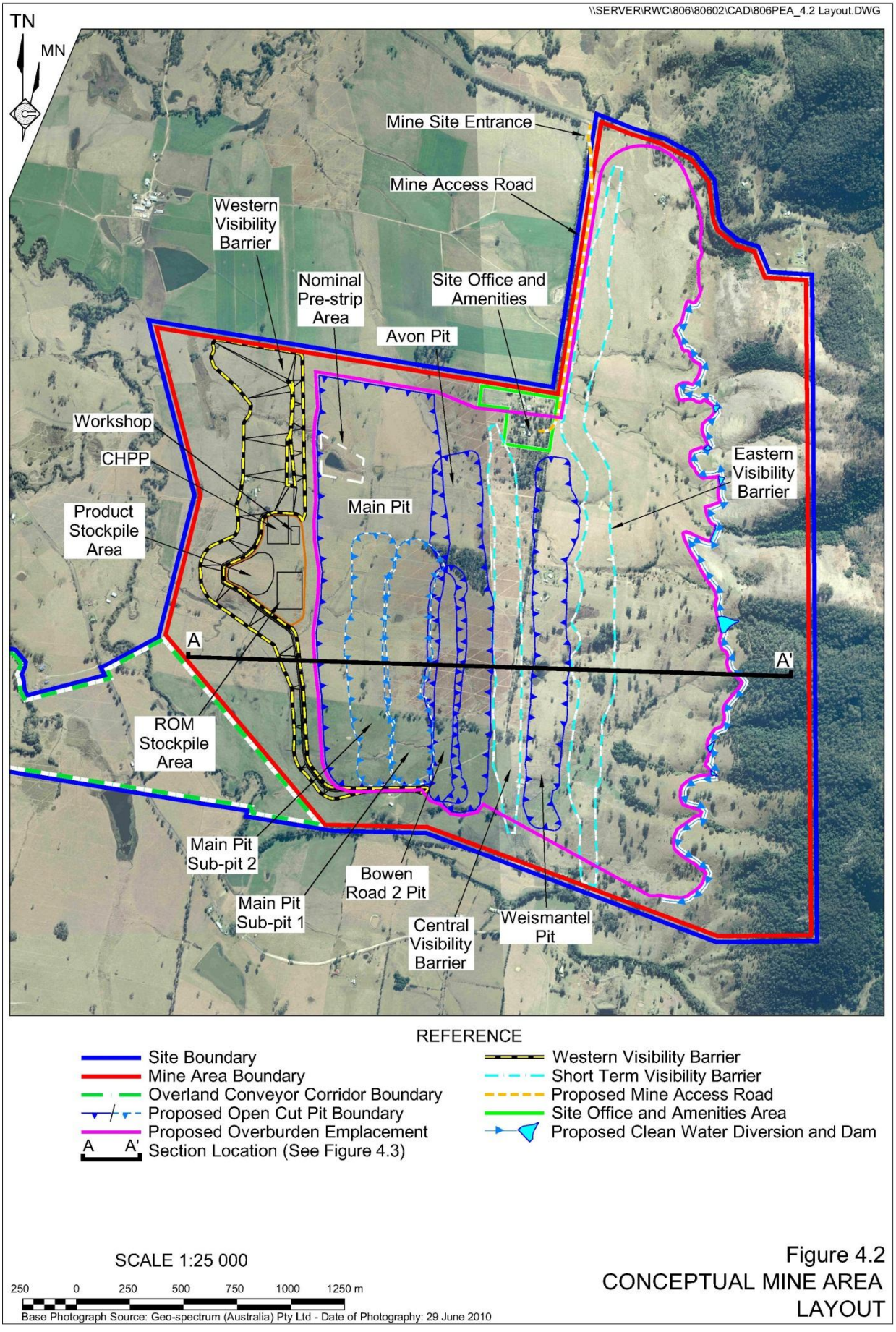


Figure 4.2
CONCEPTUAL MINE AREA LAYOUT

4.3.3 Site Establishment and Construction

Following the receipt of development consent and all necessary approvals, the Applicant would undertake a program to prepare the Site for coal recovery, processing and despatch. The key site establishment and construction activities would involve:

- construction of the site access road from near the intersection of McKinleys Lane and Waukivory Road to the site office and amenities;
- construction of the key site water management structures;
- installation/construction of required offices and amenities;
- construction of the western visibility barrier using materials excavated from the initial mining activities and a pre-strip area within the boundary of the Main Pit. (Construction of the western visibility barrier would necessitate the relocation of the existing meteorological station);
- construction of the CHPP building, installation of all processing equipment and the workshop;
- construction/erection of the overland conveyor;
- excavation works (cut and fill) required for the rail loop and demolition of the former Boral Timber Mill buildings;
- construction of the rail loop and erection of the train loading infrastructure adjacent to and above the rail loop; and
- installation of power supply and control infrastructure.

4.4 MINING OPERATIONS

4.4.1 Coal Resources

The seven main coal seams defined within the Mine Area (see Section 3.2.1 and **Table 3.1**) have been assessed on the basis of their occurrence, quality information and their potential for recovery by open cut methods. It is acknowledged, however, that the ultimate extent of development of the various open cut pits, including the depths achievable, would depend upon the sale price for the particular coal products which would be produced which, in turn, would determine the maximum economic overburden to coal stripping ratios. Based upon preliminary geological modelling, mine design and coal quality information, up to 30 Mt of ROM coal is recoverable from the open cut pits nominated in the conceptual mine plan (see Section 4.3.2). The recoverable coal resource will be further defined following the receipt of additional quality data and detailed mine planning.

4.4.2 Conceptual Mining Operations

Mining operations would involve the sequential activities of vegetation clearing (where present and its retention is not practicable), soil stripping, overburden/interburden removal, coal recovery and progressive rehabilitation.

Vegetation Clearing

The bulk of the proposed areas of disturbance comprises cleared grazing land with isolated trees and would not require any substantial native vegetation clearing. Throughout the life of the Proposal, approximately 25ha of tree clearing would be required along the section of McKinleys Lane within and adjacent to the Weismantel Pit, within the footprint of the Bowen Road 2, Avon and Main Pits, within the footprint of out-of-pit overburden emplacement and within the Conveyor Corridor and the Rail Load-out Facility. All trees would be felled by chainsaw and/or bulldozer and stockpiled for placement on selected areas of the final landform to be assigned a nature conservation land use post mining, mulched and incorporated within the topsoil or, where practicable, placed within biodiversity offset areas.

Soil Stripping

Topsoil and subsoil would be separately stripped in accordance with recommendations of Geoff Cunningham Natural Resource Consultants and stockpiled in key strategic areas within the Mine Area until the sequence of mining allows the direct transfer of topsoil and subsoil onto the final landform. Direct replacement of topsoil and subsoil would be preferentially employed, wherever possible.

Overburden/Interburden Removal

Overburden and interburden (hereafter simply referred to collectively as "overburden") is required to be removed to gain access to the targeted coal seams within the individual open cut pits. The overburden principally comprises sandstones, siltstones and occasional conglomerates, the majority of which has been confirmed by geochemical testing to be non-acid forming and containing excess neutralising capacity. The testing has established that in the few overburden samples with an elevated total sulphur content, a significant proportion of the sulphur is non-pyritic, thereby reducing the risk of acid generation from these stratigraphic units and the overburden as a whole. RGS Environmental recommends not to selectively handle bulk overburden or rejects and to emplace them randomly (and blended) in the in-pit and out-of-pit overburden emplacements. However, as a precautionary measure all uneconomic coal seams, coal seam roof or floor materials and/or rejects would be emplaced away from all final batters or surfaces.

It is anticipated that the upper weathered section of the profile within each pit would be amenable to free-digging or removal by scrapers, with the underlying consolidated material to the nominal depths identified in Section 4.3.2 requiring blasting prior to its removal.

Overburden would be preferentially emplaced in mined-out pits, with any excess or material generated during the initial development of the various pits emplaced out of pit.

During the initial stage of mining, overburden would be removed from limited pre-strip area within the Main Pit and the Bowen Road 2 Pit. This material would be placed within the western visibility barrier which extends north, south and west of the CHPP. The excess overburden, together with that generated from the initial development of the Weismantel Pit would be used to create the visibility barrier along the western margin of the Weismantel Pit (central visibility barrier). A similar barrier would be progressively developed along the western margin of the Year 2 out-of-pit overburden emplacement area prior to bulk overburden emplacement to its east. This latter barrier (the eastern visibility barrier), the majority of which would be overdumped in Year 5, would screen the bulk overburden placement activities to its

east. With a progressive northerly extension of the out-of-pit emplacement in association with the sequential development of the Weismantel Pit the Avon Pit and the sub-pits within the Main Pit (Years 2 to 4), and the subsequent westerly extensions of the overburden emplacement (Years 5 to 7), a similar approach, i.e. creation of an initial westerly facing barrier with active overburden disposal to the east, would be adopted for the management of overburden produced which is in excess of the void space available in-pit for emplacement. During the latter stages of the development of the Main Pit, overburden materials from the pit would also be stockpiled adjacent to and over the southern end of the pit and on the eastern side of the pit for subsequent emplacement in the final void at the cessation of mining. Overburden from the northern extent of the out-of-pit overburden emplacement would similarly be reclaimed and emplaced within the final void.

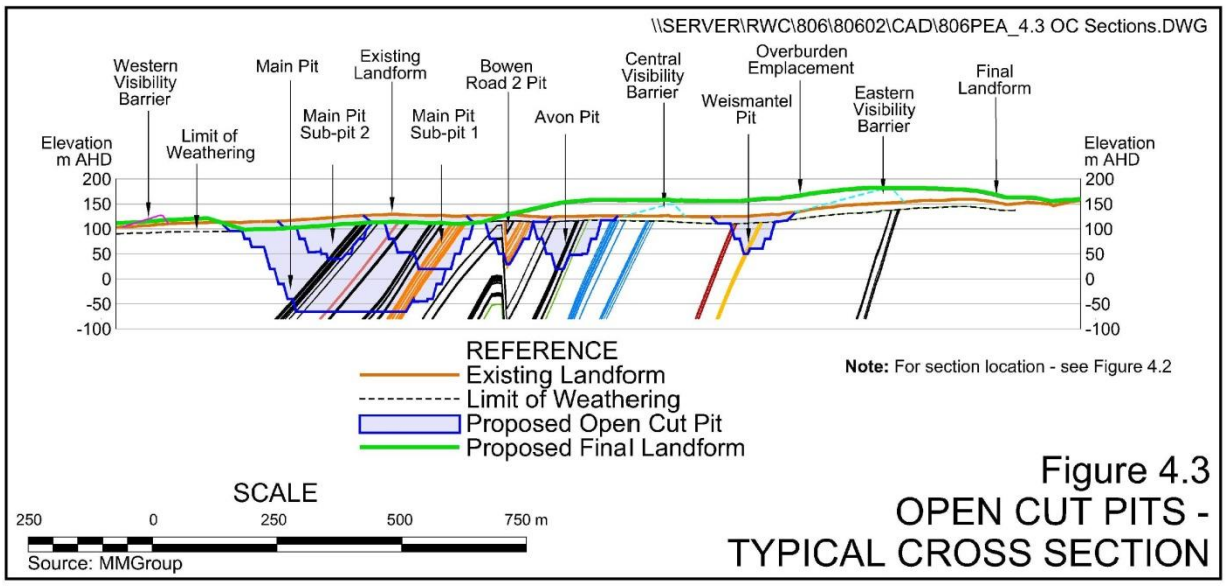
The western visibility barrier, which would remain in place for the duration of mining activities, would be constructed with outer slopes of 1:3 (V:H) to 1:4 (V:H) and inner or easterly slopes of approximately 1:2 (V:H) to 2:1 (V:H) depending on the method of construction. The bulk of materials forming the barrier would be placed into the Main Pit void on cessation of coal extraction activities.

The final surface of the out-of-pit overburden emplacement would be constructed with slopes similar to those of the existing landform, i.e. 5º to 15º. The central and eastern visibility barriers would be constructed with external slopes to the west of 1:3 (V:H) and temporarily vegetated with a range of shrubs and grasses to reduce the barriers' visibility and enhance the screening of activities to the east.

Coal Recovery

The coal exposed in each open cut pit would be removed by excavator and transported by haul truck to the ROM coal stockpile adjacent to the CHPP. Given the steep dip of the coal seams, limited blasting may also be undertaken to fracture the coal exposed in the pit floor once the main floor level is achieved, thereby potentially enabling the excavator to remove up to a further 15m of coal down the dip of the seam without any substantial additional overburden removal.

Figure 4.3 displays a typical cross-section through the four principal open cut pits and two sub-pits showing the indicative depths to the main (final) floor level.



Mining Rates

The Applicant proposes to mine up to 2.5 million tonnes of ROM coal per year, commencing at a rate of approximately 0.6 million tonnes in Year 1 and subsequently ramping up to full production. A production rate of 2.5Mtpa equates to approximately 9 000t of ROM coal per day.

4.4.3 Mobile Equipment

Table 4.1 presents an indicative list of the proposed mobile equipment the Applicant intends to use throughout the mining and CHPP operations, and beyond. The potential to use the mobile mining equipment nominated in **Table 4.1** during the night-time period (10:00pm to 7:00am) and under what limitations, e.g. minimum depth below ground level, would be determined on the basis of the noise assessment, with confirmation through monitoring. The equipment listed in **Table 4.1** is considered to be conservative and will be revised in conjunction with the detailed mine planning/scheduling.

Table 4.1
Indicative Mobile Equipment List Replace Year 5 Mining Equipment List

Type	Year 1			Year 2 - 4			Year 5 Onwards		
	Model	7am-10pm	10pm-7am	Model	7am-10pm	10pm-7am	Model	7am-10pm	10pm-7am
Mining Operations									
Drill	Rotary SKF12	1	1	Rotary-SKF12	1	1	Rotary-SKF12	1	1
	Hammer ST600	1	-	Hammer ST600	1	1	Hammer ST600	1	1
Excavator	PC 1250	1	-	PC 1250	1	-	PC 1250	1	-
	L994-200	2	1	L994-200	3	2	L994-200	2	2
							EX3600	2	
	40 tonne	1	-	40 tonne	1	-	40 tonne	1	-
Haul truck	Cat 785B)	4	-	Cat 785B	3	-	Cat 785B	4	-
							Cat 789C	10	
	Cat 777	3	-	Cat 777	3	-	Cat 777	2	-
	Haulmax	8	4	Haulmax	8	8	Haulmax	8	8
				Komatsu 785	3	-	Komatsu 785	3	-
	40 tonne Artic)	1	-	40 tonne Artic	1	-	40 tonne Artic	1	-
Bulldozer (Tracked)	Cat D11R	3	-	Cat D11R	3	1	Cat D11R	3	1
	Cat 10T	1	-	Cat 10T	1	-	Cat 10T	1	-
Bulldozer (Rubber Tyred)	Cat 690	1	1	Cat 690	1	1	Cat 690	1	1
Scraper	Cat 657G	3	-	Cat 657G	3	-	Cat 657G	3	-
	Cat 637G	2	-	Cat 637G	2	-	Cat 637G	2	-
Fuel Truck	Truck 10 000L	1	-	Truck 10 000L	1	-	Truck 10 000L	1	-
Grader	Cat 16H	1	1	Cat 16H	1	1	Cat 16H	1	1
Water Cart	Cat 777	1	-	Cat 777	1	-	Cat 777	1	-
	Cat 773B	1	1	Cat 773B	1	1	Cat 773B	1	1
	Rigid Body	1	-	Rigid Body	1	-	Rigid Body	1	-
CHPP Operations									
Type	**Year 1**			**Year 2**			**Year 5 Onwards**		
	Model	**7:00am-10:00pm**		**Model**	**7:00am-10:00pm**		**Model**	**7:00am-10:00pm**	
Front-end Loader	Cat 988	1		Cat 988	1		Cat 988	1	
Bulldozer * (Tracked with Coal Blade)	Cat D10	1		Cat D10	1		Cat D10	1	
Bobcat		1			1			1	

* Used periodically 24hrs per day if product coal is required at the Rail Load-out Facility.

4.5 PROCESSING OPERATIONS, STOCKPILES AND PRODUCTS

4.5.1 Processing Operation

All ROM coal would be processed in the Coal Handling and Preparation Plant (CHPP) to separate the product coal from the non-product materials recovered during the mining process. **Figure 4.4** displays the general layout of the CHPP and its surrounds.

The plant would be located within a 12ha area on the western side of the Mine Area and positioned adjacent to the western visibility barrier. The pad for the entire plant and all stockpiles would be constructed to an elevation of approximately 115m AHD, i.e. approximately 25m to 40m below the top of the western visibility barrier.

The plant would likely comprise the following principal components.

- Plant feeder/reclaimer
- Crushing station
- Feed conveyors to the plant
- Desliming screen
- Dense media, spirals and cyclone circuits
- Jamieson flotation cell
- Horizontal belt filter
- Thickener
- Banks of Dewatering Units for the fine reject
- Sumps, Pumps, Pipelines
- Overhead conveyors from the plant (to product stockpiles)
- Underground conveyor (from product stockpiles)
- Reject Conveyor from the Plant
- Rejects stockpile and/or bin
- Associated infrastructure (office, workshop, etc.)

With the exception of the crushing station, rejects stockpile or bin and thickener, the major plant components would be enclosed within two buildings with a combined floor area of approximately 1 600m^2. The main building would have an overall height of approximately 21m, with the smaller building which contains the belt filters, having a height of approximately 5m. The ultimate configuration of the CHPP is currently the subject of detailed design.

Although the main building would generally be shielded visually to the north, west and southwest by the western visibility barrier, the upper decks would be clad with a colorbond material of a colour selected to blend with the background in order to minimise any potential visual impact from more elevated vantage points.

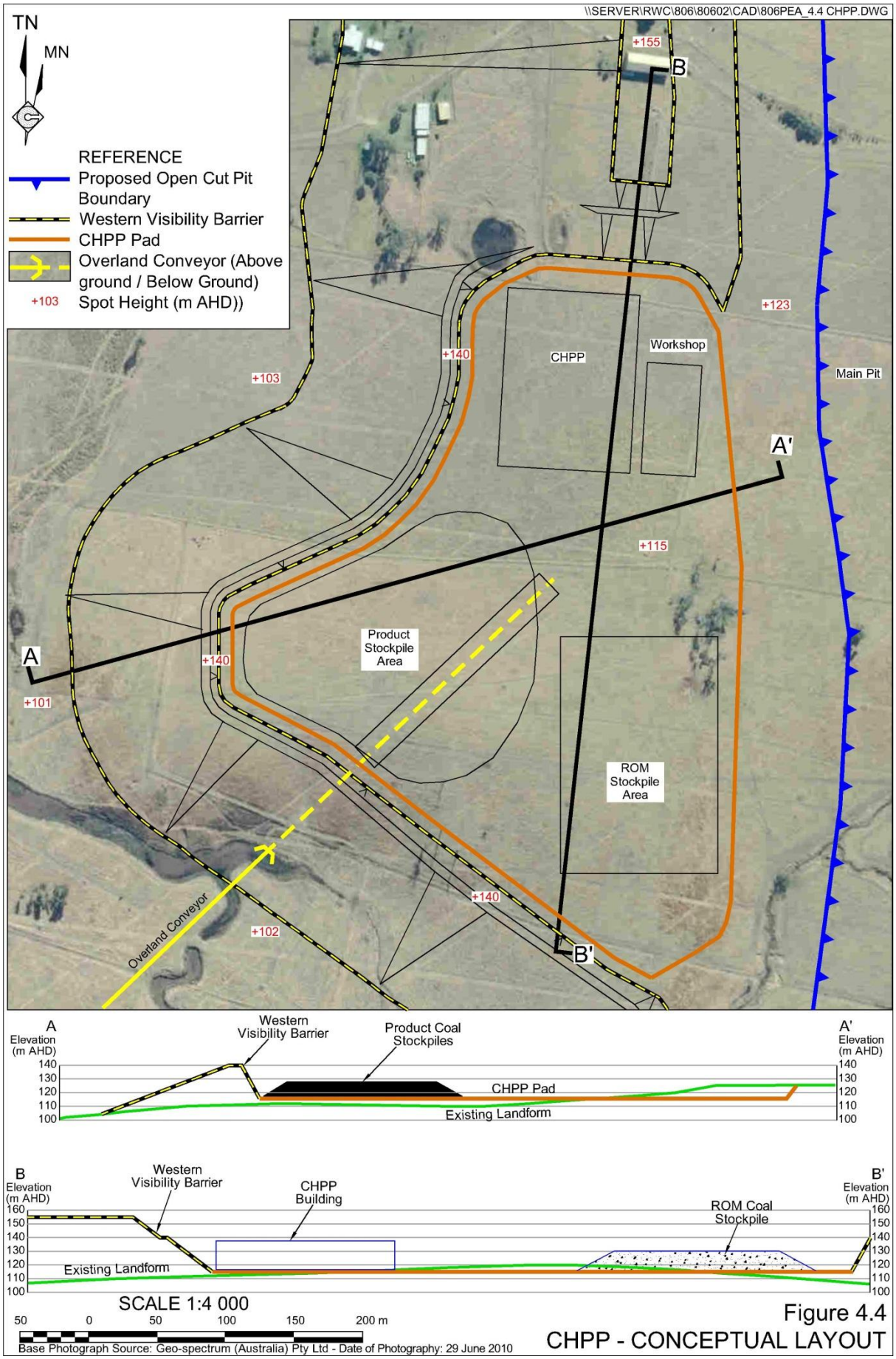


Figure 4.4
CHPP - CONCEPTUAL LAYOUT

4.5.2 Stockpiles

The ROM coal pad would be located adjacent to the CHPP building and cover an area of approximately 2ha which would provide sufficient storage for approximately 100 000t of ROM coal. The ROM coal pad would be constructed at an elevation of approximately 115m AHD using cut and fill methods and overburden recovered from either or both the Bowen Road 2 Pit and the Main Pit pre-strip. The ROM coal would be stockpiled to a height of up to 15m above the floor of the ROM pad.

The coal products produced within the CHPP would be conveyed to and stockpiled in a designated product stockpile area covering approximately 3ha adjacent to the CHPP building and the overland conveyor load-out. The coal product stockpile area would have the capacity to store a total of approximately 100 000t of product coal in separate stockpiles up to approximately 10m in height to cater for the different products produced.

4.5.3 Management of Processing Rejects

At maximum production, the CHPP would generate an estimated 0.75Mtpa to 1Mtpa of coarse and fine rejects, with the coarse rejects anticipated to represent around 70% of the total rejects. The quantity of rejects produced would depend upon customer product specifications and the resultant yield, i.e. product coal as a percentage of ROM coal processed through the CHPP. The Applicant currently proposes to use a thickener and belt filter to dewater the fine rejects, with the resultant material being blended with the coarse rejects to produce a mixture with a total moisture content of approximately 20%. The mixed coarse and fine rejects would be temporarily stockpiled or stored in an overhead bin prior to being emplaced with the overburden from mining activities. That is, there would be no defined permanent rejects emplacement area.

The geochemical testing of samples of laboratory-generated rejects established that the bulk of the rejects tested can be regarded as non-acid forming with significant excess buffering capacity. Any potentially acid forming rejects would invariably be neutralised by the non-acid forming rejects and overburden when emplaced within the in-pit or out-of-pit emplacements.

In the event the fine rejects dewatering system is not functional at any time, the rejects would be either placed within:

- the void developed during the limited pre-strip of the Main Pit and subsequently re-mined as part of Main Pit development and/or within the southern end of the Bowen Road 2 Pit (for the first 4 to 5 years of mining operations); and at all other times
- the available void space of previously worked-out pits which are being backfilled with overburden or in selected deposition areas within the active open cut pits.

4.6 PRODUCT COAL TRANSPORTATION

4.6.1 Transportation of Product Coal to and within the Rail Load-out Facility

Figure 3.2 displays the location of the Overland Conveyor Corridor between the CHPP and the Rail Load-out Facility. The overland conveyor, which would pass through the visibility barrier adjacent to the CHPP (see **Figure 4.4**) to the coal bins at the Rail Load-out Facility, would potentially comprise two sections with a transfer point where the conveyor changes direction or be curved. The design of the overland conveyor has yet to be finalised, but is likely to be partially enclosed using colorbond sheeting and mounted on metal supports placed typically 3m apart. The conveyor supports in the area of the Waukivory Creek and Avon River crossings and across their associated flood plains would be typically approximately 15m apart and designed to minimise impacts on creek, river or flood flows. **Plates 4.1** and **4.2** present views of a typical overland conveyor.

Plate 4.1 A Typical Overland Conveyor at Ground Level (E806M_003)

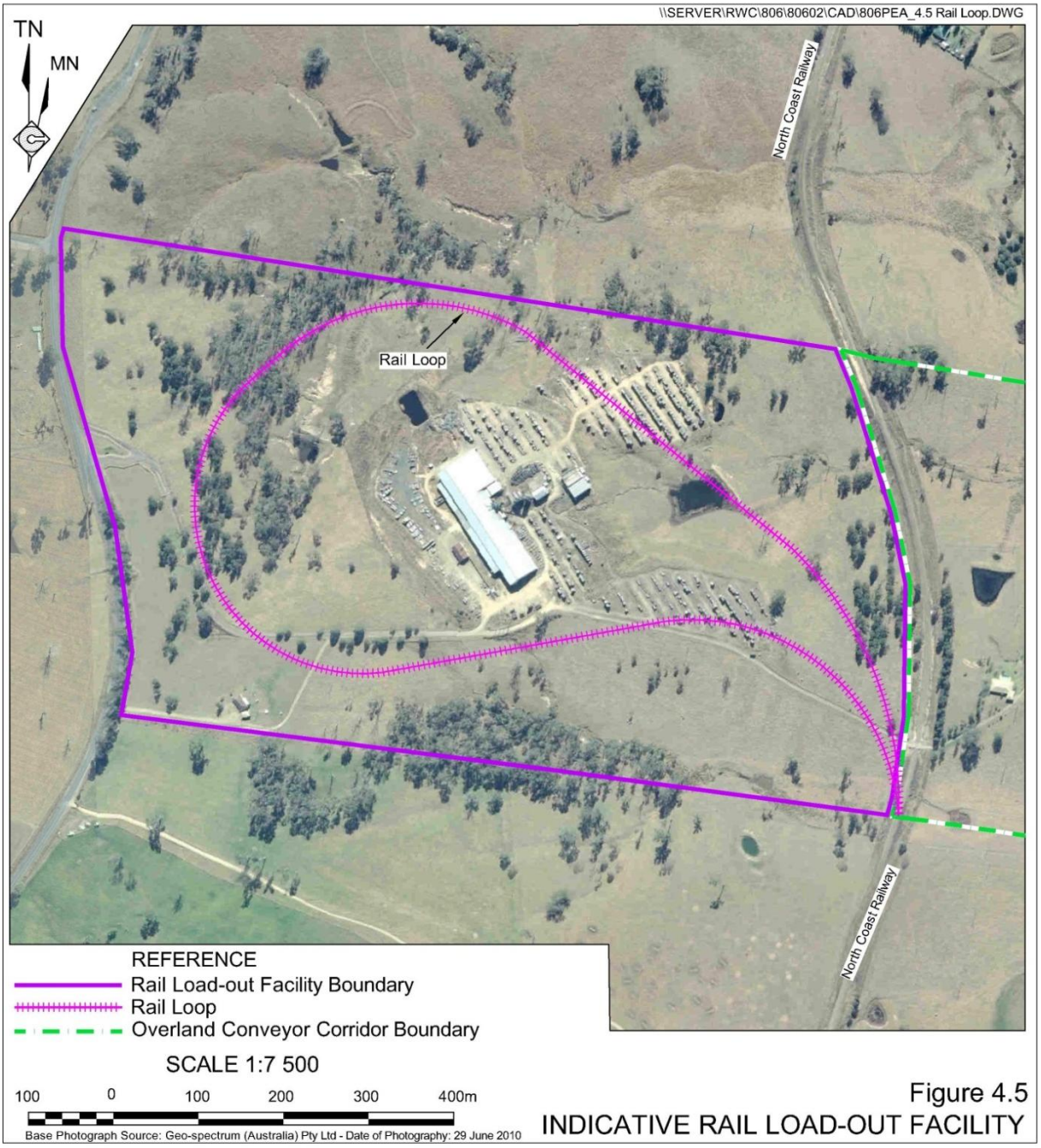
Plate 4.2 A Typical Elevated Section of an Overland Conveyor (E806M_010)

The conveyor would typically stand approximately 1m to 2m above natural ground level and, across the Waukivory Creek and Avon River floodplain, approximately 1m above the 1 in 100 year flood level. It is notable that at this level, the conveyor would also be approximately 0.5m above the 1:500 year flood level. A tray would be positioned below the conveyor where it crosses Waukivory Creek and the Avon River to collect any coal in the unlikely event of a spillage. Depending on its ultimate location, it is currently envisaged that the overland conveyor would either be placed beneath Fairbairns Road and/or the road surface raised to allow the conveyor to be constructed below the road level. Access for servicing the conveyor would be provided via an access road constructed at natural ground level adjacent to the overland conveyor, and an elevated walkway where the conveyor crosses Waukivory Creek and the Avon River.

The coal products stockpiled adjacent to the CHPP would be loaded onto the overland conveyor and transported to one or more storage bins at the Rail Load-out Facility at a rate of approximately 1 500 tonnes per hour, using a nominal 1 200mm wide belt. A feed conveyor (nominally rated at 3 500 tonnes per hour) would then be used to transfer the coal to the overhead rail loading bin(s) from which the coal wagons would be loaded. The storage and rail loading bins would be preferentially filled during daylight hours.

4.6.2 Rail Loading and Despatch

The Applicant proposes to construct a rail loop off the North Coast Railway Line which can carry up to 5400t capacity trains. **Figure 4.5** displays the conceptual layout of the rail loop within the Rail Load-out Facility.



The rail loop would be approximately 2.5km long, constructed at grades which satisfy ARTC rail loading guidelines and require minor vegetation clearing and a program of cut and fill to achieve the required grades.

The Applicant anticipates the trains transporting the coal from the rail loop to the Port of Newcastle would comprise up to 72 x 80 tonne capacity wagons which would be loaded within approximately 1 to 2 hours of their arrival. At maximum production, loaded trains would typically be despatched once or twice per day.

4.7 MINE INFRASTRUCTURE AND SERVICES

4.7.1 Mine Access

Access to the Mine Area would be provided via a 50m section of McKinleys Lane and a new road to be constructed to the east of and generally parallel to McKinleys Lane. The mine access road would be sealed following an initial stabilisation period. Access for heavy vehicles to McKinleys Lane and the mine access road would be via Jacks Road and/or Waukivory Road from The Bucketts Way, depending on the point of origin. It is currently envisaged that light vehicle access would be predominantly via Jacks and Waukivory Roads to McKinleys Lane and the mine access road, with the ultimate decision to be based on the recommendations of the Applicant's transport consultants, Constructive Solutions. Constructive Solutions have also been commissioned to identify the principal road improvements required for the Proposal such as intersection upgrades, pavement widening and the installation of improved infrastructure.

4.7.2 Site Infrastructure

Internal Road Network

The Applicant would maintain a network of internal roads to enable the haul trucks to transfer overburden from the active open cut pits to the designated areas of emplacement. Internal roads would also be constructed and maintained between each of the active open cut pits and the CHPP. Internal roads would be periodically relocated, as required, to maintain minimum road lengths and optimum grades. In-pit roads would be designed and constructed to a maximum gradient of 10%, with all roads constructed with a travelling width of three times the maximum width of the largest vehicle, plus berms and drainage as required.

Site Offices, Workshop and Facilities

In order to control the interface between mining operations and private vehicles, the Applicant would establish a site office and associated facilities for the site workforce on land adjacent to McKinleys Lane, utilising the existing buildings, where possible. A workshop would be constructed adjacent to the CHPP. The site office and amenities may need to be relocated if the area is required for the emplacement of overburden.

4.7.3 Services

Power

The Applicant estimates that its annual power consumption would be approximately 18 000MW hours. Discussions with electricity service providers indicate that electrical power could be provided to the Mine Area and Rail Load-out Facility from one of the following three sources.

1. The Applicant may source its electrical power requirements from a coal seam gas-fired power generation plant that is planned for construction by AGL within the Central Processing Facility at Stratford (**Figure 1.4**), thereby using a locally available resource and as clean a power source as could reliably satisfy the Applicant's requirements. This option will also require the installation of a high voltage power line from the power generation plant to the Mine Area across land owned by AGL, Gloucester Coal Ltd and GRL.

2. The existing 33kV or 11kV ring main feeder from Stroud Road to Gloucester along The Bucketts Way to a main switch yard at the Rail Load-out Facility, with further distribution to infrastructure on site.
3. A new injection point from the 132kV TransGrid high voltage feeder from Stroud Road to Taree and incorporating a new substation and aerial feed to site with associated infrastructure.

The decision between Options 2 and 3 would be determined by the capacity of the electricity service provider's infrastructure.

The Applicant would address the environmental impacts of the installation and use of the power transmission lines within the Site whereas the selected electricity service provider would address the impacts of the transmission lines beyond the Site.

It is noted the existing 132kV feeder traverses the eastern side of the Mine Area and, subject to a risk assessment and further consultation, may need to be relocated prior to disturbance within the feeder easement.

Water

Water for the mining operation would be obtained from the following sources.

1. Groundwater and surface water accumulating within the open cut pits.
2. Surface water drawn from on-site sediment control or water storage dams.
3. Gloucester town water supply for potable quality water requirements. The water would be piped from the existing mains within the Rail Load-out Facility or trucked in.

At maximum production, water usage on site is currently estimated at:

- CHPP (make-up water) – up to 200MLpa;
- Dust Suppression (roads, stockpiles, conveyor transfers, etc.) - up to 300MLpa; and
- Amenities, Offices and Workshops 6MLpa (i.e. 0.04ML per person/year).

The site water requirement would be achieved through:

- capturing surface water within the Applicant's Maximum Harvestable Right Dam Capacity and purchased licences;
- capturing groundwater within the open cut pits with the required purchased licences; and
- water recovered from Waukivory Creek and/or the Avon River within the limitation of the Applicant's existing or purchased licences.

The Applicant would minimise the demand for clean water sourced by harvesting surface runoff or extractions from the Waukivory Creek or the Avon River under licence by:

- maximising the use of groundwater collecting in the open cut pits and sediment-laden water collected in sediment control structures;
- maximising the recovery and re-use of water in the coal preparation process through the use of tailings dewatering; and
- where appropriate and warranted, the use of chemical dust suppressants in lieu of water.

Fuel

The earthmoving fleet would likely be diesel-fuelled with bulk diesel stored in bunded above-ground tanks adjacent to the workshop near the CHPP. Earthmoving equipment would be either fuelled adjacent to the on-site tanks or with a mobile service truck. However, GRL is also investigating the potential to use locally-sourced coal seam gas to power selected mobile equipment.

4.8 EMPLOYMENT

The construction workforce would peak at approximately 100 persons during the 9 to 12 month construction period, while at full production the Rocky Hill Coal Project would employ up to 150 persons in operational and management roles.

The construction and operational workforce would be preferentially sourced from the local district. However, it is likely that some contractors/employees would be based or reside in Newcastle or elsewhere in the Hunter Valley and either commute to and from the site daily or, in the case of short term construction activities, reside in hotels, motels, caravan parks or rental accommodation in the local area for the duration of their activities. Notwithstanding, it is envisaged that the majority of operational employees sourced from the outside the district would move to the local area permanently. There is no intention to establish camp accommodation for the workforce.

4.9 HOURS OF OPERATION AND LIFE OF THE PROPOSAL

4.9.1 Hours of Operation

Mine Construction

Mine construction activities would generally be undertaken between 7:00am and 10:00pm Monday to Saturday with selected activities undertaken between 8:00am and 6:00pm on Sundays, public holidays excluded. Activities which would be unlikely to generate noticeable noise such as electrical installation work within the CHPP, may be undertaken outside these hours.

Mine Operations

As a general rule, mining activities would be undertaken between 7:00am and 10:00pm, up to six days a week, public holidays excluded. However, as part of the environmental investigations and impact assessment, the Applicant would investigate the opportunities for drilling and/or other limited activities to be undertaken beyond 10:00pm once, for example, the open cut pits have reached a depth at which night time and sleep disturbance criteria would be satisfied. During the early years of operation, the CHPP would likely operate on day shift only. In order to process the ROM coal at maximum production, the CHPP would operate on two shifts from 7:00am to 10:00pm Monday to Saturday.

Coal Product Despatch

The hours of operation for product despatch would be dictated by the timetable nominated by the coal carrier on advice from ARTC regarding the available train paths to the Port of Newcastle. Only in the event that train loading is undertaken between 10:00pm and 7:00am and another train is scheduled for arrival prior to 10.00am on the following day would concurrent train loading and loading of the product bins via the overland conveyor potentially occur.

4.9.2 Life of the Proposal

With the defined resources identified in Section 4.3.1, the projected ramp-up in production to a maximum of 2.5Mtpa and continuing favourable economic conditions, mine production would continue for a period of up to 15 years. A 21 year development consent is being sought to accommodate any circumstance(s) that may slow down the mining of coal and to allow for both the construction phase and completion of all rehabilitation activities.

4.10 REHABILITATION

4.10.1 Rehabilitation Objectives

The Applicant's objectives for rehabilitation are centred upon the progressive restoration of areas of disturbance through the creation of a final landform, soil substrate and vegetative cover suitable for a level of agricultural productivity similar to existing levels, and/or passive nature conservation. The specific objectives for the long term rehabilitation program are to:

1. blend the created landforms and vegetation established on the post-mining landform with that of the surrounding topography;

2. provide a low maintenance, geotechnically stable and safe landform with minimal erosion; and

3. re-instate the pre-disturbance land capability and agricultural suitability.

The Applicant would also implement a program of interim rehabilitation of disturbed/constructed areas in order to:

1. reduce the visibility of mine-related activities from surrounding properties and the local road network;
2. reduce the visibility of interim activities and the barriers themselves;
3. minimise the areas of exposed surfaces which would otherwise be potential sources of windblown dust; and
4. ensure the interim slopes are stable.

4.10.2 Mine Area

Interim Landform

The Applicant would create interim landforms as temporary visibility barriers. The barriers would be orientated generally in a north-south direction and provide visual protection for mining and out-of-pit earthmoving activities, particularly overburden emplacement.

The interim landforms would be constructed with their western slopes typically at 1:3 (V:H) and vegetated with a range of shrubs and grasses.

Final Landform

Figure 4.6 presents the conceptual final landform for the Mine Area. The principal features of the final landform as presented on **Figure 4.6** are as follows.

- The landform on the eastern side of the Mine Area would be re-established to emulate that prior to mining, or elevated 5m to 15m above the existing landform and incorporate a ridge/valley configuration similar to the existing landform.
- The landform within the area of the former western visibility barrier would be similar to that prior to the commencement of mining operations, with the material used in construction of the barrier placed in the void remaining following the cessation of mining within the Main Pit.
- A gentle depression covering an area of approximately 84ha with a floor ranging in depth up to approximately 15m below the pre-mining landform, i.e. creating a floor level above the pre-mining groundwater table.
- Final slopes for all surfaces across the areas disturbed typically varying from 1:5 (V:H) to less than 1:10 (V:H).

All final slopes would be created principally through bulldozers pushing the overburden into the required form, after which subsoil and topsoil would be placed with emphasis placed upon progressive landform creation and stabilisation.

The emplacement of overburden in either the in-pit or out-of-pit emplacements would be undertaken with full recognition of the erosion and dispersion characteristics as defined in geochemical assessment of the overburden.

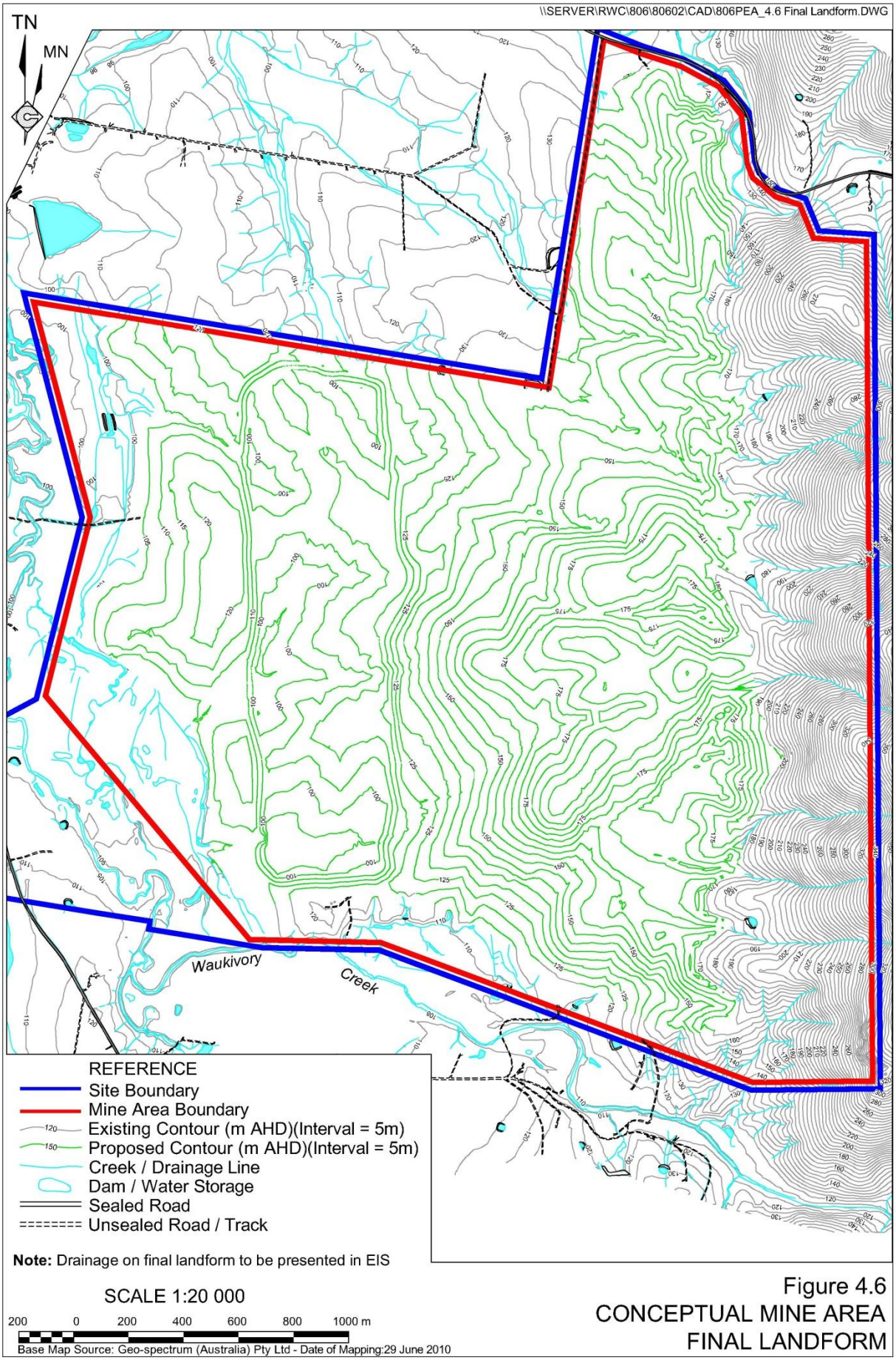


Figure 4.6
CONCEPTUAL MINE AREA
FINAL LANDFORM

Final Land Use

The Applicant currently proposes to re-instate the landform within the Mine Area to allow its use for a combination of grazing and/or passive nature conservation purposes, i.e. land uses consistent with those currently applying to the site.

An important focus of the rehabilitation program would be to return as much of the land disturbed as is practicable to a land capability and agricultural suitability comparable to the existing land.

4.10.3 Overland Conveyor Corridor

At the conclusion of mining activities and confirmation that the overland conveyor is no longer required, the conveyor structure would be disassembled and removed. All footings would be removed and either taken off the Site for disposal at a licenced landfill or buried within the Main Pit final void during its backfilling and reshaping.

4.10.4 Rail Loop and Load-out Facility

The Applicant intends to retain the Rail Load-out Facility until such time as it is no longer required for product coal despatch or for any other similar purpose, at which time the bins and conveyor structures would be removed and the associated areas of disturbance rehabilitated. Given that the rail loop would be positioned adjacent to what is a former industrial facility close to Gloucester, its retention is seen as being a likely benefit in terms of potential future land uses. Accordingly, the rail loop would be retained.

4.10.5 Potential Biodiversity Offsets

The Proposal would involve the removal of approximately 25ha of native vegetation comprising approximately 19ha of an open forest/woodland (Community 2), 3ha of a rainforest community (Community 4) and 3ha of a riparian forest (Community 3).

The Applicant intends to offset the removal of this vegetation by defining an offset area on land owned by the Applicant east of the Mine Area. The area of land and its ongoing management would be addressed in the *Environmental Impact Statement* for the Proposal.

4.11 ALTERNATIVES CONSIDERED

During the design of the Rocky Hill Coal Project, the Applicant examined a range of alternatives before deciding upon the Proposal as presented within this document. The following sub-sections outline the alternatives considered and the reasons for proceeding with the preferred option.

Mining Methods

Given the steeply dipping nature and multiple coal seams within the Mine Area, open cut methods were determined to be the only feasible means of extracting the identified resource. Underground mining of multiple steeply dipping seams is not currently, nor is likely to be, technically feasible in the foreseeable future.

Overburden Disposal

In terms of areas potentially available for overburden disposal, the Mine Area is physically constrained by:

- the presence of Waukivory Creek and the Avon River and their associated flood plains to the west;
- the steep nature of the landform to the east;
- the existence of multiple seams which subcrop across the Mine Area;
- the potential to sterilise coal resources;
- the visual sensitivities of the area; and
- a desire to minimise impacts on existing surrounding land uses and the local environment.

As a result, the conceptual configuration of the out-of-pit overburden emplacement and the final landform was the result of numerous iterations which progressed from the conventional plateau type landform to that presented. The out-of-pit emplacement incorporates valleys, ridges and slopes similar in location and form to those naturally occurring in the same area prior to mining and has been designed to minimise short term visual impacts and make the re-constructed medium to longer term landform indiscernible from those areas unaffected by mining.

CHPP Location

During the early stages of planning for the Proposal, a number of potential locations for the CHPP were examined to the southwest and west of the proposed site, with each subsequently discounted because the results of the drilling program showed a CHPP constructed in those locations would sterilise a proportion of the open cut resource. The coal underlying the proposed CHPP site is at a depth of greater than 300m and as such is not amenable to mining by open cut methods.

Disposal of Fine Rejects

The potential development of one or more dams to contain the fine rejects from the coal preparation process was considered briefly but discounted due to the physical and environmental constraints of the site and local area (as described as applying to the overburden emplacement) and the time required to achieve the consolidation necessary for successful rehabilitation. Direct disposal to the mine voids as a slurry, though practically feasible due to the development of multiple pits, was similarly discounted due to the problems associated with consolidation, and the associated delays to the rehabilitation process and the use of the area for the proposed post mining land uses.

Product Despatch to the Train Loader

Use of trucks as a means of transporting product coal to the train loader in lieu of a conveyor was considered briefly but discounted for the following reasons.

- Use of a local road network which currently primarily services rural-residential areas and agricultural enterprises, or is a “tourist route”, by several hundred trucks per day would represent a major and unacceptable change in the nature of the traffic and be contrary to the State Government’s objective to minimise or eliminate coal transportation on the public road network, where possible.

- Construction of a dedicated haul road on private property would necessitate the crossing of Waukivory Creek and/or the Avon River and their associated flood plains. Such a route, if constructed at natural ground level, would result in periods when transportation of coal to the train loader was not feasible due to elevated flows (thereby potentially necessitating the maintenance of substantial coal stockpiles at the load-out facility or interference to train loading schedules) or, if constructed on an elevated formation, interference to flood flows and increased flooding impacts in upstream areas.

GLOUCESTER RESOURCES LTD

ABN: 46 114 162 597

Documentation Supporting an Application for Director-General's Requirements for the

ROCKY HILL COAL PROJECT

Prepared by:

R.W. CORKERY & CO. PTY. LIMITED

February 2012

This page has intentionally been left blank

GLOUCESTER RESOURCES LTD

ABN: 46 114 162 597

Rocky Hill Coal Project

Documentation Supporting an Application for Director-General's Requirements

Prepared for:

Gloucester Resources Limited
ABN: 46 114 162 597
Level 37 Riverside Centre
123 Eagle Street
BRISBANE QLD 4000

Telephone: (07) 3006 1834
Facsimile: (07) 3006 1840
Email: gpolwarth@amci.com.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Brooklyn Office:
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Facsimile: (02) 9985 8208
Email: brooklyn@rwcorkery.com

Orange Office:
62 Hill Street
ORANGE NSW 2800

Telephone: (02) 6362 5411
Facsimile: (02) 6361 3622
Email: orange@rwcorkery.com

Brisbane Office:
Level 19, 1 Eagle Street
BRISBANE QLD 4000

Telephone: (07) 3360 0217
Facsimile: (07) 3360 0222
Email: brisbane@rwcorkery.com

Ref No. 806/02

February 2012

This Copyright is included for the protection of this document

CONTENTS

CONTENTS

Page

CONTENTS

Page

FIGURES

CONTENTS

Page

TABLES

PLATES

COVERAGE OF SUPPORTING DOCUMENTATION IN THIS DOCUMENT

Documentation	Coverage in this Document
1. **Site Details**	
(a) Local and regional context of the proposal	Section 3.1
(b) Surrounding development.	Section 3.3
(c) Potentially affected properties.	Section 3.3
(d) Location of key infrastructure.	Section 5.3
(e) Location of key environmental features.	Sections 5.1 to 5.10
2. **Development Description**	
(a) Concise summary of the proposal	Section 4
(b) Description of types of activities.	Sections 4.4, 4.5 and 4.6
3. **Permissibility and Strategic Planning**	
(a) Relevant strategic planning documents.	Section 2.2
(b) Relevant environmental planning instruments.	Section 2.2
(c) Key development standards.	Sections 5.1.2, 5.2.2 and 5.4.1
4. **Preliminary Environmental Assessment**	
(a) Preliminary risk assessment.	Section 2.4
(b) Expected environmental impacts.	Section 5
(c) Strategies to address expected impacts.	Section 5
5. **Justification**	
(a) Why were the site(s) chosen?	Section 4
(b) Alternatives considered.	Section 4.11
(c) Strategic context of the proposal.	Section 4.2
(d) Wider regional/state benefits.	Section 5.11.3
6. **Consultation**	
(a) Consultation with local community.	Section 1.4.1
(b) Consultation with local Council.	Section 1.4.2
(c) Consultation with NSW Government agencies.	Section 1.4.2
7. **Capital Investment Value**	
(a) Accurate estimate of the CIV.	Application Form
(b) Quantity surveyor's report.	Not Required*

* Not required for a coal mine.

This page has intentionally been left blank

COMMONLY USED ACRONYMS IN THIS DOCUMENT

AGL	AGL Upstream Infrastructure Investments Pty Ltd
ARTC	Australian Rail Track Corporation Ltd
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DGRs	Director-General's Requirements
DP&I	Department of Planning & Infrastructure (NSW)
DRE	Division of Resources and Energy (NSW)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Commonwealth)
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services (NSW)
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPL	Environment Protection Licence
GRL	Gloucester Resources Limited
LEP	Local Environmental Plan
LGA	Local Government Area
NOW	NSW Office of Water
OEH	Office of Environment and Heritage (NSW)
ROM	Run-of-Mine
SEPP	State Environmental Planning Policy
TSC Act	*Threatened Species Conservation Act 1995 (NSW)*

SUMMARY OF KEY FACTS AND STATISTICS - PROPOSED ROCKY HILL COAL PROJECT

Applicant:
- Gloucester Resources Limited

Application Area/ Site
- Mine Area (745ha)
- Overland Conveyor Corridor (111ha)
- Rail Load-out Facility (45ha)

Area of Disturbance
- Mine Area (540ha)
- Overland Conveyor Corridor (25m x 2km = 5ha)
- Rail Load-out Facility (15ha)

Project Overview
- Project Life = up to 21 years (including construction and rehabilitation)
- In situ Resource (to 150m) = 42 million tonnes
- Recoverable Coal Resource up to 30 million tonnes [1]
- Targeted Coal Seams
  - Cloverdale
  - Bowen Road
  - Avon
  - Roseville
  - Glenview
  - Weismantel
  - Marker 1

  (and other marker and minor seams)
- All coal recovered by open cut methods
- Overburden/Interburden = up to 150 million bank cubic metres (Mbcm)
- Maximum Run-of-Mine (ROM) Coal Production = up to 2.5 million tonnes per annum (Mtpa)
- All ROM coal to be washed in on-site Coal Handling and Preparation Plant (CHPP)
- Product Coal Production = maximum 1.75 Mtpa (at 70% assumed yield)
- All CHPP coarse/fine rejects to be emplaced as backfill with overburden
- Access via The Bucketts Way/Jacks Road/Waukivory Road/McKinleys Lane/private mine access road
- Estimated employment: Construction (100)/Operations (150)
- All coal products despatched by rail: at maximum production approximately 2 trains per day (average)
- Hours of Operation

	Core Hours of Operation	**Potential Additional Hours of Operation**
Mining	7:00am – 10:00pm, Monday to Saturday	10:00pm – 7:00am (limited activities subject to satisfying sleep disturbance criteria)
CHPP	7:00am – 10:00pm, Monday to Saturday	
Train Loading	24hrs/day, 7 days per week	
Maintenance	24hrs/day, 7 days per week	

[1] The recoverable coal resource will be further defined following the receipt of additional quality data and detailed mine planning.

1. INTRODUCTION

This section introduces the Rocky Hill Coal Project ("the Proposal"), the Applicant and the Site. It also provides relevant background information and an overview of the consultation undertaken and proposed, and reviews the environmental studies commenced and the team assembled to undertake the assessment of the Proposal.

1.1 SCOPE

Gloucester Resources Limited ("the Applicant" or "GRL") proposes to develop and operate a small scale open cut coal mine 3.5km to 7km southeast of Gloucester (see **Figure 1.1**). This proposed mine and its associated overland conveyor and Rail Load-out Facility are located on land owned, under an option to purchase, or the subject of current negotiations by the Applicant.

This document has been assembled by R.W. Corkery & Co. Pty Limited on behalf of the Applicant to provide the NSW Department of Planning & Infrastructure (DP&I) and other relevant government agencies with sufficient information to enable the Director-General's Requirements (DGRs) for an Environmental Impact Statement to be prepared for "the Proposal".

This document identifies the key environmental issues identified by the Applicant and its consultant team and outlines further investigations planned, as well as the approach to the overall design of the proposed mine.

Although planning to date has adequately defined the location of most Proposal components, three options are presented for the supply of power to be used on site. The definition of the proposed power infrastructure will be finalised for inclusion in the *Environmental Impact Statement* for the Proposal.

1.2 THE APPLICANT AND THE SITE

1.2.1 The Applicant

The Applicant, Gloucester Resources Limited, was initially formed to focus on coal exploration activities within Exploration Licences (ELs) 6523, 6524 and 6563 within the Gloucester Basin and, subject to favourable results from those activities, to potentially develop the identified coal resources. The proposed Rocky Hill Coal Project has arisen as a result of the Applicant's exploration activities to date.

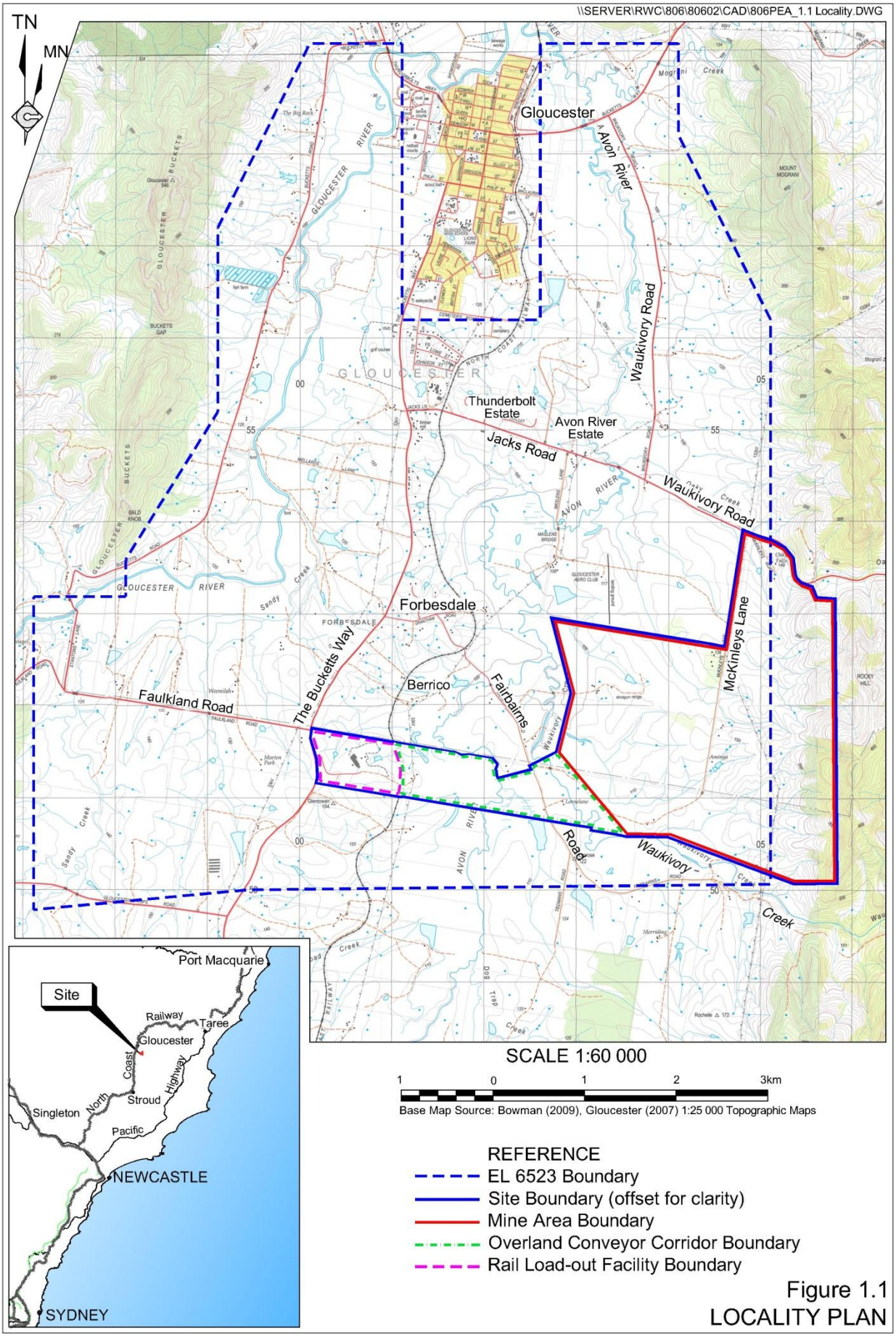


Figure 1.1
LOCALITY PLAN

GRL is operated by a board and management team with numerous years of experience in open cut and underground coal mining projects. The current board and the majority of the management team have been in place since early 2010. The key GRL personnel are as follows.

- Keith Ross – former Managing Director
- Grant Polwarth – Managing Director
- Bob Corbett – Environment Manager
- Ken Wilson – Technical Services Manager
- Mark Bobeldyk – Exploration Manager

Further information on the background which has culminated in the proposed Rocky Hill Coal Project is provided in Section 1.3.

1.2.2 The Site

The Site for the Rocky Hill Coal Project corresponds to the application area for development consent and comprises three proposed component areas, namely:

- the Mine Area;
- Overland Conveyor Corridor; and
- Rail Load-out Facility.

All land within the Site is owned, under an option to purchase, or the subject of current negotiations by the Applicant.

Figure 1.2 displays the location of each component area and **Table 1.1** lists the associated land titles. The majority of the Site lies within Exploration Licence (EL) 6523.

Table 1.1
Application Area Land Titles*

Mine Area	Conveyor Corridor	Rail Load-out Facility
Lot 2 DP 868581	Lot 1 DP 594237	Lot 28 DP 606093
Lot 21 DP 1048749	Lot 2 DP 1040412	Road Reserves
Lot 26 DP 1112877	Lot 26 DP 112877	
Lot 129 DP 979859	Lot 29 DP 606093	
Lot 222 DP 1061235	Fairbairns Road	
Lot 253 DP 785579	North Coast Railway	
Lot 251 DP 785579	Road Reserve	
Lots 301 to 304 DP 864518		
Lot 911 DP 748573		
Lot 252 DP 785579		
Council Public Road and Road Reserves		
* See **Figure 1.2** for land title boundaries		

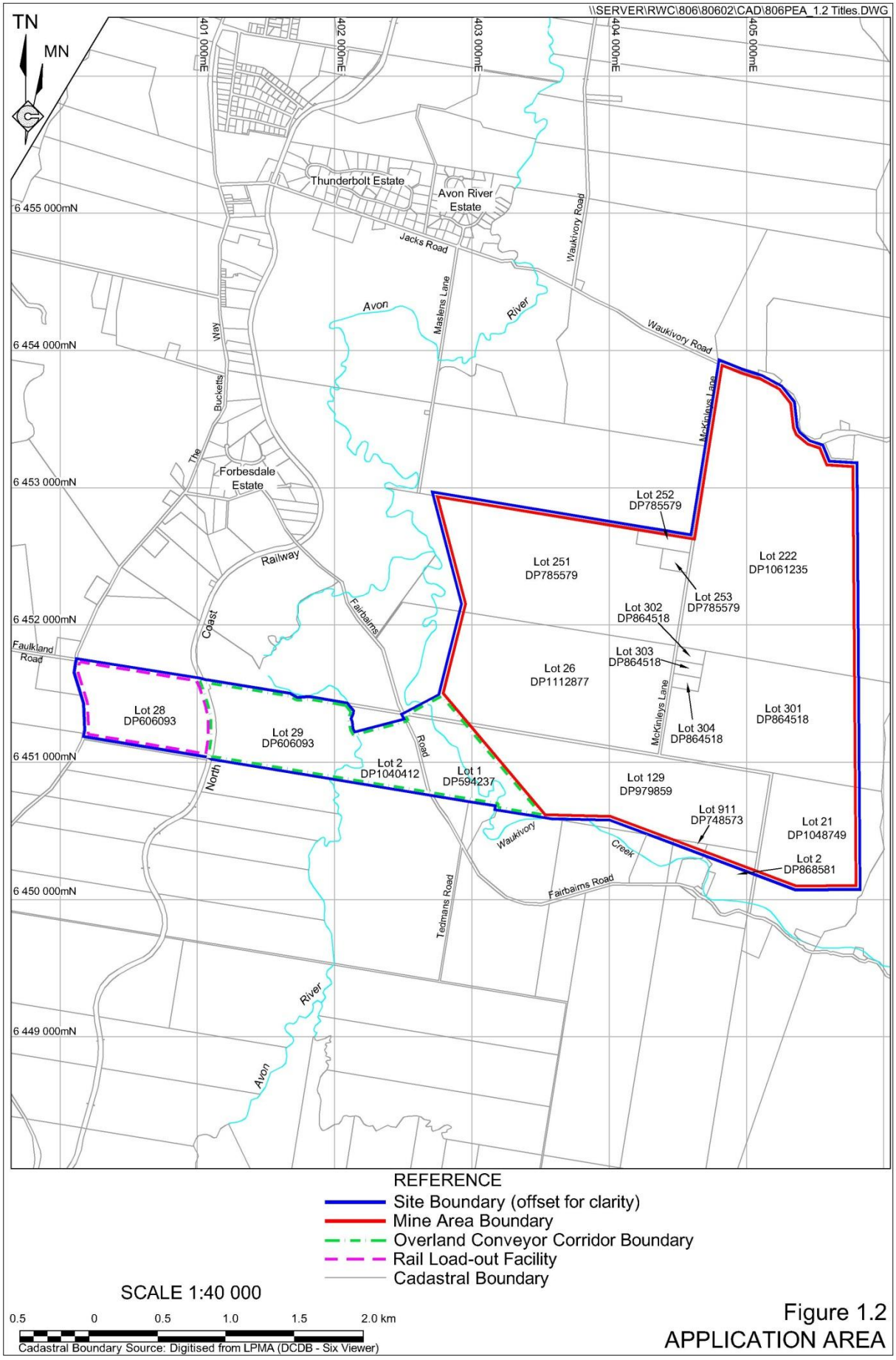


Figure 1.2
APPLICATION AREA

1.3 PROJECT BACKGROUND

Previous Coal Exploration

Coal was first discovered in the Gloucester Basin in 1855, although it was not until the early 1970s when exploration programs commenced and provided the basis for understanding the geology of the basin and the occurrence of the numerous coal seams.

Previous exploration in the Gloucester Basin was undertaken by Noranda Australia Limited, Blue Metal Industries Pty Ltd, Esso Exploration and Production Australia Inc., Excel Mining Pty Ltd and CIM Resources Ltd (now called Gloucester Coal Ltd).

In 2006, GRL was granted three exploration licences, namely EL6523, EL6524 and EL6563, covering an overall area of approximately 112km^2 (see **Figure 1.3**). The majority of the area covered by the exploration licences traversed the western side of the Gloucester Basin with a small section on the eastern side of the basin southeast of Gloucester. Following the grant of the three exploration licences, the then company management initiated a program of land acquisition and/or negotiated agreements with landowners to allow more detailed coal exploration to proceed and commenced limited exploration activities.

Recent Coal Exploration

In early 2010, the management of GRL changed and the new management adapted and accelerated the exploration program, initially concentrating in the area southeast of Gloucester within EL6523 and more recently, in the Woods Road area within EL6524 and EL6563 (see **Figure 1.3**). Exploration has now defined sufficient recoverable coal within the southeastern corner of EL6523 to allow the Applicant to develop plans for a proposed coal mine, i.e. the Rocky Hill Coal Project. The outcomes of the coal resource investigations within the Mine Area to date are summarised in Section 3.2.2.

Other Surrounding Projects

Figure 1.4 displays the location of the following two approved and/or proposed projects which need to be assessed in a cumulative manner (to the extent necessary) with the Applicant's Proposal.

Gloucester Coal Ltd – Coal Mining Operations

The exploration undertaken in the 1990s by the predecessors to Gloucester Coal Ltd (including CIM Resources Ltd and Excel Mining Pty Ltd) defined sufficient coal to allow coal mining to commence in the Stratford area. Gloucester Coal Ltd commenced coal production from the Main deposit at Stratford in 1995, its Duralie Mine in 2002, its Bowen Road North deposit in 2003 and its Roseville West Pit in 2009. The Bowen Road North and Roseville West deposits are located 1.5km north and 1km northwest of the Main deposit respectively. Gloucester Coal Ltd has recently announced that it intends to apply for development consent for an extension of its existing Stratford operations (Gloucester Coal, 2011).

The Stratford Extension Project would involve the extension of an existing approved open cut pit (Roseville West Pit) and two new additional open cut pits together with the extension of two existing waste emplacements. Other related activities include road re-alignments, continued backfill of completed open pits with an annual ROM coal production rate of 2.6Mtpa.

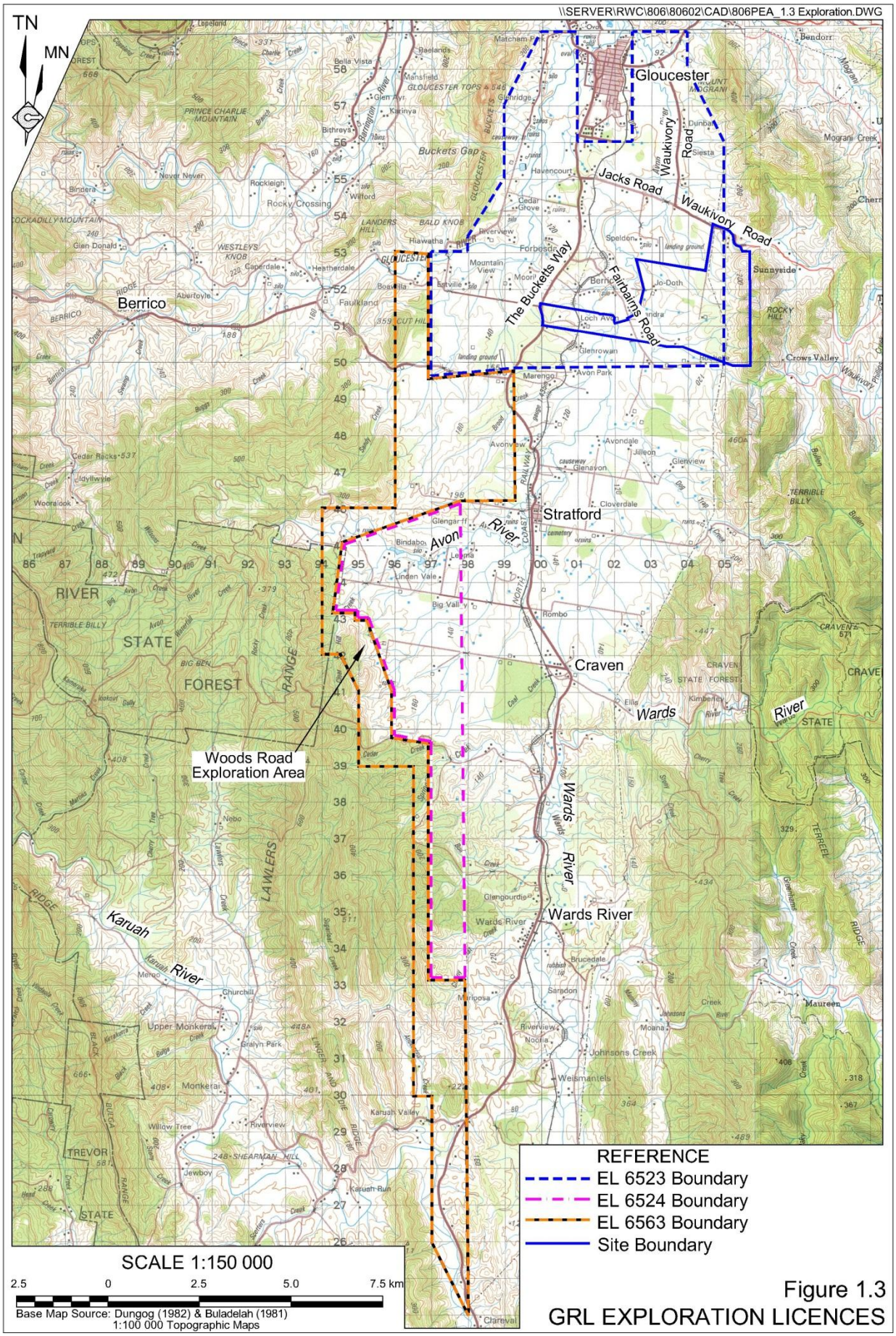


Figure 1.3
GRL EXPLORATION LICENCES

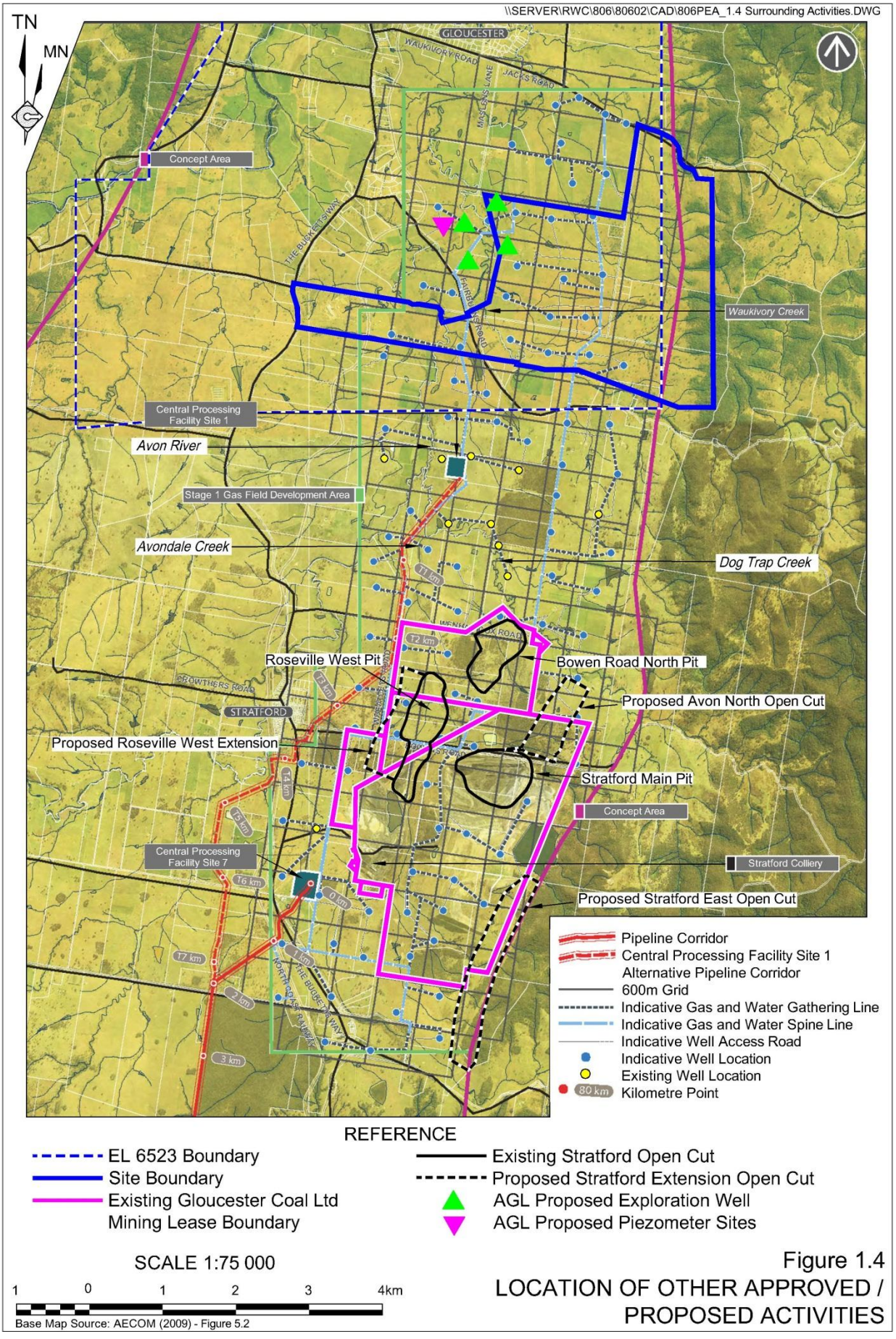


Figure 1.4
LOCATION OF OTHER APPROVED / PROPOSED ACTIVITIES

Subject to progress and information availability, the Stratford Extension Project proposed by Gloucester Coal Ltd to the south of the Site will be assessed by the consultant team advising the Applicant to ensure cumulative impacts of the two coal mining operations are clearly defined.

AGL Upstream Infrastructure Investments Pty Ltd – Coal Seam Gas Exploration and Production

AGL Upstream Infrastructure Investments Pty Ltd (AGL) has received approval (subject to a court appeal) to develop the Stage 1 Gas Field Development Area, centred on the town of Stratford. AGL has also received approval for four exploration (pilot) wells within and immediately adjacent to the Applicant's Mine Area and also plans to install two groundwater monitoring piezometers in the same area. The detailed environmental assessments of the Rocky Hill Coal Project would also address any cumulative impacts of the approved AGL Project and proposed ongoing exploration activities planned by AGL.

Both of these Projects are discussed further in Sections 6.2 and 6.3.

1.4 CONSULTATION

1.4.1 Community Consultation

Under the terms of ELs 6523, 6524 and 6563 administered by the Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS - formerly Department of Primary Industries – Mineral Resources), a community consultative community, known as the Gloucester Exploration Project Community Consultation Committee (CCC), was established in 2007 to:

> "*provide a forum for open discussion between the company, Gloucester Resources Limited, the appointed community representatives, other interested stakeholders and relevant government agencies. The process includes exchange of information, proper identification and addressing of potential concerns and conflicts of interest. Of equal importance, it is aimed at facilitating good working relationships amongst committee members and to act as a conduit to assist Gloucester Resources Limited to improve communication, education and notification with the general community*"[2].

The committee has held a total of 24 meetings to date with issues raised including land purchases, air quality and health impacts, mining in proximity to Gloucester, environmental data availability, and the development of a Company website.

[2] Source: Charter of the Gloucester Exploration Project Community Consultative Committee

Since the commencement of its exploration activities, the Applicant has also engaged in a program of individual landowner and, more recently, broader community consultation, to inform potentially affected persons and the broader community about its exploration activities and its environmental investigations. A program to discuss the planned mining operations with the broader community will be initiated. Community consultation undertaken to date has enabled the Applicant to engage with a number of potentially interested stakeholders about their concerns and identify issues that need to be addressed in the design of Proposal and subsequently covered in the *Environmental Impact Statement.* Issues raised during these various discussions have included air quality, health issues, noise, local traffic, employment potential and visibility.

Throughout the preparation of the *Environmental Impact Statement*, the Applicant intends to expand its program of community consultation through the Gloucester Exploration Project CCC, the release of newsletters, one-on-one discussions with all stakeholders who register an interest and facilitation of drop-in community forums. The Applicant maintains a website, www.grlcoal.com.au which, amongst other things, presents all approved environmental documentation pertaining to its exploration activities, and is developing a dedicated website for the Rocky Hill Coal Project. This website, www.rockyhillproject.com.au, will provide a mechanism for members of the community to pose questions and raise any issues/concerns as well as present summaries of air quality and meteorological monitoring data, fact and information sheets, and summaries of meetings of the Community Consultative Committee.

All relevant issues raised throughout the community consultation process will be comprehensively addressed in the *Environmental Impact Statement* and/or the appropriate specialist studies/assessments.

1.4.2 Government Agency Consultation

Preliminary discussions have already been held with Gloucester Shire Council, DRE (DTIRIS) DP&I and the NSW Office of Water (NOW) to introduce the Proposal to these agencies and to gain input on the studies required for the assessment of potential environmental impacts. Discussions have also been held with the Australian Rail Track Corporation Ltd (ARTC) and Essential Energy regarding the suitability of the existing rail and power infrastructure to support the Proposal.

The specific requirements of all relevant government agencies will be sought by DP&I in the near future following the circulation of this document and, if deemed warranted, a Planning Focus Meeting with representatives of each agency.

1.4.3 Other Resource Companies

GRL has initiated discussions with both Gloucester Coal Ltd and AGL Upstream Infrastructure Investments Pty Ltd regarding issues of mutual interest for their respective projects.

1.5 MANAGEMENT OF INVESTIGATIONS

This document has been prepared by Mr Rob Corkery, M.Appl.Sc., B.Sc (Hons), Principal of R.W. Corkery & Co Pty. Limited (RWC) and Mr Scott Hollamby B.EnvSc (Hons), Senior Environmental Consultant with RWC.

Details of the Proposal have been provided by the former Managing Director Mr Keith Ross, Mr Grant Polwarth and the other Directors of GRL and GRL's Environment Manager, Mr Bob Corbett, with the assistance of Mr Ken Wilson, Mr Mark Bobeldyk, MMG Civil, Mr Ken Byatt and Mr Aaron Donelan in the areas of coal quality, exploration, mine design and planning, coal processing, and geology and resource definition, respectively.

A range of environmental investigations have been initiated to identify the environmental constraints that need to be taken into account by the Applicant during the design of the Proposal. These studies are being undertaken by a team of specialist consultants managed by RWC including the following key individuals and companies

- Mr Ronan Kellaghan – PAEHolmes – Air Quality.
- Dr Marcus Lincoln-Smith – Cardno Ecology Lab Pty Ltd – Aquatic Ecology.
- Mr Brian Wilson – Ecotone Ecological Consultants Pty Ltd – Ecology.
- Mr Michael Batchelor – WRM Water & Environment Pty Ltd – Surface Water.
- Mr James Tomlin – Australasian Groundwater & Environmental Consultants Pty Ltd – Groundwater.
- Mr Adam Bioletti – Wilkinson Murray Pty Ltd – Noise and Vibration.
- Mrs Ellen Davis-Meehan and Ms Jenny Roberts – Key Insights Pty Ltd – Socio-Economic Issues.
- Mr John Appleton – Archaeological Surveys and Reports – Aboriginal and European Cultural Heritage
- Dr Richard Lamb – Richard Lamb & Associates – Visibility.
- Mr Geoff Cunningham – Geoff Cunningham Natural Resource Consultants Pty Ltd – Soils, Land Capability and Agricultural Impact.
- Mr Ben Rossiter – Constructive Solutions Pty Ltd – Traffic and Transport.

These and additional specialist consultancies will complete relevant assessments of the key issues and the identification of the design and operational safeguards for the Proposal for inclusion in the *Environmental Impact Statement*.

The Applicant also commissioned GSS Environmental to investigate and map the location of the alluvial sediments within and adjacent to the Mine Area and GHD to facilitate rail connection design and enquiries.

2. APPROVALS REQUIRED, PLANNING ISSUES AND THE APPROVALS PROCESS AND PRELIMINARY RISK ASSESSMENT

This section introduces the approvals the Applicant understands will be required for the Rocky Hill Coal Project to proceed. The State and local planning issues are canvassed and the overall approvals process outlined.

2.1 APPROVALS REQUIRED

Based upon the current design of the Proposal and understanding of relevant environmental issues, the Rocky Hill Coal Project would require the following approvals to proceed.

1. Development consent under the *Environmental Planning and Assessment Act 1979* as the Proposal, being for coal mining, is recognised as State Significant Development under *State Environmental Planning Policy (State and Regional Development) 2011* for which approval is required from the Minister for Planning and Infrastructure or the Planning Assessment Commission.
2. Mining Leases under the *Mining Act 1992* for the area nominated as the application area or Site. The issuing authority would be the Minister for Resources and Energy. Prior approval will be required from the Minister for Resources and Energy to enable a mining lease application to be lodged over the area external to the EL 6523 boundary which is required for mining purposes such as overburden emplacement.
3. An Environment Protection Licence under the *Protection of the Environment Operations Act 1997*. The issuing authority would be the Office of Environment and Heritage (Environment Protection Authority) (OEH (EPA)).
4. An Aquifer Interference Licence under the *Water Management Act 2000* for the removal of water from aquifer(s) during the course of mining. The issuing authority would be the NSW Office of Water (NOW).
5. A permit under the *Roads Act 1993* to undertake the proposed road and intersection works and improvements for the Proposal, together with the overland conveyor crossing either over or beneath Fairbairns Road. Gloucester Shire Council would be the issuing authority for the required permits.
6. Approval from the ARTC to construct an overland conveyor over the North Coast Railway.
7. Approval from the Minister for Resources and Energy under Section 100 of the *Coal Mine Health Safety Act 2002* for the establishment of emplacement areas within the Mine Area.

The Applicant also proposes to refer the Proposal to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) to establish whether the Proposal is a controlled action under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*. In the unlikely event the Proposal is determined to be a controlled action under the EPBC Act, an approval would be sought from the Commonwealth Minister for DSEWPaC.

It is noted that the issuing of a development consent as identified in 1. above is a pre-requisite for the receipt of approvals 2. to 5. and the EPBC Act approval, if required.

Following receipt of development consent, the Applicant would also seek the necessary approvals from Gloucester Shire Council for the closure of the section of McKinleys Lane south of the entrance to the proposed offices and amenities (**Figure 4.2**), that component of the east-west oriented Faulkland Road extension road reserve and the north-south road reserve adjacent to Lot 21 DP1048749 lying within the Site, and construction of buildings, structures and appropriate sewage treatment systems for the Proposal.

2.2 PLANNING ISSUES

2.2.1 State Planning Issues

The following five State Environmental Planning Policies (SEPPs) have been identified which do or could potentially apply to the Proposal.

- SEPP (State and Regional Development) 2011
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007
- SEPP 33 – Hazardous and Offensive Development
- SEPP 44 – Koala Habitat Protection
- SEPP 55 – Remediation of Land

State Environmental Planning Policy (State and Regional Development) 2011

Being a coal mine, the Applicant's Proposal is identified as State Significant Development under Schedule 1 of the SEPP which was gazetted on 1 October 2011.

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

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

The SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development. A summary of the matters that the consent authority needs to consider when assessing the Applicant's Proposal is as follows.

- **Clause 12**: Compatibility of proposed mine with other land uses.
- **Clause 13**: Compatibility of proposed development with mining.
- **Clause 14:** Natural resource management and environmental management.
- **Clause 15:** Resource recovery.
- **Clause 16:** Transportation.
- **Clause 17:** Rehabilitation.

An assessment of how each of these clauses is addressed with respect to the Applicant's Proposal will be provided within the *Environmental Impact Statement*.

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

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures, would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment. A risk screening for the Proposal would be undertaken in accordance with the document entitled *Applying SEPP 33,* (DoP, 2008).

State Environmental Planning Policy No. 44 – Koala Habitat Protection

The Gloucester 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 within the Site. Schedule 2 of this policy also provides a list of tree species that are favoured feed 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. Preliminary studies completed by Ecotone Ecological Consultants Pty Ltd have established that the Site contains three of the listed feed tree species, namely, red gum (*Eucalyptus tereticornis)*, grey gum (*E. punctata)* and tallowwood (*E. microcorys*). These species have been identified within the few areas of remnant vegetation present in parts of the Site and constitute at least 15% of these areas, albeit representing less than 5% of the total area to be disturbed throughout the life of the Proposal.

It is noteworthy no Koalas or evidence of Koalas were found during the ecological survey of the Site and its surrounds. Hence, no core Koala habitat is present. However, as a consequence of some areas of remnant vegetation containing greater than 15% of the favoured feed tree species, these parts are recognised to be "potential Koala habitat".

State Environmental Planning Policy No. 55 – Remediation of Land

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

As the areas proposed for disturbance within the Mine Area have previously been used only for dairying or grazing cattle, it is highly unlikely any contamination is present that requires remediation work prior to undertaking the proposed mining operation.

In May 2010, prior to GRL's acquisition of the proposed Rail Load-out Facility site, a Phase 1 environmental site assessment (ESA) of that component representing the decommissioned Boral Timber Mill site was undertaken by Coffey Environments Australia Pty Ltd (CE). The ESA identified 13 areas of environmental concern and recommended that a Phase 2 ESA and a Hazardous Materials Survey (HMS) be undertaken. The HMS, also undertaken in May 2010, established that no high risk (classified as A1 and A2) hazardous and/or asbestos containing

materials were present or suspected on site. The Phase 2 ESA undertaken in July 2010 (involving nine test pits, 37 soil samples and four stockpile samples) identified TPH contaminated surface soils near a former diesel tank and elevated levels of boron in an ash stockpile; recommended the off-site disposal of the ash stockpile and the management of the contaminated soil by way of an Environmental Management Plan (EMP). Under the supervision of CE, the ash stockpile and underlying soil was removed and CE also prepared an EMP for the site.

Based upon preliminary investigations regarding the grazing land and the surveys of the former Boral Timber Mill site, SEPP 55 may be relevant to the consideration of the demolition of the Boral timber treatment facility within the Rail Load-out Facility.

2.2.2 Local Planning Issues

The Site is located within the Gloucester Local Government Area for which the *Gloucester Local Environmental Plan* (LEP) *2010* is relevant. **Figure 2.1** displays the section of the Gloucester LEP 2010 relevant to the Site and its surrounds. Both the Mine Area and the Conveyor Corridor traverse both the E3 – Environmental Management Zone and RU1 – Primary Production Zone, while the Rail Load-out Facility is confined to the RU1 zone. **Figure 2.1** displays that two further zones lie within 2km of the Site, namely E2 – Environmental Conservation and Zone R5 – Large Lot Residential.

It is noted that Gloucester LEP 2010 nominates that mining is permissible with consent in the RU1 zone but is not permissible in the E3 zone. Notwithstanding the non-permissibility of mining in the E3 zone under the LEP, the proposed Rocky Hill Coal Project is permissible under the *State Environmental Planning Policy* (SEPP) *(Mining, Petroleum Production and Extractive Industry)* 2007 as Gloucester LEP 2010 nominates "extensive agriculture" as permissible in the subject area. The permissibility of agriculture is nominated in the SEPP (Mining, Petroleum Production and Extractive Industry) as a pre-requisite for the SEPP to allow mining to be permissible.

The planning objectives of the RU1 Zone (Primary Production) and E3 Zone (Environmental Management) are as follows.

Zone RU1 – Primary Production

The three objectives of the RU1 Zone are to:

1. encourage sustainable primary industry production by maintaining and enhancing the natural resources base, whilst promoting diversity in enterprise and systems appropriate to the area;
2. minimise the fragmentation of resource lands and any conflict between land uses within the zone and adjoining zones; and
3. encourage ecotourism enterprises that minimise any adverse effect on primary industry production and the scenic amenity of the area.

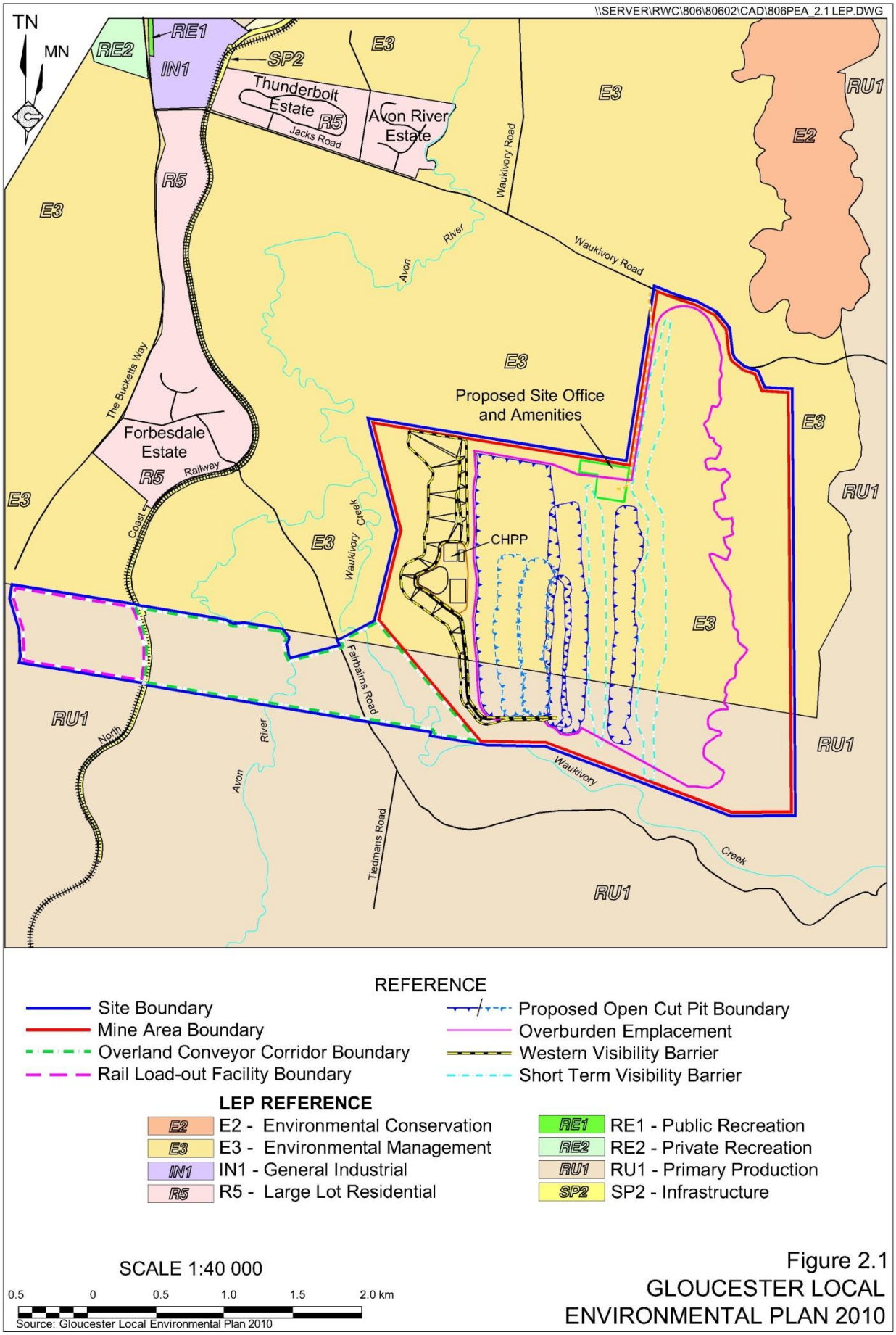


Figure 2.1
GLOUCESTER LOCAL ENVIRONMENTAL PLAN 2010

Zone E3 – Environmental Management

The three objectives of the E3 Zone are to:

i) protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values;

ii) provide for a limited range of development that does not have an adverse effect on those values; and

iii) conserve the biological diversity and native vegetation corridors, and their scenic qualities, in a rural setting.

The Applicant recognises these objectives and has endeavoured to design the Proposal, and will continue to refine the Proposal design, so as to reflect these objectives to the greatest extent possible.

2.3 THE APPROVALS PROCESS

Table 2.1 presents the component stages of the approvals process under the EP&A Act and for some of the other approvals referred to in Section 2.1 and provides an indicative Project timetable currently being followed by the Applicant. It is noted that the timing for a number of the component stages, namely those stages that are managed by the DP&I have been given an indicative timing based principally upon previous approvals issued for coal mining projects under Part 3A of the EP&A Act. However, based upon the submission of an adequate *Environmental Impact Statement* to be placed on public exhibition in September 2012 and the subsequent granting of development consent, assuming it is granted, the Applicant proposes to commence development of the mine during the first quarter of 2013 and despatch the first coal in the first quarter of 2014.

Table 2.1
Approvals Process for the Proposal and the Applicant's Indicative Timing

Page 1 of 2

Indicative Timing*	Activity
Ongoing	Extensive project planning as well as local and wider community consultation
Early February 2012	Submit Request for Director-General's Requirements and supporting documentation to the Department of Planning and Infrastructure
Mid February 2012	Refer the project to the Commonwealth Government in accordance with the requirements of the *EPBC Act 1999*
Mid March 2012	Commonwealth Government determines if the Proposal is a controlled action under the *EPBC Act 1999*
End March 2012	Department of Planning and Infrastructure issues Director-General's Requirements for the Environmental Impact Statement
Early April 2012	Lodge mining lease application(s) with Division of Resources and Energy
End July 2012	Lodge Development Application and Environmental Impact Statement with Department of Planning and Infrastructure for acceptance by the Department
Mid August 2012	Department of Planning and Infrastructure places Development Application and Environmental Impact Statement on public exhibition
September 2012	Public exhibition of the Environmental Impact Statement

Table 2.1 (Cont'd)
Approvals Process for the Proposal and the Applicant's Indicative Timing

Indicative Timing*	Activity
Early November 2012	Provide responses and clarification of issues arising from the exhibition of the Environmental Impact Statement to the Department of Planning and Infrastructure so that it can prepare its Assessment Report
Early November 2012	Lodge applications for an Environment Protection Licence as well as lodge applications for other approvals required under various other Acts.
End November 2012	Department of Planning and Infrastructure completes the assessment report
Late December 2012	Completion of assessment by Planning Assessment Commission
* Based on best estimates of the Applicant and RW Corkery & Co Pty Ltd.	

2.4 PRELIMINARY RISK ASSESSMENT

2.4.1 Introduction

The process adopted to identify the relevant issues and undertake a preliminary risk assessment has involved a combination of preliminary stakeholder consultation, preliminary environmental investigations and review of relevant documents culminating in an internal broad brush risk assessment workshop.

Further investigations on the depth and scope of the environmental issues requiring coverage in the *Environmental Impact Statement* documentation will be identified through the following processes.

- On-going consultation with the local community, and local and State government agencies, following receipt of DGRs.
- A detailed externally facilitated risk assessment undertaken in line with Australian Standards.
- Completion of preliminary environmental studies.
- Review of relevant legislation, planning documents and environmental guidelines.
- Qualitative analysis of risk for each potential environmental impact.

2.4.2 Preliminary 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 the development and operation of the Rocky Hill Coal Project. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each environmental issue identified, the potential environmental impacts have been allocated a risk rating based on the potential consequences and likelihood of occurrence and reflecting the Applicant's and its specialists' understanding of the likely effectiveness of the required mitigation measures.

Table 2.2 presents a preliminary analysis of environmental risk for the key issues identified to date for assessment of the Rocky Hill Coal Project.

Table 2.2
Preliminary Risk Analysis

Activity / Impact	Assessed Risk
Air Quality	
Dust generation from Site activities causing reduced air quality	Medium
Greenhouse gas emissions from Project activities contributing to climate change	Low
Exhaust emissions from project-related plant and equipment causing reduced air quality	Low
Noise and Vibration	
Noise generated from Site activities causing nuisance and health impacts	Medium
Noise generated off site by project-related traffic and transport causing nuisance in the surrounding area	Low
Vibration from blasting and extraction processes causing nuisance and damage to buildings	Low
Traffic and Transportation	
Mine employees, service providers and deliveries to / from the Site adding to road vehicle use	Low
Changes to rail traffic levels and scheduling with other rail users between the Site and the product destination	Low
Surface Water Resources and Quality	
Alteration of natural surface water flows within the Site and surrounding local catchments	Low
Reduction of the surface water quality in the surrounding local catchments	Medium
Groundwater Resources and Quality	
Alteration of natural groundwater flows within the Site and surrounding local area	Medium
Reduction of the groundwater quality in the surrounding local area	Low
Visual Amenity	
Changes to the visual amenity of the Site causing loss of amenity in the surrounding area	Medium
Terrestrial Ecology	
Removal and loss of threatened native flora and fauna species due to direct clearing and on-going project-related activities	Low
Aquatic Ecology	
Changes to the surface water quality in the surrounding local catchment area, leading to adverse impacts on aquatic ecology	Low
Soil Resources and Erosion	
Removal and loss or degradation of soil resources within the Site	Low
Agricultural Land Capability and Productivity	
Site activities leads to loss of important productive agricultural land	Low
Rehabilitation and Final Landform	
Inadequate or inappropriate rehabilitation and final landform at the Site leading to compromised or restricted future land use.	Low
Heritage (Aboriginal and European)	
Site activities results in loss or damage to heritage items or sites.	Low
Socio-economic	
Changes in local employment and revenue due to Project activities	Medium
Proximity of Site and proposed activities to local residences, properties and business and associated change of amenity	Medium

3. ENVIRONMENTAL SETTING

This section provides a brief overview of the regional and local setting of the Site. The attributes of the environmental setting described relate to topography, drainage, geology, surrounding land ownership and residences and climate. Each of these attributes is referred to when discussing other environmental features of the local area and in the presentation of the preliminary environmental impact assessment in Section 5.

3.1 TOPOGRAPHY AND DRAINAGE

The Site is located within the Stroud - Gloucester Valley, a local valley comprising a series of ridges and undulating lowlands. The ridges generally trend north-south, rising 100m to 200m above the valley floor with side slopes ranging from approximately 14° to 45°. The undulating lowlands, with typical slopes of <5° and elevations of 100m AHD to 130m AHD, occur across the valley floor. Terracing occurs adjacent to the main watercourses and the lower parts of the valley are subject to periodic flooding.

Two main river systems are present within the Stroud - Gloucester Valley. The Avon River and Gloucester River system drain to the north and the Mammy Johnsons Creek and Karuah River system drain to the south (see **Figure 3.1**).

The Mine Area is located on the eastern side of the Stroud - Gloucester Valley and straddles the two major topographic units, namely the ridges and intermediate undulating lowlands. Within the Mine Area, the topography is mainly undulating with gentle slopes on the western side (elevations range from 100m AHD to 130m AHD) and low to moderate hills on the eastern margin (elevations range from 130m AHD to 180m AHD). The steepest slopes located east of McKinleys Lane are effectively the lower slopes of the eastern ridge. One named hill immediately east of the Mine Area is "Rocky Hill", with an elevation of approximately 440m AHD. The local topography is shown on **Figure 3.2**.

The topography within the Overland Conveyor Corridor is largely flat given the land comprises the flood plains of Waukivory Creek and the Avon River. Elevations along the Overland Conveyor Corridor vary from approximately 100m AHD to 115m AHD.

The land within the Rail Load-out Facility generally slopes to the east within elevations of approximately 145m AHD near The Bucketts Way falling to approximately 106m AHD near the North Coast Railway Line.

Figure 3.2 also displays the drainage lines within the Site. A total of ten individual catchments have been defined within the Mine Area all of which drain either westerly or northwesterly. The drainage within the Overland Conveyor Corridor is dominated by the presence of both Waukivory Creek and the Avon River while a total of three small catchments occur within the Rail Load-out Facility, all of which flow in a general easterly direction towards the Avon River.

Further consideration of surface water resources within and surrounding the Site is presented in Section 5.4.

3.2 GEOLOGICAL SETTING

3.2.1 Regional Setting

The Gloucester Basin is a north-south trending synclinal structure approximately 40km long and 10km wide and containing two Late Permian coal measures, namely the Gloucester Coal Measures and the underlying Dewrang Group. In general, the strata are folded and dip steeply along the eastern and western basin margins and are near horizontal towards the centre of the basin. Regionally, the strata have been affected by reverse and normal faulting throughout the basin. **Figure 3.3** displays the simplified geology of the Gloucester Basin.

On the basin's eastern margin, the Gloucester Coal Measures are interbedded with over 50 generally thin coal seams subcropping at the surface. A few of the coal seams are thick and traceable over almost the entire eastern margin of the basin and are of most economic importance. The economically important seams identified within the Mine Area are the Cloverdale, Roseville, Marker 1, Bowen Road, Glenview, Avon, and Weismantel, together with associated marker and minor seams. **Figure 3.4** displays the stratigraphic sequence of the Gloucester Basin and identifies the seams proposed to be mined as part of the Applicant's Proposal.

3.2.2 Mine Area

In 2009, under the previous GRL management, the initial Stage 1 exploration program, comprising 44 open holes in the area now defined as the Mine Area, was completed with some holes geophysically logged. Chip samples were collected from seven holes. An extension to the Phase 1 exploration program began in 2010 under the current company management, the bulk of which has been completed. In 2010, Velseis conducted a three-dimensional seismic survey over a 10km^2 area in the southeastern corner of EL 6523 for AGL. This survey data, together with the results of the more recent drilling programs, has been interpreted and used to assist in the generation of the geological model for the Mine Area.

Seven main coal seams have been identified within the Mine Area as shown in **Table 3.1,** together with some additional marker and minor seams. A number of the main seams incorporate plies of varying thicknesses separated by small bands of non-coal sedimentary rocks. A summary of the average thickness and angle of dip of the identified seams is also presented in **Table 3.1**. All coal seams have been shown to be oriented north-south across the Mine Area.

Table 3.1
Main Coal Seams and Marker Seams within the Mine Area

Seam Name *[1]	Average Thickness *[2] (m)	Average Seam Dip (degrees)
Cloverdale (1, 2, 2B and 2C)	7.8	44
Roseville	3.7	45
Marker (1, 1A, 1B, 1C, 1D and 1E)	4.9	46
Bowen Road (1A, 1B, 2, 3, 4 and Lower)	9.2	47
Glenview	1.2	48
Avon (1, 2, 3, 4A, 4B and Triple)	6.9	51
Weismantel (1, 2, 3, 4 and 5)	4.4	67

*[1] Identifiers in ( ) indicate named plies within each seam.
*[2] Based upon borehole intersection. The average thickness nominated is an accumulation of the average thickness of all plies within each seam.

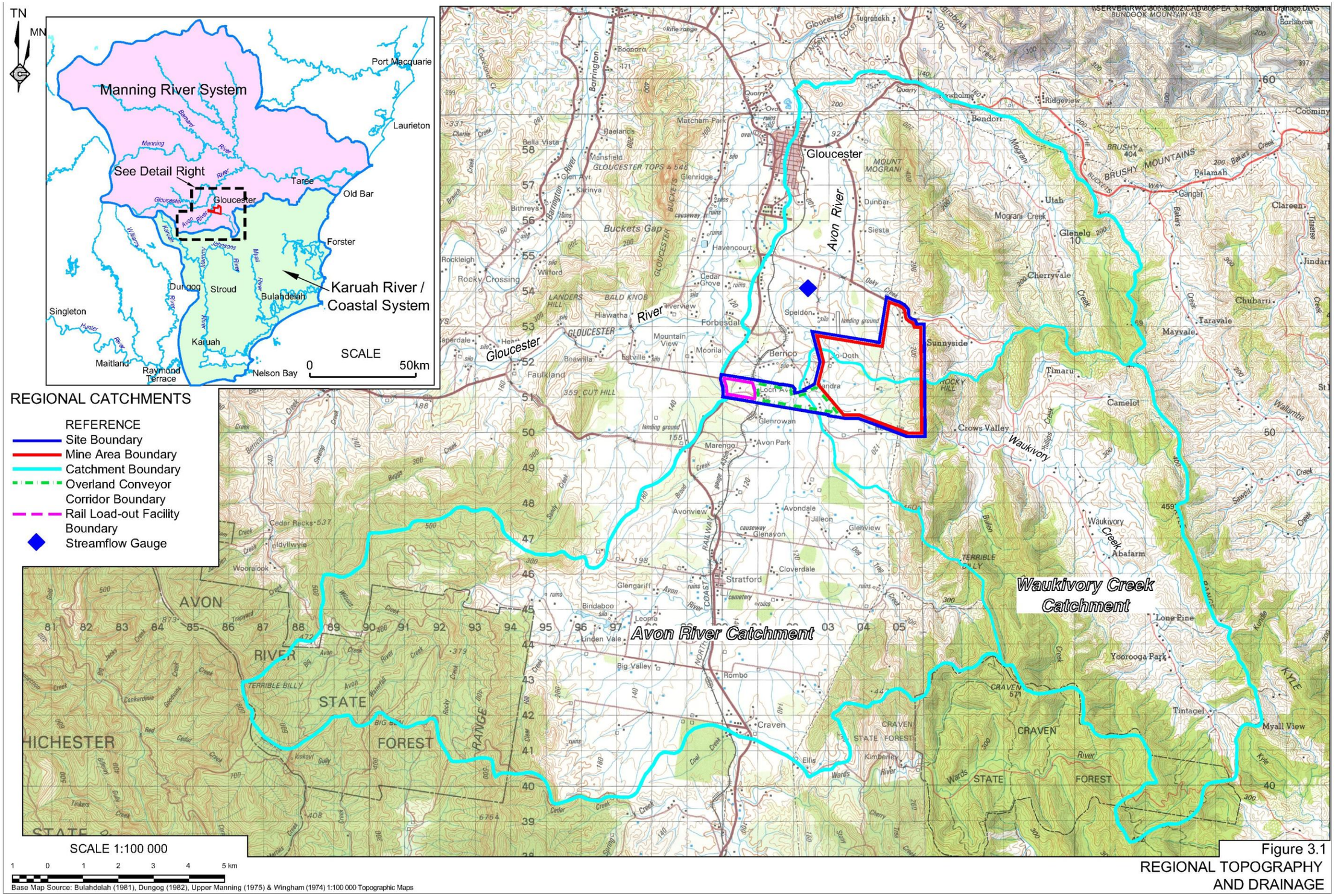


Figure 3.1
REGIONAL TOPOGRAPHY AND DRAINAGE

This page has intentionally been left blank

This page has intentionally been left blank

\\SERVER\RWC\806\80602\CAD\806PEA_3.1 Regional Drainage.DWG

TN
MN

REFERENCE
Site Boundary
Mine Area Boundary
Overland Conveyor Corridor Boundary
Rail Load-out Facility Boundary
Catchment Boundary
A Catchment Reference
1st Order Stream
2nd Order Stream
3rd Order Stream
4th Order Stream

Existing Meteorological Station

SCALE 1:20 000
200 0 200 400 600 800 1000 m

Base Map Source: Bowman (2009), Gloucester (2007) 1:25 000 Topographic Maps
Source of Stream Order: WRM Water and Environment

Figure 3.2
LOCAL TOPOGRAPHY AND DRAINAGE

This page has intentionally been left blank

This page has intentionally been left blank

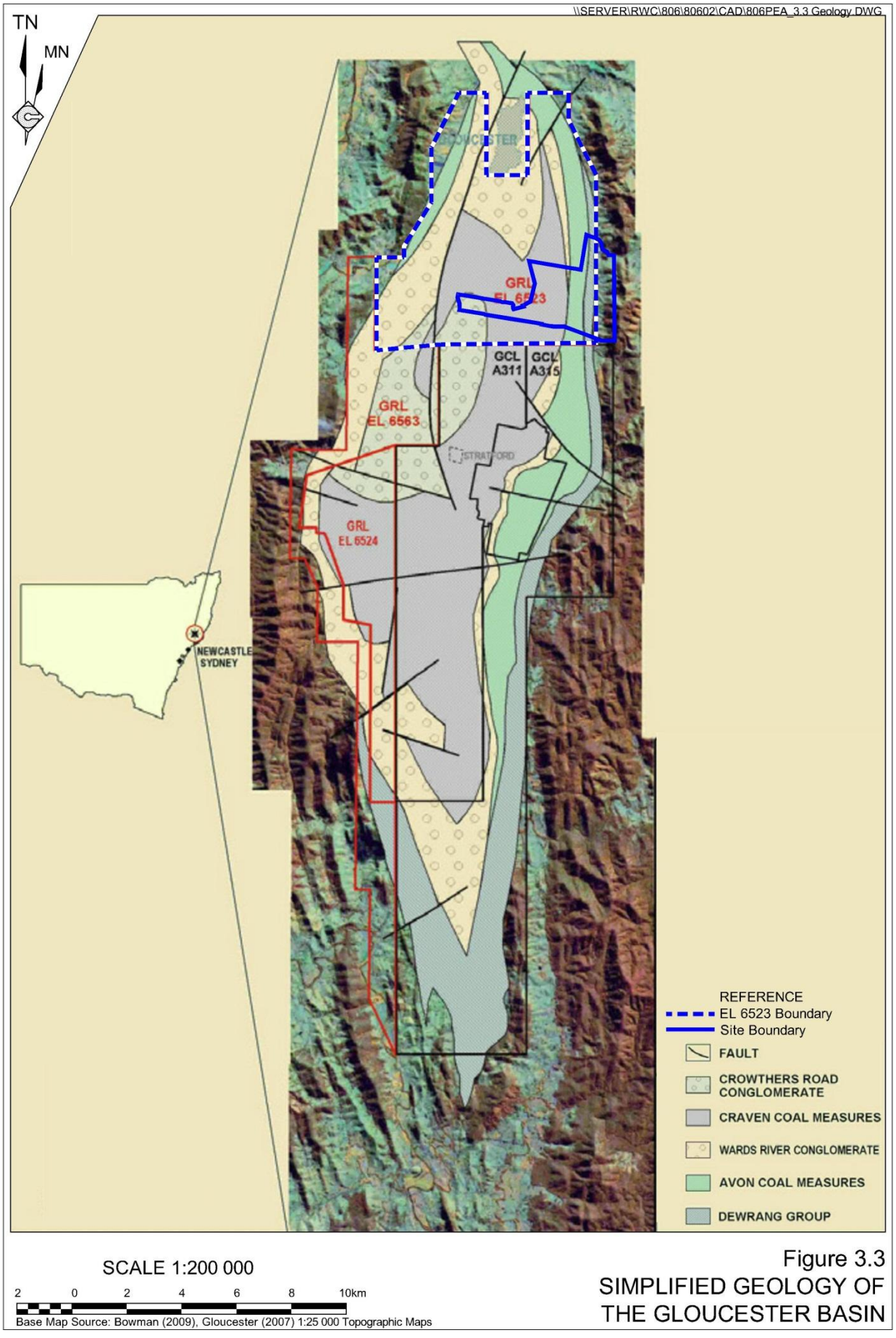


Figure 3.3
SIMPLIFIED GEOLOGY OF THE GLOUCESTER BASIN

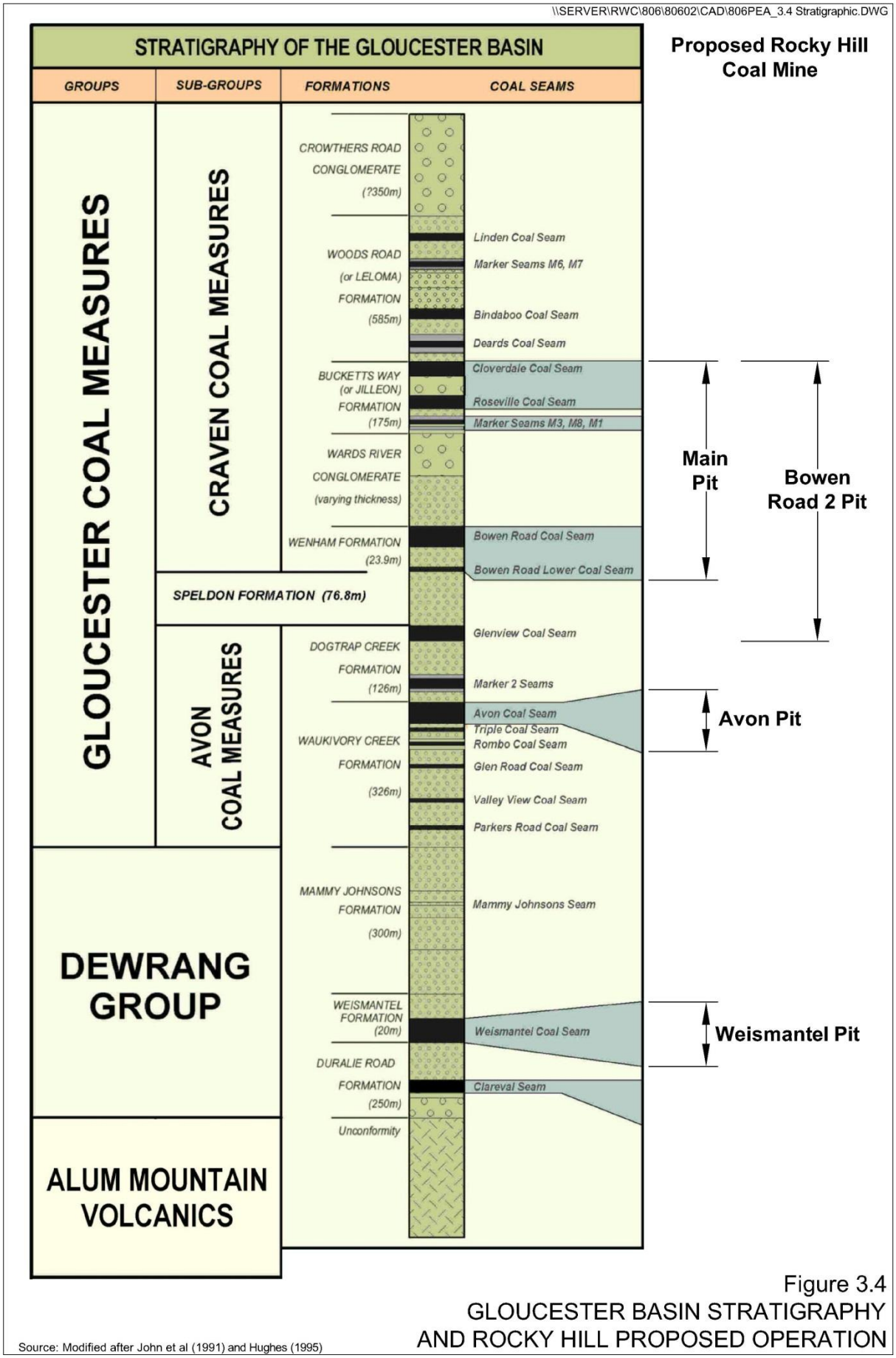


Figure 3.4
GLOUCESTER BASIN STRATIGRAPHY
AND ROCKY HILL PROPOSED OPERATION

Source: Modified after John et al (1991) and Hughes (1995)

Table 3.1 shows that the coal seams dip to the west at angles of approximately 44^{o} to 67^{o} with the dips increasing from west to east towards the basin margin, as can also be seen in the 3-dimensional view from the geological model provided in **Figure 3.5**.

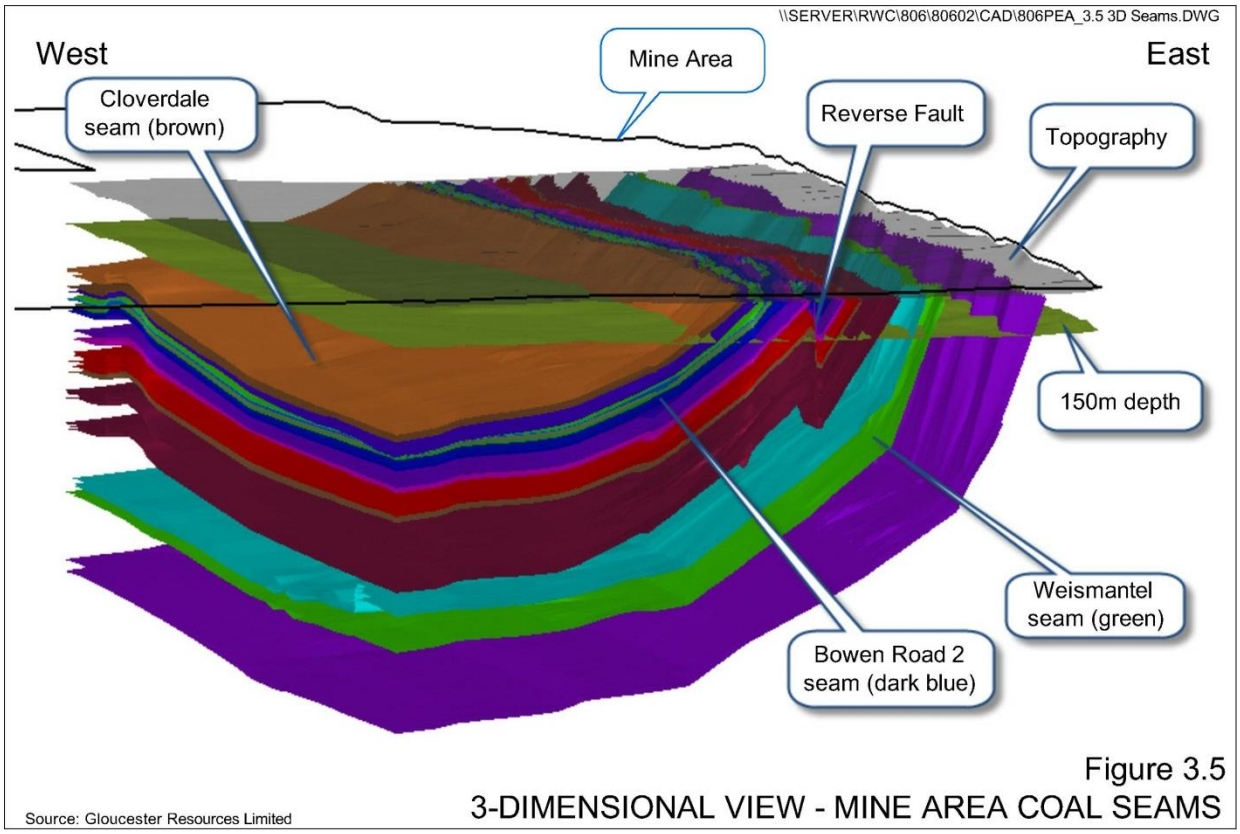


Figure 3.5
3-DIMENSIONAL VIEW - MINE AREA COAL SEAMS

The geological investigations undertaken across the Mine Area have also established the following.

- The depth of weathering within the Mine Area varies from approximately 4m to 37m and averages approximately 11m.
- The occurrence of one large reverse fault with a horizontal displacement of approximately 150m to 200m. The seismic data has also identified more complex faulting, both normal and reverse across the Mine Area but this has not been validated by drilling.
- A total of 13 holes intersected intrusions or basalts although only four holes contain intruded seams. Based on the current borehole data, intrusions do not appear to be a significant constraint to mine design or planned operations.
- Based on the data available, most of the seams analysed contain substantial quantities of bright coal with vitrinite ranges of 64.4% to 92.2%. The exceptions are the Bowen Road Seam samples with vitrinite contents of between 18.5% and 56.7% and one Avon Seam sample with a vitrinite content of 53.1%.
- Coal rank has also been determined from the chip samples with Rvmax varying from 0.83% to 0.92% in “V Steps” between 7 and 10.

3.3 SURROUNDING LAND OWNERSHIP AND RESIDENCES

All land within the Site is owned, under option to purchase, or the subject of current negotiations by the Applicant. The properties to the north, west and south of the Site are either agricultural properties varying in size from approximately 150ha to 250ha, or rural lifestyle blocks, typically of 4ha to 120ha in area. The landholdings to the east of the Mine Area comprise substantial agricultural properties, typically in excess of 200ha. **Figure 3.6** displays the land ownership status and the location of residences within and surrounding the Site.

Three rural-residential estates are located to the northwest and west of the Mine Area, namely the Thunderbolts and Avon River Estates (off Jacks Road – 104 lots) and Forbesdale Estate (off Fairbairns Road – 29 Lots). The lots within the Thunderbolts and Avon River Estates are typically approximately 6 000m^2 with a number of lots within both estates remaining without a residence. In the Forbesdale Estate, most land blocks have been sold and residences constructed, with most land blocks approximately 2ha in area. A number of rural lifestyle blocks are also present adjoining The Bucketts Way.

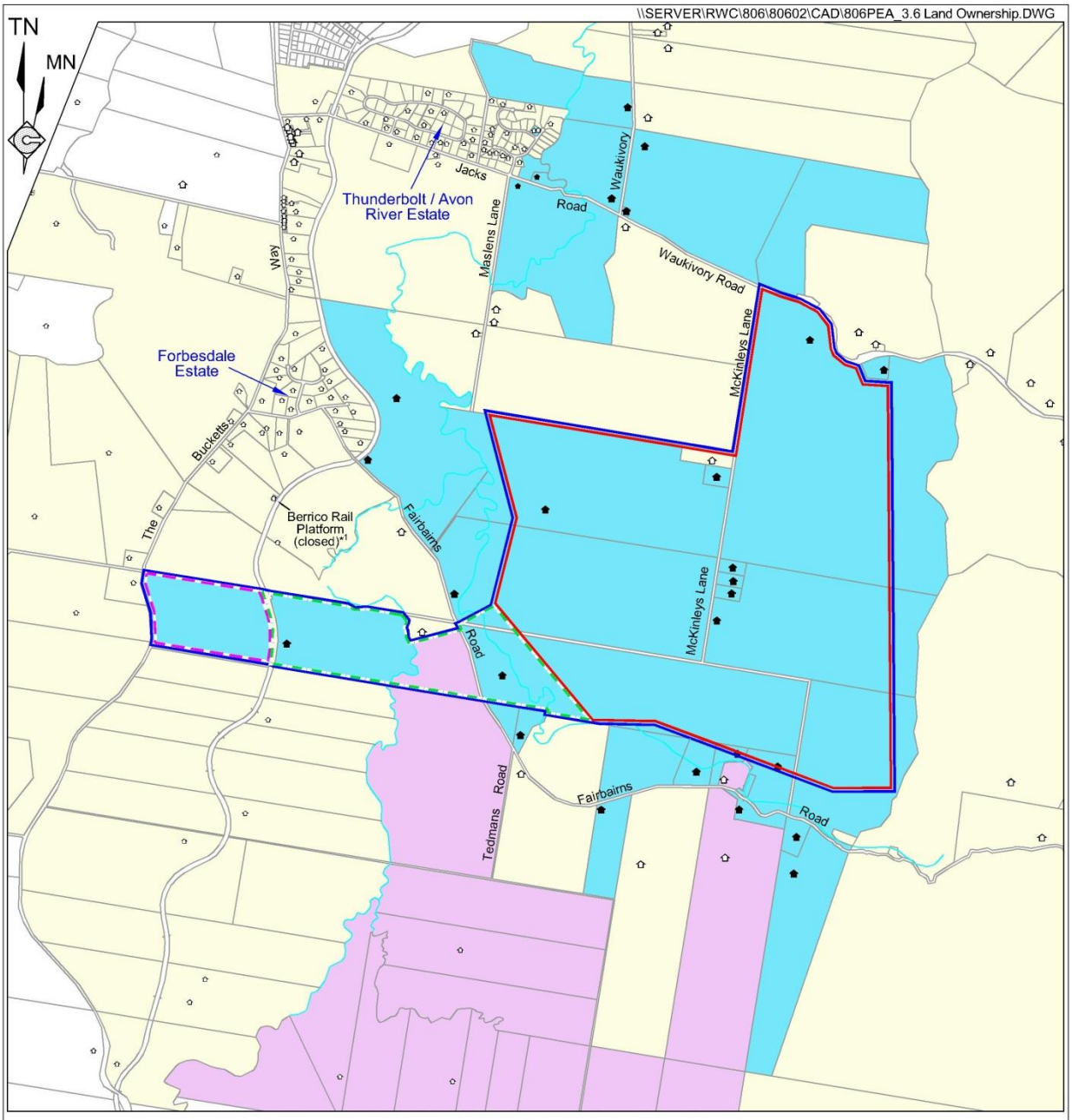
3.4 CLIMATE

The climate in the vicinity of Gloucester is warm temperate, i.e. warm to hot summers and mild to cool winters with the rainfall pattern having a summer maximum.

Long term climate data was sourced from the meteorological stations at Gloucester Post Office and Chichester Dam (38km southwest of Gloucester). Temperature, rainfall and evaporation (pan) data are presented in **Table 3.2**. The Applicant has established a comprehensive meteorological station within the Mine Area (see **Figure 3.2**). Data from the station will be incorporated into the *Environmental Impact Statement* and used/referenced in the various environmental assessments, where appropriate.

Table 3.2
Monthly Meteorological Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature (°C) Chichester Dam Station (Station # 061151)													
Mean maximum temperature	26.2	24.8	23.3	20.2	17.4	14.2	13.7	16.5	19.1	21.4	24.2	26.6	
Mean minimum temperature	16.7	16.7	16.2	12.7	9.7	7.0	6.2	6.9	9.8	12.1	14.9	17.2	
Rainfall (mm) Gloucester Post Office (Station # 060015)													
Mean monthly rainfall	115.1	122.3	127.7	77.3	68.6	67.1	51.3	46.5	51.4	69.2	83.4	104.4	982.7
Highest monthly rainfall	474.4	752.4	539.5	324.4	343.2	402.4	273.5	353.7	176.1	277.2	236.7	352.5	1875.2
Lowest monthly rainfall	0.0	2.5	9.8	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	498.4
Highest daily rainfall	154.9	158.2	170.2	108.0	152.4	112.6	114.3	109.2	89.7	121.4	107.4	112.4	
Evaporation (1975 to 2005) (mm) Data sourced from monthly evaporation maps													
Mean Monthly Evaporation	201.5	176.4	102.3	99.0	99.2	60.0	58.9	99.2	126.0	173.6	249.0	251.1	1696.2
Source: Bureau of Meteorology 2011													



REFERENCE

- Site Boundary
- Mine Area Boundary
- Cadastral Boundary
- Overland Conveyor Corridor Boundary
- Rail Load-out Facility Boundary
- Land Owned By or Under Option to the Applicant
- Land Owned By other Resource-related Companies
- Privately Owned Land
- Residence (Project-related)
- Residence (Non Project-related)

Note: *1 - Only a signalling hut remains at this location - the platform was removed in 1975

SCALE 1:50 000

0.5 0 0.5 1.0 1.5 2.0 2.5 km

Figure 3.6
LAND OWNERSHIP AND RESIDENCES

Temperature

December is the hottest month, with a mean maximum temperature of 26.6°C and a mean minimum temperature of 17.2°C. July is the coldest month with a mean maximum temperature of 13.7°C and a minimum temperature of 6.2°C.

Rainfall and Evaporation

Mean annual rainfall is 983mm, with rainfall distributed unevenly throughout the year. August is the driest month while the mean monthly rainfalls in December to March are greater than 100mm. Rainfall can, however, be extremely variable, with infrequent, high intensity rainfall events occurring. This is confirmed by the highest daily rainfall values shown in **Table 3.2**, and the fact that the maximum daily rainfall values are between 2 and 3.5 times average monthly rainfall values.

The period of above average rainfall between December and March poses the greatest risk for soil erosion, with the period from July to October posing the least risk.

Mean monthly evaporation varies throughout the year, from approximately 250mm in November and December to approximately 60mm in June and July. Annual evaporation exceeds rainfall by a factor of approximately 1.7.

Wind Speed and Direction

A summary of the wind behaviour from meteorological data collected at the Rocky Hill Coal Project Meteorological Station is presented in **Figure 3.7** for the period 1 November 2010 to 31 October 2011. Wind roses indicate that on an annual basis, prevailing winds are from the northeast and south. Seasonally, the winds from:

- the northeast and south dominate during summer;
- the south dominate during autumn;
- the southwest to south-southeast dominate during winter; while
- during spring, winds occur from all directions.

The average recorded wind speed is 2.5m/s and calm conditions occur for 2% of the year.

It is recognised the wind patterns recorded at the Rocky Hill Coal Project Meteorological Station differ slightly from those reported from a meteorological station installed at the Stratford Coal Mine to the south, reflecting the considerable influence the topography has upon wind directions throughout the Stroud - Gloucester Valley. The main difference between data recorded at the Stratford Coal Mine and the Rocky Hill Coal Project during the period 1 November 2010 to 31 October 2011 relates to the greater component of northerly winds at the Stratford station during all seasons with reduced easterly and westerly components. Notably, the southerly winds monitored at both locations are of similar wind speeds and occurrence.

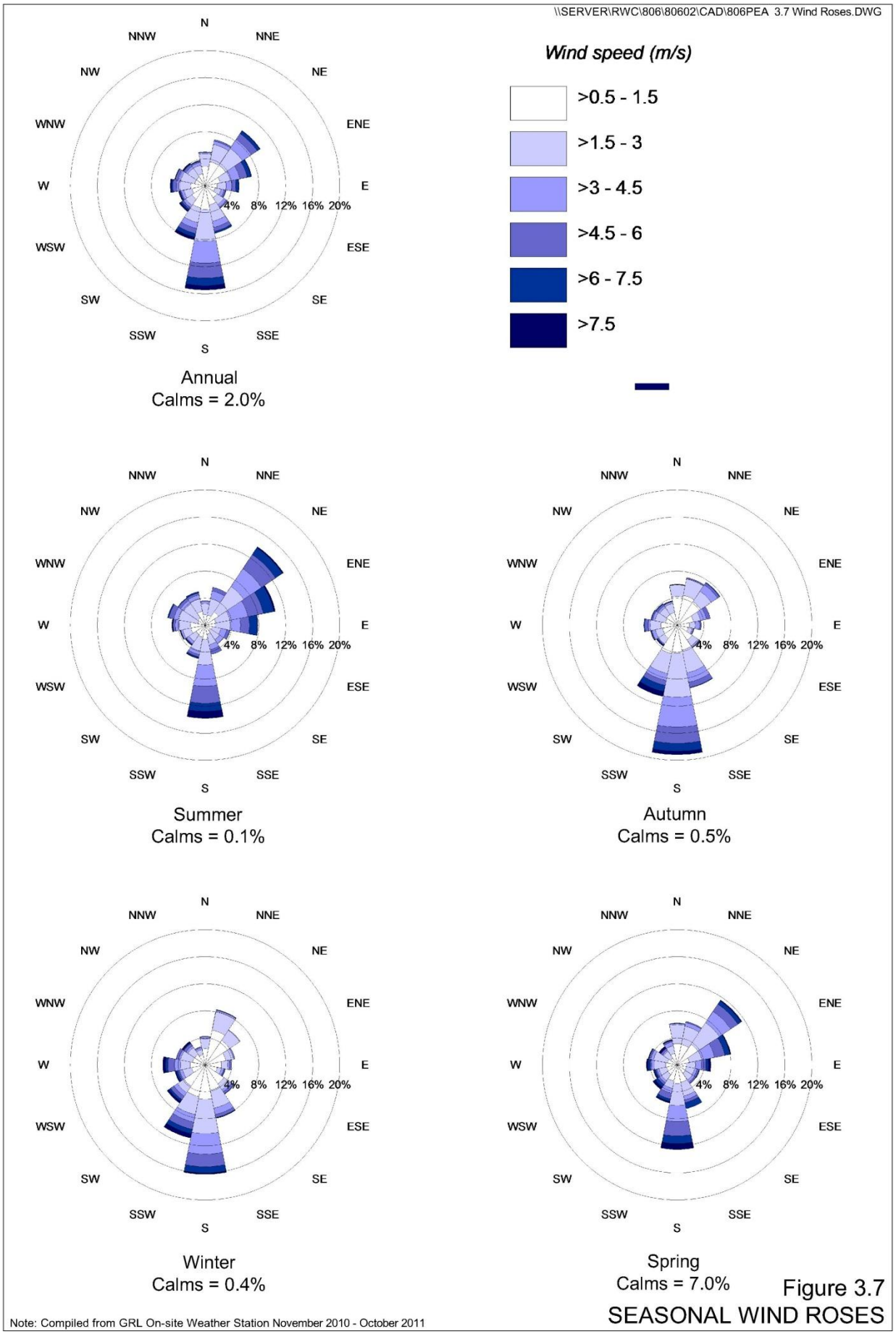


Figure 3.7
SEASONAL WIND ROSES

4. DESCRIPTION OF THE PROPOSAL

This section provides an overview of the Rocky Hill Coal Project ("the Proposal") in sufficient detail to enable the reader to understand the type and scale of activities proposed. A more detailed description of the Proposal would be included in the Environmental Impact Statement.

4.1 OBJECTIVES

The principal objectives of the Rocky Hill Coal Project are to:

1. maximise coal recovery and the efficiency of mining and processing operations;
2. provide a stimulus to the Gloucester and district economies through employment opportunities and supply of services required for the development and operation of the Proposal;
3. create a final landform that is safe, stable, visually and topographically sympathetic to the existing landform and amenable to the re-introduction of grazing activities, and nature conservation;
4. undertake all activities in an environmentally responsible manner to ensure compliance with relevant criteria/goals or reasonable community expectations; and
5. achieve the above objectives in a cost-effective manner to ensure the Rocky Hill Coal Project is viable.

4.2 NEED FOR THE PROPOSAL

Coal quality investigations indicate that the Rocky Hill Coal Project would produce two coal products suitable for the seaborne export market. The main product, a semi-hard coking coal for use in metallurgical processes, exhibits a higher fluidity, volatile content and swelling number and lower phosphorous content than the majority of coking coals produced in Australia. It also exhibits a relatively low sulphur content. The secondary, thermal coal product for use in power generation, though exhibiting a higher inherent ash than the coking coal, still exhibits a higher energy and calorific value than many other thermal products in the marketplace.

As a consequence, both product types would be in considerable demand throughout South East Asia and China, demand a higher price than many other similar export products in the marketplace, attract valuable income to Australia and help counter the Country's balance of payment.

Being located relatively close to the Port of Newcastle adjacent to a rail line which is under-utilized, the Rocky Hill Coal Project is also well positioned geographically and strategically to access the export market.

4.3 OVERVIEW OF THE PROPOSAL

4.3.1 Introduction

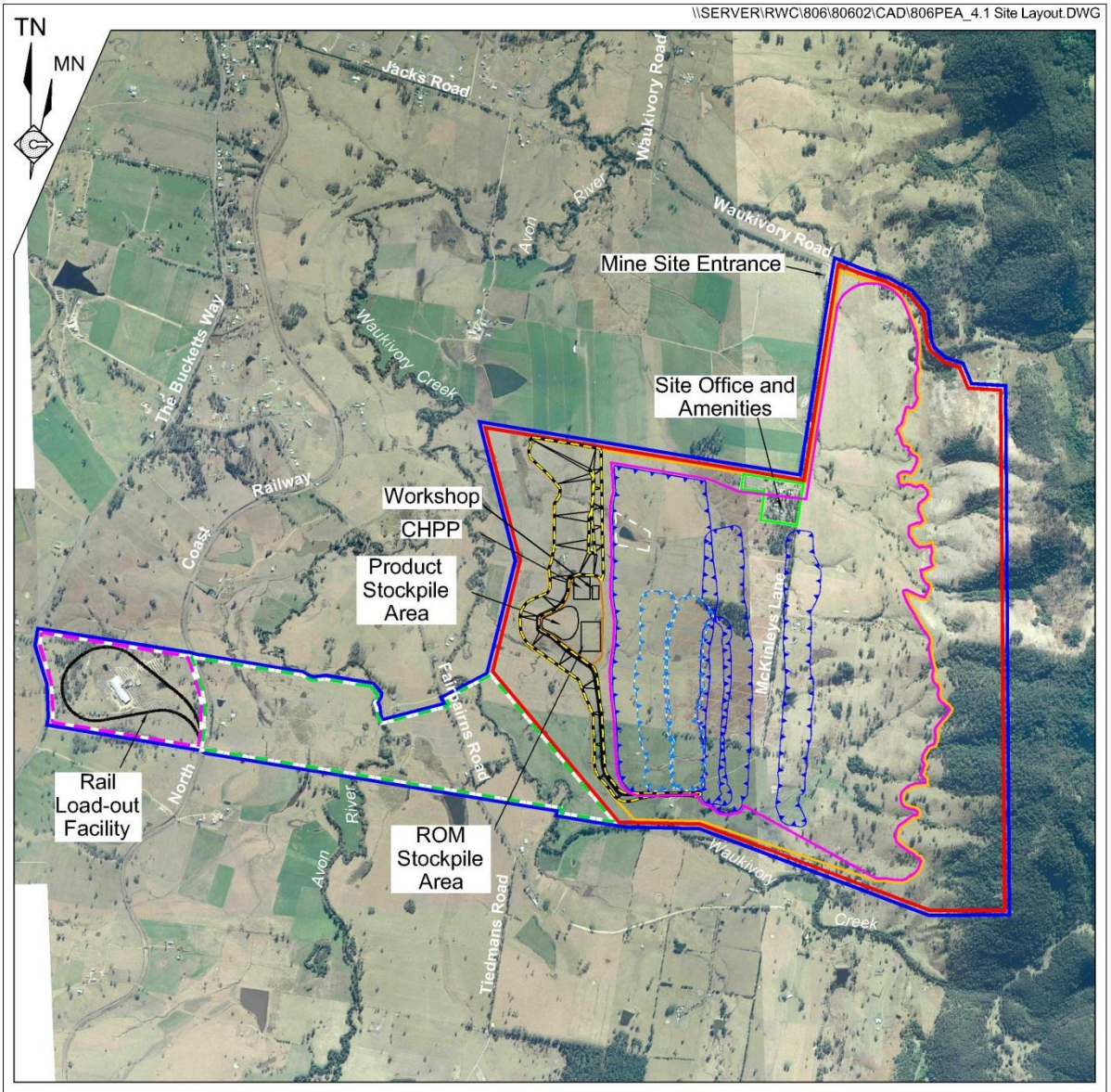
The Rocky Hill Coal Project comprises four principal components, (see **Figure 4.1**) namely:

1. four separate and/or contiguous open cut pits within the Mine Area;
2. a coal handling and preparation plant (CHPP) within the Mine Area;
3. an overland conveyor for transporting product coal to the Rail Load-out Facility; and
4. a Rail Load-out Facility (incorporating a rail loop).

4.3.2 Conceptual Mine Plan

Figure 4.1 displays the conceptual layout of the Mine Area comprising the following major components.

- The mine entrance off McKinleys Lane, 50m beyond the intersection of Waukivory Road.
- The mine access road to the site office and amenities, a road aligned generally parallel to but set back from McKinleys Lane.
- A site office and amenities complex on Company-owned land off McKinleys Lane.
- Four open cut pits (and their respective approximate depths from the base of weathering) namely the Weismantel Pit (60m – 70m), Avon Pit (80m – 90m), Bowen Road 2 Pit (70m – 80m) and Main Pit (180m) (see **Figures 4.2** and **4.3**), with mining within the limits of the Main Pit initially involving the development of two smaller, shallower sub-pits (Main Pit Sub-pit 1 (90m) and Main Pit Sub-pit 2 (70m)), to enable some production of the highest quality coals in the initial years of mining. The depths are nominal and based on current mine planning with the ultimate depths of development representing the optimisation of coal quality data and the outcomes of detailed mine planning as the mine progresses.
- Three generally north-south trending short term or long term visibility barriers. The barriers may be standalone structures or comprise the western margins of the out-of-pit emplacement as it is progressively developed.
- A series of cut-off grout curtains (or similar) in those areas where the proposed open cut pits encroach within 150m of alluvial sediments adjacent to Waukivory Creek. A similar treatment may be applied should structures be identified which would potentially provide a conduit for water movement to/from the alluvial sediments and the proposed open cut pits.
- An out-of-pit overburden emplacement overlying and extending beyond the open cut pits.
- A coal handling and preparation plant (CHPP) with associated run-of-mine (ROM) and product stockpile areas, a switchyard and a workshop.



REFERENCE
- Site Boundary
- Mine Area Boundary
- Overland Conveyor Corridor Boundary
- Rail Load-out Facility Boundary
- Proposed Open Cut Pit Boundary
- Proposed Overburden Emplacement
- Proposed Area of Disturbance
- Western Visibility Barrier

SCALE 1:40 000

0.5 0 0.5 1.0 1.5 2.0 km

Base Photograph Source: Geo-spectrum (Australia) Pty Ltd - Date of Photography: 29 June 2010

Figure 4.1
CONCEPTUAL SITE LAYOUT

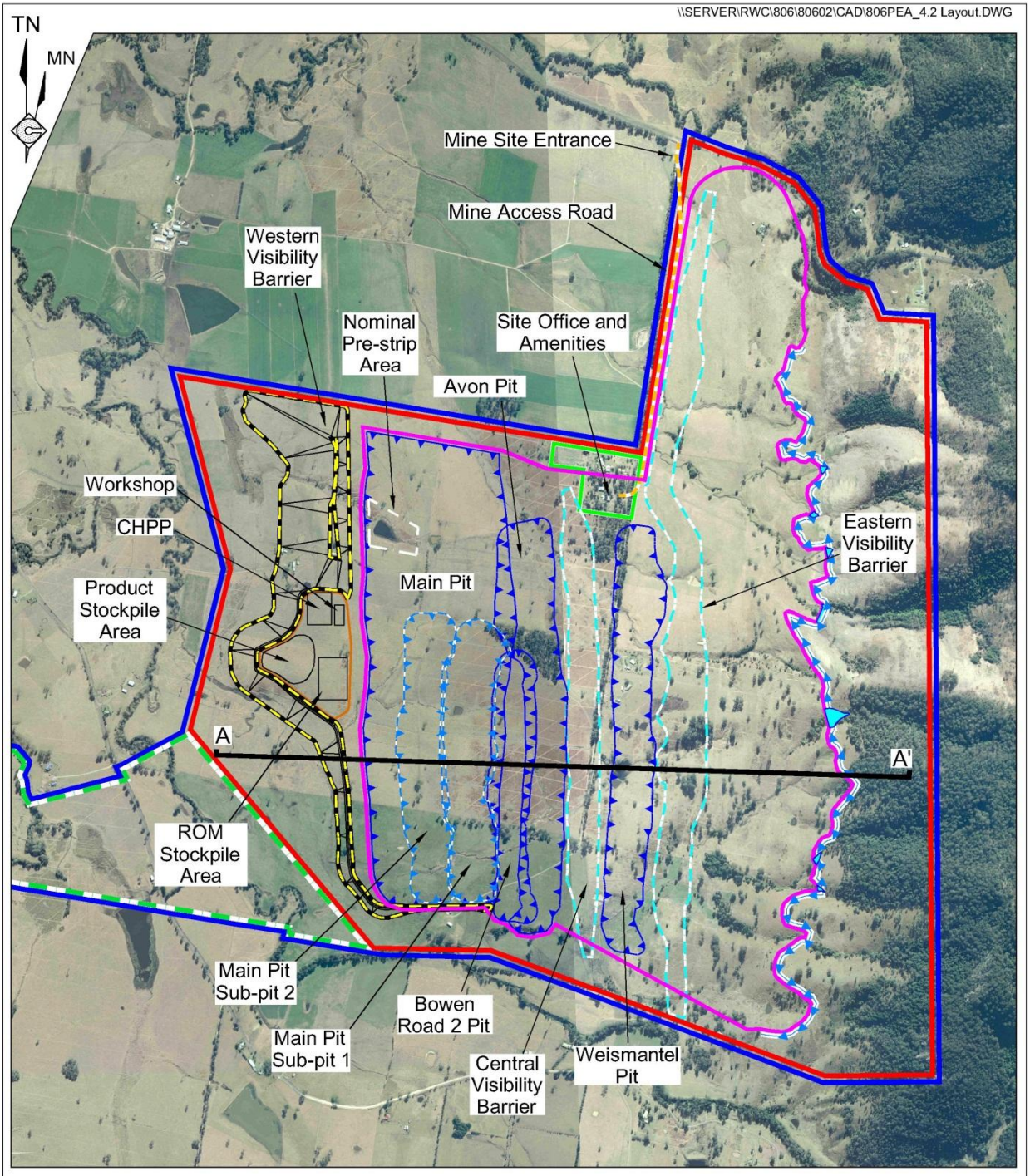


Figure 4.2
CONCEPTUAL MINE AREA LAYOUT

4.3.3 Site Establishment and Construction

Following the receipt of development consent and all necessary approvals, the Applicant would undertake a program to prepare the Site for coal recovery, processing and despatch. The key site establishment and construction activities would involve:

- construction of the site access road from near the intersection of McKinleys Lane and Waukivory Road to the site office and amenities;
- construction of the key site water management structures;
- installation/construction of required offices and amenities;
- construction of the western visibility barrier using materials excavated from the initial mining activities and a pre-strip area within the boundary of the Main Pit. (Construction of the western visibility barrier would necessitate the relocation of the existing meteorological station);
- construction of the CHPP building, installation of all processing equipment and the workshop;
- construction/erection of the overland conveyor;
- excavation works (cut and fill) required for the rail loop and demolition of the former Boral Timber Mill buildings;
- construction of the rail loop and erection of the train loading infrastructure adjacent to and above the rail loop; and
- installation of power supply and control infrastructure.

4.4 MINING OPERATIONS

4.4.1 Coal Resources

The seven main coal seams defined within the Mine Area (see Section 3.2.1 and **Table 3.1**) have been assessed on the basis of their occurrence, quality information and their potential for recovery by open cut methods. It is acknowledged, however, that the ultimate extent of development of the various open cut pits, including the depths achievable, would depend upon the sale price for the particular coal products which would be produced which, in turn, would determine the maximum economic overburden to coal stripping ratios. Based upon preliminary geological modelling, mine design and coal quality information, up to 30 Mt of ROM coal is recoverable from the open cut pits nominated in the conceptual mine plan (see Section 4.3.2). The recoverable coal resource will be further defined following the receipt of additional quality data and detailed mine planning.

4.4.2 Conceptual Mining Operations

Mining operations would involve the sequential activities of vegetation clearing (where present and its retention is not practicable), soil stripping, overburden/interburden removal, coal recovery and progressive rehabilitation.

Vegetation Clearing

The bulk of the proposed areas of disturbance comprises cleared grazing land with isolated trees and would not require any substantial native vegetation clearing. Throughout the life of the Proposal, approximately 25ha of tree clearing would be required along the section of McKinleys Lane within and adjacent to the Weismantel Pit, within the footprint of the Bowen Road 2, Avon and Main Pits, within the footprint of out-of-pit overburden emplacement and within the Conveyor Corridor and the Rail Load-out Facility. All trees would be felled by chainsaw and/or bulldozer and stockpiled for placement on selected areas of the final landform to be assigned a nature conservation land use post mining, mulched and incorporated within the topsoil or, where practicable, placed within biodiversity offset areas.

Soil Stripping

Topsoil and subsoil would be separately stripped in accordance with recommendations of Geoff Cunningham Natural Resource Consultants and stockpiled in key strategic areas within the Mine Area until the sequence of mining allows the direct transfer of topsoil and subsoil onto the final landform. Direct replacement of topsoil and subsoil would be preferentially employed, wherever possible.

Overburden/Interburden Removal

Overburden and interburden (hereafter simply referred to collectively as "overburden") is required to be removed to gain access to the targeted coal seams within the individual open cut pits. The overburden principally comprises sandstones, siltstones and occasional conglomerates, the majority of which has been confirmed by geochemical testing to be non-acid forming and containing excess neutralising capacity. The testing has established that in the few overburden samples with an elevated total sulphur content, a significant proportion of the sulphur is non-pyritic, thereby reducing the risk of acid generation from these stratigraphic units and the overburden as a whole. RGS Environmental recommends not to selectively handle bulk overburden or rejects and to emplace them randomly (and blended) in the in-pit and out-of-pit overburden emplacements. However, as a precautionary measure all uneconomic coal seams, coal seam roof or floor materials and/or rejects would be emplaced away from all final batters or surfaces.

It is anticipated that the upper weathered section of the profile within each pit would be amenable to free-digging or removal by scrapers, with the underlying consolidated material to the nominal depths identified in Section 4.3.2 requiring blasting prior to its removal.

Overburden would be preferentially emplaced in mined-out pits, with any excess or material generated during the initial development of the various pits emplaced out of pit.

During the initial stage of mining, overburden would be removed from limited pre-strip area within the Main Pit and the Bowen Road 2 Pit. This material would be placed within the western visibility barrier which extends north, south and west of the CHPP. The excess overburden, together with that generated from the initial development of the Weismantel Pit would be used to create the visibility barrier along the western margin of the Weismantel Pit (central visibility barrier). A similar barrier would be progressively developed along the western margin of the Year 2 out-of-pit overburden emplacement area prior to bulk overburden emplacement to its east. This latter barrier (the eastern visibility barrier), the majority of which would be overdumped in Year 5, would screen the bulk overburden placement activities to its

east. With a progressive northerly extension of the out-of-pit emplacement in association with the sequential development of the Weismantel Pit the Avon Pit and the sub-pits within the Main Pit (Years 2 to 4), and the subsequent westerly extensions of the overburden emplacement (Years 5 to 7), a similar approach, i.e. creation of an initial westerly facing barrier with active overburden disposal to the east, would be adopted for the management of overburden produced which is in excess of the void space available in-pit for emplacement. During the latter stages of the development of the Main Pit, overburden materials from the pit would also be stockpiled adjacent to and over the southern end of the pit and on the eastern side of the pit for subsequent emplacement in the final void at the cessation of mining. Overburden from the northern extent of the out-of-pit overburden emplacement would similarly be reclaimed and emplaced within the final void.

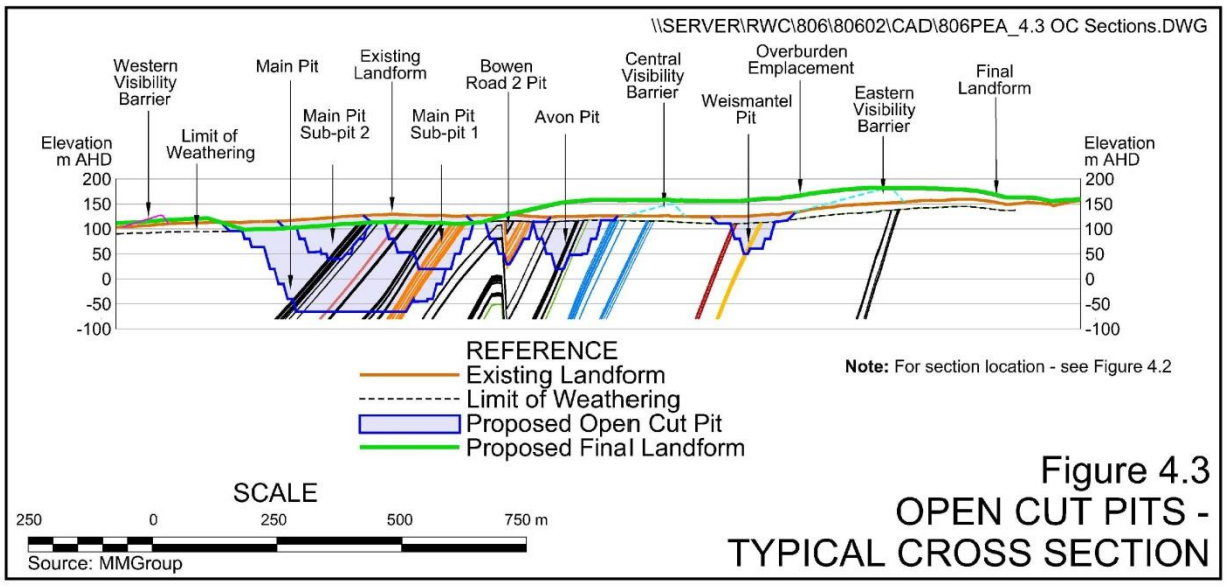
The western visibility barrier, which would remain in place for the duration of mining activities, would be constructed with outer slopes of 1:3 (V:H) to 1:4 (V:H) and inner or easterly slopes of approximately 1:2 (V:H) to 2:1 (V:H) depending on the method of construction. The bulk of materials forming the barrier would be placed into the Main Pit void on cessation of coal extraction activities.

The final surface of the out-of-pit overburden emplacement would be constructed with slopes similar to those of the existing landform, i.e. 5º to 15º. The central and eastern visibility barriers would be constructed with external slopes to the west of 1:3 (V:H) and temporarily vegetated with a range of shrubs and grasses to reduce the barriers' visibility and enhance the screening of activities to the east.

Coal Recovery

The coal exposed in each open cut pit would be removed by excavator and transported by haul truck to the ROM coal stockpile adjacent to the CHPP. Given the steep dip of the coal seams, limited blasting may also be undertaken to fracture the coal exposed in the pit floor once the main floor level is achieved, thereby potentially enabling the excavator to remove up to a further 15m of coal down the dip of the seam without any substantial additional overburden removal.

Figure 4.3 displays a typical cross-section through the four principal open cut pits and two sub-pits showing the indicative depths to the main (final) floor level.



Mining Rates

The Applicant proposes to mine up to 2.5 million tonnes of ROM coal per year, commencing at a rate of approximately 0.6 million tonnes in Year 1 and subsequently ramping up to full production. A production rate of 2.5Mtpa equates to approximately 9 000t of ROM coal per day.

4.4.3 Mobile Equipment

Table 4.1 presents an indicative list of the proposed mobile equipment the Applicant intends to use throughout the mining and CHPP operations, and beyond. The potential to use the mobile mining equipment nominated in **Table 4.1** during the night-time period (10:00pm to 7:00am) and under what limitations, e.g. minimum depth below ground level, would be determined on the basis of the noise assessment, with confirmation through monitoring. The equipment listed in **Table 4.1** is considered to be conservative and will be revised in conjunction with the detailed mine planning/scheduling.

Table 4.1
Indicative Mobile Equipment List Replace Year 5 Mining Equipment List

Type	Year 1			Year 2 - 4			Year 5 Onwards		
	Model	7am-10pm	10pm-7am	Model	7am-10pm	10pm-7am	Model	7am-10pm	10pm-7am
Mining Operations									
Drill	Rotary SKF12	1	1	Rotary-SKF12	1	1	Rotary-SKF12	1	1
	Hammer ST600	1	-	Hammer ST600	1	1	Hammer ST600	1	1
Excavator	PC 1250	1	-	PC 1250	1	-	PC 1250	1	-
	L994-200	2	1	L994-200	3	2	L994-200	2	2
							EX3600	2	
	40 tonne	1	-	40 tonne	1	-	40 tonne	1	-
Haul truck	Cat 785B)	4	-	Cat 785B	3	-	Cat 785B	4	-
							Cat 789C	10	
	Cat 777	3	-	Cat 777	3	-	Cat 777	2	-
	Haulmax	8	4	Haulmax	8	8	Haulmax	8	8
				Komatsu 785	3	-	Komatsu 785	3	-
	40 tonne Artic)	1	-	40 tonne Artic	1	-	40 tonne Artic	1	-
Bulldozer (Tracked)	Cat D11R	3	-	Cat D11R	3	1	Cat D11R	3	1
	Cat 10T	1	-	Cat 10T	1	-	Cat 10T	1	-
Bulldozer (Rubber Tyred)	Cat 690	1	1	Cat 690	1	1	Cat 690	1	1
Scraper	Cat 657G	3	-	Cat 657G	3	-	Cat 657G	3	-
	Cat 637G	2	-	Cat 637G	2	-	Cat 637G	2	-
Fuel Truck	Truck 10 000L	1	-	Truck 10 000L	1	-	Truck 10 000L	1	-
Grader	Cat 16H	1	1	Cat 16H	1	1	Cat 16H	1	1
Water Cart	Cat 777	1	-	Cat 777	1	-	Cat 777	1	-
	Cat 773B	1	1	Cat 773B	1	1	Cat 773B	1	1
	Rigid Body	1	-	Rigid Body	1	-	Rigid Body	1	-
CHPP Operations									
Type	**Year 1**			**Year 2**			**Year 5 Onwards**		
	Model	**7:00am-10:00pm**		**Model**	**7:00am-10:00pm**		**Model**	**7:00am-10:00pm**	
Front-end Loader	Cat 988	1		Cat 988	1		Cat 988	1	
Bulldozer * (Tracked with Coal Blade)	Cat D10	1		Cat D10	1		Cat D10	1	
Bobcat		1			1			1	

* Used periodically 24hrs per day if product coal is required at the Rail Load-out Facility.

4.5 PROCESSING OPERATIONS, STOCKPILES AND PRODUCTS

4.5.1 Processing Operation

All ROM coal would be processed in the Coal Handling and Preparation Plant (CHPP) to separate the product coal from the non-product materials recovered during the mining process. **Figure 4.4** displays the general layout of the CHPP and its surrounds.

The plant would be located within a 12ha area on the western side of the Mine Area and positioned adjacent to the western visibility barrier. The pad for the entire plant and all stockpiles would be constructed to an elevation of approximately 115m AHD, i.e. approximately 25m to 40m below the top of the western visibility barrier.

The plant would likely comprise the following principal components.

- Plant feeder/reclaimer
- Crushing station
- Feed conveyors to the plant
- Desliming screen
- Dense media, spirals and cyclone circuits
- Jamieson flotation cell
- Horizontal belt filter
- Thickener
- Banks of Dewatering Units for the fine reject
- Sumps, Pumps, Pipelines
- Overhead conveyors from the plant (to product stockpiles)
- Underground conveyor (from product stockpiles)
- Reject Conveyor from the Plant
- Rejects stockpile and/or bin
- Associated infrastructure (office, workshop, etc.)

With the exception of the crushing station, rejects stockpile or bin and thickener, the major plant components would be enclosed within two buildings with a combined floor area of approximately 1 600m^2. The main building would have an overall height of approximately 21m, with the smaller building which contains the belt filters, having a height of approximately 5m. The ultimate configuration of the CHPP is currently the subject of detailed design.

Although the main building would generally be shielded visually to the north, west and southwest by the western visibility barrier, the upper decks would be clad with a colorbond material of a colour selected to blend with the background in order to minimise any potential visual impact from more elevated vantage points.

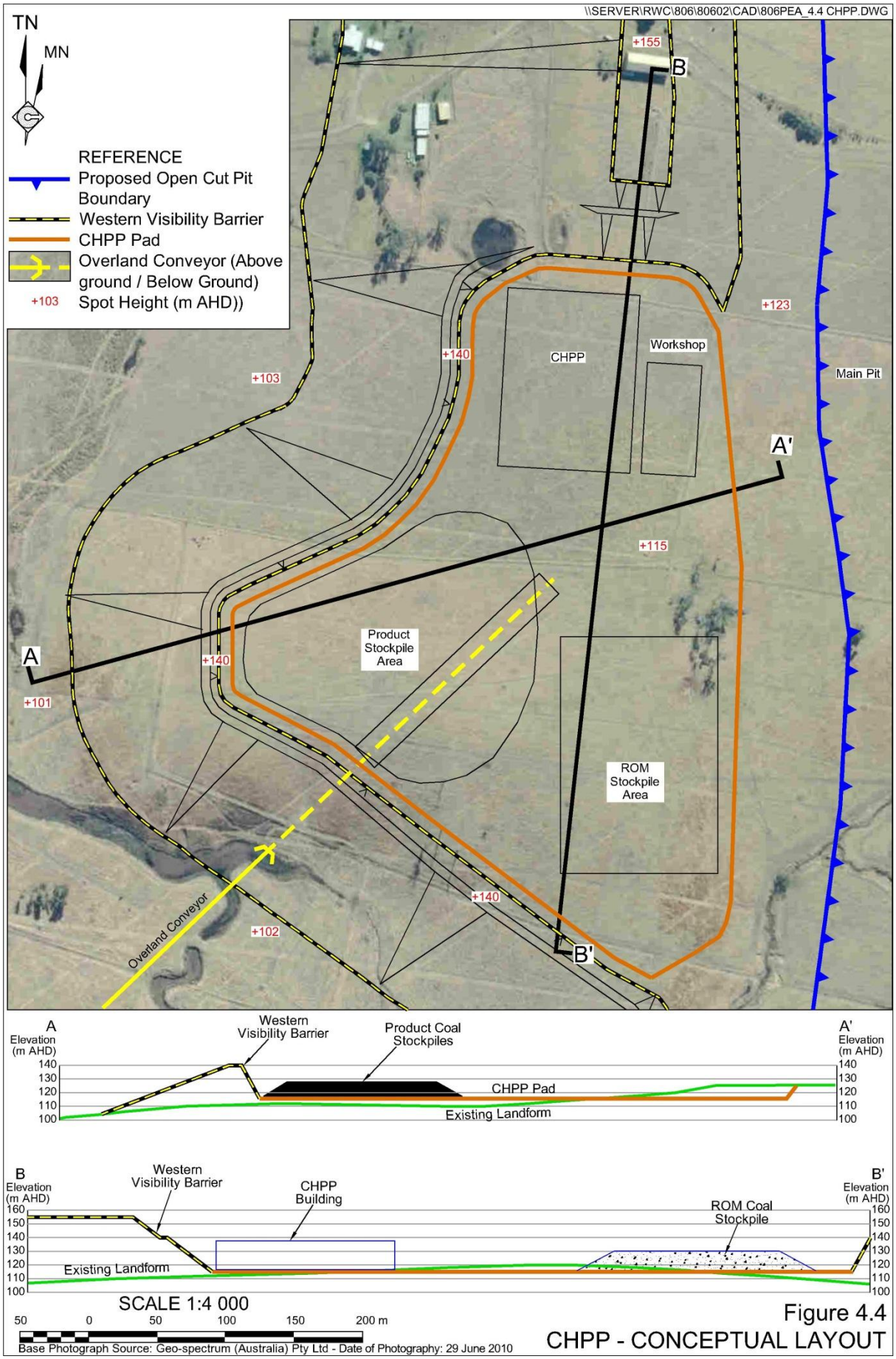


Figure 4.4
CHPP - CONCEPTUAL LAYOUT

4.5.2 Stockpiles

The ROM coal pad would be located adjacent to the CHPP building and cover an area of approximately 2ha which would provide sufficient storage for approximately 100 000t of ROM coal. The ROM coal pad would be constructed at an elevation of approximately 115m AHD using cut and fill methods and overburden recovered from either or both the Bowen Road 2 Pit and the Main Pit pre-strip. The ROM coal would be stockpiled to a height of up to 15m above the floor of the ROM pad.

The coal products produced within the CHPP would be conveyed to and stockpiled in a designated product stockpile area covering approximately 3ha adjacent to the CHPP building and the overland conveyor load-out. The coal product stockpile area would have the capacity to store a total of approximately 100 000t of product coal in separate stockpiles up to approximately 10m in height to cater for the different products produced.

4.5.3 Management of Processing Rejects

At maximum production, the CHPP would generate an estimated 0.75Mtpa to 1Mtpa of coarse and fine rejects, with the coarse rejects anticipated to represent around 70% of the total rejects. The quantity of rejects produced would depend upon customer product specifications and the resultant yield, i.e. product coal as a percentage of ROM coal processed through the CHPP. The Applicant currently proposes to use a thickener and belt filter to dewater the fine rejects, with the resultant material being blended with the coarse rejects to produce a mixture with a total moisture content of approximately 20%. The mixed coarse and fine rejects would be temporarily stockpiled or stored in an overhead bin prior to being emplaced with the overburden from mining activities. That is, there would be no defined permanent rejects emplacement area.

The geochemical testing of samples of laboratory-generated rejects established that the bulk of the rejects tested can be regarded as non-acid forming with significant excess buffering capacity. Any potentially acid forming rejects would invariably be neutralised by the non-acid forming rejects and overburden when emplaced within the in-pit or out-of-pit emplacements.

In the event the fine rejects dewatering system is not functional at any time, the rejects would be either placed within:

- the void developed during the limited pre-strip of the Main Pit and subsequently re-mined as part of Main Pit development and/or within the southern end of the Bowen Road 2 Pit (for the first 4 to 5 years of mining operations); and at all other times
- the available void space of previously worked-out pits which are being backfilled with overburden or in selected deposition areas within the active open cut pits.

4.6 PRODUCT COAL TRANSPORTATION

4.6.1 Transportation of Product Coal to and within the Rail Load-out Facility

Figure 3.2 displays the location of the Overland Conveyor Corridor between the CHPP and the Rail Load-out Facility. The overland conveyor, which would pass through the visibility barrier adjacent to the CHPP (see **Figure 4.4**) to the coal bins at the Rail Load-out Facility, would potentially comprise two sections with a transfer point where the conveyor changes direction or be curved. The design of the overland conveyor has yet to be finalised, but is likely to be partially enclosed using colorbond sheeting and mounted on metal supports placed typically 3m apart. The conveyor supports in the area of the Waukivory Creek and Avon River crossings and across their associated flood plains would be typically approximately 15m apart and designed to minimise impacts on creek, river or flood flows. **Plates 4.1** and **4.2** present views of a typical overland conveyor.

Plate 4.1 A Typical Overland Conveyor at Ground Level (E806M_003)

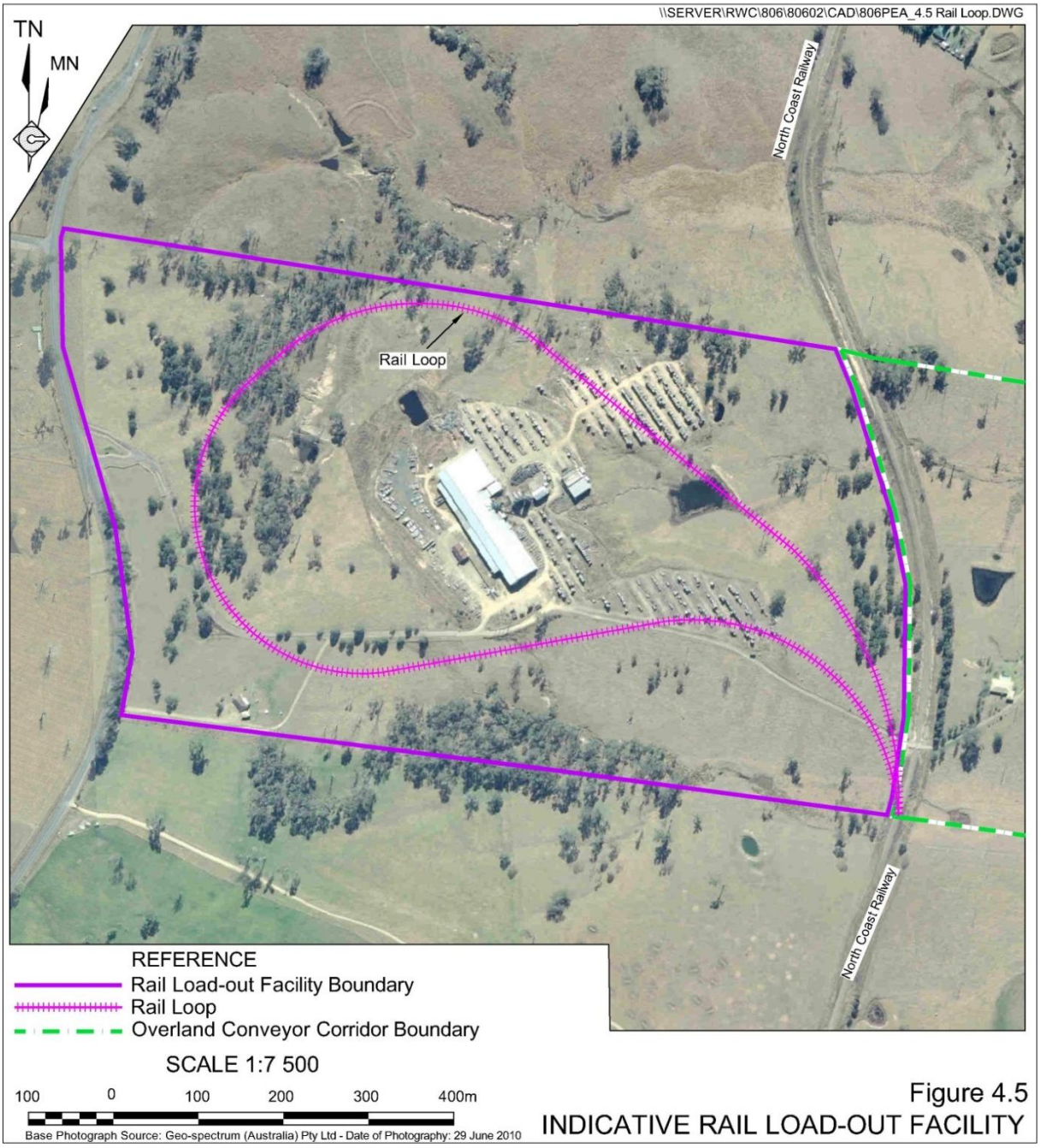
Plate 4.2 A Typical Elevated Section of an Overland Conveyor (E806M_010)

The conveyor would typically stand approximately 1m to 2m above natural ground level and, across the Waukivory Creek and Avon River floodplain, approximately 1m above the 1 in 100 year flood level. It is notable that at this level, the conveyor would also be approximately 0.5m above the 1:500 year flood level. A tray would be positioned below the conveyor where it crosses Waukivory Creek and the Avon River to collect any coal in the unlikely event of a spillage. Depending on its ultimate location, it is currently envisaged that the overland conveyor would either be placed beneath Fairbairns Road and/or the road surface raised to allow the conveyor to be constructed below the road level. Access for servicing the conveyor would be provided via an access road constructed at natural ground level adjacent to the overland conveyor, and an elevated walkway where the conveyor crosses Waukivory Creek and the Avon River.

The coal products stockpiled adjacent to the CHPP would be loaded onto the overland conveyor and transported to one or more storage bins at the Rail Load-out Facility at a rate of approximately 1 500 tonnes per hour, using a nominal 1 200mm wide belt. A feed conveyor (nominally rated at 3 500 tonnes per hour) would then be used to transfer the coal to the overhead rail loading bin(s) from which the coal wagons would be loaded. The storage and rail loading bins would be preferentially filled during daylight hours.

4.6.2 Rail Loading and Despatch

The Applicant proposes to construct a rail loop off the North Coast Railway Line which can carry up to 5400t capacity trains. **Figure 4.5** displays the conceptual layout of the rail loop within the Rail Load-out Facility.



The rail loop would be approximately 2.5km long, constructed at grades which satisfy ARTC rail loading guidelines and require minor vegetation clearing and a program of cut and fill to achieve the required grades.

The Applicant anticipates the trains transporting the coal from the rail loop to the Port of Newcastle would comprise up to 72 x 80 tonne capacity wagons which would be loaded within approximately 1 to 2 hours of their arrival. At maximum production, loaded trains would typically be despatched once or twice per day.

4.7 MINE INFRASTRUCTURE AND SERVICES

4.7.1 Mine Access

Access to the Mine Area would be provided via a 50m section of McKinleys Lane and a new road to be constructed to the east of and generally parallel to McKinleys Lane. The mine access road would be sealed following an initial stabilisation period. Access for heavy vehicles to McKinleys Lane and the mine access road would be via Jacks Road and/or Waukivory Road from The Bucketts Way, depending on the point of origin. It is currently envisaged that light vehicle access would be predominantly via Jacks and Waukivory Roads to McKinleys Lane and the mine access road, with the ultimate decision to be based on the recommendations of the Applicant's transport consultants, Constructive Solutions. Constructive Solutions have also been commissioned to identify the principal road improvements required for the Proposal such as intersection upgrades, pavement widening and the installation of improved infrastructure.

4.7.2 Site Infrastructure

Internal Road Network

The Applicant would maintain a network of internal roads to enable the haul trucks to transfer overburden from the active open cut pits to the designated areas of emplacement. Internal roads would also be constructed and maintained between each of the active open cut pits and the CHPP. Internal roads would be periodically relocated, as required, to maintain minimum road lengths and optimum grades. In-pit roads would be designed and constructed to a maximum gradient of 10%, with all roads constructed with a travelling width of three times the maximum width of the largest vehicle, plus berms and drainage as required.

Site Offices, Workshop and Facilities

In order to control the interface between mining operations and private vehicles, the Applicant would establish a site office and associated facilities for the site workforce on land adjacent to McKinleys Lane, utilising the existing buildings, where possible. A workshop would be constructed adjacent to the CHPP. The site office and amenities may need to be relocated if the area is required for the emplacement of overburden.

4.7.3 Services

Power

The Applicant estimates that its annual power consumption would be approximately 18 000MW hours. Discussions with electricity service providers indicate that electrical power could be provided to the Mine Area and Rail Load-out Facility from one of the following three sources.

1. The Applicant may source its electrical power requirements from a coal seam gas-fired power generation plant that is planned for construction by AGL within the Central Processing Facility at Stratford (**Figure 1.4**), thereby using a locally available resource and as clean a power source as could reliably satisfy the Applicant's requirements. This option will also require the installation of a high voltage power line from the power generation plant to the Mine Area across land owned by AGL, Gloucester Coal Ltd and GRL.

2. The existing 33kV or 11kV ring main feeder from Stroud Road to Gloucester along The Bucketts Way to a main switch yard at the Rail Load-out Facility, with further distribution to infrastructure on site.
3. A new injection point from the 132kV TransGrid high voltage feeder from Stroud Road to Taree and incorporating a new substation and aerial feed to site with associated infrastructure.

The decision between Options 2 and 3 would be determined by the capacity of the electricity service provider's infrastructure.

The Applicant would address the environmental impacts of the installation and use of the power transmission lines within the Site whereas the selected electricity service provider would address the impacts of the transmission lines beyond the Site.

It is noted the existing 132kV feeder traverses the eastern side of the Mine Area and, subject to a risk assessment and further consultation, may need to be relocated prior to disturbance within the feeder easement.

Water

Water for the mining operation would be obtained from the following sources.

1. Groundwater and surface water accumulating within the open cut pits.
2. Surface water drawn from on-site sediment control or water storage dams.
3. Gloucester town water supply for potable quality water requirements. The water would be piped from the existing mains within the Rail Load-out Facility or trucked in.

At maximum production, water usage on site is currently estimated at:

- CHPP (make-up water) – up to 200MLpa;
- Dust Suppression (roads, stockpiles, conveyor transfers, etc.) - up to 300MLpa; and
- Amenities, Offices and Workshops 6MLpa (i.e. 0.04ML per person/year).

The site water requirement would be achieved through:

- capturing surface water within the Applicant's Maximum Harvestable Right Dam Capacity and purchased licences;
- capturing groundwater within the open cut pits with the required purchased licences; and
- water recovered from Waukivory Creek and/or the Avon River within the limitation of the Applicant's existing or purchased licences.

The Applicant would minimise the demand for clean water sourced by harvesting surface runoff or extractions from the Waukivory Creek or the Avon River under licence by:

- maximising the use of groundwater collecting in the open cut pits and sediment-laden water collected in sediment control structures;
- maximising the recovery and re-use of water in the coal preparation process through the use of tailings dewatering; and
- where appropriate and warranted, the use of chemical dust suppressants in lieu of water.

Fuel

The earthmoving fleet would likely be diesel-fuelled with bulk diesel stored in bunded above-ground tanks adjacent to the workshop near the CHPP. Earthmoving equipment would be either fuelled adjacent to the on-site tanks or with a mobile service truck. However, GRL is also investigating the potential to use locally-sourced coal seam gas to power selected mobile equipment.

4.8 EMPLOYMENT

The construction workforce would peak at approximately 100 persons during the 9 to 12 month construction period, while at full production the Rocky Hill Coal Project would employ up to 150 persons in operational and management roles.

The construction and operational workforce would be preferentially sourced from the local district. However, it is likely that some contractors/employees would be based or reside in Newcastle or elsewhere in the Hunter Valley and either commute to and from the site daily or, in the case of short term construction activities, reside in hotels, motels, caravan parks or rental accommodation in the local area for the duration of their activities. Notwithstanding, it is envisaged that the majority of operational employees sourced from the outside the district would move to the local area permanently. There is no intention to establish camp accommodation for the workforce.

4.9 HOURS OF OPERATION AND LIFE OF THE PROPOSAL

4.9.1 Hours of Operation

Mine Construction

Mine construction activities would generally be undertaken between 7:00am and 10:00pm Monday to Saturday with selected activities undertaken between 8:00am and 6:00pm on Sundays, public holidays excluded. Activities which would be unlikely to generate noticeable noise such as electrical installation work within the CHPP, may be undertaken outside these hours.

Mine Operations

As a general rule, mining activities would be undertaken between 7:00am and 10:00pm, up to six days a week, public holidays excluded. However, as part of the environmental investigations and impact assessment, the Applicant would investigate the opportunities for drilling and/or other limited activities to be undertaken beyond 10:00pm once, for example, the open cut pits have reached a depth at which night time and sleep disturbance criteria would be satisfied. During the early years of operation, the CHPP would likely operate on day shift only. In order to process the ROM coal at maximum production, the CHPP would operate on two shifts from 7:00am to 10:00pm Monday to Saturday.

Coal Product Despatch

The hours of operation for product despatch would be dictated by the timetable nominated by the coal carrier on advice from ARTC regarding the available train paths to the Port of Newcastle. Only in the event that train loading is undertaken between 10:00pm and 7:00am and another train is scheduled for arrival prior to 10.00am on the following day would concurrent train loading and loading of the product bins via the overland conveyor potentially occur.

4.9.2 Life of the Proposal

With the defined resources identified in Section 4.3.1, the projected ramp-up in production to a maximum of 2.5Mtpa and continuing favourable economic conditions, mine production would continue for a period of up to 15 years. A 21 year development consent is being sought to accommodate any circumstance(s) that may slow down the mining of coal and to allow for both the construction phase and completion of all rehabilitation activities.

4.10 REHABILITATION

4.10.1 Rehabilitation Objectives

The Applicant's objectives for rehabilitation are centred upon the progressive restoration of areas of disturbance through the creation of a final landform, soil substrate and vegetative cover suitable for a level of agricultural productivity similar to existing levels, and/or passive nature conservation. The specific objectives for the long term rehabilitation program are to:

1. blend the created landforms and vegetation established on the post-mining landform with that of the surrounding topography;

2. provide a low maintenance, geotechnically stable and safe landform with minimal erosion; and

3. re-instate the pre-disturbance land capability and agricultural suitability.

The Applicant would also implement a program of interim rehabilitation of disturbed/constructed areas in order to:

1. reduce the visibility of mine-related activities from surrounding properties and the local road network;
2. reduce the visibility of interim activities and the barriers themselves;
3. minimise the areas of exposed surfaces which would otherwise be potential sources of windblown dust; and
4. ensure the interim slopes are stable.

4.10.2 Mine Area

Interim Landform

The Applicant would create interim landforms as temporary visibility barriers. The barriers would be orientated generally in a north-south direction and provide visual protection for mining and out-of-pit earthmoving activities, particularly overburden emplacement.

The interim landforms would be constructed with their western slopes typically at 1:3 (V:H) and vegetated with a range of shrubs and grasses.

Final Landform

Figure 4.6 presents the conceptual final landform for the Mine Area. The principal features of the final landform as presented on **Figure 4.6** are as follows.

- The landform on the eastern side of the Mine Area would be re-established to emulate that prior to mining, or elevated 5m to 15m above the existing landform and incorporate a ridge/valley configuration similar to the existing landform.
- The landform within the area of the former western visibility barrier would be similar to that prior to the commencement of mining operations, with the material used in construction of the barrier placed in the void remaining following the cessation of mining within the Main Pit.
- A gentle depression covering an area of approximately 84ha with a floor ranging in depth up to approximately 15m below the pre-mining landform, i.e. creating a floor level above the pre-mining groundwater table.
- Final slopes for all surfaces across the areas disturbed typically varying from 1:5 (V:H) to less than 1:10 (V:H).

All final slopes would be created principally through bulldozers pushing the overburden into the required form, after which subsoil and topsoil would be placed with emphasis placed upon progressive landform creation and stabilisation.

The emplacement of overburden in either the in-pit or out-of-pit emplacements would be undertaken with full recognition of the erosion and dispersion characteristics as defined in geochemical assessment of the overburden.

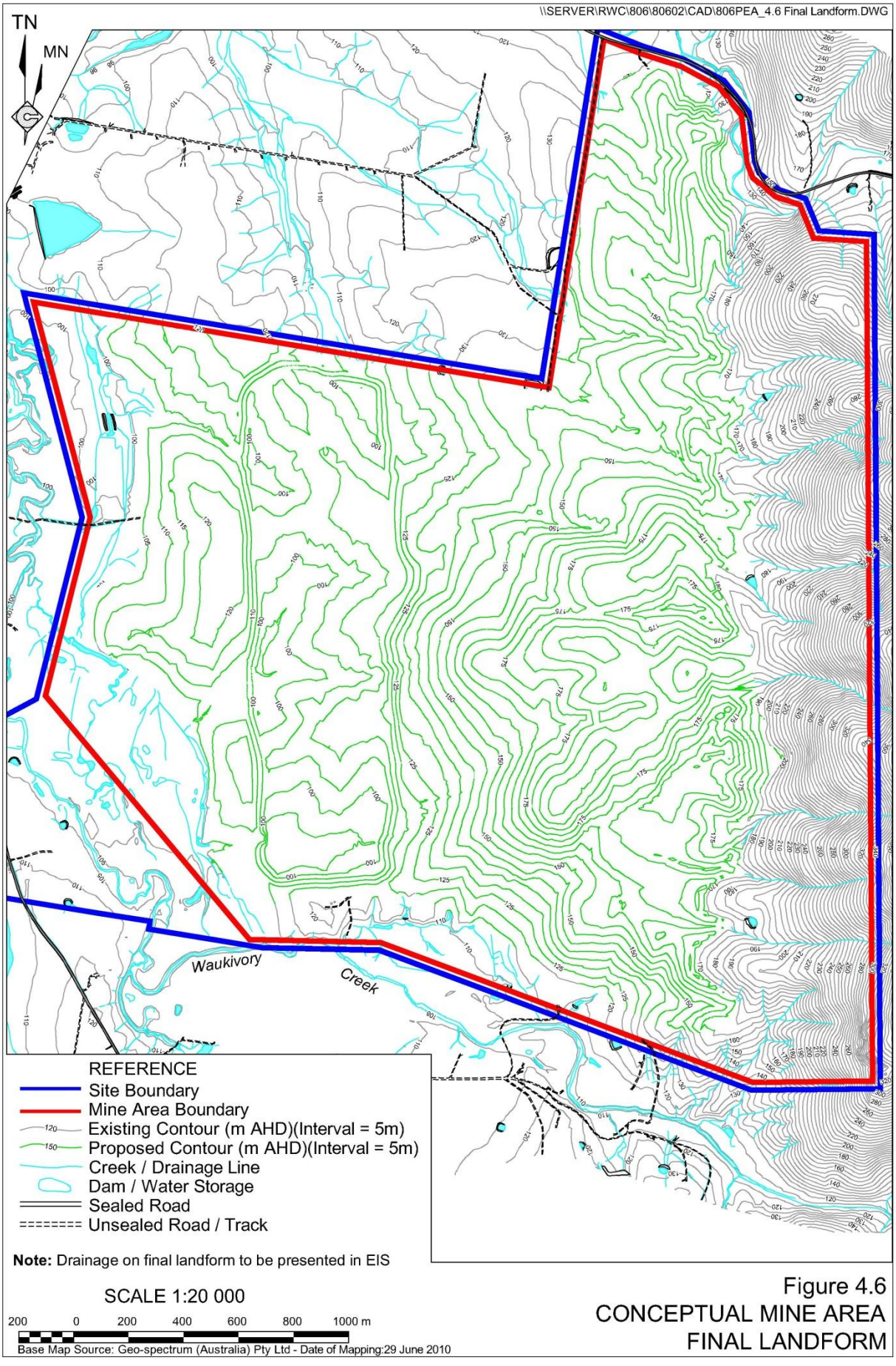


Figure 4.6
CONCEPTUAL MINE AREA
FINAL LANDFORM

Final Land Use

The Applicant currently proposes to re-instate the landform within the Mine Area to allow its use for a combination of grazing and/or passive nature conservation purposes, i.e. land uses consistent with those currently applying to the site.

An important focus of the rehabilitation program would be to return as much of the land disturbed as is practicable to a land capability and agricultural suitability comparable to the existing land.

4.10.3 Overland Conveyor Corridor

At the conclusion of mining activities and confirmation that the overland conveyor is no longer required, the conveyor structure would be disassembled and removed. All footings would be removed and either taken off the Site for disposal at a licenced landfill or buried within the Main Pit final void during its backfilling and reshaping.

4.10.4 Rail Loop and Load-out Facility

The Applicant intends to retain the Rail Load-out Facility until such time as it is no longer required for product coal despatch or for any other similar purpose, at which time the bins and conveyor structures would be removed and the associated areas of disturbance rehabilitated. Given that the rail loop would be positioned adjacent to what is a former industrial facility close to Gloucester, its retention is seen as being a likely benefit in terms of potential future land uses. Accordingly, the rail loop would be retained.

4.10.5 Potential Biodiversity Offsets

The Proposal would involve the removal of approximately 25ha of native vegetation comprising approximately 19ha of an open forest/woodland (Community 2), 3ha of a rainforest community (Community 4) and 3ha of a riparian forest (Community 3).

The Applicant intends to offset the removal of this vegetation by defining an offset area on land owned by the Applicant east of the Mine Area. The area of land and its ongoing management would be addressed in the *Environmental Impact Statement* for the Proposal.

4.11 ALTERNATIVES CONSIDERED

During the design of the Rocky Hill Coal Project, the Applicant examined a range of alternatives before deciding upon the Proposal as presented within this document. The following sub-sections outline the alternatives considered and the reasons for proceeding with the preferred option.

Mining Methods

Given the steeply dipping nature and multiple coal seams within the Mine Area, open cut methods were determined to be the only feasible means of extracting the identified resource. Underground mining of multiple steeply dipping seams is not currently, nor is likely to be, technically feasible in the foreseeable future.

Overburden Disposal

In terms of areas potentially available for overburden disposal, the Mine Area is physically constrained by:

- the presence of Waukivory Creek and the Avon River and their associated flood plains to the west;
- the steep nature of the landform to the east;
- the existence of multiple seams which subcrop across the Mine Area;
- the potential to sterilise coal resources;
- the visual sensitivities of the area; and
- a desire to minimise impacts on existing surrounding land uses and the local environment.

As a result, the conceptual configuration of the out-of-pit overburden emplacement and the final landform was the result of numerous iterations which progressed from the conventional plateau type landform to that presented. The out-of-pit emplacement incorporates valleys, ridges and slopes similar in location and form to those naturally occurring in the same area prior to mining and has been designed to minimise short term visual impacts and make the re-constructed medium to longer term landform indiscernible from those areas unaffected by mining.

CHPP Location

During the early stages of planning for the Proposal, a number of potential locations for the CHPP were examined to the southwest and west of the proposed site, with each subsequently discounted because the results of the drilling program showed a CHPP constructed in those locations would sterilise a proportion of the open cut resource. The coal underlying the proposed CHPP site is at a depth of greater than 300m and as such is not amenable to mining by open cut methods.

Disposal of Fine Rejects

The potential development of one or more dams to contain the fine rejects from the coal preparation process was considered briefly but discounted due to the physical and environmental constraints of the site and local area (as described as applying to the overburden emplacement) and the time required to achieve the consolidation necessary for successful rehabilitation. Direct disposal to the mine voids as a slurry, though practically feasible due to the development of multiple pits, was similarly discounted due to the problems associated with consolidation, and the associated delays to the rehabilitation process and the use of the area for the proposed post mining land uses.

Product Despatch to the Train Loader

Use of trucks as a means of transporting product coal to the train loader in lieu of a conveyor was considered briefly but discounted for the following reasons.

- Use of a local road network which currently primarily services rural-residential areas and agricultural enterprises, or is a “tourist route”, by several hundred trucks per day would represent a major and unacceptable change in the nature of the traffic and be contrary to the State Government’s objective to minimise or eliminate coal transportation on the public road network, where possible.

- Construction of a dedicated haul road on private property would necessitate the crossing of Waukivory Creek and/or the Avon River and their associated flood plains. Such a route, if constructed at natural ground level, would result in periods when transportation of coal to the train loader was not feasible due to elevated flows (thereby potentially necessitating the maintenance of substantial coal stockpiles at the load-out facility or interference to train loading schedules) or, if constructed on an elevated formation, interference to flood flows and increased flooding impacts in upstream areas.