



Bloomfield Colliery

Completion of Mining and Rehabilitation

Part 3A Project Application
Preliminary Assessment Report

6 July 2007

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LIST OF ABBREVIATIONS

3A	Part 3A of the <i>Environmental Planning and Assessment Act 1979</i>
µg/m ³	micrograms per cubic metre
µm	micrometre
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
C	Celcius
CCL	Consolidated Coal Lease
CHPP	Coal Handling and Preparation Plant (washery)
CO	Carbon monoxide
DECC	Department of Environment and Climate Change (formerly DEC – Dept of Environment and Conservation)
DOP	Department of Planning
DPI	Department of Primary Industries
EA	Environmental Assessment
EC	Electrical conductivity
ENCM	Environmental Noise Control Manual
ENM	Environmental Noise Model
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environment Protection Authority (part of DECC)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
g	gram
g/m ² /mth	grams per square metre per month
ha	hectares
INP	Industrial Noise Policy (NSW)
m	metre
mg/L	milligrams per litre
ML	Mining Lease ALSO megalitres
mm	millimetre
MOP	Mining Operations Plan
mt	million tonnes
mtpa	million tonnes per annum
NPWS	National Parks and Wildlife Service (part of DECC)
PA	Project Application
PM	Particulate matter
PRA	Preliminary Risk Assessment
ROM	Run-of-mine (coal)
TDS	Total dissolved solids
TSC Act	<i>Threatened Species Conservation Act 1995</i>
TSP	Total suspended particulates
TSS	Total suspended solids

1. INTRODUCTION

1.1 Purpose of this Document

This document is a Project Application prepared by Bloomfield Collieries Pty Limited (Bloomfield), part of The Bloomfield Group. The Project Application is for the completion of mining and rehabilitation at Bloomfield Colliery. Bloomfield Colliery is operated by Bloomfield.

This Project Application has been prepared under Part 3A of the *Environmental Planning and Assessment Act, 1979*, (EP&A Act) which provides an assessment and approvals regime for major projects where the NSW Minister for Planning is the approval authority.

In accordance with the *Draft Guidelines: Steps in the Assessment and Approval of Major Projects under Part 3A* (Department of Planning, 2005), this Project Application provides the following information:

Item:	Refer to Section:
Information to confirm that the project is a Part 3A Project under the EP&A Act	3.1
Information to confirm that a Concept Approval is not required	3.1
A description of the project and any ancillary components as required by Section 75E(2) of the EP&A Act	2
Location and a map identifying the site	1.2, Figure 1
Capital investment value...or any relevant order relevant for determining whether Part 3A applies to the project	2.11
The planning provisions applying to the site	3.1
The views of the other agencies, local council or the community if known	4.1, 4.2
List any other approvals required, in particular if a licence from Department of Environment and Climate Change (DECC) under the <i>Protection of the Environment Operations Act, 1997</i> is required	3.5
If relevant, justification as to why the project should be considered to be a major project under part 3A, taking into consideration the relevant criteria	3.1
A preliminary assessment to identify likely environmental issues	5, 6, 7, 8, 9, 10 & 11

1.2 Project Overview

Bloomfield Colliery is located approximately 20 kilometres north-west of Newcastle, as shown on **Figure 1**. Coal has been mined on the site for approximately 170 years, with the current owners purchasing the Bloomfield operation in 1937. Underground mining ceased on the site in 1992 and the current operation consists of open cut mining, an on-site Coal Handling and Preparation Plant (washery) and a rail loading facility that transports processed coal to the Port of Newcastle.

Bloomfield is currently in the final stages of its planned open cut mining program and is actively rehabilitating former mining areas on the site. The current maximum production rate is 1.3 million tonnes per annum (mpta) of run of mine (ROM) coal, with an average production rate of 0.8 mpta ROM coal. It is proposed to continue mining at this production rate in order to complete the mining and rehabilitation program on the site. There is estimated to be approximately 9 million tonnes of viable run-of-mine (ROM) coal remaining on the site.

Bloomfield Colliery is located on Consolidated Coal Lease 761 (CCL 761), granted under the *Mining Act, 1992* and mining operations are carried out in accordance with a Mining Operations Plan (MOP) and an Environmental Protection Licence issued under the *Protection of the Environment Operations Act, 1997*.

Mining operations at the Colliery are currently carried out pursuant to existing use rights. The introduction of Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) and *State Environmental Planning Policy (Major Projects) 2005* require Bloomfield to obtain approval under Part 3A so as to be able to continue the mining of areas subject to this application and undertake rehabilitation.

Part 3A of the EP&A Act requires that a Project Application with Preliminary Assessment be completed to clarify that the project falls under Part 3A, and to identify key issues requiring further investigation to determine any potential environmental impact. This report, prepared for the NSW Minister for Planning, provides the required Project Application and Preliminary Assessment for the completion of open cut mining and rehabilitation at Bloomfield Colliery.

The continued use of the coal washery and rail loading facility (including the management of water associated with the washery, coarse reject and tailings disposal and coal handling) is included in the Part 3A Environmental Assessment completed for the Abel Underground Mine project, prepared by Donaldson Coal Pty Limited (Donaldson Coal, 2006). This application (MP 05_0136) was approved by the NSW Minister for Planning on 7 June 2007.

The completion of open cut mining activities at Bloomfield Colliery has been designed to cater for the ongoing operation of the washery and the reject management system as outlined in detail in the Abel Underground Mine Environmental Assessment (Donaldson Coal Pty Ltd, 2006).

1.3 Applicant and Project Team

The applicant seeking approval is Bloomfield Collieries Pty Limited (Bloomfield), part of The Bloomfield Group. Bloomfield is an Australian owned family company incorporated in 1952.

Bloomfield has selected the team listed in **Table 1** to undertake the various tasks for the application.

Table 1 Project Team

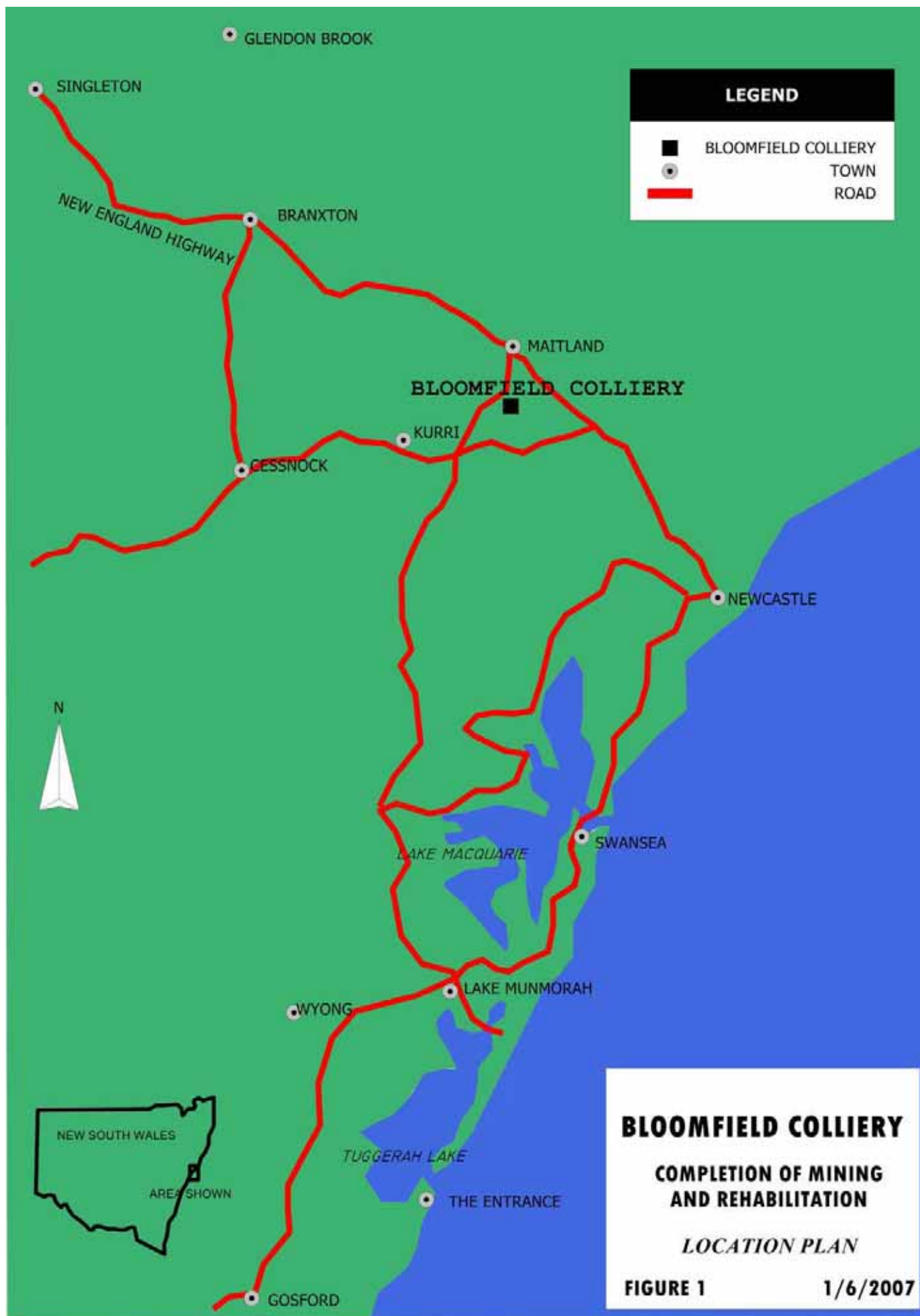
Role	Company
Project management and mine planning	Bloomfield Collieries
EA co-ordination and visual aspects	Business Environment
Preliminary risk assessment, soils and land capability	GSS Environmental
Surface hydrology	Evans & Peck
Groundwater	Peter Dundon & Associates
Noise and vibration	Heggies Australia Pty Ltd
Air quality	Holmes Air Sciences
Ecology	Eco Biological
Archaeology	South East Archaeology
Community facilitation	Margaret McDonald-Hill

1.4 Project Enquiries

All inquiries regarding the application and process should be directed in the first instance to Steve Dunn at Bloomfield Colliery:

Steve Dunn
 Manager Mine Planning
 BLOOMFIELD COLLIERIES PTY LTD
 PO Box 4
 East Maitland NSW 2323

Phone: 61 2 4930 2623
 Fax: 61 2 4933 8940
 e-mail: sdunn@bloomcoll.com.au



2. PROJECT DESCRIPTION

2.1 Property Description and Project Application Area

Consolidated Coal Lease 761 (CCL761), dated 20 November 1991, forms the boundary of the current Bloomfield Colliery site, which includes the active mining areas, rehabilitation areas, workshop, haul road, washery, water management dams and other ancillary items. This is shown on **Figures 2 and 3**, being topographic and aerial plans of CCL761. The Mining Operations Plan (MOP) approved in December 2004 includes the area of active mining within CCL 761 (refer **Figure 4**).

As shown on **Figures 2 and 3**, the proposed Project Application (PA) area is located within CCL761 and includes the following:

- The current and proposed active open cut coal mining areas (all within the current MOP area);
- The unshaped and shaped overburden dump areas;
- Workshop and surrounding area used for maintenance and fuel storage;
- Haul road linking the current and proposed coal mining areas with the ROM coal stockpiles adjacent to the coal washery; and
- Access road linking the current and proposed coal mining areas to the workshop.

The continued use of the coal washery and rail loading facility, including the management of water associated with the washery and use of coarse reject and tailings in site rehabilitation, is included in the Part 3A Environmental Assessment (MP 05_0136) prepared by Donaldson Coal Pty Ltd, approved on 7 June 2007.

Following approval of this application, it is proposed that a new surface mining lease will be sought for the PA area. Where possible, cadastral boundaries have been followed in the formation of the PA area, to assist in the development of the new mine lease. **Appendix A** shows Lot and DP details for the PA area.

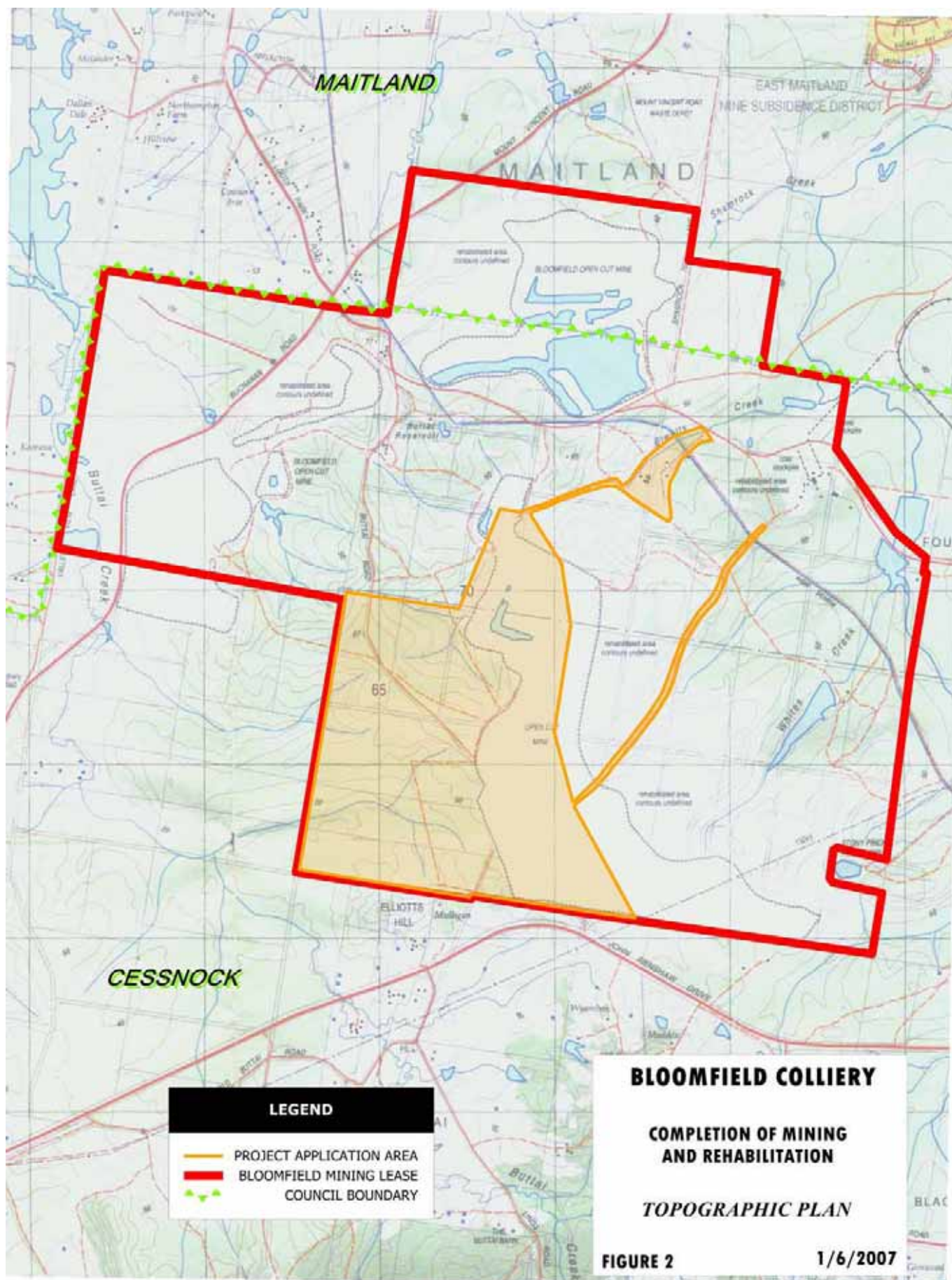
It is expected that the new surface mining lease would include all of Bloomfield's current requirements under CCL761 to complete environmental management actions for the site and to undertake rehabilitation and controlled mine closure procedures in consultation with the relevant stakeholders.

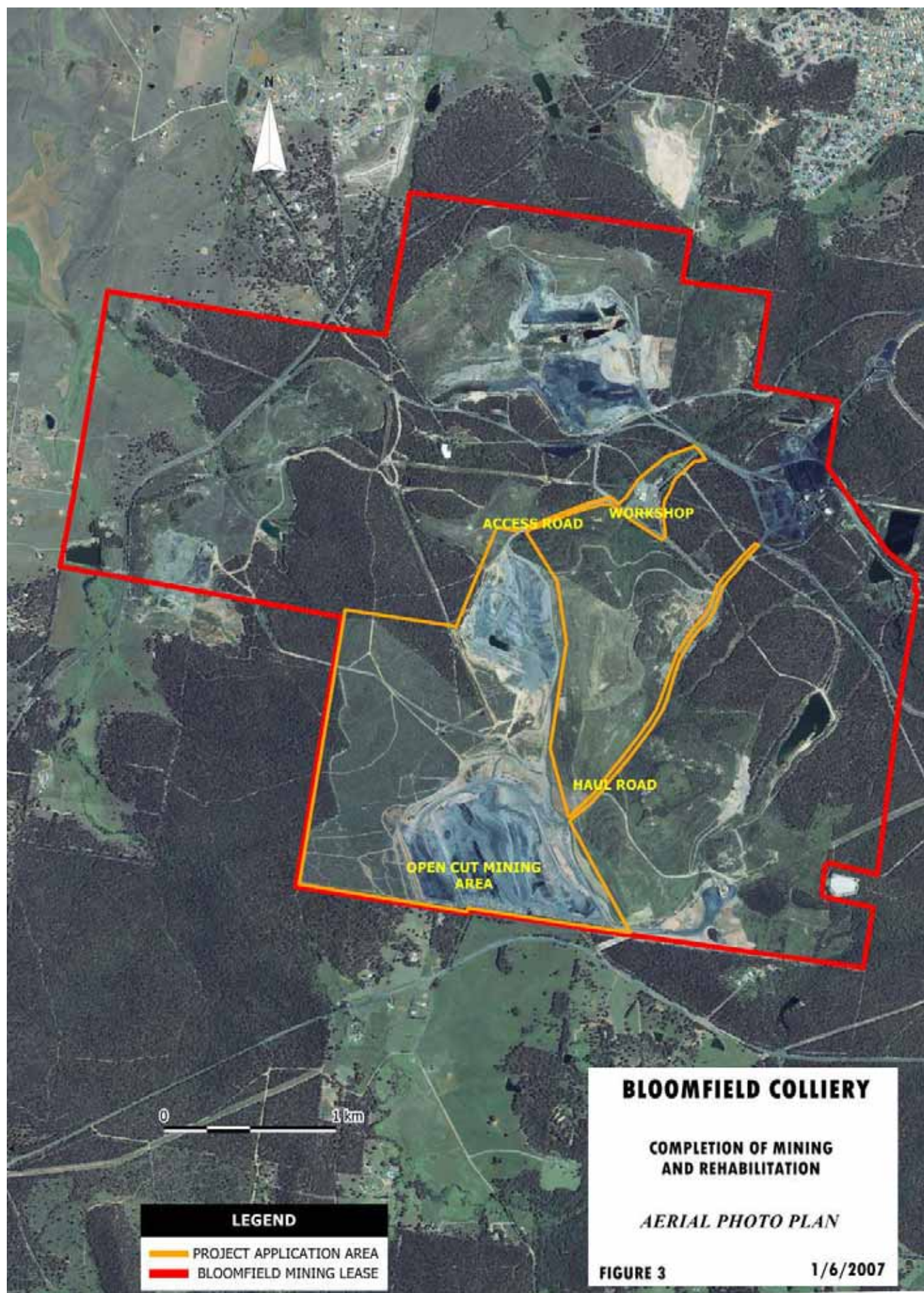
2.2 Land Ownership and Use

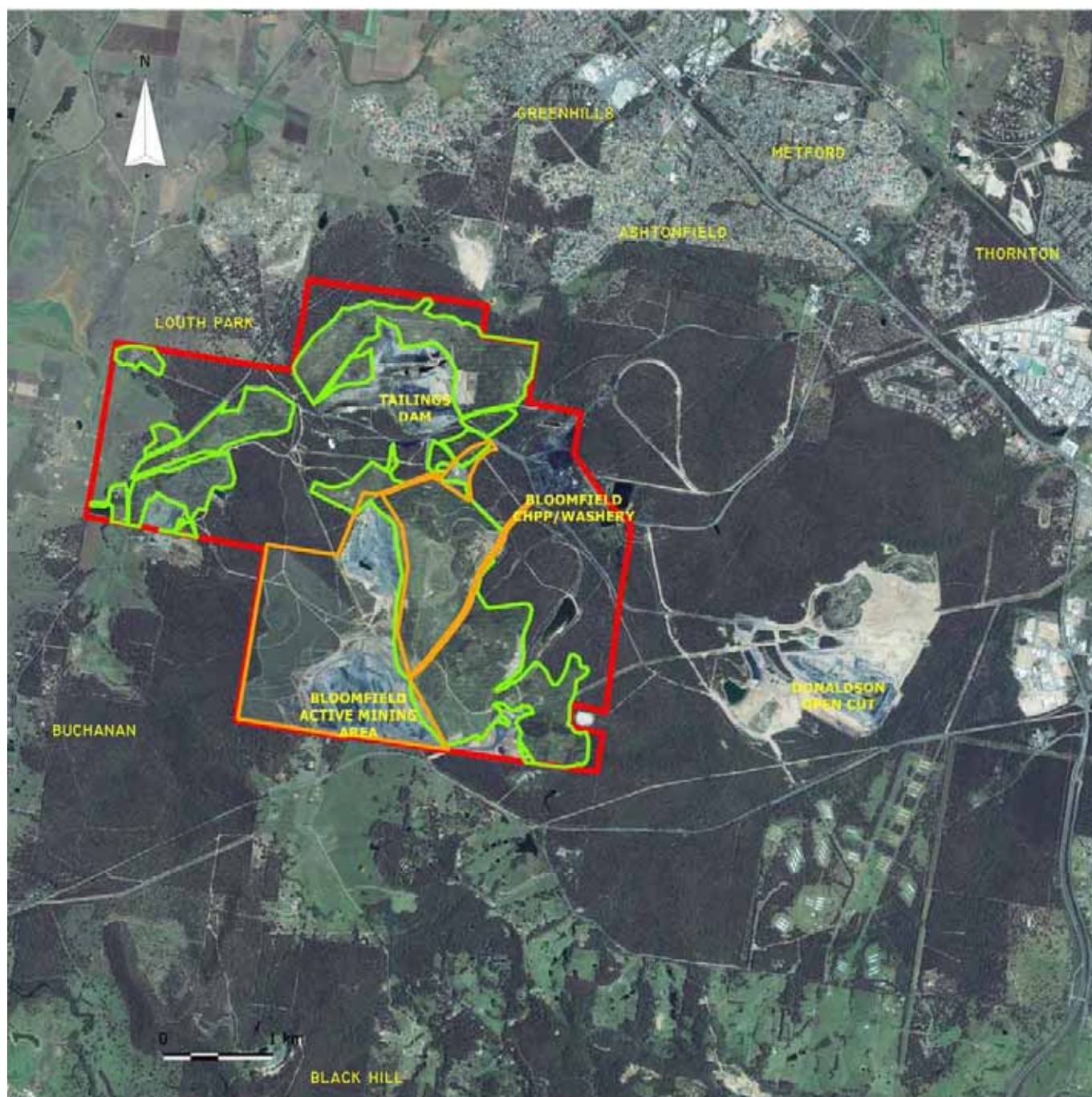
All land within the PA area is owned by The Ashtonfield Group, an independent third party with a long standing relationship with Bloomfield. Land use within the PA area is exclusively associated with the extraction, stockpiling and transport of coal and

associated maintenance and service areas. The land consists of active mining areas as well as areas associated with the mining of coal (eg: transport, equipment storage, roadways, processing plants, stockpiles, dams, etc), previously mining areas that have been or are proposed to be rehabilitated, and undisturbed vegetated areas.

Figure 4 is an aerial photograph showing the PA area and its surrounds. This figure shows that the PA area consists principally of land that has been disturbed by mining activities. Land surrounding the PA area is either forest or land used for previous mining and rehabilitation. Land adjoining the south of the PA area, near John Renshaw Drive, has been cleared for grazing. John Renshaw Drive to the south is the nearest public road to the PA area.







LEGEND

- PROJECT APPLICATION AREA
- BLOOMFIELD MINING LEASE
- PAST MINING REHABILITATION

BLOOMFIELD COLLIERY

COMPLETION OF MINING
AND REHABILITATION

LAND USE

FIGURE 4

1/6/2007

2.3 Past and Present Operations

Mining of coal seams within the Tomago Coal Measures has been carried out in the Bloomfield area for over 170 years. The current owners commenced mining on the site in 1937.

At various times the Donaldson, Big Ben and Rathluba Seams have been mined by underground methods. These seams are shown on **Figures 5, 6 and 7**. All underground mining on the site ceased in May 1992.

In 1962, a small open cut operation commenced using bulldozers and tractor scrapers. The open cut has continued to expand and develop with the introduction of new machinery and technology as follows:

- 1978: P&H 2800 Electric Face Shovel with a fleet of 85 & 180 tonne rear dump trucks was commissioned;
- 1981: P&H 5700 Electric Face Shovel commissioned;
- 1985: P&H 2355 Dragline commissioned (2800 Electric Face Shovel decommissioned);
- 1991: Marion 305M Dragline commissioned;
- 1998: draglines decommissioned;
- 2007: P&H 5700 Electric Face Shovel in maintenance; Hitachi EX500 Excavator commissioned.

Coal won from CCL761 is predominantly thermal coal with some soft coking coal for the Asian export market. All coal is transported by rail via the Bloomfield rail loading facility and exported through the Port of Newcastle.

2.4 Current Approvals

Current approvals held by Bloomfield include:

- Consolidated Coal Lease 761, (CCL761), issued 20th November 1991 and expiring 29th October 2010;
- Environment Protection Licence No. 000396 under the *Protection of the Environment Operations Act, 1997*, Licence Anniversary Date: 31st December 2006, Review Date prior to 15th November 2007;
- Notification of Dangerous Goods Held on Site to Workcover (Submitted 30th May 2006), which covers storage locations for distillate, unleaded petrol, lube

oils, waste oils, gas cylinder stores and sodium hydroxide and MIBC reagent, ammonium nitrate, emulsion and blasting accessories;

- Licence to Store Dangerous Goods issued 1st September 2006;
- Water extraction licences (under Part 5 *Water Act, 1912*) are currently under application. Open cut excavation, water extraction bores from old underground workings and monitoring bores will be covered by these applications.

Section 3.5 discusses how these approvals will be integrated into the Part 3A Project.

2.5 Geology

The coal bearing stratum occurring in the PA Area is the Tomago Coal Measures. Located below the Newcastle Coal Measures, the Tomago Measures overlay the marine Maitland Group.

The seams worked, in ascending order, are:

- Rathluba;
- Big Ben;
- Donaldson
- Elwells Creek
- Whites Creek
- A, B, and C seams; and
- Buttai Seams (E and F seams).

Seams present as either a complete seam, a number of splits of the seam or a collection of dispersed coal bands. This seam sequence is shown on **Figures 5, 6 and 7**.

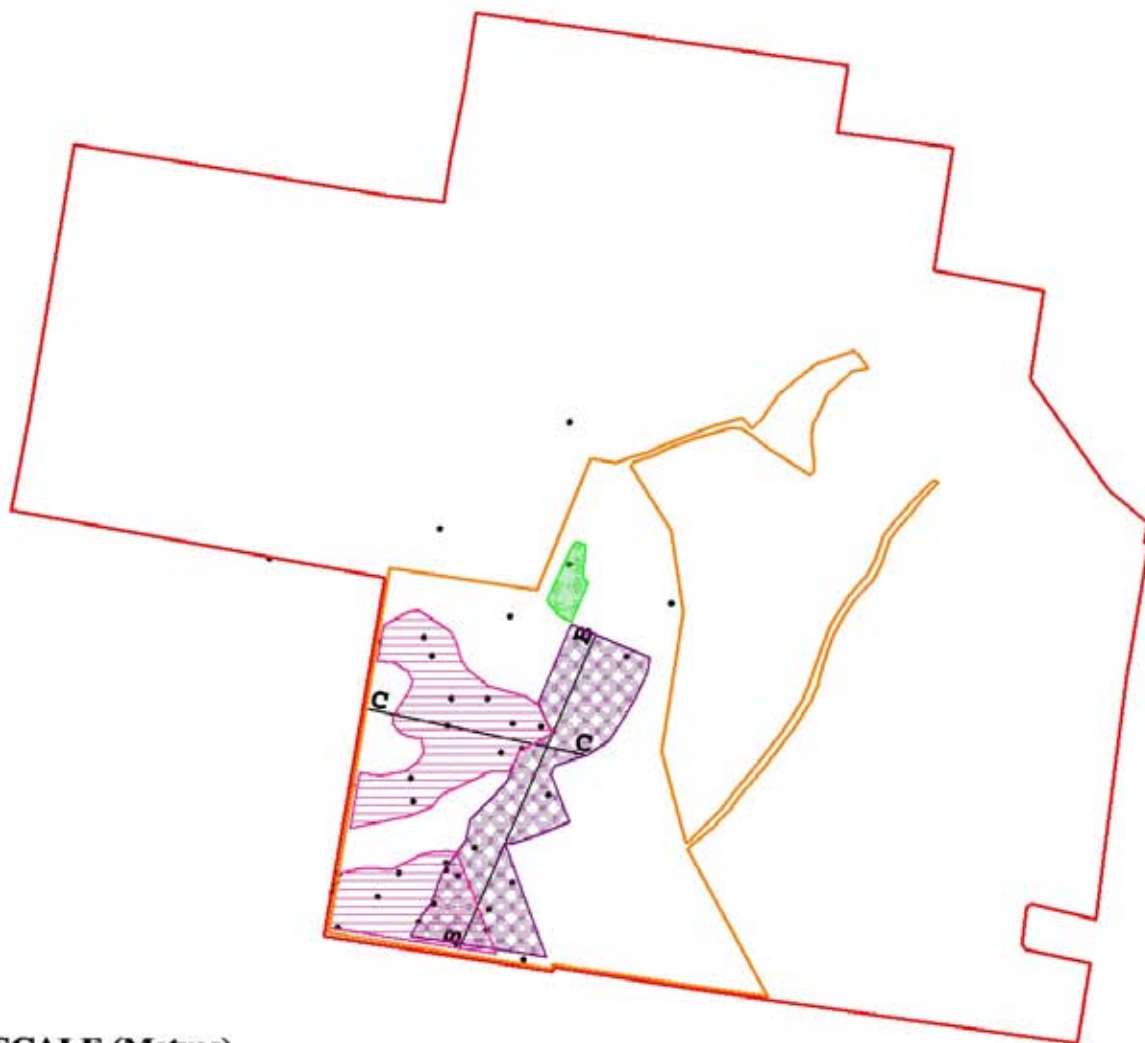
Site geology is typified by moderately dipping strata from the eastern and western sides of the lease forming a syncline running axially from the northeast to the south-west of the lease.

There is a welldefined dyke and fault structure running from the Northnorthwest to southsoutheast through areas where mining has been completed by both open cut and underground methods prior to this application.

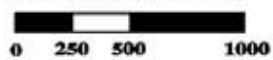
The remaining proved coal reserves have no known major geological structures.

2.6 Coal Reserves

Bloomfield's open cut mine has been operating since 1962. Exploration undertaken in October 2005 indicated that there is nearly 9 million tonnes ROM coal remaining that could be economically won on the site, at current coal market prices.



SCALE (Metres)



LEGEND

- BLOOMFIELD MINING LEASE
- PROJECT APPLICATION AREA
- BOREHOLE
- BUTTAI SEAM RESERVE
- BIG BEN SEAM RESERVE
- DONALDSON SEAM RESERVE
- CROSS SECTION LINE

BLOOMFIELD COLLIERY

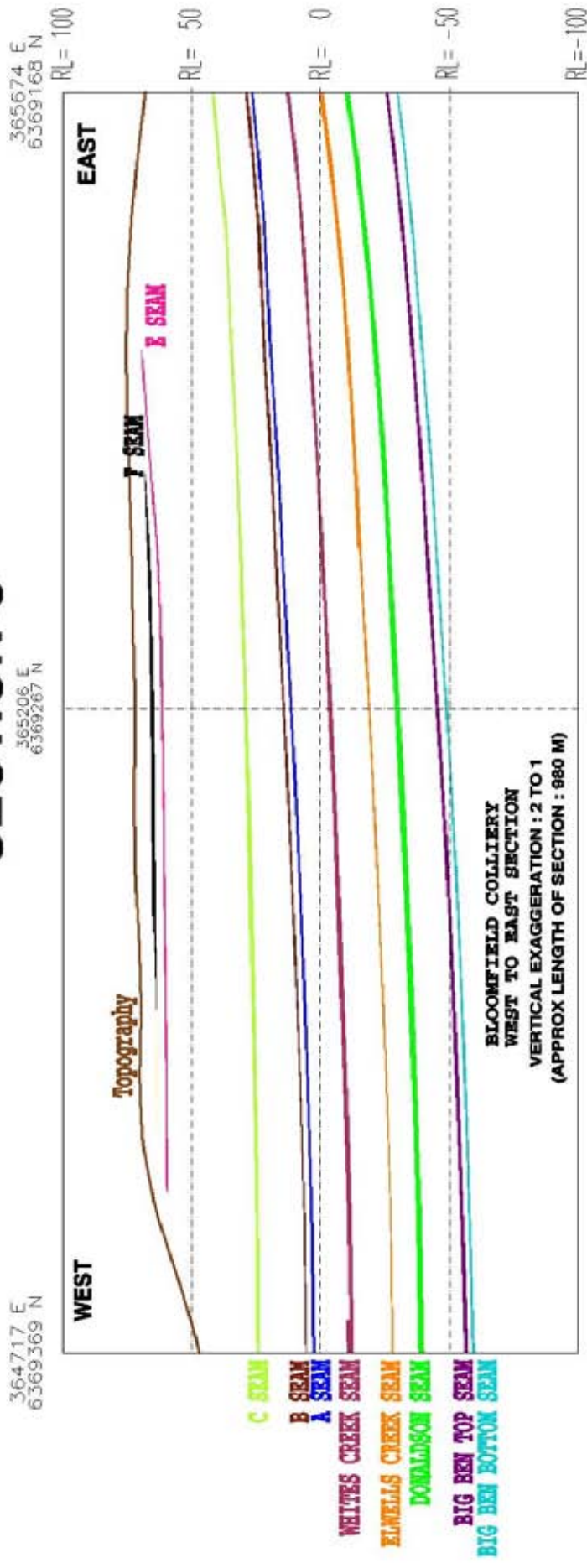
**COMPLETION OF MINING
AND REHABILITATION**

COAL SEAMS

FIGURE 5

1/6/2007

SECTION C



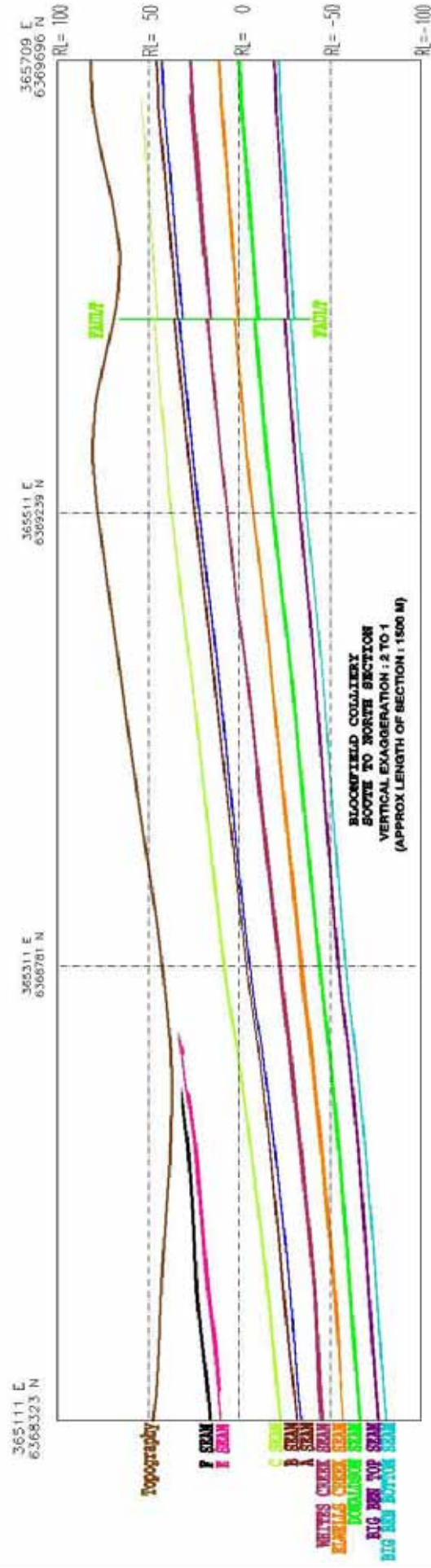
BLOOMFIELD COLLIERY

TYPICAL GEOLOGICAL SECTION

COAL SEAMS

FIGURE 6 **1/6/2007**

SECTION B



BLOOMFIELD COLLIERY

COMPLETION OF MINING AND REHABILITATION

COAL SEAMS

FIGURE 7

1/8/2007

2.7 Conceptual Mine Plan

The mine plan for extraction of the remaining coal reserves has been developed based on a drilling program undertaken in October 2005 and the output of the updated geological model.

The area that is proposed to be mined is located in the south-western section of the current mine lease and corresponds to the area contained within the current Bloomfield MOP, dated December 2004.

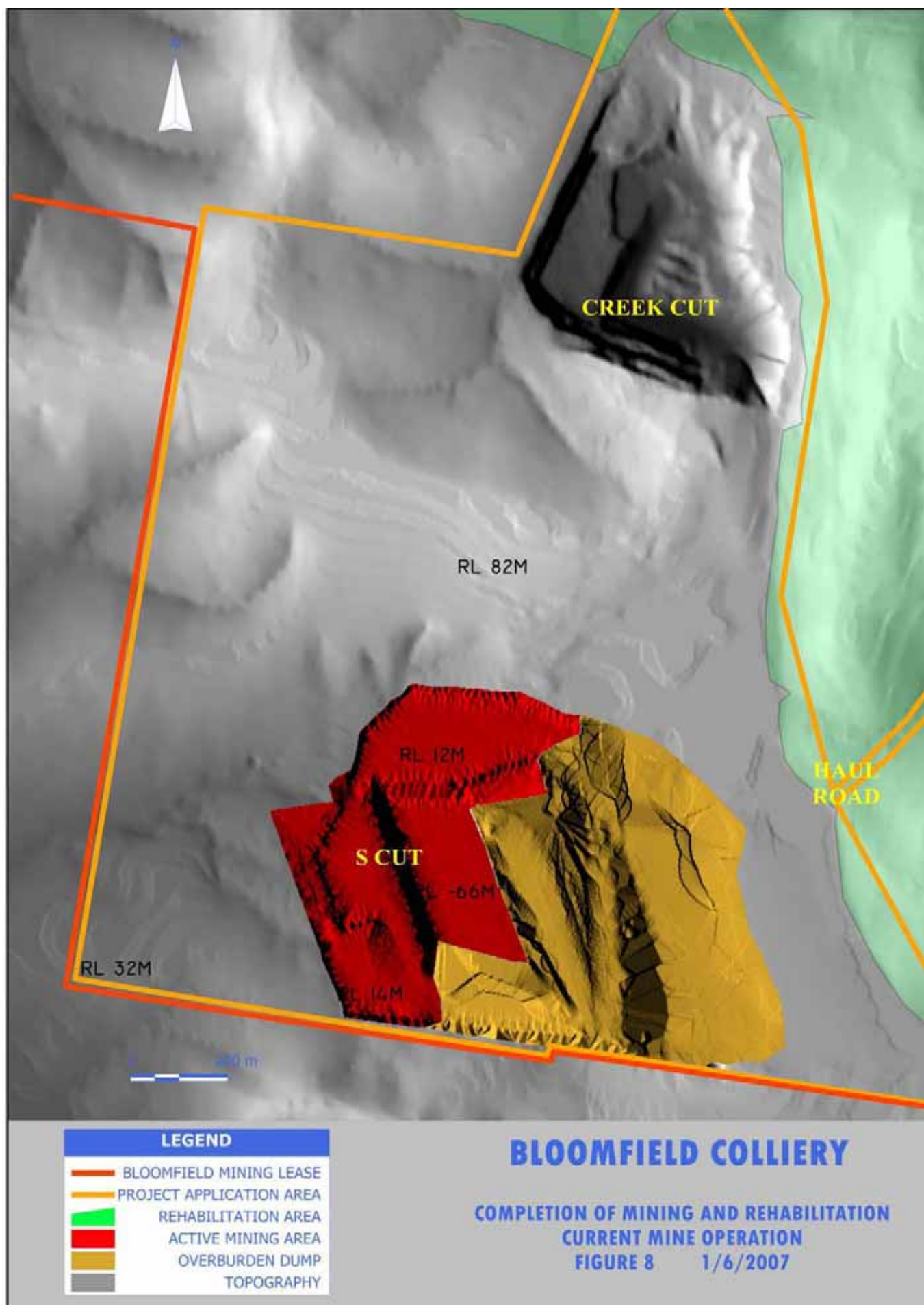
Figure 8, the current mine operation, shows the two active pit areas within this MOP area. These are referred to as 'S Cut' and 'Creek Cut'. Creek Cut is generally completed, with the majority of proposed mining to occur as a western and northern extension to S Cut. The northern extension to S Cut will ultimately link S Cut to Creek cut.

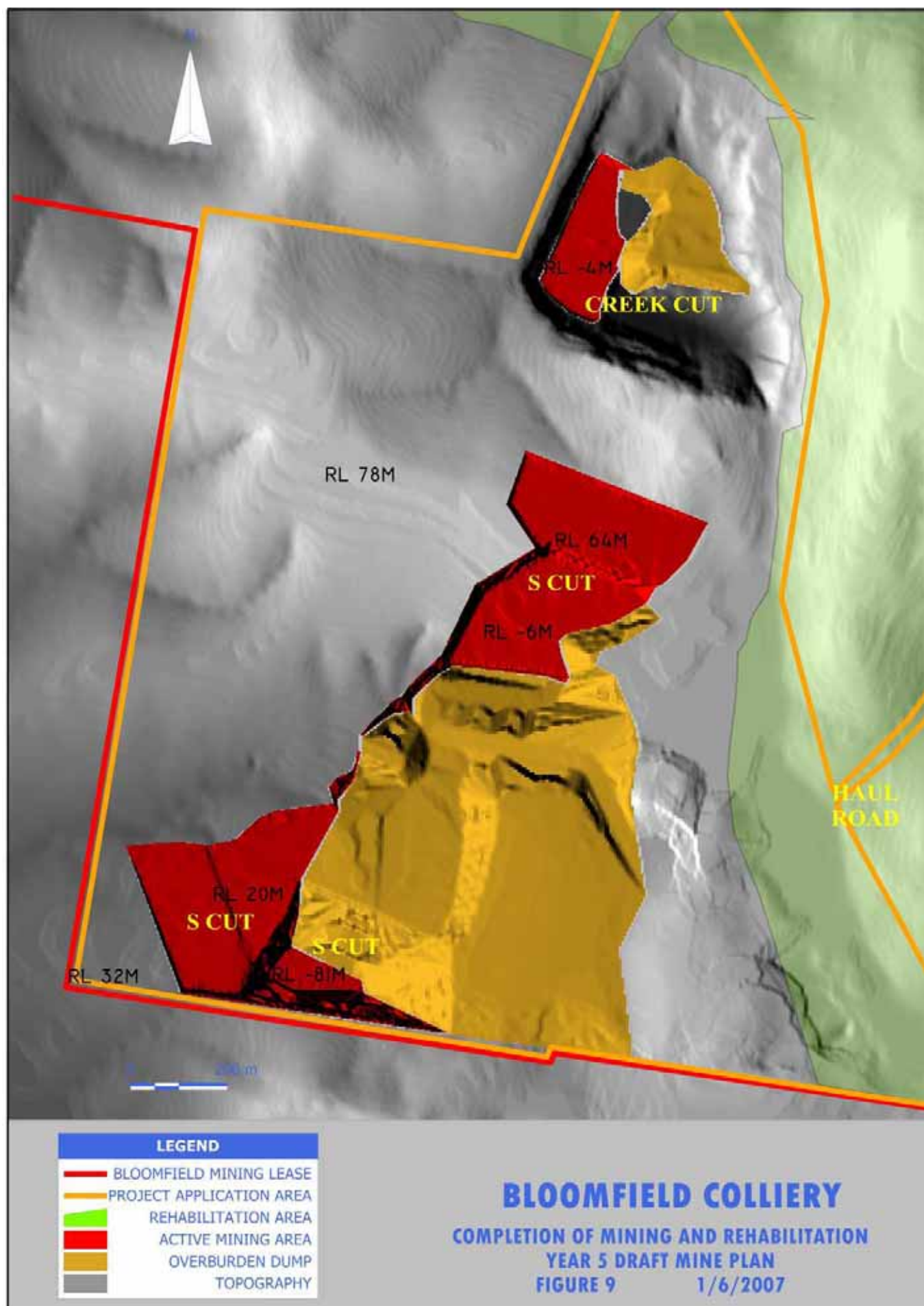
The proposed sequence of mining blocks is shown on **Figures 9 to 12**. These may be described as:

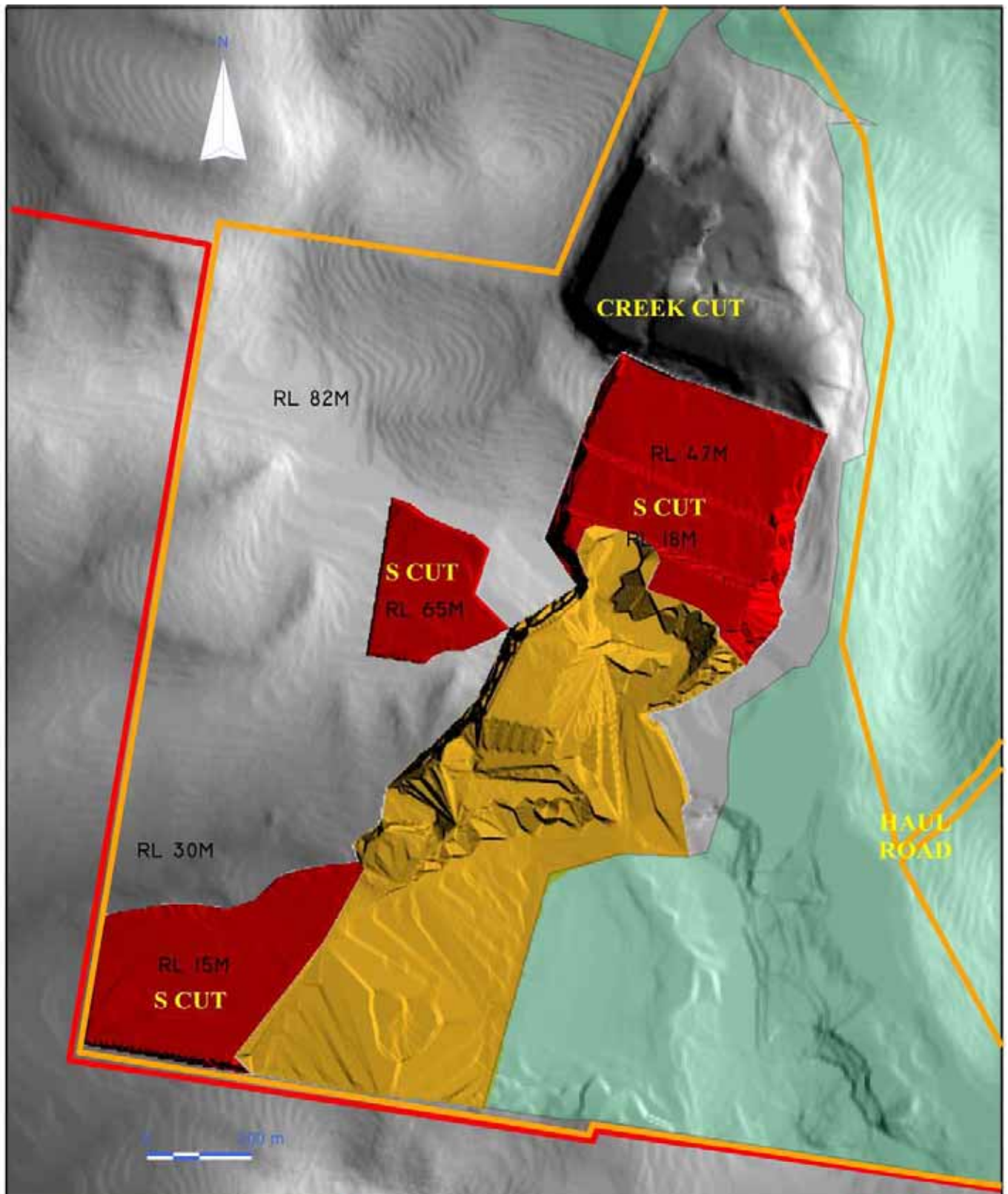
- Stage 1 (approximately Years 1-5) – **Figure 9** shows mining to the west and north of S Cut and mining within Creek Cut;
- Stage 2 (approximately Years 5 to 7) – **Figure 10** shows the opening of S Cut into Creek Cut, creating one pit, active mining in the south-western corner and mining commencing to the west of the new joined pit;
- Stage 3 (approximately Years 7 to 10) – **Figure 11** shows the completion of active mining in the south-western corner and mid-sections, with these areas being filled with overburden while active mining occurs in the western and northern sections, prior to rehabilitation; and
- Stage 4 - Post Mining Rehabilitation- **Figure 12**.

Each mining area has multiple seams that will be extracted.

It is planned to mine the remaining reserves at a maximum production rate of 1.3 million tonnes per annum (mpta) of ROM coal, with an average expected production rate of 0.8 mtpa ROM coal. These are also the current maximum and average production rates.





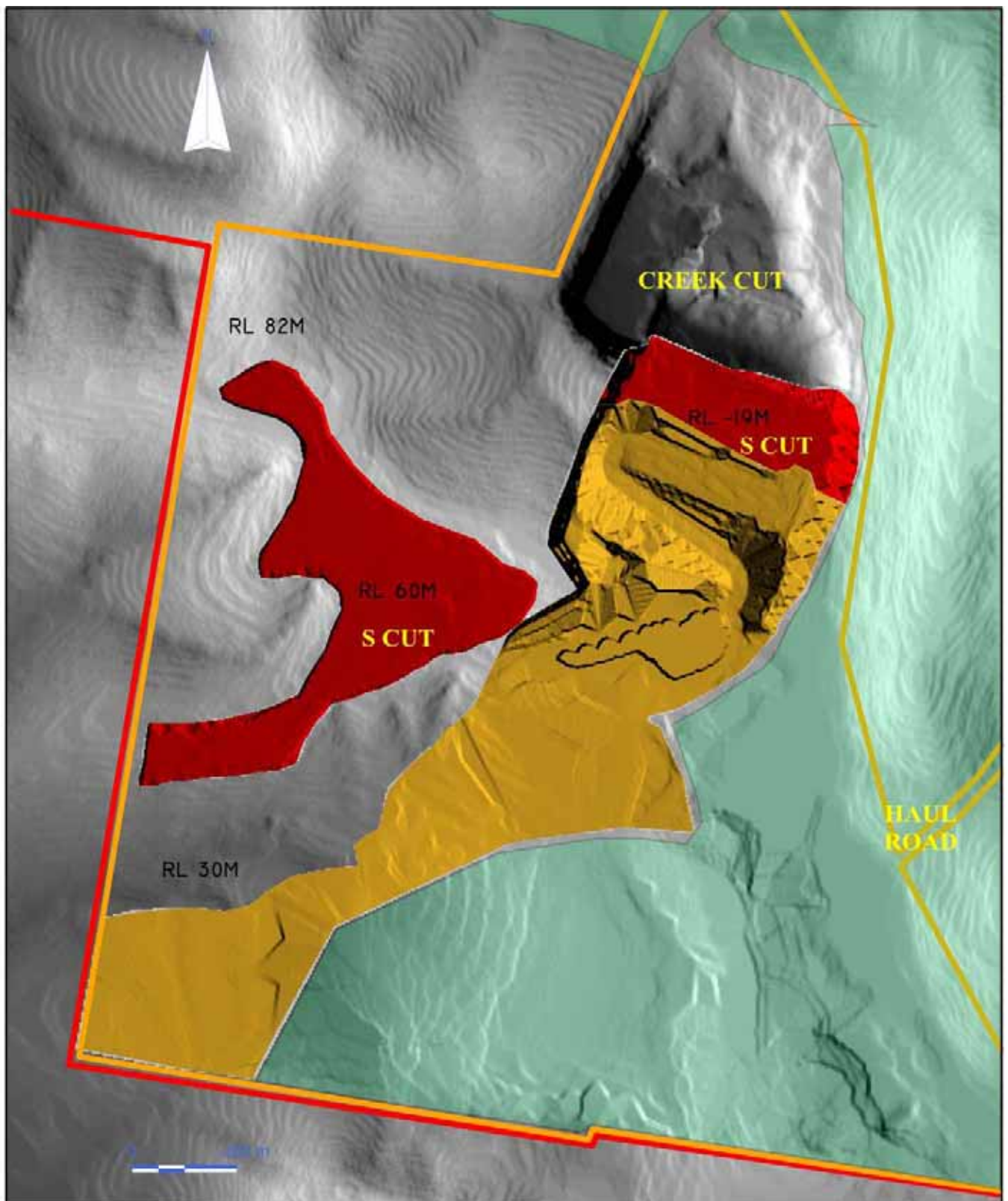


LEGEND

- BLOOMFIELD MINING LEASE
- PROJECT APPLICATION AREA
- REHABILITATION AREA
- ACTIVE MINING AREA
- OVERBURDEN DUMP
- TOPOGRAPHY

BLOOMFIELD COLLIERY

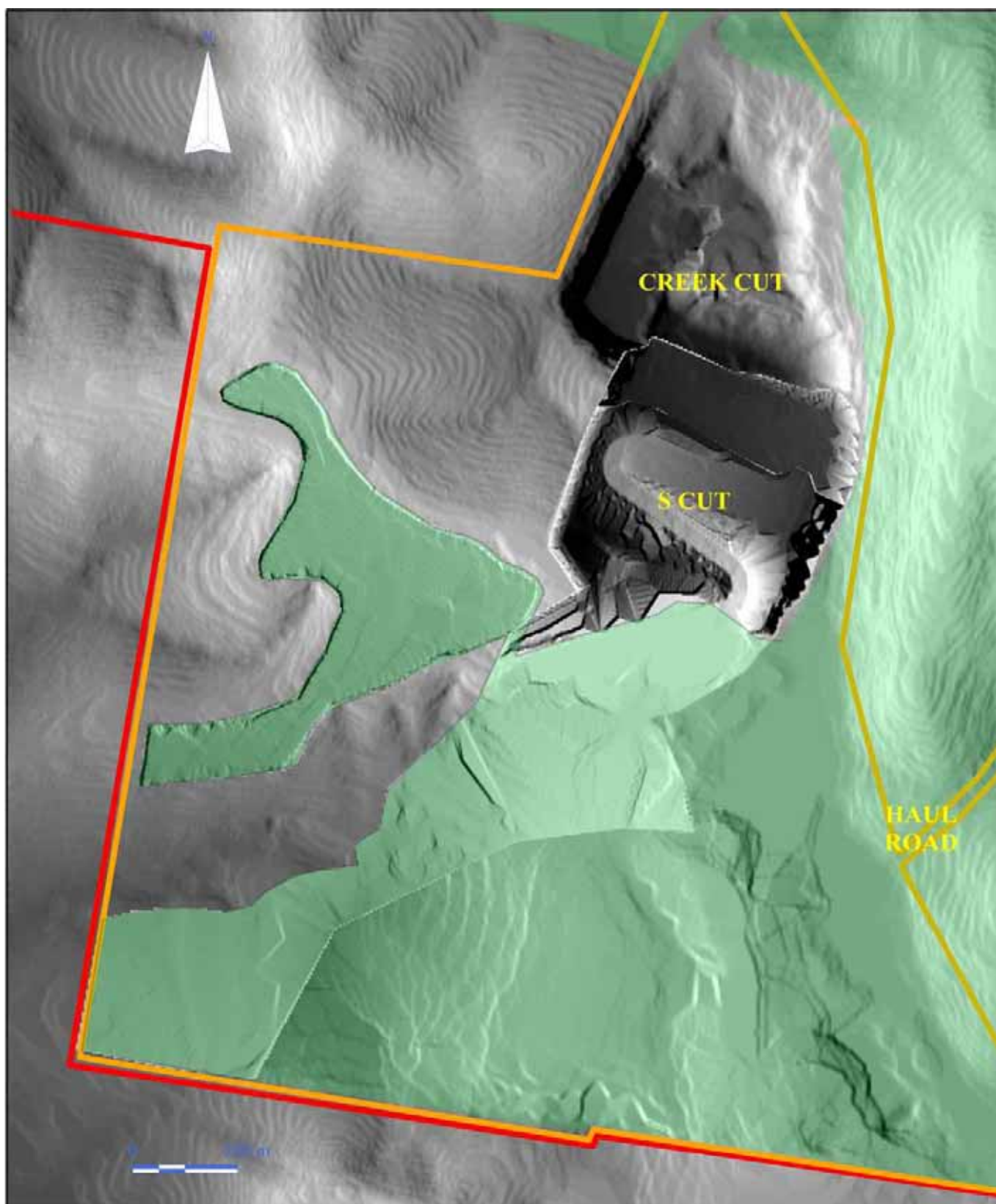
COMPLETION OF MINING AND REHABILITATION
 YEAR 7 DRAFT MINE PLAN
 FIGURE 10 1/6/2007



LEGEND	
	BLOOMFIELD MINING LEASE
	PROJECT APPLICATION AREA
	REHABILITATION AREA
	ACTIVE MINING AREA
	OVERBURDEN DUMP
	TOPOGRAPHY

BLOOMFIELD COLLIERY

COMPLETION OF MINING AND REHABILITATION
 YEAR 10 DRAFT MINE PLAN
 FIGURE 11 1/6/2007



LEGEND	
	BLOOMFIELD MINING LEASE
	PROJECT APPLICATION AREA
	REHABILITATION AREA
	TOPOGRAPHY

BLOOMFIELD COLLIERY

COMPLETION OF MINING AND REHABILITATION
DRAFT PLAN

FIGURE 12 1/6/2007

2.8 Method of Operation

Bloomfield currently utilises an excavator and a fleet of rear dump trucks for the removal of overburden and interburden to expose the various coal seams. A Coaling fleet of front end loader, rear dump trucks and a fleet of site specific coal trucks, operated by lorry owner drivers, load and transport the ROM coal. Coal is stockpiled either at out of pit dumps or on the ROM coal stockpile at the washery. It is proposed to continue this method of operation for the completion of open cut mining, using the same or similar equipment.

The area to be mined has previously been cleared of vegetation, with grasses and low vegetation allowed to regenerate to stabilize the surface until it is required for mining. Prior to mining, this vegetation will be removed and the topsoil stripped and spread over reshaped existing spoil piles, or stockpiled. Drilling rigs will then drill the overburden to the depth of the seam closest to the surface, in preparation for blasting. After blasting, loose material will be removed by the excavator and placed in trucks that will transport it to the spoil emplacements. These emplacements are all within areas that have previously been disturbed by mining. A bulldozer will be used to shape the emplacements for final slope and drainage pattern requirements.

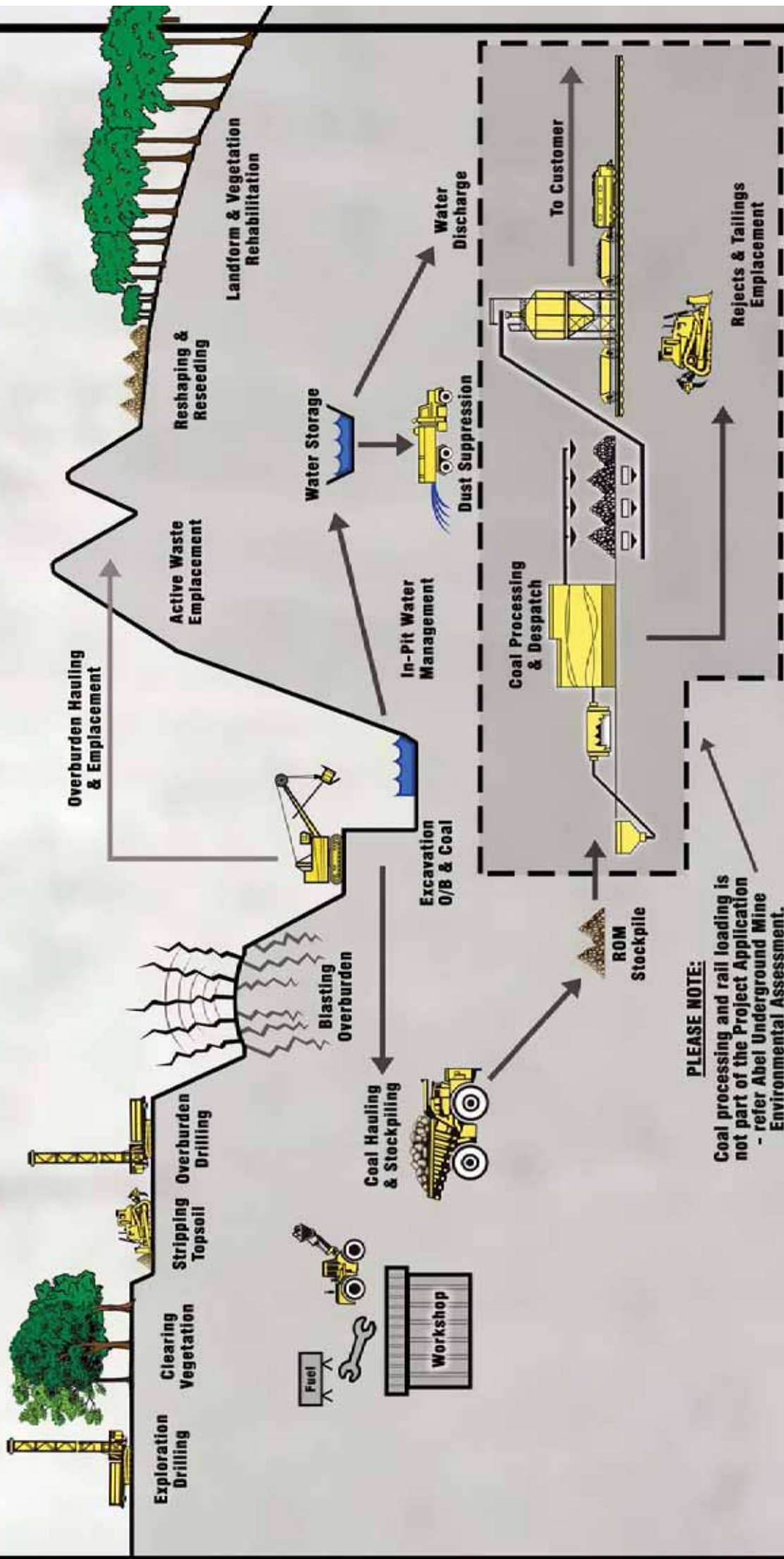
The exposed coal seam will then be ripped and pushed up by bulldozers so that the front end loader and coal trucks can load and transport the coal. Coal will be transported to the ROM coal stockpile areas, prior to processing, stockpiling and loading onto rail to be transported to the Port of Newcastle.

This extraction process will be repeated for each seam in this sequence until the basal Big Ben seam has been removed. The resultant void is then available for backfilling with the spoil from the next mining block. The sequence of mining showing extraction, backfilling and subsequent rehabilitation is shown on **Figure 13**.

Spoil emplacement strategies will continue unchanged from the current sequence. Material from the pre-strip and main dig operations is transported to the spoil emplacement area associated with that operation. Active spoil dumps are constructed in lifts 10 to 15 metres in height and a minimum width for the size of the trucks operating in the area.

Spoil piles are reshaped to produce slopes, topography and drainage patterns, which blend visually with the surrounding topography. As a general rule slopes in excess of 10 degrees are not favoured, although in some instances slopes up to 18 degrees may be permitted if approved by DPI via the MOP.

The management of coarse and fine reject material from the operation of the washery is provided for in the Abel Underground Mine approval.



Bloomfield Colliery

COMPLETION OF MINING AND REHABILITATION
MINING PROCESS

FIGURE 13

2.9 Infrastructure and Supporting Facilities

Major infrastructure components on the site, all of which already exist, will be retained for the proposed completion of open cut mining and are included in the PA area. They consist of:

- Open cut workshop, fuel storage area, offices and bathhouse,
- Temporary internal mine roads constructed as required to access mine areas;
- Permanent roads for access to the major infrastructure components such as the workshop and the coal haulage road to the ROM coal stockpile pads at the washery; and
- Water management system including 'clean' and 'dirty' water drainage structures and dams.

The coal washery and associated bathhouse/workshop, conveyor systems to carry product coal to the rail loading point, ROM and product coal storage areas at the washery form part of the approval for the Abel Underground Mine Project (Donaldson Coal Pty Ltd, 2006).

Existing infrastructure is maintained and is in good order and as such is considered sufficient for the proposed life of mine. No new infrastructure is proposed to be constructed.

2.10 Workforce and Hours of Operation

Bloomfield currently employs 66 personnel, including mining and washery operational staff and management.

Approval is sought to mine 7 days per week, 24 hours per day.

2.11 Capital Investment Value

As this project is for the completion of mining and rehabilitation, no new infrastructure is proposed under this application. Mining operational expenditure in relation to these activities will be ongoing.

2.12 Rehabilitation and Final Land Use

All rehabilitation work is currently undertaken in accordance with standards set by the Department of Primary Industry (Minerals) (DPI). Rehabilitation will continue to utilise existing procedures and will be carried out in accordance with any MOP approved by DPI. These procedures are described in the following sections. All site

rehabilitation requirements of CCL761 will be either completed by Bloomfield or included in any new lease granted under a Part 3A approval.

The final landform and land use will be developed in consultation with all stakeholders, having due consideration for the outcomes identified in the Lower Hunter Regional Strategy (Department of Planning, 2006) and existing CCL761 commitments for mine rehabilitation and closure.

2.12.1 Current Rehabilitation Objectives and Procedures

The objectives of the current rehabilitation programme are to:

- Establish post mining surfaces and a vegetation cover that ensures the pre-mining stability, capability and potential productivity of the site.
- Create new landforms that merge with adjoining undisturbed landforms.
- Accommodate all overburden spoils produced in mining and preparation plant rejects.
- Provide a top dressing cover that supports pre mining land capability.
- Reinstatement a viable drainage network that is hydrologically stable and incorporates erosion and sediment controls which isolate effectively the rehabilitated areas.
- Provide vegetation corridors where appropriate.
- Repair erosion damage and replace areas of grass, trees and shrubs that fail to meet required development.

These rehabilitation objectives and the following rehabilitation procedures will be applied to the continuing operations.

The rehabilitation procedure involves stages of reshaping, preparation, application of fertiliser, choice of sowing times, species selection and site maintenance in accordance with the approved MOP.

Spoil piles are reshaped to produce slopes, topography and drainage patterns which blend with the surrounding topography. As a general rule slopes are constructed at 10 degrees or less, with any exceptions requiring the approval of the DPI.

Exposed surface rock is removed or buried prior to the spreading of topdressing material. Soil material stripped ahead of the mining operation is applied to the new surface in an even layer. Where appropriate, biosolids may be used in the top dressing process.

After topdressing, the slopes may be deep ripped to assist in soil and spoil amelioration as well as forming drainage catchments and seed entrapment. The

area is then contour cultivated to bond the new layer with the underlying spoil. Fertiliser is then applied and the surface sown or planted with grass, crop or tree species. It may be rolled following sowing to encourage germination and improve soil stability

All of these works are performed as soon as is practical after spreading the topdressing material to minimise losses and to preserve biological activity.

Excessive pasture growth may be controlled by slashing or light grazing. Tree lots have been incorporated into the rehabilitation scheme and are situated to assist the visual blending of overburden dumps with the surrounding landscape.

Maintenance of rehabilitated areas is ongoing to ensure complete stabilisation of the areas and to achieve a land capability similar to the pre-mining landscape. Weed control is maintained by the early detection and treatment of infestation.

Any erosion occurrences are investigated to ascertain the cause of the problem and remedial actions have been implemented to prevent recurrence. These actions may be in the form of respreading of topdressing material on minor rill erosion or for more major occurrences reshaping of drainage paths and contour drainage prior to restoration of the eroded areas.

Maintenance fertiliser applications occur during the first 5 years after initial rehabilitation.

2.12.2 Final Landform and Landuse

The final landform and land use will be developed in consultation with stakeholders including the landowner and State and Local Government agencies. Discussions will need to consider the identification of the area within the Lower Hunter Regional Strategy as having potential for employment lands and a freight hub (Department of Planning, 2006). Discussions will occur during the period of preparation of the Environmental Assessment studies and findings of these studies will assist the decision-making process. The rehabilitation requirements of CCL761 will also be applied.

General land use and final landform principles that will apply include:

- Development of stable and permanent landforms, these may include voids, pits and water-bodies provided that they are part of the agreed final outcome;
- That the land does not present hazards to persons, stock or native fauna; and
- That the land has minimal environmental impact outside the disturbed area.

Each of the above points has been addressed in the design of the rehabilitation for the disturbed areas.

Consultation has taken place with the landowner in the development of the Final Rehabilitation Plan, incorporating the areas to be rehabilitated.

The final open cut void at the northern extension of S Cut where it joins with Creek Cut (refer **Figure 12**) will be used as a disposal site for coarse and fine rejects from the Bloomfield washery. Environmental impacts associated with this process and rehabilitation procedures for these areas are detailed in the Environmental Assessment prepared by Donaldson Coal for the approved Abel Underground Mine.

The landowner has requested that the major internal roads and private power lines remain at the completion of mining.

2.13 Environmental Management

The Bloomfield Mining Operations Environment Management System (EMS) has been developed to ISO 14001 standard. Bloomfield's Environmental Policy is as follows:

"It is the policy of Bloomfield Collieries to strive to achieve a high standard of care for the natural environment in all of the activities in which we are engaged and products and services we provide. We aim to conduct our operations in an ecologically sustainable manner by:

- *Minimising our impact on the environment through:*
 - *the prevention of air, ground and water pollution;*
 - *the reduction of noise associated with our activities to as low as reasonably practicable;*
 - *the control of waste associated with our activities;*
- *Identifying, monitoring and managing risks arising from our operations in accordance with the structure of our Environment Management System which establishes the appropriate objectives and targets related to the environmental aspects relevant to the scope of the Operation;*
- *Reviewing our environmental management activities and seeking to continually improve our production processes, waste management and the use of resources;*
- *Conducting our operations in compliance with all relevant environmental regulations, licences and legislation;*
- *Communicating regularly with employees about our aim and about their individual responsibilities;*
- *Informing our contractors, customers and suppliers of our aim and of their environmental responsibilities in relation to our business;*

- *Communicating with the community and appropriate government bodies with regard to the environmental performance, obligations and issues, which may relate to our business. "*

The existing Environmental Management System and procedures will apply to ongoing operations, with the addition of any requirements of the conditions of consent. The current application for use of parts of the site for the Abel Underground Mine, including the washery and areas for tailings disposal, will have environmental management procedures applied to them as described by the Abel Underground Mine EA (Donaldson Coal, 2006), as well as the conditions of consent issued for that project.

Bloomfield operates using a number of existing procedures and systems that have been developed in conjunction with the DPI and DECC to manage the impacts and operation of activities on the site. These include the following:

Mining Operations and Environmental Control Systems

- Mine Operations Plan
- Environmental Emergency Response Procedure
- Maintenance Management System
- Mining Operations Airborne Dust Management System
- Transport Rules and First Trip Escort
- Shot Firing and Explosives Management System
- Discharge Water Management System
- Erosion and Sedimentation Control Plan
- Bushfire Management Plan
- Hazard Reduction Program
- Fuel and Bulk Oil Delivery Procedures

Physical Controls and Management Measures

- On site spill kits
- Automatic shutoffs on equipment
- Bunding
- Vehicle wheel wash

- Water cart use
- Weed control contractors

Communication, Inspection and Reporting

- Employee Consultation System
- Toolbox talks
- Environmental inspections
- Contractor Management System
- Employee inductions
- Incident Notification and Reporting Procedure
- Complaints Protocol

3. REGULATORY FRAMEWORK

3.1 Statutory Application Process

The proposed development, being the completion of open cut mining and rehabilitation at Bloomfield Colliery, is classified as a major project under State Environmental Planning Policy (Major Projects), as it is development for the purpose of coal mining. A Project Application with Preliminary Assessment is therefore required to be completed in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), to clarify that the project falls under Part 3A and also to identify key issues requiring further investigation to determine any potential environmental impact.

This report, prepared for the NSW Minister for Planning, provides the required Project Application and Preliminary Assessment for the completion of open cut mining and rehabilitation at Bloomfield Colliery.

After review of the Project Application by the Minister for Planning and other relevant government agencies, key issues requiring further investigation, together with detailed requirements, will be issued by the Department of Planning. These requirements form the basis of the Environmental Assessment (EA) that will then be prepared for the project. The EA will document the detailed studies undertaken and provide more detailed information on the project. Once complete, the EA will be submitted to the Department of Planning to determine whether it is 'adequate'. If adequate, the EA is then placed on public exhibition.

3.2 Local Government Area and Permissibility

The Project Application area is within the Cessnock Local Government Area (LGA) (refer **Figure 2**).

Cessnock Local Environmental Plan, 1989 zones the Project Application area 1(a) (Rural "A" Zone). A mine is permitted within the Rural 1(A) zone with consent and it is not a listed prohibited development.

3.3 State Planning Instruments and Guidelines

State Environmental Planning Policies (SEPPs) that may be relevant to the Project include:

- SEPP No. 33 – Hazardous and Offensive Industry;
- SEPP No. 44 – Koala Habitat Protection; and
- SEPP (Major Projects) 2005.
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007

The *Hunter Regional Environmental Plan, 1989* (HREP) and HREP-Heritage, 1989 are applicable to the Project Application area. Other state-based policies and strategies that will be considered include:

- *Lower Hunter Regional Strategy* (Department of Planning, 2006);
- *Hunter Catchment Blueprint* (Hunter-Central Rivers Catchment Management Authority, 2003) and *Hunter-Central Rivers Catchment Action Plan* (Hunter-Central Rivers Catchment Management Authority, 2007);
- *Hunter and Central Coast Regional Environmental Management Strategy* (HCCREMS); and
- *Draft Thornton-Killingworth Sub-Regional Conservation and Development Strategy* (Parsons Brinckerhoff, 2003).

The Lower Hunter Regional Strategy (Department of Planning, 2006) identifies land north of John Renshaw Drive for a future inter-modal freight facility. Discussions regarding the final land use for the site will be held between the proponent, the land owners and the relevant government agencies during the EA process.

3.4 Commonwealth Legislation

The requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Native Title Act 1993* will be determined during the EA process. In particular the flora and fauna study to be undertaken will consider the requirements for threatened species and ecological communities under the EPBC Act.

3.5 Permits, Approvals and Licences

Section 2.4 lists current approvals and licences that are held by Bloomfield for existing operations.

Permits, approvals or licences that will be required for the proposed completion of mining and rehabilitation are likely to include:

- A Mining Lease from Department of Primary Industries issued under the *Mining Act, 1992*;
- An Environmental Protection Licence (EPL) under the *Protection of the Environment Operations Act, 1997*; and
- Licences under Part 5 of the *Water Act, 1912* for groundwater bores associated with the project.

As discussed in Section 2.1, it is proposed to apply for a new Mining Lease for the continuing mine operations. Bloomfield would still be required to complete all requirements associated with the current CCL761, including environmental

management and rehabilitation actions. Alternatively, these requirements could be transferred to the new lease.

The current EPL is a premise-based licence that includes the operation of the washery, rail loop and other areas that do not form part of this Application. It is considered appropriate that this licence would continue, with the inclusion of any new requirements for the PA area and proposed activities.

4. CONSULTATION

4.1 Authority Consultation

Authority consultation to date has included discussions with the following government agencies:

- Department of Planning;
- Department of Primary Industries;
- Cessnock City Council; and
- Maitland City Council.

Consultation with other agencies will be in accordance with the requirements of the Director-General of the Department of Planning.

4.2 Community Consultation

A community consultation program has been developed to inform the surrounding community of the project and involve them in the consideration of issues. This program has commenced and includes the following elements:

- A community focus group – this group had its first meeting on 18 April 2007 and meets to discuss the project and mine matters generally. They are also provided with presentations by specialist consultants on subjects such as risk assessment and the planning process. The focus group includes representatives from areas surrounding the mine site, including Buttai, Black Hill, Buchanan, Louth Park and Ashtonfield. Attendees are encouraged to discuss information provided at the meetings within their local communities and to suggest other members of their community who may be interested in attending.
- Mine management personnel doorknocked residences in areas surrounding the mine. If residents were home, the project was discussed and any concerns of environmental impact were noted. A newsletter which explained the details of the project was left at the residence with a note from the management encouraging them to contact the mine if they had any queries about the proposed activity. Approximately 300 newsletters have been distributed.
- A number of small meetings with residents to discuss the project plans and application process have been held. Briefings and information have been provided to individuals and organisations.

- A presentation has been provided to the Wallis, Fishery and Four Mile Creeks Catchment Management Forum (part of Hunter-Central Rivers Catchment Management Authority).
- A website has been developed to provide information about the project and its application process. The website address is www.bloomcoll.com.au.

Consultation to date has indicated that residents are interested in a number of issues, generally relating to the current and past operations of Bloomfield Colliery. These issues include blasting, air quality and visibility.

Some residents were unaware of the mine or had minimal interest in its operations.

The community has asked questions about the existing operations and has generally been positive and interested in the process to complete and rehabilitate the site. They are also interested to know what final land use for the site is proposed.



Bloomfield Colliery

Completion of Mining and Rehabilitation

Part 3A Project Application
Preliminary Assessment Report

6 July 2007

5. PRELIMINARY RISK ASSESSMENT

5.1 Introduction

GSS Environmental (GSSE) has undertaken a Preliminary Risk Assessment (PRA) and developed an Environmental Risk Register for the proposed project. The PRA is provided in Appendix A. The PRA was undertaken to provide the basis for identifying key issues for detailed environmental assessment.

A qualitative risk assessment methodology was developed by GSSE in accordance with the requirements of *Australian Standard AS/NZS 4360:2004 – Risk Management*.

An initial site inspection identified the various issues for consideration in the PRA. A PRA team was then assembled, comprising various people associated with mine management, planning, operations and/or environmental assessment. This was considered the most appropriate way to help define context and identify the range of risks that needed consideration throughout the process. A workshop session was then held to discuss as a group the key activities and potential risks.

The PRA will be reviewed and modified as required after completion of the various EA studies. This review is required as these studies may provide additional controls that lead to a reduction in risk, or may, through detailed assessment, lead to a change in the risk rating for a particular site activity. Consultation with the community, government and other stakeholders may also modify the results of the preliminary risk assessment.

5.2 Aim, Objectives and Scope

The aim of the PRA was to formally identify and present effective management protocols for all environmental risks associated with the proposed development. The PRA process included four main steps:

- (a) Establish the context for the risk assessment process;
- (b) Identify the environmental risks;
- (c) Analyse the risks; and
- (d) Evaluate the risks to determine the significant issues.

The following specific aims and objectives were established for the PRA:

- To assemble a range of project personnel to identify the activities, aspects and possible environmental impacts associated with the operation at the Project Area of Bloomfield;
- To consider these activities in isolation of any controls and determine a potential 'raw' risk rating;

- To identify current controls that are already in place to mitigate or minimise potential impact, in order to reduce the risk to as low as reasonably practicable;
- To identify potential future controls that may assist to either eliminate or mitigate other likely impacts;
- To provide the basis for the development of an action plan which identified the various issues requiring further consideration during the environmental impact assessment phase of project; and
- Determine the residual risk and ensure that it is appropriately low enough given the sensitivities of the project location. This was undertaken following consideration of the controls/mitigation strategies already in place and others that may be proposed.

The PRA has been prepared for the PA area. It includes a detailed review of the key activities, considered to be:

- Exploration;
- Pre-Stripping;
- Main Dig;
- Rehabilitation;
- Field Maintenance & the Open-Cut Workshop; and
- Supply.

Appendix B provides a detailed description of each of these key activities.

5.3 Methodology

The process/operational flow chart developed for the PA area (refer Figure 13) was used during the PRA to identify activities that would occur as part of the project.

A PRA team was then established to identify and discuss these activities and assign risk ratings. Selection of the team enabled the risks to be assessed by those who were experienced in the area, understood the project and had the authority to action key “findings” resulting from the risk assessment process. Members of the team are provided in Appendix B.

After identifying proposed activities, a specific Risk Rating was assigned to each activity based on discussion and analysis by the PRA team. Details of the Risk Rating methodology and compliance with *AS/NZS 4360:2004 Risk Assessment – Qualitative Risk Assessments* is provided in Appendix B.

The Risk Rating was assigned by combining the consequence of a risk occurring with the probability that it would occur. A numerical Risk Ranking between 1 and 25 was then allocated for each aspect of the proposal using an environmental Risk Matrix.

Depending on the numerical Risk Ranking, a Risk Rating Class was then applied to each aspect using the Risk Classification System, as shown following:

<i>Risk Classification System :</i>	
High Risk (H)	1 to 6 (Red)
Medium Risk (M)	7 to 15 (Yellow)
Low Risk (L)	16 to 25 (Green)

In accordance with this Risk Classification System, one of the following Environmental Risk Ratings was assigned to each aspect:

- H (high) being a Class 1 Risk - requires immediate management attention, a stop/stand down until rectified if deemed necessary.
- M (moderate) being a Class 2 Risk - acceptable with current controls but requires attention if controls absent or ineffective, and where practicable develop other controls to mitigate the risk.
- L (low) being a Class 3 Risk – acceptable risks are assessed and controlled as required.

Risk Rankings were allocated for each aspect of the existing operation, based on three separate scenarios:

- The first considering no controls, which is a measure of the raw risk associated with the activity;
- The second considered the risk rating with current controls in place; and
- The third included consideration of the effect of potential future controls, as suggested by the working group.

In the context of this PRA, a control is considered to be either a hard engineering control (e.g. bunds, diversions, etc) or an administrative control (e.g. work procedure(s) and/or management plan).

5.4 Risk Register and Identification of Key Issues

A Risk Register has been compiled (refer Appendix B) to document the risk assessment outcome(s) for all aspects identified throughout the PRA process. The Risk Register is separated into the six key phases identified for the project.

The key aspects included in the Risk Register are typical of an open cut mine of this nature and are summarised below:

- Disturbance of Aboriginal and European Heritage;
- Erosion and sedimentation;
- Fire Hazard;
- Dust;
- Noise;
- Contamination of surface and ground water resources;
- Storage and management of hydrocarbons including spills and leaks; and
- Introduction of weeds.

Introduction of weeds, storage and management of hydrocarbons and fire hazard are items that can be most effectively managed through the development of management plans and procedures. Bloomfield has plans in place to reduce the risk of these potential risks, as discussed in Section 2.13.

The Risk Assessment highlighted that the following aspects had a higher risk of occurring and/or with greater consequences, and that detailed impact assessment studies should be undertaken to further investigate this risk:

- Disturbance of Aboriginal and European heritage; and
- Disturbance of threatened flora and fauna species.

The following chapters provide a Preliminary Assessment of these issues, as well as those items that, while they presented a lower risk rating, are issues that presented a medium or high risk without the implementation of existing or proposed controls. These include:

- Noise and blasting;
- Dust, or air quality;
- Soils and erosion and sedimentation; and
- Surface water and ground water impacts.

The following items are included to provide more information on existing conditions and management controls:

- Visual aspects;

- Socio-economic aspects; and
- Traffic.

Whilst visual aspect was not flagged by the PRA as a potential risk area, early community consultation has indicated a degree of interest in this issue. This will be reflected in the PRA review undertaken at the completion of the EA study process.

6. PRELIMINARY ASSESSMENT – ECOLOGY AND HERITAGE

6.1 Ecology

6.1.1 Introduction

The investigation area consists of three separate but adjoining areas of remnant vegetation totalling approximately 300 hectares. This vegetation surrounds the existing Bloomfield open cut coal mining land as shown on Figure 3. The topography is low-relief with broad ridge tops having a maximum elevation of 70 metres AHD and drainage lines down to 6 metres AHD. The western catchment flows into the Wallis Creek floodplain and the eastern catchment flows into Four Mile Creek.

This section provides the results of the preliminary desk top assessment of ecology, including threatened species and communities, and describes the proposed methodology for the detailed EA studies to be undertaken.

6.1.2 Preliminary Assessment – Threatened Species

In order to determine the threatened species that might be present in the investigation area, data was obtained from the Atlas of NSW Wildlife for threatened species and endangered ecological communities recorded from within a 5km radius of the boundary of the investigation area. This data is provided in Table 2 and Table 3.

Table 2 Threatened flora recorded within a 5km radius of the investigation area

Family	Scientific Name	Common Name	Status TSC Act	Status EPBC Act	Most Recent Record
Fabaceae (Mimosoideae)	<i>Acacia bynoeana</i>	Bynoe's Wattle	E1	V	4/12/2001
Myrtaceae	<i>Eucalyptus parramattensis</i> <i>subsp. Decadens</i>	Earp's Gum	V	V	8/11/2004
Proteaceae	<i>Grevillea parviflora subsp.</i> <i>Parviflora</i>	Small-flower Grevillea	V	V	31/10/2002
Tremandraceae	<i>Tetraloche juncea</i>	Black-eyed Susan	V	V	6/01/1986
Asteraceae	<i>*Rutidosia heterogama</i>	Heath Wrinklewort	V	V	30/01/2006

**Rutidosia heterogama* was not reported in the Atlas data but has recently been recorded in the immediate vicinity of the investigation area.

Regional vegetation modelling for the area (NPWS 2000) indicates that the majority of the vegetation across the investigation area consists of one endangered ecological community, being Lower Hunter Spotted Gum – Ironbark Forest.

Table 3 Threatened fauna recorded within a 5km radius of the investigation area

Family	Species	Common Name	Status TSC Act	Status EBPC Act	Most Recent Record
Amphibians					
Hylidae	<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	22/08/1995
Birds					
Acanthizidae	<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	V		25/11/1991
Cacatuidae	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V		20/10/1982
Climacteridae	<i>Climacteris picumnus</i>	Brown Treecreeper	V		12/01/1991
Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V		28/02/1986
Meliphagidae	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V		1/01/1998
Meliphagidae	<i>Xanthomyza phrygia</i>	Regent Honeyeater	E	E	22/11/1981
Pomatostomidae	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V		31/10/2002
Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	V		24/07/2000
Psittacidae	<i>Neophema pulchella</i>	Turquoise Parrot	V		30/11/1982
Strigidae	<i>Ninox connivens</i>	Barking Owl	V		2/01/1998
Strigidae	<i>Ninox strenua</i>	Powerful Owl	V		18/03/1998
Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	V		1/01/1998
Microchiropteran Bats					
Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V		27/09/1995
Molossidae	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V		2/01/1998
Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V		2/01/1998
Vespertilionidae	<i>Miniopterus australis</i>	Little Bentwing-bat	V		12/01/1994
Vespertilionidae	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V		12/01/1994
Vespertilionidae	<i>Myotis adversus</i>	Large-footed Myotis	V		2/01/1998
Vespertilionidae	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V		27/09/1995
Megachiropteran Bats					
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V		31/10/2002
Marsupials					
Petauridae	<i>Petaurus australis</i>	Yellow-bellied Glider	V		13/02/1996
Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	V		15/11/2002
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V		23/11/2000

6.1.3 Field Survey Methods

The investigation methods to be used for the detailed EA study will be consistent with the draft *Guidelines for Threatened Species Assessment* (Department of Environment and Conservation and Department of Primary Industries, July 2005) and will include the following. Some of these searches and investigations have commenced in order to ensure studies are carried out during optimal seasonal conditions for locating species.

i. Vegetation and Flora

Ground searches will be conducted throughout the investigation area in order to collate a full floristic content list and to determine the extent and types of vegetation communities present. Vegetation communities will be classified according to the regional model (NPWS, 2000) commonly referred to by the acronym LHCCREMS.

The community classification will be arrived at through the acquisition of ground-truthed data describing the floristic content of the vegetation at a number of locations in the investigation area. Community boundaries will be determined through a combination of aerial photograph interpretation and on-the-ground mapping using a hand-held GPS.

ii. Fauna

The fauna investigation will use the following methods:

- Terrestrial mammal trapping using Elliott A, Elliott B and cage traps;
- Arboreal mammal trapping using Elliott B traps placed on platforms on tree trunks at 2 – 4m above the ground;
- Hair tubes placed on tree trunks;
- Harp trapping for insectivorous bats;
- Large forest owl call playback;
- Spotlighting;
- Watching of habitat hollows at dusk;
- Targeted and opportunistic amphibian and reptile searches; and,
- Targeted and opportunistic bird survey.

The survey locations will be placed in each vegetation community type.

6.2 Heritage Assessment

6.2.1 Introduction

The PA area is located within the Central Lowlands region of the lower Hunter Valley, several kilometres south of Maitland. The terrain is undulating to hilly, with simple slopes and ridge and spur crests, drained by several first and second order drainage depressions. The native vegetation has previously been cleared.

Searches of the NSW Department of Environment and Climate Change (DECC) Aboriginal Heritage Information Management System (AHIMS) (refer Figure 14) reveal that no Aboriginal sites are listed within the PA area. One isolated stone artefact, 'A7/A', occurs in close proximity to the workshop portion of the application area.

The absence of recorded sites is inferred to primarily relate to the general absence of systematic archaeological survey within this area. No Aboriginal heritage sites are listed within the application area on other heritage registers or planning instruments, including the *Cessnock Local Environmental Plan 1989* or the *Hunter Regional Environmental Plan 1989 (Heritage)* or other registers under the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, the *Environment Protection and Biodiversity Conservation Act 1999* or the *Australian Heritage Council Act 2003*, such as the Register of the National Estate, Commonwealth Heritage List and National Heritage List.

6.2.2 Predictive Model

A predictive model of site location has been constructed to identify areas of archaeological sensitivity (ie. locations where there is a probability of archaeological evidence occurring). The model indicates that there is potential for widespread evidence of Aboriginal occupation in the form of stone artefacts to occur in areas that have not been substantially impacted by previous land use. However, typically this evidence is anticipated to comprise a very low density of artefacts consistent with background discard, interspersed by occasional activity areas with higher artefact numbers. The potential for artefact evidence representing more focused occupation and potentially being of scientific significance is assessed on a preliminary basis as generally low.

The predictive model also indicates that there is some potential, albeit generally low to very low, for other heritage site types such as grinding grooves to occur within the project application area. Systematic field survey would enable refinement of the predictive model and clarification of the presence or potential for Aboriginal heritage evidence within the application area.

The PA area lies within the boundaries of the Mindaribba Local Aboriginal Land Council and within an area of potential interest to other indigenous persons and organisations. Aboriginal cultural values may be associated with the application area, relating to both traditional and contemporary use. Consultation with the relevant Aboriginal community is the primary means of identifying cultural values and a consultation process in

accordance with the *DEC Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (2005)*, is currently underway.

6.2.3 Preliminary Assessment

The *National Parks and Wildlife Act 1974* (NP&W Act) provides the primary basis for the legal protection and management of Aboriginal heritage within New South Wales.

It is anticipated that a detailed Aboriginal heritage assessment will be required with reference to the *DEC Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (2005)*, which itself involves reference to the *Aboriginal Heritage Standards and Guidelines (1997)* and the *Interim Community Consultation Requirements for Applicants policy*. This involves a formal consultation procedure with various government agencies and Aboriginal groups, media advertisements, involvement of Aboriginal stakeholders in field inspections, and review of methods and draft reports by Aboriginal stakeholders. This detailed process has commenced with some advertising and consultation being undertaken in accordance with the guidelines.

The *Part 3A DEC Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* involve four main streams of investigation:

- Social/cultural information:
 - Cultural mapping, oral histories, archival research, Aboriginal consultation;
 - Compliance with Interim Community Consultation Requirements for Applicants policy;
- Landscape assessment:
 - Subdivision of PA area into environmental units;
 - Map landscape features, places and natural resources of interest to Aboriginal community;
- Archival documentation:
 - Register searches and research; and
- Archaeological investigation:
 - Field survey - "where developments occur over a large area the sampling regime must encompass the geographic extent of the development".

Potential impacts to Aboriginal heritage (including cultural values) may arise through open cut mining and mitigation and/or management measures may be required to mitigate these impacts.

Strategies that are typically available for the management of identified and potential Aboriginal heritage resources include further investigation (eg. survey and/or sub-surface test excavation), unmitigated impact, mitigated impact, conservation and/or monitoring. In the selection of appropriate management strategies for indigenous heritage in relation to the project application area, the salient points to consider include:

- Although no heritage evidence has previously been recorded within the application area, this is likely to reflect the general absence of systematic archaeological investigation rather than a genuine absence of evidence;
- Construction of a predictive model of site location indicates that there is potential for widespread evidence of Aboriginal occupation in the form of stone artefacts, along with some potential, albeit generally low to very low, for other heritage site types such as grinding grooves, in areas not substantially impacted by recent land use. Aboriginal cultural values may be associated with the PA area, relating to both traditional and contemporary use;
- Systematic archaeological field survey would enable refinement of the predictive model and clarification of the presence or potential for Aboriginal heritage evidence within the PA area; and
- In the absence of mitigation measures, potential impacts from the proposal to any heritage evidence that exists within the PA area is anticipated to be high.

In consideration of these factors, further heritage assessment is warranted. An Aboriginal Heritage Impact Assessment will be undertaken in compliance with DECC policy, including the Aboriginal Heritage Standards and Guidelines (1997) and Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (2005).

Archaeological investigations would be undertaken by an archaeologist qualified and experienced in Aboriginal heritage, in full consultation with the registered Aboriginal stakeholders and with the appropriate permits where necessary from DECC. The Aboriginal stakeholders will be afforded the opportunity to comment on the research design of any future studies and will be involved in site management decisions and field studies as per the DEC policy entitled *Interim Community Consultation Requirements for Applicants*.

7. PRELIMINARY ASSESSMENT – NOISE AND AIR QUALITY

7.1 Noise, Vibration and Blasting

7.1.1 Introduction

Heggies Pty Ltd (Heggies) has been engaged to undertake an assessment of noise and blasting issues associated with the proposed Bloomfield Completion and Rehabilitation project.

This preliminary noise and vibration assessment report outlines the methodology and procedures to be used to identify the key noise and blasting impacts associated with the project. It also provides information on the existing noise environment.

7.1.2 Impact Assessment Procedures

The noise assessment will be prepared with reference to Australian Standard AS1055:1997 Description and Measurement of Environmental Noise Parts 1, 2 and 3 and in accordance with the NSW Industrial Noise Policy (INP).

The INP was released in January 2000 and provides a framework and process for deriving noise criteria for consents and licences that will enable DECC to regulate premises that are scheduled under the *Protection of the Environment Operations Act, 1997*.

The specific policy objectives are to:

- Establish noise criteria that would protect the community from excessive intrusive noise and preserve amenity for specific land uses.
- Use the criteria as the basis for deriving project specific noise levels.
- Promote uniform methods to estimate and measure noise impacts, including a procedure for evaluating meteorological effects.
- Outline a range of mitigation measures that could be used to minimise noise impacts.
- Provide a formal process to guide the determination of feasible and reasonable noise limits for consents or licences that reconcile noise impacts with the economic, social and environmental considerations of industrial development.
- Carry out functions relating to the prevention, minimisation and control of noise from premises scheduled under the Act.

Sleep disturbance will be assessed as a requirement of guidelines set out in Chapter 19-3 of the DEC's Environmental Noise Control Manual (ENCM).

The Project will utilise the existing rail loop/loading and washery facilities already assessed as part of the Abel project. Therefore, the noise impact of these facilities will be considered as part of a cumulative assessment. It is envisaged that no construction activities will occur as a result of this project, accordingly, construction noise will not be considered in this assessment.

7.1.3 Assessment of the Existing Environment

A series of unattended continuous and operator attended noise surveys have commenced at the nearest affected receivers to the Project Application area, being receivers situated on John Renshaw Drive, Blackhill and residences to the south of the Bloomfield mining lease. Additionally, to establish ambient noise levels in this assessment, background noise data obtained from measurements conducted for previous projects within the area such as the Abel Coal Mine will be utilised. A summary of background noise levels obtained from relevant locations with respect to the project are summarised below in Table 4.

Table 4 Background noise levels surrounding Abel Coal Mine

Location	Description	Background LA90 Noise Level	Estimated Existing Industrial LAeq Contribution
		Rating Background Level	
Browns Road (Black Hill)	Daytime	36 dBA	43 dBA
	Evening	37 dBA	< 39 dBA
	Night	31 dBA	34 dBA
Louth Park	Daytime	39 dBA	41 dBA
	Evening	37 dBA	< 39 dBA
	Night	34 dBA	< 34 dBA
Buchanan	Daytime	38 dBA	40 dBA
	Evening	36 dBA	< 39 dBA
	Night	31 dBA	33 dBA
Ashtonfield (Kilshanny Avenue)	Daytime	41 dBA	< 49 dBA
	Evening	41 dBA	< 39 dBA
	Night	38 dBA	< 34 dBA

The INP prescribes detailed calculation routines for establishing “project specific” LAeq(15minute) intrusive criteria and LAeq(Period) amenity criteria at potentially affected receivers for a development.

The INP provides procedures for cumulative noise impact assessments by ensuring that the appropriate noise emission criteria (and consent limits) are established with a view to maintaining acceptable noise amenity levels for residences.

The LAeq(period) amenity level as referenced in the INP is based on a specified “acceptable” level appropriate for the particular locality and land use and is aimed at restricting the potential cumulative increase in noise amenity levels (otherwise known as “background creep”) and will form the basis of the cumulative impact assessment.

7.1.4 Operational Noise Prediction

A computer model will be used to predict potential noise emissions associated with the Project. The modelling software Environmental Noise Model (ENM) has been produced in conjunction with DEC and levels would be assessed for general operational scenarios associated with the proposed mining plans for the development to the nearest residential receivers.

The model will be established to predict mine noise emissions for the general area surrounding the development, in particular focusing on nearest potentially affected receivers off John Renshaw Drive situated less than 400 metres to the south of the Bloomfield site. These receivers are shown on Figure 15.

Mining noise emissions will be greatest at these receivers, especially during the early stages of mine development where plant items are situated on the surface of the pit. If compliance is not achieved, detailed noise control measures may be incorporated into the model to mitigate potential project specific noise goal exceedances.

Inputs into the model will include a three-dimensional digital terrain map to incorporate relevant topographic information for the surrounding areas of the Project. The model uses this map, together with noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. Noise source data adopted in the model will include acoustically significant plant items utilised by Bloomfield’s current open cut operations. Noise emissions from the Bloomfield workshop are not considered significant and will therefore not be assessed.

7.1.5 Sleep Disturbance Assessment

The sleep disturbance assessment undertaken as part of the noise and vibration assessment will focus on maximum external noise levels that are typically generated by acoustically significant plant and equipment to be used at the subject site. The maximum noise emissions of the sources will be incorporated into the established noise model and assessed to the nearest residential areas during adverse weather conditions for night periods. Sources modelled may include coal trucks, reversing alarms and bulldozer noise.

7.1.6 Cumulative Noise Impact Assessment

Mining in the vicinity of the project includes the existing Bloomfield washery and rail loading operations, the existing Donaldson Coal Mine and the approved Abel

Underground Mine. All of these items have the potential to contribute to cumulative noise impacts on the surrounding community.

Potential cumulative noise impacts from existing and successive developments are to be determined as part of the project noise and blasting assessment.

7.1.7 Noise Management

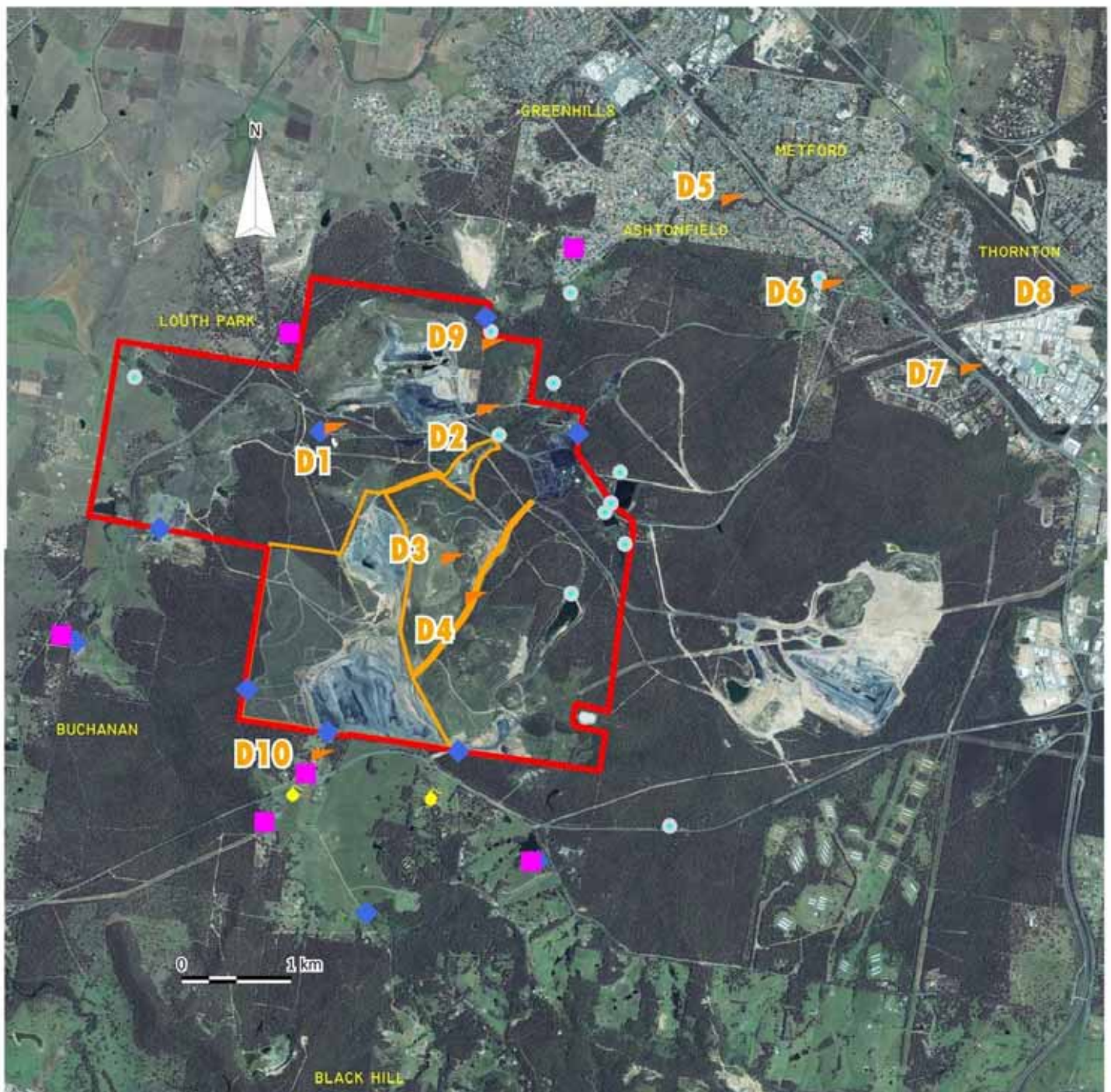
Selecting an appropriate noise management strategy for the project may involve several of the following steps:

- Determining the noise reduction required to achieve the project-specific noise levels.
- Identifying the specific characteristics of the industry and the site that would indicate a preference for specified measures.
- Examining the mitigation strategy chosen by similar industries on similar sites with similar requirements for noise reduction; and considering that strategy's appropriateness for the subject development.
- Considering the range of noise-control measures available.
- Considering community preferences for particular strategies. This is especially important when the community has particular sensitivities to noise.

7.1.8 Assessment of Blasting Impacts

Explosives are used in mining in order to dislodge overburden material to enable its removal. As a result, the use of explosives can have a potential ground vibration and airblast impact on surrounding communities. The Project noise and blasting assessment will analyse the potential vibration and airblast issues associated with proposed development and address issues in accordance with the DEC's guidelines for blasting based on human comfort levels.

Additionally, the Project noise and blasting assessment will determine vibration levels for neighbouring sensitive building structures using methods and limits presented within the DEC guidelines or *Australian Standard AS2187.2*.



LEGEND	
■	NOISE MONITORING
◆	PIEZOMETERS
●	WATER MONITORING
▲	DUST MONITORING
●	BLAST MONITORING
—	BLOOMFIELD MINING LEASE
—	PROJECT APPLICATION AREA

BLOOMFIELD COLLIERY

**COMPLETION OF MINING
AND REHABILITATION**

*MONITORING AND
ASSESSMENT LOCATIONS*

FIGURE 15

1/6/2007

7.2 Air Quality

7.2.1 Introduction

This section provides a review of existing meteorological and air quality data in the vicinity of the Bloomfield Open Cut Mine near Maitland together with proposed methodologies for a detailed assessment of air quality. Appendix C provides detailed air quality and meteorological data.

7.2.2 Air Quality Assessment Criteria

The project will result in the liberation of a number of classes of particulate matter (PM) described as total suspended particulate matter (TSP)¹, particulate matter with equivalent aerodynamic diameters 10 µm or less (PM10)² and particles with equivalent aerodynamic diameters of 2.5 µm and less (PM2.5). These emissions would occur primarily as fugitive dust from open cut mining operations.

There will also be emissions from vehicles and open cut mining equipment. These emissions will include carbon monoxide (CO) and minor quantities of sulphur dioxide (SO₂) and nitrogen dioxide (NO₂). In practice these gaseous emissions will be minor and at levels that will not give rise to environmental impacts. The focus of the assessment will be on potential impacts due to emissions of dust.

i. Particulate matter

Table 5 and Table 6 summarise the air quality goals that will be used in the environmental assessment. The air quality goals relate to the total PM burden in the air and not just that from the project. It will be necessary to consider the effects of particulate matter emissions, taking into account emissions from other mining operations and other sources of PM. This will be done via a combination of reviewing monitoring data and modelling.

¹ TSP is particulate matter suspended in the air and measured using a high volume sampler operated according to AS2724.3-1984. The size range of particles is indeterminate and depend on the measurement conditions. TSP is usually taken to comprise particles in the size range up to 0 to 50 µm. Particles larger than 50 µm are generally too large to remain suspended in the air for long enough to be considered as air pollutants.

² A particle is said to have an equivalent aerodynamic diameter of x µm if its dynamical behavior in the atmosphere is the same as a sphere of diameter x and with density 1 g/cm³.

Table 5 Air quality standards/goals for particulate matter concentrations (Source: DEC, 2005)

Pollutant	Standard / goal	Averaging period	Agency
Total suspended particulate matter (TSP)	90 $\mu\text{g}/\text{m}^3$	Annual mean	National Health and Medical Research Council (NSW DEC, 2005)
Particulate matter < 10 μm (PM ₁₀)	50 $\mu\text{g}/\text{m}^3$	24-hour maximum	NSW DEC (2005) (assessment criteria)
	30 $\mu\text{g}/\text{m}^3$	Annual mean	NSW DEC (2005) (long-term reporting goal)
	50 $\mu\text{g}/\text{m}^3$	(24-hour average, 5 exceedances permitted per year)	National Environment Protection Measure (NEPM, 1998)

$\mu\text{g}/\text{m}^3$ – micrograms per cubic metre
 μm – micrometre

ii. Dust deposition

In addition to health impacts, airborne dust also has the potential to cause nuisance impacts by depositing on surfaces and on vegetation/crops. Table 6 shows the maximum acceptable increase in dust deposition over the existing dust levels from an amenity perspective. The criteria for dust fallout levels are set to protect against nuisance impacts (DEC, 2005).

Table 6 DEC criteria for dust (insoluble solids) fallout

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

7.2.3 Existing Air Quality

iii. Dust (insoluble solids) deposition

Bloomfield has operated a network of dust deposition gauges for a considerable period. The location of the gauges is shown on Figure 15. The results showing the annual average dust (insoluble solids) deposition rate since 1998 are summarised in Table 7.

Table 7 Insoluble solids deposition rate - g/m²/month

Gauge → Month ↓	1	2	3	4	5	6	7	8	9	10
Ann. 1998	1.2	2.3	1.8	1.7	2.0	2.6	1.7	1.1		
Ann. 1999	1.5	2.4	1.8	1.1	1.9	1.7	1.8	1.3		
Ann. 2000	1.4	2.0	1.3	0.8	1.2	3.4	1.9	1.1		
Ann. 2001	1.3	1.7	1.4	5.9	1.4	2.3	2.1	1.2	1.5	1.9
Ann. 2002	1.5	1.8	1.2	4.6	1.7	2.2	2.1	1.7	1.3	2.2
Ann. 2003	2.6	1.6	0.9	5.2	1.3	1.8	1.4	1.3	1.3	1.2
Ann. 2004	1.4	1.5	1.0	5.8	1.1	2.0	1.5	1.5	0.9	1.0
Ann. 2005	3.4	1.9	1.1	2.9	1.0	1.6	1.4	1.4	0.9	1.4
Ann. 2006	1.4	1.8	1.3	3.5	1.3	1.4	1.5	1.1	1.3	2.1

Note the data for 2006 is not a complete year. It relates to the period January to July inclusive.

In the past two years all gauges have complied with the DECC's annual average assessment criterion of 4 g/m²/month for insoluble solids. In earlier years, there have been some exceedances at Gauge 4, which is well removed from residential areas.

Other monitoring data from neighbouring mines is collected in the area and this will be referred to in the assessment if the result of the dispersion modelling indicates that it is relevant.

iv. Dust concentration data

No TSP or PM10 concentration data is collected as part of the Bloomfield Mine's air quality monitoring. However, data on PM10 and TSP concentrations is made at the DECC's monitoring station at Beresfield and the Donaldson Mine's monitor at Blackhill. Data analysed from May 2000 to December 2005 shows that there have been some occasions when the 24-hour average PM10 concentration at Beresfield has exceeded the DECC's criteria of 50 µg/m³, however there has only been one such occasion in the past 12 months. Similarly, since May 2000 there have been eight occasions when 24-hour

average PM10 concentration has exceeded 50 $\mu\text{g}/\text{m}^3$ at the Blackhill monitor but none of these has occurred in the last 12 months.

The annual average PM10 concentration (running mean) at Beresfield exceeded the DECC 30 $\mu\text{g}/\text{m}^3$ criterion for a period running from late 2002 to the end of 2003, but has been below the criterion since that time. The annual average PM10 concentration at Blackhill has not exceeded the criterion since monitoring commenced in May 2000. The annual average TSP concentration at Blackhill has also been lower than the DECC 90 $\mu\text{g}/\text{m}^3$ criterion since monitoring commenced.

Although emissions from mining at Donaldson and Bloomfield will theoretically contribute to concentrations of PM10 and TSP at these Beresfield and Blackhill sites, modelling of emissions presented in the Donaldson EIS indicates that the contributions are likely to be small and are unlikely to have caused, or contributed significantly to, the measured exceedances. The highest concentrations measured are clearly not related to emissions from mining because they occur at both the Beresfield and Blackhill sites on the same days.

The location of the Donaldson mine (between the two monitoring sites) makes it impossible for emissions from the mines to contribute to both monitors simultaneously and even when averaged over a 24-hour period it is highly unlikely that emissions would cause high concentrations at two sites on opposite sides of the mines. The mostly likely explanation for the elevated levels is regional air pollution caused by bushfire smoke or regional dust storms of sufficient scale to affect both monitoring sites.

Thus, as with dust deposition, PM10 and TSP concentrations are satisfactory at present, but emission sources of PM10 that might affect air quality in the Beresfield area, should be carefully controlled to ensure that the area continues to comply with the DECC annual and 24-hour criteria of PM10. Mining at Bloomfield is unlikely to contribute significantly to the PM10 burden in the Beresfield area although modelling will be required to demonstrate this.

7.2.4 Meteorological Conditions

i. Wind speed and wind direction

A meteorological station has been operated since 1999 as part of the Donaldson Project environmental monitoring program. The Donaldson weather station is located on the mine site but is unavoidably affected by the trees. Therefore, the weather station's exposure does not comply with Australian Standard 2923-1987, which specifies the requirements for the exposure of weather stations used to collect wind speed and wind direction data for modelling. For this reason, the modelling work will use data from the nearby DECC meteorological station at Beresfield.

Wind roses prepared from the DECC's weather station for the period 1 August 2005 to 31 July 2005 at Beresfield are shown in Appendix C. The wind roses show that over the year the most common winds are from the west, west-northwest and east-southeast

and southeast. Westerlies are most common in the winter and the south-easterlies in the summer. Autumn and spring show an intermediate pattern between that which applies in the summer and the winter.

ii. Temperature and rainfall

Bureau of Meteorology data from the East Maitland Bowling Club provides a longer record of data than is available from either the Donaldson or DECC weather stations, and the Bureau of Meteorology's data set is useful for parameters such as temperature and rainfall. Temperatures are typical of the NSW Central Coast. January is the warmest month with a mean daily maximum temperature of 30.7° C and July is the coolest with a mean daily minimum temperature of 5.8° C. Rainfall data, in particular the number of rain days that can be expected per year, is of particular importance in estimating dust emissions from wind erosion. Over approximately 82 years of records, there have been approximately 84.7 rain days per year.

7.2.5 Greenhouse Gas Emissions

The procedures specified under the United Nations Framework Convention on Climate Change (the Kyoto Protocol) is the most common method of calculating greenhouse gas emissions. This is also appropriate for this project where the product coal will be shipped to and used by Kyoto signatory countries.

The protocol identifies greenhouse gases as follows:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF₆).

Carbon dioxide and N₂O are formed and released during the combustion of gaseous, liquid and solid fuels. The most significant gases associated with the Bloomfield project are CO₂ and N₂O, which will be liberated when fuels are burnt in diesel power equipment and in the generation of the electrical energy that will be used by equipment. Some methane gases may also be released from the ground during the mining process.

The emission factors published by the Australian Greenhouse Office (AGO) (2005) will be used to convert fuel usage, electricity consumption and calculated methane release into CO₂ equivalent emissions so that the total CO₂ equivalent emissions from the mine can be determined. Scope 3 emissions (being indirect emissions associated with off-site product transport and the after-sale combustion of the carbonaceous product from the proposed operations) will also be considered in a global context.

7.2.6 Summary and Conclusion

Some aspects of the existing air quality and meteorological conditions in the area in which PM emissions from Bloomfield will be dispersed have been reviewed. The review shows that dust deposition, PM10 and TSP concentrations are satisfactory at present, but emission sources of PM10 that might affect air quality in the Beresfield area should be carefully controlled to ensure that the area continues to comply with the DECC annual and 24-hour criteria of PM10. Mining at Bloomfield is unlikely to contribute significantly to the PM10 burden in the Beresfield area although modelling will be required to demonstrate this.

The project will be designed and operated in such a way as to ensure no deterioration in air quality occurs. Since the proposal is essentially a continuation of an existing activity, it should be possible to ensure that this is the case.

8. PRELIMINARY ASSESSMENT – SURFACE AND GROUNDWATER

8.1 Surface Hydrology and Water Management

8.1.1 Introduction

A preliminary assessment of the surface water issues relating to the proposed completion of open cut mining and rehabilitation within the PA area has been undertaken by Evans and Peck.

The majority of surface water management systems required to support continued mining and rehabilitation are also an integral part of the water management systems for the Abel Underground Mine project that was recently approved. For consistency, those elements of the water management system that form part of the Abel Project and are located within the Bloomfield mine lease area are included in this report. These facilities include:

- The existing surface water storages within the Bloomfield mine lease area (Lake Kennerson, Lake Foster and Possums Puddle) and the various water conveyance structures that allow water to be directed into or past these storages;
- Pumps for the supply of water from Lake Foster to the Bloomfield washery; and
- Water quality and discharge monitoring as required by the existing EPA Licence.

Detailed water management studies have generally been completed for the Bloomfield lease area and only require adaptation to consider specific additional water management requirements for the PA area.

8.1.2 Existing Operations and Water Management

Except for pre-clearing of vegetation in an area in the upper reaches of the Buttai Creek catchment, all current Bloomfield mining operations and water management facilities lie within the catchment of Four Mile Creek. The Four Mile Creek catchment also contains a complex system of natural and altered catchments, creeks, dams and pipelines that form the water management systems that support the existing Donaldson Mine operations and the Abel Mine project. The complexity of this system is illustrated by the schematic diagram in Figure 16 in which the elements that lie within the Bloomfield Mine lease area and the PA area are identified.

Water from the various storages is used for dust suppression as well as to provide water supply for the Bloomfield washery. Excess water due to rainfall or groundwater inflow to the active pit is discharged via a licenced discharge point.

Within the Bloomfield Mine lease area, both groundwater and surface water drain into the S Cut and are pumped to Whites Creek, which in turns drains to Lake Kennerson. Lake Kennerson also receives water pumped from the old underground mine workings

(Big Ben seam) that underlie much of the Bloomfield area. There are also three discharge/bypass systems associated with Lake Kennerson.

In addition to controlled discharge from Lake Kennerson, Lake Foster also receives runoff from adjoining catchment areas. Water from Lake Foster is pumped to the Bloomfield washery for coal processing. Lake Foster has no natural discharge point of its own. In extremely wet conditions it is possible for the water level in Lake Foster to reach the level of the western bypass channel and mix with water discharged from Lake Kennerson. However, this is a rare event and normally any discharge from the site only comprises water from Lake Kennerson conveyed to the licensed discharge point via the western bypass channel.

The majority of the flow passing the licensed discharge point emanates from Lake Kennerson. The existing EPA licence requires that at times of discharge, a water sample be collected and tested, as well as an estimate made of the flow.

In 2000, a flow monitoring station was established on Four Mile Creek, downstream of the junction with Elwells Creek, near the Four Mile Creek workshop.

Routine (monthly) ambient water quality monitoring is carried out at 12 locations within and around the Bloomfield Mine lease area. Water samples are tested for conductivity (EC), pH, and TSS, as required by the EPA licence conditions.

Wet weather discharge from Lake Kennerson is sampled for EC, pH, TSS and filterable iron, as required by the EPA licence conditions. Representative grab samples are taken at the discharge point and also within Four Mile Creek at the flow monitoring station (Four Mile workshops). The water management system is designed and operated such that uncontrolled discharges should not occur. A continuous logger located on Four Mile Creek behind the Four Mile Creek workshop records flow depth and EC.

Water quality data has been collected at the various monitoring locations around the Bloomfield Mine lease area that lie within the Four Mile Creek catchment during the period 1996 – 2006. Data for the annual site discharge for this period at the EPA discharge monitoring point is also available.

8.1.3 Completion of Mining and Rehabilitation – Water Management

The location of the existing S Cut high wall approximately coincides with the catchment divide between Four Mile Creek to the east and Buttai Creek to the west. As the S Cut progressively extends to the west it will encroach into two small tributary catchments of the Buttai Creek catchment. The area draining into the pits will alter as mining and backfilling of S Cut progresses.

At the completion of mining a final void will remain from the main working face of the mine in the general vicinity of the southern end of the Creek Cut. This void will be utilised as the disposal point for coarse and fine rejects from the ongoing washery operations. Upon completion the area will be treated to the requirements of the DPI.

Backfilling of the S Cut void will occur progressively commencing at the eastern side of the existing S Cut pit. The material placed in the void will primarily comprise overburden material derived from extension of the S Cut. Some coarse wastes from the washery may also be placed in the void. Emplacement methods will continue unchanged from the current sequence. The mined area will be rehabilitated and revegetated according to the principles outlined in Section 2.12.2.

The total catchment area draining to the S Cut and Creek Cut will vary from a minimum of 48 ha to a maximum of 125 ha over the period of mining. In addition to any runoff from the surrounding contributing catchment and runoff from within the pit, some groundwater seepage into the pits can be expected. Following current practice, all in-pit water from the S Cut will be pumped to Lake Kennerson.

Until such time as vegetation re-establishment has been completed on overburden dumps, all surface runoff will be directed to appropriate water treatment facilities that will be determined during the EA process.

The existing haul roads that connect the S Cut to the workshop area and the washery stockpile area will continue to be used in the same manner as present. No alteration is proposed to these haul roads which drain into the existing water management systems located within the Bloomfield Mine lease area.

The layout of the existing workshop area is shown on Figure 17. As part of the proposal for ongoing mining and rehabilitation it is proposed to review the stormwater drainage and pollution control facilities in the vicinity of the workshop, and to upgrade them if necessary to comply with contemporary standards.

Proposals to increase the capacity of the washery and upgrade the stockpile area and associated water management facilities were included as part of the Abel Project application. That application foreshadowed up to 800,000 tonnes of raw coal becoming available from 2011 onwards from an un-named open cut source. Therefore, the application for expansion of the washery and associated water management facilities (forming part of the Abel Project application) already makes allowance for the additional coal sourced from the ongoing open cut mining at Bloomfield.

Proposals for the handling and disposal of tailings slurry and coarse rejects from the washery were presented in Abel Project EA. As noted above, that application made provision for the tonnages of coal that will be produced as a result of this application and also provided for waste material from the washery to be deposited along with overburden in the S Cut and/or the Creek Cut voids once mining of individual sections had been completed. No additional facilities for disposal of tailings and coarse reject material are required to accommodate the mining activities that form the subject of this application.

The Abel Environmental Assessment provided details of changes to the arrangements for water supply to the washery as a result of the proposed increase in throughput. Those changes included a number of refinements to the water management systems

and operations within the Bloomfield lease area. No additional changes are anticipated as a result of the ongoing mining activity that forms the subject of this application.

A detailed surface water balance analysis was undertaken and documented as part of the Abel Project. The water balance analysis took account of all surface and groundwater sources that would enter the water management systems on the Bloomfield, Donaldson and Abel Mine sites. The water balance model was run for a range of scenarios representing mining and operating conditions within the Bloomfield, Donaldson and Abel mines as they are expected to exist up to 2027.

The water balance model will be documented in the EA and will include any modifications required to address the proposed Bloomfield open cut completion and rehabilitation.

8.1.4 Conclusion

The completion of open cut mining and rehabilitation at Bloomfield will make use of existing water management facilities within the Bloomfield Mine lease area for which approval has been provided through the Abel Underground Mine project, which includes the expansion of the Bloomfield washery and associated facilities.

The water management system is designed to accept all runoff and groundwater seepage that reports to the S Cut and Creek Cut pits. The areas of pits and catchments reporting to the pits are comparable to the pits and catchments assumed in the water balance analysis undertaken for the Abel Project. That analysis indicated that the available storage and conveyance systems on Bloomfield were adequate to deal with the anticipated water inflows to the pits and maintain supply to the washery, while minimising discharge to Four Mile Creek. Accordingly, it is anticipated that the proposed activities that are the subject of this application can be undertaken without the need to substantially alter the water management facilities or management regime on Bloomfield. The analysis will be re-visited in the EA to ensure all details of the Bloomfield proposal are included.

As part of this EA the operation of the stormwater drainage and pollution control systems in the vicinity of the workshops will also be reviewed and modified as necessary to comply with contemporary standards.

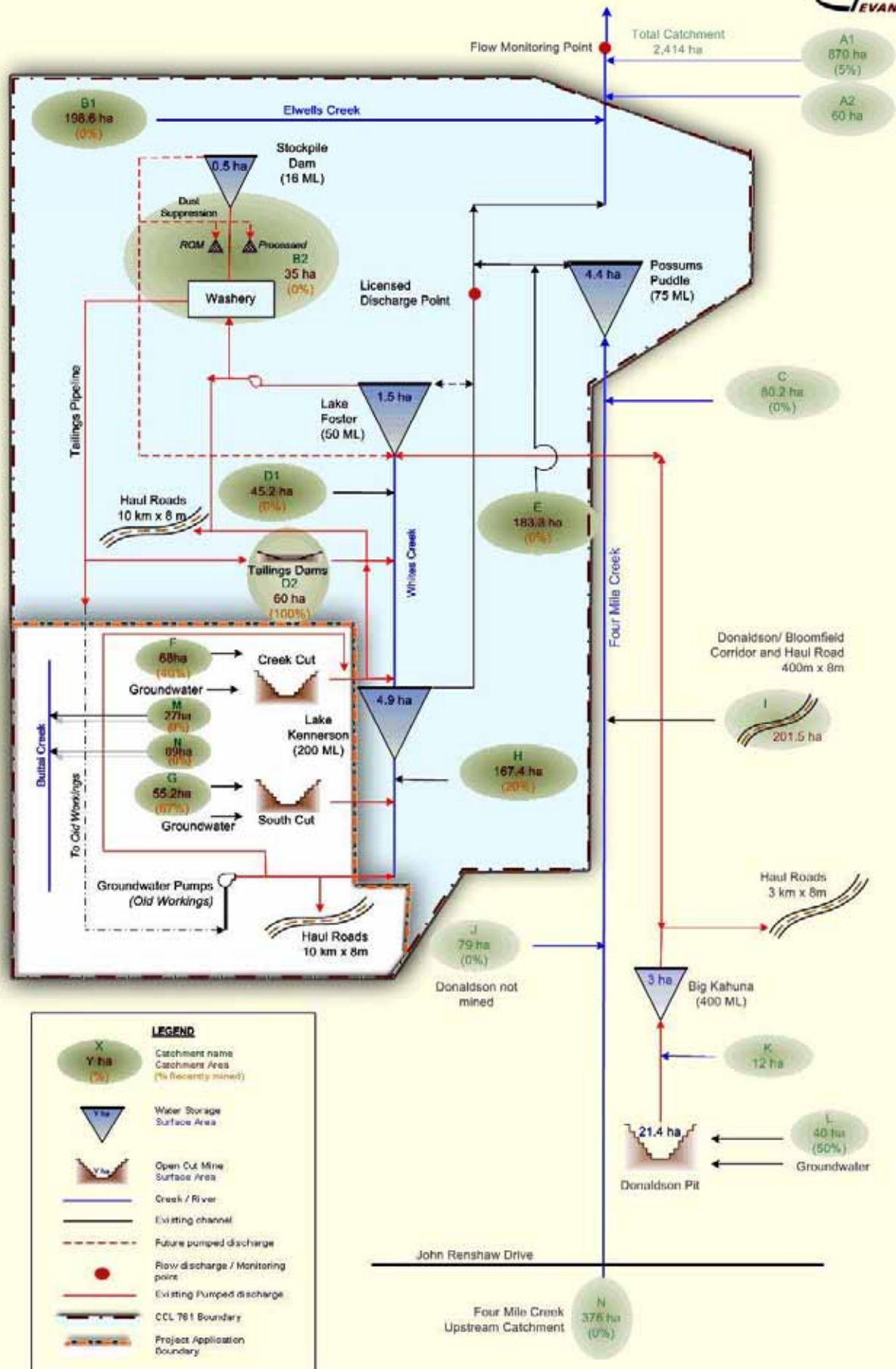


Figure 16
Schematic Diagram of Four Mile Creek
Water Management System

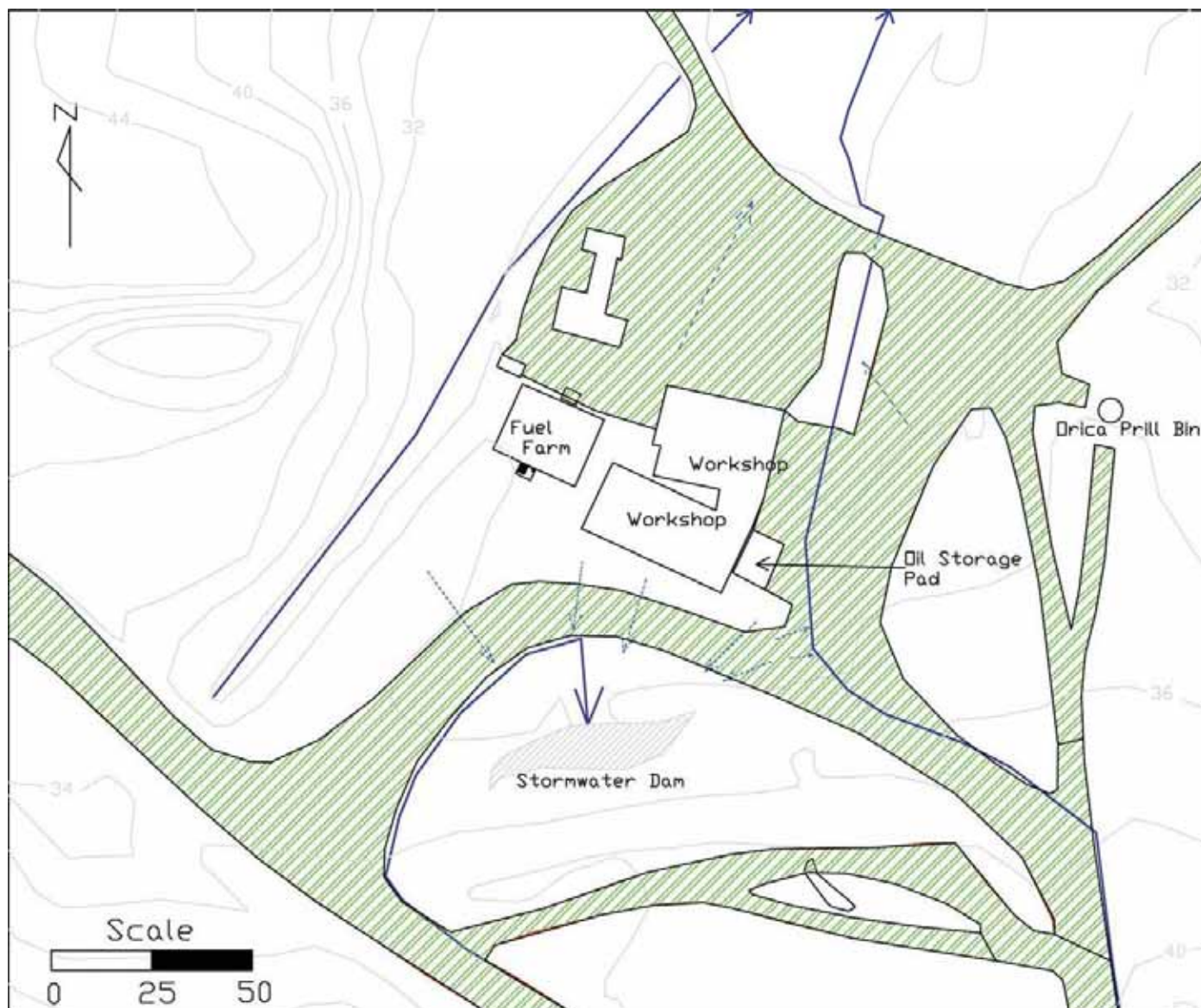


Figure 17.

Legend

-  Roads and Parking
-  Overland flow
-  Drain
-  Culvert

Layout of the Workshop and Fuel Storage Area

8.2 Groundwater

A comprehensive groundwater assessment is being undertaken by Peter Dundon and Associates. This work will be undertaken in consultation with the surface water studies, being undertaken by Evans and Peck.

8.2.1 Groundwater Occurrence

Bloomfield currently recovers coal by open cut mining from the Donaldson and Big Ben Seams within the Tomago Coal Measures. These seams and the deeper Rathluba Seam were formerly also mined by underground mining methods, which ceased in 1992.

There are two active pits near the southern boundary of the Lease. Several former pits on other parts of the lease have been partly or fully backfilled through the disposal of waste rock and tailings from the washery.

Groundwater inflows have typically occurred from all main coal seams that are intersected by mining below the regional water table level. Groundwater inflow rates to the open cuts were estimated by Mackie (1998) at 0.1 ML/day.

Groundwater levels are currently depressed around the mine area, particularly on the southern (downdip) side of the lease, due to the cumulative effects of dewatering over many years of mining.

Former underground mine areas are currently used for the disposal of tailings from the coal washery. Tailings are discharged via a borehole into former underground workings in the Big Ben Seam. Water is recovered from a borehole (BH1) into the same workings, located about 500 metres south and downdip from the tailings disposal point. The pumping from this bore is helping to maintain a groundwater depression beneath the site. Water level measured in BH1 is around -5 metres AHD. It should be noted that the pumping of tailings into the former underground workings forms part of the Abel Underground Mine proposal and is not part of this Project Application for Bloomfield.

8.2.2 Groundwater Levels

Groundwater levels measured in April-May 2007 in newly installed piezometers indicate that the water table is around +20 to +25 metres AHD over the northern part of the Bloomfield Mining Lease. This water table is elevated above the natural groundwater levels due to the disposal of tailings into former workings via the old mine shaft. Groundwater levels are depressed over the southern part of the lease, and were measured in the range -4 to -60 metres AHD, due to the influence of dewatering from the active open cuts and recovery of water from bore BH1.

8.2.3 Groundwater Quality

Groundwater quality has been measured at two old bore sites on the Bloomfield lease area. Basic parameters determined by laboratory testing are presented in Table 8.

Table 8 Groundwater Quality – Bloomfield Mine

Parameter	BL01	BL04
pH	6.58	7.11
Conductivity @ 25°C	2,700 µS/cm	2,970 µS/cm
Total Dissolved Solids (TDS)	2,020 mg/L	2,110 mg/L

Water quality information is not yet available from the recently installed standpipe piezometers. However, based on extensive testing of groundwater on the neighbouring Donaldson and Abel project sites, it is expected that groundwater quality within the coal measures on the Bloomfield site may vary from less than 1,000 to more than 10,000 mg/L TDS.

8.2.4 Hydraulic Properties

Limited hydraulic testing information is available from the Bloomfield site. Based on testing at the adjacent Donaldson and Abel sites, it is expected that the coal measures interburden sediments will have horizontal permeabilities typically in the range 10-5 to 10-3 metres/day, while the horizontal permeability of the coal seams may be 1-2 orders of magnitude higher. Vertical permeabilities are expected to be at least an order of magnitude lower than the horizontal permeabilities.

8.2.5 Potential Impacts of the Proposal

It is expected that groundwater levels within the coal measures will continue to be controlled by a combination of the effects of:

- dewatering or removal of groundwater that inflows to the active open cuts (generally on the southern parts of the lease); and
- Disposal of tailings to the abandoned underground workings via the former mine shaft located within the northern part of the lease.

Thus, it is expected that there will continue to be a slight groundwater mound across the northern part of the lease, and a depression across the southern part of the lease.

The longer-term groundwater level responses post-completion of mining will be dependent on the future tailings disposal practice, as it is understood that operation of the coal washery will continue, and the proposed final configuration and use of final pit voids on the site.

The impacts of the proposal and post-mining recovery will be assessed with the aid of groundwater modelling.

9. PRELIMINARY ASSESSMENT - SOILS AND LAND CAPABILITY

9.1 Introduction

GSS Environmental (GSSE) has undertaken a soil survey and rural land capability assessment of the area associated with the completion of mining operations.

During the completion of mining, the project area will be subject to substantial ground disturbance resulting from mining related activities, such as soil stripping, drilling and blasting, and high-wall advancement. To assist Bloomfield with management of soil resources and planning for post-mining rehabilitation, a field survey of soil resources in the PA area, and assessment of pre-mining rural land capability, was undertaken in late 2006.

9.2 Study Objectives

The major objectives of the soil survey and rural land capability assessment included:

- To describe and classify soils within the PA area;
- To identify suitable soil material for recovery and re-use in topdressing during land rehabilitation projects;
- To identify pre-mining rural land capability classes to assist with post-mining rehabilitation planning; and
- To identify any potentially adverse soil materials that may require special management upon disturbance.

9.3 Landform

Topography in the northern half of the PA area consists of moderately steep slopes and spurlines, dominated by a prominent east-west oriented ridge. Slopes are generally between 6% and 14%. The southern half of the PA area forms the footslopes of Elliot Hill, the crest of which is located approximately 200m south of the southern boundary. Slopes in the southern half of the area are gentle to moderate, between 2% and 7%. The natural landform in the eastern margins of the PA area has already been disturbed by mining. Elevation within the area is between 25m and 87m ASL.

The majority of the PA area is situated within the catchment of Buttai Creek. Several minor, slightly incised, drainage lines drain the slopes of the PA area into minor tributaries of Buttai Creek. Buttai Creek then flows north into Wallis Creek, which subsequently discharges into the Hunter River at Horseshoe Bend. The far north-east corner of the PA area drains towards the existing open-cut pit and into the mine water drainage system.

The majority of the PA area has been cleared of woody vegetation ahead of proposed mining activities. Vegetation communities surrounding the PA area consist of remnant tall open eucalypt forest, with a groundcover dominated by native grass species. A similar vegetation community existed within the PA area before clearing.

9.4 Description of Soils and Land Capability

Soils situated within the PA area are generally yellow duplex on gentler midslopes and lowerslopes and along drainage lines. Red duplex soils were identified in association with steep side slopes, and midslopes within the southern half of the PA area. Lithosols are situated on ridge crests in northern half of PA area.

Duplex Soils are suitable for stripping to 25cm. Lithosols are generally not suited for recovery, except where needed to mix with clay subsoils.

Rural land capability is limited to Class VI on the gentler slopes. The steep side slopes, lithosols and drainage lines are limited to Class VII. Those parts of the PA area already disturbed by mining are considered to be classed as M.

Emerson ratings for the yellow duplex clay subsoils in the southern half of the PA area indicate a moderate potential for dispersion. To reduce the potential for surface hardsetting or increased erosion, these soils should not be used as a surface cover in the post-mining landscape. No other potentially hazardous soils requiring special management were identified within the PA area.

Reserves of suitable natural topsoil material for use in rehabilitation topdressing are limited. The use of treated marginal soil material, supplemented by additional sources of nutrients and organic matter, such as green waste, biosolids or hydromulching is recommended.

10. PRELIMINARY ASSESSMENT – SOCIO-ECONOMIC, VISUAL AND TRAFFIC ASPECTS

10.1 Socio-Economic Aspects

The Project will enable the continued employment of 66 personnel and indirect employment (through the use of local suppliers and contractors) of approximately 100 personnel.

Approximately 5 million tonnes of marketable coal will be extracted to complete mining operations and this has significant royalty earnings for the NSW government and will boost export earnings for Australia.

The ability of Bloomfield to complete mining operations and rehabilitate the site will provide an improvement in the visual quality of the area and reduce risks associated with erosion and sedimentation and dust from unvegetated land. The ability to then develop the land for other purposes, including those outlined by the Lower Hunter Regional Strategy, will enable further economic growth for the region.

10.2 Visual and Lighting Assessment

10.2.1 Introduction

Whilst visibility and lighting were not identified as an issue of high risk by the preliminary risk assessment, these issues have been mentioned in focus group discussions held with the community to introduce the project and during door-knocks with the local community. In particular, night lighting of existing operations was mentioned as an existing issue for the local community. A preliminary assessment of the visual environment and lighting has therefore been undertaken. The objectives of this preliminary visual assessment were to:

- Determine the visual qualities of the PA area and surrounds;
- Identify viewing points around the site that have the potential to view proposed operations within the site, in particular residences or other places of public access, such as roads or public buildings or facilities, both for day-time and night-time operations;
- Determine the visual impact from these viewing points, in terms of scale, distance, change to landscape attributes, for both day-time and night-time operations; and
- Identify potential options to prevent, reduce or manage any identified visual impact.

The project consists of four main visual elements, being:

- The proposed open cut mining area, consisting of the active mine pits, spoil emplacement areas, haul ramps and areas of active rehabilitation;
- Haul road for the transportation of ROM coal from the open cut mining area to the ROM coal stockpile at the washery;
- Access road from the open cut mining area to the workshop; and
- The workshop area consisting of the truck wash, maintenance shed, fuel farm and hard stand area for equipment storage.

As the project is (and is proposed to continue to be) a 24 hour per day operation, consideration of both day-time and night-time impacts is required.

10.2.2 Visual Quality

The Project Application is for the completion and rehabilitation of the active mining area at Bloomfield Colliery. The PA area is therefore generally cleared of vegetation and consists of the active pits, stockpiles, truck haul ramps and access roads. Some areas surrounding the pits have been filled, re-shaped and planted with trees. Towards the north-east, the workshop area and haul roads are located in areas that have been part of an active mine site for many years. The area is therefore disturbed by past activities associated with mining. Vegetation in the eastern areas, towards the washery and in other parts of the Bloomfield Lease area, is generally disturbed grassland or open forest. Large sections of the central area of the Mine Lease, where mining has been completed, have been rehabilitated with trees, to form an immature forest cover.

The landscape within the PA area is gently undulating but has been greatly modified by previous open cut mining, which removed the low ridgeline running northwest-southeast through the site. This ridgeline separates the catchment of Buttai Creek, which flows into Wallis Creek to the northwest of the PA area, from the Elwells/Four Mile creek catchment to the east of the site.

Due to past land disturbance, visual quality on the site is relatively low, although areas that have been reshaped and vegetated have a higher visual quality due to the vegetation and land shaping that has created topographic relief.

The proposal will greatly improve visual quality of the mine lease area as rehabilitation will re-shape and vegetate areas that have been disturbed by previous mining operations.

10.2.3 Viewing Points

The PA area cannot be viewed from the east or north due to intervening ridgelines and vegetation. The washery, which does not form part of this application, can be viewed

from some residences in Ashtonfield to the north. Some Louth Park, East Maitland and Ashtonfield residents to the north and north-east have some views to the disturbed grassland areas that form part of the tailings management system. This system is part of the approved Abel Underground Mine operation, together with the ongoing operation of the washery.

A vegetated ridgeline to the west of the proposed mining area prevents views from this direction. An area of Buchanan Road to the west has views of current rehabilitation occurring to the north west of the PA area.

To the south of John Renshaw Drive, rural residences are located along Lings Road, Black Hill Road and Browns Road. Browns Road rises to an elevation of 150 metres AHD and some residences along this road have extensive views to the north and north-east, some towards Port Stephens. They are able to view Donaldson Open Cut operations, however, Bloomfield Open Cut operations are generally screened by an intervening ridgeline south of John Renshaw Drive which includes Elliotts Hill. Bloomfield has also constructed a vegetated bund along the northern side of John Renshaw Drive that prevents views into the pit from residences south of the road and from cars travelling along the road.

Residences along Lings Road have views towards the proposed operations blocked by the vegetated Elliotts Hill which is located between the current mine and John Renshaw Drive, at an elevation of 70 metres AHD.

During focus group discussions, residents on the southern side of Old Buttai Road raised the issue of lighting from night-time operations shining towards their residences. This issue was immediately resolved by re-directing lighting. Elliotts Hill will screen the majority of future operations from these residences, as this hill is between the residences and the western extension of open cut operations. Residents may have minor views of some pre-stripping operations in two northern sections of the proposed mining area, where elevation reaches 80 metres AHD. These operations will be short in duration and will not be viewed once the first level of extraction enables equipment to operate from a lower elevation within the pit.

10.2.4 Management and Mitigation of Visual Impact

The current vegetated bunding along John Renshaw Drive will be retained to prevent views into the site from this road and some residences to the south of John Renshaw Drive. Ongoing rehabilitation will also improve visual quality and the view to previous mining areas within the Mine Lease.

Procedures are in place to ensure lighting does not shine directly toward residences to the south. Occupants of these residences have also been provided with mine contact details so that they may ring and resolve any lighting issues as soon as possible. A detailed visual assessment combined with community consultation will be undertaken to address potential visual impacts from locations south of John Renshaw Drive, to ensure minimal visual impact from the proposal.

10.3 Traffic

Traffic on public roads associated with the mine is limited to employee vehicle movements and the delivery of equipment and supplies. The main access to the Bloomfield Mine is via the New England Highway intersection with Four Mile Creek Road.

The completion of mining at Bloomfield will not increase current volumes of mine traffic using this road and intersection.

11. SUSTAINABILITY PRINCIPLES AND CUMULATIVE IMPACTS

11.1 Cumulative Impact Assessment

Due to the interaction of the Bloomfield Completion of Mining and Rehabilitation project with nearby operations, such as the Bloomfield washery and rail loading facility, Donaldson Open Cut Mine and the Abel Underground Mine, cumulative impact will form an integral part of each assessment study undertaken for the Environmental Assessment.

As described by the Abel Underground Mine EA (Donaldson Coal, 2006), Bloomfield Colliery will form part of the Integrated Monitoring Network that will integrate monitoring stations and data between the Bloomfield, Donaldson and Abel Mines and to some degree Tasman Underground Mine (located to the south of George Booth Drive).

Water management and impact, groundwater impact, air quality, dust and visual assessments will all consider the cumulative impact of these developments and any other relevant developments on the local environment.

11.2 Sustainability Principles

The Project will consider the principles of sustainability as part of its detailed Environmental Assessment. These principles, as defined by the Australian Government (1992), include:

- The precautionary principle;
- Inter-generational equity;
- Conservation of biological diversity and ecological integrity; and
- Improved valuation, pricing and incentive mechanisms.

Wherever possible resource efficiencies will be identified and particular attention will be paid to the reuse and efficient use of water. Management systems will be devised to prevent, manage or mitigate potential environmental impacts and will be integrated with existing site policies and procedures.

The completion of mining and rehabilitation of the PA area, after a long period of use as an active underground and open cut mine site, provides a program which will ultimately enhance the local environment and increase its ecological integrity with surrounding areas. The completion program will permit the site to be exhausted of its economic coal reserves while enabling the site to be rehabilitated and developed for future land uses, in consultation with the landowner, community and relevant government agencies.

12. CONCLUSION

This document is a Project Application prepared by Bloomfield Collieries (Bloomfield), part of The Bloomfield Group. Bloomfield is the operator of Bloomfield Colliery. The Project Application is for the completion of mining and rehabilitation at Bloomfield Colliery.

The continued use of the coal washery and rail loading facility on the Bloomfield site (including the management of water associated with the washery, tailings disposal and coal handling) is included in the Part 3A Environmental Assessment completed for the Abel Underground Mine project, approved by the NSW Minister for Planning on 7 June 2007.

Bloomfield Colliery currently operates under Consolidated Coal Lease 761 (CCL 761) and in accordance with a Mining Operations Plan (MOP) and an Environmental Protection Licence issued under the *Protection of the Environment Operations Act, 1997*. Operations are carried out pursuant to existing user rights. Part 3A of the *Environmental Planning and Assessment Act, 1979* and *State Environmental Planning Policy (Major Projects) 2005* require Bloomfield to obtain approval so that it can continue mining the subject area and undertake rehabilitation.

Bloomfield proposes to continue mining at its current average production rate of approximately 0.8 million tonnes per annum (mtpa) run of mine (ROM) coal. It is estimated that there is nearly 9 million tonnes of viable ROM coal remaining on the site. Employee numbers and hours of operation will remain similar to existing arrangements.

This Project Application and Preliminary Assessment has been completed to clarify that the project falls under Part 3A of the EP&A Act. It also identifies the key issues likely to require further investigation to determine any potential environmental impact. These key issues have been identified through a Preliminary Risk Assessment process, together with preliminary community and authority consultation.

Key issues identified for the project that have been investigated in this document include:

- Disturbance of Aboriginal and European heritage;
- Disturbance of threatened flora and fauna species;
- Noise and blasting;
- Dust, or air quality;
- Soils and erosion and sedimentation;
- Surface water and ground water impacts; and
- Visual aspects.

Preliminary identification of potential risks, a description of existing conditions and proposed methodologies for further studies is provided for each of these key issues. The studies, together with the Preliminary Risk Assessment, have found that issues can generally be managed through the continued implementation of the various existing environmental management procedures on the site. Further detailed studies are proposed to identify any higher risk areas and additional controls or management procedures that may be required to minimise these risks.

A key component of this Project is the rehabilitation of the Bloomfield mine site. The rehabilitation plan for the site will be developed in consultation with the land owner, local community and relevant government authorities. It will also consider the objectives of the *Lower Hunter Regional Strategy* and the interaction of the site with neighbouring mines, including the Abel Underground Mine and Donaldson Mine.

Approval of this project will enable Bloomfield to extract the remaining economic reserves from the site in a safe, efficient and controlled manner which minimises environmental impacts, while providing continued employment for approximately 66 direct employees and numerous associated suppliers and contractors in the local and broader area. Approval will also enable Bloomfield to rehabilitate and enhance the site in accordance with the requirements of the various relevant stakeholders.

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Bloomfield Colliery

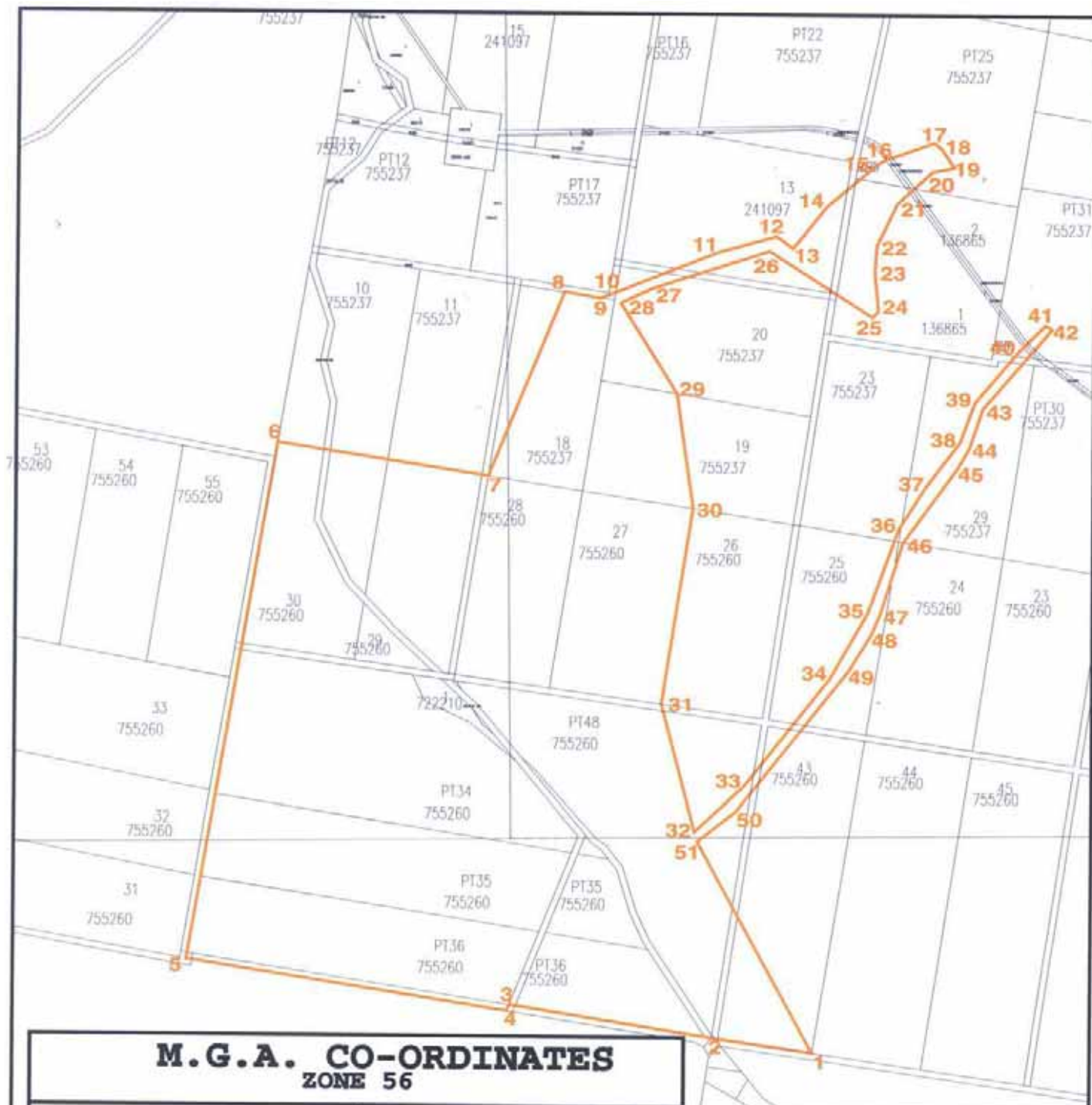
Completion of Mining and Rehabilitation

Part 3A Project Application
Preliminary Assessment Report

6 July 2007

APPENDIX A

**CADASTRAL INFORMATION – PROJECT APPLICATION
AREA**



M.G.A. CO-ORDINATES **ZONE 56**

PT	EASTING	NORTHING	PT	EASTING	NORTHING
1	366474	6368098	27	365958	6370477
2	366180	6368140	28	365862	6370431
3	365528	6368242	29	366039	6370150
4	365521	6368223	30	366092	6369795
5	364520	6368378	31	365997	6369184
6	364795	6369389	32	366103	6368787
7	365452	6369890	33	366257	6368931
8	365568	6370465	34	366522	6369268
9	365798	6370446	35	366638	6369471
10	365857	6370469	36	366734	6369735
11	366166	6370592	37	366818	6369868
12	366347	6370643	38	366923	6370007
13	366398	6370606	39	366968	6370129
14	366503	6370737	40	367108	6370294
15	366662	6370871	41	367187	6370372
16	366886	6370884	42	367208	6370360
17	366836	6370936	43	366993	6370110
18	366860	6370917	44	366952	6369988
19	366899	6370859	45	366916	6369925
20	366832	6370847	46	366747	6369693
21	366722	6370747	47	366678	6369470
22	366659	6370616	48	366650	6369405
23	366663	6370535	49	366581	6369293
24	366665	6370412	50	366523	6368851
25	366646	6370392	51	366111	6368756
26	366325	6370596			

BLOOMFIELD COLLIERY

**COMPLETION OF MINING
AND REHABILITATION**

*PROJECT APPLICATION
AREA*

APPENDIX A

14/7/07

APPENDIX B

PRELIMINARY RISK ASSESSMENT



FINAL REPORT

NOVEMBER 2006

Environmental Risk Assessment (ERA) and establishment of a Site Based Risk Register for the Completion of Mining and Rehabilitation Project at Bloomfield Colliery.

Prepared for

Bloomfield Collieries Pty Limited

Steve Dunn
Mine Planning Manager
PO Box 4
EAST MAITLAND, NSW 2323

NOVEMBER 2006

BLC1-06 Bloomfield Broad Brush



GSS ENVIRONMENTAL
Environmental, Land and Project
Management Consultants

Environmental Risk Assessment (ERA) and establishment of a Site Based Risk Register for the Completion of Mining and Rehabilitation Project at Bloomfield Colliery.

Prepared for **Bloomfield Collieries Pty Limited**

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Prepared by **GSS Environmental**

PO Box 907
HAMILTON, NSW 2303.

Original Date of Issue 03 November 2006

GSSE Ref *BLC1-0606-13 - Main Doc BBRA v3 2006-1103.doc*

ISSUE AND AMENDMENT CONTROL HISTORY

Issue	Date	Description	Author	QA/QC
1	03.11.2006	Final Draft Report	Chrissie Eckersley	Andrew Hutton
2	17.11.2006	Final Report following client comments	Chrissie Eckersley	Andrew Hutton
3.	8.05.2007	Final Report	Andrew Hutton	Klay Marchant

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1.0 INTRODUCTION

GSS Environmental (GSSE) was engaged by Steve Dunn on behalf of the Bloomfield Colliery (Bloomfield) to undertake an Environmental Risk Assessment (ERA) and develop an Environmental Risk Register for Bloomfield's *Project Area* as part of the Bloomfield Collieries Project (the project).

The project was undertaken to provide the basis for identifying issues prior to the commencement of the environmental impact assessment phase of the project.

A **qualitative risk assessment** methodology was developed by GSSE in accordance with the requirements of the Australian Standard *AS/NZS 4360:2004 - Risk Management*.

An initial site inspection was undertaken on the 30 June 2006 to identify the various issues for consideration in the Risk Assessment and to ensure appropriate consideration was given to those issues with potentially the highest risk.

GSSE assembled a project team utilising key stakeholders as this was considered the most appropriate way to help define context and identify the possible risks which needed some consideration throughout the process. A stakeholder workshop session was held at Monte Pio, Maitland on 19 July 2006. The workshop was facilitated by Andrew Hutton, Principal Environmental Consultant.

This report summarises the aims and objectives of the ERA, describes the methodology used throughout the ERA process, as well as detailing the various findings and presenting them as an Environmental Risk Register (attached as **Appendix 1**).

1.1 Background to the Project

Bloomfield Colliery (Bloomfield) is located approximately 20 kilometres north-west of Newcastle, as shown on Figure 1. Coal has been mined on the site for approximately 170 years, with the current owners purchasing the Bloomfield operation in 1937. Underground mining ceased on the site in 1992 and the current operation consists of open cut mining, an on-site Coal Handling and Preparation Plant ('washery') and a rail loading facility that transports processed coal to the Port of Newcastle.

Bloomfield is currently in the final stages of its planned open cut mining program and is actively rehabilitating former mining areas on the site. The current maximum production rate is 1.3 million tonnes per annum (mtpa) of run-of-mine (ROM) coal, with an average production rate of 0.8 mtpa ROM coal. It is proposed to continue this production rate for a ten year period to complete the mining and rehabilitation program on the site.

The Colliery currently operates under Consolidated Coal Lease 761 (CCL 761) and works are in accordance with a Mining Operations Plan (MOP) and an Environmental Protection Licence issued under the Protection of the Environment Operations Act, 1997. Operations are permissible under 'Existing Use Rights' as defined by Division 10, Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). This Division of the Act enables certain mining development on pre-existing mines as specified by Clause 35 and Item 7 of Schedule 1 of the Environmental Planning and Assessment Model Provisions, 1980.

The introduction of Part 3A of the Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act, 2005 provides a new framework for Bloomfield Colliery to regularise its consent to enable it to complete its operations and undertake rehabilitation.

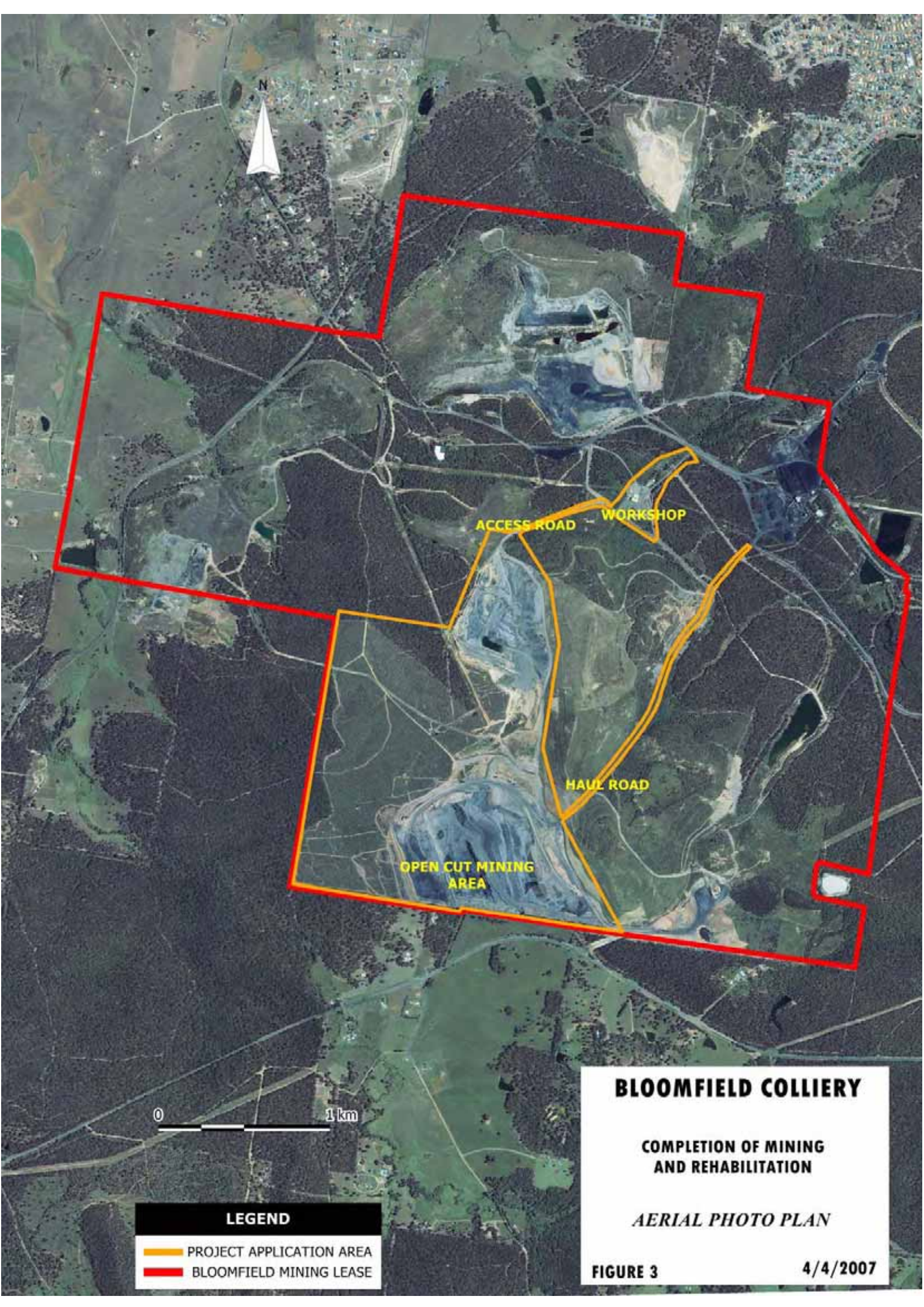
The remaining open cut mining activities at Bloomfield Colliery are classified as a major project under the State Environmental Planning Policy (Major Projects) as it is a coal mine. Part 3A amendments to the EP&A Act therefore require that a Project Application with Preliminary Assessment be completed to clarify that the project falls under Part 3A, and to identify key issues requiring further investigation to determine any potential environmental impact. This report, prepared for the NSW Minister for Planning, provides the



required Project Application and Preliminary Assessment for the completion of open cut mining and rehabilitation at Bloomfield Colliery.

The continued use of the coal washery and rail loading facility (including the management of water associated with the washery, reject disposal and coal handling) is included in the Part 3A Environmental Assessment completed for the proposed Abel Underground Mine project, prepared by Donaldson Coal Pty Limited. This application was lodged with the NSW Department of Planning in September 2006.

The completion of open cut mining activities at Bloomfield will be designed to cater for the reject management system as outlined in detail in the Abel Underground Mine Environmental Assessment.



N

ACCESS ROAD

WORKSHOP

HAUL ROAD

OPEN CUT MINING
AREA

0

1 km

LEGEND

- PROJECT APPLICATION AREA
- BLOOMFIELD MINING LEASE

BLOOMFIELD COLLIERY

**COMPLETION OF MINING
AND REHABILITATION**

AERIAL PHOTO PLAN

FIGURE 3

4/4/2007

2.0 AIMS AND OBJECTIVES

The aim of the ERA is to formally identify and present effective management protocols for all environmental risks associated with the coal operations at Bloomfield's *Project Area*. GSSE followed four (4) fundamental steps during the ERA process:

- (a) Establish the context for the risk assessment process;
- (b) Identify the environmental risks;
- (c) Analyse the risks; and
- (d) Evaluate the risks to determine the significant issues.

The following specific aims and objectives have been established for this ERA:

- To assemble the key stakeholders in the project to identify the activities, aspects and possible environmental impacts associated with the operation at the *Project Area* of Bloomfield;
- To consider these activities in isolation of any controls and determine a potential raw risk rating;
- To identify the current controls (that are already in place) to mitigate or minimise the potential for the impacts in order to reduce the risk to as low as reasonably practicable;
- To identify potential future controls that may assist to either eliminate or mitigate other likely impacts;
- To Provide the basis for the development of an action plan which identified the various issues requiring further consideration during the environmental impact assessment phase of project; and
- Determine the residual risk and ensure that is it appropriately low enough given the sensitivities of the project location. This was undertaken following consideration of the controls/mitigation strategies already in place and others that may be proposed.

3.0 SCOPE

The ERA only covers the Bloomfield *Project Area*. The ERA includes a detailed review of the key activities such as Exploration, Pre-Stripping, Main Dig, Rehabilitation, Field Maintenance & the Open-Cut Workshop, and Supply.

Table 1 below describes the six (6) distinct activities associated with the project and details what is included within each of the activities.

TABLE 1: List of key phases of the project considered in the ERA.

PROJECT PHASE	PROCESS BOUNDARY	ACTIVITIES
Exploration	Exploration of the resource and development of mining tenures	Survey of drill locations, clearing of drill lines and establishment of drill site, establishing the drill rig and undertaken drilling, traffic movement, open holes and pits and rehabilitation of the drill sites...
Pre-Stripping	Works associated with the establishment of site for the commencement and actual mining operations onsite.	Clearing of vegetation, stripping top-dressing material, drilling the overburden, blasting, excavation of the overburden, mining of coal, hauling material within the pit, hauling of material to overburden dumps.
Main Dig	Mining operations	Interburden drilling, blasting; excavation of the interburden, the mining of coal, hauling coal material to the CHPP, hauling overburden within the pit or to the overburden dumps.
Rehabilitation Areas	The re-shaping, topdressing of disturbed areas including the overburden emplacement areas as they become available.	Reshaping of the available overburden dump areas, top-dressing material spreading and ripping, and revegetation
Maintenance	The service and maintenance of equipment undertaken in the pit area or at a workshop facility away from the active working coal mine.	Waste Management, Bulk fuel storage, the refuelling bay, oil storage area, transformers, parts washers, oil water separator, workshop and field maintenance.
Supply	Provision, storage and transport of raw materials to support exploration, mining, rehabilitation and maintenance activities.	Bulk Fuel storage and the transfer of fuel from road transport.

4.0 METHODOLOGY

4.1 Process/Operational Flow Chart

A process/operational flow chart was developed for the Bloomfield *Project Area*. A copy of the process/operational flow chart used during the ERA has been included as **Appendix 2** to this report.

4.2 Workshop Session

The formulation of a key working group was integral in developing a thorough ERA as well as establishing a high level of site ownership for the process. This enabled the risks to be assessed by those who have experience in the area, understand the project and have the authority to action key “findings” that may have resulted from the ERA process. These personnel were also able to provide the best insight into the environmental effects of the activity, the frequency that the activity is undertaken, comment on the effectiveness of current controls, and suggest suitable and practical potential support control solutions where required.

The following table shows the workshop attendees, including their responsibilities within the Project team.

TABLE 2: Workshop Session and List of Attendees:

<i>Workshop Session held at Monte Pio, Maitland on 19 July 2006</i>		
1).	John Richards	<i>Director, Bloomfield Collieries</i>
2).	Reg Crick	<i>Mine Manager/Superintendent, Bloomfield Collieries</i>
3).	John Hindmarsh	<i>Environmental Officer, Bloomfield Collieries</i>
4).	Max Geyer	<i>Group Manager-Safety Systems, Bloomfield Collieries</i>
5).	Nicole Croker	<i>Environmental Consultant, Eco Central</i>
6).	Jim Eccelston	<i>Plant Operator, Bloomfield Collieries</i>
8).	Andrew Hutton	<i>Principal Environmental Consultant, GSSE</i>
7).	Kylie Gallaher	<i>Administration Representative, GSSE</i>
8).	Steve Dunn	<i>Manager - Mine Planning, Bloomfield Collieries</i>

4.3 Determination and Assigning the Environmental & Community Risk Rating

4.3.1 Outline of General Approach

The following section outlines the approach used by GSSE to assign a specific Risk Rating to each aspect of the Bloomfield *Project Area*. Risk assessment is the formalised means by which the aspects of the project and their associated impacts are systematically identified, assessed, ranked according to perceived risk and addressed by means of appropriate and effective controls or management outcomes.

Risk is the chance of something happening that will have either a positive or negative impact upon the environment and/or the community. It involves consideration of the sources of the risk (i.e. open-cut mining) assessing the consequences and considering the likelihood that an event might occur which could give rise to a consequence. The impact may vary in consequence from

***Catastrophic** -a major event which could cause severe impact to the environment or the community through to **Insignificant** -no detrimental impact on the environment or the community is measured or envisaged.* The Environmental Risk Rating assigned to the activity during this process is measured in terms of both consequence (severity) and likelihood (probability) of the event occurring.

4.3.2 Compliance with AS/NZS 4360:2004 Risk Assessment – Qualitative Risk Assessments.

A qualitative risk assessment methodology was developed by GSSE in accordance with the requirements of the Joint Australian & New Zealand Standard **AS/NZS 4360:2004 - Risk Management**.

It is intended that this **qualitative** assessment be used as an initial *screening* activity being the basis for identifying issues prior to the commencement of the environmental impact assessment phase of the project.

GSSE applied the following five (5) basic steps during the Risk Assessment process including:

- Establishing the internal and external context for the environmental risk assessment process, including developing consequence criteria and defining the structure of the risk assessment process. This is important to ensure that the objectives defined for the risk management process take into account the issues specific to the project as well as the external environment.
- Identifying the environmental related risks, including what could happen, when and where;
- Analysing the risks using a qualitative risk approach (i.e. identifying existing controls, determining specific consequences / likelihoods table (see **Table 3**) and then determining the level of risk;
- Evaluating the risks to determine the significant issues. The purpose of risk evaluation is to make decisions, based on the outcomes of the risk assessment, about which risks need controls or mitigation strategies and to assign priorities;
- Establishing the controls to mitigate/treat the risks identified as part of the process.

4.3.3 Environmental Consequence

The allocation of an Environmental Risk Rating was based on the Consequence descriptions contained in **Table 3**. The descriptions in the table were developed by GSSE through experience undertaking previous Risk Assessment exercises and have been designed such that the working group could make a subjective assessment of the consequence using a series of assumptions or descriptors. The magnitude of the consequence of an event was assessed using these descriptors and assigned a Rating of 1 to 5.

TABLE 3: Environmental Consequence Descriptions

1	Catastrophic	<u>A major event which could cause severe or irreversible damage to the natural and/or human environment.</u> - Major Closure Costs (i.e. estimated closure costs > \$5M). - Permanent premature closure of the mine. - Severe or irreversible damage to natural environment. - Could kill or permanently disable people. - Actual or potential loss of credibility with key stakeholders (community / government). - Long term environmental liability/legacy to the Company. - Loss of global reputation for the Company. - Regulatory intervention, prosecution would occur (ie. Fines). - Negative publicity/complaints (National & Global media exposure). - Pollution event causes major downstream damage that is rectified by a long term remediation program over 12 months (e.g. failure of major tailings dam that pollutes <i>international</i> waters). - Total destruction of Cultural Heritage Sites and Artefacts.
2	Major	<u>An event which could have a substantial and permanent consequence to the natural and / or human environment.</u> - Major Closure Costs (i.e. estimated closure costs \$1M - \$5M). - Could cause temporary or long term closure of mine. - Substantial and permanent consequences to the natural environment. - Could cause serious injury or disease to people - Potential loss of credibility with key stakeholders (community / government) - Reported incident, regulatory intervention which would result in prosecution the result of which could lead to a substantial fine. - Adverse publicity and community complaints (National media exposure). - Pollution event which causes serious downstream damage that is rectified by a medium term remediation program over 1-12 months (e.g. failure of major tailings dam that pollutes <i>regional/national</i> waters). - Major permanent unrepairable damage to Cultural Heritage Sites and Artefacts.
3	Moderate	<u>An event which could create substantial temporary or minor permanent damage to the natural and / or human environment.</u> - Moderate Closure Costs (ie. estimated closure costs \$500K - \$1M). - Could cause temporary closure of the mine or disruptions to the operation. - Substantial temporary or minor permanent damage to the natural environment. - A reportable incident with the potential to result in prosecution the result of which could lead to a moderate fine. - Could cause typical lost time injury (LTI) to people - Potential loss of credibility with key stakeholders (community / government) - Adverse local publicity and community complaints (Local media exposure). - Event which causes substantial temporary damage that is rectified by medium term remediation program over 3 - 6 months (i.e. earthworks to fix surface cracking under public roads or works required to stop water leaking from water storage structures). - Substantial permanent unrepairable damage to Cultural Heritage Sites and Artefacts.
4	Minor	<u>An event which could have temporary and minor effects to the natural and / or human environment.</u> - Minor Closure Costs (ie. estimated closure costs \$100K - \$500K). - Temporary minor damage to the natural environment. - Could cause a first aid injury to people. - Complaints received from near neighbours. - An incident which is either not reportable or if reportable could lead to a minor fine. - Event which causes temporary minor damage which may require some minor rectification works (i.e. cracking on surface causing minor erosion in drainage lines). - Minor repairable damage to Cultural Heritage Sites and Artefacts.
5	Insignificant	<u>No detrimental impact on the natural and / or human environment is measured or envisaged.</u> - Minor Closure Costs (ie. estimated closure costs <\$100K) - No detrimental impact to the natural environment. - Couldn't cause injury or disease to people. - No detrimental impacts to Cultural Heritage Sites and Artefacts.

4.3.4 Probability of an Incident occurring

The likelihood of an event occurring was considered by the working group. The likelihood (or probability) of an impact occurring was rated according to the following descriptions on Table 4.

TABLE 4: Qualitative Measures of Likelihood (Probability)

PROBABILITY:	
A -	Almost certain to happen
B -	Likely to happen at some point
C -	Moderate: possible, heard of so it might happen
D -	Unlikely: not likely to happen
E -	Rare: practically impossible

4.3.5 Environmental Risk Matrix

The Risk Rating was assigned by combining the consequence with the probability that the consequence would occur. A numerical Risk Ranking between 1 and 25 was allocated for each aspect of the proposal using the “Environmental Risk Matrix” included as Table 5 below.

TABLE 5: Environmental Risk Rating Matrix

		Probability				
		A	B	C	D	E
Maximum Reasonable Consequence	1	1	2	4	7	11
	2	3	5	8	12	16
	3	6	9	13	17	20
	4	10	14	18	21	23
	5	15	19	22	24	25

4.3.6 Risk Classification System

Depending on the numerical Risk Ranking, a Risk Rating Class was then applied to each aspect using the Risk Classification System. Table 6 shows the different classes of the Risk Classification System.

TABLE 6: Risk Classification System

Risk Classification System :	
High Risk (H)	1 to 6 (Red)
Medium Risk (M)	7 to 15 (Yellow)
Low Risk (L)	16 to 25 (Green)

In accordance with this Risk Classification System, one of the following Environmental Risk Ratings was assigned to each aspect:

- **H (high)** being a *Class 1 Risk* - requires immediate management attention, a stop/stand down until rectified if deemed necessary.
- **M (moderate)** being a *Class 2 Risk* - acceptable with current controls but requires attention if controls absent or ineffective, and where practicable develop other controls to mitigate the risk.
- **L (low)** being a *Class 3 Risk* - acceptable risks are assessed and controlled as required.

4.3.7 Assessment of Effectiveness of Controls

Risk Rankings were allocated for each aspect of the existing operation, based on three (3) separate scenarios. The first considering **no controls**, which is a measure of the *raw* risk associated with the activity. The second considered the risk rating with **current controls** in place. The third included consideration of the effect of potential future controls, as suggested by the working group.

In the context of this ERA, a control is considered to be either a hard engineering control (e.g. bunds, diversions, etc) or administrative control (e.g. work procedure(s) and/or management plan).

5.0 RISK REGISTER

GSSE has compiled the following Risk Register (see **Appendix 2**) to document the risk assessment outcome(s) for all aspects identified throughout the ERA process. The Risk Register has been separated into the six (6) key phases identified for the project.

The key Aspects included in the Risk Register are typical of an open cut mine of this nature and are summarised below:

- Disturbance of Aboriginal Heritage
- Disturbance of European Heritage
- Erosion and sedimentation
- Fire Hazard
- Dust
- Noise
- Contamination of surface and ground water resources
- Storage and management and hydrocarbons including spills and leaks
- Introduction of weeds.



Appendix 1– Risk Register for Bloomfield Colliery

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAINTENANCE

Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk		
			C	P	R		C	P	R		C	P	R
Maintenance / Open Cut Workshop	Waste Management	General Refuse (incl oily rags)	4	b	4b	14 (M)	1. Licensed Waste Contractor 2. Contractor Management System 3. Employee Inductions 4. Environmental Protection Licence 5. Toolbox Talks 6. Environmental Inspections	5	d	5d	24 (L)		
		Scrap steel	5	b	5b	19 (L)	1. Licensed Recycling Contractor 2. Contractor Management System 3. Employee Inductions 4. Environmental Protection Licence 5. Toolbox Talks 6. Environmental Inspections	5	e	5e	25 (L)		
		Contaminated Wastes	4	b	4b	14 (M)	1. Licensed Recycling Contractor 2. Contractor Management System 3. Employee Inductions 4. Environmental Protection Licence 5. Incident Reporting Procedure 6. Toolbox Talks 7. Environmental Inspections	5	d	5d	24 (L)		
		Oil spills on ground	4	b	4b	14 (M)	1. On-site Spill Kits 2. Employee Inductions 3. Employee Consultation Systems 4. Environmental Emergency Response Procedure 5. Incident Reporting Procedure 6. Toolbox Talks 7. Environmental Inspections	5	d	5d	24 (L)		
		Tyres	4	b	4b	14 (M)	1. Disposed of in the pit at depth	5	d	5d	24 (L)		
	Bulk fuel storage area (fuel farm)	Spills and leaks	3	b	3b	9 (M)	1. AS1940 approved area 2. WorkCover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Environmental Emergency Response Procedure 7. Incident Reporting Procedure	4	d	4d	21 (L)		
		Damage to above ground pipes (fuel and oil)	3	b	3b	9 (M)	1. AS1940 approved area 2. WorkCover notified 3. Incident Reporting Procedure 4. Environmental Emergency Response Procedure 5. Environmental Inspections 6. Toolbox Talks	4	d	4d	21 (L)		
		Bunded area filling with storm water reducing containment and resulting in bund breach during major spill	4	b	4b	14 (M)	1. AS1940 approved area 2. WorkCover notified 3. Maintenance Management System 4. Bilge Pump system in place in bunded areas 5. Incident Reporting Procedure 6. Environmental Emergency Response Procedure 7. Environmental Inspections 8. Toolbox Talks	5	d	5d	24 (L)		
	Refuelling bay (conducted in Workshop - 3 x 30,000L tanks)	Spills and leaks	3	b	3b	9 (M)	1. AS1940 approved area 2. WorkCover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Environmental Emergency Response Procedure 7. Incident Reporting Procedure 8. Environmental Inspections	4	d	4d	21 (L)		
		Damage to above ground pipes (fuel and oil)	3	b	3b	9 (M)	1. AS1940 approved area 2. WorkCover notified 3. Incident Reporting Procedure 4. Environmental Inspections	4	d	4d	21 (L)		
		Hose coming away from bowser (vehicle drives away with hose still attached)	2	b	2b	5 (H)	1. AS1940 approved area 2. WorkCover notified 3. Employee Inductions 4. Automatic shut-offs 5. Incident Reporting Procedure 6. Toolbox Talks	4	d	4d	21 (L)		
	Oil storage area	Spills and leaks	4	b	4b	14 (M)	1. AS1940 approved area 2. WorkCover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Environmental Emergency Response Procedure 7. Incident Reporting Procedure 8. Environmental Inspections	5	d	5d	24 (L)		
	Transformers	Release of PCB's in transformer oil	2	b	2b	5 (H)	1. PCB Disposal Procedure 2. Transformers in bunded areas 3. Following check on site found that no known PCB's on site.	5	e	5e	25 (L)		
		Oil spills	4	b	4b	14 (M)	1. Recycled 2. On-site Spill Kits 3. Employee Inductions 4. Transformers in bunded areas 5. Incident Reporting Procedure 6. Environmental Inspections	5	d	5d	24 (L)		
	Parts washer	Failure and release degreasers/contaminants to the environment	4	b	4b	14 (M)	1. Serviced by licensed contractor 2. Contractor Management System 3. On-site Spill Kits 4. Employee Inductions 5. Incident Reporting Procedure	5	d	5d	24 (L)		
	Oil water separator	Failure and release of oil	4	b	4b	14 (M)	1. Waste oil tank with overflow monitor 2. Environmental Inspections 3. Serviced by licensed contractor 4. Contractor Management System 5. On-site Spill Kits 6. Employee Inductions 7. Incident Reporting Procedure	5	d	5d	24 (L)		
	Workshop	Noise	3	d	3d	17 (L)	1. Isolated location 2. Employee Induction 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	e	3e	20 (L)		

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAINTENANCE

Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk		
			C	P	R		C	P	R		C	P	R
	Field Maintenance 1. Scheduled shut downs 2. breakdowns/running repairs	Noise	3	d	3d 17 (L)	1. Where ever possible maintenance conducted off site 2. Employee Induction 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	e	3e 20 (L)				
		Contaminated Waste Material	4	b	4b 14 (M)	1. Licensed Waste Contractor 2. Contractor Management System 3. Employee Inductions 4. EPL 5. Toolbox Talks 6. Maintenance Management System 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d 24 (L)				
		Spills and leaks	4	b	4b 14 (M)	1. AS1940 approved area 2. WorkCover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Environmental Emergency Response Procedure 7. Incident Notification Procedure 8. Maintenance Management System 9. Supervisor Inspections 10. Supervisor Audits	5	d	5d 24 (L)				
		Transfer of diesel and lubes around site in service truck (accident - rollover)	3	c	3c 13 (M)	1. Transport Rules 2. Employee Inductions 3. Purpose designed service truck 4. Compartmentalised tank 5. Competency Standard for service truck 6. Environmental Emergency Response Procedure 7. Fire Control and Emergency Response Management System 8. Incident Notification Procedure	4	d	4d 21 (L)				

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING															
Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk				
			C	P	R		C	P	R		C	P	R		
Pre-stripping	Clearing of vegetation - <i>note: site predominantly cleared</i>	Disturbance / damage to threatened flora and fauna	2	b	2b	5 (H)		2	b	2b	5 (H)	1. Impact Assessment			
		Disturbance of Aboriginal heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Impact Assessment			
		Disturbance of European heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Impact Assessment			
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)				
		Noise	4	d	4d	21 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	4	e	4e	23 (L)				
		Erosion with sediment leaving site	4	c	4c	18 (L)	1. Employee Inductions 2. Internal drainage 3. Existing Sediment Control Dam 4. Erosion & Sediment Control Plan 5. Mining Operations Inspection System 6. Environmental Inspections	4	d	4d	21 (L)				
		Spillage of hydraulic oil from damaged hose	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)				
		Potential to introduce weeds	4	d	4d	21 (L)	1. Weed Control Contractors 2. Environmental Inspections 3. Vehicle wash at entrance 4. Employee Inductions 5. Employee Consultation Management System 6. Contractor Induction 7. Supervisor Inspections 8. Supervisor Audits 9. Contractor Management System	5	d	5d	24 (L)				
		Disposal of cleared timber (potential loss of habitat)	3	b	3b	9 (M)	1. Move identified habitat trees to rehab area 2. Bury remaining material	4	e	4e	23 (L)				
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Mobile equipment 8. Competency Management System	4	d	4d	21 (L)				
	Stripping of Top-dressing Material	Disturbance of Aboriginal heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Impact Assessment			
		Potential to introduce weeds	4	d	4d	21 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Environmental Inspections 4. Weed Control Contractors 5. Contractor Management System 6. Contractor Inductions	5	d	5d	24 (L)				
		Disturbance of European heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Impact Assessment			
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	3	d	3d	17 (L)				
		Noise	4	d	4d	21 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	4	e	4e	23 (L)				
		Erosion with sediment leaving site	3	b	3b	9 (M)	1. Employee Inductions 2. Internal drainage for part of the area 3. Existing Sediment Control Dam 4. Erosion & Sediment Control Plan 5. Mining Operations Inspection System 6. Environmental Inspections	4	d	4d	21 (L)				
		Spillage of hydraulic oil from damaged hose	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Transport Rules	5	d	5d	24 (L)				
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)				
		Loss of top dressing material	3	b	3b	9 (M)	1. Mining Operations Plan 2. Employee awareness and supervision 3. Employee consultation system 4. Environmental inspections 5. Competency Management System	4	d	4d	21 (L)				

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk		
			C	P	R		C	P	R		C	P	R
		Quality of top dressing material reduced through damage to soil structure	4	c	4c	18 (L)	1. Direct placement wherever possible 2. Top dressing material stockpile management 3. Mining Operations Plan 4. Employee awareness and supervision 5. Employee consultation system 6. Environmental Inspections 7. Competency Management System	4	e	4e	23 (L)		
	Overburden drilling	Noise	3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	d	3d	17 (L)		
		Dust	3	c	3c	13 (M)	1. Dust Extraction Systems 2. Curtains and water on drill 3. Employee Inductions 2. Mining Operations Airborne Dust Management System 3. Water cart availability 4. Complaints protocol 7. Supervisor Inspections 8. Supervisor Audits 9. Mindful of weather (wind) conditions	4	d	4d	21 (L)		
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)		
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Transport Rules	5	d	5d	24 (L)		
	Blasting	Noise/ overpressure	2	b	2b	5 (H)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	3	d	3d	17 (L)		
		Vibration	2	b	2b	5 (H)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	4	d	4d	21 (L)		
		Dust	3	b	3b	9 (M)	1. Shot Firing and Explosives Management System 2. Access to external specialist input 3. Inductions 4. Mining Operations Airborne Dust Management System 5. Water cart availability 6. Complaints protocol 7. Supervisor Inspections 8. Supervisor Audits 9. Mindful of weather (wind) conditions	4	c	4c	18 (L)		
		Noxious gas released to atmosphere (<i>unusual to experience wet holes in pre-strip</i>)	4	d	4d	21 (L)	1. Shot Firing and Explosives Management System 2. Access to external specialist input	5	e	5e	25 (L)		
	Excavation of overburden (using the shovel)	Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	d	3d	17 (L)		
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)		
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)		
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)		
		Taking coal with overburden (sponcom in rehabilitation)	4	e	4e	23 (L)	1. Burial of oxidised coal material 2. Supervisor Audits 3. Mining Operation Plan 4. Supervisor Inspections 5. Mining Operations Inspection Management System	5	e	5e	25 (L)	not considered an issue	

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls				Proposed Controls	Residual Risk		
			C	P	R		C	P	R			C	P	R
Mining of coal	Waste Management (during service days)		5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Maintenance Management System	5	d	5d	24 (L)			
		Major shut downs (contractor)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Supervisor Audits	5	d	5d	24 (L)			
	Noise		3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	d	3d	17 (L)			
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)			
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Competency Management System	4	d	4d	21 (L)			
	Hauling with rear dump trucks	Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Competency Management System	3	d	3d	17 (L)			
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)			
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Environmental Emergency Response Procedure	5	d	5d	24 (L)			
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)			
		Exhaust emissions	4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Maintenance Management System 3. Defect Management System 4. Supervisor Inspections 5. Supervisor Audits	4	e	4e	23 (L)			
Hauling with on-highway trucks	Noise		3	c	3c	13 (M)	1. Contractor Management System 2. Engineer's Audits 3. RTA registered trucks 4. Six monthly shaker tests 5. Maintenance Management Systems 6. Complaints protocol 7. Supervisor Inspections 8. Contractor Induction	3	d	3d	17 (L)			
	Dust		3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Contractor Management System 8. Contractor Induction 9. Supervisor Audits	4	d	4d	21 (L)			
	Spillage of hydraulic oil from damaged hose		4	c	4c	18 (L)	1. Contractor Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Contractor Induction	5	d	5d	24 (L)			

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk			
			C	P	R		C	P	R		C	P	R	
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Contractor Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Contractor Induction	4	d	4d	21 (L)			
		Exhaust emissions	4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Supervisor Audits 3. Defect Management System 4. Supervisor Inspections 5. Contractor Management System 6. Contractor Induction	4	e	4e	23 (L)			
	Overburden dumping area (includes tipping with trucks)	Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)			
		Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	d	3d	17 (L)			

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG														
Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk			
			C	P	R		C	P	R		C	P	R	
Main Dig	Interburden drilling	Noise	3	d	3d	17 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	e	3e	20 (L)			
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections	4	d	4d	21 (L)			
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)			
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)			
	Blasting	Noise/ overpressure	2	c	2c	8 (M)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	3	d	3d	17 (L)			
		Vibration	2	b	2b	5 (H)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	4	d	4d	21 (L)			
		Dust	3	c	3c	13 (M)	1. Shot Firing and Explosives Management System 2. Access to external specialist input 3. Inductions 4. Mining Operations Airborne Dust Management System 5. Water cart availability 6. Complaints protocol 7. Supervisor Inspections 8. Mindful of weather (wind) conditions	4	d	4d	21 (L)			
		Noxious gas released to atmosphere (unusual to experience wet holes in pre-strip)	4	d	4d	21 (L)	1. Shot Firing and Explosives Management System 2. Access to external specialist input	5	e	5e	25 (L)			
	Excavation of interburden	Noise	3	c	3c	13 (M)	1. Maintenance Management System 2. Competent, experienced employees 3. Supervisor Inspections 4. Supervisor Audits 5. Complaints Protocol	3	d	3d	17 (L)			
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)			
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Incident Notification Procedure 6. Supervisor Inspections 7. Supervisor Audits	5	d	5d	24 (L)			
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)			
		Taking coal with overburden (sponcom in rehabilitation)	4	d	4d	21 (L)	1. Burial of oxidised coal material 2. Internal Audit Management System 3. Mining Operation Plan 4. Supervisor Inspections 5. Supervisor Audits	5	e	5e	25 (L)			
		Waste Management (during service days)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Employee Inductions	5	d	5d	24 (L)			
		Major shut downs (contractor)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Employee Inductions	5	d	5d	24 (L)			
	Mining of coal	Noise	3	d	3d	17 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Competency Management System	3	e	3e	20 (L)			
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections	4	d	4d	21 (L)			

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG													
Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk		
			C	P	R		C	P	R		C	P	R
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)		
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)		
		Hydrocarbon contamination of pit-water (pumps, spills)	3	c	3c	13 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox talks 6. Dedicated Experienced employee 7. Incident Notification Procedure 8. Supervisor Inspections 9. Supervisor Audits	4	d	4d	21 (L)		
Hauling with rear dump trucks	Noise		3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Competency Management System	3	d	3d	17 (L)		
	Dust		3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)		
	Spillage of hydraulic oil from damaged hose		4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)		
	Spillage of Hydrocarbons when transferring from Service Truck		4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)		
	Exhaust emissions		4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Maintenance Management System 3. Defect Management System 4. Supervisor Inspections	4	e	4e	23 (L)		
Hauling with on-highway trucks	Noise		3	c	3c	13 (M)	1. Contractor Management System 2. Engineer's Audits 3. RTA registered trucks 4. Six monthly shaker tests 5. Maintenance Management Systems 6. Complaints protocol 7. Supervisor Inspections 8. Contractor Inductions	3	e	3e	20 (L)		
	Dust		3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Contractor Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)		
	Spillage of hydraulic oil from damaged hose		4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Contractor Inductions 5. Contractor Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Toolbox Talks	5	d	5d	24 (L)		
	Spillage of Hydrocarbons when transferring from Service Truck		4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Contractor Inductions 5. Contractor Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Toolbox Talks	4	d	4d	21 (L)		
	Exhaust emissions		4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Maintenance Management System 3. Defect Management System 4. Supervisor Inspections 5. Contractor Management System 6. Contractor Inductions 7. RTA Approval (Rego check) 8. Engineers Audits	4	e	4e	23 (L)		
Overburden dump (in pit)	Dust		3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)		
	Noise		3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits	3	d	3d	17 (L)		

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG														
Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk			
			C	P	R		C	P	R		C	P	R	
	In pit water management	Broken leaking pipes (on surface)	4	b	4b	14 (M)	1. Maintenance Management System 2. Environmental Inspections 3. Inspection Management System 4. Supervisor Inspections 5. Engineering principles applied to design 6. Incidents Reporting Procedure 7. Dedicated Experienced person 8. Supervisor Audits	4	d	4d	21 (L)			
		Discharge from open drains (dirty water system)	2	c	2c	8 (M)	1. Environmental Inspections 2. Inspection Management System 3. Supervisor Inspections 4. Engineering principles applied to design 5. Incidents Reporting Procedure 6. Dedicated Experienced person	2	e	2e	16 (L)			
		Cross contamination of water segregation under extreme rainfall conditions	2	c	2c	8 (M)	1. Managing the level of Lake Foster 2. Discharge Water Management System 3. EPA Licence 4. Site Inspections 5. Environmental Inspections 6. Nominated Experienced person	3	d	3d	17 (L)			
		Failure of clean water segregation	2	d	2d	12 (M)	1. Environmental Inspections 2. Inspection Management System 3. Supervisor Inspections 4. Engineering principles applied to design 5. Incidents Reporting Procedure 6. Nominated Experienced person	3	d	3d	17 (L)			
	Bulk fuel storage	Bulk fuel storage (Portable Fuel Storage 1 x 40,000L, 1 x 15,000L, 2 x 5,000L) - Damage to side wall resulting in leak (NB: 40000L used for refueling, others for supply and pumps)	2	c	2c	8 (M)	1. Towed empty only 2. Towed over prepared surfaces and under supervision only 3. Ensure tanks are always within the site 4. Supervisor Audits 5. Located in a temporary earth containment area 6. Environmental Inspections 7. Maintenance Management System 8. Isolated storage area	3	d	3d	17 (L)			
		Spillage from the fuel fillpoint during filling of equipment	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)			
		Spillage from tank as a result of hose being pulled off by equipment	2	c	2c	8 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Emergency Cut off valve	4	d	4d	21 (L)			
	Sewerage treatment plant	Contamination of water ways (1 x main office, 1 x open cut workshop)	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. Environmental Inspections	4	d	4d	21 (L)			

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - ERLORATION

Process Area	Activity	Aspect	Raw (potential risk)				Existing Controls	Existing Controls			Proposed Controls	Residual Risk			
			C	P		R		C	P	R		C	P	R	
Exploration	Survey of the drill locations	Damage to vegetation	5	c	5c	22 (L)	1. Employee Inductions 2. Experienced people 3. Use of existing tracks where possible	5	d	5d	24 (L)				
		Disturbance of Aboriginal heritage	2	d	2d	12 (M)		2	d	2d	12 (M)	1Impact Assessment			
		Disturbance of European heritage	2	d	2d	12 (M)		2	d	2d	12 (M)	1Impact Assessment			
		Wheel track erosion	3	d	3d	17 (L)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Environmental inspections 4. Systems audits 5. Environmental Protection Licence 6. Existing Sediment Control Dams	4	e	4e	23 (L)				
		Fire hazard	3	d	3d	17 (L)	1. Employee Inductions 2. Hazard reduction program 3. Bush Fire Management Plan 4. Competent employees 5. Fire Control & Emergency Response Management System 6. Onsite fire fighting capabilities	4	d	4d	21 (L)				
		Dust	3	d	3d	17 (L)	1. Employee Inductions 2. Mining Operations Airborne Dust Management System 3. Water cart availability 4. Complaints protocol 5. Mindful of weather (wind) conditions.	5	e	5e	25 (L)				
		Potential for spills of hydrocarbons from vehicle accident.	4	d	4d	21 (L)	1. Transport Rules 2. Fire Control & Emergency Response Management System 3. Environmental Inspections 4. Contractor Management System 5. Incident Notification Procedure 6. Environmental Emergency Response Procedure	4	e	4e	23 (L)				
		Injury to or loss of threatened flora and fauna	4	d	4d	21 (L)	1. Transport Rules 2. Employee Inductions 3. Daylight operations	4	e	4e	23 (L)				
		Potential to introduce weeds	5	e	5e	25 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Environmental Inspections 4. Weed Control Contractors	5	e	5e	25 (L)	not considered an issue			
	Clearing of drill lines and Site establishment and Digging Pits	Injury to or loss of threatened flora and fauna	4	c	4c	18 (L)	1. Transport Rules 2. Employee Inductions 3. Daylight operations	4	d	4d	21 (L)				
		Sediment leaving the site	3	c	3c	13 (M)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Environmental inspections 4. Systems audits 5. Environmental Protection Licence 6. Existing sedimentation dam on boundary	4	d	4d	21 (L)				
		Loss of top dressing material	4	c	4c	18 (L)	1. Mining Operations Plan 2. Minimal surface disturbance 3. Topsoil is stockpiled	4	d	4d	21 (L)				
		Disturbance of Aboriginal heritage	2	c	2c	8 (M)		2	c	2c	8 (M)	1Impact Assessment			
		Disturbance of European heritage	2	c	2c	8 (M)	1. Non existent in area under investigation	2	c	2c	8 (M)	1Impact Assessment			
		Potential to introduce weeds	5	e	5e	25 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Environmental Inspections 4. Weed Control Contractors	5	e	5e	25 (L)	not considered an issue			
		Noise	4	d	4d	21 (L)	1. Daylight activity 2. Employee Inductions 3. Maintenance Management System 4. Complaints protocol	4	e	4e	23 (L)				
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections	5	e	5e	25 (L)				
		Fire hazard	3	d	3d	17 (L)	1. Employee Inductions 2. Hazard reduction program 3. Bush Fire Management Plan 4. Competent employees 5. Fire Control & Emergency Response Management System 6. Onsite fire fighting capabilities	4	d	4d	21 (L)				
		Hydraulic hose oil spill	3	c	3c	13 (M)	1. Maintenance Management System 2. Ennvironmental Emergency Response Procedure 3. Spill kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure	4	d	4d	21 (L)				
			Establish drill rig and drilling (including demobilisation)	Erosion with sediment leaving site (wheel tracks)	4	d	4d	21 (L)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Environmental inspections 4. Systems audits 5. Environmental Protection Licence 6. Existing sedimentation dam on boundary 7. Contractor Management System 8. Contractor Inductions	5	d	5d	24 (L)		

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

Process Area	Activity	Aspect	Raw (potential risk)			Existing Controls	Existing Controls			Proposed Controls	Residual Risk					
			C	P	R		C	P	R		C	P	R			
		Hydrocarbon storage	3	c	3c	13 (M)	1. Mobile equipment 2. Contract Management System 3. Contractor Induction 4. Onsite spill kits 5. Fire Control & Emergency Response Management System 6. Supervisor Inspections 7. Incident Notification Procedure	4	d	4d	21 (L)					
		Potential to introduce weeds	4	c	4c	18 (L)	1. Vehicle wash at entrance 2. Contractor inductions 3. Environmental Inspections 4. Weed Control Contractors 5. Supervisor Inspections	4	d	4d	21 (L)					
		Injury to or loss of threatened flora and fauna (<i>note work area mostly cleared</i>)	5	e	5e	25 (L)	1. Transport Rules 2. Employee Inductions 3. Daylight operations	5	e	5e	25 (L)	not considered an issue				
		Hydraulic hose oil spill	3	c	3c	13 (M)	1. Mobile equipment 2. Contract Management System 3. Contractor Induction 4. Onsite spill kits 5. Fire Control & Emergency Response Management System 6. Supervisor Inspections 7. Incident Notification Procedure	4	d	4d	21 (L)					
		Spillage of hydrocarbons during tansfer from the service truck.	3	c	3c	13 (M)	1. Mobile equipment 2. Contractor Management System 3. Contractor Induction 4. Onsite spill kits 5. Fire Control & Emergency Response Management System 6. Incident Notification Procedure	4	d	4d	21 (L)					
		Hydrocarbon leaking from tank	3	c	3c	13 (M)	1. Mobile equipment 2. Contractor Management System 3. Contractor Induction 4. Onsite spill kits 5. Fire Control & Emergency Response Management System	4	d	4d	21 (L)					
		Noise	4	c	4c	18 (L)	1. Daylight activity 2. Employee Inductions 3. Maintenance Management System 4. Complaints protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions	4	d	4d	21 (L)					
		Dust	3	c	3c	13 (M)	1. Emplpyee Inductions 2. Mining Operations Airborne Dust Management System 3. Water cart availability 4. Complaints protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions 8. Mindful of weather (wind) conditions.	3	d	3d	17 (L)					
		Fire hazard	4	d	4d	21 (L)	1. Hazard reduction program 2. Bush Fire Management Plan 3. Fire Control & Emergency Response Management System 4. Onsite fire fighting capabilities 5. Supervisor Inspections	5	d	5d	24 (L)					
		Waste management e.g. oily rags, empty drums	4	b	4b	14 (M)	1. Contractor Management System 2. Contractor Induction 3. Onsite waste bins 4. Supervisor Inspections	5	d	5d	24 (L)					
	Traffic movement e.g. water cart, geologist, driller, logger	Potential to introduce weeds	4	d	4d	21 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Environmental Inspections 4. Weed Control Contractors	5	d	5d	24 (L)					
		Wheel track erosion	4	b	4b	14 (M)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Environmental inspections 4. Systems audits 5. Environmental Protection Licence 6. Contractor Management System 7. Supervisor Inspections 8. Contractor Induction	4	d	4d	21 (L)					
		Fire hazard	4	d	4d	21 (L)	1. Hazard reduction program 2. Bush Fire Management Plan 3. Fire Control & Emergency Response Management System 4. Onsite fire fighting capabilities 5. Supervisor Inspections 6. Contractor Management System 7. Contractor Induction	5	d	5d	24 (L)					
		Noise	4	c	4c	18 (L)	1. Daylight activity 2. Employee Induction 3. Maintenance Management System 4. Complaints protocol 5. Supervisor Inspections 6. Contractor Management System 7. Contractor Induction	4	d	4d	21 (L)					
		Dust	3	c	3c	13 (M)	1. Employee Induction 2. Mining Operations Airborne Dust Management System 3. Water cart availability 4. Complaints protocol 5. Supervisor Inspections 6. Contractor Management System 7. Contractor Induction 8. Mindful of weather (wind) conditions.	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

Process Area	Activity	Aspect	Raw (potential risk)			Existing Controls	Existing Controls			Proposed Controls	Residual Risk					
			C	P	R		C	P	R		C	P	R			
		Potential for spills of hydrocarbons from vehicle accident.	4	d	4d	21 (L)	1. Transport Rules 2. Fire Control & Emergency Response Management System 3. Environmental Inspections 4. Incident Notification Procedure 5. Contractor Management System 6. Contractor Induction 7. Incident Notification Procedure	4	e	4e	23 (L)					
		Injury to or loss of threatened flora and fauna (<i>note work area mostly cleared</i>)	5	e	5e	25 (L)	1. Transport Rules 2. Employee Inductions 3. Daylight operations	5	e	5e	25 (L)	not considered an issue				
		Loss of radiation source	4	d	4d	21 (L)	1. Contractor Management System 2. Contractor Induction 3. Use of NATA approved contractor	4	e	4e	23 (L)					
	Open holes and pits after drilling	Injury to or loss of threatened flora and fauna (<i>note work area mostly cleared</i>)	4	d	4d	21 (L)	1. Fill in pits and cap holes 2. DPI guidelines 3. Mining Lease Conditions	5	e	5e	25 (L)	not considered an issue				
		Aquifer contamination	4	d	4d	21 (L)	1. Dry area 2. Capping holes 3. Deep hard rock aquifer 4. No alluvial aquifers involved 5. Poor water quality	5	e	5e	25 (L)	not considered an issue				
	Rehabilitation	Potential to introduce weeds	4	c	4c	18 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Environmental Inspections 4. Weed Control Contractors	4	d	4d	21 (L)					
		Erosion with sediment leaving site	4	d	4d	21 (L)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Environmental inspections 4 Systems audits 5 Licence 6 Existing sedimentation dam on boundary	5	d	5d	24 (L)					
		Noise	4	d	4d	21 (L)	1. Daylight activity 2. Employee Inductions 3. Maintenance Management System 4. Complaints protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions	4	e	4e	23 (L)					
		Dust	3	c	3c	13 (M)	1. Employee Inductions 2. Mining Operations Airborne Dust Management System 3. Water cart availability 4. Complaints protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions 8. Mindful of weather (wind) conditions	5	e	5e	25 (L)					
		Hydraulic hose oil spill	4	d	4d	21 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. Spill kits 4. Employee Inductions 5. Employee Consultation Management System 6. Incident Notification Procedure	5	d	5d	24 (L)					
Fire hazard	4	d	4d	21 (L)	1. Inductions 2. Hazard reduction program 3. Bush Fire Management Plan 4. Competent employees 5. Fire Control & Emergency Response Management System 6. Onsite fire fighting capabilities	5	d	5d	24 (L)							

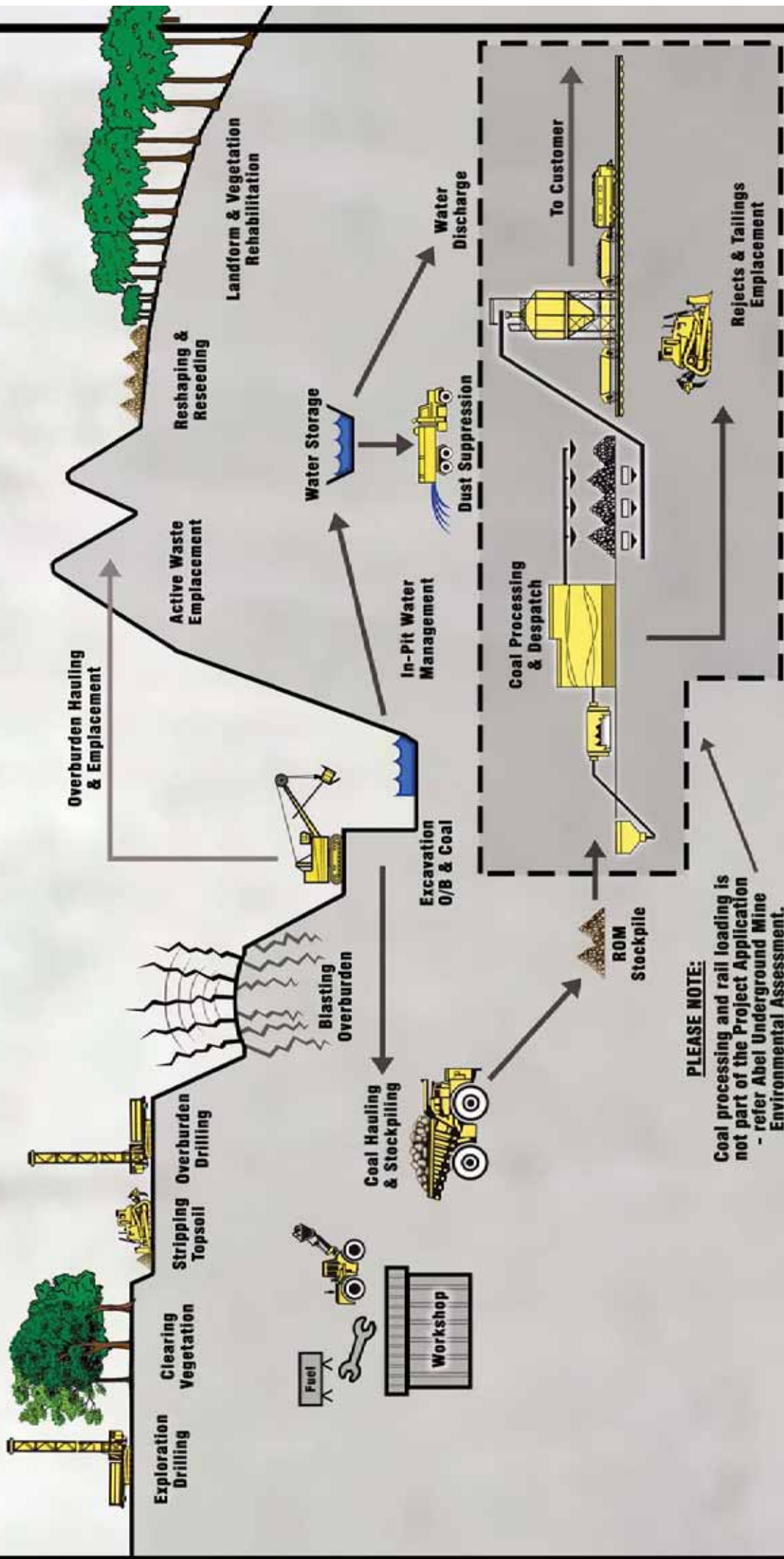
BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - SUPPLY													
Process Area	Activity	Aspect	Raw (potential risk)			Existing Controls	Existing Controls			Proposed Controls	Residual Risk		
			C	P	R		C	P	R		C	P	R
Supply	Bulk Fuel Storage	(See Maintenance)											
	Transfer of fuel from road transport	Spillage of fuel during delivery of bulk fuel and oil	2	c	2c	8 (M)	1. Fuel & Bulk Oil Delivery Procedure 2. Contractor Management System 3. Contained delivery point 4. Use of competent delivery contractor 5. System audits 6. Incident Notification Procedure 7. Environmental Inspections 8. Environmental Emergency Response Procedure	3	d	3d	17 (L)		
		Damage to transport vehicle on site at refuelling point (eg. Light vehicle running into fuel truck)	3	c	3c	13 (M)	1. Engineering separation from earthworking equipment 2. Delivery trucks have segregated tanks 3. Environmental Emergency Response Procedure 4. Tanks Located away from traffic areas	4	e	4e	23 (L)		
		Release of fuel to the environment as a result of a vehicle involved in accident on site	2	c	2c	8 (M)	1. Site Transport Rules 2. Fuel & Bulk Oil Delivery Procedure 3. Contractor Management System 4. First trip escort 5. Safety Core Risk Assessment 6. Toolbox Talks 7. Competency Management System 8. Environmental Emergency Response Procedure	4	d	4d	21 (L)		
		Fuel transfer truck driving away from fill point with out disconnecting fuel supply hose	3	c	3c	13 (M)	1. Contractor has cut-off system whereby they cannot start the vehicle if a hose is still connected 2. Use of competent contractor 3. Contractor Management System 4. Bunded Area (AS1940) 5. Environmental Emergency Response Procedure 6. Fuel & Bulk Oil Delivery Procedure	5	e	5e	25 (L)		

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - REHABILITATION

Process Area	Activity	Aspect	Raw			Existing Controls	Existing Controls			Proposed Controls	Residual Risk		
			C	P	R		C	P	R		C	P	R
Rehabilitation	Reshaping (Overburden dumps)	Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Competency Management System 8. Toolbox Talks	4	d	4d	21 (L)		
		Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Toolbox Talks	3	d	3d	17 (L)		
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)		
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Toolbox Talks	4	d	4d	21 (L)		
		Erosion and sediment control	4	c	4c	18 (L)	1. Mining Operation Erosion Sediment Control Plan 2. Environmental Inspections 3. External Audits (including Government) 4. Environmental Protection Licence 5. Existing Sediment Control Dams	5	d	5d	24 (L)		
	Top dressing material spreading and contour ripping	Dust	3	b	3b	9 (M)	1. Transport Rules 2. Inductions 3. Mining Operations Airborne Dust Management System 4. Water cart availability 5. Complaints protocol 6. Supervisor Inspections 7. Supervisor Audits 8. Mindful of weather (wind) conditions	4	d	4d	21 (L)		
		Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints protocol 4. Supervisor Inspections	3	d	3d	17 (L)		
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)		
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox talks 6. Incident Notification Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)		
		Erosion and sediment control	4	c	4c	18 (L)	1. Mining Operation Erosion Sediment Control Plan 2. Environmental Inspections 3. External Audits (including Government) 4. Environmental Protection Licence 5. Supervisor Inspections 6. Existing Sediment Control Dams	5	d	5d	24 (L)		
		Lime and gypsum dust	4	c	4c	18 (L)	1. Control moisture levels of lime	5	d	5d	24 (L)		
		Biosolids / runoff (incl odour)	3	c	3c	13 (M)	1. Use of DEC guidelines 2. Bunded storage areas	3	d	3d	17 (L)		
	Revegetation	Erosion with sediment leaving site	4	c	4c	18 (L)	1. internal drainage for part of the area 2. Erosion & Sediment Control Plan 3. Existing Sediment Control Dams	5	d	5d	24 (L)		
		Potential to introduce weeds	4	c	4c	18 (L)	1. Buy certified seed from reputable supplier 2. Vehicle wash at entrance 3. Employee inductions 4. Environmental Inspections 5. Weed Control Contractors	4	d	4d	21 (L)		
		Failure of seed to germinate and establishment	4	c	4c	18 (L)	1. Buy certified seed from reputable supplier 2. Employee and Contractor Inductions	5	d	5d	24 (L)		
		Bush fire hazard burning revegetated areas	3	c	3c	13 (M)	1. Employee Induction 2. Hazard reduction program 3. Bush Fire Management Plan 4. Competent employees 5. Fire Control & Emergency Response Management System 6. Onsite fire fighting capabilities 7. Contractor Induction	4	d	4d	21 (L)		
		Sponcom in rehabilitated areas (odour)	4	d	4d	21 (L)	1. Burial of oxidised coal material 2. Supervisor Inspections 3. Mining Operation Plan 4. Mining Operations Inspection Management System	5	e	5e	25 (L)		



Appendix 2 – Bloomfield Project Area Process / Operational Flow Chart



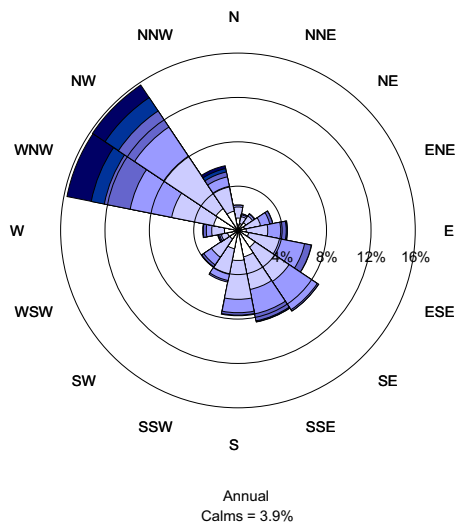
Bloomfield Colliery

COMPLETION OF MINING AND REHABILITATION
MINING PROCESS

APPENDIX C

ANNUAL AND SEASONAL WIND ROSES

**Annual and seasonal windroses
prepared from data collected at
DEC monitoring station at Beresfield
(1 August 2004 to 31 July 2005)**



Wind speed (m/s)

