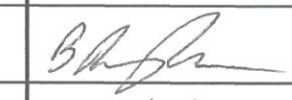

# Bloomfield Colliery

# Mining Operations Plan

# 2021 – 2023

## TITLE BLOCK

| | |
|---|---|
| **Name of Mine:** | Bloomfield Colliery |
| **MOP Commencement Date:** | January 2021 |
| **MOP Completion Date:** | December 2023 |
| **Mining Authorisations (Lease / Licence No.):** | ML1738, CCL761, AMA1001 |
| **Name of Authorisation/Title Holder:** | Bloomfield Collieries Pty Ltd |
| **Name of Mine Operator:** | Bloomfield Collieries Pty Ltd |
| **Name and Contact Details of the Mine Manager:** | Brad Donoghoe<br>Phone: 02 4930 2641<br>Mobile: 0418 923 058<br>email: bdonoghoe@bloomcoll.com.au |
| **Name and Contact Details of Environmental Representative:** | Greg Lamb<br>Phone: 02 4930 2689<br>Mobile: 0457 819 211<br>email: glamb@bloomcoll.com.au |
| **Name of Representative of the Authorisation Holder:** | Brad Donoghoe |
| **Title:** | Mine Manager |
| **Signature:** |  |
| **Date:** | 30/6/2021 |
| **Version:** | MOP Amendment A |

## SUMMARY OF TABLES, FIGURES AND PLANS

A summary of the relevant tables and plans required under *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* is provided below:

| ESG3 Requirement | Section of MOP | Table Reference | Plan Reference | Source |
|---|---|---|---|---|
| Material production schedule | Section 2.3.10 | Table 4 | N/A | Mine Planning<br>MOP Guidelines |
| Domain selection | Section 5.1 | Table 11 | Plans 2, 3A - 3C, 4A & 4B | MOP Guidelines |
| Rehabilitation phases | Section 5.3 | Table 13 | Plans 3A – 3C | MOP Guidelines |
| Performance indicators and completion criteria | Section 6 | Table 14 | N/A | LMP<br>MOP Guidelines |
| Proposed disturbance and rehabilitation activities | Section 7.2 | Table 16 | Plans 3A – 3C | Mine Planning<br>MOP Guidelines |
| Summary of rehabilitation areas | Section 7.3 | Table 18 | Plans 3A – 3C | Spatial Data<br>MOP Guidelines |
| Plans | Section 11 | N/A | All Plans | Spatial Data<br>MOP Guidelines |

# CONTENTS

## LIST OF TABLES



## LIST OF PLANS



## LIST OF FIGURES

**APPENDICIES**

Appendix 1 Project Approval 07-0087
Appendix 2 Risk Register
Appendix 3 Rehabilitation Risk Assessment
Appendix 4 DMR Rehabilitation Clearance

# 1 Introduction

This Mining Operation Plan (MOP) covers the period January 2021 to December 2023. This document is the revised and updated MOP to supersede the July 2018 to December 2020 MOP for the Bloomfield Colliery.

In accordance with the objective of the NSW DPI&E the following MOP has been configured to provide proper consideration to the environment during the operations stage through to 2023. This MOP has been prepared as a requirement of the Mining Lease conditions (ML1738, CCL761 & AMA1001).

The structure and content of the MOP have been formulated in accordance with DTIRIS *ESG3 Mining Operations Plan Guidelines, September 2013*.

## 1.1 History of Operations

Bloomfield Colliery is owned and operated by Bloomfield Collieries Pty Limited (Bloomfield) and is located approximately 20 km north-west of Newcastle in the Cessnock Local Government Area (Plan 1A).

Mining has been carried out at the present site since the late 1850's with Bloomfield taking over the Mining Lease in 1937. Underground mining operations on the site ceased in 1992 due to difficult mining and economic conditions. Open cut mining operations began in 1964.

Ashtonfields Pty Ltd owns the majority of the land at the site covered by ML1738, CCL761 and AMA1001 since the Bloomfield involvement in the operations began and a long-standing Commercial Lease agreement exists between the companies.

Approval for the Bloomfield Colliery was granted by the Minister for Planning on 3 September 2009 under Part 3A of the *Environmental Planning and Assessment Act, 1979*.

Plans 1B and 1C provides details of the site land use at the commencement of the MOP term. Approved activities include the continued operation of the following mine infrastructure and related activities:

- the current and future open cut mine areas;
- the workshop;
- the road between the open cut pit areas and the run-of-mine (ROM) coal;
- stockpiles at the washery; and
- the road that links the workshop, open cut pits and the washery.

The Approval provides for the extraction rate of up to 1.3 million tonnes ROM per annum (mtpa).

Other mining infrastructure and activities at the Colliery include:

- the Coal Handling Preparation Plant (CHPP);

- the rail loading facility; and
- the tailings disposal dam.

This other mining infrastructure was approved under Project Approval 05_0136 for the Abel Underground Mine. Project Approval 05_0136 was issued to Donaldson Coal and was granted in June 2007. It allows for the Abel Underground Mine as well as the continued use of the Bloomfield CHPP and rail loading facility, management of water associated with the washery, coarse reject and tailings disposal and coal handling. These items, associated with the operation of the CHPP, are used to process coal from Bloomfield, Donaldson and other mine sources.

## 1.2 Consents, Authorisations and Licences

Table 1 shows the status of current leases, licences and approvals at Bloomfield Colliery relevant to this MOP.

*Table 1: Leases, Licences and Approvals*

| Statutory Approval | Granted | Expires | Approval Authority |
|---|---|---|---|
| Mining Lease 1738 | June 2016 | 2037 | Department of Regional NSW- Division of Mining, Exploration and Geoscience |
| Mining Lease CCL761 | November 1991 | 2029 | Department of Regional NSW- Division of Mining, Exploration and Geoscience |
| Ancillary Mining Activity 1001 | August 2018 | 2037 | Department of Regional NSW- Division of Mining, Exploration and Geoscience |
| Project Approval PA 07_0087 Bloomfield Coal Project | September 2009 | 2030 | Department of Planning, Industry & Environment |
| Project Approval PA 05_0136 Abel Coal Project | June 2007 | 2030 | Department of Planning, Industry & Environment |
| Environmental Protection Licence No. 396 | July 2000 | Renewed Annually | NSW Environment Protection Authority |

The Project Approval (PA 07-0087) (MOD 4) is provided in Appendix 1. Bloomfield Colliery is a Level 1 mine as defined in the MOP Guidelines (DTIRIS-DRE, 2013).

## 1.3 Land Ownership and Land Use

Ashtonfields Pty Ltd owns the majority of the land at the site covered by ML1738 & CCL761 since the Bloomfield involvement in the operations began and a long-standing Commercial Lease agreement exists between the companies (Refer Section 4.1.1).

A schedule of land ownership is provided in Table 2. Plan 1C provides details of the site land tenure at the commencement of the MOP term.

Land use in the vicinity of Bloomfield Colliery is characterised by a combination of coal mining operations, woodlands, agricultural operations, urban and semi-urban residential developments (Refer Plan 1B).

*Table 2: Land Ownership*

| Lot No. | DP No. | Landowner |
|---|---|---|
| 1 | 42349 | Ashtonfields Pty Ltd |
| 1 | 58967 | Ashtonfields Pty Ltd |
| 1 | 69246 | Ashtonfields Pty Ltd |
| 1 | 136865 | Ashtonfields Pty Ltd |
| 12 | 241097 | Ashtonfields Pty Ltd |
| 13 | 241097 | Ashtonfields Pty Ltd |
| 14 | 241097 | Ashtonfields Pty Ltd |
| 15 | 241097 | Ashtonfields Pty Ltd |
| 1 | 456999 | Ashtonfields Pty Ltd |
| 2 | 456999 | Ashtonfields Pty Ltd |
| 1 | 722209 | Ashtonfields Pty Ltd |
| 1 | 722210 | Ashtonfields Pty Ltd |
| 10 | 755237 | Ashtonfields Pty Ltd |
| 18 | 755237 | Ashtonfields Pty Ltd |
| 19 | 755237 | Ashtonfields Pty Ltd |
| 20 | 755237 | Ashtonfields Pty Ltd |
| 23 | 755237 | Ashtonfields Pty Ltd |
| 29 | 755237 | Ashtonfields Pty Ltd |
| 31 | 755237 | Ashtonfields Pty Ltd |
| 37 | 755237 | Ashtonfields Pty Ltd |
| 38 | 755237 | Ashtonfields Pty Ltd |
| 39 | 755237 | Ashtonfields Pty Ltd |
| 223 | 755237 | Ashtonfields Pty Ltd |
| 36 | 755260 | Ashtonfields Pty Ltd |

| Lot No. | DP No. | Landowner |
|---|---|---|
| 35 | 755260 | Ashtonfields Pty Ltd |
| 34 | 755260 | Ashtonfields Pty Ltd |
| 48 | 755260 | Ashtonfields Pty Ltd |
| 30 | 755260 | Ashtonfields Pty Ltd |
| 29 | 755260 | Ashtonfields Pty Ltd |
| 28 | 755260 | Ashtonfields Pty Ltd |
| 27 | 755260 | Ashtonfields Pty Ltd |
| 26 | 755260 | Ashtonfields Pty Ltd |
| 43 | 755260 | Ashtonfields Pty Ltd |
| 25 | 755260 | Ashtonfields Pty Ltd |
| 24 | 755260 | Ashtonfields Pty Ltd |
| 23 | 755260 | Ashtonfields Pty Ltd |
| 22 | 755260 | Ashtonfields Pty Ltd |
| 45 | 755260 | Ashtonfields Pty Ltd |
| 46 | 755260 | Ashtonfields Pty Ltd |
| 1 | 1045719 | Ashtonfields Pty Ltd |
| 3 | 1045720 | Ashtonfields Pty Ltd |
| 4 | 1045720 | Ashtonfields Pty Ltd |
| 2 | 1045720 | Ashtonfields Pty Ltd |
| 1 | 1045720 | Ashtonfields Pty Ltd |
| 1 | 1045722 | Ashtonfields Pty Ltd |
| 2 | 1045722 | Ashtonfields Pty Ltd |
| 1 | 1045723 | Ashtonfields Pty Ltd |
| 11 | 755237 | Ashtonfields Pty Ltd |
| 44 | 755260 | Ashtonfields Pty Ltd |
| 35 | 755237 | Bloomfield Group |
| 36 | 755237 | Bloomfield Group |
| 10 | 241097 | Hunter Water |
| 4 | 241097 | Hunter Water |
| 5 | 241097 | Hunter Water |
| 6 | 241097 | Hunter Water |
| 1 | 241097 | Hunter Water |
| 2 | 241097 | Hunter Water |
| 3 | 241097 | Hunter Water |
| 7 | 241097 | Hunter Water |
| 8 | 241097 | Hunter Water |
| 9 | 241097 | Hunter Water |
| 1 | 617909 | Hunter Water |

| Lot No. | DP No. | Landowner |
|---|---|---|
| 1 | 724270 | Hunter Water |
| 1 | 814743 | Hunter Water |
| 102 | 1130948 | Hunter Water |
| 101 | 1130948 | Hunter Water |
| 100 | 1130948 | Hunter Water |
| 104 | 1131098 | Hunter Water |
| 105 | 1131098 | Hunter Water |
| 106 | 1131104 | Hunter Water |
| 107 | 1131109 | Hunter Water |
| 103 | 1131280 | Hunter Water |
| 120 | 1154927 | Hunter Water |
| 1217 | 1157771 | Hunter Water |
| 30 | 1113350 | Rathvale Pty Ltd |

## 1.4 Stakeholder Consultation

Discussions have been held with the NSW Resources Regulator leading to the preparation of this MOP. The mining areas covered by this MOP were the subject of an Environmental Assessment (PA 07_0087) during which extensive consultation was undertaken with government authorities and the local community. This MOP has been prepared to be consistent with environmental approval documentation that formed the basis of the approval process for which the above consultation was undertaken.

Bloomfield Colliery has an established Community Consultative Committee (CCC) to provide a forum for open discussion between Bloomfield, the community (and Cessnock City Council and other stakeholders) on issues directly relating to the operation and environmental performance of the mine. The CCC comprises three representative members of the local community, Bloomfield personnel and a representative of Cessnock City Council and is scheduled to meet at least every 4 months.

Bloomfield has a Commercial Lease with the landowners, Ashtonfields Pty Ltd, which sets out post mining requirements with the understanding of regulatory requirements for closure. Stakeholder expectations and agreements with the landowner in relation to post mining land-use, rehabilitation objectives and completion criteria are outlined in detail in Sections 4 and 5.

# 2 Proposed Mining Activities

## 2.1 Project Description

The area to be mined is located in the south-western section of ML1738. Mining is currently undertaken in two pits referred to as 'S Cut' and 'Creek Cut'. Mining operations will be undertaken in both pits simultaneously.

The proposed sequence will involve mining in S Cut to advance to the north, while mining in Creek Cut advances in a southerly direction, eventually joining to create one pit. Mining in the combined pit will advance to the west and will cease with the completion of mining. The annual sequence during the MOP term is shown in Plan 3A to 3C.

Multiple seams are extracted in each cut. The coal seams worked at Bloomfield Colliery are outlined in Section 3.3.1.

A final void will remain at the end of mining. This void will be used as a reject emplacement area for the washery. The Abel Project Approval enables the washery operations to continue after the completion of mining operations at the Bloomfield Colliery.

It is proposed to mine the remaining reserves at a maximum rate of up to 1.3 mtpa ROM coal. Coal reserves that are currently estimated at approximately 3.6 million tonnes ROM coal within the existing approval area. The maximum annual mining rate provides for flexibility in production rates over each year to enable Bloomfield to respond to coal market fluctuations and variations in quality and yield that occur over time. A maximum annual mining rate was generally used as the basis for impact assessment studies undertaken for the EA.

The current development consent for the Bloomfield Open Cut as approved under the PA 07_0087 (Mod 4) is valid until 31 December 2030, while the Development Consent for the CHPP, associated infrastructure and tailings dam is approved under the Abel Project PA 05_0136 which is valid until 31/12/2030. This MOP covers the period of mining operations from 1/7/2021 to 31/12/2023.

### 2.1.1 Mining Method and Equipment

Mining at Bloomfield is generally undertaken as a multi-seam truck and excavator/face shovel operation, conducted in sequential mining blocks. It is proposed to continue with these existing methods of extraction for the remaining life of the mine.

The existing mining process for each block includes:

- Vegetation removal;
- Topsoil/pre-strip;
- Drilling and blasting;
- Overburden removal and stockpiling;

- Coal removal (followed by interburden removal and coal removal for lower seams);
- Overburden reshaping and rehabilitation.

The majority of 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. Vegetation is pushed up into windrows with dozers for placement under advancing overburden dumps or, where practical, track rolled or chipped and included in top soil stripping operations.

Depending on topsoil/subsoil depth and quality, the material is pushed up with dozers and loaded onto haul trucks with front-end loaders, or excavated and loaded directly onto haul trucks with an excavator. It is then placed on reshaped overburden dumps in preparation for rehabilitation. Topsoil stockpiling is avoided where possible for operational and topsoil quality reasons. Lower unconsolidated (non-bedrock) horizons are free-dug as they do not require blasting prior to removal. They are then loaded onto rear dump trucks for hauling to overburden emplacements, as part of pre-strip operations.

Following topsoil/pre-strip removal, blast hole patterns are drilled into the overburden, in preparation for blasting. The blast is designed with consideration of excavator capability, environmental vibration / overpressure criteria and safety. The holes are loaded to design with explosives and detonated.

After blasting, loose overburden material is removed by excavator and placed onto rear dump haul trucks for hauling to overburden emplacements. Emplacement design will continue in a similar manner to the current operation.

The exposed coal seam is then ripped and pushed up with dozers, loaded onto trucks and transported to the ROM coal stockpile via internal haul roads. The interburden / coal extraction process is repeated for each seam until the basal Big Ben seam has been removed. The resultant void is then available for backfilling with the overburden from subsequent mining blocks. Emplacements are reshaped by dozer to create the final landform.

A detailed description of the rehabilitation process is provided in Section 7. The sequence of mining showing extraction, backfilling and subsequent rehabilitation is shown in Plan 3A to 3C.

Bloomfield currently uses an excavator and a fleet of rear dump trucks for the removal of topsoil, prestrip, overburden and interburden material. Two drill rigs are used for blast hole drilling. A coaling fleet comprising a front-end loader or excavator and rear-dump trucks used to transport the raw coal. It is proposed that the same, or similar, equipment will be used for the remaining life of the mine.

### 2.1.2 Coal Processing

Coal transported to the ROM stockpile is processed in the Coal Handling Preparation Plant (CHPP). All ROM coal recovered from the Bloomfield open cut is transported to the CHPP ROM pad for crushing, washing and screening. The CHPP handles coal from the Bloomfield Colliery and holds approval to receive coal from Donaldson Coal's Abel and Tasman Extension underground mines.

The CHPP approved coal throughput is up to 8.5 mtpa ROM coal. Processed coal is then stockpiled in the CHPP product coal stockpile area. Product coal is transferred by conveyor from the CHPP product stockpile area to the rail loading facility. The product coal is transported off-site by the rail loading facility and a dedicated rail loop which ties into the Hunter Valley rail line. Coal is transported to port facilities in Newcastle.

At the end of mining at the Bloomfield Colliery the CHPP and rail loading facility is approved to continue to operate processing coal when available from the Abel and Tasman Extension underground mines.

### 2.1.3 Coarse Reject and Tailing Disposal

During the coal washing process, waste coal material is produced in solid and more liquid (slurry) form. The solid material is termed *coarse reject.* The slurry material, a mixture of fine waste and water, is termed *tailings.*

The percentage of coarse rejects and fine tailings varies depending on the source of the coal and the mining method. Based on experience at Bloomfield CHPP and other mines, the estimated average proportions of coarse rejects and fine tailings are:

- Open Cut ROM coal 21% coarse rejects, 14% fine tailings;
- Underground coal 12% coarse rejects, 8% fine tailings.

Bloomfield CHPP coarse reject is currently co-disposed with overburden material and placed back into open cut pits. It is proposed to continue this process, which assists in filling voids in preparation for surface rehabilitation, including revegetation.

Fine tailings generated by the washing process are pumped to the existing tailings dam facility. The existing tailings dam facility is an old open cut void and is referred to as U-Cut (Plan 2). As the fine tailings consolidate within the dam the excess water is decanted off and returned to the CHPP water storage dam for re-use.

The current tailings emplacement area (U-Cut) has approval under the Abel Project Approval. At current production levels (i.e. with Abel in care and maintenance, and Tasman Extension not yet commenced) the current emplacement area is expected to reach allowable capacity during 2022. When tailings placement in the U-Cut tailings dam ceases a new tailings emplacement area will be established within the active mine void which would receive fine tailings throughout the remainder of the project. This future in pit tailings emplacement area is referred to as the S-Cut tailings facility (Plan 3A & 4A).

Mining operations would move progressively north which means the lowest point of the pit floor would remain down-dip (lower in the pit) of operations, allowing mining operations to continue in isolation of tailings and decant water facilities.

The Abel Project Approval enables the CHPP operations to continue after the completion of mining operations at the Bloomfield Colliery.

## 2.2 Asset Register

In accordance with MOP Guidelines (DTIRIS-DRE, 2013) an Asset Register is provided in Table 3 that lists the domains, their size and the major assets within each domain. Table 3 also lists the principal activities required for decommissioning and rehabilitation that are costed in the Rehabilitation Cost Estimate. The domain area is representative of the disturbance footprint for that domain at the start of the MOP term.

*Table 3: Asset Register*

| Domain | Size (Ha) | Major Assets | Decommissioning Activities During the MOP Term |
|---|---|---|---|
| Domain 1 – Infrastructure | 67 | • CHPP<br>• Administration Offices<br>• Warehouse<br>• Workshops<br>• Gantries<br>• Conveyors<br>• Hoppers<br>• Crusher<br>• Reclaim tunnel<br>• ROM coal pad<br>• Product coal pad<br>• Sediment dams<br>• Electricity transmission lines<br>• Substations<br>• Pipelines<br>• Sealed roads<br>• Gravel roads<br>• Explosives magazine<br>• Fuel farm<br>• Carparks<br>• Hardstand / Laydown areas | No decommissioning activities are proposed during the MOP term |
| Domain 2 – Tailings Storage Facility | 79 | • Electricity transmission line<br>• Pipelines | Decommissioning activities at the U-Cut facility are proposed to commence during the MOP term |

| Domain | Size (Ha) | Major Assets | Decommissioning Activities During the MOP Term |
|---|---|---|---|
| Domain 3 – Water Management Area | 12 | • Mine water storage dam<br>• Process water dam<br>• Clean water diversions<br>• Pipelines<br>• Electric pumps | No decommissioning activities are proposed during the MOP term |
| Domain 4 – Overburden Emplacement | 191 | N/A | N/A |
| Domain 5 – Active Mining Area | 80 | N/A | N/A |
| Rehabilitated / Relinquished Areas | 491 | • Stock yards<br>• Fencing<br>• Stock water dams | N/A |

## 2.3 Activities over the MOP Term

This section provides details of Bloomfield activities during the MOP term including:

- Exploration;
- Construction;
- Mining Operations;
- Rock/Overburden Emplacement;
- Processing Residues and Tailings;
- Waste Management;
- Decommissioning and Demolition Activities;
- Temporary Stabilisation;
- Progressive Rehabilitation and Completion; and
- Material Production Schedule during MOP Term

### 2.3.1 Exploration

No exploration activities are planned during the MOP period.

### 2.3.2 Construction

No construction activities are planned during the MOP period.

### 2.3.3 Mining Operations

The area to be mined is located in the south-western section of ML1738. Mining is currently undertaken in two pits referred to as 'S Cut' and 'Creek Cut'. Mining operations will be undertaken in both pits simultaneously.

The proposed sequence will involve mining in S Cut to advance to the north, while mining in Creek Cut advances in a southerly direction, eventually joining to create one pit. Mining in the combined pit will advance to the west and will cease with the completion of mining. The annual sequence is shown in Plan 3A to 3C which present the progressive development of the open cut and the overburden emplacement area for the MOP term.

The mining sequence presented in Plan 3A to 3C is based on a production rate of up to 1.3 Mtpa ROM coal production. (Table 4 presents the indicative mining and production schedule for the mine). Should the annual rate of mining and production fail to reach this level the sequence of mining will not alter, rather it will simply result in the presented development stages being reached over a longer time frame.

### 2.3.4 Rock / Overburden Emplacement

Waste rock mined in S Cut and Creek Cut will continue to be placed in pit behind active mining. Following blasting the overburden materials will be loaded by excavator into 180t and 220t capacity haul trucks and transported to the nominated in-pit emplacement area. Load and haul placement of the overburden material will be supplemented by throw blasting and dozer push wherever possible.

### 2.3.5 Processing Residues and Tailings

The Bloomfield CHPP coarse reject is currently mixed with overburden material and placed back into open cut pits. This process will continue throughout the MOP term, which assists in filling voids in preparation for surface rehabilitation.

Fine tailings generated by the washing process are pumped to the existing tailings dam facility. The existing tailings dam facility is an old open cut void and is referred to as U-Cut (Plan 2). As the fine tailings consolidate within the dam the excess water is decanted off and returned to the CHPP water storage dam for re-use.

The current tailings emplacement area (U-Cut) has approval under the Abel Project Approval. At current production levels (i.e. with Abel in care and maintenance) the current emplacement area is expected to reach allowable capacity during 2022. Bloomfield has approval from the Dam Safety Committee to raise the wall on the U Cut tailings emplacement area (a prescribed dam). However at this stage this option is not expected to proceed.

When tailings placement in the U-Cut tailings dam ceases a new tailings emplacement area will be established within the active mine void which would receive fine tailings throughout the

remainder of the project. This future in pit tailings emplacement area is referred to as the S-Cut tailings facility (Plan 3A & 4A).

As it is currently unknown if Abel Underground Mine would recommence operations in the future, or if Tasman Extension will commence, there are a number of variables with regard to tailings emplacement. The future tailings emplacement strategy would therefore need to be reassessed on a regular basis to consider the status of the Abel Underground Mine. The general location of the S Cut tailings area and tailings methodology are discussed in the 2017 EA (Mod 4) inside which tailings disposal could occur. This would allow the flexibility required to continue mining in the open cut pits while retaining the option to create tailings emplacement areas throughout the life of the project. The location is shown in Plan 3A to 3C.

During the MOP term the appropriate legislative approvals will be obtained to allow decommissioning and capping of the U Cut tailings emplacement area and capping operations are due to commence.

### 2.3.6 Waste Management

Key waste streams that will be generated during the MOP term consist of:

- Recyclable and non-recyclable general wastes; and
- Other wastes from mining and workshop activities (e.g. waste oils, oils filters, scrap metal and used tyres).

General waste minimisation principles (i.e. reduce, re-use and recycling) will continue to be applied at Bloomfield to minimise the quantity of wastes that require off-site disposal.

All general domestic waste and general recyclable products will continue to be collected by an appropriately licensed contractor. Records are maintained of waste streams collected by the licensed waste contractor for disposal.

Hydrocarbon contaminated soils will be treated on-site and tested in a land farm facility before disposal in open cut pit.

### 2.3.7 Decommissioning and Demolition Activities

As discussed in Section 2.1.3 and 2.3.5 the U Cut tailings facility may reach allowable capacity during the term of this MOP. During the MOP term the appropriate legislative approvals will be obtained to allow decommissioning and capping of the U Cut tailings emplacement area and capping operations are due to commence.

During the MOP term an assessment will be made of possible decommissioning and removal of areas of the clean coal stockpile area no longer required. As it is currently unknown if the Abel Underground Mine would recommence operations during the MOP term there is some uncertainty as to the stockpile area required in the future. The stockpile base material is being assessed for

use as capping material of the U Cut tailings dam. No other infrastructure is expected to be decommissioned or demolished during the MOP period.

### 2.3.8 Temporary Stabilisation

No temporary stabilisation activities are proposed during the MOP period.

### 2.3.9 Progressive Rehabilitation and Completion

The annual sequence is shown in Plan 3A to 3C which present the progressive development of the open cut and the overburden emplacement domain for the MOP term and includes:

- Areas of completed mining and overburden emplacements;
- Land under rehabilitation; and
- Water management and control structures;

During the term of this MOP there is 39 Ha of rehabilitation scheduled to be completed as shown Plans 3A to 3C (refer to Section 7.2 for details). General rehabilitation and land management activities will also continue over previously rehabilitated areas during the MOP period, including:

- Rehabilitation monitoring;
- Supplementary seeding and fertiliser application, if required;
- Slashing, fencing, and access control; and
- Weed and feral animal control.

### 2.3.10 Material Production Schedule During MOP Term

During the term of this MOP up to approximately 19.2 million $m^3$ of overburden material will be mined. Table 4 presents upper limits of the anticipated development and production schedule of the mine during the term of this MOP.

*Table 4: Production and Waste Schedule*

| Materials Production Schedule during MOP Term | | | | |
|---|---|---|---|---|
| **Material** | **Unit** | **2021** | **2022** | **2023** |
| Stripped Topsoil | $m^3$ | - | 60,000 | |
| Overburden | $m^3$ | 6,400,000 | 6,400,000 | 6,400,000 |
| ROM Coal | tonnes | 1,300,000 | 1,100,000 | 1,100,000 |
| Processing Waste* | tonnes | 600,000 | 500,000 | 500,000 |
| Product | tonnes | 700,000 | 600,000 | 600,000 |

* Abel mine currently under care and maintenance. Processing waste figure may increase if Abel operations resume commence during MOP period.

# 3 Environmental Issues Management

## 3.1 Risk Assessment

In accordance with *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* an Environmental Risk Assessment (ERA) was conducted to evaluate the environmental issues associated with the mining operations. The aim of the ERA is to identify and present effective management protocols for environmental risks associated with the mining operations.

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

- To identify the activities, aspects and possible environmental impacts associated with the operation;
- 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;
- 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.

Bloomfield has undertaken a specific rehabilitation risk assessment to identify the range of risks and associated controls throughout the life of mine to achieve sustainable rehabilitation outcomes. Further details are provided in Section 3.3 and a copy of the rehabilitation risk assessment is contained in Appendix 3.

### 3.1.1 Determination of Environmental Risk Rating

*Environmental Consequences*

The allocation of an Environmental Risk Rating was based on the Consequence descriptions contained in Table 5. The magnitude of the consequence of an event was assessed using these descriptors and assigned a Rating of 1 to 5.

*Table 5: Environmental Consequences Description*

| | | |
|---|---|---|
| 1 | Catastrophic | A major event which could cause severe or irreversible damage to the natural and/or human environment. |
| 2 | Major | An event which could have a substantial and permanent consequence to the natural and / or human environment. |
| 3 | Moderate | An event which could create substantial temporary or minor permanent damage to the natural and / or human environment. |
| 4 | Minor | An event which could have temporary and minor effects to the natural and / or human environment. |
| 5 | Insignificant | No detrimental impact on the natural and / or human environment is measured or envisaged. |

*Probability of an Incident Occurring*

The likelihood of an event occurring was considered in the ERA. The likelihood (or probability) of an impact occurring was rated according to the following descriptions on Table 6.

*Table 6: 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 |

*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 7 below.

*Table 7: Environmental Risk Rating Matrix*

| Maximum Reasonable Consequence | Probability A | B | C | D | E |
|---|---|---|---|---|---|
| 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 |

*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 8 shows the different classes of the Risk Classification System.

*Table 8: 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.

### 3.1.2 Environmental Risk Prevention Measures

A Risk Register to document the risk assessment outcomes for all aspects identified throughout the ERA process is provided in Appendix 2. 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.

## 3.2 Environmental Risk Management

An environmental management system has been established which includes implementation of environmental management commitments contained within a number of management plans and strategies which have been prepared in accordance with relevant approval conditions. The environmental management plans, strategies and programs required at Bloomfield are:

- Environmental Management Strategy (EMS);
- Noise Monitoring Plan (NMP);
- Aboriginal Cultural Heritage Management Plan (ACHMP);
- Air Quality Monitoring Program (AQMP);
- Blast Monitoring Program (BMP);
- Water Management Plan (WMP) incorporating:
    - Site Water Balance;
    - Erosion and Sediment Control Plan;
    - Surface Water Monitoring Plan; and
    - Groundwater Monitoring Program;
- Landscape Management Plan (LMP);
- Rehabilitation Management Plan (RMP);
- Final Void Management Plan (FVMP):
- Mine Closure Plan (MCP);
- Biodiversity Offset Management Plan (BOMP); and
- Energy Savings Action Plan.

These plans are available on the Bloomfield Group website (http://www.bloomcoll.com.au).

## 3.3 Specific Risks Relating to Rehabilitation

A Rehabilitation Risk Assessment was conducted to evaluate the rehabilitation issues associated with mining operations. The risk assessment outcomes for all aspects identified in the process is provided in Appendix 3.

### 3.3.1 Geology and Geochemistry

The coal bearing stratum occurring in the Project Area are the Tomago Coal Measures. These coal measures lie beneath the Newcastle Coal Measures and above the Maitland Group. The coal seams worked by Bloomfield Colliery, in descending order, are as follows:

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

Seams present as either complete seams, a number of splits of the seam, or a collection of dispersed coal bands. The Rathluba Seam is not proposed to be mined in the current mine plans.

Site geology is typified by moderately dipping strata from the eastern and western sides of the lease, forming a syncline running axially from the north-east to the south-west of the lease. There is a well-defined dyke and fault structure running from the north-north-west to south-south-east through areas where mining has been completed through both open cut and underground methods. The remaining coal reserves have no known major geological impediments.

### 3.3.2 Material Prone to Spontaneous Combustion

Experience in the stockpiling of coal at Bloomfield Colliery indicates that stored coal is not susceptible to spontaneous combustion. However, the following safeguards, controls and management measures will continue to be implemented:

- Minimising the length of time coal is held in stockpiles.
- Monitoring coal stockpiles for signs of spontaneous combustion.
- Immediately reporting incidents.
- Extinguishment by excavation, spreading and saturation with water.

Spontaneous combustion from carbonaceous material in coarse rejects produced by the CHPP is managed by incorporating the rejects with overburden prior to burying. The management measures include:

- Potential spontaneous combustion material will be placed in thin layers, only in the designated active emplacements, and to be rapidly buried with inert cover of at least 5 metre depth;
- Regular inspections of disposal areas, to identify and monitor indicators of spontaneous combustion, including surface cracking, visible smoke, and carbonaceous combustion odour;
- Corrective actions, should significant spontaneous combustion be identified; and
- Reporting of area of active spontaneous combustion in the Annual Review.
- Material to be placed in low dumps, at the toe of progressing dump to provide compaction.

Additionally Bloomfield Colliery have undertaken adiabatic self-heating testing of a known seam which occasionally displays some spontaneous combustion when not recovered. This seam, known as the “B” seam, shows a low propensity to spontaneous combustion (Figure 1).

Furthermore Bloomfield Colliery have undertaken adiabatic self-heating testing on rejects with results showing a low propensity to spontaneous combustion (Figure 2).

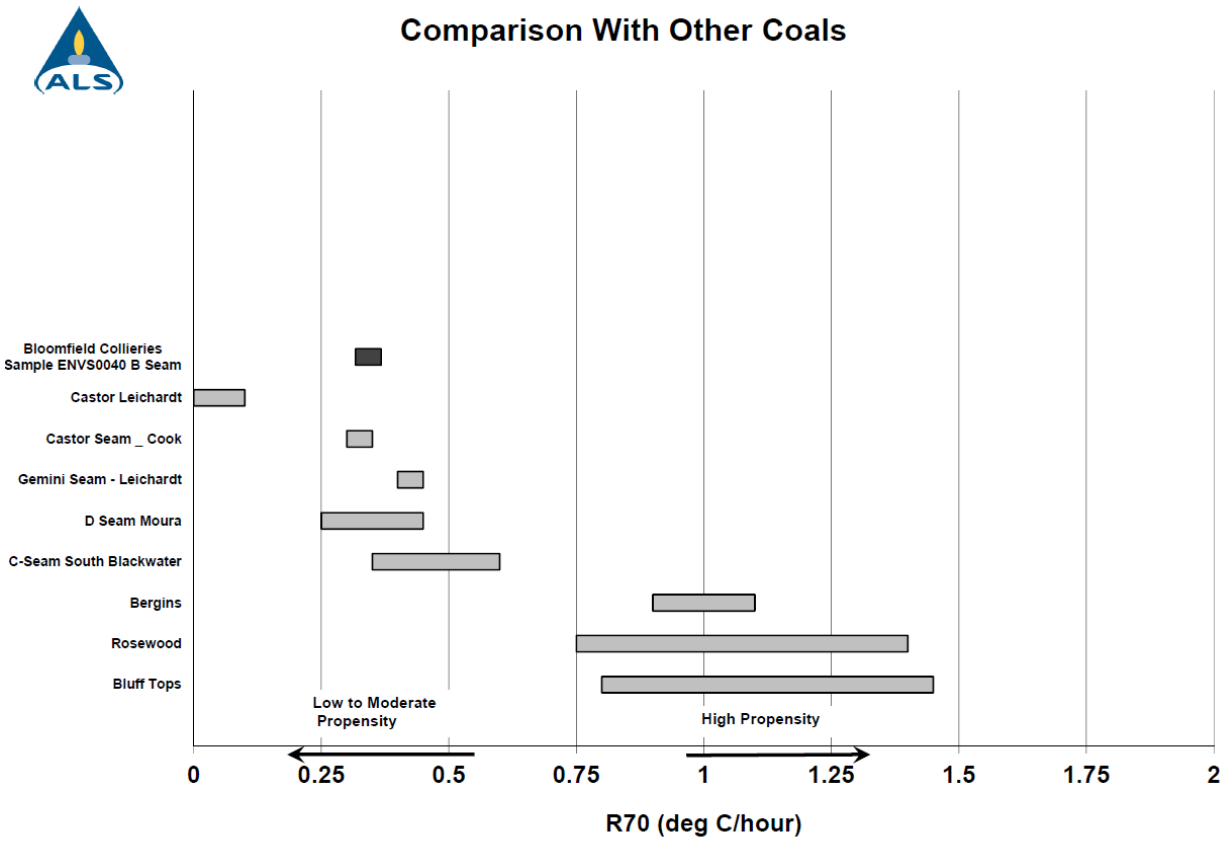


*Figure 1 - B Seam Bloomfield Colliery- Propensity for Spontaneous Combustion*

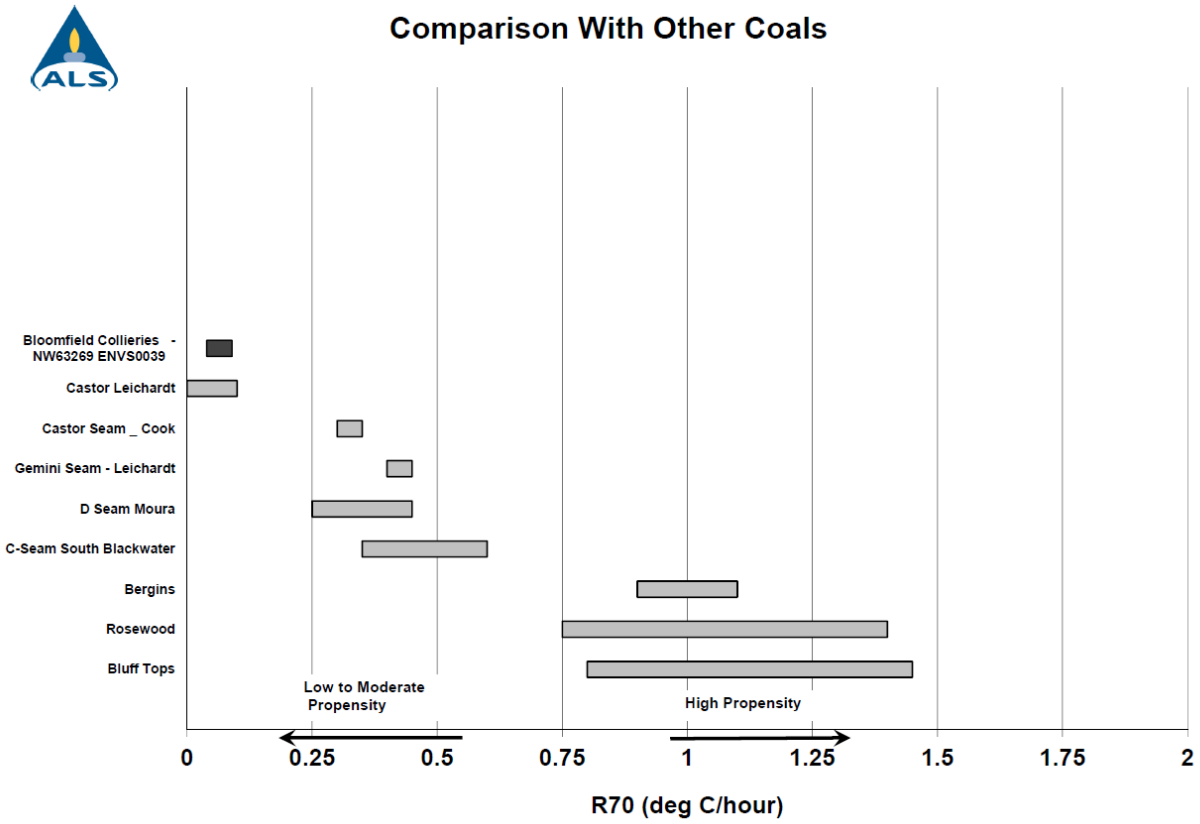



*Figure 2 - Reject Bloomfield Colliery- Propensity for Spontaneous Combustion*

In addition to the above testing, Bloomfield Colliery has commenced adiabatic self-heating testing on fine tailings material to determine its propensity to spontaneous combustion. In November 2020 a tailings sample was sent for spontaneous combustion R70 test. The results will be reported in the next Annual Review.

### 3.3.3 Material Prone to Generating Acid Mine Drainage

Historically, there has been no evidence of acid generation from overburden or interburden on the site. As such, the potential for acid rock drainage problems arising from the waste rock emplacements is considered to be low. Because of this analytical tests have not been conducted in the past. However at the start of the MOP term, to better assess the risk associated with acid production, analysis of waste rock and coarse and fine rejects will be carried out and assessed to determine if any revision to current dumping practices is required. The results will be reported in the next Annual Review.

### 3.3.4 Mine Subsidence

Mine subsidence can occur because of the amount of ground disturbance that occurs adjacent to a mine – particularly an underground mine. This MOP addresses specifically the issues relating to the open cut mine where the prevalence of ground subsidence is typically limited to the settlement of waste emplacement areas.

Areas of the Bloomfield mine site are undermined by historic underground workings. Sink holes associated with shallow workings are infrequent and if occur are located in the rehabilitated areas on the western side of the Mining Lease. If identified, the standard management procedure is to flag off and isolate the sink holes from access, back fill the holes and monitor for further subsidence. Once deemed stable, the area will then be rehabilitated and periodic inspections will continue.

During the term of the MOP staff will monitor the settlement of the waste emplacement areas for signs of uneven or excessive displacement that may alter drainage patterns or present a safety risk. If excessive displacement is identified then repair works will be carried out.

### 3.3.5 Erosion and Sediment Control

Erosion and sedimentation at Bloomfield is controlled under the *Water Management Plan* (WMP), which includes an *Erosion and Sediment Control Plan* (ESCP).

Prior to the disturbance of land associated with any mining activities at the site, appropriate erosion and sediment controls are established. Where practicable, runoff from undisturbed catchments is diverted around the mining activities via diversion drains and banks which direct water into the natural watercourses. Runoff from disturbed areas is retained on site in sediment dams and allowed to settle prior to discharge into the natural system. Drains, diversion banks and channels are compacted and stabilised as they are constructed.

General measures in place to minimise erosion and sediment mobilisation during operation include:

- Installing erosion and sediment controls prior to the disturbance of any land;
- Minimising the extent of disturbance to the extent that is practical;
- Reducing the rate of water flow across the ground particularly on exposed surfaces and in areas where water concentrates;
- Progressively rehabilitating disturbed land and constructing drainage controls to improve stability of rehabilitated land;
- Ripping of rehabilitation areas to promote infiltration;
- Protecting natural drainage lines and watercourses by constructing erosion control devices which include sediment retention dams and diversion banks and channels; and
- Restricting access to rehabilitated areas.
- Maintenance of erosion and sediment control structures

Erosion control on reshaped and rehabilitated areas is achieved by minimising the time prior to establishing vegetation. Suitable drainage densities are established with sediment detention basins being constructed in the flow lines. Sediment detention basins are also used along haul roads and around areas of disturbance; these structures are de-silted as necessary.

### 3.3.6 Soil Types and Suitability

*Topsoil Management*

The activities of stripping and stockpiling of soil resources prior to any mine-related disturbance will be undertaken in accordance with the soil resource management activities described in Table 9. These activities aim to:

- Prior to disturbance conduct soil testing to determine soil type and optimum reuse potential of the material;
- Maximise the salvage of topsoil and subsoil available for rehabilitation;
- Manage topsoil and subsoil reserves so as not to degrade the resource;
- Determine the suitability and stripping depth of soil material to be removed; and
- Ensure that the reuse of suitable soils is maximised.

A topsoil balance will be calculated annually and reported in the Annual Review. This will enable an assessment to be made of the top soil volume available for rehabilitation.

*Table 9: Soil Resource Management Activities*

| **Prior to Commencement of Stripping Activities** | **During Stripping and Stockpiling Activities** | **Prior to and During Rehabilitation Activities** |
|---|---|---|
| - Quantify the soil resource including soil testing and determine of any required ameliorants.<br>- Characterise the suitability of material for rehabilitation purposes.<br>- Formulate stripping and stockpiling guidelines specific to each activity.<br>- Guidelines are to include:<br>• Nomination of appropriate depths.<br>• Scheduling to minimise the total area disturbed or stockpiled at any one time. | - Minimise over-clearing.<br>- Keep vehicular traffic to a minimum on the soils to be stripped. Exclude all traffic from soils that are sensitive to structural degradation.<br>- Use of loaders and trucks rather than scrapers to minimise structural degradation.<br>- Selective stockpiling of soil according to type (i.e. topsoil, subsoil).<br>- Storage of soil in a manner that does not compromise the long term viability of the resource. | - Stockpiles to be sampled prior to re-use to characterise suitability for use in rehabilitation and determine what amelioration may be required.<br>- Implement amelioration measures to ensure the long term viability of the soil resource and manage salinity.<br>- Progressive rehabilitation of final landforms as soon as practicable after completion of mine-related disturbance activities. |

| Prior to Commencement of Stripping Activities | During Stripping and Stockpiling Activities | Prior to and During Rehabilitation Activities |
|---|---|---|
| • Location of areas to be stripped and stockpile locations. | - Weed management to prevent germination/succession of exotic species. | |

*Soil Stockpile Management*

The following soil stockpile management practices will be used to increase the long term viability of the soil resources in stockpiles:

- Topsoil stockpiles are to be located outside of proposed mining areas and away from slopes and drainage lines where possible;
- Stockpiles will be constructed with a "rough" surface condition to reduce the risk of erosion, improve drainage and promote revegetation;
- Topsoil stockpiles will be no deeper than three metres in order to minimise problems with anaerobic conditions;
- Fertilise and seed stockpiles to maintain soil structure, organic matter and microbial activity, whilst areas which are to be inactive for extended periods may be seeded with the final species mix;
- Stockpiles will be located to prevent runoff leaving the site;
- The appropriate soil ameliorant be applied at an appropriate rate to dispersive soil stockpiles where necessary; and
- Implement appropriate weed control strategies particularly for any noxious weeds. Immediate revegetation will provide vegetative competition to assist with control of undesirable plant species.
- New stockpiles surveyed to estimate volume after soil stripping campaign.
- Soil stockpiles will be sampled prior to re-use to characterise suitability for use in rehabilitation and determine what amelioration works may be required to ensure the needs for rehabilitation can be met.

*Soil Ameliorants*

Soils throughout the project area are generally low in organic matter and nutrients suitable for the establishment of pastures and overstorey species. These factors reduce the availability of nutrients and may create an unfavourable microclimate for germination of plant seeds. The key management practices to rectify these issues are:

- Application of the appropriate amount of soil ameliorant and fertiliser;
- The establishment of a cover crop for soil protection purposes and improvement in organic matter levels; and

- Use of imported organic materials such as bio-solids, mulch, and municipal waste compost.

### 3.3.7 Flora and Fauna

Flora and fauna surveys were carried out over the future mining areas as part the Environmental Assessment process and the subsequent Project Approval modification. One of the vegetation communities identified, the *Lower Hunter Spotted Gum – Ironbark Forest*, is listed as an Endangered Ecological Community in the Biodiversity Conservation Act 2016. A total 123 native plant species were recorded with no threatened flora species identified. A total of 73 native vertebrate fauna species were recorded of which 6 species identified are listed as Vulnerable under the BC Act. The 6 consisted of 1 bird species and 5 bat species.

Bloomfield has put in place measures to minimise impacts on flora and fauna on the site including the following:

- Implement the Rehabilitation Management Plan for the mine site.
- Clearly define all approved areas to be cleared.
- Undertake progressive rehabilitation of all disturbed areas.
- Control noxious weeds.
- Adopt a strategy to rehabilitate specific areas of the mine site to native vegetation;
- Conserve the existing native vegetation in non-mining area of the mine site during the life of the project and in the final landform.
- In areas where tree clearing is approved, carry out, where possible, tree removal, especially the mature trees in late spring and early autumn to avoid spring nesting birds and disturbance to roosting bats over the winter period.
- Undertake inspections of mature trees for nesting birds and roosting bats prior to each clearing campaign where mature tree with hollows are to be removed.
- Relocate any nesting and roosting hollows, as well as nests, used by listed threatened species to appropriate locations nearby.
- Establishment of a 40 Ha Biodiversity Offset Area to compensate for the loss of vegetation.

*Weeds and Pests*

Weed management at Bloomfield is controlled under the *Weed Management Plan.* Appropriate noxious weed control methods and programs are being undertaken in consultation with the local council weeds control officers. This program of inspection and eradication will continue as part of the post-mine ongoing maintenance program. The weed management will be required for the life of the project to ensure that no lasting legacy is left at the completion of operations at Bloomfield Colliery.

The mine site will be regularly inspected for weeds, particularly areas being revegetated, as part of a monitoring program aimed at assessing the success of rehabilitation. Additional monitoring

or eradication will be undertaken at the request of weeds inspectors of Local Councils. The results of all monitoring will be included in the relevant Annual Review.

Periodic feral animal control programs have been undertaken in conjunction with neighboring mines. Activities have included wild dog baiting programs. These programs will continue in future on an as need basis.

### 3.3.8 Air Quality

Bloomfield has put in place many measures to control dust around the site including the following:

- Dust generating activities will be temporarily ceased when protracted dry periods and/or high winds lead to significant dust generation and dispersal towards the surrounding residences.
- Where practicable, soil stripping will be undertaken at a time when there is sufficient soil moisture to prevent significant lift-off of dust.
- Bloomfield will avoid stripping soil in periods of high winds.
- The drill rig will utilise water injection or alternatively, be fitted with dust collectors.
- Blast hole stemming will be used to prevent venting of explosion gases.
- Blasting will be conducted only after low-level atmospheric temperature inversions have dissipated.
- Ripping of softer overburden material will be avoided during periods of high wind.
- Avoiding directing the placement of overburden into high emplacement dumps during periods of high wind.
- All conveyors will be fitted with appropriate cleaning and collection devices to minimise the amount of material falling from the return conveyor belts.
- Clear definition of any access or haul roads and the restriction of vehicles and equipment to those roads.
- Routine application of water with or without chemical dust suppressants.
- Progressive rehabilitation of areas of disturbance including topsoil and subsoil stockpiles.
- Internal haul roads will be regularly watered. The frequency of water application to the various internal haul roads and exposed surfaces will be dependent on climatic factors.
- Limit vehicle speeds.
- The use of a predictive meteorological modeling software program is utilised to assist in planning mine operations. The software incorporates regional weather station data to predict daily weather events that may exacerbate dust impacts from operations.

Dust monitoring is carried out in accordance with the Air Quality Monitoring Program (AQMP). The dust monitoring program in place comprises:

- 10 dust deposition gauges located on and around the mine lease area;
- 2 High Volume Air Samplers (HVOL); and
- 2 Dustrak units located upwind and downwind of the mining area.

Results of the monitoring program are reported in the Annual Review.

### 3.3.9 Surface Water

Surface water is managed in accordance with the Water Management Plan (WMP). The Plan prescribes the process water source and supply requirements, site-water balance, storage, impact management and monitoring of surface water in the vicinity of the mining operations. The water management system has been designed with three primary goals and objectives:

- Separation of clean water and mine water;
- Safe storage and priority use of mine water on-site;
- Management of water that is discharged so as to preserve the environmental values of Four Mile Creek and comply with the conditions of EPL 396.

Water quality data from surface water quality monitoring points at Bloomfield are documented in the Annual Review available on the website. In meeting the water management objectives, the following components of the system have been constructed or implemented.

*Mine Water*

Bloomfield has two major mine water storage facilities referred to as Lake Kennerson and Lake Foster. Water pumped from the open cuts (S Cut and Creek Cut) reports via open drains to Lake Kennerson. Run off from disturbed areas (i.e. high wall, haul roads, overburden dumps awaiting rehabilitation) which has the potential to carry suspended solids, is also directed to Lake Kennerson.

Lake Kennerson has a valve controlled pipe which, when opened, feeds to Lake Foster. Lake Foster also receives decant water from the tailings storage facility and water from sediment dams which collects the runoff from the CHPP and coal stockpile pads. Mine water is pumped, primarily from Lake Foster, to the CHPP for use in coal processing and for dust suppression spraying on the coal stockpile pads.

Mine water is discharged, via lockable valve pipes, into an open drain that flows to Four Mile Creek. Discharges are undertaken in accordance with conditions of the Environmental Protection Licence (EPL 396). Water samples are collected during discharge for independent water quality analysis. A monitoring station located downstream in Four Mile Creek continuously measures electrical conductivity (EC) and water level. Monthly background sampling is conducted in Lake Kennerson, Lake Foster and various upstream and downstream watercourses.

*Clean Water*

Run off from undisturbed and rehabilitated areas is directed away from operational areas and mine water storages via diversion banks and channels. These banks and channels direct this run off into clean water dams or natural watercourses. The major clean water storage dam is Possums Puddle. No clean water is accessed for operational purposes and these dams overflow into natural drainage systems. Further isolation of smaller rehabilitated catchment areas from the mine water system will continue as rehabilitation work progresses.

The major natural creek running through the site is Four Mile Creek. Most of the operational mining areas at Bloomfield are located within the catchment of Four Mile Creek. A series of drains and levees direct Four Mile Creek around Lake Foster (mine water storage) and into Possums Puddle (clean water storage). From Possums Puddle clean water overflows back into Four Mile Creek.

### 3.3.10 Groundwater

Groundwater is managed in accordance with the Water Management Plan (WMP). The Plan prescribes the process water source and supply requirements, site-water balance, storage, impact management and monitoring of groundwater in the vicinity of the mining operations.

The groundwater monitoring plan identifies locations and schedule for monitoring. The objectives of ongoing groundwater monitoring are to identify potential physical and/or chemical water quality impacts, identify and confirm trends.

Groundwater monitoring results are documented in the Annual Review available on the Bloomfield website.

### 3.3.11 Contaminated Land

No contaminated or polluted land has been identified and as such no specific management controls or monitoring procedures are required.

### 3.3.12 Blasting

Particular attention is applied in all areas of drill and blast from design through to initiation towards minimising disruption to the environment through reduction of blast overpressure, dust generation and vibration. Management controls include the following.

- Ensure all blasts are designed to comply with blast limits specified in the Environment Protection Licence.
- Blast design and implementation will be undertaken by a suitably qualified blasting engineer and/or experienced and appropriately certified shot-firer.
- The blast face, where practical, will be oriented away from or at an oblique angle to nearby residences.
- Blast hole spacing will be implemented in accordance with blast design.
- Appropriate burden distance and stemming length will be selected and then implemented precisely.
- Appropriate materials for stemming will be used, eg. 20mm aggregates.
- The use of predictive meteorological modeling software is utilised to plan blasting operations.

Blast monitoring is carried in accordance with the Blast Monitoring Program (BMP) prepared for the mine. A network of 4 blast monitors is utilized to monitor the impacts of blasting. All blasts and resultant dust plume are video recorded. Blast monitoring results are documented in the Annual Review available on the Bloomfield website.

### 3.3.13 Noise

The following safeguards, controls and management measures will continue to be implemented:

- Construct the out-of-pit overburden emplacement to provide an acoustic barrier between the open cut and non-project-related residences.
- In adverse conditions placement of overburden on the out-of-pit emplacements will be avoided as far as practicable during night-time operations.
- Confine operations to lower levels of the in-pit overburden emplacement to mitigate noise exceedances under adverse wind conditions, ie. avoid operations on elevated section of the overburden emplacements during inversions and N and NW winds.
- All equipment used on site will be regularly serviced to ensure the sound power levels remain at or below the levels used in the modelling to assess generated noise levels and compliance with the criteria.
- Cladding has been fitted surrounding the washery to reduce noise levels generated by the washery.
- Mid-high frequency broadband reverse beepers are fitted to mobile mining equipment, decreasing sound power levels by 2 dB(A) to 3 dB(A).
- The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads.
- Maintain dialogue with neighbours and local community to ensure any concerns over operational or transport noise are addressed.
- The use of predictive meteorological modeling software is utilised to plan daily operations.

Monitoring will continue to be undertaken in accordance with an approved Noise Monitoring Program (NMP). Attended and unattended quarterly noise monitoring is undertaken to assess noise impacts against relevant criteria detailed within the Development Consent at five monitoring locations. The Noise Monitoring Program also includes a Noise Monitoring Protocol which provides detail of the steps to be taken in the event of noise complaint or non-compliant monitoring results.

### 3.3.14 Visual and Lighting

The following controls are being implemented by Bloomfield:

- A buffer zone of native bush land is maintained around the site to screen mining and processing operations.

- Progressive rehabilitation of all disturbed areas within the mine site will continue to be undertaken. Ongoing rehabilitation by Bloomfield Colliery will improve the visual quality for residences with a view of the current mining operations, especially to the south of the mining area.
- Priority will be given to the completion of rehabilitation along the southern boundary of the site. This would reduce any potential visual impact, especially for residents in the Buttai Valley and users of John Renshaw Drive.
- Lighting impacts should be kept to the minimum necessary for operational and safety needs. Where possible, lights should be utilised at the lowest effective level and directed away from incoming views, in particular, Buttai Valley, John Renshaw Drive and Ashtonfield.
- All lighting should be directed to the ground and to within the work area and avoid being cast skyward or over long distances.
- Procedures are in place to ensure lighting does not shine directly toward residences in any direction. Staff and management will continue to be trained in the management of night lighting.

### 3.3.15 Heritage (Aboriginal and European)

Aboriginal and cultural heritage at the site is managed under the approved Aboriginal Cultural Heritage Management Plan (ACHMP). This document sets out the procedures for the protection of Aboriginal sites as well as the salvage and care of Aboriginal objects found within the operational activities. Additional objectives of the Plan are to:

- To establish an ongoing Aboriginal stakeholder consultation process;
- To describe the manner in which certain Aboriginal sites will be salvaged;
- the importance of ongoing consultation with Aboriginal stakeholders during mining; and
- To describe a program for Aboriginal site survey and assessment in areas not addressed by the original EA.

No items of European Heritage are present within the operational areas.

### 3.3.16 Bushfire

Bloomfield has implemented a number of measures and safeguards to minimise bushfire risk which include:

- Fitting fire extinguishers to all earthmoving and mining equipment;
- Maintaining fire trails and access roads within the lease area and on Bloomfield and Ashtonfield Pty Ltd owned land, which serve as access for firefighting services as well as establishing a fire break;
- Regular slashing of boundary fences of the lease area and on Bloomfield and Ashtonfield Pty Ltd owned land which serve as establishing a fire break;

- Regular slashing of Bloomfield owned grazing properties surrounding the lease area to reduce potential grass fire fuel loads;
- Regular contact with Rural Fire Service to assess fuel loads in native bushland surrounding and within the mining operational areas and undertaking hazard reduction burns as deemed necessary;
- On-site water carts with firefighting capabilities.

# 4 Post Mining Land Use

## 4.1 Regulatory Requirements

The regulatory requirements specific to post mining land use and rehabilitation outcomes at Bloomfield are summarised in Table 10.

*Table 10: Regulatory Requirements*

| Section / Condition | Area | Requirement |
|---|---|---|
| **PA 07_0087** | | |
| Schedule 3 Condition 25 | ML 1738 | The proponent must rehabilitate the site to the satisfaction of DRG and the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the documents in condition 2 of Schedule 2 and comply with the objectives in Table 5 of PA 07_0087 (Mod 4). |
| Schedule 3 Condition 25A | ML 1738 | The Proponent must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated. |
| Schedule 3 Condition 26 | ML 1738 | The proponent must prepare a detailed Landscape Management Plan for the project to the satisfaction of the Secretary and DRG. This plan must include a: |
| Schedule 3 Condition 27 | Rehabilitation Areas | Rehabilitation Management Plan |
| Schedule 3 Condition 28 | Final Void | Final Void Management Plan |
| Schedule 3 Condition 29 | ML 1738 | Mine Closure Plan |
| **ML 1738** | | |
| Condition 2 | ML 1738 | Any disturbance as a result of activities under this mining lease must be rehabilitated to the satisfaction of the Minister. |

| Section / Condition | Area | Requirement |
|---|---|---|
| **AMA1001** | | |
| Schedule Condition 1 | AMA1001 | The leaseholder must rehabilitate the land described in Schedule C that is or may be affected by the carrying out of the ancillary mining activities |
| **CCL761** | | |
| Condition 2 | CCL761 | Any disturbance as a result of activities under this lease must be rehabilitated to the satisfaction of the Director-General. |

### 4.1.1 Four Mile Creek Rehabilitation and Closure Plan (2004)

Bloomfield has entered into a commercial lease agreement with the majority landowner, Ashtonfields Pty Ltd, with regards to rehabilitation obligations for disturbed land at Bloomfield. In the document, Bloomfield Mine is referred to as 'Four Mile Creek Mine'. The agreement sets out general obligations such as the requirement to provide a safe and stable landform. It also sets out specific criteria for the removal of infrastructure and the rehabilitation of overburden dumps, roads, final voids, dams and tailings emplacements. Henceforth, the plan is referred to as the 'Ashtonfield Agreement'.

It is understood if alternative landforms or landuse other than currently approved under the Project Approvals is required under the Ashtonfields Agreement or through the Stony Pinch consortium that either a modification to the Project Approvals or a new approval would be required under the Environmental Planning and Assessment Act (1979). It is also understood that any infrastructure noted to remain in the Ashtonfields agreement would also require either project modification or a new approval.

## 4.2 Post Mining Land Use Goal

### 4.2.1 Factors Influencing Post-Mining Landform and Land Uses

A range of final land uses for the Project Area have previously been considered by Bloomfield and the landowner. Selection of an appropriate post-mining land use and development of a suitable post mining landform is discussed in the 2017 EA (Mod 4) and is an integral part of this MOP. Factors influencing the selection of an appropriate post-mining landform and land use are:

- DPI&E requirements with regard to landform stability and safety;
- The Hunter Regional Plan 2036 (DP&E, 2016) a 20 year blueprint for the future of the Hunter region. The vision is to create a leading regional economy in Australia with a biodiversity-rich natural environment, thriving communities and greater housing choice

and jobs. Therefore any decisions regarding the post-mining landform and land use would need to take this, and any additional detailed plans that may be prepared in the future, into consideration;

- The majority of the mining lease area is owned by Ashtonfields Pty Ltd and any decision regarding post mining landform and land use will take the obligations under the commercial lease agreement between Bloomfield and Ashtonfields Pty Ltd (Ashtonfield Agreement) into consideration (Refer Section 4.1.1);
- The Stony Pinch Consortium has been established by the major landowners of the site and surrounds to act as a coordinated and single entity in the planning and development of the overall site. The consortium includes Bloomfield, Ashtonfields, and Yancoal to develop the large combined landholdings of the member companies post mining. A legal agreement between the landowners ensures that individual landowner interests in the site are replaced by a single, shared interest in all land use and development outcomes. As outlined in the 2017 EA (Mod 4), an indicative final land use plan has been developed and the plan has been issued to Council and regulatory authorities for consideration; and
- The Bloomfield CHPP, rail loading facility and associated infrastructure may continue to operate after Bloomfield Colliery commences closure, if Abel Colliery recommence mining under Project Approval PA 05_0136. If this occurs The Bloomfield Group will investigate transfer of responsibility of the rail loading facility and associated infrastructure to Yancoal while completing closure of the Bloomfield Colliery.
- Bloomfield Colliery and the "Bloomfield Site" (as defined under PA 05_0136) will be rehabilitated in general accordance with the final landform and landuse defined in PA 07_0087 Bloomfield Colliery and the Rehabilitation Management Plan as required under PA 05_0136 for the "Bloomfield Site". It is understood if other landforms or landuse are required under the Ashtonfields Agreement or through the Stony Pinch consortium that either a modification to the Project Approvals or a new approval would be required under the Environmental Planning and Assessment Act (1979).

### 4.2.2 Consideration of Alternative Final Landforms and Uses

#### 4.2.2.1 Alternative Final Landforms

One approved option for the final landform incorporates a final void on the Bloomfield Colliery site to be used as a tailings facility for the ongoing operations at Abel Underground Mine. With the Abel Underground Mine currently in care and maintenance, the final landform presented as part of this MOP would depend on whether the Abel Underground Mine resumes operations prior to commencement of Bloomfield Colliery closure, therefore final landform designs have been prepared for two scenarios:

- One which assumes Abel Underground Mine resumes operations; and
- A second scenario which assumes the Abel Underground Mine remains in care and maintenance.

The indicative final landform for both of these scenarios is shown in Plan 4A and Plan 4B of the Bloomfield Colliery Project Approval.

Bloomfield Colliery have commenced initial Mine Closure Planning with the following assumptions;

- The Open Cut Areas as approved under PA 07_0087 (Bloomfield Open Cut) will be closed and rehabilitated with no further access provided for Yancoal's Abel Mine tailings.
- The final landform will be constructed in general accordance with the conceptual final landform as approved under PA 07_0087 Appendix 4 (Plan 4A) with no allowance for the Abel Project.
- U-Cut tailings facility as approved under PA 05-0136 will be capped and rehabilitated.
- Any variation to the final landuse outside the Project Approval will require either Project Modification or subsequent separate Development Approval under the NSW Environmental Planning and Assessment Act 1979.
- The coal handling preparation plant and associated conveyors and structures as approved under PA 05-0136 will be demolished and rehabilitated pending requirements of Yancoal. (If decision is made by Yancoal to continue to utilise the CHPP, TBG will investigate options for transfer of responsibility of the Mining Lease at time of the Bloomfield Site closure.
- The Bloomfield rail loop is approved under DA 103-5-242-90 (Maitland Council) is outside ML1738. The Bloomfield Group are investigating possible uses of this infrastructure which is outside the scope of this document.

#### 4.2.2.2 Alternative Final Land Uses

Alternative final land uses considered in the 2008 EA include residential, industrial, open forest / bushland or undulating grazing land / rural landscape.

It is noted that any alternative Final Land Use will require Modification to the Project Approval or alternatively an approved Development Consent under the EP&A Act.

Details of these alternatives, with respect to the considerations presented in Section 4.2.1, are provided as follows.

*Residential Land Use*

The current zoning of the Project Area is 1(a) Rural 'A', and as such no residential or rural residential development is currently permissible. There are no regional or local plans that currently

identify the area as being required for residential land use. The Hunter Regional Plan 2036 does not identify the mine site for future residential development. As the Hunter Regional Plan 2036 is progressed, residential development may be included in those parts of the mine site identified as reaching satisfactory safety and stability criteria associated with such development.

*Industrial Land Use*

The site and surrounding area has previously been identified as having potential for industrial-type uses in the future. Bloomfield consider that the mine site area should be rehabilitated in such a way that does not conflict with this future land use. Such rehabilitation would mean providing a flat to undulating topography suitable for mixed use industrial, seeded with grasses to stabilise, together with areas of trees for habitat, until such time as detailed determinations are made regarding any future industrial use of the site. Should no such future development eventuate, the site would remain as a stable, rural landscape.

*Open Forest / Bushland*

Previously mined areas adjacent to and parts of the current active areas have been rehabilitated to grazing land with areas of trees over pasture. Due to visibility of parts of the Bloomfield site from outside areas and the proximity of bushland to the west and east and the desire to provide ongoing habitat opportunities for fauna, Bloomfield consider it important to incorporate areas of trees over pasture into its rehabilitation plans and in general accordance with the Project Approval.

*Undulating Grazing Land / Rural Landscape*

This option would rehabilitate the mine site area to undulating grazing landform consistent with its pre-mining land capability, while still providing areas of native vegetation to enhance biodiversity and aesthetic values. This option provides local habitat opportunities and linkages with adjacent remnant native vegetation. This land use type allows Bloomfield to progressively rehabilitate the mine site area to a stable landform that minimises erosion and sedimentation.

### 4.2.3 Preferred Post-Mining Landform and Final Landuse

As discussed in Section 4.2.2.1, Option 4 is the preferred post-mining landform. The indicative final landform for Option 4 is shown in Plan 4A. Option 4 was considered to be the best option as it achieves the following:

- Allows Bloomfield to offer continued employment on the site and to service existing contracts and provides the economic and flow on benefits to the local community by developing the remaining coal reserves (as opposed to Option 1);

- A resulting landform which offers the best shape and slope for post mining commercial utilisation by the land owner;
- Removal of highwalls from the final landform which reduces the public safety risk; and
- Reduction in the extent of higher elevation land which reduces the visual impact for surrounding landholders.

After consideration the conceptual land use options discussed in Section 4.2.2.2 and the requirements under the Lease Agreement with Ashtonfields Pty Ltd, Bloomfield has determined that rehabilitated land may be suitable for a variety of future land uses, whilst enabling the retention of habitat areas. As the site and surrounding area has been identified as having potential for industrial-type uses in the future, Bloomfield consider that the mine site area should be rehabilitated in such a way that does not conflict with this future land use and in accordance with the conceptual final landform as approved under PA 07_0087. Such rehabilitation would mean providing a flat to undulating topography suitable for mixed use industrial, seeded with grasses to stabilise, together with areas of trees for habitat, until such time as detailed determinations are made regarding any future industrial use of the site. Should no such future development eventuate, the site would remain as a stable, rural landscape.

The mine site area is therefore proposed to be rehabilitated in accordance with its pre mining land capability to create a stable, undulating landscape with a mix of pasture and tree areas suitable for grazing and general habitat in accordance with the conceptual final landform as approved under PA 07_0087.

## 4.3 Project Rehabilitation Objectives

The current aim of rehabilitation at Bloomfield Colliery is to provide a safe and stable landform, compatible with the surrounding landscape, which allows for a range of possible post-mining land-uses including mixed-use development as stated in Section 4.2.3 above.

### 4.3.1 General Rehabilitation Objectives

- Land will be rehabilitated in accordance with relevant Regulator standards applicable at the time of rehabilitation;
- Rehabilitated land will represent a minimal source of off-site environmental impacts, such as dust, water pollution, visual amenity and weeds;
- Infrastructure owned by Bloomfield Colliery must be removed under the terms of its Commercial Lease with the landowner (Ashtonfields). Any remaining infrastructure will be subject to appropriate approvals in accordance with Table 5 of the Project Approval 07_0087 or subsequent development approval under the EP&A Act.;
- Rehabilitated land will require ongoing management inputs no greater than similar adjacent land; and

- Rehabilitation will be compatible with the approved post-mining land-use while being generally compatible with other land uses if subsequently approved (mixed-use development).

### 4.3.2 Landform Objectives

- Rehabilitated land will be safe and stable;
- Land capability will be returned to a class similar to that existing prior to the commencement of mining; and
- Mined land will be re-contoured to a landform compatible with the surrounding natural landscape.

### 4.3.3 Vegetation Objectives

- Rehabilitated land will be top-dressed, fertilised and sown with tropical grass seed or native vegetation species for areas of tress over pasture; and
- A sustainable vegetation cover will be established on rehabilitated land.

### 4.3.4 Additional Objectives

In addition, rehabilitation objectives will align to Table 11.

*Table 11: Rehabilitation Objectives*

| Feature | Objective |
|---|---|
| All areas of the site affected by the project | • Safe, stable and non-polluting<br>• Fit for the intended post-mining land use/s |
| Areas proposed for native ecosystem re-establishment | • Restore self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area.<br>• Establish areas of self-sustaining:<br>  ○ riparian habitat, within any diverted and/or re-established creek lines and retained water features;<br>  ○ potential habitat for threatened flora and fauna species; and<br>  ○ wildlife corridors, as far as is reasonable and feasible. |
| Areas proposed for agricultural land | • Establish/restore grassland areas to support sustainable agricultural activities<br>• Achieve the nominated land capability classification |

| | |
|---|---|
| Other land affected by the development | • Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native plant species (unless DRG agrees otherwise) |
| Final Landform | • Stable and sustainable for the intended post-mining land use/s<br>• Integrated with surrounding natural landforms<br>• Incorporate micro-relief and drainage lines that are consistent with surrounding topography, to the greatest extent practicable<br>• Maximise surface water drainage to the natural environment (excluding final void catchment) |
| Final voids | • Designed as long term groundwater sinks to maximise ground water flows across back filled pits to the final void<br>• Minimise to the greatest extent practicable:<br>o the size and depth of final voids;<br>o the drainage catchment of final voids;<br>o any high wall instability risk; and<br>o the risk of flood interaction |
| Creek restoration works | • Engineered to be hydraulically and geomorphologically stable<br>• Incorporate erosion control measures based on vegetation and engineering revetments<br>• Incorporate structures for aquatic habitat<br>• Revegetate with suitable native species |
| Surface infrastructure of the development | • To be decommissioned and removed, unless DRG agrees otherwise |
| Rehabilitation materials | • Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources, to the greatest extent practicable |
| Water quality | • Water retained on the site is fit for the intended post-mining land use/s<br>• Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation |
| Community | • Ensure public safety<br>• Minimise adverse socio-economic effects associated with mine closure |

**Source: PA 07_0087 Sch 3 Cond 25. Table 5**

# 5 Rehabilitation Planning

## 5.1 Domain Selection

In accordance with the ESG3 Mining Operations Plan (MOP) Guidelines, the primary domains have been defined on the premise of land management units within the mine site, usually with unique operational and functional purpose and therefore similar geophysical characteristics. Secondary Domains are defined as land management units characterised by a similar post mining land use objective.

The primary and secondary domains are to the defined together with the codes which have been allocated for each domain as shown in Table 12.

The purpose of this MOP is to focus on all mine disturbed land and the associated rehabilitation, accordingly unmined lands which form part of the Mining Lease and are not directly impacted have not been included as domain.

*Table 12: Primary and Secondary Domains*

| Primary Domain | | Secondary Domain | |
|---|---|---|---|
| 1 | Infrastructure Area | A | Final Void |
| 2 | Tailings Storage Area | B | Water Management Area |
| 3 | Water Management Area | C | Rehabilitated Area - Pasture |
| 4 | Overburden Emplacement | D | Rehabilitated Area - Trees over Pasture |
| 5 | Active Mining Area | E | Infrastructure |
| | | F | Relinquished Lands |

Plans 2, 3A, 3B and 3C show the domains relevant to Bloomfield. Plan 4A and 4B shows the proposed final landform and post-mining land use secondary domains.

## 5.2 Domain Rehabilitation Objectives

General rehabilitation objectives are outlined in Section 4. The rehabilitation objectives for each mine domain are presented in Table 13.

*Table 13: Domain Rehabilitation Objectives*

| Code | Domain Name | Rehabilitation Objectives |
|---|---|---|
| 1 | Infrastructure Areas | All infrastructure will be subject to obtaining appropriate approvals.<br>All buildings, fixed plant and powerlines will be demolished and removed from the site unless subsequent approvals<br>Designated roads, services and powerlines will be justified and left for landuse access, bushfire access, easement access or access for Hunter Water. Roads will be left in a maintained condition at the end of operations. Other roads which are not justified or do not obtain other approval will be deep ripped and sown with a pasture grass seed mix suitable for grazing.<br>The landform will be re-graded and contoured to be compatible with surrounding natural landscape.<br>All areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with native trees to establish trees over pasture with species similar to the surrounding vegetation community. |
| 2 | Tailings Storage Area | All tailings infrastructure will be removed and tailings capped and rehabilitated.<br>Use of rehabilitated tailings emplacements for post-closure infrastructure is unlikely due to increased stability risks, and rehabilitation will consist of stable, undulating, self-draining, landforms with a cover of pasture grass. |
| 3 | Water Management Area | The major water storage dams will remain after operations cease for stock water in alignment with the approved landuse. After removal of associated infrastructure, disturbed areas will be seeded with a pasture grass seed. Remaining infrastructure will be subject to obtaining appropriate approvals. |
| 4 | Overburden Emplacement | The landform will be graded and contoured to be compatible with surrounding natural landscape. Shaped overburden emplacement areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with native trees to establish trees over pasture with species similar to the surrounding vegetation community. This will result in a mix of rural pasture and habitat enhancement areas blending with the surrounding landscape. |
| 5 | Active Mining Area | After mining operations conclude the remaining final void will be utilised as a rejects disposal area. After operations are completed the landform will be graded and contoured to be compatible with surrounding natural landscape as far as possible.<br>The mining void remaining in the post mining landscape will be safe, stable and non-polluting. |

| | | |
|---|---|---|
| | | Final void batters will be seeded with a pasture grass seed mix suitable for grazing or seeded with native trees to establish trees over pasture with species similar to the surrounding vegetation community. |
| **Code** | **Domain Name** | **Rehabilitation Objectives** |
| C & D | Rehabilitated Areas | These areas require maintenance and monitoring only. Maintenance may include periodic fertiliser application, weed management and soil conservation works. |

## 5.3 Rehabilitation Phases

The fundamental rehabilitation objective for Bloomfield is to create stable, non-polluting post mining landforms and allow the achievement of the agreed post mining land use. This will be achieved through a series of conceptual phases which are described as:

1. Decommissioning – removal of hard stand areas, buildings, contaminated materials, hazardous materials;
2. Landform Establishment – incorporates slope, aspect, drainage, substrate material characterisation and morphology;
3. Growth Medium Development – incorporates physical, chemical and biological components of the growing media and ameliorants that are used to optimise the potential of the media in terms of the preferred vegetative cover;
4. Ecosystem and Land Use Establishment – incorporates revegetated lands and habitat augmentation, species selection, species presence and growth together with weed and pest animal control /management and establishment of flora;
5. Ecosystem and Land Use Sustainability – incorporates components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape; and
6. Rehabilitation Complete – completion criteria for rehabilitation are met and the land is determined to be suitable to be relinquished from the mining tenement.

A summary of the rehabilitation phases proposed for completion at the end of the MOP term is provided in Table 14.

*Table 14: Rehabilitation Phases Proposed for Completion at the End of the MOP Term*

| Rehabilitation Phase | Domain | | | | | |
|---|---|---|---|---|---|---|
| | Infrastructure Areas | Tailings Storage Area | Water Management Area | Overburden Emplacement | Active Mining Area | Rehabilitated Areas |
| Active | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Phase 1 Decommissioning* | | ✓ | | | | |
| Phase 2 Landform Establishment | | ✓ | | | | |
| Phase 3 Growth Medium | | | | | | |
| Phase 4 Ecosystem and land use establishment | | ✓ | | ✓ | | ✓ |
| Phase 5 Ecosystem and land use sustainability | | | | | | ✓ |
| Phase 6 Rehabilitation Complete | | | | | | |

* Note: U-Cut tailings facility expected to commence decommissioning during the MOP term.

For further information on Relinquished Lands refer to Section 7.4. The objectives, criteria and performance indicators for the domains for each rehabilitation phase are provided in Table 15.

# 6 Performance Indicators and Completion Criteria

In accordance with the ESG3 Mining Operations Plan (MOP) Guidelines the performance criteria, measure and indicators have been defined for each domain in context of the phase of the rehabilitation program. This includes the following:

- Nomination and justification of *performance measures*. Performance measures are used to quantify the rehabilitation and land management programme in terms of efficiency or effectiveness and establish the indicative timeframes for completion, and the standards of completion;
- Identification of *performance indicators* of the biophysical environment or where applicable; the built environment that can be measured reliably over time using accepted scientific techniques and standards i.e. Australian Standards; and
- Establishment of the *performance/completion criteria* for each indicator which quantitatively demonstrates rehabilitation.

The objectives, performance indicators, measures and criteria in the MOP are designed to form the basis of the performance measure and provide the ability to track the development of sustainable ecosystems through a series of conceptual stages. This information is provided for all defined rehabilitation domains in Table 15 and aligned to Plans 3A-3C.

*Table 15: Rehabilitation Table – Objectives, Performance Indicators, Measures and Criteria*

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| **Phase 1 - Decommissioning** | | | | | |
| **Domain 1 - Infrastructure** | | | | | |
| Where not required in the Ashtonfield Agreement, all buildings, fixed plant and powerlines will be demolished and removed from the site.<br>Under the Ashtonfield Agreement designated roads will be left in a maintained condition at the end of operations suitable for 2WD or 4WD dry weather access. | Services disconnected and removed. | All infrastructure not required, or identified for post-closure landuse, removed.<br>Remaining infrastructure subject to obtaining appropriate regulatory approvals. | Post closure approved landuse will require access, easements and some infrastructure. (ie Hunter Water)<br>PA 07_0087<br>PA_ 05_0136 | No | Not commenced |
| | Buildings and fixed plant removed. | | | | |
| | All road infrastructure required left in place in maintained condition. | | | | |
| | Sealed roads not required to be stripped of bitumen surface. | | | | |
| | Hazardous and contaminated materials removed and remediated. | Carbonaceous material removed from CHPP area and placed in mine void. | This MOP<br>NEPM Schedule B2 | | |
| | | Phase 2 Contamination Assessment carried out. Contaminated materials remediated or removed from site in accordance with NEPM Guidelines. | | | |
| **Domain 2 – Tailings Storage Area** | | | | | |
| All infrastructure used for transporting water and fine rejects slurry between the U-Cut Tailings Dam and the CHPP will be removed.<br>Piezometers will be left behind to measure groundwater movement as part of monitoring program. | Services disconnected and removed. | All infrastructure not required, or identified for post-closure landuse, removed.<br>Piezometers remaining subject to appropriate regulatory approval / licences. | Post closure approved landuse will require access, easements and some infrastructure. (ie Hunter Water)<br>PA 07_0087<br>PA_ 05_0136 | No | In progress |
| | All pumping infrastructure removed. | | | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| **Domain 3 – Water Management Area** | | | | | |
| Dams required for final landuse will remain as required.<br><br>All infrastructure used for transporting water between storage dams and the CHPP will be removed. | All pumping infrastructure removed | All infrastructure not required, or identified for post-closure landuse, removed.<br>Remaining infrastructure subject to obtaining appropriate regulatory approvals. | Post closure approved landuse will require access, easements and some infrastructure. (ie Hunter Water)<br>PA 07_0087<br>PA_ 05_0136 | No | Not commenced |
| | Services disconnected and removed. | | | | |
| | Lake Foster and Lake Kennerson drained of process water and mine water under EPL conditions | Retained water storage dams spilling water quality would satisfy ANZECC (2000) Guidelines. | ANZECC Guidelines for Fresh and Marine Waters | | |
| | | Harvestable rights for retained dams will be determined and any actions to satisfy these rights will be addressed prior to mine closure. | Water Management Act 2000 | | |
| **Phase 2 – Landform Establishment** | | | | | |
| **Domain 1 - Infrastructure** | | | | | |
| The landform will be re-graded and contoured to be compatible with surrounding natural landscape. | Maximum slopes gradients less than 10°. | < 10 degrees as per approved MOP | This MOP | No | Not commenced |
| | Drainage designed to utilise existing sediment control structures. | Works completed | PA_ 05_0136<br>PA 07_0087 Appendix 4 Approved final landform<br>This MOP<br>Rehabilitation Management Plan | | |
| | Area deep ripped to reduce compaction. | Works completed | | | |
| | Track banks and batters trimmed to achieve landform matching surrounding landform. | Works completed | | | |
| | Unnecessary culverts removed. | Works completed | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Natural drainage paths re-instated, utilising appropriate sediment controls if necessary. | Works completed | | | |
| **Objective** | **Performance Indicator** | **Completion Criteria** | **Justification** | **Complete (Yes/No)** | **Progress at end of MOP** |
| **Domain 2 – Tailings Storage Area** | | | | | |
| Overburden material that has been left in close proximity to the Tailings Storage Dam will be relocated to cap tailings material.<br>The landform will be graded and contoured to be compatible with surrounding natural landscape as far as possible. | Capping of reject / tailings material | At least 2 metres | This MOP<br>PA_ 05_0136<br>Rehabilitation Management Plan-Bloomfield | No | In progress |
| | Slope gradients generally less than 10°, no slopes greater than 18°. | < 18 degrees. | This MOP<br>PA_ 05_0136<br>Rehabilitation Management Plan-Bloomfield | | |
| | Drainage designed to utilise existing sediment control structures and integrated with the drainage features on the adjacent landscape. | Works completed | PA_ 05_0136<br>Rehabilitation Management Plan-Bloomfield | | |
| **Domain 3 – Water Management Area** | | | | | |
| Where no longer required for post-closure water management, diversion drains and sediment ponds will be backfilled and rehabilitated, and levees breached and stabilised to allow natural catchment flow. | Diversion drains and banks pushed in an ripped | Works completed | This MOP<br>PA 07_0087<br>PA_ 05_0136<br>Approved final landforms<br>Rehabilitation Management Plan-Bloomfield | No | Not commenced |

| **Domain 4 – Overburden Emplacement** | | | | | |
|---|---|---|---|---|---|
| The landform will be safe and stable and contoured to be compatible with surrounding natural landscape. | Slope gradients generally less than 10°, no slopes greater than 18°. | < 18 degrees. | This MOP<br>PA 07_0087 Approved final landform | No | Ongoing |
| | Drainage designed to utilise existing sediment control structures and integrated with the drainage features on the adjacent landscape, whether rehabilitated or natural. | Works completed | This MOP<br>PA 07_0087 Approved final landform | | |
| | After shaping, landform deep ripped and rock raking undertaken if required tp prepare surface for soil material placement. | Works completed | This MOP<br>Rehabilitation Management Plan | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| **Domain 5 – Active Mining Area** | | | | | |
| If Abel Colliery resumes and after Bloomfield mining operations conclude the remaining final void may be utilised as a tailings disposal area. As approved under PA 07_0087. After tailings operations are completed (est 2030) the landform will be graded and contoured to be compatible with surrounding natural landscape as far as possible.<br>Final landform is safe, stable and non-polluting.<br>Overburden material that has been left in close proximity will be relocated to cap tailings material.<br>(Refer to Domains 2 & 4 for Phases 3, 4 & 5).<br>Note this relies on Abel resuming operations prior to Bloomfield Closure. | Capping of reject / tailings material | At least 2 metres | This MOP | No | Not commenced |
| | Low wall slope gradients generally less than 10º, no slopes greater than 18º. | < 18 degrees. | This MOP<br>PA 07_0087 Approved final landform | | |
| | Drainage designed to utilise existing sediment control structures and integrated with the drainage features on the adjacent landscape. | Work completed | This MOP<br>PA 07_0087 | | |
| **Phase 3 – Growth Medium Development** | | | | | |
| **Domain 1 - Infrastructure** | | | | | |
| The areas will be top dressed with appropriate top soil material to provide suitable growth medium. | Suitable top soil material applied | Minimum 100mm of growth media | Rehabilitation Management Plan | No | Not commenced |
| | Biosolids application, if required | Approximately 100 t/Ha | As per NSW EPA Biosolids Guidelines | | |
| | Soil ameliorant application ( Green mulch, Lime, Gypsum) if required. | Dependent on soil analysis | Rates dependent on soil analysis results<br>This MOP (Section 7) | | |
| | Soil surface prepared in roughened condition. | Ripping completed | Rehabilitation Management Plan | | |
| | Tracks deep ripped to reduce compaction | Ripping completed | Rehabilitation Management Plan | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| **Domain 2 – Tailings Storage Area** | | | | | |
| The areas will be top dressed with appropriate top soil material to provide suitable growth medium. | Suitable top soil material applied | Minimum 100mm of growth media | Rehabilitation Management Plan | No | In progress |
| | Biosolids application, if required | Approximately 100 t/Ha | As per NSW EPA Biosolids Guidelines | | |
| | Soil ameliorant application (OGM, Lime, Gypsum) if required. | Dependent on soil analysis | Rates dependent on soil analysis results<br>This MOP (Section 7) | | |
| | Soil surface prepared in roughened condition. | Ripping completed | Rehabilitation Management Plan | | |
| **Domain 3 – Water Management Area** | | | | | |
| Remaining disturbed areas after removal of any infrastructure will be ripped to develop a suitable growth medium for pasture and native tree species | Diversion drain soil surface prepared in roughened condition | Ripping completed | Rehabilitation Management Plan | No | Not commenced |
| **Domain 4 – Overburden Emplacement** | | | | | |
| The areas will be top dressed with appropriate top soil material to provide suitable growth medium. | Suitable top soil material applied | Minimum 100mm of growth media | Rehabilitation Management Plan | No | Ongoing |
| | Biosolids application, if required | Approximately 100 t/Ha | As per NSW EPA Biosolids Guidelines | | |
| | Soil ameliorant application (OGM, Lime, Gypsum) if required. | Dependent on soil analysis | Rates dependent on soil analysis results<br>This MOP (Section 7) | | |
| | Soil surface prepared in roughened condition. | Ripping completed | Rehabilitation Management Plan | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| **Phase 4 – Ecosystem and Land Use Establishment** | | | | | |
| **Domain 1 - Infrastructure** | | | | | |
| All areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree species similar to the surrounding vegetation community in accordance with PA 07_0087 Approved final landform | Appropriate pasture grass species or native seed selected. | Species selected as per Section 7 | This MOP (Section 7) Rehabilitation Management Plan PA 07_0087 Approved final landform | No | Not commenced |
| | Seeding rate | Pasture 50 kg /Ha, native trees 7.5 kg /Ha | | | |
| **Domain 2 – Tailings Storage Area** | | | | | |
| Areas overlying tailings material will be seeded with a pasture seed mix only to reduce the risk of subsurface combustion. These areas will be suitable for grazing purposes. | Appropriate pasture grass species selected. | Species selected as per Section 7 | This MOP (Section 7) Rehabilitation Management Plan PA 07_0087 Approved final landform | No | In progress |
| | Seeding rate | Pasture 50 kg /Ha | | | |
| **Domain 3 – Water Management Area** | | | | | |
| The areas will be seeded with pasture grass seed or native tree species in accordance with PA 07_0087 Approved final landform | Appropriate pasture grass species or native seed selected. | Species selected as per Section 7 | This MOP (Section 7) Rehabilitation Management Plan PA 07_0087 Approved final landform | No | Not commenced |
| | Seeding rate | Pasture 50 kg /Ha, native trees 7.5 kg /Ha | | | |
| **Domain 4 – Overburden Emplacement** | | | | | |
| Shaped overburden emplacement areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree species in accordance with PA 07_0087 Approved final landform . This will result in a mix of rural pasture and trees over pasture blending with surrounding landscape. | Appropriate pasture grass species or native seed selected. | Species selected as per Section 7 | This MOP (Section 7) Rehabilitation Management Plan PA 07_0087 Approved final landform | No | Ongoing |
| | Seeding rate | Pasture 50 kg /Ha, native trees 7.5 kg /Ha | | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| **Phase 5 – Ecosystem and Land Use Sustainability** | | | | | |
| **Domain 1 - Infrastructure** | | | | | |
| Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and trees over pasture developed with evidence of natural regeneration of similar species to the surrounding vegetation community. | Stable water management structures such as diversion drains and stock dams | Water management structures functioning as designed and able to support grazing activities. | Rehabilitation Management Plan<br>PA 07_0087 Approved final landuse | No | Not commenced |
| | Ground cover % | >70%, or combined live and litter cover of 70% in tree areas | Rehabilitation Management Plan | | |
| | Litter cover % | Present at 75% of sites with 20% litter cover. | Rehabilitation Management Plan | | |
| | Presence of rill erosion | Monitoring indicates rills remaining stable in number and size.<br><30cm wide and deep. | Rehabilitation Management Plan | | |
| | Presence of weeds | No significant infestations of declared weeds.<br>Weeds controlled in accordance with relevant legislation<br>Weeds account for <15% of total herbage mass | Rehabilitation Management Plan<br>Noxious Weeds Act 1993<br>Weed Management Plan | | |
| | Soil pH | pH 4.5 - 9 | ACARP Project C13048 (2004) | | |
| | Soil EC | EC <0.6 dS/m | ACARP Project C13048 (2004) | | |
| | Soil EAT Class | Class 3-8 | ACARP Project C13048 (2004) | | |
| | Tree species displaying successful recruitment | Monitoring results show evidence of successful recruitment | Rehabilitation Management Plan | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| | Tree species assemblages and health characteristic of species found within region | Tree species composition and health is comparable to analogue site | Rehabilitation Management Plan<br>Analogue sites | | |
| | LFA monitoring results | Stability index >50<br>Infiltration index >25<br>Nutrient cycling index >20 | Rehabilitation Management Plan | | |
| | LFA index results | Comparable to analogue sites | Analogue sites | | |
| | Pasture soil analysis | Comparable with non-mined grazing reference sites | Grazing monitoring program<br>Analogue sites | | |
| | Pasture biomass | Comparable with non-mined grazing reference sites | Grazing monitoring program<br>Analogue sites | | |
| **Domain 2 – Tailings Storage Area** | | | | | |
| Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures. | Stable water management structures such as diversion drains and stock dams | Water management structures functioning as designed and able to support grazing activities. | Rehabilitation Management Plan<br>PA 07_0087 Approved final landuse | No | In progress |
| | Ground cover % | >70% | Rehabilitation Management Plan | | |
| | Presence of rill erosion | Monitoring indicates rills remaining stable in number and size<br><30cm wide and deep | Rehabilitation Management Plan | | |
| | Presence of weeds | No significant infestations of declared weeds.<br>Weeds controlled in accordance with relevant legislation<br>Weeds account for <15% of total herbage mass | Rehabilitation Management Plan<br>Noxious Weeds Act 1993<br>Weed Management Plan | | |

| | | | | | |
|---|---|---|---|---|---|
| | Soil pH | pH 4.5 - 9 | ACARP Project C13048 (2004) | | |
| | Soil EC | EC <0.6 dS/m | ACARP Project C13048 (2004) | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| | Soil EAT Class | Class 3-8 | ACARP Project C13048 (2004) | | |
| | LFA monitoring results | Stability index >50<br>Infiltration index >25<br>Nutrient cycling index >20 | Rehabilitation Management Plan | | |
| | LFA index results | Comparable to analogue sites | Analogue sites | | |
| | Pasture soil analysis | Comparable with non-mined grazing reference site | Grazing monitoring program<br>Analogue sites | | |
| | Pasture biomass | Comparable with non-mined grazing reference site | Grazing monitoring program<br>Analogue sites | | |
| **Domain 3 – Water Management Area** | | | | | |
| Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community. | Stable water management structures such as diversion drains and stock dams | Water management structures functioning as designed and able to support grazing activities. | Rehabilitation Management Plan<br>PA 07_0087 Approved final landuse | No | Not commenced |
| | Ground cover % | >70%, or combined live and litter cover of 70% in tree areas | Rehabilitation Management Plan | | |
| | Presence of rill erosion | Monitoring indicates rills remaining stable in number and size<br><30cm wide and deep | Rehabilitation Management Plan | | |
| | Presence of weeds | No significant infestations of declared weeds.<br>Weeds controlled in accordance with relevant legislation<br>Weeds account for <15% of total herbage mass | Rehabilitation Management Plan<br>Noxious Weeds Act 1993<br>Weed Management Plan | | |

| | | | | | |
|---|---|---|---|---|---|
| | Lake water pH | pH 6.5 – 8.5 | ANZECC Guidelines for Fresh and Marine Waters | | |
| | Lake water EC | EC 125-2200 uS/cm | ANZECC Guidelines for Fresh and Marine Waters | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| | Lake water TSS | <50 mg/L | ANZECC Guidelines for Fresh and Marine Waters | | |
| | Tree species displaying successful recruitment | Monitoring results show evidence of successful recruitment | Rehabilitation Management Plan<br>Analogue sites | | |
| | Tree species assemblages and health characteristic of species found within region | Tree species composition and health is comparable to analogue site | | | |
| **Domain 4 – Overburden Emplacement** | | | | | |
| Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community. | Stable water management structures such as diversion drains and stock dams | Water management structures functioning as designed and able to support grazing activities. | Rehabilitation Management Plan<br>PA 07_0087 Approved final landform | No | Ongoing |
| | Ground cover % | >70%, or combined live and litter cover of 70% in tree areas | Rehabilitation Management Plan | | |
| | Litter cover % | Present at 75% of sites with 20% litter cover. | Rehabilitation Management Plan | | |
| Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community. | Presence of rill erosion | Monitoring indicated rills remaining stable in number and size<br><30 cm wide and deep | Rehabilitation Management Plan | No | Ongoing |
| | Presence of weeds | No significant infestations of declared weeds.<br>Weeds controlled in accordance with relevant legislation<br>Weeds account for <15% of total herbage mass | Rehabilitation Management Plan<br>Noxious Weeds Act 1993<br>Weed Management Plan | | |
| | Soil pH | pH 4.5 - 9 | ACARP Project C13048 (2004) | | |
| | Soil EC | EC <0.6 dS/m | ACARP Project C13048 (2004) | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| | Soil EAT Class | Class 3-8 | ACARP Project C13048 (2004) | | |
| | Tree species displaying successful recruitment | Monitoring results show evidence of successful recruitment | Rehabilitation Management Plan<br>Analogue sites | | |
| | Tree species assemblages and health characteristic of species found within region | Tree species composition and health is comparable to analogue site | | | |
| | LFA monitoring results | Stability index >50<br>Infiltration index >25<br>Nutrient cycling index >20 | Rehabilitation Management Plan | | |
| | LFA index results | Comparable to analogue sites | Analogue sites | | |
| | Pasture soil analysis | Comparable with non-mined grazing reference site | Grazing monitoring program<br>Analogue sites | | |
| | Pasture biomass | Comparable with non-mined grazing reference site | Grazing monitoring program<br>Analogue sites | | |
| **Domain C & D – Rehabilitated Areas** | | | | | |
| These areas require maintenance and monitoring only. Maintenance may include periodic fertiliser application, weed management and soil conservation works | Stable water management structures such as diversion drains and stock dams | Water management structures functioning as designed and able to support grazing activities. | Rehabilitation Management Plan<br>PA 07_0087 Approved final landform | No | Ongoing |
| | Ground cover % | >70% , or combined live and litter cover of 70% in tree areas | Rehabilitation Management Plan | | |
| | Litter cover % | Present at 75% of sites with 20% litter cover. | Rehabilitation Management Plan | | |
| | Presence of rill erosion | Monitoring indicates rills remaining stable in number and size, <30cm wide and deep | Rehabilitation Management Plan | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| These areas require maintenance and monitoring only. Maintenance may include periodic fertiliser application, weed management and soil conservation works. | Presence of weeds | No significant infestations of declared weeds.<br>Weeds controlled in accordance with relevant legislation<br>Weeds account for <15% of total herbage mass | Rehabilitation Management Plan<br>Noxious Weeds Act 1993<br>Weed Management Plan | No | Ongoing |
| | Soil pH | pH 4.5 - 9 | ACARP Project C13048 (2004) | | |
| | Soil EC | EC <0.6 dS/m | ACARP Project C13048 (2004) | | |
| | Soil EAT Class | Class 3-8 | ACARP Project C13048 (2004) | | |
| | Tree species displaying successful recruitment | Monitoring results show evidence of successful recruitment | Rehabilitation Management Plan<br>Analogue sites | | |
| | Tree species assemblages and health characteristic of species found within region | Tree species composition and health is comparable to analogue site | | | |
| | LFA monitoring results | Stability index >50<br>Infiltration index >25<br>Nutrient cycling index >20 | Rehabilitation Management Plan | | |
| | LFA index results | Comparable to analogue sites | Analogue sites | | |
| | Pasture herbage mass | >800 kg DM/ha | This MOP<br>Grazing monitoring program | | |
| | Pasture % dead matter | <50% | | | |
| | Crude protein of pasture | >2% | | | |
| | Digestibility of pasture dry matter | >40% | | | |
| | Metabolisable energy of pasture | >6MJ/kg DM | | | |

| Objective | Performance Indicator | Completion Criteria | Justification | Complete (Yes/No) | Progress at end of MOP |
|---|---|---|---|---|---|
| | Potential stocking rates | 2-4 DSE/Ha | NSW DPI Beef Stocking Rates and Farm Size – Hunter Region (2006)<br>Grazing monitoring program | | |
| | Pasture soil analysis | Comparable with non-mined grazing reference site | Grazing monitoring program<br>Analogue sites | | |
| | Pasture biomass | Comparable with non-mined grazing reference site | Grazing monitoring program<br>Analogue sites | | |

# 7 Rehabilitation Implementation

## 7.1 Status at MOP Commencement

As at the commencement of the MOP term a total of 491 Hectares had been rehabilitated (including Relinquished Lands). At the commencement of this MOP all available areas have been rehabilitated. For the purposes of this MOP all rehabilitated areas at the commencement of the MOP term are represented as Secondary Domains.

A summary of the rehabilitation status of each of the primary domains is provided in Table 16. The rehabilitation status at the commencement of the MOP period is shown in Plan 2.

*Table 16: Rehabilitation Status of Domains at MOP Commencement*

| Primary Domain | Status |
|---|---|
| Infrastructure Area | Active |
| Tailings Storage Area | Active, with areas subject to progressive rehabilitation during MOP term |
| Water Management Area | Active |
| Overburden Emplacement | Active, with areas subject to progressive rehabilitation during MOP term |
| Active Mining Area | Active |
| **Secondary Domain** | **Status** |
| Rehabilitated Areas - Pasture | 320 Ha completed at start of MOP term |
| Rehabilitated Areas - Trees over Pasture | 171 Ha completed at start of MOP term |
| Relinquished Lands* | 21 Ha completed at start of MOP term |

* Note: 21 Ha included in total rehabilitated area figure (ie 491 Ha)

The development and finalisation of a capping design for the U Cut tailings dam is currently in progress. Within six months of the commencement of this MOP, if not prior, a capping design for the U Cut tailings dam, including the source of capping material on site, will be confirmed. As outlined in Section 2.1.3, the current emplacement area (U-Cut) is expected to reach approved capacity during 2022. When tailings placement in the U-Cut tailings dam ceases a new tailings emplacement area will be established within the active mine void which would receive fine tailings throughout the remainder of the project.

The annual sequence is shown in Plan 3A - 3C which present the progressive capping development of the U-Cut tailings dam the MOP term.

## 7.2 Proposed Rehabilitation Activities this MOP Period

During the term of this MOP there is 39 Ha of rehabilitation scheduled to be completed as shown Plans 3A to 3C. Other rehabilitation activities will include maintenance of existing rehabilitation in accordance with Section 8.

Throughout the term of this MOP overburden emplacement operations will be conducted within the mine void. This will involve backfilling the lower areas of the void and against existing highwalls towards the final landform. The highwall on the western lease boundary will eventually be backfilled to ground level.

As shown on Plans 3A-3C rehabilitation completed during the term of this MOP will be located on the western side of the Creek Cut mining void and on the U-Cut tailings storage area.

Areas within the Overburden Emplacement domain that are not delineated for reshaping are to be used for stockpiling of soil material.

All other domains will remain active throughout the term of this MOP. Rehabilitation monitoring activities, as described in Section 8, will continue in the previously rehabilitated areas. Table 17 provides a summary of the proposed disturbance and rehabilitation activities.

*Table 17: Disturbance and Rehabilitation Progression during the MOP Term*

| Year | Total Disturbance Area (Ha) | Total Rehabilitation Area (Ha) (per MOP year) | Cumulative Rehabilitation Area | Comments / Explanation |
|---|---|---|---|---|
| **Start of MOP** | **429** | | **491** | Cumulative rehabilitation area includes relinquished lands |
| 2021 | 0* | 0 | 491 | No new disturbance or rehabilitation activities scheduled to be completed during year |
| 2022 | 5* | 0 | 491 | 5 Ha of clearing, and no new rehabilitation activities scheduled to be completed during year |
| 2023 | -39** | 39 | 530 | 39 Ha of rehabilitation, and no new clearing activities scheduled to be completed during year |
| **End of MOP** | **395** | | **530** | |

* New disturbance for year

** Rehabilitation completed

### 7.2.1 Domain 4 – Overburden Emplacement

During the term of this MOP there is approximately 14 Ha of rehabilitation scheduled to be completed as shown Plans 3A to 3C. If the opportunity arises throughout the term of this MOP additional areas within the Overburden Emplacement domain may be subject to progressive rehabilitation. The following sections outline the rehabilitation activities that will be implemented.

*Landform Establishment*

Reshaping will principally involve recontouring overburden dumps into the designed shape for final rehabilitation. The bulk movement of overburden is usually undertaken using bulldozers. Ideally, reshaping will result in a stable landform with slopes and drainage patterns which blend in with the surrounding natural topography. Slope stability is integral to rehabilitation design and slopes in excess of 10 degrees will not be favoured. However, slopes steeper than 10 degrees may be necessary in some locations to ensure rehabilitation merges with adjacent undisturbed land.

Any reject emplacements integrated into the landform being reshaped will be covered by at least two metres of inert material. Site experience from capping a previous tailings dam in the 1980's has found this to be the minimum cover required to ensure successful long-term revegetation over reject materials. As the final landform of the U Cut tailings dam will be designed to be free draining, initial capping design work outlined in Section 7.1 shows that more than two metres of material will be required to provide adequate drainage. Cone Penetrometer Testing was carried out on the tailings dam in early July 2020 by consulting engineers as part of the capping design work to assist in determining a suitable capping methodology.

Once bulk reshaping is completed, the landform will be deep-ripped if required and the final trim/rock raking are undertaken. The ripping loosens up any near surface strata within the landform that have been compacted during placement, aiding root penetration during vegetation establishment. The final trim smooths out any wash-outs and gullies, rough edges, temporary access tracks, local steep slopes and prepares the surface for revegetation. Rock-raking the final stage of reshaping and removes or buries exposed surface rock greater than 200 mm in diameter. This raking is usually done along the contour, leaving a cultivated surface that assists with erosion minimisation until vegetation can be established.

Suitable drainage will also be integrated into the rehabilitation design, to ensure the final landform can safely shed surface runoff without erosion damage being caused. Until an adequate vegetation cover is re-established, there is a high potential for erosion, resulting in resource loss, gully formation and the need for expensive remedial treatment. Therefore, long or steep slopes should be divided up by the construction of contour banks to collect and divert water off the slopes. Contour banks should run the surface water at a drop of no greater than 1 in 100 into a drainage line (via a sediment dam) or into some form of protected drop structure that will run the water down the gradient in a controlled or protected manner.

Drainage design for rehabilitation will be integrated with the drainage features on the adjacent landscape, whether mine disturbed, rehabilitated or natural. Sufficient sediment control structures should be integrated into the drainage system to reduce, or intercept, sediment load being transported by surface run-off.

*Growth Medium Development*

Revegetation of the reshaped landform will generally undertaken in accordance with the steps below:

- Soil amelioration – spreading and integration of soil/spoil ameliorants into surface layer to address soil acidity and assist with soil structural properties. Ameliorants usually include lime and/or gypsum at a rate determined by soil testing results, ploughed into the top 30cm of the profile.
- Topdressing - if available, topsoil stripped ahead of mining will be applied to the reshaped surface in an even layer not less than 100mm. Depending on the quality of the topdressing material, ameliorants may be integrated with topsoil at this stage. Where topsoil has not been available in sufficient volumes, biosolids and biosolids/mulch mix have been successfully used to improve soil structure and act as a source of nutrients, improving establishment of vegetation. Biosolids are generally applied at a rate no greater than 100 tonnes/ha (wet weight), using a tractor towed spreader trailer. A biosolids/mulch mix (1:1 ratio) has been shown to be very successful topsoil supplement and is usually applied at a rate of 200 – 250 tonnes/ha.
- Integration – once the material has been topdressed, the surface will be ripped in to integrate the topdressing material. This assists in binding the topdressing material with the underlying spoil and is a requirement of the EPA biosolids guidelines. The area is then contour cultivated to create seed entrapments and microclimates prior to sowing.
- Twelve months after completion of this phase, soil samples will be analysed to characterise the material to determine whether the above treatments have been effective. Further application of ameliorants may be required to improve soil health.

*Ecosystem and Land Use Establishment*

Most vegetation establishment during land rehabilitation is via direct seeding. Pasture grass mix will generally be sown so as to establish grazing pasture on areas such as steeper slopes and drainage areas to establish faster soil stability in higher potential erosion areas. Tree seed mix, as opposed to pasture grass mix, will generally be sown so as to establish tree communities on areas such as upper slopes, hill tops and flatter areas. This assists in breaking up landform profiles and increasing habitat areas in areas of lower risk of erosion. Efforts will be made to ensure that rehabilitated tree areas are not straight edged, but blend in with adjacent remnant vegetation or previously rehabilitated areas.

The rehabilitation areas will then be sown and fertilised with the selected grass and/or tree seed mixes. These works will be undertaken shortly after spreading the topsoil to avoid loss in activity of pre-existing micro flora, it also minimises the loss of topsoil due to wind and rain action.

In pasture rehabilitation areas rolling may be undertaken to press the spread seed, increasing contact with the soil and increasing the probability of germination. It also pushes down any exposed rocks, decreasing surface rockiness.

Tubestock planting will only be used when required for rapid establishment of tree screens which are not anticipated for the term of this MOP.

An indicative species list for pasture and native species is provided in Table 18. Species and rates may vary depending on availability.

*Table 18: Species List*

| **Pasture** | | **Native** | |
|---|---|---|---|
| **Species** | **Rate kg / Ha** | **Species** | **Rate kg / Ha** |
| Wimmera Rye Grass | 6 | Acacia implexa | 0.1 |
| Haifa Clover | 6 | A.decurrens | 0.4 |
| Couch Grass | 4 | A.falcata | 0.3 |
| Kikuyu | 3 | A.longifolia | 0.5 |
| Green Panic | 6 | A.sophorae | 0.2 |
| Phalaris | 6 | A.mearnsii | 0.3 |
| Lucerne | 6 | A.myrtifolia | 0.3 |
| Selphi Medic | 6 | A.ulicifolia | 0.1 |
| Tall Fescue | 6 | A.irrorata | 0.1 |
| | | A.suaveolens | 0.1 |
| | | Angophora costata | 0.5 |
| | | Casuarina torulosa | 0.2 |
| | | Leptospermum polygalifolium | 0.1 |
| | | Syncarpia glomulifera | 0.1 |
| | | Corymbia maculata | 1.2 |
| | | Eucalyptus tereticornis | 0.5 |
| | | E.saligna | 0.2 |
| | | E.acmenoides | 0.1 |
| | | E.crebra | 0.3 |
| | | E.fibrosa | 0.3 |

| | | | |
|---|---|---|---|
| | | E.pilularis | 0.3 |
| | | E.punctata | 0.2 |
| | | E.haemostoma | 0.3 |
| | | E.resinifera | 0.2 |
| | | E.gummifera | 0.1 |

*Ecosystem and Land Use Sustainability*

The progress of rehabilitated areas will be monitored as part of the ongoing assessment program which will be used to collect sufficient data on the rehabilitated land to compare against the completion criteria to assess rehabilitation development, sustainability and suitability for sign-off. Further details are provided in Section 8.

In pasture rehabilitated areas the ongoing maintenance program may also include slashing to reduce the bulk vegetative matter. As well as providing surface mulch, this also reduces the fire hazard of those areas. Grazing on older established rehabilitation areas may also be conducted to reduce fuel loads.

### 7.2.2 Domain 2 – Tailings Storage Area (U-Cut)

The emplacement areas are rehabilitated in accordance with *Work Health and Safety (Mine and Petroleum) Regulation 2014* and approval conditions for each individual emplacement area.

Emplacement areas have been capped and rehabilitated at the Bloomfield Site previously with a combination of trees and tropical pasture.

Capping and rehabilitation of the U Cut Tailings Storage Facility (TSF) will be commenced and undertaken in a number of stages under the guidance of the mine's Responsible Technical Person with assistance from a geotechnical engineer.

Additional tailings strength testing will be required to provide further knowledge to assist in capping designs and will be undertaken as necessary. The geochemical properties of the U Cut TSF will be determined though a testing program in 2021 to 2022 with samples taken in conjunction with the tailings strength testing program.

Material for capping will be sourced from the open cut mining operation, redundant infrastructure and adjacent spoil areas in accordance with the Rehabilitation Management Plan for the Bloomfield Site.

Monitoring programs will be conducted to determine the following on capped and rehabilitated tailings storage facilities:

- Long term settlement
- Stability
- Surface water erosion

- Tree root penetration
- Livestock/ native fauna penetration
- Vegetation as per current MOP commitments

Approximately 25 Ha of rehabilitation scheduled to be completed as shown in Plans 3A to 3C which present the progressive decommissioning of the U Cut tailings emplacement area domain for the MOP term.

During the decommissioning phase all infrastructure used for transporting water and fine rejects slurry between the U-Cut Tailings Dam and the CHPP will be removed. Piezometers will be left in place to measure groundwater movement as part of the monitoring program.

During the landform establishment phase, overburden material will be relocated to cap tailings material to final landform design. Shaping will principally involve capping and contouring with overburden material into the designed shape for final rehabilitation. Reject material will be covered by a minimum two meters of inert overburden material.

Suitable drainage will be integrated into the rehabilitation design to ensure the final landform is free draining and can safely shed surface runoff without erosion damage being caused. Drainage design for rehabilitation will be integrated with the drainage features on the adjacent landscape.

The remaining rehabilitation phases are as described in Section 7.2.1 above.

### 7.2.3 Domain 1 – Infrastructure Area (CHPP Product Coal Pad)

As stated in Section 2.3.7, during the MOP term an assessment will be made of possible decommissioning and removal of unused areas of the clean coal stockpile area. As it is currently unknown if the Abel Underground Mine would recommence operations during the MOP term there is some uncertainty as to the stockpile area required in the future.

Should this proceed, decommissioning will involve the removal of the stockpile pad material and disposal in the mining void and/or U-Cut tailings emplacement area. The landform establishment phase will be achieved once the stockpile pad material has been removed down to natural ground level.

The remaining rehabilitation phases are as described in Section 7.2.1 above, however these are not expected to be completed during the MOP term.

## 7.3 Summary of Rehabilitation Area during the MOP Term

Table 19 shows the rehabilitation phases for each domain, indicating that there will be no scheduled rehabilitation completed during the term of this MOP.

Throughout the phases of rehabilitation records will be maintained containing key data through each rehabilitation phase. This will include rehabilitation methodology such as landform shaping, soil source and treatments, soil application, seeding species and rates, and monitoring progression towards completion criteria.

Where rehabilitated areas do not show progression toward completion criteria, an investigation will be undertaken to ascertain the reason. An assessment will be undertaken to determine what further inputs may be required to remediate the issue and restore the area on a trajectory toward completion.

*Table 19: Rehabilitation Summary during the MOP Term*

| Domain | Total Area at MOP start (ha) (Derived from Plan 2) | Area Affected / Rehabilitated (ha) Total Area at MOP end |
|---|---|---|
| **Infrastructure Area** | | |
| Active | 67 | 69 |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | | |
| **Total** | **67** | **69** |
| **Tailings Storage Area – U Cut** | | |
| Active | 79 | |
| Decommissioning | | 41 |
| Landform Establishment | | 13 |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | 25 |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | | |
| **Total** | **79** | **79** |

| Domain | Total Area at MOP start (ha) (Derived from Plan 2) | Area Affected / Rehabilitated (ha) Total Area at MOP end |
|---|---|---|
| **Tailings Storage Area – S Cut** | | |
| Active | | 8 |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | | |
| **Total** | | **8** |
| **Water Management Area** | | |
| Active | 12 | 12 |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | | |
| **Total** | **12** | **12** |
| **Overburden Emplacement** | | |
| Active | 191 | 212 |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | 14 |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | | |
| **Total** | **191** | **226** |
| **Active Mining Area** | | |
| Active | 80 | 53 |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | | |
| **Total** | **80** | **53** |

| Domain | Total Area at MOP start (ha) (Derived from Plan 2) | Area Affected / Rehabilitated (ha) Total Area at MOP end |
|---|---|---|
| **Secondary Domain – Rehabilitated Area - Pasture** | | |
| Active | | |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | 3 | 39 |
| Ecosystem and land use sustainability | 317 | 320 |
| Rehabilitation Complete | | |
| **Total** | **320** | **359** |
| **Secondary Domain – Rehabilitated Area – Trees over Pasture** | | |
| Active | | |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | |
| Ecosystem and land use sustainability | 171 | 171 |
| Rehabilitation Complete | | |
| **Total** | **171** | **171** |
| **Secondary Domain – Relinquished Lands** | | |
| Active | | |
| Decommissioning | | |
| Landform Establishment | | |
| Growth Medium Development | | |
| Ecosystem and land use establishment | | |
| Ecosystem and land use sustainability | | |
| Rehabilitation Complete | 21 | 21 |
| **Total** | **21** | **21** |

## 7.4 Relinquishment Phase Achieved during MOP Term

“Relinquished Lands”, i.e. the following parameters have been met:

- The area is self-sustaining,
- Has been signed off by all parties,
- The lease (or a portion of a greater lease) is relinquished;
- The security bond has been returned; and
- The mine would have no further responsibility for these areas.

The Relinquished Lands at the start of the MOP term is shown on Plan 2 and Table 19. This area was relinquished by the Department of Mineral Resources (DMR) in 2004. A copy of the DMR clearance is provided in Appendix4.

No additional areas of the Mining Lease will be deemed to be ‘relinquished lands” at the end of the MOP term.

# 8 Rehabilitation Monitoring and Ongoing Maintenance

## 8.1 Rehabilitation Monitoring

The aim of the monitoring program is to collect sufficient data on the rehabilitated land to compare against the completion criteria outlined in Table 15 to assess rehabilitation development, sustainability and suitability for sign-off. The monitoring program consists of three components:

- Maintenance inspections;
- Rehabilitation monitoring; and
- Review of inspection/measurement data over time to assess rehabilitation performance.

Monitoring is currently undertaken at 24 locations shown on Plan 2. Monitoring is conducted every two years and during the period of this MOP monitoring will be conducted in 2021 and 2023. Monitoring will be designed to collect sufficient evidence (i.e. landscape, soils, vegetation, landuse, water quality) to prove achievement of rehabilitation objectives. Cost, repeatability and practicality of the proposed monitoring methodology will also be considered, along with the long-term availability of resources to ensure monitoring completion.

Rehabilitation practices and relevant site details are documented during the rehabilitation process so that future rehabilitation assessment data can be correctly interpreted. This is undertaken immediately following the establishment of each new area of rehabilitation.

### 8.1.1 Monitoring Methodology

The following rehabilitation monitoring methodology is based on research into rehabilitation completion criteria for rehabilitation establishment on coal mines by Nichols (2005) and Grigg, Emmerton & McCallum (2001). Provided that it is conducted by experienced operators, it will reliably indicate long term rehabilitation sustainability. The following considerations were incorporated into monitoring program design:

1. Representative monitoring sites will be established in rehabilitation of different ages. Density of monitoring sites should be based on age and heterogeneity of rehabilitation. For new rehabilitation one monitoring site per 50 ha is recommended. Although no specific density is recommended for older established rehabilitation (>5 years), sufficient density of sites should be monitored to ensure coverage of different rehabilitation types and standards. Sites locations should be selected so that all rehabilitated landscape and vegetation types are covered (i.e. treed, pasture, slopes, flat ground). .
2. Sites should be monitored within the first 12 months after establishment then every 2 years. This should provide 3 sets of monitoring data in the first 5 years following rehabilitation.
3. A standard monitoring plot design is shown in Figure 3. The standard measurements to be conducted at each measurement site are outlined in the Section 8.1.2.

4. In addition to the measurement protocols conducted every two years, all rehabilitated areas should be inspected every year. These inspections should note problem areas (such as bare patches, failed vegetation, drainage structure failure, significant erosion or significant weed infestation) requiring maintenance or further treatment. Remedial works should then be scheduled to address these areas.

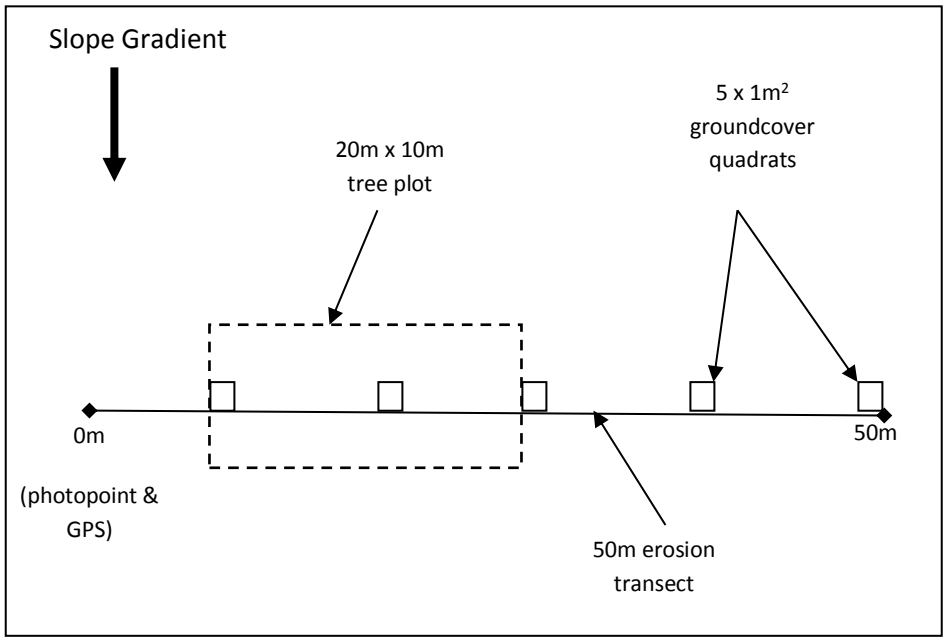



*Figure 3 - Standard Layout of Rehabilitation Monitoring Transect*

### 8.1.2 Standard Monitoring Protocol

*Site Establishment*

Each site will consist of a 50m transect, positioned along the contour of the slope, and permanently marked using steel pickets, or similar.

*Photo and General Rehabilitation Condition*

- GPS co-ordinates will be recorded for the 0m picket.
- Direction of the transect (to nearest cardinal point – N, SW, etc) from the 0m picket will be noted.
- A photo will be taken from the 0m marker of the general condition of rehabilitation in the vicinity of the transect.
- A brief description of the general condition (i.e. “rhodes dominated pasture grass with scattered shrubs and trees”) and any stand-out issues (evidence of fire, bare patches, weed infestations, tree die back or erosion) will be provided.

- A sketch will be made of the transect location in relation to prominent nearby landmarks.
- Landform gradient in the vicinity of the transect will be noted.

*Weeds*

Note presence of declared noxious weeds in vicinity of transects, or substantial infestations of weeds that may out compete or otherwise hinder rehabilitation establishment.

*Fauna*

Note evidence of fauna re-colonisation in rehabilitation along transect, including insects and birds.

*Vegetation*

The following measurements will be recorded to assess vegetation establishment:

- Five x $1m^2$ quadrats will be established (at the 0m, 10m, 20m, 30m & 40m marks). Groundcover estimate (%), number of groundcover species and dominant groundcover species (top 2 spp.) to be recorded for each quadrat.
- If trees or shrubs are present, one 20m x 10m plot, located 5m either side of the transect centreline will be established. Number of trees and shrubs taller than 1.2m will be recorded by species (if not known, allocate a number and record by genus – Acacia 1, Euc 2, etc). Stems/ha (total and for dominant spp/genus) should be calculated by multiplying plot results by 50.
- Evidence of recruitment (seedlings and small saplings) along transect should be noted. If possible, note species/genus and distance to nearest mature tree of that species/genus.
- Record general condition of tree health along the transect. Specifically recording evidence of senescence, drought stress, nutrient deficiencies, disease or severe insect attack. If applicable, note if specific species/genus are impacted.

*Nutrient Recycling*

- Record the percent coverage and average depth of litter layer in each quadrat.
- Note the degree of litter layer composition.
    - 0 = Nil: Litter lying loose on surface with little indication of decomposition or incorporation;
    - 1 = Minor: Litter broken down into smaller fragments in contact with soil surface or slightly incorporated.
    - 2 = Moderate or greater: Litter has started to form layers, with lower layers demonstrating evidence of decomposition activity.
- Record the presence of cryptograms (algae, fungi, mosses, lichens, etc):
    - 0 = Nil evidence;
    - 1 = Minor: <10% cover.
    - 2 = Moderate or greater: >10% cover

*Soils/surface Condition*

For the characterisation of soil properties, the following actions should be taken along each transect:

- Note significant soil surface characteristics likely to influence rehabilitation development, including excessive surface rockiness, surface cracking, surface precipitates (salts, gypsum, etc), surface hard setting, etc.
- In each of the 5 vegetation plots, note surface rockiness (0=nil surface rock; 1= <10% coverage and/or rocks generally < 25mm diameter; 2 = >10% rock coverage or rocks largely > 25mm diameter), surface horizon soil field texture and surface roughness (0 = surface generally smooth with little capability of impeding surface flow; 1 = some minor cracking or undulations generally <2cm; 2 = dense surface cracking or undulations generally >2cm )
- Excavate a representative soil profile hole and record the surface horizon characteristics – depth, colour, structure, root zone depth, rock content and field texture.
- Collect surface soil samples for analysis, as required to meet operation-specific soil characterisation criteria.

*Erosion and Stability*

The following landform attributes should be noted to monitor for evidence erosion and stability:

- Note the presence and, if possible, the cause of scalds or bare patches > $2m^2$ along the length of the 50m transect.
- Record the location and dimension of all erosion rills >30cm wide and/or 30cm deep, where they intersect the 50m transect. Note whether the rills are active or inactive (inactive rills are usually found in areas of well-established ground-cover and are filled/partially filled with sediment and/or vegetation established within the rill). The number of active rills deeper or wider than 30cm will be converted to a density per 50m for comparison with subsequent monitoring data.
- Note any failed water management structures (contour banks, drop structures, sediment ponds, etc).

### 8.1.3 Monitoring Review and Reporting

Monitoring data will be reviewed upon completion of monitoring. Remedial actions for significant anomalies detected during monitoring (i.e. failed rehabilitation, failed water management structures, significant weed infestations) will be included in environmental works planning.

Monitoring data will be compared with previous years' data, to identify long-term trends in rehabilitation development. Once three sets of data have been collected, this information will be compared to completion criteria and areas deemed suitable for sign-off will be identified.

Rehabilitated areas that are not progressing towards the completion criteria will also be identified and corrective strategies devised or monitoring period extended.

The results of rehabilitation monitoring will be reported in the Annual Review Report.

## 8.2 Research and Rehabilitation Trials and Use of Analogue Sites

Data from analogue sites in good condition areas near to the rehabilitated area is imperative for sensible comparisons of data. An analogue transect is installed in a pasture area outside the current open cut area and beyond the current area planned to be mined into the future. This transect is designed to act as reference sites for the study, monitoring the effects of environmental factors above those incurred by rehabilitated lands. The area where this transect occurs has previously been affected by agriculture and underground mining, however it has not been subjected to open cut operations.

The rehabilitation requirements under the development consent is a mix of pasture and trees over pasture that does not conflict with future land use (Section 4.2 and 4.3). There is no requirement to establish a particular vegetation community on rehabilitated land. However an analogue transect is installed in a woodland area outside the open cut area. This analogue transect will be designed to act as reference site for the study of flora species assemblages.

### 8.2.1 Cattle Grazing Trial

Land disturbed for mining Bloomfield Colliery has been rehabilitated to grow pasture for livestock grazing post mining. The aim of the rehabilitation has been to support a productive and sustainable grazing land use. These areas of rehabilitated mined lands have been grazed with beef cattle.

To better understand the capability of the rehabilitated pastures to support cattle enterprises, a monitoring and recording program has commenced and will continue throughout the life of the mine.

The aim is to demonstrate that livestock enterprises conducted on rehabilitated pastures at Bloomfield are of comparable productivity to local district pasture land and are capable of grazing over the long term.

Demonstration that this land is capable of sustainable and productive cattle grazing is needed to provide assurance that cattle grazing is a viable future agricultural use for the land. The stability and productivity of the pastures, as well as soil & water conditions will be monitored to determine the performance of pastures on rehabilitated land.

Monitoring and documentation will provide an assessment of progress in achieving closure criteria for rehabilitated grazing land. Evaluation of pasture conditions will provide feedback for management of the land and provide early indicators to initiate changes in management if required.

Identical monitoring of an adjoining natural pasture site which is grazed in a similar fashion will provide an analogue to which the rehabilitation sites will be compared. Monitoring and comparison with both district practice and cattle grazed on undisturbed natural pasture will provide a benchmark for comparison of productive capability.

Pasture and land condition will be compared to 'target criteria' and trigger points can be used to initiate adaptive and anticipated changes to grazing and management to suit seasonal conditions. Documentation and recording is needed to allow long term assessment over a number of seasonal conditions. Comparison across several seasons will allow the assessment of productivity under variations in seasonal conditions and markets. Long term productivity assessment will also provide guidance into maintenance requirements to meet grazing best practice management.

### 8.2.2 Further Studies / Research

A mine closure Broad Brush Risk Assessment (BBRA) was undertaken to commence the Mine Closure Planning process. The BBRA identified four primary actions that should be progressed as a priority to address the critical and high risks. GHD has been engaged to undertake a Closure Execution Plan, a Landform and Rehabilitation Assessment and a Water Study. These studies a further outlined in Table 20. The fourth primary action identified in the BBRA concerned financial planning which is outside the scope of this MOP.

*Table 20: Further Studies / Research for Mine Closure Planning*

| Study / Research | Scope / Objective | Scheduled Completion |
|---|---|---|
| Closure Execution Plan | • Confirm and document closure objectives;<br>• Define scope of closure project;<br>• Establish closure project battery limits;<br>• Identify key roles and responsibilities;<br>• Develop RACI matrix;<br>• Establish resource requirements;<br>• Develop closure project organizational structure;<br>• Establish work breakdown structure;<br>• Establish key tasks and critical milestones;<br>• Identify logic between critical project tasks;<br>• Identify critical path and key constraints;<br>• Identify data gaps in elements that inform timing of closure;<br>• Establish Closure Execution Schedule. | Dec Qtr 2021 |
| Landform & Rehabilitation Assessment | • Collate existing information / data;<br>• Understand landform design;<br>• Confirm if historical and current landform is consistent with the approved landform;<br>• Understand the historical rehabilitation area conditions; | Dec Qtr 2021 |

| | | |
|---|---|---|
| | • Establish if existing evidence requirements meet MOP requirements for relinquishment;<br>• Establish if MOP requirements meet proposed future requirements for relinquishment;<br>• Gap analysis of information or knowledge to demonstrate and provide evidence for rehabilitations and landform;<br>• Identify monitoring / methodologies to ensure information is collected. | |
| Water Study | • Collate available baseline information to inform the development of conceptual site model;<br>• Confirm and develop the conceptual model with input of site knowledge;<br>• Combine spatial data, understanding of hydrological processes and site knowledge into a conceptual water model;<br>• Document gap analysis and develop recommendations for a closure monitoring program. | Dec Qtr 2021 |

# 9 Intervention and Adaptive Management

## 9.1 Threats to Rehabilitation

Bloomfield has completed an overarching risk assessment to identify the potential threats to the success of rehabilitation for the operations. Details of the risk assessment are outlined in Section 3 and a copy of this risk assessment is provided in Appendix 2.

## 9.2 Trigger Action Response Plan

The following Trigger Action Response Plan (TARP) identifies the proposed contingencies strategies in the event of unexpected variations or impacts to rehabilitation outcomes with data as obtained from the monitoring programs and performance criteria and indicators as stipulated in Section 6 of this MOP.

The key risks associated with site rehabilitation have been assessed using the maximum reasonable consequence ratings, likelihood ratings, risk matrix and classifications (Environmental Risk Identification Matrix) presented in Section 3. Table 21 outlines the key identified risks, triggers and proposed mitigation measures.

*Table 21: Proposed Mitigation Measures to Reduce Key Risks*

| Risk | Trigger | Proposed Mitigation Measure |
|---|---|---|
| Geotechnical failure of emplacement area such as slumping. | Landform not consistent with Landform Establishment as outlined in Table 15. | Review emplacement design, including survey if required.<br>Undertake reshaping of emplacement area minimising slopes >10°. |
| Off-site release of contaminants from mined materials requiring long term management or treatment. | Data obtained from compliance monitoring program indicates exceedance of EPL limits. | Ongoing monitoring of runoff and seepage waters during operations to validate predictions.<br>Mitigation measures as proposed in the WMP. |

| Risk | Trigger | Proposed Mitigation Measure |
|---|---|---|
| Wind and water erosion leading to degradation of growth medium and rehabilitation quality. | Monitoring indicates excessive erosion (ie rilling >30cm depth and width) resulting in land stability vegetation growth issues. | Ensure appropriate erosion and sedimentation controls and drainage lines will be employed during rehabilitation activities.<br>Maintenance earth and revegetation works will be undertaken in the areas where erosion has been noted.<br>Annual monitoring detailed above will be designed to determine the type, source, degree, and location of potential erosion sites and source of sediment. |
| Inadequate or insufficient topsoil to create/enhance the desired ecological communities. | Monitoring and vegetation assessments highlight inadequate ground cover and /or paucity in species diversity / distribution as outlined in Table 15.<br>Soil analysis indicates soil parameters are not compatible to post mining vegetation community as outlined in Table 15.<br>Topsoil balance indicates potential shortfall. | Review soil management procedures and amend as appropriate.<br>Implement maintenance revegetation program including seeding, tubestock planting of native overstorey species, fertiliser.<br>Implement soil testing and amend growing media by the addition of soil ameliorants as required eg; lime, gypsum, mulch, biosolids.<br>Assess soil for weed contamination and treat affected soil. |
| Impact of weeds and /or vertebrate pest animal leading to widespread failure of revegetation ecosystems. | Monitoring and vegetation assessments highlight increased weed competition and vertebrate pest activity when compared with reference site as outlined in Table 15. | Careful use of weed free topsoil and/or topsoil management.<br>Encourage rapid establishment of ground cover species designed to outcompete weed species.<br>Assessment and management of weed incursions on topsoil stockpiles prior to respreading.<br>Weed control undertaken in accordance with the requirements of the *Noxious Weeds Act 1993.*<br>Control of pest animal species in accordance with industry guidelines. |

| Risk | Trigger | Proposed Mitigation Measure |
|---|---|---|
| Poor vegetation establishment success. | Monitoring data indicates non-compliance with performance criteria of the monitoring program in terms of landscape function, biodiversity and pasture productivity as outlined in Table 15. | Review species mix and, if required, adjust to achieve the targeted ecosystem.<br>Pasture species selection will be reviewed in context of pasture productivity.<br>Conduct remedial treatment such as soil amelioration, reseeding etc. |
| Pasture areas not suitable for grazing productively. | Monitoring data indicates non-compliance with performance criteria of the monitoring program in terms of pasture productivity as outlined in Table 15. | Pasture species selection will be reviewed in context of pasture productivity.<br>Conduct remedial treatment such as soil amelioration, reseeding etc. |
| Spontaneous combustion destabilising land surface and impeding vegetation establishment | Significant or continued spontaneous combustion surface impacts. | Apply capping, or dig out affected area where possible and seal, remedial earthworks with inert material and revegetate.<br>Spontaneous Combustion Management Plan |
| Asset Protection Zone (APZ) an unacceptable bushfire risk. | APZ not maintained as per advice from RFS. | Control and maintain a suitable Asset Protection Zone surrounding rehabilitation areas by slashing and controlled grazing. |
| Major storm event resulting in flooding, geotechnical instability, major erosion and/or widespread damage to rehabilitated areas. | Actual severe storm event and localized flooding.<br>Monitoring program indicates lack of adequate ground cover as outlined in Table 15. | Design final landforms, drainage structures and revegetation to cope with major storm events.<br>Implement maintenance program on rehabilitation and sediment structures. |
| Severe and/or prolonged drought leading to widespread failure of revegetation. | Monitoring and vegetation assessments highlight inadequate ground cover and / or paucity in species diversity / distribution following a drought as outlined in Table 15. | Re-seeding with a selection of drought-tolerant species for revegetation.<br>Selection of species aligned to desired vegetation community.<br>Time seeding/plantings to take advantage of ideal weather conditions.<br>Assess against reference site to determine if impact rehabilitation specific. |

| Risk | Trigger | Proposed Mitigation Measure |
|---|---|---|
| Changing climate leading to failure of rehabilitation, failure of environmental management controls and/or inability to attain completion criteria. | Monitoring and vegetation assessments highlight inadequate ground cover and / or paucity in species diversity / distribution as outlined in Table 15.<br>Soil analysis indicates soil parameters are not compatible to post mining vegetation community as outlined in Table 15. | Assess climate change risks and implement appropriate measures where required.<br>Use of biosolids, compost materials and mulches to increase organic carbon levels and improve soil structure with resultant increase in infiltration and water holding capacity. |
| New regulatory requirements or evolving community expectations leading to difficulties negotiating or attaining completion criteria. | Changes in relevant legislation. | Monitor trends and developments in legislation and changes to community expectations.<br>Consult with stakeholders to gain acceptance of completion criteria. |

# 10 Reporting

## 10.1 Incident Reporting

Incident reporting procedures are in place to ensure that relevant agencies are notified in the format required (verbal and or phone) and in accordance with the timeframes of the licence or Approval. Records of these reports will be stored in accordance with the site based EMS.

## 10.2 Company Website

The company website will be checked and updated on a regular basis – at least monthly – to ensure that all monitoring data, reports and other documentation as stipulated in the Project Approval (Schedule 5 Condition 8) is available.

## 10.3 Annual Environmental Management Report /Annual Review

Bloomfield prepares an Annual Review in accordance with the NSW Government Integrated Mining Policy and with the requirements of ML1738. This annual report compiles monitoring results and discusses trends, system changes and responses to any potential issues identified during monitoring. Targets and future initiatives are also identified.

Also as required under the Development Consent, Bloomfield undertakes an Annual Review of the environmental performance of the project, which is reported in the Annual Review Report. This review includes:

- Describe the works (including any rehabilitation) that were carried out during the previous calendar year, and the works that are proposed to be carried out over the current calendar year;
- Include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the:
    - relevant statutory requirements, limits or performance measures/criteria;
    - monitoring results of previous years; and
    - relevant predictions in the EAs;
- Identify any non-compliance over the previous calendar year, and describe what actions were (or are being) taken to ensure compliance;
- Identify any trends in the monitoring data over the life of the project;
- Identify any discrepancies between the predicted and actual impacts of the project, and
- Analyse the potential cause of any significant discrepancies.

# 11 Plans

The following plans have been prepared in consideration of the Plan requirements in the MOP Guidelines and are attached:

- Plan 1A - Pre Mining Environment – Project Locality;
- Plan 1B - Pre mining environment – Natural environment
- Plan 1C - Pre mining environment – Built environment
- Plan 2 - Mine Domains at Commencement of the MOP;
- Plan 3A - Mining and Rehabilitation (2021)
- Plan 3B - Mining and Rehabilitation (2022)
- Plan 3C - Mining and Rehabilitation (2023)
- Plan 4A - Final Rehabilitation and Post Mining Land Use (Abel Resumes Operations);
- Plan 4B - Final Rehabilitation and Post Mining Land Use (Abel in Care & Maintenance);
- Plan 5A - Mining Land Use Cross Sections (Abel Resumes Operations); and
- Plan 5B - Mining Land Use Cross Sections (Abel in Care & Maintenance)

# 12 Reporting and Implementation of MOP

## 12.1 Review of the MOP

The ongoing effectiveness and efficiency of the site Management System is monitored as part of the operation's day-to-day management. Feedback from this and other more formal reviews and/ or following special occurrences, form the basis for System improvement and re-design.

In general the MOP will be reviewed on the following basis:

- Every three years; or
- Whenever there is a significant change to relevant legislation; or
- If required to do so by the Regulations; or
- Whenever there is a significant change to the operations; or
- If required (in writing) to do so by the Chief Inspector; or
- Whenever control measures are found to be ineffective either through:
    - changes to the working environment; or
    - changes to operating systems; or
    - subsequent risk assessments; or
    - the findings of an audit; or
    - following a fatality or dangerous incident that could reasonably have been expected to result in a fatality; or
    - following an assessment of a related safety alert.

### 12.1.1 Continual Improvement

Operational activities will be subject to regular review to ensure conformance with commitment made in the EMS and subordinate plans and strategies.

### 12.1.2 Document Management

Copies of this document are managed under the Group Document Management System. This document and other relevant documents are kept on site and are available to all employees.

## 12.2 Implementation

The Company Directors are responsible for the overall rehabilitation and environmental performance of Bloomfield Colliery The mine manager has direct responsibility for the rehabilitation process. The Environmental Officer provides direction and advice to ensure site environmental compliance is maintained. The Environmental Officer is responsible for the implementation of the works as described in this MOP. This involves ensuring all aspects of the rehabilitation processes, as outlined in this document, are followed and carried out.

***PLANS***

- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Local Government Area
- Road
- Rail_Line
- Creek

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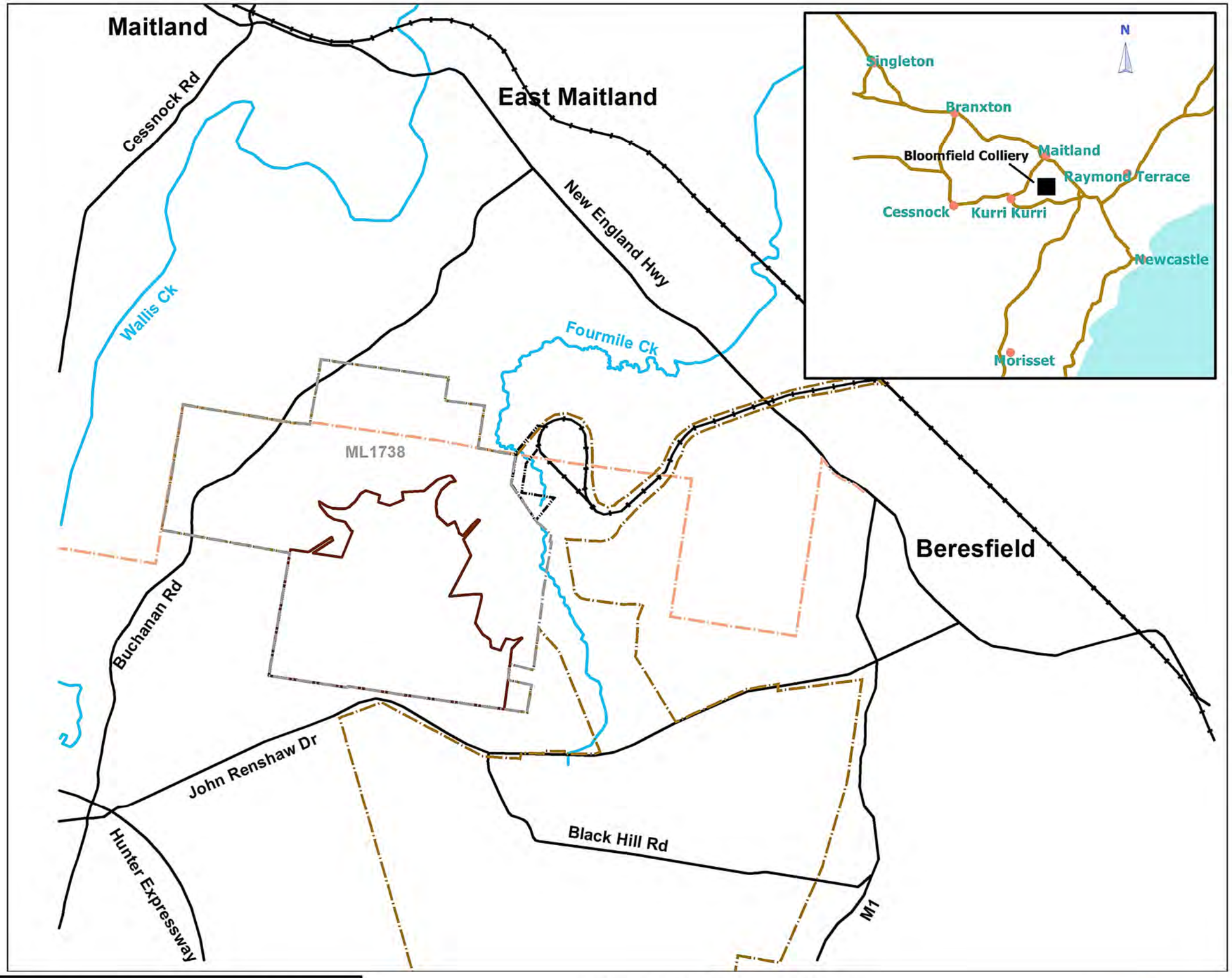
**Title Holder - Bloomfield Collieries Pty Ltd**

**Plan prepared by Greg Lamb**

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I, Brad Donoghoe, Holder of Mine Managers Certificate of Competency, certify that the information on this plan is a true indication of the proposed development

..... Mine Manager Date

I, Jeff Dunn, Registered Mine Surveyor, certify that to the best of my knowledge and belief this plan conforms to the accuracy & standards required by NSW Trade & Investmment - Division of Resources and Energy

..... Registered Mine Surveyor Date

# Bloomfield Colliery

## Pre-mining Environment - Natural Environment
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 1A**

- ML1738
- 07-0087 Approval Area
- AMA1001
- 05-0136 Able Coal Project
- Contours (5m)
- Creek
- Dam
- Clean Water
- Mine Water
- Water Management Area
- Relinquished Area
- Flood Prone Area

**Existing Rehabilitation**

- Pasture
- Trees over Pasture

**Vegetation Communities**

- MU Alluvial Cabbage Tree
- MU5 Alluvial Tall Moist Forest
- MU15 Spotted Gum - Ironbark Forest
- MU17 Spotted Gum - Ironbark Forest EEC
- MU18 Spotted Gum - Ironbark Forest
- MU30 Smooth-barked Apple Woodland
- MU35 Kurri Sands Swamp Woodland EEC
- MU41 Swamp Oak - Sedge Forest

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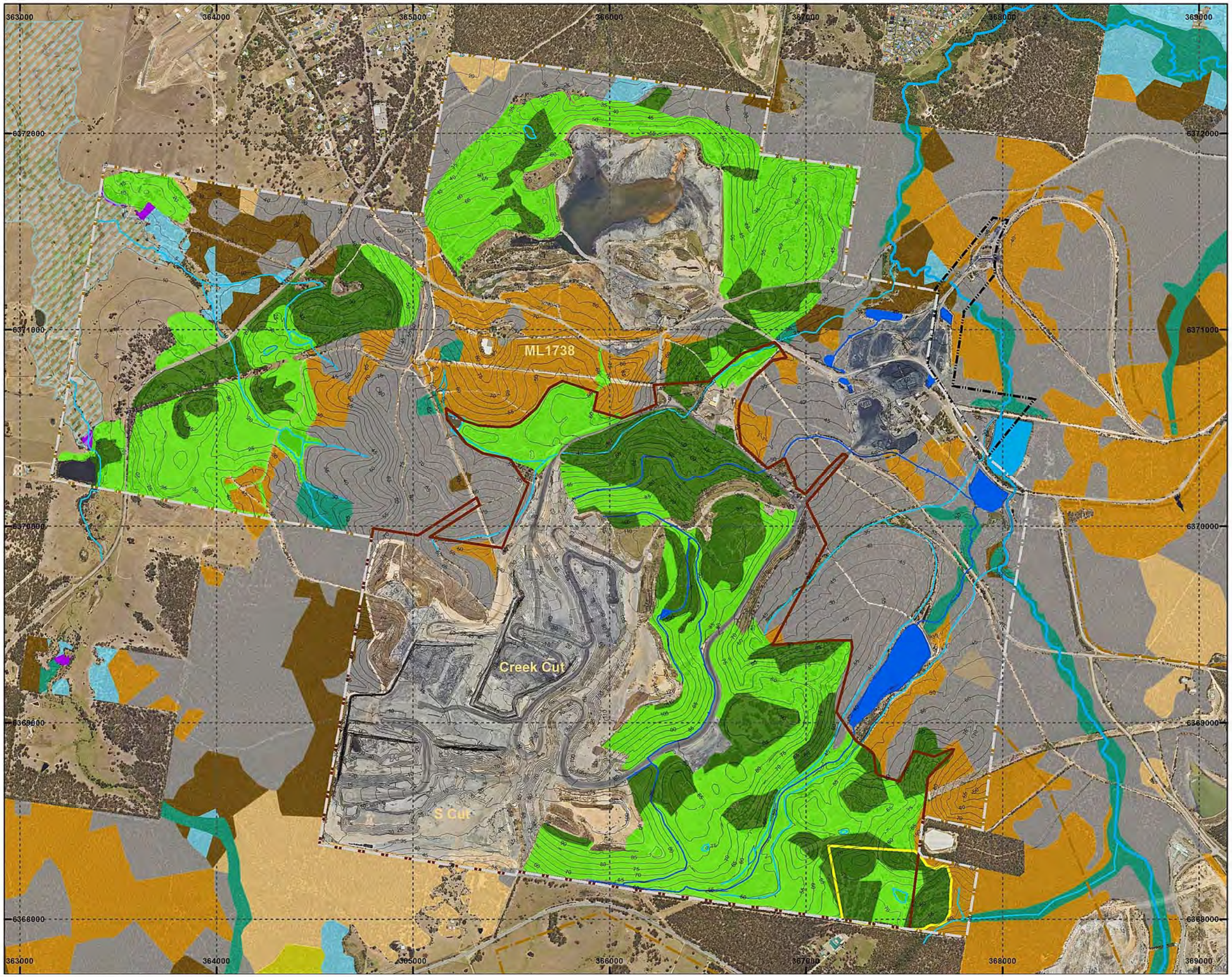
**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**

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# Bloomfield Colliery

## Pre-mining Environment - Natural Environment
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 1B**

- ML1738
- 07-0087 Approval Area
- AMA1001
- 05-0136 Able Coal Project
- Cadastral Boundary
- Creek
- Dam
- Clean Water
- Mine Water
- Water Management Area
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line
- Residences
- Infrastructure Area
- Old Underground Workings

**Land Ownership**

- Rathvale
- Yancoal
- Private
- The Bloomfield Group
- Ashtonfield

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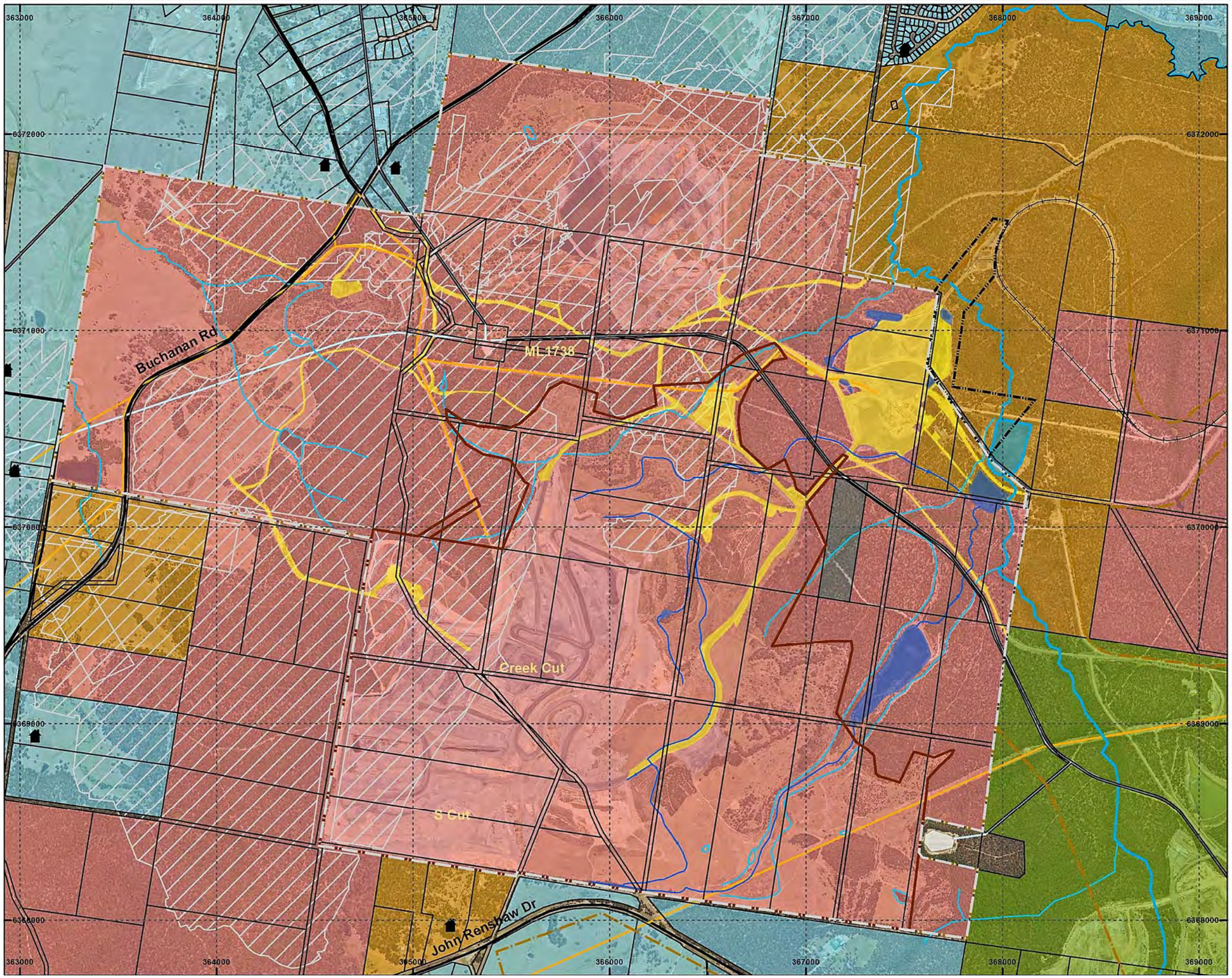
**Title Holder - Bloomfield Collieries Pty Ltd**

**Plan prepared by Greg Lamb**

**Bloomfield Orthophoto - 31/1/20**

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# Bloomfield Colliery

## Pre-mining Environment - Built Environment
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 1C**

- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Contours (5m)
- Creek
- Clean Water
- Mine Water
- Rehabilitation Monitoring Site
- Powerline
- Hunter_Water_Pipeline
- Roads
- Rail Line
- Cross-section

**Primary Mine Domains**

- Infrastructure Area
- Tailings Storage Area
- Water Management Area
- Overburden Emplacement
- Active Mining Area

**Secondary Mine Domains**

- Rehabilitated Area - Pasture
- Rehabilitated Area - Trees over Pasture
- Relinquished Lands

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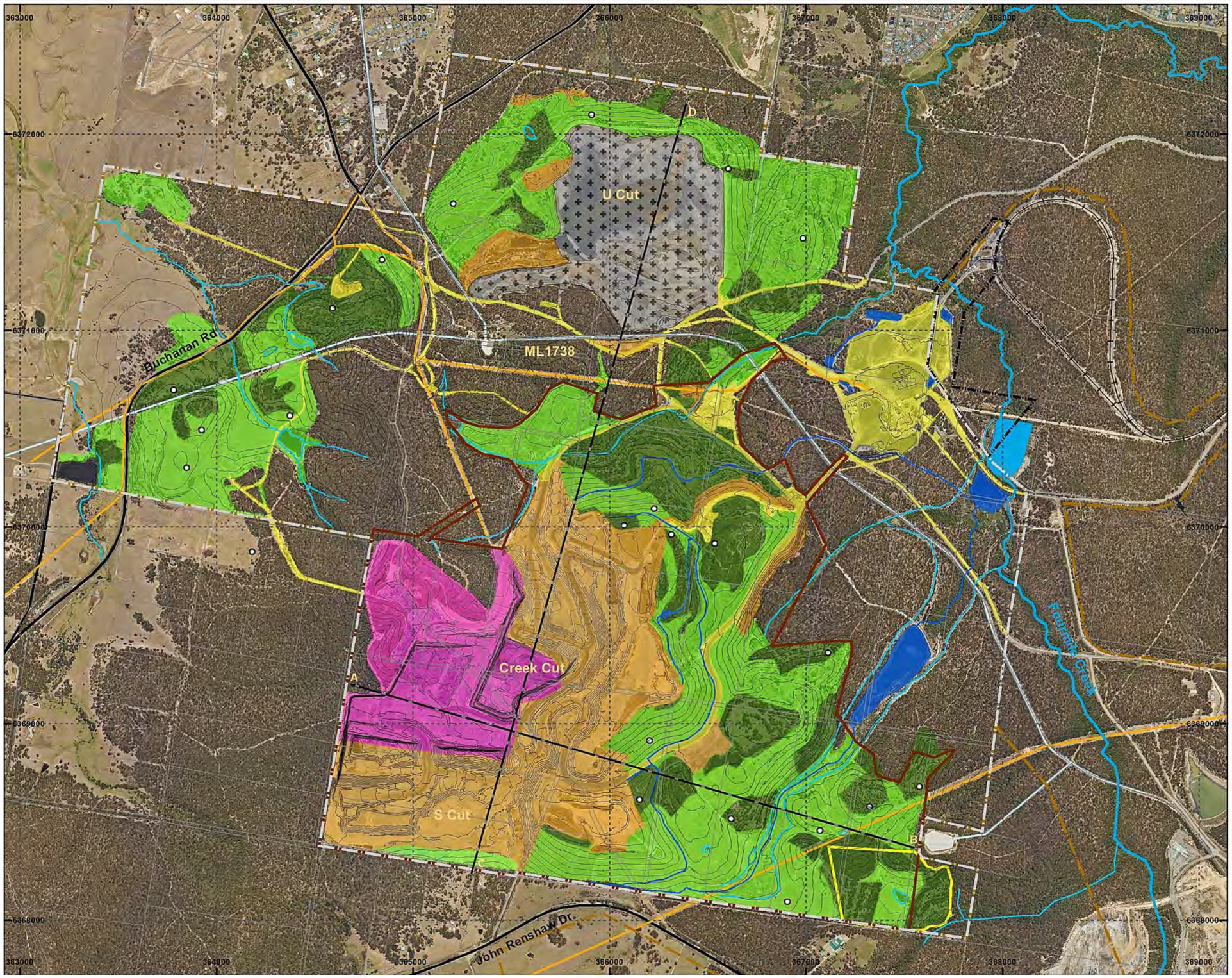
**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**

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..... Registered Mine Surveyor Date

# Bloomfield Colliery

## Mine Domains at Commencement of MOP
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 2**

- Cross-section
- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Contour (5m)
- Creek
- Clean Water
- Mine Water
- Rehabilitation Monitoring Site
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line

**Primary Mine Domains**

- Infrastructure Area
- Tailings Storage Area
- Water Management Area
- Overburden Emplacement
- Active Mining Area

**Secondary Mine Domains**

- Rehabilitated Area - Pasture
- Rehabilitated Area - Trees over Pasture
- Relinquished Lands

**Rehabilitation Phases**

- Landform Establishment
- Ecosytem and Land Use Establishment
- Ecosystem and Land Use Sustainability
- Relinquished Lands

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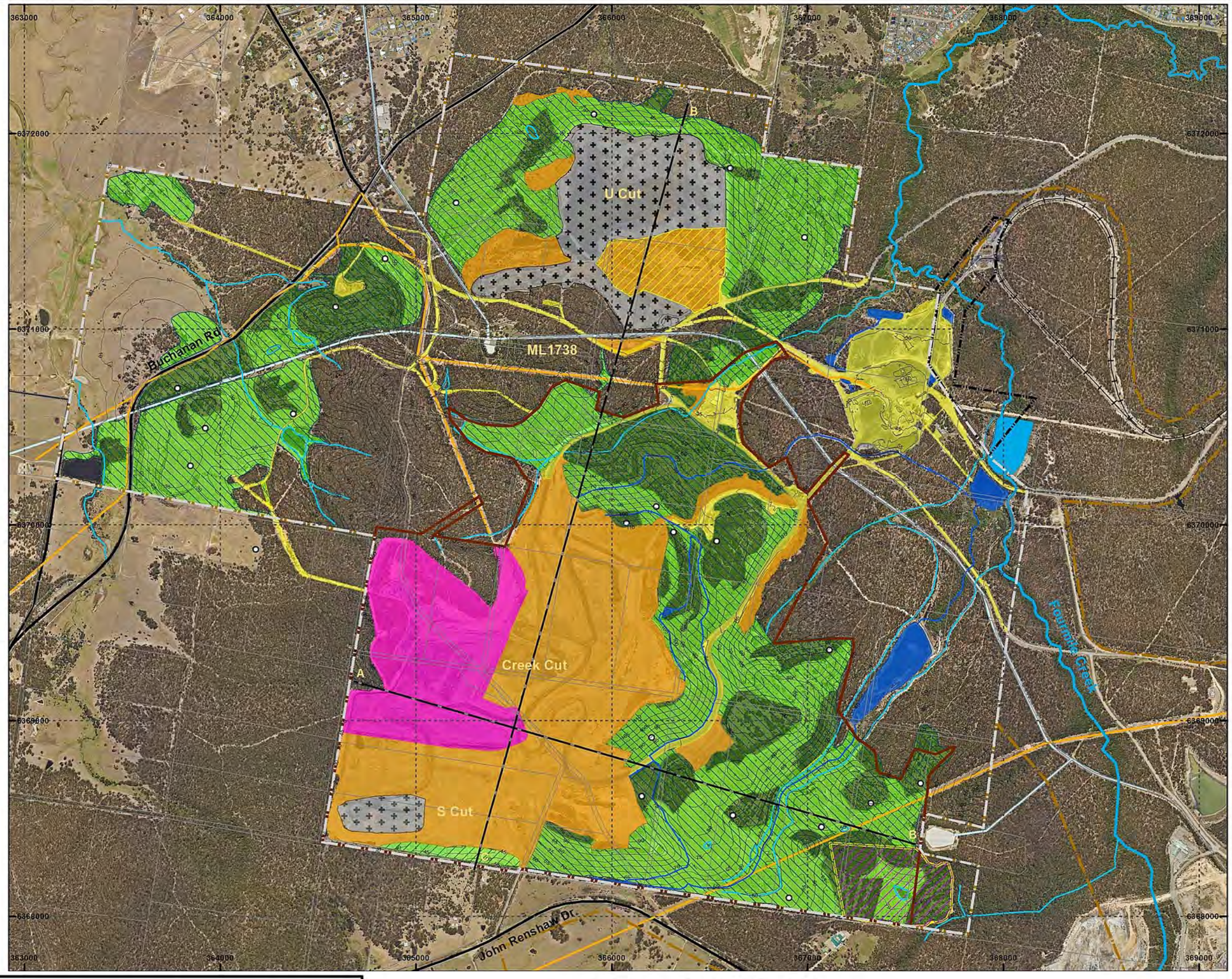
**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**

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..... Registered Mine Surveyor Date

# Bloomfield Colliery

## Mining and Rehabilitation - 2021
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

## Plan 3A

- Cross-section
- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Contour (5m)
- Creek
- Clean Water
- Mine Water
- Rehabilitation Monitoring Site
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line

**Primary Mine Domains**

- Infrastructure Area
- Tailings Storage Area
- Water Management Area
- Overburden Emplacement
- Active Mining Area

**Secondary Mine Domains**

- Rehabilitated Area - Pasture
- Rehabilitated Area - Trees over Pasture
- Relinquished Lands

**Rehabilitation Phases**

- Decommissioning
- Landform Establishment
- Ecosytem and Land Use Establishment
- Ecosystem and Land Use Sustainability
- Relinquished Lands

---

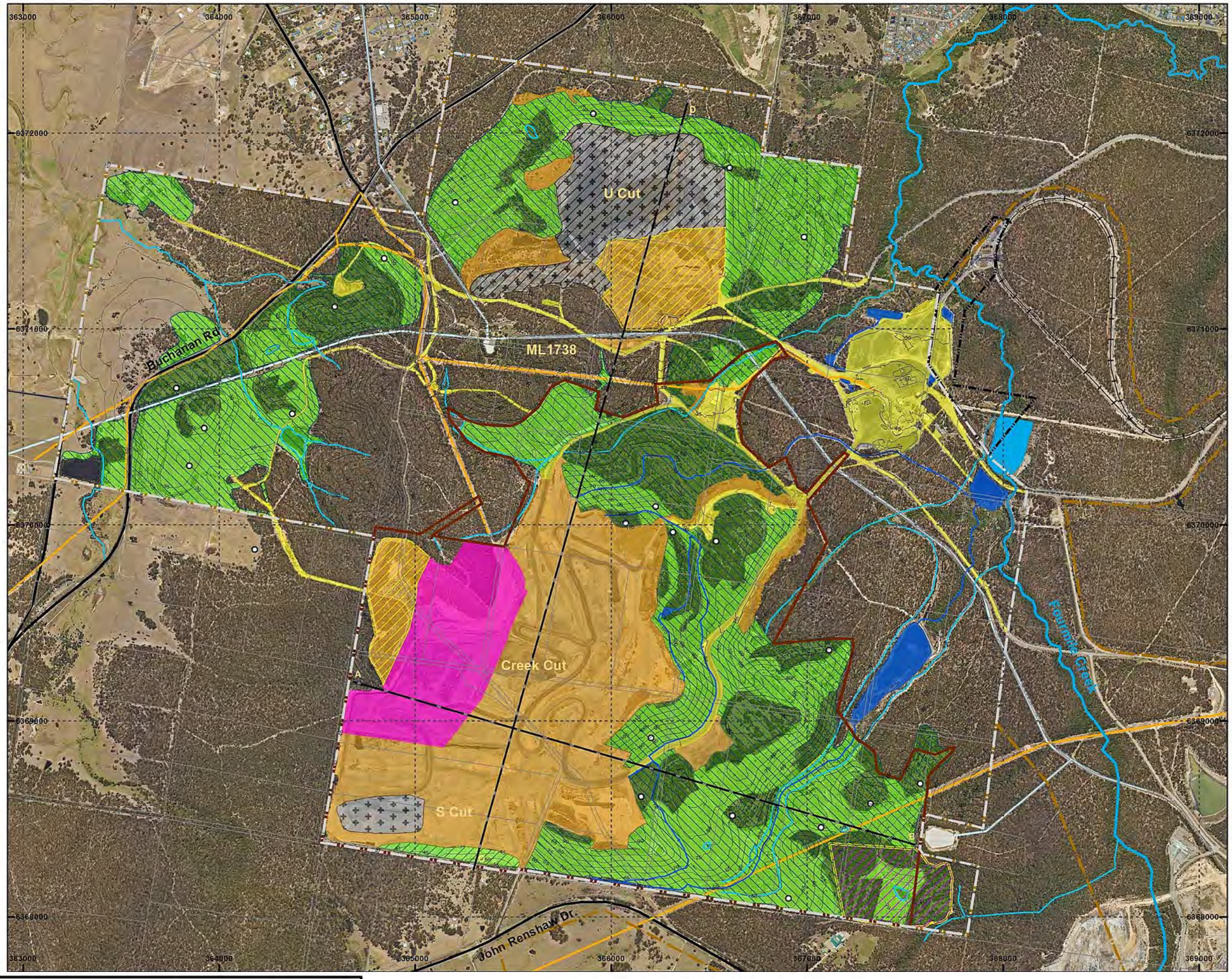
**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**

N

**Kilometers**

0 0.5 1 1.5

**Scale: 1:20,000** **MGA Zone 56**




I, Brad Donoghoe, Holder of Mine Managers Certificate of Competency, certify that the information on this plan is a true indication of the proposed development

..... Mine Manager Date

I, Jeff Dunn, Registered Mine Surveyor, certify that to the best of my knowledge and belief this plan conforms to the accuracy & standards required by NSW Trade & Investmment - Division of Resources and Energy

..... Registered Mine Surveyor Date

# Bloomfield Colliery

## Mining and Rehabilitation - 2022
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

## Plan 3B

- Cross-section
- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Contour (5m)
- Creek
- Clean Water
- Mine Water
- Rehabilitation Monitoring Site
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line

**Primary Mine Domains**

- Infrastructure Area
- Tailings Storage Area
- Water Management Area
- Overburden Emplacement
- Active Mining Area

**Secondary Mine Domains**

- Rehabilitated Area - Pasture
- Rehabilitated Area - Trees over Pasture
- Relinquished Lands

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- Decommissioning
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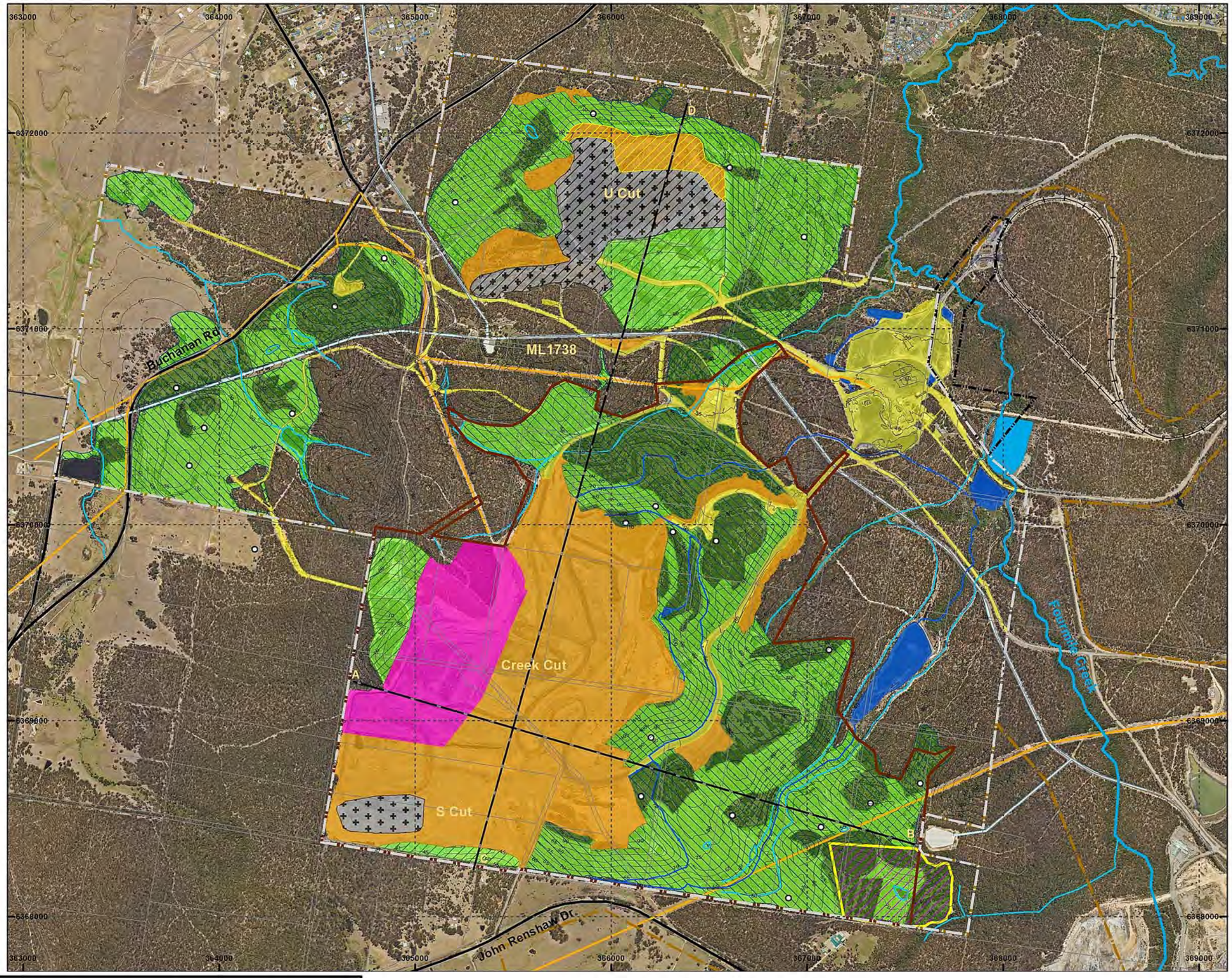
**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**




N

**Kilometers**

0 0.5 1 1.5

**Scale: 1:20,000** **MGA Zone 56**

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# Bloomfield Colliery

## Mining and Rehabilitation - 2023
## Mining Operation Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 3C**

- Cross-section
- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Contour (5m)
- Creek
- Clean Water
- Mine Water
- Rehabilitation Monitoring Site
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line
- Wildlife Corridor

**Primary Mine Domains**

- Infrastructure Area
- Water Management Area
- Tailings Storage Area
- Overburden Emplacement

**Secondary Mine Domains**

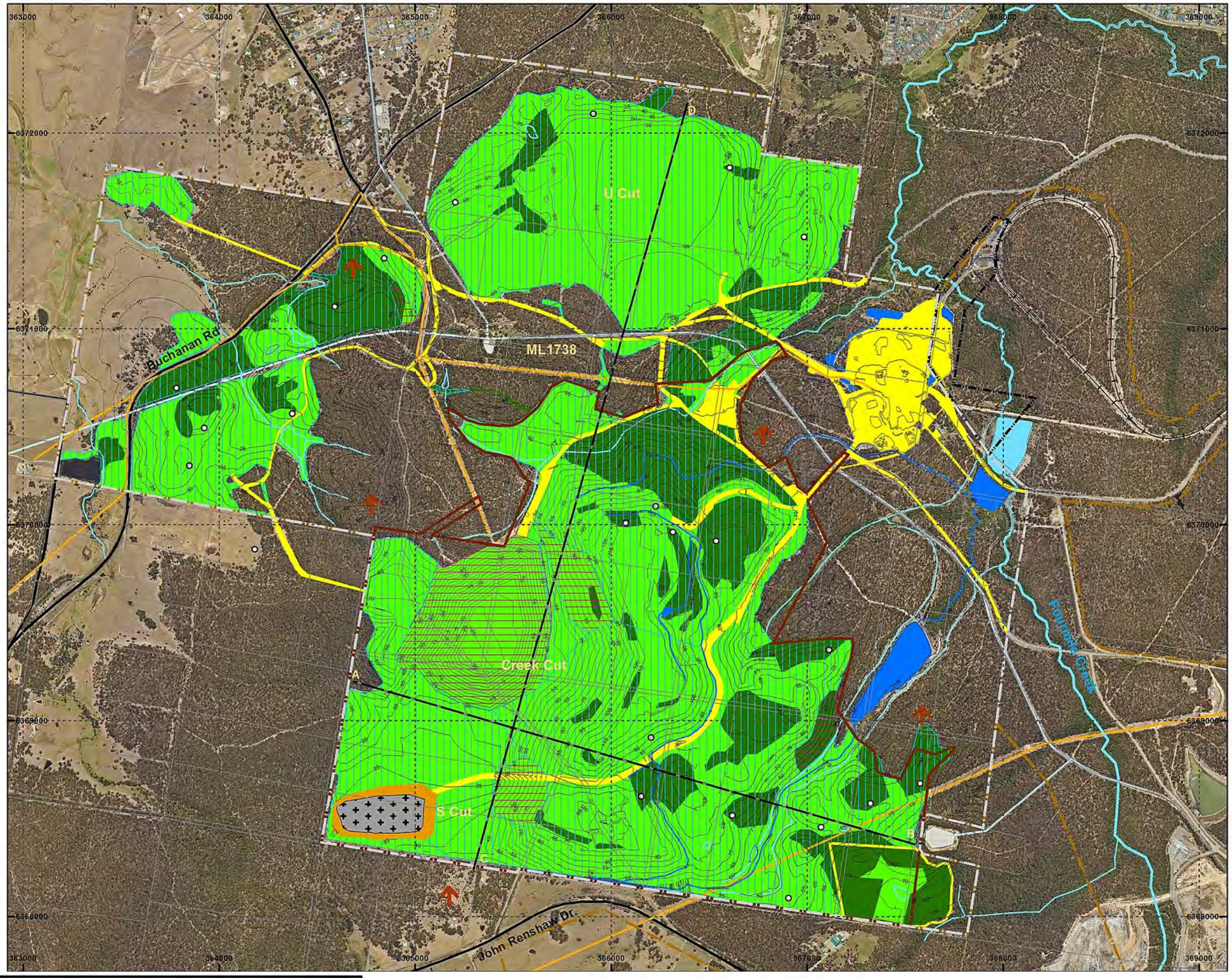
- Rehabilitated Area - Pasture
- Rehabilitated Area - Trees over Pasture
- Relinquished Lands

**Land and Soil Capability Class**

- L&SC Class 4
- L&SC Class 5

---

**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**




N

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0 0.5 1 1.5

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# Bloomfield Colliery

## Final Rehabilitation and Post Mining Land Use - 2028
## Abel Coal Mine Resumes Operation
## Mining Operations Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 4A**

- Cross-section
- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Contour (5m)
- Creek
- Clean Water
- Mine Water
- Rehabilitation Monitoring Site
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line
- Wildlife Corridor

**Primary Mine Domains**

- Infrastructure Area
- Water Management Area
- Relinquished Lands

**Secondary Mine Domains**

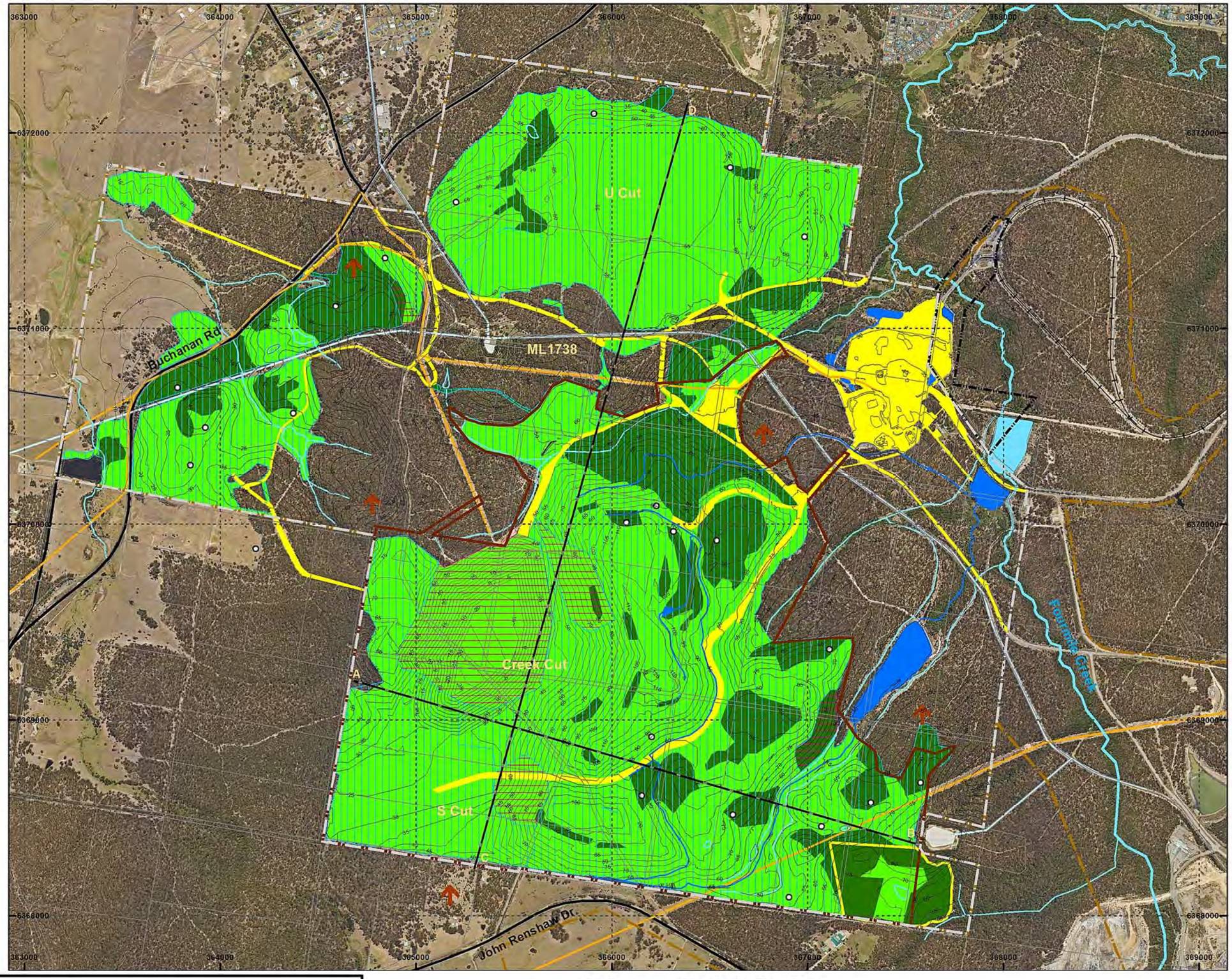
- Rehabilitated Area - Pasture
- Rehabilitated Area - Trees over Pasture

**Land and Soil Capability Class**

- L&SC Class 4
- L&SC Class 5

---

**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan prepared by Greg Lamb**
**Bloomfield Orthophoto - 31/1/20**




N

**Kilometers**

0 0.5 1 1.5

**Scale: 1:20,000** **MGA Zone 56**

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..... Registered Mine Surveyor Date

# Bloomfield Colliery

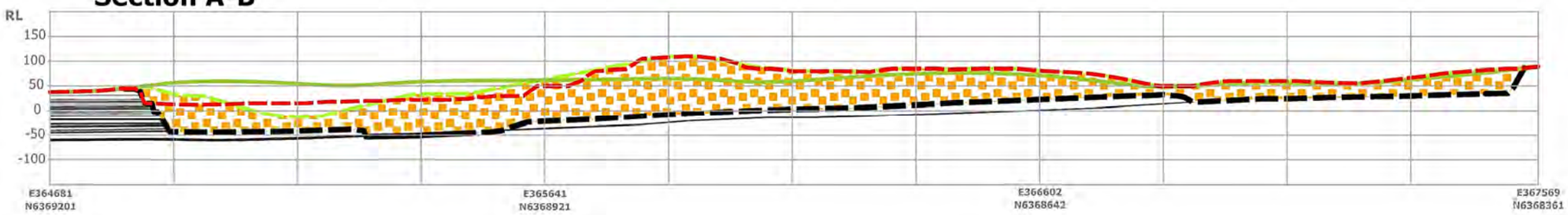
## Final Rehabilitation and Post Mining Land Use - 2028
## Abel Coal Mine in Care and Maintenance
## Mining Operations Plan - 2021 to 2023

**Date: 15/10/2020**

THE Bloomfield GROUP

**Plan 4B**

## Section A-B



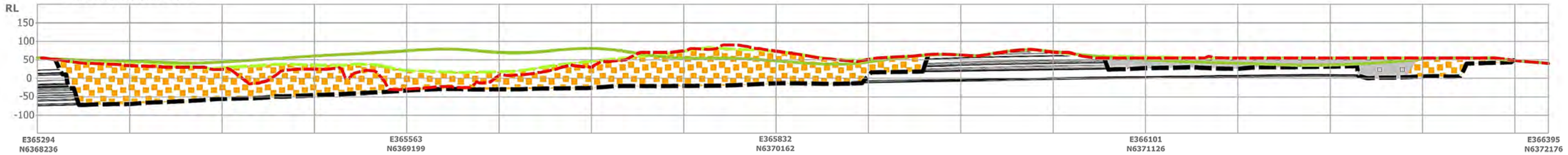

- Natural Surface
- Current Surface
- Final Surface
- Floor of Open Cut
- Overburden Emplacement
- Tailings Storage Area
- Coal Seams

**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan Prepared by Greg Lamb**

0 500 m

Horizontal Scale (A3) 1:11000
Vertical Scale (A3) 1:11000
MGA Zone 56

## Section C-D

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..... Registered Mining Surveyor Date

# Bloomfield Colliery

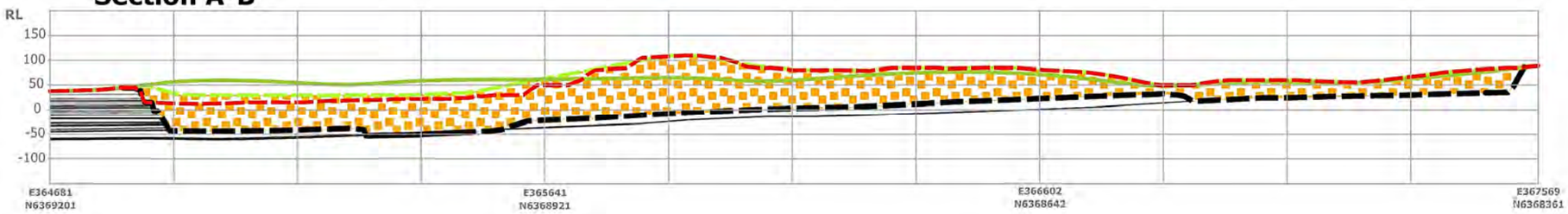
## Rehabilitation and Post Mining Land Use Sections
## Abel Coal Mine in Care and Maitenance
## Mining Operations Plan - 2021 to 2023

**Date: 9/9/2020**

THE Bloomfield GROUP

**Plan 5B**

## Section A-B



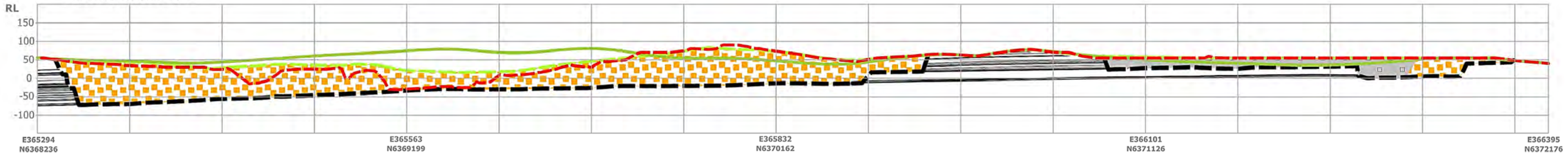

- Natural Surface
- Current Surface
- Final Surface
- Floor of Open Cut
- Overburden Emplacement
- Tailings Storage Area
- Coal Seams

**Title Holder - Bloomfield Collieries Pty Ltd**
**Plan Prepared by Greg Lamb**

0 — 500 m

Horizontal Scale (A3) 1:11000
Vertical Scale (A3) 1:11000
MGA Zone 56

## Section C-D

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..... Registered Mining Surveyor Date

# Bloomfield Colliery

**Rehabilitation and Post Mining Land Use Sections**
**Abel Coal Mine Resumes Operation**
**Mining Operations Plan - 2021 to 2023**

**Date: 8/9/2020**

THE Bloomfield GROUP

**Plan 5A**

# *APPENDIX 1*

## *PROJECT APPROVAL 07_0087 (Bloomfield Colliery)*

## *+*

## *PROJECT APPROVAL 05_0136 (Abel- "Bloomfield Site"*

# Project Approval

## Section 75J of the *Environmental Planning and Assessment Act 1979*

As delegate of the Minister for Planning, I approve the project referred to in schedule 1, subject to the conditions in schedules 2 to 5.

These conditions are required to:
- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Sam Haddad
**Director-General**

SIGNED 3 SEPTEMBER 2009

Sydney 2009

**SCHEDULE 1**

| | |
|---|---|
| **Application No:** | 07_0087 |
| **Proponent:** | Bloomfield Collieries Pty Limited |
| **Approval Authority:** | Minister for Planning |
| **Land:** | See Appendix 1 |
| **Project:** | Bloomfield Coal Project |

May 2011 modification in red
March 2012 modification in blue
February 2013 modification in green
August 2018 modification in purple

## TABLE OF CONTENTS

## DEFINITIONS

| | |
|---|---|
| Annual Review | The review required by condition 3 of Schedule 5 |
| BCA | Building Code of Australia |
| BC Act | *Biodiversity Conservation Act 2016* |
| BCT | NSW Biodiversity Conservation Trust |
| Biodiversity Offset Strategy | The Biodiversity Offset Strategy as described in EA (MOD 1) and EA (MOD 4) |
| CCC | Community Consultative Committee |
| CHPP | Coal handling and preparation plant |
| Council | Cessnock City Council |
| Day | The period between 7am and 6pm on Monday to Saturday and between 8am and 6pm on Sunday and Public Holidays |
| Department | Department of Planning and Environment |
| DoI | Department of Industry – Lands and Water |
| DRG | Division of Resources and Geoscience within the Department |
| DSC | Dams Safety Committee |
| EA | Environmental Assessment prepared for the Bloomfield Group entitled *Bloomfield Colliery Completion of Mining and Rehabilitation Part 3A Environmental Assessment Project Application 07_0087* Volumes 1, 2 and 3 (November 2008), including the response to submissions dated 5 February 2009 |
| EA (MOD 1) | Modification application 07_0087 Mod 1 and Environmental Assessment titled *Extension of the Project Approval Area for out-of-pit overburden emplacement and rehabilitation, alternative haul road and powerline relocation*, prepared by Business Environment and dated September 2010, including the Biodiversity Offset Strategy titled *Bloomfield Colliery Project Modification (07_0087 MOD 1) – Proposed Offset Strategy,* dated 31 March 2011 |
| EA (MOD 2) | Modification application 07_0087 Mod 2 and letter entitled Bloomfield Coal Project – Modification of PA 07_0087, dated November 2011 |
| EA (MOD 3) | Modification application 07_0087 Mod 3 as requested by letter entitled *Bloomfield Coal Project – Modification of PA 07-0087* and dated 17 December 2012 |
| EA (MOD 4) | Modification application 07_0087 and accompanying Environmental Assessment prepared for the Bloomfield Group entitled *Bloomfield Colliery – Life of Mine Extension, Modification 4* (January 2018), including the response to submissions dated 14 June 2018 |
| EEC | Endangered Ecological Community |
| EPA | Environment Protection Authority |
| EP&A Act | *Environmental Planning and Assessment Act 1979* |
| EP&A Regulation | *Environmental Planning and Assessment Regulation 2000* |
| EPL | Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997* |
| Evening | The period between 6pm and 10pm |
| Feasible | Means what is possible and practical in the circumstances |
| Land | The whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval |
| LGA | Local government area |
| Material harm | Is harm that:<br>• involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or<br>• results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)<br>This definition excludes "harm" that is authorised under either this approval or any other statutory approval' |
| Mining operations | The removal and emplacement of overburden and the extraction of coal |
| Minister | NSW Minister for Planning, or delegate |
| Modification 4 | The modification to the project as described in EA (MOD 4) |
| Morning shoulder | The period between 6am and 7am, Monday to Saturday (excluding Public Holidays) |
| Night | The period between 10pm and 6am, Monday to Saturday and between 10pm and 8am on Sunday and Public Holidays |

| | |
|---|---|
| OEH | Office of Environment and Heritage |
| Privately-owned land | Land that is not owned by a public agency, or a mining company (or its subsidiary) |
| Proponent | Bloomfield Collieries Pty Limited or any other person or persons who rely on this approval to carry out the project that is subject to this approval |
| Project | The Bloomfield Coal Project described in the EA |
| Reasonable | Means applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements |
| ROM | Run-of-mine |
| Secretary | Planning Secretary under the EP&A Act, or nominee |
| Site | Land to which the project application applies (see Appendix 1 and 2) |
| Statement of Commitments | The Proponent's Final Statement of Commitments for Site Operations and Management in Appendix 3 |

## SCHEDULE 2
## ADMINISTRATIVE CONDITIONS

**Obligation to Minimise Harm to the Environment**

1. The Proponent must implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

**Terms of Approval**

2. The Proponent must carry out the project generally in accordance with the:
   (a) EA, EA (MOD 1), EA (MOD 2), EA (MOD 3) and EA (MOD 4);
   (b) Biodiversity Offset Strategy; and
   (c) Statement of Commitments.

   *Notes:*
   - *The general layout of the project is shown in Appendix 2; and*
   - *The Statement of Commitments is reproduced in Appendix 3.*

2A. The Proponent must carry out the project in accordance with the conditions of this approval.

3. If there is any inconsistency between the above documents, the more recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.

4. The Proponent must comply with any reasonable requirements of the Secretary arising from the Department's assessment of:
   (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with the conditions of this approval;
   (b) any reviews, reports or audits undertaken or commissioned by the Department regarding compliance with the conditions of this approval; and
   (c) the implementation of any actions or measures contained in these documents.

**Limits on Approval**

5. Mining operations may take place on the site until 31 December 2030.

   *Note: Under this Approval, the Proponent is required to rehabilitate the site to the satisfaction of the Secretary and DRG. Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated to a satisfactory standard.*

6. The Proponent must not extract more than 1.3 million tonnes of ROM coal a year from the site.

**Hours of Operation**

7. Project operations may take place 24 hours per day, 7 days per week.

**Management Plans / Monitoring Programs**

8. With the approval of the Secretary, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

9. The Proponent must prepare revisions of any strategy, plan or program required under this project approval if directed to do so by the Secretary. Such revisions must be prepared to the satisfaction of, and within a timeframe approved by, the Secretary.

10. With the approval of the Secretary, the Proponent may integrate any strategy, plan, program, review, audit or committee required by this approval with any similar requirement under the development consent for the Donaldson Coal Mine and the project approval for the Abel Coal Mine.

**Structural Adequacy**

11. The Proponent must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

*Notes:*

- *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*

**Demolition**

12. The Proponent must ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

**Operation of Plant and Equipment**

13. The Proponent must ensure that all plant and equipment used on site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

**Community Enhancement Fund**

14. The Proponent must establish a Community Enhancement Fund of a minimum of $500,000 and implement expenditure from that fund to the satisfaction of the Secretary. Proposals for expenditure from the fund must:
    (a) be prepared by the Proponent in consultation with Council and the CCC and be submitted to the Secretary for approval by 31 December 2009;
    (b) be expended over the ten calendar years 2010-2019; and
    (c) include:
        - a minimum of $180,000 on local infrastructure projects within Cessnock LGA, to be commenced no later than 30 September 2011; and
        - a minimum of $32,000 annually to locally-operating community charities.

**Evidence of Consultation**

15. Where conditions of this approval require consultation with an identified party, the Proponent must:
    (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and
    (b) provide details of the consultation undertaken including:
        - the outcome of that consultation, matters resolved and unresolved; and
        - details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed the matters not resolved.

**Applicability of Guidelines**

16. References in the conditions of this approval to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this approval.

17. However, consistent with the conditions of this approval and without altering any limits or criteria in this approval, the Secretary may, when issuing directions under this approval in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.

**Compliance**

18. The Proponent must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this approval relevant to activities they carry out in respect of the project.

## SCHEDULE 3
## SPECIFIC ENVIRONMENTAL CONDITIONS

### NOISE

#### Noise Impact Assessment Criteria

1. The Proponent must ensure that the noise generated by the project does not exceed at any residence on privately-owned land, or on more than 25% of any privately-owned land, the noise impact assessment criteria shown in Table 1 for the monitoring location nearest to that residence or land:

*Table 1: Operational noise impact assessment criteria dB(A)*

| ***Morning shoulder*** | ***Day*** | ***Evening*** | ***Night*** | | ***Location and Locality*** |
|---|---|---|---|---|---|
| $L_{Aeq(15\ min)}$ | $L_{Aeq(15\ min)}$ | $L_{Aeq(15\ min)}$ | $L_{Aeq(15\ min)}$ | $L_{A1(1\ min)}$ | |
| 40 | 35 | 35 | 35 | 45 | **E** Browns Rd, Black Hill |
| 42 | 35 | 35 | 35 | 45 | **F** Black Hill Rd, Black Hill |
| 43 | 39 | 42 | 37 | 45 | **G** Buchanan Rd, Buchanan |
| 35 | 35 | 35 | 35 | 45 | **H** Mt Vincent Rd, Louth Park |
| 35 | 35 | 35 | 35 | 45 | **L** Kilshanny Ave, Ashtonfield |
| 48 | 39 | 39 | 37 | 46 | **M** John Renshaw Drive, Buttai |
| 43 | 42 | 42 | 35 | 45 | **N** Lings Road, Buttai |

*Note: To interpret the locations in Table 1, see Appendix 2.*

However, if the Proponent has a written negotiated noise agreement with the landowner of any privately-owned land, and a copy of this agreement has been forwarded to the Department and EPA, then the Proponent may exceed the noise limits in Table 1 on that land in accordance with the negotiated noise agreement.

#### Cumulative Noise Criteria

2. The Proponent must take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on, or on more than 25 percent of, any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50dB(A) – Morning shoulder and Day;*
   - $L_{Aeq(4\ hour)}$ *45 dBA) – Evening; and*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

#### Continuous Improvement

3. The Proponent must:
   (a) implement all reasonable and feasible noise mitigation measures;
   (b) investigate ways to reduce the noise generated by the project; and
   (c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review,
   to the satisfaction of the Secretary.

#### Monitoring

4. The Proponent must prepare a Noise Monitoring Program for the project to the satisfaction of the Secretary. The Program must :
   (a) be prepared in consultation with EPA and be submitted to the Secretary for approval within 6 months of the date of this approval; and
   (b) include:
      - a combination of unattended and attended monitoring measures; and
      - a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this approval.

The Proponent must implement the Noise Monitoring Program as approved by the Secretary.

### BLASTING AND VIBRATION

#### Airblast Overpressure Limits

5. The Proponent must ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

*Table 2: Airblast overpressure impact assessment criteria*

| ***Airblast overpressure level (dB(Lin Peak))*** | ***Allowable exceedance*** |
|---|---|
| 115 | 5% of the total number of blasts in a 12 month period |
| 120 | 0% |

**Ground Vibration Impact Assessment Criteria**

6. The Proponent must ensure that the ground vibration level from blasting at the project does not exceed the levels in Table 3 at any residence on privately-owned land.

*Table 3: Ground vibration impact assessment criteria*

| ***Peak particle velocity (mm/s)*** | ***Allowable exceedance*** |
|---|---|
| 5 | 5% of the total number of blasts in a 12 month period |
| 10 | 0% |

**Blasting Hours and Frequency**

7. The Proponent must carry out blasting on site only between 9 am and 5 pm Monday to Saturday. No blasting is allowed on Sundays and Public Holidays.

8. The Proponent may carry out on the site a maximum of:
   (a) 2 blasts a day; and
   (b) 5 blasts a week, averaged over a 12 month period.

**Operating Conditions**

9. During mining operations on site, the Proponent must implement best blasting practice to:
   (a) protect the safety of people, property, public infrastructure, and livestock; and
   (b) minimise the dust and fume emissions from blasting at the project,
   to the satisfaction of the Secretary.

10. The Proponent must not undertake blasting within 500 metres of any privately-owned land, unless suitable arrangements have been made with the landowner and any tenants to minimise the risk of flyrock-related impact to the property to the satisfaction of the Secretary.

**Public Notice**

11. The Proponent must:
   (a) notify the landowner/occupier of any residence within 2 kilometres of the mining area who registers an interest in being notified about the blasting schedule at the mine, or any other landowner nominated by the Secretary;
   (b) operate a blasting hotline, or alternate system agreed to by the Secretary, to enable the public to get up-to-date information on the blasting schedule at the project;
   (c) advertise the blasting hotline number in a local newspaper at least 4 times each year; and
   (d) publish an up-to-date blasting schedule on its website,
   to the satisfaction of the Secretary.

**Property Inspections**

12. The Proponent must advise the owners of privately-owned land that they are entitled to a structural property inspection to establish the baseline condition of buildings and other structures on the property:

(a) within 2 months of the date of this approval, for properties within 2 kilometres of blasting operations occurring at the date of this approval; and
(b) at least 2 months prior to blasting within 2 kilometres of additional properties.

If the Proponent receives a written request for a structural property inspection from any such landowner, the Proponent must:

- within 2 months of receiving this request commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to inspect the condition of any building or structure on the land (prior to blasting taking place within 2 km of the property, if possible), and recommend measures to mitigate any potential blasting impacts; and
- give the landowner a copy of the property inspection report.

**Property Investigations**

13. If any landowner of privately-owned land within 2 kilometres of blasting operations, or any other landowner nominated by the Secretary, claims that buildings and/or other structures on his/her land have been damaged as a result of blasting at the project after the date of this approval, the Proponent must within 3 months of receiving this claim:
(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to investigate the claim; and
(b) give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent must repair the damages to the satisfaction of the Secretary.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.

**Blast Monitoring Program**

14. The Proponent must prepare a Blast Monitoring Program for the project to the satisfaction of the Secretary. This program must:
(a) be submitted to the Director General for approval within 6 months of the date of this approval; and
(b) include a protocol for evaluating blasting impacts on, and demonstrating compliance with, the blasting criteria in this approval for all privately-owned residences and other structures.

The Proponent must implement the Blast Monitoring Program as approved by the Secretary.

**AIR QUALITY**

**Impact Assessment Criteria**

15. The Proponent must ensure that dust emissions generated by the project do not cause additional exceedances of the criteria listed in Tables 4 to 6 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

***Table 4:*** *Air quality criteria*

| ***Pollutant*** | ***Averaging Period*** | ***Criterion*** | |
|---|---|---|---|
| Particulate matter < 10 µm ($PM_{10}$) | Annual | [a,c] 25 µg/m$^3$ | |
| Particulate matter < 10 µm ($PM_{10}$) | 24 hour | [b] 50 µg/m$^3$ | |
| Particulate matter < 2.5 µm ($PM_{2.5}$) | Annual | [a,c] 8 µg/m$^3$ | |
| Particulate matter < 2.5 µm ($PM_{2.5}$) | 24 hour | [b] 25 µg/m$^3$ | |
| Total suspended particulates (TSP) | Annual | [a,c] 90 µg/m$^3$ | |
| [d] Deposited dust | Annual | [b] 2 g/m$^2$/month | [a] 4 g/m$^2$/month |

***Notes:***
[a] *Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).*

[b] *Incremental impact (i.e. incremental increase in concentrations due to the project on its own).*
[c] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.*
[d] *Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.*

**Monitoring**

16. The Proponent must prepare an Air Quality Monitoring Program for the project to the satisfaction of the Secretary. This program must:
    (a) be prepared in consultation with EPA and be submitted to the Secretary for approval within 6 months of the date of this approval; and
    (b) include:
        - a combination of high-volume samplers and dust deposition gauges to monitor the dust emissions of the project and provision for additional real time monitoring if required in response to monitoring results and/or complaints; and
        - an air quality monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this approval.

    The Proponent must implement the Air Quality Monitoring Program as approved by the Secretary.

**METEOROLOGICAL MONITORING**

17. During the project, the Proponent must ensure there is a suitable continuously operating meteorological station on or adjacent to the site that complies with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales* (DEC, 2007), or its latest version, to the satisfaction of the Secretary.

**WATER MANAGEMENT**

**Discharge**

18. Except as may be expressly provided for by an EPL, or in accordance with section 120 of the *Protection of the Environment Operations Act 1997*, the Proponent must not discharge any mine water from the site. However, water may be transferred between the site and the adjoining Donaldson Coal Mine and/or Abel Coal Mine, in accordance with any approved Water Management Plan (see below).

**Water Management Plan**

19. The Proponent must prepare a Water Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with EPA and DoI and be submitted to the Secretary for approval within 6 months of the date of this approval;
    (b) be prepared by suitably qualified expert/s whose appointment/s have been approved by the Secretary; and
    (c) include:
        - a Site Water Balance;
        - an Erosion and Sediment Control Plan;
        - a Surface Water Monitoring Plan;
        - a Ground Water Monitoring Program; and
        - a Surface and Ground Water Response Plan.

    The Proponent must implement the Water Management Plan as approved by the Secretary.

**Site Water Balance**

20. The Site Water Balance must:
    (a) include details of:
        - sources and security of water supply;
        - water use and management on site;
        - any off-site water transfers or discharges; and
        - reporting procedures; and
    (b) describe measures to minimise water use by the project.

**Erosion and Sediment Control**

21. The Erosion and Sediment Control Plan must:
    (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction (Volume 2E – Mines and Quarries)* manual (DECC 2008), or its latest version;
    (b) identify activities that could cause soil erosion and generate sediment;
    (c) describe measures to minimise soil erosion and the potential for transport of sediment downstream;
    (d) describe the location, function and capacity of erosion and sediment control structures; and
    (e) describe what measures would be implemented to maintain the structures over time.

**Surface Water Monitoring**

22. The Surface Water Monitoring Program must include:
    (a) detailed baseline data on surface water flows and quality in creeks and other waterbodies that could potentially be affected by the project;
    (b) surface water and stream health impact assessment criteria;
    (c) a program to monitor the impact of the project on surface water flows, water quality and stream health; and
    (d) reporting procedures for the results of the monitoring program.

**Groundwater Monitoring**

23. The Groundwater Monitoring Program must include:
    (a) further development of the regional and local groundwater model;
    (b) detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality (including at any privately owned bores in the vicinity of the site);
    (c) groundwater impact assessment criteria;
    (d) a program to monitor the impact of the project on groundwater levels, yield, quality, groundwater dependent ecosystems and riparian vegetation;
    (e) procedures for the verification of the groundwater model; and
    (f) reporting procedures for the results of the monitoring program and model verification.

**Surface and Groundwater Response Plan**

24. The Surface and Groundwater Response Plan must describe the measures and/or procedures that would be implemented to:
    (a) investigate, notify and mitigate any exceedances of the surface water, stream health and ground water impact assessment criteria;
    (b) compensate landowners of privately-owned land whose water supply is adversely affected by the project; and
    (c) mitigate and/or offset any adverse impacts on groundwater dependent ecosystems or riparian vegetation.

**LANDSCAPE MANAGEMENT**

**Rehabilitation Objectives and Commitments**

25. The Proponent must rehabilitate the site to the satisfaction of DRG and the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the documents listed in condition 2 of Schedule 2 and comply with the objectives in Table 5.

***Table 5:*** *Rehabilitation Objectives*

| ***Feature*** | ***Objective*** |
|---|---|
| All areas of the site affected by the project | • Safe, stable and non-polluting<br>• Fit for the intended post-mining land use/s |
| Areas proposed for native ecosystem re-establishment | • Restore self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area.<br>• Establish areas of self-sustaining:<br>- riparian habitat, within any diverted and/or re-established creek lines and retained water features; |

| *Feature* | *Objective* |
|---|---|
| | - potential habitat for threatened flora and fauna species; and<br>- wildlife corridors, as far as is reasonable and feasible. |
| Areas proposed for agricultural land | • Establish/restore grassland areas to support sustainable agricultural activities<br>• Achieve the nominated land capability classification |
| Other land affected by the development | • Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native plant species (unless DRG agrees otherwise) |
| Final Landform | • Stable and sustainable for the intended post-mining land use/s<br>• Integrated with surrounding natural landforms<br>• Incorporate micro-relief and drainage lines that are consistent with surrounding topography, to the greatest extent practicable<br>• Maximise surface water drainage to the natural environment (excluding final void catchment) |
| Final voids | • Designed as long term groundwater sinks to maximise ground water flows across back filled pits to the final void<br>• Minimise to the greatest extent practicable:<br>- the size and depth of final voids;<br>- the drainage catchment of final voids;<br>- any high wall instability risk; and<br>- the risk of flood interaction |
| Creek restoration works | • Engineered to be hydraulically and geomorphologically stable<br>• Incorporate erosion control measures based on vegetation and engineering revetments<br>• Incorporate structures for aquatic habitat<br>• Revegetate with suitable native species |
| Surface infrastructure of the development | • To be decommissioned and removed, unless DRG agrees otherwise |
| Rehabilitation materials | • Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources, to the greatest extent practicable |
| Water quality | • Water retained on the site is fit for the intended post-mining land use/s<br>• Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation |
| Community | • Ensure public safety<br>• Minimise adverse socio-economic effects associated with mine closure |

***Note:*** *The rehabilitation objectives detailed in 5 apply to the entire site, including all landforms constructed under either this approval or previous consents. However, they do not require any additional earthmoving works to be undertaken for landforms that have been approved and constructed prior to Modification 4 or under previous consents.*

25A. The Proponent must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.

***Note:*** *It is accepted that some parts of the site that are progressively rehabilitated may be subject to further disturbance at some later stage of the development.*

**Landscape Management Plan**

26. The Proponent must prepare a detailed Landscape Management Plan for the project to the satisfaction of the Secretary and DRG. This plan must:
    (a) be prepared in consultation with OEH, DoI and Council by suitably qualified expert/s whose appointment/s have been approved by the Secretary; and
    (b) include a:
        - Rehabilitation Management Plan to be submitted to the Secretary for approval within 6 months of the date of this approval;
        - Final Void Management Plan to be submitted to the Secretary for approval by 30 June 2012; and
        - Mine Closure Plan to be submitted to the Secretary for approval by 30 June 2012.

    The Proponent must implement the Landscape Management Plan as approved by the Secretary.

**Rehabilitation Management Plan**

27. The Rehabilitation Management Plan must include:
    (a) the rehabilitation objectives for the site;
    (b) a description of the short, medium, and long term measures that would be implemented to:
        - rehabilitate the site; and
        - manage the remnant vegetation and habitat on the site;
    (c) performance and completion criteria for the rehabilitation of the site;
    (d) a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:
        - minimising and rehabilitating disturbed areas;
        - protecting vegetation and soil outside the disturbance areas;
        - undertaking pre-clearance surveys;
        - managing impacts on fauna;
        - landscaping the site to minimise visual impacts;
        - conserving and reusing topsoil;
        - collecting and propagating seed for rehabilitation works;
        - salvaging and reusing material from the site for habitat enhancement;
        - controlling weeds and feral pests;
        - controlling access; and
        - bushfire management;
    (e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
    (f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
    (g) details of who would be responsible for monitoring, reviewing, and implementing the plan.

**Final Void Management Plan**

28. The Final Void Management Plan must:
    (a) justify the final location and future use of the final void;
    (b) incorporate design criteria and specifications for the final void based on verified groundwater modelling predictions and a re-assessment of post-mining groundwater equilibration; and
    (c) describe what actions and measures would be implemented to:
        - minimise any potential adverse impacts associated with the final void; and
        - manage and monitor the potential impacts of the final void.

**Tailings Dam Embankment**

28A. Prior to any decision to construct the embankment as described in EA (MOD 4), the Proponent must submit relevant details to the DSC.

**Mine Closure Plan**

29. The Mine Closure Plan must:
    (a) be prepared in consultation with DRG and Council;
    (b) define the objectives and criteria for mine closure;

(c) investigate options for the future use of the site in a manner consistent with the *Lower Hunter Regional Strategy* (Department of Planning, 2006) and/or other extant regional planning strategies;
(d) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local employment levels;
(e) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
(f) describe how the performance of these measures would be monitored over time.

**Biodiversity Offsets**

29A. By 31 December 2011, the Proponent must make suitable arrangements to provide appropriate long-term security for the Biodiversity Offset Area (see Appendix 6) to the satisfaction of the Secretary.

**Biodiversity Offset Management Plan**

29B. By 31 December 2011, the Proponent must prepare a Biodiversity Offset Management Plan to the satisfaction of the Secretary. This plan must:
(a) be generally consistent with OEH's "Principles for the use of biodiversity offsets in NSW";
(b) include:
- a description of the short, medium and long term measures that would be undertaken to implement the Biodiversity Offset Strategy;
- detailed performance and completion criteria for the Biodiversity Offset Strategy; and
- a detailed description of the measures that would be implemented within the Biodiversity Offset Area for:
  - revegetation and regeneration, including (where relevant) establishment of canopy, sub-canopy, understorey and ground cover;
  - appropriate protection, conservation and management of native vegetation and faunal habitat;
  - controlling weeds and feral pests;
  - management of public access; and
  - bushfire management.

The Proponent must implement the Biodiversity Offset Management Plan as approved by the Secretary.

**Conservation Bond**

29C. Within 6 months of the approval of the Biodiversity Offset Management Plan, the Applicant must lodge a conservation bond with the Department to ensure that the Biodiversity Offset Strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Offset Management Plan. The sum of the bond must be determined by:
(a) calculating the full remaining cost of implementing the offset strategy; and
(b) employing a suitably qualified quantity surveyor to verify these costs,
to the satisfaction of the Secretary.

If the Biodiversity Offset Strategy is completed to the satisfaction of the Secretary, the Secretary will release the conservation bond. If the Biodiversity Offset Strategy is not completed to the satisfaction of the Secretary, the Secretary will call in all or part of the conservation bond, and arrange for the satisfactory completion of the relevant works.

**Biodiversity Credits**

29D. Prior to works commencing for the widening of the haul road and upgrade of the watercourse as described in EA (MOD 4), the Proponent must retire 10 ecosystem credits as listed in the credit profile in Appendix D of EA (MOD 4) in consultation with OEH and in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT and OEH.

***Note**: The listed credits were calculated in accordance with Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014) and may need to be converted to reasonably equivalent 'biodiversity credits', within the meaning of the BC Act, to facilitate retirement.*

**Conservation Funding**

30. Within 6 months of the date of this approval, and again prior to 30 September 2011, the Proponent must provide contributions of $20,000 to conservation projects within the Cessnock LGA, in consultation with

OEH and to the satisfaction of the Secretary.

**HERITAGE**

**Aboriginal Cultural Heritage Management Plan**

31. The Proponent must prepare an Aboriginal Cultural Heritage Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the OEH and the local Aboriginal community and be submitted to the Secretary for approval within 6 months of the date of this approval;
    (b) include a protocol for the ongoing consultation and involvement of Aboriginal communities in the conservation and management of Aboriginal heritage on site; and
    (c) describe the measures that would be implemented to protect Aboriginal sites on site, or if any new Aboriginal objects or skeletal remains are discovered during the project.

    The Proponent must implement the Aboriginal Cultural Heritage Management Plan as approved by the Secretary.

**Historic Heritage Condition Surveys**

31A. Within 2 months of approval of Modification 4, the Proponent must undertake condition surveys of the:
    (a) Buttai No 1 and No 2 reservoirs; and
    (b) Buttai Cemetery (Wilfred Elliot Private Cemetery), including any memorial headstones, graves, fences and trees,
    to the satisfaction of the Secretary.

**Historic Heritage Conservation Management Plan**

31B. The Proponent must prepare a Historic Heritage Conservation Management Plan for the Buttai No 1 and No 2 reservoirs and the Buttai Cemetery, to the satisfaction of the Secretary: This plan must:
    (a) be prepared by a suitably qualified and experienced person/s;
    (b) be prepared in consultation with OEH, Hunter Water, Council and relevant landowners;
    (c) be prepared in accordance with Heritage Council of NSW guidelines (where relevant);
    (d) outline the results of the condition surveys required under condition 31A of Schedule 3;
    (e) include a program for the regular monitoring of the condition of the No 1 and No 2 reservoirs throughout the life of the project; and
    (f) include a contingency plan in the case of any damage to the No 1 or No 2 reservoirs, or Buttai Cemetery caused by Modification 4.

    The Proponent must implement the Historic Heritage Conservation Management Plan as approved by the Secretary.

**VISUAL**

32. The Proponent must:
    (a) take all reasonable and feasible measures to mitigate visual and off-site lighting impacts of the project; and
    (b) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*,
    to the satisfaction of the Secretary.

**GREENHOUSE GAS**

**Energy Savings Action Plan**

33. The Proponent must prepare an Energy Savings Action Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS, 2005), or its latest version, and be submitted to the Secretary for approval within 6 months of the date of this approval;
    (b) include consideration of energy use by mobile equipment;
    (c) include a program to monitor the effectiveness of measures to reduce energy use on site.

    The Proponent must implement the Energy Savings Action Plan as approved by the Secretary.

**WASTE MINIMISATION**

34. The Proponent must:

(a) monitor the amount of waste generated by the project;
(b) investigate ways to minimise waste generated by the project;
(c) implement all reasonable and feasible measures to minimise waste generated by the project; and
(d) report on waste management and minimisation in the Annual Review,

to the satisfaction of the Secretary.

## SCHEDULE 4
## ADDITIONAL PROCEDURES

### NOTIFICATION OF LANDOWNERS

1. If the results of the monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, except where a negotiated agreement has been entered into in relation to that impact, then the Proponent must, as soon as practicable and no longer than 7 days of obtaining the monitoring results, notify the Secretary, the affected landowners and tenants (including tenants of mine owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the criteria in schedule 3 and publish the results on its website.

2. If the results of monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant air quality impact assessment criteria in schedule 3, then the Proponent must send the relevant landowners and tenants (including tenants of mine owned properties) a copy of the NSW Health fact sheet entitled "Mine Dust and You" (and associated updates) in conjunction with the notification required in condition 1.

### INDEPENDENT REVIEW

3. If a landowner considers the project to be exceeding the impact assessment criteria in schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the project on his/her land.

   If the Secretary is satisfied that an independent review is warranted, the Proponent must within 2 months of the Secretary's decision:
   (a) consult with the landowner to determine his/her concerns;
   (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to conduct monitoring on the land, to:
      - determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
      - identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and
   (c) give the Secretary and landowner a copy of the independent review.

   If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.

4. If the independent review determines that the project is complying with the relevant impact assessment criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Secretary.

   If the independent review determines that the project is not complying with the relevant impact assessment criteria in schedule 3, and that the project is primarily responsible for this non-compliance, then the Proponent must:
   (a) take all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria and conduct further monitoring to determine whether these measures ensure compliance; or
   (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria,
   to the satisfaction of the Secretary.

   If further monitoring under paragraph (a) determines that the project is complying with the relevant criteria, then the Proponent may discontinue the independent review with the approval of the Secretary.

5. If the independent review determines that the relevant impact assessment criteria in schedule 3 are being exceeded, but that more than one mine is responsible for this non-compliance, then the Proponent must, together with the relevant mine/s:
   (a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the relevant impact assessment criteria are complied with, and conduct further monitoring to determine whether these measures ensure compliance; or
   (b) secure a written agreement with the landowner and other relevant mines to allow exceedances of the relevant impact assessment criteria in schedule 3,

to the satisfaction of the Secretary.

If the further monitoring referred to under paragraph (a) above determines that the project is complying with the relevant impact assessment criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Secretary.

## SCHEDULE 5
## ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING AND AUDITING

### ENVIRONMENTAL MANAGEMENT

#### Environmental Management Strategy

1. The Proponent must prepare an Environmental Management Strategy for the project, to the satisfaction of the Secretary. The strategy must:
   (a) be submitted to the Secretary for approval within 6 months of the date of this approval;
   (b) provide the strategic framework for environmental management of the project;
   (c) identify the statutory approvals that apply to the project;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
   (e) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the project;
      - respond to any non-compliance; and
      - respond to emergencies;
   (f) include:
      - references to the various strategies, plans and programs that are required under the conditions of this approval once they have been approved; and
      - a clear plan depicting all the monitoring to be carried out in relation to the project.

   The Proponent must implement the Environmental Management Strategy as approved by the Secretary.

#### Management Plan Requirements

2. The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      - any relevant limits or performance measures/criteria;
      - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the project;
      - effectiveness of any management measures (see (c) above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences;
   (f) a program to investigate and implement ways to continually improve the environmental performance of the project over time;
   (g) a protocol for managing and reporting any:
      - incidents;
      - complaints;
      - non-compliances with statutory requirements; and
      - exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

#### Annual Review

3. Each year, the Proponent must review the environmental performance of the project to the satisfaction of the Secretary. This review must:
   (a) describe the works that were carried out in the past year, and the works that are proposed to be carried out over the next year;
   (b) include a comprehensive review of the monitoring results and complaints records of the mine complex over the past year, which includes a comparison of these results against the
      - the relevant statutory requirements, limits or performance measures/criteria;

- the monitoring results of previous years; and
- the relevant predictions in the documents listed in condition 2 of Schedule 2;

(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
(d) identify any trends in the monitoring data over the life of the project;
(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
(f) describe what measure will be implemented over the next year to improve the environmental performance of the project.

**Revision of Strategies, Plans and Programs**

4. Within three months of:
(a) the submission of an annual review under Condition 3 above;
(b) the submission of an incident report under Condition 6 below;
(c) the submission of an audit report under Condition 7 below, or
(d) any modification of the conditions of this approval (unless the conditions require otherwise),
the Proponent must review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.

*Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.*

**Community Consultative Committee**

5. Within 3 months of the date of this approval, the Proponent must establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Secretary. The CCC must be operated in general accordance with the Department's *Community Consultative Committee Guidelines: State Significant Projects* (2016).

***Notes:***
- *The CCC is an advisory committee only.*
- *In accordance with the guidelines, the committee should comprise an independent chair and appropriate representation from the Proponent, Council and the local community.*
- *The CCC may also be combined with any similar CCC for the Donaldson Coal Mine or the Abel Coal Mine.*

**INCIDENT REPORTING**

6. The Proponent must notify the Secretary and any other relevant agencies of any incident associated with the project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident.

**INDEPENDENT ENVIRONMENTAL AUDIT**

7. Every 3 years, unless the Secretary directs otherwise, the Proponent must commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
(b) include consultation with the relevant agencies and the CCC;
(c) assess the environmental performance of the project and assess whether it is complying with the requirements in relevant project approvals and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);
(d) review the adequacy of strategies, plans or programs required under these approvals; and
(e) recommend appropriate measures or actions to improve the environmental performance of the mine complex, and/or any assessment, plan or program required under these approvals.

*Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Secretary.*

8. Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Secretary, the Proponent must submit a copy of the audit report to the Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Secretary.

### Monitoring and Environmental Audits

8A. Any condition of this approval that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.

***Note:*** *For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the project to provide data on compliance with the approval or on the environmental impact of the project, and an "environmental audit" is a periodic or particular documented evaluation of the project to provide information on compliance with the approval or the environmental management or impact of the project.*

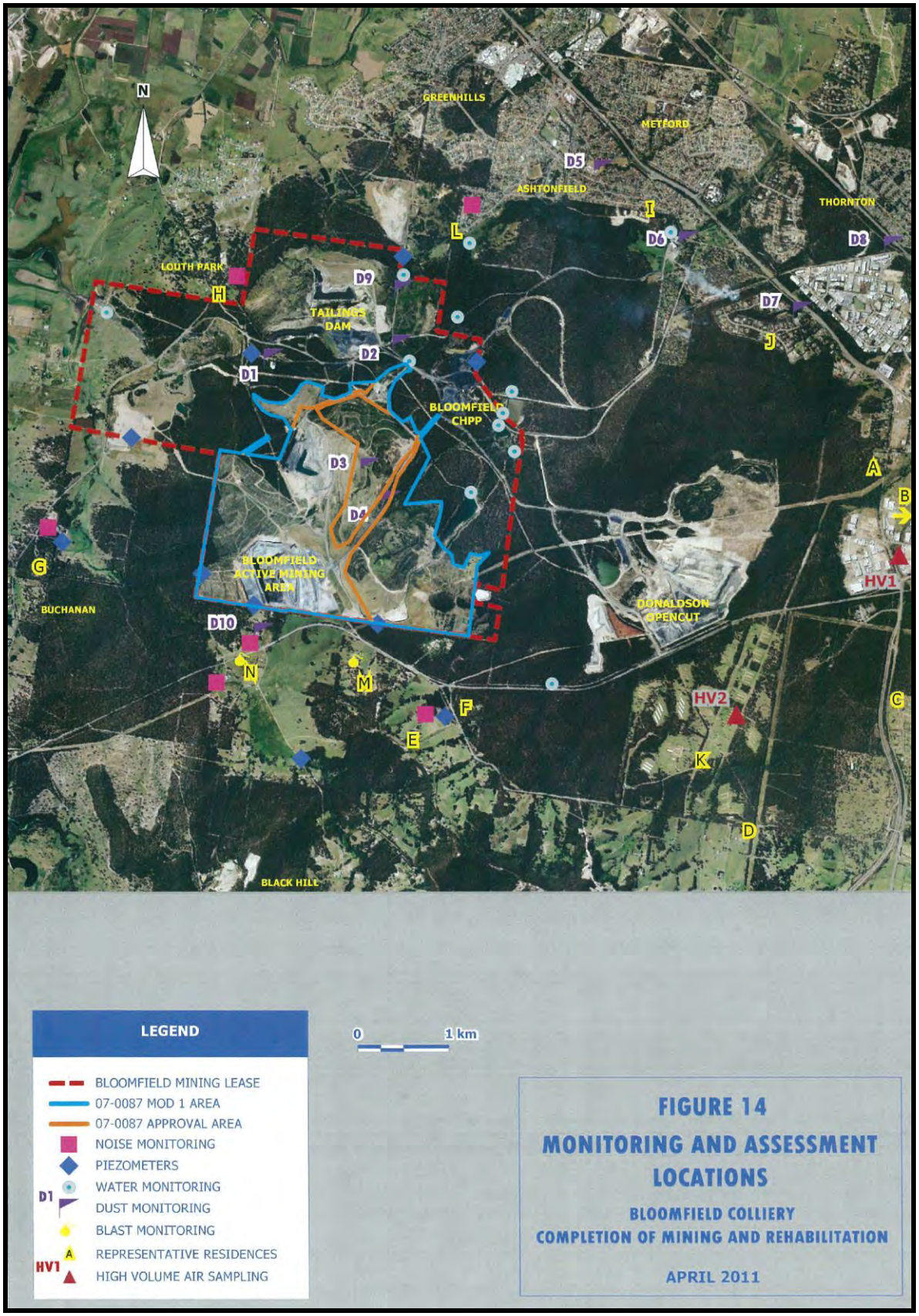
## ACCESS TO INFORMATION

9. From the end of 2009, the Proponent must make the following information publicly available on its website:
   (a) a copy of all current statutory approvals for the project;
   (b) a copy of the current environmental management strategy and associated plans and programs;
   (c) a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;
   (d) a complaints register, which is to be updated on a monthly basis;
   (e) a copy of the minutes of CCC meetings;
   (f) a copy of any Annual Reviews (over the last 5 years);
   (g) a copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and
   (h) any other matter required by the Secretary.

## APPENDIX 1
## SCHEDULE OF PROJECT LAND

| ***Lot & DP Number*** | |
|---|---|
| Lot 36 DP 755260 | Lot 1 DP 722210 |
| Lot 35 DP 755260 | Lot 26 DP 755260 |
| Lot 34 DP 755260 | Lot 25 DP 755260 |
| Lot 48 DP 755260 | Part Lot 23 DP 755260 |
| Lot 30 DP 755260 | Lot 43 DP 755260 |
| Lot 29 DP 755260 | Part Lot 1 DP 1045722 |
| Lot 28 DP 755260 | Part Lot 2 DP 1045722 |
| Lot 27 DP 755260 | Part Lot 11 DP 755237 |
| Part Lot 26 DP 755260 | Lot 13 DP 241097 |
| Part Lot 43 DP 755260 | Part Lot 1 DP 136865 |
| Part Lot 25 DP 755260 | Lot 1 DP 42349 |
| Part Lot 24 DP 755260 | Part Lot 4 DP 241097 |
| Part Lot 18 DP 755237 | Part Lot 5 DP 241097 |
| Part Lot 19 DP 755237 | Part Lot 6 DP 241097 |
| Part Lot 20 DP 755237 | Lot 44 DP 755260 |
| Part Lot 23 DP 755237 | Part Lot 45 DP 755260 |
| Part Lot 29 DP 755237 | Part Lot 46 DP 755260 |
| Part Lot 13 DP 241097 | Part Lot 2 DP 456999 |
| Part Lot 1 DP 136865 | Part Lot 10 DP 755237 |
| Part Lot 3 DP 1045720 | Part Lot 18 DP 755237 |
| Part Lot 31 DP 755237 | Lot 19 DP 755237 |
| Part Lot 4 DP 241097 (Pipeline) | Lot 20 DP 75523 |
| Part Lot 5 DP 241097 (Pipeline) | Lot 23 DP 755237 |
| Part Lot 1 DP 617909 (Pump station) | Part Lot 29 DP 755237 |
| Lot 1 DP 722210 (Road) | Part Lot 1 DP 42349 (Road) |
| Lot 6 DP 241097 (Pipeline) | Various Council Road Reserves |
| Crown Road Reserve | Hunter Water Pipeline |

## APPENDIX 2
## PROJECT MAP



**APPENDIX 3**
**STATEMENT OF COMMITMENTS**

| REF. | COMMITMENT | EA SECTION No. (Refer for further detail) |
|---|---|---|
| **1.** | **General** | |
| 1.1 | Bloomfield Collieries Pty Limited ('Bloomfield') will carry out the proposed development generally in accordance with this Part 3A Environmental Assessment ('EA'). If there is any inconsistency between this draft Statement of Commitments and the EA, the draft Statement of Commitments will prevail to the extent of the inconsistency. | 1.4 |
| 1.2 | Bloomfield will undertake mining within the Project Area, as defined by Figure 2 of the EA. The Project Area includes the following items and their associated mining activities:<br>***The current and proposed active open cut coal mining areas;***<br>***The unshaped and shaped overburden dump areas within the Project Area;***<br>***The workshop and surrounding area used for maintenance and fuel storage;***<br>***The road linking the current and proposed coal mining areas with the ROM coal stockpiles adjacent to the coal washery; and***<br>***The road linking the current and proposed coal mining areas to the workshop.*** | 1.1, 2.1 |
| **2.** | **Production** | |
| 2.1 | A maximum of 0.88 mtpa ROM coal will be mined from the Bloomfield Mine during Stage 1 with a maximum of 1.3 mtpa ROM coal mined during Stages 2 to 4. | 2.5 |
| 2.2 | Active mining will occur over 4 stages, which total approximately 10 to 21 years. The final (5$^{th}$) stage is the completion of site rehabilitation. | 2.5 |
| 2.3 | All Run-of-Mine ('ROM') coal will be transported by internal haul roads to the approved ROM coal stockpiles at the Bloomfield washery. | 2.6.1 |
| **3.** | **Hours of Operation** | |
| 3.1 | Bloomfield Mine will operate 24 hours per day, seven days per week. | 2.4 |
| **4.** | **Rehabilitation** | |
| 4.1 | All site rehabilitation, including monitoring and maintenance will be undertaken in accordance with procedures documented in the EA and the existing Bloomfield Rehabilitation Management System. | 3.2 |
| 4.2 | Any additional rehabilitation requirements and plans for this Project will be included in the existing Bloomfield Rehabilitation Management System. | 3.2 |
| 4.3 | Land that has been mined will be rehabilitated to a safe and stable form with a land capability similar to that existing prior to mining, and with a landform compatible with the surrounding landscape. | 3.3.2 |
| 4.4 | Post mining landform and land use plans will be developed in consultation with the landowner and with reference to the objectives of the Lower Hunter Regional Strategy (the Department, 2006). | 3.6.1 |

| REF. | COMMITMENT | EA SECTION No. (Refer for further detail) |
|---|---|---|
| **5.** | **Final Void** | |
| 5.1 | The final void will be retained for the deposition of washery reject material in accordance with the Abel Project Approval. | 3.5 |
| 5.2 | Rehabilitation of the final void forms part of the Abel Project Approval. However, rehabilitation of the tailings filled void at the completion of the Abel Project will remain the responsibility of Bloomfield as outlined in the Draft Bloomfield Closure and Rehabilitation Strategy (Abel). | Letter to the Department (11/5/09) |
| **6.** | **Environmental Management Systems and Plans** | |
| 6.1 | Bloomfield's existing environmental management systems, plans and procedures will be applied to this Project and will be amended where relevant to incorporate additional items required to manage, mitigate, or monitor impacts associated with this Project. | 2.8, 2.11, 3.2 |
| **7.** | **Environmental Monitoring and Reporting** | |
| 7.1 | Bloomfield will undertake ongoing environmental monitoring as detailed in this EA. | 2.8 |
| 7.2 | Bloomfield will implement and participate in the actions required for the Integrated Environmental Monitoring Program ('IEMP') that forms part of the Abel Project Approval and which includes elements of the Bloomfield Project. | 2.8, 2.12, 15.2 |
| 7.3 | An Annual Environmental Management Report ('Annual Review') will be prepared and forwarded to relevant government departments, including the Department. The Annual Review will include a summary of all monitoring undertaken during the year, including a discussion of any exceedances and responses taken to ameliorate these exceedances. | 4.3.2 |
| **8.** | **Consultation** | |
| 8.1 | Bloomfield will continue to consult with the local community throughout the life of the Project. | 5 |
| 8.2 | A specific representative of Bloomfield will be nominated and contact details provided so that members of the community may contact the mine with questions or complaints if required. | 5 |
| 8.3 | A record of any complaints received regarding the Project will be retained by Bloomfield for the duration of the Project. | 2.8 |
| **9.** | **Flora and Fauna** | |
| 9.1 | A Flora and Fauna Management Plan will be developed and implemented prior to any clearing occurring as part of the Project. | 7.6 |
| 9.2 | The existing Bloomfield pre-clearance protocol will be implemented prior to any clearing occurring as part of the Project. | 7.6, 7.7 |
| 9.3 | Bloomfield will commit to commensurate support to the value of $20,000 for a local activity or program related to biodiversity, to be commenced within the first two years of mining. | 7.6, 7.7, Response to Submissions (29/1/09) and DECC meeting minutes (30/4/09) |
| **10.** | **Aboriginal Heritage** | |

| REF. | COMMITMENT | EA SECTION No. (Refer for further detail) |
|---|---|---|
| 10.1 | An Aboriginal Heritage Management Plan ('AHMP') will be prepared in consultation with Mindaribba LALC~~,~~ prior to any Project impacts occurring. This Plan will specify the policies and actions required to mitigate and manage the potential impacts of the Project on Aboriginal heritage. The plan will include:<br>***Procedures for ongoing Aboriginal consultation and involvement;***<br>***Mitigation measures for the identified and potential Aboriginal evidence;***<br>***Management procedures for any previously unrecorded evidence or skeletal remains;***<br>***Training for relevant staff and contractors in their roles and responsibilities under the AHMP***<br>***Review of the plan.*** | 8.8 |
| 10.2 | The AHMP will include a program of salvage to be undertaken in the Project Area with representatives of Mindaribba LALC collecting identified stone artefacts from sites B2, B16, B18, B19, B20 and B22 prior to any development impacts occurring. | 8.8 |
| 10.3 | Should any skeletal remains be detected during the Project, work in that location will cease immediately and the finds will be reported to the appropriate authorities, including the Police, OEH and Mindaribba LALC. | 8.8 |
| 10.4 | In the event that Aboriginal objects are located during the Project, a protocol to ascertain the value of such finds, in consultation with the Aboriginal community representatives and a qualified archaeologist will be implemented and used to inform any management decision. OEH will be informed of any finds using the appropriate site recording cards. | 8.8 |
| 10.5 | Further consultation with and continued involvement of Mindaribba LALC will be continued through the Project, in relation to the contents and recommendations of Aboriginal Heritage studies. | 8.8 |
| **11.** | **Noise Management and Monitoring** | |
| 11.1 | A Noise Management Plan will be prepared and implemented for the Project. The Plan will include mitigation and monitoring requirements for the Project. | 9.2 |
| 11.2 | The following noise controls will be implemented to achieve noise criteria identified in this EA:<br>During Year 1 (End of Stage 1):<br>***The excavator and dump site will be situated in a shielded location during night-time operation;***<br>***No dozer operation at the drill location will occur during night~~-~~and morning shoulder periods; and***<br>***The front end loader will replace the dozer at the dump site during the night-time period unless 4 dBA of noise suppression is achieved.***<br>During Year 5 (End of Stage 2):<br>***The excavator and dump site will be situated in a shielded location during night-time operation;***<br>***No dozer operation at the drill location will occur during night and morning shoulder periods; and***<br>***The front end loader will replace the dozer at the dump site during the night-time period unless 4 dBA of noise suppression is achieved.***<br>During Year 10 (End of Stage 4):<br>***The excavator and dump site will be situated in a shielded location during night-time operation; and*** | 9.5 |

| REF. | COMMITMENT | EA SECTION No. (Refer for further detail) |
|---|---|---|
| | ***No dozer operation at the drill location will occur during the night period.*** | |
| 11.3 | Bloomfield may undertake a noise monitoring and investigation program during the Project, in consultation with OEH and the Department, to determine whether relevant noise criteria can be achieved without the use of the noise controls listed in 11.2. If such a study concludes that relevant criteria can be achieved, the above controls will be modified or removed. | 9.5 |
| 11.4 | Noise complaints received will be dealt with in accordance with Bloomfield's existing complaints protocol. | 2.8 |
| **12.** | **Blasting** | |
| 12.1 | Bloomfield will continue to consult with nearby residents regarding their blasting program, consistent with current practice and the Shot Firing and Explosives Management Plan. | 2.8 |
| 12.2 | Blasting will only be undertaken during the hours of 9.00 am to 5.00 pm Monday to Saturday. Blasting will not occur on Sundays or Public Holidays. | 9.8 |
| 12.3 | Blasts will be designed in consideration of vibration and airblast limits, wind speed and direction. | 9.8 |
| 12.4 | Blast monitoring will be conducted over the life of the mine in accordance with requirements provided by the Shot Firing and Explosives Management Plan. | 2.8 |
| 12.5 | All relevant personnel will be trained in Bloomfield's environmental obligations in relation to blasting controls. | 2.8 |
| **13.** | **Air Quality** | |
| 13.1 | An Air Quality Monitoring Program will be prepared and implemented for the Project. The Air Quality Monitoring Program will include monitoring at locations as described in the EA. | 2.12 |
| 13.2 | Dust generation on the Project Area will be minimised by implementation of the following:<br>***All vehicles will be operated according to Mine Transport Management Plan, which requires vehicles to remain on specified routes;***<br>***Disturbed areas will be minimised where possible;***<br>***Dust suppression water spraying will be used on all active haul roads and stockpile areas where required;***<br>***All mobile equipment will be maintained in good working order;***<br>***Adequate stemming will be used in blast holes; and***<br>***Meteorological conditions will be considered in the timing of blasts to minimise impacts of blast generated dust.*** | 2.8 |
| **14.** | **Greenhouse Gas Monitoring and Energy Efficiency** | |
| 14.1 | Bloomfield will assess the viability of improving energy efficiency and reducing greenhouse gas emissions from its operations, including the mining fleet, stationary equipment and mining processes. | 10.9 |
| 14.2 | Bloomfield will monitor greenhouse gas emissions in accordance with the requirements of the current EEO and Greenhouse Challenge Plus programs and comply with any reporting requirements under the *NGER Act 2007*. | 10.9 |

| REF. | COMMITMENT | EA SECTION No. (Refer for further detail) |
|---|---|---|
| **15.** | **Surface Water Management** | |
| 15.1 | Surface water management for the Project will be undertaken in accordance with Bloomfield's existing Environmental Water Management System ('EWMS'). The EMWS will be modified to address the additional requirements for this Project provided in the Draft Water Management Plan (**Appendix H**). | 2.8, 11.5 |
| 15.2 | An Erosion and Sediment Control Plan will be prepared that will form part of the EWMS. | 2.8, 11.3, 11.5 |
| **16.** | **Surface Water Monitoring Program** | |
| 16.1 | Bloomfield's existing EWMS incorporates a Surface Water Monitoring Program which will be implemented for this Project and updated to include the additional monitoring point proposed for this Project in consultation with DoI. | 11.5.2 |
| 16.2 | A response/mitigation procedure will be developed as part of the EWMS for unforeseen surface or groundwater impacts being detected during the Project. | 11.5.3, 12.4 |
| **17.** | **Groundwater Monitoring** | |
| 17.1 | Bloomfield's existing EWMS will incorporate a Groundwater Monitoring Program, developed in consultation with DoI. | 2.8, 12.4 |
| **18.** | **Visual Amenity** | |
| 18.1 | Visual impacts of the Bloomfield Mine will be mitigated by the following strategies:<br>***Rehabilitation of the southern boundary of the Project Area adjacent to John Renshaw Drive will be given priority during the early stages of mining;***<br>***Mobile directional lighting in active mine areas will be directed away from neighbouring properties and roadways; and***<br>***Complaints regarding lighting will be investigated by Bloomfield during the relevant shift.*** | 14.6.1, 14.6.2 |
| 18.2 | Tree areas will be incorporated into rehabilitation to assist the visual blending of overburden dumps with the surrounding landscape. | 3.4.3 |
| **19.** | **Staff Training** | |
| 19.1 | Bloomfield will ensure that all personnel receive training in their responsibilities to mitigate, manage and monitor potential environmental impacts. | 2.8, 2.11, 3.2 |
| **20.** | **Integration with Other Mining Operations – Roles & Responsibilities** | |
| 20.1 | Bloomfield will implement and participate in the actions required for the Integrated Environmental Monitoring Program ('IEMP') that forms part of the Abel Project Approval and which includes elements of the Bloomfield Project. | 2.8, 2.12, 15.2 |
| 20.2 | Bloomfield is responsible for the operation, maintenance and monitoring of all water management systems and structures within its Project Area. | 15.3.2<br>Letter to the Department (11/5/09) |
| 20.3 | Rehabilitation of the final void forms part of the Abel Project Approval. However, rehabilitation of the tailings filled void at the completion of | Letter to the Department |

| REF. | COMMITMENT | EA SECTION No. (Refer for further detail) |
|---|---|---|
| | the Abel Project will remain the responsibility of Bloomfield as outlined in the Draft Bloomfield Closure and Rehabilitation Strategy (Abel). | (11/5/09) |
| **21.** | **Community Enhancement Fund** | |
| 21.1 | Bloomfield will establish a Community Enhancement Fund (CEF) that will provide a range of practical commitments to local community projects and contributions to the local community. | Response to Submissions (29/1/09) and email to the Department (7/5/09) |
| 21.2 | The CEF will comprise two components:<br>***Within two years of the Bloomfield Mine being approved, $180,000 will be provided by Bloomfield for a local infrastructure project within Cessnock Local Government Area, to be determined in consultation with Cessnock City Council.***<br>• Over a period of ten years from the date of the Bloomfield Mine being approved, $320,000 will be provided by Bloomfield for a community welfare based charity/s focussed within the Cessnock LGA, to be determined in consultation with Cessnock City Council. | Email to the Department (7/5/09) |

| REF. | COMMITMENTS FOR THE PROPOSED S75W MODIFICATION (07_0087 MOD 1) | S75W Modification EA Section |
|---|---|---|
| **1.** | **General** | |
| 1.1 | Bloomfield Collieries will carry out the proposed development generally in accordance with the Section 75W Environmental Assessment ('EA') and the Part3A Environmental Assessment (07_0087).<br><br>If there is any inconsistency between this draft Statement of Commitments and the EA, the Statement of Commitments will prevail to the extent of the inconsistency. | 1.4 |
| 1.2 | Bloomfield will undertake mining and rehabilitation activities within the Project Area as defined by the Schedule of Land (Figure 8). The proposed Modification Activities include:<br>• ***Upgrade and use of Wattle Tree Drive as an alternative haul route (Area A);***<br>• ***Additional overburden emplacement and rehabilitation - east of Save a Mile Haul Road (Area B)***<br>• ***Additional out-of-pit landform reshaping and rehabilitation – northern and south-eastern areas (Area C and E)***<br>• ***Construction of a corridor and overhead powerline from an existing powerline onto the open cut mine site, together with some clearing for an associated infrastructure area (Area D)*** | 1.1, Chapter 2 |

| | | |
|---|---|---|
| **2.** | **Hours of Operation and Operational Controls** | |
| 2.1 | Bloomfield Mine will operate 24 hours per day seven days per week except for the proposed Modification Activities.<br><br>No Modification Activities will occur during the night-time period (10.00pm-6.00am). To manage noise from the various Modification Activities the following hours of operation will be followed:<br><br>• ***Wattle Tree Drive construction (Area A) and Powerline Corridor (Area D)***<br>o ***Construction hours (for the powerline corridor and construction of Wattle Tree Drive) will between the hours of 7.00am and 6.00pm Monday to Friday and 8.00am to 1.00pm Saturdays.***<br>o ***A bund will be constructed adjacent to Wattle Tree Drive and trees will be planted to screen this area, thereby minimising aesthetic impacts and stray light.***<br>• ***East of Save-a-Mile haul road (Area B)***<br>o ***Daytime operations (7.00am to 6.00pm Mondays to Saturdays, 8.00am to 6.00pm Sundays) will be in the southern part of the dump to raise the dump and provide screening for the evening (6.00pm-10.00pm) and morning shoulder (6.00am-7.00am) operations.***<br>o ***The height of the overburden emplacement area will be limited to an RL of 100 metres***<br>o ***During evening and morning shoulder periods, the following controls will be in place:***<br>▪ ***the drill and clearing dozer will be worked in a shielded location; dumping will only occur in the northern part of the dump;***<br>▪ ***the dozer will only operate in a shielded location in the northern part of the dump;***<br>▪ ***an earthern bund will be constructed in the approved dumping area to the south of the existing haul road to a minimum height of 80 metres RL; and***<br>▪ ***There will be no coal haulage from S-Cut during the morning shoulder period.***<br>• ***Northern area (Area C)***<br>o ***Dumping and rehabilitation during the daytime period only.***<br>• ***South-eastern area (Area E)***<br>o ***Dumping and rehabilitation during the daytime period only (7.00am to 6.00pm Mondays to*** | 6.6 |

| | | |
|---|---|---|
| | ***Saturdays, 8.00am to 6.00pm Sundays)***<br>o ***Dumping will be restricted to a maximum of 70 hours of work; and***<br>o ***A front end loader will replace the dozer at the Area E dump once the emplacement reaches an RL of 52 metres.*** | |
| **3.** | **Ecology** | |
| 3.1 | A pre-clearing protocol to protect any threatened species using trees within the powerline clearing area will be implemented during construction of the corridor. | 6.3 |
| 3.2 | The identified nesting tree adjacent to the powerline clearing area will be protected during construction of the powerline and associated infrastructure to prevent accidental damage by machinery. | 6.3 |
| 3.3 | Bloomfield will commit to providing a biological offset to compensate for the loss of native vegetation. The offset will be agreed with and designed to satisfy the requirements of the Department of Planning and Infrastructure and generally be consistent with OEH's "Principles for the use of biodiversity offsets in NSW". | |
| 3.4 | Bloomfield will commit to providing $20,000 towards the Stanford Merthyr Conservation Project being managed by the Land and Property Management Group within 6 months of Director General's approval of the modification. | |
| **4.** | **Water Management** | |
| 4.1 | The existing water drainage channel to Lake Kennerson will be re-routed around the disturbance area prior to commencement of works in the south-eastern area | 6.9.1 |
| 4.2 | Diversion banks and sediment control measures will be provided at the toe of the proposed batter of the emplacement area adjacent to Save-a-Mile haul road prior to works commencing to protect downstream areas | 6.9.1 |

## APPENDIX 4
## CONCEPTUAL FINAL LANDFORM

***Figure 1:*** *Proposed final landform – Abel Underground Mine in care and Maintenance*


***Figure 2:*** *Proposed final landform – Abel Underground Mine resumes operation*

**APPENDIX 5**

***Deleted***

## APPENDIX 6
## BIODIVERSITY OFFSET AREA

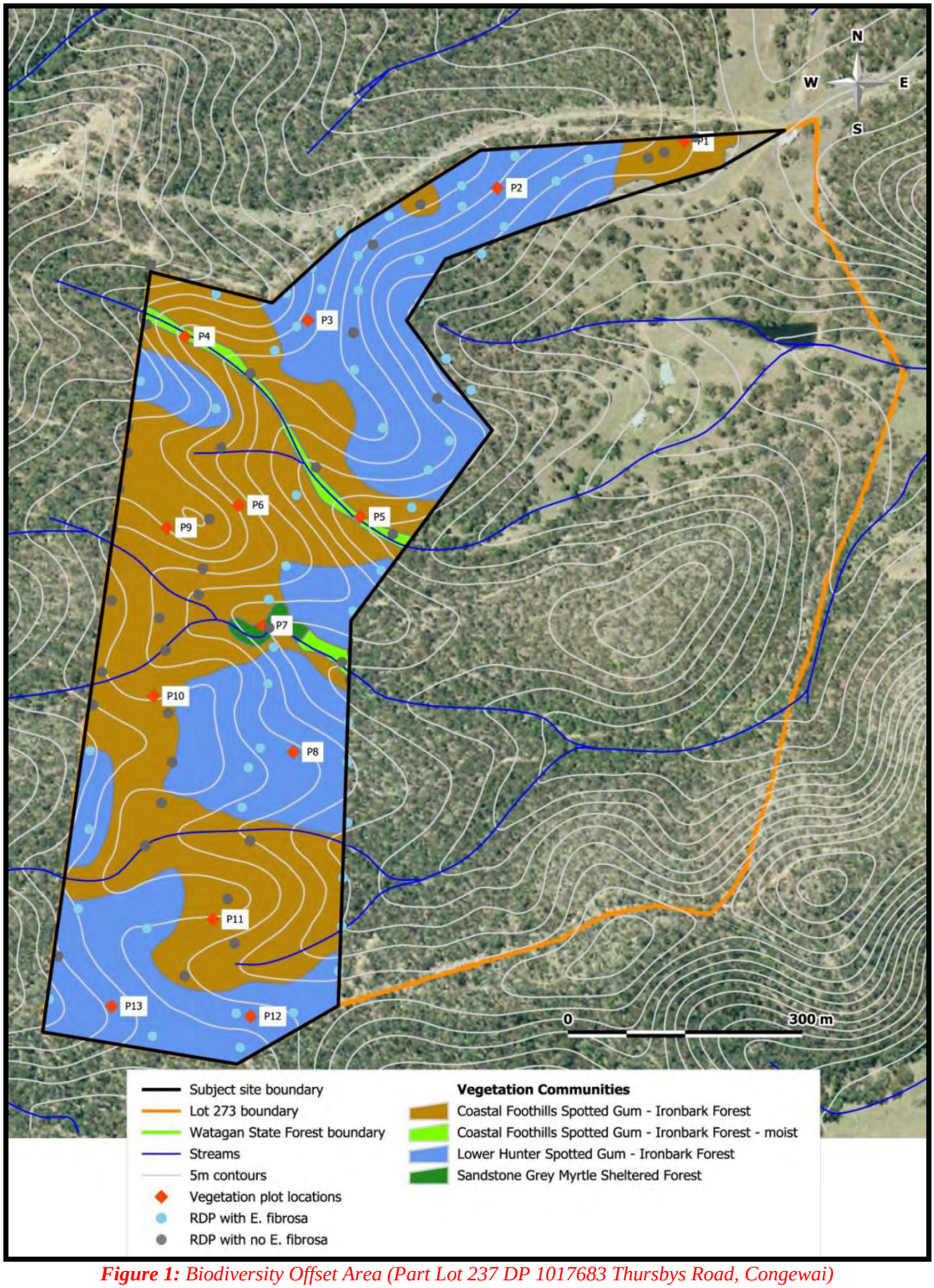



***Figure 1:*** *Biodiversity Offset Area (Part Lot 237 DP 1017683 Thursbys Road, Congewai)*

# Notice of Modification

## Section 75W of the *Environmental Planning and Assessment Act 1979*

As delegate for the Minister for Planning and Infrastructure, I modify the project approval referred to in Schedule 1, subject to the conditions in Schedule 2.

Chris Wilson
**Executive Director**
**Development Assessment Systems and Approvals**

Sydney 4 December 2013

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**SCHEDULE 1**

The Project Approval (05_0136) for the Abel Coal Project, granted by the Minister for Planning, on 7 June 2007.

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**SCHEDULE 2**

Delete all words after "Abel Coal Project", where first occurring, and replace with the following:

## TABLE OF CONTENTS

## DEFINITIONS

| | |
|---|---|
| Adaptive management | Adaptive management includes monitoring subsidence effects and impacts and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and/or designated ranges and in compliance with the conditions of this approval |
| Annual Review | The review required by condition 3 of Schedule 6 |
| Approved mine plan | The mine plans depicted in the figures in Appendix 2 |
| ARTC | Australian Rail Track Corporation |
| BCA | Building Code of Australia |
| Bloomfield site | The Bloomfield Coal Handling and Preparation Plant, the Bloomfield Rail Loading Facility, Rail Loop and Rail Spur, and the Bloomfield Colliery open-cut pits which are used to emplace coal reject and tailings from the project |
| Built features | Includes any building or work erected or constructed on land, and includes dwellings and infrastructure such as any formed road, street, path, walk, or driveway; any pipeline, water, sewer, telephone, gas or other service main |
| CCC | Community Consultative Committee |
| Cliff | A continuous rock face, including overhangs, having a minimum length of 20 metres, a minimum height of 10 metres and a minimum slope of 2 in 1 (>63.4º) |
| Conditions of this approval | Conditions contained in Schedules 2 to 6 inclusive |
| Construction | The demolition of buildings or works, carrying out of works and erection of buildings covered by this approval |
| Day | The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays |
| Department | Department of Planning and Infrastructure |
| Director-General | Director-General of the Department, or delegate |
| DRE | Division of Resources and Energy, within the Department of Trade & Investment, Regional Infrastructure & Services |
| EA | Environmental assessment titled *Abel Underground Mine Part 3A Environmental Assessment Application No. 05_0136 – Volumes 1 to 5,* dated June 2005, including the associated response to submissions (dated January 2007) |
| EA (MOD 1) | Modification application 05_0136 MOD 1 and accompanying Environmental Assessment titled *Abel Underground Mine May 2010 Modification (Downcast Ventilation Shaft) Environmental Assessment,* prepared by Donaldson Coal Pty Limited and dated May 2010 |
| EA (MOD 2) | Modification application 05_0136 MOD 2 and accompanying Environmental Assessment titled *Abel Underground Mine March 2011 Modification (Upcast Ventilation Shaft) Environmental Assessment,* prepared by Donaldson Coal Pty Limited and dated March 2011 |
| EA (MOD 3) | Modification application 05_0136 MOD 3 and accompanying Environmental Assessment titled *Abel Upgrade Modification Environmental Assessment, Volumes 1 and 2* prepared by Resource Strategies Pty Limited and dated December 2012, including the Response to Submissions document titled *Abel Upgrade Modification Environmental Assessment Response to Submissions* dated July 2013 |
| Environmental consequences | The environmental consequences of subsidence impacts, including: damage to built features; loss of surface flows to the subsurface; loss of standing pools; adverse water quality impacts; cliff falls; rock falls; damage to Aboriginal heritage sites; impacts on aquatic ecology; and ponding |
| EP&A Act | *Environmental Planning and Assessment Act 1979* |
| EP&A Regulation | *Environmental Planning and Assessment Regulation 2000* |
| EPL | Environment Protection Licence issued under the POEO Act |
| Executive Director Mineral Resources | Executive Director Mineral Resources within DRE, or the equivalent role |
| Evening | The period from 6pm to 10pm |
| Feasible | Feasible relates to engineering considerations and what is practical to build or to implement |
| First workings | Development of main headings, longwall gate roads, related cut throughs and the like |
| GDE | Groundwater Dependent Ecosystem |
| Ha | Hectare |
| Incident | A set of circumstances that:<br>• causes or threatens to cause material harm to the environment; and/or<br>• breaches or exceeds the limits or performance measures/criteria in this approval |

| | |
|---|---|
| Land | As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in Schedules 3 and 4 of this approval where it is defined to mean the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval |
| Material harm to the environment | Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial |
| Mining area | The area identified on the 2nd figure in Appendix 2 |
| Mining operations | Includes all extraction, processing, handling, storage and transportation of coal carried out on the site |
| Minister | Minister for Planning and Infrastructure, or delegate |
| Minor | Not very large, important or serious |
| Minor cliff | A continuous rock face, including overhangs, having a minimum height of 5 metres and a minimum slope of 2 in 1 (>63.4$^{o}$) |
| Mitigation | Activities associated with reducing the impacts of the project prior to or during those impacts occurring |
| MSB | Mine Subsidence Board |
| Negligible | Small and unimportant, such as to be not worth considering |
| Night | The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays |
| NOW | NSW Office of Water |
| OEH | Office of Environment and Heritage |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| Privately-owned land | Land that is not owned by a public agency, or a mining company (or its subsidiary) |
| Project | The project described in the EA, EA (MOD 1), EA (MOD 2) and EA (MOD 3) |
| Proponent | Donaldson Coal Pty Ltd, or its successors in title |
| Reasonable | Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements |
| Reasonable costs | The costs agreed between the Department and the Proponent for obtaining independent experts to review the adequacy of any aspects of the Extraction Plan, or where such costs cannot be agreed, the costs determined by a dispute resolution process |
| Rehabilitation | The treatment or management of land disturbed by the project for the purpose of establishing a safe, stable and non-polluting environment |
| Remediation | Activities associated with partially or fully repairing or rehabilitating the impacts of the project or controlling the environmental consequences of this impact |
| RMS | Roads and Maritime Services |
| Rock face feature | A rock face having a minimum length of 20 metres, heights between 3 metres and 5 metres and a minimum slope of 2 in 1 (>63.4º) |
| ROM coal | Run-of-mine coal |
| Safe, serviceable & repairable | Safe means no danger to users who are present, serviceable means available for its intended use, and repairable means damaged components can be repaired economically |
| Second workings | Extraction of coal from longwall panels, shortwall panels or pillar extraction |
| Site | The land referred to in Schedule 1, and listed in Appendix 1 |
| Statement of commitments | The Proponent's commitments in Appendix 3 |
| Steep slope | An area of land having a gradient between 1 in 3 (33% or 18.3º) and 2 in 1 (200% or 63.4º) |
| Subsidence | The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts |
| Subsidence effects | Deformation of the ground mass due to mining, including all mining-induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature |
| Subsidence impacts | Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs |
| Surface facilities sites | The Abel pit top area; all associated ventilation shaft sites; sites for other mining purposes infrastructure; and any other site subject to existing or proposed surface disturbance (excluding subsidence impacts) by the project |

## SCHEDULE 2
## ADMINISTRATIVE CONDITIONS

### OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this approval, the Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

### TERMS OF APPROVAL

2. The Proponent shall carry out the project generally in accordance with the:
   (a) EA;
   (b) EA (MOD 1);
   (c) EA (MOD 2);
   (d) EA (MOD 3);
   (e) statement of commitments; and
   (f) conditions of this approval.

   *Notes:*
   - *The general layout of the project is shown on the figures in Appendix 2.*
   - *The statement of commitments is reproduced in Appendix 4.*

3. If there is any inconsistency between the above documents, the more recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.

4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this approval; and
   (b) the implementation of any actions or measures contained in these documents.

### LIMITS ON APPROVAL

#### Mining Operations

5. The Proponent may carry out mining operations on site until the end of December 2030.

   *Note: Under this approval, the Proponent is required to rehabilitate the site and perform additional undertakings to the satisfaction of either the Director-General or the Executive Director, Mineral Resources. Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.*

#### Coal Extraction

6. The Proponent shall not extract more than 6.1 million tonnes of ROM coal from the site per calendar year.

#### Coal Processing

7. The Proponent shall not process more than 8.5 million tonnes of ROM coal at the Bloomfield site per calendar year.

#### Coal Transport

8. The Proponent shall transport all ROM coal from the Abel pit-top area to the Bloomfield site via the private haul road, or by coal conveyor, or by a combination of both methods.

9. The Proponent shall transport all product coal produced on the Bloomfield site via the Bloomfield Rail Loop, and Rail Spur and the Main Northern Railway, except in an emergency. In an emergency, product coal may be transported from the Bloomfield site by road, with the prior written approval of the Director-General, and subject to any restrictions that the Director-General may impose.

   *Note: The alignment of the approved coal conveyor is shown in Figure 3 of Appendix 2.*

**Hours of Operation**

10. The Proponent shall comply with the operating hours in Table 1.

*Table 1: Operating hours*

| ***Activity*** | ***Operating Hours*** |
|---|---|
| Mining Operations | 24 hours a day, 7 days per week |
| Construction activities | 7.00 am to 6.00 pm, Monday to Friday; and<br>8.00 am to 1.00 pm, Saturdays,<br>unless noise from these activities does not exceed 35dB(A)$_{LAeq(15\ min)}$ at any privately-owned residence |
| Maintenance activities | 24 hours a day, 7 days per week, providing maintenance activities are inaudible at any privately-owned residence |

**STRUCTURAL ADEQUACY**

11. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures that are part of the project are constructed in accordance with:
    (a) the relevant requirements of the BCA; and
    (b) any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts.

*Notes:*

- *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*
- *Under Section 15 of the Mine Subsidence Compensation Act 1961, the Proponent is required to obtain the MSB's approval before constructing any improvements within a Mine Subsidence District.*

**DEMOLITION**

12. The Proponent shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures,* or its latest version.

**OPERATION OF PLANT AND EQUIPMENT**

13. The Proponent shall ensure that all plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

**STAGED SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS**

14. With the approval of the Director-General, the Proponent may submit any strategies, plans or programs required by this approval on a progressive basis. Strategies, plans or programs approved before 31 October 2013 continue to apply to the project, until revised strategies, plans or programs required under the terms of this modified approval are approved by the Director-General.

*Notes:*

- *While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.*
- *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*

## SCHEDULE 3
## SPECIFIC ENVIRONMENTAL CONDITIONS – UNDERGROUND MINING

### SUBSIDENCE

**Performance Measures – Natural and Heritage Features, etc**

1. The Proponent shall ensure that the project does not cause any exceedances of the performance measures in Table 2, to the satisfaction of the Director-General.

*Table 2: Subsidence Impact Performance Measures*

| | |
|---|---|
| ***Water Resources*** | |
| • Hexham Swamp;<br>• Blue Gum Creek and Alluvium; and<br>• Long Gully. | • Negligible environmental consequences, including:<br>- *negligible* reduction in the quantity of water entering the swamp or the creeks (ie baseflow or environmental flows);<br>- *negligible* reduction in the quality of water entering the swamp or the creeks; and<br>- *negligible* reduction in creek bed or bank stability.<br>• No connective cracking between the surface and the mine. |
| • All other watercourses in the mining area. | • No greater environmental consequences than predicted in the EA and EA (MOD 3). |
| ***Land*** | |
| • Cliffs. | • Minor environmental consequences (that is, occasional rockfalls, displacement of or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 3% of the total face area of cliffs within the mining area). |
| • Minor cliffs<br>• Rock face features; and<br>• Steep slopes. | • Minor environmental consequences (that is, occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 5% of the total face area of each such type of feature within the mining area). |
| • Pambalong Nature Reserve. | • Negligible environmental consequences. |
| ***Biodiversity*** | |
| • Threatened species; and<br>• Endangered ecological communities (including unspecified Lowland Rainforest EEC). | • Negligible environmental consequences. |
| ***Heritage Sites*** | |
| • Aboriginal heritage sites. | • No greater subsidence impacts or environmental consequences than predicted in the EA and EA (MOD 3). |
| • Historic heritage. | • No greater subsidence impacts or environmental consequences than predicted in the EA and EA (MOD 3). |
| ***Mine workings*** | |
| • First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible subsidence impacts, negligible environmental consequences. | • To remain long-term stable and non-subsiding. |
| • Second workings. | • To be carried out only in accordance with an approved Extraction Plan. |

*Notes:*

- *The Proponent will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this approval.*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Director-General will be the final arbiter.*

- *The requirements of this condition only apply to the impacts and consequences of mining operations, construction or demolition undertaken following the date of approval of MOD 3.*

**Offsets**

2. If the Proponent exceeds the performance measures in Table 2 and the Director-General determines that:
   (a) it is not reasonable or feasible to remediate the impact or environmental consequence; or
   (b) remediation measures implemented by the Proponent have failed to satisfactorily remediate the impact or environmental consequence;

   the Proponent shall provide a suitable offset to compensate for the impact or environmental consequence, to the satisfaction of the Director-General.

   *Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.*

**Performance Measures – Built Features**

3. The Proponent shall ensure that the project does not cause any exceedances of the performance measures in Table 3, to the satisfaction of the Director-General. Any dispute between the Proponent and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 3 is to be settled by the Director-General, following consultation with the MSB and the Executive Director Mineral Resources. Any decision by the Director-General shall be final and not subject to further dispute resolution under this approval.

*Table 3: Subsidence Impact Performance Measures*

| | |
|---|---|
| ***Built Features*** | |
| *Key Public Infrastructure:*<br>• F3 Freeway;<br>• Hunter Expressway;<br>• 330kV transmission line and transmission towers; and<br>• 132kV and 66kV powerlines. | • Always safe and serviceable.<br>• Damage that does not affect safety or serviceability must be fully repairable, and must be fully repaired. |
| *Other Public Infrastructure:*<br>• Timber power poles;<br>• Roads;<br>• Fibre-optic cables; and<br>• Telecommunication cables. | • Always safe and serviceable.<br>• No greater subsidence impact or environmental consequences than predicted in the EA and EA (MOD 3).<br>• Damage that does not affect safety or serviceability must be fully repairable, and must be fully repaired. |
| *Key Privately-Owned Built Features*<br>• Principal residences;<br>• All buildings and structures on, or built in the future on:<br>- the Black Hill Public School;<br>- Catholic High School site (Lot 131 DP1057179);<br>- Black Hill Church and Cemetery;<br>- Coal & Allied Operations Pty Limited site (Lot 30 DP870411); and<br>• The 4 largest dams at the commercial orchard on Lots 11 and 12 DP877937 and Lots 610 and 611 DP1035588, while this land is used for this purpose. | • First workings only within a $26.5^{o}$ angle of draw of the structure, except with the prior written agreement of the relevant landowner.<br>• Always safe.<br>• Serviceability should be maintained wherever practicable.<br>• Damage must be fully repairable, and must be fully repaired, or else replaced or fully compensated. |
| *Other Privately-Owned Built Features*<br>• Rural buildings;<br>• Farm dams;<br>• Tracks and fences;<br>• Black Hill Quarry; and<br>• Stockrington Quarry. | • Always safe.<br>• Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated.<br>• Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated. |
| ***Public Safety*** | |
| • Public safety. | • Negligible additional risk. |

*Notes:*

- *The Proponent will be required to define more detailed performance indicators for each of these performance measures in Built Features Management Plans or a Public Safety Management Plan (see condition 4 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in*

*which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Director-General will be the final arbiter.*

- *The requirements of this condition only apply to the impacts and consequences of mining operations undertaken following the date of this approval.*
- *Requirements under this condition may be met by measures undertaken in accordance with the Mine Subsidence Compensation Act 1961.*
- *Requirements regarding safety or serviceability do not prevent preventative or mitigatory actions being taken prior to or during mining in order to achieve or maintain these outcomes.*

**Extraction Plan**

4. The Proponent shall prepare and implement an Extraction Plan for all second workings on site to the satisfaction of the Director-General. Each extraction plan must:
   (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Director-General;
   (b) be approved by the Director-General before the Proponent carries out any of the second workings covered by the plan;
   (c) include detailed plans of existing and proposed first and second workings and any associated surface development;
   (d) include detailed performance indicators for each of the performance measures in Tables 2 and 3;
   (e) give particular consideration to any proposed multi-seam mining;
   (f) include a detailed investigation of any overlying or adjacent West Borehole Seam workings, in consultation with DRE, which:
      - assesses the stability of remnant coal pillars in the former West Borehole Seam workings;
      - includes revised multi-seam subsidence predictions for the second workings areas;
      - gives particular consideration to the risks of irregular subsidence and for pillar run leading to subsidence outside of the predicted angle of draw; and
      - recommends final design of the second workings panels and any necessary adaptive management measures;
   (g) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this approval;
   (h) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 2 and 3, and manage or remediate any impacts and/or environmental consequences;
   (i) include a Built Features Management Plan, which has been prepared in consultation with DRE and the owners of affected built features, to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings, and which:
      - addresses in appropriate detail all items of key public infrastructure (with particular consideration of angle towers on transmission lines and powerlines), other public infrastructure and all other built features;
      - has been prepared following appropriate consultation with the owner/s of potentially affected feature/s;
      - recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate all predicted impacts on potentially affected built features in a timely manner; and
      - in the case of all key public infrastructure, and other public infrastructure except roads, trails and associated structures, reports external auditing for compliance with ISO 31000 (or alternative standard agreed with the infrastructure owner), and provides for annual auditing of compliance and effectiveness during extraction which may impact the infrastructure;
   (j) include a Water Management Plan, which has been prepared in consultation with EPA and NOW, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on watercourses and aquifers, including:
      - surface and groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on water resources or water quality;
      - a program to monitor and report stream flows, assess any changes resulting from subsidence impacts and remediate and improve stream stability;
      - a program to monitor and report groundwater inflows to underground workings;
      - a program to predict, manage and monitor impacts to groundwater bores on privately-owned land; and
   (k) include a Biodiversity Management Plan, which has been prepared in consultation with OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on aquatic and terrestrial flora and fauna, with a specific focus on threatened species, populations and their habitats; endangered ecological communities; and water dependent ecosystems;
   (l) include a Land Management Plan, which has been prepared in consultation with any affected public authorities, to manage the potential impacts and/or environmental consequences of the proposed

second workings on land in general, with a specific focus on cliffs, rock face features and steep slopes;

(m) include a Heritage Management Plan, which has been prepared in consultation with OEH and relevant stakeholders for both Aboriginal and historic heritage, to manage the potential environmental consequences of the proposed second workings on both Aboriginal and non-Aboriginal heritage items, and reflects the requirements of condition 21 of schedule 4;

(n) include a Public Safety Management Plan, which has been prepared in consultation with DRE, to ensure public safety in the mining area;

(o) include a Subsidence Monitoring Program, which has been prepared in consultation with DRE; to:
- provide data to assist with the management of the risks associated with subsidence;
- validate the subsidence predictions;
- analyse the relationship between the predicted and resulting subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and
- inform the contingency plan and adaptive management process;

(p) include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 1 and 2, or where any such exceedance appears likely;

(q) proposes appropriate revisions to the Rehabilitation Management Plan required under condition 28 of Schedule 4; and

(r) include a program to collect sufficient baseline data for future Extraction Plans.

*Notes:*
- *To identify the second workings mining domains referred to in this condition, see Appendix 2.*
- *In accordance with Condition 14 of Schedule 2, the preparation and implementation of Extraction Plans may be staged, with each plan covering a defined area of underground workings. In addition, these plans are only required to contain management plans that are relevant to the specific underground workings that are being carried out.*
- *An SMP that is substantially consistent with this condition and which is approved by DRE prior to 31 October 2013 is taken to satisfy the requirements of this condition.*

5. The Proponent shall ensure that the management plans required under conditions 4(h)-(m) above include:
   (a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this approval; and
   (b) a detailed description of the measures that would be implemented to remediate predicted impacts.

**First Workings**

6. The Proponent may carry out first workings on site, other than in accordance with an approved Extraction Plan, provided that DRE is satisfied that the first workings are designed to remain long-term stable and non-subsiding, except insofar as they may be impacted by approved second workings.

   *Note: The intent of this condition is not to require an additional approval for first workings, but to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with zero resulting subsidence impacts.*

**Alternative Mining Methods**

7. The Proponent may carry out bord and pillar mining and pillar extraction in the longwall mining and shortwall mining areas shown in Figure 2 of Appendix 2, subject to any necessary Extraction Plan.

**Payment of Reasonable Costs**

8. The Proponent shall pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent experts to review the adequacy of any aspect of an Extraction Plan.

**SURFACE INFRASTRUCTURE MANAGEMENT**

**Gas Drainage**

9. The Proponent shall ensure that all gas drainage pipelines (other than connection points, monitoring points, dewatering facilities, regulation or isolation points) between gas drainage plants are buried, unless otherwise agreed with the relevant landowner or unless burial is inappropriate for safety or other reasons, to the satisfaction of the Director-General.

10. The Proponent shall prepare and implement a Gas Drainage Management Plan in respect of construction and use of future gas drainage infrastructure (ie for any gas drainage not subject to approval at the date of approval of MOD 3), to the satisfaction of the Director-General. This plan must be submitted to the

Director-General for approval prior to the construction of any future gas drainage infrastructure and must include details of the Proponent's commitments regarding:

(a) community consultation;
(b) landholder agreements;
(c) assessment of noise, air quality, traffic, biodiversity, heritage, public safety and other impacts in accordance with approved methods;
(d) avoidance of significant impacts and minimisation of impacts generally;
(e) beneficial re-use or flaring of drained hydrocarbon gases, wherever practicable;
(f) achievement of applicable standards and goals;
(g) mitigation and/or compensation for significant noise, air quality and visual impacts; and
(h) rehabilitation of disturbed sites.

**Service Boreholes**

11. The Proponent shall prepare and implement a Service Boreholes Management Plan in respect of construction and use of future service boreholes (ie any service boreholes not subject to approval at the date of approval of MOD 3) to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval prior to the construction of any future service borehole and must include details of the Proponent's commitments regarding:

(a) community consultation;
(b) landholder agreements;
(c) assessment of noise, air quality, traffic, biodiversity, heritage, public safety and other impacts in accordance with approved methods;
(d) avoidance of significant impacts and minimisation of impacts generally;
(e) achievement of applicable standards and goals;
(f) mitigation and/or compensation for significant noise, air quality and visual impacts; and
(g) rehabilitation of disturbed sites.

**Personal Emergency Device (PED) Communications**

12. The Proponent shall prepare and implement a PED Communications Management Plan in respect of construction and use of future PED communications infrastructure (ie for any PED communications infrastructure not subject to approval at the date of approval of MOD 3) to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval prior to the construction of any future PED communications infrastructure and must include details of the Proponent's commitments regarding:

(a) community consultation;
(b) landholder agreements;
(c) assessment of noise, air quality, traffic, biodiversity, heritage, public safety and other impacts in accordance with approved methods;
(d) avoidance of significant impacts and minimisation of impacts generally;
(e) achievement of applicable standards and goals;
(f) mitigation and/or compensation for significant noise, air quality and visual impacts; and
(g) rehabilitation of disturbed sites.

## SCHEDULE 4
## SPECIFIC ENVIRONMENTAL CONDITIONS – GENERAL

### NOISE

#### Operational Noise Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 4 at any residence on privately-owned land.

*Table 4: Operational noise criteria dB(A)*

| ***Location*** | ***Receiver Area*** | ***Day*** | ***Evening*** | ***Night*** | |
|---|---|---|---|---|---|
| | | $L_{Aeq\ (15\ min)}$ | $L_{Aeq\ (15\ min)}$ | $L_{Aeq\ (15\ min)}$ | $L_{A1\ (1\ min)}$ |
| Location I | Lord Howe Drive, Ashtonfield | 36 | 36 | 36 | 45 |
| Location K | Catholic Diocese Land | 37 | 37 | 37 | 45 |
| Location L | Kilshanny Avenue, Ashtonfield | 40 | 40 | 40 | 47 |
| All other locations | All other privately-owned residences | 35 | 35 | 35 | 45 |

*Notes:*

- *To interpret the locations referred to Table 4, see the plan in Appendix 3.*
- *Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 4 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.*

However, these noise criteria do not apply if the Proponent has an agreement with the relevant landowner to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

#### Construction Noise Criteria

2. The Proponent shall ensure that the noise generated during the construction of the downcast ventilation shaft as described in EA (MOD 3) does not exceed the criteria in Table 5.

*Table 5: Construction noise criteria dB(A)*

| ***Location*** | ***Receiver*** | ***Day*** |
|---|---|---|
| | | $L_{Aeq\ (15\ min)}$ |
| Location R | 281 Lings Road, Buttai | 50 |
| Location S | 189 Lings Road Buttai | 43 |

*Notes:*

- *The criteria in Table 5 apply only whilst the downcast ventilation shaft is being constructed, and for a maximum of 12 weeks from the commencement of construction.*
- *To interpret the locations referred to Table 5, see the plan in Appendix 3.*
- *Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.*

However, these noise criteria do not apply if the Proponent has an agreement with the relevant landowner to generate higher construction noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

#### Rail Noise Criteria

3. The Proponent shall ensure that the noise from rail movements on the Bloomfield Rail Spur does not exceed the limits in Table 6 at any residence on privately-owned land.

*Table 6: Rail Spur noise criteria dB(A)*

| Location | Day | Evening | Night |
|---|---|---|---|
| | $L_{Aeq\ (period)}$ | | |
| All privately-owned land | 55 | 45 | 40 |

**Cumulative Noise Criteria**

4. The Proponent shall implement all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines in the area does not exceed the criteria in Table 7 at any residence on privately-owned land.

*Table 7: Cumulative noise criteria dB(A)*

| Location | Day | Evening | Night |
|---|---|---|---|
| | $L_{Aeq\ (period)}$ | | |
| All privately-owned land | 55 | 45 | 40 |

*Note: Cumulative noise is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 4 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.*

**Operating Conditions**

5. The Proponent shall:
   (a) implement best management practice to minimise the construction, operational, road and rail noise of the project;
   (b) operate an on-site noise management system to ensure compliance with the relevant conditions of this approval;
   (c) minimise the noise impacts of the project during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 4);
   (d) only receive and/or dispatch locomotives and rolling stock either on or from the site that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL (No. 3142);
   (e) carry out regular monitoring to determine whether the project is complying with the noise criteria and other relevant conditions of approval,

   to the satisfaction of the Director-General.

**Noise Management Plan**

6. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:
   (a) be prepared in consultation with EPA, and submitted to the Director-General for approval within 6 months of the date of approval of MOD 3;
   (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval;
   (c) describe the proposed noise management system in detail; and
   (d) include a monitoring program that:
      - uses attended monitoring to evaluate the compliance of the project against the noise criteria in this approval;
      - evaluates and reports on:
        - the effectiveness of the on-site noise management system; and
        - compliance against the noise operating conditions; and
      - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

**AIR QUALITY & GREENHOUSE GAS**

**Odour**

7. The Proponent shall ensure that no offensive odours are emitted from the site, as defined under the POEO Act.

**Greenhouse Gas Emissions**

8. The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.

**Air Quality Criteria**

9. The Proponent shall implement all reasonable and feasible mitigation measures to ensure that the particulate emissions generated by the project do not exceed the criteria listed in Tables 8, 9 and 10 at any residence on privately-owned land.

*Table 8: Long-term criteria for particulate matter*

| ***Pollutant*** | ***Averaging period*** | ***[d] Criterion*** |
|---|---|---|
| Total suspended particulate (TSP) matter | Annual | [a] 90 µg/m$^3$ |
| Particulate matter < 10 µm ($PM_{10}$) | Annual | [a] 30 µg/m$^3$ |

*Table 9: Short-term criterion for particulate matter*

| ***Pollutant*** | ***Averaging period*** | ***[d] Criterion*** |
|---|---|---|
| Particulate matter < 10 µm ($PM_{10}$) | 24 hour | [a] 50 µg/m$^3$ |

*Table 10: Long-term criteria for deposited dust*

| ***Pollutant*** | ***Averaging period*** | ***Maximum increase in deposited dust level*** | ***Maximum total deposited dust level*** |
|---|---|---|---|
| [c] Deposited dust | Annual | [b] 2 g/m$^2$/month | [a] 4 g/m$^2$/month |

*Notes to Tables 8-10:*

- *[a] Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to other sources);*
- *[b] Incremental impact (ie incremental increase in concentrations due to the project on its own);*
- *[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method*; *and*
- *[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Director-General.*

**Operating Conditions**

10. The Proponent shall:
    (a) implement best practice air quality management at the site, including all reasonable and feasible measures to minimise off-site odour and dust emissions generated by the project, including from any spontaneous combustion on site;
    (b) operate an air quality management system on site to ensure compliance with the relevant conditions of this approval;
    (c) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d to Tables 8-10 above); and
    (d) co-ordinate the air quality management on site with the air quality management of the Bloomfield Colliery, to minimise cumulative air quality impacts,

    to the satisfaction of the Director-General.

**Air Quality & Greenhouse Gas Management Plan**

11. The Proponent shall prepare and implement a detailed Air Quality & Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with EPA, and submitted to the Director-General for approval within 6 months of the date of approval of MOD 3;
    (b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this approval;
    (c) describe the measures that would be implemented to minimise the greenhouse gas emissions from the site;
    (d) describe the proposed on-site air quality management system; and
    (e) include an air quality monitoring program that:
        - is capable of evaluating the operating conditions of this approval;
        - evaluates and reports on:
            - the effectiveness of the air quality management system; and
            - compliance against the air quality operating conditions; and

- defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.

**METEOROLOGICAL MONITORING**

12. During the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:
    (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South* Wales guideline; and
    (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy*, unless a suitable alternative is approved by the Director-General following consultation with the EPA.

**SOIL & WATER**

*Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Proponent is required to obtain the necessary water licences for the project.*

**Water Supply**

13. The Proponent shall ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of mining operations to match its available water supply, to the satisfaction of the Director-General.

**Compensatory Water Supply**

14. The Proponent shall provide a compensatory water supply to any landowner of privately-owned land whose water entitlements are adversely impacted (other than an impact that is negligible) as a result of the project, in consultation with NOW, and to the satisfaction of the Director-General.

    The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent to the loss attributed to the project. Equivalent water supply must be provided (at least on an interim basis) within 24 hours of the loss being identified.

    If the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

    If the Proponent is unable to provide an alternative long-term supply of water, then the Proponent shall provide alternative compensation to the satisfaction of the Director-General.

**Surface Water Discharges**

15. The Proponent shall not discharge any water from the site or cause any pollution of waters except as expressly provided for in an EPL.

**Surface Water Transfer**

16. The Proponent may transfer water between the site, the Donaldson Open-Cut Coal Mine and the Bloomfield Colliery, in accordance with the Water Management Plans for these operations.

**Water Management Plan**

17. The Proponent shall prepare and implement a Water Management Plan for the project, for all areas that are not, or will not, be subject to condition 4 of schedule 3, to the satisfaction of the Director-General. This plan must be prepared in consultation with NOW and EPA, by suitably qualified and experienced persons whose appointment has been endorsed by the Director-General, and submitted to the Director-General for approval within 6 months of the date of approval of MOD 3. This plan must include:
    (a) a comprehensive water balance for the project that includes details of:
        - sources and security of water supply;
        - water make in the underground workings;
        - water use; and
        - any water discharges; and
    (b) management plans for the Surface facilities sites, that include:
        - a detailed description of water management systems for each site, including:
            - clean water diversion systems;
            - erosion and sediment controls; and
            - any water storages;

- measures to minimise potable water use and to reuse and recycle water; and
- monitoring and reporting procedures.

*Note: This plan can be integrated with the Water Management Plans prepared for the Donaldson Open-Cut Mine and the Bloomfield Colliery.*

**BIODIVERSITY**

**Biodiversity Offset Strategy**

18. The Proponent shall develop and implement a Biodiversity Offset Strategy as summarised in Table 11, prior to the commencement of construction of the coal conveyor or the vegetation clearing described in the EA, whichever is sooner, in consultation with OEH, and to the satisfaction of the Director-General.

*Table 11: Biodiversity Offset Strategy*

| ***Area*** | ***Offset Type*** | ***Minimum Size/Amount*** |
|---|---|---|
| Biodiversity Offset Area | Lower Hunter Spotted Gum-Ironbark Forest EEC | 10 ha |
| | Remnant native woodland vegetation | 10 ha |

**Long Term Security of Offset**

19. Within 12 months of the commencement of construction of the coal conveyor, or the vegetation clearing described in the EA, whichever is sooner, unless the Director-General agrees otherwise, the Proponent shall make suitable arrangements to provide appropriate long term security for the biodiversity offset area identified in Table 11, to the satisfaction of the Director-General.

*Note: In order of preference, mechanisms to provide appropriate long term security to the land within the Biodiversity Offset Strategy include incorporation into the nearby State Conservation Areas, Biobanking Agreement, Voluntary Conservation Agreement, or restrictive covenant on land titles.*

**Biodiversity Management Plan**

20. The Proponent shall prepare and implement a Biodiversity Management Plan for the project, for all areas that are not, or will not, be subject to condition 4 of schedule 3, to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with OEH, and be approved by the Director-General prior to the commencement of construction of the coal conveyor;
    (b) establish baseline data for the existing habitat in the biodiversity offset area and on the site;
    (c) describe the short, medium, and long term measures that would be implemented to:
        - manage vegetation clearing;
        - manage the remnant vegetation and habitat in the biodiversity offset area and on the site; and
        - implement the biodiversity offset strategy, including detailed performance and completion criteria;
    (d) include a program to monitor and report on the effectiveness of these measures, and progress against detailed performance and completion criteria;
    (e) identify the potential risks to the successful implementation of the Biodiversity Offset Strategy, and the contingency measures that would be implemented to mitigate these risks; and
    (j) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

**Conservation Bond**

21. Within 6 months of the commencement of construction of the coal conveyor, or the vegetation clearing described in the EA, whichever is sooner, the Proponent shall lodge a conservation bond with the Department to ensure that the Biodiversity Offset Strategy is implemented in accordance with the performance and completion criteria described in the Biodiversity Management Plan. The sum of the bond shall be determined by:
    (a) calculating the full cost of implementing the offset strategy (other than land acquisition costs); and
    (b) employing a suitably qualified quantity surveyor to verify the calculated costs.

    If the offset strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Director-General, the Director-General will release the bond.

    If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Director-General will call in all or part of the conservation bond, and arrange for the satisfactory completion of the relevant works.

**HERITAGE**

**Aboriginal Cultural Heritage Management Plan**

22. The Proponent shall prepare and implement an Aboriginal Cultural Heritage Management Plan for the project, for all areas that are not, or will not, be subject to condition 4 of Schedule 3, to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with OEH and the Aboriginal community;
    (b) be submitted to the Director-General for approval within 6 months of the date of approval of MOD 3;
    (c) identify any actions required to ensure that the performance measures in Table 1 are met;
    (d) include the following program/procedures for Aboriginal cultural heritage management:
        - managing Aboriginal cultural heritage sites, and the discovery of any new Aboriginal cultural heritage sites, objects or skeletal remains;
        - maintaining consultation with, and the involvement of, the Aboriginal community in the conservation and management of Aboriginal heritage sites, and managing access for the Aboriginal community to Aboriginal heritage sites and culturally significant areas; and
        - a trigger action response plan to manage unexpected subsidence impacts.

**TRANSPORT**

**Monitoring of Coal Transport**

23. The Proponent shall:
    (a) keep accurate records of the amount of coal transported from the site (on a monthly basis); and
    (b) make these records publicly available on its website at the end of each calendar year.

**VISUAL**

**Visual Amenity and Lighting**

24. The Proponent shall:
    (a) implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the project;
    (b) ensure no unshielded outdoor lights shine above the horizontal; and
    (c) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting* or its latest version,
    to the satisfaction of the Director-General.

**WASTE**

25. The Proponent shall:
    (a) minimise and monitor the waste generated by the project;
    (b) ensure that the waste generated by the project is appropriately stored, handled and disposed of;
    (c) manage on-site sewage treatment and disposal in accordance with the requirements of Council; and
    (d) report on waste management and minimisation in the Annual Review,
    to the satisfaction of the Director-General.

**BUSHFIRE**

26. The Proponent shall:
    (a) ensure that the project is suitably equipped to respond to fires on site; and
    (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire in the vicinity of the site.

**REHABILITATION**

**Rehabilitation Objectives**

27. The Proponent shall rehabilitate the site to the satisfaction of the Executive Director Mineral Resources. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA, and comply with the objectives in Table 12.

*Table 12: Rehabilitation Objectives*

| ***Feature*** | ***Objective*** |
|---|---|
| • Mine site (as a whole). | • Safe, stable & non-polluting; and<br>• Final land use compatible with surrounding land uses. |
| • Surface infrastructure. | • To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise. |
| • Portals and ventilation shafts. | • To be decommissioned and made safe and stable; and<br>• Retain habitat for threatened species (eg bats), where practicable. |
| • Watercourses within project area. | • Hydraulically and geomorphologically stable. |
| • Cliffs. | • No additional risk to public safety compared to prior to mining. |
| • Other land affected by the project. | • Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:<br>- local native plant species (unless the Executive Director Mineral Resources agrees otherwise); and<br>- a landform consistent with the surrounding environment . |
| • Built features damaged by mining operations. | • Repair to pre-mining condition or equivalent unless:<br>- the owner agrees otherwise; or<br>- the damage is fully restored, repaired or compensated under the *Mine Subsidence Compensation Act 1961* |
| • Community. | • Ensure public safety; and<br>• Minimise the adverse socio-economic effects associated with mine closure |

*Notes:*

- *These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by mining taking place after the date of this approval; and to all surface infrastructure sites and other disturbance which forms part of the project, whether constructed prior to or following the date of this approval.*
- *Rehabilitation of subsidence impacts and environmental consequences caused by mining which took place prior to the date of this approval may be subject to the requirements of other approvals (eg under a mining lease or a Subsidence Management Plan approval).*

**Progressive Rehabilitation**

28. The Proponent shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.

**Rehabilitation Management Plan**

29. The Proponent shall prepare and implement a Rehabilitation Management Plan for the project, in consultation with OEH, NOW, Cessnock City Council, Maitland City Council and Newcastle City Council, and the CCC, and to the satisfaction of the Director-General and the Executive Director Mineral Resources. This plan must:
    (a) be submitted to the Director-General and the Executive Director Mineral Resources for approval within 9 months of the date of approval of MOD 3;
    (b) be prepared in accordance with any relevant DRE guideline and be consistent with the rehabilitation objectives in the EA, EA (MOD 3) and in Table 11;
    (c) describe how the performance of the rehabilitation would be monitored and assessed against the objectives in Table 11;
    (d) describe the process whereby additional measures would be identified and implemented to ensure the rehabilitation objectives are achieved;
    (e) provide for detailed mine closure planning, including measures to minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance; and
    (f) be integrated with the other management plans required under this approval.

    *Note: The Rehabilitation Management Plan should address all land impacted by the project, and should be suitably integrated with the approved Rehabilitation Management Plans for the Donaldson Open-Cut Mine and the Bloomfield Colliery.*

## SCHEDULE 5
## ADDITIONAL PROCEDURES

### NOTIFICATION OF LANDOWNERS

1. As soon as practicable after obtaining monitoring results which show:
   (a) an exceedance of any relevant criteria in Schedule 4, the Proponent shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the Proponent is again complying with the relevant criteria; and
   (b) an exceedance of any relevant air quality criteria in Schedule 4, the Proponent shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

### INDEPENDENT REVIEW

2. If an owner of privately-owned land considers that the Proponent is exceeding the relevant criteria in Schedule 4, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land.

   If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision the Proponent shall:
   (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:
      (i) consult with the landowner to determine his/her concerns;
      (ii) conduct monitoring to determine whether the Proponent is complying with the relevant criteria in Schedule 4; and
      (iii) if the Proponent is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and
   (b) give the Director-General and landowner a copy of the independent review.

## SCHEDULE 6
## ENVIRONMENTAL MANAGEMENT, REPORTING & AUDITING

### ENVIRONMENTAL MANAGEMENT

#### Environmental Management Strategy

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must:
   (a) be submitted to the Director-General for approval within 6 months of the date of approval of MOD 3;
   (b) provide the strategic framework for environmental management of the project;
   (c) identify the statutory approvals that apply to the project;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
   (e) describe the procedures that would be implemented to:
      (i) keep the local community and relevant agencies informed about the operation and environmental performance of the project;
      (ii) receive, handle, respond to, and record complaints;
      (iii) resolve any disputes that may arise during the course of the project;
      (iv) respond to any non-compliance;
      (v) respond to emergencies; and
   (f) include:
      (i) copies of any strategies, plans and programs approved under the conditions of this approval; and
      (ii) a clear plan depicting all the monitoring required to be carried out under the conditions of this approval.

#### Management Plan Requirements

2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      (ii) any relevant limits or performance measures/criteria;
      (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      (i) impacts and environmental performance of the project;
      (ii) effectiveness of any management measures (see c above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
   (f) a program to investigate and implement ways to improve the environmental performance of the project over time;
   (g) a protocol for managing and reporting any:
      (i) incidents;
      (ii) complaints;
      (iii) non-compliances with statutory requirements; and
      (iv) exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

   *Note: The Director-General may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*

#### Adaptive Management

3. The Proponent must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedules 3 and 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

   Where any exceedance of these criteria and/or performance measures has occurred, the Proponent must, at the earliest opportunity:
   (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;

(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
(c) implement remediation measures as directed by the Director-General,
to the satisfaction of the Director-General.

**Annual Review**

4. By the end of March each year, or other timing as may be agreed by the Director-General, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must:
   (a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;
   (b) include a comprehensive review of the monitoring results and complaints records of the project over the past calendar year, which includes a comparison of these results against the:
      (i) relevant statutory requirements, limits or performance measures/criteria;
      (ii) requirements of any plan or program required under this approval;
      (iii) monitoring results of previous years; and
      (iv) relevant predictions in the EA and EA (MOD 3);
   (c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;
   (d) identify any trends in the monitoring data over the life of the project;
   (e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.

**Revision of Strategies, Plans and Programs**

5. Within 3 months of:
   (a) the submission of an annual review under Condition 4 above;
   (b) the submission of an incident report under Condition 7 below;
   (c) the submission of an audit report under Condition 9 below; or
   (d) any modification to the conditions of this approval, (unless the conditions require otherwise),
   the Proponent shall review the strategies, plans, and programs required under this approval, to the satisfaction of the Director-General. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Director-General.

   *Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the project.*

**Community Consultative Committee**

6. The Proponent shall continue to operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General. This CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version).

   *Notes:*
   - *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval.*
   - *In accordance with the guideline, the Committee should be comprised of an independent chair and appropriate representation from the Proponent, Council/s, recognised environmental groups and the local community.*
   - *In operating the CCC, the Department will accept the continued representation from existing CCC members.*

**REPORTING**

**Incident Reporting**

7. The Proponent shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the project, the Proponent shall notify the Director-General and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

**Regular Reporting**

8. The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.

**INDEPENDENT ENVIRONMENTAL AUDIT**

9. By the end of March 2015 (or other such timing as agreed by the Director-General), and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the project and assess whether it is complying with the requirements in this approval and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);
   (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; and
   (e) recommend appropriate measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under the abovementioned approvals.

   *Note: This audit team must be led by a suitably qualified auditor and include experts in any field specified by the Director-General.*

10. Within 6 weeks of the completion of this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

**ACCESS TO INFORMATION**

11. From the end of December 2013, the Proponent shall:
   (a) make copies of the following publicly available on its website:
      - the EA, EA (MOD 1), EA (MOD 2) and EA (MOD 3);
      - all current relevant statutory approvals for the project;
      - approved strategies, plans and programs required under the conditions of this approval;
      - a comprehensive summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;
      - a complaints register (updated monthly);
      - minutes of CCC meetings;
      - the Annual Reviews of the project;
      - any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit;
      - any other matter required by the Director-General; and

   (b) keep this information up-to-date,

   to the satisfaction of the Director-General.

## APPENDIX 1
## SCHEDULE OF LAND

### 1. ABEL SITE

**Abel Underground Mining Area – South of John Renshaw Drive**

| Lot | DP | Lot | DP | Lot | DP |
|---|---|---|---|---|---|
| 94 | 755260 | 120 | 755260 | 1 | 228477 |
| 942 | 817442 | 101 | 755260 | 1 | 986196 |
| 1 | 858353 | 100 | 755260 | 2 | 602610 |
| 94 | 755260 | 11 | 11875 | 91 | 828299 |
| 11 | 804925 | 13 | 11875 | 92 | 828299 |
| 12 | 804925 | 122 | 567150 | 951 | 600488 |
| 1 | 583620 | 21 | 1019282 | 202 | 626192 |
| 8 | 1048112 | 22 | 1019282 | 2011 | 812939 |
| 7 | 1048112 | 1 | 120851 | 2012 | 812939 |
| 3 | 237431 | A | 418390 | 952 | 600488 |
| 210 | 833717 | 11 | 877937 | A | 155698 |
| 211 | 833717 | 12 | 877937 | 101 | 837562 |
| 5 | 237431 | 610 | 1035588 | 100 | 837562 |
| 1 | 1003988 | 611 | 1035588 | 1 | 602610 |
| 932 | 816814 | 2 | 219167 | 1 | 179002 |
| 1 | 189884 | A | 181350 | 2 | 228477 |
| 83 | 629112 | 1 | 536570 | 3 | 228477 |
| 3 | 1003988 | 1 | 957782 | 12 | 528093 |
| 2 | 1003988 | 8110 | 867955 | 21 | 1043285 |
| 223 | 841899 | 8111 | 867955 | 22 | 1043285 |
| 224 | 841899 | 810 | 730001 | 111 | 1035921 |
| 84 | 629112 | 1 | 951843 | 1 | 174428 |
| 116 | 755260 | 2 | 951843 | 10 | 837813 |
| 121 | 755260 | 1 | 119630 | 1 | 910932 |
| 122 | 755260 | 1 | 123945 | 1 | 359638 |
| 113 | 755260 | 1 | 505578 | 680 | 545657 |
| 112 | 755260 | 72 | 755260 | 683 | 619758 |
| 110 | 755260 | 79 | 755260 | 686 | 619758 |
| 111 | 755260 | 82 | 755260 | 685 | 619758 |
| 2 | 449834 | 83 | 755260 | 3 | 214493 |
| 21 | 773883 | 84 | 755260 | 2 | 214493 |
| 22 | 1080823 | 89 | 755260 | 1 | 214493 |
| 23 | 1080823 | 96 | 755260 | 4 | 214493 |
| 24 | 1080823 | 125 | 755260 | 684 | 619758 |
| 220 | 836874 | 1 | 877416 | 1 | 123949 |
| 2 | 531623 | 2 | 877416 | 2 | 123949 |
| 219 | 836874 | 3 | 877416 | 70 | 755260 |
| 218 | 836874 | 4 | 877416 | 82 | 627799 |
| 107 | 755260 | 101 | 881099 | 1131 | 1057179 |
| 1061 | 855759 | 13 | 1072499 | 1 | 811514 |
| 1062 | 855759 | 2 | 503566 | 10 | 829154 |
| 105 | 755260 | 1 | 433355 | 11 | 829154 |
| 118 | 755260 | 21 | 801283 | 11 | 746684 |
| 11 | 873821 | 22 | 801283 | 41 | 811191 |
| 8 | 873821 | 2 | 285375 | 8 | 755232 |
| 9 | 873821 | 100 | 881099 | 7 | 850020 |
| 5 | 873821 | 1 | 285375 | 8 | 850020 |
| 7 | 873821 | 3 | 285375 | 4 | 1049753 |
| 6 | 873821 | 4 | 285375 | 43 | 811191 |
| 104 | 755260 | 5 | 285375 | 6 | 850020 |
| 103 | 755260 | 6 | 285375 | 101 | 860867 |
| 102 | 755260 | 3 | 602610 | 13 | 1072499 |
| 14 | 1059212 | 1 | 34665 | | |

**Abel Surface Facilities Site – North of John Renshaw Drive**

| Landowner | Lot | Deposited Plan |
|---|---|---|
| Donaldson Coal Pty Limited | PT92 | 755260 |
| Donaldson Coal Pty Limited | PT13 | 11875 |
| Donaldson Coal Pty Limited | 121 | 567150 |
| Donaldson Coal Pty Limited | PT11 | 11875 |
| Donaldson Coal Pty Limited | 21 | 1019282 |
| Donaldson Coal Pty Limited | 22 | 1019282 |
| Donaldson Coal Pty Limited | 81 | 627799 |
| Donaldson Coal Pty Limited | 1 | 838310 |
| Donaldson Coal Pty Limited | PT13 | 755260 |
| Hunter Water | | 2487-3070 |

## 2. BLOOMFIELD SITE

**Bloomfield Lease Area**

| Landowner | Lot | Deposited Plan |
|---|---|---|
| Ashtonfield Holdings | 1 | 1045723 |
| Ashtonfield Holdings | 9 | 755237 |
| Ashtonfields Pty Limited | 223 | 755237 |
| Ashtonfields Pty Limited | 1 | 456999 |
| Ashtonfields Pty Limited | 15 | 241097 |
| Ashtonfields Pty Limited | 14 | 241097 |
| Ashtonfields Pty Limited | 1 | 982215 |
| Hunter Water | 1 | 724270 |
| Ashtonfields Pty Limited | 1 | 1045720 |
| Ashtonfields Pty Limited | 2 | 1045720 |
| Ashtonfields Pty Limited | 1 | 1045722 |
| Hunter Water | | 2487-3070 |
| Ashtonfields Pty Limited | 2 | 1045722 |
| Ashtonfields Pty Limited | 13 | 241097 |
| Ashtonfields Pty Limited | 10 | 755237 |
| Ashtonfields Pty Limited | 11 | 755237 |
| Ashtonfields Pty Limited | 18 | 755237 |
| Ashtonfields Pty Limited | 20 | 755237 |
| Ashtonfields Pty Limited | 19 | 755237 |
| Ashtonfields Pty Limited | 30 | 755260 |
| Ashtonfields Pty Limited | 29 | 755260 |
| Ashtonfields Pty Limited | 28 | 755260 |
| Ashtonfields Pty Limited | 27 | 755260 |
| Ashtonfields Pty Limited | 26 | 755260 |
| Ashtonfields Pty Limited | PT34 | 755260 |
| Ashtonfields Pty Limited | 1 | 722210 |
| Ashtonfields Pty Limited | PT48 | 755260 |
| Ashtonfields Pty Limited | PT35 | 755260 |
| Ashtonfields Pty Limited | PT36 | 755260 |
| Ashtonfields Pty Limited | 1 | 42349 |
| Ashtonfields Pty Limited | 1 | 69246 |
| Ashtonfields Pty Limited | 3 | 1045720 |
| Ashtonfields Pty Limited | 4 | 1045720 |
| Ashtonfields Pty Limited | 1 | 58967 |
| Ashtonfields Pty Limited | 1 | 136865 |
| Hunter Water | 1 | 617909 |
| Ashtonfields Pty Limited | 2 | 136865 |
| Ashtonfields Pty Limited | PT31 | 755237 |
| Four Mile | 35 | 755237 |
| Four Mile | 36 | 755237 |
| Ashtonfields Pty Limited | 23 | 755237 |
| Ashtonfields Pty Limited | 29 | 755237 |
| Ashtonfields Pty Limited | 1 | 1045719 |
| Ashtonfields Pty Limited | PT37 | 755237 |
| Ashtonfields Pty Limited | PT38 | 755237 |
| Ashtonfields Pty Limited | PT39 | 755237 |

| | | |
|---|---|---|
| Ashtonfields Pty Limited | 25 | 755260 |
| Ashtonfields Pty Limited | 24 | 755260 |
| Ashtonfields Pty Limited | 23 | 755260 |
| Ashtonfields Pty Limited | 22 | 755260 |
| Ashtonfields Pty Limited | 12 | 241097 |
| Ashtonfields Pty Limited | 43 | 755260 |
| Ashtonfields Pty Limited | 44 | 755260 |
| Ashtonfields Pty Limited | 45 | 755260 |
| Ashtonfields Pty Limited | 46 | 755260 |
| Ashtonfields Pty Limited | 2 | 456999 |
| Hunter Water pipeline | 1 | 241097 |
| Hunter Water pipeline | 2 | 241097 |
| Hunter Water pipeline | 3 | 241097 |
| Hunter Water pipeline | 4 | 241097 |
| Hunter Water pipeline | 5 | 241097 |
| Hunter Water pipeline | 6 | 241097 |
| Hunter Water pipeline | 7 | 241097 |
| Hunter Water pipeline | 8 | 241097 |
| Hunter Water pipeline | 9 | 241097 |
| Hunter Water pipeline | 10 | 241097 |
| Hunter Water pipeline | 2 | 42349 |
| Hunter Water pipeline | 3 | 42349 |
| Hunter Water pipeline | 1 | 814843 |

## 3. OUT OF LEASE AREAS

| Landowner | Lot | Deposited Plan |
|---|---|---|
| Donaldson Coal | PT92 | 755260 |
| Big Ben Holdings | 4 | 11988 |
| Big Ben Holdings | 849 | 852072 |
| Cant Family Partnership | 30 | 577638 |
| Cant Family Partnership | 101 | 616161 |
| Four Mile | 5 | 866929 |
| Donaldson Coal | 12 | 1007491 |
| Ashtonfield Holdings | 43 | 755237 |
| Ashtonfield Holdings | 44 | 755237 |
| Ashtonfield Holdings | 50 | 755237 |
| Ashtonfield Holdings | 51 | 755237 |
| Big Ben Holdings | 42 | 755237 |
| Ashtonfield Holdings | 45 | 755237 |
| Ashtonfield Holdings | 49 | 755237 |
| Big Ben Holdings | 41 | 755237 |
| Hunter Water | | 2487-3070 |
| Hunter Water pipeline | 11 | 241097 |

**APPENDIX 2**
**PROJECT LAYOUT**

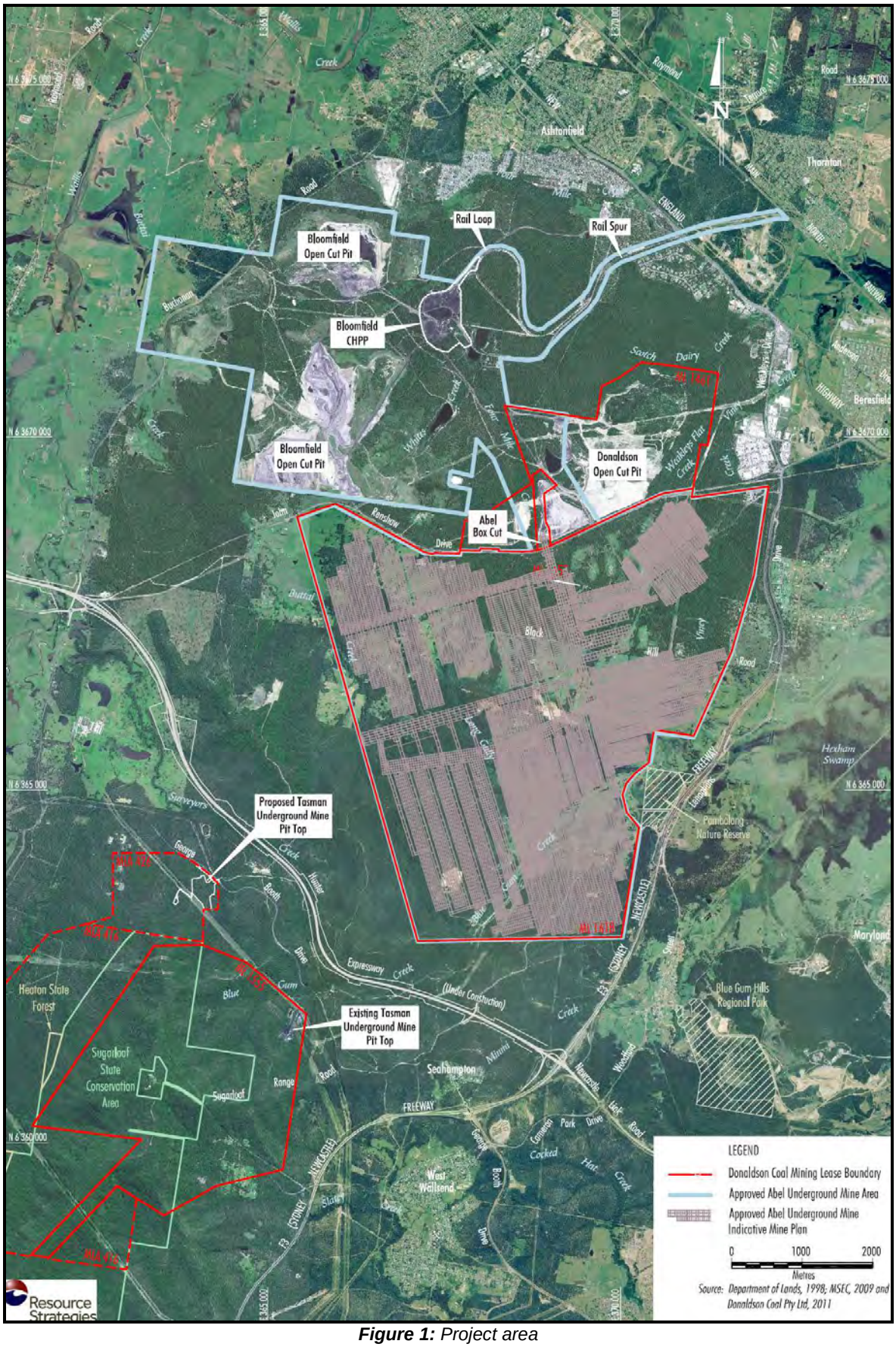


***Figure 1:*** *Project area*

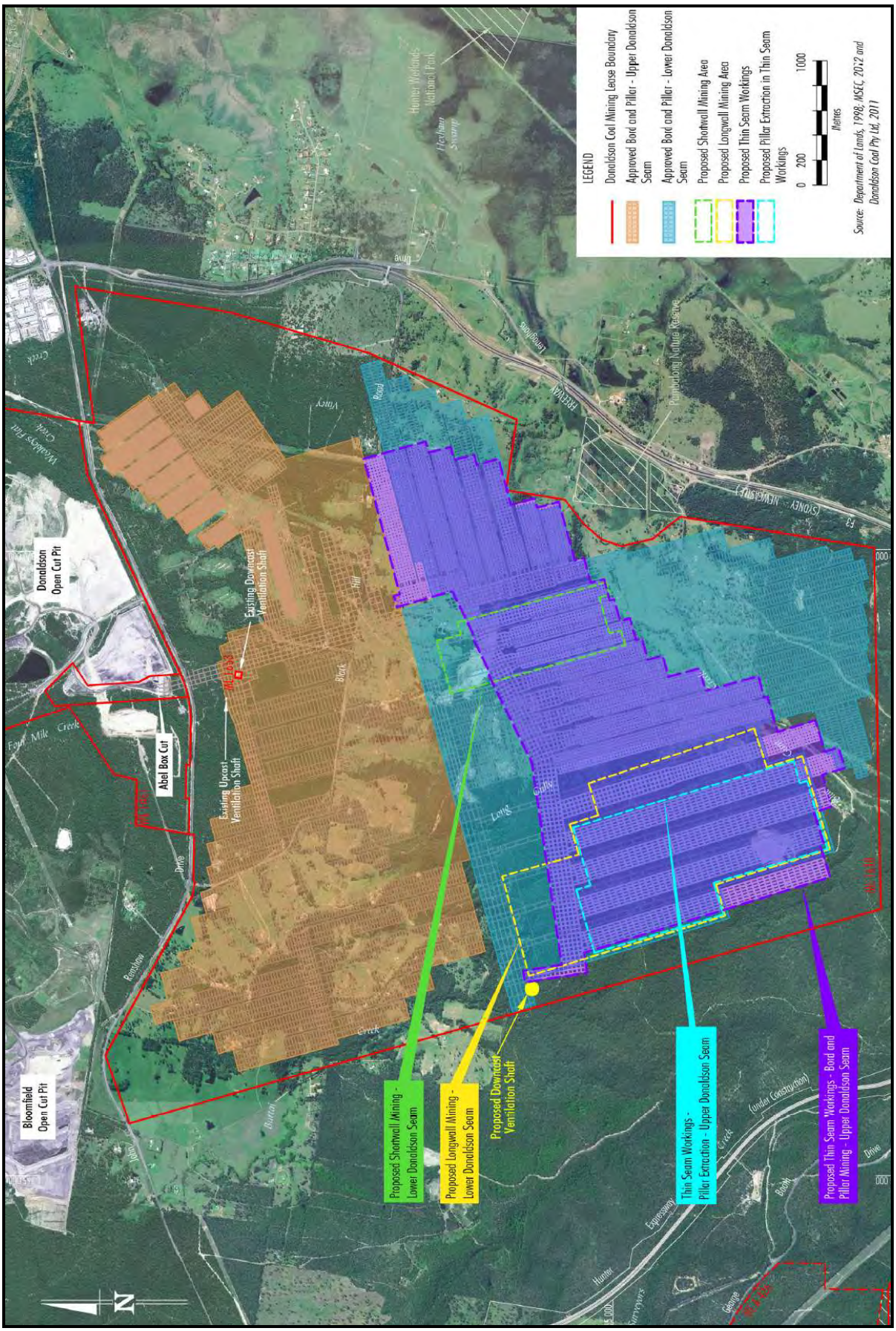


***Figure 2:*** *Approved mine plan*

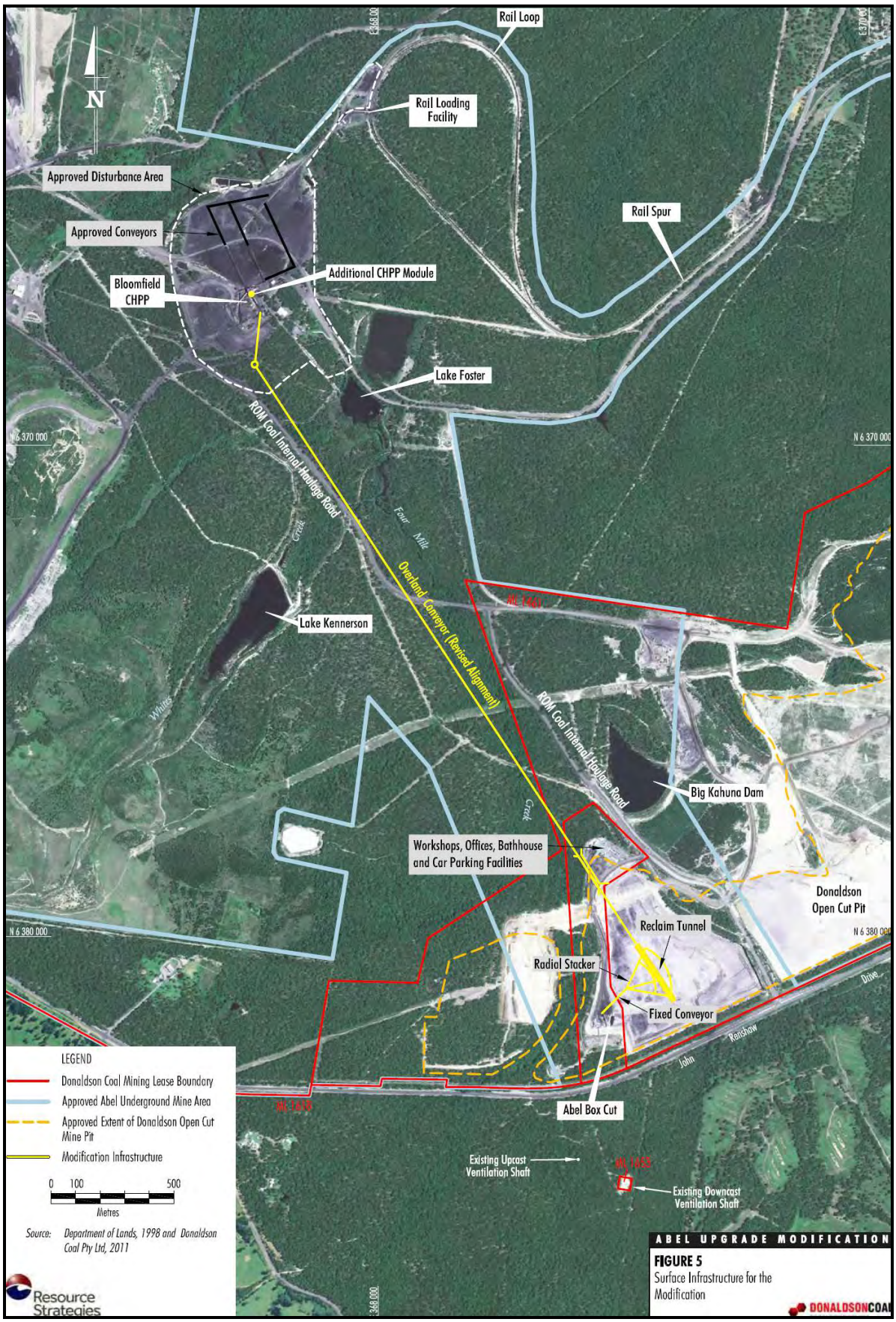


***Figure 3:*** *Surface facilities*

**APPENDIX 3**
**RECEIVERS AND MONITORING LOCATIONS**

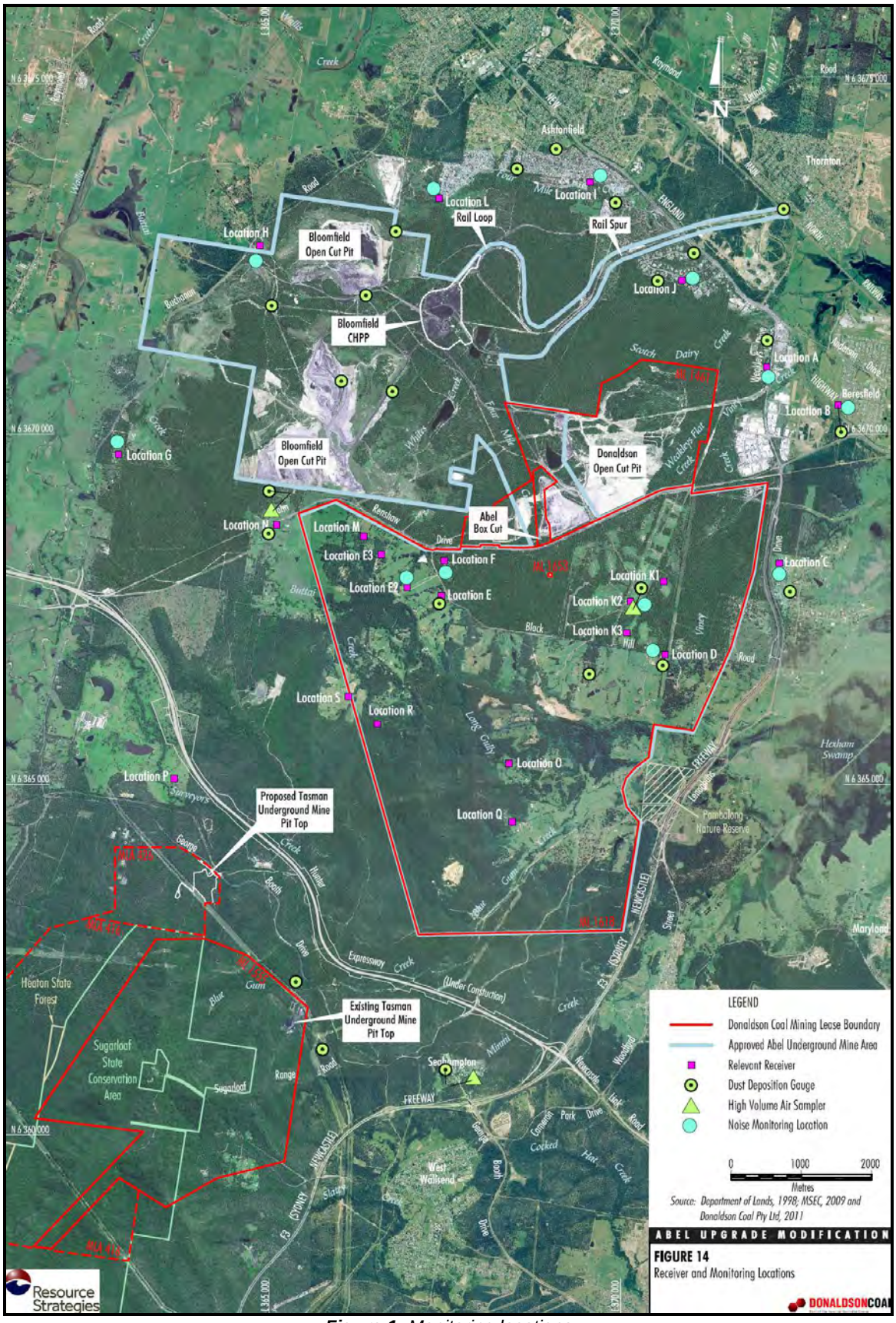


***Figure 1:*** *Monitoring locations*

## APPENDIX 4
## NOISE COMPLIANCE ASSESSMENT

**Applicable Meteorological Conditions**

1. The noise criteria in Tables 4 and 7 are to apply under all meteorological conditions except the following:
   (a) during periods of rain or hail;
   (b) average wind speed at microphone height exceeds 5 m/s;
   (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or
   (d) temperature inversion conditions greater than 3℃/100 m.

**Determination of Meteorological Conditions**

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located on the site.

**Compliance Monitoring**

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.

4. Unless otherwise agreed with the Director-General, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

## APPENDIX 5
## STATEMENT OF COMMITMENTS

Donaldson Coal Pty Ltd ('**the Company**') will commit to the following controls for construction and operation of the Abel Underground Mine.

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| **0. General** | The Company shall carry out the development generally in accordance with the:<br>(a) Abel Underground Mine Part 3A Environmental Assessment.<br>(b) modification application 05_0136 – MOD 1 and the accompanying Environmental Assessment prepared by the Company and dated May 2010;<br>(c) modification application 05_0136 – MOD 2 and the accompanying Environmental Assessment prepared by the Company and dated March 2011;<br>(d) modification application 05_0136 – MOD 3 and the accompanying Environmental Assessment prepared by the Company and dated February 2013 and Response to Submissions dated July 2013.<br>If there is any inconsistency between the conditions of this Statement of Commitments and a document listed above the conditions of this Statement of Commitments shall prevail to the extent of the inconsistency. |
| **1. Production** | 1.1 No more than 6.1 million tonnes of ROM coal a year will be mined from the Abel Underground Mine.<br>1.2 No more than 8.5 million tonnes of ROM coal a year will be processed at the Bloomfield CHPP.<br>1.3 No more than 6.5 million tonnes per annum of product coal will be transported on the Bloomfield Rail Loop. |
| **2. Hours of Operation** | 2.1 The Abel Underground Mine will operate 24 hours per day, seven days per week.<br>2.2 The Bloomfield CHPP will operate 24 hours per day, seven days per week.<br>2.3 The Bloomfield Rail Loop will operate 24 hours per day, seven days per week. |
| **3. Noise** | **3.1 Construction Activities**<br>The following noise control measures will be implemented prior to commencement of construction of the Abel Underground Mine or the upgrade of the Bloomfield CHPP:<br>(a) Maintain all machinery and equipment in working order;<br>(b) No construction activities at the Abel pit top will take place on Sundays or Public Holidays;<br>(c) Where possible locate noisy site equipment behind structures that act as barriers or at the greatest distance from noise sensitive areas; and<br>(d) Orientate equipment so that noise emissions are directed away from noise sensitive areas.<br>**3.2 Noise Control Measures**<br>(a) The following noise control measures will be implemented prior to the mining of coal from the Abel Underground Mine:<br>• Orientation of the ventilation fans away from residential receivers and angle the output parallel to the ground.<br>• The sound power level of the front end loader to be used near the portal should not exceed 113 dBA and will be fitted with a noise sensitive reversing alarm.<br>(b) The following noise control measures will be implemented prior to the Bloomfield CHPP receiving any ROM coal from the Abel Underground Mine:<br>• Noise mitigation works including partial enclosure and noise screening of drives and conveyors of the Bloomfield CHPP to screen residences to the north of the site. |

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| | **3.3 Monitoring**<br><br>The Company will implement a Noise Monitoring Program for the Abel Underground Mine and the Bloomfield CHPP, to the satisfaction of the Director-General. The Noise Monitoring Program shall include a combination of real-time and supplementary attended monitoring measures, and a noise monitoring protocol for evaluating compliance with the noise environmental assessment. This plan will be integrated with the monitoring plans for the Tasman, Donaldson and Bloomfield Mines to provide a single integrated Noise Monitoring Program for all 4 mines.<br><br>**3.4 Continuous Improvement**<br><br>The Company shall:<br><br>(a) report on these investigations and the implementation of any new noise mitigation measures on site in the AEMR, to the satisfaction of the Director-General.<br><br>The operator of the Bloomfield CHPP shall:<br><br>(b) investigate ways to reduce the noise generated by the Bloomfield CHPP, including maximum noise levels which may result in sleep disturbance;<br><br>(c) implement all reasonable and feasible best practice noise mitigation measures on the site; and<br><br>(d) report on these investigations and the implementation of any new noise mitigation measures on site in the AEMR, to the satisfaction of the Director-General. |
| **4. Air Quality** | **4.1 Construction**<br><br>The following actions shall be adopted in relation to dust control on the site during construction of the proposed Abel Underground Mine and the modifications to the Bloomfield CHPP:<br><br>• Minimise the area to be disturbed;<br>• Progressively rehabilitate disturbed areas as soon as practicable;<br>• Restrict vehicle movements to specified routes;<br>• Provide speed limited signage around the mine site;<br>• Dust suppression using water sprays;<br>• Commence landscaping as soon as practicable;<br>• Install dust gauges to monitor dust deposition levels at sensitive receptors. A minimum of 11 locations are proposed.<br><br>**4.2 Air Quality Control Measures**<br><br>(a) The following actions would be adopted in relation to dust control on the site during operation of the proposed Abel Underground Mine and the operation of the Bloomfield CHPP:<br><br>• All mobile equipment will be maintained in good working order to limit exhaust fumes.<br>• Regular watering of all roads.<br>• Use water sprays periodically on open stockpile areas and regular visual inspection will be undertaken and water sprays activated as required.<br><br>(b) Dust emissions generated by the Abel Underground Mine and the Bloomfield CHPP will not exceed any statutory limits.<br><br>(c) Dust control on site is to be aimed at prevention of air pollution and prevention of the degradation of local amenity.<br><br>(d) Dust controls on the site will comply with all relevant NSW EPA guidelines and any applicable Environment Protection Licence issued under the POEO Act 1997.<br><br>(e) Regular inspections for excessive visible dust generation will be undertaken and appropriate controls will be implemented when such events occur. This will include ceasing operations during high wind conditions if necessary to ensure effective dust control. |

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| | **4.4 Monitoring**<br><br>(a) The Company will implement a Air Quality Monitoring Program for the Abel Underground Mine and the Bloomfield CHPP, to the satisfaction of the Director-General. The Air Quality Monitoring Program shall include a combination of real-time and supplementary attended monitoring measures (including real-time air quality monitoring for 24-hour average PM10 and the recording of required meteorological monitoring data) and an air quality monitoring protocol for evaluating compliance with the air quality environmental assessment. This plan will be integrated with the existing monitoring plans for the Tasman, Donaldson and Bloomfield Mines to provide a single integrated Air Monitoring Program for all 4 mines.<br><br>(b) The Company shall ensure that there is a suitable meteorological station operating in the vicinity of the development in accordance with the requirements in Approved Methods for Sampling of Air Pollutants in New South Wales. |
| **5. Surface Water Management – Abel Underground Mine** | **5.1 Schedule 1 Streams**<br><br>(a) Schedule 1 streams (as defined in the DIPNR 2005 guideline, "Management of stream/aquifer systems in coal mining developments") will be managed via the implementation of mitigation and remediation works where needed to ensure that:<br><br>• stream stability is maintained where subsidence occurs;<br><br>• stream fractures are minimised;<br><br>• stream channels are maintained with minimal incision from bed grade change; and<br><br>• stream bed grade change is minimised to provide stable stream length.<br><br>(b) Where any stream stability controls are required they will be designed in accordance with the Rehabilitation Manual for Australian Streams (Land and Water Resources Research and Development Corporation, 2000) and will be provided primarily by vegetation.<br><br>**5.2 Schedule 2 Streams**<br><br>(a) Schedule 2 streams (as defined by DIPNR, 2005) will be managed so as to ensure that:<br><br>• they maintain pre-mining course, and maintain bed channel gradients which do not initiate erosion;<br><br>• they maintain pool riffle sequences where they pre-existed, or have pool riffle sequences installed where appropriate;<br><br>• they maintain connectivity to underground workings, and flow loss to fracture zones in similar levels to pre-mining;<br><br>• they maintain geomorphic integrity of the stream;<br><br>• the ecosystem habitat values of the stream are protected;<br><br>• no significant alteration of the water quality occurs in the stream.<br><br>(b) The above commitments for Schedule 2 streams will be achieved by:<br><br>• the provision of a minimum barrier of 40m between the 20 millimetre line of subsidence and the bank of any Schedule 2 streams; or<br><br>• the carrying out of further detailed studies and the development of a Surface Water Management Plan for the Abel Underground Mine which clearly demonstrates that the above commitments can be met prior to any mining occurring which will impact on any Schedule 2 streams.<br><br>**5.3 Pambalong Alluvium**<br><br>For the lower reach of Blue Gum Creek (from the confluence of Long Gully and Blue Gum Creek downstream), a buffer will be provided which provides for no more than 20mm of subsidence at 40m from the edge of the alluvium will be adopted, and within the buffer zone no significant subsidence will occur. |

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| | **5.4 Rainforest Communities**<br><br>Subsidence in the rain forest protection zones identified on Figure 2.2 of the EA will be limited to 20mm of subsidence at the edge of the zone identified unless further studies can demonstrate that there will be no significant impact on the rainforest communities within the buffer zone with greater subsidence impacts.<br><br>**5.5 Surface Water Management Plan**<br><br>Prior to mining occurring that will impact on any Schedule 1 streams the Surface Water Management Plan for the Abel Underground Mine will be developed so as to address the following in relation to schedule 1 streams:<br><br>• detailed identification of risk factors on a case-by-case basis;<br><br>• setting up of permanent monitoring locations along watercourses as well as regular inspection regimes;<br><br>• continuation of baseline data collection on water flow conditions and health indicators (such as macro- invertebrates);<br><br>• establishment of trigger levels that will be used to assess whether any changes observed through monitoring warrant responsive action; and<br><br>• details of responsive and remedial action to be undertaken if required.<br><br>• require the identification of any existing degradation in the streams prior to mining to allow differentiation of that degradation induced by the mining.<br><br>• provide for a post-mining assessment of any streams within the area of mine subsidence within six (6) months of the initial subsidence.<br><br>• provide for a subsequent assessment within eighteen ( 18) months of the initial subsidence to confirm that post-mining degradation resulting from the mining is successfully remediated.<br><br>• require any remediation works to be implemented to a standard approved by NOW, where the assessment has indicated degradation of the streams in the area of mining induced subsidence, and thereafter on an annual basis until any mining induced stream instability is addressed to the standard approved.<br><br>• require a photographic record of stream stability for areas where either fracturing is detected (at maximum strain points), or at maximum tilts within the subsidence envelope.<br><br>Where it is proposed not to leave a barrier around a Schedule 2 stream a detailed assessment will be undertaken for the stream and provided to NOW addressing the proposed impacts on it. The detailed assessment will include as a minimum:<br><br>• assessment of the geomorphic and vegetation condition and aquatic habitat for the stream;<br><br>• selective measurements of channel boundary sediment size;<br><br>• predications of subsidence and cracks/fractures throughout the stream;<br><br>• a detailed photographic record of the existing stream condition;<br><br>• a map of the spatial distribution of alluvium and colluvial aprons throughout the stream;<br><br>• collection of background data for the main areas of alluvium for the shallow alluvial aquifer by the installation and regular monitoring of a network of piezometers and/or wells in the main areas of alluvium for the shallow alluvial aquifer;<br><br>• assessment of the location and activity of springs, pipes/tunnels and/or salt seepages/efflorescences;<br><br>• measurement of current bed slope and any pool-riffle sequences on each channel and periodic assessments of changes over time;<br><br>• an assessment of likely erosion points, fracturing or seepage zones from the mining area to the stream, along the stream channel occurring as a result of mining activities. |

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| | • an assessment of any required remedial works on the affected stream, including:<br>- options considered for the remediation program<br>- anticipated lifetime of the remedial works<br>- details of the engineering design or process for engineering<br>- design of the remediation works<br>- long term remediation requirements, including revegetation.<br>• details of the proposed monitoring regime. It will provide for:<br>- post-mining assessment, to a standard approved by NOW, within six (6) months of the initial subsidence.<br>- provide for a subsequent assessment within eighteen (18) months of the initial subsidence to confirm that post-mining degradation resulting from the mining is successfully remediated.<br>Following consultation with NOW on the above assessment for each schedule 2 stream the Surface Water Management Plan for the Abel Underground Mine will be developed to implement the findings of the above assessment. |
| **6. Surface Water Management – Bloomfield CHPP and the Abel Underground Pit Top Facilities** | 6.1 Separate surface water management systems will be designed for the Bloomfield CHPP and the Abel Underground Pit Top Facilities which provide for:<br>• Separation of clean and dirty water;<br>• Management and control of stormwater flows;<br>• Minimisation of sediment generation, soil erosion and transport off site;<br>• Recycling of water where to minimise demand for potable water; and<br>• Provision of water for fire fighting.<br>• Maintain water supply for the coal handling and preparation plant and for dust suppression at all times;<br>• Minimise discharge to the environment from Big Kahuna;<br>• Minimise discharge from the Stockpile Dam;<br>• Minimise discharge from Lake Foster and Lake Kennerson; and<br>• Where controlled discharge is necessary, preference is given to Lake Kennerson.<br>6.2 The surface water management systems shall be based on the following principles:<br>• Minimise demand for fresh water supply by recycling water collected on the site;<br>• Store recycled water on site to reduce water consumption during operation of the proposed development;<br>• Design drainage and sediment control for the operation in accordance with the Landcom (2004) guidelines;<br>• Provide a water supply for fire fighting and provision for containment of firewater;<br>• Use of a first flush system to ensure “dirty” water is captured in accordance with EPA guidelines.<br>6.3 The surface water management systems will include an Erosion and Sediment Control Plan (ESCP). The ESCP will outline the measures that will be implemented to ensure that no undue pollution of receiving waters occurs during any earthworks construction or during the operation of the facilities. |

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| | 6.4 The following erosion and sediment control works will be implemented as part of the project:<br>• All works for the Abel box cut and subsequent construction of surface facilities will be undertaken within the boundaries of the existing Donaldson Mine lease area. These activities will be undertaken in accordance with the approved procedures for erosion protection and sediment control for the Donaldson Mine.<br>• The majority of works in the vicinity of the stockpile area for the Bloomfield CHPP will be undertaken within an area that reports to the existing Stockpile Dam and Dam F. These facilities provide adequate erosion and sediment control for those areas. For minor bunding works to be undertaken on the southern boundary of the enlarged stockpile area, standard erosion control practices such as silt fences will be used.<br>• For any earthworks associated with increasing the capacity of the bypass channel around Lake Foster, standard erosion control practices such as silt fences will be used.<br>• If a conveyor is eventually constructed between the Abel box cut and the Bloomfield CHPP, a separate Erosion and Sediment Control Plan will be prepared that takes account of the details of the conveyor, particularly the crossing of Four Mile Creek. |
| **7. Surface Water Monitoring Program** | 7.1 An integrated surface monitoring program will be undertaking for the Abel Mine, Donaldson Mine and the Bloomfield CHPP covering all potentially affected catchments including Four Mile Creek, Blue Gum Creek and other creeks on the land overlying the Abel underground lease area.<br>7.2 Monitoring of surface water in the creeks that overlie the Abel Underground Mine will commence just prior to mining and continue until one year after mining has passed the contributing catchment and will be undertaken at the following locations:<br>• Four Mile Creek at John Renshaw Drive (same as existing Donaldson site);<br>• Weakleys Flat Ck at John Renshaw Drive (same as existing Donaldson site);<br>• Buttai Creek at Lings Road;<br>• Blue Gum Creek at Stockrington Road; and<br>• Long Gully (downstream).<br>7.3. The following monitoring regime is proposed:<br>• Routine monthly baseline sampling;<br>• Daily water samples collected from the discharge point on any occasion when there is controlled discharge from Lake Kennerson. Water samples will also be collected at the flow gauging station behind the Four Mile Workshops. These samples will be analysed for: total suspended solids, conductivity, pH and filterable Iron;<br>• Daily water samples will be collected from any overflow from the Stockpile Dam. Water samples will also be collected at the flow gauging station behind the Four Mile Workshops. These samples will be analysed for: total suspended solids, conductivity, pH and filterable Iron.<br>• Collection of extensive baseline data prior to mining, including the ability to collect at least 15 years of baseline data for Blue Gum Creek and Pambalong Nature Reserve;<br>• Monthly monitoring during any substantial subsidence period for each monitoring site, and annual monitoring for all sites;<br>• Water quality sampling from each of the sampling locations shown in Figure 8.2 in the EA with analytes measured including pH, Electrical Conductivity, Total Dissolved Solids, Total Suspended Solids, Chloride, Sulfates, Alkalinity (Bicarbonate), Alkalinity (Carbonate), Calcium, |

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| | Magnesium, Sodium and Potassium;<br>• Flow gauging stations established on Blue Gum Creek to monitor water flow and level; and<br>• Macro-invertebrate monitoring within Blue Gum Creek and Pambalong Nature Reserve, including the use of AUSRIVAS (Australian River Assessment System) to assess biological health. |
| **8. Groundwater Monitoring Program** | 8.1 The Company will implement a Groundwater Monitoring Program. The Program will comply with all relevant guidelines and will address:<br>• Groundwater management within the Abel Underground Mine area, including protection, management, mitigation and remediation of groundwaters as required;<br>• Groundwater management within the area of proposed tailings disposal within Bloomfield Colliery;<br>• Proposed groundwater monitoring program;<br>• Proposed groundwater reporting schedule; and<br>• Feedback mechanisms to alter mining methods if documented groundwater monitoring values are triggered.<br>8.2 The following response plan will be implemented in the event of significant unforeseen variances from the predicted inflow rates and/or groundwater level impacts:<br>• Additional sampling and/or water level measurements to confirm the variance from expected behaviour.<br>• Immediate referral to a competent hydrogeologist for assessment of the significance of the variance from expected behaviour. The review hydrogeologist would be requested to recommend an appropriate remedial action plan or amendment to the mining or water management approach. If appropriate, this recommended action plan would be discussed with NOW and other agencies for endorsement.<br>8.3 The groundwater monitoring program will be an integrated monitoring program for the Abel Mine, Tasman Mine, Donaldson Mine and the Bloomfield CHPP (including the tailings disposal area) and will include:<br>• Monthly measurement of water levels in a representative network of piezometers. Initially, all piezometers currently available would be monitored, however it is recommended that the representativeness of the piezometers be reviewed after the first two years of the project, and an appropriate suite of piezometers be selected on the basis of this review for ongoing monitoring. All piezometers located around Pambalong Nature Reserve would continue to be monitored through the life of the project.<br>• Quarterly sampling of all standpipe piezometers, for laboratory analysis of electrical conductivity (EC), total dissolved solids (TDS) and pH.<br>• Annual collection of water samples from all standpipe piezometers for laboratory analysis of a broader suite of parameters<br>- Physical properties (EC, TDS and pH)<br>- Major cations and anions<br>- Nutrients<br>- Dissolved metals<br>• Additional sampling and/or water level measurements to confirm any variance from expected behaviour.<br>• Additional regional monitoring piezometers will be installed in the following areas:<br>- Multi-level piezometers to the north and west of Pambalong Nature Reserve, to provide additional data on groundwater pressures in the intervening strata between the Donaldson seams and the alluvium (supplementing the existing data from piezometers C081A and B and |

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| | C082).<br>- Multi-level piezometers along the eastern side of the Abel Underground Mine area, located at nominally 3 sites between the F3 Freeway and the lease boundary, to resolve the apparent anomalous water levels below sea level at C063A and B, and to provide additional data on groundwater pressures in the intervening strata between the Donaldson seams and the Hexham Swamp alluvium.<br>- Multi-level piezometers near the western and southern boundaries of the Abel project area to provide information on groundwater pressures at various depths, as this area currently lacks monitoring points. These piezometers would also aim to provide information on the current status of groundwater in the West Borehole seam near the former workings, prior to mining of the Donaldson seams approaching that area.<br>• The additional Pambalong and Hexham Swamp monitoring bores will be installed prior to commencement of coal extraction. The western piezometers will be installed at least five years prior to mining reaching that part of the lease.<br>• The subsidence/fracturing monitoring piezometer network should comprise the following:<br>− Multi-level piezometers situated centrally within the extraction panels (at least 2 locations per panel) with vibrating wire piezometers set at nominally 30m intervals from the surface down to 30m above the Upper Donaldson roof level.<br>− Shallow standpipe piezometers adjacent to each of the above multi-level piezometers, set to the base of the colluvium/weathered bedrock zone, to monitor any impact on the surficial unconfined aquifer. Standpipe piezometers will allow repeat hydraulic testing and water quality sampling, as well as water level monitoring.<br>• The above monitoring network will be implemented prior to commencement of each extraction panel, and would be monitored closely before, during and after extraction. Based on the monitoring results during extraction of the first 4 or 5 panels, an appropriate ongoing monitoring program would be developed for the subsequent deeper panels as the mining progresses downdip.<br>8.4 At the end of the second year of underground mining, a comprehensive review will be undertaken of the performance of the groundwater system. This would include re-running the groundwater model in transient calibration mode, to verify that the actual inflow rates and groundwater level impacts are in accordance with the model predictions described in this report. If necessary, further adjustment would be made to the model at that time, and new forward predictions of mine inflows and water level impacts be undertaken.<br>8.5 The current groundwater model will be expanded to include deeper layers and a larger area that will incorporate the Bloomfield operations and areas of possible groundwater impact around Bloomfield. It is proposed to calibrate this expanded model with ongoing monitoring data from Bloomfield, and more detailed simulation of the Donaldson mining and backfilling. Details of this model and scheduling for completion will be included in the Groundwater Monitoring Program. |
| **9. Visual Amenity** | Visual impacts of the Abel Underground Mine portal and the Bloomfield CHPP will be ameliorated by the following strategies:<br>(a) The access portals for the Abel underground Mine will be located in the high wall of the existing Donaldson Open Cut Pit.<br>(b) If the overland conveyor to the Bloomfield CHPP to the Abel Underground Mine portal is constructed its maximum height will not exceed 15 metres so to ensure that it is concealed from view by the surrounding tree cover. Where possible the route will follow the existing haul roads and tree clearing will be minimised where possible to reduce the visual impact of the conveyor.<br>(c) New buildings and structures, as well as existing buildings and structures at the Bloomfield CHPP, visible from the surrounding areas will be painted a dark charcoal colour. |

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| | (d) All reasonable measures will be taken to design the stockpiles at the Bloomfield CHPP so as to minimise their visual impact on the surrounding East Maitland and Ashtonfield Areas.<br><br>(e) Existing lighting will be redesigned and new lighting be designed, so as to minimise, via the use of directional lighting, light spill affecting residents in the East Mainland, Ashtonfield Areas and Black Hill areas. |
| **10. Flora and Fauna** | A Flora and Fauna Management Plan for the proposed conveyor corridor and stockpile expansion areas will be developed and implemented prior to any clearing occurring for the conveyor corridor and stockpile expansion: This plan will include:<br><br>• a vegetation clearance protocol that describes the measures to be taken in order to minimise and ameliorate any impact on flora and fauna in general, and threatened species in particular, during the clearing process.<br><br>• a commitment to conduct pre-clearance surveys of areas to be cleared of vegetation by a suitably qualified biologist. Searches will be conducted for threatened species of flora or fauna, trees having potential habitat hollows and any habitat assets such as large hollow logs or rocks which could be used in later rehabilitation. If any threatened species of flora are found in the planned clearing areas the Flora and Fauna Management will provide for the consideration of the following options to minimise any impact to the threatened species of flora:<br><br>- modification of the area to be cleared in order to leave the flora in place.<br><br>- translocation of the flora to an area of similar habitat within the Donaldson or Bloomfield properties, applying the best available knowledge about the ecology and translocation of the species.<br><br>• the pre-clearing survey will be conducted about 7 days prior to commencement and involve the following:<br><br>- Trees having potential habitat hollows should be clearly marked with a band of survey paint around the stem;<br><br>- Habitat trees watched at dusk to determine what if any fauna are using the hollows;<br><br>- At a minimum all marked trees will be left standing for at least 2 nights following the clearing to allow any mammals to vacate the trees. However as most of the areas to be cleared are narrow or in close proximity to standing forest, it cannot be guaranteed that the mammals will leave and a person experienced in capturing and handling native fauna should be in attendance when these trees are pushed over;<br><br>- Any trees found to contain bats should be left standing and soft-felled at dusk after the bats have left the hollows. This should be conducted under the supervision of a suitably experienced fauna ecologist.<br><br>An Ecological Monitoring Plan will be drafted and implemented prior to any mining which will impact on the areas of sub-tropical rainforest above Abel Underground Mine, and for Pambalong Nature Reserve, outside of the mining area to the south-east. These two areas will be monitored as follows:<br><br>**Sub-tropical Rainforest Monitoring plan**<br><br>The collection of the following data:<br><br>• At suitable locations, record the outer boundary between the rainforest and the surrounding dry forest in order to monitor the stability of the community;<br><br>• Establish groundwater piezometers at suitable locations and record water depth;<br><br>• Establish permanent transects along which floristic content is recorded; and<br><br>• Monitor the stability of selected major rock formations that occur in or near the rainforest. |

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| | **Pambalong Nature Reserve Monitoring**<br>The data to be collected would be as follows:<br>• Rainfall in the catchments supplying water to Pambalong Nature Reserve (PNR);<br>• Water levels in PNR;<br>• Annual fauna monitoring with emphasis on birds and amphibians; and<br>• Broad vegetation communities and their boundaries |
| **11. Aboriginal Heritage** | 11.1 During any construction phase if any Aboriginal sites or relics are uncovered the NSW OEH will be informed. In the event that a site or relic is found then work in the area of the find will cease until it is assessed for significance and an appropriate management strategy is devised if necessary, in accordance with the Aboriginal Heritage Management Plan.<br>11.2 An Aboriginal Heritage Management Plan will be implemented in consultation with the relevant Aboriginal stakeholders to specify the policies and actions required to mitigate and manage the potential impacts of the proposal on Aboriginal heritage.<br>11.3 The plan will provide procedures for:<br>(a) ongoing Aboriginal consultation and involvement,<br>(b) maintenance of an Aboriginal site database,<br>(c) management of recorded sites within the investigation area,<br>(d) further archaeological investigation prior to undermining,<br>The plan will be regularly verified to establish that it is functioning as designed (ie. policies adhered to and actions implemented) to the standard required.<br>11.4 Continued use of surface infrastructure and construction of new surface infrastructure will be assessed against the location of identified Aboriginal heritage evidence and where impacts may occur, mitigation measures will be implemented as specified in the Aboriginal Heritage Management Plan.<br>11.5 The Company will seek to minimise impacts to identified and potential Aboriginal heritage evidence within the northern investigation area and to conserve identified evidence where impacts are not required to occur for operational reasons.<br>11.6 The Company will seek to mitigate impacts to identified and potential Aboriginal heritage evidence within the northern investigation area where impacts must occur for operational reasons.<br>11.7 Staged systematic archaeological survey of each section proposed to be undermined in the southern investigation area will occur with the participation of an appropriately qualified archaeologist and the Aboriginal stakeholders prior to any underground mining in that section. The survey will sample the geographic extent of each section. The nature, level of integrity, potential impacts and scientific and cultural significance of any evidence identified will be assessed in consultation with the Aboriginal stakeholders and mitigation measures implemented as per the Aboriginal Heritage Management Plan.<br>11.8 Where site types susceptible to subsidence impacts (grinding grooves and rock shelters) are identified within the southern investigation area, an assessment of the potential impacts of subsidence will be undertaken by an appropriately qualified expert. Where it is determined that subsidence may impact a grinding groove or rock shelter site (including shelters with 'Potential Archaeological Deposits'), mitigation measures will be implemented in accordance with the Aboriginal Heritage Management Plan. |

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| | 11.9 A regional monitoring network for Aboriginal heritage across the Abel, Tasman, Donaldson and Bloomfield sites will be established, including continuation of the existing programme of monitoring in the Donaldson Bushland Conservation Areas, monitoring before and after undermining for a sample of Aboriginal sites within the southern investigation area for which it is not anticipated that subsidence related impacts will occur, monitoring before and after undermining for all Aboriginal sites for which it is inferred that undermining may result in impacts in order to ensure the adequacy of conservation measures around those sites, and documentation of the results of all monitoring in an annual report.<br><br>11.10 The Company will continue to consult with and involve the registered Aboriginal stakeholders, particularly the Local Aboriginal Land Councils, in the ongoing management of the heritage resources within the investigation area as per the Aboriginal Heritage Management Plan.<br><br>11.11 Should any previously unrecorded Aboriginal heritage evidence be identified within the lease area during the course of operations, the Company will ensure that this evidence is subject to temporary conservation and is recorded and appropriate management strategies are implemented in consultation with the Aboriginal community as per the Aboriginal Heritage Management Plan. The Company will maintain a current database providing details of all identified Aboriginal heritage evidence within the lease area so that the Aboriginal Heritage Management Plan can be effectively implemented and records for any Aboriginal sites identified and copies of all reports prepared in relation to ongoing monitoring and archaeological studies associated with the project will be lodged in a timely manner with OEH.<br><br>11.12 In order to form an integrated monitoring network for Aboriginal heritage across the Abel, Tasman, Donaldson and Bloomfield sites, it is proposed for the duration of the mining leases to:<br><br>(a) Continue the existing programme of monitoring in the Donaldson Bushland Conservation Areas to ensure that the condition of a sample of Aboriginal heritage sites that occur within the northern investigation area is regularly assessed. This will involve monitoring on an annual basis the seven existing datum points within the Conservation Area by a qualified archaeologist and representatives of the Mindaribba LALC;<br><br>(b) A sample of Aboriginal heritage sites within the southern investigation area, comprising site types for which it is not anticipated that subsidence related impacts will occur, will be monitored before and after undermining in their vicinity to confirm the accuracy of these predictions. This will involve inspections prior to undermining then at set periods after undermining by a qualified archaeologist and representatives of the relevant LALC;<br><br>(c) All Aboriginal heritage sites for which it is inferred that undermining may result in impacts (ie. rock shelter and grinding groove sites) will be monitored before and after undermining in their vicinity to ensure the adequacy of conservation measures around those sites. This will involve inspections prior to undermining then at set periods after undermining by a qualified archaeologist and representatives of the relevant LALC;<br><br>(d) An annual report documenting the results of monitoring will be prepared and provided to the relevant LALC and OEH detailing the methodology of the inspections, conditions of the environment and Aboriginal heritage evidence at the relevant sites, comparisons with previously reported descriptions of each site, identification of any natural and/or human impacts during the intervening period, and identification of any implications for ongoing management and protection of the Aboriginal heritage evidence throughout the lease areas. |

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| **12. Environmental Management System** | The EMS will address, separately for the Abel Underground Mine and the Bloomfield CHPP (unless otherwise specified), the following specific issues for both construction and operation of the proposed mine:<br>• Construction Management Plan;<br>• Community Involvement Plan;<br>• Noise Monitoring Program;<br>• Water Management Plan;<br>• Waste Management Plan;<br>• Air Quality Monitoring Program;<br>• Erosion and Sediment Control Plan;<br>• Flora and Fauna Management Plan;<br>• Aboriginal Heritage Management Plan;<br>• Landscape Management Plan;<br>• Rehabilitation Management Plan;<br>• *Tetratheca juncea* Management Plan;<br>• Groundwater Monitoring Program;<br>• Subsidence Management Plan;<br>• Surface Water Management Plan;<br>• Dam Monitoring and Management Strategy;<br>• Gas Management Plan; and<br>• Bloomfield CHPP and RLF Environmental Management Plan<br>Where appropriate the above plans will be integrated plans which will apply across the following mining operation areas:<br>• Abel Underground Mine;<br>• Tasman Underground Mine;<br>• Donaldson Open Cut Mine; and<br>• Bloomfield Coal Handling and Preparation Plant (CHPP) and Rail Loading Facility (RLF).<br>The Environmental Management System will include:<br>• The Company Environmental Policy that guides the direction of environmental management and provides Company commitment to environmental protection, mitigation and management.<br>• Objectives, including legislative requirements to be met and relevant guidelines and Standards;<br>• Work procedures, which detail in practical terms what will be undertaken, when and by whom;<br>• Monitoring, including what will be monitored, when and where this will occur, and reporting of results;<br>• Review procedures, being when the management plan and contents will be reviewed;<br>• Feedback mechanisms, to ensure that any required changes to the Plan, due to a review or other mechanism such as other risk assessment, are made and the plan updated;<br>• Training, describing how employees and contractors are trained in the documented procedures and updated on an ongoing basis when changes are made; and<br>• Emergency response procedures. |

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| | The Company will prepare and implement an Environmental Due Diligence Training Program which will focus on the following matters:<br>• The EMS;<br>• Environment Protection legislation;<br>• Understanding Due Diligence;<br>• Specific Environmental Impacts of construction and operation of the mine;<br>• The Company Safety Health Environmental Policy;<br>• Reporting and recording environmental incidents;<br>• Site environmental management.<br>The mine Site Manager or his/her nominee shall be responsible for implementing the EMS. |
| **12. Rehabilitation** | The Company commits to rehabilitating the Abel Underground Mine area and Abel pit top in accordance with DP&I and DRE guidelines. This includes ongoing rehabilitation in response to mine subsidence as well as rehabilitation of pit top areas after completion of mining.<br>The Company will provide a Mine Closure Plan as part of the MOP required under the relevant condition of the mining lease for the Abel Underground Mine. This Mine Closure Plan will be produced in consultation with DP&I, DRE and other stakeholders as required. |
| **13. Site Security** | Unauthorised entry of people into the Abel Underground Mine Portal Surface works and the Bloomfield CHPP is to be prevented to ensure site security and to prevent damage to components of the mine particularly damage which may result in harm to the environment. |
| **14. Community Consultation** | A Community Consultative Committee will be created which will meet on a regular basis to review environmental performance of the Abel Underground Mine and the Bloomfield CHPP.<br>Membership of the Committee is to be determined by the Company and the Committee is o be chaired by an Independent Facilitator and will include representatives of the local community and adjoining property holders, DP&I and local councils.<br>The Environment Protection Licence for the mine will require the Company to keep a record of all complaints made in relation to pollution arising from any activity to which this Licence applies and will also specify the details to be provided in the record and a complaints handling procedure.<br>The Environment Protection Licence for the mine will require that a telephone complaints line operates during the operating hours of the premises for the purpose of receiving any complaints from members of the public and that the telephone number of this line be notified to the community.<br>A 24 hour telephone complaints line will be maintained and the local community will be notified of the phone number. Complaints received would be recorded. All information from the complainant, including the nature of the complaint would also be recorded.<br>The appropriate site manager or his/her nominee will undertake an immediate investigation into the cause of any complaint relating to operations of the site and in particular environmental issues and will ensure that corrective action is taken as required.<br>The appropriate site manager or his/her nominee will provide the complainant with an explanation of the cause of any environmental incident and details of any actions taken to mitigate its effect.<br>If necessary, the appropriate site manager would initiate further corrective action, such as introducing changes in operational procedures, work instructions or modifications to equipment etc as may be required to reduce the possibility of further environmental incidents.<br>A record of all complaints received will be kept on site for 4 years. |

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| **15. Environmental Incidents** | 15.1 A Pollution Incident Response Management Plan (PIRMP) would be implemented for the site which will describe the general policy and approach to be adopted by the Company when managing and responding to an emergency or incident at the site. The PIRMP will contain a specific definition of 'incident' and 'environmental incident' which is to be consistent with the definition of 'incident' in the POEO Act.<br><br>15.2 In accordance with Part 5.7 of the POEO Act , the appropriate site manager must notify the NSW EPA of 'incidents' which occur in the course of operations of the Abel Underground Mine where material harm to the environment is caused or threatened, as soon as practicable after they become aware of the incident or threatened material harm.<br><br>15.3 Initial notification of an 'incident' (as defined) is to be made by telephoning the NSW EPA's Pollution Line.<br><br>15.4 The following information will be required by the Company:<br><br>• The time, date, nature, duration and location of the incident;<br><br>• The location of the place where pollution is occurring or is likely to occur;<br><br>• The nature, the estimated quantity or volume and the concentration of any pollutants involved;<br><br>• The circumstances in which the incident occurred (including the cause of the incident, if known);<br><br>• The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution; and<br><br>• Other relevant information.<br><br>15.5 The appropriate site manager will assess specific incidents taking into consideration the impact(s) on the environment, to determine whether what resources are required to determine what response is required, or to assist in responding to the impacts. The appropriate site manager would contact an outside agency if required.<br><br>15.6 All employees working on the site will be responsible for ensuring that the appropriate site manager is informed of any environmental incidents. All environmental incidents would be recorded on an Environmental Incident Report form. As required by Part 5.7 of the POEO Act and the EPL, the Site Manager must notify the NSW EPA of incidents, or the threat of material harm to the environment, as soon as practicable after they become aware of the incident or threat of material harm.<br><br>15.7 The management strategies for responding to and controlling incidents/emergencies will include the following:<br><br>General Procedures<br><br>• Provide adequate resources including staffing and fire fighting equipment;<br><br>• Training of staff so that a high level of preparedness is maintained by all people who could be involved in an emergency;<br><br>• Provide a first aid station which would be fully equipped and maintained at the site; and<br><br>• Periodic review and update of emergency procedures for the site.<br><br>Fire<br><br>• Consultation has been initiated with the NSW Rural Fire Service and this would be ongoing;<br><br>• Consult with adjoining landholders;<br><br>• Undertake hazard reduction as required;<br><br>• Provide fire fighting equipment at site buildings;<br><br>• Provide clear signposting and access for all fire fighting equipment;<br><br>• Make available water for fire fighting from water holding tanks or mains; and |

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| | • Regularly inspect and maintain fire fighting equipment. |
| | Chemicals<br>• Store all chemicals in appropriately bunded areas in accordance with their Material Safety Data Sheets (MSDS) and the relevant Australian Standards; and<br>• Store all fuels or flammable solvents in adequately ventilated areas<br>15.8 All environmental incidents are to be recorded on an Pollution Incident Notification form.<br>15.9 An Environmental Incident Folder is to be maintained and shall contain the following:<br>• Copies of work instructions on how to deal with particular situations;<br>• Incident contact names/numbers; and<br>• Pollution Incident Notification form containing all the details required in the PIRMP procedure. |

**Company Contribution Initiatives**

Donaldson Coal Pty Ltd committed in 2007 to providing the following monetary contributions towards environmental and community enhancements:

| No. | Proposed Activities | Monetary Value |
|---|---|---|
| 1. | **Conservation**<br>The company will contribute $1,000,000 to be distributed over ten years from the commencement of the Abel Underground Mine by a community trust to be established for the purpose.<br>These monies will be able to be expended by the trust on environmental education or research or environmental management works or activities in State Conservation Area lands or other environmentally valuable lands that lie within or above Donaldson's mining leases and exploration licences or other land owned by the company. | $1,000,000 |
| 2. | **Community Welfare**<br>The company will contribute $250,000 over 5 years from the commencement of the Abel Underground Mine to be spent as decided by a community trust on educational needs, community works or other works or activities of benefit to the community within the Abel underground mine area. | $250,000 |
| 3. | **Road Safety**<br>The company will contribute $250,000 towards the cost of upgrading the intersection of Black Hill Rd and John Renshaw Drive, provided that construction of the upgrade is initiated by June 2009. | $250,000 |
| 4. | **Employment Generation**<br>The Company also operates the **Donaldson Job Creation Trust,** a charitable trust already in operation set up to distribute $1,000,000 over ten years. Monies are expended on job training, job creation and Youth at Risk programs in the Lower Hunter. $500,000 of these monies remained to be spent at the time of project approval. | $500,000 |
| **Total** | | **$2,000,000** |

**Subsidence Specific Commitments by the Company**

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| A. Principal Residences | The Company commits to producing and implementing a plan of management for each Principal Residence existing at the date of approval of this project. A Principal Residence is defined as an existing building capable of being occupied as a separate domicile and used for such purpose. The plan of management will be produced and implemented as follows:<br><br>A1. Each Principal Residence will be individually assessed by the Mine Subsidence Board (MSB) /structural engineer who will determine tolerable levels for individual subsidence parameters. Tolerable limits are those limits which will result in no mitigation works being required to the Principal Residence due to subsidence impacts from the Abel Underground Mine.<br><br>A2. Each Principal Residence will have a pre-mining survey to identify and record pre-existing imperfections that will not be covered by the MSB.<br><br>A3. Such assessments will be done as and when the progression of the mining process dictates – i.e. mining may have commenced in other areas prior to the individual Principal Residence assessment being undertaken.<br><br>A4. Tolerable levels will be set according to such factors as dwelling construction (e.g. brick veneer, clad), type (single, double storey), size (length and width), footings (slab, strip footings, piers), surface conditions (sand, rock, clay, steep slope) etc, with reference to the MSB Graduated Guidelines (compatible with AS 2870 and the Building Code of Australia).<br><br>A5. The mine plan in proximity to each Principal Residence will be modified by the Company to maintain subsidence parameters within the tolerable levels determined above for each Principal Residence.<br><br>A6. The mine plan will be reviewed by the MSB and the DRE prior to any Subsidence Management Plan being approved under the relevant lease.<br><br>A7. Each Principal Residence will have a specific subsidence monitoring plan to monitor subsidence impacts before and after mining at the Principal Residence and to ensure that tolerable limits are achieved in practice.<br><br>A8. The MSB has the responsibility to rectify any impacts to structures that may occur as a result of mining.<br><br>In cases where the owner of the Principal Residence and the Company can agree to terms which permit second workings under the Principal Residence greater than those permitted above, the Company agrees to negotiate a plan of management similar to that proposed in the section of this Statement of Commitments titled "All Other Surface Structures". |
| B. Future Principal Residence | If there is no existing residence on a landholding and a residence is planned to be built, the site for this Future Principal Residence will be protected in the same way as that proposed above for Principal Residences. This commitment applies to a maximum of one Future Principal Residence per landholding.<br><br>NOTE: Once the Mine Subsidence District is declared for the area all Future Principal Residences will require approval from the Mine Subsidence Board and must comply with the Mine Subsidence Compensation Act 1961. |
| C. Black Hill School | All buildings and structures located at Black Hill School will be managed as if they were a Principal Residence. |
| D. Black Hill Church and Cemetery | The Black Hill Church and cemetery will be managed as if they were a Principal Residence. |
| E. All Other Surface Structures | “All Other Surface Structures” is defined as any building or structure impacted by mining-induced subsidence from the Abel Underground Mine Project which is not categorised as a Principal Residence, Future Principal Residence, Black Hill Church and Cemetery or Black Hill School.<br><br>The Company shall prepare and implement plans of management for the mitigation and remediation of any damage to All Other Surface Structures prior to any mining occurring that would impact on them.<br><br>The plan of management will include:<br><br>(a) pre-mining audit of the structure; |

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| | (b) the provision of a plan of management as part of the SMP approval process which requires the Company to mitigate/remediate any damage to improvements associated with the structure in conjunction with the Mines Subsidence Board;<br>(c) post-mining monitoring of the improvements associated with the Structure.<br>The mitigation/remediation measures to be undertaken will be related to the extent of damage experienced – see Schedule 1 for details. |
| F. Dams | A Dam Monitoring and Management Strategy (DMMS) will be formulated for all dams prior to any mining occurring which will impact on the dams. The DMMS will provide for:<br>F1. The individual inspection of each dam by a qualified engineer for:<br>• current water storage level;<br>• current water quality (EC and pH);<br>• wall orientation relative to the potential cracking;<br>• wall size (length, width and thickness);<br>• construction method and soil/fill materials;<br>• wall status (presence of rilling/piping/erosion/vegetation cover);<br>• potential for safety risk to people or animals;<br>• downstream receptors, such as minor or major streams, roads, tracks or other farm infrastructure; and<br>• potential outwash effects.<br>F2. Photographs of each dam will be taken prior to and after undermining, when the majority of predicted subsidence has occurred.<br>F3. Dam water levels, pH and EC will be monitored prior to and after undermining to assess the baseline and post mining dam water level and water quality in order to determine whether rehabilitation is required.<br>F4. In the event that subsidence/crack development monitoring indicates a significant potential for dam wall failure, dam water will be managed in one of the following manners:<br>• pumped to an adjacent dam to lower the water level to a manageable height that reduces the risk of dam wall failure,<br>• discharged to a lower dam via existing channels if the water cannot be transferred, or<br>• not transferred if the dam water level is sufficiently low to pose a minor risk.<br>An alternate water supply will be provided to the dam owner until the dam can be reinstated.<br>F5. In the event of subsidence damage to any dams the Company shall remediate the damage and reinstate the dam in conjunction with the Mine Subsidence Board. |
| G. Public Roads | The Company shall prepare and implement a plan of management as part of the SMP process implemented under the mining lease for the Abel Underground Mine. This plan of management will ensure the safety and serviceability of public roads and 4WD tracks and existing fire fighting access tracks. |
| H. Powerlines | The Company shall prepare and implement a plan of management as part of the SMP process which will ensure the safety and serviceability of powerlines. |
| I. Gas Pipeline | The Company shall prepare and implement a plan of management as part of the SMP process which will ensure the safety and serviceability of the gas pipeline. |
| J. Survey Marks | At the completion of subsidence or otherwise as required by Government Authorities, the functionalities of any survey marks affected by subsidence will be fully restored to the satisfaction of the Government Authorities. |
| K. Cliffs | Trigger-action response plans (TARPs) will be developed by the Company based on consultation with DRE and Local Councils to ensure the general public and employees |

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| | working in the vicinity of the cliffs are not exposed to rock falls caused by mine subsidence damage.<br><br>Appropriate rock fall hazard controls may include such items as rock fall catch ditches, barrier fencing, earth mounds and warning signs installed at appropriate locations to promote awareness that a rock fall hazard could exist along the top and bottom of cliff lines that will be undermined. |
| L. Water Supply | In the event of interruptions to water supplies due to subsidence impacts on farm dams, water tank pipelines, water mains and irrigation systems within the application area, the Company commits to providing water supplies of equivalent quality and quantity to locations convenient to those affected until such time that the affected farm dams, water tanks, pipelines, water mains and irrigation systems are restored. |
| M. General Surface Water Flow | The Company shall prepare and implement a plan of management to maintain the surface drainage of areas surrounding any dwellings and other structures or infrastructure, where required. This plan shall include but not be limited to monitoring, mitigation or remediation of mining-induced ponding, drainage pattern changes and any resulting serviceability difficulties and/or hazards to the public.<br><br>NOTE: Also see Water Supply. |
| N. Public Safety | The Company shall prepare and implement a surface safety management program to ensure public safety in any surface areas that may be affected by subsidence arising from the proposed underground mining. This program shall include, but not be limited to, regular monitoring of areas posing safety risks, erection of warning signs, entry restrictions, backfilling of dangerous surface cracks and securing of unstable man-made structures or rockmass, where required and appropriate, and the provision of timely notification of mining progress to the community and any other relevant Stakeholders where management of public safety is required. |
| O. Landowner Agreements | The Company will enter into separate arrangements with Coal and Allied for its Black Hill land and with the Catholic Diocese of Maitland and Newcastle with regard to an agreed mining schedule underneath these respective lands. These arrangements will set timeframes for the completion of mining beneath these areas. |

**Schedule 1 - Subsidence Effects on All Other Surface Structures**

This Schedule only applies to All Other Surface Structures and does not apply to Principal Residences as they are protected in accordance with the above commitments which relate only to them.

The main features that determine impact on buildings/structures are tilt and strain. Subsidence effects on buildings/structures are categorised according to the degree of structural damage that is likely to result from underground mining (Tables 1 and 2). These tables have been developed to assist the categorising of the subsidence impacts of this project. Accordingly, to determine the appropriate Preventative Mitigation Measures the following must occur in relation to the relevant surface structure:

1. Look at Table 1 and determine the appropriate Strain Damage Category
2. Look at Table 2 and determine the appropriate Tilt Damage Category
3. Look at Table 3 and using the Strain Damage Category from Table 1 and the Tilt Damage Category from Table 2 determine the appropriate Preventative Mitigation Measures.
4. Look at Table 4 and see the outlined of the Preventative Mitigation Measures provided by Table 3.

**Table 1 – Determine Strain Damage Category**

| Damage Category | Description of typical damage to walls and required repair | Approximate crack width limit |
|---|---|---|
| 0 (negligible) | Hairline cracks. | <0.1 mm |
| 1 (very slight) | Fine cracks that do not need repair. | 0.1 mm to 1.0 mm |
| 2 (slight) | Cracks noticeable but easily filled. Doors and windows stick slightly. | 1.0 mm to 5.0 mm |
| 3 (moderate) | Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weather- tightness often impaired. | 5.00 mm to 15.0 mm (or a number of cracks 3mm to 5mm in one group) |
| 4 (severe) | Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window or doorframes distort. Walls lean or bulge noticeably. Some loss of bearing in beams. Service pipes disrupted. | 15 mm to 25 mm but also depends on number of cracks |
| 5 (very severe) | As above but worse, and requiring partial or complete rebuilding. Roof and floor beams lose bearing and need shoring up. Windows have been broken with distortion. If compressive damage, severe buckling and bulging of the roof and walls. | >25 mm |

**Table 2 - Tilt Damage Category**

| Damage Category | Tilt | Description of typical damage to walls and required repair |
|---|---|---|
| A (negligible) | <5 | Unlikely that remedial work will be required. |
| B (tolerable) | 5 to 7 | Adjustment to roof drainage and wet area floors might be required. |
| C (questionable) | 7 to 10 | Minor structural work might be required to rectify tilt. Adjustments to roof drainage and wet area floors will probably be required and remedial work to surface water drainage and sewerage systems might be necessary. |
| D (intolerable) | >10 | Considerable structural work might be required to rectify tilt. Jacking to level or rebuilding could be necessary in the worst cases. Remedial work to surface water drainage and sewerage systems might be necessary. |

For some structures, the levels of damage shown in Tables 1 and 2 can be significantly reduced by various simple, preventative measures. The general types of management measures, and the residence types and categories of structural damage to which they apply, are provided in Table 4. The specific management measures for individual residences will be developed in consultation with the improvement owner and the Mine Subsidence Board, prior to mining.

## Table 3 – Determine Preventative Mitigation Measures

| Type of Construction | | Strain Damage Category | | | | | Tilt Damage Category | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | A | B | C | D |
| 1 | Flat slab or waffle slab on ground | None | 14 | 14 & 15 | 1, 15, 17, 18 & 1 | 1, 15, 17, 18, 20 & 25 | 1, 15, 17, 18, 20 & 25 or 21 & 26 | None | 16 | 11 | 11 & 25 or 21 & 26 |
| 2 | Strip footing | None | 14 | 14 & 15 | 1, 2, 15, 17, 18 &19 | 1, 2, 15,17, 18, 2 & 25 | 1, 2, 15, 17, 18, 20 & 25 or 21 & 26 | None | 16 | 12 | 13 & 25 or 21 & 26 |
| 3 | In-ground concrete or steel piers | None | 14 | 14 & 15 | 1, 2, 15, 17, 18 &19 | 1, 2, 15,17, 18, 2 & 25 | 1, 2, 15, 17, 18, 20 & 25 or 21 & 26 | None | 16 | 13 | 13 & 25 or 21 & 26 |
| 4 | Below-ground construction with retaining walls or basement walls | None | 14 | 14 & 15 | 1, 2, 15, 17, 18 &19 | 1, 2, 15,17, 18, 2 & 25 | 1, 2, 15, 17, 18, 20 & 25 or 21 & 26 | None | 16 | 13 | 13 & 25 or 21 & 26 |
| 5 | Stiffened waffle slab on secondary foundations | None | 14 | 14 & 15 | 1, 5, 14 & 18 | 1, 5, 14, 18, 19 & 25 | 1, 5, 14, 18, 20 & 25 | None | 5 & 18 | 5 & 18 | 5, 18 & 25 |
| 6 | Suspended floor with ground clearance less than 600 mm | None | 14 | 14 & 15 | 1, 3, 6 & 14 | 1, 3, 6, 14, 19 & 25 | 1, 3, 6, 14, 20 & 25 | None | 6 & 16 | 3 & 6 | 3, 6 & 25 |
| 7 | Above-ground stilts or poles | None | 14 | 14 & 15 | 1, 4, 6 & 14 | 1, 4, 6, 14, 19 & 25 | 1, 4, 6, 14, 20 & 25 | None | 4 & 6 | 4 & 6 | 4, 6 & 25 |
| 8 | Above-ground brick piers | None | 14 | 14 & 15 | 1, 3, 6 & 15 | 1, 3, 6, 14, 19 & 25 | 1, 3, 6, 14, 20 & 25 | None | 3 & 6 | 3 & 6 | 3, 6 & 25 |
| 9 | Demountable building | None | 14 | 5, 6 & 14 | 5, 6 & 14 | 5, 6 & 14 | 5, 6 & 14 | None | 5 & 6 | 5 & 6 | 5, 6 & 25 |
| 10 | Paved areas, paths and driveways | None | None | None | 7 or 8 | 7 or 8 & 24 | 7 or 8 & 24 | None | None | None | 11 or 24 |
| 11 | Steel sheds & outbuildings | None | None | None | 1 & 14 | 1, 9 & 17 | 9, 22 & 11 or 23 | None | None | None | 22 & 11 or 23 |
| 12 | Fences & handrails | None | None | None | 10 | 10 | 10 | None | None | None | None |

Strategies that can be used to ameliorate damage to building structures as mine subsidence occurs or to remedy the damage on completion of subsidence are listed below.

**Table 4 - Preventative Mitigation Measures**

1. Increase the capacity of structures to articulate by cutting vertical slots in the walls or slabs.
2. Excavate trenches or slots alongside the building to isolate the structure from ground strains.
3. Install jacks and relevel the structure as subsidence occurs. Rebuild piers on completion.
4. Install steel beams and jacks and relevel the structure as subsidence occurs.
5. Install jacks to relevel the building and provide packs and shims beneath bearers.
6. Provide flexible couplings to service pipes.
7. Remove pavers or paving slabs and replace after mining.
8. Cut slots in paths and drives and repair on completion of mining.
9. Provide temporary supports, bracings and ties if required to ensure the safety of the structure during mining.
10. Provide expansion or contraction joints in fences and handrails or temporarily remove a section.

**Remedial Rehabilitation Measures**

11. Raise slabs up to 300 mm using grout injection.
12. Raise walls using grout injection.
13. Underpin and jack walls to level.
14. Cosmetic repair and repainting.
15. Rehang sticking doors and adjust windows.
16. Relevelling of wet area floors and roof gutters.
17. Major repairs and painting.
18. Repairs to service pipes.
19. Demolish small area of brickwork and repair.
20. Demolish brick walls and rebuild.
21. Completely demolish building and rebuild.
22. Provide jacks and relevel steel structure.
23. Break out and replace concrete floor slab to required levels.
24. Possibly remove paving or slabs, relevel subgrade and replace on completion of mining.
25. Possible repairs to drainage and sewerage pipes or septic tanks.
26. Provide temporary replacement structure.

# *APPENDIX 2*

# *RISK REGISTER*

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

| Process Area | Activity | Aspect | Raw (potential risk) C | P | | R | Existing Controls | Existing Controls C | P | | R | Proposed Controls | Residual Risk C | P | | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exploration | Survey of the drill locations | Damage to vegetation | 5 | c | 5c | 22 (L) | 1. Employee Inductions<br>2. Experienced people<br>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) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. Aboriginal Groups have been consulted<br>4. All known artefacts have been fenced off<br>5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining.<br>6. Aboriginal Heritage Management System. | 2 | e | 2e | 16 (L) |
| | | Disturbance of European heritage | 2 | d | 2d | 12 (M) | | 2 | d | 2d | 12 (M) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. No heritage items have been identified. | 5 | e | 5e | 25 (L) |
| | | Wheel track erosion | 3 | d | 3d | 17 (L) | 1. Use existing tracks where possible<br>2. Draft Erosion & Sediment Control Management Plan<br>3. Scheduled Environmental Inspections<br>4. Systems audits<br>5. Environmental Protection Licence<br>6. Existing Sediment Control Dams | 4 | e | 4e | 23 (L) | | | | | |
| | | Fire hazard | 3 | d | 3d | 17 (L) | 1. Employee Inductions<br>2. Hazard reduction program<br>3. Competent employees<br>4. Bushfire Management Plan<br>5. Onsite fire fighting capabilities | 4 | d | 4d | 21 (L) | | | | | |
| | | Dust | 3 | d | 3d | 17 (L) | 1. Employee Inductions<br>2. Land Disturbance Management System (dust)<br>3. Water cart availability<br>4. Complaints Protocol<br>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. Mine Transport Management Plan<br>2. Bushfire Management Plan<br>3. Scheduled Environmental Inspections<br>4. Contractor Management System<br>5. Incident Notification and Reporting Procedure<br>6. Emergency Response Procedure | 4 | e | 4e | 23 (L) | | | | | |
| | | Injury to or loss of threatened flora and fauna *(note work area mostly cleared)* | 4 | d | 4d | 21 (L) | 1. Mine Transport Management Plan<br>2. Employee Inductions<br>3. Daylight operations | 4 | e | 4e | 23 (L) | | | | | |
| | | Potential to introduce weeds | 5 | e | 5e | 25 (L) | 1. Vehicle wash at entrance<br>2. Employee inductions<br>3. Scheduled Environmental Inspections<br>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 *(note work area mostly cleared)* | 4 | c | 4c | 18 (L) | 1. Mine Transport Management Plan<br>2. Employee Inductions<br>3. Daylight operations | 4 | d | 4d | 21 (L) | | | | | |
| | | Sediment leaving the site | 3 | c | 3c | 13 (M) | 1. Use existing tracks where possible<br>2. Draft Erosion & Sediment Control Management Plan<br>3. Scheduled Environmental Inspections<br>4. Systems audits<br>5. Environmental Protection Licence<br>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<br>2. Minimal surface disturbance | 4 | d | 4d | 21 (L) | | | | | |
| | | Disturbance of Aboriginal heritage | 2 | c | 2c | 8 (M) | 1. Non existent in area under investigation | 2 | c | 2c | 8 (M) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. Aboriginal Groups have been consulted<br>4. All known artefacts have been fenced off<br>5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining.<br>6. Aboriginal Heritage Management System. | 2 | e | 2e | 16 (L) |
| | | Disturbance of European heritage | 2 | c | 2c | 8 (M) | | 2 | c | 2c | 8 (M) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. No heritage items have been identified. | 5 | e | 5e | 25 (L) |
| | | Potential to introduce weeds | 5 | e | 5e | 25 (L) | 1. Vehicle wash at entrance<br>2. Employee inductions<br>3. Scheduled Environmental Inspections<br>4. Weed Control Contractors | 5 | e | 5e | 25 (L) | not considered an issue | | | | |
| | | Noise | 4 | d | 4d | 21 (L) | 1. Daylight activity<br>2. Employee Inductions<br>3. Maintenance Management System<br>4. Complaints Protocol | 4 | e | 4e | 23 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections | 5 | e | 5e | 25 (L) | | | | | |
| | | Fire hazard | 3 | d | 3d | 17 (L) | 1. Employee Inductions<br>2. Hazard reduction program<br>3. Competent employees<br>4. Bushfire Management Plan<br>5. Onsite fire fighting capabilities | 4 | d | 4d | 21 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

| Process Area | Activity | Aspect | Raw (potential risk) C | P | | R | Existing Controls | Existing Controls C | P | | R | Proposed Controls | Residual Risk C | P | | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hydraulic hose oil spill | 3 | c | 3c | 13 (M) | 1. Maintenance Management System<br>2. Environmental Emergency Response Procedure<br>3. Spill kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting 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<br>2. Draft Erosion & Sediment Control Management Plan<br>3. Scheduled Environmental Inspections<br>4. Systems audits<br>5. Environmental Protection Licence<br>6. Existing sedimentation dam on boundary<br>7. Contractor Management System<br>8. Contractor Inductions | 5 | d | 5d | 24 (L) | | | | | |
| | | Hydrocarbon storage | 3 | c | 3c | 13 (M) | 1. Mobile equipment<br>2. Contract Management System<br>3. Contractor Induction<br>4. Onsite spill kits<br>5. Bushfire Management Plan<br>6. Supervisor Inspections<br>7. Incident Notification and Reporting Procedure | 4 | d | 4d | 21 (L) | | | | | |
| | | Potential to introduce weeds | 4 | c | 4c | 18 (L) | 1. Vehicle wash at entrance<br>2. Contractor inductions<br>3. Scheduled Environmental Inspections<br>4. Weed Control Contractors<br>5. Supervisor Inspections | 4 | d | 4d | 21 (L) | | | | | |
| | | Injury to or loss of threatened flora and fauna *(note work area mostly cleared)* | 5 | e | 5e | 25 (L) | 1. Mine Transport Management Plan<br>2. Employee Inductions<br>3. Daylight operations | 5 | e | 5e | 25 (L) | not considered an issue | | | | |
| | | Hydraulic hose oil spill | 3 | c | 3c | 13 (M) | 1. Mobile equipment<br>2. Contract Management System<br>3. Contractor Induction<br>4. Onsite spill kits<br>5. Bushfire Management Plan<br>6. Supervisor Inspections<br>7. Incident Notification and Reporting Procedure | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydrocarbons during transfer from the service truck. | 3 | c | 3c | 13 (M) | 1. Mobile equipment<br>2. Contractor Management System<br>3. Contractor Induction<br>4. Onsite spill kits<br>5. Bushfire Management Plan<br>6. Incident Notification and Reporting Procedure | 4 | d | 4d | 21 (L) | | | | | |
| | | Hydrocarbon leaking from tank | 3 | c | 3c | 13 (M) | 1. Mobile equipment<br>2. Contractor Management System<br>3. Contractor Induction<br>4. Onsite spill kits<br>5. Bushfire Management Plan | 4 | d | 4d | 21 (L) | | | | | |
| | | Noise | 4 | c | 4c | 18 (L) | 1. Daylight activity<br>2. Employee Inductions<br>3. Maintenance Management System<br>4. Complaints Protocol<br>5. Supervisor Inspections<br>6. Contractors Management Systems<br>7. Contractor Inductions | 4 | d | 4d | 21 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Employee Inductions<br>2. Land Disturbance Management System (dust)<br>3. Water cart availability<br>4. Complaints Protocol<br>5. Supervisor Inspections<br>6. Contractors Management Systems<br>7. Contractor Inductions<br>8. Mindful of weather (wind) conditions. | 3 | d | 3d | 17 (L) | | | | | |
| | | Fire hazard | 4 | d | 4d | 21 (L) | 1. Hazard reduction program<br>2. Bushfire Management Plan<br>3. Onsite fire fighting capabilities<br>4. Supervisor Inspections | 5 | d | 5d | 24 (L) | | | | | |
| | | Waste management e.g. oily rags, empty drums | 4 | b | 4b | 14 (M) | 1. Contractor Management System<br>2. Contractor Induction<br>3. Onsite waste bins<br>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<br>2. Employee inductions<br>3. Scheduled Scheduled Environmental Inspections<br>4. Weed Control Contractors | 5 | d | 5d | 24 (L) | | | | | |
| | | Wheel track erosion | 4 | b | 4b | 14 (M) | 1. Use existing tracks where possible<br>2. Draft Erosion & Sediment Control Management Plan<br>3. Scheduled Environmental Inspections<br>4. Systems audits<br>5. Environmental Protection Licence<br>6. Contractor Management System<br>7. Supervisor Inspections<br>8. Contractor Induction | 4 | d | 4d | 21 (L) | | | | | |
| | | Fire hazard | 4 | d | 4d | 21 (L) | 1. Hazard reduction program<br>2. Bushfire Management Plan<br>3. Onsite fire fighting capabilities<br>4. Supervisor Inspections<br>5. Contractor Management System<br>6. Contractor Induction | 5 | d | 5d | 24 (L) | | | | | |
| | | Noise | 4 | c | 4c | 18 (L) | 1. Daylight activity<br>2. Employee Induction<br>3. Maintenance Management System<br>4. Complaints Protocol<br>5. Supervisor Inspections<br>6. Contractor Management System<br>7. Contractor Induction | 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 | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Employee Induction<br>2. Land Disturbance Management System (dust)<br>3. Water cart availability<br>4. Complaints Protocol<br>5. Supervisor Inspections<br>6. Contractor Management System<br>7. Contractor Induction<br>8. Mindful of weather (wind) conditions. | 4 | d | 4d | 21 (L) | | | | | |
| | | Potential for spills of hydrocarbons from vehicle accident. | 4 | d | 4d | 21 (L) | 1. Mine Transport Management Plan<br>2. Bushfire Management Plan<br>3. Scheduled Environmental Inspections<br>4. Incident Notification and Reporting Procedure<br>5. Contractor Management System<br>6. Contractor Induction<br>7. Incident Notification and Reporting Procedure | 4 | e | 4e | 23 (L) | | | | | |
| | | Injury to or loss of threatened flora and fauna *(note work area mostly cleared)* | 5 | e | 5e | 25 (L) | 1. Mine Transport Management Plan<br>2. Employee Inductions<br>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<br>2. Contractor Induction<br>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 *(note work area mostly cleared)* | 4 | d | 4d | 21 (L) | 1. Fill in pits and cap holes<br>2. DPI guidelines<br>3. Mining Lease Conditions | 5 | e | 5e | 25 (L) | not considered an issue | | | | |
| | | Aquifer contamination | 4 | d | 4d | 21 (L) | 1. Dry area<br>2. Capping holes<br>3. Deep hard rock aquifer<br>4. No alluvial aquifers involved<br>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<br>2. Employee inductions<br>3. Scheduled Environmental Inspections<br>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<br>2. Draft Erosion & Sediment Control Management Plan<br>3. Scheduled Environmental Inspections<br>4. Systems audits<br>5. Licence<br>6. Existing sedimentation dam on boundary | 5 | d | 5d | 24 (L) | | | | | |
| | | Noise | 4 | d | 4d | 21 (L) | 1. Daylight activity<br>2. Employee Inductions<br>3. Maintenance Management System<br>4. Complaints Protocol<br>5. Supervisor Inspections<br>6. Contractors Management Systems<br>7. Contractor Inductions | 4 | e | 4e | 23 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Employee Inductions<br>2. Land Disturbance Management System (dust)<br>3. Water cart availability<br>4. Complaints Protocol<br>5. Supervisor Inspections<br>6. Contractors Management Systems<br>7. Contractor Inductions<br>8. Mindful of weather (wind) conditions | 5 | e | 5e | 25 (L) | | | | | |
| | | Hydraulic hose oil spill | 4 | d | 4d | 21 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. Spill kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure | 5 | d | 5d | 24 (L) | | | | | |
| | | Fire hazard | 4 | d | 4d | 21 (L) | 1. Inductions<br>2. Hazard reduction program<br>3. Competent employees<br>4. Bushfire Management Plan<br>5. Onsite fire fighting capabilities | 5 | d | 5d | 24 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) | | | | Existing Controls | Existing Controls | | | | Proposed Controls | Residual Risk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C | P | R | | | C | P | R | | | C | P | R | |
| Pre-stripping | Clearing of vegetation - *note: site predominantly cleared* | Injury to or loss of threatened flora and fauna | 2 | b | 2b | 5 (H) | 1. Draft Land Disturbance Management System<br>2. Work area mostly cleared. | 3 | d | 3d | 17 (L) | 1. Assessment has been made on the presence / absence of threatened species<br>2. No threatened species were identified within the area to be disturbed<br>3. A relevant DECC approved research program will be committed to by Bloomfield commensurate to the loss of any Lower Hunter Spotted Gum Ironbark Forest Endangered Ecological Community within the Project area. | 3 | d | 3d | 17 (L) |
| | | Disturbance of Aboriginal heritage sites | 2 | c | 2c | 8 (M) | | 2 | c | 2c | 8 (M) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. Aboriginal Groups have been consulted<br>4. All known artefacts have been fenced off<br>5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining.<br>6. Aboriginal Heritage Management System. | 2 | e | 2e | 16 (L) |
| | | Disturbance of European heritage sites | 2 | c | 2c | 8 (M) | | 2 | c | 2c | 8 (M) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. No heritage items have been identified. | 5 | e | 5e | 25 (L) |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Noise | 4 | d | 4d | 21 (L) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered operating conditions at set times (ie. night time) to reduce noise. | 4 | e | 4e | 23 (L) | | | | | |
| | | Erosion with sediment leaving site | 4 | c | 4c | 18 (L) | 1. Employee Inductions<br>2. Internal drainage<br>3. Existing Sediment Control Dam<br>4. Draft Erosion & Sediment Control Plan<br>5. Mining Operations Inspection System<br>6. Scheduled Environmental Inspections | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 5 | d | 5d | 24 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) C | P | R | | Existing Controls | Existing Controls C | P | R | | Proposed Controls | Residual Risk C | P | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Potential to introduce weeds | 4 | d | 4d | 21 (L) | 1. Weed Control Contractors<br>2. Scheduled Environmental Inspections<br>3. Vehicle wash at entrance<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Contractor Induction<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Contractor Management System | 5 | d | 5d | 24 (L) | | | | | |
| | | Disposal of cleared timber (potential loss of habitat) | 3 | b | 3b | 9 (M) | 1. Pre-clearance protocol | 4 | e | 4e | 23 (L) | | | | | |
| | | Spillage of hydrocarbons when transferring from service truck | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Mobile equipment<br>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. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. Aboriginal Groups have been consulted<br>4. All known artefacts have been fenced off<br>5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining.<br>6. Aboriginal Heritage Management System. | 2 | e | 2e | 16 (L) |
| | | Potential to introduce weeds | 4 | d | 4d | 21 (L) | 1. Vehicle wash at entrance<br>2. Employee inductions<br>3. Scheduled Environmental Inspections<br>4. Weed Control Contractors<br>5. Contractor Management System<br>6. Contractor Inductions | 5 | d | 5d | 24 (L) | | | | | |
| | | Disturbance of European heritage sites | 2 | c | 2c | 8 (M) | | 2 | c | 2c | 8 (M) | 1. Employee Inductions<br>2. Surveys completed to identify sites and assess significance.<br>3. No heritage items have been identified. | 5 | e | 5e | 25 (L) |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 3 | d | 3d | 17 (L) | | | | | |
| | | Noise | 4 | b | 4b | 14 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered Operating Conditions at set times (ie night time) to reduce noise. | 4 | e | 4e | 23 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) C | P | R | | Existing Controls | Existing Controls C | P | R | | Proposed Controls | Residual Risk C | P | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion with sediment leaving site | 3 | b | 3b | 9 (M) | 1. Employee Inductions<br>2. Internal drainage for part of the area<br>3. Existing Sediment Control Dam<br>4. Draft Erosion & Sediment Control Plan<br>5. Mining Operations Inspection System<br>6. Scheduled Environmental Inspections | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Mine Transport | 5 | d | 5d | 24 (L) | | | | | |
| | | Spillage of hydrocarbons when transferring from service truck | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Loss of top dressing material | 3 | b | 3b | 9 (M) | 1. Mining Operations Plan<br>2. Employee awareness and supervision<br>3. Employee consultation system<br>4. Scheduled Environmental Inspections<br>5. Competency Management System | 4 | d | 4d | 21 (L) | | | | | |
| | | Quality of top dressing material reduced through damage to soil structure | 4 | c | 4c | 18 (L) | 1. Direct placement wherever possible<br>2. Top dressing material stockpile management<br>3. Mining Operations Plan<br>4. Employee awareness and supervision<br>5. Employee consultation system<br>6. Scheduled Environmental Inspections<br>7. Competency Management System | 4 | e | 4e | 23 (L) | | | | | |
| | Overburden drilling | Noise | 3 | c | 3c | 13 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered operating conditions at set times (ie. night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) C | P | R | | Existing Controls | Existing Controls C | P | R | | Proposed Controls | Residual Risk C | P | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dust | 3 | c | 3c | 13 (M) | 1. Dust Extraction Systems<br>2. Curtains and water on drill<br>3. Employee Inductions<br>2. Land Disturbance Management System (dust)<br>3. Water cart availability<br>4. Complaints Protocol<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Mine Transport Management Plan | 5 | d | 5d | 24 (L) | | | | | |
| | Blasting | Noise/ overpressure | 2 | b | 2b | 5 (H) | 1. Shot Firing and Explosives Management System<br>2. Competent, experienced employees<br>3. Inhouse Mining Engineer<br>4. Access to external specialist input<br>5. Supervisor Inspections<br>6. Supervisor Audits<br>7. Complaints Protocol | 3 | d | 3d | 17 (L) | | | | | |
| | | Vibration | 2 | b | 2b | 5 (H) | 1. Shot Firing and Explosives Management System<br>2. Competent, experienced employees<br>3. Inhouse Mining Engineer<br>4. Access to external specialist input<br>5. Supervisor Inspections<br>6. Supervisor Audits<br>7. Complaints Protocol | 4 | d | 4d | 21 (L) | | | | | |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Shot Firing and Explosives Management System<br>2. Access to external specialist input<br>3. Inductions<br>4. Land Disturbance Management System (dust)<br>5. Water cart availability<br>6. Complaints Protocol<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Mindful of weather (wind) conditions | 4 | c | 4c | 18 (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<br>2. Access to external specialist input | 5 | e | 5e | 25 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) C | P | R | | Existing Controls | Existing Controls C | P | R | | Proposed Controls | Residual Risk C | P | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Excavation of overburden (using the excavator) | Noise | 3 | b | 3b | 9 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered operating conditions at set times (ie. night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Visual | 3 | c | 3c | 13 (M) | 1. Progressive Rehabilitation<br>2. Mine Planning<br>3. Timber screening<br>4. Informal Operational procedures (night lighting)<br>5. Community Consultation<br>6. Complaints Protocol | 3 | d | 3d | 17 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Supervisor Audits<br>3. Mining Operation Plan<br>4. Supervisor Inspections<br>5. Mining Operations Inspection Management System | 5 | e | 5e | 25 (L) | not considered an issue | | | | |
| | | Waste Management (during service days) | 5 | b | 5b | 19 (L) | 1. Environmental Protection Licence<br>2. Onsite Waste bins<br>3. Use of Licensed Contractor for waste removal<br>4. Contractor Management System<br>5. Contractor Inductions<br>6. Supervisor Inspections<br>7. Maintenance | 5 | d | 5d | 24 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) | | | | Existing Controls | Existing Controls | | | | Proposed Controls | Residual Risk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C | P | R | | | C | P | R | | | C | P | R | |
| | | Major shut downs (contractor) | 5 | b | 5b | 19 (L) | 1. Environmental Protection Licence<br>2. Onsite Waste bins<br>3. Use of Licensed Contractor for waste removal<br>4. Contractor Management System<br>5. Contractor Inductions<br>6. Supervisor Inspections<br>7. Supervisor Audits | 5 | d | 5d | 24 (L) | | | | | |
| | Mining of coal | Noise | 3 | c | 3c | 13 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered operating conditions at set times (ie. night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Competency Management System | 4 | d | 4d | 21 (L) | | | | | |
| | Hauling with rear dump trucks | Noise | 3 | b | 3b | 9 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered operating conditions at set times (ie. night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Emergency Response Procedure | 5 | d | 5d | 24 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) C | P | R | | Existing Controls | Existing Controls C | P | R | | Proposed Controls | Residual Risk C | P | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Spillage of hydrocarbons when transferring from service truck | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Exhaust emissions | 4 | b | 4b | 14 (M) | 1. Original Equipment Manufacturer Standards<br>2. Maintenance Management System<br>3. Defect Management System<br>4. Supervisor Inspections<br>5. Supervisor Audits | 4 | e | 4e | 23 (L) | | | | | |
| | Hauling with on-highway trucks | Noise | 3 | c | 3c | 13 (M) | 1. Contractor Management System<br>2. Engineer's Audits<br>3. RTA registered trucks<br>4. Six monthly shaker tests<br>5. Maintenance Management Systems<br>6. Complaints Protocol<br>7. Supervisor Inspections<br>8. Contractor Induction<br>9. Altered operating conditions at set times (ie. night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Contractor Management System<br>8. Contractor Induction<br>9. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Contractor Management System<br>2. Emergency Spill Response<br>3. On-site On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits | 5 | d | 5d | 24 (L) | | | | | |
| | | Spillage of hydrocarbons when transferring from service truck | 4 | b | 4b | 14 (M) | 1. Contractor Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Employee Consultation Systems<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Contractor Induction | 4 | d | 4d | 21 (L) | | | | | |
| | | Exhaust emissions | 4 | b | 4b | 14 (M) | 1. Original Equipment Manufacturer Standards<br>2. Supervisor Audits<br>3. Defect Management System<br>4. Supervisor Inspections<br>5. Contractor Management System | 4 | e | 4e | 23 (L) | | | | | |

# BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

| Process Area | Activity | Aspect | Raw (potential risk) | | | | Existing Controls | Existing Controls | | | | Proposed Controls | Residual Risk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C | P | R | | | C | P | R | | | C | P | R | |
| | Overburden dumping area (includes tipping with trucks) | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Noise | 3 | b | 3b | 9 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits | 3 | d | 3d | 17 (L) | | | | | |
| | | Lighting of the dumps being directed into the residents houses resulting in visual impact issues. | 4 | b | 4b | 14 (M) | 1. Direction of lights are changed so that they are not pointed towards the residents<br>2. Opportunity to enable dumping in an alternative dump or location on the dump after dark. | 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 | |
| Main Dig | Interburden drilling | Noise | 3 | d | 3d | 17 (L) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered Operating Conditions at set times (ie night time) to reduce noise. | 3 | e | 3e | 20 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Competency Management System<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Competency Management System<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 5 | d | 5d | 24 (L) | | | | | |
| | Blasting | Noise/ overpressure | 2 | c | 2c | 8 (M) | 1. Shot Firing and Explosives Management System<br>2. Competent, experienced employees<br>3. Inhouse Mining Engineer<br>4. Access to external specialist input<br>5. Supervisor Inspections<br>6. Supervisor Audits<br>7. Complaints Protocol<br>8. Altered Operating Conditions at set times (ie night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | | Vibration | 2 | b | 2b | 5 (H) | 1. Shot Firing and Explosives Management System<br>2. Competent, experienced employees<br>3. Inhouse Mining Engineer<br>4. Access to external specialist input<br>5. Supervisor Inspections<br>6. Supervisor Audits<br>7. Complaints Protocol | 4 | d | 4d | 21 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Shot Firing and Explosives Management System<br>2. Access to external specialist input<br>3. Inductions<br>4. Land Disturbance Management System (dust)<br>5. Water cart availability<br>6. Complaints Protocol<br>7. Supervisor Inspections<br>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<br>2. Access to external specialist input | 5 | e | 5e | 25 (L) | | | | | |
| | Excavation of interburden | Noise | 3 | c | 3c | 13 (M) | 1. Maintenance Management System<br>2. Competent, experienced employees<br>3. Supervisor Inspections<br>4. Supervisor Audits<br>5. Complaints Protocol<br>6. Altered Operating Conditions at set times (ie night time) to reduce noise. | 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 | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Incident Notification and Reporting Procedure<br>6. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Competency Management System<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Internal Audit Management System<br>3. Mining Operation Plan<br>4. Supervisor Inspections<br>5. Supervisor Audits | 5 | e | 5e | 25 (L) | | | | | |
| | | Waste Management (during service days) | 5 | b | 5b | 19 (L) | 1. Environmental Protection Licence<br>2. Onsite Waste bins<br>3. Use of Licensed Contractor for waste removal<br>4. Contractor Management System<br>5. Contractor Inductions<br>6. Supervisor Inspections<br>7. Employee Inductions | 5 | d | 5d | 24 (L) | | | | | |
| | | Major shut downs (contractor) | 5 | b | 5b | 19 (L) | 1. Environmental Protection Licence<br>2. Onsite Waste bins<br>3. Use of Licensed Contractor for waste removal<br>4. Contractor Management System<br>5. Contractor Inductions<br>6. Supervisor Inspections<br>7. Employee Inductions | 5 | d | 5d | 24 (L) | | | | | |
| | Mining of coal | Noise | 3 | d | 3d | 17 (L) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Competency Management System<br>7. Altered Operating Conditions at set times (ie night time) to reduce noise. | 3 | e | 3e | 20 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections | 4 | d | 4d | 21 (L) | | | | | |
| | | Groundwater | 3 | c | 3c | 13 (M) | 1. Experience mining in the area. | 4 | d | 4d | 21 (L) | *1. Groundwater Assessment*<br>*2. Groundwater Model*<br>*Note: Groundwater quality not suitable for use (ie. saline, deep)* | 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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Hydrocarbon contamination of pit-water (pumps, spills) | 3 | c | 3c | 13 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox talks<br>6. Dedicated Experienced employee<br>7. Incident Notification and Reporting Procedure<br>8. Supervisor Inspections<br>9 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | Hauling with rear dump trucks | Noise | 3 | c | 3c | 13 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Competency Management System<br>7. Altered Operating Conditions at set times (ie night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | | Dust | 3 | c | 3c | 13 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Visual | 3 | c | 3c | 13 (M) | 1. Progressive Rehabilitation<br>2. Mine Planning<br>3. Timber screening<br>4. Informal Operational procedures (night lighting)<br>5. Community Consultation<br>6. Complaints Protocol | 3 | d | 3d | 17 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Exhaust emissions | 4 | b | 4b | 14 (M) | 1. Original Equipment Manufacturer Standards<br>2. Maintenance Management System<br>3. Defect Management System<br>4. Supervisor Inspections | 4 | e | 4e | 23 (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 | |
| | Hauling with on-highway trucks | Noise | 3 | c | 3c | 13 (M) | 1. Contractor Management System<br>2. Engineer's Audits<br>3. RTA registered trucks<br>4. Six monthly shaker tests<br>5. Maintenance Management Systems<br>6. Complaints Protocol<br>7. Supervisor Inspections<br>8. Contractor Inductions<br>9. Altered Operating Conditions at set times (ie night time) to reduce noise. | 3 | e | 3e | 20 (L) | | | | | |
| | | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Contractor Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Contractor Inductions<br>5. Contractor Management System<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Contractor Inductions<br>5. Contractor Management System<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Toolbox Talks | 4 | d | 4d | 21 (L) | | | | | |
| | | Exhaust emissions | 4 | b | 4b | 14 (M) | 1. Original Equipment Manufacturer Standards<br>2. Maintenance Management System<br>3. Defect Management System<br>4. Supervisor Inspections<br>5. Contractor Management System<br>6. Contractor Inductions<br>7. RTA Approval (Rego check)<br>8. Engineers Audits | 4 | e | 4e | 23 (L) | | | | | |
| | Overburden dump (in pit) | Dust | 3 | b | 3b | 9 (M) | 1. Mindful of weather (wind) conditions<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits | 4 | d | 4d | 21 (L) | | | | | |
| | | Noise | 3 | c | 3c | 13 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Altered Operating Conditions at set times (ie night time) to reduce noise. | 3 | d | 3d | 17 (L) | | | | | |
| | In pit water management | Broken leaking pipes (on surface) | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Scheduled Environmental Inspections<br>3. Inspection Management System<br>4. Supervisor Inspections<br>5. Engineering principles applied to design<br>6. Incidents Reporting Procedure<br>7. Dedicated Experienced person<br>8. Supervisor Audits | 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 | |
| | | Discharge from open drains (dirty water system) | 2 | c | 2c | 8 (M) | 1. Scheduled Environmental Inspections<br>2. Inspection Management System<br>3. Supervisor Inspections<br>4. Engineering principles applied to design<br>5. Incidents Reporting Procedure<br>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<br>2. Discharge Water Management System<br>3. EPA Licence<br>4. Site Inspections<br>5. Scheduled Environmental Inspections<br>6. Nominated Experienced person | 3 | d | 3d | 17 (L) | | | | | |
| | | Failure of clean water segregation | 2 | d | 2d | 12 (M) | 1. Scheduled Environmental Inspections<br>2. Inspection Management System<br>3. Supervisor Inspections<br>4. Engineering principles applied to design<br>5. Incidents Reporting Procedure<br>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 refuelling, others for supply and pumps) | 2 | c | 2c | 8 (M) | 1. Towed empty only<br>2. Towed over prepared surfaces and under supervision only<br>3. Ensure tanks are always within the site<br>4. Supervisor Audits<br>5. Located in a temporary earth containment area<br>6. Scheduled Environmental Inspections<br>7. Maintenance Management System<br>8. Isolated storage area | 3 | d | 3d | 17 (L) | | | | | |
| | | Spillage from the fuel fill point during filling of equipment | 4 | b | 4b | 14 (M) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8 Supervisor Audits<br>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<br>2. Emergency Spill Response<br>3. Scheduled Environmental Inspections | 4 | d | 4d | 21 (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<br>2. Employee Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Competency Management System<br>8. Toolbox Talks | 4 | d | 4d | 21 (L) | | | | | |
| | | Noise | 3 | b | 3b | 9 (M) | 1. Employee Inductions<br>2. Maintenance Management System<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits<br>6. Toolbox Talks | 3 | d | 3d | 17 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Competency Management System<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits<br>9. Toolbox Talks | 4 | d | 4d | 21 (L) | | | | | |
| | | Erosion and sediment control | 4 | c | 4c | 18 (L) | 1.Draft Erosion and Sediment Control Plan<br>2. Scheduled Environmental Inspections<br>3. External Audits (including Government)<br>4. Environmental Protection Licence<br>5. Existing Sediment Control Dams | 5 | d | 5d | 24 (L) | | | | | |
| | Top dressing material spreading and contour ripping | Dust | 3 | b | 3b | 9 (M) | 1. Mine Transport Management Plan<br>2. Inductions<br>3. Land Disturbance Management System (dust)<br>4. Water cart availability<br>5. Complaints Protocol<br>6. Supervisor Inspections<br>7. Supervisor Audits<br>8. Mindful of weather (wind) conditions | 4 | d | 4d | 21 (L) | | | | | |
| | | Noise | 3 | b | 3b | 9 (M) | 1. Employee Inductions<br>2. Maintenance Management Systems<br>3. Complaints Protocol<br>4. Supervisor Inspections | 3 | d | 3d | 17 (L) | | | | | |
| | | Spillage of hydraulic oil from damaged hose | 4 | c | 4c | 18 (L) | 1. Maintenance Management System<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>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<br>2. Emergency Spill Response<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox talks<br>6. Incident Notification and Reporting Procedure<br>7. Supervisor Inspections<br>8. Supervisor Audits | 4 | d | 4d | 21 (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 | |
| | | Erosion and sediment control | 4 | c | 4c | 18 (L) | 1. Draft Erosion and Sediment Control Plan<br>2. Scheduled Environmental Inspections<br>3. External Audits (including Government)<br>4. Environmental Protection Licence<br>5. Supervisor Inspections<br>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 DECC guidelines<br>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<br>2. Draft Erosion & Sediment Control Plan<br>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<br>2. Vehicle wash at entrance<br>3. Employee inductions<br>4. Scheduled Environmental Inspections<br>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<br>2. Employee and Contractor Inductions | 5 | d | 5d | 24 (L) | | | | | |
| | | Bush fire hazard burning revegetated areas | 3 | c | 3c | 13 (M) | 1. Employee Induction<br>2. Hazard reduction program<br>3. Competent employees<br>4. Bushfire Management Plan<br>5. Onsite fire fighting capabilities<br>6. Contractor Induction | 4 | d | 4d | 21 (L) | | | | | |
| | | Sponcom in rehabilitated areas (odour) | 4 | d | 4d | 21 (L) | 1. Burial of oxidised coal material<br>2. Supervisor Inspections<br>3. Mining Operation Plan<br>4. Mining Operations Inspection Management System | 5 | e | 5e | 25 (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 | |
| Maintenance / Open Cut Workshop | Waste Management | General Refuse (incl oily rags) | 4 | b | 4b | 14 (M) | 1. Licensed Waste Contractor<br>2. Contractor Management System<br>3. Employee Inductions<br>4. Environmental Protection Licence<br>5. Toolbox Talks<br>6. Scheduled Environmental Inspections | 5 | d | 5d | 24 (L) | | | | | |
| | | Scrap steel | 5 | b | 5b | 19 (L) | 1. Licensed Recycling Contractor<br>2. Contractor Management System<br>3. Employee Inductions<br>4. Environmental Protection Licence<br>5. Toolbox Talks<br>6. Scheduled Environmental Inspections | 5 | e | 5e | 25 (L) | | | | | |
| | | Contaminated Wastes | 4 | b | 4b | 14 (M) | 1. Licensed Recycling Contractor<br>2. Contractor Management System<br>3. Employee Inductions<br>4. Environmental Protection Licence<br>5. Incident Reporting Procedure<br>6. Toolbox Talks<br>7. Scheduled Environmental Inspections | 5 | d | 5d | 24 (L) | | | | | |
| | | Oil spills on ground | 4 | b | 4b | 14 (M) | 1. On-site Spill Kits<br>2. Employee Inductions<br>3. Employee Consultation Systems<br>4. Emergency Response Procedure<br>5. Incident Reporting Procedure<br>6. Toolbox Talks<br>7. Scheduled 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<br>2. Work Cover notified<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Emergency Response Procedure<br>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<br>2. Work Cover notified<br>3. Incident Reporting Procedure<br>4. Emergency Response Procedure<br>5. Scheduled Environmental Inspections<br>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<br>2. Work Cover notified<br>3. Maintenance Management System<br>4. Bilge Pump system in place in bunded areas<br>5. Incident Reporting Procedure<br>6. Emergency Response Procedure<br>7. Scheduled Environmental Inspections<br>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<br>2. WorkCover notified<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Emergency Response Procedure<br>7. Incident Reporting Procedure<br>8. Scheduled Environmental Inspections | 4 | d | 4d | 21 (L) | | | | | |
| | | Damage to above ground pipes (fuel and oil) | 3 | b | 3b | 9 (M) | 1. AS1940 approved area<br>2. Work Cover notified<br>3. Incident Reporting Procedure<br>4. Scheduled 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<br>2. Work Cover notified<br>3. Employee Inductions<br>4. Automatic shut-offs<br>5. Incident Reporting Procedure<br>6. Toolbox Talks | 4 | d | 4d | 21 (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 | |
| | Oil storage area | Spills and leaks | 4 | b | 4b | 14 (M) | 1. AS1940 approved area<br>2. Work Cover notified<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Emergency Response Procedure<br>7. Incident Reporting Procedure<br>8. Scheduled Environmental Inspections | 5 | d | 5d | 24 (L) | | | | | |
| | Transformers | Release of PCB's in transformer oil | 2 | b | 2b | 5 (H) | 1. PCB Disposal Procedure<br>2. Transformers in bunded areas<br>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<br>2. On-site Spill Kits<br>3. Employee Inductions<br>4. Transformers in bunded areas<br>5. Incident Reporting Procedure<br>6. Scheduled 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<br>2. Contractor Management System<br>3. On-site Spill Kits<br>4. Employee Inductions<br>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<br>2. Scheduled Environmental Inspections<br>3. Serviced by licensed contractor<br>4. Contractor Management System<br>5. On-site Spill Kits<br>6. Employee Inductions<br>7. Incident Reporting Procedure | 5 | d | 5d | 24 (L) | | | | |
| | Workshop | Noise | 3 | d | 3d | 17 (L) | 1. Isolated location<br>2. Employee Induction<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>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<br>1. Scheduled shut downs<br>2. breakdowns/running repairs | Noise | 3 | d | 3d | 17 (L) | 1. Where ever possible maintenance conducted off site<br>2. Employee Induction<br>3. Complaints Protocol<br>4. Supervisor Inspections<br>5. Supervisor Audits | 3 | e | 3e | 20 (L) | | | | | |
| | | Contaminated Waste Material | 4 | b | 4b | 14 (M) | 1. Licensed Waste Contractor<br>2. Contractor Management System<br>3. Employee Inductions<br>4. EPL<br>5. Toolbox Talks<br>6. Maintenance Management System<br>7. Supervisor Inspections<br>8. Supervisor Audits | 5 | d | 5d | 24 (L) | | | | | |
| | | Spills and leaks | 4 | b | 4b | 14 (M) | 1. AS1940 approved area<br>2. WorkCover notified<br>3. On-site Spill Kits<br>4. Employee Inductions<br>5. Toolbox Talks<br>6. Emergency Response Procedure<br>7. Incident Notification and Reporting Procedure<br>8. Maintenance Management System<br>9. Supervisor Inspections<br>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. Mine Transport Management Plan<br>2. Employee Inductions<br>3. Purpose designed service truck<br>4. Compartmentalised tank<br>5. Competency Standard for service truck<br>6. Emergency Response Procedure<br>7. Bushfire Management Plan<br>8. Incident Notification and Reporting Procedure | 4 | d | 4d | 21 (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 Procedures<br>2. Contractor Management System<br>3. Contained delivery point<br>4. Use of competent delivery contractor<br>5. System audits<br>6. Incident Notification and Reporting Procedure<br>7. Scheduled Environmental Inspections<br>8. 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<br>2. Delivery trucks have segregated tanks<br>3. Emergency Response Procedure<br>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. Mine Transport Management Plan<br>2. Fuel & Bulk Oil Delivery Procedures<br>3. Contractor Management System<br>4. Safety Core Risk Assessment<br>5. Toolbox Talks<br>6. Competency Management System<br>7.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<br>2. Use of competent contractor<br>3. Contractor Management System<br>4. Bunded Area (AS1940)<br>5. Emergency Response Procedure<br>6. Fuel & Bulk Oil Delivery Procedures | 5 | e | 5e | 25 (L) | | | | | |

# *APPENDIX 3*

# *REHABILITATION RISK ASSESSMENT*

THE Bloomfield GROUP

WE CARE. WE DELIVER.

# Bloomfield Mine – Rehabilitation Risk Assessment.
# 10 December 2020.

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| MINING- Material & landform unsuitable to support final land use(s) | Lack of Biological resource salvage & maintenance including soils impacting on final rehabilitation | • Uncharacterised soils<br>• Poor soil management<br>• Lack of soil for ongoing rehabilitation<br>• Loss of soil through lack of Erosion and Sediment (ERSED) contols.<br>• Loss of soil due to poor management (signage).<br>• Long term soil storage reducing biota. | 9M | •Soil testing prior to clearing to identify any adverse soil issues such as sodicity. And to determine any ameliorants which may be required.<br>•Maintain soil / subsoil materials balance.<br>•Maintain stockpile information to reduce risk of long term storage.<br>•Topsoil /subsoil signage and demarcation (GIS).<br>• Soil identification and recovery to maximise resource.<br>•Cover seeding of long term stockpiles | 20L |
| | Limited pre-existing biological resources impacting on rehabilitation outcomes. | • Lack of seed bank in soil for endemic species re-establishment.<br>• Weed species in topsoil seed bank<br>• Lack of recovery of endemic seed from natives.<br>• Destruction / loss of potential habitat structures post removal | 14 M | • Implement Land Disturbance Management Plan detailing topsoil management procedure.<br>• Minimise recovery of topsoil in high weed infested areas<br>• Designated areas of habitat structures if required<br>• Weed management plan to control weeds in advance of clearing | 18 L |
| | Exposure of adverse materials leading to rehab failure | • Unknown properties of soil and spoil<br>• Incorrect placement of material. For example poor subsoil at surface.<br>• Lack of adequate capping of overburden with soils<br>• Weed invasion due to poor soils | 9 M | • Undertake analysis of soil and spoil to determine any leachate or other risk.<br>• Determine required ameliorants to promote growth of target species and reduce weed infestation.<br>• Maintain soil / capping materials balance<br>• Weed management plan to control weeds. | 17 M |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Geochemical and geotechnical unsuitability of tailings & reject materials leading to rehab failure | • Unknown material types<br>• Lack of geotech design in rehabilitation<br>• Lack of geotech design in tailings capping.<br>• Capping using unsuitable material<br>• Lack of suitable capping material<br>• Lack of capping design increasing costs or reducing rehab outcomes. (too little or too much material).<br>• | 4 H | • Geochem testing on tailings .and reject<br>• Capping design by qualified engineer<br>• Final landform design reviewed for surface water drainage<br>• Rehab design reviewed by geotech engineer for areas in proximity to tailings dams.<br>• Detailed design to ensure adequate source of suitable capping material | 12 M |
| | Erosion / Mass movement causing landform failure | • Poor landform design leading to rehabilitation failure<br>• Landform not built to design leading to landform failure.<br>• Lack of geotechnical design leading to landform failure<br>• Lack of surface water drainage design leading to landform failure or increased erosion.<br>• Steep slope failure due to poor design. | 8 H | • Rehab design with slopes generally at 10 degrees up to 14 degrees.<br>• Landform constructed to design and verified using survey- signoff process.<br>• Hydrological review of the final landform design<br>• Geotechnical review of final landform design where slopes are greater than 14 degrees. | 12 M |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Contaminated and or/hazardous materials causing ongoing rehabilitation / pollution issues | • Hydrocarbon contamination above National Environmental Protection Measure (NEPM) Guidelines<br>• Signoff of rehabilitation not achieved<br>• Not identifying sources of contamination prior to final rehab or closure<br>• Ongoing release of hydrocarbon to the environment – ie groundwater surface water (Protection of Environment Operations Act (POEO Act).<br>• Unknown chemicals used / stored onsite.<br>• Uncharacterised tailings leachate.<br>• Potentially Acid Forming (PAF) material left on surface at completion of mining. | 9 M | • Undertake contamination assessment prior to final closure<br>• Develop remediation action plan with consideration of bioremediation<br>• Conduct assessment to disposal of materials in accordance with NEPM Schedule B1.<br>• Undertake tailings leachate assessment and characterisation with review and design for long term management<br>• Maintain hazardous chemical register<br>• Maintain bioremediation facilities onsite and ongoing management.<br>• Undertake PAF material assessment at Bloomfield Site. Remove material from surface and bury within void. | 17 M |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Adverse surface & groundwater quality and quantity impacting on rehabilitation. | • Unknown groundwater and surface water qualities<br>• Unknown groundwater and surface water quantities<br>• Lack of groundwater monitoring (levels)<br>• Lack of hydrogeological studies impacts rehab outcomes.<br>• Lack of hydrological channel modelling for drainage line reinstatement.<br>• Landform design does not consider Maximum Flood occurrence and maximum rainfall intensity.<br>• Increased erosion from lack of capacity of sediment dams prior to landform stabilisation. | 8 H | • Continued Monitoring in accordance with Site Water Management Plan.<br>• Annual review and reporting of groundwater and surface water qualities and quantities.<br>• Annual hydrogeological review and water balance.<br>• Landform design incorporates erosion and sediment structure with consideration of Max Flood occurrence and maximum rainfall intensity.<br>• Regular maintenance of ERSED structures<br>• Channel modelling and design for drainage line re-instatement. | 16 M |
| REHABILITATION- Post mining conditions & environment unsuitable to support final land use(s) | Rehabilitation failure due to substrate geochemical and soil biota conditions | • Lack of knowledge of soil characteristics and ameliorant requirements.<br>• Topsoil storage not ideal for biota and seed bank survival.<br>• Poor rehabilitation process/ method<br>• Excessive weeds in topsoil stockpiles<br>• Lack of subsoil / topsoil | 9 M | • Analyse soil and determine soil amendments.<br>• Implement rehab process methodology.<br>• Weed Management Plan and active weed management<br>• Topsoil storage in accordance with requirements (<3m + cover crop ).<br>• Subsoil / Topsoil balance- maximise reclamation.<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required | 20 L |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Rehabilitation failure due to availability of suitable substrate material | • Uncharacterised spoil comprising of unsuitable material.<br>• Lack of suitable substrate material.<br>• Substrate material requires amendment if not suitable. | 14 M | • Conduct spoil (geochemical) characterisation assessment across site.<br>• Determine if material requires amelioration and add additional material.<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required. | 23 L |
| | Failure of rehabilitated areas due to physical /structural properties of substrate | • Unknown assessment and characterisation of the physical and structural properties of substrate material.<br>• Untrained operators and NOT Fit for purpose equipment used on rehabilitation.<br>• No erosion or sediment control integrated within landform.<br>• Lack of design and rehab process. | 4 H | • Trained and competent personnel familiarised with related SWMS / SWP.<br>• Integrated erosion and sed control structures into final landform.<br>• Final landform designed to specification and approved.<br>• Use of appropriate earthmoving / farming equipment suitable for rehabilitation.<br>• Assessment of physical properties of substrate material to inform landform design.<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required | 12 M |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Failure of rehabilitation / revegetation due to unseasonal/ adverse weather | • Failure of revegetated areas.<br>• Lack of rainfall causing rehab failure<br>• Increased erosion due to revegetation failure (cover).<br>• Failure of rehabilitation due to drought conditions<br>• Failure of rehabilitation due to excessive rainfall.<br>• Increased weed competition due to lack of rainfall.<br>• Lack of erosion control structures leading to rehab failures | 9 M | • Implement rehab process methodology.<br>• Initial planting of cover crop during times of predicted low rainfall to reduce erosion and rilling.<br>• Appropriate design and Installation of erosion and sediment control structures within final landform.<br>• increased use of tropical pasture grasses in accordance with final landuse.<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required.<br>• Review long range rainfall forecasts and Southern Oscillation Index. | 17 M |
| | Lack of available areas for final rehabilitation during periods of suitable climatic conditions (ie La Nina years) for enhanced rehab establishment. | • Mine scheduling not flexible to provide areas of final landform available to conduct rehabilitation.<br>• Areas not available for direct topsoil placement during clearing.<br>• Areas not available for direct placement of other biological resources (habitat trees, mulch etc) | 15 M | • Shape areas for rehab as soon as practicable.<br>• Periodic meetings with production to determine available areas. | 19 L |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Failure of rehabilitation due to availability & integrity of seed resource. | • Availability of appropriate seed<br>• Poor seed storage<br>• Poor seed handling<br>• Inadequate topsoil / subsoil storage and management<br>• Inadequate recovery of seed bank during clearing<br>• Competition by weeds | 14 M | • Maximise seed harvesting where required.<br>• Plan for future rehabilitation needs where specific seeds are required. (ie supplier).<br>• Storage, maintenance and use of topsoil stockpiles as noted above.<br>• Weed Management Plan.<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required. | 21 L |
| | Damage to rehabilitation | • Lack of rehabilitation methodology leading to rehab damage<br>• Lack of demarcation<br>• Lack of restriction for access<br>• Impact from feral animals<br>• Impact from Bushfire | 10 M | • Demarcate rehab areas where a risk is considered to be high.<br>• Non disturbance areas noted on plans across site and within induction.<br>• Establish non disturbance areas<br>• Utilise disturbance permit system<br>• Induction and training for all employees and contractors<br>• Feral Animal control<br>• Kangaroo Management.<br>• Bushfire Management Plan. | 21 L |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Failure of landform aspect or unit | • Rehab design not in accordance with approved final landform.<br>• Vegetation not in accordance with approved landform. | 12 M | • Construct final landform to approved design<br>• Vegetation established in accordance with approved landform.<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required. | 16 M |
| | Lack of habitat structures for fauna colonisation or use | • Lack of habitat structures recovered during clearing.<br>• Lack of nestboxes for habitat where required.<br>• Lack of shelter for cattle grazing (approved final landuse).<br>• Wildlife corridors not established in accordance with approved final landform | 14 M | • Maximise recovery of habitat structures (timber) during clearing, consider re-use in appropriate biodiversity areas.<br>• Install nestboxes as per advice from ecologist<br>• Establish trees over pasture for cattle shelter.<br>• Establish wildlife corridors<br>• Conduct Rehabilitation Monitoring to assess ongoing trajectory to final landuse. Conduct additional remediation / maintenance if required. | 21 L |
| | Presence of underground workings and infrastructure | • Unsealed underground openings posing risk to safety and or rehab sign off.<br>• Unsealed / open boreholes posing risk to public safety | 9 M | • Seal known open underground workings / entrances / portals / subsidence potholes / presenting risk to public safety.<br>• Seal and remediate boreholes where accessible or located. | 17 M |

| PHASE | CATEGORY | HAZARDS | RISK RATING | CONTROL METHODS | RISK RATING |
|---|---|---|---|---|---|
| | Retained buildings, infrastructure, landform unsafe | • Unsafe infrastructure left on site at closure<br>• Services not disconnected from infrastructure<br>• No record of structures to remain after mine closure.<br>• No post mining development approval for use of existing structures<br>• No structural assessment for retained structures<br>• Lack of demarcation and exclusion areas for hazardous areas | 8 H | • Removal of unrequired infrastructure- implement decommissioning strategy to remove unrequired infrastructure.<br>• Removal of unrequired services.<br>• Seek development approval for ongoing use of remaining infrastructure.<br>• Undertake structural assessment to validate structural integrity and safety of remaining infrastructure.<br>• Review and risk assess identified areas for exclusion and demarcation- install required barriers where required. | 16 M |
| | Impact to Heritage value / Heritage items associated with mine | • Unknown Heritage Items or required conservation. | 9 M | • Historic Heritage items identified during Environmental Assessment Process.<br>• Management in accordance with approved Historic Heritage Management Plan. | 20 L |
| All Phases | Identification of knowledge gaps or additional mitigating controls identified or required | • Completion Criteria not being met or any of the above noted hazards existent after control methods on place. | 12 M | • Develop a "Treatment Plan".<br>• Complete actions in accordance with "Treatment Plan". | 16 M |

Version Tracking

| Version | Version Information | Date |
|---|---|---|
| 1.0 | Original Version | 10/12/2020 |
| 1.1 | Update to include "Treatment Plan" | 29/6/2021 |

**Risk Assessment Completed by:**

Chris Knight, MEM,BSc,(Newcastle) MAIG, JP , Environmental Manager The Bloomfield Group.- Coal Mining and rehabilitation experience + 25 years.

Greg Lamb, BSc (Macquarie) Environmental Advisor- Bloomfield Mine.. –- Mining experience 16 years

Chris Quinn, MEBM,BSc,(Newcastle), Environmental Advisor- Rix's Creek Mine.-Coal mining environmental management experience 10 years.

Dave Holmes, BEnvScMgt (Newcastle), Environmental Officer, Rix's Creek Mine – Coal mining, exploration and rehabilitation experience + 10 years.

**Risk Assessment Facilitated by:**

Danielle Stein, WHS Advisor Rix's Creek Mine.

# Bloomfield Group Risk Matrix

| THE Bloomfield GROUP WE CARE. WE DELIVER. | **Risk Rating Matrix** |
|---|---|

| **Consequence** *(most likely outcome of the event)* | | **Likelihood** *(of the event occurring)* | | | | |
|---|---|---|---|---|---|---|
| | | **A Certain** | **B Probable** | **C Possible** | **D Remote** | **E Improbable** |
| **Rating** | **Incident Outcome/Potential Outcome** | **Will Occur** | **Likely to Occur** | **Could Occur** | **Unlikely to Occur** | **Practically Impossible** |
| **1. Catastrophic** | Multiple Fatalities, Toxic release with ongoing detrimental effects, Huge financial loss | **1 (H)** | **3 (H)** | **5 (H)** | **7 (H)** | **11 (M)** |
| **2. Major** | Fatality / Extensive Injury, Off-site release with no ongoing detrimental effects, Major financial loss | **2 (H)** | **4 (H)** | **8 (H)** | **12 (M)** | **16 (M)** |
| **3. Moderate** | Medical Treatment Injury, Onsite release contained with outside assistance, High financial loss | **6 (H)** | **9 (M)** | **13 (M)** | **17 (M)** | **20 (L)** |
| **4. Minor** | First Aid Injury, Onsite release contained with on-site resources, Medium financial loss | **10 (M)** | **14 (M)** | **18 (L)** | **21 (L)** | **23 (L)** |
| **5. Insignificant** | No injury treatment, Insignificant environmental impact, Low financial loss | **15 (M)** | **19 (L)** | **22 (L)** | **24 (L)** | **25 (L)** |

# Rehabilitation Risk Assessment Workshop- Rix's Creek and Bloomfield Mines- 10 December 2020

## Background from Resources Regulator

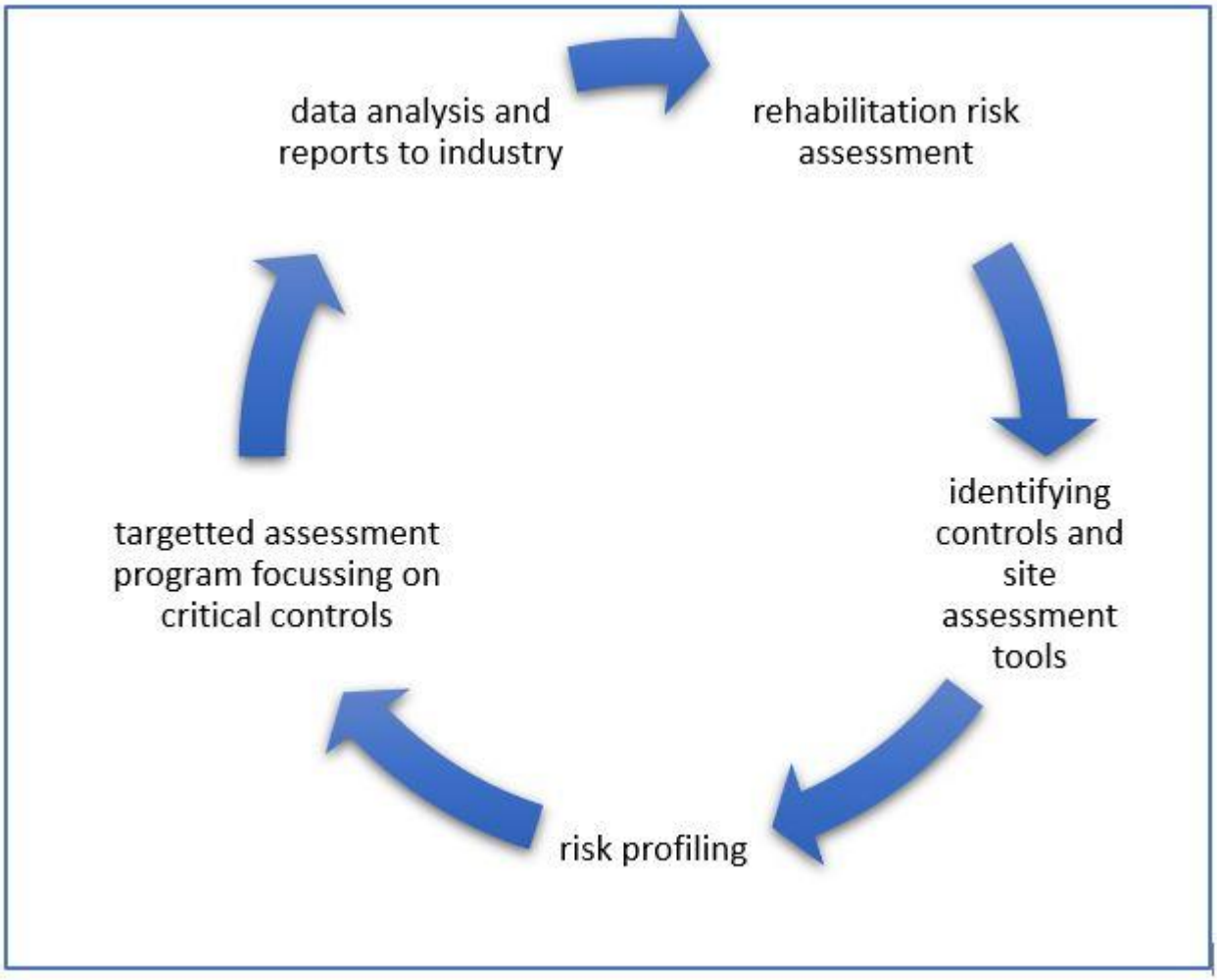
Regulating risks to rehabilitation

The Compliance and enforcement approach 2017 sets out the principles that underpin the NSW Resources Regulator's compliance and enforcement processes and regulatory actions. The Regulator manages the risks to rehabilitation as part of a risk-based and outcomes-focused approach to compliance and enforcement.

The Regulator is committed to a responsive compliance model to manage risks to rehabilitation where:

- compliance and enforcement actions are driven by a risk-based and outcomes-focused approach
- our activities are focused on areas of greatest risk and our strategic priorities
- we use our limited resources effectively by adopting an intelligence-led, risk-based model, and
- we apply a flexible and robust intervention framework to target specific risks.

The Regulator's risk-based intervention comprises the framework depicted. It includes the ongoing identification and verification of risk profiling, incorporating risk control measure verification and targeted assessments focussing on critical risks and the **critical controls** required to mitigate these risks.




## Rehabilitation risk assessment

A risk assessment focusing on rehabilitation and mine closure has been conducted by the Regulator in consultation with industry stakeholders and other government agencies. The bowtie risk assessment method was used to clearly display the links between the potential causes, the preventative and mitigative controls and the consequences of the **material unwanted event** - being where the post-mining conditions and environment are unsuitable to support the final land use(s).

The bowtie assessment addressed the rehabilitation risks during the operational **mining phase** and the **rehabilitation phase**.

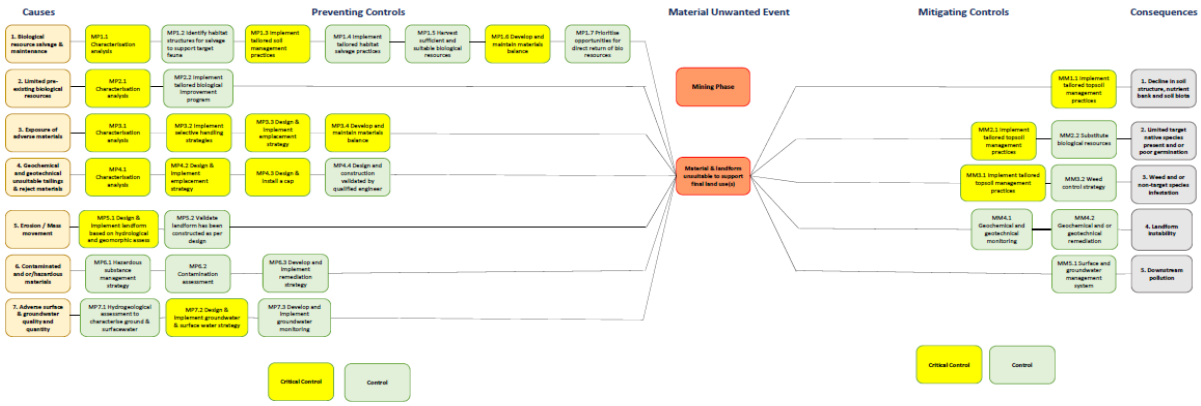
The **mining phase** included:

- land clearing

- active mining operations
- decommissioning following completion of mining
- construction of the final landform.

The key unwanted event during the mining phase is that the material and landform is unsuitable to support the final land use(s). The bowtie risk assessment addressing the mining phase can be viewed here.

Or click on image to enlarge

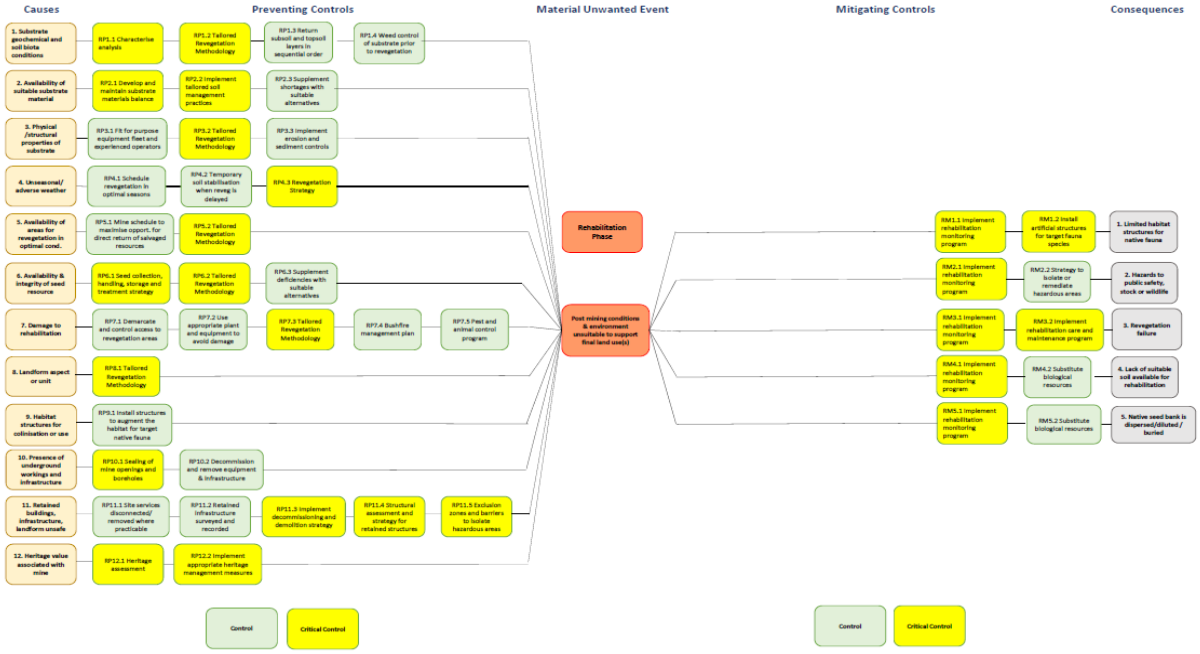



The **rehabilitation phase** included:

- growth medium development
- ecosystem and land use establishment
- ecosystem and land use development to achieve a sustainable, post-mining land use

The key unwanted event during the rehabilitation phase is that the post-mining conditions and environment are unsuitable to support the final land use(s). The bowtie risk assessment addressing the rehabilitation phase can be viewed here.

Or click on image to enlarge




The rehabilitation risk assessment is used by the Regulator to:

- provide guidance to industry on the range of risks associated with the establishment of sustainable mine rehabilitation, which can be considered in site-specific risk assessments when developing and implementing rehabilitation management plans
- inform the identification of preventative and mitigating controls, including controls that are critical to ensuring sustainable rehabilitation
- facilitate the development of site assessment tools and targeted assessment programs (TAPs) focussing on the **critical controls**
- inform the operational rehabilitation reforms
- provide the basis for the development and implementation of a range of rehabilitation guidelines.

## Critical controls

The bowtie rehabilitation risk assessments have been used by the Regulator to identify critical risk controls and assess their effectiveness. A **critical control** is defined as:

***"a control that is crucial to preventing the event or mitigating the consequences of the event. The absence or failure of a critical control would significantly increase the risk despite the existence of the other controls. In addition, a control that prevents more than one unwanted event or mitigates more than one consequence is normally classified as critical."*** (ICMM (International Council on Mining and Metals), 2015, Health and Safety Critical Control Management Good Practice Guide)

The controls that are critical to ensuring sustainable rehabilitation are identified in the bowtie risk assessment diagrams above.

## Targeted assessment program (TAP)

A crucial part of the Regulator's compliance and enforcement strategy involves implementing a scheduled and targeted assessment program for mines. The Regulator has developed targeted assessment programs (TAPs) around the identified critical controls. The TAPs comprise inspections across the mine sites in NSW to ensure measures have been identified and implemented to facilitate sustainable rehabilitation outcomes.

The TAPs proactively assesses how effectively a mine is controlling risks and managing compliance with the preventative and mitigating controls that are critical in planning for and implementing mine site rehabilitation. Each TAP focuses on the implementation of a specific critical control or compliance priority. The Regulator implements the following rehabilitation TAPs:

- decommissioning
- materials and soils management
- landform establishment
- revegetation
- surface and groundwater management
- tailings facilities storage management

Further details on these TAPs can be found here.

## Compliance

## Targeted assessment programs (TAPs)

### Overview

Improving rehabilitation performance across the NSW mining industry is a priority for the NSW Resources Regulator. This involves ensuring compliance with the provisions of the *Mining Act 1992* and the conditions of mining leases.

A crucial part of our compliance and enforcement strategy involves implementing a scheduled and targeted assessment program for mines. We have developed targeted assessment programs (TAPs) around the identified critical controls. The TAPs comprise inspections across the mine sites in NSW to ensure measures have been identified and implemented to facilitate sustainable rehabilitation outcomes.

The TAPs proactively assesses how effectively a mine controls risks and manages compliance with the preventative and mitigating controls that are critical in planning for and implementing mine site rehabilitation. Each TAP focuses on the implementation of a specific critical control or compliance priority. We implement the following rehabilitation TAPs:

- decommissioning
- materials and soils management
- landform establishment
- revegetation
- surface and groundwater management
- tailings storage facilities management

The program involves both documentary and on-site assessment, to draw conclusions and make recommendations for compliance and continual improvement.

### Decommissioning

This TAP comprises a targeted assessment of how a mine site is managing the key processes and activities required as part of the decommissioning of built infrastructure including any assessments or designs. The scope of activities that may be involved in the decommissioning process include the following:

- removal, demolition and or dismantling of buildings and infrastructure
- structural works associated with making safe those buildings and infrastructure to be retained as part of the final land use
- heritage assessment and management
- sealings of mine openings and boreholes and
- identification and remediation of hazardous areas.

The decommissioning process may occur after the end of mining or progressively over the life of an operation. It is recognised that this information may be conceptual during the initial stages of an operation.

The objectives of this targeted assessment include:

- ensuring the range of risks and opportunities associated with demolition and decommissioning are identified and appropriate controls are in place to facilitate sustainable rehabilitation outcomes
- ensuring the effective environmental management, including removal, of any contaminated materials and hazardous items (for example radioactive density gauges) or materials (such as asbestos)
- ensuring the effective decommissioning, removal and/or augmentation of the mine water management system including any dams prescribed by the *Dams Safety Act 2015*
- identifying the potential timing of decommissioning and demolition activities
- ensuring that obligations under the *Heritage Act 1977* are identified and met by the titleholder
- underground mine workings are rendered safe and sealed to ensure public safety
- ensuring the substrate following decommissioning is suitable to support the proposed revegetation outcome (e.g. native or agricultural rehabilitation)
- where buildings and infrastructure are to be retained as part of the post-mining land use, measures are implemented to ensure they are fit for purpose and risks to public safety are minimised
- ensuring control measures are validated via monitoring, inspections are recorded to enable risks to be appropriately addressed

- ensuring the mine site has engaged the appropriate skills and experience in relation to decommissioning
- ensuring decommissioning and rehabilitation is integrated into mine planning systems.

The specific need for mine sites to implement the above controls will be based on the risks, the scope of activities being undertaken at the site and any regulatory requirements or agency approvals required for decommissioning and/or demolishing infrastructure.

### Material and soil management

This TAP comprises a targeted assessment of how a mine site is managing materials and soils to achieve sustainable rehabilitation outcomes. This includes how a mine is managing any potential soil or material deficits. Further details are provided in the *Guidance note. PDF, 215.11 KB*

The objectives of this targeted assessment include:

- ensuring the range of risks associated with materials and soils are identified and appropriate controls are in place to facilitate sustainable rehabilitation outcomes
- identifying potential constraints/opportunities to maximise the salvage of soil resources for use in rehabilitation
- ensuring an inventory of soil resources and materials (e.g. inert capping material, etc) has been defined to ensure the needs for rehabilitation of the final land use can be met
- ensuring the selective handling and management of mine materials (e.g. overburden, tailings, reject materials etc.) to address potential geochemical and geotechnical constraints for rehabilitation
- ensuring the substrate is suitable to support proposed revegetation outcome (e.g. native or agricultural rehabilitation)
- ensuring control measures are validated via monitoring, inspections are recorded to enable risks to be appropriately addressed
- ensuring the mine site has engaged the appropriate skills and experience in relation to materials and soils management
- ensuring rehabilitation is integrated into mine planning systems

- ensuring techniques and measures have been developed and implemented to salvage, protect and maintain biological resources (e.g. topsoil, subsoil, seed bank, plant material, logs, hollows etc.) for use in rehabilitation.

  The specific need for mine sites to implement the above controls will be based on the risks as well as scope of activities being undertaken at the site. For example, where there are no more areas proposed to be cleared as part of future mining activities, this aspect of the assessment will not be relevant.

### Landform establishment

This TAP comprises a targeted assessment of how a mine site is establishing the final approved landform to achieve sustainable rehabilitation outcomes.

The objectives of this targeted assessment include:

- ensuring the range of risks associated with establishing the approved final landform are identified and appropriate controls are in place to facilitate sustainable rehabilitation outcomes
- identifying potential constraints and opportunities to achieve the approved final landform, including geotechnical/geochemical issues, incorporation of surrounding landforms (for example macro and micro-relief) and visual amenity
- ensuring the location, treatment and or rehabilitation of water management infrastructure is integrated into the final landform
- ensuring design and management measures to construct the final landform over reject emplacement areas and tailings dams will be to a condition/capability that supports the final land use
- identifying the key design features for final voids, highwalls and low walls and ensuring the design minimises impacts to public safety and reduces the sterilisation of land available for future final land uses
- ensuring the construction of any creek or river diversion works that will form part of the final landform will be to a condition that is sustainable in the long term
- ensuring control measures are validated via monitoring, inspections are recorded to enable risks to be appropriately addressed
- ensuring the mine site has engaged the appropriate skills and experience in relation to landform establishment,

- ensuring landform establishment and rehabilitation are integrated into mine planning systems,
- ensuring techniques and measures have been developed and implemented to achieve the final landform.

### Revegetation

This TAP comprises a targeted assessment of how a mine site is managing revegetation to achieve sustainable rehabilitation outcomes.

The objectives of this targeted assessment include:

- ensuring the range of risks associated with growth medium development and revegetation are identified and appropriate controls are in place to facilitate sustainable rehabilitation outcomes
- identifying potential constraints and opportunities to achieve the approved revegetation outcomes
- identifying any studies required to achieve the intended revegetation outcome
- ensuring control measures are validated via monitoring, inspections are recorded to enable risks to be appropriately addressed
- ensuring the mine site has engaged the appropriate skills and experience in relation to revegetation
- ensuring revegetation and rehabilitation are integrated into mine planning systems
- ensuring techniques and measures have been developed and implemented to achieve the intended revegetation outcome (e.g. native ecosystem and or agricultural land use).

### Surface and groundwater management

This TAP comprises a targeted assessment of how a mine site is managing surface and groundwater to achieve sustainable rehabilitation outcomes.

The objectives of this targeted assessment include:

- ensuring the range of risks associated with surface and groundwater management and ongoing monitoring are identified and appropriate controls are in place to facilitate sustainable rehabilitation outcomes
- identifying any studies required for the detailed design of creek construction/river diversion works, including geomorphological and hydraulic modelling and aquatic ecological assessments
- identifying any studies required for the detailed design of final landforms, including geomorphological and hydraulic modelling
- ensuring the implementation of any specific measures required for the future management of groundwater accumulation in the underground workings (which may include measures to be implemented to minimise environmental impacts associated with potential future discharges from the underground workings)
- ensuring required studies are undertaken including (but not limited to):
  - final void water balance including groundwater modelling to determine the likely final void water level
  - water quality assessments including geochemical studies required to inform management of potential pollution impacts
  - geotechnical studies required to determine what stabilisation and public safety measures will need to be incorporated into the final design
- ensuring future water licensing requirements for water retained within the final void(s) following mine closure are addressed
- ensuring control measures are validated via monitoring, inspections or recorded to enable risks to be appropriately addressed
- ensuring the mine site has engaged the appropriate skills and experience in relation to surface and groundwater management
- ensuring surface and groundwater management are integrated into mine planning systems
- ensuring techniques and measures have been developed and implemented to achieve the final land use.

## Tailings storage facilities management

The Tailings Compliance Priority Project in 2018 identified uncertainties and knowledge gaps in relation to the management of tailings storage facilities. We drew on the insights gained from this project and other assessments to develop a program to ensure industry has a clear understanding of obligations under the *Work Health and Safety Act 2011*, the *Work Health & Safety (Mines & Petroleum) Act 2013* and the *Mining Act 1992*.

A planned inspection program was undertaken in 2019 and 2020 to assess how mine operators were identifying and managing risks associated with hazards that affect worker safety (WHS Act considerations) and the environment (Mining Act considerations). Further details regarding this program can be accessed here.

## Assessment arrangements

TAPs are managed in three stages:

**Stage 1: pre-arrival arrangements, review and information exchange**

A week or two before our arrival, participant sites will receive notification of the forthcoming TAP. This may include a request for specified management plans (such as the rehabilitation management plan), records, monitoring data and other relevant supporting documentation (such as site-specific rehabilitation risk assessments). The mine will also be notified of:

- assessment visit schedules
- assessment team composition
- focus areas for the assessment (eg a specific critical control or compliance priority)
- resources required by the assessment team, including the necessary site personnel (eg technical experts) that will be required to be interviewed and participate in the site inspection
- tools to be used in the assessment

**Stage 2: on-site assessment**

This site visit will be looking for a demonstration that:

- the range of risks to rehabilitation that have been identified

- the mine site has implemented appropriate systems, procedures and controls to facilitate sustainable rehabilitation outcomes
- systems, procedures and controls are functional in practice and effective at controlling the risks
- the workforce is competent and confident about the risk controls relevant to their area and level of responsibility
- based on monitoring, the effectiveness of controls are evaluated and the risks are reviewed to facilitate continual improvement

**Stage 3: Findings, recommendations, follow-up**

The assessment team will conclude whether, and to what extent, the mine site has demonstrated:

- compliance with legislative requirements
- how relevant components of the rehabilitation management system comply with the minimum legislative requirements
- how well the rehabilitation management and monitoring plans are being implemented
- satisfactory performance in achieving sustainable rehabilitation outcomes on the ground.

The assessment team will debrief site management on their preliminary findings at the completion of the site assessment. An assessment finding letter and/or a notice under section 240 of the *Mining Act 1992* may also be issued to the mine following completion of the site assessment.

A report providing an overview of the findings and recommendations of each of the completed TAPs will be prepared and published on our website as a learning resource.

A follow-up site inspection may also be conducted to:

- verify the progress made by the mine on actioning the recommendations outlined at the initial debriefing
- verify progress made on addressing any matters outlined in any assessment finding letter
- verify compliance with any directions outlined in a section 240 notice.

## What you should do

Review your strategy and capacity to control risks and managing compliance with the preventative and mitigating controls that are critical in planning for and implementing mine site rehabilitation. Sites should ensure measures have been identified and implemented to facilitate sustainable rehabilitation outcomes and that practices are in line with:

- requirements under the *Mining Act 1992*
- conditions of the mining lease(s)
- carrying out rehabilitation progressively, that is, as soon as reasonably practicable following disturbance
- commitments outlined in the rehabilitation management plan/mining operations plan
- achieving the approved rehabilitation objectives, rehabilitation completion criteria, final landform and final landuse(s)
- available guidance material.

# Definitions and Acronyms- Rehabilitation Risk Assessment 10 December 2020.

**Cause**
A brief statement of the reason for an unwanted event (other than the failure of a control).

**Consequence**
A statement describing the final impact that could occur from the material unwanted event (MUE). It is usual to consider this in terms of the maximum foreseeable loss.

**Control**
An act, object (engineered) or system (combination of act and object) intended to prevent or mitigate an unwanted event.

**Critical control**
A control that is crucial to preventing the event or mitigating the consequences of the event. The absence or failure of a critical control would significantly increase the risk despite the existence of the other controls. In addition, a control that prevents more than one unwanted event or mitigates more than one consequence is normally classified as critical.

**Critical control management (CCM)**
A process of managing the risk of MUEs that involves a systematic approach to ensure critical controls are in place and effective.

**Hazard**
Something with the potential for harm. In the context of people, assets or the environment, a hazard is typically any energy source that, if released in an unplanned way, can cause damage.

**Material unwanted event (MUE)**
An unwanted event where the potential or real consequence exceeds a threshold defined by the company as warranting the highest level of attention (eg a high-level health or safety impact).

**Mitigating control**
A control that eliminates or reduces the consequences of the unwanted event.

**Preventing control**
A control that reduces the likelihood of an unwanted event occurring.

**Risk**
The chance of something happening that will have an impact on objectives. It is usually measured in terms of event likelihood and consequences.

**Unwanted event**
A description of a situation where the hazard has or could possibly be released in an unplanned way, including a description of the consequences.

**Verification activities**
The process of checking the extent to which the performance requirements set for a critical control are being met in practice. Company health and safety management systems might use a variety of terms for “verification” activities. Common terms include audit, review, monitoring and active monitoring.

Source *ICCM: 2015; Health and safety critical control management Good practice guide.*

# *APPENDIX 4*

# *DMR REHABILITATION CLEARANCE*

30th August 2004.

The General Manager
Bloomfield Colliery Pty Ltd
P.O. Box 4
EAST MAITLAND
NSW 2323

MINERAL RESOURCES NEW SOUTH WALES

NSW DEPARTMENT OF MINERAL RESOURCES
Level 1, 1 Civic Avenue
(P.O. Box 51), Singleton, NSW 2330, Australia
INSPECTORATE: Phone (02) 6572 1899 · Fax (02) 6572 1201
GEOLOGY: Phone (02) 6572 4200 · Fax (02) 6572 1201
MINING TITLES: Phone (02) 6572 4200 · Fax (02) 6572 1201
www.minerals.nsw.gov.au
DX 7071

File No: L89/0085

ABN 51 734 124 190-003
A BRANCH OF THE NEW SOUTH WALES
DEPARTMENT OF PRIMARY INDUSTRIES

Dear Sir,

***FINAL REHABILITATION CLEARANCE BLOOMFIELD OPEN CUT COAL MINE K CUT SOUTH OF STONY PINCH RESERVOIR***

On the 6th August 2003 Scott Brooks Environmental Officer, from the Department of Mineral Resources together with John Hindmarsh conducted a rehabilitation inspection at the Bloomfield O/C Mine on an area known as K Cut South of Stony Pinch Reservoir. The purpose of this inspection was to determine if the condition of the rehabilitation had achieved standards to satisfy the rehabilitation criteria outlined in the Departments Rehabilitation and Mine Closure Policy EDP 05.

An assessment of the inspection indicates the standard of the works reviewed to be satisfactory. All-9 points of assessment in the policy were considered and found to be acceptable to contemporary Departmental standards.

We suggest this be recognised by the areas permanently being indicated on all plans in correspondence with the Department. All plans should show this area to be rehabilitated to an accepted standard. This would include the next AEMR report and the MOP to be produced shortly. It is possible to change the Mining Lease or Colliery Holding Boundary to reflect this acceptance. However both involve considerable administrative effort, and given Bloomfield's unique Mining Lease arraignment, would mean very little. We understand the area will remain under Bloomfield's management so retaining some of the provisions of the Mining Lease will be beneficial.

Please find enclosed, for your records, the DMR Rehabilitation Assessment to support this letter of rehabilitation acceptance.

For clarification or further information on any matter, please contact Scott Brooks at the Department on (02) 6572 1899.

Yours faithfully

**GREG SUMMERHAYES**
**Principal Environmental Officer**
**Environmental Sustainability Division.**

# DMR Rehabilitation Assessment

Bloomfield Area K cut south of the Stony Pinch reservoir was assessed against the Departments Policy on Rehabilitation and Mine Closure. This assessment was carried out on the 6th August 2003. All 9 points of assessment in the policy were considered and found to be acceptable to contemporary Departmental standards. Attached to this assessment is Bloomfield's own supporting documentation.

The current relinquishment requirements are as follows:

***Be based on mine closure criteria and rehabilitation outcomes developed through stakeholder consultation;***
The operation at Bloomfield is not covered by any development consent requirements under the EP&A Act. There is no Closure Plan for the site although one is expected shortly.
A landowner acceptance letter from Ashtonfield's Pty Ltd is attached.
The landuse of the reviewed area is compatible with the Cessnock LEP.

***Be suitable for an agreed subsequent land use as far as possible compatible with the surrounding land fabric and land use requirements;***
This land is required to be rehabilitated and returned to natural bush. The landform all has slopes less than 10 degrees and is free draining. This is consistent with the surrounding land. Coverage by surface rocks is minimal and the vegetation species chosen can be expected to mature to a similar species mix to the surrounding land in forested areas. The open grass areas has a grass cover equivalent to nearby grazing land to the west, and will continue to do so, if grazed. If the area is not grazed, trees can be expected to invade and become dominant on the site. This is a similar response to ungrazed land in the Maitland area.

***Be sustainable in terms of that land use;***
The eastern end of the area has been rehabilitated for a long time (15 years) with no signs of significant erosion present. Biosolids have been used as a soil ameliorant over much of the area. This product can be expected to assist the pasture growth for some time without the need for supplementary fertilisers.

***Address heritage issues;***
There are no significant heritage issues on this site

***Have stable and permanent landforms, these may include voids, pits and water-bodies providing that they are part of the accepted final outcome;***
The site appeared stable with the following relevant comments:

There was one small dam on the site that held water, had a stable dam wall and spillway and would provide water to stock or wildlife.
All long slopes were treated with contour banks and were stable.
There were no major drainage lines on the site.

A small area of land was found to be bare and this has been remediated.
There was a moderately severe infestation of Pampas Grass on the site. These have been sprayed and any regrowth is to be managed to the satisfaction of the Rural Lands Protection Board.

***Have landforms, soils, hydrology, and ecosystems with maintenance needs no greater than those of surrounding land;***
To date the area has been managed with the use of slashers and the periodic use of biosolids. This has produced a balanced mix of grass and tree species. This will produce adequate species diversity to provide for persistent vegetative cover for the long term on this site. Older (15years) rehabilitation in the area assessed demonstrates that an adequate cover will persist on this style of rehabilitation. It is expected that Bloomfield will continue to maintain the site. There are no soils or hydrology issues that will need any additional maintenance.

***Securely and safely contain waste substances that have the potential to affect land use or result in pollution;***
There are no known waste substances on the subject land

***Not present a hazard to persons, stock or native fauna;***
There is only one shallow dam on the site that will not present a hazard to stock. There are a small number of benign small gullies on the site. These would not be a safety hazard.

***Have minimal environmental effect outside the disturbed area;***
Most the area drains to the east through the small dam mentioned above. There is no evidence of recent sediment deposition in this dam. The pH and EC. of this dam are 7.8 and 200um/cm respectively and are within the range of values expected in the Maitland district. The site is not visual from outside the mine site. There are no known contaminants on this site. This area has minimal runoff and would produce little dust. It is of similar capability (Class VI) to its surrounding land.

**Supporting Information and References**

Enclosed in Appendix A is plan outlining the area inspected for final clearance,
Enclosed in Appendix B Landholder acceptance from Ashtonfields Pty Ltd.
Enclosed in Appendix C are the Transect results,
Enclosed in Appendix D is a suite of photos together with relevant comments.

The current land manager is Bloomfield Collieries. They plan to maintain management of the site for the foreseeable future.

**Security Deposit Status**

There is no direct security deposit held for Bloomfield Collieries. There is a link to the security held for Rix's Creek mine and this is to remain unchanged.

**Conclusion**
The areas indicated on the plan in Appendix A are accepted as achieving a satisfactory standard of rehabilitation. As with any land this land will continue to require regular maintenance and be grazed using responsible stocking rates if applicable.

Scott Brooks