



## Bloomfield Colliery

Project Approval No. 07\_0087

### **Extension of the Project Approval Area for out-of-pit overburden emplacement and rehabilitation, alternative haul road and powerline relocation.**

Application for a Modification to the Minister's Approval  
Pursuant to Section 75W of the *Environmental  
Planning and Assessment Act 1979*

By: Bloomfield Collieries Pty Limited

Date: September 2010

Prepared by:



Bloomfield Colliery

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### **DOCUMENT CONTROL**

<b>Reference</b>	<b>Revision Status</b>	<b>Release Date</b>	<b>Reviewed</b>
Bloomfield Mine_75W Mod1_FINAL4	Rev 7	17 September 2010	SB/KH/NC

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## STATEMENT OF VALIDITY

Environment Assessment prepared under Part 3A Section 75W of the *Environmental Planning and Assessment Act 1979* and Regulations (NSW).

This report has been prepared  
by:

Nicole Croker  
B. App Sc (EAM) (Hons)  
Director  
Business Environment Pty Ltd

This report relates to:

Extension of the Project Approval Area for out-of-pit  
overburden emplacement and rehabilitation, alternative  
haul road and powerline relocation.  
Application for Modification to the Minister's Approval  
Pursuant to Section 75W of the *Environmental Planning  
and Assessment Act 1979*.

Applicant's Name:

Bloomfield Collieries Pty Limited

Property Description:

Bloomfield Colliery - North of John Renshaw Drive, Buttai  
& east of Buchanan Road, Buchanan, 20 km north-west of  
Newcastle.

Refer Report for detailed property description.

Declaration:

This Statement has been prepared in accordance with:

- Part 3A of the *Environmental Planning and Assessment Act 1979* and Regulations (NSW); and
- the Director General's requirements dated 14 December 2009 in relation to this environmental assessment.

This Statement contains all available information that is  
relevant to the environmental assessment of the  
modification to which the Statement relates. To the best  
of my knowledge, the information contained in this  
document is neither false nor misleading.

Signed:



Name:

Nicole Croker

Date:

10 September 2010

## EXECUTIVE SUMMARY

Bloomfield Colliery is an open cut mining operation located approximately 20 kilometres north-west of Newcastle, within the Cessnock Local Government Area. In September 2009, Bloomfield Colliery was granted approval by the NSW Minister for Planning to complete its twelve year mining and rehabilitation program ('The Bloomfield Coal Project'). Prior to approval being granted, open cut and underground mining had occurred at various locations on the site for approximately 175 years.

This Environmental Assessment Report has been prepared to accompany an application by Bloomfield Collieries Pty Limited (Bloomfield) to modify the approval for the Bloomfield Coal Project (07\_0087) pursuant to Section 75W of the *Environmental Planning and Assessment Act, 1979* (EP&A Act 1979).

This modification application seeks planning approval for the following development ('Modification Activities'):

- Extension of the approved Project Area by 259 hectares to permit rehabilitation works within Mining Lease CCL 761;
- Upgrade and use of Wattle Tree Drive as an alternative haul route for coal being transported to the washery from the northern pit areas;
- Additional overburden emplacement (1.2 million bank cubic metres) and rehabilitation adjacent to the existing Save-A-Mile haul road;
- Additional 50,000 bank cubic metres overburden emplacement, out-of-pit landform reshaping and rehabilitation in a disturbed northern area;
- Additional 100,000 bank cubic metres overburden emplacement, out-of-pit landform reshaping and rehabilitation in the south-east of the mine site (previous 'K Cut'); and
- Relocation of an existing powerline and associated corridor, to enable the continuation of mining, together with some clearing for an associated infrastructure area.

All of the development proposed above is to be carried out on land owned by Ashtonfields Pty Limited.

This Environmental Assessment describes the Modification Activities in detail and includes a risk assessment to identify key environmental issues. The requirements of the Director-General for Planning as well as consultation with other government authorities and the Bloomfield Community Consultative Committee were included in the consideration of key environmental issues.

Key environmental issues in respect of the Modification Activities are:

- Rehabilitation and final landform;

- Biodiversity;
- Air quality;
- Greenhouse gas emissions;
- Noise;
- Heritage; and
- Visual aspects.

Detailed studies of these key environmental issues identified that there are minimal environmental impacts associated with the proposed Modification Activities. Environmental impacts can be avoided, mitigated, controlled or managed through the implementation of existing Bloomfield environmental management procedures or additional procedures that have been identified for these particular activities.

The Modification Activities will improve rehabilitation and final landform outcomes for the Bloomfield site, improve mine safety by reducing conflict between coal haul trucks and overburden dump trucks and reduce fuel usage in keeping with Bloomfield's Energy Savings Action Plan.

No heritage, water, air quality or visual impacts are predicted, with a visual improvement predicted for the northern haul road area after revegetation of the batters.

Potential short-term and minor noise impacts from south-eastern works will be minimised by only operating during the day with specific equipment, or with specific controls for evening or morning shoulder period operations. The removal of an area of Lower Hunter Spotted Gum Ironbark Forest Endangered Ecological Community (EEC) for the proposed powerline is not considered to impact on the viability of the EEC in the local area.

The proposed modifications to the Bloomfield Approval are required to ensure the continued safe and efficient operation of the Bloomfield Colliery. Alternatives to these modifications were considered, and the selected designs and methods are considered the most efficient and effective. The modifications allowing minor out-of-pit emplacement and landform reshaping will enable previously disturbed areas to be rehabilitated to current industry standards.

**Table 1** provides the Director-General's requirements for this environmental assessment and indicates where the requirements are addressed in the report.

**Table 1 Summary of Director-General’s Requirements in this Report**

<b>Item No.</b>	<b>Item required by Director-General</b>	<b>Section addressed in this Report</b>
1	An Executive Summary	Summary
2	A detailed description of: <ul style="list-style-type: none"> <li>existing and approved operations and infrastructure on site</li> <li>existing environmental management and monitoring regime on site</li> </ul>	1.2 3.1
3	A detailed description of the modification including: <ul style="list-style-type: none"> <li>the need for the modification</li> <li>alternatives considered</li> <li>likely interactions between existing and approved mining operations</li> <li>likely staging of the modification</li> <li>plans of any proposed construction works</li> </ul>	8 2.8 2 2 Figures 3,7
4	A risk assessment of the potential environmental impacts of the modification, identifying the key issues for further assessment	5.1
5	A detailed assessment of the key issues, and any other significant issues identified in the risk assessment, which includes: <ul style="list-style-type: none"> <li>A description of the existing environment, using sufficient baseline data;</li> <li>An assessment of the potential impacts of all stages of the modification including any cumulative impacts associated with the concurrent operation of the modification with any other existing or approved mining operations in the region, taking into consideration any relevant policies, guidelines, plans and statutory provisions; and</li> <li>A description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts of the modification, including detailed contingency plans for managing any significant risks to the environment;</li> </ul>	6 6 6, 7.2
6	A statement of commitments, outlining all the proposed environmental management and monitoring measures	7.2
7	A conclusion justifying the modification on economic, social and environmental grounds, taking into consideration whether the modification is consistent with the objects of the EP&A Act 1979	8
8	A signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading	After Table of Contents

Key issues:		
10	Rehabilitation and Final Landform – include a justification of the revised final landform; how the site would be progressively rehabilitated; and the measures which would be put in place for the long term protection and management of the site	6.2
11	Biodiversity – including: <ul style="list-style-type: none"> <li>• Accurate predictions of any vegetation clearing on site</li> <li>• A detailed assessment of the potential impacts of the project on any terrestrial and aquatic threatened species, populations, ecological communities or their habitats; and</li> <li>• A detailed description of the measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long term</li> </ul>	6.3, App B
12	Air Quality	6.4, App C
13	Noise – including operational and construction noise	6.6, App E
14	Greenhouse Gases	6.5
15	Heritage – both Aboriginal and non-Aboriginal	6.7, App D
16	Visual	6.8
17	References – a list of guidelines, policies and plans was provided that may be of relevance	9
18	Consultation – During the preparation of the EA you should consult with the relevant local, State or Commonwealth government authorities, services providers, community groups or affected landowners. The consultation process and issues raised must be described in the Environmental Assessment, In particular you should consult with: <ul style="list-style-type: none"> <li>• Department of Environment, Climate Change and Water;</li> <li>• NSW Department of Water (within DECCW);</li> <li>• Department of Industry and Investment;</li> <li>• Cessnock City Council;</li> <li>• Maitland City Council.</li> </ul>	4.4

# 1. Introduction

## 1.1 Purpose of this Report

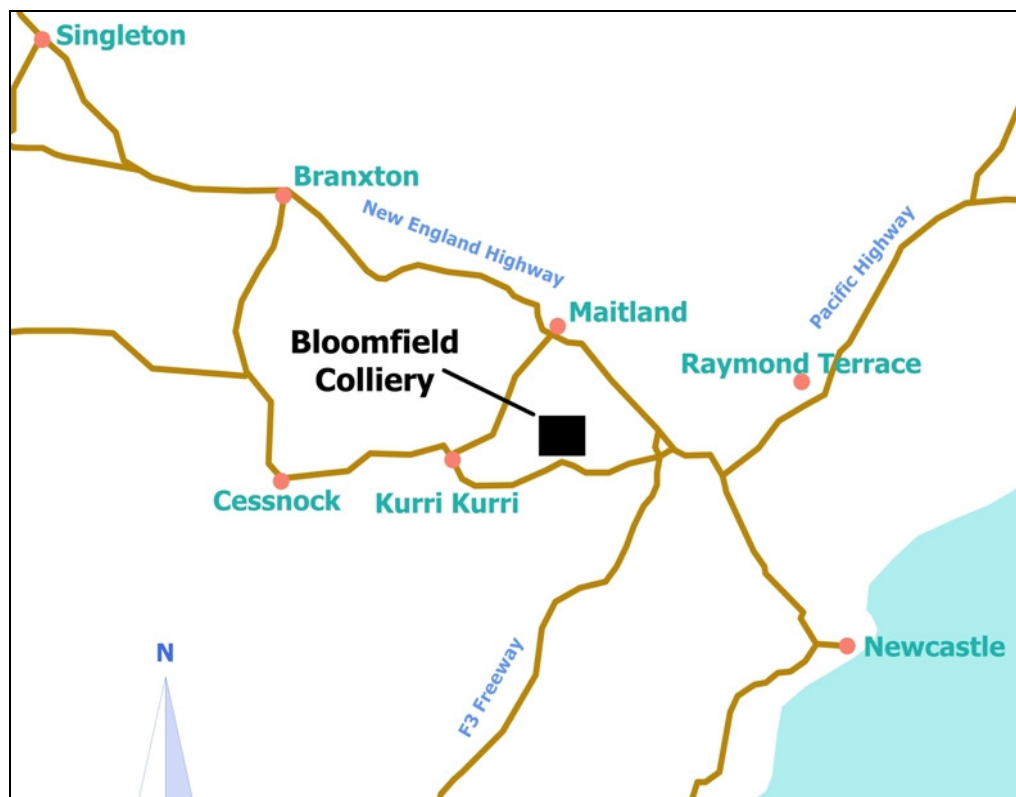
This Environmental Assessment Report has been prepared to accompany an application by Bloomfield Collieries Pty Limited (Bloomfield) to modify the Part 3A project approval for the Bloomfield Coal Project (07\_0087) (Part 3A Approval) pursuant to section 75W of the *Environmental Planning and Assessment Act, 1979* (EP&A Act 1979).

## 1.2 Background – Bloomfield Coal Project Approval

Bloomfield Colliery is an open cut mining operation located approximately 20 kilometres north-west of Newcastle, within the Cessnock Local Government Area.

**Figure 1** provides the location of the Colliery. Mining has occurred on the Colliery site for approximately 175 years.

Approval for the Bloomfield Colliery was granted by the Minister for Planning on 3 September 2009. The Approval permits the staged completion of mining and progressive rehabilitation of the mine over a 12 year period (until 2021).



**Figure 1** Location of Bloomfield Colliery

The Approval covers an area of approximately 317 hectares, of which 299 hectares (95%) has previously been disturbed by mining-related activities. All land within the approval area is owned by Ashtonfields Pty Limited ('Ashtonfields').

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 of approximately 14 million tonnes of ROM coal at a maximum extraction rate of up to 1.3 million tonnes per annum (mtpa). The approved mine consists of the extension of the existing S Cut and Creek Cut open mine pits by multi-seam truck and excavator or face shovel methods. Mining is undertaken in sequential blocks, with progressive overburden emplacement and coal removal by front end loader for transportation by truck to the ROM coal stockpiles at the washery.

**Figure 2** shows the approved mine area and activities, including the Bloomfield Mining Lease boundary (CCL 761 is currently in the process of being renewed), approved Project Area boundary, open cut pits, haul road, access road and workshop, as well as the location of the washery approved by the Donaldson Coal approval (05\_0139).

Other mining infrastructure and activities at the Colliery were approved under Project Approval 05\_0139 for the Abel Underground Mine. Project Approval 05\_0139 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 washery 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 washery, are used to process coal from Bloomfield, Donaldson and other mine sources.

### **1.3 The Applicant**

The Applicant for the Modification Application is Bloomfield Collieries Pty Limited, which forms part of The Bloomfield Group of companies. Bloomfield is an Australian-owned family company.





## 1.4 Overview of Proposed Modifications

It is proposed to extend the approved Project Area to allow for some minor physical alterations and rehabilitation works to the mine. The proposed extension of 259 hectares is in addition to the approved 317 hectare Project Area. The additional area is predominantly land that has been mined and heavily disturbed by historic mining activities. No additional winning of coal is proposed in this extension area.

The other Modification Activities are summarised as follows:

- Upgrade and use of Wattle Tree Drive as an alternative haul route (location marked as 'A' on **Figure 2**).
- Additional overburden emplacement and rehabilitation - east of Save a Mile Haul Road (location marked as 'B' on **Figure 2**);
- Additional out-of-pit landform reshaping and rehabilitation – northern and south-eastern areas (locations marked as 'C' and 'E' on **Figure 2**); and
- 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 (location marked as 'D' on **Figure 2**).

A detailed description of the Modification Activities, including the extension of the approved Project Area, is provided in **Section 2**. These modifications are required to improve operational efficiencies and enhance rehabilitation outcomes across the site.

The Modification Activities will not result in any change to the approved volumes of coal or overburden removed, the equipment used, hours of operation, employment numbers or approved life of the mine.

## 2. Description of the Proposed Modifications

### 2.1 Introduction

This Chapter describes in detail the Modification Activities to be carried out at the approved Bloomfield Mine. It also describes any likely interactions between approved development and the Modification Activities. The following chapters provide details of any required mitigation measures and any potential environmental impacts or risks associated with each of the described modifications.

### 2.2 Extension of the Approved Project Area

To carry out the Modification Activities within a mining lease, an extension of the approved Project Area is required.

The existing Project Area under the original Part 3A application (Business Environment, 2008) only includes those areas of the existing Bloomfield Colliery site that are specifically required for active mining and other activities associated with the winning of coal. Rehabilitated areas that were within the existing mining lease and adjacent to the open cut pits are not included.

Section 6 of Schedule 1 of the *Mining Amendment Act 2008* (soon to commence) will make it an offence to *"carry out a mining purpose specified for the purposes of this section except in accordance with an authorisation that is in force in respect of the land where the purpose is carried out."* The mining purposes specified under section 6 include the removal, stockpiling or depositing of overburden.

We note however that under section 65 of the EP&A Act, a mining lease (being the "authorisation" required by Section 6 quoted above) must not be granted unless an appropriate development consent is in force over the land.

As referred to above, the Modification Activities involve extensive overburden emplacement and rehabilitation activities. Accordingly, Bloomfield seeks planning approval for Modification Activities in the proposed extension area to enable it to obtain a mining lease once the relevant amendments to the Mining Act commence.

Bloomfield seeks to extend the boundary of the Project Area to include all areas of previous rehabilitation associated with its S Cut and Creek Cut operations, including those areas requiring improvement works as described in the following sections. Only those activities as described following and associated with the mining operation will be undertaken within this extended area.

**Figure 2** shows the proposed modification to the Project Area boundary.



### 2.3 Development of Wattle Tree Drive as an Alternative Haul Route (Area A)

A minor road between the northern open cut pit (Creek Cut) and the north-eastern end of the haul road leading to the washery stockpiles has been in existence for some years. Bloomfield proposes to upgrade this road (called "Wattle Tree Drive" on site) so that it can be utilised as an alternative haul road and provide a safe access between the northern pit and the washery stockpiles. The indicative location of this alternative haul route is shown on **Figure 3** and is approximately 750 metres in length.

Use of this alternative route will greatly reduce haulage distances during times when coal is being extracted from the northern areas of S Cut and Creek Cut. The use of this road to haul coal will also improve the level of safety for trucks operating within the open cut area by reducing interaction between coal haul trucks and rear dump trucks working in the cut.

Wattle Tree Drive will be constructed to meet current standards and design requirements for haul roads as specified by the Department of Industry and Infrastructure. Some cut and fill in addition to slope stabilisation work will be required to upgrade the road. The southern and northern batters will be shaped and stabilised as part of the construction works and revegetated. Construction is expected to take approximately six to twelve weeks.

**Photograph 1** shows the view looking upwards towards the current route, showing the northern batter of the road that will be reshaped and revegetated.



**Photograph 1**  
View southwards towards Wattle Tree Drive (open grassed area).





0 200 m

LEGEND	
	07-0087 Approval Area
	Proposed Project Area
	Wattle Tree Modification Boundary
	Proposed Contours (2m)
	Existing Contours (10m)

**FIGURE 3**  
**WATTLE TREE DRIVE DEVELOPMENT**  
**75W MODIFICATION APPLICATION**  
**BLOOMFIELD COLLIERY**  
**MAY 2010**



## 2.4 Additional Overburden Emplacement and Rehabilitation - East of Save-a-Mile Highway (Area B)

An out-of-pit area to the east of the approved haul road (called "Save-a-Mile Highway" on site) has been identified as an area that is capable of receiving an amount of overburden to assist with out-of-pit overburden management, as well as improving the overall site final landform shaping and revegetation. The area has been rehabilitated in the past but is considered not to be to current rehabilitation standards.

The area is approximately 14.2 hectares in size and shown on **Photograph 2**. To maximise operational efficiencies and improve final land shaping and vegetation cover in this area, Bloomfield proposes to place approximately 1.2 million bank cubic metres (bcm's) of overburden on this area prior to reshaping and revegetation to current rehabilitation standards. Works would occur over approximately twelve months during the early stages of the approved "Stage 2" of mining.

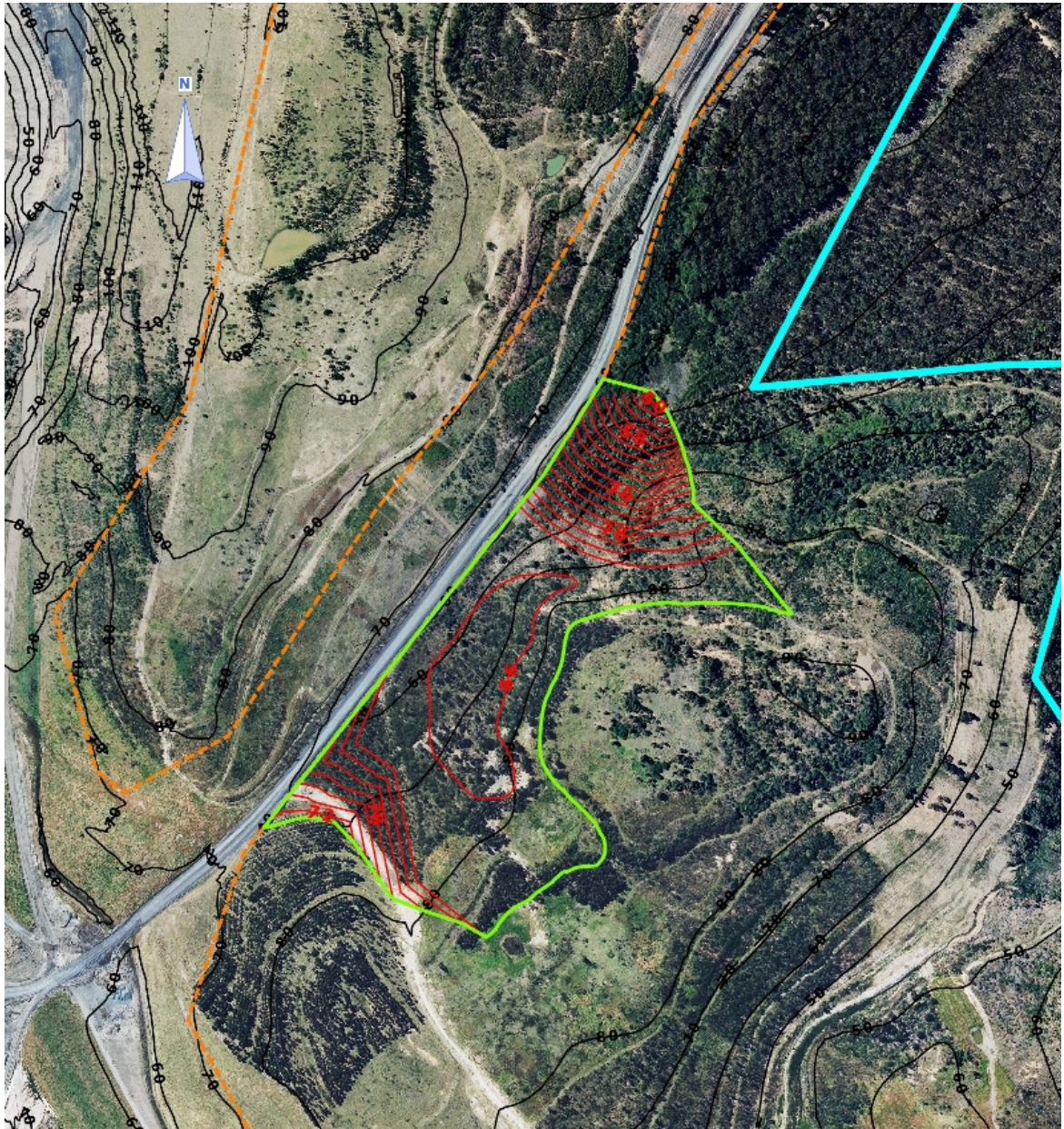
This out-of-pit emplacement and rehabilitation would not alter the approved mine plan or tonnages as this site would replace the previous emplacement location approximately 850 metres south-west at similar RL's.

Equipment proposed for these works would be that used for the currently approved operation as described by Section 2.6.2 of the EA (Business Environment, 2008), with no additional equipment to be introduced for these works. Rear dump haul trucks would transport overburden material to the area with dozers pushing and shaping material prior to topsoil application and seeding. No preliminary construction works would be required, however, erosion and sediment controls will be installed to the north-east as work progresses to protect water quality in this area.



**Photograph 2**  
Proposed  
emplacement  
area east of  
Save-A-Mile haul  
road – showing  
existing  
rehabilitation.





0 200 m

**LEGEND**

- 07-0087 Approval Area
- Proposed Project Area
- Earthworks Modification Boundary
- Proposed Contours (2m)
- Existing Contours (10m)

**FIGURE 4**

**ADDITIONAL OVERBURDEN EMPLACEMENT  
& REHABILITATION -  
EAST OF SAVE A MILE HAUL ROAD**

**75W MODIFICATION APPLICATION  
BLOOMFIELD COLLIERY**

**MAY 2010**

## **2.5 Out-of-Pit Landform Reshaping and Rehabilitation - Northern and South-Eastern Areas (Areas C and E)**

Two out-of-pit areas of approximately 10 hectares and 7 hectares respectively, are located to the north and south-east of the current mine pits. **Photograph 3** and **Photograph 4** show the general nature of these two areas. Their indicative locations are shown on **Figure 5** and **Figure 6**.

These locations are former mining areas consisting of overburden material with some minor shaping and grass seeding. There is minimal native vegetation and the native vegetation that does exist has grown from adjacent tree seeding. To improve the landform shape, drainage and rehabilitation of these areas and revegetate to current standards, minor import of overburden and subsequent revegetation is proposed. The amount of overburden material that would be transported to these areas would be approximately 50,000 and 100,000 bcm's respectively. Works would be undertaken over approximately 6 months.

Equipment to be used will be as described in **Section 2.4**. No particular construction works are proposed prior to the shaping of these areas, and the interaction of works within these areas with existing operations will be minimal and short-term. Overburden material will be trucked to the northern location from the pits using the haul road system, which is adjacent to the area. Trucks will transport material to the south-eastern area (referred to historically on site as "K Cut") using an existing track accessed off Save-A-Mile Haul Road.





**Photograph 3**  
View towards  
proposed northern  
emplacement area.



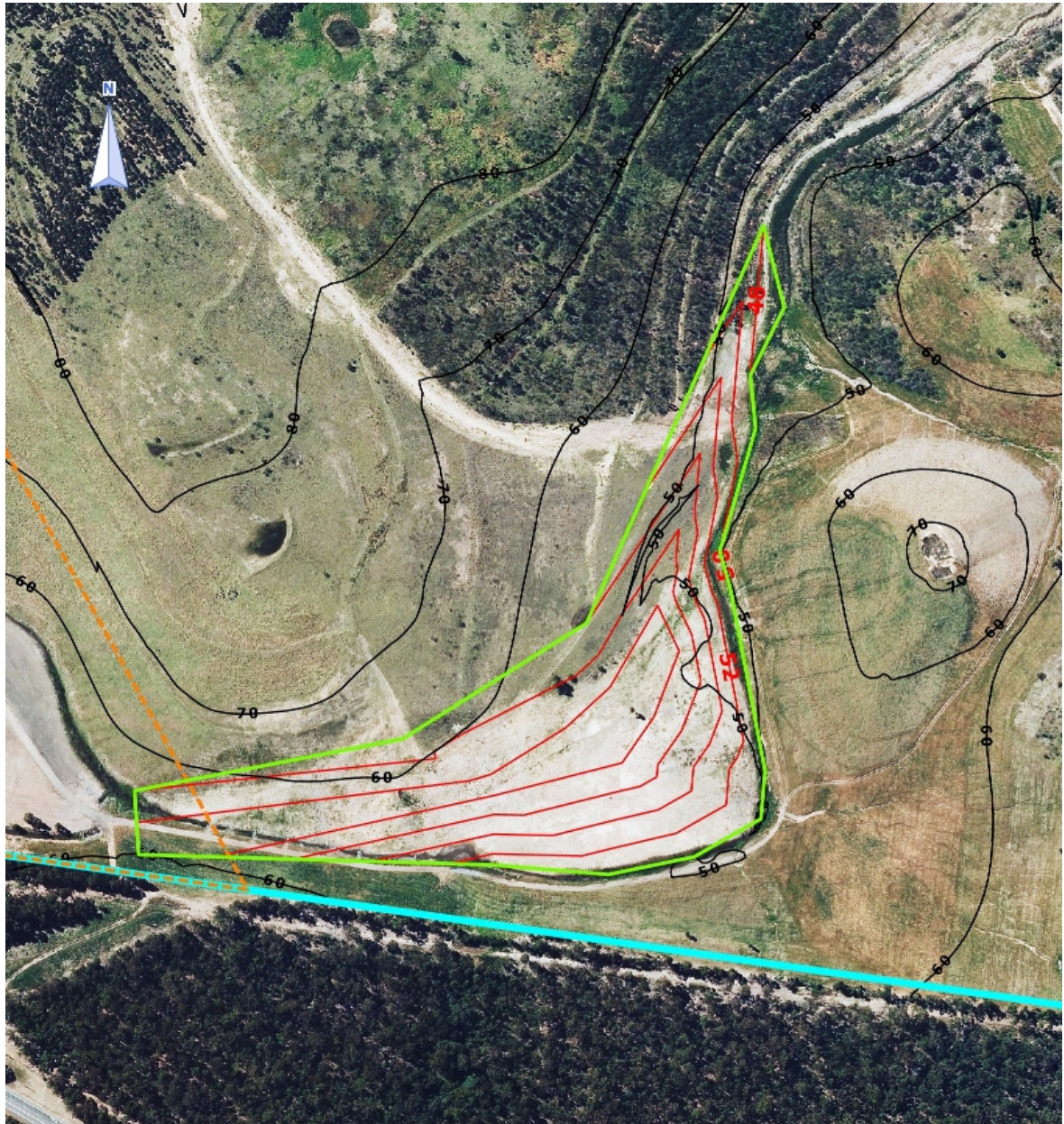
**Photograph 4**  
Proposed south-  
east landform  
reshaping area.





**FIGURE 5**  
**OUT-OF-PIT LANDFORM RESHAPING AND REHABILITATION - NORTHERN AREA**  
**75W MODIFICATION APPLICATION BLOOMFIELD COLLIERY**  
**MAY 2010**





**FIGURE 6**  
**OUT-OF-PIT LANDFORM RESHAPING**  
**AND REHABILITATION -**  
**SOUTH-EASTERN AREA**  
**75W MODIFICATION APPLICATION**  
**BLOOMFIELD COLLIERY**  
**MAY 2010**



## 2.6 Construction of an Overhead Powerline and Corridor (Area D)

An existing overhead powerline and associated corridor is located to the north-west of the Bloomfield Project Area. This line, shown on **Figure 7**, extends from a previous open cut mine area in the north of the Bloomfield Colliery site into the current Creek Cut area. The powerline currently provides power for the water cart filling station, water pumps and shovel.

To enable the approved expansion of Creek Cut and S Cut to proceed, the southern section of this powerline, within the current Project Area, needs to be relocated. It is also proposed to remove some vegetation within the existing Project Area to enable the infrastructure required to connect the power supply to site equipment, namely transformers, earth leakage grids and cables.

It is proposed to relocate a 330 metre section of the powerline and clear an area inside the existing Project Area, as shown on **Figure 7**. This would require construction of a 40 metre wide corridor, removing approximately one hectare of native vegetation outside the existing Project Area as well as approximately ten hectares of native vegetation clearing within the existing approved Project Area. The ten hectares inside the existing Project Area includes approximately seven hectares of Lower Hunter Spotted Gum-Ironbark Forest Endangered Ecological Community (LHSGIF EEC). The general nature of the area where the clearing is proposed is shown on **Photograph 5**.

Construction would consist of marking of the corridor and area to be cleared, vegetation clearing, installation of posts and lines, connection to the existing line and relocation of transformers, earth grids and other associated infrastructure. The existing line and posts would then be removed.

The works would be undertaken within six months of the modification being approved and construction works would be less than six weeks in duration.









**Photograph 5** The proposed powerline corridor within the Lower Hunter Spotted Gum-Ironbark Forest





0 200m

LEGEND	
	07-0087 Approval Area
	Project Modification Boundary
	Archeology Study Area
	Existing Powerline
	Proposed Powerline
	Area to be Cleared for Powerline Infrastructure

**FIGURE 7**  
**POWERLINE AND CORRIDOR**  
**LOCATION**  
**75W MODIFICATION APPLICATION**  
**BLOOMFIELD COLLIERY**  
**SEPTEMBER 2010**

## **2.7 Land Description for the Proposed Modification Activities**

All proposed Modification Activities are on land within the Bloomfield Colliery, operated by Bloomfield Collieries Pty Limited and owned by Ashtonfields Pty Limited. The local government area is Cessnock. Lot and DP details for the land that is within the modified Project Area described by this Application are provided on **Figure 8**.

## **2.8 Alternatives to the Proposed Modification Activities**

As described in the previous section, the extension of the approved Project Area is required under the provisions of the soon to commence *Mining Amendment Act 2008*. The removal, stockpiling or depositing of overburden in the relevant areas requires an authorisation under the Mining Act for which a planning approval is a condition precedent. There is therefore no alternative than to seek this modification of the current Approval. Without planning approval, the out-of-pit emplacement, landform shaping, rehabilitation and alternative haul road activities cannot occur.

The area east of Save-A-Mile Highway was selected to receive additional overburden material after a detailed review of other potential out-of-pit areas, which are limited. Areas west of the existing pits have undisturbed vegetation, to the north the areas are either part of the tailings emplacement or are elevated and visible from outside the site, and to the east areas are either vegetated, part of the water management system or have previous rehabilitation that is considered to be successful and to current standards. The area selected is considered the most capable of receiving material due to its lower elevation, screening from outside the site, proximity to the existing haul road and current poor rehabilitation that requires improvement. If this area is not approved for overburden emplacement, the open operational area within the current pits will become smaller and difficult to operate, and some overburden material will require double-handling, which should be avoided so as to reduce impacts such as noise, dust and fuel use.

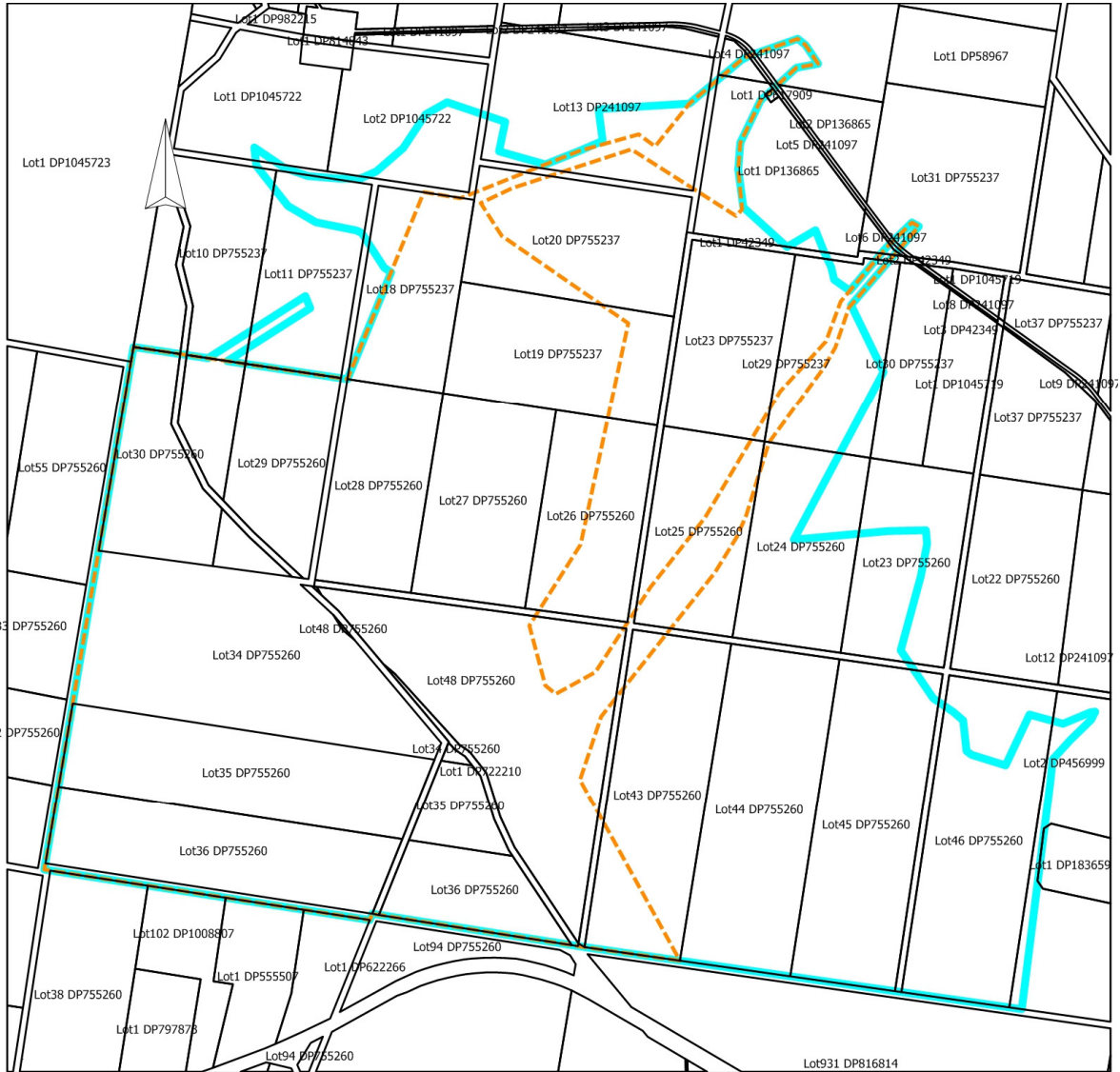
The two areas selected for landform shaping and rehabilitation currently have poor quality pastures and experience drainage problems during wet periods. Minor overburden emplacement on these areas to slightly elevate the landform, with landform shaping and revegetation, will enable these areas to meet current rehabilitation standards and contribute more effectively to the final landform and land use.

The upgrade and use of the proposed Wattle Tree Drive as an alternative haul route will greatly reduce haulage distances during times when coal is being extracted from the northern areas of S Cut. This will reduce fuel usage as haul trucks will have a

reduced haulage distance to the washery. The use of Wattle Tree Drive to haul coal will also improve the level of safety for trucks operating within the open cut area by reducing interaction between coal haul trucks and rear dump trucks working in the cut. The alternative to developing Wattle Tree Drive is to retain all haulage along the existing Save A Mine haul road, which will increase haulage distances and decrease safety as overburden and coal haul trucks interact more closely with each other within the cut. Wattle Tree Drive is an existing track and therefore only requires some shaping and widening prior to use. There are no other disturbed tracks or areas between the northern pit area and the washery that are capable of being developed with minimal disturbance.

The modified powerline corridor location is required to enable Creek Cut works to be completed. The current powerline corridor is within the path of the approved works and cannot be retained if coal is to be won in this area in accordance with the Bloomfield Approval. The proposed corridor location and its associated powerline infrastructure area was selected for minimal distance and impact on vegetation. As can be seen on **Figure 7**, the proposed clearing area has some areas of clearing already, reducing the need for further vegetation clearance, and the proposed powerline corridor is the shortest route that enables the powerline to remain out of the way of the mine path.





CADASTRAL INFORMATION			
LOT	DP	LOT	DP
36	755260	35	755260
34	755260	1	722210
29	755260	30	755260
28	755260	27	755260
pt of 48	755260	pt of 43	755260
pt of 25	755260	pt of 24	755260
pt of 23	755237	pt of 29	755237
pt of 25	755237	pt of 4	241097
pt of 5	241097	pt of 1	136865
pt of 13	241097	pt of 20	755237
pt of 19	755237	pt of 18	755237
1	42349	2	42349
3	42349	pt of 10	755237
pt of 11	755237	pt of 1,2	1045722
pt of 23	755260	44	755260
pt of 31	755237	pt of 45	755260
pt of 46	755260	pt of 2	456999



LEGEND	
	Proposed Project Area Boundary
	Cadastral Boundary
	07-0087 Approval Area

**FIGURE 8**  
**BLOOMFIELD MINE SITE**  
**CADASTRAL PLAN**  
**75W MODIFICATION PLAN**  
**BLOOMFIELD COLLIERY**  
**MAY 2010**



### **3. Environmental Management Strategy & Plans**

#### **3.1 Existing Environmental Management Strategy & Plans**

An Environmental Management Strategy (EMS) has been prepared in accordance with the requirements of the Approval and lodged with Department of Planning. The purpose and objectives of the EMS are to:

- Provide an overall framework for environmental management;
- Identify key environmental aspects to be addressed in the strategy and supporting plans and procedures;
- Establish procedures for reviewing progress and implementing corrective actions; and
- Provide a framework for review and continual improvement.

Environmental Management Plans (EMP's) and monitoring strategies that are included within the EMS framework that guide on-site operations include:

- Site Water Management Plan;
- Noise Monitoring Plan;
- Blast Monitoring Plan;
- Air Quality Monitoring Plan;
- Landscape Management Plan (which includes rehabilitation, final void and mine closure plans);
- Aboriginal Cultural Heritage Management Plan; and
- Energy Savings Action Plan.

Existing plans and procedures that have guided Bloomfield mine operations in the past have been amended to meet the requirements of the Approval granted in 2009. The plans have been submitted to the NSW Department of Planning for endorsement by the Director General. The plans outline a monitoring regime which includes a network of noise, dust, blast and surface/ground water monitoring sites.

#### **3.2 Modifications to Existing Environmental Management Strategy & Plans**

The EMS and EMPs described above are to be amended where required to include the Modification Activities. This will generally only require the alteration of the Project Area boundary on included plans. This will be undertaken during the next scheduled review of the documents.

No existing monitoring sites are located within or adjacent to Modification Activity areas and therefore no sites will require relocation. The assessment of impact for the Modification Activities (**Section 6**) does not identify any additional monitoring locations to be provided. Each of the examined key issues determined that no changes would be required to the various management plans and procedures in

order to include additional procedures. Existing procedures within the management plans will be followed to minimise any potential impact from modification activities.

There are no changes proposed to the approved monitoring or reporting regime as part of the Modification Activities, or to the operation of the site water management system. Accordingly, the Site Water Management Plan and Noise, Blast and Air Quality Monitoring Plans will not require any amendment to their operational content. The Modification Activities do not require any change to the current Aboriginal Cultural Heritage Management Plan or Energy Savings Action Plan.

The Landscape Management Plan, which includes a Rehabilitation Management Plan, will not require any change to its rehabilitation objectives, performance and completion criteria or general procedures. Rehabilitation plans for the proposed additional areas described in this document will be added to the relevant plans for Rehabilitation Management.

The Void Management Plan and Mine Closure Plan will reflect the proposed improvements to the previously rehabilitated areas.

## 4. Regulatory Framework & Consultation

### 4.1 The Bloomfield Mine Approval

The Minister for Planning granted approval for the Bloomfield Colliery (07\_0087) on 3 September 2009, under Part 3A of the EP&A Act. The Approval permits the staged completion of mining and rehabilitation at Bloomfield Colliery over a 12 year period (until 2021).

The Approval covers an area of approximately 317 hectares, of which 299 (95%) is presently disturbed by mining-related activities. All land within the approval area is owned by Ashtonfields Pty Limited.

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 ROM coal stockpile at the washery; and
- the road that links the workshop, open cut pits and washery.

The complete EA that was prepared for the Bloomfield Mine (Business Environment, 2008) is provided on the Bloomfield Colliery website.

### 4.2 Proposed Modification Process

Section 75W of the EP&A Act provides for the modification of the Minister's approval for a major (Part 3A) project. The section states that:

- *75W (2) "The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.*
- *75W (3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.*
- *75W (4) The Minister may modify the approval (with or without conditions) or disapprove of the modification."*

Bloomfield requested a modification to the Minister's approval and received the Department of Planning's Director-General's Requirements for the modification by letter dated 14/12/2009 (**Appendix A**).

The investigations and studies required to be undertaken by the Director-General have been completed and are included in this document. **Table 1** in the Summary provides a list of the Director-General's requirements and where they are addressed.

#### **4.3 Other Relevant Instruments, Policies, Permits & Licences**

The proposed modifications to the Bloomfield Mine all lie within the Cessnock Local Government Area on land zoned 1(a) Rural A under the *Cessnock Local Environmental Plan 1989*. Mining and associated surface activities are permitted with consent in this zone and the activities are compatible with the objectives of this zone.

Bloomfield currently holds Environment Protection Licence 000396 under the *Protection of the Environment Operations Act 1997*. The requirements under this Licence, and the relevant activities contributing to the licence, will not be affected by the proposed modifications.

The modification will not require any changes to the *Notification of Dangerous Goods on Premises* required by Work Cover NSW.

Licences under Part 5 of the *Water Act 1912* and the *Water Management Act 2000* are also not affected or required to be altered by the proposed modifications.

Following the approval of the modification application, a mining lease under the *Mining Act 1992* will be sought. This matter has been discussed and agreed with the Department of Industry and Infrastructure (refer **Section 4.4**).

No changes that are considered relevant to the proposed modifications have occurred to Commonwealth legislation, State Environmental Planning Policies or regional planning strategies since preparation of the EA. The *Lower Hunter Regional Strategy*, examined by the Bloomfield EA, was re-endorsed by the NSW Government in February 2010 (NSW Government Press Release, 18 February 2010).

The revised *Lower Hunter Regional Conservation Plan* was published December 2009 by DECCW with minor amendments from the draft Plan that was considered in the Bloomfield EA. None of the amendments to the Plan are considered relevant to the proposed modifications.

Policies and guidelines that have been used in the preparation of this modification report are listed in the relevant Appendices and sections.

No new instruments, policies, permits, licences or guidelines are required due to the proposed modification activities.

#### 4.4 Consultation

A summary of consultation undertaken to discuss the proposed modifications is provided in **Table 2**.

**Table 2** Consultation undertaken for the Modification Activities

Authority/Group	Type of Consultation/Date	Issues Discussed/Comments
Department of Environment, Climate Change and Water	Telephone call 24/05/10	Called Fergus Hancock to advise that Bloomfield is planning to submit an application under 75W to modify the Project Approval. No significant changes to water management system required.
Department of Industry and Investment	Meeting held 10/08/09	Meeting with David Agnew to discuss the modifications and mine lease.
Cessnock City Council	Telephone call 04/05/10	Discussion with Rod Sandell regarding the modification. Outlined the proposed modification and need to modify the approval. Advised that key issues such as noise will be assessed.
Maitland City Council	Email 17/05/10 and telephone call 24/05/10	Called Leanne Harris to advise that Bloomfield is planning to submit an application under 75W to modify the Project Approval. All modifications are minor and within the Cessnock LGA. Advised that key issues such as noise will be assessed.
Community Consultative Committee	CCC meeting held 3/5/10	The matter was raised by Bloomfield during general business of the first CCC meeting. A brief overview of the proposed modifications was provided and an explanation about the need for the changes. General discussion about rehabilitation standards followed.

## 5. Risk Assessment and Key Issues

### 5.1 Environmental Risk Identification

**Table 3** following has been prepared to assist in the identification of potential environmental risks associated with the proposed Modification Activities and identify which key issues require further investigation.

This table includes those types of activity aspects that were identified by the more comprehensive risk assessment undertaken for the Bloomfield Mine Project Environmental Assessment, and includes the risk categories that were developed for similar activities (GSSE Appendix C in Business Environment, 2008).

The key aspects included in the Bloomfield EA Risk register were typical of an open cut mine, being:

- Disturbance of Aboriginal heritage;
- Disturbance of European heritage;
- Erosion and sedimentation;
- Fire hazard;
- Dust;
- Noise and vibration;
- Light disturbance;
- Contamination of surface and ground water resources;
- Storage and management of hydrocarbons including spills and leaks;
- Injury to or loss of threatened flora and fauna and/or habitat; and
- Introduction of weeds.

As the proposed Modification Activities are directly related to the approved Bloomfield mining operation, the above aspects are considered to remain relevant.

The probability/consequence overview is based on the summarised risk classification system used in the Bloomfield EA, being as follows:

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

**Table 3 Environmental Risk Assessment Overview**

Activity	Aspect (Potential Impact) <sup>1</sup>	Existing or Proposed Controls	Probability/ Consequence Overview (L, M, H)
<b><i>Extension of the approved Project Area</i></b>			
Documentation change only – nil physical activities	Nil	Nil	N/A
<b><i>Development of Wattle Tree Drive as alternative haul route</i></b>			
Construction & operation of the haul route	Noise from construction and haulage	Existing Noise Monitoring Plan and set noise limits, hours of operation	<b>M</b> – model levels to determine
	Dust from construction and haulage	Existing Air Quality Management Plan (AQMP), procedure controls dust, use of water cart	<b>M</b> – model levels to determine
	Hydrocarbon spillage during construction/haulage	Existing emergency spill response actions	<b>L</b> – disturbed area, within mine catchment
	Loss of threatened flora/fauna/habitat due to construction	Nil mature vegetation on route, pre-clearance survey for batter disturbance, flora and fauna management plan, plant operator training, seasonal clearing if required, include in offset management strategy if LHSIGIF EEC	<b>M</b> – undertake survey to investigate further.
	Disturbance of Aboriginal heritage due to construction	Existing Aboriginal Cultural Heritage Management Plan (ACHMP) controls actions, staff training	<b>L</b> – previously disturbed area
	Disturbance of European heritage due to construction	Nil located during EA	<b>L</b> – none on site known from EA
	Erosion and dirty water runoff - change to on site water balance requiring off site discharge or dirty water overflow to clean water system	Existing ESCP/Water management plan controls actions, staff training	<b>L</b> – within Bloomfield mine catchment

<b>Activity</b>	<b>Aspect (Potential Impact)<sup>1</sup></b>	<b>Existing or Proposed Controls</b>	<b>Probability/ Consequence Overview (L, M, H)</b>
	Lighting affecting residential areas during construction and operation	Construction during daylight hours, haulage at night – design to consider headlight directions	<b>M</b> – visual study required from Ashtonfield
	Greenhouse gas emissions – construction and operation	Equipment used serviced to standards, efficient use of plant and equipment	<b>L</b> – route reduces haulage to reduce GHGs
	Visual impact on outside areas	Planting of trees on northern side, staged rehabilitation of batters/banks	<b>M</b> – visual study required from Ashtonfield
<b><i>South-east area – additional overburden emplacement and rehabilitation Northern and south-eastern areas – out-of-pit landform shaping and rehabilitation</i></b>			
Clearing of vegetation	Minimal clearing required, regrowth only or grassland	Existing erosion, weed control procedures	<b>L</b> – no mature vegetation
Transport of overburden to emplacement area and dumping	Noise from transport movements and dumping	Existing Noise Monitoring Plan and set noise limits, hours of operation	<b>M</b> - known to be near set limits for EA - model levels to determine
	Dust from transport movements and dumping	Existing Air Quality Management Plan (AQMP), procedure controls dust, use of water cart	<b>M</b> – model levels to determine
	Hydrocarbon spillage	Existing emergency spill response actions	<b>L</b> – disturbed area, within mine catchment
	Loss of threatened flora/fauna/habitat	No mature vegetation on site – nil to be cleared	<b>L</b> – previously disturbed areas
	Disturbance of Aboriginal heritage	Existing Aboriginal Cultural Heritage Management Plan (ACHMP) controls actions, staff training	<b>L</b> – previously disturbed area
	Disturbance of European heritage	Nil located during EA	<b>L</b> – none on site known from EA
	Erosion and dirty water runoff	Existing ESCP/Water management plan controls actions, staff training	<b>L</b> – within Bloomfield mine catchment
	Lighting of dumps affecting residential areas	Provision of directional lighting – shield from residences if required, no night operations	<b>L</b> – minimal as no night operations



<b>Activity</b>	<b>Aspect (Potential Impact)<sup>1</sup></b>	<b>Existing or Proposed Controls</b>	<b>Probability/ Consequence Overview (L, M, H)</b>
	Greenhouse gas emissions	Equipment used serviced to standards, efficient use of plant and equipment	L – minimal time and operation
	Visual impact on outside areas of roads/dump sites	Consideration of dump design/rehabilitation and revegetation	L – minor change – undertake visual study to determine degree
	Change to on site water balance requiring off site discharge or dirty water overflow to clean water system	Existing ESCP/Water management plan controls actions, staff training	L – within Bloomfield catchment
Rehabilitation/revegetation	Biosolid odour/runoff	Existing management procedure for application	L – minimal application and area – not current issue
	Lime and/or gypsum dust	Control moisture levels at time of application	L – minimal application and area
	Potential to introduce weeds	Existing control procedure – purchase of certified seed/tubestock, weed control contractors	L – minimal area, existing controls in place
	Failure of seed/tubestock to germinate/establish	Purchase of certified seed/plants, staff training, existing rehabilitation maintenance procedure	L – good recent history of growth
	Bushfire hazard in revegetated areas	Existing bushfire management plan, existing site hazard reduction planning	L – minimal area, procedures in place
	Spon. com. in rehabilitated areas	Burial of oxidised coal material via rehabilitation management plan, existing emergency response plan procedures	L - material unlikely to spon com.
<b><i>Construction &amp; Operation of Overhead Powerline and Corridor</i></b>			
Clearing of vegetation and maintenance of corridor	Removal of threatened flora/fauna/habitat (LHSGIF EEC)	Pre-clearance survey, flora and fauna management plan, plant operator training, seasonal clearing if required, include in offset management strategy if LHSGIF EEC	<b>M</b> – known LHSGIF EEC – completed survey
	Loss of top dressing material	Existing procedure to strip and reuse on areas being rehabilitated, staff training	L – minimal material

<b>Activity</b>	<b>Aspect (Potential Impact)<sup>1</sup></b>	<b>Existing or Proposed Controls</b>	<b>Probability/ Consequence Overview (L, M, H)</b>
	Disturbance of Aboriginal heritage	Existing Aboriginal Cultural Heritage Management Plan (ACHMP) controls actions, staff training	<b>M</b> – complete survey
	Disturbance of European heritage	Nil located during EA	<b>L</b> – none located on site
	Erosion and dirty water runoff	Existing ESCP/Water management plan controls actions, staff training	<b>L</b> – all within site catchment
	Dust emissions	Existing Air Quality Management Plan (AQMP), procedure controls dust, use of water cart	<b>M</b> – model levels to determine
	Potential for hydrocarbon spill	Existing emergency spill response actions	<b>L</b> – minimal area
	Potential to introduce weeds	Use of weed control contractors, vehicle check before entering site	<b>L</b> – minimal area
	Noise disturbance	Existing Noise Monitoring Plan and set noise limits, hours of operation	<b>M</b> – model levels to determine
	Greenhouse gas emissions	Equipment used serviced to standards, efficient use of plant and equipment	<b>L</b> – minimal area/activity
Construction and operation of overhead powerline	Dust emissions to residential areas during construction	Existing Air Quality Management Plan (AQMP), procedure controls dust, use of water cart	<b>L</b> – minimal dust generating activities
	Potential for hydrocarbon spill during construction	Existing emergency spill response actions	<b>L</b> – minimal risk activities
	Noise disturbance to residential areas during construction	Existing Noise Monitoring Plan and set noise limits, hours of operation	<b>M</b> – model levels to determine
	Greenhouse gas emissions	Equipment used serviced to standards, efficient use of plant and equipment	<b>L</b> – minimal area/activity

**Notes:**

<sup>1</sup>. Selected from those aspects identified in the Bloomfield Colliery Environmental Risk Register (Appendix C, GSSE in Business Environment 2008)

## 5.2 Key Issues

**Table 3** shows that the majority of Modification Activities and their aspects have a low environmental risk rating. Those with a medium risk rating, that require further investigation to determine their scope, degree of potential impact and whether additional controls may be required, are:

- Potential for dust emissions from the Modification Activities;
- Potential for noise disturbance from the Modification Activities;
- Potential for visual disturbance from Ashtonfield from the development of Wattle Tree Drive, requiring a visual study from this location to be undertaken;
- Potential for the loss of some Lower Hunter Spotted Gum Ironbark Forest Ecologically Endangered Community for the construction of the powerline corridor and associated infrastructure; and
- Potential for disturbance of Aboriginal heritage during clearing for the powerline corridor.

These items are examined in detail in the following chapter.

## **6. Review of Key Environmental Issues**

### **6.1 Introduction**

This Chapter investigates in detail each of the key environmental issues identified from the Environmental Risk Assessment and those identified by the Director-General's Requirements issued for the modification application. The Modification Activities are based on the descriptions provided in **Chapter 2**. Detailed studies undertaken by specialist consultants are provided as Appendices.

Each key issue describes the existing environment, any potential impact from the proposed Modification Activities and any required controls to mitigate or manage any predicted impact. Cumulative impact with existing operations and with nearby mine activities is considered where relevant, for example, for noise and air quality.

### **6.2 Rehabilitation and Final Landform**

#### *6.2.1 Existing Rehabilitation and Final Landform Strategies*

*A Rehabilitation and Landscape Management Strategy* was provided in the Bloomfield EA (Business Environment, 2008). This provided information on the Bloomfield rehabilitation management system, rehabilitation aims, objectives and procedures, as well as information on the final void, post-mining landform and land use and integration of rehabilitation with other projects.

After the Approval was granted, a Landscape Management Plan, including a Rehabilitation Management Plan (Bloomfield Collieries 2/3/10 final draft), was prepared and lodged with the Department of Planning as required by the environmental conditions of the Approval.

This section considers any change to the above strategy and plans that may be required to accommodate the proposed modifications, and any environmental risks and/or required controls. It also describes the proposed rehabilitation and final landform for the proposed modification areas.

Final landform and revegetation plans for the whole Bloomfield Mine area will be influenced in the future by the requirements of various other projects, which are not owned or operated by Bloomfield. These projects include the use of the final void for rejects disposal from the washery operations, as provided for by the adjacent Abel Mine Project Approval and the final outcomes of the Lower Hunter Regional Strategy (Department of Planning, 2006) that provides for a range of future land use options for the mine site. These final land use decisions will be in consultation

with Ashtonfields Pty Limited, the owners of the land on which the Bloomfield Mine is located.

Notwithstanding the future unknown influences on site development and final landform, in order to meet regulatory requirements and land owner expectations, an agreement has been established with the landowner that sets out general obligations for post-mining rehabilitation, such as the requirement to provide a safe and stable landform, remove site infrastructure and rehabilitate overburden dumps, roads, final voids, dams and tailings emplacements.

In general, the overall aim of the rehabilitation plan for the Bloomfield mine site is to provide a safe and stable landform that is compatible with the surrounding landscape and that can allow for a range of potential future land uses. Overburden dumps will be reshaped with a maximum slope of 18 degrees. Where steep slopes are constructed, suitable erosion and sediment controls banks will be incorporated to provide for stability. Detailed rehabilitation objectives and procedures are provided in the Bloomfield Rehabilitation Management Plan.

#### *6.2.2 Proposed Modifications to the Rehabilitation and Final Landform Strategies*

Extension of the approved project area for the purpose of the Modification Activities has no impact on rehabilitation and final landform. The purpose of the extension is to ensure active mine areas are included within the Project Area.

**Figure 3** shows the landform contours required for the development of Wattle Tree Drive as an alternative haul route. The plan shows that the road is an existing access track, and that the upslope and downslope batters will be reshaped to widen Wattle Tree Road, enabling its use as a haul road. The road is at a higher elevation in the northern section of the mine site and these batters will be revegetated with a range of tree and shrub species to reduce any visual impact and stabilise the slopes.

Tree, shrub and pasture species that will be used to revegetate the above sites will be selected from vegetation species currently used by Bloomfield on the mine site and described in the draft Rehabilitation Management Plan.

Procedures for water management, erosion control, topsoil management, weed control, fertilising, etc will also be in accordance with current procedures, as detailed in the current draft Rehabilitation Management Plan.

The final landform contours for the area of additional overburden emplacement to the south-east of the Save-A-Mile haul road is shown on **Figure 4**. This Plan shows that the elevated area of the road will be extended to the south-east, with the slope tapering towards the lower elevated forest area to the north-east. After completion of overburden emplacement, the area will be revegetated to extend into the

forested area to the north-east. Species and rehabilitation procedures will be as per the existing Rehabilitation Management Strategy and will be similar to the area of rehabilitation that can be seen immediately to the south on **Figure 4**. Water diversion banks and sediment control measures will be established prior to dumping of overburden in the area to manage potentially sediment laden water from the area prior to its movement into the lower elevated forested area to the north east.

The final landform contours for the additional overburden emplacement and rehabilitation areas to the north and south-east of the existing mine pits are shown on **Figure 5** and **Figure 6** respectively. These figures show that for the northern site, the area is already disturbed and supports only poor quality pasture and will be shaped to fill in a slightly lower elevated area, with the area remaining generally flat. After overburden emplacement of approximately 50,000 bcm's, rehabilitation and revegetation will be undertaken in accordance with the objectives and procedures of the Rehabilitation Management Strategy. The site will be revegetated to blend with the existing vegetation to the north, with a buffer retained for the continuing use of the Wattle Tree Drive haul road which borders the south-eastern boundary.

The south-eastern site, where approximately 100,000 bcm's of overburden will be dumped for shaping and rehabilitation over approximately 6 months, will be shaped to form a slightly elevated mound in keeping with the surrounding elevations. This area will be revegetated with a range of pasture and tree species similar to those used in current rehabilitation in the nearby southern areas of the site.

Construction of the new powerline corridor onto the open cut mine site will not interfere with any existing or planned rehabilitation areas. Rehabilitation of the corridor, after completion of mining, will be in accordance with the objectives and procedures provided by the Bloomfield Landscape Management Plan, which includes the Rehabilitation Management Strategy and Mine Closure Plan. As the corridor is currently within a forested area, on completion and removal of infrastructure the corridor will be revegetated with similar species to those in the surrounding area, pending the final land use requirements of the landowner.

### **6.3 Biodiversity**

An Ecological Assessment of the proposed Modification Activities has been prepared by Hunter Eco and is provided in **Appendix B**. Each of the areas to be disturbed were investigated.

Wattle Tree Drive is an existing access track and therefore unvegetated, with some Rhodes Grass on the fringes.

The two out-of-pit emplacement areas to the south-east and one to the north are located on either cleared ground or in areas with only spontaneous regrowth of exotic grasses and wattles. The previously rehabilitated area adjacent to Save-A-Mile Highway also contains a mix of planted Spotted Gum and Wattles.

The overhead powerline corridor & infrastructure area is forested with Spotted Gum (*Corymbia maculata*) and Red Ironbark (*Eucalyptus fibrosa*) being the main canopy species. Lower Hunter Spotted Gum – Ironbark Forest, consistent with that of the listed Endangered Ecological Community (EEC) in the *Threatened Species Conservation Act 1995* (TSC Act) *Lower Hunter Spotted Gum – Ironbark Forest* is present, together with Coastal Plains Smooth-barked Apple Woodland. No threatened flora species were noted as present.

Relocation of a section of the powerline would require construction of a 40 metre wide corridor, removing approximately one hectare of native vegetation outside the existing Project Area, and removal of approximately 10 hectares of native vegetation within the existing approved Project Area for infrastructure associated with the relocated powerline. This includes approximately seven hectares of Lower Hunter Spotted Gum-Ironbark Forest Endangered Ecological Community (LHSGIF EEC).

Of the proposed modification areas, only the relocated powerline corridor and infrastructure area would necessitate the removal of remnant vegetation. The other areas are located either on open ground or rehabilitated opencut areas. Habitat in these disturbed areas was found to be in poor condition and unsuitable for any of the threatened species recorded in the area.

Given that the area to be cleared for the relocated powerline corridor is continuous with the area referred to as the 'eastern block' in the Bloomfield EA, the ecology assessment has been based on the data from that original report. Data from the Atlas of NSW Wildlife was updated and a habitat tree survey was conducted in the area to be cleared. Detailed methods that were used to investigate the ecology of the area are provided in **Appendix B**.

An assessment of the possible impact of the proposed powerline corridor construction and associated land clearing on threatened species and endangered communities was undertaken in accordance with the *Draft Guidelines for Threatened Species Assessment* (DECC & DPI 2005). A review of the threatened species profiles shows that there were threatened species that could be found on the subject site under different conditions to those prevailing at the time of this investigation or could be found in similar habitat in the immediate region. An impact assessment was carried out with respect to these species, threatened flora and fauna species and any endangered ecological communities that were recorded during the field surveys.

The proposed clearing will result in the loss of approximately seven hectares of LHSIGIF EEC. However, there is approximately 145 hectares of this community in the immediate vicinity of the proposed disturbance area and the loss of seven hectares would not have a significant impact on the remaining community. This is demonstrated by the fact that historical clearing around remnants of this EEC has not impacted negatively on those remnants.

In the area to be cleared, 31 trees having potential fauna habitat hollows were found. One tree of particular note in the vicinity was a tall Spotted Gum (*Corymbia maculata*) which contained a large raptor nest. This tree is located just outside of the proposed clearing area and care will be taken during clearing not to disturb this tree, such as by pushing other trees against it.

The recommendation of the ecology assessment has been adopted as a control for the proposed clearing for the powerline corridor and powerline infrastructure area. This recommendation is that in the week prior to clearing, these trees will be inspected at dusk to determine whether any of the hollows are occupied. If there is a colony of microbats or a threatened owl using the hollows, clearing will be timed to minimise any impact. When clearing is then carried out, these trees will be left standing for at least five nights so that any occupants can relocate. When these trees are brought down, an experienced fauna ecologist will be present to attend to any fauna that may still be occupying the hollows.

#### **6.4 Air Quality**

An air quality assessment of the Modification Activities, including additional modelling, was undertaken by Holmes Air Sciences. This assessment is provided in **Appendix C**. Cumulative assessment, considering emissions from the Donaldson Open-Cut and Abel Underground coal mines, located to the east of Bloomfield, were also included in the assessment.

The results of the modelling were plotted as shown in **Appendix C**. The results indicate the potential area of impact for 24-hour average PM<sub>10</sub> (sub-ten micron particulate matter), annual average PM<sub>10</sub>, TSP (total suspended particulates) and dust deposition, as a result of the proposed modifications, together with the existing operations. The modelling results indicate that there are no predicted exceedances of the required criterion due to the modifications of Bloomfield Colliery at any of the surrounding residences.

#### **6.5 Greenhouse Gas Emissions**

An inventory of potential greenhouse gas emissions from the Bloomfield Mine as approved was provided in the Bloomfield EA (Appendix G, Holmes Air Sciences in



Business Environment, 2008). Greenhouse gas emissions for two scenarios – being a ROM coal extraction volume of 800,000 tonnes per annum (tpa) from Year 2 onwards, and a ROM coal extraction volume of the maximum approved 1.3 mtpa from Year 2 onwards - were provided. Greenhouse gas emissions from the use of Scope 1 items (diesel and petrol), Scope 2 (electricity) and Scope 3 items (such as the manufacturing of site products and the burning of the product coal by another country) were calculated. It was found that the averaged, total estimated greenhouse gas emissions from mine activities would be in the order of 402,000 tonnes, or an average of 36,545 tonnes per year. This does not include the greenhouse gases released from the burning of the product coal in the export country, which would equate to an additional 19 million tonnes over the life of the mine.

The Modification Activities will improve mine efficiencies by reducing the distance and double handling of overburden spoil. By creating these small out-of-pit overburden emplacements, rehabilitation outcomes for the total site will be enhanced and overburden from the pit that would have needed to be double-handled, or relocated to make room within the pit for operations, will be more efficiently managed. Use of the proposed Wattle Tree Drive haul road will greatly improve efficiencies in the haulage of coal from the northern end of the pits (S Cut) to the washery, as trucks will not have to drive via the southern Save-A-Mile haul road. These efficiencies will reduce the amount of diesel used in site vehicles, a Scope 1 greenhouse gas. Efficiencies, estimated at up to 5% of total on site diesel usage, will reduce the use of diesel over the life of the mine by 2.95 megalitres, reducing greenhouse gas emissions by approximately 8,860 tonnes (based on a 3 kg Co<sub>2</sub> equivalent/litre diesel usage emission factor as used in the Bloomfield EA).

## 6.6 Noise

A Noise Assessment of the proposed Modification Activities was undertaken by Heggies Pty Ltd and is provided in **Appendix E**. The assessment considered the potential noise impact of the proposed Modification Activities, including construction activities, for example, for the corridor, powerline and Wattle Tree Drive, and any required mitigation strategies. The assessment was prepared with reference to Australia Standard AS 1055: 1997 *Description and Measurement of Environment Noise* and in accordance with DECCW's NSW *Industrial Noise Policy*, the *Interim Construction Noise Guideline* and the NSW *Environmental Noise Control Manual*.

The noise criteria and controls provided by the Bloomfield Approval and the project-specific noise levels (PSNLs) developed for the Bloomfield EA have been referenced by the noise assessment.

In order to meet these criteria, no Modification Activities will occur during the night-time period (10.00pm-6.00am). Therefore sleep disturbance noise goals are not applicable. Construction hours (for the powerline corridor and construction of Wattle Tree Drive) will be between the hours of 7.00am and 6.00pm Monday to Friday and 8.00am to 1.00pm Saturdays.

Specific noise mitigation and management procedures have been developed for the various Modification Activities. These are as follows:

- East of Save-a-Mile haul road (Area B)
  - The height of the overburden emplacement area will be limited to an RL of 100 metres.
  - 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.
  - During evening and morning shoulder periods, the following controls will be in place:
    - the drill and clearing dozer will be worked in a shielded location; dumping will only occur in the northern part of the dump;
    - the dozer will only operate in a shielded location in the northern part of the dump;
    - an earthen 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;
    - There will be no coal haulage from S-Cut during the morning shoulder period.
- Northern area (Area C)
  - Dumping and rehabilitation during the daytime period only.
- South-eastern area (Area E)
  - Dumping and rehabilitation during the daytime period only (7.00am to 6.00pm Mondays to Saturdays, 8.00am to 6.00pm Sundays);
  - Dumping will be restricted to approximately 70 hours of work;
  - A front end loader will replace the dozer at the Area E dump once the emplacement reaches an RL of 52 metres.

The above noise control procedures are consistent with those provided by the Approval, namely that dump sites are required to be situated within the pit during night-time operations, hence no out-of-pit dumping and emplacement reshaping will

occur at the emplacement areas during periods other than day-time except where an earthen mound (Area B) is constructed to adequately reduce noise from Area B.

The worst case noise conditions have been considered with operational noise levels for the Modification Activities modelled under calm and prevailing meteorological conditions at the nearest affected residences to the Bloomfield site.

The location of the described receptors is as follows. **Figure 9** shows their location. These locations are the same as those referenced in the Bloomfield EA. Missing letters are those locations that, whilst relevant to the Bloomfield EA, are not relevant to these proposed Modification Activities due to their distance from the activities.

- E – Browns Road, Black Hill;
- F – Black Hill, Road, Black Hill;
- G – Buchanan Road, Buchanan;
- H – Mt Vincent Road, Louth Park;
- L – Kilshanny Avenue, Ashtonfield;
- M – John Renshaw Drive, Buttai;
- N – Lings Road, Buttai.

Considering the proposed noise controls noted above and the mitigation and management measures as detailed in the Approval, operational noise levels are predicted to meet the existing Approval criteria at locations G, H, L and N (refer **Figure 9** for location of receptors).

Operational noise levels from Area B operations are predicted to exceed the existing Approval criteria at location M during day-time operations and at locations E and F when the height of the dump exceeds 81 metres. During the morning shoulder period under a prevailing NW wind, Approval criteria will be exceeded for Area B at locations E, F and M and at location L during evening and morning shoulder periods under a prevailing SE wind.

Operational noise levels for Area E are predicted to exceed Approval criteria at locations E, F and M during the day-time period. Works at Area E are minor in nature and will be limited to a total of 70 hours work over a few months, during day-time periods only.

Noise levels at all of the above mentioned locations are predicted to meet the approved noise levels established with reference to the INP and reported in the EA for the approved development and are therefore unlikely to cause disturbance at the surrounding residential receivers.

Since the operational scenario modeled is likely to represent an acoustically worst-case scenario, actual operational noise levels from the proposed Modification Activities are likely to be less than those predicted.

The Modification Activities in these areas are short-term and will take a maximum of six to twelve months to complete. Controls such as restricting operating times and limiting of height and types of equipment to be used will minimise potential impacts that may occur.

Predicted construction noise levels from the development of Wattle Tree Drive as an alternative haul route and the construction of the overhead powerline and corridor are predicted to be significantly below the relevant construction noise criteria.



0 1 km

LEGEND	
	07-0087 Approval Area
	Proposed Project Area
	Representative Residences
	Modified Project Location

**FIGURE 9**  
**LOCATION OF NEAREST**  
**NOISE RECEPTORS**  
**75W MODIFICATION APPLICATION**  
**BLOOMFIELD COLLIERY**  
**MAY 2010**

## 6.7 Heritage

As described in the Bloomfield EA (Business Environment, 2008), there are no recorded European heritage sites on or in close proximity to the Bloomfield Mine. Therefore, no impact on items of European heritage would occur as a result of the Modification Activities.

South East Archaeology was engaged to undertake an Aboriginal Heritage Impact Assessment of the proposed powerline corridor. This assessment, which included a field survey undertaken with representatives of the local Aboriginal community, is provided in **Appendix D**. An assessment of the other modification areas was not undertaken as these are all within existing areas of mine disturbance.

No Aboriginal heritage evidence was identified within the powerline study area, and no Aboriginal heritage sites have previously been recorded in this location. The heritage potential of the landform units within the subject area is considered low generally due to the moderate gradients and in the case of the ridge crest, the high level of existing impacts. A very low density distribution of artefacts may occur across the study area, however the potential for sub-surface deposits of artefacts that may be in situ and/or of research value is very low. Other types of heritage evidence (such as grinding grooves or scarred trees) are not anticipated to occur within the study area and other Aboriginal cultural values or associations were not identified during the course of the assessment. It is therefore considered that the potential for significant impacts to occur to the Aboriginal heritage resources from the powerline corridor construction are very low.

Site protocols in place under the Bloomfield Aboriginal Heritage Management Plan will remain relevant for the proposed Modification Activities.

## 6.8 Visual Aspects

Due to the undulating topography of the Bloomfield site, the majority of the Modification Activities will be screened from viewpoints external to the mine site. Detailed internal and external mine site viewing, from a range of viewpoints, indicated that all Modification Activities except sections of Wattle Tree haul road would be screened from external viewpoints by existing topography or vegetation.

The powerline corridor is within a forested area remote from any external viewpoint, such as residence or road. Buchanan Road and Louth Park residences, the nearest to the corridor site, do not view the site due to intervening topography.

The overburden emplacement and landform shaping proposed for two areas of the south-east of the site cannot be viewed from John Renshaw Drive or residences to



the south due to intervening topography and vegetation. As shown on **Figure 6**, the south-eastern landform shaping area is screened from residences to the south and John Renshaw Drive by existing mature forest vegetation abutting the southern boundary. In the visual assessment undertaken for the EA (Business Environment, 2008), the emplacement along the southern boundary was shown to be visible from some sections of John Renshaw Drive. This proposed emplacement will not be viewed from these locations due to its location to the east, where there is a screen of existing vegetation and elevated intervening topography not available in the approved emplacement area. This change in vegetation cover along the southern boundary can be seen on **Figure 2**. Residents to the south of John Renshaw Drive who raised previous concerns regarding night lighting will not be affected by the Modification Activities proposed for the more southern areas of the mine site as these areas are further to the east and therefore hidden by intervening topography and vegetation.

**Figure 5** shows the existing mature forest vegetation to the north and west of the northern landform shaping area that screens this area from views from the north and north-east, where residences within Ashtonfield are located.

Wattle Tree Drive is located at a high elevation on the Bloomfield site and has the potential to be viewed from some residences and roads within Ashtonfield.

**Photograph 6** shows the view looking south-west along Tipperary Drive, from near the intersection with Kilshanny Avenue, Ashtonfield. Mt Sugarloaf west of Newcastle can clearly be seen on the horizon in the middle of the photograph. Two items of Bloomfield's operations can be viewed in the photograph. The washery can be seen as a slight grey disturbance in the left of the scene, and the slight mound viewed to the right is the highest elevation of Wattle Tree Drive, as it changes direction from north to east as it heads towards the washery.

The slight disturbance that can be seen due to Wattle Tree Drive will be improved by the proposed modification as the works will include stabilisation of the batter and revegetation. The works will also include the construction of a bund to the north of the haul road to screen trucks from views to the north-east. The disturbance that is currently seen will therefore blend with the surrounding view once trees grow on the batters, and trucks will be screened.

With haul trucks proposed to use Wattle Tree Drive, headlights of these trucks as they travel around the bend have the potential to be seen from this location at night. However, due to the bund and this viewpoint being approximately 2.5 km from the haul road bend, the impact of this disturbance will be minimal. Also, as the bund is constructed and the trees grow on the batter, headlights will be screened. Other sections of Ashtonfield Estate generally have views towards the Bloomfield site screened by existing vegetation or are oriented away from the site.



**Photograph 6 View towards Bloomfield Mine site from Tipperary Drive, Ashtonfield**

## **6.9 Other Issues**

### *6.9.1 Water, Erosion & Sedimentation*

The Water Management Plan for the Bloomfield site ensures the effective water management of the whole Bloomfield site, including those parts of the site that are approved under the Donaldson approval. The current water management system includes the following:

- Existing surface water storages and sediment control dams (Lake Kennerson, Lake Foster, Possums Puddle and stockpile Dam) and the pipelines and drains that allow water to be transferred between these storages, or discharged off site;
- Pumps for the supply of water from Lake Foster to the washery;



- Pumps for the supply of groundwater extracted from old underground workings to supplement water supply to the washery when required;
- The washery associated stockpile areas and the Stockpile Dam;
- Previously mined areas including S Cut and Creek Cut used for disposal of wastes from the washery (coarse rejects and fine tailings) and the rehabilitation of these areas following completion of waste disposal; and
- Mine water discharge regime as per the existing Environmental Protection Licence.

The proposed northern area to be reshaped is currently draining poorly and the proposed works will improve this situation and drain the area towards the haul road and the existing drainage system.

All existing overburden dump areas and pit operations are drained via pipes and pumps to Lake Kennerson (refer **Figure 2** for location). The proposed overburden emplacement area adjacent to Save-a-Mile haul road will be shaped to drain into this current system. The eastern part will drain towards an existing drainage line that contains surrounding partially undisturbed forest. Diversion banks and sediment control measures will be provided at the toe of the batter on the north-eastern side to divert any sediment laden flow away from this existing channel until the area is stabilized and revegetated.

The proposed south-east landform reshaping area covers part of the area used as a drainage channel from the pits to Lake Kennerson. This channel will be relocated around the area of proposed disturbance to ensure this system continues to operate.

#### *6.9.2 Socio-Economic and Community Issues*

There are no potential socio-economic or community impacts predicted for the proposed Modification Activities. The activities will not alter the workforce, hours of operation, life of the mine or current approved extraction tonnages.

## **7. Required Modifications To The Existing Approval and Statement Of Commitments**

### **7.1 Required Modifications to the Existing Approval**

The Modification Activities will require amendments (shown in ***bold italics***) to the following parts of the Bloomfield approval (07\_0087) issued on 3 September 2009:

- 2. Terms of Approval – The Proponent shall carry out the project generally in accordance with the:
  - (a) EA;
  - (b) Statement of Commitments;
  - (c) conditions of this approval;
  - ***(d) Modification to the Approval and conditions provided by this Modification***
  - ***Appendix 2 – Project Map – to be modified to include the modified Project Area.***

No changes to the conditions of the Approval, such as noise, air quality or blasting criteria or monitoring regimes, or the water management, landscape management, heritage, visual or greenhouse gas requirements are required necessary for this proposed modification to the Approval.

The various required plans that have been prepared for the Approval, such as the Landscape Management Plan, Rehabilitation Management Plan and various monitoring plans will be amended to include the Modification Activities as relevant.

### **7.2 Statement of Commitments for the Modification**

The following Statement of Commitments (SOCs) has been prepared to append to the SOC's provided with the 2009 Approval. These SOC's include all of the proposed measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts of the modification:

- Bloomfield Collieries will undertake mining activities within the modified Project Area as defined by the EA and this document;
- A pre-clearing protocol to protect any threatened species using trees within the powerline clearing area will be implemented during construction of the corridor;
- 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;
- Construction of the powerline and the associated infrastructure will occur only during day-time periods as specified for construction works;

- Operational controls that will be put in place during works within particular areas are as follows:
  - East of Save-a-Mile haul road (Area B)
    - The height of the overburden emplacement area will be limited to an RL of 100 metres.
    - 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.
    - During evening and morning shoulder periods, the following controls will be in place:
      - the drill and clearing dozer will be worked in a shielded location; dumping will only occur in the northern part of the dump;
      - the dozer will only operate in a shielded location in the northern part of the dump;
      - an earthen 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;
      - There will be no coal haulage from S-Cut during the morning shoulder period.
  - Northern area (Area C)
    - Dumping and rehabilitation during the daytime period only (7.00am to 6.00pm Mondays to Saturdays, 8.00am to 6.00pm Sundays)
  - South-eastern area (area E)
    - Dumping and rehabilitation during the daytime period only (7.00am to 6.00pm Mondays to Saturdays, 8.00am to 6.00pm Sundays);
    - Dumping will be restricted to a maximum of 70 hours of work;
    - A front end loader will replace the dozer at the Area E dump once the emplacement reaches an RL of 52 metres.
- 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;
- 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;
- 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;
- Wattle Tree Drive construction will occur only during day-time periods as specified for construction works.

## 8. Project Justification and Conclusion

Bloomfield Colliery is an open cut mining operation located approximately 20 kilometres north-west of Newcastle, within the Cessnock Local Government Area. In September 2009, Bloomfield Colliery was granted approval by the NSW Minister for Planning to complete its twelve year mining and rehabilitation program. Prior to approval being granted, open cut and underground mining had occurred at various locations on the site for approximately 175 years.

This Environmental Assessment Report has been prepared to accompany an application by Bloomfield to modify the approval for the Bloomfield Coal Project pursuant to section 75W EP&A Act 1979.

The modification application seeks planning approval for the following Modification Activities:

- extension of the approved Project Area by 259 hectares to enable the proposed Modification Activities to be undertaken,
- upgrade and use of Wattle Tree Drive as an alternative haul route for coal being transported to the washery from the northern pit areas;
- additional overburden emplacement (1.2 million bank cubic metres) and rehabilitation adjacent to the existing Save-A-Mile haul road;
- additional 50,000 bank cubic metres overburden emplacement, out-of-pit landform reshaping and rehabilitation in a disturbed northern area;
- additional 100,000 bank cubic metres overburden emplacement, out-of-pit landform reshaping and rehabilitation in the south-east of the mine site (previous 'K Cut'); and
- construction of a corridor and overhead powerline from an existing powerline onto the open cut mine site, relocating an existing powerline to enable the continuation of mining, together with some clearing for associated infrastructure consisting of transformers, earth leakage grids and cables.

The Project Area under the existing Approval only includes those parts of the site that were directly related to the completion of mining, as well as rehabilitation associated with this mining. The two active pits ('Creek Cut' and 'S Cut'), the current coal haul road ('Save-A-Mile') to the washery, the workshop used to maintain mining equipment and an internal access road providing access between the open cut pits, were the only works included in the Project Area. The main reason for this omission was to avoid confusion between the Approval and any planning approval for the adjacent Abel Underground Mine, which also included approval for the Bloomfield washery and tailings disposal areas and included the whole Bloomfield Lease area in its Project Area.

The effect of soon to commence amendments to the Mining Act require that all mining-related activities are subject to planning approval. Therefore, Bloomfield must obtain planning approval for the expansion of the Project Area to include all future rehabilitation and associated works. The Modification Activities have been examined to ensure they fall within this extended area. Only the Modification Activities will be undertaken within this extended Project Area.

The upgrade and use of an existing access road as a haul road ('Wattle Tree Drive') would reduce current conflict between coal haul trucks and overburden dump trucks within the pits, thus improving mine safety. It would also reduce fuel usage over the remaining life of the mine by reducing the distance coal is transported from the pits to the washery. Noise, air quality and visual investigations of this route predict minimal environmental impact from this proposed haul road and improved energy savings for the mine.

Three areas are proposed to receive additional overburden material prior to reshaping and rehabilitation. These areas are required to improve the efficiency of overburden management by providing additional room in-pit and avoiding the need to double-handle overburden material during Stage 2. Areas were selected based on their ability to receive the material with minimal change to the overall landscape and minimal environmental impact. These three areas are considered not to have been rehabilitated to current standards and Bloomfield wishes to improve long term rehabilitation outcomes in these locations.

A 14.2 hectare area in the south-east of the mine site, adjacent to the Save-A-Mile haul road, is proposed to replace an existing out-of-pit overburden emplacement area approximately 850 metres to the south-west. Work in this area would occur over approximately twelve months. The area would then be revegetated to current standards.

A small area to the north of the existing Creek Cut and an area in the south-east of the site (the previous 'K Cut' area adjacent to the southern boundary) are also identified to receive minor amounts of overburden material (50,000 and 100,000 bank cubic metres respectively) over a six to twelve month period, prior to minor landform shaping and rehabilitation.

Air quality, noise, visual and biodiversity investigations indicate minimal environmental impact associated with these three emplacement areas. Any potential noise impact from operations on the south-eastern works will be minimised through a series of noise controls and management actions associated with the operation of equipment and placement of material.

An existing overhead powerline and corridor is located to the north-west of the Bloomfield Project Area. The powerline currently provides power for the water cart filling station, water pumps and shovel. To enable the approved expansion of Creek Cut and S Cut to proceed, the southern section of this powerline, within the current



Project Area, needs to be relocated. It is proposed to relocate a 330 metre section of the powerline, requiring construction of a 40 metre wide corridor, and clearing within the Project Area for associated infrastructure. This clearing will require the removal of approximately 11 hectares of bushland, which includes 7 hectares of Lower Hunter Spotted Gum-Ironbark Forest Endangered Ecological Community.

Air quality, noise, Aboriginal heritage, visual and biodiversity studies were undertaken for the proposed powerline corridor. No Aboriginal heritage evidence was located and the potential for evidence is considered to be low. Impacts associated with visual, air quality and noise are also considered to be minimal. The proposed powerline relocation will result in the loss of approximately seven hectares of LHSGIF EEC. However, there is approximately 145 hectares of this community in the immediate vicinity of the proposed disturbance area and the loss of seven hectares would not have a significant impact on the remaining community. This is demonstrated by the fact that historical clearing around remnants of this EEC has not impacted negatively on those remnants. Clearing procedures will be put in place in the proposed clearing area to ensure any threatened fauna located within trees is identified and relocated prior to the felling period.

A risk assessment has been undertaken to identify any potential environmental impacts associated with the proposed Modification Activities. The requirements of the Director-General have been addressed and the Modification Activities discussed with relevant government authorities and the Bloomfield Community Consultative Committee. Detailed studies of the key environmental issues have identified that there will be minimal environmental impacts associated with the proposed activities and that these can be avoided, further mitigated or controlled through the implementation of existing environmental management procedures or additional procedures that have been identified for these particular activities.

The Modification Activities are required to ensure the continued safe and efficient operation of the Bloomfield Colliery. Alternatives to these activities were considered, and the selected designs and methods are considered the most efficient and effective. The modifications allowing minor out-of-pit emplacement and landform reshaping will enable previously disturbed areas to be rehabilitated to current industry standards.

## 9. References

Bloomfield Collieries (2010) Draft Landscape Management Plan - 2/3/10 final draft

Business Environment (2008) Bloomfield Colliery Completion of Mining and Rehabilitation – Part 3A Environmental Assessment Project Application 07\_0087.

DECC & DPI (2005) Draft Guidelines for Threatened Species Assessment. NSW Government, Sydney.

NSW Department of Planning (2006) *Lower Hunter Regional Strategy*. NSW Government, Sydney.

NSW Government (2010) *Lower Hunter Regional Strategy re-endorsed by the NSW Government* (NSW Government Press Release, 18 February 2010).



## Bloomfield Colliery

Project Approval No. 07\_0087

# **Extension of the Project Approval Area for out-of-pit overburden emplacement and rehabilitation, alternative haul road and powerline relocation.**

Application for a Modification to the Minister's Approval  
Pursuant to Section 75W of the *Environmental  
Planning and Assessment Act 1979*

## **APPENDICES**

September 2010

# **Appendix A - Director-General's Requirements – Section 75W Modification**

## **Appendix B – Biodiversity Assessment**



## **Appendix C – Air Quality Assessment**

# **Appendix D – Aboriginal Heritage Impact Assessment**

## **Appendix E – Noise Impact Assessment**



## Bloomfield Colliery

Project Approval No. 07\_0087

# **Extension of the Project Approval Area for out-of-pit overburden emplacement and rehabilitation, alternative haul road and powerline relocation.**

Application for a Modification to the Minister's Consent  
Pursuant to Section 75W of the *Environmental  
Planning and Assessment Act 1979*

## **APPENDICES**

August 2010

# **Appendix A - Director-General's Requirements – Section 75W Modification**





Planning

**Major Projects Assessment  
Mining & Industry**

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23-33 Bridge Street  
GPO Box 39  
SYDNEY NSW 2001

Mr Steve Dunn  
General Manager, Technical Services  
Bloomfield Collieries Pty Limited  
PO Box 4  
EAST MAITLAND NSW 2323

Our ref: S07/01215

Dear Mr Dunn

**Bloomfield Coal Project  
Section 75W Modification (07\_0087 MOD 1)  
Director-General's Requirements**

The Department has received your application to modify the approval for the Bloomfield Coal Project (07\_0087 MOD 1) under section 75W of the *Environmental Planning and Assessment Act 1979*.

I have attached the Director-General's requirements (DGRs) for the proposed modification. Please note that the Director-General may alter these requirements at any time.

If the proposed modification is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. It is your responsibility to contact the Department of Environment, Water, Heritage and the Arts in Canberra (6274 1111 or <http://www.environment.gov.au>) to determine if the proposal requires an approval under the EPBC Act. The Commonwealth Government has accredited the NSW environmental assessment process, so if it is determined that an approval is required under the EPBC Act, please contact the Department immediately as supplementary Director-General's requirements may need to be issued.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit the Environmental Assessment for the modification. This will enable the Department to determine the:

- applicable fee (see Division 1A, Part 15 of the *Environmental Planning and Assessment Regulation 2000*); and
- number of copies (hard-copy and CD-ROM) of the Environmental Assessment that will be required for exhibition purposes.

Following receipt the Department will review the Environmental Assessment in consultation with the relevant agencies to determine if it adequately addresses the Director-General's requirements. The Department may require you to revise the Environmental Assessment prior to public exhibition.

The Department is required to make all the relevant information associated with the modification publicly available on its website. Consequently, I would appreciate it if you would ensure that all the documents you subsequently submit to the Department are in a suitable format for the web, and arrange for the Environmental Assessment to be hosted on a suitable website.

If you have any enquiries about these requirements, please contact Paul Freeman.

Yours sincerely

*DKitto* 14/12/09

David Kitto  
**Director**  
**Major Development Assessment**  
As delegate for the Director-General

# Director-General's Requirements

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

<b>Application number</b>	07_0087 MOD 1
<b>Modification Description</b>	<p>Modifying the Bloomfield Coal Project, including:</p> <ul style="list-style-type: none"> <li>• emplacing overburden on, reshaping and rehabilitating an area of previously rehabilitated land south-east of the S Cut Pit;</li> <li>• reshaping and rehabilitating two non-vegetated areas, north of the Creek Cut Pit and east of the S Cut Pit respectively;</li> <li>• constructing a new haul road from the northern area of the Creek Cut Pit to the washery stockpile; and</li> <li>• establishing an easement and overhead powerline west of the S Cut Pit.</li> </ul>
<b>Location</b>	North of John Renshaw Drive, Buttai.
<b>Proponent</b>	Bloomfield Collieries Pty Limited.
<b>Date of Issue</b>	14 December 2009
<b>General Requirements</b>	<p>The Environmental Assessment of the proposed modification must include:</p> <ul style="list-style-type: none"> <li>• an executive summary;</li> <li>• a detailed description of: <ul style="list-style-type: none"> <li>- existing and approved operations and infrastructure on site; and</li> <li>- the existing environmental management and monitoring regime on site;</li> </ul> </li> <li>• a detailed description of the modification, including the: <ul style="list-style-type: none"> <li>- need for the modification;</li> <li>- alternatives considered;</li> <li>- likely interactions between existing and approved mining operations;</li> <li>- likely staging of the modification; and</li> <li>- plans of any proposed construction works;</li> </ul> </li> <li>• a risk assessment of the potential environmental impacts of the modification, identifying the key issues for further assessment;</li> <li>• a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above), which includes: <ul style="list-style-type: none"> <li>- a description of the existing environment, using sufficient baseline data;</li> <li>- an assessment of the potential impacts of all stages of the modification, including any cumulative impacts associated with the concurrent operation of the modification with any other existing or approved mining operations in the region, taking into consideration any relevant policies, guidelines, plans and statutory provisions (see below); and</li> <li>- a description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts of the modification, including detailed contingency plans for managing any significant risks to the environment;</li> </ul> </li> <li>• a statement of commitments, outlining all the proposed environmental management and monitoring measures;</li> <li>• a conclusion justifying the modification on economic, social and environmental grounds, taking into consideration whether the modification is consistent with the objects of the <i>Environmental Planning &amp; Assessment Act 1979</i>;</li> <li>• a signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading.</li> </ul>

<p><b>Key Issues</b></p>	<ul style="list-style-type: none"> <li>• <b>Rehabilitation and Final Landform</b> – including a justification of the revised final landform; how the site would be progressively rehabilitated; and the measures which would be put in place for the long term protection and management of the site;</li> <li>• <b>Biodiversity</b> – including: <ul style="list-style-type: none"> <li>- accurate predictions of any vegetation clearing on site;</li> <li>- a detailed assessment of the potential impacts of the project on any terrestrial and aquatic threatened species, populations, ecological communities or their habitats; and</li> <li>- a detailed description of the measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long term;</li> </ul> </li> <li>• <b>Air Quality</b>;</li> <li>• <b>Noise</b> – including operational and construction noise;</li> <li>• <b>Greenhouse Gases</b>;</li> <li>• <b>Heritage</b> – both Aboriginal and non-Aboriginal; and</li> <li>• <b>Visual</b>.</li> </ul>
<p><b>References</b></p>	<p>The environmental assessment of the key issues listed above must take into account relevant guidelines, policies, and plans. While not exhaustive, the following attachment contains a list of guidelines, policies and plans that may be relevant to the environmental assessment of this modification.</p>
<p><b>Consultation</b></p>	<p>During the preparation of the EA, you should consult with the relevant local, State or Commonwealth government authorities, service providers, community groups or affected landowners. The consultation process and the issues raised must be described in the Environmental Assessment.</p> <p>In particular you should consult with:</p> <ul style="list-style-type: none"> <li>• Department of Environment, Climate Change and Water;</li> <li>• NSW Office of Water (within DECCW);</li> <li>• Department of Industry and Investment;</li> <li>• Cessnock City Council; and</li> <li>• Maitland City Council.</li> </ul>
<p><b>Deemed refusal period</b></p>	<p>60 days</p>

# Policies, Guidelines & Plans

Aspect	Policy / Methodology
<b>Rehabilitation</b>	<p>Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)</p> <p>Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)</p> <p>Strategic Framework for Mine Closure (ANZMEC/MCA)</p>
<b>Flora &amp; Fauna</b>	<p>Draft Guidelines for Threatened Species Assessment under Part 3A of the <i>Environmental Planning and Assessment Act 1979</i> (DEC)</p> <p>Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 - Guide to implementation in NSW (DoP)</p>
<b>Noise</b>	<p>NSW Industrial Noise Policy (DEC)</p> <p>Environmental Criteria for Road Traffic Noise (NSW EPA)</p> <p>Interim Construction Noise Guideline (DECC)</p>
<b>Air Quality</b>	<p>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)</p> <p>Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)</p>
<b>Greenhouse Gas</b>	<p>National Greenhouse Accounts (NGA) Factors</p>
<b>Heritage</b>	<p>Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC)</p> <p>NSW Heritage Manual (NSW Heritage Office &amp; DUAP)</p>
<i>Aboriginal</i>	
<i>Non- Aboriginal</i>	<p>The Burra Charter (The Australia ICOMOS charter for places of cultural significance)</p>



## **Appendix B – Biodiversity Assessment**



Bloomfield Colliery East Maitland  
Part 3A variation ecology report

## Bloomfield Colliery Part 3A variation ecology report

This report was prepared for the sole use of the proponents, their agents and any regulatory agencies involved in the approval process. It should not be otherwise referenced or reproduced without permission of the author.

HUNTER ECO



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## Bloomfield Colliery Part 3A variation ecology report

### 1 Description of the Proposed Modifications – Bloomfield Colliery

During preparation of the Environmental Assessment that accompanied the original Part 3A application (Business Environment, 2008), the PA Area only included those areas of the larger existing Bloomfield Colliery site that were specifically required for active mining and other activities associated with the winning of coal. Rehabilitated areas that were within the existing mine lease and adjacent to the open cut pits were not included.

Section 6 of the Mining Amendment Act 2008 states that *"A person must not carry out a mining purpose specified for the purposes of this section except in accordance with an authorisation that is in force in respect of the land where the purpose is carried out."*

As the Mining Lease (being the "authorisation" required by Section 6 quoted above) to be granted to Bloomfield for the approved operation is only for that area included in the Approval under Part 3A of the EP&A Act, Bloomfield are seeking to extend the PA Area so that it may be included in the Mining Lease, and therefore satisfy the *Mining Amendment Act 2008*.

Bloomfield therefore seeks to extend the boundary of the Project Application Area to include all areas of previous rehabilitation associated with its S Cut and Creek Cut operations, including those areas requiring improvement works as described following. Only those activities as described following and associated with the mining operation will be undertaken within this extended area.

#### 1.1 Construction of an Overhead Powerline and Easement

An existing overhead powerline and easement is located to the north-west of the Bloomfield PA Area. This line, as shown on **Figure 1**, extends from a previous open cut mine area in the north of the Bloomfield Colliery site into the current Creek Cut area. The powerline currently provides power for the water cart filling station, water pumps and rope shovel.

To enable the approved mining areas of Creek Cut and S Cut to proceed, the southern section of this powerline and associated infrastructure, within the current PA Area, needs to be relocated.

It is proposed to relocate a **330 metre** section of the powerline as shown on **Figure 1**. This would require construction of a 40 metre wide easement, removing approximately one hectare of native vegetation outside the existing project area plus approximately 10 hectares of native vegetation within the existing approved project area, including approximately 7ha Lower Hunter Spotted Gum-Ironbark Forest Endangered Ecological Community (LHSGIF EEC).

The area within the approved project area is required for infrastructure associated with the power supply to the face shovel and mine water management. It includes: transformers, earth leakage grids, cables and powerlines. This area is outside current mining areas.

Construction would consist of marking of the easement, vegetation clearing within the easement and the existing project area, installation of posts and lines, connection to the existing line and relocation of transformers, earth grids etc. The existing line and posts would then be removed.

## 1.2 South-East Area - Overburden Dumping and Rehabilitation

An out-of-pit area to the east of the approved haul road ("Save-a-Mile Highway") has previously been rehabilitated but not to current standards. This area is approximately **14 hectares** in size and shown on **Figure 1**. To maximise operational efficiencies and improve final land shaping and vegetation cover in this area, Bloomfield proposes to place approximately 1.2 million bank cubic metres (bcm's) of overburden on this area prior to reshaping and revegetation to current rehabilitation standards. Works would occur over approximately twelve months during the early stages of the approved "Stage 2" of mining.

This out-of-pit emplacement and rehabilitation does not alter the approved mine plan or tonnages as this site would replace the previous emplacement location approximately 850 metres south-west at similar RL's.

Equipment proposed for these works will be that used for the currently approved operation as described by Section 2.6.2 of the EA (Business Environment, 2008), with no additional equipment to be introduced for these works. Rear dump haul trucks will transport overburden material to the area with dozers pushing and shaping material prior to topsoil application and seeding.

## 1.3 Northern and South-Eastern Areas – Out-of-Pit Reshaping and Rehabilitation

Two out-of-pit areas of approximately **10 hectares** and **7 hectares** respectively, as shown on **Figure 1**, are former mining areas consisting of overburden material with some minor shaping and grass seeding. There is minimal native vegetation and any native vegetation that does exist has grown from adjacent tree seeding. To improve the rehabilitation of these areas and revegetate to current standards, minor

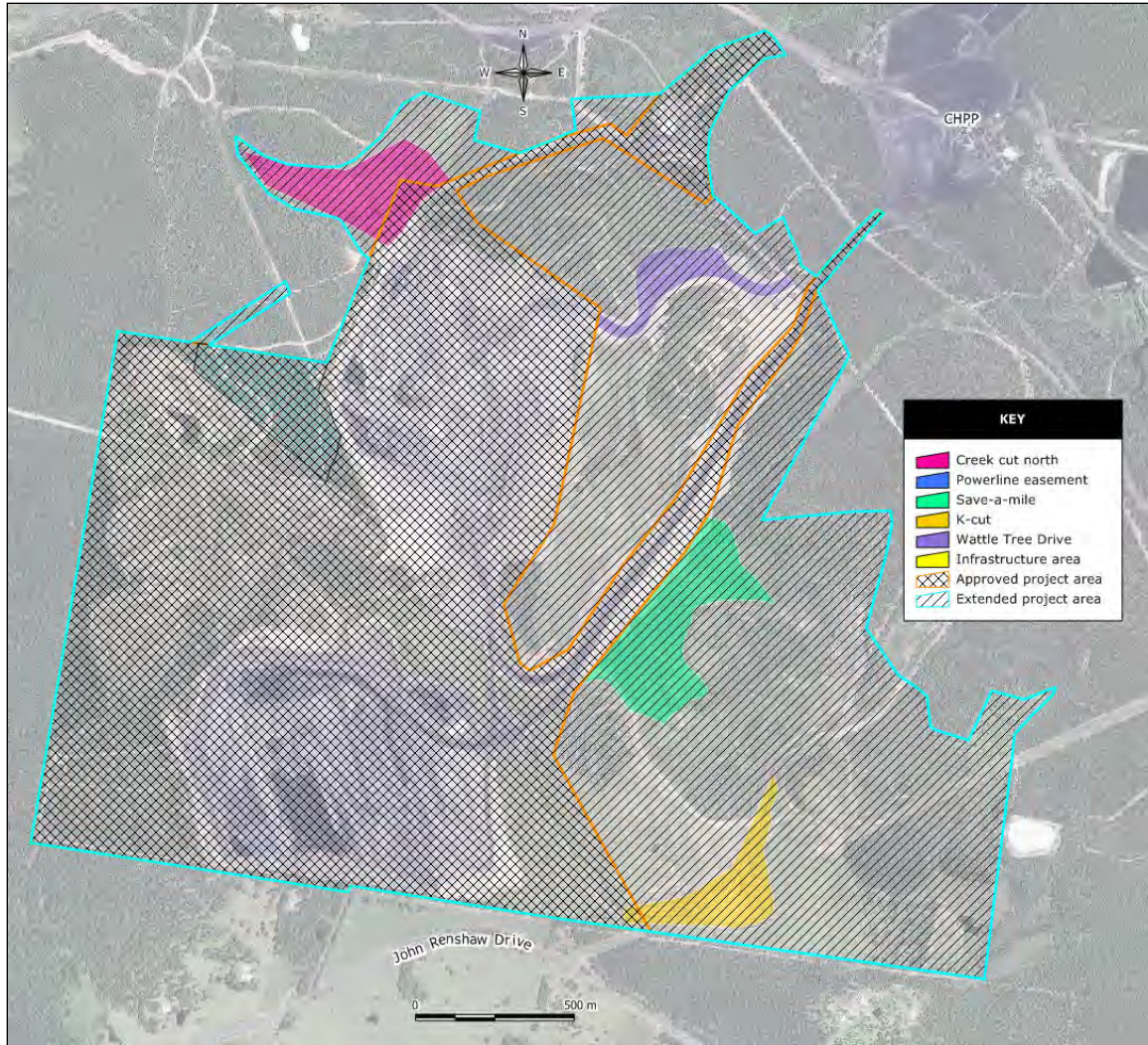


Figure 1: The application and disturbance areas

import of overburden to reshape and improve drainage is proposed, as well as revegetation. The amount of overburden material that would be transported to these areas would be 50,000 and 100,000 bcm's respectively. Works would be undertaken over approximately **6 months during Stage 2**.

### 1.4 Development of Wattle Tree Drive as an Alternative Haul Route

An existing access track between the northern open cut pit (Creek Cut) and the north-eastern end of the haul road leading to the washery stockpiles has been in existence for some years. Bloomfield proposes to develop this track ("Wattle Tree Drive") as an alternative haul road and general access road between the northern pit and the washery stockpiles. The location of this proposed alternative haul route is shown on **Figure 1**. The alternative haul route will be approximately **750 metres** in length.

Use of this alternative route will reduce haulage distances during times when coal is being extracted from the northern areas of Creek Cut. Some cut and fill and slope stabilisation works will be required to construct the road, which will be used by coal trucks and general vehicles.

To construct this alternative haul road, the existing track will require widening and levelling. The southern and northern batters will be shaped and stabilised as part of the construction works.

## 2 Methods

Of the proposed additional areas as described above, only the relocated powerline easement and infrastructure area would necessitate the removal of remnant vegetation. The other areas are located over either open ground or rehabilitated opencut areas.

Given that the area to be cleared for the relocated powerline easement is continuous with the area referred to as the eastern block in the 2009 application, this ecology assessment will be based on the data from that original report. Data from the Atlas of NSW Wildlife has been updated and a habitat tree survey was conducted in the area to be cleared.

The following described methods are those used to investigate the ecology of the eastern block from the 2009 application.

### 2.1 Threatened species, ecological communities and key threatening processes

Schedules 1 and 2 of the TSC Act contain lists of flora and fauna species and communities, which have been determined by the NSW Scientific Committee as being under threat of serious decline that could ultimately lead to extinction. The DEC & DPI (2005) guidelines for the assessment of threatened species for Part 3A applications provides a test for the impact of any proposal on threatened species occurring or considered as likely to occur in the investigation area.

Schedule 3 of the TSC Act contains a list of 'key threatening processes' deemed to be processes that have a negative impact on threatened species, populations or communities.



An assessment of the threatened species and endangered communities that could possibly occur on the subject site was made using Atlas of NSW Wildlife records from within a 5km radius of the subject site. Next, based on information available concerning the habitat requirements of these species (drawn from <http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/>), an assessment was made as to the likelihood of any of the reported threatened species occurring on the subject site or using the habitat of the subject site as an essential part of a foraging range.

A field survey was then conducted using the list of threatened species as a guide to species potentially likely to occur on the subject site. The survey was however, not limited to the species reported on the database extract. Searches were carried out for any species listed on Schedules 1 and 2 of the TSC Act that were considered likely to occur in the type of vegetative habitat present on the subject site.

The likelihood of any 'key threatening processes' (KTP) occurring on the subject site was also assessed.

## 2.2 Flora

Systematic transect searches were conducted across the whole area. This method improves the likelihood of finding any rare or threatened species. A floristic list was compiled for each different vegetation community from the transect searches as well as from a standard .04ha floristic plot placed in a representative part of each community in each vegetation block (using the Braun-Blanquet 1-6 scale for cover-abundance). **Figure 2** shows the location of plots and transects used for the 2009 application.

Floristic nomenclature was based on Harden (1992, 1993, 2000, 2002) with subsequent revisions as published on PlantNet (<http://plantnet.rbgsyd.nsw.gov.au>). Targeted searches were conducted for those threatened plant species that were identified during the preliminary assessment as likely to occur on the subject site. Plants listed under the ROTAP scheme (Briggs and Leigh 1996) were also considered in this assessment along with species and vegetation deemed to be of local conservation significance.

## 2.3 Vegetative Community Type Determination

The remnant vegetation for the whole of the Bloomfield, Ashtonfield and Donaldson areas has been mapped previously (Driscoll & Bell 2006) however while this mapping was ground-truthed, the area of the powerline easement and infrastructure area was inspected to confirm the communities present.

## 2.4 Fauna

The fauna assessment involved ground and arboreal trapping, targeted searches, spotlighting and the broadcasting of the calls of threatened owls. **Figure 2** shows the location of the various components of the fauna survey that was conducted for the 2009 application in relation to the powerline easement.

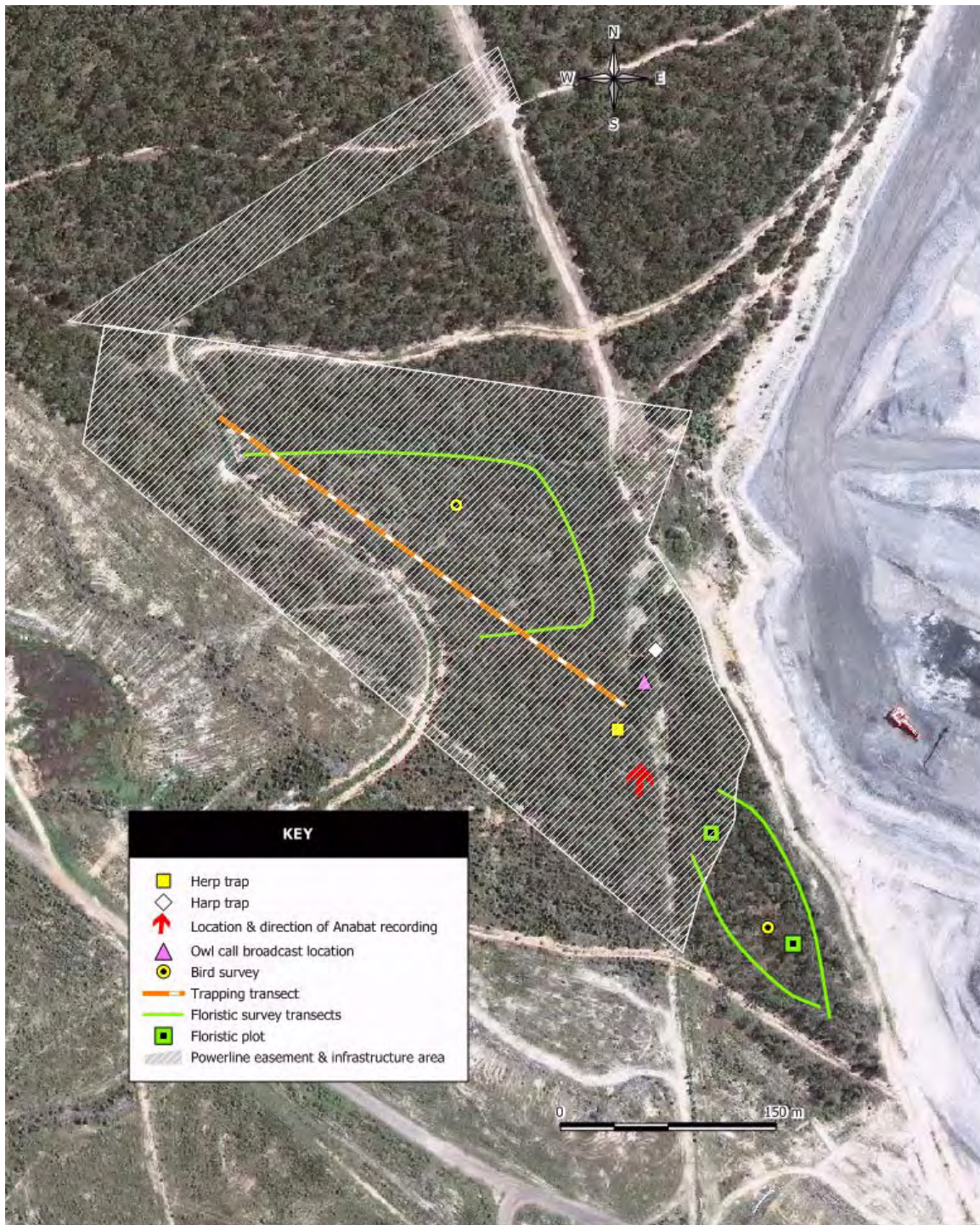


Figure 2: Flora and fauna survey locations



### 2.4.1 Arboreal Mammals

Trapping transects were designed to assess the presence of arboreal and terrestrial mammals utilising the subject site. For arboreal mammals, Elliot B traps and hair tubes were placed in trees at heights of 3m or above, along two transects and baited with a mixture of rolled oats, honey, peanut butter and treacle. The trunks of trees with the traps were sprayed with a honey and water mixture. These traps were checked daily for arboreal species and wafers from the hair tubes were collected after the four-night period and checked for the presence of hair samples. Hair identification methods followed those of Brunner *et al.* (2002).

Spotlighting was undertaken from dusk for a 3-hour period on one night to identify the presence of any arboreal mammals. Trees were inspected (during daylight hours) for the presence of habitat hollows and if present these were watched at dusk to see if any nocturnal birds or mammals emerged.

### 2.4.2 Terrestrial Mammals

In order to identify any terrestrial mammals, Elliot A traps, Elliot B traps and Cage traps were placed along transects at regular intervals. All traps were baited with a mix of rolled oats, honey, peanut butter and treacle. The traps were set in position for four consecutive nights and checked each morning.

Spotlighting from dusk for a 3-hour period on one night was also undertaken to identify the presence of any terrestrial mammals. Careful daytime searches were also conducted for the presence of fauna activity such as diggings, droppings or scratch marks.

### 2.4.3 Bats

An Anabat II bat-call recorder (Titley Electronics, Ballina) was used to record the calls of any Microchiropteran bats feeding in the area. The unit was set up at dusk and recording occurred for 2 hours continuous on one night at two locations. Spotlighting searches of blossoming trees were undertaken to identify any Megachiropteran bat species.

### 2.4.4 Birds

The method employed to survey diurnal birds was an area search of vegetation on the subject site. Four plots, each approximately 1ha in size, were surveyed for 30 minutes. Birds were identified either visually, with the aid of binoculars, or by call interpretation. Surveys were conducted in the morning when bird activity is maximised (Bibby *et al.* 2000). Opportunistic sightings were also recorded and listed separately to actual survey results. Other data recorded included the field site number, coordinates of the location using a handheld GPS unit, location description, start and finish times, as well as the temperature, relative humidity and wind speed using a Kestrel 4000 portable weather unit.

After dark, the calls of threatened owl species were broadcast over a megaphone in an attempt to encourage a response. The subject site was also searched to locate any regurgitated owl pellets. If any pellets were found, their size, shape and content would be used in an attempt to determine the species of owl from which the pellet originated as well as the prey species the owl had been feeding on. Analysis methods followed those of Brunner *et al.* (2002) and Triggs (1996).

#### **2.4.5 Reptiles**

Type IV funnel traps were set in along both sides of two 20m runs of drift fence. Trapping lines were left for four consecutive days and nights and traps were checked daily.

During survey periods on the subject site suitable reptile habitat was inspected to detect the presence of any reptile species by way of occupancy, scats or other detectable traces. Suitable habitat included roadsides, rock outcrops and crevices, any fallen hollow logs and limbs, burrows and suitable rubbish items such as sheets of tin.

#### **2.4.6 Habitat Hollows**

Hollows are an important resource utilised by a variety of forest fauna. Vertebrate and invertebrate species use hollows as diurnal or nocturnal shelter sites, for rearing young, feeding, thermoregulation and to facilitate ranging behaviour and dispersal (Gibbons & Lindenmayer 2002). Approximately 400 Australian species potentially use hollows either on a permanent or opportunistic basis. Many threatened species are obligate users, requiring the presence of hollows to survive in the landscape (Gibbons & Lindenmayer 2002).

The areas to be cleared were inspected and any trees having potential habitat hollows were marked with a band of survey paint and their location recorded using a hand-held GPS.

### 3 Threatened flora

According to the Atlas of NSW Wildlife (data extracted 2 February 2010) a total of 6 threatened flora species have been recorded within a 5-kilometre radius of the subject site (**Table 1**).

**Table 1: Threatened flora species recorded within a 5-kilometre radius of the subject site**

Family	Scientific Name	Common Name	Status
Asteraceae	<i>Rutidosis heterogama</i>	Heath Wrinklewort	V
Elaeocarpaceae	<i>Tetratheca juncea</i>	Black-eyed Susan	V
Fabaceae (Mimosoideae)	<i>Acacia bynoeana</i>	Bynoe's Wattle	E1
Myrtaceae	<i>Callistemon linearifolius</i>	Netted Bottle Brush	V
Myrtaceae	<i>Eucalyptus parramattensis subsp. decadens</i>	Drooping Redgum	V
Proteaceae	<i>Grevillea parviflora subsp. parviflora</i>	Small-flower Grevillea	V

E = Endangered; V = Vulnerable (NSW TSC Act 1995)

Using known habitat requirements, the species from **Table 1** were assessed for their likelihood of occurrence in the powerline easement vegetation (**Table 2**).

**Table 2: The likelihood of threatened flora species occurring in the powerline easement**

Scientific Name	Likelihood of occurring	Impact assessed
<i>Rutidosis heterogama</i>	Possible	Yes
<i>Tetratheca juncea</i>	Unsuitable habitat In the locality, occurs in Smooth-barked Apple Woodland.	No
<i>Acacia bynoeana</i>	Unsuitable habitat In the locality occurs in Kurri Sands Swamp Woodland,	No
<i>Callistemon linearifolius</i>	Unsuitable habitat Normally occurs in moister habitat,	No
<i>Eucalyptus parramattensis subsp. decadens</i>	Unsuitable habitat In the locality occurs in Kurri Sands Swamp Woodland,	No
<i>Grevillea parviflora subsp. parviflora</i>	Unsuitable habitat Occurs locally in Smooth-barked Apple Woodland.	No

## 4 Threatened fauna

According to the Atlas of NSW Wildlife (data extracted 2 February 2010) a total of 27 threatened fauna species have been recorded within a 5-kilometre radius of the subject site (**Table 3**).

**Table 3: Threatened fauna species recorded within a 5-kilometre radius of the subject site**

Family	Scientific Name	Common Name	Status
<b>Birds</b>			
Acanthizidae	<i>Pyrrholaemus saggitatus</i>	Speckled Warbler	V
Cacatuidae	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V
Climacteridae	<i>Climacteris picumnus</i>	Brown Treecreeper	V
Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V
Meliphagidae	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V
Meliphagidae	<i>Xanthomyza phrygia</i>	Regent Honeyeater	E1
Petroicidae	<i>Petroica boodang</i>	Scarlet Robin	V
Pomatostomidae	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V
Psittacidae	<i>Glossopsitta pusilla</i>	Little Lorikeet	V
Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E1
Psittacidae	<i>Neophema pulchella</i>	Turquoise Parrot	V
Strigidae	<i>Ninox connivens</i>	Barking Owl	V
Strigidae	<i>Ninox strenua</i>	Powerful Owl	V
Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	V
Tytonidae	<i>Tyto tenebricosa</i>	Sooty Owl	V
<b>Marsupials</b>			
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V
Petauridae	<i>Petaurus australis</i>	Yellow-bellied Glider	V
Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	V
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V
<b>Megachiropteran Bats</b>			
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V
<b>Microchiropteran Bats</b>			
Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V
Molossidae	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V
Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V
Vespertilionidae	<i>Miniopterus australis</i>	Little Bentwing-bat	V
Vespertilionidae	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V
Vespertilionidae	<i>Myotis macropus</i>	Southern Myotis	V
Vespertilionidae	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V
Vespertilionidae	<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V

E = Endangered; V = Vulnerable (NSW TSC Act 1995)

The recorded threatened fauna were assessed as to the likelihood of their occurring in the proposed disturbance area (**Table 4**). Occurrence is considered to be either using the disturbance area as a significant part of a home range or more opportunistically as foragers with much larger home ranges or as itinerants.

**Table 4: The likelihood of threatened fauna species occurring in the powerline easement**

Common Name	Likelihood of occurring	Impact assessed
<b>Birds</b>		
Speckled Warbler	Unsuitable habitat Requires a number of fallen logs which were not present.	No
Gang-gang Cockatoo	Suitable habitat	Yes
Brown Treecreeper	Unsuitable habitat Requires open woodland, sparse ground cover and fallen logs.	No
Wompoo Fruit-Dove	Unsuitable habitat A bird of moist riparian habitat.	No
Black-chinned Honeyeater (eastern subspecies)	Suitable habitat	
Regent Honeyeater	Unsuitable habitat Migrates to the area and feeds on winter-flowering blossom.	No
Grey-crowned Babbler (eastern subspecies)	Unsuitable habitat	No
Little Lorikeet	Suitable habitat	Yes
Scarlet Robin	Suitable habitat	Yes
Swift Parrot	Suitable habitat	Yes
Turquoise Parrot	Suitable habitat	Yes
Barking Owl	Unsuitable habitat A bird of riparian forest	No
Powerful Owl	Suitable habitat	Yes
Masked Owl	Suitable habitat	Yes
Sooty Owl	Unsuitable habitat A bird of dense forest	No
<b>Marsupials</b>		
Spotted-tailed Quoll	Unsuitable habitat Requires a large home range	No
Yellow-bellied Glider	Unsuitable habitat Requires large trees with habitat hollows,	No
Squirrel Glider	Suitable habitat	Yes
Koala	Unsuitable habitat Requires suitable feed trees not present in the habitat.	No
<b>Megachiropteran Bats</b>		
Grey-headed Flying-fox	Suitable habitat	Yes
<b>Microchiropteran Bats</b>		
Yellow-bellied Sheath-tail-bat	Suitable habitat	Yes
Eastern Freetail-bat	Suitable habitat	Yes
Eastern False Pipistrelle	Suitable habitat	Yes
Little Bentwing-bat	Suitable habitat	Yes
Eastern Bentwing-bat	Suitable habitat	Yes
Southern Myotis	Suitable habitat	Yes
Greater Broad-nosed Bat	Suitable habitat	Yes
Eastern Cave Bat	Suitable habitat	Yes

## 5 Results

### 5.1 Habitat description

A broad description of the habitat of each of the proposed areas:

Overhead powerline easement & infrastructure area: fully forested with Spotted Gum (*Corymbia maculata*) and Red Ironbark (*Eucalyptus fibrosa*) being the main canopy species.

Save-a-Mile: Landscaped overburden back-fill with a mix of planted Spotted Gum, wattles and exotic grasses as well as areas of spontaneous regrowth of exotic grasses and wattles.

K-cut: Landscaped overburden back-fill with spontaneous regrowth of exotic grasses and wattles.

Wattle Tree Drive: Landscaped overburden back-fill with sown exotic grasses, predominantly Rhodes Grass.

Creek-cut North: Landscaped overburden back-fill with spontaneous regrowth of exotic grasses and wattles.

The only area having potential habitat for threatened species was that of the powerline easement. The habitat in the other four areas was in poor condition and unsuitable for any of the threatened species recorded in the area.

The ecological impact assessment that follows is applied to the vegetation in and around the proposed powerline easement.

### 5.2 Vegetation community and flora

#### Lower Hunter Spotted Gum – Ironbark Forest

The overstorey was dominated by *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa* (Red Ironbark) and *Eucalyptus umbra* (Bastard Mahogany); other overstorey species were *Eucalyptus punctata* (Grey Gum), *Syncarpia glomulifera* (Turpentine), *Angophora costata* (Smooth-barked Apple) and *Allocasuarina torulosa* (Forest Oak). The shrub layer was dominated by *Bursaria spinosa* and *Daviesia ulicifolia* and the ground layer was dominated by *Joycea pallida*, *Themeda australis* and *Entolasia stricta*.

This combination of species is consistent with that of the listed EEC (TSC Act) *Lower Hunter Spotted Gum – Ironbark Forest*.

54 species of flora were recorded across the area (Appendix 1). There were no threatened flora species present.



Coastal Plains Smooth-barked Apple Woodland

The overstorey was dominated by *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus umbra* (White Mahogany). There was also *Eucalyptus punctata* (Grey Gum), *Corymbia maculata* (Spotted Gum) and *Eucalyptus siderophloia* (Grey Ironbark). The shrub layer contained *Ceratopetalum gummiferum*, *Pultenaea villosa*, *Gompholobium latifolium* *Glochidion ferdinandi* and *Xylomelum pyriforme*. The ground cover was dominated by *Entolasia stricta*, *Themeda australis* and *Imperata cylindrica*.

68 species of flora were recorded in this community (Appendix 1). There were no threatened flora species present.

### 5.3 Fauna

Overall, 2 amphibian, 7 reptile, 12 mammal and 45 bird species were recorded in the area. Of these, six threatened fauna species were recorded (**Table 5**).

**Table 5: Threatened fauna species recorded on the subject site**

Scientific Name	Common Name	Method	Habitat	Legal Status
<i>Ninox strenua</i>	Powerful Owl	Call Playback	Open forest	V
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail Bat	Anabat	Open forest	V
<i>Mormopterus norfolkensis</i>	East Coast Freetail Bat	Anabat	Open forest	V
<i>Miniopterus australis</i>	Little Bent-wing Bat	Anabat	Open forest	V
<i>Miniopterus schreibersii</i>	Large Bent-wing Bat	Anabat	Open forest	V
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Anabat	Open forest	V

#### 5.3.1 SEPP 44

SEPP 44 requires that for proposals on properties involving 1 hectare or more, the habitat should be evaluated for potential Koala habitat and core Koala Habitat. Potential Koala habitat is defined as 'areas of native vegetation where the trees listed in Schedule 2 (of SEPP 44) 'constitute at least 15% of the total number of trees in the upper and lower strata of the tree component'. Should potential Koala habitat be found, further investigation of the existence of core Koala habitat should be undertaken and if this habitat is found to be present then a detailed Plan of Management should be prepared for the Koala colony in the area. A list of Schedule 2 feed trees is provided in **Table 6** below.

**Table 6: SEPP 44, Schedule 2 - Koala Feed Tree Species**

Scientific Name	Common Name
<i>Eucalyptus tereticornis</i>	Forest Red Gum
<i>Eucalyptus microcorys</i>	Tallowwood
<i>Eucalyptus punctata</i>	Grey Gum
<i>Eucalyptus viminalis</i>	Ribbon or Manna Gum
<i>Eucalyptus camaldulensis</i>	River Red Gum
<i>Eucalyptus haemastoma</i>	Broad-leaved Scribbly Gum
<i>Eucalyptus signata</i>	Scribbly Gum
<i>Eucalyptus albens</i>	White Box
<i>Eucalyptus populnea</i>	Bimble Box or Poplar Box
<i>Eucalyptus robusta</i>	Swamp Mahogany

Of the feed trees listed in Table 7, only *Eucalyptus punctata* was present and at less than 15% of the total number of trees. This meant that potential Koala habitat was not present and that further investigation was not required.

#### 5.3.2 Habitat trees

In the areas to be cleared, 31 trees having potential fauna habitat hollows were found (Figure 3). One tree of particular note was a tall Spotted Gum (*Corymbia maculata*) which contained a large raptor nest. This tree was located just outside of the powerline clearing area and care should be taken during clearing not to disturb this tree, such as by pushing other trees against it.

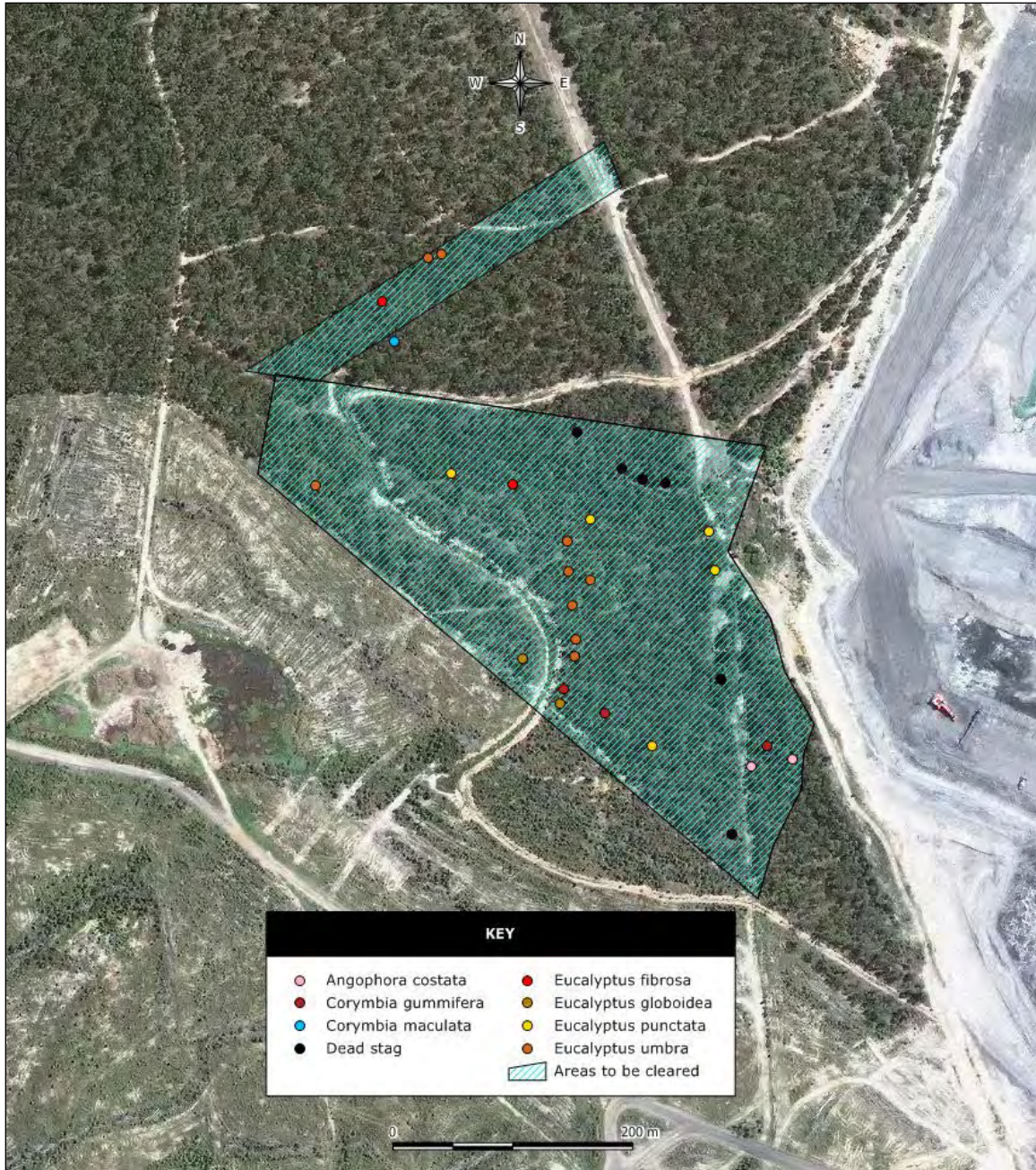


Figure 3: The location and species of habitat trees recorded in the areas to be cleared



The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Little Lorikeet

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

Three trees having potential breeding hollows would be lost but this would not have an impact on the life cycle of the species..

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The loss of canopy trees would reduce the amount of available foraging habitat for the species. However the loss of about 1 hectare would be insignificant in the overall context of available habitat in the locality.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Little Lorikeet is not at the known limit of its distribution at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Swift Parrot

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The habitat at the forest/cleared interface is marginal for these birds with little grassland foraging available and none of these birds were recorded during the investigation. The small amount of clearing required would not have any impact on the life cycle of these birds were they present at the subject site.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this bird.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Swift Parrot is not at the known limit of its distribution at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Gang-gang Cockatoo

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The small amount of clearing required would have no impact on the life-cycle of the Gang-gang Cockatoo. The loss of three trees having potential breeding hollows would not have a detrimental impact on the life-cycle of the species.

- b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this bird.

- c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Gang-gang Cockatoo is not at the known limit of its distribution at this location.

- d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

- e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

- f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

## Powerful Owl

- a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The Powerful Owl home range is around 1000 ha. The small amount of vegetation that is proposed to be cleared does not contain essential habitat features for this bird i.e. there were no trees with suitable breeding hollows and no vegetation suitable for daytime roosting.

- b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this bird.

- c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Powerful Owl is not at the known limit of its distribution at this location.

- d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

- e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

- f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

## Masked Owl

- a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The Masked Owl home range is around 750 ha. Three trees having possible breeding hollows would be lost however no Masked Owls were recorded in the area.

- b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this bird.

- c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Powerful Owl is not at the known limit of its distribution at this location.

- d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

- e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Black-chinned Honeyeater (eastern subspecies)

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The species can be found foraging and breeding in habitat similar to that present. The loss of 1 hectare would not place any local population at risk.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this bird.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The species is not at the known limit of its distribution at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Scarlet Robin

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The species can be found foraging and breeding in habitat similar to that present. The loss of 1 hectare would not place any local population at risk.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this bird.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The species is not at the known limit of its distribution at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Squirrel Glider

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

No Squirrel Gliders were recorded during the field work although they are known to be in the area having been recorded elsewhere on Bloomfield as well as on Donaldson to the east. The proposed clearing would not place any local population of Squirrel Gliders under threat. Three trees having potential denning hollows would be lost, however no Squirrel Gliders were recorded in the area.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this glider.



- c) **Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Squirrel Glider is not at the known limit of its distribution at this location.

- d) **How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

- e) **How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

- f) **How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

## Grey-headed Flying Fox

- a) **How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

There were no breeding colonies of this flying fox present and the small amount of vegetation proposed to be cleared would not impact on the overall available foraging resources of the species.

- b) **How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for this flying fox.

- c) **Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Grey-headed Flying Fox is not at the known limit of its distribution at this location.

- d) **How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

- e) **How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

- f) **How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

## Cave Roosting *Microchiropteran* Bats

Little Bent-wing Bat

Eastern Bent-wing Bat

Eastern Cave Bat

- a) **How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The proposed action would not remove foraging habitat from the home ranges of these species. No breeding habitat was present in the area.

- b) **How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for these bats.

- c) **Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

Neither species of bat are at the known limit of their distributions at this location.

- d) **How is the proposal likely to affect current disturbance regimes?**

Very little change to current disturbance regimes as the habitat is on the edge of a cleared mining area.

- e) **How is the proposal likely to affect habitat connectivity?**

## 6 Impact assessment

This section examines the possible impact of the proposed powerline easement construction on threatened species and endangered communities. An impact assessment is conducted according to the Draft Guidelines for Threatened Species Assessment (DECC & DPI 2005). A review of the threatened species profiles shows that there were threatened species that could be found on the subject site under different conditions to those prevailing at the time of this investigation or could be found in similar habitat in the immediate region. An impact assessment was applied to these species, threatened flora and fauna species and any endangered ecological communities that were recorded during the field surveys.

### 6.1 Flora

#### Rutidosia heterogama

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

No *Rutidosia heterogama* was found in or near the area to be cleared.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The clearing of approximately 8 hectare would have no impact on the availability of suitable habitat for the species.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

*Rutidosia heterogama* would not be at the limit of its known distribution at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

There would be no additional risks to the surrounding habitat as a result of the establishment of the powerline easement.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat was present.

### 6.2 Fauna

#### Turquoise Parrot

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The habitat at the forest/cleared interface is marginal for these birds with little grassland foraging available and none of these birds were recorded during the investigation. The small amount of clearing required would not have any impact on the life cycle of these birds were they present at the subject site. It may in fact create a small amount of suitable habitat for the species.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The new powerline easement could make more suitable habitat available for these birds by creating additional forest/grassland interface.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

The Turquoise Parrot is not at the known limit of its distribution at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

### Tree Roosting *Microchiropteran* Bats

Eastern Freetail-bat

Yellow-bellied Shearwater Bat

Greater Broad-nosed Bat

Eastern False Pipistrelle

Southern Myotis

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

The small area of clearing involved in the proposed development would not impact on the life cycle of these species and would not restrict their foraging.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposal would not affect the potential habitat for these bats.

**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

None of the species of bat are at the known limit of their distributions at this location.

**d) How is the proposal likely to affect current disturbance regimes?**

Very little change to current disturbance regimes as the habitat is on the edge of a cleared mining area.

**e) How is the proposal likely to affect habitat connectivity?**

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

**f) How is the proposal likely to affect critical habitat?**

No critical habitat for this species occurs at this location.

## 6.3 Endangered Ecological Community

### Lower Hunter Spotted Gum – Ironbark Forest

**Figure 4** shows the mapped vegetation for the clearing required for the powerline easement and infrastructure areas. A total of about 8 hectares of the EEC would be cleared.

**a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?**

Not applicable.

**b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?**

The proposed mining will result in the loss of about 8 hectares of this community. However there is about 145 ha of this community in the immediate vicinity of the proposed disturbance area and the loss of 8 hectares would not have a significant impact on the remaining community. This of course has been demonstrated by the fact that historical clearing around remnants of this EEC has not impacted negatively on those remnants.

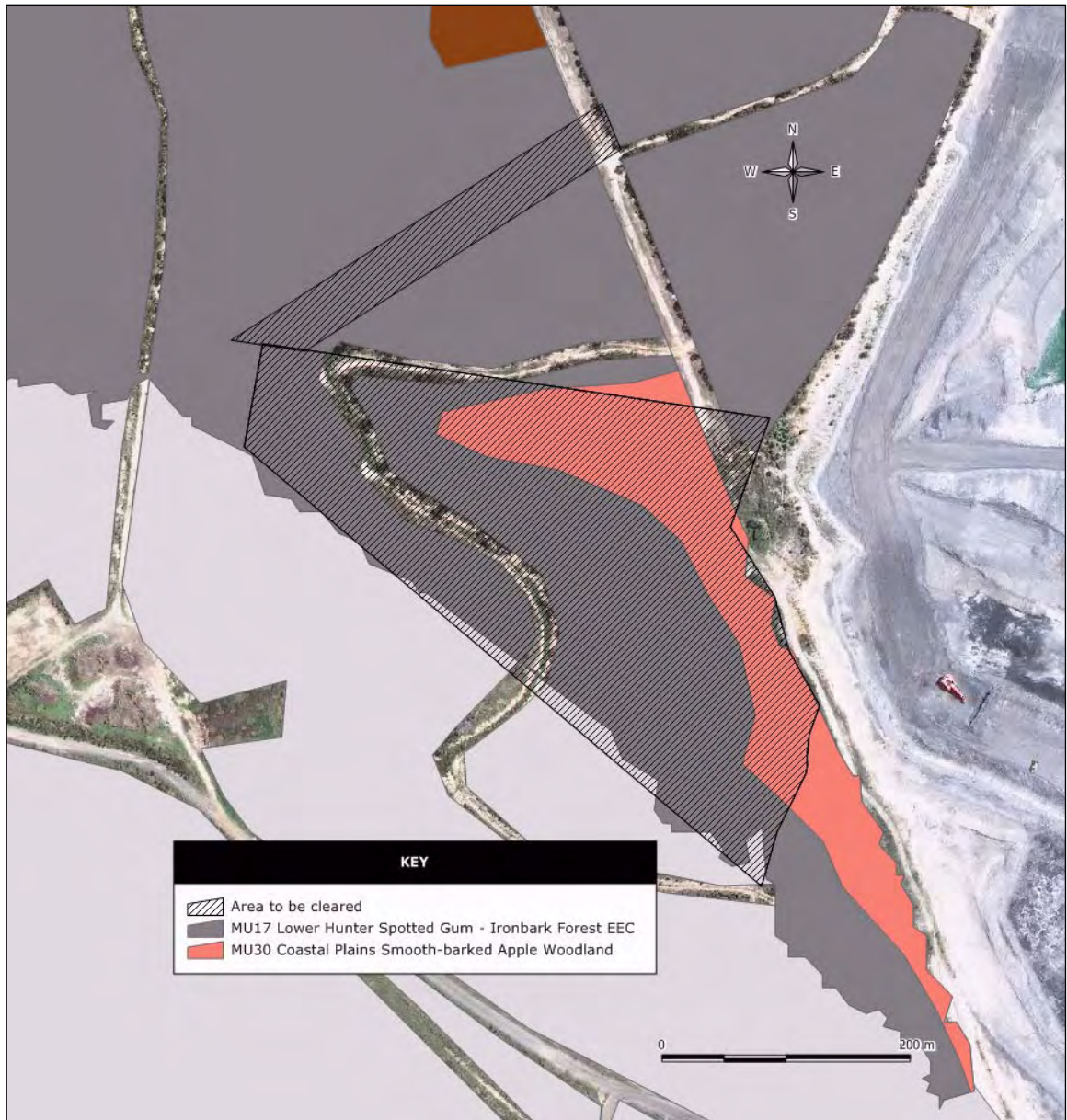
**c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?**

Not applicable.

**d) How is the proposal likely to affect current disturbance regimes?**

Very little change to current disturbance regimes as the habitat is on the edge of a cleared mining area.

**e) How is the proposal likely to affect critical habitat?**



**Figure 4 Vegetation map for the powerline easement and infrastructure areas to be cleared**

## 6.5 Commonwealth considerations

Matters of national significance protected under the EPBC Act 1999 are as follows:

- World Heritage properties
- National heritage places
- Wetlands of international importance (Ramsar wetlands)
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- Nuclear actions (including uranium mining)

None of these matters would be involved in the proposed extension to activities. In particular there were: no wetlands; no migratory species; and, none of the Commonwealth listed threatened species or ecological communities were present.

## 7 Conclusion & recommendations

The treatment of the habitat trees in the powerline easement is the only recommendation. In the week prior to clearing, these trees should be inspected at dusk to determine whether any of the hollows are occupied. If there is a colony of microbats or a threatened owl using the hollows then clearing should be timed to minimise any impact. When clearing is finally carried out these trees should be left standing for at least 5 nights so that any occupants can relocate. When these trees are finally brought down an experienced fauna ecologist should be present to attend to any fauna that are still occupying the hollows.

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### Appendix 1 - Flora species recorded on the subject site

#### MU17 Lower Hunter Spotted Gum – Ironbark Forest

Common Name	Scientific Name	Family Name
Pastel Flower	<i>Pseuderanthemum variabile</i>	Acanthaceae
Mulga Fern	<i>Cheilanthes sieberi</i>	Adiantaceae
	<i>Tricoryne elatior</i>	Anthericaceae
	<i>Chrysocephalum semipapposum</i>	Asteraceae
	<i>Lagenifera stipitata</i>	Asteraceae
	<i>Ozothamnus diosmifolius</i>	Asteraceae
Fuzzweed	<i>Vittadinia cuneata</i>	Asteraceae
Wonga Vine	<i>Pandorea pandorana</i> subsp. <i>pandorana</i>	Bignoniaceae
Forest Oak	<i>Allocasuarina torulosa</i>	Casuarinaceae
	<i>Lepidosperma laterale</i>	Cyperaceae
	<i>Ptilothrix deusta</i>	Cyperaceae
	<i>Hibbertia empetrifolia</i> subsp. <i>empetrifolia</i>	Dilleniaceae
	<i>Leucopogon juniperinus</i>	Epacridaceae
Coffee Bush	<i>Breynia oblongifolia</i>	Euphorbiaceae
	<i>Phyllanthus hirtellus</i>	Euphorbiaceae
	<i>Daviesia squarrosa</i>	Fabaceae (Faboideae)
Gorse Bitter Pea	<i>Daviesia ulicifolia</i>	Fabaceae (Faboideae)
	<i>Dillwynia retorta</i>	Fabaceae (Faboideae)
	<i>Glycine clandestina</i>	Fabaceae (Faboideae)
	<i>Glycine microphylla</i>	Fabaceae (Faboideae)
False Sarsaparilla	<i>Hardenbergia violacea</i>	Fabaceae (Faboideae)
	<i>Acacia elongata</i>	Fabaceae (Mimosoideae)
	<i>Acacia falcata</i>	Fabaceae (Mimosoideae)
	<i>Acacia parvipinnula</i>	Fabaceae (Mimosoideae)
	<i>Goodenia rotundifolia</i>	Goodeniaceae
Whiteroot	<i>Gonocarpus teucrioides</i>	Haloragaceae
	<i>Pratia purpurascens</i>	Lobeliaceae
	<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Lomandraceae
Spotted Gum	<i>Corymbia maculata</i>	Myrtaceae
Red Ironbark	<i>Eucalyptus fibrosa</i>	Myrtaceae
White Mahogany	<i>Eucalyptus umbra</i>	Myrtaceae
	<i>Dianella longifolia</i> var. <i>longifolia</i>	Phormiaceae
	<i>Dianella tasmanica</i>	Phormiaceae
Apple Dumplings	<i>Billardiera scandens</i> var. <i>scandens</i>	Pittosporaceae
	<i>Bursaria spinosa</i> var. <i>spinosa</i>	Pittosporaceae
	<i>Anisopogon avenaceus</i>	Poaceae
Threeawn Speargrass	<i>Aristida vagans</i>	Poaceae
	<i>Aristida warburgii</i>	Poaceae
Wallaby Grass	<i>Austrodanthonia fulva</i>	Poaceae
	<i>Dichelachne sieberiana</i>	Poaceae
	<i>Digitaria ramularis</i>	Poaceae

Hedgehog Grass	<i>Echinopogon ovatus</i>	<b>Poaceae</b>
Wiry Panic	<i>Entolasia stricta</i>	<b>Poaceae</b>
	<i>Eragrostis brownii</i>	<b>Poaceae</b>
	<i>Microlaena stipoides</i> var. <i>stipoides</i>	<b>Poaceae</b>
	<i>Panicum simile</i>	<b>Poaceae</b>
	<i>Paspalidium distans</i>	<b>Poaceae</b>
Kangaroo Grass	<i>Themeda australis</i>	<b>Poaceae</b>
Narrow-leaved Geebung	<i>Persoonia linearis</i>	<b>Proteaceae</b>
	<i>Boronia polygalifolia</i>	<b>Rutaceae</b>
	<i>Dodonaea triquetra</i>	<b>Sapindaceae</b>
	<i>Hybanthus stellarioides</i>	<b>Violaceae</b>
Grass Tree	<i>Xanthorrhoea latifolia</i> subsp. <i>latifolia</i>	<b>Xanthorrhoeaceae</b>
	<i>Macrozamia reducta</i>	<b>Zamiaceae</b>

## MU30 Coastal Plains Smooth-barked Apple Woodland

Common Name	Scientific Name	Family Name
Pastel Flower	<i>Pseuderanthemum variabile</i>	<b>Acanthaceae</b>
Maiden Hair Fern	<i>Adiantum aethiopicum</i>	<b>Adiantaceae</b>
Mulga Fern	<i>Cheilanthes sieberi</i>	<b>Adiantaceae</b>
	<i>Tricoryne elatior</i>	<b>Anthericaceae</b>
	<i>Astrotricha obovata</i>	<b>Araliaceae</b>
Elderberry Ash	<i>Polyscias sambucifolia</i>	<b>Araliaceae</b>
Wonga Vine	<i>Pandorea pandorana subsp. pandorana</i>	<b>Bignoniaceae</b>
Forest Oak	<i>Allocasuarina torulosa</i>	<b>Casuarinaceae</b>
Orange Bark	<i>Maytenus silvestris</i>	<b>Celastraceae</b>
	<i>Ceratopetalum gummiferum</i>	<b>Cunoniaceae</b>
Swordgrass	<i>Gahnia clarkei</i>	<b>Cyperaceae</b>
	<i>Lepidosperma concavum</i>	<b>Cyperaceae</b>
	<i>Lepidosperma laterale</i>	<b>Cyperaceae</b>
	<i>Hypolepis muelleri</i>	<b>Dennstaedtiaceae</b>
Bracken Fern	<i>Pteridium esculentum</i>	<b>Dennstaedtiaceae</b>
	<i>Hibbertia empetrifolia subsp. empetrifolia</i>	<b>Dilleniaceae</b>
Cheese Tree	<i>Glochidion ferdinandi</i>	<b>Euphorbiaceae</b>
	<i>Phyllanthus hirtellus</i>	<b>Euphorbiaceae</b>
Gorse Bitter Pea	<i>Daviesia ulicifolia</i>	<b>Fabaceae (Faboideae)</b>
	<i>Dillwynia retorta</i>	<b>Fabaceae (Faboideae)</b>
	<i>Glycine clandestina</i>	<b>Fabaceae (Faboideae)</b>
	<i>Gompholobium latifolium</i>	<b>Fabaceae (Faboideae)</b>
	<i>Hovea linearis</i>	<b>Fabaceae (Faboideae)</b>
	<i>Pultenaea villosa</i>	<b>Fabaceae (Faboideae)</b>
	<i>Acacia elongata</i>	<b>Fabaceae (Mimosoideae)</b>
	<i>Acacia linifolia</i>	<b>Fabaceae (Mimosoideae)</b>
	<i>Gonocarpus teucrioides</i>	<b>Haloragaceae</b>
Lacy Wedge Fern	<i>Lindsaea microphylla</i>	<b>Lindsaeaceae</b>
Whiteroot	<i>Pratia purpurascens</i>	<b>Lobeliaceae</b>
Whiteroot	<i>Pratia purpurascens</i>	<b>Lobeliaceae</b>
	<i>Lomandra filiformis subsp. coriacea</i>	<b>Lomandraceae</b>
	<i>Lomandra multiflora subsp. multiflora</i>	<b>Lomandraceae</b>
Fishbone	<i>Lomandra obliqua</i>	<b>Lomandraceae</b>
Muttonwood	<i>Rapanea variabilis</i>	<b>Myrsinaceae</b>
Smooth-barked Apple	<i>Angophora costata</i>	<b>Myrtaceae</b>
Red Bloodwood	<i>Corymbia gummifera</i>	<b>Myrtaceae</b>
Spotted Gum	<i>Corymbia maculata</i>	<b>Myrtaceae</b>
Red Ironbark	<i>Eucalyptus fibrosa</i>	<b>Myrtaceae</b>
	<i>Eucalyptus globoidea</i>	<b>Myrtaceae</b>
	<i>Eucalyptus punctata</i>	<b>Myrtaceae</b>
	<i>Eucalyptus siderophloia</i>	<b>Myrtaceae</b>
White Mahogany	<i>Eucalyptus umbra</i>	<b>Myrtaceae</b>
	<i>Leptospermum polygalifolium subsp. polygalifolium</i>	<b>Myrtaceae</b>
	<i>Leptospermum trinervium</i>	<b>Myrtaceae</b>
Native Olive	<i>Notelaea longifolia</i>	<b>Oleaceae</b>

	<i>Dianella caerulea</i> var. <i>caerulea</i>	<b>Phormiaceae</b>
	<i>Dianella longifolia</i> var. <i>longifolia</i>	<b>Phormiaceae</b>
	<i>Dianella tasmanica</i>	<b>Phormiaceae</b>
Apple Dumplings	<i>Billardiera scandens</i> var. <i>scandens</i>	<b>Pittosporaceae</b>
Hairy Pittosporum	<i>Pittosporum revolutum</i>	<b>Pittosporaceae</b>
	<i>Anisopogon avenaceus</i>	<b>Poaceae</b>
Threeawn Speargrass	<i>Aristida vagans</i>	<b>Poaceae</b>
Wallaby Grass	<i>Austrodanthonia fulva</i>	<b>Poaceae</b>
	<i>Cymbopogon refractus</i>	<b>Poaceae</b>
Hedgehog Grass	<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	<b>Poaceae</b>
Wiry Panic	<i>Entolasia stricta</i>	<b>Poaceae</b>
Bladey Grass	<i>Imperata cylindrica</i> var. <i>major</i>	<b>Poaceae</b>
	<i>Joycea pallida</i>	<b>Poaceae</b>
	<i>Microlaena stipoides</i> var. <i>stipoides</i>	<b>Poaceae</b>
Kangaroo Grass	<i>Themeda australis</i>	<b>Poaceae</b>
	<i>Banksia spinulosa</i> var. <i>collina</i>	<b>Proteaceae</b>
	<i>Lomatia silaifolia</i>	<b>Proteaceae</b>
Narrow-leaved Geebung	<i>Persoonia linearis</i>	<b>Proteaceae</b>
Woody Pear	<i>Xylomelum pyriforme</i>	<b>Proteaceae</b>
	<i>Ripogonum album</i>	<b>Ripogonaceae</b>
	<i>Pomax umbellata</i>	<b>Rubiaceae</b>
	<i>Pimelea linifolia</i> subsp. <i>linifolia</i>	<b>Thymelaeaceae</b>
	<i>Macrozamia reducta</i>	<b>Zamiaceae</b>

**Appendix 2 - Fauna species in the immediate vicinity if the proposed powerline easement**

<b>Scientific Name</b>	<b>Common Name</b>
<b>Amphibians</b>	
<i>Litoria latopalmata</i>	Broad-palmed Frog
<i>Pseudophryne coriacea</i>	Red-back Toadlet
<b>Reptiles</b>	
<i>Amphibolurus muricatus</i>	Jacky Lizard
<i>Carlia tetradactyla</i>	Southern Rainbow Skink
<i>Diplodactylus vittatus</i>	Eastern Stone Gecko
<i>Furina diadema</i>	Red-naped Snake
<i>Oedura lesueurii</i>	Lesueur's Velvet Gecko
<i>Ramphotyphlops nigrescens</i>	Blackish Blind Snake
<i>Saiphos equalis</i>	Three-toed Skink
<b>Mammals</b>	
<i>Antechinus stuartii</i>	Brown Antechinus
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Oryctolagus cuniculus</i> *	Rabbit
<i>Perameles nasuta</i>	Long-nosed Bandicoot
<i>Trichosurus vulpecula</i>	Brushtail Possum
<b>Bats</b>	
<i>Chalinobus gouldii</i>	Gould's Wattled Bat
<i>Chalinobus morio</i>	Chocolate Wattled Bat
<i>Miniopterus australis</i> #	Little Bent-wing Bat
<i>Miniopterus schreibersii</i> #	Large Bent-wing Bat
<i>Mormopterus norfolkensis</i> #	East Coast Freetail Bat
<i>Mormopterus planiceps</i>	Southern Freetail Bat
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat
<i>Rhinolopus megaphyllus</i>	Eastern Horseshoe Bat
<i>Saccolaimus flaviventris</i> #	Yellow-bellied Sheath-tail Bat
<i>Scoteanax rueppellii</i> #	Greater Broad-nosed Bat
<i>Scotorepens balstoni</i>	Inland Broad-nose Bat
<i>Scotorepens orion</i>	Eastern Broad-nose Bat
<i>Tadarida australis</i>	White-striped Mastiff Bat
<i>Vespadelus vulturnus</i>	Little Forest Bat
<b>Birds</b>	
<i>Acanthiza lineata</i>	Striated Thornbill
<i>Acanthiza nana</i>	Yellow Thornbill
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
<i>Alisterus scapularis</i>	Australian King-Parrot
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo

<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo
<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo
<i>Colluricincla harmonica</i>	Grey Shrike-thrush
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
<i>Coracina tenuirostris</i>	Cicadabird
<i>Cormobates leucophaeus</i>	White-throated Treecreeper
<i>Corvus coronoides</i>	Australian Raven
<i>Coturnix ypsilophora</i>	Brown Quail
<i>Cracticus nigrogularis</i>	Pied Butcherbird
<i>Dacelo novaeguineae</i>	Laughing Kookaburra
<i>Eopsaltria australis</i>	Eastern Yellow Robin
<i>Geopelia humeralis</i>	Bar-shouldered Dove
<i>Gerygone olivacea</i>	White-throated Gerygone
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater
<i>Lichenostomus melanops</i>	Yellow-tufted Honeyeater
<i>Malurus cyaneus</i>	Superb Fairy-wren
<i>Malurus lamberti</i>	Variiegated Fairy-wren
<i>Myiagra rubecula</i>	Leaden Flycatcher
<i>Neochmia temporalis</i>	Red-browed Finch
<i>Ninox strenua</i> <sup>#</sup>	Powerful Owl
<i>Nycticorax caledonicus</i>	Nankeen Night Heron
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Oriolus sagittatus</i>	Olive-backed Oriole
<i>Pachycephala rufiventris</i>	Rufous Whistler
<i>Pardalotus punctatus</i>	Spotted Pardalote
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Philemon corniculatus</i>	Noisy Friarbird
<i>Platycercus elegans</i>	Crimson Rosella
<i>Platycercus eximius</i>	Eastern Rosella
<i>Podargus strigoides</i>	Tawny Frogmouth
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo
<i>Sericornis frontalis</i>	White-browed Scrubwren
<i>Strepera graculina</i>	Pied Currawong
<i>Taeniopygia bichenovii</i>	Double-barred Finch
<i>Todiramphus sanctus</i>	Sacred Kingfisher
<i>Zosterops lateralis</i>	Silvereye

\*Introduced, <sup>#</sup>Vulnerable (TSC Act)



**Appendix 3 – Habitat images**



Powerline easement/infrastructure area Lower Hunter Spotted Gum – Ironbark Forest



K-cut

No critical habitat was present.

**f) How is the proposal likely to affect habitat connectivity?**

The areas to be cleared are at the edge of larger areas of remnant forest and their clearing will not break any habitat connectivity.

## 6.4 Key threatening processes

The following listed threatening processes could be in action as a result of the proposed works being carried out:

- *Clearing of native vegetation*

Approximately 10 ha of native vegetation would be cleared.

- *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*

Bloomfield Colliery has a fire management plan in place to control the frequency of fire

- *Invasion and establishment of exotic vines and scramblers*

Can be monitored and controlled through a weed management plan

- *Invasion of native plant communities by exotic perennial grasses*

Can be monitored and controlled through a weed management plan

- *Invasion, establishment and spread of Lantana camara*

Can be monitored and controlled through a weed management plan

- *Loss of Hollow-bearing Trees*

31 hollow bearing trees would be removed

- *Removal of dead wood and dead trees*

This KTP relates particularly to the removal of dead material from standing forest rather than the loss associated with the clearing of native vegetation





Save-a-mile



Save-a-mile





Creek Cut North



Wattle Tree Drive (the open grassed area)

## **Appendix C – Air Quality Assessment**

31 May 2010

Steve Dunn  
Bloomfield Colliery  
Via email: [sdunn@bloomcoll.com.au](mailto:sdunn@bloomcoll.com.au)

Dear Steve

**Re: Bloomfield Modification Analysis for Air Quality**

We have completed the modelling for the proposed additional overburden emplacement area and modification of the two rehabilitation areas for Stage 2. The additional emplacement area will facilitate the storage of 1,200,000 bcm of overburden at the "Save a mile south" emplacement area as shown in **Figure 1**. The modification of the rehabilitation areas, also shown in **Figure 1**, will involve the reshaping of the final landform to improve drainage along with the addition of 50,000 bcm and 100,000 bcm of overburden to the northern and southern rehabilitation areas, respectively.

Also proposed are the relocation of the southern end of the powerline that provides electricity to the site along with a 40 m wide easement. The construction of these works is anticipated to take less than 6 weeks and is to be built during Stage 2. In addition, it is proposed to develop a northern haul road known as "Wattle Tree Drive" along the alignment of an existing access road. The location of Wattle Tree Drive is shown in **Figure 1**. The implementation of the new haul route would result in a decreased haul distance for the ROM coal transported from Creek Cut to the washery for processing. While dust would be generated from the earthworks associated with the proposed relocation of the powerline and construction of Wattle Creek Drive, there are a number of safe guards that can be put in place during these type of operations to ensure there is no detrimental impact on the local air quality. Therefore the impacts have not been specifically modelled.

The modelling of emissions from Bloomfield is based on the emissions estimation tables, as agreed on 11 January 2010. Copies of the emissions tables are provided in **Table 1** for reference.

For the cumulative assessment, emissions from the Donaldson Open-Cut and Abel Underground coal mines, located to the east of Bloomfield, have been included in the assessment. Bloomfield, Donaldson and Abel make use of a common Coal Handling and Processing Plant (CHPP) and also operate stockpiles in the same area and share the same rail loop. These activities were approved as part of the Abel Underground Mine Project (**Holmes Air Sciences, 2006**). Emissions from these common facilities have only been included in the cumulative assessment.

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GOLD COAST

TOOWOOMBA

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It was assumed that annual average concentrations due to emissions from distant mines and other sources, including the shared CHPP are:

- PM<sub>10</sub> – 9.6 µg/m<sup>3</sup>
- TSP – 24.5 µg/m<sup>3</sup>
- Dust deposition – 0.5 g/m<sup>2</sup>/month

These data are consistent with values used in recent assessments (**Holmes Air Sciences, 2008**).

### **Meteorological data**

A meteorological station has been operated since 1999 as part of the Donaldson Project environmental monitoring program. **Figure 2** shows the windroses for this site. The weather station is located on the Donaldson mine site, to the east of Bloomfield mine, but is unavoidably affected by trees. Therefore, the weather station's exposure does not comply with Australian Standard 2923-1987, which specifies the requirements for the exposure of weather stations used to collect wind speed and wind direction data for modelling. For this reason, the modelling work has been undertaken using data from the nearby DECCW meteorological station at Beresfield located 8 km to the east. **Figure 3** presents the windroses compiled for the 2004 and 2005 dataset at Beresfield. Meteorological information was available from the 1<sup>st</sup> of August 2004 to 31<sup>st</sup> July 2005 with 92% data retrieval.

The two sites show a similar distribution of winds, but the Donaldson site shows a much higher frequency of light winds. This is not unexpected given the shielding effect of the vegetation on the mine site.

### **Results**

The results of the modelling are presented as contour plots in **Figure 4** to **Figure 7** for Bloomfield Colliery alone and **Figure 8** to **Figure 10** for the cumulative impact assessment. A summary of these results for each residence has been provided in **Table 2**.

The figures indicate the potential area of impact for 24-hour average PM<sub>10</sub>, annual average PM<sub>10</sub>, TSP and dust deposition, as a result of the proposed modifications to Bloomfield Colliery shown in **Figure 1**.

The modelling results indicate that there are no predicted exceedances of the DECCW criterion due to the modifications of Bloomfield Colliery at any of the residences.

### **Concluding comments**

The assumptions included in the dispersion modelling which would influence the predicted impacts include:

- Quantity of overburden and coal removed.
- Length and location of haul roads.
- Level of dust control on haul roads (assumed to be 75% through the application of water).
- Size of exposed areas that would be impacted by wind erosion i.e. any increase in rehabilitated areas would be beneficial and tend to reduce the impacts.
- Meteorological data used – the data used are considered to be reliable, representative data.
- Assumptions related to activities at nearby mines e.g. any operations at Donaldson and Abel mines would increase the cumulative impacts.

- 
- Assumptions related to “background” concentrations. Whilst the approach generally taken is to review ambient air quality monitoring data and professional judgement, a more representative “background”, could be determined by modelling detailed mining activities for 2008 and comparing the predicted impacts with contemporaneous monitoring data. There are still limitations to this approach as it will not be possible to accurately model the activities at the nearby mines.

Please feel free to contact me on 02 9874 8644 if you would like any clarification or if I can assist in any way.

Yours sincerely

Justine Beaney  
PAEHolmes

### **References**

Holmes Air Sciences (2006). *Air Quality Assessment Abel Underground Coalmine*. Suite 2B, 14 Glen Street, Eastwood NSW 2122: Holmes Air Sciences.

Holmes Air Sciences (2008). *Air Quality Assessment Bloomfield Mine*. Suite 2B, 14 Glen Street, Eastwood NSW 2122: Holmes Air Sciences.

**Table 1: Stage 2 – Bloomfield Modifications Emissions Data**

ACTIVITY	TSP	Intensity	units	Emission	units	Variable 1	units	Variable 2	units	Variable 3	units
OB - Stripping topsoil - Creek cut	280	20	h/y	14.0	kg/h						
OB - Stripping topsoil - S cut	266	19	h/y	14.0	kg/h						
OB - Stripping topsoil - Save a mile south	14	1	h/y	14.0	kg/h						
OB - Drilling - Creek cut	10,386	17,604	holes/y	0.59	kg/hole						
OB - Drilling - S cut	9,588	16,250	holes/y	0.59	kg/hole						
OB - Blasting - Creek cut	7,872	115	blasts/y	68	kg/blast	4590	Area of blast in square metres				
OB - Blasting - S cut	7,266	106	blasts/y	68	kg/blast	4590	Area of blast in square metres				
OB - Sh/Ex/FELs loading - Creek cut	44,157	10,140,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
OB - Sh/Ex/FELs loading - S cut	40,760	9,360,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
OB - Hauling to emplacement - from Creek cut	67,532	8,520,000	t/y	0.00793	kg/t	190	t/truck load	1,506	km/return trip	1.0	kg/VKT
OB - Hauling to emplacement - from S cut	95,495	8,100,000	t/y	0.01179	kg/t	190	t/truck load	2.24	km/return trip	1.0	kg/VKT
OB - Hauling to save a mile south emplacement - from Creek	27,966	1,440,000	t/y	0.01942	kg/t	190	t/truck load	3.69	km/return trip	1.0	kg/VKT
OB - Hauling to save a mile south emplacement - from S cut	32,938	1,440,000	t/y	0.02287	kg/t	190	t/truck load	4.35	km/return trip	1.0	kg/VKT
OB - Emplacing at dumps - Creek cut	37,102	8,520,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
OB - Emplacing at dumps - S cut	35,273	8,100,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
OB - Emplacing at save a mile south dumps - Creek cut	6,271	1,440,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
OB - Emplacing at save a mile south dumps - S cut	6,271	1,440,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
OB - Dozers on O/B - Creek cut	61,316	1,488	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on O/B - S cut	66,797	1,621	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on O/B - Save a mile south	4,203	102	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on Rehabilitation - Creek cut	30,902	750	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on Rehabilitation - S cut	28,375	689	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on Rehabilitation - Save a mile south	4,664	113	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
CL - Dozers ripping - Creek cut	36,106	1,024	h/y	35.3	kg/h	5	silt content in %	4	moisture content in %		
CL - Dozers ripping - S cut	33,329	945	h/y	35.3	kg/h	5	silt content in %	4	moisture content in %		
CL - Loading ROM to trucks -Creek cut	56,834	676,000	t/y	0.08407	kg/t	5	moisture content of coal in %				
CL - Loading ROM to trucks - South Pit	52,462	624,000	t/y	0.08407	kg/t	5	moisture content of coal in %				
CL - Hauling ROM coal to dump hopper - Creek cut - wattle	78,213	676,000	t/y	0.11570	kg/t	40	t/load	4.628	km/return trip	1.0	kg/VKT
CL - Hauling ROM coal to dump hopper - S cut	115,970	624,000	t/y	0.18585	kg/t	40	t/load	7.434	km/return trip	1.0	kg/VKT
RE - Hauling OB to northern rehab	10,956	120,000	t/y	0.09130	kg/t	40	t/load	3.652	km/return trip	1.0	kg/VKT
RE - Hauling OB to southern rehab	29,964	240,000	t/y	0.12485	kg/t	40	t/load	4.994	km/return trip	1.0	kg/VKT
RE - unloading OB at northern rehab	523	120,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
RE - unloading OB at southern rehab	1,045	240,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2) <sup>1.3</sup> in m/s	1	moisture content in %		
RE - Dozers at northern rehab	777	19	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
RE - Dozers at southern rehab	389	9	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
WE - OB spoil area - Creek cut	16,983	5	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - OB spoil area - S cut	161,586	46	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - Open pit - Creek cut	38,212	11	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - Open pit - S cut	95,176	27	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - ROM stockpiles	-	0	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - Product stockpiles	-	0	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - OB Save a mile south	24,961	14	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - Northern rehab area	18,017	10	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - Southern rehab area	12,784	7	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
Grading roads	13,516	21,960	km	0.61547	kg/VKT	8	speed of graders in km/h				
Donaldson and Abel wi	61813										
Donaldson and Abel ws	11400										
Donaldson and Abel we	11231										
Donaldson and Abel - Dumping ROM	13140										
Donaldson and Abel - Hauling to CHPP	148000										
Donaldson and Abel -Handling coal at CHPP	117000										
Donaldson and Abel - loading coal to stockpile	2250										
Donaldson and Abel - Loading coal to trains/trucks	2250										
<b>Total</b>	<b>1,423,499</b>										

**Table 2: Predicted PM<sub>10</sub> concentrations at discrete receptors (µg/m<sup>3</sup>)**

			Project alone			Project and other sources			
			PM <sub>10</sub> (µg/m <sup>3</sup> )		TSP (µg/m <sup>3</sup> )	Dust Deposition (g/m <sup>2</sup> /month)	PM <sub>10</sub> (µg/m <sup>3</sup> )	TSP (µg/m <sup>3</sup> )	Dust Deposition (g/m <sup>2</sup> /month)
Averaging Period			24-hour	Annual	Annual	Annual	Annual	Annual	Annual
Map Grid Australia Coordinates (Zone 56)		ID	Impact Assessment Criteria						
X (m)	Y (m)		50	30	90	2	30	90	4
366938	6366795	E	21	3	4	0.4	13	29	0.9
367471	6367197	F	23	4	5	0.6	21	46	1.1
362820	6368716	G	11	2	2	0.1	11	27	0.6
364843	6371713	H	29	5	5	0.2	15	30	0.7
369556	6372623	I	10	1	1	0.0	11	26	0.5
370119	6366617	K	8	1	2	0.2	13	28	0.8
367414	6372389	L	17	2	2	0.0	12	28	0.6
366319	6367539	M	32	6	7	0.9	16	33	1.4
365080	6367704	N	33	4	5	0.4	14	30	0.9

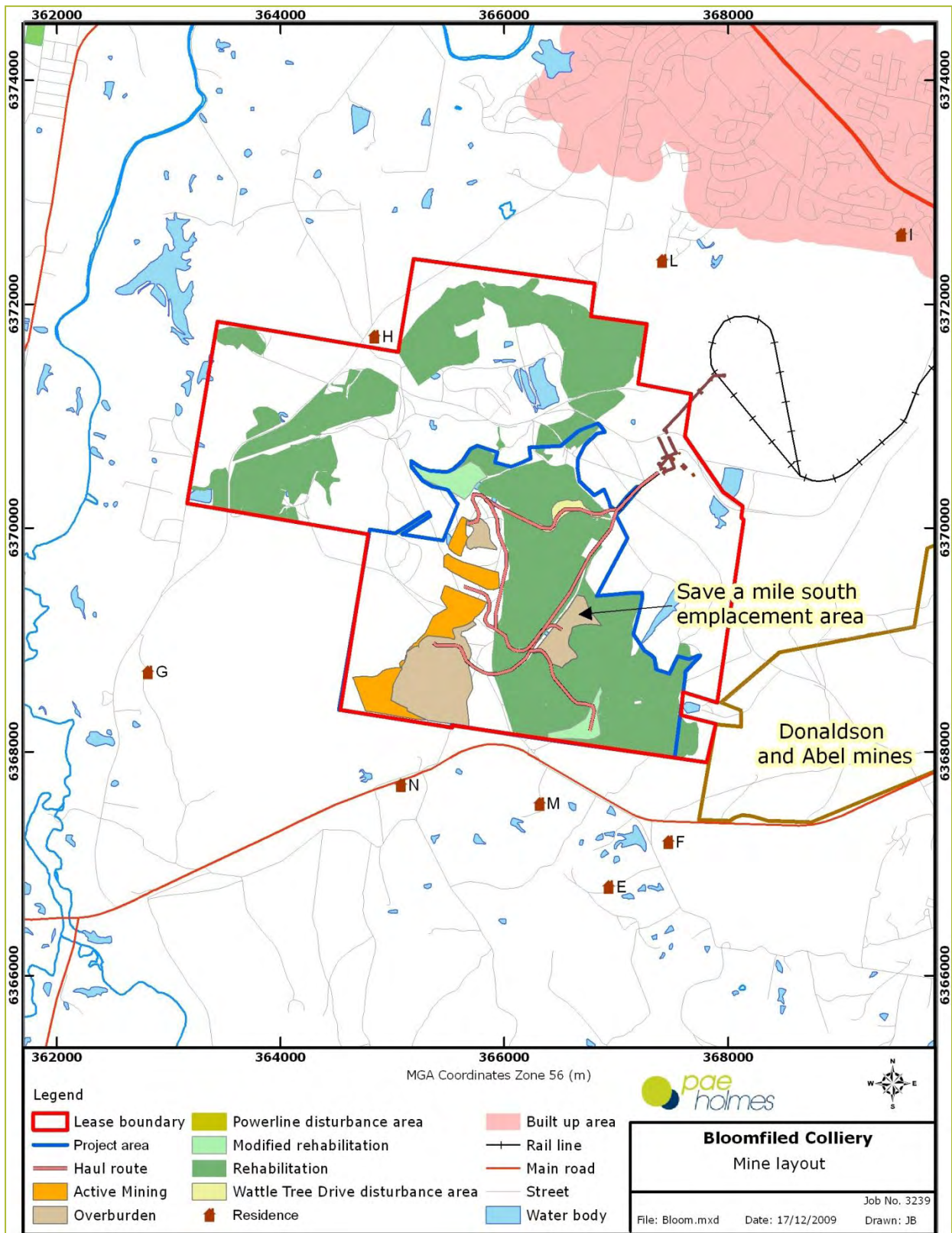
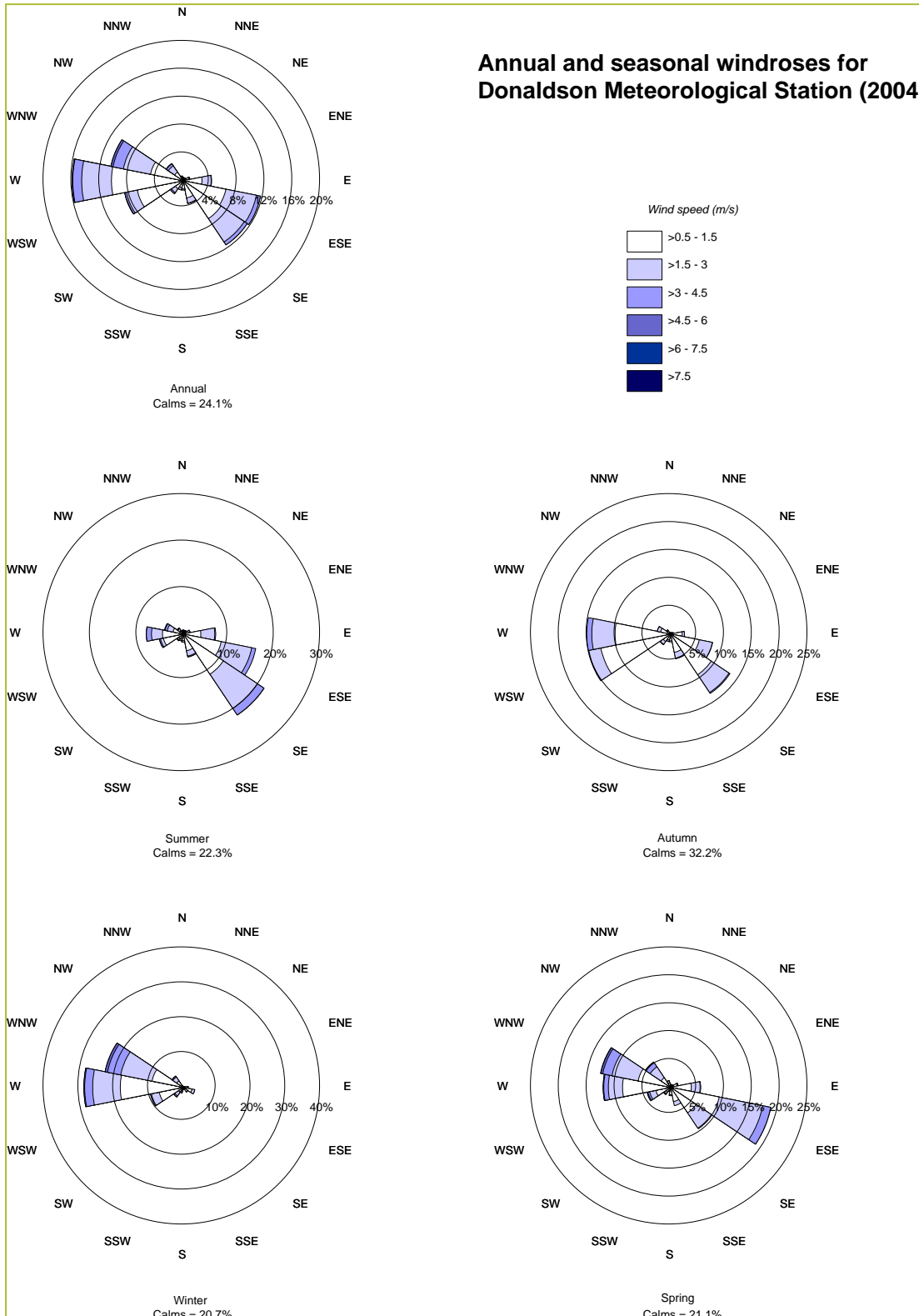
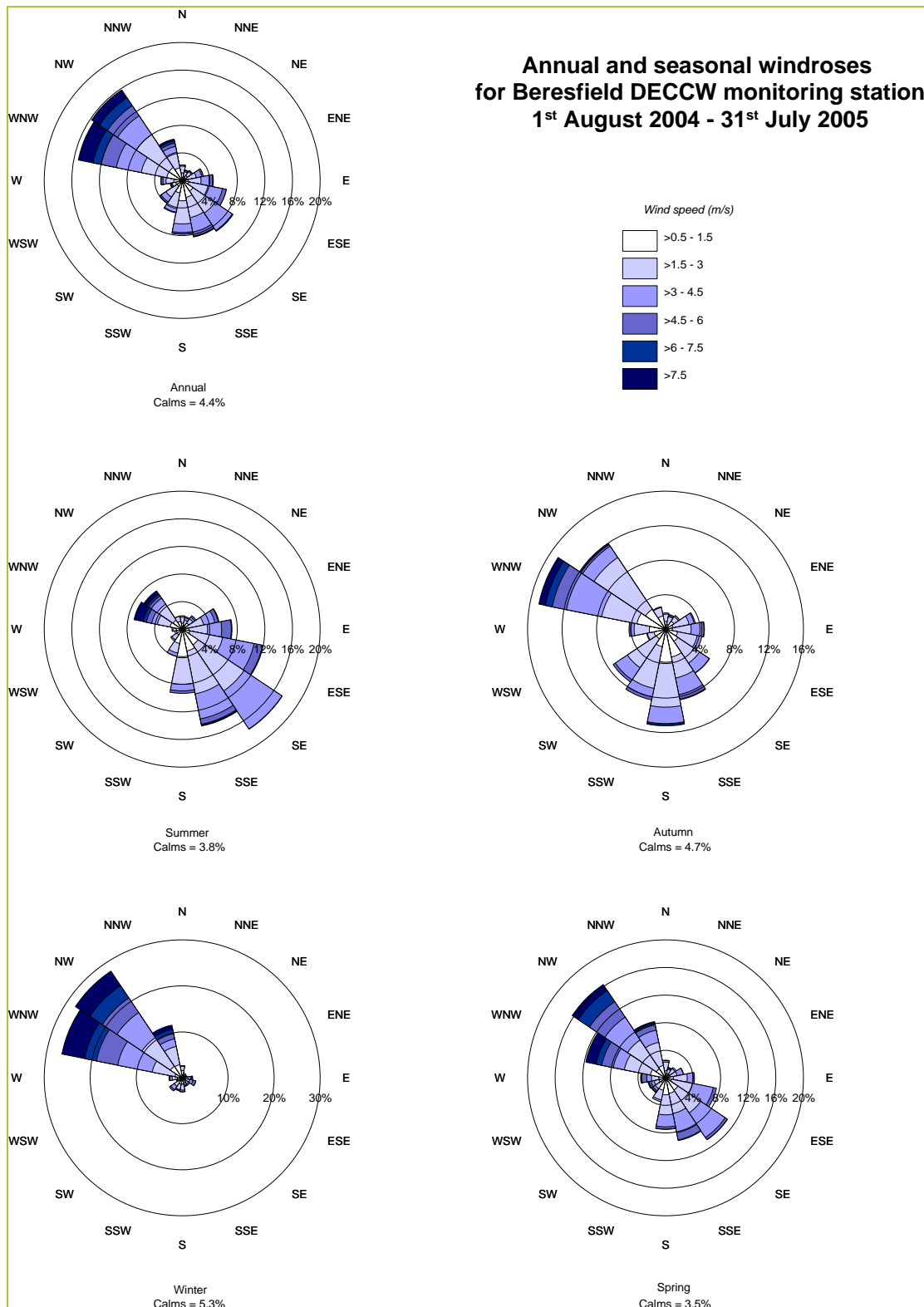


Figure 1: Site layout for Bloomfield Colliery Stage 2

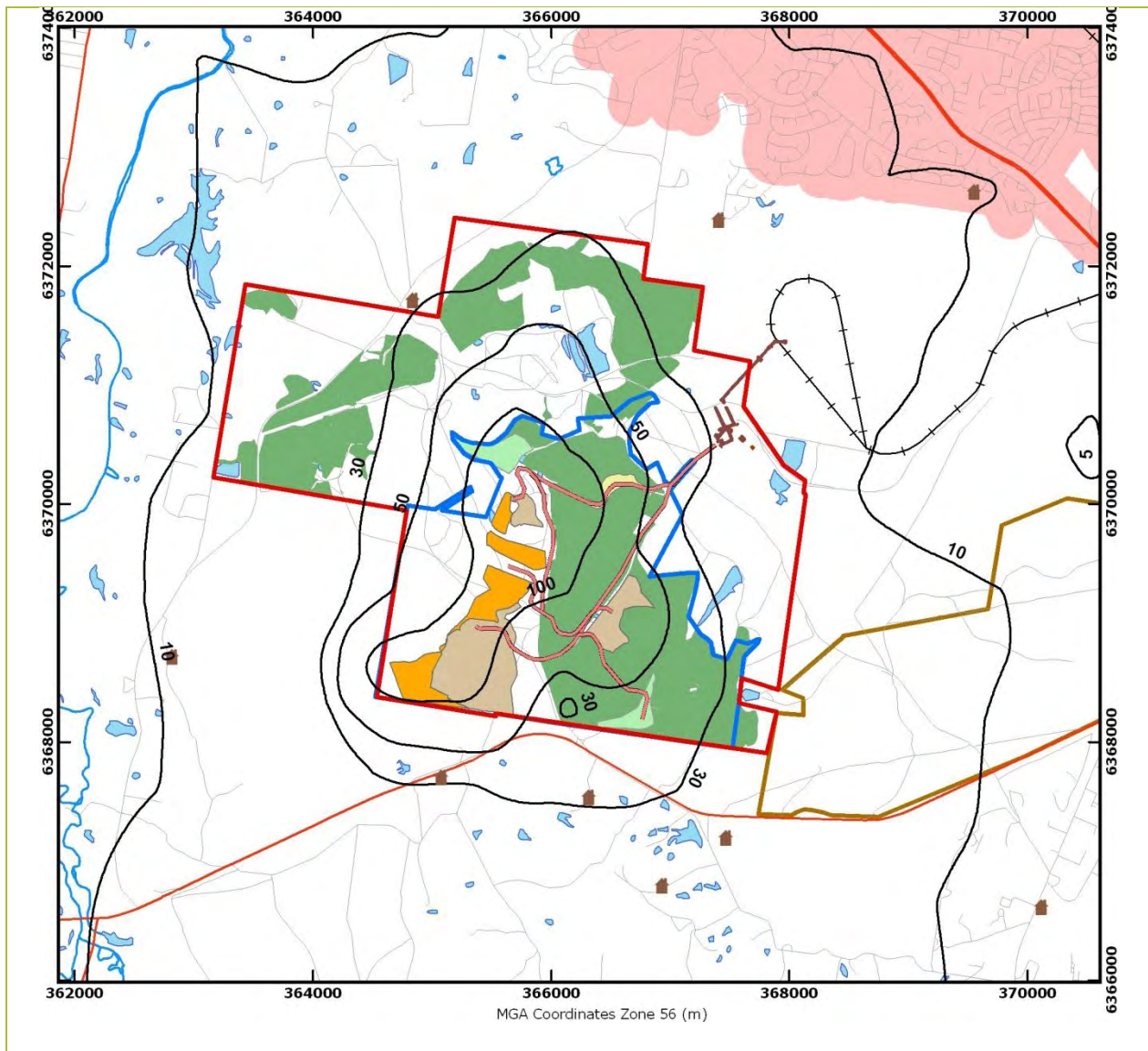


**Figure 2: Annual and seasonal windroses for Donaldson 2004**



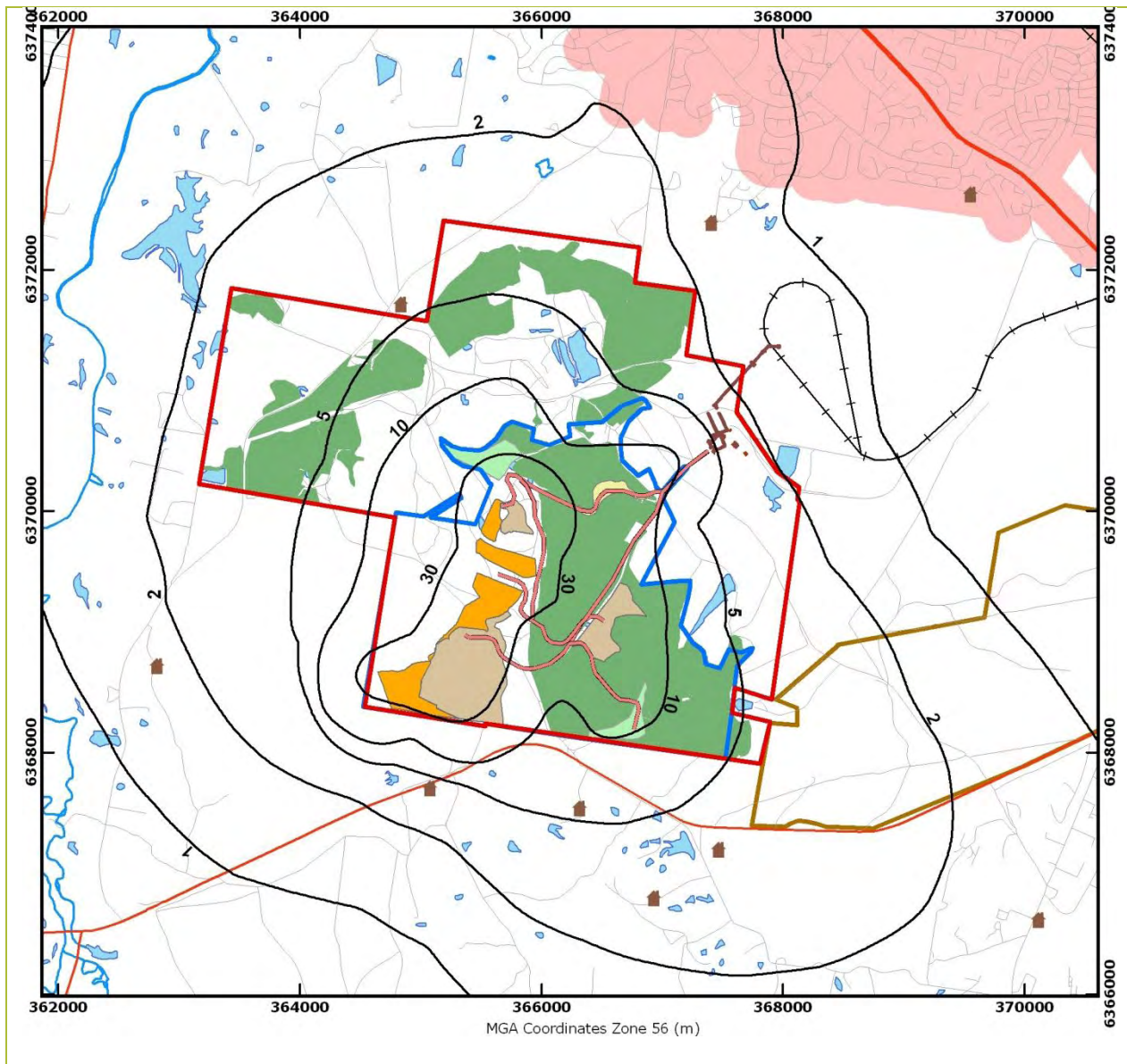


**Figure 3: Annual and seasonal windroses for Bloomfield August 2004 to July 2005**



<b>Species:</b> PM <sub>10</sub>	<b>Location:</b> Bloomfield	<b>Scenario:</b> Stage 2	<b>Percentile:</b> Maximum	<b>Averaging Time:</b> 24-hour
<b>Model Used:</b> ISCMOD	<b>Units:</b> µg/m <sup>3</sup>	<b>Guideline:</b> DECCW =50 µg/m <sup>3</sup>	<b>Met Data:</b> Bloom0405	<b>Plot:</b> J. Beaney

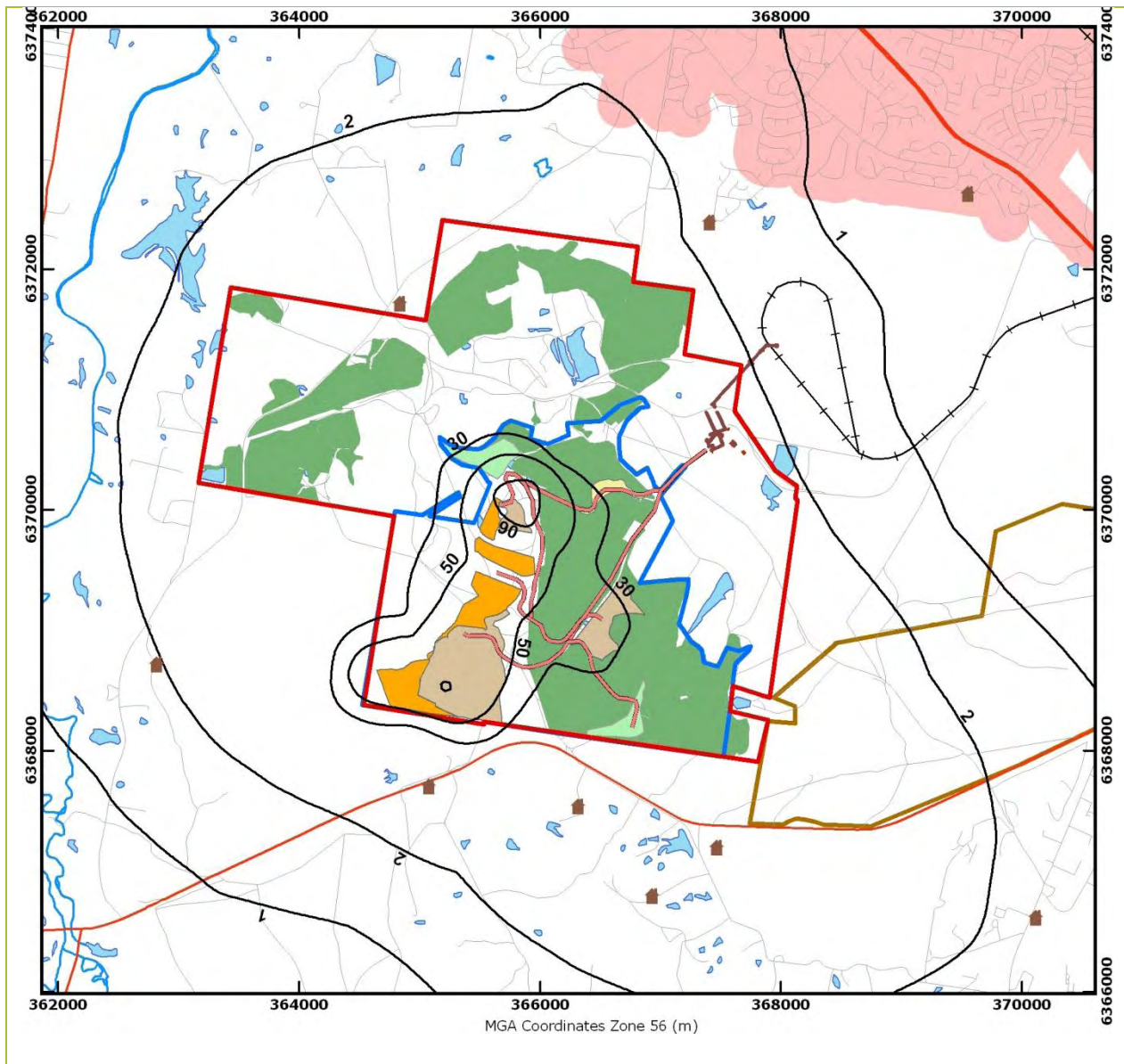
**Figure 4: Predicted 24-hour maximum PM<sub>10</sub> concentrations for Stage 2 – Bloomfield Colliery**



<b>Species:</b> PM <sub>10</sub>	<b>Location:</b> Bloomfield	<b>Scenario:</b> Stage 2	<b>Percentile:</b> Average	<b>Averaging Time:</b> Annual
<b>Model Used:</b> ISCMOD	<b>Units:</b> µg/m <sup>3</sup>	<b>Guideline:</b> DECCW = 30 µg/m <sup>3</sup>	<b>Met Data:</b> Bloom0405	<b>Plot:</b> J. Beaney

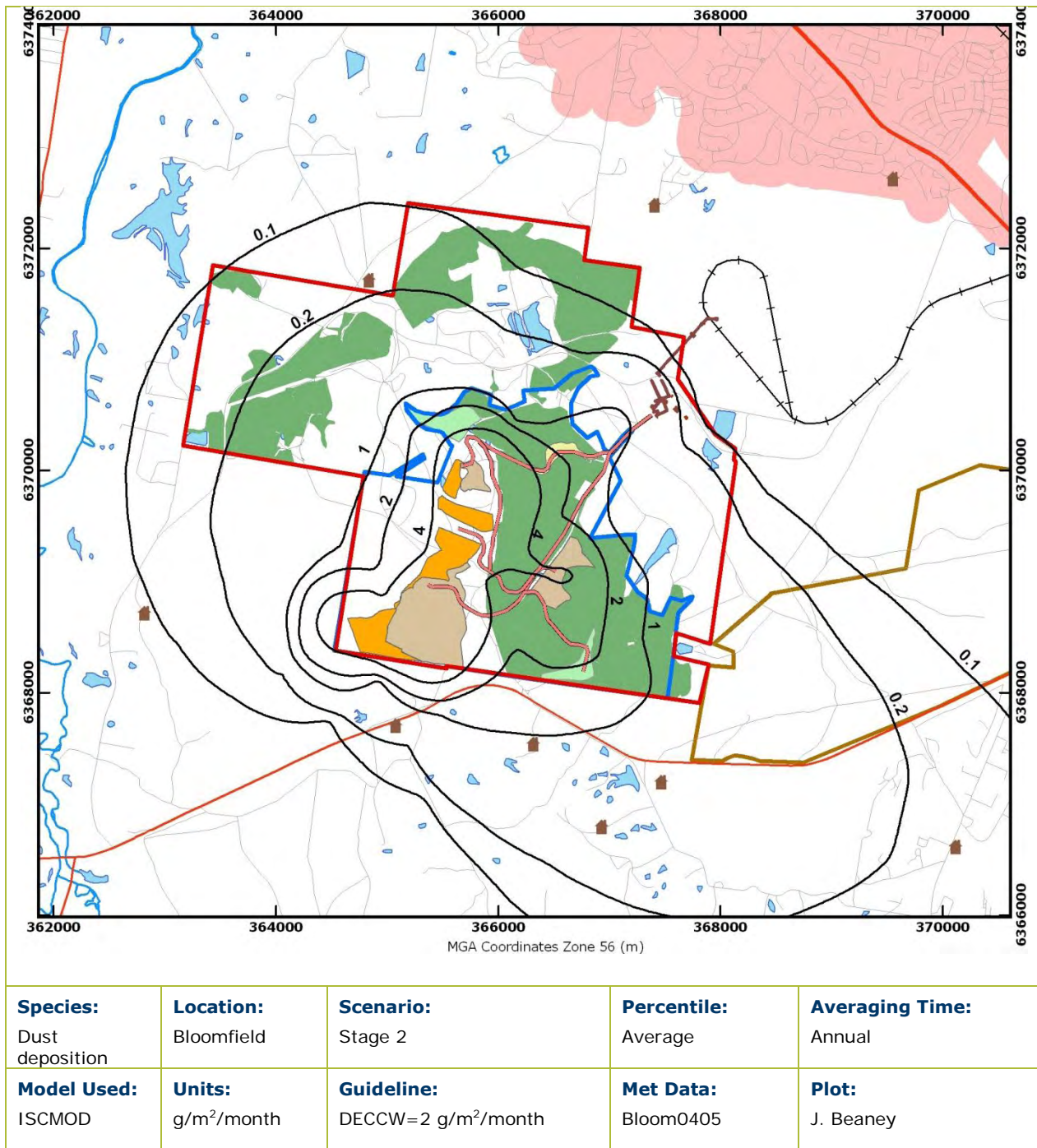
**Figure 5: Predicted annual average PM<sub>10</sub> concentrations for Stage 2 – Bloomfield Colliery**





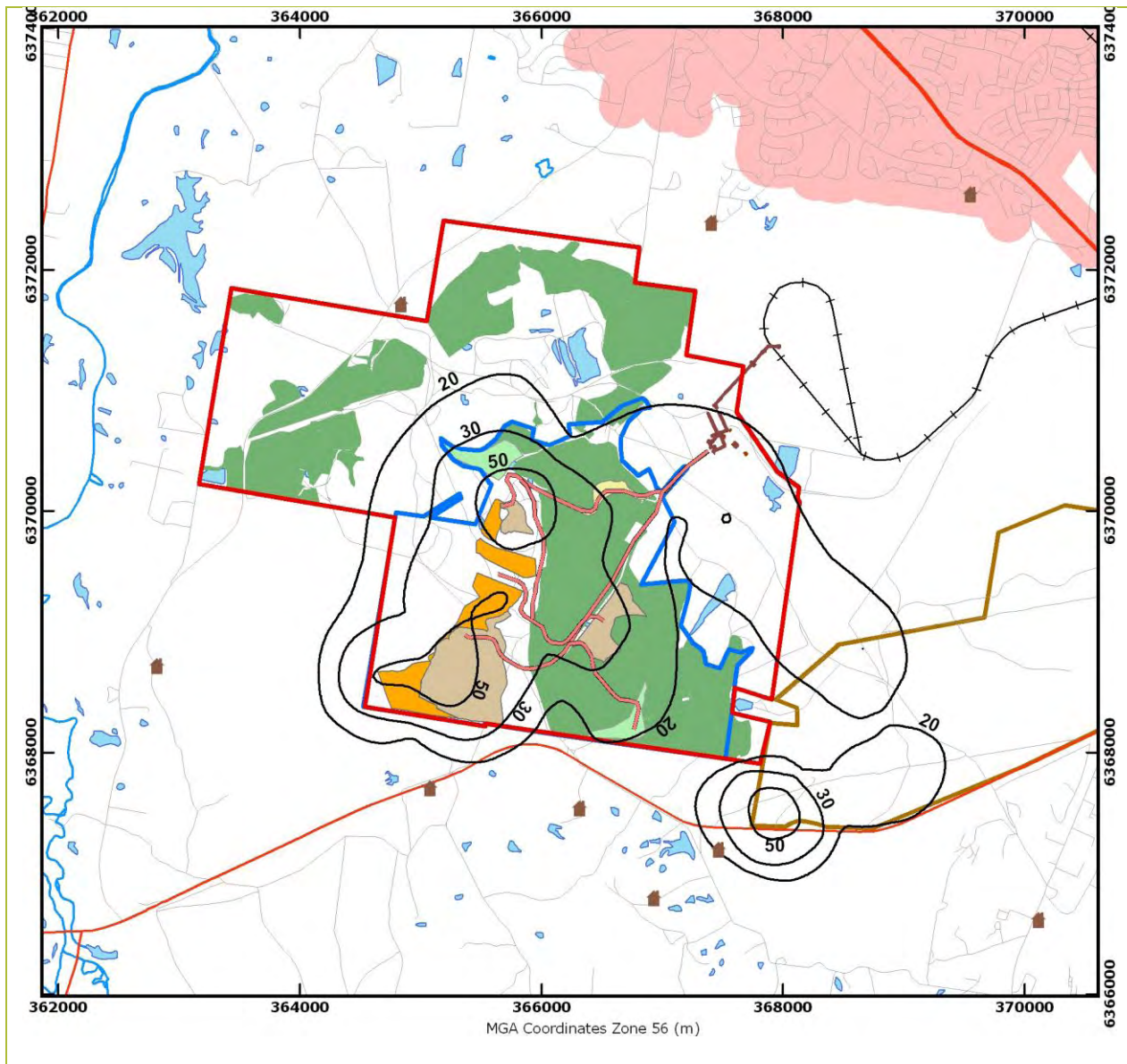
<b>Species:</b> TSP	<b>Location:</b> Bloomfield	<b>Scenario:</b> Stage 2	<b>Percentile:</b> Average	<b>Averaging Time:</b> Annual
<b>Model Used:</b> ISCMOD	<b>Units:</b> µg/m <sup>3</sup>	<b>Guideline:</b> DECCW = 90 µg/m <sup>3</sup>	<b>Met Data:</b> Bloom0405	<b>Plot:</b> J. Beaney

**Figure 6: Predicted annual average TSP concentrations for Stage 2 – Bloomfield Colliery**



**Figure 7: Predicted annual average dust deposition for Stage 2 – Bloomfield Colliery**

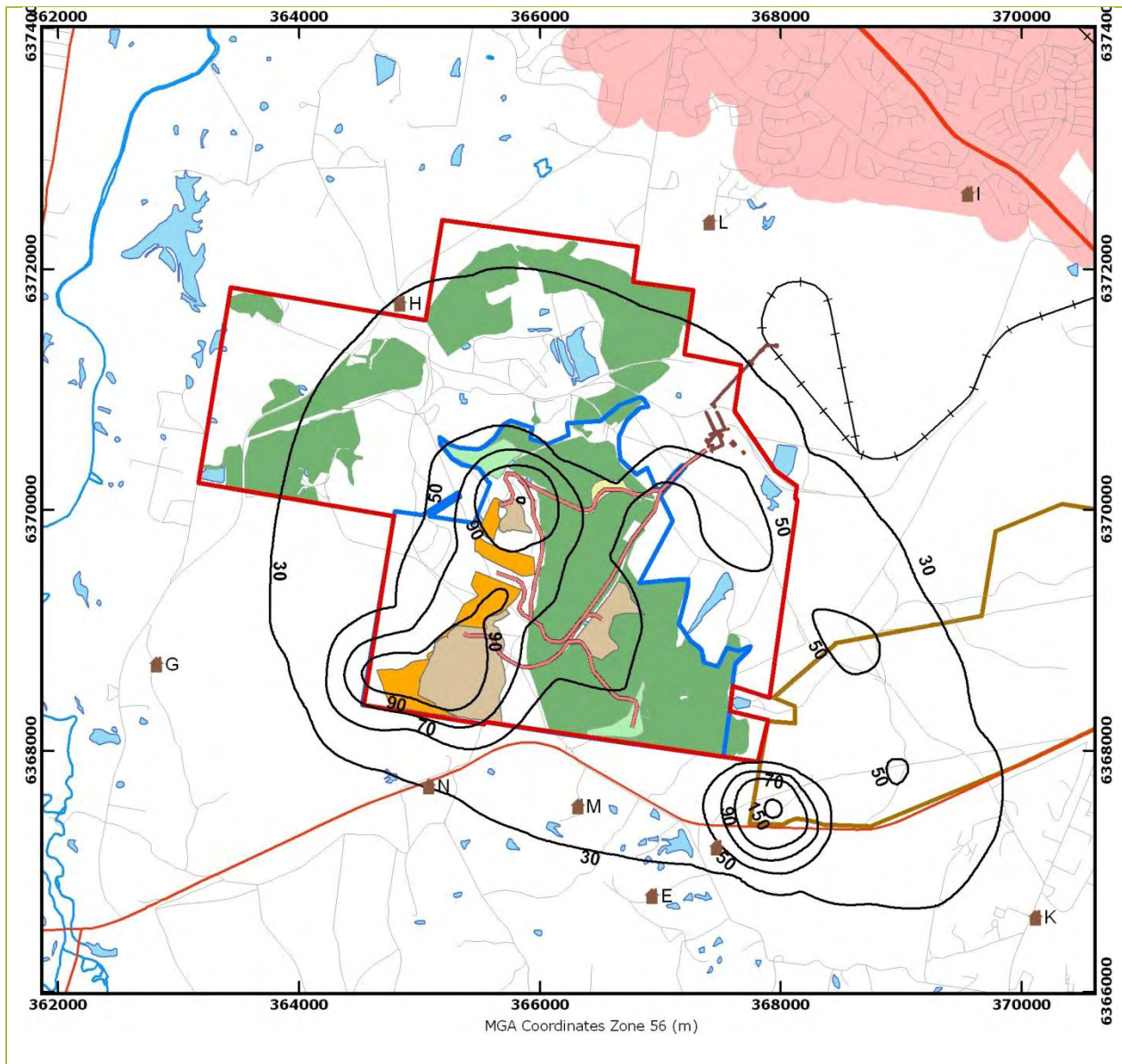




<b>Species:</b> PM <sub>10</sub>	<b>Location:</b> Bloomfield	<b>Scenario:</b> Stage 2	<b>Percentile:</b> Average	<b>Averaging Time:</b> Annual
<b>Model Used:</b> ISCMOD	<b>Units:</b> µg/m <sup>3</sup>	<b>Guideline:</b> DECCW = 30 µg/m <sup>3</sup>	<b>Met Data:</b> Bloom0405	<b>Plot:</b> J. Beaney

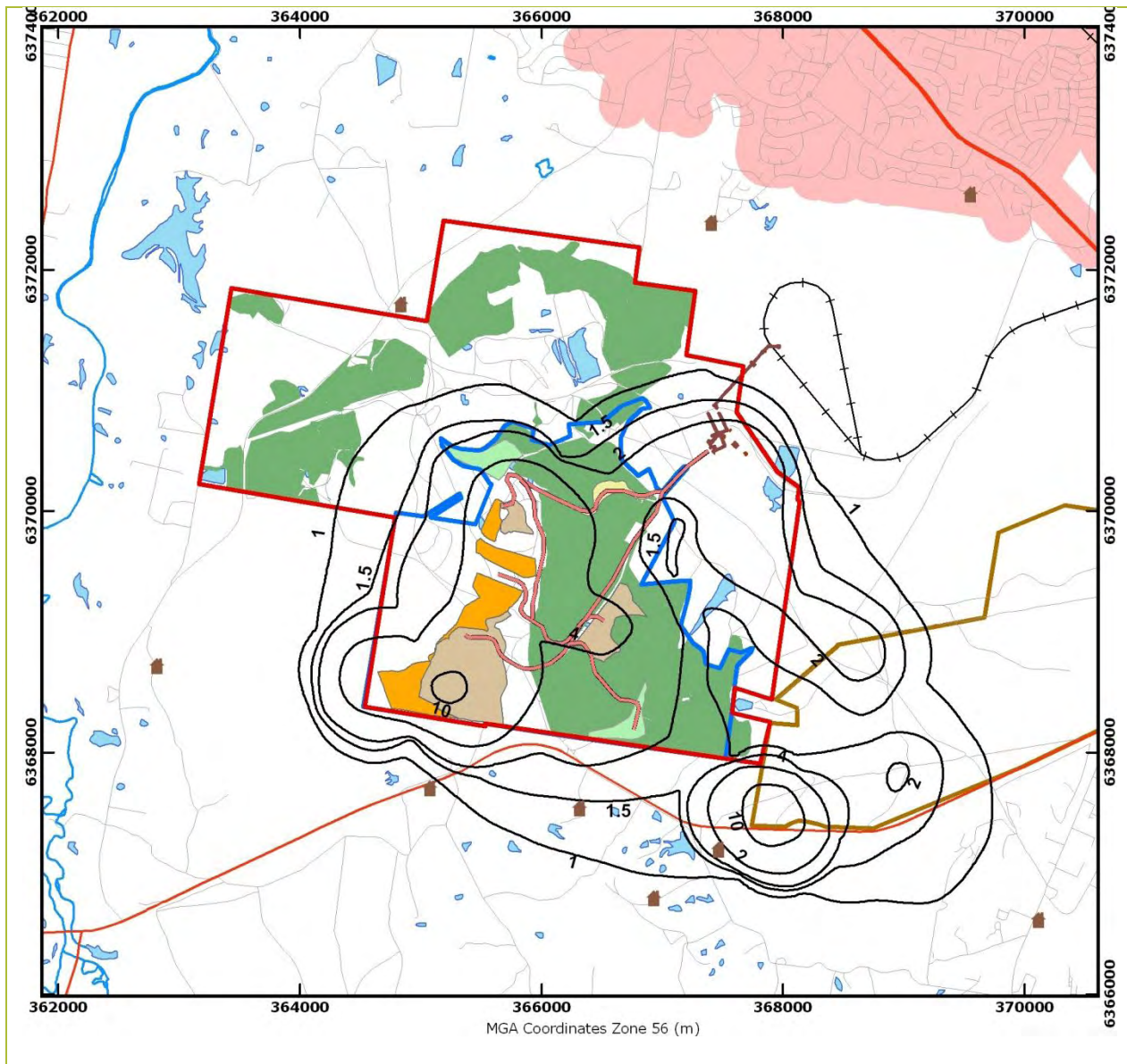
**Figure 8: Predicted annual average PM<sub>10</sub> concentration for Stage 2 – Bloomfield Colliery and other sources**





<b>Species:</b> TSP	<b>Location:</b> Bloomfield	<b>Scenario:</b> Stage 2	<b>Percentile:</b> Average	<b>Averaging Time:</b> Annual
<b>Model Used:</b> ISCMOD	<b>Units:</b> µg/m <sup>3</sup>	<b>Guideline:</b> DECCW = 90 µg/m <sup>3</sup>	<b>Met Data:</b> Bloom0405	<b>Plot:</b> J. Beaney

**Figure 9: Predicted annual average TSP concentration for Stage 2 – Bloomfield Colliery and other sources**



<b>Species:</b> Dust deposition	<b>Location:</b> Bloomfield	<b>Scenario:</b> Stage 2	<b>Percentile:</b> Average	<b>Averaging Time:</b> Annual
<b>Model Used:</b> ISCMOD	<b>Units:</b> $\mu\text{g}/\text{m}^3$	<b>Guideline:</b> DECCW = $4 \text{ g}/\text{m}^2/\text{month}$	<b>Met Data:</b> Bloom0405	<b>Plot:</b> J. Beaney

**Figure 10: Predicted annual average dust deposition for Stage 2 – Bloomfield Colliery and other sources**

## **Appendix D – Aboriginal Heritage Impact Assessment**

**BLOOMFIELD COLLIERY, HUNTER VALLEY, NEW SOUTH WALES:  
COMPLETION OF MINING AND REHABILITATION PROJECT -  
ABORIGINAL HERITAGE IMPACT ASSESSMENT -  
ADDENDUM REPORT TO ASSESS POWERLINE RELOCATION**

**Prepared by Peter Kuskie, South East Archaeology Pty Ltd**

**On behalf of Bloomfield Collieries Pty Ltd**

**9 October 2009**

*Introduction:*

Bloomfield Collieries Pty Ltd has obtained a Part 3A Major Project Approval (3 September 2009) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the completion of open-cut coal mining and rehabilitation of areas within Mining Lease CCL761.

The project area is located several kilometres south of East Maitland in the lower Hunter Valley of NSW. It measures a total of 290 hectares and includes all of the existing Mining Operations Plan approved area, as well as a workshop area, an access road to the workshop and a haul road from the active mining area to the washery coal stockpile pad.

South East Archaeology (Kuskie 2008) undertook an Aboriginal heritage impact assessment for the Part 3A project application. The investigation proceeded by recourse to the archaeological and environmental background of the locality, followed by a field survey undertaken with representatives of the local Aboriginal community, in accordance with the relevant Department of Environment, Climate Change and Water (DECCW) policies and Department of Planning (DoP) requirements.

The investigation focused on the "unmodified" portion of the study area of approximately 108 hectares (land yet to be mined area immediately west of the S-Cut and southwest of the Creek Cut) in which there remains some potential for heritage evidence. The remaining 182 hectares of the project area comprises land that has been extensively impacted by earthmoving works and building, such that there is negligible potential for any Aboriginal heritage evidence to survive.

The "unmodified" portion of the study area was subdivided and inspected within 26 environmentally discrete survey areas. Even within this "unmodified" area, levels of ground disturbance are typically high, due to the removal of the forest vegetation in early 2004 by earthmoving equipment under existing approvals (Kuskie 2008).

Six Aboriginal heritage sites, comprising 19 loci of identified evidence, were recorded within the 108 hectare unmodified portion of the study area. These site loci are all stone artefact occurrences and contain a total of 53 artefacts.



The identified artefact evidence occurs in a very low density distribution. Further artefacts are expected to occur across the unmodified study area in a distribution and density consistent with the survey results. However, notwithstanding that shallow deposits may be present in some forested areas or along the drainages where the A unit soil may have been retained, the potential for sub-surface deposits of artefacts that may be *in situ* and/or of research value is low to very low. Other types of heritage evidence (for example, scarred trees and grinding grooves) are not anticipated to occur within the unmodified study area (ie. very low or negligible potential) and other Aboriginal cultural values or associations have not been identified (Kuskie 2008).

*Proposed Powerline Variation to Approved Project:*

Bloomfield Collieries is seeking a variation under Section 75W of the EP&A Act to the Part 3A Major Project Approval to permit relocation of an existing powerline outside of the project approved area. The powerline supplies power for the Abel Water Management System, water cart filling station and P&H5700 rope shovel. Re-routing of the powerline would require the removal of approximately one hectare of native vegetation to the north of the current approval area.

*Purpose and Scope of Additional Aboriginal Heritage Assessment:*

South East Archaeology has been commissioned by Bloomfield Collieries to assess the potential impacts of the proposed powerline variation on Aboriginal heritage.

Consistent with the investigation undertaken to date for the approved project (Kuskie 2008), the principal aims of the additional assessment were to identify and record any Aboriginal heritage evidence or cultural values within the study area, assess the potential impacts of the proposal on this evidence, assess the significance of this evidence, and formulate recommendations for the conservation and management of this evidence, in consultation with the local Aboriginal community.

For the purpose of the additional Aboriginal heritage assessment, the study area is taken to be the zone of approximately five hectares marked on Figure 1, although project impacts will be confined to an area of approximately one hectare.

*Methodology of Additional Aboriginal Heritage Assessment:*

As an addendum to the investigation undertaken to date for the approved project (Kuskie 2008), the additional assessment has involved:

- Review of previous searches of the DECCW Aboriginal Heritage Information Management System (AHIMS) and other relevant indigenous heritage registers and planning instruments, along with other relevant information;
- Archaeological survey of the powerline study area with the Mindaribba Local Aboriginal Land Council (LALC), following the same methodology and consultation procedures established for the main project (Kuskie 2008). This was undertaken on 8 October 2009 by Peter Kuskie of South East Archaeology and Ricky-Jo Griffiths of the Mindaribba LALC; and
- Preparation of this addendum report to present the results of the investigation, assessment of the significance of any Aboriginal evidence identified, and recommendations for the management of such evidence, in consultation with the Mindaribba LALC.



### *Results and Discussion of Additional Aboriginal Heritage Assessment:*

The additional powerline study area was subdivided into seven survey areas, on the basis of landform element and class of slope, each of which was inspected for Aboriginal heritage evidence. The locations of the individual survey areas are marked on Figure 1. A summary of the survey coverage is presented in Table 1.

The total survey coverage (ground physically inspected for heritage evidence) equated to approximately 8,040 m<sup>2</sup>, or 16% of the study area. As this coverage only refers to an area of several metres width directly inspected by each member of the survey team, the actual coverage for obtrusive site types, such as rock shelters, scarred trees and grinding grooves, was significantly greater than this. The total effective survey coverage (*visible* ground surface physically inspected with potential to host heritage evidence) equated to around 882 m<sup>2</sup>, or 1.8% of the study area.

No Aboriginal heritage evidence was identified within the study area, and no Aboriginal heritage sites have previously been recorded in this location.

The heritage potential of the landform units within the study area is low, generally due to the moderate gradients and in the case of the ridge crest, the high level of existing impacts. A very low density distribution of artefacts may occur across the study area, however the potential for sub-surface deposits of artefacts that may be *in situ* and/or of research value is very low. Other types of heritage evidence (such as grinding grooves or scarred trees) are not anticipated to occur within the study area and other Aboriginal cultural values or associations have not been identified during the course of the assessment.

The proposed powerline will result in impacts to a small proportion of the study area. In the absence of appropriate management and mitigation measures, it is concluded that the impacts of the proposal on Aboriginal heritage will be very low.

### *Recommendations:*

In consideration of the limited nature of the proposed impacts, the results of the survey and community consultation, it is considered that the potential for significant impacts to occur to the Aboriginal heritage resource from the current proposal is very low. Therefore, there are no Aboriginal heritage constraints to the proposed works proceeding.

Under the terms of the *National Parks and Wildlife Act 1974* it is an offence to knowingly destroy, damage or deface an Aboriginal object without obtaining the prior written permission of the Director-General of DECCW or *in lieu*, Part 3A approval. Therefore, should any previously unrecorded Aboriginal sites or objects be detected during the course of development which are not covered by a Section 90 Aboriginal Heritage Impact Permit, work in the immediate vicinity of those objects would need to promptly cease and the finds be reported to DECCW and advice sought as to the appropriate course of action. Alternatively, if the Part 3A approval is extended to the study area, any Aboriginal objects identified can be managed in accordance with the Aboriginal Heritage Management Plan approved for the project. This is anticipated to involve salvage by surface collection of any items that may be identified, in consultation with the registered Aboriginal stakeholders.

References:

Kuskie, P. J. 2008 *Bloomfield Colliery, Hunter Valley, New South Wales: Completion of Mining and Rehabilitation Project - Aboriginal Heritage Impact Assessment*. Unpublished report to Bloomfield Collieries Pty Ltd.

Table 1: Archaeological survey coverage of powerline study area.

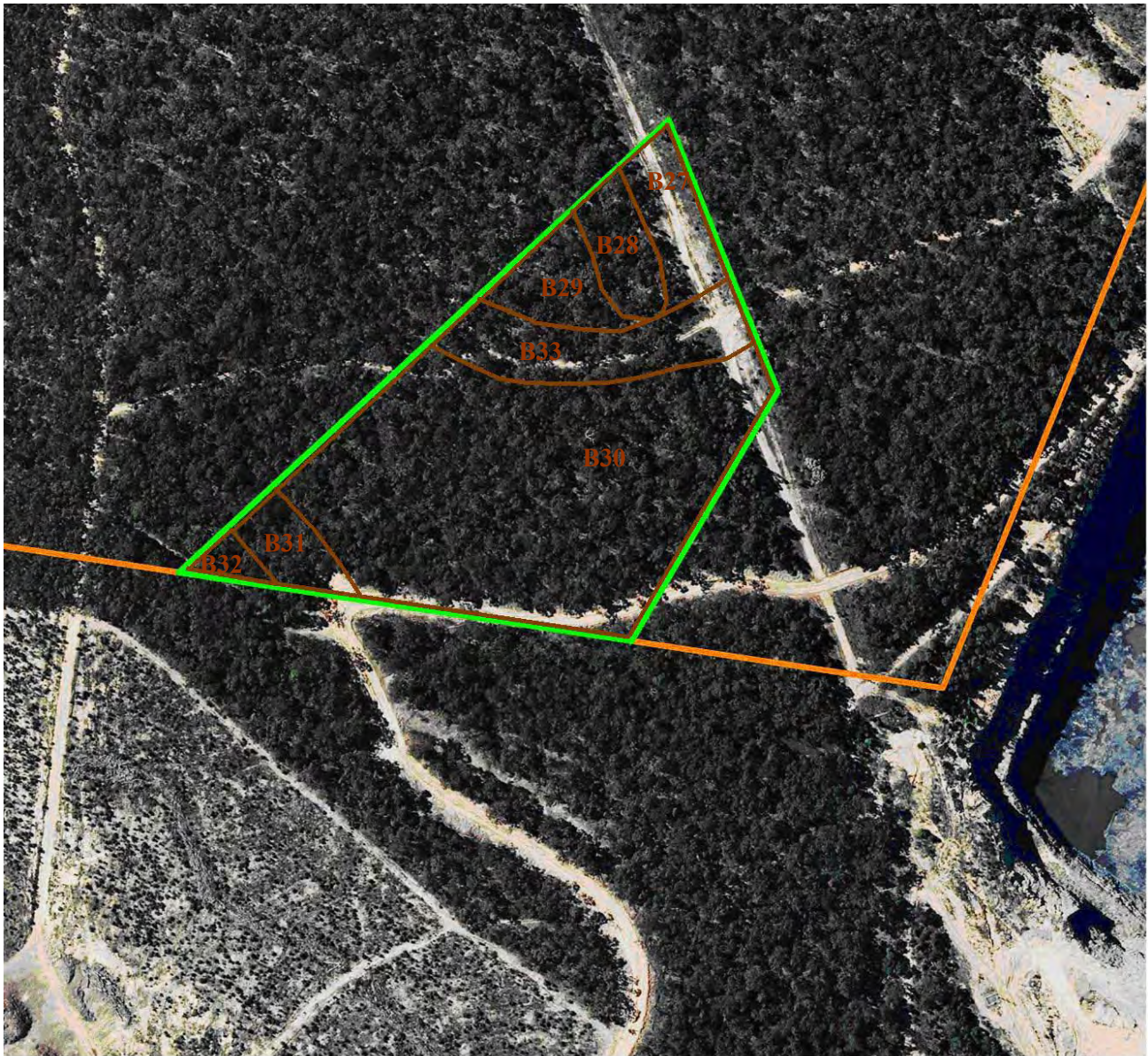
Survey Area	Landform Element	Slope	Distance to Water (metres)	Vegetation	Land Surface	Total Sample Area (m <sup>2</sup> )	Surface Visibility (%)	Detection Limiting Factors	Archaeological Visibility %	Ground Disturbance	Effective Survey Coverage (m <sup>2</sup> )	# of Artefacts	Artefact Density/m <sup>2</sup> of Effective Survey Coverage	Comments
B27	simple slope	moderate	<50	2	4, 5	1000	50	1	50	low-mod	500	0	-	power easement, vehicle track, erosion, vegetation cleared in easement; sandy loam, gravel; low potential
B28	drainage depression	moderate	<50	2	4	560	0.2	1, 2	0.2	low	3	0	-	dense leaf litter, some grass; low potential; minor sandstone cobbles; young Ironbarks and several older Eucalypts
B29	simple slope	moderate	<50	2	4	200	0.2	1, 2	0.2	low	1	0	-	dense leaf litter; low potential
B30	simple slope	moderate	>50	2	4, 5	3820	0.1-70	1, 2	0.1-60	low-mod	315	0	-	power easement, vehicle track, erosion, dozer pushes, vegetation cleared in easement; contour drain on southern border, now heavily overgrown, all B unit soil; dense grass, leaf litter in forest; mainly young Ironbark and Spotted Gum; low potential
B31	drainage depression	moderate	<50	2	4	400	0.5	1, 2	0.5	low	2	0	-	dense grass, leaf litter; low potential
B32	simple slope	moderate	<50	2	4	320	0.1	1, 2	0.1	low	1	0	-	dense grass, leaf litter; low potential
B33	ridge crest	gentle	>50	1, 2	4, 5	1740	0.5-60	1, 2	0.5-10	low-high	60	0	-	well formed old vehicle track; graded, heavily cut in; spoil mounds adjacent to track; some sandstone bedrock exposed; high disturbance along road and adjacent areas, has lowered heritage potential of crest from moderate-high to low

Vegetation: 1 = cleared/grass/crop; 2 = regrowth/native forest.

Land Surface: 1 = sheet erosion; 2 = gully erosion; 3 = stream bank erosion; 4 = vegetated; 5 = modified (eg. vehicle track).

Detection Limiting Factors: 1 = vegetation; 2 = leaf litter/gravel; 3 = sediment deposition; 4 = other.

Figure 1: Aboriginal heritage investigation area for proposed powerline, archaeological survey areas (brown shapes) (base map courtesy Bloomfield Collieries Pty Ltd).



0 200 m

LEGEND	
	ARCHEOLOGY STUDY AREA
	Project Consent Area

**FIGURE D**

**POWERLINE RELOCATION**

**BLOOMFIELD COLLIERY**  
**OPEN CUT CONSENT MODIFICATION**

**AUGUST 2009**

## **Appendix E – Noise Impact Assessment**





**HEGGIES**

REPORT 30-1573-R2

Revision 1

# **Bloomfield Colliery Modifications Noise Impact Assessment**

PREPARED FOR

**Bloomfield Collieries Pty Ltd  
Four Mile Creek Road  
Ashtonfield NSW 2323**

21 JULY 2010

**HEGGIES PTY LTD**  
ABN 29 001 584 612





# Bloomfield Colliery Modifications

## Noise Impact Assessment

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This document has been prepared in accordance with the requirements of that System.

### DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
30-1573-R2	Revision 1	21 July 2010	Nathan Archer	John Cotterill	John Cotterill
30-1573-R2	Revision 0	28 April 2010	Nathan Archer	John Cotterill	John Cotterill



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### Appendix A Equipment Sound Power Levels



## 1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been engaged by Bloomfield Collieries Pty Ltd (Bloomfield) to undertake an assessment of noise impacts associated with the proposed modification (Bloomfield Modifications) to the approved development (Project Approval 07\_0087) to allow minor changes to the configuration of out of pit dumping and the realignment of a power easement. This report has been prepared for inclusion within the Environmental Assessment report to support an application to modify the Approval under section 75W of the Environmental Planning and Assessment Act.

Broadly, the objective of the assessment was to identify the potential impacts of noise from the proposed modification. The proposed modification includes:

- Small extensions to the areas currently approved for overburden dumping.
- Use of an existing road as an alternative haul route to reduce energy consumption.
- Recontouring and revegetation of areas that were rehabilitated over 20 years ago and do not meet current NSW Government standards.

Comment will also be made with regard construction activities associated with the relocation of an existing overhead powerline and easement which is required to enable the approved continuation of mining of Creek Cut and S Cut.

Advice with regard to effective mitigation strategies will be provided where necessary.

The noise assessment has been prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in accordance with the Department of Environment, Climate Change and Water's (DECCW's) NSW Industrial Noise Policy (INP) and the Interim Construction Noise Guideline. Where issues relating to noise are not addressed in the INP, such as sleep disturbance, reference has been made to the NSW Environmental Noise Control Manual (ENCM).

The modification to the out of pit dumping area, alternative haul route and change to the powerline easement was not anticipated during the Environmental Assessment (EA) process that commenced in 2007. The need to modify the out of pit areas for the emplacement of overburden provides an opportunity to make improvements to three small areas that were rehabilitated over 20 years ago. The area will be designed to ensure that the current standards are met in relation to slope and final landform.



## 2 PROPOSAL DETAILS

The proposed modifications to the approved Bloomfield Colliery operations are detailed below and are illustrated in **Figure 1**.

### 2.1 Operational Activities

#### **South-East Area – Overburden Dumping and Rehabilitation (Modification Area B)**

An out-of-pit area to the east of the approved haul road (Area B as shown in **Figure 1**) was rehabilitated approximately 20 years ago. Due to the historic nature of the rehabilitation, it does not reflect current standards particularly in relation to slope and final landform requirements. To maximise operational efficiencies and improve final land shaping and vegetation cover in this area, Bloomfield proposes to place approximately 1.2 million bank cubic metres (bcm's) of overburden in this area prior to reshaping and revegetation. Area B will be included in the end of mine design and shaped in accordance with current rehabilitation standards.

Equipment proposed for these works will be that used for the currently approved operation as described by Section 2.6.2 of the EA (The Bloomfield Group, 2009), with no additional equipment to be introduced for these works. Rear dump haul trucks will transport overburden material to the area with dozers pushing and shaping material prior to topsoil application and seeding.

#### **Northern and South-Eastern Areas – Out-of-Pit Reshaping and Rehabilitation (Modification Areas C and E).**

Two out-of-pit areas (Areas C and E as shown in **Figure 1**) are former mining areas consisting of overburden material with some minor shaping and grass seeding. The areas have been stabilised with grass cover and there are a few native shrubs and trees that have regenerated naturally. To improve these areas and rehabilitate to current standards, minor import of overburden to reshape and improve drainage is proposed, as well as revegetation. Equipment to be used will be as for modification Area B.

Work in Area C would occur over approximately three (3) months during the approved “Stage 2” of mining.

Due to the minor nature of the works in Area E, it is expected the overburden emplacement and shaping would only take 70 hours. However, this work would be scheduled over a three (3) month period to enable normal rates of dumping and the continuation of mining.

### 2.2 Construction Activities

#### **Construction of an Overhead Powerline and Easement (Modification Area D)**

An existing overhead powerline and easement is located to the north-west of the approved Bloomfield mine area. The powerline extends from a previous open cut mine area in the north of the Bloomfield Colliery site into the current Creek Cut area. The powerline currently provides power for the water cart filling station, water pumps and the rope shovel.

To enable the approved expansion of Creek Cut and S Cut to proceed, the southern section of this powerline, within the current approved Bloomfield Mine area, needs to be relocated.

It is proposed to relocate a section of the powerline within Area D as shown in **Figure 1**. This would require construction of a 40 metre wide easement, removing approximately one hectare of native vegetation.





Construction would consist of marking the easement, vegetation clearing within the easement, installation of posts and lines, and connection to the existing line. The existing line and posts would then be removed.

It is anticipated that this work will be undertaken within six months of the modification being approved and construction works would be less than six weeks in duration.

### **Development of Wattle Tree Drive as an Alternative Haul Route**

An existing access road between the northern open cut pit (Creek Cut) and the north-eastern end of the haul road leading to the washery stockpiles has been used for some years by light vehicles. Bloomfield proposes to upgrade this access ("Wattle Tree Drive") so that it can be used as an alternative haul road and general access road between the northern pit operations and the washery stockpiles. The location of this proposed alternative haul route is entirely within previously rehabilitated spoil emplacement areas and is shown as Area A on **Figure 1**.

Use of this alternative route will reduce haulage distances during times when coal is being extracted from Creek Cut and the northern areas of S Cut. Some cut and fill and slope stabilisation works will be required to construct the road, which will be used by coal trucks and general vehicles.

So that the road can be used as an alternative haul route, the existing track will be widened and improvements made to the horizontal alignment and road surface. The southern and northern batters will be shaped and stabilised as part of the construction works.



Figure 1 Open Cut Consent Modification Areas





### 3 NOISE MANAGEMENT

Selecting appropriate noise management strategies for the proposed Bloomfield Modifications involves the following steps:

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

The preference ranking (from most preferred to least preferred) for noise mitigation strategies is as follows:

- **Land-use controls** - a long-term strategy preferable to other measures when such strategic decisions are possible in planning land use, as it separates noise-producing industries from sensitive areas and avoids more expensive short-term measures.
- **Control at the source** - Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA). These strategies serve to reduce the noise output of the source so that the surrounding environment is protected against noise.
- **Control in transmission** - the next best strategy to controlling noise at the source. It serves to reduce the noise level at the receiver but not necessarily the environment surrounding the source.
- **Receiver controls** - the least-preferred option, as it protects only the internal environment of the receiver and not the external noise environment.

The proponent will take into account the cost-effectiveness of strategies in determining how much noise reduction is affordable. A proponent's choice of a particular strategy is likely to have unique features due to the economics of the industry and site specific technical considerations.

The above steps and the range of measures described in this chapter can be used as a guide in assessing the strength of the proponent's mitigation proposals. Where a proposed mitigation strategy will not achieve the desired noise reduction and leaves a remaining noise impact, the problem needs to be solved by negotiation between the land owner and regulatory authority.



## 4 IMPACT ASSESSMENT PROCEDURES

### 4.1 General Objectives

Responsibility for the control of noise emission in New South Wales is vested in Local Government and the DECCW. The INP was released in January 2000 and provides a framework and process for deriving noise criteria for consents and licences that will enable the DECCW to regulate premises that are scheduled under the Protection of the Environment Operations Act, 1997.

The specific policy objectives are:

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

### 4.2 Assessing Intrusiveness

For assessing intrusiveness, the background noise level must be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level ( $L_{Aeq}$ ) of the source should not be more than five decibels above the measured background level ( $L_{A90}$ ).

### 4.3 Assessing Amenity

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include road, rail or community noise. The existing noise level from industry is measured. If it approaches the criterion value, then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion. For high-traffic areas there is a separate amenity criterion.

An extract from the INP that relates to the amenity criteria is given in **Table 1** and **Table 2**.



**Table 1 Amenity Criteria - Recommended LAeq Noise Levels from Industrial Noise Sources**

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended LAeq(Period) Noise Level (dBA)	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
	Urban	Day	60	65
		Evening	50	55
		Night	45	50
School classrooms - internal	All	Noisiest 1 hour period when in use	35	40
Hospital wards - internal	All	Noisiest 1 hour period	35	40
			- external	50
Place of worship - internal	All	When in use	40	45
Area specifically reserved for passive recreation (eg National Park)	All	When in use	50	55
Active recreation area (eg school playground, golf course)	All	When in use	55	60
Commercial premises	All	When in use	65	70
Industrial premises	All	When in use	70	75

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am, On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am.

The LAeq index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.





**Table 2 Modification to Acceptable Noise Level (ANL)\* to Account for Existing Levels of Industrial Noise**

<b>Total Existing LA<sub>eq</sub> noise level from Industrial Noise Sources</b>	<b>Maximum LA<sub>eq</sub> Noise Level for Noise from New Sources Alone, dBA</b>
≥ Acceptable noise level plus 2 dBA	If existing noise level is <i>likely to decrease</i> in future acceptable noise level minus 10 dBA If existing noise level is <i>unlikely to decrease</i> in future existing noise level minus 10 dBA
Acceptable noise level plus 1 dBA	Acceptable noise level minus 8 dBA
Acceptable noise level	Acceptable noise level minus 8 dBA
Acceptable noise level minus 1 dBA	Acceptable noise level minus 6 dBA
Acceptable noise level minus 2 dBA	Acceptable noise level minus 4 dBA
Acceptable noise level minus 3 dBA	Acceptable noise level minus 3 dBA
Acceptable noise level minus 4 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 5 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 6 dBA	Acceptable noise level minus 1 dBA
< Acceptable noise level minus 6 dBA	Acceptable noise level

\* ANL = recommended acceptable LA<sub>eq</sub> noise level for the specific receiver, area and time of day from **Table 1**

#### 4.4 Assessing Sleep Disturbance

The DECCW has acknowledged that the relationship between maximum noise levels and sleep disturbance is not currently well defined. Criteria for assessing sleep disturbance has not been identified under the INP and hence, sleep arousal has been assessed using the guidelines set out in the ENCM Chapter 19-3.

To avoid the likelihood of sleep disturbance the ENCM recommends that the LA<sub>1(1minute)</sub> noise level of the source under consideration should not exceed the background noise level (LA<sub>90</sub>) by more than 15 dBA when measured outside the bedroom window of the receiver during the night-time hours (10.00 pm to 7.00 am).

#### 4.5 Construction Noise

The DECCW has prepared a new interim guideline covering construction noise. The NSW Interim Construction Noise Guideline sets out noise criteria applicable to construction site noise for the purpose of defining intrusive noise impacts. **Table 3** sets out the noise management levels and how they are to be applied. The approach is intended to provide respite for residents exposed to excessive construction noise outside the recommended standard hours whilst allowing construction during the recommended standard hours without undue constraints.



**Table 3 Construction Noise Management**

Time of Day	Management Level L <sub>Aeq,(15mins)</sub> *	How to apply
<b>Recommended standard hours :</b>	Noise affected RBL + 10 dBA	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <ul style="list-style-type: none"> <li>• Where the predicted or measured L<sub>Aeq,(15mins)</sub> is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise.</li> <li>• The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</li> </ul>
<p>Monday to Friday 7:00am to 6:00pm</p> <p>Saturday 8:00am to 6:00pm</p> <p>No work on Sundays or public holidays</p>	Highly noise affected 75 dBA	<p>The highly affected noise level represents the point above which there may be strong community reaction to noise.</p> <ul style="list-style-type: none"> <li>• Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:               <ol style="list-style-type: none"> <li>1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences.</li> <li>2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.</li> </ol> </li> </ul>
<b>Outside recommended standard hours</b>	Noise affected RBL + 5 dBA	<ul style="list-style-type: none"> <li>• A strong justification would typically be required for works outside the recommended standard hours.</li> <li>• The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>• Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.</li> </ul>

Based upon this document, the project specific construction noise goals outlined in **Table 3** will apply during the construction of the Wattle Tree Drive haul road at the nearest potentially affected residential locations.



## 5 PROJECT SPECIFIC NOISE CRITERIA

### 5.1 Existing Project Approval and Consent Conditions

Project Approval was granted on 3 September 2009 for the Bloomfield Project (Application No: 07\_0087). The relevant Consent Conditions relating to noise are reproduced below.

#### **Schedule 3 NOISE**

#### **Noise Impact Assessment Criteria**

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 4**:

**Table 4 Operational noise impact assessment criteria**

<b>Morning Shoulder</b>	<b>Day</b>	<b>Evening</b>	<b>Night</b>		<b>Location and Locality</b>
<i>L<sub>Aeq</sub>(15min)</i>	<i>L<sub>Aeq</sub>(15min)</i>	<i>L<sub>Aeq</sub>(15min)</i>	<i>L<sub>Aeq</sub>(15min)</i>	<i>L<sub>A1</sub>(1min)</i>	
40	35	35	35	45	E Browns Road, Black Hill
42	35	35	35	45	F Black Hill Road, Black Hill
43	39	42	37	45	G Buchanan Road, Buchanan
35	35	35	35	45	H Mt Vincent Road, Louth Park
35	35	35	35	45	L Kilshanny Avenue, Ashtonfield
48	39	39	37	46	M John Renshaw Drive, Buttai
43	42	42	35	46	N Lings Road, Buttai

#### Notes

- To interpret the locations in Table 1, see Appendix 2.
- The limits in Table 1 are to apply under meteorological conditions of up to 3 m/s at 10 m above ground level, excluding F and G class inversions as described in the NSW Industrial Noise Policy.

However, if the Proponent has a written negotiated noise agreement with the landowner of any land, and a copy of this agreement has been forwarded to the Department and DECC, 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 shall 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<sub>Aeq</sub>(11 hour) 50 dB(A) – Day;*
- *L<sub>Aeq</sub>(4 hour) 45 dB(A) – Evening; and*
- *L<sub>Aeq</sub>(9 hour) 40 dB(A) – Night.*



### **Continuous Improvement**

3. *The Proponent shall:*

*(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 AEMR, to the satisfaction of the Director-General.*

### **Monitoring**

4. *The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General.*

*The Program must:*

*(a) be prepared in consultation with DECC and be submitted to the Director-General 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.*

## **5.2 Bloomfield Project Environmental Assessment**

### **5.2.1 Project Specific Noise Levels**

It should be noted that the consent criteria determined in the Project Approval (07\_0087) for the approved operation differed from the Project Specific Noise Levels (PSNLs) established with reference to the INP. The noise assessment is provided in the Environmental Assessment (refer Part 3A Environmental Assessment Project Application 07\_0087 *Bloomfield Colliery Completion of Mining and Rehabilitation* and Heggies Report 30-1573-R1R1 *Noise and Blasting Assessment - Bloomfield Project*).

The intrusive and amenity noise assessment criteria based on the INP for the assessment localities are presented in **Table 5**.

**Table 5 Bloomfield Project Specific Noise Levels**

Location	Locality (Noise Amenity Area)	Period	Intrusiveness Criteria LAeq(15minute)	Amenity Criteria LAeq(Period)
E	Black Hill (Suburban)	Day	41 dBA	55 dBA
		Evening	40 dBA	45 dBA
F		Night	36 dBA	39 dBA
		Shoulder	44 dBA	47 dBA
G	Buchanan & Louth Park (Suburban)	Day	43 dBA	55 dBA
		Evening	41 dBA	45 dBA
H		Night	36 dBA	40 dBA
		Shoulder	45 dBA	48 dBA
L	Ashtonfield (Suburban)	Day	46 dBA	55 dBA
		Evening	46 dBA	45 dBA
		Night	43 dBA	40 dBA
		Shoulder	51 dBA	48 dBA
M	Buttai (Suburban)	Day	45 dBA	55 dBA
		Evening	43 dBA	45 dBA
N		Night	36 dBA	40 dBA
		Shoulder	53 dBA	48 dBA

For Monday to Saturday, Daytime 7.00 am - 6.00pm; Evening 6.00pm - 10.00pm; Night-time 10.00pm - 7.00am. Morning Shoulder 6.00 am to 7.00 am

On Sundays and Public Holidays, Daytime 8.00am - 6.00pm; Evening 6.00pm - 10.0 pm; Night-time 10.0 pm - 8.00am. Morning Shoulder 6.00 am to 8.00 am

1. The RBL's calculated for the Black Hill area were adopted as representative of the background levels at the occupied residential receivers on the Catholic Diocese Land (K1, K2 and K3).

The INP states that these criteria have been selected to protect at least 90% of the population, living in the vicinity of industrial noise sources, from the adverse effects of noise for at least 90% of the time. Provided the criteria in the INP are achieved, it is unlikely that most people would consider the resultant noise levels excessive.

### 5.2.2 Sleep Disturbance Noise Goals

The relevant sleep disturbance noise goals identified for each residential area are provided in **Table 6**. To minimise the potential for sleep disturbance in the morning shoulder period between 6.00 am and 7.00 am night-time RBL's have been used to set criteria instead of those recorded during the morning shoulder period.





**Table 6 Sleep Disturbance Noise Goals**

Location	Locality (Noise Amenity Area)	Period	Sleep Disturbance Criteria LA1(1minute)
E	Black Hill (Suburban)	Night and Morning Shoulder	46 dBA
F			
G	Buchanan & Louth Park (Suburban)	Night and Morning Shoulder	46 dBA
H			
L	Ashtonfield (Suburban)	Night and Morning Shoulder	53 dBA
M	Buttai (Suburban)	Night and Morning Shoulder	46 dBA
N			

### 5.3 Bloomfield Modification Project Specific Noise Levels

This report will make reference to both the existing consent criteria and the Environmental Assessment PSNLs in considering the impact of noise at the nearest affected receivers.

### 5.4 Construction Noise Criteria

Similar to the intrusive project specific noise goals, the adopted project specific noise goal for construction activities is background plus 10 dBA (LA90 + 10 dBA). **Table 7** presents the noise goals for construction work along the Wattle Tree Drive haul road.

**Table 7 Construction Noise Goals**

Location	Locality (Noise Amenity Area)	Period	Project Specific Noise Criteria LAeq(15minute) (dBA)
E	Black Hill (Suburban)	Day	46 dBA
F			
G	Buchanan & Louth Park (Suburban)	Day	48 dBA
H			
L	Ashtonfield (Suburban)	Day	51 dBA
M	Buttai (Suburban)	Day	50 dBA
N			

Construction may only occur between the hours of 7.00 am and 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm Saturdays. For all other times construction noise must be inaudible at the receiver. No construction work is to take place on Sundays or Public Holidays.



## 6 ASSESSMENT OF NOISE IMPACTS

### 6.1 Operational Noise Modelling

#### 6.1.1 Operational Noise Modelling Parameters

A computer model was used to predict noise emissions from operation of the proposed Bloomfield Modifications. The Environmental Noise Model (ENM) used has been produced in conjunction with the DECCW. The modelling process has utilised the Bloomfield noise model prepared by Heggies for the EA for the existing approved operation. The model has been updated to incorporate the latest topographic information available for the site and each of the proposed modifications to be assessed.

The Bloomfield noise model uses a three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. The model used this map, together with noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers.

Topographic contours and operational descriptions were supplied by Bloomfield for the purpose of modelling noise from the proposed modifications.

Prediction of noise sources were carried out, under calm and prevailing atmospheric conditions (prevailing winds), for three operational scenarios namely;

- Area B dumping & rehabilitation.
- Area C dumping & rehabilitation.
- Area E dumping & rehabilitation.

Prevailing atmospheric conditions established during the previous EA have been utilised for the purpose of this assessment. Atmospheric parameters under which noise predictions were made are given in **Table 8**.

**Table 8 Meteorological Parameters for Noise Predictions**

	Temperature	Humidity	Wind Speed	Wind Direction (degrees from north)	Temperature Gradient
Calm (All periods)	20°C	65%	N/A	N/A	N/A
North-west wind (morning shoulder)	10°C	90%	3m/s	315	N/A
South-east wind (evening and morning shoulder)	10°C	90%	3m/s	135	N/A

Other assumptions made relating to the modifications in the modelling process include:

- All acoustically significant plant and equipment operates simultaneously.
- Mobile noise sources, such as haul trucks, were modelled at typical locations and assumed to operate in repetitive cycles.
- All operations and noise controls described in the assessment of the approved operation will remain; operational modifications are limited to the location of the dump site and associated haul routes.
- Dumping and rehabilitation will not occur during the night-time period in Area B.



- Dumping and rehabilitation will not occur during the evening, night-time or morning shoulder periods in Areas C and E.

### 6.1.2 Acoustically Significant Plant and Equipment

Sound power levels of all plant and equipment operating on the site has been based on those modelled in the EA for the approved Bloomfield mine area. Since the publication of the EA, Heggies have performed on site sound power level measurements of some items of plant, where this has occurred the modelled sound power levels have been updated to include the measured data.

Plant operating within the modification areas will include CAT 793 dump trucks and a CAT D11 dozer unless stated in **Section 6.1.3**.

Sound power levels of relevant items of plant and equipment are contained within **Appendix A**.

### 6.1.3 Noise Controls, Mitigation and Management

The following noise controls are recommended for the proposed modified development. Noise mitigation and management procedures that have been incorporated into the noise model with the aim of achieving project specific noise criteria include the following:

#### Area B

- Daytime:
  - The height of the overburden emplacement area will be limited to an RL of 100m.
  - Daytime operations will be in the southern part of the dump to raise the dump and provide screening for the evening and morning shoulder operations.
- Evening and morning shoulder
  - The drill and clearing dozer will be working in a shielded location.
  - Dumping will only occur in the northern part of the dump.
  - The dozer will only operate in a shielded location in the northern part of the dump.
  - An earthen bund will be constructed in the approved dumping area to the south of the existing haul road to a minimum height of 80m RL (refer **Figure 2**).
  - There will be no coaling from S-Cut during the morning shoulder period.
- Night-time
  - There will be no dumping and rehabilitation in Area B during the night-time period.

#### Area C

- Dumping and rehabilitation will occur in Area C during the daytime period only.

#### Area E

- Dumping and rehabilitation in Area E will occur during the daytime period only.
- Dumping will be restricted to a maximum of 70 hours of work.
- A front end loader would replace the dozer at the Area E dump once the emplacement reaches an RL of 52m.



These recommended noise control procedures are consistent with those recommended for the approved Bloomfield mine area; namely that the dump site is required to be situated within the pit during night-time operations, hence no out of pit dumping and rehabilitation will occur at Areas B, C and E during the night-time period.

Figure 2 Proposed Haul Road Bund Location





## 6.1.4 Operational Noise Modelling Results

Noise emission levels were predicted from the proposed operation for the typical operational scenarios described in **Section 6.1.1** including the noise control and management procedures described in **Section 6.1.2**. Noise from all sources that contribute to the total noise from the site have been examined to identify characteristics that may cause greater annoyance (for example tonality, impulsiveness etc). The appropriate modifying factors, as outlined in the INP, have been applied where these characteristics are considered to be present.

A summary of the predicted operational noise levels from the proposed modifications for the worst case receiver locations are contained within **Table 9** to **Table 12**.

Exceedences of the existing consent criteria are highlighted in **bold** and exceedences of the consent criteria and EA PSNLS are highlighted in **bold italics** within the results tables.

**Table 9 Predicted Bloomfield Modification Project Noise Levels – Area B Daytime**

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)						Noise Criteria (dB LAeq)	
		75m	79m	81m	84m	90m	100m	Consent Conditions	PSNLS
E Browns Road Black Hill	Day	31	32	35	<b>37</b>	<b>39</b>	<b>39</b>	35	41
F Black Hill Road Black Hill	Day	29	31	34	<b>36</b>	<b>39</b>	<b>39</b>	35	41
G Buchanan Road Buchanan	Day	38	38	38	38	38	38	39	43
H Mt Vincent Rd Louth Park	Day	<30	<30	<30	<30	<30	<30	35	43
L Kilshanny Avenue Ashtonfield	Day	<30	<30	<30	<30	<30	30	35	46
M John Renshaw Drive Buttai	Day	<b>40</b>	<b>41</b>	<b>42</b>	<b>42</b>	<b>44</b>	<b>45</b>	39	45
N Lings Road Buttai	Day	34	34	34	35	35	35	42	45

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLS are highlighted in bold italics within the results tables.



**Table 10 Predicted Bloomfield Modification Project Noise Levels – Area B Evening and Morning Shoulder**

Location	Period	Predicted Noise Level (dB LAeq)			Noise Criteria (dB LAeq)	
		Calm	NW	SE	Consent Conditions	PSNLs
E Browns Road Black Hill	Morning shoulder	<30	<b>41</b>	<30	40	44
	Evening	<30	N/A	<30	35	40
F Black Hill Road Black Hill	Morning shoulder	<30	<b>44</b>	<30	42	44
	Evening	<30	N/A	<30	35	40
G Buchanan Road Buchanan	Morning shoulder	<30	<30	38	43	45
	Evening	<30	N/A	39	42	41
H Mt Vincent Rd Louth Park	Morning shoulder	<30	<30	33	35	45
	Evening	<30	N/A	30	35	41
L Kilshanny Avenue Ashtonfield	Morning shoulder	<30	<30	<b>37</b>	35	48
	Evening	<30	N/A	<b>39</b>	35	46
M John Renshaw Drive Buttai	Morning shoulder	32	<b>47</b>	<30	48	48
	Evening	33	N/A	<30	39	43
N Lings Road Buttai	Morning shoulder	<30	31	<30	43	48
	Evening	<30	N/A	<30	42	43

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLs are highlighted in bold italics within the results tables.





**Table 11 Predicted Bloomfield Modification Project Noise Levels – Area C**

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)	Noise Criteria (dB LAeq)	
			Consent Conditions	PSNLs
E Browns Road, Black Hill	Day	30	35	41
F Black Hill Road, Black Hill	Day	<30	35	41
G Buchanan Road, Buchanan	Day	39	39	43
H Mt Vincent Rd, Louth Park	Day	<30	35	43
L Kilshanny Avenue Ashtonfield	Day	30	35	46
M John Renshaw Drive, Buttai	Day	38	39	45
N Lings Road, Buttai	Day	30	42	45

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLs are highlighted in bold italics within the results tables.

**Table 12 Predicted Bloomfield Modification Project Noise Levels – Area E**

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)			Noise Criteria (dB LAeq)	
		52m (with dozer on dump)	56m (with front end loader on dump)	60m (with front end loader on dump)	Consent Conditions	PSNLs
E Browns Road Black Hill	Day	<b>41</b>	<b>41</b>	<b>41</b>	35	41
F Black Hill Road Black Hill	Day	<b>37</b>	<b>36</b>	<b>37</b>	35	41
G Buchanan Road Buchanan	Day	38	38	38	39	43
H Mt Vincent Rd Louth Park	Day	<30	<30	<30	35	43
L Kilshanny Avenue Ashtonfield	Day	<30	<30	<30	35	46
M John Renshaw Drive Buttai	Day	<b>46</b>	<b>45</b>	<b>45</b>	39	45
N Lings Road Buttai	Day	35	35	35	42	45

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLs are highlighted in bold italics within the results tables.



## 6.1.5 Discussion

### Area B - Daytime

Noise levels including dumping operations in Area B are predicted to meet the existing consent conditions at locations G, H, L and N during the daytime period. Noise levels are also predicted to meet the existing conditions of consent at locations E and F when the elevation of the dump is 81m or lower.

Operational noise levels from the Area B modification are predicted to exceed the existing consent criteria at location M during daytime operations and at locations E and F when the height of the dump exceeds 81m. However, noise levels at these locations are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project and are therefore unlikely to cause disturbance.

### Area B – Evening and Morning Shoulder

Noise levels including dumping operations in Area B are predicted to meet the existing consent criteria at locations G, H and N during the evening and morning shoulder periods under calm and prevailing weather conditions with the proposed mitigation and management strategies in place and at all locations under calm weather conditions.

Operational noise levels from the Area B modification are predicted to exceed the existing consent conditions at locations E, F and M during the morning shoulder period under the influence of a prevailing NW wind and at location L during the evening and morning shoulder periods under the influence of a prevailing SE wind. Notwithstanding this, noise levels at these locations are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project and are therefore unlikely to cause disturbance.

### Area C

Operational noise levels from the proposed Area C modification are predicted to meet the existing conditions of consent at all receiver locations during the daytime period under calm weather conditions.

### Area E

Operational noise levels from the proposed Area E modification are predicted to meet the existing consent conditions at locations G, H, L and N during the daytime period. Noise levels at locations E, F and M are all predicted to exceed the existing consent criteria by up to 6 dBA.

Notwithstanding this, noise levels are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project at all locations with the exception of Location M where a 1 dBA exceedence is predicted with a dozer working on the dump. This 1 dBA exceedence is unlikely to cause disturbance during the daytime period.

It should be noted that the works required in Area E are minor in nature and will be limited to a total of 70 hours in daytime periods.

Additionally, since the operational scenario modelled is likely to represent an acoustically worst-case scenario, actual operational noise levels from the proposed modifications are likely to be less than those predicted.



## 6.2 Sleep Disturbance Analysis

In assessing sleep disturbance, typical  $L_{Amax}$  noise levels of plant and equipment to be used at the subject site during the night was used as input to the ENM acoustic model and predictions were made at the nearest residential areas under adverse weather conditions during the morning shoulder.

A summary of the predicted maximum noise levels at the most affected locations are contained within **Table 13**.

**Table 13 Predicted Maximum Morning Shoulder Noise Levels – Area B**

Location	Period	Predicted Noise Level $L_{Amax}$ (dBA)		Sleep Disturbance Criteria ( $LA1(1min)$ )	
		NW Wind	SE Wind	Consent Conditions	PSNLs
E Browns Road Black Hill	Morning Shoulder	46	<30	45	46
F Black Hill Road Black Hill		48	<30	45	46
G Buchanan Road Buchanan		<30	38	45	46
H Mt Vincent Rd Louth Park		<30	31	45	46
L Kilshanny Avenue Ashtonfield		<30	40	45	53
M John Renshaw Drive Buttai		48	34	46	46
N Lings Road Buttai		39	<30	46	46

The predicted  $L_{Amax}$  noise levels from the proposed Area B Modification will meet the sleep disturbance consent criteria at all locations for all operational scenarios considered with the exception of Locations E, F and M where exceedances of up to 3 dBA are predicted during the morning shoulder period under the influence of a NW wind.

As discussed in **Section 5.2.2**, in order to minimise the potential for sleep disturbance, noise goals are based on the night-time RBLs rather than those measured during the morning shoulder. However, it should be noted that during the morning shoulder period, noise levels are typically significantly higher than during the night-time due to the increase in road traffic along John Renshaw drive (measured noise levels during the morning shoulder period at locations E, F and M were between 8 and 17 dBA higher than those monitored during the night-time period (refer Heggies report 30-1573-R1R1 *Noise and Blasting Assessment – Bloomfield Project*)).

Furthermore, the use of the  $L_{Amax}$  noise level provides a worst-case prediction since the  $LA1(1minute)$  noise level of a noise event is likely to be less than the  $L_{Amax}$ . As such, the predicted 3 dBA exceedance is unlikely to cause sleep disturbance during the morning shoulder period.



Since it has been recommended that dumping and rehabilitation in the proposed modification areas does not occur in Areas C and E at night-time or during the morning shoulder period, sleep disturbance analysis has not been undertaken for these locations.

## **6.3 Construction Noise Modelling**

### **6.3.1 Construction Scenarios**

#### **Development of Wattle Tree Drive as Alternative Haul Route (Modification Area A)**

The construction of the alternative haul road will involve the widening and levelling of the existing track at Wattle Tree Drive. As part of the construction works the southern and northern batters will be shaped and stabilised.

It has been assumed that the following equipment will be utilised for the construction works:

- CAT D11 Dozer.
- CAT 16G Grader.
- CAT 365 Backhoe.

Noise modelling has considered the worst case construction scenario with all the plant operating at the south-western end of the haul road where the plant will be at its most elevated and exposed level.

#### **Construction of Overhead Powerline and Easement (Modification Area D)**

Construction of the overhead powerline and easement would involve the marking of the easement, vegetation clearing and the relocation of the powerline. It is anticipated that construction works would be less than 6 weeks in duration.

It has been assumed that the most acoustically significant equipment operating during the construction period will be a dozer clearing vegetation and marking the easement. This has been modelled at the most elevated level within modification area D to provide a worst case assessment.

### **6.3.2 Construction Noise Modelling Results**

The maximum predicted noise levels due to the development of Wattle Tree Drive as an alternative haul route are less than 30 dBA at all locations and as such are well below the construction noise criteria. Furthermore, once the haul route is in place it is likely that operational noise impacts will be reduced due to the greater separation distances between the haul road and the nearest affected residences to the south.

The maximum predicted noise levels due to the clearing and marking of the easement within modification area D are also predicted to be less than 30 dBA and are significantly below the relevant construction noise criteria.



## 7 CONCLUSION

Heggies has conducted a noise impact assessment for the proposed modifications to operations at the Bloomfield Colliery located near Beresfield, NSW. The objective of the study was to assess the potential impact of noise from dumping and rehabilitation within the proposed modification areas B, C and E.

Operational noise levels were predicted under calm and prevailing meteorological conditions at the nearest affected residences to the site. With proposed noise controls, mitigation and management in place, operational noise levels are predicted to meet the existing consent criteria during the daytime at locations G, H, L and N during dumping and rehabilitation in Areas B and E and at all locations during dumping and rehabilitation in Area C.

Noise levels are predicted to exceed the existing daytime consent criteria at locations E, F and M during dumping and rehabilitation in Areas B and E. Notwithstanding this, noise levels are predicted to be below the project specific noise levels established with reference to the INP and reported in the EA for the approved development and are therefore unlikely to cause disturbance at the surrounding residential receivers.

Noise levels including dumping operations in Area B are predicted to meet the existing consent criteria at locations G, H and N during the evening and morning shoulder periods under calm and prevailing weather conditions.

Operational noise levels from the Area B modification are predicted to exceed the existing consent conditions at locations E, F and M during the morning shoulder period under the influence of a prevailing NW wind and at location L during the evening and morning shoulder periods under the influence of a prevailing SE wind. Notwithstanding this, noise levels at these locations are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project and are therefore unlikely to cause disturbance.

The proposed activity in Areas B and E are necessary to ensure that the rehabilitation measures and final landform meets current standards as prescribed by the NSW Government. The long history of mining on the site and changing rehabilitation standards has prompted the need to make improvements. Whilst there may be some short term exceedence of noise criteria outlined in the Project Approval, the proposed modifications comply with the requirements of the Industrial Noise Policy.

The predicted  $L_{Amax}$  noise levels from the proposed Area B Modification are predicted to meet the existing sleep disturbance criteria with the exception of Locations E, F and M under adverse weather conditions. Notwithstanding this, predicted maximum noise levels are considered worst case and are unlikely to cause sleep disturbance during the morning shoulder period where existing noise levels are significantly higher due to the influence of road traffic on John Renshaw Drive.

Predicted construction noise levels from the development of Wattle Tree Drive as an alternative haul route and the construction of the overhead powerline and easement are predicted to be significantly below the relevant construction noise criteria.