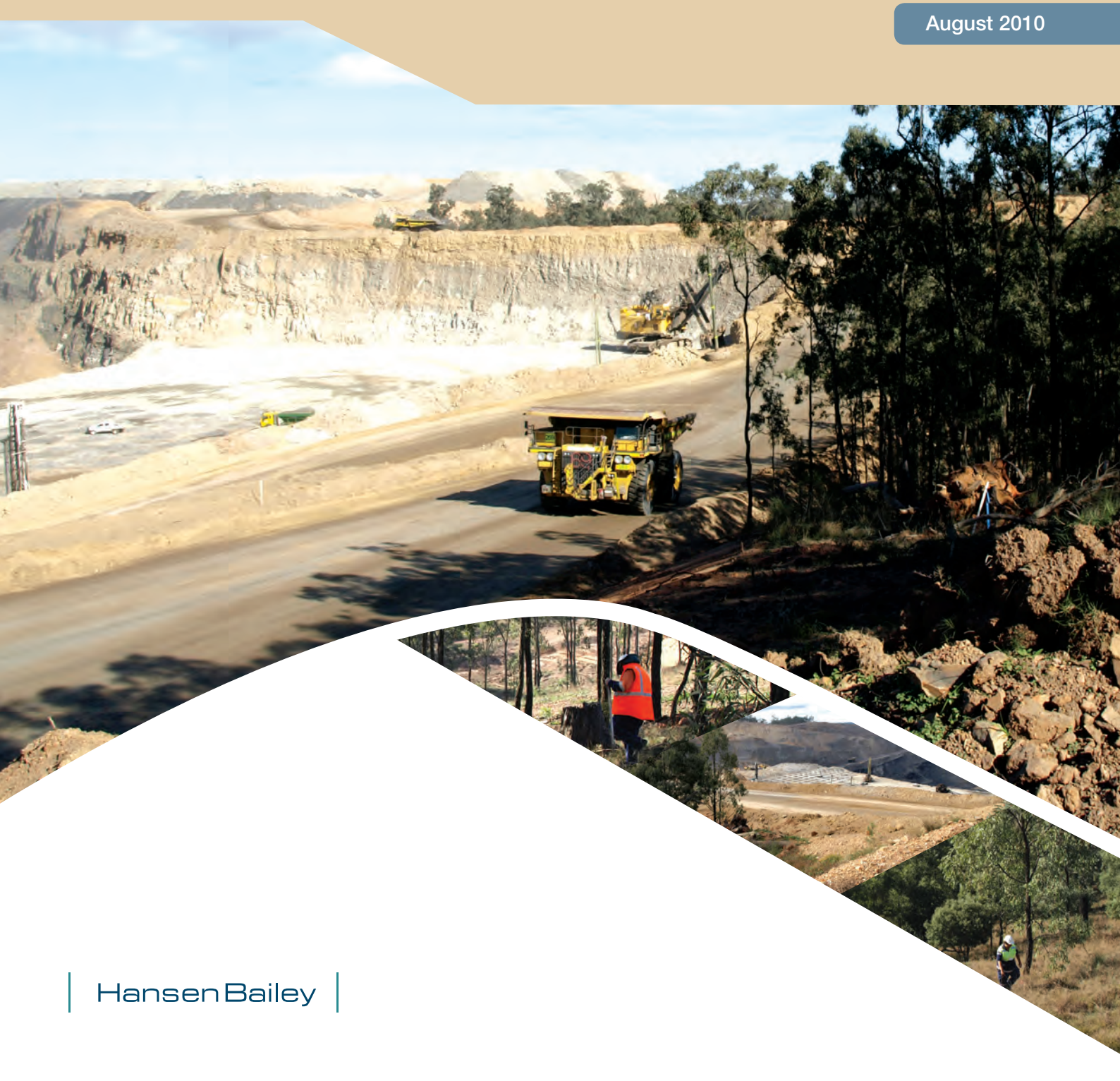
ESTABLISHED 1907

MUSWELLBROOK COAL COMPANY LIMITED

Development Consent Modification Statement of Environmental Effects

August 2010



HansenBailey

MUSWELLBROOK COAL MINE
DEVELOPMENT CONSENT MODIFICATION

STATEMENT OF ENVIRONMENTAL EFFECTS

Prepared by

HANSEN BAILEY
6 / 127-129 John Street
SINGLETON NSW 2330

August 2010

for

MUSWELLBROOK COAL COMPANY LIMITED
PO Box 123
MUSWELLBROOK NSW 2333

EXECUTIVE SUMMARY

The Muswellbrook Coal Mine has operated continuously since 1907.

This Statement of Environmental Effects supports an Application to Muswellbrook Shire Council by Muswellbrook Coal Company to modify its No. 1 Open Cut Extension Development Consent under Section 96(2) of the *Environmental Planning and Assessment Act 1979*.

The Modification will authorise the recovery of an additional 5.2 Million tonnes of coal from the area of the long standing mining operations and from within the area of the existing mining leases held by Muswellbrook Coal Company under the *Mining Act 1992* but which are not currently approved for recovery under the *Environmental Planning & Assessment Act 1979*.

The additional coal extraction will be undertaken using the same mining methods and at the same annual rate as is presently approved. This additional coal recovery will be achieved by utilising the existing workforce, infrastructure and equipment fleet and will be undertaken within the currently approved mine life.

This additional resource was originally considered to be economically unviable for open cut mining operations due to the historic underground mining operations undertaken in this area. However, due to the extensive experience Muswellbrook Coal Company now has in extracting coal via open cut methods from old underground workings, this once thought to be sterilised resource can now be safely recovered. This additional resource recovery will be undertaken in accordance with the approved open cut mining activities at the Muswellbrook Coal Mine. The additional resource can be recovered without material additional environmental impacts. Environmental impacts from the operations as proposed by the Modification are assessed as minor in nature and are consistent with the environmental goals set in the existing approval DA 205/2002 (MOD 1 and MOD 2), and described within the *Muswellbrook Coal Company Limited, No. 1 Open Cut Extension Environmental Impact Statement 2002*, *Section 96(1A) Application to Modify Development DA 205/2002* and the *Muswellbrook Coal Mine Development Consent Modification Statement of Environmental Effects*.

The Modification Area will effectively integrate with the conceptual rehabilitation and final landform design for the site. A proposed Ecological Offset Area will ensure the ongoing biodiversity and sustainability of the local natural environment.

The additional recovery will result in optimal resource recovery and maximum economic benefits utilising existing infrastructure with minimal, if any, additional environmental effects to those already approved in the existing approvals for mining.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 BACKGROUND

1.1 INTRODUCTION

Muswellbrook Coal Mine (MCM) is located approximately 2.5 km to the north-east of the township of Muswellbrook in the Upper Hunter Valley of NSW (see Figure 1). Muswellbrook Coal Company (MCC) has a long history of underground and open cut coal mining in the Muswellbrook area, dating back to the opening of the Muswellbrook No. 1 Underground Colliery in 1907. MCC has been an integral part of the Muswellbrook community for over 100 years.

Mining operations at MCM commenced prior to any planning controls and have since then occurred in accordance with a number of development consents and other approvals. MCC currently operates under Development Consent Approval (DA 205/2002) (Development Consent) granted by Muswellbrook Shire Council (MSC) for the "*Extension of MCC's No. 1 Open Cut Coal Mine"* (September 2003). The supporting document to DA 205/2002 is the "*Muswellbrook Coal Company Limited, No. 1 Open Cut Extension Environmental Impact Statement 2002*" (HLA EnviroSciences, 2002) (MCC EIS) which describes the mining operations and associated activities within No. 1 Open Cut Extension Area (No. 1 Extension).

A modification to DA 205/2002 was granted by MSC on 19 December 2005 (DA 205/2002 MOD1) to relocate powerlines to allow the progression of approved mining operations and to carry out minor extensions to the workshop and store facilities. This modification was supported by a Statement of Environmental Effects entitled "*Section 96(1A) Application to Modify Development DA 205/2002"* (Parsons Brinckerhoff, 2005).

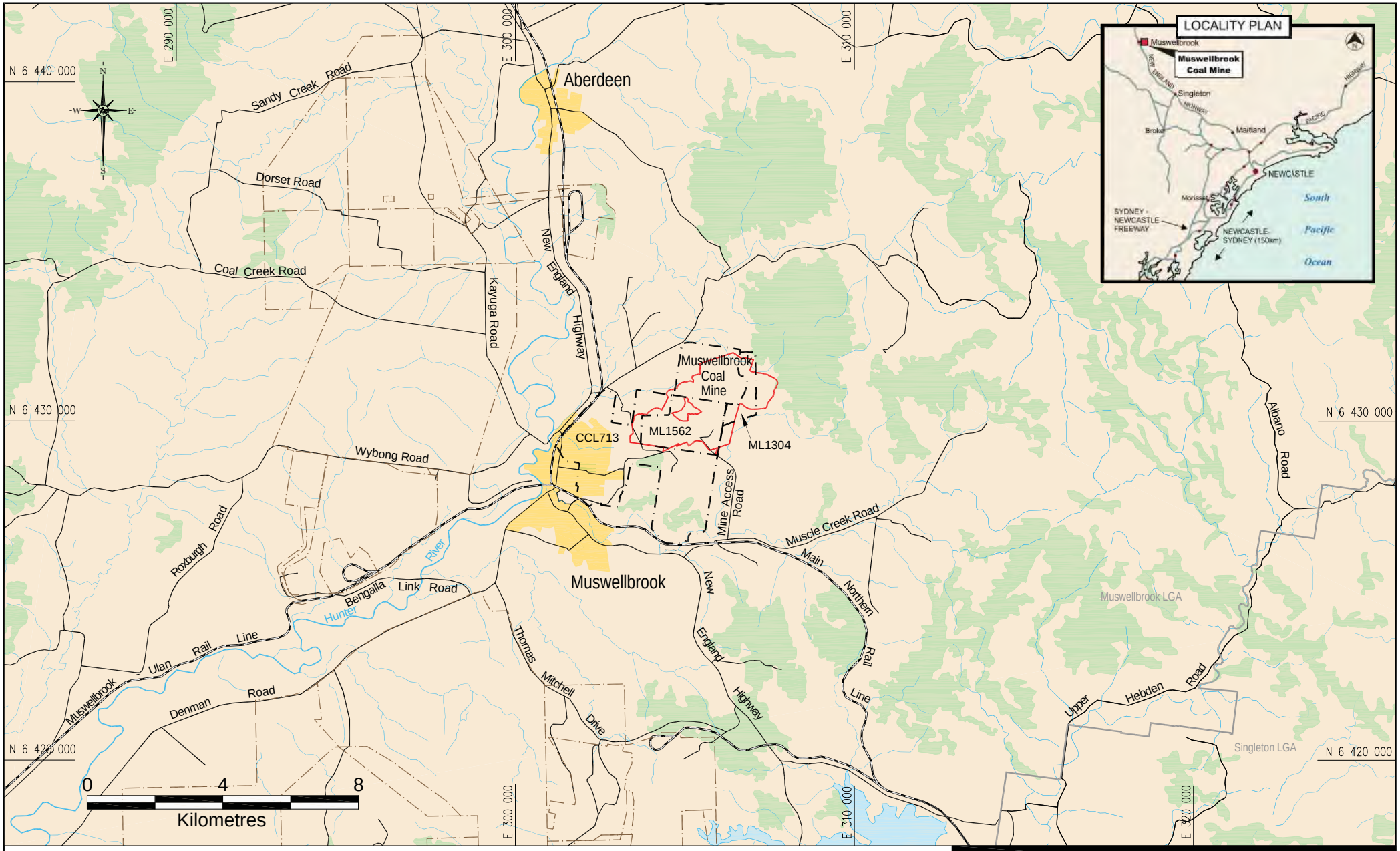
A further modification to DA 205/2002 was granted by MSC on 3 July 2009 (DA 205/2002 MOD2) to facilitate the relocation of existing surface facilities to enable the approved extraction of the underlying coal resource and seek approval for a revised conceptual final landform at MCM. This modification was supported by the "*Muswellbrook Coal Mine Development Consent Modification Statement of Environmental Effects"* (2008 Modification SEE) (Hansen Bailey, 2009).

1.2 THE PROPONENT

MCM is owned and operated by MCC which is a wholly owned subsidiary of Idemitsu Australia Resources Pty Limited (IAR). IAR is part of the Idemitsu Kosan Company Limited Group (Idemitsu) which is a Japanese company with commercial interests in energy supply around the world.

Idemitsu is Japan's second largest oil refiner with a network of 36 international offices, 18 offices in Japan and over 4,700 service stations. Idemitsu's primary activities are the securing of oil resources, crude oil refining and petroleum product marketing. Idemitsu also has interests in alternative energy sources such as coal, uranium and geothermal generation, as well as petrochemicals and related fields.

MCC holds an 11% share in the Ravensworth Coal Terminal (RCT) which facilitates train loading of export coal MCM for transport to the Port of Newcastle.



MUSWELLBROOK COAL COMPANY

Regional Locality

Cad File: 06455D.dwg	Date: 27.07.10	Drawn: CP	Figure 1

1.3 DOCUMENT PURPOSE

This Statement of Environmental Effects (SEE) supports an application to modify DA 205/2002 under Section 96(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). MCC has extensive operational experience in extracting coal from areas of old underground mining operations by open cut methods. MCC has identified additional resources outside the originally approved No. 1 Extension suitable for open cut mining operations (the Modification) which will serve to maximise resource recovery in this area.

The Modification is required to facilitate an extension of mining operations at MCM within its current mining authorities. The Modification will result in the extraction of an additional 5.2 Million tonnes (Mt) of Run of Mine (ROM) coal outside of the current No. 1 Open Cut Extension Area boundary (DA boundary). The extension is approximately 28.4 ha in size (the Modification Area).

This SEE has been prepared to support the Modification application which will be lodged with MSC for determination. It has been prepared consistent with discussions held with MSC.

1.4 DOCUMENT STRUCTURE

This SEE includes the following sections:

- Section 2.0 provides detail on the existing approved operations at MCM;
- Section 3.0 includes a description of the various components of the Modification;
- Section 4.0 discusses the regulatory framework relevant to the Modification;
- Section 5.0 summarises the stakeholder consultation undertaken and any issues raised during that process;
- Section 6.0 outlines impacts identified in relation to the Modification and provides management and mitigation measures to be implemented by MCC in response;
- Section 7.0 provides a justification for the Modification as sought;
- Section 8.0 provides a list of abbreviations referenced in this SEE; and
- Section 9.0 provides a list of documents referenced in this SEE.

2.0 EXISTING OPERATIONS & ENVIRONMENT

This section of the SEE provides a summary of the existing operations at the MCM as approved under DA 205/2002 (MOD 1 and MOD 2).

2.1 APPROVED MINING ACTIVITIES

MCC has mined coal in the Muswellbrook area since 1907. Initially the No. 1 Underground Colliery supplied coal to the railways and in later years, coal was supplied to Muswellbrook township for power generation. Open cut mining commenced at the No. 1 Open Cut in 1944 and was one of the first open cut coal mines in the southern hemisphere.

Whilst planning controls have not existed for the majority of the past 100 years, MCC has undertaken coal mining under numerous approvals since the need for approvals commenced. The areas and phases of operation of MCM are as follows:

- No. 1 Colliery (Underground) (1907 – 1980);
- No. 1 Open Cut (1944 – 1970, 2001 – 2002);
- No. 1 Extension (2005 – Current);
- Common Open Cut (January 1992 – June 1992);
- St Helliers Colliery (Underground) (1923 – 1966);
- No. 2 Colliery (Underground) (1980 – 1997); and
- No. 2 Open Cut (1965 – Current).

Mining operations at MCM currently occur in the No. 1 Extension within the approved DA Boundary shown on Figure 1. Some minor operations are also being undertaken in the No. 2 Open Cut area to extract coal seams which were temporarily sterilised following a highwall failure in January 2005.

MCC also holds development consent for the development of the Sandy Creek Underground Mine under Development Consent DA 86/98, which was granted by MSC in April 1999. Works under DA 86/98 commenced on 5 April 2004. However, no extraction of coal via underground methods has occurred under this approval.

2.2 CURRENT OPERATIONS

Mining in the No. 1 Extension is undertaken generally in accordance with DA 205/2002 (MOD 1 and MOD 2) and its supporting documents. DA 205/2002 (MOD 1 and MOD 2) provides MCC approval for (at least) the following activities:

- Open cut mining operations within the No. 1 Extension with a combined maximum production rate of up to 2 Million tonnes per annum (Mtpa) product coal from MCM until 2015;
- Mining of a total of 11.6 Mt of ROM coal from the No. 1 Extension utilising truck and shovel methods similar to those utilised within the No. 2 Open Cut;
- Relocation and utilisation of the service infrastructure including: administration offices; bathhouse, workshop and store facilities;
- Utilisation of the No. 2 Open Cut mining equipment and Coal Preparation Plant (CPP);
- Transport of up to 2 Mtpa product coal from MCM by highway trucks either to the RCT for transport by rail to the Port of Newcastle for export, or to regional power stations for power generation; and

- 24 hours per day, seven days per week operation utilising a 10.5 hour shift roster and approximately 95 permanent employees as well as the use of contractors and casual employees.

Further details on operations within the No. 1 Extension are provided below.

2.2.1 Mining

Mining operations in the No. 1 Extension commenced in March 2005 and have involved the extraction of remnant coal within areas of old underground workings. Mining commenced in the north-western part of the No. 1 Extension and has progressed to the east away from Muswellbrook.

The No. 1 Extension is a truck and shovel/excavator open cut operation extracting coal from the Greta Coal Measures. Operations within the No. 1 Extension involve the stripping of topsoil and the drilling and blasting of overburden material which is then removed utilising a P&H 2800 Shovel, hydraulic excavators and a fleet of 11 Komatsu 730E 190 tonne (t) dump trucks. The uncovered coal seams are extracted utilising a hydraulic excavator or front end loader to load 190 t rear dump trucks which transport coal to the ROM coal receival area.

Operations within the No. 2 Open Cut involve the mining of failed highwall material to create a long-term stable highwall to accommodate future Sandy Creek Underground entries. This operation will involve utilising the same hydraulic excavators/shovels and 190t Komatsu dump trucks (as used in No. 1 Extension) for the removal of both waste and coal.

2.2.2 Coal Processing

Coal extracted from the No. 1 Extension is loaded into a 250 t ROM receival bin which feeds a crushing plant that reduces the coal to a size of approximately 50 mm. Crushed coal is then passed through a belt-ash analyser which provides immediate feedback on the coal quality and diverts the coal to specific locations dependant on the ash content. MCM's CPP was constructed in the early 1980s and is currently utilised to wash product coal from the No. 1 Extension.

2.2.3 Coal Transport

MCC has approval under DA 205/2002 to transport, by road, up to 2 Mtpa product coal from MCM. All product coal is transported by highway trucks up to 38 t in capacity which travel via the Mine Access Road to Muscle Creek Road and then on to the New England Highway. Product coal is largely hauled to a rail loading facility at the RCT where it is railed to the Port of Newcastle for sale to the export market. A small amount of product coal may also be sold to regional power utilities for use in domestic power generation.

2.3 EXISTING REGULATORY APPROVALS

Table 1 lists the current licences and approvals under which MCM operates. A detailed discussion on legislation relevant to the Modification is provided in Section 4.0.

Table 1
MCC Licences & Approvals

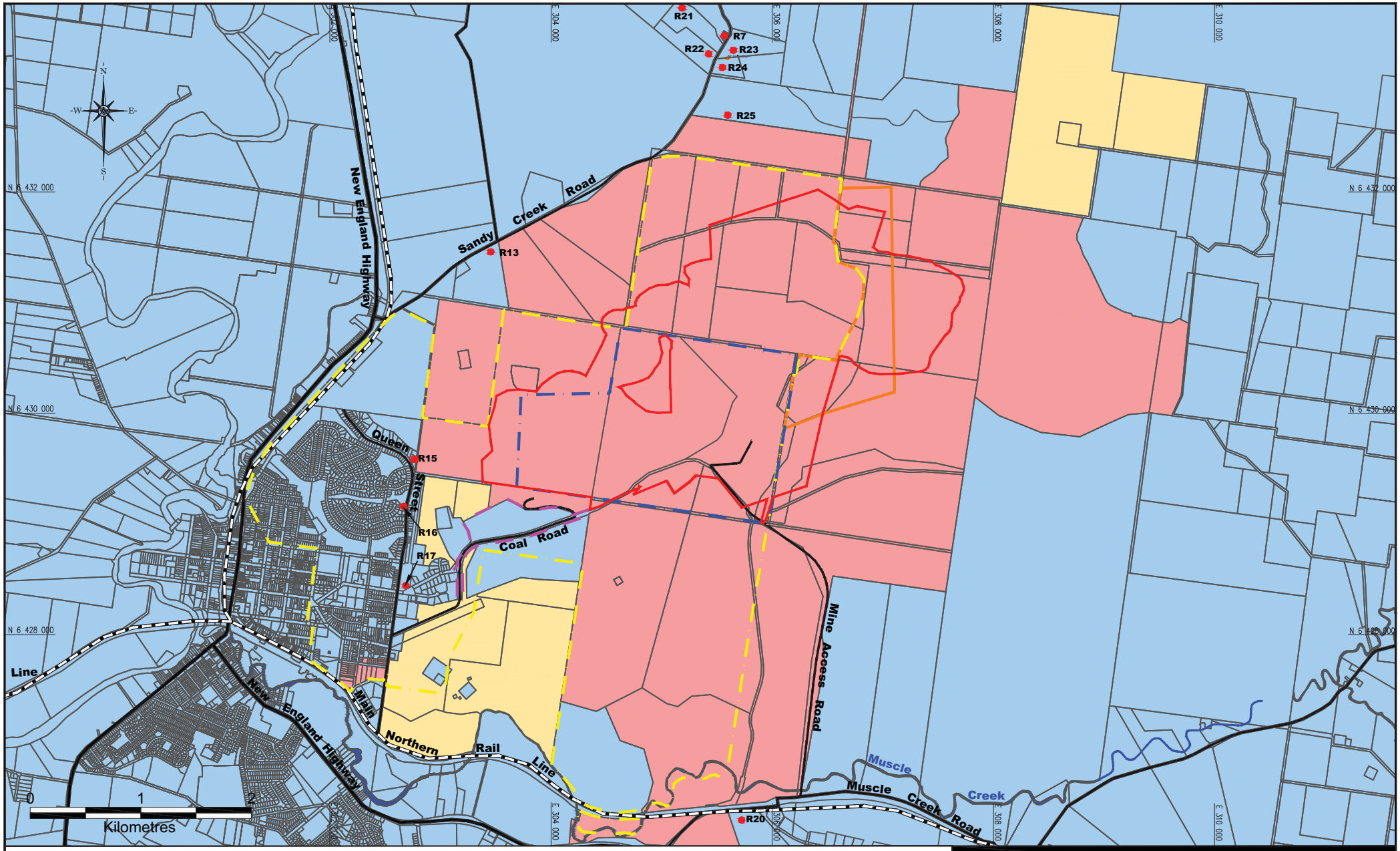
Instrument	Reference	Validity Periods	Authority
Environmental Protection Licence (EPL)	656	17/11/2009 – 9/07/2013	Department of Environment, Climate Change and Water (DECCW)
Mining Lease	1304	12/01/1993 – 12/01/2014	Industry & Investment NSW (I&I NSW)
Mining Lease	1513	20/03/2002 – 20/03/2023	I&I NSW
Mining Lease	1562	16/02/2005 – 16/02/2026	I&I NSW
Consolidated Coal Lease	713	04/12/2008 – 24/11/2025	I&I NSW
Development Consent Coal Washery	ID 721	16/08/1985	MSC
Development Consent Coal Haul Road & Coal Haulage	18/88	13/04/1989	MSC
Development Consent Eastern No. 2 Open Cut	78/92	15/10/1992	MSC
Development Consent Sandy Creek Underground	86/98	12/04/1999 – 12/04/2020	MSC
Development Consent No. 1 Open Cut Extension	205/2002	01/09/2003 – 01/09/2015	MSC
Development Consent Modification	205/2002 (MOD 1)	19/12/2005 – 01/09/2015	MSC
Development Consent Modification	205/2002 (MOD 2)	03/07/2009 – 01/09/2015	MSC

2.4 LAND OWNERSHIP

Table 2 lists selected non-mine owned land relevant to the environmental assessments undertaken for the Modification. These receivers were selected to be representative of all receivers surrounding MCM. Figure 2 illustrates land ownership surrounding the operation relevant to the Modification.

Table 2
Land Ownership

ID	Owner
R7	Watts
R13	McMaster
R15	Collins
R16	Tuckey
R17	Colvin
R20	Gordon
R21	French
R22	Aird
R23	Nielson
R24	Edwards
R25	Hamson



- Revised DA Boundary
- Private/Unidentified Land
- Muswellbrook Coal Land
- Crown Land
- CCL 713
- CCL 713 Exemption Area
- ML 1304
- ML 1562
- Residences

Source: MCC (2008)
Co-ordinate System: MGA 94 Zone 56

Hansen Bailey

MUSWELLBROOK COAL COMPANY

MUSWELLBROOK COAL COMPANY

Land Ownership

Cad File: 06456G.dwg	Date: 10.08.10	Drawn: CP	Figure 2

2.5 ENVIRONMENTAL MANAGEMENT SYSTEM

MCC's Environmental Management System (EMS) provides a framework under which environmental issues are managed at MCM. The major components of the EMS include: MCC's Environmental Policy, a range of approved management plans and documents and various environmental monitoring programs. The main components of the EMS are further discussed below.

2.5.1 Environmental Management

The EMS has been developed and implemented to ensure that environmental issues and impacts are effectively managed and that compliance with all regulatory requirements is maintained. The EMS also provides a mechanism for the identification of issues of concern and the continued improvement in the environmental performance of MCM.

The EMS incorporates a number of environmental management plans that are designed to assist in meeting community and regulatory expectations. A strategic framework for the management of environmental issues at MCM and a context for the management plans under the EMS are provided by the Environmental Management Strategy.

MCM's regulatory management plans and documents are listed in Table 3. These documents and plans provide a framework for the planning of mining operations while considering potential environmental issues and their management onsite.

Table 3
DA 205/2002 Required Management Plan & Programs

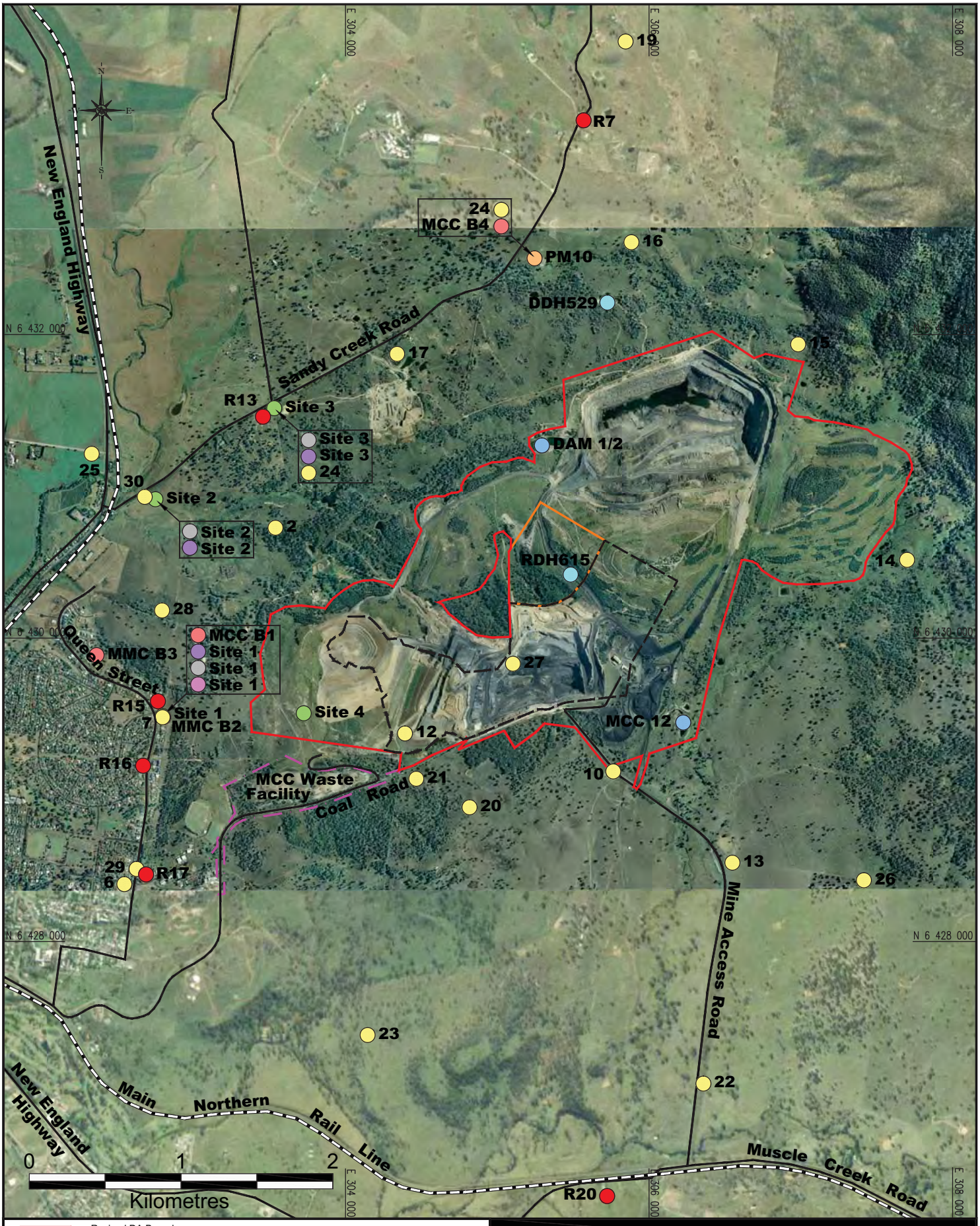
Reference	Document
Condition 2.1	Mining Operations Plan
Condition 2.2	Spontaneous Combustion Management Plan
Condition 3.2	Annual Environmental Management Plan
Condition 3.2	Environmental Management Strategy
Condition 3.3	Archaeology and Cultural Heritage Management
Condition 3.4	Fauna and Flora Management Plan
Condition 3.5	Erosion and Sediment Control Plan
Condition 3.6	Soil Stripping Management Plan
Condition 3.8	Visual Amenity and Landscaping Management Plan
Condition 3.9	Final Void Management Plan
Condition 3.10	Bushfire Management Plan
Condition 3.11	Land Management Plan
Condition 4.0	Water Management and Monitoring Plan
Condition 4.1	Site Water Management Plan
Condition 4.1 & 4.3	Surface & Groundwater Management Plan and Monitoring Program
Condition 5.1	Waste Management Plan
Condition 6.1.3	Dust Management Plan
Condition 6.3.2	Blast and Vibration Management Plan
Condition 6.4.5	Noise Management Plan
Condition 6.5	Lighting Management Plan

2.5.2 Environmental Monitoring

MCC currently undertakes a comprehensive environmental monitoring program in accordance with the requirements of DA 205/2002. The environmental monitoring program ensures that MCC's operations meet regulatory requirements and enables the proactive management of environmental issues. Environmental monitoring locations are identified in Figure 3.

Environmental monitoring is carried out in accordance with the requirements specified in the approved management plans provided in the management documents listed in Table 3. The MCC environmental monitoring program currently incorporates the following:

- Four real-time Meteorological Monitoring Stations;
- 17 depositional dust gauges;
- Three real-time Particulate Matter less than 10 microns (PM_{10}) Tapered Element Oscillating Microbalances (TEOM);
- Three Total Suspended Particulate (TSP) and one PM_{10} High Volume Air Samplers (HVAS);
- Five attended noise monitoring locations and one real-time noise directional monitoring system;
- Four blast monitoring locations;
- Eight surface water monitoring locations;
- Two groundwater monitoring locations; and
- Quarterly spontaneous combustion monitoring.



Revised DA Boundary
No.1 Extension Coal Extraction Boundary
Existing Roads
Modification Area
Dust Deposition Gauges
PM10 TEOM
PM10 High Volume Air Sampler
TSP High Volume Air Sampler
Blast Monitors
Surface Water Monitoring Location
Ground Water Monitoring Location
Noise Monitor (Barn Owl)
Meteorological Station
Periodic Noise Measurement Locations

Hansen Bailey

MUSWELLBROOK COAL COMPANY

Source: MCC (2008)
Co-ordinate System: MGA 94 Zone 56

MUSWELLBROOK COAL COMPANY

Environmental Monitoring Program

Cad File: 06473D.dwg	Date: 27.07.10	Drawn: CP	Figure 3

3.0 MODIFICATION DESCRIPTION

This section of the SEE provides a description of the various components of the Modification for which MCC is applying.

3.1 BACKGROUND

The approved No. 1 Extension Coal Extraction Boundary (see Figure 1) area was originally defined by the extent of the known coal resource that had not been extensively mined by previous underground operations and was assessed to contain a viable open cut mineable resource. Other areas assessed were considered economically unviable for open cut operations at the time.

Having gained extensive operational experience in extracting coal from areas of old underground mining operations during the last five years additional resources that would otherwise be sterilised, have now been identified for open cut extraction.

3.2 THE MODIFICATION

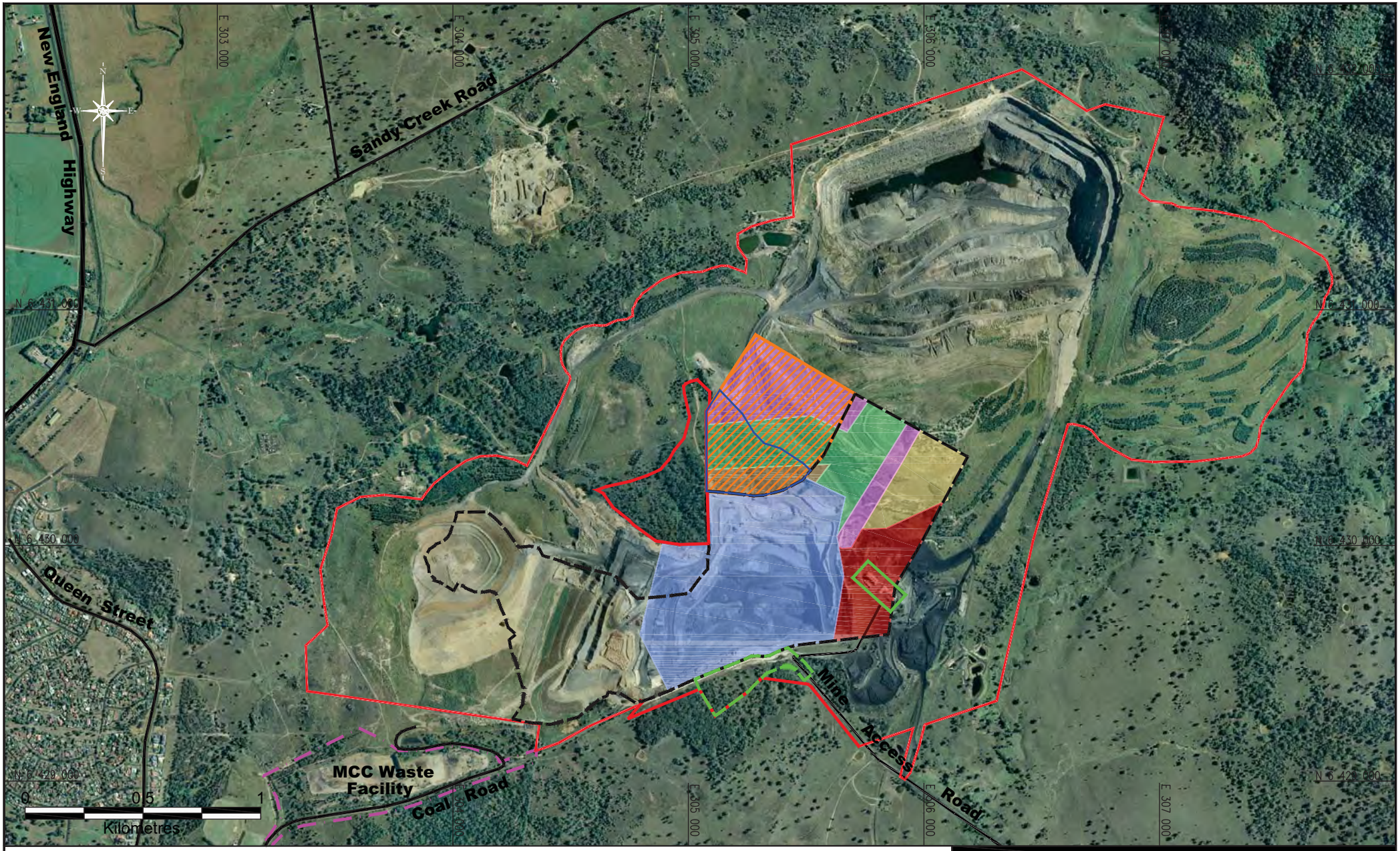
The Modification is required to facilitate an extension of mining operations at MCM within its current mining authorities. It will result in the extraction of an additional 5.2 Mt of ROM coal from within the Modification Area.

Approximately 8.2 ha of the Modification Area is situated outside of the current approved DA boundary but within the wider area of mining activities. The revised DA Boundary to incorporate the Modification is illustrated on Figure 4.

Mining operations will continue to be undertaken at the currently approved production rate of up to 2 Mtpa in accordance with DA 205/2002. Mining operations will continue to be undertaken utilising the existing equipment fleet and currently approved 95 full time equivalent employees as well as the existing mining infrastructure and using the currently approved mining methods. The indicative mining sequence (which includes the Modification) is presented in Figure 4.

Despite the additional coal resource that is proposed to be extracted, mining of this area will be undertaken within the mine life currently approved under DA 205/2002 (i.e. 2015). The transport of product coal will continue to be undertaken via the New England Highway and operations will continue to utilise the approved infrastructure for the life of the mine.

Mining operations will continue to progress to the east away from sensitive receivers in North Muswellbrook (see Figure 4). Rehabilitation will continue to be undertaken as soon as areas become practically available, working towards a landform at the completion of mining that is generally consistent with the conceptual plan illustrated in Figure 5 and as approved in DA 205/2002 (MOD 2). This conceptual final landform provides a stable, free draining landform within the revised DA Boundary. The northern and western faces of the overburden emplacement areas will be rehabilitated as a priority to limit the period that overburden dump faces are exposed to receivers in North Muswellbrook.



- Revised DA Boundary
- No.1 Extension Coal Extraction Boundary
- Existing Roads
- Modification Area
- Present Mining and Overburden Emplacement
- 2011 Mining
- 2012 Mining
- 2013 Mining
- 2014 Mining
- 2015 Mining
- Approved Infrastructure
- Existing Infrastructure
- Survey Area

Hansen Bailey

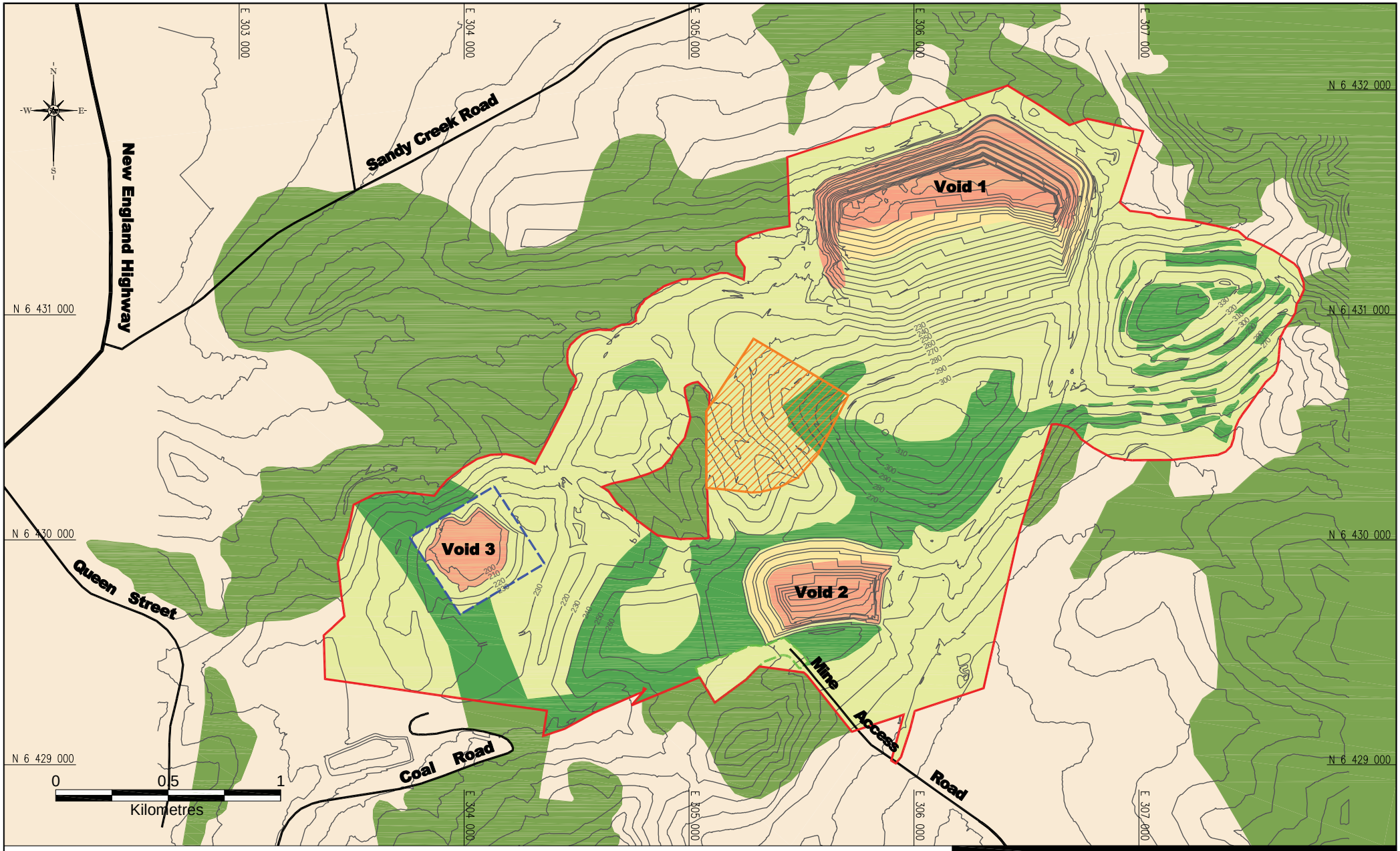
MUSWELLBROOK COAL COMPANY

Source: MCC (2008)
Co-ordinate System: MGA 94 Zone 56

MUSWELLBROOK COAL COMPANY

Layout Plan

Cad File: 05605K.dwg	Date: 27.07.10	Drawn: CP	Figure 4



- Revised DA Boundary
- Mine Infrastructure Survey Area
- Possible Future MSC Waste Management Facility
- Existing Roads
- Modification Area
- Void
- Shaped Overburden
- Rehabilitation
- Rehabilitation (Woodland)
- Remnant Vegetation

Source: MCC (2008)
Co-ordinate System: MGA 94 Zone 56

Hansen Bailey

MUSWELLBROOK COAL COMPANY

MUSWELLBROOK COAL COMPANY

Conceptual 2015 Landform

Cad File: 06485B.dwg	Date: 27.07.10	Drawn: CP	Figure 5

3.3 ALTERNATIVES CONSIDERED

A number of alternatives were considered during the planning and development stages of the Modification. The principles of Ecologically Sustainable Development (ESD) have been applied during the planning phase of the Modification and throughout the preparation of this SEE. The foremost options that were considered throughout the planning and development stages included:

- Option 1 – Extend mining operations within an area of approximately 28.4 hectares to extract an additional coal resource of 5.2 Mt coal that would otherwise be sterilised (the Modification); or
- Option 2 – The 'Do Nothing' approach.

When applying the principle of ESD, Option 1 is considered to be the appropriate Option as it will facilitate the maximum recovery of coal at MCM in a logical sequence with minimal social and environmental impacts (see Figure 4). Option 1 will also provide ongoing employment security and significant additional state government revenue and royalties.

Implementing Option 2 would sterilise a known coal resource of approximately 5.2 Mt resulting in the loss of the social and economic benefits available to the community without material environmental costs and thus not satisfying the principal of ESD.

4.0 REGULATORY FRAMEWORK

This section of the SEE describes the relevant regulatory framework and provides detail in relation to the legislative considerations relevant to the Modification.

4.1 ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

This application seeks to modify DA 205/2002 under the power to do so provided by section 96 (2) of the EP&A Act.

DA 205/2002 was granted by MSC on 1 September 2003 for "*the extension of the No. 1 Open Cut*". The Development Consent was granted in accordance with the provisions of Section 80 under Part 4 of the EP&A Act

The Development Consent has been modified previously including:

- On 19 December 2005 (under section 96(1A) EP&A Act) for the relocation of powerlines and some minor additions to the workshop buildings; and
- On 13 July 2009 (under section 96(2) EP&A Act) for relocation of existing office buildings, bathhouse and workshop to facilitate mining of an approved coal resource.

The Development Consent is current and operative.

4.1.1 Section 96(2) Modification

Section 96 of the EP&A Act allows for an existing Development Consent to be modified by the original consent authority in certain circumstances. As DA 205/2002 was originally granted by MSC, the Department of Planning (DoP) has confirmed that the Modification application should be submitted to MSC for approval (see Appendix A). The EP&A Act, Section 96(2) (b) states that:

> *"A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:*
>
> *(a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and*
>
> *(b) it has consulted with the relevant Minister, public authority or approval body (within the meaning of Division 5) in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and*
>
> *(c) it has notified the application in accordance with:*
>
> > *(i) the regulations, if the regulations so require, or*
> >
> > *(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and*
>
> *(d) it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be."*

Substantially the Same Development

The first prerequisite to a modification under Section 96(2) of the EP&A Act is that the consent authority is satisfied that the proposed development (including the proposed Modification and any previous modifications) is "*substantially the same development*" as that which was originally approved.

The "development to which the consent as modified relates" will incorporate the modifications already approved as well as this Modification proposed. When compared to the "development for which consent was originally granted" it is open to the consent authority to conclude that it is satisfied that the prerequisite to the power to grant the modification application (namely that the modified development will be "substantially the same development") is satisfied having regard for the following matters.

This Modification involves the following material aspects:

- Extraction, processing, handling and transportation of an additional 5.2 Mt of ROM coal by open cut mining methods; and
- Mining within an additional 28.4 hectares of land (which has been previously mined by underground methods).

The Modification Area is within existing mining authorities held by MCC.

The following elements of the MCC will remain unchanged from that originally approved:

- Methods of mining;
- Annual production and transportation methods;
- Hours of operation;
- Employee numbers;
- Coal haulage method, routes and movements;
- Access to site;
- Dust emissions;
- Noise generated; and
- Duration of the Development Consent.

Based upon these circumstances, it is open to the consent authority (MSC) to be satisfied that the modified development will be "*substantially the same*" as the development for which consent was originally granted under DA 205/2002 in 2003. It is therefore available for MSC to modify the Development Consent as sought under the provisions of section 96(2) EP&A Act.

Consultation

The second prerequisite to the exercise of the consent authority's power to modify the Development Consent under section 96(2) of the EP&A Act is that there has been consultation with "*the relevant Minister, public authority or approval body within the meaning of Division 5* …"

Stakeholder consultation as described in Section 5.0 has been undertaken by MCC.

Notification

The third prerequisite to the exercise of the power to modify the Development Consent under section 96 of the EP&A Act is that the application is notified in accordance with the *Environmental Planning and Assessment Regulation NSW 2000* (EP&A Reg). The notification obligations are set out in clauses 118 of the EP&A Reg.

They include (relevantly) obligations on MCC to cause notice of the application to be:

- Published in a local newspaper (Under clause 3 of the EP&A Reg, "local newspaper" means a newspaper circulating throughout the relevant area at intervals of not more than 2 weeks); and
- Given to each person who made a submission in relation to the original development application.

The notice is required to contain a brief description of the development consent, the land to which it relates and the details of the Modification sought and a statement that written submissions may be made within a period of no less than 14 days commencing the day after the notice of the application is published in the newspaper and a statement about appeal rights.

MCC will assist MSC in the preparation of the required notifications.

4.1.2 Application Formal Requirements

The formal requirements for the Modification Application are set out in Clause 115 of the EP&A Reg. They are satisfied by this SEE in the following sections as outlined in Table 4.

Table 4
Modification Application Requirements

Application Requirements	SEE Section
Name and Address of Application (cl. 115(1)(a))	Muswellbrook Coal Company Limited, Common Road Muswellbrook
Description of Development to be carried out (as previously modified) (cl. 115(1)(b))	Section 2.0 & 3.0
Address and formal particulars of title of the land on which the development is to be carried out (cl. 115(1)(c))	Appended to Application to Modify Development Consent
Description of the proposed modification to the development consent (cl. 115(1)(d))	Section 3.0
Statement of the effects which the modification will have (cl. 115(1)e)(ii))	Section 6.0
Description of the expected impacts of the modification (cl. 115(1)(f))	Section 6.0
Undertaking to the effect that the development (as to be modified) will remain substantially the same as the development that was originally approved (cl. 115(1)g))	Section 3.0 & 4.0

4.1.3 Landowner Consent

Landowner consent is not required for this application as Division 2 of Part 1 of Schedule 1 of the *Mining Act 1992* (Mining Act) provides that "*any requirement of the Environmental Planning and Assessment Act 1979 that an application for … the modification of a development consent be accompanied … the consent of the owner of the land concerned … does not apply*" (Clause 14).

4.1.4 Section 79C Considerations

Section 96(3) EP&A Act provides that "*In determining an application for modification of a consent … the consent authority must take into consideration such of the matters referred to in section 79C (1) as are of relevance to the development the subject of the application*."

The location within this SEE in which each of the relevant considerations under Section 79C of the EP&A Act are considered is set out in Table 5.

Table 5
Section 79C of the EP&A Act Considerations

Section 79C Consideration	SEE Section
Environmental Planning Instruments applicable (Section 79C(1)(a)(i))	Section 4.0
Likely impacts of the development (Section 79C(1)(b))	Section 6.0
Suitability of the Site for the development (Section 79C(1)(c))	Section 7.0
Any submissions made in accordance with the EP&A Act (Section 79C(1)(d))	To be received (if any)
The public interest (Section 79C(1)(e))	Section 7.0

4.1.5 Objects of the EP&A Act

The objects of the EP&A Act are set out in Section 5 of the EP&A Act.

The assessment of this application is required to take into consideration whether the objects of the EP&A Act are achieved in granting the application.

The satisfaction of the objects of the Act is considered in Section 7.0 which concludes that the objects of the EP&A Act will be satisfied.

4.2 RELEVANT PLANNING INSTRUMENTS AND PERMISSIBILITY

4.2.1 Muswellbrook Local Environmental Plan 2009

The revised DA Boundary is primarily located on lands classified under the Muswellbrook LEP as Zone E3 Environmental Management. The DA Boundary also contains lands listed under Zone RU1 Primary Production.

The objects of the Zone E3 Environmental Management include the following:

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values;
- To provide for a limited range of development that does not have an adverse effect on those values;
- To maintain, or improve in the long term, the ecological values of existing remnant vegetation of significance including wooded hilltops, river valley systems, major scenic corridors and other local features of scenic attraction;
- To limit development that is visually intrusive and ensure compatibility with the existing landscape character;
- To allow agricultural activities that will not have an adverse impact on the environmental and scenic quality of the existing landscape;
- To promote ecologically sustainable development; and
- To ensure that development in this zone on land that adjoins land in the land zoned E1 National Parks and Nature Reserves is compatible with the objectives for that zone.

Mining is a permissible use in this zone with development consent as agriculture is permissible in this zone and under clause 7 of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (SEPP Mining), surface mining is permissible on these lands.

The objects of Zone RU1 include the following:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base;
- To encourage diversity in primary industry enterprises and systems appropriate for the area;
- To minimise the fragmentation and alienation of resource lands;
- To minimise conflict between land uses within the zone and land uses within adjoining zones;
- To protect the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services;
- To maintain the rural landscape character of the land in the long term; and
- To ensure that development for the purpose of extractive industries, underground mines (other than surface works associated with underground mines) or open cut mines (other than open cut mines from the surface of the floodplain), will not:

  (a) destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or

  (b) detrimentally affect in any way the quantity, flow and quality of water in either subterranean or surface water systems, or

  (c) visually intrude into its surroundings, except by way of suitable screening.

  - *To protect or conserve (or both):*

    (a) soil stability by controlling development in accordance with land capability, and

    (b) trees and other vegetation, and

    (c) water resources, water quality and wetland areas, and their catchments and buffer areas, and

    (d) valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits.

Mining is permissible in lands of this zoning with consent in the RU1 zoning under the Muswellbrook LEP.

4.2.2 SEPP (Mining, Petroleum Production and Extractive Industries) 2007

The aims of SEPP Mining include:

"(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources."

Clause 5 of SEPP Mining provides: "...if this Policy is inconsistent with any other environmental planning instrument, whether made before or after this Policy, this Policy prevails to the extent of any inconsistency".

Clause 7 of SEPP Mining states:

"7 Development permissible with consent

(1) Mining Development for any of the following purposes may be carried out only with development consent:

(a) underground mining carried out on any land,

(b) mining carried out at surface level:

(i) on land where development for the purposes of agriculture or industry may be carried out (with or without development consent), or

(ii) on land that is, immediately before the commencement of this clause, the subject of a mining lease under the Mining Act 1992 or a mining license under the Offshore Minerals Act 1999"

The lands upon which the Modification is sought are zoned as Zone RU1 and Zone E3 under the Muswellbrook LEP. Agriculture is permissible with consent in these zones. All of the land required for the Modification is the subject of an existing mining lease, thus in accordance with clause 7 of SEPP (Mining), the carrying out of development for the purpose of mining is a use permissible with development consent.

Clause 12 of SEPP Mining requires that the consent authority consider *"existing and approved uses in the vicinity of the development and whether or not the development is likely to have a significant impact that, in the opinion of the consent authority, ... are likely to be the preferred uses of land in the vicinity of the development"* and any ways in which there may be incompatibility between the proposed use and the preferred use. Mining has been carried out in the vicinity of the Modification for over 100 years. Mining is considered to be the preferred land use in the area. It is not considered that there will be any incompatibility between the use proposed by the Modification and the preferred land use.

Clause 14 of SEPP Mining requires that the consent authority must consider whether or not the Development Consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner. The need for such conditions is addressed in this SEE by the assessment of the impacts of the Modification as described in Section 6.0.

Clause 14 of SEPP Mining also requires that an assessment of greenhouse gas emissions of the development be undertaken. This issue is addressed in Section 6.2.

Clause 15 of SEPP Mining requires that the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery. The efficiency of resource recovery is addressed in Section 3.3 and Section 7.0.

The Modification will meet with the objectives of SEPP Mining.

4.3 OTHER REGULATORY REQUIREMENTS

4.3.1 Protection of the Environment Operations Act 1997

MCC holds EPL 656 granted by the DECCW. Should MSC grant the Modification, a variation to EPL 656 will be sought to incorporate the Modification as required under the *Protection of the Environment Operations Act 1997* (POEO Act).

4.3.2 Mining Act 1992

The Modification is located entirely within MCC's existing mining authorities (see Table 1). MCC currently has in place a Mining Operations Plan (MOP) for its operations within the No. 1 Extension and the No. 2 Open Cut areas. Should MSC grant the Modification, a variation to the MOP will be sought to incorporate the Modification as required under the relevant mining lease and the Mining Act. There will be no need for MCC to secure any further mining authority under the Mining Act because it already holds a mining lease over the surface and to an unlimited depth.

4.3.3 Water Management Act 2000 and Water Act 1912

MCC will seek from the NSW Office of Water any licences required under Part 5 of the *Water Act 1912* and/or the *Water Management Act 2000* for the works described in the modification if this application is approved.

4.4 COMMONWEALTH LEGISLATION

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires approval of "controlled activities".

Under section 68 of the EPBC Act, a person proposing to take an action which the person thinks may be or is a *controlled action*, is required to refer the proposal to the Minister for the Environment, Water, Heritage and the Arts, for the Minister's decision as to whether the proposal is a *controlled action*.

A "controlled action" is defined under the EPBC Act to be an action the taking of which without approval under Part 9 of the EPBC Act would be prohibited.

If the proposal will have or is likely to have a significant impact on a Matter of National Environmental Significance (these are set out in Part 3 of the EPBC Act) then it is prohibited to take the action without approval under Part 9 of the EPBC Act (subject to a few exceptions).

The Modification will not impact on any Matters of National Environmental Significance. There is therefore no need to refer the proposal under section 68 of the EPBC Act and no need for an approval under Part 9 of the EPBC Act.

5.0 STAKEHOLDER ENGAGEMENT

A relevant consultation program was undertaken with the aim of identifying stakeholder issues in relation to the Modification and ensuring that these issues were addressed as part of the SEE process.

5.1 COMMUNITY ENGAGEMENT

The Modification was presented to the MCM Community Consultative Committee (CCC) at an extraordinary meeting held on 1 June 2010. No concerns were raised and the meeting representatives provided support for the Modification.

A notification of the Modification was placed in the Muswellbrook Chronicle and Hunter Valley News on 30 June 2010. Two enquiries from private landowners requesting additional information on the Modification was received in July 2010. Hansen Bailey responded to these landowners and no further issues were identified. No other enquiries on the Modification were received from the local community.

5.2 REGULATORY ENGAGEMENT

A letter was provided to the DoP on 26 May 2010 to provide details of the Modification and to request confirmation of the appropriate approvals path. DoP confirmed its support for an approvals path under Section 96(2) of the EP&A Act with MSC as the determining authority in letter correspondence dated 9 June 2010 (see Appendix A).

Various meetings have been held with MSC during the planning and development stages of the Modification.

An initial meeting was held with MSC on 11 January 2010 to notify them of MCC's intention to submit an application for the Modification. A second meeting was held with MSC to describe the Modification and confirm the environmental assessments to be included in this SEE.

In addition to consultation undertaken with MSC and DoP, MCC also consulted with I&I NSW through briefings and various correspondence. No issues were raised during this consultation process in regard to the Modification; however I&I NSW expressed its support for continued and successful rehabilitation.

5.3 ABORIGINAL COMMUNITY ENGAGEMENT

The requirements of the DECCW *Interim Community Consultation Requirements for Applicants 2004, DECCW Questions and Answers – Transitional arrangements* and the *Guidelines for Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW Guidelines) have been applied to the Modification to ensure an appropriate level of stakeholder consultation in relation to Aboriginal archaeology and Cultural Heritage. Further detail is provided in Section 6.3.

6.0 IMPACTS, MANAGEMENT & MITIGATION

This section of the document provides detail on the potential environmental impacts identified in relation to the Modification and measures for their management and mitigation.

6.1 NOISE AND BLASTING

A Noise and Blasting Impact Assessment has been completed by Bridges Acoustics for the mining operation as proposed to be modified to determine the potential noise and vibration impacts on neighbouring receivers (see Appendix B). A brief summary of this assessment is provided in the following sections.

6.1.1 Methodology

Introduction

The Noise and Blasting Impact Assessment has been carried out in accordance with the DECCW's relevant noise policy documents, including:

- *NSW Industrial Noise Policy* (INP) (EPA, 2000);
- *Environmental Noise Control Manual* (EPA, 1985);
- *Environmental Criteria for Road Traffic Noise* (ECRTN) (EPA, 1999);
- *Guideline to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990); and
- *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990).

The Noise and Blasting Impact Assessment involved the review of noise and vibration assessments previously undertaken at MCM, including: the 'Noise and Vibration Impact Assessment' completed for the MCC EIS (HLA EnviroSciences 2002), the 'Noise Impact Assessment 'completed for the 2008 Modification SEE (Hansen Bailey) and various noise surveys conducted by Global Acoustics and Spectrum Acoustics for the period between December 2008 and June 2009.

MCC carries out noise monitoring at five attended monitoring locations and operates one real-time noise directional monitoring system as illustrated on Figure 3. While the acoustics impact assessment considers all receivers that may be affected by this Modification, focus has been on the receivers to the north of the Modification Area, as mining operations would be closer to these receivers than currently approved.

This assessment has been completed in two sections:

- Detailed noise modelling using RTA Technology's Environmental Noise Model (ENM) for receivers generally north of the Modification Area, as the mining operations would be closer to these receivers than currently approved; and
- A comparison between the mining operation as proposed to be modified and the currently approved No. 1 Open Cut mining area for all other receivers that are located further from the Modification Area than the currently approved No. 1 Open Cut mining area.

Noise Criteria

Table 6 shows the intrusive and amenity criteria applicable to the Modification for day, evening and night, as listed in DA 205/2002 (MOD 1 and MOD 2).

Table 6
DA 205/2002 Noise Criteria

Ref	Day (LAeq (15 min))	Evening (LAeq (15 min))	Night (LAeq (15 min))
R7 (Watts)	36	36	36
R13 (McMaster)	40	40	40
R15 (Collins)	35	35	35
R16 (Tuckey)	35	35	35
R17 (Colvin)	35	35	35
R20 (Gordon)	38	38	38

Weather Conditions

Following a review of the available meteorological data from the MCC weather station (see Figure 3), the Noise and Blasting Impact Assessment adopted the following prevailing weather conditions which are consistent with neighbouring mining operations and those used in the MCC EIS and 2008 Modification SEE:

- 3°/100 m temperature inversion during the night; and
- 3 m/s winds from the south-east and north-west.

6.1.2 Impact Assessment

Table 7 presents the predicted noise levels due to the mining operation as proposed to be modified at the northern receivers. Predicted noise levels should be compared to the noise criteria for Receiver R7, which is the representative receiver in this group that was assessed in the MCC EIS and listed in DA 205/2002 (Table 3). The development consent criterion for Receiver R7 is 36 $LAeq_{,15min}$ in all time periods.

The predicted noise levels presented in Table 7 represent the worst-case mining scenario with all equipment operating under noise enhancing weather conditions. While this situation may occur occasionally, noise levels will generally be lower than the predicted levels for much of the time.

Table 7
Predicted Received Noise Levels

Ref	Predicted Noise Level LAeq,15min		
	Day Neutral (No Wind)	Day Prevailing (3m/s SE Wind)	Night Prevailing (3°C/100m Inversion)
R7 (Watts)	20	31	32
R21 (French)	20	32	32
R22 (Aird)	22	26	27
R23 (Neilson)	21	33	33
R24 (Edwards)	22	32	33
R25 (Hamson)	23	33	33

The results in Table 7 indicate that all receivers are anticipated to receive noise levels consistent with the intrusive noise criteria listed in DA 205/2002 (Table 3). For all other receivers, as the Modification Area is located further away than the currently approved mining area, no additional noise impacts due to the mining operation as proposed to be modified are anticipated.

Noise levels from the Modification Area are therefore expected to be acceptable at all residences.

Sleep Disturbance

Disturbance to sleep at night can take place when a short, sharp noise that is clearly audible over the background noise level occurs. Based on the predicted changes in noise level due to the mining operation as proposed to be modified as listed in Table 7, receivers are predicted to experience noise levels below the sleep disturbance criterion.

Road Traffic Noise

No changes to the production profile or transport arrangements are proposed as part of the Modification. Approved coal truck movements from the mine to the RCT or other destinations would not change. Similarly, no increase in other mine-related traffic flows or road traffic noise is expected as there will be no increase in employee numbers.

Blasting Impacts

Blasting impacts (including ground vibration and overpressure) depend on the Maximum Instantaneous Change (MIC) per blast, distance from the blast site to each receiver and any shielding due to topography or noise barriers between the blast site and receivers.

The Noise and Blasting Impact Assessment presented in Appendix B considered the minimum distance to be maintained between each blast monitoring location and the Modification Area, accounting for intervening topography.

The assessment found that at all four monitoring sites (B1 – Queen Street, B2 – School, B3 – Queen Street North and B4 – Sandy Creek Road (see Figure 3)), the Modification Area will be located at a similar distance or further than 2008/09 blasting areas (which included blasts within the No. 2 Open Cut Extension Area near Sandy Creek Road). As such, proposed blast effects due to the Modification would be similar or slightly lower than recent effects and would remain within all relevant criteria.

6.1.3 Mitigation and Management

Noise emissions from the Modification will remain substantially the same to current noise levels and generally acceptable compared to current Development Consent noise criteria. The mining operation as proposed to be modified would have little effect on current blast impacts and is not expected to increase sleep disturbance, low frequency or road traffic noise levels.

Noise and Blasting impacts from the MCM will continue to be managed in accordance with DA 205/2002, the approved Noise Management Plan and the Blast and Vibration Management Plan.

6.2 AIR QUALITY AND GREENHOUSE GAS

PAE Holmes has conducted an Air Quality and Greenhouse Gas Impact Assessment for the mining operation as proposed to be modified which is presented in full in Appendix C and includes:

- A review of the prevailing meteorological conditions in the area;
- A review of recent ambient air quality data;
- An estimate of the air quality emissions from the Modification;
- A qualitative assessment of potential air quality impacts from the mining operation as proposed to be modified including a cumulative assessment; and
- A greenhouse gas assessment.

6.2.1 Methodology

The modelling has been prepared following the procedures outlined in the DECCW *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005).

This assessment utilises the most contemporary guidelines for the assessment of air pollution sources using dispersion models (DEC, 2005). The model used for the assessment was a modified version of the US EPA ISCST3 model (ISCMOD). For the purposes of impact assessment for the Modification, Year 2 (2012) was selected as the representative 'worst-case' scenario for the Project as this year would include the highest quantity of overburden and ROM coal moved as part of the mining operation as proposed to be modified.

It should be noted that the predicted concentrations of annual PM_{10}, TSP and dust deposition levels from Year 9 of the MCC EIS (which corresponds to Year 2 of the mining operation as proposed to be modified) were very low and well below the assessment criteria.

Meteorological Data

Meteorological data collected from the MCC meteorological station was incorporated into the air dispersion model for the Modification. 2009 meteorological data from the MCC weather station was reviewed to provide a comparison with the 2007/2008 meteorological dataset used in the previous 2008 Modification SEE (HAS, 2008).

When compared with the 2007/2008 data, the annual wind patterns are very similar with dominant winds from the east-southeast and lighter winds from the north-western quadrant. The autumn windrose appears to have a slightly less frequent percentage of winds from the north-west and a higher percentage of winds from the east.

There is also a difference in the winter winds with the 2009 windrose showing less frequent and lighter winds from the east-southeast than in the 2007/2008 data. The annual average wind speed is 3.5 m/s and the annual percentage of calms is 15% which is slightly higher than that of the 2007/2008 data.

Existing Air Quality

As discussed in Section 2.5.2, MCC conducts air quality at three TEOMs measuring 24-hour average PM_{10} concentrations, three HVAS measuring TSP matter and an air quality monitoring network comprising 17 dust deposition gauges, as shown on Figure 3.

A detailed review of monitoring data collected between 2005 and 2009 was completed for the Modification and is included in Appendix C. The review concluded that there were no exceedances of the annual average DECCW criteria for either PM_{10} or TSP. The average PM_{10} over all sites is 17.6 $\mu g/m^3$ and the average TSP over all sites is 41.4 $\mu g/m^3$, both of which are below their respective assessment criterion.

In general, the air quality surrounding the Modification Area (in terms of deposited dust) is reasonably good. The average dust deposition level over all sites and years is 1.9 g/m^2/month.

Based on the monitoring data provided above, the following background levels can be assumed for assessment purposes:

- Annual average PM_{10} – 17.6 µg/m^3;
- Annual average TSP – 41.4 µg/m^3; and
- Annual average dust deposition – 1.9 g/m^2/month.

Assessment Criteria

Table 8 and Table 9 summarises the DECCW air quality assessment criteria relevant to the mining operation as proposed to be modified. Generally these air quality criteria relate to the total dust burden in the air and not just the dust generated by MCM. Consideration of background levels needs to be made when using these criteria to assess impacts. In addition to health impacts, airborne dust also has the potential to cause nuisance impacts by depositing on surfaces.

Table 8
Total Suspended Particulates and PM_{10} Assessment Criteria

Pollutant	Criteria (µg/m^3)	Averaging Period	Agency
TSP	90	Annual mean	National Health & Medical Research Council
PM_{10}	50	24-hour maximum*	DECCW
	30	Annual mean	DECCW long term reporting goal

Source: DEC, 2005

** For coal mining operations in rural areas, this criteria is taken to be non cumulative for assessment purposes, provided the mine operates with best practice dust control measures*

Table 9
Dust Deposition Assessment Criteria

Pollutant	Averaging period	Maximum Increase in Deposited Dust Levels (g/m^2/month)	Maximum Total Deposited Dust Levels (g/m^2/month)
Deposited Dust	Annual mean	2	4

Source: DEC, 2005

Greenhouse Gas

The procedure specified in *National Greenhouse Accounts* (NGA) *Factors* (2010) published by the Department of Climate Change and Energy Efficiency (DCCE) has been adopted for this assessment which is consistent with internationally applied methods. The assessment takes into account the remaining five years of the mine life with inclusion of the Modification. The procedure nominates the following greenhouse gases:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O); and
- Synthetic gases (HFCs, CF_4, $C2F_6$).

Emission factors are standardised and expressed as a carbon dioxide equivalent (CO_2-e) which is calculated by multiplying the individual gas emission factor by its respective Global Warming Potential (GWP).

6.2.2 Impact Assessment

Air Quality

The assessment found that a small increase in dust emissions as a result of Year 2 of the mining operation as proposed to be modified is predicted; however this increase is not anticipated to cause a significant additional impact at nearby receivers.

Accordingly, the DECCW 24-hour PM_{10}, Annual Average PM_{10}, TSP and Dust Deposition assessment criteria listed in Table 8 and Table 9 will continue to be met with the Modification.

In regard to cumulative impacts of the Modification and surrounding industry, the Modification is not anticipated to result in any exceedance of the DECCW assessment criteria when considered in a cumulative context.

Greenhouse Gas

The greenhouse gas assessment estimated that the maximum annual increase in emissions would be in Year 2 of the Modification which would represent an approximate annual contribution of 0.05% to baseline 2007 NSW emissions. Therefore, the greenhouse gas emissions associated with MCM (and the Modification) are not considered to be substantial. Applying the principles of ESD, it is considered that there will be no increase or measureable impact on climate change as a result of the Modification.

6.2.3 Mitigation and Management

Air quality at MCM will continue to be managed in accordance with the approved Dust Management Plan. Operations at MCM will be managed to ensure minimal impacts to the neighbouring receivers by continuing to implement the following air quality mitigation and management measures:

- Use of water carts to maintain trafficked areas;
- Maintain areas to be stripped of topsoil and vegetation in a damp condition to minimise dust emissions;
- Maintain equipment to minimise the emissions of black diesel smoke;
- Cover all loads when transporting on public roads; and
- Limit the extent of disturbance activities by defining areas to be disturbed.

6.3 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE

An Aboriginal Archaeology Cultural Heritage Assessment was undertaken by AECOM Australia for the Modification to assess the potential impacts on Aboriginal heritage values (Appendix D). As the majority of the Modification Area is highly disturbed, the Aboriginal Archaeology and Cultural Heritage Assessment focused on 11.2 ha not previously disturbed (the Survey Area) (see Figure 4).

The overall aim of this assessment was to identify Aboriginal and historic heritage values of the Survey Area, to identify potential development impacts on those values and to provide suitable management recommendations.

6.3.1 Methodology

The assessment methodology included background research, field survey and consultation with registered Aboriginal stakeholders in accordance with *National Parks & Wildlife Act 1974: Part 6 Approvals – Interim Community Consultation Requirements for Applicants* (ICCRs) and the *Aboriginal cultural heritage consultation requirements for Proponents 2010* (Requirements for Proponents 2010)(DECCW 2010).

Desktop Assessment

The desktop survey methodology comprises:

- A search of the DECCW Aboriginal Heritage Information Management System (AHIMS) database prior to the field survey;
- A desktop review of previous archaeological and heritage reports relevant to the regional and local area;
- Consultation with registered Aboriginal stakeholder groups through a request for information on the cultural heritage values of the Survey Area;
- A review of landscape character and landuse history which influences patterning of sites; and
- The development of a site prediction model based on the findings of the desktop study.

Field Survey

An archaeological field survey of the Survey Area was undertaken on 19 May 2010 with five local Aboriginal community members of the Wanaruah Local Aboriginal Lands Council, Yarrawalk, Cacatua Cultural Consultants, Lower Hunter Wonnarua Council and Yinarr Cultural Service.

The assessment included 100% survey coverage of the identified area with AECOM Archaeologists and registered stakeholder representatives spaced between 5 and 10 m apart. While all parts of the Survey Area were covered, particular attention was paid to areas of likely archaeological potential including creeklines, ridgetops, hill tops and flats.

Photography was used to document any environmental and archaeological features of the Survey Area.

Social/Cultural Values Assessment

During the assessment process, Hansen Bailey and AECOM consulted with Aboriginal stakeholders regarding the Aboriginal cultural heritage values of the Modification Area. Aboriginal Consultation was initially conducted in accordance with the ICCRs.

On the 12 April 2010, DECCW released the Requirements for Proponents 2010. These requirements replace the ICCRs and were effective from this date. As part of this release, Transitional Arrangements were also provided by DECCW for those heritage assessments that were currently underway. The Transitional Arrangements state:

> *"In the case where a notification has been placed in the newspaper and list of registered Aboriginal people has been complied in accordance with the Interim community consultation requirements for applicants 2005 but no meetings with Aboriginal people have been held, the notification is taken to comply with the requirements for notification under 4.13 and registration of interest under 4.1.6 of the Aboriginal cultural heritage consultation requirements for proponents 2010. The proponent may then proceed with consultation in accordance with the requirements for proponents 2010."*

As discussed further below, consultation for this assessment begun under the ICCRs and is deemed to have complied up to and including Section 4.1.3 and 4.1.6 of the Requirements for Proponents 2010. Ongoing consultation for the Modification was continued from section 4.1.7 of the Requirements for Proponents 2010, as per the DECCW Transitional Agreements outlined above.

The Aboriginal stakeholder consultation process for the Modification consisted of the following (detailed further in Appendix D):

- A newspaper advertisement was placed in the Muswellbrook Chronicle on 12 March 2010 seeking registrations of interest. Initial registrations were open for 14 days. In addition, the Registrar of Aboriginal Owners, Local Council, Native Title Services and DECCW were contacted in order to identify Aboriginal communities that may have direct interest in being involved in the assessment process;
- The following Aboriginal stakeholder groups registered an interest in the Modification:
    - Yinnar (Y);
    - Cacatua Culture Consultants (CCC);
    - Wanaruah Local Aboriginal Land Council (WLALC);
    - Yarrawalk Aboriginal Corporation (YAC); and
    - Lower Hunter Wonnarua Council Incorporated (LHWCI).
- Groups registered at this stage of the Modification were sent a letter containing project information and a draft copy of the assessment methodology for comment by mail on 9 April 2010. Comments were received from Y, CCC, WLALC, YAC and LHWCI, who supported the methodology;
- Fieldwork was conducted with the five registered stakeholder groups on 19 May 2010; and
- The draft report was sent by mail to registered Aboriginal stakeholders on 27 June 2010. Comments were received from all registered stakeholders who supported the findings of the assessment (see Appendix D).

6.3.2 Impact Assessment

No evidence of Aboriginal material was identified during the field survey. Therefore no impacts are anticipated due to the Modification.

During this assessment, preliminary requests for information on cultural heritage values were made as part of the assessment methodology provided to stakeholders. No information related to cultural heritage was received as a result of these preliminary requests.

During the field survey, requests were made to participating stakeholders for information on the cultural heritage values of the Modification Area. Stakeholders stated that there were no cultural heritage issues related to the proposed works within the Modification Area. Stakeholders also stated that there was limited likelihood for Aboriginal heritage material to be located within the Survey Area due to disturbance and the landform (i.e. steep, gullied slopes).

No cultural heritage values were identified in responses to the draft heritage assessment.

6.3.3 Mitigation and Management

Management of Aboriginal Archaeology and Cultural Heritage issues at MCM will continue to be undertaken in accordance with the approved Archaeology & Cultural Heritage Management Plan.

6.4 NON-ABORIGINAL HERITAGE

A Historic Heritage Assessment was undertaken by AECOM Australia to assess the potential impacts on Non-Aboriginal heritage values due to the Modification (Appendix D).

6.4.1 Methodology

This assessment was undertaken in accordance with the *NSW Heritage Office guidelines for heritage impact studies* (NSW Heritage Office, 2001). The methodology for the assessment consisted of several components to ensure that all relevant Non-Aboriginal heritage items that had a potential to be impacted by the Modification were assessed.

This included:

- Historical and archival research and searches of the relevant Commonwealth and State heritage lists to identify known heritage items of significance within 5 km of the Modification Area that had a potential to be impacted by the Modification;
- A review of previous Non-Aboriginal heritage assessments of the Modification Area and surrounding lands; and
- A field survey of the areas not previously the subject of earlier assessments to identify and record any Non-Aboriginal heritage items.

6.4.2 Impact Assessment

One heritage item listed on the Muswellbrook LEP and the NSW State Heritage Register was identified outside of the Modification Area – the Muswellbrook Brickworks. The Muswellbrook Brickworks is located approximately 1.5 km to the north-west of the Modification Area and are in a derelict and unsafe condition. MCC has recently gained approval from MSC to demolish the Muswellbrook Brickworks.

The assessment found that there are no Non-Aboriginal heritage items within the Modification Area and hence, no impacts are anticipated.

6.4.3 Mitigation and Management

As no impacts on Non-Aboriginal heritage items due to the Modification were identified, no mitigation measures are therefore warranted.

6.5 FLORA AND FAUNA

A Flora and Fauna Impact Assessment of the Modification Area was undertaken by Cumberland Ecology which is provided in Appendix E and summarised below.

6.5.1 Methodology

A preliminary inspection and flora survey of the Modification Area was conducted on 1 March 2010, with a continuation of the site survey undertaken on 11 and 12 May 2010. Methods employed for the collection of floristic data and vegetation community identification included quadrat sampling as well as random meanders, while also targeting threatened flora species.

Fauna survey was based on seeking to identify habitat features if present and recording of all species detected. Bat recording equipment and spotlighting techniques were employed for nocturnal surveys.

The assessments focused on threatened species and communities as listed under the *Threatened Species Conservation Act 1995* (TSC Act). It also addressed impacts to Matters of National Environmental Significance listed under the EPBC Act.

6.5.2 Flora and Fauna Descriptions

The Modification Area is largely cleared of its original forest cover, with the regeneration having occurred in approximately the last 50 years. Native vegetation covers less than half of the Modification Area, with a haul road and small strip of planted rehabilitation occurring in the north-eastern portion. The native vegetation present occurs on either side of a deeply incised and forked drainage channel that receives storm water runoff. At either end of the channel is a detention pond, one of which creates a simplified wetland with fringing and in-stream vegetation. A vegetation map of the Modification Area is shown on Figure 6.

The vegetation associated with the riparian zone is open in structure with a sparse shrubby or bare understorey. The remaining areas support open woodland that mostly comprises regenerating canopy trees above a grassy understorey and a low density shrub storey. Some older-growth trees occur in the eastern portion of the Modification Area.

Four vegetation communities were identified:

- Hunter Floodplain Red Gum Woodland;
- Central Hunter Grey Box-Ironbark Woodland;
- Regenerating Central Hunter Grey Box-Ironbark Woodland; and
- Mine Rehabilitation.

8.5 ha of the Central Hunter Grey Box-Ironbark Woodland and Hunter Floodplain Red Gum Woodland both conform to an Endangered Ecological Communities (EEC) as listed under the TSC Act.

6.5.3 Impact Assessment

Endangered Ecological Communities

Central Hunter Grey Box-Ironbark Woodland occurs as loosely connected patches in the locality and also within adjoining and proximate areas to the Modification Area. Hunter Floodplain Red Gum Woodland also occurs in the locality within drainage depressions and has been identified in proximate areas to the Modification Area.

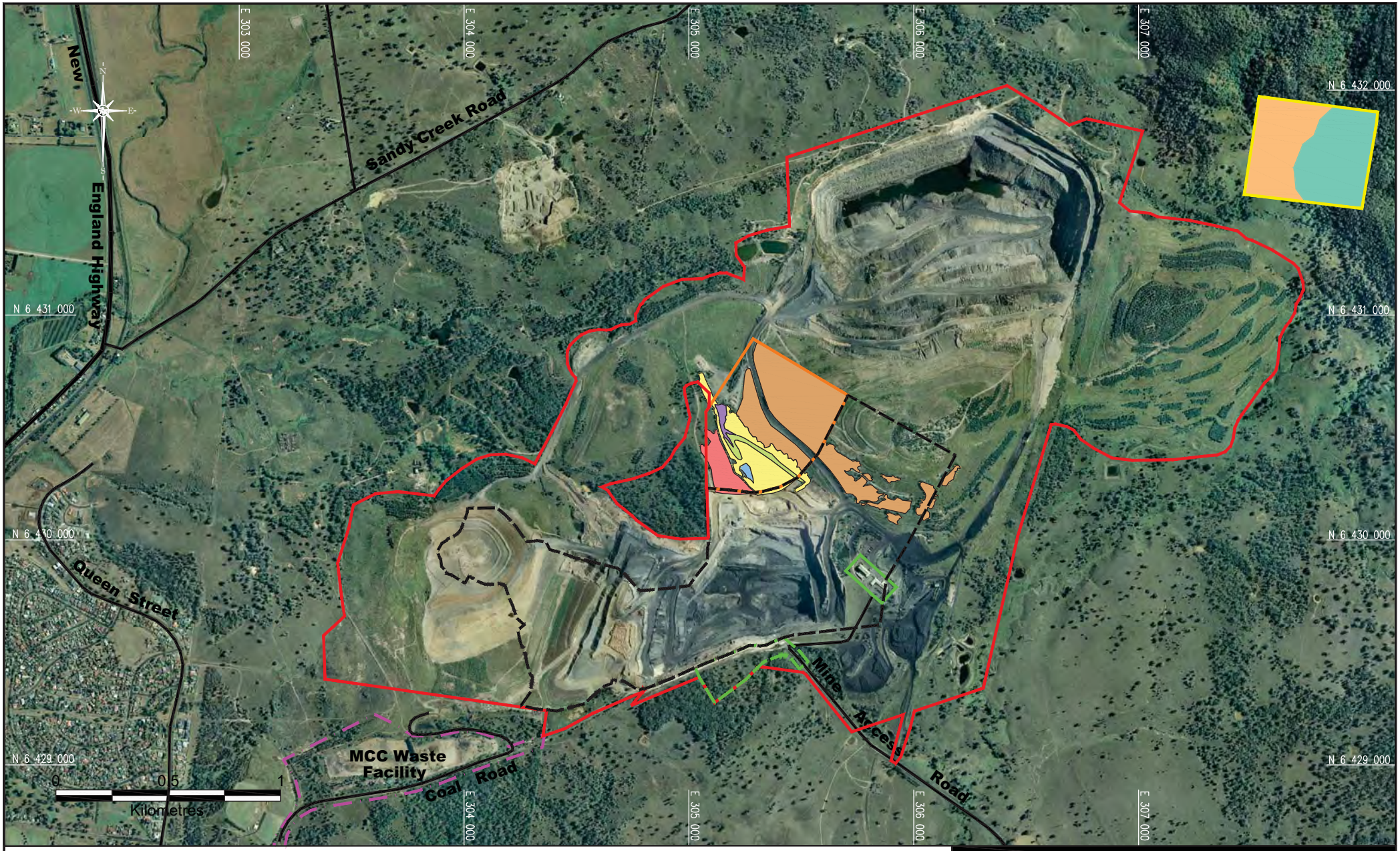
Both EECs are generally isolated from broader connective tracts of woodland in the locality and are suffering the impacts of edge-effects from existing active open cut mining operations. The woodland exists in several stages of regeneration and the adjoining patch to the west is relatively young regrowth.

When taking into account the existing threats to the EECs in the Modification Area and adjoining patch of similarly fragmented vegetation, the removal of a relatively small area of habitat from the Modification Area is not likely to have a significant impact on EECs.

Threatened Species

No threatened flora species as listed under the TSC Act or EPBC Act were recorded in the Modification Area or have previously been recorded during past assessments. No impact to threatened flora species is anticipated as a result of the Modification.

The Grey-crowned Babbler, Speckled Warbler, Brown Treecreeper and Diamond Firetail were all identified to potentially forage within the Modification Area despite the absence of records for the latter two species. However, the Modification Area provides only marginal habitat for these species. Loss of degraded and marginal habitat for these species as a result of the Modification is therefore unlikely to result in any significant impacts on the Grey-crowned Babbler, Specked Warbler, Brown Treecreeper or the Diamond Firetail. Assessments of significance have been undertaken for the aforementioned species and are included in Appendix E.



- Revised DA Boundary
- No.1 Extension Coal Extraction Boundary
- Existing Roads
- Modification Area
- Approved Infrastructure
- Existing Infrastructure
- Proposed Offset Area
- Central Hunter Grey Box - Ironbark Woodland
- Watercourse
- Hunter Floodplain Red Gum Woodland
- Regenerating Central Hunter Grey Box - Ironbark Woodland
- Rehabilitation - planted Vegetation
- Wetland
- White Box - Yellow Box Blakely's Red Gum Woodland (EEC)
- Wet Sclerophyll Forest with Dry Rainforest Elements

Source: MCC (2008)
Co-ordinate System: MGA 94 Zone 56

Hansen Bailey

MUSWELLBROOK COAL COMPANY

MUSWELLBROOK COAL COMPANY

Ecology

Cad File: 06474D.dwg	Date: 06.08.10	Drawn: JD	Figure 6

Roosting habitat for cave dwelling species is not present in the Modification Area. Hollow-dwelling species could potentially utilise the small to medium sized hollows found in the Modification Area, although the competition from other hollow-dependant mammals may be prohibitive. The reduction in habitat as a result of the Modification is not likely to have a significant impact.

No Koalas or evidence of Koalas were identified in the Modification Area. The one feed tree species present, Forest Red Gum, does not make up greater than 15% of the canopy within the Modification Area and therefore the site is not considered to be Potential Koala Habitat under the *State Planning Policy No. 44 – Koala Protection 1995*.

6.5.4 Mitigation and Management

The clearance of vegetation within the Modification Area will be undertaken in accordance with the approved Flora and Fauna Management Plan and its vegetation clearance protocol to limit any adverse impacts to native fauna.

A range of mitigation measures are currently employed at MCC, including flora and fauna pre-clearance surveys, soil and water management and improved rehabilitation techniques post-mining. These measures will help to protect the remaining remnants of these communities in the locality and re-instate a grassy woodland formation post-mining.

Ecological Offset Area

MCC will establish an ecological offset area of approximately 20 ha to provide an offset for the ecological impacts of the Modification (see Figure 6). In order to achieve the best environmental outcomes, the ecological offset area aims to meet state-wide standards in offsetting ecological impacts as specified by DECCW in '*Guidelines for Biodiversity Certification of Environmental Planning Instruments Working Draft – Department of Environment and Climate Change, October 2007'.*

A site inspection and preliminary survey was conducted within the ecological offset area, to determine its suitability in relation to the Modification. The vegetation consists of moderate to good quality Grey Box, Yellow Box, Blakely's Red Gum Woodland EEC on the slopes and Dry Rainforest on the elevated gully, with a transitional community presenting elements of Dry Rainforest and Eucalypt Forest. The ecological offset area has special habitat features, containing elements of Dry Rainforest and also being well connected to an expansive block of vegetation surrounding Bells Mountain.

A diverse range of ecological features are also present in the ecological offset area including:

- Open grassy woodland habitat suitable for foraging by small woodland birds including threatened species Diamond Firetail, Speckled Warbler, Grey-crowned Babbler, Brown Treecreeper and Spotted Harrier;
- Wet schlerophyl and rainforest vegetation suitable for a range of bat species (including threatened species Eastern False Pipistrelle and Eastern Bent-wing Bat);
- High diversity of flora species, including fruiting and flowering trees, shrubs and vines suitable for foraging by a range of mammals and birds, including threatened species Squirrel Glider and Grey-headed Flying Fox;
- Mature eucalypt trees containing small and medium sized hollows, suitable for roosting and nesting of hollow-dwelling fauna, including the aforementioned threatened bats and the Squirrel Glider. A small number of old-growth trees with large hollows are also present as are suitable nest sites for owls, such as the threatened Sooty Owl; and
- Dry rainforest vegetation with dense mid-storey and understorey vegetation suitable for sheltering of small fauna and foraging resources for a range of species.

The ecological offset area contains some grassy Box Gum woodland on the lower slopes that will be managed in a way that promotes natural regeneration through weed removal and continued exclusion of grazing. The ecological offset area will be supported by the future rehabilitation works of the Modification Area post-mining that will aim to revegetate a full stratum of species and provide a link to the Bells Mountain Wildlife Corridor.

The ecological offset area will be conserved in the long term pursuant to a legal mechanism, such as under Section 88 of the *Conveyancing Act 1919*. The existing approved MCC Land Management Plan will be revised to include the ecological offset area and its management, in consultation with DECCW and Muswellbrook Shire Council.

6.6 VISUAL AND LIGHTING

A Visual Impact Assessment was conducted to determine any potential visual impacts of the mining operation as proposed to be modified. This included consideration of potential visual impacts of the modified operation as illustrated by cross-sections prepared from Woodlands Ridge Estate and the New England Highway shown on Figure 7.

Due to the location of the Modification Area within the currently approved No. 1 Extension Coal Extraction Boundary and the surrounding undulating topography, it will not be directly visible to the closest receivers (that are more than 2 km away) (see Figure 7). Receivers to the south in the Woodlands Ridge Estate will be shielded by an existing topographic peak. Receivers to the north-east near the New England Highway will continue to receive distant views of the highwall, as currently approved and experienced. Negligible visual impacts will be experienced due to the Modification.

The mining operation as proposed to be modified will require the continued use of night lighting facilities to ensure safe mining operations within the area and for security. All lighting required to be installed for mining operations will be in accordance with *AS 4282 – Control of the Obtrusive Effects of Outdoor Lighting* (or the latest version).

All lighting shall be shielded and directed in such a way as to minimise any potential direct lighting impacts on neighbouring residential or road receivers due to light spillage whilst maintaining safety and security onsite.

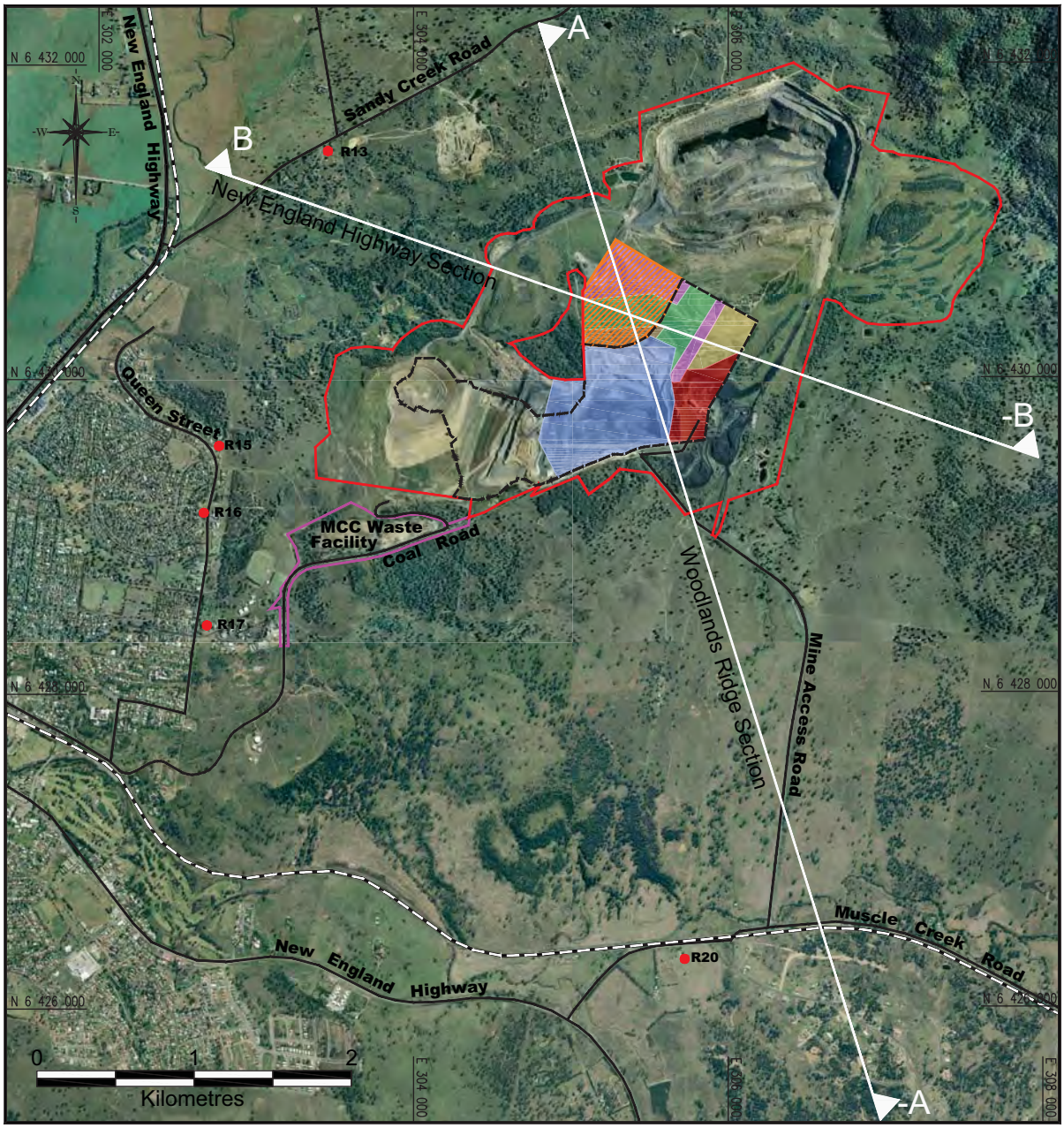
Visual and lighting issues associated with MCM will continue to be managed in accordance with the approved Visual Amenity & Landscaping Management Plan and Lighting Management Plan.

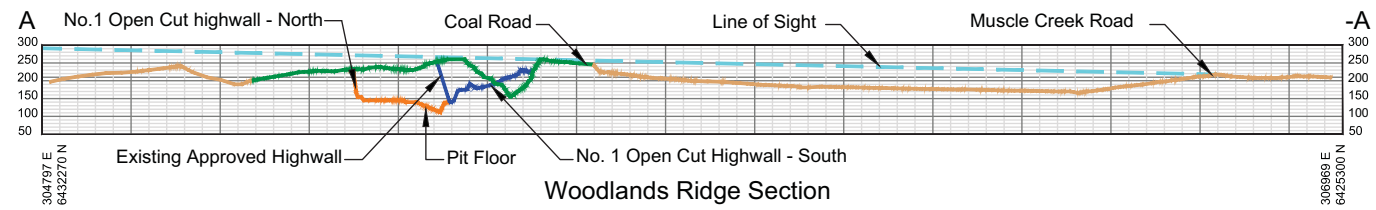
6.7 SURFACE WATER

A Surface Water Impact Assessment was undertaken for the mining operation as proposed to be modified which involved a review of the existing water management system and identification of water supplies and demands associated with it. The water management system at MCC principally consists of:

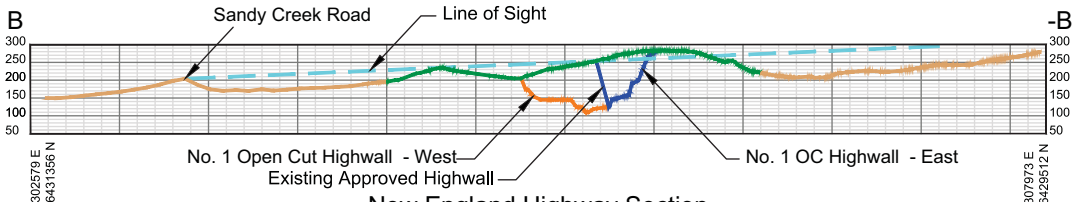
- The use of the No.1 Open Cut as storage;
- The use of the No.2 Open Cut as water storage after completion of mining – groundwater inflows into the pit will gradually decrease because of the increasing head of water in the pit;
- The gradual reduction of the No.2 Open Cut in pit emplacement catchment by up to 50%, reducing the amount of water entering the mine water system;
- The use of the underground workings as water storage; and
- The storage of water in the mine water dams for use as dust suppression.

The two main catchments in the vicinity of the Modification Area are associated with Muscle and Sandy Creeks, both of which discharge into the Hunter River. Drainage from the Modification Area is to the north to Sandy Creek and west to the Hunter River. The existing mining operations and Modification Area are well beyond the boundary of the alluvial floodplain and the 100 year flood limit of the Hunter River.





Woodlands Ridge Section



New England Highway Section

- Revised DA Boundary
- No.1 Extension Coal Extraction Boundary
- Present Mining
- 2011 Mining
- 2012 Mining
- 2013 Mining
- 2014 Mining
- 2015 Mining
- Modification Area
- Final Rehabilitation Surface
- Proposed Modification Surface
- Existing Approved Surface
- Existing Surface

Hansen Bailey

ESTABLISHED 1907

MUSWELLBROOK COAL COMPANY

Visual Cross Sections

Cad File: 06408G.dwg	Date: 12.08.10	Drawn: JD	Figure 7

6.7.1 Impact Assessment

Water Supplies

Any increase in water supply as a result of the Modification is considered negligible and manageable within the tolerance of the existing mine water management system. The volume of surface run-off water entering the mine water management system is dependent on rainfall and the catchment areas of the open cut, active overburden emplacement areas, industrial areas and rehabilitation areas. As discussed in Section 6.8.2, groundwater contributes a relatively small volume of water to the mine water management system due to the low permeability of the coal seam aquifers.

Water Demands

Mine water demands will not change as a result of the Modification with water being supplied from within the existing MCC mine water management system. Potable water will continue to be supplied via the MSC water supply as required.

Water Balance

The mining operation as proposed to be modified will not have a significant impact on the existing water balance at MCM and as a result, the existing mine water management system will remain relatively unchanged.

6.7.2 Mitigation and Management

Water management at MCM will continue to be managed in accordance with the measures outlined in the approved Site Water Management Plan and Erosion and Sediment Control Plan.

6.8 GROUNDWATER

A Groundwater Impact Assessment was undertaken by Australian Groundwater & Environmental Consultants Pty Ltd (AGE). A full copy of this report is presented in Appendix F. The purpose of this report is to assess the impact of the Modification on the existing groundwater environment.

6.8.1 Background

A 3D, numerical, groundwater flow model using the MODFLOW software was developed for the MCC EIS. The model domain covered an 8 x 8 km area with Sandy Creek, Muscle Creek and the Hunter River forming the northern, southern and western boundaries respectively with the groundwater divide beneath Bell Mountain forming the eastern boundary.

An additional 3D numerical model has not been developed for the current impact assessment of the Modification Area as:

- The detailed predictive model developed as part of the MCC EIS encompasses the extent of the Modification Area;
- Monitoring has shown that the model predictions are reasonably accurate; and
- The area is quite small and adjoins the No. 1 Open Cut Extension.

A spreadsheet model was developed in order to provide a broad assessment of the radius of influence of mining the Modification Area on the piezometric surface of the coal measures aquifer system, and inflow to the pit from the coal measures. The equation developed by Marinelli and Niccoli (2002) for inflow to a mine pit was used for the assessment.

6.8.2 Impact Assessment

The assessment found that groundwater levels in the coal measures are maintained by the flooded underground workings with water being pumped into and out of the workings depending on mine requirements.

The impact of mining operation as proposed to be modified will be to lower the water level in the underground workings to this level and extend the radius of influence of the mine on the potentiometric surface. A spreadsheet model based on classical groundwater flow equations indicate that the radius of influence will be approximately 1 km from the mine, and as such will not extend beneath or impact the alluvial aquifers associated with the Hunter River, Sandy and Muscle Creeks.

The spreadsheet model indicates that steady state groundwater inflow to the Modification Area when it reaches maximum depth will be approximately 24 Megalitres per year, which is a similar order of magnitude to that presented in the MCC EIS. A large volume of stored water will also have to be pumped from the flooded underground workings as mining progresses to its maximum depth. The NSW Office of Water database of registered bores indicates that there are no registered bores within the assessed 1 km radius of impact of MCM.

Alluvial aquifers and groundwater dependent ecosystems will not be impacted by mining within the Modification area; therefore groundwater quality should not be adversely impacted.

6.8.3 Mitigation and Management

Groundwater at MCC will continue to be managed and monitored in accordance with the approved Site Water Management Plan. As the Modification Area overlies much of the old St Helliers Colliery workings and is adjacent to the approved No. 1 Open Cut Extension, it is considered that the current approved monitoring program is adequate.

It should however be noted that bore RDH 615 is within the footprint of the Modification Area and will therefore be removed by mining. A replacement bore will have to be constructed in the future to monitor groundwater recovery. It is recommended that this be installed inside the revised DA boundary to the north-west of the Modification Area.

6.9 SOILS

The MCC EIS Soils Assessment was reviewed to identify the soils within the Modification Area.

The review determined that the predominant soils are Yellow Duplex with Brown Subsoils occurring along the ridgeline. Yellow Duplex soils dominate and have dark brown topsoils overlying a bleached yellow to light brown A2 horizon. These soils are generally quite shallow with loamy topsoils underlain by clayey subsoils. The Yellow Duplex topsoils are suitable for use in rehabilitation and are capable of being stripped at a depth of no more than 150 mm.

Brown subsoils which occur on the ridgeline have a thin, acidic topsoil layer of weak structure, overlying a conspicuously bleached A2 layer. Brown subsoils are suitable for use in rehabilitation and are capable of being stripped to a depth of not more than 50 mm.

All soil stripping within the Modification Area will be undertaken in accordance with the approved MCC Soil Stripping Management Plan which includes a detailed procedure for the stripping and stockpiling of soils suitable for rehabilitation at MCC.

All topsoil stockpiles will continue to be signposted and inspections will be undertaken to assess vegetative cover and weed infestation.

6.10 REHABILITATION AND FINAL LANDFORM

A key imperative for MCM has been to develop an integrated, free-draining final landform that is consistent with the principles of the *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales* (Synoptic Plan) (DMR, 1999).

The conceptual final landform approved under DA 205/2002 (MOD 1 and MOD 2) will not be altered as a result of the Modification. Figure 5 provides the conceptual landform at the completion of open cut mining which considers the progression of mining activities in the No. 1 Extension, the Modification and all historical open cut coal mining activities being completed as currently approved.

Rehabilitation activities within the Modification Area will be undertaken consistent with the approved Flora and Fauna Management Plan, Land Management Plan and the Final Void Management Plan. The Final Void Management Plan will not require revision as a result of the Modification.

Pursuant to Condition 3.4.2 (iv) of DA 205/2002 (MOD 1 and MOD 2), MCC will reafforest the Modification Area with tree species such as: Greybox, Bulloak, Narrow-leaved Iron Box and Grey Gum (see Figure 5).

Three voids will remain at the completion of mining. All of the voids are consistent with that approved in DA 205/2002 (MOD 1 and MOD 2).

6.11 TRAFFIC AND TRANSPORT

The Traffic Assessment undertaken for the MCC EIS was reviewed with consideration of the Modification. The Modification does not seek any changes to the currently approved coal haulage arrangements to transport up to 2 Mtpa product coal via road from MCM. The Modification will not cause any additional impacts on local traffic and no further mitigation is required.

6.12 WASTE MANAGEMENT

The existing waste management procedures will continue to be implemented in accordance with the approved MCC Waste Management Plan. Waste streams will continue to be segregated and removed from site by a licensed waste contractor.

6.13 HYDROCARBON MANAGEMENT

The Modification does not propose any changes to the existing hydrocarbon management system. Any storage facilities approved to be established at MCM will be designed in accordance with *AS 1940:2004 – The Storage and Handling of Flammable and Combustible Liquids* or its latest version.

7.0 JUSTIFICATION

7.1 SITE SUITABILITY

MCM is an existing mining operation which has successfully operated since 1907 and continues to do so within its existing mining authorities. The Modification is a logical change in the approved mining sequence to facilitate the extraction of 5.2 Mt of open cut mineable coal from an otherwise sterilised resource. The mining operation as proposed to be modified will utilise the existing workforce, infrastructure and equipment fleet using the same mining methods producing at the same annual coal production rates and will be completed within the currently approved mine life.

7.2 ECONOMIC, SOCIAL AND ENVIRONMENTAL IMPACTS

This SEE has assessed all the relevant economic, social and environmental impacts associated with the mining operation as proposed to be modified by applying the following principles:

- The application of a methodical risk assessment process throughout the Modification planning, design and assessment process;
- The consideration of ESD principles and best practice environmental and social standards in the development of Modification specific mitigation and management measures;
- Applying the objectives of the EP&A Act; and
- Undertaking stakeholder consultation and addressing issues raised, where possible.

Despite the application of a stringent, contemporary environmental assessment, this SEE has not identified any significant impacts associated with the extension of mining into the Modification Area, additional to that previously identified within the MCC EIS. The extraction of an additional 5.2 Mt of open cut mineable coal utilising existing and approved infrastructure is considered an efficient and logical land use optimising the recovery of the in-situ resource and maximising the social and economic benefits resulting form the operation of the MCM without material changes to social and environmental costs.

To mitigate the ecological impacts of the Modification, MCC will establish an ecological offset area of approximately 20 ha located to the north-east of the No. 1 Open Cut Extension DA Boundary to be conserved in the long term.

7.3 PUBLIC INTEREST

The economic benefits to the immediate community of Muswellbrook as well as the broader economic benefits to the State of New South Wales from indirect benefits and taxes and royalties which will be derived from this Modification are in the public interest.

The extraction of this resource utilising existing infrastructure and directly ensuring the continuation of employment of 95 persons are also in the public interest.

It is accepted that incorporated within the principles of the public interest are the principles of ESD, which in turn incorporate the precautionary principle, intergenerational equity and the need to consider the conservation of biological diversity and ecological integrity.

The impacts of the Modification are known and explained in Section 6.0. There is no material uncertainty so as to generate the need for the invocation of the precautionary principle.

The extraction of the coal resource from this already underground-mined area will immediately benefit the community. The rehabilitation and reinstatement of the land after the completion of mining will ensure the interests of future generations are not harmed.

The operation of MCM as proposed by the Modification takes place largely in an area which has previously been mined and is cleared of native vegetation. The only impact resulting from this Modification that has been assessed to have any materiality is the clearing of 8.5 ha of largely regrowth woodland (EEC under the TSC Act) in respect of which offsets will be provided.

7.4 CONSISTENCY WITH THE OBJECTS OF THE EP&A ACT

Section 5 of the EP&A Act describes its objects which are reproduced below, followed by comment on each to the extent that they are relevant to the Modification:

> *"To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment."*

The mining operation as proposed to be modified will facilitate the ongoing orderly and logical extraction of a coal resource within MCC's mining authorities, the benefit of which will promote social and economic welfare.

> *"To encourage the promotion and co-ordination of the orderly and economic use and development of land."*

The mining operation as proposed to be modified will result in a logical minor change in the approved mining sequence to facilitate the extraction of 5.2 Mt of open cut mineable coal from an otherwise sterilised resource, through utilisation of the existing employee resource, infrastructure and equipment fleet, within the approved mine life.

> *"To encourage the protection, provision and co-ordination of communication and utility services"*

The mining operation as proposed to be modified will not disrupt communication or utility services.

> *"To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats."*

The mining operation as proposed to be modified will result in the implementation of the ecological offset area specifically designed to protect native flora and fauna.

> *"To encourage ecologically sustainable development"*

The mining operation as proposed to be modified addresses ESD principles as discussed in Section 4.0 as well as meets the objectives of the EP&A Act. Impacts of the mining operation as proposed to be modified have been identified with measures to address them incorporated into the proposal, thus addressing the Precautionary Principle.

The maximised recovery of the coal resource by utilising the existing workforce, infrastructure and equipment fleet within the currently approved mine life incorporates the principles of Intergenerational Equity and Improved Valuation. The principle of Conservation of Biological Diversity and Ecological Integrity are addressed by the Modification in the commitment to implement the ecological offset area and conserve biodiversity in the long-term.

Section 5.0 of the SEE describes the stakeholder engagement process relied upon during the preparation of the SEE.

It can be concluded by an analysis of the comments following each stated objective of the EP&A Act that each has been met during the preparation of the SEE.

7.5 CONCLUSION

The Modification sought relates to the minor extension of the approved mining disturbance footprint. This will facilitate the extraction of 5.2 Mt of open cut mineable coal that would otherwise be sterilised. This additional coal recovery will be achieved by utilising the existing workforce, infrastructure and equipment fleet within the currently approved mine life using the approved methods of mining.

This additional resource was originally considered to be economically unviable for open cut mining operations due to the historic underground mining operations undertaken in this area. However, due to the extensive experience MCC now has in extracting coal via open cut methods from old underground workings, there is confidence that viable mining activities can occur safely in this area.

The additional recovery of coal maximises the economic and social benefits without any material change in the social and environmental costs of the mining, thus addressing the objectives of the EP&A Act and the principles of ESD.

An ecological offset area will be established for the Modification and conserved in the long term.

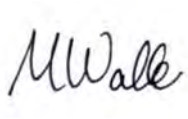
The review of the environmental impact assessments and principles of ESD completed for SEE have confirmed that the impacts from the Modification will be minor in nature and are consistent with those already approved by DA 205/2002 (MOD 1 and MOD 2) and described within the *Muswellbrook Coal Company Limited, No. 1 Open Cut Extension Environmental Impact Statement 2002*, *Section 96(1A) Application to Modify Development DA 205/2002* and the *Muswellbrook Coal Mine Development Consent Modification Statement of Environmental Effects*.

The mining operation as proposed to be modified, if granted, will allow for the effective and efficient extraction of an identified coal resource in a small area adjacent to the approved mining disturbance footprint that would otherwise be sterilised. The location of the minor extension area will allow MCC to effectively integrate the Modification with the conceptual rehabilitation and final landform design for the site, while the ecological offset area will ensure the ongoing biodiversity and sustainability of the local natural environment.

* * *

for

HANSEN BAILEY



Melissa Walker James Bailey

Senior Environmental Scientist *Director*

8.0 ABBREVIATIONS

Abbreviation	Description
AEMR	Annual Environmental Management Report
CCC	Community Consultative Committee
CCL	Consolidated Coal Lease
CPP	Coal Preparation Plant
DECCW	NSW Department of Environment, Climate Change and Water
DoP	NSW Department of Planning
DPI-MR	NSW Department of Primary Industries - Mineral Resources
ECRTN	*Environmental Control for Road Traffic Noise* (EPA 1999)
EEC	Endangered Ecological Community
EMS	Environmental Management System
ESD	Ecologically Sustainable Development
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999 (Cth)*
EPA	Environmental Protection Authority
EPL	Environmental Protection Licence
EP&A Act	*Environmental Planning and Assessment Act 1979*
Idemitsu	Idemitsu Kosan Company Limited Group
LEP	*Muswellbrook Shire Local Environmental Plan 1985*
MCC	Muswellbrook Coal Company Limited
MCC EIS	*Muswellbrook Coal Company Limited, No. 1 Open Cut Extension Environmental Impact Statement 2002* (HLA EnviroSciences, 2002)
ML	Mining Lease
MCM	Muswellbrook Coal Mine
MOP	Mining Operations Plan
Mtpa	Million tonnes per annum
MSC	Muswellbrook Shire Council
No. 1 Extension	No. 1 Open Cut Extension Area
POEO Act	*Protection of the Environment Operations Act 1997*
RCT	Ravensworth Coal Terminal
Hunter REP	*Hunter Regional Environmental Plan 1989*
ROM	Run of Mine
RTA	NSW Roads and Traffic Authority
SEE	Statement of Environmental Effects
TSC Act	*Threatened Species Conservation Act 1995*

9.0 REFERENCES

- Department of Climate Change (2009) *National Greenhouse Account (NGA) Factors June 2009*.
- Department of Environment, Climate Change and Water NSW (2010), *Aboriginal Cultural Heritage Consultation Requirements for Proponents*.
- Department of Environment and Climate Change NSW (2004a), *Interim Community Consultation Requirements for Applicants*.
- Department of Mineral Resources NSW (1999), *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales.*
- Environmental Protection Authority NSW (2000), *NSW Industrial Noise Policy*.
- Environmental Protection Authority NSW (1999), *Environmental Criteria for Road Traffic Noise*.
- Environmental Protection Authority NSW (1985), *Environmental Noise Control Manual*.
- Hansen Bailey (2009), *Section 96(2) Development Consent Modification*.
- HLA EnviroSciences (2002), *Muswellbrook Coal Company Limited, No. 1 Open Cut Extension Environmental Impact Statement 2002*.
- Parsons Brinckerhoff (2005), *Section 96(1A) Application to Modify Development DA 205/2002.*
- Standards Australia (2004), *Australian Standard 1940-2004: The Storage and Handling of Flammable and Combustible Liquids.*
- Standards Australia (1997), *Australian Standard 4282-1997: Control of the Obtrusive Effects of Outdoor Lighting.*

10.0 STUDY TEAM

Section	EA Component	Team Member	Company
Modification Management			
	Peter Wilkinson / John Furner	General Manager	MCC
	Kim Nguyen	Engineering Manager	
SEE Management			
	James Bailey	Modification Director	Hansen Bailey
	Melissa Walker	Modification Manager	
SEE Sections			
	Executive Summary	Melissa Walker	Hansen Bailey
1.0	Introduction	Belinda Hale	Hansen Bailey
2.0	Existing Environment	Belinda Hale	Hansen Bailey
3.0	Modification Description	Belinda Hale	Hansen Bailey
4.0	Regulatory Framework	Melissa Walker	Hansen Bailey
5.0	Stakeholder Consultation	Belinda Hale	Hansen Bailey
6.0	Impacts, Management & Mitigation	Melissa Walker, Belinda Hale	Hansen Bailey
7.0	Justification	James Bailey, Melissa Walker	Hansen Bailey
8.0	Abbreviations		
9.0	References		
10.0	SEE Study Team		
Appendices			
Appendix A	Regulatory Correspondence		
Appendix B	Noise and Blasting Impact Assessment	Mark Bridges	Bridges Acoustics
Appendix C	Air Quality and Greenhouse Gas Impact Assessment	Francine Triffett	PAE Holmes
Appendix D	Aboriginal and Historic Heritage Impact Assessment	Geordie Oakes	AECOM Australia
Appendix E	Flora and Fauna Impact Assessment	Vanessa Orsborn	Cumberland Ecology
Appendix F	Groundwater Impact Assessment	Errol Briese	AGE Consultants
Legal Advice provided by Sparke Helmore Drafting and Graphics Design by Pegasus Technical Pty Limited and Melissa Bahur			

Prepared By:

HansenBailey
ENVIRONMENTAL CONSULTANTS

Phone:
(02) 6575 2000

Fax:
(02) 6575 2001

Address:
6/127–129 John Street
Singleton NSW 2330

Postal:
PO Box 473
Singleton NSW 2330