Centennial Coal

Briefing Paper

Angus Place Mine Extension Project

Angus Place Colliery

September 2012

TABLE OF CONTENTS

List of Tables

List of Figures

ABBREVIATIONS

AHIMS	Aboriginal Heritage Information Management System
Angus Place	Angus Place Colliery
APC-VS	Angus Place Colliery Ventilation Site
Banpu	Banpu Public Company Limited
BOM	Bureau of Meteorology
CCC	Community Consultative Committee
Centennial	Centennial Coal Company Ltd
CHP	Coal Handling Plant
DGRs	Director-General's Requirements
DP&I	Department of Planning and Infrastructure
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
GDE	Groundwater Dependent Ecosystem
LCC	Lithgow City Council
LDP	Licensed Discharge Point
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
Mtpa	Million tonnes per annum
NGER Act	National Greenhouse and Energy Reporting Act 2007
NOW	NSW Office of Water
NPW Act	National Parks and Wildlife Act 1974
OEH	NSW Office of Environment and Heritage
PA	Project Approval
PEA	Preliminary Environmental Assessment
POEO Act	Protection of the Environment Operations Act 1997
ROM	Run of Mine
SDWTS	Springvale-Delta Water Transfer Scheme
SEPP	State Environmental Planning Policy

SEWPAC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
TSP	Total Suspended Particulates
TSC Act	Threatened Species Conservation Act 1995
WM Act	Water Management Act 2000

1.0 INTRODUCTION

1.1 Overview

Centennial Angus Place Pty Ltd (the Applicant) proposes to extend its mining operations, using longwall mining techniques, to the east of its existing operations at the Angus Place Colliery (Angus Place), located 15 kilometres northwest of the city of Lithgow (refer **Figure 1**). The Project Application Area boundary is shown in **Figure 2**.

Angus Place's development consent will lapse on 18 August 2024. However, the planned longwall mining at Angus Place in accordance with the current mine plan will end in March 2016. Accordingly, the proposed Project is seeking approval for the continuation of longwall mining at Angus Place to the east of the current workings within its Mining Lease (ML) 1424 lease boundary (refer **Figure 2**) beyond March 2016 (the Project).

The Project is a State Significant Development in accordance with Clause 8 and Schedule 1 (Item 5) of *State Environmental Planning Policy (State and Regional Development) 2011*. As such the Applicant will be seeking approval under Part 4 Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Briefing Paper describes the Project, and provides information on the key environmental issues that could potentially be impacted by the Project, the specialist studies that will be undertaken to assess the level of potential mining impacts, and the mitigation measures required to minimise these impacts.

This Briefing Paper is intended to enable the Department of Planning and Infrastructure (DP&I) to issue Director-General's requirements (DGRs) for the preparation of the *Environmental Impact Statement* (EIS) required to support the Development Application.

1.2 The Applicant

Centennial Angus Place Pty Ltd is the Applicant for this Project.

Angus Place Colliery is managed by Centennial Angus Place Pty Ltd under a joint venture arrangement between Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd. Centennial Angus Place Pty Ltd is 100% owned by Centennial Coal Company Pty Ltd. Centennial Coal Company Pty Ltd is a wholly owned subsidiary of Banpu Public Company Ltd, listed on the Thailand Stock Exchange.

Centennial supplies thermal and semi soft coking coal to domestic and export markets, providing NSW with coal for approximately 40% of the State's coal fired electricity.

1.3 Background

Angus Place Colliery commenced production in 1979, after being developed as an extension of the Newcom Mine at Kerosene Vale. Coal is extracted from the Lithgow seam using longwall mining techniques. The main components of the development are an underground longwall mine and development panels, supporting surface infrastructure (within the Angus Place pit top area and on the Newnes State Forest), a coal stockpile area (Kerosene Vale) and dedicated haul roads to Delta Electricity's Wallerawang and Mount Piper power stations.

Project Approval PA06_0021 is applicable to Angus Place, which was approved by the Department of Planning (DoP) pursuant to Part 3A of the EP&A Act. Project Approval PA06_0021 was granted on 13 September 2006 to expand the mining area and increase the production limit to 3.5 million tonnes per annum. PA 06_0021 is currently due to lapse on 18 August 2024.

During 2010, Angus Place submitted an application to the Department of Planning (DoP) requesting to modify Project Approval 06_0021 pursuant to Section 75W of the EP&A Act. This Project proposed an extension to Angus Place's operations through the development and extraction of two additional longwall panels (910 and 900W), as well as development of supporting surface infrastructure. The Project additionally provisioned to increase the annual production limit from 3.5 Mtpa to 4 Mtpa. Project Approval 06_0021 Modification 1 was approved on 29 August 2011.

On 22 December 2011, Angus Place lodged a request to modify its existing Project Approval with the DP&I regarding the construction and operation of a ventilation facility and supporting infrastructure in accordance with section 75W of the EP&A Act. The Director-General Requirements for the modification project were received on 18 January 2012. An Environmental Assessment in support of the modification was submitted to DP&I in September 2012.

Angus Place's coal processing and distribution network is being proposed to be amalgamated into the existing Springvale Coal Services Facility. The Springvale Coal Services Facility is in the process of submitting an application for the upgrade of their facilities, and as part of this proposed upgrade, the coal processing and distribution logistics of Angus Place will be transferred into Springvale Coal Services operations. This is an administrative transfer of the existing infrastructure between three of Centennial's business units.

1.4 Project Objectives and Overview

The overall objective of this Project is to obtain approval for the continuation of mining at the Angus Place Colliery. The objectives of the Project are as follows.

- Design of the extension project in accordance with ecological sustainable principles;
- Coal production of a total of up to 4 million tonnes per annum (Mtpa) of coal from the Lithgow coal seam;
- Extraction of coal using longwall mining techniques from an area identified as Angus Place East within the Project Application Area (refer **Figure 2**);
- Construction and operation of the following facilities to support the extension Project:
    - A ventilation facility (APC-VS3) consisting of a single downcast (intake) shaft;
    - Dewatering borehole sites to deliver water into the existing Springvale-Delta Water Transfer Scheme;
    - Water management structures;
    - Shaft spoil emplacement area;
- Upgrade of access track from Sunnyside Ridge Road to the proposed ventilation facility (APC-VS3) and dewatering borehole sites; and
- Continue to provide employment of a full time workforce of 225 persons and up to 75 contractors.

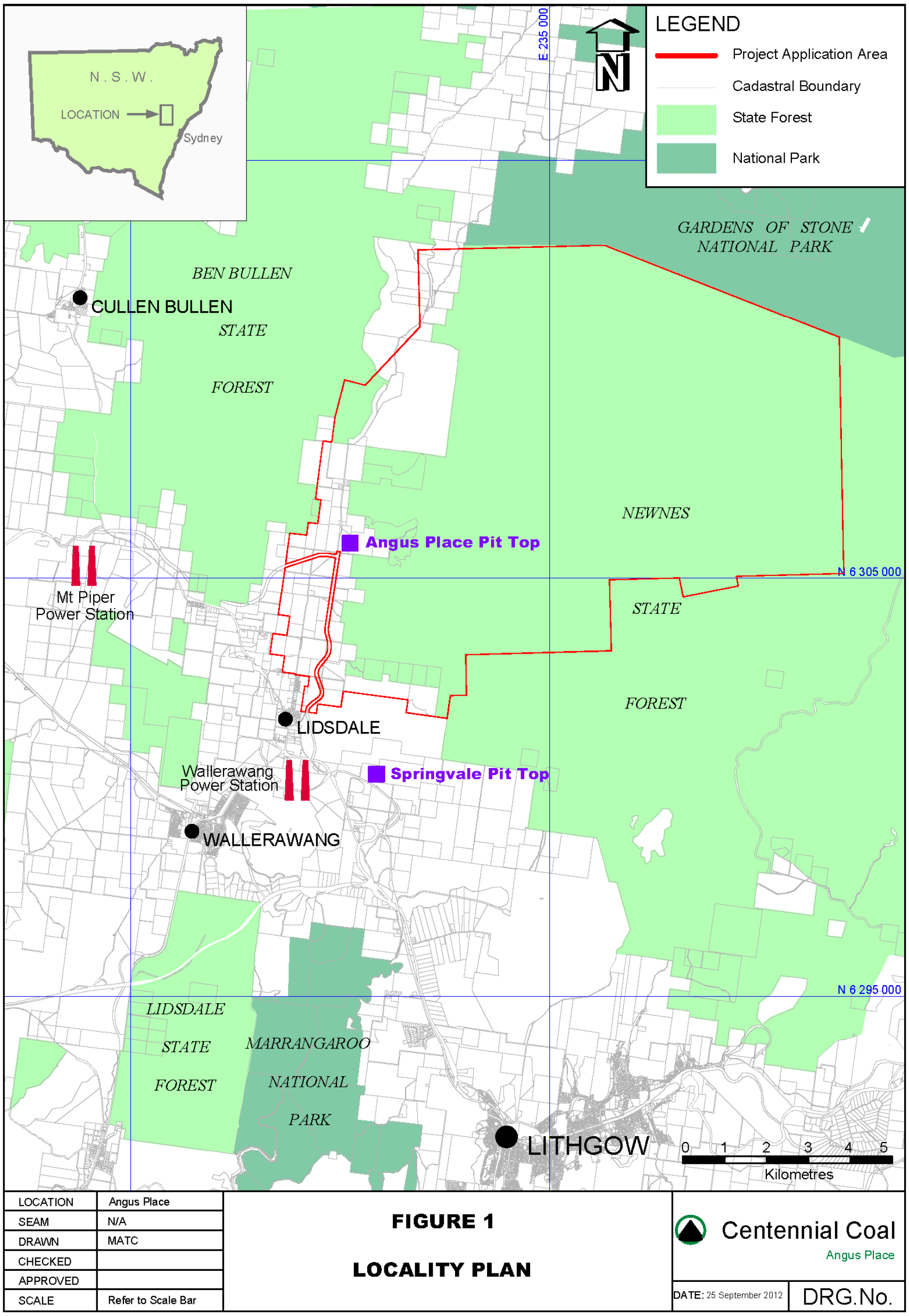
1.5 Briefing Paper Aims and Objectives

Overall this Briefing Paper aims provide an adequate description of the proposed Project in addition to a summary of existing operations. To achieve this aim, key objectives of this Briefing Paper are to inform all stakeholders of the components proposed within the Angus Place Mine Extension Project. The Briefing Paper provides a general overview of the Project with reference to applicable legislation and

relevant planning policies. From the pre-project risk assessment, expected environment and community impacts are outlined alongside the proposed level of assessment required to address each risk. Stakeholder consultation requirements are outlined against the proposed stakeholder consultation plan to act as a framework through which to identify and appropriately consult with stakeholders who may be influenced by or have an interest in the Project.

The Briefing Paper is structured as follows:

- **Section 1** introduces the Project;
- **Section 2** provides a description of the Project application Area and an overview of the existing environment;
- **Section 3** provides an overview of the existing and approved mining operations of Angus Place Colliery;
- **Section 4** provides a detailed description of the Project;
- **Section 5** summarises the legislation relevant to the Project;
- **Section 6** provides an overview of the preliminary environmental risks associated with the Project and describes the proposed assessment methodology for all key environmental issues identified in the preliminary environmental risk assessment for the Project;
- **Section 7** describes the stakeholder consultation program to be undertaken to ensure all interested parties are consulted with regard to the Project; and
- **Section 8** provides concluding remarks.



LOCATION	Angus Place
SEAM	N/A
DRAWN	MATC
CHECKED	
APPROVED	
SCALE	Refer to Scale Bar

FIGURE 1

LOCALITY PLAN

Centennial Coal
Angus Place

DATE: 25 September 2012 | DRG.No.

Figure 1 – Locality Plan

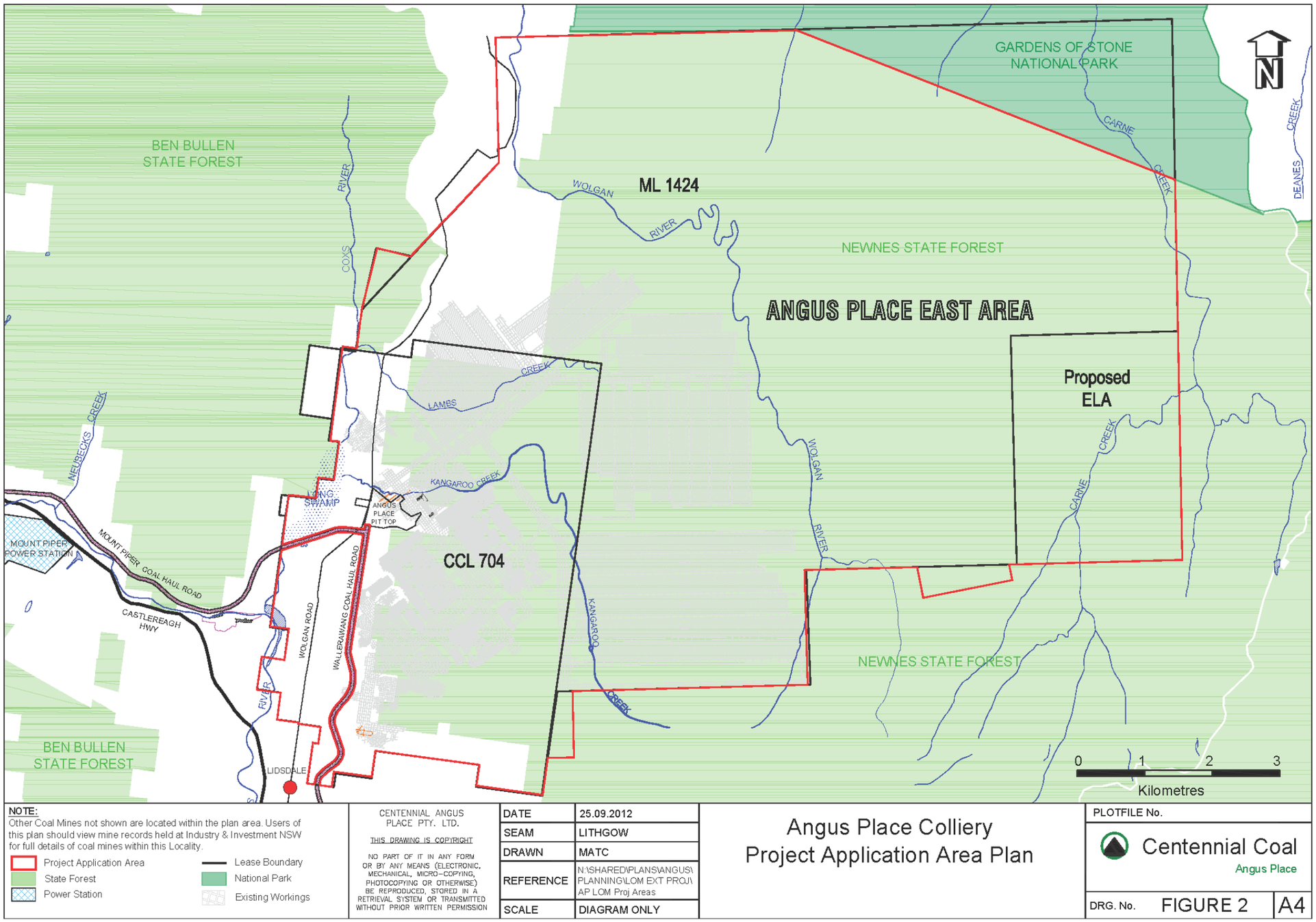


Figure 2 –Project Application Area

2.0 EXISTING SITE DESCRIPTION

2.1 Site Locality and Existing Land Uses

The Angus Place Colliery pit top is located five kilometres north of the village of Lidsdale, eight kilometres northeast of the township of Wallerawang and 15 kilometres northwest of the city of Lithgow. Angus Place is within the Lithgow City Council Local Government Area (LGA). The underground longwall mine is situated directly below a sandstone plateau of undulating unpopulated bushland which is part of the Newnes State Forest.

Angus Place is bordered by Baal Bone Colliery (Xstrata Coal Pty Ltd) and Invincible Colliery (CET Resources Pty Ltd) to the north, Springvale Colliery (Centennial Springvale Pty Ltd) to the south and the Wolgan Valley and Newnes State Forest to the north-east. Collectively, existing land uses in the vicinity of the colliery include pastoral farming, open cut and underground coal mining, power generation and commercial forestry.

2.2 Topography and Hydrology

The surface lands adjacent to and above the Angus Place underground workings are situated on the Newnes State Forest, which comprises of narrow gorges with high ridgelines, steep sided slopes and sandstone cliffs above incised valleys, hilly areas with relatively flat crests and spurs and moderately sloped ephemeral drainage lines. Streams, such as Kangaroo Creek, the Wolgan River, Carne Creek and their tributaries can be found in the vicinity. At a far lower elevation, pastoral farming lands and private land surrounds the existing Angus Place pit top. The Coxs River and Lambs Creek exist within the western portion of the Colliery Holding Boundary.

The Angus Place pit top lies within the Coxs River Catchment, reporting to the Sydney Catchment area. The Colliery Holding Boundary (mining lease area) traverses the Coxs River Catchment area and Wolgan River Catchment area, the latter of which reports to the Hawkesbury Nepean Catchment.

2.3 Climate

The climate for the Newnes State Forest is classified as warm temperate with an annual rainfall of 1,097 mm. Summers are mild with average maximum temperatures of 23.5°C and winters are cold with average minimum temperatures of -1.0°C.

Rainfall and temperature tends to be seasonally distributed with the highest falls and the highest temperatures occurring in the summer months, and the lowest rainfall and temperatures experienced during the winter months.

2.4 Geology and Coal Reserves

The Lithgow coal seam lies in the Cullen Bullen Subgroup of the Illawarra Coal Measures (**Table 1**). The Lithgow coal seam is the major economic coal seam in the Lithgow, Rylstone and Bylong areas and overlies the well-exposed, bench forming outcrops of the Marrangaroo Formation. In the western coalfield, the Lithgow seam ranges in thickness from less than 1m to 9m and consists generally of dull coal with minor bright layers, generally increasing towards the base and top of the formation. Some thin carbonaceous or tuffaceous claystone layers are present in the upper half. The coal measures are overlain by massive sandstone units and conglomerates. The sediments that form the Illawarra Coal Measures were deposited in the late Permian era. The seam is relatively horizontal, however, depth of cover varies considerably due to the surface topography.

Table 1 – Illawarra Coal Measures Stratigraphy

GROUP	FORMATION	COAL SEAMS / SIGNIFICANT UNITS
NARRABEEN GROUP		
ILLAWARRA COAL MEASURES	WALLERAWANG SUBGROUP	KATOOMBA SEAM Farmers Creek Formation MIDDLE RIVER COAL MEMBER
	CHARBON SUBGROUP	ANGUS PLACE SANDSTONE BAAL BONE FORMATION THE NEWNES FORMATION (Upper and Middle Irondale seams) IRONDALE SEAM LONG SWAMP FORMATION
	CULLEN BULLEN SUBGROUP	LIDSDALE SEAM BLACKMANS FLAT CONGLOMERATE LITHGOW SEAM MARANGAROO CONGLOMERATE
	NILE SUBGROUP	
SHOALHAVEN GROUP		

Table 2 provides the Statement of Reserves at Angus Place as at 31 March 2012. The data were obtained from *Coal Resource and Reserve Statement* of Centennial Coal Company Limited prepared by Malcolm Ives and Mark Levey in accordance with *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* (Joint Ore Reserves Committee, 2004).

Table 2 – Statement of Reserves at Angus Place as at 31 March 2012

Remaining Resources and Reserves (Million of tonnes (Mt))							
Remaining Resources (Mt)				**Remaining Reserves (Mt)**			
Measured	**Indicated**	**Inferred**	**Total**	**Proved**	**Probable**	**Total**	**Marketable**
72.0	176.9	0.0	248.9	16.9	67.3	84.3	84.3
Source: Malcolm Ives and Mark Levey, *Coal Resource and Reserve Statement*, Centennial Coal Company Limited, 31 March 2012							

Angus Place Colliery's geological exploration program commenced in 2010 and is aimed at determining the viability of the remaining portion of the Lithgow coal seam within the Project Application Area. The results to date indicate the coal reserves within the Angus Place East area could add up to 65 million tonnes mineable reserve to Angus Place Colliery's current coal reserves.

2.5 Land Ownership

Land ownership within and surrounding the Project Application Area includes (refer **Figure 3**; **Appendix 1**):

- Crown land;
- Privately owned land;
- Land owned and managed by Forests NSW.

The majority of land within the Project Application Area is Crown Land managed by Forests NSW and privately owned land.

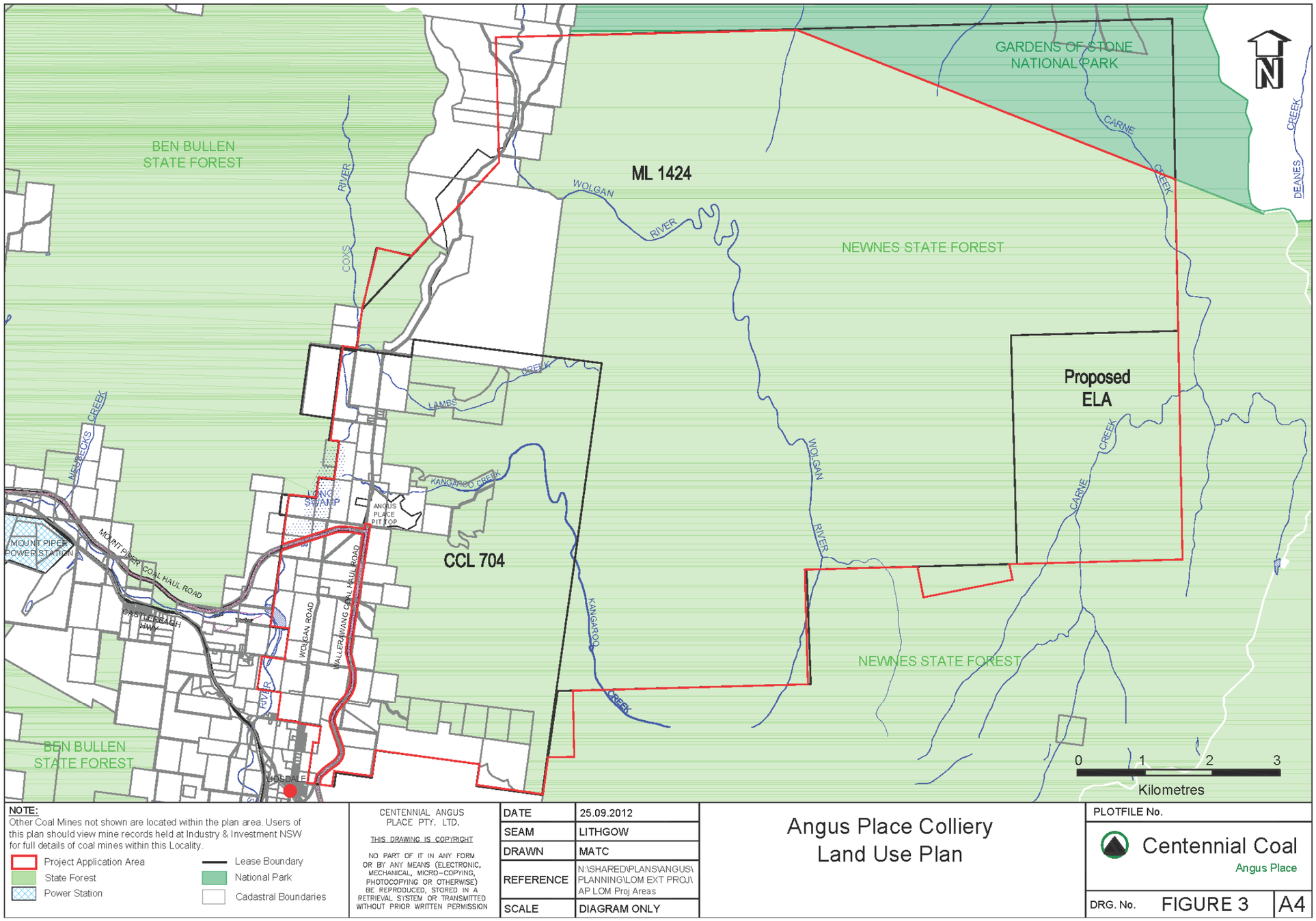


Figure 3 – Land Use Plan

3.0 EXISTING APPROVED INFRASTRUCTURE AND CURRENT OPERATIONS

3.1 Approved Activities

Angus Place Colliery is approved to undertake the following activities:

- **Production** – Annual extraction limit of 4 Mtpa of ROM coal.
- **Mining method** - Longwall mining methods are used for the primary extraction of each longwall block. Development headings are mined using continuous miner units, which also install roof and rib support.
- **Mining area** – Longwall blocks are mined in sequence. Within the current approved area, Longwalls 930 to 960 have been extracted and Longwalls 970 and 980 are scheduled for extraction between 2012 and 2014. Longwalls 910 and 900W are scheduled for development and extraction following Longwall 980.
- **Mine ventilation** – Existing intake ventilation via three drifts (main drift, conveyor drift and the previous conveyor drift) and return ventilation via a shaft on the pit top site. Angus Place is in the process of procuring approval for an additional ventilation facility to be situated on the Newnes State Forest, identified as APC-VS2.
- **Mine services** – Existing service boreholes and compressor units exist on the pit top site. Other mine services located on the pit top include dirty and clean water management systems, sewage treatment, licensed mine water discharge points, workshops, storage bays, bathhouse, administration buildings and parking facilities. Power reticulation and access tracks support the operation of these mine services. Angus Place is in the process of procuring approval for additional mine service borehole to be situated at the proposed additional ventilation facility.
- **Mine dewatering** – Groundwater is currently pumped from the underground workings to the surface by the existing 940 dewatering borehole, for transfer to Wallerawang Power Station, using the Springvale – Delta Water Transfer Scheme (SDWTS). One emergency licensed discharge point (LDP006) exists as a contingency when water is unable to be transferred via the SDWTS. Some of the groundwater collected by underground pumps is pumped to the Angus Place pit top collection system. This water is discharged to Kangaroo Creek, a tributary of the Coxs River via Licensed Discharge Point 1 (LDP001).
- **Employment** – 225 permanent staff and provision for up to 75 contractors to assist with development activities approved from PA06_0021 Modification 1.
- **ROM stockpile** – Current stockpile capacity is: pit top site (90,000 tonnes) and Kerosene Vale (500,000 tonnes). When conveyed from the underground mine, coal is deposited on the pit top ROM stockpile prior to being crushed and transported off site to customers or to Kerosene Vale stockpile.
- **Coal preparation** – Coal is crushed on site within the CHP.
- **Land preparation** – As Angus Place is a well-established underground mine with adequate supporting infrastructure, minimal land preparation occurs. In recent years, minor land preparation has been undertaken to facilitate the Angus Place East resource exploration program.
- **Mine access** – Access to Centennial Angus Place is via an entrance from Wolgan Road. Access into the mine is via existing workings. Access to infrastructure situated on the Newnes State Forest is via the Old Bells Line of Road from Clarence.

- **Product coal transport** – All ROM coal produced is loaded into trucks, from the final product bin pit top after stockpiling and sizing. Coal is not trucked on public roads as dedicated private haul roads to transport coal have been installed as part of the infrastructure associated with the mine. The trucks transport the coal along two private haul roads to either Wallerawang or Mount Piper Power Stations. The Wallerawang Haul Road is only to be used during the hours of 07:00 to 22:00. The Mount Piper Haul Road's development consent allows for trucking 24 hours/day, 7 days a week, however it is limited to 5 loaded trucks per hour between 21:30 and 07:00 hours.
- **Coal destination** – all coal produced by Angus Place is transported via private haul roads to either Mount Piper or Wallerawang Power Station.
- **Site water management** – The surface water management system at Angus Place relies on the separation of clean and dirty water and the treatment of dirty water prior to discharge. Angus Place holds two licenced discharge points, LDP002 which discharges from the pit top and LDP003 which discharges from the Kerosene Vale Stockpile area. Treated water from the sewage treatment facility is irrigated onto the approved utilisation area. Current water management practice occurs in accordance with the Site Water Management Plan.
- **Rehabilitation** – Rehabilitation is currently undertaken on the Newnes State Forest only following the cessation of exploration activities. Angus Place is in the process of commencing rehabilitation activities at Kerosene Vale and recently undertook a Stage 2 Environmental Site Assessment in accordance with the *NSW Contaminated Land Management Act 1997*. This process will determine if there are any land contamination issues to be managed prior to rehabilitation. A Kerosene Vale Rehabilitation Plan has been prepared and circulated to the Department of Resources and Energy through the Angus Place Colliery Annual Environmental Management Report.
- **Operating times –** Angus Place is currently approved to operate activities 24 hours per day 7 days a week.

3.2 Existing Infrastructure and Operations

3.2.1 Surface Infrastructure

The existing Angus Place surface facilities supporting the underground operations are located adjacent to Wolgan Road, five kilometres north of the village of Lidsdale. The surface facilities include:

- Administration building and portable offices on the pit top site;
- Bathhouse with adequate facilities and services for the intended workforce;
- Coal Handling Plant and coal storage bins;
- Various workshops, service buildings and material storage sheds;
- Visitor and employee parking areas;
- Personnel and materials drift winder for access to underground workings;
- Coal conveyor drift and coal conveyor drive to transport coal from the underground workings to the surface at Angus Place Colliery;
- A ventilation fan installation at the Angus Place Colliery pit top;
- Coal stockpiles at both the Angus Place Colliery pit top and Kerosene Vale site;

- Diesel, solcenic and oil storage facilities;
- A dirty and clean water management control system; and
- Mine dewatering infrastructure.

3.2.2 Mining Method

The Longwall mining method is utilised at Angus Place. In the current mining area at Angus Place Colliery the longwall blocks have typically been approximately 3 km long by up to 287 m wide at an average depth of cover of 280 – 380 m. The longwall mining method is supported by roadway development, mined using continuous miner units. Development activities, using continuous miners entail the extraction of coal and installation of strata support to produce underground roadways which enable access to future longwall extraction areas.

3.2.3 Mine Ventilation System

The current ventilation system at Angus Place consists of three intake drifts, providing fresh air into the mine, and one upcast shaft which is connected to the mine fan. All these surface entry/exits are located on or within the vicinity of the current Angus Place pit top area. The current mine fan (the Howden fan) operates at approximately 4600 Pa and 230 m^3/s, providing sufficient ventilation for mining operations. A former mine fan (the Flakt fan) is still serviceable and "in-line" to the ventilation system (parallel to the Howden Fan). It is, however, only operated when the Howden fan has scheduled downtime.

Angus Place has prepared an Environmental Assessment regarding an application to modify its existing Project Approval for the construction and operation of an additional Angus Place Ventilation Facility (APC-VS2), to be located in the Newnes State Forest.

3.2.4 Power Supply Infrastructure

Centennial Springvale currently operates an overhead 66 kV power line to power its ventilation shaft No.3 site on the Newnes State Forest. This power line originates from Centennial Clarence Colliery and travels along a separate easement which generally follows the Blackfellows Hand Trail and later Beecroft Track.

3.2.5 Underground Mine Water Management

Water is extracted from the underground workings either through the in-seam water management system, which directs water to the Groundwater Collection System at the pit top. A portion of the mine water pumped to the pit top Groundwater Collection System is discharged via LDP001. Additional water is also extracted via the 940 dewatering bore, located on Newnes Plateau, which extracts mine inflows using submersible pumps from the low point in the mine to the surface where it is transferred into the SDWTS. **Plate 1** shows a typical dewatering site layout.

Plate 1 – A Typical Dewatering Facility Site

The SDWTS comprises a network of predominantly trenched pipelines that are connected to the Angus Place 940 bore and Springvale's existing Bore 6 and a second bore located at the Ventilation Shaft 3 Facility. Mine inflows are pumped out of the mine working using submersible pumps which deliver water directly into the SDWTS pipelines. Mine water pumped into the SDWTS via the 940 borehole is transferred to Wallerawang power station to be used as part of the cooling process. This importantly reduces the volume of water sourced by the power station from surface rivers and lakes that form part of the Sydney Catchment water supply.

3.2.6 Coal Handling and Transport

All ROM coal produced is transported to Mount Piper and Wallerawang Power stations on dedicated private haul roads by trucks.

3.2.7 Reject Management

No coal from Angus Place is washed and no reject management is required in the current operations.

3.3 Consents, Leases and Licences

The current consents held by Angus Place are listed in **Table 3**.

Angus Place additionally holds an Environment Protection Licence, Mining Lease and Consolidated Coal Lease, Exploration Licences, Subsidence Management Plan approval, Groundwater Licences, a Radiation Licence, two Occupation Permits and a Section 95 Certificate, and these are also listed in **Table 3**.

Table 3 - Current Consents, Leases and Licences

Consents and Approvals			
Reference	**Description**	**Expiry Date**	**Issued By**
PA06_0021 (Mod1)	Approved the extension of mining operations at Angus Place Colliery and increased the production limit to 4mtpa and the ability to haul this amount by truck	18/08/2024	DP&I
DA105/92	Held by Coal Link Pty Ltd for the purpose of a private haul route	Perpetuity	Lithgow City Council
2011/5952	Mining of Longwalls 910 and 900W	19/03/2032	SEWPAC
Leases			
Authority	**Type of Authority**	**Expiry Date**	**Holder**
ML1424	Mining Lease	18/08/2024	Centennial Angus Place Pty Ltd
CCL702	Sublease	24/11/2024	Coal Pac Pty Ltd
CCL704	Consolidated Coal Lease	14/01/2023	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
Licences			
Reference	**Description**	**Expiry Date**	**Issued By**
EPL467	Environment Protection Licence 467 issued under the Protection of the Environment Operations Act 1997 for mining of coal and coal works up to 5 million tonnes per annum	Anniversary 1 January	EPA
EL6856	Exploration licence to permit prospecting activities in accordance with DTIRIS -MR guidelines	8/09/12	DTIRIS
EL6293	Exploration licence to permit prospecting activities in accordance with DTIRIS -MR guidelines	16/09/14	DTIRIS
10BL601852	930 dewatering bore (decommissioned)	3/09/12	NOW
10BL601851	940 dewatering bore	3/09/12	NOW
10BL601838	Groundwater collection system	3/09/12	NOW
10BL601829	Newnes Plateau groundwater piezometers	Perpetuity	NOW
10BL603236	Piezometers across sites AP1PR to AP6PR	Perpetuity	NOW
10BL603802	Piezometers across sites AP8PR to AP12PR	Perpetuity	NOW
10BL604512	Licensing of geological boreholes and groundwater monitoring bores	Perpetuity	NOW
RR11830	Radiation licence for measuring product ash percentage in the coal handling plant fixed radiation gauge	7/07/2012	EPA

29229	Licence to sell/possess under the Radiation Control Act 1990	EPA	
Approvals			
Reference	**Description**	**Expiry Date**	**Issued By**
SMP Approval	Subsidence Management Approval for Longwalls 930 – 980	Extraction completion	DTIRIS - MR
Permits			
Reference	**Description**	**Issued By**	
Occupation Permits	Occupation Permit (PB 28362) is held by Angus Place Colliery and this covers all surface facilities associated with the Colliery that are located on State Forest land. Occupation Permit (PB 03797) extends into the Ben Bullen Forest to the west of the pit top.	Forests NSW	

3.4 Environmental Management System

Angus Place has an established Environmental Management System (EMS) that has been developed in accordance with the Centennial Coal Environmental Management System Framework.

The EMS has been developed and implemented to ensure the effective management of environmental aspects and impacts and compliance with regulatory requirements while providing a means for continued improvement in the environmental performance of the Angus Place Colliery. The EMS incorporates a number of environmental management plans that are designed to assist in meeting community and regulatory expectations.

Angus Place Colliery has the following management plans. These documents provide a framework for the planning of mining operations while considering potential environmental issues and their management on site.

Table 4 – Angus Place Colliery Environmental Management Plans

Management Plan or System	Purpose
• Public Safety Management Plan	This describes the processes developed to ensure Public Safety in any surface areas that may be affected by subsidence arising from longwall mining in the SMP area at Angus Place Colliery. The Management Plan fulfils the requirements of Condition 16 of the Angus Place Subsidence Management Plan Approval.
• Infrastructure Management Plan	The Infrastructure Management Plan has been developed to manage the risks to infrastructure as a result of surface subsidence and mining operations.
• Kangaroo Creek Management Plan	The purpose is to measure and manage potential subsidence impacts from longwall mining (within the SMP area) on Kangaroo Creek. The Kangaroo Creek Management Plan fulfils the requirements of Condition 2a of the Angus Place Subsidence Management Plan Approval. The document describes the environmental monitoring, reporting program and management to detail how the effects of subsidence on Kangaroo Creek are to be monitored and managed. This includes baseline data collection, investigation, assessment and regular reviews. The program aims to identify appropriate management measures to remediate/mitigate any subsidence impacts.
• Land Management Plan	The purpose is to ensure adequate management of any impacts associated with surface cracking, erosion, soil slumping and land

Management Plan or System	Purpose
	degradation caused by subsidence due to longwall mining and/or activities associated with subsidence monitoring or other management actions by Angus Place in the Subsidence Management Plan area. The Land Management Plan has been developed and implemented to comply with the requirements of Condition 20 within PA06_0021.
• Environmental Management Strategy	This describes the overall environmental management strategy at Angus Place Colliery.
• Environmental Monitoring Program	The Environmental Monitoring Program provides the details of monitoring work and reporting functions in response to the various management plans. The purpose of environmental monitoring is to gather data on the performance of the operation and determine the need for improvements or additional mitigation measures in order to achieve the assessment criteria for the operation.
• Subsidence Management Plan	Approval granted from DII. Variations of the SMP were approved by the DII in October 2005, October 2006 and March 2008.
• Extraction Plan	Schedule 3 Condition 3C requires Angus Place to develop an extraction plan regarding the secondary extraction of LWs 910 and 900W. This secondary extraction phase is currently scheduled to commence in July 2014 and as such Angus Place will develop the Extraction Plan and seek approval prior to this date.
• Subsidence Community Consultation Process	Angus Place Colliery has as an approved Subsidence Management for longwalls 930 – 980. The SCCP fulfils the requirements of Condition 2c (SMP approval dated 19/01/2007) of the Angus Place SMP Approval. The objectives of this SCCP include: • Developing an effective process to communicate with relevant stakeholders regarding the subsidence from Angus Place activities on the Newnes Plateau; • Defining the responsibilities in respect of the communication paths and forums; • Implementing a system to monitor and manage issues from relevant stakeholders; and • Providing the Angus Place complaints protocols.
• Subsidence Management and Reporting Program	The purpose is to provide a subsidence monitoring and reporting program to measure how the effects of subsidence are proposed to be monitored. The program includes monitoring both pre and post mining in Longwalls LW930 – LW980 (the SMP area). This Management Plan fulfils the requirements of Condition 11 and partially fulfils the requirements of Condition 17 with respect to the development of a program to ensure on-going baseline data collection, investigation, assessment and regular reviews with the relevant stakeholders.
• Flora and Fauna Management Plan	The purpose of the Flora and Fauna Management Plan is to protect threatened species and communities, minimise impact on native flora and fauna, manage clearing on the site, control weeds, control access to environmentally sensitive areas and manage any potential conflicts between flora and fauna.
• Newnes Plateau Shrub Swamp Management Plan	The purpose of this Management Plan is to measure and manage potential subsidence impacts from longwall mining (within the Subsidence Management Plan (SMP) area) on the Newnes Plateau Shrub Swamps at Angus Place.
• Air Quality Management Plan	The Air Quality Monitoring Program sets out methods of monitoring dust generated from Angus Place Colliery.
• Noise Monitoring Program	This program sets out procedures for monitoring and assessing noise impacts from Angus Place Colliery to acceptable levels for residential neighbours and regulatory stakeholders. A key outcome is that the Noise Monitoring Program needs to demonstrate compliance with the noise level criteria set out in the existing Project Approval. Quarterly noise monitoring is undertaken at residential properties, colliery surface plant and the haul road and additional noise monitoring is undertaken in response to noise complaints.
• Site Water Management Plan	This Management Plan aims to coordinate the management of all surface water within the Angus Place Colliery Holding Boundary in an efficient and sustainable manner. Angus Place is proposing to update the Site Water Management Plan during 2012 with regard to an

Management Plan or System	Purpose
	enhanced hydrogeological model and site water balance.
• Groundwater Management Plan	The Groundwater Management Plan aims to coordinate the management of all ground water within the Angus Place Colliery Holding Boundary in an efficient and sustainable manner.
• Contractor Environmental Management Plan	The CEMP aims to ensure that all activities carried out on behalf of Angus Place comply with internal and external practices and guidelines for the impacts generated by the proposed activity.
• Bushfire Management Procedure and Management of Bushfire Assets Procedure	These set out the procedures for reporting fire and for the inspection and maintenance of firebreaks and asset protection zones at Angus Place Colliery and on the Newnes Plateau.
• Wallerawang Haul Road Inspection Protocol	Directs haul road inspections to assess the surface conditions and identify areas requiring maintenance/additional work to repair surface deformations, which may increase noise levels when vehicles pass over them.
• Wallerawang Haul Road Landscape Management Plan	The purpose of the Wallerawang Power Station Coal Haul Road Landscape Plan is to provide for the establishment and maintenance of landscaping measures to minimise the visual impacts of the haul road, particularly those from residential areas.
• Erosion and Sediment Control Plan	In compliance with Schedule 3, Condition 10 of PA 06_0021, the ESCP has been prepared in accordance with the Department of Housing's Managing Urban Stormwater: Soils and Construction Manual, 2004 (the 'Blue Book'). The ESCP includes the following: ▪ Identification of potential sources of sediment; ▪ Description of management principles to be implemented; ▪ Description of the erosion sediment control structures in place; and ▪ Description of measures to be implemented to decommission structures over time.
• Rehabilitation Management Plan	A Rehabilitation Management Plan will be prepared in accordance with Schedule 3 Condition 37. This document is to be prepared prior to the secondary extraction of LWs 910 and 900W.
• Ventilation Management System	In accordance with Clause 21 of the Coal Mine Health and Safety Regulation 2006, Angus Place has implemented a Ventilation Management System. The objectives of this management system are to ensure as far as reasonably practicable the safety of all persons present at the coal operation with regard to mine ventilation.
• Strata Failure Management System	In accordance with Clause 28b (ii) of the Coal Mine Health and Safety Regulation 2006, Angus Place has implemented a Ventilation Management System. The objectives of this management system are to ensure as far as reasonably practicable the safety of all persons present at the coal operation with regard to underground strata.

4.0 PROPOSED PROJECT

4.1 Background

Angus Place is seeking approval for its Mine Extension Project based on resource modeling within the Angus Place Colliery Holding Boundary. This involves an extension to current mining practices through longwall extraction methods which would extend the mine life by up to 25 years. The Project will continue to use existing surface and underground facilities at Angus Place.

New facilities and modifications to existing facilities are required to support the Project. The proposed new facilities will assist with ensuring adequate underground mine ventilation in accordance with Clause 13(h) of the *Coal Mine Health and Safety Regulation 2006* as well as mine dewatering and ancillary support such as power.

4.2 Project Application Area

The Project Application Area is identified in **Figure 2**.

4.3 Mining Method

Angus Place is proposing to continue to use longwall mining methods for the Project. A conceptual mine plan, showing proposed areas of longwall mining, is provided in **Figure 4**.

4.3.1 Longwall Mining

It is proposed to extract the coal from the Lithgow seam within the Angus Place East area by longwall mining generally in accordance with the mining layout shown on **Figure 4**. The longwalls are in an east north-east to west south-west orientation, which generally aligns with the horizontal stress direction. Computer generated models have indicated that this orientation would maximise resource recovery at the western end of the longwall blocks whilst continuing to utilise Angus Place's existing longwall equipment.

The eastern portion of the Project Application Area referred to as Angus Place East, has been identified as an area suitable for longwall mining due to the underground geotechnical conditions. The weak roof anticipated in this area would facilitate longwall mining which is the only viable method of extraction at depths of cover exceeding 200m.

Roadways will be driven at a nominal width of 4.8 m. Development roadway height is proposed to be between 2.8 m and 3.2 m. Longwall width will be approximately 360 m. However, the final dimensions of the longwall blocks will be contingent on the occurrence of sensitive surface features on Newnes Plateau and subsidence predictions to be undertaken during the EIS. Surface features, such as swamps, cliff-lines, significant rock features, water courses and sites of cultural significance, which are sensitive to mine induced subsidence are apparent within the Project Application Area. These sensitive surface features will ultimately influence the siting and the layout of the mine plan that will be proposed in the EIS, i.e., the mine plan will avoid potentially adverse impacts, wherever practical and feasible in the final mine plan.

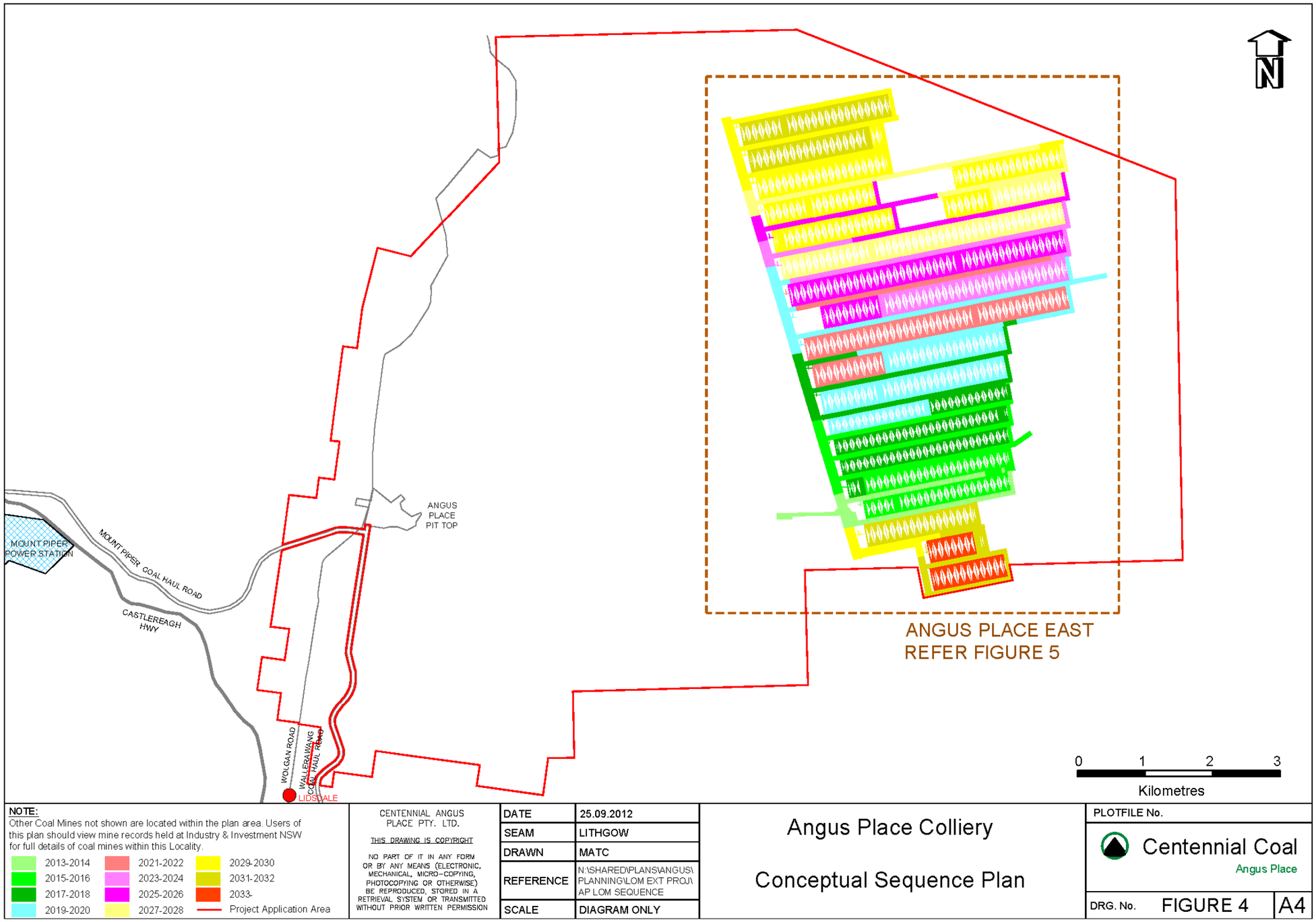


Figure 4 – Conceptual Angus Place East Sequence Plan

4.4 Coal Handling and Transport

ROM coal will continue to be transported underground from the longwall face to the ROM stockpile at the pit top by a high capacity conveyor system. Coal will then be sized and dispatched using trucks on dedicated private haul roads (Wallerwang Haul Road and Mount Piper Haul Road) to the Mount Piper or Wallerawang Power Stations.

The construction and operation of a new private haul road linking the Springvale Coal Services site with the Mount Piper Haul Road is being proposed as part of the Springvale Coal Services Project (refer **Appendix 2** and Section 4.12). The purpose of this link is to enable coal from Angus Place pit top to be delivered to the Springvale Coal Services Site for processing and distribution.

It is noted that the coal preparation and transfer of coal from the Angus Place pit top area to final destinations will be undertaken on the Springvale Coal Services consent. Approval for the transfer of coal beyond the Springvale pit top is not being sought as part of the Project.

4.5 Reject Management

Coarse and fine reject materials generated at the Springvale Coal Services site through processing of ROM coal from Angus Place (and other mines) will be managed under their consent. Given the washing of ROM coal transported from Angus Place pit top will be undertaken within the Springvale Coal Services site on their consent, no approval for reject emplacement is being sought for the Project.

4.6 Surface Water Management

Appropriately sized water management structures will be constructed to manage clean and dirty water at the proposed dewatering borehole sites and downcast ventilation facility. Each compound will be adequately lined with sediment fencing.

Centennial is working towards a regional water strategy involving beneficial reuse of mine water from the Springvale Coal Services Site, Springvale Mine, Angus Place Colliery and other Centennial operations. This will be discussed further in the EIS.

4.7 Ventilation Services

Mine planning regarding the longwalls within Angus Place East area has identified that additional ventilation capacity is required to ensure compliance with Clause 13(h) of the *NSW Coal Mine Health and Safety Regulation 2006*. To optimise the existing ventilation system it is proposed to construct a downcast (intake) ventilation facility to deliver fresh air to the underground mine. This facility, identified as Angus Place Ventilation Site 2 (APC – VS3), is proposed to be situated approximately 4 km to the north of the Angus Place Ventilation Site 2 (APC-VS2) location within the Newnes State Forest. The construction and operation of the APC-VS3 downcast facility is considered most appropriate and cost effective solution to allow the mining operations to continue safely. Once constructed the APC-VS3 will not require any supporting infrastructure, such as electrical power.

The APC-VS3 infrastructure has been positioned to fit in with the layout of the proposed underground roadways within the Angus Place East longwall area and the existing surface infrastructure within Newnes State Forest such as forest roads and tracks. Known sensitive natural surface features will be avoided in designing the layout. The proposed remote location of APC-VS3 will minimise any potential construction related impacts on the regional community.

4.8 Dewatering Provisions

Based on the contours of the coal seam it is proposed to provision for several dewatering boreholes at the eastern end of specific longwall panels within the Angus Place East area. Inferred from the geological exploration program is the fact that the seam dips in a north-easterly direction, implying that the movement of groundwater occurs from the south-west to the north-east. A number of dewatering borehole sites will be established within the Project Application Area. Hydrogeological modeling and the consideration of surface topography has determined several areas in the vicinity of the proposed Angus Place East area, in which dewatering borehole sites may be required. These sites will be identified and discussed further in the EIS.

Each proposed borehole site will be equipped with submersible pump(s) and ancillary surface control equipment. All dewatering boreholes will continue to deliver water into the SDWTS, discussed in Section 3.6. An extension of this scheme northwards from Springvale Colliery's Dewatering Borehole 6 site is required as part of this Project. The extent of the extension and the access routes to be used for the SDWTS infrastructure corridor will be discussed in detail in the EIS

4.9 Power supply Infrastructure

It is proposed to extend the existing power supply (refer Section 3.5) along Sunnyside Ridge Road in order to operate the proposed dewatering boreholes sites.

4.10 Exploration Drilling and Angus Place Coal Reserves

Angus Place will continue to undertake exploration activities within the Project Application Area.

4.11 Consequences of Not Proceeding

In the event that the proposed Project does not proceed, Angus Place will likely cease longwall operations following the extraction of Longwall 910. Based on the current mine schedule this is forecast for March 2016.

Most importantly, the extraction of LW910 means that access to the Angus Place East coal reserves using the present mine surface infrastructure would be lost. To avoid this, the current life of mine planning is that all of the Angus Place East coal reserves would be extracted and then LW910 would be the last longwall block extracted at Angus Place Colliery.

4.12 Relationship Between the Proposed Springvale Coal Services Upgrade Project and the Angus Place Mine Extension Project

In order that both the existing Project Approval for the Angus Place Colliery and the Project are ultimately compatible with the proposed development consent for the Springvale Coal Services Upgrade Project, the grant of development consent for both Projects would necessitate the following modifications to be incorporated into the new approval for the Angus Place Colliery:

- Express approval being granted to haul coal from Angus Place to the washery (or the Coal Preparation Plant) at Springvale Coal Services Site via that Project's proposed private haul road. The conditions which regulate the construction and maintenance of this new private haul road would be contained in the development consent for the Springvale Coal Services Upgrade Project, but the conditions regulating the use of the private haul road should be contained in the development consent for Angus Place; and

- The deletion of conditions which impose responsibility for the maintenance and landscaping of the existing private haul road from Angus Place to the Wallerawang Power Station. These

conditions, which are conditions 26 and 29 in Schedule 3 of Angus Place Part 3A Approval, will be redundant because the maintenance and landscaping of the road would be regulated by the new development consent for the Springvale Coal Services Upgrade Project.

5.0 PERMISSIBILITY AND STRATEGIC PLANNING

5.1 Introduction

This section sets out the planning and environmental regulatory framework applicable to the Project, including the identification of relevant strategic planning documents, environmental planning instruments and key development standards. Both NSW and Commonwealth legislation are identified.

5.2 Commonwealth Legislation

5.2.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) came into effect on 16 July 2000 and is administered by the Commonwealth Department of the Sustainability, Environment, Water, Population and Communities (SEWPaC). Part 3 of the EPBC Act states that an action that has, will have or is likely to have a significant impact on a Matter of National Environmental Significance (MNES), may not be undertaken without prior approval of the Minister for SEWPaC. MNES include:

- Listed threatened species, ecological communities and migratory species; and
- Protected areas such as Ramsar wetlands of international significance and world heritage properties.

The EPBC Act contains an assessment and approval process for proposed actions which are a 'controlled action' because it will have, or is likely to have, a significant impact on a MNES.

5.3 New South Wales State Legislation

5.3.1 Environmental Planning and Assessment Act 1979

The EIA and approval system in NSW is set out in Parts 3A (repealed), 4 and 5 of the EP&A Act. With the repeal of Part 3A, a new assessment system for projects of genuine state significance came into effect on 1 October 2011 under Part 4; Division 4.1 of the EP&A Act. The state significant assessment system establishes two separate assessment pathways known as State significant development (SSD) and State significant infrastructure (SSI). Projects that fall into these categories are assessed by the Department of Planning and Infrastructure. All NSW coal mining developments are deemed a State significant development under Schedule 1(5) of the NSW State Environmental Planning Policy (State and Regional Development) 2011. The Minister for Planning and Infrastructure (or delegate, such as the NSW Planning Assessment Commission) determines development applications for SSD Projects under Part 4; Division 4.1 of the EP&A Act.

5.3.1.1 Application of Division 4.1 in Part 4 of the EP&A Act and the Permissibility of the Project

Upon the repeal of Part 3A of the EP&A Act on 1 October 2011, the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011* inserted a new Division 4.1 in Part 4 of the EP&A Act. This Division provides for a new planning assessment and determination regime for "Stage significant development".

Under section 89C of the EP&A Act, development will be "State significant development" if it is declared to be such by the new *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Clause 8(1) of the SRD SEPP provides:

> **8 Declaration of State significant development: section 89C**
>
> (1) Development is declared to be State significant development for the purposes of the Act if:

(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and

(b) the development is specified in Schedule 1 or 2.

- The Project is "State significant development" because it meets each of the two limbs in clause 8(1) of the SRD SEPP – that is:
- the Project is not permissible without development consent on the land on which the Project will be carried out; and
- the Project is development that is specified in Schedule 1 to the SRD SEPP.

Each limb is briefly discussed in turn below.

Permissibility of the Project

Clause 7(1) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) provides:

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.;

…

(e) mining on land that is reserved as a state conservation area under the *National Parks and Wildlife Act 1974*,

The Mining SEPP applies to the whole of NSW and pursuant to clause 5(3) of the Mining SEPP, prevails over any other environmental planning instrument to the extent of any inconsistency (except in respect of the Majors Projects SEPP, Coastal Wetlands SEPP and Littoral Rainforests SEPP). The practical effect of clause 5(3) is that if there is any inconsistency between the provisions in the Mining SEPP and those contained in any other environmental planning instrument, including relevantly the *Lithgow Local Environment Plan 1994*, the provisions of the Mining SEPP will prevail.

"Underground mining" is defined for the purposes of the Mining SEPP as follows:

underground mining means:

(a) mining carried out beneath the earth's surface, including bord and pillar mining, longwall mining, top-level caving, sub-level caving and auger mining, and

(b) shafts, drill holes, gas and water drainage works, surface rehabilitation works and access pits associated with that mining (whether carried out on or beneath the earth's surface),

but does not include open cut mining.

And further, "mining" is defined for the purposes of the Mining SEPP as follows:

mining means the winning or removal of materials by methods such as excavating, dredging, or tunnelling for the purpose of obtaining minerals, and includes:

(a) the construction, operation and decommissioning of associated works, and

(b) the stockpiling, processing, treatment and transportation of materials extracted, and

(c) the rehabilitation of land affected by mining.

Accordingly, because the Project in its entirety can be characterised as development for the purpose of "underground mining" (which incorporates in its definition the defined term "mining") the Project is permissible with development consent on all of the land on which the Project will be carried out.

The Project is development specified in Schedule 1 to the SRD SEPP

Clause 5(1)(a) in Schedule 1 to the SRD SEPP specifies the following development:

5 Mining

(1) Development for the purpose of mining that:

(a) is coal … mining, or

…

Given that the Project in its entirety is development for the purpose of coal mining, the Project is development specified in Schedule 1 to the SRD SEPP.

As each of the two limbs in clause 8(1) of the SRD SEPP can be satisfied, the Project is declared to be "State significant development". As a consequence of this declaration, the Minister is the consent authority for the Project (EP&A Act, section 89D(1)).

The Minister has delegated his consent authority function for certain "State significant development", relevantly:

- to the NSW Planning Assessment Commission (PAC) for development applications made by private proponents for "State significant development"; and
- to officers of DP&I for development applications which have attracted less than 25 public submissions objecting to the development and where the local council has not objected.

5.3.1.2 Application of other Provisions of the EP&A Act to the Project

The other applicable provisions of the EP&A Act are:

- The objects of the EP&A Act set out in section 5 of the EP&A Act, relevantly:
    - to encourage the proper management of natural resources, including minerals, for the purpose of promoting the social and economic welfare of the community;
    - to encourage the promotion and co-ordination of the orderly and economic use and development of land; and
    - to encourage ecologically sustainable development;
- Divisions 6 and 6A of the EP&A Act, relating to contributions and affordable housing provisions;
- Section 89J of the EP&A Act, which provides that the following authorisations are not required for the Project if it is approved State significant development:
    - the concurrence of the Minister administering Part 3 of the *Coastal Protection Act 1979*;
    - a permit under sections 201, 205 or 219 of the *Fisheries Management Act 1994;*

- an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977;*
- an Aboriginal heritage impact permit under the *National Parks and Wildlife Act 1974;*
- an authorisation under section 12 of the *Native Vegetation Act 2003;*
- a bush fire safety authority under section 100B of the *Rural Fires Act 1997*;
- a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*;

- Section 89K of the EP&A Act, which provides that the following authorisations cannot be refused if they are necessary for the carrying out of the Project if it is approved State significant development, and that the authorisations granted must be substantially consistent with the Project's State significant development consent:
  - an aquaculture permit under section 144 of the *Fisheries Management Act 1994*;
  - an approval under section 15 of the *Mine Subsidence Compensation Act 1961*;
  - a mining lease under the *Mining Act 1992*;
  - a production lease under the *Petroleum (Onshore) Act 1991*;
  - an environment protection licence under the *Protection of the Environment Operations Act 1997*;
  - a consent under section 138 of the *Roads Act 1993*;
  - a licence under the *Pipelines Act 1967.*

5.3.2 Other NSW State Legislation

The provisions and requirements of additional NSW legislation will be considered and addressed within the EIS. A summary of potentially relevant Acts is included in **Table 5**.

Table 5 - Summary of NSW Legislation Relevant to the Project

Legislation	Relevance to the Project
Protection of the Environment Operations Act 1997	The *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the Environment Protection Agency (EPA), which is part of the Office of Environment and Heritage (OEH). The POEO Act regulates and requires licensing for environmental protection, including for waste generation and disposal, and for water, air, land and noise pollution. Under the POEO Act, an Environment Protection Licence (EPL) is required for premises at which a "scheduled activity" is conducted. Schedule 1 of the POEO Act lists activities that are scheduled activities for the purposes of the Act. Angus Place Colliery is a scheduled activity and operates under EPL 467.
Mining Act 1992	Angus Place Colliery current holds Consolidated Coal Lease 704 (CCL704), CCL702 as a sublease and Mining Lease 1424 (ML1424). New mining leases will be required within sections of the Project Application Area.
Water Management Act 2000	The *Water Management Act 2000* (WM Act) and the *Water Act 1912* are

Legislation	Relevance to the Project
and Water Act 1912	administered by the NSW Office of Water (NOW) and contains approval requirements for some developments to protect watercourses from any adverse effects resulting from works within or in proximity of these watercourses. The WM Act is relevant to this Project as the Project Application Area is within the Greater Metropolitan Water Sharing Plan (WSP) – groundwater sources and unregulated rivers (surface water). The WSP is situated with the Sydney Basin Richmond Groundwater Source, the Sydney Basin Coxs River Groundwater Source, the Hawkesbury and Lower Nepean Rivers Water Source/Colo River Management Unit / Colo River Catchment Sub Zone and the Upper Nepean & Upstream Warragamba Water Source/Wywandy Management Zone. Section 91 of the WM Act details activity approvals to be considered with regard to developments proposed within a WSP. The two activity approvals stipulated under Section 91, namely controlled activity approvals and aquifer interference approvals, will be investigated for applicability. Angus Place Colliery holds several water licences issued under the *Water Act 1912*.
National Parks and Wildlife Act 1974	The *National Parks and Wildlife Act 1974* (NPW Act) is administered by the National Parks and Wildlife Service (NPWS) and provides for the establishment, care, control, and management of National Parks, historic sites, nature reserves, State conservation areas, Aboriginal areas, and State game reserves. An archaeological survey will be conducted as part of the EIS, which will identify the presence of any known Aboriginal sites, as well as strategies for the management and mitigation of any identified impacts on such sites. No Aboriginal heritage impact permit will be needed for the Project if development consent is granted. Refer to Section 89J of the EP&A Act.
Heritage Act 1977	The purpose of the Heritage Act 1977 (Heritage Act) is to protect and conserve non-indigenous cultural heritage, including scheduled heritage items, sites, and relics. The Heritage Act is administered by the NSW Office of Environment and Heritage within DP&I. The archaeological survey to be undertaken as part of the EIS will identify any items of heritage significance in the Project Site and recommend appropriate management strategies if and where required. No approval under Part 4 of the Heritage Act will be needed for the Project if development consent is granted. Refer to Section 89J of the EP&A Act.
Threatened Species Conservation Act 1995	The *Threatened Species Conservation Act 1995* (TSC Act) provides for the conservation of threatened species, populations, and ecological communities of animals and plants. The EIS will identify any threatened species in the Project Application Area, as well as strategies for the management and mitigation of impacts.
Roads Act 1993	Under section 138 of the Roads Act 1993, consent from the appropriate roads authority is required to: • erect a structure or carry out a work in, on or over a public road; • dig up or disturb the surface of a public road;

Legislation	Relevance to the Project
	• remove or interfere with a structure, work or tree on a public road; • pump water into a public road from any land adjoining the road; or • connect a road (whether public or private) to a classified road, otherwise than with the consent of the appropriate roads authority. However, if the Project is granted development consent, by the operation of section 89K of the EP&A Act the appropriate roads authority must grant any section 138 consent necessary for the Project, and that consent must be substantially consistent with the development consent. Regardless, additional approvals for road works are not anticipated to be required for the Project.
Crown Lands Act 1989	The *Crown Lands Act 1989* provides for the administration and management of Crown land in the Eastern and Central Division of NSW (which includes the Project Application Area). A lease, licence or, where appropriate, an easement, to use Crown land would be required where use of Crown land is required for the Project (e.g. the State Conservation Areas).
Fisheries Management Act 1994	Generally, a permit must be obtained under the Fisheries Management Act 1994 for any works that involve dredging or reclamation, any structure that may inhibit or obstruct the movement of fish within a waterway or cause damage or destruction on marine vegetation. However, under section 89J of the EP&A Act, such permits are not required for State significant development the subject of a development consent. Regardless, the Project is unlikely to impact on fish habitat or waterways.
Aboriginal Land Rights Act 1983	The *Aboriginal Land Rights Act 1983* provides for the constitution of Local Aboriginal Land Councils and the NSW Aboriginal Land Council. It also provides a mechanism for Aboriginal Land Councils to claim Crown Land. The currency of any claim will be reviewed during the EIS preparation.

5.3.3 State Environmental Planning Policies

The following State Environmental Planning Policies (SEPPs) could apply to the Project and will be considered as part of the EIS.

5.3.3.1 State and Regional Development SEPP

The application of the SRD SEPP to the Project has been discussed in Section 5.3.1.1 above.

5.3.3.2 Mining SEPP

The aims of the Mining SEPP are listed below and recognise the importance to NSW of mining, petroleum production and extractive industries:

- 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;
- to facilitate the orderly and economic use of development of the land containing mineral, petroleum and extractive material resources; and

- to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive resources.

The application of the Mining SEPP to the Project has been discussed in Section 5.3.1.1 above.

In addition, clauses 12, 13, 14, 15, 16 and 17 of the Mining SEPP set out matters that the Minister must consider before determining the development application for the Project. These matters will be considered in the Project's EIS.

5.3.3.3 State and Environmental Planning Policy No 33 – Hazardous and Offensive Development

The State and Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33) requires the consent authority to consider particular matters in determining a development application for a project that is a potentially hazardous industry or potentially offensive industry.

A Preliminary Hazard Analysis will be prepared for the Project for inclusion in the EIS if it is determined to be a potentially hazardous industry, as that expression is defined in SEPP 33.

5.3.3.4 State and Environmental Planning Policy No 44 – Koala Habitat Protection

The aim of *State Environmental Planning Policy 44 – Koala Habitat Protection* (SEPP 44) is to encourage the 'proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.'

SEPP 44 applies to each local government area listed in Schedule 1 of SEPP 44, excluding land dedicated or reserved under the NPW Act or land dedicated under the *Forestry Act 1916* as a State forest or flora reserve.

The Project Application Area is located within the Greater Lithgow LGA which is listed within Schedule 1 of SEPP 44. Therefore, SEPP 44 applies to the Project Application Area, excluding that part of the Project Application Area within the Mugii Murum-ban State Conservation Area,

SEPP 44 restricts councils, only, from granting development consent for proposals on land identified as core koala habitat without the preparation of a Plan of Management. Although it is the Minister (and not the council) that is the consent authority for the Project, the potential for the Project to impact on land identified as core koala habitat will be assessed as part of the EIS for the Project.

5.3.3.5 State and Environmental Planning Policy (Infrastructure) 2007

Clause 45 of State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) is relevant if the Project involves the penetration of ground within 2m of an underground electricity power line or an electricity distribution pole, or within 10m of any part of an electricity tower. It will also be relevant if the Project is within or immediately adjacent to an easement for electricity purposes, an electricity substation or within 5m of an overhead electricity power line. If clause 45 applies, the Minister must give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks and take into consideration any response to the notice that is received within 21 days of the notice being given.

5.3.3.6 State and Environmental Planning Policy No 55 (Remediation of Land)

State Environmental Planning Policy No 55 (Remediation of Land) (Contamination SEPP) provides that the Minister must not consent to the carrying out of the Project unless it has considered certain matters relating to whether or not the Project land is contaminated.

The relevant provisions of the Contamination SEPP will be addressed in the EIS.

5.3.4 Local Environment Plans

Lithgow Local Environment Plan

The Project Application Area is located within the *Lithgow City Local Environment Plan 1994* (Lithgow City LEP) and is zoned 1(c) Rural (small holdings) and 1(f) Rural (Forestry). A 'mine' is permissible with consent in this zone. Consequently, the Minister can approve the carrying out of the Project pursuant to the State Significant Development provision of Part 4 of the EP&A Act.

Under clause 11(1) of the Lithgow City LEP, before determining a development application relating to land within Zone No 1 (a), the Council must take into consideration the effect that the proposed development would have on:

- the present use of the land, and the potential for sustained agricultural production of so much (if any) of the land as is prime crop and pasture land,
- vegetation, timber production, land capability and water resources (including the quality of the water, stability of water courses, ground water storage and riparian rights),
- the future recovery from known or prospective areas of valuable deposits of minerals, coal, petroleum, sand, gravel or other extractive materials,
- the protection of areas of nature conservation significance or of high scenic or recreational value, and of items of heritage significance,
- the cost of providing, extending and maintaining public amenities and services,
- development on adjoining land and on other land in the locality, including any cumulative impact, and
- the future expansion of settlements in the locality.

The Minister (not the Council) is the consent authority for the Project. Notwithstanding, the abovementioned provision of the Lithgow City LEP, insofar as it is relevant to the Project, will be considered in the EIS. Further, the provision will be considered having regard to the application of clause 8 of the Mining SEPP. Clause 8 provides:

> **8 Determination of permissibility under local environmental plans**
>
> (1) If a local environmental plan provides that development for the purposes of mining, petroleum production or extractive industry may be carried out on land with development consent if provisions of the plan are satisfied:
>
> (a) development for that purpose may be carried out on that land with development consent without those provisions having to be satisfied, and
>
> (b) those provisions have no effect in determining whether or not development for that purpose may be carried out on that land or on the determination of a development application for consent to carry out development for that purpose on that land.
>
> (1) Without limiting subclause (1), if a local environmental plan provides that development for the purposes of mining, petroleum production or extractive industry may be carried out on land with development consent if the consent authority is satisfied as to certain matters specified in the plan, development for that purpose may be carried out on that land with development consent without the consent authority having to be satisfied as to those specified matters.

5.3.5 Local Environment Plans

Lithgow City Council has prepared the Draft Land Use Strategy 2010-2030 (LLUS) which has been exhibited and amended in accordance with Council's resolutions, and has now been forwarded to the NSW Department of Planning and Infrastructure for endorsement.

The LLUS is a combined Land Use Issues Paper and Strategy. It explores the issues that currently face the Lithgow LGA and recommends a new planning approach to address these issues. The Strategy will be implemented through the planning system, primarily through a new Local Environmental Plan and Development Control Plan, as well as Council's other policy, regulatory and governance functions.

This Strategy is significant to Council and the community because it will set directions and policy for the LGA's settlement and land use management for the next 20 years. The Strategy will be reviewed throughout this period every five years to ensure that its findings and recommendations remain relevant, are in keeping with sound planning principle and are continuing to meet the needs and expectations of the community.

6.0 KEY ENVIRONMENTAL ISSUES

6.1 Identification of Environmental Issues

The key project-related issues warranting detailed assessment in the EIS will be identified through:

- The existing environmental context of the Project Application Area and surrounding locality;
- The legislative framework applicable to the Project;
- A preliminary environmental risk assessment, which has already been completed;
- The outcomes of consultation to be undertaken with government agencies and other relevant stakeholders; and
- Specialist studies completed as part of the preparation of the EIS.

The outcomes of the preliminary environmental risk assessment, including the issues identified for further detailed assessment in the EIS, are discussed in Section 6.2. These issues will form the basis of the EIS, subject to the outcomes of consultation with government agencies, including the Director General Requirements, as well as outcomes of the specialist assessments as they progress.

6.1.1 Preliminary Risk Assessment

The preliminary identification and assessment of hazards and risks (aspects and impacts) associated with the Project is required to provide direction and context for the various components associated with the EIS. The outcomes gained in terms of risk ratings and recommended controls will specifically guide the development of the assessment work scopes.

The primary objectives of the environment and community risk assessment included:

- Identifying those issues relating to the Project that represent the greatest risk to the environment and local community;
- Determination of the consequence of the issue occurring;
- Determination of the likelihood of the issue occurring;
- Assessment of the risk by determining the probability (likelihood) and consequence (effect) of each hazard/impact; and
- Assisting in setting the level of assessment required to address each identified risk within the EIS.

Centennial Coal's Risk Management Standard Risk Matrix is used to calculate the consequence and likelihood of an event to evaluate the subsequent risk level (risk rank). This system operates in accordance with AS/NZS 4360:2004 *Risk Management*.

The issues that were specifically assessed in the risk assessment include:

- Flora and Fauna
- Aboriginal/Cultural Heritage
- European Heritage
- Noise
- Surface Water
- Groundwater
- Water Management
- Greenhouse Gas

- Air Quality
- Traffic
- Visual Impact
- Cumulative Impact
- Social Impact
- Erosion/sedimentation
- Bushfire
- Subsidence
- Surface Infrastructure
- Land Clearance
- Cliff lines and rock features
- Economic Impact
- Community and Public Safety
- Rehabilitation
- Soil and land

Once they were identified, the various project risks were assessed in light of the mitigation measures and management strategies already in place (i.e. documented in management plans and operational procedures). Where the risks were considered unacceptable, or a knowledge gap was identified in the information available, specialist consultants will be engaged to undertake further assessments and to present additional mitigation measures that may be required.

A Risk Assessment report, including a risk register, was prepared to document the outcomes of the risk assessment, and is attached as **Appendix 3**. A summary of the Centennial Coal risk matrix used and the management requirements in accordance with the Centennial Risk Standard and Risk Matrix is provided in **Table 6**.

Table 6 - Requirements for Management of Risks (Centennial Coal Risk Standard)

Risk Ranking	Risk Category		Generic Management Actions
1 to 4	E	Extreme	Immediate intervention required from senior management to eliminate or reduce this risk.
5 to 9	H	High	Imperative to eliminate or reduce risk to lower level by the introduction of control measures. Management planning required at senior level.
10 to 15	S	Significant	Corrective action required, senior management attention needed to eliminate or reduce risk.
16 to 19	M	Moderate	Corrective action to be determined, management responsibility must be specified.
20 to 25	L	Low	Monitor and manage by corrective action were practicable.

The risk assessment did not identify any ‘extreme’ issues relating to the Project. The risk assessment identified one ‘high’ environmental issue. There is a risk to Angus Place by the mine life not being extended caused by no approval for the mine life extension resulting in mine closure. To ensure each risk is adequately assessed in the EIS several recommended controls were determined to direct the additional assessment work and to enable the specialist consultants to identify suitable mitigation measures.

The impact of greenhouse gas (GHG) emissions on the business due to the potential costs of GHG abatement was identified as a ‘significant’ risk to the project. Additionally, the issue of subsidence with regard to potential impacts on groundwater dependant ecosystems was identified as a ‘significant’ risk. A detailed hydrogeological investigation as well as a subsidence predictions and impact assessment will be executed as part of the EIA process. An ecological impact assessment will consider the effect of

predicted subsidence levels and hydrogeological impacts on the surface ecology. Finally, the ability of the site's existing water management infrastructure to manage dirty water at the site for the duration of the Project was identified as a significant risk. As such a surface water assessment will evaluate the existing infrastructure based on current and projected groundwater extraction rates and meteorological inputs with respect to disturbed ground (erosion/sedimentation issues).

A number of 'moderate' issues were identified, relating to the Project including:

- Aboriginal heritage impacts from subsidence;
- Community support (or lack of) and angst resulting from the Project;
- Potential impacts to surface features including cliffs and rock formations;
- Noise impacts as a result of coal handling operations and haulage activities; and
- Traffic impacts to forest tracks and local road networks due to increased personnel.

Potential impacts to European heritage sites, impacts to creek geomorphology, infrastructure impacts from subsidence, air quality impacts, construction impacts, impacts to groundwater users and visual amenity issues were ranked as a 'low' risks to the project.

6.2 Identified Environmental Issues

The environmental issues identified during the environment and community risk assessment, and how they will be assessed in the EIS, is discussed in the sections below.

6.2.1 Subsidence

A subsidence predictions and impact assessment report will be developed for the proposed first workings and longwall extraction area. The subsidence impacts will take into consideration the sensitive surface features present within the Project Application Area (refer **Figure 5**).

The subsidence assessment will be undertaken by a suitably qualified subsidence engineering consultant, who will be requested to:

- Initially undertake a collaborative risk based subsidence constraints analysis;
- Identification of mine characteristics (depth of cover, geology, mining method, mining height, mine layout and percentage extraction) and how these characteristics influence transient and final subsidence;
- Identification of sensitive features potentially affected by subsidence, both natural and manmade (surface and sub-surface), and (by involvement in the subsidence risk assessment) an assessment of the significance and sensitivity of those features;
- Identification of known geotechnical constraints (including known and inferred geological structures and known and inferred aquifers and aquicludes) to existing and/or proposed mine design;
- Identification of all natural and man-made features at a minimum 600m of the edge of secondary extraction, and recalibrated to the zero subsidence line following completion of predictions;
- Where possible, a review of previous subsidence predictions from nearby operations against actual subsidence results and, if required, a critique of regional subsidence applicability to the project;

- Review of regional data sets and interpretation of applicability to the specific site;
- Identification of conventional and non-conventional subsidence effects and impacts likely to be experienced at the site (based on known data);
- Identification of an appropriately scaled subsidence prediction methodology for the site that is clearly described and, where available, supported by actual subsidence data. The model must be calibrated to the specific site;
- Assessment of the conservativeness applied to the prediction methodology used;
- Assessment and interpretation of prediction versus measured subsidence;
- Maximum predicted vertical subsidence, tilt and strain;
- Sensitivity analysis including predictions based on mining additional increments of 50m towards natural and man-made features;
- Figures that identify angle of draw and the zero subsidence line, and all natural and man-made features within both zones;
- Make recommendations for impact management and appropriate minimisation strategies.

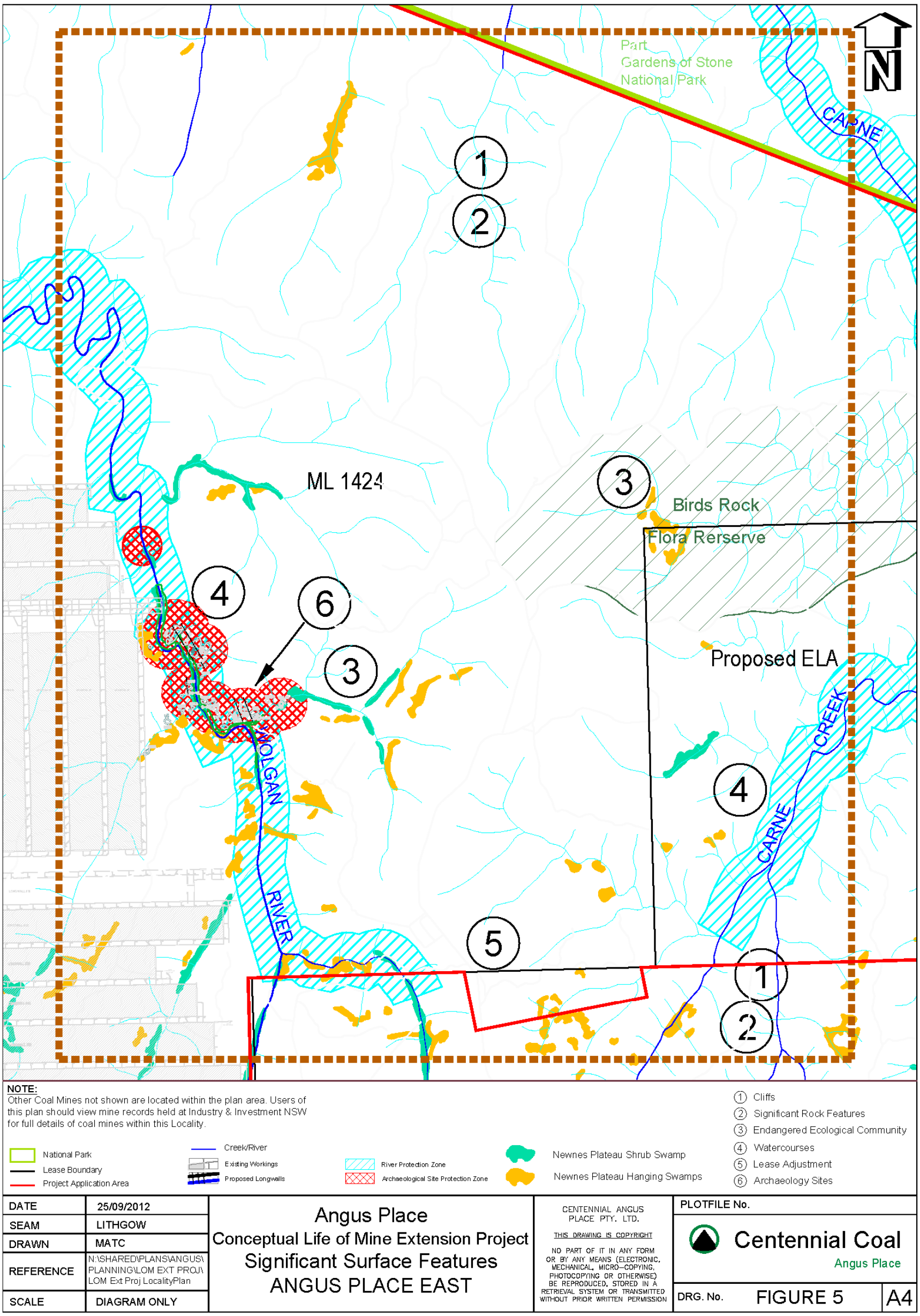


Figure 5 – Surface Features

6.2.2 Flora and Fauna

Clearing activities, as identified from the risk assessment process, pose environmental risks if not adequately assessed and managed. Further, subsidence levels have the potential to impact on surface ecology by affecting aspect and ground/surface water. To this end, Angus Place will appoint a suitably qualified consultant to assess the ecological risks posed by the development and determine suitable mitigation measures.

Angus Place is aware that there are Temperate Highland Peat Swamps on Sandstone (THPSS) within the vicinity of the Project Application Area that may be potentially impacted by the development. THPSS are listed as an Endangered Ecological Community (EEC) under the EPBC Act. There is also the potential for other listed flora and fauna species to be located within the project application area. The Project will be referred to SEWPAC under the provisions of Division 1, Part 7 of the EPBC Act.

Specifically the ecological assessment work to be undertaken for the EIS will focus on the following areas in addition to the impacts of vegetation clearing:

- Subsidence predictions from development and longwall mining. Impact assessment informed by assessments for subsidence, groundwater, surface water and soils and land (regarding land stability and sedimentation and erosion issues).
- Depressurisation of groundwater aquifers. Impacts on any present groundwater dependant ecosystems will be assessed based on the outcomes of the groundwater assessment.

Construction:

- Impacts from the construction of the ventilation facility and dewatering boreholes, in particular clearance of vegetation and habitat removal. Include consideration of fragmentation and the creation of any barriers, weeds and an offset strategy.
- Impacts from construction of supporting surface infrastructure (power supply, pipelines, substation etc.) in particular clearance of vegetation and habitat removal. Include consideration of fragmentation and the creation of any barriers, weeds and an offset strategy.

Operation:

- Any impacts arising from operation e.g. maintenance of bushfire clearance areas, disturbance etc.

Rehabilitation:

- Biodiversity offset strategy
- Liaison with rehabilitation consultants regarding appropriate measures to be included.
- Impacts from proposed rehabilitation strategy.

6.2.3 Surface Water

The Project Application Area traverses both the Wolgan River and Coxs River sub-catchments which report to the Hawkesbury-Nepean River and Sydney Drinking Water Catchments, respectively. As identified from the risk assessment process, there are several potential sources for surface water contamination or loss emanating from the proposed Project. As such, impacts to be addressed include the following:

- Collection and review of background data;

- Classification and mapping of surface water drainage lines overlying the underground mining area;
- Assessment of impacts to creeks which could be impacted by the proposed Project;
- Review of the existing site water balance which includes analysis of any water quality data to determine the median, 80th and 20th percentile values for each parameter. The background water quality will be compared to the ANZECC water quality guidelines;
- Review and update existing monitoring program as required (including any licensing requirements);
- Determine mitigation or management measures as required; and
- Identify any residual environmental risk.

It is anticipated that the EIS will present a full analysis of potential surface water impacts, as well as outline any practical mitigation and management measures required to minimise or mitigate potential impacts.

6.2.4 Groundwater

A Groundwater Impact Assessment will be undertaken as part of the EIS and will include:

- A review of any available background hydrogeological and mining data;
- Searches of the NSW Groundwater Bore Database to identify beneficial use of groundwater in the anticipated radius of drawdown;
- Consideration of the ecological assessment report (to be prepared concurrently to the groundwater assessment) to identify possible Groundwater Dependant Ecosystems (GDEs);
- Development of a high level, conceptual hydrogeological model, including the identification of model layers and boundaries, material properties and sources / sinks;
- Construction of a hydrogeological model based on the conceptual model with calibration of the model against available underground water level data;
- Predictive simulations of water level change in the workings;
- Development of groundwater management strategies and mitigation measures as required;
- Identification of any residual environmental risk; and
- As part of this process the Groundwater Impact Assessment will consider the implications of the Water Sharing Plan.

6.2.5 Greenhouse Gas

This Project will continue to mine the Lithgow seam, which from historic monitoring generally contains low concentrations of GHGs. The GHG assessment will:

- Calculate Scope 1, 2 and 3 GHG estimations for the on-site activities associated with the Project in accordance with the requirements of the NGER Act, and by applying all relevant emission factors and methods including those documented in the NGER System Measurement, Technical Guidelines (June 2010);

  - Scope 1 GHG consist of direct emissions from sources within the boundary of an organisation such a vehicle emissions and manufacturing processes;
  - Scope 2 GHG are indirect emissions from the use of purchase electricity and other consumables;
  - Scope 3 includes all other emissions which occur as a consequence of an organisation's activities but are not from sources owned or controlled by the organisation. A good example in the case of Angus Place is the release of GHG from the combustion of coal used in the generation of electricity.

- Assess the significance of GHG emissions for the Project in relation to national GHG objectives, and report on the Project's GHG implications in terms of Federal and NSW Government policies and protocols;
- Determine mitigation or management measures as required; and
- Identify any residual environmental risk.

6.2.6 Air Quality

An Air Quality Assessment will be undertaken as part of the EIS to assess potential impacts on nearby sensitive receptors. This assessment will include:

- An identification of sensitive receptors within the vicinity of the Project Application Area;
- Identification of all likely dust generating sources including depositional dust, PM10, and Total Suspended Particulates (TSP);
- Identification of any odour resulting from the proposed activities;
- Establishment of background air quality levels and air quality goals for all relevant air quality emissions in accordance with the NSW DECCW "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales" (2005) and other relevant guidelines;
- Consideration of the recently issued state wide Pollution Reduction Program requiring NSW coal mines to undertake an investigation into the practicality of implementing best practise measures to reduce particle emissions;
- Estimation of emission rates, primarily using emission inventory data, including the National Pollutant Inventory (NPI) Emission Estimation Technique Manuals and USEPA AP-42 Emissions Inventory documentation, as required;
- Dispersion modelling to predict PM_{10}, TSP and deposition rates at the closest private receptors;
- Recommendations on mitigation and management strategies; and
- Identification of any residual environmental risk.

6.2.7 Noise and Vibration

The Project has the potential to generate noise and/or vibrations both during the construction and operational phases. As such, a noise impact assessment will be undertaken as part of the EIS and will include:

- An identification of sensitive receptors within the vicinity of the Project Application Area.

- Review of existing background noise levels and contributors from existing infrastructure;
- The assessment will consider noise emissions and vibration levels generated by both the construction and operation of the proposed surface infrastructure;
- Analysis of noise data with reference to local weather conditions and cumulative impacts;
- Impact assessment of the proposed Project's contribution to the noise environment at the nearest sensitive receptors for day, evening and night time periods under calm and prevailing meteorological conditions;
- Identification of noise management strategies and mitigation measures, as required; and
- Identification of any residual environmental risk.

6.2.8 Heritage (Aboriginal and European)

An Aboriginal and Non-Aboriginal Impact Assessment will be undertaken as part of the EIS and will include:

- Background research, including:
    - Identify statutory requirements relevant to the proposed Project;
    - Consultation with the Aboriginal community and other interested stakeholders in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010);
    - Literature review of previous archaeological studies relevant to the Project Application Area;
    - Search of the Aboriginal Heritage Information Management System (AHIMS) database;
    - Assessment of Aboriginal and European archaeological and cultural heritage items identified within the Project Application Area;
    - Baseline inventory of all Aboriginal heritage sites inside the Project Application Area
- Field surveys over the Project Application Area
- Identification of mitigation and management strategies to avoid and/or minimise against identified Aboriginal and/or European impacts; and
- Identification of any residual environmental risk.

6.2.9 Social

A Social Impact Assessment will be undertaken as part of the EIS to identify impacts of the proposed Project on the community, stakeholders and recreational users of the Newnes State Forest to identify mitigation and management measures as required.

6.2.10 Soils, Land Capability and Agriculture Impact Assessment

The EIS will include an assessment and reporting of soils and soil-related issues and recommending further appropriate management and mitigation measures as required. The Project will additionally address the recently issued Agricultural Impact Assessment Guidelines.

6.2.11 Traffic and Transport

A traffic and transport assessment will be carried out and will include:

- Characterisation of the existing road transport environment;
- Identification of potential impacts of the project to the public road network;
- Quantification of traffic generated by the Project during both the construction and operational phases;
- Potential impacts on traffic conditions; and
- Measures to potential impacts from traffic.

6.2.12 Economics

An economic assessment will be conducted for the Project. It is anticipated that the scope of the assessment include:

- A cost benefit analysis;
- A regional economic impact assessment of the project;
- Quantification of the economic cost, benefits and impacts of the project; and
- The provision of recommendations on any relevant management and mitigation.

6.2.13 Visual

A visual impact assessment will be undertaken as part of the EIS.

6.2.14 Other

Other assessments will be carried out for the environmental assessment including cumulative impacts, bushfire, hazards and public safety, mine closure and rehabilitation and waste.

7.0 STAKEHOLDER AND COMMUNITY CONSULTATION

Angus Place will lead the stakeholder and community consultation for the Project. A detailed stakeholder consultation plan will be developed. It will provide a framework to identify and appropriately consult with stakeholders that may be influenced by or have an interest in the Project. Key stakeholders include:

- Community;
- Local industry;
- Non-government organisations and community bodies;
- Mine staff and employees; and
- Government (Federal, State and Local).

A stakeholder consultation log will be maintained as a record of the consultation activities undertaken, and the contents of this log will be summarised in the EIS.

Consultation to be undertaken as part of the Project will include:

- Correspondence and information updates to all residents surrounding the Project Application Area;
- Updates to the Community Consultative Committee;
- Updates to Non-governmental organisations;
- Project updates provided on the Centennial Coal website;
- Project updates provided in local print media;
- Community Information sessions; and
- Face to face meetings with landowners and other regulatory and industry stakeholders where required or requested.

Angus Place maintains a community complaints and enquiries telephone line which is available so that members of the community can obtain information regarding the Project. The community complaints and enquiries telephone number, which is operational 24/7, and an e-mail address are listed in the Angus Place section of the Centennial Coal website.

8.0 PROJECT JUSTIFICATION

The Project will continue to be designed in accordance with ecologically sustainable principles and as such, the Project will avoid, minimise or mitigate any potential impacts to the environment. To date, significant effort by Angus Place has been invested in the design phase of the Project to avoid or minimise potential impacts that could be associated with the Project. A risk based approach has been relied on in designing the Project. A Risk Assessment was undertaken at an early stage and identified potential environmental impacts associated with the Project. This will guide decisions on specialist assessments that should be undertaken across the Project Application Area.

A number of design iterations have occurred throughout the Project scoping phase to minimise and, where possible, avoid impacts to the environment and community. The subsequent environmental impact assessment process, to be supported by the specialist assessments, will refine the Project further by assessing the impacts and determining mitigation measures.

The Project will allow for continued operations at Angus Place within the Colliery Holding Boundary. Angus Place currently employs approximately 225 full time employees and up to 75 contractors. These positions would be sustained over the life of the Project. Statistics available from the Australian Bureau of Statistics show that, in 2006, 10% of the regional workforce was directly engaged in mining. A higher proportion work in mining in this region than for NSW as a whole (around 1%) representing the local industry's importance as an employer.

Angus Place has a long standing history in the regional Lithgow area, and has well-established community relationships. As a coal mine, Angus Place's challenge is to maximise returns through the mineral wealth within existing lease areas, whilst ensuing a minimal environmental impact. Angus Place acknowledges the need to co-exist with its regional community as well as underpin the economic opportunity the mine represents.

9.0 CONCLUSION

Centennial Angus Place Pty Ltd is seeking approval via Division 4.1 under Part 4 of the EP&A Act to undertake the continuation of mining activities at Angus Place Colliery as outlined within this Briefing Paper.

For over 30 years Angus Place Colliery has been:

- mining coal from the Lithgow Seam for its consistent coal characteristics;
- using the same access and egress as that which currently exists; and
- delivering coal to the local power stations (Wallerawang and/or Mount Piper power stations).

To this end, Angus Place considers this proposed Project to be a continuation of existing activities within the currently approved Colliery Holding Boundary. There will be no changes to the way Angus Place manages coal on the pit top, therefore there will be no requirement to change the currently approved surface facilities. These will continue to operate in accordance with the current approval and comply with the current approval conditions. Administrative changes are proposed with regard to existing coal processing and distribution network.

This Briefing Paper has been prepared to provide a description of the Project and identify likely key social, economic and environmental issues. It is further anticipated that this Briefing Paper will provide the Department of Planning and Infrastructure with sufficient information regarding the issue of Director-General Requirements (DGRs). Angus Place is specifically seeking DGRs for the assessment of the specifics detailed in Section 4 of this Briefing Paper with respect to the existing environment and legislative framework.

Appendix 1 – Schedule of Land

APPENDIX 1
SCHEDULE OF LAND

Lot	DP	County	Parish
7	751634	Cook	Cook
13a	751666	Cook	Wolgan
173	751666	Cook	Wolgan
40	751666	Cook	Wolgan
3	722335	Cook	Wolgan
34	751666	Cook	Wolgan
39	751666	Cook	Wolgan
33	751666	Cook	Wolgan
10d	751666	Cook	Wolgan
11c	751666	Cook	Wolgan
40	751636	Cook	Cox
7002	1026540	Cook	Cox
51	751636	Cook	Cox
56	751636	Cook	Cox
63	751636	Cook	Cox
62	751636	Cook	Cox
71	751636	Cook	Cox
72	751636	Cook	Cox
73	751636	Cook	Cox
74	751636	Cook	Cox
75	751636	Cook	Cox
76	751636	Cook	Cox
77	751636	Cook	Cox
78	751636	Cook	Cox
79	751636	Cook	Cox
60	751636	Cook	Cox
358	44086	Cook	Cox
24	751636	Cook	Cox
248	751636	Cook	Cox
1	751636	Cook	Cox
A	418163	Cook	Cox
B	418163	Cook	Cox
C	418163	Cook	Cox
26	751636	Cook	Cox
54	751636	Cook	Cox
55	751636	Cook	Cox
350	751636	Cook	Cox
340	751636	Cook	Cox
1	542432	Cook	Cox
2	542432	Cook	Cox
3	542432	Cook	Cox
25	751636	Cook	Cox
2	751636	Cook	Cox
6	751636	Cook	Cox
15	751636	Cook	Cox
1	825887	Cook	Cox
2	825887	Cook	Cox
41	751636	Cook	Cox
20	827626	Cook	Cox
21	827626	Cook	Cox
22	827626	Cook	Cox
23	827626	Cook	Cox
24	827626	Cook	Cox
25	827626	Cook	Cox
26	827626	Cook	Cox
27	827626	Cook	Cox
4	751636	Cook	Cox
43	751636	Cook	Cox
34	751636	Cook	Cox
5	751636	Cook	Cox
354	751636	Cook	Cox
1	260621	Cook	Cox
2	260621	Cook	Cox
3	260621	Cook	Cox
4	260621	Cook	Cox

Lot	DP	County	Parish
5	260621	Cook	Cox
31	751636	Cook	Cox
33	751636	Cook	Cox
28	751636	Cook	Cox
1	552422	Cook	Cox
2	552422	Cook	Cox
1	732119	Cook	Cox
2	732119	Cook	Cox
57	751636	Cook	Cox
32	751636	Cook	Cox
351	751636	Cook	Cox
1	65810	Cook	Lidsdale
1	860363	Cook	Cox
101	1033592	Cook	Cox
100	1033592	Cook	Cox
2	860363	Cook	Lidsdale
1	568265	Cook	Lidsdale
11	864305	Cook	Lidsdale
16	855844	Cook	Lidsdale
5	115922	Cook	Wolgan
1	523671	Cook	Lidsdale
2	523671	Cook	Lidsdale
1	652799	Cook	Lidsdale
406	751651	Cook	Lidsdale
51	751651	Cook	Lidsdale
15	751651	Cook	Lidsdale
418	751651	Cook	Lidsdale
419	751651	Cook	Lidsdale
2	609683	Cook	Lidsdale
403	751651	Cook	Lidsdale
404	751651	Cook	Lidsdale
405	751651	Cook	Lidsdale
176	751651	Cook	Lidsdale
5	829137	Cook	Lidsdale
16	855844	Cook	Lidsdale
17	855844	Cook	Lidsdale
12	864305	Cook	Lidsdale
30	751651	Cook	Lidsdale
173	666814	Cook	Lidsdale
1	386554	Cook	Lidsdale
2	386554	Cook	Lidsdale
40	751651	Cook	Lidsdale
43	751651	Cook	Lidsdale
1	52865	Cook	Lidsdale
2541-3090		Cook	Cox
1	651723	Cook	Cox
359	44086	Cook	Cox
2	722335	Cook	Wolgan
7003	1026540	Cook	Cox
Newnes State Forest		Cook	Cook

LOTS WITHIN COLLIERY HOLDING

Lot	DP
359	44086
2	732119
1	732119
2	860363
3	545089
29	827626
1	651723
1	597541
700	1067040
1	825124
1	568265
2	1139982
1	1139982
4	1139982
3	1139982
2	722335
7006	1055080
5	115922
101	1033592
40	751636
7003	1026540
11	751636
100	1033592
52	751636
7001	1055079
7318	1149348
7300	1139065

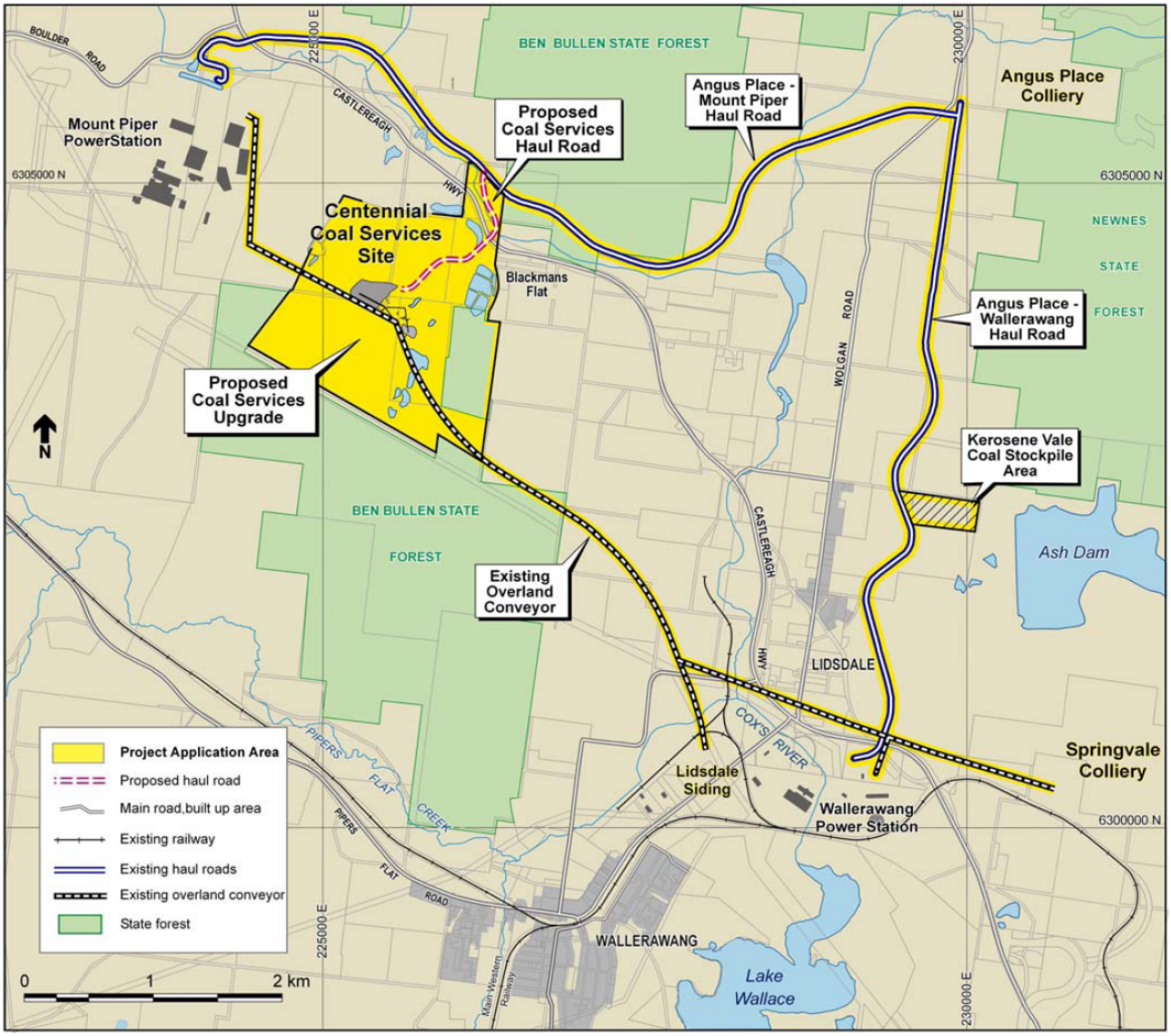
KEROSENE VALE STOCKPILE AREA

Lot	DP
4	1139982
1	386554
1	1139982
2	1139982

Parts of Ben Bullen State Forest
Parts of Newnes State Forest

MINING AUTHORITIES
Consolidated Coal Lease 704
Mining Lease 1424
Sublease Area of Consolidated Coal Lease 702
Part lease transfer ML1326
Exploration Licence 6856
Exploration Licence 6293

Appendix 2 – Springvale Coal Services Project Application Area


BOULDER ROAD
225000 E
BEN BULLEN STATE FOREST
230000 E
Angus Place Colliery
Mount Piper PowerStation
CASTLEREAGH HWY
Proposed Coal Services Haul Road
Angus Place - Mount Piper Haul Road
6305000 N
Centennial Coal Services Site
Blackmans Flat
NEWNES STATE FOREST
WOLGAN ROAD
Angus Place - Wallerawang Haul Road
Proposed Coal Services Upgrade
N
Kerosene Vale Coal Stockpile Area
BEN BULLEN STATE FOREST
Existing Overland Conveyor
CASTLEREAGH HWY
Ash Dam
LIDSDALE
COXS RIVER
Springvale Colliery
Lidsdale Siding
Wallerawang Power Station
6300000 N
PIPERS FLAT CREEK
PIPERS FLAT ROAD
WALLERAWANG
Lake Wallace
Main Western Railway
Project Application Area
Proposed haul road
Main road,built up area
Existing railway
Existing haul roads
Existing overland conveyor
State forest
0
1
2 km

Appendix 3 – Broad Brush Risk Assessment

Dyadem Stature for Risk Management:

Risk Assessment Title: Angus Place East PEA
Version: 1
Region: West
Site: Angus Place
Department: ZZZZ Whole Site
Equipment / Process: Community
Stature Risk Assessment No.: 1000075001
Study Lifecycle State: Risk Assessment In Progress
Potential Hazard No.:
PULSE Actions Required URL:
Site Risk Assessment Ref. No. (Optional): RA0560

1. Background

Angus Place Colliery is situated in the New South Wales western coal field and is owned and operated by Centennial Springvale Pty Ltd, which exists as a joint venture company between Centennial Coal Pty. Ltd. and SK Kores Pty Ltd, pursuant to the joint venture agreement. Centennial Coal Ltd acquired Angus Place Colliery from Powercoal Pty Ltd in August 2002.

In 2010, Centennial Coal Ltd was the subject of a successful takeover bid by Banpu Public Company Limited, listed on the Thailand Stock Exchange. Following the acquisition, Centennial Coal Company was delisted and now exists as Centennial Coal Company Pty Ltd, a subsidiary of Banpu Public Limited.

Angus Place Colliery commenced production in 1979, after being developed as an extension of the Newcom Mine at Kerosene Vale. Coal is extracted from the Lithgow seam. The principal components of the development are an underground longwall mine and development panels, supporting surface infrastructure (Angus Place pit top), a coal stockpile area (Kerosene Vale) and dedicated haul roads to Delta Electricity's Wallerawang and Mount Piper power stations. It is conceivable that in the future Angus Place Colliery may seek access to coal export infrastructure to enable the sale of coal to overseas markets.

Currently, Angus Place Colliery is gathering additional geological information regarding the project area. This application seeks approval for the Angus Place Mine Extension Project. Approval is required by mid-2014.

2. Objective

The following Hierarchy of Controls offers a framework for considering the effectiveness of controls. Note that the effectiveness of a control that is intended to reduce a risk decreases from top to bottom of the list. In other words, the closer the control type is to the top of the hierarchy, the more potentially effective the control.

·Eliminate the hazard or energy source (do not use the energy)

·Minimise or replace the hazard or energy source (reduce the amount of energy to a less damaging level or replace the energy with another that has less potential negative consequences)

·Control the hazard or energy using engineered devices (ex. Lock outs, chemical containers, mechanical roof support, gas monitors, etc.)

·Control the hazard or energy by using physical barriers (ex. machine guarding, warning signs, etc.)

·Control the hazard or energy with procedures (ex. Isolation procedures, standard operating procedures, etc.)

·Control the hazard or energy with personal protective equipment (ex. hard hats, boots with toe caps, gloves, safety glasses, welding gear, etc.)

·Control the hazard or energy with warnings and awareness (ex. posters, labels, stickers, verbal warnings, etc.)

The objectives of this Risk Assessment are to identify the environment and community risks associated with the proposed Angus Place Mine Extension Project and to identify knowledge gaps where further information and/or assessment will be required to support an Environmental Impact Statement for the proposed Project.

3. Potential Hazards

The potential hazards for the proposed Angus Place Mine Extension Project include:

- Impact to Flora / Fauna

- Subsidence impacts;

- Loss of groundwater or depressurisation of groundwater aquifers;

- Discharge requirements exceeding current EPL limits for volume;

- Discharge of water than does not meet EPL or ANZECC quality criteria;

- Traffic Impacts;

- Noise Impacts;

- Impacts to air quality;

- Impacts from GHG emissions;

- Community impacts.

- Impact to Aboriginal / Cultural Heritage

- Impact to European Heritage

- Agricultural impacts

4. Risk Assessment Boundary Definition

This is a preliminary Environment and Community Risk Assessment aimed to identify knowledge gaps and areas where further assessments will be required. The full extent of environmental risks associated with this Project will not be understood until further and more detailed investigations have been undertaken. This risk assessment should be reviewed following the completion of the detailed investigations to ensure all environmental risks associated with the Project have been identified, understood and are at an acceptable level for the company.

5. Risk Assessment Methods

Yes/No	Method
Yes	Workplace Risk Assessment and Control (WRAC)
No	Fault Tree Analysis (FTA)
No	Safety Integrity Level Analysis to Australian Standard 61508 (SIL)
No	Bow Tie Analysis (BTA)
No	Failure Modes and Effects Analysis (FMEA)
No	Hazard and Operability Analysis (HAZOP)

6. Previous Risk Assessment and other documents to be used and/or referenced

Document Name	Title	Version	Referenced Document Date
RA0515	Angus Place Life of Asset Concept Risk Assessment		
	Angus Place Ventilation Facility Project Description		

7. Information Required for Risk Assessment

(This page intentionally left blank)

8. Venue and Time

Date	Description	Location	Start Time	End Time	Comment
1. 28-Mar-2011	Scoping	Angus Place Board Room	7:00 AM	9:00 AM	
2. 28-Mar-2011	Assessment	Angus Place Board Room	1:00 PM	5:00PM	
3.	Review				

9. Risk Assessment Team Selection

Name	Title	Company	Industry Start Date	Yrs. of Exp.	Mobile Phone #	E-Mail Address	Pulse User No.	Role	Attendance		
									1. 28-Mar-2011	2. 28-Mar-2011	3.
Iain Hornshaw	Environmental Coordinator	Angus Place Colliery	20-Aug-2007	4		iain.hornshaw@centennialcoal.com.au	10991	Risk Assessment Owner	P	P	
Peter Corbett	Technical Services Manager	Angus Place Colliery	11-Mar-1992	19		peter.corbett@centennialcoal.com.au	10000	Facilitator	P	P	
James Gower	Mining Engineer	Angus Place Colliery	01-Jan-2001	10		james.gower@centennialcoal.com.au	10005			P	
Natalie Conroy	Environmental Officer	Angus Place Colliery	31-Jan-2011	0		natalie.conroy@centennialcoal.com.au				P	

10. Scope Confirmation

Approver	Scope Confirmation	Date	Comments
1. Jacques Le Roux	Yes	March 28, 2011	

WRAC Analysis Worksheet

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to Aboriginal heritage sites.	1.1.a. Consultation with the Aboriginal community has been undertaken in accordance with the DECCW 2010 Aboriginal Cultural Heritage Consultation Requirements for Proponents.	**C** (D)	4 (R)	18 (M)	1. Detailed subsidence assessment to be completed on final mine layout/design.	
		1.1.b. Longwall panels designed to minimise subsidence effects.				2. Mine design to consider minimising potential impacts	
		1.1.c. Peer review of longwall panel design.				3. Peer review of subsidence assessment.	
		1.1.d. SRK geotechnical hazard map				4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment.	
		1.1.e. Surface topographic mapping indicates known cliff lines.				5. Consultation with the Aboriginal Community to continue in accordance with the 2010 DECCW Aboriginal Cultural Heritage Consultation Requirements for Proponents.	
		1.1.f. Approved and implemented Subsidence Management Plan					
	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods	1.2.a. Limited listed European Heritage sites within lease area.	**E** (D)	5 (E)	25 (L)	6. European heritage impact assessment to be completed as part of the Environmental Assessment.	
		1.2.b. No listed European Heritage sites within proposed mining area.				1. Detailed subsidence assessment to be completed on final mine layout/design.	
						2. Mine design to consider minimising potential impacts	
						3. Peer review of subsidence assessment.	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Resulting in: Impacts to European heritage sites.						
	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to Endangered Ecological Communities or Impacts to fauna habitat.	1.3.a. Flora and Fauna surveys have been conducted over sections of the Angus Place East mining area. 1.3.b. Known listed communities (NPSS & NPHS) have been surveyed. 1.3.c. Approved and implemented Subsidence Management Plan 1.3.d. Detailed surface water monitoring programme in place. 1.3.e. Longwall panels designed to minimise subsidence effects. 1.3.f. Monitoring bores have been installed in some parts of the project area 1.3.g. Peer review of longwall panel design. 1.3.h. SRK geotechnical hazard map	**C** (D)	3 (E)	13 (S)	7. Ecological impact Assessment to be completed as part of the Environmental Assessment. 28. Aquatic Assessment to be conducted as part of Environmental Assessment 1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment.	
	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods	1.4.a. Surface topographic mapping indicates known cliff lines. 1.4.b. Longwall panels designed to avoid subsidence impacts to cliffs ad rock features 1.4.c. Peer review of longwall panel design.	**D** (Pb)	4 (E)	21 (L)	33. Detailed subsidence assessment to be completed on final mine design as part of the Environmental Assessment 2. Mine design to consider minimising potential impacts	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Resulting in: Impacts to Cliff lines and Rock Features.						
	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Changes in flooding regime or Erosion and sediment impacts or Impacts to creek geomorphology.	1.5.a. Mapping of known water courses and 1st, 2nd, 3rd order streams across Project Area. 1.5.b. Angus Place Colliery has an existing Water Management Plan. 1.5.c. Approved and implemented Subsidence Management Plan 1.5.d. Detailed surface water monitoring programme in place. 1.5.e. Longwall panels designed to minimise subsidence effects. 1.5.f. Peer review of longwall panel design. 1.5.g. SRK geotechnical hazard map	**D** (IF)	4 (E)	21 (L)	8. Surface water impact assessment to be completed as part of the Environmental Assessment. 1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment. 29. Stream classification and mapping to be conducted as part of the Environmental Assessment	
	There is a risk to Angus Place from ::: Subsidence ::: Caused by:	1.6.a. Approval of mine design required for secondary extraction through an SMP or extraction plan. 1.6.b. Location of significant infrastructure known 1.6.c. Angus Place has an existing Stakeholder Engagement Plan. 1.6.d. Longwall panels designed to minimise subsidence effects.	**C** (IF)	5 (R)	22 (L)	1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment. 9. Approval of mine design required for secondary extraction through an SMP or extraction plan.	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Mining using continuous miner methods or Mining using Longwall methods Resulting in: Significant impacts to infrastructure.	1.6.e. Peer review of longwall panel design. 1.6.f. SRK geotechnical hazard map 1.6.g. Approved and implemented Subsidence Management Plan				10. Infrastructure Impact Assessment to be completed as part of the Environmental Assessment.	
	There is a risk to Angus Place from ::: Depressurisation of groundwater aquifers ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impact to Groundwater Dependent Ecosystems or Impacts to other groundwater users.	1.7.a. Monitoring bores have been installed in some parts of the project area 1.7.b. Limited number of groundwater users around the project area. 1.7.c. Known extraction rates at bore 940 and pit top groundwater collection system. 1.7.d. Angus Place East multilevel piezometers 1.7.e. Angus Place has an existing Stakeholder Engagement Plan. 1.7.f. Longwall panels designed to minimise subsidence effects. 1.7.g. Mine water balance has been prepared for Angus Place Colliery. 1.7.h. Monitoring bores have been installed in some parts of the project area	**A** (D)	5 (E)	15 (S)	11. Groundwater impact assessment to be completed as part of the Environmental Assessment. 2. Mine design to consider minimising potential impacts 7. Ecological impact Assessment to be completed as part of the Environmental Assessment. 28. Aquatic Assessment to be conducted as part of Environmental Assessment 30. Exploration program to investigate near surface stratigraphy and aquifers	
	There is a risk to Angus Place from ::: Release of GHG emissions :::	1.8.a. Annual NGERS reporting undertaken. 1.8.b. Monitoring and reporting of electricity and diesel usage. 1.8.c. Low in-seam gas content	**A** (D)	5 (E)	15 (S)	12. Greenhouse Gas assessment to be completed as part of the Environmental Assessment. 23. Upgrade the gas monitoring technology for greater accuracy at the site ventilation upcast shaft.	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Caused by: Diesel use or Electricity use or Extraction of coal Resulting in: Increase in GHG emissions from the site.	1.8.d. Gas monitoring (tube bundle system)					
	There is a risk to Angus Place from ::: Extension of mining operations ::: Caused by: Extending mining using continuous miner methods or Extending mining using Longwall methods Resulting in: Community complaints or Community protests or Media coverage.	1.9.a. Social impact assessment completed for the current Angus Place Colliery. 1.9.b. Angus Place has an existing Stakeholder Engagement Plan. 1.9.c. Angus Place Colliery Community Consultative Committee.	**D** (Pb)	3 (R)	17 (M)	13. Review and update the stakeholder engagement plan. 14. Prepare a social impact assessment for the project as part of the Environmental Assessment. 15. Ensure all stakeholders are kept informed of the project. 2. Mine design to consider minimising potential impacts	
2. Coal Handling	There is a risk to Angus Place from	2.1.a. Air quality modelling of existing Angus Place Colliery operations has been conducted 2.1.b. Approved and implemented Air	**D** (D)	4 (L)	21 (L)	16. Air quality assessment to be reviewed and updated for the project as part of the Environmental assessment	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	::: Impacts to air quality ::: Caused by: Coal handling operations at the Angus Place Colliery surface facilities Resulting in: Exceedances of air quality criteria at nearby receptors or Local complaints.	Quality Monitoring Program					
	There is a risk to Angus Place from ::: Noise impacts ::: Caused by: Coal handling operations at the Angus Place Colliery surface facilities or Transport of Coal along haul roads Resulting in: Exceedances of Project specific noise criteria or Local complaints.	2.2.a. Noise modelling of existing Angus Place Colliery operations has been conducted 2.2.b. Approved and implemented Noise Monitoring Program	**C** (IF)	4 (L)	18 (M)	17. Noise model to be reviewed and updated for the project as part of the Environmental Assessment	
3. Water Management	There is a risk to Angus Place from	3.1.a. Angus Place Colliery has an existing Site Water	**D**	4	21	18. Prepare Hydrogeological model for the proposed Angus Place East project area.	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
		Management Plan.					
	::: Exceedances of EPL volumetric limits ::: Caused by: Potential increases in mine water discharge requirements Resulting in: Community complaints or Non-compliance with EPL conditions.	3.1.b. Mine water balance has been prepared for Angus Place Colliery.	(D)	(L)	(L)	19. Update the water balance for the Angus Place East Project Area.	
		3.1.c. Angus Place East multilevel piezometers				20. Groundwater impact assessment to be completed as part of the Environmental Assessment.	
						24. Review the capacity of the Springvale Delta Water Transfer Scheme	
						31. Investigate contingencies for the Water Transfer Scheme	
	There is a risk to Angus Place from ::: Exceedances of EPL and/or ANZECC water quality criteria ::: Caused by: Ability of existing infrastructure to manage extension of life or Insufficient capacity to store water during intense and prolonged rainfall events or Poor quality of water extracted from the underground water storages.	3.2.a. Approved and implemented Site Water Management Plan	**C** (D)	3 (L)	13 (S)	25. Surface water assessment for the Project inclusive of the pit top area and Kerosene Vale stockpile area.	
		3.2.b. Pollution Reduction Programme on EPL.				26. Site to implement a Water Management Committee to review system adequacy and make recommendations for improvement.	
		3.2.c. Pollution control infrastructure					

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Resulting in: Community complaints or Non-compliance with EPL conditions.						
4. Construction	There is a risk to Angus Place from ::: Construction of new infrastructure or upgrades to existing infrastructure ::: Caused by: Requirements of the Project Resulting in: Bushfire impacts or Impacts to Aboriginal heritage sites or Impacts to Endangered Ecological Communities or Impacts to European heritage sites or Impacts to fauna habitat or Impacts to flora or Rehabilitation requirements or Visual impacts.	4.1.a. Flora and Fauna surveys have been conducted over sections of the Angus Place East mining area. 4.1.b. Centennial Project Standard 4.1.c. Implemented Bushfire Management Plan 4.1.d. Mapping of sensitive surface features 4.1.e. Emergency response procedures 4.1.f. Existing contractor management plan framework.	**D** (D)	4 (E)	21 (L)	7. Ecological impact Assessment to be completed as part of the Environmental Assessment. 27. Individual project areas to be specified during Project Development. 4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment. 6. European heritage impact assessment to be completed as part of the Environmental Assessment. 32. Conduct rehabilitation planning as part of the Environmental Assessment	
5. Traffic	There is a risk to Angus Place from ::: Traffic Impacts ::: Caused by:	5.1.a. Traffic Impact Assessment conducted for existing Angus Place operations and for proposed 910N / 900W modification. 5.1.b. On site car park 5.1.c. Agreement with Forests NSW to maintain tracks 5.1.d. Angus Place has an existing	**B** (IF)	5 (R)	19 (M)	21. Traffic impact assessment to be reviewed for the prosed project as part of the Environmental Assessment.	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Increasing employee numbers travelling to and from the Angus Place Colliery surface facilities area or Traffic impacts resulting from construction phase Resulting in: Impact to Forest tracks or Impacts on road safety or Impacts on the local road network.	Stakeholder Engagement Plan.					
6. Visual	There is a risk to Angus Place from ::: Impacts to visual amenity ::: Caused by: Land clearing or Lighting on site or New infrastructure Resulting in: Changes in scenic quality.	6.1.a. Angus Place Colliery Community Consultative Committee. 6.1.b. Angus Place has an existing Stakeholder Engagement Plan. 6.1.c. Location of significant infrastructure known	**C** (D)	5 (R)	22 (L)	22. Visual Impact Assessment to be undertaken as part of the Environmental Assessment.	
7. Gain Approval for Project	There is a risk to Angus Place from ::: Mine life not extended :::	7.1.a. Awareness of Likely Requirements for EA	**C** (Pb)	1 (F)	5 (H)	34. Economic Assessment to be conducted as part of Environmental Assessment 35. Consider assessing cumulative impacts of proposed Angus Place and Springvale Mine Extension Projects in one Environmental Assessment	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Caused by: No approval for mine life extension Resulting in: Mine Closure.						

WRAC Analysis Sorted by RR

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
7. Gain Approval for Project	There is a risk to Angus Place from ::: Mine life not extended ::: Caused by: No approval for mine life extension Resulting in: Mine Closure.	7.1.a. Awareness of Likely Requirements for EA	**C** (Pb)	1 (F)	5 (H)	34. Economic Assessment to be conducted as part of Environmental Assessment 35. Consider assessing cumulative impacts of proposed Angus Place and Springvale Mine Extension Projects in one Environmental Assessment
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods	1.3.a. Flora and Fauna surveys have been conducted over sections of the Angus Place East mining area. 1.3.b. Known listed communities (NPSS & NPHS) have been surveyed. 1.3.c. Approved and implemented Subsidence Management Plan 1.3.d. Detailed surface water monitoring programme in place. 1.3.e. Longwall panels designed to minimise subsidence effects. 1.3.f. Monitoring bores have been	**C** (D)	3 (E)	13 (S)	7. Ecological impact Assessment to be completed as part of the Environmental Assessment. 28. Aquatic Assessment to be conducted as part of Environmental Assessment 1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Impacts to Endangered Ecological Communities or Impacts to fauna habitat.	installed in some parts of the project area				
		1.3.g. Peer review of longwall panel design.				
		1.3.h. SRK geotechnical hazard map				
3. Water Management	There is a risk to Angus Place from ::: Exceedances of EPL and/or ANZECC water quality criteria ::: Caused by: Ability of existing infrastructure to manage extension of life or Insufficient capacity to store water during intense and prolonged rainfall events or Poor quality of water extracted from the underground water storages. Resulting in: Community complaints or Non-compliance with EPL conditions.	3.2.a. Approved and implemented Site Water Management Plan	**C** (D)	3 (L)	13 (S)	25. Surface water assessment for the Project inclusive of the pit top area and Kerosene Vale stockpile area.
		3.2.b. Pollution Reduction Programme on EPL.				26. Site to implement a Water Management Committee to review system adequacy and make recommendations for improvement.
		3.2.c. Pollution control infrastructure				
1. Mining	There is a risk to Angus Place from ::: Depressurisation of groundwater aquifers :::	1.7.a. Monitoring bores have been installed in some parts of the project area	**A** (D)	5 (E)	15 (S)	11. Groundwater impact assessment to be completed as part of the Environmental Assessment.
		1.7.b. Limited number of groundwater users around the project area.				2. Mine design to consider minimising potential impacts
		1.7.c. Known extraction rates at bore 940 and pit top				7. Ecological impact Assessment to be completed as part of the Environmental Assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impact to Groundwater Dependent Ecosystems or Impacts to other groundwater users.	groundwater collection system.				
		1.7.d. Angus Place East multilevel piezometers				28. Aquatic Assessment to be conducted as part of Environmental Assessment
		1.7.e. Angus Place has an existing Stakeholder Engagement Plan.				30. Exploration program to investigate near surface stratigraphy and aquifers
		1.7.f. Longwall panels designed to minimise subsidence effects.				
		1.7.g. Mine water balance has been prepared for Angus Place Colliery.				
		1.7.h. Monitoring bores have been installed in some parts of the project area				
1. Mining	There is a risk to Angus Place from ::: Release of GHG emissions ::: Caused by: Diesel use or Electricity use or Extraction of coal Resulting in: Increase in GHG emissions from the site.	1.8.a. Annual NGERS reporting undertaken.	**A** (D)	5 (E)	15 (S)	12. Greenhouse Gas assessment to be completed as part of the Environmental Assessment.
		1.8.b. Monitoring and reporting of electricity and diesel usage.				23. Upgrade the gas monitoring technology for greater accuracy at the site ventilation upcast shaft.
		1.8.c. Low in-seam gas content				
		1.8.d. Gas monitoring (tube bundle system)				
1. Mining	There is a risk to Angus Place from	1.9.a. Social impact assessment completed for the current Angus Place Colliery.	**D** (Pb)	3 (R)	17 (M)	13. Review and update the stakeholder engagement plan.
		1.9.b. Angus Place has an existing				14. Prepare a social impact assessment for the project as part of the

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Extension of mining operations ::: Caused by: Extending mining using continuous miner methods or Extending mining using Longwall methods Resulting in: Community complaints or Community protests or Media coverage.	Stakeholder Engagement Plan.				Environmental Assessment.
		1.9.c. Angus Place Colliery Community Consultative Committee.				15. Ensure all stakeholders are kept informed of the project. 2. Mine design to consider minimising potential impacts
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to Aboriginal heritage sites.	1.1.a. Consultation with the Aboriginal community has been undertaken in accordance with the DECCW 2010 Aboriginal Cultural Heritage Consultation Requirements for Proponents.	**C** (D)	4 (R)	18 (M)	1. Detailed subsidence assessment to be completed on final mine layout/design.
		1.1.b. Longwall panels designed to minimise subsidence effects.				2. Mine design to consider minimising potential impacts
		1.1.c. Peer review of longwall panel design.				3. Peer review of subsidence assessment.
		1.1.d. SRK geotechnical hazard map				4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment.
		1.1.e. Surface topographic mapping indicates known cliff lines.				5. Consultation with the Aboriginal Community to continue in accordance with the 2010 DECCW Aboriginal Cultural Heritage Consultation Requirements for Proponents.
		1.1.f. Approved and implemented Subsidence Management Plan				
2. Coal Handling	There is a risk to Angus Place from	2.2.a. Noise modelling of existing Angus Place Colliery	**C**	4	18	17. Noise model to be reviewed and updated for the project as part of the Environmental Assessment

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
		operations has been conducted	(IF)	(L)	(M)	
	::: Noise impacts ::: Caused by: Coal handling operations at the Angus Place Colliery surface facilities or Transport of Coal along haul roads Resulting in: Exceedances of Project specific noise criteria or Local complaints.	2.2.b. Approved and implemented Noise Monitoring Program				
5. Traffic	There is a risk to Angus Place from ::: Traffic Impacts ::: Caused by: Increasing employee numbers travelling to and from the Angus Place Colliery surface facilities area or Traffic impacts resulting from construction phase Resulting in:	5.1.a. Traffic Impact Assessment conducted for existing Angus Place operations and for proposed 910N / 900W modification.	**B** (IF)	5 (R)	19 (M)	21. Traffic impact assessment to be reviewed for the prosed project as part of the Environmental Assessment.
		5.1.b. On site car park				
		5.1.c. Agreement with Forests NSW to maintain tracks				
		5.1.d. Angus Place has an existing Stakeholder Engagement Plan.				

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Impact to Forest tracks or Impacts on road safety or Impacts on the local road network.					
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to Cliff lines and Rock Features.	1.4.a. Surface topographic mapping indicates known cliff lines.	**D** (Pb)	4 (E)	21 (L)	33. Detailed subsidence assessment to be completed on final mine design as part of the Environmental Assessment
		1.4.b. Longwall panels designed to avoid subsidence impacts to cliffs ad rock features				2. Mine design to consider minimising potential impacts
		1.4.c. Peer review of longwall panel design.				
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods	1.5.a. Mapping of known water courses and 1st, 2nd, 3rd order streams across Project Area.	**D** (IF)	4 (E)	21 (L)	8. Surface water impact assessment to be completed as part of the Environmental Assessment.
		1.5.b. Angus Place Colliery has an existing Water Management Plan.				1. Detailed subsidence assessment to be completed on final mine layout/design.
		1.5.c. Approved and implemented Subsidence Management Plan				2. Mine design to consider minimising potential impacts
		1.5.d. Detailed surface water monitoring programme in place.				3. Peer review of subsidence assessment.
		1.5.e. Longwall panels designed to minimise subsidence effects.				29. Stream classification and mapping to be conducted as part of the Environmental Assessment

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Changes in flooding regime or Erosion and sediment impacts or Impacts to creek geomorphology.	1.5.f. Peer review of longwall panel design. 1.5.g. SRK geotechnical hazard map				
2. Coal Handling	There is a risk to Angus Place from ::: Impacts to air quality ::: Caused by: Coal handling operations at the Angus Place Colliery surface facilities Resulting in: Exceedances of air quality criteria at nearby receptors or Local complaints.	2.1.a. Air quality modelling of existing Angus Place Colliery operations has been conducted 2.1.b. Approved and implemented Air Quality Monitoring Program	**D** (D)	4 (L)	21 (L)	16. Air quality assessment to be reviewed and updated for the project as part of the Environmental assessment
3. Water Management	There is a risk to Angus Place from ::: Exceedances of EPL volumetric limits ::: Caused by: Potential increases in mine water discharge requirements	3.1.a. Angus Place Colliery has an existing Site Water Management Plan. 3.1.b. Mine water balance has been prepared for Angus Place Colliery. 3.1.c. Angus Place East multilevel piezometers	**D** (D)	4 (L)	21 (L)	18. Prepare Hydrogeological model for the proposed Angus Place East project area. 19. Update the water balance for the Angus Place East Project Area. 20. Groundwater impact assessment to be completed as part of the Environmental Assessment. 24. Review the capacity of the Springvale Delta Water Transfer Scheme 31. Investigate contingencies for the Water Transfer Scheme

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Community complaints or Non-compliance with EPL conditions.					
4. Construction	There is a risk to Angus Place from ::: Construction of new infrastructure or upgrades to existing infrastructure ::: Caused by: Requirements of the Project Resulting in: Bushfire impacts or Impacts to Aboriginal heritage sites or Impacts to Endangered Ecological Communities or Impacts to European heritage sites or Impacts to fauna habitat or Impacts to flora or Rehabilitation requirements or Visual impacts.	4.1.a. Flora and Fauna surveys have been conducted over sections of the Angus Place East mining area.	**D** (D)	4 (E)	21 (L)	7. Ecological impact Assessment to be completed as part of the Environmental Assessment.
		4.1.b. Centennial Project Standard				27. Individual project areas to be specified during Project Development.
		4.1.c. Implemented Bushfire Management Plan				4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment.
		4.1.d. Mapping of sensitive surface features				6. European heritage impact assessment to be completed as part of the Environmental Assessment.
		4.1.e. Emergency response procedures				32. Conduct rehabilitation planning as part of the Environmental Assessment
		4.1.f. Existing contractor management plan framework.				
1. Mining	There is a risk to Angus Place from ::: Subsidence :::	1.6.a. Approval of mine design required for secondary extraction through an SMP or extraction plan.	**C** (IF)	5 (R)	22 (L)	1. Detailed subsidence assessment to be completed on final mine layout/design.
		1.6.b. Location of significant infrastructure known				2. Mine design to consider minimising potential impacts
		1.6.c. Angus Place has an existing				3. Peer review of subsidence assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Significant impacts to infrastructure.	Stakeholder Engagement Plan.				
		1.6.d. Longwall panels designed to minimise subsidence effects.				9. Approval of mine design required for secondary extraction through an SMP or extraction plan.
		1.6.e. Peer review of longwall panel design.				10. Infrastructure Impact Assessment to be completed as part of the Environmental Assessment.
		1.6.f. SRK geotechnical hazard map				
		1.6.g. Approved and implemented Subsidence Management Plan				
6. Visual	There is a risk to Angus Place from ::: Impacts to visual amenity ::: Caused by: Land clearing or Lighting on site or New infrastructure Resulting in: Changes in scenic quality.	6.1.a. Angus Place Colliery Community Consultative Committee.	**C** (D)	5 (R)	22 (L)	22. Visual Impact Assessment to be undertaken as part of the Environmental Assessment.
		6.1.b. Angus Place has an existing Stakeholder Engagement Plan.				
		6.1.c. Location of significant infrastructure known				
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by:	1.2.a. Limited listed European Heritage sites within lease area.	**E** (D)	5 (E)	25 (L)	6. European heritage impact assessment to be completed as part of the Environmental Assessment.
		1.2.b. No listed European Heritage sites within proposed mining area.				1. Detailed subsidence assessment to be completed on final mine layout/design.
						2. Mine design to consider minimising potential impacts
						3. Peer review of subsidence assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to European heritage sites.					

WRAC Analysis Sorted by Consequence

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
7. Gain Approval for Project	There is a risk to Angus Place from ::: Mine life not extended ::: Caused by: No approval for mine life extension Resulting in: Mine Closure.	7.1.a. Awareness of Likely Requirements for EA	**C** (Pb)	1 (F)	5 (H)	34. Economic Assessment to be conducted as part of Environmental Assessment 35. Consider assessing cumulative impacts of proposed Angus Place and Springvale Mine Extension Projects in one Environmental Assessment
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods	1.3.a. Flora and Fauna surveys have been conducted over sections of the Angus Place East mining area. 1.3.b. Known listed communities (NPSS & NPHS) have been surveyed. 1.3.c. Approved and implemented Subsidence Management Plan 1.3.d. Detailed surface water monitoring programme in place. 1.3.e. Longwall panels designed to minimise subsidence effects. 1.3.f. Monitoring bores have been	**C** (D)	3 (E)	13 (S)	7. Ecological impact Assessment to be completed as part of the Environmental Assessment. 28. Aquatic Assessment to be conducted as part of Environmental Assessment 1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Impacts to Endangered Ecological Communities or Impacts to fauna habitat.	installed in some parts of the project area 1.3.g. Peer review of longwall panel design. 1.3.h. SRK geotechnical hazard map				
3. Water Management	There is a risk to Angus Place from ::: Exceedances of EPL and/or ANZECC water quality criteria ::: Caused by: Ability of existing infrastructure to manage extension of life or Insufficient capacity to store water during intense and prolonged rainfall events or Poor quality of water extracted from the underground water storages. Resulting in: Community complaints or Non-compliance with EPL conditions.	3.2.a. Approved and implemented Site Water Management Plan 3.2.b. Pollution Reduction Programme on EPL. 3.2.c. Pollution control infrastructure	**C** (D)	3 (L)	13 (S)	25. Surface water assessment for the Project inclusive of the pit top area and Kerosene Vale stockpile area. 26. Site to implement a Water Management Committee to review system adequacy and make recommendations for improvement.
1. Mining	There is a risk to Angus Place from ::: Extension of mining operations ::: Caused by:	1.9.a. Social impact assessment completed for the current Angus Place Colliery. 1.9.b. Angus Place has an existing Stakeholder Engagement Plan. 1.9.c. Angus Place Colliery Community Consultative Committee.	**D** (Pb)	3 (R)	17 (M)	13. Review and update the stakeholder engagement plan. 14. Prepare a social impact assessment for the project as part of the Environmental Assessment. 15. Ensure all stakeholders are kept informed of the project. 2. Mine design to consider minimising potential impacts

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Extending mining using continuous miner methods or Extending mining using Longwall methods Resulting in: Community complaints or Community protests or Media coverage.					
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to Cliff lines and Rock Features.	1.4.a. Surface topographic mapping indicates known cliff lines.	**D** (Pb)	4 (E)	21 (L)	33. Detailed subsidence assessment to be completed on final mine design as part of the Environmental Assessment
		1.4.b. Longwall panels designed to avoid subsidence impacts to cliffs ad rock features				2. Mine design to consider minimising potential impacts
		1.4.c. Peer review of longwall panel design.				
1. Mining	There is a risk to Angus Place from ::: Subsidence :::	1.5.a. Mapping of known water courses and 1st, 2nd, 3rd order streams across Project Area.	**D** (IF)	4 (E)	21 (L)	8. Surface water impact assessment to be completed as part of the Environmental Assessment.
		1.5.b. Angus Place Colliery has an existing Water Management Plan.				1. Detailed subsidence assessment to be completed on final mine layout/design.
		1.5.c. Approved and implemented				2. Mine design to consider minimising potential impacts

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Changes in flooding regime or Erosion and sediment impacts or Impacts to creek geomorphology.	Subsidence Management Plan				
		1.5.d. Detailed surface water monitoring programme in place.				3. Peer review of subsidence assessment.
		1.5.e. Longwall panels designed to minimise subsidence effects.				29. Stream classification and mapping to be conducted as part of the Environmental Assessment
		1.5.f. Peer review of longwall panel design.				
		1.5.g. SRK geotechnical hazard map				
4. Construction	There is a risk to Angus Place from ::: Construction of new infrastructure or upgrades to existing infrastructure ::: Caused by: Requirements of the Project Resulting in: Bushfire impacts or Impacts to Aboriginal heritage sites or Impacts to Endangered Ecological Communities or Impacts to European heritage sites or Impacts to fauna habitat or Impacts to flora or Rehabilitation requirements or Visual impacts.	4.1.a. Flora and Fauna surveys have been conducted over sections of the Angus Place East mining area.	**D** (D)	4 (E)	21 (L)	7. Ecological impact Assessment to be completed as part of the Environmental Assessment.
		4.1.b. Centennial Project Standard				27. Individual project areas to be specified during Project Development.
		4.1.c. Implemented Bushfire Management Plan				4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment.
		4.1.d. Mapping of sensitive surface features				6. European heritage impact assessment to be completed as part of the Environmental Assessment.
		4.1.e. Emergency response procedures				32. Conduct rehabilitation planning as part of the Environmental Assessment
		4.1.f. Existing contractor management plan framework.				

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
2. Coal Handling	There is a risk to Angus Place from ::: Impacts to air quality ::: Caused by: Coal handling operations at the Angus Place Colliery surface facilities Resulting in: Exceedances of air quality criteria at nearby receptors or Local complaints.	2.1.a. Air quality modelling of existing Angus Place Colliery operations has been conducted 2.1.b. Approved and implemented Air Quality Monitoring Program	**D** (D)	4 (L)	21 (L)	16. Air quality assessment to be reviewed and updated for the project as part of the Environmental assessment
2. Coal Handling	There is a risk to Angus Place from ::: Noise impacts ::: Caused by: Coal handling operations at the Angus Place Colliery surface facilities or Transport of Coal along haul roads Resulting in: Exceedances of Project specific noise criteria or Local complaints.	2.2.a. Noise modelling of existing Angus Place Colliery operations has been conducted 2.2.b. Approved and implemented Noise Monitoring Program	**C** (IF)	4 (L)	18 (M)	17. Noise model to be reviewed and updated for the project as part of the Environmental Assessment

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
3. Water Management	There is a risk to Angus Place from ::: Exceedances of EPL volumetric limits ::: Caused by: Potential increases in mine water discharge requirements Resulting in: Community complaints or Non-compliance with EPL conditions.	3.1.a. Angus Place Colliery has an existing Site Water Management Plan. 3.1.b. Mine water balance has been prepared for Angus Place Colliery. 3.1.c. Angus Place East multilevel piezometers	**D** (D)	4 (L)	21 (L)	18. Prepare Hydrogeological model for the proposed Angus Place East project area. 19. Update the water balance for the Angus Place East Project Area. 20. Groundwater impact assessment to be completed as part of the Environmental Assessment. 24. Review the capacity of the Springvale Delta Water Transfer Scheme 31. Investigate contingencies for the Water Transfer Scheme
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to Aboriginal heritage sites.	1.1.a. Consultation with the Aboriginal community has been undertaken in accordance with the DECCW 2010 Aboriginal Cultural Heritage Consultation Requirements for Proponents. 1.1.b. Longwall panels designed to minimise subsidence effects. 1.1.c. Peer review of longwall panel design. 1.1.d. SRK geotechnical hazard map 1.1.e. Surface topographic mapping indicates known cliff lines. 1.1.f. Approved and implemented Subsidence Management Plan	**C** (D)	4 (R)	18 (M)	1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment. 4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment. 5. Consultation with the Aboriginal Community to continue in accordance with the 2010 DECCW Aboriginal Cultural Heritage Consultation Requirements for Proponents.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impacts to European heritage sites.	1.2.a. Limited listed European Heritage sites within lease area.	**E** (D)	5 (E)	25 (L)	6. European heritage impact assessment to be completed as part of the Environmental Assessment.
		1.2.b. No listed European Heritage sites within proposed mining area.				1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment.
1. Mining	There is a risk to Angus Place from ::: Depressurisation of groundwater aquifers ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in: Impact to Groundwater Dependent	1.7.a. Monitoring bores have been installed in some parts of the project area	**A** (D)	5 (E)	15 (S)	11. Groundwater impact assessment to be completed as part of the Environmental Assessment.
		1.7.b. Limited number of groundwater users around the project area.				2. Mine design to consider minimising potential impacts
		1.7.c. Known extraction rates at bore 940 and pit top groundwater collection system.				7. Ecological impact Assessment to be completed as part of the Environmental Assessment.
		1.7.d. Angus Place East multilevel piezometers				28. Aquatic Assessment to be conducted as part of Environmental Assessment
		1.7.e. Angus Place has an existing Stakeholder Engagement Plan.				30. Exploration program to investigate near surface stratigraphy and aquifers
		1.7.f. Longwall panels designed to minimise subsidence effects.				
		1.7.g. Mine water balance has been prepared for Angus Place Colliery.				

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Ecosystems or Impacts to other groundwater users.	1.7.h. Monitoring bores have been installed in some parts of the project area				
1. Mining	There is a risk to Angus Place from ::: Release of GHG emissions ::: Caused by: Diesel use or Electricity use or Extraction of coal Resulting in: Increase in GHG emissions from the site.	1.8.a. Annual NGERS reporting undertaken. 1.8.b. Monitoring and reporting of electricity and diesel usage. 1.8.c. Low in-seam gas content 1.8.d. Gas monitoring (tube bundle system)	**A** (D)	5 (E)	15 (S)	12. Greenhouse Gas assessment to be completed as part of the Environmental Assessment. 23. Upgrade the gas monitoring technology for greater accuracy at the site ventilation upcast shaft.
1. Mining	There is a risk to Angus Place from ::: Subsidence ::: Caused by: Mining using continuous miner methods or Mining using Longwall methods Resulting in:	1.6.a. Approval of mine design required for secondary extraction through an SMP or extraction plan. 1.6.b. Location of significant infrastructure known 1.6.c. Angus Place has an existing Stakeholder Engagement Plan. 1.6.d. Longwall panels designed to minimise subsidence effects. 1.6.e. Peer review of longwall panel design. 1.6.f. SRK geotechnical hazard map 1.6.g. Approved and implemented Subsidence Management	**C** (IF)	5 (R)	22 (L)	1. Detailed subsidence assessment to be completed on final mine layout/design. 2. Mine design to consider minimising potential impacts 3. Peer review of subsidence assessment. 9. Approval of mine design required for secondary extraction through an SMP or extraction plan. 10. Infrastructure Impact Assessment to be completed as part of the Environmental Assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Significant impacts to infrastructure.	Plan				
5. Traffic	There is a risk to Angus Place from ::: Traffic Impacts ::: Caused by: Increasing employee numbers travelling to and from the Angus Place Colliery surface facilities area or Traffic impacts resulting from construction phase Resulting in: Impact to Forest tracks or Impacts on road safety or Impacts on the local road network.	5.1.a. Traffic Impact Assessment conducted for existing Angus Place operations and for proposed 910N / 900W modification. 5.1.b. On site car park 5.1.c. Agreement with Forests NSW to maintain tracks 5.1.d. Angus Place has an existing Stakeholder Engagement Plan.	**B** (IF)	5 (R)	19 (M)	21. Traffic impact assessment to be reviewed for the prosed project as part of the Environmental Assessment.
6. Visual	There is a risk to Angus Place from ::: Impacts to visual amenity ::: Caused by: Land clearing or Lighting on site or New infrastructure	6.1.a. Angus Place Colliery Community Consultative Committee. 6.1.b. Angus Place has an existing Stakeholder Engagement Plan. 6.1.c. Location of significant infrastructure known	**C** (D)	5 (R)	22 (L)	22. Visual Impact Assessment to be undertaken as part of the Environmental Assessment.

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Changes in scenic quality.					

Recommended Controls

Recommended Controls Do NOT enter additional Recommended Controls on this sheet.	Place(s) Used	Allocated To (Only one SITE person for each Recommended Control)	Required By Date	Pulse User No.	PULSE Ref. No.
1. Detailed subsidence assessment to be completed on final mine layout/design.	Events: 1.1, 1.2, 1.3, 1.5, 1.6	Peter Corbett	30-Nov-2011	10000	
2. Mine design to consider minimising potential impacts	Events: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.9	Peter Corbett	30-Nov-2011	10000	
3. Peer review of subsidence assessment.	Events: 1.1, 1.2, 1.3, 1.5, 1.6	Iain Hornshaw	30-Dec-2011	10991	
4. Aboriginal heritage impact assessment to be completed as part of the Environmental Assessment.	Events: 1.1, 4.1	Iain Hornshaw	29-Mar-2012	10991	
5. Consultation with the Aboriginal Community to continue in accordance with the 2010 DECCW Aboriginal Cultural Heritage Consultation Requirements for Proponents.	Events: 1.1	Iain Hornshaw	29-Mar-2012	10991	
6. European heritage impact assessment to be completed as part of the Environmental Assessment.	Events: 1.2, 4.1	Iain Hornshaw	29-Mar-2012	10991	
7. Ecological impact Assessment to be completed as part of the Environmental Assessment.	Events: 1.3, 1.7, 4.1	Iain Hornshaw	29-Mar-2012	10991	
8. Surface water impact assessment to be completed as part of the Environmental Assessment.	Events: 1.5	Iain Hornshaw	29-Mar-2012	10991	
9. Approval of mine design required for secondary extraction through an SMP or extraction plan.	Events: 1.6	Iain Hornshaw	21-Dec-2012	10991	
10. Infrastructure Impact Assessment to be completed as part of the Environmental Assessment.	Events: 1.6	Iain Hornshaw	29-Mar-2012	10991	
11. Groundwater impact assessment to be completed as part of the Environmental Assessment.	Events: 1.7	Iain Hornshaw	29-Mar-2012	10991	
12. Greenhouse Gas assessment to be completed as part of the Environmental Assessment.	Events: 1.8	Iain Hornshaw	29-Mar-2012	10991	
13. Review and update the stakeholder engagement plan.	Events: 1.9	Iain Hornshaw	29-Mar-2012	10991	
14. Prepare a social impact assessment for the project as part of the Environmental Assessment.	Events: 1.9	Iain Hornshaw	29-Mar-2012	10991	
15. Ensure all stakeholders are kept informed of the project.	Events: 1.9	Iain Hornshaw	29-Mar-2012	10991	

Recommended Controls Do NOT enter additional Recommended Controls on this sheet.	Place(s) Used	Allocated To (Only one SITE person for each Recommended Control)	Required By Date	Pulse User No.	PULSE Ref. No.
16. Air quality assessment to be reviewed and updated for the project as part of the Environmental assessment	Events: 2.1	Iain Hornshaw	29-Mar-2012	10991	
17. Noise model to be reviewed and updated for the project as part of the Environmental Assessment	Events: 2.2	Iain Hornshaw	29-Mar-2012	10991	
18. Prepare Hydrogeological model for the proposed Angus Place East project area.	Events: 3.1	Peter Corbett	29-Mar-2012	10000	
19. Update the water balance for the Angus Place East Project Area.	Events: 3.1	Iain Hornshaw	29-Mar-2012	10991	
20. Groundwater impact assessment to be completed as part of the Environmental Assessment.	Events: 3.1	Iain Hornshaw	29-Mar-2012	10991	
21. Traffic impact assessment to be reviewed for the prosed project as part of the Environmental Assessment.	Events: 5.1	Iain Hornshaw	29-Mar-2012	10991	
22. Visual Impact Assessment to be undertaken as part of the Environmental Assessment.	Events: 6.1	Iain Hornshaw	29-Mar-2012	10991	
23. Upgrade the gas monitoring technology for greater accuracy at the site ventilation upcast shaft.	Events: 1.8	Josh Cornford	29-Mar-2012	10016	
24. Review the capacity of the Springvale Delta Water Transfer Scheme	Events: 3.1	John Swane	29-Mar-2012	140069	
25. Surface water assessment for the Project inclusive of the pit top area and Kerosene Vale stockpile area.	Events: 3.2	Iain Hornshaw	29-Mar-2012	10991	
26. Site to implement a Water Management Committee to review system adequacy and make recommendations for improvement.	Events: 3.2	Scott Wyborn	29-Mar-2012	100052	
27. Individual project areas to be specified during Project Development.	Events: 4.1	Iain Hornshaw	29-Mar-2012	10991	
28. Aquatic Assessment to be conducted as part of Environmental Assessment	Events: 1.3, 1.7	Iain Hornshaw	29-Mar-2012	10991	
29. Stream classification and mapping to be conducted as part of the Environmental Assessment	Events: 1.5	Iain Hornshaw	29-Mar-2012	10991	
30. Exploration program to investigate near surface stratigraphy and aquifers	Events: 1.7	Peter Corbett	29-Mar-2012	10000	
31. Investigate contingencies for the Water Transfer Scheme	Events: 3.1	Greg Banning	29-Mar-2012	140061	
32. Conduct rehabilitation planning as part of the	Events: 4.1	Iain Hornshaw	29-Mar-2012	10991	

Recommended Controls Do NOT enter additional Recommended Controls on this sheet.	Place(s) Used	Allocated To (Only one SITE person for each Recommended Control)	Required By Date	Pulse User No.	PULSE Ref. No.
Environmental Assessment					
33. Detailed subsidence assessment to be completed on final mine design as part of the Environmental Assessment	Events: 1.4	Peter Corbett	30-Nov-2011	10000	
34. Economic Assessment to be conducted as part of Environmental Assessment	Events: 7.1	Iain Hornshaw	29-Mar-2012	10991	
35. Consider assessing cumulative impacts of proposed Angus Place and Springvale Mine Extension Projects in one Environmental Assessment	Events: 7.1	Richard Tacon	30-Jun-2011	0031	

CEY Risk Matrix Page 1

RISK MANAGEMENT STANDARD **Management Standard-004**

CENTENNIAL RISK MATRIX							Likelihood					
							A Certain	B Probable	C Possible	D Remote	E Improbable	Description (D)
Rating	Consequence Note: Consequence may result from a single event or may represent a cumulative impact over a period of 12 months. Use the worst case reasonable consequence if there is more than one.						Common"	Has Happened within Centennial"	"Could Happen & has happened in non-CEY operations	Not Likely	"Practically impossible	Probability (Pb)
	Impact to Annual Business Plan (F)	Personal Injury (PI)	Business Interruption (BI)	Legal (L)	Reputation (R)	Environment (E)	Frequent incidents	Regular incidents	Infrequent incidents	Unlikely to occur. Very few recorded or known incidents	May occur in exceptional circumstances. Almost no recorded incidents.	Incident Frequency (IF)
							Operations – within 3 months	Operations – within 2 years	Operations – within 5 years	Operations – within 10 years	Operations – within 30 years	Operations (Op)
							Project – Every project	Project – Every 2 projects	Project – Every 5 projects	Project – Every 10 projects	Project – Every 30 projects	Project (Pr)
1. Catastrophic	>$50m	Multiple Fatalities	> 1month	Prolonged litigation, heavy fines, potential jail term	Prolonged International media attention	Long term impairment habitats/ ecosystem	1 (E)	2 (E)	5 (H)	7 (H)	11 (S)	
2. Major	$10m - $50m	Single Fatality	1 week to 1 month	Major breach/ major litigation	International media attention	Long term effects of ecosystem	3 (E)	4 (E)	8 (H)	12 (S)	16 (M)	
3. Moderate	$1m - $10m	Serious/ Disabling Injury	1 day to 1 week	Serious breach of regulation. prosecution/ fine	National media attention	Serious medium term environmental effects	6 (H)	9 (H)	13 (S)	17 (M)	20 (L)	
4. Minor	$100k - $1m	Lost Time Injury	12 hrs to 1 day	Non-compliance, breaches in regulation	Adverse local public attention	Minor effects to physical environment	10 (S)	14 (S)	18 (M)	21 (L)	23 (L)	
5. Insignificant	<$100k	First Aid Treatment Only	< 12 hrs	Low level compliance issue	Local complaints	Limited physical damage	15 (S)	19 (M)	22 (L)	24 (L)	25 (L)	

CEY Risk Matrix Page 2

Risk Rating	Risk Category		Generic Management Actions
1 to 4	E	Extreme	Immediate intervention required from senior management to eliminate or reduce this risk
5 to 9	H	High	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
10 to 15	S	Significant	Corrective action required, senior management attention needed to eliminate or reduce risk
16 to 19	M	Moderate	Corrective action to be determined, management responsibility must be specified
20 to 25	L	Low	Monitor and manage by corrective action where practicable

CEY Risk Matrix Page 3

BOW TIE ANALYSIS - Control Effectiveness Matrix									
	Examples	Description	Rank	Control Category	CONTROL – Impact / Status / Quality				
					A >= 80%	B 50 – 80%	C 50 / 50%	D 50 – 20%	E <= 20%
TYPE OF CONTROL	Replace electric hand tools with compressed air alternatives in wet conditions	Eliminates a hazard by removal	1.	**Elimination of hazard**					
	Replace large diameter, heavy cables with smaller ones that are easier to handle manually	Replace element with less risky alternative	2.	**Substitution**					
	Automatic fire fighting sprinkler systems	An automatic device that operates without intervention by personnel	3.	**Engineered without people**					
	Fire alarm that sounds & the operator then has to initiate an evacuation	A device that requires personnel to respond to a stimulus	4.	**Engineered with people**					
	Inspection, maintenance and repair of machinery	A process carried out by personnel	5.	**Procedural**					
	Employee made aware of dangers of large moving equipment where the operators have limited vision	Induction training programs	6.	**Awareness**					